City of Goodyear

Engineering Design Standards and Policies Manual

2017 Edition

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CITY OF GOODYEAR

ENGINEERING DESIGN STANDARDS AND POLICIES MANUAL

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0.1 INTRODUCTION

This section contains various forms, checklists and other materials to assist in the preparation and submittal of construction plans and reports to the City of Goodyear for approval and that must be completed and submitted to obtain any Construction Permit from the City of Goodyear.

Sub-section 0.7 “Clarifications, Corrections and Additions” addresses items in the Engineering Standards that were unclear, incorrect, conflicting, or omitted and that will be addressed during the next revision to the Engineering Standards.

0.2 SIGNATURE BLOCKS

0.2.1 CITY OF GOODYEAR BLOCKS

A. Data Certification

Following is the data certification block required on all plans:

DATA CERTIFICATION
I HEREBY CERTIFY THAT THIS DESIGN IS BASED ON ACCURATE FIELD DATA WHICH HAS BEEN CHECKED IN THE FIELD PRIOR TO SUBMISSION OF THESE PLANS TO THE CITY FOR APPROVAL. BY DATE

B. As-Built Certification

Following is the as-built certification block:

AS-BUILT CERTIFICATION	
I HEREBY CERTIFY THAT THE “AS-BUILT” INFORMATION SHOWN HEREON WAS OBTAINED UNDER MY DIRECT SUPERVISION AND IS CORRECT AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF. BY DATE	(SEAL)

C. Plan Approval

Following is the plan approval block:

CITY OF GOODYEAR – PLAN APPROVAL			
REVIEW AND RECOMMENDED APPROVAL BY:			
FIRE DEPARTMENT		GRADING & DRAINAGE	
LANDSCAPING & PLANNING		WATER & SEWER	
TRAFFIC		PAVING	
STREET LIGHTS		SIGNING & STRIPING	
APPROVED BY: _____			_____
PLANS EXAMINER			DATE

0.2.2 GOODYEAR SIGNATURE BLOCKS

All City of Goodyear Signature/Approval blocks will be added to the cover sheet of each plan set or report cover by the plan preparer. Sufficient room shall be provided for the City approval stamps. See City of Goodyear Standards Section 0.2.1 for approval blocks.

0.2.3 OTHER SIGNATURE BLOCKS

Contact Private Utility Companies (Liberty Water, EPCOR, RID, BWCDD, etc.) for approval blocks for plans within their respective service areas.

A. MCESD Approval Block required for water and sewer approval.

Maricopa County Environmental Services Department APPROVAL
BY: _____ DATE: _____

B. Final Plat Approval Blocks

FINAL PLAT APPROVAL
APPROVED BY THE CITY COUNCIL OF THE CITY OF GOODYEAR, ARIZONA THIS _____ DAY OF _____, 20___. BY: _____ MAYOR (NAME PRINTED) ATTEST: _____ CITY CLERK (NAME PRINTED)

FINAL PLAT APPROVAL
APPROVED BY THE CITY ENGINEER OF THE CITY OF GOODYEAR, ARIZONA THIS _____ DAY OF _____, 20___. BY: _____ CITY ENGINEER (NAME PRINTED)

C. Utility No Conflict Certification Block

Shall be placed on all construction plans to be used to construct underground improvements or aboveground improvements that could potentially impact, or conflict with, existing utilities.

UTILITY NO CONFLICT CERTIFICATION				
Utility	Utility Company	Name of Company Representative	Telephone Number	Date Signed
Water				
Sewer				
Electric				
Telephone				
Natural Gas				
Cable TV				
other				
other				
Engineer's Certification I, being the person responsible for designing the facilities necessary to serve this development, hereby certify that all of the utility companies listed above have reviewed this project proposal and all conflicts have been resolved at this point. 'No Conflict' forms have been obtained from each utility company.				

0.3 CHECKLISTS

Checklists to guide the development of improvement plans can be downloaded from the City of Goodyear website or obtained from the City Engineering Department. These Checklists include but are not limited to the following:

- General Plan Review
- Drainage Report Review
- Mass Grading Plan Review
- Grading and Drainage Plan Review
- Best Management Practices (BMP) Plan for Small Sites Plan Review
- Stormwater Pollution Prevention Plan (SWPPP) for Large Sites Plan Review
- Drywell Plan Review
- Storm Drain Plan Review
- Water Plan Review
- Reclaimed Water Plan Review
- Sewer Plan Review
- Sewer Force Main Plan Review
- Paving Plan Review
- Signing and Striping Plan Review
- Commercial Sites Plan Review
- Fire Department Regulations Plan Review
- Irrigation Plan Review
- Street Light Plan Review
- Traffic Signal Plan Review
- Landscape Plan Review
- Grading and Drainage for Custom Lots Plan Review
- Sales Trailer Plan Review
- As-Builts Plan Review
- Amendments Plan Review

0.4 GENERAL NOTES

0.4.1 GENERAL NOTES FOR CONSTRUCTION

ALL plans for construction within the City of Goodyear Shall have the following shown on either the Cover Sheet or the Detail Sheet

CITY OF GOODYEAR
GENERAL NOTES FOR CONSTRUCTION

A. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION.
B. ALL CONSTRUCTION SHALL CONFORM TO THE CITY ENGINEERING DESIGN STANDARDS AND POLICIES MANUAL (EDS&PM), CITY STANDARD DETAILS, AND CURRENT MARICOPA ASSOCIATION OF

GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION.

C. THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH CITY REQUIREMENTS PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS. HOWEVER, SUCH REVIEW SHALL NOT PREVENT THE CITY FROM REQUIRING CORRECTION OF ERRORS IN PLANS FOUND TO BE IN VIOLATION OF ANY LAW OR ORDINANCE.

D. THE CITY DOES NOT WARRANT ANY QUANTITIES SHOWN ON THESE PLANS.

E. THE CITY APPROVAL IS FOR GENERAL LAYOUT IN THE RIGHT-OF-WAY ONLY. THIS APPROVAL IS VALID FOR A PERIOD OF ONE YEAR. CONSTRUCTION PERMITS SHALL BE OBTAINED DURING THIS PERIOD OR THE PLANS SHALL BE RESUBMITTED FOR REVIEW AND APPROVAL.

F. AN APPROVED SET OF PLANS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.

G. THE CITY CONSTRUCTION INSPECTOR SHALL BE NOTIFIED **48 HOURS** PRIOR TO ANY CONSTRUCTION WORK AND INSPECTIONS (623-932-3004). CONSTRUCTION WORK CONCEALED WITHOUT INSPECTION BY THE CITY CONSTRUCTION INSPECTOR SHALL BE SUBJECT TO EXPOSURE AT THE CONTRACTOR'S EXPENSE.

H. ANY WORK PERFORMED WITHOUT THE APPROVAL OF THE CITY ENGINEER, OR DESIGNEE, AND ANY WORK/MATERIAL NOT IN CONFORMANCE WITH CITY ENGINEERING STANDARDS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

I. RIGHT-OF-WAY IMPROVEMENTS SHALL NOT BE ACCEPTED UNTIL "AS-BUILT" PLANS HAVE BEEN SUBMITTED AND APPROVED BY THE CITY. (SEE AS-BUILT REQUIREMENTS)

J. THE DEVELOPER IS RESPONSIBLE FOR THE REMOVAL OR RELOCATION OF ALL OBSTRUCTIONS WITHIN THE RIGHT-OF-WAY PRIOR TO STARTING NEW CONSTRUCTION.

K. THE DEVELOPER IS RESPONSIBLE FOR ARRANGING THE RELOCATION AND ASSOCIATED COSTS OF ALL UTILITIES. A UTILITY RELOCATION SCHEDULE SHALL BE SUBMITTED PRIOR TO THE ISSUANCE OF PERMITS.

L. THE DEVELOPER IS RESPONSIBLE FOR OBTAINING OR DEDICATING ALL REQUIRED RIGHTS-OF-WAY AND EASEMENTS TO THE CITY PRIOR TO ISSUANCE OF PERMITS.

M. THE CONTRACTOR SHALL CONTACT BLUE STAKE (602-263-1100) AT LEAST **48 HOURS** PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL LOCATE ALL CONFLICTS PRIOR TO CONSTRUCTION.

N. THE CONTRACTOR SHALL BARRICADE CONSTRUCTION SITES AT ALL TIMES PER THE CITY OF PHOENIX TRAFFIC BARRICADE MANUAL. A TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE CITY FOR APPROVAL IN ADVANCE OF CONSTRUCTION.

O. POTABLE WATER IS NOT AVAILABLE FOR CONSTRUCTION USE OTHER THAN THE FILLING AND TESTING OF NEW LINES. THE UNLAWFUL REMOVAL OF WATER FROM A FIRE HYDRANT OR ANY

OTHER SOURCE IS A VIOLATION OF THE MUNICIPAL CODE, PUNISHABLE BY FINE AND/OR IMPRISONMENT.

P. PRIOR TO MOVING OR DESTROYING PROTECTED NATIVE PLANT SPECIES, THE CONTRACTOR SHALL FILE A FORMAL NOTICE OF INTENT (NOI) WITH THE ARIZONA DEPARTMENT OF AGRICULTURE (602-542-6408).

Q. THE CONTRACTOR SHALL COMPLY WITH THE ENVIRONMENTAL PROTECTION AGENCY NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER REQUIREMENTS ESTABLISHED FOR CONSTRUCTION SITES, ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ) GENERAL PERMIT FOR DISCHARGE FROM CONSTRUCTION ACTIVITIES, AND THE CITY OF GOODYEAR STORM WATER MANAGEMENT PLAN.

R. NO PERSON SHALL USE ANY MECHANICAL EQUIPMENT FOR LAND LEVELING OR CLEARING, ROAD CONSTRUCTION, TRENCHING, EXCAVATING, DEMOLITION, NOR ENGAGE IN ANY EARTHMOVING ACTIVITY WITHOUT FIRST OBTAINING A PERMIT FROM THE MARICOPA COUNTY AIR QUALITY DEPARTMENT (MCAQD) (602-506-0666), 1001 N. CENTRAL AVENUE, SUITE 150, PHOENIX, AZ 85003. (THIS NOTICE IS ISSUED PURSUANT TO ARIZONA REVISED STATUES (ARS) 36-779.07, NOTICE OF BUILDING AGENCIES.)

S. THESE PLANS REFLECT CONDITIONS AS THEY EXIST AT THE TIME OF DESIGN. IF EXISTING CONDITIONS HAVE CHANGED BY THE TIME OF CONSTRUCTION THE CONTRACTOR SHALL NOTIFY THE CITY AND THESE PLANS MAY HAVE TO BE AMENDED PRIOR TO PROCEEDING WITH CONSTRUCTION ACTIVITIES.

T. ALL IMPROVEMENTS DAMAGED OR REPLACED DURING CONSTRUCTION SHALL BE REPLACED WITH IMPROVEMENTS THAT MEET THE CURRENT CITY STANDARDS.

0.4.2 GENERAL NOTES FOR MASS GRADING

All plans for on-site Mass Grading shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR MASS GRADING

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.

B. RESULTANT DRAINAGE PATTERN FROM THIS MASS GRADING PLAN WILL NOT NEGATIVELY IMPACT ADJACENT PROPERTIES.

C. THE DEVELOPER ACKNOWLEDGES THAT THESE MASS GRADING PLANS ARE FOR ROUGH GRADING ONLY AND FINAL GRADING PLANS WILL BE REQUIRED PRIOR TO SUBSEQUENT PERMITS BEING ISSUED.

0.4.3 GENERAL NOTES FOR GRADING AND DRAINAGE CONSTRUCTION

All plans for on-site Grading and Drainage construction shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR GRADING AND DRAINAGE CONSTRUCTION

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.
B. FINISHED FLOOR ELEVATIONS SHALL BE A MINIMUM OF 18 INCHES ABOVE POINT OF OUTFALL. LOTS SHALL BE DESIGNED TO FALL TOWARDS THE STREET AT A GRADE NO LESS THAN ONE PERCENT.
C. A PERMIT IS REQUIRED FOR ANY ON-SITE GRADING.
D. A SEPARATE PERMIT IS REQUIRED FOR ANY GRADING RELATED TO OFF-SITE CONSTRUCTION.
E. STAKING PAD AND/OR FINISHED FLOOR ELEVATIONS ARE THE RESPONSIBILITY OF THE DEVELOPER OR HIS ENGINEER. IN A CRITICAL DRAINAGE AREA (FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) ZONES A, AO, AH, A1-A33, AND A99), CERTIFICATION OF THE FINISHED BUILDING FLOOR OR STEM WALL ELEVATION SHALL BE SUBMITTED AND APPROVED PRIOR TO ANY VERTICAL CONSTRUCTION. IN NON-CRITICAL AREAS, THE DEVELOPER'S ENGINEER SHALL SUBMIT CERTIFICATIONS OF CONSTRUCTED BUILDING PAD ELEVATIONS PRIOR TO THE CITY'S ACCEPTANCE OF THE PROJECT.
F. THE CONTRACTOR SHALL COMPLY WITH THE APPROVED STORMWATER POLLUTION PROTECTION PLAN (SWPPP) PREPARED IN ACCORDANCE WITH THE CITY'S GENERAL ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES) STORM WATER PERMIT REQUIREMENTS.
G. THE GRADING CONTRACTOR SHALL DESIGNATE THE LOCATION FOR WASTING SPOIL MATERIALS AND OBTAIN A LETTER FROM THE OWNER GIVING PERMISSION FOR SAID DISPOSAL PRIOR TO STARTING ON-SITE CONSTRUCTION.
H. GRADING AND DRAINAGE PLAN APPROVAL INCLUDES: RETENTION AREAS, DETENTION AREAS, OTHER DRAINAGE FACILITIES, CHANGES TO SURFACE GRADING AFFECTING DRAINAGE STRUCTURES, CURBS, ASPHALT PAVEMENT, AND BUILDING FLOOR ELEVATIONS.
I. THE CONTRACTOR SHALL PROVIDE ALL RETENTION AND DETENTION BASINS AT ELEVATIONS AS SHOWN ON THE PLANS. RETENTION BASINS SIDE SLOPES SHALL NOT EXCEED 4:1 ON PRIVATE PROPERTY OR 6:1 ADJACENT TO WALKWAYS OR AREAS DESIGNATED FOR PEDESTRIAN ACCESS AND PUBLIC RIGHTS-OF-WAY. RETENTION BASIN HIGH WATER ELEVATIONS SHALL NOT EXCEED 3-FOOT DEPTH ON PRIVATE PROPERTY OR 1.5-FOOT DEPTH WITHIN 10-FEET OF PUBLIC RIGHTS-OF-WAY. RETENTION IS NOT

PERMITTED WITHIN PUBLIC RIGHTS-OF-WAY OR PUBLIC UTILITY EASEMENTS (PUE).

J. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND CONFIRMING DEPTHS OF ALL THE EXISTING UTILITY LINES WITHIN PROPOSED RETENTION BASIN AREAS. IF THE BASIN CANNOT BE CONSTRUCTED PER PLAN AS A RESULT OF CONFLICT WITH UNDERGROUND UTILITIES, THE CONTRACTOR SHOULD CONTACT THE CITY AND DESIGNER AND REQUEST MODIFICATION OF THE BASIN DESIGN.

K. "AS-BUILT" DRAWINGS (ONE SET OF PRINTS FOR EACH REVIEW AND A FINAL SET OF MYLARS), CERTIFIED BY THE DEVELOPER'S ENGINEER, SHALL BE SUBMITTED AND APPROVED PRIOR TO ISSUANCE OF A BUILDING "CERTIFICATE OF OCCUPANCY."

L. DEVELOPERS OF NEW PROJECTS SHALL PROVIDE FINANCIAL ASSURANCE IN A FORM AND AMOUNT ACCEPTABLE TO THE CITY ENGINEER AND CITY ATTORNEY TO COVER THE COST TO CORRECT ANY STORM WATER DRAINAGE OR DISPOSAL PROBLEMS THAT MAY ARISE DURING THE FIRST 5 YEARS FOLLOWING THE COMPLETION OF THE INITIAL PROJECT CONSTRUCTION. DURING THE 5-YEAR PERIOD, IF DISPOSAL METHODS IN USE ARE FOUND TO BE INSUFFICIENT TO DISPOSE OF RETAINED STORM WATER WITHIN A 36-HOUR PERIOD FOLLOWING A RAIN EVENT, THE DEVELOPER'S ENGINEER SHALL SUBMIT A CORRECTIVE ACTION PLAN TO THE CITY FOR REVIEW AND APPROVAL. THE SUBMITTED INFORMATION SHALL DEMONSTRATE MEASURES THAT WILL BE IMPLEMENTED TO CORRECT DEFICIENCIES IN THE SYSTEM. THE PLAN SHALL CONFORM TO THE REQUIREMENTS OF THESE GENERAL NOTES.

M. PRIOR TO THE ISSUANCE OF STORM DRAIN PERMITS, STREET SUBGRADE ELEVATIONS SHALL BE GRADED TO WITHIN 0.5 FEET OF THE APPROVED PAVING PLANS; OPEN SPACES, TRACTS, AND RIGHTS-OF-WAY ELEVATIONS GRADED TO WITHIN 0.3 FEET OF APPROVED GRADING PLAN ELEVATIONS; AND PADS CERTIFIED TO BE AT OR +0.1 FOOT ABOVE THE PAD ELEVATIONS AS SHOWN ON THE APPROVED GRADING PLANS.

Drywells

Additional General Notes for Grading and Drainage Construction when Drywells are utilized.

All plans for on-site Grading and Drainage construction in which drywells are used shall have the following shown:

N. DRYWELLS THAT CEASE TO DRAIN A FACILITY WITHIN 36 HOURS OF A STORM EVENT SHALL BE REPLACED OR REFURBISHED BY THE OWNER WITH A NEW ONE(S) WHERE POSITIVE GRAVITY OUTLET METHODS OF DISPOSAL ARE STILL NOT AVAILABLE. SUCH A REQUIREMENT SHALL BE WRITTEN INTO THE CONDITIONS COVENANTS & RESTRICTIONS FOR ALL SUBDIVISIONS WHERE

DRYWELLS ARE USED TO DRAIN STORM WATER STORAGE FACILITIES.

O. A PERCOLATION TEST SHALL BE PERFORMED ON THE DRYWELL TO VERIFY THAT DESIGN PERCOLATION RATES HAVE BEEN ACHIEVED. A COPY OF THE REPORT SHALL BE SUBMITTED TO THE CITY PRIOR TO FINAL APPROVAL OF THE GRADING AND DRAINAGE AND DRYWELL CONSTRUCTION FOR THE PROJECT. TEST WATER SHALL BE POTABLE WATER ONLY.

P. DRYWELLS WITH BORE LOGS THAT INDICATE GREATER THAN 10 FEET OF PERMEABLE SOIL HAS BEEN PENETRATED AS DETERMINED BY A GEOTECHNICAL ENGINEER SHALL NOT REQUIRE A PERCOLATION TEST.

Q. DRYWELLS SHALL NOT BE USED FOR PROJECTS THAT WOULD REQUIRE A DRYWELL AQUIFER PROTECTION PERMIT FROM ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ), WHICH INCLUDES BUT IS NOT LIMITED TO THE USE, STORAGE, LOADING, OR TREATMENT OF HAZARDOUS OR TOXIC MATERIALS.

R. DRYWELLS SHALL NOT BE USED IF THERE ARE HAZARDOUS MATERIALS THAT WILL NEGATIVELY IMPACT ANY DRYWELL INSTALLATION WITHIN THE DRAINAGE AREA.

S. THE DEVELOPER SHALL BE RESPONSIBLE FOR THE REPAIR AND MAINTENANCE OF THE DRYWELL DISPOSAL SYSTEM FOR A PERIOD OF 5 YEARS AFTER INSTALLATION. DURING THE 5-YEAR PERIOD IF DISPOSAL METHODS IN USE ARE FOUND TO BE INSUFFICIENT TO DISPOSE RETAINED STORM WATER WITHIN A 36-HOUR PERIOD FOLLOWING A RAIN EVENT, THE DEVELOPER'S ENGINEER SHALL SUBMIT A CORRECTIVE ACTION PLAN TO THE CITY FOR REVIEW AND APPROVAL.

0.4.4 GENERAL NOTES FOR BMP PLAN, SMALL SITES

All BMP Plans for Small Sites shall have the following notes shown on the BMP plan sheet or BMP detail sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR BMP PLAN, SMALL SITES

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.

B. APPROVAL OF THIS DOCUMENT INDICATES THE CITY OF GOODYEAR ENGINEERING DEPARTMENT HAS REVIEWED AND FOUND THIS TO BE IN GENERAL COMPLIANCE WITH THE CITY'S STORMWATER MANAGEMENT PLAN AND THAT THE CITY OF GOODYEAR IS AT NO TIME RESPONSIBLE FOR THE APPLICANT'S/OPERATOR'S DUTIES TO COMPLY WITH ANY FEDERAL, STATE, OR LOCAL LAW OR ORDINANCE.

C. A CITY OF GOODYEAR CONSTRUCTION STORMWATER PERMIT (CSP) AND A GRADING AND DRAINAGE PERMIT ARE REQUIRED PRIOR TO PERFORMING ANY LAND DISTURBANCE ACTIVITIES. A COPY OF

THE PERMITS AND APPROVED PLANS SHALL BE MAINTAINED ON-SITE.

D. THE FACILITIES SHOWN ON THIS PLAN SHALL BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER STANDARDS. ADDITIONALLY, THEY SHALL BE INSTALLED AND IN OPERATION PRIOR TO ANY GRADING OR LAND CLEARING. WHEREVER POSSIBLE, NATURAL VEGETATION SHALL BE MAINTAINED TO ASSIST IN SILT CONTROL.

E. CONSTRUCTION SHALL BE PERFORMED IN SUCH A MANNER SO THAT STORMWATER DISCHARGES DO NOT CAUSE ANY FLOODING OR DAMAGE TO ADJACENT PROPERTIES OR FLOWS OF SEDIMENT ONTO PUBLIC STREETS, SIDEWALKS, DRAINAGE CHANNELS, PUBLIC UTILITY EASEMENTS (PUE), OR RIGHTS-OF-WAYS.

F. FACILITIES SHALL BE MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONALITY. IN ADDITION, ALL CONTROLS SHALL BE MAINTAINED IN SATISFACTORY CONDITION UNTIL SUCH TIME THAT CONSTRUCTION IS COMPLETED, PERMANENT DRAINAGE FACILITIES ARE OPERATIONAL, AND THE POTENTIAL FOR EROSION HAS PASSED.

G. THE PLANS SHALL BE AMENDED AS NECESSARY DURING THE COURSE OF CONSTRUCTION TO RESOLVE ANY PROBLEM AREAS, WHICH BECOME EVIDENT DURING CONSTRUCTION, ROUTINE INSPECTIONS, AND/OR PERIODS OF RAINFALL. IF IT IS DETERMINED THAT CURRENT CONTROLS ARE NOT EFFECTIVE AT MINIMIZING POLLUTANT DISCHARGES FROM THE SITE, IMMEDIATE EFFORTS SHALL BE MADE TO CORRECT THE PROBLEM WITHIN 72 HOURS AND/OR PRIOR TO THE NEXT RAIN EVENT. THE AMENDED PLAN SHALL BE MAINTAINED ON-SITE.

H. IF AT ANY TIME, THIS SITE BECOMES IMPACTED BY OTHER CONSTRUCTION, STORMWATER POLLUTION PREVENTION ACTIVITIES SHALL BE COORDINATED BETWEEN THE SITES AND DOCUMENTED ON THE PLANS.

I. PROPERTY THROUGH WHICH A WATERCOURSE PASSES SHALL BE KEPT FREE OF CONSTRUCTION MATERIALS, TRASH, DEBRIS, EXCESSIVE VEGETATION, AND OTHER OBSTACLES OR SUBSTANCES WHICH WOULD POLLUTE, CONTAMINATE, OR SIGNIFICANTLY RETARD OR DIVERT THE FLOW OF STORMWATER THROUGH THE PROPERTY.

J. NO CONSTRUCTION MATERIAL, INCLUDING PORTABLE TOILETS SHALL BE STORED ON ANY PORTION OF ANY STREET, SIDEWALK, RIGHT-OF-WAY OR EASEMENT, OR WITHIN 50 FEET OF ANY DRAINAGE WAY.

K. THE SITE SHALL AT ALL TIMES REMAIN FREE OF LOOSE TRASH AND DEBRIS. APPROPRIATELY SIZED COVERED WASTE RECEPTACLES SHALL BE PROVIDED ONSITE AND STORED A MINIMUM OF 50 FEET FROM ANY DRAINAGEWAY OR DRAINAGE INLET.

0.4.5 GENERAL NOTES FOR STORM WATER POLLUTION PREVENTION, LARGE SITES

All plans for Storm Water Pollution Prevention, Large Sites shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR STORM WATER POLLUTION PREVENTION, LARGE SITES

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.
B. APPROVAL OF THIS DOCUMENT INDICATES THE CITY OF GOODYEAR ENGINEERING DEPARTMENT HAS REVIEWED AND FOUND THIS TO BE IN GENERAL COMPLIANCE WITH THE CITY'S STORMWATER MANAGEMENT PLAN AND THAT THE CITY OF GOODYEAR IS AT NO TIME RESPONSIBLE FOR THE APPLICANT'S/OPERATOR'S DUTIES TO COMPLY WITH ANY FEDERAL, STATE, OR LOCAL LAW OR ORDINANCE.
C. IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE THE STORMWATER POLLUTION PROTECTION PLAN (SWPPP) IS MAINTAINED IN COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS. THIS INCLUDES IMPLEMENTATION, CONSTRUCTION, INSPECTION, MAINTENANCE, REPLACEMENT, UPGRADING OF FACILITIES AND RECORD MANAGEMENT. ANY VIOLATIONS AND FINES ARE THE RESPONSIBILITY OF THE OWNER/OPERATOR AND/OR SITE CONTRACTOR.
D. A CITY OF GOODYEAR CONSTRUCTION STORMWATER PERMIT (CSP) PERMIT AND A GRADING AND DRAINAGE PERMIT ARE REQUIRED PRIOR TO PERFORMING ANY LAND DISTURBANCE ACTIVITIES. A COPY OF THE PERMITS AND APPROVED PLANS SHALL BE MAINTAINED ON-SITE.
E. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND CONFIRMING THE DEPTH OF EXISTING UTILITY LINES WITHIN PROPOSED SEDIMENT AND RETENTION BASIN AREAS. IF A BASIN CANNOT BE CONSTRUCTED PER PLAN AS A RESULT OF CONFLICT WITH UNDERGROUND UTILITIES, THE CONTRACTOR SHALL CALL THE CITY AND DESIGNER AND REQUEST MODIFICATION OF THE BASIN DESIGN.
F. BMP SHALL BE INSTALLED IN SUCH A MANNER SO THAT STORMWATER DISCHARGES DO NOT CAUSE ANY FLOODING OR DAMAGE TO ADJACENT PROPERTIES OR FLOWS OF SEDIMENT ONTO PUBLIC STREETS, SIDEWALKS, DRAINAGE CHANNELS, OR RIGHTS-OF-WAYS.
G. A COPY OF THE APPROVED SWPPP, NOTICE OF INTENT (NOI) AND ALL RELATED RECORDS SHALL BE MAINTAINED ON THE SITE AND AVAILABLE FOR REVIEW UPON REQUEST TO THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ) AND THE CITY

OF GOODYEAR. THE CITY OF GOODYEAR MAY AT ANY TIME PERFORM A COMPLIANCE INSPECTION OF THE SITE.

H. THE OPERATOR SHALL POST THE ADEQ AUTHORIZATION NUMBER(S) IN A CONSPICUOUS LOCATION NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE AND RETAIN A COPY OF THE AUTHORIZATION CERTIFICATE WITH THE SWPPP.

I. THE FACILITIES SHOWN ON THIS PLAN SHALL BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER STANDARDS. ADDITIONALLY, THEY SHALL BE INSTALLED AND IN OPERATION PRIOR TO ANY GRADING OR LAND CLEARING. WHEREVER POSSIBLE, NATURAL VEGETATION SHALL BE MAINTAINED TO ASSIST IN SILT CONTROL.

J. THE OPERATOR SHALL PERFORM, AT A MINIMUM, A VISUAL INSPECTION OF THE CONSTRUCTION SITE ONCE EVERY SEVEN CALENDAR DAYS OR ONCE EVERY 14 CALENDAR DAYS AND WITHIN 24 HOURS OF ANY RAIN EVENT GREATER THAN OR EQUAL TO 1/2-INCH AS RECORDED BY THE CLOSEST FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC) RAIN GAGE. IF WITHIN 1/4 MILE OF AN IMPAIRED WATER, INSPECTIONS SHALL BE PERFORMED AT A MINIMUM OF ONCE EVERY SEVEN CALENDAR DAYS AND SHOULD INCLUDE VISUAL OBSERVATIONS OF STORM WATER DISCHARGES AT ALL DISCHARGE LOCATIONS WITHIN ONE BUSINESS DAY AFTER EACH RAIN EVENT OF 1/2-INCH OR GREATER, AS RECORDED BY THE CLOSEST FCDMC RAIN GAGE. THE OPERATOR SHALL PREPARE A REPORT DOCUMENTING HIS/HER FINDINGS ON THE CONDITIONS OF THE SWPPP CONTROLS AND NOTE ANY EROSION PROBLEM AREAS. THE OPERATOR'S REPORT IS TO BE MAINTAINED ON SITE BY THE OPERATOR.

K. THE OPERATOR OF THE SITE SHALL ALSO MAINTAIN RECORDS WITH THE FOLLOWING INFORMATION:
   1. THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR IN A PARTICULAR AREA; AND
   2. THE DATES WHEN CONSTRUCTION ACTIVITIES CEASE IN AN AREA, TEMPORARILY OR PERMANENTLY; AND
   3. THE DATES WHEN AN AREA IS STABILIZED, TEMPORARILY OR PERMANENTLY; AND
   4. THE DATES OF MAINTENANCE/REPLACEMENT OR REMOVAL OF BMP.

L. FACILITIES SHALL BE MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING. IN ADDITION, ALL CONTROLS AS OUTLINED IN THE SWPPP SHALL BE MAINTAINED IN A SATISFACTORY CONDITION UNTIL SUCH TIME THAT CONSTRUCTION IS COMPLETED, PERMANENT DRAINAGE FACILITIES ARE OPERATIONAL, AND THE POTENTIAL FOR EROSION HAS PASSED.

M. THE OPERATOR SHALL AMEND THE SWPPP AS NECESSARY DURING THE COURSE OF CONSTRUCTION TO RESOLVE ANY PROBLEM AREAS WHICH BECOME EVIDENT DURING CONSTRUCTION, ROUTINE

INSPECTIONS, AND/OR PERIODS OF RAINFALL. IF IT IS DETERMINED THAT CURRENT CONTROLS ARE NOT EFFECTIVE AT MINIMIZING POLLUTANT DISCHARGES FROM THE SITE, THE OPERATOR SHALL TAKE IMMEDIATE EFFORTS TO CORRECT THE PROBLEM WITHIN 72 HOURS AND/OR PRIOR TO THE NEXT RAIN EVENT. THE AMENDED PLAN SHALL BE MAINTAINED ON-SITE AND IF REQUIRED, SUBMITTED WITHIN 15 CALENDAR DAYS TO ADEQ.

N. IF, AT ANY TIME, THIS SITE BECOMES IMPACTED BY OTHER CONSTRUCTION, STORM WATER POLLUTION PREVENTION ACTIVITIES SHALL BE COORDINATED BETWEEN THE SITES AND DOCUMENTED IN THE PROJECT SWPPP.

O. ONCE CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED AND THE SITE HAS MET FINAL STABILIZATION REQUIREMENTS WITH ALL TEMPORARY BMP REMOVED, THE AUTHORIZED SITE REPRESENTATIVE MAY FILE A NOTICE OF TERMINATION (NOT) WITH ADEQ, WITH A COPY SUBMITTED TO THE CITY OF GOODYEAR ENGINEERING DEPARTMENT.

P. THE OPERATOR SHALL SUBMIT A COPY OF THE ADEQ *NOT* ACKNOWLEDGEMENT LETTER TO THE CITY, WHICH WILL EFFECTIVELY TERMINATE COVERAGE UNDER THE CSP ISSUED BY THE CITY.

0.4.6 GENERAL NOTES FOR WATER MAIN CONSTRUCTION

All plans for water main construction within right-of-way or easements shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR WATER MAIN CONSTRUCTION

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.

B. ALL CONSTRUCTION SHALL CONFORM TO THE CITY ENGINEERING DESIGN STANDARDS AND POLICIES MANUAL (EDS&PM), CITY STANDARD DETAILS, AND CURRENT MAG UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION.

C. CITY OF GOODYEAR INSPECTORS SHALL BE NOTIFIED **48-HOURS** PRIOR TO STARTING EACH PHASE OF CONSTRUCTION, AND EACH INSPECTION REQUESTED (623-932-3004).

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND ELEVATION OF ANY UTILITY LINES BEFORE STARTING CONSTRUCTION. IF THE EXISTING LINE IS FOUND TO BE IN A SUBSTANTIALLY DIFFERENT LOCATION, OR WILL ADVERSELY AFFECT THE OPERATION OF THE UTILITY, THE CONTRACTOR SHALL NOTIFY THE CITY OF GOODYEAR PRIOR TO MAKING THE CONNECTIONS. AMENDMENTS TO THE PLANS MAY BE REQUIRED PRIOR TO PROCEEDING WITH CONSTRUCTION ACTIVITIES.

E. THE CITY OF GOODYEAR IS NOT LIABLE FOR DELAYS OR DAMAGES TO UTILITIES RELATED TO THIS CONSTRUCTION.

F. AS-BUILT DRAWINGS (ONE SET OF PRINTS FOR EACH REVIEW AND A FINAL SET OF MYLARS), CERTIFIED BY THE DEVELOPER'S ENGINEER, SHALL BE SUBMITTED TO AND ACCEPTED BY THE CITY ENGINEER BEFORE FINAL ACCEPTANCE OF THE WORK. SEE AS-BUILT REQUIREMENTS.

G. BACKFILLING SHALL NOT BE DONE UNTIL LINES ARE INSPECTED AND APPROVED BY THE CITY CONSTRUCTION INSPECTOR.

H. MATERIALS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR ACCORDING TO THE CITY'S APPROVED MATERIALS LIST, EDS&PM CITY STANDARD DETAILS AND MAG UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION. THE APPROVED MATERIALS LIST IS AVAILABLE ON THE CITY WEBSITE OR FROM THE CITY ENGINEERING DEPARTMENT.

I. ALL SERVICE LINES SHALL BE TYPE K COPPER PIPE OR TUBING. THE MINIMUM SIZE SERVICE SHALL BE ONE-INCH. SERVICE LINES SHALL BE CONTINUOUS UNDER PAVEMENT WITHOUT A CONNECTION OR EXTENSION.

J. ALL TAPS SHALL USE ALL BRONZE DOUBLE STRAP SERVICE SADDLES.

K. THE DEVELOPER IS TO INSTALL ALL TAPS AND METER BOXES. THE TAP SHALL TERMINATE WITH AN ANGLE METER VALVE WITHIN THE METER BOX PER CITY STANDARDS.

L. METERS SHALL BE FURNISHED AND INSTALLED BY THE UTILITY AGENCY AFTER PAYMENT OF ALL PREVAILING FEES.

M. METERS WILL ONLY BE INSTALLED IF:
   1. ALL BACTERIOLOGICAL TESTS AND A COUNTY APPROVAL OF CONSTRUCTION (AOC) LETTER HAVE BEEN RECEIVED.
   2. CURB AND GUTTER HAS BEEN CONSTRUCTED AND THE METER BOX IS INSTALLED TO THE SPECIFIED GRADE PER PLANS.
   3. THE LOT NUMBER AND ADDRESS ARE CLEARLY POSTED.
   4. THE METER BOX IS VISIBLE AND FREE OF OBSTRUCTION AND DAMAGE.
   5. THE METER BOX AND LID ARE PER THE CITY APPROVED MATERIALS LIST.
   6. THE METER BOX AND LID ARE OF THE CORRECT SIZE.
   7. THE SERVICE LINES AND CONNECTIONS ARE FREE OF LEAKS.

N. PAVEMENT REPLACEMENTS SHALL BE MADE PER THE CITY EDS&PM, CITY STANDARD DETAILS, AND MAG UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION.

O. ALL WATER SERVICE CONNECTIONS SHALL BE EXTENDED A SUFFICIENT DISTANCE ACROSS THE RIGHT-OF-WAY TO CLEAR ALL FACILITIES TO BE INSTALLED IN PUE PARALLELING STREET RIGHT-OF-WAY.

P. TRACER WIRE SHALL BE INSTALLED ON ALL PRIVATE POLY VINYL CHLORIDE (PVC) WATER LINES LARGER THAN 6 INCHES.

Q. ALL WATER LINES 12 INCHES AND LARGER AND RECLAIMED WATER LINES SHALL BE MARKED WITH LOCATING TAPE ONE FOOT ABOVE THE MAIN.
R. ALL CHANGES IN DIRECTION OF WATER LINES 6 INCHES AND LARGER SHALL BE MARKED WITH AN ELECTRONIC MARKER. ELECTRONIC MARKER SHALL BE A SELF-LEVELING TYPE AND OPERATE ON A FREQUENCY OF 145.7 KHZ UP TO A DEPTH OF 4 FEET.
S. PRIOR TO THE ISSUANCE OF WATER PERMITS, STREET SUBGRADE ELEVATIONS SHALL BE GRADED TO WITHIN 0.5 FEET OF THE APPROVED PAVING PLANS; OPEN SPACES, TRACTS, AND RIGHTS-OR-WAYS ELEVATIONS GRADED TO WITHIN 0.3 FEET OF APPROVED GRADING PLAN ELEVATIONS; AND PADS CERTIFIED TO BE AT OR +0.1 FEET ABOVE THE PAD ELEVATIONS AS SHOWN ON THE APPROVED GRADING PLANS.
T. PRIVATE ON-SITE WATER AND SEWER LINES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL APPLICABLE CITY STANDARDS.
U. ALL DUCTILE IRON WATER LINES LARGER THAN 12 INCHES IN DIAMETER SHALL BE ENCASED IN POLYETHYLENE WRAP PER MAG STANDARD AND MANUFACTURER SPECIFICATIONS.
V. THE CONTRACTOR MUST REQUEST A METER FOR FILLING AND TESTING OF NEW WATER LINES FROM THEIR ASSIGNED CITY CONSTRUCTION INSPECTOR. THIS METER SHOULD BE ORDERED TWO WORKING DAYS PRIOR TO THE START OF CONSTRUCTION.

0.4.7 GENERAL NOTES FOR SEWER MAIN CONSTRUCTION

All plans for sewer main construction within right-of-way or easements shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR SEWER MAIN CONSTRUCTION

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.
B. CONTRACTOR WILL EXPOSE ANY LINES BEING TIED INTO, TO VERIFY LOCATION.
C. THE CITY IS NOT LIABLE FOR DELAYS OR DAMAGES TO UTILITIES RELATED TO THIS CONSTRUCTION.
D. AS-BUILT DRAWINGS (ONE SET OF PRINTS FOR EACH REVIEW AND A FINAL SET OF MYLARS), CERTIFIED BY THE DEVELOPER'S ENGINEER, SHALL BE SUBMITTED TO AND ACCEPTED BY THE CITY ENGINEER BEFORE FINAL ACCEPTANCE OF THE WORK. SEE AS-BUILT REQUIREMENTS.
E. BACKFILLING SHALL NOT BE DONE UNTIL LINES ARE INSPECTED AND APPROVED BY THE CITY CONSTRUCTION INSPECTOR.
F. PAVEMENT REPLACEMENTS SHALL BE MADE PER THE CITY ENGINEERING DESIGN STANDARDS AND POLICIES MANUAL

(EDS&PM), CITY STANDARD DETAILS, AND MAG UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION.

G. POLYVINAL CHLORIDE (PVC) SEWER PIPE MAY BE USED AS AN ALTERNATIVE FOR VITRIFIED CLAY SEWER PIPE IN ACCORDANCE WITH MAG SPECIFICATION SECTION 745 FOR SIZES THROUGH 15-INCH WITH THE FOLLOWING **ADDITION:** 745.8 INSTALLATION AND TESTING: INSTALLATION MUST ALSO COMPLY WITH STANDARD SPECIFICATION (AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) D 2321). SHORT TERM DEFLECTION TESTING SHALL BE PERFORMED ON THE TOTAL FOOTAGE, AFTER COMPLETE BACKFILL AND COMPACTION, BUT PRIOR TO THE INSTALLATION OF FINISHED SURFACE MATERIAL. ADDITIONAL TESTING MAY BE REQUIRED. A SHORT TERM DEFLECTION IN EXCESS OF FIVE PERCENT SHALL BE CONSIDERED UNSERVICEABLE AND SHALL BE REPAIRED OR REPLACED AND RETESTED.

H. A VISUAL INSPECTION OF THE INTERIOR OF THE SEWER LINE USING A TELEVISION CAMERA WILL BE PERFORMED ON THE TOTAL FOOTAGE OF ALL SEWER LINES, AFTER COMPLETE BACKFILL AND COMPACTION, BUT PRIOR TO THE INSTALLATION OF FINISHED SURFACE MATERIAL. ANY PORTION CONSIDERED UNSERVICEABLE BY THE CITY SHALL BE REPAIRED OR REPLACED AND RETESTED AT NO ADDITIONAL COST TO THE CITY AND RETESTED. TWO (2) COPIES OF THE DVD OF THE SEWER LINE AND REPORT OF OBSERVATIONS SHALL BE PROVIDED TO THE CITY FOR INSPECTION AND PERMANENT RECORD. ALL EXPENSES FOR VISUAL INSPECTION USING TELEVISION CAMERA IS THE RESPONSIBILITY OF THE CONTRACTOR.

I. ALL MANHOLE RINGS AND LIDS SHALL BE CAST IRON, LIDS SHALL BE IMPRINTED “CITY OF GOODYEAR SANITARY SEWER.”

J. ALL TAPS SHALL BE WYE TYPE.

K. SEWER TAPS MUST BE A MINIMUM OF 4.5 FEET DEEP AT PROPERTY LINES.

L. ALL SEWER SERVICE CONNECTIONS SHALL BE EXTENDED A SUFFICIENT DISTANCE ACROSS RIGHT-OF-WAY TO CLEAR ALL FACILITIES TO BE INSTALLED IN PUBLIC UTILITY EASEMENTS (PUE) PARALLELING THE RIGHT-OF-WAY.

M. TRACER WIRE SHALL BE INSTALLED ON ALL PRIVATE PVC SEWER LINES.

N. ALL SANITARY SEWER MANHOLES SHALL BE TESTED IN ACCORDANCE WITH ASTM C-1244-93 (PER ARIZONA REVISED STATUTE (ARIZONA ADMINISTRATIVE CODE R18-9-E301. 4.01 D.3.f.ii).

O. ALL SANITARY SEWER MANHOLES SHALL BE COATED WITH A CORROSION RESISTANT COATING AND TREATED WITH AN INSECTICIDE THAT ARE LISTED IN THE CITY’S SEWER APPROVED MATERIALS LIST. RE-APPLICATION OF CORROSION RESISTANT COATING AND INSECTICIDE MUST BE PERFORMED AFTER MODIFICATION TO EXISTING MANHOLES SUCH AS NEW STUBS OR MANHOLE EXTENSIONS ARE DONE.

P. PRIOR TO THE ISSUANCE OF SEWER PERMITS, STREET SUBGRADE ELEVATIONS SHALL BE GRADED TO WITHIN 0.5 FEET OF THE APPROVED PAVING PLANS; OPEN SPACES, TRACTS, AND RIGHTS-OR-WAYS ELEVATIONS GRADED TO WITHIN 0.3 FEET OF APPROVED GRADING PLAN ELEVATIONS OR SUBGRADE BULE-TOP STAKES ARE SET AT MINIMUM 100 FOOT INTERVALS BY A SURVEYOR; AND PADS CERTIFIED TO BE AT OR +0.1 FEET ABOVE THE PAD ELEVATIONS AS SHOWN ON THE APPROVED GRADING PLANS.
PRIVATE ON-SITE WATER AND SEWER LINES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL APPLICABLE CITY STANDARDS.

0.4.8 GENERAL NOTES FOR RECLAIMED WATER MAIN CONSTRUCTION

All plans for reclaimed water main construction within right-of-way or easements shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR RECLAIMED WATER MAIN CONSTRUCTION

A. THE CITY OF GOODYEAR ENGINEERING DEPARTMENT (OR ITS AUTHORIZED REPRESENTATIVE) SHALL INSPECT AND APPROVE ALL TRENCHING, BEDDING, PIPE INSTALLATION, BACKFILL AND COMPACTION. THE CITY OF GOODYEAR SHALL INSPECT AND APPROVE ALL PRESSURE TESTING, DISINFECTIONS, AND ALL OPERATIONAL SYSTEMS TESTS. AFTER COMPLETION OF EACH PHASE OF THE RECLAIMED WATER SYSTEM, BUT BEFORE ACCEPTANCE BY THE CITY OF GOODYEAR AND THE WARRANTY PERIOD, ALL PUNCH LIST ITEMS SHALL BE 100 % COMPLETED, AS GENERATED BY THE CITY OF GOODYEAR.
B. THE MINIMUM COVER OVER RECLAIMED WATER MAINS IS 36 INCHES.
C. BACKFILLING SHALL NOT BE DONE UNTIL MAINS ARE INSPECTED AND APPROVED BY THE CITY CONSTRUCTION INSPECTOR.
D. MATERIALS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR ACCORDING TO THE CITY'S APPROVED MATERIALS LIST, AND MAG UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. THE APPROVED MATERIALS LIST IS AVAILABLE ON THE CITY WEBSITE OR FROM THE ENGINEERING DEPARTMENT.
E. PAVEMENT REPLACEMENTS SHALL BE MADE PER THE CITY OF GOODYEAR ENGINEERING STANDARDS, AND MARICOPA COUNTY ASSOCIATION OF GOVERNMENTS UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION.

F. CONCRETE ENCASEMENT OF RECLAIMED WATER MAINS PER MAG STANDARD DETAIL 404 SHALL BE REQUIRED WHEN A RECLAIMED WATER MAIN CROSSES ABOVE A WATER MAIN OR SANITARY SEWER OR WHEN THE RECLAIMED WATER MAIN IS BELOW THE WATER MAIN OR SANITARY SEWER AND THE SEPARATION BETWEEN THE PIPES IS LESS THAN 24 INCHES IN ACCORDANCE WITH THE CURRENT MAG SPECIFICATION. SECTION 610.5 “SEPARATION”.

G. ANY CHANGES FROM APPROVED PLANS SHALL BE SUBMITTED TO THE ENGINEERING DEPARTMENT FOR APPROVAL PRIOR TO BEING SUBMITTED TO THE CITY OF GOODYEAR WATER SERVICES DEPT. FOR WRITTEN APPROVAL PRIOR TO INSTALLATION.

H. AS-BUILT DRAWINGS (ONE SET OF PRINTS FOR EACH REVIEW AND A FINAL SET OF MYLARS), CERTIFIED BY THE DEVELOPER’S ENGINEER, SHALL BE SUBMITTED TO AND ACCEPTED BY THE CITY ENGINEER BEFORE FINAL ACCEPTANCE OF THE WORK. SEE AS-BUILT REQUIREMENTS.

I. AN APPROVED METALLIC MARKING TAPE SHALL BE PLACED ABOVE THE INSTALLED RECLAIMED WATER MAIN PER MAG SPEC. SECTION 616.4 IDENTIFICATION AND SHALL HAVE THE WORDS “CAUTION: RECLAIMED WATER – DO NOT DRINK”.

J. ALL RECLAIMED WATER VALVE COVERS SHALL BE SQUARE AND IDENTIFIED AS “RECLAIMED WATER” ACCORDING TO MAG SPECIFICATION SECTION 616.4 IDENTIFICATION.

K. ALL RECLAIMED WATER DUCTILE IRON PIPE (DIP), VALVES AND FITTINGS SHALL BE PROTECTED FROM CORROSION BY ENCASEMENT IN A POLYETHYLENE PURPLE WRAPPING, PER MAG STANDARD SPECIFICATION 610.6 POLYETHYLENE CORROSION PROTECTION.

L. DISINFECTION OF WATER DISTRIBUTION MAIN AND RECLAIMED WATER MAIN PIPE AND FITTINGS SHALL BE IN ACCORDANCE WITH MAG SPECIFICATION SECTION 610.16, “DISINFECTING WATER LINES “AND MAG SPECIFICATION SECTION 611, “DISINFECTING WATER MAINS.”

M. ALL CHANGES IN DIRECTION OF RECLAIMED WATER MAINS 6-INCH AND LARGER SHALL BE MARKED WITH AN ELECTRONIC MARKER AS LISTED IN THE CITY’S RECLAIMED WATER APPROVED MATERIALS LIST. ELECTRONIC MARKER SHALL BE A SELF LEVELING TYPE AND OPERATE ON A FREQUENCY OF 145.7 KHz UP TO A DEPTH OF 4 FEET.

N. A 2-INCH x 4-INCH METAL STUD (PAINTED PURPLE) SHALL BE SET ONE-FOOT BEHIND EACH RECLAIMED WATER STUB-OUT. A 2-INCH x 4-INCH STUD MARKING RECLAIMED WATER MAIN STUB-OUT SHALL BE FIRMLY SET INTO THE GROUND AND SET ONE (1) FOOT ABOVE THE GROUND SURFACE DOWN TO THE CROWN OF PIPE.

O. ALL CURB STOPS WITH FLUSHING PIPES SHALL BE PAINTED PURPLE AS IDENTIFIED IN THE CITY’S RECLAIMED WATER APPROVED MATERIALS LIST AND THE CURB STOP SHALL BE LABELED WITH TAGS IN ACCORDANCE WITH MAG SPECIFICATION SECTION 616.4.

THE TAGS SHALL BE PURPLE AND SHALL HAVE THE WORDS "RECLAIMED WATER-DO NOT DRINK".

P. ALL RECLAIMED WATER LINES LARGER THAN 12 INCHES IN DIAMETER SHALL BE ENCASED IN POLYETHYLENE WRAP PER CITY, MAG AND MANUFACTURER STANDARD SPECIFICATIONS.

Q. THE CONTRACTOR MUST REQUEST A METER FOR FILLING AND TESTING OF NEW RECLAIMED WATER LINES FROM THEIR CITY CONSTRUCTION INSPECTOR. THIS METER SHOULD BE ORDERED TWO WORKING DAYS PRIOR TO THE START OF CONSTRUCTION.

0.4.9 GENERAL NOTES FOR STREET CONSTRUCTION

All plans for street construction within right-of-way or easements shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR STREET CONSTRUCTION

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.

B. ANY WORK PERFORMED WITHOUT APPROVAL OF THE CITY ENGINEER, AND ANY WORK/MATERIAL NOT IN CONFORMANCE WITH THE SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND ELEVATION OF ANY UTILITY LINES BEFORE STARTING CONSTRUCTION ACTIVITIES. IF THE EXISTING LINE IS FOUND TO BE IN A SUBSTANTIALLY DIFFERENT LOCATION, OR WILL ADVERSELY AFFECT THE OPERATION OF THE UTILITY, THE CONTRACTOR SHALL NOTIFY THE CITY OF GOODYEAR PRIOR TO MAKING THE CONNECTIONS. AMENDMENTS TO THE PLANS MAY BE REQUIRED PRIOR TO PROCEEDING WITH CONSTRUCTION ACTIVITIES.

D. CITY OF GOODYEAR IS NOT LIABLE FOR DELAYS OR DAMAGES TO UTILITIES RELATED TO THIS CONSTRUCTION; NEITHER WILL THE CITY PARTICIPATE IN THE COST OF UTILITY CONSTRUCTION OR RELOCATION.

E. AS-BUILT DRAWINGS (ONE SET OF PRINTS FOR EACH REVIEW AND A FINAL SET OF MYLARS), CERTIFIED BY THE DEVELOPER'S ENGINEER, SHALL BE SUBMITTED TO AND ACCEPTED BY THE CITY ENGINEER BEFORE FINAL ACCEPTANCE OF THE WORK. (SEE AS-BUILT REQUIREMENTS).

F. CONTRACTOR SHALL CONTINUOUSLY REFERENCE LOCATION OF ALL VALVES DURING CONSTRUCTION.

G. ALL UNDERGROUND UTILITIES LOCATED IN THE ROADWAY SHALL BE COMPLETED BEFORE PAVING.

H. BASE COURSE SHALL NOT BE PLACED UNTIL SUBGRADE HAS BEEN APPROVED BY THE CITY CONSTRUCTION INSPECTOR.

I. GUTTERS SHALL BE WATER TESTED FOR DRAINAGE IN THE PRESENCE OF THE CITY CONSTRUCTION INSPECTOR.

J. THE EXACT POINT OF MATCHING TERMINATION AND OVERLAY SHALL BE DETERMINED IN THE FIELD BY THE CITY CONSTRUCTION INSPECTOR.

K. CURB, GUTTER, SIDEWALK, AND PAVEMENT SHALL BE SWEPT CLEAN OF DIRT AND DEBRIS.

L. CONTRACTOR SHALL INSTALL A BLUE REFLECTOR AT ALL FIRE HYDRANT LOCATIONS. REFLECTOR SHALL BE GLUED WITH A CITY APPROVED BITUMINOUS ADHESIVE TO THE FINISHED PAVING AT THE APPROPRIATE LOCATION.

M. ANY SAW CUT ALONG EXISTING ROADWAY EDGE WHICH REMOVES THE EDGE OF THE ROADWAY SHALL BE A MINIMUM OF ONE-FOOT FROM THE EDGE OF THE EXISTING ROADWAY. THE CUT DISTANCE MAY BE GREATER, BASED ON PAVEMENT CONDITIONS OR ROADWAY ELEVATIONS BUT SHALL NOT BE LOCATED WITHIN A LANE WHEEL PATH, AND IF NEEDED SHALL BE IN HALF LANE INCREMENTS.

N. ALL PAVEMENT MARKING, SIGNING AND CONSTRUCTION SHALL CONFORM TO MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION (MCDOT) PAVEMENT MARKING AND SIGNING MANUALS, MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD MOST RECENT EDITION), THE ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT) SUPPLEMENT TO MUTCD, THE CITY OF GOODYEAR ENGINEERING STANDARDS.

O. PRIOR TO THE EXPIRATION OF THE WARRANTY PERIOD, ALL PAVEMENT CRACKS ¼-INCH OR WIDER SHALL BE CLEANED, PREPARED, AND CRACK SEALED IN ACCORDANCE WITH MAG SECTION 337.

P. PRIOR TO THE EXPIRATION OF THE WARRANTY PERIOD, ALL NEW PAVEMENTS (EXCEPT RAC) SHALL BE SEALED IN ACCORDANCE WITH MAG SECTION 333 WITH A CITY-APPROVED MATERIAL. NEW RPM'S, FIRE HYDRANT REFLECTORS, THERMOPLASTIC MARKINGS, AND OTHER SYMBOLS AND MARKINGS MAY BE REQUIRED AFTER APPLICATION OF THE PRESERVATIVE SEAL.

0.4.10 GENERAL NOTES FOR SIGNING AND STRIPING

All plans for Signing and Striping shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR SIGNING AND STRIPING

A. ALL PAVEMENT MARKING, SIGNING AND CONSTRUCTION SHALL CONFORM TO MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION (MCDOT) PAVEMENT MARKING AND SIGNING MANUALS, MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES MOST RECENT EDITION (MUTCD), AND THE ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT) SUPPLEMENT TO MUTCD.

B. TEMPORARY TRAFFIC CONTROL SHALL CONFORM TO THE CITY OF PHOENIX "TRAFFIC BARRICADE MANUAL" AND/OR AS DIRECTED BY THE CITY OF GOODYEAR ENGINEERING DEPARTMENT.

C. ALL PAVEMENT SUBJECT TO A WARRANTY PERIOD (TYPICALLY TWO YEARS) WILL BE REQUIRED TO PROVIDE NEW THERMOPLASTIC MARKINGS AS A PART OF THE FINAL WARRANTY INSPECTION.

D. ALL PAVEMENT MARKINGS ARE TO BE MAINTAINED BY THE DEVELOPER DURING THE WARRANTY PERIOD AND MAY BE INSTALLED AS 0.015" (15 MIL) REFLECTORIZED TRAFFIC PAINT.

E. ALL LANE STRIPING, CROSSWALKS AND CHEVRONS SHALL BE 0.060" (60 MIL) HOT SPRAYED THERMOPLASTIC, UNLESS OTHERWISE NOTED ON THE PLANS. ALL PAVEMENT SYMBOLS, ARROWS AND LEGENDS SHALL BE 0.090" (90 MIL) HOT SPRAYED THERMOPLASTIC. RUBBERIZED ASPHALT MUST CURE FOR A MINIMUM OF 30 DAYS PRIOR TO APPLYING THERMOPLASTIC MARKINGS. ALL TEMPORARY STRIPING SHALL BE 0.015" (15MIL) REFLECTORIZED TRAFFIC PAINT.

F. RAISED PAVEMENT MARKERS SHALL BE INSTALLED PER THE MCDOT PAVEMENT MARKING MANUAL AND SIGNING MANUALS, WITH A CITY APPROVED BITUMINOUS ADHESIVE.

G. ALL EXISTING PAVEMENT MARKINGS WHICH CONFLICT WITH PROPOSED MARKINGS SHALL BE REMOVED BY WATER BLASTING, OR BY CITY APPROVED METHOD, PRIOR TO THE INSTALLATION OF NEW PAVEMENT MARKINGS. REMOVALS SHALL BE TO THE SATISFACTION OF THE CITY INSPECTOR. ALL AREAS THAT ARE OBLITERATED WILL BE SEALED WITH A CITY APPROVED PRODUCT.

H. THE CONTRACTOR SHALL SPOT LAYOUT THE ENTIRE PROJECT PRIOR TO STRIPING. THE CONTRACTOR SHALL CONTACT THE CITY OF GOODYEAR CONSTRUCTION INSPECTOR TO MAKE ARRANGEMENTS FOR INSPECTION PRIOR TO APPLYING PAVEMENT MARKINGS. THE PERMANENT PAVEMENT MARKING PLANS SHALL BE MODIFIED WHEN DIRECTED BY THE DESIGN ENGINEER. ANY STRIPING APPLIED BEFORE LAYOUT APPROVAL SHALL BE SUBJECT TO REMOVAL, PAVEMENT RESURFACING, AND RESTRIPING AT THE CONTRACTOR'S EXPENSE.

I. "NO PARKING" SIGNS (R8-3a) SHALL BE INSTALLED OR REINSTALLED APPROXIMATELY EVERY 350 FEET ALONG THE LENGTH OF THE ARTERIAL, COLLECTOR, AND OTHER RESTRICTED STREETS THAT ARE A PART OF THE PROJECT, APPROXIMATELY 5 FEET FROM THE BACK OF THE CURB. BAND TO STREETLIGHT POLES WHEN AVAILABLE. SIGNS MOUNTED ON STREETLIGHT POLES SHALL NOT COVER THE STREETLIGHT POLES NUMBERS. POLE NUMBERS SHALL BE RELOCATED SO THEY ARE VISIBLE.

J. ALL SIGNS SHALL BE 3M DIAMOND VIP GRADE SHEETING OR ASTM D-4956-04 PROPOSED TYPE XI SHEETING (3M 4090 SERIES OR EQUIVALENT) WHICH WILL BE ATTACHED TO THE STANDARD SIGNAGE ALUMINUM PLATES. SIGN IMAGING SHALL BE IN COMPLIANCE WITH THE REFLECTIVE SHEETING MANUFACTURER'S MATCHED COMPONENT SYSTEM. SIGN IMAGING SHALL CONSIST OF AN ACRYLIC BASED ELECTRONIC CUTTABLE FILM (3M 1170 SERIES

OR EQUIVALENT) WITH STANDARD HIGHWAY COLORS. IN ADDITION, IF CALLED OUT ON THE APPROVED PLANS TO CREATE A GRAFFITI-PROTECTIVE COATING, A PROTECTIVE OVERLAY FILM (3M OR EQUIVALENT) SHALL BE USED WHICH IS DESIGNATED TO COMPLY WITH THE UNDERLYING REFLECTIVE SHEETING MATCHED COMPONENT SYSTEM. SHEETING SHALL HAVE A 12 YEAR MANUFACTURER'S WARRANTY. A LETTER OF CERTIFICATION FROM THE SIGN FABRICATOR SHALL BE SUBMITTED PRIOR TO SIGN INSTALLATION STATING THE MATERIALS TO BE USED.

K. SIGNS SHALL BE INSTALLED ON 2" TELESPAR POSTS PER CITY OF GOODYEAR (C.O.G.) STANDARD DETAIL NO. G-3209-2 UNLESS THEY CAN BE MOUNTED ON A STREET LIGHT POLE WHICH IS IN CLOSE PROXIMITY. SIGNS MOUNTED ON STREET LIGHT POLES CANNOT COVER THE STREET LIGHT POLES NUMBERS. POLE NUMBERS WILL NEED TO BE RELOCATED SO THEY ARE VISIBLE.

L. STREET NAME SIGNS SHALL BE O.80-INCH FLAT SHEET ALUMINUM FOR SIGNS UP TO 48 INCHES. SIGNS 48 INCHES AND OVER SHALL BE .125-INCH FLAT SHEET ALUMINUM. POST CAPS, SEPARATOR AND CANTILEVER BRACKETS SHALL BE A MINIMUM OF HALF THE WIDTH OF THE SIGN TO BE MOUNTED.

M. ALL ADVANCED STREET NAME SIGNS SHALL BE HIGHWAY SERIES "C" 8 INCH WHITE UPPER-CASE AND LOWER-CASE LETTERS. ALL ADVANCED STREET NAME SIGNS WILL BE INSTALLED UTILIZING TWO (2), 2" POSTS WITH ANCHORS.

0.4.11 GENERAL NOTES FOR LANDSCAPING

All plans for Landscaping shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR LANDSCAPING

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.

B. ALL SIGNS, MONUMENT WALLS AND SITE LIGHTING REQUIRE SEPARATE BUILDING APPROVAL.

C. ALL FIRE HYDRANTS SHALL REQUIRE A 7-FOOT CLEARANCE IN ALL DIRECTIONS TO ANY NEW OR EXISTING LANDSCAPE.

D. SUBSTITUTIONS IN TYPE, AND/OR DEVIATIONS IN SIZE OR QUANTITY FROM THE APPROVED LANDSCAPE OR IRRIGATION PLANS SHALL NOT BE PERMITTED WITHOUT PRIOR WRITTEN APPROVAL FROM THE CITY OF GOODYEAR. (CONTACT THE CITY LANDSCAPE TECHNICIAN REGARDING ALL PLANTING AND IRRIGATION SUBSTITUTIONS AT 623-932-3004.)

E. ALL PLANT MATERIAL LOCATED IN THE PUBLIC RIGHTS-OF-WAY OR CITY OF GOODYEAR MAINTAINED AREAS SHALL BE IN COMPLIANCE WITH THE DEPARTMENT OF WATER RESOURCES LOW WATER USE PLANT LIST FOR THE PHOENIX ACTIVE MANAGEMENT AREA.

F. ALL PLANT MATERIAL AND SPECIFICATIONS SHALL CONFORM TO THE ARIZONA NURSERYMAN ASSOCIATION CURRENT STANDARDS.
G. THE CONTRACTOR IS TO ENSURE A ONE-FOOT CLEARANCE BETWEEN THE SIDEWALK AND MATURE TREE CANOPY.
H. PLANT LEGEND PROVIDED FOR CONTRACTOR'S CONVENIENCE. CONSTRUCTION PLANS TAKE PRECEDENCE.
I. A 10-FOOT CLEARANCE SHALL BE MAINTAINED BETWEEN A TREE TRUNK AND A UTILITY LINE.
J. ALL EXISTING LANDSCAPE AND IRRIGATION SYSTEMS THAT ARE DESIGNATED TO REMAIN ON THE APPROVED LANDSCAPE PLANS SHALL NOT BE DAMAGED OR DESTROYED DURING CONSTRUCTION. ANY DAMAGE THAT DOES OCCUR DURING CONSTRUCTION SHALL BE REPLACED IN KIND BY THE CONTRACTOR.
K. SIDEWALK AND PAVING CONSTRUCTION THAT ARE PART OF THE LANDSCAPE IMPROVEMENTS SHALL BE IN COMPLIANCE WITH ALL ON-SITE PAVING AND SHALL MEET DESIGN AND CONSTRUCTION REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA).
L. PRIOR TO ACCEPTANCE OF ANY BACKFLOW DEVICE, EACH DEVICE SHALL BE TESTED BY A STATE CERTIFIED TESTER AND THE RESULTS PROVIDED TO THE CITY.
M. UTILITY BOXES, METERS AND VAULTS SHALL BE LOCATED IN THE ROW AND WILL NOT BE PERMITTED IN ANY STREET MEDIAN.
N. "AS-BUILT" DRAWINGS, CERTIFIED BY THE DEVELOPER'S LANDSCAPE ARCHITECT, SHALL BE SUBMITTED AND APPROVED PRIOR TO ISSUANCE OF A BUILDING "CERTIFICATE OF OCCUPANCY."

Commercial or Residential Development

All plans for Commercial or Residential development shall have the following shown on the Cover Sheet.

O. LANDSCAPED AREAS THAT WILL BE MAINTAINED BY CITY PARKS DEPARTMENT SHALL BE CLEARLY IDENTIFIED ON THESE PLANS AND ARE SUBJECT TO THE FOLLOWING REQUIREMENTS.
   1. THE DEVELOPER SHALL MAINTAIN AND WARRANTY ALL PLANTED AREAS INCLUDING IRRIGATION SYSTEMS FOR A PERIOD OF TWO YEARS BEGINNING IMMEDIATELY AFTER THE CITY ISSUES THE NOTIFICATION OF APPROVAL FOR THE PROJECT.
   2. DURING THE MAINTENANCE AND WARRANTY PERIOD, THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE PROTECTION TO ALL AREAS. ANY DAMAGED PLANTINGS AND OR IRRIGATION SYSTEMS SHALL BE IMMEDIATELY REPAIRED OR REPLACED AT THE DEVELOPER'S EXPENSE.
   3. MAINTENANCE SHALL INCLUDE CONTINUOUS OPERATIONS OF WATERING, WEEDING, REMOVAL OF DEAD PLANT MATERIAL, MOWING, ROLLING, FERTILIZING, SPRAYING, INSECT AND PEST

CONTROL, RE-SEEDING, REPLACEMENT, AND ALL OTHER MEASURES NECESSARY TO ENSURE GOOD NORMAL GROWTH.

4. WHEN THE TURF HAS ESTABLISHED SUFFICIENT ROOT STRUCTURE AND AN APPROXIMATE HEIGHT OF 3 INCHES, MOWING SHALL BEGIN IMMEDIATELY AND REDUCE IN SAFE INCREMENTS TO A HEIGHT OF 2 INCHES AND SHALL BE MAINTAINED THEREAFTER AT THE HEIGHT OF 2 INCHES.
5. AT THE TERMINATION OF THE MAINTENANCE AND WARRANTY PERIOD, ALL TURF AREAS SHALL BE LIVE, HEALTHY, UNDAMAGED, AND FREE OF INFESTATIONS. ALL AREAS SHALL BE COMPLETELY VOID OF BARREN SPOTS LARGER THAN 3 INCHES BY 3 INCHES.
6. IF ALL PLANTINGS ARE NOT ACCEPTABLE AT THE END OF THE TWO YEAR PERIOD, THE MAINTENANCE AND WARRANTY PERIOD SHALL CONTINUE UNTIL ALL UNACCEPTABLE PLANTINGS ARE REPLACED OR REPAIRED AND THE LANDSCAPING MEETS CITY APPROVAL.
7. AREAS MAY INCLUDE RETENTION BASINS, PARKS, RIGHTS-OF-WAY, AND STREET CENTER MEDIAN LANDSCAPING.

City Capital Improvement Projects (CIP)

All City CIP plans shall have the following shown on the Cover Sheet.

P. LANDSCAPED AREAS THAT WILL BE MAINTAINED BY THE CITY PARKS DEPARTMENT SHALL BE CLEARLY IDENTIFIED ON THESE PLANS AND ARE SUBJECT TO THE FOLLOWING REQUIREMENTS:

1. THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN AND WARRANTY ALL PLANTED AREAS, INCLUDING IRRIGATION SYSTEMS FOR A PERIOD OF ONE YEAR BEGINNING IMMEDIATELY AFTER THE CITY ISSUES THE NOTIFICATION OF APPROVAL FOR THE PROJECT.
2. DURING THE MAINTENANCE AND WARRANTY PERIOD, THE CONSTRUCTION CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE PROTECTION TO ALL AREAS. ANY DAMAGED PLANTINGS AND OR IRRIGATION SYSTEMS SHALL BE IMMEDIATELY REPAIRED OR REPLACED AT THE CONSTRUCTION CONTRACTOR'S EXPENSE
3. MAINTENANCE SHALL INCLUDE CONTINUOUS OPERATIONS OF WATERING, WEEDING, REMOVAL OF DEAD PLANT MATERIAL, MOWING, ROLLING, FERTILIZING, SPRAYING, INSECT AND PEST CONTROL, RE-SEEDING, REPLACEMENT, AND ALL OTHER MEASURES NECESSARY TO ENSURE GOOD NORMAL GROWTH.
4. WHEN THE TURF HAS ESTABLISHED SUFFICIENT ROOT STRUCTURE AND AN APPROXIMATE HEIGHT OF 3 INCHES, MOWING SHALL BEGIN IMMEDIATELY AND REDUCE IN SAFE INCREMENTS TO A HEIGHT OF 2 INCHES AND SHALL BE MAINTAINED THEREAFTER AT THE HEIGHT OF 2 INCHES.

5. AT THE TERMINATION OF THE MAINTENANCE AND WARRANTY PERIOD, ALL TURF AREAS SHALL BE LIVE, HEALTHY, UNDAMAGED, AND FREE OF INFESTATIONS. ALL AREAS SHALL BE COMPLETELY VOID OF BARREN SPOTS LARGER THAN 3 INCHES BY 3 INCHES.
6. IF ALL PLANTINGS ARE NOT ACCEPTABLE AT THE END OF THE ONE YEAR PERIOD, THE MAINTENANCE AND WARRANTY PERIOD SHALL CONTINUE UNTIL ALL UNACCEPTABLE PLANTINGS ARE REPLACED OR REPAIRED AND THE LANDSCAPING MEETS CITY APPROVAL.
7. AT THE COMPLETION OF THE ONE YEAR WARRANTY AND MAINTENANCE PERIOD, PARK MAINTENANCE WILL BE TRANSFERRED FROM THE CONSTRUCTION CONTRACTOR TO THE PARKS DEPARTMENT.
8. AREAS MAY INCLUDE RETENTION BASINS, PARKS, RIGHTS-OF-WAY, AND STREET CENTER MEDIAN LANDSCAPING.

0.4.12 GENERAL NOTES FOR CUSTOM HOME CONSTRUCTION

All plans for Custom Home Construction shall have the following shown on either the Cover Sheet or the Detail Sheet.

CITY OF GOODYEAR
GENERAL NOTES FOR CUSTOM HOME CONSTRUCTION

A. ALL GENERAL CONSTRUCTION NOTES SHALL APPLY.
B. AN ON-SITE GRADING PERMIT IS REQUIRED.
C. A SEPARATE PERMIT IS REQUIRED FOR ANY OFF-SITE CONSTRUCTION WITHIN THE CITY OF GOODYEAR RIGHTS-OF-WAY.
D. GRADING AND DRAINAGE PLAN APPROVAL INCLUDES RETENTION AND DETENTION AREAS, OTHER DRAINAGE FACILITIES AND CHANGES TO SURFACE GRADING AFFECTING DRAINAGE STRUCTURES, CURBS, ASPHALT PAVEMENT, AND BUILDING FLOOR ELEVATIONS.
E. ALL RETAINING WALLS THAT RETAIN GREATER THAN ONE FOOT ARE REVIEWED AND PERMITTED THROUGH THE BUILDING SAFETY DEPARTMENT. A SEPARATE PERMIT IS REQUIRED FOR RETAINING WALL CONSTRUCTION AND INSPECTION.
F. FINISHED FLOOR ELEVATIONS SHALL BE A MINIMUM OF 18 INCHES ABOVE LOT OUTFALL AND A MINIMUM OF 12 INCHES ABOVE ANY ADJACENT HIGH WATER ELEVATION. LOT GRADING SHALL BE PER THE APPROVED PLAN AND COMPLY WITH CHAPTER 4 OF THE INTERNATIONAL RESIDENTIAL CODE AS CURRENTLY ADOPTED BY THE CITY OF GOODYEAR.
G. STAKING PAD AND/OR FINISHED FLOOR ELEVATIONS ARE THE RESPONSIBILITY OF THE DEVELOPER OR HIS ENGINEER. CERTIFICATION OF THE FINISHED BUILDING PAD FOR BOTH ELEVATION AND COMPACTION SHALL BE SUBMITTED TO THE CITY

CONSTRUCTION INSPECTOR AND APPROVED PRIOR TO ANY VERTICAL CONSTRUCTION. ADDITIONAL SUBMITTALS MAY BE REQUIRED BY THE CITY'S BUILDING INSPECTOR.

H. THE PROJECT ENGINEER OR REGISTERED LAND SURVEYOR SHALL CERTIFY THAT THE SITE, INCLUDING RETAINING WALLS BUT WITH THE EXCEPTION OF THE BUILDING PAD, HAS BEEN GRADED TO WITHIN 0.1-FOOT OF THE ELEVATIONS INDICATED ON THE APPROVED GRADING AND DRAINAGE PLANS. THE BUILDING PAD SHALL BE CERTIFIED TO BE AT OR ABOVE APPROVED PLAN ELEVATION. ANY DEVIATION FROM THE APPROVED GRADING AND DRAINAGE PLANS SHALL BE IDENTIFIED IN THE CERTIFICATION AND WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE CITY'S ENGINEERING DEPARTMENT.

I. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ANY EXISTING WATER OR SEWER LINE BEFORE STARTING CONSTRUCTION. IF THE EXISTING LINE IS FOUND TO BE IN A SUBSTANTIALLY DIFFERENT LOCATION, OR WILL ADVERSELY AFFECT THE OPERATION OF THE UTILITY, THE CONTRACTOR SHALL NOTIFY THE CITY CONSTRUCTION INSPECTOR. THE CONTRACTOR SHALL ONLY CONNECT NEW WATER AND SEWER SERVICE LINES TO THE EXISTING SYSTEM WITH SPECIFIC APPROVAL OF THE CITY CONSTRUCTION INSPECTOR.

J. THE CITY OF GOODYEAR IS NOT LIABLE FOR DELAYS OR DAMAGE TO UTILITIES RELATING TO THIS CONSTRUCTION; NEITHER WILL THE CITY PARTICIPATE IN THE COST OF UTILITY CONSTRUCTION OR RELOCATION.

K. WATER METERS SHALL BE INSTALLED BY THE UTILITY AGENCY AFTER PAYMENT OF ALL PREVAILING FEES. THE METER BOX SHALL BE INSTALLED TO THE PROPER GRADE, BE VISIBLE AND FREE OF OBSTRUCTION AND DEBRIS. ALL SERVICE LINES AND CONNECTIONS SHALL BE FREE OF LEAKS.

L. TRACER WIRE SHALL BE INSTALLED ON ALL PRIVATE PVC WATER AND SEWER LINES.

M. THE FOLLOWING IS REQUIRED BY THE ENGINEERING DEPARTMENT FOR ISSUANCE OF A CERTIFICATE OF OCCUPANCY:

1. "AS-BUILT" DRAWINGS (ONE SET OF MYLARS AND TWO SETS OF PRINTS) CERTIFIED BY THE DEVELOPER'S ENGINEER, RECEIVED AND APPROVED BY THE CITY OF GOODYEAR. SEE AS-BUILT REQUIREMENTS.
2. INSPECTOR-APPROVED PAD CERTIFICATIONS (COMPACTION REPORTS AND PAD ELEVATIONS).
3. APPROVAL OF SITE GRADING.
4. PROPERTY CORNER PINS INSTALLED AND VISIBLE.
5. FINAL INSPECTION PERFORMED ON ALL ON-SITE AND OFF-SITE CONSTRUCTION AND ALL PUNCH LIST ITEMS COMPLETED.

0.4.13 GENERAL NOTES FOR FINAL PLAT

All Final Plats shall have the following general notes shown on either the Cover Sheet or the Detail Sheet, unless otherwise approved by the City Engineering and Community Development Departments.

CITY OF GOODYEAR
GENERAL NOTES FOR FINAL PLAT

A. WATER SERVICE NOTE (ONE OF THE FOLLOWING)
   1. THIS DEVELOPMENT IS WITHIN THE SERVICE AREA OF THE CITY OF GOODYEAR WHICH HAS BEEN DESIGNATED AS HAVING AN ASSURED WATER SUPPLY PURSUANT TO ARS 45-576 SUBSECTION B. THE CITY OF GOODYEAR'S ASSURED WATER SUPPLY DESIGNATION IS SUPPORTED IN PART BY THE CITY'S MEMBERSHIP IN THE CENTRAL ARIZONA GROUNDWATER REPLENISHMENT DISTRICT (CAGRD). PROPERTY WITHIN THIS DEVELOPMENT MAY BE ASSESSED A FEE BASED ON ITS PRO RATA SHARE OF THE CITY'S COST FOR CAGRD PARTICIPATION.
   2. CERTIFICATE OF ASSURED WATER SUPPLY
      THIS DEVELOPMENT IS LOCATED WITHIN THE SERVICE AREA OF (*insert water company name here*) AND HAS BEEN GRANTED A CERTIFICATE OF ASSURED WATER SUPPLY FROM THE ARIZONA DEPARTMENT OF WATER RESOURCES (ADWR).

      _____ _____
      MANAGER DATE
      (*insert water company name here*)

B. NO STRUCTURES OF ANY KIND SHALL BE CONSTRUCTED OR PLACED WITHIN OR OVER THE UTILITY EASEMENTS EXCEPT: UTILITIES, ASPHALT PAVING, GRASS, AND WOOD, WIRE OR REMOVABLE SECTION TYPE FENCING. THE CITY OF GOODYEAR SHALL NOT BE REQUIRED TO REPLACE OR PROVIDE REIMBURSEMENT FOR THE COST OF REPLACING ANY OBSTRUCTIONS, PAVING OR PLANTING THAT IS REMOVED DURING THE COURSE OF MAINTAINING, CONSTRUCTING OR RECONSTRUCTING UTILITY FACILITIES.

C. NO STRUCTURE OF ANY KIND SHALL BE CONSTRUCTED OR ANY VEGETATION SHALL BE PLANTED NOR WILL BE ALLOWED TO GROW WITHIN, ON OR OVER ANY DRAINAGE EASEMENT WHICH WOULD OBSTRUCT OR DIVERT THE FLOW OF STORM WATER. THE CITY MAY, IF IT SO DESIRES, CONSTRUCT OR MAINTAIN DRAINAGE FACILITIES ON OR UNDER THE LAND OF THE DRAINAGE EASEMENT.

D. IMPROVEMENTS MADE WITHIN A CITY RIGHT-OF-WAY, TRACT, OR EASEMENT THAT WILL BE MAINTAINED IN THE FUTURE BY THE CITY OF GOODYEAR SHALL BE CLEARLY IDENTIFIED ON THE APPROVED PLANS AND ARE SUBJECT TO THE FOLLOWING REQUIREMENTS. IMPROVEMENTS MAY INCLUDE BUT ARE NOT LIMITED TO STREET SURFACES, CURBS, GUTTERS, SIDEWALKS,

RAMPS, DRIVEWAYS, TURN BAYS, BUS BAYS, STREET LIGHTING, SIGNAGE, AND STREET STRIPING.

1. THE DEVELOPER SHALL MAINTAIN AND WARRANTY ALL IMPROVEMENTS FOR A PERIOD OF TWO-YEARS BEGINNING IMMEDIATELY AFTER THE CITY ISSUES THE NOTIFICATION OF APPROVAL FOR THE PROJECT.
2. DURING THE MAINTENANCE AND WARRANTY PERIOD, THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE PROTECTION TO ALL IMPROVEMENTS. ANY DAMAGED IMPROVEMENT SHALL BE IMMEDIATELY REPAIRED OR REPLACED AT THE DEVELOPER'S EXPENSE.
3. MAINTENANCE SHALL INCLUDE BUT IS NOT LIMITED TO STREET SWEEPING, APPLICATION OF A SEALANT ON ALL CRACKS AND JOINTS, AND APPLICATION OF A SEALANT OVER ALL ASPHALT PAVEMENTS.
4. AT THE TERMINATION OF THE MAINTENANCE AND WARRANTY PERIOD ALL IMPROVEMENTS SHALL BE UNDAMAGED AND SHALL MEET CITY STANDARDS.
5. IF ALL IMPROVEMENTS ARE NOT ACCEPTABLE AT THE END OF THE TWO-YEAR WARRANTY PERIOD, THE MAINTENANCE AND WARRANTY PERIOD SHALL CONTINUE UNTIL THE IMPROVEMENTS MEET CITY APPROVAL.

E. LANDSCAPED AREAS THAT WILL BE MAINTAINED IN THE FUTURE BY THE CITY OF GOODYEAR SHALL BE CLEARLY IDENTIFIED ON THE APPROVED PLANS AND ARE SUBJECT TO THE FOLLOWING REQUIREMENTS. THESE AREAS MAY INCLUDE RETENTION BASINS, PARKS, RIGHTS-OF-WAY, AND STREET CENTER MEDIAN LANDSCAPING.

1. THE DEVELOPER SHALL MAINTAIN AND WARRANTY ALL PLANTED AREAS INCLUDING IRRIGATION SYSTEMS FOR A PERIOD OF TWO-YEARS BEGINNING IMMEDIATELY AFTER THE CITY ISSUES THE NOTIFICATION OF APPROVAL FOR THE PROJECT.
2. DURING THE MAINTENANCE AND WARRANTY PERIOD, THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE PROTECTION TO ALL AREAS. ANY DAMAGED PLANTING AND OR IRRIGATION SYSTEMS SHALL BE IMMEDIATELY REPAIRED OR REPLACED AT THE DEVELOPER'S EXPENSE.
3. MAINTENANCE SHALL INCLUDE CONTINUOUS OPERATIONS OF WATERING, WEEDING, REMOVAL OF DEAD PLANT MATERIAL, MOWING, ROLLING, FERTILIZING, SPRAYING, INSECT AND PEST CONTROL, RE-SEEDING, REPLACEMENT, AND ALL OTHER MEASURES NECESSARY TO ENSURE GOOD NORMAL GROWTH.
4. WHEN THE TURF HAS ESTABLISHED SUFFICIENT ROOT STRUCTURE AND AN APPROXIMATE HEIGHT OF 3-INCHES, MOWING SHALL BEGIN IMMEDIATELY TO A 2-INCH HEIGHT AND SHALL BE MOWED THEREAFTER AND REDUCED IN SAFE INCREMENTS TO A HEIGHT OF 2-INCHES.

5. AT THE TERMINATION OF THE MAINTENANCE AND WARRANTY PERIOD ALL TURF AREA SHALL BE LIVE, HEALTHY, UNDAMAGED, AND FREE OF INFESTATIONS. ALL AREAS SHALL BE COMPLETELY VOID OF BARREN SPOTS LARGER THAN 3 INCHES BY 3 INCHES.
6. IF ALL PLANTINGS ARE NOT ACCEPTABLE AT THE END OF THE TWO-YEAR PERIOD, THE MAINTENANCE AND WARRANTY PERIOD SHALL CONTINUE UNTIL THE LANDSCAPING MEETS CITY APPROVAL.

F. STRUCTURES WITHIN VISIBILITY EASEMENTS WILL BE LIMITED TO A HEIGHT OF THREE (3) FEET; LANDSCAPING WITHIN VISIBILITY EASEMENTS WILL BE LIMITED TO GROUND COVER, FLOWERS AND GRANITE LESS THAN TWO (2) FEET (MATURE) IN HEIGHT AND/OR TREES WITH BRANCHES NOT LESS THAN SEVEN (7) FEET ABOVE THE GROUND. TREES SHALL NOT BE PLACED LESS THAN EIGHT (8) FEET APART.

G. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE PROPER MAINTENANCE AND REPAIR OF ALL FACILITIES ASSOCIATED WITH STORMWATER MANAGEMENT ON A PROPERTY.

H. THIS PARCEL IS SUBJECT TO ATTENDANT NOISE, VIBRATIONS, DUST, AND ALL OTHER EFFECTS THAT MAY BE CAUSED BY OVERFLIGHTS AND BY THE OPERATION OF AIRCRAFT LANDING AT, OR TAKING OFF FROM PHOENIX-GOODYEAR AIRPORT AND LUKE AIR FORCE BASE.

I. THIS DEVELOPMENT IS SUBJECT TO ATTENDANT NOISE CAUSED FROM VEHICULAR TRAFFIC ON INTERSTATE 10 AND THE PROPOSED LOOP 303.

J. THIS DEVELOPMENT IS ADJACENT TO AGRICULTURAL USES AND IS THEREFORE SUBJECT TO NOISE, DUST AND ODORS ASSOCIATED WITH SUCH A USE.

K. ALL NEW OR RELOCATED UTILITIES WILL BE PLACED UNDERGROUND *(EXCEPTIONS ARE TO BE NOTED)*.

L. ALL LOT CORNERS SHALL BE MONUMENTED WITH ½" REBAR WITH CAP, TAG OR OTHER MONUMENTATION AS DESCRIBED BEARING THE REGISTRATION NUMBER OF THE SURVEYOR RESPONSIBLE FOR THEIR PLACEMENT.

M. THE CITY OF GOODYEAR IS NOT RESPONSIBLE FOR AND WILL NOT ACCEPT MAINTENANCE OF ANY PRIVATE UTILITIES, PRIVATE STREETS, PRIVATE FACILITIES, OR LANDSCAPED AREAS WITHIN THIS DEVELOPMENT.

N. THE STREETS IN TRACT (IDENTIFY TRACT) ARE PRIVATE STREETS, TO BE OWNED AND MAINTAINED BY THE PROPERTY OWNERS ASSOCIATION (POA) OR HOMEOWNERS ASSOCIATION (HOA). AFTER THIS PLAT IS RECORDED, THE CITY OF GOODYEAR WILL NOT ACCEPT DEDICATION OF THE STREET MAINTENANCE RESPONSIBILITIES UNLESS ALL STREET IMPROVEMENTS AND RIGHTS-OF-WAY MEET CURRENT APPLICABLE CITY STANDARDS. **(***DEVELOPMENTS WITH PRIVATE STREETS***)**

O. MAINTENANCE OF EASEMENTS THAT LIE WITHIN THE BOUNDARIES OF A SUBDIVISION LOT SHALL BE THE RESPONSIBILITY OF THE POA OR HOA, WITH THE FOLLOWING EXCEPTIONS **(***RESIDENTIAL AND COMMERCIAL SUBDIVISIONS – LIST THE LOTS AND SPECIFY THE EXCEPTIONS***)**.

P. MAINTENANCE OF LANDSCAPING THAT LIES WITHIN THE FRONT YARD OF A SINGLE FAMILY RESIDENCE SHALL BE THE RESPONSIBILITY OF THE HOMEOWNER UNLESS OTHERWISE NOTED ON THIS PLAT. THIS INCLUDES LANDSCAPING WITHIN THE RIGHT-OF-WAY, PRIVATE STREET TRACT, AND/OR PUBLIC UTILITY EASEMENT (PUE). **(***RESIDENTIAL SUBDIVISIONS***)**

Q. ALL CORNER LOTS AND ALL LOTS ABUTTING AN ARTERIAL STREET ARE LIMITED TO SINGLE-STORY STRUCTURES. **(***RESIDENTIAL SUBDIVISIONS – PROVIDE A LIST OF LOT NUMBERS***).**

R. DRIVEWAYS ON KEY LOTS ARE TO BE LOCATED ON THE SIDE OF THE LOT OPPOSITE THE ADJACENT REAR LOT LINE. **(***RESIDENTIAL SUBDIVISIONS – KEY LOTS NUMBERS TO BE SHOWN***).**

S. DRIVEWAYS ON CORNER LOTS ARE TO BE LOCATED ON THE SIDE OF THE LOT FURTHEST FROM THE STREET INTERSECTION. *(RESIDENTIAL SUBDIVISIONS – CORNER LOTS NUMBERS TO BE SHOWN***).**

T. AT T-INTERSECTIONS (THREE-WAY INTERSECTIONS) THE NON-LIVING SPACE SIDE OF THE HOUSE SHALL BE POSITIONED ON THE LOT IN ORDER TO AVOID HEADLIGHT INTRUSION INTO LIVING AREAS *(RESIDENTIAL SUBDIVISIONS – T LOTS NUMBERS TO BE SHOWN*).

0.4.14 GENERAL NOTES FOR TRAFFIC SIGNAL PLANS

All Traffic Signal Plans shall have the following general notes shown on either the Cover Sheet or the Detail Sheet, unless otherwise approved by the City Engineering and Community Development Departments.

CITY OF GOODYEAR
GENERAL NOTES FOR TRAFFIC SIGNAL PLANS

A. ALL MATERIALS AND INSTALLATION SHALL CONFORM TO THE ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT) STANDARD SPECIFICATIONS, CURRENT EDITION, AND THE ADOT "TRAFFIC SIGNALS AND LIGHTING" STANDARD DRAWINGS, CURRENT EDITION, AS MODIFIED BY THE CITY OF GOODYEAR. TRAFFIC SIGNAL STRUCTURES AND FOUNDATIONS SHALL CONFORM TO CURRENT CITY OF TEMPE STANDARDS FOR MODULAR TRAFFIC SIGNAL STRUCTURES AND APPROVED FOR USE BY THE CITY OF GOODYEAR. DRAWINGS OF ANY NON-STANDARD FOUNDATIONS OR STRUCTURES SHALL BE SEALED BY AN ARIZONA REGISTERED STRUCTURAL ENGINEER AND SUBMITTED TO THE CITY OF GOODYEAR TRAFFIC ENGINEER. THESE DRAWINGS MUST BE APPROVED BY THE CITY TRAFFIC ENGINEER IN ORDER TO BE USED ON PROJECTS IN THE CITY OF GOODYEAR.

B. THE CONTRACTOR SHALL PROVIDE 4 SETS OF EQUIPMENT SUBMITTALS TO BE APPROVED BY THE CITY OF GOODYEAR TRAFFIC ENGINEER PRIOR TO INSTALLATION. CONTACT: GOODYEAR ENGINEERING DEPARTMENT (623) 932-3004.

C. THE CONTRACTOR SHALL WORK FROM THE CITY APPROVED PLAN SET.

D. THE CONTRACTOR SHALL HOLD A PRECONSTRUCTION MEETING WITH KEY STAKEHOLDERS, WHICH INCLUDES OWNERS, INSPECTORS, UTILITY COMPANIES, BARRICADE AND POLICE SERVICES BEFORE THE START OF WORK.

E. THE LOCATION OF UTILITIES AND EXISTING CONDUITS AND SLEEVES SHOWN ON THE PLANS IS AS PROVIDED BY VARIOUS SOURCES. ALL INVOLVED UTILITIES MAY NOT BE SHOWN ON THE PLANS. PER SECTION 730-6 OF THE ADOT STANDARD SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITIES FOR THEIR EXACT LOCATION PRIOR TO ANY CONSTRUCTION ACTIVITY. IN ADDITION, THE CONTRACTOR SHALL PERFORM NECESSARY POTHOLING TO DETERMINE LOCATION, SIZE AND OWNERSHIP OF UTILITIES.

F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY AND ALL PERMITS AND INSPECTIONS, INCLUDING COORDINATION WITH THE CITY OF GOODYEAR ENGINEERING DEPARTMENT, AT (623) 932-3004 AND ARIZONA PUBLIC SERVICE (APS) FOR UTILITY CONNECTION. CONTRACTOR SHALL CONTACT THE ENGINEERING INSPECTOR A MINIMUM OF 3 WORKING DAYS PRIOR TO BEGINNING WORK, AND AT MILESTONES SPECIFIED BY THE CITY OF GOODYEAR ENGINEERING INSPECTOR.

G. ANY WORK PERFORMED WITHOUT THE APPROVAL OF THE CITY OF GOODYEAR ENGINEERING DEPARTMENT, AND NOT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS, IS SUBJECT TO REMOVAL AND REPLACEMENT BY THE CONTRACTOR AT NO EXPENSE TO THE CITY.

H. POLE, CABINET, CONDUIT AND PULL BOX LOCATIONS AND ORIENTATIONS SHOWN ON THE PLANS ARE SUBJECT TO FIELD ADJUSTMENT BY THE CITY OF GOODYEAR ENGINEERING INSPECTOR AS A RESULT OF FIELD CONDITIONS. THESE ADJUSTMENTS SHALL OCCUR AT NO ADDITIONAL EXPENSE TO THE CITY. THE CONTRACTOR SHALL OBTAIN BLUE STAKE MARKINGS, MARK TENTATIVE LOCATIONS OF FACILITIES, RIGHT OF WAY AND FINAL GRADE AT STRUCTURE LOCATIONS, AND GET APPROVAL FROM THE CITY OF GOODYEAR ENGINEERING INSPECTOR PRIOR TO EXCAVATION AND FIELD CONSTRUCTION. ITEMS PLACED PRIOR TO THIS APPROVAL ARE SUBJECT TO REMOVAL AND REPLACEMENT BY THE CONTRACTOR AT NO COST TO THE CITY.

I. ANY EXISTING IMPROVEMENTS, SIDEWALKS, RAMPS, LANDSCAPING AND IRRIGATION SYSTEMS DISRUPTED OR DAMAGED BY THE CONTRACTOR DURING THE COURSE OF THIS CONSTRUCTION SHALL BE REPLACED IN KIND BY THE CONTRACTOR AT NO EXPENSE TO THE CITY. CONTRACTOR SHALL BE RESPONSIBLE, TO THE

SATISFACTION OF THE CITY OF GOODYEAR ENGINEERING INSPECTOR, FOR THE REPAIRS AND REPLACEMENT OF ANY PRIVATE OR PUBLIC PROPERTIES OR FACILITIES DAMAGED, MISPLACED OR RELOCATED DURING THIS CONSTRUCTION.

J. ELECTRICAL SERVICE SHOWN ON PLAN IS BASED ON BEST AVAILABLE INFORMATION AT DESIGN AND IS SUBJECT TO VERIFICATION BY THE CONTRACTOR WITH APS PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL BE PREPARED TO ADJUST SERVICE LOCATION IF REQUIRED BY APS. CONTACT APS AT (602) 371-7989 FOR ELECTRICAL SERVICE. ELECTRICAL SERVICE SHALL BE FULLY METERED FOR SIGNALS AND LIGHTING PER APS REQUIREMENTS. SERVICE ADDRESS SHALL BE AS SHOWN ON THE PLANS OR AS PROVIDED BY THE ENGINEERING INSPECTOR. THE ADDRESS LABEL SHALL BE ENGRAVED TYPE USING BLOCK LETTERS. THE ELECTRICAL SERVICE SHALL NOT BE LOCATED WITHIN 20 FEET OF THE SIGNAL CONTROL CABINET.

K. ELECTRICAL SERVICE SHALL BE 100 AMP, 120/240V, SINGLE-PHASE, FULLY METERED. METER PEDESTAL SHALL CONTAIN CONTRACTOR SUPPLIED AND INSTALLED BREAKERS OF ADEQUATE SIZE FOR LOADS (LABELED IN TYPE SET) SHOWN ON THE PLANS, PLUS REASONABLE FUTURE EXPANSION, AND APPROVED FOR USE BY APS. LUMINARIES SHALL BE 240V; ILLUMINATED STREET NAME SIGNS SHALL BE 120V. METER PEDESTAL SHALL CONTAIN PHOTOCELL AND CONTACTOR. INSTALL PEC, 20 AMP FUSED LIGHTING CONTACTOR.

L. ILLUMINATED STREET NAME SIGN MESSAGE/TEXT WILL BE DETERMINED BY THE CITY OF GOODYEAR AS PART OF THE EQUIPMENT SUBMITTAL PROCESS.

M. CITY SHALL INSPECT ALL POLE FOUNDATIONS PRIOR TO PLACEMENT OF CONCRETE. CONCRETE SHALL BE MAG CLASS AA, 4,000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS. THE CONTRACTOR SHALL PROVIDE A COPY OF EACH CONCRETE LOAD TICKET TO THE ENGINEERING INSPECTOR. THE CONCRETE SHALL BE PLACED PER SECTION 506.6 OF THE MARICOPA ASSOCIATION OF GOVERNMENT MAG STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, WHICH STATES THAT FRESH CONCRETE SHALL NOT BE PERMITTED TO FALL FROM A HEIGHT OF GREATER THAN SIX FEET WITHOUT THE USE OF ADJUSTABLE LENGTH PIPES OR ELEPHANT TRUNKS.

N. EACH FOUNDATION THAT SUPPORTS A MAST ARM STRUCTURE SHALL BE TESTED FOR STRENGTH AT SEVEN, FOURTEEN AND 28 DAYS OR UNTIL 4000 PSI IS ACHIEVED. A COPY OF THE TESTING RESULTS SHALL BE SUBMITTED TO THE CITY OF GOODYEAR ENGINEERING INSPECTOR BEFORE MAST ARM STRUCTURES CAN BE INSTALLED.

O. CONTRACTOR SHALL HAVE AN INDEPENDENT CERTIFIED TESTING AGENCY PERFORM A THREE POINT GROUND RESISTANCE TEST AT ELECTRICAL SERVICE, SIGNAL CABINET AND FOR EACH INSTALLED GROUND ROD AND POLE FOUNDATION GROUND COIL IN

ACCORDANCE WITH ADOT SUBSECTION 732-3.03, & SUBMITTED TO THE CITY ENGINEERING INSPECTOR FOR APPROVAL.

P. EXISTING CONDUIT OR SLEEVES MAY EXIST WITHIN THE PROJECT AND MAY BE USED WITH THE APPROVAL OF THE CITY OF GOODYEAR ENGINEERING INSPECTOR. IF USED, CONDUITS SHALL BE PROOFED IN THE PRESENCE OF THE CITY OF GOODYEAR ENGINEERING INSPECTOR AT NO EXPENSE TO THE CITY. CONTRACTOR SHALL MANDREL AND CLEAN ANY EXISTING CONDUITS TO BE REUSED WITH A RAG PULLED THROUGH THE CONDUIT PRIOR TO CONDUCTOR INSTALLATION.

Q. STREET CROSSING CONDUITS SHALL CONSIST OF THREE 3" SCHEDULE 80 CONDUITS. TYPICALLY, ONE CONDUIT IS USED EXCLUSIVELY FOR VIDEO DETECTION & PREEMPTION CABLES, ONE IS USED FOR ELECTRICAL CIRCUITS AND ONE IS A SPARE WITH INSULATED BOND.

R. THE CONTROLLER CABINET AND ITS COMPONENTS SHALL BE DELIVERED TO THE CITY OF GOODYEAR TRAFFIC OPERATIONS FACILITY AT 200 S. CALLE DEL PUEBLO FOR TESTING A MINIMUM OF THREE WORKING DAYS PRIOR TO INSTALLATION.

S. THE CONTROLLER CABINET SHALL BE WIRED AND LABELED WITH THE SAME PHASE NUMBER DESIGNATIONS, FOR INITIAL AND FUTURE PHASES, AS SHOWN IN THE PHASE MOVEMENT DIAGRAM. EACH CONNECTOR SHALL HAVE ALL PINS WITHIN THE CONNECTOR BROUGHT TO CABINET TIE POINTS. CITY WILL REJECT ANY CONTROL CABINET NOT WIRED ACCORDINGLY.

T. PEDESTRIAN PUSH BUTTONS AND ASSOCIATED ACCESS SHALL CONFORM TO ADA REQUIREMENTS. SIDEWALK PADS SHALL BE PROVIDED AS NECESSARY, AT NO ADDITIONAL COST TO THE CITY, TO ENSURE SIDEWALK ACCESS TO FACE OF POLES WITH PEDESTRIAN BUTTONS. THE SIDEWALK LAYOUT SHALL BE BASED ON THE FINAL POLE LOCATIONS AND SHALL BE APPROVED BY THE CITY OF GOODYEAR ENGINEERING INSPECTOR.

U. BACKFILLING SHALL NOT BE STARTED UNTIL CONDUIT HAS BEEN INSPECTED AND APPROVED BY THE CITY OF GOODYEAR ENGINEERING INSPECTOR.

V. ALL PULL BOXES SHALL BE ADOT-APPROVED BRANDS AND MODELS OF POLYMER BOXES, LIDS, EXTENSIONS & LOCKS (PENTA HEAD BOLTS). TRAFFIC SIGNAL PULL BOX LIDS SHALL SAY "TRAFFIC SIGNAL" UNLESS OTHERWISE NOTED ON THE PLANS.

W. ALL PULL BOXES, AT PROJECT COMPLETION, SHALL BE LEFT IN CLEAN CONDITION, FREE OF DIRT AND DEBRIS. ALL PULL BOXES SHALL BE LEVEL AND ALL LIDS AND BOXES SHALL BE UNCRACKED/UNBROKEN, WITH APPROPRIATE LID WORDING.

X. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH THE MANUAL ON TRAFFIC CONTROL DEVISED MOST RECENT EDITION (MUTCD), SECTION VI, ANY ADOT SUPPLEMENTS, AND CITY OF PHOENIX TRAFFIC BARRICADE MANUAL, CURRENT EDITION. THE CITY REQUIRES A POLICE OFFICER AND MARKED POLICE VEHICLE TO BE PRESENT DURING CERTAIN CRITICAL PHASES OF

CONSTRUCTION, AS DETERMINED BY THE CITY OF GOODYEAR ENGINEERING INSPECTOR. POLICE OFFICER ABSENCE AUTOMATICALLY CANCELS CRITICAL PHASES OF CONSTRUCTION UNTIL A POLICE OFFICER IS PRESENT.

Y. CONTRACTOR SHALL SUBMIT AN ACTIVATION DATE TO THE CITY OF GOODYEAR ENGINEERING INSPECTOR FOR APPROVAL. ONCE APPROVED, THE ACTIVATION SHALL BE SHOWN IN THE CONSTRUCTION SCHEDULE. ACTIVATION SHALL NOT OCCUR ON MONDAY, FRIDAY OR WEEKENDS

Z. CROSSWALKS AND STOP LINES SHALL BE IN PLACE AT THE TIME OF SIGNAL ACTIVATION. EXISTING STOP SIGNS, OPERATIONAL TRAFFIC SIGNALS AND ROADWAY LIGHTING, STREET NAME SIGNS AND POSTS SHALL REMAIN IN PLACE UNTIL ACTIVATION OF THE NEW SIGNAL, AT WHICH TIME THEY SHALL BE IMMEDIATELY REMOVED AND SALVAGED TO THE CITY OF GOODYEAR. DAMAGED OR LOST MATERIALS SHALL BE REPLACED IN KIND BY CONTRACTOR AT NO EXPENSE TO THE CITY.

AA. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE CITY OF GOODYEAR ENGINEERING INSPECTOR A TWO WEEK CONSTRUCTION SCHEDULE, UPDATED EACH FRIDAY DURING CONSTRUCTION. A COPY OF APPROVED PROJECT PLANS SHALL BE ON SITE AT ALL TIMES AND IN THE POSSESSION OF THE TRAFFIC SIGNAL CONTRACTOR DURING CONSTRUCTION. ANY DEVIATIONS FROM APPROVED PLANS SHALL BE APPROVED IN WRITING ON THE ON-SITE PLANS, BY THE CITY OF GOODYEAR ENGINEERING INSPECTOR.

BB. AN INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION (IMSA)-CERTIFIED TRAFFIC SIGNAL LEVEL II TECHNICIAN SHALL BE ON SITE AT ALL TIMES DURING CONSTRUCTION.

CC. THE CONTRACTOR IS RESPONSIBLE FOR PREPARING FINAL AS-BUILT DRAWINGS, ON MYLAR, AND SUBMITTING TO THE ENGINEERING INSPECTOR BEFORE FINAL ACCEPTANCE WILL BE GRANTED BY THE CITY OF GOODYEAR. MAST ARM HEIGHTS SHALL BE DOCUMENTED ON AS-BUILTS FOR EACH ARM.

DD. CONTRACTOR SHALL FURNISH & INSTALL 4-CONDUCTOR AND/OR 7-CONDUCTOR IMSA CABLES FROM EACH SIGNAL FACE AND PEDESTRIAN BUTTON ON INDIVIDUAL STRUCTURES, TO THE BASE PANEL TERMINAL BLOCK, WHERE THEY WILL BE TERMINATED TO THE 20-CONDUCTOR IMSA CABLE THAT FEEDS THE STRUCTURE FROM THE CONTROLLER CABINET. PANELS AT ENDS OF MAST ARMS, AS WELL AS "FAR LEFT" SIDE STRUCTURES FOR AN APPROACH THAT DO NOT INITIALLY HAVE LEFT TURN ARROW DISPLAYS SHALL HAVE SEPARATE 4-CONDUCTOR CABLES RUN THROUGH THE STRUCTURE AND COILED AT THE FUTURE SIGNAL HEAD LOCATION. THESE CABLES SHALL BE COILED AND TAGGED IN THE BASE PANEL, FOR FUTURE CONNECTION TO ACTIVATE THE ARROWS WITHOUT THE NEED TO PULL ADDITIONAL CABLES. ALL FUTURE SIGNAL HEADS SHALL BE COVERED USING A MANUFACTURED SIGNAL HEAD COVER WITHOUT PRINT. SIGNAL HEADS SHALL BE COVERED USING A MANUFACTURED SIGNAL

HEAD COVER WITHOUT PRINT IF NOT ACTIVATED WITHIN 30 DAYS OF INSTALL.

EE. THE CONTRACTOR SHALL MAINTAIN A MINIMUM CLEARANCE OF 17' FROM THE CROWN OF THE ROAD TO THE BOTTOM OF THE MAST ARM. DOCUMENTATION SHALL BE PROVIDED TO THE CITY OF GOODYEAR ENGINEERING INSPECTOR ON SITE.

FF. PRIOR TO SCHEDULING ACTIVATION OF THE TRAFFIC SIGNAL, THE CONTRACTOR SHALL CONDUCT A FIELD RING-OUT TEST IN THE PRESENCE OF THE ENGINEERING INSPECTOR AND TRAFFIC SIGNAL TECHNICIAN, TO VERIFY THAT ALL VEHICLE AND PEDESTRIAN INDICATIONS ILLUMINATE WITH THE APPROPRIATE CIRCUIT BY TOUCHING VOLTAGE TO FIELD CABLE CONDUCTORS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TESTING AND VERIFYING THE INTEGRITY AND CORRECT CONNECTION AND AIMING OF ALL DETECTION DEVICES, INCLUDING ALL VIDEO DETECTION, PREEMPTION DEVICES, AND PEDESTRIAN DETECTORS. IN ADDITION, THE CONTRACTOR SHALL PROVIDE ADEQUATE TRAFFIC CONTROL, WHICH INCLUDES ONE OR MORE OFF-DUTY POLICE OFFICERS, PRIOR TO SCHEDULING RING-OUT. CROSSWALK AND STOP BAR STRIPING SHOULD BE SCHEDULED TO OCCUR DURING RING-OUT. UPON COMPLETION OF A SUCCESSFUL RING-OUT. THE INTERSECTION WILL BE PLACED INTO FLASH MODE. UPON COMPLETION OF STRIPING OF STOP BARS AND CROSSWALKS, THE TRAFFIC SIGNAL WILL BE FULLY ACTIVATED.

GG. ALL NEW OR MODIFIED INTERSECTION, ROADWAY AND UNDERDECK LIGHTING ALONG WITH ILLUMINATED STREET NAME SIGNS SHALL AFTER BEING ENERGIZED WILL HAVE A 72 HOUR BURN IN TEST PERIOD. START AND STOP TIMES SHALL BE RECORDED AND FORWARDED TO THE CITY OF GOODYEAR ENGINEERING INSPECTOR. TESTING WILL BE COMPLETE WHEN ALL INTERSECTION, ROADWAY AND UNDERDECK LIGHTING ALONG WITH ILLUMINATED STREET NAME SIGNS HAVE BEEN OPERATIONAL CONCURRENTLY FOR 72 HOURS.

HH. CONTRACTOR SHALL SUPPLY AND INSTALL A 36" X 36" "TRAFFIC CONTROL CHANGE" SIGN, WITH TWO ORANGE FLAGS PER SIGN, ON EACH APPROACH, AS DIRECTED BY THE ENGINEERING INSPECTOR. THE LOCATION OF EACH SIGN SHALL CONFORM TO MUTCD REQUIREMENTS, AND MUST BE APPROVED BY THE CITY OF GOODYEAR ENGINEERING INSPECTOR. THE MOUNTING HEIGHT SHALL BE MINIMUM 7'-0". SIGNS SHALL BE IN PLACE AT THE TIME OF ACTIVATION OF THE SIGNAL AND REMAIN IN PLACE FOR 30 CONSECUTIVE DAYS, AT WHICH TIME THE CITY OF GOODYEAR WILL REMOVE AND SALVAGE.

II. A PUNCH LIST OF DISCREPANCIES WILL BE PROVIDED TO THE CONTRACTOR BY THE CITY OF GOODYEAR ENGINEERING INSPECTOR AFTER ACTIVATION. AFTER THE PUNCH LIST IS SATISFIED A LETTER OF COMPLETION WILL BE ISSUED BY THE CITY OF GOODYEAR AND THE WARRANTY PERIOD SHALL BEGIN.

JJ. CITY FURNISHED EQUIPMENT MUST BE PICKED UP AT THE CITY OF GOODYEAR PUBLIC WORKS EQUIPMENT YARD. THE CONTRACTOR SHALL NOTIFY THE CITY OF GOODYEAR ENGINEERING INSPECTOR THREE WORKING DAYS IN ADVANCE OF EQUIPMENT PICK UP.

KK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING/MARKING ALL PROJECT INSTALLED UNDERGROUND CONDUITS FOR TRAFFIC SIGNAL AND INTERCONNECT FROM THE TIME OF INSTALLATION UNTIL PROJECT ACCEPTANCE BY THE CITY.

LL. ALL LOCATIONS FOR VEHICULAR SIGNAL HEADS ON MAST ARMS SHALL BE POPULATED WITH SIGNAL HEADS.

0.4.15 GENERAL NOTES FOR UTILITY CONSTRUCTION

All Utility Construction Plans shall have the following general notes shown on either the Cover Sheet or the Detail Sheet, unless otherwise approved by the City Engineering and Community Development Departments.

CITY OF GOODYEAR
GENERAL NOTES FOR UTILITY CONSTRUCTION

A. ALL CONSTRUCTION SHALL CONFORM TO THE CITY ENGINEERING DESIGN STANDARDS AND POLICIES MANUAL (EDS&PM), CITY STANDARD DETAILS, CITY POLICIES AND ORDINANCES, AND CURRENT MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION.

B. AN APPROVED SET OF PLANS AND PERMITS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.

C. A PRE-CONSTRUCTION MEETING WITH THE CITY INSPECTOR IS REQUIRED PRIOR TO CONSTRUCTION. VALID AND COMPLETE BLUE-STAKE MARKINGS SHALL BE VISIBLE AT THE TIME OF THE MEETING. THE CONTRACTOR SHALL CONTACT BLUE STAKE (602-263-1100) AND MAINTAIN NUMBER ON-SITE.

D. THE CITY SHALL BE NOTIFIED 48-HOURS PRIOR TO ANY CONSTRUCTION WORK OR INSPECTION (623-932-3004). CONSTRUCTION WORK CONCEALED WITHOUT INSPECTION BY THE CITY SHALL BE SUBJECT TO EXPOSURE AT THE CONTRACTOR'S EXPENSE.

E. THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH CITY REQUIREMENTS PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS. HOWEVER, SUCH REVIEW SHALL NOT PREVENT THE CITY FROM REQUIRING CORRECTION OF ERRORS IN PLANS FOUND TO BE IN VIOLATION OF ANY LAW OR ORDINANCE OR RE-SUBMITTAL OF PLANS IF THEY DO NOT REPRESENT ACTUAL SITE CONDITIONS. THE CITY DOES NOT WARRANT ANY QUANTITIES SHOWN ON THESE PLANS.

F. DOCUMENTATION OF EXISTING DAMAGED ITEMS SHALL BE DELIVERED TO THE CITY INSPECTOR PRIOR TO STARTING

CONSTRUCTION. UNLESS DOCUMENTED AND REPORTED TO THE CITY PRIOR TO THE START OF CONSTRUCTION, ALL DAMAGED PROPERTY WITHIN AND ADJACENT TO THE LIMITS OF WORK SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT THE REQUEST OF THE CITY. THE PERMIT HOLDER SHALL PROVIDE A WRITTEN SCHEDULE FOR COMPLETION OF REPAIRS.

G. THE CONTRACTOR SHALL BARRICADE CONSTRUCTION SITES AT ALL TIMES PER THE CITY OF PHOENIX TRAFFIC BARRICADE MANUAL.

H. TRAFFIC CONTROL PLANS SHALL BE SUBMITTED FOR APPROVAL IN ADVANCE OF CONSTRUCTION. THE APPROVED TRAFFIC CONTROL PLAN AND PERMIT SHALL BE AVAILABLE AT THE WORK SITE AT ALL TIMES. A UNIFORMED OFFICER IS REQUIRED WHEN WITHIN 300' OF A SIGNALIZED INTERSECTION. A CERTIFIED FLAGMAN SHALL BE PROVIDED AT ANY ACCESS TO A PUBLIC ROADWAY WHEN MINIMUM SITE DISTANCES PER CITY OF GOODYEAR (COG) DETAIL G-3232 ARE OBSTRUCTED BY CONSTRUCTION OPERATIONS.

I. THE DEVELOPER/PURVEYOR IS RESPONSIBLE FOR THE REMOVAL OR RELOCATION OF ALL OBSTRUCTIONS WITHIN THE RIGHT-OF-WAY PRIOR TO STARTING NEW CONSTRUCTION.

J. CONTRACTOR IS REQUIRED TO COORDINATE ANY LANDSCAPE IRRIGATION AND PLANT REMOVALS AND/OR REPLACEMENT WITH THE PROPERTY OWNER AND THE CITY INSPECTOR. LANDSCAPE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER. ANY DAMAGE TO AN IRRIGATION SYSTEM SHALL BE REPAIRED WITHIN 48 HOURS. THE CITY MAY REQUIRE LANDSCAPE PLANS BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO START OF CONSTRUCTION. PROPERTY OWNERS SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF CONSTRUCTION. ALL LANDSCAPE SHALL BE PRESSURE TESTED AND WITNESSED BY THE CITY ENGINEERING INSPECTOR. CALL ENGINEERING INSPECTIONS TO SCHEDULE A PRESSURE TEST.

K. ASPHALT CUTS ARE STRICTLY PROHIBITED, UNLESS AN OPEN CUT HAS BEEN SPECIFICALLY APPROVED ON THE PLANS. ALL STREET CROSSINGS, DRIVEWAYS, SIDEWALKS AND OTHER STRUCTURES AS DIRECTED SHALL BE BORED USING HORIZONTAL DIRECTIONAL DRILLING, UNLESS AN ALTERNATE METHOD HAS BEEN APPROVED BY THE CITY. A BORE PROFILE SHALL BE APPROVED BY THE CITY INSPECTOR PRIOR TO ANY BORING.

L. UNLESS OTHERWISE APPROVED, UTILITIES SHALL CROSS UNDER ALL WATER MAINS. MINIMUM SEPARATIONS SHALL BE PER COG DETAIL G-3300.

M. ALL EXCAVATION AND BACKFILL IN RIGHTS-OF-WAYS AND EASEMENTS SHALL BE PER MAG SECTION 601 AND COMPACTED TO A MINIMUM DENSITY OF 95%.

N. MATERIALS TESTING SHALL BE PER THE CITY'S MATERIAL TESTING FREQUENCY GUIDE. TESTING INFORMATION SHALL BE MAINTAINED ON-SITE AND AVAILABLE UPON REQUEST BY THE CITY INSPECTOR.

O. DRAINAGE SHALL BE RE-ESTABLISHED TO THE SATISFACTION OF THE CITY PRIOR TO ACCEPTANCE OF WORK.

P. AT NO TIME SHALL EXCAVATED MATERIALS BE STOCKPILED IN, OR ALLOWED TO IMPEDE ANY STREET, GUTTER, DRAINAGE WAY OR EASEMENT. POLLUTION PREVENTION MEASURES SHALL BE IMPLEMENTED DURING CONSTRUCTION AND IT IS THE PERMITTEE'S AND/OR CONTRACTOR'S RESPONSIBILITY TO INSURE THE SITE IS IN COMPLIANCE WITH ALL ENVIRONMENTAL REGULATIONS.

Q. ALL DISTURBED AREAS SHALL BE STABILIZED TO THEIR ORIGINAL CONDITION WITHIN SEVEN CALENDAR DAYS AFTER UTILITY WORK IS COMPLETE. FOR LARGER PROJECTS, STABILIZATION SHALL BE DONE IN PHASES RATHER THAN AT THE END OF CONSTRUCTION, AND IN NO CASE SHALL ANY AREA REMAIN UNSTABILIZED LONGER THAN 14 CALENDAR DAYS.

R. THE CONTRACTOR SHALL OBTAIN A DUST CONTROL PERMIT FROM THE MARICOPA COUNTY AIR QUALITY CONTROL DEPARTMENT (MCAQD).

S. POTHOLE UTILITIES IN ASPHALT BY VACUUM WITH A 1'X1' MAX. HOLE. BACKFILL WITH ½ SACK CONTROLLED LOW STRENGTH MATERIAL (CLSM) PER MAG 728. PAVE BACK FLUSH WITH GRADE AND THICKNESS OF EXISTING ASPHALT PAVEMENT OR MINIMUM THICKNESS AS DIRECTED BY THE CITY INSPECTOR.

T. STEEL PLATES SHALL BE IN ACCORDANCE WITH MAG STD. DETAIL 211. ALL TRENCHES UNDER PLATES SHALL EITHER BE BACKFILLED OR SHORED TO PREVENT COLLAPSE. PLATES SHALL BE FLUSH WITH STREET SURFACE ON ALL STREETS POSTED 30 MPH OR GREATER. PLATES LOCATED IN STREETS SHALL NOT REMAIN LONGER THAN 10 WORKING DAYS. PLATES SHALL NOT BE STORED IN THE RIGHTS-OF-WAYS.

U. TYPE A AND B PAVEMENT SURFACE REPLACEMENT MATCH POINT LOCATION SHALL NOT BE WITHIN A LANE WHEEL PATH. WHEN THE MATCH POINT FALLS IN A WHEEL PATH, THE MATCH POINT SHALL BE MOVED OUT OF THE WHEEL PATH AREA TO WITHIN 1' OF A LANE STRIPE OR WITHIN THE CENTER 2' OF THE TRAVEL LANE. TYPE A AND B PAVEMENT SURFACE REPLACEMENT MATCHING SHALL NOT BE LOCATED WITHIN 4' OF AN EXISTING ASPHALT EDGE, CURB OR GUTTER. WHEN THIS OCCURS, ALL ASPHALT SURFACING SHALL BE REMOVED AND REPLACED FROM THE PAVEMENT EDGE, CURB, OR GUTTER TO THE NEW MATCH POINT.

V. ALL ABOVE-GROUND EQUIPMENT SHALL NOT; ENCROACH INTO THE CITY RIGHT-OF-WAY AND/OR WITHIN 1' OF ANY SIDEWALK EDGE AND 2' OF ANY EDGE OF PAVEMENT; BE LOCATED WITHIN ANY ROADWAY CLEAR ZONE; OR RESTRICT SITE VISIBILITY PER COG DETAIL G-3232. NO CONDUIT SHALL BE LEFT EXPOSED ABOVE GRADE AND SHALL TERMINATE IN AN APPROVED BOX WITH LID 1" ABOVE ADJACENT GRADE. THE BOX SHALL NOT BE LOCATED WITHIN 1' OF ANY SIDEWALK OR PAVEMENT.

W. ALL ABANDONED UTILITIES SHALL BE COMPLETELY REMOVED FROM THE CITY'S RIGHTS-OF-WAYS AND EASEMENTS.

X. ALL ALLEY WORK SHALL BE COORDINATED WITH THE CITY'S SANITATION DIVISION.
Y. A FINAL INSPECTION WITH THE CITY INSPECTOR AFTER WORK IS COMPLETED IS REQUIRED TO CLOSE OUT THE PERMIT.

0.4.16 GENERAL NOTES FOR STREETLIGHTS

All Street Light Construction Plans shall have the following general notes shown on either the Cover Sheet or the Detail Sheet, unless otherwise approved by the City Engineering and Community Development Departments.

The following information is provided to emphasize critical work and is intended to supplement the specifications.

CITY OF GOODYEAR
GENERAL NOTES FOR STREET LIGHTS

A. THE CONTRACTOR SHALL COMPLY WITH STATE AND CITY STATUTES AND ORDINANCES.
B. PRIOR TO SUBMITTAL, THE STREET LIGHT DESIGNER SHALL EXAMINE ALL GENERAL CONSTRUCTION DRAWINGS AND VISIT THE CONSTRUCTION SITE TO BECOME FAMILIAR WITH EXISTING CONDITIONS UNDER WHICH HE WILL OPERATE AND WHICH WILL IN ANY WAY AFFECT THE WORK UNDER THE CONTRACT.
C. THE STREET LIGHT DESIGNER SHOULD VERIFY DIMENSIONS AT THE SITE AND IMMEDIATELY REPORT DIFFERENCES TO THE DEVELOPER'S CONSTRUCTION MANAGER AND NOT PROCEED WITH WORK UNTIL THE CONSTRUCTION MANAGER RENDERS A DECISION.
D. THE ELECTRICAL CONTRACTOR SHALL COMPLY WITH ALL LICENSING REQUIREMENTS SET FORTH BY THE STATE REGISTRAR OF CONTRACTORS OFFICE TO PERFORM WORK RELATING TO STREET LIGHT INSTALLATION IN CITY OF GOODYEAR RIGHT-OF-WAY.
E. ONE DRY UTILITY PERMIT FOR EACH CITY OF GOODYEAR STREET LIGHT PROJECT SHALL BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
F. LIGHT POLES SHALL BE INSTALLED PLUMB, BE ADJUSTED TO PROVIDE PROPER ALIGNMENT TO THE ROADWAY BEING LIGHTED AND BE PROPERLY GROUNDED WHEN THE INSTALLATION IS COMPLETED.
G. STREET LIGHTS ARE INSPECTED BY THE CITY OF GOODYEAR STREET LIGHTING INSPECTOR. WHEN ACCEPTED AND ENERGIZED THE CONTRACTOR WILL INSTALL POLE NUMBERS PRIOR TO INSPECTION.
H. LUMINAIRES SHALL BE INSTALLED LEVEL AND INCLUDE A LAMP AND PHOTOCELL. THE LUMINAIRES SHALL BE FREE OF DUST, DIRT OR ANYTHING THAT WOULD IMPAIR THE OUTPUT OF THE LIGHT.

I. LUMINAIRES FURNISHED WITH MULTI-TAP DRIVERS SHALL BE REWIRED OR RECONNECTED TO MATCH THE VOLTAGE SUPPLIED BY THE ELECTRIC UTILITY COMPANY.

J. POLE SHALL BE SET PLUMB IN TWO DIRECTIONS, NINETY (90) DEGREES APART.

K. SURPLUS EXCAVATION SHALL BE DISPOSED OF BY THE CONTRACTOR.

L. WIRING SHALL BE INSTALLED PER SERVING UTILITY COMPANY STANDARDS. CONDUIT SHALL BE INSTALLED AT THE DEPTH SPECIFIED ON THEIR PLANS.

M. CONDUIT MUST BE LISTED AND LABELED AND SUITABLE FOR UNDERGROUND USE.

N. CONNECTIONS SHALL BE PER SERVING UTILITY COMPANY STANDARDS. EACH POLE SHALL HAVE AN 8' X 5/8" COPPER CLAD GROUND ROD DRIVEN BENEATH PULL BOX. A #6 BARE COPPER LEAD FROM THE GROUND ROD IN PULL BOX TO LANDING LUG IN STREET LIGHT POLE HAND HOLE IS REQUIRED.

O. EXCAVATION FOR PULL BOXES AND MATERIAL SPECIFICATIONS SHALL BE PER SERVING UTILITY COMPANY STANDARDS.

P. TRENCH SHALL BE INSTALLED PER SERVING UTILITY COMPANY STANDARDS. THE USE OF A COMMON ELECTRIC UTILITY COMPANY TRENCH IS PERMITTED.

Q. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE UTILITY COMPANY FOR COORDINATION OF THE TRENCHING AND THE INSTALLATION OF CONDUIT.

R. IT IS THE CONTRACTOR'S RESPONSIBILITY TO RESTORE ALL PROPERTY, LANDSCAPING, PAVING AND DRIVEWAYS THAT ARE DISTURBED DURING STREET LIGHT CONSTRUCTION TO THEIR ORIGINAL CONDITION IN CONFORMANCE WITH MAG SPECIFICATION SECTION 107.9.

S. IF A FIXTURE SHOULD FAIL, IT SHALL BE IMMEDIATELY REPLACED. THE DEVELOPER SHALL BE RESPONSIBLE FOR FURNISHING ALL PERSONNEL AND EQUIPMENT NECESSARY TO SUCCESSFULLY REPAIR THE FIXTURE.

T. THE CONTRACTOR SHALL GUARANTEE ALL WORK FOR A PERIOD OF TWO YEARS FROM THE DATE OF FINAL ACCEPTANCE BY THE CITY, AGAINST IMPERFECT WORKMANSHIP, FAILURE, MALFUNCTION OF MATERIALS, AND/OR EQUIPMENT DUE TO FAULTY OR IMPERFECT WORKMANSHIP.

U. THIS GUARANTEE IS TO BE IN WRITING TO THE CITY AT THE TIME OF ISSUING FINAL ACCEPTANCE. MATERIALS AND WORKMANSHIP FOUND TO BE DEFECTIVE WITHIN THE WARRANTY PERIOD SHALL BE REPLACED WITHOUT COST TO THE CITY.

LED Streetlight Notes

V. SPECIAL PEDESTRIAN: INSTALL ONE 45W LED (4,100 LUMEN) FIXTURE WITH PHOTOELECTRIC CONTROL ON A 30'-6" POLE WITH A 2' MAST ARM PER ARIZONA PUBLIC SERVICE (APS) DETAIL AND

SPECIFICATIONS. FOUNDATION AND GROUNDING PER APS STANDARDS AND SPECIFICATIONS. POLE SHALL BE CENTERED 1'-0" BEHIND BACK OF SIDEWALK OR 4' BEHIND CURB. INSTALL (2) #12 THHN/THWN FROM LUMINAIRE TO FUSE HOLDER IN POLE. INSTALL APS PULL BOX ADJACENT POLE WITH 1" FLEX CONDUIT TO POLE PER APS SPECIFICATIONS AND REQUIREMENTS. ALL WIRING, FUSING, AND GROUNDING PER APS DETAILS AND SPECIFICATIONS.

W. LOCAL: INSTALL ONE 60W LED (5,100 LUMEN) FIXTURE WITH PHOTOELECTRIC CONTROL ON A 30'-6" POLE WITH A 6' MAST ARM PER APS DETAIL AND SPECIFICATIONS. FOUNDATION AND GROUNDING PER ARIZONA PUBLIC SERVICE (APS) STANDARDS AND SPECIFICATIONS. POLE SHALL BE CENTERED 1'-0" BEHIND BACK OF SIDEWALK OR 4' BEHIND BACK OF CURB. INSTALL (2) #12 THHN/THWN FROM LUMINAIRE TO FUSE HOLDER IN POLE. INSTALL APS PULL BOX ADJACENT POLE WITH 1" FLEX CONDUIT TO POLE PER APS SPECIFICATIONS AND REQUIREMENTS. ALL WIRING, FUSING, AND GROUNDING PER APS DETAILS AND SPECIFICATIONS.

X. COLLECTOR: INSTALL ONE 95W LED (8,200 LUMEN) FIXTURE WITH PHOTOELECTRIC CONTROL ON A 38'-6" POLE WITH A 6' MAST ARM PER APS DETAIL AND SPECIFICATIONS. FOUNDATION AND GROUNDING PER APS STANDARDS AND SPECIFICATIONS. POLE SHALL BE CENTERED 1'-0" BEHIND BACK OF SIDEWALK OR 4' BEHIND BACK OF CURB. INSTALL (2) #12 THHN/THWN FROM LUMINAIRE TO FUSE HOLDER IN POLE. INSTALL APS PULL BOX ADJACENT POLE WITH 1" FLEX CONDUIT TO POLE PER APS SPECIFICATIONS AND REQUIREMENTS. ALL WIRING, FUSING, AND GROUNDING PER APS DETAILS AND SPECIFICATIONS.

Y. MAJOR: INSTALL ONE 113W LED (10,000 LUMEN) FIXTURE WITH PHOTOELECTRIC CONTROL ON A 38'-6" POLE WITH A 6' MAST ARM PER APS DETAIL AND SPECIFICATIONS. FOUNDATION AND GROUNDING PER APS STANDARDS AND SPECIFICATIONS. POLE SHALL BE CENTERED 1'-0" BEHIND BACK OF SIDEWALK OR 4' BEHIND BACK OF CURB. INSTALL (2) #12 THHN/THWN FROM LUMINAIRE TO FUSE HOLDER IN POLE. INSTALL APS PULL BOX ADJACENT POLE WITH 1" FLEX CONDUIT TO POLE PER APS SPECIFICATIONS AND REQUIREMENTS. ALL WIRING, FUSING, AND GROUNDING PER APS DETAILS AND SPECIFICATIONS.

Z. SPECIAL MAJOR: INSTALL ONE 257W LED (19,200 LUMEN) FIXTURE WITH PHOTOELECTRIC CONTROL ON A 38'-6" POLE WITH A 6' MAST ARM PER APS DETAIL AND SPECIFICATIONS. FOUNDATION AND GROUNDING PER APS STANDARDS AND SPECIFICATIONS. POLE SHALL BE CENTERED 1'-0" BEHIND BACK OF SIDEWALK OR 4' BEHIND BACK OF CURB. INSTALL (2) #12 THHN/THWN FROM LUMINAIRE TO FUSE HOLDER IN POLE. INSTALL APS PULL BOX ADJACENT POLE WITH 1" FLEX CONDUIT TO POLE PER APS SPECIFICATIONS AND REQUIREMENTS. ALL WIRING, FUSING, AND GROUNDING PER APS DETAILS AND SPECIFICATIONS.

Arizona Public Service (APS) Notes

AA. CONTRACTOR SHALL CONTACT APS INSPECTOR IDENTIFIED ON THE APS CONSTRUCTION DRAWING FOR PRE-CONSTRUCTION MEETING PRIOR TO ANY EXCAVATION.

BB. CONTRACTOR TO SUPPLY ALL TRENCH AND CONDUIT, PER APS REQUIREMENTS, UNLESS OTHERWISE NOTED.

CC. GRADE STAKE WILL BE SET WITHIN 2' OF J-BOX LOCATION.

DD. CONTRACTOR WILL COORDINATE WITH APS AND CITY OF GOODYEAR FOR DE-ENERGIZING OF STREETLIGHT CONDUCTOR.

EE. GROUND ROD TO BE PROVIDED AND INSTALLED BY CONTRACTOR IN APS J-BOX AT EACH STREETLIGHT LOCATION.

FF. IF THE CONTRACTOR INSTALLS THE POLE, THE BARE #6 COPPER GROUND WIRE SHALL BE CONNECTED FROM THE GROUND ROD IN THE APS J-BOX TO THE GROUND CONNECTION IN THE HAND-HOLE.

GG. ALL TRENCH AND CONDUIT TO BE INSPECTED BY APS. DO NOT BACKFILL UNTIL INSPECTED.

HH. APS CONSTRUCTION PRINT MUST BE USED AS A TRENCHING REFERENCE. TRENCHING VARIATIONS MUST HAVE WRITTEN APS CSR APPROVAL. FOLLOW DETAILS FOR CONSTRUCTION. VARIATIONS IN TRENCH ROUTE MAY RESULT IN A REDESIGN FEE.

II. CONTACT APS FOR ALL TRENCH AND CONDUIT SPECIFICATIONS AND REQUIREMENTS.

JJ. CONTRACTOR IS RESPONSIBLE FOR INTEGRITY OF ALL CONDUITS UNTIL APS HAS INSTALLED CONDUCTORS.

KK. CONTRACTOR IS RESPONSIBLE FOR OBTAINING REQUIRED VARIANCES PRIOR TO SUBMITTING CIP DRAWINGS TO THE UTILITIES.

LL. CONTRACTOR IS RESPONSIBLE FOR VERIFYING VERTICAL AND HORIZONTAL CLEARANCES TO EXISTING OVERHEAD LINES AND POLES WHEN PLACING NEW STREETLIGHTS.

CHAPTER 1

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1.1 GENERAL INFORMATION

1.1.1 GENERAL TERMS

A. Terms

Unless otherwise specifically defined for use in a given Chapter, the following terms shall have the following meaning throughout the EDS&PM.

1. City shall mean the City of Goodyear
2. Council shall mean the Mayor and Council of the City of Goodyear
3. Development Standards shall mean:

    a. the City of Goodyear Subdivision Regulations,
    b. the City of Goodyear Zoning Ordinance,
    c. the Engineering Standards,
    d. the City of Goodyear Flood Prevention Regulations,
    e. the City of Goodyear General Plan,
    f. other applicable City of Goodyear Codes or Ordinances,
    g. any applicable Zoning Conditions,
    h. any applicable Development Agreements,
    i. any applicable Development Master Plans, and
    j. all other applicable federal, state, and local laws, ordinances, codes, rules, regulations, policies, and guidelines, including by way of example, but not limitation:

        (1) regulations established by the Maricopa County Flood Control District relating to the construction or prevention of construction of streets in lands established as being subject to periodic inundation;

        (2) regulations established by the ADOT relating to provisions for safety of entrance upon and departure from abutting state highways;

        (3) regulations established by the ADHS and MCDHS relating to the provision of domestic water supply and sanitary sewage disposal;

        (4) regulations established by the ADWR, and the MCESD governing development in Maricopa County.

4. City Engineer shall mean the City Engineer or his/her designee.

5. Complete Set of Engineering Construction Plans shall mean all applicable improvement plans, reports, studies, addendums, and other documents necessary for the City to approve all improvement plans and to issue of improvement permits for a specific development as determined by the City Engineer.
6. Construction shall mean the erection, construction, installation, alteration, demolition, of any improvement and / or change to any improvement.
7. Development(s) shall mean a specific project for which a developer desires to construct improvements necessary to support a structure, utility, or other facility. A development may be part of a larger development or may function as a standalone project.
8. Developer shall mean the property owner, person, firm, company, party, and / or agency that is engaged in and is financially responsible for the construction of improvements in a development.
9. Engineering Standards shall mean the EDS&PM.
10. Improvement(s) shall mean any construction, temporary construction, or maintenance work performed on properties within the City limits that constructs or otherwise modifies Grading, Drainage, Water, Sewer, Reclaimed Water, Irrigation, Paving, Concrete, Landscaping, Storm Water Management Systems, Vehicular Circulation, Pedestrian Circulation, Floodplains, Signing, Striping, Street Lighting, Traffic Signals, Dry Utilities, and/or construction of temporary facilities. Plans developed to demonstrate how improvements shall be constructed are referred to as improvement plans or construction plans.
11. Individual means person(s), partnership, limited liability partnership, limited liability company, corporation or any other legal entity.
12. MAG Uniform Standard Details and Standard Specifications means the standards adopted by the City in Article 9-6 of the Goodyear City Code.
13. UBC means all of the technical codes adopted by the City in Article 9-1 of the Goodyear City Code.

B. Abbreviations

Unless otherwise specifically defined for use in a given Chapter, the following abbreviations shall have the following meaning throughout the EDS&PM.

AAC	Arizona Administrative Code
AASHTO	American Association of State Highway and Transportation Officials
ABC	Aggregate Base Course
ABPA	American Backflow Prevention Association
AC	Asphalt Concrete or Alternating Current as the context dictates
ACP	Asbestos Cement Pipe
ADA	Americans with Disabilities Act
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
ANSI	American National Standards Institute
AOC	Approval of Construction
APS	Arizona Public Service
ARS	Arizona Revised Statues
ARV	Air Relief Valve
ASETT	Arizona State Environmental Technology Training
ASTM	ASTM International Standards Worldwide
ATC	Approval to Construct
AWG	American Wire Gauge
AWWA	American Water Works Association
AZPDES	Arizona Pollutant Discharge Elimination System
BID	Buckeye Irrigation District
BMP	Best Management Practices
BWCDD	Buckeye Water Conservation & Drainage District
BWOSP	Bullard Wash Open Space Project
CADD	Computer-Aided Design and Drafting
CAGRD	Central Arizona Groundwater Replenishment District
CC&R	Covenants, Conditions, and Restrictions
CCTV	Closed-Circuit Television
CD	Compact Disc
cfs	cubic feet per second
CIP	Capital Improvement Project or Clean in Place as the context dictates
CLOMR	Conditional Letter of Map Revision
CLSM	Controlled Low Strength Material
COG	City of Goodyear
CPSC	U.S. Consumer Products Safety Commission
CSP	Construction Stormwater Permit
DC	Directional Control
DIP	Ductile Iron Pipe
DU	Dwelling Unit
DVD	Digital Video Disc
EDS&PM	Engineering Design Standards and Policy Manual 2017 Edition adopted by Ordinance No. 17-1359 and all amendment thereto
EPA	Environmental Protection Agency
FCDMC	Flood Control District of Maricopa County

FDC	Fire Department Connection
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
GPA	General Plan Amendments
gpad	gallons per average day
gpcd	Gallons per capita per day
gpd	gallons per day
gpdu	gallons per dwelling unit
gpm	gallons per minute
HDPE	High-Density Polyethylene
HOA	Homeowners Association
HP	Horse Power
HTE	Permit Number
IAPMO	International Association of Plumbing and Mechanical Officials
ID	Interior Diameter
IES	Illuminating Engineering Society
IMSA	International Municipal Signal Association
IPR	Indirect Potable Reuse
ITE	Institute of Transportation Engineers
ITS	Information Transmission System
IWMP	Integrated Water Master Plan
LED	Light Emitting Diode
LOMR	Letter of Map Revision
MAG	Maricopa Association of Governments
MCAQD	Maricopa County Air Quality Department
MCDHS	Maricopa County Department of Health Services
MCDOT	Maricopa County Department of Transportation
MCESD	Maricopa County Environmental Services Department
MS4	Municipal Separate Storm Sewer System
MUTCD	Manual on Uniform Traffic Control Devices most recent edition
MWD	Maricopa Water District
N/A	Not Applicable
NACE	National Association of Corrosion Engineers
NAVD88	North America Vertical Datum of 1988
NFPA	National Fire Protection Association
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NSF	NSF International
OSHA	Occupational Safety and Health Administration
PAD	Planned Area Development
PC	Point of Curvature
PI	Point of Intersection
PIPE	Piping Industry Progress and Education
psi	pressure per square inch
POA	Property Owners Association
POTW	Publicly Owned Treatment Work
PRV	Pressure Relief Valve
PT	Point of Tangent
PTOE	Professional Traffic Operations Engineer
PUE	Public Utility Easement
PVC	Poly Vinyl Chloride
RAC	Rubberized Asphalt Concrete

RID	Roosevelt Irrigation District
ROC	Registrar of Contractors
RGRCP	Rubber Gasket Reinforced Concrete Pipe
RPP	Reduced Pressure Principle
SCADA	Supervisory Control and Data Acquisition
SMFO	Single Mode Fiber Optic
SSPC	Society for Protective Coatings
SVT	Sight Visibility Triangles
SWP	Steam Working Pressure
SWPPP	Stormwater Pollution Prevention Plan
THW	Thermoplastic Heat & Water Resistant Insulated Wire
TIA	Traffic Impact Analysis
UL	Underwriters Laboratories
UPC	Uniform Plumbing Code
UPS	Uninterrupted Power Supply
USC	University of Southern California
USF	Underground Stormwater Storage Facilities
VAC	Volts Alternating Currents
VCP	Vitrified Clay Pipe
VFD	Variable Frequency Drive
XHHW	Cross-Linked High Heat Water
ZONE AO	FEMA Designated Flood Hazard Zone Requiring Flood Insurance

C. Utility Master Plan References

References in the EDS&PM to the City's water master plan or City's master water plan relating to water infrastructure requirements shall mean: the 2007 Integrated Water Master Plan prepared by Black and Veatch adopted by the Goodyear City Council on June 23, 2008 Volumes 1 and 2

References in the EDS&PM to the City's wastewater master plan relating to any wastewater infrastructure requirements shall mean: the 2007 Integrated Water Master Plan prepared by Black and Veatch adopted by the Goodyear City Council on June 23, 2008 Volumes 1 and 3

References in the EDS&PM to the City's reclaimed water master plan relating to any reclaimed water infrastructure requirements shall mean: the 2007 Integrated Water Master Plan prepared by Black and Veatch adopted by the Goodyear City Council on June 23, 2008 Volumes 1 and 4

1.1.2 IMPROVEMENTS

Improvements constructed within the City of Goodyear shall comply with all requirements of the Engineering Standards and Development Standards. Preliminary and final design plans shall be prepared in accordance with these standards unless specific variances have been approved by the City.

1.1.3 CONSTRUCTION

All construction shall be performed in accordance with the construction plans approved by the City.

A. Engineering Plan Review

Once the plans and reports for the development have been prepared, they shall be submitted to the City's Engineering Department. From there, they will be distributed to the appropriate City departments for their review and comment. Comments will be compiled and consolidated by the Engineering Department and returned to the Applicant. All such comments shall be incorporated into the plans and reports by the Applicant for resubmittal.

B. Rights-of-Way

The acquisition and dedication of new street rights-of-way and/or utility easements shall be coordinated through the City. Deeds containing legal descriptions and scale drawing for these rights-of-way, easements and/or parcels prepared by an Arizona registered professional engineer or Arizona registered land surveyor shall be submitted to the City for approval and recording.

C. Construction

Construction permits are required for all construction within the City. Any contractor found working on a project without an official set of approved plans and permit shall discontinue work excluding any work required to bring the site to a safe condition. The site shall be immediately restored to the satisfaction of the City which may include temporary protection devices placed which will be the responsibility of the contractor performing the unauthorized work. Prior to the issuance of a permit the developer shall provide the appropriate financial assurance for the construction of the improvements.

D. General Notes for Improvements and Landscaped Areas to be Maintained by City

The references in the General Notes for Landscaped Areas and Improvements that are to be maintained by the City applies only to areas that the City owns or is required by ordinance, law, or regulation, to maintain.

1.2 AUTHORIZATION

1.2.1 CITY ENGINEER

The City Engineer is hereby authorized and directed to enforce the requirements of the Engineering Standards, the requirement as set forth in Chapter 15 of the Goodyear City Code as such regulations relate to Improvements as defined therein, and any and all other requirements for which the City Engineer has been delegated responsibility. Pursuant to this grant of authority, the City Engineer shall have the authority to render interpretations of the Engineering Standards and all other regulations, including regulations in Chapter 15 related to Improvements, for which the City Engineer has been delegated responsibility.

The City Engineer shall receive applications, review construction documents and issue permits for the construction of all improvements identified in the Engineering Standards.

The City Engineer shall have the authority to take all actions necessary to ensure compliance with the Engineering Standards, which includes the right to enter premises at reasonable times to inspect and/or perform other actions provided for in the Engineering Standards.

1.3 PURPOSES

1.3.1 ENGINEERING STANDARDS

The purpose of this Engineering Standards is to provide developers and their designers the planning and designing requirements of public and private infrastructure within the City and to provide an enhanced quality of life for Goodyear citizens and visitors. Design concepts and specific technical data are outlined, but are not intended to supersede sound engineering judgment. All plans are to be prepared with these concepts in mind and will be reviewed accordingly.

These standards are divided into individual sections which cover specific elements of the design and development review process. It begins with general information followed by specific technical details. Updates will be published and made available periodically. Pending updates, new standards, forms, checklists, approved material lists, and exhibits are available on the City's web site (www.goodyearaz.gov).

The Engineering Standards are intended to be used in conjunction with the City Subdivision Regulations, Zoning Ordinance, Floodplain Ordinance, Grading Ordinance and other applicable City Ordinances and Standards of other agencies that may have jurisdiction.

1.4 POLICIES RELATED TO DEVELOPMENT IMPROVEMENTS

1.4.1 CITY'S POLICIES

The following sections outline the City's policies related to various improvements associated with the development process. They are by nature general in scope. Reference should be made to the appropriate sections within the balance of these standards for specific details.

A. Street Improvement Policy

1. All developments within the City shall provide an interior street system adequate to insure that all parcels and/or facilities within the development shall have reasonable access to the balance of the public street system. Further, they shall provide legal and physical access into the development for public service and/or emergency operations.
2. All access improvements, both public and private, shall be in compliance with the Engineering Standards and the street standards (contained in Chapter 15 of the City Code - Subdivision Regulations). All streets shall be of such width and structural strength as to provide safe and unrestricted access.
3. In a single-family residential development, it is the intent of the City that the local residential street system be designed in conformance with current street classifications. There shall be minimal direct access from the local residential street system to the collector streets and very limited to no access to the arterial streets.
4. When the development occurs adjacent to a boundary street, it is the City's policy that it shall be the responsibility of the developer to dedicate the right-of-way and construct improvements along their frontage to the ultimate half width of the street. Improvements shall be constructed to the ultimate grade and alignment for the said boundary street. This may include removal and replacement of the existing street surface to the centerline and beyond if that structure or street geometrics are inadequate to meet the current design standards and the adjustment of any utility found to be located at an unacceptable depth in relation to the new street grade profile. Half street only improvements will not be allowed to be constructed for local streets, and half street only improvements on other street classifications must be approved by the Engineering Department. Street lighting, landscaping, burial of overhead utilities, and improvements to irrigation facilities will be required, at the sole or substantial expense of the developer.

B. Storm Drainage Policy

1. It is the City's policy that all developments within the City shall provide sufficient retention so as to minimize the adverse impact of that development on adjacent, upstream, or downstream properties. To that end, all developments shall provide sufficient on-site retention to contain, at the least, the runoff generated by a 100-year 6-hour storm falling on the property. A stormwater retention waiver may be submitted if the conditions in Section 3.3.5.I apply.
2. Further, it is the City's policy that all developments shall provide adequate drainage facilities so as to convey runoff, generated both on and off the project, around or through the project in such a manner as to insure that the structures will be free from flooding and that there is reasonable access for emergency and public service vehicles. The developer shall install storm drain pipes, channels, retention basins and/or other physical improvements necessary to achieve this result.
3. It is the City's policy that all developments shall comply with the NPDES Stormwater Requirements for construction sites, ADEQ, AZPDES Stormwater Requirements for Construction, City of Goodyear Storm Water Pollution Elimination Ordinance Article 16-7, The City of Goodyear Storm Water Management Plan, and related documents. See section 3 of this manual for information related to storm water pollution prevention plans.
4. The Drainage Design Manual for Maricopa County; Hydrology, shall be utilized to determine peak discharge volumes for design purposes and Hydraulics is to be utilized as a basis for design guidance and criteria. The Drainage Design Manual for Maricopa County; Erosion Control, or subsequent guidance, shall be used to select appropriate Dust and Erosion Control BMP for use during construction activities except for provisions required in this manual or other City adopted documents.

C. Water Line Extension Policy

It is the City's policy that all developments within the City shall have an adequate and secure source of potable water. To that end the City has developed a comprehensive program for supplying municipal water. Therefore, unless specifically excepted in writing by the City Engineer or those within another service area, all developments within the City shall be serviced by the City's potable water system. Further, the developer shall extend said system to and through the development as necessary to insure adequate supply to the development. If deemed necessary and appropriate, the developer shall extend the water distribution system to the extremities of the project so as to insure that more distant potential users shall have reasonable access to the City's water system.

D. Sewer Line Extension Policy

It is the City's policy that, unless specifically excepted in writing by the City Engineer or those within another service area, all developments within the City shall provide for the discharge of domestic and other liquid waste into the municipal sewerage system. All developers shall be required to extend to and through their project a sewage collection system of a size sufficient to dispose of these wastes to the public system. When deemed appropriate and necessary, the developer shall extend the main trunk and/or collector lines to the upstream extremities of the project so as to provide reasonable access for potential upstream users to the City system.

E. Site Development Policy

It is the City's policy that all developments within the City shall be designed and constructed in such manner as to provide a safe and pleasant environment for the current and future citizens of Goodyear. To that end, the appropriate standards have been established for site development to include: Public and/or private access for general and special uses; public water and sewerage systems; on-site and off-site drainage; landscaping; storm retention; street lighting and public utilities as may be required. The site and structures are to be constructed in accordance with the Subdivision Regulations and/or Zoning Ordinance, the current adopted UBC, MAG Uniform Standard Details and Standard Specifications, and the Engineering Standards, as appropriate. Other standards may be approved on a case by case basis.

1.5 ORDER OF PRECEDENCE

It is not intended by these standards to repeal, abrogate, annul, or in any way impair or interfere with existing provisions of other laws or ordinances except those specifically repealed with private agreement, or with restrictive covenants running with the land to which the City is a party. Where the Engineering Standards impose a greater restriction on land, buildings, or structures than is imposed or required by such existing provisions of law, ordinance, contract, or deed, the provisions of the Engineering Standards shall prevail.

1.6 DEFINITIONS AND ABBREVIATIONS

Some of the words, abbreviations, or phrases used in these standards that have not been defined herein are defined in the City of Goodyear Subdivision Regulations, the City of Goodyear Flood Prevention Regulations, the City of Goodyear Zoning Ordinance, the City of Goodyear Administrative Policy Manual, and/or the MAG Uniform Standard Specifications and Details for Public Works Construction and in such cases those definitions apply. All other words or phrases shall be interpreted per the generally accepted meaning in the civil engineering industry.

1.7 PENALTIES

Any person or Enterprise found guilty of violating any provisions of the Engineering Standards shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not to exceed $2,500 for an individual and not more than $20,000 for an enterprise or by imprisonment for a period of not to exceed six months, or by both such fine and imprisonment. Each day that a violation, continues shall be a separate offense punishable as hereinabove described. The term *ENTERPRISE* as used in this subsection shall mean any corporation, partnership, association, labor union or other entity or any group of persons associated in part although not a legal entity.

1.8 APPEAL PROCEDURES

1.8.1 GENERAL INFORMATION

Persons aggrieved by any order, decision, or determinations relative to the application and interpretation of the Engineering Standards shall be entitled to appeal such order, decision or determination by filing a written notice of such appeal with the City Engineer within ten business days of the date the order, decision or determination was issued. The following procedures shall govern appeals filed pursuant to this provision:

A. Provisions

1. The appeal shall be heard by a Hearing Officer retained by the City whose authority shall be limited to determining whether the order, decision, or determination being appealed complies with the Engineering Standards. The Hearing Officer shall have no authority to waive the requirements of the Engineering Standards.
2. The party filing the appeal bears the burden of proof.
    a. The party challenging interpretation(s) of the Engineering Standards and/or Subdivision Regulations by the City Engineer bears the burden of proving that the interpretation is clearly contrary to legislative intent or that it is without rational basis.
    b. The party challenging factual determination(s) of the City Engineer bears the burden of proving that no reasonable person could have reached the City Engineer's determination.
3. Hearings on an appeal shall be scheduled as soon as practicable following the receipt of the Notice of Appeal.
4. Parties to an appeal shall have the right to be represented by counsel or to proceed without counsel, to submit evidence and to cross-examine witnesses.
5. Each party shall serve on the opposing party and the Hearing Officer, a List of Exhibits which includes a description of each exhibit the

party intends to introduce at the hearing during the presentation of the party's case and a copy of each exhibit; a List of Witnesses each party intends to call at the hearing during the presentation of the party's case. Unless modified by the Hearing Officer, the parties' respective List of Witnesses and List of Exhibits shall be served no later than five days before the date of the hearing.

6. Hearings may be conducted in an informal manner and without adherence to the rules of evidence required in judicial proceedings. Subject to the provisions herein, the Hearing Officer shall control and dictate the hearing proceedings and his/her responsibilities shall include continuing a hearing as needed, ensuring that testimony, statements, and questions pertain to the appeal; ruling on objections to evidence; setting limits for opening and concluding remarks; calling breaks; and generally coordinating the hearing.

7. All hearings shall be recorded.

8. All parties to the appeal shall have the opportunity to respond, and present evidence and argument on all relevant issues. All relevant evidence is admissible, but the Hearing Officer may at his/her discretion, exclude certain witnesses or documents even if timely disclosed if he/she finds such evidence to be irrelevant, cumulative, redundant, or overly prejudicial.

9. The Hearing Officer may take notice of judicially cognizable facts and of generally recognized technical and/or scientific facts within the City's specialized knowledge. The City's experience, technical competence and specialized knowledge may be used in the evaluation of the evidence.

10. Prior to opening statements, the Hearing Officer will specify a time limit to be adhered to by both parties. Opening statements will be presented first by the City's representative and then by the appellant's representative.

11. The Hearing Officer shall administer oaths and affirmations to the witnesses prior to allowing their testimony.

12. Order of Presentation. The City's representative shall present the City's case first. The appellant shall be entitled to cross-examine any witnesses called by the City and the City shall be entitled to examine on re-direct any of the City's witnesses cross-examined by appellant. After the City has completed the presentation of its case, appellant's representative shall present appellant's case. The City shall be entitled to cross-examine any witnesses called by appellant and appellant shall be entitled to examine on re-direct any witnesses cross-examined by the City. After the appellant has completed its presentation of its case, the City shall be entitled to present rebuttal.

13. The Hearing Officer shall be entitled to ask questions of any witness at any time the witness is being questioned and is entitled to recall witnesses as needed.

14. Prior to closing remarks, the Hearing Officer will specify a time limit to be adhered to by both parties. Closing remarks will be presented first by the appellant's representative and then by the City's representative.

15. The Hearing Officer shall issue a written decision within twenty days after the hearing is concluded. The written decision shall contain a concise explanation of the reasons supporting the decision and shall include findings of fact and conclusions of law underlying the decision. The written decision shall be served on the City Engineer. The City Engineer shall, within ten business days of the date the decision is served on the City Engineer, accept, reject or modify the Hearing Officer's decision. If the City Engineer rejects or modifies the Hearing Officer's decision, the City Engineer shall provide all parties to the appeal and the City Manager a copy of the Hearing Officer's decision with the rejection or modification and a written justification setting forth the reasons for the rejection or modification. The City Manager will review the Hearing Officer's decision, the City Engineer's rejection or modification and the justifications for the rejection or modification and within ten business days of the date such information is received by the City Manager, the City Manager shall either accept the Hearing Officer's decision or accept the City Engineer's rejection or modification. The City Manager shall notify the parties to the appeal in writing of his/her decision and the City Manager's decision shall be final.

16. Neither the manner of conducting the hearing nor the failure to adhere to the rules of evidence required in judicial proceedings is grounds for reversing a decision rendered by a Hearing Officer if the evidence supporting the decision is substantial, reliable and probative.

CHAPTER 2

CONSTRUCTION PLANS & PERMITS

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2.1 CONSTRUCTION PLAN REQUIRMENTS

2.1.1 GENERAL INFORMATION

This chapter contains general information to assist the Consultant in the preparation of all construction plans and documents to be submitted to the City for approval. The information contained herein is general in nature and more detailed information related to submittal requirements is contained in other chapters of the Engineering Standards.
(Please Note there are differences between the plans review and permitting processes for improvement plans and permits subject to the Engineering Standards and for approvals and permitting for Building, Life Safety and Fire plans.)

2.1.2 CHAPTER STRUCTURE

The general structure of this chapter is as follows: a general explanation of the various types of required plan reviews; the administrative and substantive time frames applicable for plan review approvals; explanation of the review process for administrative reviews and substantive reviews of applications for plan review approvals; submittal requirements for plans review approvals; summary of submittal requirements for construction permits.

2.2 ENGINEERING CONSTRUCTION PLANS REVIEW

2.2.1 APPROVALS

Approval(s) of Construction Plans shall be obtained prior to obtaining permit(s) for the construction of improvement(s)

2.2.2 TYPES OF ENGINEERING CONSTRUCTION PLAN REVIEWS

A. Improvement Plan Review

Includes the review of all applicable plans and reports (i.e. utility plans, roadway plans, grading & drainage plans, TIA, drainage reports, sewer reports, water reports, and reclaimed water reports etc.) necessary for the development of a project within the City of Goodyear.

B. Expedited Plan Review

Plans are generally reviewed in the order received. An expedited designation will move a project as far forward as possible in the plan review queue by the payment of fees at twice the rate of non-expedited fees. Timeframes cannot be guaranteed to be any faster than our normal plan review and approval process. Items that may affect how quickly a plan can be reviewed include size of the project, complexity of the project, phasing of the project, the current backlog of expedited plans, number of standard review plans that are currently due for completion, or any other

item or event that upsets the normal flow of plan reviews and approvals. Otherwise an expedited review will follow the standard plan review and approval procedure.

C. Mass Grading Plan Review

A plan review for the purpose of approving a mass grading plan for a private property. Mass grading plans are approved separate from the comprehensive engineering construction plan package that is required to be submitted through the standard construction plan review and approval process.

D. Dry Utility Plan Review

A plan review for the purpose of approving dry utility or similar construction. Dry utility plans prepared for the purpose of constructing dry utilities within the right-of-way of a new subdivision may be provided as a deferred submittal from the comprehensive engineering construction plan package. All other dry utility plans may be submitted as a separate and distinct plan review.

1. A joint trench utility permit is required when the installation of multiple dry utilities within one common trench is proposed. This permit shall be obtained prior to any other dry utility permits for the project.

E. Traffic Control Plan Review

A plan review for the purpose of requesting approval to place temporary traffic control devices or equipment within the City of Goodyear right-of-way.

F. Amended Plan Review

A plan review for the purpose of approving changes to a plan for which a construction permit has already been issued. Amendment reviews are required for all changes to construction plans other than minor deviations from the plans that normally occur during construction (as determined by the City Engineer). A minor amendment that does not normally occur during construction may be approved as an 8-1/2”x11” attachment if it can easily be incorporated on the as-built drawings. ALL other plan amendments shall be incorporated into the original plan sheets and “clouded” and a numbered delta symbol identifying the revision number accompanying all clouds. All amended sheets shall be resealed by a Professional Engineer registered in the State of Arizona. Only plan sets being amended are required to be provided for review. Otherwise an amended review will follow the standard plan review and approval procedure.

G. Extension Plan Review

Extension reviews may be sought at the time a set of construction plans has reached the one-year expiration date OR up to a period of up to 2 years from the original approval date if construction permits have not yet been issued by the City for the work. The process will include a review of the construction plan set to verify that they comply with prevailing City Standards. A construction plan set may only be extended for a period of up to but not exceeding one additional year from the original date of expiration (extensions will not be granted for a time frame beyond 2 years from the original approval date). Once the extended expiration date has passed no further extensions can be offered and the construction plan set will need to be resubmitted through the standard plan review and approval procedure. Where applicable, all financial assurance shall be posted and the Final Plat or ultimate street right-of-way dedication shall be recorded for a project's construction plans to qualify for an extension review. Otherwise an extension review will follow the standard plan review and approval procedure.

H. Dedications or Abandonments

All dedication of easements, land, or right-of-way or abandonment of such that is identified as being required of a development through the preliminary plat, site plan, or improvement plan review process and are not performed through a final plat, map of dedication, minor land division, condominium plat, or replat document shall be processed through the City's Dedication / Abandonment review, approval, and recording process identified herein.

I. As-Built Plan Review

As-Built plans are required to be submitted to the Engineering Department for all improvements constructed within the City. Acceptance of construction or certificates of occupancy shall be withheld until the as-built plans have been reviewed and approved by the Engineering Department. Chapter 10 of the Engineering Standards provides instructions on the preparation of as-built plans. Otherwise an as-built plan review will follow the standard construction plan review and approval procedure.

2.3 CONSTRUCTION PERMITS REQUIREMENTS

2.3.1 REQUIREMENTS FOR ISSUANCE

A. Permits

1. Permits are required before any work on improvements may begin.

2. Permits shall not be issued until all required plans for the work being permitted have been approved and signed by the City Engineer.
3. Permits shall not be issued until all conditions of plans approval have been satisfied.
4. Permits shall not be issued until all applicable fees and in-lieu payments have been made.
5. Permits shall only be issued for work performed by contractors who are licensed with the State of Arizona, bonded, have an Arizona State Tax number and who have a City of Goodyear Business Registration number.

2.3.2 APPLICABLE DEVELOPMENT REQUIREMENTS

Permits shall not be issued until all applicable requirements for development have been satisfied.

A. Requirements

1. A final plat has been approved by the City Council, signed by all appropriate parties and recorded with the Maricopa County Recorder.
2. A site plan for the site upon which the improvements are to be constructed has been approved.
3. All agencies and service providers that are legally able to regulate development and/or that hold properties or easements that will be impacted by the construction of the permitted approvals have approved and signed the appropriate plans [e.g., MCDOT, MCESD, ADOT, FCDMC, RID, MWD, BWCDD, Liberty Water, EPCOR, etc.]
4. All dedications of easements or fee interests in property where improvements that are to be owned, controlled and/or maintained by the City have been provided to the City for recording.
5. Required maps of dedication, other dedicatory documents, abandonments, and/or extinguishments have been approved by City Council, executed by all required parties, and provided to the City for recording.
6. NOI has been obtained by the owner and provided to the City.

2.3.3 REQUIRED REGULATORY APPROVALS

Permits shall not be issued until all other required regulatory approvals and permits have been obtained (i.e. ATC, issued by Maricopa County for water and sewer improvements, etc.)

2.3.4 PERMITS FOR CERTAIN TYPES OF WORK

Permits for certain types of work shall not be issued until certain requirements have been met.

A. Water, Sewer, and Reclaimed Water Improvements

A permit for construction of sewer improvements shall not be issued until:

1. MCESD has approved the sewer plans and has issued an ATC.
2. In the area where the reclaimed water lines are to be located have been installed.

B. Concrete Structures, Concrete, Pavement Cuts and/or Paving Improvements

A permit for the construction of Concrete Structures, Concrete, Pavement cuts, and/or Paving improvements shall not be issued until:

1. Building Official has issued a permit for the construction of a retaining wall if applicable.

C. Floodplain or Floodway Permit

A permit for construction of improvements within a Floodplain or Floodway (Floodway Permit) shall not be issued until:

1. Mass Grading Plans or Grading and Drainage Plans have been approved and signed by the City Engineer.
2. Mass Grading Plans or Grading and Drainage Plans have been approved and signed by the FEMA, and FEMA has issued a CLOMR or LOMR.

2.4 REVIEW TIME FRAMES FOR ENGINEERING REVIEWS

This section sets forth the review times applicable to the various types of plans and permit reviews and the general process followed for such reviews.

2.4.1 REVIEW TIME FRAMES FOR PLANS

A. Construction Plan Review

Except as otherwise expressly provided elsewhere, the following review time frames apply to applications for approvals of the construction plans referred to above:

1. Administrative Completeness Review Time Frame is a maximum of 45 calendar days.
2. Substantive Review Time Frame is a maximum of 130 calendar days.
3. Overall Review Time Frame is a maximum of 175 calendar days.

B. Traffic Control Plans Review

1. Without Full Closure of City Roadway

   Review Time Frames for Traffic Control Plans that will not involve the full closure of a City Roadway are as follows:

   a. Administrative Completeness Review Time Frame is a maximum of 15 calendar days.
   b. Substantive Review Time Frame is a maximum of 45 calendar days.
   c. Overall Review Time Frame is a maximum of 60 calendar days.

2. With Full Closure of City Roadway

   Review Time Frames for Traffic Control Plans that will involve the full closure of a City Roadway are as follows:

   a. Administrative Completeness Review Time Frame is a maximum of 15 calendar days.
   b. Substantive Review Time Frame is a maximum of 85 calendar days.
   c. Overall Review Time Frame is a maximum of 100 calendar days.

C. Haul Route/Encroachment Permit Review

Review Time Frames for Plans for Haul Route/Encroachment Permit are as follows:

1. Administrative Completeness Review Time Frame is a maximum of 15 calendar days.
2. Substantive Review Time Frame is a maximum of 85 calendar days.
3. Overall Review Time Frame is a maximum of 100 calendar days.

D. Mass Grading Plans Review

Review Time Frames for Mass Grading Plans are as follows:

1. Administrative Completeness Review Time Frame is a maximum of 20 calendar days.

2. Substantive Review Time Frame is a maximum of 80 calendar days.
3. Overall Review Time Frame is a maximum of 100 calendar days.

E. Dry Utilities Plans Review.

Dry Utilities Plans that are part of a new residential or commercial development are to be submitted as a separate and distinct plan review. The review times for "Mass Grading Plan Review" apply.

Review Time frames for Dry Utilities Plans that are not part of a new residential or commercial development are as follows:

1. Administrative Completeness Review Time Frame is a maximum of 15 calendar days.
2. Substantive Review Time Frame is a maximum of 45 calendar days.
3. Overall Review Time Frame is a maximum of 60 calendar days.

F. Review Times for Dedications or Abandonments are as follows:

1. Administrative Completeness Review Time Frame is a maximum of 20 calendar days.
2. Substantive Review Time Frame is a maximum of 130 calendar days.
3. Overall Review Time Frame is a maximum of 150 calendar days.

2.4.2 SUBSTANTIVE AND OVERALL REVIEW TIME FRAME EXTENSION

By mutual written agreement between the applicant and the City Engineer, the Substantive Review time frames and the Overall Review time frames set forth in this manual may be extended to allow for additional reviews. An extension of the applicable Substantive Review time frame and the Overall Review time frame may not exceed twenty-five (25%) of the Overall Review time frame.

2.5 ENGINEERING REVIEW PROCESS

2.5.1 ADMINISTRATIVE COMPLETENESS REVIEW

A. Submittal of Application and Supporting Documentation

Completed application and all required supporting documentation shall be submitted to the City Engineer. Upon receipt of the completed application and supporting documentation, the Administrative Completeness Review time frame shall begin to run and the application will be reviewed for completeness by the City Engineer.

B. Modification of Submittal Requirements

During the Administrative Completeness Review, the City Engineer may, at the City Engineer's sole discretion, waive or modify a submission requirement if the City Engineer determines that the requirement is not applicable or necessary because of the nature of the submission.

C. First Administrative Review

Following the completion of its first administrative review of the application, and prior to the expiration of the Administrative Completeness Review Time frame, the City Engineer will provide the applicant with written or electronic notice of:

1. Administrative Completeness and that the application has been accepted; or
2. Application Deficiencies, which shall include a comprehensive list of the specific deficiencies in the application. The Administrative Completeness Review time frame and the Overall Review Time Frames are suspended from the date of the written or electronic notice of Application Deficiencies until the City Engineer receives the missing information.

D. Subsequent Administrative Reviews

Following its receipt and review of the missing information, and prior to the expiration of the Administrative Completeness Review time frame, the City Engineer will provide the applicant with written or electronic notice of:

1. Administrative Completeness and that the application has been accepted; or
2. Rejection for Application Deficiencies, which shall include a comprehensive list of specific deficiencies in the application; or
3. Application Deficiencies, which shall include a comprehensive list of specific deficiencies in the application. Subsequent notices of Application Deficiencies are at the discretion of the City Engineer. If the amount of the Administrative Completeness time frame that remains is sufficient for the City Engineer to review the missing information when it is submitted, the City Engineer may, but is not required to, provide a subsequent notices of Application Deficiencies. The Administrative Completeness Review time frame and the Overall Review Time Frames are suspended from the date of the written or electronic notices of Application Deficiencies until the City Engineer receives the missing information from the applicant.

E. Written or Electronic Notice of Review

Prior to the expiration of the Administrative Completeness Review time frame, the City Engineer will provide the applicant with written or electronic notice of:

1. Administrative Completeness and that the application has been accepted; or
2. Rejection for Application Deficiencies, which shall include a comprehensive list of specific deficiencies in the application. If the application is rejected, the application will only be considered upon submission of a new application together with a new application fee; or
3. If the City Engineer does not respond to the submission by the end of the Administrative Completeness Review time frame, the application shall be deemed administratively complete and accepted for processing under the Substantive Review procedures and time frames.

F. Failure to Supply Additional Information.

If at any time during the Administrative Completeness Review time frame the applicant fails to supply the additional information identified in the written notice within 30 business days from the date of such written notice, the application will be deemed withdrawn and the applicant will be notified of such in writing. The requested approval shall be considered upon submission of a new application and supporting documentation together with a new application review fees.

2.5.2 SUBSTANTIVE REVIEW

A. Substantive Review Time Frame

Upon the Notice of Administrative Completeness, the Substantive Review time frame shall begin to run and the application will be reviewed by the City Engineer for conformance with all applicable requirements.

B. First Substantive Review

Following the completion of its first substantive review of the application, and inspection if performed, the City Engineer will provide the applicant with written or electronic notice that:

1. The application is approved; or
2. The application is conditionally approved, with a list of the conditions; or

3. The application is rejected (i.e. denied); or additional information and/or revisions are needed before a recommendation for approval or for approval with conditions can be made, including a comprehensive list of the additional information and/or revisions required. The request for additional information and/or revisions is at the discretion of the City Engineer. If the amount of the Substantive Review time frame remaining (including any extensions) is sufficient for the City Engineer to review the additional information or revisions prior to the expiration of the Substantive Review time frame, the City Engineer may, but is not required to, provide a notice of the need for additional information and/or revisions. The Substantive Review time frame and the Overall Review Time Frame are suspended from the date of the written or electronic notice that revisions and/or additional information are required until the City Engineer receives the revisions and/or missing information from the applicant.

C. Subsequent Substantive Reviews

Following its receipt and review of the revisions and/or additional information requested by the City Engineer following a prior substantive review and any follow-up inspection that is performed, the City Engineer shall provide the application with written or electronic notice of:

1. The application is approved; or
2. The application is conditionally approved, with a list of the conditions; or
3. The application is denied; or additional information and/or revisions are needed before a recommendation for approval or for approval with conditions can be made, including a comprehensive list of the additional information and/or revisions required, but only if the applicant and the City Engineer have mutually agreed in writing that the City may submit supplemental requests for additional information and/or revisions. The request for additional information and/or revisions is at the discretion of the City Engineer. If the amount of the Substantive Review time frame remaining (including any extensions) is sufficient for the City Engineer to review the additional information or revisions prior to the expiration of the Substantive Review time frame, the City Engineer may, but is not required to, provide a notice of the need for additional information and/or revisions. The Substantive Review time frame and the Overall Review Time Frame are suspended from the date of the written or electronic notice that revisions and/or additional information are required until the City Engineer receives the revisions and/or missing information from the applicant.

D. Written or Electronic Notice of Decision

Prior to the expiration of the Substantive Review Time Frame, the City Engineer will endeavor to provide the applicant with written or electronic notice that:

1. The application is approved; or
2. The application is conditionally approved; with a list of conditions; or
3. The application is denied.

2.6 SUBMITTAL REQUIREMENTS – IMPROVEMENT PLANS APPROVAL

Except as otherwise expressly provided in this manual or as agreed to by the City Engineer in writing, all submittals for approval of Engineering Construction Plans shall meet all applicable requirements.

2.6.1 REQUIREMENTS

A. Application Information

A completed application must be filed with the City Engineer using the electronic application form provided on the City of Goodyear Engineering webpage.

B. Form Information

1. City of Goodyear Site Plan or Preliminary Plat tracking number (if available);
2. Project Name;
3. Project Type (Commercial Residential, Other);
4. Project Address or Cross Streets;
5. Project Acreage;
6. Number of sheets, service drops and reports for normal or amended review or sets of plans for extension review;
7. Types of plans being submitted for review;
8. Name, address, telephone number and e-mail address of the applicant;
9. Name, address, telephone number and e-mail address of the property owner.
10. Any other information requested on the application.

C. Site Plan or Approved Preliminary Plat

If the City of Goodyear Site Plan or Preliminary Plat tracking number is not available, submit a copy of approved Site Plan or approved Preliminary Plat.

D. Plan Review Fees

All applicable plan review fees are to be paid at the time of submittal. Fees paid at the time of application are estimates. Final fees will be calculated at the end of each review cycle. Outstanding fees due shall be paid prior to the start of the next review cycle along with fees identified for the next review cycle. Approvals will be conditioned upon payment of final adjusted fees. Review fees can be found on the City's Engineering Department website.

E. Comprehensive Engineering Construction Plan

1. Requirements

Comprehensive Engineering Construction Plan, which includes:

a. All applicable improvement plans for the entire project (utility plans, roadway plans, grading & drainage plans, etc.)
b. Cover Sheets for each set of plans
c. Completed Checklists for engineering review, which can be found on the City's website. A completed check list applicable to each set of plans shall be submitted along with a completed "General" checklist.
d. All other documents identified in the individual plan check lists and in the general check list being submitted.

F. Copies of Reports

Copies of all approved Master Reports, Preliminary Reports (TIA, drainage, water, sewer, reclaimed water), and Final Reports specific to the property being developed shall submitted:

G. Dedications and Easements

Documentation demonstrating that all rights-of-ways and/or easements required for the improvements have been created and/or dedicated as applicable.

H. Construction Permit Fee Schedule

A completed Construction Permit Fee Schedule, which can be found on the City of Goodyear Engineering website shall be submitted at the time of application. If the fees do not change before construction permits are pulled, the amounts reflected in the approved Construction Permit Fee Schedule shall be the amount of the fees owed when construction permits are pulled. If fees increase between the time the Construction Permit Fee Schedule was approved and the time construction permits were issues, the fees schedule will be updated to reflect the current fees, and the applicant will be required to pay the fees based on the rates in effect when the construction permits are pulled.

I. Engineer's Estimates for In-lieu Payments

If applicant will be making an "in-lieu" payment for the cost of improvements applicant would otherwise have to construct, applicant shall submit an engineer's estimate of the cost of the improvements for which the "in-lieu" payment will be provided. The engineer's estimate shall comply with the requirements for establishing the amount of a financial assurance as provided in this Chapter.

J. Engineer's Estimates of Cost of Improvements

An engineer's cost estimate for 100% of the cost for all of the infrastructure improvements for the project shall be submitted at the time of application. The cost estimate should include sub-totals for City-maintained and privately-maintained infrastructure improvements. The engineer's cost estimate shall comply with the requirements for establishing the amount of a financial assurance as provided in this Chapter.

K. Check List Documentation

All other documentation identified in the Checklist(s) for Engineering Plans Review.

L. Improvement Plans Associated with a Final Plat or Other Dedicatory Document

Improvement plans that are required as part of a Final Plat, Map of Dedication, or other dedicatory document, shall be approved prior to recordation of the dedicatory document by the Goodyear City Council.

M. Outside Agency Approval

Documentation reflecting required approvals from outside agencies, property owners, or other involved entities (including but not limited to: MCESD, RID, BID, ADOT, MCDOT, Liberty Utilities, EPCOR Water,

Arizona American Water, Arizona Water), which can be in the form of signed plans and/or signed letters of approval.

N. Separate Detail Sheets

Separate detail sheets prepared in accordance with the requirements set forth below may be submitted with the approval of the City Engineer, at the City Engineer's sole discretion.

O. Special Construction Details

Special construction details shall be submitted when required by the City Engineer. Typical situations in which these would be required include:

1. Modifications or relocation detail for existing irrigation structures.
2. Special construction where utility locations conflict.
3. Others not included in the City of Goodyear Standard Details, but determined by the City Engineer as necessary to clarify construction plans. Presentation of design and construction information shall be made to the satisfaction of the City Engineer.

P. Additional Submittal Requirements

1. Any other information or documentation requested by the City Engineer as needed to determine compliance with Development Standards and Engineer Standards.
2. Mass grading plans shall be accompanied by a drainage report and a SWPPP.
3. The SWPPP, which shall include BMP Plans, shall be submitted with Grading and Drainage plans. The SWPPP and BMP Plans shall be prepared in conformance with the requirements set forth in Chapter 3 of this manual and shall include the information the on the Check List for SWPPP and the Check List for BMP Plans respectively, which can be found on the City's website. Additional information related to the preparation of the SWPPP can be found on the City's website.
4. A master utility plan shall be submitted with final subdivision construction plans. This plan shall also be updated with the "As-Built Drawings."

Q. Application Submittal Process

All of the application submittal documents (completed application, complete set of engineering construction plans, reports, and other documents as required) shall be submitted electronically via the City

Electronic Plan Review System. Information regarding the Electronic Plan Review system and requirements for electronic submittal can be found on the City Engineering Department's webpage. Checklists listing the requirements for the development of construction plans can be found on the City's Engineering Department's webpage. Requirements for the development of construction reports can be found on the City's Engineering Department's webpage and within the Engineering Standards.

2.7 TRAFFIC CONTROL PLANS SUBMITTAL REQUIREMENTS

2.7.1 REQUIREMENTS

A. Approval Required

Approval of Traffic Control Plans and the issuance of the appropriate permit is required prior to any traffic control device or equipment being installed within the City of Goodyear rights-of-way.

B. Traffic Control Plan Submittal

A submittal of approval of traffic control plans shall include:

1. A completed Traffic Control Permit Application, using the electronic application form provided on the City of Goodyear Engineering webpage, signed by the applicant, shall be submitted to the City electronically via the City Electronic Plan Review System or via email to the City's Engineering Permit Technician (engr.permits@goodyearaz.gov). The application shall include the following minimum information:

    a. Information regarding the proposed traffic control request and description of construction work; Start and End dates and times
    b. Project Name
    c. Project Address
    d. Barricade Company name, phone number and contact name; 24-hour contact name and phone number
    e. Contractor name, phone number and contact name; 24-hour contact name and phone number
    f. Applicant name, address, phone number, fax number, and e-mail address

2. All applicable fees shall be paid at the time of submittal.
3. Documentation identified in the Traffic Control Permit Application.

4. Traffic control plans that meet the MUTCD and Phoenix Barricade Manual requirements and all other applicable requirements, including requirements, as applicable, for preparation of plans set forth below.
5. Any other information or documentation requested by the City Engineer as needed to determine compliance with Development Standards and Engineering Standards.
6. Completed Application for Off-Duty Police Officer.
7. Construction Schedule
8. Insurance Certificate naming the City as Additional Insured that meets requirements of risk management.
9. Satisfactory documentation demonstrating that the contractor is adequately bonded and insured.
10. All applicable plan review fees are to be paid at the time of submittal. Traffic control review and permit fees are identified on the application.

2.8 HAUL ROUTE/ENCROACHMENT PLANS SUBMITTAL REQUIREMENTS

2.8.1 HAUL ROUTE/ENCROACHMENT PERMITS

Haul Route/Encroachment Permits are required as follows:

A. More than 5,000 cubic yards

For estimated dirt hauls of 5,000 cubic yards or more that require use of public rights-of-way and

B. Less than 5,000 cubic yards

For estimated dirt hauls of less than 5,000 cubic yards when required by the City Engineer.

2.8.2 APPLICATION SUBMITTAL

A submittal for approval of plans needed for a Haul Route/Encroachment Plans shall meet with all applicable requirements.

A. Requirements

1. A completed Traffic Control Permit Application, using the electronic application form provided on the City of Goodyear Engineering webpage, signed by the applicant, shall be submitted to the City electronically via the City Electronic Plan Review System or via email to the City’s Engineering Permit Technician

(engr.permits@goodyearaz.gov). The application shall include the following minimum information:

a. Information regarding the proposed traffic control request and description of construction work; Start and End dates and times.
b. Project Name
c. Project Address
d. Barricade Company name, phone number and contact name; 24-hour contact name and phone number if applicable
e. Contractor name, phone number and contact name; 24-hour contact name and phone number
f. Applicant name, address, phone number, fax number, and e-mail address

2. All applicable fees shall be paid at the time of submittal.
3. Traffic Control Plan that provides the following information and any other information relevant to the proposed work:

a. Proposed Haul Routes
b. Proposed Travel Times
c. Proposed Traffic Control Measures
d. Proposed Safety Procedures

4. Copy of approved SWPPP that covers the proposed work. If applicant does not have an approved SWPPP that covers the proposed work, applicant shall submit SWPPP plan for approval, which includes a BMP Plan. The SWPPP Plan, including the BMP Plan, shall be prepared in conformance with the requirements set forth in Chapter 3 of this manual and shall include the information on the Check List for SWPPP and the Check List for BMP Plans respectively, which can be found on the City's website.
5. Restoration Plans for any damages resulting from proposed work.
6. Any other information or documentation requested by the City Engineer as needed to determine compliance with City Code requirements, Development Standards and Engineer Standards.

2.9 CONSTRUCTION PERMIT SUBMITTAL REQUIREMENTS

A Construction Permit will be issued upon submission of all of the following:

2.9.1 REQUIREMENTS

A. Application Information

A completed Permit Application must be filed with the City Engineer using the form provided on the City of Goodyear Engineering webpage at (www.goodyearaz.gov).

1. Form Information

a. Name, telephone, fax number, e-mail address of applicant;

b. Type of permit(s) requested;

c. Project name, address, parcel number, work order number;

d. Description of permit request;

e. Owner's/Developer's name, contact name, address, phone, fax number, and e-mail address;

f. Following information for the contractor that will be performing the work:

(1). Contractor's name, address, phone number, fax number and e-mail address

(2). Contact name for contractor, and contact person's phone number, fax number and e-mail address

(3). Contractor's current City of Goodyear Business Registration number

(4). Registrar of Contractors (ROC) License number and copy of current construction license showing the type of contractor and the expiration date.

(5). A completed Transaction Privilege and Use Tax License form (which can be downloaded at www.azdor.gov) or a copy of the Arizona State Sales Tax License showing the City of Goodyear listed on the license.

(6). Contractor's Arizona State Tax Number

(7). Current certificate of insurance listing the City of Goodyear as additionally insured with the following limits of coverage as noted:

i. General liability insurance - $1,000,000 each occurrence, $2,000,000 Products and Completed Operations Aggregate and $2,000,000 General Aggregate.

ii. Vehicle liability insurance - $1,000,000 combined single limit.

iii. Workers compensation insurance – as required by Arizona law.

(8). Signature of applicant.

(9). Any other information requested on the application.

B. Applicable Permit Fees

Payment of all applicable permit fees, which are calculated using the Construction Permit Fee Schedule during the improvement plan review and approval process. The construction permit fee schedule can be found at the City of Goodyear Engineering webpage (www.goodyearaz.gov).

C. In-lieu payments

Payment of in-lieu payments for the cost of improvements applicant would otherwise have to construct, which were established during the improvement plan review and approval process.

D. Compliance Documentation

Documentation demonstrating compliance with the requirements for the issuance of a construction permit as set forth above in section 2.3.

E. Performance Bond

A performance bond or other financial assurance, in the form and amount acceptable to the City Engineer and City Attorney, is required prior to the issuance of a permit. Financial assurance, which guarantees that the owner/developer will complete permitted improvements, issued for the benefit of the City of Goodyear and that complies with the requirements set forth in this Chapter shall be provided for the following:

1. Improvements and work within the City rights-of-way, easements, property or interests.
2. Improvements and work in developments that divide, dedicate, or subdivide their properties and are required to provide legal access and utilities to lots that are created that would otherwise not have acceptable access to the City rights-of-way or utilities, which includes onsite improvements for access, utilities, and any other associated improvement required by the City Engineer.
3. Improvements that are to be owned, controlled, and/or maintained by the City.

F. Performance Bond Requirements:

Performance Bonds or other financial assurance in the form acceptable to the City Engineer and City Attorney shall comply with the following requirements:

1. Financial assurance shall equal 100% of the estimated cost to construct all improvements within the boundary of a Final Plat, Map of Dedication, Condominium Plat, or Amended Plat and shall not be determined by separate phasing limits on construction plans.
2. Financial assurance for any improvement to be constructed within the City right-of-way, property, and/or easement shall be provided to the City prior to obtaining City permits.
3. Costs for all improvements for which financial assurance is to be provided shall be established by means of an engineer's cost estimate. An engineer's cost estimate shall comply with the following requirements:

    a. The cost estimate shall be provided in tabular form with the heading of Improvement Item, Quantity, Unit, Unit Rate, and Cost. A total cost shall be provided at the bottom of the estimate.
    b. A separate cost estimate shall be provided for each plan set coversheet of the improvement plan package.
    c. The quantities and units shall match the quantities and units identified on the improvement plan coversheets. Other than in special cases, as approved by the City Engineer in writing, the unit "each" shall not be used.
    d. The unit rates shall be based on industry standards and the engineer's knowledge of current unit rates in the industry.
    e. The cost estimate shall be signed and sealed by a professional engineer registered in the State of Arizona.

4. Performance bonds shall only be accepted from entities that have been rated A+ rating or better by A.M. Best Company.
5. All performance bonds shall be in favor of the City, shall be continuous in form and shall require that the total aggregate liability of the surety for all claims shall be limited to the face amount of the performance bond, regardless of the number of years the performance bond is in force.
6. All financial assurance shall specifically identify the amount of the financial assurance, the specific location of the improvements for which the financial assurance would apply, the name of the development, and the types of improvements the financial assurance will apply towards.
7. All financial assurance shall remain in effect until satisfactory performance of the work and its acceptance by the City except as otherwise expressly provided in the Engineering Standards.
8. All financial assurance shall be provided to the City as originally signed, sealed, and perforated documents prior to approving. Copies cannot be accepted for approval.

G. Construction Plan Copies

Two complete full size copies (24" x 36") of all approved improvement plans for the project, one complete one-half size copy (11" x 17") of all approved improvements plans, and a hard copy of all Final Reports approved during the plan review process shall be provided for inspection purposes. Construction plans submitted to the City for inspection purposes shall be prepared in black ink.

2.10 DEDICATION / ABANDONMENT SUBMITTAL REQUIREMENTS

2.10.1 DEDICATIONS AND ABANDONMENTS

At such times when it is identified through the City's review processes that a project is required to dedicate or abandon rights-of-way, easements, lands, etc. as a stipulation of approval, the applicant shall follow the submittal requirements unless the dedication or abandonment will be carried out by a process otherwise documented in the City's Administrative Policy Manual, such as a Final Plat, Map of Dedication, Condominium Plat, Amended Plat, etc.

2.10.2 APPLICATION SUBMITTAL

A submittal for approval of a dedication or abandonment shall meet with all applicable requirements.

A. Requirements

1. A completed Dedication or Abandonment Application, using the electronic application form provided on the City of Goodyear Engineering webpage, signed by the Owner or the Owner's Representative (as established by a letter authorizing the representative to act in the name of the Owner for the property), shall be submitted to the City electronically via the City Electronic Plan Review System or via email to the City's Engineering Permit Technician (engr.permits@goodyearaz.gov). The application shall include the following minimum information:

   a. Legal Owner / Agent:

      (1). Name

      (2). Address, City, State, Zip

      (3). Phone, Fax, Email

   b. Contact Person:

      (1). Name

(2). Address, City, State, Zip

(3). Phone, Fax, Email

c. Project Name or name of related development

d. Project Address, Major Cross Streets, Township & Range, Assessor's Parcel Number(s)

e. A brief description regarding the purpose of the application

f. Checkmarks indicating that all supporting information submitted for the request has been provided.

2. The following supporting information shall be provided along with each submittal:

a. A Narrative or Cover Letter explaining in detail the nature of the request

b. A Vicinity Map on 8 1/2" by 11" paper

c. A Legal Description of the property, easement, right-of-way, etc. to be dedicated or abandoned, prepared on 8 1/2" by 11" paper, and sealed by a professional registrant registered in the State of Arizona.

d. An Exhibit that accurately depicts the Legal Description and includes ties to two separate section quarter corner or section corner survey monuments, prepared on 8 1/2" by 11" paper, and sealed by a professional registrant registered in the State of Arizona.

e. AutoCAD drawings that include the linework drawn up for the proposed dedication or abandonment.

f. A copy of the most recent recorded document(s) associated with the property(s).

g. An updated Title Report.

h. All applicable Lien Release documentation.

i. All applicable Dedication Documents as provided by the City's Right-of-Way Specialist, with original signatures.

j. Copies of any approved preliminary plat, site plan, zoning documents, associated stipulations of approval, and any development agreements associated with the property(s).

3. The base fee shall be paid at the time of submittal. Review fees beyond the base fee that are identified for a submittal shall be paid prior to the City recording a dedication or abandonment.

2.11 PREPARATION OF PLAN REVIEW SUBMITTAL DOCUMENTS

2.11.1 ENGINEERING CONSTRUCTION PLANS, REPORTS, AND DETAILS

A. General Standards

1. All plans, details, cover sheets, reports, and other submittal documents shall conform to all applicable requirements in the Engineering Standards and the Development Standards, including engineering design practices and guidelines as well as plan preparation and presentation. Plans should be one hundred percent (100%) complete and ready for approval on the first submittal.
2. Except as otherwise provided herein, all plans, details, cover sheets, reports and other applicable submittal documents that that are to be reviewed and/or approved by a technical registrant shall be signed and sealed by a Civil Engineer registered to practice in the State of Arizona. Includes seal, signature, seal expiration date, and date on each plan sheet and on the cover and table of contents of each report.
3. All Landscape Plans and Reports to be reviewed and/or approved shall be sealed by a Landscape Architect registered to practice in the State of Arizona.
4. Street lighting plans may be signed and sealed by an Electrical Engineer or Civil Engineer registered to practice in the State of Arizona.
5. Separate plan sets can be prepared for off-site infrastructure improvements and on-site infrastructure improvements if separate construction permits will be desired. This may also be accomplished by showing separate quantities and delineating clearly on the same plan set between the off-site infrastructure improvements and on-site infrastructure improvements.
6. Improvement plan sets shall not be phased under one cover, with the exception of a model home phase. The model home phase shall be delineated clearly on the plans and should be accompanied by an index showing the phasing. The model home phase shall include the necessary infrastructure to provide services to each structure in the phased area. The quantities shall reflect the separate phase, if the issuance of separate construction permits is desired.

    a. Performance bond or other financial assurance in the form acceptable to the City Engineer and City Attorney for a development, shall be determined by the boundary established on a Final Plat, Map of Dedication, or other dedicatory document and not by separate phasing limits on construction plans.

b. A notice of acceptance will not be issued and the two-year warranty period will not commence until all improvements associated with the improvement plan set is fully constructed.

7. Material quantities shown on plans shall be provided in an ownership type format. For example, quantities for materials that will be City owned shall be separated from quantities that will be owned by the property owner(s). Likewise, quantities for private utilities shall also be separated.

8. ALL plans for construction within the City of Goodyear shall have the appropriate General Notes on the Cover Sheet or on a Detail Sheet. All General Notes can be found in the Administrative Section of this manual.

2.11.2 STANDARDS FOR PLANS, DETAIL SHEETS, AND REPORTS.

A. Requirements

Plans and Detail Sheets shall comply with the following:

1. Construction plans shall be prepared on a 24-inch by 36-inch sheet size, with a minimum 1.5-inch left border and minimum 0.5-inch border on all other sides.
2. Plan layout, graphics, and callouts must be clearly presented in an uncluttered manner acceptable to the City Engineer or his or her designee.
3. Zoning as it currently exists on the property shall be included.
4. Legend for symbols, non-standard abbreviations, etc. shall be included.
5. “Key Map” shall be provided on multi-sheet plans to relate plan sheets to project locations and type of improvements. “Key Map” scale must be sufficient to clearly show all required information (i.e. valves, fire hydrant, manholes, street signs, and drainage arrows).
6. Callouts shall be boxed narrative text callouts.
7. Numeric style callouts may be used. When used, each number shall relate to the same topic for the entire set of plans, and narrative callouts shall be grouped and clearly shown on every page where callouts are used. Stationing and offset shall accompany every applicable callout number.
8. Plans may show all utilities as long as the information is clear and uncluttered. All proposed utilities shall be shown as a bold line type. All other infrastructure, existing and future, shall be shown lighter (smaller pen width or dashed) for reference only (minimum bold line weight: 0.70-mm; minimum light line weight: 0.30-mm). If separating out utilities, as a minimum.

a. Storm drain and paving may be on the same sheet.

b. Water, reclaimed water, and sewer may be on the same sheet

9. Plans shall provide cross-referencing between all sheets which have details, detail callouts, notes, etc.

10. Drafting and lettering of new topography and construction shall be sufficiently heavier (darker) than existing topography and infrastructure, so as to allow it to be quickly and clearly distinguishable.

11. Plans shall be oriented with north at the top or right side of each sheet whenever possible. A north arrow and bar scale shall be provided on each sheet. The north arrow and scale shall be located at the right side of each sheet whenever possible.

12. Construction plans shall be drawn to the following drawing scales:

Type of Plan	Horizontal Scale	Vertical Scale
Grading & Drainage Plan	1inch = 40 feet	N/A
Water & Sewer Plans	1inch = 20 feet	1inch = 4 feet
Paving & Storm Drain Plans	1inch = 20 feet	1inch = 2 feet
Master Plan/Reports	1inch = 100 feet	N/A

13. Unusual situations may warrant the use of a nonstandard drawing scale. Prior approval in writing from the City Engineer is required.

14. Minimum lettering and numbering size shall be 3/16-inch for manually drafted or 1/8-inch for mechanically produced letters, numbers, and symbols. Lettering, numbering, and line work must be uniform and with clear definition to be legible after half-size reduction.

15. Construction plans shall be of a quality to allow half-size reduction (i.e. line weight and letter size shall be easily read when reduced by 50%). NOTE: Plans which, in the opinion of City staff, cannot produce usable half-size reductions will not be accepted for review.

16. Construction plans shall be drawn with the drafting symbols presented in the City of Goodyear Standard Details or the MAG Uniform Standard Details for Public Works Construction.

17. City project HTE number or case number in border along right edge shall have a 1/4-inch minimum lettering size. This is to be assigned at first review and shall be placed on all subsequent construction plan submittals.

18. “Blue Stake” note is required on all plan sheets which include excavation of any type.

19. Construction Plans shall include all of the information contained in the Check Lists for each type of plans and in the “General” Check

List as applicable. The Check Lists can be found on the City's website.

20. Master utility plans shall be prepared at a 1-inch = 100 feet scale and shall show all applicable water lines, valves, fire hydrants, sewer lines, sewer manholes, reclaimed water lines and associated facilities to be constructed on or in conjunction with the project.
21. Drywell information shall be included on Grading and Drainage plans.

B. Cover Sheets Required

1. An individual coversheet shall be required for each construction plan submitted whether at the time of application or after.
2. The Cover Sheet Format and Information included therein shall conform to the requirements for cover sheets set forth in the Standard Details.
3. Each cover sheet shall include the following:

   a. Project Name and Description.
   b. Type of plans. (i.e., On-site/Off-site, Water, Sewer, etc.).
   c. City Name: Below the title, include the words "Goodyear, Arizona."
   d. Developer's name, contact address, email, and telephone number.
   e. Technical Registrant's name, contact, name, address, email, and telephone number.
   f. Owner's contact, name address, email, and telephone number.
   g. Engineer's seal and signature in the data certification block.
   h. Name of the engineer who prepared the soils report for the project and date the soils report was prepared.
   i. Approval block for signatures (see Administrative Chapter).
   j. Other agency approval blocks as required (see Administrative Chapter).
   k. City project HTE number or case number in border along right edge shall have a 1/4-inch minimum lettering size. This is to be assigned at first review and shall be placed on all subsequent construction plan and cover sheet submittals.
   l. Utility system ownerships and conflict table block (see the Administrative Section).
   m. Provide the township, range, and section.
   n. Project Benchmark – NAVD88. Approved City Benchmarks using NAVD88 elevations shall be used. In areas that have been master-

planned and partially developed using a different elevation datum, the City Engineer may approve a project datum. If a project datum is approved, an equation to the City approved datum shall be provided on each sheet of the plans. A list of City-approved benchmarks can be found on the City website or upon request at the Engineering Counter.

o. City of Goodyear, General Construction Notes, as applicable shall be included on Cover Sheet if not included on a Detail Sheet.

p. "Key Map" shall be provided on multi-sheet plans to relate plan sheets to project locations and type of improvements. "Key Map" scale must be sufficient to clearly show all required information (i.e. valves, fire hydrant, manholes, street signs, and drainage arrows). This may be shown on a Detail Sheet.

q. Legend for symbols, non-standard abbreviations, etc.

r. Sheet Index.

s. "Blue Stake" note is required on all plans which include excavation of any type.

t. Estimate of Quantities with construction items shown in units as required in the Construction Permit Fee Schedule as follows:

(1). Quantities shall be separated to show which materials will be City-owned, privately owned, and owned by another agency (i.e. Liberty Water, MCDOT, etc.)

(2). A detailed cost estimate sealed and certified by a civil engineer registered in the State of Arizona shall be submitted to the City for approval.

(3). The cost estimate shall be provided on a separate 8 1/2" by 11" sheets.

C. Detail Sheets – Additional Requirements

In addition to complying with the General Standards and Drafting Standards, the above shall also comply with the following:

1. City of Goodyear General Notes for Construction and other applicable General Notes, as shown in the Administration Section, shall be shown on Detail Sheets.

2. A typical cross section shall be shown for each street that matches the approved preliminary plat. The information required for a typical section is:

a. Dimensions

b. Street centerline, right-of-way and PUE

c. MAG standard Details and Specifications

d. City Standard Details
e. Pavement structural design
f. Slopes for all surfaces
g. Material types for all surfaces
h. Sawcut and match to existing street
i. Existing and proposed utilities
j. Landscaped areas
k. Scale
l. Title

D. Plan View Only Sheets

1. Plan View Only Sheets

a. Plan view only sheets are allowed for construction plans for the following:

(1). Grading and Drainage Plans with supplemental cross sections as needed to explain drainage.

(2). Water and reclaimed water plans for development where there is no existing infrastructure with proposed pipes sized under 12 inches in diameter.

(3). Street Light Plans, Landscape Plans, Mass Grading Plans, Traffic Signal Plans, SWPPP, Dry Utility Plans, and Signing and Striping Plans.

b. Plan View Only Sheets, in addition to complying with the General Standards and Drafting Standards above, shall also comply with the following:

(1). The drawing scale shall be clearly indicated for each plan view and a graphic scale at least 2 inches long, or 100 scale feet, shall be placed adjacent to each north arrow;

(2). All existing topography and features shall be show. Typically, this will include:

i. Existing contours with adequate spot elevations to show drainage.
ii. Existing Utilities – overhead and underground.
iii. Existing irrigation facilities.
iv. Adjacent land uses.
v. City limits, where applicable.

vi. 100-year floodplain limits, where applicable.

vii. 100-year floodway limits, where applicable.

(3). Existing and proposed rights-of-way, easements and property lines. Dimensions of these shall be clearly indicated.

(4). New drainage slopes may be shown as a percentage of slope or in foot-per-foot change of grade.

(5). Grade breaks shall be clearly shown.

(6). Separation distances between outside edges of utilizes shall be shown.

(7). "Blue Stake" block shall be provided on each sheet.

(8). Limits of grading (cut and fill) shall be identified with a heavy dashed line type.

(9). Show centerline of all existing and proposed streets including stationing along street centerline and station equations at all centerline monuments if applicable.

E. Plan View and Profile Sheets

1. Plan View and Profile sheets required for construction plans for the following:

a. All street paving plans.

b. All storm drain plans.

c. Water and Reclaimed Water plans for construction of improvements in locations with existing infrastructure.

d. Water and Reclaimed Water Plans for construction with proposed pipe sizes 12 inches in diameter or greater.

e. All sewer plans.

2. Plan View and Profile Sheets, in addition to complying with the General Standards and Drafting Standards above, shall also comply with the following:

a. Profile View shall show the following:

(1). Elevation and stationing grid clearly indicated.

(2). Profile of existing surface over proposed construction.

(3). Existing utility crossings.

(4). Proposed construction (i.e. elevations, slopes, grade breaks, proposed utility constructions, etc.)

F. Double Plan and Profile

Double Plan and profile shall only be permitted with written approval by the City Engineer at the sole discretion of the City Engineer.

G. Reports and Other Documents

1. All Reports and Documents, other than plans, cover sheets, and detail sheets, shall be provided on 8 1/2-inch by 11-inch format except as follows.

   a. Larger size exhibits may be included, provided they are secured inside.

2. Reports shall be prepared in accordance with and in conformance to the requirements for such reports as set forth in the Engineering Standards, applicable Development Standards, and applicable requirements for the development of construction reports that can be found on the City's Engineering Department's webpage.

2.12 RESUBMITTALS

Following receipt of the City's comments following the City's substantive review of the application submittal materials, applicant shall respond to all City comments and shall modify plans, detail sheets, reports and other documents to conform to the comments within 180 days from the receipt of the Plan Review transmittal. If a complete resubmittal is not returned within 180 days, the review will be considered expired and the review process will start over from the beginning. The subsequent submittal will be considered 1st review, and all applicable review fees will apply. If there are any questions about any of the comments or if clarification of comments is needed, please contact the Plan Review staff at City of Goodyear (623) 882-3110. If changes are made to plans, detail sheets, reports and other documents other than the changes requested by the City in its review comments, such changes shall be listed in detail with the location in plans clearly stated. FAILURE TO IDENTIFY ADDITIONAL CHANGES SHALL RESULT IN A DENIAL OF THE APPLICATION.

2.13 PLAN REVIEW APPROVAL

2.13.1 NOTIFICATION OF APPROVAL OR CONDITIONAL APPROVAL

When in the opinion of the City Engineer the construction plans and final reports meet the requirements for approval, and all fees have been paid, applicant will be notified of the City's approval or conditional approval. If applicant has not provided documentation reflecting required third party approvals, such approval shall be conditioned upon receipt of such approval. Until documentation, in the form provide herein, of the required

third party approvals is provided, and until applicable conditions of approval have been satisfied, the City will withhold signing the plans.

2.13.2 OTHER AGENCY APPROVAL REQUIRED

Before the City Engineer will sign conditionally approved plans, all other reviewing agencies (i.e. Liberty Water, EPCOR, Arizona American Water, Arizona Water, MCESD, MCDOT, RID, BWCDD, ADOT, FCDMC, MWD, Luke Air Force Base and / or others as required) shall have approved the plans by signing the cover sheet; or, if the agency does not sign the cover sheet, a letter of their approval shall accompany the signature submittal with the letter date and signing party noted on the cover sheet.

2.13.3 ELECTRONIC APPROVAL PROVIDED TO APPLICANT

When in the opinion of the City Engineer the construction plans and final reports meet the requirements for approval, and all fees have been paid and conditions of approval have been satisfied, the City Engineer will provide an electronic .pdf of the engineering construction plans and reports with a signed approval block on the cover via the City electronic plan review system for downloading by the Applicant.

2.13.4 EXPIRATION OF APPROVED PLANS

The City of Goodyear's approval for an improvement plan set shall expire one year after the City's approval date. An improvement plan set may receive a time extension through the Extension Review process identified in this chapter. Time extensions may be granted for up to one additional year from the original date of expiration (a maximum of two years from the date of original approval). An Extension Review submittal may be made at any time within the first year after a plan has expired however, the maximum time extension shall not extend beyond a maximum of 2 years from the date of original approval. Improvement plans with approval dates that are more than 2 years old from the date of original approval shall be submitted as a new project through the standard plan review and approval process.

2.14 INSPECTION PROCEDURES FROM ISSUANCE OF PERMIT THROUGH COMPLETION OF PERMITTED WORK

2.14.1 GENERAL PROCEDURE INFORMATION

The provisions set forth in this sub-section govern the inspection process for the construction or work for which an Engineering Permit is required ("Permitted Work") from the time an Engineering Permit is issued until the Permitted Work has been completed and a Notice of Approval of Work has been issued by the City Engineer.

2.14.2 PERMITTED WORK SUBJECT TO INSPECTION

Permitted Work shall be subject to inspection by the City Engineer or designee and such Permitted Work shall remain accessible and exposed for inspection purposes until approved. It shall be the duty of the Permit holder to cause the Permitted Work to remain accessible and exposed for inspection purposes. The City of Goodyear and its employees, contractors, agents and/or representatives shall not be liable for any expense entailed in the removal or replacement of any material required to allow for the inspection of any Permitted Work.

2.14.3 CONSTRUCTION STARTS FOR CERTAIN TYPES OF WORK

The construction for certain types of work shall not start until the associated work permit has been obtained from the City and the City construction inspector has confirmed that there are no field conditions or situations that would interfere with the start of construction. As a minimum, the following shall occur prior to prior to start of construction for following types of work activities:

A. Installation/Construction of Stormwater BMPs

1. A permit has been obtained from the City of Goodyear.
2. A preconstruction meeting has been held with the City Inspector.

B. Mass Grading

1. A permit has been obtained from the City of Goodyear.
2. A preconstruction meeting has been held with the City Inspector and all SWPPP controls are in place prior to grading activities.
    a. When there are estimated dirt hauls of 5,000 cubic yards or more, that require the use of the public right-of-way, then a haul route permit shall be obtained prior to the haul.

C. Grading

1. A permit has been obtained from the City of Goodyear.
2. A preconstruction meeting has been held with the City Inspector and all SWPPP controls are in place prior to land disturbance.
    a. When there are estimated dirt hauls of 5,000 cubic yards or more, that require the use of the public right-of-way, then a haul route permit shall be obtained prior to the haul.

D. Soil Haul/Encroachment

1. A permit has been obtained from the City of Goodyear.

2. A preconstruction meeting has been held with the City Inspector and existing infrastructure conditions have been documented and provided to the inspector prior to the haul.
3. Any other agency permits have been acquired.

E. Water, Reclaimed Water, Sewer, And/or Storm drain

1. A permit has been obtained from the City of Goodyear.
2. A preconstruction meeting has been held with the City Inspector and all applicable SWPPP controls are in place.
3. Property Pins/Stakes have been installed at all front lot corners and verified by the City Inspector.
4. All excess soils have been removed from the site.
5. Any letters of special conditions have been received and approved by the City. (i.e. temporary construction ponds, stockpiles, driveway slopes not exceeding maximum when raising pad elevations, etc.)
6. Materials testing information has been received on embankment/fill construction to include compaction certification for each finished pad.
7. Letter received from the Project Engineer or Registered Land Surveyor that all grading per the approved grading plans has been completed per the following tolerances:
   a. Pad Elevations are at or 0.1 feet above plan elevation (driveway slope compliance letter required if pad exceeds .1 feet above)
   b. All open spaces, tracts, and rights-of-ways (with exception of streets) graded to w/in 0.3 feet of plan grades. Street grades shall be within 0.5 feet of plan grades.

F. Dry Utility Joint Trench

1. A permit has been obtained from the City of Goodyear.
2. A preconstruction meeting has been held with the City Inspector and all applicable SWPPP controls are in place.
3. Water mains, services and appurtenances installed and verified to be functional (except water meter boxes, blow-off assemblies, air relief assemblies and water sampling stations).
4. Water main placed into service by Water Management. (Alternative – The waterline construction may be complete and left energized with a backflow device installed and trench backfill compaction testing completed. Flushing, testing, and sanitizing the line may be completed during dry utility installations.)
5. Copy of bacteria test results and custody form letter received by City Inspector. (If the Alternative described in item 4 is used, then test

results are due prior to concrete permits and new lines tied into existing with trench backfilling completed.)

6. Sewer mains, manholes and cleanouts installed, air tested, mandrel, and video camera of the sewer line completed.
7. An electronic copy (Windows Media Format preferred) of sewer video with a detailed report has been received and approved.
8. Sewer, water, and storm drain trenches backfilled, density testing information received and approved by the construction inspector for density and frequency. (Alternative – The developer may submit a sealed letter from the Geotechnical Engineer that the testing has been completed prior to the City receiving and approving the testing report.)
9. Field inspection performed on sewer system and deficiencies corrected:
    a. Manhole bases inspected for invert ponding, cracks and flow
    b. Pipe inspected for flow
    c. A blue top rim elevation shall be set prior to inspection for verification of depth of cone.
10. All water and sewer service stubs marked.
11. Property pins/stakes have been re-established at all front lot corners.

G. Concrete Structure, Concrete, and/or Paving Permit.

1. Concrete Box Culvert/Bridge Structures
    a. A permit has been obtained from the City of Goodyear.
    b. A preconstruction meeting has been held with the City Inspector and all applicable SWPPP controls are in place.
    c. These structures may be approved by the City to start when all utilities and/or sleeves have been completed in the vicinity of the structure.
2. All other Concrete
    a. A permit has been obtained from the City of Goodyear.
    b. A preconstruction meeting has been held with the City Inspector and all applicable SWPPP controls are in place.
    c. All dry utility conduits installed, inspected and backfill compaction tests received and approved.
    d. Prior to lowering water valves risers, waterline verified to be 100% operational and all valves open.

e. Sewer mains re-pressure tested.

f. Water and sewer markers in place.

g. Property pins/stakes have been re-established.

h. All retaining walls have been permitted.

H. Paving

1. A permit has been obtained from the City of Goodyear.
2. Interim storm drain, water, and sewer as-builts are approved by the city inspector.
3. A preconstruction meeting has been held with the City Inspector and all applicable SWPPP controls are in place.
4. All concrete items have been completed and verified by the City Inspector to be true to plan grade and free of defects, cracks, etc.
5. Each lot verified to have a water and sewer service and located out of driveways.
6. All water and sewer electronic marker balls verified to be installed and water/sewer crossings stamped in concrete curb.
7. The service lines for all remaining water appurtenances installed (meter boxes, blow-off assemblies, water sampling stations and air relief assemblies). Actual placement of appurtenances may be installed after paving.
8. All associated sleeves and/or utility street crossings have been installed (landscaping irrigation, wet/dry utilities, traffic signal interconnect, etc.)
9. Prior to actual Asphalt Concrete (AC) Placement:

    a. Subgrade density tests received.

    b. ABC density tests received.

    c. ABC gradation received.

    d. Valley gutters completed and concrete has met minimal strength requirements.

    e. Damaged, broken, chipped, and cracked concrete replaced that new pavement adjoins (curb & gutter, valley gutters, ramps, etc.)

I. Landscape

1. A permit has been obtained from the City of Goodyear.
2. A preconstruction meeting has been held with the City Inspector and all applicable SWPPP controls are in place.

3. Placement of landscape sleeves may start after the dry utilities have been installed. No other landscape work can start until concrete items have been completed.
4. No irrigation line installation, sidewalk construction in landscaped areas, planting, or granite placement, may start until the Inspector has verified that grades are per the approved grading plans and development standards.

J. Street Light

1. A permit has been obtained from the City of Goodyear.
2. Concrete items must be complete prior to placing streetlights.
3. A preconstruction meeting has been held with the City Inspector and all applicable SWPPP controls are in place.

K. Traffic Signal

1. A permit has been obtained from the City of Goodyear.
2. Construction Inspector has verified there are no field conditions or situations exists that would be in conflict with Traffic Signal work.
3. A preconstruction meeting has been held with the City Inspector and all applicable SWPPP controls are in place.

L. Signing and Striping

1. A permit has been obtained from the City of Goodyear.
2. The City has inspected the completed pavement and all pavement deficiencies have been corrected.
3. A preconstruction meeting has been held with the City Inspector.
4. Any field changes to plans have been approved by the City.

M. Traffic Control

1. A permit has been obtained from the City of Goodyear.
2. A preconstruction meeting has been held with the City Inspector.

2.14.4 INPSECTION STAGES

Except as otherwise expressly provided herein, inspections for the following “Permitted Work” shall occur at the following Inspection Stages:

A. Grading – Inspection Stages

1. Mass grading

2. Finish grading
3. Certification

B. Sewer – Inspection Stages

1. Trenching
2. Bedding
3. Pipe installation
4. Shading
5. Manhole
6. Backfill compaction
7. Pipe testing

C. Drainage (Storm Drain) – Inspection Stages

1. Trenching
2. Bedding
3. Piping installation
4. Shading
5. Manholes
6. Backfill compaction
7. Pipe testing
8. Riprap

D. Dry Utilities – Inspection Stages

1. Trenching
2. Conduit placement
3. Backfill compaction
4. Asphalt/concrete/landscape restoration

E. Drywells – Inspection Stages

1. Number and locations
2. Approved materials
3. Perc Testing

F. Water – Inspection Stages

1. Trenching

2. Bedding
3. Piping/hydrant installation
4. Restraint
5. Backfill compaction
6. Testing

G. Structures for Storm Drain – Inspection Stages

1. Compaction
2. Inside forms/rebar
3. Outside forms
4. Concrete mix ticket
5. Poured concrete
6. Backfill compaction
7. Handrails
8. Test results review

H. Paving – Inspection Stages

1. Sub grade
2. Base course
3. AC placement

I. Concrete – Inspection Stages

1. Compaction
2. Forms
3. Concrete mix ticket
4. Poured concrete
5. Test results review

J. Landscape Inspection Stages

1. Trenching
2. Irrigation mainline
3. Pressure Test
4. Planting

K. Storm Water – Inspection Stages

1. Setup and maintenance of BMP devices

L. Traffic Signal – Inspection Stages

1. Foundation hole/rebar
2. Concrete mix ticket
3. Poured concrete
4. Test results review
5. Upright installation
6. Mast arm installation
7. Electrical inspection
8. Traffic signal and meter pedestal inspection
9. Material certification

M. Street Lights – Inspection Stages

1. Pole installation/backfill
2. Activation

N. Signing – Inspection Stages

1. Sign installation
2. Sheeting certification

O. Striping Inspection Stages

1. Striping layout
2. Striping

P. Traffic Control Inspection Stages

1. Traffic control setup

2.14.5 INSPECTIONS

Inspections for all other Permitted Work shall occur at stages designated by the City Engineer, subject to the provisions set forth herein.

2.14.6 DAILY INSPECTIONS AND PERMIT HOLDER DUTIES

Permit holder may request daily inspections for Permitted Work to expedite the inspection process, which request may be granted at the discretion of the City Engineer or his/her designee. Unless permit holder obtains approval for daily inspections, Permitted Work shall not be done

beyond the point indicated in each successive Inspection Stage above without first obtaining approval of the City Engineer. It shall be the duty of the Permit holder or its duly authorized agent to contact the City Engineer when Permitted Work is ready for inspection and to schedule an inspection. It shall be the duty of the Permit holder to provide access to and means for inspecting Permitted Work.

2.14.7 NOTIFICATION OF PERMITTED WORK THAT FAILED TO MEET REQUIREMENTS/STANDARDS

Within two business days following an inspection, the City Engineer or designee shall notify the Permit holder or its duly authorized representative, if any of the Permitted Work was not installed or constructed in accordance with the approved construction plans for the Permitted Work, the requirements of the Engineering Standards, the Development Standards or other applicable requirements of any other federal, state, or local laws, rules and/or regulations applicable to the Permitted Work. Any of the Permitted Work that does not comply with the approved construction plans for the Permitted Work, the requirements of the Engineering Standards or any requirement of any other federal, state, or local laws, rules and/or regulations applicable to the Permitted Work shall be corrected and the portion of the Permitted Work being corrected shall not be covered or concealed until authorized by the City Engineer or his/her designee. The City of Goodyear and its employees, contractors, agents and/or representatives shall not be liable for any expense entailed in correcting the Permitted Work so that it complies with the approved construction plans for the Permitted Work, the requirements of the Engineering Standards, or the requirements of any other federal, state, or local laws, rules and/or regulations applicable to the Permitted Work.

2.14.8 OTHER INSPECTIONS

All other inspections conducted pursuant to the authority granted in the Engineering Standards shall be conducted pursuant to procedures adopted by the City Engineer, which procedures shall comply with all applicable state and federal laws, regulations or rules governing such inspections.

2.14.9 FINAL INSPECTION

The final inspection will be scheduled after the City inspector has verified that all of the Permitted Work under all Engineering permits issued for a specific project has been completed per development standards, and after all associated testing reports, materials certification, other permitting agency approval letters, and private utility acceptance letter have been received and approved. Applicant shall make the repairs, modifications and/or corrections for all items identified on the Final Inspection punch list (“Punch List Repairs”).

2.14.10 APPROVALS OF PERMITTED WORK

Approvals as a result of an inspection shall not be construed to be an approval of a deviation from the approved construction plans, or an approval of a violation of the provisions of the City of Goodyear Engineering Standards and Policies or of any other applicable federal state, or local laws, rules and/or regulations applicable to the Permitted Work. Approvals of Permitted Work presuming to authorize the violation of, deviation from, or avoidance of provisions of the Engineering Standards, Development Standards, or of any other applicable federal state, or local laws, rules and/or regulations applicable to the Permitted Work shall not be valid.

2.15 COMPLETION OF IMPROVEMENTS

2.15.1 AS-BUILTS

A. Process

1. Approved and Accepted "As-Builts" are required for all permitted work. The process for obtaining "As-Built" approval and acceptance is as follows:
2. Following the completion of the Punch List Repairs, applicant shall submit black line copies of "As-Built" drawings for all permitted work for review. The "As-Built" drawings shall conform to the requirements of Chapter 10 of this manual and the "As-Built" drawing shall be certified and sealed by Professional Engineer or Land surveyor registered to practice in the State of Arizona.
3. The Master Utility Plan shall be updated with the "As-Builts."
4. Once the drawings have been approved, Mylars of the approved "As-Built" drawings shall be provided to the City Engineer for acceptance.

2.15.2 LETTER OF ACCEPTANCE / NOTICE OF APPROVAL

Following the completion of the Punch List Repairs, submittal of closeout documentation and submittal and acceptance of the "Mylar As-Builts" for the permitted work, applicant shall seek from the City Engineer a Letter of Acceptance for improvements for which the City is to own and maintain, or a Notice of Approval for improvements that the City will not own or maintain.

A Letter of Acceptance or Notice of Approval will not be issued for the completion of a single phase of a phased improvement plan set. All improvements associated with an improvement plan set shall be completed prior to issuance of a Letter of Acceptance or Notice of Approval.

A. Obtaining a Letter of Acceptance or Notice of Approval

Once the City is satisfied that all improvements have been constructed per the City approved improvement plans, Engineering Standards, and Development Standards, the City Engineer shall provide either a Letter of Acceptance, indicating that the City is accepting the improvements that are to be owned and maintained by the City, or a Notice of Approval, indicating that the City Engineer has approved the improvements that are not to be owned and maintained by the City. The warranty period begins to run upon the issuance of a Letter of Acceptance or Notice of Approval by the City Engineer.

To obtain a Letter of Acceptance or Notice of Approval the applicant shall provide the following:

1. Warranty bond that meets the requirements set forth herein.

2.15.3 WARRANTY PERIOD AND WARRANTY BOND REQUIREMENTS

A. Warranty Period

1. The warranty period for completed improvements shall be two years from the date a Letter of Acceptance or Notice of Approval is issued except as otherwise provided herein.
2. The warranty period for all stormwater disposal and erosion related improvements shall be five years from the date a Letter of Acceptance or Notice of Approval is issued.
3. The Warranty period shall continue until all warranty punch list items are resolved to the sole satisfaction of the City Engineer.

B. Warranty Bond Requirements

Warranty Bonds shall comply with the following:

1. The amount of the Warranty Bond shall be equal to 10% of the original engineer's estimate of the cost of the improvements covered by the Warranty Bond.
2. Warranty bonds shall be issued in favor of the City.
3. Warranty bonds shall only be accepted from entities that have been rated A+ rating by A.M. Best Company.
4. Warranty shall specifically identify the amount of the warranty bond, the specific location of the improvements for which the warranty bond would apply, the name of the development, and the types of improvements the warranty bond will apply towards.
5. Warranty bonds for all improvements except stormwater disposal and erosion related improvements shall be held for a minimum of two

years after the City has issued a Letter of Acceptance or Notice of Approval and until all improvement defects have been remedied as identified by the City Inspector during the warranty period.

6. Warranty bonds for stormwater disposal and erosion related improvements shall be held for a minimum of 5 years after the City has issued a Letter of Acceptance or Notice of Approval and until all stormwater disposal and erosion related improvement defects have been remedied as identified by the City Inspector during the warranty period.

2.15.4 RELEASE OF PERFORMANCE BONDS

A. Performance Bond Retention

Except as otherwise provided in this subsection, performance bonds shall be retained by the City until all of the following have occurred:

1. All of the improvements covered by the performance bond have been completed.
2. Mylars of approved As-Built Drawings for all of the improvements covered by the performance bond have been accepted by the City.
3. A Notice of Approval and/or Letter of Acceptance for all of the improvements covered by the performance bond has been issued by the City Engineer.
4. A warranty bond that meets the requirements set forth in this Chapter has been provided.

CHAPTER 3

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3.1 INTRODUCTION

3.1.1 GENERAL INFORMATION

A. Purpose

These policy statements are standards and interpretations made to assist in the implementation of the requirements of the ordinances. These policies are to be followed unless adequate documentation is submitted to and approved by the City Engineer that demonstrates that the intent and requirements of the ordinances will still be met.

3.1.2 DEFINITIONS

A. Adjacent Grade

The elevation of the ground, sidewalk, patio, deck support, or basement entryway immediately next to the structure.

B. The 100-Year Flood

A flood with a 1% chance of being equaled or exceeded in any given year. Throughout the United States, the standard for floodplain management is protection from flooding up to and including the 100-year flood event.

C. First Flush

The first half-inch of rainfall runoff (Q=iA), where Q is the runoff flow in cfs, i is the average rainfall intensity in inches per hour, and A is the drainage area.

3.2 GRADING AND DRAINAGE

3.2.1 DESIGN

A. General

1. Drainage easements should be identified as early as possible in the planning of any development project, preferably as part of the master plan process. The City will check for and avoid discontinuous drainage easements. Unless otherwise agreed to in writing by the City, maintenance of drainage facilities is the responsibility of the Individual, POA or the HOA that owns the property within which the drainage facilities are located. The Grading and Drainage Plan and Recorded Plat should specify who has maintenance responsibility.
2. All developments are required to have on-site retention sufficient to hold 100% of the 100-year 6-hour storm. A stormwater retention waiver may be submitted if the conditions in Section 3.3.5.I apply.
3. Stormwater runoff volumes will be calculated using the methods, charts, tables and isopluvials found in the Drainage Design Manual for Maricopa County, Volume I, Hydrology.

4. Grades
   a. Grades adjacent to and within 10 feet of sidewalks or roadways shall not exceed a slope of 6:1.
   b. All other grades shall not exceed a slope of 4:1 without prior permission from the City Engineering Department.

B. Structures

1. Structures must be designed such that they do not flood during any storm up to the 100-year 6-hour event.
2. Habitable structures located in an area designated as a Special Flood Hazard Zone by the FEMA Flood Insurance Rate Maps (FIRM) shall be designed to meet the City requirements as identified in the Flood Damage Prevention Ordinance.
3. Finished Floor elevations shall be a minimum of 18 inches above the low lot outfall and a minimum of 12 inches above the high water elevation.

C. Subdivisions

1. Lots shall drain to the street.
2. Lots shall have a minimum slope of 1%.
3. On-Lot retention will not be allowed on lots that are less than one acre in size.
4. Retaining walls will be required when the elevation difference between two adjacent lots is greater than 1foot.
5. Avoid design of common drainage facilities that require maintenance by Individual property owners. Drainage facilities should be located in a common tract that is to be owned and maintained by a POA or HOA.

D. Retaining Walls

1. Retaining walls that retain greater than 1foot of material will be reviewed and approved by the Building Safety Department.
2. Retaining walls should be shown on the Grading Plans for informational purposes only.
3. Retaining walls shall have a maximum retained height of 6 feet.

3.2.2 DRAINAGE REPORT PREPARATION

The Drainage Report must be prepared in accordance with the EDS&PM, and Development Regulation regarding the construction of drainage and retention infrastructure.

This section outlines the City's requirements and provides guidance for preparing drainage reports to submit to the City of Goodyear.

This section is based on procedures, data, and basic assumptions, including but not limited to: publications of the FCDMC, regulatory requirements, and the EDS&PM. When methods or data not included in the EDS&PM are used, the Drainage Report must include sufficient information to enable the City staff to fully evaluate the applicability of the methods and data.

A. Purpose of a Drainage Report

The purpose a Drainage Report is to document that stormwater runoff has been considered in the planning of each project, that the runoff will be properly managed by the project, and that the public and its property will be protected from damage by runoff flows and flooding. The requirement applies to those who will own and/or use a proposed project and to those who own or occupy property adjacent to or near the proposed project.

B. Types of Drainage Reports

There are Drainage Memorandums, Master Drainage Reports, Preliminary Drainage Reports, and Final Drainage Reports. The section below describes the four report types.

1. Drainage Memorandum

A Drainage Memorandum shall be provided for all GPA, Rezone, and PAD applications that are not part of a phased construction. The following information, at a minimum, shall be provided:

a. Describe and show the locations and sizes of all existing and/or proposed floodplains, natural and artificial channels, storm drains, storage basins, and any other drainage structures or improvements within, adjacent to, and downstream of the site.

b. Describe how both flows generated on-site and flows impacting the development from off-site are to be managed.

2. Master Drainage Report

A Master Drainage Report provides a governing design plan by which all Preliminary and Final Drainage Reports will be based for each phased portion of development. The Master Drainage Report shall be provided when the project is to be designed and constructed in phased succession. A Preliminary and Final Drainage Report may be submitted following the approval of a Master Drainage Report when a preliminary plat or site plan and civil construction drawings are submitted.

3. Preliminary Drainage Report

A Preliminary Drainage report may be proceeded by a Master Drainage Report if the project is part of a phased construction.

When a Master Drainage Report has previously been approved by the City for an overall development, the Preliminary Drainage Report shall match the Master Report in respect to the portion of the overall development being designed. However, the Preliminary Drainage Report is not a conceptual view of drainage on the property, but rather a draft version of the Final Drainage Report.

A Final Drainage Report shall follow the Preliminary Drainage Report when right-of-way improvement, construction, or grading plans are required.

4. Final Drainage Report

A Final Drainage Report may be proceeded by a Preliminary Drainage Report when a Preliminary Plat or Site Plan have previously been approved for the project.

The Final Drainage Report shall closely follow the Approved Master Drainage Report and Preliminary Drainage Report (if applicable).

See the summary table below for guidance on when the various drainage reports are due to the City and the corresponding requisites. All master, preliminary and final drainage reports must be signed and sealed by a registered professional engineer.

Table 3.2.2 Drainage Report Guidance

Types of Drainage Report	Activities Requiring a Drainage Report	Drainage Report Due	Pre-requisite Drainage Reports	Post-requisite Drainage Reports
Drainage Memorandum	• GPA, Rezone or PAD that are not part of a phased construction	Submit with GPA, Rezone, or PAD application	N/A	N/A
Master Drainage Report	• Phased construction with Rezone or PAD	Submit with Rezone, or PAD application	N/A	Preliminary and Final Drainage Report*
Preliminary Drainage Report	• Site Plan • Preliminary Plat	Submit with the Site Plan or Preliminary Plat application	Master Drainage Report*	Final Drainage Report
Final Drainage Report	• Permit to construct right-of-way improvements • Permit to construct any structure • Grading Permit	Submit with the construction plans	Preliminary Drainage Report	N/A

*If part of a phased construction

C. Elements of a Drainage Report

Each Drainage Report shall include a discussion and provide all relevant maps, tables, and calculations necessary to describe and justify how off-site and on-site stormwater will be managed in conjunction with site improvements. For specific items to be included (as applicable) in all drainage report types see the Drainage Report Outline, at the end of Chapter 3.

There will be cases when one or more of these elements would not be applicable, and there could be special projects requiring additional analyses or information not covered in these elements. The elements are described in the following subparagraphs:

1. Introduction

   The introduction shall include the following items:

   a. Project name
   b. Project location – including a vicinity map exhibit
   c. Type of Drainage Report (Master, Preliminary, or Final)
   d. Project description – including the size of the project in acres and scope of project
   e. Include any pertinent existing drainage studies. The existing studies should be described and the information that is being referenced should be summarized. Pertinent excerpts from these studies should be included in the Appendix of the drainage report.
   f. Purpose and Objectives of project

2. On-site Drainage Conditions

   This section shall include a narrative of the on-site drainage network, patterns, and watershed and floodplain boundaries. This section of the report should include the following information about the project, as applicable.

   a. Narrative description of existing drainage network, drainage patterns, watershed boundaries, floodplain boundaries, natural and artificial channels, storm drains, storage basins, and any other drainage structures or improvements that are within the project site. Include location and sizes of all drainage ways and drainage systems within the project limits.
   b. Topographic map depicting the existing conditions including all the aforementioned items, plus the 100-year floodplain for all washes with a capacity of 100 cfs or greater.
   c. Site specific photographs and aerial photographs that describe the location and condition of the property to be developed.
   d. Description of the existing ground cover conditions and the identification of the hydrologic soil group(s) found on the property.
   e. Description of any existing development located on the property and how it affects drainage.
   f. Description of any existing and/or proposed developments on adjacent properties and how it affects drainage on the project area.

g. Justification for the selection of parameters used in analysis of on-site conditions.

3. Off-site Watershed Conditions

This section shall include a narrative of the off-site watershed conditions and the drainage network entering and existing the project. This description will correspond to the watersheds delineated on the topographic map. This section of the report should include the following basic information, as applicable:

a. Narrative description of existing upstream and downstream drainage patterns, watershed boundaries, floodplain boundaries, natural and artificial channels, storm drains, storage basins, and any other drainage structures or improvements that are adjacent to or downstream of the project site. Include location and sizes of drainage ways and drainage systems that are adjacent to and downstream of the project.

b. Topographic map delineating watersheds from which stormwater enters or affects the project's property. These maps shall be prepared at a scale that clearly shows the drainage areas so that the watershed boundaries can be drawn with accuracy. Contour lines should be shall be shown on the maps at an interval appropriate for the slope and complexity of the terrain. The map shall show the locations and flow rates for the off-site flows impacting the property.

c. Site specific photographs and aerial photographs that describe the upstream watersheds and downstream conditions and/or constraints that affect the property.

d. A description of the groundcover conditions and the hydrologic soil group(s) found in the off-site watersheds.

e. A description of existing development in the watersheds and how this affects drainage.

f. A description of any proposed projects or developments, which have approved designs and that will affect this property.

g. Describe any other condition which would significantly affect the runoff from the watershed.

h. Justification of the selection parameters used in analysis of off-site conditions

4. Floodplain Designation

A description of the floodplain designation of the development shall be provided. The description shall identify the flood zone(s) for which the project is located as identified by the current FEMA Flood Map. This section shall also identify the risks of that zone(s). An

excerpt of the current FEMA floodplain map with the location of the property shown shall be provided as an exhibit in the report.

5. Proposed Drainage Plan

The proposed drainage plan shall describe how the proposed project will manage stormwater runoff, including how the project will affect stormwater runoff.

a. Basis of Design for Drainage and Flood Control Facilities

(1). Summarize the design criteria used, and include a brief description of the design approach and methods used. Include exhibits, data, and calculations that support the selection of materials, locations, and design of facilities. Include if the project will be retaining the 100-yr 6-hr volume or a first flush approach will be taken. See Section 3.2 for design criteria and policy guidance, and Section 3.3, Stormwater Management, for design guidance of the specific drainage facility. If the drainage report will be using information from existing drainage studies, these studies should be described and the information that is being referenced should be summarized. Pertinent excerpts from these studies should be included in the appendix.

(2). The peak flows, times of concentration, and other pertinent hydrologic data, for each off-project drainage area tributary to the project shall be computed and submitted in summary form. For the time of concentration include the equation used and minimum time of concentration allowed.

(3). State the peak flow rate calculated and describe the flow capacity requirements and inflow-outflow relationships (as applicable) for the following items:

i. Retention/detention basins - For retention basins specify the design criteria used and explain how the basin will be dewatered

ii. Up and/or downstream ends of culverts;

iii. Intake points for storm drains (i.e. inlets, catch basins, scuppers, etc.);

iv. Points immediately upstream and downstream of channel junctions and/or street intersections;

v. Other items as may be necessary to give a complete hydrologic picture and allow a thorough hydraulic evaluation and/or design of the drainage system.

(4). If approval of a development will require that a wash be retained in its natural state, then supporting hydrologic and hydraulic calculations must be submitted in sufficient detail with the Drainage Report to demonstrate that the easement or tract set aside for drainage will be of sufficient width to convey the peak 100-year storm drainage flow, without endangering life or property which is outside the easement or tract, and to accommodate usual maintenance equipment.

b. Pre- and Post-Project Topography

(1). Prior to development, existing topographic conditions influence the flows of stormwater runoff from off-site watersheds as well as runoff originating on the property. Topographic changes resulting from development will impact these drainage characteristics, including the time of concentration. The drainage report shall include sufficient pre- and post-project topographic information to demonstrate the effects of the project. This information shall be depicted on contour maps that show adjacent properties, including off-site watersheds, in addition to the property being developed, to provide context for the potential impact of development. Information about adjacent property, such as significant differences in elevation, walls, drainage structures, buildings (including lowest floor elevations) shall be included.

c. Pre- and Post-Project Stormwater Runoff of Off-site Flows

(1). Compare and analyze the stormwater runoff exiting the project both prior to and after construction, for the 5-year, 10-year, 50-year, and 100-year storm events. Include the “C” value used to calculate stormwater runoff for the project and when applicable, include calculations to show how a weighted “C” value was developed.

(2). Describe the proposed facilities for collection, routing, and discharging off-site flows.

(3). If, as a result of the project, drainage flows will be reduced by facilities such as retention or detention basins, the effect of these facilities on flows exiting the property shall be described and depicted on appropriate maps. Construction of roads, parking areas, roofs, channels and other development features results in the increase of runoff volumes, peak discharge rate, and reduces times of concentration.

(4). Verify that on-site and off-site flows will not combine.

d. Basis for Selection of Lowest Floor Elevation

For all development projects the lowest floor elevation(s) shall be provided. The lowest floor elevations must provide protection from flooding. The basis for the selection of a floor elevation or the design of protection for the interior of the building, must be clearly presented. See Sections 3.2.1 for design criteria. Supporting documentation should be included in an appendix.

e. Description of the Provisions for Project Phasing:

(1). Describe the phasing of parcels and the timing of the installation of drainage facilities. Any project, particularly a large one, may have interim stormwater runoff, flooding, and erosion problems that would not exist after project completion. The report shall explain how the phasing will occur, what interim drainage problems are anticipated, and what interim measures will be taken to protect against the interim problems.

6. Special Conditions

In this section include project stipulations, 401 and 404 permits, and AZPDES.

7. Data Analysis Methods

Include the hydrologic, hydraulic, and stormwater methods and assumptions utilized in the drainage report.

8. Conclusions

a. Overall Project

(1). Provide a summary of findings and recommendations outlined within the report based on the completion of the project in its entirety. For projects that are constructed in phases, provide conclusions based upon the completion of all phases within the project.

D. Additional Documentation Required with Drainage Reports

1. A construction schedule shall be included in table format for all drainage-related construction required on the development, per signed zoning or other agreements.
2. If construction activity will disturb an acre or more, then a SWPPP and a copy of the NOI must be submitted to the City, by the owner, to obtain a grading permit. For developments that meet the qualification of a “Small Site”, the SWPPP may be included as a separate sheet in the Grading Plans. A copy of the SWPPP and NOI

must also be submitted to ADEQ as required by law. The SWPPP shall include all requirements of Maricopa County Rule 310[1].

a. Effective February 7, 2000, the NPDES Stormwater Program was expanded to address stormwater discharges from small Municipal Separate Storm Sewer Systems (MS4s) and construction sites that disturb one or more acres. The NPDES program requires owners/operators of construction projects disturbing one or more acres to prepare a SWPPP and to file a NOI.

E. Additional Information

Refer to the Drainage Report Checklist, as found on the Engineering Department website, for specific items that are to be included within a Drainage Report.

3.2.3 SITE PLANS AND PRELIMINARY PLATS

A. Submittal

1. All Site Plans and Preliminary Plats shall provide a full size (24" x 36") drainage exhibit with the following information provided:

a. All existing stormwater management features, storm drain lines (with line sizes and line material types listed), retention basins, and drainage channels (with flow direction and CFS listed).

b. Existing information shall be shown in dashed screened back line types.

c. All proposed improvements shall be shown in dark lines.

d. Clearly show and define, on the preliminary grading and drainage drawing, each sub-area of the property that will contribute runoff to each retention basin or interconnected retention basin system.

e. Show, label, and quantify (cfs) all stormwater runoff generated offsite which will be impacted by construction of the development.

f. Show the areas to be used for storm drainage retention or detention. These areas shall be tracts to be maintained by the Individual, HOA or POA that owns the area within which the stormwater retention or detention will be located. Sufficient dimensions, contours, side slopes, volumes, top, bottom and high water elevations, and other relevant information shall be provided.

g. Indicate (by arrows) the location, direction, and amount of flow (cfs) of all natural washes or man-made drainage channels which exist or are planned, and which flow through, are adjacent to, or begin within the proposed development.

[1] Copies of all requirements, forms, and guidance are available in the "Drainage Design Manual for Maricopa County Volume III, Erosion Control" available at the Flood Control District, 2801 West Durango, Phoenix, Arizona 85009. Phone No. 602-506-1501.

h. Easements for surface drainage shall be wide enough to provide a channel which meets the City engineering design requirements.

(1). Surface drainage easements may be split so that 1/2 lies on one lot and 1/2 lies on the adjacent lot.

(2). If a development is to have an HOA or POA, the land area set aside for surface drainage should be on a tract which will be owned and maintained by the HOA or POA and not on an easement where maintenance responsibility would be split among several property owners.

i. Show the street drainage pattern by arrows and indicate those points at which it is intended to add concentrated flow to the street drainage and to remove drainage from the street.

3.2.4 CONSTRUCTION PLAN REQUIREMENTS

A. Review

1. All improvement plans which include work within the City shall be submitted for review and approval by City Staff. Plan review submittals are made to the Engineering Department.

2. Grading & Drainage improvement plans shall provide sufficient topography and/or point elevations to clearly show that the grading and drainage related improvements have been designed to meet the requirements of this chapter.

B. Review Guidelines

No permits for public storm drain installation will be issued until the Owner/Developer has provided the necessary easements and rights-of-way. The instruments of dedication must be approved by the City and recorded at the Maricopa County Recorder's Office. The following paragraphs highlight construction plan requirements pertaining to the preparation of Grading & Drainage Improvement Plans which are to be submitted to the City for approval:

1. Plans shall be prepared and submitted per the information provided in Chapter 2 of this manual.

2. General Construction Notes and Grading & Drainage Construction Notes which apply to grading a site and the construction of drainage facilities on a site are required on each set of construction plans which include work on the City's storm drain system or a storm drain system which is to be dedicated to the City. These notes are provided in Chapter 1 of this manual.

3. If a storm drain line is to be connected to an existing system, the following note shall be placed on the plans: "Contractor shall verify

the location of the existing storm drain line before proceeding with trenching."

4. Where storm drain lines or culverts cross water lines, sewer lines, reclaimed water lines, or drainage culverts, the relationship shall be shown in both plan and profile and actual separations shall be called out.
5. For permitting purposes, quantities for all items of work within public rights-of-way and public easements shall be included on the cover sheet of the plans unless otherwise approved by the City Engineer.
6. Plans and profiles of storm drain lines shall show size, invert and grade elevations, materials of construction, utility location, and any other details which define the construction requirements.
7. Easements of record shall be noted and shown in plan view. Annotations should include the docket and page number and / or the Maricopa County Recorder's number.
8. The checklist for developing a grading and drainage plan can be located on the City's engineering website. The checklist also provides detailed information regarding the information required for a grading and drainage plan.

C. Mass Grading

A mass grading plan may be submitted to Engineering for permitting. The purpose of a mass grading plan is to balance large scale cut and fill on the site, prior to final grading. The criteria for submitting and permitting of a mass grading plan are as follows:

1. The subject project is part of a current, approved site plan or preliminary plat.
2. The plan should include topographic contours at one (1) foot maximum intervals.
3. No street grading or structures shall be included on the plans. All proposed grading shall be within the project boundary and shall not negatively impact any adjacent property.
4. Retention basins with ponding no more than one (1) foot deep are to be used for the interim condition drainage mitigation.
5. Grading is prohibited in existing City right-of-way or FEMA flood plain (Special Flood Hazard Areas).
6. The submittal shall include a mass grading drainage report (final design report) or mass grading section in the final drainage report for the project, if included in an overall improvement plan package.
7. A SWPPP site plan and narrative shall be submitted.
8. Financial assurances are not required for mass grading permits.

9. For proposed subdivisions, a recorded Final Plat is not required prior to the issuance of a mass grading permit.

D. "At-Risk" Permit

1. An At-Risk Grading and Drainage plan may be approved as a convenience to the developer. The City is not obligated to approve an At-Risk Grading plan. If an At-Risk Grading plan is accepted to be submitted it must follow the below listed requirements:

a. The subject project is part of a current, approved site plan or preliminary plat.

b. The City must complete first review of the Final Grading and Drainage plans for the proposed development and find that the plans are substantially acceptable. The Final Drainage Report must also be substantially acceptable.

c. The City must review and approve the SWPPP.

d. Developer/Contractor must provide a copy of the signed NPDES NOI and construction schedule prior to issuance of At-Risk Grading permit.

e. Contractor to provide to City one copy of the Maricopa County Rule 310 (Dust Control Permit).

f. Contractor shall obtain a Haul Route permit if more than 5,000 cubic yards of material is to be imported to the site or exported from the site, or at the discretion of the Engineering Inspector.

g. Contractor to obtain a "At Risk Grading" permit at a cost of 150% of the actual grading and drainage permit cost, which has a one time "life" of 60-calander days. The total fee (for the "At Risk Grading" permit) will be collected at the time of "At Risk Grading permit application.

h. Developer/Contractor shall obtain an actual Grading and Drainage permit, within 60-calendar days of the issuance of the At-Risk Grading permit and following approval of the Grading and Drainage plans. The Contractor shall cease construction activities at the site if the grading plans and/or the Final Grading permit is not issued within 60-calander days.

i. Grading is prohibited in existing City right-of-way or FEMA flood plain (Special Flood Hazard Areas).

j. The permit is restricted to earth moving operations only – no structures, storm drain or underground storage may be constructed under an "At-Risk Grading" Permit.

(1). The City will issue an "At Risk Grading" permit which is effective for 60-calender days provided that the developer/owner/contractor agree to complete the items listed below. **No other permits such as building, water, sewer,**

concrete, dry utilities or paving will be issued until such time as:

i. All civil drawings are approved by the City; and

ii. The final grading and drainage permit is obtained; and

iii. All fees associated with plan review have been paid to the City; and

iv. The financial guarantee for construction of the project has been posted with the City

2. If the above mentioned items are not submitted and accepted by the City within the 60-calander days (unless otherwise extended by the City Engineer,) the "At Risk Grading" permit will be withdrawn and the contractor will be required to return the property to its original condition.

3.2.5 AS-BUILT DRAWINGS

A City-approved set of As-Built Drawings are required for all grading and drainage improvements constructed in the City, prior to acceptance of the system and start of the 5-year warranty period. The 5-year warranty period applies to the stormwater disposal system. As-built plans shall be signed and sealed by a qualified professional registrant registered in the State of Arizona. See Chapter 10 of this manual for applicable as-built standards.

3.3 STORMWATER MANAGEMENT

3.3.1 INTRODUCTION

A. Design

The design of drainage and flood control facilities in the City of Goodyear shall follow the latest edition of the Drainage Design Manuals of the FCDMC that pertain to Hydrology, Hydraulics, and Erosion, as supplemented by this manual. This manual contains clarifications or modifications applicable to the design of facilities within the City of Goodyear.

B. Hydrology

Table 3.3-1 outlines the minimum drainage design criteria for stormwater management and drainage facilities within the City of Goodyear.

C. General Information

1. All developments within the City shall provide such storm drainage facilities as are necessary to ensure that all structures and properties- including those within, upstream of, and downstream of the development- shall be protected from the adverse impact of

stormwaters due to the proposed development. All development projects disturbing one acre or more will implement strategies that include a combination of structural and/or non-structural BMP's designed to reduce pollutants in post-construction runoff to the City's municipal separate storm sewer system.

2. All on-site drainage channels and other structures handling stormwater runoff shall be designed and constructed in accordance with these standards, including single family residential lots. Any proposed structural changes which may accelerate, retard, convey, or redirect surface water runoff in any way must be approved by the City Engineer.
3. Any culverts installed for stormwater conveyance shall be 18 inches minimum inside diameter, constructed of approved materials.
4. All culverts shall be installed with both upstream and downstream end sections or headwalls.
5. Where driveways cross existing stormwater channels, the finished elevation of the driveway at the point of crossing the channel shall be at or below the lowest top of curb elevation at the intersection of the driveway and the public street. Where the flow line of the channel is less than 2 feet below the lowest intersected curb elevation, a drop inlet type headwall shall be required if a culvert is used.
6. All scuppers, storm drain inlets and culvert headwalls shall be constructed with a "NO DUMPING" inlet marker per the City Standards Details.

TABLE 3.3-1 Hydrology Design Criteria

Peak Frequencies (Six-Hour Storm Evenet)				
Drainage Feature	5-Year	10-Year	50-Year	100-Year
Street with Curb & Gutter	Runoff (the flow of water) on collector and local streets shall be contained within the street curbs	Runoff (the flow of water) on arterial streets shall be contained within street curbs. For major collector and all arterial streets, one 12-foot dry lane must be maintained in each direction.	Runoff to be confined to road right–of-way or to drainage easements.	Runoff to be confined to road right-of-way or to drainage easements. Maximum depth for water (dmax) dmax = 8 inches above the low spot in the street.
Street with Storm Drain System	Storm Drain Pipes and Inlets shall be added if the 5-year runoff exceeds street capacity as addressed above.	Storm Drain Pipes and Inlets or roadway channels shall be are added if the 10-year runoff exceeds street capacity as addressed above.	N/A	Storm drain systems are used to maintain runoff within the road right-of-way or drainage easements. Storm drain systems: catch basins, scuppers, etc. to be provided to remove water so as not to exceed dmax = 8 inches (12 inches in weir conditions)
Cross Road Culvert or Bridges for Arterial and Major Collector Streets	N/A	N/A	Runoff to be conveyed by culvert or bridge under road with no flow overtopping the road.	Culverts shall be used to maintain a maximum 6-inch flow depth over the roadway while maintaining at least one dry lane in each direction
Cross Road Culvert or Bridges for Local and Minor Collector Streets	N/A	Runoff to be conveyed by culvert or bridge under road with no flow overtopping the road.	The 25-year frequency storm runoff shall be conveyed by culvert or bridge while maintaining a maximum 6 -inch flow depth over the road.	Maximum flow depth over roadway crown is 12 inches.
Any street crossing a water course which provides access to residential areas	N/A	N/A	N/A	May be used as a secondary access road only if an all-weather access road is available to every lot or parcel. Depth of flow shall be no greater than one foot over the road during the 100-year runoff event.
FEMA Floodplain Channel	N/A	N/A	N/A	100-year peak discharge.
Channel to Convey Offsite Flow Through Development	N/A	N/A	N/A	100-year peak discharge
Stormwater Storage	N/A	N/A	N/A	100-year 6-hour runoff for determining on-site storage volume.

3.3.2 COLLECTION SYSTEM

This portion of the system is intended to collect runoff and convey it to retention/detention facilities and/or outfall points. No structure of any kind shall be constructed, nor any vegetation be planted nor be allowed to grow within, on, or over any drainage easement, if it would obstruct or divert the flow of stormwater. The City may, if it so desires, construct or maintain drainage facilities on or under the land of the drainage easement. Stormwater retained in retention basins or conveyed through drainage channels during the 100-year 6-hour event shall not be located above any City utility line including, but not limited to, water, sewer, reclaimed water, and storm drain. In general, the collection system shall consist of the following:

A. Surface Drainage Facilities

1. Streets
2. Open channels

B. Sub-surface Drainage Facilities

Sub-surface drainage facilities are required whenever the capacity of the surface system is exceeded. It is comprised of the following:

1. RGRCP, Polypropylene, and HDPE Pipes
2. Manholes/junction boxes
3. Catch basins and scuppers

C. Retention/Detention Facilities

Retention/Detention Facilities are intended to retain/detain sufficient volumes of runoff to minimize the adverse impact of the new developments on downstream areas.

1. All developments must provide retention/detention facilities.
2. Single family development, when the lots are less than one acre in area, shall provide a common retention tract that is to be owned and maintained by the HOA or POA.

3.3.3 DRAINAGE

A. Street Drainage

1. Underground storm drains or open channels are required when the street capacity is exceeded.
2. Dip crossings of open channels shall only be accepted when an alternative all-weather access is available to every property. When

dip crossings are used, the depth of water over a roadway shall be no greater than what is permitted in Table 3.3.1 of this chapter.

3. Theoretical Capacity

   A Manning's "n" value of 0.020 shall be used for residential streets and parking lots, and 0.016 shall be used for non-residential street flow. If special conditions exist, they must be clearly documented in the Drainage Design Report.

4. Longitudinal Street Grades

   The desirable minimum longitudinal street grade is 0.4% to ensure good gutter drainage. Wherever possible, longitudinal street grades greater than or equal to the desirable minimum grade shall be provided. All grades less than 0.4% must be approved by the City Engineering Department.

5. Valley Gutters

   a. Valley gutters shall be used to transport runoff across local streets when a storm drain system is not required. The minimum width of a valley gutter is 4 feet.

   b. Mid-block valley gutters are not allowed. Storm drains or culverts shall be constructed where mid-block stormwater crossings are required.

6. Design Criteria for Roadside Ditches

   Geometry shall be designed to allow maximum conveyance of flows and minimal maintenance.

7. Catch Basins

   a. Catch Basins shall be constructed as shown in the City Standard Details.

   b. For scuppers, MAG Standard Detail 206 shall be used as the basis of design.

B. Drainage Between Lots

1. No subsurface routing of drainage ways between lots or buildings shall be permitted in an easement unless the Engineering Department has approved, in writing, the placement of the drainage way in an easement, and the property owner has granted the necessary easement.

2. If approved, the channel shall be designed to convey the 100-year flow without flooding adjacent properties.

3. If approved, the channel shall be constructed in a dedicated drainage easement leading to a positive outfall point. The minimum width of the easement shall be the top width of the channel plus eight feet for a maintenance roadway. The ends of the easement shall be treated in such a manner as to prevent non-maintenance vehicular access without diminishing the hydraulic capacity of the channel. For design purposes, a minimum of 25% of the upstream opening shall be assumed to be clogged with debris.

C. Underground Storm Drains

1. Underground storm drains shall be provided whenever the capacity of a street is exceeded.
2. Pipes shall be sized using "Manning's Formula". Values of Manning's "n" shall be per appropriate technical literature and shall be referenced.
3. Velocities shall range between 3 fps and 9 fps.
4. The minimum pipe size of a lateral collector and a main shall be 18" ID. In situations where debris is expected, the City's Engineering staff should be consulted for applicable clogging design criteria.
5. The hydraulic grade line for a 10-year storm event may be above the pipe, provided that it remains at least one foot below the ground elevation at all manholes, catch basins, inlets, etc.
6. When the pipe changes direction more than 30 degrees, there shall be a drop, between match points, of at least 0.1 feet. In no case shall the deflection angle be greater than 90 degrees.

D. Separation of storm drain from water and sewer lines

1. Horizontal separation of storm drains to water, sewer, or reclaimed water lines shall be a minimum of 6 feet.
2. Vertical separation of storm drains to a lower sewer should be 2 feet, unless the sewer line is manufactured from epoxy coated ductile iron with mechanical joints or equal.
3. Vertical separation of storm drain to a lower water or reclaimed water line shall be 2 feet.
4. Separation is measured from the outside edges of the two pipes.

E. Bubble-Up Structures

1. Bubble up structures shall not be used to discharge on-site or off-site stormwater.

3.3.4 DRAINAGE MATERIALS

A. Pipes

Standard material for storm drain pipes in the public rights-of-way shall be RGRCP per ASTM C76, Polypropylene Pipe per ASTM F2881, or HDPE per ASTM F894. HDPE may only be used up to a maximum diameter of 48 inches. Generally, the minimum rating shall be Class III; when the cover is less than two feet, the minimum rating shall be Class IV. Concrete backfill used to protect pipe shall be subject to City approval.

For additional Polypropylene Pipe information see the City Standard Details.

B. Manholes/Junction Boxes

1. Materials: All manholes shall be per MAG Uniform Standard Specifications and Details.
2. Locations: Manholes and/or junction boxes are required at all of the following:

   a. Junctions of two or more pipes
   b. Changes in grade
   c. Changes in alignment
   d. Changes in pipe sizes (pipe crowns are to match)

3. Spacing: The maximum spacing for manholes shall be:

   a. 400 feet on lines 18 inches to 36 inches diameter
   b. 660 feet on lines 36 inches in diameter and larger

C. Open Channels

1. Natural Channels: Whenever possible and appropriate, existing natural drainage channels shall be left in a natural state. A drainage easement or right-of-way shall be dedicated over the 100-year floodplain of the natural drainage way.
2. Man-made Channels: When man-made channels are required, the emphasis should be placed on creating a "natural" appearance. Grass lining with side slopes 6:1 or flatter are preferred.
3. Maximum Velocities/Erosion Protection: In general, the maximum velocity shall not exceed the scouring velocity of the soil (with natural cover). When the scour velocity is exceeded, additional erosion protection shall be provided. The protection may consist of one or more of the following:

   a. Concrete/gunite lining (reinforced with 4 x 4-inch WWF - 12GA).

b. Natural stone rip-rap, grouted in place, comprised of 4-inch to 12-inch diameter stones with from 1/4 to 1/2 diameter exposed.

c. Check dams, at maximum 3-foot elevation intervals.

4. Maintenance

a. Access: Open channels to be properly maintained should provide reasonable access for maintenance. Minimum width of accessways should be 8 feet. Spacing between vehicular access points should be a maximum of 1/2-mile. A minimum of one access point per subdivision is required. Non-vehicular access points shall be provided every 660-foot maximum. If the facility is to be City-maintained, the above minimum requirements are mandatory.

b. Responsible Party: General maintenance of drainage conveyance facilities within the City of Goodyear is the responsibility of the Individual, POA or HOA that owns the property within which the drainage conveyance facilities are located. For new drainage conveyance facilities, the Developer shall be responsible to repair any deficient material or workmanship for the first 5 years of the facility. The Developer's name, address, phone number, and specific repair and maintenance responsibilities shall be shown on the Recorded Plat and the Grading and Drainage Plan.

3.3.5 DETENTION OR RETENTION FACILITIES

A. Sizing

1. Basis of Design

a. All retention/detention facilities shall be sized to retain 100% of the 100-year 6-hour storm falling over the entire project, measured in gross area and including streets. For purposes of determining the volume required, the project shall be considered to extend to the centerline of all existing and/or future streets on the exterior boundaries, and to include all interior streets and other rights-of-way within the project. A stormwater retention waiver may be submitted if the conditions in Section 3.3.6.I apply.

b. Freeboard

(2). There shall be a minimum of eighteen inches of freeboard from the basin high water surface elevation to the lowest building elevation and a minimum of one foot of freeboard from the basin high water surface elevation to the gutter of the upstream streets.

(3). There shall be a minimum 6 inches freeboard from the water surface outfall to the lowest top of bank. An outlet weir may be set at the design high water surface.

2. Volume

Required volumes shall be determined using the methods, charts, tables, and isopluvial maps described in the Drainage Design Manual for Maricopa County, Volume I.

3. Retention/detention basins shall be located such that they can intercept the flows from the entire site.

If the basin is located other than at the lowest point of the project, the Design Engineers shall denote on the Master Drainage Map the actual or effective drainage area. If portions of the project cannot drain to the primary basin, additional basins shall be added to retain runoff from these areas. Credit will not be given for providing volume in excess of that needed to retain the 100-year 6-hour storm from a basin's effective drainage area.

B. Volume Certification

The property owner will provide the City with certified as-built dimensions of the basins and the actual volume of storage provided. This must be based on "As-Built" topographic surveys made by either a Civil Engineer or Land Surveyor who is registered to practice in the State of Arizona. These as-built volumes must reflect permanent conditions, with finished landscaping in place. The volumes shall be certified by the Design Engineer that the volumes provided meet or exceed the required design volumes per City Ordinance and the approved Drainage Plan. The volume of storage provided must equal or exceed the approved design volumes before the City will issue Letters of Acceptance for maintenance of any public facilities.

C. Grading

1. Depths

a. Retention shall not be within the right-of-way or any public non-drainage easement. Temporary shallow (12-inch depth) retention basins may be approved in special, wide rights-of-way where street improvements will not commence within 12 months.

b. The Zoning Ordinance restricts retention to 50% of the street frontage. The percentage may be increased for a shallower basin on a case-by-case basis by the City Planning & Zoning Division during the Site Plan/Preliminary Plat process.

c. The basins shall not exceed 1.5 feet of water depth within 10 feet of the right-of-way unless there is a fence or other similar protection to restrict access to the area.

d. The overall average retained high water depth shall not exceed 3 feet. If special allowances are granted by the City Engineering

Department to retain greater than 3 feet, the basin must be fenced to prohibit access; alternatively, a side slope of 8:1 may be provided for a minimum distance of 25 feet as measured from the 100-year high water elevation.

e. While it is the City's intent that the "average" depth is not to exceed three feet, it is also the City's intent that the basins be contoured to present an aesthetically pleasing appearance. Therefore, up to 25% of the bottom area may be up to 4 feet deep as long as the average depth does not exceed three feet.

f. In no case shall the depth exceed one foot, or the total volume exceed 1,000 cubic yards (27,000 cubic feet), without a positive means of disposing accumulated runoff.

2. Slopes - Side and Bottom

a. Bottom - The bottom of all basins shall be sloped towards the discharge points. The minimum bottom slope shall be 0.5%.

b. Side Slopes

(1). Side slopes adjacent to public rights-of-way, or when there is pedestrian-type access to that portion of the basin, shall have a side slope of 6:1or flatter.

(2). Side slopes adjacent to walls, fences, hedges, or other similar areas with no or limited pedestrian-type access, may have side slopes up to 4:1.

(3). Retaining walls may be used in areas adjacent to permanent walls, fences, or other areas where pedestrian access is not encouraged.

3. Grading/Landscaping/Joint Use as Parks

a. The contours of basin bottoms and side slopes shall be varied to enhance the basin appearance.

The Developer and Designer shall work with representatives of the City's Community Development Department to determine the need/desirability and feasibility of joint usage of the basin as a park site. If appropriate, the design shall provide for appropriate open areas for recreational facilities.

b. It is not the intent of these guidelines to dictate the specific details of the configuration to the designers; however, the following concepts will be used as the basis of reviewing the plans:

(1). Curvilinear sides should be used in lieu of long stretches of straight lines.

(2). Side slopes should be varied (i.e., start with 6:1 then change to 7-8:1 or more). With appropriate use of landscaping, side

slopes can be reduced to 4:1 subject to approval by the City Planning & Zoning and Engineering departments.

(3). Bottom areas should contour to varying depths in lieu of uniform depth/slope.

c. The tops and bottoms of side slopes shall be rounded off - generally over a distance of 5 feet each way of the "PI".

d. Landscaping - Section 7 of this manual defines the basic landscaping requirements for retention/detention basins. As with the grading, the Landscape Plans shall be reviewed in regard to the aesthetic effects of the proposed design.

4. Retention/Detention in Parking Lots.

a. Retention/detention in parking lots of multi-family developments is not permitted. All retention/detention of such developments shall be in landscaped areas.

b. Retention/detention of runoff in parking lots of industrial/commercial developments is permitted subject to the following guidelines:

(1). No more than 50% of the required storage volume may be retained / detained in parking areas. The balance shall be provided in landscaped areas. The tributary areas to each "basin" shall be noted on the Master Drainage Map.

(2). No more than 50% of the required parking spaces shall be covered by stormwater retention/detention.

(3). Storage systems shall be designed to store the first 30% of the required runoff volume off of paved areas, in order to avoid nuisance water constantly ponding on the pavement.

(4). Depth of water shall not exceed six inches within the parking area, nor shall it exceed 0.15 feet at the midpoint of any parking space.

(5). Interference with pedestrian traffic will be minimized in the design of the storage facility.

(6). A continuous fire access lane shall be provided throughout the development, and it shall be free of ponded water from the retention areas.

(7). All parking spaces shall be accessible during periods when the basins are filled to capacity, without pedestrians having to cross ponded water deeper than 0.15 feet.

c. Before final plan approval, an approved Drainage Report must show the calculated stormwater storage volume based on runoff from the 100-year 6-hour storm.

5. Overflow/Outfall

   a. Outfalls: Each project shall be designed such that the "ultimate" outfall for all drainage in excess of the 100-year 6-hour storm is routed to a public street, storm drain, drainage channel, or natural watercourse. The outfall shall be accessible without draining over private property.

   b. If such an outfall does not exist, the project must provide an outfall.

6. Overflow/Conveyance

   a. Off-project flows which historically flowed through the project shall be routed through or around, or retained within the development. Off-site flows routed through a development shall not combine with on-site flows retained within the development.

   b. Off-site runoff volumes shall not be allowed to cross over or encroach upon private lots, streets, or public/private access ways.

   c. On-site runoff volumes in excess of those required to be retained / detained (currently the 100-year 6-hour storm) may be routed directly through the outfall, although they must be routed via the retention/detention facilities.

7. Location/Conflicts with Existing Utilities

   a. Retention/detention facilities shall not encroach into existing easements for private utilities without written approval of the encroachment from all utility companies which are in or may use the easement.

   b. Retention/detention facilities and swales shall not encroach into public rights-of-way or into public easements. If necessary, the Developer shall relocate conflicting utilities into a new dedicated easement.

   c. The top of the retention/detention facilities (i.e., freeboard elevation) shall be at least 4 horizontal feet from any building or public roadway.

   d. Retention/detention facilities shall not be located within 20 feet of an active septic system, nor within 100 feet of an active water well.

   e. A minimum three feet of cover (from the bottom of the basin to the top of the pipe) shall be maintained over water, sewer, and reclaimed water service lines.

8. Disposal/Discharge

   a. All retention/detention facilities shall have a positive method to dispose of retained/detained runoff waters. All stormwater so retained/detained shall be disposed of within a 36-hour time frame.

Public streets are not considered an acceptable outlet for disposal of retained/detained runoff; however, they are considered an acceptable outlet for overflow. Only under special circumstances with prior City staff approval should pump disposal methods be used.

b. The minimum allowable pipe size for primary outlet structures is 18 inches.

c. Methods of disposal of accumulated stormwater runoff shall meet the following requirements prior to issuance of a Grading and Drainage Permit(s):

(1). Developments within 1/4-mile of a positive gravity outlet shall provide a connection between all retention areas greater than one foot in depth, or having more than 1,000 cubic yards of storage volume to the positive gravity outlet. Positive gravity outlets shall be identified as follows:

i. An existing City storm drain (Note: a maximum discharge of 1 cfs will be permitted).

ii. A natural drainage channel of sufficient capacity to convey the anticipated flows from the tributary drainage area.

iii. A man-made drainage channel that connects into a natural drainage channel, each of which is of sufficient capacity to convey the anticipated flows from the tributary drainage area.

(2). Developments not within the specified distance of a positive gravity outlet, which use a one-foot deep or less than 1,000 cubic yards' volume retention basin, shall provide information verifying that surface percolation is sufficient to dispose of retained stormwater within 36 hours of the end of a storm event.

(3). Developments not capable of meeting the above requirements (1 and 2) shall provide information indicating an alternative method to be used for the disposal of retained stormwater within 36 hours of the end of a storm event. The following options may be approved by the City Engineering Department:

i. Drywells, in accordance with this chapter.

ii. Other alternatives as approved by the City Engineering Department.

(4). Stormwater shall not be discharged onto a City street, gutter, or alley.

D. Basin Floors

1. The basin floor to infiltrate properly must be an “engineered basin floor”. They are generally landscaped and maintained for aesthetics only.
2. Drain time: All storage facilities should be designed such that the stored runoff shall be discharged completely from the facility within 36 hours following the end of a storm event. This is a City ordinance requirement related to County Health Department Standards.

   Percolation tests and results shall accompany all drainage reports.
3. Nuisance Water: Each basin, particularly when used as a park, shall be graded such that there are one or more "sump" areas wherein runoff from the more frequent storms, as well as nuisance runoff, may be retained/detained without flooding the balance of the basin. The preference here is surface percolation.

E. Embankment Design Criteria

1. Detention or retention facilities should be constructed below the natural ground surface.
2. The use of embankments to impound stormwater runoff requires prior approval by the City Engineering Department. Embankments become small dams that could potentially present serious downstream flood hazards.
3. If approval is obtained, all of the design requirements contained in the FCDMC Manual Section 9.3.3 must be completely and thoroughly followed.
4. The Owner/Developer must provide to the City an as-built certification by a Registered Geotechnical or Civil Engineer, experienced in dam technology. This information should confirm that the embankment was designed and constructed properly, is stable, and will safely impound the design volumes of water.

F. Operation and Maintenance

Maintenance of detention or retention facilities within the City of Goodyear is usually the responsibility of the subdivision’s HOA or POA.

G. Drainage Corrective Measures

Developers of new projects shall provide financial assurance in a form and amount acceptable to the City Engineer and City Attorney to cover the costs to correct any stormwater erosion and disposal problems that may arise during the first 5 years following the completion of the initial project construction. During the 5-year period, if disposal methods in use are found to be insufficient to dispose retained stormwater within a 36-hour period following the end of a rain event, and/or drainage improvements

fail to operate as designed creating erosion, the Developer's Engineer shall submit a corrective action plan to the City for review and approval. The submitted information shall demonstrate measures that will be implemented to correct deficiencies in the system. The plan shall conform to the requirements of this chapter.

H. Underground Stormwater Storage Facilities (USF)

USF's may be used as a part of a private stormwater management system under the following conditions:

1. USFs shall maintain a positive means to bleed off the retained stormwater. This includes the use of drywells or a connection to a City storm drain line, open channel, or natural drainage channel.
2. Stormwater entering into a USF shall first pass through a cleaning mechanism (such as a retention basin) capable of retaining the first flush event, or a sand & debris separation mechanism capable of treating the first flush peak flow prior to discharging stormwater into the USF.
    a. Sand & debris separation devices shall be designed to remove sands and debris from the first flush peak flows. Flows greater than the first flush peak flows may bypass this device. The manufacturer and model of a proposed sand & debris separation device shall be provided in the Preliminary Drainage Report.
3. Where drywells are selected to bleed off a USF, a drywell with a pre-treatment component shall be required. See the Drywell section of this chapter and the City Standard Details for additional information.
4. Several types of USF materials and systems are permitted within the City. Manufacturers' specifications shall indicate that the USF material shall have a minimum 75-year life span.

I. Drywell Implementation Criteria and Guidelines

1. Drywells may be permitted to be installed in the City for the use of stormwater disposal in retention areas as identified in this chapter.
2. Drywells shall not be used for projects that would require a Drywell Aquifer Protection Permit from ADEQ; this includes but is not limited to the use, storage, loading, or treatment of hazardous or toxic materials.
3. Drywell usage shall comply with all prevailing City, State, and Federal requirements including but not limited to the following ADEQ documents:
    a. "Guidance for Design, Installation, Operation, Maintenance and Inspection of Drywells"

b. "Annual Drywells Inspection Checklist"

c. "Drywell Registration Form"

4. Design and Construction

a. See the City Standard Details for drywell construction requirements.

(1). Standard drywell(s) with a pre-treatment component shall be required in the following circumstances:

i. In industrial and commercial development retention basins that drain parking lots.

ii. In retention basins where the drywell is located closer than the following distances to the outfall location of an opening conveying stormwater from a paved surface:

(a). 20' – Turf-lined basin

(b). 50' – Decomposed Gravel-lined basin

iii. As the primary drywell for a basin that requires more than three drywells. "Primary" signifies the drywell that is located at a lower elevation than the other drywells in the basin.

iv. As the bleed-off for USF's.

v. In retention basins that will accept greater-than-normal levels of debris, sediments, or oils as a result of the proposed use of contributing drainage areas.

(2). A stand-alone standard drywell may be used in situations where the pre-treatment component is not required.

b. Construction shall be performed by a contractor qualified in the construction of drywells.

c. All drywells located in retention basin bottoms are to be equipped with a secured grate to prevent unauthorized removal.

d. Drywell grates shall be elevated 0.5 feet above basin bottoms.

e. Drywells in all other areas except a basin bottom shall have watertight covers. In landscaped areas, drywell covers shall be elevated 0.2 feet above the finished ground elevation.

f. Pipes or facilities conveying stormwater from any surface other than a turf or decomposed granite-lined first flush basin shall not be allowed to enter a standard drywell.

g. Standard drywells shall be located a minimum distance from the outfall location of an opening conveying stormwater from a paved area:

(1). 20’ – Turf-lined basin

(2). 50’ – Decomposed Gravel-lined basin

h. Drywells shall not be installed within City rights-of-way.

i. The number of drywells required to drain a site shall be calculated by using a maximum 0.25 cfs discharge, unless a lower cfs value is recommended by the manufacturer.

j. Drywells that cease to drain a basin or USF within 36 hours of the end of a storm event shall be replaced or refurbished by the Owner with a new one(s) where positive gravity outlet methods of disposal are still not available. Such a requirement shall be written in the Covenants, Conditions and Restrictions (CC&R) for all subdivisions where drywells are used to drain stormwater storage facilities.

k. The excavation for the drywell shall penetrate a minimum of 10 continuous feet into sand, gravel, or other suitable permeable layer approved by the City or when the depth of 75 feet has been reached, unless otherwise approved by the City Engineer.

l. For drywells that do not penetrate into a continuous 10-foot permeable layer, a percolation test shall be performed on the drywell to verify that design percolation rates have been achieved. The test shall consist of injecting the finished drywell system with clean (potable) water until the rates of inflow and percolation have stabilized for one hour. A copy of the report shall be submitted to the City prior to final approval of the grading and drainage for the project.

m. Where possible, drywells shall be located near basin side slopes and away from low areas within the basin but shall not be elevated more than 6-inches above the bottom of the basin.

5. Drywell Maintenance Plan

a. A Drywell Maintenance Plan shall be submitted to the City for review and approval prior to issuance of a drywell installation permit. The plan shall require the following:

(1). Settling chambers and interceptors to be inspected annually.

(2). Removal of deposited sediments and debris is to be performed along with an annual inspection or when:

i. Sediment /debris levels fill more than 10% - 25% of the chamber capacity,

ii. Drywell ownership or maintenance responsibility changes,

iii. Material not resulting from stormwater or urban surface runoff enters the drainage system interceptor or the settling chamber.

b. The plan shall require that a copy of the ADEQ Drywell Registration be submitted to the City Engineering Department.

c. The plan shall require drywell information including but not limited to: Location, depth, type, installing contractor, date of installation, Owner, maintenance contractor, and emergency contact to be provided to the Engineering Department. This information shall also be included on each annual inspection report.

d. Copies of inspection reports and maintenance reports shall be submitted to the Engineering Department within 10 days of inspection or maintenance.

J. Stormwater Retention Waiver

1. Under the current City of Goodyear policy, stormwater storage is required for 100% of the 100-year 6-hour storm. Stormwater retention requirements may be waived to only retain the first flush (the first ½ inch of rainfall runoff volume) if specific criteria are met and if approved by the City Engineer. If not, the development must store the runoff volume necessary to maintain the integrity of the drainage system. Specific criteria for considering a stormwater retention waiver are:

a. The runoff for the project has been included in a storage facility at another location. The applicant must demonstrate that the stormwater storage facility was specifically designed to accommodate runoff from the subject property and that the runoff will be conveyed to this location through an adequately designed conveyance facility.

b. The subject property is adjacent to, and drains directly into, a regional drainage system that an engineering analysis shows has been designed and constructed to handle the additional runoff without increasing the potential for flood damage to the subject property or to any other property.

c. If neither criteria in “a” or “b” can be satisfied, the subject property shall detain sufficient runoff volume to attenuate post-development flows to or below pre-development levels for the 2-, 10-, and 100-year, 6-hour storm events.

2. In no case shall the development of a property increase runoff or change drainage characteristics to the detriment of any other property owner. The Developer/Owner is not relieved of liability if the development causes increased drainage problems or flooding on any other property.

3. If a first flush waiver is granted, Article 16-7 of the Goodyear City Code requires controls to reduce pollutants for the 100-year 6-hour storm, or any amount leaving the property.

3.3.6 MISCELLANEOUS DESIGN GUIDELINES

The following guidelines are based on recurring drainage and flooding problems observed in Goodyear, as related to specific design or construction practices:

A. Subdivisions

1. A subdivision should always have an approved subdivision-wide drainage plan. Calculating drainage based on individual lots, and submitting separate grading plans as each lot is developed, should be avoided.
2. Avoid design of a common drainage facility that requires maintenance by individual property owners. Unless not feasible, drainage facilities shall be located in a common tract that is to be owned and maintained by the HOA or POA.

B. Storm Drains

1. If at all possible, avoid the interception of an offsite natural wash with the intent of collecting the water and putting it into a pipe or an underground storm sewer system.
2. If there is no alternative to the routing of an open channel into a piped system, water should be first routed into a sediment or debris basin. Periodic maintenance of the debris basin should be undertaken by the Individual, HOA or POA that owns the property within which the basin is to be located.

C. Culverts

1. Culverts should not be placed more than 0.5 feet below the natural wash invert, or the capacity must be reduced by the cross-sectional area below this depth.
2. Culverts or small free span bridges for private driveways or walkways over washes or drainage channels whose source originates off-site or off-lot should be designed by a Professional Civil Engineer.
3. For small private driveways or walkways, dip crossings or free span bridges that won’t constrict the flow capacity of the channel are recommended.

D. Open Channels

1. Diversions of natural washes or changes in the channel's profile should be avoided whenever possible.
2. Do not permit encroachment into a drainage easement, channel, or its floodway.
3. If channel lining or landscaping material is used, it must be inlaid or located below the design invert (bottom) of the channel. Do not place it on top of the designed finished grade of the channel cross section. The channel surface material (and roughness coefficient) or cross-sectional area shall not be changed without a plan revision, and re-approval by the City.
4. If only the channel banks are being lined, the lining material must extend down below the channel invert to below the anticipated scour depth.
5. Avoid designing turns in open channel conveyance systems sharper than 45 degrees, whenever possible. If curves or bends can't be avoided, the run-up on the outside of curves must be calculated and incorporated into the channel design.
6. Lot lines should not extend out to where they overlay or cross a drainage easement or wash. The wash area or drainage channel should be dedicated in a separate drainage easement tract whenever possible. This will avoid "backyard" drainage channels, which can result in serious flooding problems.

3.3.7 STORMWATER MAINTENANCE AGREEMENT

Stormwater management facilities shall have an enforceable operation and maintenance agreement to ensure the system functions as designed. This agreement will include any and all maintenance easements required to access and inspect the stormwater management facility, and to perform routine maintenance as necessary to ensure proper functioning of the stormwater management facility. In addition, a binding covenant specifying the party/parties responsible for the proper maintenance of all stormwater management facilities shall be secured prior to approval of final subdivision plat and issuance of any permits for land disturbance activities. The use of non-structural stormwater treatment practices is encouraged in order to minimize the reliance on structural practices.

3.4 STORMWATER POLLUTION PREVENTION FOR CONSTRUCTION SITES

3.4.1 PURPOSE

Outline minimum requirements for compliance with the City's Stormwater Management Plan, MS4 Permit, and associated City ordinances adopted as

a result of changes in stormwater pollution regulations. Although specific regulations are referenced, this is not a comprehensive recitation or interpretation of minimum requirements that may apply to construction activity by agencies such as ADEQ or the Environmental Protection Agency (EPA).

3.4.2 HISTORY

The EPA issued regulations in 1990 authorizing the creation of a phased NPDES permitting system for stormwater discharges. In 1999, the EPA published rules that implemented Phase II of the stormwater program. In December 2002, the EPA designated ADEQ as the regulating authority, and the AZPDES program was developed.

In March of 2003, the Phase II program expanded to small municipalities which included the City of Goodyear. Over a five-year period, operators of small municipalities were required to develop, implement, and enforce a program to prevent or reduce, to the maximum extent practicable, discharges of pollutants to the City's MS4 and Waters of the United States.

In compliance with Phase II regulations, the City of Goodyear developed both a Stormwater Management Plan and a Stormwater Pollution Ordinance, and obtained permit coverage through ADEQ. The Stormwater Management Plan outlines six distinct programs in which the Engineering Department participates through plan review and compliance inspection processes relating to construction site stormwater runoff control.

3.4.3 SITE CLASSIFICATIONS

The City has two classifications for all construction sites that result in a land disturbance. There are distinct plan preparation, construction, and permit termination requirements for each classification. Documents have been prepared to assist applicants with developing plans and are available on the City's website. Projects are classified as either Small Sites or Large Sites as follow:

A. Small Sites and Large Sites

1. Small Sites must meet all of the following criteria:

   a. Area of land disturbance is less than 1 acre, and

   b. not part of a Larger Common Plan of Development or Sale, and

   c. located farther than ¼ mile from impaired or unique waters. *

2. Large Sites must meet any of the following criteria:

   a. Construction that results in land disturbance of 1 acre or greater, or

   b. part of a Larger Common Plan of Development or Sale, or

c. project is located within ¼ mile of unique or impaired waters *

* The City of Goodyear identifies a project to be within ¼ mile of impaired or unique waters if any portion of the project is closer than ¼ mile to the water's floodway boundary as delineated in FEMA FIRM.

3.4.4 PLAN REQUIREMENTS AND REVIEWS

All projects shall incorporate methods to control erosion and minimize pollutants from leaving the site associated with any storm event. As a City minimum, erosion and sediment controls shall be designed to manage peak discharges from the 2-year, 24-hour event as determined by utilizing the Drainage Design Manual for Maricopa County, Hydrology. BMPs shall be selected, installed and maintained per the Drainage Design Manual for Maricopa County, Erosion Control. Unless specific approval is granted, the use of straw bales as BMPs is not permitted in the City of Goodyear. Plans shall be developed so as to not cause flooding, negatively affect drainage, or impact adjacent property. Sites adjacent to or having a potential to discharge stormwater into another municipality shall obtain consent of proposed construction from that municipality prior to final plan approval by the City of Goodyear. Submittal to the City of Goodyear and approval of any document by the City does not negate or replace requirements for compliance with any ADEQ or EPA regulation. The Owner and/or Operator is to submit any information to ADEQ or the EPA and must obtain permits as required.

A. Small Site Requirements

A "BMP Exhibit" shall be included as a separate sheet in the Grading and Drainage Plan set and shall demonstrate placement of controls (BMPs) to prevent runoff of pollutants into any stormwater system or adjacent property. If a project does not require grading plans, then either a separate BMP exhibit shall be included in the plans, or BMPs shall be clearly identified on the plan sheets. The exhibit shall include any perimeter control, drainage inlet protection devices, and wash protection devices necessary to control erosion and to prevent sediments and pollutants from leaving the site. Exhibits shall also identify the person responsible for implementation and maintenance of BMPs. Exhibits are considered to be living documents that are subject to change until the project is complete. SWPPP preparation as described in Section 3.4.5 does not apply to small sites. A Small Site Checklist is available to aid applicants with preparing the exhibit for review, and a completed copy shall accompany the plans submitted for review.

B. Large Site Requirements

A SWPPP shall be prepared and shall accompany the grading and drainage documents submitted for review. Reviews follow the normal plan

review process unless the SWPPP is required to be submitted to ADEQ for review and approval. ADEQ currently reviews and approves only those projects located within 1/4 mile of unique or impaired waters. For these projects, the SWPPP shall be submitted to the City for review and found to be in general compliance with the City's requirements prior to submitting to ADEQ; the City will not issue a CSP until the City receives a copy of ADEQ's approval to proceed. Plans submitted to ADEQ prior to City review may require correction and/or resubmittal to ADEQ. A Large Site Checklist is available to aid applicants with preparing documents for plan review, and a completed copy shall accompany the plans submitted for review.

3.4.5 SWPPP PREPARATION (LARGE SITES ONLY)

A SWPPP is a two-part living document consisting of a Narrative and a Site Map. Documents shall conform to ADEQ's General Permit AZG2008-001 and the City's Engineering Standards.

A. Narrative

An EPA template is available from the City's website and can be used as a guide for basic formatting and basic information to include when developing narratives. The narrative shall be a separate document including enough topographical information to demonstrate pre- and post-stormwater flows and impacts to adjacent property. Narratives shall indicate any existing or proposed construction adjacent to or within the site and how SWPPP efforts will be coordinated between the sites. Narratives shall also identify any sensitive and protected areas and indicate how these areas will be preserved. Construction staging shall be described including the sequence of activities applicable to that stage.

B. Site Map

The Site Maps shall be prepared as a separate and individual plan set including a cover sheet and additional sheets as necessary to identify changes in drainage during different stages of construction. The site shall be divided into the following three stages of construction: Initial, Interim, and Final. Each stage shall be shown on a separate sheet and shall include BMPs applicable to that stage. If the project is phased, then each project phase shall be broken down into construction stages. Refer to the Plan Review Checklist for minimum information shown on every sheet.

C. Staging

1. Initial Stage

This plan sheet shall provide grading, erosion, and sediment controls for the initial clearing, grubbing and grading of the site. These BMPs shall be installed at the outset of construction, prior to any land-disturbing activities. Initial controls are to be placed on existing

grades, but shall be based in part on proposed grading operations. In addition to minimum required information, this sheet shall include:

a. Contours appropriate to the site to demonstrate existing topography, extending a minimum of 100 feet beyond the property line.

2. Interim Stage

These BMPs shall be based on proposed grades and drainage features and are installed after initial stage. For some BMPs, such as inlet protection, interim controls are installed after the construction of site infrastructure. In addition to minimum required information, this sheet shall include:

a. Location of all interim erosion and sediment controls, designed in conjunction with the proposed site topography. This should also consider the controls designed in the Initial phase sheet.

b. Location of all buildings, drainage features and facilities, paved areas, retaining walls, water quality facilities, or other permanent features to be constructed in connection with, or as a part of, the proposed work, per approved plans.

c. Flow arrows and volumes with proposed contours or major dimensions, locations, and slopes of proposed grading.

3. Final Stage

BMPs shown in the Final phase sheet shall be installed as one of the last steps in the construction process, such as final seeding and mulching and granite placement. This plan sheet shows controls for final completion of the site. In addition to minimum required information this sheet shall:

a. Include any Initial or Interim BMPs that are to be removed, and any resulting disturbed area to be stabilized.

b. Include location of all final erosion and sediment control BMPs, permanent landscaping, and measures necessary to minimize the movement of sediment off site until permanent vegetation can be established.

c. Show area of buildings, pavement, sod, and permanent landscaping (define types) per approved improvement plans.

d. Show BMPs to be removed at the end of construction; for example:

(1). construction pond dewatering

(2). stabilized staging areas

(3). street inlet protection

(4). vehicle tracking controls

(5). construction fencing

3.4.6 CITY-ISSUED CONSTRUCTION STORMWATER PERMITS (CSP)

The City will issue a separate CSP for all projects requiring a Grading Permit and all "Large Sites". The CSP shall be obtained prior to performing any land disturbance activities. A CSP Fee Schedule is required for issuance of the permit. The Permittee and/or Owner/Operator shall be ultimately responsible for compliance with City permit conditions and City-issued violations and fines. This permit is not an authorization to discharge, but a permit relating to ATC within the City of Goodyear boundaries, and is in addition to any permit required by other agencies such as ADEQ or the EPA. The permit shall be renewed until such a time that the City has determined the site stabilized and improvements acceptable.

There are Federal, State, and City permits that may be required prior to the start of construction of a project. It is not the City's responsibility to ensure that the plans for a proposed project satisfy State and Federal permit requirements or that all permits have been obtained (e.g., Section 404 permitting, U.S. Fish and Wildlife Service Threatened and Endangered Species Clearance, Archeological, etc.).

A. Terminating Coverage under the CSP

1. Small Sites

Site stabilization, final inspection, and approval of improvements are required to terminate coverage under the CSP.

2. Large Sites

After all construction activities have been completed and the City determines that the site has met final stabilization requirements with temporary BMPs removed, the authorized site representative may file a NOT with ADEQ, with a copy submitted to the City Inspector. The authorized site representative shall also submit a copy of the NOT Acknowledgement Letter issued by ADEQ to the City, which will effectively terminate coverage under the CSP.

3.4.7 CONSTRUCTION SITE REQUIREMENTS

A. Pre-construction Meeting

An on-site pre-construction meeting shall be arranged with the City Inspector after obtaining a CSP and prior to any construction activity or placement of BMPs. In attendance shall be the Operator, the Owner or

Owner's Representative, the General Contractor, and any person delegated to carry out Stormwater Pollution Prevention provisions.

B. BMP Placement and Maintenance

BMPs shall be installed and in operation prior to any grading or land clearing activities. Controls shall be placed in such a manner as to ensure that sediment-laden water does not enter drainage systems, adjacent properties, or violate any water standard. Regular inspection and maintenance shall be provided to ensure BMPs are in an operable condition at all times. Damaged controls shall be repaired within 72 hours, and prior to the next rain event. BMPs shall not be removed until the site has been stabilized and the potential for erosion has passed.

C. SWPPP Inspection and Management (Large Sites Only)

It is the Operator's responsibility to ensure the project is in compliance with all federal, state, and local requirements, to include implementation, construction, inspection, maintenance, replacement, upgrading of facilities, and record management of the SWPPP. Any violations and fines are the responsibility of the Owner/Operator and/or site Contractor. All SWPPP documents shall be on site and available for review upon notice by ADEQ, EPA, or City of Goodyear representatives.

The Operator shall perform, at a minimum, a visual inspection of the construction site once every seven calendar days or once every 14 calendar days and within 24 hours of a rain event equal to or greater than half an inch (1/2 inch). If within ¼ mile of an impaired water, inspections shall be performed at a minimum of once every seven calendar days. This should include visual observation of stormwater discharges at all discharge locations within one business day after each rain event of half an inch (1/2 inch) or greater. The Operator shall prepare a report documenting their findings on the conditions of the SWPPP controls and note any erosion problem areas. The report is to be maintained on site by the Operator.

D. Dewatering Activities

Dewatering devices must discharge in a manner that will not affect streams, wetlands, drainage systems, or off-site property. Discharged waters shall be free of any sediment and pollutants. Dissipation and filtering devices shall be placed at the discharge end of any hoses to contain sediments and to prevent any erosion.

3.4.8 POST-CONSTRUCTION SEDIMENT CONTROL

The Developer/Owner is responsible for the cleanup of any sediment and the repair or correction of any deficient item relating to the design and construction methods used for stormwater management through the project warranty period. Facilities found to have accumulated sediments

shall be immediately cleaned and measures shall be taken to prevent sediment from entering any adjacent property or storm sewer system. The cleanup should be completed within 72 hours and prior to the next rain event. Sediments shall be removed from the project and properly disposed.

Facilities found deficient in minimizing sediment and erosion from stormwater events shall be immediately reported to the City Engineering Department. These facilities shall be repaired, replaced, or re-designed to correct the deficiency to the City's satisfaction. Additional plan review and permitting may be required prior to correcting the deficiency.

3.4.9 ENFORCEMENT

The City may at any time perform a compliance inspection of the construction site and/or SWPPP. Violation of any ordinance or non-compliance with any conditional or correction notice may lead to legal and enforcement action and/or fines. Non-compliance notices issued by the Engineering Department are independent of enforcement actions that may be implemented by other departments within the City of Goodyear or any county, state, and federal agency.

The Engineering Department has two levels of enforcement action for non-compliance. Enforcement action varies for each category, depending on the severity of the violation. Non-compliance may also result in the violation being reported to other City departments or agencies. Levels of Actions:

A. Level I

Level I Actions may result in an immediate issuance of a Stop Work Order. Examples of Level I Actions include the following, among others:

1. Clearing, grubbing, grading, or placement of BMPs without a required CSP and/or grading permit
2. Failure to restrict construction to limits of disturbance
3. Failure to protect sensitive/protected areas
4. Failure to place BMPs prior to construction activity
5. Failure to correct Level II violations as directed

B. Level II

Remediation for Level II Actions may result in a Notice to Comply being issued. Examples of Level II Actions include the following, among others:

1. Failure to clean up tracking of material onto roadways or sediment leaving the site
2. Failure to maintain SWPPP and CSP requirements
3. Failure to schedule a pre-construction meeting

C. Stop Work Orders

If a project is issued a Stop Work Order, all work on site shall cease, excluding any work required to bring the site to a safe condition (e.g., backfilling of holes and trenches). The above corrective actions may be completed, but the Permittee(s) shall inform the Inspector of such activities.

3.4.10 DEFINITIONS

BMPs or Best Management Practices – Methods, measures, or practices used to prevent or reduce the introduction of pollutants into receiving waters. In addition, the term shall include erosion and sediment control BMP devices, stormwater conveyance, stormwater diversion and treatment structures, and any procedure or facility used to minimize the exposure of pollutants to stormwater or to remove pollutants from stormwater.

Construction Activity – Includes clearing, grading, excavating, stockpiling of fill material, and other similar activities resulting in a land disturbance.

CSP- a Construction Stormwater Permit issued by the City of Goodyear Engineering Department.

Day - a calendar day or any consecutive 24-hour period that reasonably represents the calendar day.

Discharge - any addition of any pollutant to Waters of the United States or to an MS4 from any point source.

Ephemeral - a surface water which has a channel that is at all times above the water table, and that flows only in direct response to precipitation.

Impaired Water - Waters that have been assessed by ADEQ, under the Clean Water Act, Section 303(d), as not attaining a water quality standard for at least one designated use, and are listed in Arizona's 2004 303(d) List and Other Impaired Waters.

Larger Common Plan of Development or Sale - A contiguous area where multiple separate and distinct construction activities are occurring under one plan (e.g., the Operator is building on three half-acre lots in a 6-acre development). The plan in a common plan of development or sale is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.), or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activities may occur on a specific plot.

MS4 (Municipal Separate Storm Sewer System) - A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) which is: (i) Owned or operated by a state, city, town, borough, county,

district, association, or other public body (created by or pursuant to State law), including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the Clean Water Act, that discharges into Waters of the United States. (ii) Designed or used for collecting or conveying stormwater; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

NOI (Notice of Intent) - the application to operate under the ADEQ general permit.

NOT (Notice of Termination) - the application to terminate coverage under the ADEQ general permit.

Non-stormwater Discharge – any discharge to City right-of-way or a stormwater collection system that is not composed entirely of stormwater.

Pollutant - sediments, fluids, contaminants, toxic wastes, toxic pollutants, dredged spoil, solid wastes, substances and chemicals, pesticides, herbicides, fertilizers and other agricultural chemicals, incinerator residue, sewage, garbage, sewage sludge, munitions, petroleum products, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt (e.g., overburden material), and mining, industrial, municipal and agricultural wastes or any other liquid, solid, gaseous or hazardous substances. See ARS § 49-201(29).

Rain Event - is defined as when rain drops reach the ground surface of the construction site, ultimately resulting in 0.5 inch accumulation as recorded by the closest FCDMC rain gage. Separate rain events are distinguished by a 24-hour period of no rain reaching the ground surface of the construction site.

Receiving Water - includes Waters of the U.S. and conveyances thereto, including MS4s.

Significant Materials or Sediment - any solid, liquid, or gaseous substance other than stormwater that causes or may cause or contribute to the violation of a water quality standard pursuant to Article 2, Title 49, Arizona Revised Statutes.

Site Operator - any person associated with a construction project that meets one or both of the following two criteria: a) The person has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications, or b) The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

Stabilization - covering or maintaining an existing cover over soil that reduces and minimizes erosion

Stormwater - runoff, surface flows, and drainage that is comprised solely of any form of precipitation.

Stormwater Collection System - all or any part of any publicly or privately owned system or structure designed or utilized to receive, collect, detain, retain, or convey stormwater, and any direct connection to such system or structure. Such a system may include, but is not limited to, swales, curbs, gutters, ditches, channels, parks, pipes, watercourses, drywells, culverts, storm drains, catch basins, retention or detention areas, spillways, scuppers, pump stations, and common areas.

SWPPP (Stormwater Pollution Prevention Plan) - a plan which includes narrative information and a site map describing how requirements in ADEQ's AZG 2008-001 Permit are met, an identification of construction/ contractor activities that could cause pollutants in the stormwater, and a description of measures or practices to control these pollutants.

Unique Water - a surface water that has been designated by ADEQ as an outstanding state resource under AAC R18-11-112.

Waters of the United States –

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
2. All interstate waters, including interstate wetlands.
3. All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds - the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters: a) Which are or could be used by interstate or foreign travelers for recreational or other purposes; b) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or c) Which are used or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under this definition.
5. Tributaries of waters identified in paragraphs 1 - 4 of this definition.
6. The territorial sea, and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1 through 6 of this definition.

Drainage Report Outline

Detailed Explanations of Each Element are in Section 3.2.2 (C)

Title Page: Project Name; Location; Type of Drainage Report (Preliminary, Master Plan, Final, etc.); and Engineer's Seal, Signature, and Date.

Table of Contents: Engineer's Seal, Signature, and Date

1. Introduction

- Project Name
- Project Location
- Type of Report (Master, Preliminary, or Final)
- Project Description
- Summarize referenced existing drainage studies
- Purpose and Objectives

2. On-Site Drainage Conditions

- Drainage network, watershed, and floodplain boundaries within the project site and corresponding topographic map
- Site specific photographs and aerial photographs to support parameter selection.
- Ground cover conditions
- Existing and proposed developments

3. Off-Site Watershed Conditions

- Watershed conditions and the drainage network entering and existing the project site and corresponding topographic map
- Site specific photographs and aerial photographs to support parameter selection
- Ground cover conditions
- Context relative to adjacent projects and improvements

4. Floodplain Designation

- Description of floodplain, flood zones, and FEMA Floodplain map

5. Proposed Drainage Plan

- General description of proposed drainage system and components; including conveyance of off-site flows;
- Future conditions; including development of adjacent properties;
- Stormwater storage requirements: Volume required, volume provided, and basin locations.
- Proposed drainage structures or special drainage facilities: Include design criteria and probable effect on the existing upstream and downstream drainage system.
- Pre- and post- runoff characteristics at concentration points exiting the property;
- Lowest Floor Elevation
- Project Phasing: Improvements to be constructed with each phase, impact of phased construction, and required interim improvements. Development requirements must be met independently for each phase.

6. Special Conditions

- Project Stipulations, 401 and 404 Permits, and AZPDES

7. Data Analysis Methods

- Hydrologic procedures, parameter selection and assumptions.
- Hydraulic procedures, methods, parameter selection and assumptions.
- Stormwater storage calculation methods and assumptions.

8. Conclusions

- Overall Project
- Project Phasing

References

- List all references cited in the report

Appendices

- Data and Calculations (as applicable)
- Peak flow calculations (Rational Method, HEC-1 printouts, etc.)
- Channel design calculations including toe-down protection and drop structure design.
- Culvert design calculations
- Floodplain calculations (Manning's HEC-RAS printouts)
- Storage volume calculations
- Retention/detention basin inflow outflow analysis and design calculations

- Street Capacity Calculations *(Final Reports Only)*
- Curb Opening, Catch Basin Calculations *(Final Reports Only)*
- Storm Drain Calculations
- Sediment and Scour Calculations
- Rip-Rap Sizing *(Final Reports Only)*
- Erosion/ Sediment Control Plan
- Soils and or Geologic Analyses
- Rainfall calculations
- Basis for setting finished floor elevations:
    - In relation to designated floodplains or adjacent washes
    - In relation to natural or adjacent ground elevation if in a Special Flood Hazard Zone or not in floodplain
- Pertinent excerpts from studies that are being referenced

Exhibits

- Vicinity Map
- Floodplain Map
- Off-site Map: Topography, watershed boundaries, floodplains, and flows impacting the project
- On-Site Map with current 1-foot (minimum) contour mapping based on a current topographic survey: project location, topography, drainage ways with flows labeled (including natural and artificial channels), watershed boundaries, concentration points, floodplain for washes with a flow of 100 cfs or greater, flow entering the project, and flow existing the project
- Current aerial photo, 800 scale or larger, showing site in context.
- Proposed On-site Drainage Plan

Electronic Input Files - HEC-1, HEC-HMS, and HEC-2 or HEC-RAS files, and a working copy of nonstandard software should be included. A PDF file of the drainage report must also be provided that includes all exhibits, plates, figures, etc.

CHAPTER 4

TRANSPORTATION

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4.1 STREETS & RIGHTS-OF-WAYS

4.1.1 INTRODUCTION

A. General Overview

This section describes geometric requirements for various street classifications within the City of Goodyear. The requirements described herein are primarily based on safety considerations; therefore, standards that provide a greater degree of safety may be used or required within reasonable economic limits, but standards that provide a lesser degree of safety may not be used.

While every effort has been made to ensure the accuracy and completeness of these guidelines, the City of Goodyear shall not be held responsible for any errors or omissions. It shall be the sole responsibility of the Designing Engineer to ensure a correct design and the accuracy and completeness of construction documents containing his or her signature.

B. Use of National Standards

1. Geometric Design Standards - The American Association of State Highway and Transportation Officials' (AASHTO) "Policies on Highway Design" are approved references and shall be used together with this manual for the geometric design of roadways.
2. Traffic Control Standards - All traffic control devices shall be designed in accordance with this manual, together with the MUTCD as prepared by the U.S. Department of Transportation, and the ADOT supplement to the MUTCD.

C. Traffic Related Studies

A TIA may be required to be submitted in conjunction with a Rezone, Site Plan, or Preliminary Plat application. The need for this report is generally a function of the development size. Contact the City Traffic Engineer to determine if a TIA is required for a specific development.

D. Preliminary Plats & Site Plans

Plan sets associated with these documents shall provide the following information:

1. Show all existing and proposed streets, medians, turn lanes, and bus bays. Provide a cross section detail of the full right-of-way for each road that is different in right-of-way width, pavement width, or median width (excluding turning lane variances).
2. Provide centerline dimensions and other information required to show the street curvatures, intersection offsets, etc., to enable City

staff to verify compliance with the Subdivision Ordinance and applicable design standards.

3. Show the proposed locations of all bike paths, multi-use trails, equestrian trails, etc. that are located within the property boundaries. Refer to the City's approved General Plan to identify all required paths and trails.

4. Show all SVTs, PUEs, and other easements associated with City roadways.

E. Private Streets & Roadways

1. All private streets or roadways must be identified as tracts, and the associated Final Plat shall have all applicable note pertaining to private streets on the cover sheet, as detailed in Chapter 1 of these standards.

F. Street Types

Standard street cross sections are illustrated in the City's Standard Engineering Details. Developing properties shall provide for public streets as outlined in the City's General Plan or by the Phoenix-metro standard grid alignments in cases where the streets are not shown on the current General Plan.

1. Freeways and Expressways (Parkways)

a. Freeways will be designed to safely handle very large volumes of through-traffic.

(1). Direct access will be limited to interchanges normally spaced at one-mile intervals.

(2). Design, construction, and operation shall be provided by ADOT, MCDOT, and/or the City of Goodyear.

b. Expressways provide for efficient movement of large volumes of through-traffic. Direct access is limited to designated intersections.

2. Arterial Streets

a. Arterial streets provide regional continuity and carry large volumes of traffic.

b. Arterial streets are divided into two primary types: Major Arterial and Minor Arterial, per City Standard Details. In addition to the two primary types of arterial streets, there is also a separate standard for City Center Arterial Streets and for Scenic Arterial Streets.

c. Full access to abutting land uses from an arterial street is limited to median openings.

d. Residential lots shall NOT have direct access onto or off of arterial streets.

3. Collector Streets

a. Collector streets provide access to abutting land uses, handle local traffic, and provide access to the arterial street system.

b. Collector streets are divided into three primary types: Major Collector, Minor Collector, and Commercial/Industrial Collector, per City Standard Details. In addition to the three primary types of collector streets there is also a Special Use Major Collector Street and a Special Use Minor Collector Streets. The details for a Special Use Major Collector Street and a Special Use Minor Collector Street shall be used only at locations where the City desires to match an existing street cross-section and only when the City Engineer has approved the use.

c. Residential lots shall NOT have direct access onto or off of collector streets.

4. Local Streets

a. Local streets provide direct access to abutting land uses, handle local traffic, and provide access to the collector street system.

b. Local streets are divided into two types: Local (also sometimes referred to as Residential Local or Local Residential) and Commercial/Industrial Local, per City Standard Details.

5. Private Streets

a. Private streets shall be owned and maintained by the Individual, HOA or POA that owns the tracts within which the private streets are located.

b. Private streets provide direct access to abutting land uses, handle local traffic, and provide access to the local or collector street system.

c. Minimum cross sectional dimensions for private streets shall be per City Standard Details.

6. Marginal Access Roads

a. Marginal access roads are local roads located within the Major road right-of-way that run parallel to the Major road. They provide direct access to the abutting property while controlling access to the major street.

b. Marginal access roads shall not intersect a major street or a collector street.

c. Marginal access road openings to major streets, at a local street intersection, shall have a minimum 30-foot wide separation island between the major street traffic lanes and the marginal access road, which shall be provided within the major street right-of-way.

7. Unless identified in the City's General Plan, the classification and location of streets is determined during the development site planning or platting process. Planning for City streets is influenced by several factors and includes, among other things, plans for adjacent developments which have recently been approved. The City Engineering Department will review the plans for each proposed development and will specify any changes required to keep conformity with previously planned and approved street alignments. The City Engineering Department will also provide direction for the classification of each street involved in a proposed development.

G. Street Names

Street names shall be consistent with the natural alignment and extension of existing streets and the "MAG Address and Street Assignment Policy". New street names shall not duplicate in whole or in part, nor shall they be close to or confusing with, other existing street names. The City Council reserves the right to modify any street name such that it is in conformance with City standards.

H. Intersections

1. Arterial streets normally intersect other arterial streets at one-mile intervals. Arterial streets may intersect other streets as approved by the City Engineering Department.
2. Collector streets normally intersect other collector streets or arterial streets at the half-mile (2640 feet) and quarter-mile (1320 feet) interval. Other collector-to-arterial intersection intervals may be approved by the City Engineering Department.
3. Local streets may intersect collector streets at a minimum interval of one every 125 feet. Local streets do NOT intersect arterial streets.

4.1.2 GENERAL INFORMATION

A. Street Name Signs

1. All new developments shall provide for street name signs and posts at all intersections per approved City Standard Details.
2. Private streets shall be signed by the Developer in the same manner as streets signs for public streets (see item 1 above).

B. Survey Monuments

1. All developments shall provide survey monuments at section corners, street centerline intersections, street centerline alignment changes (PCs or PI if it is within street pavement), and subdivision corners.
2. All section corners, section quarter corners, and centers of section shall be a brass cap in a hand hole per MAG Standard Detail 120-1-A. All other required survey monuments shall be a brass cap on the surface per MAG Standard Detail 120-1-B or 120-1-C, as appropriate. All existing monumentation shall be preserved both horizontally and vertically.

C. Irrigation Facilities

1. All new developments shall provide for continued and undiminished service of affected irrigation systems.
2. The Developer is responsible for coordinating with irrigation system owners (typically RID or BID) for the design and construction of new facilities.
3. Private irrigation facilities shall be located on private property and sized to carry at least the same flow as the existing ditch, or as may otherwise be directed by the City Engineering Department. The Designing Engineer shall submit appropriate data to support the design.
4. Where there is need to cross, or remain in, public rights-of-way, it shall be done at approximately 90 degree angles and shall be tiled with RGRCP in accordance with the criteria outlined in ASTM Specifications Section C-361.

D. Barricades

1. All new developments shall provide for barricades at all dead end streets and incomplete streets per City Standard Details, and MAG Standard Detail 130-B.
2. New barricades shall be constructed per MAG Standard Detail 130-B, modified with red and white reflectorized stripes using engineer grade reflective sheeting.
3. Barricades installed with phased construction may be relocated within the same development, if the condition of the materials is acceptable to the City.

E. Sidewalks

1. Sidewalks shall remain within City right-of-way, PUE, or landscape tract.
2. Developers are encouraged to enhance the visual quality of street frontage areas through the use of detached sidewalks. See the City

Standard Details for allowable detached sidewalk landscape area widths.

4.1.3 DESIGN STANDARDS

A. Street Location and Arrangement

1. All streets included in an adopted city streets and highways plan shall be platted in conformance with that plan.
2. Street layout shall provide for the continuation of such streets as the City Engineer may designate.
3. Street layouts should conform to any approved neighborhood plans.
4. Certain streets, as designated by the City Engineer, shall be extended to the property boundary to provide future connection with adjoining properties.
5. Local streets shall be so arranged as to discourage their use by through-traffic.
6. Where a proposed subdivision abuts or contains an existing or proposed major street, the City may require marginal access roads or reverse frontage roads with non-access easements along the major street, or such other treatment as may be justified. This is to protect residential properties from the nuisance and hazard of high volume traffic and to preserve the traffic function of the major street in other types of developments.
7. Streets shall be so arranged in relation to existing topography as to produce desirable lots of maximum utility and streets of reasonable gradient, and to facilitate adequate drainage.
8. Maximum length of blocks, measured along the centerline of the street and between intersecting street centerlines, shall be 1500 feet. When lot areas average one-half acre or more, or where extreme topographic conditions warrant, this maximum may be exceeded by 500 feet.
9. The minimum number of access points required for single family and multi-family residential projects are regulated by the International Fire Code, as amended by the City of Goodyear.

B. Street Right-of-Way and PUE Requirements

1. The right-of-way requirements shown in the City Standard Details are based on the width needed for street improvements constructed to meet the ultimate development requirements. When necessary, the right-of-way width shall be sized to include auxiliary lanes, transit facilities, or other required facility.
2. PUEs shall be provided adjacent to all roadway types. Dry utilities shall be placed within the PUE except where they must cross a

roadway. Cut or fill slopes (at maximum 10H:1V grades), sidewalks, bicycle paths, trails, traffic control devices, information signs, fire hydrants, landscaping, and other public facilities to be located adjacent to street pavements may be located within the PUE with prior approval by the City Engineer.

3. Right-of-way widths or PUEs in excess of the standard widths may be required in special circumstances, including but not limited to situations where:

   a. Cut or fill slopes cannot be confined within the standard width;

   b. Minimum sight distance lines on horizontal curves are not within standards;

   c. Minimum sight distances at intersections are not within standards;

   d. Auxiliary lanes or bus stops are to be provided.

4. Cul-de-sac streets shall terminate in a circular right-of-way turnaround 50 feet in radius. A PUE of a width appropriate to the road type shall be provided around this turnaround.

C. Pavement Cross Section Slopes

1. Typical Street Cross Sections

   a. Undivided Streets - Undivided streets should have a normal crown that is a two-way cross slope with the cross-sectional high point on the street centerline.

   b. Divided streets

      (1). Divided streets should have cross slope on each pavement section.

      (2). The high point of each slope on each pavement section shall occur on the edge of the pavement nearest to the median.

   c. See City Standard Details for intersection cross slope standards.

   d. Unusual conditions may cause cross slope requirements to vary, but normally the desirable cross slope is 2 percent, with a maximum cross slope of 3 percent. Any deviation from the desirable cross slope is subject to review and approval by the City Engineering Department.

2. Street Dip Sections

   When storm drainage runoff flows cannot be conveyed under a street by means of a pipe or culvert, a dip section may be used. When a dip section is designed, a minimum 8-foot wide valley gutter having a one-way slope across the right-of-way (with no crown in the street) shall be used. Cut-off walls shall be installed per City Standard

Details. Curbing and medians shall not be raised within the dip section. Transitions back to normal street cross slopes will be required at both ends of the dip section.

a. Dip sections on arterial streets are NOT allowed.

b. Dip sections on collector streets are strongly discouraged and will require specific approval by the City Engineering Department.

c. Dip sections on local streets are discouraged and will be reviewed closely to verify that other options for conveying the flows cannot be used.

3. Right Turn Lanes

a. Right turn lanes constructed into private developments shall be 9" class "A" concrete. A 2% cross-slope will be provided to a 3-foot valley gutter between the through lane and right turn lane. Storage length and taper to be per City of Goodyear Standard Details.

D. Traffic Calming Devices

1. Traffic calming devices within the City rights-of-way or on private streets shall be designed and installed in accordance with the City Neighborhood Traffic Management Program.

E. Medians

1. Median Widths

The width of a median is measured from back of median curb to back of median curb. If the median has no curb, the width is measured between the centers of the continuous, painted median stripes. Median widths shall be per the City Standard Details.

2. Paved Medians

A median less than 4 feet wide shall be paved. The paved surface should be crowned and have the same cross slope as the street pavement. Acceptable median paving materials and methods are shown in the City Standard Details.

3. See the landscape section of this manual for grading and landscaping requirements. See the City Standard Details of typical street cross sections for additional information.

F. Curbs

1. Vertical Curbs

a. Vertical curbs are required for all streets except local streets. Vertical curbs may be used on local streets if drainage considerations or vehicular access issues make such use desirable.

b. Concrete and asphalt curbs that are extruded onto pavement may be permitted on a temporary basis (for periods less than one year) in commercial/industrial developments.

c. Vertical curbs with gutter are to be constructed in accordance with MAG Standard Detail 220 Type "A". Vertical curb and gutter type shall match the adjacent pavement slope to the gutter cross slope direction. The curb height shown on the standard detail is 6 inches, but the following variations may be used when approved by the City Engineering Department:

(1). Where fire lane or public maintenance vehicle access to abutting property must be provided over the curb, MAG standard roll curb or MAG mountable curb Type "F" (MAG Standard Detail 220-2) shall be used. A modified ribbon curb may be used for temporary Fire Department access roads as shown in the City Standard Details.

(2). If drainage conditions of an arterial street are significantly improved, the vertical curb height may be increased to 8 inches maximum and the width of the gutter may be increased to 24 inches.

(3). Curb height through the return shall be reduced (or transitioned) to match an adjacent curb height.

(4). A vertical curb 4 inches in height may be used to control vehicle access on local residential streets.

2. Roll Curb

Except where vertical curb is required for drainage or access control, roll curbing shall be used on local streets adjacent to residential lots, and is to be constructed in accordance with MAG Standard Detail 220 Type "C" or City Standard Details.

3. Cut-Off Walls

In locations where dip sections are permitted to allow drainage flows to cross roadways, cut-off walls conforming to City Standard Details shall be installed:

a. Cut-off walls shall be at least 3 feet deep and have a top that is flush with the pavement surface.

b. The cut-off walls shall extend across the flow path in the dip section to protect the pavement structure during runoff flows from a 100-year storm event.

c. Transitions will be required between the regular curbs and the cut-off walls at each end of the dip section.

4. Curb Returns

a. Vertical curb shall be used through the curb return from PC to PT regardless of whether the tangent curb sections are vertical or roll curb.

b. All curb returns shall be provided with sidewalk from PC to PT of the same width as that provided for the sidewalk behind the tangent curb sections. If sidewalk is not provided adjacent to the return or behind either tangent curb section, the curb return sidewalk width shall be equal to the greater width as required for the adjacent street types. ADA sidewalk ramps with detectable warnings are required to be constructed where appropriate.

c. Curb Return Radii

All street intersections shall be constructed with concrete vertical curb returns and ramps per MAG Standard Details, and must meet the minimum ADA requirements, including use of detectable warnings. See Table 4.1.1 for specific requirements regarding curb return radii and right-of-way cutoffs at the City standard intersections.

TABLE 4.1.1 - Curb Return Radii & Right-of-Way Cutoffs

BACK OF CURB RETURN RADIUS				
STREET TYPE	ALL ARTERIALS	ALL MAJOR COLLECTORS	ALL MINOR COLLECTORS	ALL LOCALS
ALL ARTERIALS	35 FEET	30 FEET	30 FEET	30 FEET
ALL MAJOR COLLECTORS	30 FEET	30 FEET	30 FEET	30 FEET
ALL MINOR COLLECTORS	30 FEET	30 FEET	30 FEET	20 FEET
ALL LOCALS	30 FEET	30 FEET	20 FEET	20 FEET

RIGHT-OF-WAY CUTOFFS (NOT RADIUS) AT INTERSECTIONS
ALL LOCALS TO LOCALS ….....…….. 12 FEET x 12 FEET
ALL LOCALS TO ANY OTHER TYPE ….…. 20 FEET x 20 FEET
ALL OTHER CUTOFFS …… 33 FEET x 33 FEET

G. Selection of a Design Speed

The design of geometric features such as horizontal and vertical curves will depend upon the design speed selected for the street. The choice of the design speed is primarily determined by the street classification. The design speed is the maximum speed for the safe operation of a vehicle that can be maintained over a specific section of a street when conditions are so favorable that the design features of the street govern.

The design speed shall be greater than the posted speed limit. Typically, this will include speeds 10 mph over the posted speed limit but may be more as conditions warrant. The following posted speeds should be used as a guideline:

1. Expressway/Freeway - Posted Speed Limit 65 mph
2. Arterial Streets - Posted Speed Limit 45 mph
3. Collector Streets - Posted Speed Limit 35 mph
4. Local Streets - Posted Speed Limit 25 mph
5. Rural Roads - Posted Speed Limit 50 mph

H. Horizontal Curves

1. Minimum Radii of Curvature

a. The minimum radius of curvature will be determined by the design speed or by the stopping sight distance. In general, the minimum centerline radius is 900 feet for arterial streets, 500 feet for collector streets and 100 feet for local streets.

b. Consideration of Stopping Sight Distance

(1). When walls, buildings, bridge piers, cut slopes, vegetation, or other obstructions are near the roadway on the inside of a curve, they can block a driver's view of the road ahead. If they are too close, the driver will not have sufficient distance along the curved roadway to stop when a hazardous condition comes into view.

(2). For design, the driver's eye elevation shall be taken at 3.5 feet above the center of the inside lane (the driving lane closest to the inside of the curve).

(3). The hazardous condition is an object 0.5 feet high in the center of the inside lane.

(4). The line-of-sight is assumed to intercept the view obstruction at the midpoint of the line-of-sight two feet above the center of the inside lane.

(5). The clear distance, "M", is measured from the center of the inside lane to the view obstruction.

(6). The AASHTO publication A Policy on Geometric Design of Highways and Streets depicts these relationships and provides a table of minimum stopping sight distances for various design speeds.

2. Reduced Design Speeds on Curves

a. The reduction of a street design speed on a curve should be avoided. However, where physical restrictions prohibit increasing the radius of the curve or the clear distance "M", the design speed for the curved section may be reduced.

b. In such circumstances, signing in accordance with the MUTCD and the ADOT Supplement to the MUTCD is required. The difference between the design speed for the roadway approaching the curve and the design speed for the curve shall not be greater than 10 miles per hour.

c. The design speed for a curved roadway section shall not be reduced if the reduction would occur at the end of a long tangent or at any location where high approach speeds may be expected.

3. Compound Curves

Compound curves should be avoided.

a. If site conditions make the use of compound curve unavoidable, the shorter radius shall be at least two-thirds the length of the longer radius when the shorter radius is 1,000 feet or less.

b. Compound curves are not permitted when design speeds require the shorter radius to be greater than 1,000 feet.

c. Compound curves are not permitted on two-lane roads.

4. Tangent Sections between Reverse Curves

A minimum 100-foot tangent section shall be provided between two curves that curve in the opposite direction for all local and minor collector streets, and as required by the City Engineering Department for all other circumstances.

I. Superelevation in Curves

1. Superelevation is discouraged on horizontal curves.

2. Superelevation Standards:

a. A maximum superelevation of 0.02 ft/ft may be used when the standard radius cannot be provided due to circumstances beyond the control of the Engineer, and the general alignment cannot be changed.

b. Superelevations greater than 0.02 ft/ft may not be used.

3. Transition for Superelevation:

a. The length of superelevation transition shall be based on the superelevation rate and the width of rotation. The axis of rotation shall generally be about the pavement centerline. For superelevation design, refer to the AASHTO publication, A Policy on Geometric Design of Highways and Streets.

b. With respect to the beginning or ending of a horizontal curve, one-third of the transition should be on the curve and two-thirds of the transition should be on the tangent pavement section.

4. Drainage on Superelevation Curves

Whenever superelevation is allowed on a divided street, a storm drainage system to collect the runoff along the median curb shall be provided. It is preferred that the structure be a curb opening type catch basin. In no case shall nuisance water from the higher traveled way be allowed to cross the lower traveled way.

J. Vertical Alignment

1. Longitudinal Street Grades

a. For freeways, expressways, and arterial streets the maximum grade shall be 6 percent.

b. For collector and local streets, the maximum grade shall be 9 percent.

c. The minimum longitudinal street grade for all streets is 0.4 percent. Wherever possible, longitudinal street grades greater than or equal to the minimum grade shall be provided.

d. Where necessary, grades less than 0.4 percent may be used as approved by the City Engineering Department. In no case shall the longitudinal street grade be less than 0.15 percent as measured at any curb.

2. Vertical Curves

A vertical curve is required when grade changes are equal to or greater than 1.5 percent for local streets, 1.0 percent for collector streets, and 0.5 percent on other major roadways. Local streets may also use a series of grade breaks at a 25-foot minimum spacing in lieu of a vertical curve.

a. The minimum length of the vertical curve is 100 feet for local streets.

b. All sections of a street's vertical alignment must meet passing and stopping sight distance requirements for the design speed.

c. The design speed of a road shall not be reduced due to a vertical curve.

d. For further details, see the AASHTO publication, A Policy on Geometric Design of Highways and Streets.

3. Combined Horizontal and Vertical Curves

When horizontal and vertical curves are combined, the horizontal curve shall lead and follow the vertical curve. For additional information on this topic, refer to the AASHTO publication, A Policy on Geometric Design of Highways and Streets.

K. Intersections

Although all intersections share certain common elements, they are not subject to generalized treatment.

1. Typical designs for intersections found in the City are illustrated in the City Standard Details. However, to minimize conflicts and provide for anticipated traffic movements, each intersection shall be evaluated with regard to its individual characteristics and shall be designed based on the following:

a. Traffic factors such as capacities, turning movements, vehicle size and operating characteristics, vehicle speed, pedestrian movements, transit operations, and accident history;

b. Physical factors such as topography, existing conditions, and channelization requirements;

c. Human factors such as driving habits, reaction to surprises, decision and reaction time, and natural paths of movement.

2. Angle of Intersection

A right-angle intersection provides the shortest crossing distance for intersecting traffic streams. It also provides the most favorable condition for drivers to judge the relative position and speed of intersecting vehicles. Where special conditions exist, intersection angles may diverge from a right-angle by a maximum of 2 degrees on expressway/freeway, arterial, major collector, and commercial / industrial collector streets, and by a maximum of 4 degrees on minor collector and all local streets.

3. Alignment and Profile

Intersections occurring on horizontal or crest vertical curves are undesirable. When there is latitude in the selection of intersection

locations, vertical or horizontal curvature should be avoided. A line or grade change is frequently warranted when major intersections are involved. If a curve is unavoidable, it should be as flat as site conditions permit. Where the grade of the through-roadway is steep, flattening through the intersections is desirable as a safety measure.

4. Intersection Sight Distance

In order to provide the opportunity for vehicles on a stop-controlled intersection leg to safely cross or make left or right turns onto a non-controlled intersection leg, adequate sight distance must be provided.

a. Two SVTs may be drawn on either side of a driveway, or four SVTs per intersecting roads to represent the areas that must be free of all objects, vegetation and topography.

b. All objects within SVTs shall be kept clear in the range of two feet and seven feet above the pavement.

c. SVTs shall be calculated per City Standard Details with the following exception:

SVT on local to local street intersections, and at all commercial and industrial driveways, shall have minimum dimensions of 33 feet by 33 feet as shown in the City Standard Details. SVTs shall be located along right-of-way lines rather than curb lines.

5. Valley Gutters at Street Intersections

a. Concrete valley gutters per City Standard Details shall be constructed at all minor collector and local street intersections where the drainage pattern requires them.

b. Concrete valley gutters per MAG Standard Detail 240 may be used in residential developments as approved by the City Engineering Department.

c. Asphalt valley gutters are not allowed on public streets.

d. Wide valley gutters as provided in the City Standard Details shall be used in dip crossings and other locations where traffic controls will not stop a vehicle within 100 feet of the valley gutter, or as required by the City Engineering Department.

6. Turning Lanes

A separate turning lane permits separation of conflicting traffic movements and removes turning vehicles from the intersection area. The storage and taper length requirements and other pertinent information relating to turning lanes can be found in the City Standard Details.

a. Right turn lanes shall be provided on all arterial to arterial and arterial to collector street intersections. See the City Standard Details for storage and taper length requirements.

b. Right turn lanes shall be provided at all new driveways that access onto arterial streets and parkways.

c. For left turn lanes at signalized intersections, dual turn lanes should be considered when identified by the City Engineering Department or when:

(1). The turn volume exceeds 200 vehicles per hour,

(2). The opposing through-volume exceeds 1,000 vehicles per hour, or

(3). The delay to left turning vehicles exceeds 45 seconds.

d. Abrupt reduction of alignment and sight distance standards should be avoided. The length of these lanes depends on several factors and shall be determined on a case-by-case basis.

e. Driveways shall not be permitted within a right turning lane for any street intersection involving an arterial street.

L. Median Design

Raised medians are required on arterial and major collector streets to separate traffic flows, channelize left turns, and reduce conflicts. On minor collector streets, commercial/industrial collector streets, and commercial/industrial local streets, flush or painted medians provide space between the through-traffic lanes for left turning vehicles.

1. Raised Medians

Raised medians, where required, shall be provided in accordance with City Standard Details.

2. Spacing and Location of Median Openings

If a street has a raised median, it is not possible to provide an opening in the median for every street intersection or driveway location. Median openings shall be located in harmony with the driveway spacing criteria established in the City Standard Details but shall be no greater than allowed by the following criteria:

a. Major arterial streets:

(1). Full median openings shall not be located closer than a quarter-mile apart.

(2). Partial median openings, which allow only left in turns (not left out), may be located at eighth-mile intervals.

b. Minor arterial and major collector streets:

Full median breaks shall not be located closer than an eighth-mile apart.

3. Configuration of Median Openings

a. For street intersections with legs intersecting at an angle of 88 to 90 degrees, configuration of the median opening shall meet the requirements of City Standard Details.

b. Streets intersections with legs at an angle less than 88 degrees require the approval of the City Engineering Department on a case-by-case basis.

4. Medians on Superelevated Roads

Median openings on curves with superelevation exceeding 0.02 ft/ft will not be permitted.

5. Flush Medians

Flush, painted medians are required on minor and commercial collector roadways.

M. Rubberized Asphalt Pavement Cross-Sections

1. Rubberized asphalt pavement shall be used as the final surface course on Arterial and Major Collector Streets that are within a 1/4-mile radius of a residential area as designated on the City's Land Use Plan. Refer to City Standard Detail G-3216 for minimum pavement design sections. Exceptions to this specification must be submitted in writing to the City Engineer and approvals must be received in writing.

4.1.4 Street Access and Driveways

All driveways serving property abutting public streets in the City shall conform to the following guidelines:

A. Driveway Design

1. Width

The width of a driveway shall be the width at the throat of the driveway exclusive of wings or return radii.

2. Construction

a. Residential Driveways:

With vertical curb – Construct driveways per MAG Standard Detail 250.

b. Commercial, Industrial, and Multi-Family Residential Driveways:

Roll and vertical curb – Construct driveways per MAG Standard Detail 251.

B. Driveway Spacing

Minimum driveway spacing shall conform to the requirements established in the City Standard Details.

C. Driveway Location Limitation

It is encouraged that driveways be shared between two abutting commercial properties. Driveways that eliminate or severely reduce the access for an adjacent property will not be permitted.

D. Protection of Access

Except at approved access points, for proper control of driveway access, a vehicular non-access easement shall be granted to the City along all expressway/freeway, arterial, and collector streets, and open space when abutting property develops.

E. Driveways

Driveways approved for use in the City are shown in the City Standard Details.

1. Residential Development Driveways

a. Single Family Residential Development

(1). Driveways serving single family residential units shall be D-1 Type driveways as shown in City Standard Detail, G-3236.

(2). Only one driveway per lot is allowed. See “Limitations on Residential Access” in this chapter for residential driveways in which two access points are allowed.

(3). The minimum driveway length is 20 feet. This minimum length shall be maintained clear of both sidewalk and structures such that a 20-foot long vehicle may park in the driveway without impeding pedestrian access to the sidewalk or being completely or partially beneath a structure. If no sidewalk is provided, this distance shall be taken from the back of curb.

(4). The maximum driveway grade is 12 percent as measured along the centerline of the driveway.

b. Multi-Family Residential Development

The D-2, D-3, and D-4 Type driveways shall be used to serve multi-family developments.

(1). Type D-2 is for low volume driveways. D-2 can serve more than three off-street parking stalls for more than two dwelling units, or may be used for low volume driveways such as well sites and lift stations.

(2). Type D-3 is for high volume driveways. D-3 can serve more than 50 dwelling units and is normally accessed from an arterial or collector street.

(3). Type D-4 driveways shall be used when a separate left turn lane is needed.

(4). The minimum driveway length is 80 feet for D-3 and D-4 Type driveways, and 30 feet for D-2 Type driveways, as measured from the street back of curb (the width of a decel lane may be included in the measurement) to the first drive aisle turn or parking stall.

c. Limitations on Residential Access

(1). Residential properties (other than multi-family developments) that have frontage on a local street as well as on an arterial or collector streets shall only access the local street.

(2). In some instances, residential parcels fronting only on an arterial or collector street may be given access when no other alternate public access is available. When such access is allowed, the driveway shall be circular or it shall have a turnaround area to ensure that there is no need for backing onto the street.

2. Commercial and Industrial Development Driveways

a. Driveways for commercial and industrial developments shall be Types D-3 through D-8 where accessed from parkway, arterial, major collector, minor collector streets, or at other locations as directed by the City Engineering Department.

b. The unimpeded, uninterrupted minimum length for inbound access on a commercial or industrial driveway from an arterial street shall be 80 feet, as measured from the street back of curb (the width of a decel lane may be included in the 80-foot measurement) to the first drive aisle turn or off-street parking stall. The unimpeded, uninterrupted minimum length for inbound access on a commercial or industrial driveway from a collector street shall be 50 feet, as measured from the street back of curb to the first drive aisle turn or

off-street parking stall. Modifications to the minimum lengths stated above must be based on the recommendations of an approved TIA, and will require approval from the City Engineer.

c. Driveways opposite median openings shall at a minimum meet the dimensions of D-4 or D-8 Type driveways.

d. Industrial access is not permitted on arterial or major collector streets.

e. Slopes on a commercial/industrial driveway shall not exceed 12 percent. Grade breaks shall not exceed 9 percent and shall be spaced no closer together than 20 feet.

3. Non-residential Driveway Grades

Driveway profile standards are illustrated in the City Standard Details.

4.1.5 Bridges, Retaining Walls and Structural Clearances

A. Bridges

1. Bridge Roadbed Width

The clear width of all bridges, including grade separation structures, shall equal the full width of the physical improvements consisting of sidewalk, street, median, and curb and gutter.

2. Approach Guardrail

If a vehicular railing or safety-shaped barrier is provided and is within 10 feet of a traveled way with or without a sidewalk, approach guardrails shall be installed on all approach ends in accordance with AASHTO guidelines.

3. Cross Slope

a. The bridge crown is normally centered on the bridge.

b. A straight cross slope in one direction shall be used for one-way bridges. The cross slope shall match the slope of the approach pavement.

4. Railings

ADOT standard design railings shall be used for all bridge structures. The four approved types of railings are described below:

a. Vehicular Barrier Railings

The primary function of these railings is to retain and redirect errant vehicles.

b. Combination Vehicular and Pedestrian Railings

These railings perform the dual function of retaining both vehicles and pedestrians on the bridge. These railings consist of two parts:

(1). a concrete barrier railing with a sidewalk

(2). a metal hand railing or fence-type railing

c. Pedestrian Railings

These railings prevent pedestrians from accidentally falling from the structure and, in the case of the fence-type railing, prevent objects from being thrown to the roadway below the bridge.

d. Bridge Approach Railings

(1). Approach railings are required at the ends of bridge railings exposed to approach traffic. On divided highways, with separate one-way traffic structures, they shall be placed to the left and right of approaching traffic.

(2). On two-way roadbeds with a clear width less than 60 feet across the structure, approach railings shall be placed on both sides of the structure.

(3). When the clear width is 60 feet or more, approach railings shall be placed only to the right of approaching traffic.

(4). Several types of approach railings are available, including Metal Beam Guardrail, Bridge Approach Guardrail (Types I and II), and Safety-Shape Barriers. The type of approach railing selected should match the rail to be used on the bridge. When long runs of guardrail (such as embankment guardrail) precede the bridge, the guardrail should connect to the bridge railing and thus serve the approach railing function.

(5). Approach railings shall be flared at their exposed end. The greatest flare offset possible should be used commensurate with the approach roadway. For detailed information, refer to the AASHTO publication, Roadside Design Guide.

B. Retaining Walls

1. Types and Uses

Recommended types of retaining walls include reinforced concrete and structural masonry. Heavy timber construction is not encouraged and will require special review and consideration by the Engineering

Department. The walls shall also include integral attachments for railing and weep drainage where applicable.

2. Aesthetic Considerations

a. In general, the materials and design of retaining walls shall match or blend with the adjacent natural features, landscaping, and/or buildings. The surface of a retaining wall should have a low light reflectance. Suggested surface treatments include exposed aggregate, stucco or mortar wash, native stone, or other surfaces as approved by the Development Policy Committee.

b. The height of retaining walls shall not exceed 6 feet. Terracing is encouraged and the length of the alignment of the retaining walls should be foreshortened by vertical grooves, periodic offsets, height changes, or other configurations as approved by the Development Policy Committee.

3. Safety Railings

A safety railing is required on or adjacent to vertical faces such as retaining walls, wing-walls, abutments, etc., where the vertical fall is two feet or more. The safety railing shall be constructed per City Standard Details and shall be placed on top of the vertical face structure. On tiered retaining walls railing shall be required on the top tier. This standard does not apply to retaining walls within or between residential lots.

4. Building Safety Permit

All retaining walls greater than 1 foot in height will require a permit from and will be inspected by the Building Safety Division. Any perimeter wall or wall that is adjacent to an arterial or major collector street and has an exposed face that is greater than 8 feet in height will require approval from the Engineering Department and Planning & Zoning Division before a Building Permit is issued or construction begins.

C. Structural Clearance

1. Horizontal Clearance

a. Fixed objects other than street lights, signal poles, utility boxes, street sign poles, fire hydrants and other water appurtenances, landscaping, and utility poles will not be allowed within 10 feet of the traveled way.

b. A lesser clearance will only be allowed when other controls make the desired clearance unreasonable, and if appropriate traffic barriers are installed. In no case shall a fixed object be allowed within two feet of a traveled way.

c. The horizontal clearance to bridge piers, abutments, and retaining walls on all streets shall be not less than 10 feet from the edge of the traveled way.

2. Vertical Clearance

a. The minimum vertical clearance shall be 16.5 feet over the entire width of the traveled way of expressway, parkway, freeway, arterial, or collector streets.

b. On all other streets, the minimum vertical clearance shall be 14.5 feet.

4.1.6 Side Slopes

A. Side Slope Standards

Side slopes should be designed for functional effectiveness, ease of maintenance, and pleasing appearance. See City Standard Details for minimum and maximum slope requirements.

1. Steeper slopes may be approved in areas more than 30 feet back of curb when soils are not highly susceptible to erosion, or when a cut is not more than 4 feet.

2. Consult the AASHTO publication Roadside Design Guide for additional information. Cuts or fills greater than 4 feet shall be reviewed by the Development Policy Committee.

B. Slope Rounding

The top of all cut slopes shall be rounded where the material is other than solid rock. A layer of earth overlaying a rock cut also shall be rounded. The top and bottom of all fill slopes for or adjacent to a traveled way, sidewalk, or bicycle path shall also be rounded.

4.1.7 Street Construction Requirements

A. Construction Standards

1. All construction shall conform to the latest MAG Standard Details and Specifications together with this manual and the City Standard Details.

2. A right-of-way Construction Permit is required for all work within the right-of-way.

3. All contractors working within the right-of-way shall provide the City with proof of insurance in a form and with limits of coverage acceptable to the City.

4. The minimum pavement width for a street widening shall be 12 feet. When improvements occur on a rural arterial and the existing

roadway does not match the new profile, the existing section will need to be removed to match the new cross section.

5. All work within the right-of-way shall be inspected and approved by the City.

6. All newly constructed public ways shall be kept barricaded and access denied to the public until such public way is accepted by the City and all traffic control devices are installed to the approval of the City.

7. All new pavements shall remain in a new uncut condition for a period of 5 years from the date of acceptance by the City. New pavement is defined as follows: addition of new layer of asphalt, cape seals, hot in-place recycling, microsurfacing/ thin-lift overlay, mill and fill, mill and overlay, new construction, open-graded surface course, and rehabilitation and reconstruction. Proposed projects should avoid all pavement cuts within that 5-year period. If a pavement cut is unavoidable a fine per the "Pavement Cut Fines Schedule", as established by City Code, will be assessed.

   The following pavement treatment types are considered maintenance and not new pavement: chip seals, crack filling and sealing, fog seals, joint crack seals, joint repairs, pavement patching, scrub sealing, slurry seals, spot high-friction treatments, and surface sealing. Pavement cuts within a pavement maintenance area will not be assessed for the "Pavement Cut Fines Schedule".

8. Prior to the expiration of the two-year warranty and before the required sealant s applied, all pavement cracks 1/4-inch or wider shall be cleaned and prepared in accordance with MAG Section 337 before crack sealing. Crack sealing shall also be performed around all manholes, valve boxes, survey monuments, and other facilities within the roadway and along all curb and gutter lines in accordance with MAG. After the crack sealing has been completed and before the expiration of the two-year warranty, the streets shall be sealed as follows unless the City agrees to accept an in-lieu payment for the work.

   All new pavement, except rubberized asphalt, shall be sealed as follows:

   a. Streets paved with rubberized asphalt do not need to be sealed;

   b. Unless the City determines that an alternative treatment is required based on the condition of the asphalt, paving on Local Streets shall be sealed with a minimum of a High Density Mineral Bond.

   c. Unless the City determines that an alternative treatment is required based on the condition of the asphalt or unless the City agrees to accept an in-lieu payment for the work, paving on Arterial and Collector Streets shall be sealed with a minimum of a Rubberized Micro Surface.

d. If the City determines an alternative treatment is required, the alternative treatment shall be used to seal the paving on the streets being sealed. Alternative treatments shall be limited to those treatments included in the City's approved pavement management plan.

e. If the City agrees to accept an in-lieu payment, the in-lieu payment will be the cost of applying, testing, inspecting and striping the roadway at the current cost at the 2-year warranty period. In-lieu payments may only be accepted to satisfy the obligation to seal Arterial and Collectors Streets.

f. At the direction of the City Engineer, new thermoplastic markings, fire hydrant reflectors, symbols and raised pavement markers shall be applied following the application of the sealant.

B. Construction of Less-Than-Ultimate Cross Section Improvements

1. Construction of the full street cross section is required for interior streets of a development.

2. Construction of the full half-street cross section is required for the perimeter streets of a development. When approved by the City Engineering Department, an in lieu payment for the cost of the perimeter street improvements may be paid by the Developer in the place of constructing the improvement. Unless a Developer is responsible for the construction of a full median, the Developer shall submit an in-lieu payment for fifty percent (50%) of the costs of the median and median landscaping. If a development is approved for an in lieu payment, rather than to construct the perimeter street, the amount of the payment will be determined by following the City's In Lieu Payment Calculation Worksheet. This worksheet is available from the City Engineering Department.

3. When major arterial streets are constructed, 4 of the 6 lanes of the full street or 2 of the 3 lanes of the half street may be required to be constructed at the time of development. Where so elected, the City may financially participate and require that the additional lane(s) be constructed as part of the project.

4. The determination as to whether the unconstructed lanes will be on the outer edge of the cross section or adjacent to the median location will be made on a case-by-case basis.

C. Construction of Half-Streets

Construction of half streets is discouraged and shall only be permitted in special circumstances. Where approved, minimum pavement widths and temporary turnarounds may be required to satisfy emergency vehicle passage and turning needs.

D. Pavement Transitions

When development causes the widening of a portion of the pavement of an existing road, pavement transitions are required at each end of the widened portion. Design of the various features of the transition between pavements of different widths should be consistent with the design standards of the superior facility. See City Standard Details for minimum transition dimensions.

1. Pavement Transitioning Requirements

a. The transitions should be made on a tangent section whenever possible.

b. Locations with horizontal and vertical sight distance restrictions should be avoided.

c. Whenever feasible, the entire transition should be visible to the driver of a vehicle approaching the narrower section.

d. Intersections at grade within the transition area should be avoided.

4.1.8 Subdivision Street Planning

Refer to Chapter 15, Subdivision Regulations, of the City Code of Ordinances for information regarding the development and design of Subdivisions.

Subdivision street plans should be designed to produce the minimum number of intersections and wash crossings. Street layout and planning shall also be done in a manner that discourages pass-through traffic by the general public but maintains good connectivity to and from adjacent neighborhoods.

A. Existing and Proposed Streets

Existing streets and proposed streets shown on the City General Plan, Roadway Functional Classification Plan, or other City-approved Transportation Plan shall be incorporated into the design of new subdivisions. Exceptions will require approval by the Development Policy Committee and City Council.

B. Street Abandonment

An existing street may be abandoned if it is not a street indicated in the Roadway Functional Classification Plan of the City's General Plan or an Area Plan, and will not eliminate reasonable access to existing properties. The abandonment shall occur prior to the submittal of a Final Plat to City Council.

C. Cul-de-Sac Street Lengths

A cul-de-sac street is a street that serves more than one property owner and has only one direct access to the public street system. The following requirements apply to both public and private streets:

1. The length of a cul-de-sac is measured from the intersection of right of way lines to the extreme depth of the turning circle along the street centerline.
2. A cul-de-sac street shall not be longer than 325 feet, and it shall not serve more than 25 single family dwelling units.
3. Cul-de-sac lengths may also be limited by the maximum length of dead-end water lines. See Chapter 5 (Water) of this manual for further information.
4. Exceptions may be made where topography justifies but shall not be made merely because the tract has restrictive boundary dimensions, wherein provision should be made for extension of street pattern to the adjoining unplatted parcel and a temporary turn around installed

D. Dead-End Streets

1. Dead-end streets will be required where a street connection is necessary to serve adjacent properties that will develop at a future date.
2. When a dead-end street is required and it serves more than 4 lots or is longer than 150 feet, a temporary turnaround shall be provided. In addition, the length and number of lots on a dead-end local street shall be the same as that of a cul-de-sac street.

E. Bubbles

Bubbles are roadway areas expanded to provide a turnaround and additional access or lot frontage on minor collector and local streets.

1. Bubbles are required at intersections where each street extends in only one direction from the intersection.
2. Bubbles are permitted between intersections to improve accessibility to odd-shaped sites or on minor collector streets where direct access is not permitted.
3. The outside radii for bubbles shall be 55 feet.
4. The use of bubbles (except for a cul-de-sac) on other-than-local streets will be reviewed on a case-by-case basis. Radii appropriate for these bubbles will be established as part of that review.

F. Alleys

Alleys may be permitted as allowed by the Goodyear Zoning Ordinance and/or PAD zoning approval.

G. Intersections

1. Street jogs with centerline offsets less than 250 feet will not be permitted along arterial and major collector streets. Street jogs with centerline offsets less than 250 feet will not be permitted on minor collector or commercial/industrial collector streets where interlocking left turns will occur.
2. Offsets as small as 125 feet are allowed on minor collector, commercial/industrial collector, and all local streets where interlocking left turns will not occur.
3. Street intersections with more than four legs and Y-Type intersections where legs meet at acute angles shall be avoided; provision of T-Type intersections for local streets shall be encouraged.

H. Intersecting Tangents

Where a curvilinear street intersects another roadway, a tangent section shall be provided as follows:

1. Local streets intersecting a collector street shall have a tangent section of centerline at least 150 feet in length measured from the right-of-way line of the intersected street;
2. When the local street curve has a centerline radius greater than 400 feet and is perpendicular to the right-of-way line of the intersected street (at the point of intersection), a tangent length shall at a minimum be provided from the centerline of the intersected street to the right-of-way line of the intersected street.

I. Horizontal Alignment

1. When tangent centerlines deflect from each other more than 10 degrees and less than 90 degrees, they shall be connected by a curve with a minimum centerline radius of 500 feet for minor collector and commercial/industrial collector streets or 100 feet for all local streets.
2. Between reverse curves there shall be a tangent section of centerline not less than 100 feet for local streets. The length of tangent sections for collector and arterial streets shall be determined by the City Engineering Department. See the Horizontal curves section of this document for further information on reverse curve requirements.

4.1.9 Technical Reports and Technical Design Requirements

A. Site Plan/Preliminary Plat

Preliminary design information for roadways shall be provided along with the submittal of a Site Plan or a Preliminary Plat. At a minimum, the preliminary design information shall address the following subjects:

1. Traffic Impact Study, as outlined in MCDOT standards, and a Traffic Circulation Study.
2. Roadway cross sections (include the relevant City Standard Detail number)
3. Auxiliary and additional lanes
4. Parking requirements
5. Pedestrian, bicycle, equestrian, and multi-use facility requirements
6. Special features and their influence

B. Design Study

Developers are responsible for submitting a Design Study Report to validate the design shown on the construction plans. The Design Study Report should not be excessively long or complex; rather it shall briefly describe the basis of the design and the assumptions made, explain "special" solutions to problems encountered, etc.
The following sections shall be contained in the report:

1. Soils Report

   A Soils Report shall be submitted with new street construction plans indicating "R" value, sieve analysis, and plastic index of the subgrade, and street structural cross section design.

2. Drainage Report

   A Drainage Report shall be submitted with new street construction plans or the Grading Plans. This report shall be prepared per Chapter 3 of this manual.

3. Pavement Evaluation Report

   a. A Pavement Evaluation Report shall be submitted with new street construction plans when it is proposed to match existing pavement. The Design Engineer is responsible for investigating and evaluating the existing pavement structure.

   b. If the existing pavement meets City Standards, it may be matched by trimming a minimum of one foot for a longitudinal match, or two feet for a perpendicular match. Exact points of matching and method of trimming (sawcut or wheelcut) shall be determined in the field by the City.

c. If the existing pavement does NOT meet City Standards, the pavement must be removed to the limits of the project, or as directed by the City Engineer.

4. Supplemental sketches, details, calculations, and design rationale.

4.1.10 STREETLIGHT REQUIREMENTS

A. General Requirements

1. All streetlights shall use Light Emitting Diode ("LED") lighting fixtures.

2. Dual mast arm light poles shall be installed within the medians of all streets in the City of Goodyear. If, however, a street that will, upon completion have a median but the street is only partially constructed and the median is not completed, streetlights shall be alternating. This situation occurs when a development constructs its half-street improvements, but the median cannot be completed until the development on the other side completes its half-street improvements.

B. Arterial Street

1. Except as otherwise provided in Tables 4.1.3 and 4.1.4. streetlights on all categories of arterial streets shall use 113 Watt 10,400 lumen 4,000 CRI Light Emitting Diode (LED) lighting with 20-year life photo control. Except when a dual mast arm is to be installed in a median, arterial streets shall be illuminated on both sides of the street. Except as otherwise provided in Tables 4.1.3 and 4.1.4, street light spacing shall comply with the Spacing and Mounting Height Criteria for the applicable category of arterial street in Table 4.1.2.

2. Once the right-of-way permit is issued, adherence to streetlight locations is expected. Exceptions may be granted for shifts up to 5 feet parallel to the roadway when underground obstructions are encounter upon the written approval of Engineering Inspector. Shifts in streetlight placement allowed hereunder shall not interfere with a driveway.

3. Streetlights shall be located approximately 1-foot back of sidewalk where the sidewalk abuts the curb. Where the sidewalk is detached to create a landscaped area, streetlights shall be located approximately 4-feet back of the curb. The intent is to keep obstructions, including streetlights, out of the sidewalk.

C. Collector Streets

1. Except as otherwise provided in Tables 4.1.3 and 4.1.4, streetlights on all categories of collector streets shall use 95 Watt 8,600 lumen 4,000 K CRI LED lighting with 20-year life photo control. Except when a dual mast arm is to be installed in a median per Table 4.1.2, collector streets shall be illuminated on both sides of the street when there are four (4) or more through lanes of traffic or when there is a raised, landscaped median. Except as otherwise provided in Tables 4.1.3 and 4.1.4, streetlight spacing shall comply with the Spacing and Mounting Height Criteria for the applicable category of collector street in Table 4.1.2.

2. Streetlights shall be located approximately 1-foot back of sidewalk where the sidewalk abuts the curb. Where the sidewalk is detached to create a landscaped area, streetlights shall be located approximately 4-feet back of the curb.

D. Residential Local Streets

1. Streetlights on residential local streets shall use 60 Watt 5,300 lumen 4,000K CRI LED lighting with 20-year life photo control. Residential local streets shall be illuminated on one side of the street. Streetlight spacing shall comply with the Spacing and Mounting Height Criteria for residential streets in Table 4.1.2.

2. Streetlights shall be located approximately 1-foot back of sidewalk where the sidewalk abuts the curb. Where the sidewalk is detached to create a landscaped area, streetlights shall be located at least 3-feet from back of curb to face of pole.

E. Dark Sky Street Light Design

1. Dark Sky Street Lighting Design providing for reduced level of lighting may apply in areas designated as “Lighting Zone 1” pursuant to Article 10 of the Goodyear Zoning Ordinance.

2. If Dark Sky Street Lighting Design is applicable and the Dark Sky Street Light Table 4.1.3 indicates that lighting is to be mounted on traffic signal poles and no traffic signal exists, then streetlights on all four corners shall be installed using a 132 Watt 16,000 lumen 4,000K CRI LED lighting with 20-year life photo control. These street lights shall be placed in such a manner that the traffic signal can be installed at a later date with no interruption of street light service

TABLE 4.1.2 – Standard Street Light Design

STREET TYPE	LUMINAIRE (WATTS)	MOUNTING HEIGHT (FT)	SPACING MIN/MAX (FT)	POLE SPACING
RESIDENTIAL LOCALS	60	28	190/210	(1) ONE SIDE
ALL MINOR COLLECTORS	95	31.5	100/150	ALTERNATING
ALL MAJOR COLLECTORS	95	31.5	200/200	MEDIAN
ALL MAJOR COLLECTORS	95	31.5	175/225	ALTERNATING
ALL MINOR ARTERIALS	113	39.5	175/225	ALTERNATING
ALL MINOR ARTERIALS	113	39.5	200/200	MEDIAN
ALL MINOR ARTERIALS	113	39.5	100/150	ALTERNATING
ALL MAJOR ARTERIALS	113	39.5	100/150	ALTERNATING
ALL MAJOR ARTERIALS	113	39.5	200/200	MEDIAN
ALL MAJOR ARTERIALS	113	39.5	150/200	ALTERNATING

TABLE 4.1.3 – Dark Sky Street Light Table

THROUGH STREET CLASS	SIDE STREET CLASS	INTERSECTION TYPE	STANDARD LOCATION	FC	NO. OF POLES	WATTS	POLE HEIGHT	ARM	MOUNTING HEIGHT	POS	DIM A	DIM B
LOCAL	LOCAL	CROSS/TEE	ON CORNER	0.76	1	60	31’	2’	31’	A	24'	39'
MINOR COLLECTOR	LOCAL	CROSS/TEE	OPPOSITE CORNERS	1.12	2	95	31’	2’	31’	A	34'	39'
MAJOR COLLECTOR	LOCAL	CROSS/TEE	OPPOSITE CORNERS	0.95	2	113	31’	2’	31’	A	48'	49'
MINOR COLLECTOR	MINOR COLLECTOR	CROSS/TEE	OPPOSITE CORNERS	1.08	2	95	31’	4’	31’	A	34'	56'
MAJOR COLLECTOR	MINOR COLLECTOR	CROSS/TEE*	OPPOSITE CORNERS	0.89	2	113	31’	4’	31’	A	48'	56'
MAJOR COLLECTOR	MAJOR COLLECTOR	CROSS/TEE*	OPPOSITE CORNERS	1.15	2	132	31.5’	8’x8’	39.5’	A	48'	70'
MINOR ARTERIAL	MINOR COLLECTOR	CROSS/TEE*	OPPOSITE CORNERS	1.53	2	132	31.5’	8’x8’	39.5’	A	60'	56'
MAJOR ARTERIAL	MINOR COLLECTOR	CROSS/TEE*	ALL CORNERS	1.39	4	113	30’T	8’	30’	B	34'	94'
MINOR ARTERIAL	MAJOR COLLECTOR	CROSS/TEE*	ALL CORNERS	1.34	4	113	30’T	8’	30’	B	48'	82'
MAJOR ARTERIAL	MAJOR COLLECTOR	CROSS/TEE*	ALL CORNERS	1.84	4	132	30’T	8’	30’	B	48'	94'
MINOR ARTERIAL	MINOR ARTERIAL	CROSS/TEE*	ALL CORNERS	2.04	4	132	30’T	8’	30’	B	48'	87'
MAJOR ARTERIAL	MINOR ARTERIAL	CROSS/TEE*	ALL CORNERS	1.59	4	132	30’T	8’	30’	B	48'	99'
MAJOR COLLECTOR	MAJOR ARTERIAL	CROSS/TEE*	ALL CORNERS	1.32	4	132	30’T	8’	30'	B	60'	99'

* Alternate locations for these intersections are found in Table 4.1.4

T – Light to be mounted on traffic single pole

TABLE 4.1.4 – Dark Sky Intersection Alternate Locations

THROUGH STREET CLASS	SIDE STREET CLASS	INTERSECTION TYPE	ALTERNATE LOCATION	FC	NO. OF POLES	WATTS	POLE HEIGHT	ARM	MOUNTING HEIGHT	POS	DIM	
											A	B
MAJOR COLLECTOR	MINOR COLLECTOR	CROSS/TEE	MEDIAN	1.03	2	4X95	25'	8'x8'	33'	C	58'	n/a
MAJOR COLLECTOR	MAJOR COLLECTOR	CROSS/TEE	MEDIAN	1.33	2	4X113	25'	8'x8'	33'	C	72'	n/a
MINOR ARTERIAL	MINOR COLLECTOR	CROSS/TEE	MEDIAN	1.74	2	4X113	25'	8'x8'	33'	C	58'	n/a
MAJOR ARTERIAL	MINOR COLLECTOR	CROSS/TEE	MEDIAN	1.59	2	4X113	32'	8'x8'	40'	C	58'	n/a
MINOR ARTERIAL	MAJOR COLLECTOR	CROSS/TEE	MEDIAN	1.31	2	4X113	25'	8'x8'	33'	C	72'	n/a
MAJOR ARTERIAL	MAJOR COLLECTOR	CROSS/TEE	MEDIAN	2.07	2	4X132	32'	8'x8'	40'	C	72'	n/a
MINOR ARTERIAL	MINOR ARTERIAL	CROSS/TEE	MEDIAN	1.98	2	4X133	32'	8'x8'	40'	C	77'	n/a
MAJOR ARTERIAL	MINOR ARTERIAL	CROSS/TEE	MEDIAN	1.81	2	4X134	32'	8'x8'	40'	C	77'	n/a
MAJOR ARTERIAL	MAJOR ARTERIAL	CROSS/TEE	MEDIAN	1.7	2	4X135	32'	8'x8'	40'	C	89'	n/a

F. Developer Responsibility

1. Developers of residential subdivisions, apartments, condominiums, commercial, industrial projects, and all permitees are responsible for the design, materials, and installation costs of all Street lighting on public streets within and adjacent to their project.
2. APS – Specific Requirements – All costs for streetlight installation including construction and energization are to be addressed in streetlight construction contract between developer and APS. The Developer shall be financially responsible for the installation, operation and maintenance of the street lights for a two-year service term during the two-year warranty period.

G. Design Guidelines

1. Streetlight layout and design shall include existing and known future streetlight location information for all streets adjacent to and across from the proposed development.
2. Streetlights shall be shown on all roadway right-of-way adjacent to private developments. The Developer shall pay all City permit fees. Design conflicts shall be resolved by the Developer to the satisfaction of the electrical utility company and City of Goodyear. It shall be Developer's responsibility to coordinate conflict resolution with electric utility company facilities, including vertical clearances without compromise to the uniformity in the lighting design.
3. Streetlight layout and design shall include two (2) streetlights at each arterial street intersection and one streetlight at all other intersections.
4. Label specific locations, sizes, and dimension from the center line and/or monument line along with the following:

    a. Existing and proposed underground utilities
    b. Existing and proposed overhead utilities
    c. Face of curb
    d. Width of sidewalk
    e. Width of any PUE
    f. Edge of right-of-way
    g. Edge of pavement

5. There shall be a minimum six (6) feet of clearance between streetlight poles, fire hydrants, and City water services facilities. Three (3) feet clearance required for service taps (water/sewer) and two (2) feet clearance required from storm drains and city sewer facilities. Street lights shall not be installed within twenty-five feet of a traffic signal pole that is illuminated.

6. The public streetlight system shall be installed in the right-of-way unless right-of-way is not available. Where right-of-way is not available and where an easement allows for streetlight equipment, the engineer may design equipment within the easement with approval from the City Engineer.
7. Any public street cul-de-sac having a depth of one hundred fifty (150) feet or greater from face of nearest curb of interesting street to cul-de-sac radius point shall have a streetlight or lights located in the cul-de-sac.
8. Public street lighting plans shall show luminaire and streetlight pole type including assigned street number.
9. The streetlight design shall be submitted on E size sheets (24 inches by 36 inches). Plans shall be prepared so the north is to the top or right side of the sheet. The scale for the streetlight plan shall be 1-inch equals 20 feet or 1-inch equals 40 feet. See Plan Review requirement for electronic submittal.
10. Design line characteristics are as follows:
    a. Solid medium for proposed street improvements
    b. Light and/or dashed for existing street improvements
    c. Bold for streetlight system design
11. On local, collector and arterial streets, all existing and/or proposed driveways and ADA ramps shall be shown on the streetlight plans.
12. In areas where standard vertical curb, roll curb or sidewalk do not exist, all poles shall be centered at least then (10) feet from edge of asphalt pavement.
13. Information needed on each set of plans:
    a. Vicinity Map
    b. Legend
    c. Construction Notes
    d. Streetlight Notes
    e. General Notes as Required
    f. Project Number/Kiva number, SDEV Number, CSPR Number, Project Title and Address, if applicable (36-point minimum font)
    g. Blue Stake Caution Label
    h. Quantities List
    i. City Project Number, if applicable
    j. Utility provider

4.1.11 SUPPLEMENTAL DEVELOPMENT GUIDELINES

A. General Information

1. To achieve reasonable uniformity, deviations away from the point of radius up to 25 feet may be permitted.
2. Private streetlights should be labeled in the streetlight plans per APS Standards.
3. In cases where the required location for streetlights are in conflict with underground or overhead utilities and streetlights may be set back a minimum of two feet back of curb. However, any setback deviation must be approved by Engineering Department, Streetlight Section.
4. All streetlight poles and equipment shall be shown on streetlight plans with station and offset dimension.
5. Streetlight equipment shall conform to approved manufacturers per current utility company standards.
6. When proposed streetlights are to be located in near vicinity of an airport runway, the Developer shall provide all necessary pole height clearance calculations for review by COG Street lighting.
7. Developer shall provide additional details of any items not covered by COG standard details requested by the City Engineer.
8. Streetlight general notes shall be included on streetlight plans. See General Notes.

4.1.12 STREETLIGHT LOCATION LAYOUTS

In order to provide the designer with guidelines for various roadway scenarios, typical roadway configurations with corresponding spacing recommendations are shown in Standard Details. These layouts are show as examples only. The design engineer should use their professional judgment when designing all type of scenarios.

4.1.13 BRIDGE SPECIFICATIONS

A. General Information

1. This section applies to poles and luminaires installed on all bridge decks regardless of utility service area. Bridge mounted pole details and specifications are provided by APS.
2. Consulting Engineer shall coordinate with bridge structural engineer to design foundations for pole into bridge wall. See streetlight pole specifications for design criteria.
3. Cast in place junction box is required within 3’ of each pole mounted on a bridge.

4. Conduit between junction boxes on a bridge shall be a minimum of 2.5” in diameter.
5. Streetlight pole spacing shall be in accordance with typical spacing criteria corresponding to roadway designation as described in the design guidelines section.
6. Consulting Engineer shall provide details showing the installation of expansion couplings in bridge abutments.

4.2 TRAFFIC SIGNALIZATION

4.2.1 INTRODUCTION AND DEFINITIONS

A. Purpose

1. This section describes the design criteria for traffic signals within the City’s jurisdiction. The requirements described herein are primarily based on safety considerations. Therefore, standards that provide a greater degree of safety may be used, within reasonable economic limits, but standards that provide a lesser degree of safety may not be used without prior approval from the City’s Traffic Engineer.
2. While every effort has been made to ensure the accuracy and completeness of these guidelines, the City is not responsible for any errors or omissions. It shall be the sole responsibility of the Design Engineer to ensure proper design and accuracy, and the completeness of construction documents containing that Engineer’s seal.
3. Recognizing the liability implications associated with traffic signal design and operations, all traffic signal designs for traffic signals that will be the operational responsibility of the City should be conducted by professionals experienced in the design of traffic signals. Such individuals shall be Registered Professional Engineers (Civil Engineer or Electrical Engineer) in the State of Arizona and should be a Registered by the Institute of Transportation Engineers (ITE) as a Professional Traffic Operations Engineers (PTOE.

B. Applicable Standards

The following documents represent applicable standards documents, in order of precedence and hierarchy:

1. Manual on Uniform Traffic Control Devices, current edition.
2. Arizona Department of Transportation Supplements or Addenda to the MUTCD.
3. City of Goodyear Approved Products List for Traffic Signals, current edition.

4. City of Goodyear Standard Details.
5. City of Goodyear Engineering Standards.
6. ADOT Standard Specifications for Road and Bridge Construction, current edition, including any Supplements/Addenda.
7. Arizona Department of Transportation Standard Traffic Signal Details, current edition, including any Supplements/Addenda.

4.2.2 TRAFFIC SIGNAL NEEDS STUDY

All proposed traffic signals shall be justified by a complete and comprehensive Traffic Signal Needs Study. All Traffic Signal Needs Studies shall be supported by traffic data taken from the site within the last six months for any warrant based on existing traffic or pedestrian volumes. Signal warrants based on future traffic volumes shall be supplied with explanation of the logic by which the traffic volumes were derived.

A. Traffic Signal Needs Study Requirements

1. Spacing

   Spacing between adjacent signals shall be a concern and shall be analyzed by the party proposing any new signal. Typical signal spacing should be no closer than 1/2-mile between signals. Closer spacing may be proposed with supporting analysis, but is subject to the review and written approval of the City Traffic Engineer.

2. Signal Coordination Analysis

   A Signal Coordination Analysis shall be part of a traffic signal analysis. Unless a Signal Coordination Analysis is prepared by the City, a traffic signal needs study for proposed traffic signals located within 1/2-mile or less of any adjacent traffic signal shall include a Signal Coordination Analysis showing how the proposed signal may interact with neighboring signals under coordination. This Signal Coordination Analysis shall analyze both the AM and PM weekday peak periods, based on existing cycle lengths and any proposed changed cycle lengths deemed necessary to suitably operate the new signal in sync with adjacent signals. In cases of commercial developments of land uses typical of high weekend peak traffic, analysis periods may include weekend data, as directed by the City Traffic Engineer. The City Traffic Engineer shall establish the time frames and geographic limits of the Signal Coordination Analysis prior to the analysis being performed. The Design Engineer shall be responsible for obtaining any and all necessary data for this analysis.

3. Authentication

All Traffic Signal Needs Studies shall be submitted to the City for review and approval, sealed by a Registered Professional Engineer experienced in the procedures and application of such procedures as set forth in the MUTCD and other industry standards.

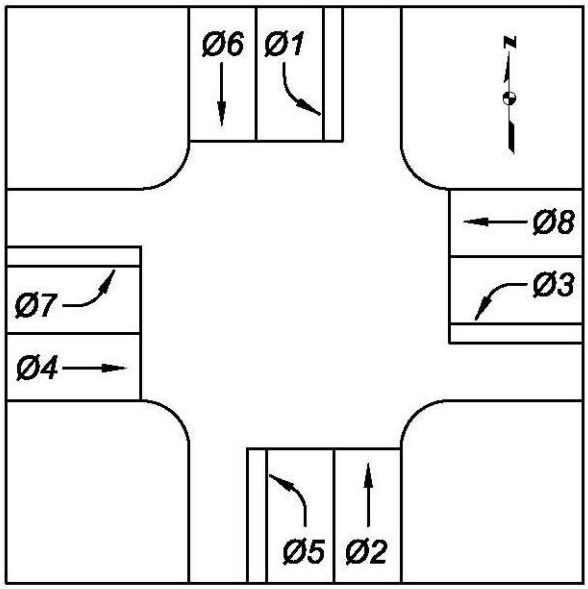
4. Approval

Only traffic signal warrant and signal coordination studies approved in writing by the City Traffic Engineer shall justify the legal installation of a traffic signal. Satisfaction of a signal warrant alone does not necessarily justify installation of a traffic signal, as noted in the MUTCD, and is still subject to the review and approval of the City Traffic Engineer. Such approvals may include requirements such as responsibility for installation of associated interconnect conduit and cables. Conduit and pull boxes may be installed for future traffic signals. Above ground equipment shall not be installed and the signal shall not be turned on until the intersection is meeting signal warrants and the City Traffic Engineer approves the installation of the traffic signal.

4.2.3 SIGNAL PHASING & TIMING

Only approved phasing, standardized by direction and as approved by the City Traffic Engineer, shall be utilized. Existing signals being modified shall be converted to standard phasing directions as part of the overall modifications, if not already in compliance.

FIGURE 4.2.1 – Traffic Signal Phasing



A. Left Turn Arrows

1. All left turn arrow phases shall be “lagging” left and shall be justified by analysis and justification comparing the volumes of left turning traffic with the volumes of oncoming traffic via the MCDOT Cross Product methodology (MCOT PGP 3-3.5-0). When approved by the City Traffic Engineer, “leading” left turns may be used in conjunction with “lagging” left turns to improve traffic flow.
2. Phasing shall be designed to be safe and to avoid trapping left turn vehicles who may believe it is safe to turn on a yellow display, when oncoming through-traffic still has a green indication (the “trap” condition).

B. Right Turn Arrows

1. Right turn arrows may be considered whenever an exclusive right turn lane exists on an approach and left turn arrows are used on the adjacent street.
2. Locations where the right turn arrow is implemented shall provide NO U-TURN signs for the movement that would be in conflict with the right turn arrow.

C. Other Phasing Cases

It is recognized that a variety of other cases may manifest themselves in the way of arrow combinations, phasing, and preemption needs. Any and all phasing sequences shall be supported by analysis, shown on the plans, reviewed and approved by the City Traffic Engineer prior to construction and implementation.

D. Signal Timing

Traffic signal timing development for actual use in the field, installation, and maintenance shall be the responsibility of the Design Engineer, subject to review and approval by the City Traffic Engineer.

4.2.4 SIGNAL PREEMPTION

A. Emergency Vehicle Preemption

1. All new traffic signals, and all existing traffic signals being modified, shall be designed to provide emergency vehicle signal preemption.
2. Preemption shall be through the use of optical devices, such as a strobe light on the approved emergency vehicle, light sensitive sensor at the traffic signal (typically mounted on the mast arm or other location offering adequate visibility), and interface card(s) in the controller cabinet.

3. In cases of vertical and horizontal curvature, preemption sensors may need to be mounted on additional poles located upstream from the traffic signal. The desirable unobstructed preemption visibility distance shall be 1,800 feet, unless dealing with a development driveway with limited length.

4. Preemption cables shall run un-spliced from the sensor on the signal support structure to the controller cabinet terminals.

B. Railroad Preemption

1. All traffic signals located within 500 feet of any at-grade rail crossing shall be considered for railroad preemption. The Design Engineer shall coordinate with and make all arrangements with the railroad, including specifics on how and where any interfaces shall occur, and whether the circuit is “normally open” or “normally closed”. Any relays required in the signal controller cabinet to support proper preemption operation shall be identified by the Design Engineer and shown in the project plans as provided and included as part of the project.

2. Typical preference shall be for a preemption operation capable of being provided by the City’s standard traffic signal controller without the use of special equipment or external “black box” logic, and should provide for continued limited signal operation for directions and movement combinations that are not in conflict with the rail crossing during the preemption event. The preemption sequences shall be shown on the plans.

3. Internally illuminated NO RIGHT TURN signs may be utilized if field conditions warrant extra emphasis, in conformance with the provisions of the MUTCD.

4. All traffic signal plans with railroad preemption shall contain a note indicating the railroad agency contact person and telephone number, as well as any specific coordination elements and permits necessary for the Contractor, on the plan sheets.

C. Transit Priority

The City does not provide transit priority features at traffic signals. Any proposals for transit priority shall be submitted to and approved by the City Traffic Engineer.

4.2.5 PLANS

A. Drafting

1. All Traffic Signal Plans shall be developed in AutoCAD (.dwg) or Microstation (.dgn) format.

2. The Design Engineer shall submit plans electronically to the Engineering Department, Plan Review Division through the City's Electronic Plan Review System. All plans shall be submitted at a 100% level of completion. A submittal package shall consist of a complete set of Plans, Specifications, Signal Warrant Study, left turn arrow analysis, voltage calculations (if requested by the City), conduit capacity calculations (if requested by the City), and Engineer's Estimate (if requested by the City).
3. Final approved plans shall be sealed and signed by a Registered Professional Engineer (Civil or Electrical) of the State of Arizona.
4. At the end of the design project, CADD files shall be submitted to the City's Engineering Department on CD ROM, with each plan sheet as a stand-alone file with no reference files, electronic Engineer's seal, or attachments. Specifications shall be provided in Microsoft Word format, current version. Engineer's Estimates shall be provided in either Microsoft Word or Excel formats.

B. Sample Plans

1. Sample plans of recent City-approved traffic signals may be requested from the Engineering Department as a guide, but the Design Engineer must recognize the possibility that recent design criteria or site required revisions may be necessary.
2. A typical stand-alone traffic signal plan set shall consist of the following sheets with typical content:

a. Cover Sheet:

(1). Project Title

(2). Location

(3). Project Number

(4). Design Engineer's name and PE seal, Firm name, address, telephone number

(5). City logo (for City CIPs only)

(6). Vicinity map showing project location(s) relative to entire City

(7). Approval Signature lines for the City Traffic Engineer

(8). List of utility companies and contacts within project limits

(9). Bench mark.

b. Notes Sheet (or Plan View Sheet):

(1). Obtain latest notes from the City and add notes specific for project under design.

c. Plan View Sheet:

(1). A separate sheet detailing signing and striping modifications may be necessary if extent of such work causes undue clutter on the Signal Plan View Sheet. If separate Signing and Striping Plans are created, they may be in 1inch = 40 feet scale.

(2). Scale shall be 1inch = 20 feet.

(3). Use exploded views or blowups of specific areas, if necessary, to enhance clarity of information.

(4). ADOT Traffic Engineering CADD Standards and ADOT symbology shall be used and symbols shall be identified in a legend.

(5). Use English units.

(6). Use City border and title block (for City CIPs only).

(7). Show “existing” features dashed, and in light pen weight, for:

i. Centerline

ii. Curb & gutter/edge of road

iii. Sidewalk & wheelchair ramps

iv. Utilities – Both overhead and underground, identified by type, such as manhole covers, valves, hydrants

v. Bus stops

vi. Striping & signing, including dimensions of lane widths

vii. Right-of-way lines (Existing & Proposed), including dimensions from face of curb

viii. All Easements (Utility, Drainage, etc.)

ix. Existing traffic signal features (support structures, conduits, pull boxes)

x. Street names

xi. North Arrow, indicating scale of drawing.

(8). Show “new” features solid, in bold pen weight:

i. New centerline (if applicable)

ii. New signing & striping

iii. Lane widths

iv. Support structures & callouts

v. Vehicle signals

vi. Vehicle signal phase designation

vii. Pedestrian signals with phase designation

viii. Luminaires

ix. Cabinets & callouts

x. Electric service cabinets & callouts

xi. Pull boxes

xii. Conduit & callouts

xiii. Detection

d. Schedule Sheet:

(1). Use City standard layout format.

(2). Distinguish between existing and new equipment and conductors by using dash symbology and light pen weight for existing, and solid symbology and bolder pen weight for new equipment and conductors, per ADOT symbology.

(3). Distinguish between existing and new by using “existing” and “new” callouts in the Schedules.

(4). Indicate locations by station and offset for all support structures, cabinets, and poles.

(5). In areas where support structures are placed in areas of future development, indicate elevation of support structure base so structure elevation is compatible with future grades.

(6). Include IMSA cable color code and conductor assignment by phase and circuit type.

(7). Show current City Approved Materials List for Traffic Signals on plans.

e. Detail Sheets:

(1). Detail Sheets shall be created and used in plan sets as needed or required by the City.

(2). Scale of drawings shall be sufficient for their purpose.

4.2.6 CONDUCTORS

The following sections provide design level information on conductor requirements:

A. General Information

1. Where indicated that conductors are to be sized for associated loads/uses, load and voltage drop calculations shall be performed by the Design Engineer. The maximum tolerable voltage drop between the controller cabinet and field device shall not exceed 3%.

2. Splicing of electrical conductors for street lighting and commons shall occur only in pull boxes and cabinets. IMSA cables, CCTV cables, video detection cables, loop detector lead-in cables, preemption cables and interconnect cables shall run un-spliced from controller cabinet to device (or loop pull box). Under no circumstances will splicing be allowed within any conduit.

B. IMSA Multi-Conductor Cable

1. IMSA No. 14 AWG solid core copper multi-conductor cable shall be used to provide electrical circuits to all traffic signals, pedestrian signals and pedestrian pushbuttons. IMSA cables may be used to provide linkage to other electrical circuits such as railroad cabinets, beacons, internal to structures, etc.

2. Conductor size and number of conductors per cable shall be appropriate for the intended number of displays, associated electrical loads, plus future left and right turn arrow phases per each support structure. The standard size of conductor shall be No. 14 AWG solid core copper, unless voltage calculations, based on a maximum allowable loss of 3% (3.6 VAC), indicate the need for a larger conductor size.

3. Designers shall minimize the variety of IMSA cable sizes. Typically, a 20 conductor (minimum) cable is sufficient for all structures, unless unique signal arrangements are used.

4. One IMSA cable shall be routed un-spliced from each support structure to the controller cabinet. Thus, if eight support structures are proposed, eight cables, running un-spliced from each support structure to the controller cabinet, are required. Cables between support structures and controller cabinets shall contain an adequate number of conductors to serve existing and future phases, plus at least 3 spare conductors.

TABLE 4.2.1 – Traffic Signal Wiring Plan

Phase/Corner	Upright	Type A Pole	Type A3 Pole	Add On/Leading	Ped Post
1	Red/Black Orange/Black Green/Black	Red/Black Orange/Black Green/Black	Red/Black Orange/Black Green/Black	Black/Red Orange/Red Blue/Red	
2	Red Orange Green	Red Orange Green	Red Orange Green	Red/White Black/White Green/White	
3	Red/Black Orange/Black Green Black	Red/Black Orange/Black Green Black	Red/Black Orange/Black Green Black	Black/Red Orange/Red Blue/Red	
4	Red Orange Green	Red Orange Green	Red Orange Green	Red/White Black/White Green/White	
5	Red/Black Orange/Black Green Black	Red/Black Orange/Black Green Black	Red/Black Orange/Black Green Black	Black/Red Orange/Red Blue/Red	
6	Red Orange Green	Red Orange Green	Red Orange Green	Red/White Black/White Green/White	
7	Red/Black Orange/Black Green Black	Red/Black Orange/Black Green Black	Red/Black Orange/Black Green Black	Black/Red Orange/Red Blue/Red	
8	Red Orange Green	Red Orange Green	Red Orange Green	Red/White Black/White Green/White	
2 Ped	Black Blue	Black Blue	Black Blue	Red/Green Blue/black	
4Ped	Black Blue	Black Blue	Black Blue	Red/Green Blue/black	
6Ped	Black Blue	Black Blue	Black Blue	Red/Green Blue/black	
8 Ped	Black Blue	Black Blue	Black Blue	Red/Green Blue/black	
Ped Button DC+ Ped Button Comm	White/Black White	White/Black White	White/Black White		White/Red White
Northeast Southeast Southwest Northwest	Red Tape White Tape Blue Tape Green Tape	Douible Red Tape Double White Tape Double Blue Tape Double Green Tape	Triple Red Tape Triple White Tape Triple Blue Tape Triple Green Tape		4x Red Tape 4x White Tape 4x Blue Tape 4x Green Tape

C. Street Lighting

1. Street lighting shall be provided on all traffic signal structures.
2. Street lighting on traffic signal structures shall conform to the City's current Approved Products List. Lighting shall be controlled by a photocell and lighting contactor mounted in the meter pedestal. Meter pedestals shall provide an AUTO/OFF/ON toggle switch for controlling and testing lighting circuits.
3. All street lighting conductors shall consist of two individual conductors (No. 10 AWG Minimum Size) with XHHW insulation, black in color and of adequate size to accommodate at least four luminaries (existing plus future) at each intersection. Provide one circuit with two breakers in the meter pedestal cabinet.
4. Watertight fuses shall be utilized in the pull box adjacent to street lights.

D. Signal Common

1. One signal common of adequate size (No. 6 AWG minimum size), to accommodate the electrical load of the installed signals plus all future signals, shall run from the controller cabinet, around the intersection to each corner pull box. This conductor shall be stranded, with white insulation.
2. A smaller gauge, individual THW conductor, shall be connected to the larger gauge common in the corner pole box and routed to the support structure to serve the vehicle and pedestrian signal heads.

E. Pedestrian Pushbutton Common

The pedestrian pushbutton common shall be contained within the IMSA cables to each structure.

F. Detector Cables

1. Video detection power and image cabling shall conform to the manufacturer's specifications. Consult the City's current Approved Products List for acceptable brands.
2. Design Engineers shall acknowledge that specific manufacturers will NOT support warranties for video detection if "approved equal" brands of cable have been used or specified. Use ONLY the brands and models specified by the specific manufacturer.
3. Video cables shall run un-spliced from the device to the controller cabinet.

G. Interconnect

1. All traffic signals, including existing signals being modified, shall have interconnected facilities added/included as a part of the design. Interconnect cable shall be 96-fiber loose tube SMFO cable in trunk runs between intersections. Runs between splice vaults and the controller cabinet shall be 12-fiber loose tube SMFO cable. See the City's Approved Material List for information on the current Fiber Optic Cable.
2. Plans shall detail all appropriate fusion splicing and enclosures, and identify size and locations of splice enclosures and end treatments.
3. In the controller cabinets, the Design Engineer shall arrange for appropriate connections resulting in an operating system for interconnect to the traffic signal controller and any applicable CCTV or other Information Transmission System (ITS) devices. The Design Engineer shall consult with the City Traffic Engineer to identify specific fibers to connect in trunk lines to avoid conflicts of fiber assignment.

H. Emergency Vehicle Preemption Cable

1. Emergency vehicle preemption cables shall conform to the current City Approved Products List. No "approved equal" has been established for this item.
2. Emergency vehicle preemption cable shall run un-spliced from the controller cabinet to the sensor.
3. Any proposed signal modifications that disturb any conduits containing emergency vehicle preemption cables will require installation of new cable from the cabinet, back to the affected preemption sensors to accomplish the above requirement.
4. Absolutely no splices are allowed in preemption cables.
5. In the controller cabinet, the Design Engineer shall arrange for appropriate terminal strips, interface cards, and connectors, and identify same on the project plans.

I. Grounding

A No. 8 AWG solid copper conductor, with green insulation, shall be used in all PVC conduits containing electrical voltage circuits. Generally, the ground bond wires are connected to the ground rod in the cabinet to form a continuous grounded system.

4.2.7 CONDUITS

A. Material

1. PVC conduits, of adequate size, shall be used for all underground installations. Conduits above ground or otherwise exposed to weather or sunlight shall be rigid galvanized conduit to the end of the first conduit section or sweep that is below ground, at which point a rigid-to-PVC adapter shall be used.
2. The use of HDPE material is allowed for conduits bored under paved areas, if it conforms to the UL listing and schedule 40 thickness requirements, and is terminated with bell ends.

B. Installation Method

1. Conduits under existing streets and paved or concrete areas shall be bored unless boring is met with refusal due to rocky conditions in which case trenching would be permitted.
2. Trenching shall be allowed only in unpaved areas, unless otherwise pre-approved in writing by the City Traffic Engineer. Trench warning tape conforming to ADOT specifications and placement shall be utilized when conduit is installed in open trench.
3. Mule tape with tracer wire shall be installed in all empty conduit.

C. Size

1. Conduits shall utilize sizes in 1/2-inch increments, and shall be sized such that no more than 40% of the cross-sectional area conduit capacity is utilized. Calculations of conduit capacity for the four most occupied conduits shall be provided to the City.
2. Street crossing conduits shall consist of three separate 3-inch Schedule 80 conduits.

   The three conduits shall be assigned as follows:

   a. One conduit exclusively used for electrical circuits (IMSA cables, lighting, common, bond, etc.).
   b. One conduit exclusively used for non-electrical circuits (video detection cable, fiber optic cable, preemption cable).
   c. One conduit as a spare which shall contain an insulated ground wire.

3. Conduits between the controller cabinet and main pull box in the controller cabinet corner shall typically be 4-inch PVC conduits.

   The four conduits shall be assigned as follows:

   a. Two conduits exclusively used for electrical circuits
   b. Two conduits exclusively used for non-electrical circuits

4. Interconnect shall be routed to a No. 9 pull box which shall be connected to the cabinet foundation with a two-inch conduit, bypassing the traffic signal home run pull box.
5. The controller cabinet shall typically have the abovementioned conduits (unless capacity calculations indicate otherwise), plus a 1-inch vertical PVC sleeve in the foundation for installation of a ground rod, and a separate 2-inch conduit for electrical service conductors. A City template shall be used in configuring the conduit layout inside the controller cabinets.
6. Conduits into support structures shall generally be 3-inch PVC conduits, assuming the above capacity constraints can be met.
7. Conduit for interconnect duct shall typically be two 2-inch conduits over one 3-inch conduit.

4.2.8 CONTROLLERS

A. General Information

1. A traffic signal controller conforming to the current City Approved Material List, with Ethernet port, shall be used, unless directed otherwise by the City Traffic Engineer.
2. Design engineers shall confirm latest configuration data with the City to ensure the controller will be compatible with the new signal system protocols.

4.2.9 CONTROLLER CABINETS

A. Cabinet Requirements

An ADOT Type V controller cabinet shall typically be used unless directed otherwise by the City Traffic Engineer. The typical configuration to be called out on the plans shall include an MMU, BIU, 60-amp surge suppression, detector rack, shelf, LED and goose neck work lights, and all load switches and flasher modules.

B. Video Cabinet Requirements

The Design Engineer shall include, on the project plans, an upgraded rack power supply sufficient to provide the extra power consumed by the video detection system.

C. Location

1. Typically locate the controller cabinet and foundation in a safe location that offers good visibility of the displays for maintenance personnel, is not in a low area where water will collect, does not obscure visibility to drivers observing oncoming traffic, and is protected from collision but is not a safety nuisance to pedestrians or

others. The controller cabinet should typically be located on the same corner as the electrical service source, but not at the expense of pedestrian safety or the other factors listed above, with a minimum distance of 20 feet between the two.

2. If necessary, guard posts may be used to protect the cabinet location.
3. See 4.2.7 (Conduits) regarding conduits and sleeves for the controller cabinet foundation.

4.2.10 DETECTION

A. General Information

1. Video imaging detection shall be used to detect vehicular traffic on all new or modified traffic signals that do not already have video detection. Refer to the current City Approved Products List for video detection manufacturers, and design to conform to manufacturers' specifications.
2. Please note that some manufacturers require very specific items without "equal" substitutions, in order to honor warranties.

4.2.11 CCTV

A. General Information

1. All signalized intersections shall be provided with a dome CCTV camera at a minimum 25-foot height on one corner, with associated video equipment and cables to provide streaming video and camera control to the City's Traffic Management Center via fiber optic interconnect. Designers shall ensure structural adequacy of any support system proposed for a CCTV camera. Refer to the current City Approved Products List.
2. CCTV camera location shall be coordinated with and approved by the City Traffic Engineer, and offer the best visibility for traffic observation.

4.2.12 ELECTRICAL SERVICE

A. Relocation, Reconstruction, or Additional Loads

All electrical services and modifications to existing electrical service resulting from relocation, reconstruction or additional loads being added shall be coordinated with the providing Utility by the Design Engineer.

B. Location

Typically, the controller cabinet and electrical service should reside on the same corner or quadrant of the intersection. Design shall route conduit from service pedestal directly to the controller cabinet.

C. Plans

1. Plans shall contain the name, company, and telephone number of the electrical service utility company contact. Any specific instructions from the utility company regarding service installation shall be clearly shown on the plans, on the Signal Plan View Sheet.
2. Plans shall indicate the service address, as assigned through the City, so Contractor's permit corresponds to the correct service address and does not conflict with other City-assigned addresses for the area.
3. The Design Engineer shall be responsible for verifying the size of conduit to the utility source (pole, transformer base, etc.) and exact process and materials the Contractor will be expected to provide information (e.g. conduit stubbed out of pedestal foundation, conduit sweep at base of service pole, quadrant of pole for conduit attachment, trench only requirements, depth of conduit, inspection procedures, required pull ropes, who is to supply/pull service conductors, etc.) to the utility company. Such process shall be detailed in the Special Provisions and/or plan sheets.

D. Meter Method

1. Typically, a meter pedestal cabinet is used, located as close as allowed by the utility company, 5-foot minimum, within City right-of-way.
2. Meter pedestal, conforming to the current City Approved Products List, shall be called out on plans and shall contain a photocell and contactor to serve the illuminated street name signs/traffic signals (120 VAC) and street light fixtures (240 VAC).

E. Material

1. The meter pedestal shall be 100-amp capacity, 120/240 volt, serving the street name signs/traffic signals (120 VAC) and street light fixtures (240 VAC).
2. A toggle switch with AUTO/OFF/ON positions shall be provided for testing circuits.
3. Breakers shall be labeled with engraved plastic with white letter on a black background as to what they serve. Labels shall be self-adhesive and able to withstand temperatures up to 140 degrees F.
4. If necessary, use guard posts to protect the cabinet location.
5. All meter pedestals shall have an engraved metal address tag secured to the meter pedestal with metal rivets.

4.2.13 PEDESTRIAN FEATURES

A. Traffic Signals

1. All pedestrian features in the vicinity of the traffic signal shall comply with the latest edition of the MUTCD and the ADA Guidelines.
2. All traffic signals shall provide overlapping filled-in man/hand symbol countdown LED pedestrian signals and ADA-compliant pedestrian pushbuttons conforming to the current City Approved Products List, and R10-3b pedestrian button signs. Typically, all corners will be connected with crosswalks unless specifically directed otherwise by the City Traffic Engineer.

B. Pedestrian Crosswalks

1. The design and installation of stand-alone pedestrian crosswalks (unsignalized intersection) with electrical devices to control or warn oncoming traffic of pedestrians are required to be reviewed and approved in accordance with the procedures set forth in these guidelines, including justification by an approved Engineering Study.

4.2.14 PULL BOXES

A. General Requirements

All pull boxes shall be secured with Pentahead stainless steel locks.

B. Size

1. A polymer 20-inch deep Number 7 pull box with 8-inch extension shall be utilized on all corners. Each pull box shall be indicated on the signal plan view to contain a ground rod and connected to the grounding system. All pull box foundations shall conform to the City's Standard Details.
2. A polymer 20-inch deep Number 7 pull box with 8-inch extension shall be used along the fiber optic interconnect route. Typical spacing between number 7 boxes along an interconnect route shall be 800-feet. All pull box foundations shall conform to the City's Standard Details.
3. A reinforced concrete Fiber Optic Splice Vault (ADOT #9 with spring assisted lid) shall be provided at each traffic signal controller corner, with a 2-inch conduit directly to the controller cabinet. The interconnect duct shall then connect to this box and splice enclosures contained within the box. This provision applies even in the event the duct is to be installed in the future, with approximately 5 to 10-feet of the duct system installed in both directions from the box to avoid future disruption of the box when connecting the future duct system. All pull box foundations shall conform to the City's Standard Details.

4. Number 5 and number 3-1/2 pull boxes shall not be used, unless approved by the City Traffic Engineer.

5. All pull boxes and splice boxes shall be polymer, and provided with Pentahead, stainless steel locking bolts and appropriate wording on lids (CITY OF GOODYEAR TRAFFIC SIGNAL, FIBER OPTIC). All pull box foundations shall conform to the City's Standard Details.

C. Location

1. Pull boxes shall not be placed in the roadway.

2. Pull boxes shall not be placed in sidewalk and pedestrian ramps.

3. Pull boxes and conduit placement in existing concrete areas shall require removal and replacement of complete slabs to existing joints. No slot cutting or saw cutting of areas inconsistent with original slab joint design shall be allowed.

4. Where possible, disruption to existing landscaping and facilities shall be minimized in locating pull boxes and conduits. When removal of landscape is necessary, the plans shall contain specific call-outs that note "remove existing landscape"

5. Pull boxes shall not be placed in medians.

D. Modification to Existing Intersections

1. When an existing traffic signal is being modified, pull boxes affected by the modification shall be examined in the field prior to design. Cracked boxes, cracked lids, or boxes being entered for wiring purposes that do not comply with the size provisions shown above, shall be designed to be replaced with appropriately sized boxes.

2. Pull boxes located in existing concrete shall require the complete slab to be removed and replaced. No "slot" saw cutting shall be planned in any design.

3. Any existing pull boxes being replaced shall have the pull box foundations reconstructed to conform to the City's Standards Details.

4.2.15 LIGHTING

A. General Information

1. Street lighting shall be provided at each intersection, as a component of the traffic signal installation, and integral to the signal support structures. Typical lighting design shall provide LED lighting on all traffic signal structures.

2. The Design Engineer shall verify and account for any overhead obstructions, and resolve such obstructions as necessary in order to

obtain appropriate clearance distance or approved alternative lighting arrangements.

3. Existing street lights within 25 feet of a new traffic signal pole with a luminaire shall be removed.

4.2.16 SIGNAL SUPPORT STRUCTURES

A. Support Structures

1. Signal support structures shall include and provide internally illuminated street name signs using LED illumination with high intensity sign sheeting and graffiti sheathing. Signs shall be powered with a separate 120V-AC circuit. Sign text/symbology shall be provided as directed by the City Traffic Engineer.
2. The use of span wire supporters for temporary or permanent signal installations are not allowed unless approved by the City Traffic Engineer.
3. Typically, two structures are located on each corner, to support a mast arm assembly and a free-standing support for pedestrian, near-right and far-left indications. The Design Engineer is responsible for location the support structures in such a manner as they comply with industry standards for roadside structures and are not a hazard to the traveling or pedestrian public. Any portion of the signal structure or attachments shall be closer than 24 inches from the face of any roadside curb.
4. Concrete used in mast arm support bases shall have a minimum compressive strength of 4000 psi as specified in the MAG Standard Specifications (i.e. “MAG AA”).
5. All signal displays and placement shall comply with the current edition of the MUTCD. Traffic signal heads shall conform to the current City Approved Products List and be compatible with the support structure.
6. Designers shall attempt to align the end of the mast arm head with the lane line separating the left turn lane and adjacent through lane as much as possible. Mast arm length and sidewalk width shall be considered in the design. Designs that are intended to be temporary on roadways known to be widened and improved in the future shall incorporate the head and structural support placement policies described herein, otherwise approved for deviation by the City Traffic Engineer on a case-by-case basis. The intent is to minimize future relocation and modifications of support structures and components.
7. ADA access requirements require any structure with a pedestrian pushbutton provide a paved concrete or asphalt sidewalk or walkway to the face of the structure. All structures must account for this

requirement, including those adjusted in response to field conditions during construction.

8. The City utilizes two types of traffic signal structures based on geographic location within the City.

   a. The City requires decorative support structures in the locations illustrated in the Standard Details, and allows the decorative support structures elsewhere. These standards are based on the City of Tempe specifications as found on pages 18 through 25 and details as found in T-540 to T-577 in the "City of Tempe, Arizona, Modular Traffic Signal Specifications" Approved equipment and manufacturers have been listed in the City's Approved Material list as found on the City's website.

      (1). Support structures designed for an interim condition shall be located on their ultimate locations, whenever possible, to minimize relocations and modification upon future improvements. The Design Engineer shall verify a 17-foot minimum clearance for the present and future conditions.

      (2). The Design Engineer shall provide structure section and wiring design that allow for future turn signal head configurations. All "far right side" structures (usually structures with mast arms) shall provide paneling and structural members to allow expansion to a 5-section vertical head, providing for existing or future right turn arrows. Structure design shall be such that in order to change from a 3-section to 5-section head, replacement of the front panel and internal head support nipples is all that is required. No horizontal support members shall require modification or replacement to accomplish this change.

      (3). All traffic signal structure panels shall be interchangeable and installed without modification regardless of manufacturer.

      (4). One "far-right" hand side signal face shall be provided between the vertical legs of the support structure, above the pedestrian signal. This head may be either a 5 or 3-section head, depending on initial phasing, but able to ultimately accommodate a 5-section head without modification to the support structure's horizontal internal supports.

      (5). One "far-left" hand signal face shall be provided between the vertical legs of the support structure, above the pedestrian signal. This head may be either a 5 or 3-section head, depending on initial phasing, but able to ultimately accommodate a 5-section head without modification to the support structure's horizontal internal supports.

      (6). All luminaire arms shall be 69 inches in length.

(7). All mast arm traffic signal structures shall include an internally illuminated street name sign.

(8). The color of all signal structure components shall be Tempe Bronze.

b. The City allows ADOT traffic signal poles in the locations illustrated in Standard Details. These standards are based on the ADOT Traffic Signals and Lighting Standard Drawings (Current Edition).

(1). Support structures designed for an interim condition shall be located in their ultimate location, whenever possible, to minimize relocations and modification upon future improvements. The Design Engineer shall verify a 21-foot minimum clearance for the present and future conditions.

(2). All traffic signal poles with a traffic signal mast arm shall include a 96.75-inch x 30-inch x 12-inch internally illuminated street name sign.

(3). When a 5-section head is required, Q heads shall be used at all time. Q-2 heads are not allowed.

(4). Louvered aluminum backplates, black in color, shall be used on all signal heads.

(5). The color of all signal pole components (poles, signal mast arms, luminaire mast arms and the internally illuminated street name sign) shall be powered coated Tempe Bronze. A color sample and coating certification shall be approved by the City Traffic Engineer prior to ordering.

4.2.17 DOME CAMERAS

A dome camera with pan/tilt/zoom capabilities, and all controller devices, communications interface, and modem shall be provided at every signalized intersection. The Design Engineer shall accommodate and specify camera placement, cabling, and associated equipment, conforming to the City's current Approved Products List.

4.2.18 INTERCONNECT

A. General Information

1. A polymer 20-inch deep Number 7 pull box with 8-inch extension shall be placed at approximately 800-foot intervals. Lids shall be marked CITY OF GOODYEAR FIBER OPTIC. All pull box foundations shall conform to the City's Standard Details.

2. A reinforced concrete Fiber Optic Splice Vault (ADOT #9 with spring assisted lid) shall be provided at each existing traffic signal location and proposed traffic signal locations and at all one mile

arterial streets. All pull box foundations shall conform to the City's Standard Details.

3. The Design Engineer shall identify the intended means and equipment necessary for interconnection of the proposed traffic signal or any existing traffic signal being modified. The proposed plans shall indicate the means, route, splicing details and transceiver description of any interconnect, as approved by the City Traffic Engineer.

4.2.19 REMOVAL AND SALVAGE

A. General Information

1. Any existing traffic signal poles, arms, equipment, and cabinets that are to be removed shall be salvaged and transported to the location identified by the City Traffic Engineer.
2. Existing wiring, trash, debris, excess spoil, concrete boxes, and wood that will not be reused shall be removed and disposed of at the Contractor's expense.
3. Existing foundations that will not be reused shall be removed completely and backfilled using a flowable material as specified by MAG standards.

4.2.20 SIGNING & STRIPING

A. General Information

1. Typically, each approach to a new traffic signal shall have a new stop line and new crosswalk. Plan notes shall indicate that the striping shall not be installed until immediately prior to signal activation, so as not to mislead the public into believing the new signals are malfunctioning.
2. All new signals shall include provisions for a TRAFFIC CONTROL CHANGE sign with flags, on each approach for 30 days.
3. Locations where a right turn arrow is used shall have mast arm mounted NO U-TURN signs for the associated left turn movements.

4.2.21 EQUIPMENT SUBMITTALS

A. General Information

1. All new and modified traffic signals shall bear a note on the plans indicating that the Contractor is to provide four sets of equipment submittals to the City Traffic Engineer for review and approval prior to ordering or installing any equipment. Level of detail and procedure of what the materials should be is the same as the ADOT process, except only four sets of submittals shall be required.

2. Anywhere these criteria or the City's current Approved Products List specifies a specific brand and model, that brand and model must be provided without exception.

4.2.22 AS-BUILT PLANS

See the As-Built Chapter of the EDS&PM.

4.2.23 PERMITS

All Permits and acquisition of Standards referred to herein shall be solely the responsibility of the Contractor and the Design Engineer, as appropriate. All Permits shall be obtained and paid for by the Contractor.

4.2.24 CONSTRUCTION

A. General Information

1. Inspections of material, equipment, and workmanship will take place during the entire duration of the construction process. Prior to commencement of construction activities, the Contractor shall:

   a. Schedule a preconstruction meeting with the City Traffic Engineering Inspector.

   b. Supply a three-week schedule of work to the City Traffic Signal Foreman at the preconstruction meeting. The schedule of work shall be updated weekly.

2. The Contractor shall perform a ring-out test of the intersection in the presence of the City Traffic Signal Inspector and make all terminations in the controller cabinet.

3. The Contractor shall correctly phase tape the field wiring, perform a ground resistance test by a certified independent testing agency, and make all necessary adjustments to meet operational requirements.

4. The Contractor shall be responsible for securing a Police Officer and marked patrol vehicle while working within the roadway of any signalized intersection, and/or at all other times as directed by the City Engineering Inspector.

4.3 TRANSIT

4.3.1 INTRODUCTION

A. Purpose

This section provides specifications for locating bus stops and transit amenities such as bus benches and transit shelters. It includes street geometrics for bus bays, standard signage, review, and submittal requirements.

B. Applicability

1. The information presented in this document is intended for use by all those involved in the development and improvement of the City.
2. These guidelines are generalizations, applicable to most situations. They are not intended as detailed engineering solutions; each site will have its own unique set of needs. However, the City review process will expect compliance to these standards as is reasonable and prudent.
3. Developers are responsible for obtaining all City approvals and permits necessary to complete the transit improvements.

C. Goals

1. The goal of these guidelines is to provide a clean, safe, comfortable and convenient environment for users of Goodyear's transit system, and to provide developers a framework in which transit amenities are located and designed for new projects.
2. All transit improvements will be designed to meet the regulations set forth by the ADA.

4.3.2 CRITERIA FOR BUS STOPS

A. Location

1. The standard location for bus stops in the City is at the half-mile and one-mile intervals, at any location where an arterial street intersects another arterial street, and at other locations along arterial streets as identified by the City Engineering Department.
2. Bus stops shall generally be located as close to intersections as possible, and should be constructed on the far side of an intersection.
3. Near-side bus stops (those stops located immediately before an intersection) will be considered when placement of a far-side stop is not feasible or when that stop will be located near buildings with high volumes of transit riders. These types of stops may also be located where a high-volume bus transfer location would otherwise require a pedestrian crossing at a busy street.
4. On occasion, a mid-block bus stop may be utilized to provide access to a major generator, but it is generally discouraged due to the likelihood that pedestrians would cross streets mid-block rather than at an intersection

B. Design and Construction

1. See the City Standard Details for detailed information regarding the location and configuration of bus bays.

2. Where a development or subdivision is walled off from the street, it is recommended that steps be taken to allow easy pedestrian access. This could include a pedestrian access path linking various sections of the development to the bus stop or a system of offset walls around developments which allows pedestrian passage.
3. All transit stop furniture must be placed outside the standard 5-foot sidewalk. A minimum 7-foot clearance is required between transit components and fire hydrants, switch boxes, mail boxes, etc.
4. Unless circumstances require otherwise, a minimum 10 feet of curb shall extend tangent from the curb return prior to beginning the entry taper for a bus bay facility.

C. Accessibility

All transit facilities shall comply with the applicable provisions of the ADA. In general, a 36-inch clearance is to be maintained between bus stop components to allow for maneuvering by wheelchairs. A minimum clear length of 96 inches (measured from the curb or roadway edge) and a minimum clear width of 60 inches (measured parallel to the roadway) shall be provided at transit locations where a lift or ramp is to be deployed.

4.3.3 TRANSIT AMENITIES

Passenger waiting areas shall be comfortable and provide a sense of security. The waiting areas may include a varying range of improvements depending upon ridership and specific needs. Below are typical transit amenities and conditions under which they should be employed:

A. Benches

Benches shall be located at bus stops where the concentration of waiting passengers is not sufficient to warrant provision of a bus shelter.

B. Shelters

Shelters shall be located at bus stops where there will be a concentration of waiting passengers at exposed locations. Shelters are appropriate along arterial and major collector streets, or adjacent to high-activity centers. In a development, any requirement for bus shelters may be waived if adequate exterior shading and architectural shelter is provided by the Developer.

C. Landscaping

1. Shade trees and other protective landscaping should be provided wherever possible. This landscaping could be considered part of the development’s frontage landscape and could count towards any

landscaping requirements which may apply. Considerations for selection and location of landscaping include:

a. Trees should be mature and have an adequate canopy to shade the seating area.

b. Low-water consumption trees and shrubs should be used.

c. Tree location should consider the solar orientation of the transit stop. Priority should be given to providing shading from afternoon summer sun.

d. Transit landscaping should be compatible with other frontage landscaping.

2. All landscaping shall be carefully located so as not to obstruct the visibility of either the transit user or the bus operator. The Developer, property owner, HOA or POA shall be responsible for the maintenance of landscaping at bus stops.

3. See the Landscaping Chapter of this manual for a list of approved trees and vegetation.

4.3.4 BUS STOP MAINTENANCE

A. General Information

1. Repair of items that pose a safety problem shall be performed within 24 hours; repairs that do not pose safety problems shall be completed within 3 days.

2. Regular maintenance shall include but is not limited to:

a. Full wash-down of shelter and accessories

b. Removal of all dirt, graffiti, and pasted material

c. Litter pick up around stop or shelter/accessories to a distance of 10 feet

d. Manual or chemical removal of weeds

e. Pruning of obstructing tree growth

f. Touch up of paint scratches

4.3.5 SUBMITTAL REQUIREMENTS AND REVIEW PROCEDURES

A. Approval

1. The design and location of bus stops or other transit facilities shall be approved by the City during the development approval process.

2. When approved by the City Engineering Department, developers may deposit funds in lieu of construction and installation of stipulated transit amenities. The amount of funds to be deposited

shall be determined during the project review process and shall be paid to the City prior to issuance of any permits.

4.4 BIKEWAYS

4.4.1 INTRODUCTION

A. Preface

These Engineering Standards as presented in this section are derived primarily from the "Arizona Bicycle Facilities Planning and Design Guidelines" as prepared by the Facilities Planning Committee, Arizona Bicycle Task Force, November 1, 1988. Additional references include the Guide for the Development of Bicycle Facilities (AASHTO, 1999) and the MUTCD.

B. Purpose

This section has been prepared for both private and public development and improvement projects within the City. The use of this section will establish uniform bicycle facilities in the City and throughout the region, and will be in conformance with Federal and State Highway Administration Guidelines.

C. Definitions

1. Bikeway: Any road, path, or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.
2. Bicycle Lane: A portion of the roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists.
3. Bicycle Route: Shared facilities to provide continuity to other bicycle facilities (usually bike lanes) or to designate preferred routes through high demand corridors. Routes may be signed but not striped.
4. Bicycle Path: Physically separated from motor vehicle traffic by an open space or barrier, and within either the highway right-of-way or an independent right-of-way.

4.4.2 LOCATION CRITERIA

A. Accessibility

1. Bicycle facilities should be located along a route where they can be maintained.

2. Consideration shall be given to the frequency of access points.
3. Where reasonable and prudent, bikeways shall serve activity centers along a direct course.
4. Where bikeways cross freeways, canals, railroad tracks, etc., proper crossing facilities shall be provided.
5. Routes should be developed that minimize delays for the cyclist.
6. Where possible, stop signs shall be oriented to restrict cross traffic rather than the bike traffic.

B. Safety

1. Bike paths and pedestrian paths should be separate, per Arizona Bicycle Facilities Planning and Design Guidelines and City Standard Details.
2. Two-way paths immediately adjacent to a roadway should be discouraged.
3. Sidewalks may be used as bike paths only under conditions approved by the City Engineering Department.
4. Bicycle lanes shall be one-way and in the same direction as vehicular traffic.

C. Security

Bicycle parking devices that provide for protection from theft and damage should be placed at common trip destinations, i.e. work, library, mall, etc. See the City Zoning Ordinance and Section 4.4.6 below for further information regarding bicycle parking.

D. Riding Environment

1. Steep grades greater than 6% uphill should be avoided.

4.4.3 SELECTION CRITERIA

A. Bicycle Paths

1. Paths should be used to serve corridors not served by streets and highways.
2. Paths should offer opportunities (shorter routes) not provided by the road system.
3. Paths should be considered where they can provide a recreational opportunity or a high speed commuter route.

B. Bicycle Lanes

1. Bicycle lanes shall be designed for preferential or exclusive use of bicyclists.
2. Bicycle lanes should be established along streets with significant bicycle demand.
3. Special effort should be made to ensure that appropriate levels of service are maintained including sweeping, lane markings, and lighting where required.

C. Bicycle Routes

1. Routes are shared facilities and should be developed to provide continuity with other bicycle facilities or as designated preferred routes through high demand corridors.
2. Routes are usually signed but do not require striping.

D. Wide Curb Lanes

1. These are placed along streets in corridors where there is significant bicycle demand on major arterial streets, and are unmarked and unsigned.
2. Wide curb lanes are appropriate where traffic speeds and volumes are tolerable for shared roadway facilities.

4.4.4 DESIGN CRITERIA

A. Roadway Improvements

1. On new roadways, curb inlets should be used and drainage grates and covers should be kept out of cyclists' path.
2. Railroad highway grade crossings should ideally be at a right angle to the bicycle facility. Consideration shall be given to the materials on the crossing surface and to the flangeway depth and width.
3. Pavements should be free of holes, cracks, bumps, and other surface irregularities. Where possible, joints shall be filled, pavement edges shall be uniform and void of drop-offs, and edges shall be level with pavement.

B. Bicycle Routes

Routes should be marked as connectors to other bike facilities and as touring routes. It is desirable to furnish sign information for directional changes and for distance marking for long routes.

C. Bicycle Paths

1. Bicycle paths are facilities on exclusive rights-of-way and with minimal cross flow by motor vehicles.

2. A minimum right-of-way width of 10 feet may be required where essential for circulation or access to schools, playgrounds, shopping centers, transportation, and other community facilities.
3. The desirable minimum paved width for a bike path is 8 feet. A 2-foot minimum graded area shall be maintained on each side of the path.
4. In general, the minimum design speed for a paved bicycle path is 20 mph; however, this speed should be substantially less in areas of multiple use, high traffic volume, and unpaved surfaces.
5. Where possible, grades shall be 6% or less, particularly on long inclines.
6. Sight and stopping distances are important considerations in the design of bicycles paths.
7. Intersections present challenging design considerations, and those with the most favorable conditions shall be used. The ideal intersection design for a bicycle path crossing is grade separation.
8. Signing must be included in the design criteria for both regulatory and informational purposes. General guidelines for markings are provided in the MUTCD.
9. Pavement markings for bicycle paths (and lanes) should follow the same general guidelines as for road markings, with particular attention given to non-slip treatments.
10. Pavement selections for bicycle paths should be selected similarly to highway selections, with particular care to how the edges are constructed. Broom finish or burlap drag concrete surfaces are preferred over trowel finishes.

D. Multi-use Paths

1. Motor vehicle use is limited to maintenance and emergency vehicles only.
2. Fixed lighting is highly desirable on paths that may be used at night, for underpasses, at intersections, and to provide a sense of security.

4.4.5 RIGID PAVEMENTS

A. Introduction

1. Rigid pavements are created by mixing portland cement with crushed rock. Commonly known as concrete, a rigid pavement retains a long life span with a very low maintenance cost. Concrete pavements are used in specialized locations such as bus bays, deceleration lanes, and on-street parking areas.

2. It is not typical to pave a standard City road with a concrete pavement.

B. Purpose

This section provides reference to design standards for producing and paving with concrete. This will include providing mix design requirements, material production requirements, and placement requirements.

C. Standard Design and Construction Manuals

Standards for the design and production of concrete pavements include:

1. MAG Standard Details and Specifications,
2. City of Goodyear Engineering Standards.

4.4.6 ASPHALT PAVEMENTS

A. Introduction

The installation of AC and Rubberized Asphalt Concrete (RAC) on all City streets shall conform to MAG Standard Details and Specifications, City of Goodyear Engineering Standards as applicable to the installation of asphalt pavement through the permit process, unless noted below.

1. Applicable MAG sections include, but are not limited to:

a. Section 321 Asphalt Concrete
b. Section 325 Asphalt-Rubber Asphalt Concrete
c. Section 329 Tack Coat
d. Section 330 Asphalt Binder
e. Section 701 Aggregate
f. Section 702 Base Materials
g. Section 710 Asphalt Concrete Materials
h. Section 717 Asphalt-Rubber Asphalt Concrete Materials

B. General Information

1. Night Work

Night work for paving will not be permitted without written approval from the City Engineer. Certain processes associated with a paving project such as striping may be performed at night where appropriate and where it would not create noise levels that would impact residents.

2. Dust Prevention

   The Contractor shall take whatever steps, procedures, or means necessary to prevent dust caused by his construction operations. The dust control measures shall be maintained at all times during construction of the project, to the satisfaction of the Engineer, in accordance with the requirements of the "Maricopa County Health Department Air Pollution Control Regulations". Prior to the pre-construction conference, the Contractor shall have an approved dust control plan, approved by the MCAQD. For information and requirements for dust control plan submittal please contact:

   Maricopa County Air Quality Department
   1001 North Central Avenue, Suite 400
   Phoenix, Arizona 85004
   (602)-506-6010

3. Clean Up

   It shall be the Contractor's responsibility to immediately clean up any spillage or tracking which may occur. Failure to prevent spillage and keep the job site, haul routes, and adjacent streets clean shall be justification to stop work until adequate procedures and resources are provided to resolve the problem.

C. Exceptions/Modifications from MAG Specifications

1. Aggregate: All aggregate material will be tested using the LA Abrasion test method at least 45 days prior to installation of the asphalt mix for any paving project larger than 500 tons. The test results shall be supplied no later than five (5) days prior to the installation date.
2. Mix Designs: Certain mix designs shall be preapproved by the Engineering Dept. annually. These mix designs shall be posted as approved for use on specific street types. Any mix designs submitted for installation that have not been preapproved shall require submittal at least two weeks prior to the installation date. No changes to the mix design may be made without approval by the city Engineer.
3. Pavement Thickness: Pavement thickness shall be determined by the City of Goodyear Standard Details and installed in lifts as specified in that detail (Detail 3216).
4. Rubberized Asphalt pavement shall be used as the final surface coarse on Arterial and Major Collector Streets that are within a 1/4-mile radius of a residential area as designated on the City’s Land Use Plan

5. Pavement fabric interlayer are not required, unless specifically requested by the City Engineer.

4.5 TRAFFIC SIGNS & MARKINGS

4.5.1 DESIGN SPECIFICATIONS

The following publications or their current revisions along with the design criteria in this section shall apply to the preparation of traffic signs and markings design plans.

A. Publications

1. "Manual on Uniform Traffic Control Devices for Streets and Highways" - U.S. Department of Transportation, Federal Highway Administration, Current Revision.
2. "Signing and Marking" - Standard Drawings, ADOT.
3. "Traffic Control Manual for Highway Construction and Maintenance" - ADOT 1989.
4. "Policies, Guide and Procedure Manual" – ADOT.
5. "Uniform Standard Specifications for Public Works Construction" – MAG.
6. "Uniform Standard Details for Public Works Construction" – MAG.
7. "MCDOT Pavement Marking Manual" - MCDOT
8. "City of Phoenix Barricade Manual"

4.5.2 DESIGN STANDARDS

A. General

Design shall be in accordance with the MUTCD unless modified by the City as noted herein.

B. Striping

1. Unless otherwise noted on the plans, all permanent longitudinal striping (lines, chevrons) shall be 60 mil hot-sprayed thermoplastic, and all lateral striping (crosswalks and stopbars), pavement symbols, arrows, and legends shall be 90 mil hot sprayed thermoplastic.
2. The Developer shall be responsible for maintaining all markings during the warranty period, and may opt to install reflectorized temporary traffic paint for longitudinal markings (unless directed otherwise by the Engineering Department), reapplying as needed at 0.015" (15 mil) minimum thickness. At the end of the warranty

period, all temporary traffic paint shall be restriped with thermoplastic at the required thickness.

3. City striping and marking standards are to be shown per MUTCD, MCDOT Pavement Marking Manual, and City Standard Details for street cross sections.

4. Retro-Reflective Pavement Marker Requirements

a. Blue retro-reflective pavement markers shall be used as a method of identifying fire hydrant locations. Retro-reflective pavement markers shall be per the City Approved Materials List.

b. Blue marker installations shall conform to the following required marker installation locations:

(1). Two-Way Streets or Roads and Private Drives in apartments, condos, etc.: Markers should be placed 6 inches from edge of painted centerline on the side nearest the fire hydrant. If the street has no centerline, the marker should be placed 6 inches from the approximate center of the roadway on the side nearest the hydrant.

(2). Streets with Left Turn Lanes at Intersections: Markers should be placed 6 inches from edge of the painted white line (designating the left turn lane) on the side nearest the hydrant.

(3). Streets with Continuous Two-Way Left Turn Lanes: Markers should be placed 6 inches from the edge of the painted yellow barrier line on the side nearest the fire hydrant.

(4). Street with Raised Medians: Markers should be placed 6 inches from lip of gutter on the side nearest the fire hydrant, and on the top of median curb on the side opposite the fire hydrant.

(5). Freeways and Expressways: Because of higher maintenance at these locations if placed on the roadway, markers should be placed on the shoulder 1 foot to the right of the painted edge line opposite the right-of-way fire hydrant location.

4.5.3 STANDARD PLAN LAYOUT

A. General

1. Signing and pavement marking design shall be shown in the same plan view.

2. Plan sheets are to be complete and to scale 1 inch = 40 feet.

3. Entire length of project is to be shown in plan view. “Typical Sections” representative of striping and/or signing will not be accepted.

4. A street name detail sheet at 1 inch = 100 feet is required for all projects that require street plans and is to include an indexed and referenced Street Sign Schedule.
5. Signing and Pavement Marking Plans shall include all existing signing and pavement markings for a minimum of 1,250 feet past the limits of construction and shall include all transitions and tapers.
6. Right-of-way lines shall be shown and appropriately dimensioned.
7. Control points shall be stationed and clearly identified.

B. Standard Plan Sheet Notes

1. These notes, along with any additional project-specific notes, shall be placed on the lead Signing and Pavement Marking Plan sheet.
2. All pavement markings, signing, and construction shall conform to ADOT Standard Drawings and Specifications unless otherwise specified in the MUTCD.
3. Traffic control shall conform to the City of Phoenix "Traffic Barricade Manual", and/or as approved by the City Engineer.

C. Signing

1. All signs shall be graphically depicted in the direction of travel.
2. All signs shall be stationed and referenced to the appropriate MUTCD sign designation with size noted.
3. Existing signs will be identified to remain, be removed, or be relocated consistent with Note 2 above.
4. Designer shall field-verify all existing advance or approach signing applicable to the project. Reference signs on Plan sheet, including location or station, and note status of sign.

D. Striping

1. Existing striping shall be fully shown (as screened lines or lightly inked pen lines), identified by type and width, and completely dimensioned across roadway.
2. Raised pavement markers shall be graphically shown in plan view and referenced by construction notation.
3. All new striping shall be clearly identified, noting color and line width.
4. All striping shall be fully dimensioned across roadway and tied to a construction centerline or monument line at each side of an intersection.

5. All pavement arrows, legends, crosswalks, etc. shall be located by station or dimension lines.

6. Raised pavement markers shall be installed per City Standard Details and ADOT Standard Drawing, No. M-19, with a City-approved bituminous adhesive.

7. All existing pavement markings which conflict with proposed markings shall be removed by waterblasting or other City-approved method prior to the installation of new pavement markings. Removal shall be to the satisfaction of the City Engineering Department representatives. When excessive damage to the asphalt is caused by the Contractor, the Contractor shall be responsible to correct the damaged area to the satisfaction of the City Engineer, at the Contractor's expense.

4.5.4 STRIPING INSTALLATION STANDARDS

A. General

1. Unless otherwise noted on the plans, all permanent longitudinal striping (lines, chevrons) shall be 60 mil hot-sprayed thermoplastic, and all lateral striping (crosswalks and stopbars), pavement symbols, arrows, and legends shall be 90 mil hot sprayed thermoplastic.

2. City striping and marking standards shall comply with the requirements for MUTCD, MCDOT Pavement Marking Manual, and City Standard Details for street cross sections.

3. The Developer shall be responsible for maintaining all markings during the warranty period, and may opt to install reflectorized temporary traffic paint for longitudinal markings (unless directed otherwise by the Engineering Department), reapplying as needed at 0.015" (15 mil) minimum thickness. At the end of the warranty period, all temporary traffic paint shall be restriped with thermoplastic at the required thickness

CHAPTER 5

WATER

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5.1 POTABLE WATER SYSTEM DESIGN

5.1.1 GENERAL INFORMATION

A. Introduction

This document provides guidance and minimum design criteria for the modification and construction of water systems within the City of Goodyear. It is intended for use in the planning, design, plan preparation, and construction processes.

The City maintains a citywide Water Master Plan that has been developed to ensure that the City's water system develops in an organized manner. Contact the City Engineering department for further information regarding latest editions and updates to this Master Plan.

Wherever the language of this document refers to equipment or material to be used, or the language of a standard refers to an Approved Materials List, the "Potable Water System Approved Materials List" shall be used. The "Flushing and Disinfecting Meter Program" and Water Line Flushing Procedures" documents shall be followed when installing new meters and water lines. These documents can be obtained from the City's Engineering Department or from the City's website, www.goodyearaz.gov.

B. Ordinance Requirements

1. The Developer shall install, at his/her own expense, all on-site and off-site improvements necessary to service the development. This may include but is not limited to: pump stations, reservoirs, transmission mains, fire lines, fire hydrants, pressure reducing valves, and all other facilities necessary to service the development. The Developer shall also remit payment of all required development fees.
2. Each lot in a subdivision shall be supplied with safe, reliable, and potable water in a sufficient volume and pressure for domestic use and fire protection. This shall be verified by the Design Engineer by performing a flow test of that part of the potable system to be extended. The flows and pressures must meet minimum requirements for domestic and fire flow.
3. If the occupancy is to be supplied with domestic service and with fire flows from a storage tank or facility that is not City owned, the Design Engineer must provide a report indicating that sufficient volumes exist as required by the City's Fire Department, and are available to meet calculated fire demands as defined by this manual.
4. Upon development of property within the City limits, the Developer shall submit construction plans for the water system. The plans shall be prepared by a Professional Engineer licensed in the State of Arizona. All water lines and facilities constructed within the City limits shall be inspected by City of Goodyear staff.

5. The City requires developers to install water mains along street frontages of developments, where future extension of the line is required by the City Engineering Department. The street frontage is that portion of the property adjacent to a public right-of-way and/or PUE. If a parcel to be developed has more than one street frontage, water mains shall be installed along each frontage.

6. For current information on ordinance requirements, review of the Goodyear Code of Ordinances is recommended.

C. City Policies

Proposed developments that alter land use and are determined by the City Engineering Department to have a significant impact on the City Master Water Plan, and/or propose a water system that differs from the City's Water Master Plan, shall be financially responsible to have the City's Water Master Plan and model updated to reflect changes. The effects of Maximum Day Demand + Fire Flows, and all other water demand scenarios from these developments, will be reviewed by the City Engineering Department to verify the sizing and layout of the proposed water system elements. This information will also be used to assist the City in planning for current and future developments.

D. Private Water Companies

1. Portions of the City's municipal service area are provided water service by private water companies. Private companies shall meet the requirements defined in the ARS.

2. Modifications or construction of water systems within private water company franchise areas shall be reviewed by the City and the private water company. Private water systems shall be designed and constructed to meet the minimum requirements of this manual. The applicable review fees shall be paid and a note placed on the drawings delineating operation and maintenance responsibilities. The City cannot provide water service within private water company franchise areas.

5.1.2 PLAN PREPARATION

A. Reports

1. Preliminary Water Information

a. Preliminary information regarding the water system for a development shall be provided for all General Plan Amendment, Rezone, and PAD applications. The preliminary information provided within these documents shall at a minimum show and discuss the conceptual location and size of the existing and proposed water distribution and transmission mains within and

adjacent to the site. The text shall also identify the City water zone, discuss storage and booster facilities, and identify any foreseeable need to provide additional storage or pumping capacity to serve the development. Sites that will be constructed in phases shall provide a master water report at the time of rezone or PAD application.

2. Master Water Report

A master water report ("master water report" or "Master Water Report") shall be developed for each project in which the project is to be designed and constructed in a phased succession. Typically, this level of planning is provided in conjunction with a rezone or PAD application.

The Master Water Report will provide a governing plan by which each individual preliminary and final water reports are based. The Master Water Report shall be prepared in accordance with this manual or as otherwise directed by the City Engineering Department and shall be signed and sealed by a Professional Engineer registered in and licensed to practice in the State of Arizona.

The objective of the report is to provide sufficient information to adequately review the water design for a proposed project.

At a minimum, the Master Water Report shall address the following:

a. The location of storage facilities serving the site, the adequacy of available storage, and the ability to meet fire and domestic flow requirements.

b. All connections to the existing system, supply (size, location, length, etc.), and whether the failure of any single pipe will disconnect the site from the system.

c. Design assumptions and computations, demands, pressure and flows, water production requirements, cathodic protection requirements, and rights-of-way or easements that exist or are being proposed.

   (1). The water demand requirements for a development shall be calculated according to the information shown in Table 5.1.1 – Average Day Water Demands.

d. The Master Water Report will become the basis for a Water and Wastewater Service Agreement between the Developer and the City when such agreement is required by the City. The agreement will specify terms and requirements for water and wastewater service to the development. This shall be stated in the introduction to the report.

e. All development projects shall be responsible for determining their specific water system needs.

f. The Master Water Report shall verify that service for proposed developments shall not be provided at the expense of existing customers.

(1). A development's potable water demand requirements shall be calculated according to information shown in Table 5.1-1, Average Day Water Demands.

(2). A development's Fire Flow Demand shall be determined as identified in this chapter.

(3). A development's water storage requirements shall be determined as identified in the City Water Master Plan.

g. Computer Water Models

(1). A water model demonstrating that system pressures do not exceed the maximum nor fall below the minimum operating levels, as identified in this chapter, will be required in each water report.

(2). The water model shall specifically verify that minimum pressures are available within the development's system during the Maximum Day Demand +Fire Flow demand scenario.

(3). When requested, the water model shall be provided to the City electronically for purposes of updating the City Water Model.

(4). Proposed developments that alter land use and are determined by the City Engineering Department to have a significant impact on the City Master Water Plan, and/or propose a water system that differs from the City's Water Master Plan, shall be financially responsible to have the City's Water Master Plan and model updated to reflect changes.

(5). All model data shall include the following:

i. Average Day Demand scenario - based on information in Table 5.1-1.

ii. Maximum Day Demand scenario – 1.7 times the Average Day Demand.

iii. Maximum Day Demand + Fire Flow.

iv. Peak Hour Demand – 2.9 times the Average Day Demand.

v. The fire flows shall be determined per the Fire portion of this chapter.

vi. See the Pressure Requirements section of this chapter for minimum pressure design requirements.

vii. Pipeline calculations verifying that head loss per 1,000 feet of any pipe is no greater than 10 feet/feet during peak period demand conditions, and not more than 8 feet/feet under any maximum day condition.

viii. Sufficient supply for domestic demand must be provided without the use of dedicated fire pumps or backup pumps. Calculations which include both domestic demand plus fire flow may use fire pumps as a portion of the supply.

ix. A data CD containing all electronic calculations shall be submitted along with the Master Water Report.

h. Each Master Water Report shall show or discuss the following information:

(1). All proposed on-site and off-site facilities including, but not limited to: pump stations, transmission and distribution mains, wells, and reservoirs.

(2). Proposed street locations, parcel boundaries, and proposed lots within each parcel.

(3). Contour lines showing the elevation of the land surface shall be at 5- or 10-foot intervals. Sufficient information shall be provided to allow the evaluation of network node elevations.

(4). All water pressure zone boundaries adjacent to or within the project.

(5). A separate area location map shall be provided showing existing and proposed streets, as well as existing parcels surrounding the project, to a distance of one mile from the exterior boundaries of the project. Assessor maps may provide the information required to prepare these composite maps.

(6). The scale of all maps shall be sufficient to show all required information clearly.

i. The Master Water Report shall comply with all other requirements identified as being necessary for the functioning of the City's water system in the area as determined by the City Engineering department and City Environmental Services division.

j. More specific information regarding master water report requirements and the City's requirements for a specific area can be obtained by contacting the City's Engineering Department.

3. Preliminary Water Reports

a. The Preliminary Water Report shall be provided along with a site plan or preliminary plat application which does not require a Master Water Report.

b. When a master water report has previously been approved by the City for a master planned and phased development, the Preliminary Water Report shall follow the same development protocol as identified in the Master Report with the following exceptions:

(1). The Preliminary Water Report shall be developed to identify specific water demand and infrastructure needs for the phase(s) of development being submitted for Site Plan or Preliminary Plat approval.

(2). The Preliminary Water Report will not be the basis of a Water Services Agreement.

4. Final Water Reports

a. A Preliminary Water Report shall be used as the basis for developing a Final Water Report.

b. The Final Water Report shall finalize all design calculations and model information provided in the Preliminary Water Report.

c. The Design Engineer shall have a flow test performed by a private company who will certify the results in writing to the City. The pressures determined in the Master Water Report shall be revised per this flow test information in the final water report. A copy of the flow test shall be provided to the City Engineering department and City Environmental Services division for their records.

d. If a certified flow test(s) performed on the existing system to which the project will be connected does not confirm that sufficient capacity exists, the final report's water model shall be used to determine the required on-site and off-site facilities such as pump stations and pipelines necessary to serve the project.

B. Site Plan and Preliminary Plat Requirements

All site plans and preliminary plats shall show and label the following:

1. All existing improvements shall be shown in dashed and screened back line types. Existing improvements such as water lines (with line size and line material type clearly labeled), storage reservoirs, well sites, booster pump station sites, and associated transmission mains shall be shown and labeled. It is encouraged that a separate plan sheet be provided to show all of the public wet utilities.

2. All proposed improvements such as water lines, reservoirs, well sites, and booster pump stations shall be shown in dark lines.

3. The service provider for the area shall be labeled.
4. All existing and proposed water line easements shall be shown, labeled, and dimensioned.

C. Construction Plan Requirements

1. Review Guidelines

No permits for public water installation will be issued until the Owner/Developer has provided the necessary easements and rights-of-way. The instruments of dedication must be approved by the City and recorded at the Maricopa County Recorder's Office.

The following paragraphs highlight construction plan requirements pertaining to the preparation of water improvement plans which are to be submitted to the City for approval:

a. Plans shall be prepared per the guidelines in Chapter 2 of this manual.
b. General Construction Notes and Water Construction Notes which apply to construction of the City of Goodyear's sewer system are required on each set of construction plans which include work on the City's water system or a water system which is to be dedicated to the City. These notes are provided in the Administrative chapter of this manual.

2. Water line stationing shall be along the pipe, monument, or roadway centerline and shall be provided for all water appurtenances (valves, Air Relief Valve (ARV's), hydrants, bends and taps).
3. Concrete encasement shall be shown in both plan and profile. The beginning and ending stations of the encasement shall be called out.
4. If a line is to be connected to an existing system, the following note shall be placed on the plans: "Contractor shall verify the location of the existing water line prior to proceeding with trenching".
5. The end invert elevation shall be shown on all proposed water main stubs and where there is a change on elevation or direction (profile required for all line sizes).
6. Where water lines cross sewer lines, storm drains, reclaimed water lines, or drainage culverts, the relationship shall be shown in both plan and profile and actual separations shall be called out.
7. For permitting purposes, quantities for all items of work within public rights-of-way and public easements shall be included on the cover sheet of the plans, unless otherwise approved by the City Engineer.

8. The drawings shall show all utility locations, sizes, material types, easements, rights-of-way, and other structural features of the water system for current and future building construction.
9. Private water lines shall be noted as such on plans. The responsibility for operation and maintenance should also be called out.
10. Easements of record shall be noted and shown in plan view, including docket and page numbers and/or the Maricopa County Recorder's number.
11. There are additional requirements for the preparation of improvement plans in the City. These additional requirements are presented in Chapter 2 of this manual.

D. As-Built Drawings

A City-approved set of As-Built Drawings are required for all water system improvements constructed in the City prior to acceptance of the system and start of the 2-year warranty period. Substantial completion shall not be used as a trigger for the 2-year warranty period. As-built plans shall be signed and sealed by a qualified Professional Registrant in the State of Arizona. See Chapter 10 of this manual for applicable As-Built standards.

TABLE 5.1-1 – Average Day Water Demands

Land Use	Demand (gpdu)	Demand (gpad)	Demand (gpd/sf)
Agricultural Residential 1 DU per acre	500	-	-
Residential < 2 DU per acre	444	-	-
Residential 2 to 4 DU per acre	390	-	-
Residential 4 to 6 DU per acre	320	-	-
Residential 6 to 10 DU per acre	285	-	-
Residential 10 to 20 DU per acre	256	-	-
Residential >20 DU per acre	222	-	-
Community Commercial	-	2,033	0.14
Regional Commercial	-	2,323	0.16
Luke Compatible Land Use	-	2,323	0.16
City Center	-	12,342	0.17
Ball Park Village	-	8,228	0.17
Light Industrial	-	1,742	0.12
General Industrial	-	2,323	0.16
Public / Quasi-Public	-	2,178	0.15
Prison	-	3,630	0.25
Airport	-	363	0.15

* These numbers may need to be increased to account for irrigation if a reclaimed water system is not constructed or if reclaimed water is not available for use.

5.1.3 PRODUCTION SYSTEMS

A. Construction of Water Production & Treatment Facilities

Facilities constructed for water production and treatment that are to be dedicated to the City shall be designed and built as approved by the City Engineering Department and Environmental Services division.

B. General Requirements for All Water Production Facilities

All water facilities must include the following:

1. All electrical equipment must be shaded from direct light, contained in an air conditioned room, depending on the conditions of the specific location in accordance with the requirements of Public Works and the Engineering Department. If the equipment is cooled by air conditioning, the cabinet or room shall be sized and designed for maximum energy efficiency using appropriate material to maintain adequate climate inside.
2. Security at the facility shall be provided by constructing a minimum eight-foot block fence with two feet of wrought iron picket extension located at the top of the wall.
3. The facility shall have an automatic rolling entry gate and an access door with automated key pad for access into the facility. Auto key pad shall connect with the Supervisory Control and Data Acquisition (SCADA) and integrate into City access card protocols. A knock box is required for Fire Department access per City Standard Details.
4. Above ground valves eight inches in diameter and greater shall have a motorized operator device to open and close, and shall interface with SCADA.
5. All indicator lights shall be LED and push to test.
6. All equipment shall be designed for ease and safety of maintenance and repair.
7. Security cameras and an intrusion alarm system shall be provided to monitor all access areas in and around the treatment facilities, reservoir, well site, or booster pump station. These areas include, but are not limited to, the following: reservoir tank area, reservoir top hatch tank entry, wellhead area, well master control cabinets, and booster pumps. They also must interface with SCADA.
8. All valves shall be epoxy-coated valves.
9. Gate valves shall be resilient wedge valves.
10. Facility lighting shall be provided to illuminate the site in accordance with City light codes.

11. All water facilities access and interior roads shall be paved per City of Goodyear paving and grading guidelines.

C. Well Facilities

1. The City shall be notified of any proposed well drilling, and shall review plans of all proposed groundwater wells.
2. Under the Arizona Groundwater Management Code, the ADWR regulates all groundwater wells in Arizona. Before drilling and installing a well, a "Notice of Intent to Drill" and "Application for a Drilling Permit" must be obtained from and filed with ADWR. The well must subsequently be registered as a recovery well with ADWR. Forms and additional information are available from the ADWR Operation's Division; contact them at 602-417-2400, or www.azwater.gov/dwr
3. All wells, at a minimum, shall comply with the ADEQ Engineering Bulletin No. 10, Guidelines for the Construction of Water Systems.
4. All well sites shall provide facilities and infrastructure for the application of chlorine disinfection. The chlorine building shall maintain a minimum 8-foot separation from any wall, or adjacent piece of equipment.
5. Production well facilities without treatment shall be constructed on a minimum 100-foot by 100-foot area, or as approved by the City Engineering department and Environmental Services division. The dedicated land shall be accessible from a public street right-of-way, or through a dedicated access easement of 23-foot minimum width.
6. Developers and property owners that abandon a water well(s) during development of a property within the City shall inform the Water Resources division and Engineering department prior to abandonment, and shall transfer all water rights into the City's name, where applicable.
7. Water wells shall be abandoned per the ADWR guidelines. These may be obtained through the following website: www.azwater.gov/dwr.
8. The well casing shall be of the Moscoe Moss Casing Type.
9. The well screening shall be of the louvered design, manufactured with stainless steel material.
10. Pumping equipment shall be designed as follows:
    a. Vertical turbine water-lubricated pump.
    b. Submersible pump.
11. Well construction shall include two (2) sounding tubes:

a. One, 1-inch tubing schedule 40 PVC attached to column pipe dedicated for manual means to collect water level data.

b. One, 2-inch constructed of schedule 80 PVC for a level transducer to monitor continuous static, drawdown, and pumping levels of the production well to interface with SCADA. Measurements shall indicate the distance from the top of well head to the water level.

12. Flow monitoring devices will be of electromagnetic metering technology with a pulse output. The meter shall read flow in gallons per minute, and totalized gallons produced in thousand gallons, and shall be able to interface with SCADA.

13. Well sites shall be equipped with permanent emergency generator with an automatic transfer switch.

14. A variable frequency drive (VFD) motor control shall be provided at all production well facilities and shall interface with SCADA, unless otherwise approved by the Public Works Director.

15. VFD controls shall be housed in an enclosed climate-controlled building. This building shall be constructed with two entry doors.

16. Sound enclosures shall be provided when required for noise abatement.

17. Wells shall be provided with a flow to waste line. When a sand separator is required, an automatic flushing system with a bypass must be installed along with a discharge line and discharge location. Automatic flushing equipment shall be accompanied with features that allow 24-hour programming with 5-hour minimum increments. Equipment must interface with SCADA.

18. Eye wash stations shall be provided at all facilities that contain chemical applications.

19. Chlorination equipment shall use calcium hypochlorite and shall interface with SCADA.

20. Chlorine residual analyzer shall be installed at all sites requiring disinfection and/or monitoring. The monitoring equipment shall interface with SCADA.

21. 21. Chlorination equipment shall be housed in a permanent dedicated building with minimum dimensions of 10 feet by 10 feet. The interior clearance between the chlorine equipment and the walls of the chlorine buildings shall be a minimum of 3 feet on all four sides. Intrusion alarms must be provided and shall interface with SCADA.

22. Hour meters shall be provided in order to monitor equipment run times and performance. These meters shall interface with SCADA.

23. All well facility equipment shall conform to the City's current SCADA standards.

D. Reservoirs

1. Storage facilities shall provide emergency fire protection and maximize the use of water production facilities. Therefore, storage in each pressure zone shall exceed each of the following criteria:

   a. Three hours Fire Flow Reserve + 25% of Maximum Day Demand, or;

   b. One Average Day Demand.

2. The capacity of new storage facilities shall be rounded up to the nearest 0.25 million gallons when being designed.

3. All tanks and reservoirs shall be supplied with dual measurement devices. 1) A visual level device (target) for tanks and reservoirs, level must be visible 24 hours a day and shall read in feet and tenths of foot increments; and 2) Two electronic level devices, primary and secondary, to interface with SCADA.

4. Retention basins around reservoirs shall be large enough to accept 1-1/2 times the maximum storage capacity and meet with dewatering standards.

5. Reservoirs shall be installed on a minimum 3.5-acre parcel. Parcel sizes will be reviewed and approved by the Engineering department and Environmental Services division. The dedicated land shall be accessible from a public street right-of-way or through a dedicated access easement of 23-foot minimum width.

6. All reservoirs shall be constructed with a concrete base ring.

7. Reservoir shall have an interior and exterior access ladder. Design shall meet or exceed the Occupational Safety and Health Administration (OSHA) requirements.

8. The tops of all reservoirs shall have a safety railing installed three feet in height surrounding the entire radius of the tank.

9. Reservoir vent structures shall be double contained; disassembly of the vent cover must be possible from the interior of the reservoir only.

10. All reservoirs shall have a top fill inlet and bottom outlet piping structure located at opposite sides of the reservoir.

11. Reservoirs shall be constructed of either steel welded or pre-stressed concrete and shall follow AWWA standards.

12. The height of the tank shall not exceed 12 feet from the street final grade in residential and commercial areas, unless otherwise approved by the City Engineer.
13. All steel welded constructed reservoirs shall include a cathodic protection system in order to protect the interior floor and tank walls coating. The cathodic system shall be installed from the roof structure.
14. Reservoir interior tank coating shall be a two-part epoxy process. Prime and finished coat shall have a minimum of 16 mils and must comply with the Society for Protective Coatings SSPC-SP10. All work must be inspected by a NACE certified inspector.
15. Reservoir exterior finish shall be per the Water Production Approved Materials List and shall consist of a two coats application, and shall meet the SSPC-SP2, SP3 cleaning methods. All work must be inspected by an NACE certified inspector.
16. A 48" diameter manhole entry way shall be provided at one side of the reservoir, an entry door on the opposite side 4' tall by 5'8" wide, per proposed detail for hinged tank man way, and a 24" diameter top hatch off set from exterior ladder.
17. A reservoir tank draining system shall be provided for the purpose of draining and cleaning of the interior. This draining system shall consist of a side drain with exterior catch basin. The tank floor shall be sloped in a direction that allows the water within the tank to flow downward and outward to a collection basin that contains additional piping to remove the flow away from the reservoir to the retention area.
18. All reservoir equipment shall conform to the City's current SCADA standards. Each entry shall be designed with a swing hinge mechanism.
19. The overflow structure shall have a removable panel for access during interior coating repairs.
20. The tank outlet suction structure shall be flush and perpendicular to the floor with anti-vortex structure.
21. All reservoir facilities shall have a compacted decomposed granite access road 12' wide around the tank structure to allow for service and emergency vehicles.

E. Booster Pump Stations

1. A "Preliminary" or "Basis of Design" report shall be prepared and submitted to the City Engineering department for approval prior to submission of the station final design. This report shall outline the type of equipment and controls proposed for the station. A final design report prepared by a Registered Professional Engineer

licensed in Arizona shall accompany the pump station design drawings.

2. Booster pumps shall be designed to maintain adequate pressure for domestic and fire protection water supply as identified in the City Water Master Plan.
3. Designers shall refer to ADEQ's Engineering Bulletin No. 10 for additional design criteria.
4. NOTE: It is recommended that designers coordinate their pump station design with the City Engineering department and Environmental Services divisions prior to final plan preparation.
5. All stations shall provide chlorine facilities.
6. All pump station control panels shall be designed and constructed to incorporate SCADA.
7. All booster pump station equipment shall conform to the City's current SCADA standards.
8. An analog hour meter shall be provided for each pump inside the control panel and shall interface with SCADA.
9. Pumping stations shall be equipped with electromagnetic (Magmeter) water meters which register flow in gallons per minute, totalized in thousand US gallons.
10. VFD motor controls may be provided for pump motor operation as determined by City Engineering department.
11. VFD controls shall be housed in an enclosed climate-controlled building. This building shall also house master control equipment for pump and motors, along with any other necessary control equipment.
12. Pump discharge heads shall be provided with adequate space to allow for ease of maintenance and mechanical seal removal. Pump discharge heads shall be provided with approved removable safety guards.
13. Pump discharge equipment shall be epoxy-coated to inhibit rusting of the metal. Coatings shall comply with the approve materials list. Interior coatings shall comply with NSF-61 standards. This coating shall encompass the entire interior of the pump stuffing box area.
14. Pump motors shall be hollow shaft. Pump discharge head shall have a one-piece shaft (no coupler between pump and motor) and shaft meet minimum alignment requirements of 2-5 thousands of an inch. Pump design will also include a non-reversal ratcheting assembly to eliminate possible equipment failure. Pump motor design shall include a pressed steady bushing /bearing.
15. Motor assemblies shall be rated no lower than 85% efficiency.

16. Mechanical seals shall be included in all pump equipment designs and shall be a one-piece design.
17. Chlorine disinfection shall be liquid chlorination technology and shall interface with SCADA.
18. A chlorine residual analyzer shall be provided at all sites requiring disinfection. The monitoring equipment shall interface with SCADA.
19. Chlorination equipment shall be housed in a permanent dedicated building with minimum dimensions of 10 feet by 10 feet and with a minimum of three feet of clearance on all four sides. Intrusion alarms must be provided and shall interface with SCADA.
20. Eye wash stations shall be provided at all facilities that contain chlorine disinfection on site.
21. A hydro-tank assembly shall be installed at all booster stations in order to provide an expansion point for possible system water hammer. All hydro-tank ports / taps shall be 2-inch or larger. Entry access (manway) shall be located below the midpoint of the end of the vessel and a minimum opening dimension of a 36" diameter flange with hinges.
22. Approved electronic measuring devices shall be installed on all hydro-tank assemblies, along with a measuring sight glass in order to check hydro-tank water/air level. All connecting pipes shall be a minimum of 3/4-inches in diameter.
23. Air compressors shall be provided for hydro-tank control. The air compressor unit shall be protected and enclosed inside a clamshell design lockable cage assembly. The unit shall include automatic purge valve with manual test and by-pass. Air compressors shall be furnished with an H-O-A switch and an hour meter that will interface with SCADA.
24. System pressure monitoring shall be accessed via a pressure transducer and shall interface with SCADA.
25. Standby power emergency diesel generator(s) shall be installed at all facilities. Generator size shall be approved by the City Engineering department and Environmental Services division.

F. Treatment Facilities

1. Reverse osmosis treatment shall be designed around 8-inch spiral wound membrane technology.
2. Arsenic treatment systems shall be design with a Lead-Lag paired configuration. The under drain system shall be designed with stainless steel lateral and gravel system.
3. All brine waste line piping shall be constructed of C900 material.

4. All reverse osmosis shall be housed in a permanent building that will include all basic safety equipment and sanitary needs.
5. The reverse osmosis facility shall include a pretreatment filtration system, and pre- and post-chemical treatment as necessary based on water chemistry.
6. A Clean in Place (CIP) system shall be provided with a reverse osmosis facility.
7. Additional information on reverse osmosis design standards can be obtained from the City Environmental Services division.
8. Treatment facility feed water piping shall be constructed of DIP.
9. Treatment facility piping shall either be buried or be located below elevated flooring as much as possible.
10. Treatment facility controls and equipment shall interface with the City of Goodyear's SCADA system and be housed in an enclosed, climate controlled environment.

G. Pressure Reducing/Pressure Sustaining Valve

1. All pressure reducing/pressure sustaining/pressure relief valves (PRV) shall be telemetry compatible with SCADA.
2. Pressure reducing/pressure sustaining and PRV shall be designed and constructed above ground. The equipment shall be installed inside an enclosure, similar in design to a lift station enclosure, to provide security for the equipment.

5.1.4 WATER LINES

A. General Information

The City potable water delivery system, which is based on a grid system, has three basic classifications of water lines which are determined by use. These classifications are transmission, distribution, and service.

1. ADHS Bulletin 10 shall apply to the design of all City water lines.
2. All developments shall design and construct water transmission, distribution, services, and associated equipment of appropriate size, material identified through the City's Master Plan and the project design reports.
3. The City Construction Inspector shall be contacted 48 hours prior to all water system shutdowns. The Contractor shall have all materials and equipment necessary to do the work at the job site prior to shut down. It shall be the Contractor's responsibility to provide all affected water customers with a written notice of the proposed shutdown. Such notice shall be given a minimum of 24 hours in advance.

4. Water mains shall be identified by:

    a. Locating traceable tape labeled WATER and placed a minimum of 24” above the water main.

B. Transmission Lines

Transmission lines are used to convey potable or raw water to storage tanks or other points of distribution. In general, they have line sizes of 16 inches and larger and are located in arterial or collector streets.

1. Major arterial street alignments shall have 16-inch minimum diameter lines.
2. When existing or future development requirements are such that a transmission water line is required, then a transmission water line of a size approved by the City Engineering department and designed and sealed by a Professional Engineer shall be constructed by the Developer.
3. Design flows for transmission mains shall be based on the current City General Plan and City Water Master Plan. The flow to a new development shall be calculated to confirm that existing supply is sufficient to meet the proposed development’s need. When additional improvements are required to increase the flow to a development, all necessary improvements, including but not limited to, pumping stations, reservoirs, lines, and appurtenances shall be a part of the design.
4. Peak flow calculations on transmission mains shall be based on fire flow figures in accordance with the City Fire Code.

C. Distribution Lines

Distribution lines are typically sizes 8 inches to 12 inches in diameter, and are located in arterial, collector, or local streets. Distribution mains are supplied by transmission lines and may have service connections.

1. See the City’s Approved Materials List for approved materials.
2. Minor arterial street alignments shall have 12-inch minimum diameter lines.
3. Eight-inch diameter pipe shall be the minimum diameter of a distribution main installed in any street or public easement.
4. These are minimum guidelines; the City may require larger sizes, different materials, and varying locations depending on circumstances.

D. Service Connections

A service connection includes the water line from the distribution main to the meter, and includes the meter and all connections.

1. Water Services to Residential Developments

   a. The Developer shall only install 1-inch and/or 2-inch water services in new residential subdivisions.

   b. The Developer is responsible for application and payment of all applicable fees.

   c. Water services maintained by the City shall be installed within a public right-of-way, PUE, or 20-foot minimum width dedicated water line easement.

   d. All water service lines constructed under existing pavement shall be installed by underground boring.

   e. Within the right-of-way, cover for water service lines shall be a minimum of 36” measured from existing or proposed finished grade of pavement or natural ground, whichever measurement is greater and results in adequate pipe protection during construction.

   f. Water service lines maintained by the City shall not be located in parking spaces, driveways, washes, manmade or natural drainage channels, or retention/detention basins.

   g. Construction plans shall indicate the locations of water and sewer service taps to each unit referenced, with stations and dimensions from the street center line or monument line. Location of the sewer service relative to the water service shall also be shown.

   h. Service connections shall not be made to mains 16 inches or larger in diameter or to water lines designed solely to transmit water from one pressure zone to another pressure zone.

   i. All galvanized iron and PVC water service lines and fittings in sizes 3/4-inch through 2 inches, which are exposed during construction, shall be replaced in their entirety with Type “K” copper tubing and bronze fittings. This will include the replacement of iron service saddles with low lead brass saddles, and the replacement of both the corporation stop and the meter stop with low lead brass fittings in all cases when a direct tap is present.

   j. Only soft Type “K” seamless annealed copper is to be used on water services; sweated joints will not be allowed.

   k. All service lines for potable water use shall be a separate dedicated line that is tapped off the water main within a public right-of-way, PUE, or water line easement. Branched water service line tees are not allowed.

l. Newly installed water services up to 2" diameter shall not have any compression coupling installed between the water main and the water meter.

m. Services damaged after installation are required to be replaced back to the corporation stop.

2. Water Services to Commercial Development

a. Service lines for commercial developments shall be sized to meet the calculated demand of the building.

b. In case that a 2-inch service line does not meet adequate flow, the line shall be increased to a 4-inch minimum.

c. Pipe material for services 4-inch and above shall be DIP, see MAG detail #340.

3. Water Meters

a. General Information

Water meters to be used shall conform to City Standard Specifications and approved materials list for water meters as found on the City Engineering webpage. Information regarding water meters may be obtained from the City Environmental Services division. Types of approved water meters include:

(1). Positive Displacement - Single and multi-family residential.

(2). Compound - Generally residential, this unit is designed for use where most of the flow is low, some intermittent, and no more than occasionally high.

(3). Turbo – Generally irrigation, this shall be used where a wide variety of flows can be expected, but most are at the high end.

b. Each building requiring a separate water bill (including single-family residences) shall have a separate water meter installed.

c. There shall only be one water meter per service line.

d. Manifolding, combining, or connecting several smaller meters to meet a flow demand that could be provided by a single larger meter is not permitted.

e. Water meters shall be sized and designed in accordance with the requirements of the UPC as adopted by the City. Any field changes shall require a letter from the developer with an approval from a registered engineer and the City Engineering Department.

f. Water Meter Installation

All water meters shall be provided by the City, after payment of all prevailing fees.

(1). All 3/4-inch to 2-inch water meters shall be installed by City Public Works personnel.

(2). Water meters 4 inches to 6 inches shall be installed by the Developer in accordance with City Standard Details and MAG Standard Specification, Section 631. After installation, City personnel will inspect and accept the work if all requirements for installation are met. Refer to meter size under approved list.

g. Water Meter Locating

(1). Water meters shall be located outside of street improvements but within the right-of-way or adjacent PUE.

(2). Water meters shall not be located in parking lots, driveways, sidewalks, washes, manmade or natural drainage channels, or retention/detention basins.

(3). Water meters shall not be fenced in or enclosed, and must be accessible by City personnel at all times.

(4). If an existing water service/meter must be relocated, a contractor or property owner may relocate the service a maximum distance of 10 feet, provided the joint is not below concrete, asphaltic pavement or other permanent surfaces without prior approval from the Engineering department. If the desired relocation is greater than 10 feet, the old service must be severed and shut off at the corporation stop on the main; a new service shall be installed by a licensed contractor. Both services shall be noted on the “as-built” drawings. Refer to Detail G-3310.

4. Water Meter Boxes and Vaults

a. Water Meter Boxes

(1). Water meter boxes shall be installed within the right-of-way or PUE at a distance of no less than 1-foot back of curb for detached sidewalks, and no less than 1-foot back of sidewalk for attached sidewalks. The elevation shall be 0.2 feet above the curb finished grade. See City Standard Details.

b. Water Meter Vaults 4 inches and Larger

(1). Water meter vaults for sizes 4 inches and larger shall be installed in a vault as shown in the City Standard Detail G-3313.

(2). Vaults for water meters larger than 6 inches shall be reviewed and approved by the City Engineering department on a case-by-case basis.

5. Taps

a. Both installation of tapping sleeves and the tapping of an energized water main shall be performed by the Developer, after approval is received by the City Engineering department and City Environmental Services Divisions, and in accordance with MAG Detail 340.

b. A 3-foot minimum separation is required between service taps, and between a service tap and a pipe connection on a main water line.

c. A double strap low lead brass saddle shall be installed on newly installed water service taps.

d. Service taps are prohibited downstream of backflow devices on any line primarily designed to service fire sprinkler systems and/or fire hydrants.

e. Taps

(1). The Contractor shall make all taps from the City's operational water system.

(2). The Developer is responsible for preparing application and payment of all applicable fees prior to taps being made.

(3). Size on size tapping sleeves are not permitted.

E. Water Quality

1. Water lines shall be disinfected in strict conformance with the City's "Flushing and Disinfecting Meter Program" and "Water Line Flushing Procedures" unless otherwise approved by Public Works and the Engineering Department.

2. Notify the City Construction Inspector when samples are ready to be taken to verify disinfection of water lines. The City Construction Inspector must be present, and samples shall be collected in strict conformance with MAG Standard Specification, Section 611.15. The Contracting Agency is the City of Goodyear, and it is the responsibility of the Developer to hire a certified lab to process the samples.

3. Sampling Stations

a. The City requires water quality sampling stations to be located in all new developments. The sampling stations are to be located within the right-of-way and in a full flow path area (see City

Standard Details). Sampling stations shall be constructed per City Standard Details.

b. A sampling station shall be provided in residential developments at a minimum rate of 1 station for every 100 dwelling units. All residential developments shall have a minimum of one sampling station.

c. A sampling station shall be installed prior to the issuance of building permits for each new group of 100 dwelling units.

F. Pipe Materials

1. Standard material for water lines located within a City right-of-way or PUE shall be per the City Approved Materials List and installed per this manual, City Standard Details and MAG Standard Specifications and Details.

2. All DIP lines shall be encased in polyethylene wrap per MAG Standard Specifications. Polyethylene wrap shall be installed per manufacturer specifications.

3. Water lines located within private property and not within a City right-of-way, PUE, or water line easement may be constructed of C900 PVC Class 200 pipe.

4. Soil corrosivity tests shall be conducted and reported in accordance with the American Ductile Iron Pipe Research Association. Reports shall be filed with the City Engineering Department.

G. Locating Water Lines

1. Where conditions prevent adequate horizontal and vertical separation between a water line and a sewer and/or reclaimed water line, each line shall be constructed of DIP (minimum Class 250 for mains smaller than 24 inches and 200 for mains 24 inches and larger) with mechanical or flanged joints per MAG.

2. Separation of water and electrical or gas lines shall conform to City Standard Details.

3. Locating Water Lines within City rights-of-way

a. Rights-of-way and/or utility easements shall be dedicated to the City prior to the issuance of construction permits.
b. Water line location in rights-of-way shall be in accordance with City Standard Details.

4. Cut stakes shall be set for all trenching of waterlines 12 inches or greater in diameter.

5. Locating Water Lines within Easements

a. A water line shall not be installed unless the property owner has granted all necessary easements and rights-of-way to the City.

b. All water lines which cross golf courses, open areas, or any area outside a dedicated right-of-way shall be located within a minimum 20-foot wide water line easement that is dedicated to the City.

c. Easements wider than 20 feet will be required if multiple utilities are co-located, or if additional area is required for maintenance equipment access due to the size and/or depth of the lines.

d. No structures of any kind shall be constructed or placed within or over a utility easement except: utilities, wire (or removable section-type) fencing, wood, decomposed granite, grass, or asphalt paving.

e. Easements shall at all times be clear and accessible to City service equipment such as trucks, backhoes, etc. Easements shall be accessible from City rights-of-way or other easements.

f. Easements shall be dedicated prior to the commencement of construction activities.

6. Locating Water Lines in Areas Not Accessible by Normal Excavation Methods

a. All pipe in these areas must be restrained DIP through the inaccessible area, extending one full joint-length before and after the section.

b. All pipes must be sleeved using steel or concrete pipe.

H. Cover and Bedding Requirements

1. Water mains in arterial and major collector streets shall have a minimum cover of 48 inches over the top of pipe to top of finished grade. Water mains in other locations shall have a minimum cover over the top of pipe as follows:

a. 48 inches for water lines 12 inches and larger.

b. 48 inches for water mains in industrial areas.

c. 36 inches for water lines smaller than 12 inches, and all lines in minor collector streets, residential streets, and in utility easements.

2. Cover for water mains shall be measured from existing or proposed finished grade of pavement or natural ground, whichever measurement is greater and results in adequate pipe protection during construction.

3. The proposed depth shall be clearly noted in each plan sheet. Any changes in depth required to avoid conflicting utilities, etc., shall be noted.

4. When PVC or ACP water lines 12 inches and smaller are exposed during construction and the bedding is disturbed, the water line shall be removed to the nearest joints and replaced with DIP (minimum Class 250) with restrained, mechanical, or flanged joints.

I. Pressure Requirements

Pressure extremes in water systems result in potential for contamination to enter the network. Low pressures in the water system may allow polluted fluids to be forced into the system. High pressures may cause ruptures or breaks in some elements of the network.

1. Engineers designing domestic water systems shall use 20 psi under fire flow conditions per ADEQ as the minimum basis of design for pressure at the highest ground level to be served (highest finished floor elevation). Operating water system pressure shall be a minimum of 40 psi and shall not exceed 100 psi. Any pressures greater than 80 psi will require compliance with the UPC. Ultimate pressure requirements shall be approved by the City Engineering department.
2. All water mains and service lines shall be designed for a minimum normal internal working pressure of 150 psi plus appropriate allowances for water hammer.
3. Water hammer may produce momentary pressures greatly in excess of normal static pressures, thus increasing the probability of water main failure.
    a. Suitable provisions shall be made to protect the system from water hammer.
    b. The occurrence and severity of water hammer can be reduced through the use of slow-closing valves, pressure-release valves, surge tanks, VFDs, soft-start motor controllers, and air chambers.
4. In cases where greater than the above noted maximum pressures are required for effective operation, all elements of the system shall be designed accordingly. Pressure information for existing water lines may be obtained by having a flow test performed on the existing system.
    a. A Right-of-Way Permit issued by the City Engineering Department is necessary to perform the flow test.
    b. These tests may be performed by a private fire protection company who must certify the results of the tests and submit them to the City Engineering department and City Environmental Services divisions.
    c. Flow testing shall be arranged through the City. A minimum of 48 hours' notice shall be given prior to testing.

J. Miscellaneous Requirements and Specifications

1. All new water mains shall be designed in a looped configuration, with exceptions being dead-end lines with lengths less than or equal to the maximum allowable length (as determined by fire hydrant limitations).
2. Trenching, backfilling, and compacting shall be in accordance with MAG Standard Specifications unless otherwise specified in this manual.
3. Water Line Termination
    a. Water lines that terminate at the end of a cul-de-sac shall have a fire hydrant at the non-connected end.
    b. Water lines that terminate at a temporary basin and will extend in the future shall have a device for flushing or depressurization in accordance with MAG Standard Detail 390'A' at the non-connected end.
4. No water line shall be deflected or swept (either vertically or horizontally) in excess of the maximum recommended deflection specified by the manufacturer of the pipe or coupling. The appropriate use of bends or offsets shall be used where the maximum deflection is exceeded. Fittings may be required where more than two pipe lengths are deflected.
5. The minimum clearance under major washes, culverts, storm drain lines, manmade and natural drainage ways, canals, railroads, highways, bridges, airports, etc. shall be 2 feet.
6. All changes in direction in water lines 6 inches or larger in diameter shall be marked with a programmable electronic ball marker. Valve locations permit adequate identification of pipeline location (typically at crosses and tees). Electronic markers ball manufacturers and models shall comply with the City Approved Materials List.
7. Water lines to be abandoned shall be approved by the City Engineering department.
8. Water lines shall be restrained per MAG standards.

5.1.5 VALVES AND ZONE SPLITS

A. General Valve Requirements

1. Valve Specifications
    a. All gate valves shall be resilient seated, solid wedge gate, and shall open left.

b. Gate valves shall be required on water mains 16 inches and smaller.

c. Butterfly valves shall be required on water mains larger than 16 inches.

d. At selected locations between the City's water zones, special water zone valves shall be installed if not previously existing.

e. Per City Standard Details, valved bypass lines shall be required on valves 16 inches and larger in diameter.

f. Manholes shall be provided for all butterfly valves as identified in the City Standard Details.

g. Valve box installations and grade adjustments shall be performed per MAG Standard Detail, No. 391-1 Type "A" and 391-2.

h. Debris caps shall be included along with all valve box installations. Debris caps shall conform to City Standard Details.

i. When encountered during construction, existing valve boxes shall be replaced to meet MAG Standard Detail, No. 391-1 Type "A" and 391-2 with associated debris caps.

2. Spacing

a. Valve spacing for transmission mains with no branches shall be no less than 1/2-mile.

b. The maximum spacing of valves on distribution mains shall be 660 feet for all types of developments.

c. Valve Isolation

(1). The maximum number of valves required to isolate an area is four, with two or three being the preferred number.

(2). No more than two fire hydrants shall be out of service at any given time due to any given valve closure.

(3). No more than 30 homes shall be without water due to a single valve closure.

d. Valves shall be spaced and located such that they are beneficial to the operation and maintenance of the system. The City Engineering department shall approve all valve locations.

e. Where valves are to be located off of a tee or cross, the valves shall be flanged to the tee or cross.

f. Valves shall be provided to allow for the isolation of lines crossing major washes (10 feet bottom width or wider), culverts, storm drain lines, manmade and natural drainage ways, canals, railroads,

highways, bridges, airports, etc. as directed by the City Engineering department.

g. All mains branching from feeder mains or loops shall be valved adjacent to the feeders so that the branch mains can be taken out of service without interrupting the supply to other locations.

h. Any water line that will be extended in the future shall have a valve, a 13-foot minimum stub, and a flushing device at the non-connected end, in accordance with MAG Standard Detail 390 Type 'A'. The stub shall be extended beyond the area of existing or proposed pavement so that the water line can be accessed and extended in the future without having to cut the pavement.

3. Operation

a. Only City personnel are authorized to open and close all existing water valves at all times and in all circumstances: flushing, pressure testing, chlorinating, etc.

b. Valves that control the Water System Zone Split shall be designated by permanently imprinting the letters "ZS" on the lid.

c. Valves intended to remain closed shall be designated by painting those valve covers white.

4. Backfilling and Compaction

a. The area immediately surrounding any City valve shall be compacted. A test(s) verifying the compaction of the soil around the valve shall be provided to the City for each 3-foot depth of trench backfill, and prior to placement of any portion of pavement section materials (ABC or AC).

b. Compaction testing around valves shall be performed as follows:

(1). A minimum one test per valve per water valve cluster shall be performed unless additional tests are required by the City Inspector. The test(s) shall be performed within 2 horizontal feet of the valve and directly over the water main. Care shall be taken to prevent damage to the pipe and valve during compaction and testing.

(2). Additional compaction tests may be required as determined on a case-by-case basis. The need for additional tests will be identified by City Engineering Department representatives.

B. Air Release Valves

Air release valves shall be required on all water mains as follows:

1. When water line changes from a positive slope to a zero slope in primary direction of flow.
2. When water line changes from a positive slope to a negative slope in primary direction of flow.
3. When water line changes from a zero slope to a negative slope in primary direction of flow.
4. When vertical alignment changes to undercross or overcross another facility (i.e. utility, drainage wash, etc.), air release valves shall be installed on both sides of the crossing where conditions identified in standards 1 through 3 above exist. In cases where a positive slope is maintained across the vertical alignment, an air release valve is required on the upstream side only. Isolation valves on transmission lines shall be constructed on both sides of a vertical alignment.
5. NOTE: Slopes less than or equal to 0.002 feet/feet shall be treated as zero slopes.
6. All air release valves shall be a combination air/vacuum release type per the City Approved Materials List.

C. Pressure Reducing Valves

1. Transmission and Distribution Lines

   a. PRVs on transmission and distribution lines shall be rated to maintain pressures between 40 psi and 100 psi within the distribution system.
   b. PRVs shall be designed in accordance with the criteria shown in City Standard Details and as outlined in the City Water Master Plan.
   c. A vault shall be provided for each PRV as shown in the City Standard Details.
   d. PRVs shall be located in the right-of-way or water easement accessible from the right-of-way.

2. Residential Services

   The City operates its system from wells and pump stations that commonly have pressures exceeding 80 psi. Changes in demand, supply, and the distribution system also vary the pressure at single family residences.

   a. The UPC requires a PRV to be placed at each structure when local water pressure exceeds 80 psi.
   b. The City requires single family residences to have a PRV installed on service lines where pressures at the taps are greater than 80 psi.

D. Zone Splits

The City's water distribution system may be divided into various water zones as defined by the City Master Water Plan. If approved, each zone shall operate as an independent water distribution system. Cross-connections between zones are prohibited.

1. Valves

See the Valve section of this chapter.

2. Special Requirements for Developments Bordering Zone Splits

If a proposed development is located adjacent to a zone split boundary, the Developer shall extend, as necessary, redundant water mains within the development's side of the zone split boundary to close the zone loop.

3. Plans

Plans for water distribution mains adjacent to a zone split boundary shall clearly indicate the different zones involved and the location of the zone split boundary.

5.1.6 FIRE LINES AND ASSOCIATED EQUIPMENT

A. Fire Lines

1. Location of on-site fire lines and taps should be determined by the site relationships of the FDC, riser location, emergency access, and fire hydrant locations. Fire lines sizes shall be determined by City design criteria and flow test data provided by the Design Engineer for the design of the project. All fire systems that connect to a potable water distribution system shall include a double detector check valve backflow assembly, utilizing a meter provided by the Service Provider at each connection.
2. Fire line designs shall be based on a flow test per the Fire Flow Requirements section of this manual. The drawings shall be of uniform size (24-inch by 36-inch) and shall be drawn to scale. One set of the approved civil water plans shall accompany this submittal. Applicable City and National Fire Protection Association (NFPA) 24 construction notes shall also be included on the construction drawings.
3. All fire lines shall be dedicated for fire use only. No other water lines or water service lines shall be connected to a dedicated fire line. Installation shall be completed per the City-approved construction plans.

4. Private fire line mains shall be installed and inspected per the NFPA 24 Standard, and shall include one isolation valve for each individual fire line, located at the PUE.
5. The Owner shall be responsible for maintenance of the sprinkler line/fire line main and appurtenances beyond the isolation valve.
6. Fire sprinkler line locations shall be such that maintenance activity will not disrupt normal access to the development.

B. Fire Hydrants

1. General Requirements

a. Fire hydrants and associated bypass assemblies shall be installed as identified in the standard details and this chapter.

b. The Developer shall provide the fire hydrant, materials, and all labor required for installation.

c. All new fire hydrant installations will be installed per manufacturer's specifications. Extensions shall not be used to reach finished grade.

d. Where the finished grade around existing fire hydrants is changed, an extension kit, installed per manufacturer's specifications, may be used. Refer to the City Approved Materials List for approved products.

e. One valve shall be placed between each fire hydrant and the water main.

f. Valves for fire hydrant connections shall be flanged to the tee.

g. All fire hydrants that are privately owned shall be painted red.

h. All public fire hydrants shall be painted yellow. See the City Approved Materials List for approved paints.

2. Spacing

a. The spacing of fire hydrants is to be measured along the street or roadway in which a fire hose would be laid. Generally, this spacing is measured along the curb line.

b. Fire hydrants shall be located outside of street improvements but within the right-of-way or PUE. General spacing between fire hydrants shall be:

(1). 400 feet maximum in a single-family residential development or a commercial development.

(2). 300 feet maximum in a multi-family residential development.

(3). 300 feet maximum in a high rise, storage, or industrial complex.

(4). 1,320 feet maximum for transmission mains.

(5). Fire hydrants shall not be installed on any portion of a dead-end line which is more than 400 feet from a looped water line.

(6). A fire hydrant shall be located within 150 feet of the FDC.

(7). Fire hydrant spacing shall be maintained along required Fire Department access roads.

3. Locations

a. The location of a fire hydrant shall be such that the pipe leading to the hydrant will be under the least amount of pavement.

b. Private and public fire hydrants shall be accessible per the Fire Department requirements.

c. A 7-foot radius minimum clearance shall be maintained around the fire hydrant from landscape material with a maturity height exceeding 6 inches per City Standard Details.

d. Fire hydrant protection is required where no curb is present, per the City standard detail.

e. In no case shall a fire hydrant be located in a wash, natural or manmade drainage way, detention or retention basin, sidewalk, or driveway.

4. Backfilling and Compaction

a. The area immediately surrounding any City fire hydrant shall be compacted per MAG Standards. Test(s) verifying the compaction of the ABC around the hydrant shall be provided to the City for each 3-foot depth of trench backfill, and prior to placement of any portion of pavement section materials (ABC or AC).

b. Compaction testing around hydrants shall be performed as follows:

(1). A minimum one test per hydrant per 3-foot depth of trench backfill shall be performed. The test(s) shall be performed within 2 horizontal feet of the hydrant. Care shall be taken to prevent damage to the hydrant, valve, or water main during compaction and testing.

(2). Additional compaction tests may be required as determined on a case-by-case basis. The need for additional tests will be identified by City Engineering Department representatives.

C. Fire Department Connections

1. General Requirements

    a. FDCs from service lines (4 inches and larger), and all hydrant connections, shall be constructed of DIP (minimum Class 150 or equal) to the supply line class.

    b. All FDCs shall be located in a visible location and shall have an unobstructed access, as approved by the Fire Department.

    c. FDCs shall be located and arranged so that the hose can be readily attached without obstructions.

    d. FDCs shall be installed on the customer side of the water double detector check valve and shall be painted red.

    e. Signage for FDCs shall be used if the FDC is not easily visible and shall be in conformance with the most currently adopted City Fire Code.

    f. There shall be a minimum of 18 inches to the bottom and a maximum of 48 inches to the top of the FDC. See the City Standard Details.

    g. Fire risers and FDCs located at the building do not need to be co-located.

D. Fire Flow Requirements

1. Water distribution facilities shall be sized to deliver a minimum fire flow of:

    a. 3,500 gpm to commercial, industrial, and multi-family residential properties.

    b. 1,500 gpm to 1- and 2-family dwelling unit residential properties.

2. Fire flow for buildings with approved automatic sprinkler systems shall be determined based on the requirements of the City Fire Code.

3. Fire flow tests are valid for a period of six months, unless a known significant change has been made to the City's system or private water system within the 6-month period.

E. Fire Equipment & Storage Facilities

1. A double detector check valve backflow assembly is required on all fire line connections to a City water main. Information on backflow prevention may be found in the Cross-Connection Section of this chapter.

2. Auxiliary Storage Tanks

    a. Auxiliary storage tanks for commercial developments shall provide pressurized Fire Flow Demand as required by the City Fire

Department for a minimum 3 hour's time period, per the City's Integrated Master Water Plan (IWMP).

b. Where a building's construction type, occupancy fire load, commodities' classification, volumetric building area, building height and individual square footage areas per floor level require a pressurized Fire Flow Demand in excess of the transmission main's capabilities, a fire pump package shall be installed.

c. For residential storage requirements see the City Ordinance.

5.1.7 CROSS-CONNECTION CONTROL

It shall be the responsibility of the City to protect the public water system from health hazards and non-health hazards by the implementation of a cross-connection control program. The program shall consist of inspection by the City Environmental Services division and implementation of a backflow prevention and maintenance program, as outlined in the "Manual of Cross-Connection Control" published by the University of Southern California (USC).

A. Implementation

1. Air-gap separation shall be required for developments where entry is or will be restricted and cross-connection inspections cannot be made with sufficient frequency or can only be made on short notice. Air-gap separation shall be required in, but not limited to, areas where the following high-hazard conditions exist:

   a. Public water system is used to supplement reclaimed water.

   b. Wastewater is pumped and/or treated.

   c. Reclaimed water is used.

   d. Hazardous substances are handled or stored.

   e. Irrigation systems exist into which fertilizers, herbicides, or pesticides could be injected.

   f. Unapproved water supply exists which is interconnected with the public water system.

   g. As required by ADEQ, or the City Public Works and Engineering departments.

2. RPP (or at times DC Valve Assembly backflow prevention) devices shall be required in locations where air-gap is not required, or where entry is not restricted and cross-connection inspection can be made with sufficient frequency or on short notice. Specific uses of these backflow prevention devices are as follows:

a. An RPP backflow prevention device may be installed on all lines that connect to the City's potable water system, but shall be installed at all connections in which a double check detector backflow prevention device is not permitted.

b. Double check valve assembly backflow prevention devices may only be installed on dedicated fire lines that supply fire flow to a structure. DC assemblies shall not be installed in the following situations:

(1). When a chemical is used in the fire suppression system.

(2). When an on-site private storage tank for fire suppression is located on the premises.

(3). When an on-site booster pumping system is located on the fire line or private storage tank.

3. Detection Assemblies

a. RPP detection assemblies may be used on all fire suppression systems, but shall be used on all private waterlines that tap into the City's potable water system with the exception of fire lines that do not. RPP detection assemblies shall be required on all Class V and VI fire sprinkler systems. An RPP detection assembly shall also be required when any hazardous or nonhazardous solutions are added to the fire sprinkler systems or used as part of the fire protection system.

b. DC detection assemblies may be used on all nonresidential fire sprinkler systems where the City's potable water supply is used. A DC detection assembly may be considered for fire sprinkler systems in residential dwellings that are constructed with approved potable water piping and materials. A DC detection assembly may be used on Class I, II, III and IV fire protection systems.

B. Installation

The Owner, at their own expense, shall purchase, install, operate, and maintain any approved backflow prevention device required by the City. Approved cross-connection equipment manufacturers and models are identified in the City Approved Materials List. Installation of approved backflow prevention devices shall be as follows:

1. All backflow prevention devices shall be constructed with a security enclosure.

2. An air-gap separation shall be located as close as practical to the user's connection at the meter. The piping between the user's connection and the receiving tank shall be entirely visible. The air-gap separation shall be at least twice the diameter of the supply pipe,

measured vertically from the flood rim of the receiving vessel to the supply pipe. In no case shall this separation be less than 1inch. See the City Standard Details for approved air-gap separation methods for portable tanks.

3. RPP and DC Valve Assembly backflow prevention devices and detection assemblies shall be located outside of the PUE and shall be installed as close as practical to the user's water meter. See the City Standard Details for backflow prevention methods on portable tanks.

   a. RPP and DC Valve Assembly backflow prevention devices and assemblies shall be installed a minimum of 12 inches above grade and not more than 36 inches above grade, with 12 inches of clearance on both sides, and in a manner where it is accessible for testing.

      (1). For RPP and DC backflow prevention device installation information, see the City Standard Details.

C. Maintenance

Maintenance of backflow prevention devices shall be as follows:

1. Backflow prevention devices shall be tested immediately after installation, relocation, or repair. Devices shall not be placed in service unless they are functioning as required.
2. Devices shall be tested on an annual basis, or more frequently if determined to be necessary. When devices are found to be defective they shall be repaired or replaced.
3. Backflow prevention devices shall be tested by persons certified as a General Tester or Specialist by USC, Arizona State Environmental Technology Training (ASETT), American Backflow Prevention Association (ABPA), International Association of Plumbing and Mechanical Officials (IAPMO), Piping Industry Progress and Education (PIPE), or All American Backflow Prevention.
4. Accurate records of these tests shall be maintained by the City for a minimum of 5 years. Copies of these records shall be submitted to the City Environmental Services division.

Water Report Outline

Title Page: Project Name; Location; Type of Report (Preliminary, Master Plan, Final, etc.); Engineer's Seal, Signature, and Date; and Consulting Firm, Name, Address, Phone Number

Table of Contents: Engineer's Seal, Signature, and Date

1. Introduction

- Project Name
- Type of Report (Preliminary, Master Plan, Final, etc.)
- Project Description (Size, Area)
- General Land Use Proposed for Project
- Water Service Provider
- Number of Dwelling Units, Commercial Acres, etc.
- Project Location (Major Cross Streets, Section Township & Range)
- Topographic Conditions
- Project Phasing

2. Projected System Demands

- Summarize Water Demand Factors (include reference)
- Summarize Peaking Factors (include reference)
- Provide Demand Calculations Summary (Avg Day, Max Day, and Peak Hour)
    - Summarize Demands by Phase
    - Include Full Calculations in the Appendix
    - Include Irrigation Demands as Required
- Summarize Fire Flow Requirements: Flow & Duration (Include Reference)

3. Existing Distribution System

- Location and size of the existing and proposed water distribution and transmission mains adjacent to the site.
- Pressure Zone
- Storage and Booster Facilities that will serve the site (include existing tank capacity and booster pump capacity)
- Identify any need to provide additional storage or booster pump capacity
- Discuss existing system pressure range

4. System Improvements

- Summarize Design Criteria (include reference)
- Water Storage
- Booster Pump Capacity
- Water Source
- Discuss connection to existing system

5. Water Model

- Discuss setup of water model
- Discuss Assumptions
- Discuss Modeling Software
- Discuss Fire Flow Test if connection to existing system (include in Appendix)
- Average Day Demand Analysis (Include results in the Appendix)
- Maximum Day Demand Analysis (Include results in the Appendix)
- Peak Hour Demand Analysis (Include results in the Appendix)
- Fire Flow Demand Analysis (Include results in the Appendix)
- Discuss System Phasing

6. Conclusion

- Project Summary
- Project Phasing

7. References

- List references cited in the report

Appendices

- Demand Calculations
- Fire Flow Test
- Average Day Demand Analysis Results
    - Junction Results
    - Pipe Results
    - Reservoir Results
    - Pump Results

- Valve Results
- Maximum Day Demand Analysis Results
  - Junction Results
  - Pipe Results
  - Reservoir Results
  - Pump Results
  - Valve Results
- Peak Hour Demand Analysis Results
  - Junction Results
  - Pipe Results
  - Reservoir Results
  - Pump Results
  - Valve Results
- Fire Flow Analysis Results

Exhibits

- Vicinity Map
- Water System Exhibit (Include all on-site and off-site facilities)
  - Existing Pipes
  - Proposed Pipes
  - Pressure Zone Boundaries
  - Contour Lines
  - Street Names
  - Parcel Boundaries
  - Pump Stations, transmission and distribution mains, wells, and reservoirs
- Node Id Exhibit
- Pipe Id Exhibit
- Phasing Exhibit

Results Report Requirements: (The modeling results must include the following fields)

- Junction Report
  - Label
  - Elevation (ft)
  - Demand (gpm)
  - Hydraulic Grade (ft)
  - Pressure (psi)
- Pipe Report
  - Label
  - Length (ft)
  - Start Node
  - Stop Node
  - Diameter (in)
  - C-Factor
  - Flow (gpm)
  - Velocity (ft/s)
  - Headloss Gradient (ft/ft)
- Reservoir Report
  - Label
  - Elevation (ft)
  - Flow (gpm)
  - Hydraulic Grade (ft)
- Pump Report
  - Label
  - Elevation (ft)
  - Hydraulic Grade (Suction) (ft)
  - Hydraulic Grade (Discharge) (ft)
  - Flow (gpm)
  - Pump Head (ft)
  - Also include the pump curve as a separate output.
- Valve Report
  - Label
  - Elevation
  - Pressure Setting
  - Flow (gpm)
  - Hydraulic Grade (From)(ft)

- Hydraulic Grade (To)(ft)
- Headloss (ft)

- Fire Flow Report
  - Label
  - Fire Flow Required (gpm)
  - Flow (Total Needed) (gpm)
  - Flow (Total Available) (gpm)
  - Residual Pressure Required (psi)
  - Residual Pressure (psi)
  - Lowest System Pressure (psi)
  - Junction w/ Minimum Pressure
  - Pipe w/ Maximum Velocity
- Velocity of Maximum Pipe (ft/s)

CHAPTER 5.2

RECLAIMED WATER

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5.2 RECLAIMED WATER SYSTEM DESIGN

5.2.1 GENERAL INFORMATION

A. Introduction

This document provides guidance and imposed minimum design criteria for the modification and construction of the City's reclaimed water delivery system. It is intended for use in the planning, design, plan preparation, and construction processes.

Wherever the language of this document refers to equipment or material to be used or the language of a standard refers to an Approved Materials List, the "Reclaimed Water System Approved Materials List" shall be used. The "Flushing and Disinfection Meter Program" and "Water Line Flushing Procedures" documents shall be followed when installing new reclaimed water infrastructure. These documents can be obtained from the City's Engineering Department or from the City's website, www.goodyearaz.gov.

B. City Policies

The City of Goodyear' policy is to recharge reclaimed water to the maximum extent possible to provide for drought protection and Colorado River shortages firming, and sustainable management of the West Salt River Sub-Basin and the Rainbow Valley Sub-Basin aquifers. Therefore, unless specifically approved by the City Council, the City will not be expanding its reclaimed water direct delivery system but recharging the reclaimed water and when needed it will be recovered through the existing Indirect Potable Reuse and delivered to service area as potable water.

If the City Council approves the direct delivery of reclaimed water to a development and if the City Engineer determines such delivery will have a significant impact on the City Reclaimed Water System, the Developer shall, its sole costs and expense, pay the City for the costs incurred in modeling the proposed delivery system expansion on the City's computer reclaimed water model and in amending the City approved Reclaimed Water Master Plan to incorporate the proposed reclaimed water delivery system expansion. The effects of peak demand from the development will be reviewed by the City Engineer to verify the sizing and layout of the proposed reclaimed water system elements. This information will also be used to assist the City in planning for current and future developments.

Potable water or, irrigation water (from RID, BID, or private wells) shall be used for dust suppression and control for all construction related uses. Reclaimed water shall not be used for dust suppression and control for construction related uses.

C. Qualifying Developments

1. The following are developments that may be eligible for reclaimed water delivery:

a. A development for which the City has, as of the effective date of the EDS&PM, contractually agreed to the development's use of reclaimed water.

b. An industrial development that intends to use either directly delivered or recovered reclaimed water supplies for non-potable industrial processes and shall return 90% or more of the reclaimed water used back to the City via the City's sewer collection system for recycling.

c. An eligible development seeking to use reclaimed water must complete a City application requesting the use of reclaimed water. Applications can be located at the City Engineering Office or Development Service Counter.

2. A development is a Qualifying Development or Qualified Development entitled to use either directly delivered or recovered reclaimed water supplies if the City Council has approved the use of reclaimed water on the development.

5.2.2 PLAN PREPARATION

A. Reports

1. Preliminary Reclaimed Water Information

a. Preliminary information regarding the reclaimed water system for a Qualifying Development shall be provided with all General Plan Amendment, Rezone, and PAD applications. The preliminary information provided with these documents shall at a minimum show the location and dimensions of existing and proposed reclaimed water infrastructure including distribution and transmission mains, City reclaimed water zones, reclaimed water storage facilities, recovery well information, etc. Text shall be provided with these documents to provide background to support the proposed infrastructure. When a site is planned to be constructed in phases, a Master Reclaimed Water Report shall be provided with the Rezone or PAD application.

2. Master Reclaimed Water Report

The master reclaimed water report will provide a governing design plan by which all Preliminary and Final Reclaimed Water Reports are

supported for each phase of Qualified Developments. The Master Reclaimed Water Report shall be prepared, as directed by the City Engineering Department, in accordance with this manual, and shall be sealed by a Professional Engineer registered in and licensed to practice in the State of Arizona.

The Master Reclaimed Water Report shall present relevant project information concerning improvements of the reclaimed water system for the proposed delivery, use, and recycling of reclaimed water.

The objective of the report is to provide sufficient information to adequately review the delivery, use and recycling of the reclaimed water system at a Qualifying Development.

At a minimum the Master Reclaimed Water Report shall address the following:

a. Design assumptions and computations, demands, pressures and flows, reclaimed water production requirements, cathodic protection requirements, storage facilities serving the site and the adequacy of said storage, connections to the existing system, and rights-of-way or easements that exist or are being proposed.

    (1). Qualifying development's reclaimed water demand requirements shall be calculated according to information shown on Table 5.2-1, Reclaimed Water Average Day Demands and/or approved volumes of reclaimed water.

b. The Master Reclaimed Water Report will become the basis for a Water, Reclaimed Water and Wastewater Service Agreement between the Developer and the City when such agreement is required by the City. The agreement will specify terms and requirements for water, wastewater, and reclaimed water service to the development. This shall be stated in the introduction to the report.

c. All Qualifying Development projects shall be responsible for determining their specific reclaimed water system needs based on accepted industry standards and BMP. The Master Reclaimed Water Report shall verify that service for proposed developments shall be bore by the development and not provided at the expense of existing customers.

d. Computer Reclaimed Water Models

    (1). A reclaimed water model demonstrating that system pressures do not exceed the maximum nor fall below the minimum operating levels, as identified in this chapter, will be required in each reclaimed water report.

(2). The reclaimed water model shall verify that minimum pressures are available within the development during the Maximum Day demand scenario.

(3). The reclaimed water model shall be provided to the City electronically for purposes of updating the City's Water Model.

(4). If the proposed development will significantly change the land use identified in the City's Reclaimed Water Master Plan or proposes a reclaimed water system that differs from the City's requirements, then the developer shall be financially responsible to have the City's Reclaimed Water Master Plan updated to address the changes.

(5). All model data shall include the following:

i. Average Day Demand scenario - based on information in Table 5.2-1.

ii. Maximum Day Demand scenario – 1.8 times the Average Day Demand

iii. See the pressure requirements section of this chapter for minimum pressure design requirements.

iv. Pipeline calculations verifying that head loss per 1,000 feet of any pipe is no greater than 10 feet/feet during peak period demand conditions and not more than 8 feet/feet under any maximum day condition.

v. A data CD containing all electronic calculations shall be submitted along with the master reclaimed water report.

e. Each Master Reclaimed Water Plan shall show the following information:

(1). All existing and proposed on-site and off-site facilities including, but not limited to transmission and distribution mains, storage facilities, and booster pumps.

(2). Proposed street locations, parcel boundaries, and proposed lots within each parcel.

(3). Contour lines showing the elevation of the land surface shall be at 5 or 10 foot intervals. Sufficient information shall be provided to allow the evaluation of network node elevations.

(4). All reclaimed water pressure zone boundaries.

(5). The scale of all maps shall be sufficient to show all required information clearly.

f. The Master Reclaimed Water Report shall comply with all other requirements identified as being necessary for the functioning of the City's reclaimed water system in the area as determined by the City Engineering and Public Works Department.

g. More specific information regarding master reclaimed water report requirements and the City's requirements for a specific area can be obtained by contacting the City's Engineering Department.

3. Preliminary Reclaimed Water Reports

a. Preliminary Reclaimed Water Report shall be provided along with all site plans, preliminary plats or other applications which do not require a Master Reclaimed Water Report.

b. When a Master Reclaimed Water Report has previously been approved by the City for a Qualifying Development and a phase of the Qualified Development is submitted for Site Plan Approval, a Preliminary Reclaimed Water Report specific to that phase shall be provided to the City.

(1). The Preliminary Reclaimed Water Report shall be created using the same criteria as identified for a master reclaimed water report.

4. Final Reclaimed Water Reports

a. Either a Master Reclaimed Water Report or a Preliminary Reclaimed Water Report shall be used as the basis for a Final Reclaimed Water Report.

b. The Final Reclaimed Water Report shall finalize all calculations and modeling information provided in the Master or Preliminary Reclaimed Water Report.

c. The Design Engineer shall have a flow test performed by a private company who will certify the results in writing to the City. The pressures determined in the Master or Preliminary Reclaimed Water Report shall be revised per this flow test information and shown in the Final Reclaimed Water Report. A copy of the flow test shall be provided to the City Engineering Department and Environmental Services division for their records.

d. If a certified flow test(s) performed on the existing system to which the project will be connected does not confirm that sufficient capacity exists, the final report's reclaimed water model shall be used to determine the required on-site and off-site facilities such as pump stations and pipeline diameters necessary to serve the project.

B. Site Plan Requirements

All site plans shall show and label the following:

1. All existing improvements shall be shown in dashed and screened back line types. Existing improvements such as reclaimed water lines (with line size and line material type clearly labeled), storage reservoirs, booster pump station sites, and associated transmission mains shall be shown and labeled. It is encouraged that a separate plan sheet be provided to show all of the public wet utilities.
2. All proposed improvements such as reclaimed water lines, storage reservoirs, well sites, and booster pump stations shall be shown in dark lines.
3. The service provider for the area shall be labeled.
4. All existing and proposed reclaimed water line easements shall be shown, labeled, and dimensioned.

C. Construction Plan Requirements

1. Reviews and Approvals
   a. All improvement plans which include work within the City shall be submitted for review and approval by City Staff. Plan review submittals are made to the Engineering Department.
   b. Maricopa County Department of Environmental Services approval is required prior to City approval.
2. Review Guidelines

   No permits for public reclaimed water installation will be issued until the Owner/Developer has provided the necessary easements and rights-of-way. The instruments of dedication must be approved by the City and recorded at the Maricopa County Recorder's Office.

   The following paragraphs highlight construction plan requirements pertaining to the preparation of reclaimed water improvement plans which are to be submitted to the City for approval.

   a. Plans shall be prepared per the guidelines in Chapter 2 of this manual.
   b. General Construction Notes and Reclaimed Water Construction Notes which apply to construction of the City of Goodyear's sewer system are required on each set of construction plans which include work on the City's reclaimed water system or a reclaimed water system which is to be dedicated to the City. These notes are provided in the Administrative Chapter of this manual.

3. Reclaimed water line stationing shall be along the center line of the pipe.
4. Concrete encasement shall be shown in both plan and profile. The beginning and ending stations of the encasement shall be called out.
5. If a line is to be connected to an existing system, the following note shall be placed on the plans: "Contractor shall verify the location of the existing reclaimed water line before proceeding with trenching."
6. The end invert elevation shall be shown on all proposed reclaimed water main stubs (profile required for lines larger than 12 inches).
7. Where reclaimed water lines cross sewer lines, storm drains, water lines or drainage culverts, the relationship shall be shown in both plan and profile and actual separations shall be called out.
8. Quantities for all items of work within public rights-of-way and public easements shall be included on the cover sheet of the plans.
9. The drawings shall show all utility locations, sizes, material types, easements, rights-of-way, and other structural features of the reclaimed water for current and future building construction.
10. Private reclaimed water lines shall be noted as such on plans. The responsibility for operation and maintenance should also be called out.
11. Easements of record shall be noted and shown in plan view including docket and page numbers and / or the Maricopa County Recorder's number.
12. There are additional requirements for the preparation of improvement plans in the City. The additional requirements are presented in Chapter 2 of this manual.
13. Prior to issuance of the reclaimed water construction permit, a construction schedule shall be included in table format for all reclaimed water-related construction required to serve a development.

D. As-Built Drawings

A City approved set of As-Built Drawings are required for all reclaimed water system improvements constructed in the City prior to approval of the construction and start of the 2-year warranty period. As-built plans shall be signed and sealed by a qualified registered professional in the State of Arizona. See Chapter 10 of this manual for applicable As-Built standards.

TABLE 5.2-1 – Reclaimed Water Average Day Demands

USE	Average Day (gpd/ac)	Maximum Day Multiplier
Parks & Schools	4,500	1.8
Golf Courses	6,000	
Lakes	5,800	
Low Water Use Irrigation	1,700	

5.2.3 RECLAIMED WATER PRODUCTION SYSTEM

A. Construction of Reclaimed Water Production Facilities

Facilities constructed for reclaimed water production and treatment that are to be dedicated to the City shall be designed and built as approved by the City Engineering department and Environmental Services division.

1. Reclaimed Water Production Facilities

All reclaimed water facilities must include the following:

a. All electrical equipment must be air conditioned.

b. A security system in place which includes video surveillance.

c. Security at the facility shall be provided by constructing a minimum eight-foot block fence with two feet of wrought iron picket extension located at the top of the wall.

d. The facility shall have an automatic rolling entry gate and an access door with automated key pad for access into the facility. A knock box is required for Fire Department access per City Standard Details.

e. Valves eight inches in diameter and greater shall have a motorized operator device to open and close and shall interface with SCADA.

f. Security cameras and an alarm system shall be provided to monitor all access areas in and around the storage tanks or booster pump station. These include, but are not limited to the following: the reservoir tank area, reservoir top hatch tank entry, wellhead area, well master control cabinets and booster pumps. They also must interface with SCADA.

g. All valves shall be epoxy coated valves.

h. Gate valves shall be resilient wedge valves

B. Reservoirs

1. Reservoirs shall provide storage for developments in which the pressure in the reclaimed water system is not sufficient to serve.
2. The developer shall be responsible for upgrading the City's reclaimed water reservoir system to provide for reclaimed water demands.
3. The capacity of new reservoirs shall be rounded up to the nearest 0.25 million gallons when being designed.
4. All tanks and reservoirs shall have level indicators that are clearly visible 24 hours a day from the outside. Level indicators shall read in feet and tenths of foot increments.
5. Retention basins around reservoirs shall be large enough to accept 1-1/2 times the maximum storage capacity.
6. Reservoirs shall be installed on a minimum 3.5-acre parcel. Parcel sizes will be reviewed and approved by the Public Works and Engineering departments. The dedicated land shall be accessible from a public street right-of-way or through a dedicated access easement of 23-foot minimum width.
7. All reservoirs shall be constructed with a concrete base ring.
8. Reservoir tank levels shall interface with SCADA.
9. The tops of all reservoirs shall have a safety railing installed three feet in height surrounding the entire radius of the tank.
10. Reservoir vent structures shall be double contained; disassembly of the vent cover must be possible from the interior of the reservoir only.
11. All reservoirs shall have a dedicated inlet and outlet piping structure.
12. Reservoirs shall be constructed of either steel welded, or pre-stressed concrete and shall follow AWWA standards.
13. The height of the tank shall not exceed 12 feet from the street final grade in residential and commercial areas unless otherwise approved by the City Engineer.
14. All steel welded constructed reservoirs shall include a cathodic protection system in order to protect the interior floor and tank walls coating. The cathodic system shall be installed from the roof structure.
15. Reservoir interior tank coating shall be a two-part epoxy process. Prime and finished coat shall have a minimum of 16 mils and must comply with SSPC-SP No. 10. All work must be inspected by a NACE certified inspector.
16. Reservoir exterior finish shall be Devoe 6579 Gloss DTM buff finish, consisting of two coats application and meet the SSPC-SP2, SP3

cleaning methods. All work must be inspected by a NACE certified inspector.

17. All above ground piping and reservoir appurtenances shall have a purple exterior finish.
18. A 48" diameter manhole entry way shall be provided at opposite sides of the reservoir.
19. A reservoir tank draining system shall be provided for the purpose of draining and cleaning of the interior. This draining system shall consist of a center floor drain located in the interior of the tank. The tank floor shall be sloped in a direction that allows the water within the tank to flow downward and outward to a collection basin that contains additional piping to remove the flow away from the reservoir to the retention area.
20. Valves eight-inches and larger shall have a motorized operator to open and close the valve. The actuator shall interface with SCADA.
21. All tanks and reservoirs shall be subject to an inspection of the interior at the 11-month warranty inspection. The expense of this inspection shall be included in the construction cost for the tank or reservoir.

C. On-site Storage Facilities

1. Where on-site storage facilities are approved for storage of reclaimed water, the property owner shall retain ownership, care, and maintenance responsibilities for the facility, associated pumping equipment control, signage, maintenance of pedestrian areas, and all other associated improvements.
2. The City of Goodyear will maintain responsibility for maintenance of reclaimed water pipes and associated equipment up to the meter located within an easement typically adjacent to the right-of-way. All lines and equipment beyond the City meter shall be the responsibility of the property owner to maintain.
3. The City of Goodyear will not accept ownership or maintain on-site storage facilities.

D. Booster Pump Stations

1. A "Preliminary" or "Basis of Design" report shall be prepared and submitted to the City Engineering department for approval prior to submission of a reclaimed water pump station or upgrade to an existing reclaimed water pump station final design. This report shall outline the type of equipment and controls proposed for the station. A final design report prepared by a Registered Professional Engineer licensed in Arizona shall accompany the pump station design drawings.

2. Reclaimed water booster pumps shall be designed to maintain adequate pressure for reclaimed water supply.
3. Engineers shall coordinate their pump station design with the City Engineering department and Environmental Services division prior to final plan preparation.
4. All pumps shall be designed such that the pumping mechanism is a centrifugal horizontal type pump that is located above ground.
5. All pump station control panels shall be designed and constructed with SCADA.
6. All booster pump station equipment shall conform to the City's current SCADA standards.
7. An hour meter shall be provided for each reclaimed water pump.
8. Reclaimed water pumping stations shall be equipped with water meters which register and totalize in US gallons.

5.2.4 RECLAIMED WATER LINES

A. General Information

The City reclaimed water delivery system has three basic classifications of reclaimed water lines which are determined by use. These classifications are distribution, transmission, and service.

1. City reclaimed water use Qualified Developments shall design and construct reclaimed water transmission lines, distribution lines, services, and associated equipment of appropriate size, material, and location.

    a. Temporary connections between a newly installed and isolated reclaimed water system and an approved alternate water system may be permitted on a case by case basis as approved by the City Engineering department. At a minimum the following conditions shall be met prior to acceptance of this connection:

        (1). Existing charged reclaimed water lines are not located nearer than one mile from the nearest main in the proposed reclaimed water system.

        (2). Only one point of connection is proposed.

        (3). The proposed single point of connection includes a RPP backflow prevention device that is painted purple and signed appropriately.

        (4). The Developer shall provide the City with an in-lieu payment for future abandonment of the connection and the future connection to a City reclaimed water line.

2. The City Engineering Construction Inspector shall be contacted two working days prior to all reclaimed water system shut downs. City approval is required prior to shut downs. The Contractor shall have all materials and equipment necessary to do the work at the job site prior to shutdown. It shall be the Contractor's responsibility to provide all affected reclaimed water customers with a written notice of the proposed shutdown. Such notice shall be given a minimum of one working day in advance.

B. Transmission Lines

Transmission lines are located in arterial or collector streets and have line sizes of 12 inches and larger. Transmission mains are typically used to convey reclaimed water between two City reservoirs and generally do not maintain a constant pressure required of the distribution system. Transmission mains shall be located as identified by the Engineering Department.

1. When existing reclaimed water demands or proposed reclaimed water demands are shown to be insufficient to support a Qualified Development such that in the opinion of the City Engineering department a transmission reclaimed water line is required, a transmission reclaimed water line of a size approved by the City Engineering department and designed by a professional engineer shall be constructed by the developer in conjunction with the construction of the project.
2. Long, straight reaches of transmission mains shall be marked every 440 feet with a programmable electronic marker ball. See the Approved Materials List for marker ball models, which are to be programmed by the Contractor. Installation of an electronic marker may be omitted when valve locations permit identification of pipeline location.
3. Design flows for transmission mains shall be based on the current City Reclaimed Water Master Plan or a reclaimed water report approved by the City Engineering Department.
4. All transmission lines shall be C-900 purple PVC pipe. Where DIP is required for fittings, crossings, etc. the pipe shall be wrapped in purple poly wrap with the words "Reclaimed Water Line" written on the poly wrapping.
5. Transmission mains shall not have service connections.

C. Distribution Lines

Distribution lines are typically 4 inches to 12 inches in size and can be located in arterial, collector, or local streets. However, all lines in an arterial, collector, or local street shall be designed and constructed with the

sizes identified by the Engineering Department or to a diameter sufficient to accommodate the extension of reclaimed water services to areas of development beyond the project as identified by the City's Engineering Department.

1. Eight-inch diameter pipe shall be the minimum size installed in any arterial street.
2. Distribution mains in arterial street alignments shall be installed as identified in the City's Reclaimed Water Master Plan or City approved reclaimed water report.
3. All service lines shall be connected to a distribution main
4. See the City's "Approved Materials List" for materials that have been approved to be installed within the City.
5. Distribution mains shall be constructed in all arterial streets.
6. The flow to a Qualified Development shall be calculated to confirm that existing supply is sufficient to meet the proposed use. When additional improvements are required to increase the flow, all improvements necessary, including but not limited to pumping stations, storage facilities, transmission and distribution lines, and appurtenances necessary to provide the flow shall be a part of the design.
7. Four-inch diameter pipe shall be the minimum size installed in any collector, residential, or private street or public easement.
8. These are minimum guidelines. The City may require larger sizes, different materials, and varying locations depending on circumstances.
9. All distribution mains shall be C-900 purple PVC pipe.

D. Service Connections

A Service connection includes the reclaimed water line from the distribution main to the meter and includes the meter and all connections.

1. Reclaimed Water Services to Qualified Developments

    a. All reclaimed water service lines shall be of a material as listed in the Approved Materials List.
    b. The Developer is responsible for application and payment of all applicable fees.
    c. Reclaimed water services maintained by the City shall be installed within a public right-of-way, PUE, or a 20-foot minimum width dedicated reclaimed water line easement.

d. All reclaimed water service lines constructed under existing pavement shall be installed by underground boring.

e. Reclaimed water service lines maintained by the City shall not be located in parking spaces, driveways, washes, manmade or natural drainage channels, or retention / detention basins.

f. Construction plans shall indicate the location of reclaimed water service lines, water services, and sewer taps referenced with stations and dimensions from the street center line or monument line. Location of sewer service and water service relative to the reclaimed water service shall also be shown.

g. Reclaimed water services 2 inches or smaller shall be of a material as identified in the City Approved Materials List. Service lines shall have a purple polymer wrapping with the words "Reclaimed Water" in white letters printed every foot.

h. All service lines for reclaimed water use shall be a separate dedicated line that is tapped off the reclaimed water main within a public right-of-way, PUE, or reclaimed water line easement.

i. Branched reclaimed water service line tees are not allowed.

j. Newly installed reclaimed water services shall not have a compression coupling installed unless the length of the service is a distance longer than that of a full roll of copper.

k. Services damaged after installation are required to be replaced back to the corporation stop.

l. The corporation and curb stops shall be of a type and manufacture as identified in the City's Approved Materials List.

2. Reclaimed Water Meters

a. General Information

Reclaimed water meters to be used shall conform to City Standard Specifications for reclaimed water meters. Information regarding reclaimed water meters may be obtained from the City Environmental Services division. Types of approved reclaimed water meters include:

(1). Positive Displacement

(2). Compound - This unit is designed for uses where most of the flow is low, some intermittent and no more than occasionally high.

(3). Turbo - This shall be used where a wide variety of flows can be expected but most are at the high end.

b. Each building or area requiring a separate reclaimed water bill shall have a separate reclaimed water meter installed.

c. There shall only be one reclaimed water meter per service line.

d. Manifolding, combining, or connecting several smaller reclaimed meters to meet a flow demand that could be provided by a single larger meter is not permitted.

e. Reclaimed water meters shall be sized and designed in accordance with the requirements of all applicable plumbing code as adopted by the City.

f. Reclaimed Water Meter Installation

All reclaimed water meters shall be supplied by the City, after all prevailing fees have been paid, all applicable permits have been obtained (federal, state, and local), and all required signage has been posted.

(1). All reclaimed water meters shall be installed by City personnel.

(2). Reclaimed water meters 3 inches to 6 inches shall be installed by the Developer in accordance with City Standard Details and MAG Standard Specification, Section 631. After installation, City personnel will inspect and accept the work if all requirements for installation are met.

g. Reclaimed Water Meter Locating

(1). Reclaimed water meters shall be located outside of street improvements but within the right-of-way or adjacent PUE.

(2). Reclaimed water meters shall not be located in parking lots, driveways, sidewalks, washes, manmade or natural drainage channels, or retention / detention basins.

(3). Reclaimed water meters shall not be fenced in or enclosed and must be accessible by City personnel at all times.

(4). If an existing reclaimed water service/meter must be relocated, a contractor may relocate the service a maximum of 10 feet. If the desired relocation is greater than 10 feet, the old service must be severed and shut off at the corporation stop on the main; a new service shall be installed by the contractor. Relocation of reclaimed water service lines shall be done so by shutting off and severing the line at the corporation stop, and making a new tap at the proper location. Both services shall be noted on the As-Built Drawings.

3. Reclaimed Water Meter Boxes and Vaults

a. Irrigation Reclaimed Water Meter Boxes

(1). Reclaimed water meter boxes shall be installed within the right-of-way or PUE at a distance of no less than 1 foot back of curb for detached sidewalks and no less than 1 foot back of sidewalk for attached sidewalks and at an elevation of 0.2 feet above the adjacent sidewalk or curb. See City Standard Details and Approved Materials List.

(2). All other locations shall be approved by the City Engineering department.

(3). Reclaimed water meter boxes shall be of a type and manufacture as identified in the Reclaimed Water Approved Materials List.

b. Reclaimed Water Meter Vaults 3 to 6 inches and Larger

(1). Reclaimed water meter vaults for sizes 3 to 6 inches shall be installed as a water meter vault as shown in the City Standard Details with the exception that the inside of the vault lid be painted purple.

(2). Vaults for reclaimed water meters larger than 6 inches shall be reviewed and approved by the City Engineering department on a case by case basis.

(3). All valves shall be of a type and manufacture as identified in the Approved Materials List.

4. Taps

a. Installation of tapping sleeves and tapping an energized reclaimed water main shall be performed by the Developer after approval is received by the City Engineering department.

b. A 3-foot minimum separation is required between service taps on a reclaimed water main.

c. Saddles that meet the specifications of the Approved Materials List shall be installed on all new reclaimed water service taps.

d. The Contractor shall make all taps from the City's operational reclaimed water system unless otherwise directed by the City Engineering department or Environmental Services division. The Developer is responsible for preparing application and payment of all applicable fees prior to taps being made.

E. Water Quality

1. Reclaimed water lines that are temporarily connected to the City’s potable water system shall be disinfected in conformance with MAG Standard Specifications for water lines, Section 611.9 and the City’s

Flushing and Disinfection Meter and Water Line Flushing Procedures.

a. Dry powdered calcium-hypochlorite compounds shall not be placed within pipelines during construction.

b. Notify the City Engineering Construction Inspector when samples are ready to be taken to verify disinfection of reclaimed water lines. The Construction Inspector must be present and samples shall be collected in strict conformance with MAG Standard Specification, Section 611.15. The Contracting Agency is the City of Goodyear, and it is the responsibility of the Developer to hire a lab to process the samples.

F. Pipe Materials

1. Standard material for reclaimed water lines larger than 8" located within a City right-of-way or PUE shall be purple PVC C-900 class 200. Mains 8" and smaller shall be class 150.

2. All PVC C-900 reclaimed water pipe shall be purple in color. The words "Reclaimed Water Do Not Drink" shall be stenciled with not more than 12" separating the repetitions of words.

3. For all DIP/fittings, or other metallic pipe installations, soil corrosivity tests shall be conducted and reported in accordance with the American Ductile Iron Pipe Research Association. Reports shall be filed with the City Engineering Department.

4. All fittings shall be ductile iron with restrained joints, and shall be wrapped in purple polyethylene wrap with the words "Reclaimed Water" written on the poly wrap. A programmable marker ball programmed by the Contractor, shall be installed at each fitting.

G. Locating Reclaimed Water Lines

1. Where conditions prevent adequate horizontal and vertical separation between a reclaimed water line and a water and/or sewer line, each line shall be constructed of DIP (minimum Class 150) with mechanical or flanged joints.

2. Separation of reclaimed water and electrical or gas lines shall conform to City Standard Details.

3. Locating Reclaimed Water Lines within Rights-of-Way

a. Rights-of-way and/or utility easements shall be dedicated prior to the issuance of construction permits.

b. Reclaimed water line location in rights-of-way shall be in accordance with City Standard Details.

4. Cut stakes shall be set for all trenching of reclaimed waterlines 12-inches or greater in diameter.

5. Locating Reclaimed Water Lines within Easements

   a. All reclaimed water lines which cross golf courses, open areas, or any area outside a dedicated right-of-way shall be located within a minimum 20-foot-wide PUE or reclaimed water line easement that is dedicated to the City.

   b. Easements larger than 20 feet in width will be required if multiple utilities are co-located or if additional area is required for maintenance equipment access due to the size and/or depth of the lines.

   c. No structures of any kind shall be constructed or placed within or over a utility easement except: utilities, wire (or removable section-type) fencing, decomposed granite and/or wood, asphalt paving, or grass. Masonry fencing that crosses easement in a perpendicular alignment shall be permitted.

   d. Easements shall at all times be accessible to City service equipment such as trucks, backhoes, etc. Easements shall be accessible from City rights-of-way or other public easements.

   e. Easements shall be dedicated prior to the commencement of construction activities.

6. Locating Reclaimed Water Lines in Areas Not Accessible by Normal Excavation Methods

   a. All pipe in these areas must be restrained through the inaccessible area extending one full joint before and after the section.

   b. All reclaimed water pipe within the inaccessible area shall be sleeved using C900 PVC class 200 pipe.

H. Cover Requirements

1. Reclaimed water mains in arterial and major collector streets shall have a minimum cover of 48 inches over the top of the pipe. Reclaimed water mains in other locations shall have a minimum cover over the top of the pipe as follows:

   a. 48 inches for reclaimed water mains 12 inches and larger

   b. 48 inches for reclaimed water mains in industrial areas

   c. 36 inches for reclaimed water mains smaller than 12 inches, and all lines in minor collector streets, residential streets, and in utility easements.

2. Cover for reclaimed water mains shall be measured from finished grade of pavement or natural ground, whichever is lower, to the top of pipe. Greater depths may be required to ensure adequate pipe protection during construction.
3. The proposed depth shall be clearly noted in each plan sheet. Any changes in depth required to avoid conflicting utilities, etc., shall be noted.

I. Pressure Requirements

Pressure extremes in reclaimed water systems result in potential for contamination to enter the network. Low pressures in the reclaimed water system may allow polluted fluids to be forced into the system. High pressures may cause ruptures or breaks in some elements of the network.

1. Where reclaimed water lines are located adjacent to potable water lines, engineers shall design the system such that pressures in reclaimed water lines are at least 20 psi lower than the pressure in the adjacent potable water line. Operating reclaimed water system pressures shall be a minimum of 20 psi and not to exceed a 60 psi. Ultimate pressure requirements shall be approved by the City Engineering.
2. All reclaimed water mains and service lines shall be designed for a minimum normal internal working pressure of 150 psi plus appropriate allowances for water hammer.
3. Water hammer may produce momentary pressures greatly in excess of normal static pressures, thus increasing the probability of reclaimed water main failure.

    a. Suitable provisions shall be made to protect the system from water hammer.

4. In cases where greater than the above noted maximum pressures are required for effective operation, all elements of the system shall be designed accordingly. Pressure information for existing reclaimed water lines may be obtained by having a flow test performed on the existing system.

    a. A Right-of-Way Permit issued by the City Engineering Department is necessary to perform the flow test.
    b. These tests may be performed by a private fire protection company who must certify the results of the tests and submit them to the City Engineering department and Environmental Services division for approval.

c. Flow testing shall be arranged through the City's Environmental Services division. A minimum of two working days' notice shall be given prior to testing.

J. Miscellaneous Requirements and Specifications

1. Trenching, backfilling, and compacting shall be in accordance with MAG Standard Specifications.

2. Reclaimed water lines that have one-ended connections (dead-end lines) shall have a hydrant at the non-connected end. In no case shall a hydrant be located in a wash, natural or manmade drainage way, detention or retention basin, sidewalk, or driveway. All reclaimed water hydrants shall be painted purple in color.

3. No reclaimed water line shall be deflected or swept, either vertically or horizontally, in excess of the maximum recommended deflection specified by the manufacturer of the pipe or coupling. The appropriate use of bends or offsets shall be used where the maximum deflection is exceeded. Fittings may be required where more than two pipe lengths are deflected.

4. The minimum clearance under major washes, culverts, storm drain lines, manmade and natural drainage ways, canals, railroads, highways, bridges, airports, etc. shall be 2 feet. Greater clearance requirements may be required by other conditions such as scour depth, traffic loading, etc.

5. All changes in direction in reclaimed water lines shall be marked with a programmable electronic marker. Valve locations permit adequate identification of pipeline location (typically at crosses and tees). Electronic markers ball manufacturers and models shall comply with the City Approved Materials List.

6. Reclaimed water lines to be abandoned shall be approved by the City Engineering department.

5.2.5 VALVES AND ZONE SPLITS

A. General Valve Requirements

1. Valve Specifications

a. Gate valves are required in all reclaimed water lines smaller than 16 inches and shall be resilient seated, solid wedge gate, and shall open left.

b. Butterfly valves shall be required on reclaimed water mains larger than 16 inches.

c. At selected locations between the City's reclaimed water zones special reclaimed water zone valves shall be installed if not previously existing.

d. Per City Standard Details, valved bypass lines shall be required on valves larger than 16 inches in diameter.

e. Manholes shall be provided for all Butterfly valves as identified in the City Standard Details.

f. Valve box installation and grade adjustments shall be performed per MAG Standard Detail, No. 391-1 Type "A" and 391-2.

g. Debris caps shall be included along with all valve box installations. Debris caps shall conform to City Standard Details.

h. When encountered during construction, existing valve boxes shall be replaced to meet MAG Standard Detail, No. 391-1 Type "A" and 391-2 with associated debris cap.

i. Valve box equipment shall be of a type and manufacture as identified in the Reclaimed Water Approved Materials List.

2. Spacing

a. Valve spacing for transmission mains with no branches shall be no less than 1/4-mile and no more than 1/2-mile.

b. The maximum spacing of valves on distribution mains shall be 1/4-mile for all types of Qualified Developments.

c. Valves shall be spaced and located such that they are beneficial to the operation and maintenance of the system. The City Engineering department shall approve all valve locations.

d. Where valves are to be located off of a tee or cross, the valves shall be flanged to the tee or cross.

e. Valves shall be provided to allow for the isolation of lines crossing major washes, culverts, storm drain lines, manmade and natural drainage ways, canals, railroads, highways, bridges, airports, etc. as directed by the City Engineering department.

f. All mains branching from feeder mains or loops shall be valved adjacent to the feeders so that the branch mains can be taken out of service without interrupting the supply to other locations.

g. Any reclaimed water line that will be extended in the future shall have a valve, along with a 13-foot minimum stub and a blind flange in a Number 4 box with a marker ball at the non-connected end.

3. Operation

a. Only City personnel are authorized to open and close all existing reclaimed water valves at all times and in all circumstances including but not limited to flushing, pressure testing, chlorinating, etc.

b. Valves that control the Reclaimed Water System Zone Split shall be designated by permanently imprinting the letters "RZS" on the lid.

c. Valves intended to remain closed shall be designated by painting those valve covers white.

4. Backfilling and Compaction

a. The area immediately surrounding any City valve shall be compacted. A test(s) verifying the compaction of the soil around the valve shall be provided to the City for each 3-foot depth of trench backfill and prior to placement of any portion of pavement section materials (ABC or AC).

b. Compaction testing around valves shall be performed as follows:

(1). A minimum one test per valve per 3-foot depth of trench backfill shall be performed. The test(s) shall be performed within 2 horizontal feet of the valve and directly over the reclaimed water main. Care shall be taken to prevent damage to the pipe and valve during compaction and testing.

(2). Additional compaction tests may be required as determined on a case-by-case basis. The need for additional tests will be identified by City Engineering Department representatives.

B. Air Release Valves

Air release valves shall be installed as follows:

1. When the slope of a reclaimed water line changes from a positive slope to a zero slope in primary direction of flow.

2. When reclaimed water line changes from a positive slope to a negative slope in primary direction of flow.

3. When reclaimed water line changes from a zero slope to a negative slope in primary direction of flow.

4. When vertical alignment changes to undercross or overcross another facility (i.e. utility, drainage wash, etc.), air release valves shall be installed on both sides of the crossing where conditions identified in standards 1 through 3 above exist. In cases where a positive slope is maintained across the vertical alignment, an air release valve is required on the upstream side only. Isolation valves shall also be constructed on either side of a vertical alignment.

5. NOTE: Slopes less than or equal to 0.002 feet/feet shall be treated as zero slopes.
6. All air release valves shall be a combination air/vacuum release type per the Approved Materials List.

C. Pressure Reducing Valves

1. Transmission and Distribution Lines

a. PRV's on reclaimed water lines shall be rated to maintain pressures between 20 and 80 psi within the distribution system.
b. PRV's shall be designed in accordance with the criteria shown in City Standard Details and as outlined in the City's Reclaimed Water Master Plan.
c. A vault shall be provided for each PRV as shown in the City Standard Details.
d. A minimum 6 feet of DIP shall extend out from the PRV on either side before transitioning to PVC pipe.

D. Zone Splits

The City's reclaimed water distribution system is divided into various reclaimed water zones as outlined in the City Reclaimed Water Master Plan. Each zone shall operate as an independent reclaimed water system. Cross-connections between zones are prohibited.

1. Valves - See the valve section of this chapter.
2. Plans - Plans for reclaimed water distribution mains adjacent to a zone split boundary shall clearly indicate the different zones involved and the location of the zone split boundary.

E. Reclaimed Water Hydrants

1. General Requirements

a. All reclaimed water hydrants shall be painted per the color indicated in the Approved Materials List.
b. All hydrants shall have signage that indicates "Reclaimed Water Do Not Drink" as identified in the Approved Materials List.
c. The Developer shall provide the hydrant, materials, and all labor required for installation.
d. All new hydrant installations will be installed per manufacturer's specifications. Extensions shall not be used to reach finished grade.

e. Where the finished grade around existing hydrants is changed, an extension kit, installed per manufacturer's specifications, may be used.

f. One valve shall be placed between each hydrant and the reclaimed water main.

g. Valves for hydrant connections shall be flanged to the tee.

h. All hydrants shall have a locking device installed as a part of the Qualified Development costs and of a type and manufacture as identified in the Approved Materials List.

2. Spacing and Locating

a. Reclaimed water hydrants shall be installed as directed by the City Engineering department.

b. Where hydrants are required they shall be located outside of street improvements but within the right-of-way or PUE.

3. Locations

a. The location of a hydrant shall be such that the pipe leading to the hydrant will be under the least amount of pavement.

b. A 3-foot minimum clearance shall be maintained around the hydrant.

c. Hydrant protection is required where no curb is present.

4. Backfilling and Compaction

a. The area immediately surrounding any City hydrant shall be compacted per MAG Standards. Test(s) verifying the compaction of the ABC around the hydrant shall be provided to the City for each 3-foot depth of trench backfill and prior to placement of any portion of pavement section materials (ABC or AC).

b. Compaction testing around hydrants shall be performed as follows:

(1). A minimum one test per hydrant per 3-foot depth of trench backfill shall be performed. The test(s) shall be performed within 2 horizontal feet of the hydrant. Care shall be taken to prevent damage to the hydrant, valve, or reclaimed water main during compaction and testing.

(2). Additional compaction tests may be required as determined on a case-by-case basis. The need for additional tests will be identified by City Engineering department representatives.

5.2.6 CROSS-CONNECTION CONTROL

The program shall consist of inspection by the City Environmental Services division and implementation of a backflow prevention and maintenance program, as outlined in the "Manual of Cross-Connection Control" published by USC.

A. Implementation

1. Air-gap separation shall be required for Qualified Developments where entry is or will be restricted and cross-connection inspections can't be made with sufficient frequency or on short notice. Air-gap separation shall be required in, but not limited to, areas where the following high-hazard conditions exist:

   a. Public water system is used to supplement reclaimed water.
   b. Wastewater is pumped and/or treated.
   c. Hazardous substances are handled or stored.
   d. Irrigation systems exist into which fertilizers; herbicides or pesticides could be injected.
   e. As required by ADEQ, or the City Public Works and Engineering departments.

2. RPP backflow prevention devices painted purple shall be required in all locations where air-gap is not required or where entry is not restricted and cross-connection inspection can be made with sufficient frequency.

B. Installation

The owner, at his or her own expense, shall purchase, install, operate and maintain any approved backflow prevention device required by the City. Approved cross-connection equipment manufactures and models are identified in the City's Approved Materials List. Installation of approved backflow prevention devices shall be as follows:

1. All backflow prevention devices shall be constructed with a security enclosure as shown on the City Standard Details.
2. An air-gap separation shall be located as close as practical to the user's connection at the meter. The piping between the user's connection and the receiving tank shall be entirely visible. The air-gap separation shall be at least twice the diameter of the supply pipe, measured vertically from the flood rim of the receiving vessel to the supply pipe. In no case shall this separation be less than 1 inch. See the City Standard Details for approved air-gap separation methods for portable tanks.
3. RPP backflow prevention devices and detection assemblies shall be located outside of the right-of-way or PUE and shall be installed as

close as practical to the user's reclaimed water meter. See the City Standard Details for backflow prevention methods on portable tanks.

a. RPP Assembly backflow prevention devices and assemblies shall be installed a minimum of 12 inches above grade and not more than 36 inches above grade with 12-inch clearance on both sides, and in a manner where it is accessible for testing.

(1). For RPP backflow prevention device installation information see the City Standard Details.

C. Maintenance

Maintenance of backflow prevention devices shall be as follows:

1. Maintenance of backflow prevention devices shall be tested immediately after installation, relocation, or repair. Devices shall not be placed in service unless they are functioning as required.
2. Devices shall be tested on an annual basis or more frequently if determined to be necessary. When devices are found to be defective they shall be repaired or replaced.
3. Backflow prevention devices shall be tested by persons certified as a General Tester or Specialist by USC or ASETT.
4. Accurate records of these tests shall be maintained by the City for a minimum of 5 years. Copies of these records shall be submitted to the City Environmental Services division.

CHAPTER 6

SEWER

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6.1 WASTEWATER COLLECTION AND TREATMENT SYSTEM

6.1.1 GENERAL INFORMATION

A. Purpose

This section provides guidance and minimum design criteria for the modification and construction of wastewater collection and treatment systems constructed within City public rights-of-way or easements. It is intended for general use in the planning, design, and plan preparation processes.

B. Ordinance Requirements

1. The City requires sewer lines to be installed along the entire length of property line frontage of the property to be developed whenever future extension of the line is possible. The property line frontage is that portion of the property along a public right-of-way. If a parcel to be developed has more than one property line frontage, the City will require a sewer line to be installed along all frontages.
2. Upon development of property for which City water or sewer service is available, the Developer shall submit a plan, prepared by a Professional Engineer licensed in the State of Arizona, for the sewer system.
3. The Developer shall install, at his or her expense, all on-site and off-site improvements necessary to serve the development. This includes payment of all required development fees.
4. The City may require users who have a nonresidential discharge to monitor their discharges and obtain an Industrial Waste Discharge Permit. The permit may be obtained from the City's Community Development counter.
5. For more specific information on ordinance requirements, review of the Goodyear Revised Code is recommended.

C. City Policies

1. Sanitary sewers shall be designed to serve the ultimate population density expected in the tributary area. The design must be in conformance with the current City-approved Wastewater Master Plan, and as such, shall take future connections into consideration.
2. Sewer lines shall not be privately owned if future connection to said sewer lines will be necessary to serve adjacent parcels.
3. Private sewer lines shall meet Maricopa County Health Department and City Building Safety Department inspection requirements for approval. Privately owned and maintained sewer lines shall not be located within the street right-of-way or a PUE. On-site sewer

collection systems within commercial shopping centers shall be designed as private systems.

4. Private Sewer Companies

   a. Portions of Goodyear's municipal service area are provided sewer service by private sewer companies. Private companies are those defined by the ARS.

   b. Modifications or construction of sewage collection systems within private sewer company franchise areas shall be reviewed by the City and the subject company. The City shall also review private sewer systems within the City limits. Private sewer systems within the City shall meet current City standards. The applicable review fees shall be paid and a note placed on the drawings delineating operation and maintenance responsibilities. The City cannot provide sewer service within private sewer company franchise areas.

5. EPA Regulation

   The City is required by the U.S. EPA to develop and implement a program to control discharges that might harm the POTW. The program establishes local discharge limits for non-residential users and provides for a permitting process based on user discharges and business types. Details of the program and requirements are found in the Goodyear Code of Ordinances. Specific information may be obtained by calling the Engineering Department at 623-882-3110.

D. Sewer System

1. All developments are required to connect to the City's sewer system. Onsite disposal systems are not allowed. Exceptions are made only with the written approval of the City Engineer.

2. The City's sewer system includes 6 classifications of sewer lines which are determined by use. These classifications are:

   a. Service Line - In plumbing, the extension from the building drain to the public sewer or other place of disposal; also called house connection.

   b. Lateral Sewer - A sewer that discharges into a branch or other sewer and has no other common sewer tributary to it.

   c. Branch Sewer - A sewer that receives wastewater from a relatively small area and discharges into a main sewer serving more than one branch sewer area.

d. Submain Sewer - A sewer into which the wastewater from two or more lateral sewers is discharged, and which subsequently discharges into a main, trunk, or other collector.

e. Main Sewer/Trunk Sewer - In larger systems, the principal sewer to which branch sewers and submains are tributary. In small systems, a sewer to which one or more branch sewers are tributary. In plumbing, the public sewer to which the house or building sewer is connected.

f. Interceptor Sewer - A sewer that receives flow from a number of transverse sewers or outlets, and conducts such wastewaters to a point for treatment or disposal.

3. All developments shall provide for trunk, main, and service lines as required to provide sewer service for not only the individual development, but for the ultimate service area, as deemed necessary by the City Engineer.

4. Sewer lines shall be sized to accommodate their ultimate service area. Reference shall be made to the City's Wastewater Master Plan for the sizes and locations of sewer mains within the City. The minimum size line for a public main is 8-inch diameter.

5. Public Sewage Lift Stations - The City Wastewater Master Plan has estimated wastewater generation from the entire City. Refer to this plan for information regarding the approved location for public sewage lift stations. Public lift stations in size and location other than those identified in the City Wastewater Master Plan will not be permitted.

6. At a minimum, Preliminary and Final Wastewater Reports shall be prepared by a Civil Engineer registered to practice in the State of Arizona for each development within the City. The cost of said reports shall be the responsibility of the Developer. These reports shall be designed per the requirements of this manual and the City Wastewater Master Plan.

7. Information provided in the City Wastewater Master Plan has been developed based upon the zoning land uses existing at the time of completion. If a proposed development changes the land use of an area in such a manner that it significantly impacts the functionality of the City Wastewater Master Plan, the Developer will be financially responsible to update the City Wastewater Model prior to obtaining permits for construction.

8. ADHS Bulletin 11 shall apply to all City sewer lines.

6.2 PLAN PREPARATION

6.2.1 REPORTS

A. Preliminary Wastewater Information

Preliminary information regarding the wastewater system for a development shall be provided for in all General Plan Amendment, Rezone, and PAD applications. The preliminary information provided within these documents shall at a minimum show and discuss the location and sizes of existing and proposed sewer mains within and adjacent to the site. The text shall also identify the wastewater treatment facility that will be accepting flows, and provide information regarding the current capacity of the facility and any scheduled CIP improvements or Developer-financed improvements to be constructed at the facility prior to construction of the proposed project. When a site is planned to be constructed in phases, a Master Wastewater Report shall be completed at the time of rezone or PAD application, or at the time of preliminary plat or site plan submittal if the property does not go through the rezone / PAD process.

B. Master Wastewater Reports

A Master Water Report shall be developed for each project in which the project is to be designed and constructed in a phased succession. The Master Wastewater Report will provide a governing design by which all Preliminary and Final wastewater reports will be based for each phased portion of a development. A Master Wastewater Report shall be prepared in accordance with these Design Standards by a Registered Professional Engineer who is licensed to practice in the State of Arizona. The Master Report shall at a minimum address the following:

1. The Master Wastewater Report will become the basis for a Water and Wastewater Service Agreement between the Developer and the City of Goodyear when such agreement is required by the City. This agreement will specify terms and requirements for water and wastewater service to the development. The introduction to the report should include the above underlined sentence as a statement.
2. All development projects shall be responsible for determining their specific wastewater system needs. Services for proposed developments shall not be provided at the expense of existing customers. The Wastewater Master Plan shall state this in the introduction.
3. Adequate sewer line capacity shall be shown for the development. In addition, sewer system calculations or a sewer model shall be used to identify the size of on-site and off-site facilities such as sewer lines, and if necessary lift stations and force mains, required to serve the project. It is understood that plans are conceptual in this stage, and it is customary to show a general layout within a property rather than a detailed layout through a street system.

a. If no change in zoning is proposed, the wastewater system for the project must be analyzed to the point of discharge to an existing sewer which has been identified in the Wastewater Master Plan as having sufficient capacity to serve the project.

b. If a property is desired to be rezoned, or a PAD is sought which would result in increased line sizes within or downstream of the property or would otherwise significantly alter the sewer main alignments as shown in the City's current Wastewater Master Plan, a Master Report shall be prepared and shall provide all text, calculations, and other documentation appropriate to support the proposed changes, as required by the City Engineering Department.

c. Changes in land use sought for in a property, in conjunction with a rezone or PAD application, that significantly modify the density or developable area from what is identified in the current City Wastewater Master Plan, will require an update to the City Master Wastewater Model as determined by the City Engineering department. The Developer will be financially responsible to update the City Wastewater Master Model and / or Wastewater Master Plan prior to obtaining construction permits.

d. Calculations should be based on Manning's equations using a Manning's "n" of 0.013, as well as the invert elevations and pipe diameters of all existing and proposed pipes.

e. Wastewater flows generated within the development shall be calculated as specified in the Design Flows section of this chapter.

f. Off-site calculations shall be based on a sewer sub-basin which shall be shown on an accompanying map. The sub-basin shall include all areas upstream of the development and downstream of the development to the next interceptor sewer. An interceptor sewer shall be defined as 15-inch diameter or larger. Refer to the City Wastewater Master Plan for the identification of areas which will impact the capacity of lines within the development being designed.

g. Off-site wastewater flows shall be as specified in the City's current Wastewater Master Plan unless newer information is provided to the City.

h. A computer disk containing all calculations shall be submitted along with the Master Plan Report. Common spreadsheet formats compatible with Microsoft Excel are acceptable.

4. Compliance with the current City Wastewater Master Plan for the respective area:

a. Each Master Plan must include a map showing the following:

(1). All proposed on-site and off-site facilities; these include but are not limited to interceptors, sewer lift stations, and force mains.

(2). Proposed street locations, parcel boundaries, and proposed lots within each parcel.

(3). Contour lines at 2-foot intervals showing the elevation of the land surface shall be provided. If drainage requirements will require extensive grading, then finished grades should also be shown. Sufficient information must be provided to evaluate pipe cover.

b. A separate area location map shall be provided showing existing and proposed streets, as well as existing parcels surrounding the project to a distance of not less than 1 mile from the exterior boundaries of the project. The County Assessor's maps can provide the information required to prepare these composite maps.

c. The scale of all maps must be sufficient to show all required information clearly.

5. When a Preliminary or Final Report is submitted for a portion of a development that has a Master Report, and the Preliminary or Final report significantly changes the design or layout of the system, the Master Report will be required to be revised at the expense of the Developer requesting the change prior to approval of the preliminary or final report.

C. Preliminary Wastewater Reports

1. A Preliminary or Final Report shall be provided along with every site plan or preliminary plat application.

2. When a Master Wastewater Report has previously been approved by the City for an overall development, the Preliminary Wastewater Report should follow the Master Report as closely as possible.

3. The Preliminary Wastewater Report shall follow the same development protocol as identified in the Master Wastewater Report section of this chapter with the following exceptions:

a. The Preliminary Wastewater Report shall provide a more detailed layout of the wastewater system than is typically provided with the Master Report. Where applicable, additional detail regarding the system shall be provided as well.

b. The Preliminary Wastewater Report will not be the basis of a Water Services Agreement.

D. Final Wastewater Reports

1. A Final Wastewater Report shall be required at the time of construction plan submittal. The Final Wastewater Report shall closely follow the approved Wastewater Master Report (if applicable) and approved Preliminary Wastewater Report. The Final Wastewater Report shall be developed as follows:

    a. The objective of the Final Wastewater Report is to provide a document that finalizes the wastewater system design for a development according to all applicable comments and changes made during the site plan / preliminary plat and construction plan reviews processes.

    b. The Final Wastewater Report must show compliance with the Goodyear Code of Ordinances regarding the construction of sewer lines within City right-of-way as identified in the City's Wastewater Master Plan and this document.

2. A construction schedule shall be included in table format for all wastewater-related construction required to serve the development, per signed zoning or other agreements.

6.2.2 SITE PLANS AND PRELIMINARY PLATS

A. General Information

1. All site plans and preliminary plats shall provide a full-sized (24-inch x 36-inch) exhibit that shows and labels the following:

    a. All existing wastewater lines, line sizes, and line material types. Lift stations and associated force mains shall also be shown and labeled. It is encouraged that a separate plan sheet be provided to show all of the public wet utilities. Existing information shall be shown in dashed screened black line types.

    b. All proposed improvements such as wastewater lines, lift stations, and force main lines shall be shown in dark lines.

    c. The service provider for the area.

    d. All existing and proposed wastewater line easements.

6.2.3 CONSTRUCTION PLAN REQUIREMENTS

A. Reviews and Approvals

1. All improvement plans which include work within the City shall be submitted for review and approval by City Staff. Plan review submittals are made to the Engineering Department.

2. Maricopa County Department of Environmental Services approval is required prior to City approval.

B. Review Guidelines

No permits for public sewer installation will be issued until the Owner / Developer has provided the necessary easements and rights-of-way. The instruments of dedication must be approved by the City and recorded at the Maricopa County Recorder's Office. The following paragraphs highlight construction plan requirements pertaining to the preparation of sewer improvement plans which are to be submitted to the City for approval:

1. Plans shall be prepared per the guidelines in Chapter 2 of this manual.
2. General Construction Notes and Sewer Construction Notes which apply to construction of the City of Goodyear's sewer system are required on each set of construction plans which include work on the City's sewer system or a sewer system which is to be dedicated to the City. These notes are provided in Chapter 1 of this manual.
3. Sewer line stationing shall be along the pipe, monument, or roadway centerline.
4. Concrete encasement shall be shown in both plan and profile. The beginning and ending stations of the encasement shall be called out.
5. If a line is to be connected to an existing system, the following note shall be placed on the plans: "Contractor shall verify the location of the existing sewer line before proceeding with trenching."
6. Both slope and elevation shall be shown on all proposed sewer main stubs. A profile is required for lines larger than 12 inches.
7. Where sewer lines cross water lines, storm drains, reclaimed water lines or drainage culverts, the relationship shall be shown in both plan and profile and actual separations shall be called out.
8. For permitting purposes, quantities for all items of work within public rights-of-way and public easements shall be included on the cover sheet of the plans.
9. Sewer line invert elevations shall be called out for all plans showing sewer line construction.
10. The drawings shall show all utility locations, sizes, material types, easements, rights-of-way, and other structural features of the sewer for current and future building construction.
11. Lift station details shall show all invert elevations, structural elevations, existing and finished grades, control setting elevations, structural design of wet wells and dry wells, valves and piping, surge control devices, pump suction, discharge details, and any other details which will provide a clear understanding of the design.

12. Plans and profiles of force mains shall show size, invert and grade elevations, materials of construction, utility location, and any other details which define the force main construction requirements.
13. Private sewer lines shall be noted as such on plans. The responsibility for operation and maintenance should also be called out.
14. Easements of record shall be noted and shown in plan view, including docket and page numbers and / or the Maricopa County Recorder's number.
15. All plan documents for sewers and / or wastewater treatment works shall be prepared by a Registered Professional Engineer licensed in the State of Arizona under the provisions of ARS § 32-121 et seq. and § 32-141 et seq.
16. There are additional requirements for the preparation of improvement plans in the City. The additional requirements are presented in Section 2.1 of this manual.

6.2.4 AS-BUILT DRAWINGS

A City-approved set of as-built drawings are required for all sewer system improvements constructed in the City prior to acceptance of the system and start of the 2-year warranty period. As-built plans shall be signed and sealed by a qualified professional registered in the State of Arizona. See Chapter 10 of this manual for applicable As-Built standards.

6.3 TECHNICAL DESIGN REQUIREMENTS

6.3.1 SEWER LINES

A. Materials and Details

In selecting pipe material for sewers, consideration shall be given to the chemical characteristics of the wastewater (especially in industrial waste flow areas), the possibility of septicity, exclusion of infiltration, external and internal pressures, abrasion, and similar problems encountered with the established grades.

1. Approved DIP, PVC, or VCP may be used for main lines and service lines, between 4 and 15 inches. Epoxy lined DIP and VCP may be used for 15- to 24-inch sewer lines in the rights-of-way. Materials and details for trunk sewer mains of 24-inch diameter or larger will be reviewed on a case-by-case basis.
2. No public sewers other than service lines shall be less than 8 inches in diameter unless permission is received in writing from the City Engineering Department.
3. Pipe material shall not change between manholes.

4. Where standard-strength pipe is not structurally sufficient, or when sufficient cover cannot be maintained, additional strength must be obtained by using higher class pipe, special bedding specifications, and / or special construction methods.
5. All types of pipe materials used in design shall have established ASTM, ANSI, or NSF standards of manufacture or seals of approval, and shall be designated for use as sewer pipe.
6. Pavement replacement type and compaction type shall be indicated per City Standard Details, this manual, and MAG standards, and shall be identified on each sheet.

B. Hydraulic Design

1. For sewer lines 10 inches in diameter and smaller, slopes shall be sufficient to maintain a velocity of 2 fps; for sewer mains larger than 10 inches in diameter, slopes shall be sufficient to maintain a velocity of 2.5 fps. These calculations are to be based upon Manning's Formula, using an "n" value of 0.013 and d/D of 0.65 for wet weather flow.
2. Hydrogen sulfide problems must be analyzed in the Design Report and be provided for in the design of the system where required.
3. All velocities should be analyzed under peak flow conditions.
4. The following table indicates the minimum and maximum slopes generally considered necessary to obtain desired velocities. Exceptions require the written approval of the City Engineer:

TABLE 6.3-1 - Slopes for Sanitary Sewers (n = 0.013)

Pipe Size (inches)	Minimum Slope *2.0 fps* (ft/ft)	Maximum Slope 9.*0 fps* (ft/ft)
4	0.0084	0.1703
6	0.0049	0.0992
8	0.0033	0.0676
10	0.0025	0.0502
Pipe Size (inches)	Minimum Slope *2.5 fps* (ft/ft)	Maximum Slope *10.0 fps* (ft/ft)
12	0.0031	0.0486
15	0.0023	0.0361
18	0.0018	0.0283
24	0.0012	0.0193

C. Location within the Right-of-Way

1. All public sanitary sewer lines shall be located within a street right-of way or easement dedicated to the City.
2. Sewer lines shall be located per City Standard Details.
3. Sewer lines in arterial and collector roads shall be located on the street side as shown in the City standard details. Sewer lines in local residential streets shall typically not cross street centerline, unless approved by the City Engineering Department.
4. Centerline of the sewer line shall not be closer than 5 feet to the lip of gutter.
5. The center of manhole shall be located at least 3 feet from the street centerline.
6. All sewer lines shall be aligned parallel to the property lines or the street centerlines, or as close to parallel as possible.
7. Sewer mains shall not be located within a street median unless otherwise approved by the City Engineering Department.

D. Easement Requirements

1. No sewer line shall be installed in an easement unless the Engineering department has approved the placement of the line in an easement and the property owner has dedicated the necessary easements and rights-of-way.
2. If approved, sewer lines outside of public rights-of-way shall be placed in easements not less than 20 feet wide. A 30-foot wide easement is required for lines larger than 8 inches and deeper than 10 feet; for pipes with diameters greater than 20 inches the Developer shall contact the City Engineering department to determine required easement width. Sewer lines shall be accessible from a public right-of-way or other accessible public easement at all times.
3. Easements larger than 20 feet in width may be required if other utilities are also co-located in the easement or if additional area is needed for maintenance and equipment access due to the size and/or depth of the lines.
4. Easements shall be free of above ground obstructions including landscaping plant material, shall not be located in a fenced area, and shall at all times be accessible to City service equipment. Easement surface shall be designed to have a dust resistant surface capable of supporting the largest, heaviest service vehicles (vac truck, excavators, cranes), and allowing them to maneuver.
5. Easements shall be dedicated prior to obtaining any sewer construction permit.

E. Pipe Locations and Separations

1. Service Lateral Locations - Service lines shall not be located under driveways or driveway wings with the following exceptions:

   a. A service line may be located beneath a driveway wing of a residential lot, if the narrowness of the lot does not permit an alternative location.

   b. The engineering plans shall contain the following statement: “If a sewer service falls under a driveway during the construction of a home, it shall be relocated or a MAG 440-2 cleanout shall be installed at the outside PUE line, at the City’s discretion”.

2. Separation of Water and Sewer Lines - Caution should be taken in the design and construction of sewer lines to protect all water supplies from wastewater contamination. To minimize the potential of contamination, the Engineer shall design the horizontal and vertical separation of water and sewer lines in accordance with MAG Standard Specifications and City Standard Details.

3. Separation from Gas Lines - The minimum horizontal distance from a sewer mainline or service line to a gas mainline or service shall be 6 feet, from nearest edge to nearest edge. This does not apply to sewer and gas line crossings.

4. Separation from Storm Drains and Culverts

   a. Sewer lines crossing less than two feet below a storm drain or culvert, or under large structures such as box culverts and bridges, shall require additional protection such as the use of DIP or encasement.

   b. Sewers crossing over storm drains and culverts must be a minimum of one foot above, as measured from nearest edge to nearest edge.

F. Cover and Depth

1. All private service lines shall have a minimum of 4 feet of cover, as measured from finished ground at the property line or easement line. In no case shall a sewer service line be installed with less than 4 feet of cover over the top of the pipe. Refer to the City Standard Details.

2. All sewer trunks, mains, or branches shall be designed and constructed at a sufficient depth to serve the ultimate drainage area. A minimum cover of 6 feet, as measured from finished grade to the top of the sewer line, shall be maintained for all public sewer lines.

3. When a sewer line passes under an irrigation ditch, at least 4 feet of cover between the flow line of the ditch and the crown of the

sewer shall be maintained. If this condition cannot be met, the crossing shall be made according to the directions of the City Engineer.

4. Where cover is less than three feet due to topography (e.g. canals, washes, etc.), a 6-inch thick concrete cap shall be constructed in-place over the sewer line. This cap shall extend not less than two feet on either side of the sewer pipe, and shall extend not less than 5 feet beyond the limits of the canal, wash, etc. This is allowed only with the written approval of the City Engineer.
5. All sewer lines that extend across designated floodways shall be installed with DIP material with 401 protector and shall be constructed 2-feet below the 100-year scour limit as described in the Arizona Administrative Code Title 18, Chapter 9, Subsection (D)(2)(c).
6. Sewer lines constructed in designated floodways shall have their crowns at least 2 feet below the 100-year storm scour depth and shall be constructed with DIP. The DIP shall extend a minimum of 10 feet each side of the 100-year storm scouring area.
7. Sewers shall be installed at a depth sufficient to ensure gravity drainage of wastes from each service. Sewer design shall ensure adequate drainage from the ultimate drainage area, and shall allow for the future extension of service to adjacent parcels.
8. All sewers shall be designed to absorb superimposed live loads and backfill overburden without damage to the pipe material, and without adversely affecting the hydraulic characteristics of the pipe. The Engineer shall specify minimum depths of cover to be provided during the construction of roadways or other facilities affecting cover over the sewer line.

G. Intersecting Lines

1. When the diameter of a sewer line changes within a manhole, the inside crown elevations of the two pipes shall match.
2. Where the ground slope is less than the slope of the sewer there shall be no drop across the manhole where the incoming pipe is 0 degrees to 30 degrees from the projection of the downstream line.
3. Where the ground slope is greater than the slope of the sewer, 0.10 foot of drop is required from 0 degrees to 30 degrees from the projection of the downstream line.
4. All manholes where the incoming line is 30 degrees to 60 degrees from the projection of the downstream sewer, 0.10 foot of drop is required.

5. All manholes where the incoming line is 60 degrees to 90 degrees from the projection of the downstream sewer, 0.20 feet of drop is required.

6. For manholes with a line intersecting the through-line, the intersection line invert shall be a minimum of 0.10 feet above the flow line of the through-line. The sewer lines shall intersect at no greater than a 90-degree angle.

H. Curved Sewers

Horizontal curvilinear sewers will not be accepted.

I. Tie-in to Existing System

Construction plans shall call for the Contractor to tie-in new work to the existing, active system only after completion of the new work, and with specific approval of the Engineering Inspector to make the tie-in.

J. Design Flows

Domestic sewage systems shall be designed in accordance with the following:

1. Sewer lines 8 to 12 inches in diameter:

   a. Shall be designed with peak capacities of not less than 1000 gpdu when flowing full. Note that the d/D used in this calculation shall be based on full flow.

2. Sewer mains larger than 12 inches in diameter:

   a. Shall be designed using the criteria identified in the City's Wastewater Master Plan. The current master plan can be downloaded from the City's Engineering website.

   b. The Maximum Day wastewater generation rate used to determine line size capacities shall equal 2.89 times the Average Day generation rate.

   c. Table 6.3-2 below lists the wastewater generation rates identified in the current Master Plan. Refer to the Master Plan for additional information regarding the implementation and use of these generation rates.

TABLE 6.3-2 – Average Day Wastewater Generation Rates

Land Use	WW Generation (gpdu)	WW Generation (gpad)
Agricultural Preservation - 1 DU per acre	176	
Residential < 2 DU per acre	160	
Residential - 2 to 4 DU per acre	144	
Residential - 4 to 6 DU per acre	129	
Residential - 6 to 10 DU per acre	128	
Residential - 10 to 20 DU per acre	124	
Residential - 20+ DU per acre	110	
Community Commercial		951
Regional Commercial		1,087
Luke-Compatible Land Use		1,087
City Center		5,776
Ball Park Village		3,851
Light Industrial		815
General Industrial		1,087
Public / Quasi Public		1,019
Prison		1,699
Airport		170

Generation Rates per City's Wastewater Master Plan, Black & Veatch, June 2008

6.3.2 MANHOLES

A. Materials and Details

All manholes shall be 5 feet in diameter and per MAG Standard Details and Specifications. Manhole frames and covers shall be Class 35, and their weights and dimensions shall be in accordance with details shown in MAG Standard Detail 424. Manholes used in the City wastewater system will not contain built-in steps. See the City Approved Materials List for Wastewater.

1. City approved corrosion resistant coating of sewer manholes shall be required under one or more of the following conditions:

a. Manholes that are equal or greater than ten feet deep, as measured from rim elevation to lowest invert

b. Manholes in sewer lines 12 inches or greater in diameter

c. Forcemain outfall manholes

d. Manholes in sewer lines located in arterial and collector streets

e. Manholes in main/trunk sewer lines located within City easements, as defined by the classification system detailed in this chapter.

f. Manholes located between a forcemain outfall and the next main/trunk sewer line, as defined by the classification system detailed in this chapter.

2. All manholes and rings shall be constructed of concrete as specified by MAG; brick substitutes will not be permitted.

3. Sewer manholes shall be tested per ASTM C-1244-93 as per the ARS R18-9-E301.401D.3.f.ii.

4. The flow channel through the manhole shall be steel-trowel finished to conform in shape and slope to that of the sewer lines. The manhole shelf shall be brush or broom finished. The manhole bottom should be filleted to prevent solid depositions, and channeled to ensure satisfactory flow to the lower invert.

5. Manholes should be protected from storm drainage and flooding conditions whenever possible. Sewers shall typically not be allowed in washes or drainage areas where avoidable.

6. If a design specifies that manholes shall be located in a wash or drainage area, bolted water-tight manhole covers or water-tight manhole inserts shall be used to prevent inflow. The manhole shall be a monolithically-poured structure, designed such that infiltration or exfiltration cannot occur. Providing for the elimination of infiltration and/or exfiltration in washes is the Engineer's responsibility in the design of the system.

B. Spacing

1. Manholes are required at all changes in grade or pipe size, at all changes in alignment, and at locations necessary to ensure the sewer line does not cross the street centerline. The horizontal angle formed between the two lines shall not be less than 90 degrees in the direction of flow.

2. Maximum manhole spacing shall be:

a. 400 feet for 8-inch to 15-inch sewer lines.

b. 500 feet for all sewer lines 18 inches or greater.

3. Manholes in City streets must be located near the center of a traffic lane, rather than on or near the line separating traffic lanes. Manholes should not be located in bike trails, equestrian trails, sidewalks, or crosswalks.
4. Cleanouts are not allowed in the City of Goodyear public right-of-way or dedicated easement. If there are services between the last manhole and the end of the line, a manhole shall be required at the end of the line.
5. Manholes on boundaries of the subdivision or improvement district shall have stubs with shaped inverts in appropriate directions for future connections.
6. Centerline stations and offsets shall be shown on all manholes.
7. A sewer manhole shall be required at the upstream end of a cul-de-sac. All manholes shall be located in such a manner as to provide easy access for the City's cleaning equipment.

C. Intersecting Lines Within Manholes

1. Manholes with lines intersecting at angles more than 30 degrees shall have a minimum 0.10-foot drop across the manhole.
2. When sewer lines of differing sizes enter the same manhole, the crown of the downstream pipe shall be lower than the crown of the upstream pipe.
3. In large trunk lines, inverts at junctions should be designed to maintain the energy gradient across the junction and prevent backflow.

D. Drop Manholes

Manholes with drop connections that are less than 2.5 feet shall not have a difference of manhole inflow and outflow invert elevations that is greater than 12 inches. All drop connections greater than 2.5 feet shall be per MAG Standard Detail, No. 426.

MAG Type "A" drop sewer connections shall have a poured invert as required for Type "B" installations.

E. Monitoring Manholes

1. The City shall determine whether or not a sewer service will be required to have a monitoring manhole to test the flow and composition of their sewage. As a general rule, sewer users with a projected water consumption of 25,000 gpd or greater, sewer discharges of a categorical industrial nature, or other situations as deemed necessary by the City's Public Works Department, shall be required to have a monitoring manhole.

2. On sewer service lines with diameters smaller than 6 inches, monitoring manholes shall be constructed per MAG Standard Details 420-1, 420-2, and 421. These are to have straight channels, with no taps or bends for two pipe lengths upstream and one pipe length downstream.
3. Design details for monitoring manholes on sewer service lines 6 inches or larger, or with a peak flow greater than 40 gpm, shall be approved by the City.
4. Monitoring manholes shall be located in a minimum 20-foot wide PUE which extends from a 20-foot radius around the manhole to the existing public sewer. The monitoring manhole shall be accessible at all times to monitoring crews and vehicles.

F. Manholes Vector Spraying

All sewer manholes installed in the City limits shall be treated with an insecticide approved by the City and identified in the City Approved Materials List for Wastewater Collection Systems.

1. The two-year warranty for the insecticide application shall run concurrently with the two year sewer system warranty.
2. A record of the insecticide applications and warranty information shall be provided to the City Environmental Services Division and the necessary regulatory agencies.
3. The insecticide shall be applied to a depth of 12 feet. Sewer outlets and inlets to manholes shall also be treated.
4. The product and coating shall be applied per the manufacturer's label rate and EPA labels.
5. Only qualified and state-licensed personnel shall be permitted to perform the work of applying the insecticide.

6.3.3 SERVICE LINES

A. Materials and Details

All service lines, whether into a line or into a manhole, shall be constructed by a licensed Contractor at the expense of the Developer. Prior to the construction of any service line, the Contractor shall contact the City's Engineering Inspections Division (623-882-3110) and Environmental Services division (623-932-3010) for inspection services not less than 24 hours prior to tapping.

1. New sewer service lines shall be per the City Standard Details and MAG Standard Details and specifications.
2. The maximum number of service lines into manholes shall be:

a. Three into a manhole in a cul-de-sac,

b. Two into a manhole in all situations other than in a cul-de-sac.

c. No service lines are allowed into a manhole against incoming flow through the manhole.

3. When a sewer service line connects to a manhole the invert elevation shall not be:

a. Located below the crown of the outflow pipe

b. Located more than 1.5 feet above the crown of the outflow pipe.

4. A three-foot minimum separation between sewer service lines is required.

5. All service lines shall be dimensioned and stationed using the closest downstream manhole as Station 0 + 00. Typical dimensions to water service lines shall be shown.

6. Service lines installed for future connection shall be marked.

7. When installed, all service lines must be perpendicular to the lateral. Service lines may be at an angle only if inserted into a manhole, but the flow line of the sewer service line shall not be more than 4 inches below the crown of the line to be tapped.

8. No service lines will be made directly into sewers 6 inches or greater in diameter. Such service lines must be into an existing manhole, or the Developer shall install a new manhole at his or her own expense.

9. Plans shall be reviewed by the Design Engineer for backflow prevention valves. These are required where finished floor elevations are below both upstream and downstream manhole rim elevations.

10. Grease, oil, or sand interceptors which are acceptable to the City and approved by the City Engineer shall be provided for laundries, restaurants, automobile service facilities, and other facilities when, in the opinion of the City, they are necessary for the proper handling of liquid wastes. Interceptors shall be supplied and maintained by the Owner.

11. No sewer service lines will be allowed between the sewer trunk and the odor control manhole.

B. Sizes

1. Tap sizes for private single family residential developments shall be 4 inches. A 4-inch diameter tap shall be provided for each platted lot.

2. Commercial lots with buildings shall have 6-inch minimum private service lines and shall provide service adequate for discharge.

3. Commercial lots without buildings shall have no service lines unless requested by owners; then only 6-inch or larger service lines shall be allowed.
4. Multi-family developments shall have a minimum 6-inch tap.
5. All service lines larger than 6 inches require the installation of a manhole.

C. Location

1. Service lines shall be located so as to avoid conflicts with driveway locations.
2. Proposed tap locations shall be shown on all plans.
3. Because water lines are located behind the curb in many locations, conflicts with sewer service lines are possible. In order to minimize potential health hazards, sewer lines should be designed to allow sewer service lines to pass under water mains behind the curb with a minimum clearance of 12 inches.
4. When it is not possible to maintain sufficient clearance, or if the sewer service will pass over the water main, the sewer service must be epoxy coated DIP or must be encased in concrete. Concrete encasement shall have a minimum thickness of 6 inches, and both options must extend at least three feet from each side of the crossing.

D. Construction Details

All construction shall be per this manual and MAG Standard Details and Specifications.

E. Televised Inspection

All newly installed sewers shall be inspected by CCTV methods acceptable to the City. Any defects discovered during televised inspection shall be corrected at no cost to the City. After correction of defects has been completed, affected sewer sections shall be re-televised at no cost to the City. Two DVDs containing video of all televised inspections shall be provided to the City prior to final acceptance of the sewer. All DVD's shall be formatted for playing on a standard DVD player without any special hardware or software.

F. Sewer System Testing

1. Sewer lines and services shall be pressure tested per MAG specifications
2. Manholes shall be vacuum tested per MAG specifications.

6.4 SEWAGE LIFT STATIONS

6.4.1 SITE SELECTION

A. Considerations

In selecting a site for a sewage pumping facility, consideration should be given to:

1. Accessibility
2. Drainage Characteristics
3. Visual Impact
4. Function and Design Constraints

B. Flooding

The potential for flooding should be considered when selecting a pump station location. The station's equipment shall be protected from damage and remain operable during a 100-year flood event.

6.4.2 LIFT STATION DESIGN

A. Requirements

1. Sewage lift station requirements are provided by ADEQ and are published in their Engineering Bulletin No. 11. Additional requirements specific to the City can be obtained from the Engineering department and Environmental Services division before beginning design. At a minimum, telemetry, dual pumps, generator, three-phase power, and odor control, water supply, canopy, lighting, air release valve, discharge flow meter, and a stationary crane unit for stations with pumps larger than 5 HP will be required.
2. It is recommended that, prior to the preparation of construction drawings, a Preliminary or Basis of Design Report be prepared and submitted to the City for acceptance. The Preliminary Report should outline the type of equipment and controls proposed for the station. A Final Design Report, prepared by a Registered Professional Engineer licensed in the State of Arizona, must accompany all lift station design drawings.

B. Sewer Lift Station Design Standards

1. There shall be a minimum of two pumps at each site. Pumps shall be capable of passing 2-1/2-inch solids, and shall be equipped with stainless steel motor shafts.
2. Check valves shall be silent closing type and located in a separate vault.

3. Three-phase 480-Volt power shall be used where available.
4. Field prints shall include all electrical information.
5. Phase protection shall be provided for all three-phase motors and pumps.
6. An hour meter shall be provided for each pump.
7. Pump failure indicator lights shall be provided on the control panel and the exterior of the station.
8. A locking access hatch with a fall protection grate shall be installed in the wet well.
9. All lift station control panels shall be designed for future installation of a telemetry system.
10. Only submersible pumps shall be used.
11. Approved submersible pump stations shall be supplied per manufacture and model identified in the Wastewater Approved Materials List found on the City's website.
12. A minimum of three sets of the operation and maintenance manuals shall be prepared and provided to the Environmental Services division prior to the final inspection.
13. Force main shall be identified as such with magnetic marking tape one foot above the pipe.
14. Cleanouts shall be installed per section 6.4.4.D.
15. Lift station shall be located a minimum distance of 100 feet from the nearest home. A block wall shall be constructed around the perimeter of the lift station site.
16. Odor control measures must be identified in the Design Concept Report and incorporated into the design.
17. The interior of all lift stations shall be coated with a corrosion-resistant coating as identified in the City Approved Materials List for Wastewater.
18. Provide spare parts as recommended by the manufacturers.
19. Electrical specifications information is to be provided on field prints as follows:

    a. Electrical specifications
    b. Size and type of conduits
    c. Size and type of over-current protection for all disconnects
    d. Phase protection for all three-phase motors and pumps
    e. Ultrasonic level sensor shall be used for all primary controls and alarms; floats shall be used as the backup.

f. Failure indicator lights on control panel

g. Hour meter totalizer for each pump

h. Flashing light to warn of pump failure

i. Alarm circuitry to one terminal board for telemetry

j. No electrical connections in wet well

k. All lift station equipment shall conform to the City's current SCADA standards.

l. NOTE: It is recommended that designers coordinate their pump station design with the City Engineering department and the Environmental Services division prior to final plan preparation.

6.4.3 FORCE MAINS

A. Velocity Requirements

The velocity of flow in the force main shall be between 4 fps and 6 fps.

B. Materials of Construction

1. All types of pipe materials used in design of force mains shall be DIP with a ceramic epoxy lining. The DIP and epoxy lining shall meet established ASTM, ANSI, AWWA, and NSF standards of manufacture or seals of approval and shall be designated as pressure sewer pipe.
2. The epoxy lining shall be provided as identified in the City Approved Materials List for Wastewater.
3. All cut ends or damaged epoxy-sealed DIP shall be repaired or sealed per the epoxy manufacturer's requirements.
4. Force mains shall be identified as such with magnetic marking tape one foot above the pipe.

C. Air Release Valves

Approved air release valves designed for sewage shall be provided on force mains at all peaks in elevation. See the City Standard Details for air release valve requirements and the Approved Materials List for approved models.

D. Cleanouts and Manholes

1. Two-way cleanouts shall be provided every 800 feet or one-way cleanouts every 400 feet. See the City Standard Details.
2. For details regarding force main discharge into a manhole, refer to the City Standard Details.

E. Water Line Separation

1. For details regarding force main discharge into a manhole, refer to the City Standard Details.
2. The minimum separation between force mains and water lines shall be 2 feet vertical and 6 feet horizontal, all as measured from nearest wall to nearest wall.

F. Testing

1. Prior to issuance of a Certificate to Operate, all force mains shall be pressure tested. Preparatory to testing, the section of the pipeline to be tested shall be filled with water and placed under a slight pressure for at least 48 hours. The pipeline shall then be brought up to working pressure plus 50 psi, or to 125% of working class pressure, whichever is greater. This pressure shall be maintained on the section under test for a period of not less than 4 hours.
2. Accurate means shall be provided for measuring the quantity of water required to maintain full test pressure on the line for the test period. Maximum allowable leakage is to be determined by the following formula:

$$L = [JD\sqrt{(Pt)}]/4500$$

Where:

a. L = Maximum allowable leakage in gallons per hour for the section of pipeline tested
b. J = number of joints in length tested
c. D = diameter of pipe in inches
d. Pt = test pressure in psi

6.5 WASTEWATER TREATMENT

6.5.1 GENERAL INFORMATION

A. Treatment Plants

The subject of wastewater treatment plant design is beyond the scope of this design manual. The Engineer shall contact the MCESD, the City of Goodyear Engineering department, and the City of Goodyear Environmental Services division for further information pertaining to the development of wastewater treatment facilities within the City.

B. Septic Systems

1. When sewer service is not available, a temporary septic system may be allowed with the approval of both the City and the MCESD.
2. A “dry” sewer line shall be installed along the entire length of the property line frontage. The property line frontage is that portion of the property along a public right-of-way. If a parcel to be developed has more than one property line frontage, the City will require a sewer line to be installed along all frontages.
3. The operation and maintenance of septic systems are the responsibility of the Owner. The City will not accept any septic system for operation and maintenance.

C. Reclaimed Water

Wastewater Reclamation and Advanced Treatment - The City’s current Wastewater Master Plan calls for the development of regional wastewater reclamation facilities. Reclaimed water is to be recharged and stored underground within the local groundwater aquifer to the maximum extent possible. Reclaimed water will be used when needed for replenishment obligations for the potable water deliveries IPR) or recovered in times of declared shortages on the Colorado River that affect the Central Arizona Project water deliveries and the City. Reclaimed water will only be directly delivered to qualifying industrial applicants or to those users with whom the City is contractually obligated to provide reclaimed water.

Sewer Report Outline

Title Page: Project Name; Location; Type of Report (Preliminary, Master Plan, Final, etc.); Engineer's Seal, Signature, and Date; and Consulting Firm, Name, Address, Phone Number

Table of Contents: Engineer's Seal, Signature, and Date

1. Introduction

- Project Name
- Type of Report (Preliminary, Master Plan, Final, etc.)
- Project Description (Size, Area)
- General Land Use Proposed for Project
- Sewer Service Provider
- Number of Dwelling Units, Commercial Acres, etc.
- Project Location (Major Cross Streets, Section Township & Range)
- Topographic Conditions
- Project Phasing

2. Projected Wastewater Flows

- Summarize Wastewater Generation Factors (include reference)
- Summarize Peaking Factors (include reference)
- Provide Flow Projection Calculations Summary (Avg Flow, Peak Flow)
    - Summarize Flow Projections by Phase
    - Include Full Calculations in the Appendix

3. Existing Sewer System

- Location and size of the existing and proposed sewer collection mains adjacent to the site (Demonstrate adequate capacity to serve the proposed development)
- WWTP that will serve the site (Discuss WWTP Capacity)
- Lift stations that will serve the site (Discuss wet well and pump capacity)
- Identify any required improvements within the existing system to serve the project
- Discuss existing force main capacity

4. System Improvements

- Summarize Design Criteria (include reference)
    - Manning's n
    - Pipe Capacity
    - d/D ratio
    - Velocity
    - Slope
    - Minimum Cover
    - Invert Drop Through Manhole
- Lift Stations
- Force Mains
- Discuss connection to existing system (Verify invert depth is adequate)

5. Sewer Model / Calculations

- Discuss setup of sewer model/calculations
- Discuss Assumptions
- Discuss Modeling Software
- Average Flow Analysis (Include results in the Appendix)
- Peak Flow Analysis (Include results in the Appendix)
- Discuss System Phasing

6. Conclusion

- Project Summary
- Project Phasing

7. References

- List references cited in the report

Appendices

- Flow Projection Calculations
- Average Flow Analysis Results
    - Manhole Report
    - Pipe Report
    - Outfall Report
    - Pump Report (If Required)
    - Force Main Report (If Required)
- Peak Flow Analysis Results

- Manhole Report
- Pipe Report
- Outfall Report
- Pump Report (If Required)
- Force Main Report (If Required)

Exhibits

- Vicinity Map
- Sewer System Exhibit (Include all on-site and off-site facilities)
  - Existing Pipes
  - Proposed Pipes
  - Contour Lines
  - Street Names
  - Parcel Boundaries
  - WWTP, Lift Stations, Force Mains
- Manhole Id Exhibit
- Pipe Id Exhibit
- Phasing Exhibit

Results Report Requirements: (The modeling results must include the following fields)

- Manhole Report
  - Label
  - Elevation (Rim) (ft)
  - Elevation (Invert) (ft)
  - Flow (Total In) (gpd)
  - Flow (Total Out) (gpd)
  - Hydraulic Grade Line (In) (ft)
  - Hydraulic Grade Line (Out) (ft)
- Pipe Report
  - Label
  - Start Node
  - Invert (Start) (ft)
  - Stop Node
  - Invert (Stop) (ft)
  - Length (ft)
  - Slope (ft/ft)
  - Diameter (in)
  - Manning's n
  - Flow (gpd)
  - Velocity (ft/s)
  - Capacity (Full Flow) (gpd)
  - d/D (%)
- Outfall Report
  - Label
  - Elevation (Ground) (ft)
  - Elevation (Invert) (ft)
  - Boundary Condition
  - Hydraulic Grade (ft)
  - Flow (Total Out) (gpd)
- Pump Report (If Required)
  - Label
  - Elevation (Ground) (ft)
  - Elevation (Invert) (ft)
  - Flow
  - Hydraulic Grade Upstream (ft)
  - Hydraulic Grade Downstream (ft)
- Force Main Report (If Required)
  - Label
  - Start Node
  - Stop Node
  - Length (ft)
  - Diameter (in)
  - Friction Factor
  - Flow (gpm)
  - Velocity (ft/s)

- Wet Well Report (If Required)
    - Label
    - Elevation (Ground) (ft)
    - Elevation (Invert) (ft)
    - Area
    - Depth (ft)
    - Hydraulic Grade

CHAPTER 7

LANDSCAPING AND RECREATIONAL FACILITIES

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7.1 GENERAL INFORMATION

All landscaping shall conform to the City Zoning Ordinance, the MCDOT Roadway Design Manual, the City's Approved Materials List for Landscaping, and the EDS&PM.

7.1.1 MAINTENANCE AND WARRANTIES

Prior to the start of the maintenance period, the City Landscape Inspector and representatives of the Parks & Recreation Department shall inspect all landscaping areas within rights-of-way that will be maintained by the City.

A. Private Development Projects

Areas in which landscaping is installed as part of a private development project that are to be maintained in the future by the City of Goodyear shall be clearly identified on the Approved Plans and are subject to the following requirements. These areas may include retention basins, parks, and street center median landscaping:

1. The Developer shall maintain and warranty all landscape improvements, including planted areas and irrigation systems, utility payments (water, electric), for a period of two years beginning immediately after the City issues the notification of 100 percent approval for the project.
2. During the maintenance and warranty period, the Developer shall be responsible for maintaining adequate protection to all areas. Any damaged planting and/or irrigation systems shall be immediately repaired or replaced at the Developer's expense.
3. Maintenance shall include continuous operations of watering, weeding, removal of dead plant material, mowing, rolling, fertilizing, spraying, insect and pest control, re-seeding, replacement, and all other measures necessary to ensure healthy, normal growth.
4. When the turf has established sufficient root structure and has reached an approximate height of 3 inches, mowing shall begin immediately to achieve a turf height of 2 inches; the turf shall be mowed thereafter to safely maintain the 2-inch height.
5. At the termination of the maintenance and warranty period, all turf areas shall be live, healthy, undamaged, and free of infestations. All areas shall be completely void of barren spots larger than 3 inches by 3 inches.
6. If all plantings are not acceptable at the end of the two-year period, the maintenance and warranty period shall continue until the landscaping meets City approval.

B. City Capital Improvement Projects

Areas in which landscaping is installed as part of a City CIP that are to be maintained in the future by the City of Goodyear Parks & Recreation Department shall be clearly identified on the approved plans and are subject to the following requirements. These areas may include retention basins, parks, rights-of-way, street center medians, and site landscaping:

1. The Contractor shall maintain and warranty all improved areas, including planted areas and irrigation systems, and utility payments (water, electric) for a period of one year beginning immediately after the City issues the notification of 100 percent approval for the project.
2. During the maintenance and warranty period, the Contractor shall be responsible for maintaining adequate protection to all areas. Any damaged planting and/or irrigation systems shall be immediately repaired or replaced at the Contractor's expense.
3. Maintenance shall include continuous operations of watering, weeding, removal of dead plant material, mowing, rolling, fertilizing, spraying (pre-emergent applied every 6 months), insect and pest control, re-seeding, replacement, and all other measures necessary to ensure normal healthy growth.
4. When the turf has established sufficient root structure and has reached an approximate height of 3 inches, mowing shall begin immediately to achieve a turf height of 2 inches; the turf shall be mowed thereafter to safely maintain the 2-inch height.
5. At the termination of the maintenance and warranty period, all turf areas shall be live, healthy, undamaged, and free of infestations. All areas shall be completely void of barren spots larger than 3 inches by 3 inches.
6. If all plantings are not acceptable at the end of the one-year period, the maintenance and warranty period shall continue until the landscaping meets City approval.
7. At the completion of the one-year warranty and maintenance period, park maintenance will be transferred from the Contractor to the Parks & Recreation Department.

7.2 MEDIAN AND RIGHT-OF-WAY LANDSCAPING

7.2.1 PURPOSE

This section provides standards for the landscape design of City rights-of-way and medians. It is intended for general use in the planning, design, and plan preparation processes. In addition to acquainting designers and developers with these standards, it should assist them in submitting plans through the plan review process in an efficient and timely manner.

It should be noted that areas within the City typically known as Overlay Districts have been designated as requiring special landscaping improvements. Documents that discuss in greater detail the median and right-of-way landscaping requirements for those areas can be provided by the City Development Services Department upon request.

7.2.2 GENERAL LANDSCAPE GUIDELINES

A. Widths

1. Detailed information regarding median dimensions can be found in Chapter 4 ("Geometrics") of this manual, and in the City Standard Details.
2. Median width is measured from back of median curb to back of median curb. The minimum width for a median is 3 feet. If the median is landscaped, a 4-foot minimum width is required. Trees shall not be planted in medians which are less than 10 feet wide. Shrubs shall not be planted in medians which are less than 4 feet wide unless otherwise approved by the Engineering Department.

B. Ends of a Median

The first 10 feet and the last 10 feet of a median are to be decorative concrete (stamped, exposed aggregate, etc.) as approved by the City Landscape Plan Reviewer.

C. Trees and Shrubs Placement

1. Refer to the ADWR's "Low Water Use Drought Tolerant Plant List" for a list of plants and shrubs approved to be installed within the City right-of-way.
2. Refer to the City's "Trees for Public Spaces" document for a list of trees allowed within the City right-of way.
3. See the City Standard Details for information regarding planting details of trees, shrubs, and groundcovers.
4. All plant material located on slopes shall be planted as indicated in the City Standard Details.
5. Trees shall be located a minimum of 5 feet from the back of any curb, sidewalk or wall.
6. Mature canopy size shall be considered in determining the location of trees. Trees may require a greater setback due to canopy size.
7. Landscape plans shall illustrate the location of trees and shrubs by showing their size at maturity.
8. Tree locations in medians shall be designed such that a minimum distance of 10 feet is provided between mature canopy widths.

9. All plant material shall be located such that, at maturity, a minimum 18-inch clearance is maintained to any face of roadway curb.
10. Shrubs shall be located to maintain a 7-foot clearance from any fire hydrant.
11. Shrubs shall be located to maintain a 3-foot clearance from any new or existing tree at maturity.

D. Tree Quantities and Sizes

The minimum tree size is 15 gallons, and 50% of all trees placed shall be 24-inch box or larger.

E. Median Grading

1. Median finished grades within curb separations greater than 7 feet shall be lower in the center, with slopes of 8 %. The finished grade at the edges shall be designed at a 1-inch depth below the top of adjacent curbs, includes finish grade granite.
2. In narrower medians, the finished grade shall be a smooth, flat, and uniform surface at an elevation of 1-inch below the top of curb, finish grade includes granite.

F. Median Trees

1. Trees located within medians shall have single trunks.

G. Decomposed Granite

1. Decomposed granite shall be 3/4-inch screened.
2. Decomposed granite shall be selected from the City Approved Materials List for Landscaping.
3. A minimum 2 inches of decomposed granite shall be provided unless a greater thickness is required per plan.
4. Subgrade to be landscaped with decomposed granite shall be treated (by a licensed professional) with a pre-emergent that is listed in the City's Approved Materials List for Landscaping, after placement of the decomposed granite. A certificate of application document (pre-emergent certification) shall be provided to the City Landscape Inspector prior to the acceptance of the start of any maintenance and warranty period.

H. Boulders

1. One-third of any boulder is to be set in the ground.
2. Vertical exposure shall be a maximum of 18 inches above grade in sight visibility areas.

I. Turf

Turf will not be allowed within the City right-of-way.

7.2.3 RECOMMENDED PLANTS

A. Approved Materials

See the City's "Trees For Public Spaces" list and ADWR's "Low Water and Drought Tolerant Plant List" for approved plant material information.

7.2.4 SIGHT VISIBILITY

A. Sight Visibility Areas

1. Residential street sight visibility areas shall be determined per Chapter 4 of this manual.
2. Arterial and collector roadway sight visibility areas shall be determined using the criteria set forth in the City Standard Details.

B. Planting within Sight Visibility Areas

1. Shrubs and groundcovers planted within SVT shall have a mature height of not more than 18 inches. Height shall be measured from the edge of pavement, and total height shall include the height of any mounding.
2. Trees planted within SVT shall have a clear trunk pruned to a height of 7 feet or greater upon installation. Height shall be measured from pavement surface.

7.2.5 COMPLETION REQUIREMENTS

A. Alterations

If field conditions require relocation of a water meter, backflow prevention device, controller, valve, or any other major component of the irrigation system as shown on the Approved Landscape Plans, contact the City Landscape Inspector at 623-882-7979 prior to any installation.

B. As-Builts

The Contractor shall provide an accurate set of as-built drawings as identified in Chapter 10 of this manual.

C. Maintenance and Warranty

1. See the section on maintenance and warranty located at the beginning of this chapter.

7.3 PARK FACILITIES

7.3.1 GENERAL INFORMATION

A. Purpose

The Park Facilities portion of the Engineering Standards has been established to ensure that the City's Parks & Recreation Department provides quality and safe experiences for its citizens. These standards and policies are not intended to provide specific design criteria, but to serve as a guide during the design phase. The design review of each park will be done on an individual basis.

7.3.2 PARK MASTER PLAN DEVELOPMENT PROCESS

A. Master Plan

A Master Plan shall be developed for each park to help guide the planning of facilities and infrastructure. Contact the City Development Services Department and Parks & Recreation Department for detailed information regarding this process.

7.3.3 CITY PARK DESIGN

A. Development Review

Park design must be approved by the Development Policy Committee before any development occurs on the park site.

B. Park Development

1. Park land ratio is encouraged to consist of open space (25%), passive space (25%), and facility space (50%).
2. Whenever possible, parks shall be located adjacent to school sites in order to create a fluid joint use between the park and school facilities.
3. Sidewalks

    a. Designated multi-use paths shall be a minimum of 10 feet in width. See Chapter 4 ("Transportation") of this manual and Section 7.4 of this chapter for bike paths and multi-use paths.

    b. Sidewalks utilized specifically for pedestrians shall be a minimum of 8 feet in width.

    c. All multi-use paths shall be located a safe distance away from active courts or fields.

4. Playgrounds

a. Playgrounds shall contain some type of shading, either from ramadas (16 feet x 16 feet minimum) and/or non-deciduous trees (30-inch boxes minimum).

b. An engineered wood fiber, as identified in the City's Approved Materials List for Landscaping, shall be provided for all play areas that are not turf or other approved hardscape surface.

c. Playground equipment and surfaces shall meet or exceed all current CPSC, ADA, and ASTM standards.

5. Softball/Baseball Fields

a. All fields shall be lighted to meet all current Illuminating Engineering Society (IES) and City Zoning Ordinance standards and shall utilize effective shielding systems to reduce spill light off play areas.

b. Infields shall be constructed with an approved non-toxic organic binder, red in color. This mixed material shall be specially prepared for ball fields and shall be a minimum of 4 inches in compacted depth. Material should be bound by crushing aggregate screenings down to 1/4-inch or 3/8-inch fine particles. See Approved Material List.

c. Home plate and Little League pitcher's mounds shall be filled with a minimum of 2 inches of fine gray brick clay (no black gumbo permitted) incorporated at a uniform rate with established infield red mix. Infields and outfield turf areas shall consist of a Tifwey 419 Hybrid Bermuda Grass.

6. Court Facilities

a. All courts facilities shall be lighted to meet all current IES Standards and City Zoning Ordinance standards.

b. Sand volleyball courts shall consist of sand at a depth of 12 inches.

7. Irrigation

a. All systems shall be capable of interfacing with a Calsense computerized central system per the Approved Materials List for Landscaping.

b. Irrigation guidelines, except as noted below, shall comply with Section 7.9 ("Landscape Watering Systems") of this chapter.

(1) All irrigation pipe shall be 1-inch diameter or larger.

(2) All valve boxes shall be jumbo in size and set at grade and supported by blocks to prevent crushing by construction and maintenance equipment.

(3) The tops of all valve boxes shall be set at the same elevation as the top of adjacent finished grade (i.e. flush with adjacent decomposed granite).

8. Landscaping

Plant material shall consist of low water use, drought-tolerant species. Plants and shrubs shall be selected from the ADWR "Low Water and Drought Tolerant List". Trees shall be selected from the City's "Trees for Public Spaces List".

9. Construction Material

a. Park fixtures and ramadas shall consist of steel, metal, aluminum or recycled material or approved equal; wood will not be permitted.

b. Headers consisting of concrete or brick shall be installed between turf and landscaped areas.

c. All drinking fountains installed in parks shall be chilled and shall meet all ADA Standards.

10. Signage

a. The standard park sign will be located at the main entrance of every neighborhood and community park. The mold shall be pre-cast with the park name engraved into the mold. The park sign mold can be obtained from the City's Parks & Recreation Department.

b. Specialty parks may deviate from standard park signage with approval from the Parks & Recreation Department. A marquee meeting the City's Sign Ordinance may be acceptable with the approval of the Development Services Department and will require a City Sign Permit.

c. All signage must meet the City's Sign Zoning Ordinance. Ordinance information can be obtained at the Development Services Department at 623-932-3494.

11. Parking

a. All parking shall meet the City's parking requirements stipulated in the Parks Master Plan and City zoning requirements.

b. Parking lot lights shall meet all current IES and City Zoning Ordinance standards and City zoning requirements.

c. Thornless, single trunk, non-deciduous trees (24-inch boxes minimum) shall be planted adjacent to parking lots to provide shading. An acceptable ratio is one tree per every five parking stalls.

7.4 LANDSCAPING FOR FLOOD RETENTION BASINS

7.4.1 GENERAL INFORMATION

This section provides guidance and minimum design criteria for the modification and construction of landscaping features in flood retention basins constructed within the City of Goodyear. It is intended for general use in the planning, design, and plan preparation processes.

7.4.2 LANDSCAPING SPECIFICATIONS FOR FLOOD RETENTION BASINS

A. Native Desert Landscaping

Native desert landscaping may be used where a retention basin is located directly adjacent to native landscape desert preserve lands. Other applications of native desert landscaping in public retention basins must be approved by the City Landscape Plan Reviewer. Native desert landscaping shall be reviewed on a case-by-case basis.

B. Granite Landscaping

Granite is an acceptable landscaping material for flood retention basins. Granite landscaping shall be reviewed on a case–by-case basis. Approved granite colors are identified in the City's Approved Materials List for Landscaping. Where granite is used, plant materials will need to be enhanced appropriately.

C. Turf Landscaping

Turf is an acceptable landscaping material for flood retention basins. The following specifications provide a guide for construction of turf within retention basins:

1. Turf Construction

a. Materials

(1) Seed - The kind of seed planted shall be appropriate for the planting season, and shall be one of the seeds identified in the City's Approved Materials List for Landscaping. Winter grass seed is not acceptable as a permanent turf seed.

(2) Mulch - Mulch shall be decomposed, stabilized, fortified, and treated (nitrolized) wood products with no more than 1% nitrogen after treatment. Acceptable mulches are identified in the City's Approved Materials List for Landscaping.

2. Soil Test in Lieu of Removing and Replacing Topsoil - If the Developer has a specific reason for not removing and storing the

topsoil, he may request to perform grading without replacing topsoil. If the City concurs, upon final grading of the site, the Developer may sample soils for analysis and make recommendations for improving the soil; if necessary, these analyses will be made by an independent soils lab. Any recommendations must be implemented by the Developer and inspected by the City prior to proceeding with lawn construction.

3. Moisture Content - The soils shall not be worked when the moisture content is so great that excess compaction occurs, or when it is so dry that dust will form in the air or clods will not break readily. Water shall be applied if necessary to provide ideal moisture content for tilling and for planting as herein specified.

4. Where soil tests show that existing topsoil is satisfactory, a seedbed shall be prepared by scarifying to a depth of at least 3 inches and dragging to a smooth surface. Where existing soil ("caliche type") is cemented, it shall be excavated to a depth of 6 inches, removed from the site, and replaced with acceptable topsoil. Irregularities in the surface shall be leveled before the commencement of seeding operations.

5. After raking, the entire area shall be rolled in 2 directions at approximate right angles with a water ballast roller weighing 100 to 300 pounds. Any irregularities that develop shall be re-raked, scarified for bond, and again rolled until the area is true and uniform and free from lumps or depressions. Water shall be applied to the surface whenever necessary to ensure proper working of soil. No heavy objects except lawn rollers shall be taken over these areas. Grade and compaction must be approved by the City prior to planting.

6. Planting

   a. Just prior to broadcasting the seed, apply and lightly rake into the surface the soil amendments identified in the City's Approved Materials List for Landscaping.

   b. After the City has approved the areas to be seeded, the seed will be broadcast at the rate of 3 1/2 pounds Bermuda per 1,000 square feet. One half of the seed will be sown with the sower moving in one direction, and the other half shall be sown with the sower moving at right angles to the first sowing. Broadcasting shall not be done in windy weather.

   c. Bermuda seeding will not be allowed between the months of September and May. A minimum nighttime ambient temperature of 80 degrees is required prior to seeding.

7. Fertilizing

a. Top dress all seeded areas with a fertilizer as identified in the City's Approved Materials List for Landscaping.

b. Lightly roll all areas and thoroughly water with a fine spray. Turf shall then be kept continually moist by watering as often as required.

8. Any areas that do not root properly shall be replanted at 10-day intervals until an acceptable stand of grass is obtained.

7.4.3 PLANTING OF TREES, SHRUBS AND GROUNDCOVER

A. General

1. All retention basins shall be landscaped with trees, shrubs, and other plant material approved for use in the City. Landscaping densities and type shall meet the needs of the basin's use.

2. All plant material located on slopes shall be planted as indicated in the City Standard Details.

B. Quality and Size

1. Fifty percent (50%) of all trees shall be a minimum size of 15 gallons; the remainder of the trees shall be a minimum of 24-inch box as outlined in the City Zoning Ordinance. They shall have sufficient roots to hold the earth together after removal from the containers, but shall not be root-bound. Plants shall have been grown in pots, cans or boxes for a minimum of three months and a maximum of one year.

2. All plants shall exhibit normal growth and shall be sound, healthy, vigorous, and free from disease, insect infestations, or weeds.

3. Trees shall have a straight trunk throughout their height, and shall be in accordance with the American Standard for Nursery Stock. Multi-trunk trees are not permitted.

C. Nomenclature

For inspection and identification, durable legible labels shall be securely attached to the tree trunks for all trees delivered to the site. These labels shall state, in weather-resistant ink, the correct plant name and size, as specified in the ADWR plant list or "City Trees for Public Spaces" list.

1. Material for Planting

a. Mulch in planting basins - Mulch shall be evenly spread throughout the tree basin to a depth of 2 inches.

b. Prepared soil for backfilling tree pits - Prepared soil shall, by volume, be composed of 3 parts topsoil, 2 parts washed clean sand,

and 1 part humus; these components shall be thoroughly mixed to ensure uniformity. Topsoil shall be natural, fertile, friable soil, shall not be excessively acid or alkaline, shall not contain toxic substance harmful to plant growth, and shall be reasonably free of noxious weeds, clay lumps, clods, stones, roots, stumps, and debris of any kind.

c. Agriform tablets or approved equivalent shall be included in the backfill for each shrub and tree. Include one tablet for shrubs/groundcovers and two or more tablets for trees; tablet quantity for trees shall be determined according to tree size.

d. Staking materials

(1) Stakes for supporting trees shall be of the lodge pole style, 2 inches by 2 inches by 10 feet long, and shall be straight, sound, stout, and free of knots which may weaken the stake. Each tree shall receive two stakes, to be installed 12” beyond the outside of the root ball. All nursery stakes shall be removed at placement of permanent staking. See Landscape and Park Details 3600 Series.

(2) All tree and shrub site staking shall remain in place for a maximum of one year from the time of planting. If the tree is not stable enough after one year, stakes shall be replaced.

(3) Wire for fastening trunks to stakes shall be No. 12 gauge, annealed galvanized steel (not iron). One wire shall be placed at the top of the stake, and another halfway down the stake. If necessary, staple or tack wire to stakes to hold firm.

(4) Hose used to protect trunk from wire shall be new 2-ply reinforced rubber or plastic garden hose.

(5) As determined necessary by the City Landscape Inspector, stakes for supporting shrubs shall be 2 inches by 2 inches by 4 feet long, and shall be straight, sound, stout, and free of knots which may weaken the stake. Each shrub shall receive two or more stakes, to be installed outside of the root ball. All nursery stakes shall be removed at placement of permanent staking.

(6) Any landscape stake or associated wire or hose that is broken or otherwise needs to be replaced during the maintenance and warranty period shall be replaced by the Contractor within seven calendar days upon notification by the City Landscape Inspector.

D. Plant Material

1. For areas that will be City-maintained, a representative of the City shall accompany the Landscape Contractor to the nursery for tree

and/or plant selection. A minimum 72-hour notification will be required.

2. Unless otherwise indicated, all plant materials furnished shall be nursery-grown, well-branched, and well-proportioned. All plants are subject to inspection and approval before planting, whereupon all plants found unsuitable shall be removed and replaced.

3. For basins that will be City maintained, plant material shall be from those listed on the ADWR plant list. All trees within City maintained basins shall be listed on the City of Goodyear "Trees for Public Spaces" document.

4. Upon delivery to the site, all nursery stock shall be planted as soon as possible. Until planting, stock plants shall not be exposed to excessive sun or drying winds during planting operations.

E. Setting Plants

Unless otherwise specified, all plants shall be planted in pits and shall be set so that the finished grade level (after settlement) will be the same as that at which plants were grown. They shall be planted upright and faced to give the best appearance and relationship to adjacent plants or structures. All trees shall be set plumb and braced rigidly in position until the soil has been tamped solidly around the rootball. Plants shall be backfilled with planting soil which shall be thoroughly settled by watering and tamping to fill all voids. A water basin shall be created at the base of each tree, and shall be a minimum of 4 feet in diameter. Side slopes shall be no greater than 6:1. See Landscape and Park Details 3600 Series.

F. Cleanup

Any soil, manure, or other material dropped onto paved areas by hauling operations shall be removed promptly, as these areas are to be kept clean at all times. Upon completion of planting, all excess soil, stones, and debris not heretofore disposed of under this scope of work shall be removed from the site or disposed of as directed by the Developer.

G. Maintenance and Warranty

1. See the section on maintenance and warranty located at the beginning of this chapter.

H. Tree and Shrub List for Flood Retention Basins

1. See the City's Approved Plant Material List.

2. All trees with spreading habit, seed pods or thorns shall be planted a minimum of 15 feet from walls, walks, and pavements.

7.5 LANDSCAPE FOR FLOOD DRAINAGEWAYS

Landscaping in drainageways shall be approved by the City's Development Services and Engineering departments.

7.6 LANDSCAPE WATERING SYSTEMS

7.6.1 GENERAL INFORMATION

A. Purpose

This section provides guidance and minimum design criteria for the modification and construction of landscape watering systems constructed within the City of Goodyear. It is intended for general use in the planning, design, and plan preparation processes.

7.6.2 WATERING SYSTEMS

A. Design Requirements

All watering systems installed in the City shall conform to the following specifications:

1. The City will review and approve all watering systems prior to any installation. All watering systems shall be automatic and shall utilize a reduced pressure vacuum breaker (as required) before the remote control valves. All applicable codes shall be adhered to and a permit will be required.
2. All City-maintained landscape watering systems shall be independent of other users. Landscape dedicated to the City for maintenance shall have a power meter, irrigation control, and water meter separate from all other landscape watering systems.
3. Friction pressure loss calculations for the longest run in the system for both full-circle and part-circle circuits shall be provided along with all other details which may be required to verify the capabilities of the system.

B. Plans

1. Plans shall indicate existing, design, and minimum operating water pressure requirements.
2. The location of the power source shall be indicated and noted on the final landscape watering plans.
3. The water source and location of proposed tap is to be shown on final landscape watering plans.

4. All plans submitted for approval must specify the following if applicable: brand, model, diameter, pressure rating, and/or size of each material item used in the construction of watering systems.

5. Final submittal for landscape watering system plans shall show details for irrigation controllers, controller valves, pressure regulators, backflow prevention devices, security enclosures, valve boxes, flush caps, trenching, backfill, controller security cabinets, sprinklers, emitters, bubblers, and all other details necessary and applicable for review and construction purposes.

C. Construction Requirements

1. Workmanship

a. All workmanship shall conform to the requirements and recommendations of the Irrigation Association Standards, this manual, and the City Standard Details. All work standards shall be in compliance with ANSI Standards.

b. All workmanship shall be under warranty for a period of one year against defective workmanship for City CIP and two years for work within private development projects that will later be maintained by the City.

2. Pipes in Trenches - Pipes located in the same trench are to have a minimum vertical/horizontal separation of 4 inches.

3. Excavation, Backfilling, and Compaction - Trenches for irrigation lines, sprinkler lines, and control wiring shall be excavated to a minimum depth of 18 inches for mains under constant pressure and 12 inches for laterals not under constant pressure. When in common trenches, all control wires shall be placed first, followed by a layer of fine backfill; then the mainline shall be placed, followed by a minimum 6-inch lift of fine backfill; lastly the laterals shall be placed, followed by final backfill and compaction. Backfill shall be done in accordance with MAG Standard Specifications, Section 601.

4. Existing Utilities and Structures - The Developer shall protect existing structures and utility services and shall be responsible for their replacement. Minor adjustments to the system will be permitted to clear existing obstructions subject to the approval of the City.

5. Materials - Once the plans have been approved by the City, no substitutions shall be allowed, except when unavailable from the supplier, and another approved product is locally available. All such substitutions must be approved in writing by the City. All materials shall be new and the best of their class and kind. All materials shall be warrantied for a period of one year against defective materials for

City CIP and two years for materials within private development projects that will later be maintained by the City.

6. Power Source

   a. The Contractor is responsible for initiating account and service connection.

   b. A power cut-off switch is to be provided to each controller.

   c. All wiring (110 and 24-volt) is to be sleeved under right-of-way improvements such as pavement, sidewalks, etc.

   d. Power Sources for right-of-way landscaping - The power source shall be located within the median or within the right-of-way behind the curb. If the power source cannot be located within the right-of-way, a utility easement must be provided.

7. Water Source

   a. The Contractor is responsible for initiating account and service connection.

   b. Contact the City's Engineering department at 623-882-3110 for information on tapping into City waterlines for landscape watering purposes.

D. Inspections

The City shall inspect and approve the work at the following stages of completion. Any work completed without these inspections shall be removed prior to acceptance of that phase of the work. These stages are:

1. Completion of all trenching and installation of all control wires and mainlines prior to backfilling.
2. Installation of all mainline piping prior to backfilling, including the vacuum breaker, quick coupler circuits, and any shut-off valves. The mainline shall be pressure tested at 90 psi for two hours at this inspection.
3. Installation of all lateral valves, lines and heads.

E. Flushing and Testing

A City Inspector shall be present during system flushing. Control valves shall be opened completely and shall remain open until all debris and material is cleared from the system. After the system is thoroughly flushed, risers shall be capped off and the system pressure tested to the design pressure (at a minimum) prior to backfilling the laterals.

System flushing shall occur:

1. After all new watering system piping and risers are in place and connected, and
2. After all necessary division work has been completed, and
3. Prior to the installation of distribution mechanisms

F. As-Built Drawings

The Developer shall be responsible for providing blackline drawings of the system with all changes in location marked on the drawings. This shall be submitted to the City prior to final acceptance. See As-Built Requirements in Chapter 10 of this manual for specifics.

7.6.3 WATERING SYSTEM MATERIALS

A. Materials Overview

All materials shall conform to the requirements and recommendations of the Irrigation Association Standards unless otherwise indicated in the City's Approved Materials List for Landscaping.

All material specifications shall be based on ASTM, AWWA, other approved industry standards as applicable, or as otherwise identified in the City's Approved Materials List for Landscaping.

B. Control Cable

All wiring to be used for connection of the automatic controller to the electric solenoid actuated remote control valves shall be as required by the City's Approved Materials List for Landscaping. A maximum of 5 wires per color shall be used.

C. Sleeving Lines and Wires Below Paving

1. PVC pipes shall be installed within a separate Schedule 40 sleeve. Piping shall be installed by jacking, boring, or hydraulic driving.
2. All sleeves shall be 4 inches in diameter, have a minimum horizontal separation of 4 inches from all other sleeves, and have a minimum backfill cover of 24 inches.
3. Where needed, existing sleeving shall be extended under new paving to meet the requirements of this section.

D. Pipe

1. Pipe Routing

a. Meter to vacuum breaker - Copper

b. Vacuum breaker risers – Copper

c. Copper or brass shall be used between water meter and backflow prevention device.

d. Exposed pipe to booster pump (if required), Type K hard copper.

2. Galvanized pipe shall not be used.

3. Type K hard copper shall be used for all mainline piping above grade and shall extend 18 inches below finished grade.

4. Plastic Pipe

a. Plastic pipe shall be as described on the approved drawings. It shall be un-plasticized PVC extruded from virgin parent of the type specified on the plans. The pipe shall be homogeneous throughout and free from cracks, holes, foreign materials, blisters, deleterious wrinkles, and dents.

b. All pipes shall be continuously and permanently marked with the following information: Manufacturer's name, pipe size, schedule, type, working pressure at 73 degrees Fahrenheit, and NSF approval.

c. All solvent welded PVC pipe and joints are to be primed with pipe primer. The type of glue and primer shall be per the pipe manufacturer’s recommendations or directions.

d. Plastic Pipe, Fittings and Connections on Mains - All pipe shall be approved Type 1, Grade 1, PVC, Schedule 40 pipe, conforming to ASTM D-1784and D-2241, and shall be either solvent weld pipe or rubber ring joint pipe. When a connection is plastic to metal, either a PVC Schedule 80 nipple, brass nipple, or Schedule 80 male adapter shall be used. The male adapter shall be hand tightened plus one turn with a strap wrench.

(1) All risers shall be threaded, rigid PVC pipe.

(2) Compression couplings shall not be allowed on mainlines.

(3) All fittings shall be minimum Schedule 80 PVC.

e. Plastic Pipe, Fittings and Connections On Laterals

(1) All plastic pipe and fittings shall be PVC pipe and shall meet the following requirements:

1/2 to 2-inch = Schedule 40
2-3” inch = Bell gasket
3” & larger = Class 200

(2) All fittings shall be molded fittings manufactured of the same materials as the pipe and shall be suitable for either solvent

weld or screwed connections. Use male adapters as described above. Only Schedule 80 PVC pipe may be threaded.

f. All pipe (PVC or copper) installed in rocky or caliche (cemented) soils shall be thoroughly embedded and completely covered in sand or approved imported topsoil.

g. Installation of Plastic Pipe - Plastic pipe shall be installed in a manner so as to provide for expansion and contraction as recommended by the manufacturer. Plastic pipe shall be cut with a hand saw or hack saw with the assistance of a squared-in sawing vise, or in a manner so as to ensure a square cut. Burrs at cut ends shall be removed prior to installation so that a smooth, unobstructed flow will be obtained. Pipe for use with rubber gaskets will be tapered as recommended by the manufacturer.

E. Valves

Separate electric control valves shall be used to supply tree, shrub, and turf watering systems.

1. Electric Control Valves

a. Electric control valves shall be globe type valves of plastic construction, and have a minimum size of 1-inch.

b. Electric control valves shall be of a manufacturer approved by the City and shall be installed per manufacturer's recommendations.

c. A flow meter and master valve shall be installed between the backflow prevention device and the first electric control valve on systems that will be maintained by the City and will use Calsens controllers.

d. A schedule 80 PVC ball valve shall be installed in front of all electric control valves with unions in before and after the valve.

2. Ball Valves

a. Ball valves shall be Schedule 80 PVC in sizes of 1/2-inch through 2 1/2 inches, and ductile iron in sizes of 3 inches through 12 inches.

b. There shall be an isolation ball valve preceding every electric control valve.

3. Check Valves

a. Check valves 2 inches and smaller shall be swing type, bronze bodied with threaded connections and replaceable composition disc, rated at 150 pounds SWP.

b. Check valves 2 ½ inches and larger shall be swing type iron body, bronze mounted with flanged or threaded connections and replaceable rubber disc, rated at 126 pounds SWP.

F. Valve Boxes

All valve boxes shall be jumbo in size and have bolt securing lids and meet the following specifications:

1. Rectangle Boxes

   a. Turf areas - green

   b. Granite areas - tan

   c. Effluent uses - purple

2. Valve boxes shall be located in areas of decomposed granite wherever possible.

3. Round valve box (10-inch) shall be used for all isolation valves, wire splices, quick couplers, and flush caps.

4. All valve boxes shall have a 4-inch minimum pea gravel sump.

5. All valve boxes shall be permanently marked to identify irrigation zones types, station number, gate valves, wire splices, etc. Marking shall be performed as identified in the City's Approved Materials List for Landscaping.

G. Electric Controllers

1. Electric controllers shall be capable of operating on 115 volts, 60-cycle AC current, and shall provide output current of 25 to 26.5 volts at 1.1 amps for electric control valves, and 115 volts for a pump start circuit (if required). Controllers shall be pedestal mount or wall mount with factory supplied hardware for either. Controllers shall be sized to perform the watering efficiently and adequately.

2. The acceptable manufacturers and models are identified in the City's Approved Materials List for Landscaping.

3. A security cabinet is to be provided for each controller.

4. Controllers are to be grounded. Show details on final Irrigation Plans.

H. Backflow Prevention Devices

Only reduced pressure assemblies shall be used in the City.

1. Sizes shall be 1 inch to 2 inches.

2. Reduced pressure assemblies shall consist of an approved check valve, vacuum relief, inlet, discharge shutoffs and field testing cocks.

All nipples and other fittings shall be red brass. Reduced pressure assemblies shall be rated at 150 psi working pressure and shall withstand water temperatures to 160 degrees Fahrenheit.

3. Unions shall be installed on both the distribution side and discharge side of all reduced pressure assemblies.

4. A flow meter and a master valve shall be installed immediately following all reduced pressure assemblies that service the City-maintained areas.

5. The assembly shall be mounted 12 inches above the highest head in the system it is protecting, and adjacent to a fence or structure when available. Vacuum breakers must comply with local and state codes and the Foundation for Cross-Connection Control Research, USC.

6. Backflow prevention devices must be tested by a Certified Tester before the City accepts responsibility for maintenance of the system.

7. Backflow Prevention Assembly Enclosures

   a. All reduced pressure assemblies shall have a security enclosure mounted on a concrete pad. See the City Standard Details.

I. Booster Pumps

If the pressure is not sufficient to operate the sprinklers efficiently, the City may require a booster pump. This pump must be enclosed within a 6-foot high slump block wall along with the controller, vacuum breaker and all electric controls. Access is to be by a 6-foot wrought iron gate with wooden slats and a lock. Acceptable booster pumps are identified in the City's Approved Materials List for Landscaping. If a booster pump is used, a reduced pressure backflow prevention assembly will be required in lieu of a pressure type vacuum breaker.

7.6.4 TURF WATERING SYSTEMS

A. Sprinkler Heads

1. Turf heads shall be rotary pop-up or gear drive sprinklers, both part circle and full circle types.

2. Acceptable sprinkler heads are identified in the City's Approved Materials List for Landscaping.

3. All heads of a particular type of function in the system shall be of the same manufacturer and shall be marked with the manufacturer's name and identification in such a position that they can be identified without being removed from the system. All sprinkler heads shall be set perpendicular to finished grades unless otherwise designated on the plans. Sprinkler heads shall be 4" from adjacent existing walks, curbs, or other paved areas shall be set to grade. All nozzles on rotary

pop-up sprinklers shall be tightened after installation. All sprinklers shall be tightened after installation. All sprinklers having an adjustment stem shall be adjusted on a lateral line for the proper radius, diameter and/or flow rate.

4. Swing Joints - All sprinklers and quick couplers shall be installed on prefabricated swing joints.

7.6.5 IRRIGATION SYSTEMS

A. Irrigation Systems in Medians

The irrigation system is to be located entirely within the median, with the exception of control valves which may remain in the right-of-way behind the curb & gutter.

B. Irrigation Systems for Trees and Shrubs

Watering systems for trees and shrubs shall use separate electric control valves.

1. An emitter system with electric control valves, Y-strainer, and pressure regulating valve.
2. A bubbler system with electric control valves shall be used for palm trees only.
3. A drip system with electric control valves using a multi-port distributor, and 1/4-inch poly tubing shall convey the water. No length of poly tubing shall be longer than 6 feet.
4. A “deep watering system” shall consist of a 4-inch diameter perforated pipe. The pipe shall be buried 18 inches deep with the end of the 1/4-inch emitter distribution line at the bottom. A 4-inch drain grate shall be used to cover the top opening of the pipe. The perforated pipes shall be located 1foot outside the drip line.

7.7 NON-PAVED TRAILS

7.7.1 GENERAL INFORMATION

A. Purpose

This section describes the City’s Non-Paved Trail Design Standards. It is intended for general use in the planning, design, and plan preparation processes. In addition to acquainting designers and developers with these standards, it should assist them in submitting plans through the plan review process in an efficient and timely manner.

B. Definitions

1. Trail - For the purposes of this document, a trail shall be defined as a route or path which has been prepared or designated for recreational functions. This manual presents guidelines applicable to foot, horse, and bicycle trail usage that can occur on an unpaved trail surface. Trails are not simply avenues to get from one place to another; rather they offer the user opportunities to participate in numerous recreational activities. Providing quality recreational opportunities while protecting the resource is a major trail management concern and challenge. The information in this manual should be used as a guideline. Each trail needs its own plan of operation.
2. Urban Trail - Urban trails are those trails which occur in areas of urban or suburban densities, or where improvement of the trail surface is necessitated by the nature of the development within which it occurs.
3. Rural Trail - Rural trails are those trails which occur in natural washes or other natural areas, and require little improvement of the trail surface.
4. History of Use Corridor - These trails are those trails which have been established by historical use, however are not currently protected by right-of-way or some similar method to preserve the use.
5. Supplemental Trails/Urban Easements - These are additional trails which provide access to the main trail network. These may also include existing equestrian easements. These are normally provided for and maintained by the adjoining landowners.

7.7.2 LOCATION STANDARDS

A. Urban Trails

Urban trails provide readily available recreation and aesthetic amenities by enhancing natural or manmade open spaces. These trails can also provide for possible routes for non-motorized circulation throughout the urban network. Refer to the City’s General Plan for designated trail locations.

B. Supplemental Trails

Additional trails shall be required in areas where development would block access to the main trail system.

C. Underpasses/Overpasses

Grade-separated crossings shall be provided for crossing major streets where the crossing does not occur at a signalized intersection and where there is no safe alternative.

D. Bridges

These should be used to cross major barriers such as the Roosevelt Irrigation Canal. Site design and landscaping shall provide for the maximum possible retention of native plant materials on the site.

7.7.3 TRAIL NODES

A. Hiking Support Site

Facilities include year-round shade and water. Vehicular parking, not to exceed four spaces, is optional.

B. Equestrian Support Site

Facilities include water for people and horses, hitching posts, year-round shade, two to five parking spaces for trailers, and up to four spaces for regular parking.

C. Major Trail Head Site

Facilities include a corral, rest rooms, water for people and horses, year-round shade, five to eight trailer parking spaces, and eight to twelve regular parking spaces.

D. Design

All facilities shall be compatible with adjacent development.

7.7.4 TRAIL DESIGN

A. Urban Trails

1. Minimum Clearances

a. 15-foot minimum right-of-way or easement for trails.
b. 8-foot minimum width of clear trail surface.
c. 10-foot vertical clearance from surface.
d. 3-foot lateral clearance from edge of trail 3-foot above surface.
e. Distance from back of curb to edge of trail

(1) 25 feet along expressways, freeways, and parkways
(2) 15 feet along arterials
(3) 9 feet along major collectors
(4) Elsewhere - maximum distance feasible

2. Sight Distance

a. As a trail approaches within 100 feet of a street intersection, the maximum height of landscaping and wall between the trail and the curb shall be
4 feet.

b. Trail facilities shall not infringe upon typical sight distance.

3. Alignment

a. Except in areas of steep grades, trail alignments should not weave excessively or abruptly.

b. Grade changes should not be abrupt.

c. Where alignment changes are necessarily abrupt or tight, additional clear trail surface(s) should be provided.

d. Where applicable, grades shall meet current ADA accessibility requirements. In other areas, grades shall not exceed a maximum of 12%. This grade may be able to be increased for short distances, with approval from the City Engineering Department.

e. Clear trail surfaces shall flare to 14 feet wide within 24 feet of signalized intersection crossings.

4. Drainage

a. Trails should not occur within detention or retention basins. Any exceptions must have Engineering Department approval.

b. Grading and surface treatments adjacent to the trail should not allow impounding of water or excessive erosion of soil material onto the path.

c. Where trail grades are greater than or equal to 6%, water bars shall be provided at 100-foot intervals in order to control erosion of the trail.

d. When a trail occurs in a developed drainageway, nuisance water bars shall be provided at 100-foot intervals in order to control erosion of the trail.

e. Where drainage structures or culverts block trails in drainageways, bypass routes are to be provided around the obstruction.

5. Trail Surface

a. Native soil is to be used whenever possible.

b. Decomposed granite or gravel can be used, if compacted; maximum size of gravel is 3/8-inch.

c. Where concrete surfacing is required (e.g. bridges, underpasses, crossings, etc.), only rough (broom) finished or other approved texturing will be accepted.

d. Stable earth, chopped branches and leaves, or other finely ground organic materials may be used on the trail if they are worked into the top 2 to 4 inches of soil under the trail.

6. Trail Construction

a. Provide 1/2-inch crown on graded slopes of less than 3% grade.

b. Provide 2- to 3-inch out-slope on steeper graded trails.

c. Stake the trail alignment until all adjacent development and construction is completed.

7. Safety Barriers

a. Application criteria - Structural safety barriers or suitably dense landscaping shall be required on the street side of trails:

(1) The trail is closer to the roadway than the suggested design criteria by the City

(2) If the trail shares an underpass or overpass with a roadway

(3) Where the trail is elevated above an adjacent roadway and the side slope is steeper than 6:1.

(4) These railings are to be compatible with neighborhood development and/or topography.

b. Minimum Height:

(1) 4.5 feet, if structural

(2) 5 feet, if landscaping

c. Design - The materials and character of such barriers shall be compatible with adjacent development and landscaping.

B. Rural Trails

1. Minimum clearances

a. 15-foot minimum right-of-way or easement for trails not in street or scenic corridor right of way.

b. 8-foot minimum width of cleared trail surface.

c. 10-foot vertical clearance from surface.

d. Distance from back of curb to edge of trail – maximum distance feasible

2. Alignment - The trail should follow the contours of the natural topography whenever reasonable.

3. Drainage

    a. Erosion control measures are to be provided wherever the trail grades exceed 12%. Logs, railroad ties, and hand-set boulders may be used.

    b. Where roadways obstruct trails in washes, bypass routes are to be provided.

4. Trails Surface - Larger native rocks are to be moved to the side of trail tread.

5. Trail Construction - Trail improvement is to be generally limited to brush clearing, branch trimming, and signage.

6. If a trail follows a roadway, locate the trail as far as possible from the roadway.

C. Underpasses / Undercrossings

1. Dimensions

    a. 12-foot minimum trail width.

    b. 8-foot minimum height above trail surface at 4 feet from trail centerline.

    c. 10-foot minimum height above surface within 3 feet of trail centerline.

2. Lighting - Light wells shall be provided at the median location on arterials and expressways. Such wells shall be covered by a grate, flush with the top of the median curb and with a maximum gap opening of 1 inch.

3. Drainage

    a. The underpass design shall not allow nuisance water to stand on the path. If water does not drain from the underpass by gravity flow, a system must be provided to pump water from the underpass.

    b. The design of the approaches shall preclude the erosion of local soil or vegetation material into the underpass.

4. Surface - The trail surface shall be sand, compacted decomposed granite, or brushed concrete. Nuisance water shall not be allowed to stand on the surface.

D. Overpasses/Bridges

1. Dimensions

a. 15-foot minimum width.

b. Minimum railing height:

(1) 10 feet on structures over streets, canals or washes

(2) 4.5 feet elsewhere

2. Alignment

a. Helical approaches are not allowed.

b. Extend approach railings a minimum of 12 feet from the end of the structure.

c. Maximum grade on ramped approaches is 12%.

d. Extend approach railing to beginning of ramp.

e. Flare approach railing except where no room is available next to roadways.

f. Any bank slopes at the approaches shall be protected to avoid excessive erosion.

3. Drainage - The design shall not allow nuisance water to stand on the trail.

4. Construction

a. Use a solid concrete barrier base between the trail and the roadway when the trail bridge is built as an integral part of a roadway bridge.

b. If the trail surface grade on an overpass or bridge is less than 2 %, drains shall be provided to avoid ponding on the trail surface. The drain shall be covered by a non-skid grate which is flush with the surface of the trail.

c. The overpass type of cross section on railing shall be used wherever the trail crosses over a street or canal or is built as part of a street bridge.

d. The trail surface on a structure using the overpass type of cross section shall be broom-finished concrete. Creosote-treated wood is also acceptable on structures using the bridge type cross section if the maximum trail grade on the structure is less than 6%.

7.7.5 SIGNAGE

A. Locations

1. Trail crossing sign shall be 50 feet from street crossings

2. Trail markers

a. At trail intersections

b. At abrupt or major changes in trail direction

c. At intervals no less than 1000 feet, if that frequency is appropriate. Effort should be made to only use signs when required for safe trail use and to guide along the trail.

d. At trail access points/trail heads.

B. Locating

1. On wall side of trail when wall is on one side only.

2. Staggered on both sides elsewhere.

C. Posts and Signs

1. Post burial depth: 2.5 feet

2. Installed height: 2.5 feet or 8 feet

3. Materials – note that other material can be approved by the City Engineering department:

a. 3-inch diameter metal tubing or pipe

b. 4-inch diameter treated wood posts

c. 0.080-gauge aluminum sign blanks

4. Construction

a. Lettering, markings, and border on trail markers is white, background is dark green.

b. Trail crossing signs standard highway type warning sign.

c. When signage is to be located within 9 feet of back of curb, install to a height of 8 feet.

d. Typical trail markers are installed to a height of 2.5 feet.

e. Smaller signage may be used on rural trails or as approved by the City Engineering department.

7.7.6 TRAIL ACCESS GATES

A. General Information

1. These gates are to discourage motor vehicle access to trails, except as required under City Ordinance. They should be located at trail heads, where trails cross major roads, and at other points where vehicles are likely to try to access a trail. These structures should be made of heavy gauge metal, concrete, native boulders, or other durable and maintenance-free materials.

2. Native boulders used for gates shall be approved by the City Engineering Inspector.

7.7.7 RESTRICTED LANDSCAPING

It is recommended that plants that may be harmful to humans and animals not be located in close proximity to trails. Plant material recommended to be located at least 8 feet from the edge of the cleared or designated trail tread can be found in ADWR's "Low Water & Drought Tolerant Plant List" and the City's "Trees for Public Spaces". In natural areas this shall not be construed to encourage the removal of native plants.

7.8 NATIVE PLANT SALVAGE

7.8.1 GENERAL

Prior to clearing or grading native desert lands, it is recommended that the Arizona Department of Agriculture be contacted to determine what requirements, if any, may need to be followed for the salvaging of native protected plants.

CHAPTER 8

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8.1 PROJECT DEVELOPMENT

8.1.1 SITE PLANS

Any construction work that will require a permit from the City Engineering Department shall provide information to the City in the form of a Site Plan or Preliminary Plat, unless otherwise approved by the City Engineer. Information regarding preliminary plats can be found in Chapter 9 of this manual.

A development Site Plan shall show all engineering-related information for all existing and proposed infrastructure improvements within and adjacent to the site. At a minimum, the following items should be shown on a Site Plan if applicable: potable water infrastructure, sewer infrastructure, reclaimed water infrastructure, drainage infrastructure and features, traffic infrastructure and related improvements, refuse collection areas, landscaping, and other information required by the City to evaluate the proposed development.

Overall requirements for the submittal of Site Plans are set forth in the City's Zoning Ordinance; however, the Engineering-related items reviewed as a part of a Site Plan submittal are identified in this chapter. Other sections of the City Code should also be referenced for information regarding Site Plan development.

A. General Requirements

1. Site Plans shall generally provide information similar to that required of preliminary plats in Chapter 9 of this manual. This includes but is not limited to existing background information, design reports, plan sheet information, etc., unless otherwise not required by the City Engineering Department.
2. The following additional requirements apply to the preparation of site plans. Some of the requirements may be waived if it is demonstrated that the requirements are not appropriate because of the size or nature of the development:

    a. For site plans with multiple, separate pads, show pad dimensions and provide pad identification labels.

    b. All site plan drawings and associated reports that provide information related to the Engineering review of the development shall be sealed and signed by a Registered Engineer licensed to practice in the State of Arizona.

B. Dedications and Abandonments by Separate Instrument

Dedication or abandonment of public rights-of-way or easements that will be recorded by means of an instrument other than those identified in Chapter 9 of this manual shall be processed using the City's "Application for Dedication or Abandonment". Copies of this document can be found

on the City Engineering Department website or by contacting the Engineering Department.

C. Site Plan Notes

The following notes shall be shown on all approved site plans:

1. IMPROVEMENTS MADE WITHIN A CITY RIGHT-OF-WAY, TRACT, OR EASEMENT THAT WILL BE MAINTAINED IN THE FUTURE BY THE CITY OF GOODYEAR SHALL BE CLEARLY IDENTIFIED ON THE APPROVED PLANS AND ARE SUBJECT TO THE FOLLOWING REQUIREMENTS. IMPROVEMENTS MAY INCLUDE BUT ARE NOT LIMITED TO STREET SURFACES, CURB, GUTTER, SIDEWALKS, RAMPS, DRIVEWAYS, TURN BAYS, BUS BAYS, STREET LIGHTING, SIGNAGE, AND STRIPING. LANDSCAPE RESPONSIBILITIES ARE IDENTIFIED UNDER SEPARATE NOTE:

   a. THE DEVELOPER SHALL MAINTAIN AND WARRANTY ALL IMPROVEMENTS FOR A PERIOD OF TWO YEARS BEGINNING IMMEDIATELY AFTER THE CITY ISSUES THE NOTIFICATION OF APPROVAL FOR THE PROJECT.

   b. DURING THE MAINTENANCE AND WARRANTY PERIOD, THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE PROTECTION OF ALL IMPROVEMENTS. ANY DAMAGED IMPROVEMENTS SHALL BE IMMEDIATELY REPAIRED OR REPLACED AT THE DEVELOPER'S EXPENSE.

   c. MAINTENANCE SHALL INCLUDE BUT IS NOT LIMITED TO STREET SWEEPING, APPLICATION OF SEALANT IN ALL PAVEMENT CRACKS AND JOINTS, AND APPLICATION OF SEALANT OVER ALL ASPHALT PAVEMENTS.

   d. AT THE TERMINATION OF THE MAINTENANCE AND WARRANTY PERIOD, ALL IMPROVEMENTS SHALL BE UNDAMAGED AND SHALL MEET CITY STANDARDS.

   e. IF ALL IMPROVEMENTS ARE NOT ACCEPTABLE AT THE END OF THE TWO-YEAR PERIOD, THE MAINTENANCE AND WARRANTY PERIOD SHALL CONTINUE UNTIL THE IMPROVEMENTS MEET CITY APPROVAL.

2. LANDSCAPED AREAS THAT WILL BE MAINTAINED IN THE FUTURE BY THE CITY OF GOODYEAR SHALL BE CLEARLY IDENTIFIED ON THE APPROVED PLANS AND ARE SUBJECT TO THE FOLLOWING REQUIREMENTS. THESE AREAS MAY INCLUDE RETENTION BASINS, PARKS, RIGHTS-OF-WAY, AND STREET CENTER MEDIAN LANDSCAPING:

a. THE DEVELOPER SHALL MAINTAIN AND WARRANTY ALL LANDSCAPE IMPROVEMENTS, INCLUDING PLANTED AREAS AND IRRIGATION SYSTEMS, FOR A PERIOD OF TWO YEARS BEGINNING IMMEDIATELY AFTER THE CITY ISSUES THE NOTIFICATION OF APPROVAL FOR THE PROJECT.

b. DURING THE MAINTENANCE AND WARRANTY PERIOD, THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE PROTECTION TO ALL AREAS. ANY DAMAGED PLANTING AND/OR IRRIGATION SYSTEMS SHALL BE IMMEDIATELY REPAIRED OR REPLACED AT THE DEVELOPER'S EXPENSE.

c. MAINTENANCE SHALL INCLUDE CONTINUOUS OPERATIONS OF WATERING, WEEDING, REMOVAL OF DEAD PLANT MATERIAL, MOWING, ROLLING, FERTILIZING, SPRAYING, INSECT AND PEST CONTROL, RE-SEEDING, REPLACEMENT, AND ALL OTHER MEASURES NECESSARY TO ENSURE NORMAL HEALTHY GROWTH.

d. WHEN THE TURF HAS ESTABLISHED SUFFICIENT ROOT STRUCTURE AND HAS OBTAINED AN APPROXIMATE HEIGHT OF 3 INCHES, MOWING SHALL BEGIN IMMEDIATELY TO ACHIEVE A TURF HEIGHT OF 2 INCHES; THE TURF SHALL BE MOWED THEREAFTER TO SAFELY MAINTAIN THE 2-INCH HEIGHT.

e. AT THE TERMINATION OF THE MAINTENANCE AND WARRANTY PERIOD, ALL TURF AREAS SHALL BE LIVE, HEALTHY, UNDAMAGED, AND FREE OF INFESTATIONS. ALL AREAS SHALL BE COMPLETELY VOID OF BARREN SPOTS LARGER THAN 3 INCHES BY 3 INCHES.

f. IF ALL PLANTINGS ARE NOT ACCEPTABLE AT THE END OF THE TWO-YEAR PERIOD, THE MAINTENANCE AND WARRANTY PERIOD SHALL CONTINUE UNTIL THE LANDSCAPING MEETS CITY APPROVAL.

8.1.2 REFUSE COLLECTION

A. Collection Services

The City requires that all refuse shall be collected and disposed of by the City. If the City cannot provide the service, a private contractor may be issued a permit to provide this service. For information on schedules and collection fees, contact Utility Services in the Environmental Services division at 623-882-7887.

B. Refuse Enclosure – Construction

All service and construction of enclosures will be in accordance with Maricopa County Health codes, MAG Standards, this manual, and the City's Standard Details.

C. Refuse Enclosure – Requirements

All developments shall provide areas for refuse containers per the following guidelines:

1. Single Family Subdivisions

Refuse shall be placed at the curb in approved containers provided by the individual users or the City. Developers shall contact Utility Services in the Environmental Services division at 623-932-3010 to find out which type of collection system is being used in their particular area. Arrangements will be made for distribution of rules and regulations to new residents.

2. Multi-Family Developments

a. Multi-family developments will be required to contract with the City's refuse and recycle Contractor. Containers shall be provided as directed by the City's Contractor.

b. The Developer shall construct a concrete pad for the required container(s); pad dimensions are determined by the number of containers: the concrete pad shall be 10 feet wide by 10 feet deep by 6 inches thick for a single container, 13 feet wide by 10 feet deep by 6 inches thick for a double container station, or 19 feet wide by 10 feet deep by 6 inches thick for a triple container station. Measurements are all inside dimensions. See City Standard Details.

c. The container station shall be located immediately adjacent to an interior driveway or private street improved to City standards. The City will not be responsible for repairing any pavement damage incurred during normal collection activities. The concrete pad elevation shall match the adjacent pavement and shall be sloped to provide positive drainage. See City Standard Details.

d. All multiple container stations shall be located on the same side of the driveway, or private street so that the collection truck may be routed through the site in one direction only. Collection shall be from the right side of the truck.

e. The driveway or private street along which the container station is located shall provide access through the site or provide a turnaround with a 45-foot (minimum) turning radius if it is a dead end.

f. Container stations shall be free of all obstructions (adjacent to and above) for a distance of 20 feet.

g. Container stations shall be enclosed and gated. It shall be the Owner's responsibility to ensure that the gates are open when the City's collection truck arrives, or the collection will not be made. See City Standard Details.

3. Commercial/Industrial Developments

a. Refuse and recycle containers shall be provided by the Developer. The size of the container and frequency of collection required will be determined by the City on an individual basis determined by the amount of refuse generated. Compactors should be installed whenever practicable.

b. The 2- and 3-cubic yard container stations shall be located and constructed per the guidelines in the previous section covering multi-family developments.

c. Restaurants

The size of the concrete pad will be increased to 19 feet wide by 12 feet deep by 6 inches thick if other items such as grease cans, soft drink cylinders, or plastic trays will be placed inside enclosures with refuse containers.

8.1.3 WASTEWATER CONTROL

A. Swimming Pool Connections

1. Upon receipt of a City Discharge Permit, swimming pool wastewater will be allowed to be pumped to the sanitary sewer system through an indirect drain. Maximum pumping rate shall not exceed 1/2 of the calculated capacity of the receiving sanitary sewer, nor 100 gpm.

2. Indirect drain connections shall be designed, located, and constructed to exclude surface or underground water from entering the sanitary sewer system.

3. The indirect drain connection shall provide an air gap, equal to twice the diameter of the wastewater discharge pipe, between the lowest opening of the wastewater discharge pipe and the flood level rim of the receiving plumbing fixture.

4. Swimming pools having a pressure or gravity sand type filter shall be allowed to connect to the sanitary sewer only through an indirect drain.

5. Swimming pools having a diatomaceous earth type filter shall be allowed to connect to the sanitary sewer through an indirect drain, only if the diatomaceous earth type filter is equipped with a diatomaceous earth separation tank on the backwash wastewater line. All diatomaceous earth or other type filter aids shall be removed from the backwash water before the backwash water may be discharged to the sanitary sewer.

B. Laundry Room Facilities

1. Laundry rooms with ten or more washing machines shall be equipped with a 350-gallon lint interceptor, Smith Pre-Cast or approved equal.
2. No wastes other than those requiring treatment or separation shall be discharged into the lint interceptor.
3. Each interceptor shall be properly vented and shall have a cleanout on the discharge pipeline.
4. For outside installations, the interceptor shall be elevated 3 inches above existing grade to exclude surface water.
5. The interceptor shall be located as to be readily and easily accessible for cleaning and inspection.

C. Commercial Developments

1. Interceptors

a. Grease, oil, or sand interceptors shall be provided for laundries, restaurants, service stations, auto repair shops, car washes, and other facilities when the City determines they are necessary for the proper handling of liquid wastes containing excessive amounts of sand or grease, oil, flammable wastes, or other harmful ingredients.

b. All interceptors shall be of a type and capacity approved by the City and shall be located as to be readily and easily accessible for cleaning and inspection.

c. Grease and oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be watertight, of substantial construction, and equipped with easily removable covers. When bolted covers are required, they shall be gas-tight and watertight.

d. Where installed, all grease, oil, and sand interceptors shall be maintained by and at the expense of the Owner, and shall be in continuously efficient operation at all times.

2. Cross-Connections

No person shall connect any water-operated equipment or mechanism, or any water treating chemical or substance, to the City water system if it is determined by the City that such equipment, mechanism, chemical or substance may cause pollution of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with a backflow prevention device approved by the City. Written acceptance of a backflow prevention device must be received from the City Engineer or his designee.

D. Industrial Pretreatment

1. Preliminary Treatment Facilities

   a. Preliminary treatment facilities are required where necessary or as determined by the City; any user of the City's sewer system shall provide, at their expense, such preliminary treatment as may be necessary to reduce objectionable characteristics or constituents to within the maximum limits provided for in Chapter 12 of the Goodyear City Code.

   b. Plans, specifications, and any other pertinent information relating to proposed preliminary treatment facilities shall be submitted for the approval of the City Engineer.

   c. No construction of such facilities shall commence until approval is obtained in writing from the City Engineer or his designee. The completed facilities shall not be placed in service until they have been inspected for conformance to the Approved Plans and the final construction has been approved by the City Engineer or his designee. The approval of the plans and inspection of construction shall not relieve the Owner from complying with discharge limitations set forth in Chapter 12 of the Goodyear City Code.

   d. The City shall also enforce federal pre-treatment requirements as set forth in the Code of Federal Regulations, Title 40, Part 403.

2. Cross-Connections

   No person shall connect any water-operated equipment or mechanism, or any water treating chemical or substance, to the City water system if it is determined by the City that such equipment, mechanism, chemical or substance may cause pollution of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with a backflow prevention device approved by the City. Written acceptance of a backflow prevention device must be received from the City Engineer or his designee.

3. Control Vaults

   a. For uses identified in Table 8.1-1, or when required by the City, the Owner of any property served by a building sewer carrying potentially harmful or other industrial wastes shall install an industrial waste control vault in the building sewer to facilitate observation, measurement, and sampling of the wastes.

   b. Such control vault, when required, shall be:

      (1). Accessible, safely located, and constructed in accordance with plans approved by the City Engineer or his designee.

      (2). Installed by the Owner at their expense and shall be maintained by the Owner so as to be safe and accessible at all times.

(3). If a manhole servicing only one industrial user is available for sampling, this requirement may be met by installing a lockable watertight shutoff valve in the service line upstream of the sampling manhole.

TABLE 8.1-1: Businesses Requiring Control Vaults

Electroplating	Feedlots	Coil coating	Copper forming
Ink formulating	Grain mills	Laundries	Metal finishing
Adhesives manufacturing	Aluminum forming	Asbestos manufacturing	Battery manufacturing
Carbon black manufacturing	Ferroalloy manufacturing	Fertilizer manufacturing	Glass manufacturing
Iron and steel manufacturing	Food Processing Plants	Leather tanning and finishing	Paint formulating
Petroleum refining	Pharmaceutical manufacturing	Porcelain enameling	Printing and publishing
Textile mills	Sugar processing	Rubber manufacturing	Timber processing
Metal molding and casting (foundries)	Nonferrous metals manufacturing	Pesticide chemicals manufacturing	Plastic Manufacturing / Molding
Pulp, paper and paperboard manufacturing	Foundries (metal molding and casting)	Soap and detergent manufacturing	Steam electric power generating
Electrical / electronic components manufacturing	Tar and asphalt paving / roofing materials manufacturing	Mechanical products manufacturing	Inorganic chemicals manufacturing

8.1.4 VEHICLE PARKING

All developments shall provide for on-site vehicular parking per the current City of Goodyear Zoning Ordinance.

8.1.5 FIRE DEPARTMENT ACCESS

A. General Information

All developments shall provide access for Fire Department Vehicles and personnel per the adopted City Fire Code. The Fire Department has the right of final approval and may have additional requirements for unique situations. Requirements of the Fire Department shall supersede these standards in all instances.

The required minimum number of access points for single family and multi-family residential projects is regulated by the International Fire Code, as adopted and amended by the City of Goodyear.

B. Access Width and Turning Radius

1. A 20-foot wide (minimum) lane is required for typical Fire Department access. See City Standard Details.
2. A 26-foot wide (minimum) lane is required for Fire Department access when the building height is 30 feet or greater, measured from the point of Fire Department access to the roof level. Tilt panel or similar construction shall be measured to the top of the parapet.
3. A minimum 28-foot inside turning radius and 48-foot outside radius is required at all entrances and interior driveway intersections where access is required.
4. Ladder truck access is required for all developments except the following:

    a. Single or multi-level mini-storage facilities when the office is located adjacent to a public street.

    b. Storage yards when non-combustible materials are the only items stored.

C. Building Access

1. Buildings shall be located so that Fire Department apparatus may be parked within 150 feet of the farthest point on the ground floor of the building. This 150-foot dimension is measured along the route a person would follow from the truck to a given point on the building.
2. A fire sprinkler system shall be installed per Fire Code requirements. Specifications for the sprinkler system vary with the type of development. It is the Developer's responsibility to contact the Fire Department to determine the specific requirements for the development.
3. FDC shall be per the Potable Water Section - Chapter 5 of this manual.
4. Retention areas shall not be considered as part of the required access.
5. Vertical clearance shall be a minimum of 13½ feet.
6. A minimum 10-foot setback from fire lanes shall be maintained.

7. Any roadway intended for Fire Department access shall not have a grade greater than 8%.
8. At a minimum, Fire Department access roads shall be improved to the residential street cross section standard or per City Standard Details.
9. Fire lane signs shall be posted on Fire Department access roads perpendicular to the flow of traffic. Signs shall be visible from both directions and mounted 5 to 7 feet above final grade. Signs shall be installed a maximum of 100 feet apart and at any horizontal change in direction. See City Standard Details.
10. The Fire Department does not allow speed bumps or any obstructions that may impede an emergency vehicle response on a Fire Department access roadway.
11. Multi-unit occupancy buildings shall post building numbers and / or directional signage, as approved by the Fire Department, when structures are located adjacent to the fire lane. All types and styles of building numbers and directional signage shall be approved by the Fire Department.

D. Private Security Gates

Private security gates, which in the opinion of the Fire Chief and/or the Police Chief hamper the adequate responses to emergencies by Public Safety Services, shall be equipped with a Pre-Emption Device approved by the Fire Department.

1. The equipment shall be capable of fail-safe operation in case of power loss. In the event of an emergency, a means shall be provided to leave gates unlocked.
2. An approved list of devices may be obtained by contacting the City of Goodyear Fire Department.

8.1.6 RESIDENTIAL PROPERTY LINE WALLS AND FENCES

All walls constructed on residential property lines are subject to the following standards:

Except at street corners and driveways where line-of-sight requirements govern wall height, walls between single family residential lots (or between such lots and public alleyways) shall not exceed 6 feet in height. Walls on residential lots abutting non-residential zone/use shall be 6 feet minimum or higher if required by the City, and shall be constructed of such materials and shall use such methods to ensure that the wall will not constitute a hazard. The appearance of the wall shall meet the standards of the neighborhood; any substandard wall is prohibited.
All walls and fences bordering alleyways where garbage or trash is collected shall provide an indentation into the wall at least 3 feet deep by 8

feet wide, and shall have a minimum vertical clearance of 4 feet for the placement of refuse cans. Gate swings shall not encroach on the minimum area. A provision may be made to fill the cans from inside the wall, or the indentation may be the full height of the wall. The indented area shall have a concrete floor 3 inches thick, set 1inch above grade.

Masonry walls shall have a reinforced footing of a minimum width of 25% of the wall height and a minimum depth of 8% of the wall height, and shall otherwise be reinforced as a "non-bearing masonry wall" as defined by the International Building Code as adopted.

8.1.7 LANDSCAPING

All developments shall provide for on-site and right-of-way landscaping per the City of Goodyear Zoning Ordinance and Chapter 7 of this manual.

CHAPTER 9

SUBDIVISIONS

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9.1 SUBDIVISION PLATS

9.1.1 GENERAL INFORMATION

This chapter describes the City Engineering Department requirements for the preparation of preliminary and final plats for subdivisions, condominium development plats, amended plats, and for maps dedicating land to the public and easements for public use.

Additional requirements for development of these documents are found in Chapter 15 ("Subdivision Regulations") of the City Code of Ordinances, City Zoning Ordinance, City Floodplain Management Code, specific zoning stipulations, and/or established development agreements. The Applicant is responsible for meeting these requirements.

9.1.2 PRELIMINARY PLATS

A. Purpose

The Preliminary Plat is a document that provides a general layout design for a subdivision. The purpose for providing this document is to evaluate if the design is suitable for the land and to ensure compliance with the City's development regulations. Generally, a Preliminary Plat shall show the location of proposed and existing streets, proposed traffic-related improvements, proposed and existing water, reclaimed water, irrigation and sewer systems, proposed and existing stormwater management systems, the size and configuration of each proposed lot and tract, and all other information needed by the City to evaluate the design of the proposed subdivision. Reports such as Preliminary Drainage, Water, Sewer, Reclaimed Water, and TIA shall be provided as applicable with the submission of a Preliminary Plat. See the appropriate sections of this manual for information as to the development of these reports.

In addition to the information provided herein, a Preliminary Plat shall also be in conformance with those City regulations identified in the General Information section of this chapter.

B. General Preparation & Submittals

The following requirements apply to the preparation and submission of a Preliminary Plat for a subdivision:

1. If an application for a preliminary plat is not signed by the property owner(s) as reflected in the title report, the application shall be accompanied with an authorization letter from the property owner(s) stating that the applicant is authorized to represent the property owner(s) in this application.
2. All Preliminary Plat sheets shall be signed and sealed by a Professional Engineer or Surveyor licensed by the State of Arizona.

3. The drawing of the Plat shall be to a scale no greater than 1inch = 100 feet and no less than 1inch = 60 feet. A Plat drawn to a scale of 1inch = 50 feet may be submitted if the subdivision is equal to or less than 10 acres in size.
4. All plans and drawings shall meet the minimum requirements for lines, lettering, and numbers as outlined in Chapter 2 of the EDS&PM.
5. Preliminary Plat drawings shall be oriented such that north always points in the same direction. North may be oriented toward the top of the sheet or toward the right side of the sheet, but all drawings shall be oriented the same. The top of the sheet is defined as having the 36-inch dimension. The side of the sheet is defined as having the 24-inch dimension. All notations should be oriented to read with north pointed up. A north arrow shall be provided in a prominent manner on all drawings, with a bar scale indicating the scale of the drawing.
6. If a large parcel of land is intended to be subdivided by means of recording several plats over a period of time, it is not recommended that a Preliminary Plat be approved for the entire parcel. It is recommended that first a Master Plan for the entire property be submitted and approved. Following the Master Plan approval, it is recommended that preliminary plats, followed by construction plans and final plats, be submitted for only those phases of the parcel that will be developed. See also the Zoning Code for direction on submittal of Master Site Plans.
7. Any development on property containing protected native plant material shall submit a copy of the Native Plant Salvage Program as required by the State of Arizona.
8. Because of the unique and peculiar problems inherent in the development of hillside areas, special standards and conditions for hillside development areas must be considered. When approved by the City Engineer and Development Services Director, the special considerations associated with hillside development identified within this manual may be used to develop a preliminary plat submittal package.
9. A title report prepared for the property to be subdivided shall be provided to the City with a Preliminary Plat submittal. The title report shall be prepared within 30 days prior to the submittal to the City.
10. The property owner and any party, entity, or agency with a recorded deed restriction on the property (as identified in the title report) shall provide a letter to the City authorizing the approval of the preliminary plat for the property or the acknowledging a representative that has the legal rights to provide said approval.

C. Coversheet

1. The name of the proposed subdivision shall be shown prominently on the coversheet.
2. Following the subdivision name, state the Quarter Section(s) within which the proposed subdivision is to be located. For example: "A Subdivision of Part of the SE 1/4 of Section 10, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona." An accompanying complete legal description of the subdivision boundaries should be located somewhere on the first sheet.
3. The boundary lines of each subdivision shall be dimensioned completely with bearings and distances, curve lengths, central angles, radii, etc. The boundary lines shall be shown together with ties by course and distance to a minimum of two Section or Quarter Section monuments. The Section or Quarter Section monuments are to be used as the basis of bearing. All Section and Quarter Section monuments must be identified and notes must indicate whether they were found or set.
4. Provide a statement describing the identification, location, and elevation for at least two vertical control benchmarks for the development. Approved benchmarks are identified on the City of Goodyear Approved Benchmark List. The current list can be downloaded from the City Engineering Department website or by contacting the City Engineering Department. The vertical control datum to be used in the City of Goodyear is NAVD88 unless otherwise approved by the City Engineer.
5. Provide in block form in the lower right hand corner of the Plat the following information:
    a. The name, address, and telephone number of the individual or agency that prepared the Preliminary Plat.
    b. "Preliminary Plat for (name) subdivision."
    c. Date prepared and job number.
    d. Scale
    e. "Sheet ___ of ____ Sheets.
6. The name, address, and telephone number of the Property Owner, Developer and the Surveyor, Engineer, and/or Architect submitting the drawings shall be provided on the drawing set.
7. A table shall be provided on the coversheet that identifies the following information for tracts:
    a. Tract identification letter
    b. Tract area (to the hundredth square foot),
    c. Tract use,

d. Tract ownership, and

e. Party(s) responsible for tract maintenance.

8. Provide a vicinity map showing the relationship of the proposed development to the nearest existing and planned arterial and major collector streets and any other facility which might help to locate the subdivision.

   a. The orientation of the vicinity map must agree with the orientation of the Plat drawing.

   b. The vicinity map need not be drawn to a particular scale.

9. Provide a table on the Coversheet with the following information:

   a. existing zoning

   b. gross subdivision area in acres

   c. number of lots

   d. minimum lot size

   e. average lot size

10. If the Developer intends to have one Recorded Plat for the whole subdivision, but plans to phase the improvements, the Preliminary Plat should have a statement on the coversheet indicating this intent, and the proposed phasing should be shown by suitable markings on the Plat drawing. All temporary facilities necessary for phasing including cul-de-sacs, drainage facilities, infrastructure lines, valves, etc. should also be shown.

11. If the subdivision is to have an HOA or POA, indicate this on the coversheet with an appropriate statement as it relates to the duties and requirements as outlined in the CC&R's –e.g. maintenance.

12. List the amount of passive and active recreational open space being proposed.

13. List the total percentage of open space being proposed.

14. Provide a key map on the coversheet that shows the limits of the property to be platted, the proposed roadways, lot and tracts along with the identifying lot numbers and tract letters.

    a. The orientation of the key map must agree with the orientation of the Plat drawing.

    b. The key map shall be drawn to an appropriate scale such that the lot numbers and tract letters can be read.

15. Add the following notes to the coversheet of all designated hillside developments: Grading standards for lots, parcels and PAD sites.

a. Not more than 5% of a lot, parcel or PAD site shall be left with a cross slope steeper than the natural grade of the ground or steeper than 20%, whichever is greater.

b. All driveway and garage cuts shall be made at the time of street grading and before street improvements are installed.

c. The total area of all cuts and fills other than the enclosed floor area of the dwelling shall not exceed 10% of the lot, parcel or PAD site area.

d. Cut or fill slopes shall be entirely contained within the downhill lot.

e. All excavated material shall be removed from the premises, contained behind retaining walls or otherwise placed so that the slopes of any fill material will not be visible from any public street.

D. General Plat Sheet Requirements

1. Provide a legend with appropriate abbreviation and drawing symbol explanations. Chapter 2 of this manual indicates specific requirement with regard to symbols.

2. Show adequate topography (contours and/or spot elevations) to clearly describe the site. Topography information shall be shown on the same map as the proposed subdivision layout. Contour interval shall be such as to adequately reflect the character and drainage of the land

3. Show the location of all existing easements and rights-of-way, as well as existing features and man-made structures such as wet and dry utilities, fences, trees, wells, streams, washes, lakes, other water features, stormwater management features, canals, ditches, irrigation structures, flood zones, septic tanks, etc. within the boundary of the proposed subdivision.

4. Show the location and size of all driveways, rights-of-way, and easements on the property, adjacent to the property, and within 150 feet of the boundaries of the proposed subdivision. Identify adjacent properties by their subdivision name or as unsubdivided land and provide the Maricopa County Recorder's Office recording information (APN, Recording Number, Recording Book and Page, and/or Subdivision name). Provide the current zoning designation for all adjacent land.

5. Easement Requirements

a. No utilities (water, sewer, storm drain) shall be installed in an easement unless the property Owner has granted the necessary easement(s) and/or right(s)-of-way.

b. If approved, utilities outside of public rights-of-way shall be placed in easements of a width and length dimension as approved by the

City Engineering Department; easements shall not be less than 20 feet wide. The utilities shall be centered in the easement and shall be accessible from a public right-of-way.

c. Easements wider than 20 feet may be required if other utilities are also located in the easement, or if additional area is needed to grant access to maintenance equipment due to the size and/or depth of the line(s). Easements shall be free of obstructions, shall not be located in a fenced area, and shall at all times be accessible to City service equipment such as trucks, backhoes, etc. Areas in question shall be approved in writing by City staff.

6. Number all lots sequentially and identify all tracts by letter. Provide dimensions to indicate the sizes of all lots and tracts.

7. All preliminary plats shall show required setback lines. Proposed building envelopes or construction disturbance areas may also be required.

8. Each tract or area which is not to be a lot or public right-of-way shall be designated as a tract.

9. Care should be taken in establishing the size and shape of corner lots. A corner lot should not be so small or narrow that the space left for construction of homes and fenced yards is not adequate for the builder or ultimate homeowner.

   The space limitations on corner lots are:

   a. Almost all corner lots will have an 8-foot PUE adjacent to the property line in the yard facing the side street as well as in the front yard.

   b. A minimum 33-foot by 33-foot sight visibility triangle per City Standard Details shall be required and shown adjacent to the intersection on all corner lots.

   c. Where a corner lot abuts a key lot, the height and location of walls and fences in the yard facing the side street must conform to the front yard requirements for walls and fences.

10. Lots with drainage easements, along subdivision perimeters, or on adverse terrain (or where substantial cuts or fills occur) will typically be larger than the average lot size.

11. Boundaries of the parcel of land to be subdivided shall be fully dimensioned with both bearings and distances.

12. The plat shall show the location, width, centerline dimensions, curved radii, crosswalks, connections to adjacent properties, and proposed names of all public and private streets. The street layout and design shall conform to the requirements of Chapter 4 of this manual.

13. All sewer designs shall conform to the requirements of Chapter 6 of this manual.
14. All water designs shall conform to the requirements of Chapter 5.1 of this manual.
15. All reclaimed water designs shall conform to the requirements of Chapter 5.2 of this manual.
16. All stormwater drainage designs shall conform to the requirements of chapter 3 of this manual.
17. All landscaping designs shall conform to the requirements of chapter 7 of this manual and the City Zoning Ordinance.
18. All land to be dedicated or reserved for public use shall be clearly identified and the use clearly indicated.
19. If plat includes land for which multi family, commercial or industrial use is proposed, such areas shall be clearly designated, together with existing zoning classifications and status of zoning change, if any.
20. Access shall be identified to provide for the inspection and maintenance of stormwater management facilities
21. If the property being subdivided is within a hillside development area, then the following information must also be provided:

    a. Any proposed special design standards.
    b. Topographic map of existing terrain with contour intervals adequate to show the nature and variations in the terrain; two foot intervals for grades less than 15%; five foot intervals for grades greater than 15%; elevations of critical spots, rock outcrops and special characteristics; cross sections or profiles shall be provided in areas that require structures such as retaining walls or otherwise have unique configurations.
    c. Drawing showing building area envelope and proposed building pad finished grade for each lot in conformance with the grading and drainage regulations required by the city (in accordance with the City's Engineering Standards), showing the natural topography of the total parcel to be platted, the location and size of all structures, the finished grade at all improvement locations and the depth and extent of all cuts and fills.
    d. Road profiles and cross sections at all significant changes in the cross slopes; the cross section to show proposed and natural grade at the centerline of the road, edge of roadway, the right of way line and the proposed building setback lines.
    e. Street and private access way grades shall conform as closely as possible to natural topography, but shall not exceed 15%. Street grades exceeding 12% shall have a maximum length of 600 feet.

f. Upon approval of the City Engineer, horizontal alignments may provide curves with less than 100 feet centerline radius.

g. Upon approval of the City Engineer, alternate methods of turning and backing areas may be substituted for turnarounds.

h. Location of all proposed driveways.

i. Upon approval of the City Engineer, required paving width of the traffic lanes may be modified when off street parking bays are provided, developed and paved in the public right of way.

j. The centerline of the paving may be offset from the centerline of the right of way to provide parking bays in the right of way.

k. Where equestrian trails are approved along the roadway, the trail may replace the sidewalk on the upgrade side of the right of way.

l. Vertical curbs shall be required on the downhill side of streets having grades of 6% or greater; concrete U or V gutters may be installed in lieu of conventional rolled or vertical curbs elsewhere.

m. On a corner lot, no grading shall be allowed which results in the ground level being raised so as to obstruct the vision more than a height of three feet above the grade of either street within an area formed by the lot lines on the street sides of such lot and a line joining points on such lot lines located a distance of 33 feet from the point of their intersection.

n. Transverse street cross sections (one way graded streets) with the gutter on the uphill side may be used where approved by the City Engineer.

o. All cut and fill slopes shall be within the roadway right of way or roadway easement; slope maintenance easements for roadway cuts and fills may be required by the City Engineer.

p. Private access ways may be permitted to provide access to lots in lieu of the required street frontage. Each private access way serving one lot shall be a minimum of 20 feet wide with a minimum paved surface of 12 feet in width, and each private access way serving more than one lot shall have a minimum paved surface of 24 feet in width or as may be otherwise required by city standards and specifications. Where needed, additional easements for drainage or utilities shall be provided.

q. Driveway grades shall be no greater than 12%. Driveway grades up to 20% may be approved by the City Engineer upon demonstration that the inflection point between the street and the driveway will not render the lot inaccessible.

r. Building sites shall be free of geological hazards.

s. Soils report (prepared in accordance with the City's Engineering Standards); and,

t. Conservation easements exhibit that identifies protective easements on slopes too steep to develop.

22. If the property being subdivided is within 500 feet from an existing or proposed freeway alignment, and the property is intended for future residential development, then a sound attenuation plan will be required. The approval of the sound attenuation plan must occur prior to approval of the preliminary plat (Section 9-1-3 COGZO).

23. A preliminary grading and drainage plan that conforms to the City Design Standards and matches the information shown on the preliminary drainage report shall be provided with a preliminary plat submittal.

24. Preliminary Plats shall be developed in compliance with:

    a. Regulations and standards as may be established by a County Flood Control District relating to the construction or prevention of construction of streets and lots in land established as being subject to inundation by stormwater;

    b. Regulations and standards as may be established by ADOT relating to provisions for safety of entrance upon and departure from abutting state primary highways;

    c. Regulations and standards as may be established by the State Department of Health Services or a County Health Department relating to the provision of domestic water supply and sanitary sewerage disposal;

    d. Regulations and standards and/or guidance as may be established by County Flood Control District relating to erosion and sediment control at AZPDES regulated construction sites (construction sites with one acre or more disturbed area or if the activity is part of a larger common plan of development or sale that would disturb one acre or more).

25. All utilities shall be installed underground in the streets or private access ways. Water and public sewer service shall be provided to each lot.

26. The locations, orientations, building materials, roof pitch, and color palette of all proposed cluster mailboxes within a development shall be included as part of the preliminary plat submittal package. At a minimum the locations shall be shown with the Landscaping sheets but may also be shown on other sheets as well. The architecture (including building materials and colors) shall compliment the architecture of the subdivision.

27. A table shall be provided listing each lot's square footage.

28. All utility providers shall be identified on the coversheet of the plat.

29. Provide lot width dimensions as follows:

a. If the side property lines are parallel, the shortest distance between these side lines. This can be done by a typical lot detail.

b. If the side property lines are not parallel, the length of a line at right angles to the axis of the lot at a distance equal to the front setback required for the zoning district in which the lot is located. The axis of a lot shall be the line joining the midpoints of the front and rear property lines.

E. Reports & Plans to Submit in Conjunction with a Preliminary Plat

See the relevant chapters in this manual for information on the preparation of these reports and plans:

1. Preliminary Grading and Drainage Plan
2. Preliminary Drainage Report
3. Utility Plan Master Sheet – a plan sheet that shows the proposed water, sewer, and reclaimed water lines on no more than two plan sheets.
4. Preliminary Sewer Report
5. Preliminary Water Report
6. Preliminary Reclaimed Water Report
7. Traffic Impact Analysis (TIA)

9.1.3 FINAL PLATS

A. Purpose

A Final Plat is the instrument by which the subdivision of a property is legally recorded. This document will show the division of property into lots, tracts, rights-of-way, etc. All easements necessary for utilities, drainage, etc. shall also be shown on the Final Plat.
In addition to the information provided herein, a Final Plat shall also be in conformance with those City regulations identified in the General Information section of this chapter.

B. General Preparation & Submittals

The information presented on a Final Plat shall be in substantial conformance with the Preliminary Plat. Significant differences between the approved Preliminary Plat and proposed Final Plat will require a revision to the Preliminary Plat prior to Final Plat approval and recordation. The following requirements apply to the preparation and submission of a Final Plat for a subdivision:

1. All Final Plat sheets shall be signed and sealed by a Professional Engineer or Surveyor licensed by the State of Arizona.

2. All Final Plats shall be prepared in accordance with the Development Standards including the City's Engineering Standards.
3. The drawing of the Plat shall be a scale of 1inch = 100 feet. A Plat drawn to a scale of 1inch = 50 feet may be submitted if the subdivision is equal to or less than 10 acres in size.
4. All lettering, numbers, and drawings must be clear and distinct and of sufficient size to enable the City to have usable records when the drawings are scanned. Chapter 2 of this manual describes the minimum requirements for lines, lettering, and numbers.
5. Prepare the drawing of the proposed Plat so that the direction of north will either be toward the top of the sheet or toward the right side of the sheet, whenever possible; the top of the sheet will have the 36-inch dimension. All notations shall be oriented to read with the north pointed up. A north arrow shall be provided in a prominent manner with a bar scale indicating the scale of the plat drawing.
6. PUE shall provide the same utility easement rights to Cable TV licensees with a license approved by the City as they do any other public utility.
7. A title report prepared for the property to be subdivided shall be provided to the City with a Final Plat submittal. The title report shall be prepared within 30 days prior to the submittal to the City.
8. Easements or other dedications associated with the plat but not included within the plat boundary area shall be dedicated by separate instrument prior to recordation of the plat. The Maricopa County Recorder's Office recording information of the separate instruments shall be included on the plat prior to recording. Easements to be dedicated to the City by separate instrument must be submitted at the same time as the Final Plat.
9. The Final Plat Submittal and associated Improvements Plans submittal shall be submitted to the City at the same time.

C. Coversheet

1. All Final Plat notes that apply to the development shall be provided on the Coversheet of the Plat. Final Plat notes can be found in the Administrative Chapter of this manual.
2. The name of the subdivision must be shown prominently. Any parcel, unit, phase, or number which may apply shall be included in the name.
3. Following the subdivision name, state the Quarter Section(s) within which the proposed subdivision is to be located. For example: "A subdivision of part of the SE quarter of Section 10, Township 3 North, Range 5 East, of the Gila and Salt River Base and Meridian, Maricopa County, Arizona." An accompanying complete legal

description of the subdivision boundaries should be located somewhere on the first sheet.

4. Provide a vicinity map showing the relationship of the proposed development to the nearest existing and planned arterial and major collector streets and any other facility which might help to locate the subdivision.

   a. The orientation of the vicinity map must agree with the orientation of the Plat drawing.

   b. The vicinity map need not be drawn to a particular scale.

5. Provide a key map on the coversheet that shows the limits of the property to be platted, the proposed roadways, lot and tracts along with the identifying lot numbers and tract letters.

   a. The orientation of the key map must agree with the orientation of the Plat drawing.

   b. The key map shall be drawn to an appropriate scale such that the lot numbers and tract letters can be read.

6. Provide in block form in the lower right hand corner of the Plat the following information:

   a. The name, address, and telephone number of the individual or agency that prepared the Final Plat.

   b. “Final Plat for (name) subdivision.”

   c. Date prepared and job number.

   d. Scale

   e. “Sheet ___ of ____ Sheets.

7. The name, address, and telephone number of the Property Owner, Developer and the Surveyor, Engineer, and/or Architect submitting the drawings shall be provided on the drawing set.

8. A table shall be provided on the coversheet that identifies the following information for tracts:

   a. Tract identification letter

   b. Tract area (to the hundredth square foot),

   c. Tract use,

   d. Tract ownership, and

   e. Party(s) responsible for tract maintenance.

9. If the subdivision is to have an HOA or POA, indicate this on the

10. Final Plat with an appropriate statement.

11. Identify on the coversheet the total gross and net acreage of the property, the acreage of both the passive and active recreational openspace, and the percentage of openspace to non-openspace.

12. Dedication Statement

    a. As part of the Final Plat submittal a statement of dedication of all rights-of-way, drainage ways, pedestrian ways, and other easements for City, public, or private use by the person holding legal title of record, or by persons holding legal titles as vendees under land contract. If lands dedicated are mortgaged, the mortgagee shall also sign the plat. Dedication shall include a written location by section, township and range of the tract.

    b. Stormwater management facilities shall have an enforceable operation and maintenance agreement to ensure the system functions as designed. This agreement will include any and all maintenance easements required to access and inspect the stormwater management facilities, and to perform routine maintenance as necessary to ensure proper functioning of the stormwater management facility. In addition, a binding covenant specifying the parties responsible for the proper maintenance of all stormwater management facilities shall be secured prior to approval of final subdivision plat and issuance of any permits for land disturbance activities.

    c. All developments having private streets shall include language in the dedication statement that assures access to emergency vehicles and to the City for refuse collection. Where Private Streets are located within the City of Goodyear utility service areas, the dedication statement shall also include language that grants access to the City of Goodyear for operation, maintenance, and repair of City utilities such as water, sewer, reclaimed water, non-potable water, and storm water lines and facilities. Private streets shall not be dedicated as a PUE.

    d. Rights-of-way needed for public streets shall be dedicated in fee. All private streets or roadways must be in tracts.

    e. If the owner is a legal entity (i.e. a corporation, limited liability partnership, limited liability corporation, etc.) a certified copy of a resolution or some other document approved by the City Attorney showing who is authorized to sign on behalf of the legal entity shall accompany the Final Plat when submitted to the City for recording.

13. If streets in the subdivision are to be private streets, then the Plat must have the appropriate “Private Street” note on the Coversheet.

14. If any property is encumbered by a Deed of Trust, Mortgage, and/or Agreement, the “Lender” must ratify (consent to, approve and subordinate Lender’s security interest to the easement dedications and release the Lender’s security interest in fee dedications) the Final

Plat. The ratification must reference the date the encumbrance (i.e. lien, mortgage, deed of trust) was recorded and the docket and page in which the instrument was recorded by the Maricopa County Recorder's Office. Lender's signature must be acknowledged before a notary.

15. An assured water supply must be available for each subdivision; therefore, an assured water supply note must appear on the Plat. See the Administrative Chapter of this manual for the appropriate water supply notes and signature blocks.
16. A certification must be provided by a Land Surveyor registered to practice in Arizona stating that the Plat was made under his direction and that it meets the minimum standards for Arizona Land Boundary surveys. His seal must be placed on each sheet of the Plat.
17. Provide in block form in the lower right hand corner of the Plat the following information:
    a. Land surveyor's name and address.
    b. "Plat for (name) subdivision."
    c. Date prepared and job number.
    d. Scale
    e. "Sheet __ of __ sheets."
18. Prior to recording the Final Plat, it must have the signature of the City Engineer and the Mayor. The City Clerk must attest to the Mayor's signature. Places for these signatures must be provided on the Plat coversheet. See the Administrative Chapter of this manual for the appropriate signature blocks.
19. All utility providers shall be identified on the coversheet of the plat.
20. Any proposed private deed restrictions to be imposed upon the plat or any part or parts thereof pertaining to the intended use of the land and to be recognized by the city shall be noted on the plat.

D. General Plat Sheet Requirements

1. Provide a legend with appropriate abbreviation and drawing symbol explanations. Chapter 2 of this manual indicates specific requirement with regard to symbols.
2. The boundary lines of each subdivision shall be dimensioned completely with bearings and distances, curve lengths, central angles, radii, etc. The boundary lines shall be shown together with ties by course and distance to a minimum of two Section or Quarter Section monuments. The Section or Quarter Section monuments are to be used as the basis of bearing. All Section and Quarter Section

monuments must be identified and notes must indicate whether they were found or set.

3. Show and identify all abutting rights-of-way, easements, subdivisions, property lines, etc. on the property within 150 feet adjacent to the proposed subdivision. Identify the property and adjacent properties by their subdivision name or as unsubdivided land and provide the Maricopa County Recorder's Office recording information (APN, Recording Number, Recording Book and Page, and/or Subdivision name where applicable).
4. Identify all lots by sequential numbering and all tracts by letter. Show all lots, tracts, and street rights-of-way to be included with the subdivision. Provide the bearings, dimensions, and curve data necessary for the complete description of each lot, tract, and street right-of-way. All areas within the Plat boundaries not occupied by lots or public streets shall be designated as tracts.
5. All plats shall show required setback lines and sight visibility easements. Building envelopes or construction disturbance areas identified on the preliminary plat shall also be shown.
6. Where applicable, the corners of the plat shall be located on the monument lines of abutting streets.
7. The boundary of the property to be subdivided and all lots and tracts within the plat shall fully close. Bearings, distances, and curve information shall be provided on all roadway centerlines and boundary, right-of-way, lot, and tract lines. All linework shall determined by an accurate survey in the field. All dimensions shall be expressed in feet and decimals thereof.
8. Any excepted parcels within or surrounded by the plat boundaries shall be noted as "not a part of this subdivision" and show all bearings, distances, and curves of the excepted parcel as determined by an accurate survey in the field. All dimensions shall be expressed in feet and decimals thereof.
9. Show the location of all physical encroachments upon the boundaries of the tract.
10. The names of all public and private roadways located along existing county alignments shall match the existing county naming conventions unless otherwise approved by the City Engineer and/or the City Council. All names shall be preceded by the appropriate cardinal direction prefix. Roadway names not along a county alignment shall be approved on a case by case basis by the City Engineer and/or City Council.
11. The courses, lengths, and widths of all public and private streets shall be provided on the Final Plat. Where rights-of-way are curvilinear, radii, points of tangency, cord lengths, and central angles of all curves shall be provided in a table on the plat.

12. All drainage ways shall be shown on the plat and shall be located within tracts and/or easements. Drainage shall be identified as one of the uses of a tract that includes drainage ways. All major drainage ways may be required to be dedicated to the City of Goodyear as right-of-way, as determined by the City Engineer
13. All existing private and public easements within, on or over the plat shall be labeled, dimensioned, and noted as to their use. The dedication language shall identify the purpose and use of all easements.
14. All lots or tracts to be dedicated to the City of Goodyear shall be clearly indicated on the plat and specifically identified in the dedication statement.
15. It shall be the responsibility of the subdivider to provide on the Final Plat, prior to plat recordation, such easements in such location and width as required for utility and drainage purposes.
16. A table shall be provided listing each lot's square footage.
17. Provide lot width dimensions as follows:

    a. If the side property lines are parallel, the shortest distance between these side lines. This can be done by a typical lot detail.

    b. If the side property lines are not parallel, the length of a line at right angles to the axis of the lot at a distance equal to the front setback required for the zoning district in which the lot is located. The axis of a lot shall be the line joining the midpoints of the front and rear property lines.

9.1.4 AMENDED PLATS

One of the three following methods shall be used to amend a Recorded Plat. The Developer shall arrange an initial contact meeting with staff from the City Planning & Zoning Division and Engineering Department to determine the acceptable method of amendment. Any re-platting or amendment to plats may be subject to changes of ordinance, city codes, or state statutes which may have occurred since the original plat was reviewed, as determined by City staff:

A. Return to the Preliminary Plat/Final Plat Procedure (Major Changes):

This method shall be used when there are proposed changes involving any of the following: Zoning, type of lot, number of lots (+/- three or more), tracts or common area facilities. Any change which substantially alters the original Approved Plat, as determined by City staff, shall require a new Preliminary Plat and Final Plat to be produced.

B. Re-Plat Procedure (Moderate Changes):

This method may be used when there are proposed changes involving any of the following: Number of lots (+/- one or two), lot lines (+/- 3 feet or more) of more than three lots, roadway alignment, abandonment of public right-of-way, vacation of easement, re-dedication of easements or rights-of-way, third party involvement (i.e. lien holders, financial institutions, HOA, POA). A Preliminary Plat is not required with this procedure. The re-plat shall conform to the requirements of the Final Plat as identified above.

C. Certificate of Correction (Minor Changes):

This method may be used when there are three or fewer minor changes being proposed which involve any of the following: Lot lines (+/- 2 feet or less) of one or two lots, bearing or distance changes, minor corrections to language of dedication, notes, or legal description. Certificates of Correction shall be prepared by the original Plat Engineer or Surveyor.

9.1.5 MAPS OF DEDICATION

Maps of Dedication are to be used to dedicate land to the public or to grant an easement to the public for roadway, drainage, flood control, utility line, emergency or service vehicle access, or other public uses.

Maps of Dedication shall meet the minimum requirements described in the Final Plat section of this chapter, along with the following change: The words “map of dedication” shall replace the word “subdivision.” Some requirements may be waived by the City Engineer if it is demonstrated that the requirements are not appropriate because of the size or nature of a development.

9.1.6 CONDOMINIUM PLATS

Condominium developments in the City are reviewed by City staff in much the same manner as a site plan for an apartment development would be reviewed. The exception to this process is that a plat (much the same as a Final Plat) showing the property and the exact condominium locations is required to be recorded to facilitate the division of living space for the condominium owners.

A. Requirements

Condominium Plats shall meet the minimum requirements described in the Final Plat section of this chapter, along with the following changes:

1. The word “condominium” shall replace the word “subdivision.”
2. The floor elevations for each residential unit must be tied to the City’s vertical control datum and the residential unit boundaries must be tied by appropriate dimensions to the development boundary lines.

3. Each subdivided condominium space shall be identified by number and all tracts of land for common use shall be identified by letter. Provide bearings, distances, dimensions, and curve data necessary for the complete description of each subdivided space or tract. Since there are no dedications to the public on condominium plats covered under this section, all areas within the development that are not occupied by residential units are common areas and must be designated as tracts.
4. If a common area for a condominium development will be used as a "blanket easement" for public utilities, the areas which will be used for swimming pools, saunas, or other permanent structures (other than dwelling units) should be shown as exceptions to the "blanket easement."

9.1.7 DEDICATIONS AND ABANDONMENTS BY SEPARATE INSTRUMENT

Dedication or abandonment of public rights-of-way or easements that will be recorded by means of an instrument other than those previously discussed in this chapter shall be processed using the City's "Application for Dedication or Abandonment". Copies of this document can be found on the City Engineering Department website or by contacting the Engineering Department.

9.1.8 MINOR LAND DIVISIONS

A Minor Land Division shall be provided when division of property, combination of properties, or other changes to property lines are desired. Minor Land Divisions are processed through the City Planning & Zoning Division.

A. Minor Land Division Plan

A Minor Land Division plan shall include the following items in addition to those items required by the Zoning Ordinance:

1. All lettering, numbers, and drawings must be clear and distinct and of sufficient size to enable the City to have usable records when the drawings are scanned. Section 2.1 ("Construction Plan Requirements") of this manual describes the minimum requirements for lines, lettering, and numbers which must be met.
2. Any parcel, unit, phase, or number which may apply shall be included in the name of the Minor Land Division. The name must be shown prominently.
3. Following the name, state the Quarter Section(s) within which the proposed subdivision is to be located. For example: "A Minor Land Division of part of the SE quarter of Section 10, Township 3 North,

Range 5 East, of the Gila and Salt River Base and Meridian, Maricopa County, Arizona."

4. Prepare the drawing so that the direction of north will either be toward the top of the sheet or toward the right side of the sheet, whenever possible; the top of the sheet will have the 36-inch dimension. All notations shall be oriented to read with north pointed up. A north arrow shall be provided in a prominent manner with a bar scale indicating the scale of the Plat drawing.
5. Provide a small vicinity map showing the relationship of the proposed Minor Land Division to the nearest existing or planned arterial streets. The orientation of the vicinity map shall agree with the orientation of the Plat drawing. The vicinity map need not be drawn to a particular scale.
6. A legal description of the parent property(s) and of the resulting property(s) shall be provided.
7. The boundary lines of property shall be dimensioned completely with bearings and distances, curve lengths, central angles, radii, etc. The boundary lines shall be shown together with ties to a minimum of two Quarter Section monuments. The Quarter Section monuments are to be used as the basis of bearing. All Quarter Section monuments must be identified and notes must indicate whether they were found or set.
8. Show and identify all abutting rights-of-way, easements, subdivisions, property lines, etc. on the property within 150 feet adjacent to the proposed subdivision. The Maricopa County Recorder's Office recording information for adjacent dedications, plats, etc. must be shown.
9. A table that identifies the following information for properties shall be provided on the Coversheet:
    a. Property identification
    b. Property area (to the hundredth square foot),
    c. Property ownership, and
    d. Party(s) responsible for property maintenance.
10. If the property(s) is a part of or will have an HOA or, indicate this on the Plat with an appropriate statement.
11. An Acknowledgement signed by the Property Owner shall be provided on the Minor Land Division Coversheet.
12. A title report(s) for the property(s) to be subdivided shall be provided to the City prior to approval. The title report shall be prepared within 30 days prior to the submittal to the City.
13. If any property is encumbered by a Deed of Trust, Mortgage, and/or Agreement, the Lender must ratify (consent to and approve) the

Minor Land Division. The ratification must reference the date the lien was recorded and the docket and page in which the instrument was recorded by the Maricopa County Recorder's Office.

a. If the Lender is a corporation, a certified copy of a resolution showing who is authorized to sign on behalf of the corporation shall accompany the Minor Land Division when submitted to the City for recording.

b. If a partnership and/or joint venture is involved, a copy of the partnership or joint venture agreement must be submitted to the City for review. If either agreement does not designate an individual to sign on behalf thereof, it should be accompanied by a resolution covering same.

c. Lender's signature must be acknowledged before a notary.

14. A certification must be provided by a Land Surveyor registered to practice in Arizona stating that the Minor Land Division was made under his direction and that it meets the minimum standards for Arizona Land Boundary surveys. His seal must be placed on each sheet of the Plat.

15. At a minimum, provide the following information on the Plat Coversheet block/border:

a. Land Surveyor's name and address.

b. Project Name

c. Date prepared and job number.

d. Scale

e. "Sheet __ of __ Sheets."

9.1.9 RECORDING DOCUMENTS

A. Prior to Recording

1. All the required improvement plans (water, sewer, paving, grading, etc.) must be approved before the City Engineer will sign a Final Plat, Amended Plat, Condominium Plat, or Map of Dedication.

2. A performance bond or other financial assurance, acceptable to the City Engineer and City Attorney, equal to 100% of the estimated cost to construct all improvements proposed within the boundary of a Final Plat, Map of Dedication boundary, Condominium Plat, Amended Plat, and Minor Land Division shall be provided to the City prior to recording. Financial assurance requirements are further described in Chapter 2 of this manual.

CHAPTER 10

AS-BUILT REQUIREMENTS

10.1 "AS-BUILT" REQUIREMENTS 1

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10.1 "AS-BUILT" REQUIREMENTS

10.1.1 INTERIM AS-BUILT SUBMITTAL REQUIREMENTS

Water, Sewer, and Storm Drain Interim As-built drawings shall be provided to the City Inspector for review and approval prior to placing any asphalt pavement. Interim As-Builts are in addition to Final As-Builts required prior to acceptance.

A. Interim Storm Drain As-Builts shall include:

1. Street centerline station, offset, and invert elevation of pipe at all proposed structures.
2. Calculated pipe slope between structures.

B. Interim Water As-Builts shall include:

1. Street centerline station and elevation at all changes in profile/vertical alignment.
2. Street centerline station and offset to main at all changes in horizontal alignment.
3. Street centerline station and offset to all fire hydrants, valves and fittings.
4. Centerline station and offset to each service tap and the size of tap.
5. Dimension to all operating nuts referenced to the water main on valves with offset operating devices (i.e. butterfly valves).

C. Interim Sewer As-Builts shall include:

1. Sewer line station and offset from street centerline at center of each manhole.
2. Calculated pipe slope between manholes.
3. Sewer line stationing at each service tap referenced from the closest downstream manhole.
4. If service is not installed at 90 degrees to main, station and offset provided to end of each service tap at the back of right-of-way.

10.1.2 FINAL AS-BUILT SUBMITTAL REQUIREMENTS

"As-Built" Plans shall be submitted prior to acceptance by the City Engineer and the commencement of the warranty period. "As-Built" plans submitted to the City shall be of high enough quality to allow microfilming. They shall have dimensions between 22 inches x 34 inches and 24 inches x 36 inches with a thickness of 4 mils. A bond or paper set of black line drawings (including redlines of all field changes) shall be submitted to the Engineering Department for review. Upon Engineering

Department approval of the redlined bond set, a final Mylar copy of the plans shall be submitted for signature.

As-Built plans shall be signed and sealed by a Registered Professional Engineer or Registered Land Surveyor with the "AS-BUILT CERTIFICATION" approval block (See Administrative section of this manual).

As-Built submittals shall include the most current approved plans with amendments. Plans shall reflect changed field conditions as well as any field changes to the plans.

All required checks and changes shall be noted with "AB" (as-built)

A. Paving Plan As-Builts shall include:

1. Station for all grade breaks.
2. Back of curb offset dimension at all changes in alignment.
3. Top of curb, gutter, and pavement centerline elevations at all grade breaks, curb returns, valley gutters, plus any other location necessary to adequately show drainage.
4. Survey monuments - installation and accuracy certifications.
5. Longitudinal Street Grade calculated (per plan if approved < .4%)
6. Changes in curb alignment

B. Traffic Signal Plan As-Builts shall include:

1. Street centerline station and offset dimension to all fixture poles, cabinets, boxes, or other signal related equipment.
2. Street centerline station and offset dimension to all interconnect conduit runs, and junction boxes.

C. Signing & Striping Plan As-Builts shall include:

1. Street centerline station and offset dimension to all signage, painted arrows, wording, and symbols.
2. Face of curb dimensions to all striping and lane dimensions.

D. Irrigation and Storm Drain Plan As-Builts shall include:

1. Street centerline station and offset dimension to the main at all changes in alignment and/or changes in grade (Station, offset, and Elevation).
2. Street centerline station and offset dimension to all structures and changes in alignment.
3. Top, inlet, and invert elevations for all structures.

E. Landscaping Plan As-Builts shall:

1. Be revised as needed to reflect the addition, removal, relocation or change of irrigation lines, plant materials or hardscape.
2. Identify City maintained irrigation water meters
3. Identify City maintained irrigation controllers.
4. Identify City maintained landscape areas.
5. Identify City maintained irrigation valves.
6. Identify what City maintained irrigation valves are irrigating (shrub/trees/palms/cactus).
7. Identify City maintained irrigation valve stations numbered from the controller.
8. Identify City maintained irrigation master valves.
9. Identify City maintained irrigation backflows.
10. Identify City maintained power meter pedestals.
11. Identify City maintained irrigation water mains & irrigation lateral lines.
12. Identify City maintained irrigation sleeves.

City maintained improvements referred to above are to be limited solely to those improvements that are located within areas the city owns or is required by ordinance, law, or regulation to maintain.

F. Grading and Drainage As-Builts shall include:

1. Elevations at all drainage control points shown on the grading plans (i.e. retention overflow point, top and bottom of retention basins, drain rims, top of channels and channel flowlines, weirs, top of curb elevation at lot outfalls, valley gutters, etc.).
2. Calculations verifying the actual as-built volume of all retention facilities shall be included on the as-builts. They shall also include a table which compares the as-built volumes with the approved, required volumes indicated in the approved Drainage Report.
3. Retention calculations revised to as-built condition.
4. Pad elevations.
5. Location of all existing structures (e.g. buildings).
6. Location of all retaining walls and elevations.

G. Water Plan As-Builts shall include:

1. Street centerline station and elevation at all changes in profile/vertical alignment.
2. Street centerline station and offset to main at all changes in horizontal alignment.
3. Street centerline station and offset to all fire hydrants, valves, and fittings.
4. Dimension to all operating nuts referenced to the water main on valves with offset operating devices (e.g. butterfly valves).
5. Centerline station and offset to each service tap and the size of tap.
6. Dimension of meter box to nearest side property line if not per typical lot detail.
7. Street centerline stationing and offset to all other appurtenances (e.g. sampling stations, ARVs, blowoffs, backflow assemblies, landscape meters, etc.).
8. Updated Master utility plan sheet updated to reflect any changes.
9. Notations indicating whether polywrap was added to the pipe if not called out on plans.

H. Sewer Plan As-Builts shall include:

1. Sewer line station and offset from street centerline at center of each manhole and all changes in alignment.
2. Final Rim and invert elevation for each connection to a manhole.
3. Calculated pipe slope between manholes.
4. Sewer line stationing at each service tap referenced from the closest downstream manhole.
5. If service is not installed at 90 degrees to main, station and offset provided to end of each service tap at the back of right-of-way.
6. Updated Master Utility plan sheet updated to reflect any changes.
7. Minimum depth has been provided (6’).
8. Updated Master Utility plan sheet updated to reflect any changes.

I. Reclaimed Water Plan As-Builts shall include:

1. Street centerline station and elevation at all changes in profile/vertical alignment.
2. Street centerline station and offset to main at all changes in horizontal alignment.
3. Street centerline station and offset to all fire hydrants, valves, and fittings.

4. Dimension to all operating nuts referenced to the water main on valves with offset operating devices (e.g. butterfly valves).
5. Centerline station and offset to each service tap and the size of tap.
6. Dimension of meter box to nearest side property line if not per typical lot detail.
7. Street centerline stationing and offset to all other appurtenances (e.g. sampling stations, ARVs, blowoffs, backflow assemblies, landscape meters, etc.).
8. Updated Master utility plan sheet updated to reflect any changes.
9. Notations indicating whether polywrap was added to the pipe if not called out on plans.

J. Drywell Plan As-Builts shall include:

1. The ADEQ Registration Number for each drywell constructed in the project, which shall be provided by the Engineer/Land Surveyor who prepared the As-Built Grading & Drainage plans.
2. Latitude & Longitude for each drywell constructed in the project.
3. Rim elevations for each drywell constructed in the project.
4. The completed Annual Drywell Inspection Report for each drywell constructed in the project

K. Streetlight Plan As-Builts shall include:

1. ID number noted on plan.
2. Street centerline stationing and offsets to pole locations.
3. Changes to locations referenced by street centerline station and offset.

APPENDIX A

Supplemental Standard Details for Public Works Construction

3100 Series – General Details……...G-3110 to G-3170

3200 Series – Street Details……...…. G-3204 to G-3296-29

3300 Series – Water Details……...G-3300 to G-3390-2

3400 Series – Sewer Details……...…...G-3429 to G-3450-2

3500 Series – Drainage Details…….G-3510 to G-3580

3600 Series – Landscape and Parks Details…….G-3604 to G-3620-18

3100 SERIES – GENERAL DETAILS

G–3110	STANDARD SYMBOLS TO BE USED ON CITY IMPROVEMENT PLANS
G–3112	IMPROVEMENT PLAN COVER SHEET
G–3120	CITY CENTER & SCENIC ARTERIAL STREET CROSS SECTION
G–3122	ARTERIAL STREET CROSS SECTIONS
G–3124–1	COLLECTOR STREET CROSS SECTIONS
G–3124–2	MINOR COLLECTOR STREET WITH ON–STREET PARKING
G–3124–3	COMMERCIAL / INDUSTRIAL COLLECTOR AND LOCAL STREET CROSS SECTIONS
G–3124–4	SPECIAL USE MAJOR AND MINOR COLLECTOR STREET CROSS SECTIONS
G–3126	LOCAL STREE CROSS SECTIONS
G–3128	PRIVATE STREET CROSS SECTIONS
G–3130	STANDARD UTILITY LOCATIONS – CITY CENTER & SCENIC ARTERIAL
G–3132	STANDARD UTILITY LOCATIONS – ARTERIAL
G–3134	STANDARD UTILITY LOCATIONS – COLLECTOR
G–3136	STANDARD UTILITY LOCATIONS – LOCAL
G–3142	FIRE LANE SIGN INSTALLATION
G–3144	HANDICAP ACCESSIBLE PARKING SIGN
G–3150	PARKING LOT DIMENSIONS
G–3160	REFUSE CONTAINERS DESIGN CRITERIA FOR 2 YD. & 3 YD.
G–3161	REFUSE CONTAINERS DESIGN CRITERIA FOR 20 YD. & 40 YD.
G–3162–1	REFUSE ENCLOSURE
G–3162–2	REFUSE ENCLOSURE W/ GREASE CONTAINMENT AREA
G–3164–1	DOUBLE REFUSE ENCLOSURE
G–3164–2	DOUBLE REFUSE ENCLOSURE W/ GREASE CONTAINMENT AREA
G–3170	BARRICADING ON SUBDIVISION STREETS
G–3171–1	MASONRY RETAINING WALL – SHEET 1 OF 2
G–3171–2	MASONRY RETAINING WALL – SHEET 2 OF 2

3200 SERIES – STREET DETAILS

G–3204	INTERSECTION & STREETS TYPICAL CROSS–SLOPES & CROWN RUN–OFF

3200 SERIES – STREET DETAILS (CONTINUED)

G–3206	TYPICAL CUT, FILL, OR ADJACENT SLOPE ROADWAY CROSS–SECTION
G–3208–1	TYPICAL 4–LANE AT 4–LANE TEE INTERSECTION WITH MEDIAN LAYOUT, SIGNING, & STRIPING
G–3208–2	TYPICAL COLLECTOR AT COLLECTOR TEE INTERSECTION WITH CENTERLINE LAYOUT, SIGNING, & STRIPING
G–3208–3	TYPICAL ARTERIAL & COLLECTOR RIGHT TURN & RAISED MEDIAN LEFT TURN LAYOUT, SIGNING, & STRIPING
G–3208–4	4–LANE AT 4–LANE DUAL LEFT INTERIM T–INTERSECTION LAYOUT, SIGNING, & STRIPING
G–3208–5	TYPICAL STREET INTERSECTION SIGNAGE
G–3208–6	TYPICAL BIKEWAY SIGNAGE AND PAVEMENT MARKINGS
G–3209–1	SAMPLE STREET NAME SIGN
G–3209–2	SAMPLE ADVANCED STREET NAME SIGN
G–3209–3	STREET SIGN POST
G–3209–4	(12") STREET SIGN SEPARATOR BRACKET
G–3209–5	(12") STREET SIGN POST CAP
G–3210–1	TYPICAL PULLBOX AND CONDUIT LAYOUT
G–3210–2	DRY UTILITY CLEAR ZONE LOCATION
G–3211	TYPICAL MEDIAN LEFT TURN BAY AND NOSES
G–3212	TYPICAL HYDRANT MARKER LOCATION
G–3214	PAVEMENT WIDTH TRANSITION LAYOUT, SIGNING, & STRIPING
G–3215	TYPICAL COLLECTOR TO ARTERIAL INTERSECTION
G–3216	MINIMUM PAVEMENT SECTION THICKNESS
G–3218	3' ROLL CURB
G–3219	ARROW AND "ONLY" PAVEMENT MARKING FOR LEFT TURN LANES
G–3226	8' VALLEY GUTTER
G–3228	LOCAL STREET SIGHT VISIBILITY
G–3230	TYPICAL DRIVEWAY & RIGHT TURN BAY STANDARD
G–3232	INTERSECTION SIGHT VISIBILITY TRIANGLES
G–3236	TYPICAL DRIVEWAY DETAILS
G–3242–1	TYPICAL BUS BAY DETAIL
G–3242–2	TYPICAL BUS SHELTER ACCESSORY PAD
G–3244–1	FIRE DEPARTMENT PERMANENT ACCESS ROADWAY TYPICAL CROSS–SECTION
G–3244–2	FIRE DEPARTMENT ALTERNATIVE ACCESS ROADWAY TYPICAL CROSS–SECTION

3200 SERIES – STREET DETAILS (CONTINUED)

G-3244-3	FIRE DEPARTMENT TEMPORARY ACCESS ROADWAY TYPICAL CROSS-SECTION
G-3246-1	FIRE DEPARTMENT ACCESS ROADWAYS & CUL-DE-SAC / MODIFIED CUL-DE-SAC TURNAROUNDS
G-3246-2	FIRE DEPARTMENT ACCESS HAMMERHEAD / MODIFIED HAMMERHEAD TURNAROUNDS
G-3250-1	ROADWAY POLE AND LUMINAIRE SPECIFICATIONS
G-3250-2	STANDARD DARK BRONZE SQUARE POLES (1 OF 2)
G-3250-3	STANDARD DARK BRONZE SQUARE POLES (2 OF 2)
G-3250-4	STANDARD GRAY ROUND ROADWAY POLES (1 OF 2)
G-3250-5	STANDARD GRAY ROUND ROADWAY POLES (2 OF 2)
G-3250-6	STANDARD DUAL MAST ARM ROUND ROADWAY POLES
G-3250-7	STANDARD DARK BRONZE SQUARE POLES
G-3250-8	STANDARD GRAY ROUND ROADWAY POLES
G-3250-9	SPECIAL GRAY ROUND ROADWAY POLES
G-3250-10	STANDARD POLE CABLE ATTACHMENTS
G-3250-11	STANDARD POLE GROUNDING AND WIRING DETAIL
G-3250-12	STANDARD APS J-BOX DETAIL
G-3255-1	STREET LIGHTING – ARTERIAL STREET STAGGERED WITHOUT MEDIAN
G-3255-2	STREET LIGHTING – ARTERIAL INTERSECTIONS
G-3255-3	STREET LIGHTING – COLLECTOR STREET SPACING
G-3255-4	STREET LIGHTING – LOCAL / LOCAL ROUNDABOUT
G-3255-5	STREET LIGHTING – ELBOW INTERSECTIONS
G-3263	STREET LIGHT PULL BOX & CONNECTION DETAILS
G-3291-1	STREAMLINE STEEL POLE STREET LIGHT DETAIL
G-3291-2	STREAMLINE STEEL POLE STREET LIGHT DETAIL
G-3292-1	ARCHITECTURAL STREET LIGHT DETAIL
G-3292-2	ARCHITECTURAL STREET LIGHT DETAIL
G-3293	INTERCONNECT CONDUIT TRENCHING DETAIL
G-3294-1	INTERCONNECT CONDUIT SPLICE BOX DETAIL
G-3294-2	INTERCONNECT CONDUIT SPLICE BOX DETAIL – SHEET 2
G-3294-3	INTERCONNECT CONDUIT SPICE BOX DETAILS – SHEET 3
G-3295	POLYMER NUMBER 7 PULL BOX DETAIL
G-3296-1	MODULAR POLE 'F' – 20' MAST ARM
G-3296-2	MODULAR POLE 'E' – 20' MAST ARM
G-3296-3	MODUAR POLE 'Q' – 25' MAST ARM
G-3296-4	MODULAR POLE 'J' – 25' MAST ARM

3200 SERIES – STREET DETAILS (CONTINUED)

G-3296-5	MODULAR POLE 'Q' – 30' MAST ARM
G-3296-6	MODULAR POLE 'J' – 30' MAST ARM
G-3296-7	MODULAR POLE 'Q' – 35' MAST ARM
G-3296-8	MODULAR POLE 'J' – 35' MAST ARM
G-3296-9	MODULAR POLE 'Q' – 40' MAST ARM
G-3296-10	MODULAR POLE 'J' – 40' MAST ARM
G-3296-11	MODULAR POLE 'Q' – 45' MAST ARM
G-3296-12	MODULAR POLE 'J' – 45' MAST ARM
G-3296-13	MODULAR POLE 'Q' – 50' MAST ARM
G-3296-14	MODULAR POLE 'J' – 50' MAST ARM
G-3296-15	MODULAR POLE 'A-1'
G-3296-16	MODULAR POLE 'A-2'
G-3296-17	MODULAR POLE MAST ARM CONNECTION
G-3296-18	MODULAR SIGNAL 'ADD-ON' STRUCTURES
G-3296-19	MODULAR SIGNAL MAST ARM SIGN MOUNTING DETAILS
G-3296-20	TRAFFIC SIGNAL FOUNDATION DETAIL TYPE 'A' FOUNDATION (SHEET 1 OF 2)
G-3296-21	TRAFFIC SIGNAL FOUNDATION DETAIL TYPE 'A' FOUNDATION (SHEET 2 OF 2)
G-3296-22	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 20' – 40' MAST ARM STRUCTURES (SHEET 1 OF 2)
G-3296-23	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 20' – 40' MAST ARM STRUCTURES (SHEET 2 OF 2)
G-3296-24	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 45' MAST ARM STRUCTURES (SHEET 1 OF 2)
G-3296-25	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 45' MAST ARM STRUCTURES (SHEET 2 OF 2)
G-3296-26	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 50' MAST ARM STRUCTURES (SHEET 1 OF 2)
G-3296-27	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 50' MAST ARM STRUCTURES (SHEET 2 OF 2)
G-3296-28	PEDESTRIAN POST FOR MODULAR STRUCTURES
G-3296-29	MODULAR TRAFFIC SIGNAL WIRING DETAIL
G-3297-1	TRAFFIC SIGNAL STYLE
G-3297-2	TRAFFIC SIGNAL STYLE

3300 SERIES – WATER DETAILS

G-3300	DRY UTILITY TO WET UTILITY MINIMUM SEPARATION REQUIREMENTS
G-3301	VERTICAL REALIGNMENT OF WATER & RECLAIMED WATER MAINS
G-3305	ELECTRONIC BALL MARKER PLACEMENT
G-3307	BUTTERFLY VALVE OPERATOR MANHOLE
G-3310	WATER SERVICE CONNECTIONS
G-3313-1	4" & 6" WATER METER VAULTS
G-3313-2	8" WATER METER VAULT
G-3313-3	4", 6", & 8" WATER METERS
G-3316	CHLORINE INJECTIONS ASSEMBLY FOR UNDERGROUND WATERLINES
G-3321	DEBRIS CAP INSTALLATION
G-3323	PRESSURE REDUCING VALVE
G-3324-1	PRESSURE REDUCING VALVE VAULT
G-3324-2	PROPOSED PRV VAULT LID DETAIL
G-3325	RECLAIMED WATER VALVE BOX AND LID
G-3328	2" AIR/VACUUM RELEASE VALVE
G-3330	FIRE HYDRANT INSTALLATION
G-3332	HYDRANT SAFETY POSTS
G-3334	TEMPORARY WATER SUPPLY HYDRANT METER ASSEMBLY
G-3336	FIRE HYDRANT BYPASS ASSEMBLY (FOR LINES > 16")
G-3338	FIRE DEPARTMENT CONNECTION
G-3350	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY INSTALLATION – 3" AND LARGER
G-3351	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY INSTALLATION – 2.5" AND UNDER
G-3352	DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY INSTALLATION – 3" TO 10"
G-3353	DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY INSTALLATION – 2.5" AND UNDER
G-3356	TEMPORARY JUMPER CONNECTION
G-3357	METAL ENCLOSURE FOR ABOVE GROUND UTILITIES
G-3358	SAFETY POST LOCATION FOR BACKFLOW PREVENTION ASSEMBLIES
G-3360	FILL PIPE DETAILS FOR PORTABLE TANKS WITH AIR GAP SEPARATION
G-3361	BACKFLOW PREVENTION METHOD FOR PORTABLE TANKS WITH NO AIR GAP SEPARATION
G-3362	PROPOSED TANK LADDER AND HATCH POSITION DETAIL

3300 SERIES – WATER DETAILS (CONTINUED)

G-3363	PROPOSED TANK HATCH DETAIL
G-3364	TYPICAL WELL SITE
G-3365	TYPICAL WELL SITE WITH ONSITE TREATMENT
G-3366	WALL ELEVATION FOR WELL SITE OR PUMP STATION
G-3367-1	TYPICAL WELL CASING
G-3367-2	TURBINE PUMP INSTALLATION DETAIL
G-3367-3	SUBMERSIBLE PUMP INSTALLATION DETAIL
G-3368	120" OD AIR CHAMBER
G-3369	96" OD AIR CHAMBER
G-3370	WATER QUALITY SAMPLING STATION
G-3390-1	16' SLIDING GATE & HINGED DOOR
G-3390-2	16' SLIDING GATE

3400 SERIES – SEWER DETAILS

G-3429	ELECTRONIC MARKER BALL PLACEMENT – SEWER
G-3430	TYPICAL SEWER SERVICE FOR SEWER MAINS > 10' – 15' DEEP
G-3430-2	DEEP SEWER SERVICE CONNECTION – 15' DEEP OR GREATER
G-3440	FORCE MAIN CLEANOUTS
G-3441	SEWAGE AIR RELEASE VALVE
G-3442	FORCE MAIN – MANHOLE DISCHARGE
G-3450-1	MONITORING/SAMPLING VAULT
G-3450-2	MONITORING/SAMPLING VAULT

3500 SERIES – DRAINAGE DETAILS

G-3510	STORM DRAIN INLET MARKER
G-3511	STORM DRAIN INLET MARKER ON HEADWALL
G-3520	CUT-OFF WALL
G-3531-1	STORM SEWER OUTFALL ACCESS BARRIER
G-3531-2	BARRIER SPECIFICATIONS SCHEDULE
G-3535-1	CATCH BASIN TYPE 'M'
G-3535-2	CATCH BASIN TYPE 'M' – NOTES & DETAILS
G-3535-3	CATCH BASING TYPE "M" TOP MODIFICATION IN LANDSCAPE PARKWAY
G-3535-4	STORM DRAIN INLET MARKER ON CATCH BASIN SCUPPER
G-3540-1	HDPE STORM DRAIN PIPE DETAILS (PIPE DIAMETER UP TO 48 INCHES)
G-3540-2	POLYPROPYLENE TRENCH INSTALLATION

3500 SERIES – DRAINAGE DETAILS (CONTINUED)

G–3540–3 POLYPROPYLENE TRENCH INSTALLATION FOR NON–TRAFFIC APPLICATION
G–3560–1 STANDARD DRYWELL
G–3560–2 DRYWELL PRE–TREATMENT CHAMBER
G–3570 MINIMUM FINISH FLOOR TO DRAINAGE FACILITY ELEVATION RELATIONSHIPS
G–3580 SINGLE RESIDENTIAL LOT SWPPP DETAIL

3600 SERIES – LANDSCAPE & PARKS DETAILS

G–3604 LANDSCAPE DETAILS
G–3610–1 TREE PLANTING AND STAKING
G–3610–2 SINGLE–TRUNK TREE PLANTING ON SLOPE
G–3610–3 TREE PLANTING IN TURF
G–3610–4 DATE PALM TREE PLANTING
G–3610–5 FAN PALM TREE PLANTING
G–3610–6 ROOT BARRIER
G–3610–7 SHRUB/GROUNDWATER PLANTING
G–3610–8 SHRUM/GROUNDCOVER PLANTING ON SLOPE
G–3610–9 TYPICAL PLANT SPACING AND CLEAR ZONES FOR MEDIAN LANDSCAPING
G–3610–10 CACTI/ACCENT PLANTING
G–3610–11 VINE PLANTING
G–3610–12 OCOTILLO PLANTING
G–3610–13 SAGUARO PLANTING
G–3610–14 BOULDER
G–3610–15 DECOMPOSED GRANITE
G–3610–16 STABILIZED DECOMPOSED GRANITE
G–3610–17 CONCRETE HEADER
G–3618 IRRIGATION WIRE SLEEVING CHART
G–3620–1 REDUCED PRESSURE ASSEMBLY
G–3620–2 CALSENSE CONTROLLER (MODEL CS2000/PEDESTAL)
G–3620–3 CALSENSE CONTROLLER (MODEL CS3000/PEDESTAL)
G–3620–4 SOLAR CONTROLLER
G–3620–5 ELECTRIC VALVE – DRIP WITH BALL VALVE
G–3620–6 ELECTRIC VALVE – TURF WITH BALL VALVE
G–3620–7 MASTER VALVE AND FLOW SENSOR
G–3620–8 ISOLATION VALVE – 2.0" OR SMALLER
G–3620–9 ISOLATION VALVE – 2.5" OR LARGER
G–3620–10 QUICK COUPLER

3600 SERIES – LANDSCAPE & PARK DETAILS (CONTINUED)

G–3620–11 PVC SLEEVE
G–3620–12 TYPICAL TRENCHING
G–3620–13 THRUST BLOCK
G–3620–14 FLUSH CAP ASSEMBLY
G–3620–15 EMMITTER MANIFOLD
G–3620–16 EMMISSION POINT – SHRUB AND GROUNDCOVER
G–3620–17 EMISSION POINT – TREE
G–3620–18 POP UP SPRAY HEAD WITH SWING JOINT

Existing Improvements
(Light & Dashed Linetype)

Right of Way Line

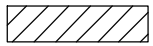
Property Line

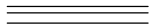
Center or Monument Line

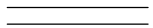
Easement Line


Barricade

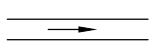

Traffic Sign & Delineator


Pavement Sawcut


Vertical Curb & Gutter


Roll Curb & Gutter

Single Vertical Curb


Concrete Valley Gutter
(w/Direction of Flow)

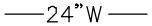
Edge of Proposed Pavement
w/Thickened Edge

Survey Monument (Brass Cap,
Stone, Etc. in Hand Hole)

Survey Monument
(Brass Cap on Surface)

Survey Monument
(Rebar or Pipe)

Sewer Line & Size

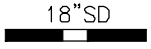


Water Line & Size

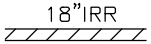

Water or Gas Valve


Tapping Sleeve & Valve

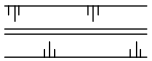

Fire Hydrant

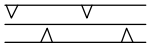


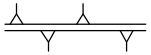
Storm Drain & Size



Irrigation Line & Size

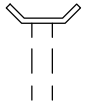

Concrete Lined Ditch


Dirt Ditch


Irrigation Berm

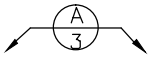

Top of Bank

Toe of Slope


Headwall


Irrigation Standpipe


Irrigation (Alfalfa) Valve



Section No.
Sheet No.

NOTES:

1. PLANS SHALL BE OF A QUALITY TO ALLOW MICROFILMING. (i.e. LINE WEIGHT AND LETTER SIZE SHALL BE EASILY READ WHEN REDUCED BY 50%)
2. EXISTING IMPROVEMENTS INCLUDE BUT ARE NOT LIMITED TO CURB & GUTTER, SIDEWALK, AND DRIVEWAYS.
3. ALL PROPOSED CONSTRUCTION NOTES SHALL BE BOXED.

DETAIL NO. G-3110	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	STANDARD SYMBOLS TO BE USED ON CITY IMPROVEMENT PLANS	DETAIL NO. G-3110

XYZ SUBDIVISION

IMPROVEMENT PLANS
DESCRIPTION, SECTION, TOWNSHIP, & RANGE
GOODYEAR, ARIZONA

ACCURATE FIELD DATA BLOCK

BLUE STAKE BLOCK
(ALL SHEETS)

CITY OF GOODYEAR GENERAL
NOTES FOR CONSTRUCTION

ZONING

UTILITY CONFLICT CERTIFICATION

MARICOPA COUNTY
DEPARTMENT OF
ENVIRONMENTAL SERVICES
APPROVAL (AS REQUIRED)

BENCHMARK
(NAVD 88)

ADD AS-BUILT
CERTIFICATION BLOCK

OWNER/DEVELOPER
NAME, ADDRESS
TELEPHONE NUMBER

VICINITY MAP

ARCHITECT
NAME, ADDRESS
TELEPHONE NUMBER

SHEET INDEX

OTHER SIGNATURE BLOCKS AND
NOTES, AS REQUIRED – (RID,
LIBERTY, ADOT, MCDOT, ETC.)

ENGINEERING COMPANY
NAME, ADDRESS
TELEPHONE NUMBER

QUANTITIES

CITY OF GOODYEAR	LIBERTY	PROPERTY OWNER

(MATCHES PERMIT)

CITY OF GOODYEAR			
REVIEW AND RECOMMENDED APPROVAL BY:			
FIRE DEPT		GRADING & DRAINAGE	
LANDSCAPING		WATER & SEWER	
TRAFFIC SIGNAL		PAVING	
STREET LIGHTS		SIGNING & STRIPING	

APPROVED BY:

PLANS EXAMINER _____ DATE _____

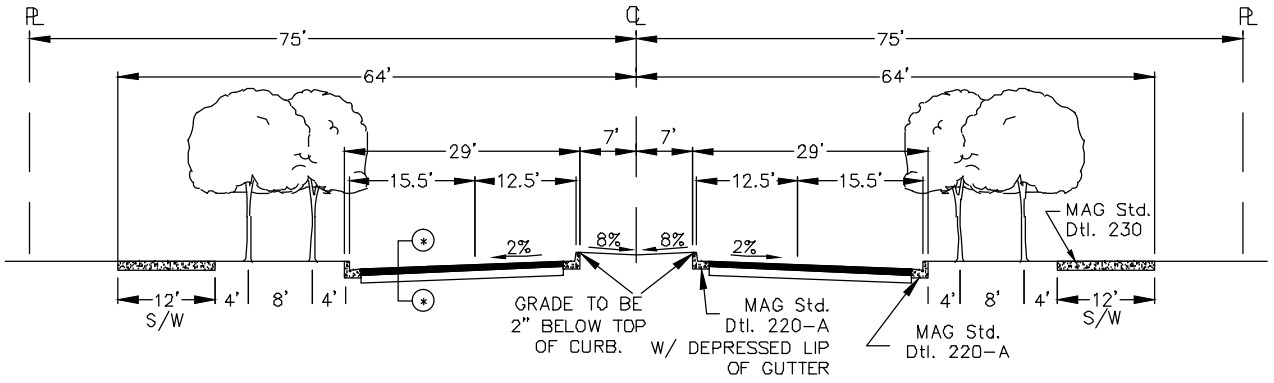
SEAL & SIGNATURE

SHEET NO.
SHT _ OF _

XYZ SUBDIVISION
IMPROVEMENT PLANS

HTE# XX-XXXX

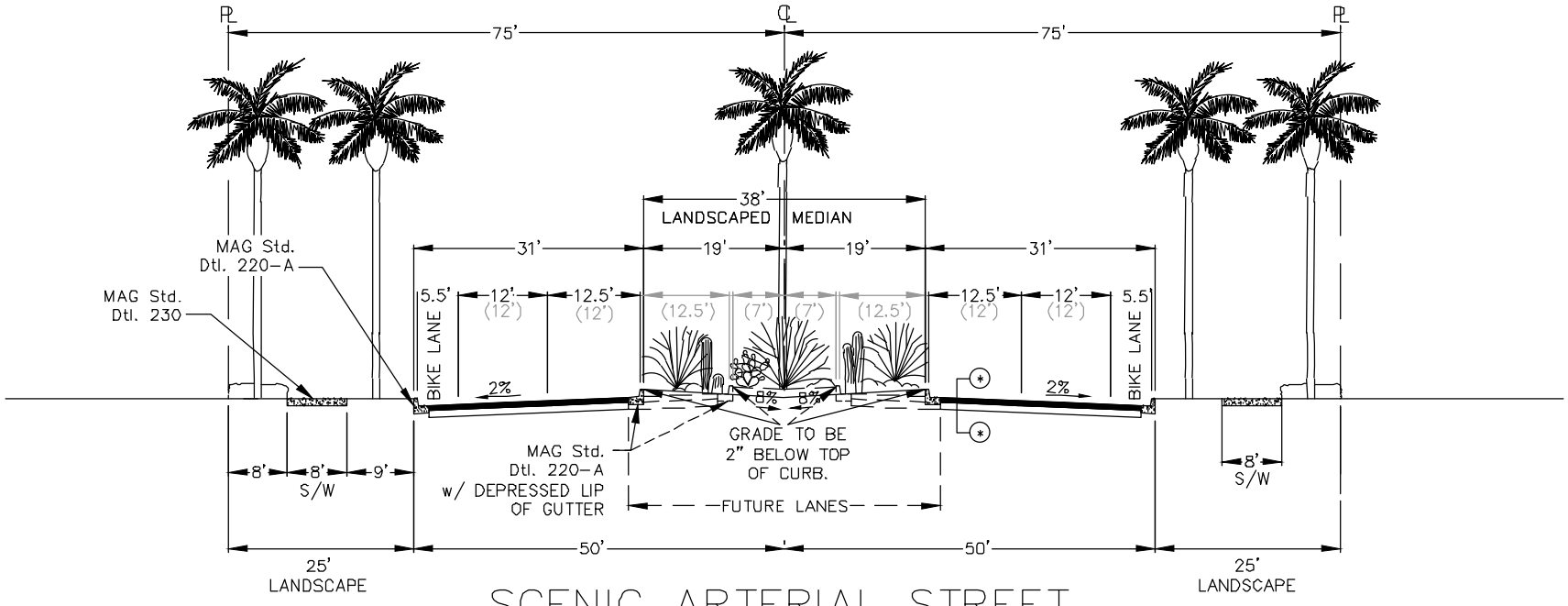
DETAIL NO. G-3112	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	IMPROVEMENT PLAN COVER SHEET	DETAIL NO. G-3112



CITY CENTER ARTERIAL STREET

NOTES:

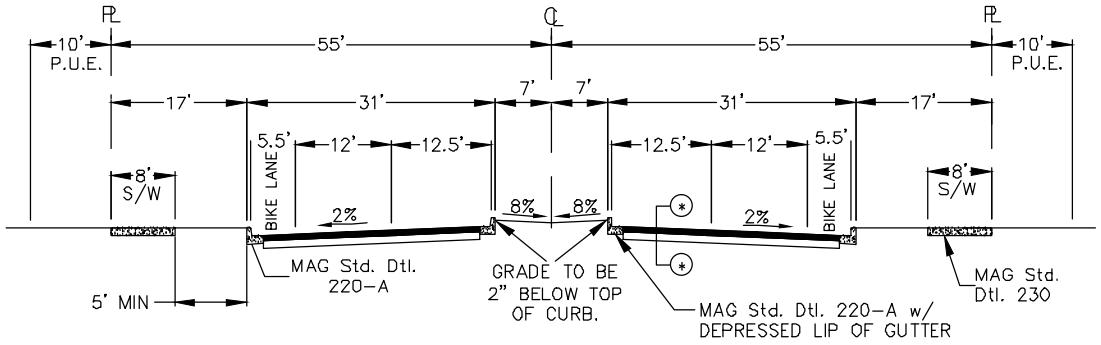
1. LANDSCAPE EASEMENTS AND PUBLIC UTILITY EASEMENTS ARE CONSIDERED INCLUSIVE IN THE CITY CENTER ARTERIAL ROW. NO ADDITIONAL EASEMENT IS TYPICALLY REQUIRED. LANDSCAPE SETBACKS SHALL MEET THE CITY STANDARD FOR ARTERIAL ROADWAYS.
2. BIKE LANES ARE TYPICALLY NOT REQUIRED ON CITY CENTER ARTERIAL ROADWAYS, HOWEVER THE CITY ENGINEERING DEPARTMENT RESERVES THE RIGHT TO REQUIRE ADDITIONAL PAVEMENT, SIGNAGE, AND STRIPING FOR BIKE LANES AS NEEDED.
3. WALLS IN EXCESS OF 3' IN HEIGHT (6' FOR RESIDENTIAL SUBDIVISIONS) AND BUILDINGS SHALL NOT BE PERMITTED WITHIN THE LANDSCAPE SETBACKS ON SCENIC ARTERIAL ROADWAYS.
4. DIMENSIONS IN PARENTHESES REFLECT ULTIMATE PAVING DIMENSIONS.
5. PAVING DIMENSIONS ARE MEASURED TO THE BACK OF CURB.
6. STRIPING DIMENSIONS ARE MEASURED TO THE FACE OF CURB.



SCENIC ARTERIAL STREET

* SEE CITY Std. Dtl. G-3216 FOR PAVEMENT STRUCTURAL SECTION

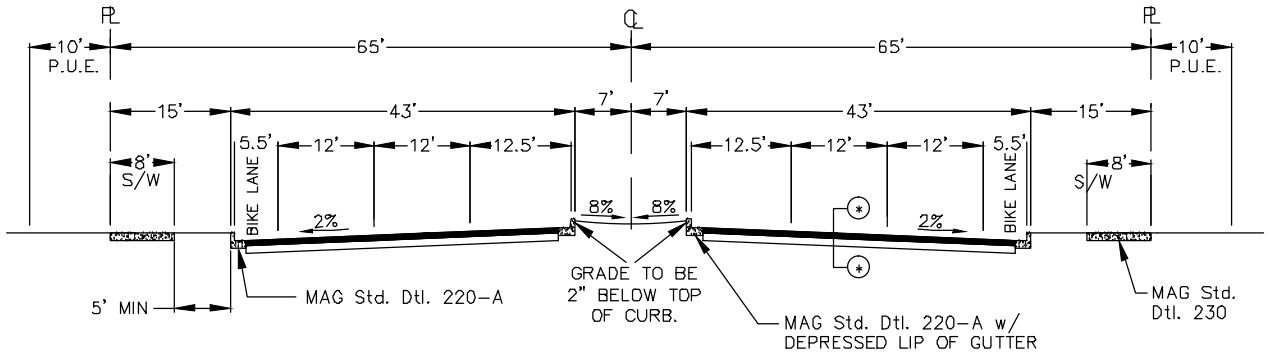
DETAIL NO. G-3120	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	CITY CENTER & SCENIC ARTERIAL STREET CROSS SECTION	DETAIL NO. G-3120



NOTES:

1. PAVING DIMENSIONS ARE MEASURED TO THE BACK OF CURB.
2. STRIPING DIMENSIONS ARE MEASURED TO THE FACE OF CURB.

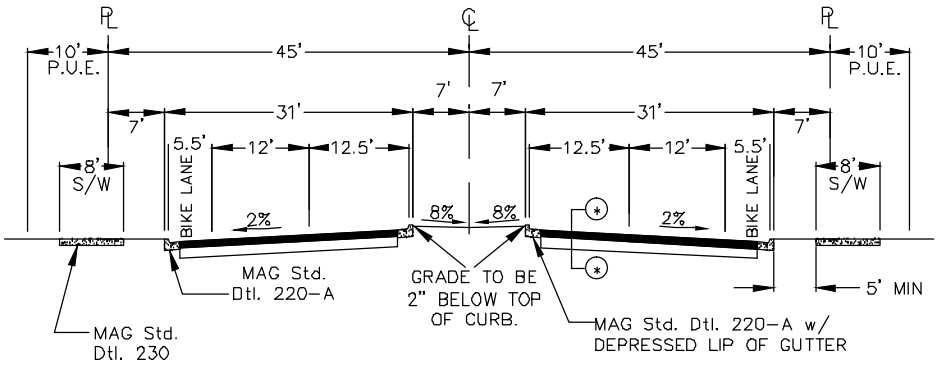
MINOR ARTERIAL STREET



MAJOR ARTERIAL STREET

* SEE CITY Std. Dtl. G-3216 FOR PAVEMENT STRUCTURAL SECTION

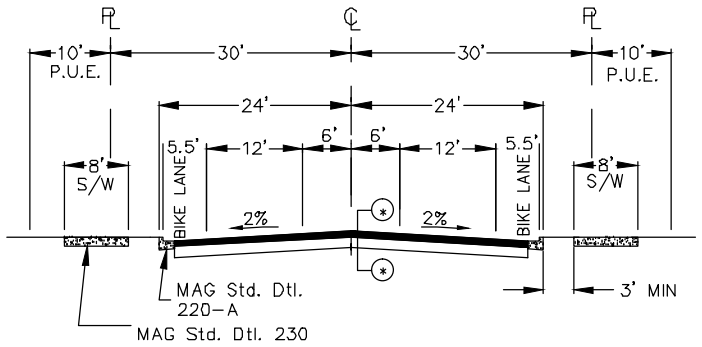
DETAIL NO. G-3122	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	ARTERIAL STREET CROSS SECTIONS	DETAIL NO. G-3122



MAJOR COLLECTOR STREET

NOTES:

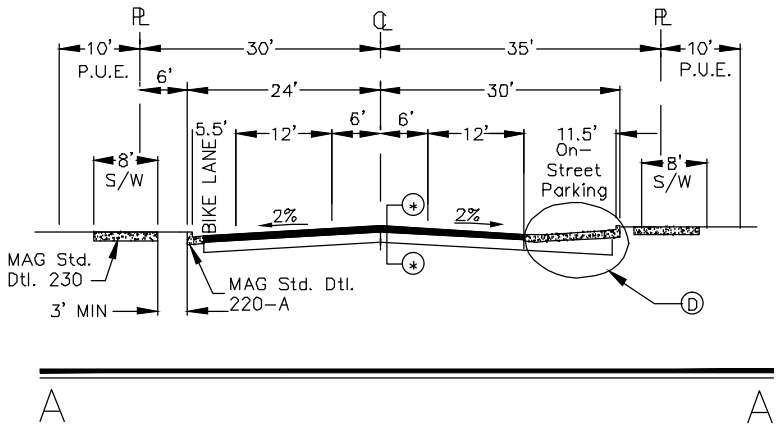
1. PAVING DIMENSIONS ARE MEASURED TO THE BACK OF CURB.
2. STRIPING DIMENSIONS ARE MEASURED TO THE FACE OF CURB.

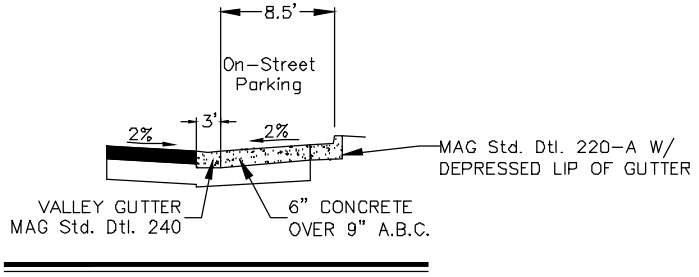


MINOR COLLECTOR STREET

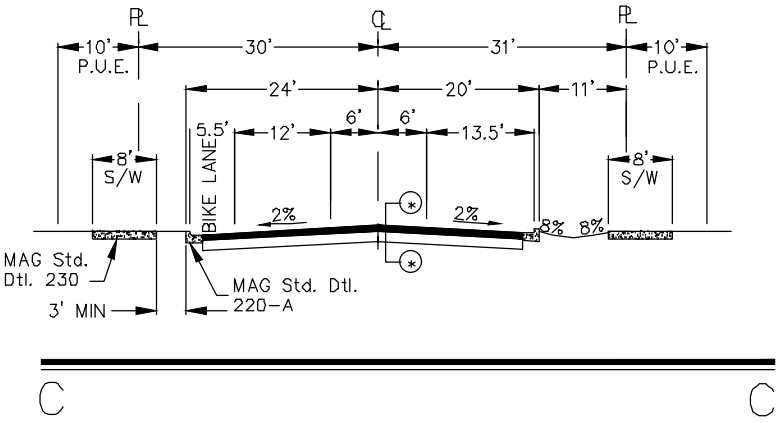
* SEE CITY Std. Dtl. G-3216 FOR PAVEMENT STRUCTURAL SECTION

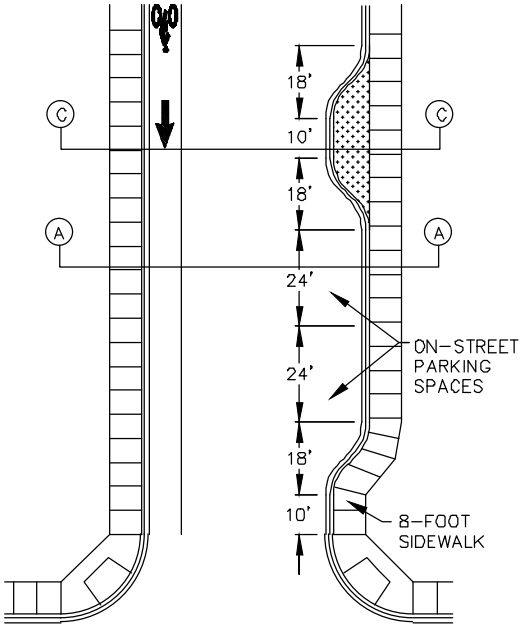
DETAIL NO. G-3124-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	COLLECTOR STREET CROSS SECTIONS	DETAIL NO. G-3124-1





DETAIL D





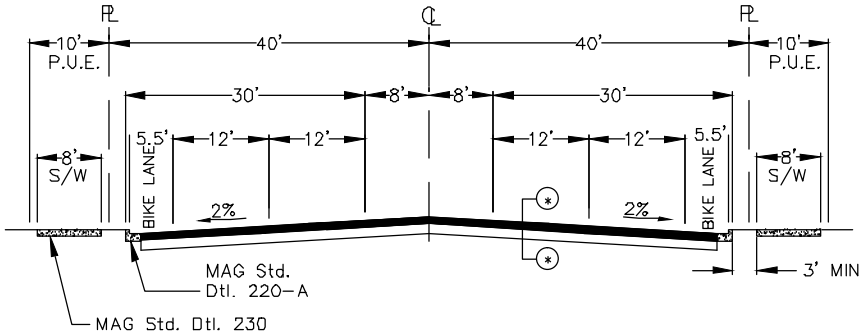
MINOR COLLECTOR WITH
ON-STREET PARKING

NOTES:

1. SIDEWALKS MAY BE EITHER ATTACHED OR DETACHED TO THE CURB. DETACHED SIDEWALKS SHALL BE A MINIMUM 3' FROM THE BACK OF CURB AND A MINIMUM 5' FOR LANDSCAPING.
2. PAVING DIMENSIONS ARE MEASURED TO THE BACK OF CURB.
3. STRIPING DIMENSIONS ARE MEASURED TO THE FACE OF CURB.

* SEE CITY Std. Dtl. G-3216 FOR PAVEMENT STRUCTURAL SECTION

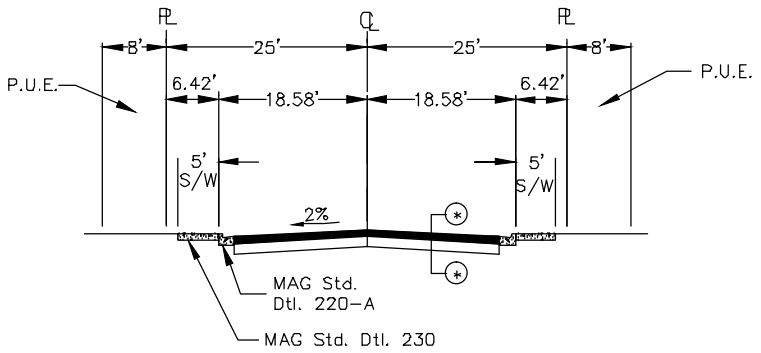
DETAIL NO. G-3124-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MINOR COLLECTOR STREET WITH ON-STREET PARKING	DETAIL NO. G-3124-2



COMMERCIAL / INDUSTRIAL COLLECTOR STREET

NOTES:

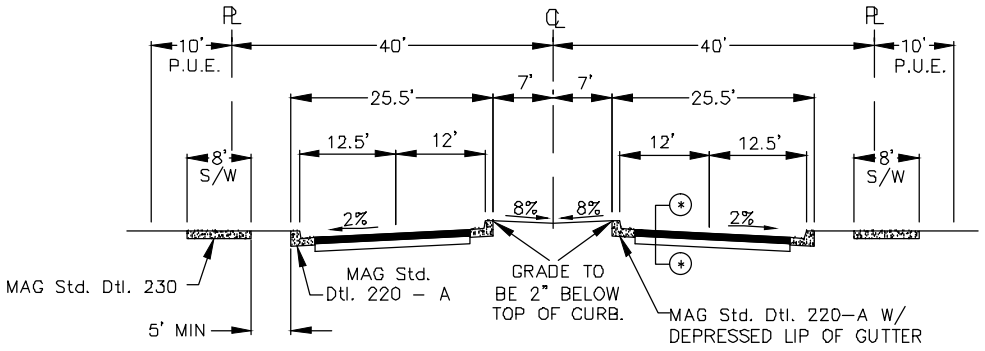
1. ON COLLECTOR USE 5' SIDEWALK IN INDUSTRIAL AREAS ONLY.
2. PAVING DIMENSIONS ARE MEASURED TO THE BACK OF CURB.
3. STRIPING DIMENSIONS ARE MEASURED TO THE FACE OF CURB.



COMMERCIAL / INDUSTRIAL LOCAL STREET

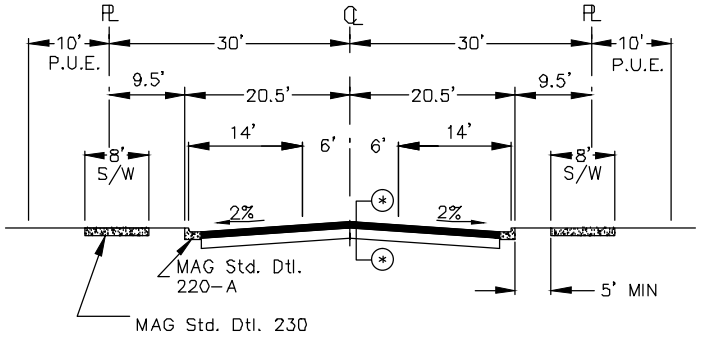
* SEE CITY Std. Dtl. G-3216 FOR PAVEMENT STRUCTURAL SECTION

DETAIL NO. G-3124-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	COMMERCIAL / INDUSTRIAL COLLECTOR AND LOCAL STREET CROSS SECTIONS	DETAIL NO. G-3124-3



SPECIAL USE MAJOR COLLECTOR STREET

THIS DETAIL IS NOT TO BE USED AS THE CITY STANDARD FOR COLLECTOR ROADS. (See Note 1)



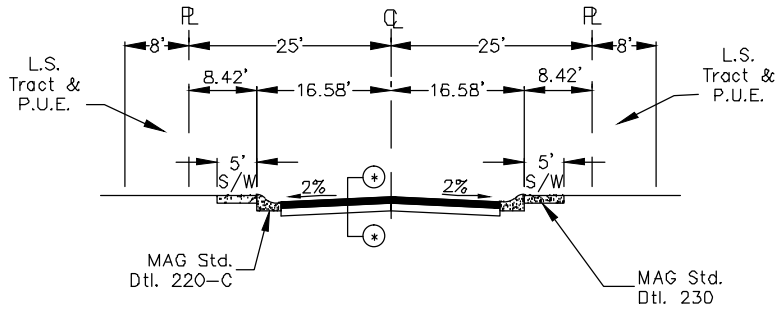
SPECIAL USE MINOR COLLECTOR STREET

NOTES:

1. CITY STD. DTL. G–3124–1 SHALL BE USED AS THE TYPICAL CROSS–SECTIONS FOR COLLECTOR ROADS.
2. THIS DETAIL SHALL ONLY BE USED AT LOCATIONS WHERE THE CITY DESIRES TO MATCH AN EXISTING STREET CROSS–SECTION.
3. APPROVAL FROM THE CITY ENGINEER SHALL BE OBTAINED PRIOR TO USING THIS DETAIL.
4. PAVING DIMENSIONS ARE MEASURED TO THE BACK OF CURB.
5. STRIPING DIMENSION ARE MEASURED TO THE FACE OF CURB.

* SEE CITY Std. Dtl. G–3216 FOR PAVEMENT STRUCTURAL SECTION

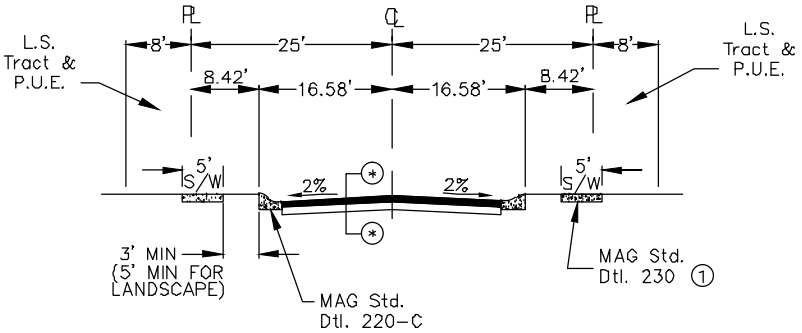
DETAIL NO. G-3124-4	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SPECIAL USE MAJOR AND MINOR COLLECTOR STREET CROSS SECTIONS	DETAIL NO. G-3124-4



LOCAL STREET

NOTES:

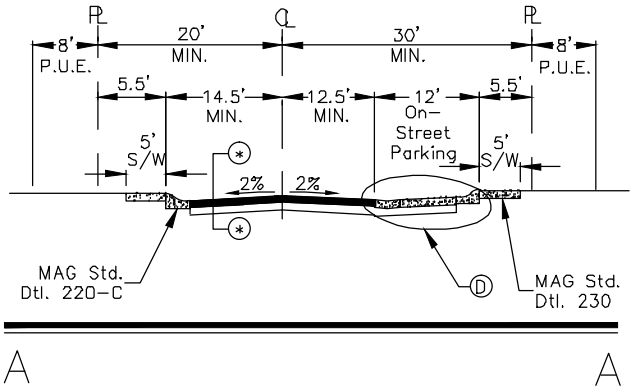
1. THE DETACHED 5' SIDEWALK MAY ENCROACH UP TO 1.5' INTO THE PUE.
2. PAVING DIMENSIONS ARE MEASURED TO THE BACK OF CURB.



LOCAL STREET
WITH DETACHED SIDEWALK

* SEE CITY Std. Dtl. G-3216 FOR PAVEMENT STRUCTURAL SECTION

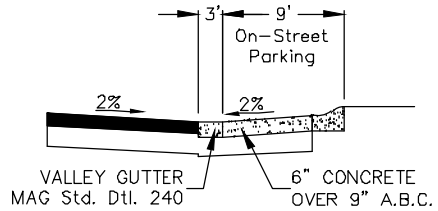
DETAIL NO. G-3126	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	LOCAL STREE CROSS SECTIONS	DETAIL NO. G-3126



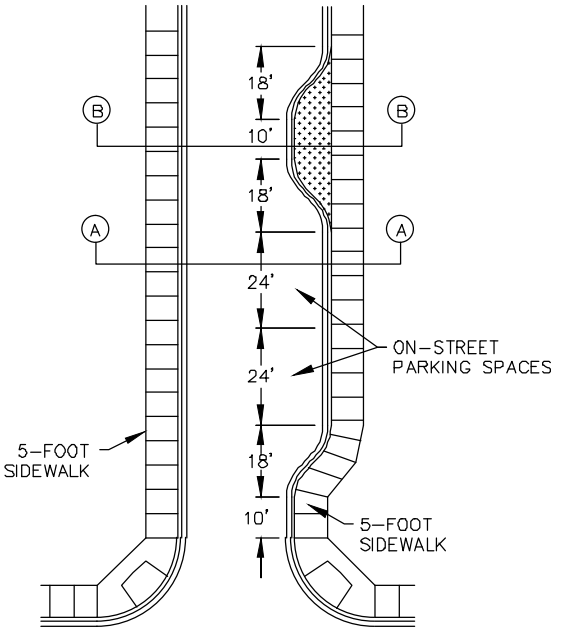
A A

NOTES:

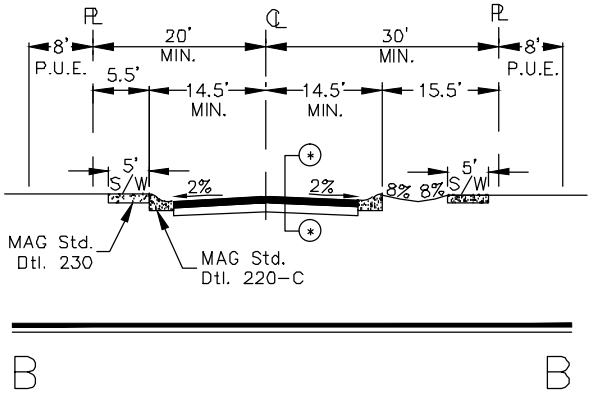
1. DETACHED SIDEWALK NOT PERMITTED ADJACENT TO ON-STREET PARKING.
2. PAVING DIMENSIONS ARE MEASURED TO THE BACK OF CURB.



DETAIL D



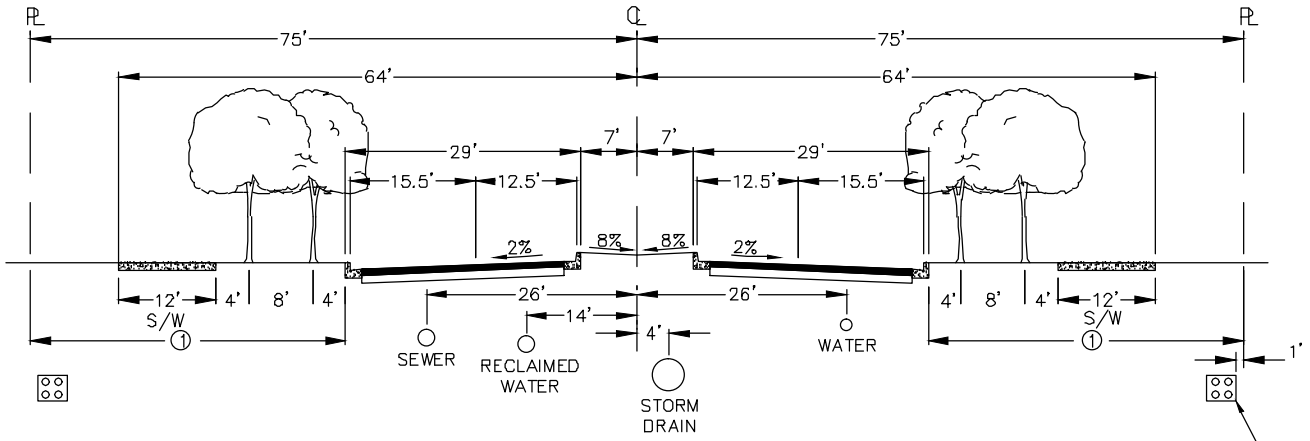
PRIVATE STREET WITH ON-STREET PARKING



B B

* SEE CITY Std. Dtl. G-3216 FOR PAVEMENT STRUCTURAL SECTION

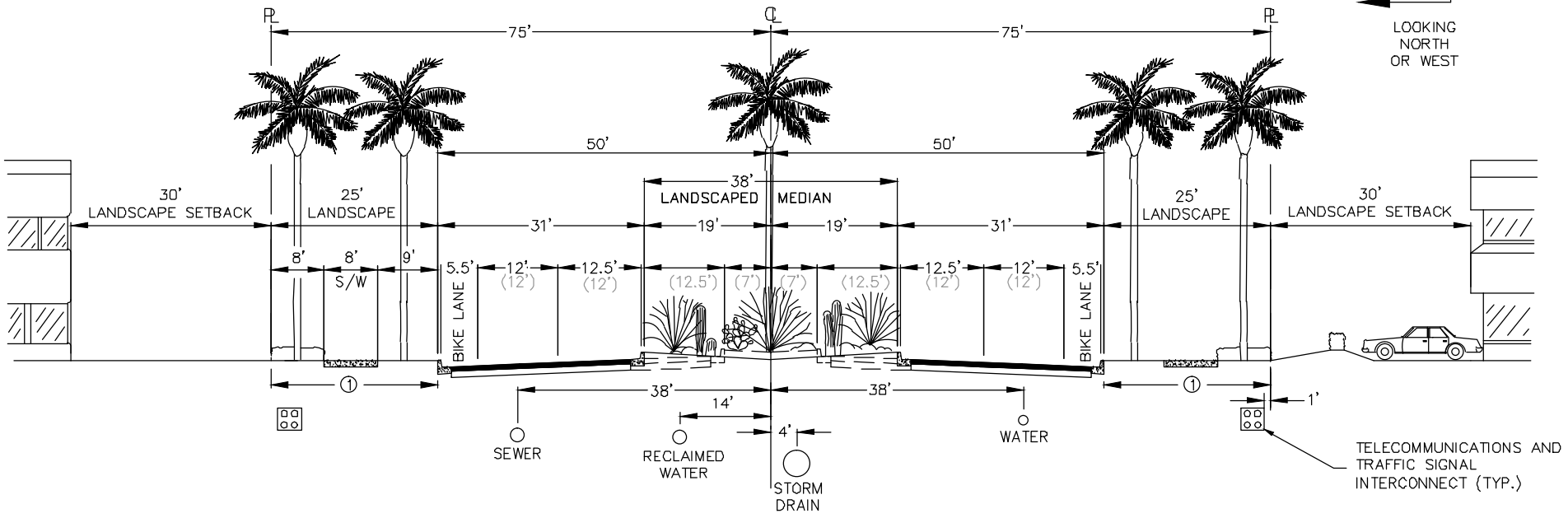
DETAIL NO. G-3128	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	PRIVATE STREET CROSS SECTIONS	DETAIL NO. G-3128



CITY CENTER ARTERIAL STREET

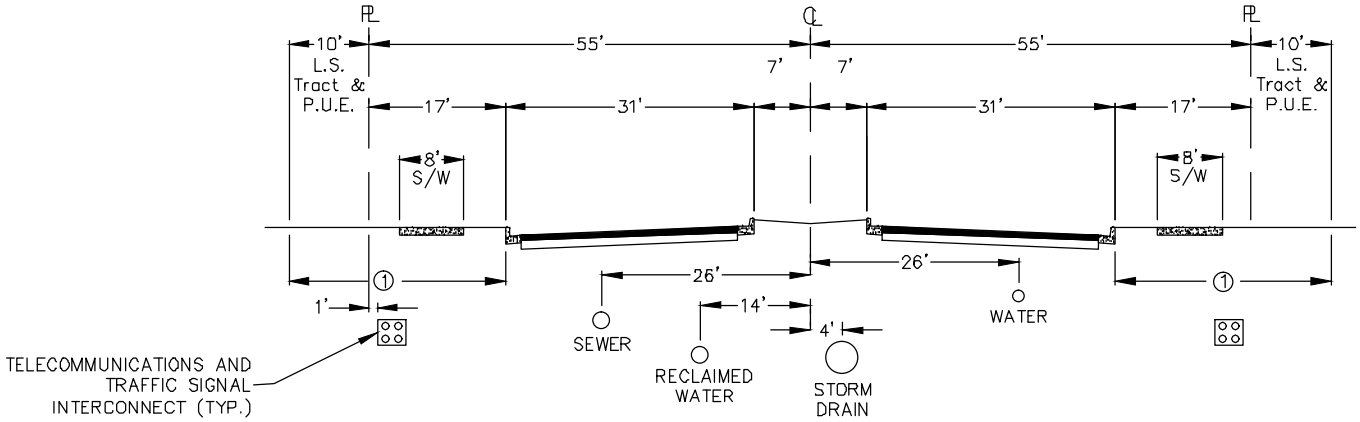
NOTES:

1. TELECOMMUNICATIONS AND TRAFFIC SIGNAL INTERCONNECT CONDUIT SHALL BE INSTALLED BEHIND THE BACK OF CURB AT A DISTANCE OF 1' FROM THE RIGHT OF WAY LINE.
2. PAVEMENT CUTS OF PUBLIC STREETS ARE NOT PERMITTED. FACILITIES SHALL BE BORED UNDER PAVEMENT AND CURB.
3. ALTERNATIVE FACILITY LOCATIONS AND REQUESTS TO CUT STREET PAVEMENT REQUIRE THE APPROVAL OF THE PUBLIC WORKS AND ENGINEERING DEPARTMENTS. SUPPORTING JUSTIFICATION IS REQUIRED FOR ALL REQUESTS.
4. WHERE STREET LIGHTS ARE LOCATED WITHIN THE MEDIAN, A MINIMUM 18" CLEAR SHALL BE MAINTAINED FROM THE STREET LIGHT FOUNDATION TO THE OUTSIDE EDGE OF A STORM DRAIN LINE OR OTHER CITY UTILITY LINE.
5. IRRIGATION MAINS AND LATERALS SHALL BE INSTALLED IN THE PERMANENT AREA OF THE LANDSCAPED MEDIAN.

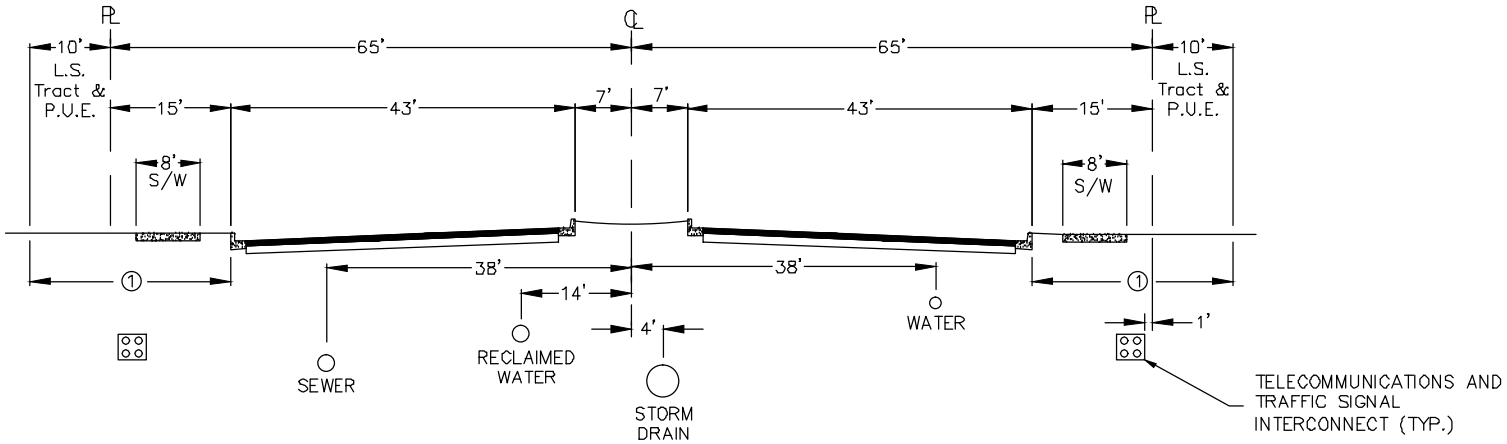


SCENIC ARTERIAL STREET

DETAIL NO. G-3130	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD UTILITY LOCATIONS - CITY CENTER & SCENIC ARTERIAL	DETAIL NO. G-3130



MINOR ARTERIAL STREET

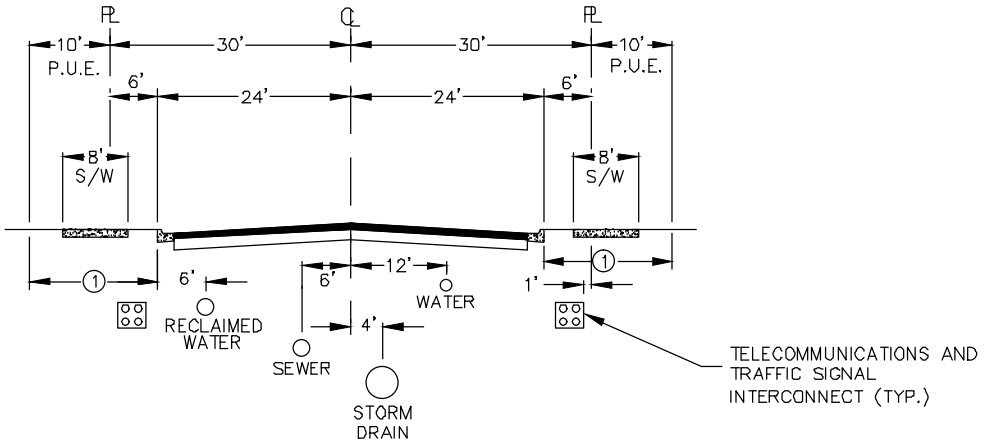


MAJOR ARTERIAL STREET

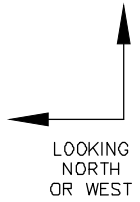
NOTES:

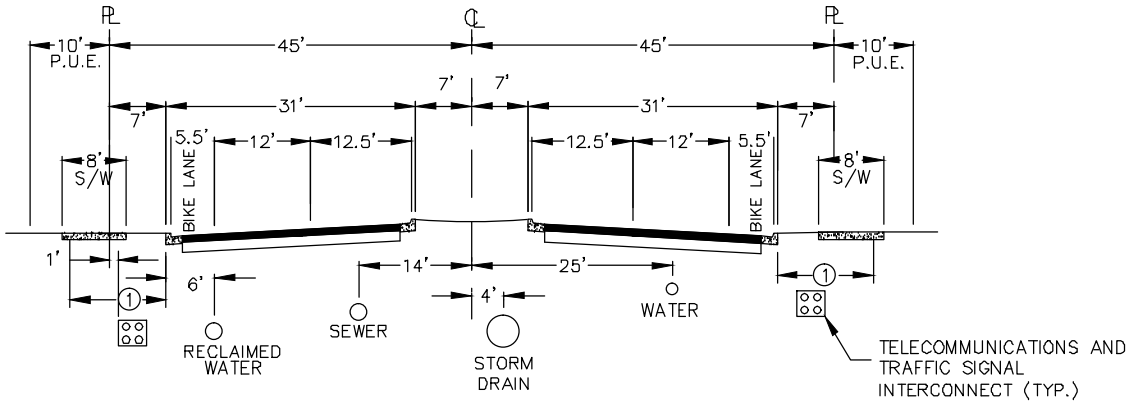
1. TELECOMMUNICATIONS AND TRAFFIC SIGNAL INTERCONNECT CONDUIT SHALL BE INSTALLED BEHIND THE BACK OF CURB AT A DISTANCE OF 1' FROM THE RIGHT OF WAY LINE.
2. PAVEMENT CUTS OF PUBLIC STREETS ARE NOT PERMITTED. FACILITIES SHALL BE BORED UNDER PAVEMENT AND CURB.
3. ALTERNATIVE FACILITY LOCATIONS AND REQUESTS TO CUT STREET PAVEMENT REQUIRE THE APPROVAL OF THE PUBLIC WORKS AND ENGINEERING DEPARTMENTS. SUPPORTING JUSTIFICATION IS REQUIRED FOR ALL REQUESTS.
4. WHERE STREET LIGHTS ARE LOCATED WITHIN THE MEDIAN, A MINIMUM 18" CLEAR SHALL BE MAINTAINED FROM THE STREET LIGHT FOUNDATION TO THE OUTSIDE EDGE OF A STORM DRAIN LINE OR OTHER CITY UTILITY LINE.

DETAIL NO. G-3132	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	STANDARD UTILITY LOCATIONS - ARTERIAL	DETAIL NO. G-3132



MINOR COLLECTOR ROAD



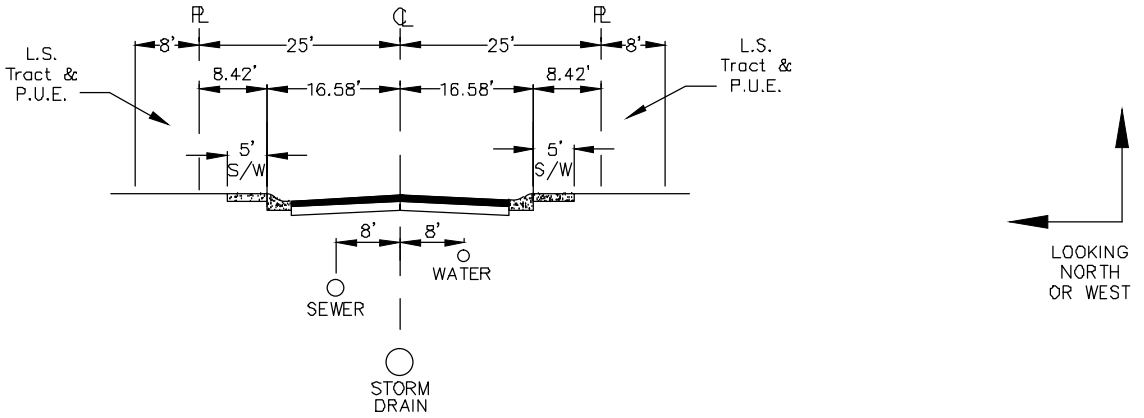


MAJOR COLLECTOR ROAD

NOTES:

1. TELECOMMUNICATIONS AND TRAFFIC SIGNAL INTERCONNECT CONDUIT SHALL BE INSTALLED BEHIND THE BACK OF CURB AT A DISTANCE OF 1' FROM THE RIGHT OF WAY LINE.
2. PAVEMENT CUTS OF PUBLIC STREETS ARE NOT PERMITTED. FACILITIES SHALL BE BORED UNDER PAVEMENT AND CURB.
3. ALTERNATIVE FACILITY LOCATIONS AND REQUESTS TO CUT STREET PAVEMENT REQUIRE THE APPROVAL OF THE PUBLIC WORKS AND ENGINEERING DEPARTMENTS. SUPPORTING JUSTIFICATION IS REQUIRED FOR ALL REQUESTS.
4. WHERE STREET LIGHTS ARE LOCATED WITHIN THE MEDIAN, A MINIMUM 18" CLEAR SHALL BE MAINTAINED FROM THE STREET LIGHT FOUNDATION TO THE OUTSIDE EDGE OF A STORM DRAIN LINE OR OTHER CITY UTILITY LINE. THE STREET LIGHT POLE SHALL BE LOCATED NO CLOSER THAN 18" TO THE NEAREST BACK OF CURB.

DETAIL NO. G-3134	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD UTILITY LOCATIONS - COLLECTOR	DETAIL NO. G-3134



LOCAL STREET

NOTES:

1. PAVEMENT CUTS OF PUBLIC STREETS ARE NOT PERMITTED. FACILITIES SHALL BE BORED UNDER PAVEMENT AND CURB.
2. ALTERNATIVE FACILITY LOCATIONS AND REQUESTS TO CUT STREET PAVEMENT REQUIRE THE APPROVAL OF THE PUBLIC WORKS AND ENGINEERING DEPARTMENTS. SUPPORTING JUSTIFICATION IS REQUIRED FOR ALL REQUESTS.

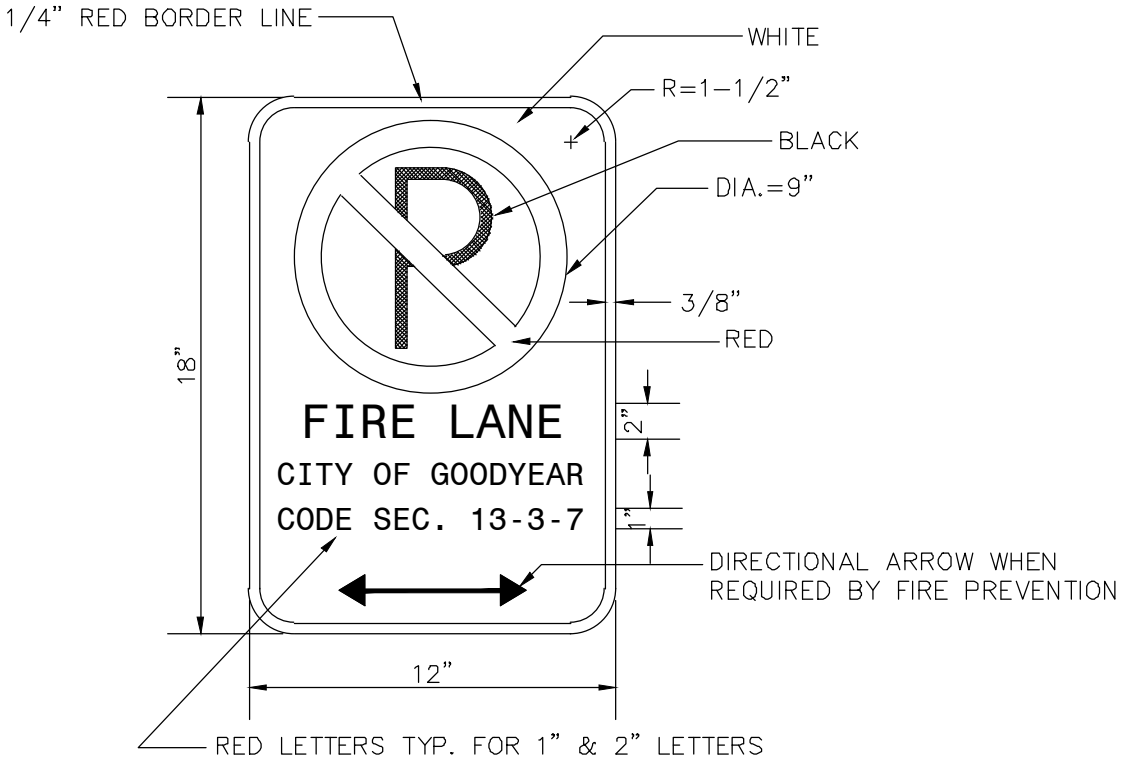
DETAIL NO. G-3136	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	STANDARD UTILITY LOCATIONS - LOCAL	DETAIL NO. G-3136

1. FIRE LANE SIGNS SHALL BE INSTALLED AS REQUIRED BY THE CITY FIRE DEPARTMENT.

   A. SIGNS SHALL BE 12" WIDE AND 18" LONG BY .063" THICK. THEY SHALL HAVE A REFLECTORIZED SURFACE USING SCOTCHLITE MATERIAL OR EQUAL.

   B. THEY SHALL BE MOUNTED ON STURDY METAL POSTS WITH THE BOTTOM OF THE SIGN NO LESS THAN 5' AND NO GREATER THAN 7' ABOVE GRADE.

   C. THE SIGN SHALL READ AS FOLLOWS:



2. SIGNS SHALL BE PROVIDED AND MAINTAINED BY PROPERTY OWNER/OCCUPANT.

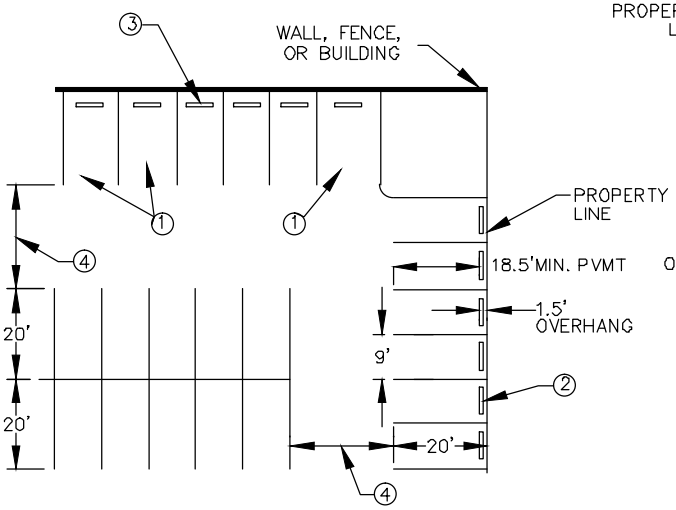
DETAIL NO. G-3142	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	FIRE LANE SIGN INSTALLATION	DETAIL NO. G-3142



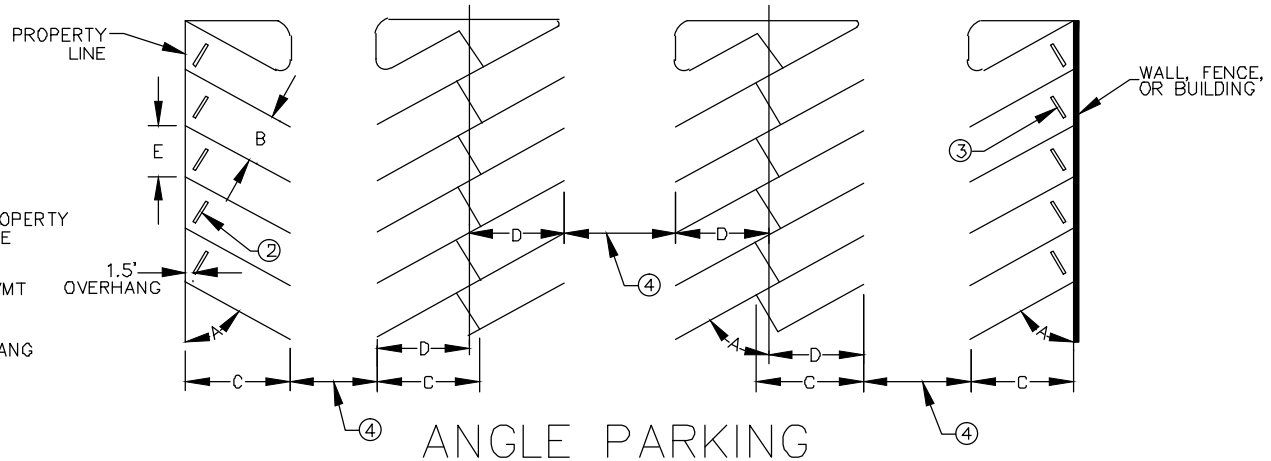
NOTES:

1. THE SIGN PLATE SHALL HAVE MINIMUM DIMENSIONS OF 12" X 24", A THICKNESS OF 0.08", AND BE CONSTRUCTED FROM VIP DIAMOND SHEETING.
2. THE SIGN FACE SHALL HAVE A WHITE REFLECTIVE BACKGROUND WITH A BLUE LEGEND. SEE THE CITY APPROVED MATERIALS LIST FOR SPECIFIC MATERIAL REQUIREMENTS.
3. ALL ACCESSIBLE PARKING SPACES SHALL BE IDENTIFIED BY A SIGN ON A CITY APPROVED STATIONARY POST OR APPROVED WALL LOCATION. THESE SIGNS SHALL NOT BE OBSCURED FROM VIEW.
4. THE BOTTOM OF THE SIGN SHALL BE LOCATED NOT LESS THAN 5' NOR MORE THAN 6' ABOVE THE GRADE (PARKING LOT SURFACE) AND SHALL BE VISIBLE DIRECTLY IN FRONT OF THE PARKING SPACE.
5. ACCESSIBLE PARKING SPACES SHALL BE DESIGNATED AS RESERVED FOR PHYSICALLY DISABLED BY A SIGN SHOWING THE INTERNATIONAL WHEELCHAIR SYMBOL.
6. THE SIGN SHALL AT A MINIMUM HAVE THE FOLLOWING ITEMS "RESERVED PARKING" NOTICE, INTERNATIONAL WHEELCHAIR SYMBOL, "CITY OF GOODYEAR" NAME, AND "CITY CODE 13-3-6".

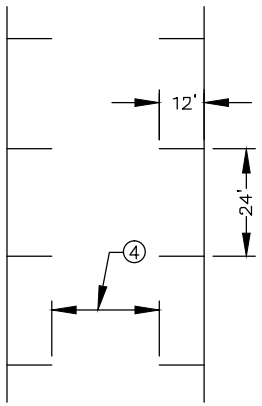
DETAIL NO. G-3144	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	HANDICAP ACCESSIBLE PARKING SIGN	DETAIL NO. G-3144



90° PARKING



ANGLE PARKING



PARALLEL
PARKING

TABLE A

A	B	C	D	E
PARKING ANGLE	STALL WIDTH	STALL DEPTH	PARKING DEPTH	CURB LENGTH
30°	9'	18.0'	14.1'	18.0'
45°	9'	20.5'	17.3'	12.7'
60°	9'	22.0'	19.8'	10.4'

NOTES:

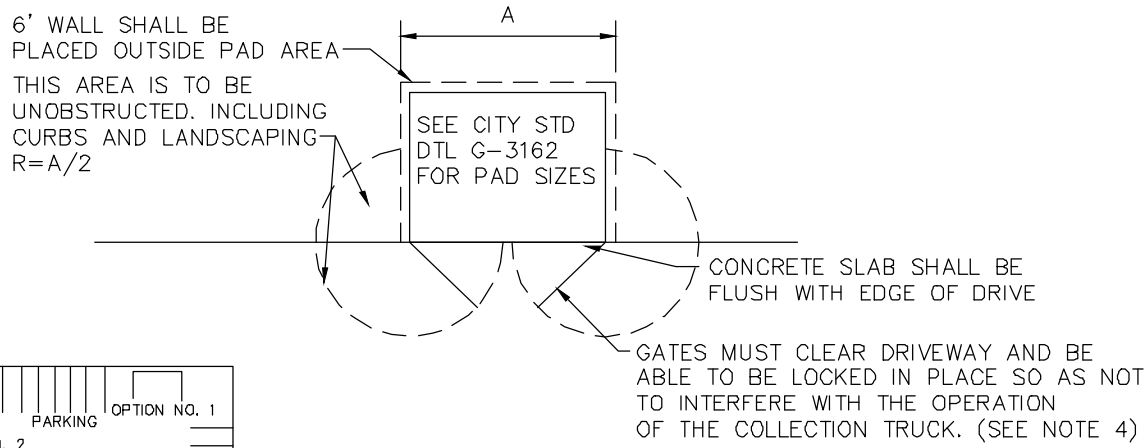
1. HANDICAP STALLS ARE REQUIRED IN ALL PARKING LOTS. THIS DETAIL DOES NOT ADDRESS HANDICAP PARKING STALL DIMENSIONS. REFER TO THE APPLICABLE BUILDING CODE OR ADA REQUIREMENT FOR SPECIFIC INFORMATION ON HANDICAP STALL REQUIREMENTS.

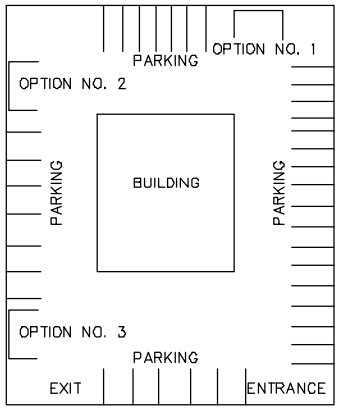
2. WHERE NO WALL OR BUILDING EXISTS, A 6" HIGH CURB OR BUMPER GUARD IS REQUIRED SO THAT NO PART OF THE VEHICLE EXTENDS OVER OR BEYOND THE PROPERTY LINE. A MAG Std 220-A CONCRETE CURB IS REQUIRED BETWEEN AREAS OF VEHICULAR ACTIVITY AND CITY RIGHT-OF-WAY.

3. WHERE PARKING ABUTS A PERIMETER WALL/FENCE OR BUILDING, A 6" HIGH BUMPER GUARD IS RECOMMENDED TO PREVENT VEHICLE OR STRUCTURE DAMAGE.

4. DRIVE AISLES DESIGNED FOR 2-WAY TRAFFIC FLOW SHALL HAVE A MINIMUM WIDTH OF 23'; DRIVE AISLES DESIGNED FOR 1-WAY TRAFFIC SHALL HAVE A MINIMUM WIDTH OF 12'; DRIVE AISLES TO BE USED FOR FIRE DEPARTMENT ACCESS SHALL HAVE A MINIMUM WIDTH OF 20', HOWEVER ADDITIONAL DRIVE AISLE WIDTH MAY BE REQUIRED AS DIRECTED BY THE FIRE DEPARTMENT.

DETAIL NO. G-3150	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	PARKING LOT DIMENSIONS	DETAIL NO. G-3150

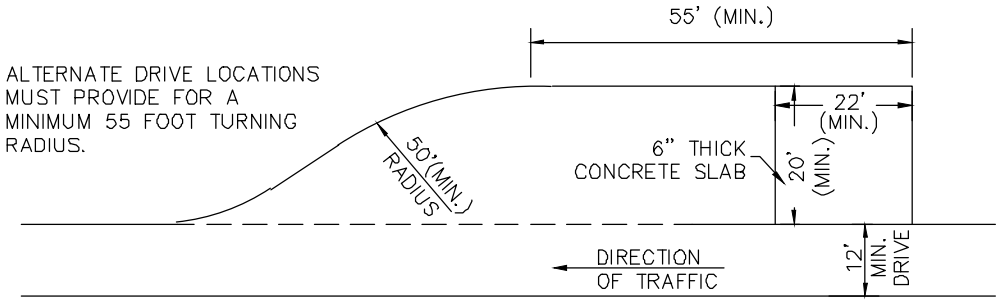




NOTES:

1. FRONT-END LOADED CONTAINERS WILL BE PLACED THROUGHOUT THE CITY AND AT ALL NEW COMMERCIAL BUSINESSES.
2. ENCLOSURES IN INDUSTRIAL AREAS SHALL BE PLACED IN THE BACK OF THE LOT IN LINE WITH THE DRIVE THRU SO THE DRIVER CAN HAVE A DIRECT APPROACH TO THE REFUSE BIN, SERVICE IT, AND EXIT THE FACILITY.
3. THE ENCLOSURE SHOULD NOT BE PLACED AT THE END OF A DEAD END STREET UNLESS THERE IS A TURN AROUND WITH A RADIUS OF FIFTY FIVE (55) FEET.
4. THE ENCLOSURE SHALL BE FREE OF ANY OVERHEAD OBSTRUCTION WHICH MAY INTERFERE IN THE SERVICING OF THE CONTAINER.
5. ENCLOSURES SHALL NOT LIMIT THE VISIBILITY OF ONCOMING TRAFFIC FOR PEDESTRIANS OR VEHICLES.
6. GATES ARE REQUIRED ON REFUSE AND RECYCLE ENCLOSURES.
7. ENCLOSURES SHALL NOT BE LOCATED WITHIN ANY APPLICABLE BUILDING SETBACK.

DETAIL NO. G-3160	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	REFUSE CONTAINERS DESIGN CRITERIA FOR 2 YD. & 3 YD.	DETAIL NO. G-3160



NOTES:

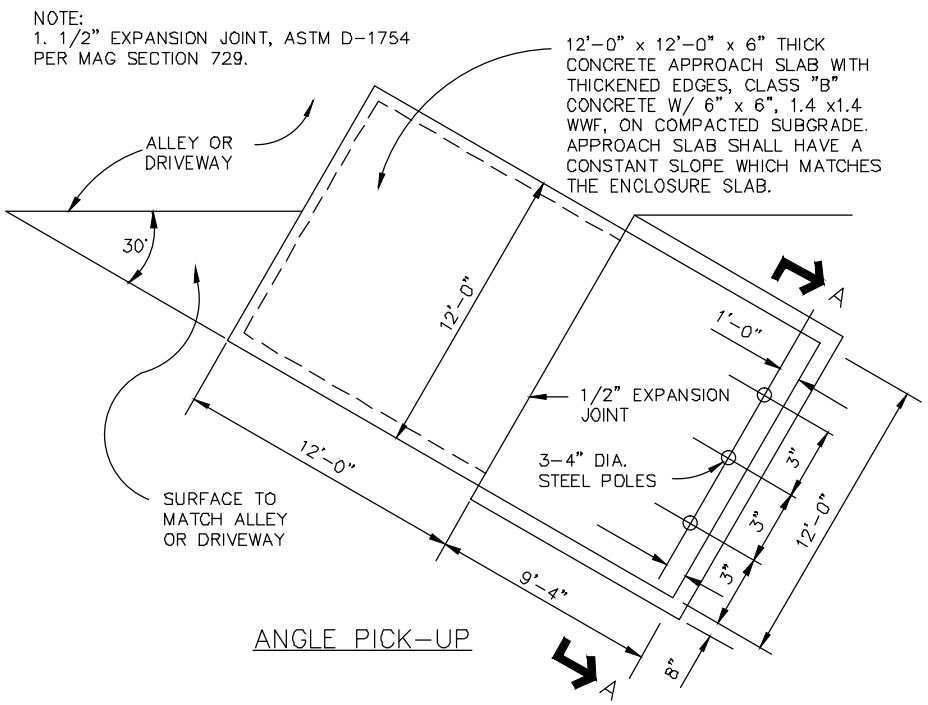
1. MULTIPLE REFUSE CONTAINERS SHALL BE PLACED ON THE RIGHT SIDE OF THE DRIVE IN RELATION TO THE TRAFFIC FLOW SO COLLECTION TRUCKS MAY BE ROUTED THROUGH THE SITE IN ONE DIRECTION.

2. REFUSE CONTAINERS USED FOR CONSTRUCTION PURPOSES DO NOT REQUIRE A CONCRETE PAD.

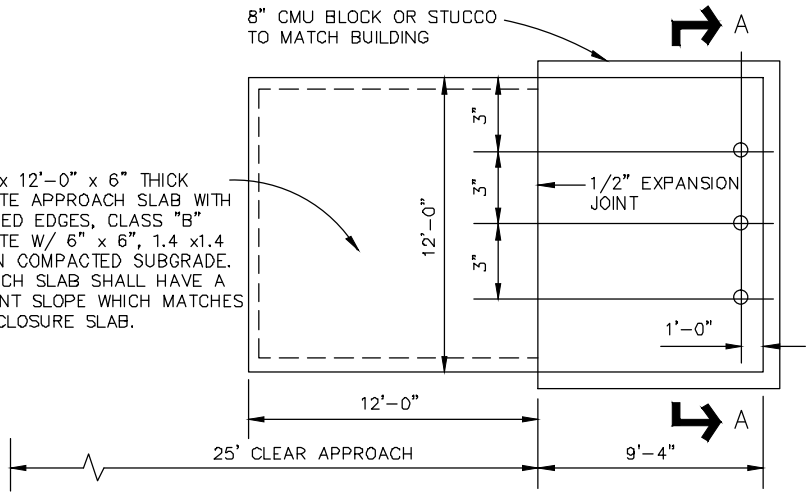
3. GATES ARE REQUIRED ON REFUSE AND RECYCLE ENCLOSURES FOR ALL COMMERCIAL, INDUSTRIAL, AND MULTI–FAMILY DEVELOPMENTS.

DETAIL NO. G-3161	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	REFUSE CONTAINERS DESIGN CRITERIA FOR 20 YD. & 40 YD.	DETAIL NO. G-3161

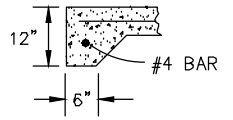
NOTE:
1. 1/2" EXPANSION JOINT, ASTM D-1754 PER MAG SECTION 729.



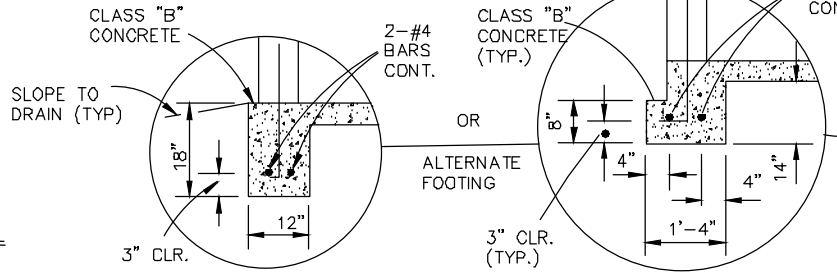
ANGLE PICK-UP

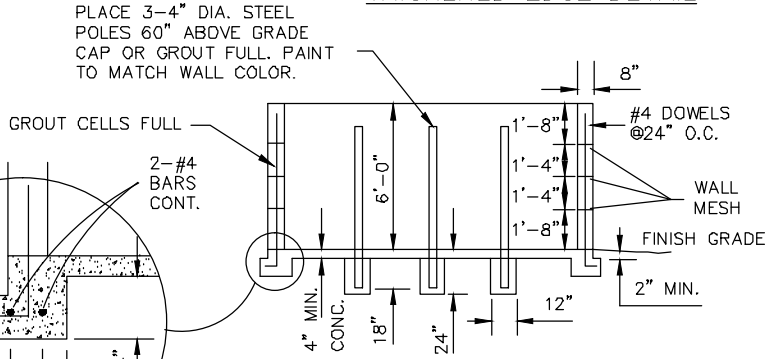


THICKENED EDGE DETAIL



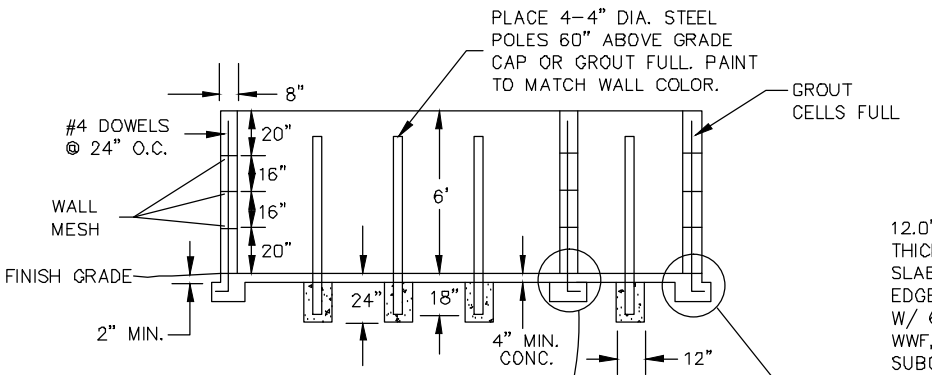
APPROACH SLAB
THICKENED EDGE DETAIL



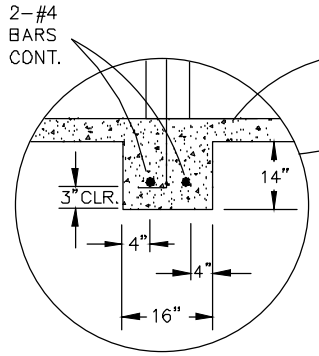


SECTION A-A

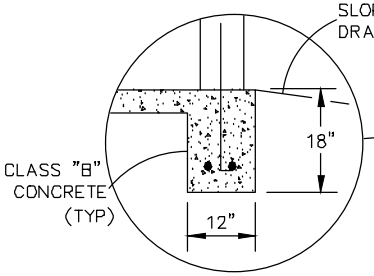
DETAIL NO. G-3162-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	REFUSE ENCLOSURE	DETAIL NO. G-3162-1



SECTION A–A

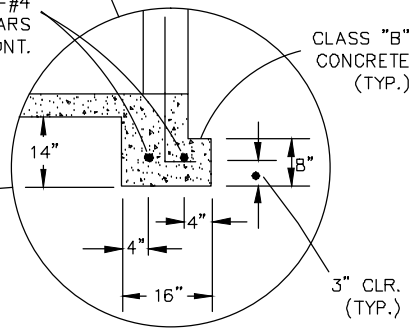


INNER FOOTING

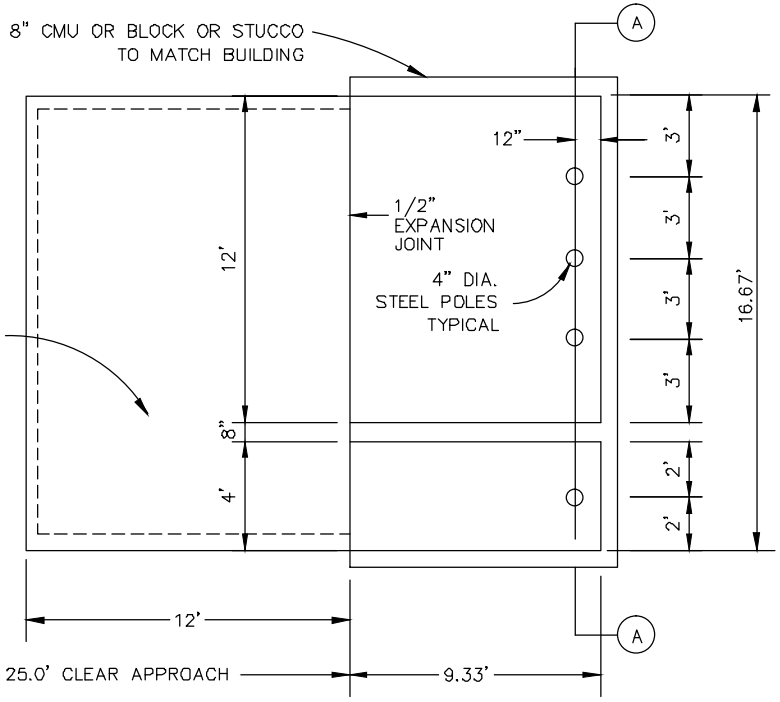


ALTERNATE FOOTING

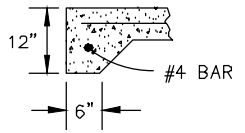
OR



OUTER FOOTING



PLAN

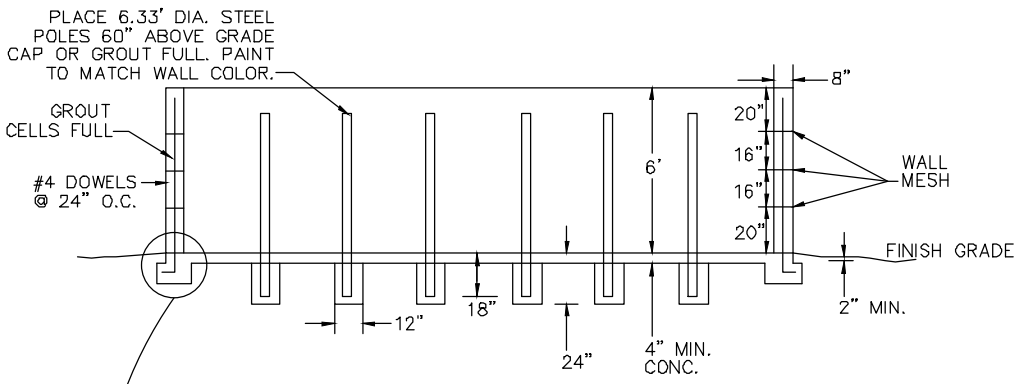


APPROACH SLAB THICKENED EDGE DETAIL

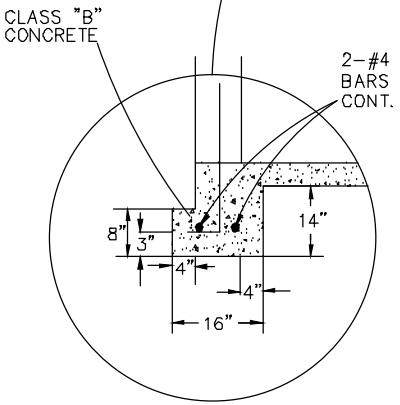
NOTES

1. DOUBLE ENCLOSURE FOR ANGLE PICK–UP
2. 1/2" EXPANSION JOINT, ASTM D–1751 PER MAG SECTION 729.

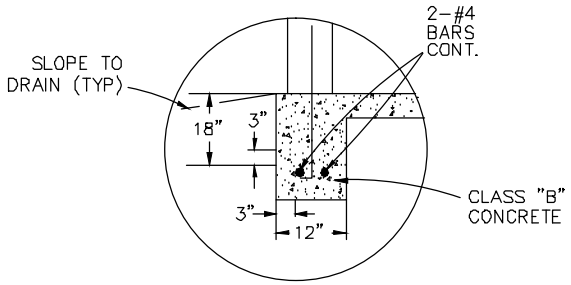
DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	REFUSE ENCLOSURE W/ GREASE CONTAINMENT AREA	DETAIL NO.
G-3162-2				G-3162-2



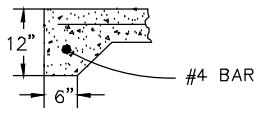
SECTION A–A



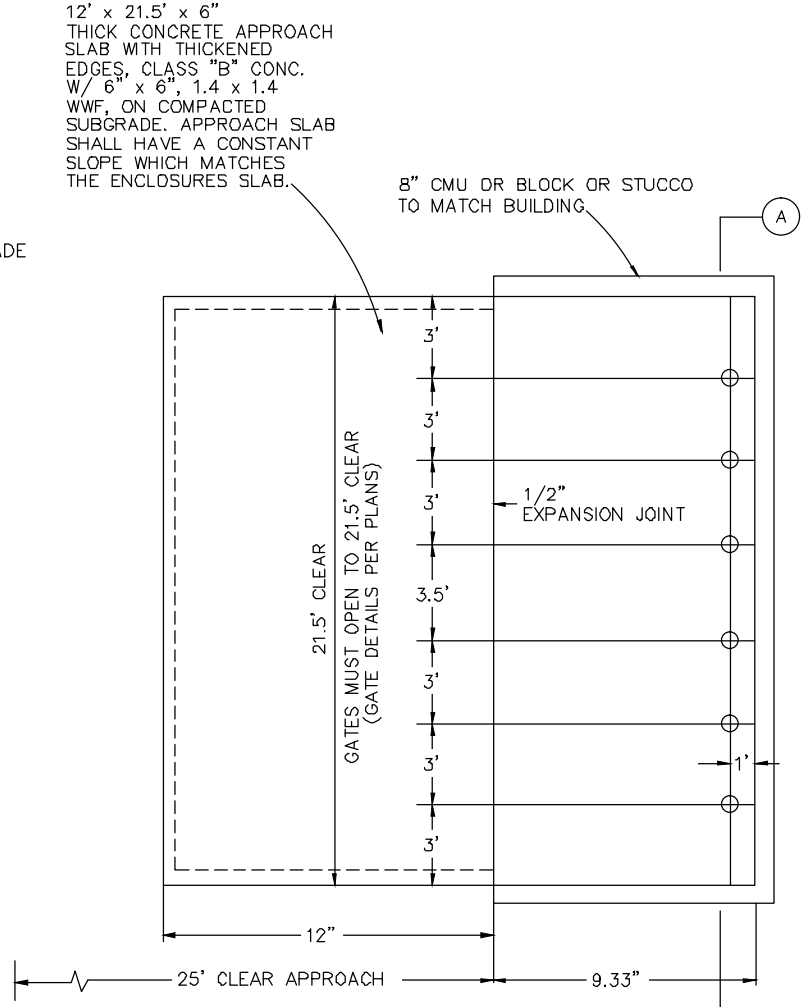
FOOTING



ALTERNATE FOOTING



APPROACH SLAB
THICKENED EDGE DETAIL

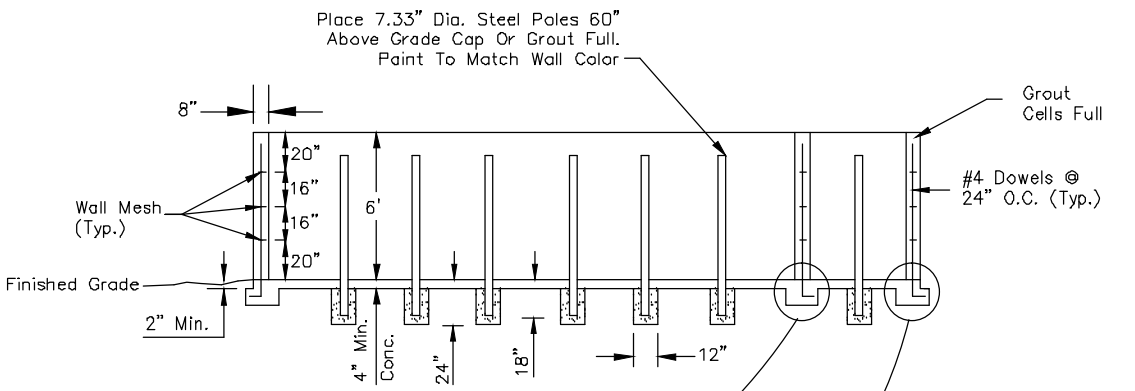


PLAN VIEW

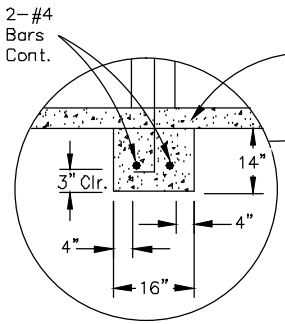
NOTES:

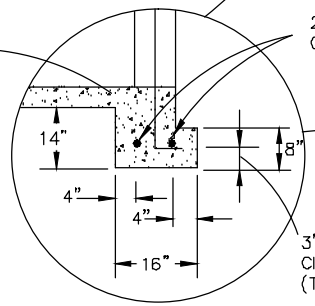
1. 1/2" EXPANSION JOINT, ASTM D–1751 PER MAG SECTION 729.

DETAIL NO. G-3164-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	DOUBLE REFUSE ENCLOSURE	DETAIL NO. G-3164-1

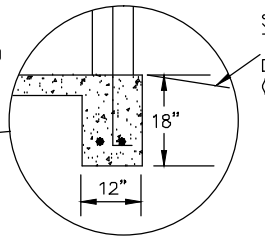


SECTION A–A

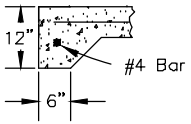




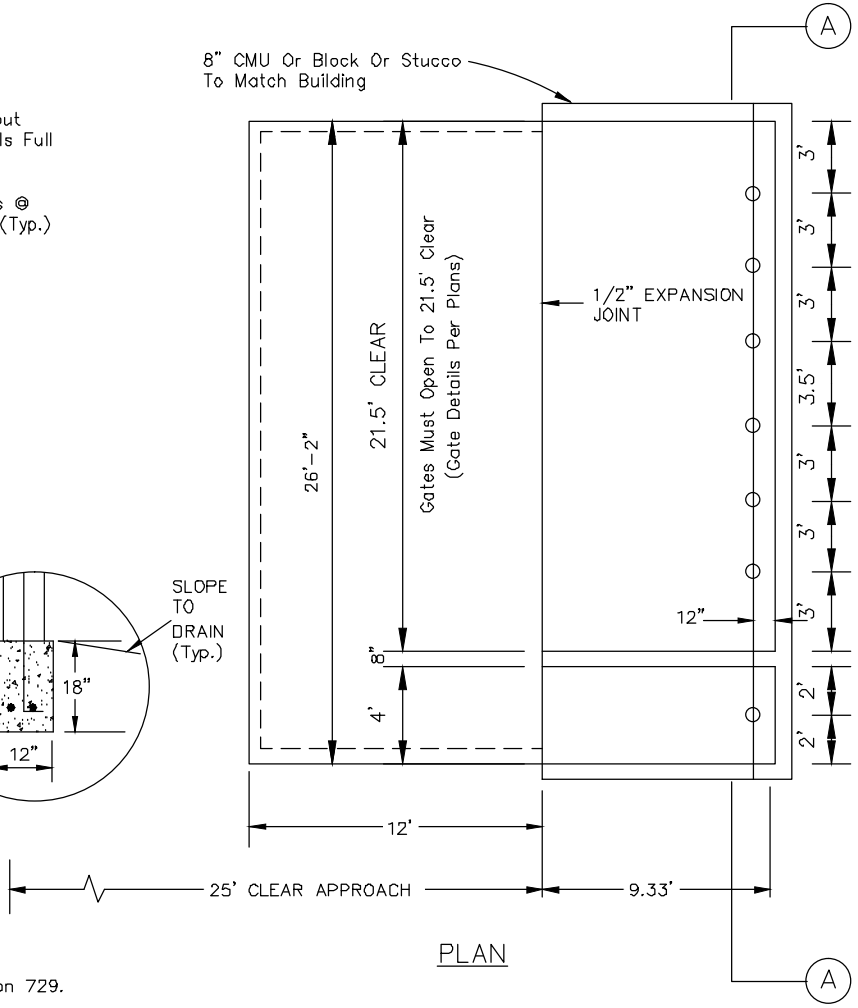
OR Alternate Footing



(Typ.)



APPROACH SLAB
THICKENED EDGE DETAIL

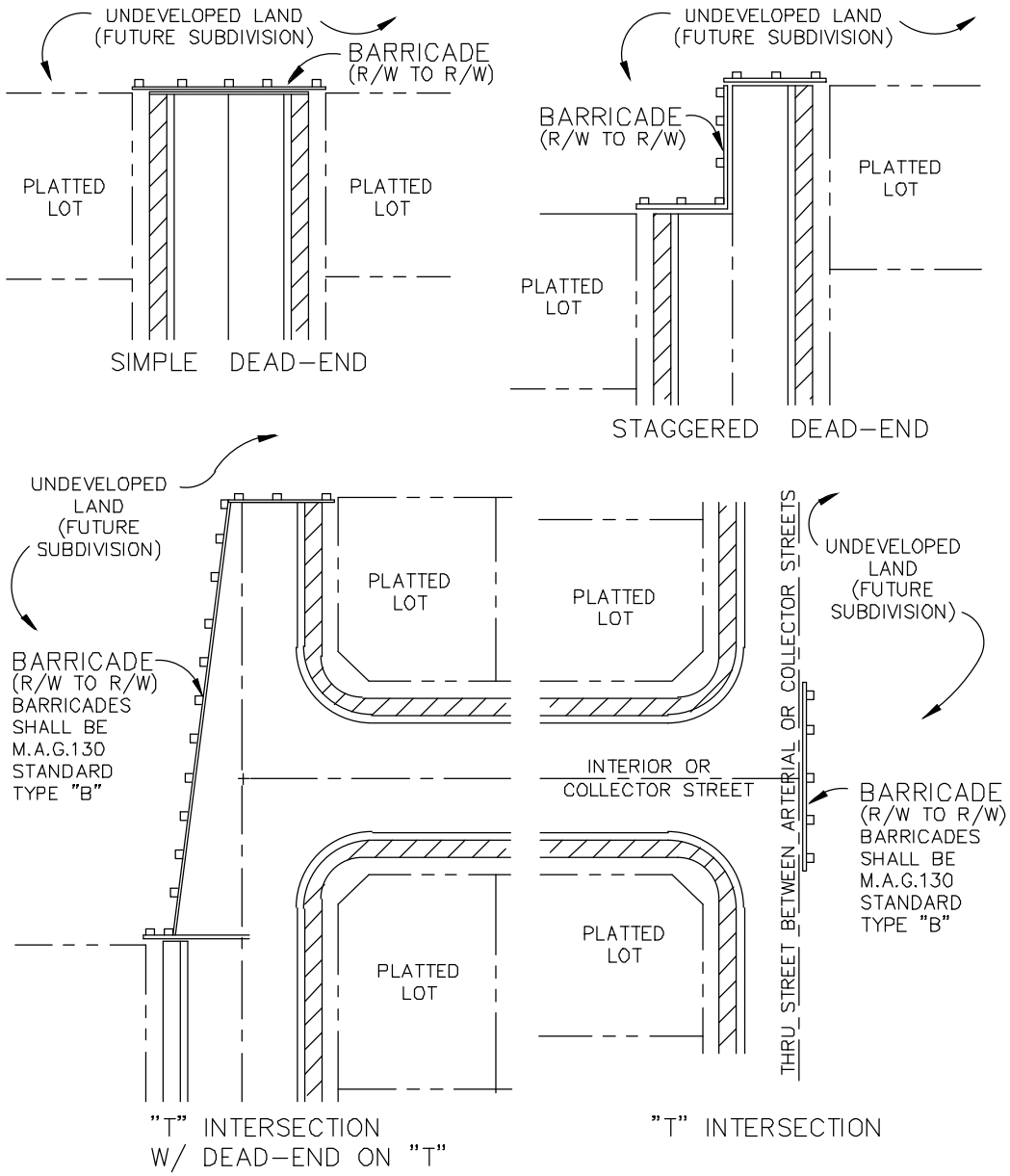


PLAN

NOTES:

1. 1/2" Expansion Joint, ASTM D–1751 Per MAG Section 729.
2. Concrete Approach Slab Shall Be 12' x 26.17' x 6" Thick With Thickened Edges Class "B" Conc. w/ 6" x 6", 1.4 x 1.4 WWF, On Compacted Subgrade. Approach Slab Shall Have A Constant Slope Which Matches The Enclosure Slab.

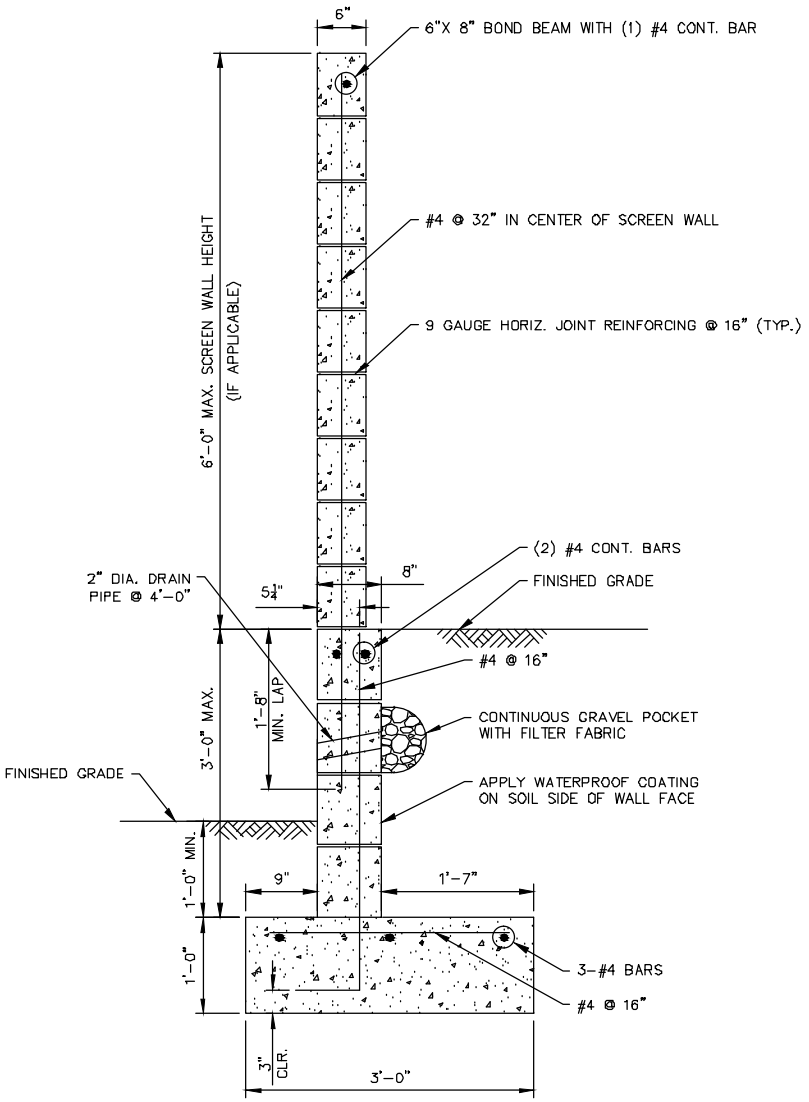
DETAIL NO. G-3164-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	DOUBLE REFUSE ENCLOSURE W/ GREASE CONTAINMENT AREA	DETAIL NO. G-3164-2



NOTES:

1. BARRICADES SHALL BE INSTALLED PER MAG STD DTL 130 USING THE OM4-2 WARNING SIGN. WARNING SIGN SHALL BE INSTALLED BY CONTRACTOR.

DETAIL NO. G-3170	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	BARRICADING ON SUBDIVISION STREETS	DETAIL NO. G-3170



RETAINING WALL SECTION

DESIGN ASSUMPTIONS

MAX SOIL BEARING PRESSURE IS 1,500 psf.
EQUIVALENT FLUID PRESSURE IS 40 psf/ft.
IF SITE CONDITIONS DO NOT MEET THIS CRITERIA, CONTACT THE CITY OF GOODYEAR.

WIND PRESSURE OF 18.0 psf APPLIED TO SCREEN WALL.

RETAINING WALLS DESIGNED WITH LEVEL BACKFILL.

RETAINING WALL NOT DESIGNED FOR ANY SURCHARGE LOAD FROM ADJACENT FOOTING OR SURCHARGE LOAD OVER HEEL.

WALL NOTES

ALL BLOCK CELLS THAT RETAIN SOIL SHALL BE FILLED WITH CONCRETE OR GROUT.

ALL REINFORCING STEEL SHALL HAVE 2 INCH CLEAR COVER UNLESS NOTED OTHERWISE.

COMPACT BACKFILL A MINIMUM OF 95 PERCENT OF ASTM D698 MAXIMUM DRY DENSITY.

ALL REBAR LAP SPLICES SHALL BE A MINIMUM OF 40 BAR DIAMETERS.

MASONRY: f'm = 1,500 psi, ASTM C90, MEDIUM OR NORMAL WEIGHT, RUNNING BOND, SLUMP BLOCK.

MORTAR: ASTM C270, TYPE S, CUBE STRENGTH 1,800 psi, ASTM C91 CEMENT.

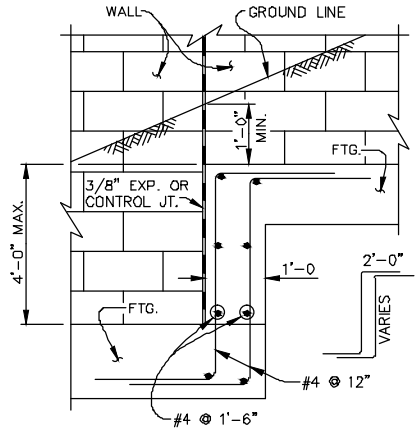
GROUT: ASTM C476, TYPE COARSE, CUBE STRENGTH 2,000 psi.

REINFORCING STEEL: ASTM A615, GRADE 60.

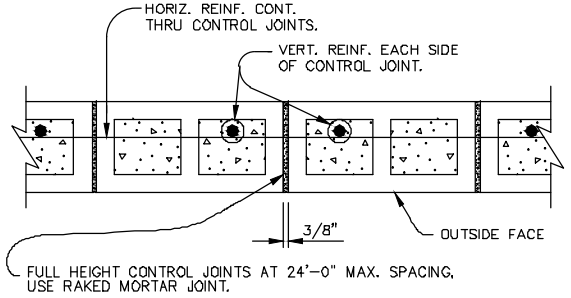
JOINT REINFORCING: 9 GAUGE LADDER OR TRUSS TYPE, STANDARD WEIGHT, fy=33,000 psi, ASTM A82 WIRE.

CONCRETE: f'c=2,500 psi.

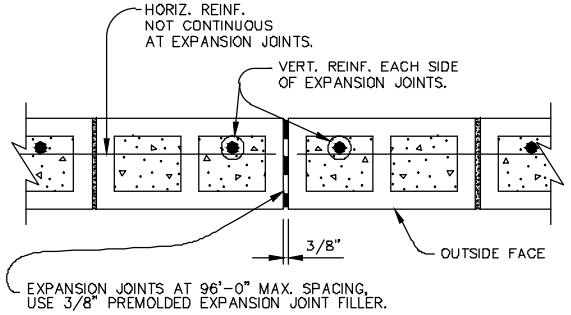
DETAIL NO. G-3171-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED: 08/17	MASONRY RETAINING WALL - SHEET 1 OF 2	DETAIL NO. G-3171-1



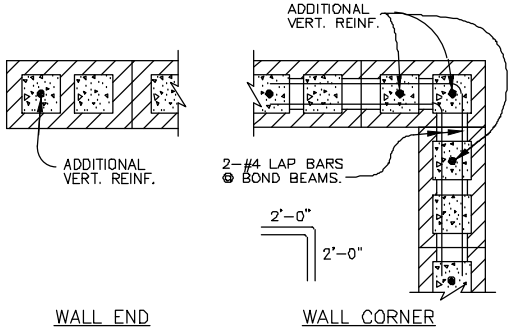
FOOTING STEP DETAIL



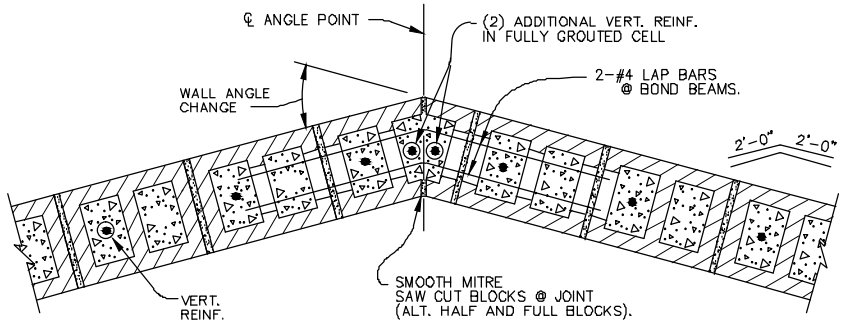
CONTROL JOINT DETAIL



EXPANSION JOINT DETAIL



WALL DETAILS AT CORNER AND ENDS



SECTION AT WALL ANGLE POINT

DETAIL NO. G-3171-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED: 08/17	MASONRY RETAINING WALL - SHEET 2 OF 2	DETAIL NO. G-3171-2

LEGEND

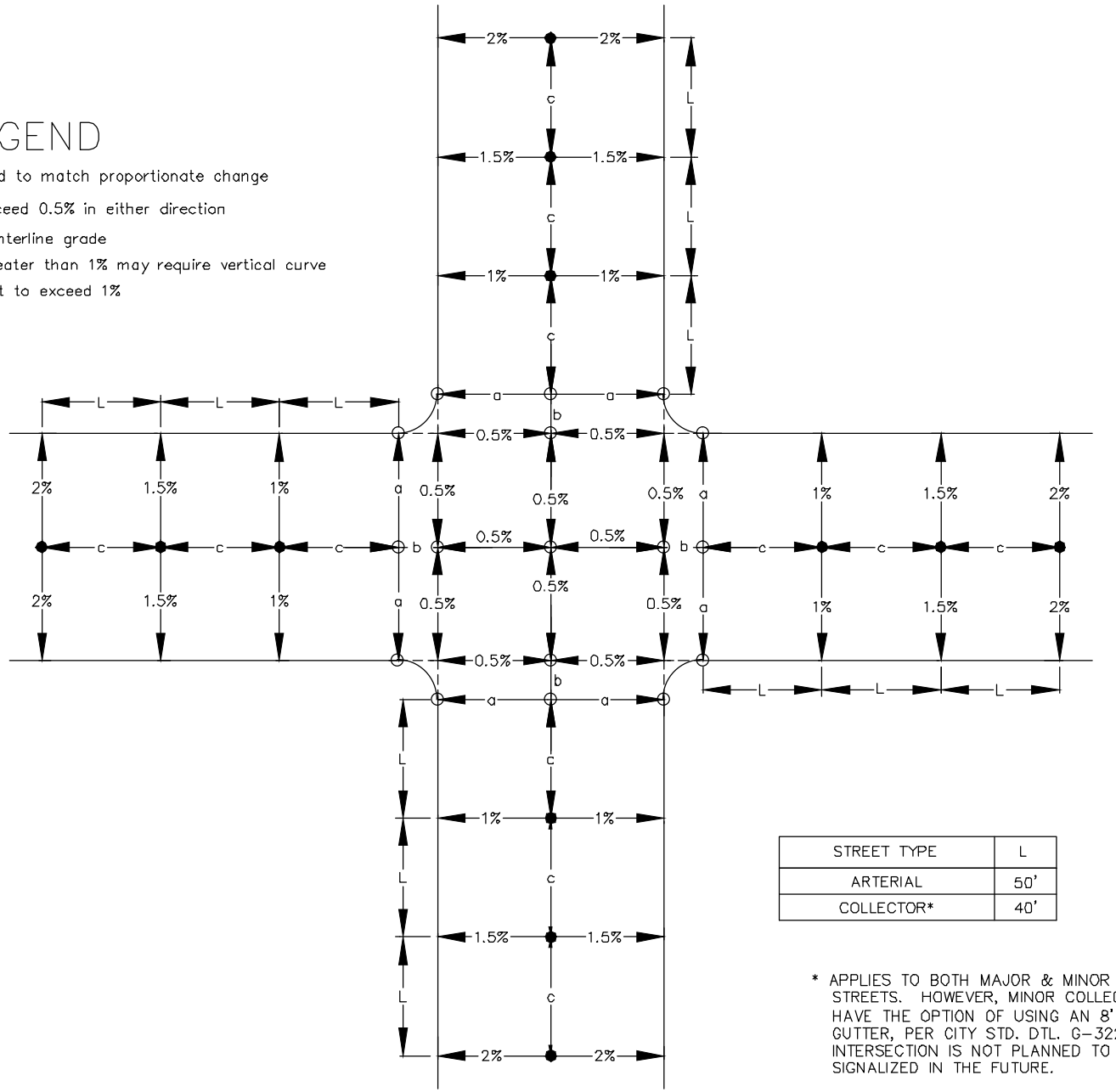
= (a) As required to match proportionate change

= (b) Not to exceed 0.5% in either direction

= (c) Normal centerline grade

● = Grade break greater than 1% may require vertical curve

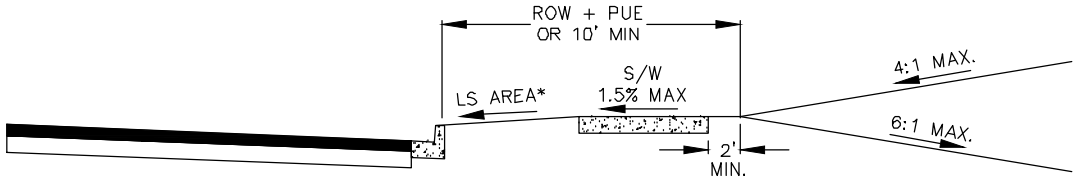
○ = Grade break not to exceed 1%



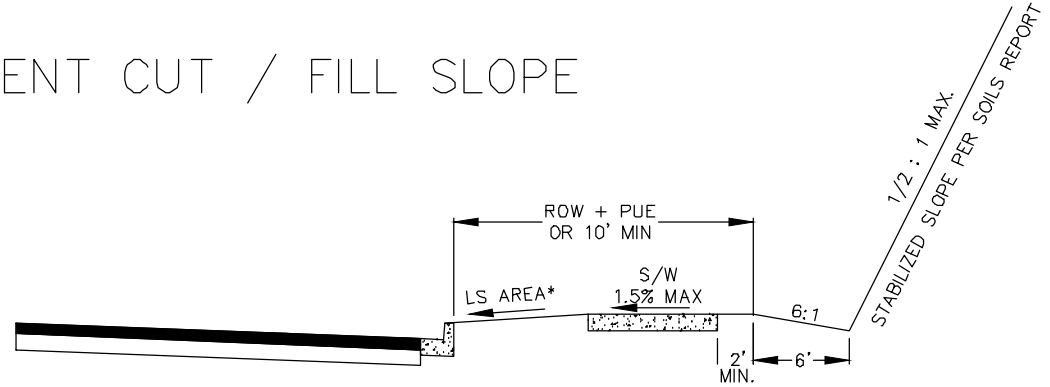
STREET TYPE	L
ARTERIAL	50'
COLLECTOR*	40'

* APPLIES TO BOTH MAJOR & MINOR COLLECTOR STREETS. HOWEVER, MINOR COLLECTOR STREETS HAVE THE OPTION OF USING AN 8' WIDE VALLEY GUTTER, PER CITY STD. DTL. G-3226, IF THE INTERSECTION IS NOT PLANNED TO BE TRAFFIC SIGNALIZED IN THE FUTURE.

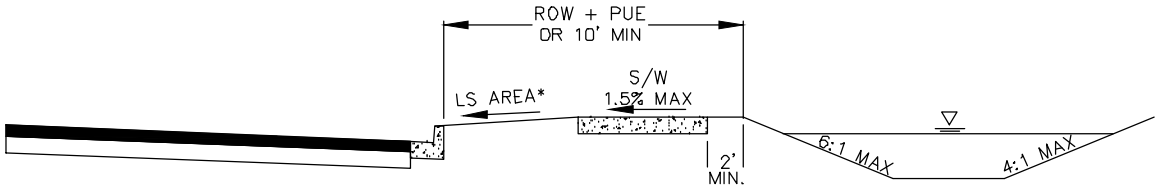
DETAIL NO. G-3204	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	INTERSECTION & STREETS TYPICAL CROSS-SLOPES & CROWN RUN-OFF	DETAIL NO. G-3204



ROADWAY WITH ADJACENT CUT / FILL SLOPE



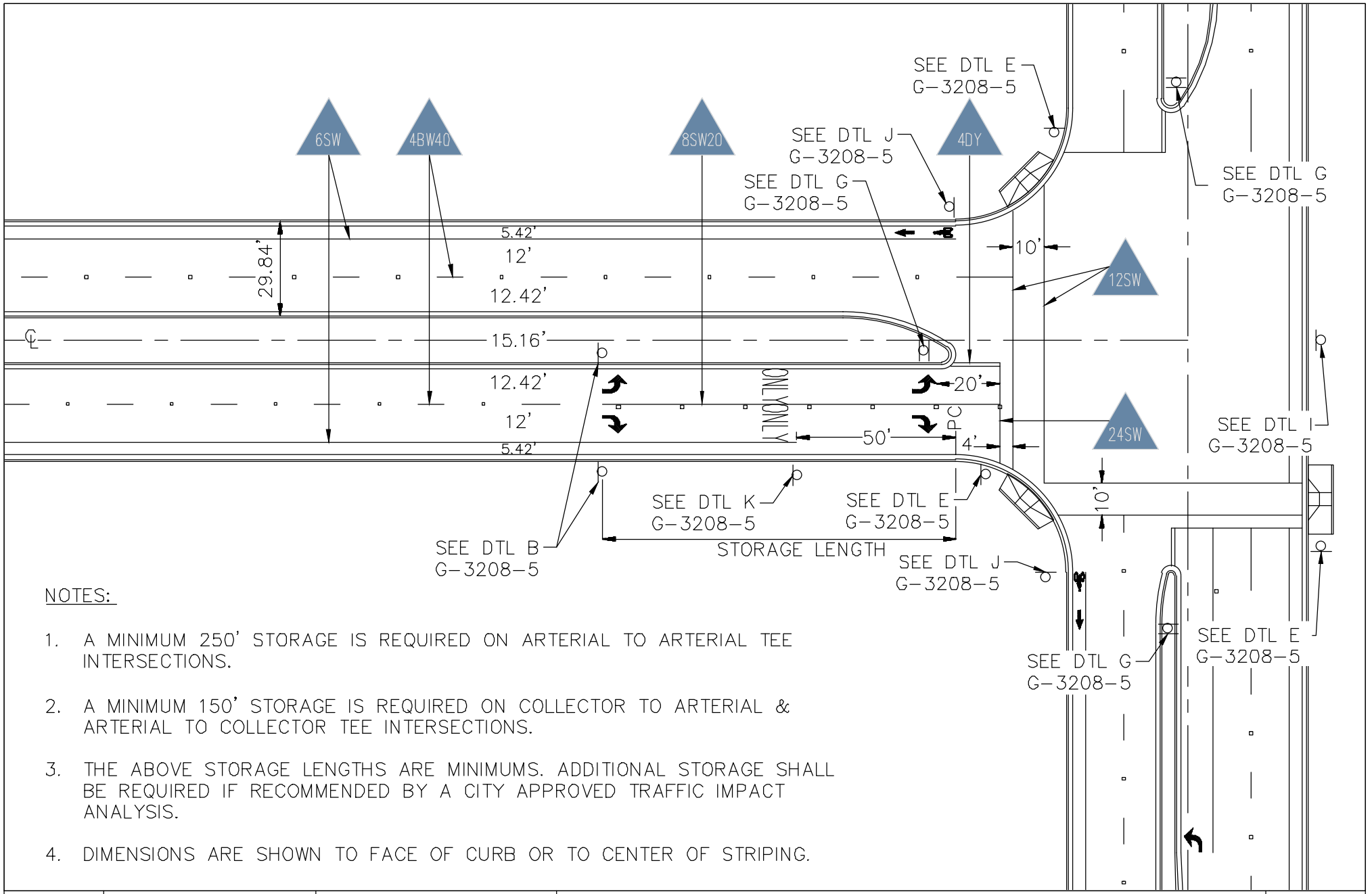
ROADWAY WITH ADJACENT MOUNTAINOUS SLOPE



ROADWAY WITH ADJACENT RETENTION BASIN

* LANDSCAPE AREAS SHALL HAVE A MAXIMUM 6:1 SLOPE IN THE ROW AND 10:1 SLOPE IN THE PUE.

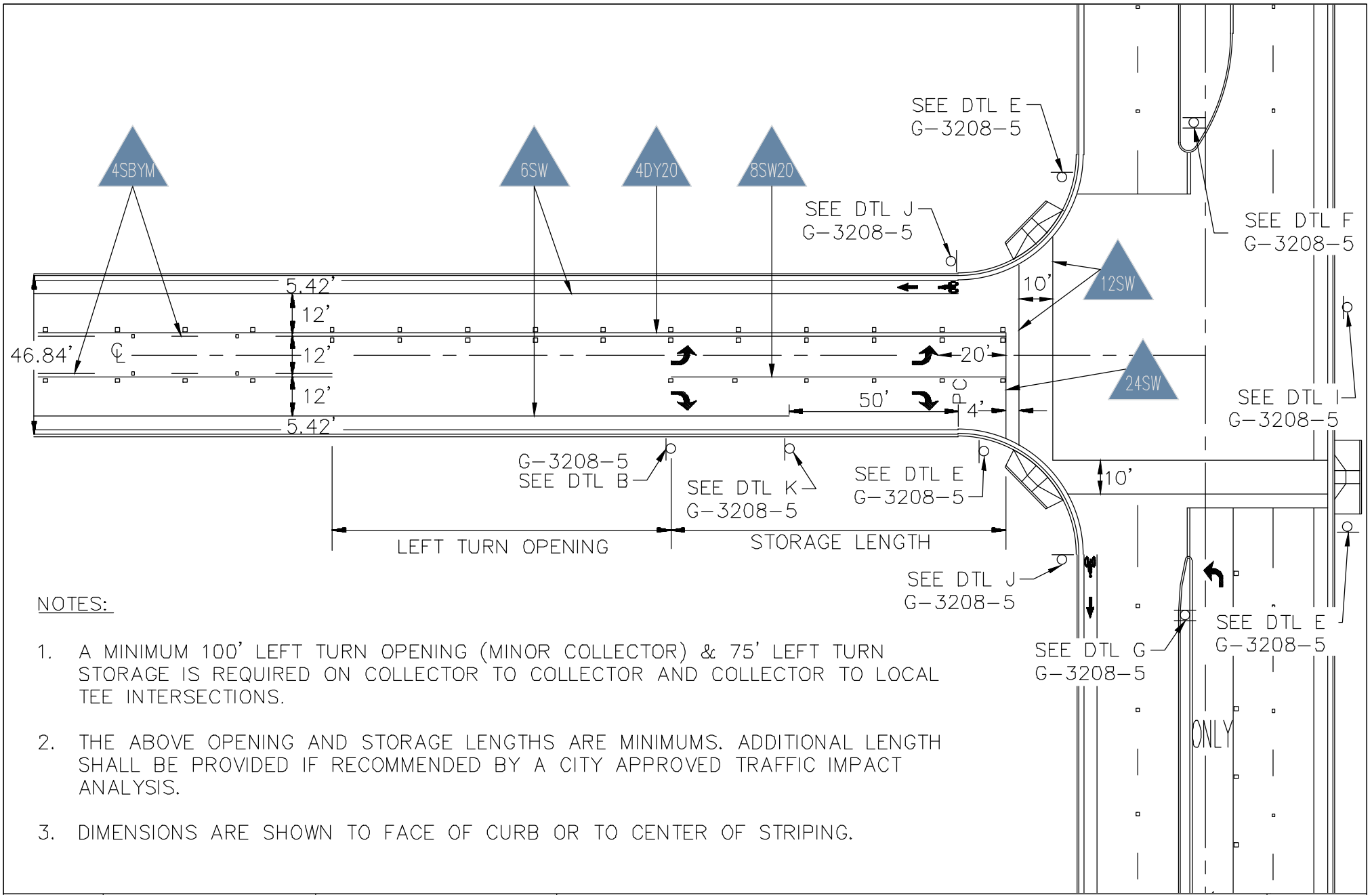
DETAIL NO. G-3206	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL CUT, FILL, OR ADJACENT SLOPE ROADWAY CROSS-SECTION	DETAIL NO. G-3206



NOTES:

1. A MINIMUM 250' STORAGE IS REQUIRED ON ARTERIAL TO ARTERIAL TEE INTERSECTIONS.
2. A MINIMUM 150' STORAGE IS REQUIRED ON COLLECTOR TO ARTERIAL & ARTERIAL TO COLLECTOR TEE INTERSECTIONS.
3. THE ABOVE STORAGE LENGTHS ARE MINIMUMS. ADDITIONAL STORAGE SHALL BE REQUIRED IF RECOMMENDED BY A CITY APPROVED TRAFFIC IMPACT ANALYSIS.
4. DIMENSIONS ARE SHOWN TO FACE OF CURB OR TO CENTER OF STRIPING.

DETAIL NO. G-3208-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL 4-LANE AT 4-LANE TEE INTERSECTION WITH MEDIAN LAYOUT, SIGNING, & STRIPING	DETAIL NO. G-3208-1



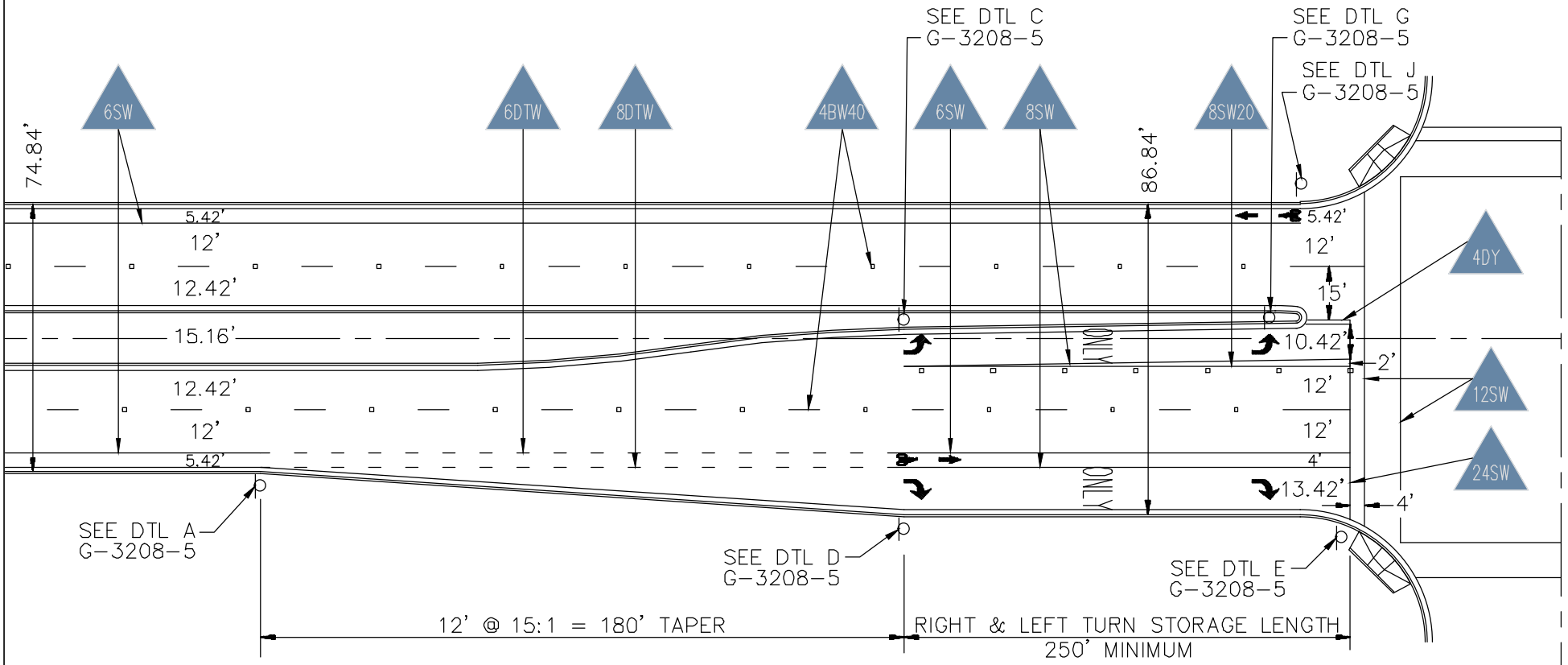
NOTES:

1. A MINIMUM 100' LEFT TURN OPENING (MINOR COLLECTOR) & 75' LEFT TURN STORAGE IS REQUIRED ON COLLECTOR TO COLLECTOR AND COLLECTOR TO LOCAL TEE INTERSECTIONS.

2. THE ABOVE OPENING AND STORAGE LENGTHS ARE MINIMUMS. ADDITIONAL LENGTH SHALL BE PROVIDED IF RECOMMENDED BY A CITY APPROVED TRAFFIC IMPACT ANALYSIS.

3. DIMENSIONS ARE SHOWN TO FACE OF CURB OR TO CENTER OF STRIPING.

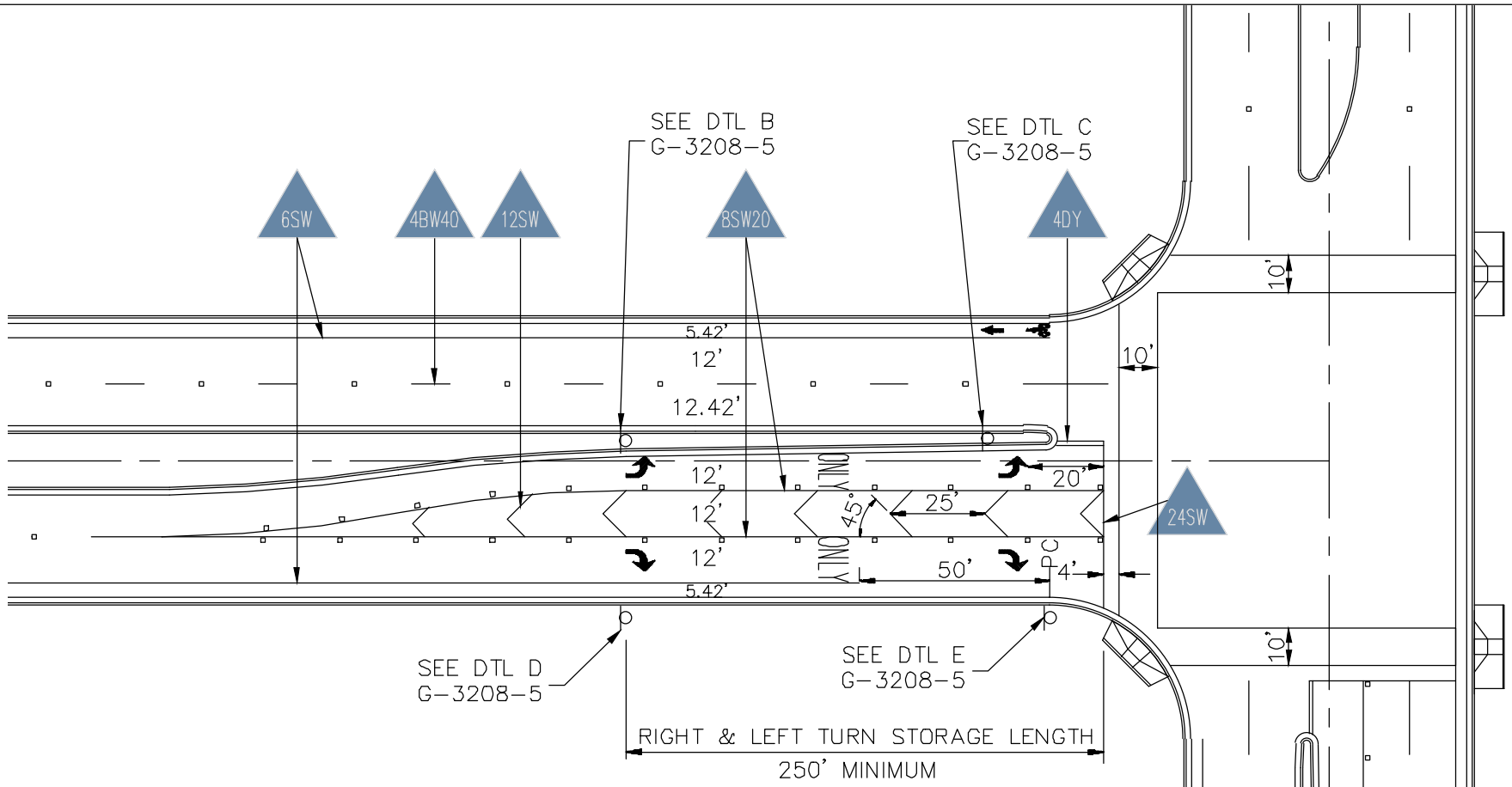
DETAIL NO. G-3208-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL COLLECTOR AT COLLECTOR TEE INTERSECTION WITH CENTERLINE LAYOUT, SIGNING, & STRIPING	DETAIL NO. G-3208-2



NOTES:

1. SEE CITY STD DTL G-3211 FOR LEFT TURN REVERSE CURVE DIMENSIONS AND RADII.
2. DIMENSIONS ARE SHOWN TO FACE OF CURB OR TO CENTER OF STRIPING.
3. THE ABOVE STORAGE AND TAPER LENGTHS ARE MINIMUMS. ADDITIONAL LENGTHS SHALL BE PROVIDED IF RECOMMENDED BY A CITY APPROVED TRAFFIC IMPACT ANALYSIS.

DETAIL NO. G-3208-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL ARTERIAL & COLLECTOR RIGHT TURN & RAISED MEDIAN LEFT TURN LAYOUT, SIGNING, & STRIPING	DETAIL NO. G-3208-3



NOTES:

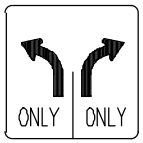
1. SEE CITY STD DTL G-3211 FOR LEFT TURN REVERSE CURVE DIMENSIONS AND RADII.
2. STRIPING DIMENSIONS ARE FROM FACE OF CURB OR CENTER OF STRIPE.
3. THE ABOVE STORAGE LENGTH IS A MINIMUM. ADDITIONAL LENGTH SHALL BE PROVIDED IF RECOMMENDED BY A CITY APPROVED TRAFFIC IMPACT ANALYSIS.

DETAIL NO. G-3208-4	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	4-LANE AT 4-LANE DUAL LEFT INTERIM T-INTERSECTION LAYOUT, SIGNING, & STRIPING	DETAIL NO. G-3208-4



R4-4
(30"X36")

DETAIL A



R3-8LR
(30"X30")

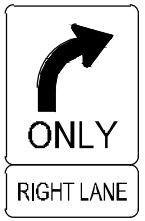
DETAIL B



R3-5L
(30"X36")

R3-5B
(30"X12")

DETAIL C



R3-5R
(30"X36")

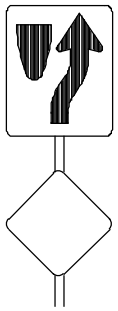
R3-5F
(30"X12")

DETAIL D



R1-1
(36"X36")

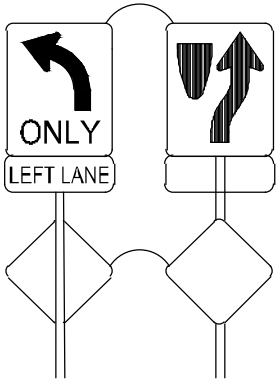
DETAIL E



R4-7
(24"X30")

OM1-3
(18"X18")

DETAIL F



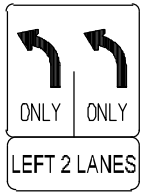
R3-5L
(24"X30")

R3-5B
(30"X12")

R4-7
(24"X30")

OM1-3
(18"X18")

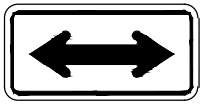
DETAIL G



R3-8LL
(30"X30")

R3-5DL*
(30"X12")

DETAIL H
*SPECIALTY SIGN



W1-7
(36"X18")

DETAIL I



R7-9a
(12"X18")

DETAIL J



R3-17
(30"X24")

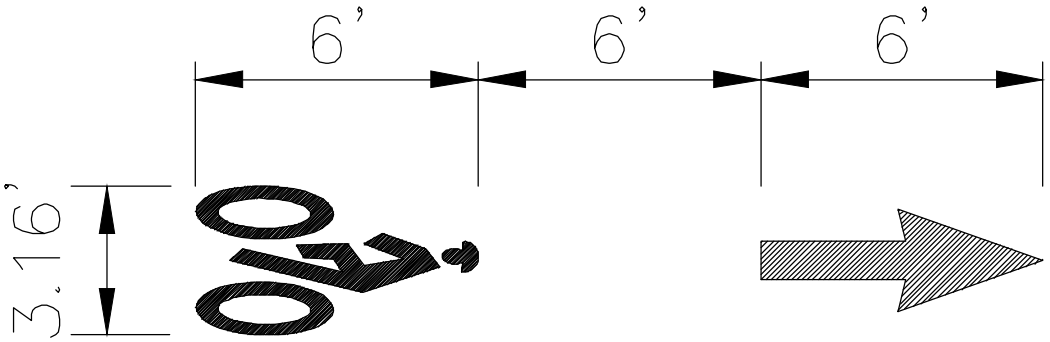
R3-17b
(30"X12")

DETAIL K

NOTES:

1. DETAIL J TO BE USED AT THE BEGINNING OF A BIKE LANE, AT THE FAR SIDE OF AN ARTERIAL OR COLLECTOR INTERSECTION, AND AT A SPACING OF 1320' ALONG CONTINUOUS LENGTHS OF BIKE LANE NOT INTERSECTED BY AN ARTERIAL OR COLLECTOR ROAD.

DETAIL NO. G-3208-5	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL STREET INTERSECTION SIGNAGE	DETAIL NO. G-3208-5



BIKE LANE PAVEMENT MARKING

NOTES:

1. BICYCLE PAVEMENT MARKINGS SHALL ONLY BE PLACED ON ARTERIAL AND COLLECTOR ROAD BIKE LANES.

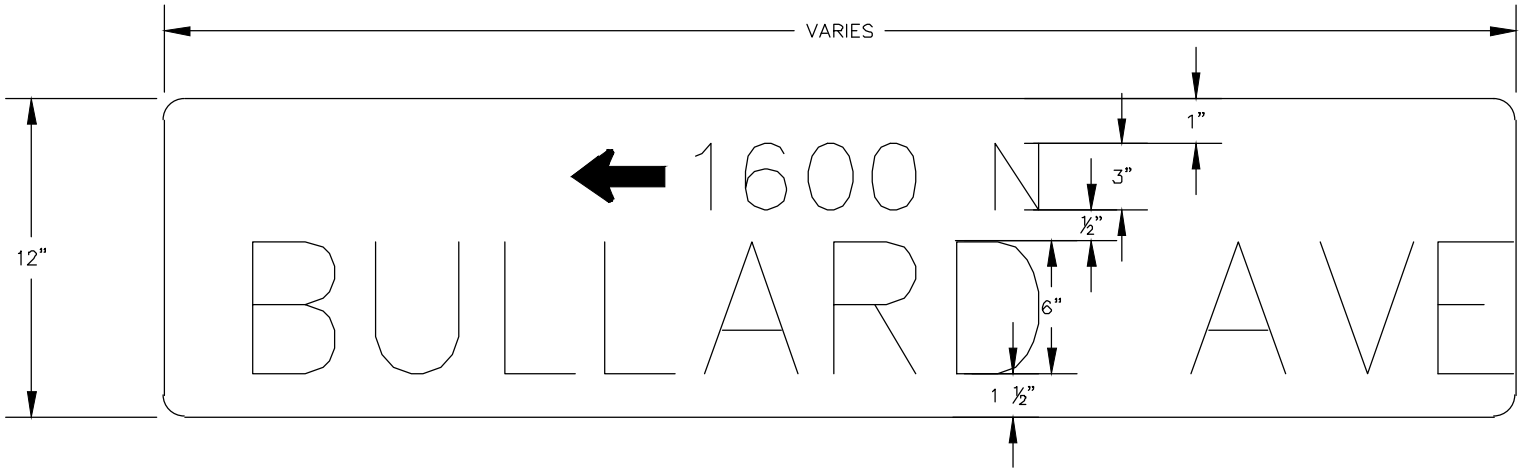
2. PAVEMENT MARKING LOCATIONS AND STYLES SHALL MEET THE REQUIREMENTS OF MUTCD, THE CITY ENGINEERING DESIGN STANDARDS AND POLICIES MANUAL, AND THIS DRAWING.

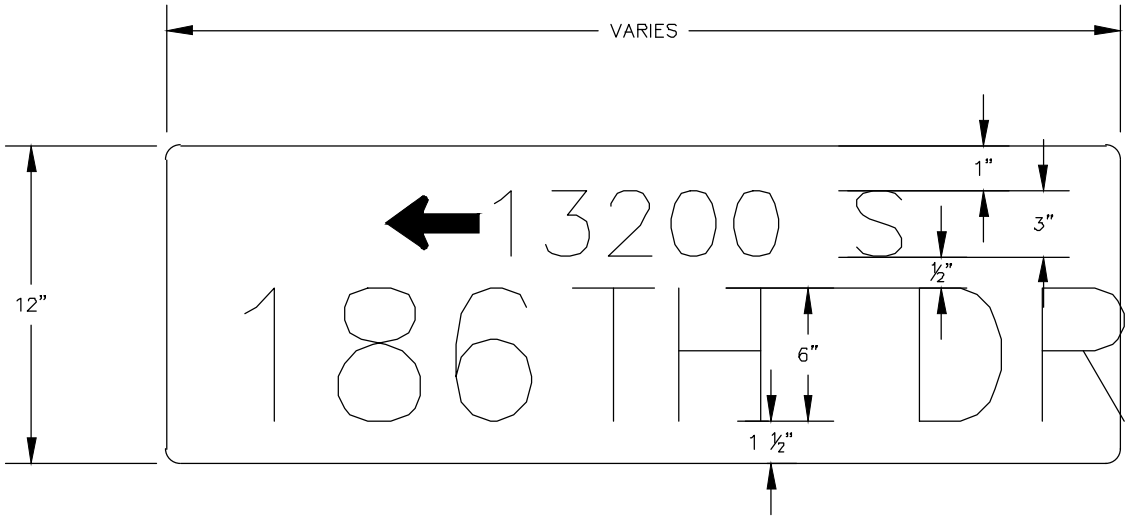
3. BICYCLE PAVEMENT MARKINGS SHALL BE PLACED AT THE BEGINNING OF AN ARTERIAL OR COLLECTOR BIKE LANE, ON THE BIKE LANE ON THE FAR SIDE OF ARTERIAL OR COLLECTOR INTERSECTION, AT A SPACING OF 1320' ALONG CONTINUOUS LENGTHS OF BIKE LANE, AND IN LOCATIONS DESIGNATED BY THE CITY ENGINEER.

4. DISTANCES BETWEEN THE ARROW AND BICYCLE PAVEMENT MARKINGS SHALL BE NO GREATER THAN 20' AND NO LESS THAN 6'.

5. PAVEMENT MARKING MATERIAL SHALL BE 60 MIL THERMOPLASTIC.

DETAIL NO. G-3208-6	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL BIKEWAY SIGNAGE AND PAVEMENT MARKINGS	DETAIL NO. G-3208-6





NOTES:

1. Highway Series "C" Lettering (Standard Highway Signs as Published by FHWA).
2. All Street Names Shall Be Formatted With 6 Inch White Upper–Case Letters. All Block Numbers And Directions Shall be Formatted With 3 Inch White Upper–Case Letters.
3. All City Signs Shall Use A Green Background. See Signing and Striping Notes For Sheeting Information.
4. See Current Version Of Standard Highway Signs Manual For Standard Arrow Details.

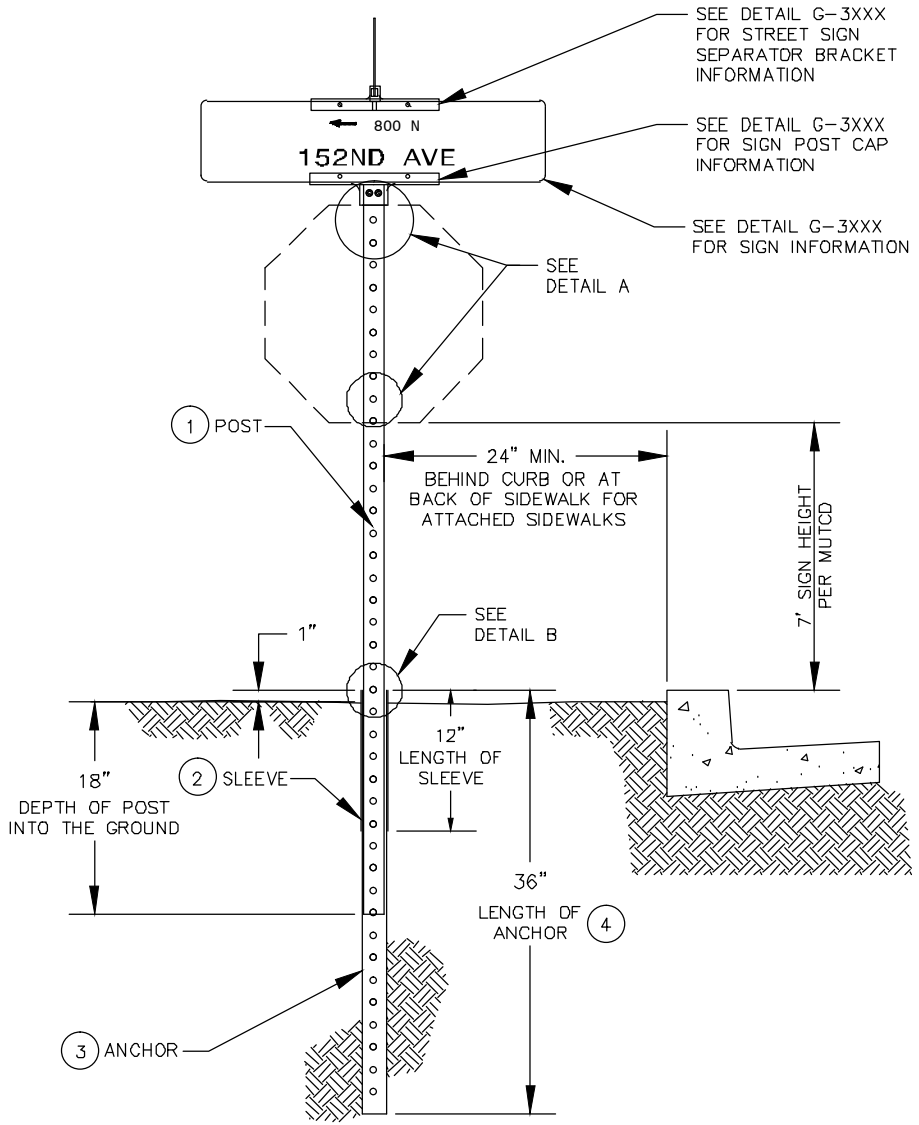
DETAIL NO. G-3209-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SAMPLE STREET NAME SIGN	DETAIL NO. G-3209-1

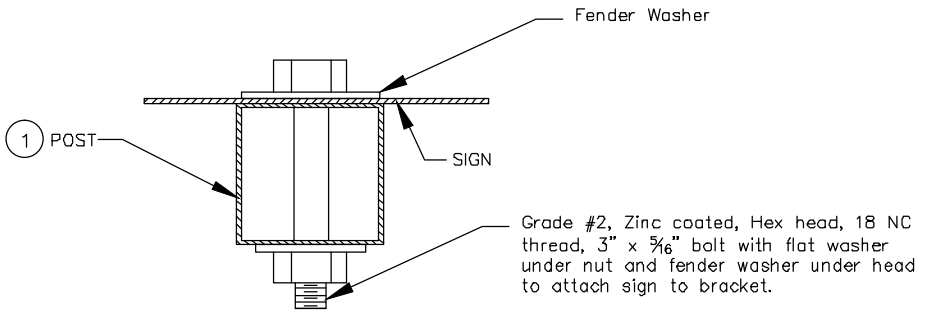


NOTES:

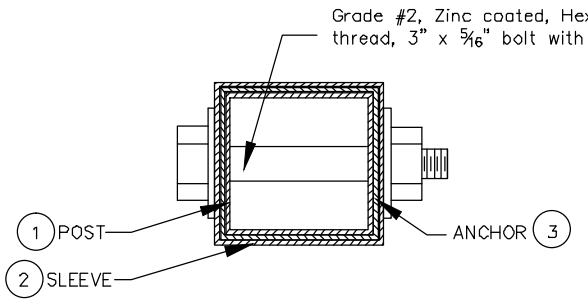
1. Highway Series "C" Lettering (Standard Highway Signs as Published by FHWA).
2. All Street Names Shall Be Formatted With 8 Inch White Upper–Case and Lower–Case Letters.
3. All City Signs Shall Use A Green Background. See Signing and Striping Notes For Sheeting Information.
4. All Signs Wider Than 36 Inches Shall Use Two Sign Posts.

DETAIL NO. G-3209-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SAMPLE ADVANCED STREET NAME SIGN	DETAIL NO. G-3209-2





DETAIL A
SIGN MOUNTING

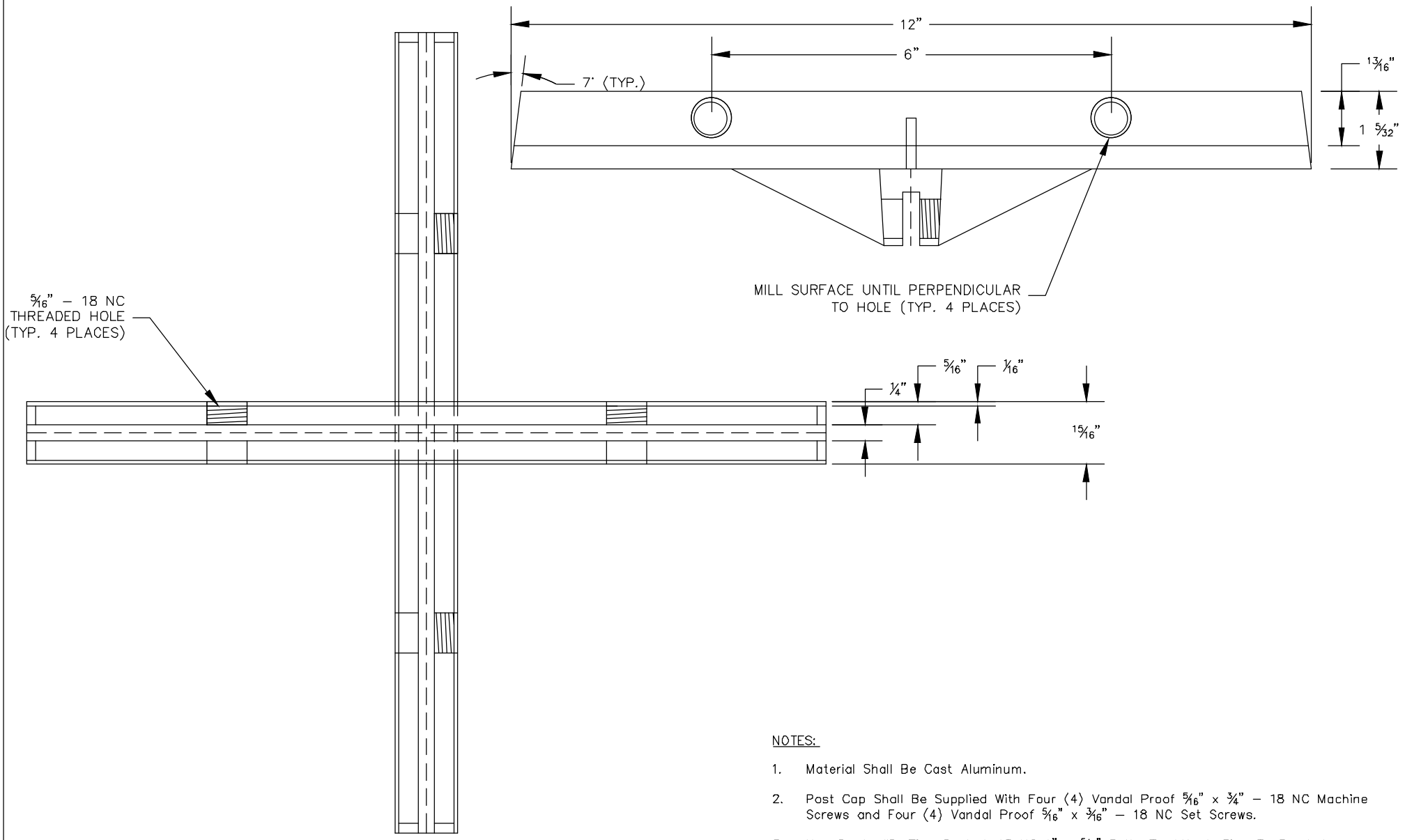


DETAIL B
ANCHOR ASSEMBLY

NOTES:

1. POST – 2" x 2", Square Perforated Galvanized Steel Tubing With 7/16" Diameter Perforations On 1" Centers, 0.105" Thick.
2. SLEEVE – 2 ½" x 2 ½" x 12", Square Perforated Galvanized Steel Tubing With 7/16" Diameter Perforations On 1" Centers, 0.105" Thick.
3. ANCHOR – 2 ¼" x 2 ¼" x 36", Square Perforated Galvanized Steel Tubing With 7/16" Diameter Perforations On 1" Centers, 0.105" Thick.
4. Below Top of Curb or Edge of Pavement If Not Curbed.
5. All Signs (Except Street Name Signs) With A Dimension Over 36" Shall Use A Minimum Of Two Sign Posts.

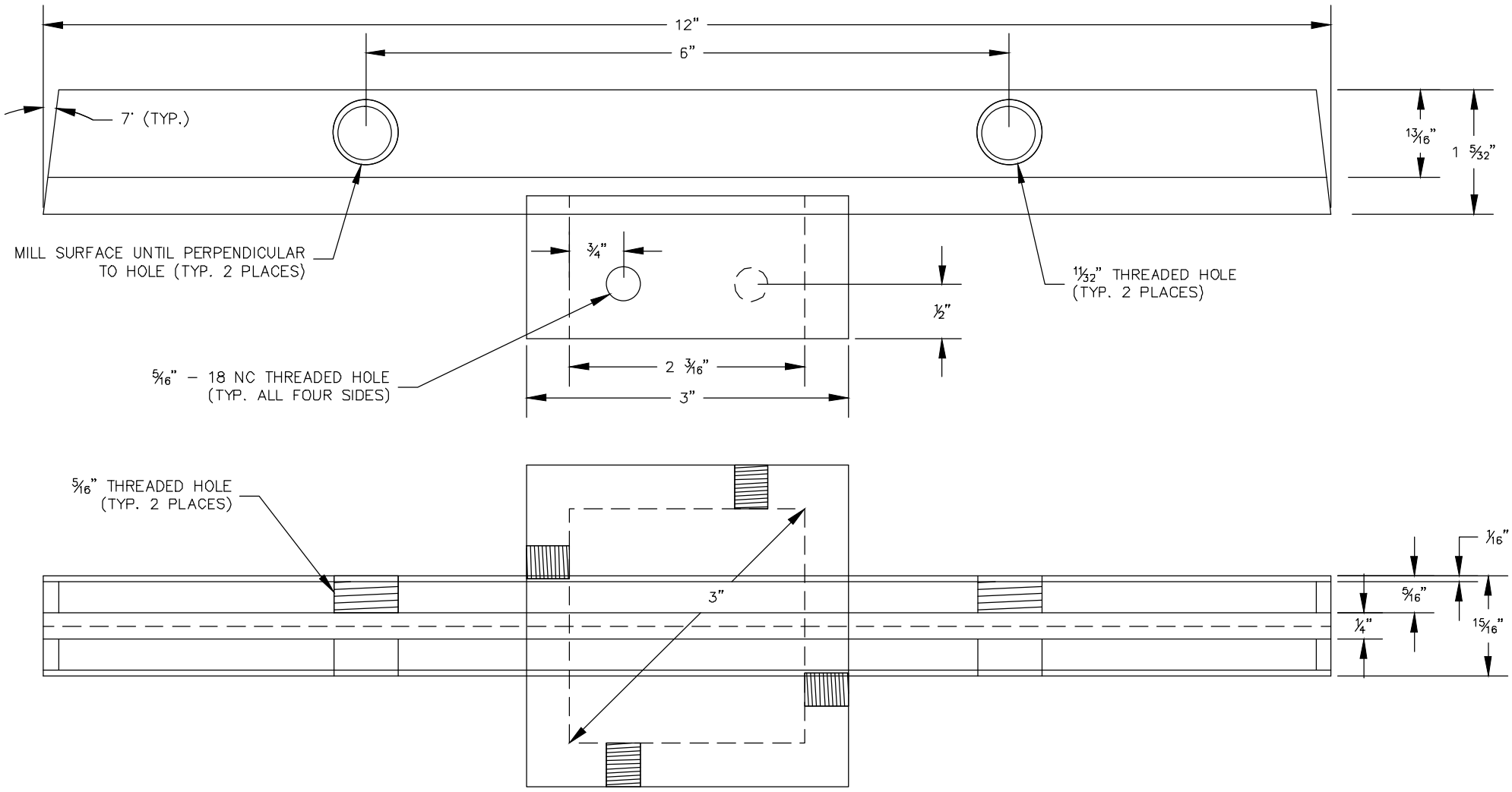
DETAIL NO. G-3209-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STREET SIGN POST	DETAIL NO. G-3209-3



NOTES:

1. Material Shall Be Cast Aluminum.
2. Post Cap Shall Be Supplied With Four (4) Vandal Proof 5/16" x 3/4" – 18 NC Machine Screws and Four (4) Vandal Proof 5/16" x 3/16" – 18 NC Set Screws.
3. Use Grade #2, Zinc Coated, 18 NC 1" x 5/16" Bolts To Attach Sign To Bracket.

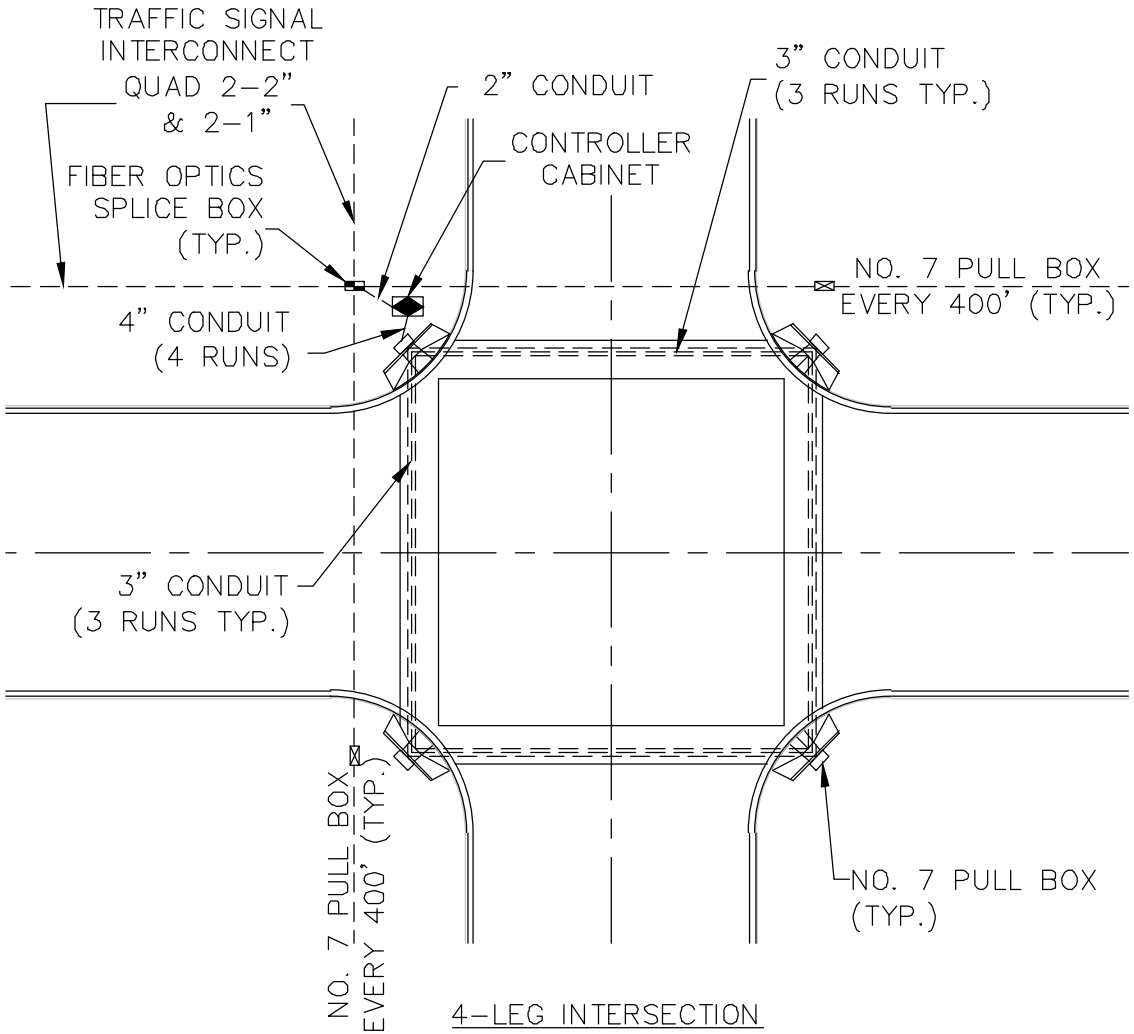
DETAIL NO. G-3209-4	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	(12") STREET SIGN SEPARATOR BRACKET	DETAIL NO. G-3209-4



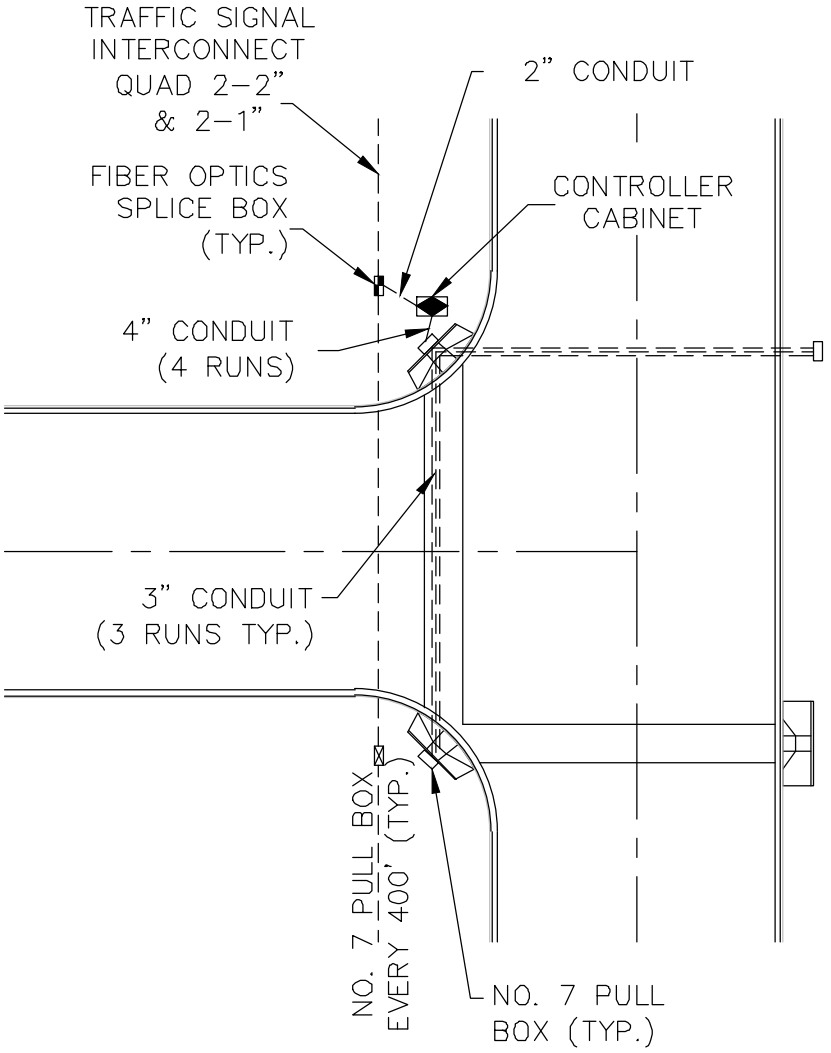
NOTES:

1. Material Shall Be Cast Aluminum.
2. Post Cap Shall Be Supplied With Two (2) Vandal Proof 5/16" x 3/4" – 18 NC Machine Screws and Two (2) Vandal Proof 5/16" x 3/16" – 18 NC Set Screws.
3. Use Grade #2, Zinc Coated, 18 NC 1 1/2" x 5/16" Bolts To Attach Sign Cap To Post.
4. Use Grade #2, Zinc Coated, 18 NC 1" x 5/16" Bolts To Attach Sign To Bracket.

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	(12") STREET SIGN POST CAP	DETAIL NO.
G-3209-5				G-3209-5



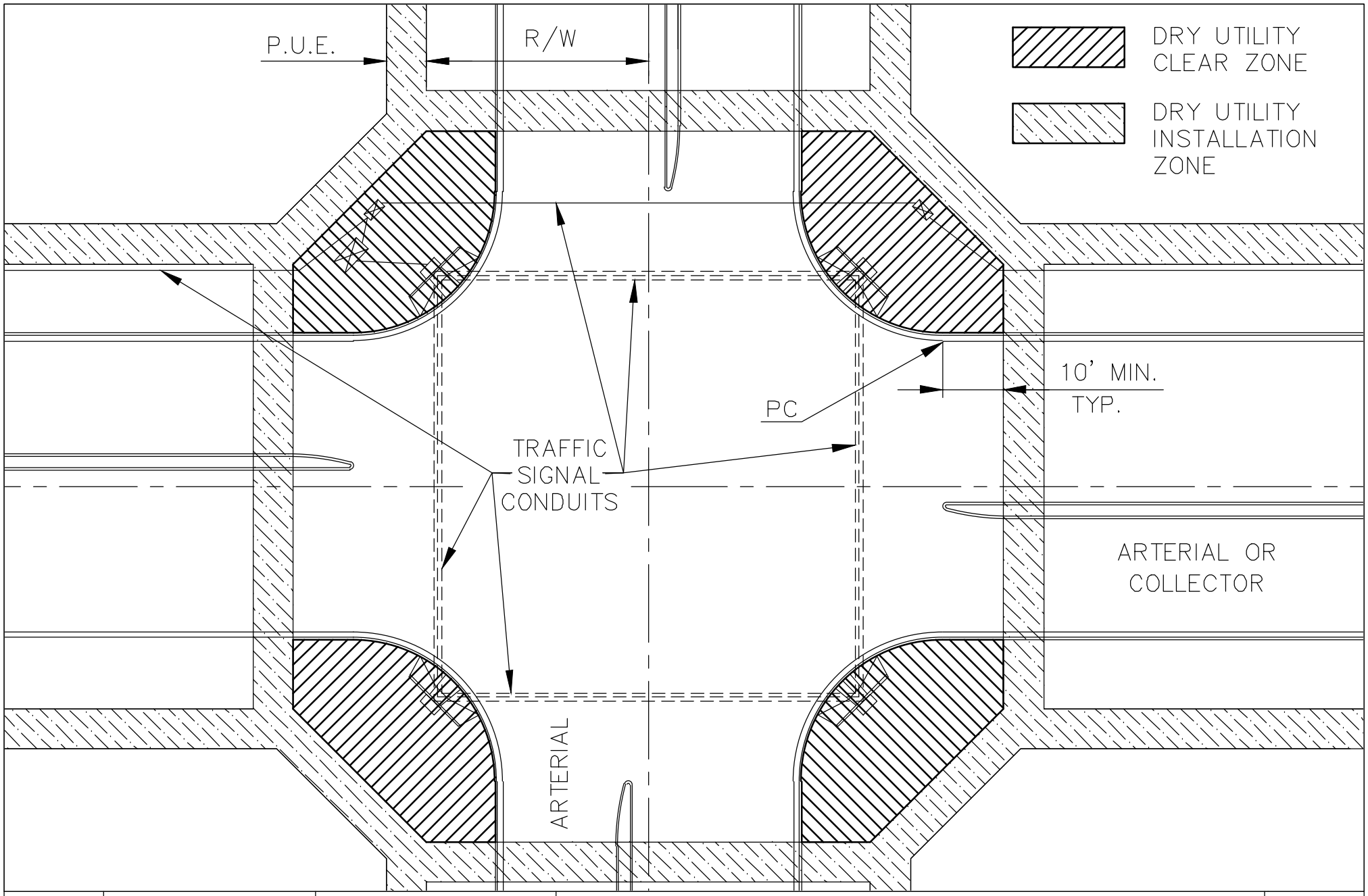
4–LEG INTERSECTION



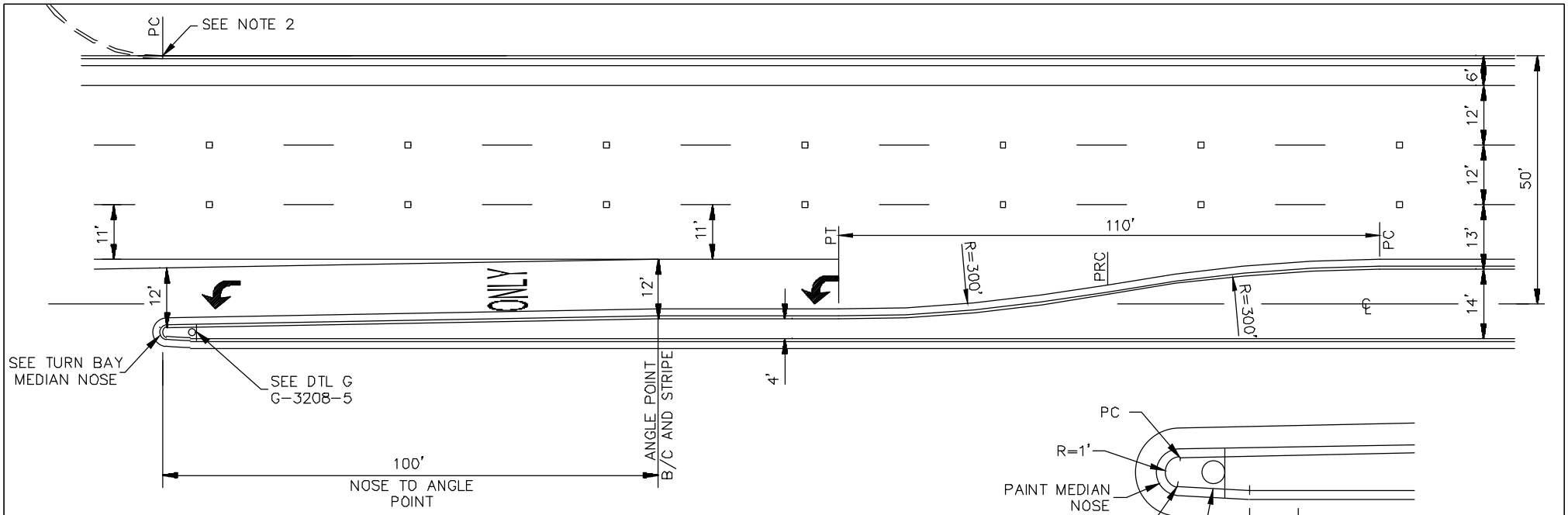
3–LEG INTERSECTION

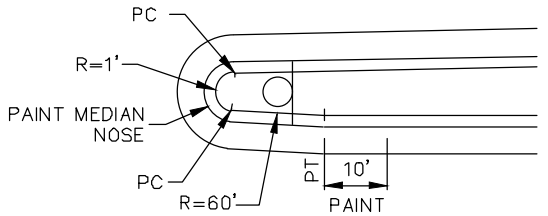
NOTE:
1. ALL CONDUIT SHALL BE SCHEDULE 80 PVC.

DETAIL NO. G-3210-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL PULLBOX AND CONDUIT LAYOUT	DETAIL NO. G-3210-1

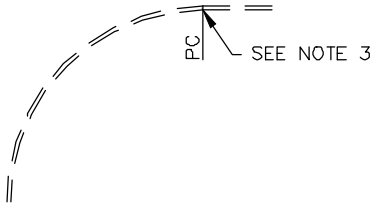


DETAIL NO. G-3210-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	DRY UTILITY CLEAR ZONE LOCATION	DETAIL NO. G-3210-2





TURN BAY MEDIAN NOSE

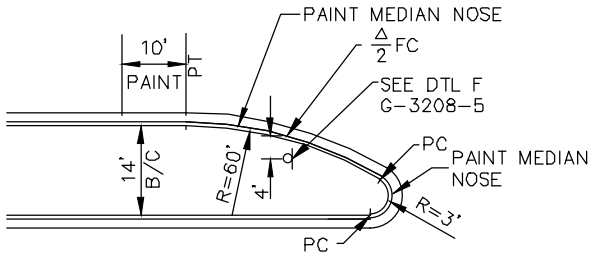


ABBREVIATIONS:

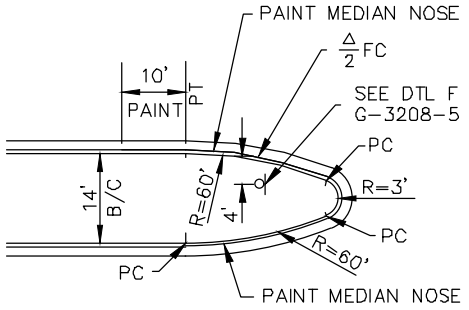
—FC = HALF THE DISTANCE FROM THE PT AND END
$\frac{\Delta}{2}$ OF THE MEDIAN NOSE
B/C = BACK OF CURB
PC = POINT OF CURVATURE
PT = POINT OF TANGENT
PRC = POINT OF REVERSE CURVATURE
R = RADIUS

NOTES:

1. DIMENSIONS ARE FROM B/C TO B/C, B/C TO CENTER OF STRIPE, OR CENTER OF STRIPE TO CENTER OF STRIPE.
2. AT A 4-LEGGED INTERSECTION, THE END OF THE MEDIAN NOSE SHALL ALIGN WITH THE PC OF THE RIGHT TURN CURB RETURN RADIUS (SEE REFERENCE).
3. AT A TEE INTERSECTION, THE END OF THE MEDIAN NOSE SHALL ALIGN WITH THE PC OF THE OPPOSITE CURB RETURN RADIUS (SEE REFERENCE).
4. MEDIAN NOSE PAINT SHALL BE YELLOW PAINT MEETING THE REQUIREMENTS ON THE SIGNING & STRIPING GENERAL NOTES.



FULL WIDTH MEDIAN NOSE



MEDIAN TERMINATION NOSE

DETAIL NO. G-3211	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL MEDIAN LEFT TURN BAY AND NOSES	DETAIL NO. G-3211

Figure 1
TWO LANE STREET

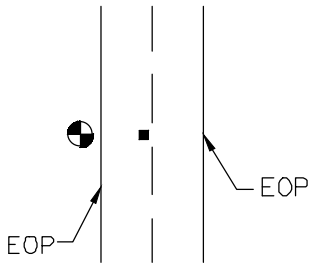


Figure 2
MULTI–LANE STREET

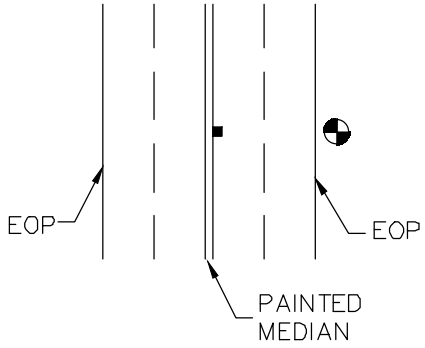


Figure 3
TWO LANE STREET
AT INTERSECTION

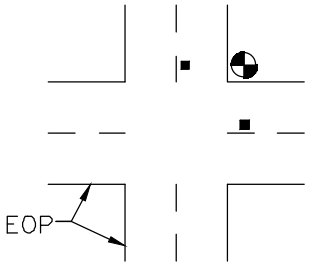


Figure 4
FOUR LANE STREET WITH
TURN LANE AT INTERSECTION

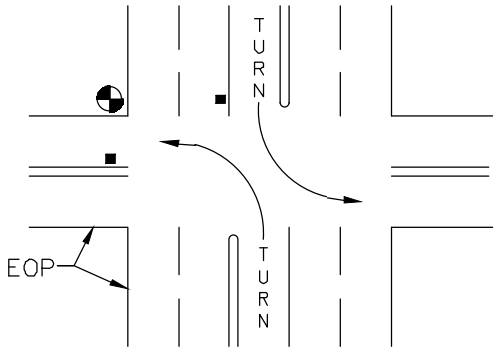


Figure 5
MULTI–LANE STREET WITH
TURN LANE

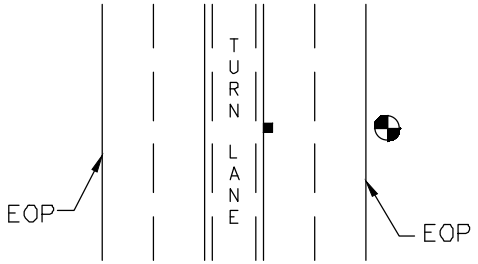
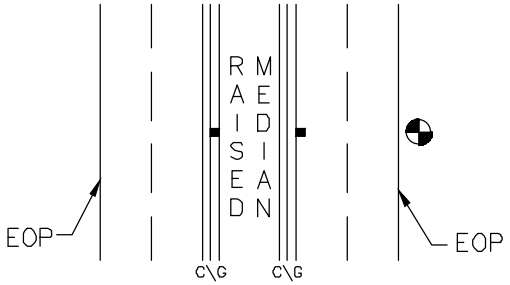
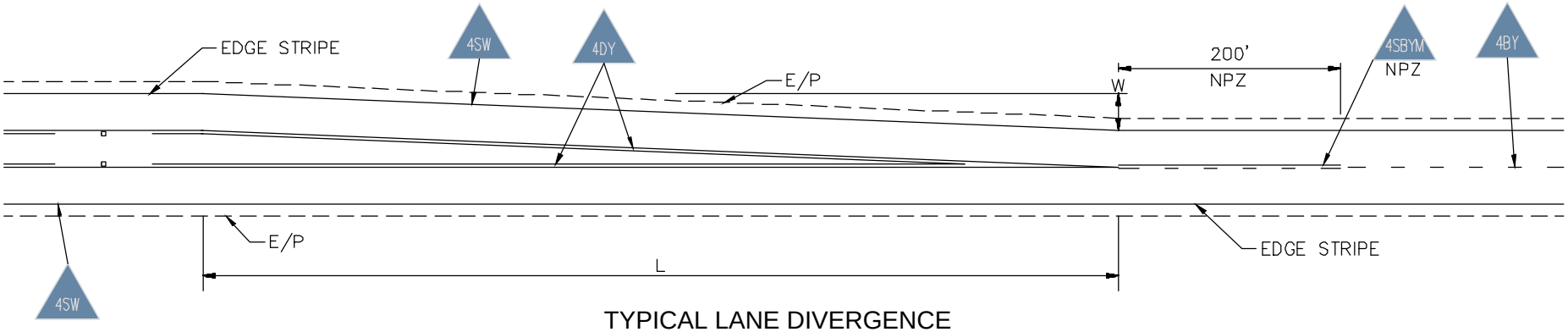


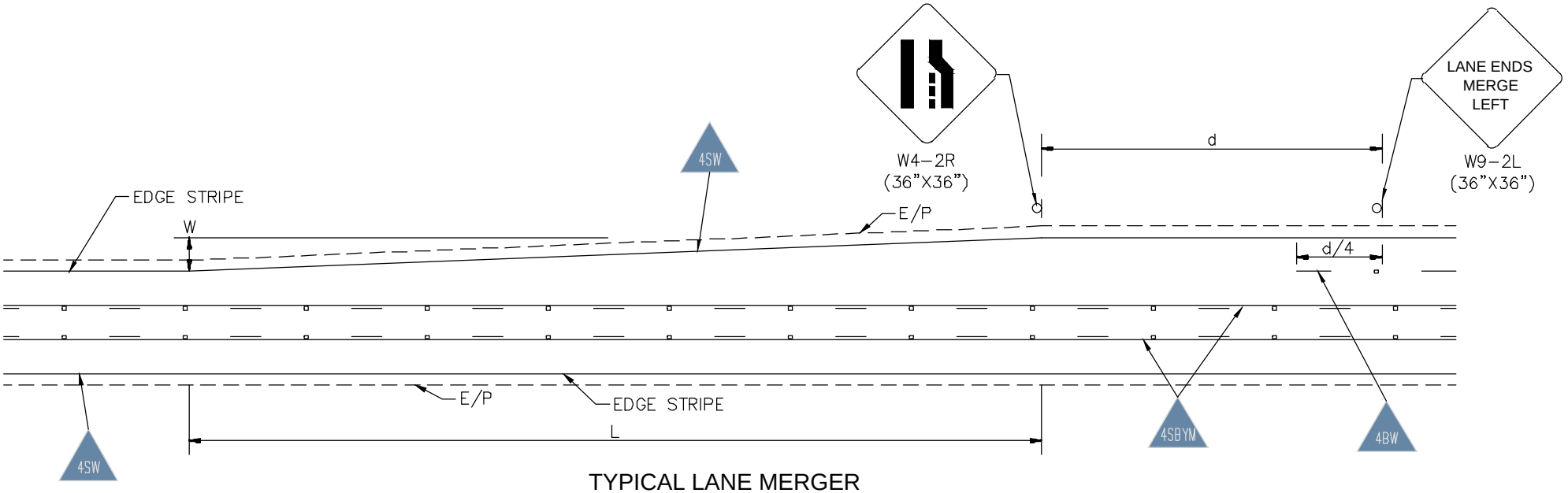
Figure 6
MULTI–LANE STREET
WITH RAISED MEDIAN



DETAIL NO. G-3212	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL HYDRANT MARKER LOCATION	DETAIL NO. G-3212



TYPICAL LANE DIVERGENCE



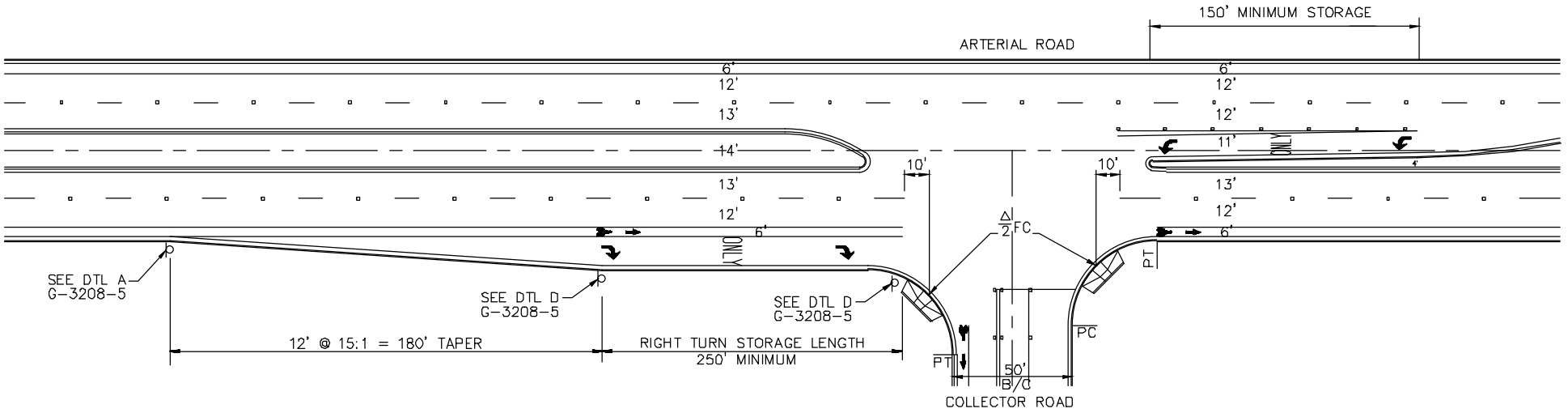
TYPICAL LANE MERGER

L = LENGTH
S = POSTED SPEED + 5MPH
W = OFFSET
d = ADVANCE WARNING DISTANCE PER MUTCD LATEST EDITION
NPZ = NO PASSING ZONE

FOR S = 45 OR GREATER:
$L = WS$

FOR S = 40 OR LESS:
$L = \frac{WS^2}{60}$

DETAIL NO. G-3214	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	PAVEMENT WIDTH TRANSITION LAYOUT, SIGNING, & STRIPING	DETAIL NO. G-3214



NOTES:

1. ALL DIMENSIONS ARE FROM B/C OR CENTER OF STRIP.
2. THE ABOVE STORAGE LENGTH IS A MINIMUM. ADDITIONAL LENGTH SHALL BE PROVIDED IF RECOMMENDED BY A CITY APPROVED TRAFFIC IMPACT ANALYSIS.

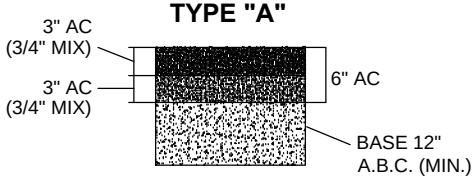
ABBREVIATIONS:

△/2 FC = HALFWAY POINT BETWEEN CURVE PC & PT
B/C = BACK OF CURB
PC = POINT OF CURVE
PT = POINT OF TANGENT

DETAIL NO. G-3215	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TYPICAL COLLECTOR TO ARTERIAL INTERSECTION	DETAIL NO. G-3215

ARTERIAL STREETS

TYPE "A"



AC PAVEMENT SECTION
(GYRATORY MIX)

TYPE "B"

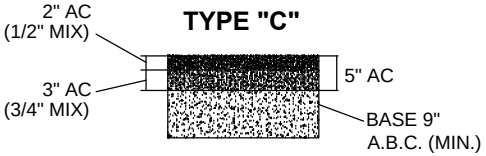


AC PAVEMENT SECTION (GYRATORY MIX)WITH RAC OVERLAY (HIGH TRAFFIC MARSHALL MIX)

(RAC IS FOR USE ON ARTERIAL ROADS LOCATED WITHIN A SPECIFIED DISTANCE OF A RESIDENTIAL DEVELOPMENT, PER CHAPTER 4 OF THE EDS&PM)

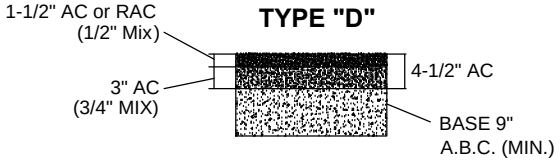
COLLECTOR STREETS (RESIDENTIAL & INDUSTRIAL)

TYPE "C"



INDUSTRIAL
AC PAVEMENT SECTION
(GYRATORY MIX)

TYPE "D"



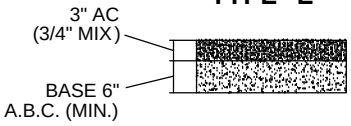
RESIDENTIAL

AC PAVEMENT SECTION (HIGH TRAFFIC MARSHALL MIX) WITH RAC OVERLAY (HIGH TRAFFIC MARSHALL MIX)

(RAC IS FOR USE ON MAJOR COLLECTOR ROADS LOCATED WITHIN A SPECIFIED DISTANCE OF A RESIDENTIAL DEVELOPMENT, PER CHAPTER 4 OF THE EDS&PM)

LOCAL STREETS (RESIDENTIAL & INDUSTRIAL)

TYPE "E"

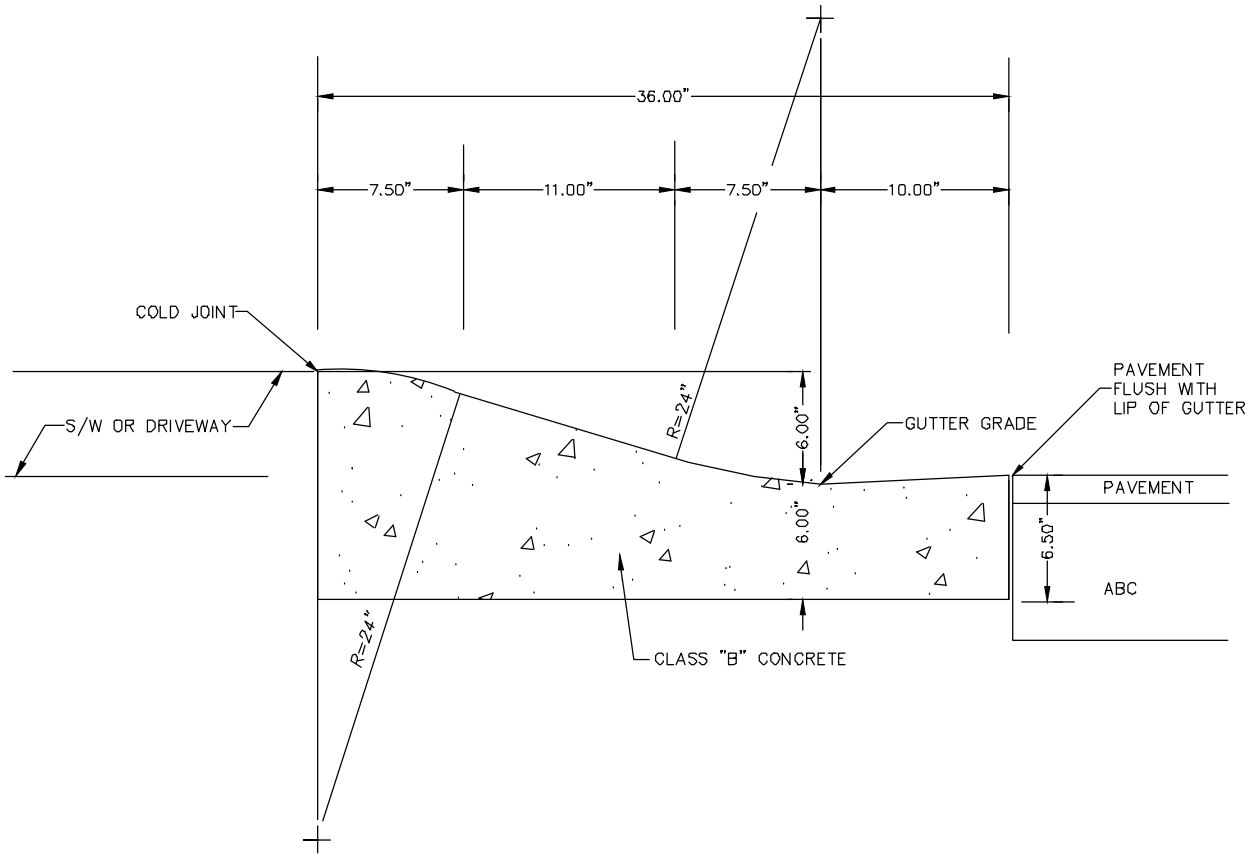


AC PAVEMENT SECTION
(LOW TRAFFIC MARSHALL MIX)

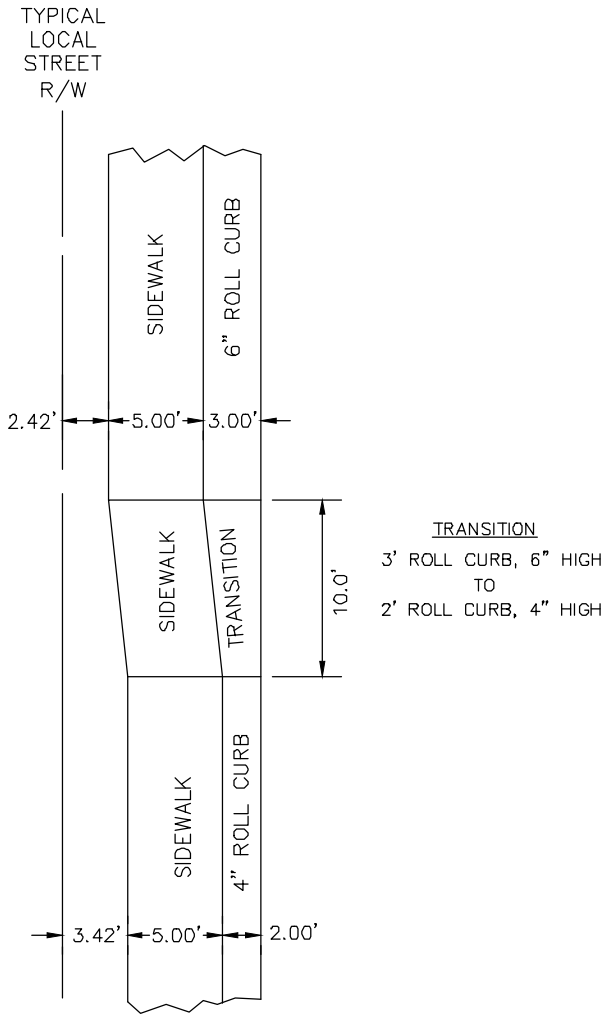
NOTES:

1. THE AC PAVEMENT SECTIONS IDENTIFIED HEREIN ARE MINIMUM THICKNESS. PAVEMENT STRUCTURAL DESIGN SHALL BE PERFORMED IN ACCORDANCE WITH MCDOT REQUIREMENTS WHEN ESTIMATED ARTERIAL TRAFFIC VOLUMES EXCEED 10 MILLION ESALS OVER 20 YEARS AND DESIGN OF OTHER CITY ROADWAYS SHALL BE PERFORMED ON A CASE-BY-CASE BASIS. A PAVEMENT CROSS-SECTION GREATER THAN THE MINIMUMS SHOWN HERE SHALL BE REQUIRED IF SO DETERMINED BY THE DESIGNING ENGINEER.
2. ALL MATERIALS SHALL AT A MINIMUM MEET MAG STANDARD SPECIFICATIONS AND THE CITY'S SPECIFICATIONS AS IDENTIFIED IN THE ENGINEERING DESIGN STANDARDS AND POLICY MANUAL AND APPROVED MATERIALS LIST.
3. APPROVED MIX DESIGNS ARE AVAILABLE ON THE ENGINEERING WEBSITE.
4. RAC MIXES SHALL USE ONLY CRUMB TIRE RUBBER PER MAG METHOD B.

DETAIL NO. G-3216	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MINIMUM PAVEMENT SECTION THICKNESS	DETAIL NO. G-3216



3' ROLL CURB 6" HIGH

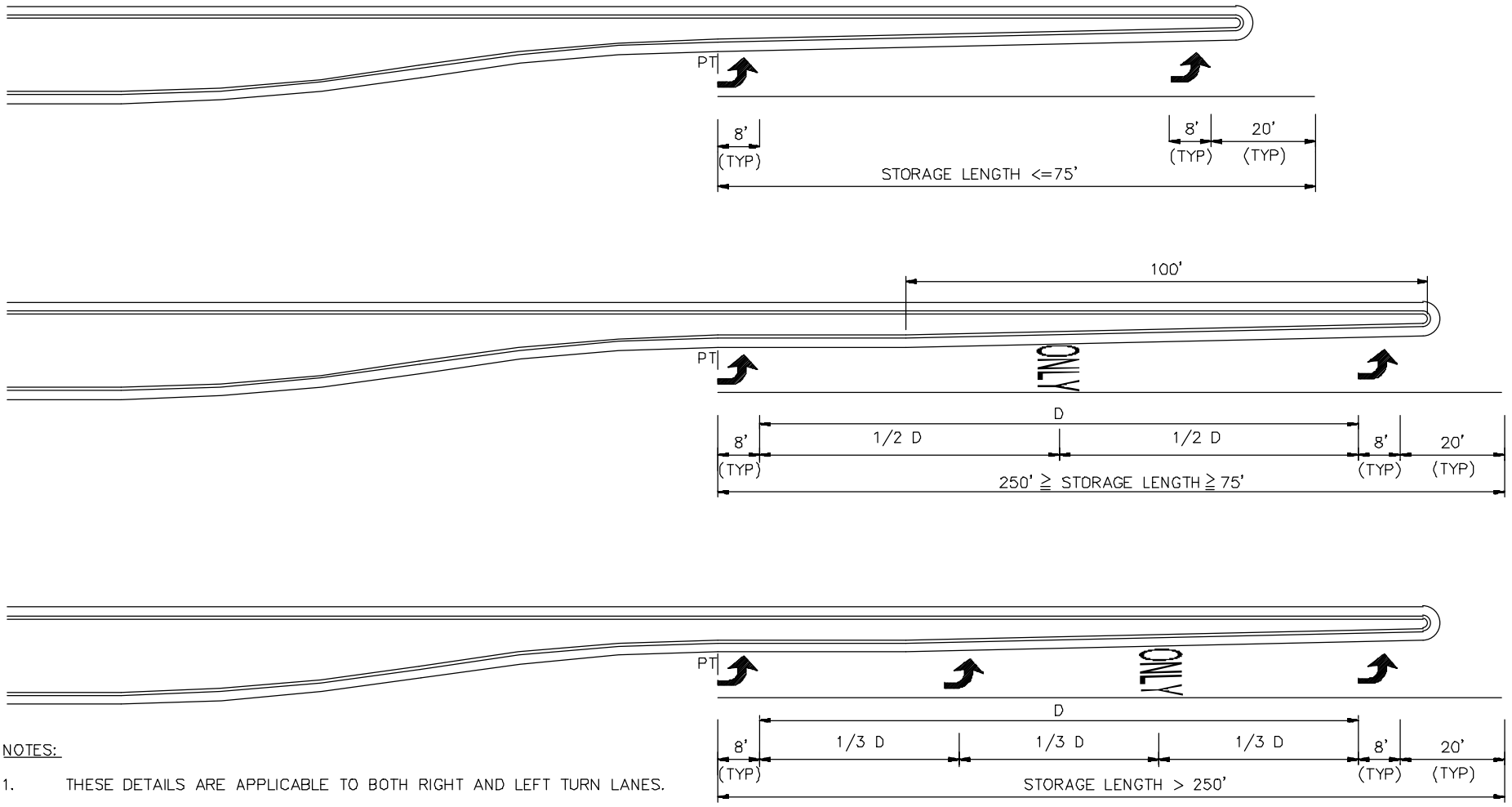


PLAN VIEW

NOTES:

1. ALL WORK AND MATERIALS SHALL CONFORM TO MAG STANDARD SPECIFICATIONS, SECTIONS 340, 505, AND 725 BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING SHALL BE A MAXIMUM OF 10 FEET.
3. EXPANSION JOINTS SHALL BE CONSTRUCTED AS PER MAG STANDARD SPECIFICATIONS SECTION 340.
4. MAY BE USED ON PRIVATE OR PUBLIC LOCAL ROADS UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEERING DEPARTMENT.

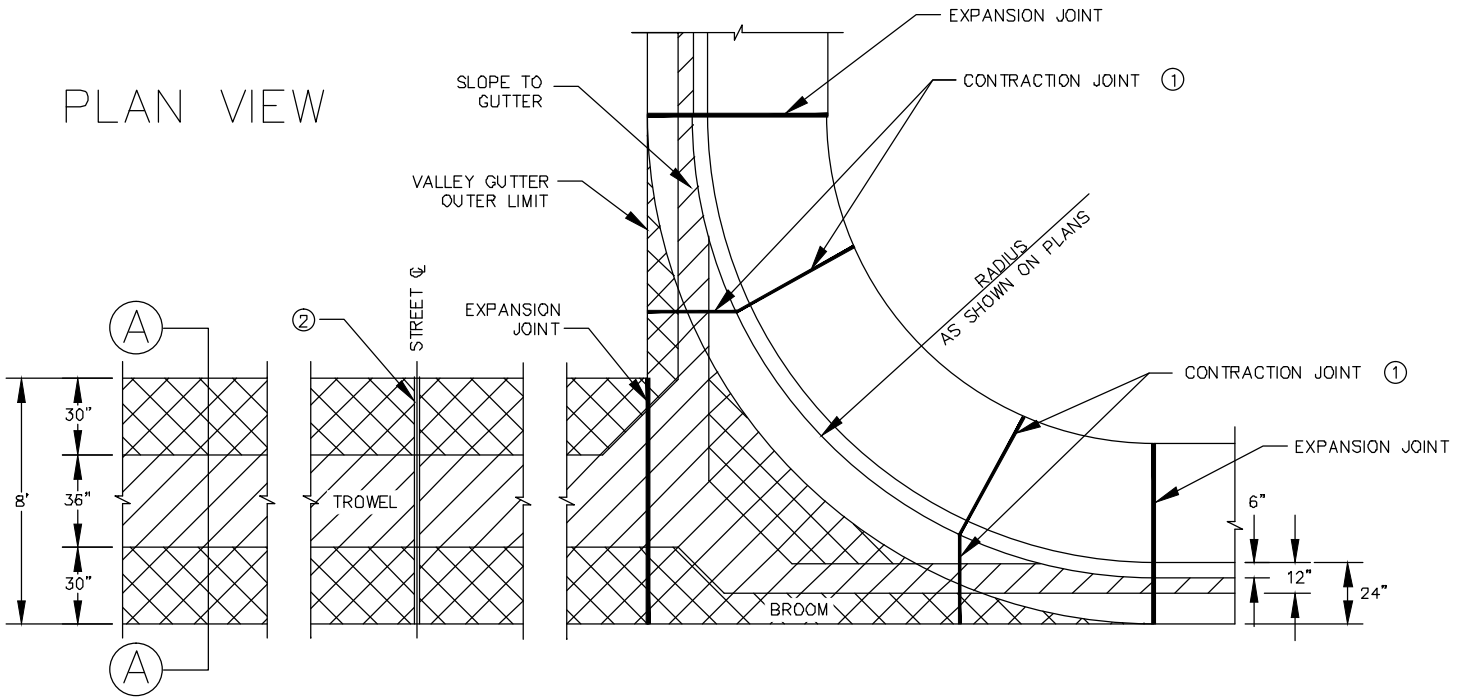
DETAIL NO. G-3218	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	3' ROLL CURB	DETAIL NO. G-3218

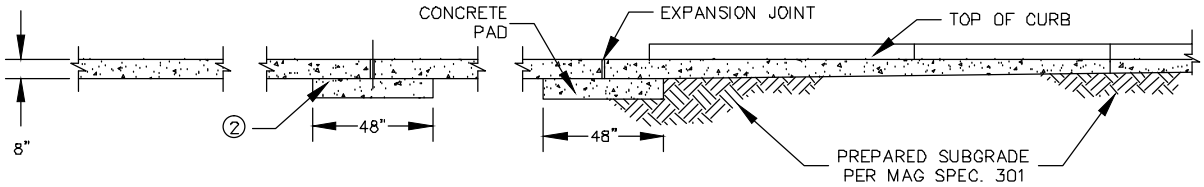


NOTES:

1. THESE DETAILS ARE APPLICABLE TO BOTH RIGHT AND LEFT TURN LANES.
2. DUAL LEFTS AND RIGHTS SHALL MAINTAIN THE SAME SPACING FOR EACH LANE.
3. ALL ARROW AND "ONLY" PAVEMENT MARKINGS SHALL BE HOT SPRAYED THERMOPLASTIC.
4. PLACEMENT OF THE ARROW CLOSEST TO THE INTERSECTION IS MEASURED FROM THE STOP BAR OR 10' OFFSET OF A REFERENCE LINE FROM MIDPOINT OF CURB RETURN TO MIDPOINT OF CURB RETURN FOR THE INTERSECTION LEG.

DETAIL NO. G-3219	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	ARROW AND "ONLY" PAVEMENT MARKING FOR LEFT TURN LANES	DETAIL NO. G-3219

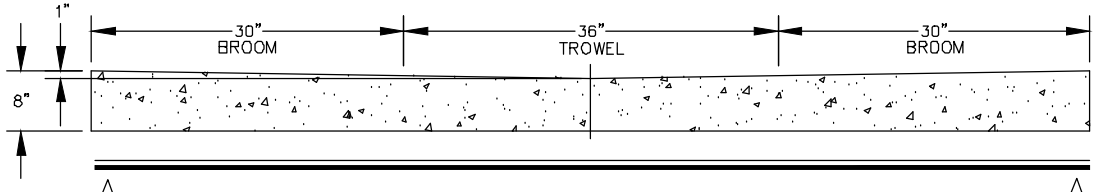




PROFILE VIEW

NOTES

1. CONTRACTION JOINTS SHALL BE LOCATED AT APPROXIMATELY 1/3 DISTANCE FROM EXPANSION JOINTS (MATCH TO JOINT IN SIDEWALK).
2. A SEPARATE CONCRETE PAD IS REQUIRED WHEN THE VALLEY GUTTER IS POURED HALF AT A TIME.
3. EXPANSION JOINTS SHALL BE CONSTRUCTED AS PER MAG STD. SPEC. 340.
4. EITHER CONSTRUCTION JOINT OR CONTRACTION JOINT IS REQUIRED AT CENTERLINE OF STREET.
5. ALL CONCRETE TO BE CLASS 'A' UNLESS OTHERWISE APPROVED (PER MAG STD. SECT. 725).



SECTION VIEW

DETAIL NO. G-3226	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	8' VALLEY GUTTER	DETAIL NO. G-3226

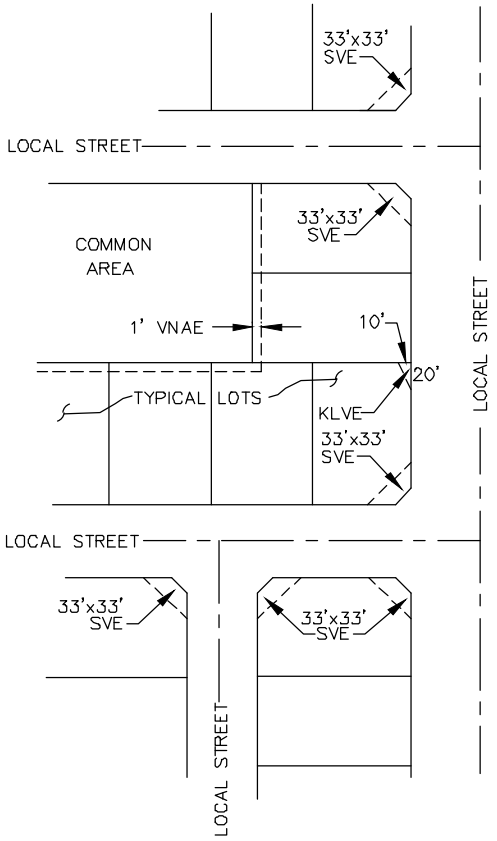
NOTES:

1. SIGHT VISIBILITY EASEMENTS (SVE): WITHIN THESE AREAS, NO OBSTRUCTION IN EXCESS OF 3' IN HEIGHT WILL BE PERMITTED. TREES PRUNED TO A HEIGHT OF 7' MAY BE PERMITTED SO LONG AS TRUNKS ARE NO LARGER THAN 8" IN DIAMETER AND AN UNOBSTRUCTED VISION OF AUTOMOBILES IS MAINTAINED.

2. MAXIMUM HEIGHT OF A FENCE WITHIN A VISIBILITY EASEMENT SHALL BE 3'. WHERE PERMISSIBLE, REAR OR SIDE YARDS MAY HAVE A MAXIMUM HEIGHT OF 6'.

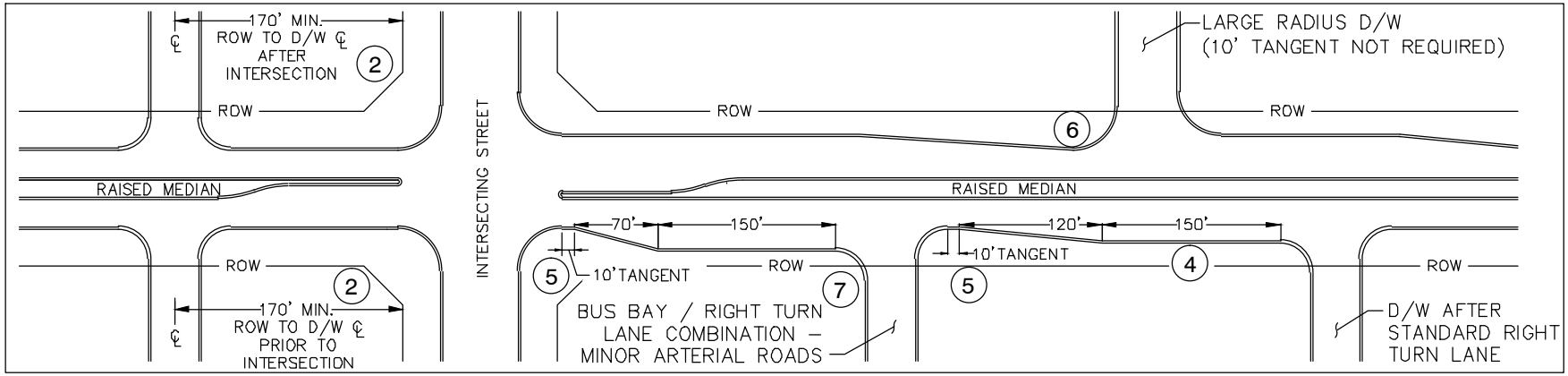
3. KEY LOT VISIBILITY EASEMENTS (KLVE): A 10' BY 20' VISIBILITY EASEMENT SHALL BE PROVIDED ON KEY LOTS. EASEMENT RESTRICTIONS ARE THE SAME AS IN ITEM 1 ABOVE.

4. VEHICLE NO ACCESS EASEMENT (VNAE): A 1' VNAE SHALL BE PROVIDED ALONG THE INSIDE PORTION OF ALL LOTS THAT SHARE A COMMON PROPERTY LINE WITH ANY PUBLIC OR PRIVATE COMMON AREA.



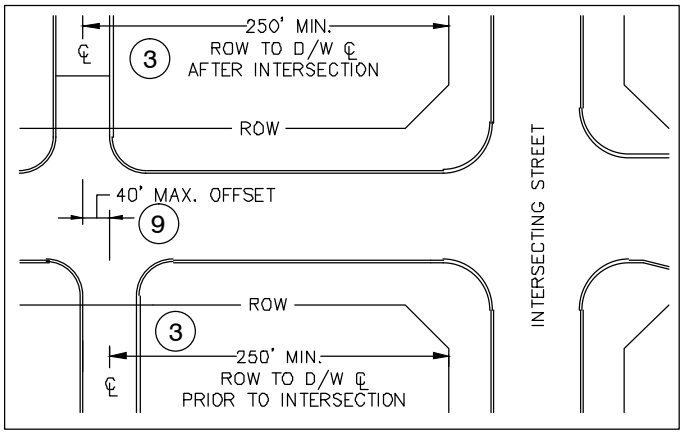
PLAN VIEW

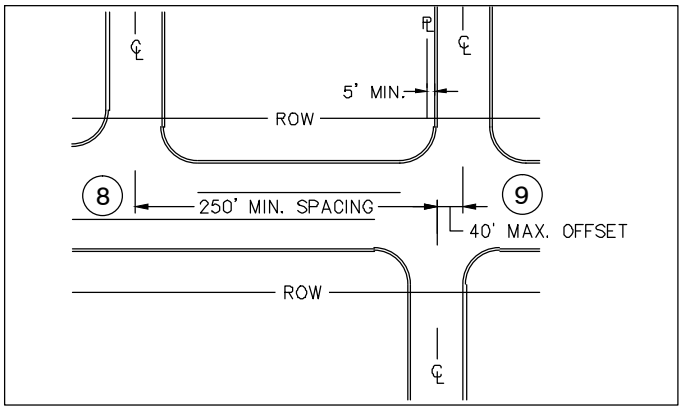
DETAIL NO. G-3228	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	LOCAL STREET SIGHT VISIBILITY	DETAIL NO. G-3228



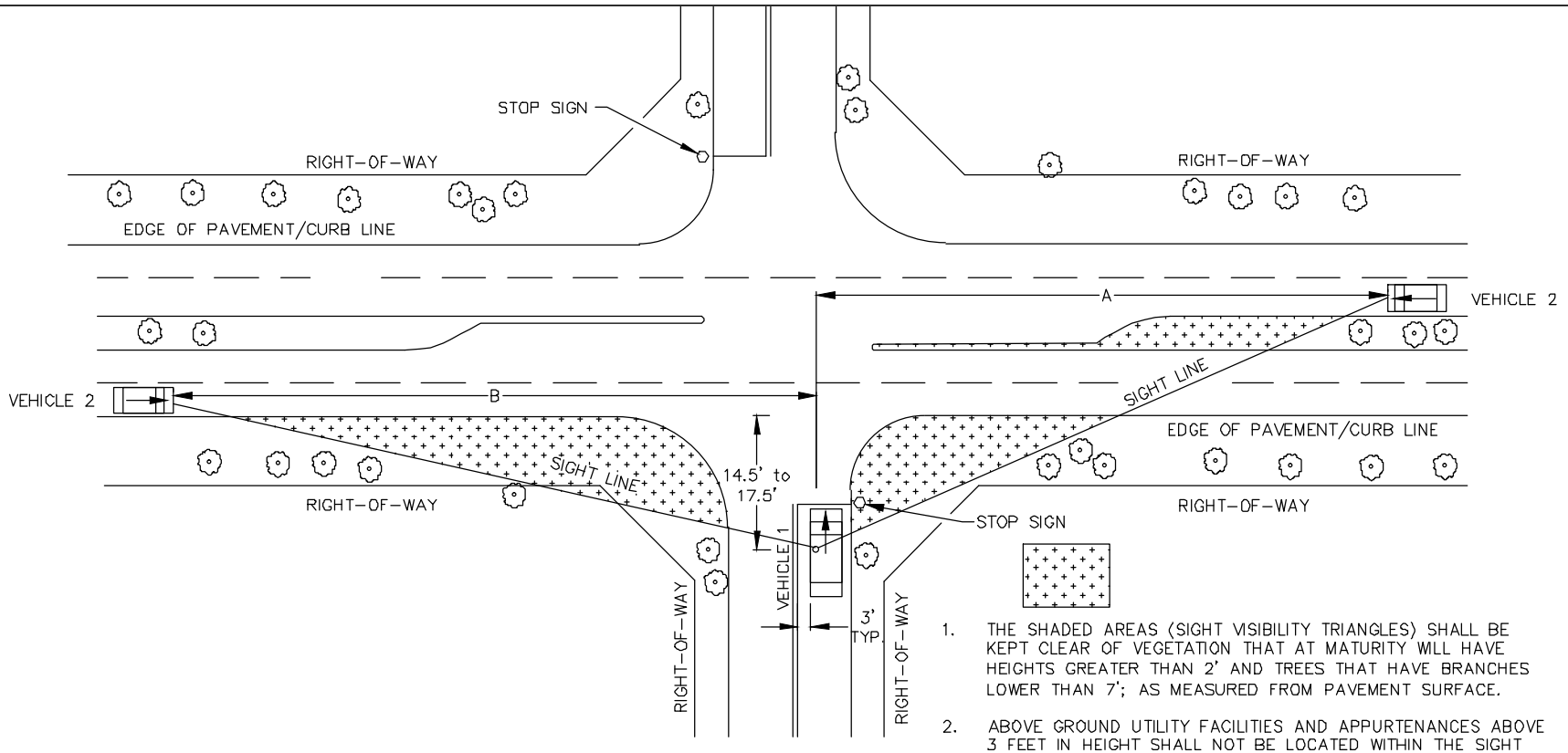
NOTES:

1. AS AN OVERALL GUIDING PRINCIPLE, DRIVEWAYS (D/W) SHALL NOT BE LOCATED WITHIN THE TAPER OR STORAGE AREA OF A RIGHT TURN LANE.
2. FOR ROADS WITH RAISED MEDIANS, THE FIRST D/W LOCATED PRIOR TO OR AFTER AN INTERSECTION SHALL BE LOCATED A MIN. 170' FROM THE NEAREST INTERSECTING RIGHT-OF-WAY LINE, AS MEASURED TO THE D/W CENTERLINE.
3. FOR COLLECTOR, ARTERIAL, OR PARKWAY ROADS WITHOUT RAISED MEDIANS, THE FIRST COMMERCIAL/INDUSTRIAL D/W LOCATED PRIOR TO OR AFTER AN INTERSECTION SHALL BE LOCATED A MIN. 250' FROM THE NEAREST INTERSECTING RIGHT-OF-WAY LINE, AS MEASURED TO THE D/W CENTERLINE.
4. THE MIN. RIGHT TURN LANE TAPER LENGTH ON ARTERIAL AND PARKWAY ROADS SHALL BE 120'. THE MIN. STORAGE LENGTH SHALL BE 150'.
5. A MIN. 10' TANGENT LENGTH IS REQUIRED AFTER A CURB RETURN PC AND PRIOR TO BEGINNING A BUS BAY OR RIGHT TURN LANE TAPER.
6. WHEN A D/W CURB RETURN RADIUS IS 35' OR GREATER, THE 10' TANGENT LENGTH BETWEEN CURB RETURN PC AND START OF THE TAPER MAY BE OMITTED.
7. ONLY RIGHT TURN LANES ON MINOR ARTERIAL D/W MAY BE COMBINED WITH A BUS BAY. THE MIN. TAPER LENGTH SHALL BE 70' AND THE MIN. STORAGE LENGTH SHALL BE 150'.
8. A MIN. 250' SHALL BE PROVIDED BETWEEN COMMERCIAL/INDUSTRIAL D/W LOCATED ON OPPOSITE SIDES OF ROADS WITHOUT RAISED MEDIANS.
9. COMMERCIAL/INDUSTRIAL D/W LOCATED ON OPPOSITE SIDES OF A ROAD WITHOUT A MEDIAN MAY HAVE UP TO A MAX. 40' OFFSET.





DETAIL NO. G-3230	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL DRIVEWAY & RIGHT TURN BAY STANDARD	DETAIL NO. G-3230



1. THE SHADED AREAS (SIGHT VISIBILITY TRIANGLES) SHALL BE KEPT CLEAR OF VEGETATION THAT AT MATURITY WILL HAVE HEIGHTS GREATER THAN 2' AND TREES THAT HAVE BRANCHES LOWER THAN 7'; AS MEASURED FROM PAVEMENT SURFACE.
2. ABOVE GROUND UTILITY FACILITIES AND APPURTENANCES ABOVE 3 FEET IN HEIGHT SHALL NOT BE LOCATED WITHIN THE SIGHT VISIBILITY TRIANGLES.
3. SIGNAGE APPROVED BY THE CITY FOR USE IN THE ROW MAY BE LOCATED WITHIN THE SIGHT VISIBILITY TRIANGLES.

DESIGN SPEED (85th PERCENTILE) OF INTERSECTING ROADWAY	SIGHT DISTANCE FOR PASSENGER VEHICLE 1 TO TURN LEFT OR RIGHT				
	A				B
	1-LANE	2-LANE	3-LANE/2-LANE & MEDIAN	3-LANE & MEDIAN	
25 MPH	280'	295'			240'
30 MPH	335'	355'			290'
35 MPH	390'	415'	440'	465'	335'
40 MPH	445'	475'	500'	530'	385'
45 MPH	500'	530'	565'	600'	430'
50 MPH	555'	590'	625'	665'	480'
55 MPH	610'	650'	690'	730'	530'
60 MPH		710'	750'	795'	575'
65 MPH		765'	815'	860'	625'

NOTES:

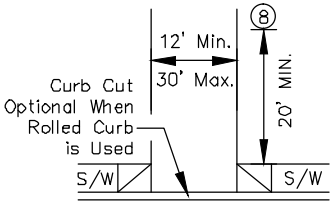
1. TO ESTABLISH THE LINE OF SIGHT, VEHICLE 1 SHOULD BE POSITIONED SO THAT THE DRIVERS EYE IS 14.5 TO 17.5' BACK FROM THE EDGE OF PAVEMENT/ FACE OF CURB AND 3.5' ABOVE THE PAVEMENT. DRIVER IS ASSUMED TO BE 3.0' RIGHT OF CENTER LINE IN LANE.
2. APPROACH VEHICLE (VEHICLE 2) IS POSITIONED IN THE CENTER OF ITS LANE AND ASSUMED TO BE 4.25' ABOVE THE PAVEMENT.
3. DRAWING DEPICTS TYPICAL PASSENGER CAR SITUATION WITHOUT GRADES. ADJUSTMENTS FOR GRADES SHALL BE MADE PER AASHTO.
4. EASEMENTS TO BE SHOWN AND DIMENSIONED ON FINAL PLAT.

A = SIGHT DISTANCE TO RIGHT FOR VEHICLE 1

B = SIGHT DISTANCE TO LEFT FOR VEHICLE 1

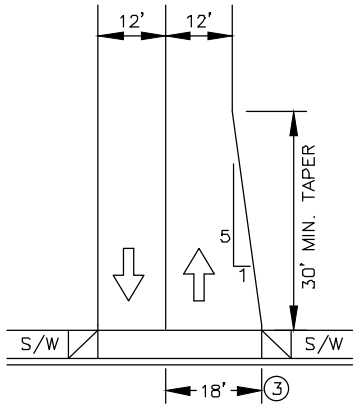
DETAIL NO. G-3232	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	INTERSECTION SIGHT VISIBILITY TRIANGLES	DETAIL NO. G-3232

D-1



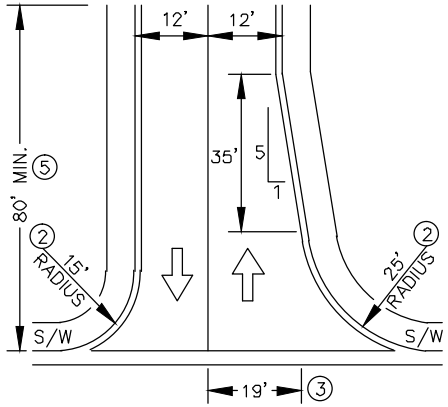
SINGLE FAMILY
(SEE MAG DTL 250-1&2)

D-2



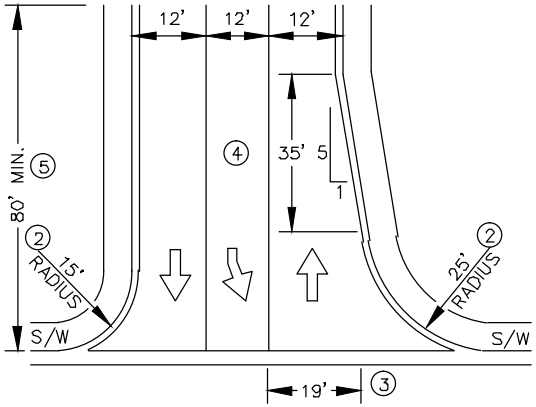
TWO WAY (LOW VOLUME)
(SEE MAG DTL 250-1&2)

D-3



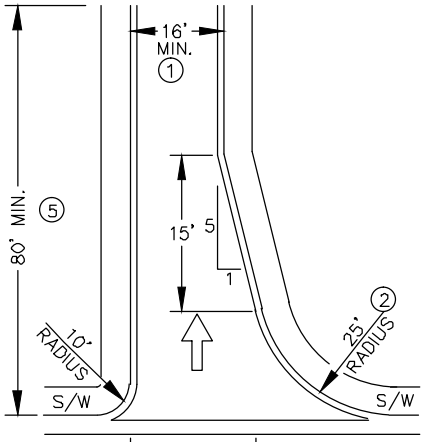
TWO WAY (HIGH VOLUME)
(SEE MAG DTL 251)

D-4



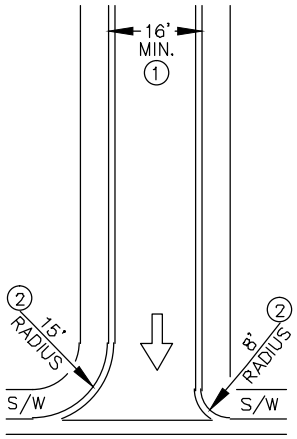
TWO WAY WITH TWO EGRESS LANES
(SEE MAG DTL 251)

D-5



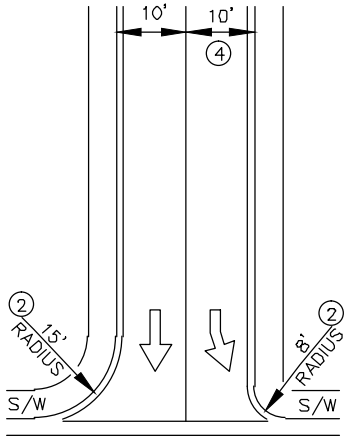
ONE WAY INGRESS
(SEE MAG DTL 251)

D-6



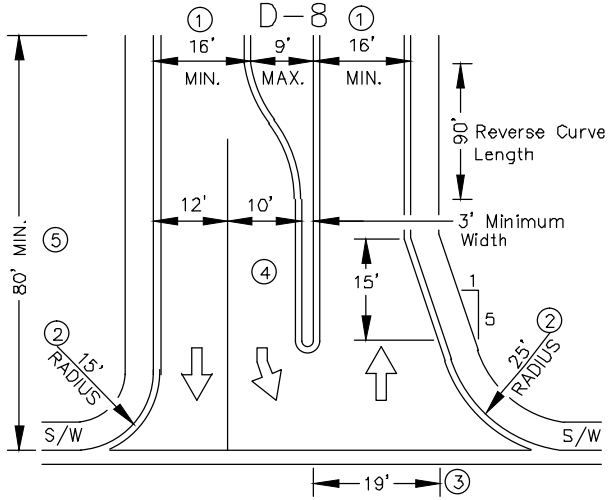
ONE WAY EGRESS
(SEE MAG DTL 251)

D-7



ONE WAY WITH TWO EGRESS LANES
(SEE MAG DTL 251)

D-8

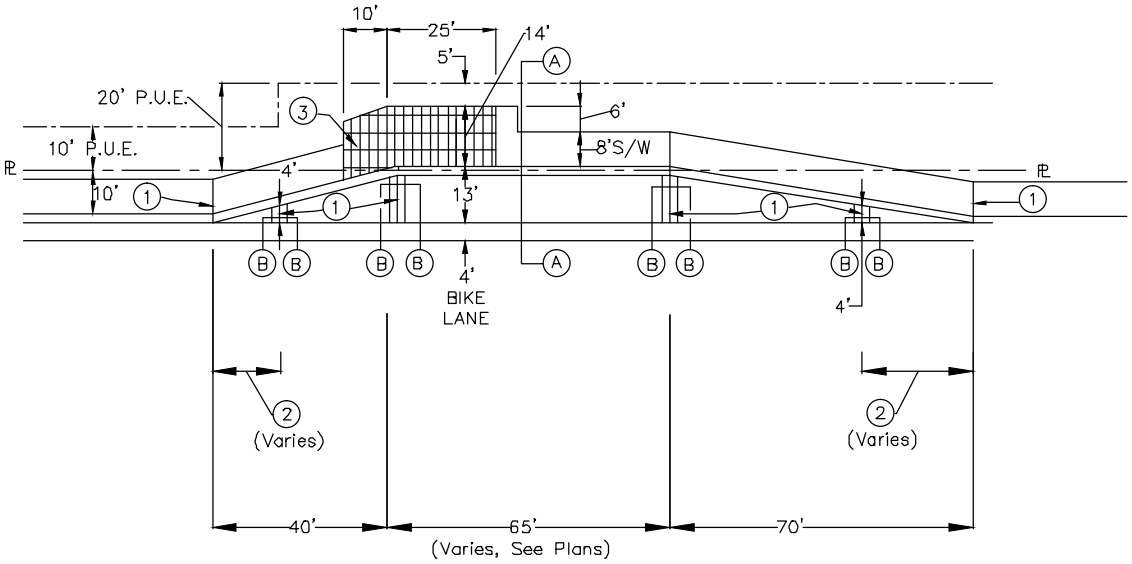


TWO WAY WITH TWO LANE EGRESS AND RAISED MEDIAN
(SEE MAG DTL 251)

NOTES

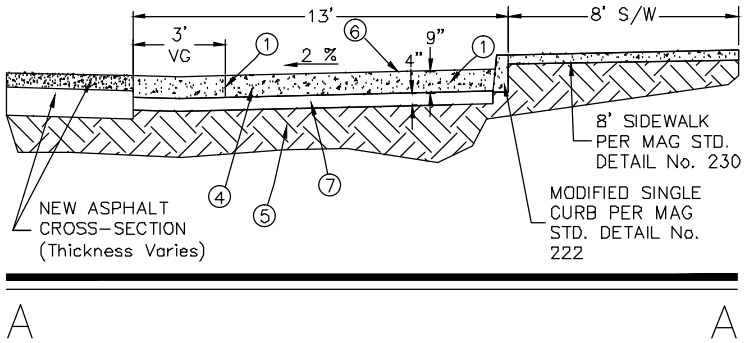
1. IF DRIVE IS ALSO FOR FIRE EQUIPMENT ACCESS THEN THE MINIMUM WIDTH SHALL BE 20 FEET.
2. A 35' RADIUS CURB RETURN WILL BE REQUIRED AT DRIVEWAYS THAT HAVE FREQUENT LARGE TRUCK TRAFFIC OR AS REQUIRED BY THE CITY ENGINEERING DEPARTMENT.
3. WHEN THE INGRESS LANE IS GREATER THAN 19', A PAINTED OR RAISED MEDIAN IS REQUIRED.
4. A MINIMUM LEFT TURN STORAGE LENGTH OF 75' SHALL BE PROVIDED.
5. INTERSECTING DRIVE AISLES, D/W, OR PARKING STALLS SHALL NOT BE NEARER THAN 80'.
6. D-1&2 WIDTHS ARE TO EDGE OF PAVEMENT. D-3 TO D-8 WIDTHS ARE TO BACK OF CURB
7. INGRESS TAPER DIMENSIONS ARE SHOWN FOR D/W WITHOUT DECELERATION LANES.
8. A MIN. 20' SHALL BE MAINTAINED BETWEEN THE BACK OF SIDEWALK (APPLIES TO ATTACHED & DETACHED WALKS) AND THE NEAREST STRUCTURE DIRECTLY IN FRONT OF THE D/W.
9. RESIDENTIAL D/W WINGS SHALL NOT ENCROACH INTO THE P.C. OF THE STREET CURB RETURN.
10. SINGLE FAMILY DRIVEWAYS SHALL BE LOCATED ONLY ON LOCAL RESIDENTIAL ROADWAYS.
11. D/W WINGS OR PC'S SHALL BEGIN A MIN. 5' FROM NEAREST SIDE PROPERTY LINE EXTENDED.
12. DIMENSIONS PROVIDED ON THIS DETAIL OVERRIDE WHAT IS SHOWN ON REFERENCED MAG DETAILS. ALL OTHER INFORMATION APPLIES.

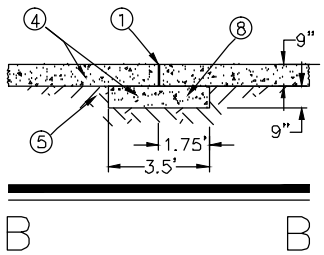
DETAIL NO. G-3236	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TYPICAL DRIVEWAY DETAILS	DETAIL NO. G-3236



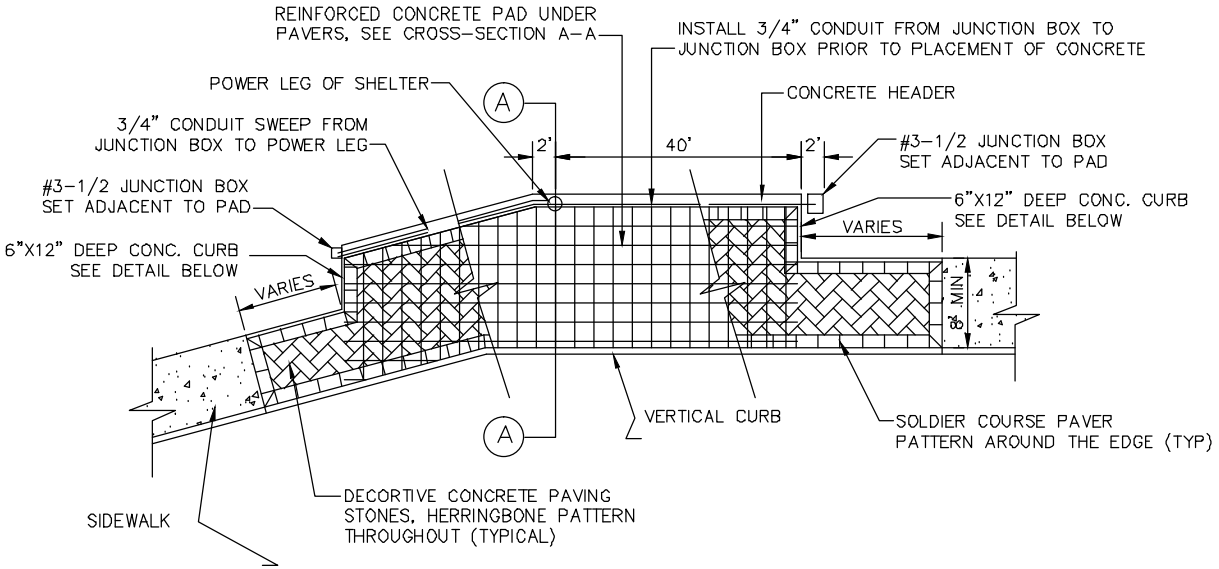
NOTES:

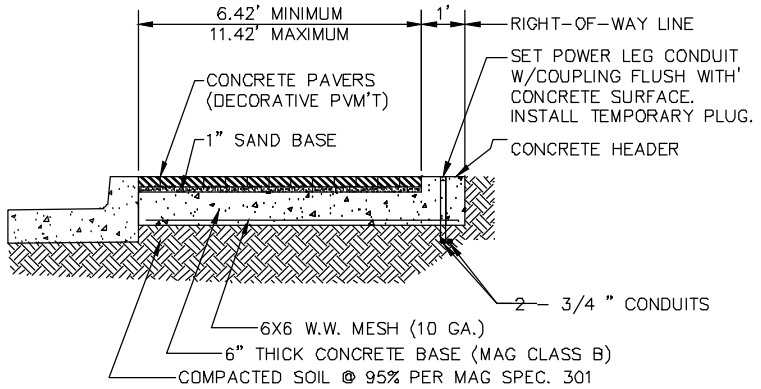
1. 1/2" BITUMINOUS PREFORMED EXPANSION JOINT FILLER, ASTM D-1751.
2. ASPHALT TO CONCRETE BUS BAY TRANSITION (Length Varies).
3. BUS BAY ACCESSORY PAD (See City STD DTL. No. G-3242-2).
4. CONCRETE SHALL BE CLASS "A" PER MAG SPECS OR CLASS "S", f'c = 3000 psi PER ADOT SPECS.
5. SUBGRADE PREPARATION TO BE PER MAG SECTION 301.
6. CONCRETE BUS BAY PAVEMENT SHALL BE BROOM FINISHED.
7. ABC TO BE PLACED PER MAG SECTION 310.
8. CONCRETE VALLEY GUTTER TO BE POURED SEPARATELY FROM CONCRETE BUS BAY PAVEMENT.
9. FROM AN INTERSECTION CURB RETURN PROVIDE A MINIMUM TANGENTIAL LENGTH OF 10 ' PRIOR TO THE START OF THE BUS BAY TAPER.





DETAIL NO. G-3242-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TYPICAL BUS BAY DETAIL	DETAIL NO. G-3242-1

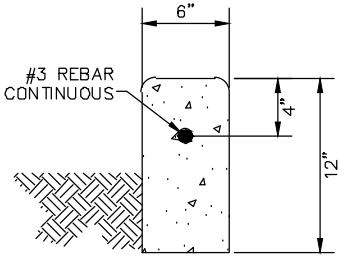




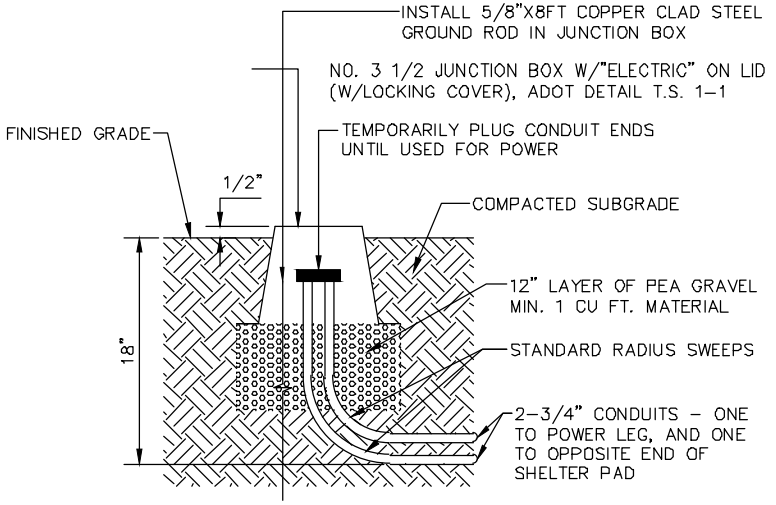
CROSS-SECTION A - A

NOTES:

1. ALL CONDUIT SHALL BE P.V.C. SCHEDULE 40, U.L. LISTED.
2. ACTUAL PLAN LAYOUT MAY VARY. ALL DETAIL INFORMATION REMAINS THE SAME. SEE PLANS FOR SPECIFIC LOCATIONS AND DIMENSIONS OF BUS SHELTER PAD CONCRETE BASE AND DECORATIVE PAVEMENT TREATMENT.
3. ANY DECORATIVE PAVEMENT TREATMENT OUTSIDE THE AREA OF THE BUS SHELTER PAD CONCRETE BASE SHALL BE CONSTRUCTED ON A 1 INCH SAND BASE OVER 4 INCHES CEMENT-ENRICHED AGGREGATE BASE SLURRY (1 SACK TYPE II PORTLAND CEMENT PER CUBIC YARD OF AGGREGATE BASE COURSE MATERIAL) OVER 95% COMPACTED SUBGRADE SOIL (PER MAG SPEC. 301).
4. ANY SHELTER OR BUS STOP FURNITURE PLACEMENT SHALL BE LOCATED TO PROVIDE A MIN. 5 FT WIDE CLEAR SIDEWALK.
5. ALL COSTS ASSOCIATED WITH ELECTRICAL AND RELATED ITEMS SHOWN ON THESE DETAILS (CONDUITS, JUNCTION BOXES, GROUND ROD, ETC.) SHALL BE CONSIDEREED INCLUDED IN THE COST OF THE PAY ITEM FOR CONCRETE BUS SHELTER PAD.
6. BUS BAY PAVEMENT, DECORATIVE PAVEMENT (INCLUDING CEMENT-ENRICHED A.B.C. SLURRY AND SANDBASE), 6"X12" D CONCRETE CURB, SINGLE CURB, CURB & GUTTER, SIDEWALKS, & DRIVEWAYS ARE SEPARATE PAY ITEMS.

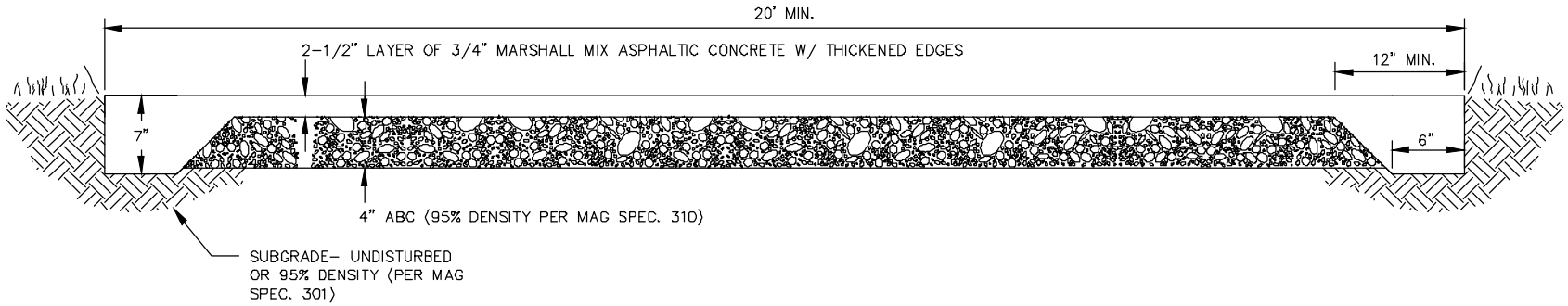


CONCRETE HEADER
MAG DETAIL 222-B(MOD)



SLEEVE SWEEP &
JUNCTION BOX DETAIL

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL BUS SHELTER ACCESSORY PAD	DETAIL NO.
G-3242-2				G-3242-2



FIRE DEPARTMENT
PERMANENT ACCESS ROADWAY

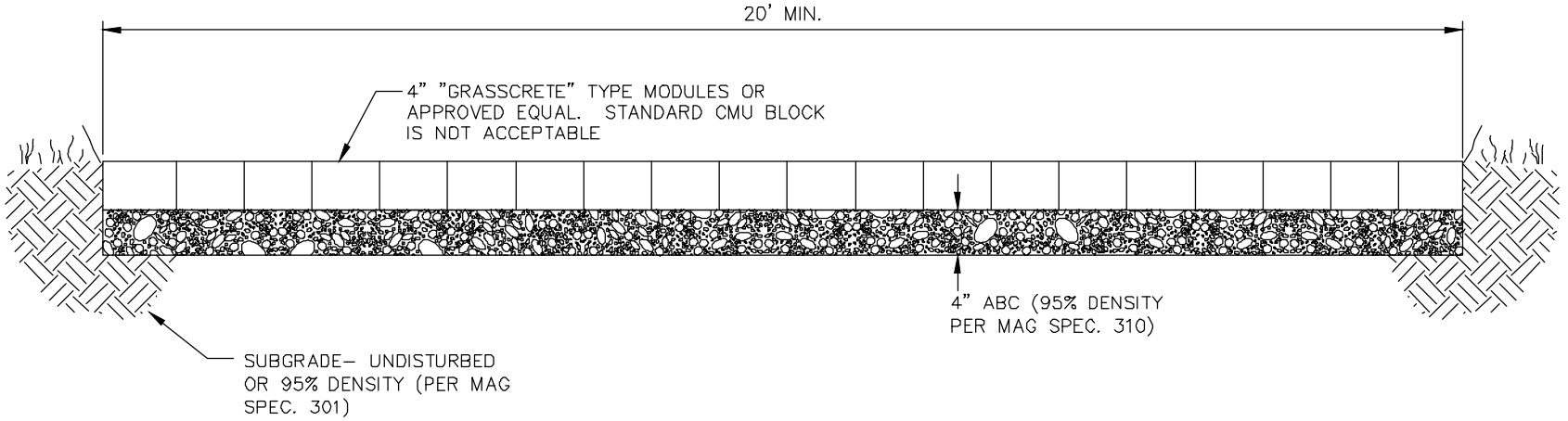
NOTES:

1 THE MAXIMUM GRADIENT OF A FIRE DEPARTMENT ACCESS ROAD SHALL NOT EXCEED 8% (8' IN 100').

2 WHERE BUILDINGS ARE LESS THAN 30' IN HEIGHT, A 20' UNOBSTRUCTED WIDTH SHALL BE MAINTAINED FOR THE ACCESS ROADWAY.

3 WHERE BUILDINGS ARE MORE THAN 30' IN HEIGHT, A 26' UNOBSTRUCTED WIDTH SHALL BE MAINTAINED FOR THE ACCESS ROADWAY.

DETAIL NO. G-3244-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	FIRE DEPARTMENT PERMANENT ACCESS ROADWAY TYPICAL CROSS-SECTION	DETAIL NO. G-3244-1

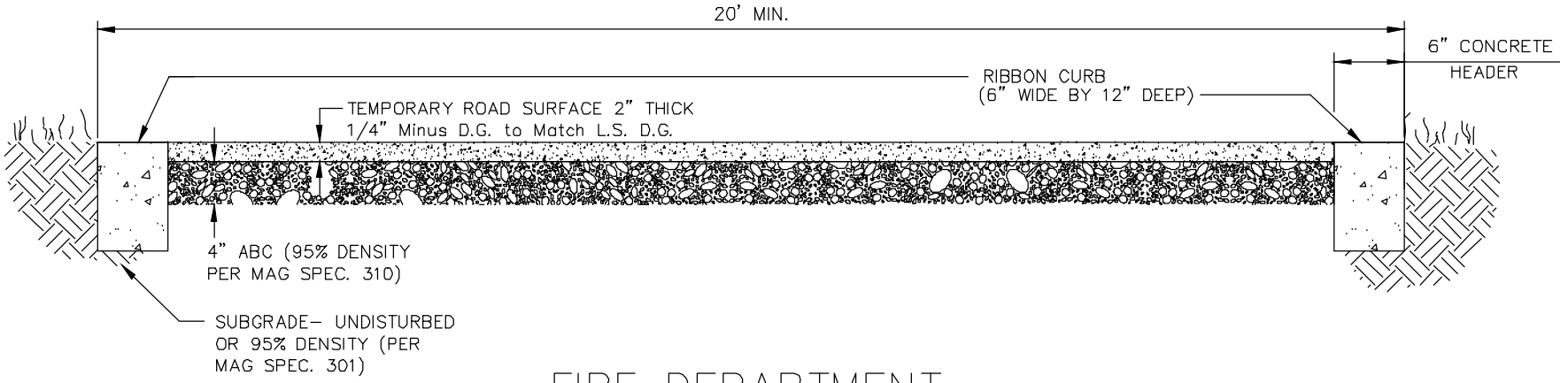


FIRE DEPARTMENT
ALTERNATIVE ACCESS ROADWAY

NOTES

1. THE MAXIMUM GRADIENT OF A FIRE DEPARTMENT ACCESS ROAD SHALL NOT EXCEED 8% (8' IN 100').
2. WHERE BUILDINGS ARE LESS THAN 30' IN HEIGHT, A 20' UNOBSTRUCTED WIDTH SHALL BE MAINTAINED FOR THE ACCESS ROADWAY.
3. WHERE BUILDINGS ARE MORE THAN 30' IN HEIGHT, A 26' UNOBSTRUCTED WIDTH SHALL BE MAINTAINED FOR THE ACCESS ROADWAY.
4. THIS IS AN ALTERNATIVE CROSS–SECTION TO THE CROSS–SECTION OF THE PERMANENT ACCESS ROADWAY.
5. CONSTRUCTION OF THIS ALTERNATIVE IS SUBJECT TO APPROVAL BY THE CITY OF GOODYEAR FIRE DEPARTMENT AND MUST ALSO INCLUDE AN ENGINEERS STAMP AND SIGNATURE.
6. DOCUMENTATION THAT THIS CROSS–SECTION WILL SUPPORT FIRE VEHICLE LOADS MUST BE STAMPED AND SIGNED BY A PROFESSIONAL CIVIL ENGINEER AND SUBMITTED TO THE CITY FIRE AND ENGINEERING STAFF FOR REVIEW.

DETAIL NO.				DETAIL NO.
G-3244-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	FIRE DEPARTMENT ALTERNATIVE ACCESS ROADWAY TYPICAL CROSS-SECTION	G-3244-2

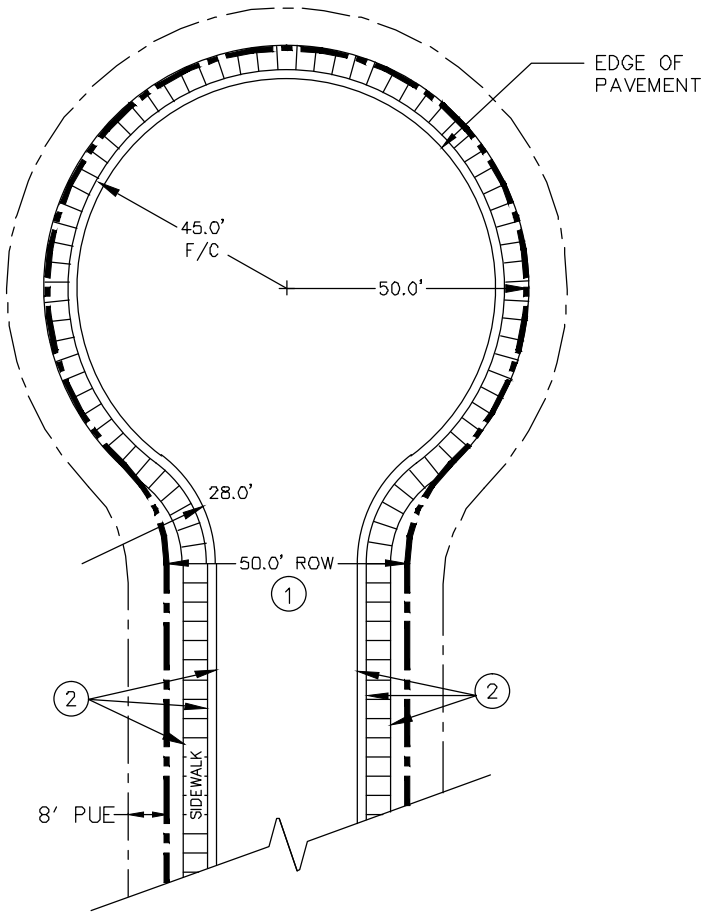


FIRE DEPARTMENT
TEMPORARY ACCESS ROADWAY

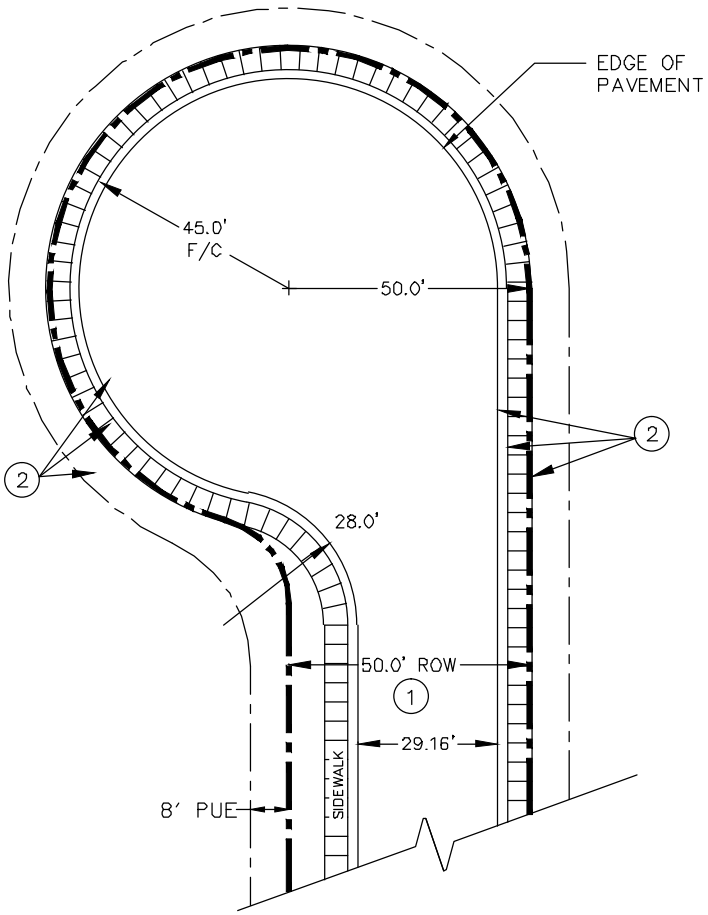
NOTES

1. ALL CONCRETE SHALL BE MAG CLASS A.
2. THE MAXIMUM GRADIENT OF A FIRE DEPARTMENT ACCESS ROAD SHALL NOT EXCEED 8% (8' IN 100').
3. WHERE BUILDINGS ARE LESS THAN 30' IN HEIGHT, A 20' UNOBSTRUCTED WIDTH SHALL BE MAINTAINED FOR THE ACCESS ROADWAY.
4. WHERE BUILDINGS ARE MORE THAN 30' IN HEIGHT, A 26' UNOBSTRUCTED WIDTH SHALL BE MAINTAINED FOR THE ACCESS ROADWAY.

DETAIL NO.				DETAIL NO.
G-3244-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	FIRE DEPARTMENT TEMPORARY ACCESS ROADWAY TYPICAL CROSS-SECTION	G-3244-3



CUL-DE-SAC



MODIFIED CUL-DE-SAC

NOTES:

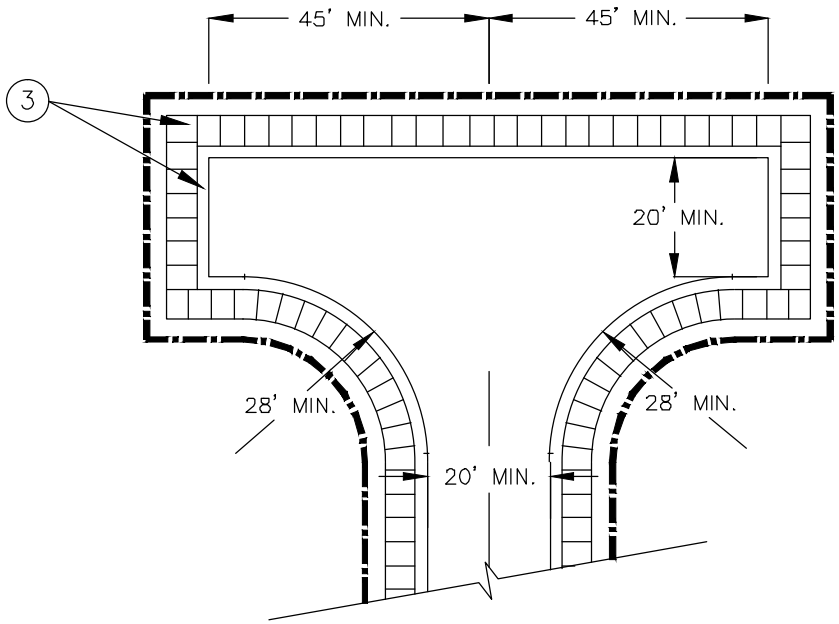
1. FIRE DEPARTMENT ACCESS ROADWAY WIDTHS SHALL MEET OR EXCEED THE WIDTHS INDICATED IN THE CITY STANDARD ROADWAY CROSS-SECTIONS. A MINIMUM 20' WIDE DRIVE SHALL BE PROVIDED FOR ALL OTHER CIRCUMSTANCES. A WIDER FIRE ACCESS ROADWAY WIDTH MAY BE REQUIRED AS DETERMINED BY CURRENT FIRE DEPARTMENT STANDARDS (TYPICALLY REQUIRED ADJACENT TO TALL BUILDINGS). WIDTHS SHOWN REFLECT THE CITY STANDARD LOCAL STREET CROSS-SECTION.

2. SIDEWALKS AND CURB & GUTTER SHALL BE INSTALLED AND A MINIMUM 8' PUE SHALL BE DEDICATED AROUND ALL PERMANENT PUBLIC AND PRIVATE STREET TURNAROUNDS AND IN OTHER CIRCUMSTANCES AS DETERMINED BY THE CITY ENGINEERING DEPARTMENT.

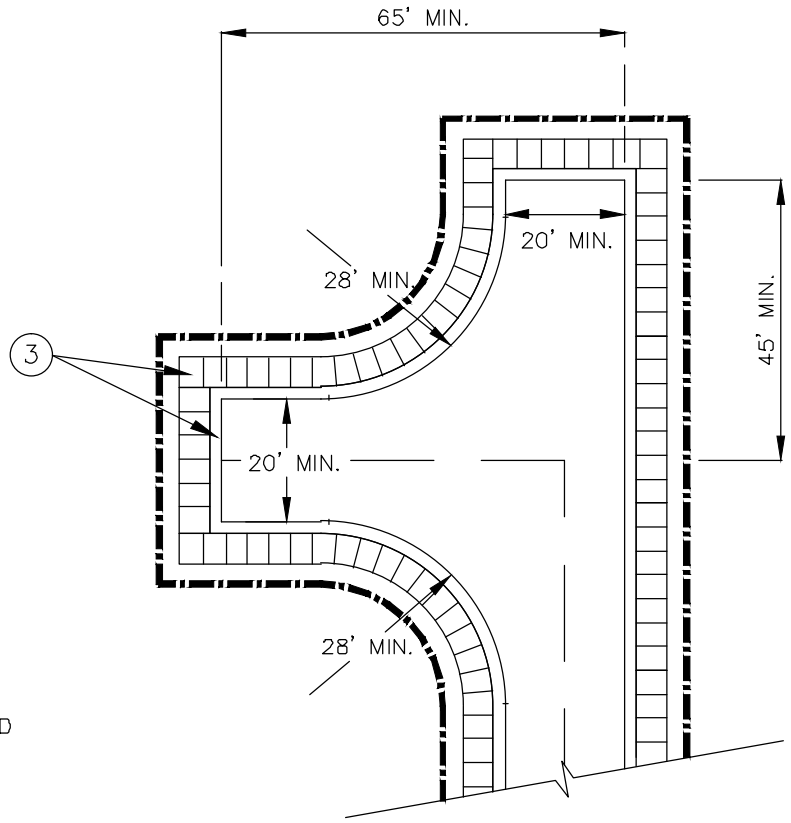
3. ROLL OR VERTICAL CURBING MAY BE USED ALONG FIRE DEPARTMENT ACCESS ROADWAYS. HOWEVER, A MINIMUM PAVED WIDTH OF 24' (B/C TO B/C) SHALL BE MAINTAINED.

4. DETACHED OR ATTACHED SIDEWALKS MAY BE USED.

DETAIL NO. G-3246-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	FIRE DEPARTMENT ACCESS ROADWAYS & CUL-DE-SAC / MODIFIED CUL-DE-SAC TURNAROUNDS	DETAIL NO. G-3246-1



HAMMERHEAD



MODIFIED HAMMERHEAD

NOTES:

1. THE HAMMERHEAD TURNAROUND SHALL NOT BE CONSTRUCTED WITHIN A PUBLIC OR PRIVATE ROADWAY.
2. THE WIDTH OF EACH LEG IN THE HAMMERHEAD SHALL BE A MINIMUM 20' WIDE. LEG WIDTHS GREATER THAN 20' MAY BE REQUIRED AS DETERMINED BY THE CITY'S FIRE CODE (TYPICALLY REQUIRED ADJACENT TO TALL BUILDINGS).
3. WHEN DETERMINED NECESSARY BY THE CITY ENGINEERING DEPARTMENT, SIDEWALKS AND CURB & GUTTER SHALL BE INSTALLED AROUND PERMANENT HAMMERHEAD IMPROVEMENTS.
4. ROLL OR VERTICAL CURBING MAY BE USED. HOWEVER, A MINIMUM PAVED WIDTH OF 24' (B/C TO B/C) SHALL BE MAINTAINED.
5. DETACHED OR ATTACHED SIDEWALKS MAY BE USED.

DETAIL NO. G-3246-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	FIRE DEPARTMENT ACCESS HAMMERHEAD / MODIFIED HAMMERHEAD TURNAROUNDS	DETAIL NO. G-3246-2

GRAY ROADWAY LED STREETLIGHT POLE AND LUMINAIRE SPECIFICATIONS

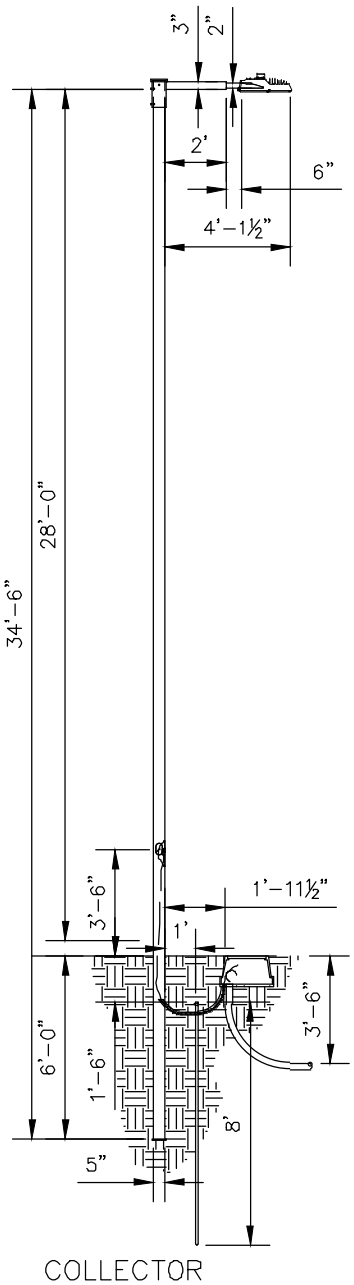
ITEM NUMBER	TYPE OF STREET	QUANTITY	MOUNTING HEIGHT	POLE LENGTH	MAST ARM	APPROVED POLE & ARM MANUFACTURERS	LUMEN	TYPE	WATTAGE	VOLTAGE	LUMINAIRE STYLE	APPROVED LUMINAIRE MANUFACTURERS
(1)	LOCAL	0	25'-11"	30'-6"	6'	CEM-TEC MS-1936 VALMONT CB09158 SOUTHWEST FABRICATION, LLC 306RDB	5,100	LED	60 W	120/208/240/277 AS POWER CO. REQUIRES	COBRAHEAD	GENERAL ELECTRIC ERS10A3B1740A GRAY R
(2)	COLLECTOR	0	32'-11"	38'-6"	6'	CEM-TEC MS-1944 VALMONT CB09159 SOUTHWEST FABRICATION, LLC 386RDB	8,200	LED	95 W	120/208/240/277 AS POWER CO. REQUIRES	COBRAHEAD	GENERAL ELECTRIC ERS10C3C1740A GRAY R
(3)	ARTERIAL	0	34'-3"	38'-6"	6'	CEM-TEC MS-1944 VALMONT CB09159 SOUTHWEST FABRICATION, LLC 386RDB	10,000	LED	113 W	120/208/240/277 AS POWER CO. REQUIRES	COBRAHEAD	GENERAL ELECTRIC ERS20D3E1740A GRAY R

ALL CATALOG NUMBERS SHALL BE CONFIRMED WITH POWER COMPANY PRIOR TO ORDERING

DARK BRONZE LED STREETLIGHT POLE AND LUMINAIRE SPECIFICATIONS

ITEM NUMBER	TYPE OF STREET	QUANTITY	MOUNTING HEIGHT	POLE LENGTH	MAST ARM	APPROVED POLE & ARM MANUFACTURERS	LUMEN	TYPE	WATTAGE	VOLTAGE	LUMINAIRE STYLE	APPROVED LUMINAIRE MANUFACTURERS
(1)	LOCAL	0	25'-11"	30'-6"	2'	CEM-TEC MS-1936 VALMONT CB09158 SOUTHWEST FABRICATION, LLC 306RDB	5,100	LED	60 W	120/208/240/277 AS POWER CO. REQUIRES	DKBZ LED	GENERAL ELECTRIC ERS10A3B1740A DKBZ R
(2)	COLLECTOR	0	32'-11"	38'-6"	2'	CEM-TEC MS-1944 VALMONT CB09159 SOUTHWEST FABRICATION, LLC 386RDB	8,200	LED	95 W	120/208/240/277 AS POWER CO. REQUIRES	DKBZ LED	GENERAL ELECTRIC ERS10C3C1740A DKBZ R
(3)	ARTERIAL	0	34'-3"	38'-6"	2'	CEM-TEC MS-1944 VALMONT CB09159 SOUTHWEST FABRICATION, LLC 386RDB	10,000	LED	113 W	120/208/240/277 AS POWER CO. REQUIRES	DKBZ LED	GENERAL ELECTRIC ERS20D3E1740A DKBZ R

ALL CATALOG NUMBERS SHALL BE CONFIRMED WITH POWER COMPANY PRIOR TO ORDERING



COLLECTOR

CONSTRUCTION NOTES:

1. ADJUST PHOTO EYE TO FACE NORTH
2. A GROUND ROD IS PROVIDED WITH THE JUNCTION BOX. WHERE A GROUND ROD CANNOT BE DRIVEN ALTERNATE GROUND SHALL BE USED. SEE 2449 THRU 2460 FOR APPROVED ALTERNATES.
3. THE 40'–6" SELF–SUPPORTING STEEL POLE AND ONE OF THE 38'–0", HAVE TWO, MANUFACTURED INSTALLED SIMPLEX FITINGS 180 APART FOR DOUBLE ARMS, SEE CHART.
4. APN 33701054 IS A POLE BAND ADAPTOR WITH A SIMPLEX FITTING. ADAPTOR IS REQUIRED FOR THE SECOND ARM IN DOUBLE ARM APPLICATIONS ON EXISTING PLES IN THE FIELD WITHOUT TWO SIMPLEX FITTINGS. SEE 8198 FOR AVAILABLE SIZES.
5. POLES THAT HAVE MORE THAN ONE LUMINAIRE REQUIRE A SEPARATE CIRCUIT WITH FUSING FROM THE J–BOX TO EACH LUMINAIRE.

ENGINEERING NOTES:

A. THE LIGHT CODE PROVIDES TWO SAME WATTAGE LUMINAIRES WHEN DOUBLE ARM ARE SPECIFIED.

B. SEE SPEC 8130 – 8131 FOR IN–LINE FUSE FOR UNDERGROUND FEEDS.

C. SEE 8100 THRU 8107 FOR OVERHEAD ATTACHMENTS.

LIGHT CODE	COLOR	APN	TYPE	WATTS	MULTIVOLT	INITIAL LUMENS	PHOTOMETRIC CURVE
RL50	DARK BRONZE	00128251	LED	45	120/208/240/277 DRIVER	4,100	454669
RL52		00126804		60	120/208/240/277 DRIVER	5,100	454659
RL53		00126805		95	120/208/240/277 DRIVER	8,200	454677
RL54		00126806		113	120/208/240/277 DRIVER	10,000	454688
RL56		00128365		257	120/208/240/277 DRIVER	19,200	454942

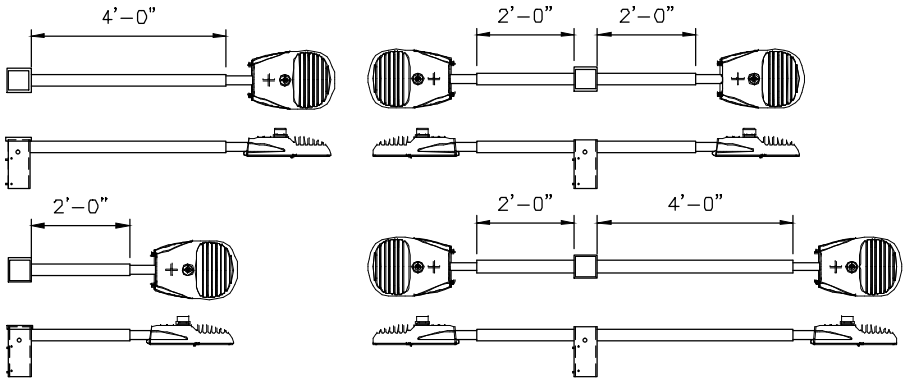
POLE TYPE	POLE CODE	POLE LENGTH	BURY DEPTH	POLE ABOVE GROUND	POLE BUTT DIAMETER			LUMINAIRE HEIGHT ABOVE GROUND ON ARM		
					STEP	TAPER	WEIGHT	20" X 6'	3' X 8'	8' X 8'
LOCAL	1944.3D	30' – 6"	5' – 6"	25' – 0"	5–9/16"	7–5/16"	460	25' – 11"	27' – 3"	–
COLLECTOR	1944.38	38' – 6"	6' – 6"	32' – 0"	6–5/8"	9–3/4"	640	32' – 11"	34' – 3"	39' – 3"
ARTERIAL	1944.38X	38' – 6"	6' – 6"	32' – 0"	6–5/8"	9–3/4"	640	32' – 11"	34' – 3"	39' – 3"

**FOR NON–STANDARD POLES, CONTACT THE STREET TRANSPORTATION STREETLIGHTING SECTION FOR INFORMATION.

1944._ _

19 = 19' – 0" POLE
SNG SIMPLEX
30 = 30' – 6" POLE
SNG SIMPLEX
38 = 38' – 6" POLE
SNG SIMPLEX
38X = 38' – 6" POLE
DBL SIMPLEX
** SEE SPEC. NOTE

BRONZE SQUARE POLE LUMINAIRES



DARK BRONZE LUMINAIRE DESCRIPTIONS

APN# 128251
45W LED RWDB – PEDESTRIAN
ERS10A3B1540A DKBZ R

APN# 126804
60W LED RWDB – LOCAL
ERS10A3B1740A DKBZ R

APN# 126805
95W LED RWDB – COLLECTOR
ERS10CEC1740A DKBZ R

APN# 126806
113W LED RWDB – MAJOR
ERS20D3E1740A DKBZ R

APN# 128365
257W LED RWDB – SPECIAL MAJOR
ERS20G3C1140A DKBZ R

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD DARK BRONZE SQUARE POLES (1 OF 2)	DETAIL NO.
G-3250-2				G-3250-2

ELECTRICAL REQUIREMENTS FOR NEW POLE INSTALLATION

1. JUNCTION BOXES SHALL MEET UTILITY COMPANY STANDARDS.
2. CONDUIT, CONDUCTORS, AND FUSE HOLDERS SHALL BE LISTED AND LABELED FOR USE IN A WET LOCATION WHEN USED IN A JUNCTION BOX. NEC300.5(B), 310.8(C)
3. IN-LINE FUSE HOLDER USED IN HAND HOLE OR SERVICE DROP SHALL BE CONSIDERED AS DISCONNECTING MEANS. FUSE HOLDERS TO BE RATED AT 22,000 AIC MINIMUM. NEC 240.40
4. ELECTRICAL CONNECTIONS-CONDUCTORS OF DISSIMILAR METALS SHALL NOT BE INTERMIXED IN A TERMINAL OR SPLICING CONNECTOR WHERE PHYSICAL CONTACT OCCURS BETWEEN DISSIMILAR CONDUCTORS, (COPPER, ALUMINUM) UNLESS THE DEVICE IS IDENTIFIED FOR THE PURPOSE AND CONDITIONS OF USE. NEC 110.14
5. ELECTRICAL CONNECTIONS OR SPLICES IN AN UNDERGROUND INSTALLATION SHALL BE APPROVED FOR WET LOCATIONS. (NEC 300.5)
6. NON-CURRENT CARRYING CONDUCTIVE MATERIALS ENCLOSING ELECTRICAL CONDUCTORS OR EQUIPMENT, OR FORMING PART OF SUCH EQUIPMENT, SHALL BE CONNECTED TO EARTH IN A MANNER THAT WILL LIMIT THE VOLTAGE IMPOSED BY LIGHTNING OR UNINTENTIONAL VOLTAGE DUE TO SHORT CIRCUITS AND LIMIT THE VOLTAGE TO GROUND ON THESE MATERIALS. NEC 250.4(B) (GROUND RODS)
7. AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED FROM THE GROUND LUG IN THE HAND-HOLE TO THE LUMINAIRE WITH THE CURRENT CARRYING CONDUCTORS. NEC 410.30(B)(3).
8. CONNECTION TO THE GROUND ROD AND THE GROUNDING ELECTRODE SHALL BE LISTED AND LABELED FOR USE. NEC 250.8
9. CONNECT #6 BARE COPPER WIRE FROM THE GROUND ROD ADJACENT TO THE POLE OR IN JUNCTION BOX TO THE GROUND LUG IN THE POLE.

CONSTRUCTION NOTES:

1. ADJUST PHOTO EYE TO FACE NORTH
2. A GROUND ROD IS PROVIDED WITH THE JUNCTION BOX. WHERE A GROUND ROD CANNOT BE DRIVEN ALTERNATE GROUND SHALL BE USED. SEE 2449THRU 2460 FOR APPROVED ALTERNATES.
3. THE 40'-6" SELF-SUPPORTING STEEL POLE AND ONE OF THE 38'-0", HAVE TWO, MANUFACTURED INSTALLED SIMPLEX FITINGS 180 APART FOR DOUBLE ARMS,SEE CHART.
4. APN 33701054 IS A POLE BAND ADAPTOR WITH A SIMPLEX FITTING. ADAPTOR IS REQUIRED FOR THE SECOND ARM IN DOUBLE ARM APPLICATIONS ON EXISTING POLES IN THE FIELD WITHOUT TWO SIMPLEX FITTINGS. SEE 8198 FOR AVAILABLE SIZES.
5. POLES THAT HAVE MORE THAN ONE LUMINAIRE REQUIRE A SEPARATE CIRCUIT WITH FUSING FROM THE J-BOX TO EACH LUMINAIRE.

ENGINEERING NOTES:

A. THE LIGHT CODE PROVIDES TWO SAME WATTAGE LUMINAIRES WHEN DOUBLE ARM ARE SPECIFIED.

B. SEE SPEC 8130 – 8131 FOR IN-LINE FUSE FOR UNDERGROUND FEEDS.

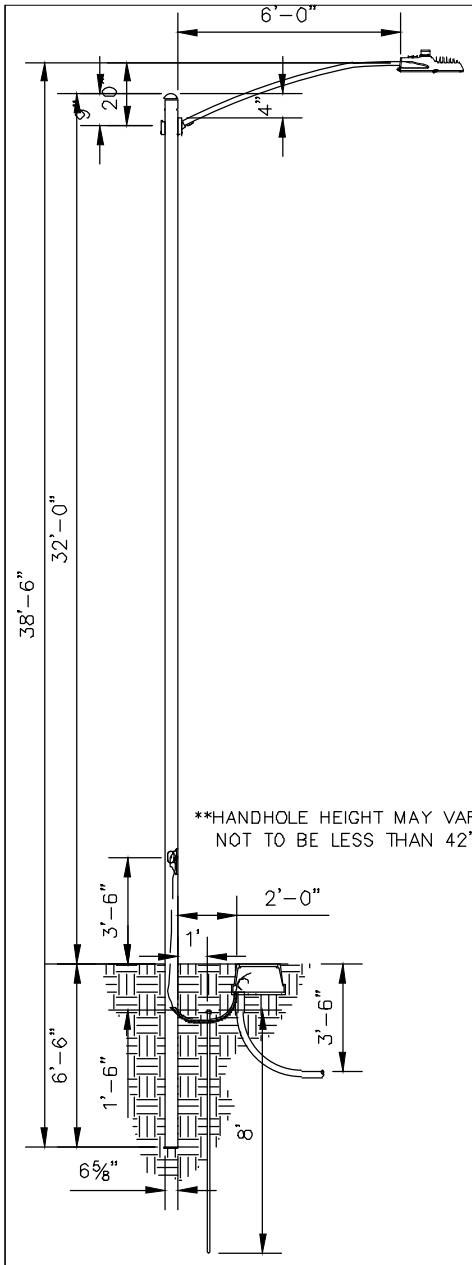
C. SEE 8100 THRU 8107 FOR OVERHEAD ATTACHMENTS.

20 YEAR PHOTOCELL REQUIREMENTS

APN# 00073241 CONTROL PHOTO MULTI BR-20 CONTROL, PHOTO-ELECTRIC, BROWN, 20YEAR FAIL OFF, 120/208/240/277 MULTI-VOLT, SILICON, SOLID STATE, 2.40 TO 3.60 FC ON 1.2 TO 2.4 FC OFF, 60 HERTZ, 320 JOULE MOV, INVERSE ON/OFF RATIO .6:1 +/- .1, FAIL OFF, THREE PIN NEMA TWISTLOCK, 20 YEAR LIFE, 8483-SIDE SELC, MODEL #8483F2TMABR

GE Evolve II Dark Bronze Shoebox LED Fixtures

WATT	LUMEN	DESCRIPTION	APN	MODEL#
45W	4,100	SCALABLE ROADWAY GE LED GRAY Pedestrian LUMINAIRE 45WATT, 4000K, 4,100 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, DARK BRONZE, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	128251	ERS10A3B1540A DKBZ R
60W	5,100	SCALABLE ROADWAY GE LED GRAY Local Street LUMINAIRE 60WATT, 4000K, 5,100 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, DARK BRONZE, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	126804	ERS10A3B1740A DKBZ R
95W	8,200	SCALABLE ROADWAY GE LED GRAY Collector Street LUMINAIRE 95WATT, 4000K, 8,200 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, DARK BRONZE, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	126805	ERS10C3C1740A DKBZ R
113W	10,000	SCALABLE ROADWAY GE LED GRAY Major Roadway LUMINAIRE 113WATT, 4000K, 10,000 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, DARK BRONZE, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	126806	ERS20D3E1740A DKBZ R
257W	19,200	SCALABLE ROADWAY GE LED GRAY Special Major Roadway LUMINAIRE 257WATT, 4000K, 19,200 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, DARK BRONZE, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	128365	ERS20G3C1140A DKBZ R



COLLECTOR

CONSTRUCTION NOTES:

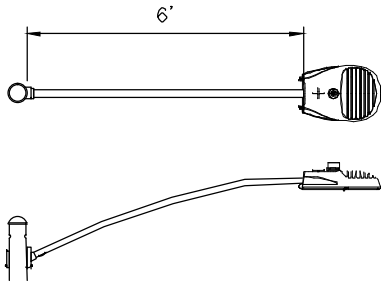
1. ADJUST PHOTO EYE TO FACE NORTH
2. A GROUND ROD IS PROVIDED WITH THE JUNCTION BOX. WHERE A GROUND ROD CANNOT BE DRIVEN ALTERNATE GROUND SHALL BE USED. SEE 2449 THRU 2460 FOR APPROVED ALTERNATES.
3. THE 40'-6" SELF-SUPPORTING STEEL POLE AND ONE OF THE 38'-0", HAVE TWO, MANUFACTURED INSTALLED SIMPLEX FITINGS 180 APART FOR DOUBLE ARMS, SEE CHART.
4. APN 33701054 IS A POLE BAND ADAPTOR WITH A SIMPLEX FITTING. ADAPTOR IS REQUIRED FOR THE SECOND ARM IN DOUBLE ARM APPLICATIONS ON EXISTING PLES IN THE FIELD WITHOUT TWO SIMPLEX FITTINGS. SEE 8198 FOR AVAILABLE SIZES.
5. POLES THAT HAVE MORE THAN ONE LUMINAIRE REQUIRE A SEPARATE CIRCUIT WITH FUSING FROM THE J-BOX TO EACH LUMINAIRE.

ENGINEERING NOTES:

A. THE LIGHT CODE PROVIDES TWO SAME WATTAGE LUMINAIRES WHEN DOUBLE ARM ARE SPECIFIED.

B. SEE SPEC 8130 - 8131 FOR IN-LINE FUSE FOR UNDERGROUND FEEDS.

C. SEE 8100 THRU 8107 FOR OVERHEAD ATTACHMENTS.



LIGHT CODE	COLOR	APN	TYPE	WATTS	MULTIVOLT	INITIAL LUMENS	PHOTOMETRIC CURVE
RL50	GRAY	00128251	LED	45	120/208/240/277 DRIVER	4,100	454669
RL52		00126804		60	120/208/240/277 DRIVER	5,100	454659
RL53		00126805		95	120/208/240/277 DRIVER	8,200	454677
RL54		00126806		113	120/208/240/277 DRIVER	10,000	454688
RL56		00128365		257	120/208/240/277 DRIVER	19,200	454942

POLE TYPE	POLE CODE	POLE LENGTH	BURY DEPTH	POLE ABOVE GROUND	POLE BUTT DIAMETER			LUMINAIRE HEIGHT ABOVE GROUND ON ARM		
					STEP	TAPER	WEIGHT	20" X 6'	3' X 8'	8' X 8'
LOCAL	1944.30	30' - 6"	5' - 6"	25' - 0"	5-9/16"	7-5/16"	460	25' - 11"	27' - 3"	-
COLLECTOR	1944.38	38' - 6"	6' - 6"	32' - 0"	6-5/8"	9-3/4"	640	32' - 11"	34' - 3"	39' - 3"
ARTERIAL	1944.38X	38' - 6"	6' - 6"	32' - 0"	6-5/8"	9-3/4"	640	32' - 11"	34' - 3"	39' - 3"
**FOR NON-STANDARD POLES, CONTACT THE STREET TRANSPORTATION STREETLIGHTING SECTION FOR INFORMATION.										

GRAY ROADWAY LUMINAIRE DESCRIPTIONS

APN# 128329
45W LED RWGR - PEDESTRIAN
ERS10A3B1540A GRAY R

APN# 128330
60W LED RWGR - LOCAL
ERS10A3B1740A GRAY R

APN# 128331
95W LED RWGR - COLLECTOR
ERS10C3C1740A GRAY R

APN# 128332
113W LED RWGR - MAJOR
ERS20D3E1740A GRAY R

APN# 128364
257W LED RWGR - SPECIAL MAJOR
ERS20G3C1140A GRAY R

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD GRAY ROUND ROADWAY POLES (1 OF 2)	DETAIL NO.
G-3250-4				G-3250-4

ELECTRICAL REQUIREMENTS FOR NEW POLE INSTALLATION

1. JUNCTION BOXES SHALL MEET UTILITY COMPANY STANDARDS.
2. CONDUIT, CONDUCTORS, AND FUSE HOLDERS SHALL BE LISTED AND LABELED FOR USE IN A WET LOCATION WHEN USED IN A JUNCTION BOX. NEC300.5(B), 310.8(C)
3. IN-LINE FUSE HOLDER USED IN HAND HOLE OR SERVICE DROP SHALL BE CONSIDERED AS DISCONNECTING MEANS. FUSE HOLDERS TO BE RATED AT 22,000 AIC MINIMUM. NEC 240.40
4. ELECTRICAL CONNECTIONS-CONDUCTORS OF DISSIMILAR METALS SHALL NOT BE INTERMIXED IN A TERMINAL OR SPLICING CONNECTOR WHERE PHYSICAL CONTACT OCCURS BETWEEN DISSIMILAR CONDUCTORS, (COPPER, ALUMINUM) UNLESS THE DEVICE IS IDENTIFIED FOR THE PURPOSE AND CONDITIONS OF USE. NEC 110.14
5. ELECTRICAL CONNECTIONS OR SPLICES IN AN UNDERGROUND INSTALLATION SHALL BE APPROVED FOR WET LOCATIONS. (NEC 300.5)
6. NON-CURRENT CARRYING CONDUCTIVE MATERIALS ENCLOSING ELECTRICAL CONDUCTORS OR EQUIPMENT, OR FORMING PART OF SUCH EQUIPMENT, SHALL BE CONNECTED TO EARTH IN A MANNER THAT WILL LIMIT THE VOLTAGE IMPOSED BY LIGHTNING OR UNINTENTIONAL VOLTAGE DUE TO SHORT CIRCUITS AND LIMIT THE VOLTAGE TO GROUND ON THESE MATERIALS. NEC 250.4(B) (GROUND RODS)
7. AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED FROM THE GROUND LUG IN THE HAND-HOLE TO THE LUMINAIRE WITH THE CURRENT CARRYING CONDUCTORS. NEC 410.30(B)(3).
8. CONNECTION TO THE GROUND ROD AND THE GROUNDING ELECTRODE SHALL BE LISTED AND LABELED FOR USE. NEC 250.8
9. CONNECT #6 BARE COPPER WIRE FROM THE GROUND ROD ADJACENT TO THE POLE OR IN JUNCTION BOX TO THE GROUND LUG IN THE POLE.

CONSTRUCTION NOTES:

1. ADJUST PHOTO EYE TO FACE NORTH
2. A GROUND ROD IS PROVIDED WITH THE JUNCTION BOX. WHERE A GROUND ROD CANNOT BE DRIVEN ALTERNATE GROUND SHALL BE USED. SEE 2449THRU 2460 FOR APPROVED ALTERNATES.
3. THE 40'-6" SELF-SUPPORTING STEEL POLE AND ONE OF THE 38'-0", HAVE TWO, MANUFACTURED INSTALLED SIMPLEX FITINGS 180 APART FOR DOUBLE ARMS,SEE CHART.
4. APN 33701054 IS A POLE BAND ADAPTOR WITH A SIMPLEX FITTING. ADAPTOR IS REQUIRED FOR THE SECOND ARM IN DOUBLE ARM APPLICATIONS ON EXISTING POLES IN THE FIELD WITHOUT TWO SIMPLEX FITTINGS. SEE 8198 FOR AVAILABLE SIZES.
5. POLES THAT HAVE MORE THAN ONE LUMINAIRE REQUIRE A SEPARATE CIRCUIT WITH FUSING FROM THE J-BOX TO EACH LUMINAIRE.

ENGINEERING NOTES:

A. THE LIGHT CODE PROVIDES TWO SAME WATTAGE LUMINAIRES WHEN DOUBLE ARM ARE SPECIFIED.

B. SEE SPEC 8130 – 8131 FOR IN-LINE FUSE FOR UNDERGROUND FEEDS.

C. SEE 8100 THRU 8107 FOR OVERHEAD ATTACHMENTS.

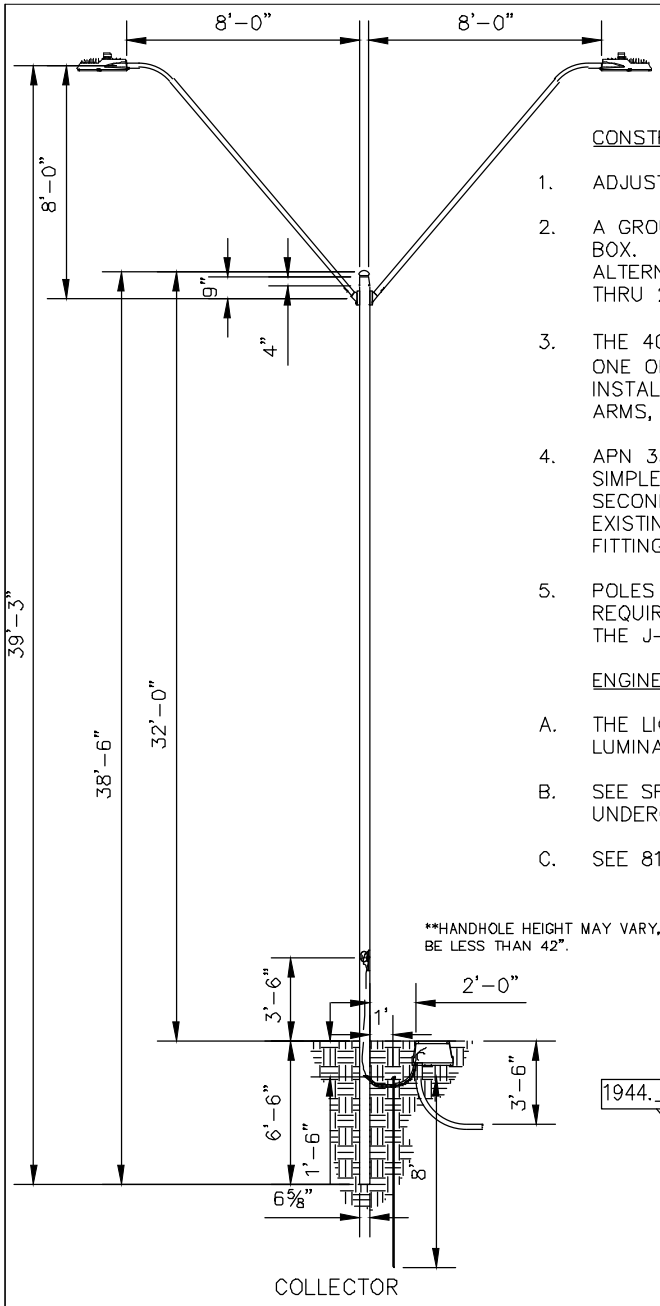
20 YEAR PHOTOCELL REQUIREMENTS

APN# 00073241 CONTROL PHOTO MULTI BR-20 CONTROL, PHOTO-ELECTRIC, BROWN, 20YEAR FAIL OFF, 120/208/240/277 MULTI-VOLT, SILICON, SOLID STATE, 2.40 TO 3.60 FC ON 1.2 TO 2.4 FC OFF, 60 HERTZ, 320 JOULE MOV, INVERSE ON/OFF RATIO .6:1 +/- .1, FAIL OFF, THREE PIN NEMA TWISTLOCK, 20 YEAR LIFE, 8483-SIDE SELC, MODEL #8483F2TMABR

GE Evolve II Gray Cobra LED Fixtures

WATT	LUMEN	DESCRIPTION	APN	MODEL#
45W	4,100	SCALABLE ROADWAY GE LED GRAY Pedestrian LUMINAIRE 45WATT, 4000K, 4,100 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, GRAY, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	128329	ERS10A3B1540A GRAY R
60W	5,100	SCALABLE ROADWAY GE LED GRAY Local Street LUMINAIRE 60WATT, 4000K, 5,100 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, GRAY, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	128330	ERS10A3B1740A GRAY R
95W	8,200	SCALABLE ROADWAY GE LED GRAY Collector Street LUMINAIRE 95WATT, 4000K, 8,200 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, GRAY, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	128331	ERS10C3C1740A GRAY R
113W	10,000	SCALABLE ROADWAY GE LED GRAY Major Roadway LUMINAIRE 113WATT, 4000K, 10,000 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, GRAY, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	128332	ERS20D3E1740A GRAY R
257W	19,200	SCALABLE ROADWAY GE LED GRAY Special Major Roadway LUMINAIRE 257WATT, 4000K, 19,200 LUMEN, ROADWAY, LED, TERMINAL BOARD, 10KV SURGE PROTECTION, 90 DEGREE CUTOFF, GRAY, MULTIVOLT 120/208/240/277 DRIVER, IES NARROW ASYMMETRIC MEDIUM, ANSI C136.41 7 PIN TWISTLOCK PHOTO CONTROL RECEPTACLE, CSA OR UL CERTIFIED, ANSI C136.15 WATTAGE LABEL.	128364	ERS20G3C1140A GRAY R

DETAIL NO.				DETAIL NO.
G-3250-5	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD GRAY ROUND ROADWAY POLES (2 OF 2)	G-3250-5



CONSTRUCTION NOTES:

1. ADJUST PHOTO EYE TO FACE NORTH
2. A GROUND ROD IS PROVIDED WITH THE JUNCTION BOX. WHERE A GROUND ROD CANNOT BE DRIVEN ALTERNATE GROUND SHALL BE USED. SEE 2449 THRU 2460 FOR APPROVED ALTERNATES.
3. THE 40'-6" SELF-SUPPORTING STEEL POLE AND ONE OF THE 38'-0", HAVE TWO, MANUFACTURED INSTALLED SIMPLEX FITINGS 180 APART FOR DOUBLE ARMS, SEE CHART.
4. APN 33701054 IS A POLE BAND ADAPTOR WITH A SIMPLEX FITTING. ADAPTOR IS REQUIRED FOR THE SECOND ARM IN DOUBLE ARM APPLICATIONS ON EXISTING PLES IN THE FIELD WITHOUT TWO SIMPLEX FITTINGS. SEE 8198 FOR AVAILABLE SIZES.
5. POLES THAT HAVE MORE THAN ONE LUMINAIRE REQUIRE A SEPARATE CIRCUIT WITH FUSING FROM THE J-BOX TO EACH LUMINAIRE.

ENGINEERING NOTES:

A. THE LIGHT CODE PROVIDES TWO SAME WATTAGE LUMINAIRES WHEN DOUBLE ARM ARE SPECIFIED.

B. SEE SPEC 8130 – 8131 FOR IN-LINE FUSE FOR UNDERGROUND FEEDS.

C. SEE 8100 THRU 8107 FOR OVERHEAD ATTACHMENTS.

1944._ _

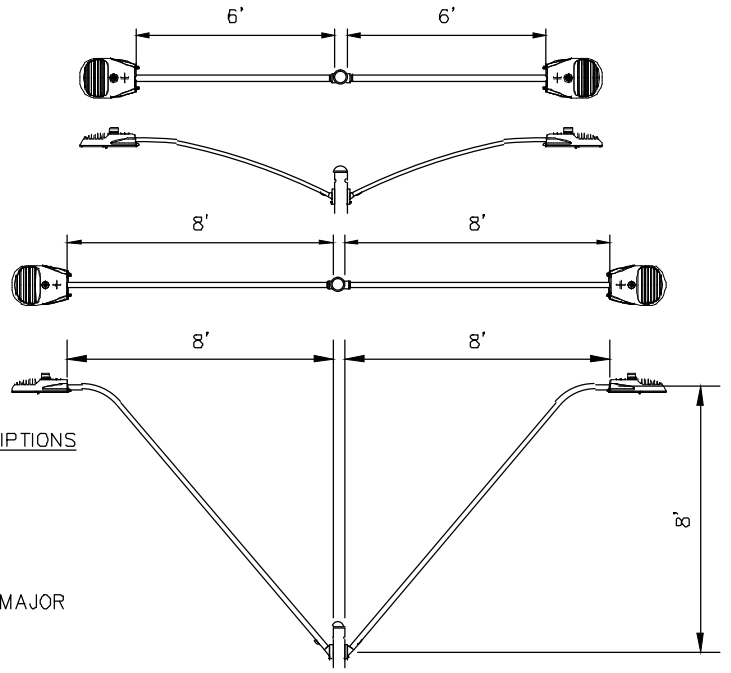
19 = 19' – 0" POLE SNG SIMPLEX
30 = 30' – 6" POLE SNG SIMPLEX
38 = 38' – 6" POLE SNG SIMPLEX
38X = 38' – 6" POLE DBL SIMPLEX
** SEE SPEC. NOTE

LIGHT CODE	COLOR	APN	TYPE	WATTS	MULTIVOLT	INITIAL LUMENS	PHOTOMETRIC CURVE
CL60	GRAY	00128329	LED	45	120/208/240/277 DRIVER	4,100	454669
CL61		00128330		60	120/208/240/277 DRIVER	5,100	454659
CL62		00128331		95	120/208/240/277 DRIVER	8,200	454677
CL63		00128332		113	120/208/240/277 DRIVER	10,000	454688
CL64		00128364		257	120/208/240/277 DRIVER	19,200	454942

POLE TYPE	POLE CODE	POLE LENGTH	BURY DEPTH	POLE ABOVE GROUND	POLE BUTT DIAMETER		WEIGHT	LUMINAIRE HEIGHT ABOVE GROUND ON ARM		
					STEP	TAPER		20" X 6'	3' X 8'	8' X 8'
LOCAL	1944.30	30' – 6"	5' – 6"	25' – 0"	5-9/16"	7-5/16"	460	25' – 11"	27' – 3"	–
COLLECTOR	1944.38	38' – 6"	6' – 6"	32' – 0"	6-5/8"	9-3/4"	640	32' – 11"	34' – 3"	39' – 3"
ARTERIAL	1944.38X	38' – 6"	6' – 6"	32' – 0"	6-5/8"	9-3/4"	640	32' – 11"	34' – 3"	39' – 3"

**FOR NON-STANDARD POLES, CONTACT THE STREET TRANSPORTATION STREETLIGHTING SECTION FOR INFORMATION.

DUAL MAST ARM POLE LUMINAIRES

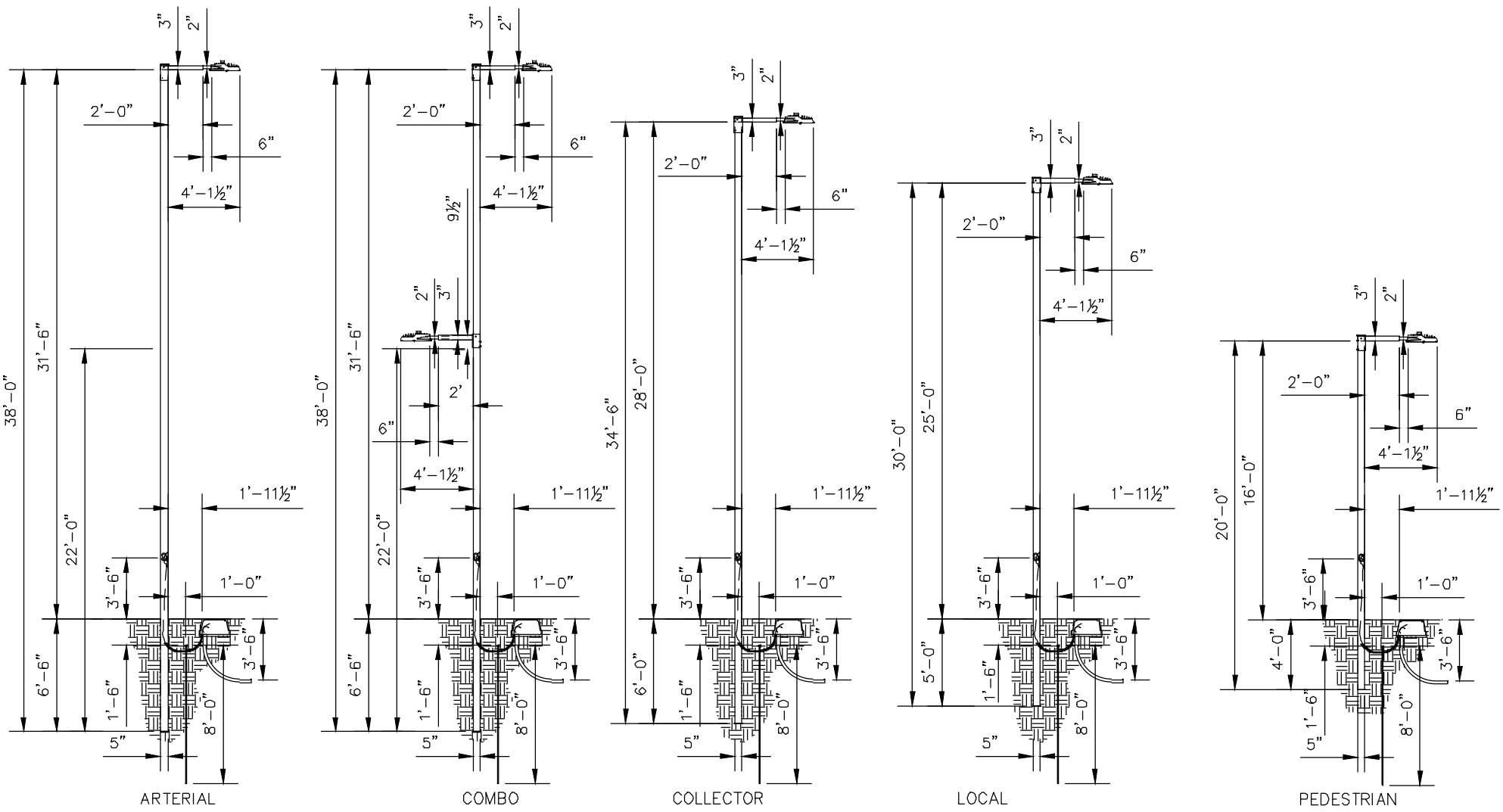


GRAY ROADWAY LUMINAIRE DESCRIPTIONS

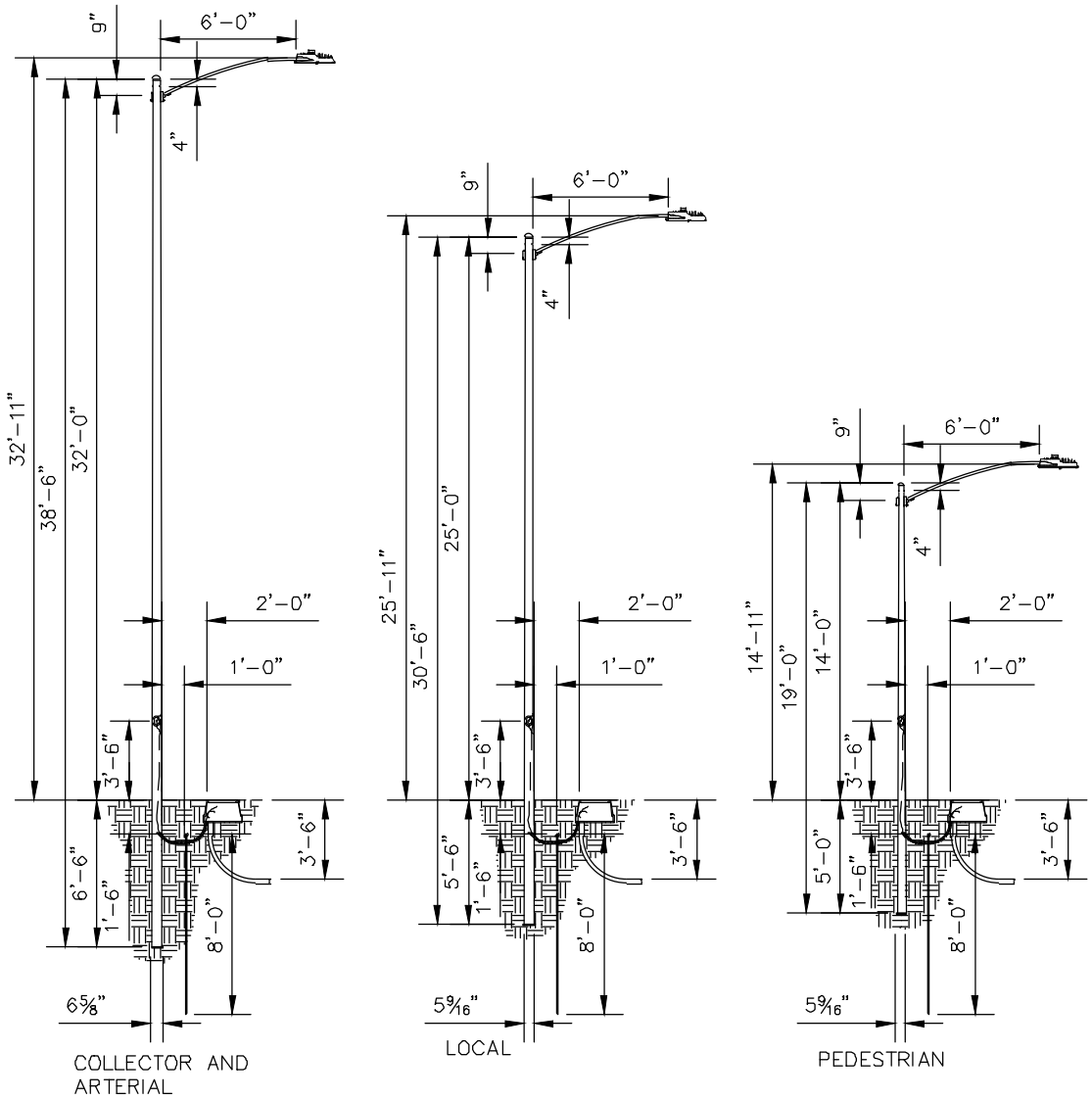
APN# 128332
113W LED RWGR – MAJOR
ERS20D3E1740A GRAY R

APN# 128364
257W LED RWGR – SPECIAL MAJOR
ERS20G3C1140A GRAY R

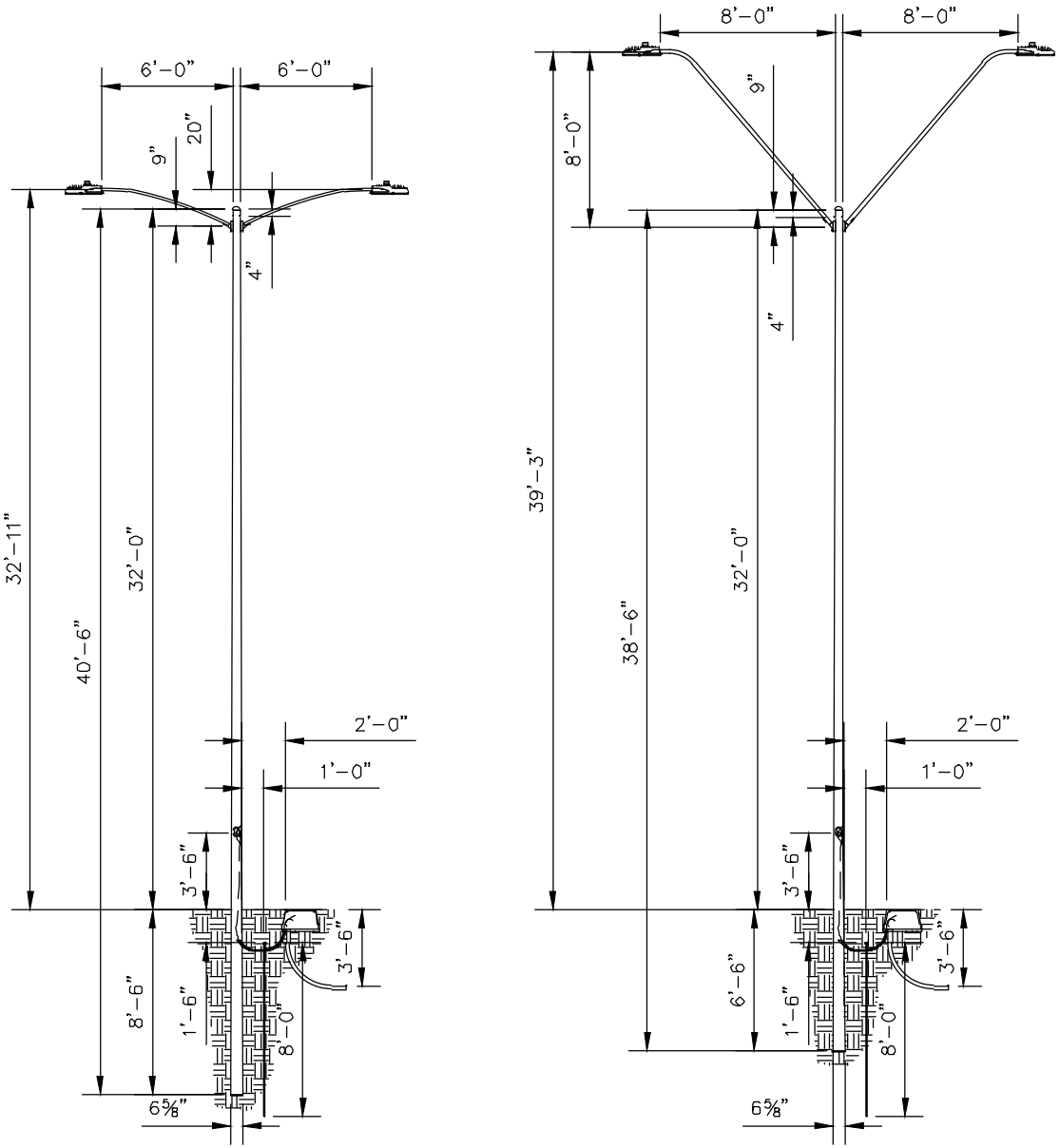
DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD DUAL MAST ARM ROUND ROADWAY POLES	DETAIL NO.
G-3250-6				G-3250-6



DETAIL NO. G-3250-7	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD DARK BRONZE SQUARE POLES	DETAIL NO. G-3250-7

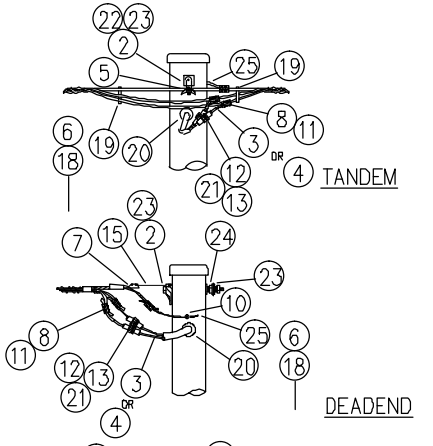


DETAIL NO. G-3250-8	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD GRAY ROUND ROADWAY POLES	DETAIL NO. G-3250-8



**HANDHOLE HEIGHT MAY VARY, NOT TO BE LESS THAN 42".

DETAIL NO. G-3250-9	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SPECIAL GRAY ROUND ROADWAY POLES	DETAIL NO. G-3250-9



NOTES:

1. STEEL POLES AND ALL MAST ARMS MUST BE GROUNDED.
2. OVERHEAD ATTACHMENTS MUST BE GROUNDED TO THE STREET LIGHT POLE. A 1/16" HOLE HAS BEEN ADDED 6" BELOW TOP OF STREET LIGHT POLE TO INSTALL A GROUNDING INSERT APN 00055552. TOOL TO INSTALL RIVNUT IS APH 00053279. SEE STANDARD 2408. WHERE RIVNUTS ARE NOT AVAILABLE GROUND PER DETAIL A.
3. ALL OVERHEAD FED STREET IGHT POLES SHALL HAVE A GROUND ROD INSTALLED AND A #6 GROUND WIRE BONDED TO THE GROUNDING LUG AT THE BACK OF THE HAND HOLE.
4. THESE CODES PROVIDE THE #14 CU FOR THE MAST ARMS., HARDWARE FOR ATTACHING TANGENT OR DEADEND SECONDARY, AND THE CONNECTORS.

8100. __ _ TWO WIRE 120V, 277V TANGENT

8101. __ _ THREE WIRE 208V, 240V TANGENT

IF APPLICABLE:
DE = DUSK-TO-DAWN

WIRE CODE

8102. __ _ TWO WIRE 120V, 277V DEADEND

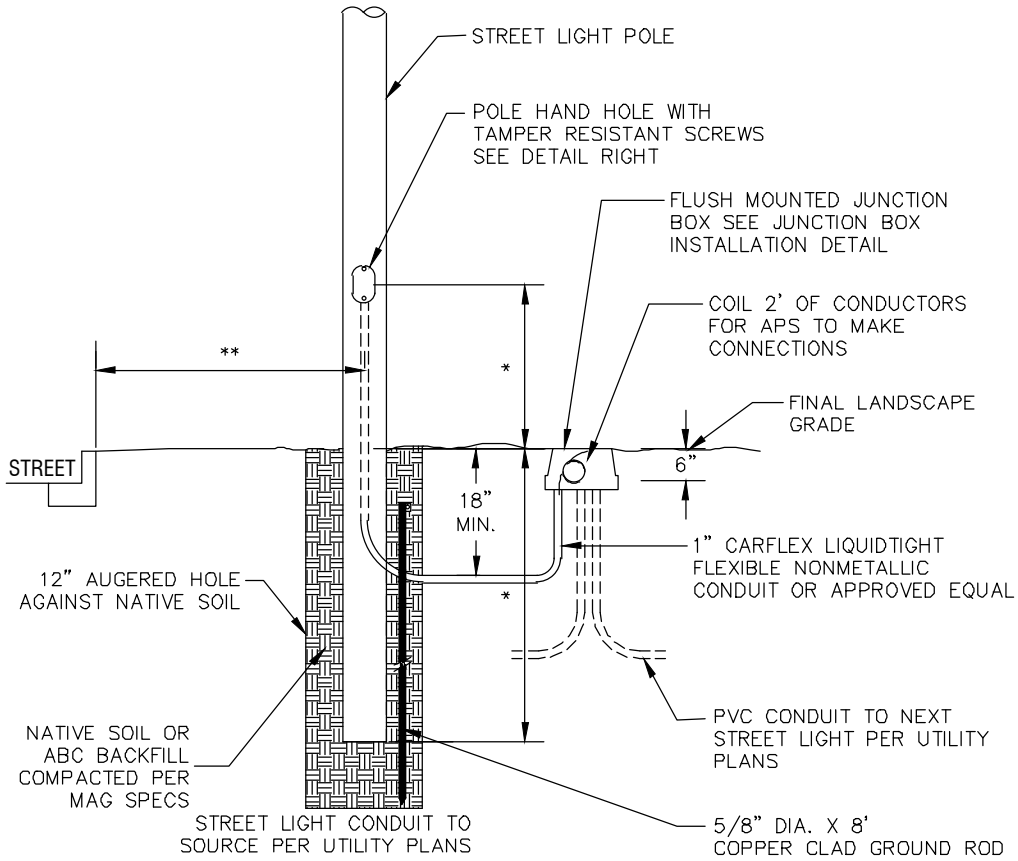
8103. __ _ THREE WIRE 208V, 240V

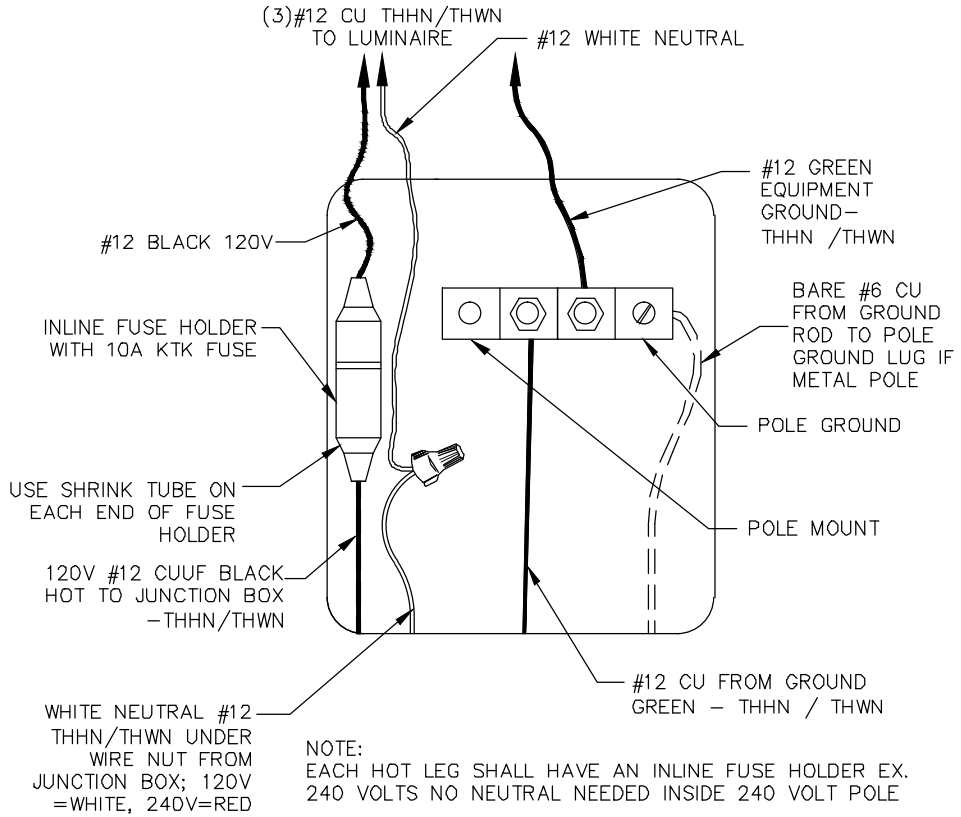
8106. __ _ TWO WIRE 120V, 277V DEADEND WITH GUY HOOK

8107. __ _ THREE WIRE 208V, 240V DEADEND WITH GUY HOOK

CODE	8100	8101	8102	8103	8106	8107	DETAIL A	MATERIAL LIST	
ITEM	QTY	QTY	QTY	QTY	QTY	QTY	QTY	DESCRIPTION	APN
1	–	–	–	–	1	1	–	BOLT GALV MACH 5/8" X 10"	33001549
2	1	1	1	1	–	–	–	BOLT GALV MACH 5/8" X 8"	33001547
3	10	–	10	–	10	–	–	CABLE 2/C #14CU UF	31102132
4	–	10	–	10	–	10	–	CABLE 3/C #14CU UF	31102135
5	1	1	–	–	–	–	–	CLAMP ANGLE .162 TO .60	33002502
6	1	1	1	1	1	1	–	CLAMP GROUND ROD 5/8"	33002580
7	–	–	1	1	–	–	–	CLAMP WEDGE FELX 4-2AL	33002772
8	2	3	2	3	4	2	–	CONN AL PG - SEE 2250	
9	–	–	–	–	1	1	–	CONN CU "C" - SEE 2255	
10	1	1	1	1	1	1	–	CONN POST 1/2"S SS #6-1/0	00095704
11	1	2	1	2	1	2	–	COVER D DIE INSULATING	33003192
12	1	2	1	2	1	2	–	FUSE CARTRIDGE 15A	72602410
13	1	2	1	2	1	2	–	FUSEHOLDER IN-LINE 600V	00097502
14	–	–	–	–	1	1	–	GRIP DE PREF - SEE2135	
15	–	–	1	1	2	2	–	HOOK GUY - MED DUTY 5/8"	33003831
16	1	1	1	1	1	1	–	NUT INSERT RIVNUT	00055552
17	–	–	–	–	–	–	1	NUT SQ GALV 5/8"	33004176
18	1	1	1	1	1	1	–	ROD COPPERCLAD GRD 5/8" X 8"	33004805
19	2	2	–	–	–	–	–	SPACER MULTIPLEX CABLE	33006510
20	1	1	1	1	1	1	–	STOPPER BUG AND DUST	33806955
21	1	1	1	1	1	1	–	TUBING SHRINKABLE 1/4	71606200
22	2	2	2	2	–	–	–	WASHER GALV CU 3X3X1/4"	33007126
23	1	1	1	1	1	1	1	WASHER GALV DBL COIL 5/8"	33007154
24	–	–	–	–	–	–	2	WASHER GALV RD 5/8"	33007185
25	2	2	2	2	2	2	–	WIRE BARE #6 SOLID CU	33007580

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD POLE CABLE ATTACHMENTS	DETAIL NO.
G-3250-10				G-3250-10





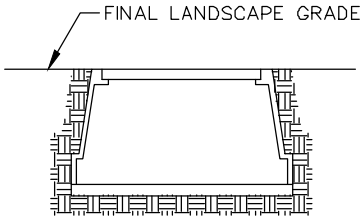
* SEE POLE DETAILS FOR DIMENSION

DETAIL NO. G-3250-11	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD POLE GROUNDING AND WIRING DETAIL	DETAIL NO. G-3250-11

DESCRIPTION
15" X 21" X 12" JUNCTION BOX WITH 3/8" CAPTIVE PENTA HEAD BOLTS

WORD "ELECTRIC" ON COVER

BOX TO BE POLYMER CONCRETE MATERIAL WITH POLYMER CONCRETE BOLT DOWN (NON-CONDUCTIVE COVER).



FLUSH MOUNTED-BOLT ON COMPOSOLITE LID

SRP APPROVED SUPPLIERS	PART NUMBER
STRONGWELL	PC1118B513 BOX PC1118C504-17/UH0390AA COVER WITH ELECTRIC
ARMORCAST PRODUCTS	A6001429A
CDR SYSTEMS	PA40-1015-12
CARSON & ASSOCIATES	HLW111B-12 BOX HLW1118-PO LID

CODE	JUNCTION BARS
A	THREE-POSITION MOLDS
B	FIVE-POSITION MOLDS
C	EIGHT-POSITION MOLDS
D	TWO-POSITION GEL PACKS
N	NO CONNECTORS

8655. _ __ _ _ SEE NOTE 10 AND 11 SMALL BOX

8656. _ __ _ _ SEE NOTE 10 AND 12 MEDIUM BOX

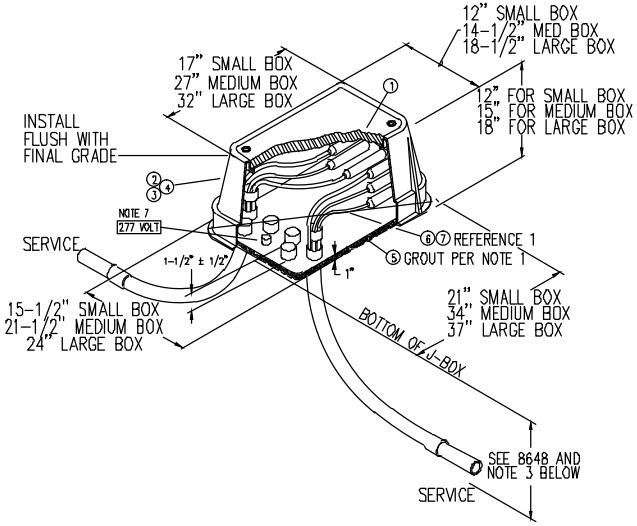
8657. _ __ _ _ SEE NOTE 13 LARGE BOX

IF APPLICABLE
G= APS GROUT PROVIDED

IF APPLICABLE
L = LIGHTS
D= DUSK-TO-DAWN

SECONDARY WIRE CODES

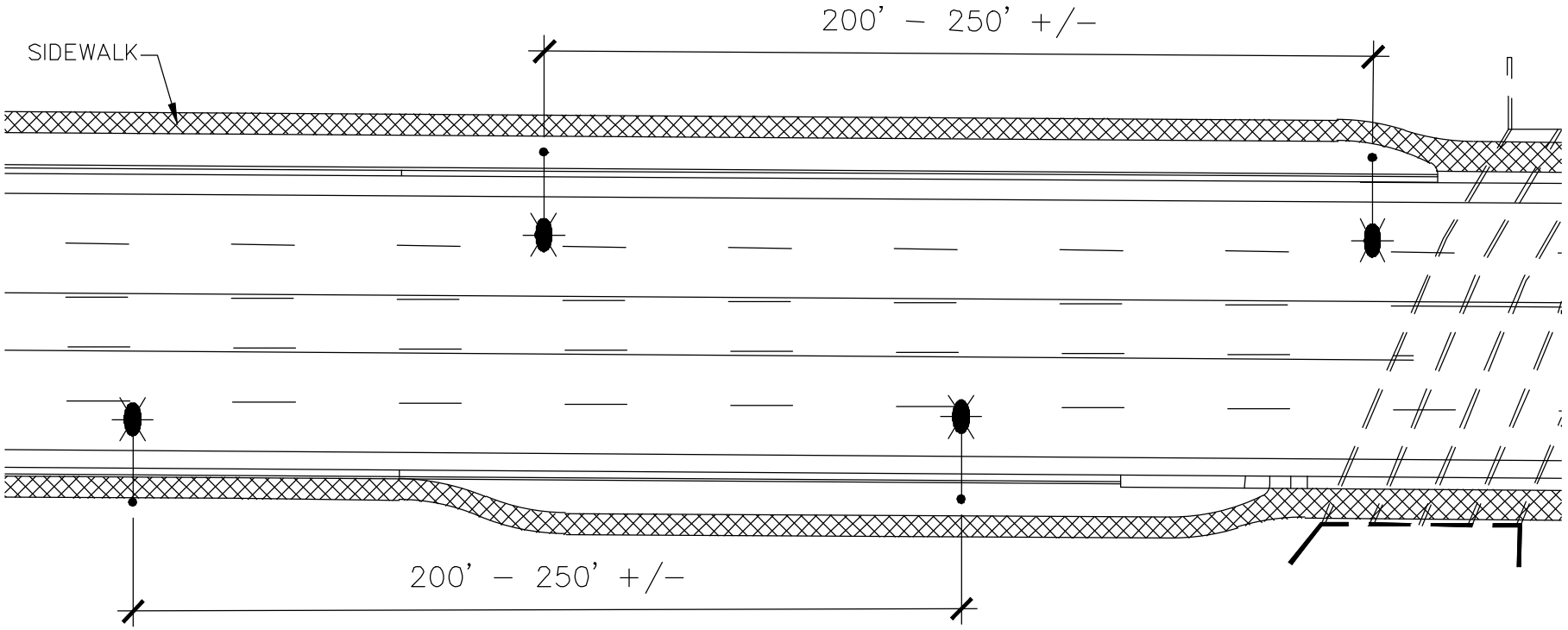
JUNCTION BARS



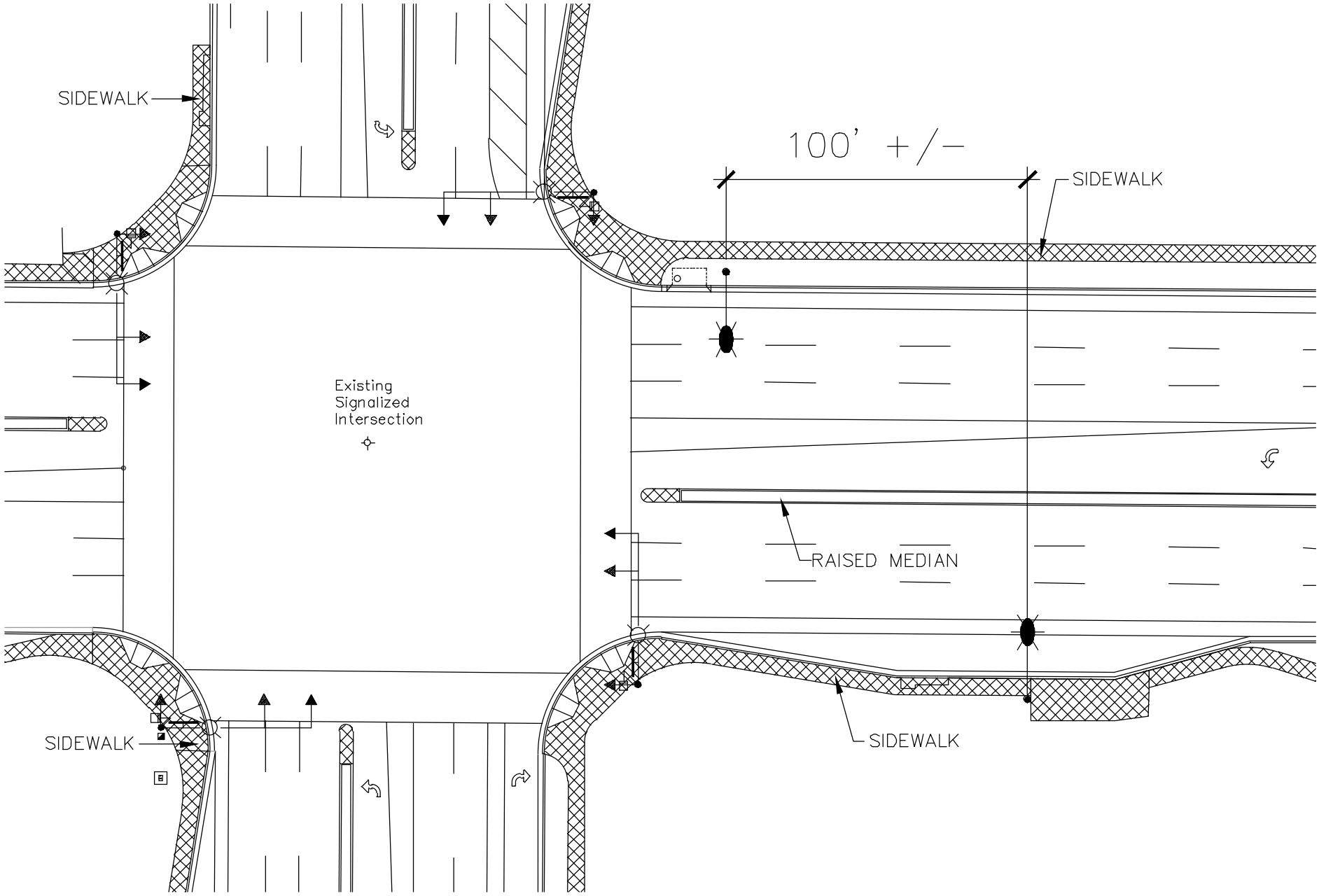
NOTES:

1. CONCRETE GROUT SHALL BE PREMIX, APN 71301280 OR EQUIVALENT.
2. PENTA-HEAD BOLTS SHALL BE INSTALLED PRIOR TO ENERGIZING NEW UNDERGROUND SYSTEMS. LOST OR MISPLACED PENTA-HEAD BOLTS SHALL BE REPLACED WITH APN 71402608.
3. BRINGING ALL CABLE/CONDUITS AND GROUND ROD INTO THE SAME END OF THE BOX TO ENABLE CABLES TO BE RAISED AND LOWERED EASILY. CONDUIT SWEEPS SHALL BE POSITIONED AND ALIGNED SO THAT WHEN TWO AND FOUR POSITION JUNCTION BARS ARE SPECIFIED, THE ST. LT., SECONDARY AND SERVICE CONDUITS SHALL BE INSTALLED AS SHOWN IN DETAIL "A". WHEN SIX POSITION JUNCTION BARS ARE SPECIFIED, THE ST. LT., SECONDARY AND SERVICE CONDUITS SHALL BE INSTALLED AS SHOWN IN DETAIL "B".
4. COMPACTION BENEATH AND AROUND JUNCTION BOX SHALL BE A MINIMUM OF 85 PERCENT.
5. REPLACEMENT LID FOR MEDIUM PLASTIC JUNCTION BOX IS 33100981. PENTAHEAD BOLTS AND EMS MARKER MUST BE REUSED FROM OLD LID.
6. ADDITIONAL TRENCH DEPTH IS USUALLY REQUIRED AT ALL EQUIPMENT LOCATIONS. SEE 8648 FOR THE MINIMUM TRENCH DEPTHS AND THE DEGREE OF SLOPE ALLOWED AS THE TRENCH DEPTH CHANGES.
7. ON 277 VOLT STREET LIGHT CIRCUITS, INSTALL "277 VOLT" RED MICARTA TAG (APN 00080796) PROVIDED BY SPEC 8129.
8. TORQUE BOLTS TO 5 FT - LBS (60 IN - LBS).

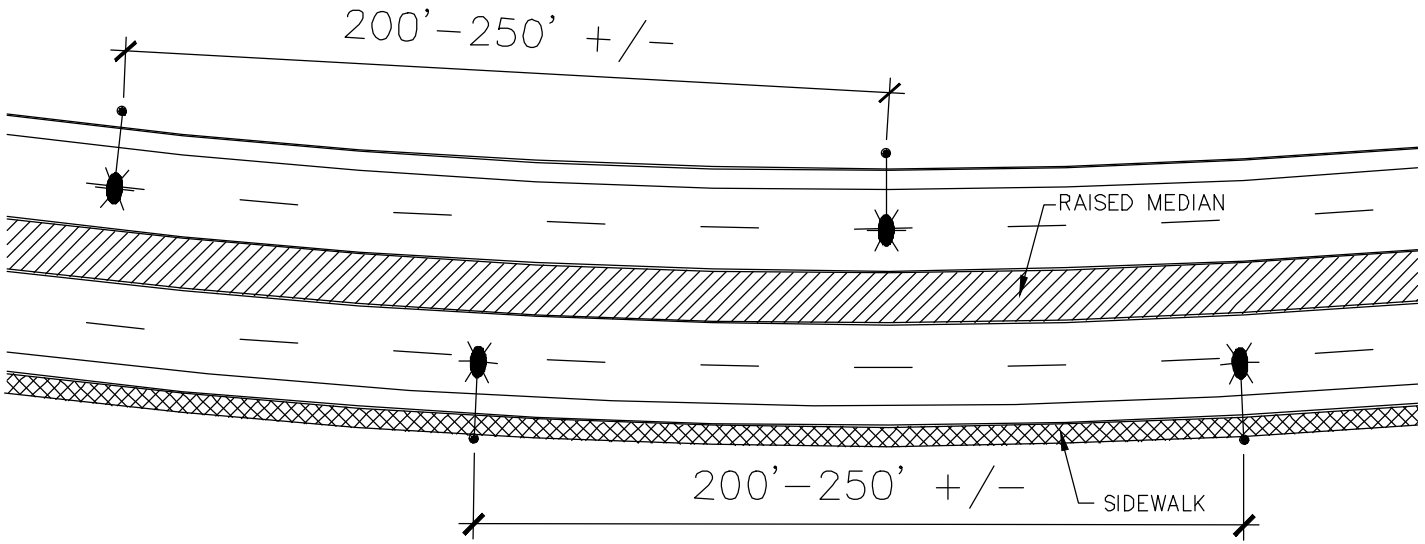
DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STANDARD APS J-BOX DETAIL	DETAIL NO.
G-3250-12				G-3250-12



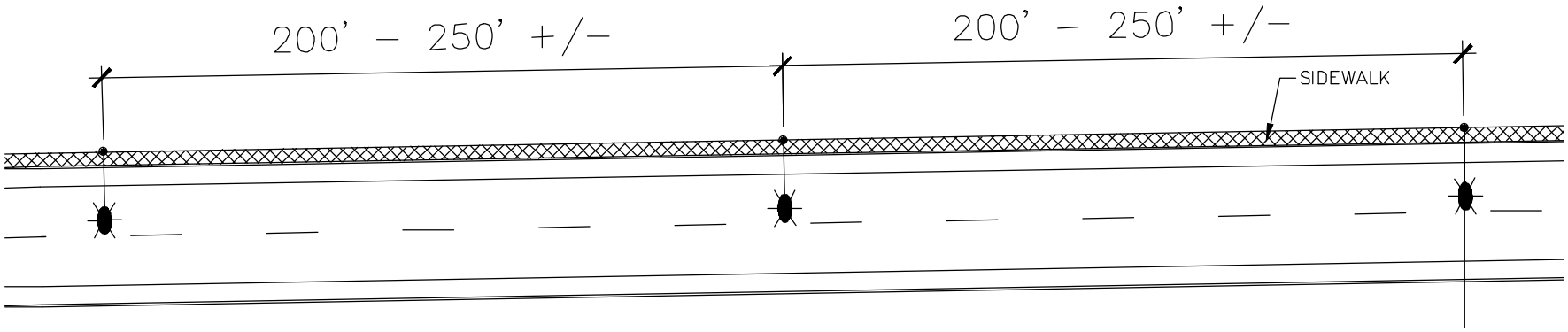
DETAIL NO. G-3255-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STREET LIGHTING - ARTERIAL STREET STAGGERED WITHOUT MEDIAN	DETAIL NO. G-3255-1



DETAIL NO. G-3255-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STREET LIGHTING - ARTERIAL INTERSECTIONS	DETAIL NO. G-3255-2

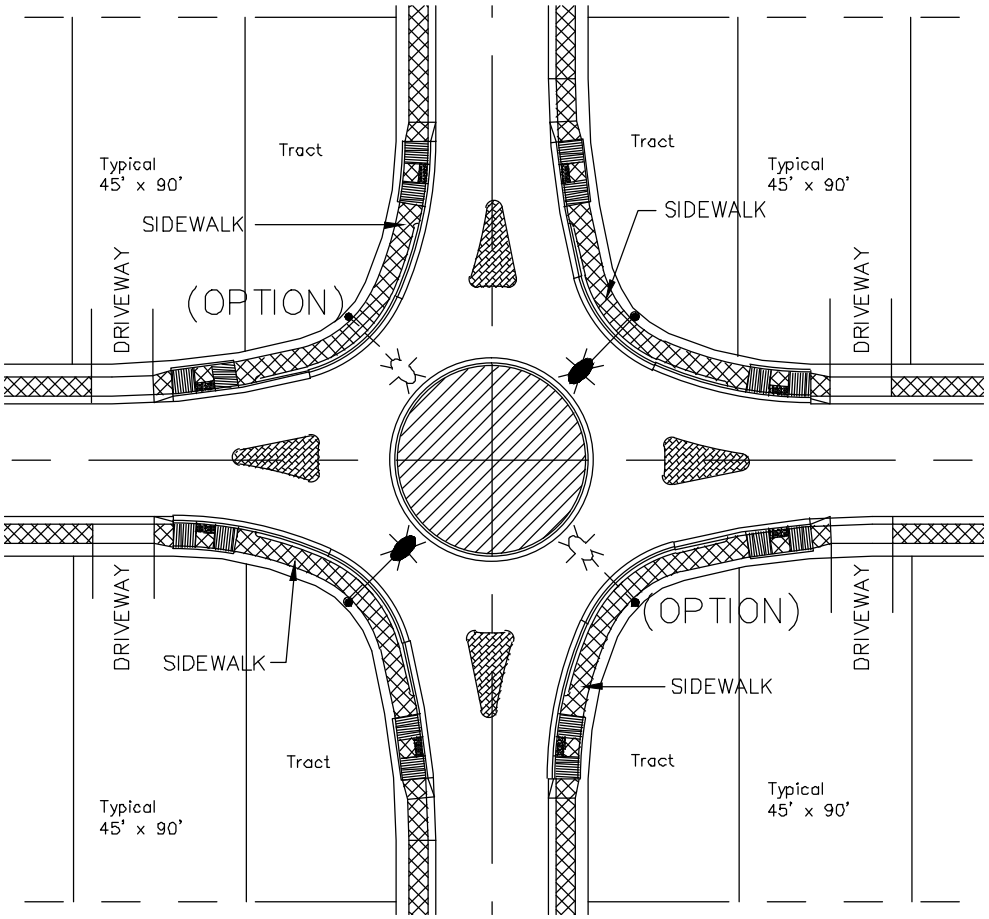


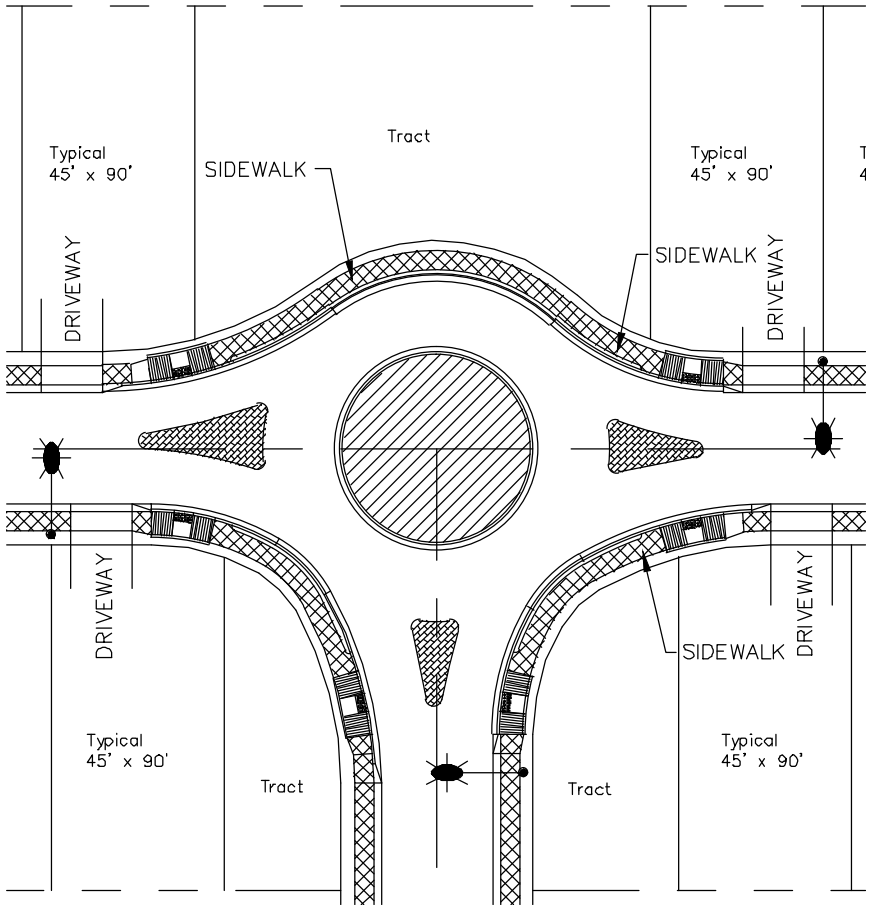
STAGGERED



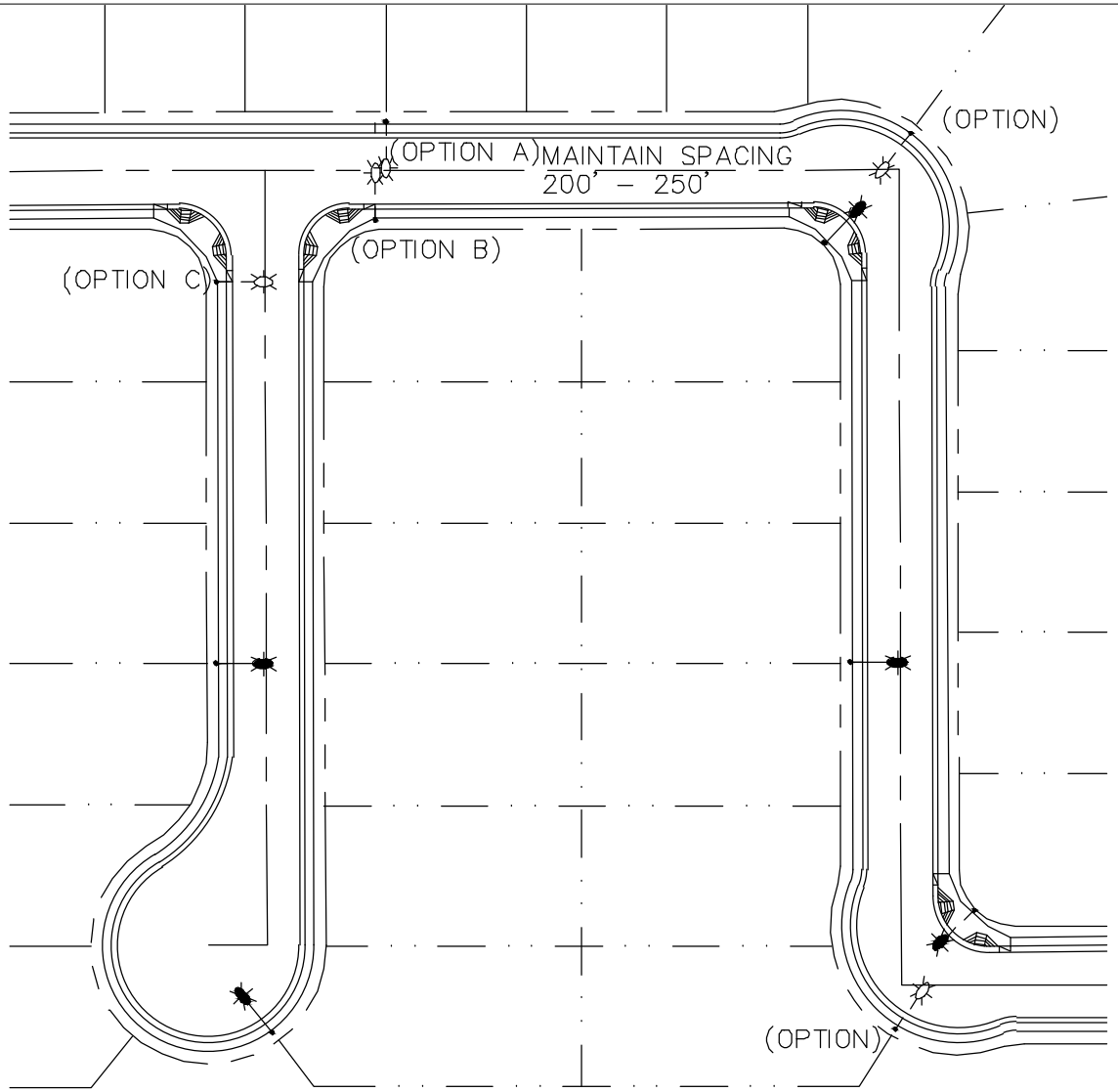
SINGLE SIDE

DETAIL NO. G-3255-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STREET LIGHTING - COLLECTOR STREET SPACING	DETAIL NO. G-3255-3



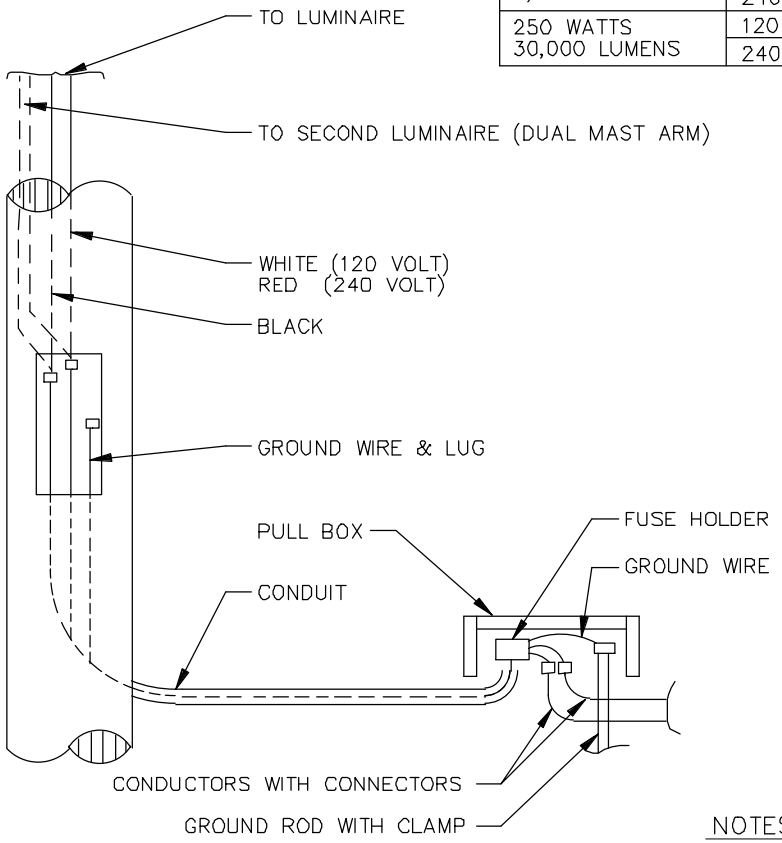


DETAIL NO. G-3255-4	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STREET LIGHTING - LOCAL / LOCAL ROUNDABOUT	DETAIL NO. G-3255-4

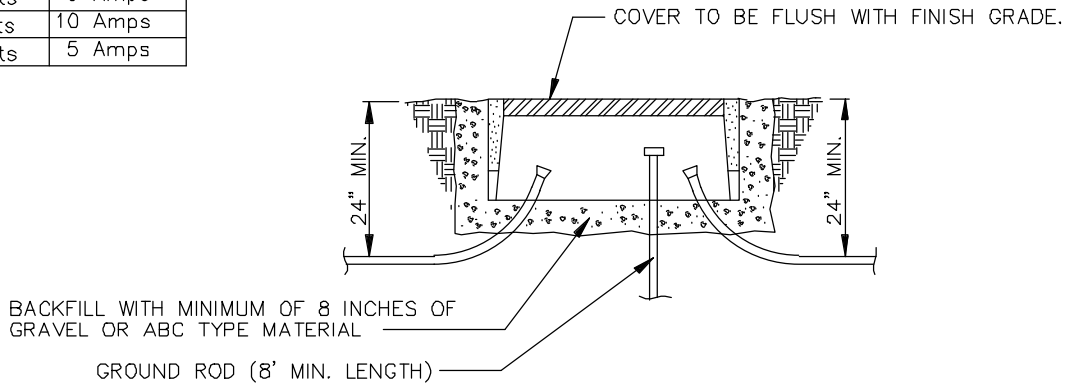


DETAIL NO. G-3255-5	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STREET LIGHTING - ELBOW INTERSECTIONS	DETAIL NO. G-3255-5

LAMP	VOLTAGE	FUSE SIZE
100 WATTS 9,500 LUMENS	120 Volts	8 Amps
	240 Volts	5 Amps
250 WATTS 30,000 LUMENS	120 Volts	10 Amps
	240 Volts	5 Amps



CONNECTION DETAIL



PULL BOX DETAIL

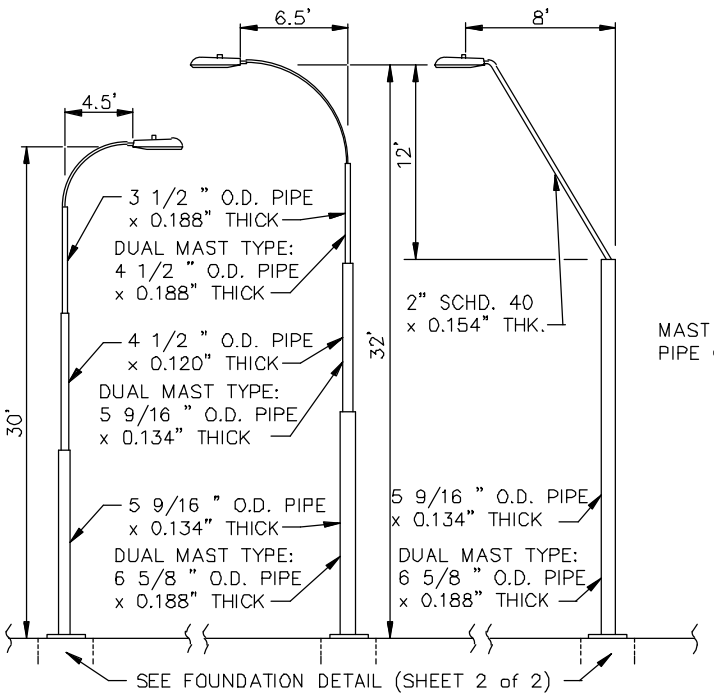


COVER DETAIL

NOTES:

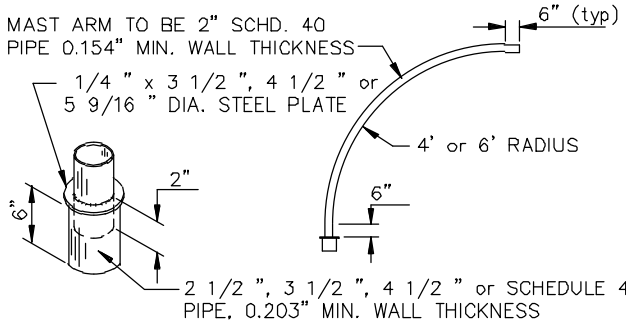
1. ALL PULL BOXES SHALL BE A.D.O.T. TYPE 3-1/2, OR APPROVED EQUAL.
2. ALL PULL BOXES SHALL BE PROVIDED BY ARIZONA PUBLIC SERVICES.

DETAIL NO. G-3263	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:11/07	STREET LIGHT PULL BOX & CONNECTION DETAILS	DETAIL NO. G-3263

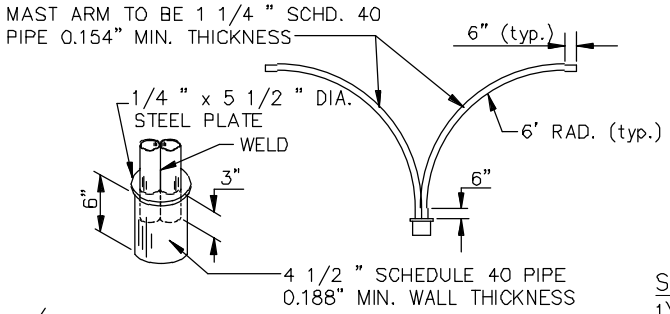


MNTG. HGT.	ARM	5 9/16 " PIPE	4 1/2 " PIPE	3 1/2 " PIPE	POLE HEIGHT
28'	4'-6"	10'-0"	6'-9"	6'-9"	23'-6"
30'	4'-6"	10'-0"	7'-9"	7'-9"	25'-6"
32'	6'-6"	10'-0"	7'-9"	7'-9"	25'-6"

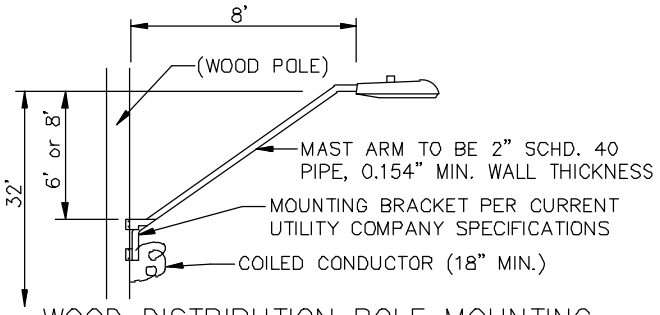
NOTE:
FOR PAINT SPECIFICATIONS SEE
STREET LIGHTING SPECIFICATION



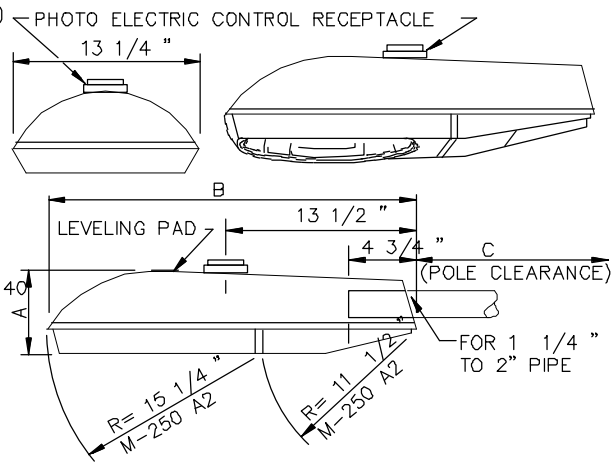
SINGLE MAST ARM



DUAL MAST ARM



WOOD DISTRIBUTION POLE MOUNTING



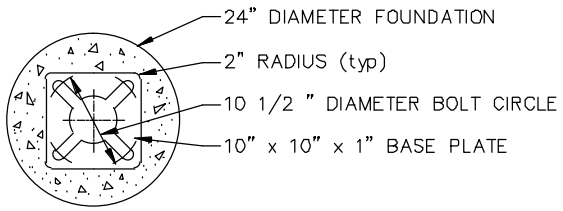
ACCEPTED LUMINAIRE TYPES
(OR APPROVED EQUAL)

LUMINAIRE TYPE	A	B	C
M-250 A2 CUTOFF SERIES	6 1/2"	27 1/2"	12"
M-250 R2 CUTOFF SERIES	5 3/4"	26 1/4"	16"

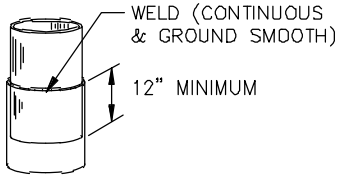
SPECIFICATION FEATURES:

1) POWER/MODULE BALLAST ASSEMBLY FOR M-256 A2 ONLY.
2) 1 1/2 " TO 2" FOUR- BOLT SLIPFITTER.
3) DIE-CAST ALUMINUM HOUSING WITH ELECTROCOAT GRAY PAINT FINISH.
4) ADJUSTABLE MOGUL BASE SOCKET.
5) ALGLAS FINISH ON REFLECTOR.
6) NO-TOOL PE RECEPTACLE.
7) PLUG-IN STARTING AID.
8) TRUE 90 DEGREE CUTOFF.
9) EXTERNAL STAINLESS STEEL BAIL LATCH.

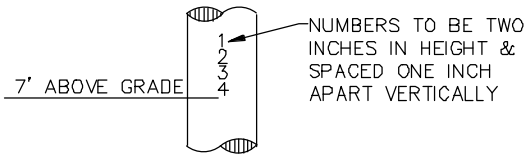
DETAIL NO.				DETAIL NO.
G-3291-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:11/07	STREAMLINE STEEL POLE STREET LIGHT DETAIL	G-3291-1



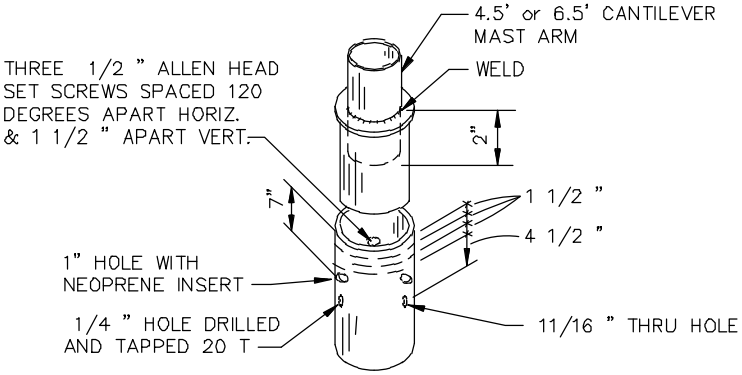
BASE PLATE SECTION



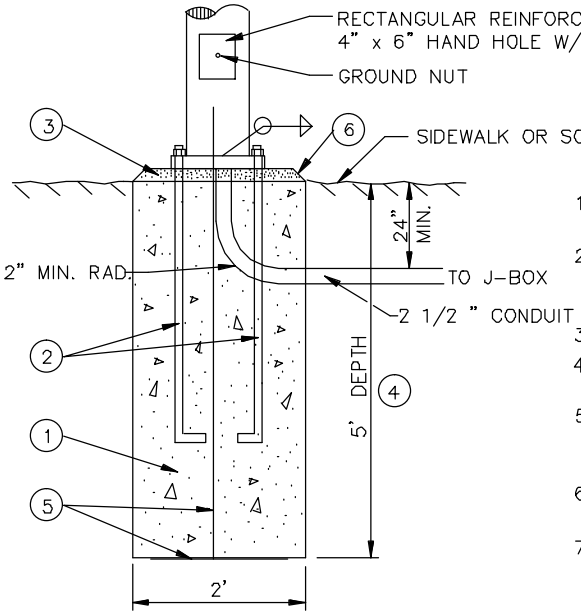
POLE JOINTS



POLE NUMBER LOCATIONS



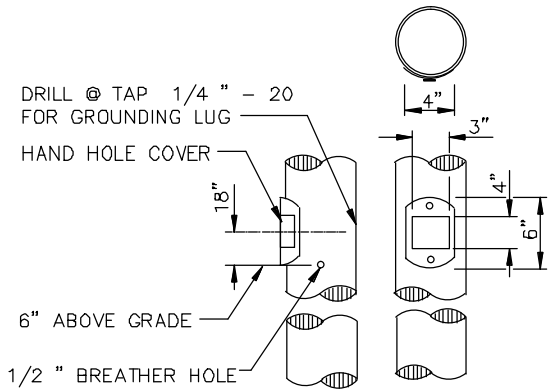
MAST ARM CONNECTION



FOUNDATION SECTION

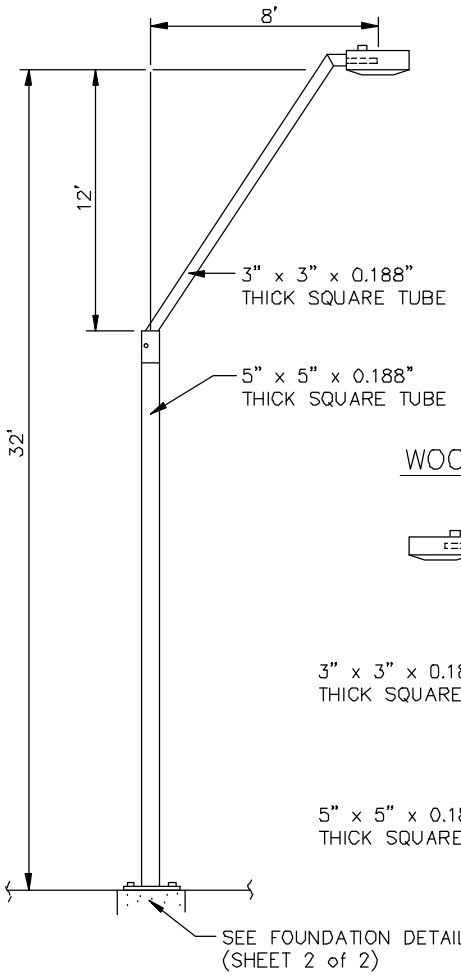
FOUNDATION NOTES

1. 3000 P.S.I. CLASS A CONCRETE PLACED NEXT TO UNDISTURBED EARTH.
2. 4 – 7/8 " x 36" GALVANIZED ANCHOR BOLTS WITH LEVELING NUTS & WASHERS. TACK WELD NUTS TO WASHERS AND WASHERS TO BASE PLATE AFTER TIGHTENING. (2 1/2 " PROJECTION)
3. 1 1/2 " THICK EMBECO GROUT #636 OR APPROVED EQUAL.
4. UNSTABLE SOILS, AND/OR POLE HEIGHTS OVER 40', SHALL REQUIRE SPECIAL ENGINEERING.
5. A 25' COIL OF NO. 4 STRANDED A.W.G. BARE COPPER CONDUCTOR SHALL BE INSTALLED BEFORE THE CONCRETE IS POURED. IT SHALL BE CONNECTED TO POLE GROUNDING SCREW IN THE BASE OF THE POLE.
6. ALL FINISHED POLE FOUNDATIONS SHALL BE CHAMFERED, AND AT SIDEWALK GRADE UNLESS OTHERWISE NOTED.
7. THIS FOUNDATION MAY ALSO BE USED FOR DUAL MAST ARM POLES.

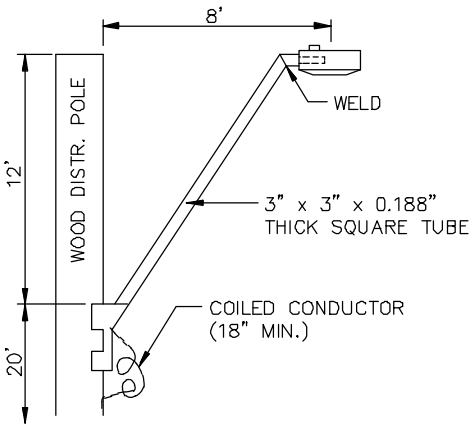


PENETRATIONS

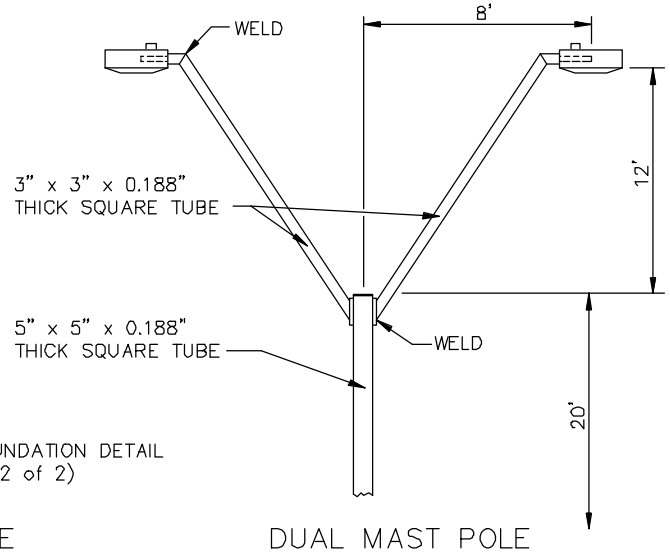
DETAIL NO. G-3291-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:11/07	STREAMLINE STEEL POLE STREET LIGHT DETAIL	DETAIL NO. G-3291-2



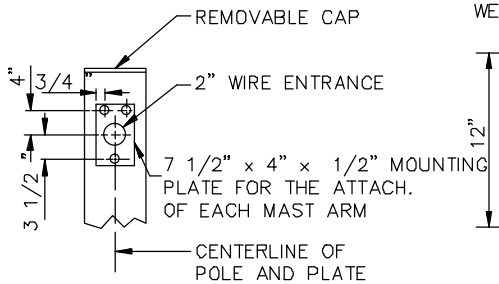
SINGLE MAST POLE



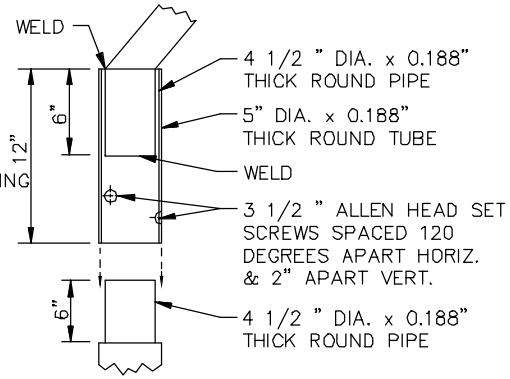
WOOD DISTRIBUTION POLE MOUNTING



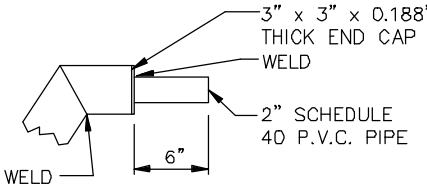
DUAL MAST POLE



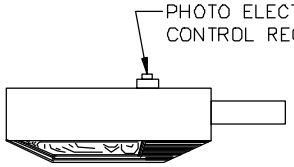
DUAL MAST ARM



SINGLE MAST ARM



LUMINAIRE CONNECTION

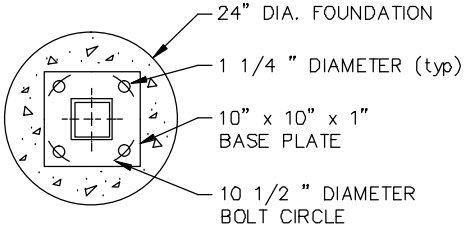


LUMINAIRE TYPE

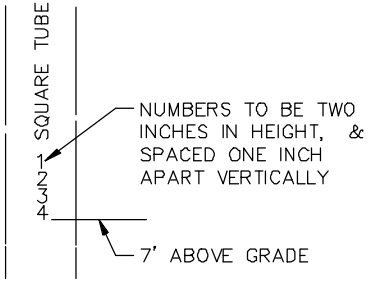
SPECIFICATION FEATURES:

1) HEAVY GAUGE FORMED ALUMINUM HOUSING.
2) SEPARATE SWING DOWN OPTICAL AND BALLAST DOOR ACCESS.
3) ALGLAS FINISH ON REFLECTOR.
4) HEAT AND IMPACT RESISTANT TEMPERED FLAT GLASS LENS.
5) DECORATIVE MOUNTING ARM STANDARD.
6) MOGUI BASE SOCKET.
7) MULTITAP BALLAST–120/208/240/277.

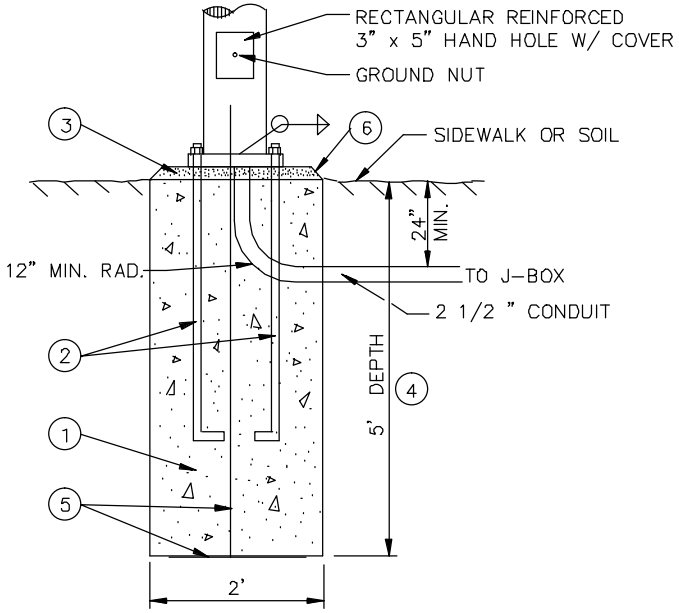
DETAIL NO. G–3292–1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:11/07	ARCHITECTURAL STREET LIGHT DETAIL	DETAIL NO. G–3292–1



BASE PLATE SECTION



POLE NUMBER LOCATIONS



FOUNDATION SECTION

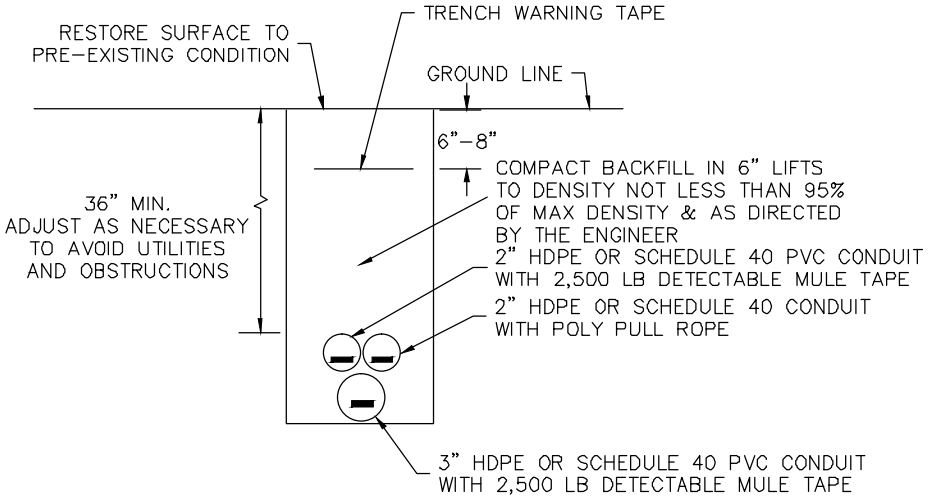
GENERAL NOTES

1. POLES ARE TO BE DESIGNED PER A.A.S.H.T.O. – 80 SPECIFICATIONS.
2. ALL TUBING IS TO BE A.S.T.M. A500 GRADE B (46,000 P.S.I. MIN. YIELD).
3. ACCEPTED POLE MANUFACTURER:
   CEM-TEC CORPORATION OR APPROVED EQUAL.
4. ACCEPTED LUMINAIRE MANUFACTURER:
   AMERICAN ELECTRIC SERIES 153/154 OR G.E. DECASHIELD III,
   OR APPROVED EQUAL.
5. FOR PAINT SPECIFICATIONS SEE STREET LIGHTING
   SPECIFICATION.

FOUNDATION NOTES

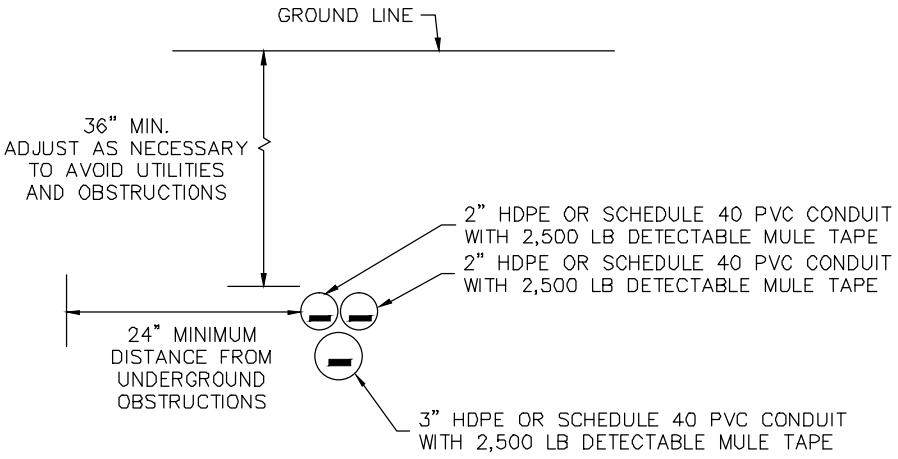
1. 3000 P.S.I. CLASS A CONCRETE PLACED NEXT TO
   UNDISTURBED EARTH.
2. 4 – 7/8 " x 36" GALVANIZED ANCHOR BOLTS WITH LEVELING
   NUTS & WASHERS. TACK WELD NUTS TO WASHERS AND WASHERS
   TO BASE PLATE AFTER TIGHTENING. (2 1/2 " PROJECTION)
3. 1 1/2 " THICK EMBECO GROUT #636 OR APPROVED EQUAL.
4. UNSTABLE SOILS, AND/OR POLE HEIGHTS OVER 40', SHALL
   REQUIRE SPECIAL ENGINEERING.
5. A 25' COIL OF NO. 4 STRANDED A.W.G. BARE COPPER CONDUCTOR SHALL
   BE INSTALLED BEFORE THE CONCRETE IS POURED. IT SHALL BE
   CONNECTED TO POLE GROUNDING SCREW IN THE BASE OF THE POLE.
6. ALL FINISHED POLE FOUNDATIONS SHALL BE CHAMFERED, AND
   AT SIDEWALK GRADE UNLESS OTHERWISE NOTED.
7. THIS FOUNDATION MAY ALSO BE USED FOR DUAL MAST ARM POLES.

DETAIL NO. G-3292-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:11/07	ARCHITECTURAL STREET LIGHT DETAIL	DETAIL NO. G-3292-2



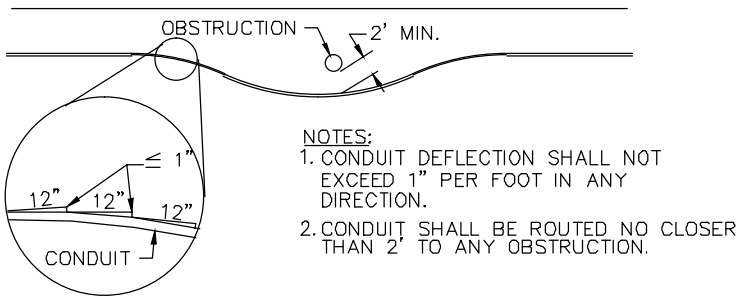
TRENCHED INSTALLATION DETAIL

TRENCHED INSTALLATION ALLOWED
ONLY IF APPROVED BY ENGINEER



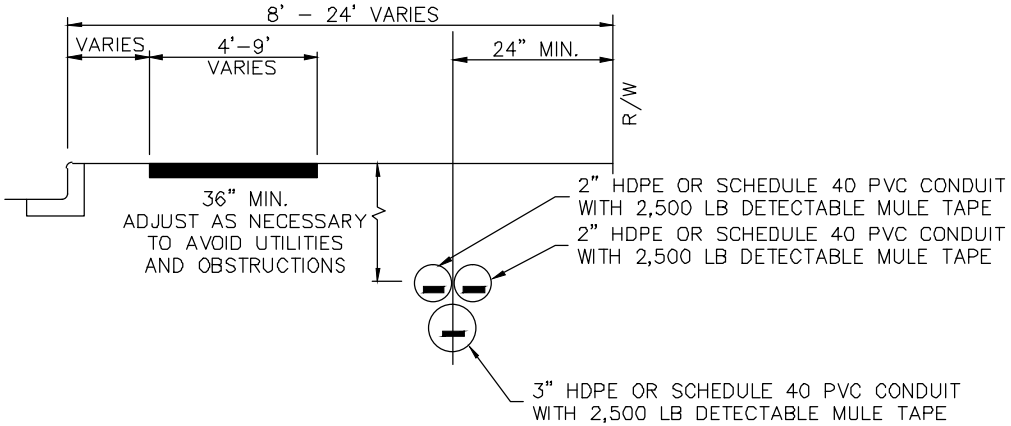
DIRECTIONAL BORE DETAIL

CONDUIT SIZE, QUANTITY AND CONTENTS
PER PLANS AND SPECIFICATIONS



NOTES:
1. CONDUIT DEFLECTION SHALL NOT EXCEED 1" PER FOOT IN ANY DIRECTION.
2. CONDUIT SHALL BE ROUTED NO CLOSER THAN 2' TO ANY OBSTRUCTION.

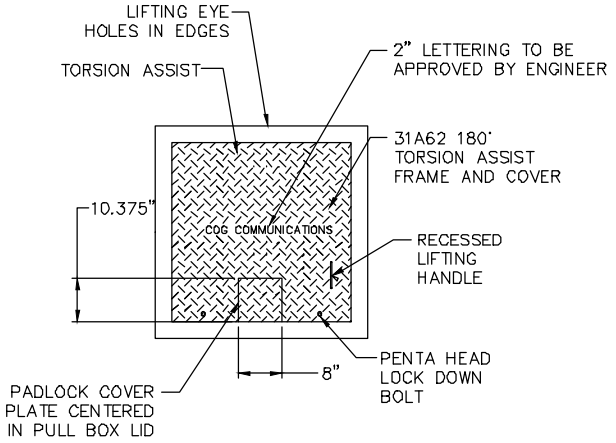
TYPICAL ROUTING OF CONDUIT AROUND AN OBSTRUCTION



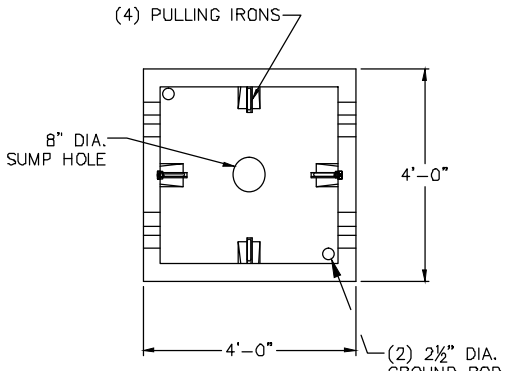
TYPICAL CONDUIT PLACEMENT DETAIL

ALL CONDUIT PLACEMENT SHALL BE SUCH AS TO AVOID
ALL EXISTING UTILITIES AND OBSTRUCTIONS AND
MINIMIZING DAMAGE TO EXISTING LANDSCAPE AND TREES

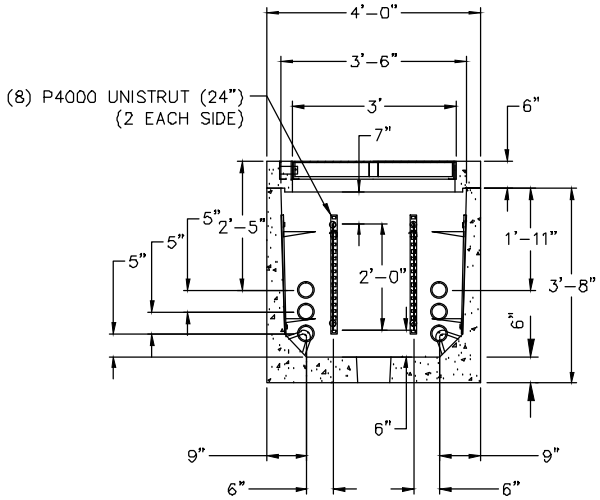
DETAIL NO. G-3293	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	INTERCONNECT CONDUIT TRENCHING DETAIL	DETAIL NO. G-3293



PLAN VIEW WITH COVER



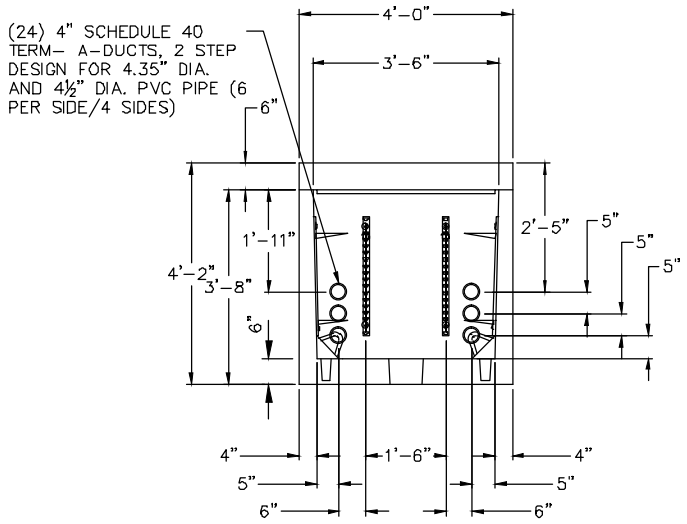
PLAN VIEW



SECTION VIEW

NOTE:

SEE SHEET G-3294-2 FOR GENERAL NOTES, STRUCTURAL NOTES AND RACKING PACKAGE DETAIL.



END VIEW

DETAIL NO. G-3294-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	INTERCONNECT CONDUIT SPLICE BOX DETAIL	DETAIL NO. G-3294-1

RACKING PACKAGE DETAIL

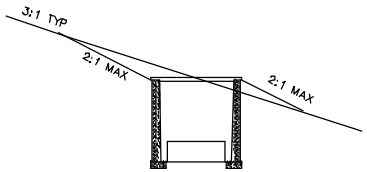
8 – 18 HOLE RACK

16 – ½" SPRING NUTS AND BOLT

16 – 7½" STRAIGHT HOOKS

PLAN SYMBOL

EXISTING NEW



INSTALLATION IN SLOPED AREAS

GENERAL NOTES:

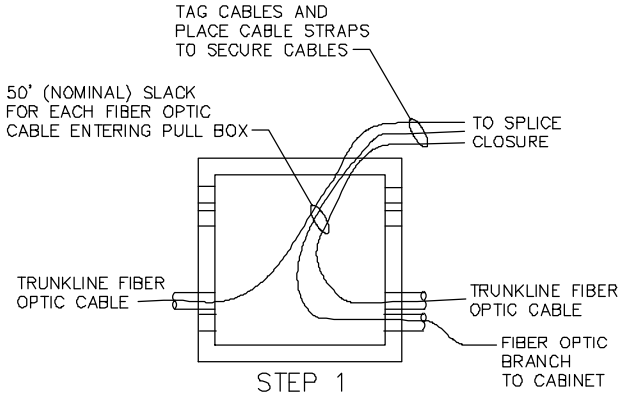
1. BACKFILL WITH DESIGNATED SIZE NO. 57 AGGREGATE BELOW PULL BOX. BACKFILL AROUND SIDES OF PULL BOX WITH SELECT EXCAVATED MATERIAL AND THOROUGHLY COMPACT.
2. CONDUIT FROM THE TYPICAL TRENCH SECTION SHALL NOT DEFLECT BY MORE THAN 1"/12" FROM THE ALIGNMENT PRECEDING OR FOLLOWING THE PULL BOX.
3. TOP OF CONDUITS SHALL BE LOCATED AT 25" BELOW EXISTING GROUND. CONDUITS AT PULL BOXES SHALL DEFLECT NO MORE THAN 1"/12" TO ENTER PULL BOX. CONDUITS SHALL BE FLUSH WITH INSIDE OF PULL BOX.
4. LONGITUDINAL AND LATERAL CONDUITS ENTER AND EXIT SAME WALL. LATERAL CONDUITS AS REQUIRED.
5. ALL NEW PULL BOXES SHALL BE FURNISHED WITH RACKS AND HOOKS INSTALLED.
6. PLUG EACH UNUSED CONDUIT END WITH APPROVED, WATERPROOF DUCT PLUG.
7. "COG COMMUNICATIONS" SHALL BE THE TITLE EMBOSSED ON THE LID.
8. PULL BOX HEIGHT SHALL BE FINISHED GRADE TO MATCH EXISTING GRADE/SLOPE.
9. LID SHALL OPEN 180 DEGREES WITH A TORSION BAR LIFT ASSIST.
10. LID SHALL BE DIAMOND PLATE AND HAVE GALVANIZED FINISH.
11. BOX SHALL BE ORIENTED SO THAT LID OPENS AWAY FROM ANY ROADWAY LANE.
12. COVER HARDWARE SHALL BE CADMIUM PLATED.
13. RECESSED PADLOCK SHALL BE LOCATED IN THE CENTER OF THE OPENING SIDE OF THE COVER.
14. PULLING IRONS SHALL BE LOCATED AS SHOWN IN PLAN VIEW, NO DEVIATIONS ACCEPTED.
15. PULLING IRONS SHALL BE ¾" ø COLD ROLLED GALVANIZED STEEL.
16. WEIGHT COVER = 1075#, VAULT 3250# – 4250#, TOTAL 4325# – 5325#.
17. GROUT OR SEAL SHALL BE USED AROUND CONDUITS PENETRATING THE PULL BOX.
18. ALL JOINTS SHALL BE SEALED USING CONSEAL CS–101 BUTYL RUBBER ROPE.
19. ONE – 5/8" X 8' COPPER–CLAD GROUND ROD(10 MILS MINIMUM) SHALL BE INSTALLED INTO ONE OF THE GROUND ROD KNOCK–OUTS IN THE BOTTOM OF THE PULL BOX.

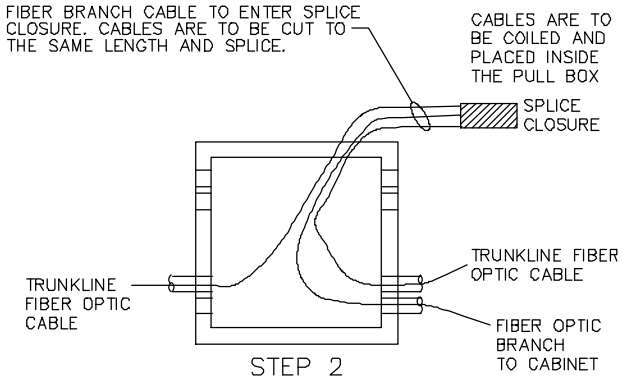
STRUCTURAL NOTES:

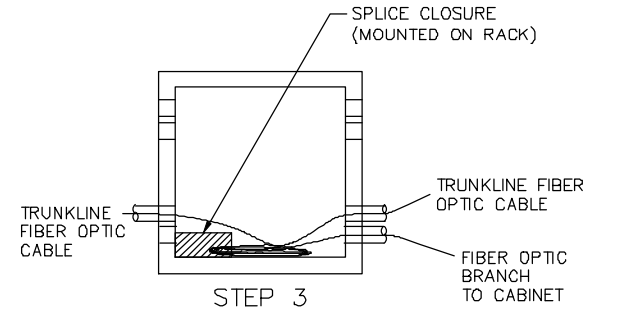
1. CONCRETE: 28 DAY COMPRESSIVE STRENGTH f'c = 4500 PSI
2. REBAR ASTM A–615 GRADE 60
3. MESH: ASTM A–185 GRADE 65
4. DESIGN: ACI–318–99 BUILDING CODE AND ASTM C–857 "MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE LOADING STRUCTURES"
5. LOADS: HS20 WHEEL LOADING IN OFF–STREET LOCATIONS WHERE NOTE SUBJECTED TO HIGH DENSITY TRAFFIC
   80 PSF LATERAL LIVE LOAD SURCHARGE – UP TO 8'–0" DEPTH
   SOIL:
   40 PCF LATERAL SOIL PRESSURE ABOVE WATER TABLE
   80 PCF LATERAL SOIL PRESSURE BELOW WATER TABLE
   120 PCF SOIL DENSITY
6. SOIL COVER: 0' TO 5' (MAX.)
7. WATER TABLE: 5'–0" BELOW GRADE

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	INTERCONNECT CONDUIT SPLICE BOX DETAIL - SHEET 2	DETAIL NO.
G-3294-2				G-3294-2

FIBER OPTIC SPLICE PROCEDURE



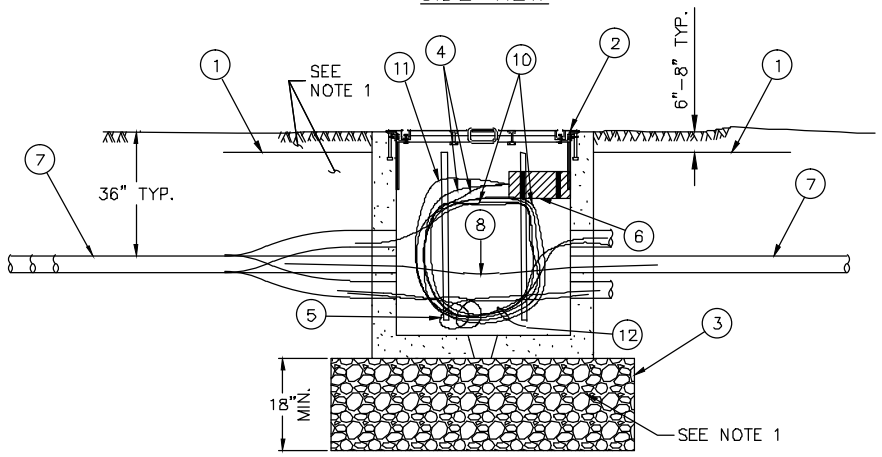




NOTES:

1. LOCATOR WIRES TO BE ATTACHED TO EACH OTHER.
2. PROVIDE 50 FEET OF EACH COILED FIBER OPTIC CABLE PER EACH ENTRY (100 FEET TOTAL) AND 10 FEET OF SLACK ON ANY CONDUCTORS.
3. ALL POWER AND COMMUNICATION CABLES SHALL BE TAGGED WITH CABLE IDENTIFICATION.
4. FIBER SLACK MOUNTED TO RACK OFF OF GROUND.

CONDUIT PLACEMENT AND COILING DETAIL SIDE VIEW

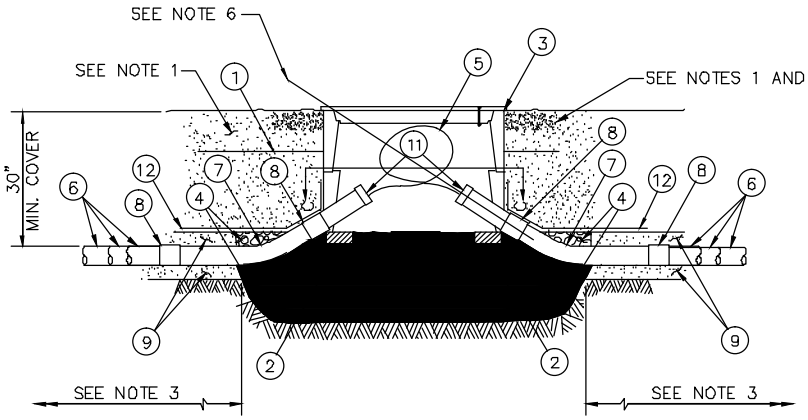


NOTES:

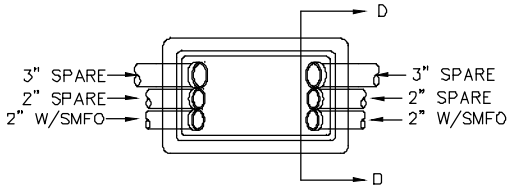
1. BACKFILL WITH DESIGNATED SIZE NO. 57 AGGREGATE BELOW PULL BOX. BACKFILL AROUND SIDES OF PULL BOX WITH SELECT EXCAVATED MATERIAL AND THOROUGHLY COMPACT.
2. NUMBERS IN CIRCLES REFER TO ITEMS IN MATERIAL LIST.

MATERIAL LIST	
ITEM ○	DESCRIPTION
1	WARNING TAPE (AS REQUIRED)
2	NO. 9 PULL BOX
3	CLASS "B" CONC. AGG. DESIGNATED SIZE NO. 57
4	SINGLE MODE FIBER OPTIC CABLE (SMFO)
5	#8 GREEN BOND (AS REQUIRED)
6	FIBER OPTIC SPLICE CLOSURE
7	CONDUIT PER PLANS
8	2500 LB DETECTABLE MULE TAPE
9	RACK & HOOK (EACH WALL TYP)
10	SINGLE MODE FIBER OPTIC BRANCH CABLE (AS REQUIRED)
11	100' NOMINAL SLACK (50' ENTRY/50' EXIT)

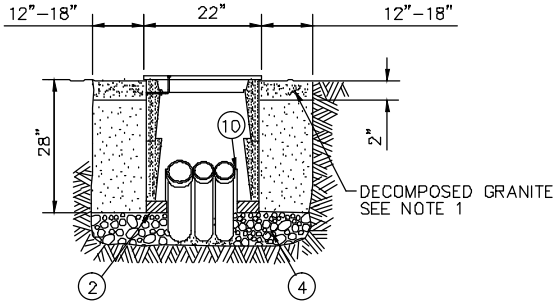
DETAIL NO.				DETAIL NO.
G-3294-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	INTERCONNECT CONDUIT SPICE BOX DETAILS - SHEET 3	G-3294-3



DETAIL D1
INSTALLATION FOR NO. 7 PULL BOX WITH EXTENSION
W/ CONDUITS SWEEPING INTO PULL BOX
N.T.S.



SECTION C–C

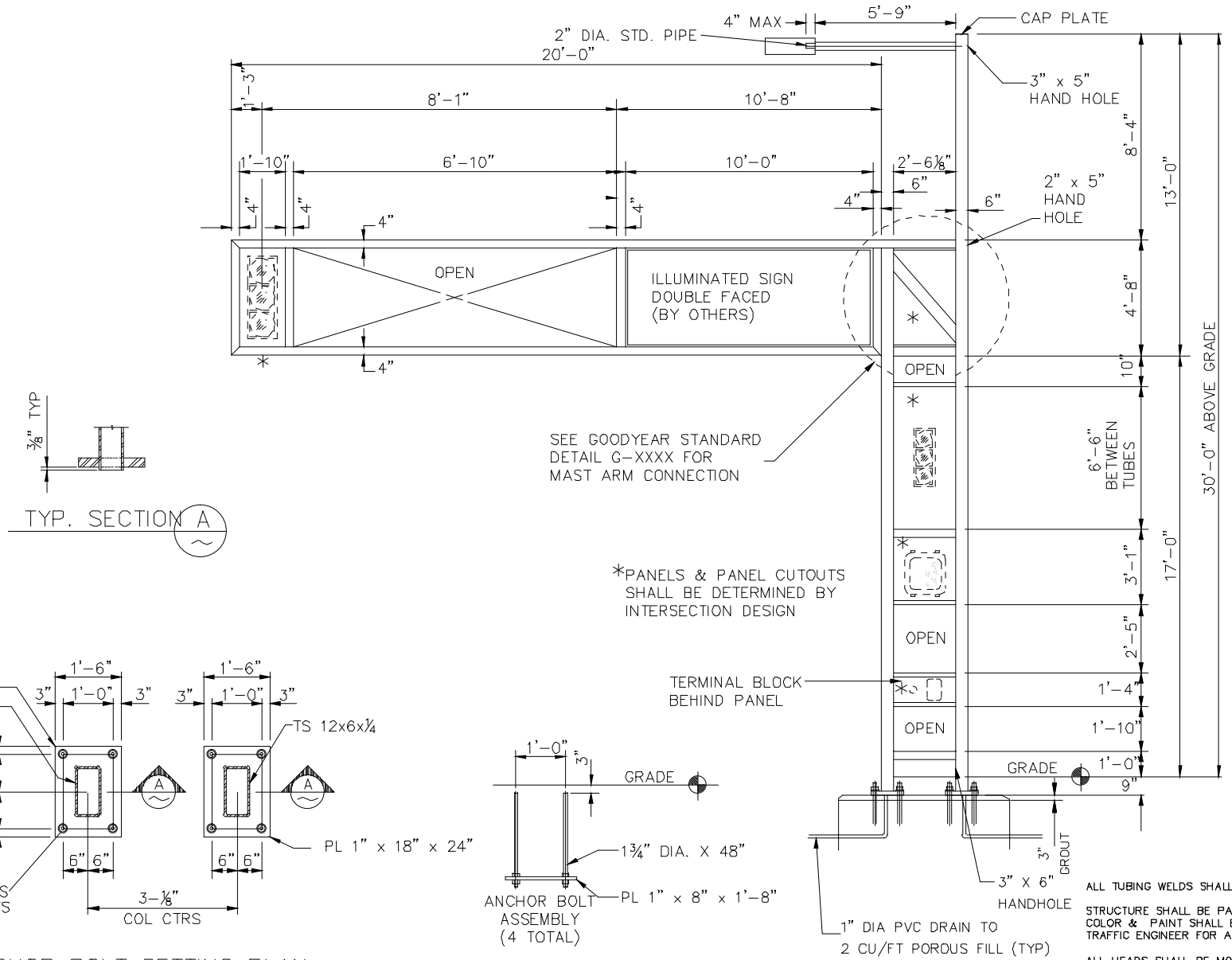


SECTION D–D

MATERIAL LIST	
ITEM	DESCRIPTION
①	WARNING TAPE
②	CONCRETE MASONRY BLOCK 2" X 4" X 8"
③	NO. 7 PULL BOX WITH EXTENSION WITH EXCEPTIONS AS DRAWN
④	CLASS 'B' CONCRETE AGGREGATE DESIGNATED SIZE NO. 57
⑤	SINGLE MODE FIBER OPTIC (SMFO) CABLE
⑥	2–2" AND 1–3" DIA SCH. 40 PVC OR HDPE CONDUITS – SEE NOTE 13
⑦	30 DEGREE SCH. 40 PVC ELBOW, WITH 15" RADIUS
⑧	SCH. 40 PVC–TO–PVC COUPLING
⑨	SELECT EXCAVATED BACKFILL
⑩	KNOCK OUT 6" X 12" –SEE NOTE 12
⑪	BELL END FOR PVC–SEE NOTE 9
⑫	30# FELT PAPER

1. BACKFILL WITH SELECT EXCAVATED MATERIAL AND THOROUGHLY COMPACT TO WITHIN 2" OF ORIGINAL GRADE.
2. THIS PULL BOX IS DESIGNED FOR NON–TRAFFIC AREAS. COMPOSITE COVERS SHALL BE USED.
3. CONDUIT FROM THE TYPICAL TRENCH SECTION SHALL NOT DEFLECT BY MORE THAN 1 IN./FT. FROM THE ALIGNMENT PRECEDING OR FOLLOWING THE PULL BOX.
4. CONDUITS SHALL ENTER PULL BOX AS SHOWN.
5. LATERAL CONDUITS AS REQUIRED.
6. CONDUIT CENTERLINE SHALL BE ALIGNED TO TOP EDGE OF PULL BOX TO FACILITATE CABLE PULLING.
7. ALL COMMUNICATIONS CABLE SHALL BE TAGGED WITH CABLE IDENTIFICATION.
8. "CITY OF GOODYEAR FIBER OPTIC" SHALL BE EMBOSSED ON THE LID.
9. PVC USED TO EXTEND INTO PULL BOX.
10. USE FELT PAPER TO BLOCK OPENING BETWEEN CONDUITS AND PREVENT BACKFILL MATERIAL FROM ENTERING PULL BOX.
11. EXISTING PULL BOX CONFIGURATIONS MAY VARY. LOCATIONS WHERE NO. 7 PULL BOXES ARE BEING REPLACED SHALL BE INSTALLED AS SHOWN ON THIS SHEET UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
12. EXISTING CONDUIT ENTERING A PULL BOX MAY NOT BE CORRECTLY ALIGNED TO FACILITATE PULLING CABLES THROUGH THE PULL BOX BY USE OF A PULLING SHOE. THE FORCE ACCOUNT ITEM FOR CONDUIT RECONDITIONING DOES NOT COVER REALIGNMENT OF CONDUIT.
13. REFER TO CONDUIT AND CABLE SCHEDULE FOR SIZE OF CONDUITS.

DETAIL NO. G-3295	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	POLYMER NUMBER 7 PULL BOX DETAIL	DETAIL NO. G-3295



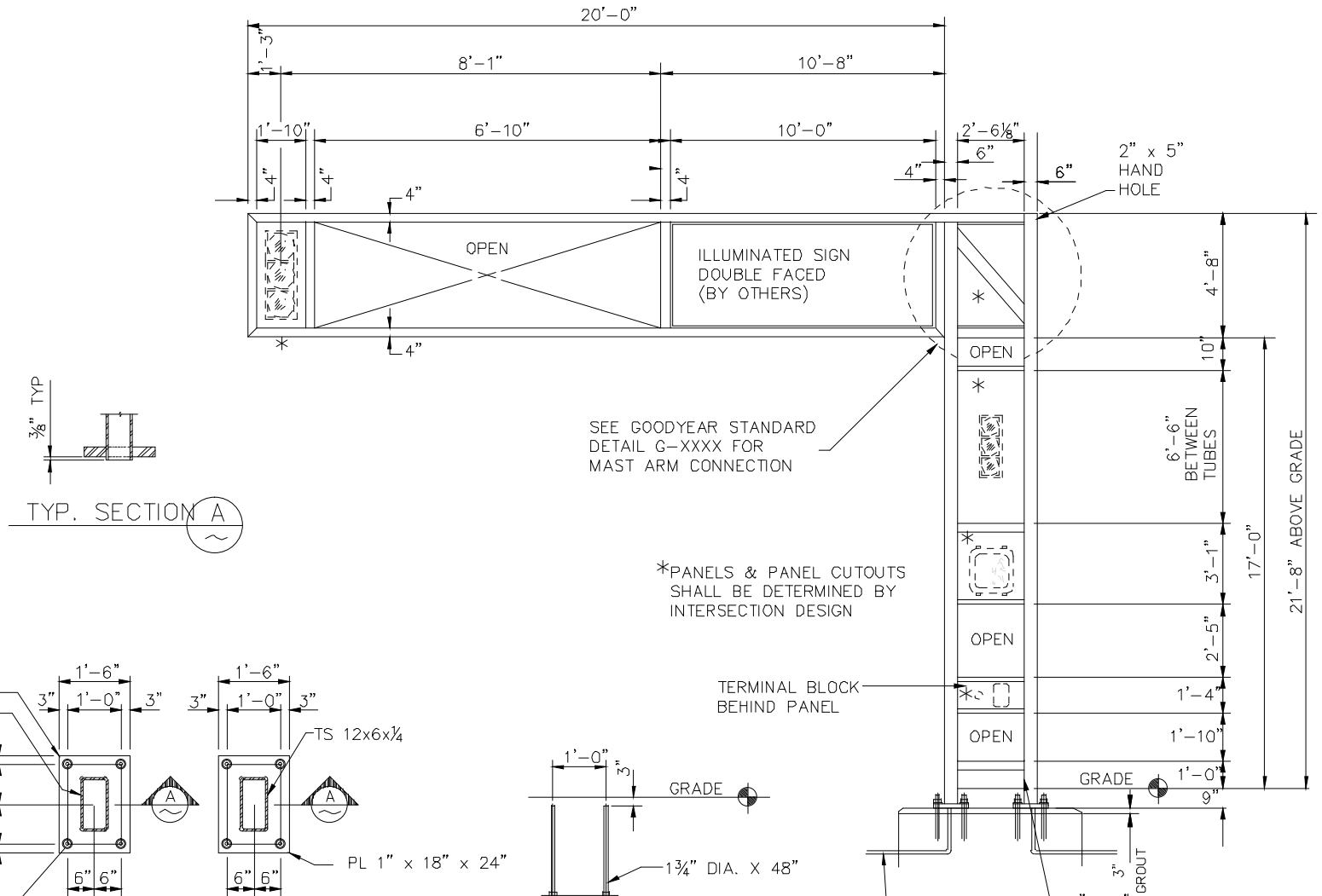
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'F' - 20' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-1



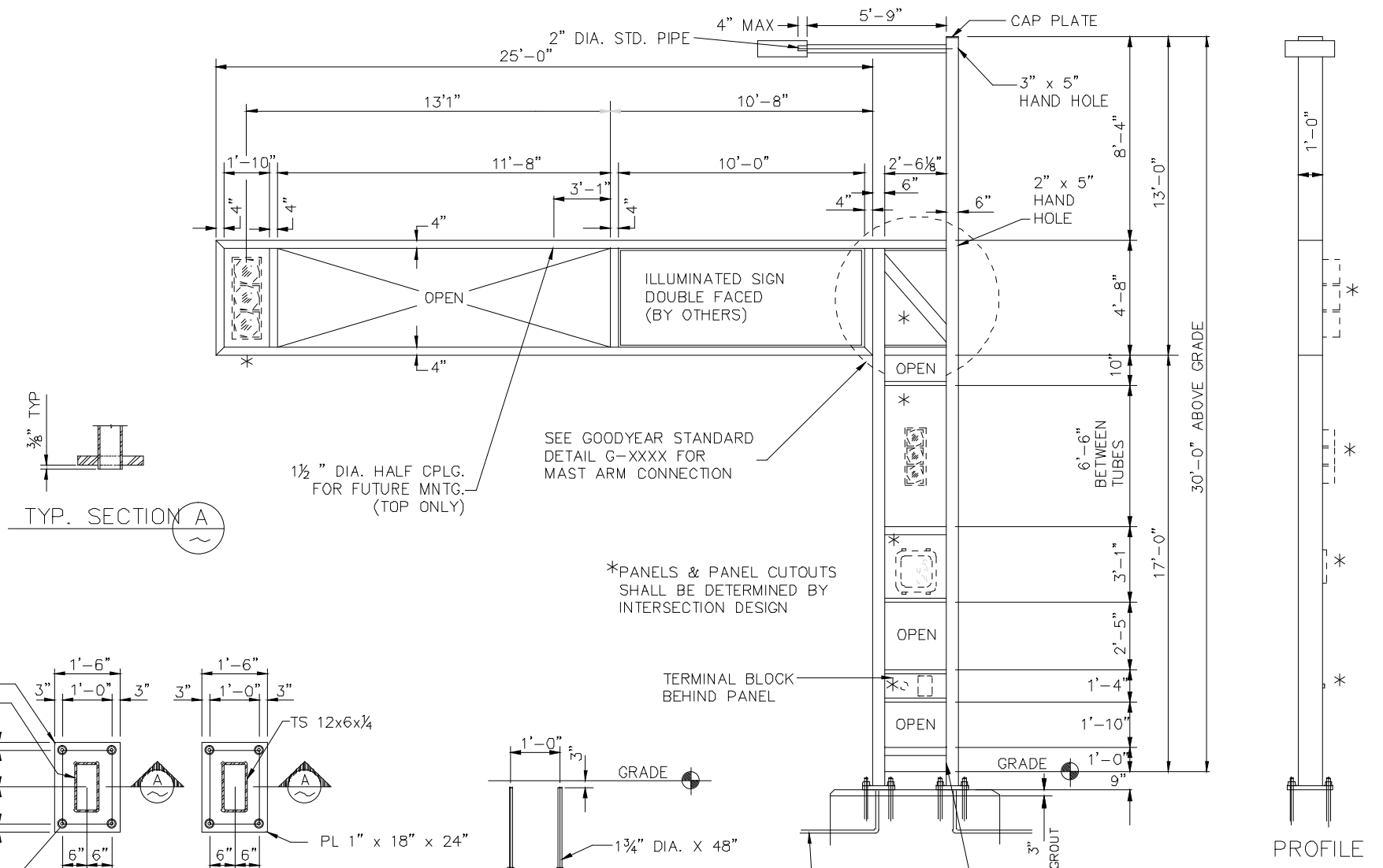
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'E' - 20' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-2



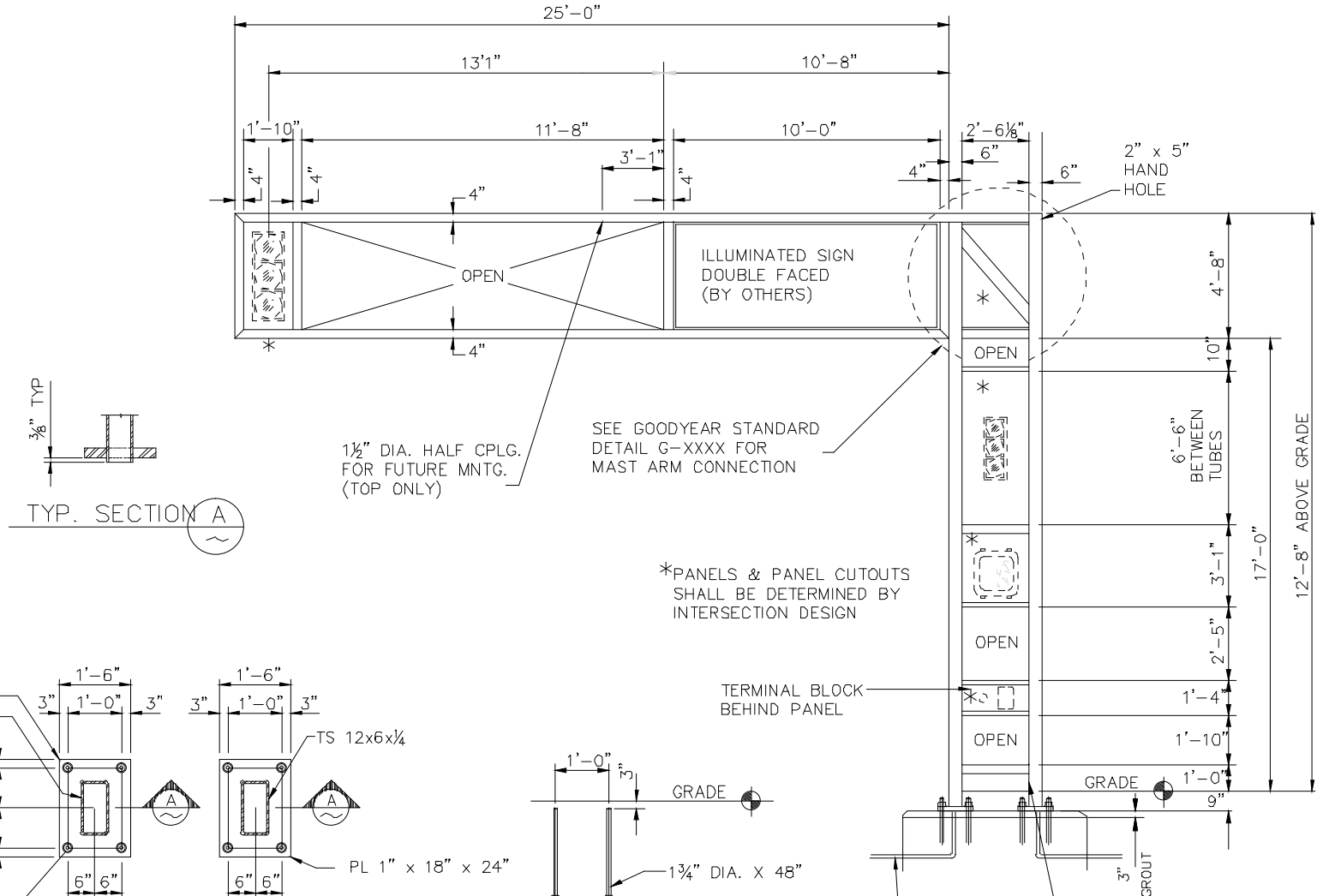
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODUAR POLE 'Q' - 25' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-3



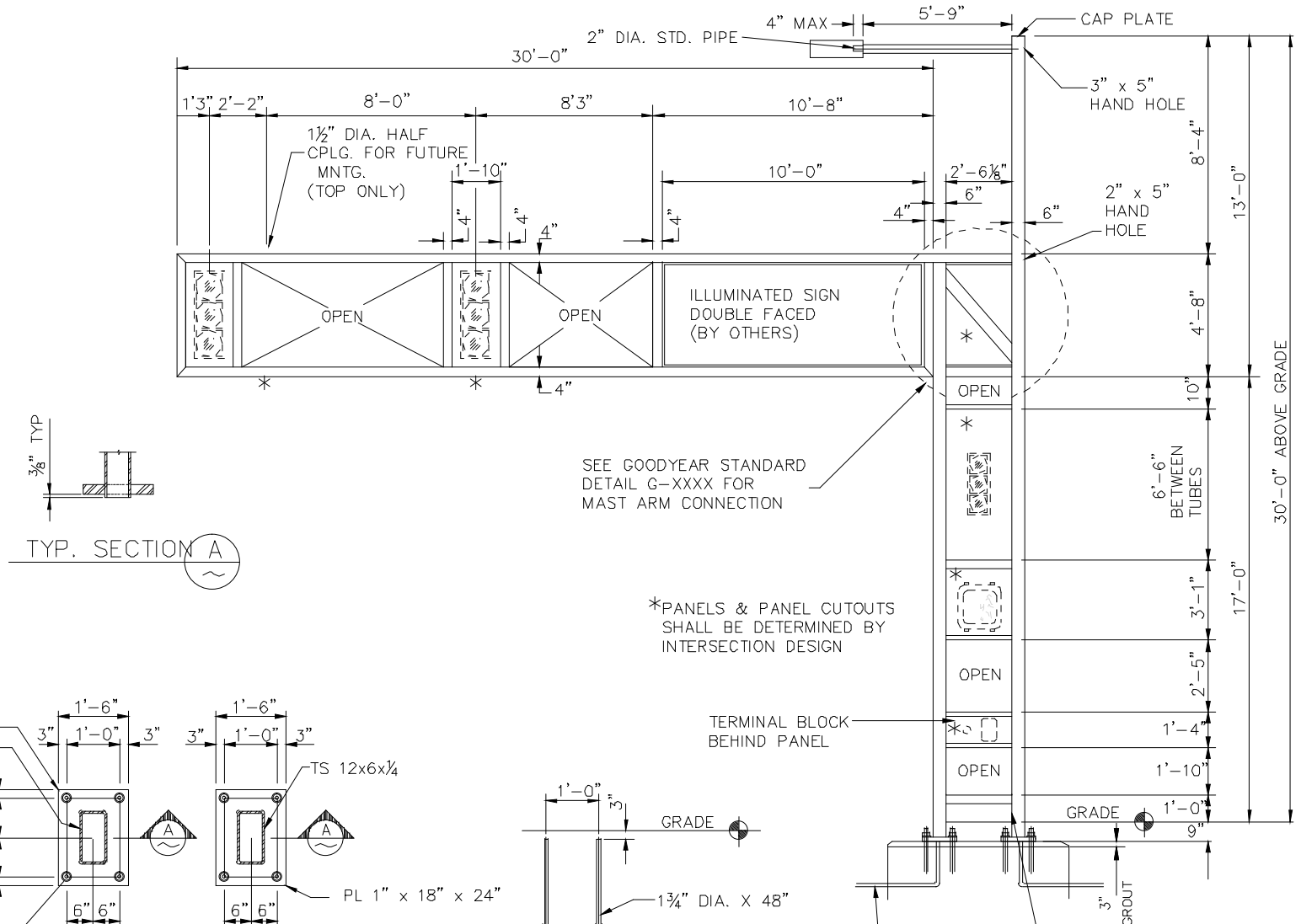
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-4	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'J' - 25' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-4



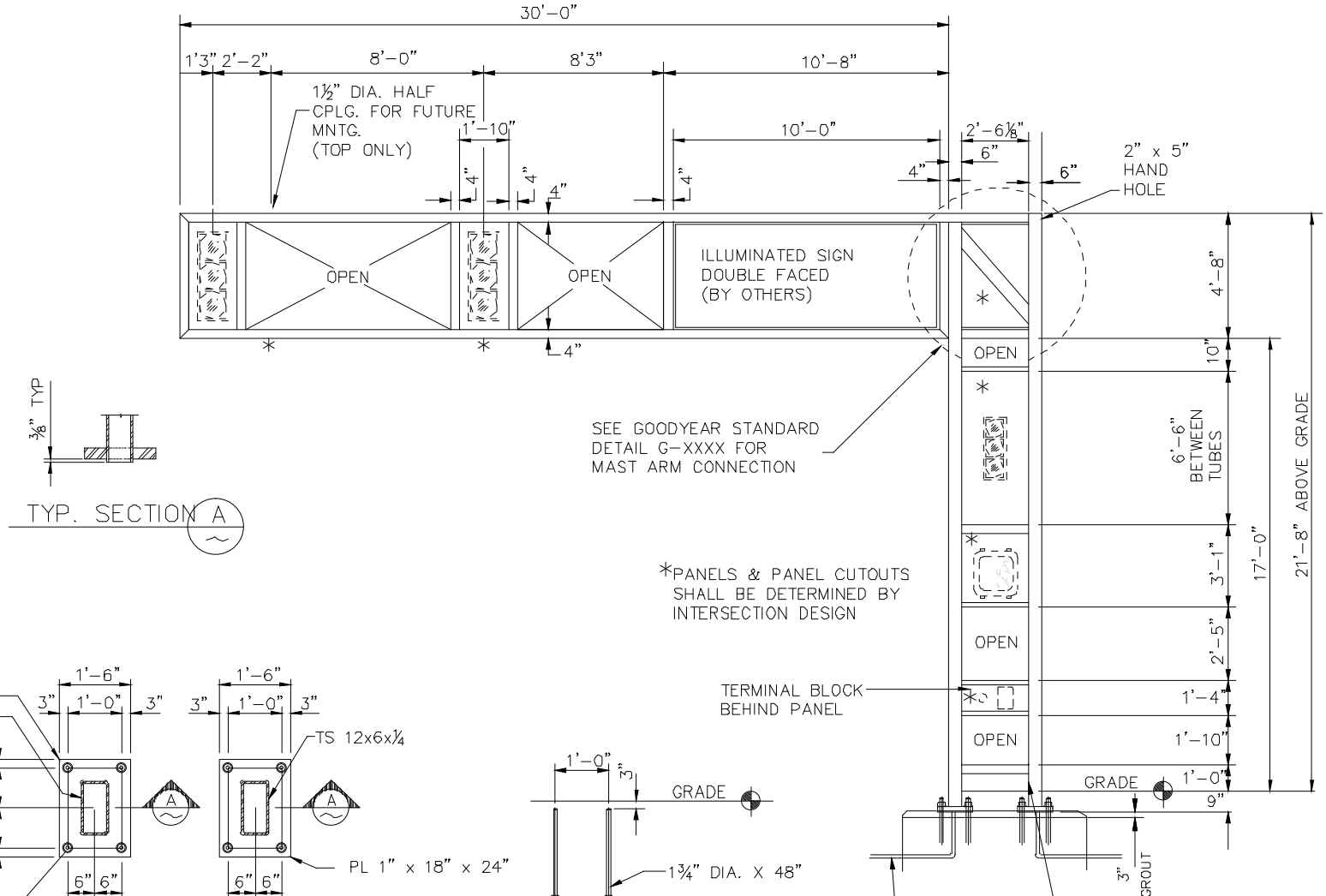
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-5	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'Q' - 30' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-5



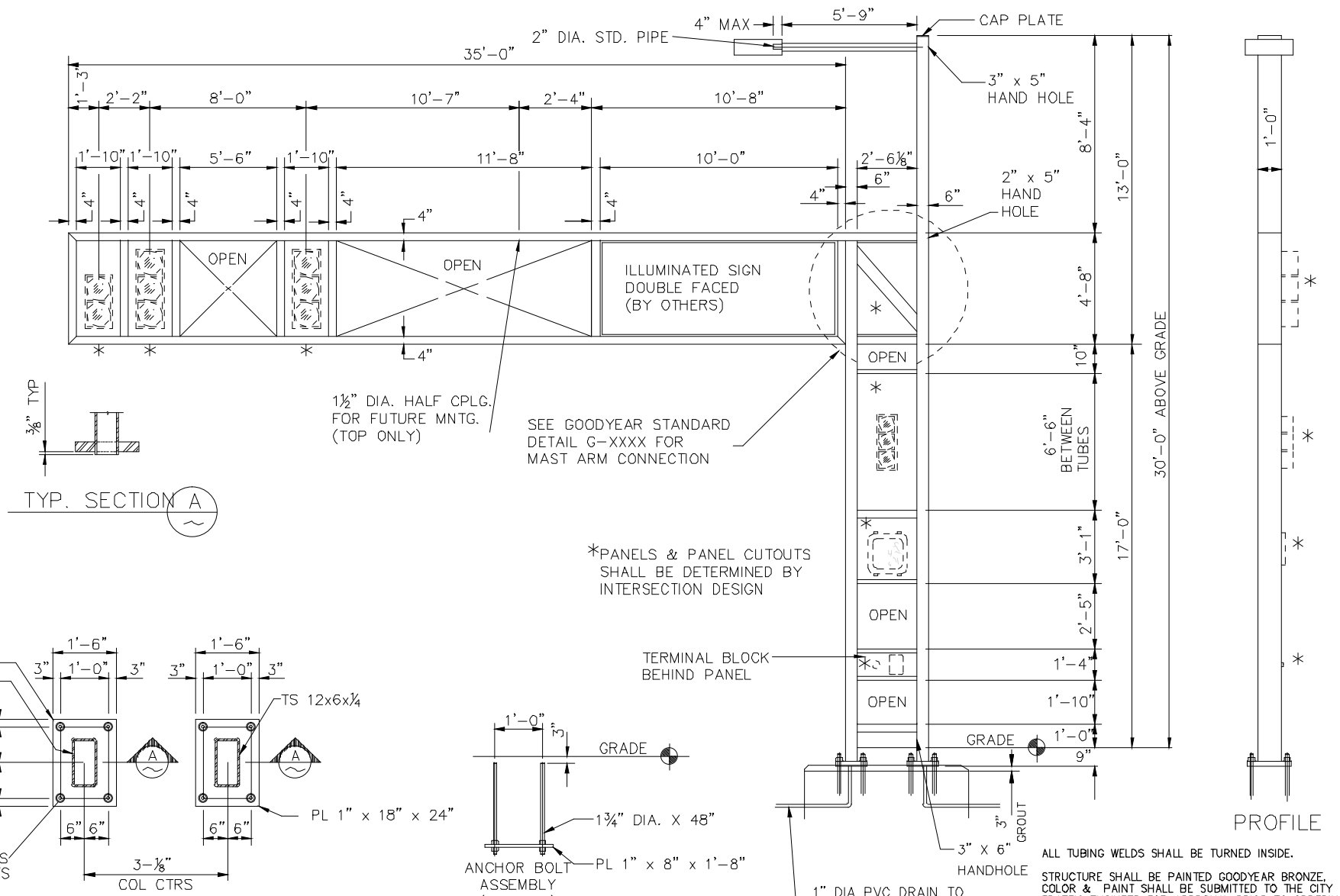
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-6	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'J' - 30' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-6



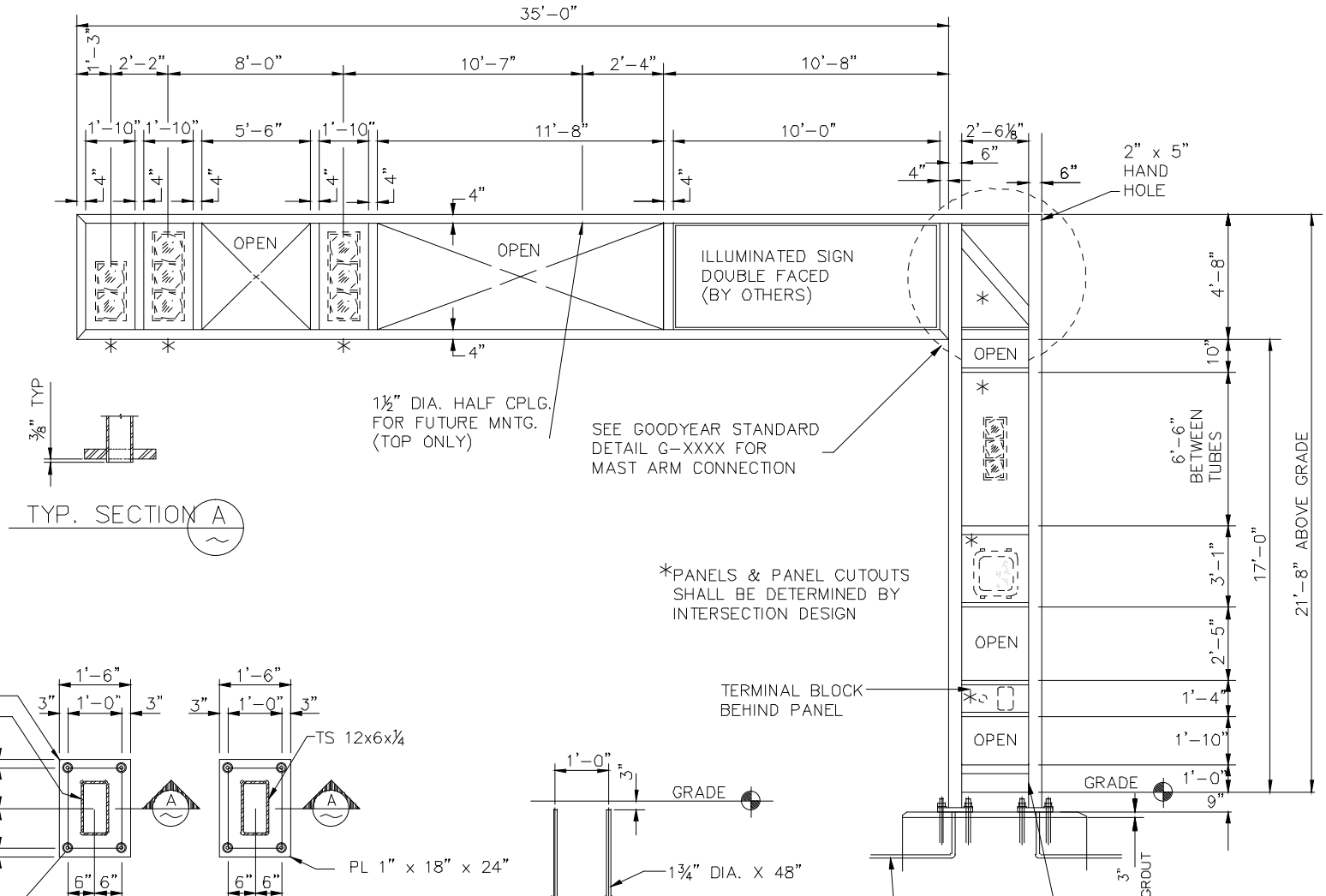
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-7	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'Q' - 35' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-7



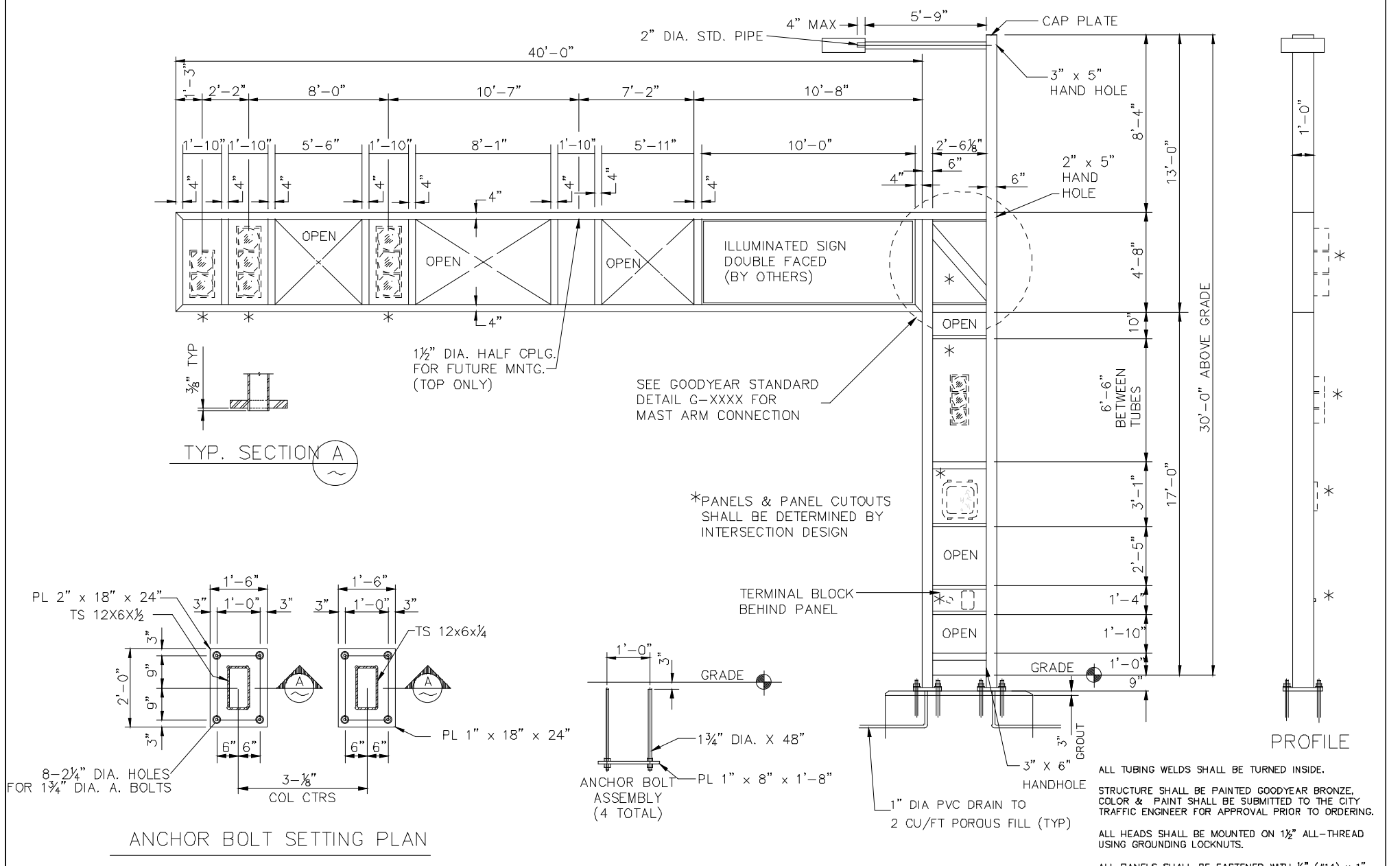
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-8	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'J' - 35' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-8



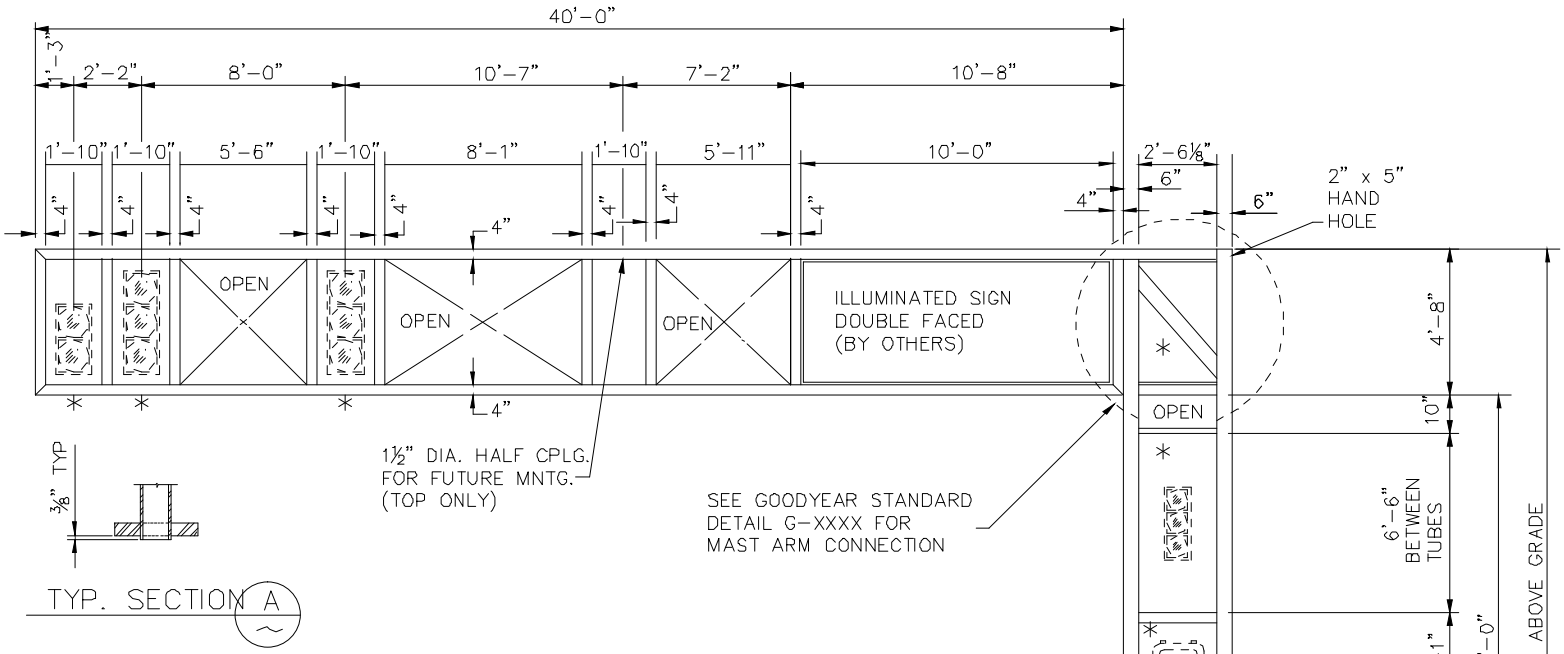
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

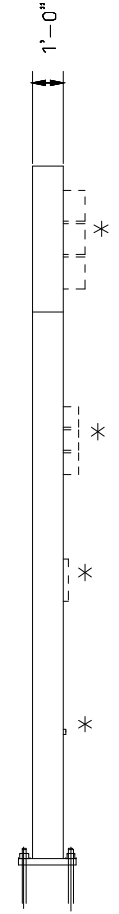
ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

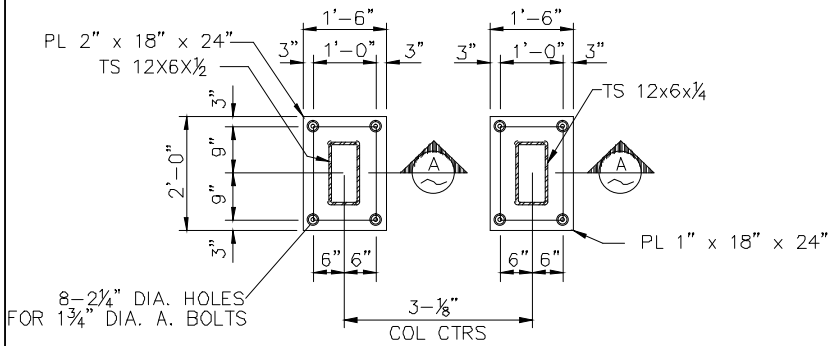
DETAIL NO. G-3296-9	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'Q' - 40' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-9



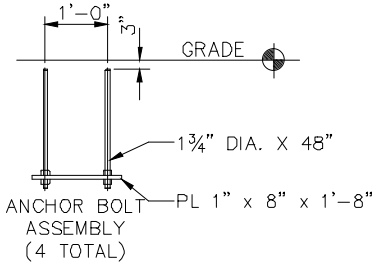
TYP. SECTION A



PROFILE



ANCHOR BOLT SETTING PLAN



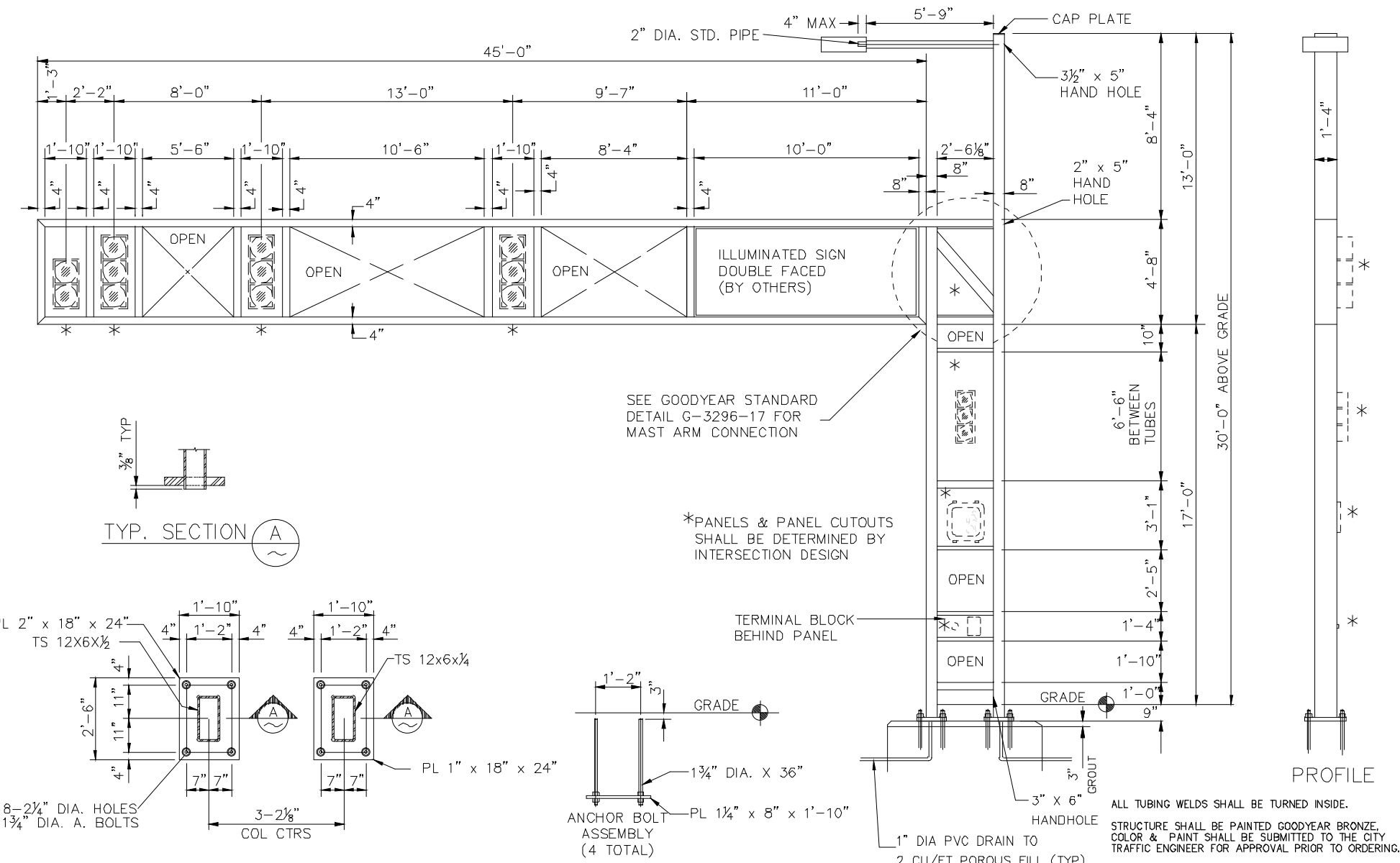
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-10	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'J' - 40' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-10



ANCHOR BOLT SETTING PLAN

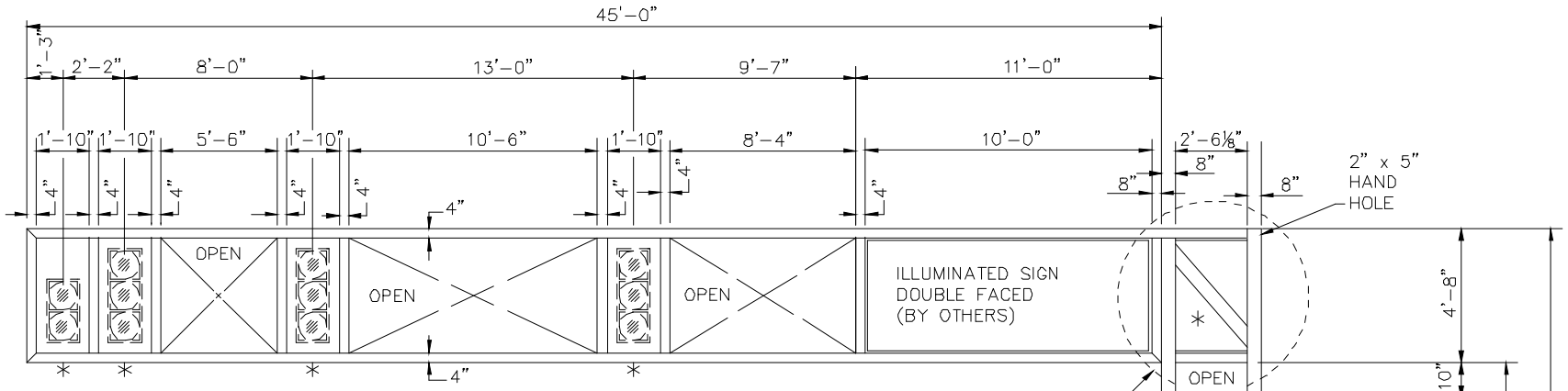
ALL TUBING WELDS SHALL BE TURNED INSIDE.

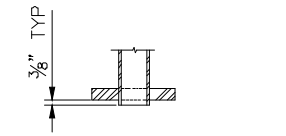
STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

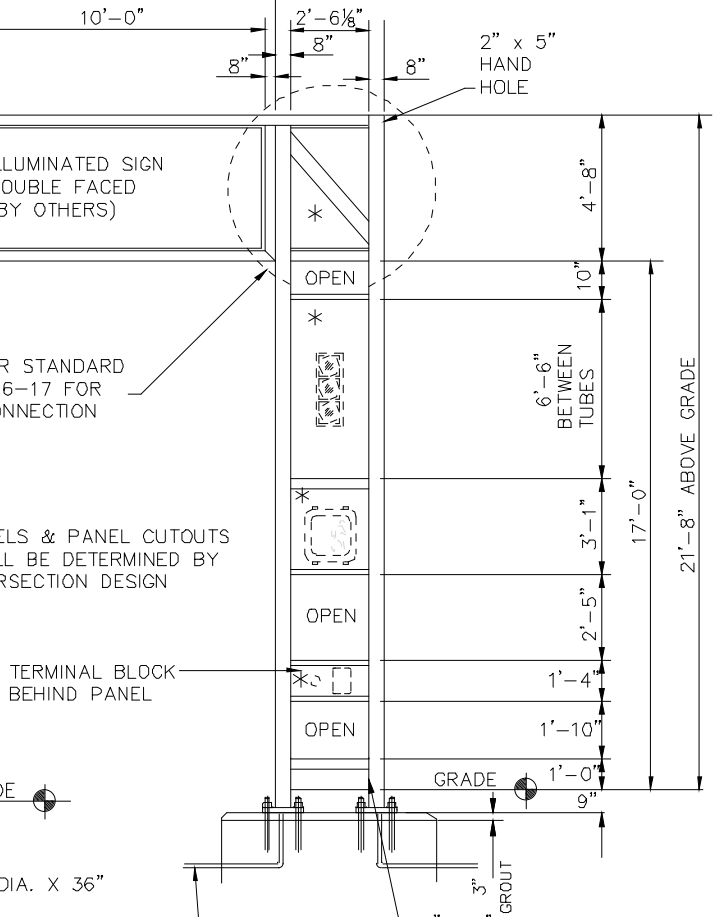
DETAIL NO. G-3296-11	CITY OF GOODYEAR STANDARD DETAIL	APPROVED: 08/17	MODULAR POLE 'Q' - 45' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-11

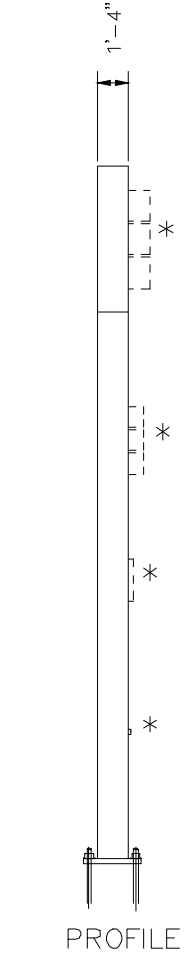




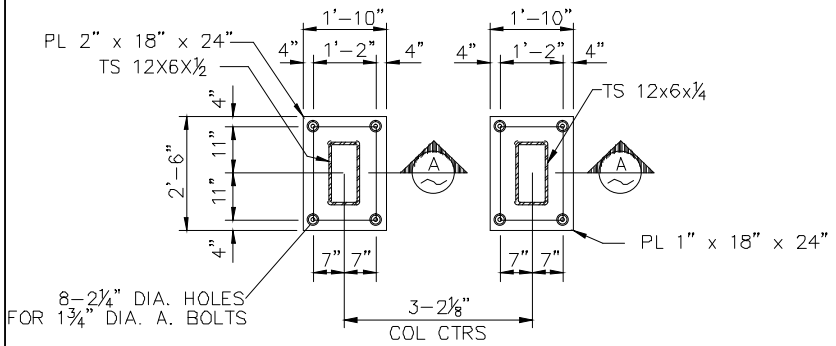
TYP. SECTION (A)

*PANELS & PANEL CUTOUTS SHALL BE DETERMINED BY INTERSECTION DESIGN

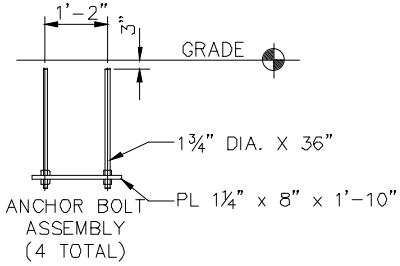




PROFILE



ANCHOR BOLT SETTING PLAN



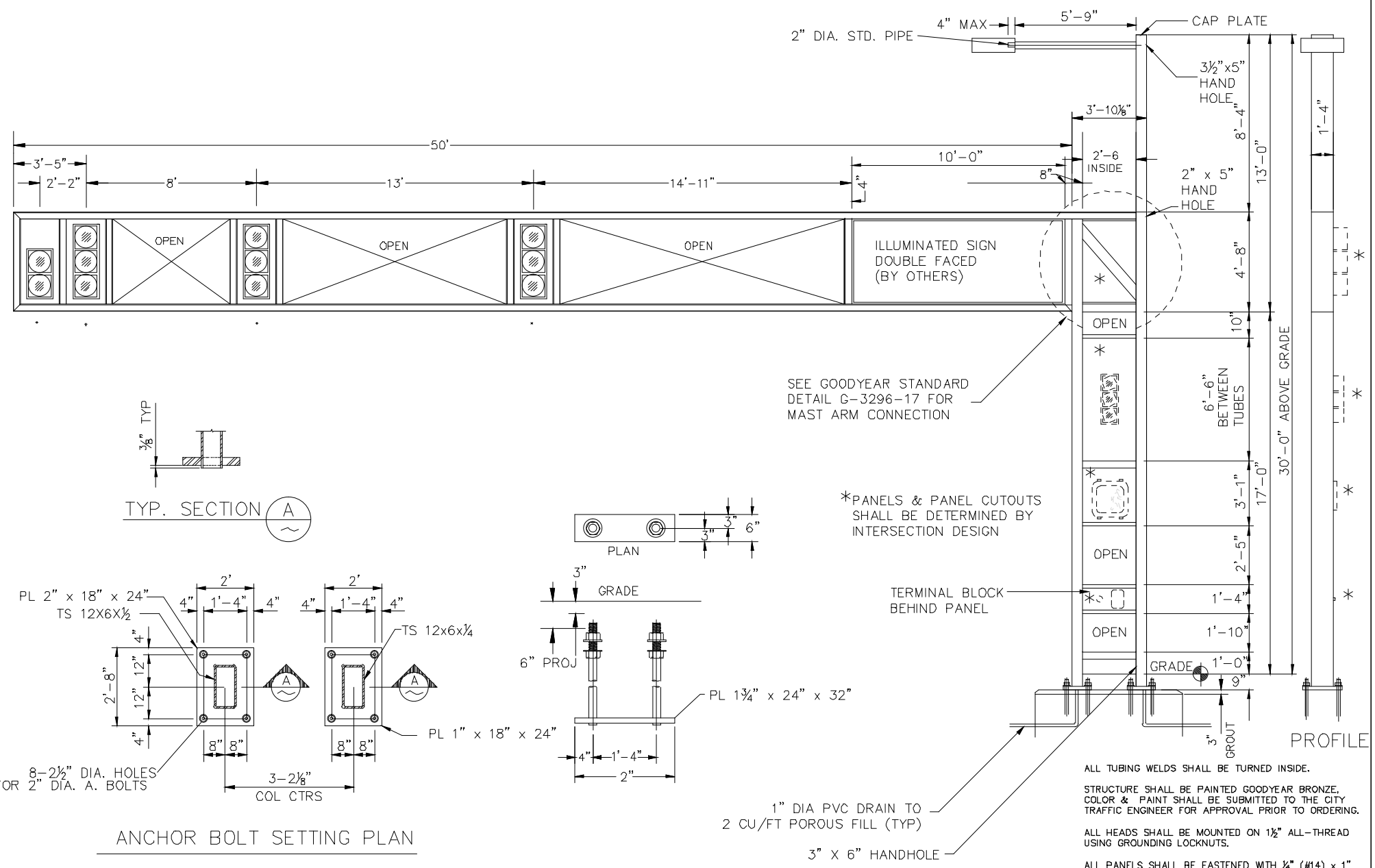
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

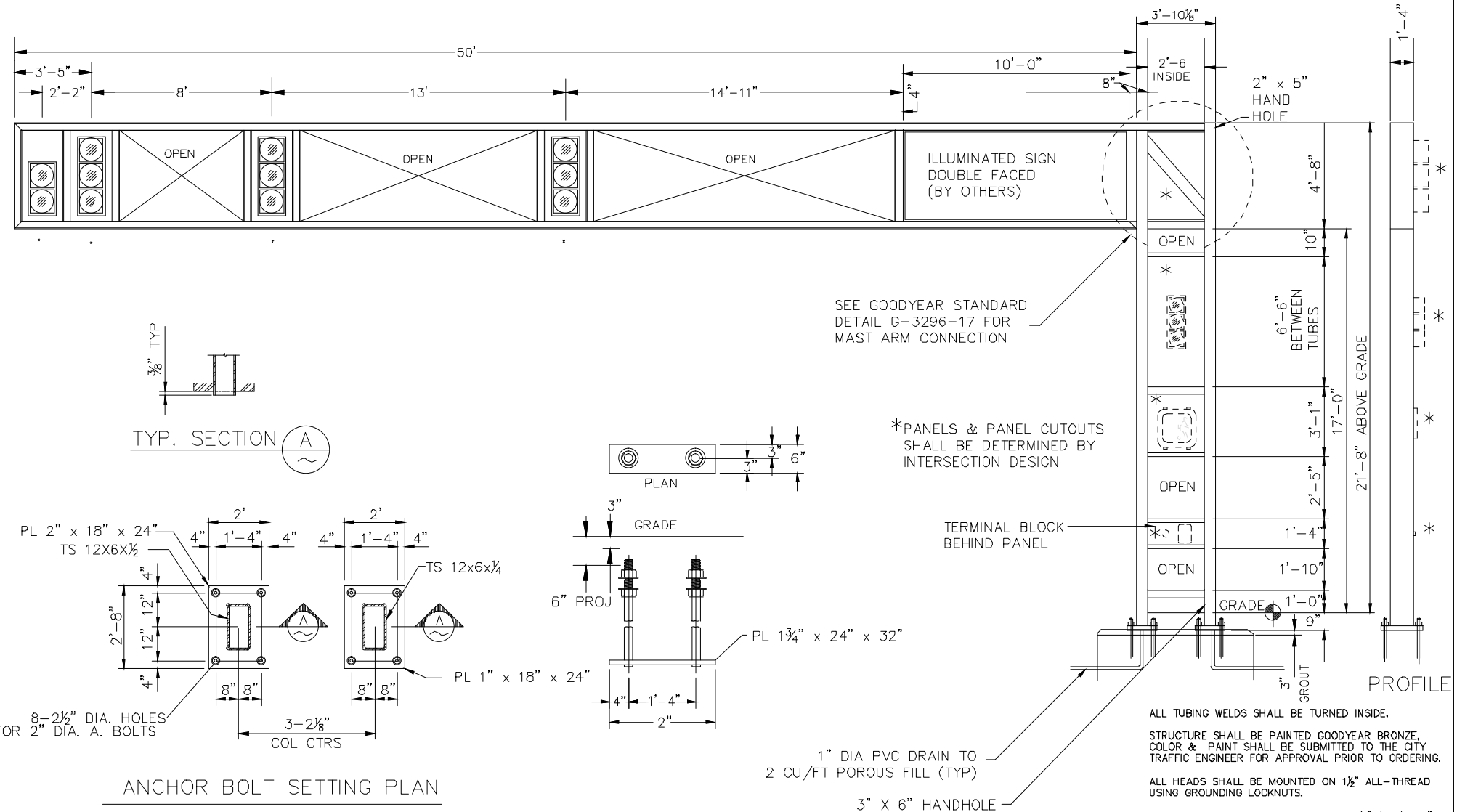
ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-12	CITY OF GOODYEAR STANDARD DETAIL	APPROVED: 08/17	MODULAR POLE 'J' - 45' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-12



ANCHOR BOLT SETTING PLAN

DETAIL NO. G-3296-13	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'Q' - 50' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-13



ANCHOR BOLT SETTING PLAN

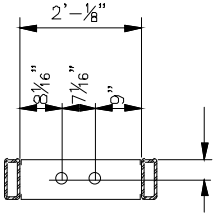
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

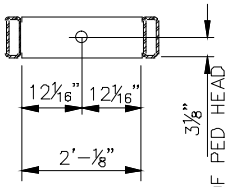
ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

DETAIL NO. G-3296-14	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'J' - 50' MAST ARM	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-14

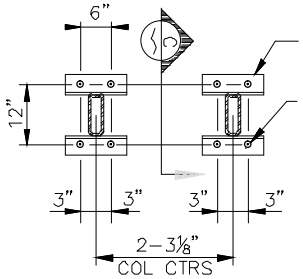


SECTION A

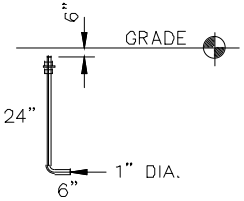


SECTION B

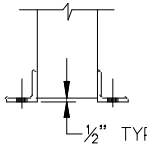
*PANELS & PANEL CUTOUTS SHALL BE DETERMINED BY INTERSECTION DESIGN



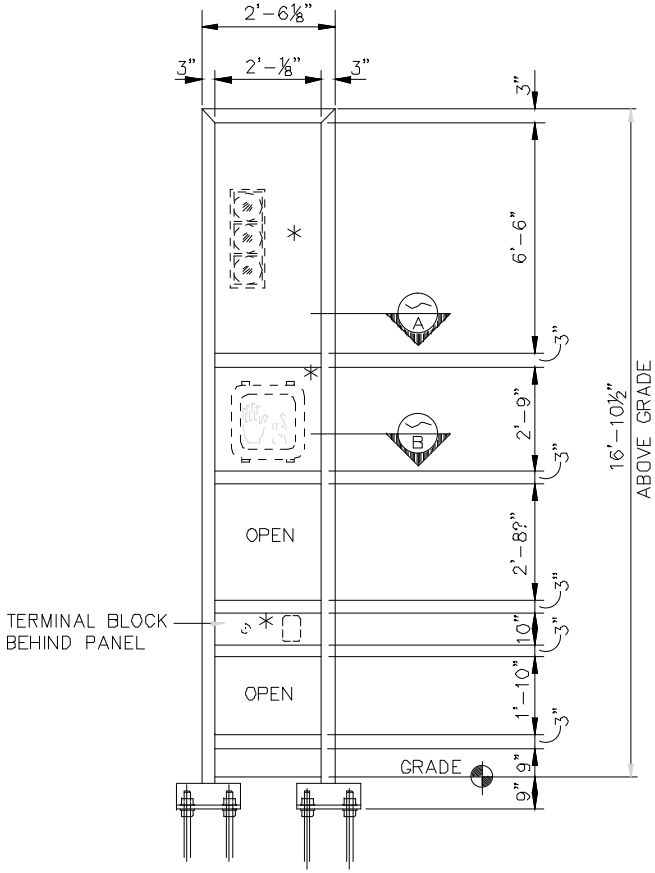
ANCHOR BOLT SETTING PLAN

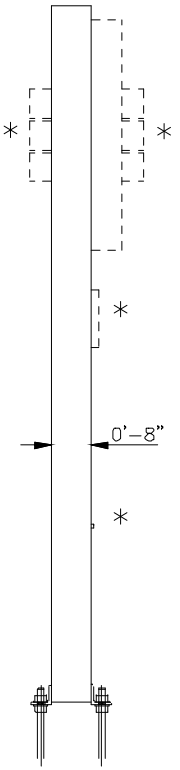


ANCHOR BOLT WITH NUTS & WASHERS (8 TOTAL)



TYP. SECTION C





PROFILE

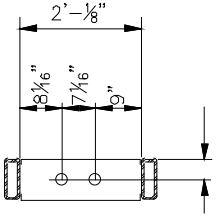
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

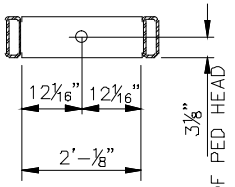
ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

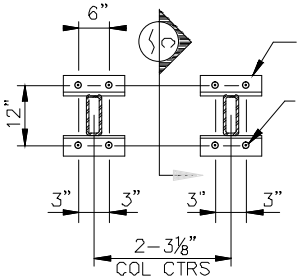
DETAIL NO. G-3296-15	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'A-1'	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-15



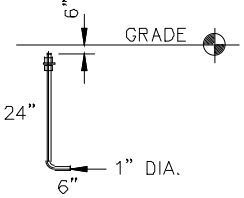
SECTION A



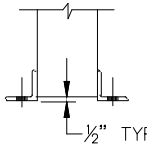
SECTION B



ANCHOR BOLT SETTING PLAN

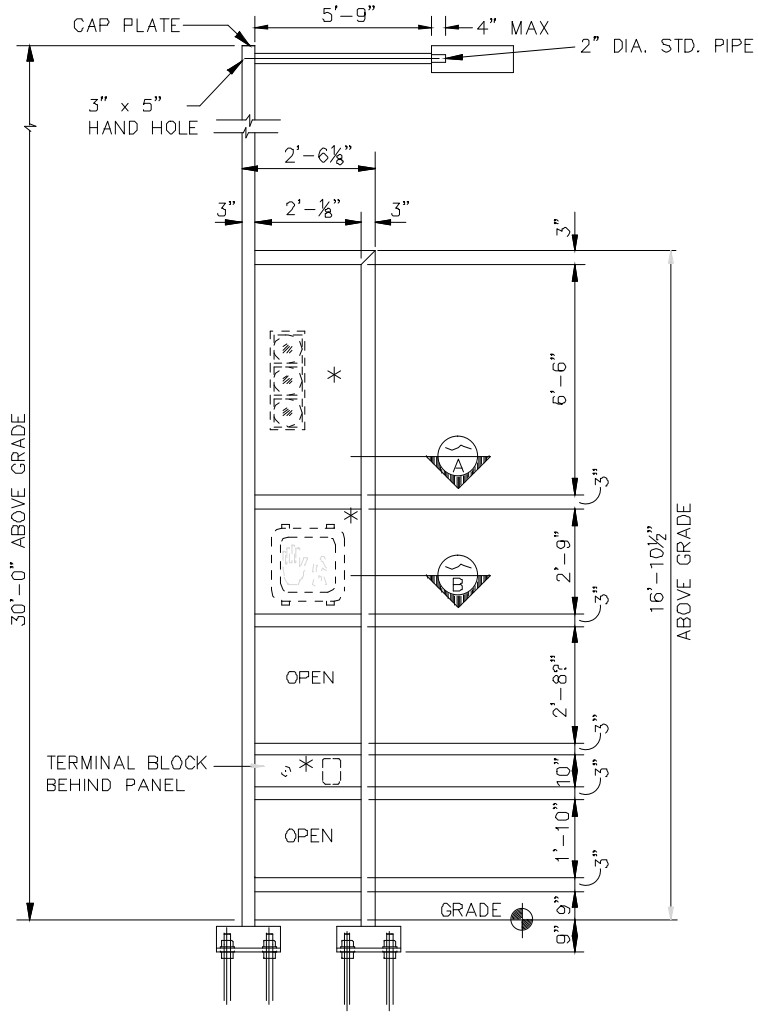


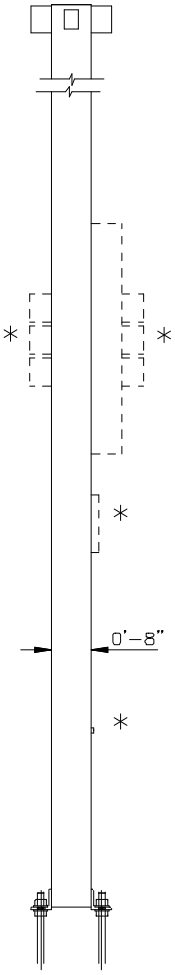
ANCHOR BOLT WITH
NUTS & WASHERS
(8 TOTAL)



TYP. SECTION C

*PANELS & PANEL CUTOUTS SHALL BE DETERMINED BY INTERSECTION DESIGN





PROFILE

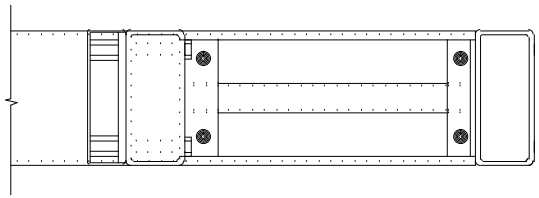
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

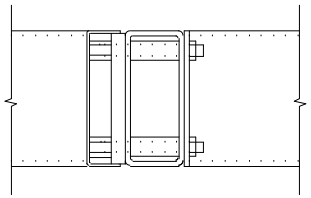
ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

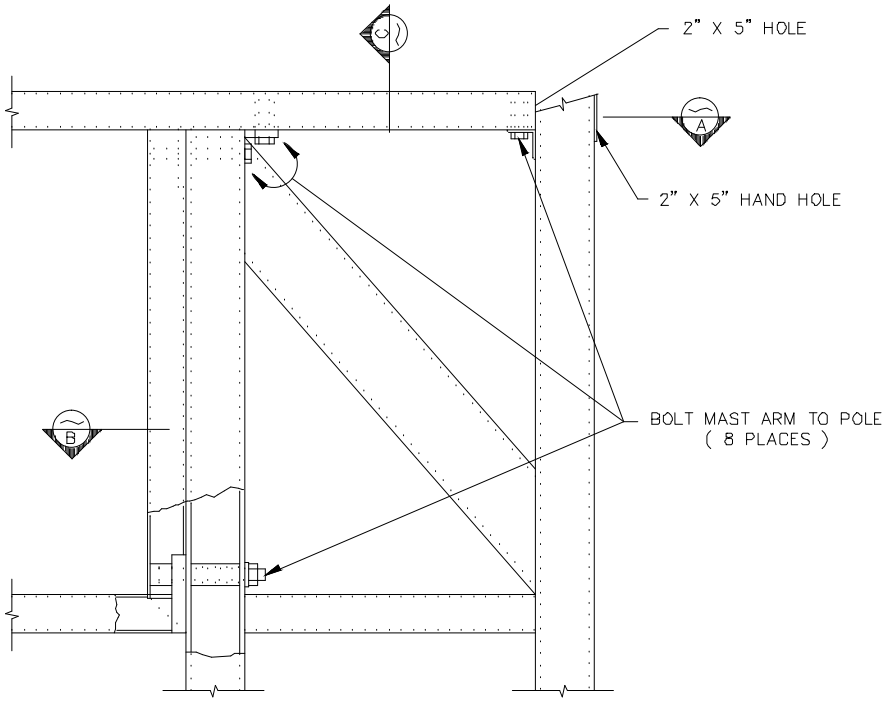
DETAIL NO. G-3296-16	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE 'A-2'	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-16



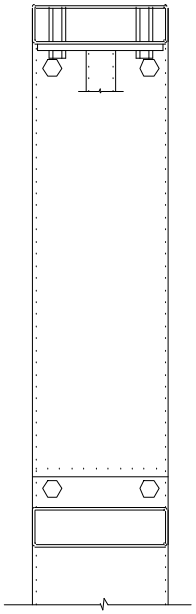
SECTION A



SECTION B



MAST ARM CONNECTION DETAIL

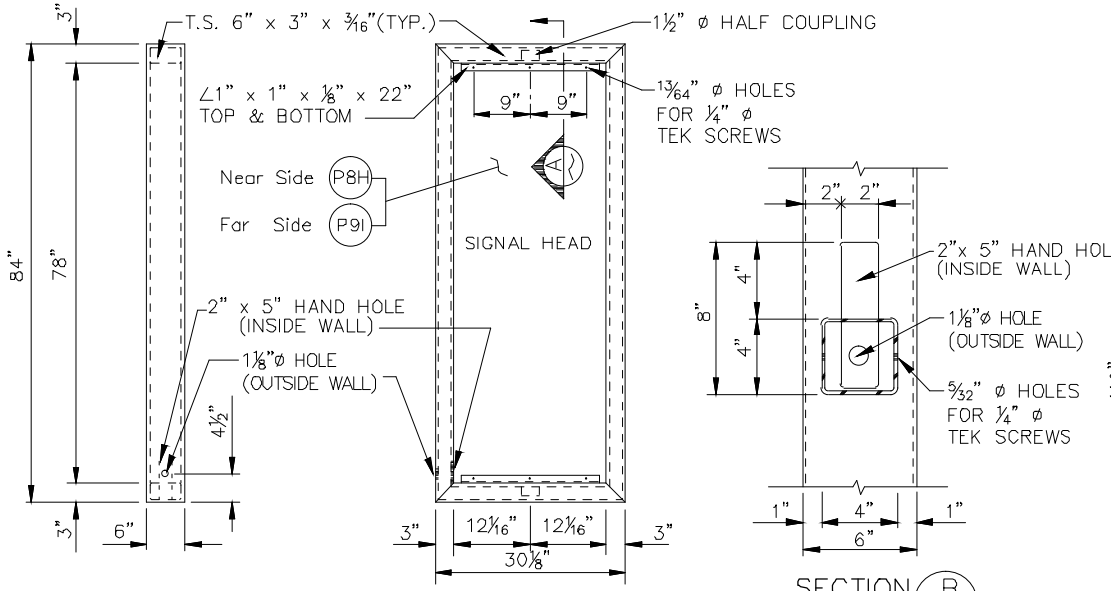


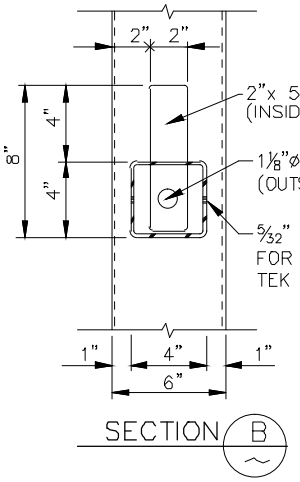
SECTION C

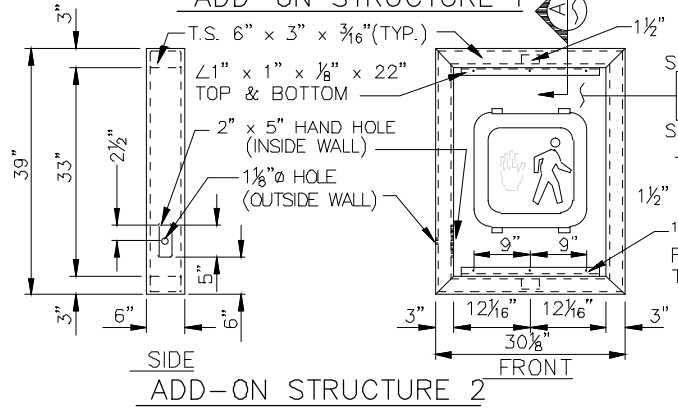
ALL TUBING WELDS SHALL BE TURNED INSIDE.

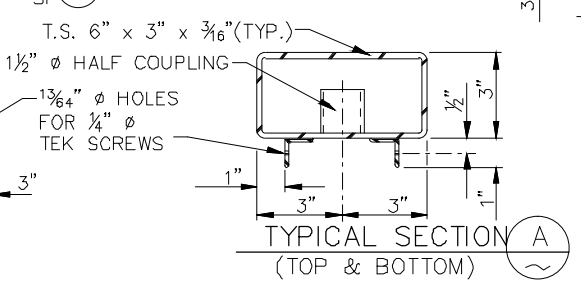
STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

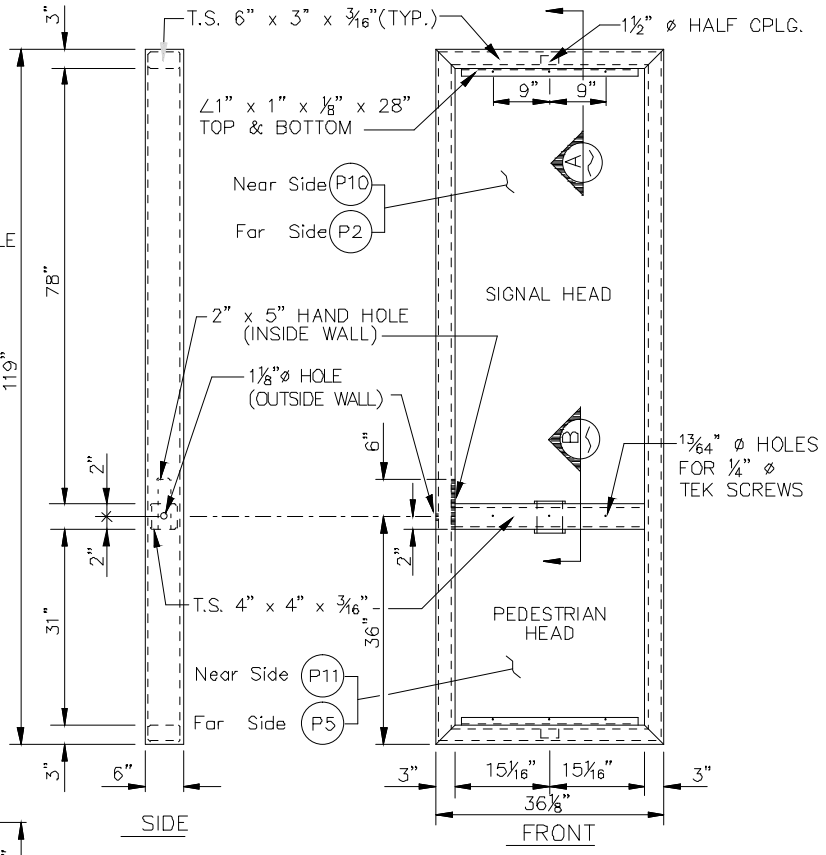
DETAIL NO. G-3296-17	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR POLE MAST ARM CONNECTION	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-17











ALL ADD-ON STRUCTURES SHALL BE ATTACHED TO THE MAIN STRUCTURE WITH A 3/8" CONTINUOUS WELDS ALONG THE ENTIRE HEIGHT OF THE ADD-ON STRUCTURE, FRONT AND BACK.

WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER. NO WELDING SHALL BE PERFORMED UNTIL CERTIFICATION HAS BEEN APPROVED BY THE CITY ENGINEERING INSPECTOR..

WELDS SHALL BE GROUND SMOOTH AND PAINTED UPON COMPLETION.

ALL ADD-ON STRUCTURE LOCATIONS SHALL BE APPROVED BY THE CITY ENGINEERING INSPECTOR PRIOR TO WELDING.

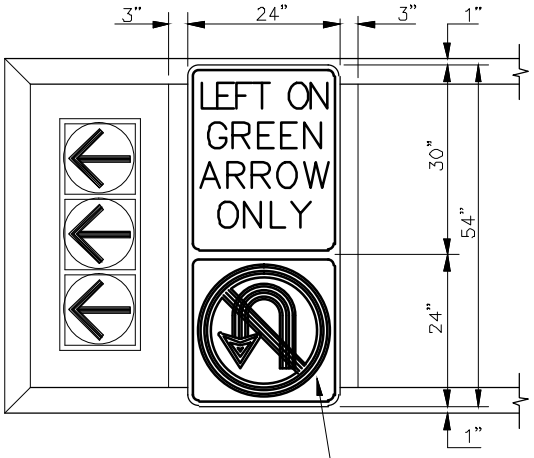
ALL TUBING WELDS SHALL BE TURNED INSIDE.

STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

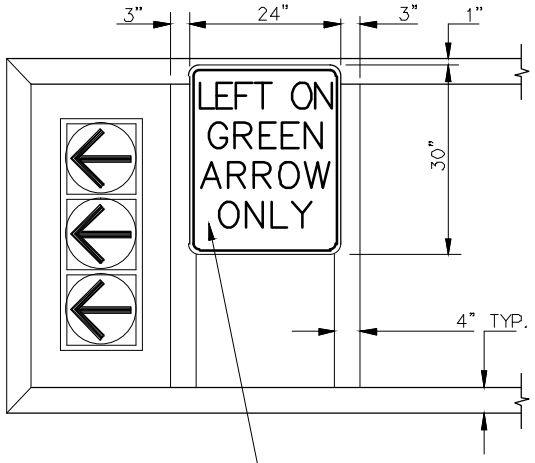
ALL HEADS SHALL BE MOUNTED ON 1½" ALL-THREAD USING GROUNDING LOCKNUTS.

ALL PANELS SHALL BE FASTENED WITH ¼" (#14) x 1" BLACK TEK SCREWS.

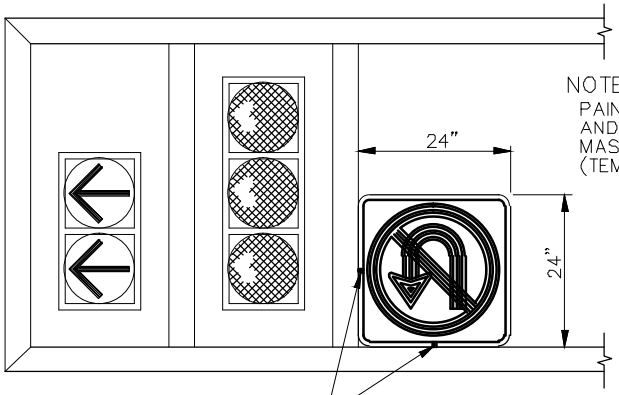
DETAIL NO. G-3296-18	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR SIGNAL 'ADD-ON' STRUCTURES	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-18



MOUNT DUAL SIGN ON SINGLE UNIT, CENTER OVER BLANK PANEL ON SIGNAL MAST ARM

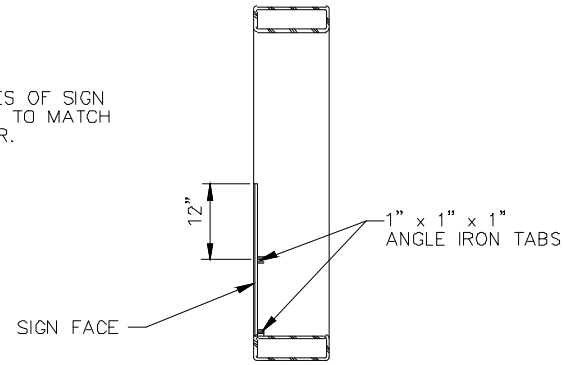


MOUNT SINGLE SIGN , CENTER OVER BLANK PANEL ON SIGNAL MAST ARM



NOTE:
PAINT BACK SIDES OF SIGN AND ANGLE IRON TO MATCH MAST ARM COLOR. (TEMPE BRONZE)

1" x 1" x 1" ANGLE IRON TABS WELDED TO MAST ARM FOR SIGN MOUNTING. (SIGN FACE TO BE FLUSH WITH APPROACH SIDE OF MAST ARM)



SECTION

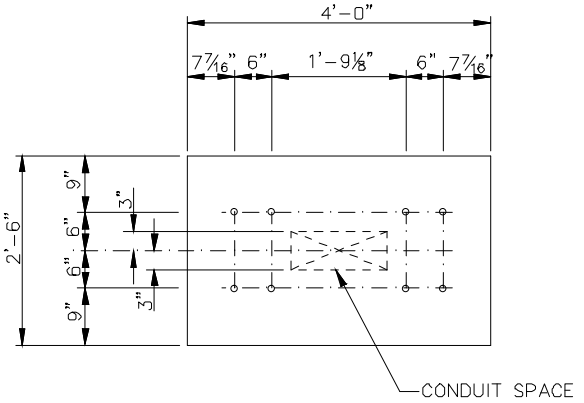


R10-5z

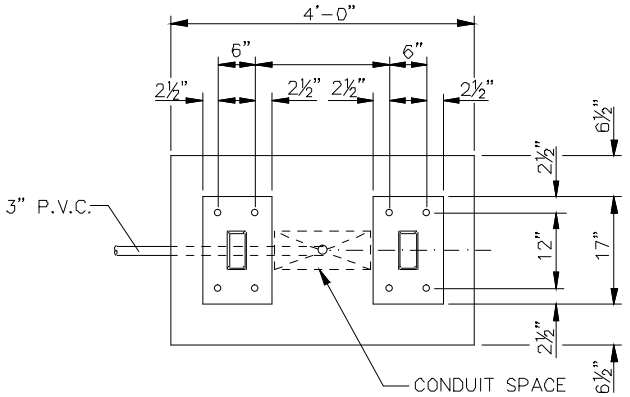


R3-4

DETAIL NO. G-3296-19	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR SIGNAL MAST ARM SIGN MOUNTING DETAILS	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-19



ANCHOR BOLT LAYOUT PLAN

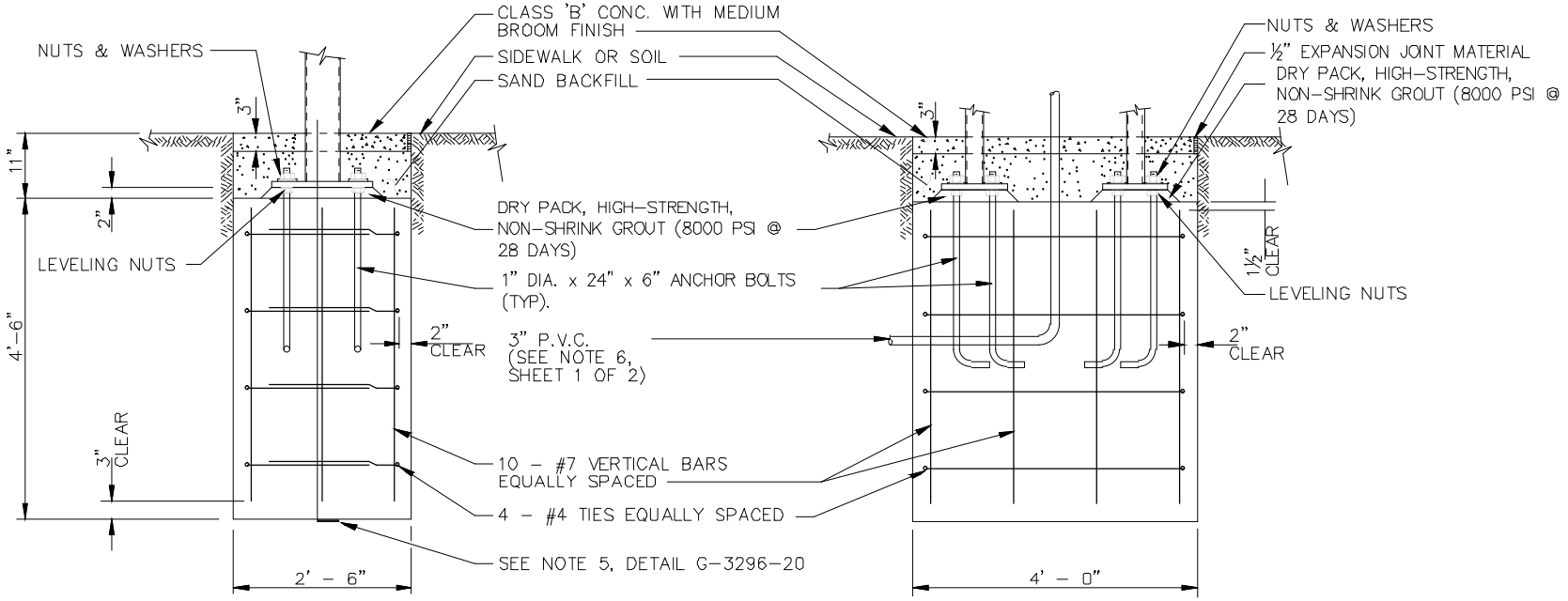


BASE PLATE LAYOUT PLAN

GENERAL NOTES

1. CONCRETE 4000 P.S.I. @ 28 DAYS
2. REBAR GRADE 60
3. ANCHOR BOLTS A-36 FULLY GALVANIZED
4. EXISTING SOIL CONDITIONS TO BE DETERMINED PRIOR TO FINAL FOUNDATION DESIGN.
5. A 25' COIL OF NO. 4 STRANDED A.W.G. BARE COPPER CONDUCTOR SHALL BE INSTALLED BEFORE THE CONCRETE IS POURED.
6. ADDITIONAL 2" P.V.C. CONDUIT MAY BE REQUIRED FOR LOOPS, SEE SIGNAL PLAN.

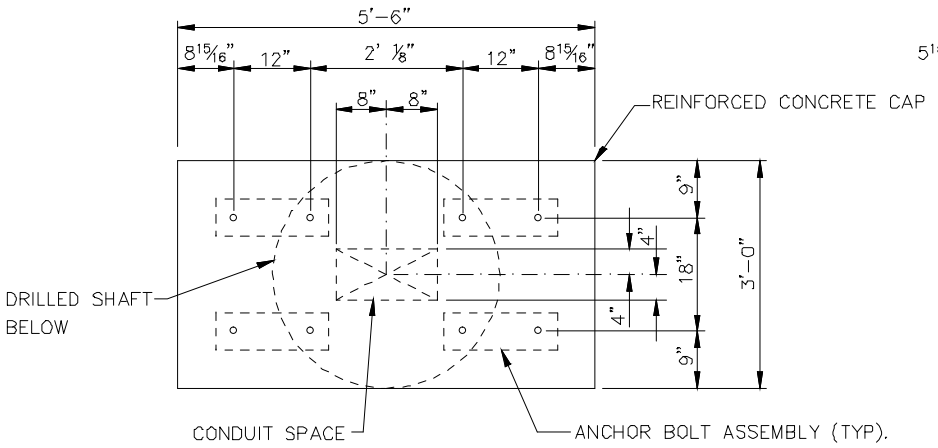
DETAIL NO. G-3296-20	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL FOUNDATION DETAIL TYPE 'A' FOUNDATION (SHEET 1 OF 2)	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-20



END VIEW SECTION

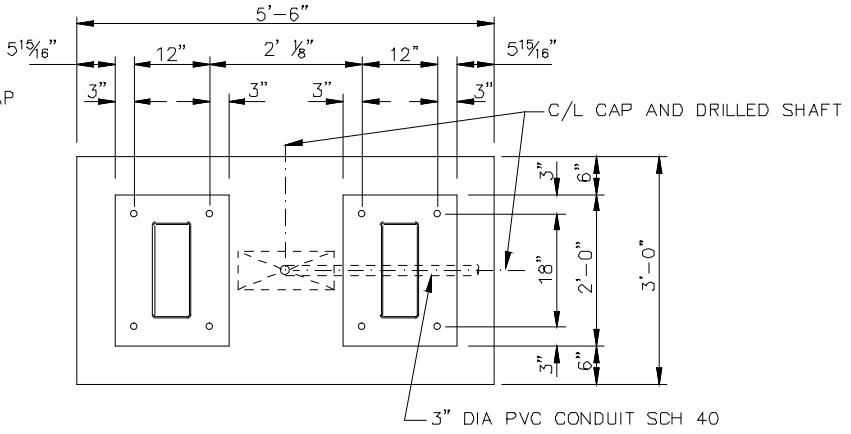
SIDE VIEW SECTION

DETAIL NO. G-3296-21	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL FOUNDATION DETAIL TYPE 'A' FOUNDATION (SHEET 2 OF 2)	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-21



ANCHOR BOLT LAYOUT PLAN

N.T.S.



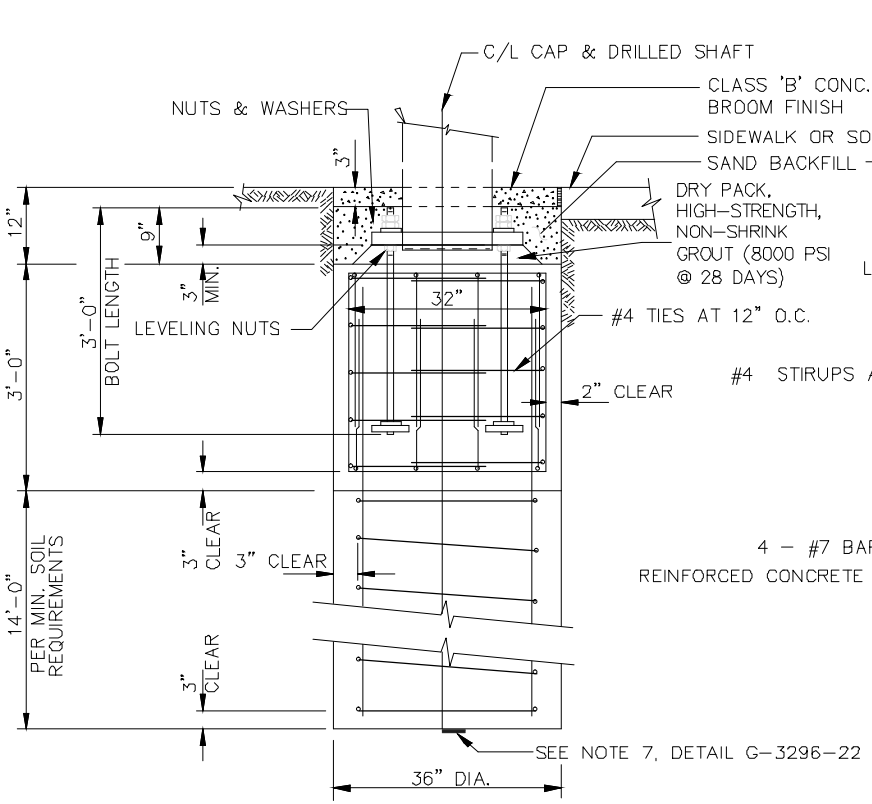
BASE PLATE LAYOUT PLAN

N.T.S.

GENERAL NOTES

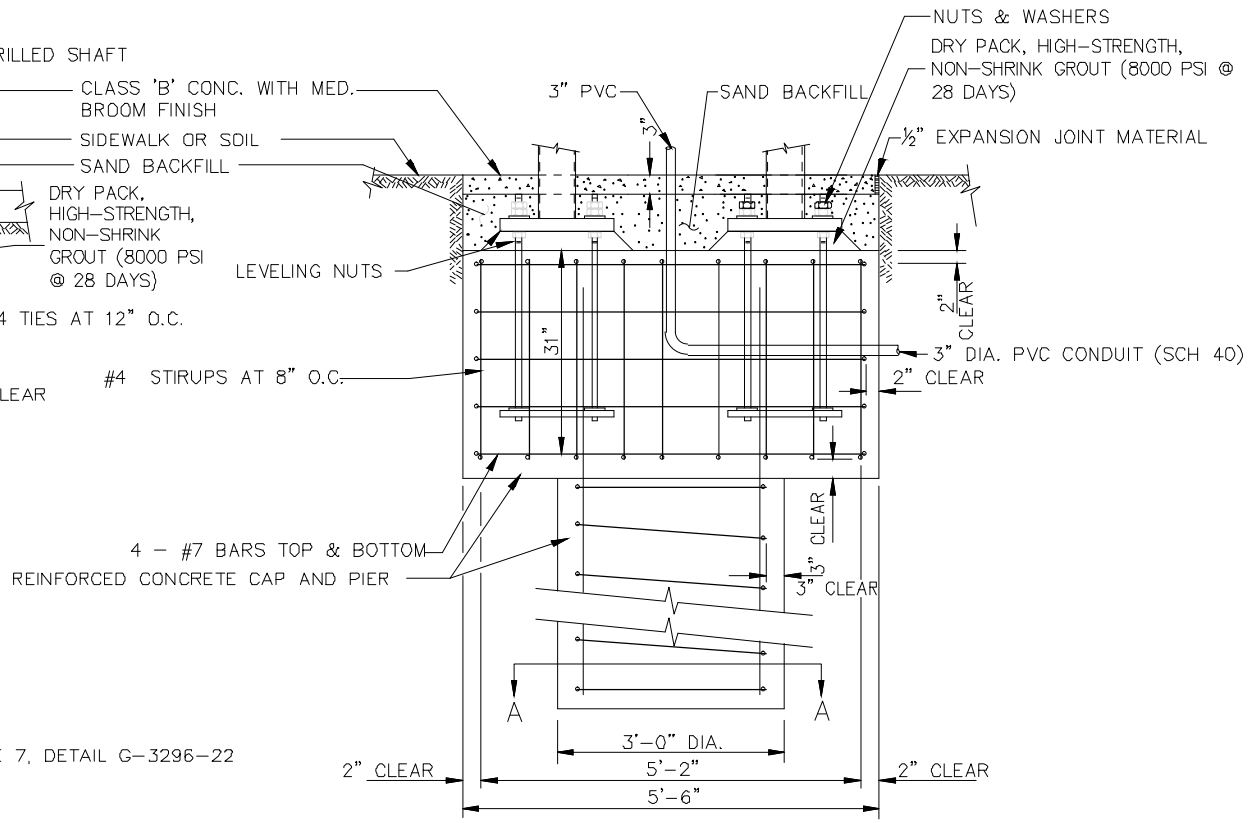
1. MINIMUM SOIL REQUIREMENTS:
   THIS FOUNDATION DESIGN IS BASED ON SOILS ABLE TO DEVELOP THE FOLLOWING VALUES FOR CONCRETE FILLED DRILLED IN PLACE PIERS, SKIN FRICTION AT 500 LBS/SQ. FT., LATERAL BEARING PRESSURE = 200 LBS/ SQ. FT. PER FOOT OF DEPTH.
2. EXISTING SOIL CONDITIONS TO BE DETERMINED PRIOR TO FINAL FOUNDATION DESIGN.
3. CONCRETE 4000 P.S.I. @ 28 DAYS.
4. REBAR – ASTM 615 GRADE 60.
5. EMBEDDED PLATES – ASTM A-36.
6. ANCHOR BOLTS – A-36 FULLY GALVANIZED (ASTM 123)
7. A 25' COIL OF NO. 4 STRANDED A.W.G. BARE COPPER CONDUCTOR SHALL BE INSTALLED BEFORE THE CONCRETE IS POURED.

DETAIL NO. G-3296-22	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 20' - 40' MAST ARM STRUCTURES (SHEET 1 OF 2)	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-22



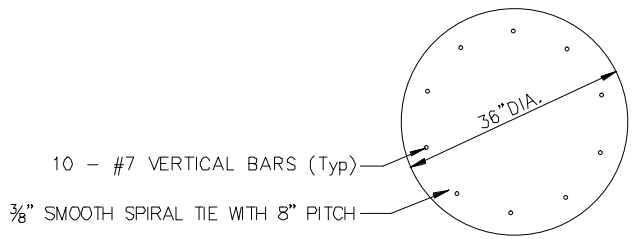
END VIEW SECTION

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SIDE VIEW SECTION

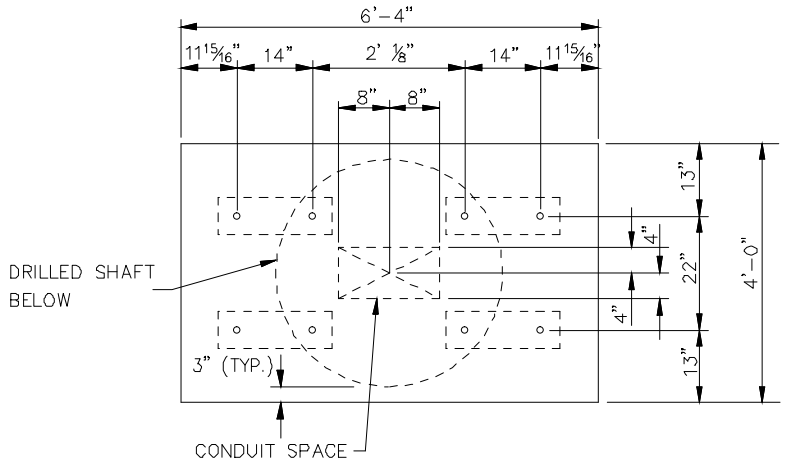
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SECTION A - A

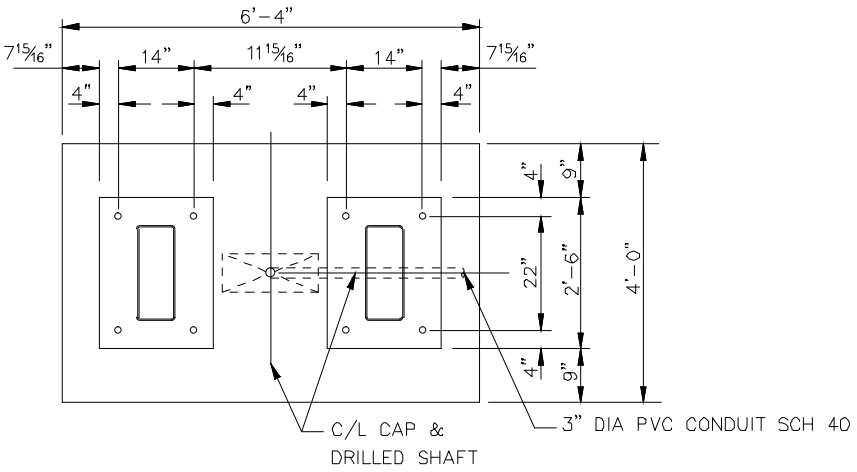
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DETAIL NO. G-3296-23	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 20' - 40' MAST ARM STRUCTURES (SHEET 2 OF 2)	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-23



ANCHOR BOLT LAYOUT PLAN

N.T.S.



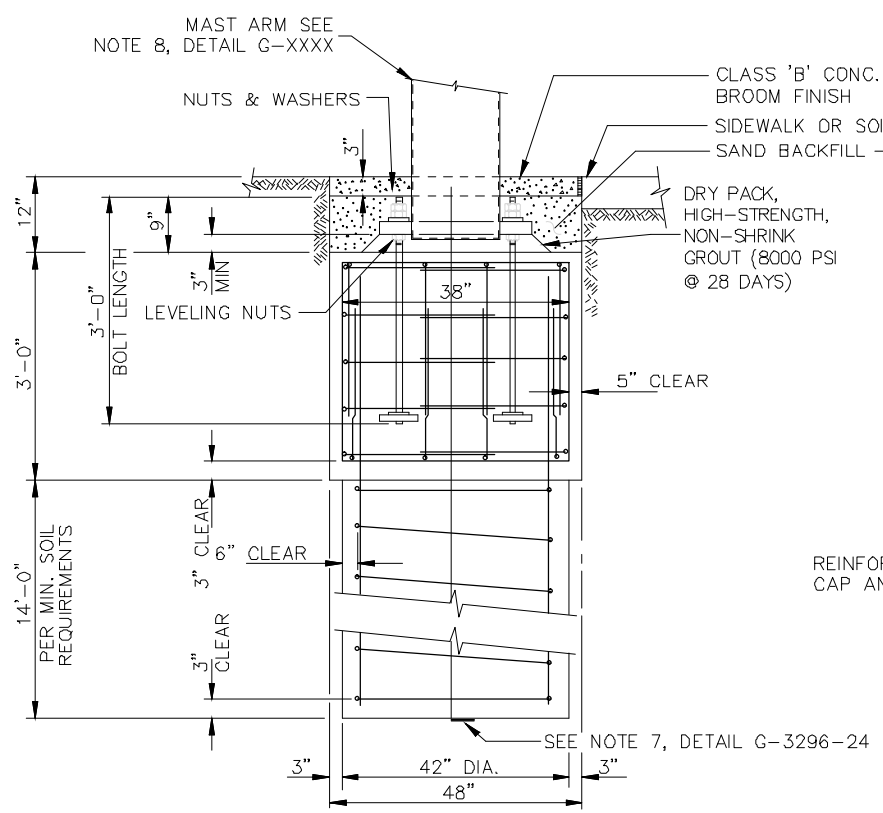
BASE PLATE LAYOUT PLAN

N.T.S.

GENERAL NOTES

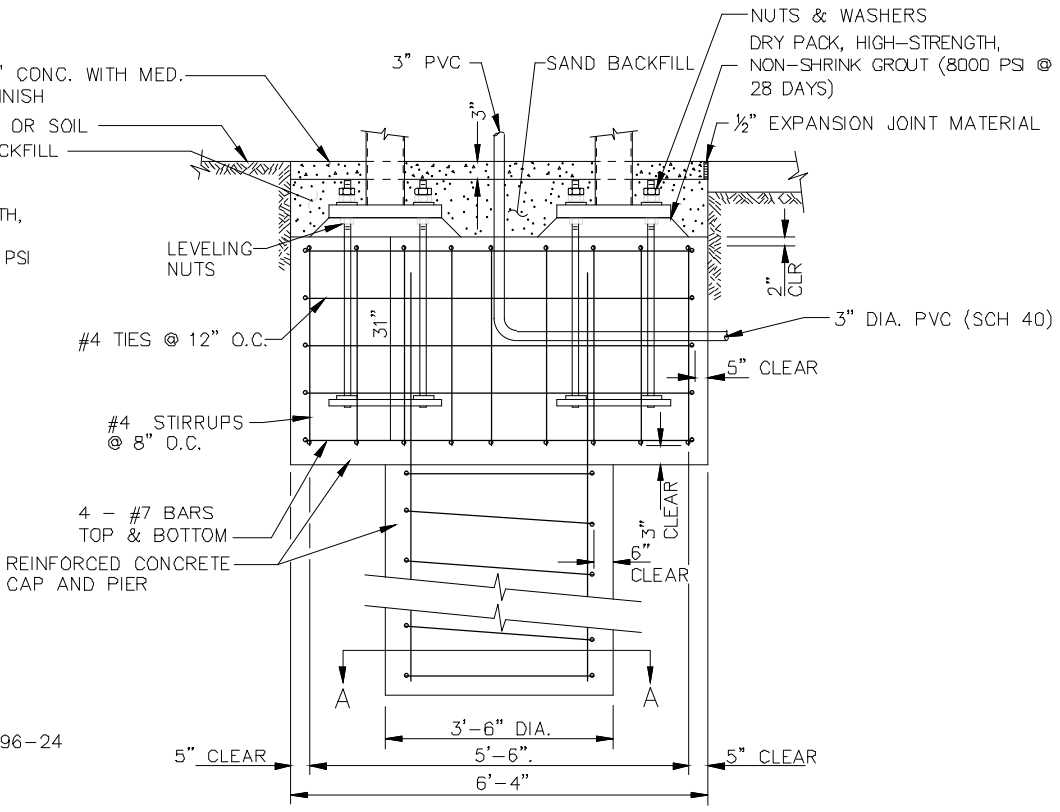
1. MINIMUM SOIL REQUIREMENTS:
   THIS FOUNDATION DESIGN IS BASED ON SOILS ABLE TO DEVELOP THE FOLLOWING VALUES FOR CONCRETE FILLED DRILLED IN PLACE PIERS. SKIN FRICTION AT 500 LBS/SQ. FT., LATERAL BEARING PRESSURE = 200 LBS/SQ. FT. PER FOOT OF DEPTH.
2. EXISTING SOIL CONDITIONS TO BE DETERMINED PRIOR TO FINAL FOUNDATION DESIGN.
3. CONCRETE 4000 P.S.I. AT 28 DAYS.
4. REBAR ASTM-A615 GRADE 60.
5. EMBEDDED PLATES ASTM A-36.
6. ANCHOR BOLTS - A-36 FULLY GALVANIZED (ASTM 123)
7. A 25' COIL OF NO. 4 STRANDED A.W.G. BARE COPPER CONDUCTOR SHALL BE INSTALLED BEFORE THE CONCRETE IS POURED.

DETAIL NO. G-3296-24	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 45' MAST ARM STRUCTURES (SHEET 1 OF 2)	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-24



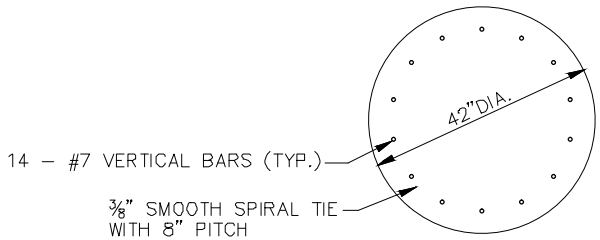
END VIEW SECTION

N.T.S.



SIDE VIEW SECTION

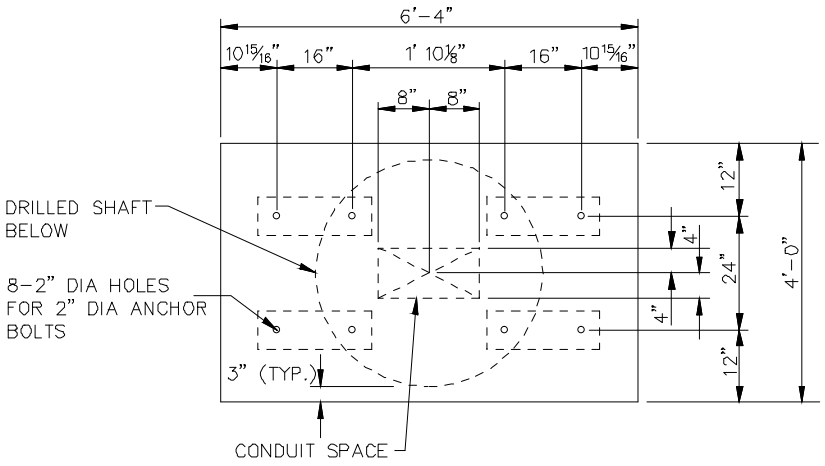
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SECTION A - A

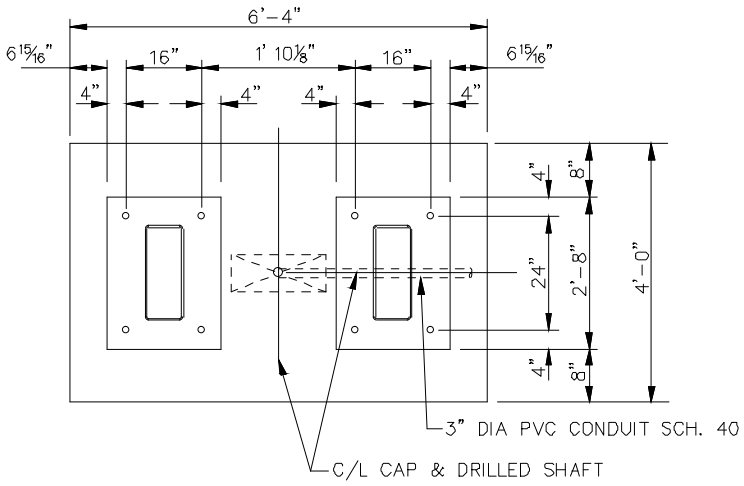
N.T.S.

DETAIL NO. G-3296-25	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 45' MAST ARM STRUCTURES (SHEET 2 OF 2)	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-25



ANCHOR BOLT LAYOUT PLAN

N.T.S.



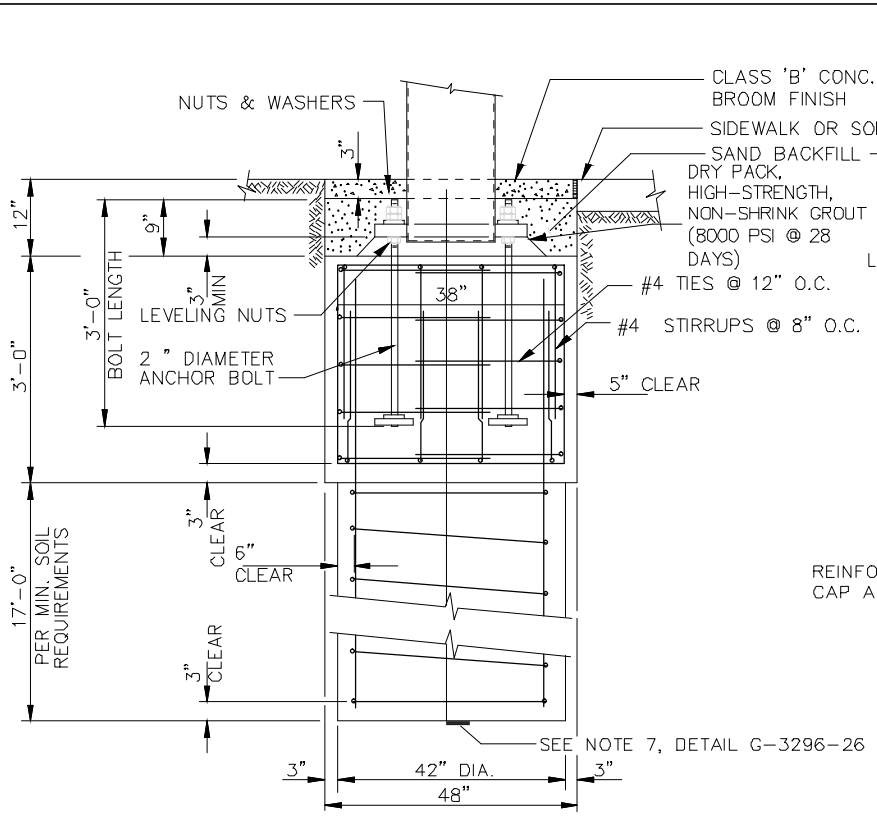
BASE PLATE LAYOUT PLAN

N.T.S.

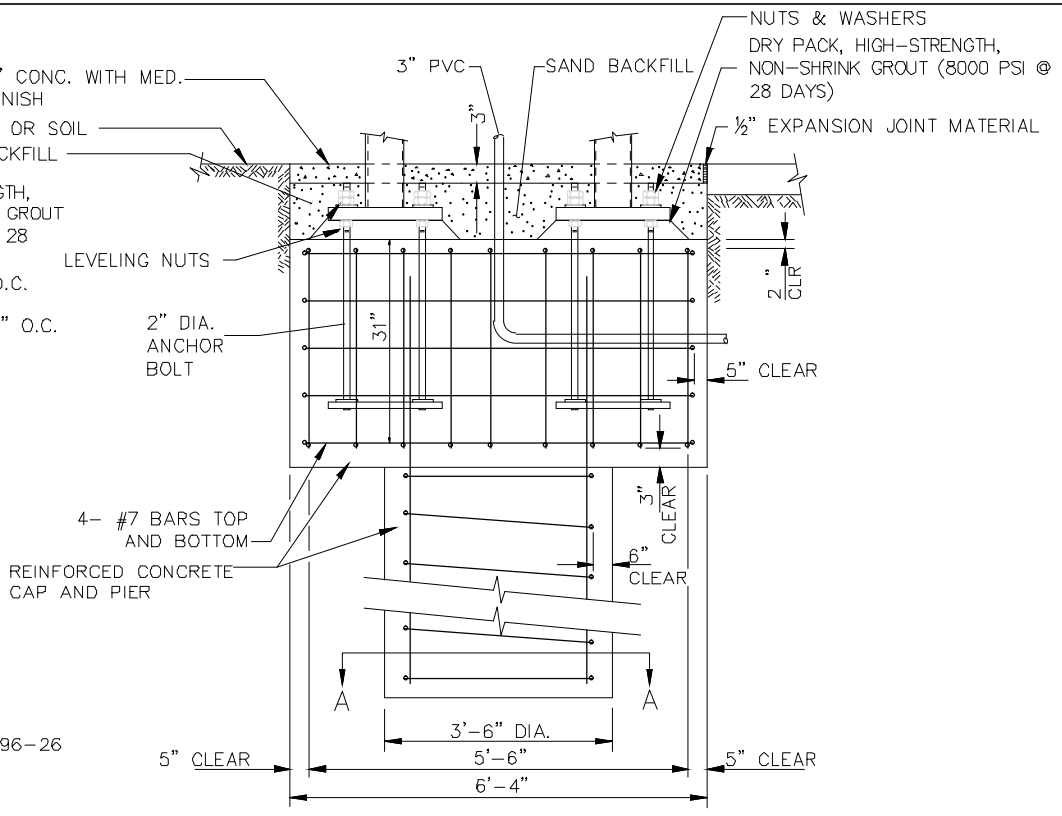
GENERAL NOTES

1. MINIMUM SOIL REQUIREMENTS:
   THIS FOUNDATION DESIGN IS BASED ON SOILS ABLE TO DEVELOP THE FOLLOWING VALUES FOR CONCRETE FILLED DRILLED IN PLACE PIERS. SKIN FRICTION AT 500 LBS/SQ. FT., LATERAL BEARING PRESSURE = 200 LBS/SQ. FT. PER FOOT OF DEPTH.
2. EXISTING SOIL CONDITIONS TO BE DETERMINED PRIOR TO FINAL FOUNDATION DESIGN.
3. CONCRETE 4000 P.S.I. AT 28 DAYS.
4. REBAR – ASTM 615 GRADE 60.
5. EMBEDDED PLATES – ASTM A-36.
6. ANCHOR BOLTS – A-36 FULLY GALVANIZED (ASTM 123)
7. A 25' COIL OF NO. 4 STRANDED A.W.G. BARE COPPER CONDUCTOR SHALL BE INSTALLED BEFORE THE CONCRETE IS POURED.

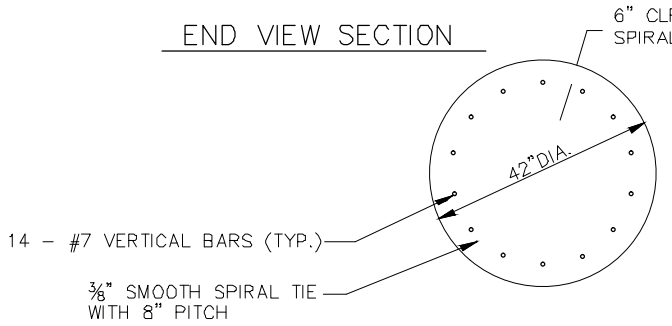
DETAIL NO. G-3296-26	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 50' MAST ARM STRUCTURES (SHEET 1 OF 2)	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-26



END VIEW SECTION

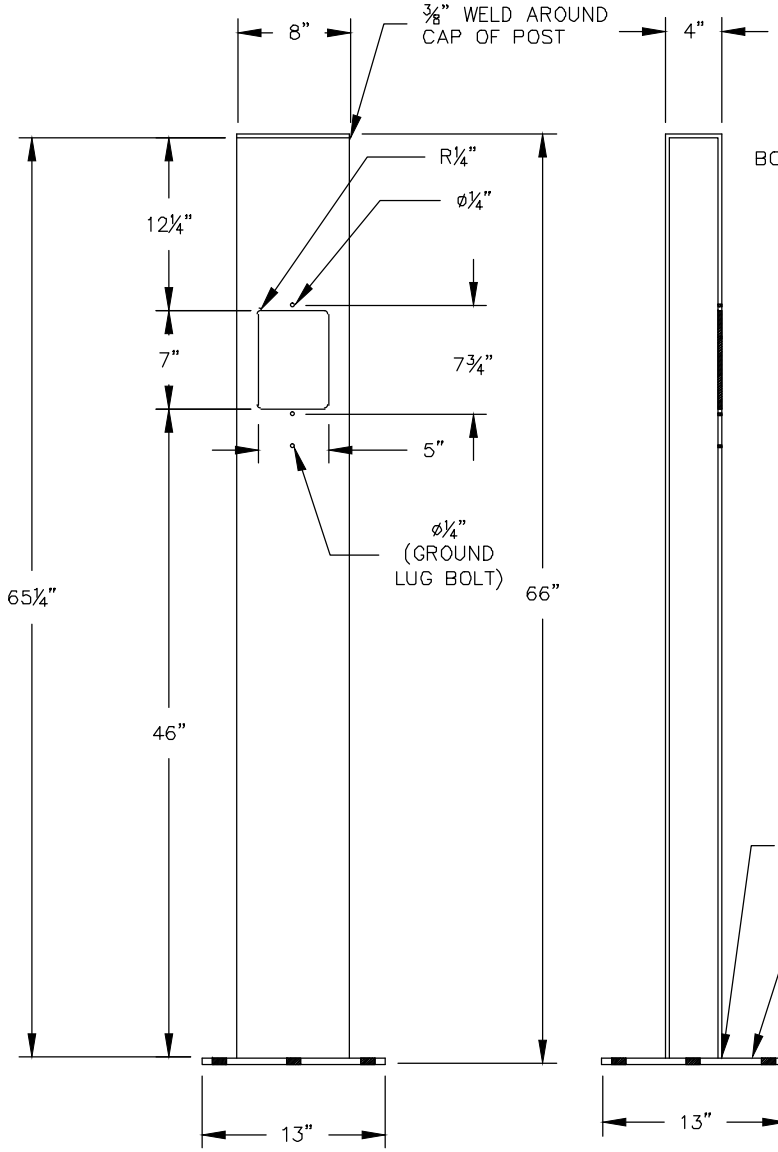


SIDE VIEW SECTION



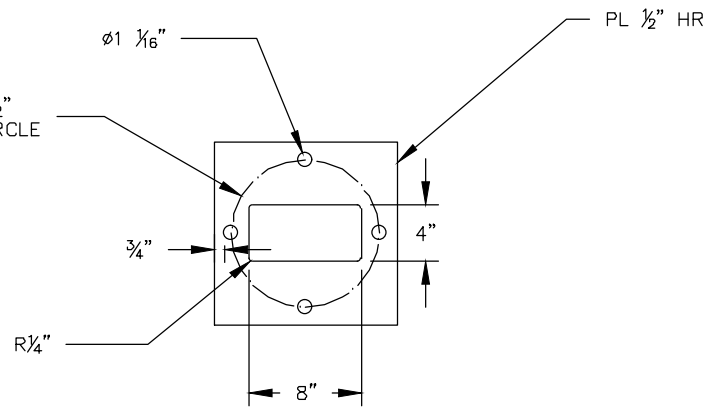
SECTION A - A

DETAIL NO. G-3296-27	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL FOUNDATION DETAIL FOR MODULAR 50' MAST ARM STRUCTURES (SHEET 2 OF 2)	ASSEMBLY DRAWING ONLY SPECIFICATIONS AND DESIGN BY T.A. CAID INDUSTRIES, INC. TUCSON, AZ	DETAIL NO. G-3296-27

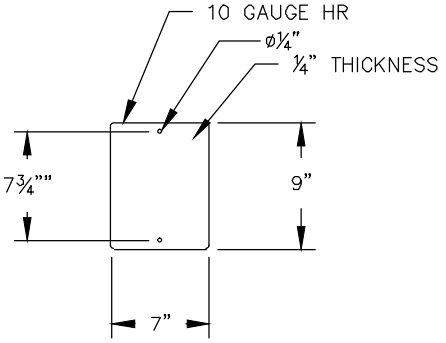


FRONT VIEW

SIDE VIEW



BASE PLATE DETAIL



HANDHOLE COVER DETAIL

ALL PEDESTRIAN POSTS SHALL USE A 2' DIAMETER x 3' DEEP CONCRETE FOUNDATION WITH 10½" BOLT CIRCLE AND 1½" PVC SCH. 40 CONDUIT.

ALL TUBING WELDS SHALL BE TURNED INSIDE.

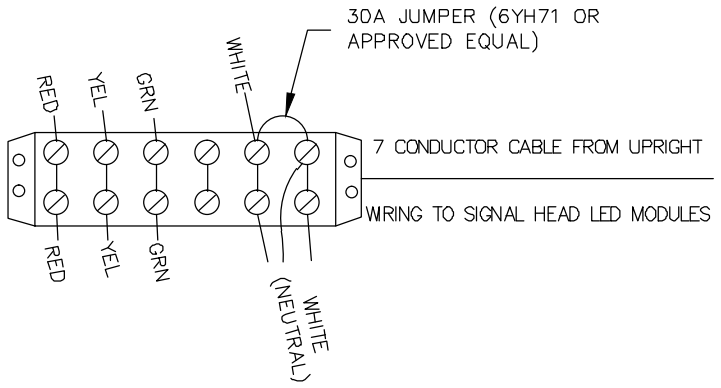
STRUCTURE SHALL BE PAINTED GOODYEAR BRONZE, COLOR & PAINT SHALL BE SUBMITTED TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING.

DETAIL NO. G-3296-28	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	PEDESTRIAN POST FOR MODULAR STRUCTURES	DETAIL NO. G-3296-28

TRAFFIC SIGNAL WIRING SCHEDULE

Phase/Corner	UPRIGHT	A–POLE	A3–POLE	Add On/Leading	Ped Post
1	R/Bk, O/Bk, G/Bk	R/Bk, O/Bk, G/Bk	R/Bk, O/Bk, G/Bk	Bk/R, O/R, Bl/R	
2	R, O, G	R, O, G	R, O, G	R/W, Bk/W, G/W	
3	R/Bk, O/Bk, G/Bk	R/Bk, O/Bk, G/Bk	R/Bk, O/Bk, G/Bk	Bk/R, O/R, Bl/R	
4	R, O, G	R, O, G	R, O, G	R/W, Bk/W, G/W	
5	R/Bk, O/Bk, G/Bk	R/Bk, O/Bk, G/Bk	R/Bk, O/Bk, G/Bk	Bk/R, O/R, Bl/R	
6	R, O, G	R, O, G	R, O, G	R/W, Bk/W, G/W	
7	R/Bk, O/Bk, G/Bk	R/Bk, O/Bk, G/Bk	R/Bk, O/Bk, G/Bk	Bk/R, O/R, Bl/R	
8	R, O, G	R, O, G	R, O, G	R/W, Bk/W, G/W	
2 PED	Bk, Bl	Bk, Bl	Bk, Bl	R/Gr, Bl/Bk	
4 PED	Bk, Bl	Bk, Bl	Bk, Bl	R/Gr, Bl/Bk	
6 PED	Bk, Bl	Bk, Bl	Bk, Bl	R/Gr, Bl/Bk	
8 PED	Bk, Bl	Bk, Bl	Bk, Bl	R/Gr, Bl/Bk	
PED BUTTON DC+	W/Bk	W/Bk	W/Bk		W/Rd
PED BUTTON COM	W	W	W		W
NORTHEAST	RED TAPE	Double Red Tape	3x Red Tape		4x Red Tape
SOUTHEAST	WHITE TAPE	Double White Tape	3x White Tape		4x White Tape
SOUTHWEST	BLUE TAPE	Double Blue Tape	3x Blue Tape		4x Blue Tape
NORTHWEST	GREEN TAPE	Double Green Tape	3x Green Tape		4x Green Tape

TERMINAL BLOCK DIAGRAM: INSIDE SIGNAL HEADS

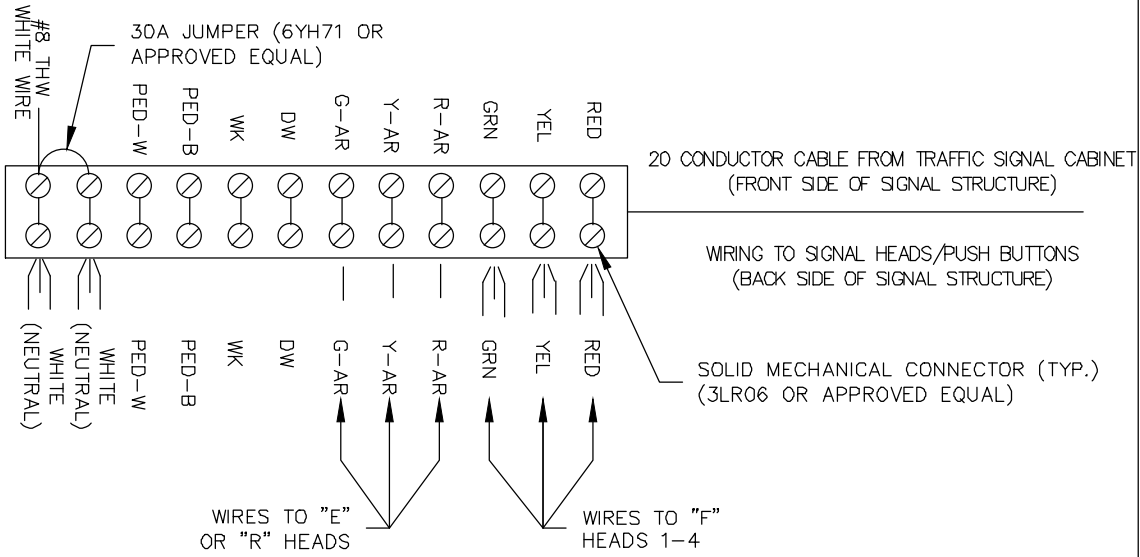


ALL TRAFFIC SIGNAL CABLE SHALL BE IMSA 19–1 SOLID CORE COPPER.

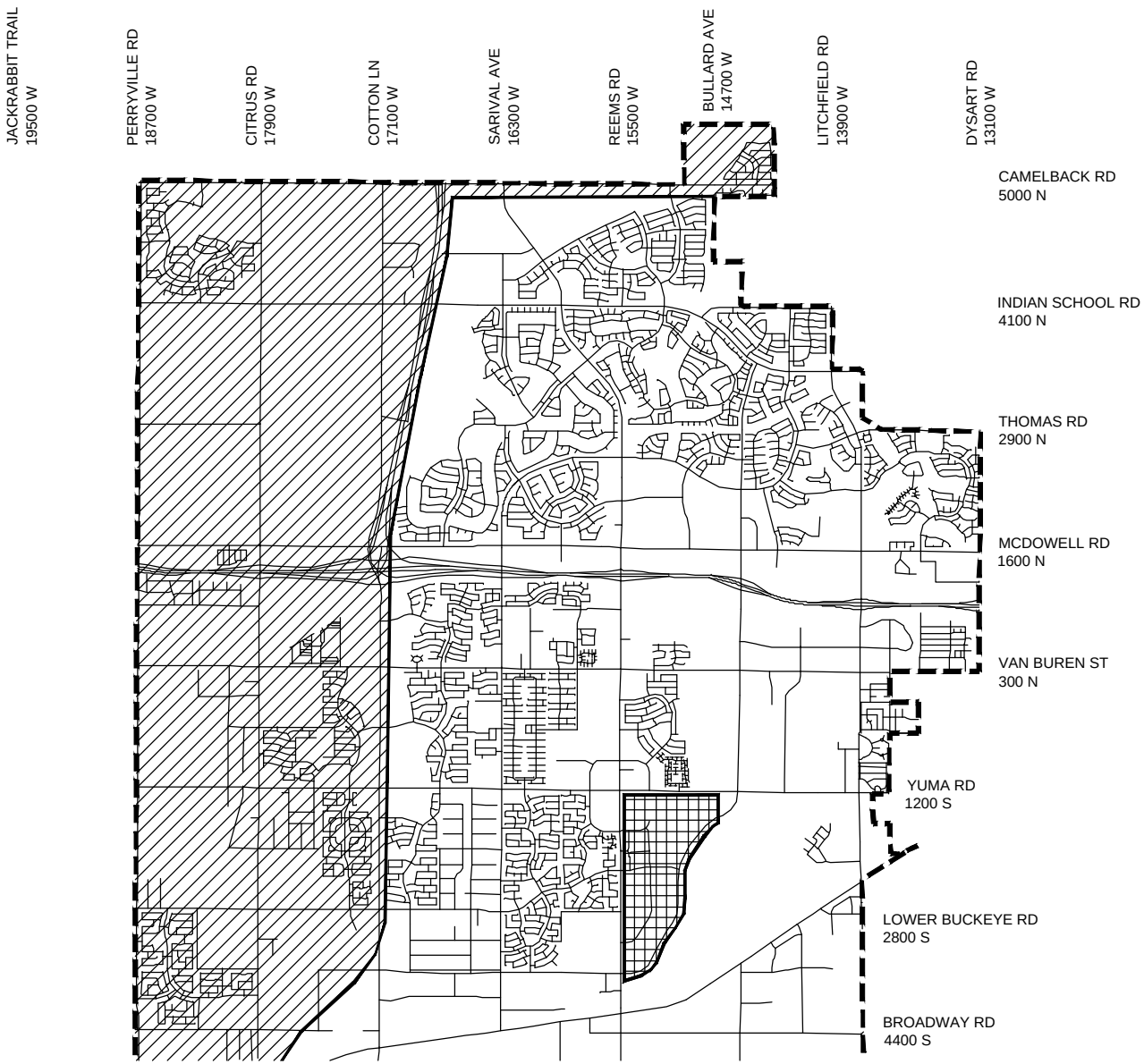
WIRING STANDARD:

- 20 CONDUCTOR (IMSA 19–1) UNSPLICED BETWEEN EACH STRUCTURE AND TRAFFIC SIGNAL CABINET
- 7 CONDUCTOR (IMSA 19–1) TO ALL VEHICLE SIGNAL HEADS
- 4 CONDUCTOR (IMSA 19–1) TO ALL PEDESTRIAN SIGNAL HEADS
- 4 CONDUCTOR (IMSA 19–1) TO ALL PEDESTRIAN PUSH BUTTONS

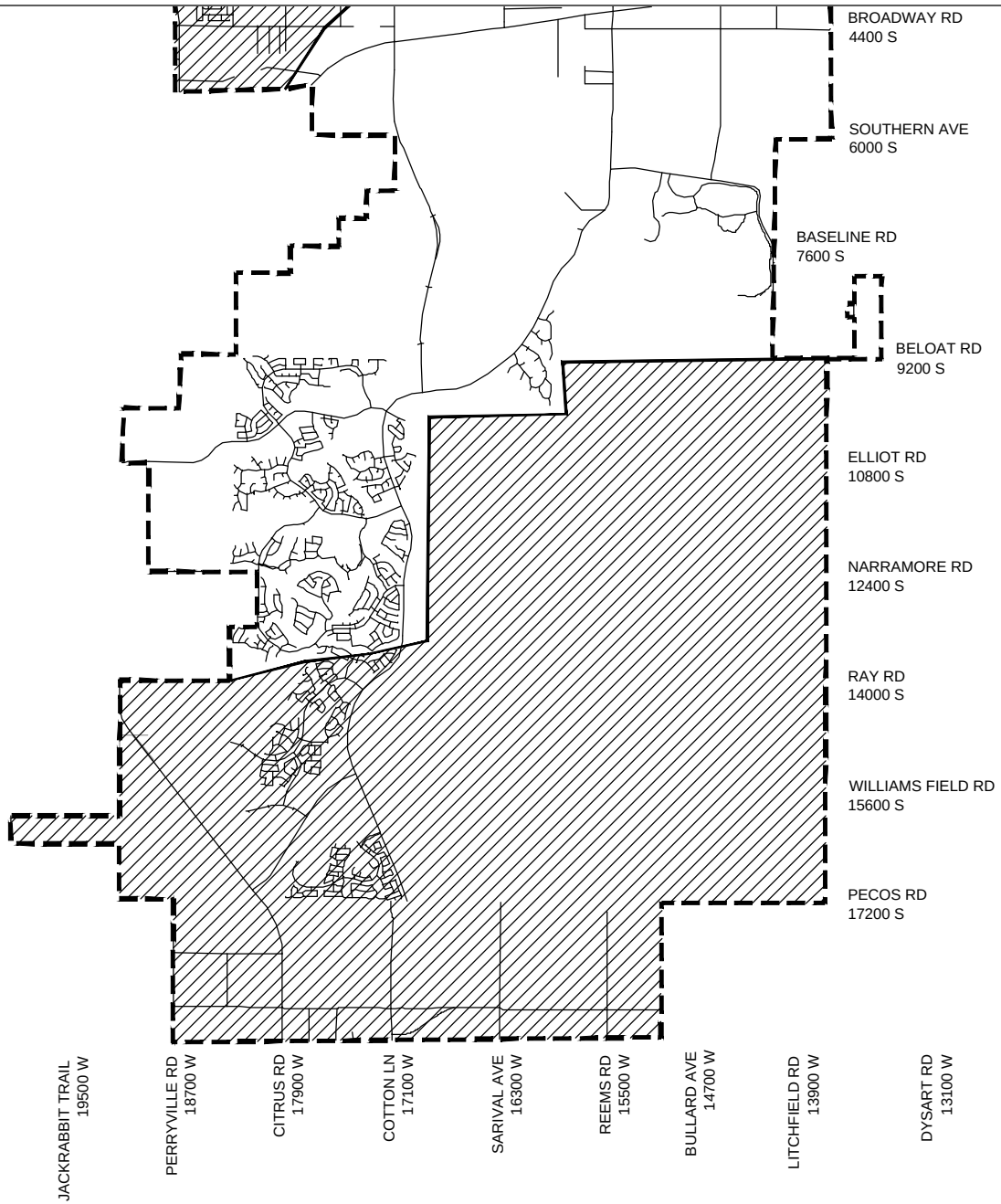
TERMINAL BLOCK DIAGRAM: INSIDE SIGNAL STRUCTURE UPRIGHT



DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MODULAR TRAFFIC SIGNAL WIRING DETAIL	DETAIL NO.
G-3296-29				G-3296-29



DETAIL NO. G-3297-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL STYLE	DETAIL NO. G-3297-1





LEGEND

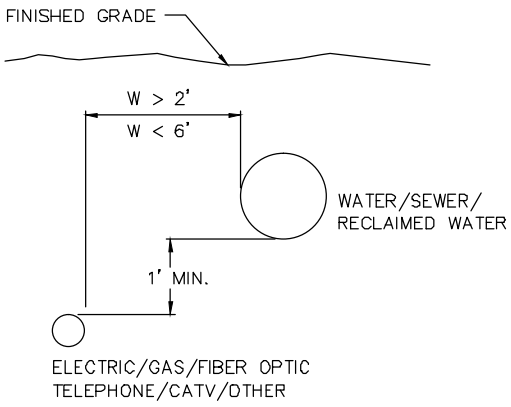
CITY LIMITS

ADOT STYLE W/ ENHANCED

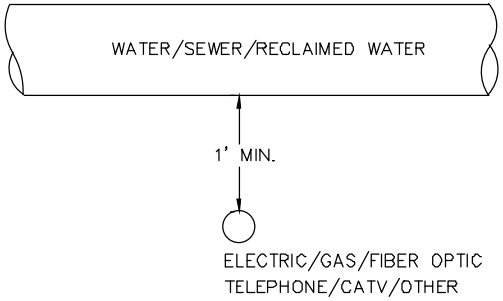
CURRENT MODULAR

ADOT STYLE/ SPECIAL BALLPARK DISTRICT

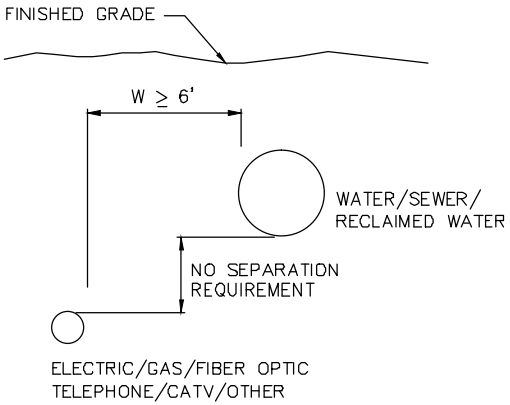
DETAIL NO. G-3297-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TRAFFIC SIGNAL STYLE	DETAIL NO. G-3297-2



2' TO 6' SEPARATION



CROSSING



6'+ SEPARATION

NOTES

1. ELECTRIC SEPARATION REQUIREMENTS ARE FOR PRIMARY ELECTRIC CONDUCTORS. SEPARATION FOR SERVICE CONDUCTORS SHALL BE PROVIDED BY THE ENGINEER ON THE CONSTRUCTION PLANS.

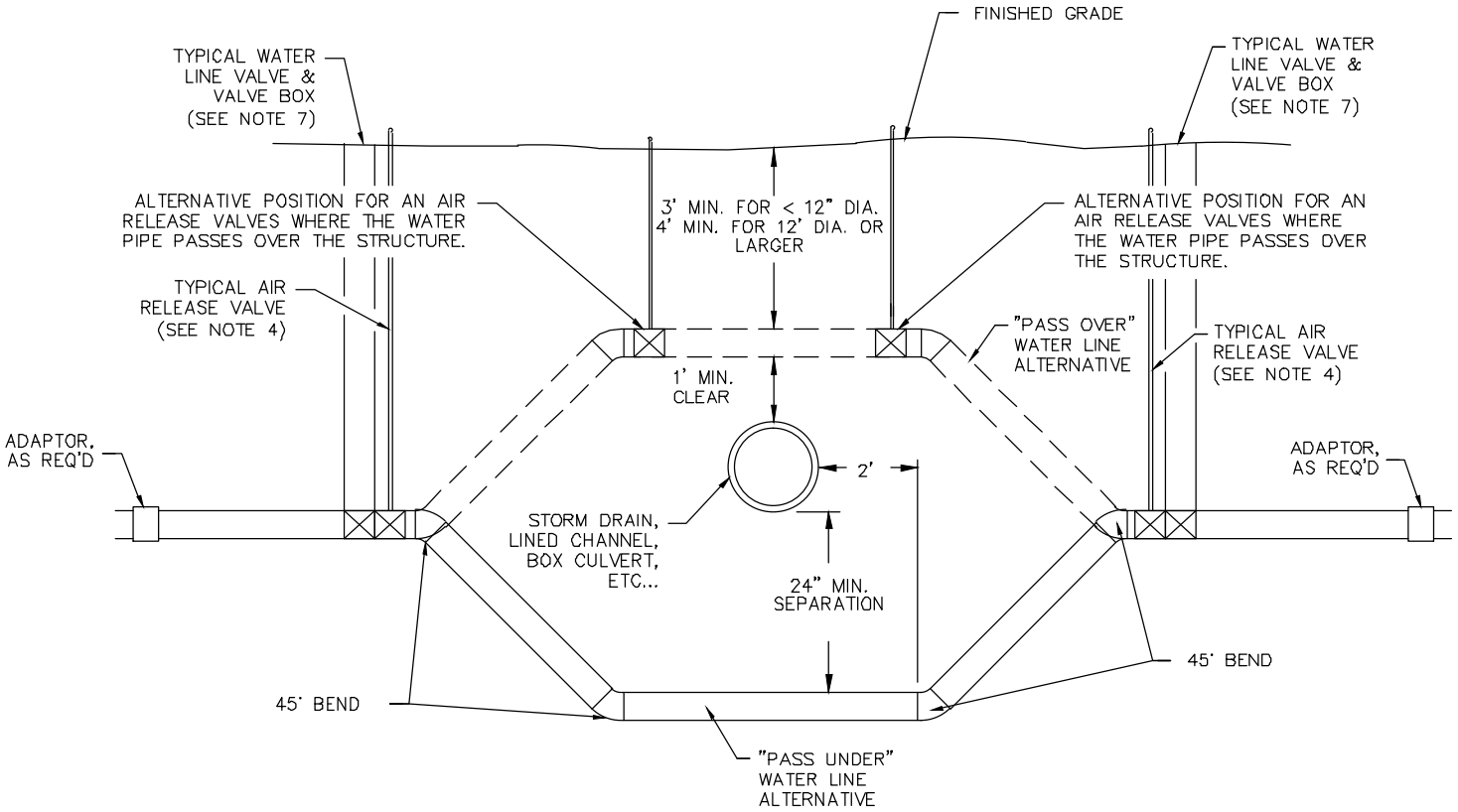
2. PRIMARY ELECTRIC, GAS, TELEPHONE, CABLE TV OR FIBER OPTIC LINES SHALL NOT CROSS ABOVE A WATER LINE WITHOUT WRITTEN APPROVAL FROM THE CITY'S WATER RESOURCES DEPARTMENT.

3. IF APPROVED, A UTILITY LOCATOR STRIP SHALL BE INSTALLED AND CLSM PER MAG SECTION 604 & 728 SHALL BE USED AS BACKFILL.

4. MINIMUM 2' HORIZONTAL SEPARATION. NO VERTICAL SEPARATION REQUIRED IF HORIZONTAL SEPARATION IS GREATER THAN 6'.

   W = HORIZONTAL SEPARATION

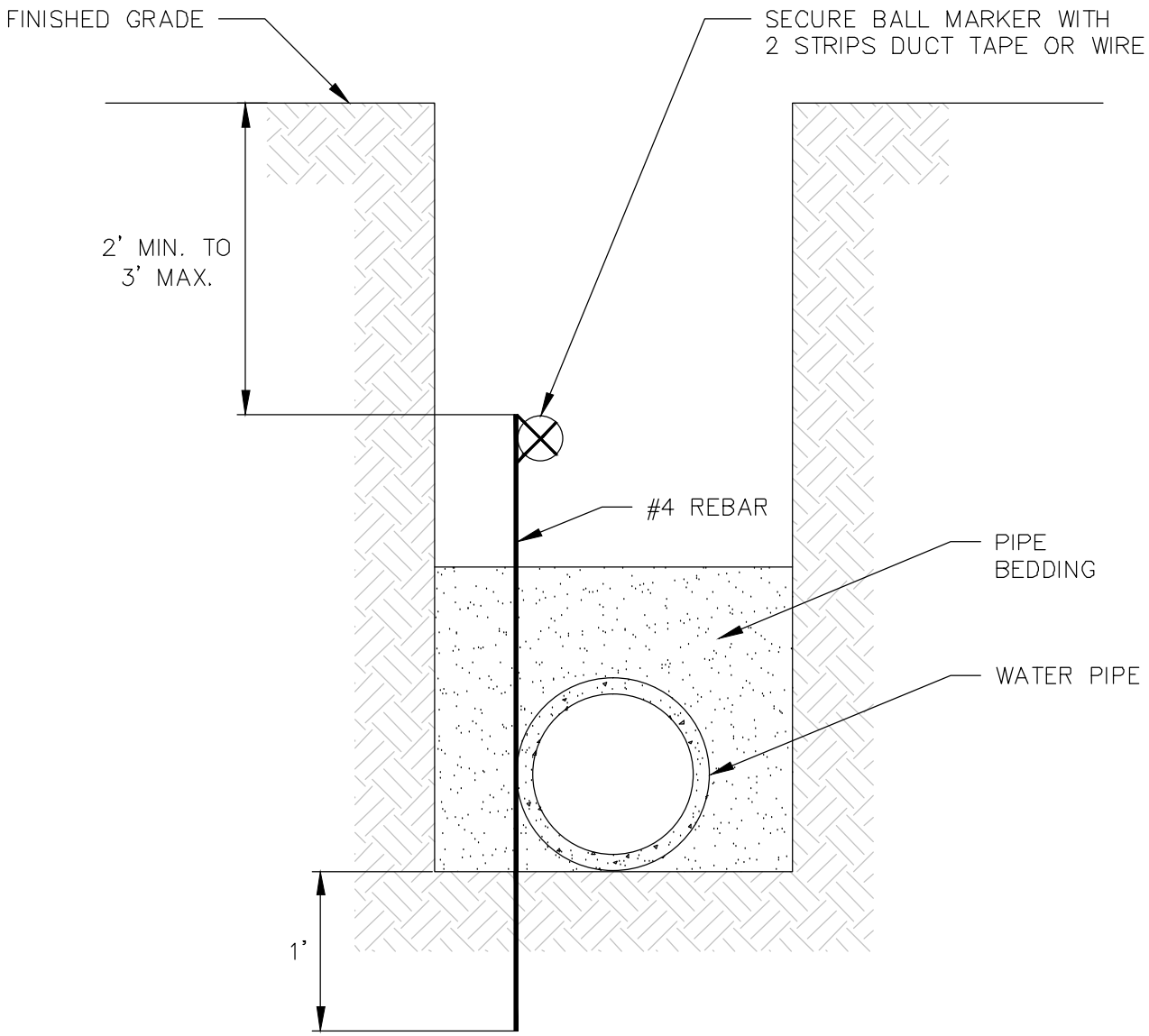
DETAIL NO. G-3300	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	DRY UTILITY TO WET UTILITY MINIMUM SEPARATION REQUIREMENTS	DETAIL NO. G-3300



NOTES:

1. THIS DETAIL PROVIDES SEPARATION & COVER REQUIREMENTS ONLY.
2. RESTRAINED JOINTS SHALL BE INSTALLED PER MAG STANDARDS 302 & 303.
3. ALL PIPE SHALL BE DUCTILE IRON PIPE.
4. UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER, AIR RELEASE VALVES SHALL BE INSTALLED AT LOCATIONS ALONG WATER AND RECLAIMED WATER LINES.
5. ELECTRONIC BALL MARKERS SHALL BE LOCATED AT ALL BENDS.
6. VALVES AND FITTINGS ARE NOT ALLOWED WITHIN A VERTICAL REALIGNMENT SECTION.
7. SEE CHAPTER 5.0 & 5.2 OF THE EDS&PM FOR INFORMATION REGARDING THE INSTALLATION OF VALVES ON A VERTICAL REALIGNMENT SECTION.

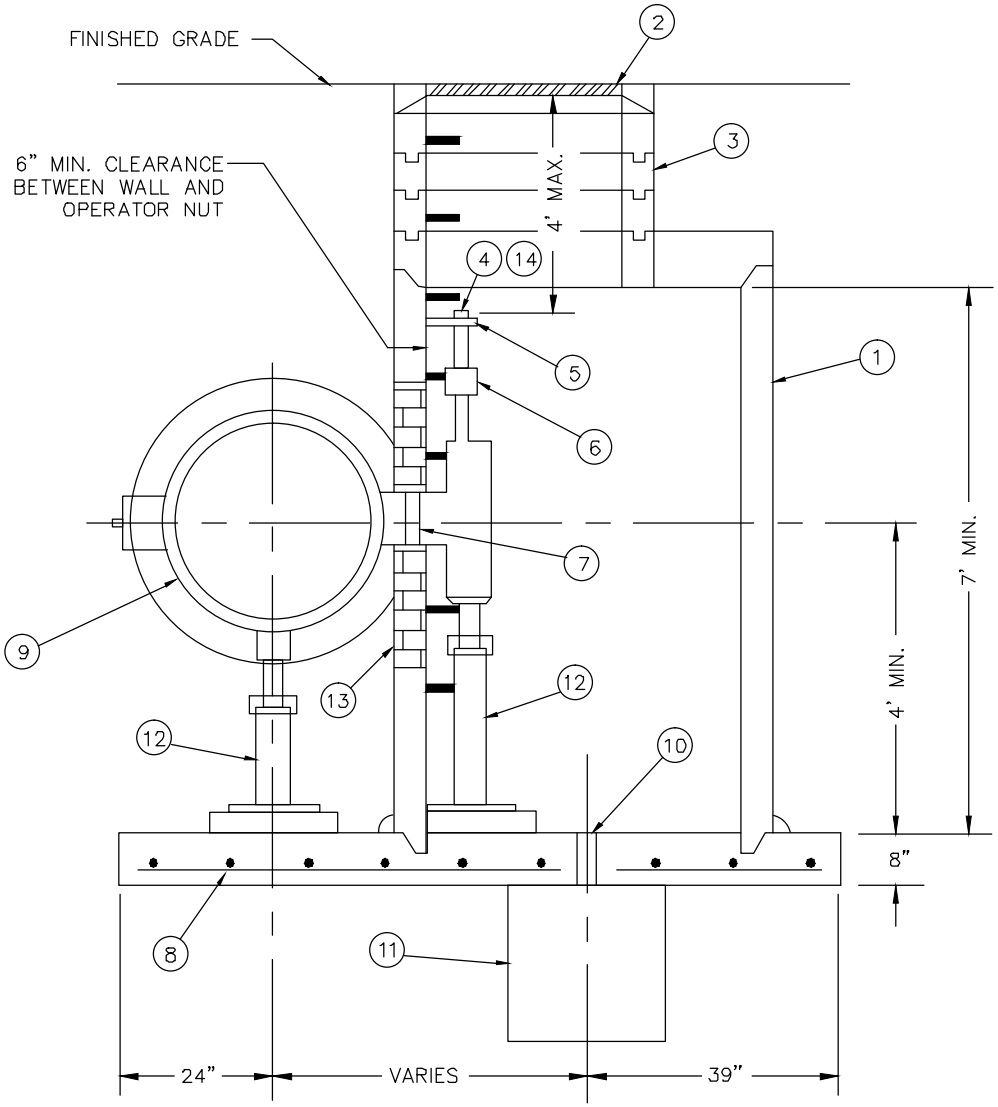
DETAIL NO. G-3301	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	VERTICAL REALIGNMENT OF WATER & RECLAIMED WATER MAINS	DETAIL NO. G-3301



NOTES:

1. CONTRACTOR IS TO INSTALL, ACTIVATE, AND PROGRAM BALL MARKER WITH SIZE OF MAIN, MATERIAL OF MAIN, AND THE TYPE OF FITTING.
2. BALL MARKERS ARE REQUIRED AT CHANGES IN DIRECTION, BENDS, FITTINGS, AND STUBS FOR ALL WATER LINES 6" AND GREATER.
3. FOR WATER LINE DIAMETERS 16" AND GREATER, BALL MARKERS SHALL BE LOCATED AT ALL FITTINGS AND AT A MAXIMUM SPACING OF 440', IF VALVES ARE NOT PROVIDED AT A CLOSER SPACING.
4. SEE THE CITY POTABLE WATER APPROVED MATERIALS LIST FOR ACCEPTABLE BALL MARKER MANUFACTURERS.

DETAIL NO. G-3305	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	ELECTRONIC BALL MARKER PLACEMENT	DETAIL NO. G-3305

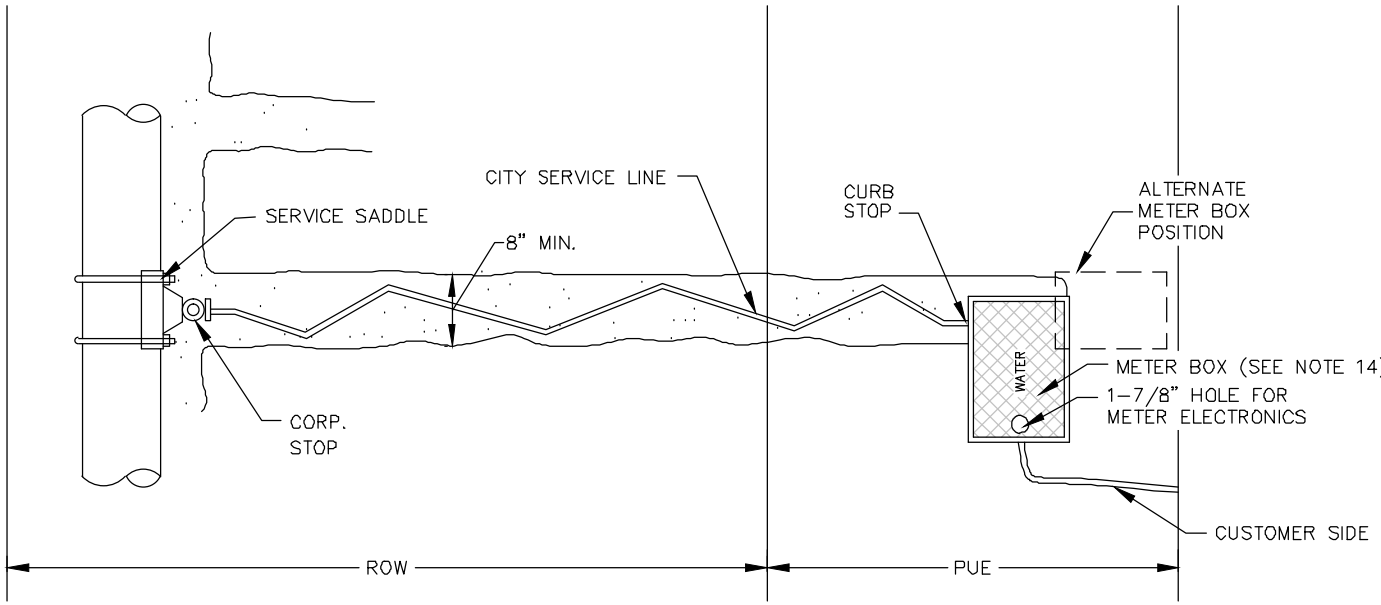


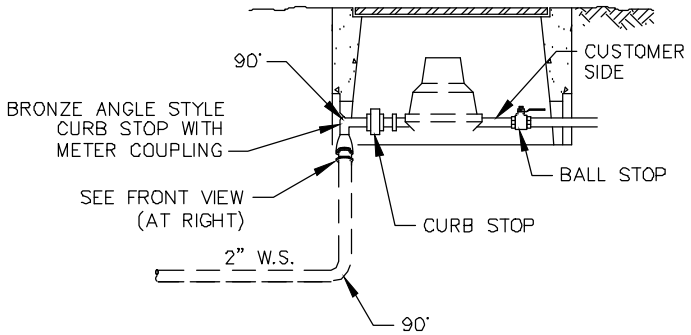
SECTION

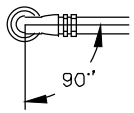
NOTES:

1. 48" I.D. MANHOLE SHAFT PER MAG STD. DETAIL 420-2, TYPE "B" TOP.
2. 30" MANHOLE FRAME & COVER PER MAG STD. DETAIL.
3. GROUTED ADJUSTMENT RINGS.
4. OPERATOR NUT.
5. WALL BRACKET.
6. PACKING GLAND.
7. SUGGESTED 6" EXTENSION.
8. #4 REBAR, 12" ON CENTER EACH WAY (2" CLEAR TYPICAL).
9. BUTTERFLY VALVE, LARGER THAN 16 INCHES.
10. 3" DIAMETER DRAIN.
11. 8 CU. FT. GRAVEL SUMP.
12. ADJUSTABLE PIPE SADDLE SUPPORT.
13. RECTANGULAR CUTOUT IN MANHOLE SHAFT FILL SPACE BETWEEN SHAFT AND PIPE WITH 1" SHEET FOAM, BRICK, AND MORTAR.
14. OPERATOR NUT MUST BE ACCESSIBLE FROM MANHOLE AT ALL TIMES.

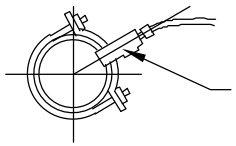
DETAIL NO. G-3307	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:11/07	BUTTERFLY VALVE OPERATOR MANHOLE	DETAIL NO. G-3307







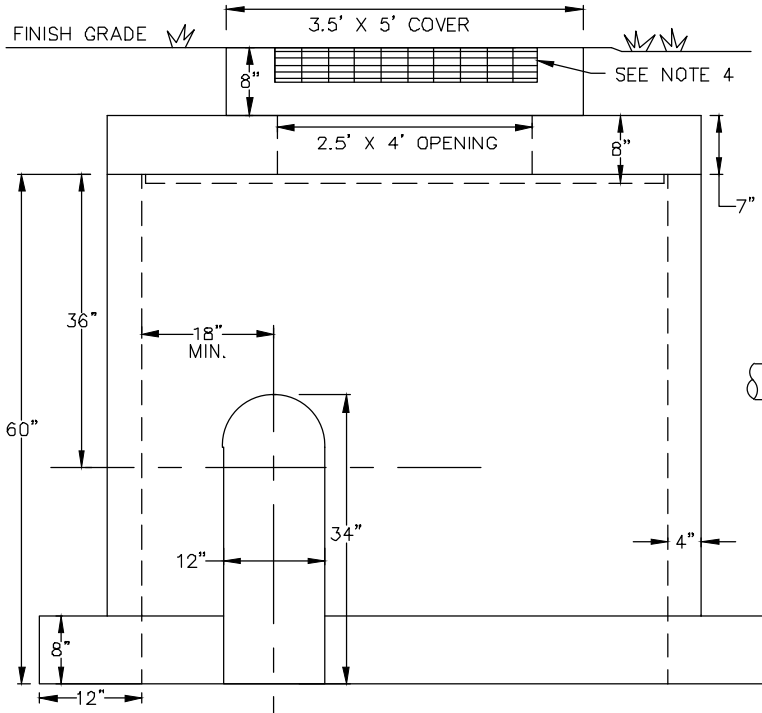
FRONT VIEW

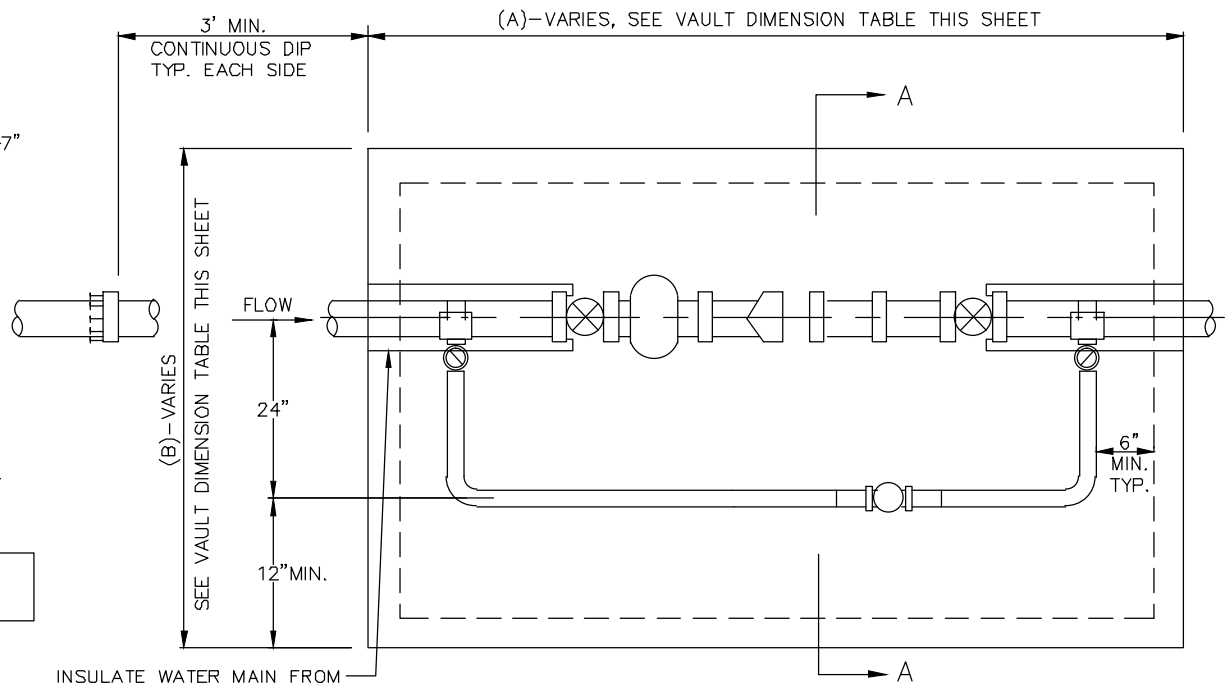


NOTES:

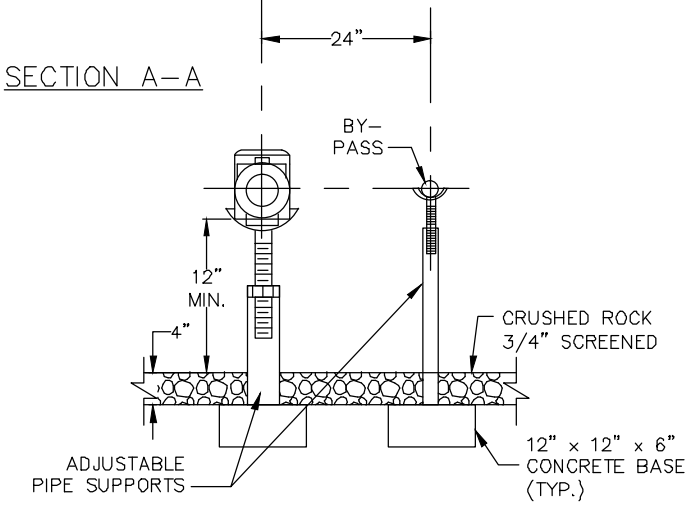
1. AT A MINIMUM, WATER SERVICES SHALL INCLUDE A CORP. STOP, SERVICE PIPE, TAPPING SADDLE, CURB STOP, AND CONCRETE METER BOX.
2. NEW WATER SERVICE TAPS SHALL BE INSTALLED USING A BRONZE DOUBLE-STRAP TAPPING SADDLE.
3. SERVICE LINES SHALL BE 1" OR 2" IN SIZE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEERING AND PUBLIC WORKS DEPARTMENTS. ALL SERVICE LINES SHALL BE SOFT TYPE K SEAMLESS ANNEALED COPPER PIPE.
4. 36" MINIMUM COVER IS REQUIRED OVER SERVICE LINES.
5. ALL WATER METERS SHALL BE PROVIDED BY THE CITY AFTER PAYMENT OF ALL PREVAILING FEES.
6. ONLY AUTHORIZED PERSONNEL OF THE CITY PUBLIC WORKS DEPT. SHALL INSTALL WATER METERS OF SIZES 3/4" to 2" IN ACCORDANCE WITH THE METER INSTALLATION POLICY.
7. FOR WATER METER LOCATION, SEE THE CITY OF GOODYEAR ENGINEERING DESIGN STANDARDS AND POLICY MANUAL CHAPTER 5.
8. CONCRETE WATER METER BOXES SHALL BE PROVIDED BY THE DEVELOPER PER MAG STANDARD DETAIL 320.
9. THE MINIMUM CONCRETE BOX SIZE SHALL BE #2 FOR 3/4" AND 1" METERS, AND #4 BOX FOR 1-1/2" AND 2" METERS.
10. METER BOX LIDS SHALL BE PER MAG STANDARDS AND COME WITH A 1-7/8" PRE-DRILLED HOLE FOR THE INSTALLATION OF ELECTRONIC METER READING DEVICES.
11. SEE THE CITY "POTABLE WATER SYSTEM APPROVED MATERIALS LIST" FOR INFORMATION REGARDING SPECIFIC BRANDS AND MODELS PERMITTED TO BE INSTALLED WITHIN THE CITY LIMITS.
12. COPPER SERVICE LINES IN THE 1" AND 2" SIZES THAT CROSS STREETS WILL BE ONE CONTINUOUS PIECE FROM THE METER TO THE MAIN LINE. NO SOLDERED JOINTS WILL BE PERMITTED.
13. 2" COPPER SERVICE LINES SHALL NOT BE BENT INTO ANGLE STOP. 90° FITTINGS SHALL BE USED. REFERENCE THE APPROVED MATERIALS LIST FOR SPECIFIC PART NUMBERS.
14. WATER METERS SHALL BE LOCATED OUTSIDE OF STREET IMPROVEMENTS BUT WITHIN THE RIGHT-OF-WAY OR ADJACENT PUE.

DETAIL NO. G-3310	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	WATER SERVICE CONNECTIONS	DETAIL NO. G-3310





PLAN VIEW

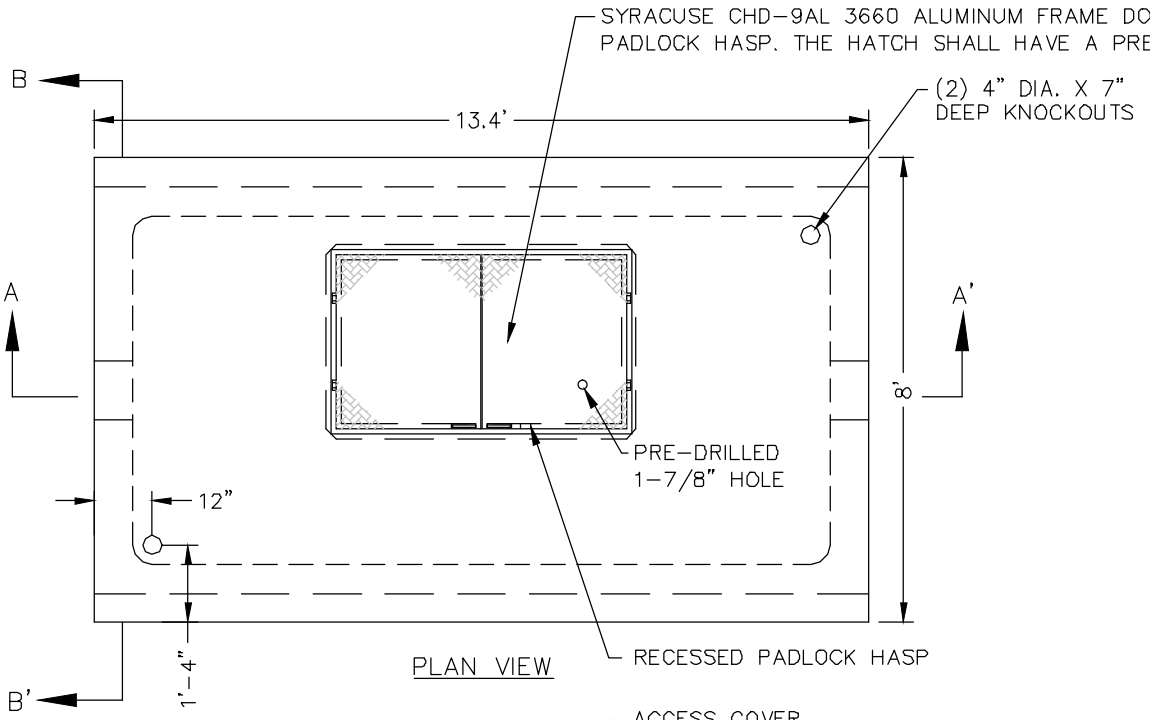


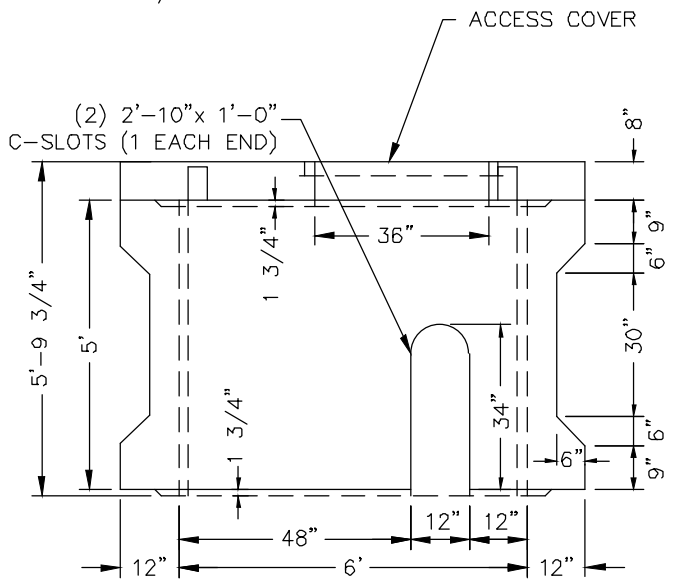
VAULT DIMENSIONS TABLE		
MAIN SIZE	4"	6"
(A)	11'-2"	13'-0"
(B)	5'-8"	7'-0"

NOTES:

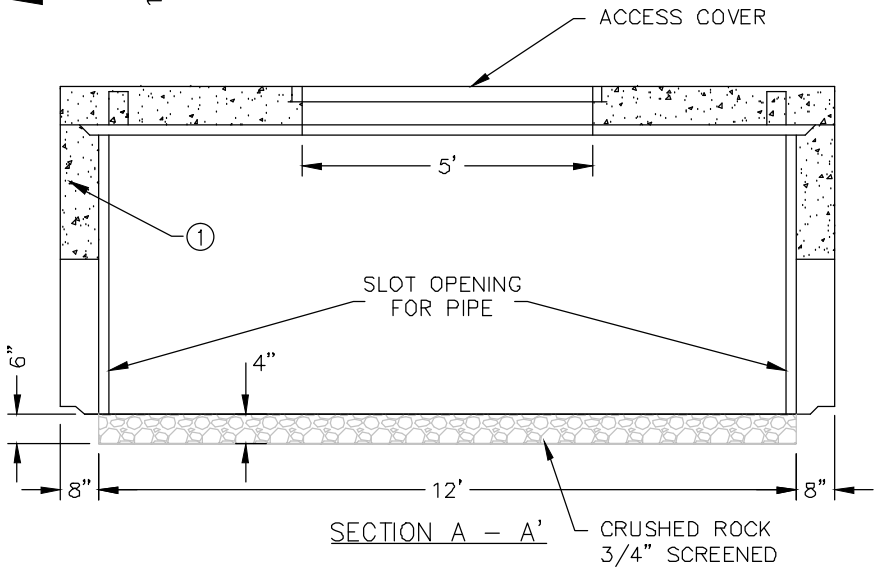
1. CONCRETE SHALL BE MAG CLASS A.
2. METER VAULTS MAY BE EITHER CAST-IN-PLACE OR PRE-CAST CONCRETE.
3. ALL FITTINGS SHALL BE FLANGED EXCEPT FOR 2" COPPER BYPASS. UNIFLANGE IS NOT ACCEPTABLE UNLESS APPROVED BY THE CITY ENGINEERING AND PUBLIC WORKS DEPARTMENTS. 2" COPPER BYPASS WILL BE JOINED WITH SILVER SOLDER EXCEPT AT 2" CORP. STOPS.
4. COVERS SHALL HAVE A SYRACUSE CHD-9AL 3660 ALUMINUM FRAME DOUBLE LEAF HATCH WITH RECESSED PADLOCK HASP. THE HATCH SHALL HAVE A PRE-DRILLED 1-7/8" METER READER HOLE.
5. ALL JOINTS SHALL BE SEALED USING CONSEAL CS-101 BUTYL RUBBER ROPE.

DETAIL NO. G-3313-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	4" & 6" WATER METER VAULTS	DETAIL NO. G-3313-1





SECTION B – B'



SECTION A – A'

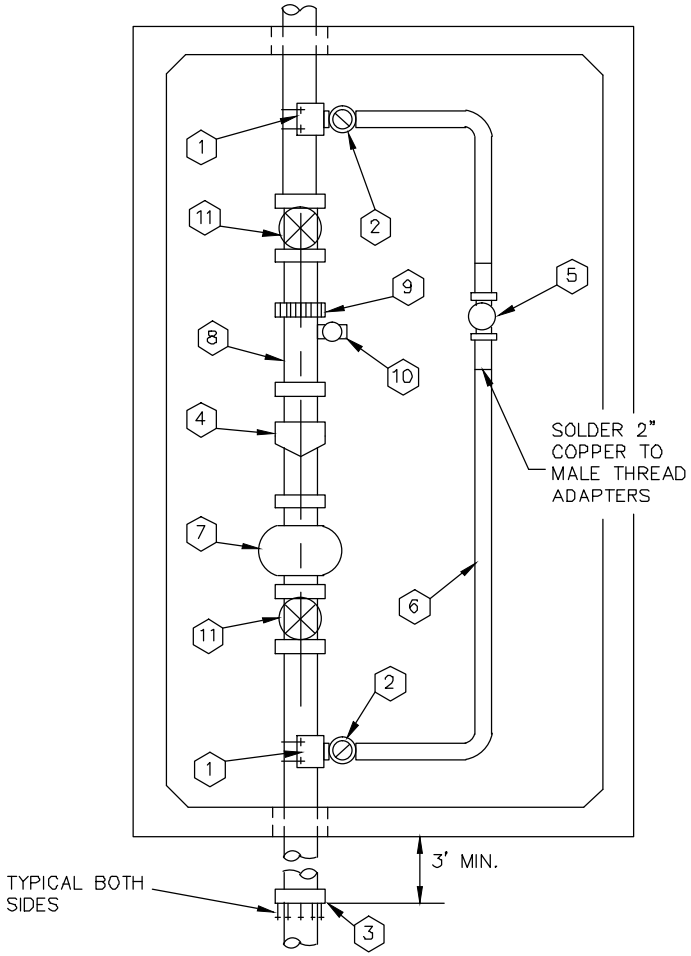
STRUCTURAL NOTES:

1. CONCRETE SHALL BE MAG CLASS A.
2. REBAR: ASTM A-615 GRADE 60.
3. MESH: ASTM A-185 GRADE 65.
4. DESIGN: ACI-318-99 BUILDING CODE ASTM C-857 "MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES".

GENERAL NOTES:

1) ALL JOINTS SHALL BE SEALED USING CONSEAL CS-101 BUTYL RUBBER ROPE.

DETAIL NO. G-3313-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	8" WATER METER VAULT	DETAIL NO. G-3313-2



COMPOUND/TURBOMETER

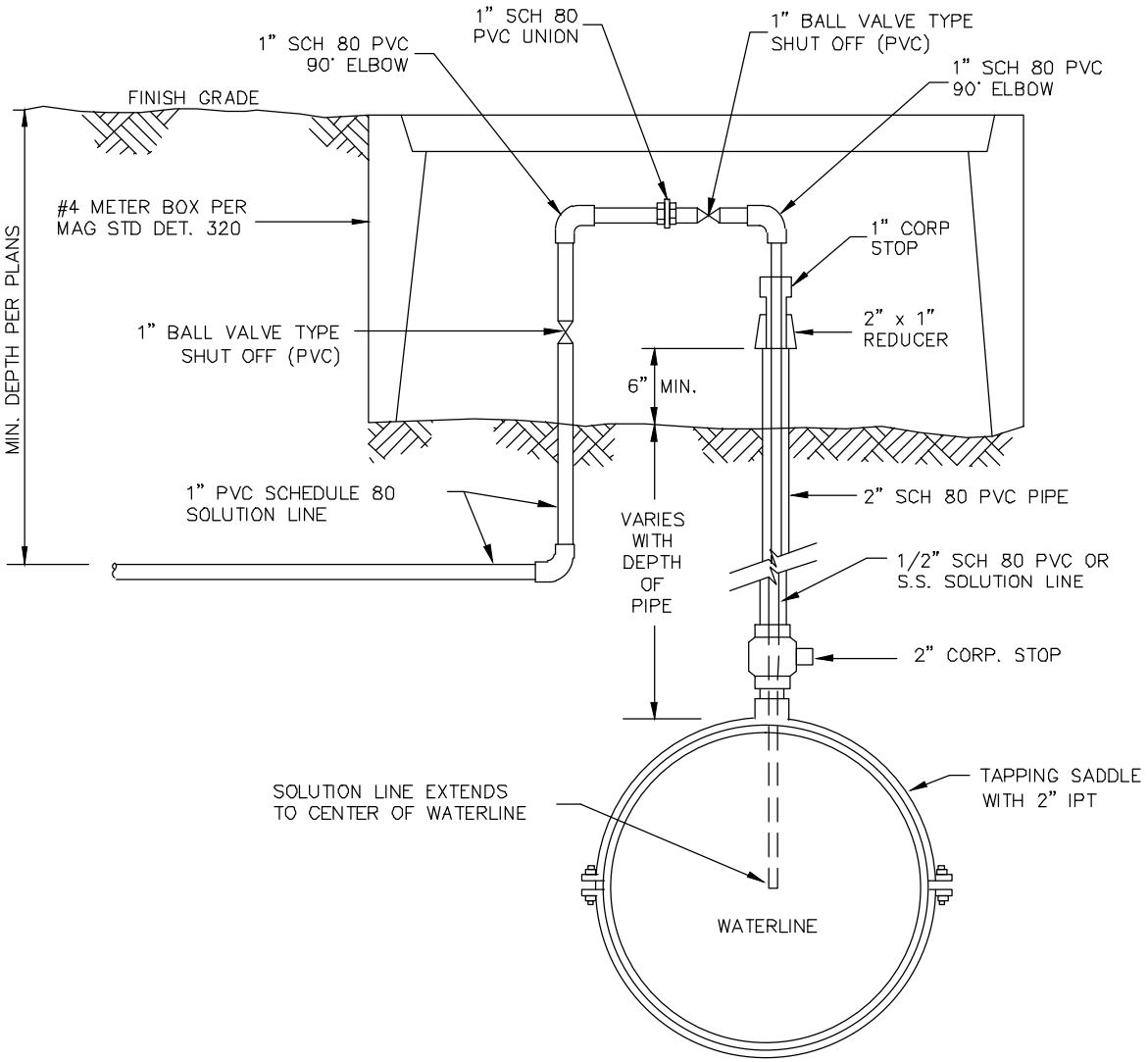
KEY NOTES

1. DOUBLE STRAP ALL BRONZE SERVICE SADDLES, OR FLANGED X FLANGED TEE WITH FLANGED X FLANGED VALVE FOR SIZES 4" OR LARGER.
2. CORP. STOP.
3. ADAPTER, FLANGED TO MECH. JOINT FOR A.C.P.
4. TURBOMETER OR COMPOUND METER.
5. BRONZE CHECK VALVE FOR 2" LINE, CAST IRON WITH COUNTERWEIGHT FOR 4" LINES AND LARGER. (SAME SIZE AS BY-PASS LINE).
6. 2" RIDGED TYPE "K" COPPER BY-PASS LINE, 4" OR LARGER TO BE DUCTILE IRON. NOT LESS THAN ONE PIPE SIZE SMALLER THAN METER IN NOTE 4.
7. STRAINER, SUPPLIED WITH METER.
8. FLANGED SPOOL (3 PIPE DIAMETERS IN LENGTH, MIN.).
9. PROVIDE RESTRAINED FLEX COUPLING ADAPTERS (RFCA) FOR ALL LINES 4" OR LARGER.
10. 2" THREADED OUTLET AND BALL VALVE NOT NEEDED IF VERTICAL TEST VALVE IS PROVIDED ON METER.
11. RESILIENT WEDGE GATE VALVE, FLANGED, WITH HAND WHEEL, OPEN LEFT, WITH NON-RISING STEM.

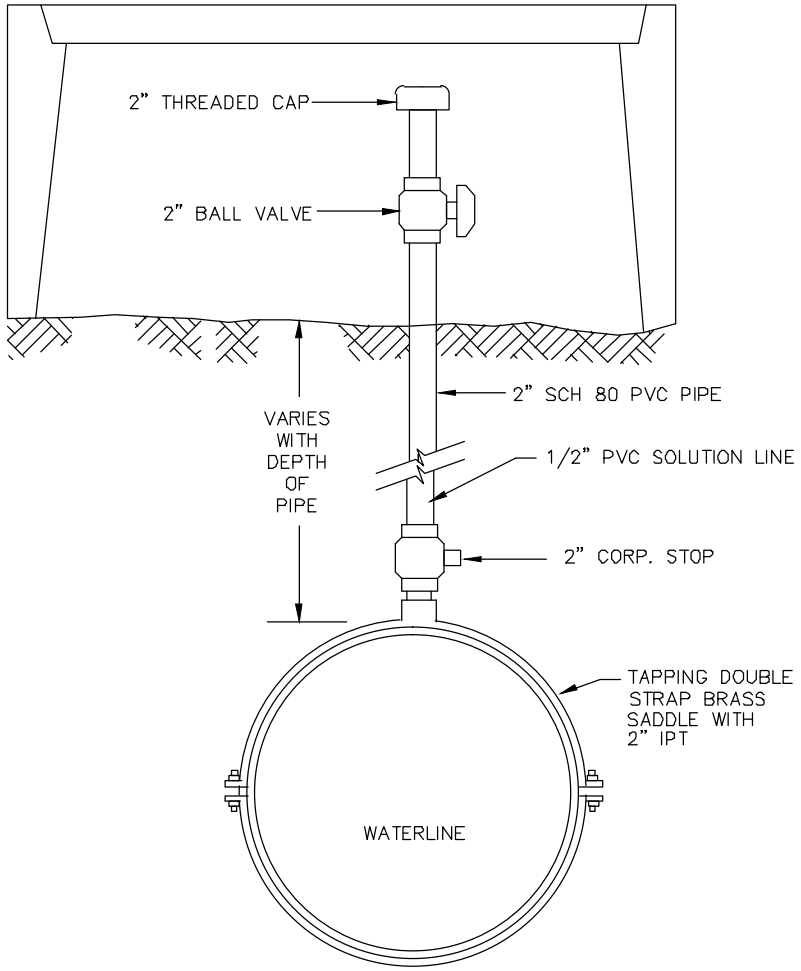
NOTES:

1. THE DESIGN OF 4" METERS OR METERS LARGER THAN 8" MAY REQUIRE ADDITIONAL INFORMATION FROM THE CITY. CONTACT THE CITY PUBLIC WORKS DEPARTMENT PRIOR TO BEGINNING DESIGN WORK.
2. INSTALLATION OF A REMOTE READING DEVICE TO BE REQUIRED AS DIRECTED BY THE PUBLIC WORKS DEPARTMENT.
3. AN APPROVED BACKFLOW PREVENTION ASSEMBLY SHALL BE REQUIRED DOWNSTREAM OF THE WATER METER. CONTACT PUBLIC WORKS, BACKFLOW PREVENTION FOR SPECIFIC INFORMATION.

DETAIL NO. G-3313-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	4", 6", & 8" WATER METERS	DETAIL NO. G-3313-3



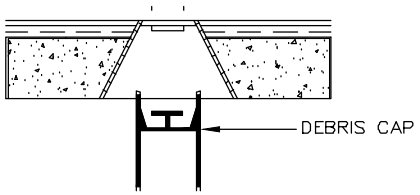
CHLORINE INJECTION ASSEMBLY



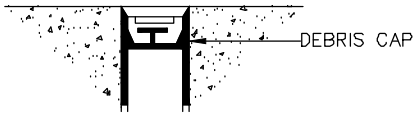
TAP FOR FUTURE CHLORINE INJECTION ASSEMBLY

NOTE:
SPECIFICATIONS ON ALL FITTINGS SHALL EXCEED THE MAXIMUM PRESSURES OF THE SYSTEM.

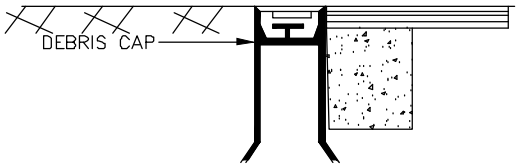
DETAIL NO. G-3316	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	CHLORINE INJECTIONS ASSEMBLY FOR UNDERGROUND WATERLINES	DETAIL NO. G-3316



TYPE "A"



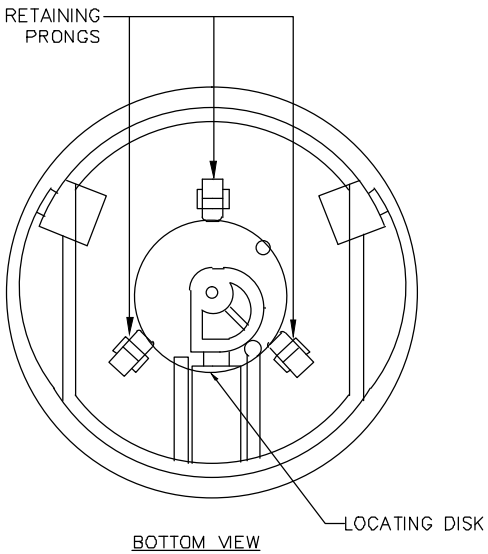
TYPE "B"



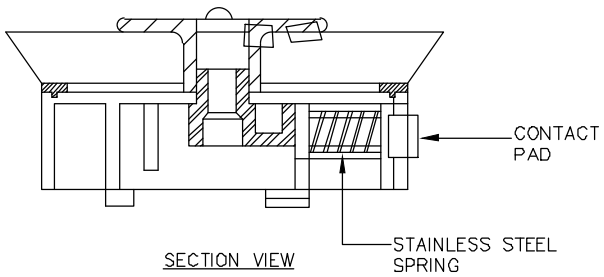
TYPE "C"

NOTES

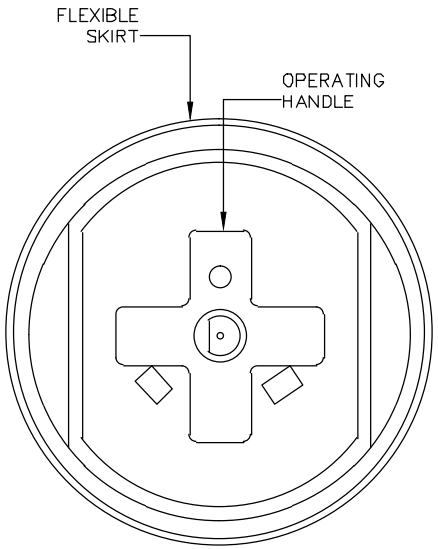
1. DEBRIS CAP SHALL BE INSTALLED AS CLOSE UNDER THE CAST IRON COVER WITHOUT INTERFERING WITH COVER OPERATION.
2. THE DEBRIS CAPS SHALL BE PROVIDED AS IDENTIFIED IN THE APPROVED MATERIALS LIST.
3. THE DEBRIS CAP SHALL BE COMPRISED OF A HOLLOW MEMBER HAVING A CYLINDRICAL OUTER SURFACE, A CLOSURE FOR ONE END, AND THREE-POINT RESILIENT CONTACT PADS PROJECTING FROM THE OUTER SURFACE. THE CAP SHALL HAVE A FLEXIBLE SKIRT PROVIDING AN OUTWARD SEAL PREVENTING DEBRIS FROM GETTING PAST THE CAP. THE CAP MUST WITHSTAND, WITHOUT SLIPPAGE, A MINIMUM VERTICAL FORCE OF 50 POUNDS, AT A LOADING RATE OF 1.0 INCHES/MINUTE. THE CAP SHALL HAVE RETAINING PRONGS TO RETAIN A STANDARD LOCATING COIL.
4. THE CAP SHALL BE MOLDED PER THE APPROVED MATERIALS LIST.



BOTTOM VIEW

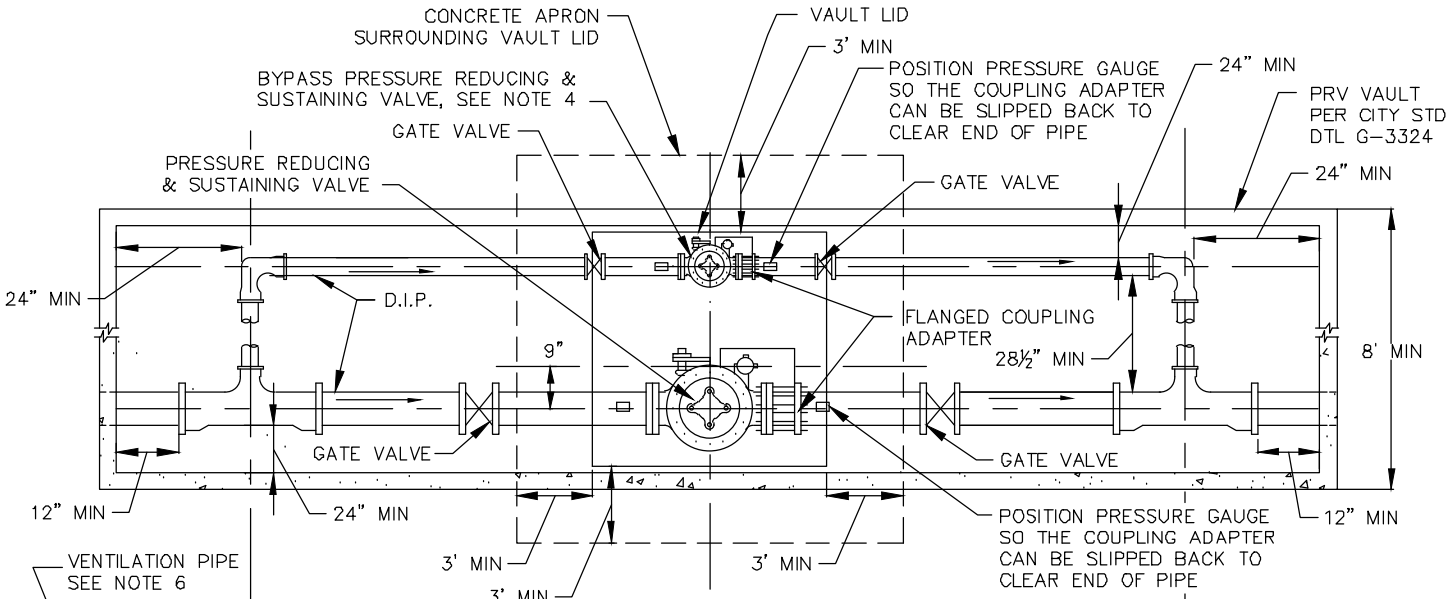


SECTION VIEW

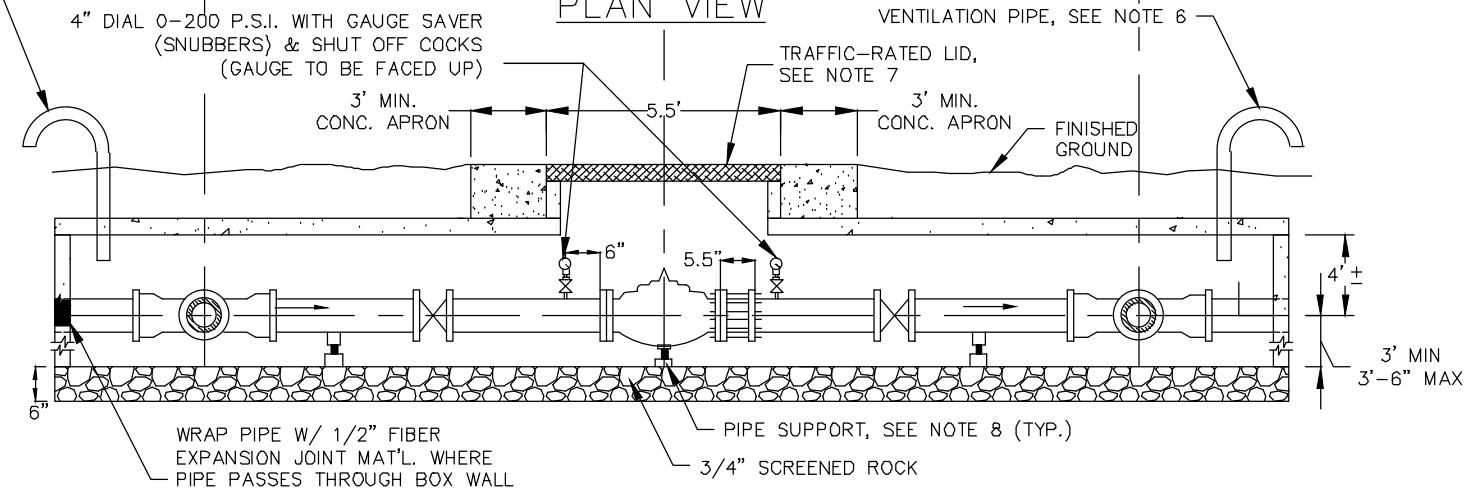


TOP VIEW

DETAIL NO. G-3321	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	DEBRIS CAP INSTALLATION	DETAIL NO. G-3321



PLAN VIEW

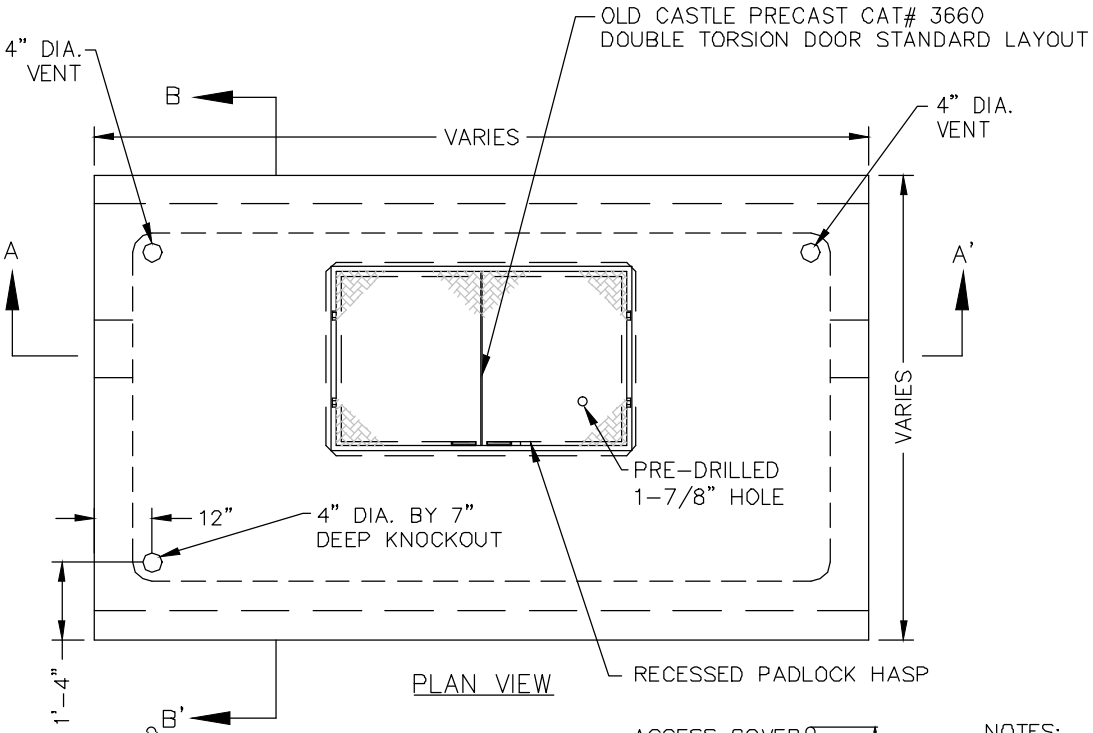


SECTION

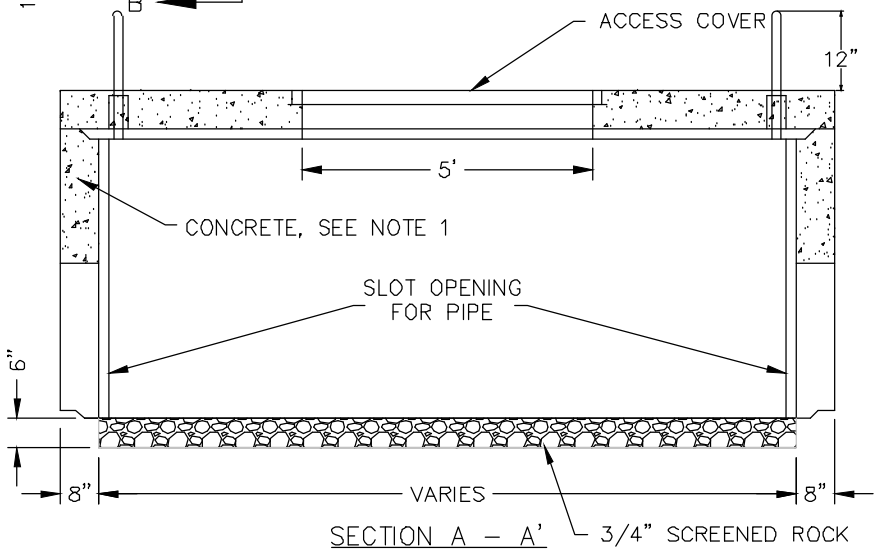
NOTES:

1. VALVE SHALL BE IRON BODY, EPOXY-COATED IN AND OUT, CLASS 150, FLANGED ENDS, HYDRAULICALLY OPERATED, PILOT CONTROLLED, DIAPHRAGM TYPE, GLOVE PATTERNED VALVE. IT SHALL BE TREATED AT 175 P.S.I. MINIMUM PRESSURE.
2. MANUFACTURER'S NAME, YEAR OF MANUFACTURE, SIZE OF VALVE, AND GUARANTEED WORKING PRESSURE SHALL BE ENGRAVED ON THE VALVE OR A NAME PLATE ATTACHED TO THE VALVE.
3. VALVE SHALL BE OPERATED BY A CONTROL SYSTEM WHICH INCLUDES PILOT CONTROLS FOR PRESSURE REDUCING AND SUSTAINING. BOTH PILOT CONTROLS SHALL BE FIELD ADJUSTABLE FOR ANY PRESSURE IN THE RANGE OF 50 TO 150 P.S.I.
4. A REDUCED SIZE VALVE AND BYPASS LINE TO BE INSTALLED FOR THE PURPOSE OF MAINTAINING FLOW AROUND THE MAIN VALVE DURING MAINTENANCE. VALVE AND LINE TO BE SIZED AS SPECIFIED BY THE PUBLIC WORKS AND ENGINEERING DEPARTMENTS.
5. ALL LINES SHALL BE D.I.P. AND CONNECTIONS SHALL EITHER BE FLANGED OR MECHANICALLY RESTRAINED JOINTS.
6. VENTILATION PIPE – SEE DETAIL G-3324 FOR ADDITIONAL INFORMATION.
7. TRAFFIC-RATED LID – SEE DETAIL G-3324 FOR ADDITIONAL INFORMATION.
8. PIPE SUPPORTS SHALL REST ON A 1' X 1' X 6" THICK CONCRETE BASE.
9. LARGE PRV MUST BE CENTERED UNDER ACCESS LID SO THAT PRV CAN BE LIFTED THROUGH HATCH WITH NO DEFLECTION.
10. VAULT MUST BE INSTALLED IN RIGHT OF WAY AND NOT IN ANY ROADWAY.

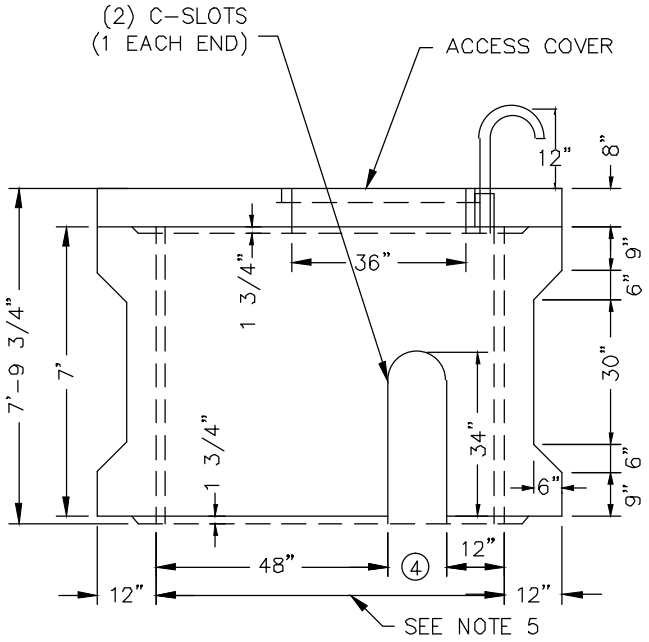
DETAIL NO. G-3323	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	PRESSURE REDUCING VALVE	DETAIL NO. G-3323



PLAN VIEW



SECTION A – A'

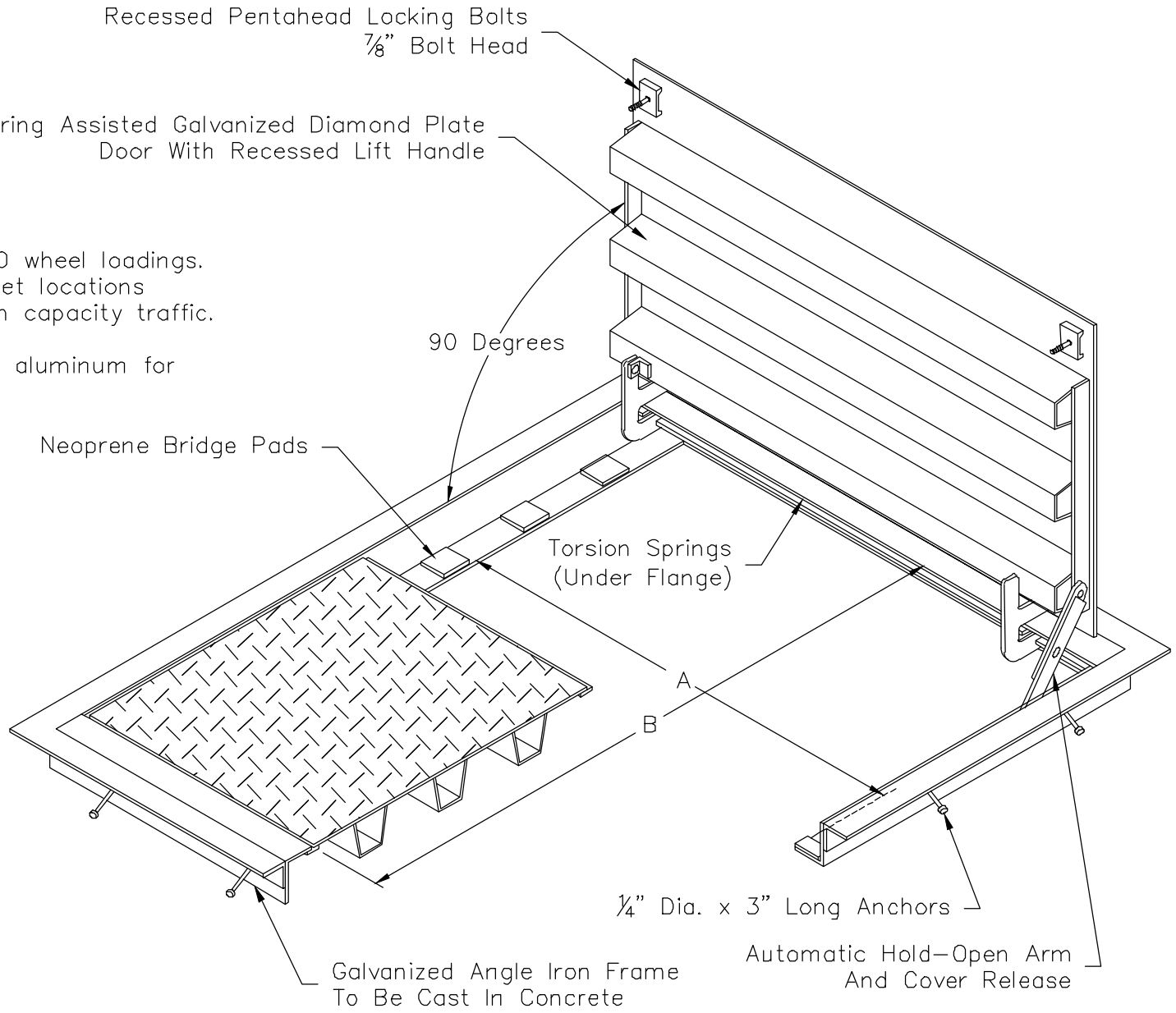


SECTION B – B'

NOTES:

1. CONCRETE: CLASS A PER MAG STANDARDS.
2. REBAR: ASTM A-615 GRADE 60.
3. MESH: ASTM A-185 GRADE 65.
4. WIDTH SHALL BE 12 INCHES MINIMUM. WIDTH FOR PIPE DIAMETERS GREATER THAN 6 INCHES SHALL EQUAL THE PIPE DIAMETER PLUS 6 INCHES.
5. WIDTH SHALL BE 8 FEET MINIMUM. WIDTH MAY INCREASE AS REQUIRED BY THE CITY ENGINEERING AND PUBLIC WORKS DEPARTMENTS.
6. ALL VAULTS SHALL BE LOCATED OFF THE ROADWAY. 2-4 INCH GALVANIZED VENTS WITH WIRE MESH ON EACH END SHALL BE INSTALLED.
7. DESIGN: ACI-318-99 BUILDING CODE ASTM C-857 "MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES".
8. ALL JOINTS SHALL BE SEALED USING CONSEAL CS-101 BUTYL RUBBER ROPE.

DETAIL NO. G-3324-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	PRESSURE REDUCING VALVE VAULT	DETAIL NO. G-3324-1



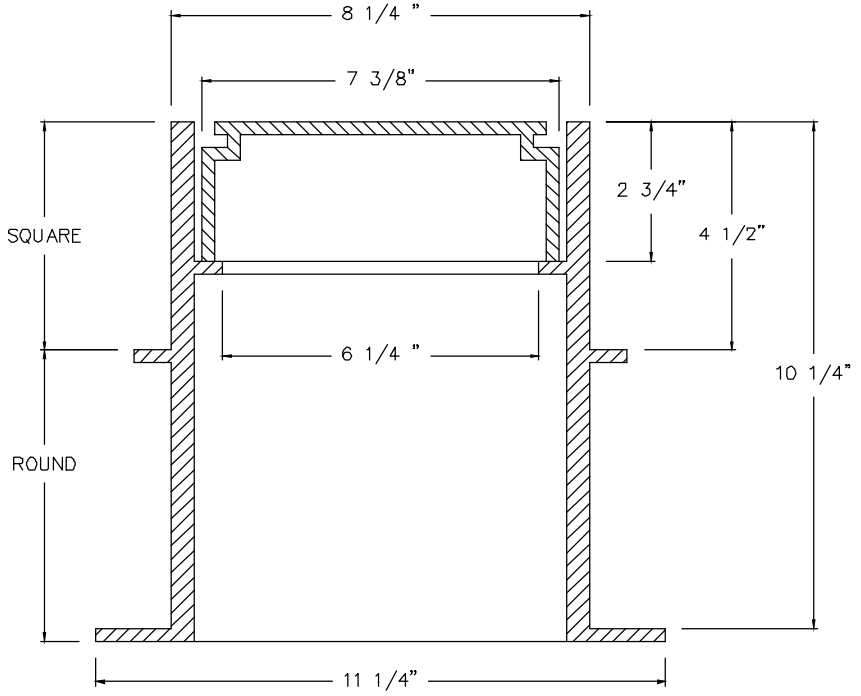
NOTE:
Designed to withstand H-20 wheel loadings.
Suitable for use in off-street locations
where not subjected to high capacity traffic.

* These sized are available in aluminum for pedestrian traffic only.

DIMENSIONS	
A	B
36"	60"

DETAIL NO. G-3324-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	PROPOSED PRV VAULT LID DETAIL	DETAIL NO. G-3324-2

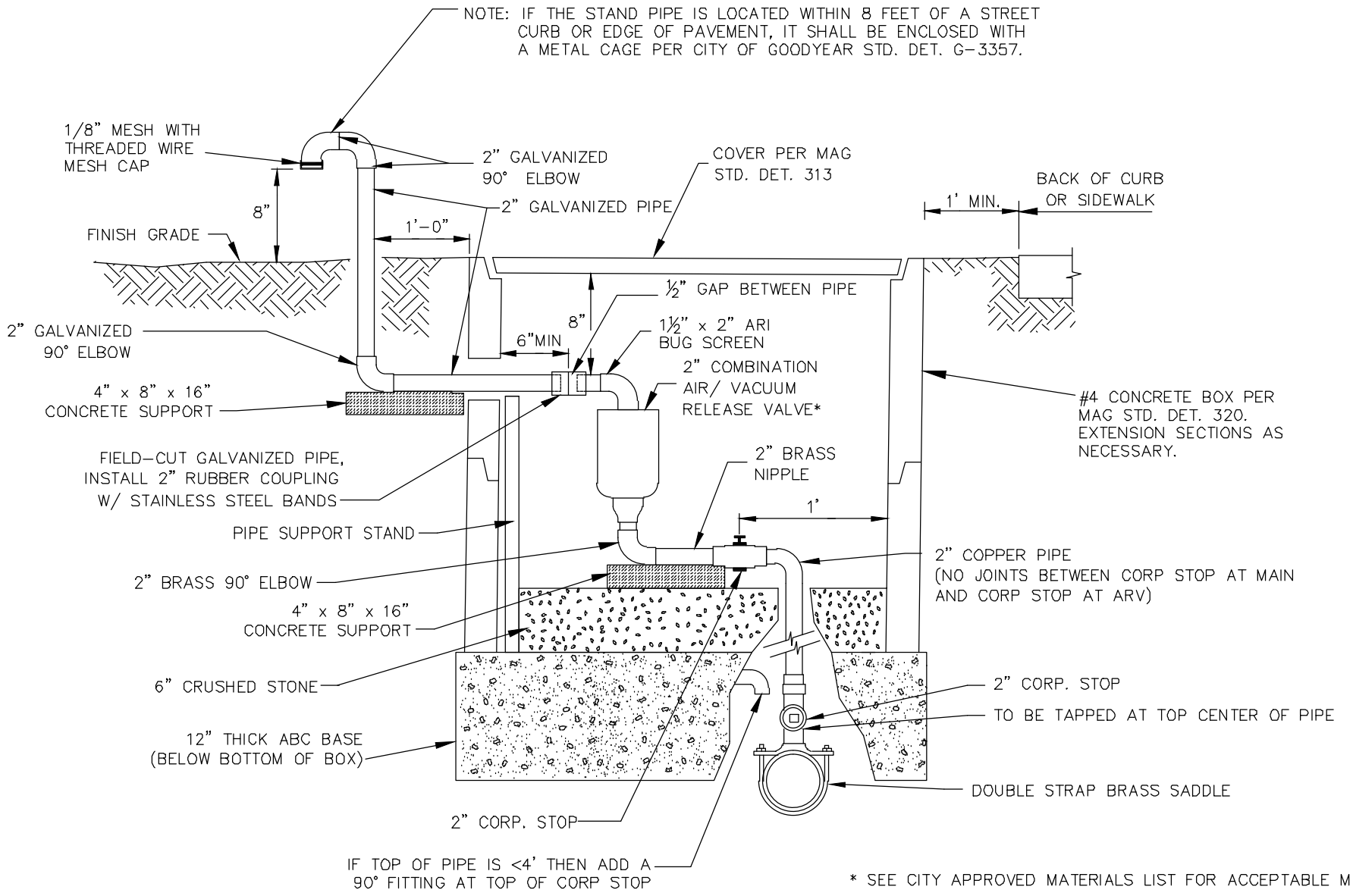




NOTES

1. THIS VALVE BOX IS DESIGNED TO FIT OVER 6" DIAMETER PIPE OR ATOP 8" DIAMETER PIPE.
2. EACH LID IS CAST WITH TWO PICK POCKETS SET 180 DEGREES APART.
3. A MAG CLASS "AA" CONCRETE APRON SHALL BE USED SURROUNDING THE LID.
4. ALL RECLAIMED WATER VALVE BOXES AND VALVE BOX LIDS SHALL BE PAINTED PURPLE IN COLOR.

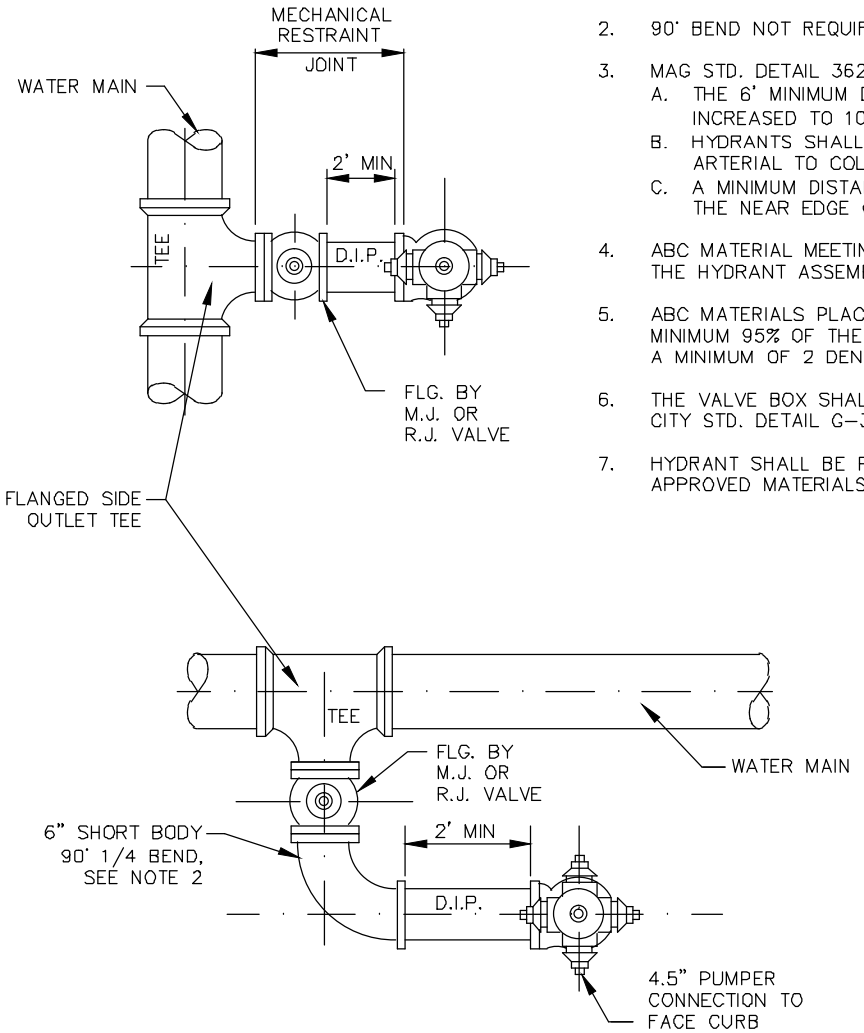
DETAIL NO. G-3325	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	RECLAIMED WATER VALVE BOX AND LID	DETAIL NO. G-3325

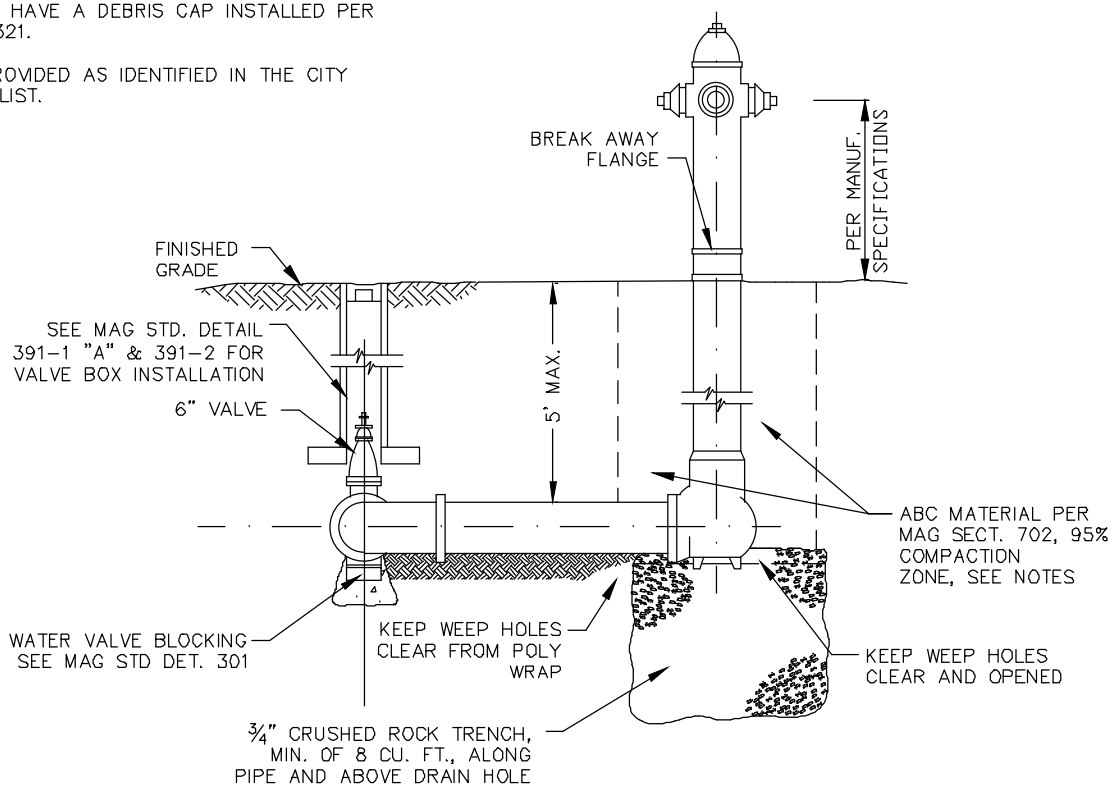


DETAIL NO. G-3328	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	2" AIR/VACUUM RELEASE VALVE	DETAIL NO. G-3328

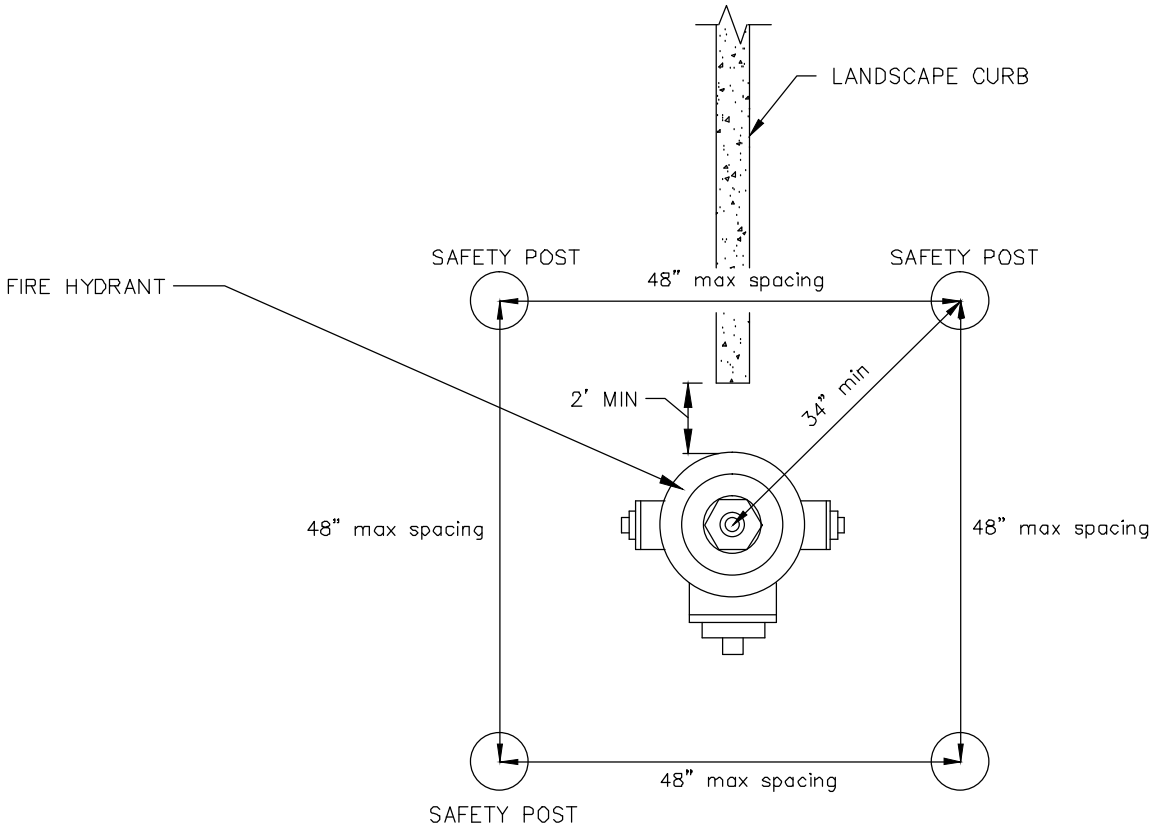
NOTES:

1. ALL JOINTS BETWEEN THE VALVE AND THE MAIN SHALL BE FLANGED TYPE. JOINTS BETWEEN THE VALVE AND HYDRANT SHALL BE RESTRAINT TYPE.
2. 90° BEND NOT REQUIRED IF SUFFICIENT ROOM FOR PERPENDICULAR INSTALLATION.
3. MAG STD. DETAIL 362 SHALL BE USED FOR LOCATING HYDRANTS WITH THE FOLLOWING MODIFICATIONS:
   A. THE 6' MINIMUM DISTANCE FROM THE P.T. OR P.C. OF THE CURB RETURN TO THE STANDARD LOCATION SHALL BE INCREASED TO 10'.
   B. HYDRANTS SHALL NOT BE LOCATED WITHIN THE CURB RETURN (ALTERNATIVE LOCATION) AT ARTERIAL TO ARTERIAL OR ARTERIAL TO COLLECTOR ROAD INTERSECTIONS.
   C. A MINIMUM DISTANCE OF 2' SHALL BE MAINTAINED FROM THE BACK OF CURB TO THE CENTER OF HYDRANT AND FROM THE NEAR EDGE OF SIDEWALK TO THE CENTER OF HYDRANT.
4. ABC MATERIAL MEETING THE REQUIREMENTS OF MAG SECTION 702 SHALL BE USED FOR PIPE BEDDING FROM THE TEE TO THE HYDRANT ASSEMBLY AND AS BACKFILL AROUND THE HYDRANT.
5. ABC MATERIALS PLACED IN AND AROUND HYDRANTS SHALL BE COMPACTED TO A MINIMUM 95% OF THE MAXIMUM DENSITY AS DETERMINED BY A STANDARD PROCTOR. A MINIMUM OF 2 DENSITY TESTS SHALL BE RECORDED AROUND EACH HYDRANT.
6. THE VALVE BOX SHALL HAVE A DEBRIS CAP INSTALLED PER CITY STD. DETAIL G-3321.
7. HYDRANT SHALL BE PROVIDED AS IDENTIFIED IN THE CITY APPROVED MATERIALS LIST.





DETAIL NO. G-3330	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	FIRE HYDRANT INSTALLATION	DETAIL NO. G-3330

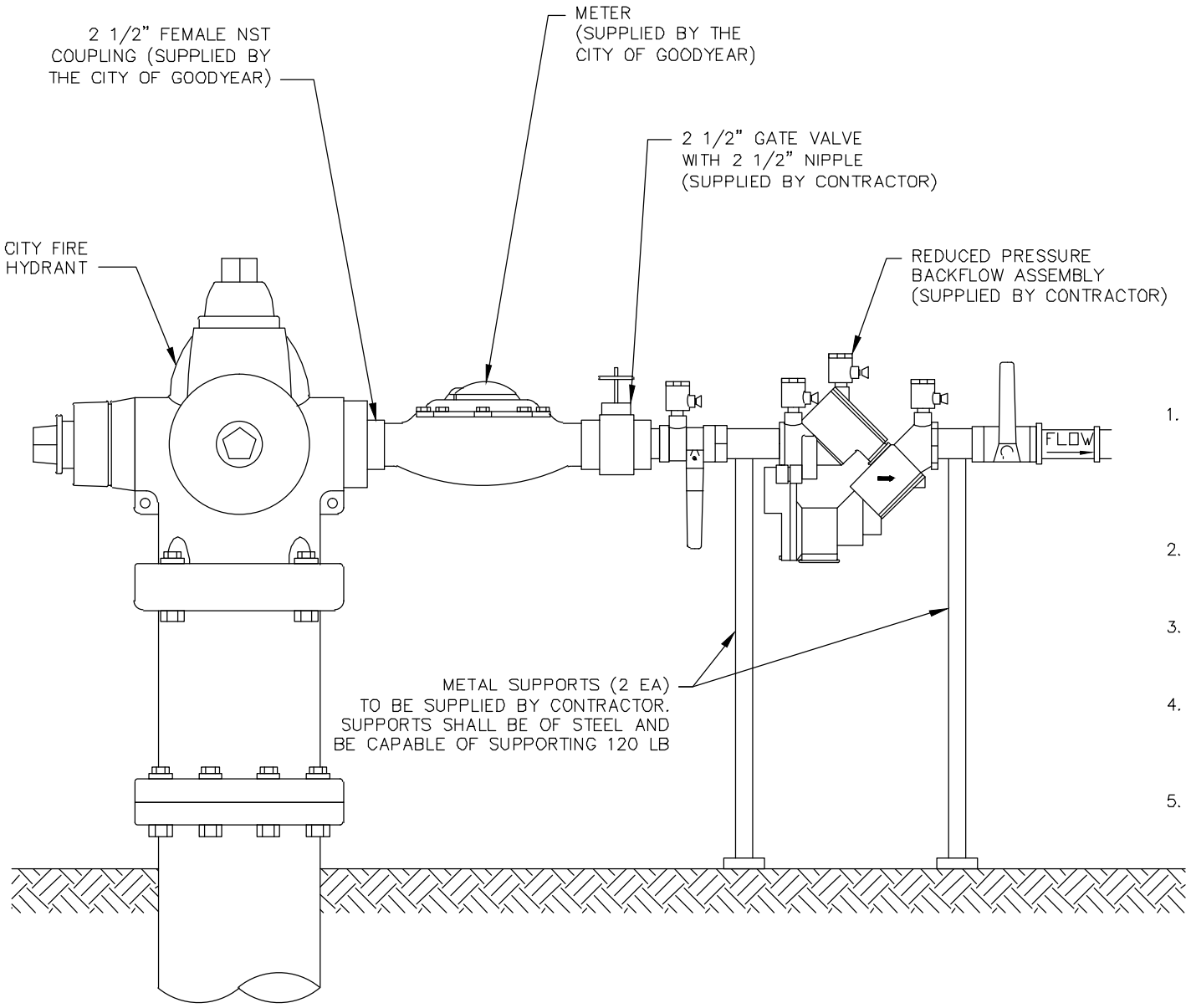


SAFETY POSTS PER
MAG STD. DET. 140
Modified PER IFC SEC
312.2

NOTE:

1. SAFETY POSTS ARE NOT REQUIRED IN ALL SITUATIONS.
2. SAFETY POSTS ARE REQUIRED WHEN NO CURB IS PRESENT OR AS DIRECTED BY THE PUBLIC WORKS AND ENGINEERING DEPARTMENTS. SAFETY POSTS WILL NOT BE INSTALLED IN CITY RIGHT-OF-WAY.
3. CONSTRUCTION SHALL COMPLY WITH IFC SECTION 312.2

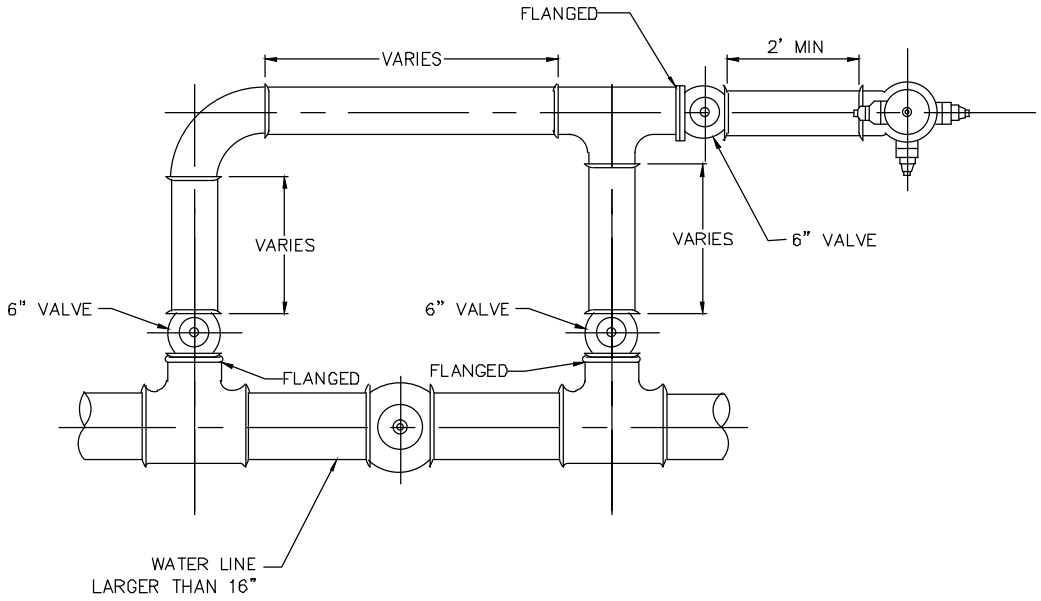
DETAIL NO. G-3332	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	HYDRANT SAFETY POSTS	DETAIL NO. G-3332



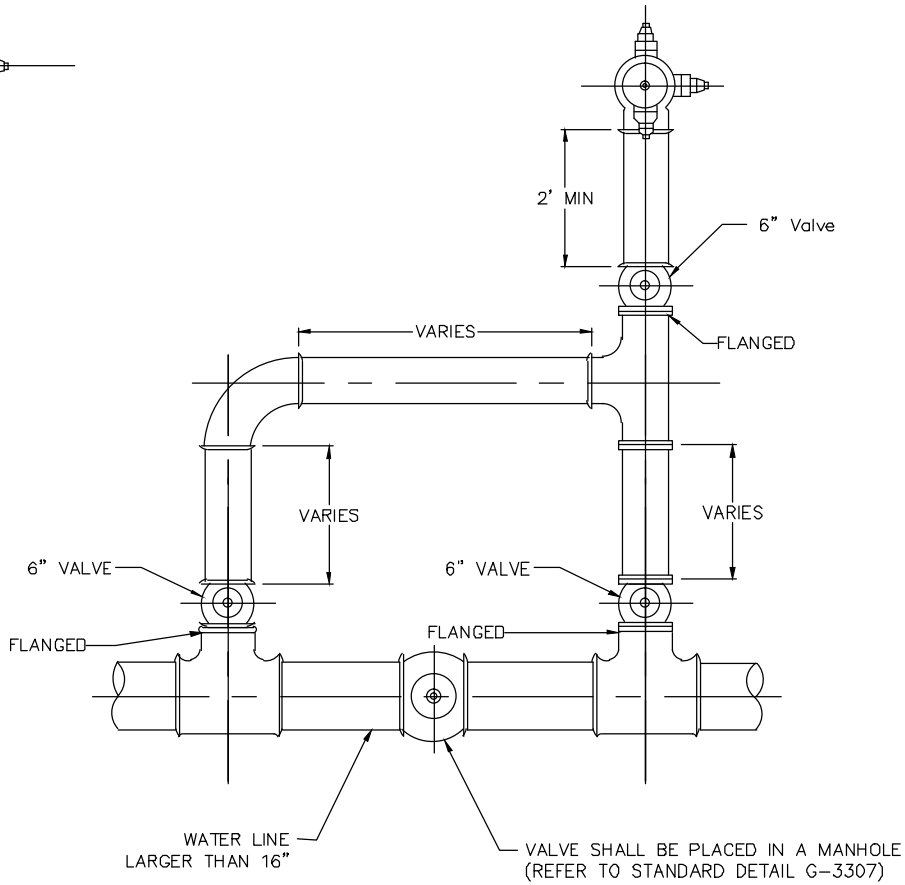
GENERAL NOTES

1. BACKFLOW ASSEMBLY SHALL BE TESTED BY A CERTIFIED BACKFLOW ASSEMBLY TESTER AND TESTING INFORMATION SUBMITTED TO THE CITY PRIOR TO USE AND ALSO EACH TIME THE METER IS MOVED.
2. USER SHALL REMOVE THE BACKFLOW ASSEMBLY WHEN THE HYDRANT METER IS REMOVED OR RELOCATED.
3. USER IS LIABLE FOR ANY DAMAGE TO THE HYDRANT AND ALL ATTACHMENTS TO THE HYDRANT.
4. USER SHALL USE THE BACKFLOW ASSEMBLY GATE VALVE TO CONTROL FLOW OF WATER, NOT THE HYDRANT VALVE ASSEMBLY.
5. REQUIRED ON ALL INSTALLATIONS TO POTABLE SYSTEM.

DETAIL NO. G-3334	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TEMPORARY WATER SUPPLY HYDRANT METER ASSEMBLY	DETAIL NO. G-3334



FIRE HYDRANT PARALLEL TO MAIN LINE



FIRE HYDRANT PERPENDICULAR TO MAIN LINE

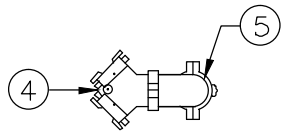
NOTES:

1. THIS DETAIL APPLIES TO WATER LINES WITH DIAMETERS GREATER THAN 16 INCHES OR AS REQUIRED BY THE CITY WATER RESOURCES AND ENGINEERING DEPARTMENTS.
2. ALL JOINTS IN HYDRANT RUN-OUT SHALL BE MECHANICAL RESTRAINT JOINTS.
3. SEE MAG STD. DETAIL 391-1 "A" & 391-2 FOR VALVE BOX INSTALLATION.
4. FOR WATER VALVE BLOCKING SEE MAG STD. DETAIL 301.
5. FOR ADDITIONAL INFORMATION SEE CITY STD. DETAIL G-3330.
6. THE VALVE BOX SHALL HAVE A DEBRIS CAP INSTALLED PER CITY STD. DETAIL G-3321.

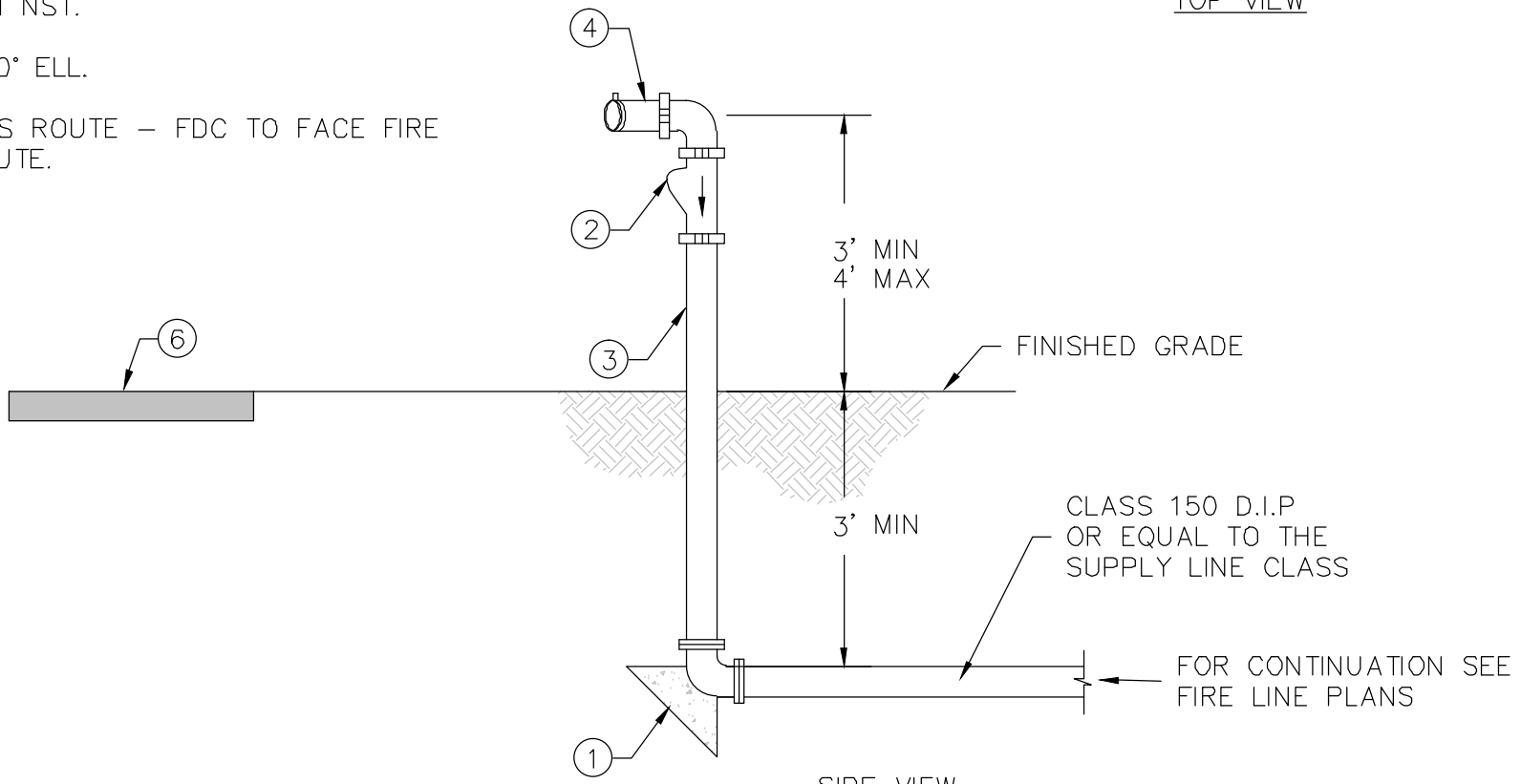
DETAIL NO. G-3336	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	FIRE HYDRANT BYPASS ASSEMBLY (FOR LINES > 16")	DETAIL NO. G-3336

NOTES:

1. THRUST BLOCKING PER MAG STD. DETAIL 380.
2. APPROVED CHECK VALVE.
3. 4" WRAPPED STEEL PIPE PER FIRE CODE OR EQUAL TO THE SUPPLY LINE CLASS.
4. 2-1/2" x 2-1/2" x 4" FIRE DEPARTMENT CONNECTION NST.
5. GROOVED 90° ELL.
6. FIRE ACCESS ROUTE – FDC TO FACE FIRE ACCESS ROUTE.



TOP VIEW

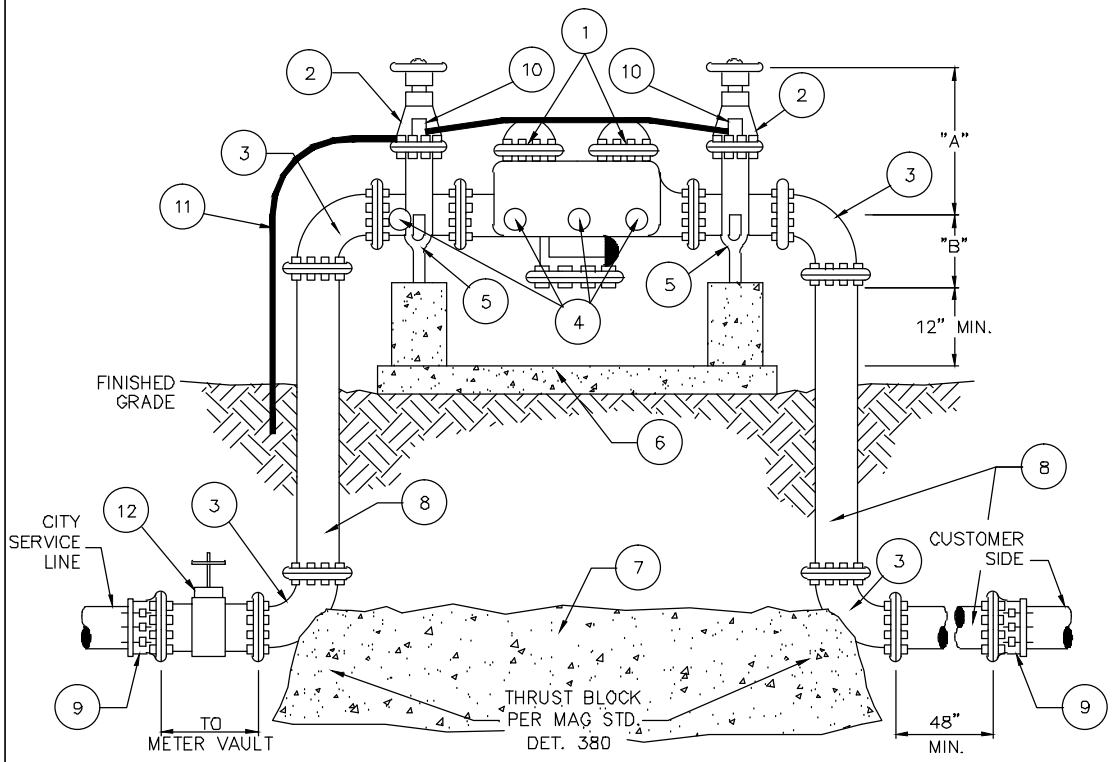


SIDE VIEW

DETAIL NO. G-3338	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	FIRE DEPARTMENT CONNECTION	DETAIL NO. G-3338

"A"	
ASSEMBLY SIZE	APPROX. DIMENSION
3"	14"
4"	16"–(22" OS&Y)
6"	20"–(30" OS&Y)
8"	25"–(40" OS&Y)
10"	29"–(48" OS&Y)
12"	32"–(56" OS&Y)

"B"	
ASSEMBLY SIZE	APPROX. DIMENSION
3"	10"
4"	11"
6"	12"
8"	22"
10"	23"
12"	24"



REDUCED PRESSURE PRINCIPLE DEVICE

OS&Y = OUTSIDE SCREW & YOKE

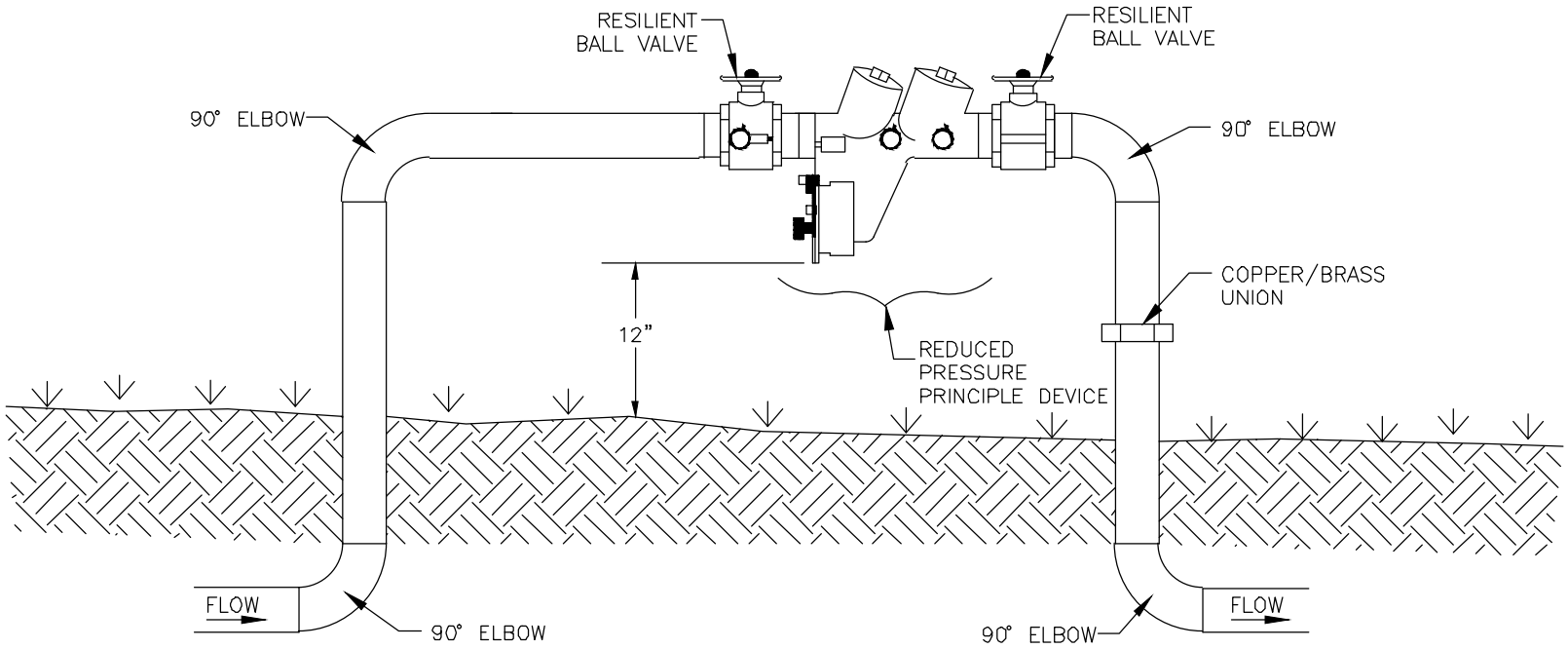
NOTES

1. ASSEMBLY SHALL BE APPROVED BY USC FOUNDATION FOR CROSS–CONNECTION AND HYDRAULIC RESEARCH.
2. SEE THE CITY'S "POTABLE WATER SYSTEM APPROVED MATERIALS LIST" FOR APPROVED MANUFACTURERS AND MODEL INFORMATION.
3. FOUR TEST COCKS TO BE INSTALLED PER USC.
4. COPPER FITTINGS SHALL BE CONNECTED WITH LEAD–FREE SOLDER JOINTS.
5. FINISHED GRADE BELOW BACKFLOW PREVENTER SHALL BE 95% COMPACTION.
6. THE ASSEMBLY SHALL BE PAINTED TO BLEND WITH LANDSCAPE SURFACE TREATMENT OR ONSITE STRUCTURES. THE ASSEMBLY MAY ALSO BE SCREENED WITH SHRUBBERY. VEGETATION SHALL BE A MINIMUM OF 24" FROM THE OUTSIDE FACE OF ANY PORTION OF THE BACKFLOW PREVENTION DEVICE.
7. ADEQUATE DRAINAGE FOR SURFACE WATER IS REQUIRED.
8. ASSEMBLY MAY BE REQUIRED TO BE PROTECTED BY GUARD POSTS. GUARD POSTS SHALL BE CONSTRUCTED PER CITY STD. DET. G–3358.

LIST OF MATERIALS

1	APPROVED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICE.
2	GATE VALVE, RESILIENT SEATED (NON–RISING STEM) (O.S.&Y. REQUIRED ON FIRE LINES).
3	90° ELL (FLANGED D.I.P. 3" THROUGH 12").
4	TEST COCK, RESILIENT SEATED (4 REQUIRED) FIT WITH BRASS PLUG.
5	ADJUSTABLE PIPE SUPPORT PERMANENTLY ATTACHED TO BASE (4" AND LARGER ASSEMBLY ONLY).
6	CONCRETE SUPPORT PAD 4" THICK BY 18" WIDE MINIMUM BENEATH 4" AND LARGER ASSEMBLIES. (CLASS "A" CONCRETE)
7	EXTEND CONCRETE BETWEEN THRUST BLOCKS.
8	PIPE SPOOL (FLANGED D.I.P. 3" THRU 12").
9	FLANGED ADAPTER (WHEN REQUIRED).
10	TAMPER SWITCH (ON FIRE LINE ONLY, OPTIONAL).
11	ELECTRICAL CONDUIT FOR TAMPER SWITCH.
12	GATE VALVE (FLANGE X FLANGE). MATCH LINE SIZE.

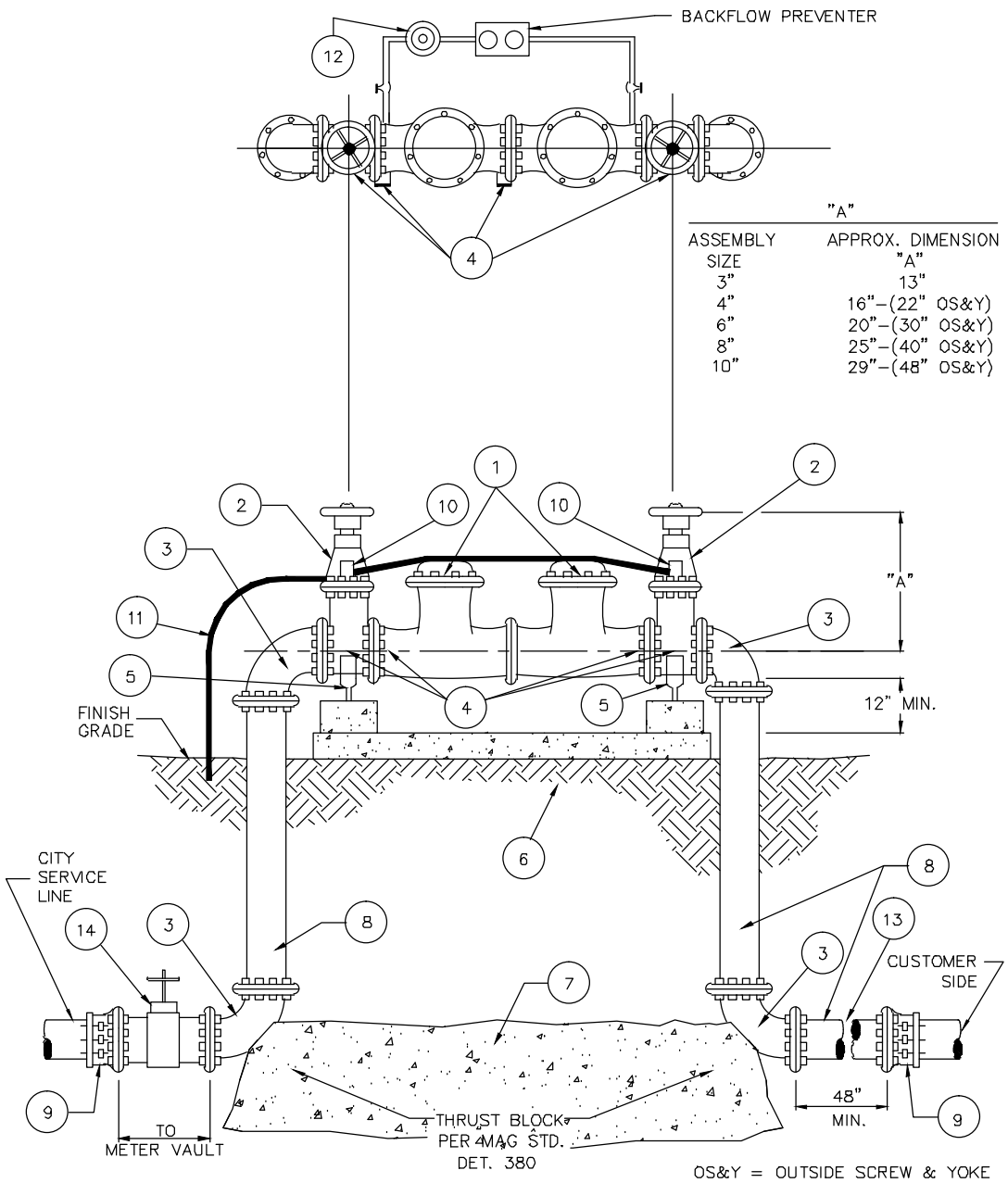
DETAIL NO. G-3350	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY INSTALLATION - 3" AND LARGER	DETAIL NO. G-3350



NOTES:

1. ALL PIPE/FITTINGS TO BE TYPE "K" COPPER.
2. REFER TO THE CITY OF GOODYEAR "POTABLE WATER SYSTEM APPROVED MATERIALS LIST" FOR APPROVED BACKFLOW PREVENTION ASSEMBLIES.
3. BACKFLOW PREVENTION ASSEMBLY MUST BE LEVEL AND INSTALLED A MINIMUM AND A MAXIMUM OF 12 INCHES FROM ASSEMBLY BODY TO FINAL GRADE.
4. ALL TEST COCKS SHALL BE FITTED WITH BRASS PLUGS INSTALLED WITH TEFLON TAPE.
5. SHUTOFF VALVES TO BE RESILIENT BALL TYPE WITH REMOVABLE HANDLES.
6. INSTALL BACKFLOW PREVENTION ASSEMBLY WITH RELIEF PORT FACING TOWARD THE GROUND.
7. COMPRESSION TYPE FITTINGS ARE NOT ALLOWED.
8. INSTALL THE BACKFLOW PREVENTION ASSEMBLY IMMEDIATELY DOWNSTREAM OF THE CITY WATER METER.
9. A COPPER/BRASS UNION MUST BE INSTALLED IN THE MIDDLE OF THE DOWNSTREAM RISER.
10. ASSEMBLY SHALL BE APPROVED BY USC FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH.
11. COPPER FITTINGS SHALL BE CONNECTED WITH LEAD-FREE SOLDER JOINTS.
12. PAVER CONCRETE BLOCK UNDER RELIEF PORT, SET AT FINAL GRADE.
13. ASSEMBLIES SHALL HAVE A SECURITY ENCLOSURE AS SHOWN ON CITY STD. DET. G-3357, OR APPROVED EQUAL.

DETAIL NO. G-3351	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY INSTALLATION - 2.5" AND UNDER	DETAIL NO. G-3351



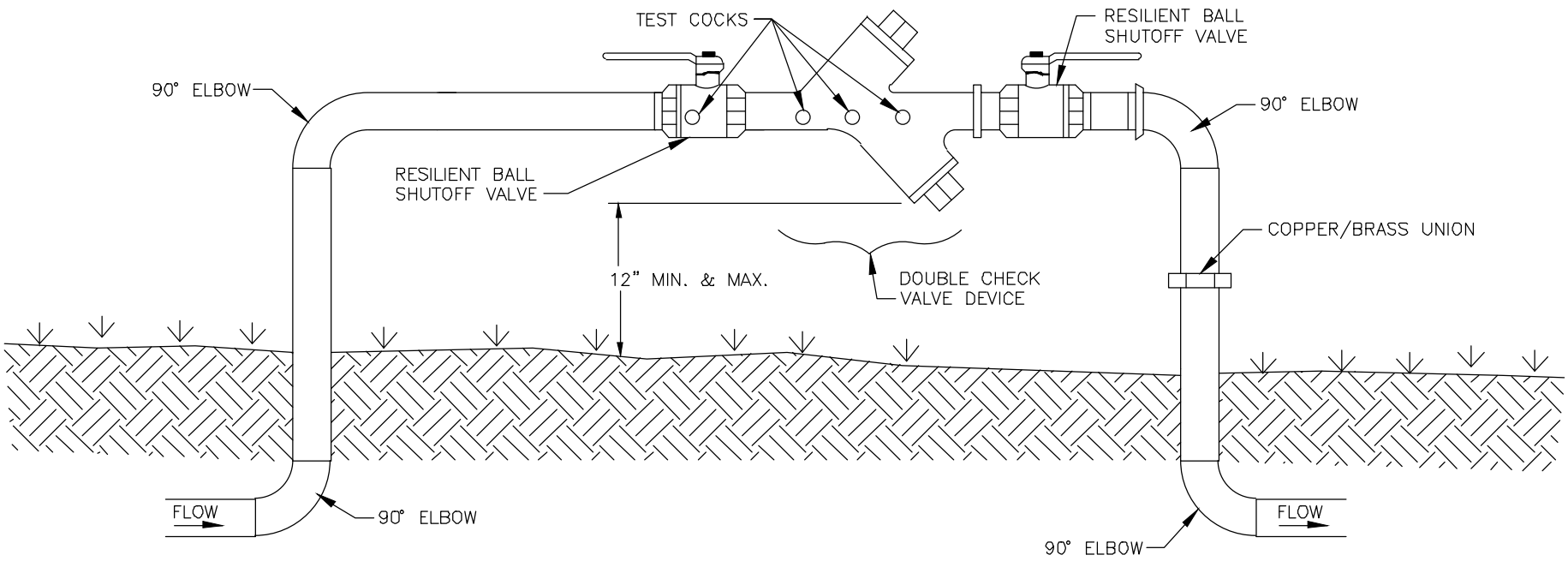
NOTES

1. ASSEMBLY SHALL BE APPROVED BY USC FOUNDATION FOR CROSS CONNECTION AND HYDRAULIC RESEARCH.
2. CONTACT THE CITY OF GOODYEAR WATER RESOURCES DEPARTMENT FOR A LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES.
3. FOUR TEST COCKS TO BE INSTALLED PER USC
4. COPPER FITTINGS SHALL BE CONNECTED WITH LEAD–FREE SOLDER JOINTS.
5. FINISHED GRADE BELOW BACKFLOW PREVENTER SHALL BE 95% COMPACTION.
6. THE ASSEMBLY SHALL BE PAINTED TO BLEND WITH LANDSCAPE SURFACE TREATMENT OR ONSITE STRUCTURES. THE ASSEMBLY MAY ALSO BE SCREENED WITH SHRUBBERY. VEGETATION SHALL BE A MINIMUM OF 24" FROM THE OUTSIDE FACE OF ANY PORTION OF THE BACKFLOW PREVENTION DEVICE.
7. ADEQUATE DRAINAGE FOR SURFACE WATER IS REQUIRED.
8. ASSEMBLY MAY BE REQUIRED TO BE PROTECTED BY GUARD POSTS. GUARD POSTS SHALL BE CONSTRUCTED PER CITY STD. DET. G–3358.

LIST OF MATERIALS

1. APPROVED DOUBLE CHECK VALVE ASSEMBLY.
2. GATE VALVE, RESILIENT SEATED (NON–RISING STEM) (D.S.&Y. REQUIRED ON FIRE LINES).
3. 90° ELL (FLANGED D.I.P. 3" THROUGH 10").
4. TEST COCK, RESILIENT SEATED (4 REQUIRED) FIT WITH BRASS PLUG.
5. ADJUSTABLE PIPE SUPPORT PERMANENTLY ATTACHED TO BASE (4" AND LARGER ASSEMBLY ONLY).
6. CONCRETE SUPPORT PAD 4" THICK BY 18" WIDE MINIMUM BENEATH 4" AND LARGER ASSEMBLIES. (CLASS "A" CONCRETE)
7. EXTEND CONCRETE BETWEEN THRUST BLOCKS.
8. PIPE SPOOL (FLANGED D.I.P. 3" THRU 10").
9. FLANGED ADAPTER (WHEN REQUIRED).
10. TAMPER SWITCH (ON FIRE LINE ONLY, OPTIONAL).
11. ELECTRICAL CONDUIT FOR TAMPER SWITCH.
12. 3/4" WATER METER.
13. PIPE REDUCER/ INCREASER, IF REQUIRED, SHALL HAVE FLANGED ENDS AND SHALL BE INSTALLED PRIOR TO THE THRUST BLOCK.
14. GATE VALVE (FLANGE X FLANGE). MATCH LINE SIZE.

DETAIL NO. G-3352	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY INSTALLATION - 3" TO 10"	DETAIL NO. G-3352



NOTES:

1. ALL PIPE/FITTINGS TO BE TYPE "K" COPPER.
2. REFER TO THE CITY OF GOODYEAR "POTABLE WATER SYSTEM APPROVED MATERIALS LIST" FOR APPROVED BACKFLOW PREVENTION ASSEMBLIES.
3. BACKFLOW PREVENTION ASSEMBLY MUST BE LEVEL AND INSTALLED A MINIMUM AND A MAXIMUM OF 12 INCHES FROM ASSEMBLY BODY TO FINAL GRADE.
4. ALL TEST COCKS SHALL BE FITTED WITH BRASS PLUGS INSTALLED WITH TEFLON TAPE.
5. SHUTOFF VALVES TO BE RESILIENT BALL TYPE WITH REMOVABLE HANDLES.
6. COMPRESSION TYPE FITTINGS ARE NOT ALLOWED.
7. INSTALL THE BACKFLOW PREVENTION ASSEMBLY IMMEDIATELY DOWNSTREAM OF THE CITY WATER METER.
8. A COPPER/BRASS UNION MUST BE INSTALLED IN THE MIDDLE OF THE DOWNSTREAM RISER.
9. ASSEMBLY SHALL BE APPROVED BY USC FOUNDATION FOR CROSS CONNECTION AND HYDRAULIC RESEARCH. CONTACT THE CITY OF GOODYEAR WATER RESOURCES DEPARTMENT FOR A LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES.
10. COPPER FITTINGS SHALL BE CONNECTED WITH LEAD–FREE SOLDER JOINTS.
11. ASSEMBLIES SHALL HAVE A SECURITY ENCLOSURE AS SHOWN ON CITY STD. DET. G–3357, OR APPROVED EQUAL.

DETAIL NO. G-3353	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY INSTALLATION - 2.5" AND UNDER	DETAIL NO. G-3353

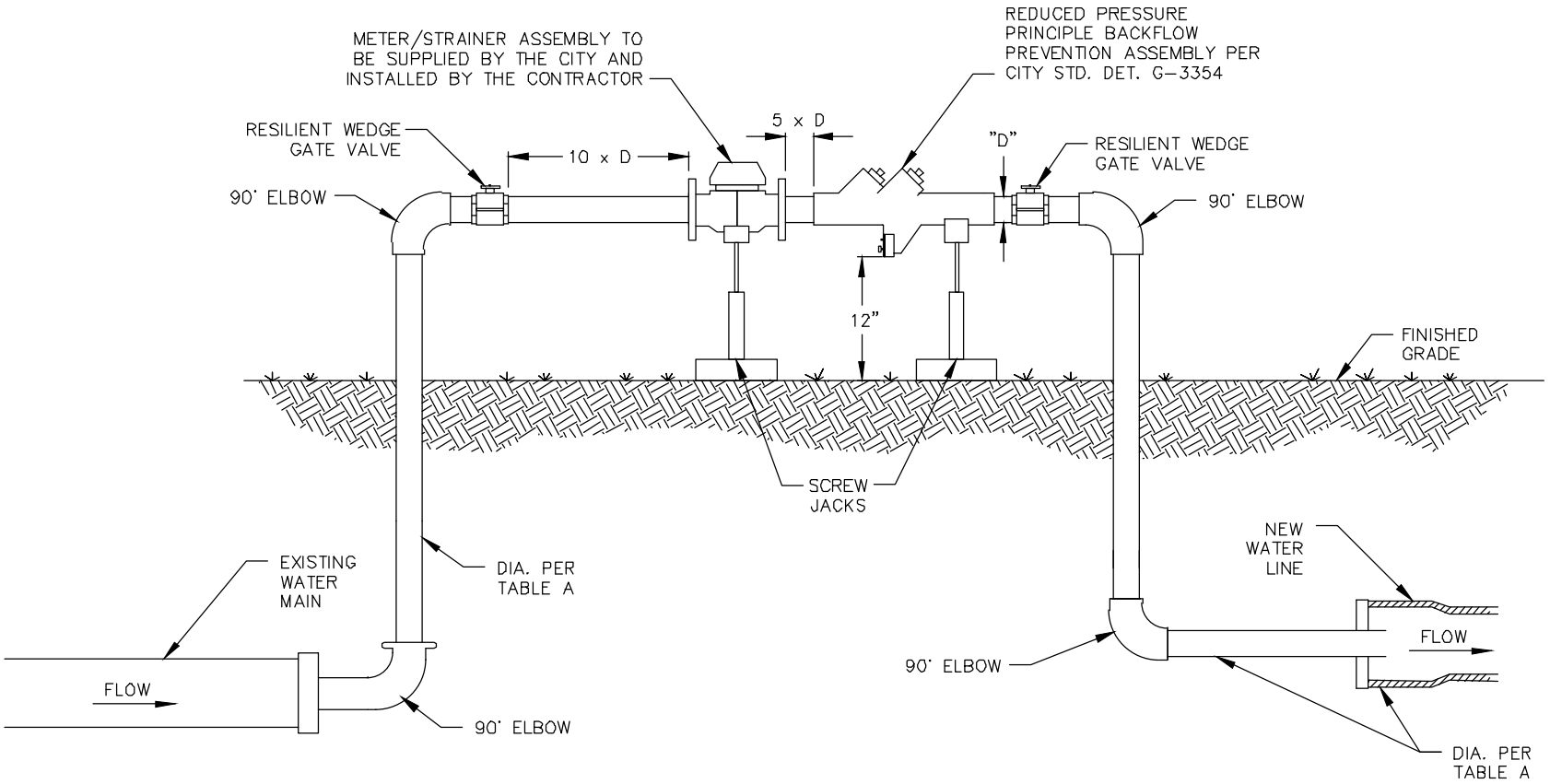


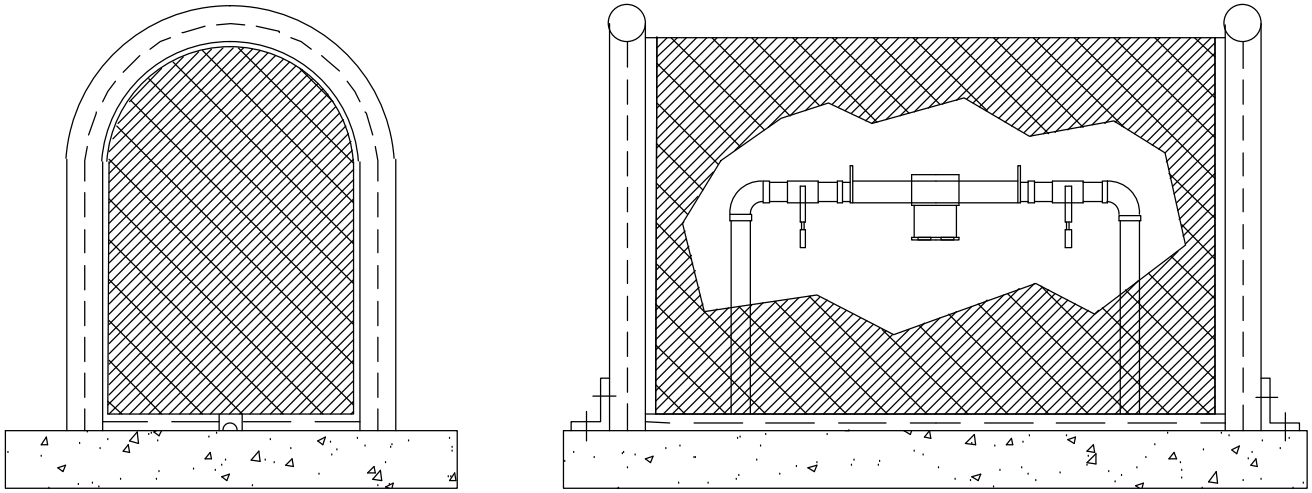
TABLE A

NEW WATER LINE PIPE DIAMETER (inches)	FLOW VELOCITY (gpm)	SIZE OF CONNECTION (inches)	LENGTH OF PIPE BERFORE METER (inches)	LENGTH OF PIPE AFTER METER (inches)	MINIMUM NUMBER OF 2.5" NOZZLES FLOWING
6	200	4	40	20	1
8	400	4	40	20	1
10	600	4	40	20	1
12	900	4	40	20	2
16	1600	6	60	30	2
20	1800	6	60	30	2
24	2000	6	60	30	2

NOTES:

1. DO NOT INSTALL ELBOWS, BENDS, NONCONCENTRIC REDUCERS, CHECK VALVES, BACK FLOW PREVENTERS AND/OR PRESSURE REDUCING DEVICES WITHIN 10 PIPE DIAMETERS UPSTREAM OR 5 PIPE DIAMETERS DOWNSTREAM OF THE METER.
2. ALL JOINTS AND FITTINGS BELOW GROUND SHALL BE FLANGED, MECHANICAL, OR RESTRAINED.
3. ALL JOINTS ABOVE GROUND SHALL BE FLANGED.

DETAIL NO. G-3356	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TEMPORARY JUMPER CONNECTION	DETAIL NO. G-3356



NOTES

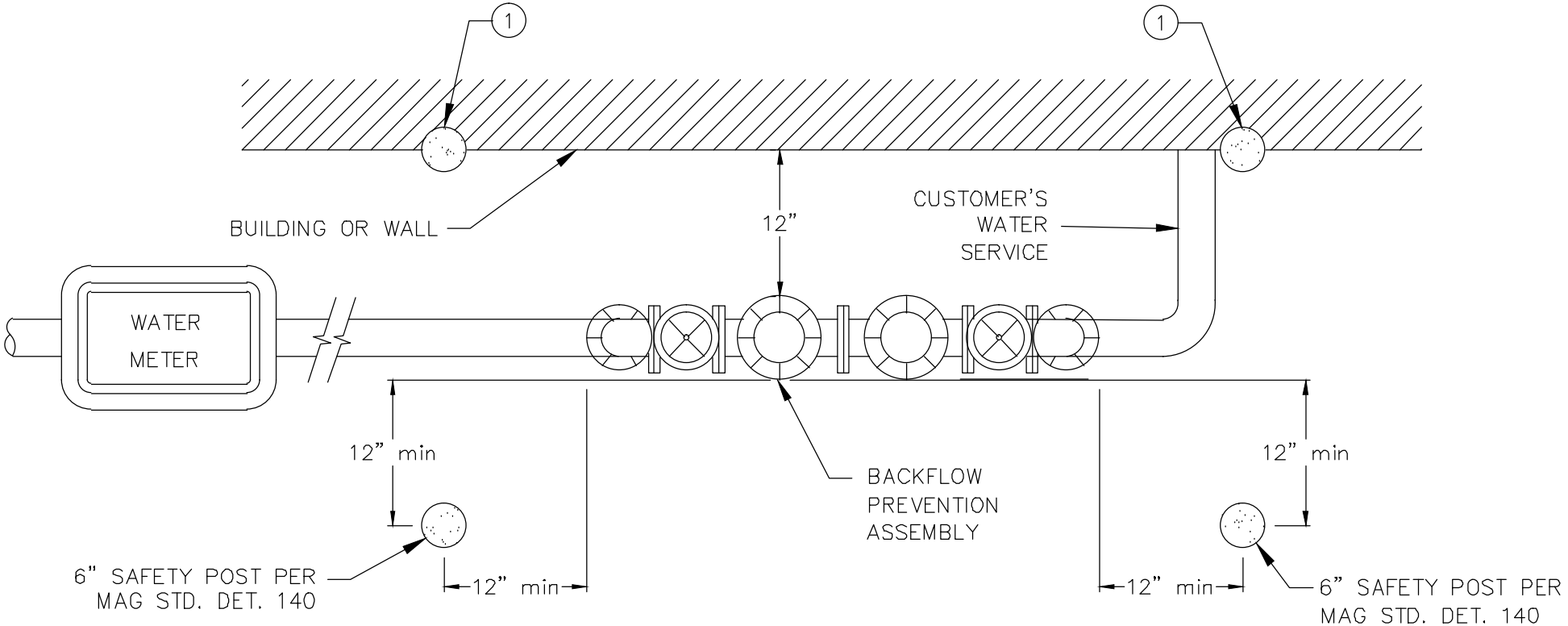
1. SET EYEBOLT WITH BOTTOM OF CIRCLE FLUSH WITH CONCRETE BASE, SUCH THAT EYEBOLT CANNOT BE TURNED IN PLACE.

2. BOLT BRACKETS TO ENCLOSE ON ENDS OR BOTH SIDES. USE 1/4" X 1-1/4" TAMPER-PROOF BOLTS WITH HEX NUTS AND WASHERS.

3. SUGGESTED PAD DIMENSIONS - 32"L x 18"W x 3-3/4" THICK.

4. COLOR OF ENCLOSURE SHALL MATCH COLOR OF NEAREST STRUCTURE, WALL OR LANDSCAPING.

DETAIL NO. G-3357	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	METAL ENCLOSURE FOR ABOVE GROUND UTILITIES	DETAIL NO. G-3357

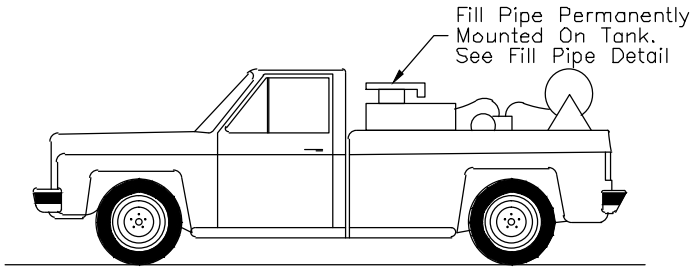


PLAN VIEW

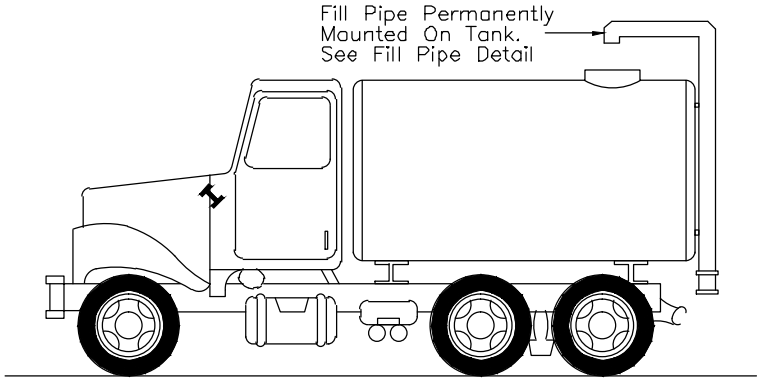
NOTE:

(1) ADDITIONAL SAFETY POSTS, PER MAG STD. DET. 140, ARE REQUIRED IF THE BACKFLOW PREVENTION ASSEMBLY IS LOCATED GREATER THAN 7' FROM THE NEAREST STRUCTURE (WALL, BUILDING, OR OTHER SIGNIFICANT STRUCTURE).

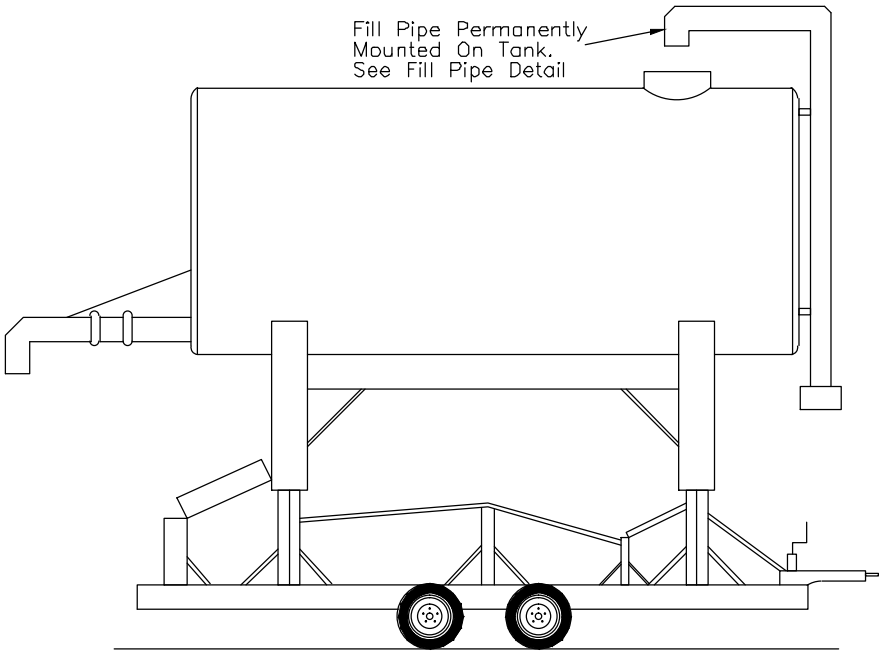
DETAIL NO. G-3358	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	SAFETY POST LOCATION FOR BACKFLOW PREVENTION ASSEMBLIES	DETAIL NO. G-3358



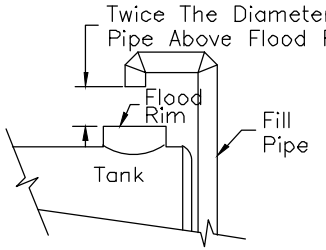
PESTICIDE APPLICATOR TRUCK



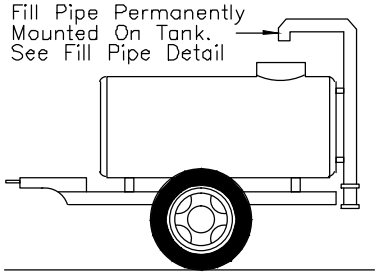
WATER TRUCK



ELEVATED TANK

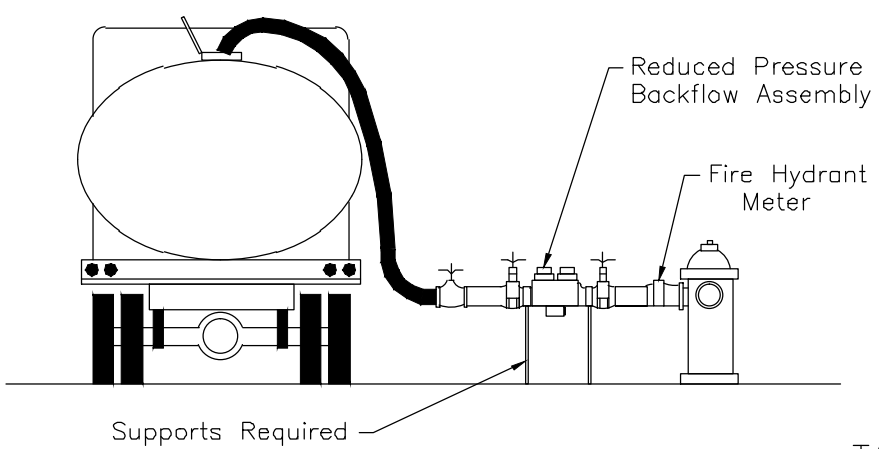


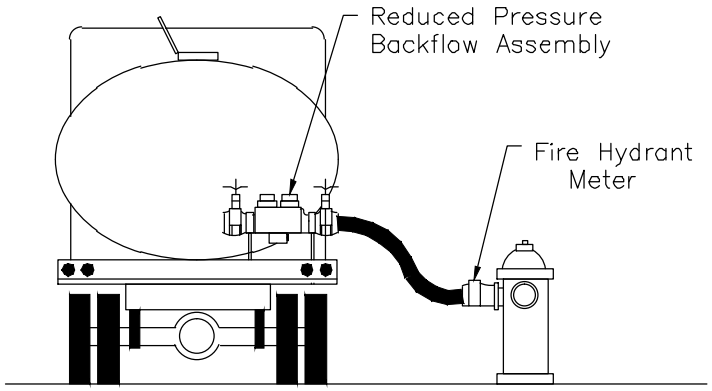
FILL PIPE DETAIL



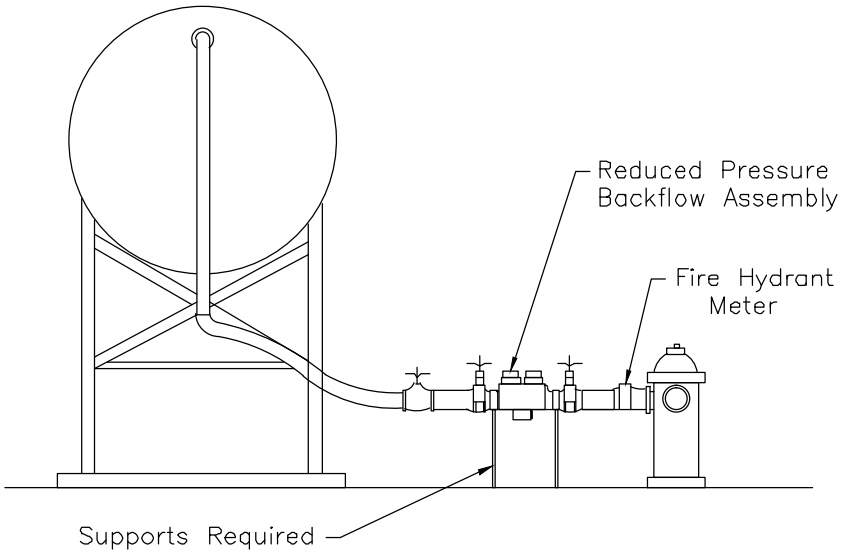
WATER WAGON

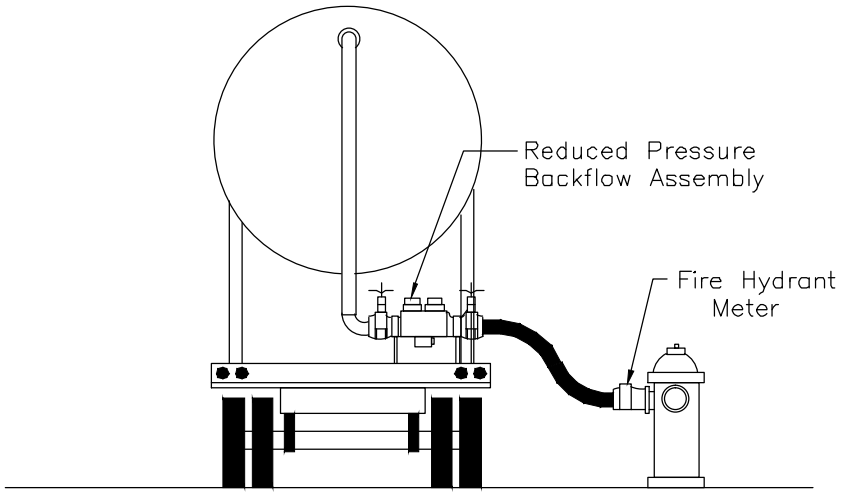
DETAIL NO. G-3360	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:11/07	FILL PIPE DETAILS FOR PORTABLE TANKS WITH AIR GAP SEPARATION	DETAIL NO. G-3360





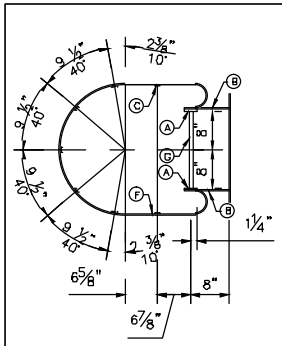
TANK TRUCKS

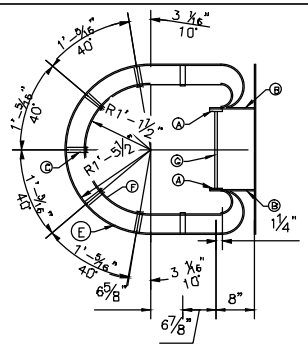


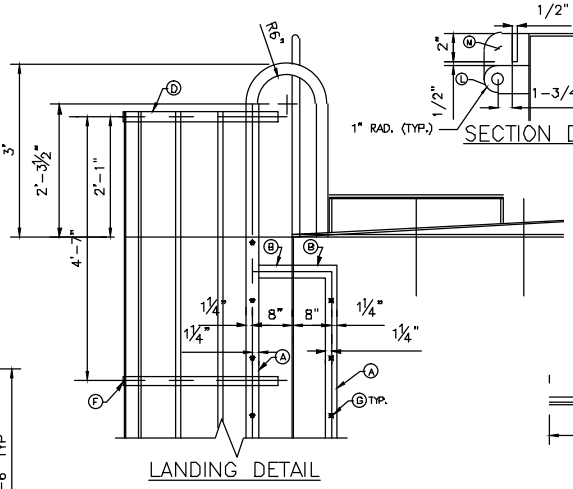


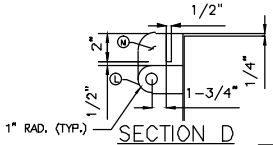
ELEVATED TANKS

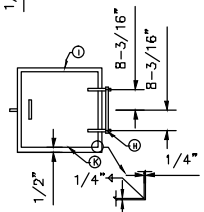
DETAIL NO. G-3361	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:11/07	BACKFLOW PREVENTION METHOD FOR PORTABLE TANKS WITH NO AIR GAP SEPARATION	DETAIL NO. G-3361

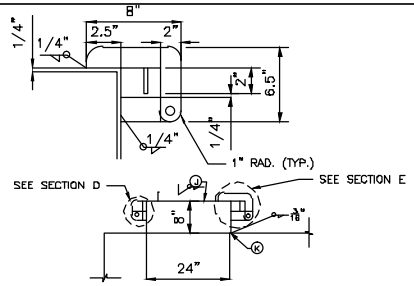


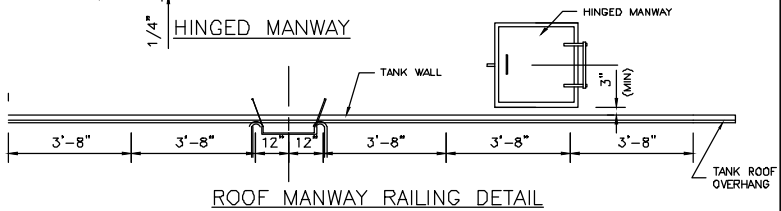




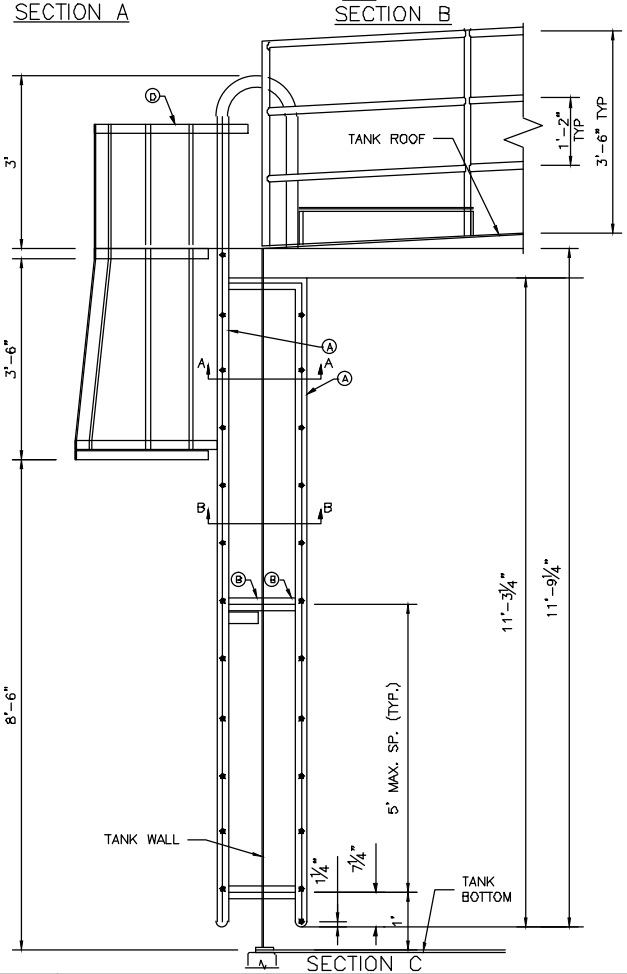


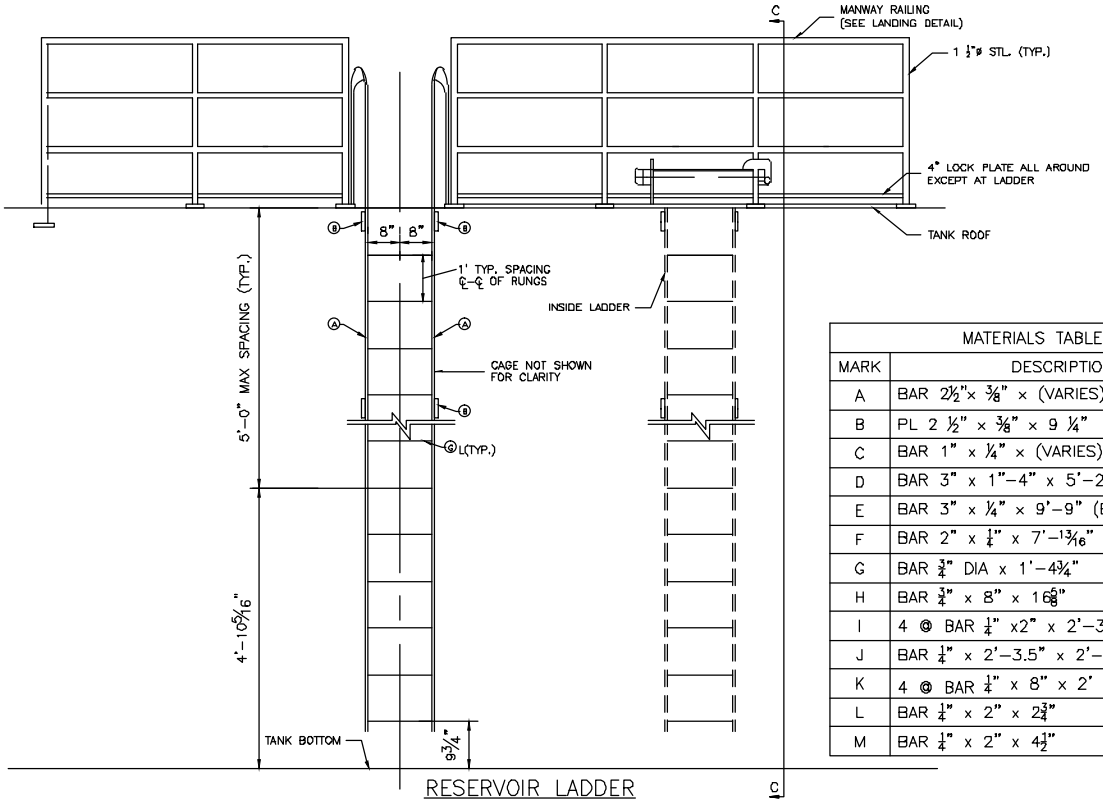






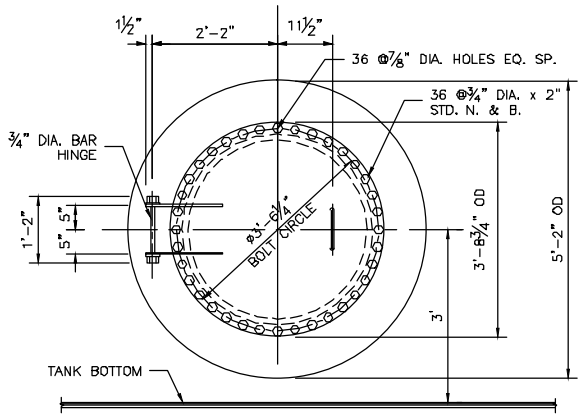
ROOF MANWAY RAILING DETAIL



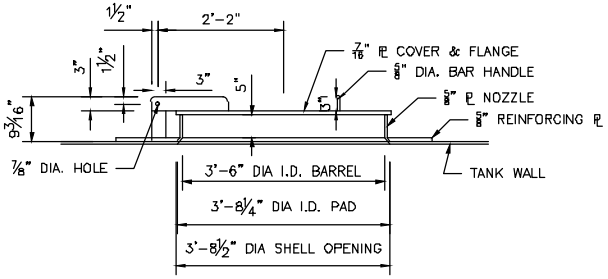


MATERIALS TABLE	
MARK	DESCRIPTION
A	BAR 2½"× ⅜" × (VARIES)
B	PL 2 ½" × ⅜" × 9 ¼"
C	BAR 1" × ¼" × (VARIES)
D	BAR 3" x 1"–4" x 5'–2¾" (BEND)
E	BAR 3" x ¼" x 9'–9" (BEND)
F	BAR 2" x ¼" x 7'–1¾6" (BEND)
G	BAR ¾" DIA x 1'–4¾"
H	BAR ¾" x 8" x 16⅝"
I	4 @ BAR ¼" x2" x 2'–3.5"
J	BAR ¼" x 2'–3.5" x 2'–3.5"
K	4 @ BAR ¼" x 8" x 2'
L	BAR ¼" x 2" x 2¾"
M	BAR ¼" x 2" x 4½"

DETAIL NO. G-3362	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	PROPOSED TANK LADDER AND HATCH POSITION DETAIL	DETAIL NO. G-3362

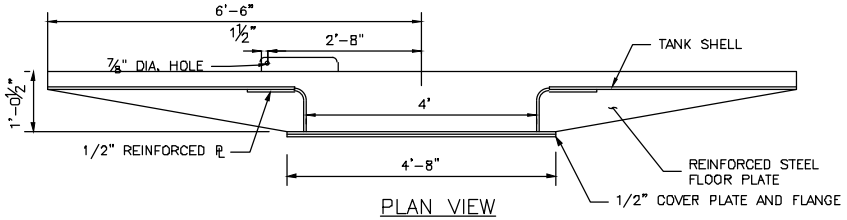


PLAN VIEW

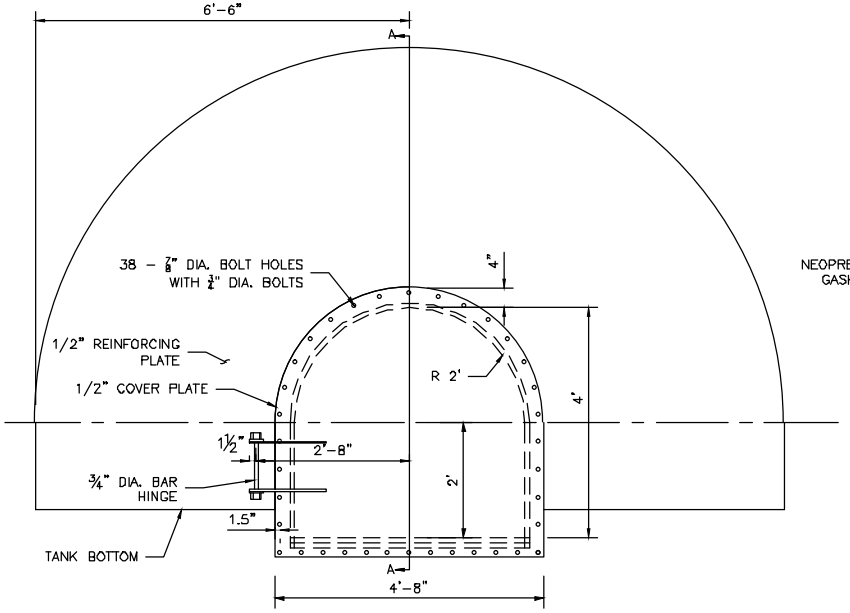


SECTION VIEW

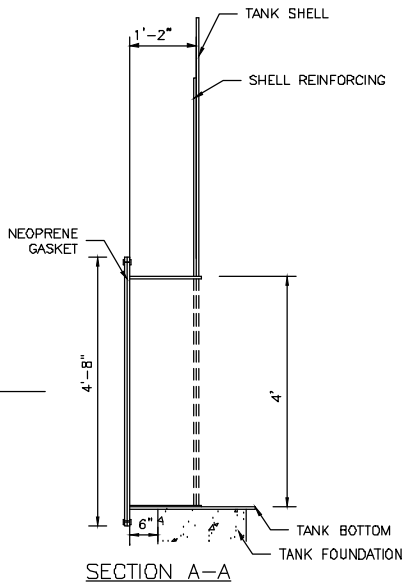
3'-6" DIA. HINGED TANK SHELL MANWAY SECTION



PLAN VIEW

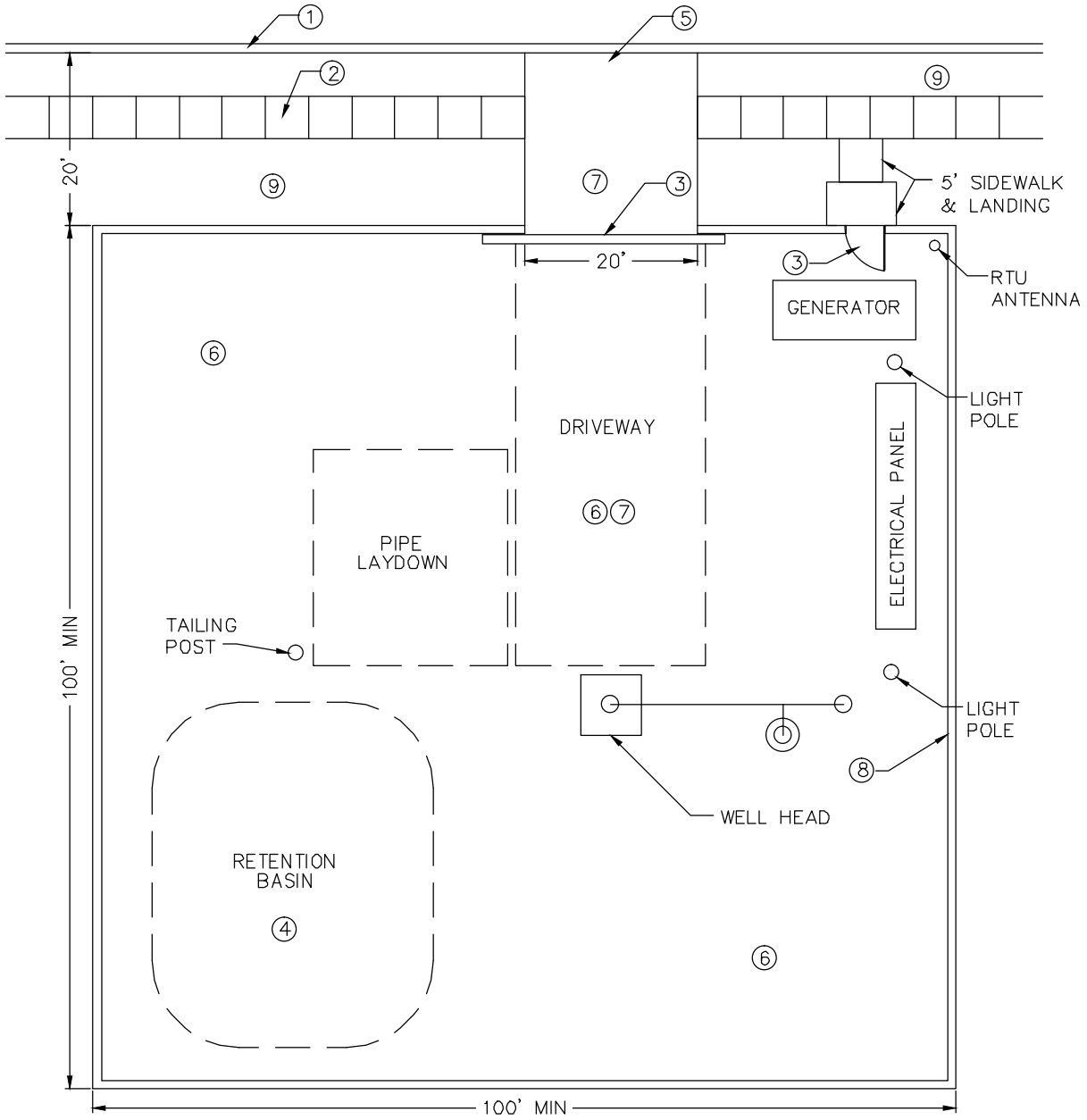


ACCESS HATCH AND FLANGE DETAIL



SECTION A–A

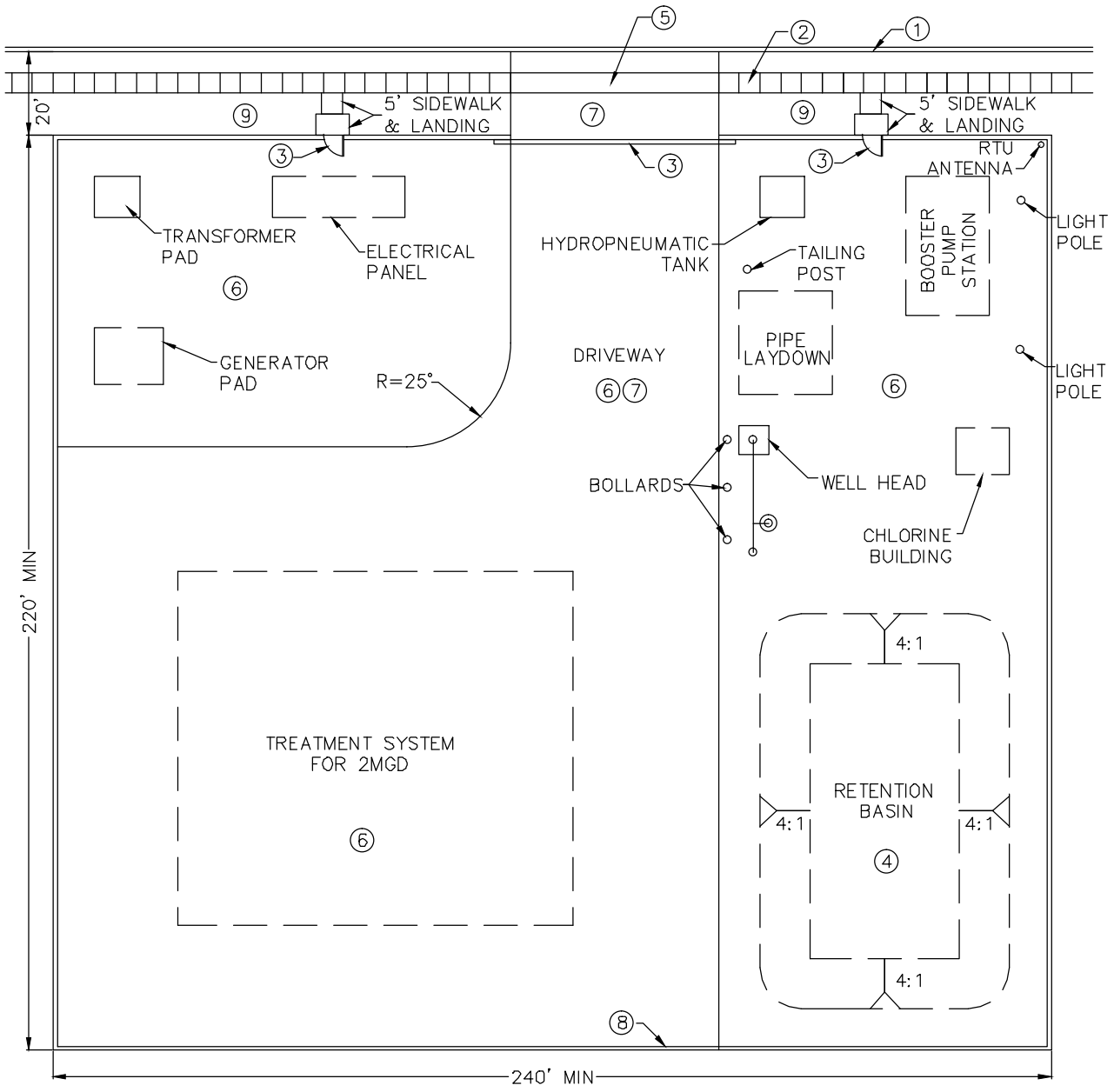
DETAIL NO. G-3363	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	PROPOSED TANK HATCH DETAIL	DETAIL NO. G-3363



NOTES:

1. CURB & GUTTER PER MAG STD. DET. 220-1 TYPE A COLLECTOR OR ARTERIAL STREETS; TYPE A OR C FOR LOCAL STREETS.
2. 8' SIDEWALK FOR ARTERIAL AND COLLECTOR STREETS; 5' SIDEWALK FOR LOCAL STREETS.
3. AUTOMATED ROLL GATE AND ACCESS DOOR TO BE PROVIDED PER CITY STD. DET. G-3390-1 & 2.
4. RETENTION BASINS SHALL HAVE A MAXIMUM 4:1 SIDE SLOPES AND A MAXIMUM 3' HIGH WATER DEPTH DURING THE 100 YEAR 6 HOUR STORM EVENT AND ENOUGH CAPACITY TO PUMP THE WELL TO WASTE OR DRY WELL FOR A MINIMUM OF 3 HRS AT FULL FLOW.
5. ARTERIAL AND COLLECTOR STREET DRIVEWAYS SHALL BE PER CITY STD. DET. G-3236 & MAG STD. DET. 251; LOCAL STREET DRIVEWAYS SHALL BE PER CITY STD. DET. G-3236 AND MAG STD. DET. 250.
6. A MAXIMUM 1% GRADE SHALL BE MAINTAINED ACROSS THE SITE.
7. DRIVEWAYS AND AREAS ACCESSED BY VEHICLES ON-SITE WILL BE REQUIRED TO BE PAVED PER THE STRUCTURAL SECTION RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
8. A MINIMUM 8' HIGH CMU BLOCK WALL WILL BE REQUIRED AROUND THE SITE WITH 2' PICKETS, (REFER TO DETAIL G-3366). WHERE TREATMENT FACILITIES WILL BE HIGHER THAN 8', WALL HEIGHTS OR SPECIAL PAINTING REQUIREMENTS MAY BE REQUIRED AS DIRECTED BY THE CITY WATER RESOURCES AND PLANNING DEPARTMENTS.
9. AREA TO BE LANDSCAPED PER CITY LANDSCAPING STANDARDS.
10. THIS DETAIL WAS DEVELOPED TO SERVE AS A PRELIMINARY GUIDE FOR ALLOCATING LAND AREA FOR A TYPICAL WELL SITE WITH ONSITE RETENTION. THE DETAIL MAY NOT SHOW ALL INFRASTRUCTURE OR THEIR EXACT LOCATIONS. LAND AREA SHOWN MAY BE SUBJECT TO CHANGE CONTINGENT UPON SUPPLY AND DISCHARGE FLOWS, STORAGE, TREATMENT, AND SITE LOCATION AS REQUIRED BY THE CITY.

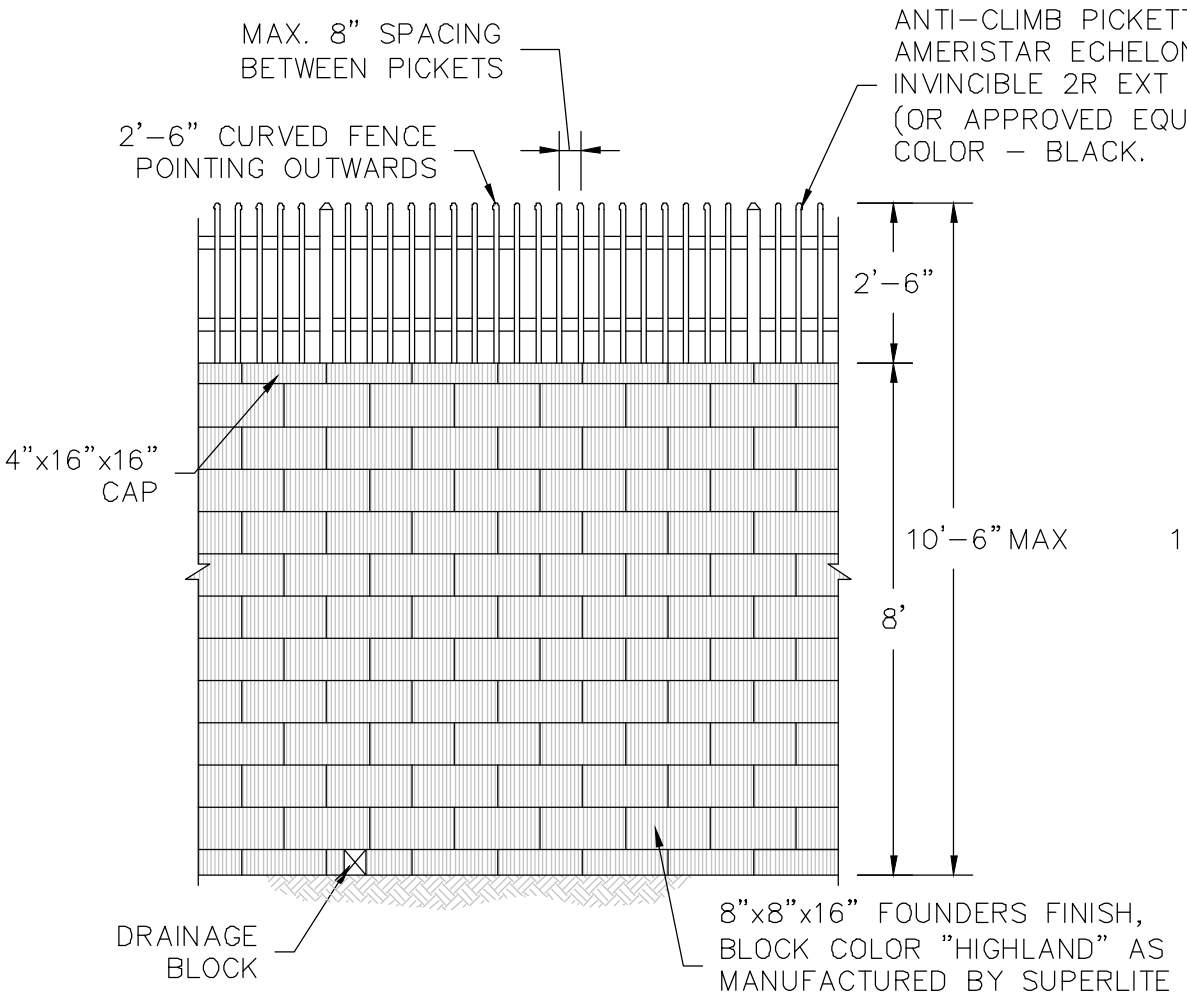
DETAIL NO. G-3364	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TYPICAL WELL SITE	DETAIL NO. G-3364



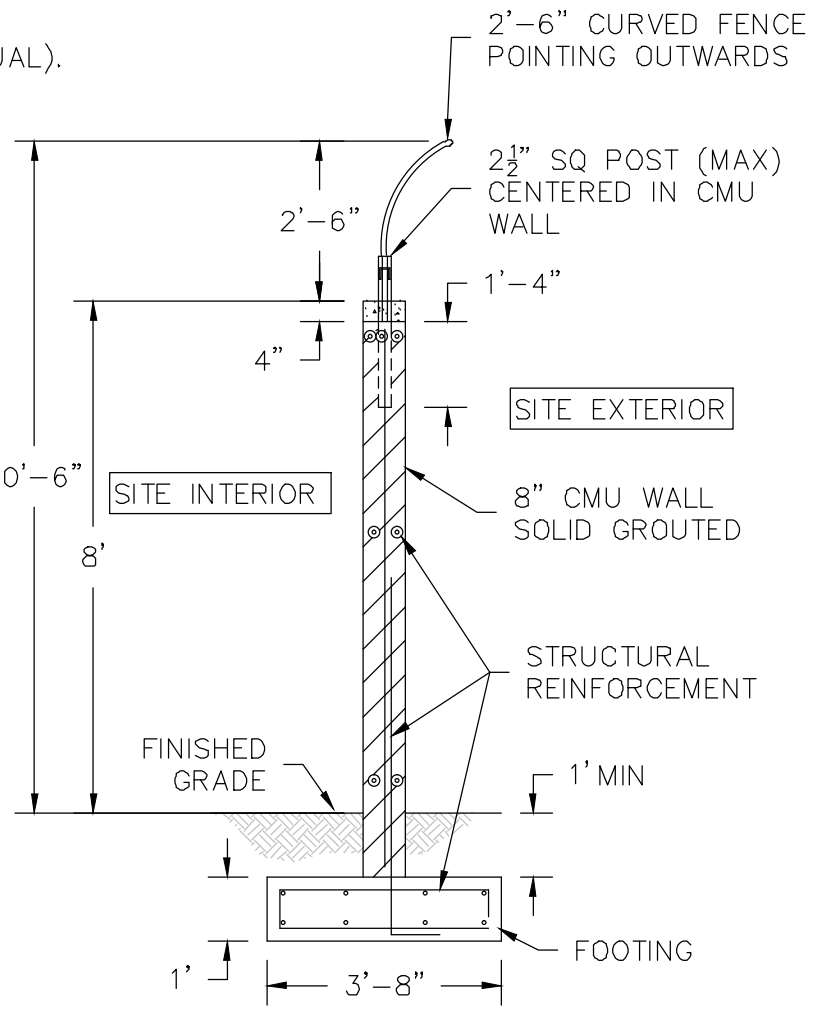
NOTES;

1. CURB & GUTTER PER MAG STD. DET. 220–1 TYPE A COLLECTOR OR ARTERIAL STREETS; TYPE A OR C FOR LOCAL STREETS.
2. 8' SIDEWALK FOR ARTERIAL AND COLLECTOR STREETS; 5' SIDEWALK FOR LOCAL STREETS.
3. AUTOMATED ROLL GATE AND ACCESS DOOR TO BE PROVIDED PER CITY STD. DET. G–3390–1 & 2.
4. RETENTION BASINS SHALL HAVE A MAXIMUM 4:1 SIDE SLOPES AND A MAXIMUM 3' HIGH WATER DEPTH DURING THE 100 YEAR 6 HOUR STORM EVENT AND ENOUGH CAPACITY TO PUMP WELL TO WASTE OR DRY WELL FOR A MINIMUM OF 3 HRS AT FULL FLOW.
5. ARTERIAL AND COLLECTOR STREET DRIVEWAYS SHALL BE PER CITY STD. DET. G–3236 & MAG STD. DET. 251; LOCAL STREET DRIVEWAYS SHALL BE PER CITY STD. DET. G–3236 AND MAG STD. DET. 250.
6. A MAXIMUM 1% GRADE SHALL BE MAINTAINED ACROSS THE SITE.
7. DRIVEWAYS AND AREAS ACCESSED BY VEHICLES ON–SITE WILL BE REQUIRED TO BE PAVED PER THE STRUCTURAL SECTION RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
8. A MINIMUM 8' HIGH CMU BLOCK WALL WILL BE REQUIRED AROUND THE SITE WITH 2' PICKETS, (REFER TO DETAIL G–3366). WHERE TREATMENT FACILITIES WILL BE HIGHER THAN 8', WALL HEIGHTS OR SPECIAL PAINTING REQUIREMENTS MAY BE REQUIRED AS DIRECTED BY THE CITY WATER RESOURCES AND PLANNING DEPARTMENTS.
9. AREA TO BE LANDSCAPED PER CITY LANDSCAPING STANDARDS.
10. THIS DETAIL WAS DEVELOPED TO SERVE AS A PRELIMINARY GUIDE FOR ALLOCATING LAND AREA FOR A TYPICAL WELL SITE WITH ONSITE RETENTION AND ONSITE WATER TREATMENT. THE DETAIL MAY NOT SHOW ALL INFRASTRUCTURE OR THEIR EXACT LOCATIONS. LAND AREA SHOWN MAY BE SUBJECT TO CHANGE CONTINGENT UPON SUPPLY AND DISCHARGE FLOWS, STORAGE, TREATMENT, AND SITE LOCATION AS REQUIRED BY THE CITY.

DETAIL NO. G-3365	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TYPICAL WELL SITE WITH ONSITE TREATMENT	DETAIL NO. G-3365



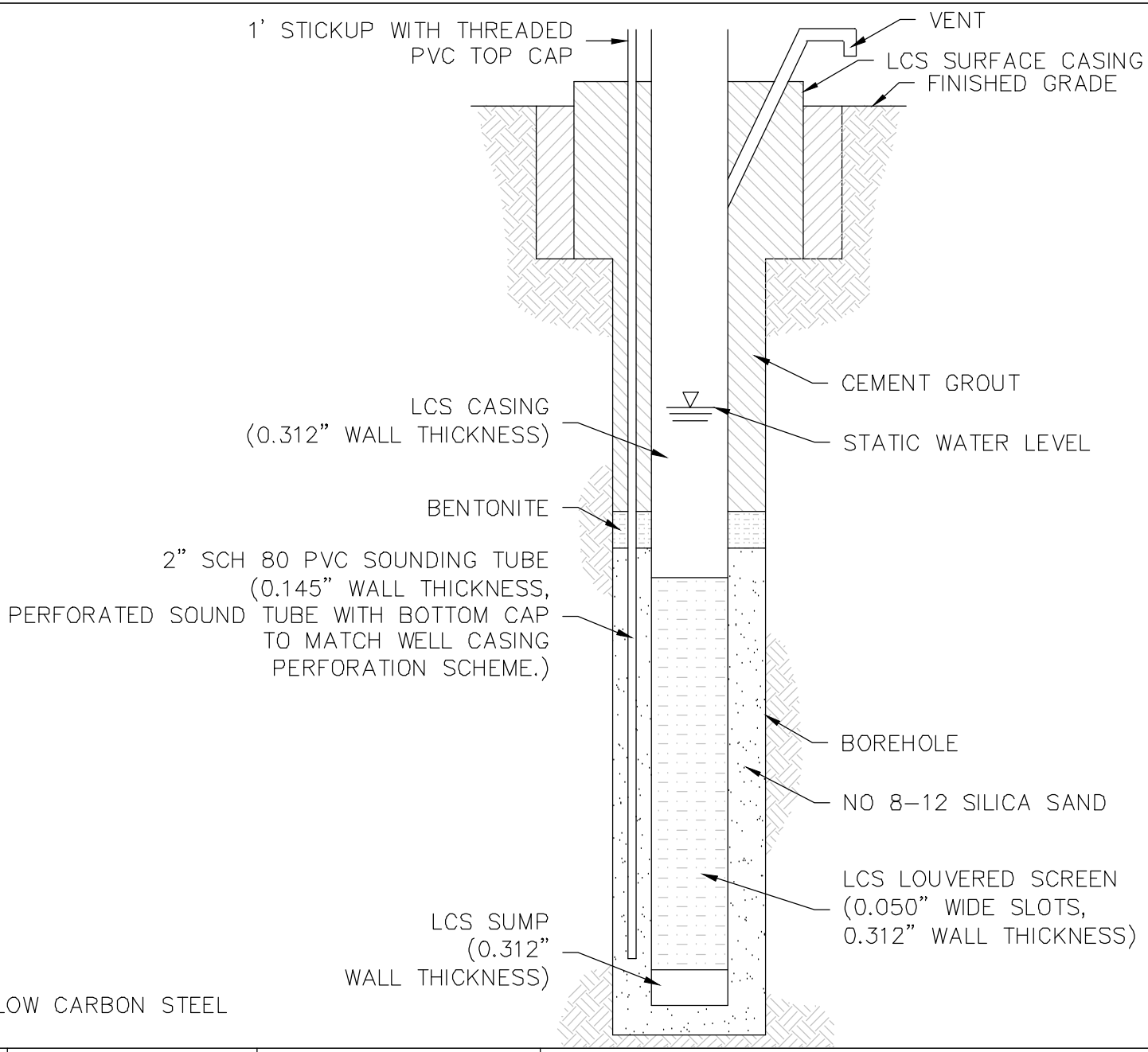
TYPICAL CMU WALL ELEVATION



TYPICAL CMU WALL REINFORCING

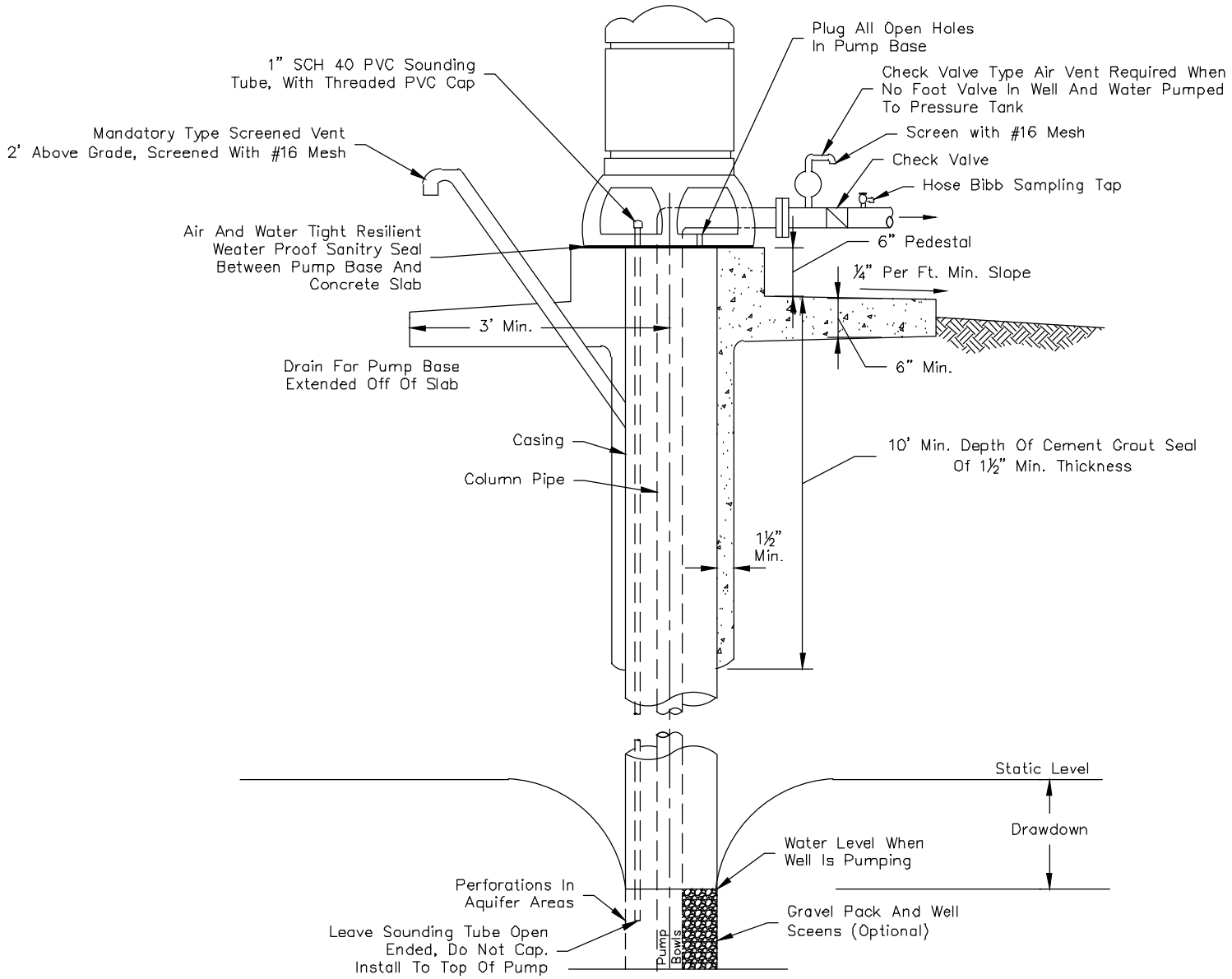
NOTE:
1. WALL PERMIT REQUIRED TO BE OBTAINED FROM BUILDING SAFETY DEPARTMENT.

DETAIL NO. G-3366	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	WALL ELEVATION FOR WELL SITE OR PUMP STATION	DETAIL NO. G-3366

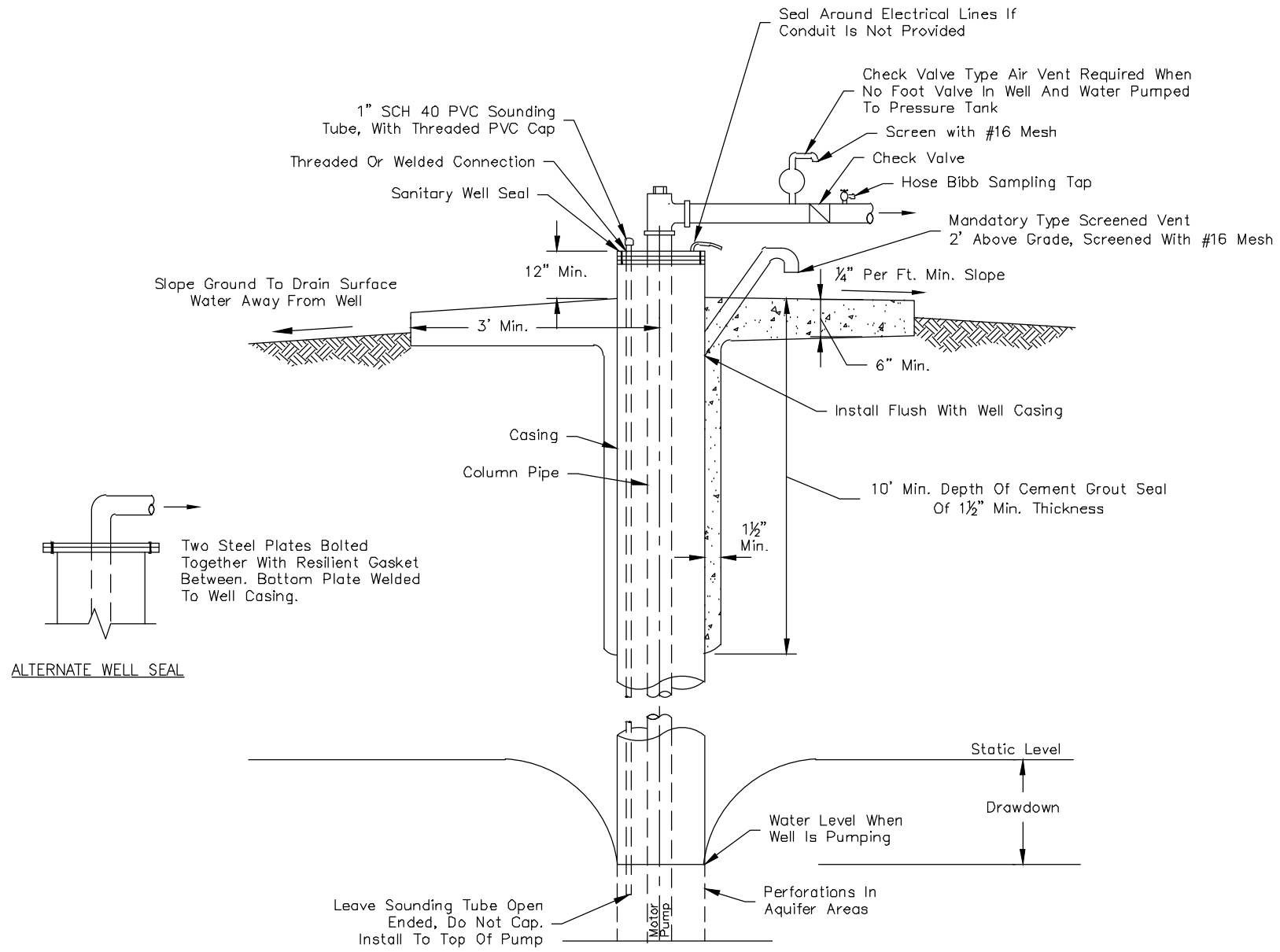


LCS= LOW CARBON STEEL

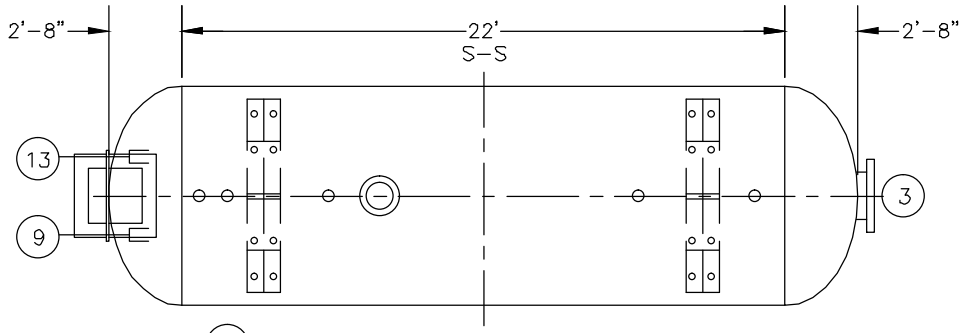
DETAIL NO. G-3367-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TYPICAL WELL CASING	DETAIL NO. G-3367-1

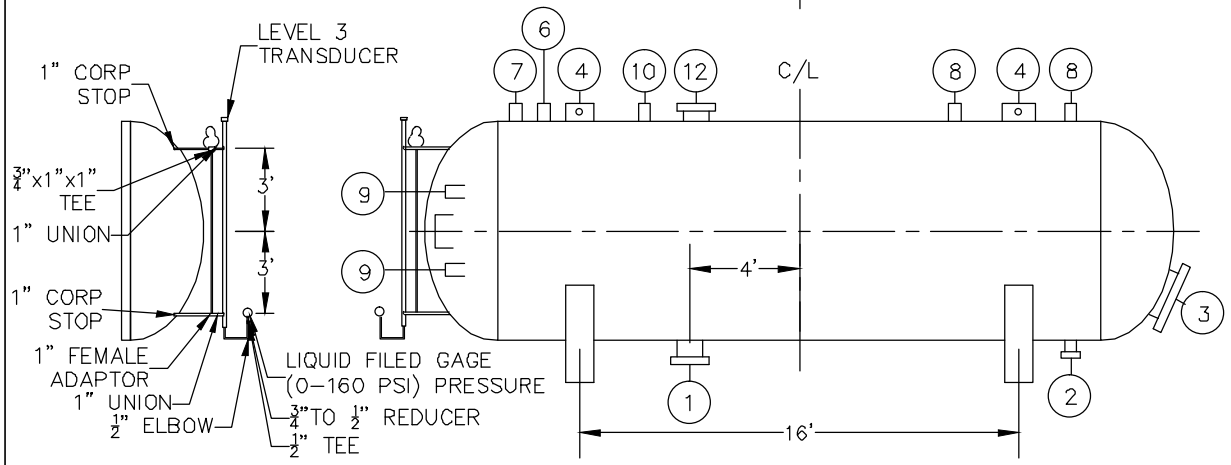


DETAIL NO. G-3367-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TURBINE PUMP INSTALLATION DETAIL	DETAIL NO. G-3367-2

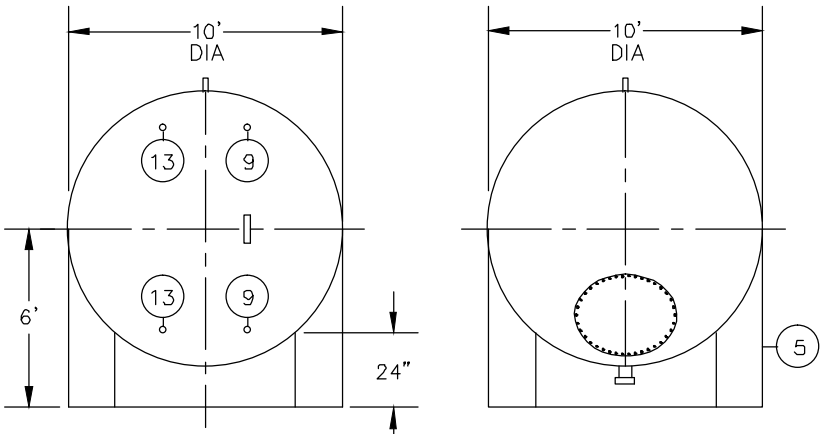


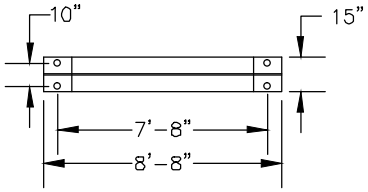
DETAIL NO. G-3367-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SUBMERSIBLE PUMP INSTALLATION DETAIL	DETAIL NO. G-3367-3





WATER SIGHT GAUGE





BASEPLATE

1-1/2" DIA HOLES
TYP 4 PLCS

NOZZLE SCHEDULE

1. INLET – 12" 150# FFSO.
2. DRAIN – 4" 150# FFSO.
3. MANWAY – 30" HINGED ACCESS DOOR.
4. LIFT LUGS – 1" THK.
5. SADDLES – 3/4" THK, 1-1/4" THK BASE.
6. COUPLING – 2-1/2" 3000# NPT (VAC BRKR).
7. COUPLING – 2" 3000# NPT (SAFETY VALVE).
8. COUPLING – 2" 3000# NPT (AIRLINE).
9. COUPLING – 2" 3000# NPT (PROBE WELL).
10. COUPLING – 2" 3000# NPT (PRESS CONTROL).
11. FLANGE – 10" 150# FFSO (SPARE).
12. FLANGE – 8" 150# FFSO (SPARE).
13. COUPLING – 2" 3000# NPT (SPARE).

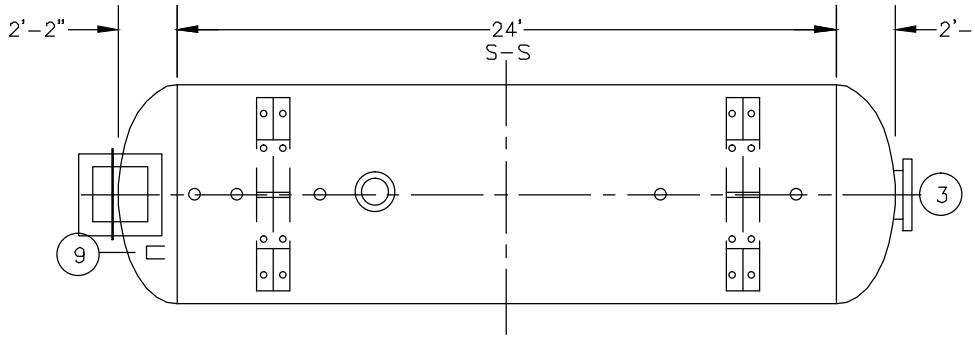
NOTE: ACCESS TO MANWAY SHOULD NOT REQUIRE A LADDER OR SCAFFOLDING.

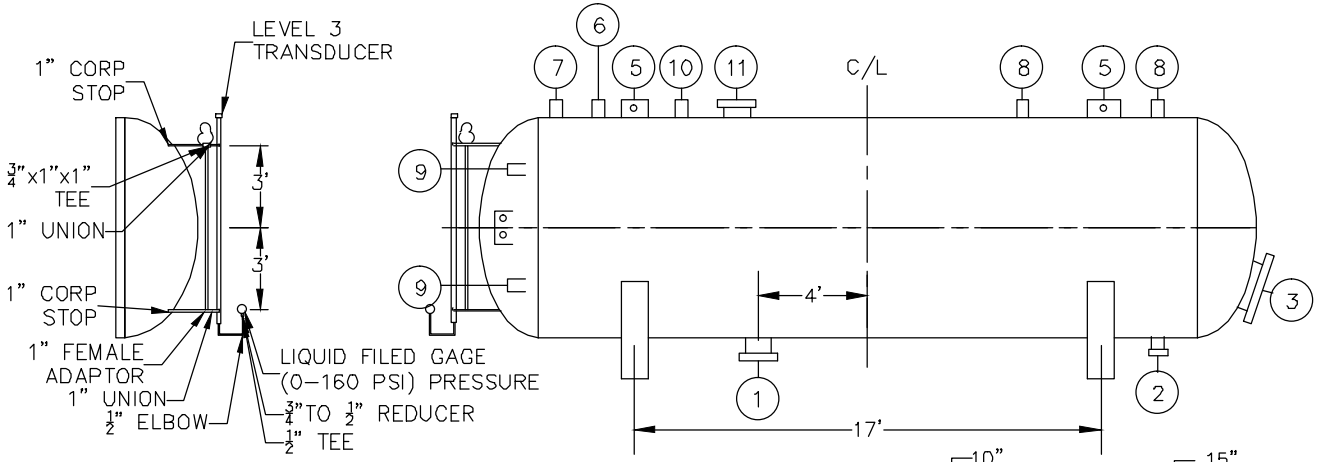
VESSEL DESIGN:	ASME SEC VIII DIV 1
DESIGN PRESSURE:	250 PSIG
INTERNAL COATING:	DEVO OR DUDICK NSF APPROVED, 10-12 MILS
EXTERNAL COATING:	DEVO OR DUDICK NSF APPROVED, 4-6 MILS
SHIPPING WEIGHT:	38,000 POUNDS
FLOODED WEIGHT:	160,000 POUNDS

HYDROTANK SET POINTS

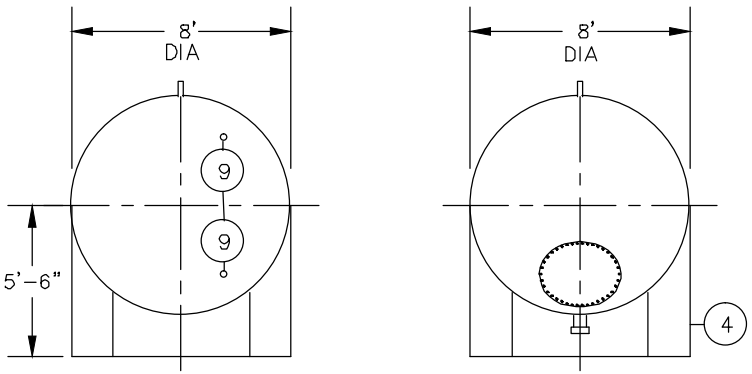
NEUTRAL TARGET LEVEL @ 50% FROM TOP
LSHH @ 65% OR 62.4" (33.6" FROM TOP / 35%) VS. 19%
LSH @ 60% OR 57.6" (38.4" FROM TOP / 40%) VS. 31%
LSL @ 40% OR 38.4" (57.6" FROM TOP / 60%) VS. 69%
LSLL @ 35% OR 33.6" (62.4" FROM TOP / 65%) VS. 81%

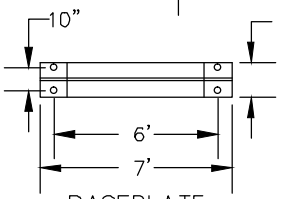
DETAIL NO.				DETAIL NO.
G-3368	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	120" OD AIR CHAMBER	G-3368





WATER SIGHT GAUGE





BASEPLATE

1-1/4" DIA HOLES
TYP 4 PLCS

NOZZLE SCHEDULE

1. INLET – 12" 150# FFSO.
2. DRAIN – 4" 150# FFSO.
3. MANWAY – 30" HINGED ACCESS DOOR.
4. SADDLES – 3/4" THK, 1-1/4" THK BASE.
5. LIFT LUGS – 1" THK.
6. COUPLING – 2" 3000# NPT (VAC BRKR).
7. COUPLING – 2" 3000# NPT (PSV).
8. COUPLING – 2" 3000# NPT (AIRLINE).
9. COUPLING – 2" 3000# NPT (PROBE WELL).
10. COUPLING – 2" 3000# NPT (PRESS CONTROL).
11. FLANGE – 8" 150# FFSO (SPARE).

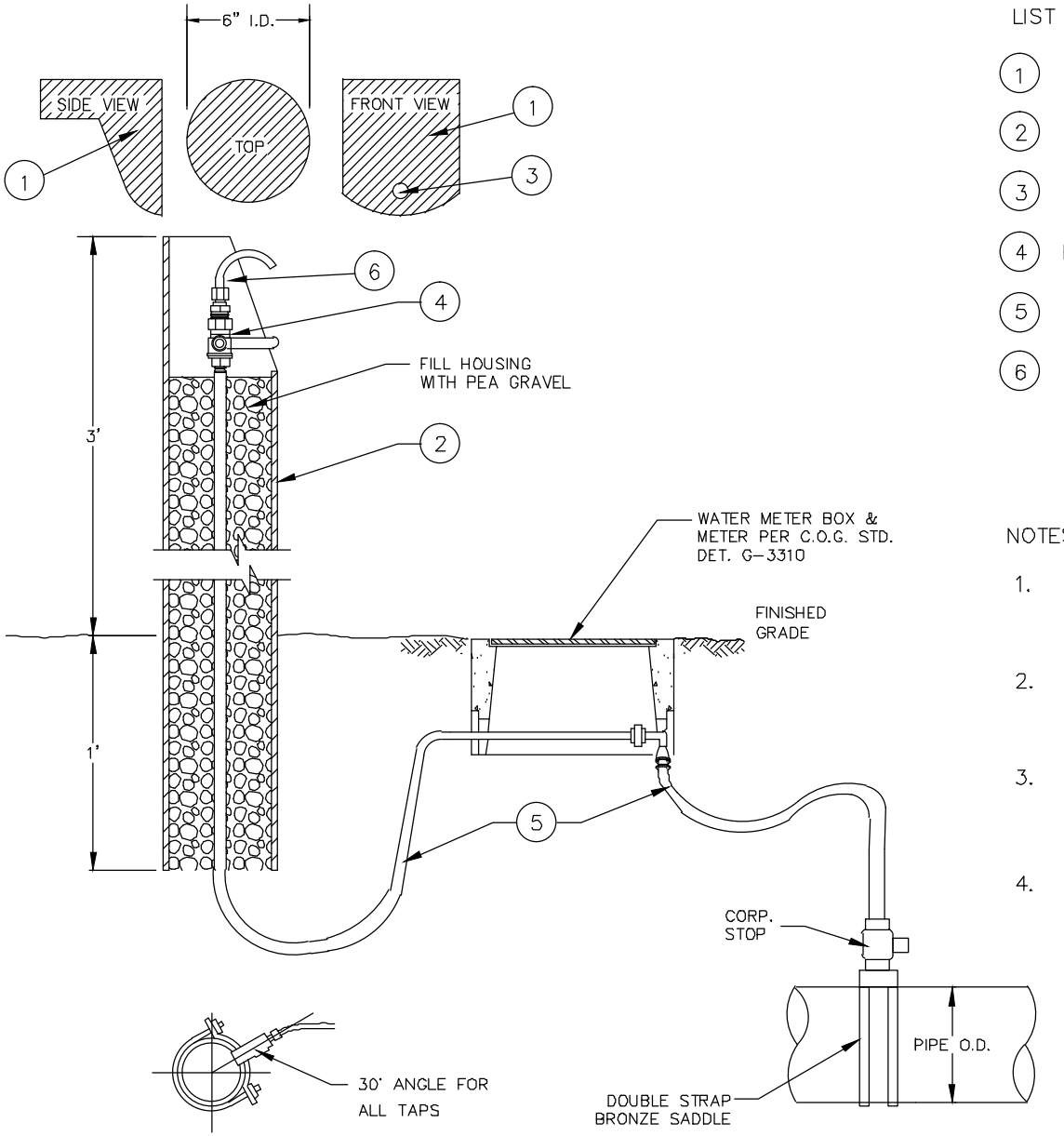
NOTE: ACCESS TO MANWAY SHOULD NOT REQUIRE A LADDER OR SCAFFOLDING.

VESSEL DESIGN:	ASME SEC VIII DIV 1
DESIGN PRESSURE:	250 PSIG
INTERNAL COATING:	DEVO OR DUDICK NSF APPROVED, 10-12 MILS
EXTERNAL COATING:	DEVO OR DUDICK NSF APPROVED, 4-6 MILS
SHIPPING WEIGHT:	38,000 POUNDS
FLOODED WEIGHT:	160,000 POUNDS

HYDROTANK SET POINTS

NEUTRAL TARGET LEVEL @ 50% FROM TOP
LSHH @ 65% OR 62.4" (33.6" FROM TOP / 35%) VS. 19%
LSH @ 60% OR 57.6" (38.4" FROM TOP / 40%) VS. 31%
LSL @ 40% OR 38.4" (57.6" FROM TOP / 60%) VS. 69%
LSLL @ 35% OR 33.6" (62.4" FROM TOP / 65%) VS. 81%

DETAIL NO.				DETAIL NO.
G-3369	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	96" OD AIR CHAMBER	G-3369



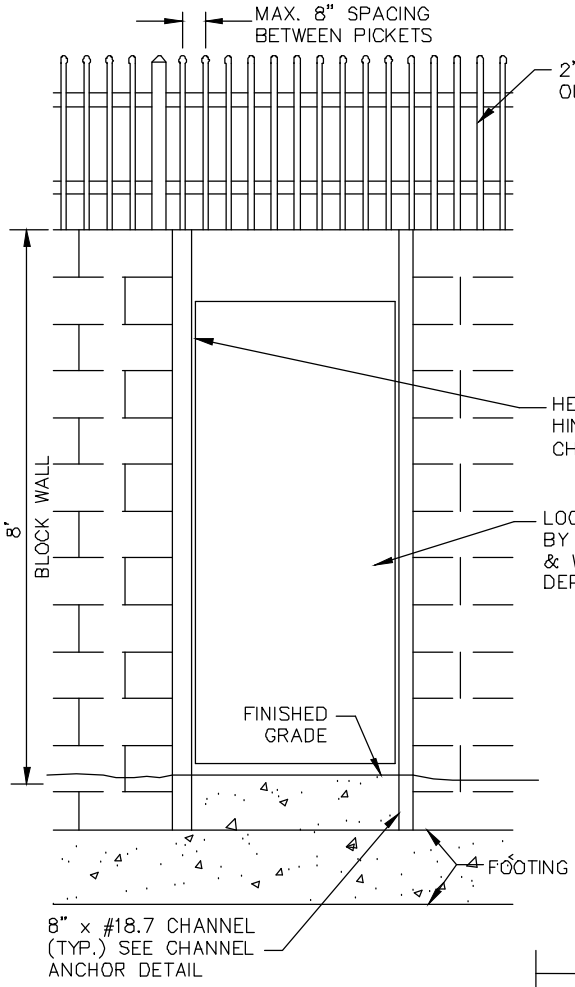
LIST OF MATERIALS:

1. ALUMINUM LID
2. ALUMINUM HOUSING – 6" x 48"
3. FLUSH MOUNTED LOCK
4. BALL VALVE, 1/2" x 3/8", 400 P.S.I.
5. COPPER SERVICE LINE (1" MIN.)
6. 1/2" SAMPLING SPIGOT

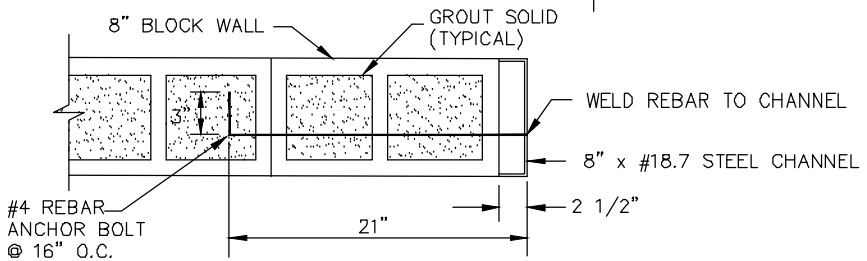
NOTES:

1. CARE SHOULD BE GIVEN TO LOCATE WATER SAMPLING STATIONS ADJACENT TO OPEN SPACES WHENEVER POSSIBLE.
2. IF A WATER SAMPLING STATION IS TO BE LOCATED IN FRONT OF A RESIDENCE, IT SHALL BE LOCATED ON A LOT LINE.
3. ONE SAMPLING STATION TO BE INSTALLED PER EVERY 100 RESIDENTIAL (SINGLE OR MULTIFAMILY) POTABLE SERVICE TAPS.
4. REFER TO THE CITY "APPROVED MATERIALS LIST" FOR ACCEPTABLE MODELS.

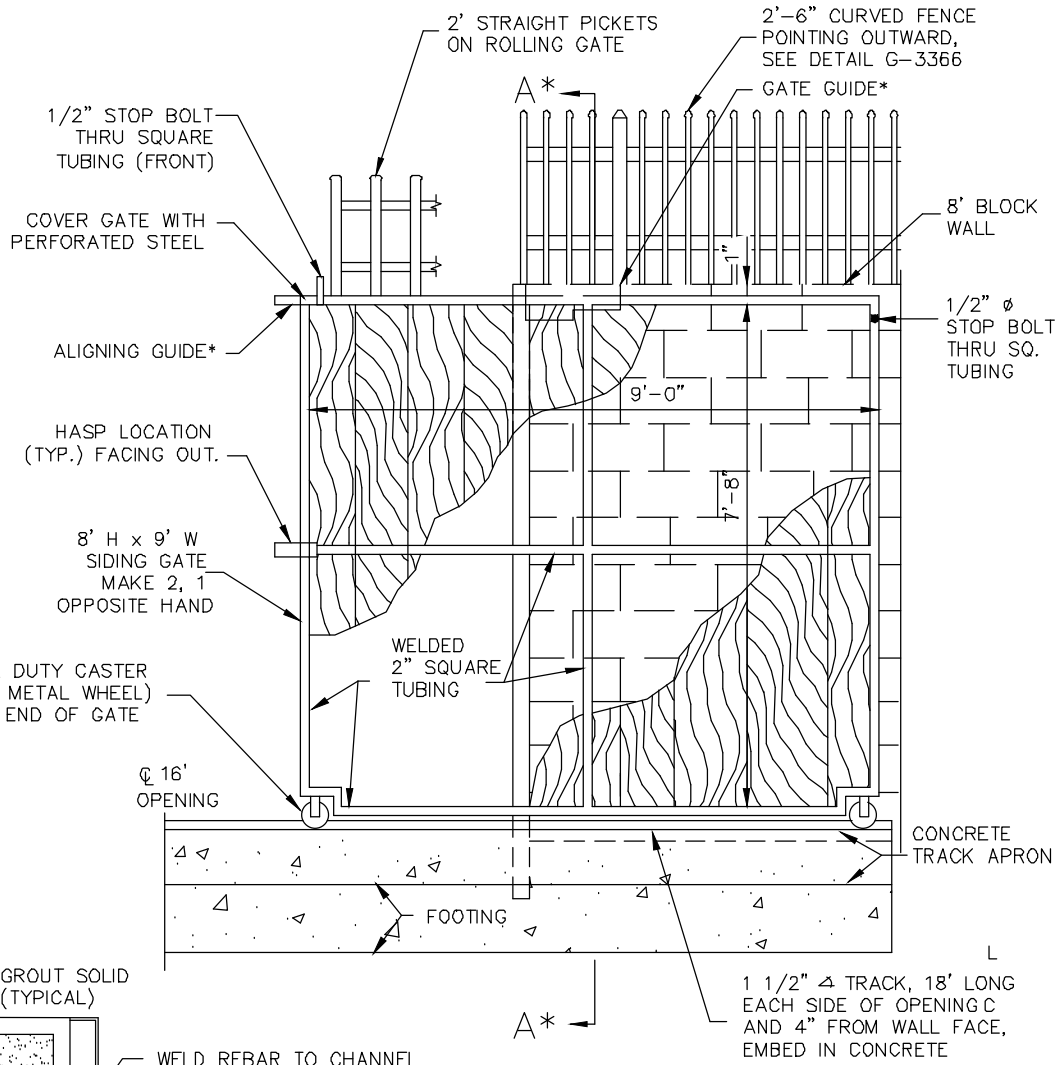
DETAIL NO. G-3370	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	WATER QUALITY SAMPLING STATION	DETAIL NO. G-3370



HINGED DOOR

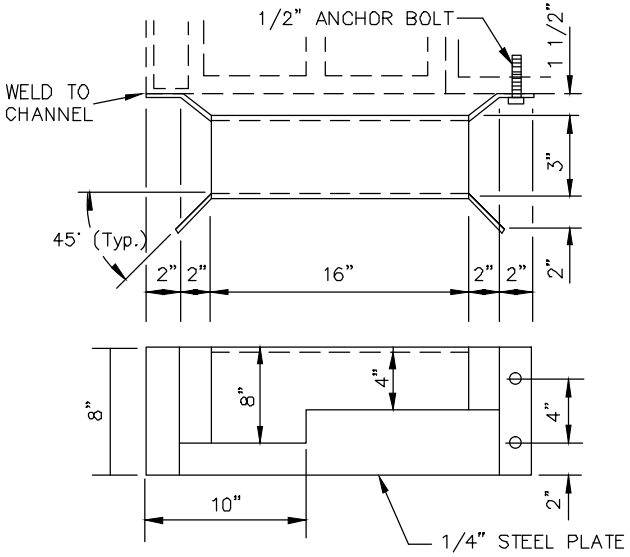


CHANNEL ANCHOR DETAIL



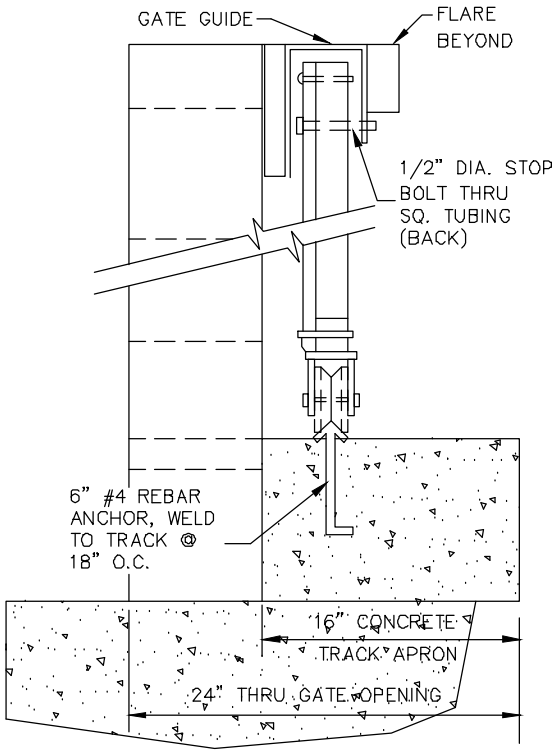
ELEVATION

DETAIL NO. G-3390-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	16' SLIDING GATE & HINGED DOOR	DETAIL NO. G-3390-1

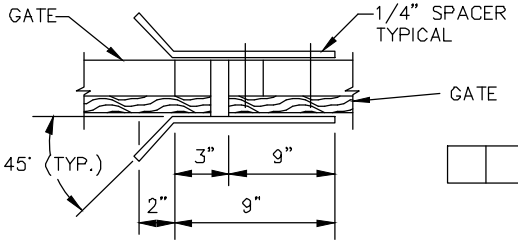


GATE GUIDE DETAIL

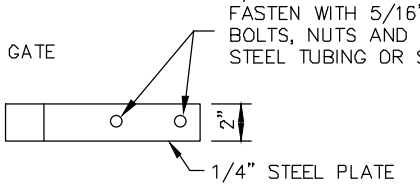
(MAKE 2, 1 OPPOSITE HAND)



SECTION A–A



PLAN



ELEVATION

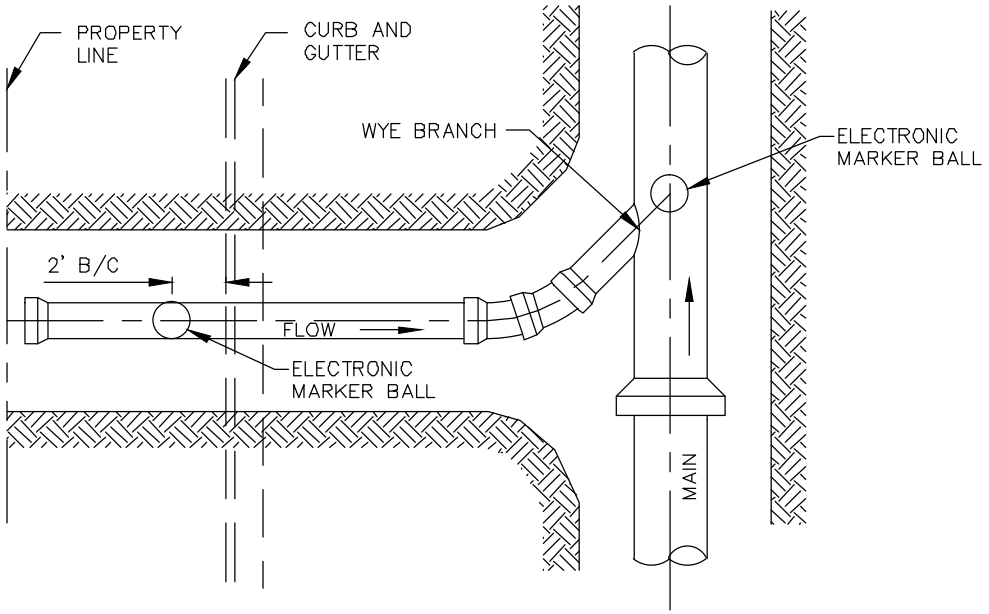
ALIGNING GUIDE DETAIL

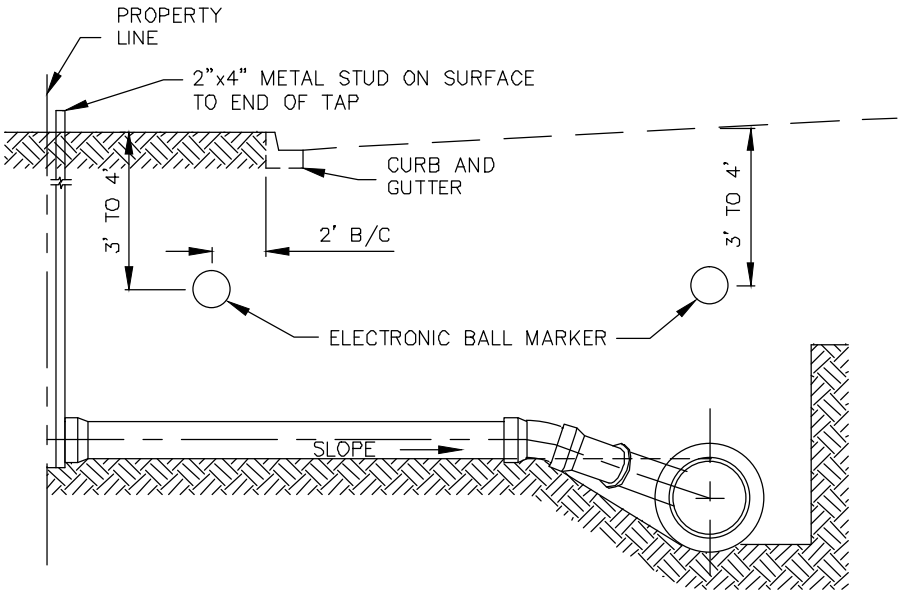
(2 REQUIRED)

NOTES:

1. CONTRACTOR SHALL PRIME AND PAINT ALL METAL SURFACES, AND SHALL SEAL ALL WOOD SURFACES. BEFORE APPLICATION, THE COLOR AND MANUFACTURE OF THE PAINT AND SEALER SHALL BE APPROVED BY THE CITY PUBLIC WORKS & WATER RESOURCES DEPARTMENT.
2. PRIOR TO PAINTING, ALL SURFACES SHALL BE CLEANED FREE OF CONCRETE, MORTAR, RUST, DIRT, AND ANY OTHER OBJECTIONAL MATERIALS.
3. APPLY ONE (1) PRIMER COAT AND TWO (2) EXTERIOR ALKYD GLOSS ENAMEL COATS TO METAL.

DETAIL NO. G-3390-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	16' SLIDING GATE	DETAIL NO. G-3390-2





NOTES:

1. APPROVED ELECTRONIC BALL MARKER MANUFACTURER'S CAN BE FOUND IN THE CITY'S APPROVED MATERIALS LIST.
2. MARKER BALLS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, 2' BEHIND THE BACK OF CURB ABOVE PIPE (OR 2' BEHIND WALK FOR ATTACHED SIDEWALK). AN ADDITIONAL MARKER BALL SHALL BE INSTALLED ABOVE THE WYE.
3. ELECTRONIC MARKER BALLS SHALL BE RESTORED BY CONTRACTOR IF DISTURBED WHEN PRIVATE SERVICE LINE CONNECTION IS INSTALLED.
4. MARKER BALLS SHALL BE USED IN ADDITION TO A 2"x4" METAL STUD.

DETAIL NO. G-3429	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	ELECTRONIC MARKER BALL PLACEMENT - SEWER	DETAIL NO. G-3429

NOTES:

1. CONSTRUCTION DETAIL APPLIES WHERE CONTRACTOR BUILDS SERVICE CONNECTION. TAP EXTENDS 3' BEYOND P.U.E.

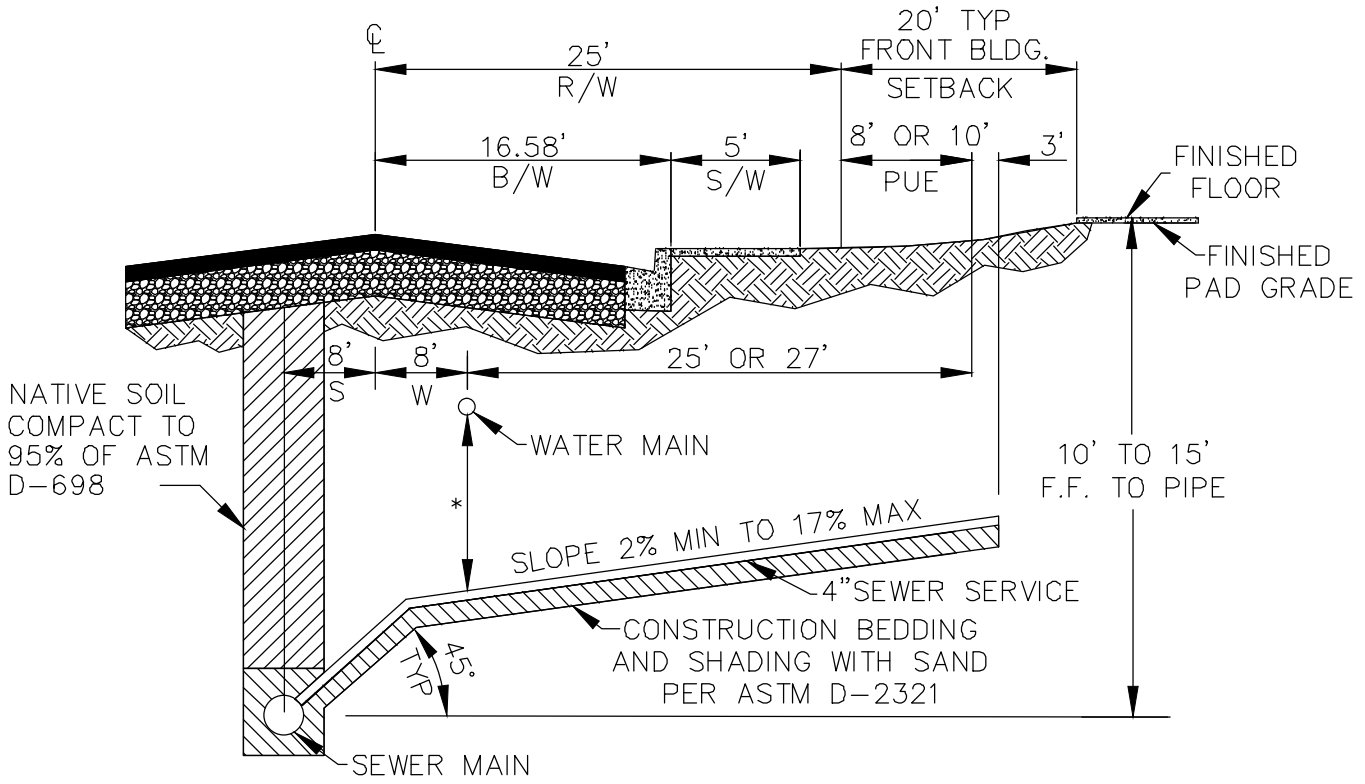
2. SIZE OF TAP SHALL BE DESIGNATED ON PLANS.

3. CONSTRUCT TAP AT MINIMUM SLOPE IF COVER WILL BE LESS THAN 5' AT PROPERTY LINE.

4. ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321. THE CONTRACTOR MAY VARY FROM THE DRAWING TO USE THE APPROPRIATE WYES, TEE-WYES, AND BENDS TO ENSURE NO MISALIGNMENT OF THE PIPE AND FITTINGS. BLOCK OR BRACE FITTING JOINTS TO ENSURE ZERO DEGREES ANGULAR JOINT DEFLECTION.

5. END OF TAP TO BE SEALED AND MARKED AS NOTED.

6. SEE CITY STD. DET. G-3428 & G-3305 FOR ELECTRONIC BALL MARKER LOCATIONS.

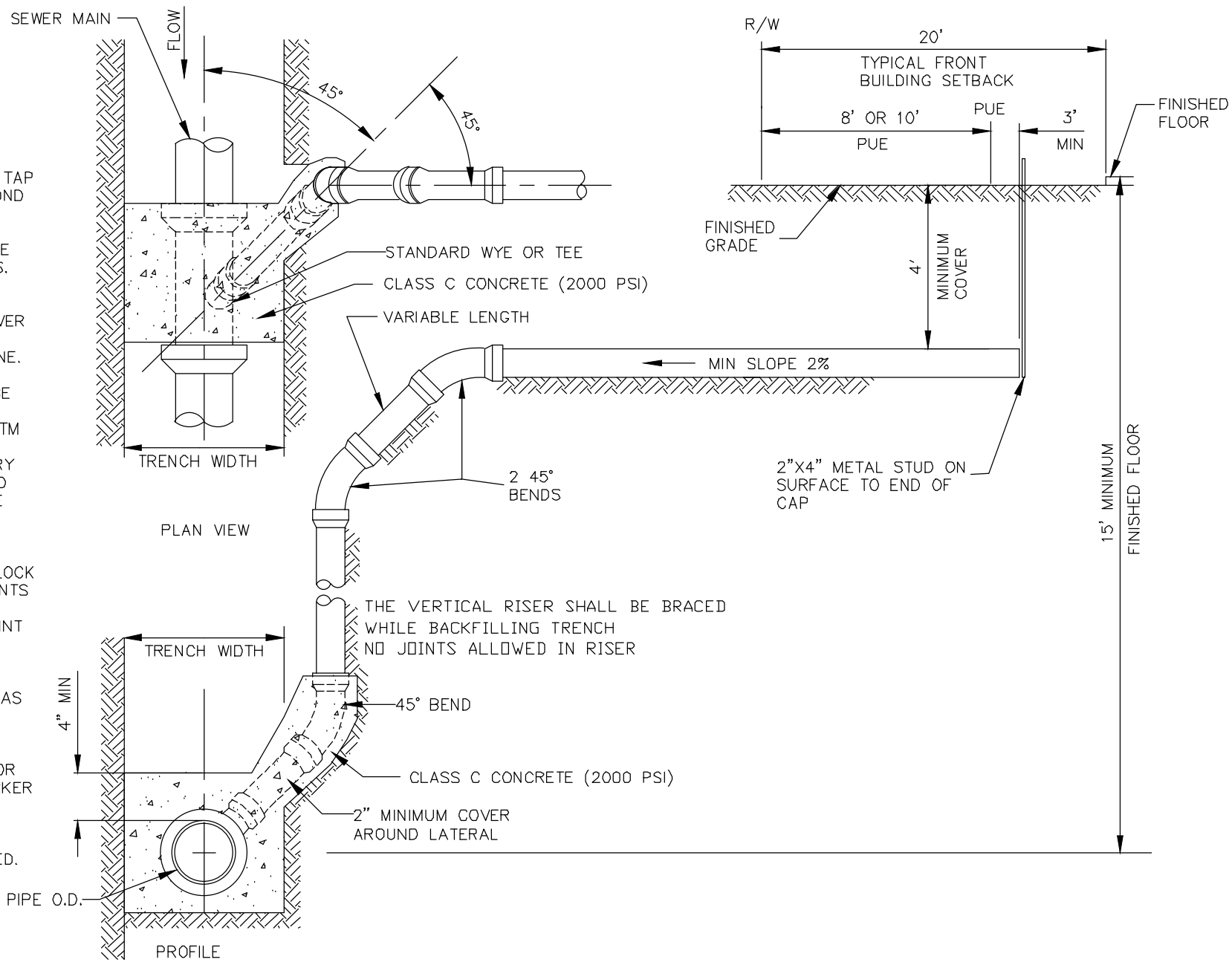


*PROVIDE A MINIMUM SEPARATION BETWEEN WATER LINE AND SEWER SERVICE PER MAG STD. DET. 404-1

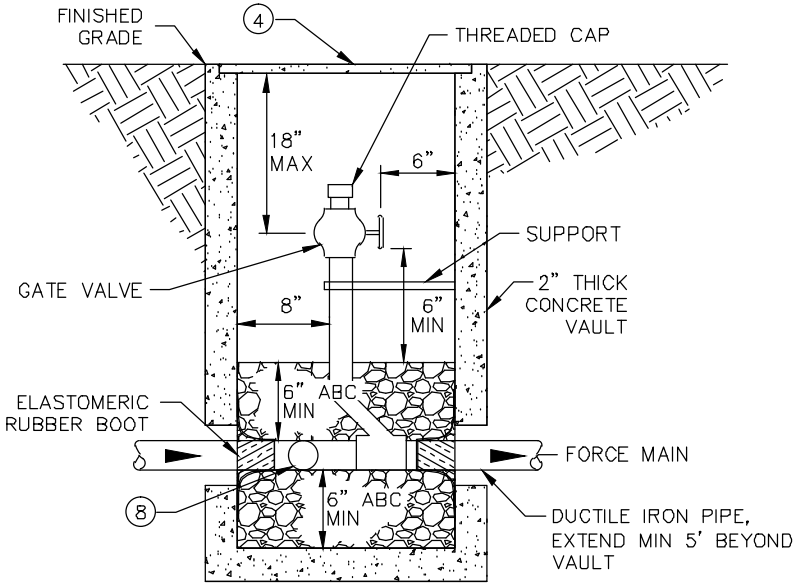
DETAIL NO. G-3430	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	TYPICAL SEWER SERVICE FOR SEWER MAINS > 10' - 15' DEEP	DETAIL NO. G-3430

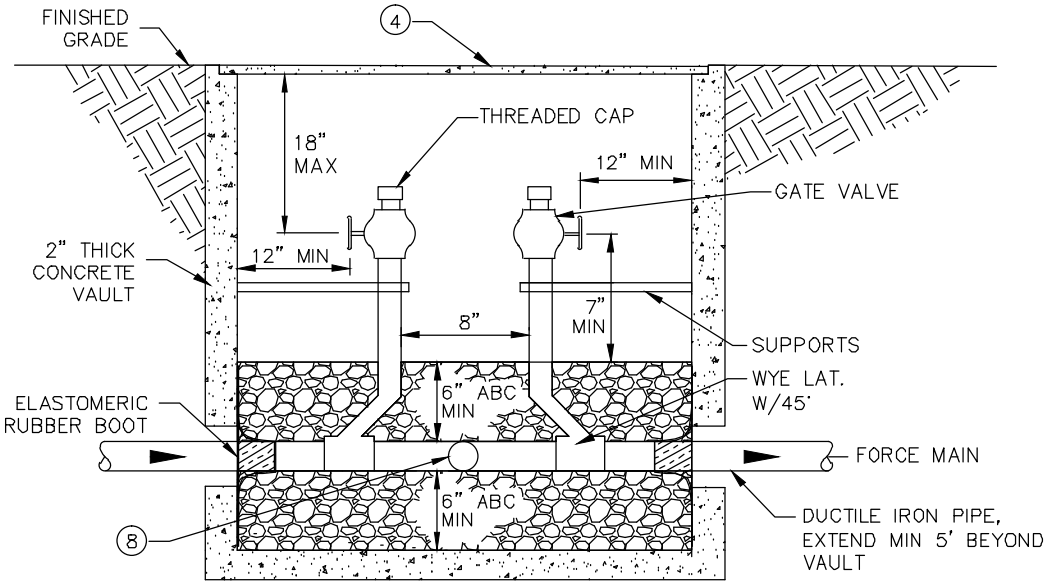
NOTES:

1. CONSTRUCTION DETAIL APPLIES WHERE CONTRACTOR BUILDS SERVICE CONNECTION. TAP EXTENDS 3 FEET BEYOND P.U.E.
2. SIZE OF TAP SHALL BE DESIGNATED ON PLANS.
3. CONSTRUCT TAP AT MINIMUM SLOPE IF COVER WILL BE LESS THAN 5 FEET AT PROPERTY LINE.
4. ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321. THE CONTRACTOR MAY VARY FROM THE DRAWING TO USE THE APPROPRIATE WYES, TEE-WYES AND BENDS TO ENSURE NO MISALIGNMENT OF THE PIPE AND FITTINGS. BLOCK OR BRACE FITTING JOINTS TO ENSURE ZERO DEGREES ANGULAR JOINT DIRECTION.
5. END OF TAP TO BE SEALED AND MARKED AS NOTED.
6. SEE CITY STD. DET. G-3428 & G-3305 FOR ELECTRONIC BALL MARKER LOCATIONS.
7. SEWER PIPE SHALL BE SDR 26 IF PVC IS USED.



DETAIL NO. G-3430-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	DEEP SEWER SERVICE CONNECTION - 15' DEEP OR GREATER	DETAIL NO. G-3430-2

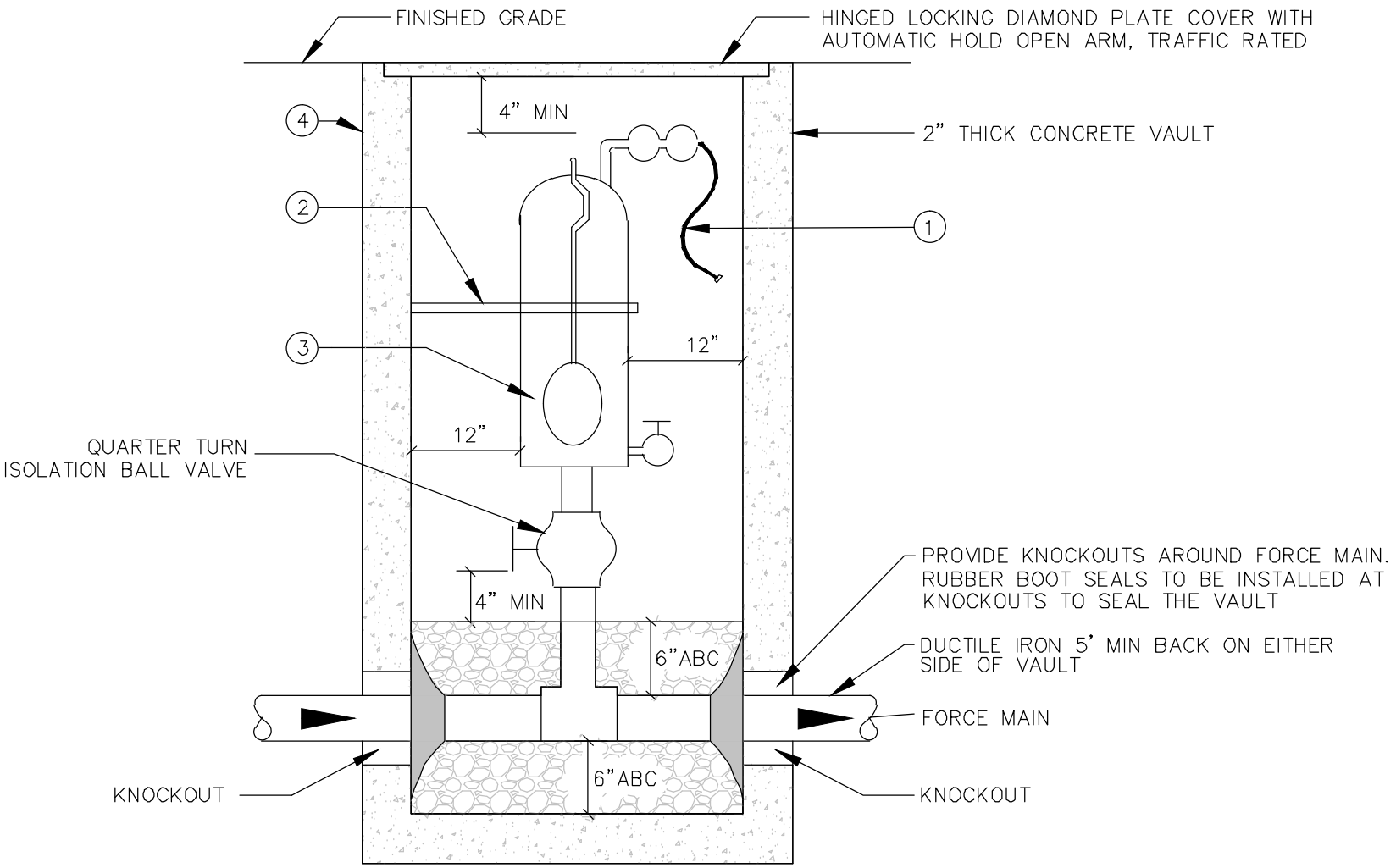




NOTES:

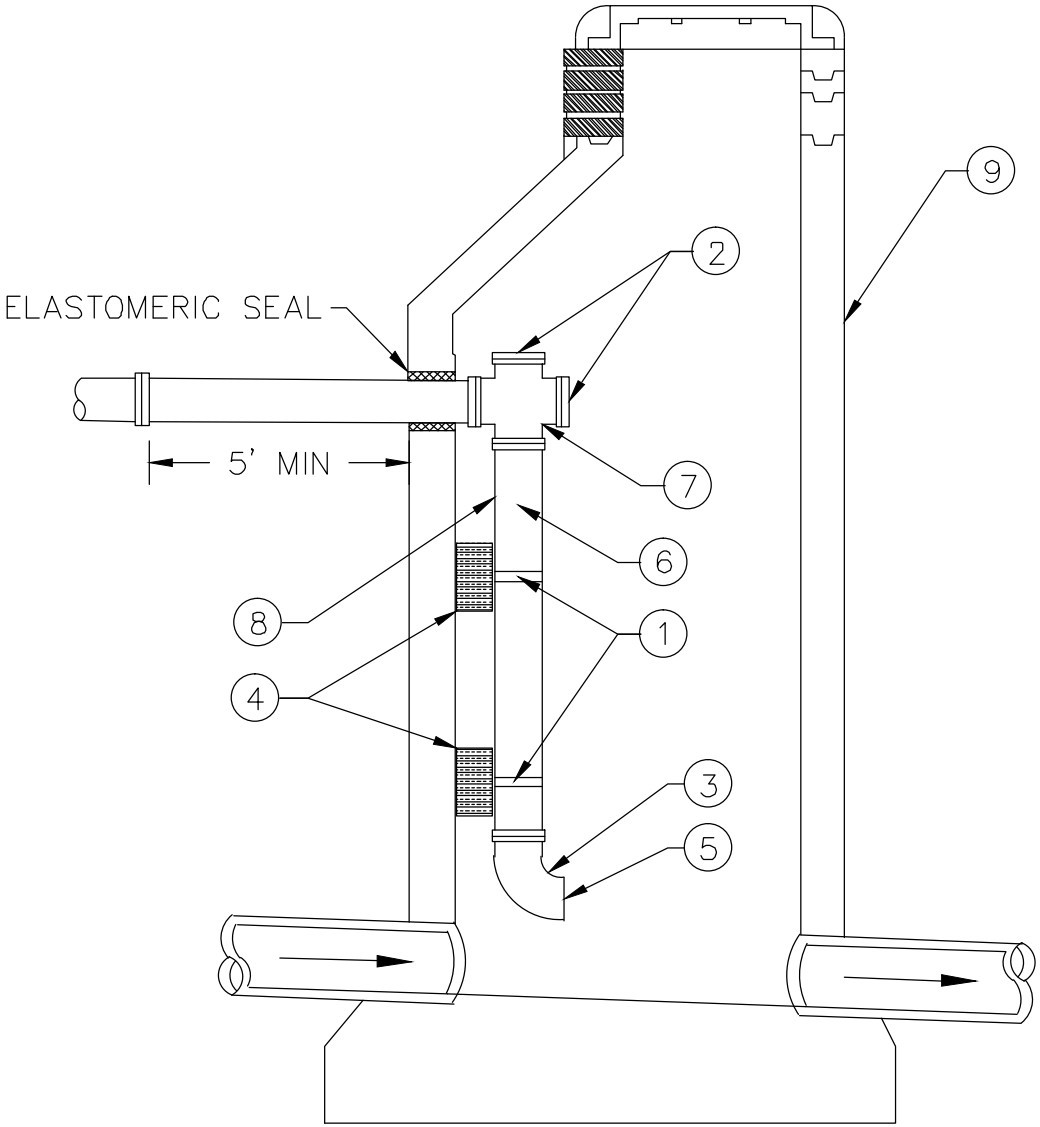
1. ONE-WAY CLEANOUTS SHALL BE INSTALLED ON MAXIMUM 400- FOOT CENTERS ALONG FORCE MAIN. ROTATE VAULT AS REQUIRED TO KEEP BEHIND BACK OF CURB.
2. TWO-WAY CLEANOUTS SHALL BE INSTALLED ON A MAXIMUM 800-FOOT CENTERS ALONG FORCE MAIN. ROTATE VAULT AS REQUIRED TO KEEP BEHIND BACK OF CURB.
3. AN AIR RELEASE VALVE SHALL BE INSTALLED ADJACENT TO ANY FORCE MAIN CLEANOUT.
4. LOCKING DIAMOND PLATE COVER WITH AUTOMATIC HOLD OPEN ARM, TRAFFIC-RATED.
5. RISER PIPES TO BE SAME DIAMETER AS FORCE MAIN (PLUG END WITH THREADED CAP).
6. PROVIDE KNOCKOUTS AROUND FORCE MAIN. RUBBER BOOT SEALS TO BE INSTALLED AT KNOCKOUTS TO SEAL THE VAULT.
7. PROVIDE 12" ABC MATERIAL AROUND FORCE MAIN.
8. PROVIDE GATE VALVE FOR FORCE MAINS WITH DIAMETERS OF 2" OR LESS.
9. A MINIMUM 12" OF CLEARANCE SHALL BE MAINTAINED BETWEEN THE VAULT WALLS AND THE CLEANOUT EQUIPMENT.

DETAIL NO. G-3440	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	FORCE MAIN CLEANOUTS	DETAIL NO. G-3440



NOTES:
1. SUPPORT FOR AIR RELEASE VALVE.
2. SEWAGE AIR RELEASE VALVE FROM THE APPROVED MATERIALS LIST.
3. ROTATE VAULT AS REQUIRED TO KEEP BEHIND BACK OF CURB.

DETAIL NO. G-3441	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SEWAGE AIR RELEASE VALVE	DETAIL NO. G-3441

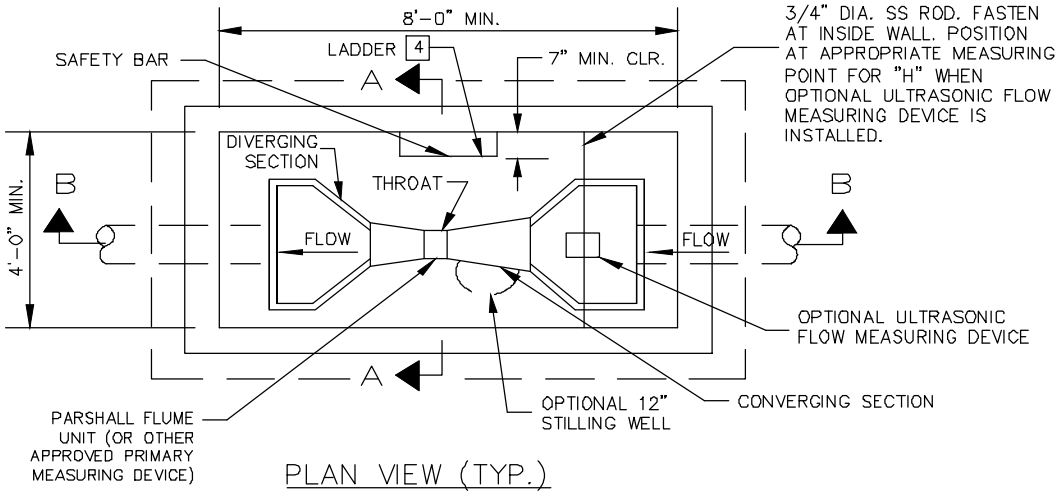


NOTE: DISCHARGE OUTLET SHALL NEVER BE BELOW CROWN OF DOWNSTREAM PIPE.

NOTES:

1. GRADE 316 STAINLESS STEEL FASTENERS. INSTALL 1 PER SECTION OF MANHOLE (MINIMUM OF 2).
2. BLIND FLANGE W/STAINLESS STEEL BOLTS GRADE 316 3" AND ABOVE IPT CAP, 2" BELOW.
3. MJ X PLAIN END 90 DEGREE ELBOW RESTRAINED TO DIRECT FLOW DOWN STREAM.
4. ELASTROMERIC SPACER (1 PER FASTENER).
5. FORCE MAIN SHALL TRANSITION INTO A GRAVITY LINE WITHIN A MANHOLE IN A MANNER THAT MINIMIZES AGITATION OF SEWAGE. THE CROWN OF THE FORCE MAIN AND OUTLET GRAVITY LINE SHALL MATCH WHERE POSSIBLE, WITH BENCH GROUTING INSTALLED TO DIRECT FLOW INTO THE OUTLET WITH A MINIMAL CHANGE IN THE GRAVITY FLOW ANGLE.
6. THE FORCE MAIN LINES WITHIN THE MANHOLE SHALL HAVE 401 EPOXY COATING ON THE PIPE.
7. FLG CROSS W/401 EPOXY COATING ON THE OUTSIDE.
8. DIP PER APPROVED MATERIALS LIST.
9. MINIMUM 5' DIAMETER MANHOLE.

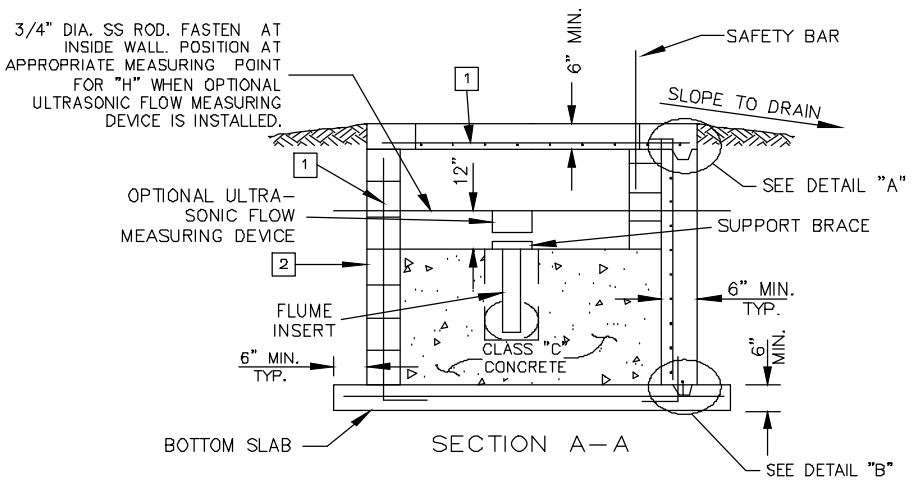
DETAIL NO. G-3442	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	FORCE MAIN - MANHOLE DISCHARGE	DETAIL NO. G-3442



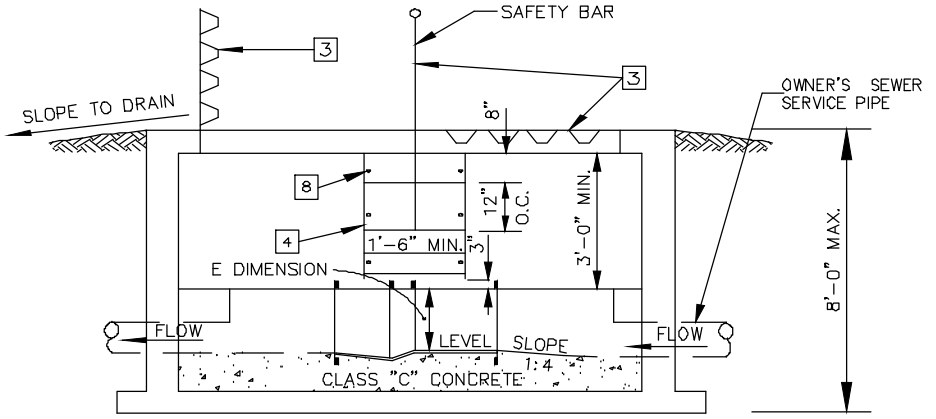
PLAN VIEW (TYP.)

CONSTRUCTION NOTES:

1. REINFORCED STEEL AND CLEARANCE AS APPROVED BY THE ENGINEER.
2. BLOCK MASONRY MAY BE USED IN LIEU OF CIP WALLS. 8" BLOCK MASONRY, GROUT EACH CELL TO FULL HEIGHT (GROUT PER MAG SECTION 776).
3. 2 TORSION SPRING-ASSISTED GALVANIZED DIAMOND PLATE ACCESS DOORS (TRAFFIC RATED) LOCKING WITH TYPE 304SS HARDWARE AND SAFETY BAR.
4. LADDER SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE DETAIL AND SHALL MEET THE REQUIREMENTS OF OSHA FOR TYPE 1A (300lbs) FIXED LADDERS, SINGLE SECTION. DETAILS OF LADDER CONSTRUCTION, ALONG WITH A CERTIFICATION THAT THE LADDER MEETS OR EXCEEDS OSHA REQUIREMENTS FOOT TYPE IA (300lbs) SERVICE SHALL BE SUBMITTED FOR REVIEW PRIOR TO FURNISHING AND INSTALLING. MILL FINISHED ALUMINUM LADDER OR APPROVED CORROSION RESISTANT MATERIAL.
5. 2"x4" KEY, CENTER ON WALL. (INSTALL ROPE CAULK CONTINUOUSLY).
6. 1-5/8" x 2-1/2" x 3" KEY.
7. 4" PVC DUMBELL-TYPE CONTINUOUS WATERSTOP 3/8" MIN. THICKNESS. (WASH THOROUGHLY PRIOR TO INSTALLATION.
8. ANCHOR STRAPS (3 EACH SIDE) WITH 5/8" x 3-1/2" 316SS ANCHOR BOLTS WITH LOCK WASHER AND NUT.



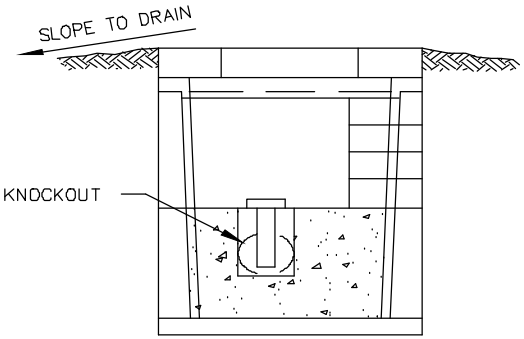
SECTION A-A



SECTION B-B

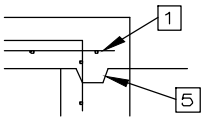
CAST-IN-PLACE VAULT

DETAIL NO. G-3450-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	MONITORING/SAMPLING VAULT	DETAIL NO. G-3450-1



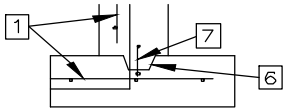
SECTION A–A

PRE–CAST VAULT



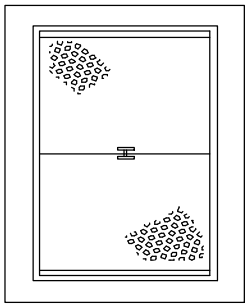
TOP KEY

DETAIL "A"



BOTTOM KEY

DETAIL "B"



COVER WITH LID

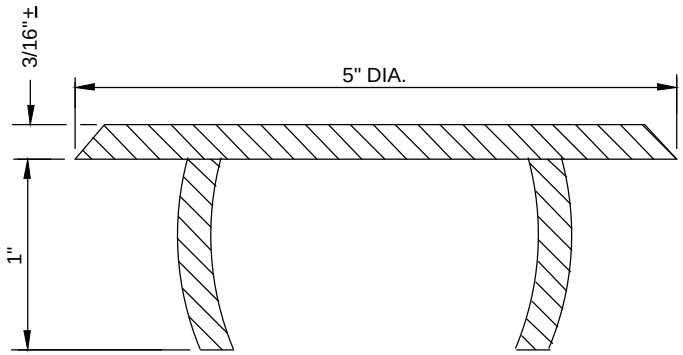
CONSTRUCTION NOTES:

1. REINFORCED STEEL AND CLEARANCE AS APPROVED BY THE ENGINEER.
2. BLOCK MASONRY MAY BE USED IN LIEU OF CIP WALLS. 8" BLOCK MASONRY, GROUT EACH CELL TO FULL HEIGHT (GROUT PER MAG SECTION 776).
3. 2 TORSION SPRING–ASSISTED GALVANIZED DIAMOND PLATE ACCESS DOORS (DESIGN LOADING AASHO–H20), LOCKING WITH TYPE 304SS HARDWARE AND SAFETY BAR.
4. LADDER SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE DETAIL AND SHALL MEET THE REQUIREMENTS OF OSHA FOR TYPE 1A (300lbs) FIXED LADDERS, SINGLE SECTION. DETAILS OF LADDER CONSTRUCTION, ALONG WITH A CERTIFICATION THAT THE LADDER MEETS OR EXCEEDS OSHA REQUIREMENTS FOOT TYPE IA (300lbs) SERVICE SHALL BE SUBMITTED FOR REVIEW PRIOR TO FURNISHING AND INSTALLING. MILL FINISHED ALUMINUM LADDER OR APPROVED CORROSION–RESISTANT MATERIAL.
5. 2"x4" KEY, CENTER ON WALL (INSTALL ROPE CAULK CONTINUOUSLY).
6. 1–5/8" x 2–1/2" x 3" KEY.
7. 4" PVC DUMBELL–TYPE CONTINUOUS WATERSTOP 3/8" MIN. THICKNESS. (WASH THOROUGHLY PRIOR TO INSTALLATION.
8. ANCHOR STRAPS (3 EACH SIDE) WITH 5/8" x 3–1/2" 316SS ANCHOR BOLTS WITH LOCK WASHER AND NUT.

EQUIPMENT DESCRIPTION

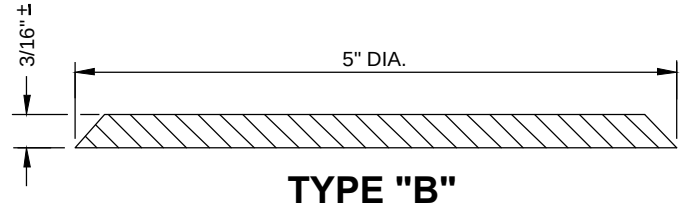
MOLDED FIBERGLASS REINFORCED POLYESTER PARSHALL FLUME (OR APPROVED EQUAL) SHALL BE INSTALLED. THE FLUME SHALL BE MOLDED IN ONE PIECE WITH AMPLE WALL THICKNESS AND REINFORCING RIBS TO PREVENT DISTORTION DURING SHIPMENT, INSTALLATION, AND OPERATION. THE FLUME SHALL BE SELF–SUPPORTING AND REQUIRE NO EXTERNAL SUPPORTING STRUCTURE. INTERIOR DIMENSIONS SHALL CONFORM TO THOSE IN THE LATEST REVISION OF WATER MEASUREMENT MANUAL PUBLISHED BY THE U.S. DEPARTMENT OF THE INTERIOR, WATER AND POWER RESOURCES SERVICES. THE THROAT WIDTH AND FLUME HEIGHT (*E DIMENSION) SHALL BE PER PLAN.

DETAIL NO. G-3450-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	MONITORING/SAMPLING VAULT	DETAIL NO. G-3450-2



TYPE "A"

TO BE INSTALLED IN WET CONCRETE
DURING CONSTRUCTION



TYPE "B"

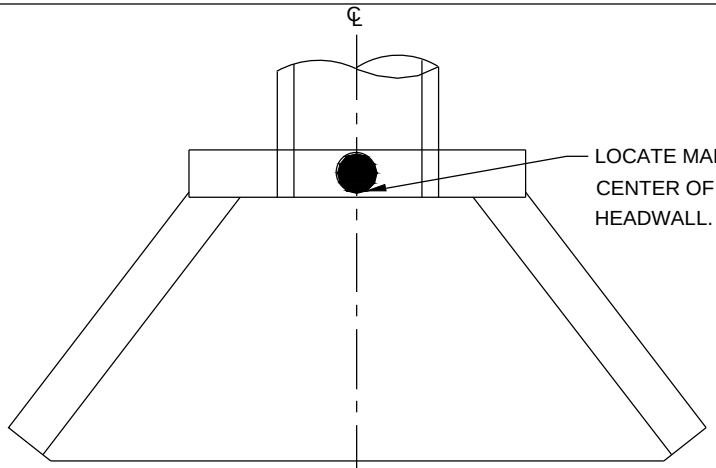
TO BE INSTALLED WITH ADHESIVE
ON EXISTING STRUCTURES



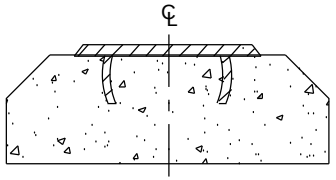
NOTES:

1. MATERIAL: CAST ALUMINUM.
2. THE TOTAL WIDTH OF INDIVIDUAL LETTERS TO BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED.
3. LETTERS TO BE 1/2" IN HEIGHT. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL.

DETAIL NO. G-3510	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STORM DRAIN INLET MARKER	DETAIL NO. G-3510

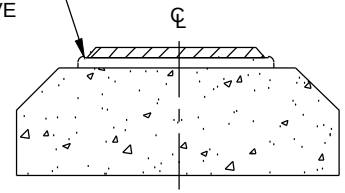


PLAN VIEW



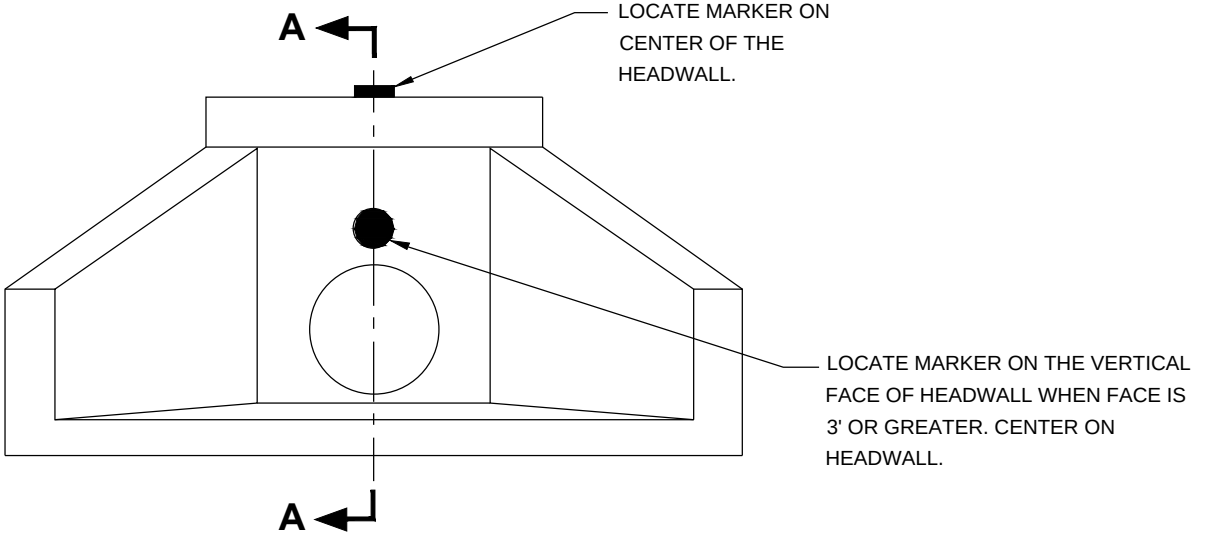
TYPE "A"

TO BE INSTALLED IN WET CONCRETE DURING CONSTRUCTION

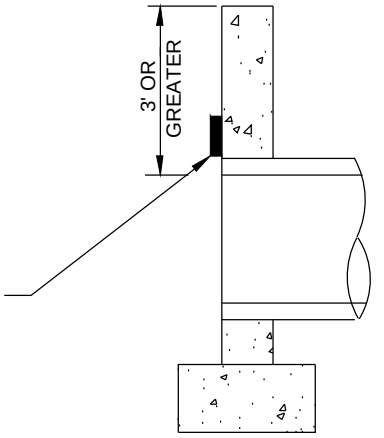


TYPE "B"

TO BE INSTALLED WITH ADHESIVE ON EXISTING STRUCTURES

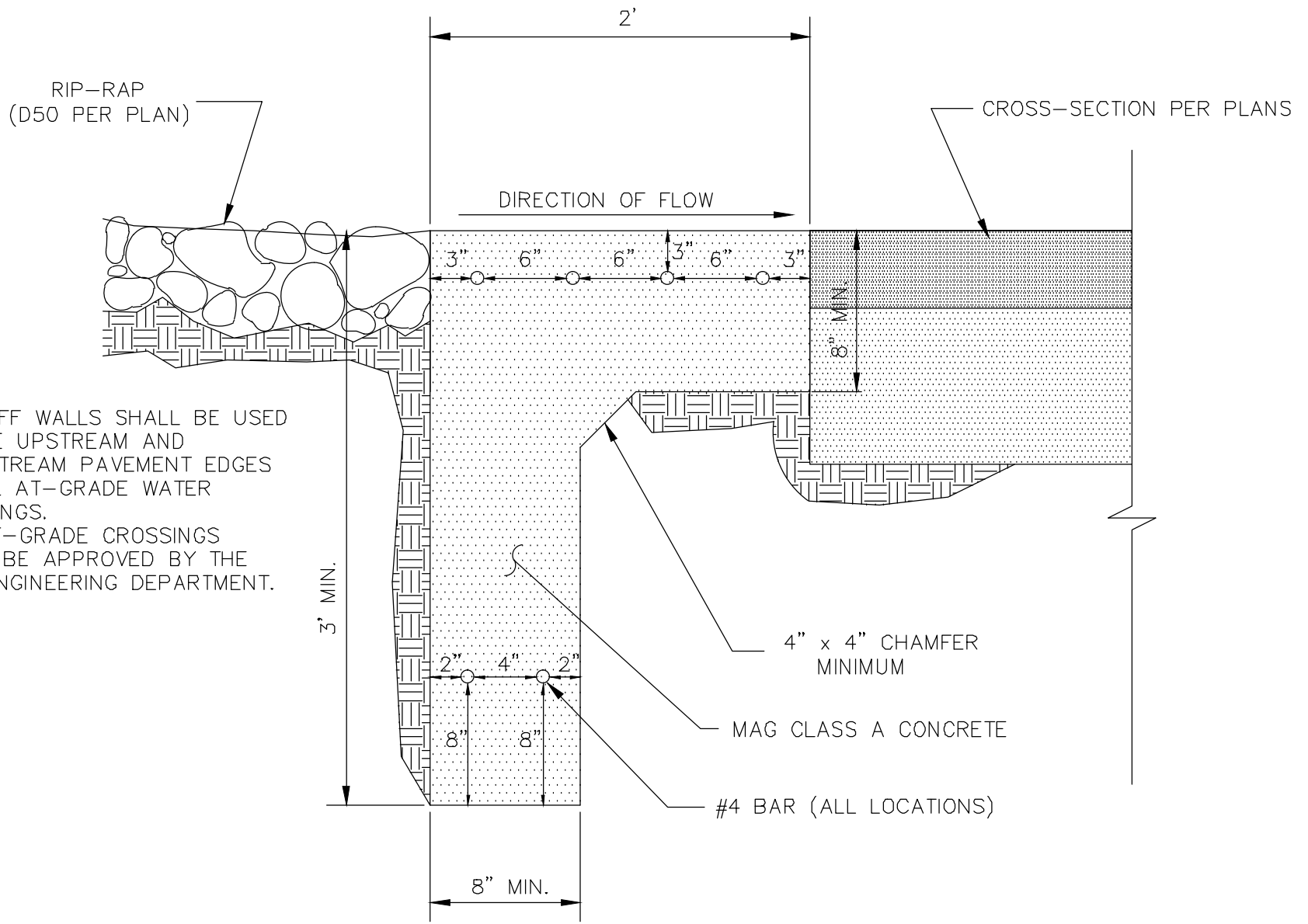


SIDE VIEW

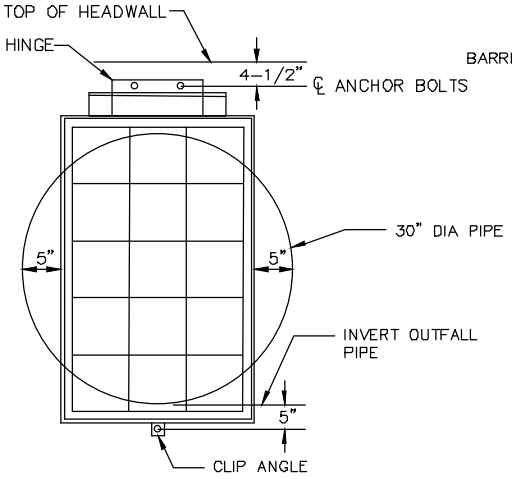


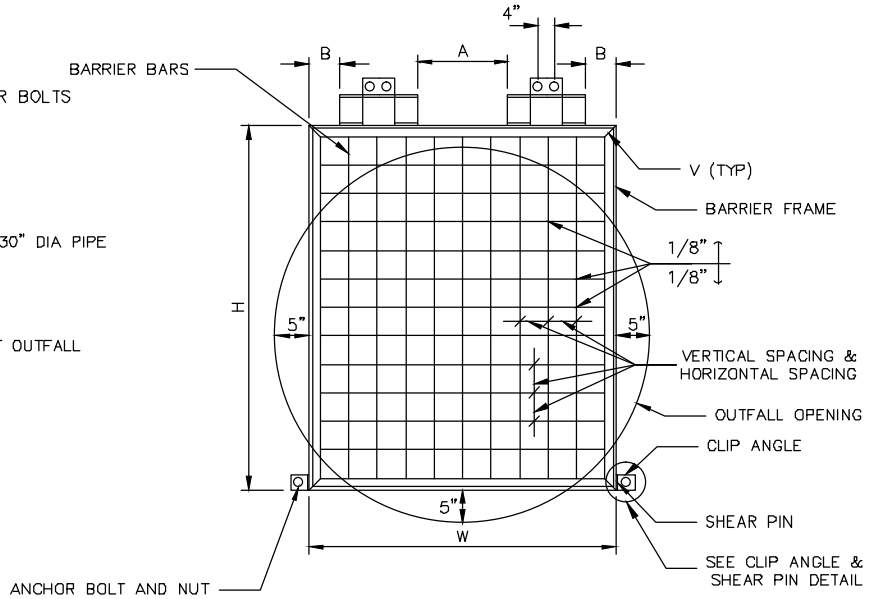
SECTION A-A

DETAIL NO. G-3511	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STORM DRAIN INLET MARKER ON HEADWALL	DETAIL NO. G-3511

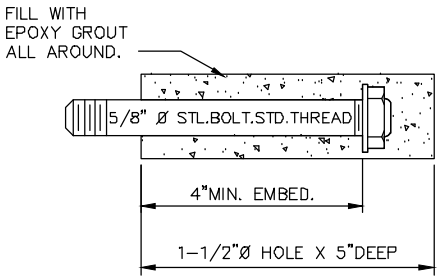


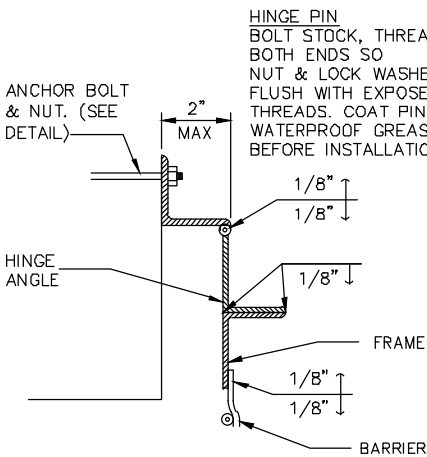
DETAIL NO. G-3520	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	CUT-OFF WALL	DETAIL NO. G-3520

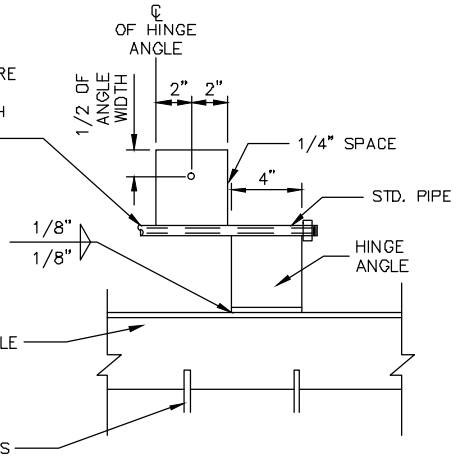


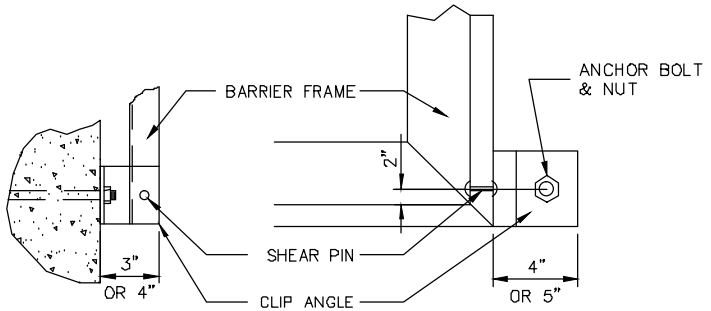


1. ALL SHEAR PIN ANGLES SHALL FIT SNUGLY AND TRULY FACE TO FACE. COVER WITH WATERPROOF GREASE PRIOR TO INSTALLATION OF PIN.
2. GALVANIZE ALL FERROUS PARTS AFTER FABRICATION.
3. THE SHEAR PIN HOLES IN THE ANGLE SHALL BE DRILLED FOR A TIGHT FIT OF THE SHEAR PINS.
4. FRAME AND HINGE ANGLES SHALL HAVE THE OUTSTANDING LEGS OUT FOR OUTLETS.
5. ALL ANCHOR BOLTS SHALL BE 5/8 0 ANCHOR BOLTS EMBEDDED 4"(MIN.) INTO EPOXY GROUT.
6. ALL SHEAR PINS ARE TO BE PEENED BOTH ENDS AFTER INSTALLATION.
7. SHEAR PIN MATERIAL SHALL BE COMMERCIALLY PURE ALUMINUM WIRE.
8. SEE BARRIER SPECIFICATION SCHEDULE, DET. G-3531-2 FOR VARIABLE DIMENSIONS.
9. COVER ALL MOVABLE CONTACT SURFACE WITH A COAT OF WATERPROOF GREASE PRIOR TO INSTALLATION.
10. ALL BARRIER BARS TO BE 1/2"PLAIN.







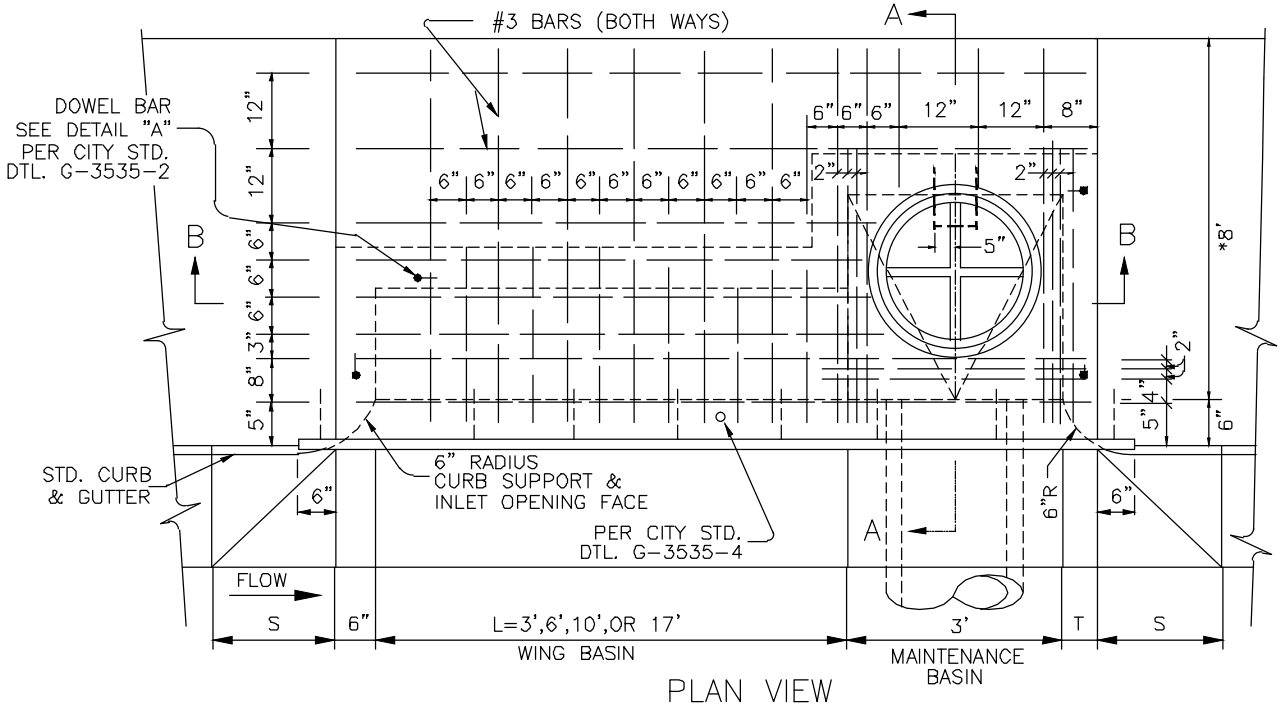


DETAIL NO.				DETAIL NO.
G-3531-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	STORM SEWER OUTFALL ACCESS BARRIER	G-3531-1

SIZE OF OUTFALL CONDUIT	FRAME ANGLES	SHEAR PIN CLIP ANGLES	SHEAR PINS	ANCHOR BOLTS	HINGE PINS	HINGE ANGLE	HINGE STANDARD PIPE	*NO. OF EQUAL BARRIER BAR SPACES (HORIZ.)	NO. OF EQUAL BARRIER BAR SPACES (VERT.)	H (OUT TO OUT FRAME ANGLES)	W * (OUT TO OUT FRAME ANGLES)	A	B
30"	2x2x1/4	4x4x1/4	1–1/8ø	5/8ø	1/2"ø	2x2x1/4	3/4"	3	5	34"	20"	SINGLE HINGE CENTERED	
36"	2x2x1/4	4x4x1/4	1–1/8ø	5/8ø	3/4ø	2–1/2X 2–1/2X1/4	1"	4	6	40"	26"	SINGLE HINGE CENTERED	
42"	2x2x1/4	4x4x1/4	2–1/8ø	5/8ø	1/2"ø	2x2x1/4	3/4"	5	6	42"	32"	2 HINGES	
48"	3x3x7/16	5x3x1/4	2–1/8ø	5/8ø	3/4"ø	2–1/2x1/4	1"	5	7	47"	38"	3"	1"
54"	3x3x7/16	5x3x1/4	2–1/8ø	5/8ø	3/4"ø	2x2x1/4	1"	6	8	54"	44"	5"	3"
60"	3x3x7/16	5x3x1/4	2–1/8ø	5/8ø	3/4"ø	2x2x1/4	1"	7	9	60"	50"	9"	4"
66"	3x3x7/16	5x3x1/4	2–1/8ø	5/8ø	3/4"ø	2x2x1/4	1"	8	10	66"	56"	11"	6"
72"	4x4x5/8	5x3x1/4	2–3/16ø	5/8ø	1"ø	3x3x3/8	1–1/4"	9	11	73"	62"	15"	7"
78"	4x4x5/8	5x3x1/4	2–3/16ø	5/8ø	1"ø	3x3x3/8	1–1/4"	10	11	79"	68"	17"	9"
84"	4x4x5/8	5x3x1/4	2–3/16ø	5/8ø	1"ø	3x3x3/8	1–1/4"	11	13	86"	74"	21"	10"
90	4x4x5/8	5x3x1/4	2–3/16ø	5/8ø	1"ø	3x3x3/8	1–1/4"	12	13	92"	80"	23"	12"
96"	4x4x5/8	5x3x1/4	2–3/16ø	5/8ø	1"ø	3x3x3/8	1–1/4"	12	14	98"	86"	29"	12"

*NOTE: ADJUST THESE VALUES FOR SKEWED CONDUITS. PROVIDE 5" MAXIMUM OPENING AT EACH SIDE AND BETWEEN BARS.

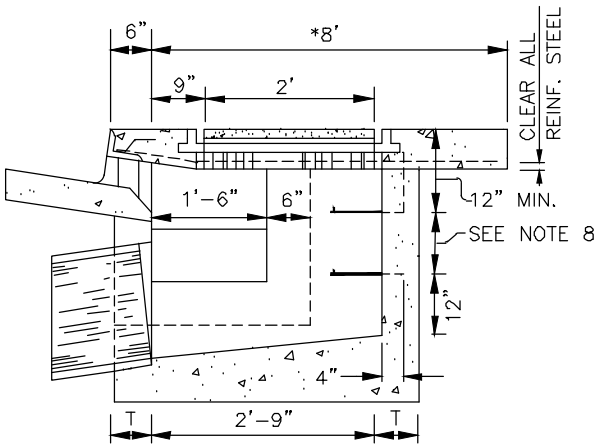
DETAIL NO. G-3531-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	BARRIER SPECIFICATIONS SCHEDULE	DETAIL NO. G-3531-2



PLAN VIEW

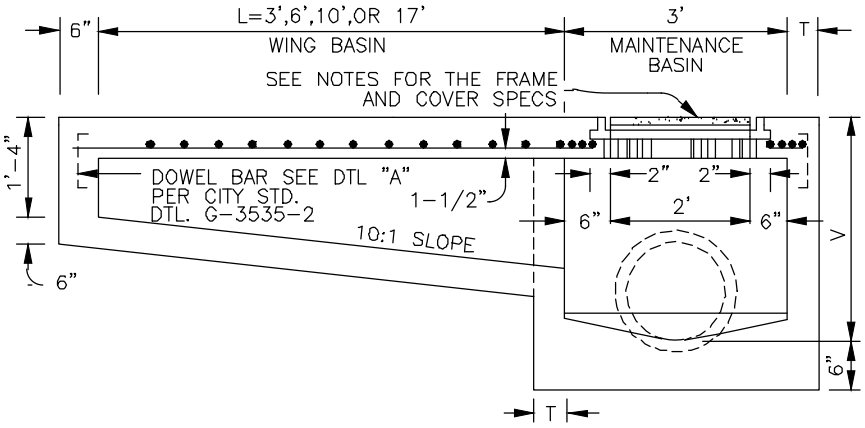
NOTES

1. FOR CONSTRUCTION NOTES, TABLES AND ADDITIONAL DETAILS SEE CITY STD DTL. G-3535-2.



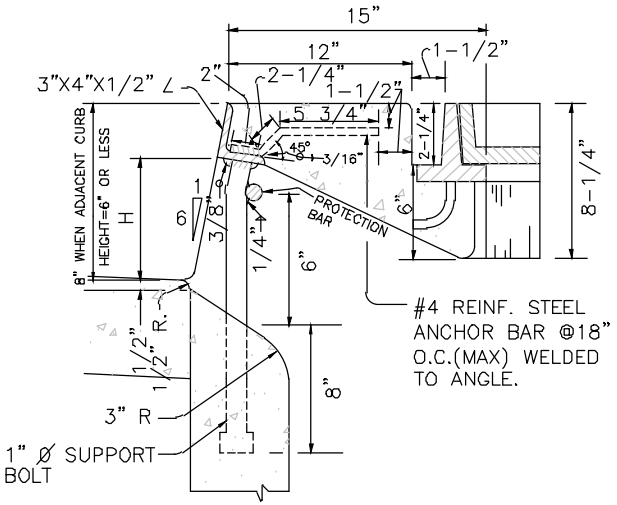
SECTION A-A

TRANSITION (BOTH SIDES)

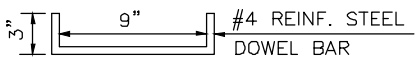


SECTION B-B

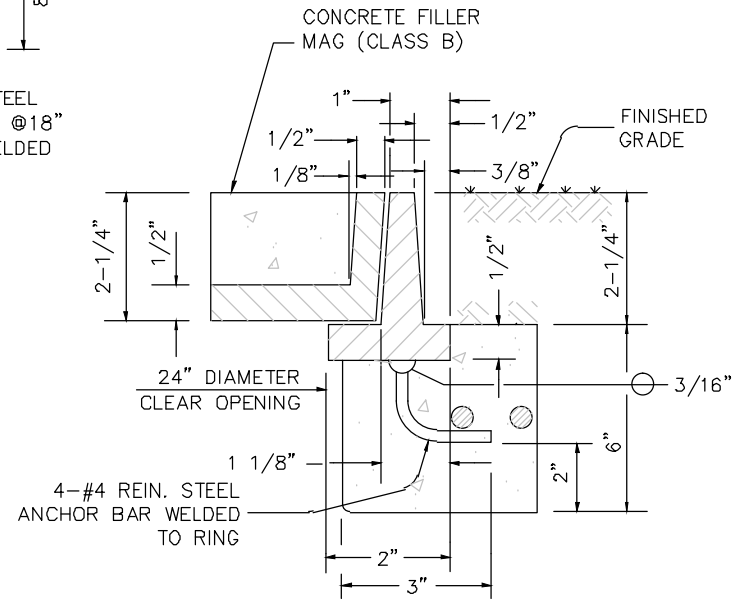
DETAIL NO. G-3535-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	CATCH BASIN TYPE 'M'	DETAIL NO. G-3535-1



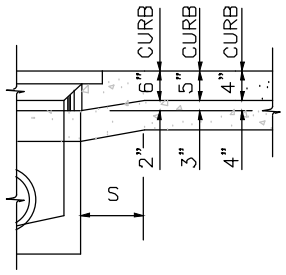
INLET CURB OPENING



DOWEL BAR
DETAIL A



CATCH BASIN LID WITHIN LANDSCAPE



DEPRESSED GUTTER

NOTES

1. TYPES ARE DESIGNATED AS FOLLOWS: 'M'.. NO WING; 'M-1'.. ONE WING; 'M-2'.. TWO WINGS.
2. ALL CONCRETE SHALL BE CLASS 'A'.
3. ALL REINFORCING STEEL SHALL BE DEFORMED BARS AMD SHALL CONFORM TO ASTM SPECIFICATION 615.
4. CONNECTOR PIPES SHALL BE PLACED IN THE APPROPRIATE WALL OF THE MAINTENANCE BASIN.
5. FLOOR OF BASIN SHALL BE TROWELLED TO A HARD, SMOOTH SURFACE AND SHALL SLOPE FROM ALL DIRECTIONS TO OUTLET.
6. CONSTRUCTION DRAINS SHALL BE INSTALLED IN ALL INLETS BUILT WITH PAVING PROJECTS.
7. LOCATE WING BASIN ON UPSTREAM SIDE OF MAINTENANCE BASIN FOR TYPE M-1. WING BASINS FOR TYPE M-2 SHALL BE BOTH SIDES OF MAINTENANCE BASIN.
8. STEPS (MAG DTL. 428 POLYPROPYLENE)- V=3' (INCL.), PLACE ONE STEP 12" ABOVE THE FLOOR OF THE BASIN. V OVER 3', PLACE STEPS AT 12" INTERVALS FROM THE FLOOR OF THE BASIN WITH THE TOP STEP AT 12" (MIN.) BELOW THE TOP OF THE GRATE.
9. ACCESS FRAME AND COVER PER MAG STD DTL. 536-2

TABLE A

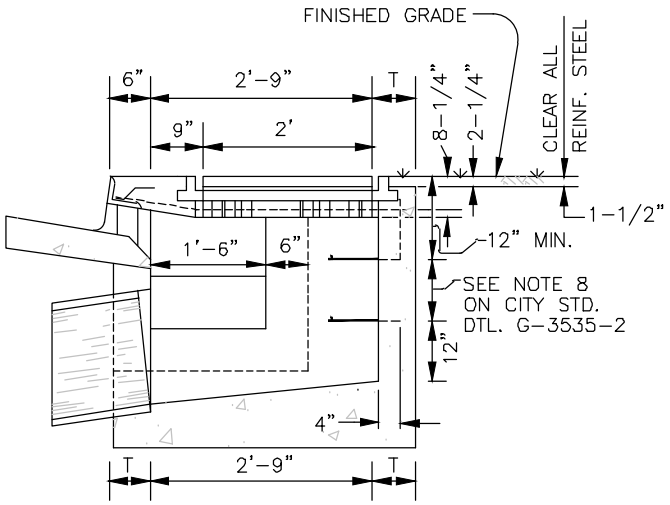
CATCH BASIN WALL THICKNESS
T = 6" IF V = 4' OR LESS T = 8" IF V = 4' TO 8' (IF V EXCEEDS 8', SPECIAL DESIGN IS REQUIRED.)
L = 0' UNLESS SPECIFIED ON THE PLANS V = 3'-6" MIN. WHEN L = 0',3', OR 6' V = 4' MIN. WHEN L = 10' OR 17'

*5' IN LOCATIONS WHERE 5' SIDEWALK IS ALLOWED

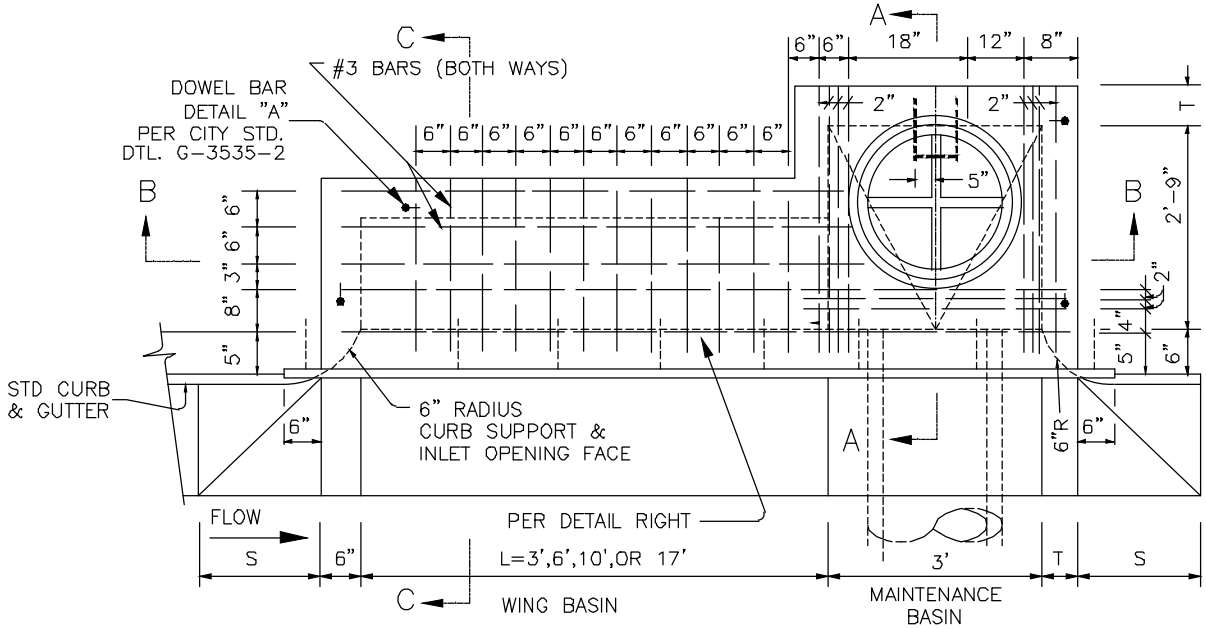
TABLE B

GUTTER TRANSITION	
CURB HEIGHT (H)	DIM 'S'
4"	3'-3"
5"	2'-6"
6"	1'-9"

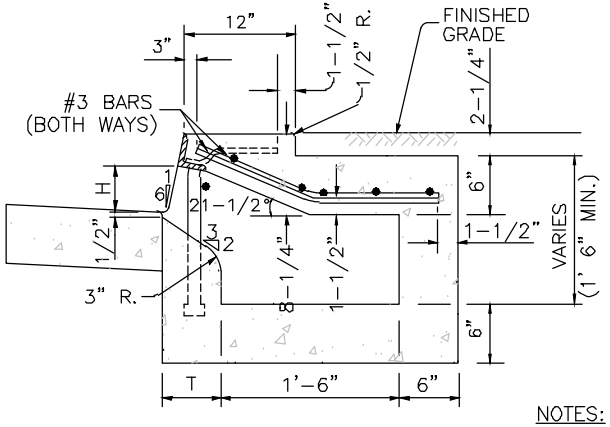
DETAIL NO.				DETAIL NO.
G-3535-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	CATCH BASIN TYPE 'M' - NOTES & DETAILS	G-3535-2



SECTION A–A

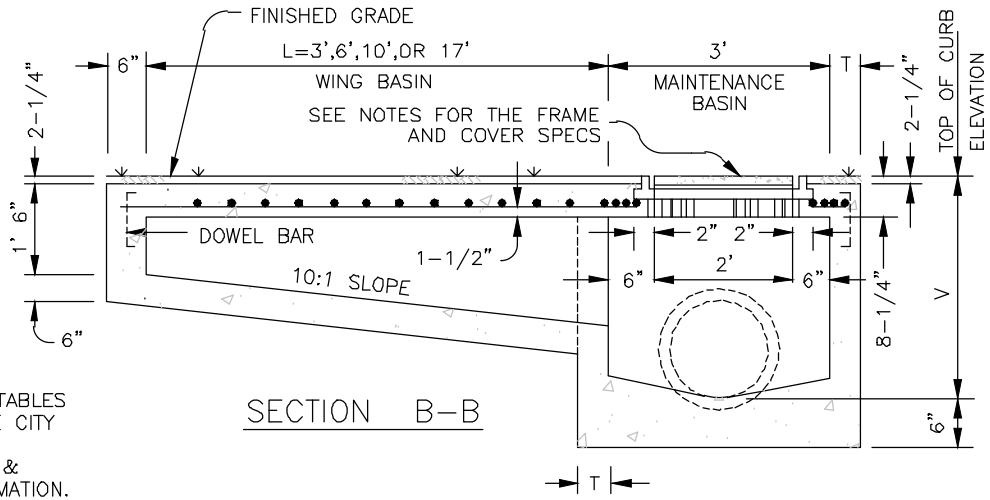


PLAN VIEW



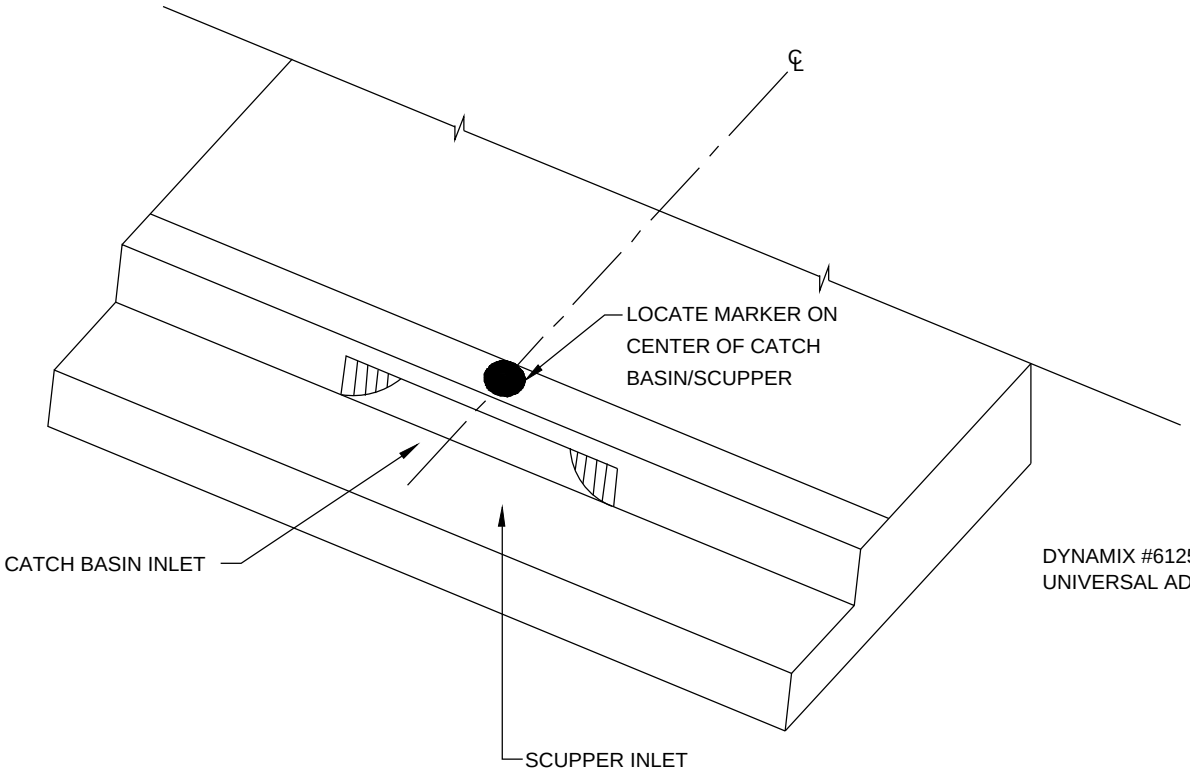
SECTION C–C

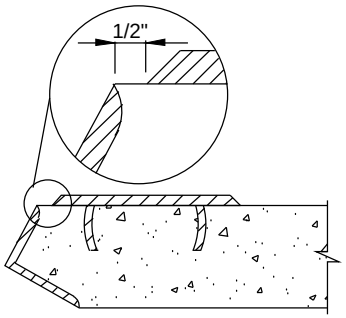
NOTES:
1. FOR CONSTRUCTION NOTES, TABLES AND ADDITIONAL DETAILS SEE CITY STD. DTL. G-3535-2.
2. SEE G-3535-2 FOR FRAME & COVER IN LANDSCAPE INFORMATION.



SECTION B–B

DETAIL NO. G-3535-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	CATCH BASING TYPE "M" TOP MODIFICATION IN LANDSCAPE PARKWAY	DETAIL NO. G-3535-3

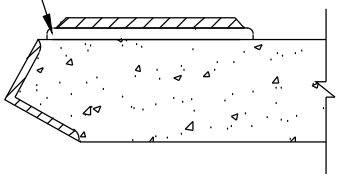




TYPE "A"

TO BE INSTALLED IN WET CONCRETE
DURING CONSTRUCTION

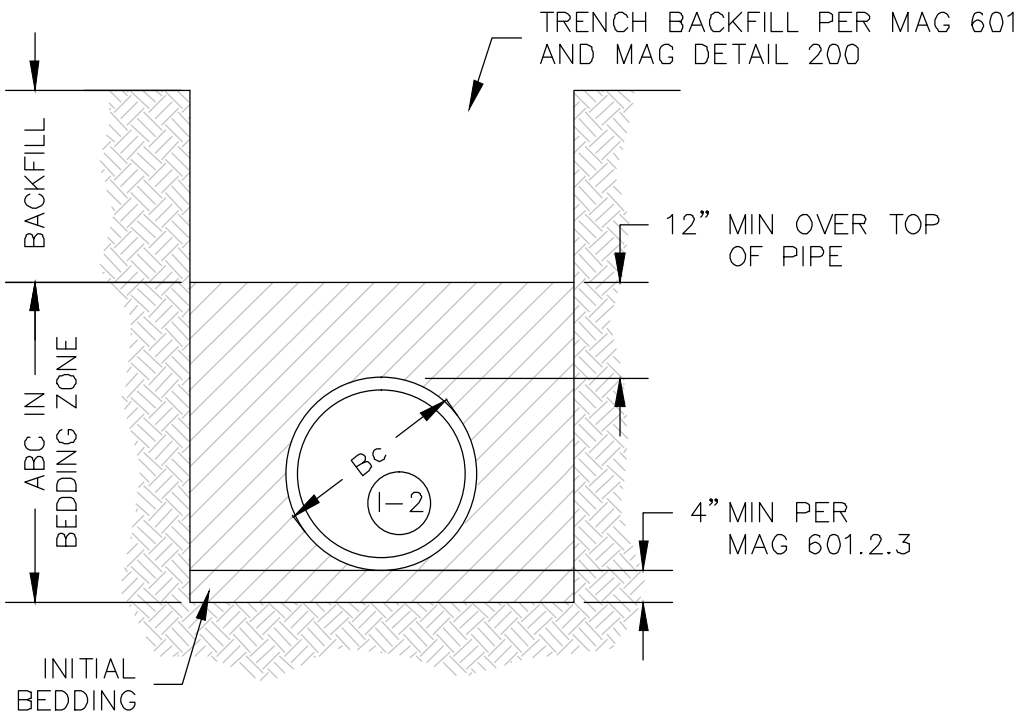
DYNAMIX #6125-1 URETHANE
UNIVERSAL ADHESIVE



TYPE "B"

TO BE INSTALLED WITH ADHESIVE
ON EXISTING STRUCTURES

DETAIL NO. G-3535-4	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STORM DRAIN INLET MARKER ON CATCH BASIN SCUPPER	DETAIL NO. G-3535-4

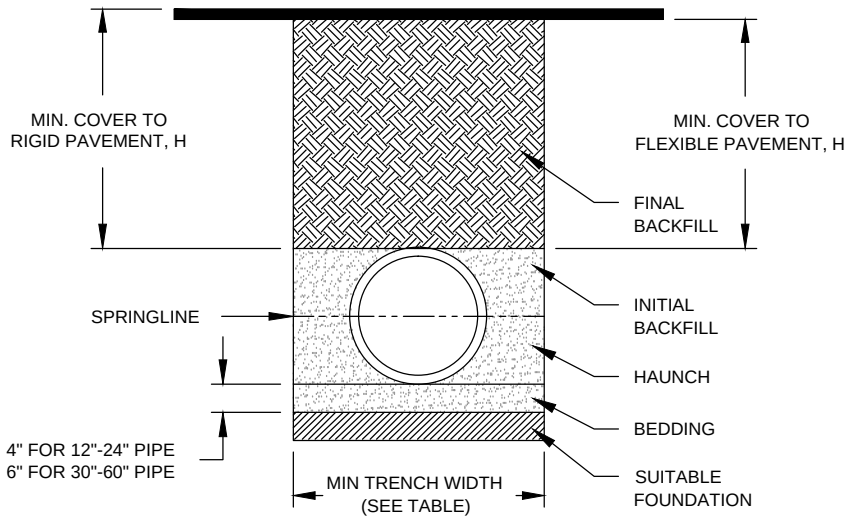


NOTES:

1. FOR USE WITH CORRUGATED HDPE PIPE WHICH SHALL CONFORM WITH MAG 618. HDPE PIPE SHALL NOT EXCEED 48" IN DIAMETER.
2. ALL ABC BEDDING MATERIAL TO BE IN ACCORDANCE WITH MAG 603.4.6, WITH MINIMUM THICKNESS PER THIS DETAIL.
3. NO BEDDING IS TO BE CONSIDERED TO BE A PART OF THE ROADWAY STRUCTURAL SECTION.
4. CONTRACTOR SHALL TAKE PRECAUTIONS TO AVOID PIPE
5. MOVEMENT WHEN PLACING BEDDING.
   THIS DETAIL IS NOT TO SUPERSEDE MORE STRINGENT
6. MANUFACTURER REQUIREMENTS.
7. COMPACTION TESTS SHALL BE DONE ON BOTH SIDES OF THE PIPE. THE MINIMUM NUMBER OF TESTS TO BE PROVIDED IS ONCE PER ROADWAY TRAVEL LANE, AT INTERVALS, OR FOR THE DAY'S WORK IF IT IS LESS THAN 100'.
8. PIPES 18" TO 24" WILL BE MANDREL–TESTED FOR 5% MAXIMUM DEFLECTION PER ASTM F–894.
9. TRENCH EXCAVATION PER MAG 603.2.

DETAIL NO. G-3540-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	HDPE STORM DRAIN PIPE DETAILS (PIPE DIAMETER UP TO 48 INCHES)	DETAIL NO. G-3540-1

TRENCH INSTALLATION DETAIL



NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLEDPER MAG SECTION 618.

TABLE 1, RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
12" (300mm)	30" (762mm)
15" (375mm)	34" (864mm)
18" (450mm)	39" (991mm)
24" (600mm)	48" (1219mm)
30" (750mm)	56" (1422mm)
36" (900mm)	64" (1626mm)
42" (1050mm)	72" (1829mm)
48" (1200mm)	80" (2032mm)
60" (1500mm)	96" (2438mm)

TABLE 2, MINIMUM RECOMMENDED COVER BASED ON VEHICLE LOADING CONDITIONS

	SURFACE LIVE LOADING CONDITION	
PIPE DIAM.	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12" - 48" (300mm - 1200mm)	12" (305mm)	48" (1219mm)
60" (1500mm)	24" (610mm)	60" (1524mm)

* VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

TABLE 3, MAXIMUM COVER FOR ADS HP STORM PIPE, ft

	CLASS I	CLASS II			CLASS III		CLASS IV
PIPE DIA	COMPACTED	95%	90%	85%	95%	90%	95%
12" (300mm)	41 (12.5m)	28 (8.5m)	21 (6.4m)	16 (4.9m)	20 (6.1m)	16 (4.9m)	16 (4.9m)
15" (375mm)	42 (12.8m)	29 (8.8m)	21 (6.4m)	16 (4.9m)	21 (6.4m)	16 (4.9m)	16 (4.9m)
18" (450mm)	44 (13.4m)	30 (9.1m)	21 (6.4m)	16 (4.9m)	22 (6.7m)	17 (5.2m)	16 (4.9m)
24" (600mm)	37 (11.3m)	26 (7.9m)	18 (5.5m)	14 (4.3m)	19 (5.8m)	14 (4.3m)	14 (4.3m)
30" (750mm)	39 (11.9m)	27 (8.2m)	19 (5.8m)	14 (4.3m)	19 (5.8m)	15 (4.6m)	14 (4.3m)
36" (900mm)	28 (8.5m)	20 (6.1m)	14 (4.3m)	10 (3.0m)	14 (4.3m)	11 (3.4m)	10 (3.0m)
42" (1050mm)	30 (9.1m)	21 (6.4m)	14 (4.3m)	10 (3.0m)	15 (4.6m)	11 (3.4m)	10 (3.0m)
48" (1200mm)	29 (8.8m)	20 (6.1m)	14 (4.3m)	9 (2.7m)	14 (4.3m)	10 (3.0m)	10 (3.0m)
60" (1500mm)	29 (8.8m)	20 (6.1m)	14 (4.3m)	9 (2.7m)	14 (4.3m)	10 (3.0m)	9 (2.7m)

FILL HEIGHT TABLE GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:
NO HYDROSTATIC PRESSURE

DETAIL NO.				DETAIL NO.
G-3540-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	POLYPROPYLENE TRENCH INSTALLATION	G-3540-2

HP STORM TRENCH INSTALLATION DETAIL (ALTERNATE)

TABLE 1, RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
12" (300mm)	30" (762mm)
15" (375mm)	34" (864mm)
18" (450mm)	39" (991mm)
24" (600mm)	48" (1219mm)
30" (750mm)	56" (1422mm)
36" (900mm)	64" (1626mm)
42" (1050mm)	72" (1829mm)
48" (1200mm)	80" (2032mm)
60" (1500mm)	96" (2438mm)

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLEDPER MAG SECTION 618.

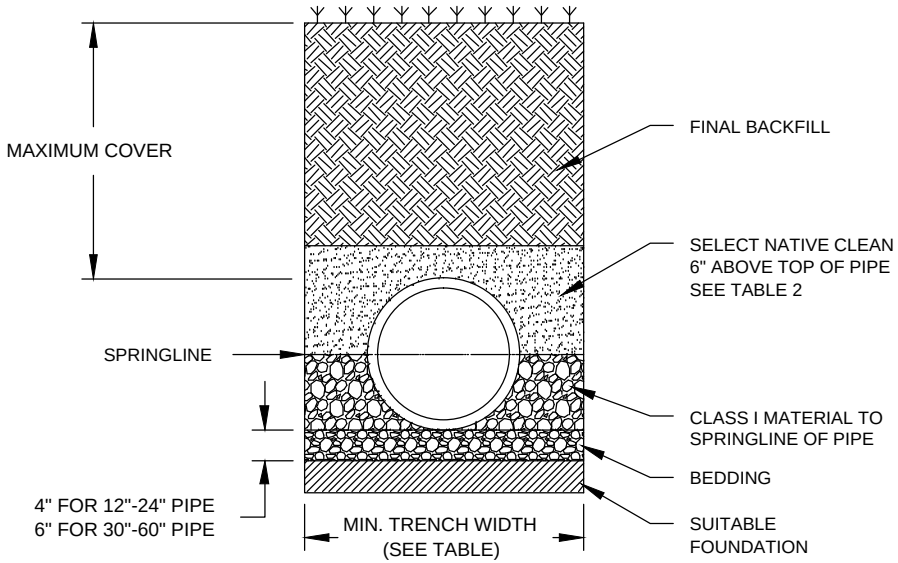


TABLE 2, MAXIMUM COVER FOR ADS HP STORM PIPE, ALTERNATE INSTALLATION, ft (γ_s=120)

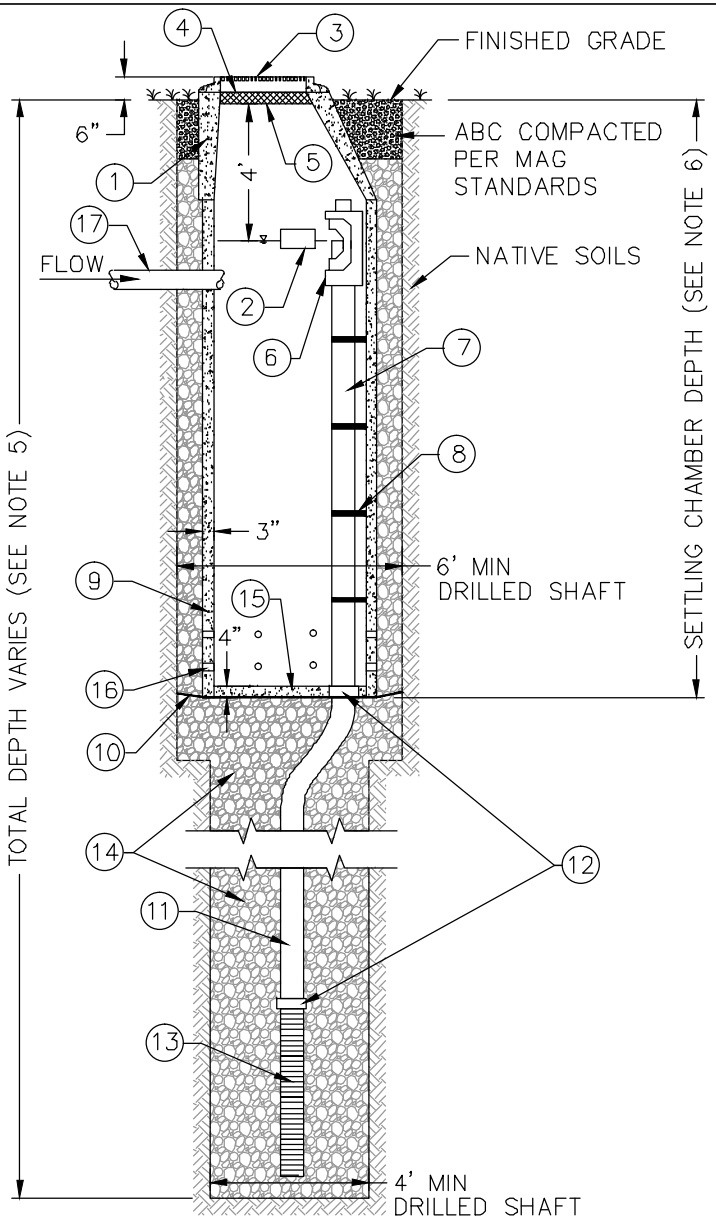
	SELECT NATIVE CLEAN MATERIAL CLASSIFICATION		
PIPE DIAM.	CLASS II	CLASS III	CLASS IV
12" (300mm)	17 (5.2m)	14 (4.3m)	11 (3.4m)
15" (375mm)	17 (5.2m)	14 (4.3m)	10 (3.0m)
18" (450mm)	16 (4.9m)	13 (4.0m)	10 (3.0m)
24" (600mm)	14 (4.3m)	12 (3.7m)	9 (2.7m)
30" (750mm)	13 (4.0m)	12 (3.7m)	8 (2.4m)
36" (900mm)	11 (3.4m)	11 (3.4m)	7 (2.1m)
42" (1050mm)	11 (3.4m)	11 (3.4m)	7 (2.1m)
48" (1200mm)	11 (3.4m)	10 (3.0m)	6 (1.8m)
60" (1500mm)	11 (3.4m)	10 (3.0m)	6 (1.8m)

FILL HEIGHT TABLE GENERATED ASSUMING DRY CONDITIONS, OUTSIDE OF WATER TABLE. FOR INSTALLATION WITHIN THE WATER TABLE, CONTACT APPLICATIONS ENGINEERING.

DETAIL NO.				DETAIL NO.
G-3540-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	POLYPROPYLENE TRENCH INSTALLATION FOR NON-TRAFFIC APPLICATION	G-3540-3

SPECIFICATIONS:

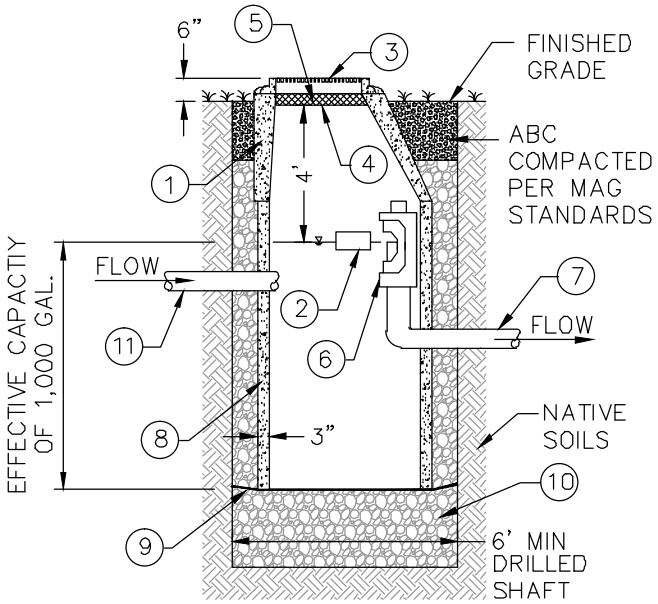
1. MODIFIED MANHOLE CONE.
2. HYDROPHOBIC PETROCHEMICAL SPONGE. MIN 128 oz. CAPACITY.
3. MINIMUM 30" DIA. BOLTED RING AND GRATE. FOR USE IN RETENTION BASIN BOTTOM ONLY (TOP OF GRATE RAISED TO 6" ABOVE BASIN BOTTOM). OR MINIMUM 30" DIA. BOLTED C.I. RING AND COVER WITH RAISED LETTERS "STORM WATER ONLY". FOR USE OUTSIDE OF RETENTION BASIN BOTTOM (TOP SHALL BE FLUSH WITH ADJACENT FINISHED GRADE).
4. FABRIC SEAL - 100X U.V. RESISTANT GEOTEXTILE - TO BE REMOVED BY OWNER AT PROJECT COMPLETION. FOR USE WITH GRATE ONLY.
5. DEBRIS BASKET - 6" X 30" DIA. 10 GA. FLATTENED EXPANDED STEEL SCREEN. FUSION BONDED EPOXY COATED. FOR USE WITH GRATE ONLY.
6. DEBRIS SCREEN - ANTI SIPHON (ROLLED 13 GAGE BY 0.265" MAXIMUM SWO FLATTENED EXPANDED STEEL. GALVANIZED OR FUSION BONDED EPOXY COATED.
7. 8" DIA. SCHEDULE 40 PVC OVERFLOW PIPE.
8. SUPPORT BRACKET (TYP.) GALVANIZED OR FUSION BONDED EPOXY COATED STEEL MIN. 3/8".
9. PRECAST CONCRETE LINER, 4000 PSI - 48" ID, 54" OD.
10. GEOFABRIC 100 mil MIN., 300 lb. MIN. T.S.
11. 6" - 12" DIA. SCH. 40 PVC INJECTION PIPE. NO PERFORATIONS.
12. COUPLER (MDI CAULDER, TRI-A, OR EQUAL).
13. INJECTION SCREEN - SCH. 40 PVC 0.120" SLOTTED WELL SCREEN WITH 23 SLOTS PER ROW/FT. 6" - 12" DIA. OVERALL LENGTH = 96" WITH COUPLER.
14. 3/8" TO 1-1/2" WASHED ROCK.
15. 4" THICK CONCRETE BASE FOR USE WITH THE PARKING LOT DRAINAGE DRYWELL ONLY.
16. 1" DIA. PERFORATIONS - 8 PER LINEAR FOOT FOR BOTTOM 3 FEET OF CHAMBER. APPLIES TO THE PARKING LOT DRAINAGE DRYWELL USE ONLY.
17. OPTIONAL INFLOW PIPE OR PRE-TREATMENT CONNECTOR PIPE - MIN. 4" DIA. SCH. 40 PIPE.



NOTES:

1. STD. DRYWELLS SHALL BE LOCATED NO CLOSER THAN 20' TO THE NEAREST OUTFALL THAT CONVEYS STORMWATER FROM PAVED AREAS.
2. A PERCOLATION TEST SHALL BE PERFORMED ON THE DRYWELL TO VERIFY THAT DESIGN PERCOLATION RATES HAVE BEEN ACHIEVED. A COPY OF THE REPORT SHALL BE SUBMITTED TO THE CITY PRIOR TO FINAL APPROVAL OF THE GRADING AND DRAINAGE AND DRYWELL CONSTRUCTION FOR THE PROJECT. TEST WATER SHALL BE POTABLE WATER ONLY PER ORDINANCE.
3. DRYWELLS WITH BORE LOGS THAT INDICATE GREATER THAN 10 FEET OF PERMEABLE SOIL HAS BEEN PENETRATED AS DETERMINED BY A GEOTECHNICAL ENGINEER SHALL NOT REQUIRE A PERCOLATION TEST.
4. DRYWELL AS-BUILT DRAWINGS SHALL PROVIDE THE ADEQ REGISTRATION NUMBER, LATITUDE AND LONGITUDE, AND ANNUAL DRYWELL INSPECTION REPORT FOR EACH DRYWELL CONSTRUCTED ON A PROJECT
5. THE TOTAL DEPTH OF A DRYWELL SHALL BE 75' OR UNTIL 10' OF PERMEABLE SOIL IS PENETRATED.
6. THE DEPTH OF THE SETTLING CHAMBER SHALL BE A MINIMUM OF 18'. GREATER DEPTHS MAY BE REQUIRED BY THE CITY ENGINEERING DEPARTMENT.

DETAIL NO. G-3560-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	STANDARD DRYWELL	DETAIL NO. G-3560-1



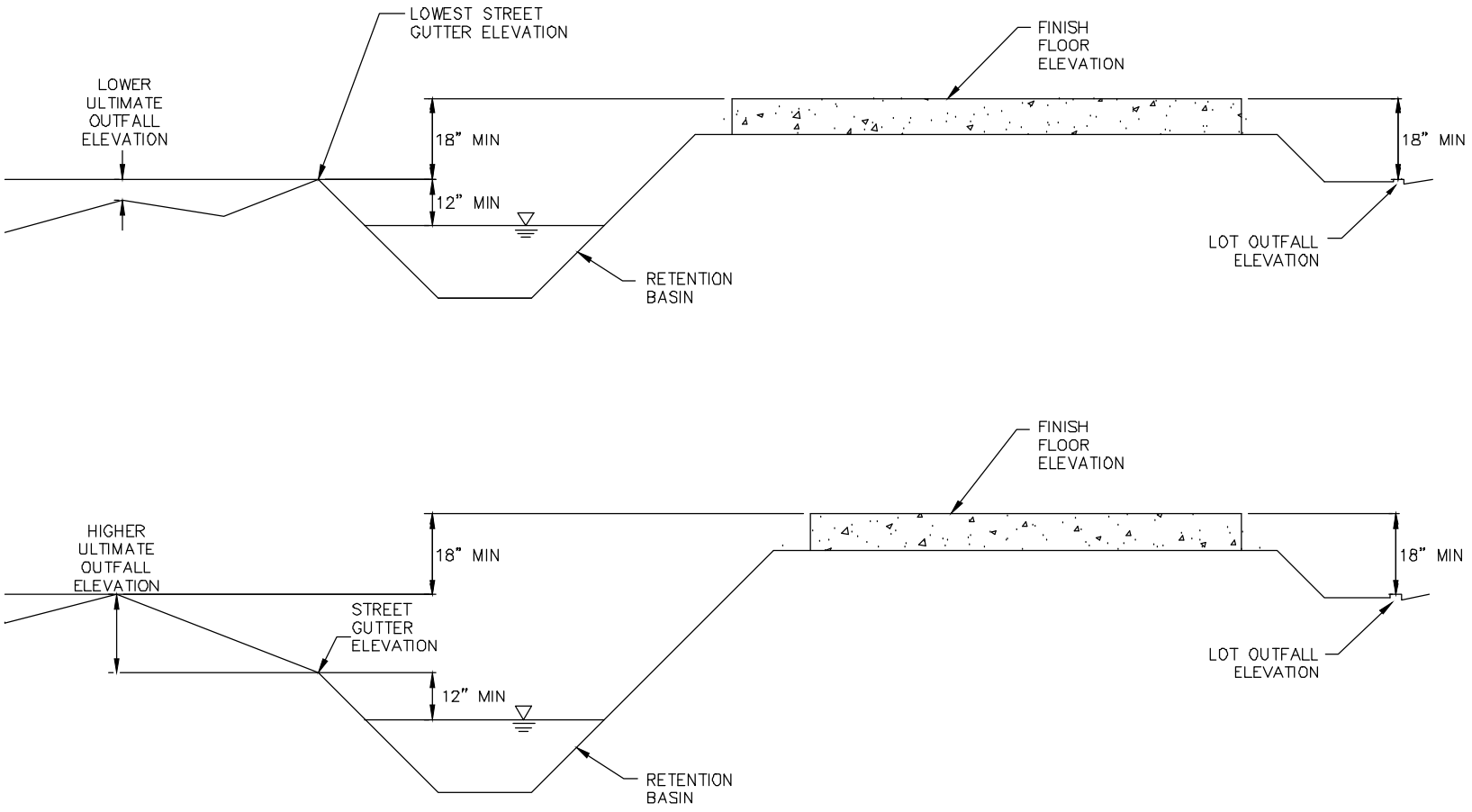
NOTES:

1. DRYWELL PRE-TREATMENT CHAMBERS SHALL BE USED TO IN RETENTION BASINS THAT COLLECT DRAINAGE DIRECTLY FROM PARKING LOTS OR OTHER AREAS THAT GENERATE HIGH LEVELS OF OILS, SANDS, AND DEBRIS.
2. DRYWELL PRE-TREATMENT CHAMBERS SHALL BE USED IN CONJUNCTION WITH A STANDARD DRYWELL WITH THE MODIFICATIONS AS INDICATED ON THE STANDARD DRYWELL DETAIL.

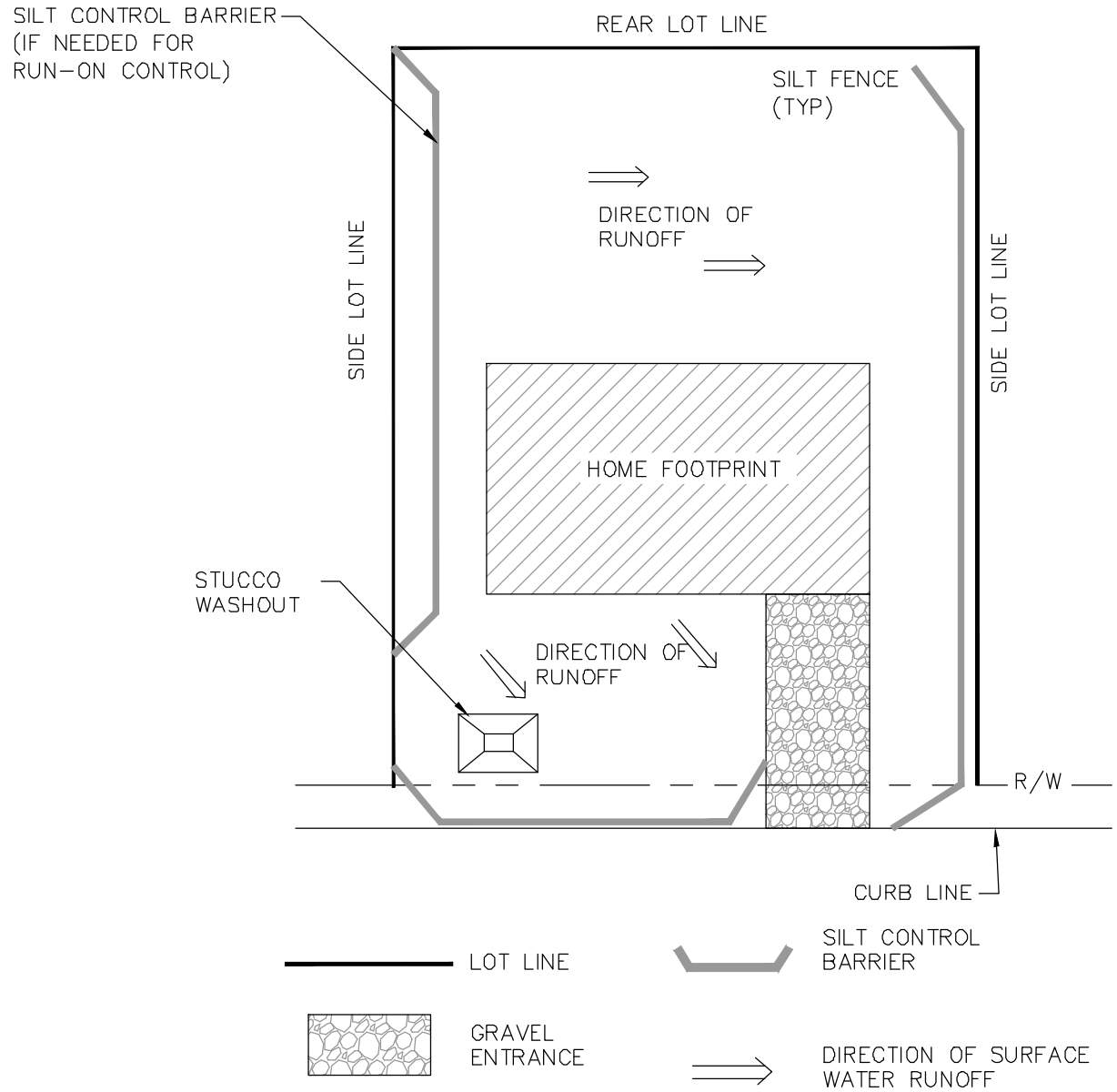
SPECIFICATIONS:

1. MODIFIED MANHOLE CONE.
2. HYDROPHOBIC PETROCHEMICAL SPONGE. MIN 128 oz. CAPACITY.
3. MINIMUM 30" DIA. BOLTED RING AND GRATE. FOR USE IN RETENTION BASIN BOTTOM ONLY.
4. FABRIC SEAL - 100X U.V. RESISTANT GEOTEXTILE - TO BE REMOVED BY OWNER AT PROJECT COMPLETION.
5. DEBRIS BASKET - 6" X 30" DIA. 10 GA. FLATTENED EXPANDED STEEL SCREEN. FUSION BONDED EPOXY COATED.
6. DEBRIS SCREEN - ANTI SIPHON (ROLLED 13 GAGE BY 0.265" MAXIMUM SWO FLATTENED EXPANDED STEEL. GALVANIZED OR FUSION BONDED EPOXY COATED.
7. 8" DIA. SCHEDULE 40 PVC CONNECTOR PIPE WITH FLOW REGULATOR. SEE NOTE 1. 10-FOOT MINIMUM.
8. PRECAST CONCRETE LINER, 4000 PSI - 48" ID, 54" OD.
9. GEOFABRIC 100 mil MIN., 300 lb. MIN. T.S.
10. 3/8" TO 1-1/2" WASHED ROCK.
11. INFLOW PIPE - MINIMUM 4" DIA. SCH. 40 PIPE.

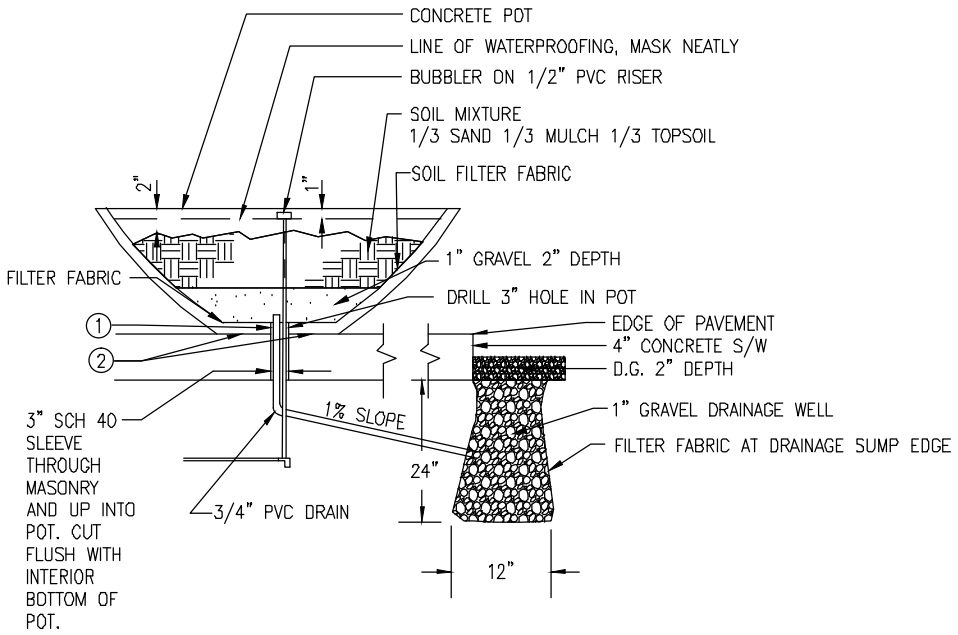
DETAIL NO. G-3560-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	DRYWELL PRE-TREATMENT CHAMBER	DETAIL NO. G-3560-2



DETAIL NO. G-3570	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	MINIMUM FINISH FLOOR TO DRAINAGE FACILITY ELEVATION RELATIONSHIPS	DETAIL NO. G-3570



DETAIL NO. G-3580	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SINGLE RESIDENTIAL LOT SWPPP DETAIL	DETAIL NO. G-3580



① SEAL BETWEEN POT AND PIPING PRIOR TO WATERPROOFING APPLICATION, THEN THOROUGHLY APPLY WATERPROOFING AROUND PIPES TO PROVIDE PRIMARY SEAL.

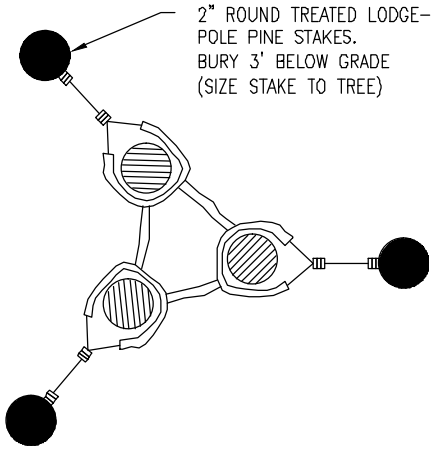
② SET POT IN URETHANE SEALANT/CAULT (COMPLETE RING ROUND PIPING TO PROVIDE A SECONDARY SEAL)

NOTES:

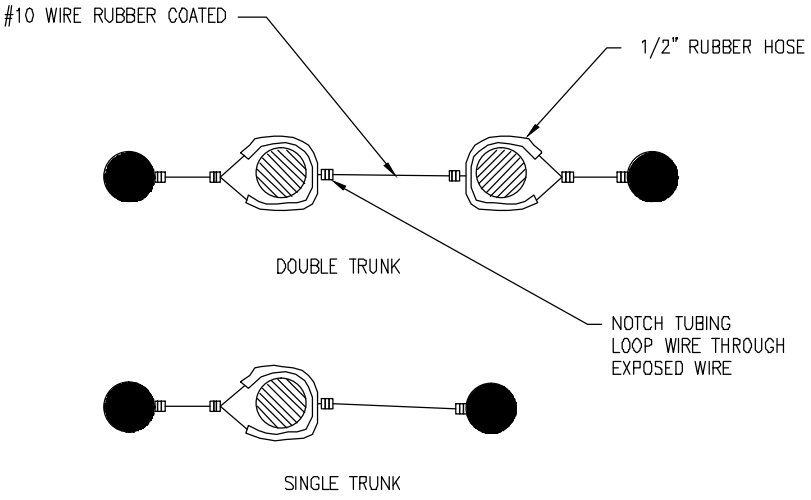
* ALL POTS TO BE GROUPED ON SEPARATE VALVE(S) UNLESS NOTED
* COORDINATE DRAINAGE WELL AND SLEEVING WITH CONCRETE CONTRACTOR
* LOCATE POTS ACCORDING TO LAYOUT ON PLAN
* SHIM POTS LEVEL AS NEEDED WATERPROOF INSIDE OF POT
* CRACKED OR CHIPPED POTS ARE NOT ACCEPTABLE
* WATERPROOFING TO BE PACIFIC POLYMERS ELASTO-DECK BT OR OTHER EQUIVALENT ELASTOMETRIC MATERIAL. CEMENTITIOUS WATERPROOFING IS NOT ACCEPTABLE.
* EXTEND PIPE 1/4" INSIDE THE POT

PLANTER POT PLANTING DETAIL (AT GRADE POT W/DRAINAGE WELL)

NOTE
ALL MULTI-TRUNKED TREES TO HAVE ALL MAJOR LEADERS STAKED



MULTI-TRUNK

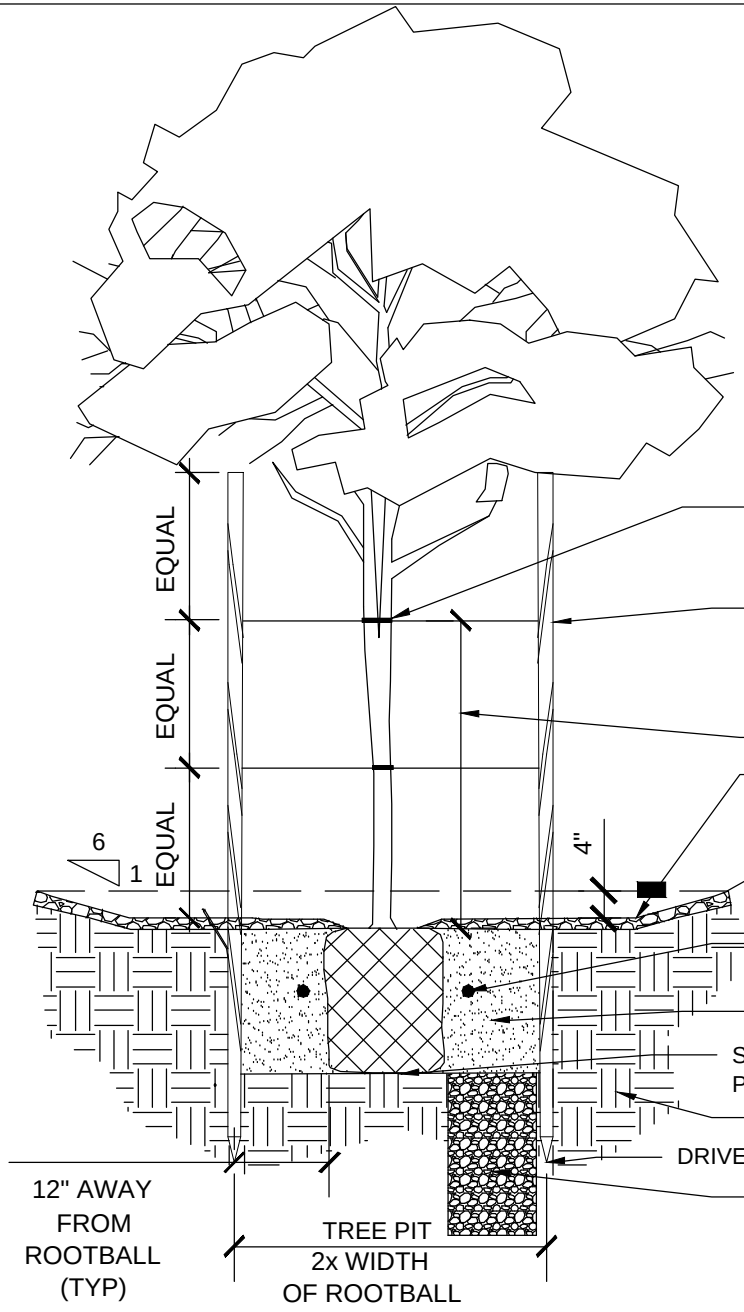


DOUBLE TRUNK

SINGLE TRUNK

TREE GUYING DETAIL

DETAIL NO. G-3604	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	LANDSCAPE DETAILS	DETAIL NO. G-3604



NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. REMOVE SUCKERS AND POORLY ATTACHED LOWER BRANCHES AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE.
3. TREE SHALL HAVE A SINGLE, RELATIVELY STRAIGHT CENTRAL LEADER AND TAPERED TRUNK FREE OF CODOMINANT STEMS.
4. TREES WITH CALIPER EQUAL TO OR LESS THAN 4" WILL BE MEASURED AT 6" ABOVE THE SOIL LINE.
5. TREE SHALL HAVE TWO (2) STAKES AT 9 O'CLOCK AND 3 O'CLOCK POSITIONS. STAKES SHALL BE SET WITH THE PREVAILING WIND.
6. CONTRACTOR SHALL REMOVE TREE STAKES TWELVE (12) MONTHS FROM AUTHORIZED MAINTENANCE PERIOD START DATE, ADJUST TREE TIES TO ACCOMODATE TREE GROWTH AND PRUNE TREE AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE.
7. CONTRACTOR SHALL REMOVE NURSERY STAKES IMMEDIATELY AFTER PLANTING.

2-1/2" I.D. RUBBER HOSE LOOP WITH 12 GA. DOUBLE STRAND GALVANIZED AND ANNEALED WIRE. MAINTAIN 4" I.D. MINIMUM LOOP AROUND TREE. WRAP WIRE AROUND TREE STAKE, AND STAPLE. LOCATE TIE ABOVE FIRST BRANCH.

2" DIA. LODGEPOLE PINE STAKES. STAKES SHALL BE 10' VERTICAL. LOCATE 12" OUTSIDE ROOTBALL. (TYP. OF 2) TREE TRUNK SHALL BE CAPABLE OF MOVEMENT IN ALL DIRECTIONS. TREE STAKE SHALL NOT PROTRUDE INTO CANOPY (CUT STAKE AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE)

THE STANDARD HEIGHT TO LOWEST SCAFFOLD LIMB ON THE TRUNK SHALL BE 36" MIN.

4" DEEP WATERING BASIN SHALL BE GENTLE AND UNIFORM THROUGHOUT, WITHOUT ANY OBTRUSIVE EDGES. BOTTOM OF BASIN TO BE 48" DIAMETER WITH 6:1 TAPER TO GRADE. SET TOP OF TREE ROOT BALL AT SOIL SURFACE.

FINISHED GRADE: 2" DEEP DECOMPOSED GRANITE PER LANDSCAPE SCHEDULE. MAINTAIN 4" CLEAR ZONE AROUND TRUNK

PLANT TABLET: LOCATION OF PLANT TABLETS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS (SEE NOTE 1)

BACKFILL MIX (SEE NOTE 1)

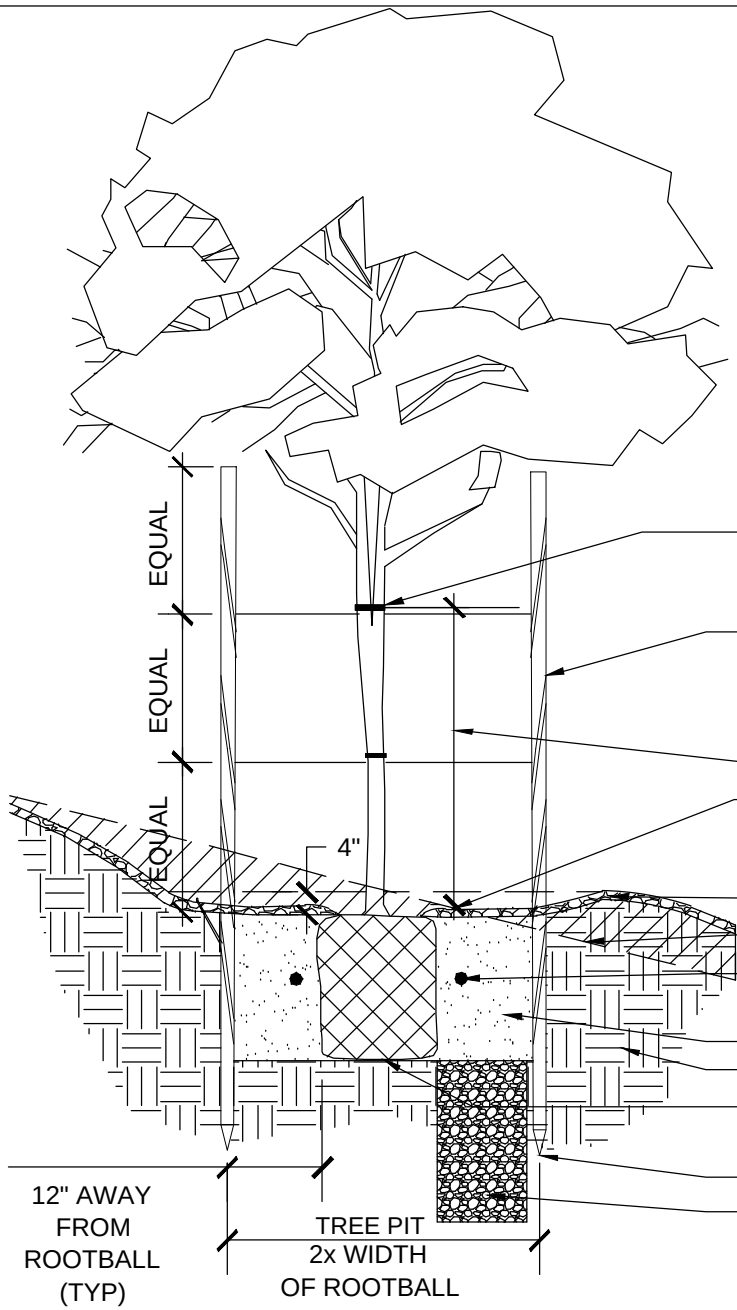
SET ROOTBALL ON NATIVE UNDISTURBED SOIL. SCARIFY SIDES AND BOTTOM OF PLANT PIT. SCARIFY/SHAVE A MAXIMUM OF 2" OFF THE ROOTBALL.

UNDISTURBED NATIVE SOIL OR SUBGRADE

DRIVE STAKES 12" MIN. INTO UNDISTURBED SOIL (TYP.) OR SUBGRADE

IF PLANT PIT DOES NOT DRAIN THEN DRILL ONE (1) 12" DIAMETER X 24" DEEP HOLE. BELOW EXCAVATED PIT, RE-TEST PERCOLATION PER SPECIFICATIONS , CERTIFY PERCOLATION TEST AND FILL HOLE WITH PEA GRAVEL. COORDINATE LOCATION WITH TREE STAKES

DETAIL NO. G-3610-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TREE PLANTING AND STAKING	DETAIL NO. G-3610-1



NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. REMOVE SUCKERS AND POORLY ATTACHED LOWER BRANCHES AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE.
3. TREE SHALL HAVE A SINGLE, RELATIVELY STRAIGHT CENTRAL LEADER AND TAPERED TRUNK FREE OF CODOMINANT STEMS.
4. TREES WITH CALIPER EQUAL TO OR LESS THAN 4" WILL BE MEASURED AT 6" ABOVE THE SOIL LINE.
5. TREE SHALL HAVE THREE (3) STAKES AT 2 O'CLOCK, 6 O'CLOCK, AND 10 O'CLOCK POSITIONS.
6. CONTRACTOR SHALL REMOVE TREE STAKES TWELVE (12) MONTHS FROM AUTHORIZED MAINTENANCE PERIOD START DATE, ADJUST TREE TIES TO ACCOMODATE TREE GROWTH AND PRUNE TREE AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE.
7. CONTRACTOR SHALL REMOVE NURSERY STAKES IMMEDIATELY AFTER PLANTING.

2-1/2" I.D. RUBBER HOSE LOOP WITH 12 GA. DOUBLE STRAND GALVANIZED AND ANNEALED WIRE. MAINTAIN 4" I.D. MINIMUM LOOP AROUND TREE. WRAP WIRE AROUND TREE STAKE, AND STAPLE. LOCATE TIE ABOVE FIRST BRANCH.

2" DIA. LODGEPOLE PINE STAKES. STAKES SHALL BE 10' VERTICAL. LOCATE 12" OUTSIDE ROOTBALL. (TYP. OF 2) TREE TRUNK SHALL BE CAPABLE OF MOVEMENT IN ALL DIRECTIONS. TREE STAKE SHALL NOT PROTRUDE INTO CANOPY (CUT STAKE AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE)

THE STANDARD HEIGHT TO LOWEST SCAFFOLD LIMB ON THE TRUNK SHALL BE 36" MIN.

4" DEEP WATERING BASIN SHALL BE GENTLE AND UNIFORM THROUGHOUT, WITHOUT ANY OBTRUSIVE EDGES. BASIN TO BE 6' DIAMETER. SET TOP OF TREE ROOT BALL AT SOIL SURFACE.

GENTLE SLOPE TREE WELL

6:1 MAX GRADED SLOPE (CUT SOIL ON UP-SLOPE AND PLACE ON DOWN-SLOPE)

PLANT TABLET: LOCATION OF PLANT TABLETS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS (SEE NOTE 1)

BACKFILL MIX (SEE NOTE 1)

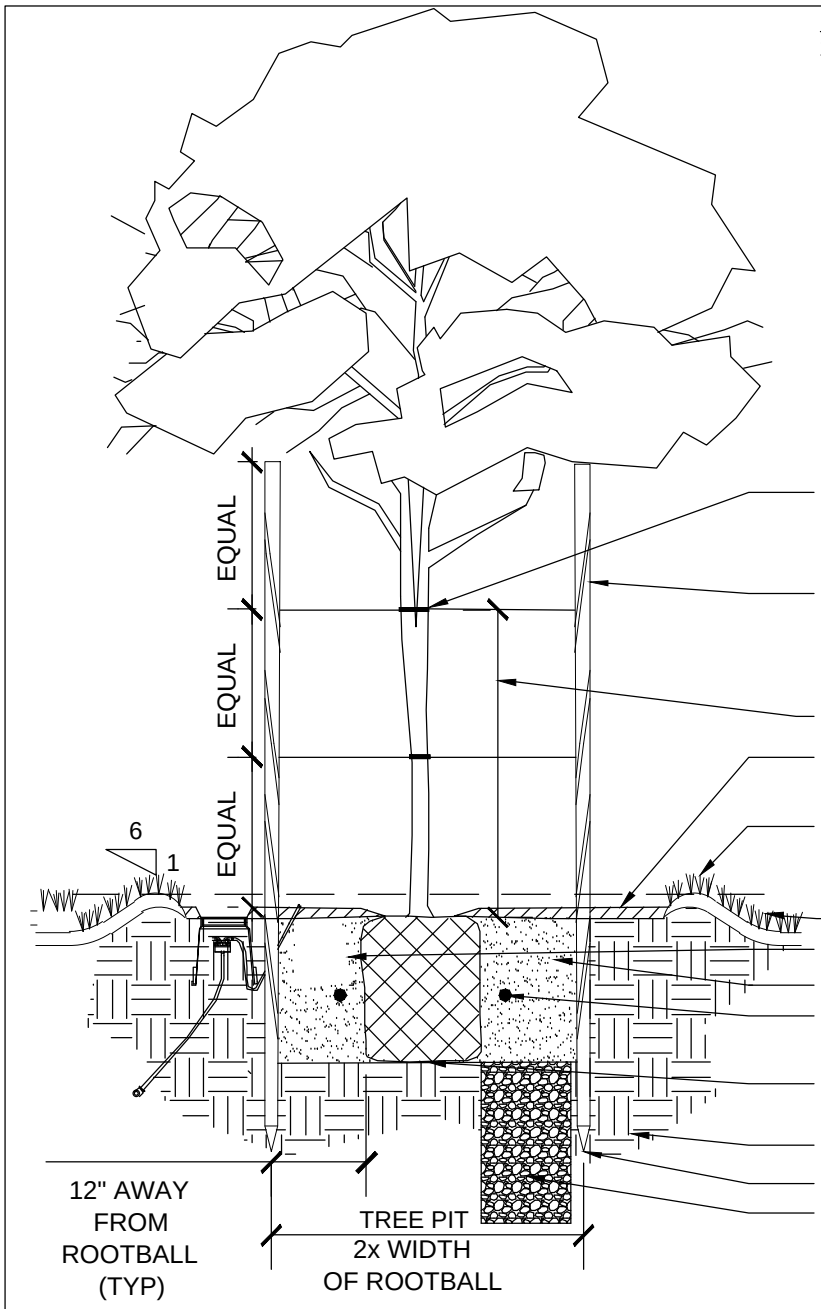
UNDISTURBED NATIVE SOIL OR SUBGRADE

SET ROOTBALL ON NATIVE UNDISTURBED SOIL. SCARIFY SIDES AND BOTTOM OF PLANT PIT. SCARIFY/SHAVE A MXIMUM OF 2" OFF THE ROOTBALL.

DRIVE STAKES 12" MIN. INTO UNDISTURBED SOIL OR SUBGRADE (TYP.)

IF PLANT PIT DOES NOT DRAIN THEN DRILL ONE (1) 12" DIAMETER X 24" DEEP HOLE. BELOW EXCAVATED PIT, RE-TEST PE RCOLATION PER SPECIFICATIONS , CERTIFY PERCOLATION TEST AND FILL HOLE WITH PEA GRAVEL. COORDINATE LOCATION WITH TREE STAKES

DETAIL NO. G-3610-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SINGLE-TRUNK TREE PLANTING ON SLOPE	DETAIL NO. G-3610-2



NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. REMOVE SUCKERS AND POORLY ATTACHED LOWER BRANCHES AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE.
3. TREE SHALL HAVE A SINGLE, RELATIVELY STRAIGHT CENTRAL LEADER AND TAPERED TRUNK FREE OF CODOMINANT STEMS.
4. TREES WITH CALIPER EQUAL TO OR LESS THAN 4" WILL BE MEASURED AT 6" ABOVE THE SOIL LINE.
5. TREE SHALL HAVE TWO (2) STAKES AT 9 O'CLOCK AND 3 O'CLOCK POSITIONS.
6. CONTRACTOR SHALL REMOVE TREE STAKES TWELVE (12) MONTHS FROM AUTHORIZED MAINTENANCE PERIOD START DATE, ADJUST TREE TIES TO ACCOMODATE TREE GROWTH AND PRUNE TREE AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE.
7. CONTRACTOR SHALL REMOVE NURSERY STAKES IMMEDIATELY AFTER PLANTING.

2-1/2" I.D. RUBBER HOSE LOOP WITH 12 GA. DOUBLE STRAND GALVANIZED AND ANNEALED WIRE. MAINTAIN 4" I.D. MINIMUM LOOP AROUND TREE. WRAP WIRE AROUND TREE STAKE, AND STAPLE. LOCATE TIE ABOVE FIRST BRANCH.

2" DIA. LODGEPOLE PINE STAKES. STAKES SHALL BE 10' VERTICAL. LOCATE 12" OUTSIDE ROOTBALL. (TYP. OF 2) TREE TRUNK SHALL BE CAPABLE OF MOVEMENT IN ALL DIRECTIONS. TREE STAKE SHALL NOT PROTRUDE INTO CANOPY (CUT STAKE AS DIRECTED BY CITY OF GOODYEAR REPRESENTATIVE)

THE STANDARD HEIGHT TO LOWEST SCAFFOLD LIMB ON THE TRUNK SHALL BE 36" MIN.

3" THICK WOOD FIBAR. COLOR AND SIZE TO BE APPROVED BY CITY PRIOR TO CONSTRUCTION. MAINTAIN 3" CLEAR ZONE AROUND TREE TRUNK

4" DEEP WATERING BASIN SHALL BE GENTLE AND UNIFORM THROUGHOUT, WITHOUT ANY OBTRUSIVE EDGES. BASIN TO BE 6' DIAMETER. SET TOP OF TREE ROOT BALL AT SOIL SURFACE.

FINISHED GRADE:TURF

LOCATE IRRIGATION EMITTER PER DETAIL G-3620-18

BACKFILL MIX (SEE NOTE 1)

PLANT TABLET: LOCATION OF PLANT TABLETS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS (SEE NOTE 1)

SET ROOTBALL ON NATIVE UNDISTURBED SOIL. SCARIFY SIDES AND BOTTOM OF PLANT PIT. SCARIFY/SHAVE A MAXIMUM OF 2" OFF THE ROOTBALL.

UNDISTURBED NATIVE SOIL OR SUBGRADE

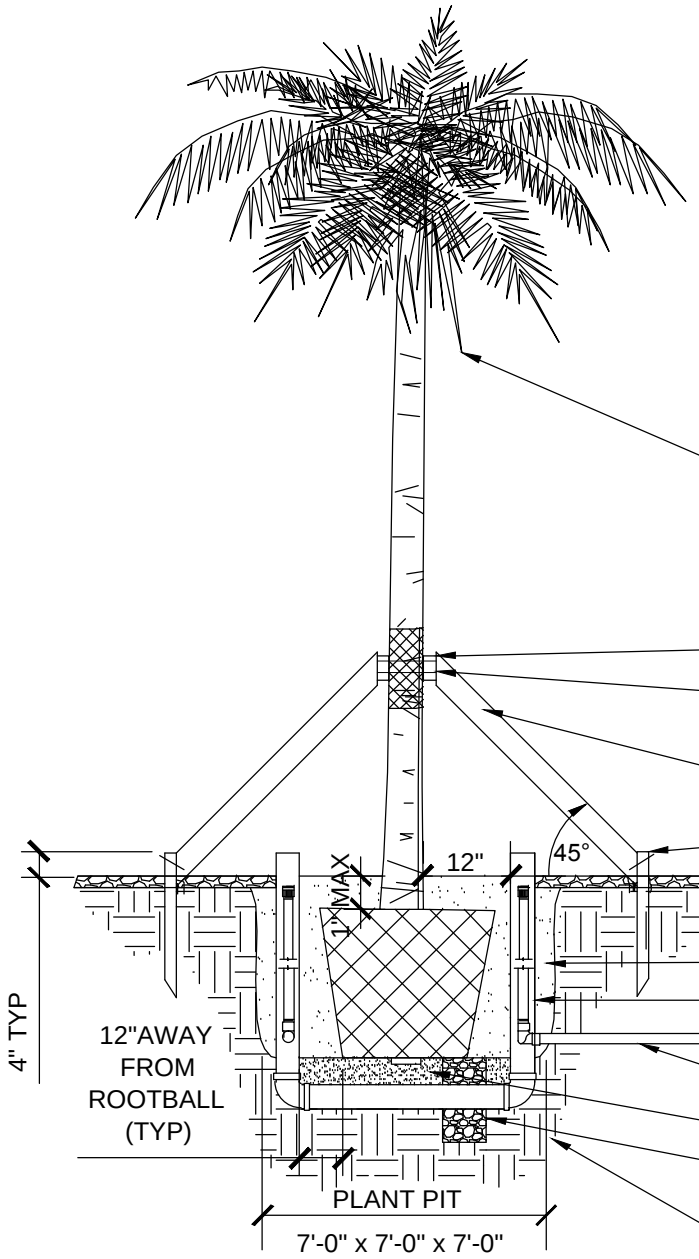
DRIVE STAKES 12" MIN. INTO UNDISTURBED SOIL (TYP.) OR SUBGRADE

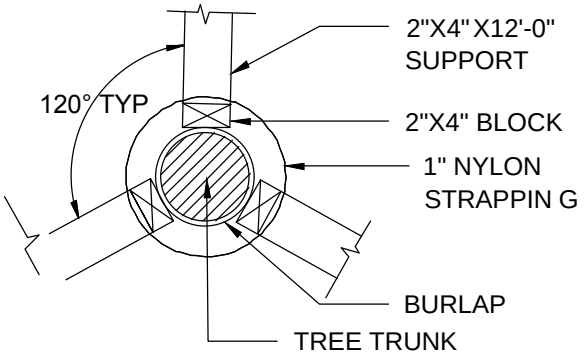
IF PLANT PIT DOES NOT DRAIN THEN DRILL ONE (1) 12" DIAMETER X 24" DEEP HOLE. BELOW EXCAVATED PIT RE-TEST PE RCOLATION PER SPECIFICATIONS CERTIFY PERCOLATION TEST AND FILL HOLE WITH PEA GRAVEL. COORDINATE LOCATION WITH TREE STAKES

DETAIL NO. G-3610-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TREE PLANTING IN TURF	DETAIL NO. G-3610-3

NOTES:

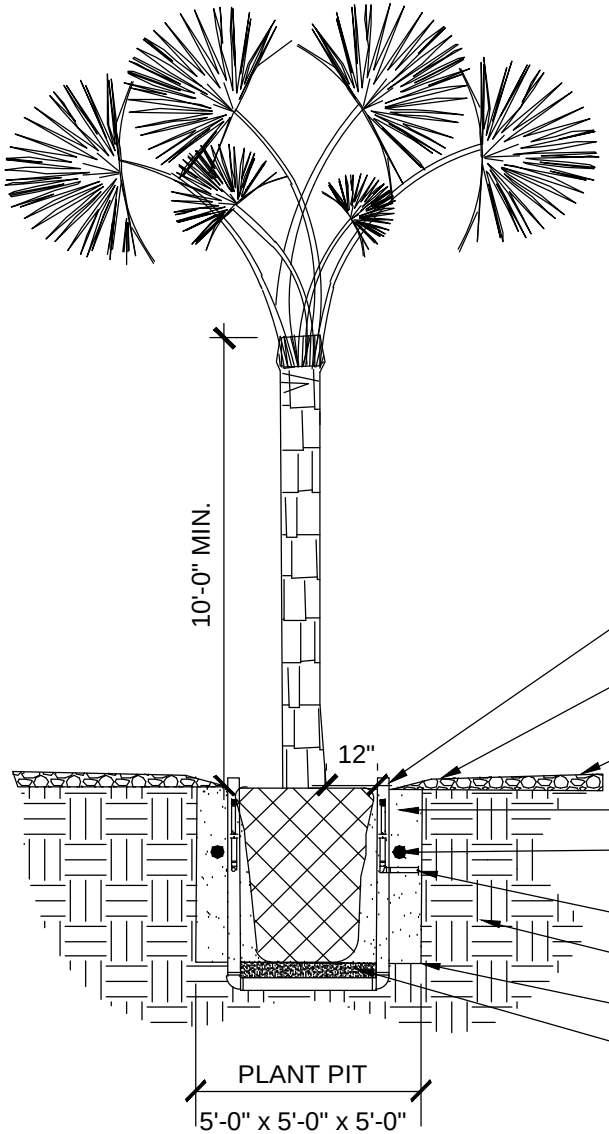
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. DO NOT BURY PALM - MAX 12" DEPTH LOWER THAN ORIGINAL PLANT DEPTH TO MINIMIZE AIR ROOTS .
3. 12 MONTHS FROM THE BEGINNING OF THE MAINTENANCE PERIOD THE LANDSCAPE CONTRACTOR SHALL UNTIE THE PALM FRONDS AND REMOVING ALL DEAD FRONDS.
4. BUBBLERS TO BE FIXED 1 GAL. AND PLACED 12" FROM THE VERTICAL 3" PERFORATED PIPE SET AT 3" ABOVE FINISHED GRADE.
5. CONTRACTOR TO TRIM OLD FRONDS (MAINTAIN A MINIMUM OF 10 HEALTHY FRONDS). PALM FRONDS SHALL BE SECURLY BUNDED AND TIED. CONTRACTOR SHALL CUT TIES ONCE NEW FRONDS HAVE GROWN 2'-6" MIN.





PLAN VIEW

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	DATE PALM TREE PLANTING	DETAIL NO.
G-3610-4				G-3610-4



NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. DO NOT BURY PALM - MAX 12" DEPTH LOWER THAN ORIGINAL PLANT DEPTH.
3. BUBBLERS TO BE FIXED 1 GAL. AND PLACED 12" FROM THE VERTICAL 3" PERFORATED PIPE SET AT 3" ABOVE FINISHED GRADE.
4. TREE BRACING PER DETAIL 3610-4.
5. CONTRACTOR TO TRIM OLD FRONDS (MAINTAIN A MIN. OF 10 HEALTHY FRONDS). PALM FRONDS SHALL BE SECURELY BUNDLED AND TIED. CONTRACTOR SHALL CUT TIES ONCE NEW FRONDS HAVE GROWN 2'-6" (MIN.).

(2) 3" CAPPED PERFORATED PIPE SET AT 3" ABOVE FINISHED GRADE, WRAPPED IN FILTER FABRIC

2" DEEP WATERING BASIN SHALL BE GENTLE AND UNIFORM THROUGHOUT WITH NO OBTRUSIVE EDGES. BASIN TO BE 2 TIMES WIDTH OF ROOTBALL

FINISH GRADE: 2" DEPTH DECOMPOSED GRANITE PER LANDSCAPE SCHEDULE

BACKFILL MIX (NATIVE SOIL)

LOCATION OF PLANT TABLET PER MANUFACTURER'S SPECIFICATION (SEE NOTE 1)

BUBBLER LATERAL AND BUBBLER

UNDISTURBED NATIVE SOIL OR SUBGRADE

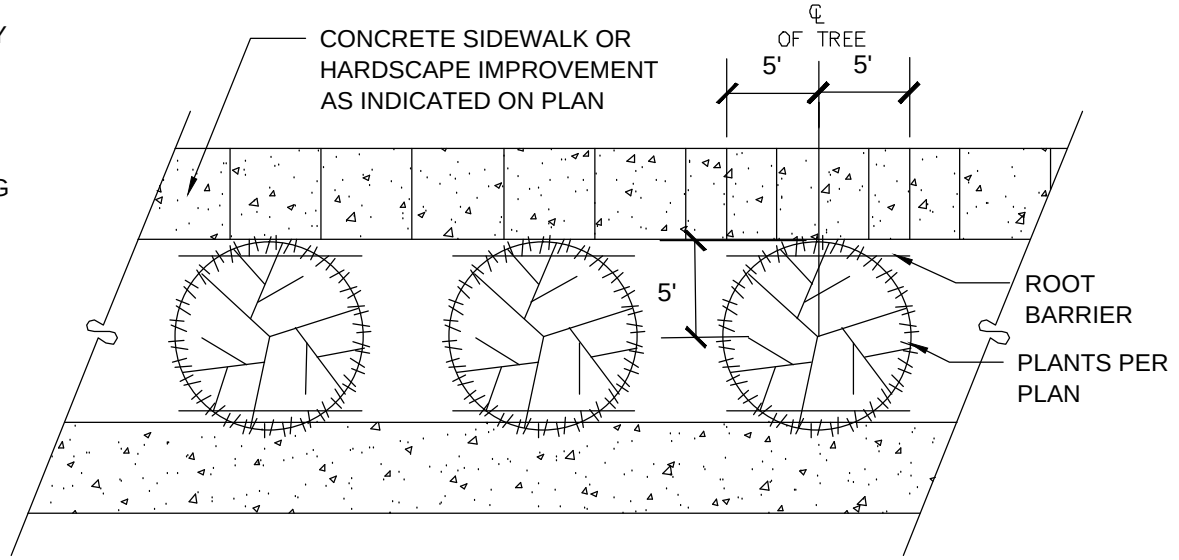
SET ROOTBALL ON NATIVE UNDISTURBED SOIL AND/OR SUBGRADE

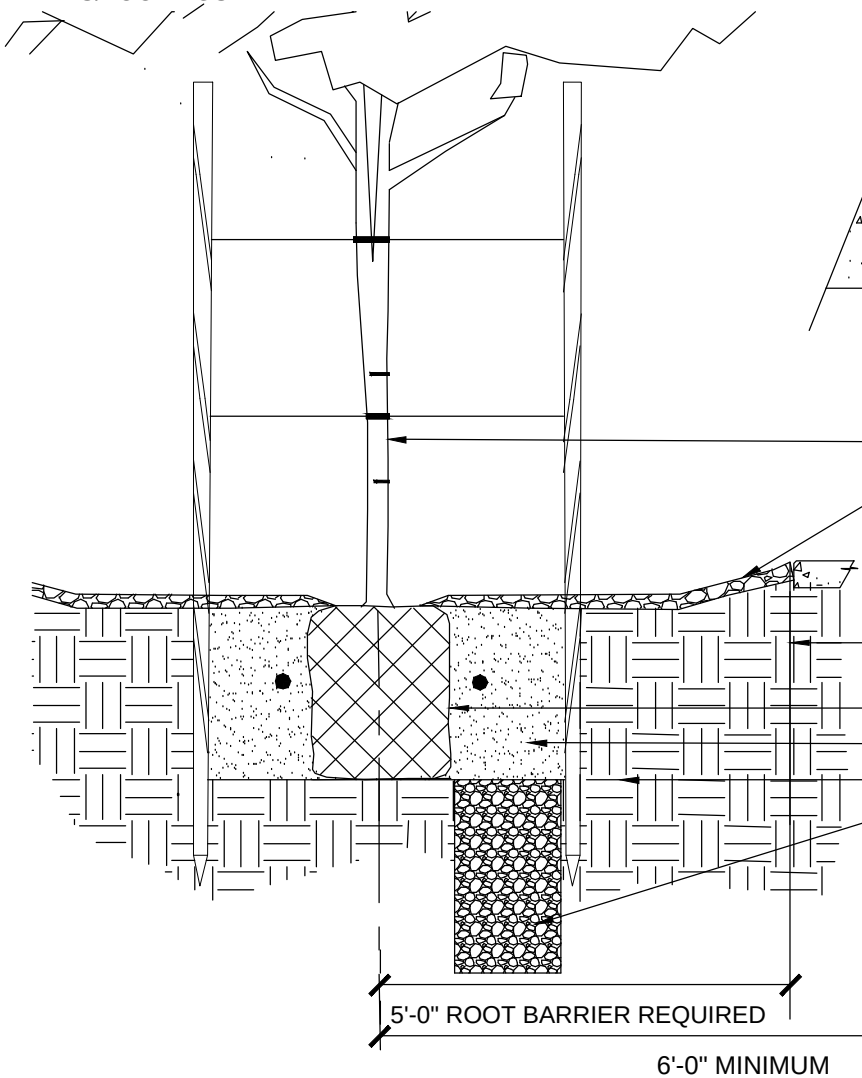
APPROXIMATELY 1" SAND BETWEEN BOTTOM OF ROOTBALL AND TOP OF PIPE

DETAIL NO. G-3610-5	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	FAN PALM TREE PLANTING	DETAIL NO. G-3610-5

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. A ROOT BARRIER IS REQUIRED FOR TREES PLANTED LESS THAT 5'-0" FROM ANY PAVED OR CONSTRUCTED SURFACES, INCLUDING WALLS/FOOTINGS.

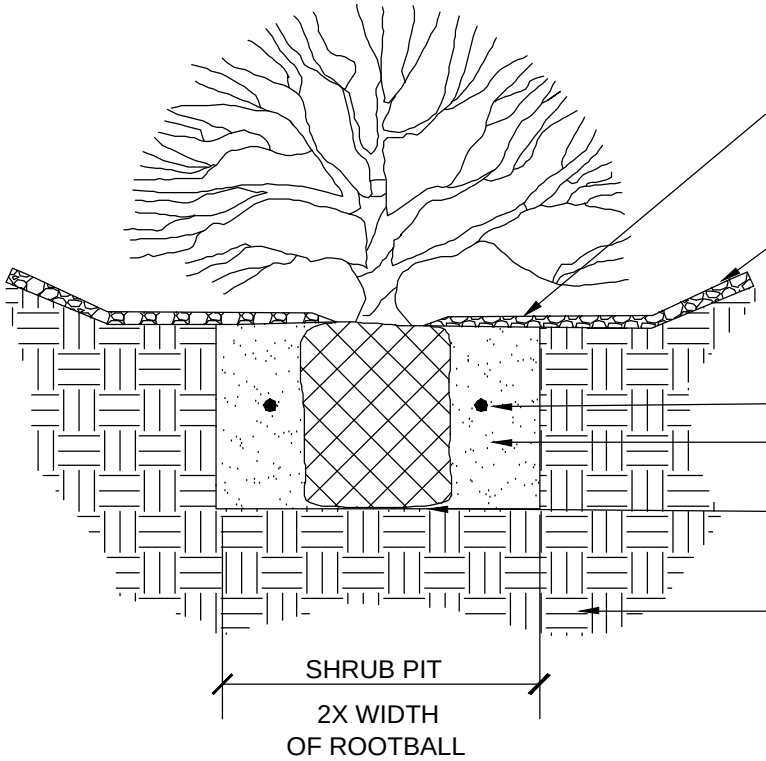




DETAIL NO. G-3610-6	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	ROOT BARRIER	DETAIL NO. G-3610-6

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.



2" DEEP WATERING BASIN SHALL BE GENTLE WITH 4:1 SIDE SLOPES, UNIFORM THROUGHOUT WITH NO OBTRUSIVE EDGES. BASIN TO BE 3'-0" DIAMETER. SET TOP OF SHRUB ROOT BALL AT SOIL SURFACE

FINISHED GRADE: 2" DEEP DECOMPOSED GRANITE
MAINTAIN 2" CLEAR ZONE AROUND SHRUB TRUNK

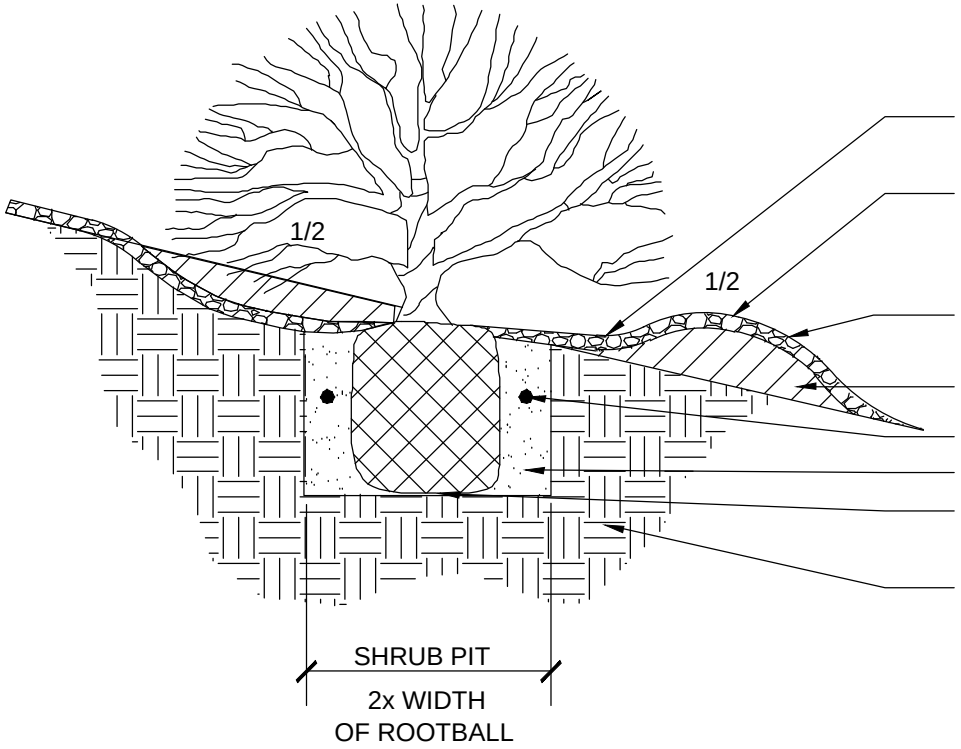
PLANT TABLET (SEE NOTE 1)

BACKFILL MIX (SEE NOTE 1)

SET ROOTBALL ON NATIVE UNDISTURBED SOIL OR SUBGRADE. SCARIFY SIDES AND BOTTOM OF PLANT PIT

UNDISTURBED NATIVE SOIL OR SUBGRADE

DETAIL NO.				DETAIL NO.
G-3610-7	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SHRUB/GROUNDWATER PLANTING	G-3610-7



NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.

2" DEEP WATERING BASIN SHALL BE GENTLE AND UNIFORM THROUGHOUT WITH NO OBTRUSIVE EDGES. BASIN TO BE 3'-0" DIAMETER

FORM WELL BY DIVING SOIL EQUALLY ACROSS SLOPE

FINISHED GRADE: 2" DEEP DECOMPOSED GRANITE PER LANDSCAPE SCHEDULE. MAINTAIN 2" CLEAR ZONE AROUND SHRUB TRUNK

CUT SOIL ON UP SLOPE SIDE AND PLACE ON DOWN SLOPE SIDE

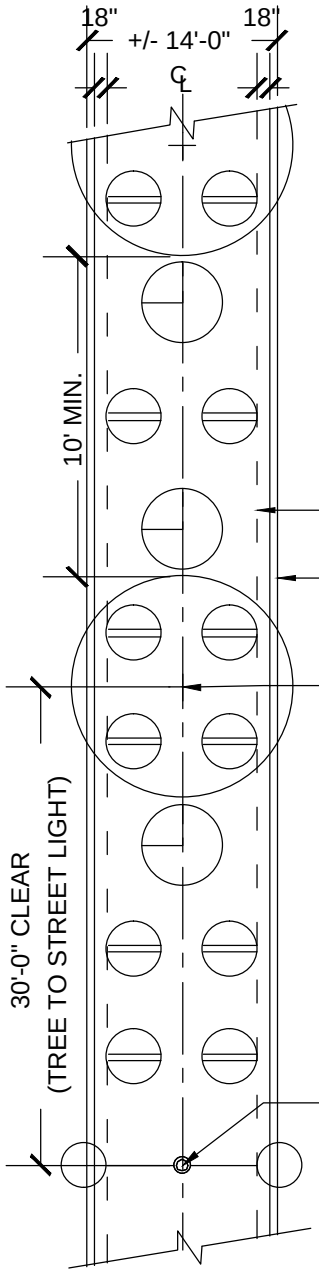
PLANT TABLET (SEE NOTE 1)

BACKFILL MIX (SEE NOTE 1)

SET ROOTBALL ON NATIVE UNDISTURBED SOIL OR SUBGRADE. SCARIFY SIDES AND BOTTOM OF PLANT PIT

UNDISTURBED NATIVE SOIL OR SUBGRADE

DETAIL NO.				DETAIL NO.
G-3610-8	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SHRUM/GROUNDCOVER PLANTING ON SLOPE	G-3610-8



NOTES:

1. CONTRACTOR SHALL USE CURRENT CITY OF GOODYEAR PARKS AND RIGHT-OF-WAYS "MATERIALS LIST" AS REFERENCED ON THE DETAIL.
2. GRADE OF MEDIAN SHALL SLOPE 8% FROM FACE OF CURB TO MIDDLE OF MEDIAN.
3. MAINTAIN TOP OF DECOMPOSED GRANITE 1" BELOW TOP OF CURB
4. SOIL WITHIN MEDIAN SHALL BE SLOPED TOWARD THE CENTER OF THE MEDIAN WITH AN 8% GRADIENT.

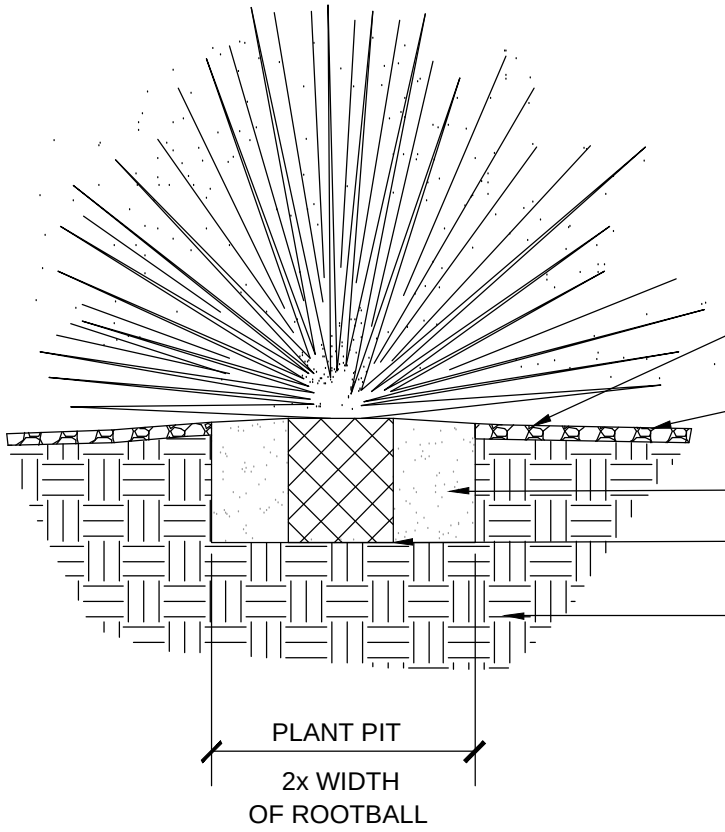
18" CLEAR FROM FACE OF CURB TO OUTSIDE EDGE OF MATURE SHRUB CANOPY

MEDIAN CURB

STREET TREE SPACED 1 $\frac{1}{2}$" TIMES THE WIDTH OF THE CANOPY.

STREET LIGHT; MAINTAIN 1 $\frac{1}{2}$" TIMES THE WIDTH OF THE TREE CANOPY CLEAR BETWEEN TREE AND STREET LIGHT

DETAIL NO. G-3610-9	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TYPICAL PLANT SPACING AND CLEAR ZONES FOR MEDIAN LANDSCAPING	DETAIL NO. G-3610-9



NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.

TO REDUCE PONDING, ESTABLISH POSITIVE DRAINAGE AWAY FROM PLANT BASE

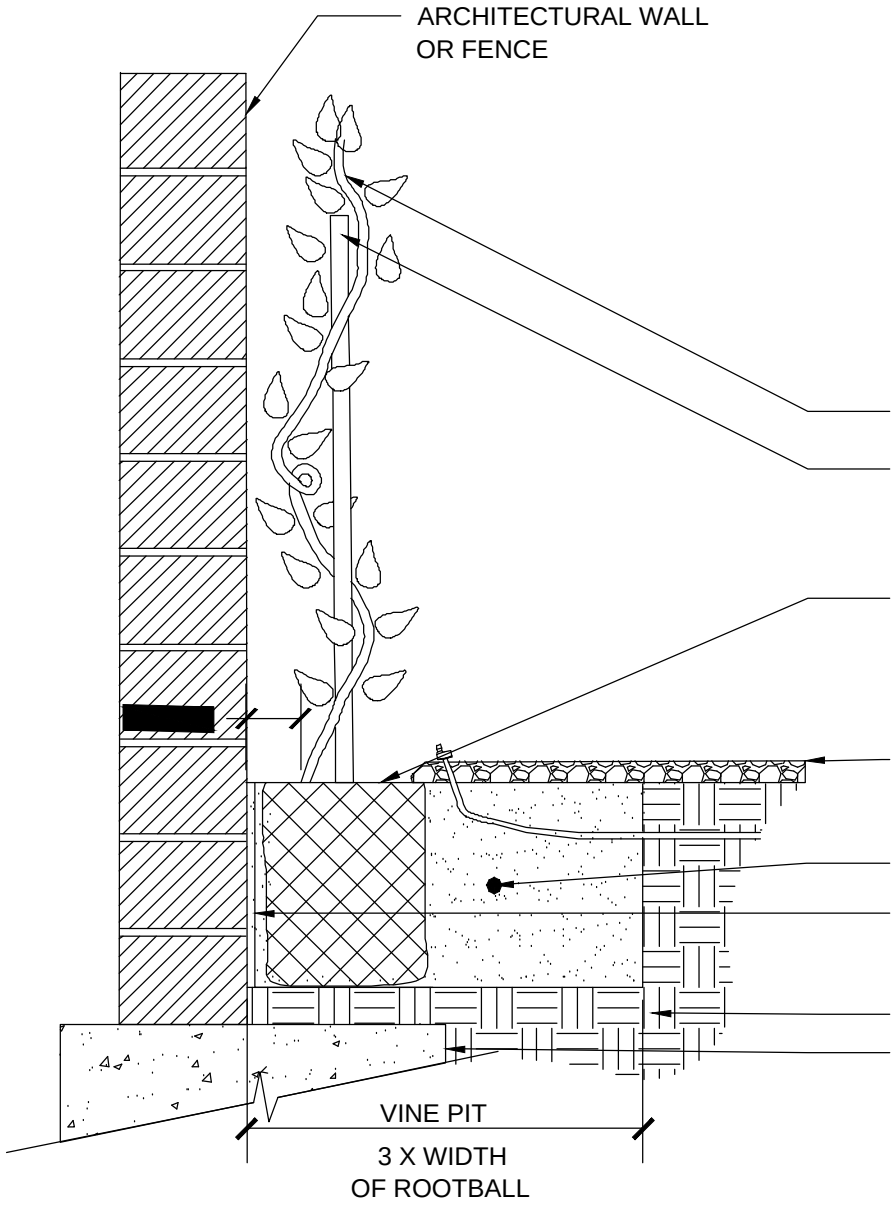
FINISHED GRADE: 2" DEEP DECOMPOSED GRANITE PER LANDSCAPE SCHEDULE
MAINTAIN 4" CLEAR ZONE AROUND ACCENT TRUNK

BACKFILL MIX (SEE NOTE 1)

SET ROOTBALL ON NATIVE UNDISTURBED SOIL OR SUBGRADE. SCARIFY SIDES AND BOTTOM OF PLANT PIT

UNDISTURBED NATIVE SOIL OR SUBGRADE

DETAIL NO. G-3610-10	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	CACTI/ACCENT PLANTING	DETAIL NO. G-3610-10



NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. ALTERNATE METHOD OF ATTACHMENT. VINE SHALL BE ATTACHED TO SURFACE OF FREESTANDING MASONRY WALLS WITH CLEAR EPOXY VINE TIES. DO NOT ATTACH VINES TO BUILDING.
3. VINES WITH NURSERY ESPALIER STAKE TO BE MOVED OUT OF ROOTBALL AND INSTALLED 6" FROM BUILDING.
4. TOP OF WATERING BASINS TO BE MIN 6" BELOW FINISHED FLOOR OF BUILDING.

SPREAD VINE ONTO WALL WITH VINYL PLANT TIES (SEE NOTE 1)

CONTRACTOR SHALL REMOVE NURSERY STAKE ONCE VINE HAS ATTACHED TO ARCHITECTURAL WALL OR FENCE

SET ROOTBALL TIGHT TO FOOTING, REMOVE ANY EXCESS TRASH OR CONCRETE THAT WOULD AFFECT PLANTING PIT

FINISHED GRADE: 2" DEEP DECOMPOSED GRANITE PER LANDSCAPE SCHEDULE

PLANT TABLET (SEE NOTE 1)

CONTRACTOR SHALL INSTALL A 3'-0" WIDE WATER PROOF MAT BETWEEN WALL AND FOOTING; ATTACH PER MANUFACTURER'S RECOMMENDATIONS (SEE NOTE 1)

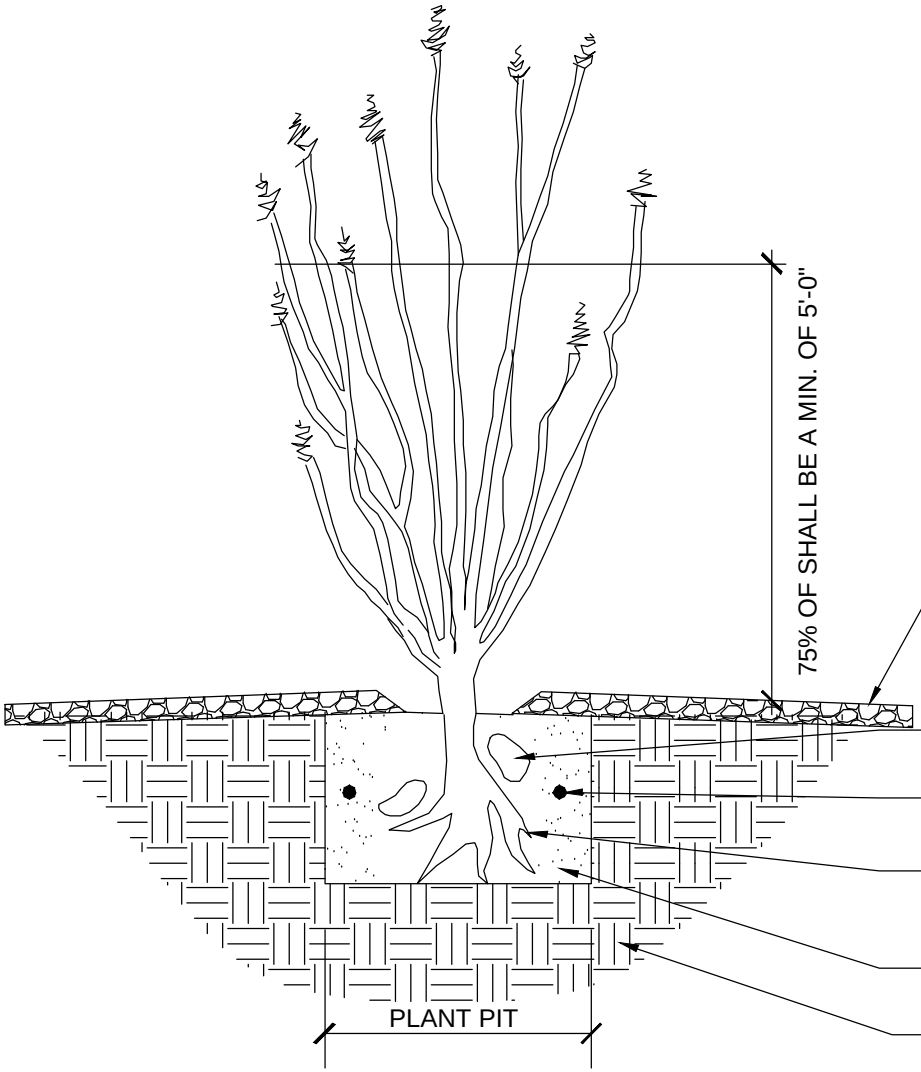
UNDISTURBED NATIVE SOIL OR SUBGRADE

ANY DEVIATION TO STANDARD INSTALLATION TO AVOID CONFLICTS WITH THE WALL OR FENCE FOOTING SHALL BE COORDINATED WITH THE CITY OF GOODYEAR REPRESENTATIVE

DETAIL NO. G-3610-11	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	VINE PLANTING	DETAIL NO. G-3610-11

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. OCOTILLO SHALL HAVE TWELVE (12) CANES MINIMUM
3. DURING WARM GROWING MONTHS, IRRIGATE EVERY MONTH IF NO RAIN.
4. TO REDUCE PONDING, ESTABLISH POSITIVE DRAINAGE AWAY FROM OCOTILLO BASE.



FINISHED GRADE: 2" DEEP DECOMPOSED GRANITE
MAINTAIN 4" CLEAR ZONE AROUND OCOTILLO BASE

USE 6" TO 8" ROCKS TO ANCHOR ROOTS

PLANT TABLET: LOCATION OF PLANT TABLETS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS (SEE NOTE 1)

ROOT PRUNE ALL SHREDDED OR DAMAGED ROOTS AND DUST ENTIRE ROOT STRUCTURE WITH WETTABLE SULPHUR (1.5 MIN.) AT PLANTING SITE

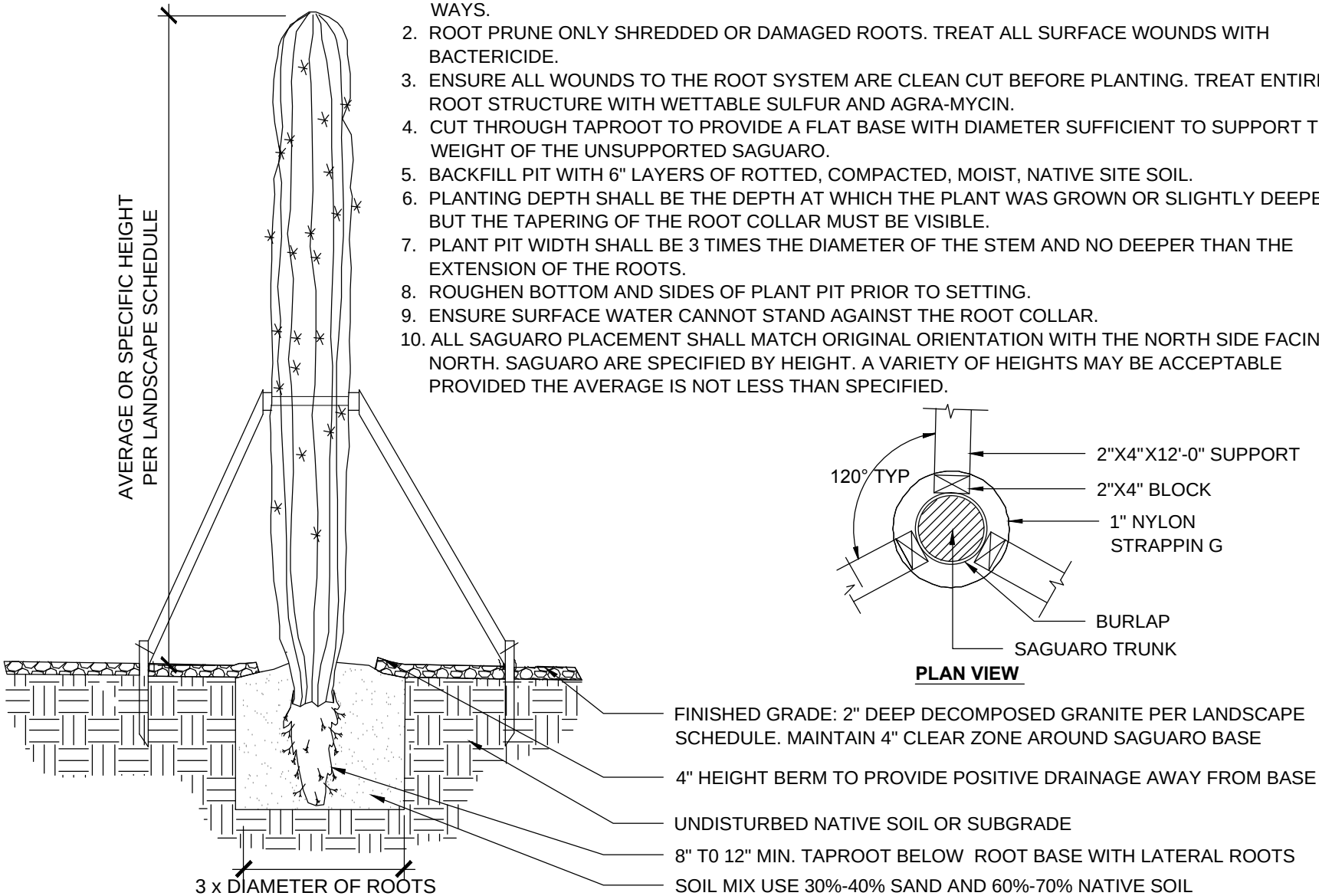
BACKFILL WITH MOIST NATIVE SITE SOIL.
FOR SOIL MIX (SEE NOTE 1)

UNDISTURBED NATIVE SOIL OR SUBGRADE

DETAIL NO. G-3610-12	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	OCOTILLO PLANTING	DETAIL NO. G-3610-12

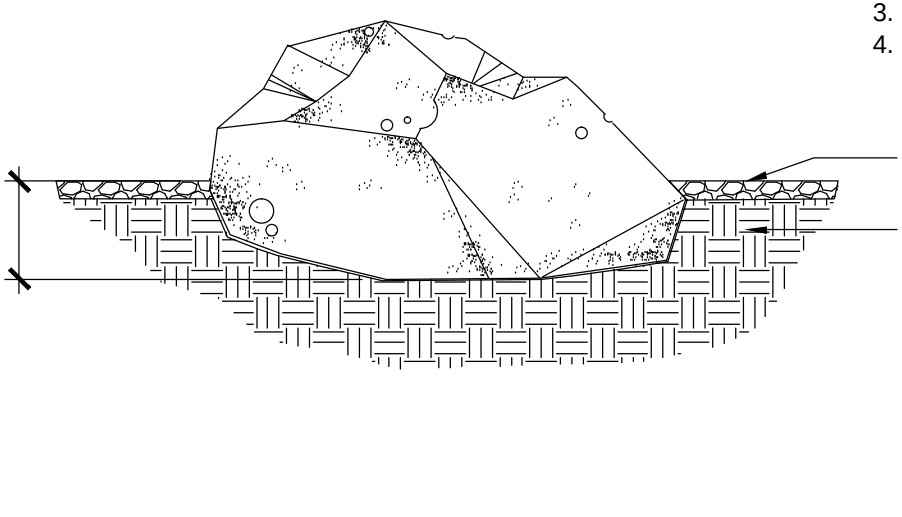
NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. ROOT PRUNE ONLY SHREDDED OR DAMAGED ROOTS. TREAT ALL SURFACE WOUNDS WITH BACTERICIDE.
3. ENSURE ALL WOUNDS TO THE ROOT SYSTEM ARE CLEAN CUT BEFORE PLANTING. TREAT ENTIRE ROOT STRUCTURE WITH WETTABLE SULFUR AND AGRA-MYCIN.
4. CUT THROUGH TAPROOT TO PROVIDE A FLAT BASE WITH DIAMETER SUFFICIENT TO SUPPORT THE WEIGHT OF THE UNSUPPORTED SAGUARO.
5. BACKFILL PIT WITH 6" LAYERS OF ROTTED, COMPACTED, MOIST, NATIVE SITE SOIL.
6. PLANTING DEPTH SHALL BE THE DEPTH AT WHICH THE PLANT WAS GROWN OR SLIGHTLY DEEPER, BUT THE TAPERING OF THE ROOT COLLAR MUST BE VISIBLE.
7. PLANT PIT WIDTH SHALL BE 3 TIMES THE DIAMETER OF THE STEM AND NO DEEPER THAN THE EXTENSION OF THE ROOTS.
8. ROUGHEN BOTTOM AND SIDES OF PLANT PIT PRIOR TO SETTING.
9. ENSURE SURFACE WATER CANNOT STAND AGAINST THE ROOT COLLAR.
10. ALL SAGUARO PLACEMENT SHALL MATCH ORIGINAL ORIENTATION WITH THE NORTH SIDE FACING NORTH. SAGUARO ARE SPECIFIED BY HEIGHT. A VARIETY OF HEIGHTS MAY BE ACCEPTABLE PROVIDED THE AVERAGE IS NOT LESS THAN SPECIFIED.



PLAN VIEW

DETAIL NO.				DETAIL NO.
G-3610-13	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SAGUARO PLANTING	G-3610-13



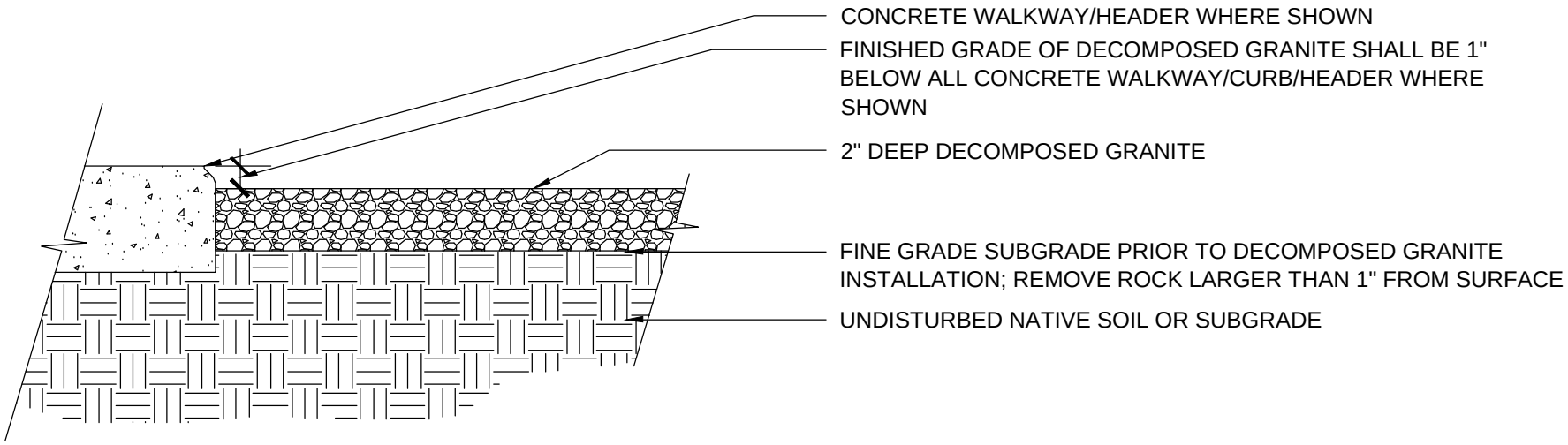
NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. BOULDERS SHALL BE PLACED UNDER THE DIRECTION OF CITY OF GOODYEAR REPRESENTATIVE.
3. SEE LANDSCAPE SCHEDULE FOR TYPE AND SIZE OF BOULDER.
4. BOULDERS TO BE PLACED IN A WAY THAT THERE IS NO SCARRING.

DETAIL NO. G-3610-14	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	BOULDER	DETAIL NO. G-3610-14

NOTES:

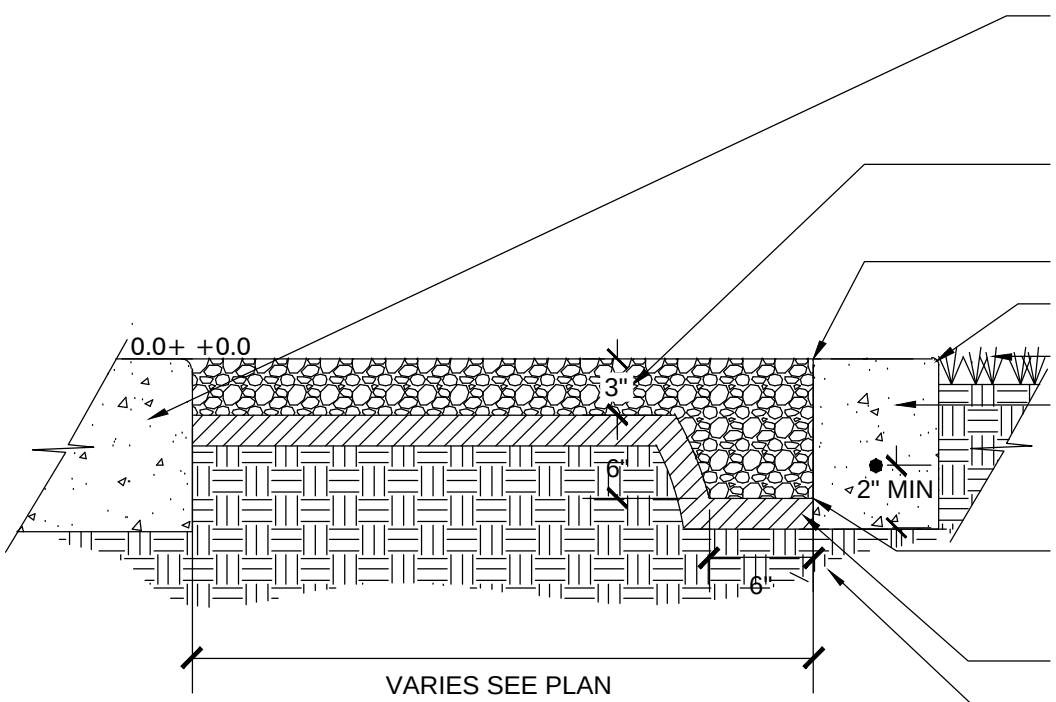
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. APPLY PRE-EMERGENT HERBICIDE PRIOR TO INSTALLATION OF DECOMPOSED GRANITE, ONE WEEK AFTER INSTALLATION OF DECOMPOSED GRANITE, AND ONE WEEK BEFORE PROJECT IS TURNED OVER TO THE CITY OF GOODYEAR. PRE-EMERGENT TO BE APPLIED AT 6 MONTH INTERVALS (MAX.) AND SHALL BE FULL-STRENTH. EACH APPLICATION OF PRE-EMERGENT SHALL BE WATERED IN PER MANUFACTURER'S RECOMMENDATIONS.
3. FINISH GRADE SHALL BE RAKED SMOOTH WITH NO CONTAMINATES OF CONSTRUCTION AND/OR UNDULATION CREATED BY CONSTRUCTION.
4. PRIOR TO INSTALLATION, THE COLOR AND GRADATION OF THE DECOMPOSED GRANITE SHALL BE APPROVED BY THE CITY OF GOODYEAR REPRESENTATIVE.



DETAIL NO. G-3610-15	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	DECOMPOSED GRANITE	DETAIL NO. G-3610-15

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN STABILIZED DECOMPOSED GRANITE AND CONCRETE WALKWAY/CURB/HEADER WHERE SHOWN.
3. THERE SHALL BE NO PONDING ON STABILIZED DECOMPOSED GRANITE. ENSURE POSITIVE DRAINAGE.
4. APPLY PRE-EMERGENT HERBICIDE PRIOR TO INSTALLATION OF STABILIZED DECOMPOSED GRANITE, ONE WEEK AFTER INSTALLATION OF STABILIZED DECOMPOSED GRANITE, AND ONE WEEK BEFORE PROJECT IS TURNED OVER TO THE CITY OF GOODYEAR. PRE-EMERGENT SHALL BE APPLIED AT 6 MONTH INTERVALS (MAX.) AND SHALL BE FULL-STRENGTH. EACH APPLICATION OF PRE-EMERGENT SHALL BE WATERED IN PER MANUFACTURERS RECOMMENDATIONS.



CONCRETE WALKWAY/CURB/HEADER WHERE SHOWN. CONTRACTOR SHALL INSTALL STABILIZED DECOMPOSED GRANITE AT THE SAME ELEVATION OF THE ADJACENT CONCRETE HEADER/WALKWAY TO ENSURE A SMOOTH TRANSITION

3" THICK DECOMPOSED $\frac{1}{4}$" MINUS GRANITE. INSTALL PER MANUFACTURE'S SPECIFICATIONS. (SEE NOTE 1)

INSIDE EDGE FLUSH WITH STABILIZED DECOMPOSED GRANITE

1/2" RADIUS ON OUTSIDE EDGES

TURF/DECOMPOSED GRANITE WHERE SHOWN

10" DEEP CONCRETE HEADER WHERE SHOWN PER G-3610-17 (ALL OUTSIDE EDGE TREATMENT SHALL BE INSTALLED WITH MODIFIED STANDARD CONCRETE HEADER BETWEEN STABILIZED DECOMPOSED GRANITE AND TURF

6" x 6" STABILIZED DECOMPOSED GRANITE TURN-DOWN (TYPICAL OF ALL OUTSIDE EDGES THAT ARE NOT ADJACENT TO A SMOOTH TRANSITION BETWEEN CONCRETE WALKWAY/CURB/HEADER

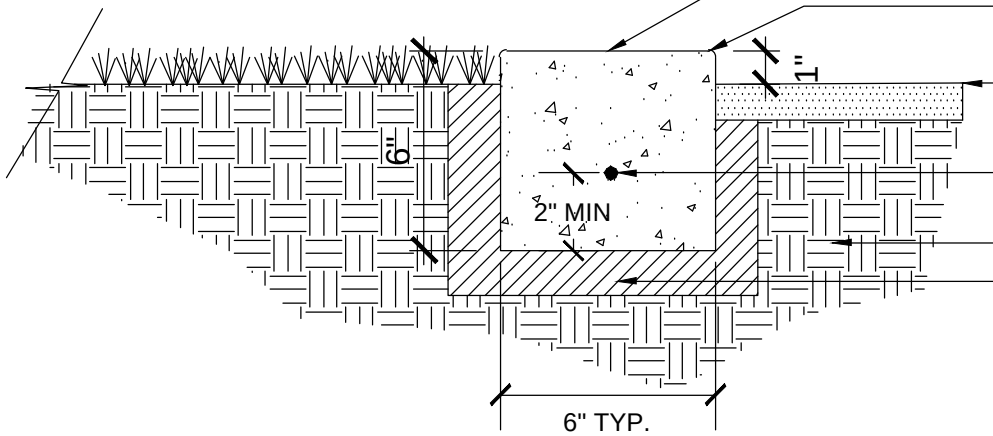
ENGINEERED FILL AND COMPACTED SUBGRADE PER GEOTECHNICAL REPORT OR AS NOTED ON PLANS/SPECIFICATIONS

UNDISTURBED NATIVE SOIL OR SUBGRADE

DETAIL NO. G-3610-16	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	STABILIZED DECOMPOSED GRANITE	DETAIL NO. G-3610-16

NOTES:

1. HEADER SHALL BE FLUSH WITH ADJACENT STABILIZED DECOMPOSED GRANITE PATHWAY AND TRANSITION WITH CONCRETE WALKWAYS.
2. ADJACENT TO TURF; FINISHED GRADE OF TURF SHALL BE 1" BELOW TOP OF CONCRETE HEADER.
3. CITY OF GOODYEAR REPRESENTATIVE SHALL APPROVE FORM WORK PRIOR TO PLACING CONCRETE.
4. CONCRETE SHALL BE MAG. CLASS "B".
5. EXPANSION JOINTS @ 24'-0" ON CENTER AND AT ALL LOCATIONS WHERE NEW CONCRETE MEETS EXISTING CONCRETE.
6. CONTRACTOR SHALL INSTALL CONTROL JOINTS EVERY 4'-0" O.C. OR AT EQUAL DISTANCE ALONG HEADER IF SECTION LENGTH IS NOT DIVISIBLE BY 4'-0".
7. STRAIGHT SECTIONS TO MEET CURVED SECTIONS AT TRUE TANGENT POINTS WITH NO BROKEN CURVE SECTIONS.
8. CURVED SECTIONS TO BE FORMED IN SMOOTH, EVEN CURVES.
9. FORM STAKING SHALL KEEP CONCRETE FROM DEFORMING OR LEAKING. ALL SPILL OF EXCESS CONCRETE SHALL BE CLEANED UP AND REMOVED FROM SITE BY CONTRACTOR.



TYPICAL GREY CONCRETE HEADER WITH MEDIUM BROOM FINISH (TYP.) UNLESS NOTED OTHERWISE.

$\frac{1}{2}$" RADIUS ON ALL SIDES, UNLESS HEADER IS ADJACENT TO STABILIZED DECOMPOSED GRANITE

FINISHED GRADE: DECOMPOSED GRANITE OR NATIVE SOIL/SEED: TURF AT 1" BELOW PER NOTES

#3 REBAR CENTERED AND CONTINUOUS PROVIDE 8" LAP AT EACH END

UNDISTURBED NATIVE SOIL OR SUBGRADE

CONTRACTOR SHALL COMPACT SUB GRADE AROUND HEADER PER GEOTECHNICAL REPORT OR AS NOTED ON PLANS/SPECIFICATIONS

DETAIL NO. G-3610-17	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	CONCRETE HEADER	DETAIL NO. G-3610-17

WIRE SIZE (AWG)	MAXIMUM NUMBER OF WIRES TO BE INSTALLED IN A SCHEDULE 40 PVC SLEEVE			WIRE SIZE (AWG)
	2"	2-1/2"	3"	
14	25	40	56	14
12	20	33	50	12

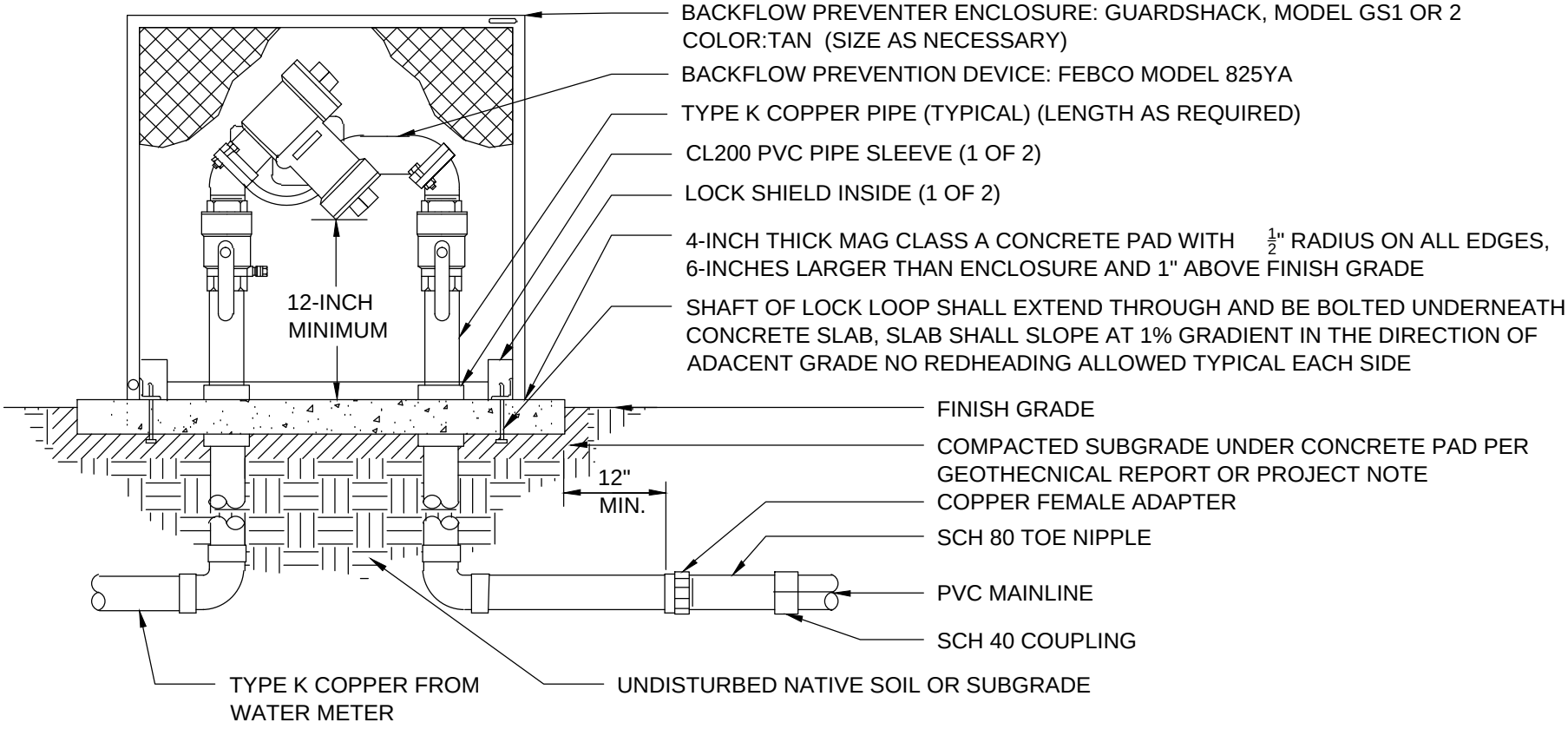
NOTE:

1. ALL WIRE SLEEVES TO BE SHC. 40 PVC AND SHALL BE INSTALLED WITH A MINIMUM OFFSET AT THE JOINTS TO PERMIT EASY INSTALLATION AND REMOVAL OF CONTROL AND COMMON WIRES. ALL WIRES SHALL BE INSTALLED IN SLEEVES UNDER THE PAVED AREAS. SLEEVES SHALL EXTEND AT LEAST 12" BEYOND THE EDGES OF THE PAVEMENT. SIZE OF SLEEVES SHALL BE AS SHOWN.

DETAIL NO. G-3618	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:12/12	IRRIGATION WIRE SLEEVING CHART	DETAIL NO. G-3618

NOTES:

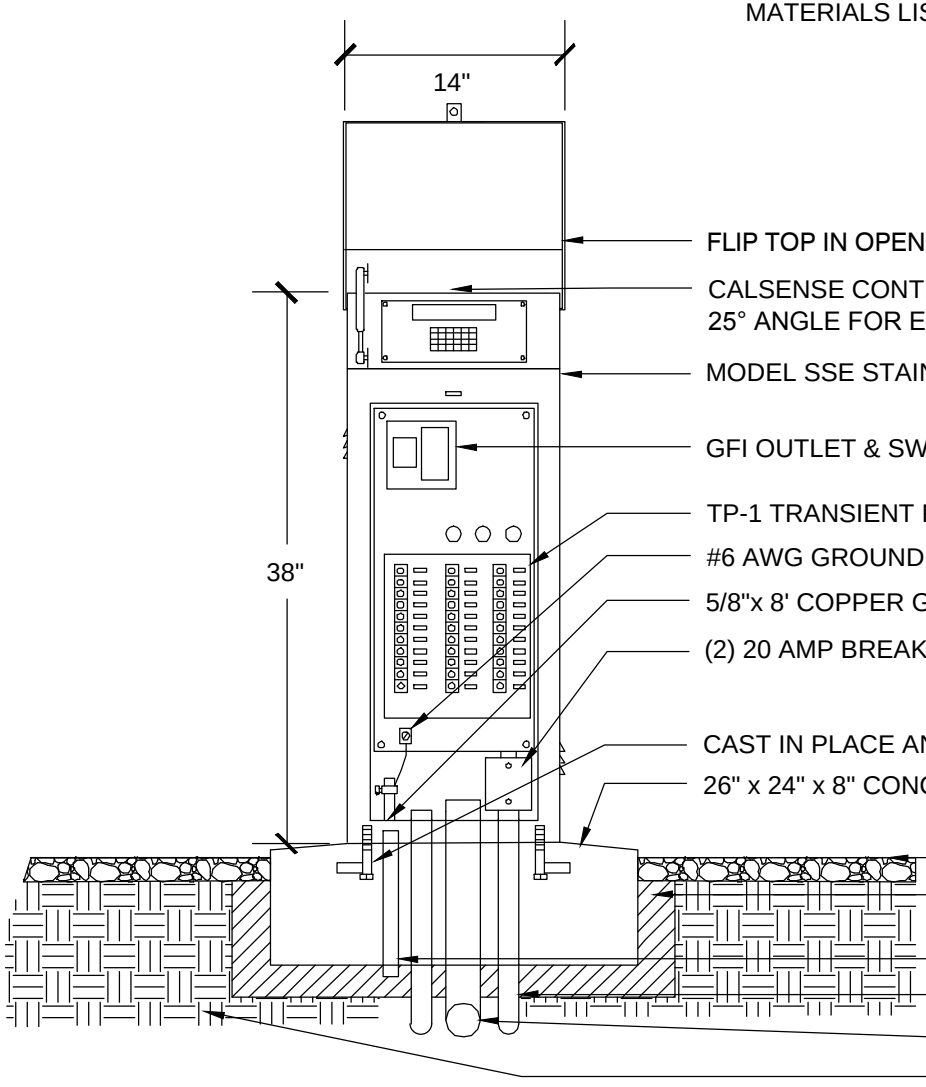
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS .
2. SUBMIT SHOP DRAWINGS SPECIFYING ENCLOSURE SIZE AND SHOWING RELATIVE LAYOUT OF EQUIPMENT.
3. CONTRACTOR SHALL PROVIDE A LOCK FOR THE ENCLOSURE UNTIL SUBSTANTIAL COMPLETION APPROVAL. AT THAT TIME CONTRACTOR SHALL REMOVE HIS LOCK AND THE CITY SHALL PROVIDE A LOCK FOR THE ENCLOSURE.
4. IRRIGATION MAINLINES LESS THAT 2" SHALL BE SCH. 40, MAINLINES 2"-3" SHALL BE BALL GASKET CLASS 315, MAINLINES GREATER THAN 3" SHALL BE CLASS 200. MAINLINES SHALL COMFORM TO ASTM D1785.
5. CONTRACTOR SHALL FURNISH FITTINGS AND PIPING SIZED IDENTICALLY WITH NOMINAL BACKFLOW PREVENTION DEVICE.



DETAIL NO. G-3620-1	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	REDUCED PRESSURE ASSEMBLY	DETAIL NO. G-3620-1

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.



FLIP TOP IN OPEN POSITION

CALSENSE CONTROLLER PANEL MOUNTED FLUSH ON FACE OF ENCLOSURE AT A 25° ANGLE FOR EASY ACCESS AND VIEWING

MODEL SSE STAINLESS STEEL ENCLOSURE MODEL SSE-R (WITH DOME ANTENNA)

GFI OUTLET & SWITCH

TP-1 TRANSIENT PROTECTION BOARD

#6 AWG GROUNDING WIRE CONNECTED TO GROUND LUG

5/8"x 8' COPPER GROUNDING ROD

(2) 20 AMP BREAKERS WITH BUILT-IN SURGE PROTECTION

CAST IN PLACE ANCHOR BOLTS (INCLUDED WITH ENCLOSURE)

26" x 24" x 8" CONCRETE BASE 1" ABOVE FINISHED GRADE

FINISHED GRADE

COMPACTED SUBGRADE PER GEOTHECNICAL REPORT OR PROJECT NOTES

PVC SLEEVE FOR GROUND ROD

SCH 40 PVC ELECTRICAL SWEEP FOR 120 VAC POWER

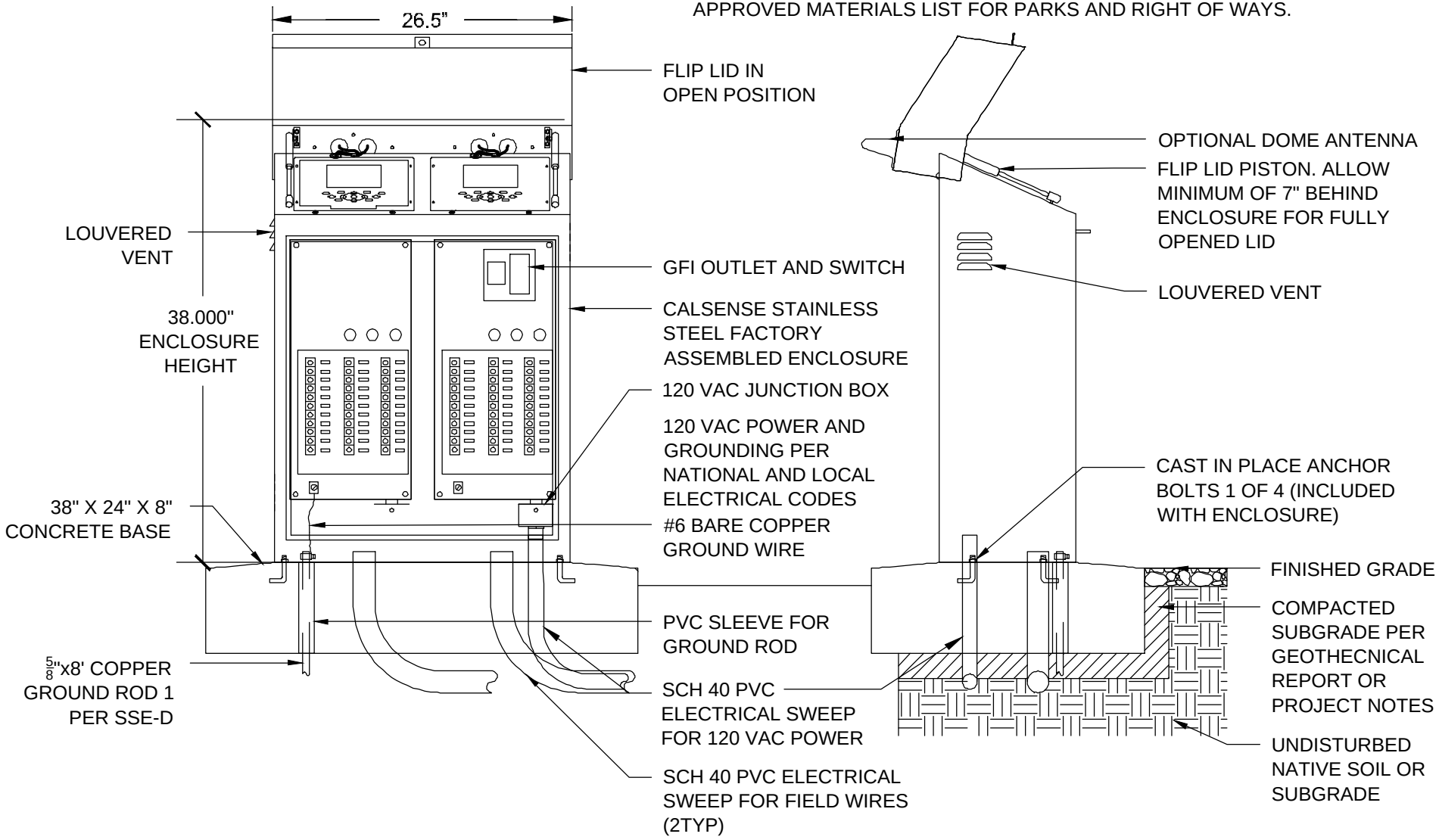
SCH 40 PVC ELECTRICAL SWEEP FOR FIELD WIRES

UNDISTURBED NATIVE SOIL OR SUBGRADE

DETAIL NO. G-3620-2	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	CALSENSE CONTROLLER (MODEL CS2000/PEDESTAL)	DETAIL NO. G-3620-2

NOTES:

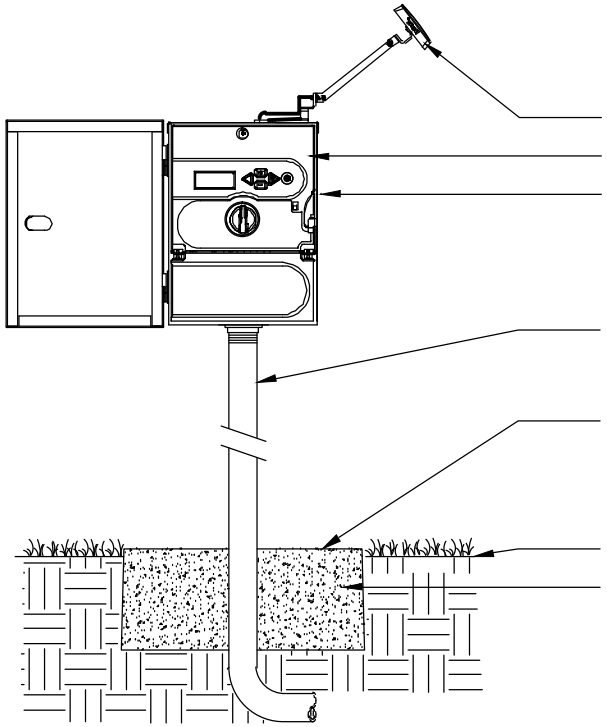
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.



DETAIL NO. G-3620-3	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	CALSENSE CONTROLLER (MODEL CS3000/PEDESTAL)	DETAIL NO. G-3620-3

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAY S.
2. INSTALL CONTROLLER PER MANUFACTURER'S SPECIFICATIONS.
3. SPECIFY STATION MODEL CONTROLLER. MOUNT CONTROLLER WITH LCD SCREEN AT EYE LEVEL.



SOLAR PANEL. MOUNT TO TOP OF ENCLOSURE TO MAXIMIZE SUN LIGHT

SOLAR CONTROLLER

POWER WIRE,18-20 PACKAGE KIT AWG (WIRE TO MEET INSTALLATION CODE REQUIREMENTS), FROM MODULE TO SENSOR. MAXIMUM TOTAL WIRE DISTANCE 200 FEET.

STEEL CONDUIT WITH SWEEP ELBOW FOR CONTROL WIRES AND CONTROLLER SUPPORT

CONCRETE FOOTING 2' THICK 1" ABOVE ADAJACENT GRADE SLOPE TO DRAIN

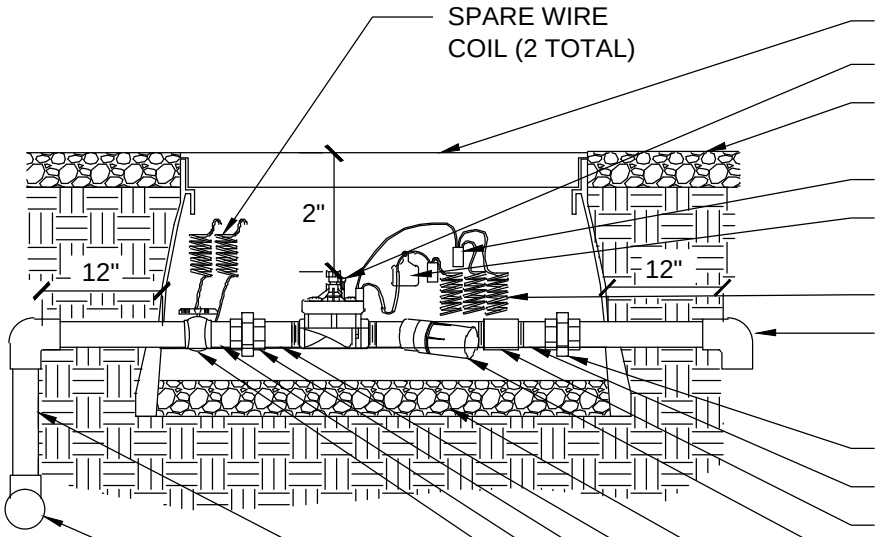
FINISH GRADE

1' x 1' x 2' CUBIC FEET OF MAG B CONCRETE WITH 1/2" RADIUS EDGE ON ALL SIDES FOR POST SUPPORT

DETAIL NO. G-3620-4	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	SOLAR CONTROLLER	DETAIL NO. G-3620-4

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. STATION NO. ENGRAVED ON LID.
3. MAINLINE SHALL NOT TO BE INSTALLED UNDER VALVE BOX.
4. ALL VALVE BOXES TO BE (MIN) 3 FEET APART FROM EACH OTHER.
5. INSTALL 2 EXTRA WIRES, ONE WHITE (COMMON) AND ONE GREEN INTO EACH VALVE BOX AND COIL PER NOTE 1 ABOVE.
6. IRRIGATION MAINLINES LESS THAT 2" SHALL BE SCH. 40, MAINLINES 2"-3" SHALL BE BALL GASKET CLASS 315, MAINLINES GREATER THAN 3" SHALL BE CLASS 200. MAINLINES SHALL COMFORM TO ASTM D1785.
7. COILED WIRE, WRAP AROUND 1" PVC PIPE 15 TIMES.

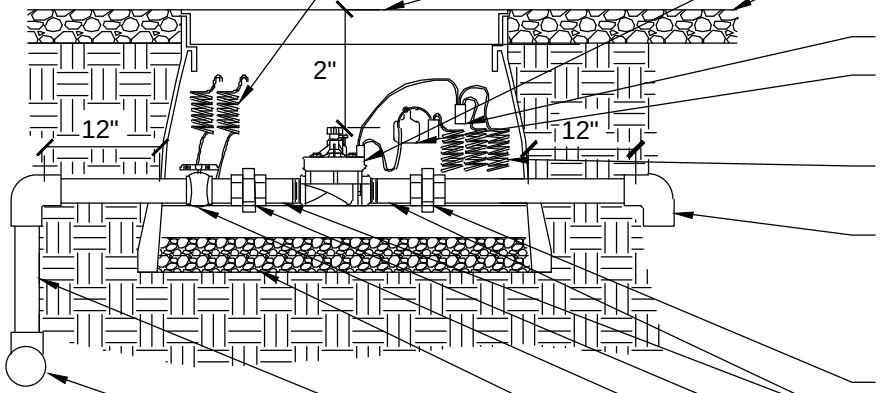


SPARE WIRE COIL (2 TOTAL)
VALVE BOX WITH COVER SET FLUSH WITH ADJACENT GRADE
REMOTE CONTROL VALVE
FINISHED GRADE
WATER PROOF CONNECTION 1 OF 2
ID TAG W/ VALVE NUMBER
COILED WIRE
PVC LATERAL LINE
SCH 80 S X S UNION
SCH 80 TOE NIPPLE
COUPLING T x T
PRESSURE REGULATING FILTER
2" MINIMUM DEPTH OF PEA GRAVEL WITH A MIN 1" SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL
SCH 80 TOE NIPPLE
SCH 80 S X S UNION
SCH 40 PVC (TYP)
S X S BALL VALVE (LINE SIZE)
PVC SEE NOTE 6 ABOVE (LENGTH AS REQUIRED)
PVC MAINLINE TEE OR ELL

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	ELECTRIC VALVE - DRIP WITH BALL VALVE	DETAIL NO.
G-3620-5				G-3620-5

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. EXPANSION COIL WRAP AROUND 1" PIPE 15 TIMES.
3. VALVE BOX COVER IS ENGRAVEDED WITH THE VALVE NUMBER (2" HIGH MIN.).
4. VALVE BOXES SHALL NOT BE PLACED IN TURF UNLESS ABSOLUTELY NECESSARY. KEEP TOP OF VALVE BOX FLUSH WITH ADJACENT GRANDE.
5. IRRIGATION MAINLINES LESS THAT 2" SHALL BE SCH. 40,MAINLINES 2"-3" SHALL BE BALL GASKET CLASS 315, MAINLINES GREATER THAN 3" SHALL BE CLASS 200. MAINLINES SHALL CONFORM TO ASTM D1785.
6. REMOTE CONTROL VALVE (SIZED AS SHOWN ON DRAWINGS).



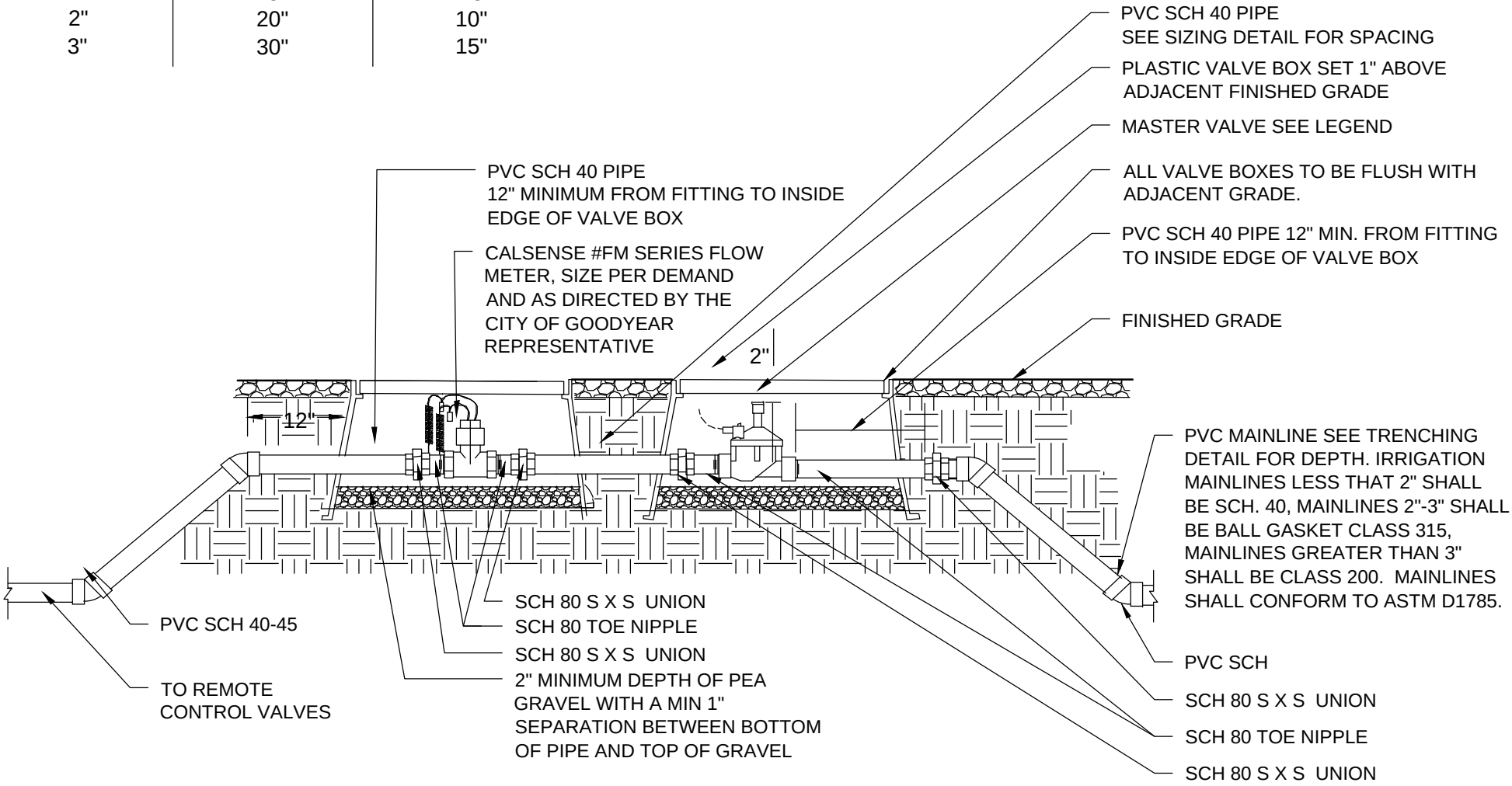
SPARE WIRE COIL (2 TOTAL)
VALVE BOX WITH COVER
REMOTE CONTROL VALVE (SIZED AS SHOWN ON DRAWINGS)
FINISHED GRADE
WATER PROOF CONNECTION 1 OF 2
ID TAG W/ VALVE NUMBER
COILED WIRE
PVC LATERAL LINE
SCH 80 S X S UNION
SCH 80 TOE NIPPLE
SCH 80 S X S UNION
S X S BALL VALVE (LINE SIZE)
2" MINIMUM DEPTH OF PEA GRAVEL WITH A MIN 1" SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL
PVC SEE NOTE 5 ABOVE (TYP)
PVC MAINLINE TEE OR ELL

DETAIL NO. G-3620-6	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	ELECTRIC VALVE - TURF WITH BALL VALVE	DETAIL NO. G-3620-6

FLOW METER SIZE	MIN UPSTREAM DISTANCE	MIN DOWNSTREAM DISTANCE
1"	12"	5"
1-1/4"	12.5"	6.25"
1-1/2"	15"	7.5"
2"	20"	10"
3"	30"	15"

NOTES:

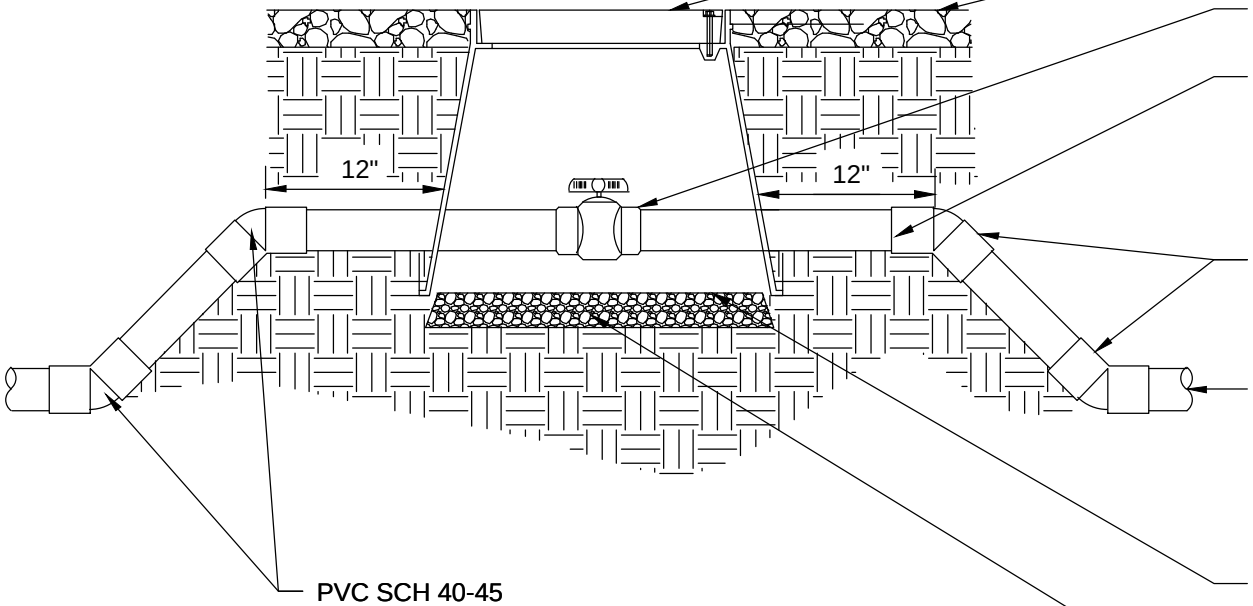
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.



DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	MASTER VALVE AND FLOW SENSOR	DETAIL NO.
G-3620-7				G-3620-7

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. BALL VALVE SHALL MATCH NOMINAL SIZE OF MAINLINE PIPE.



VALVE BOX WITH COVER
FLUSH WITH ADJACENT GRADE

FINISH GRADE

S x S SCH 80 BALL VALVE

PVC MAINLINE. IRRIGATION MAINLINES LESS THAN 2" SHALL BE SCH. 40, MAINLINES 2"-3" SHALL BE BALL GASKET CLASS 315, MAINLINES GREATER THAN 3" SHALL BE CLASS 200. MAINLINES SHALL CONFORM TO ASTM D1785.

PVC SCH 40-45

FLOW

PVC SCH 40-45

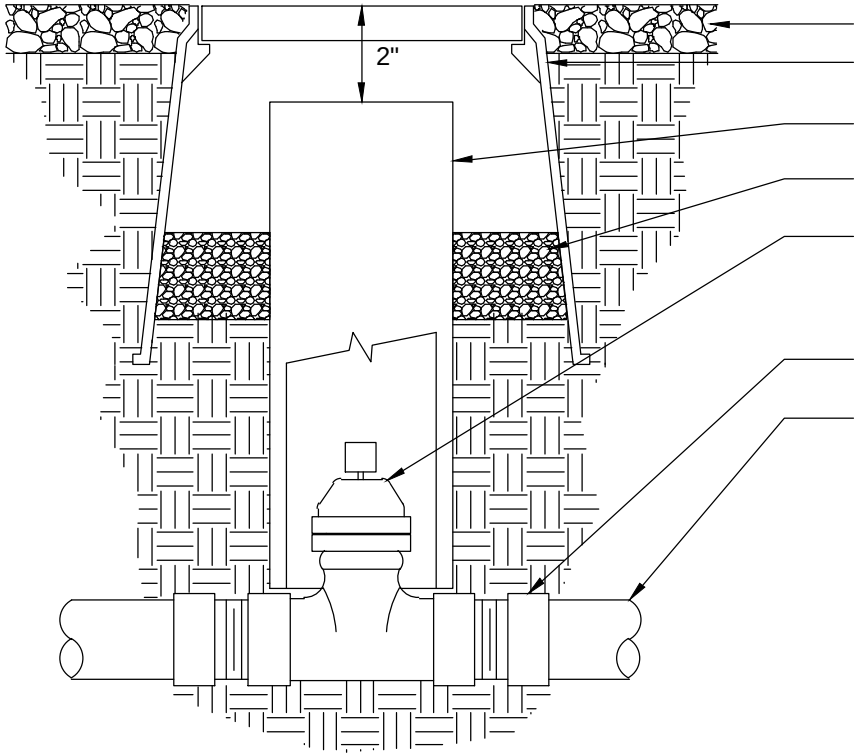
MIN 1" SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL

PEA GRAVEL DEPTH SHALL BE TWICE THE DISTANCE OF SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL

DETAIL NO. G-3620-8	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	ISOLATION VALVE - 2.0" OR SMALLER	DETAIL NO. G-3620-8

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. NOMINAL SIZE OF GATE VALVE TO MATCH NOMINAL MAINLINE SIZE.



FINISHED GRADE

VALVE BOX WITH COVER SET FLUSH WITH ADJACENT GRADE

6-INCH PVC CL 200 PIPE (LENGTH AS REQUIRED)

2" MINIMUM DEPTH OF PEA GRAVEL

GATE VALVE W / SQUARE OPERATING NUT, SEE CITY OF GOODYEAR APPROVED PRODUCTS LIST FOR WATER DISTRIBUTION POTABLE SYSTEM

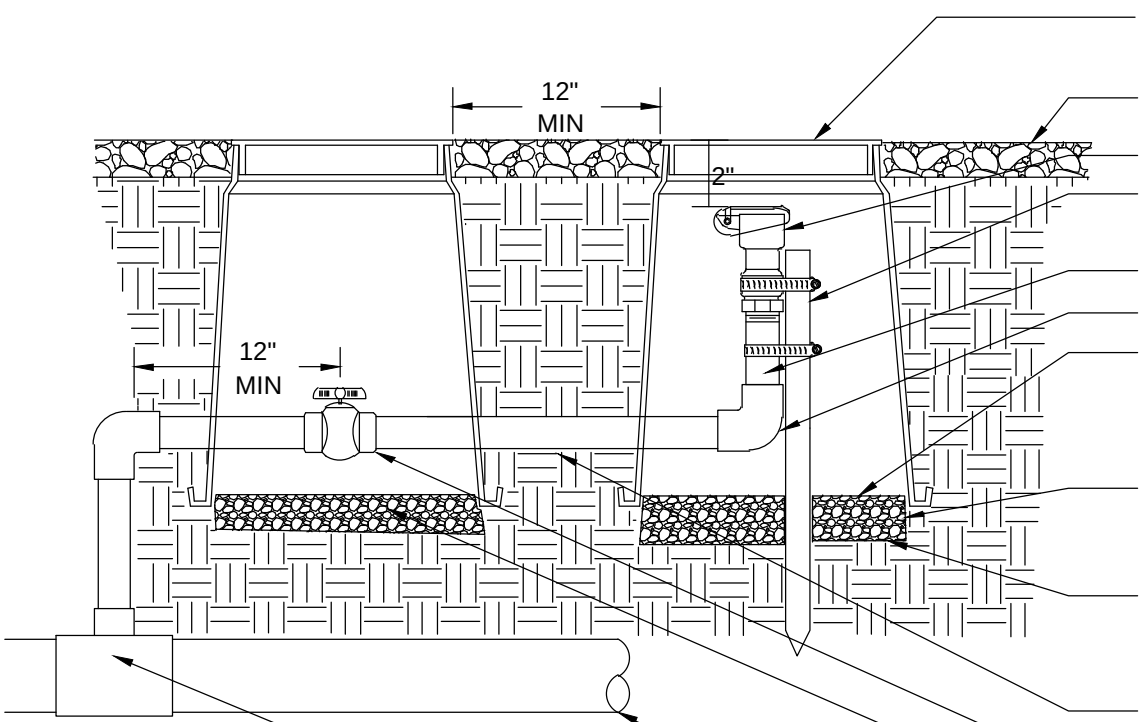
PVC MALE ADAPTER

PVC MAINLINES 2"-3" SHALL BE BALL GASKET CLASS 315, MAINLINES GREATER THAN 3" SHALL BE CLASS 200. MAINLINES SHALL CONFORM TO ASTM D1785.

DETAIL NO. G-3620-9	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	ISOLATION VALVE - 2.5" OR LARGER	DETAIL NO. G-3620-9

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.



VALVE BOX WITH COVER SET FLUSH WITH ADJACENT GRADE

FINISH GRADE/TOP OF TURF,CURB/SIDEWALK

QUICK COUPLER SEE LEGEND

#4 X 24" REBAR STAKE WITH STAINLESS STEEL GEAR SUPPORT SYSTEM CLAMPS OR EQUIVALENT

6" SCH 80 TOE NIPPLE

SCH 40 ELL SXS

MIN. 1" SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL, TYPICAL BOTH VALVE BOXES

2" MINIMUM DEPTH OF PEA GRAVEL WITH A MIN 1" SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL

PEA GRAVEL DEPTH SHALL BE TWICE THE DISTANCE OF SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL

SCH 40 PVC (TYP) MATCH QUICK COUPLER SIZE

SCH 80 S X S BALL VALVE (LINE SIZE)

2" MINIMUM DEPTH OF PEA GRAVEL WITH A MIN 1" SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL

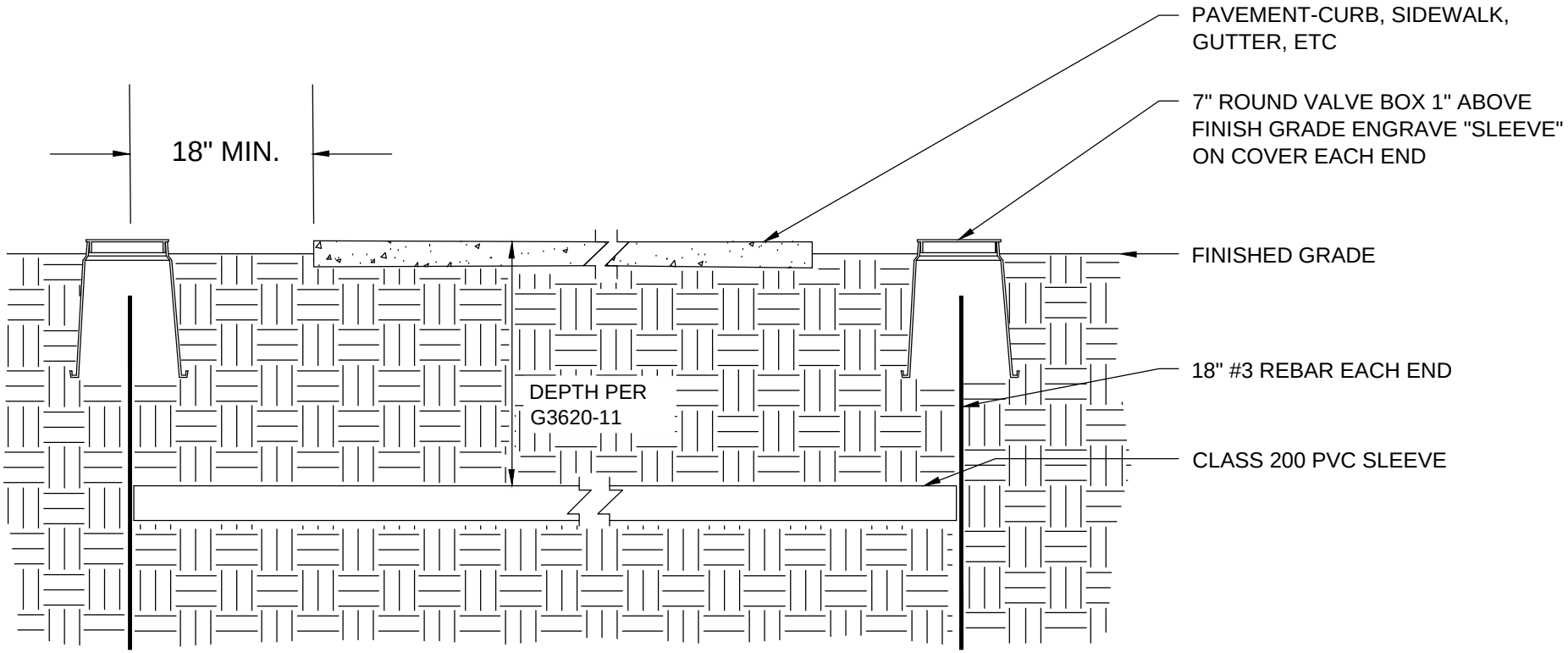
IRRIGATION MAINLINES LESS THAN 2" SHALL BE SCH. 40, MAINLINES 2"-3" SHALL BE BALL GASKET CLASS 315, MAINLINES GREATER THAN 3" SHALL BE CLASS 200. MAINLINES SHALL CONFORM TO ASTM D1785

PVC MAINLINE TEE

DETAIL NO. G-3620-10	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	QUICK COUPLER	DETAIL NO. G-3620-10

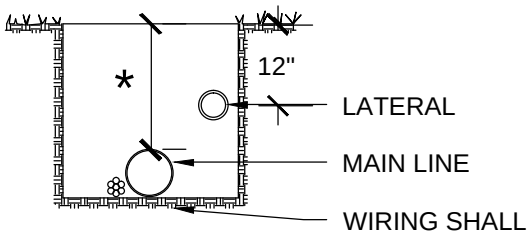
NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. VALVE BOX AND REBAR MARKERS TO BE INSTALLED WHEN LANDSCAPE AND IRRIGATION IS A FUTURE CONTRACT.



DETAIL NO. G-3620-11	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	PVC SLEEVE	DETAIL NO. G-3620-11

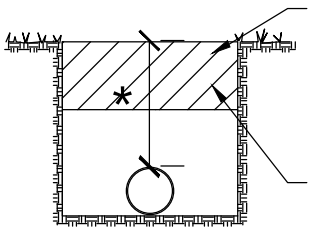
MAINLINE AND WIRING WITH LATERAL



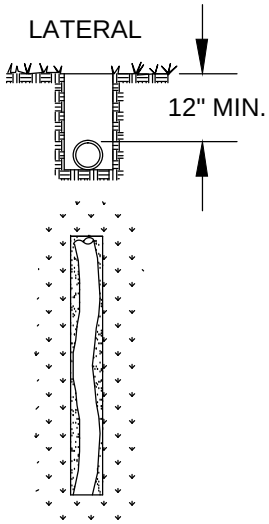
NOTE:

TAPE AND BUNDLE TUBING OR WIRING AT 10' INTERVALS.

MAINLINE AND WIRING WITHOUT LATERAL



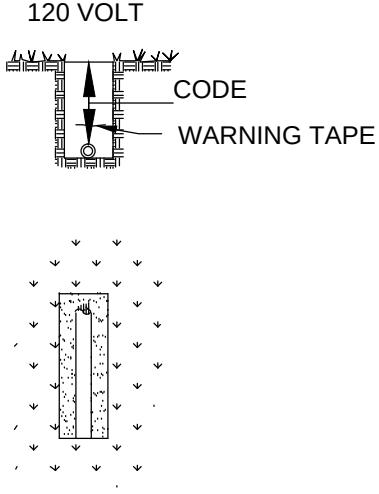
* PIPE DIA	TRENCH DEPTHS
3/4" - 2"	18"
2-1/2" - 3"	24"
4" - 6"	36"
8" - 12"	48"



NOTE:

ALL PLASTIC PIPING TO BE SNAKED IN TRENCHES WITH A 2" MIN. CLEARANCE BETWEEN PIPES AND PIPES AND SIDE OF TRENCH.

120 VOLT



NOTE:

ALL 120 VOLT WIRING IN CONDUIT TO BE INSTALLED IN ACCORDANCE WITH LOCAL CODE.

APPROVED "ELECTRICAL POWER WIRES BELOW" WARNING TAPE SHALL BE INSTALLED 12" ABOVE ALL POWER WIRING IN TRENCHES.

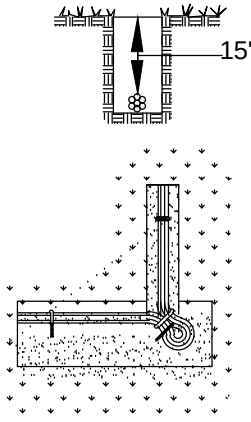
NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. NO TRENCH TO BE CLOSER THAN 18" TO CONCRETE SIDEWALK CURBS, ELECTRIC POLES, J-BOXES, ELECTRIC CABINETS, STREET SIGNALS, SIGNS, ETC.
3. WHEN MULTIPLE MAIN OR LATERAL LINES RUN IN THE SAME TRENCH MAINTAIN 3" HORIZONTAL CLEARANCE BETWEEN PIPES.
4. DETAIL APPLIES WHEN A 2" OR LARGER MAINLINE IS IN A SEPARATE TRENCH.

WIRE LEGEND

RED-CONTROLLER
BLUE-MASTER VALVE
BLACK/ORANGE-FLOW METER
WHITE-COMMON
GREEN-EXTRA

CONTROL WIRING NOT IN MAINLINE TRENCH



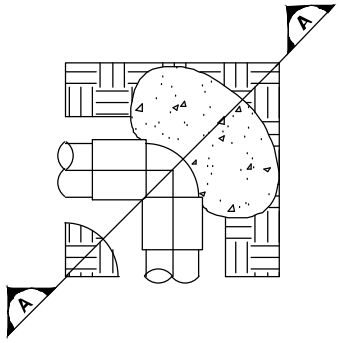
NOTE:

TIE A LOOSE 20" LOOP IN ALL WIRING AT CHANGES OF DIRECTION GREATER THAN 30°. UNTIE ALL LOOPS AFTER ALL CONNECTIONS HAVE BEEN MADE.

DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	TYPICAL TRENCHING	DETAIL NO.
G-3620-12				G-3620-12

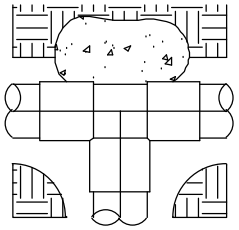
NOTES:

1. MINIMUM THRUST BLOCK AREAS ARE BASED ON A SOIL BEARING CAPACITY OF 3000 LBS/SF
2. THRUST BLOCK SHALL EXTEND INTO UNDISTURBED SOIL.
3. THRUST BLOCK SHALL BE MAG SECT. 725-CLASS C.
4. MAINLINE PIPING 4" AND LARGER SHALL HAVE MEGA/LUG JOINT RESTRAINTS INSTALLED AT ALL FLOW DIRECTION CHANGES (CONCRETE THRUST BLOCK NOT REQUIRED IF BELL END HARNESS JOINT RESTRAINTS ARE INSTALLED PER MAG 303-1 AND 303-2).



90° ELL

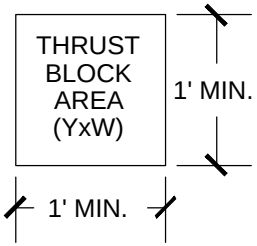
SCALE: NTS

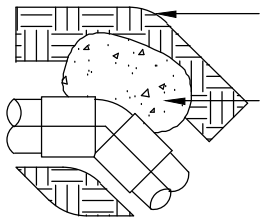


TEE

SCALE: NTS

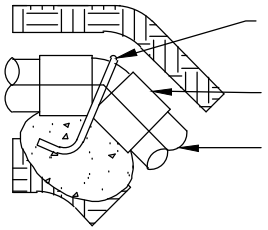
MINUMUM THRUST BLOCK AREA (YxW)		
PIPE SIZE	IRRIGATION PIPE	
	TEE, DEAD END 90°BEND	45°,22.5°
3"	2 SF	1 SF
4"	2 SF	1 SF
5" & LARGER	2 SF	1.5 SF
	PER MAG DETAIL 380	PER MAG DETAIL 380





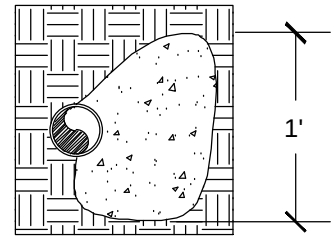
45° ELL

SCALE: NTS



45° ELL (VERTICAL)

SCALE: NTS

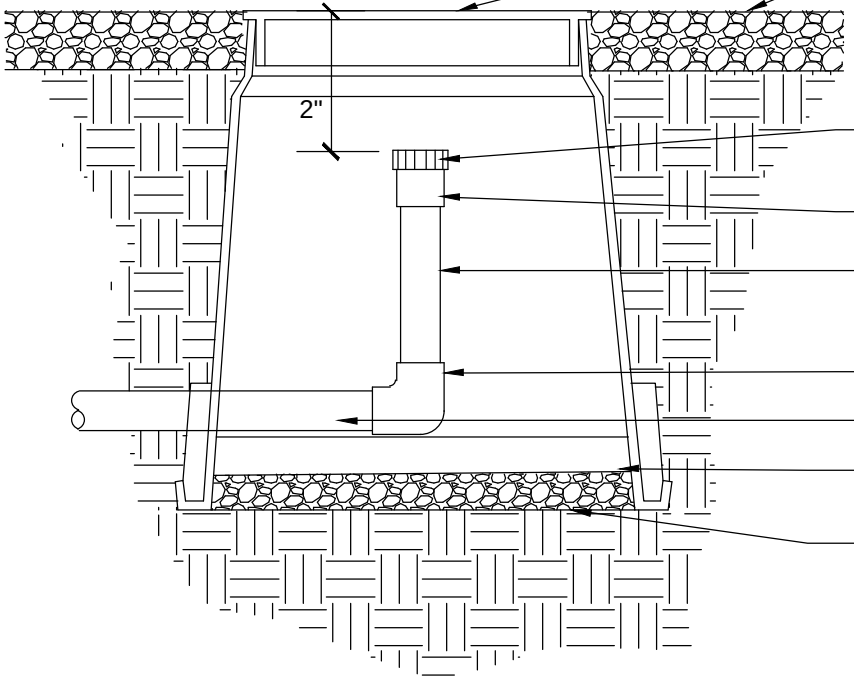


SECTION A-A

DETAIL NO.				DETAIL NO.
G-3620-13	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	THRUST BLOCK	G-3620-13

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.



VALVE BOX

FINISHED GRADE SET FLUSH TO ADJACENT GRADE

FLUSH CAP WITH HOSE THREADED CAP AND WASHER

SCH 40 SLIP 3/4" MHT ADAPTER

DRIP LATERAL PIPE

SCH 40 PVC ELL (SXS)

DRIP LATERAL PIPE

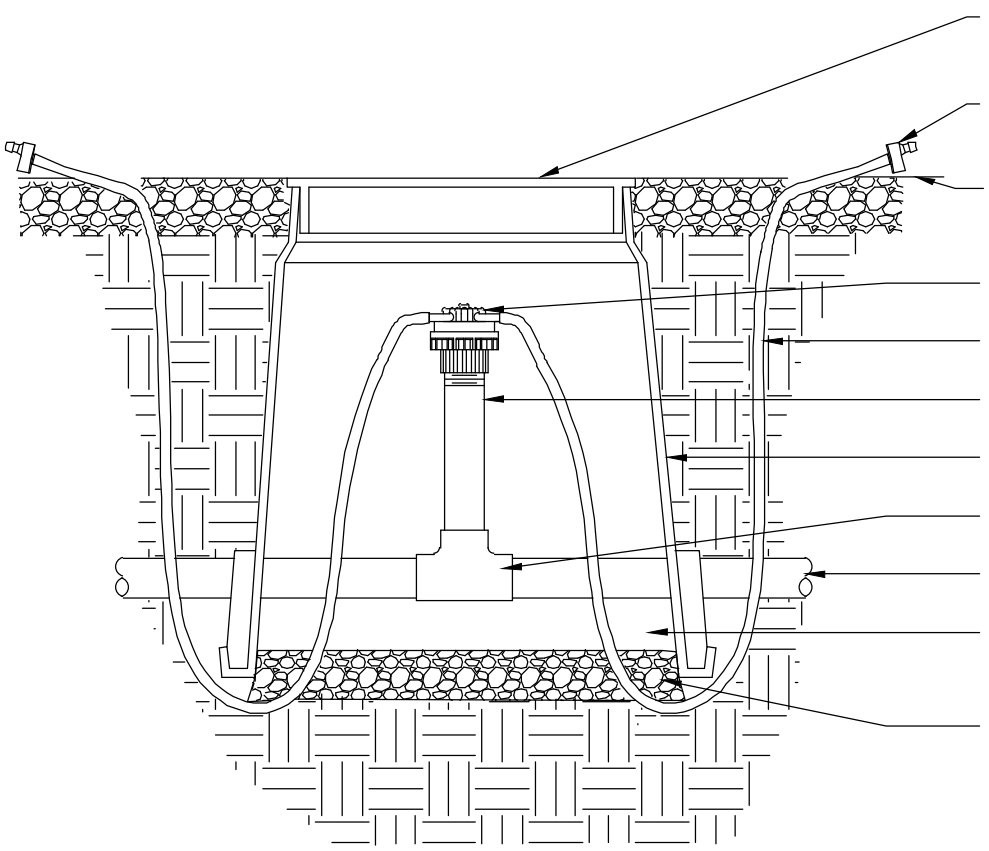
MIN 1" SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL

PEA GRAVEL THICKNESS SHALL BE TWICE THE DISTANCE BETWEEN BOTTOM OF PIPE AND TOP OF GRAVEL

DETAIL NO. G-3620-14	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	FLUSH CAP ASSEMBLY	DETAIL NO. G-3620-14

NOTES:

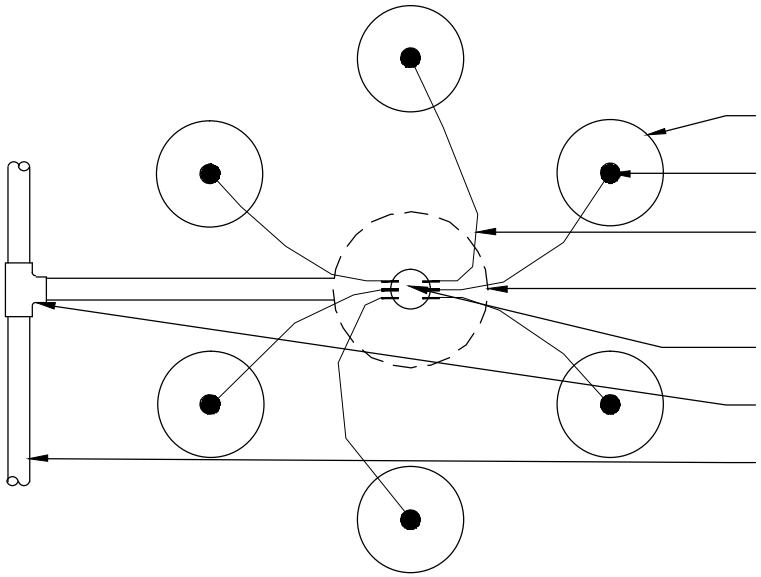
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.
2. EMITTER TUBE OUTLET SHALL BE LOCATED DIRECTLY OVER ROOT BALL FOR PLANTS.
3. EMITTER TUBE OUTLET FOR CACTI ACCENTS SHALL NOT BE PLACED DIRECTLY ON ROOT BALL BUT 4" TO 6" AWAY.
4. NUMBER OF EMITTER TUBES REQUIRED PER PLANT IS BASED ON PLANT SIZE. SEE EMITTER SCHEDULE.
5. ONE 6-ORIFICE MANIFOLD PER TREE. THE EMITTERS ARE PLACED EVENLY AROUND TREE PER CITY OF GOODYEAR STANDARD DETAIL G-3620-18. MANIFOLD PLACEMENT TO BE APPROVED BY CITY OF GOODYEAR REPRESENTATIVE.
6. MANIFOLD OUTLETS NOT USED SHALL BE PLUGGED TO THE SATISFACTION OF THE CITY OF GOODYEAR REPRESENTATIVE.
7. TREE MANIFOLD EMITTER VALVE BOX SHALL BE 5' MIN. FROM TREE TRUNK AND 12" FROM PAVEMENT EDGE.
8. EMISSION POINTS SHALL BE LOCATED UPHILL OF PLANT CENTERLINE AND SHALL DELIVER WATER DIRECTLY TO ROOT BALL (TYP.).



DETAIL NO. G-3620-15	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	EMMITTER MANIFOLD	DETAIL NO. G-3620-15

NOTES

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS .
2. EMITTER OUTLETS SHALL BE LOCATED TO DIRECT WATER FLOW TO MIDDLE OF ROOTBALL.
3. PROVIDE SPECIFIED NUMBER OF OUTLETS PER EMITTER SCHEDULE AND PLANT TYPE.
4. MAXIMUM EMITTER TUBING LENGTH 12' LOCATE EMITTERS UPHILL OF PLANT CENTER.



PLANT ROOTBALL

EMITTER 1" ABOVE FINISHED GRADE

DISTRIBUTION TUBING

7" VALVE BOX

6 OUTLET EMITTER MANIFOLD PLACEMENT TO BE APPROVED BY CITY OF GOODYEAR REPRESENTATIVE

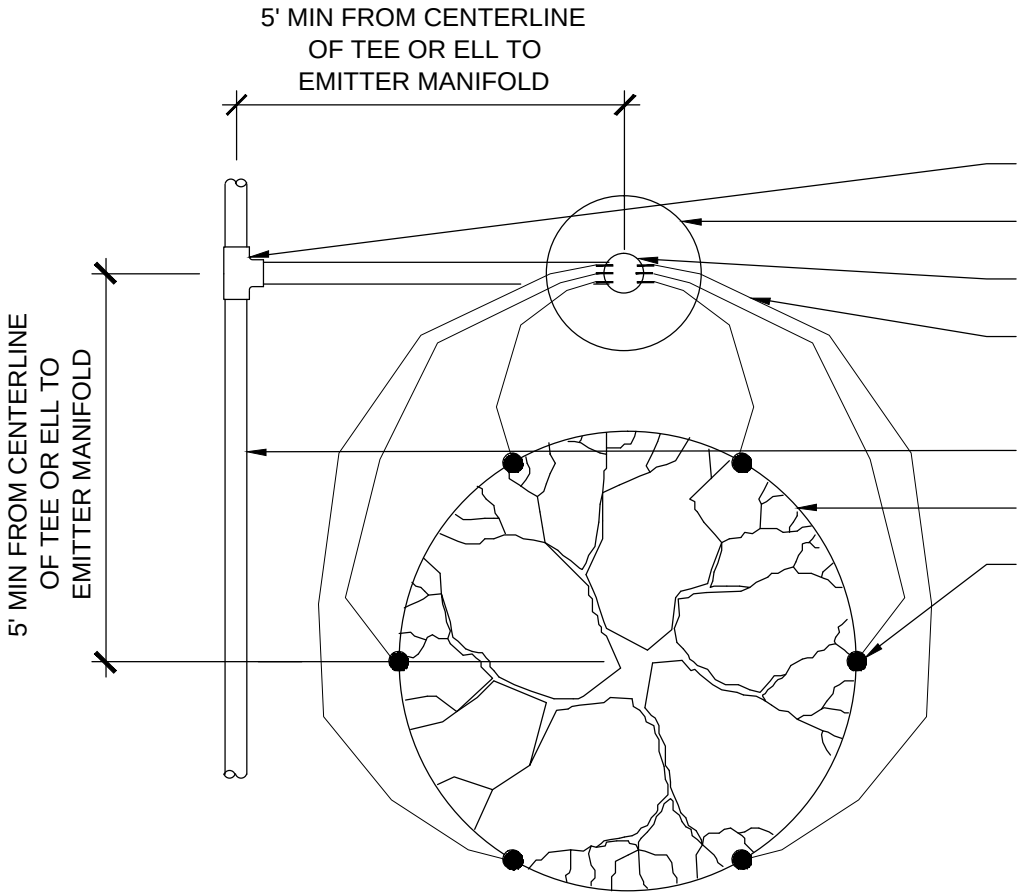
SCH 40 TEE OR ELL

DRIP LATERAL

DETAIL NO. G-3620-16	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	EMMISSION POINT - SHRUB AND GROUNDCOVER	DETAIL NO. G-3620-16

NOTES:

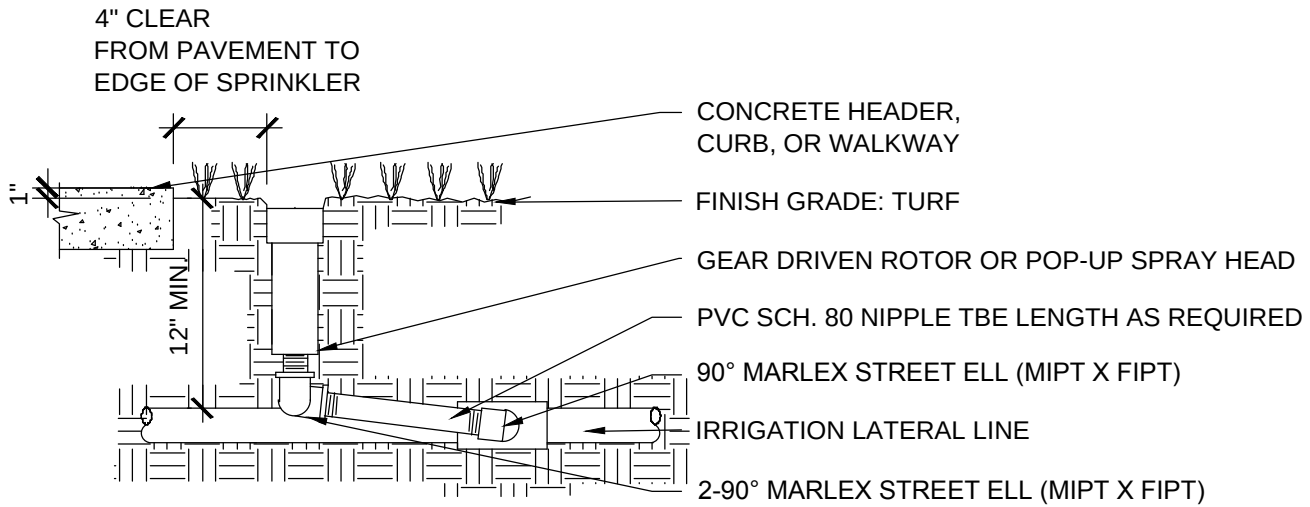
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS .
2. EMITTER OUTLETS SHALL BE EQUALLY SPACED, AND LOCATED TO DIRECT WATER FLOW TO PERIMETER OF DRIP LINE AS WELL AS ROOT BALL.
3. PROVIDE SPECIFIED NUMBER OF OUTLETS PER EMITTER SCHEDULE AND TREE TYPE.
4. MAXIMUM EMITTER TUBING LENGTH 12' LOCATE EMITTERS UPHILL OF PLANT CENTER.



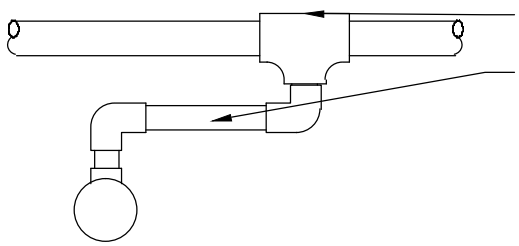
DETAIL NO.	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	EMISSION POINT - TREE	DETAIL NO.
G-3620-17				G-3620-17

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SHALL ONLY USE MATERIALS FROM THE LATEST EDITION OF THE CITY OF GOODYEAR APPROVED MATERIALS LIST FOR PARKS AND RIGHT OF WAYS.



SIDE VIEW



TOP VIEW

DETAIL NO. G-3620-18	CITY OF GOODYEAR STANDARD DETAIL	APPROVED:08/17	POP UP SPRAY HEAD WITH SWING JOINT	DETAIL NO. G-3620-18