

# CITY OF STREETSBORO

## CONSTRUCTION STANDARDS

### INDEX OF SHEETS:

COVER SHEET	GT-1
GENERAL SPECIFICATIONS	GN-1
PAVEMENT SPECIFICATIONS	PV-1
TYPICAL ROADWAY SECTION	PV-2
TYPICAL INDUSTRIAL & COMMERCIAL ROADWAY SECTION	PV-3
PAVEMENT REPAIR DETAILS	PR-1-PR-2
TRENCH REPAIR DETAILS	TR-1-TR-2
DRIVEWAY DETAILS	DV-1
DRIVE APRONS, SIDEWALK, AND CURB RAMP DETAILS	SW-1-SW-3
STORM WATER DETAILS	ST-1-ST-4
MANHOLE RECONSTRUCTION DETAILS	MH-1
SERVICE AND LATERAL CONNECTION DETAILS	SC-1
WATER MAIN DETAILS	WM-1-WM-6
TRACER WIRE NOTES	TW-1
WATER MAIN TRACER WIRE DETAILS	TW-2
UNDERGROUND PUBLIC UTILITY CONSTRUCTION	PO-1
FIBER CONDUIT DETAILS	FO-1
MISCELLANEOUS DETAILS	GM-1

1. SPECIFICATIONS

- A. ALL CONSTRUCTION OF ANY PROJECT SHALL BE IN CONFORMANCE WITH CITY OF STREETSBORO'S CODIFIED ORDINANCES AND THE OHIO REVISED CODE.
  - B. NO PERSON, FIRM OR CORPORATION SHALL COMMENCE ANY WORK WITHOUT FIRST FILING ALL PROPER PERMITTING AND DEPOSITING OF ANY BONDS PER THE CITY OF STREETSBORO CODE. CONTRACTOR MUST OBTAIN THE PROPER PERMITS & BONDS FOR ALL WORK PERFORMED IN/ON THE PUBLIC RIGHT-OF-WAY WITH NO EXCEPTIONS. THIS PROCEDURE IS REQUIRED SO THAT THE PROPER INSPECTIONS WILL BE MADE.
  - C. THE CONSTRUCTION OF ANY PROJECT SHALL BE GOVERNED BY CURRENT CITY OF STREETSBORO STANDARDS AND SPECIFICATIONS, ALONG WITH CONFORMING TO THE LATEST EDITION OF THE STATE OF OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA), AND THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS (ODOT CMS) AND SUPPLEMENTAL SPECIFICATIONS, UNLESS OTHERWISE NOTED. THE CITY OF STREETSBORO ENGINEER OR DIRECTOR OF PUBLIC SERVICE SHALL RESOLVE ALL ITEMS NOT CLEARLY COVERED.
  - D. THE CONSTRUCTION OF ALL WATERLINES, SANITARY SEWER, AND APPURTENANCES SHALL BE GOVERNED BY THE CURRENT CITY OF STREETSBORO CITY DEVELOPMENT STANDARDS, THE AMERICAN WATERWORKS ASSOCIATION (AWWA) STANDARD SPECIFICATIONS, PORTAGE COUNTY WATER RESOURCES (PCWR) AND OHIO EPA (OEPA) UNLESS OTHERWISE NOTED.
2. ALL CONTRACTORS PERFORMING WORK MUST ABIDE BY ALL GENERAL NOTES THAT APPLY OF THE CITY STANDARDS
3. WHEN THESE SPECIFICATIONS ARE USED FOR SUBDIVISION WORK, THE CITY OF STREETSBORO ENGINEER IN APPROVING THESE PLANS, DOES NOT IN ANY WAY RELIEVE THE DEVELOPER'S ENGINEER OF THE RESPONSIBILITY FOR ACCURATE AND COMPLETE ENGINEERING DESIGN RELATIVE TO THE PLANS AND THE PRESENT AND FUTURE ENVIRONMENTAL IMPACT ON SURROUNDING PROPERTIES.
4. THE CITY OF STREETSBORO SHALL NOT BE HELD LIABLE FOR DAMAGES OF ANY TYPE WHICH MAY OCCUR AS A RESULT OF ERRORS AND/OR OMISSIONS OF THE ENGINEERING DATA PRESENTED BY THE DEVELOPER'S ENGINEER, NEITHER SHALL THEY BE LIABLE FOR DAMAGES RESULTING FROM THE DEVELOPER'S CONTRACTOR, NOT COMPLYING WITH APPROVED PLANS NOR BY USING CONSTRUCTION METHODS OR MATERIALS NOT APPROVED BY THE CITY OF STREETSBORO.
5. THE DEVELOPER'S ENGINEER CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE AND THROUGH INTENSIVE RESEARCH, ALL UTILITIES WITHIN THE RIGHT-OF-WAY AND EASEMENTS INVOLVED IN THE IMPROVEMENT HAVE BEEN LOCATED AND SHOWN ON THE PLANS.
6. PRECONSTRUCTION MEETING: A PRECONSTRUCTION MEETING WITH THE DEVELOPER, CONTRACTOR, REPRESENTATIVES OF ALL UTILITY COMPANIES, THE CITY OF STREETSBORO SERVICE DEPARTMENT(S), PORTAGE SOIL & WATER, AND CITY ENGINEER IS REQUIRED FOR THIS PROJECT TO START ANY CONSTRUCTION ACTIVITY.
7. PROJECT SAFETY: THE CONTRACTOR SHALL ALWAYS MAINTAIN A SAFE WORKING ENVIRONMENT AT THE PROJECT SITE. THE CONTRACTOR SHALL PROPERLY SUPPORT, MAINTAIN AND COMPLY WITH ALL OSHA REGULATIONS. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THE SAFETY OF THE GENERAL PUBLIC AS WELL AS ALL CONSTRUCTION PERSONNEL. PUBLIC STREETS SHALL BE KEPT CLEAN AND FREE OF DEBRIS (MUD, STONE, ETC.) OF THE NATURE OF THE PROPOSED PROJECT PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY. ACCESS FOR EMERGENCY VEHICLES SHALL ALWAYS BE MAINTAINED.
8. PROJECT LIABILITY: CONTRACTOR SHALL ASSUME THE ENTIRE RESPONSIBILITY AND LIABILITY FOR ALL DAMAGES OR INJURIES OF ANY KIND OR NATURE WHATSOEVER TO ALL PERSONS, WHETHER ITS EMPLOYEES OR OTHERWISE, AND TO ALL PROPERTY GROWING OUT OF OR RESULTING FROM THE EXECUTION OF THE WORK PROVIDED FOR IN THIS CONTRACT OR OCCURRING IN CONNECTION THEREWITH. CONTRACTOR AGREES TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY OF STREETSBORO, ITS AGENTS, EMPLOYEES, AND INSURERS FROM AND AGAINST ANY AND ALL LOSSES AND EXPENSES, INCLUDING COURT COSTS AND ATTORNEY'S FEES, DAMAGES OR INJURIES GROWING OUT OF OR RESULTING FROM OR OCCURRING IN CONNECTION WITH THE EXECUTION OF THE WORK HEREIN PROVIDED FOR; PROVIDE, HOWEVER, THAT CONTRACTOR WILL NOT BE HELD LIABLE FOR LOSS OF LIFE OR INJURY OR DAMAGE TO PERSON OR PROPERTY DUE TO THE SOLE NEGLIGENCE OF THE CITY, ITS AGENTS, OR ITS EMPLOYEES. IF ANY DAMAGE IS DONE TO THE PROPERTY OF OTHERS BY CONTRACTOR, ITS EMPLOYEES, OR AGENTS DURING THE TERM OF THIS CONTRACT, CONTRACTOR WILL REPAIR AND RESTORE AT ITS SOLE COST ANY SUCH PROPERTY AND CORRECT ANY DAMAGES INFLICTED THERETO, RETURNING IT TO AS GOOD A CONDITION AS THE PROPERTY WAS IN BEFORE BEING DAMAGED, IN A MANNER SATISFACTORY TO THE OWNER(S) OF THE PROPERTY FOR THE DAMAGE SUFFERED.
9. UTILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT ALL THE VARIOUS UTILITY COMPANIES (PUBLIC AND PRIVATE) TO VERIFY THE EXISTENCES, LIMITS AND OR LOCATION OF ANY UTILITIES WHICH MAY BE ALONG THE ROUTE OR WITHIN THE VICINITY OF THE WORK OR PROJECT. THE CONTRACTOR MUST CONTACT OHIO UTILITIES PROTECTION SERVICES TO HAVE UTILITIES MARKED BEFORE THE START OF THE PROJECT - CALL 811.
10. ALL EXISTING CONDITIONS WITHIN THE RIGHT-OF-WAY AND EASEMENTS DISTURBED BY THE CONSTRUCTION OF THIS PROJECT SHALL BE IMMEDIATELY RESTORED TO THE PRE-CONSTRUCTION CONDITION OR BETTER, AS DIRECTED BY THE CITY OF STREETSBORO CITY ENGINEER OR ITS AUTHORIZED REPRESENTATIVE.
11. NO SANITARY SEWER OR WATER MAIN CONSTRUCTION SHALL BE PERMITTED UNTIL THE PLANS ARE APPROVED BY OEPA AND SANITARY SEWERS ARE REVIEWED BY PORTAGE COUNTY WATER RESOURCES, INCLUDING PAYMENT OF REVIEW AND "PERMIT TO INSTALL" FEES AS REQUIRED.
12. ALL WORK AND MATERIAL MUST BE INSPECTED AND APPROVED BY THE CITY OF STREETSBORO ENGINEER OR AUTHORIZED REPRESENTATIVE. CONTRACTOR SHALL NOTIFY THE CITY OF STREETSBORO CITY ENGINEER @ 330-626-4942 (MON-FRI 8:00 AM - 4:00 PM, EXCLUDING HOLIDAYS) FORTY-EIGHT (48) HOURS BEFORE STARTING ANY CONSTRUCTION.
13. TEMPORARY STORM WATER POLLUTION, SOIL EROSION AND SILTATION CONTROL SHALL BE REQUIRED (ODOT CMS) AS DIRECTED BY THE CITY OF STREETSBORO ENGINEER AND THE PORTAGE SOIL AND WATER CONSERVATION DISTRICT. ALL REQUIRED PERMITS SHALL BE OBTAINED BY THE CONTRACTOR PRIOR TO STARTING CONSTRUCTION.
14. WHERE NECESSARY TO DISTURB PAVEMENTS OR DRIVES, THE PAVEMENT SHALL BE FULL DEPTH SAW CUT IN NEAT, STRAIGHT LINES.
15. ALL ROUGH GRADING, WITHIN SIX (6) INCHES OF FINISHED GRADE, SHALL BE COMPLETED WITHIN THE RIGHT-OF-WAY PRIOR TO TRENCH EXCAVATION.
16. CONTRACTOR SHALL SEED, MULCH AND FERTILIZE ALL DISTURBED AREAS WITHIN THE ROAD RIGHT OF WAY FROM BACK OF CURB TO 10 FEET INSIDE THE PROPERTY LINE (ODOT CMS), USING FOUR (4) INCHES OF TOPSOIL. EROSION CONTROL MATTING SHALL BE PLACED IN AREAS WHERE GRASS COVER CANNOT BE ESTABLISHED DUE TO STEEP SLOPES.
17. FOR ALL CONDUIT WITHIN THE RIGHT-OF-WAY, COMPACTED PREMIUM BACKFILL, ODOT ITEM 304, CMS, IS REQUIRED FOR UNDERGROUND CONSTRUCTION. GRAVEL, CRUSHED AGGREGATE, AND STEEL SLAG SHALL NOT BE USED. THE METHOD OF BACKFILLING SHALL CONFORM TO BACKFILLING FOR CONDUIT, AS SPECIFIED PER ODOT ITEM 611 OR AS DIRECTED BY THE CITY OF STREETSBORO ENGINEER. LOW STRENGTH MORTAR (LSM) OR CONTROL DENSITY FILL (CDF) SHALL BE USED FOR BACKFILL WHERE A TRENCH IS WITHIN EXISTING PAVEMENT. THE CITY OF STREETSBORO WILL SPECIFY WHICH OF THE TWO SHALL BE USED.
18. NO OPEN TRENCHES WILL BE PERMITTED OVERNIGHT. FENCES AND STEEL PLATING MAY BE REQUIRED AT THE DISCRETION OF THE CITY TO PROTECT PEDESTRIAN TRAFFIC.
19. ACCESS TO ALL DRIVES SHALL BE MAINTAINED UNLESS IT IS DETERMINED AND AGREED TO BY THE CITY THAT THERE IS NO FEASIBLE MEANS OF PROVIDING ACCESS. IT WILL BE REQUIRED THAT EACH AFFECTED PROPERTY OWNER BE GIVEN AT LEAST TWENTY-FOUR (24) HOUR NOTICE BEFORE CLOSING THE DRIVE.
20. ACCESS TO ALL MAILBOXES SHALL BE MAINTAINED DURING CONSTRUCTION. IF ACCESS TO MAILBOXES WILL NOT BE FEASIBLE THEN ALTERNATE MAILBOXES SHALL BE PROVIDED BY CONTRACTOR WITH CLEARLY MARKED HOUSE NUMBERS FOR EACH MAILBOX.
21. THE CONTRACTOR SHALL CAREFULLY PRESERVE BENCH MARKS, PROPERTY CORNERS, REFERENCE POINTS, AND CONSTRUCTION STAKES AND, IN CASE OF DESTRUCTION, SHALL BE CHARGED WITH THE RESULTING EXPENSE OF REPLACEMENT AND SHALL BE RESPONSIBLE FOR ANY MISTAKES THAT MAY BE CAUSED BY THEIR UNNECESSARY LOSS OR DISTURBANCE.
22. SHOULD THE CONTRACTOR HAVE ANY QUESTIONS AS TO THE INTENT OF THESE PLANS AND SPECIFICATIONS, HE SHALL IMMEDIATELY BRING IT TO THE ATTENTION OF THE CITY OF STREETSBORO CITY ENGINEER, WHO SHALL RESPOND IN A TIMELY MANNER. ANY CHANGE IN THE PROPOSED IMPROVEMENTS MUST BE APPROVED BY THE CITY OF STREETSBORO.
23. TRAFFIC CONTROL SHALL BE MAINTAINED AS PER THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. THE CONTRACTOR SHALL UTILIZE STANDARD TRAFFIC CONTROL DEVICES AS SHOWN IN THE MANUAL FOR ONE LANE ROAD CLOSURES, STATIONARY OPERATIONS ON THE SHOULDER AND OPERATIONS BEYOND THE SHOULDER. PROPER SAFETY LIGHTING AND REFLECTORS SHALL BE USED AS NECESSARY FOR OVERNIGHT CLOSURES OR WARNING DEVICES. CONTRACTOR MUST SUBMIT A MAINTENANCE OF TRAFFIC PLAN FOR APPROVAL IN ADVANCE OF CONSTRUCTION START.
24. ANY DAMAGE CAUSED TO THE PAVEMENT, DRIVES, DRAINAGE SYSTEMS, UNDERGROUND OR OVERHEAD UTILITIES, PIPELINES OR LANDSCAPING, EITHER WITHIN THE RIGHT-OF-WAY OR ON ADJACENT PROPERTIES, SHALL BE FULLY RESTORED PROMPTLY BY THE CONTRACTOR WITH ALL RELATED COSTS BEING THE FULL RESPONSIBILITY OF THE CONTRACTOR.
25. ALL EMBANKMENTS SHALL BE CONSTRUCTED IN COMPLIANCE WITH ODOT ITEM 203. ALL TOPSOIL SHALL BE STRIPPED PRIOR TO PLACEMENT OF ANY EMBANKMENT MATERIAL.
26. ADJUSTMENTS TO VALVE BOXES, MANHOLES, HYDRANTS, MONUMENT BOXES, ETC. SHALL BE MADE BY THE CONTRACTOR AS REQUIRED TO COMPLETE THIS WORK. THIS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM NECESSITATING THE ADJUSTMENT.
27. THE CONTRACTOR IS RESPONSIBLE FOR ORDERLY JOB SITE CONDITIONS THROUGHOUT THE DURATION OF THE JOB. THE CONTRACTOR SHALL KEEP ALL EXISTING PAVEMENTS CLEAR OF MUD, GRAVEL, GREASE AND OILS. CONTRACTOR WILL BE CHARGED AT THE CURRENT RATE PER HOUR FOR A MINIMUM OF 2 HOURS DURING NORMAL WORKING HOURS AND 4 HOURS MINIMUM FOR ANY HOURS AFTER 4:00 PM BY THE CITY OF STREETSBORO FOR A STREET SWEEPER AND OPERATOR IF SITE DOES NOT REMAIN CLEAN AT THE END OF THE WORK DAY.
28. THE CONTRACTOR/DEVELOPER WILL BE CHARGED FOR A FULL-TIME PROJECT REPRESENTATIVE FOR INSPECTION PURPOSES AT AN HOURLY RATE PER CURRENT LABOR CONTRACT. CONTRACTOR WILL AUTOMATICALLY BE CHARGED FOR AN 8-HOUR WORKDAY FOR SATURDAY, SUNDAY, OR ANY LEGAL HOLIDAYS PLUS ANY HOURS WORKED BEYOND THE EIGHT (8) HOURS.
29. THE CITY OF STREETSBORO MAY HIRE AN ADDITIONAL INSPECTOR OR INDEPENDENT TESTING LABORATORY TO PROVIDE ADDITIONAL INSPECTION AND/OR TESTING SERVICES. THIS EXPENSE WILL BE CHARGED TO THE DEVELOPER AND/OR CONTRACTOR.
30. IN AREAS OF EXCAVATION IN EXCESS OF 2 FEET, NUCLEAR COMPACTION TESTS SHALL BE PERFORMED BY AN APPROVED TESTING COMPANY. THESE TESTS SHALL BE APPROVED BY THE CITY OF STREETSBORO PRIOR TO ANY PAVING OPERATIONS. THE COST OF THE TESTING SHALL BE INCLUDED WITH THE UNIT PRICE FOR EXCAVATION AND PAID FOR BY THE CONTRACTOR.
31. CLEARANCE: SEWERS SHALL BE AT LEAST TEN (10) FEET HORIZONTALLY FROM EXISTING OR PROPOSED WATER MAIN. SEWERS CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN (18) INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER. CONTRACTOR SHALL USE SDR 23 WHEN CLEARANCES CANNOT BE MET INSIDE THE 10' RULE. AT ALL STORM SEWER MAIN AND SANITARY MAIN INTERSECTIONS, HAVING LESS THAN EIGHTEEN (18) INCH VERTICAL SEPARATION, ENCASE THE LOWER AND MONOLITHICALLY CRADLE THE UPPER PIPE IN 2500 PSI CONCRETE FOR THE WIDTH OF THE TRENCH. AT ALL STORM OR SANITARY MAIN INTERSECTIONS (CROSSINGS) LESS THAN 18", THE UPPER PIPE SHALL BE BRIDGED OVER THE LOWER PIPE BY CONSTRUCTION OF CEMENT OR HARDWOOD SUPPORTS UNDER THE UPPER PIPE ON EACH SIDE OF LOWER PIPE.
32. WHEN UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, WORK SHALL BE DISCONTINUED UNTIL THE AREA IS STABILIZED TO THE SATISFACTION OF THE CITY ENGINEER. ALL CONDUIT SHALL BE INSTALLED ON A FIRM BED FOR THE FULL LENGTH OF PIPE.



PAVEMENT

1. GENERAL

- 1a. ALL CONSTRUCTION OF ANY PROJECT SHALL BE IN CONFORMANCE WITH CITY OF STREETSBORO'S CODIFIED ORDINANCE AND LATEST EDITION OF THE ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS UNLESS OTHERWISE SPECIFIED.
- 1b. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING PAVEMENT SYSTEM RESULTING FROM NEGLIGENCE OR NON-CONFORMANCE WITH APPROVED PLANS. ANY PAVEMENT DISTURBED OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED WITH SAME MATERIAL (CONCRETE WITH CONCRETE). SEE SPECIFICATIONS FOR DESCRIPTIONS OF SPECIFIC PAVEMENT TYPES.
- 1c. NO PERSON, FIRM, CORPORATION OR CONTRACTOR SHALL COMMENCE ANY WORK IN/ON THE PUBLIC RIGHT-OF-WAY WITHOUT FIRST FILING ALL PROPER PERMITS AND BONDS PER THE CITY OF STREETSBORO CODE.
- 1d. THE CONTRACTOR SHALL FIELD VERIFY ANY AND ALL UTILITIES THE LOCATION AND IS RESPONSIBLE FOR CONTACTING OUPS (OHIO UTILITY PROTECTION SERVICES) PRIOR TO ANY EXCAVATION OR SURVEYING
- 1e. ALL CONTRACTORS PERFORMING WORK ON CITY STREETS MUST ABIDE BY ALL GENERAL NOTES THAT APPLY OF THE CITY DEVELOPMENT STANDARDS AND/OR OTHER CITIES POLICIES AND PRACTICES DEEMED TO BE RELEVANT AND ACCEPTABLE BY THE CITY ENGINEER.
- 1f. PRIOR TO ACCEPTANCE BY THE CITY OF STREETSBORO ENGINEER, THE SUB GRADE IN ALL AREAS TO BE PAVED SHALL BE PROPERLY PREPARED AND PROOF ROLLED PER ODOT CMS.
- 1g. PERFORM PAVEMENT REPAIR PER CURRENT ODOT PAVEMENT REPAIR STANDARDS AS DIRECTED BY CITY OF STREETSBORO ENGINEER OR CITY'S REPRESENTATIVE.
- 1h. THE PAVING CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL MONUMENT BOX ASSEMBLIES. SETTING OF ALL MONUMENT BOXES SHALL BE PERFORMED UNDER THE SUPERVISION OF A REGISTERED SURVEYOR.
- 1i. PAVING CONTRACTORS SHALL BE RESPONSIBLE FOR ADJUSTING MANHOLE, INLET, AND VALVE BOX ASSEMBLIES TO FINAL PAVEMENT ELEVATION. ADJUST MANHOLES TO GRADE PER DETAIL SHOWN ON SHEET MH-1.
- 1j. ASPHALT TESTING: A MINIMUM OF TWO ASPHALT SAMPLES MUST BE TAKEN FOR EACH ROAD THAT IS RESURFACED. ONE SAMPLE MUST INCLUDE INTERMEDIATE COURSE, AND ANOTHER SAMPLE MUST BE USED ON TOP COURSE. ANY ROAD OR LOCATION THAT EXCEEDS 700 TONS MUST RECEIVE ADDITIONAL TEST(S). THE TEST MUST BE COMPLETED BY A CERTIFIED COMPANY. EACH SAMPLE MUST HAVE THE ADDRESS, DATE, TEMPERATURE, AND WEATHER CONDITIONS OF THE TIME OF WHEN THE SAMPLE WAS COMPLETED. TESTING MUST INCLUDE A COPY OF THE MIX DESIGN. THE ASPHALT MUST MEET THE REQUIREMENTS OF THE SUBMITTED AND APPROVED JMF. ADDITIONALLY NOT LESS THAN SIXTY PERCENT (60%) BY WEIGHT OF CRUSHED GRAVEL SHALL CONSIST OF PIECES HAVING TWO OR MORE FACES BEING FRESHLY FRACTURED.

1k. FULL DEPTH REPAIRS: STANDARD FOR PAVEMENT REPAIR WILL BE 8-INCH DEPTH OF EXCAVATION. THIS CAN BE ACCOMPLISHED BY USE OF AN EXCAVATING MACHINE OR A PAVEMENT MILLING MACHINE. THIS ITEM CONSISTS OF THE EXCAVATION AND DISPOSAL OF ALL MATERIALS WITHIN THE REPAIR AREA. INSTALL 8 INCHES OF 301 BITUMINOUS AGGREGATE BASE ASPHALT COMPACTED IN PROPER LIFTS AND AC THE EDGES OF THE REPAIR AREA. ALL AREAS WILL BE DETERMINED AND APPROVED BY THE CITY OF STREETSBORO AT THE TIME OF CONSTRUCTION.

1l. ELIMINATING DRIVEWAYS: ANYTIME THERE IS A NEW LOCATION OF DRIVEWAY INSTALLED, EXISTING APRON LOCATION MUST BE RESTORED. THIS INCLUDES CURBING, SIDEWALK, AND LAWN RESTORATION.

1m. CURBING: CURBING SHALL BE REPLACED MATCHING THE EXISTING TO BE REPLACED OR REPAIRED AS SPECIFIED.

1n. COLD WEATHER PAVING: ASPHALT PAVEMENT SHALL ONLY BE PLACED PER ODOT CMS SECTION 401.06 UNLESS EXPLICIT APPROVAL BY THE CITY HAS BEEN GIVEN IN WRITING. ANY PAVEMENT PLACED OUTSIDE OF THESE REQUIREMENTS SHALL BE REMOVED AND REPLACED AT NO ADDITIONAL COST TO THE PROJECT.

2. COLD-WEATHER CONCRETE PAVING

CONCRETE PAVEMENTS MAY BE PLACED DURING COLD WEATHER FOR SUBDIVISIONS IN THE CITY OF STREETSBORO IF THE FOLLOWING RULES ARE STRICTLY ADHERED TO.

2a. APPROPRIATE EQUIPMENT SHALL BE AVAILABLE FOR HEATING THE CONCRETE MATERIALS, FOR CONSTRUCTING ENCLOSURE, AND FOR MAINTAINING FAVORABLE TEMPERATURES AFTER CONCRETE IS PLACED.

2b. THE AMBIENT AIR TEMPERATURE MUST BE AT LEAST 40°F. THIS MAY BE ACHIEVED BY HEATING THE AGGREGATE AND/OR THE WATER.

2c. THE SUB GRADE MUST BE ENTIRELY FREE FROM FROST PRIOR TO PAVING. CONCRETE PLACING SHOULD BE DELAYED UNTIL THE GROUND THAWS AND WARMS UP SUFFICIENTLY TO ENSURE THAT IT WILL NOT FREEZE AGAIN DURING THE CURING PERIOD.

2d. THE CONCRETE, WHEN PLACED, MUST BE BETWEEN 50°F AND 80°F. THIS MAY BE ACHIEVED BY HEATING THE AGGREGATE AND/OR THE WATER.

2e. WATER-REPELLENT INSULATION IN AN AMOUNT SUFFICIENT TO COVER AND PROTECT TO MAINTAIN A MINIMUM 55°F CONCRETE TEMPERATURE FOR THE PLANNED PAVING MUST BE PRESENT ON THE JOB SITE BEFORE ANY CONCRETE MAY BE PLACED. THIS MATERIAL MUST BE PLACED ON THE CONCRETE TOP AND EDGES.

2f. NO CONCRETE SHALL BE MIXED, PLACED OR FINISHED AFTER DARK UNLESS AN ADEQUATE AND APPROVED ARTIFICIAL LIGHTING SYSTEM IS OPERATED.

2g. CALCIUM CHLORIDE, IF ADDED TO THE MIX, MUST BE NO MORE THAN TWO PERCENT (2%) OF THE MIX.

2h. A QUARTER-DEPTH (1/4) TOOLED CONTRACTION JOINT MUST BE FORMED BEFORE COVERING THE CONCRETE AT A MAXIMUM SPACING OF SIX (6) FEET. THIS IS TO BE SPACED TO CORRESPOND TO A LOCATION OF A PLANNED SAWED CONTRACTION JOINT, SO THAT WHEN THE REMAINING CONTRACTION JOINTS ARE SAWED THIS FORMED JOINT IS ALSO SAWED FOR A UNIFORM APPEARANCE.

2i. THE CONCRETE MUST BE MAINTAINED AT A TEMPERATURE OF AT LEAST 55°F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE CONCRETE FROM FREEZING UNTIL BEAMS ATTAIN A STRENGTH OF 600 POUNDS PER SQUARE INCH.

2j. THE TEST BEAMS MUST BE CURED ON THE JOBSITE UNDER IDENTICAL CURBING PROCEDURES AS THE PAVEMENT.

2k. THE NEW CONCRETE MUST BE PROTECTED FROM ROAD SALT FOR ONE MONTH TO PREVENT SCALING OF THE SURFACE BY METHOD APPROVED BY CITY ENGINEER.

2l. THE MAINTENANCE BOND WILL BE HELD UNTIL AT LEAST THE SECOND APRIL 1ST FOLLOWING PLACEMENT OF THE CONCRETE, OR LATER DEPENDING ON WHEN THE REMAINDER OF THE PERFORMANCE IS COMPLETED.

2m. THE CITY MAY HIRE AN ADDITIONAL INSPECTOR TO PROVIDE ADDITIONAL TESTING SERVICES. THIS EXPENSE WILL BE CHARGED TO THE DEVELOPER AND/OR CONTRACTOR.

2n. IN THE EVENT THAT THE PRECEDING SPECIFICATIONS ARE NOT FOLLOWED, THE CITY OF STREETSBORO AND/OR ITS REPRESENTATIVE RESERVE THE RIGHT TO SHUT DOWN CONSTRUCTION OPERATIONS AT NO ADDITIONAL COST TO THE CITY. THESE SPECIFICATIONS ARE IN ADDITION TO THE CURRENT ODOT C&MS SPECIFICATIONS.

3. CONCRETE

3a. THE CONTRACTOR SHALL SUBMIT A MIX DESIGN FORMULA FOR ALL CONCRETE BEING USED IN THE PROJECT FOR APPROVAL BY THE CITY OF STREETSBORO ENGINEER.

3b. ALL CONCRETE INSTALLED IN ROADWAYS OR DRIVE APRONS SHALL BE MODERATE SETTING (MS) CONCRETE.

3c. NEW CONCRETE MUST BE PROTECTED FROM ROAD SALT FOR 60 DAYS TO PREVENT SCALING OF THE SURFACE.

3d. FOR ROADWAY PANEL REPLACEMENT THE CONTRACTOR MUST USE CURRENT ODOT ITEM FOR NON-REINFORCED PCC PAVEMENT AT A MINIMUM OF 8" THICK. INTEGRAL CURBS SHALL BE INCLUDED.

3e. THE ROADWAY PANEL REPLACEMENT WILL INCLUDE 4" THICK OF CURRENT ODOT ITEM 304 LIMESTONE AGGREGATE BASE OR AS APPROVED BY CITY ENGINEER.

3f. WHEN JOINING NEW CONCRETE WORK TO OLD CONCRETE WORK, PIN THE TWO SECTIONS TOGETHER DRILLING 5/8-INCH HOLES SIX INCHES DEEP INTO OLD CONCRETE. USING 5/8" HOOK BOLTS EVERY 30 INCHES ON CENTER LINE AND EVERY 12 INCHES AT THE CONTRACTION JOINTS. KEEP THE HOLES AT LEAST SIX INCHES IN FROM ANY EDGES, TO AVOID BREAKING CHIPS OUT OF THE OLD CONCRETE. FLUSH THE HOLES WITH WATER PRIOR TO INJECTING EPOXY INTO THE BACKS OF THE HOLES. USE ENOUGH EPOXY TO FILL THE HOLES APPROXIMATELY HALFWAY.

3g. NO CONCRETE SHALL BE MIXED, PLACED OR FINISHED AFTER DARK UNLESS AN ADEQUATE AND APPROVED ARTIFICIAL LIGHTING SYSTEM IS OPERATED.

3h. A QUARTER INCH DEPTH TOOLED CONSTRUCTION JOINT MUST BE FORMED BEFORE COVERING THE CONCRETE AT A MAXIMUM SPACING OF SIXTY (60) FEET. THIS IS TO BE SPACED TO CORRESPOND TO A LOCATION OF A PLANNED SAWED CONTRACTION JOINT, SO THAT WHEN THE REMAINING CONTRACTION JOINTS ARE SAWED, THIS FORMED JOINT IS ALSO SAWED FOR A UNIFORM APPEARANCE.

3i. THE MAINTENANCE BOND WILL BE HELD FOR A MINIMUM OF EIGHTEEN MONTHS FROM THE DATE OF SUBSTANTIAL COMPLETION.

3j. TWO CONCRETE CYLINDERS SHALL BE TAKEN FOR EACH 30 CY OF CONCRETE PLACED EACH DAY. SEVEN AND THIRTY DAY COMPRESSIVE STRENGTH TESTS SHALL BE PERFORMED ON THE CYLINDERS TO VERIFY THAT THE 28 DAY COMPRESSIVE STRENGTH IS AT LEAST 4000PSI. FOR PAVEMENTS UTILIZING FAST SET CONCRETE CLASS MS, FS OR HIGH EARLY, CONCRETE BEAM BREAKS SHALL BE MADE PRIOR TO OPENING THE PAVEMENT TO TRAFFIC TO VERIFY THE 600PSI FLEXURAL STRENGTH IS ATTAINED.

3k. THE CITY OF STREETSBORO IS NOT ACCOUNTABLE OR RESPONSIBLE FOR ANY LOSS INCLUDING TIME, MATERIALS, COSTS, OR CORRECTIONS REQUIRED AS A RESULT OF INSPECTIONS.

4. ASPHALT CONCRETE PAVEMENT TYPE 1

4a. THE CONTRACTOR SHALL SUBMIT A MIX DESIGN FORMULA FOR ALL ASPHALT CONCRETE BEING USED IN THE PROJECT FOR APPROVAL BY THE CITY OF STREETSBORO ENGINEER. CRUSHED AGGREGATE FOR ITEM SURFACE ASPHALT CONCRETE SHALL BE CRUSHED LIMESTONE OR CRUSHED GRAVEL AND SHALL HAVE A MINIMUM OF SIXTY (60) PERCENT BY WEIGHT OF FRACTURED PIECES. NO RAP WILL BE PERMITTED IN THE SURFACE COURSE, WILL BE INSTALLED 1 1/2" TO 2" THICK.

4b. THE CONTRACTOR SHALL PLACE A 6" ODOT ITEM 301 LAYER TO BE INSTALLED IN TWO (2) 3" LIFTS.

4c. USE CURRENT ODOT ITEM 251, 252, AND/OR 253 AS DIRECTED TO REPAIR DAMAGED PAVEMENT PRIOR TO RESURFACING. INCLUDED IN THIS ITEM IS THE REMOVAL OF PAVEMENT, SUBGRADE COMPACTION, INSTALLING BITUMINOUS AGGREGATE BASE AND AC EDGES OF THE REPAIR AREAS.

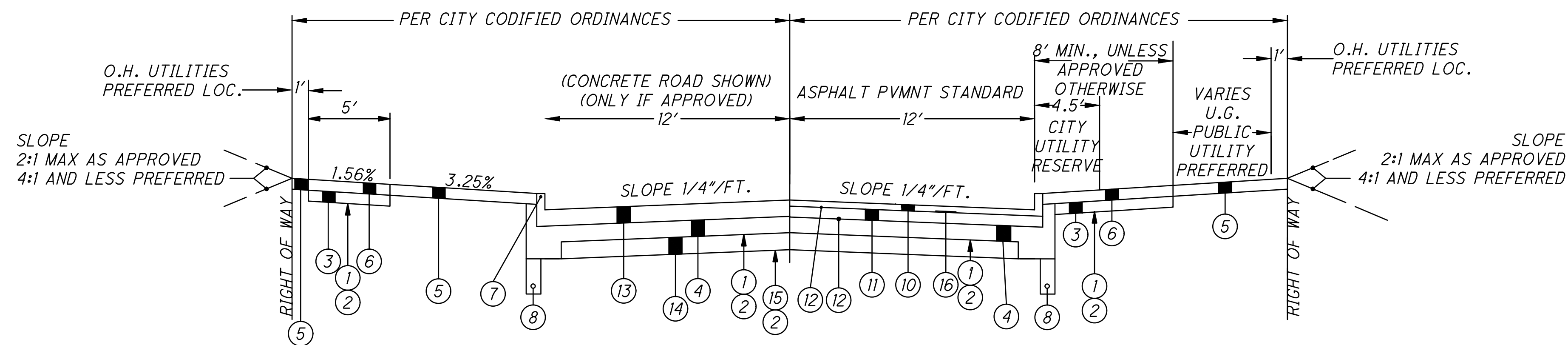
4d. USE CURRENT ODOT ITEM 254: THIS ITEM IS FOR PAVEMENT MILLING AND BUTT JOINT AT ALL INTERSECTIONS ROADS AS MARKED OUT BY THE CITY. BUTT JOINTS ARE TO PER ODOT STANDARDS.

4e. PLACE ODOT ITEM 407 TACKLESS TACK: IT IS THE CITY'S INTENTION TO SEAL COAT THE PAVEMENT ON THE ENTIRE ROADWAY BEFORE PLACING THE LEVELING COURSE.

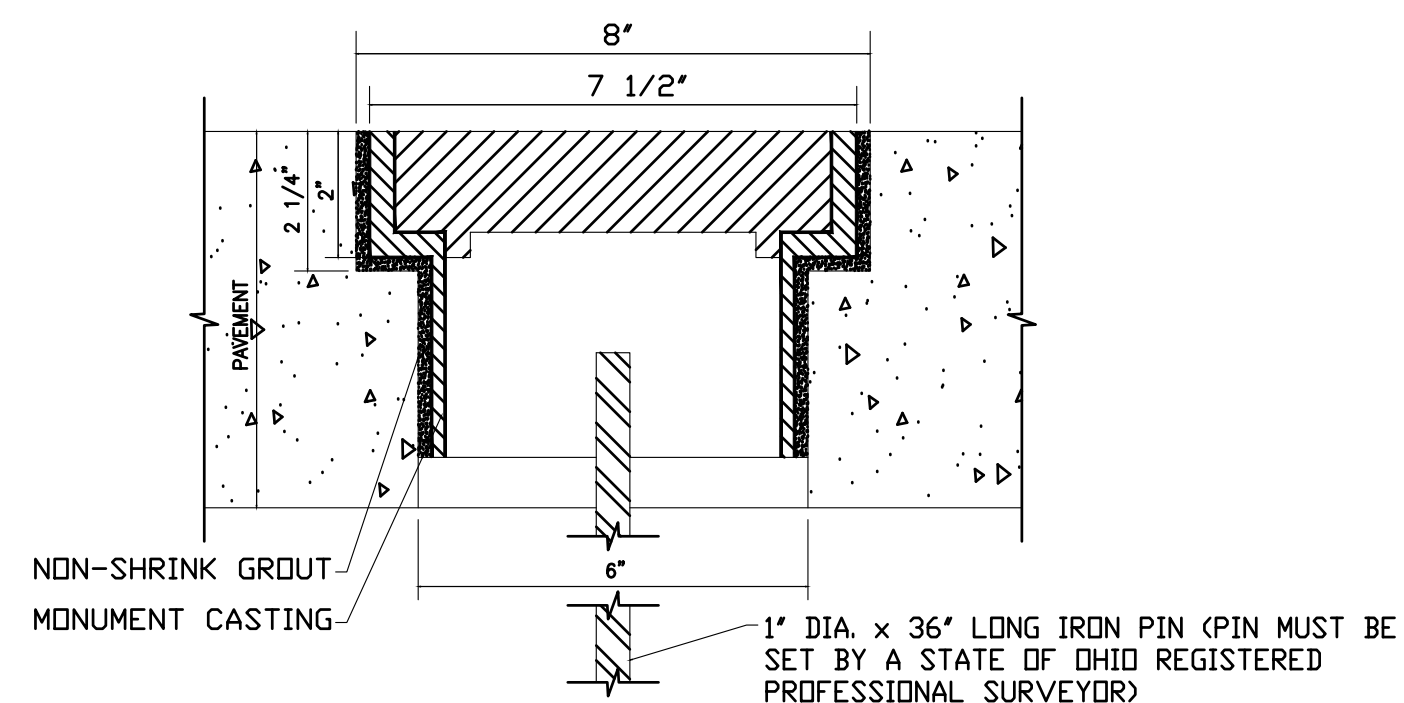
4f. ITEM 209 - PREPARING SHOULDER FOR SUBGRADE PAVING AND ITEM 617 - COMPACTED AGGREGATE AS DIRECTED BY THE CITY. THIS WORK CONSISTS OF PREPARING, FURNISHING, SHOULDER PLACEMENT AND COMPACTION ALONG THE EDGE OF PAVEMENT IMMEDIATELY AFTER THE MAIN LINE PAVING IS DONE.

4g. THE MAINTENANCE BOND WILL BE HELD FOR A MINIMUM OF EIGHTEEN MONTHS FROM THE DATE OF SUBSTANTIAL COMPLETION.

4h. THE CONTRACTOR SHALL INSTALL PAVEMENT MARKINGS PER ITEM 642 AS NEEDED.



- ① ODOT ITEM 203 - EXCAVATION & EMBANKMENT
- ② ODOT ITEM 204 - SUBGRADE COMPACTION
- ③ ODOT ITEM 304 - 4" AGGREGATE BASE
- ④ ODOT ITEM 304 - 6" AGGREGATE BASE  
NO FOUNDRY SAND, ACBFS, RECYCLED CONCRETE, GRANULATED SLAG, RECYCLED CONCRETE, OR OTHER SLAG PERMITTED IN ODOT 304 BASE
- ⑤ ODOT ITEM 659 - LAWNSTRIP; 4" TOPSOIL / SEED / MULCH  
CLASS 1 LAWN MIX
- ⑥ ODOT ITEM 608 - 4" CONCRETE WALK  
6" THICK - RESIDENTIAL DRIVE  
8" THICK - COMMERCIAL DRIVE  
ODOT 499 CLASS "QC" CONCRETE; SEE CURRENT CITY SPECS FOR CURB / WALK CONSTRUCTION.
- ⑦ ODOT ITEM 609 - INTEGRAL CURB - TYPE 2A
- ⑧ ODOT ITEM 605 - 6" UNCLASSIFIED PIPE UNDERDRAIN
- ⑨ CONTRACTION, EXPANSION, CONSTRUCTION JOINTS TO BE SEALED PER ODOT 609.04. JOINTS SHALL BE FILLED WITH ITEM 705.03, SILICONE SEALER
- ⑩ ODOT ITEM 441 - 1.5" ASPHALT CONC. SURFACE COURSE, TYPE 1, (448)  
CRUSHED LIMESTONE W/ MIN. 60% BY WEIGHT FRACTURED PIECES
- ⑪ ODOT ITEM 302 - 6" ASPHALT CONC. BASE (PLACED IN 2 - 3" LIFTS)
- ⑫ ODOT ITEM 407 - TACK COAT (.1 GAL/SY)
- ⑬ ODOT ITEM 452 - 8" PLAIN PORTLAND CEMENT CONC. PAVEMENT,  
ODOT 499 CLASS "QC" CONCRETE
- ⑭ ODOT ITEM 206 - CEMENT STABILIZATION OF THE SUBGRADE WILL BE REQUIRED WHERE THE SUBGRADE CBR VALUE IS LESS THAN 6. SUBGRADE COMPACTION AND PROOF ROLLING WITH ZERO DEFLECTION USING 50 TON LOADED TANDEM TRUCK WITH TICKET WILL PROVIDE DETERMINATION PER CITY ENGINEER.
- ⑮ ODOT ITEM 204 - PROOF ROLLING
- ⑯ ODOT ITEM 441 - 1.75" ASPHALT LEVELING COURSE, TYPE 2, (448) RECYCLED MIX AS APPROVED BY CITY ENGINEER



**NOTES:**

MONUMENT BOX CASTING SHALL BE E.J.I.W. #2960 WITH SPECIAL ORDER LID. ANNULAR SPACE BETWEEN CASTING AND PAVEMENT SHALL BE FILLED WITH NON-SHRINK GROUT PER D.D.O.T. 705.20.

FOR MONUMENT BOXES NOT WITHIN PAVEMENT, USE E.J.I.W. 8365 CASTING WITH 1" DIA. x 36' LONG IRON PIN.

**NOTES ON INSTALLATION:**

1. CORE BOTH OPENINGS IN PAVEMENT.
2. REMOVE DEBRIS AND PREPARE CONCRETE FOR GROUT PER MANUFACTURE'S INSTRUCTIONS.
3. COAT PAVEMENT OPENING AND EXTERIOR OF CASTING WITH GROUT.
4. INSTALL CASTING AND FINISH FLUSH WITH EXISTING PAVEMENT.

**NOTES:**

FOR ALL NEW STREET CONSTRUCTION AND IMPROVEMENT THE OWNER/DEVELOPER SHALL PROVIDE A TYPICAL SECTION PREPARED BY A PROFESSIONAL ENGINEER TO BE REVIEWED AND APPROVED BY THE CITY BASED ON A GEOTECHNICAL EVALUATION.

ODOT ITEM REFERENCES ARE PER THE LATEST CONSTRUCTION & MATERIAL SPECIFICATION (CMS). CROSS REFERENCE TO CURRENT CMS AT TIME OF CONSTRUCTION.

ALL CURB AND WALK CONSTRUCTION TO CONFORM TO CURRENT CITY OF STREETSBORO SPECIFICATIONS FOR THE CONSTRUCTION, REPAIR AND REPLACEMENT OF SIDEWALKS, CURBS AND DRIVEWAYS. REFER TO SW-1 & DV-1.

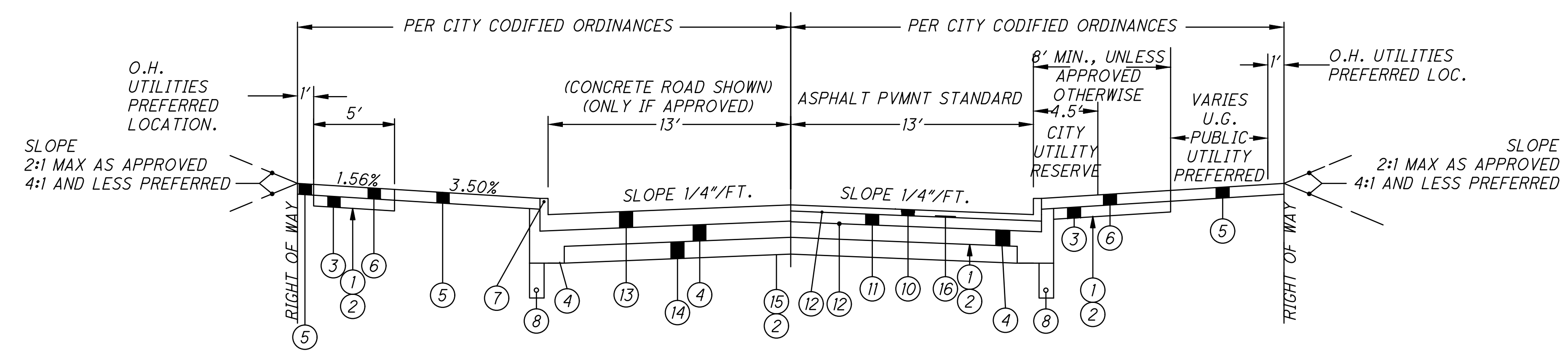
4.5' CITY UTILITY RESERVE IS FOR CITY SIGNAGE, U.G. UTILITIES, STREET LIGHTING ETC. NO OBSTRUCTIONS PERMITTED WITHIN 2' OF ROAD PAVEMENT.

U.G. PUBLIC UTILITIES TO BE PLACED IN THE CITY UTILITY RESERVE AS APPROVED AND PERMITTED BY CITY. WATER METER PITS TO BE LOCATED BEHIND WALK BUT INSIDE R/W.

**CORED/BOXLESS MONUMENT ASSEMBLY DETAIL  
FOR USE IN RIGID OR FLEXIBLE PAVEMENT)**

N.T.S.





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- ③ ODOT ITEM 304 - 4" AGGREGATE BASE
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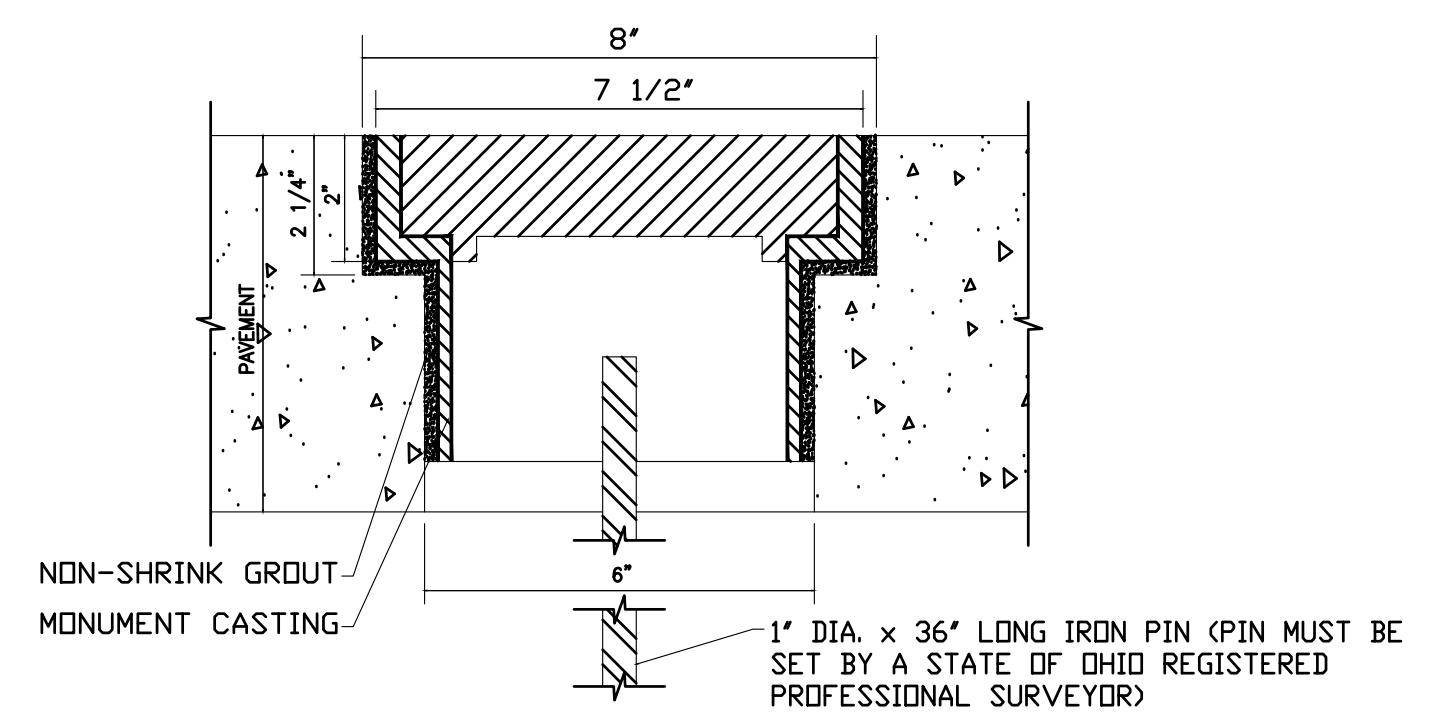
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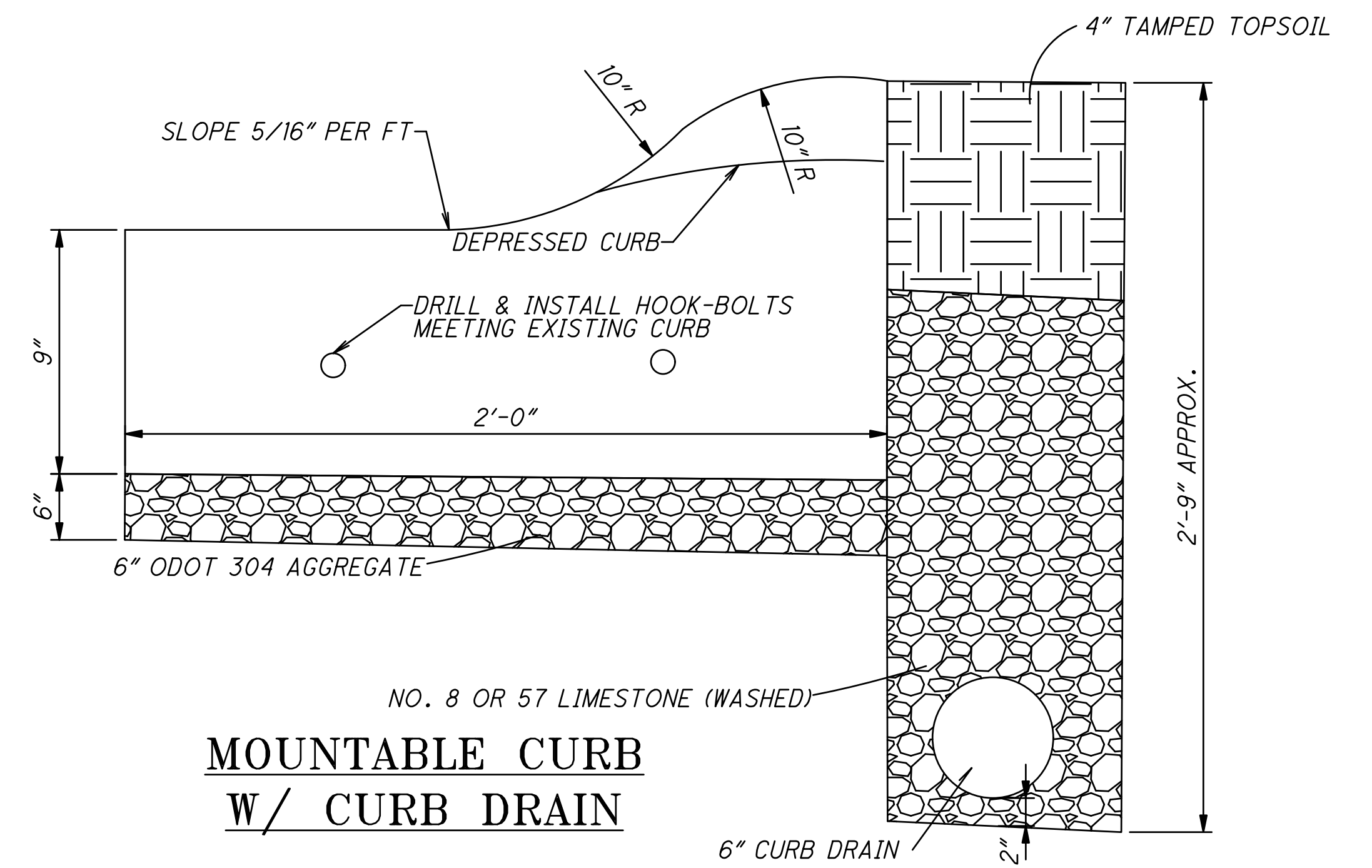
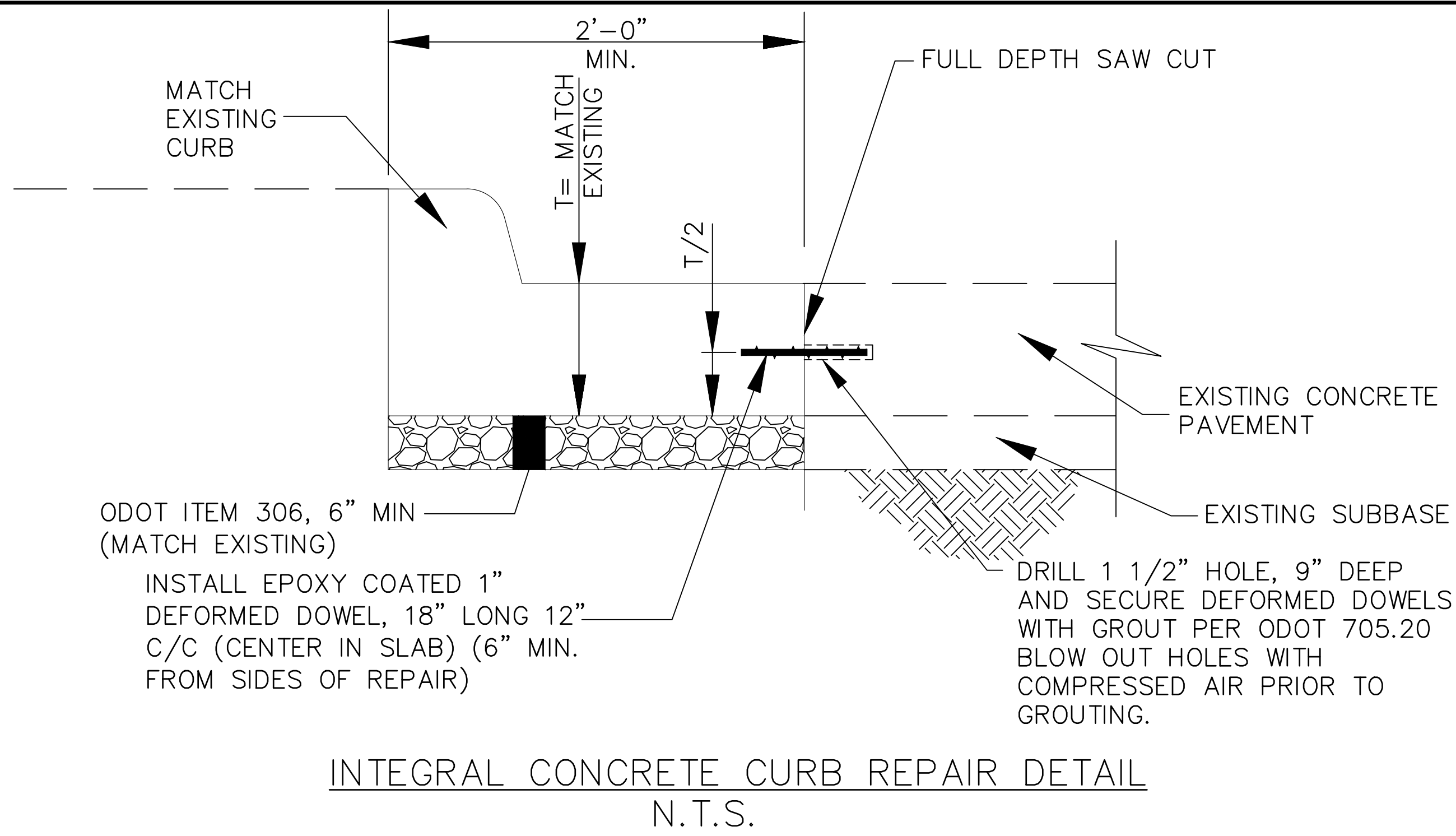
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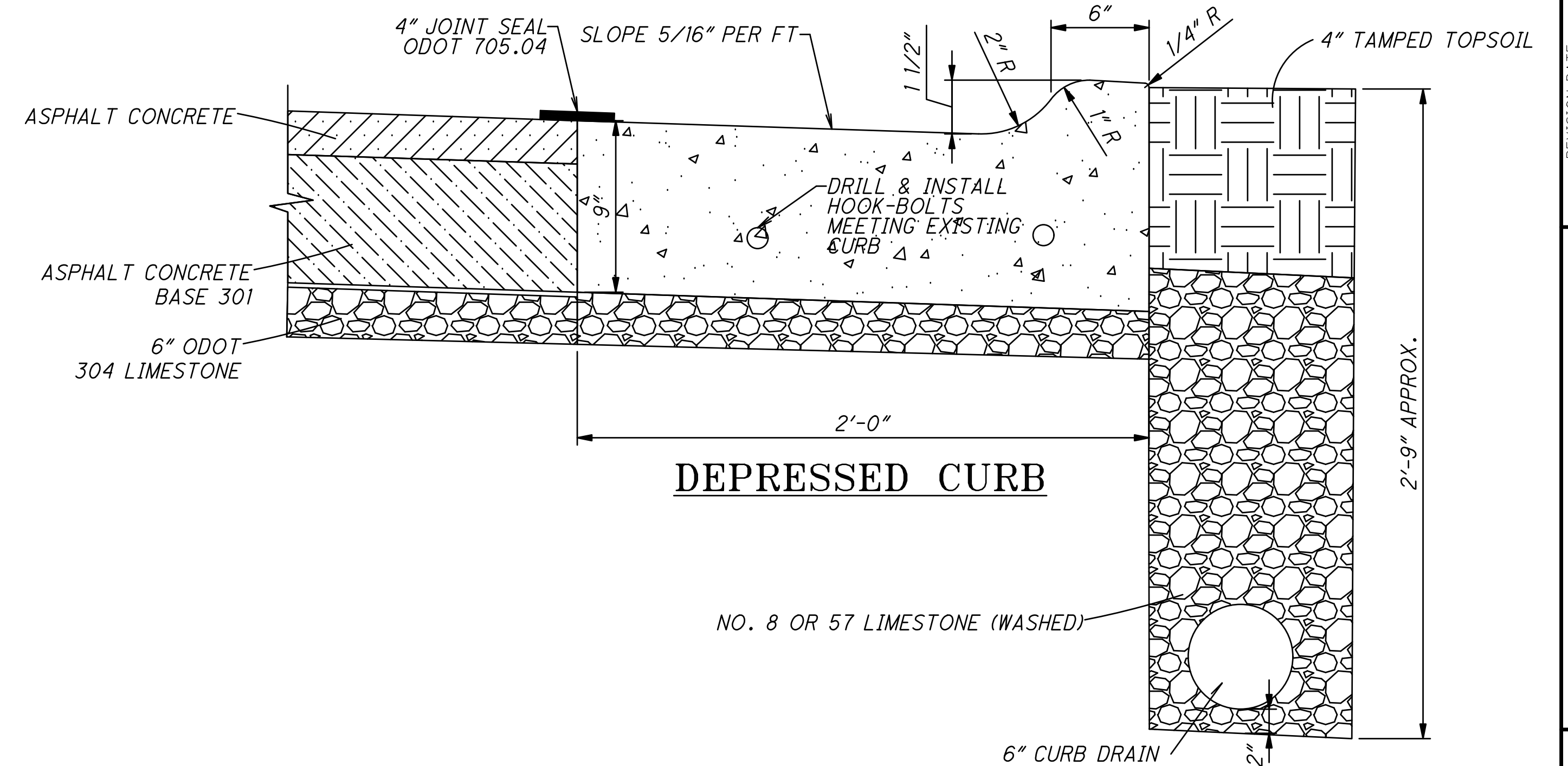
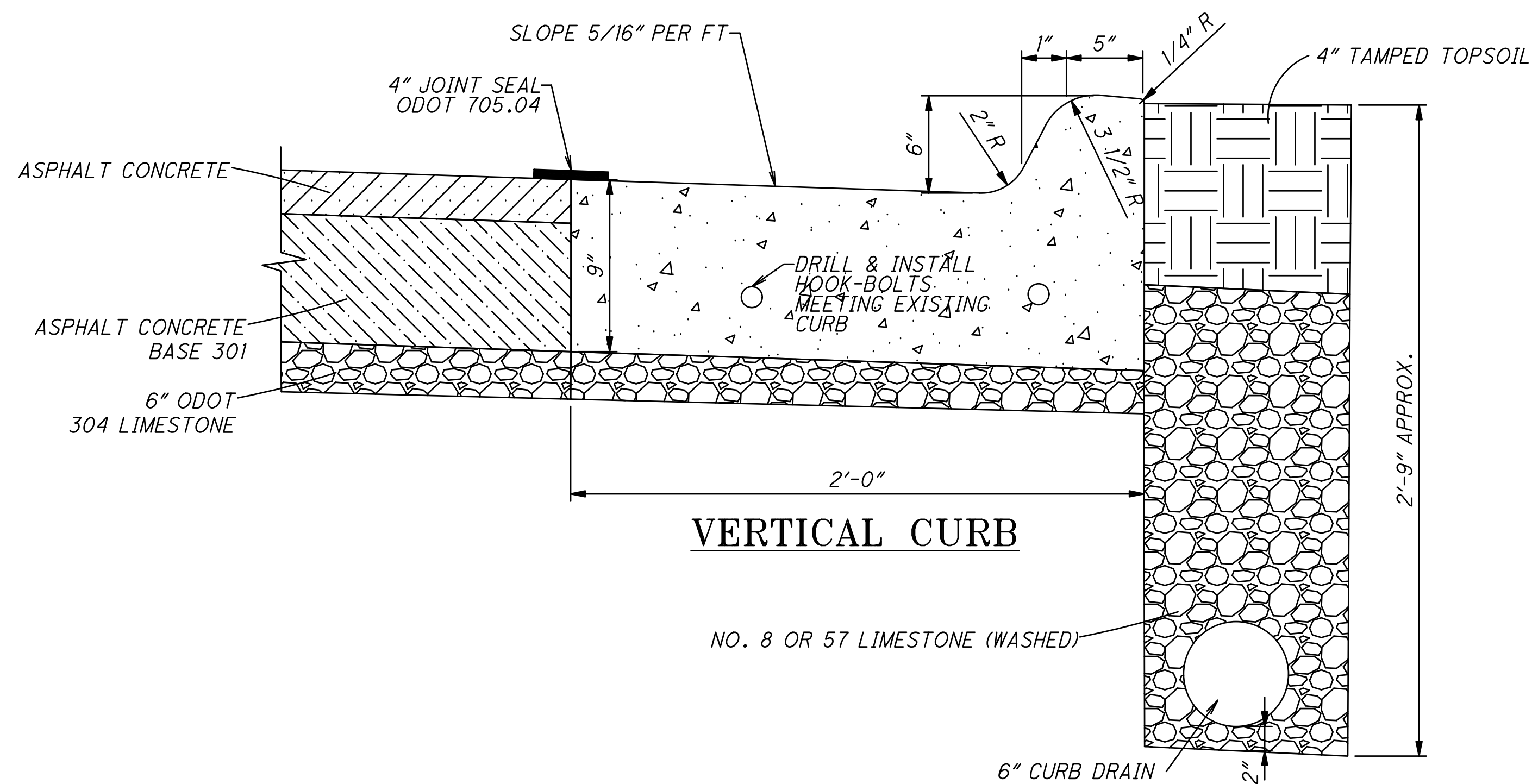
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- NOTES ON INSTALLATION:
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CORED/BOXLESS MONUMENT ASSEMBLY DETAIL  
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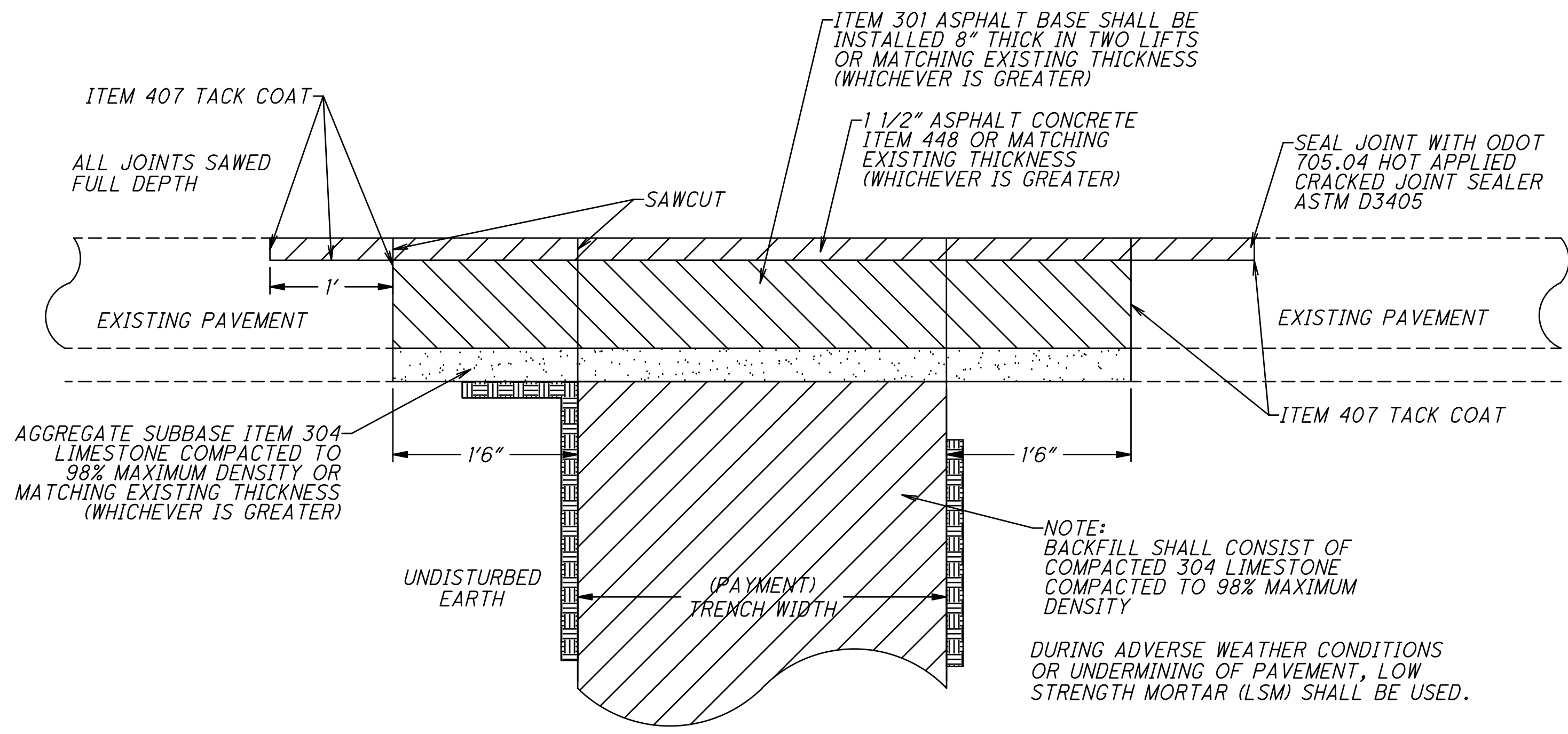


NOTE: CURB THICKNESS SHALL MATCH PAVEMENT THICKNESS.  
CONCRETE SHALL BE 4000PSI 6% AIR ENTRAINMENT

CONCRETE CURB REPAIRS SHALL BE PER ODOT REQUIREMENTS, ITEM 106. TWO 1" DOWEL BARS, GREASED AND CAPPED SHALL BE USED.

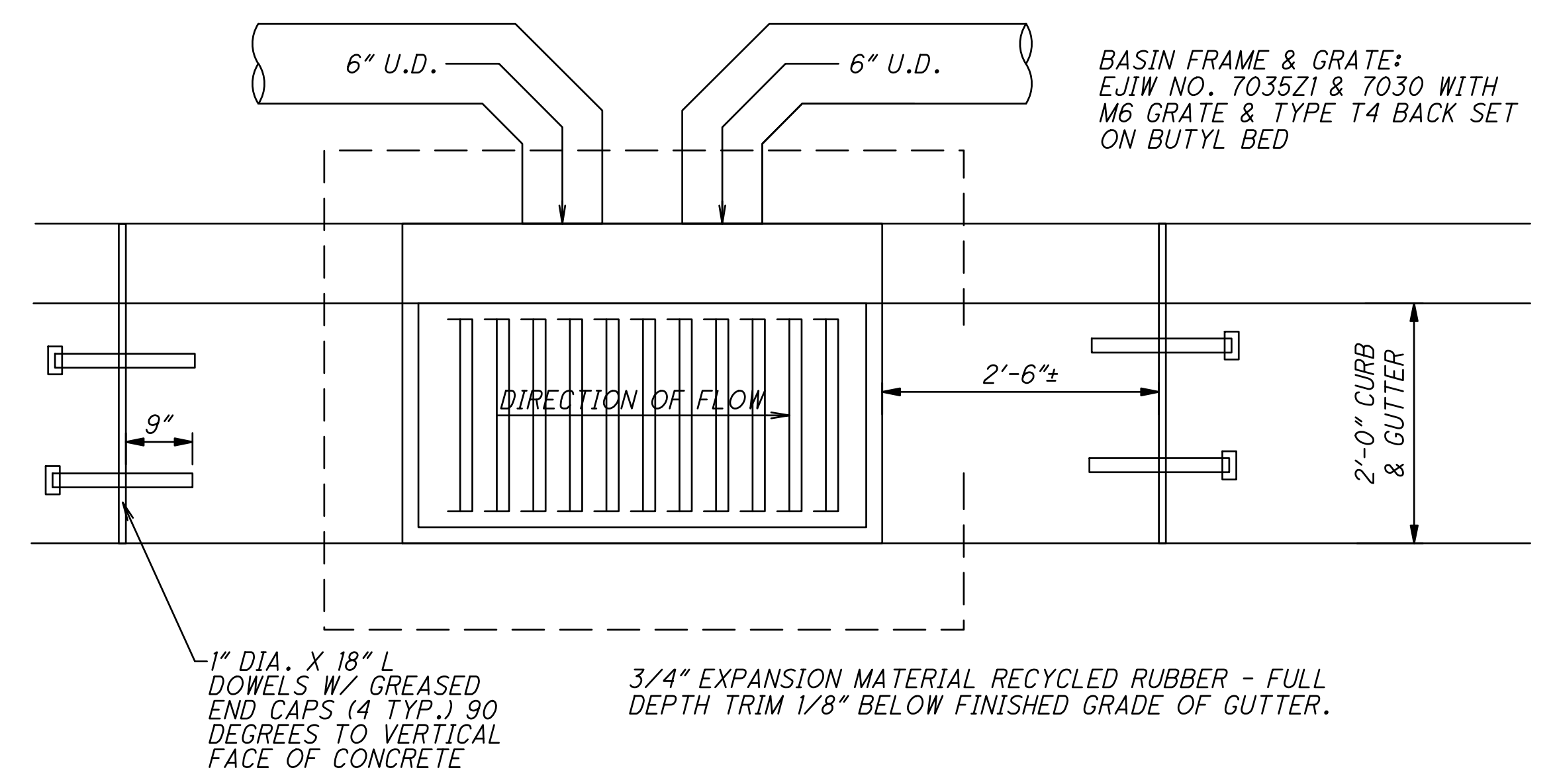






NOTE:  
IF EXISTING MATERIAL IS SUPERIOR TO MINIMUM REPLACEMENT REQUIREMENTS - MATCH EXISTING MATERIALS

NOTE:  
BACKFILL SHALL CONSIST OF COMPACTED 304 LIMESTONE COMPACTED TO 98% MAXIMUM DENSITY  
DURING ADVERSE WEATHER CONDITIONS OR UNDERMINING OF PAVEMENT, LOW STRENGTH MORTAR (LSM) SHALL BE USED.



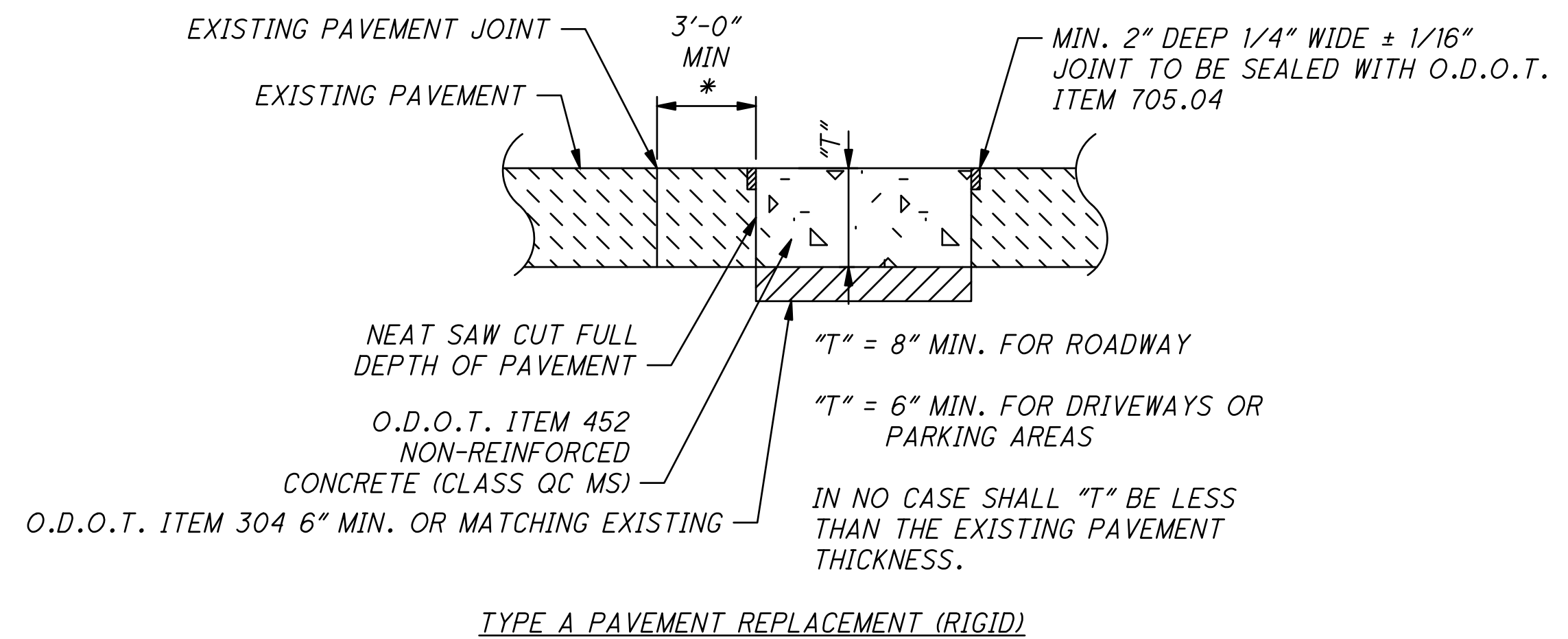
1" DIA. X 18" L DOWELS W/ GREASED END CAPS (4 TYP.) 90 DEGREES TO VERTICAL FACE OF CONCRETE

3/4" EXPANSION MATERIAL RECYCLED RUBBER - FULL DEPTH TRIM 1/8" BELOW FINISHED GRADE OF GUTTER.

NOTE:  
TWO HOLES FOR UNDERDRAIN SHALL BE IN BACK OF BASIN AND CORED ALL THE WAY THROUGH AT THE TIME OF PRECAST MANUFACTURE. NO KNOCK-OUTS PERMITTED. THE UNDERDRAIN SHALL BE CONNECTED TO THE BASIN WITH THE USE OF 2 - 45 DEGREE BENDS. THE VOIDS SHALL BE SEALED WITH NON-SHRINK MORTAR ON THE INSIDE & OUTSIDE OF STRUCTURE.

NOTES:

- EXISTING SUBBASE MATERIAL (IF ANY) SHALL BE REPLACED, AS DIRECTED BY ENGINEER.
- REPLACEMENT SHALL BE REINFORCED AS PER O.D.O.T ITEM 709.10 OR 709.12 IF EXISTING PAVEMENT IS REINFORCED.
- 5/8"φ HOOKBOLT @ 30" O.C. MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.



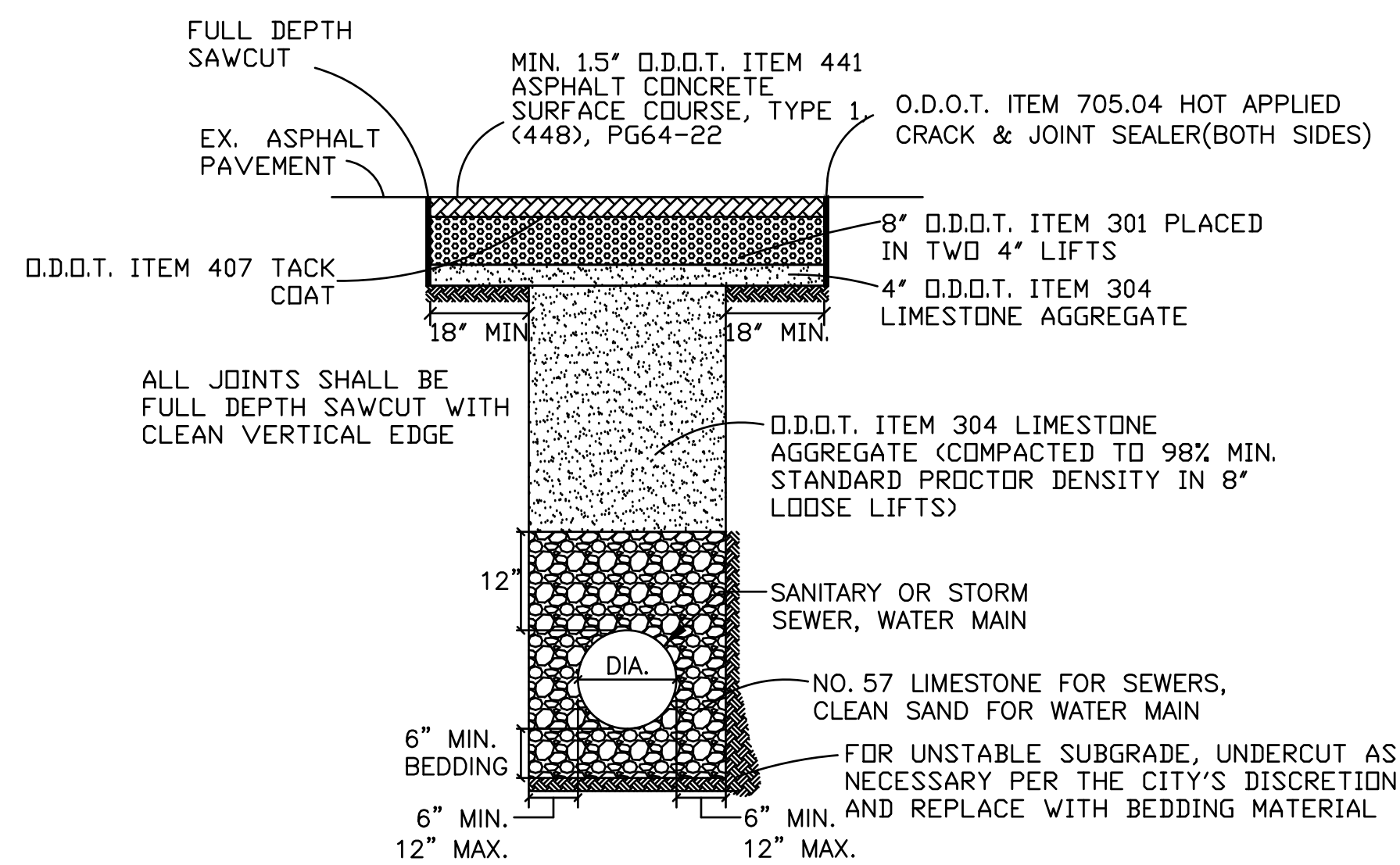
TYPE A PAVEMENT REPLACEMENT (RIGID)

\* WHERE WIDTH IS LESS THAN 3'-0" OR EXISTING PAVEMENT IS DETERIORATED, THE CONTRACTOR SHALL REPLACE ADDITIONAL PAVEMENT AS DIRECTED BY THE ENGINEER. PAYMENT FOR ADDITIONAL PAVEMENT REPLACEMENT AS DIRECTED BY THE ENGINEER SHALL BE AT THE SAME UNIT PRICE BID.

CONDUIT TRENCHING, EMBEDMENT AND BACKFILL

1. MAXIMUM EXCAVATED TRENCH WIDTH: THE MAXIMUM EXCAVATED TRENCH WIDTH FROM THE BOTTOM OF THE TRENCH TO 12" OVER THE TOP OF THE PIPE (WITHIN PIPE EMBEDMENT) SHALL BE O.D. + 24" FOR ALL PIPES UP TO AND INCLUDING 24" I.D. + 30" FOR PIPE FROM 24" I.D. TO 54" I.D. AND O.D. + 40" FOR PIPE SIZES 60" I.D. AND OVER.
2. FOUNDATION: WHERE AN UNSTABLE TRENCH BOTTOM CONDITION IS ENCOUNTERED, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH MATERIAL AS DIRECTED BY THE ENGINEER.
3. PIPE EMBEDMENT: ALL PIPE EMBEDMENT TO 12" ABOVE THE PVC WATERMAIN SHALL BE O.D.O.T. 703.02 FINE AGGREGATE NATURAL. ALL PIPE EMBEDMENT TO 12" ABOVE THE SEWER SHALL BE #304 AGGREGATE.
4. FINAL BACKFILL: IN ALL AREAS UNDER PAVEMENT, STRUCTURES PR WITHIN THE ZONE OF INFLUENCE THE FINAL BACKFILL SHALL BE SPECIAL BACKFILL MATERIAL. IN ALL AREAS OUTSIDE OF PAVEMENT, STRUCTURES OR THE ZONE OF INFLUENCE, THE FINAL BACKFILL SHALL BE SUITABLE ON-SITE MATERIAL APPROVED BY THE ENGINEER. SEE DETAILS SHEET 505.01.
5. CLAY TRENCH DAMS: CLAY TRENCH DAMS SHALL BE REQUIRED AS SHOWN ON PLANS OR WHEN AND WHERE NECESSARY AS DIRECTED BY THE ENGINEER.
6. GEOTEXTILE FABRIC: INSTALL A GEOTEXTILE FABRIC IN ACCORDANCE WITH ODOT 712.09, TYPE A, AFTER ALL INITIAL BACKFILL CONSISTING OF AASHTO NO. 57 OR NO. 67 GRANULAR PIPE EMBEDMENT.
7. DETECTOR TAPE: INSTALL PER ALL CITY OF STREETSBORO SPECIFICATIONS AND REQUIREMENTS
8. PAVEMENT RESTORATION NECESSITATED BY CONDUIT CONSTRUCTION SHALL BE PERFORMED AS AN INCIDENTAL TO THE APPROPRIATE SEWER ITEM TO THE COMPOSITION OF THE EXISTING PAVEMENT OR STANDARD CITY COMPOSITION AT THE DISCRETION OF THE ENGINEER.
9. ANY SETTLEMENT IN OPEN TRENCH BACKFILL TAKING PLACE WITHIN GUARANTEED PERIOD SHALL BE REFILLED WITH SATISFACTORY MATERIALS & AFFECTED SURFACE PROPERLY REPAIRED BY CONTRACTOR AT THE EXPENSE OF THE CONTRACTOR AT NO ADDITIONAL COST TO THE CITY

\*\*NO ROADWAY SHALL BE OPEN CUT WITHOUT WRITTEN PERMISSION FROM THE DIRECTOR OF PUBLIC SERVICES.\*\*



**NOTE:**

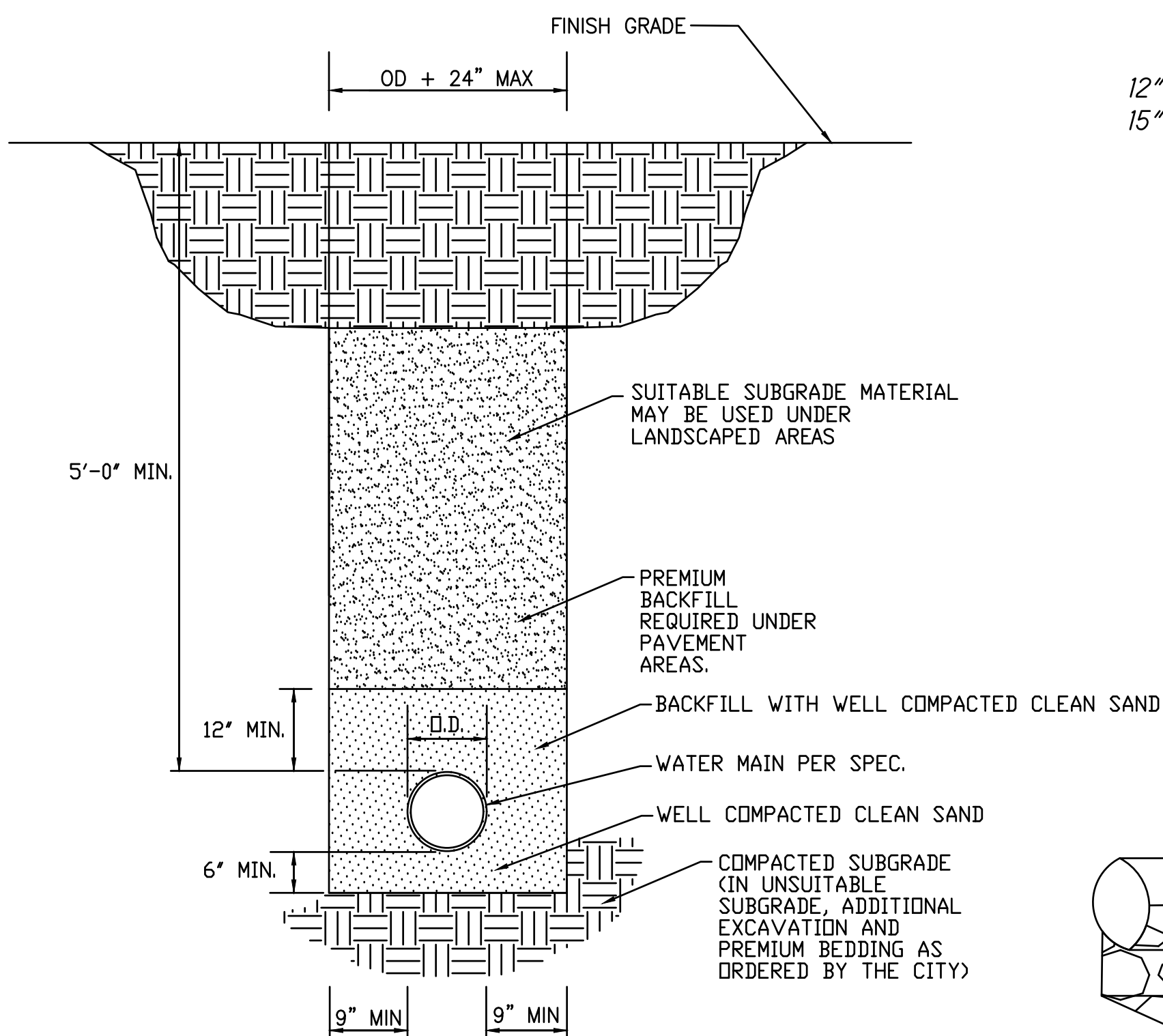
1. FOR CONCRETE PAVEMENT: ASPHALT SECTION SHALL BE REPLACED BY 8" OF FIBERMESH REINFORCED CONCRETE.
2. USE 5/8" DOWELS PLACED AT 30" MAX. SPACING.

IF EXISTING MATERIAL IS SUPERIOR TO THE MINIMUM REQUIREMENTS, MATCH EXISTING PAVEMENT SECTION.

**PAVEMENT RESTORATION/  
STREET OPENING STANDARD  
DETAIL**

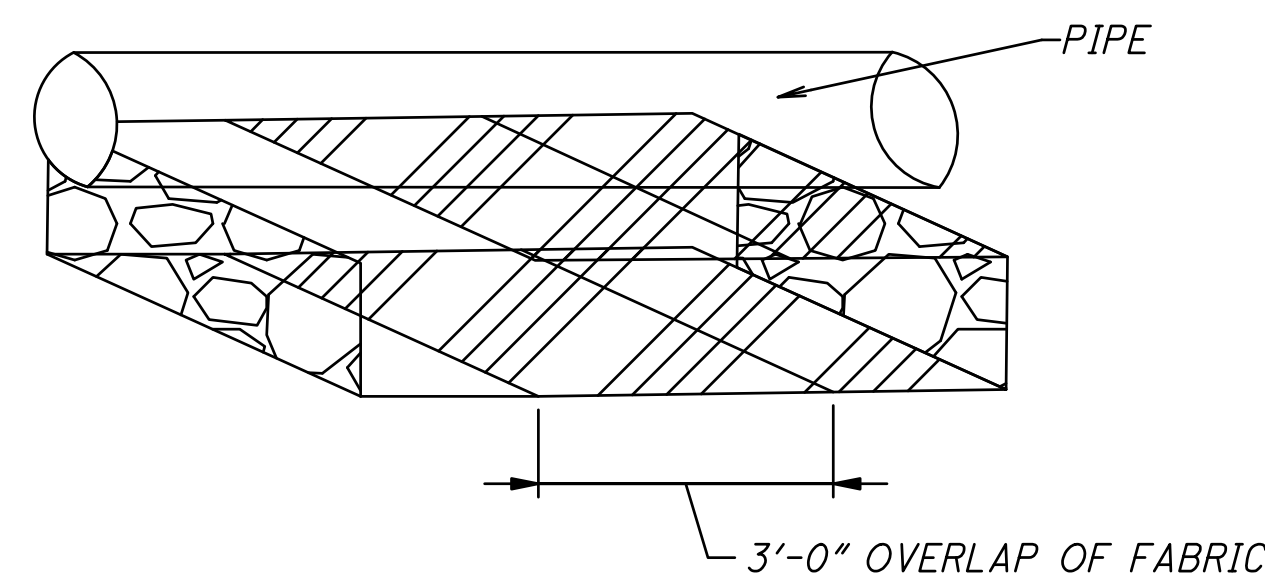
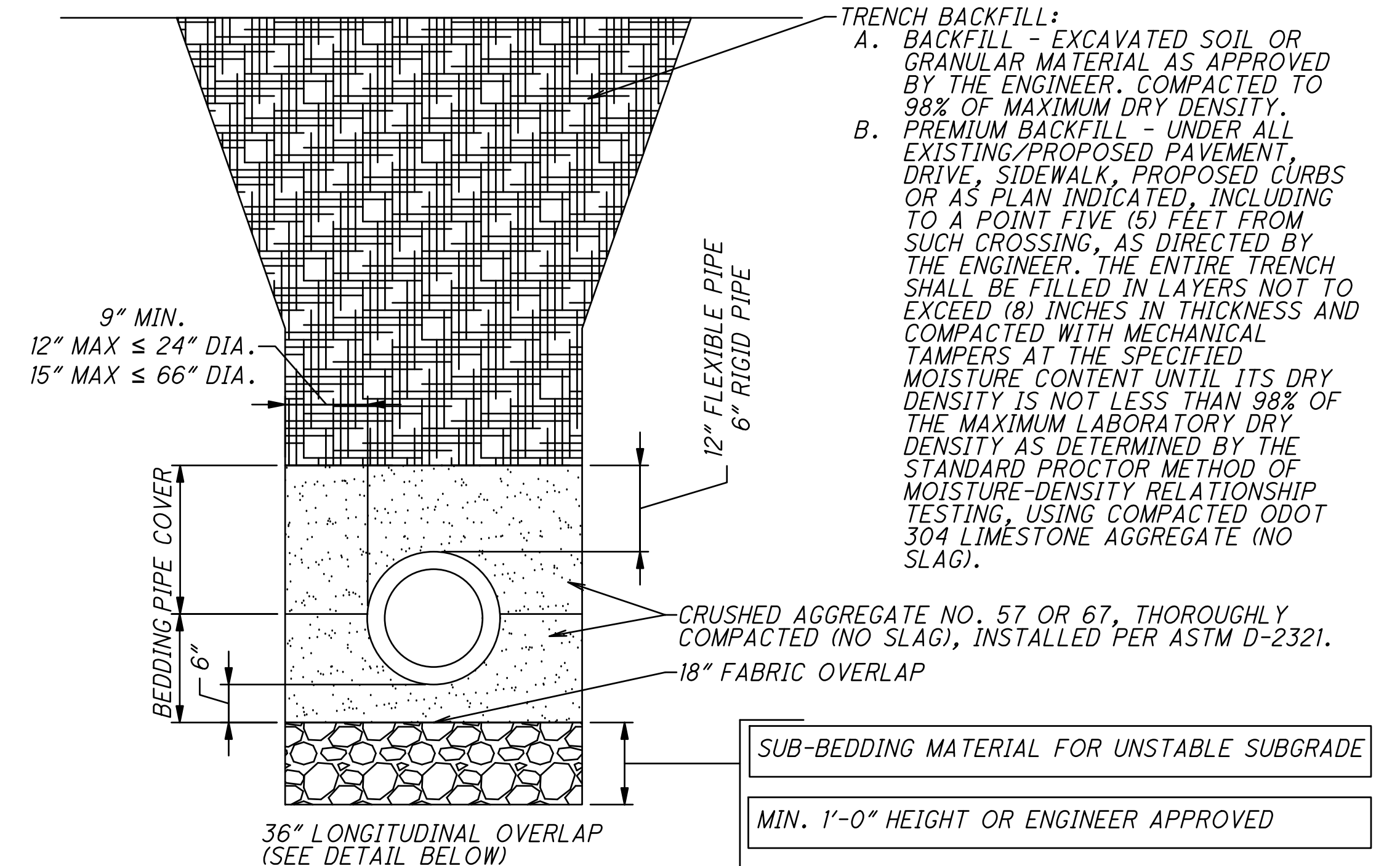
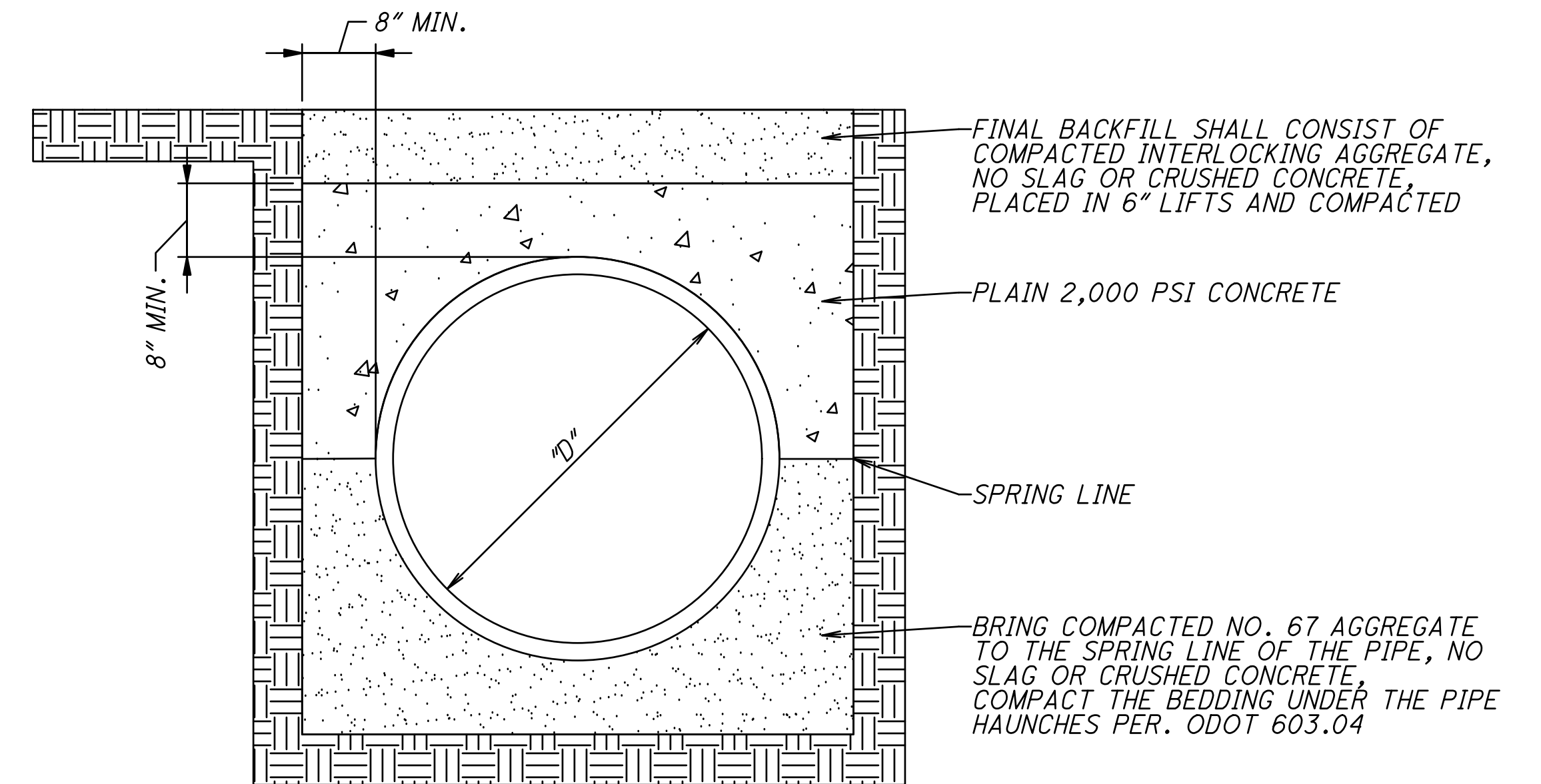
N.T.S.

(STREET OPENING PERMITS ARE ORIGINATED THROUGH THE CITY OF STREETSBORO SERVICE DEPARTMENT)



**TYPICAL WATER MAIN TRENCH**

NOT TO SCALE

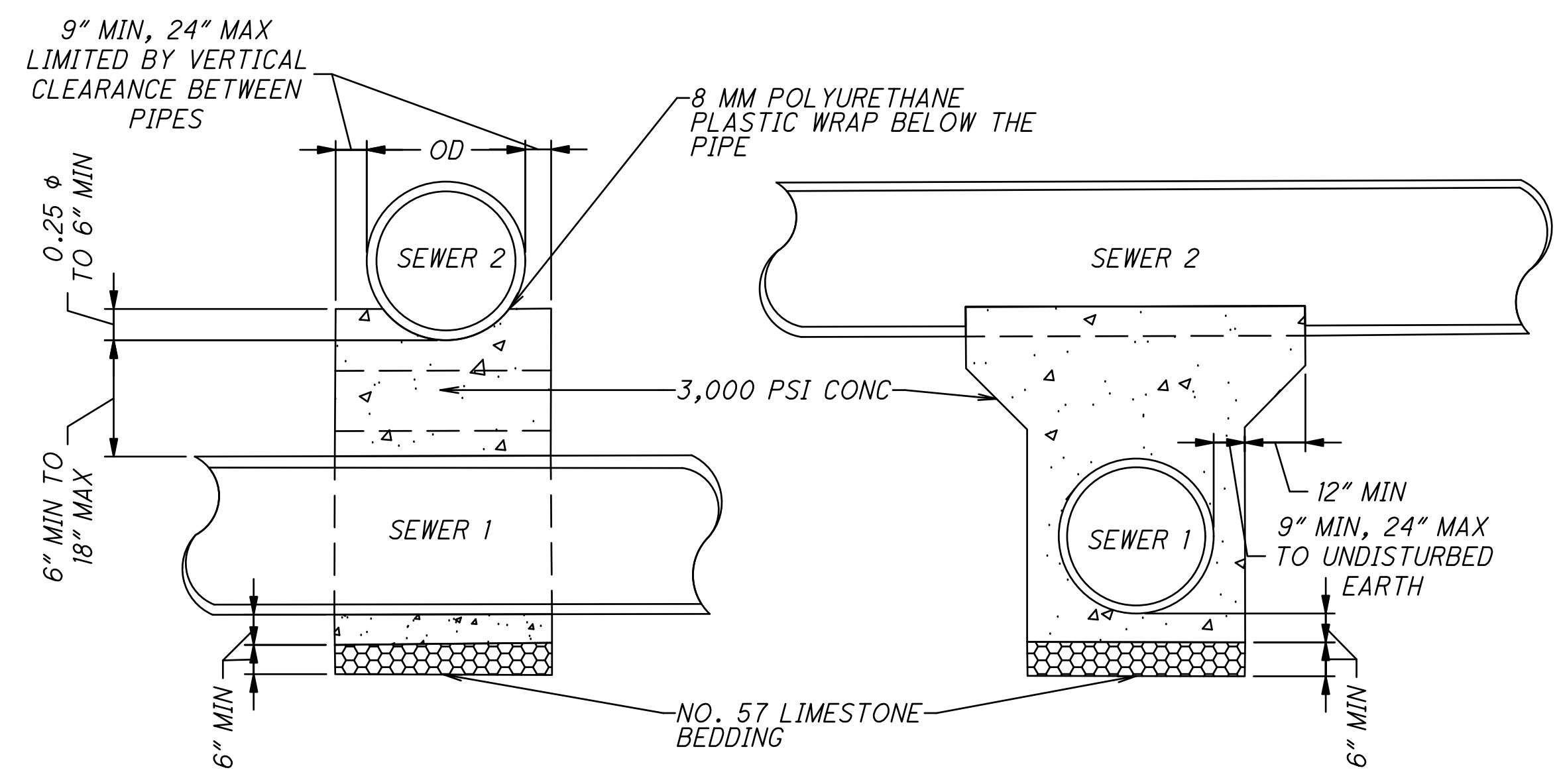
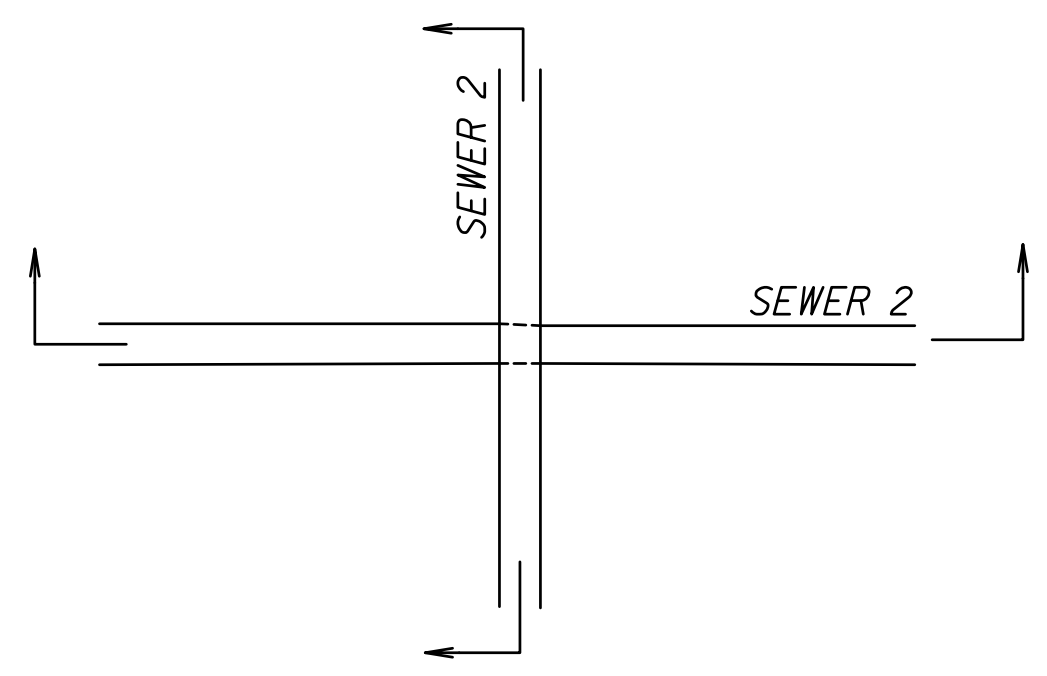


**SUBBEDDING DETAIL**

**NOTES:**

1. PIPE TO BE INSTALLED PER CITY STANDARDS AND ODOT 603 EXCEPT AS MODIFIED HEREIN:
  - 1.1. LOW STRENGTH MORTAR (LSM) BACKFILL - LSM SHALL BE USED WHERE DIRECTED BY THE CITY ENGINEER FOR CONDITIONS SUCH AS BUT NOT LIMITED TO ADVERSE WEATHER, ROAD OPENINGS AND WHEN UNDERMINING OF PAVEMENTS OCCURS.
2. ALL OPEN TRENCH EXCAVATIONS ARE TO COMPLY WITH MINIMUM OSHA SAFETY STANDARDS.

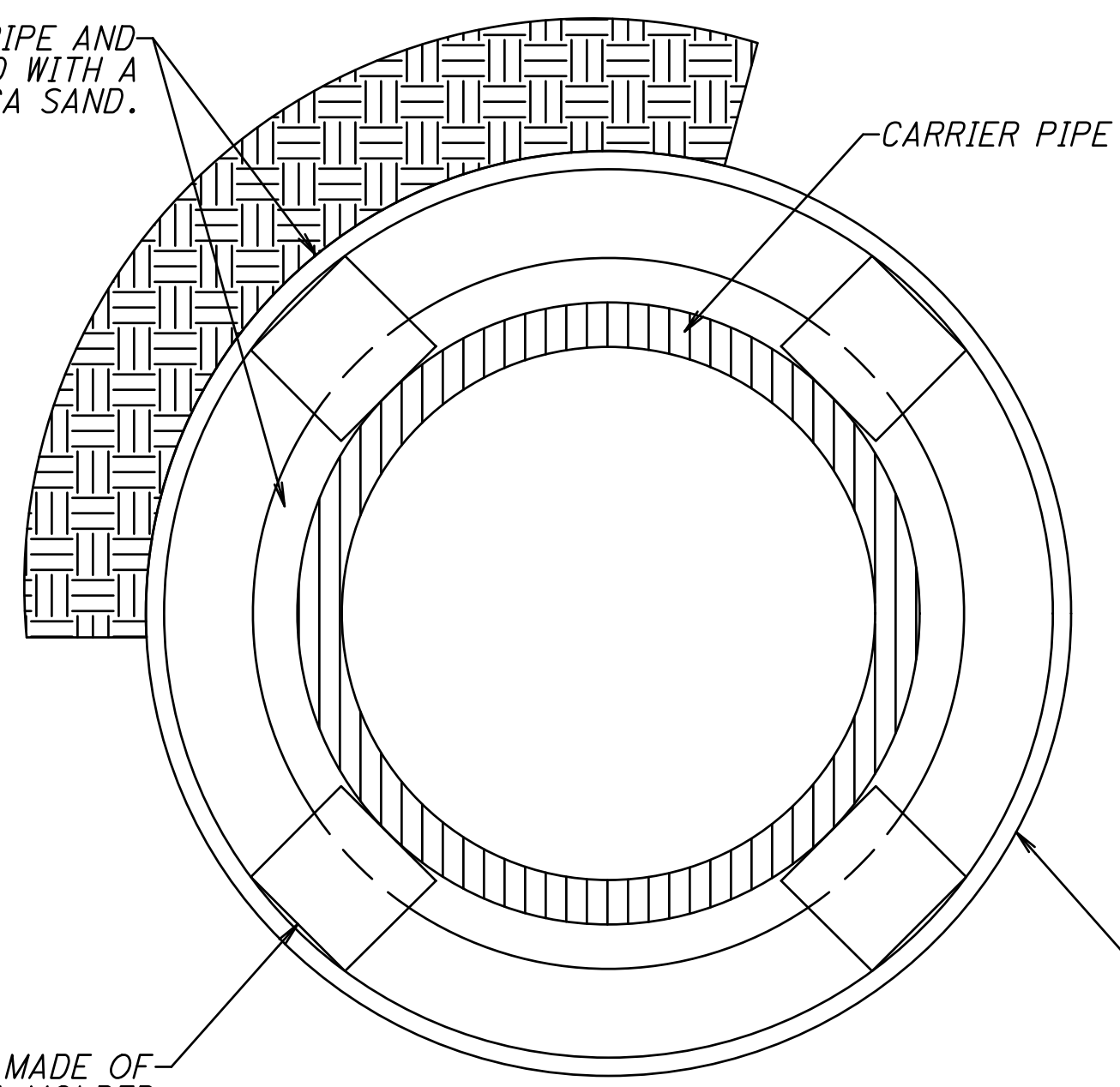




**CONCRETE ENCASEMENT  
NOT TO SCALE**

NOTE: ENCASEMENT IS REQUIRED WHEN PIPE CLEARANCE IS LESS THAN 18".

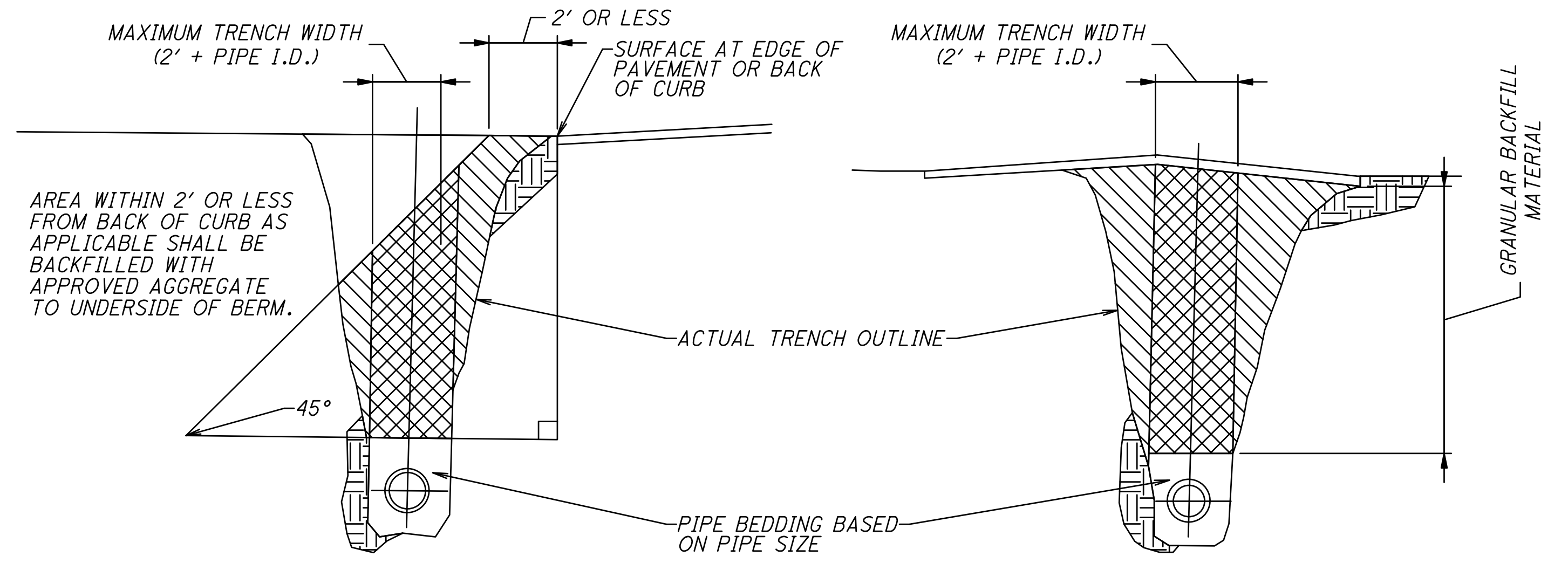
THE AREA BETWEEN PIPE AND CASTING SHALL BE FILLED WITH A LSM GROUT OR SILICA SAND.



SPACERS SHALL BE MADE OF TREATED HARDWOOD OR A MOLDED NYLON. THE SPACERS SHALL BE SECURELY FASTENED AROUND THE CARRIER PIPE WITH STAINLESS STEEL STRAPS. SPACERS SHALL BE PLACED SNUG ENOUGH TO PREVENT PIPE FROM FLOATING OUT OF GRADE WITHOUT CAUSING DAMAGE TO THE CARRIER PIPE.

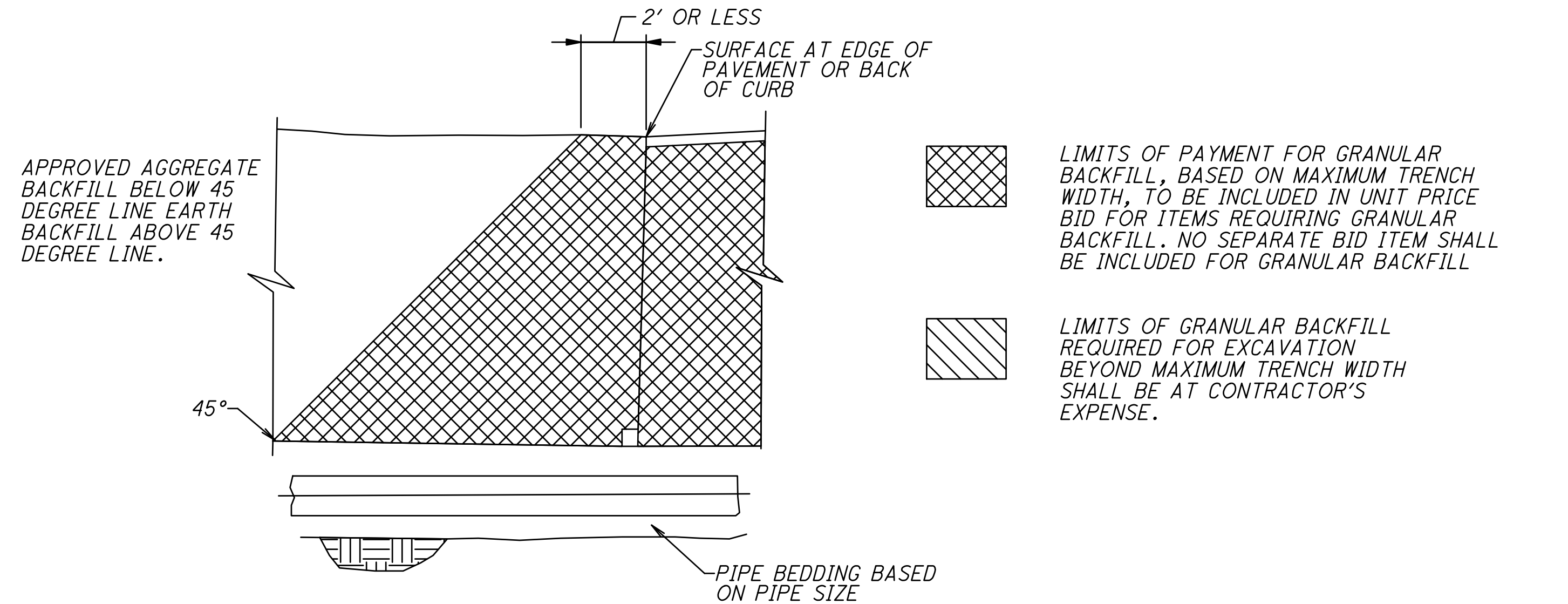
METHOD OF INSTALLATION:  
BULKHEAD THE DOWN STREAM END OF CASING BY USING RED SEWER BRICK AND MORTAR. INSTALL A MIN. 2" DIA. PIPE FOR A RELEASE STACK A TOP OF BULKHEAD. BULKHEAD THE UPSTREAM END IN SAME MANNER INSTALLING A MIN. 4" DIA. PIPE BE VIBRATED, SAND SHALL BE DELIVERED WARM AND INSTALLED WITH A BLOWER EQUIPMENT TRUCK TO ASSURE VOID IS FULL.

STEEL CASING (CONFORMING TO THE REQUIREMENTS OF ODOT SPEC. 707.11).



**SECTION OUTSIDE PAVEMENT**

**SECTION INSIDE PAVEMENT**



**SECTION CROSSING PAVEMENT WITHIN MAXIMUM TRENCH WIDTH**

1. ALL CONSTRUCTION OF ANY PROJECT SHALL BE IN CONFORMANCE WITH CITY OF STREETSBORO'S CODIFIED ORDINANCE AND THE OHIO REVISED CODE
2. PERMIT FOR DRIVEWAY APPROACHES
  - A. ANY PERSON CONSTRUCTING A DRIVEWAY APPROACH WITHIN THE CORPORATION LIMITS OF THE CITY SHALL FIRST SECURE A PERMIT FROM THE ZONING DEPARTMENT.
3. CONCRETE APPROACHES

ALL FORMS MUST BE IN PLACE AND THE SUB-GRADE PROPERLY COMPACTED. CONCRETE APPROACHES SHALL BE 6" INCHES MINIMUM THICKNESS FOR RESIDENTIAL DRIVES AND 8" FOR COMMERCIAL DRIVES. CONCRETE APRONS THAT BUTT UP TO ASPHALT ROADWAYS MUST HAVE A FORM (BULKHEAD) SET AT THE FRONT OF THE APRON. THE DISTANCE OF THE FORM FROM THE ASPHALT WILL BE DETERMINED BY THE CITY ENGINEER. CONTRACTOR IS RESPONSIBLE FOR INSTALLING 448 ASPHALT BETWEEN THE FORM AND THE ROADWAY. ASPHALT MUST BE ROLLED AND LEVELLED TO A PROFESSIONAL FINISH. ASPHALT MUST BE INSTALLED A MINIMUM OF 6" IN DEPTH. A MINIMUM 24 HOUR NOTICE SHALL BE GIVEN PRIOR TO CONSTRUCTION. SEE THE ATTACHED DESIGN DIAGRAMS FOR ALL OTHER DIMENSIONS. MATERIAL AND INSTALLATION SPECIFICATIONS ARE AS FOLLOWS.

**MATERIALS:** CEMENT SHALL MEET ASTM SPECIFICATIONS FOR PORTLAND CEMENT C-150, TYPE 1, OR C-175, TYPE 1A. CEMENT CONFORMING TO ASTM C-150 SHALL BE USED WITH AN APPROVED AIR-ENTRAINING AGENT. FINE AGGREGATE SHALL BE SAND MEETING THE REQUIREMENT OF STATE HIGHWAY SPECIFICATIONS. COARSE AGGREGATE SHALL BE NO. 57 (1/2" TO 3/4") GRADE A LIMESTONE OR SLAG.

**CONCRETE:** ALL CONCRETE SHALL BE CLASS "C" PER ODOT 499 AND PROPERLY CONSOLIDATED. (NO SLAG) CURING COMPOUND SHALL BE LIQUID WHITE CURING COMPOUND MEETING WITH THE REQUIREMENTS OF SECTION 705.07 OF THE STANDARD SPECIFICATION AND APPLIED AT THE RATE OF 1 GALLON PER 200 SQUARE FEET. DRIVE APRONS, SIDEWALKS, AND CURB AT LOCATIONS THAT REQUIRE ACCESS AS DETERMINED BY NEED AND OR AS REQUIRED PER CITY ENGINEER SHALL REQUIRE MODERATE SET (MS) OR FAST SET (FS) CONCRETE. THE QUANTITY OF WATER SHALL BE REGULATED SO AS TO PRODUCE CONCRETE HAVING A SLUMP OF 2" TO 3".

**PLACING & FINISHING:** WHILE BEING PLACED, THE CONCRETE SHALL BE TAMPED, SPADED AND SCREENED. AT THE PROPER TIME, THE SURFACE OF THE CONCRETE SHALL BE FINISHED WITH A FLOAT TO A WORKMANLIKE FINISH, SMOOTH AND EVEN, BUT WITH A SLIGHTLY ROUGH TEXTURE WHICH CAN BE ACCOMPLISHED BY BROOMING. SPECIAL CARE SHALL BE EXERCISED IN FINISHING ON EACH SIDE OF DIVIDER PLATES SO AS TO AVOID DIFFERENCE IN ELEVATION BETWEEN ADJACENT BLOCKS, THE TOP EDGES OF ALL BLOCKS SHALL BE ROUNDED WITH SUITABLE EDGING TOOLS.

**BASE:** SIDEWALK AND DRIVE APRONS MUST HAVE A MINIMUM OF 4" THICK OF 57 LIMESTONE AGGREGATE BASE IN ACCORDANCE WITH ODOT CMS ITEM 57 OR AS DIRECTED BY THE CITY ENGINEER. ALL DRIVEWAYS SHALL MEET ODOT ITEM 304, COMPACTED TO 95% COMPACTION REQUIREMENTS.

**CURING & PROTECTION:** AFTER IT HAS HARDENED SUFFICIENTLY, TO PREVENT MARKING, THE CONCRETE SHALL BE COVERED WITH WET BURLAP, WHICH SHALL BE KEPT CONTINUOUSLY MOIST FOR 3 DAYS. A PIGMENTED LIQUID MEMBRANE CURING COMPOUND MAY BE USED IN LIEU OF THE BURLAP CURING. THE CONTRACTOR SHALL PROTECT THE WALK AGAINST DAMAGE OF ALL KINDS UNTIL THE WORK HAS BEEN ACCEPTED.

**OTHER REQUIREMENTS:** ALL VALVE BOXES, MANHOLE COVERS AND OTHER CASTINGS IN THE SIDEWALK AND DRIVE APRON AREA SHALL BE ADJUSTED TO THE GRADE WITH BRASS CASTING AS APPROVED BY ENGINEER. ALL NEWLY CONSTRUCTED WALKS SHALL HAVE THE CONTRACTOR'S NAME IMPRINTED IN FRONT OF EACH LOT.

**GENERAL REQUIREMENTS:** ALL PAVEMENT DRIVES SHALL CONFORM TO ODOT SPECIFICATIONS IF NOT SPECIFIED HEREIN. ALL PAVEMENT DRIVES REPLACEMENTS SHALL CONFORM TO THE GRADE OF THE EXISTING PAVEMENT DRIVE, SIDEWALK AND/OR CURB RAMP. DRIVEWAY REPLACEMENT SHALL MATCH EXISTING DRIVE DIMENSIONS UNLESS APPROVED BY CITY ENGINEER.

**NOTIFICATION TO RESIDENTS:** THE SCHEDULING FOR THIS WORK SHALL BE DISCUSSED WITH EACH PROPERTY OWNER AFFECTED PRIOR TO COMMENCING THE REPLACEMENT OPERATION. EXCAVATION IN TRAFFIC AREAS SHALL NOT BE LEFT OPEN OVERNIGHT. ALL DRIVE APRON CONSTRUCTION SHALL FOLLOW A SCHEDULE THAT ALLOWS ACCESS TO AND FROM RESIDENCE, BUSINESS, ETC. AT ALL TIMES. THE DISRUPTION OF ACCESS TO DRIVEWAYS DUE TO THIS WORK SHALL BE KEPT TO A MINIMUM.

**TESTING:** AT LEAST TWO CONCRETE CYLINDERS WILL BE MADE IN THE MORNING AND AT LEAST TWO CONCRETE CYLINDERS MADE 25 IN THE AFTERNOON DURING EACH DAY CONCRETE IS PLACED. IF THE AMOUNT OF CONCRETE POURED IN EITHER THE MORNING OR AFTERNOON EXCEEDS 30 CUBIC YARDS, AN ADDITIONAL TWO CYLINDERS SHALL BE MADE. SLUMP AND ENTRAINED AIR CONTENT MUST BE MAINTAINED AND TESTED AND TESTED WHEN MORE THAN 10 CU. YDS. OF CONCRETE IS PLACED. A MINIMUM OF ONE TEST BEAM WILL BE TAKEN IN THE MORNING AND ONE IN THE AFTERNOON ON ALL CLASS MS CONCRETE INSTALLED. IN EACH GROUP OF TWO CYLINDERS, ONE WILL BE BROKEN AT 7 DAYS AND ONE AT 28 DAYS AFTER THEY ARE MADE. THE CYLINDERS MUST BE TAKEN AND TESTED BY AN APPROVED TESTING LABORATORY IN ACCORDANCE WITH ASTM METHODS. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAKING ALL THE ARRANGEMENTS FOR THE TESTING UNLESS OTHERWISE SPECIFIED. WRITTEN REPORTS FOR ALL INSPECTION AND TESTING SHALL BE SUBMITTED TO THE OWNER AND THE CITY FOR APPROVAL.

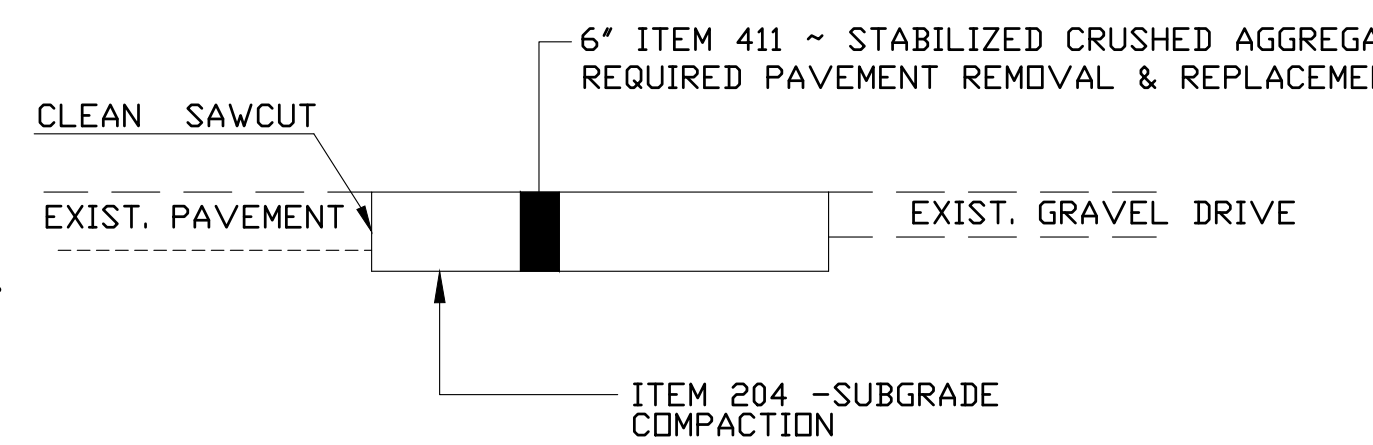
4. ASPHALT APPROACHES

ASPHALT APPROACHES SHALL BE INSTALLED AT A MINIMUM 3-INCH THICKNESS FOR RESIDENTIAL DRIVES AND 5 INCHES FOR COMMERCIAL DRIVES. SUB BASE MATERIAL SHALL BE PROPERLY COMPACTED PRIOR TO ASPHALT PLACEMENT. PLACE ASPHALT ONLY IF THE SURFACE IS DRY AND IF WEATHER CONDITIONS ARE SUCH THAT PROPER HANDLING, FINISHING AND COMPACTION CAN BE ACCOMPLISHED. DO NOT PLACE ASPHALT IF THE SURFACE IS BELOW 36°F OR THE AMBIENT AIR TEMPERATURE IS BELOW 40°F. ASPHALT TEMPERATURES MUST BE AT A MINIMUM TEMPERATURE AT THE PAVER OF 250°F. THE SUB-BASE SHALL BE INSPECTED PRIOR TO THE PLACEMENT OF ASPHALT FOR PROPER DEPTH AND COMPACTION. SEE BELOW DIAGRAMS.

NOTE: WHERE POSSIBLE APPROACHES SHOULD BE CROSS SLOPED TO PREVENT RUNOFF FROM FLOWING ONTO THE ROADWAY.

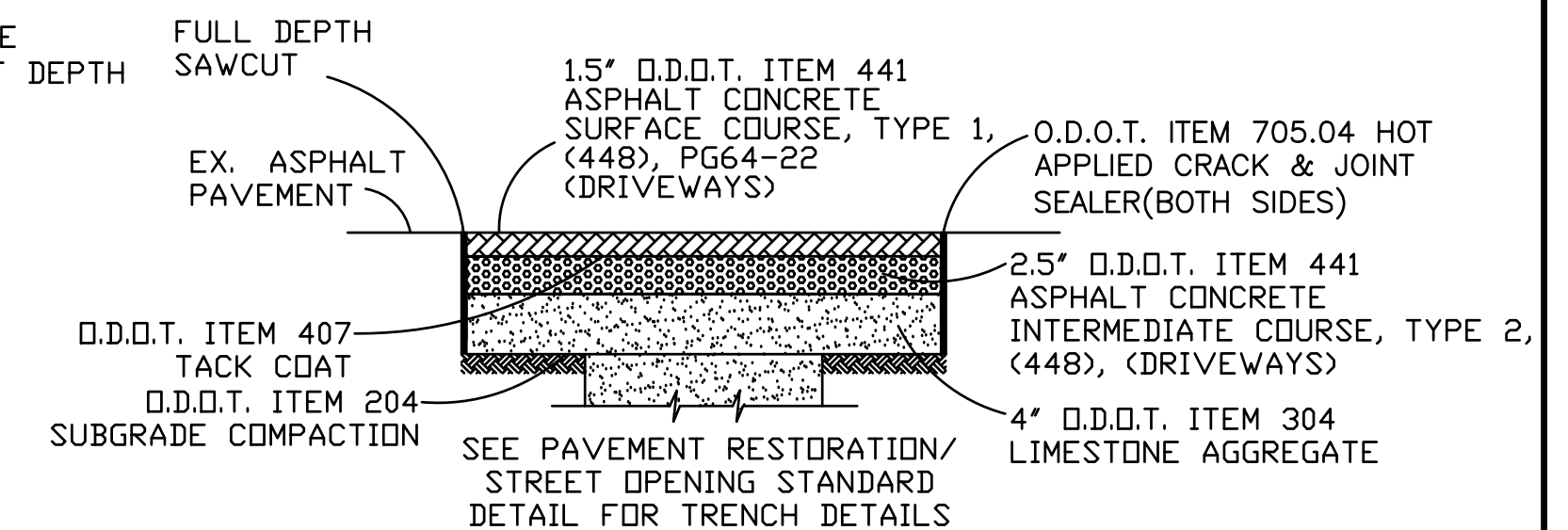
5. ELIMINATING DRIVEWAYS

ANY TIME THERE IS A DRIVEWAY INSTALLED OR DRIVEWAY REMOVED, THE EXISTING APRON LOCATION MUST BE RESTORED. THIS INCLUDES CURBING, SIDEWALK, AND LAWN RESTORATION.



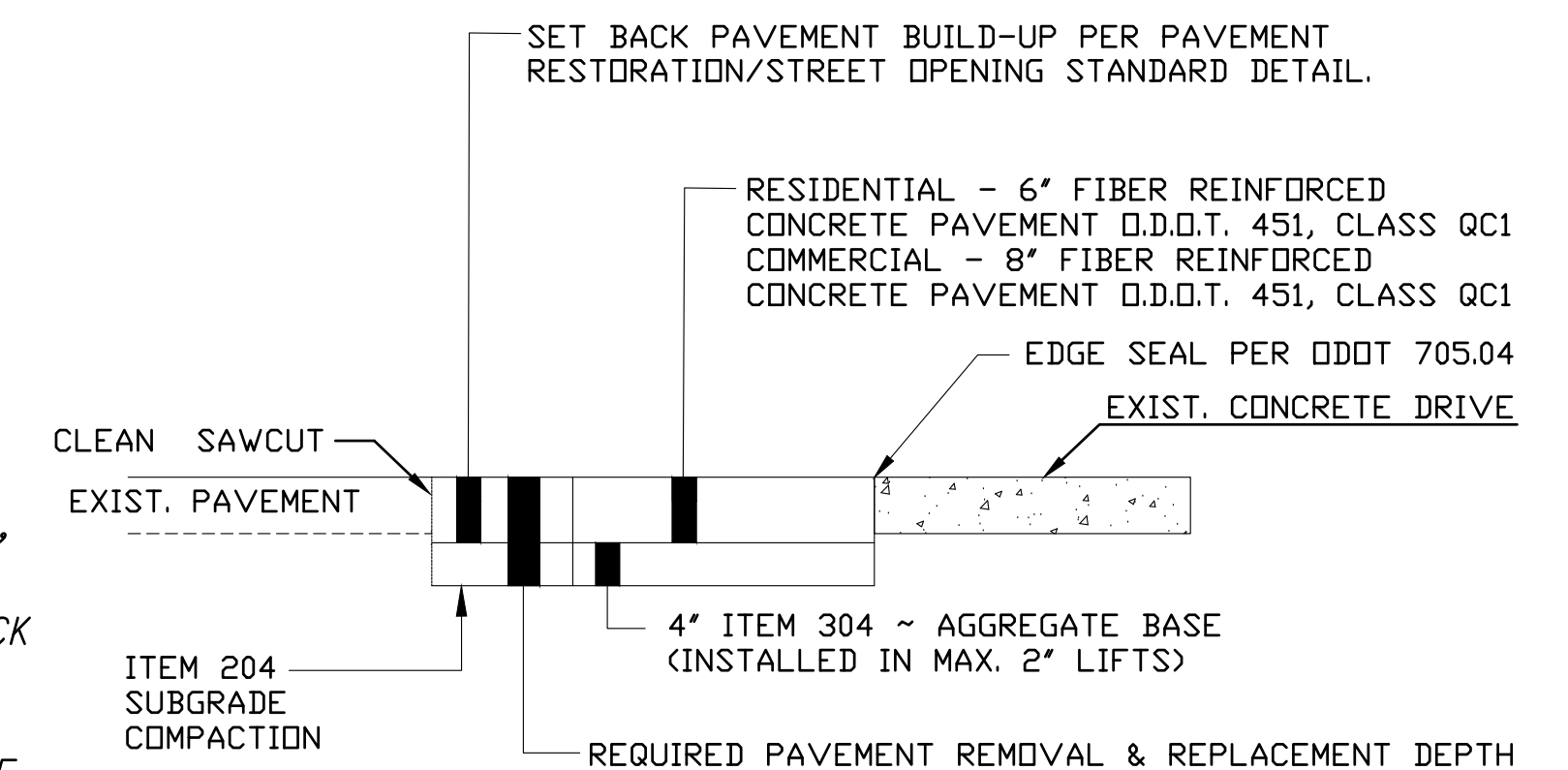
**PAVEMENT REPLACEMENT  
AGGREGATE DRIVES  
DIRT, GRAVEL, OR STONE DRIVES**

N.T.S.



**PAVEMENT REPLACEMENT  
ASPHALT DRIVES**

N.T.S.

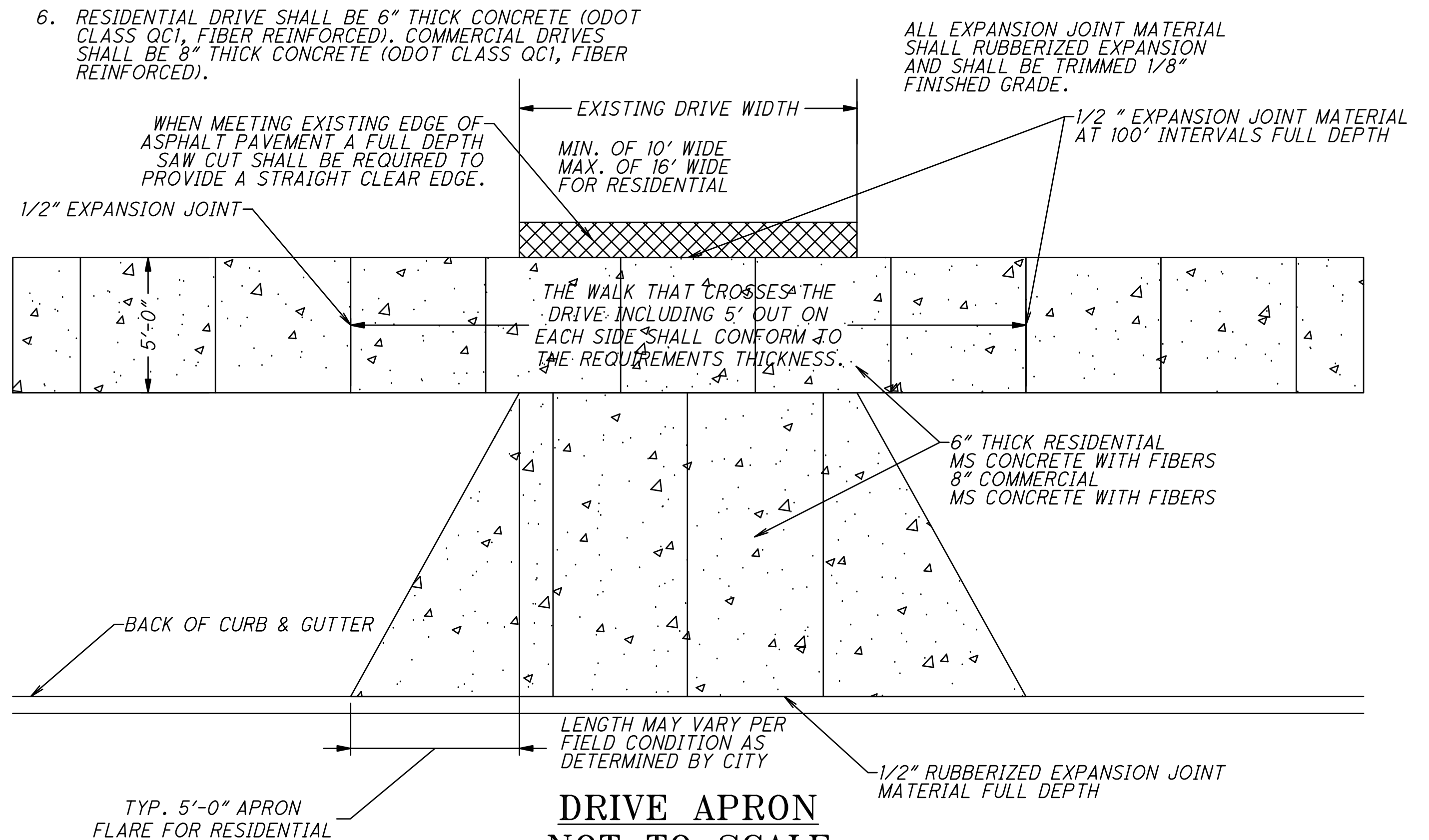


NOTE:

FOR UNCURBED ROADS, CONCRETE DRIVEWAY SHALL BE SET BACK 12" TO 18" FROM THE EDGE OF THE ROAD. PAVING OF THE 12" TO 18" WING OUT SHALL BE WITH THE SAME PASS AS THE ROADWAY PAVEMENT RESTORATION.

**PAVEMENT REPLACEMENT  
CONCRETE DRIVES**

N.T.S.



**DRIVE APRON  
NOT TO SCALE**

DRIVEWAY DETAILS

REVISION DATE

7-18-2022

CITY OF STREETSBORO

DV-1



1. ALL CONSTRUCTION OF ANY PROJECT SHALL BE IN CONFORMANCE WITH CITY OF STREETSBORO'S CODIFIED ORDINANCE AND THE OHIO REVISED CODE

WIDTH:

THE MINIMUM WIDTH OF ALL SIDEWALKS SHALL BE 5'. THE DIRECTOR OF PUBLIC SERVICE MAY INCREASE THE MINIMUM WIDTH AT HIS DISCRETION.

THICKNESS:

ALL SIDEWALKS SHALL BE A MINIMUM THICKNESS OF FOUR (4) INCHES EXCEPT WITHIN THE LIMITS OF THE DRIVEWAYS, WHERE THE MINIMUM THICKNESS SHALL BE SIX (6) INCHES FOR ONE OR TWO FAMILY RESIDENTIAL DRIVEWAYS AND EIGHT (8) INCHES FOR ALL OTHER DRIVEWAYS. ONE-HALF (1/2) INCH RUBBER EXPANSION JOINTS SHALL BE PLACED AT INTERVALS NOT TO EXCEED ONE HUNDRED (100) FEET OR AS SPECIFIED ON CONSTRUCTION DRAWINGS. EXPANSION JOINTS SHALL 1/2" THICK. CONSTRUCTION JOINTS SHALL BE A MINIMUM OF 15' SPACING WITH THE CONCRETE SCORED EVERY FIVE FEET. ALL CONCRETE SIDEWALK AND/OR CURB SHALL BE OF MONOLITHIC CONSTRUCTION. ALL SIDEWALKS SHALL HAVE A FOUR (4) INCH SUB-BASE, ODOT ITEM 304, COMPACTED TO 95% COMPACTION.

COURSES:

ALL SIDEWALKS AND DRIVEWAY APPROACHES SHALL BE ONE COURSE CONSTRUCTION.

GRADE & ALIGNMENT:

ALL SIDEWALKS SHALL BE LAID ON A GRADE RISING 3/8" TO THE FOOT FROM THE ESTABLISHED CURB GRADE TO THE STREET RIGHT-OF-WAY SO THEY ARE CONTIGUOUS EITHER WITH THE RIGHT-OF-WAY LINE OF THE STREET OR CURB, AS DETERMINED BY THE CITY ENGINEER, EXCEPT THAT WHERE ANY SIDEWALK EXISTS WITHIN ANY BLOCK BETWEEN INTERSECTING STREETS, NEW SIDEWALKS SHALL BE BUILT IN THE SAME LOCATION IN RELATION TO THE STREET AS EXISTING SIDEWALKS.

BASE:

SIDEWALK AND DRIVE APRONS MUST HAVE A MINIMUM OF 4" THICK OF #57 LIMESTONE AGGREGATE BASE IN ACCORDANCE WITH ODOT CMS ITEM 703 OR AS DIRECTED BY THE CITY ENGINEER.

FORMS:

THE SIDEWALK SHALL BE CONSTRUCTED BETWEEN STANDARD STEEL FORMS OF THE REQUIRED HEIGHT, EXCEPT THAT AROUND SHARP CURVES WOODEN STRIPS MAY BE USED. ON SMALL JOBS WOODEN FORMS MAY BE USED WHEN APPROVED BY THE ENGINEER.

JOINTS:

THE SIDEWALK SHALL BE DIVIDED INTO BLOCKS 5' X 5' BLOCK BY MEANS OF A TOOL IMPRESSION JOINTS. EXPANSION JOINTS SHALL BE PROVIDED WHENEVER THE SIDEWALK COMES AGAINST FIXED OBJECTS SUCH AS CURBS, RETAINING WALLS, BUILDINGS OR OTHER SIDEWALKS. WHERE CONCRETE SIDEWALKS SURROUND POSTS, POLES, FIRE HYDRANTS, GRATINGS, CASTINGS AND OTHER SIMILAR OBJECTS, THE CONCRETE IMMEDIATELY ADJACENT TO SUCH OBJECTS SHALL BE SEPARATED FROM THE REMAINING CONCRETE BY MEANS OF JOINTS EXTENDING THROUGH THE FULL DEPTH OF THE SIDEWALK. IN GENERAL, THESE JOINTS SHALL BE PLACED ABOUT 6" FROM THE OBJECTS AND ARRANGED IN THE FORM OF SQUARES OR RECTANGLES OR AS DIRECTED BY THE ENGINEER.

MATERIALS:

CEMENT SHALL MEET ASTM SPECIFICATIONS FOR PORTLAND CEMENT C-150, TYPE 1, OR C-175, TYPE IA. CEMENT CONFORMING TO ASTM C-150 SHALL BE USED WITH AN APPROVED AIR-ENTRAINING AGENT. FINE AGGREGATE SHALL BE SAND MEETING THE REQUIREMENT OF STATE HIGHWAY SPECIFICATIONS. COURSE AGGREGATE SHALL BE NO. 46 (1/2" TO 3/4") GRADE A LIMESTONE OR SLAG.

CONCRETE:

CONCRETE MATERIALS SHALL BE ACCURATELY PROPORTIONED BY WEIGHT SO THAT EACH CUBIC YARD OF CONCRETE WILL CONTAIN 6.6 SACKS (62 LBS) OF CEMENT. BATCHES SHALL BE REGULATED SO THAT FRACTIONAL SACKS OF CEMENT ARE NOT REQUIRED. CONCRETE SHALL BE MIXED IN AN APPROVED MIXER FOR 1-1/2" MINUTES. IN THE CASE OF TRUCK MIXERS, THE ENGINEER WILL SPECIFY THE MIXING TIME. THE QUANTITY OF WATER SHALL BE REGULATED SO AS TO PRODUCE CONCRETE HAVING A SLUMP OF 2 TO 3".

PLACING & FINISHING:

WHILE BEING PLACED, THE CONCRETE SHALL BE TAMPED, SPADED AND SCREENED. AT THE PROPER TIME, THE SURFACE OF THE CONCRETE SHALL BE FINISHED WITH A FLOAT TO A WORKMANLIKE FINISH, SMOOTH AND EVEN, BUT WITH A SLIGHTLY ROUGH TEXTURE. SPECIAL CARE SHALL BE EXERCISED IN FINISHING ON EACH SIDE OF DIVIDER PLATES SO AS TO AVOID DIFFERENCE IN ELEVATION BETWEEN ADJACENT BLOCKS, THE TOP EDGES OF ALL BLOCKS SHALL BE ROUNDED WITH SUITABLE EDGING TOOLS.

CURING & PROTECTION:

AFTER IT HAS HARDENED SUFFICIENTLY, TO PREVENT MARKING, THE CONCRETE SHALL BE COVERED WITH WET BURLAP, WHICH SHALL BE KEPT CONTINUOUSLY MOIST FOR 3 DAYS. A PIGMENTED LIQUID MEMBRANE CURING COMPOUND MAY BE USED IN LIEU OF THE BURLAP CURING. THE CONTRACTOR SHALL PROTECT THE WALK AGAINST DAMAGE OF ALL KINDS UNTIL THE WORK HAS BEEN ACCEPTED. AN APPROVED SEALER SHALL SEAL ALL EXPOSED CONCRETE APPROPRIATE TO APPLICATION ON SURFACE OF CONCRETE. SEE ODOT SPECIFICATION 451.11 FOR APPLICATION METHODS.

OTHER REQUIREMENTS:

ALL VALVE BOXES, MANHOLE COVERS AND OTHER CASTINGS IN THE SIDEWALK AREA SHALL BE ADJUSTED TO THE GRADE OF THE WALK.

GENERAL REQUIREMENTS:

ALL PAVEMENT SIDEWALKS AND CURB RAMPS SHALL CONFORM TO ODOT SPECIFICATIONS IF NOT SPECIFIED HEREIN. ALL REPLACEMENTS SHALL CONFORM TO THE GRADE OF THE EXISTING PAVEMENT DRIVE, SIDEWALK AND/OR CURB RAMP. DRIVEWAY REPLACEMENT SHALL MATCH EXISTING DRIVE DIMENSIONS UNLESS APPROVED BY CITY ENGINEER. THE FOLLOWING REQUIREMENTS APPLY TO ALL PAVEMENT DRIVE APRONS, SIDEWALKS AND CURB RAMPS PLACED WITHIN THE MUNICIPALITY. ALL PAVEMENT DRIVES, SIDEWALKS AND/OR CURB RAMPS SHALL CONFORM TO ODOT SPECIFICATIONS IF NOT SPECIFIED HEREIN. ALL PAVEMENT DRIVES, SIDEWALKS AND CURB RAMP REPLACEMENTS SHALL CONFORM TO THE GRADE OF THE EXISTING PAVEMENT DRIVE, SIDEWALK AND/OR CURB RAMP.

CONCRETE:

ALL CONCRETE SHALL BE CLASS "C" PER ODOT 499 AND PROPERLY CONSOLIDATED. (NO SLAG) CURING COMPOUND SHALL BE LIQUID WHITE CURING COMPOUND MEETING WITH THE REQUIREMENTS OF SECTION 705.07 OF THE STANDARD SPECIFICATION AND APPLIED AT THE RATE OF 1 GALLON PER 200 SQUARE FEET. DRIVE APRONS, SIDEWALKS, AND CURB AT LOCATIONS THAT REQUIRE ACCESS AS DETERMINED BY NEED AND OR AS REQUIRED PER CITY ENGINEER SHALL REQUIRE MODERATE SET (MS) OR FAST SET (FS) CONCRETE. THE QUANTITY OF WATER SHALL BE REGULATED SO AS TO PRODUCE CONCRETE HAVING A SLUMP OF 2" TO 3".

SIGNAGE:

THE CONTRACTOR MUST PROVIDE ADEQUATE SIGNS, MARKERS AND BARRICADES TO PROTECT PEDESTRIAN TRAFFIC, VEHICULAR TRAFFIC AND CONSTRUCTION PERSONNEL DURING THE PROGRESS OF THIS WORK. ADDITIONAL SIGNS INDICATING ENTRANCES FOR BUSINESSES IN A CONSTRUCTION ZONE ARE REQUIRED AS DIRECTED BY THE CITY ENGINEER.

CURB RAMPS:

CURB RAMPS SHALL BE PLACED AT ALL INTERSECTION CORNERS FOR ACCESS WHEN CROSSING ROADWAY PAVEMENT. ALL SIDEWALKS SHALL CONNECT TO THE PAVEMENT OR CURB AT INTERSECTIONS WITH WHEELCHAIR RAMPS AND ONE-HALF (1/2) INCH EXPANSION JOINTS BETWEEN THE WALK AND CURB. EXPANSION JOINTS SHALL BE RUBBERIZED AND TRIMMED 1/8" BELOW FINISHED GRADE. ALL CURB RAMPS SHALL MEET THE CURRENT ADA REQUIREMENTS INCLUDING USE OF RED TRUNCATED DOMES.

CONSTRUCTION SAW CUTTING:

WHERE IT IS NECESSARY TO DISTURB EXISTING CURB RAMPS OR SIDEWALKS THE CONCRETE SHALL BE SAW CUT IN NEAT STRAIGHT LINES AS DIRECTED BY MUNICIPALITY. THE DEPTH OF SAW CUT SHALL BE FULL DEPTH. WHERE IT IS NECESSARY TO DISTURB EXISTING PAVEMENT DRIVES, CURBS AND/OR WALKS THE ASPHALT CONCRETE SHALL BE LINE CUT WITH STRAIGHT VERTICAL EDGES. ALL CUT BITUMINOUS SURFACES SHALL BE SEALED WITH A 4" WIDE RUBBERIZED JOINT SEALER USING A SQUEEGEE.

COMPACTION REQUIREMENTS:

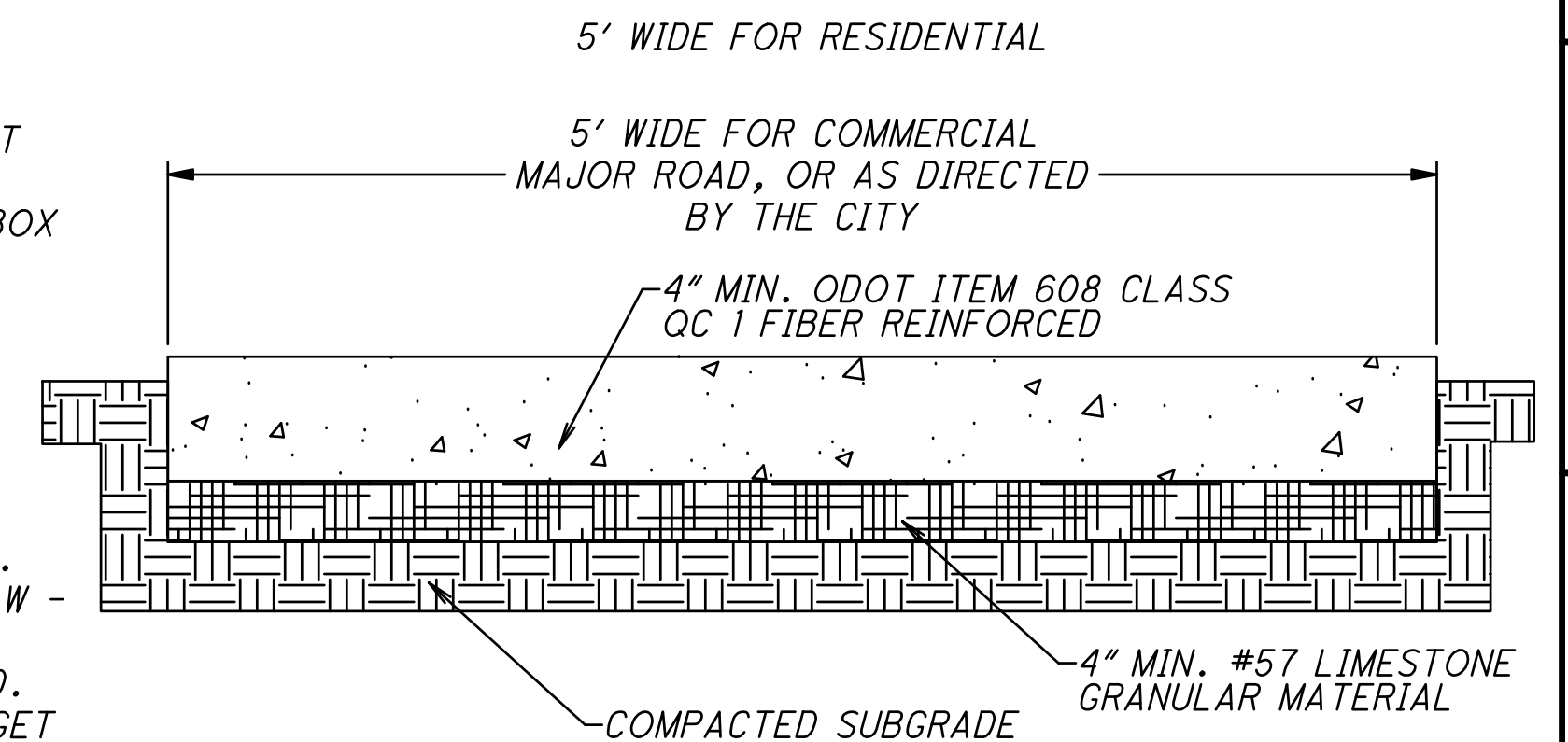
ALL BACKFILL UNDER WALKS OR DRIVE APRON AREAS SHALL CONFORM TO ODOT 611.06 DENSITY REQUIREMENTS.

TESTING:

PUBLIC IMPROVEMENTS OR PROJECTS WITHIN THE RIGHT-OF-WAY REQUIRE TESTING. AT LEAST TWO CONCRETE CYLINDERS WILL BE MADE IN THE MORNING AND AT LEAST TWO CONCRETE CYLINDERS MADE 25 IN THE AFTERNOON DURING EACH DAY CONCRETE IS PLACED. IF THE AMOUNT OF CONCRETE POURED IN EITHER THE MORNING OR AFTERNOON EXCEEDS 30 CUBIC YARDS, AN ADDITIONAL TWO CYLINDERS SHALL BE MADE. SLUMP AND ENTRAINED AIR CONTENT MUST BE MAINTAINED AND TESTED AND TESTED WHEN MORE THAN 10 CU. YDS. OF CONCRETE IS PLACED. A MINIMUM OF ONE TEST BEAM WILL BE TAKEN IN THE MORNING AND ONE IN THE AFTERNOON ON ALL CLASS MS CONCRETE INSTALLED. IN EACH GROUP OF TWO CYLINDERS, ONE WILL BE BROKEN AT 7 DAYS AND ONE AT 28 DAYS AFTER THEY ARE MADE. THE CYLINDERS MUST BE TAKEN AND TESTED BY AN APPROVED TESTING LABORATORY IN ACCORDANCE WITH ASTM METHODS. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAKING ALL THE ARRANGEMENTS FOR THE TESTING UNLESS OTHERWISE SPECIFIED. WRITTEN REPORTS FOR ALL INSPECTION AND TESTING SHALL BE SUBMITTED TO THE OWNER AND THE CITY FOR APPROVAL.

CURBS:

CURBS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ODOT 609, CAST IN PLACE CONCRETE CURB AND GUTTER. FOR STRUCTURES LOCATED IN CURB AND GUTTER SECTIONS A BOX OUT IS REQUIRED USING AN EXPANSION JOINT WITH 1" PERFORMED EXPANSION JOINT FILLER ITEM 705.03 OR RUBBERIZED EXPANSION AND 1" X 18" SMOOTH DOWEL, GREASED AND SLEEVE ON ONE END WITH A 3" METAL CAP. WHEN TYING INTO EXISTING CURB AND GUTTER TWO (2) ANCHOR HOOK BOLTS ARE REQUIRED. SAW CUTS SHALL BE PERFORMED AT TEN-FOOT INTERVALS AT A DEPTH OF 1/4 THE THICKNESS MINIMUM ON THE SAME DAY AS PLACEMENT. SAW CUT TOP OF CURB TO MARK LOCATION OF UTILITIES W - WATER. CURB CUTS ARE THE RESPONSIBILITY OF THE CONTRACTOR OR OWNER. PERMITS & BONDS ARE REQUIRED. CURB CUTS MUST BE CUT PROFESSIONALLY IN ORDER TO GET BOUND RETURNED. BONDS ARE RETURNED AFTER ACCEPTANCE.

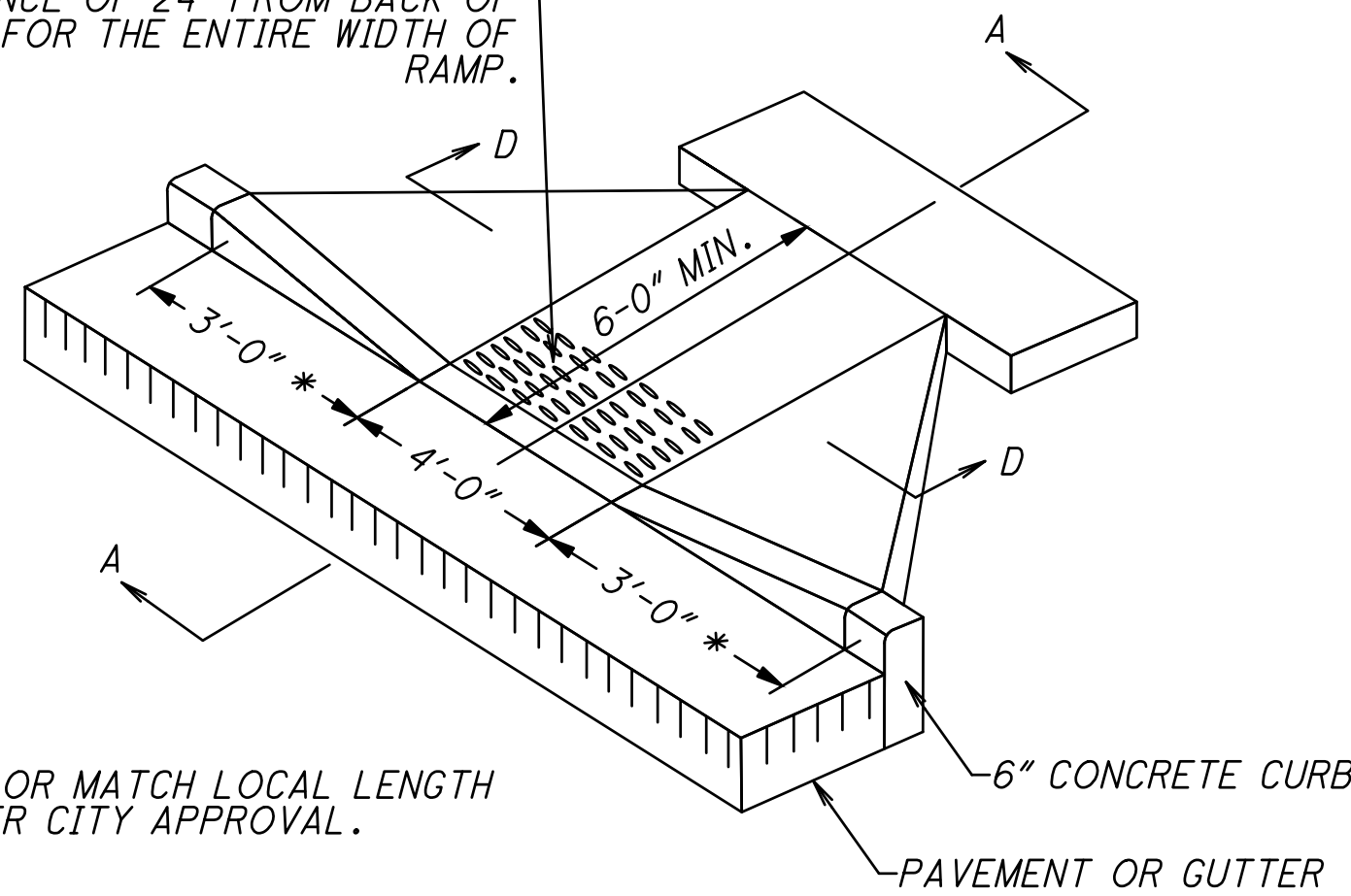


**CONCRETE WALKS**

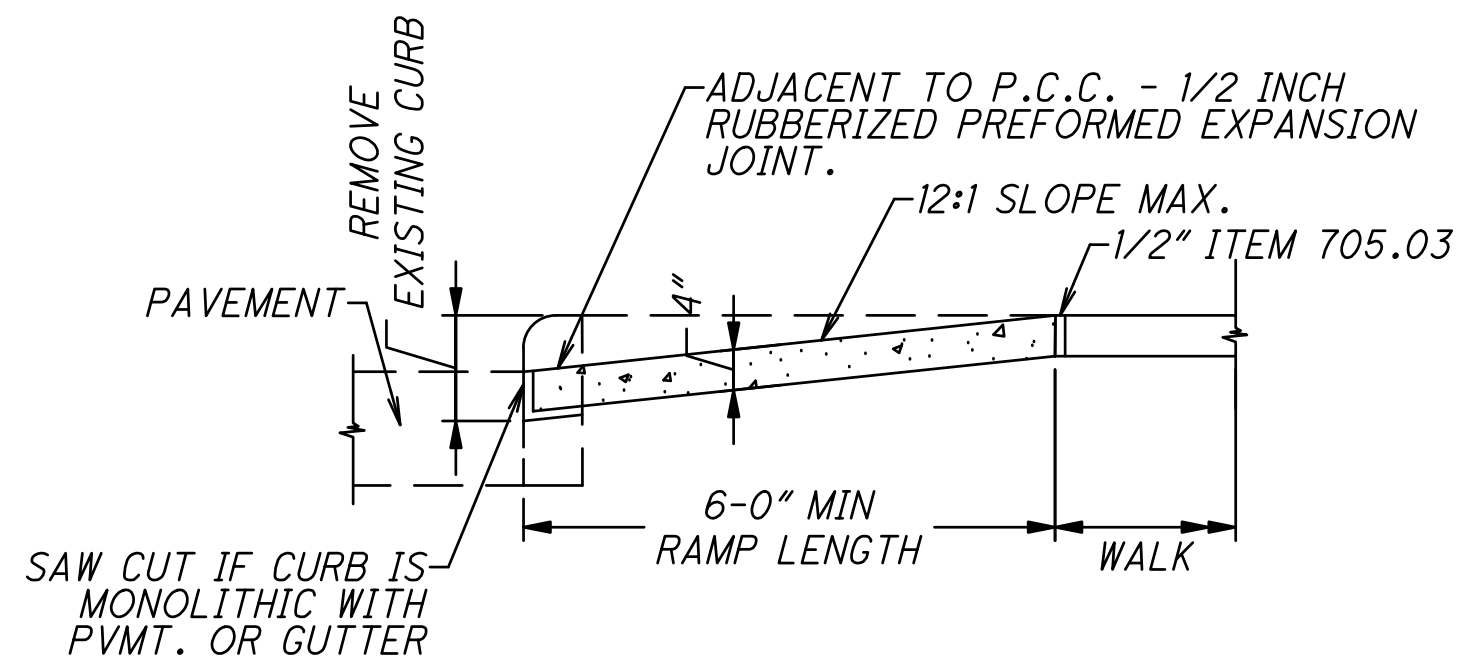
NOTES:

- CROSS SLOPES FOR WALKS = 3/16" PER FOOT.
- PROVIDE TOOL IMPRESSED JOINTS 1/4" WIDE MINIMUM 1" DEEP AT 5' INTERVALS. EXPANSION CONTROL JOINT SHALL BE PROVIDED EVERY 100' INTERVALS UNLESS OTHERWISE NOTED ON THE PLANS. USE ONLY 1/2" JOINT MATERIALS FULL DEPTH. RUBBERIZED EXPANSION SHALL BE FLUSH WITH CONCRETE EDGES.
- BROOM FINISH PERPENDICULAR TO TRAFFIC FLOW. TROWEL FINISH EDGES. APPLY CURING AND SEALING COMPOUNDS PER ODOT 451.11.
- ALL SIDEWALKS SHALL HAVE THE FOLLOWING THICKNESS:
  - 4" TYPICAL THICKNESS
  - 6" RESIDENTIAL DRIVE APRONS (5' ON EACH SIDE OF DRIVE)
  - 8" COMMERCIAL DRIVE APRONS (5' ON EACH SIDE OF DRIVE)

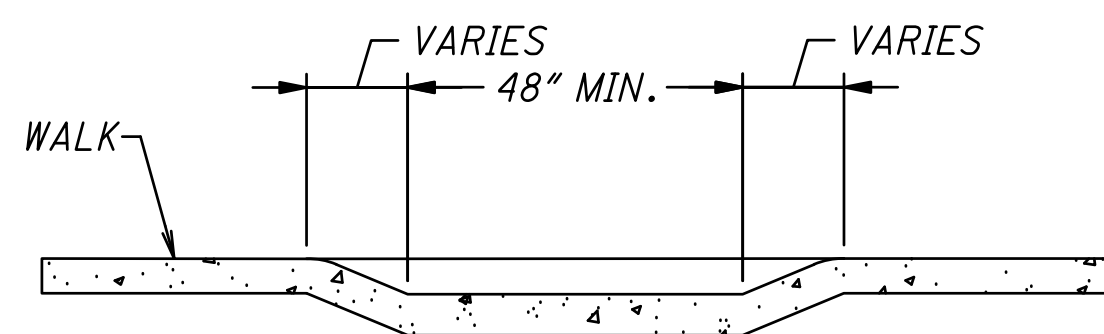
DETECTABLE WARNINGS (TRUNCATED DOMES) ARE TO BE INSTALLED FOR A DISTANCE OF 24" FROM BACK OF CURB FOR THE ENTIRE WIDTH OF RAMP.



\* OR MATCH LOCAL LENGTH PER CITY APPROVAL.



SECTION A-A EXISTING WALK DETAIL



SECTION D-D

**PAVEMENT:**  
WALK AND CURB, ITEMS 608 AND 609, SHALL BE MEASURED THROUGH THE CURB RAMP AREA AND PAID FOR UNDER THEIR RESPECTIVE ITEMS. ITEM "608, EACH, CURB RAMP" CONSTRUCTED IN CURB AND WALK SHALL INCLUDE THE COST OF ANY ADDITIONAL MATERIALS, GRADING, FORMING AND FINISHING. ITEM "608, SQUARE FOOT, CURB RAMP" CONSTRUCTED IN EXISTING CURB AND WALK SHALL INCLUDE THE COST OF ANY ADDITIONAL MATERIALS, GRADING, FORMING AND FINISHING OF THE CURB AND WALK OF THE CURB RAMP. REMOVAL OF EXISTING CURB AND WALK SHALL BE PAID UNDER ITEM 202.

**SURFACE TEXTURE:**  
SHALL BE OBTAINED COARSE BROOMING TRANSVERSE TO THE RAMP SLOPES AND SHALL BE ROUGHER THAN ADJACENT WALKS. DETECTABLE WARNINGS (TRUNCATED DOMES) ARE TO BE INSTALLED FOR A DISTANCE OF 24" FROM BACK OF CURB FOR THE ENTIRE WIDTH OF RAMP.

**ACCEPTABLE MANUFACTURES AND PRODUCTS ARE:**

1. ADA PLASTIC INSERT  
12 ANCHOR LOCATIONS  
1.670" IN LINE TRUNCATED DOMES  
SIZE: 12" X 36"  
COLOR: RED

**JOINTS**  
SHALL BE PROVIDED IN THE CURB RAMP AS EXTENSIONS OF WALK JOINTS AND CONSISTENT WITH 608.03 REQUIREMENTS FOR A NEW CONCRETE WALK. A 1/2 INCH 705.03 EXPANSION JOINT FILLER SHALL BE PROVIDED ROUND THE EDGE OF RAMPS BUILT IN EXISTING CONCRETE WALK. LINES SHOWN ON THIS DRAWING INDICATE THE RAMP EDGE AND SLOPE CHANGES AND ARE NOT NECESSARILY JOINT LINES.

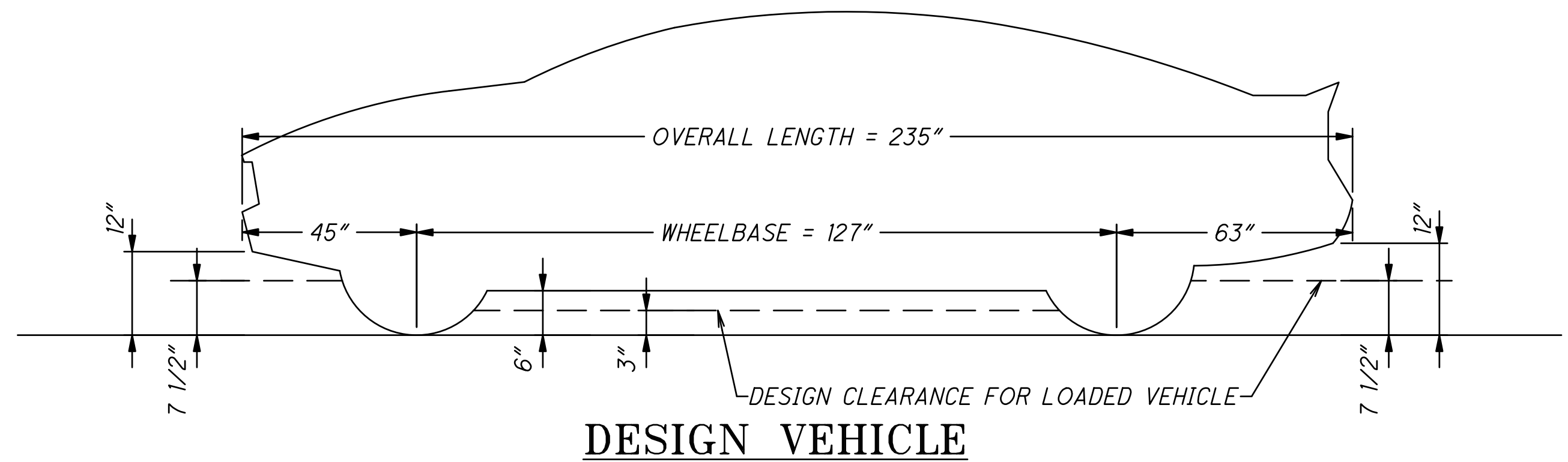
**DIMENSIONS, LOCATIONS AND TYPE**

**TYPE:**  
SHAPE OF CURB RAMP BUILT SHALL BE THE TYPE THAT BEST FITS THE LOCATION UNLESS A TYPE IS SPECIFIED IN THE PLANS. CURB RAMPS (FLARED SIDES) SHOULD BE USED AT LOCATIONS WHERE PEDESTRIANS MUST WALK ACROSS THE RAMP AT AN ANGLE. CURB RAMPS (STEEP SIDE) SHOULD BE USED WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS OR PERPENDICULAR TO THE CENTERLINE OF THE RAMP. SIDES OF THESE RAMPS MUST BE PARALLEL TO THE PEDESTRIAN FLOW.

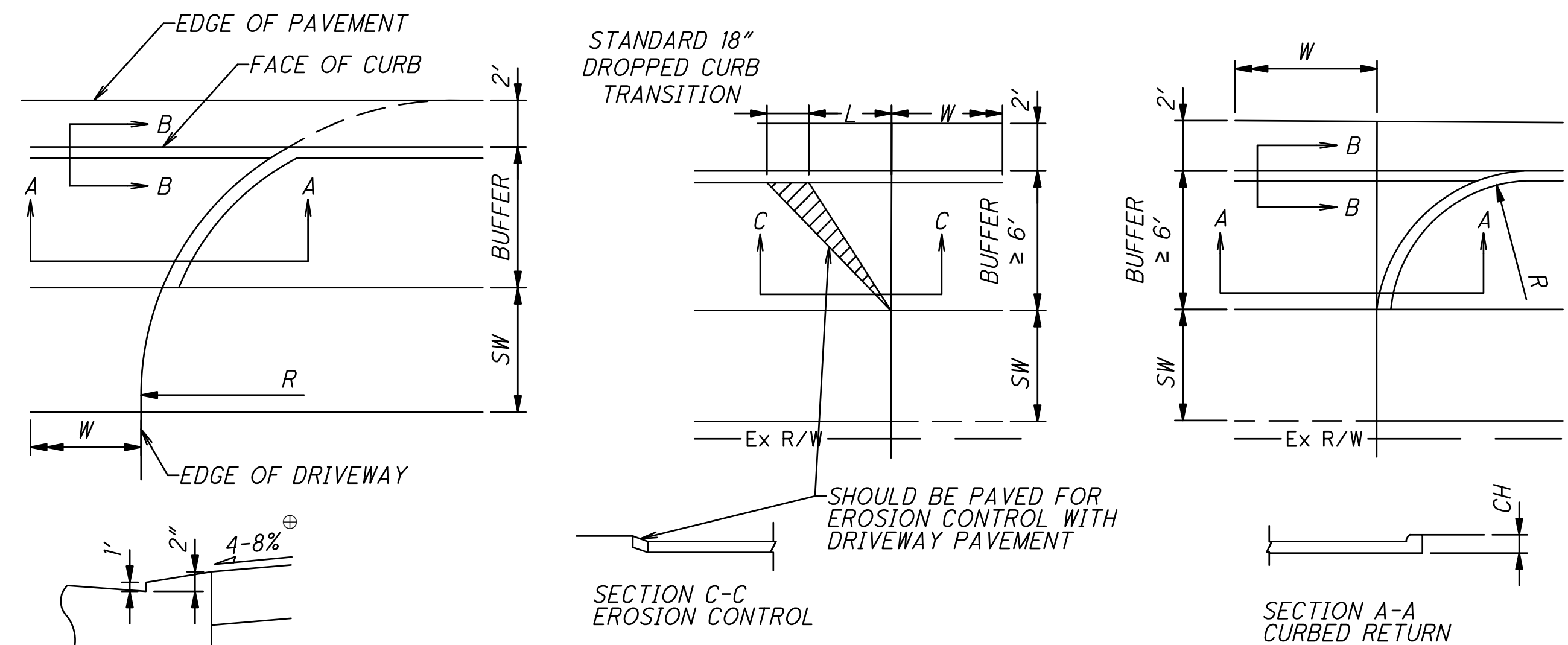
**SLOPE:**  
SLOPE OF THE RAMP TOWARD THE CURB IS PREFERRED TO BE 12:1 OR FLATTER RELATIVE TO THE HORIZONTAL BUT THE MAXIMUM SLOPE SHALL BE 12:1 RELATIVE TO THE EXISTING OR PROPOSED WALK SLOPE. THE MINIMUM RAMP LENGTH IS 6 FT. FROM THE BACK OF A 6 IN. CURB AND MAY BE INCREASED WHERE FEASIBLE TO OBTAIN A FLATTER RAMP SLOPE OR TO BETTER BLEND WITH THE WALK CONFIGURATION.

**WIDTH:**  
WIDTH OF RAMP SHALL NORMALLY BE 4 FT. BUT A MINIMUM WIDTH OF 3 FT. MAY BE USED TO BETTER FIT THE WALK CONFIGURATION OR WHERE SITE CONDITIONS ARE RESTRICTED BY NARROW WALKS, POLE FOUNDATIONS, DRAINAGE INLETS, ETC. THE WIDTH MAY BE TAPERED.

**WALK THICKNESS:**  
WALK THICKNESS IN THE RAMP SLOPES SHALL BE 4 IN. MINIMUM OR THICKER AS NECESSARY TO MATCH ADJACENT WALK THICKNESS.

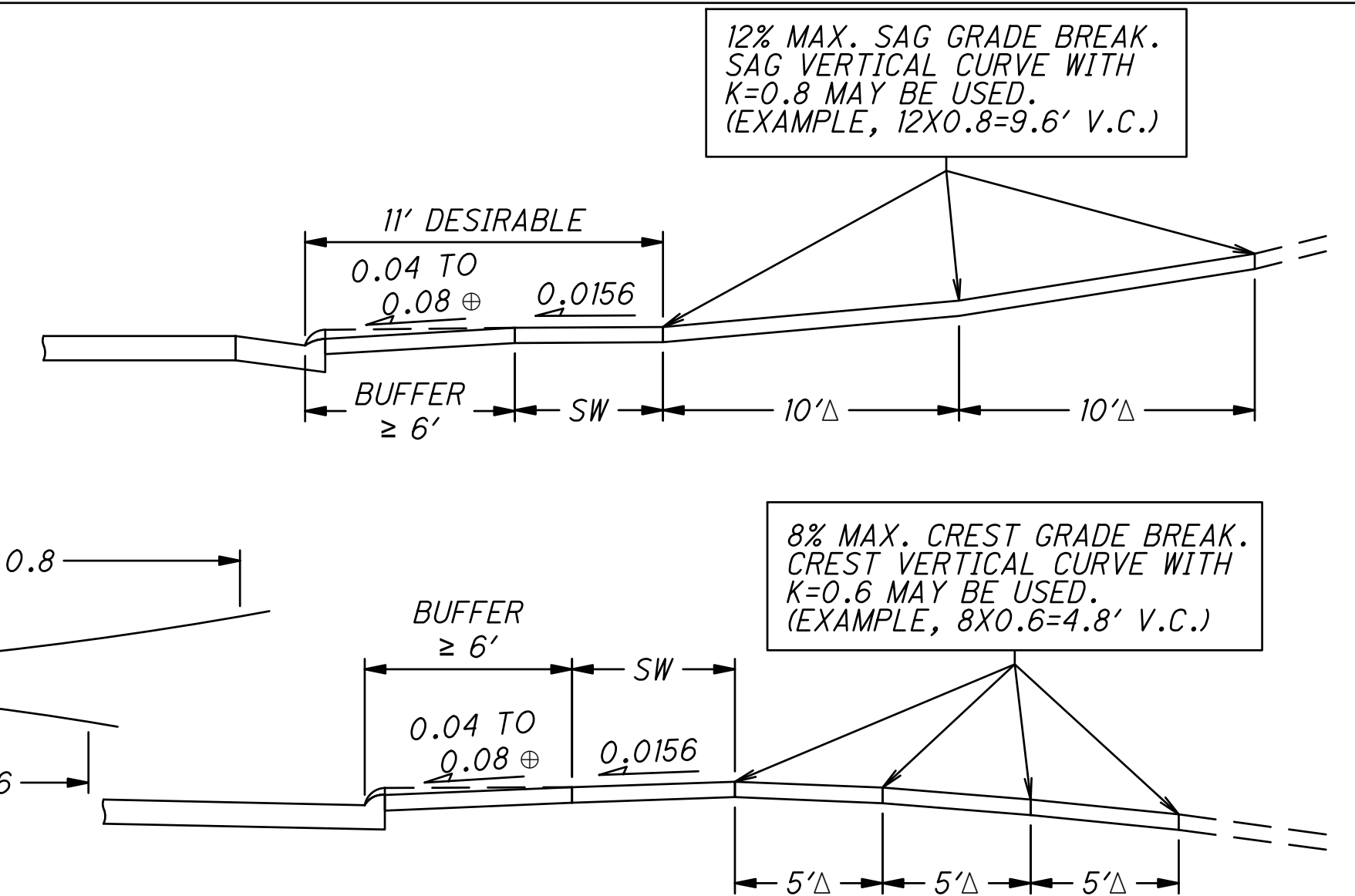


DESIGN VEHICLE



DRIVES WITH CURB AND SIDEWALK (PLAN VIEW OF THREE APRON DESIGNS)

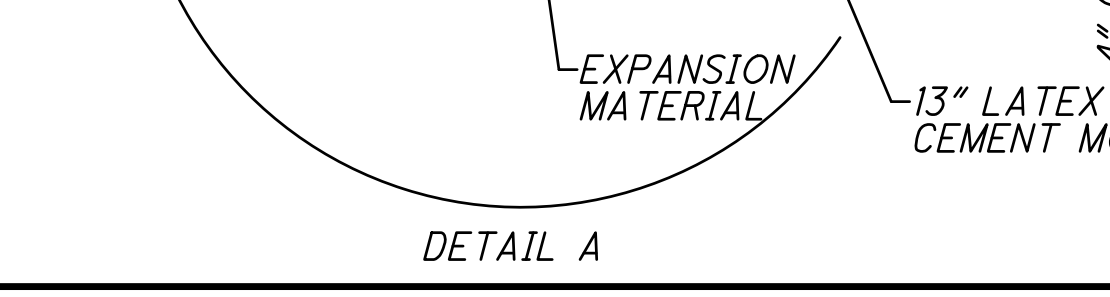
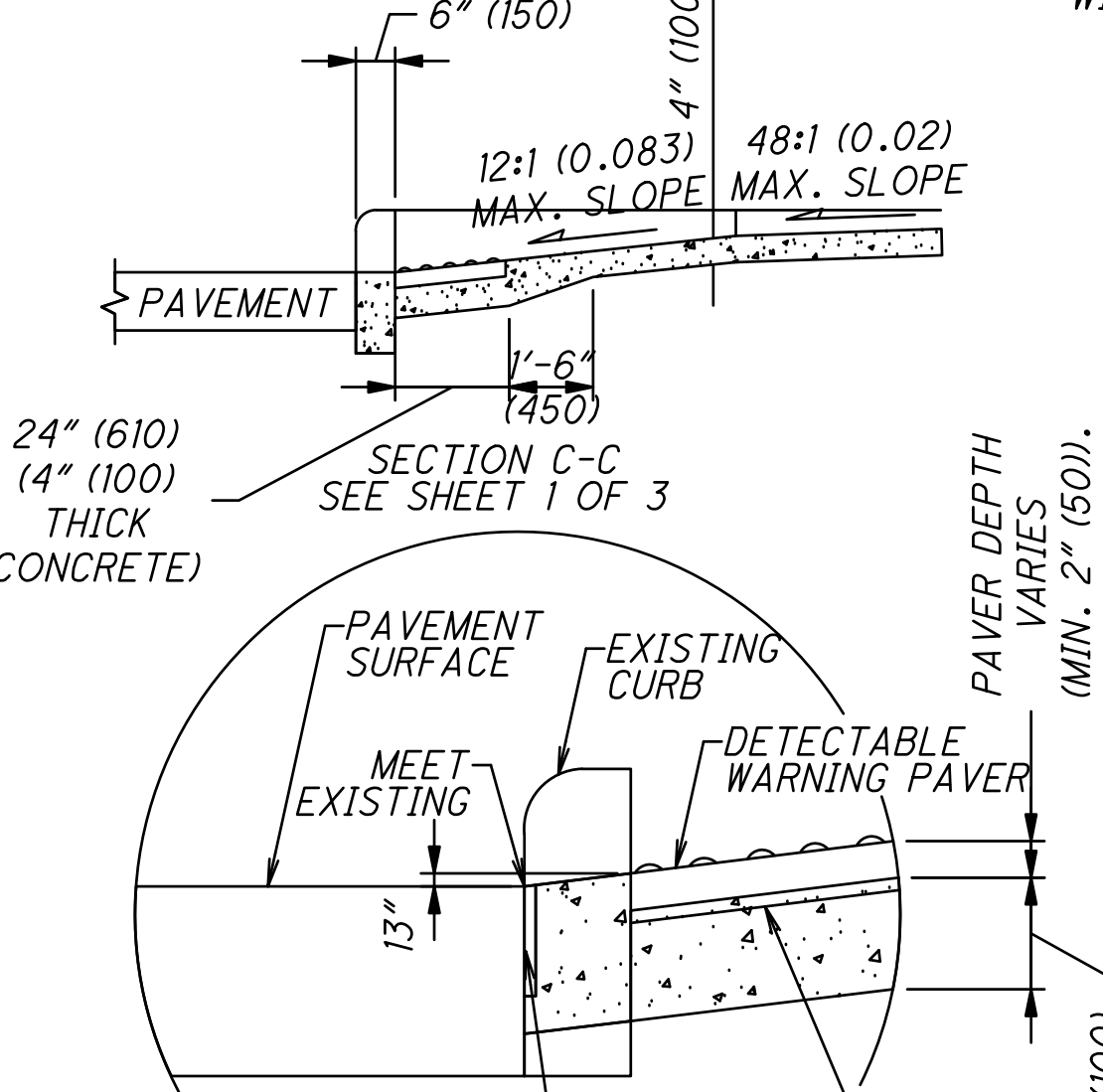
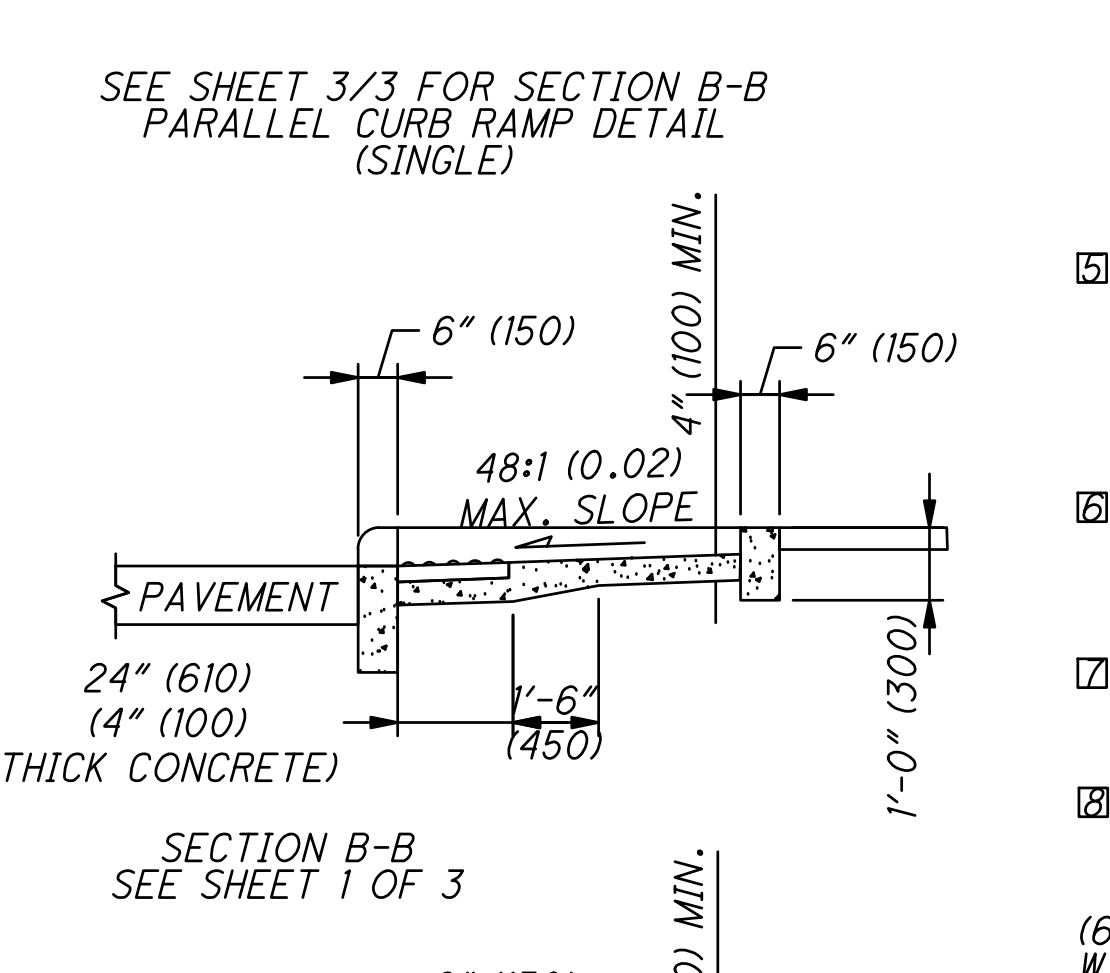
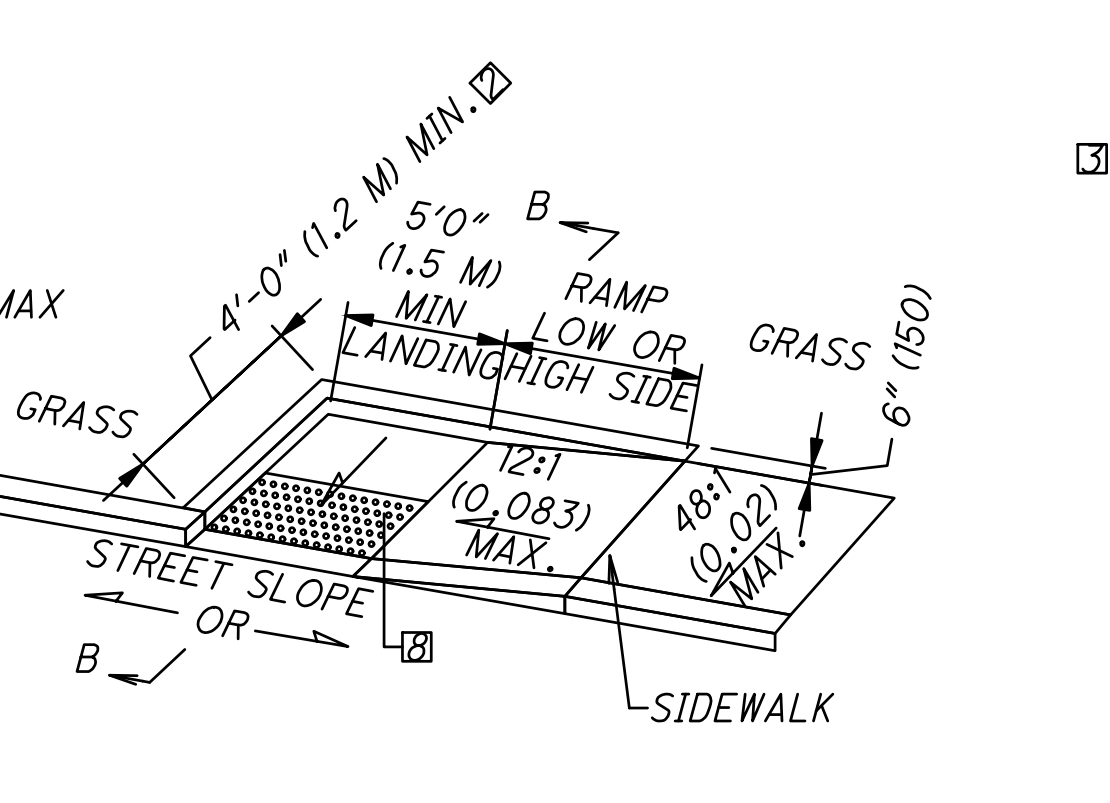
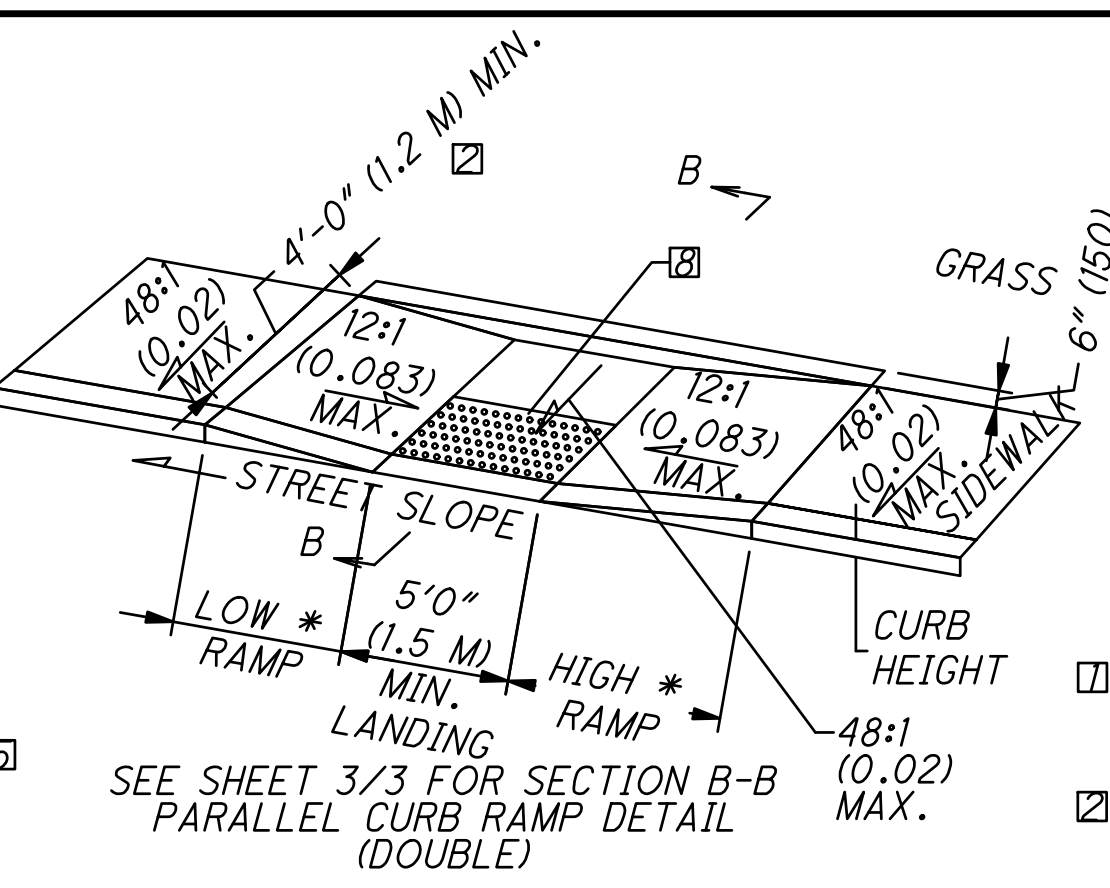
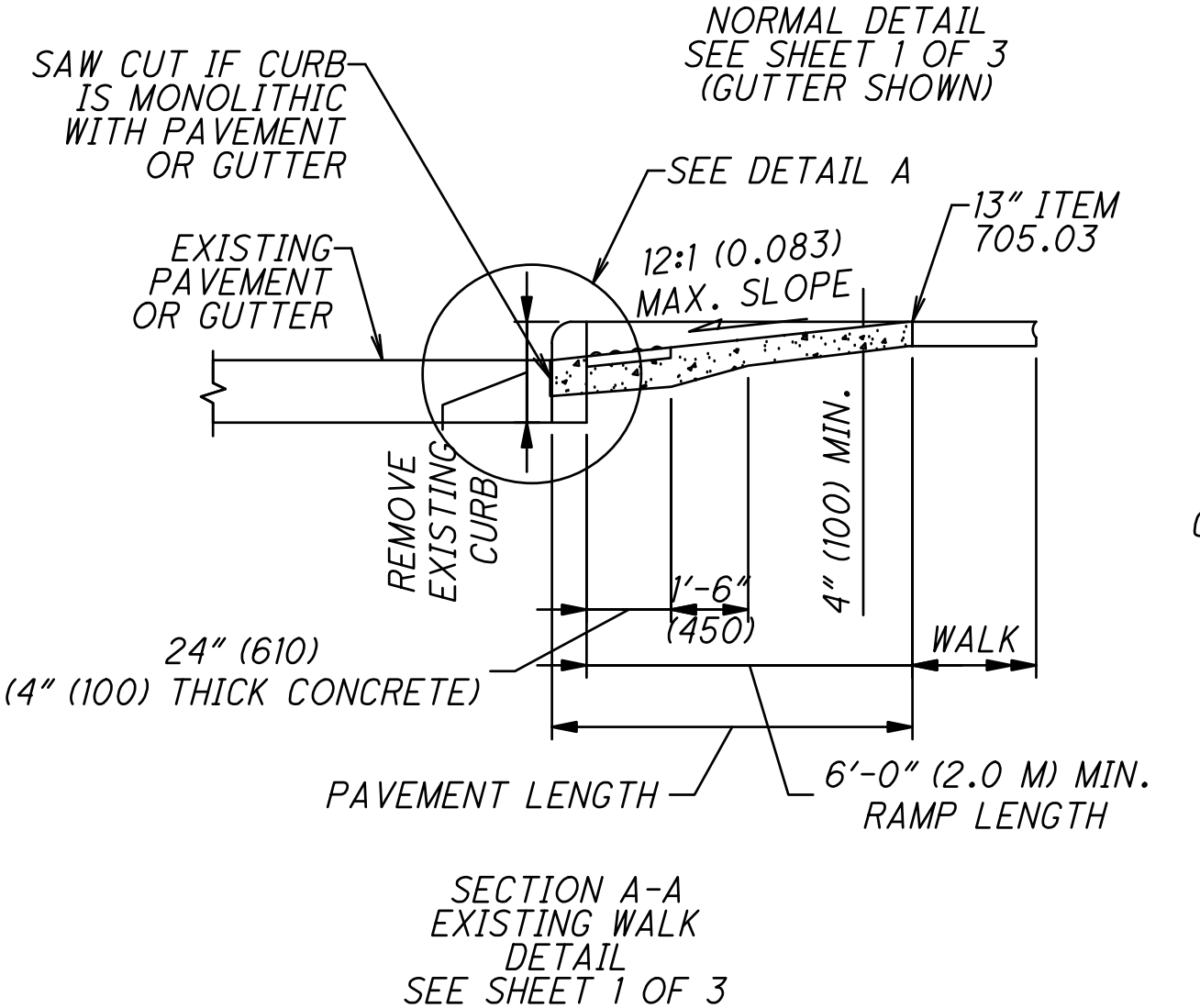
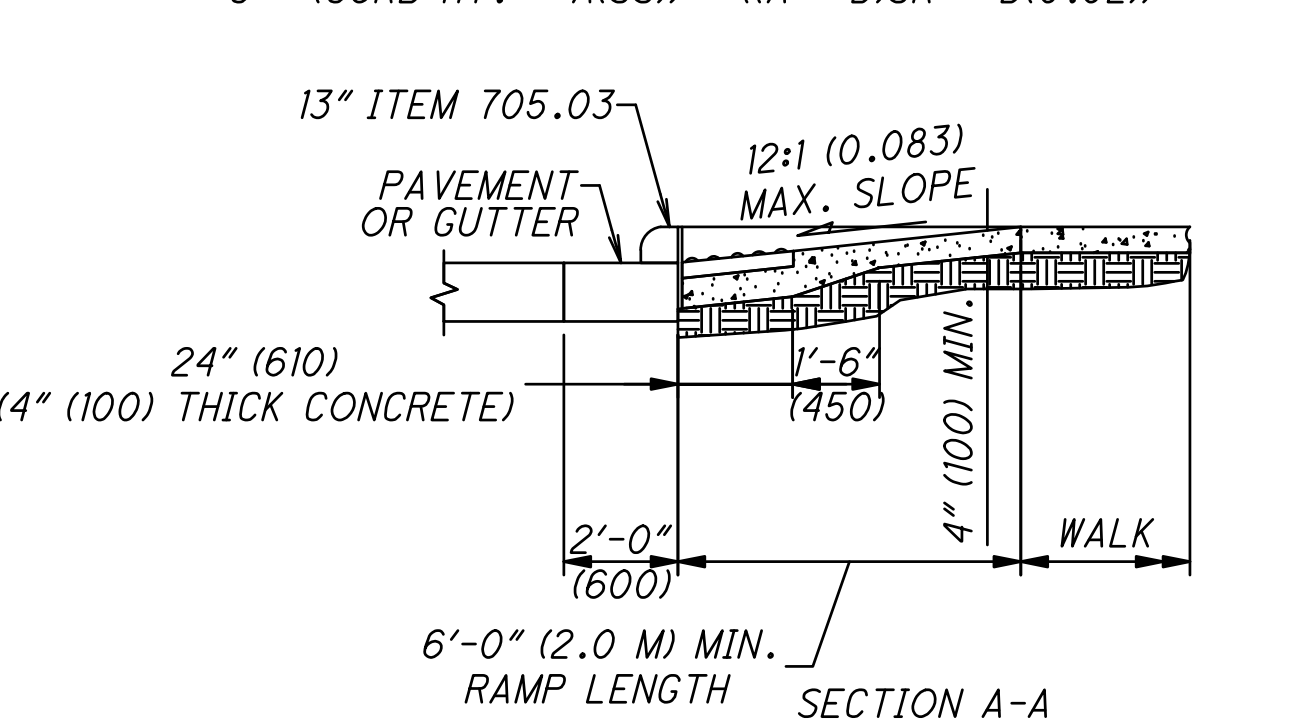
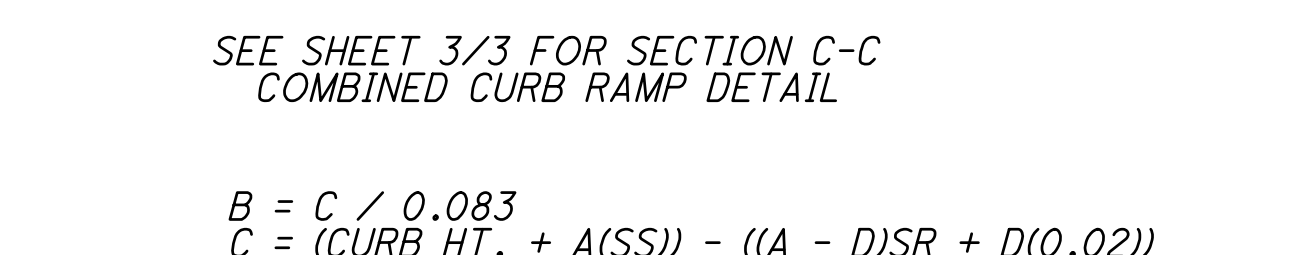
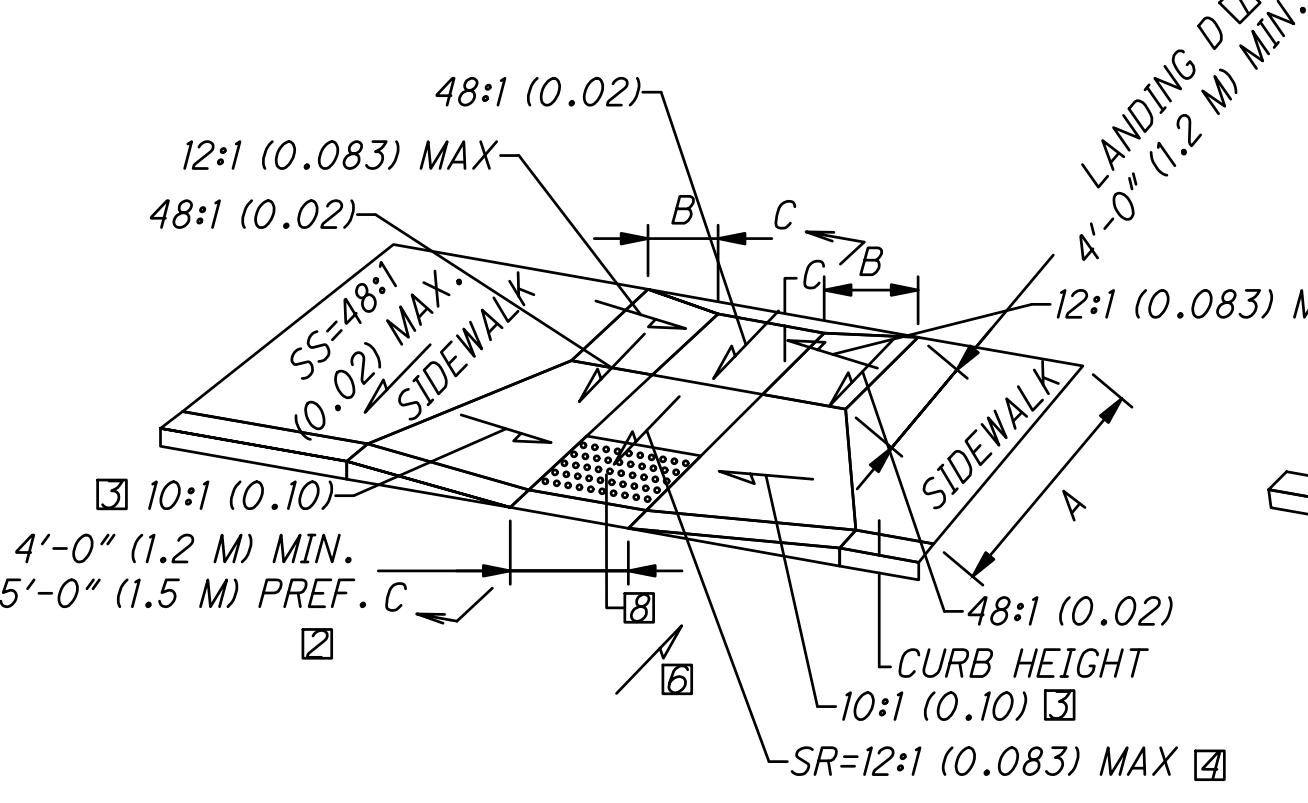
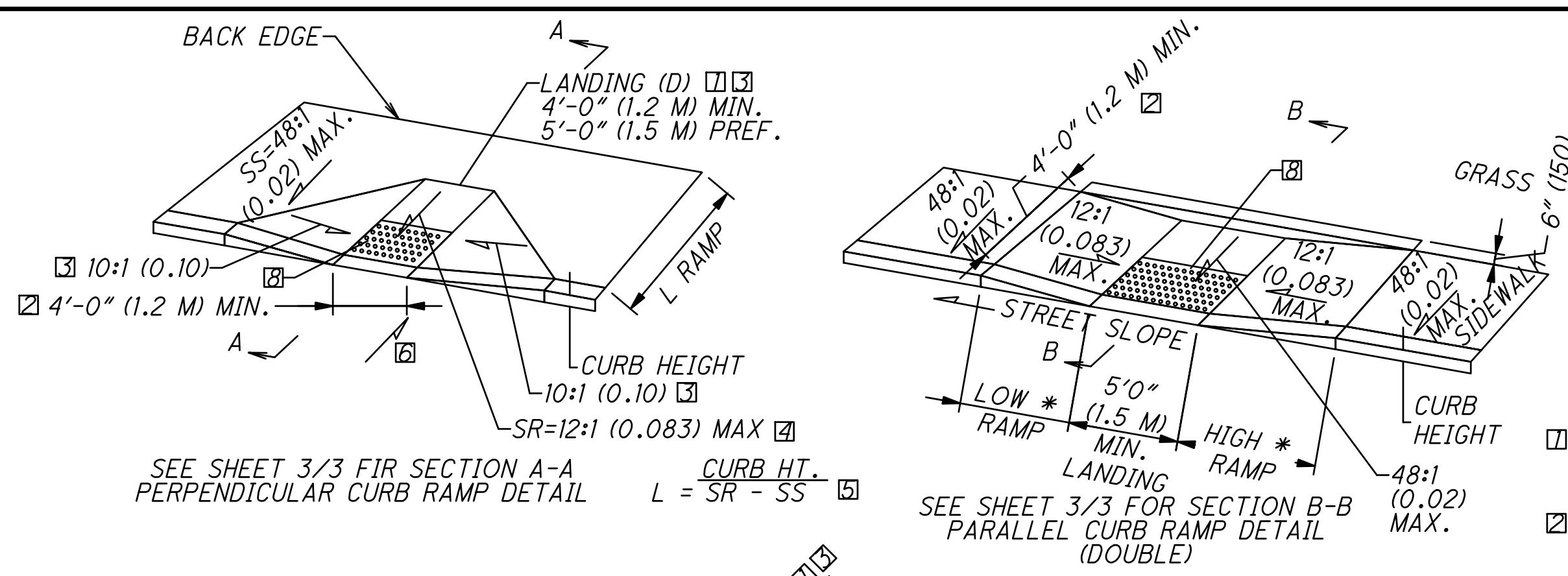
- LEGEND**
- R = 3' MIN.
  - L = 1/2" BUFFER WIDTH, 1'-6" MIN.
  - W = DRIVEWAY WIDTH, 5' TYP.
  - CH = CURB HEIGHT. VARIABLE HEIGHT.
  - 0" AT SIDEWALK
  - Δ = MINIMUM GRADE LENGTH
  - ⊕ = BUFFER > 6' WILL HAVE A FLATTER SLOPE



RESIDENTIAL DRIVEWAY PROFILES 6' OR GREATER BUFFER

JANUARY 2022





STREET SLOPE	RAMP LENGTH @ 1"/FT (0.083) LOW SIDE *	RAMP LENGTH @ 1"/FT (0.083) HIGH SIDE *
0.01	5'-6" (1.7 M)	7'-2" (2.2 M)
0.02	5'-0" (1.5 M)	8'-4" (2.5 M)
0.03	4'-6" (1.4 M)	10'-0" (3.0 M)
0.04	4'-2" (1.3 M)	12'-6" (3.8 M)
0.05	3'-10" (1.2 M)	16'-8" (5.1 M)

\* MEASURED ALONG THE BACK OF A 6" (150) HIGH CURB.

HIGH =  $\frac{\text{CURB HT.}}{0.083 - \text{STREET SLOPE}}$

LOW =  $\frac{\text{CURB HT.}}{0.083 - \text{STREET SLOPE}}$

- MAY BE REDUCED TO 3'-0" (915) IN EXISTING SIDEWALKS IF THE LANDING IS UNCONSTRAINED ALONG THE BACK EDGE
- MAY BE REDUCED TO 3'-4" (1.02 M) IN EXISTING SIDEWALKS TO BETTER FIT THE WALK CONFIGURATION OR WHERE SITE CONDITIONS ARE RESTRICTED BY NARROW WALKS, POLE FOUNDATIONS, DRAINAGE INLETS, ETC. THE WIDTH MAY BE TAPERED.

- WHERE LANDING WIDTH (D) HAS BEEN REDUCED TO 3'-0" (915) THE FLARED SIDES SHALL HAVE A MAXIMUM SLOPE OF 12:1 (0.083). FLARED SIDES ARE NOT REQUIRED WHERE THE EDGES OF A CURB RAMP ARE PROTECTED BY LANDSCAPING OR OTHER BARRIERS TO TRAVEL BY WHEEL CHAIR USERS OR PEDESTRIANS ACROSS THE EDGE OF THE CURB RAMP. HOWEVER, IF THE FLARED SIDES ARE USED IN THESE AREAS, THEY MAY BE OF ANY SLOPE. THE SLOPE OF THE RAMP TOWARD THE CURB IS PREFERRED TO BE 12:1 (0.083) OR FLATTER RELATED TO THE HORIZONTAL, BUT THE MAXIMUM SLOPE SHALL BE 12:1 (0.083) RELATIVE TO THE EXISTING OR PROPOSED WALK SLOPE.
- IN EXISTING SIDEWALKS, WHERE THE MAXIMUM RAMP SLOPE (SR) IS NOT FEASIBLE, IT MAY BE REDUCED AS FOLLOWS:
  - A. 10:1 (0.10) FOR A MAX. RISE OF 6" (150),
  - B. 8:1 (0.125) FOR A MAX. RISE OF 3" (75)
  - C. 6:1 (0.167) OVER A MAX. RUN OF 2'-0" (610) FOR HISTORIC AREAS WHERE A FLATTER SLOPE IS NOT FEASIBLE.

- THE MINIMUM LENGTH OF A PERPENDICULAR RAMP IS 6' (2.0 M) FROM THE BACK OF A 6" (150) CURB AND MAY BE INCREASED WHERE FEASIBLE TO OBTAIN A FLATTER RAMP SLOPE OR TO BETTER BLEND WITH THE WALK CONFIGURATION.
- GUTTER COUNTER SLOPES AT THE FOOT OF PERPENDICULAR CURB RAMP SHOULD NOT EXCEED 20:1 (0.05) OVER A DISTANCE OF 2'-0" (610) FROM THE CURB.
- DIMENSIONS DERIVED BY EQUATION ARE NOMINAL. CONSTRUCT RAMPS TO MEET REQUIRED SLOPES AND EXISTING CONDITIONS.
- DETECTABLE WARNINGS (TRUNCATED DOMES) ARE TO BE INSTALLED IN THE LOCATION SHOWN. DIMENSIONS OF THE DOMES ARE 24" (610) FROM THE BACK OF THE CURB BY THE WIDTH OF THE RAMP. SEE NOTES ON SHEET 3

**NOTES**

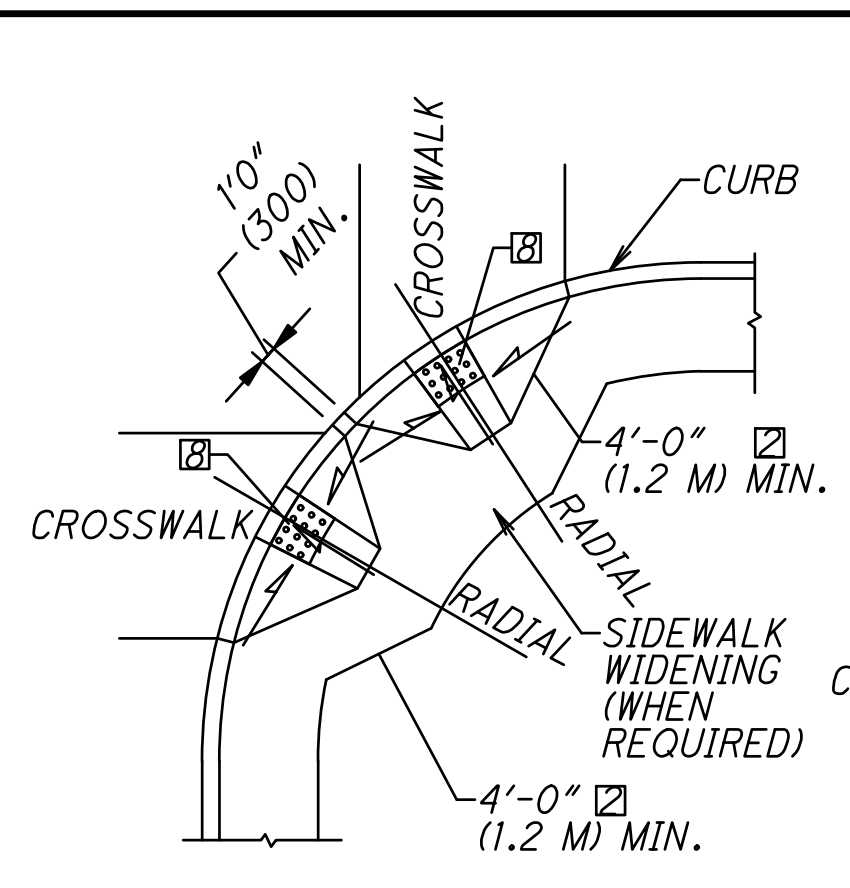
**SURFACE TEXTURE:** TEXTURE OF CONCRETE SURFACES SHALL BE OBTAINED BY COARSE BRUSHING TRANSVERSE TO THE RAMP SLOPES AND SHALL BE ROUGHER THAN ADJACENT WALK.

**TRUNCATED DOMES:** INSTALL DETECTABLE WARNINGS (TRUNCATED DOMES) FOR A DISTANCE OF 24" (610) FROM THE BACK OF THE CURB FOR THE ENTIRE WIDTH OF THE RAMP OPENING AS SHOWN ON DETAILS ON SHEET 1.

PAVERS WILL MEET ASTM C 902 CLASS SX, TYPE 1, OR C 96, OR 1272 TYPE R.

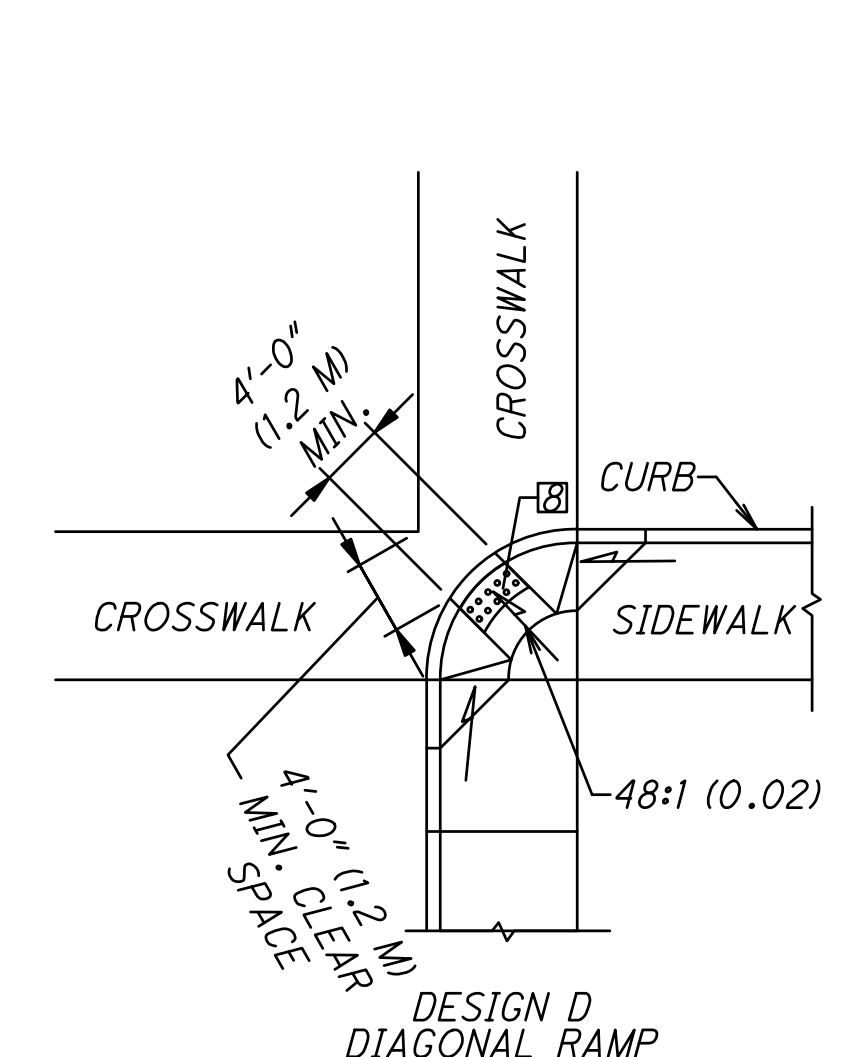
ACCEPTABLE MANUFACTURERS AND PRODUCTS ARE:

- WHITACRE-GREER FIREPROOFING COMPANY, 1400 S. MAHONING AVE, ALLIANCE, OH, 44601, ADA PAVER, 4"x8"x2-1/4", CLEAR RED (RUSTIC) #30.
- HANOVER ARCHITECTURAL PRODUCTS, 240 BENDER RD., HANOVER, PA. 17331, DETECTABLE WARNING PAVER, 4"x8"x2", RED OR QUARRY RED.
- ENDICOTT CLAY PRODUCTS, PO BOX 17, FAIRBURY, NE, 68352, HANDICAP DETECTABLE WARNING PAVER, 4"x8"x2-1/4", RED BLEND.



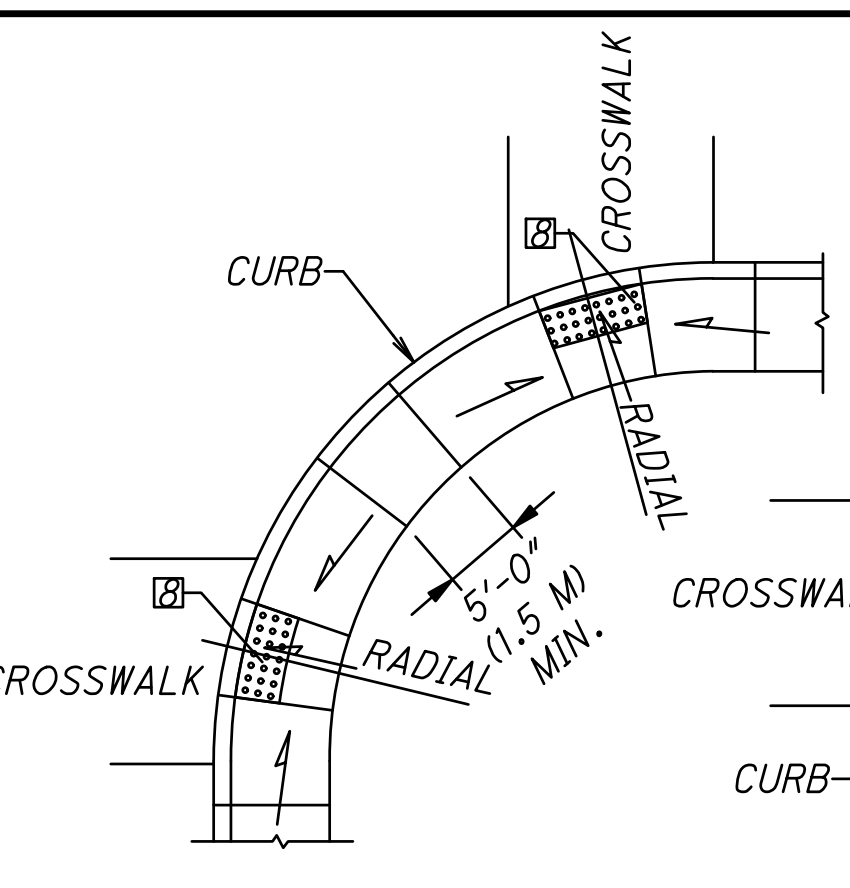
DESIGN A PERPENDICULAR RAMP

FOR LEGEND, SEE SHEET 1.



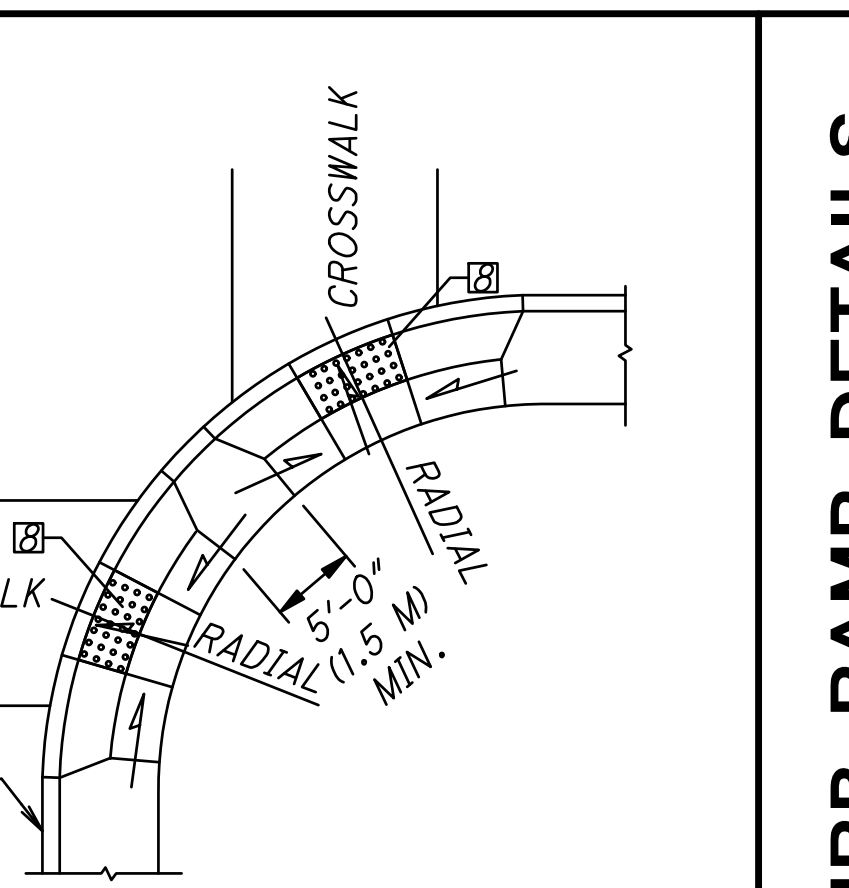
DESIGN D DIAGONAL RAMP

USE IN EXISTING WALKS ONLY AND WHEN SITE CONSTRAINTS PROHIBIT OTHER DESIGNS. THE DIAGONAL RAMP MAY BE PERPENDICULAR, PARALLEL OR COMBINATION. AVOID USING WHERE CURB RADII ARE LESS THAN 20'-0" (6.0 M)

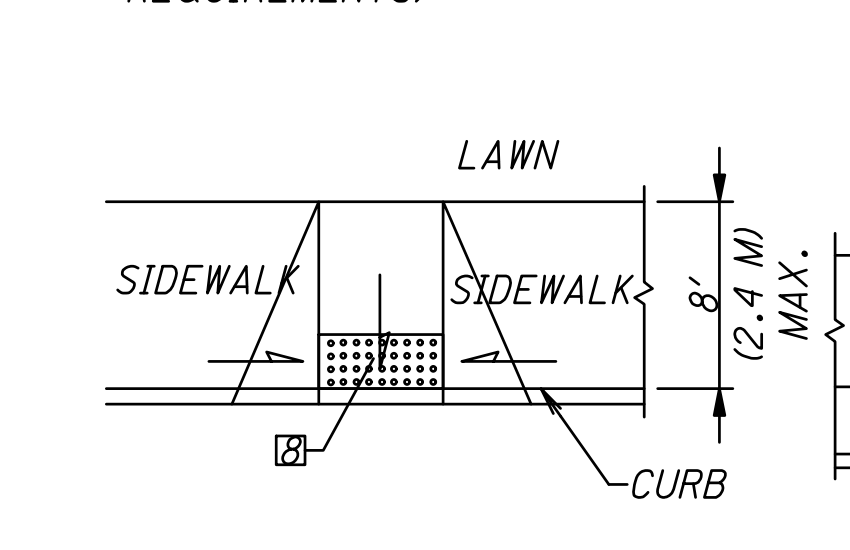


DESIGN B PARALLEL RAMP

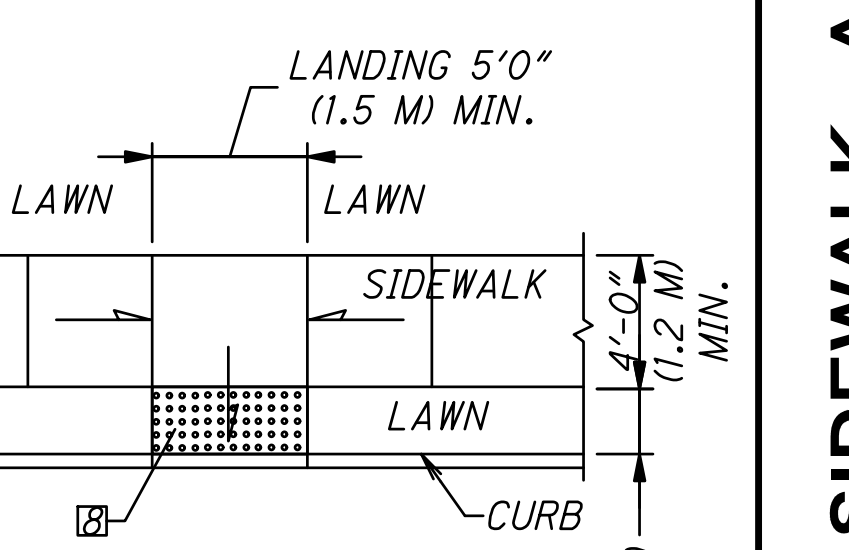
CORNER CURB RAMP DESIGNS (SEE CURB RAMP DETAILS ON SHEET 1/3 FOR ADDITIONAL REQUIREMENTS)



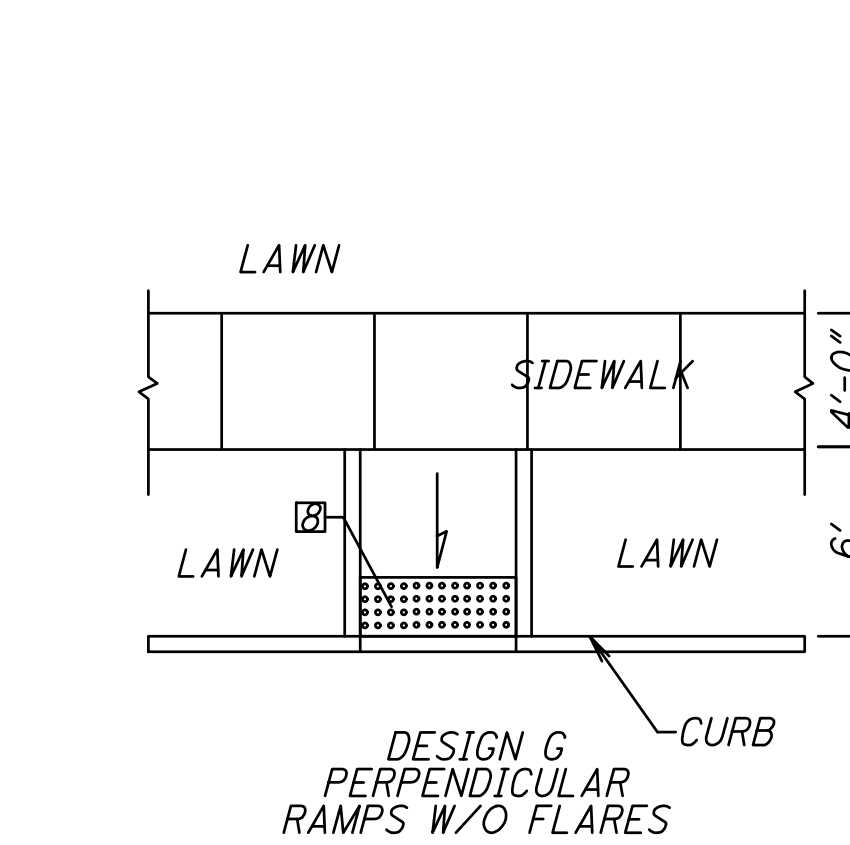
DESIGN C COMBINATION RAMP



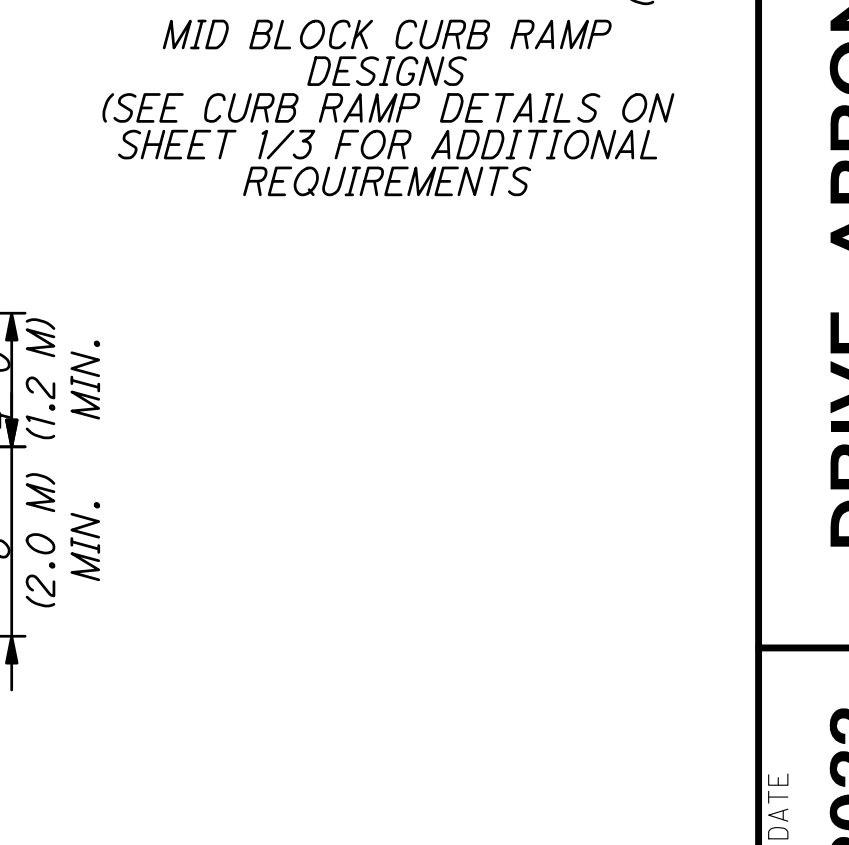
DESIGN E PERPENDICULAR RAMP



DESIGN F PARALLEL RAMP



DESIGN G PERPENDICULAR RAMPS W/O FLARES



MID BLOCK CURB RAMP DESIGNS (SEE CURB RAMP DETAILS ON SHEET 1/3 FOR ADDITIONAL REQUIREMENTS)

**EXPANSION JOINTS:** SHALL BE PROVIDED IN THE CURB RAMP AS EXTENSIONS OF WALK JOINTS AND CONSISTENT WITH ITEM 608.03 REQUIREMENTS FOR A NEW CONCRETE WALK, A 13" ITEM 705.03 EXPANSION JOINT FILLER SHALL BE PROVIDED AROUND THE EDGE OF RAMPS BUILT IN EXISTING CONCRETE WALK. LINES SHOWN ON THIS DRAWING INDICATE THE RAMP EDGE AND SLOPE CHANGES AND ARE NOT NECESSARILY JOINT LINES.

**PAVEMENT:** WALK AND CURB, ITEMS 608 AND 609, SHALL BE MEASURED THROUGH THE CURB RAMP AREA PAID FOR UNDER THEIR RESPECTIVE ITEMS. ITEM 608 - CURB RAMP, AS PER PLAN, EACH CONSTRUCTED IN NEW CURB AND WALK SHALL INCLUDE THE COST OF ANY ADDITIONAL MATERIALS AND INSTALLATION (INCLUDING TRUNCATED DOMES), GRADING, FORMING AND FINISHING. ITEM 608 - CURB RAMP, AS PER PLAN, SQUARE FOOT (METER), CONSTRUCTED IN EXISTING CURB AND WALK SHALL INCLUDE THE COST OF FURNISHING AND INSTALLING ALL MATERIALS (INCLUDING TRUNCATED DOMES), GRADING, FORMING, AND FINISHING OF THE CURB AND WALK OF THE CURB RAMP. REMOVAL OF EXISTING CURB AND WALK SHALL BE PAID FOR UNDER ITEM 202.



1. ALL CONSTRUCTION OF ANY PROJECT SHALL BE IN CONFORMANCE WITH CITY OF STREETSBORO'S CODIFIED ORDINANCE AND THE OHIO REVISED CODE. ALL STORM INLET AND MANHOLE INSTALLATION SHALL CONFORM TO ODOT ITEM 611 IF NOT SPECIFIED HEREIN.
2. GENERAL
  - A. STORM SEWER STRUCTURES SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE FOLLOWING ODOT SPECIFICATIONS
  - B. INVERTS: WHERE THERE ARE CHANGES IN THE DIRECTION OF THE SEWER OR ENTERING BRANCHES TO THE MANHOLE, THE CENTERLINE OF THE INVERT SHALL HAVE A TRUE CURVE OF A RADIUS, AS THE SIZE OF THE MANHOLE WILL PERMIT. CATCH BASINS AND INLET BASINS SHALL HAVE POURED AND FINISHED CONCRETE PAVED INVERT FLOORS UNLESS A SUMP IS REQUIRED PER PLANS.
  - C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY MAINTAINING STORM FLOW DURING THE DURATION OF CONSTRUCTION. THE CONTRACTOR'S METHOD FOR MAINTAINING FLOW SHALL BE APPROVED BY THE CITY ENGINEER.
  - D. ALL REPAIRS FOR REPLACEMENT OF CONDUIT SECTIONS SHALL USE RIGID REINFORCED FENCO STYLE COUPLINGS AS PER APPROVED BY THE CITY ENGINEER. REPAIR SHALL BE NONPROTRUDING PROVIDING MATCHING DIAMETERS OF CONDUIT.
  - E. OFFSET: OFFSET SHALL BE SET TO AVOID SIDEWALKS, CURBS AND/OR UNDERDRAINS.
  - F. COLD WEATHER: IF THE WORK IS CARRIED OUT IN COLD WEATHER, BELOW 40 DEGREES F, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROVIDE THE NECESSARY MEANS FOR HEATING CONCRETE AND MORTAR AND FOR COMPLYING WITH ALL THE REQUIREMENTS OF THE SPECIFICATIONS HEREIN.
  - G. ALL CONDUITS ENTERING MANHOLES SHALL HAVE A SMOOTH INTERIOR WITH POSITIVE FLOW CONSTRUCTED IN CHANNEL.
  - H. CONDUIT BURIAL DEPTHS SHALL ADHERE TO MANUFACTURE PIPE REQUIREMENTS OR AS APPROVED BY THE CITY ENGINEER.
  - I. LINE AND GRADE CONTROL: THE LINE AND GRADE OF SEWER MAINS SHALL BE CONTROLLED DURING THE SEWER CONSTRUCTION BY USE OF AN APPROVED LASER DEVICE. THE LINE AND GRADE SHALL BE "CHECKED" FROM LINE AND GRADE STAKES AT A MAXIMUM OF FIFTY FOOT (50) INTERVALS. A MINIMUM OF 1% SLOPE AND 10% MAXIMUM SLOPE SHALL BE MAINTAINED WITH A MINIMUM COVER OF THREE (3) FOOT DEPTH FROM FINAL GRADE.
  - J. SERVICE CONNECTIONS SHALL BE LOCATED A MINIMUM OF 5 FEET FROM ANY OTHER UTILITY. ADJUSTMENTS TO OFFSET SHALL BE APPROVED BY THE CITY ENGINEER.
  - K. AT ALL STORM SEWER MAIN INTERSECTION CROSSINGS LESS THAN 18", THE UPPER CONDUIT SHALL BE BRIDGED OVER THE LOWER CONDUIT BY CONSTRUCTION OF CONCRETE SUPPORT. (SEE DETAIL)
  - L. WHEN EVER UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED THE AREA SHALL BE STABILIZED TO THE SATISFACTION OF THE ENGINEER. ALL CONDUIT SHALL BE INSTALLED A FIRM BED FOR THE FULL LENGTH IN ACCORDANCE WITH ODOT 6033 UNLESS OTHERWISE SPECIFIED.
  - M. AS-BUILT AUTOCAD AND PDF DRAWINGS SHALL BE SUBMITTED TO THE CITY WITHIN 60 DAYS AFTER IMPROVEMENTS HAVE BEEN APPROVED AND ACCEPTED BY CITY. ELECTRONIC AUTOCAD 2015 OR NEWER VERSION INCLUDING PDF FORMAT SHALL INCLUDE PROFESSIONAL SURVEY P.S. STAMP AND SIGNATURE ON COVER PAGE. CONTACT STREETSBORO ENGINEERING DEPARTMENT CONCERNING REQUIREMENTS. SURVEYOR SHALL ALSO PROVIDE A SEPARATE LIST OF ALL SURVEY MONUMENTS FOUND AND/OR USED WITH THEIR RESPECTIVE COORDINATES.

### 3. VIDEO TAPING

- A. GENERAL REQUIREMENTS: ALL INSPECTION AND TESTING SHALL BE DONE BY AN EXPERIENCED AND QUALIFIED FIRM ENGAGED IN THIS TYPE OF WORK, AS APPROVED BY THE CITY ENGINEER. WRITTEN REPORTS FOR ALL INSPECTION AND TESTING SHALL BE SUBMITTED TO THE CITY ENGINEER FOR SANITARY SEWER WORK FOR REVIEW AND APPROVAL. ALL STORM SEWER PIPES SHALL BE COLOR VIDEOTAPED ACCORDING TO SPECIFICATIONS HEREIN.
- B. INSPECTION REQUIREMENTS:
  - B.A. ALL STORM SEWER PIPING, UP TO AND INCLUDING THIRTY (30) INCHES IN DIAMETER SHALL BE VIDEOTAPED. BEYOND THIRTY (30) INCHES A VISUAL INSPECTION WILL BE REQUIRED.
  - B.B. THE CONTRACTOR SHALL INSPECT AND RECORD THE CONDITION OF ALL PIPE RUNS THAT MEET THE CRITERIA STATED ABOVE. ALL PIPES SHALL BE FLUSHED CLEAN OF DEBRIS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH VIDEOTAPING. MAJOR CLEANING WILL BE DONE BEFORE VIDEO INSPECTION.
  - B.C. THE INSPECTION RATE SHOULD BE SUITABLE FOR PIPE SIZE TO ALLOW DETECTION OF DISCREPANT AREAS, BUT SHOULD NOT EXCEED FIFTY (50) FEET PER MINUTE.
  - B.D. ADDITIONAL VIDEO TAPE OR STILL PHOTO COVERAGE OF SUSPECT DISCREPANT AREAS SHALL BE PROVIDED THROUGH THE USE OF ROTATING HEAD CAMERA OR STILL CAMERA. DISCREPANCIES INCLUDE, BUT ARE NOT LIMITED TO: PIPE JOINT SEPARATIONS, CRACKS OR BREAKS IN THE WALL OF THE PIPE, DEFORMATION OF THE PIPE WALL, PENETRATION OF THE WALL BY VEGETATION OR FOREIGN OBJECTS OR EXCESSIVE DEBRIS.
  - B.E. THE LOCATION OF DISCREPANT AREAS SHALL BE ESTABLISHED BY MEASUREMENT FROM NEAREST KNOWN ESTABLISHED FEATURE SUCH AS A CATCH BASIN, MANHOLE OR HEADWALL. ACCURACY OF SUCH LOCATIONS SHALL BE WITHIN PLUS OR MINUS ONE (1) FOOT.
- C. INSPECTION REPORT:
  - C.A. THE CONTRACTOR SHALL PROVIDE COLOR VIDEO OF ALL AREAS INSPECTED. SUBTITLES ON THE RECORDING SHALL INCLUDE THE FOLLOWING: SUBDIVISION NAME DATE & TIME PAPER SIZE NAME OF CITY INSPECTOR PRESENT REFERENCE TO END POINTS OF PIPE INSPECTED, AS IDENTIFIED ON A SKETCH, NOTING THE DIRECTION OF INSPECTION. CONTINUOUS PLAY OF DISTANCE FROM A KNOWN REFERENCE POINT.
  - C.B. THE CONTRACTOR SHALL PROVIDE A WRITTEN REPORT IDENTIFYING LOCATION, LENGTH AND SIZE OF ALL PIPE INSPECTED. THE REPORT SHALL IDENTIFY ALL AREAS WHERE THE INTEGRITY OF THE PIPE SYSTEM IS SUSPECT. RECOMMENDATIONS FOR REPAIRS SHALL BE PROVIDED AND THE CORRECTED.
  - C.C. DEFECTS FOUND: ANY DEFECTS FOUND SHALL BE CORRECTED AND REINSPECTED PRIOR TO FINAL APPROVAL.

### 4. STORM SEWER

- A. ALL YARD & DITCH INLETS MUST BE TO GRADE OF DITCH, STREET OR DEVIL-STRIP.
- B. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE DIPPED GRAY IRON CASTINGS. ALL FRAMES SHALL BE SET ON BITUMASTIC STRIPS. THE COVER AND SEAT SHALL HAVE MACHINED BEARING SURFACES TO PREVENT ROCKING. ALL CASTINGS SHALL CONFORM TO ONE OF THE FOLLOWING REQUIREMENTS: (1) STORM MANHOLE W/ WORD "STORM" VENTED LID, EJ NO. 1020 COVER & 1022Z1 FRAME; (2) - STORM CURB CATCH/INLET BASIN (6" CURB) FRAME, EJ NO. 7035 WITH TYPE M6 GRATE AND TYPE T4 BACK & EJ 7030 M6 GRATE; (3) - STORM CURB CATCH/INLET BASIN (ROLL CURB) FRAME, EJ NO. 7390 WITH TYPE 7390M3 GRATE; (4) -YARD BASIN 2-2-B VENTED LID, EJ NO.5110 M3 GRATE.

- C. ALL DRIVEWAY CULVERT PIPES AND APPROVED DITCH ENCLOSURES DONE BY A CONTRACTOR OR OWNER MUST BE SIZED BY THE ENGINEER. INSPECTIONS MUST BE MADE AND APPROVED. STORM SEWER PIPES MUST BE A MINIMUM OF 12" DIAMETER. RESIDENTIAL DRIVEWAYS MUST BE 16" WIDE AND NO LONGER THAN 22' WIDE. COMMERCIAL DRIVEWAYS ARE A MINIMUM OF 20' WIDE AND NO WIDER THAN 45' UNLESS AUTHORIZED BY THE CITY ENGINEER. 304 LIMESTONE MUST BE USED TO COMPACT AROUND CULVERT PIPES UNDER DRIVES. ALL ROOF DRAINS MUST DRAIN TO THE STREET OR DITCH DRAINAGE.
- D. ALL STORM SEWER PIPE, CASTINGS, INLET BASINS, CONCRETE BLOCK AND ANY OTHER MATERIALS TO BE USED ON THE PROJECT MUST BE INSPECTED BY THE CITY OF STREETSBORO ENGINEER'S OFFICE AT LEAST 48 HOURS BEFORE INSTALLATION.
- E. ALL STORM SEWERS SHALL BE COLOR VIDEOTAPED BY THE CONTRACTOR AND FOUND TO BE FREE OF DEFECTS AND FOREIGN MATTER AND TO BE OF PROPER ALIGNMENT PRIOR TO FORMAL ACCEPTANCE BY THE CITY OF STREETSBORO ENGINEER. ALL LATERAL LOCATIONS ARE TO BE NOTED, VIDEOTAPED AND A VIDEO LOG SUBMITTED TO THE CITY OF STREETSBORO.
- F. ALL PIPE BEDDING SHALL BE SPECIFIED IN ODOT ITEM 611. TRENCHES UNDER PROPOSED PAVEMENT AND/OR WITHIN THE RIGHT-OR-WAY SHALL HAVE PREMIUM BACKFILL AS PER THE DETAIL SHEET. PREMIUM GRANULAR BEDDING SUB-GRADE CONSISTING OF ODOT 304 LIMESTONE COMPACTED TO 98% DRY DENSITY, #57 OR #67 LIMESTONE, SHALL ALSO BE USED WHENEVER TWO UTILITIES CROSS WITH PROPER VERTICAL CLEARANCE. OTHERWISE, A MONOLITHIC CRADLE SHALL BE USED.
- G. STORM SEWER CONDUIT SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH ODOT ITEM 611. ADDITIONAL 6-INCH CUSHION OF #57 OR #67 LIMESTONE SHALL BE PLACED UNDER ALL STORM UTILITY LINES CONSTRUCTED ON ROCK.
- H. AS PER DIRECTING CITY ENGINEER ALL EXCAVATION WITHIN EXISTING PAVEMENT SHALL BE FILLED WITH CONTROLLED DENSITY FILL (LOW STRENGTH MORTAR) PER ODOT CMS. VISQUEEN MUST BE USED 9 INCHES BELOW SUBGRADE OF ROAD. AFTER CONTROLLED DENSITY FILL HAS CURED ASPHALT MUST BE INSTALLED (SEE PAGE TR-1 FOR DETAILS). AC MUST BE USED TO SEAL EDGES OF REPAIR.
- I. REPAIR OF EXISTING PAVEMENTS IN TRENCH AREAS SHALL CONFORM TO THE DETAILS SHOWN ON SHEET TR-1 OF THE STREETSBORO CONSTRUCTION DRAWINGS.
- J. ROOF DRAIN TIE IN: ANY TIE IN THAT IS MADE INTO AN EXISTING COLLECTOR DRAINAGE SYSTEM MUST FOLLOW PROCEDURE OF CUTTING OUT COLLECTOR DRAINAGE AND INSTALL A 6" WYE TEE WITH A 45 FITTING. ALL CONNECTIONS MUST BE DONE USING RIGID ARC COUPLINGS WITH STAINLESS STEEL BANDS. LATERAL TIE-IN TO STORM MAIN SHALL BE THE USE OF INSERTA-TEE OR APPROVED METHOD BY CITY ENGINEER.
- K. TYPE A CONDUITS - CULVERTS
  - K.A. MATERIAL SHALL BE CONCRETE OR HDPE FOR SEWERS UP TO 24 INCH.
  - K.B. MATERIAL SHALL BE CONCRETE FOR SEWERS GREATER THAN 24 INCH
  - K.C. MATERIAL SHALL BE CONCRETE FOR CONDUITS WITH COVER LESS THAN TWENTY-FOUR (24) INCHES FROM SUBGRADE TO TOP OF PIPE.
  - K.D. MINIMUM COVER SHALL BE NINE (9) INCHES FROM SUBGRADE TO TOP OF PIPE. IF MINIMUM COVER CANNOT BE MAINTAINED, THE PIPE SHALL BE CONCRETE ENCASED.
- L. TYPE B CONDUITS - STORM SEWER UNDER PAVEMENT
  - L.A. MATERIAL SHALL BE CONCRETE OR HDPE FOR CONDUIT SIZES UP TO AND INCLUDING THIRTY SIX (36) INCH DIAMETER WITH MINIMUM COVER OF TWENTY-FOUR (24) INCHES FROM SUBGRADE TO TOP OF PIPE.
  - L.B. MATERIAL SHALL BE CONCRETE FOR CONDUIT SIZES GREATER THAN THIRTY SIX (36) INCH.
  - L.C. MATERIAL SHALL BE CONCRETE FOR CONDUITS WITH COVER LESS THAN TWENTY-FOUR (24) INCHES FROM SUBGRADE TO TOP OF PIPE.

- M. TYPE C CONDUITS - STORM SEWER OR SANITARY NOT UNDER PAVEMENT
  - M.A. MATERIAL SHALL BE CONCRETE, HDPE, OR PLASTIC FOR SIZES UP TO TWELVE (12) INCH.
  - M.B. MATERIAL SHALL BE CONCRETE OR HDPE FOR CONDUIT SIZES FROM TWELVE (12) INCH UP TO AND INCLUDING FORTY-EIGHT (48) INCH DIAMETER WITH MINIMUM COVER OF TWELVE (12) INCHES FROM SUBGRADE TO TOP OF PIPE.
  - M.C. MATERIAL SHALL BE CONCRETE FOR CONDUIT SIZES GREATER THAN FORTY-EIGHT (48) INCH.
  - M.D. MATERIAL SHALL BE CONCRETE FOR CONDUITS WITH COVER LESS THAN TWELVE (12) INCHES FROM SUBGRADE TO TOP OF PIPE.
- N. TYPE D CONDUITS - DRIVE PIPES AND BIKEWAYS
  - N.A. MATERIAL SHALL BE CONCRETE OR PLASTIC FOR CONDUIT SIZES UP TO AND INCLUDING TWENTY-FOUR (24) INCH DIAMETER WITH MINIMUM COVER OF TWELVE (12) INCHES FROM SUBGRADE TO TOP OF PIPE.
  - N.B. MATERIAL SHALL BE CONCRETE FOR CONDUIT SIZES GREATER THAN TWENTY-FOUR (24) INCH.
  - N.C. MINIMUM SIZE SHALL BE TWELVE (12) INCH.
  - N.D. ALL COMMERCIAL DRIVE CULVERTS SHALL BE CONCRETE.
- O. TYPE E CONDUIT - MISCELLANEOUS SMALL DRAIN CONNECTIONS AND HEADERS SHALL BE PER ODOT SPECIFICATIONS.
- P. TYPE F CONDUIT - CONDUITS ON STEEP SLOPES: UNDERDRAN OUTLETS SHALL BE PER ODOT SPECIFICATIONS.
- Q. PIPE REQUIREMENTS: REINFORCED CONCRETE PIPE MATERIAL SHALL CONFORM TO ODOT SPECIFICATION SECTION 706.02, WITH RESILIENT AND FLEXIBLE GASKET CONFORMING TO ASTM C443, POLYVINYL CHLORIDE PIPE SHALL CONFORM TO ODOT SECTION 707.45, AND POLYETHYLENE PIPE SHALL CONFORM TO ODOT SECTION 707.33. THE GASKET JOINT SHALL BE OF THE INTEGRAL BELL DESIGN FORMED AS A CONTINUOUS, HOMOGENEOUS ENTITY WITH THE PIPE. THE GASKET SHALL BE FACTORY ASSEMBLED AND SECURELY LOCKED INTO PLACE TO PREVENT DISPLACEMENT DURING ASSEMBLY. A JOINT LUBRICANT SUPPLIED BY THE MANUFACTURER SHALL BE USED ON THE GASKET AND BELL DURING ASSEMBLY. THE GASKET SHALL MEET THE REQUIREMENTS OF ASTM F477 AND THE JOINT SHALL MEET THE REQUIREMENTS OF ASTM D3212. JOINT DEFLECTION SHALL NOT EXCEED THE MAXIMUM ALLOWABLE AS RECOMMENDED BY THE MANUFACTURER.
- R. DIMENSIONS: REINFORCED CONCRETE - UNLESS OTHERWISE SHOWN, THE MINIMUM THICKNESS FOR REINFORCED CONCRETE SHALL BE CLASS IV WITH THE CLASS VALUE INCREASING AS PER DESIGN.
- S. FITTINGS: REINFORCED CONCRETE - FITTINGS SHALL BE FACTORY MADE AND PROVIDED WITH PREMIUM JOINTS MEETING ASTM C443 WITH RESILIENT AND FLEXIBLE GASKET JOINTS. HDPE - FITTINGS SHALL BE FACTORY MADE AND PROVIDED WITH WATERTIGHT JOINTS AND POLYISOPRENE GASKETS MEETING ASTM D 2321 WITH AN INTEGRAL BELL AND SPIGOT. CONNECTION TO STRUCTURE SHALL BE MADE WITH ADS C923 CONNECTION OR EQUAL.
- T. CONNECTION TO STRUCTURES: CONCRETE PIPE SHALL USE RED SEWER BRICK AND NON-SHRINK GROUT TO SEAL THE PIPE TO THE STRUCTURE. PLASTIC PIPE SHALL USE CORE-N-SEAL BOOTS TO MAKE THE CONNECTION TO A STRUCTURE. HDPE PIPE SHALL USE ADS C923 CONNECTION TO THE STRUCTURE, OR EQUAL.
- U. INSPECTION: THE ENGINEER OR HIS AUTHORIZED REPRESENTATIVE IMMEDIATELY PRIOR TO INSTALLATION WILL INSPECT ALL PIPE AND FITTINGS AND ALL REJECTED PIECES MUST BE COMPLETELY REMOVED FROM THE PROJECT. NO REPAIRS OF PIPE OR FITTINGS WILL BE ALLOWED; UNDAMAGED LENGTHS OF STRAIGHT PIPE MAY BE SALVAGED BY NEATLY SAWING OFF THE DAMAGED PORTION OF THAT PIPE.



5. PRECAST STORM SEWER MANHOLE

- A. WITH NORMAL SOIL AND SITE CONDITIONS, STANDARD PRECAST MANHOLE MAY BE USED FOR REQUIRED MANHOLE DEPTH.
- B. SECTIONS OF THE PRECAST MANHOLE SHALL BE CAST AND ASSEMBLED WITH EITHER ALL TONGUE OR ALL GROVE ENDS UP.
- C. LIFT HOLES MAY BE PROVIDED IN EACH SECTION FOR HANDLING.

- TOP AND TRANSITION (OR REDUCER) SECTIONS MAY BE EITHER ECCENTRIC CONE OR FLAT SLAB.
- BASES - BASES FOR MANHOLES ARE SHOWN WITH MONOLITHIC FLOOR AND RISER WHICH MAY BE CAST IN ONE OR TWO OPERATIONS. A PERMISSIBLE ALTERNATE IS TO CAST AND SHIP THE FLOOR AND BARREL SEPARATELY. OPENINGS FOR INLET AND OUTLET PIPES SHALL BE PROVIDED, EITHER WHEN THE UNIT IS CAST OR LATER, TO MEET PROJECT REQUIREMENTS. BOTTOM CHANNELS MAY BE FORMED OF CONCRETE PRECAST IN THE BASE OR BY FIELD CONSTRUCTION.

- OPENINGS IN RISER SECTIONS FOR 18-INCH AND SMALLER INLET PIPES SHALL BE PREFABRICATED OR CUT IN THE FIELD, PROVIDED THE SIDES OF PIPE AT THE SPRINGLINE DO NOT PROJECT INTO THE MANHOLE.

- MATERIALS FOR BASES AND OTHER PRECAST SECTIONS, INCLUDING REINFORCEMENT NOT SPECIFIED, SHALL COMPLY WITH THE REQUIREMENTS OF ODOT 706.13.

- MANHOLE STEPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C478. THE DISTANCE BETWEEN THE TOP OF THE CASTING AND FIRST STEP SHALL NOT EXCEED TWENTY-FOUR (24) INCHES.

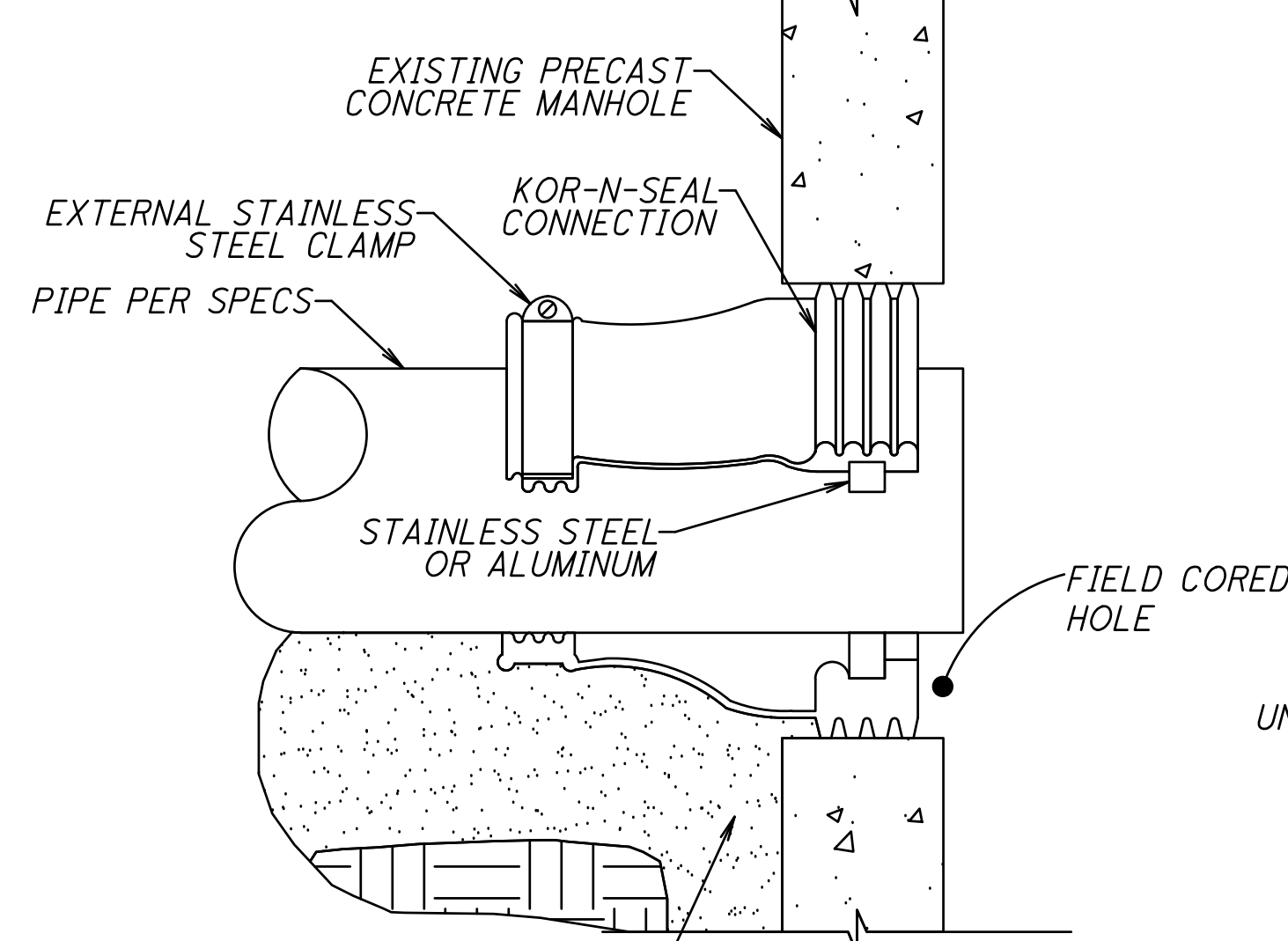
- MANHOLE AND INLET REQUIREMENTS: ALL MANHOLES AND INLETS SHALL BE PRECAST SECTIONS TO CONFORM TO ASTM C-478 WITH A RESILIENT GASKET JOINT CONFORMING TO ASTM C-433 FOR SANITARY MANHOLES AND BITUMASTIC TYPE JOINT FOR STORM MANHOLE, CYLINDRICAL SECTION OF MANHOLE TO BE EXTENDED VERTICALLY FROM INVERT SHELF A MINIMUM OF FOUR (4) FEET. MANHOLES SHALL HAVE A MINIMUM DIAMETER OF 48" FOR PIPE SIZES LESS THAN OR EQUAL TO 30", 60" FOR PIPE SIZES MORE THAN 30" BUT LESS THAN OR EQUAL TO 36" AND FOR PIPES OF LARGER SIZE INCREASE THE MANHOLE OF DIAMETER ACCORDINGLY TO MAINTAIN A MINIMUM OF 6" BETWEEN ADJACENT HOLES MEASURED ALONG THE INSIDE PERIMETER.

- CONNECTIONS: ALL HOLES FOR PIPE TO MANHOLE CONNECTIONS ARE TO BE CORED OR FORMED AT THE TIME OF PRECAST MANUFACTURING. ALL DEVICES OR MOLDS SHALL BE USED TO AID IN THE FORMING OF HOLES IN PRECAST STRUCTURES SHALL BE REMOVED PRIOR TO INSTALLING ANY CONDUIT. ALL HOLES IN STRUCTURES SHALL BE FORMED OR COMPLETELY CORED THROUGH STRUCTURE WALL. NO KNOCKOUTS WILL BE ACCEPTED. THESE CORED HOLES SHALL BE MEASURED ALONG THE INSIDE PERIMETER OF THE MANHOLE A MINIMUM DISTANCE OF SIX (6) INCHES BETWEEN ADJACENT HOLES. MANHOLE TO PIPE SHALL BE A WATERTIGHT CONNECTION PROVIDING A FLEXING AND LATERAL MOVEMENT WITHOUT SHEARING OF THE SEWER PIPE INSTALLED PER ASTM C-923. THE SEWER PIPE AT THE OPENING SHALL NOT EXTEND BEYOND THE INSIDE FACE OF MANHOLE. FOR HDPE PIPE AN ADS C923 CONNECTION OR EQUAL IS REQUIRED TO CONNECT TO STRUCTURES.

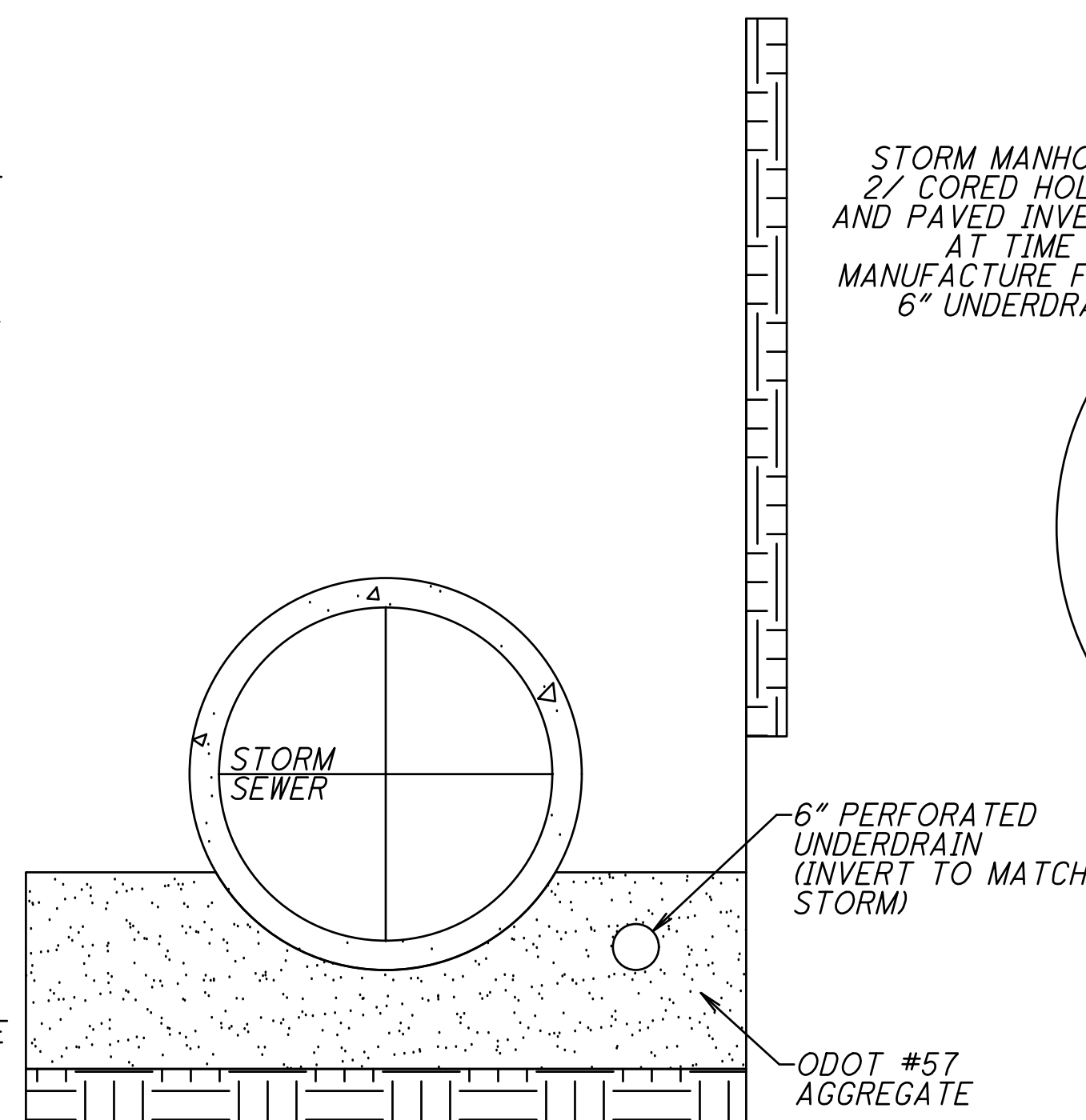
- EXTERNAL DROP MANHOLES ARE REQUIRED WHEN THE INVERT IS 24" ABOVE THE BOTTOM INVERT OF THE MANHOLE. INTERNAL DROP MANHOLES ARE NOT PERMITTED ON NEW PROPOSED MANHOLES. INTERNAL MANHOLES ON EXISTING SANITARY MANHOLES ARE NOT PERMITTED UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER.

- GRADE ADJUSTMENT: PRECAST REINFORCED CONCRETE ADJUSTING COLLARS, FOUR (4) INCHES MINIMUM AND 6" MAXIMUM THICKNESS, SHALL BE SET ON BED OF BITUMASTIC STRIPS. ONLY THE OUTSIDE OF THE GRADE ADJUSTMENT SHALL BE PURGED WITH MORTAR. NO MORTAR SHALL BE PLACED ON THE INSIDE OF THE STRUCTURES. GRADE ADJUSTMENT SHALL BE TWELVE (12) INCH MAXIMUM FOR MANHOLES AND SIX (6) INCH MAXIMUM FOR CATCH & INLET BASINS. MORTAR SHALL BE NON-SHRINKING AND CONFORM TO ODOT SECTION 705.22. NO RED SEWER BRICK SHALL BE USED AS REPLACEMENT FOR PRECAST GRADE RINGS. FINAL HEIGHT ADJUSTMENT SHALL CONSIST OF 1/2" MINIMUM RUBBER GRADE RING SET BETWEEN MANUFACTURES ADHESIVE IN PAVEMENT AREAS. RISER RING EQUAL TO EAST JORDAN INFRASISER. WATERPROOFING TAR SHALL BE USED ON OUTSIDE OF ALL GRADE RINGS.

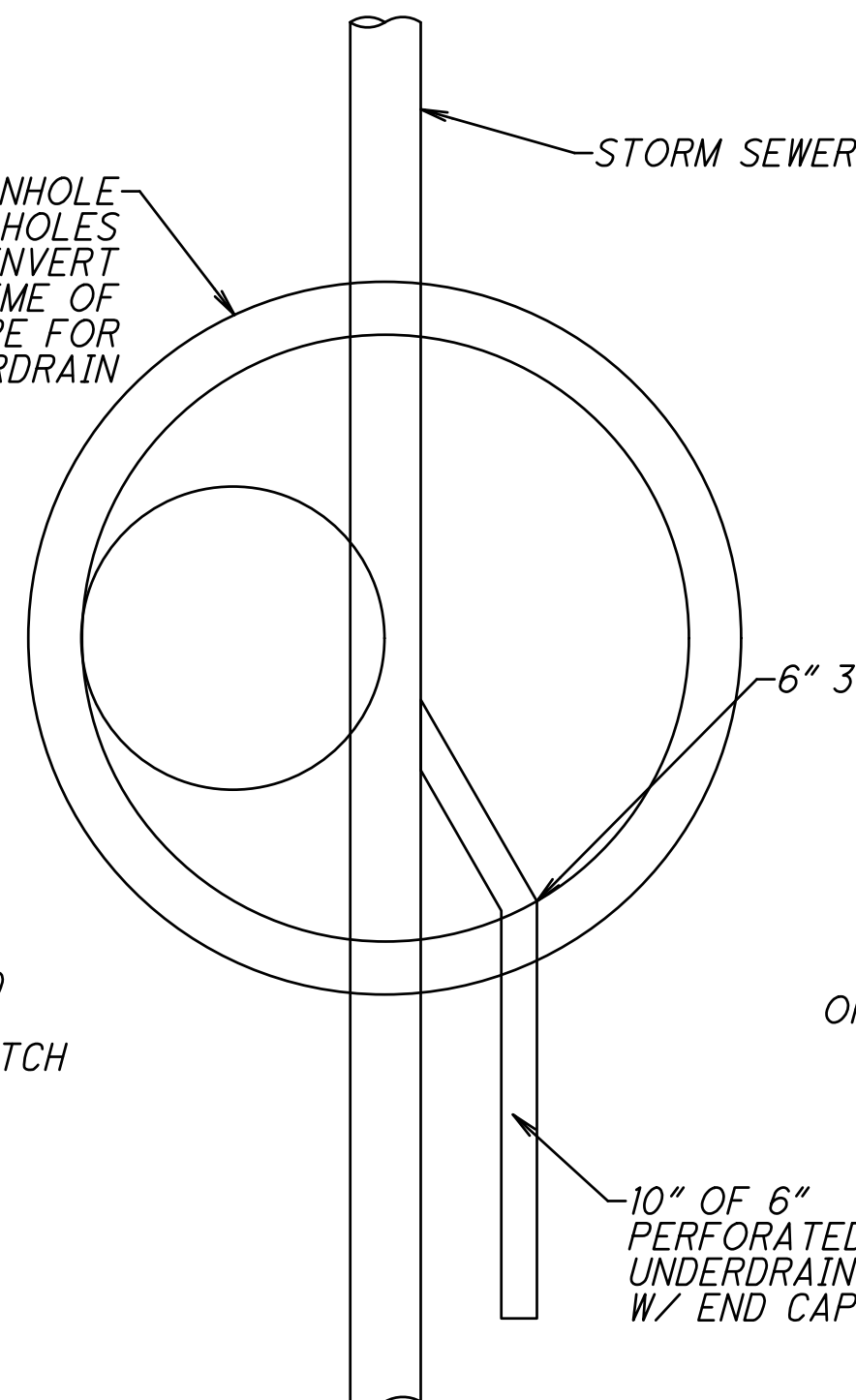
NOTE: WHEN CORING INTO EXISTING MANHOLE A BOOT NEEDS TO BE INSTALLED.



CONNECTION TO EXISTING STORM MANHOLE  
NOT TO SCALE



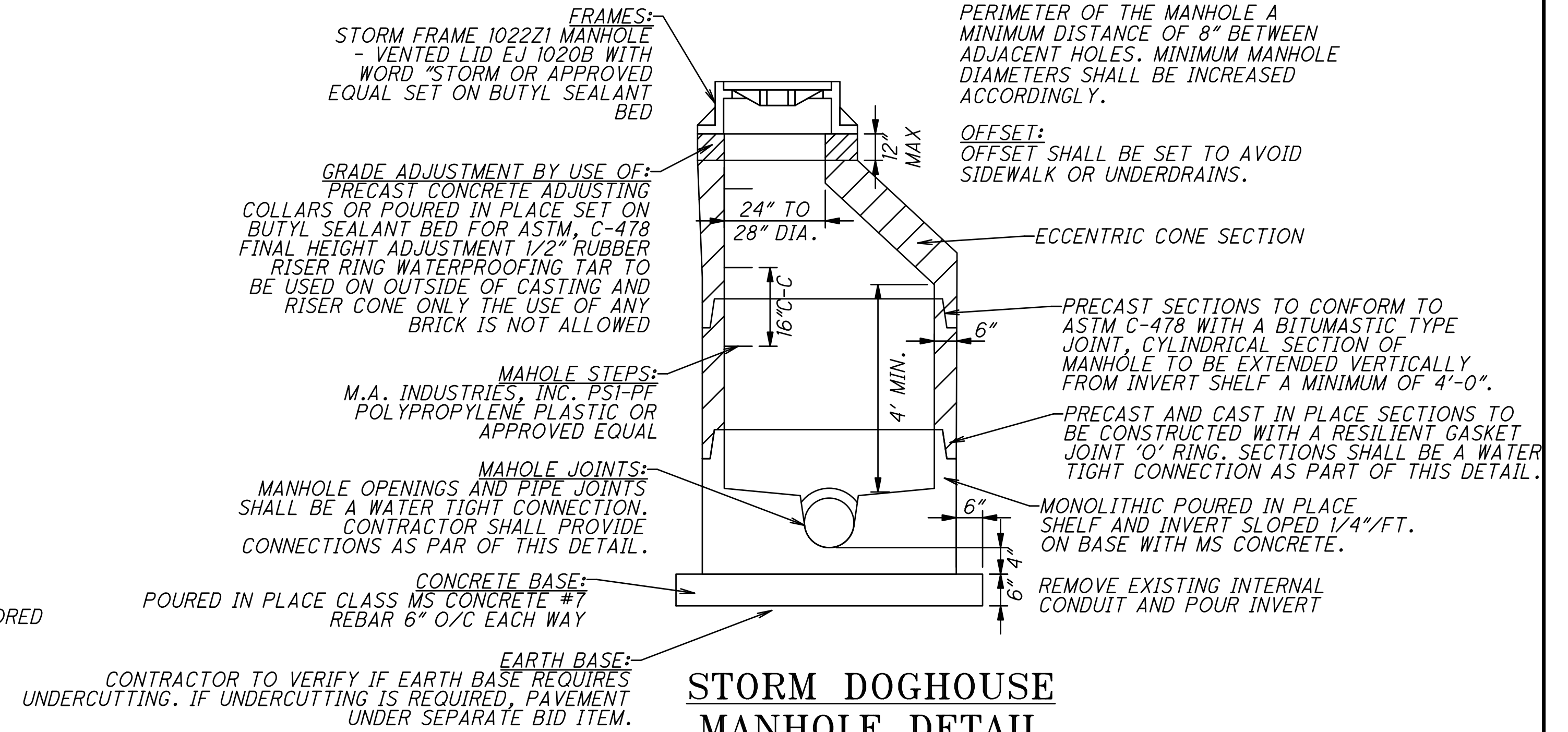
TRENCH VIEW



TOP VIEW

MINIMUM MANHOLE DIAMETERS  
REFER TO PLAN FOR SPECIFIC SIZING REQUIREMENTS

M.H. INSIDE DIAMETER	MAX. PIPE DIAMETER
48"	30"
60"	36"
72"	48"
84"	54"
90"	60"
96"	60"

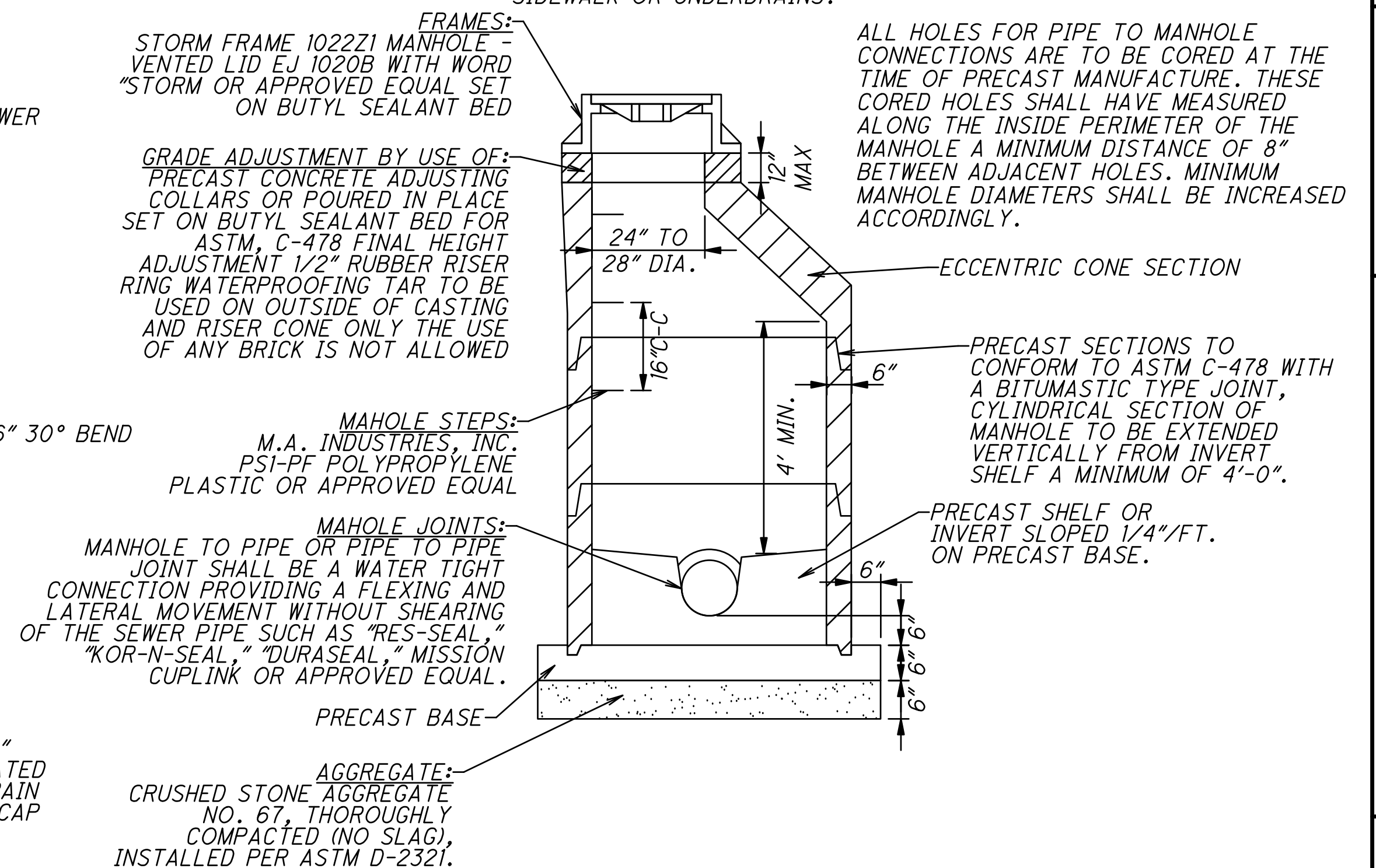


MINIMUM MANHOLE DIAMETERS  
REFER TO PLAN FOR SPECIFIC SIZING REQUIREMENTS

M.H. INSIDE DIAMETER	MAX. PIPE DIAMETER
48"	30"
60"	36"
72"	48"
84"	54"
90"	60"
96"	60"

- NOTES:
1. A DROP M.H. SHALL BE CONSTRUCTED IN SEWERS WHEREVER THE DISTANCE BETWEEN INVERTS IS 2.5' OR GREATER.
  2. ALL SECTIONS SHALL BE PRECAST CONFORMING TO C-478.

OFFSET:  
OFFSET SHALL BE SET TO AVOID SIDEWALK OR UNDERDRAINS.



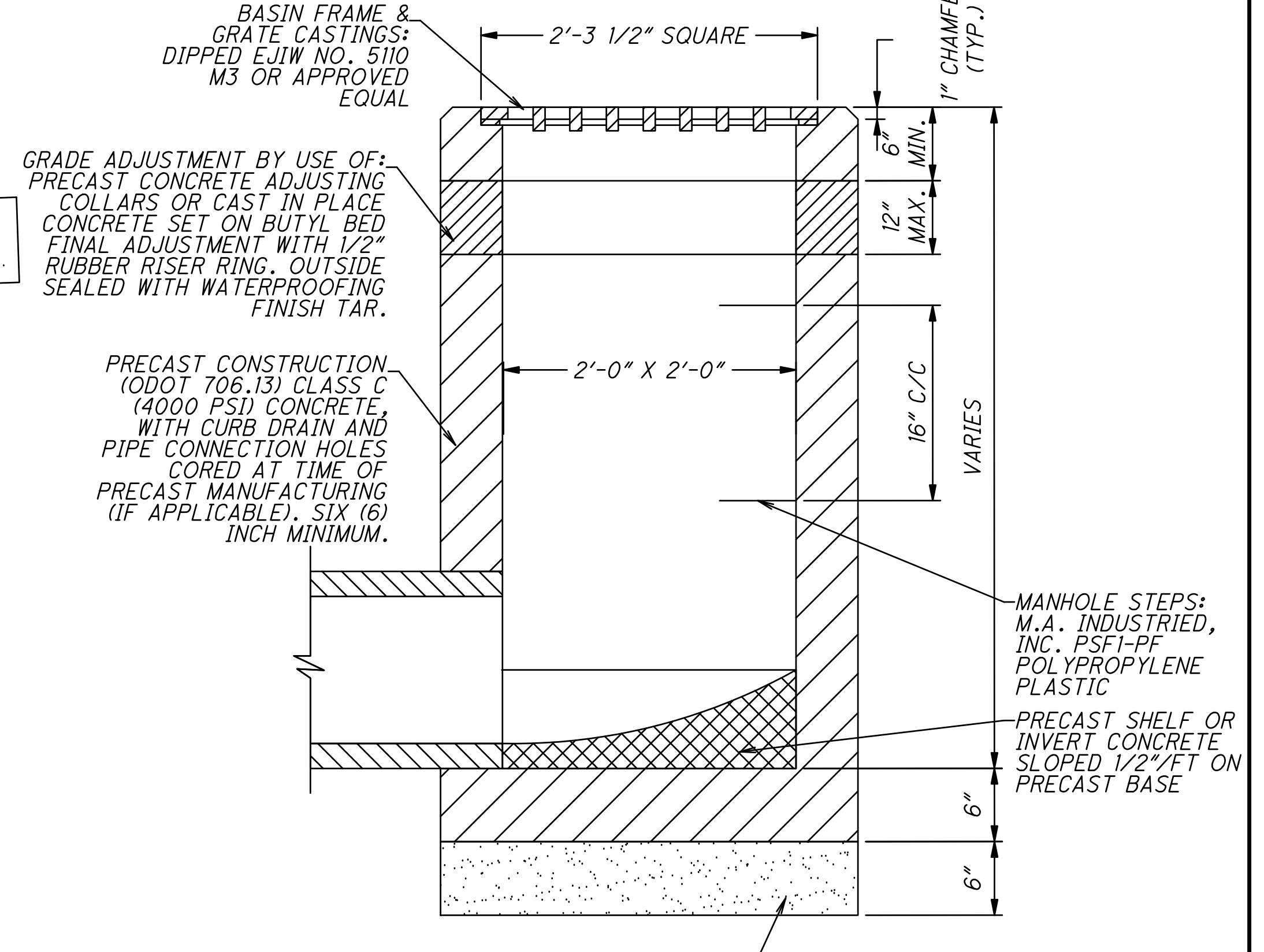
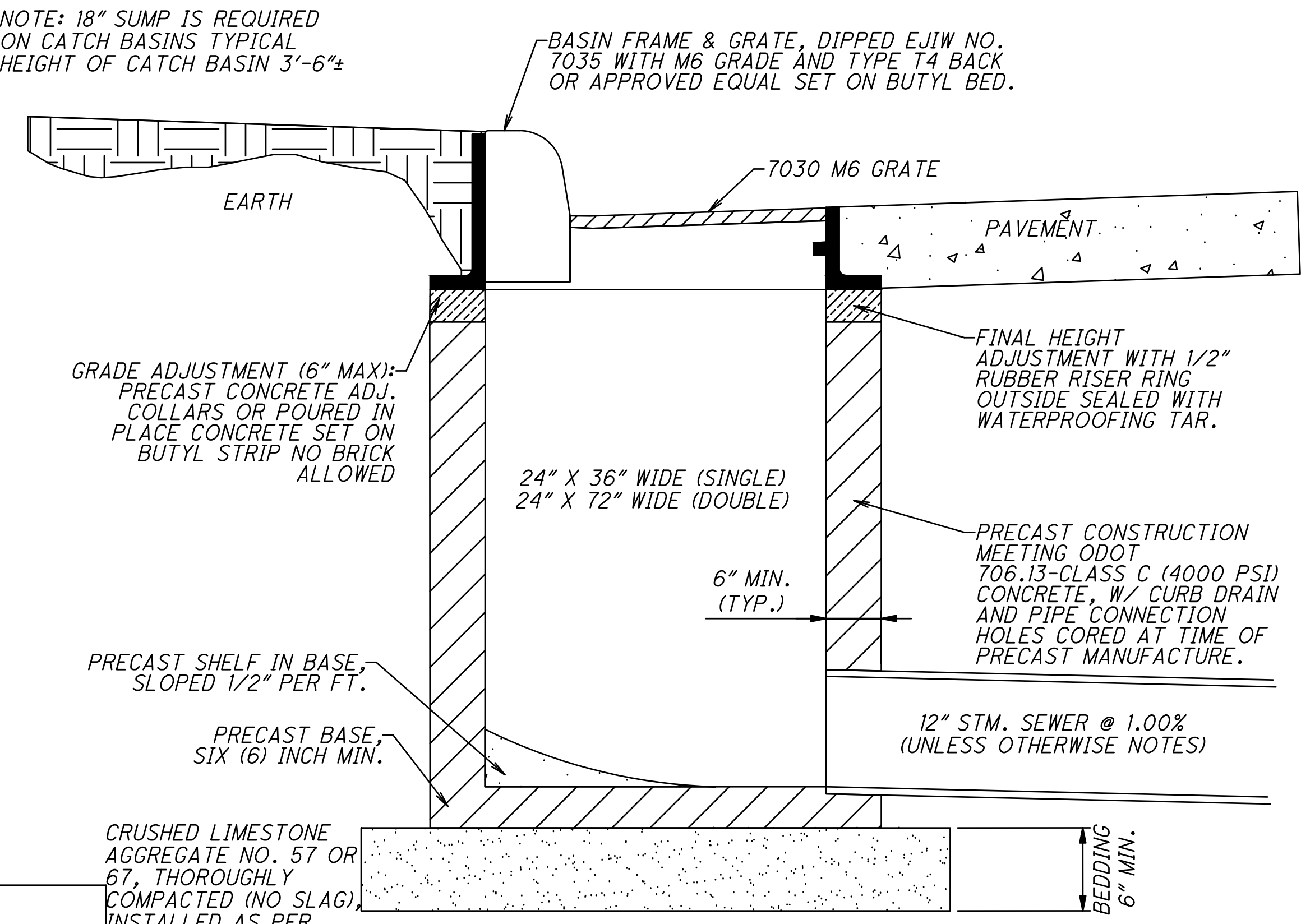
STORM MANHOLE DETAIL



6. HEADWALLS

- A. CONCRETE FOR HEADWALLS SHALL BE CLASS "C". CONCRETE QUANTITIES ARE BASED ON HEADWALLS WITHOUT THE 6" EXTENSION UNDER THE INLET CHANNEL PROTECTION.
- B. WITH NORMAL SOIL AND SITE CONDITIONS, STANDARD PRECAST MANHOLE MAY BE USED FOR REQUIRED MANHOLE DEPTH.
- C. 4-B HALF-HEIGHT HEADWALLS SHALL BE CONSTRUCTED PER ODOT SCD HW-2.2
- D. 4-B NO. 1 FULL HEIGHT HEADWALLS SHALL BE CONSTRUCTED PER THE FOLLOWING:
  - CONCRETE SHALL BE CLASS "C"
  - REINFORCING STEEL BARS SHALL BE 5/8-INCH ROUND.
  - DIMENSIONS AND QUANTITIES (ONE SHOWN FOR CIRCULAR SECTIONS ONLY): IT WILL BE NECESSARY TO DETERMINE DIMENSIONS FOR THE NO. 1 HEADWALL REQUIRED FOR REINFORCED ELLIPTICAL CONCRETE PIPE OR CORRUGATED METAL PIPE ARCHES IN ACCORDANCE WITH THE EQUATIONS LISTED ON THIS DRAWING. CHAMFER ALL EXPOSED CORNERS 3/4 OF AN INCH.
  - FOUNDATION: WHERE THE SOIL BORINGS INDICATE A BEARING CAPACITY OF LESS THAN 2600 POUNDS PER SQUARE FOOT, IT WILL BE NECESSARY TO INCREASE THE WIDTH OF THE BASE.

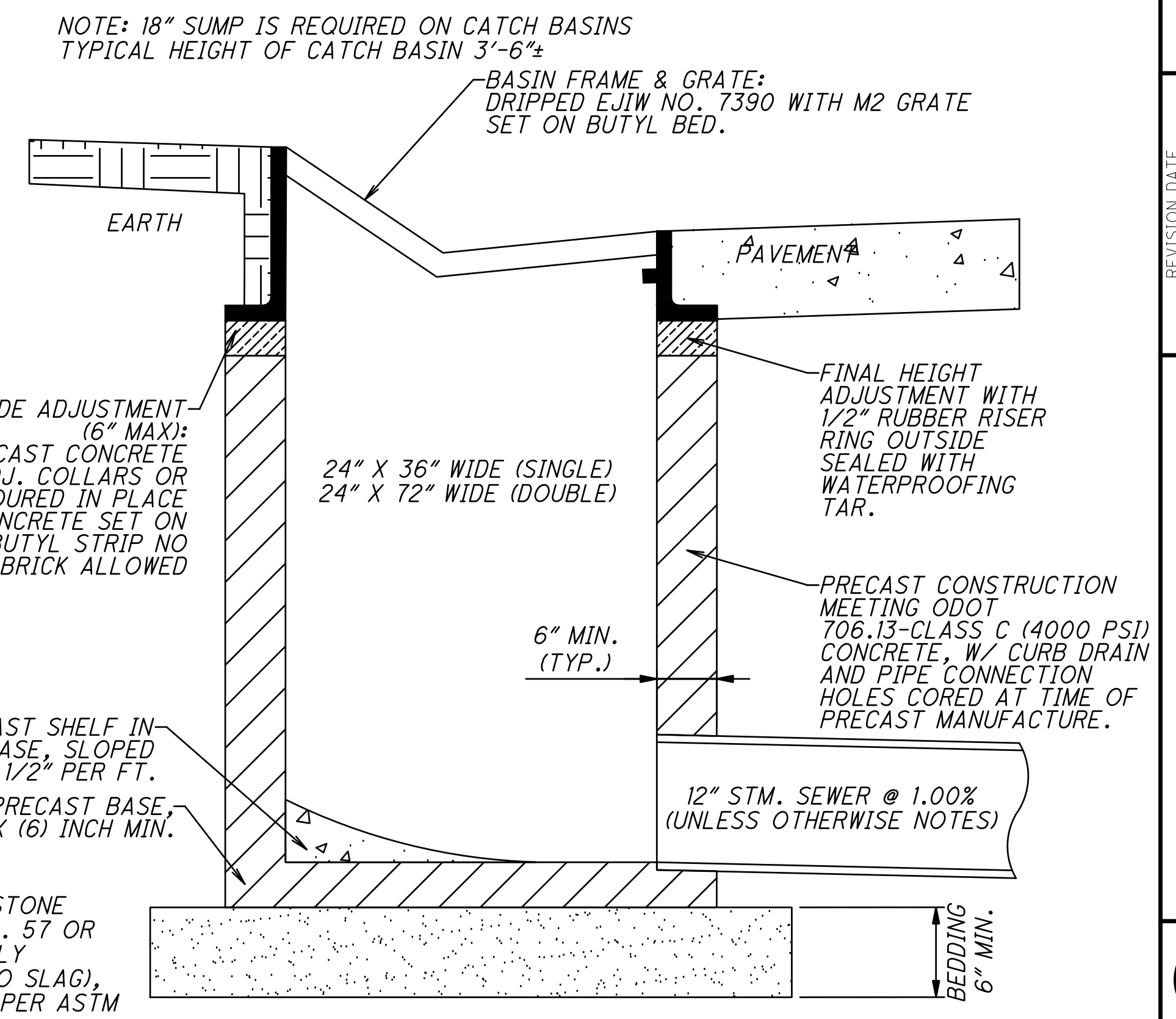
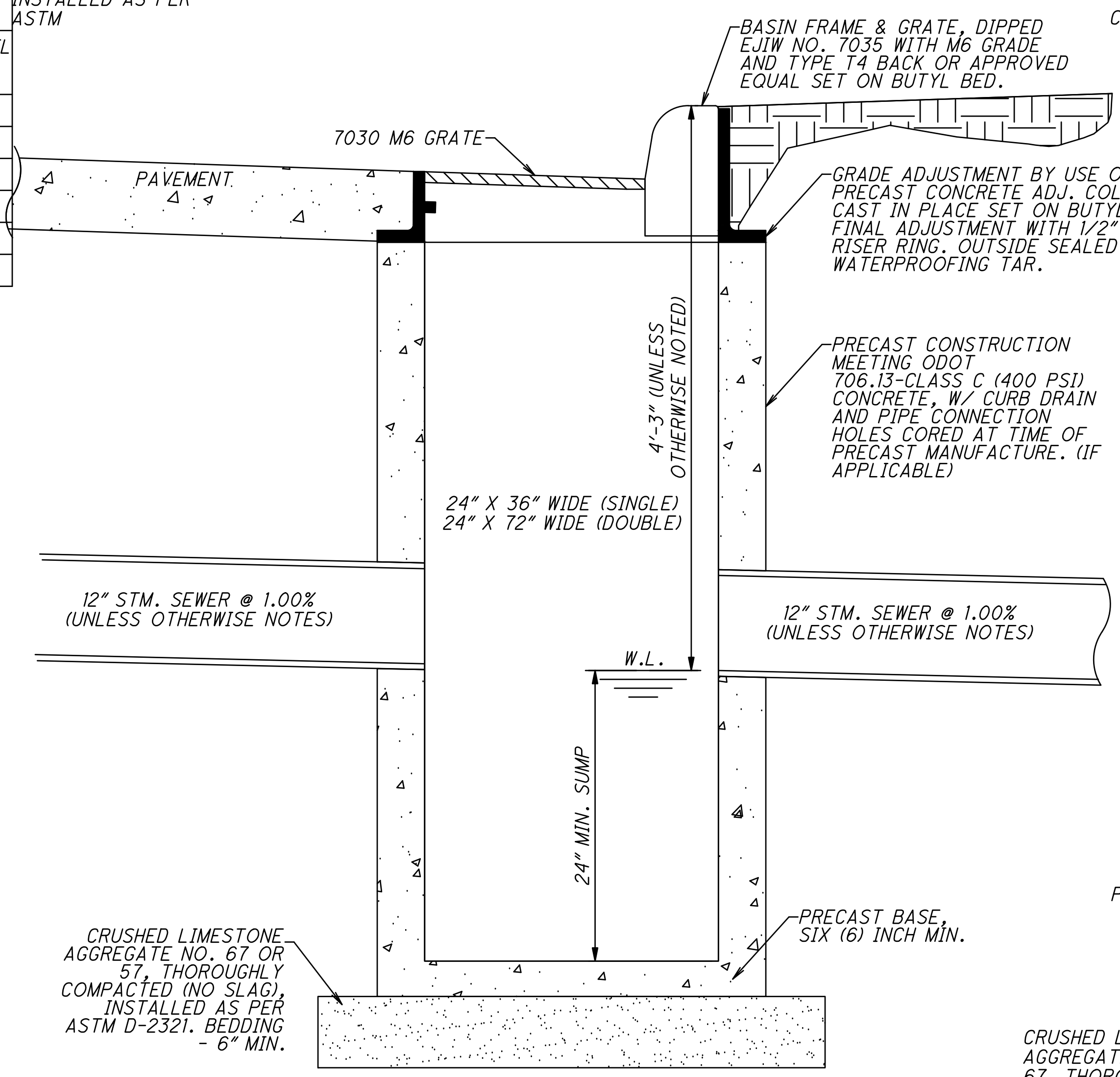
NOTE: 18" SUMP IS REQUIRED ON CATCH BASINS TYPICAL HEIGHT OF CATCH BASIN 3'-6"



DIMENSIONS			QUANTITIES ONE HEADWALL	
DIAMETER	H	L	CONCRETE CU. YDS.	REINFORCING STEEL LBS
15"	5'-2"	7'-0"	1.7	41
18"	5'-5"	8'-4"	2.2	57
21"	5'-8"	9'-8"	2.8	62
24"	5'-11"	11'-0"	3.3	69
30"	6'-5"	13'-8"	4.7	92
36"	7'-0"	16'-4"	6.5	105

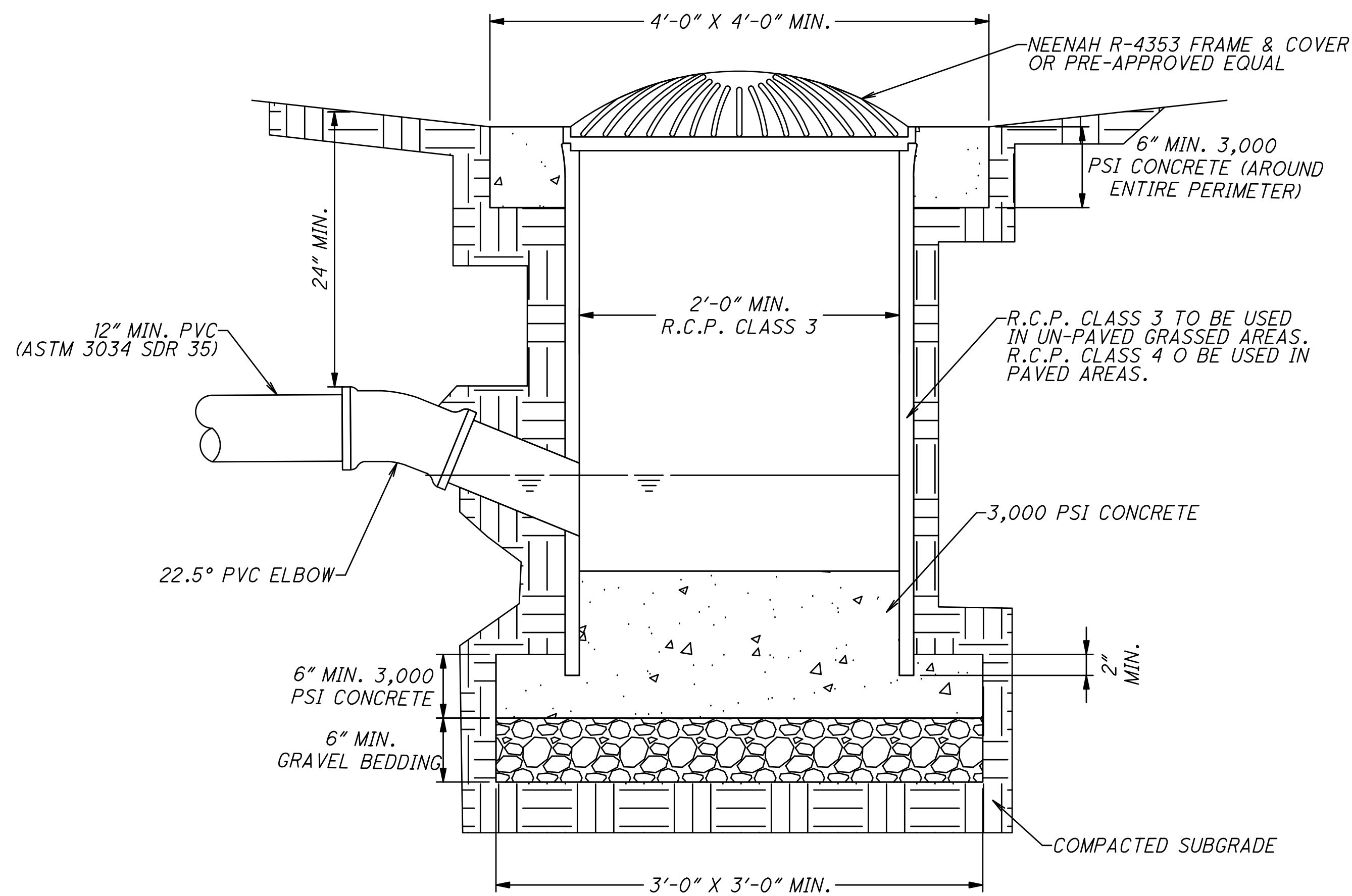
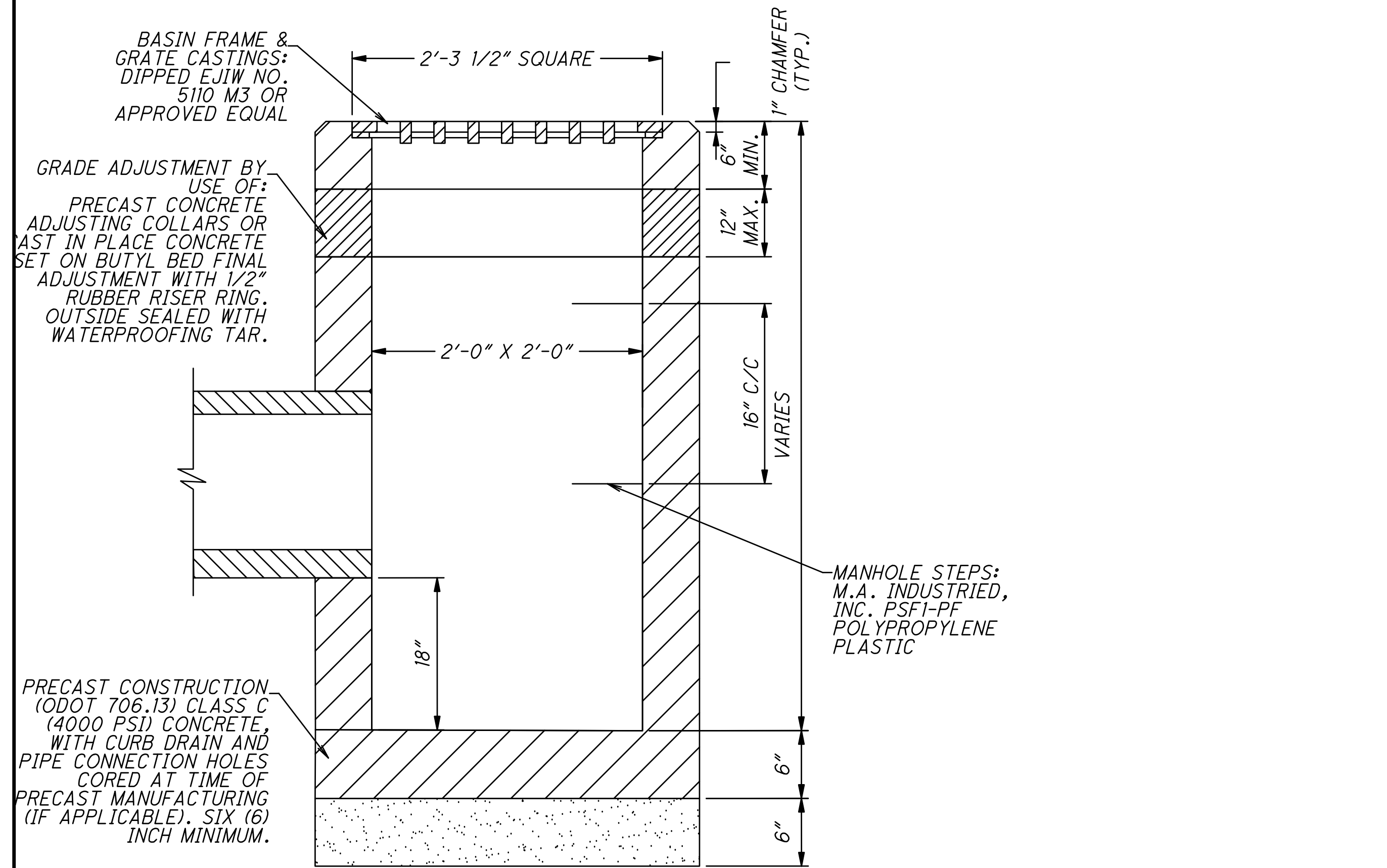
FORMULA		
L	CIRCULAR SECTIONS	5D+RT
L	ELLIPTICAL OR PIPE-ARCH	4R+4T+3
H	CIRCULAR SECTIONS	D+T+44"
H	ELLIPTICAL OR PIPE-ARCH	R+T+44"

D = DIAMETER OF PIPE    T = THICKNESS OF PIPE  
 R = RISE OF PIPE        L = LENGTH OF HEADWALL  
 S = SPAN OF PIPE        H = HEIGHT OF HEADWALL



(NO KNOCKOUTS)

6. HEADWALLS (CONTINUED)



YARD DRAIN

NOT TO SCALE

7. CATCH BASINS

- A. STANDARD CATCH BASINS AND/OR CURB INLET BASINS SHALL BE 24" X 36" (SINGLE) OR 24" X 72" (DOUBLE) RECTANGULAR STRUCTURE INSTALLED IN ACCORDANCE WITH ODOT ITEM 611. CATCH BASINS SHALL HAVE A 30" MINIMUM SUMP. CATCH OR INLET BASINS SHALL HAVE COMPACTED ODOT ITEM 304 LIMESTONE SUB-BASE MATERIAL BACKFILL ON ALL FOUR SIDES TO PLAN GRADE. TWO (2) FORTY-FIVE (45) DEGREE SIX (6) INCH BENDS SHALL BE INSTALLED ON THE CURBSIDE OF STRUCTURE FOR CONNECTION OF UNDERDRAINS. CATCH BASINS SHALL BE PLACED IN THE SYSTEM PRIOR TO STORM SEWER. ALL "LIFT HOOKS" SHALL BE REMOVED FROM ALL STRUCTURES INCLUDING RISERS AND ALL RESULTANT HOLES FILLED WITH NON-SHRINK MORTAR.
- B. STANDARD 2-3/2-4 CATCH BASINS SHALL BE CONSTRUCTED PER ODOT SCD CB-2-3/CB-2-4 EXCEPT AS MODIFIED HEREIN:
  - CAST IN PLACE CONCRETE SHALL BE CLASS C.
  - SIDE INLETS SHALL BE PROVIDED ONLY WHEN SPECIFIED ON THE PLANS.

STRUCTURE TYPE	SPECIFICATION
MANHOLE	MH-3
CURBED ROADWAY CATCH BASIN	CB-3A OR CB-6 IF IN DRIVEWAY
CURBED ROADWAY CATCH BASIN (SUMP)	CB-3 OR DUAL CB-6 IF IN DRIVEWAY
DITCH CATCH BASIN	CB-2-2A/CB-2-2B

8. STORM SEWER LATERALS

- A. AIR TIGHT PLUG AND STAKING: THE END OF EACH CONNECTION SHALL BE SEALED WITH AN AIR TIGHT PLUG AND THE END OF EACH CONNECTION SHALL BE MARKED 2" X 2" HARDWOOD STAKE, EXTENDING VERTICALLY FROM THE END OF THE CONNECTION TO A POINT APPROXIMATELY THREE (3) FEET ABOVE THE SURFACE OF THE GROUND. MARKERS SHALL BE COLOR-CODED: STORM - GREEN.
- B. STORM LATERALS: STORM LATERALS SHALL BE PVC SDR 35. PIPE SHALL HAVE PREFORMED WYES FOR HOUSE LATERAL CONNECTIONS F SIX (6) INCHES DIAMETER. A 6" X 6" STRAIGHT TEE OR DOUBLE TEE SHALL BE INSTALLED AT ONE (1) FOOT OUTSIDE THE RIGHT-OF-WAY WITH A RISER OF SIX (6) INCH PVC, THREE (3) FOOT ABOVE GRADE AND AN EXTENSION OF SIX (6) INCH PVC TO END OF UTILITY EASEMENT. A CAP WITH A STAINLESS STEEL TRAP COVER, FASTENED TO A STAINLESS STEEL NUT AND BOLT SHALL BE FURNISHED AT RISER. NINETY DEGREE (90) BENDS ARE PROHIBITED. POSITIVE FALL SHOULD BE FIELD VERIFIED BY CONTRACTOR. THE USE OF AN INSERTA-TEE AS SUBSTITUTION FOR WYE CONNECTING TO EXISTING SEWER MAIN MAYBE ALLOWED AS APPROVED BY THE CITY ENGINEER.
- C. SIX (6) INCH UNDERDRAIN: UNDERDRAIN SHALL BE INSTALLED IN ACCORDANCE WITH ODOT ITEM 605. UNDERDRAN CONDUIT SHALL MEET ONE OF THE FOLLOWING ODOT ITEM SPECIFICATIONS:
  - C.A. ODOT ITEM 707.41 - SIX (6) INCH POLYVINYL CHLORIDE (PVC) PIPE CONFORMING TO ASTM F758, TYPE PS46 WITH A MINIMUM OF FUR (4) ROWS OF PERFORATIONS.

- C.B. ODO ITEM 707.42 - SIX (6) INCH (PVC) CORRUGATED, DOUBLE WALLED SMOOTH INTERIOR PIPE CONFORMING TO ASTM F949 WITH PERFORATIONS. BEDDING SHALL BE NO. 57 WASHED LIMESTONE. UNDERDRAIN SHALL BE FABRIC WRAPPED AS DIRECTED BY THE ENGINEER. THE GASKET JOINT SHALL BE OF THE INTEGRAL BELL DESIGN FORMED AS A CONTINUOUS, HOMOGENEOUS ENTITY WITH THE PIPE. THE GASKET SHALL BE FACTORY ASSEMBLED AND SECURELY LOCKED INTO PLACE TO PREVENT DISPLACEMENT DURING ASSEMBLY. A JOINT LUBRICANT SUPPLIED BY THE MANUFACTURER SHALL BE USED ON THE GASKET AND BELL DURING ASSEMBLY. THE GASKET SHALL MEET THE REQUIREMENTS OF ASTM F477 AND THE JOINT SHALL MEET THE REQUIREMENTS OF ASTM D3212. JOINT DEFLECTION SHALL NOT EXCEED THE MAXIMUM ALLOWABLE AS RECOMMENDED BY THE MANUFACTURER. ALL STORM SEWERS INCLUDING UNDERDRAIN ENTERING A STRUCTURE SHALL HAVE A 6" X 6" CLASS C CONCRETE COLLAR POURED AROUND THE PIPE ON THE OUTSIDE OF THE STRUCTURE TO SEAL THE VOIDS BETWEEN THE CONDUIT AND STRUCTURE. HYDRAULIC CEMENT MAYBE SUBSTITUTED.
- D. SERVICE CONNECTIONS SHALL BE A MINIMUM OF 6" DIAMETER, INSTALLED AT A MINIMUM GRADE OF 1% AND SHALL BE PVC, CONFORMING TO ASTM D-3034 SDR 35 OR SDR 26 EQUAL TO OR GREATER THAN 12 FOOT BURIED DEPTH PER MANUFACTURES REQUIREMENTS.
- E. SERVICE CONNECTION CLEANOUT WITH TEE SHALL BE INSTALLED ONE (1) FOOT OUTSIDE RIGHT-OF-WAY BOUNDARY.
- F. NEW SEWER MAINS INSTALLED SHALL HAVE PREFORMED WYE-BRANCH FITTINGS OF THE THICKNESS CLASS OF THE SEWER MAIN, INSTALLED INTEGRALLY WITH THE MAIN FOR FUTURE HOUSE CONNECTIONS.
- G. THE END OF EACH SERVICE CONNECTION SHALL BE SEALED WITH A SOIL TIGHT FITTING PLUG AND MARKED WITH A 4" X 4" HARDWOOD STAKE EXTENDING VERTICALLY ABOUT 3 FEET ABOVE GROUND SURFACE.
- H. PROHIBITED CONNECTIONS: CLEAN WATER CONNECTIONS SUCH AS CONNECTIONS TO ROOF DRAINS AND/OR FOUNDATION DRAINS AND OTHER CLEAR WATER CONNECTIONS TO THE SANITARY PIPE ARE PROHIBITED.



MANHOLES ADJUSTED TO GRADE

1. CUT AND REMOVE THE ASPHALT PAVEMENT, AROUND THE EXISTING MANHOLE CASTING, IN A CIRCULAR FASHION WITH A MINIMUM DIAMETER OF 54" AND CENTERED ABOUT THE FRAME. THE CONTRACTOR SHALL USE EITHER "MR. MANHOLE," "COREMASTER," SYSTEMS OR APPROVED EQUAL TO MAKE A CLEAN CIRCULAR CUT AROUND THE CASTING. DISPOSE OF ALL ASPHALT, CONCRETE, BRICK AND ROAD DEBRIS.
2. REMOVE THE CASTING (MANHOLE RIM AND COVER) FROM THE TOP OF THE MANHOLE. INSPECT THE RIM AND COVER FOR DEFECTS. IF DEFECTS ARE PRESENT, REPLACE WITH NEW RIM/COVER AS NEEDED. IF DEFECTS ARE NOT PRESENT, CLEAN & RETAIN FOR USE IN RECONSTRUCTION.
3. CONCRETE MANHOLE  
REMOVE ALL ADJUSTING RINGS TO THE TOP OF THE CONCRETE CONE. DISPOSE OF THIS MATERIAL  
MASONRY MANHOLE  
REMOVE MASONRY TO THE LEVEL SPECIFIED IN FIG. 2.M. DISPOSE OF THIS MATERIAL.
4. REMOVE ALL AGGREGATE AROUND THE MANHOLE THAT HAS BEEN EXPOSED BY THE ASPHALT REMOVAL AND DISPOSE OF THIS AGGREGATE. THE AGGREGATE MUST BE REMOVED TO A MINIMUM OF 3" BELOW THE LEVEL OF THE TOP OF THE CONCRETE CONE/REMAINING MASONRY.
5. CONCRETE MANHOLE  
CLEAN AND INSPECT THE TOP SURFACE OF THE CONCRETE CONE SECTION. THE SURFACE SHOULD BE SMOOTH AND FREE OF BUMPS AND PITS THAT MAY PREVENT A GOOD WATER TIGHT SEAL. GRIND THE SURFACE AS NEEDED TO REMOVE PROTRUSIONS. UTILIZE COMPRESSED AIR TO BLOW DUST AND DEBRIS FROM THE SURFACE AFTER GRINDING. UTILIZE A HYDRAULIC CEMENT, ACCORDING TO MANUFACTURERS RECOMMENDATIONS, TO FILL IN DEPRESSIONS.  
MASONRY MANHOLE  
CLEAN AND INSPECT THE TOP SURFACE OF THE MASONRY. THE SURFACE MUST BE STRUCTURALLY SOUND. UTILIZE COMPRESSED AIR TO BLOW DUST AND DEBRIS FROM THE SURFACE. THE ENGINEER SHALL INSPECT THE MASONRY MANHOLE FOR STRUCTURAL INTEGRITY.
6. BRING THE AREA AROUND THE CONE/MASONRY BACK TO FLUSH WITH THE TOP OF THE MASONRY USING ODOT 703.01 #57 AGGREGATE.
7. APPLY MORTAR TO THE TOP OF THE MASONRY AND IMMEDIATELY INSTALL A CONCRETE COLLAR/ADJUSTING RING (2" MIN. THICKNESS) ON TOP OF THE MORTAR. THE CONCRETE COLLAR/ADJUSTING RING MUST HAVE AN INSIDE DIAMETER OF 24 INCHES. THE OUTSIDE DIAMETER MUST BE SUCH THAT THERE IS A MINIMUM OF 3 INCHES OF THE CONCRETE COLLAR/ADJUSTING RING BEARING ON MASONRY ALL THE WAY AROUND THE MANHOLE. (MASONRY MANHOLES ONLY)
8. A PVC PIPE SHALL BE USED AS A CHIMNEY LINER (SEE CHIMNEY LINER SPECIFICATIONS) AND MUST BE CUT TO THE EXACT PROFILE OF THE ROAD IN ALL DIRECTIONS SUCH THAT WHEN THE MANHOLE RIM AND COVER ARE RESTING ON TOP OF THE LINER, THE TOP OF THE CASTING SHALL BE EXACTLY 0.25" BELOW FLUSH WITH THE PAVEMENT SURFACE IN ALL DIRECTIONS.
9. THE LINER SHALL BE MARKED IN SUCH A WAY, UPON COMPLETION OF THE CUTTING PROCESS, THAT ROTATION DOES NOT OCCUR, WHICH COULD BE DETRIMENTAL TO THE END PRODUCT. THE TOP AND/OR BOTTOM OF THE LINER SHALL ALSO BE MARKED TO PREVENT THE LINER FROM BEING INSTALLED UP SIDE DOWN, WHICH COULD BE DETRIMENTAL TO THE END PRODUCT.
10. APPLY A LIBERAL AMOUNT OF SEALANT TO THE BOTTOM OF THE LINER AND SET IN PLACE ON TOP OF THE CONCRETE COLLAR/ADJUSTING RING WHILE MAKING SURE IT IS PROPERLY ALIGNED. THIS WILL CREATE A WATER TIGHT SEAL BETWEEN THE LINER AND THE CONCRETE COLLAR/ADJUSTING RING.
11. APPLY A LIBERAL AMOUNT OF SEALANT TO THE TOP OF THE LINER. SET THE MANHOLE RIM CASTING ON THE LINER WHILE MAKING SURE IT IS PROPERLY ALIGNED. THIS WILL CREATE A WATER TIGHT SEAL BETWEEN THE LINER AND THE MANHOLE RIM CASTING.

12. PLACE THE MANHOLE LID ON THE RIM CASTING TO LESSEN THE POSSIBILITY OF DEBRIS ENTERING THE MANHOLE.
13. PLACE EPOXY COATED #3 REBARS AS SHOWN IN FIG. 3.C & 3.M. THE CIRCULAR SHAPED REBARS SHALL HAVE A 6" MINIMUM OVERLAP.
14. APPLY WATERSTOP AS SHOWN IN FIG. 3.C & 3.M AND SPECIFIED IN THIS STANDARD DRAWING. THIS WILL ADD AN ADDITIONAL WATER TIGHT SEAL WHERE THE LINER MEETS THE CONCRETE COLLAR/ADJUSTING RING.
15. UTILIZE ODOT-CLASS C CONCRETE WITH BLACK DYE TO CAST A CONCRETE COLLAR AROUND THE RIM CASTING AND LINER. THE SURFACE OF THE CONCRETE SHALL BE FINISHED FROM FLUSH WITH THE PAVEMENT TO FLUSH WITH THE RIM CASTING. THE EDGE OF THE CONCRETE SHALL BE ROUNDED (1/4" RADIUS) WHERE IT MEETS THE ASPHALT. THIS WILL CREATE A SMALL GROOVE FOR A JOINT SEALER AT THIS LOCATION.
16. FILL THE GROOVE WITH A COLD POUR CRACK SEALER. THIS WILL PREVENT WATER FROM ENTERING THE CIRCULAR SEAM WHERE THE CONCRETE COLLAR MEETS THE ASPHALT.
17. APPLY AN ACRYLIC POLYMER CONCRETE CURING AND SEALING COMPOUND TO THE SURFACE OF THE CONCRETE COLLAR.
18. BARRICADE THE AREA AROUND THE CONCRETE TO PROTECT IT UNTIL THE CONCRETE ATTAINS A MODULUS OF RUPTURE OF 400 POUNDS PER SQUARE INCH. A CHEMICAL ADMIXTURE THAT ACTS AS A CONCRETE ACCELERATOR MAY BE USED TO SPEED UP THE PROCESS IF THE ROADWAY NEEDS TO BE OPENED SOONER.
19. IN ORDER TO MINIMIZE INCONVENIENCE TO MOTORISTS, THE CONTRACTOR PERFORMING THE WORK DESCRIBED IN THIS SPECIFICATION MUST BE CAPABLE OF PERFORMING ALL OF BOTH STEPS OF THIS SPECIFICATION IN 1.5 HOURS OR LESS.
20. THE CONTRACTOR SHALL WARRANT THE RECONSTRUCTED MANHOLE CHIMNEY TO BE LEAK FREE AND STRUCTURALLY SOUND FOR A MINIMUM OF 5 YEARS FROM THE DATE OF RECONSTRUCTION.

CHIMNEY LINER SPECIFICATIONS:

THE CHIMNEY LINER MUST BE MADE FROM POLYVINYL CHLORIDE COMPOUNDS WHICH COMPLY WITH THE REQUIREMENTS FOR A MINIMUM CELL CLASSIFICATION OF 12364 AS DEFINED BY ASTM D-1784.

THE CHIMNEY LINER MUST ALSO MEET ALL THE FOLLOWING PHYSICAL REQUIREMENTS:

PIPE STIFFNESS - MINIMUM PIPE STIFFNESS SHALL BE 46 PSI WHEN TESTED IN ACCORDANCE WITH ASTM D-2412

IMPACT RESISTANCE - NO VISUAL CRACKING OR SPLITTING OF THE WATERWAY WALL SHALL BE EVIDENCED WHEN TESTED IN ACCORDANCE WITH ASTM D-2444 WITH A 20 LB. WEIGHT, TUP B, FLAT PLATE HOLDER B TO A LEVEL OF 220 FT. LBS.

FUSION QUALITY - THERE SHALL BE NO SIGN OF FLAKING OR DISINTEGRATION WHEN IMMERSED IN ANHYDROUS ACETONE FOR 20 MINUTES AS DESCRIBED IN ASTM D-2152.

DUCTILITY - THERE SHALL BE NO EVIDENCE OF CRACKING OR SPLITTING WHEN PIPE IS FLATTENED IN A CIRCUMFERENTIAL ORIENTATION BETWEEN TWO FLAT PLATES BY SIXTY PERCENT (60%) OF THE ORIGINAL DIAMETER.

AIR TIGHTNESS - EACH LENGTH OF PIPE SHALL PASS A FACTORY 3.5 PSI AIR TEST AS DESCRIBED IN ASTM F-1803.

WATERSTOP SPECIFICATIONS:

THE WATERSTOP MUST MEET ALL OF THE FOLLOWING PHYSICAL REQUIREMENTS:

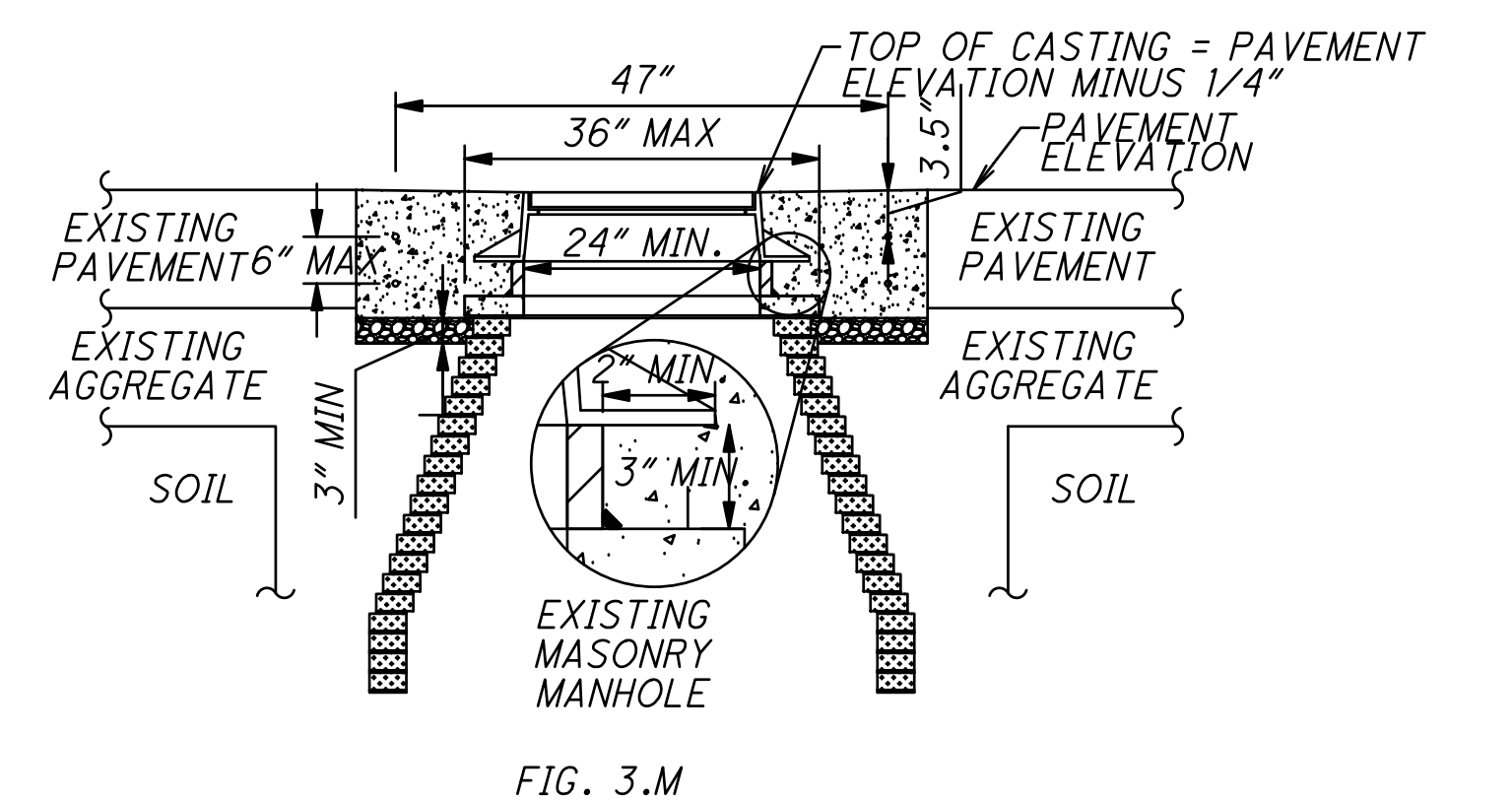
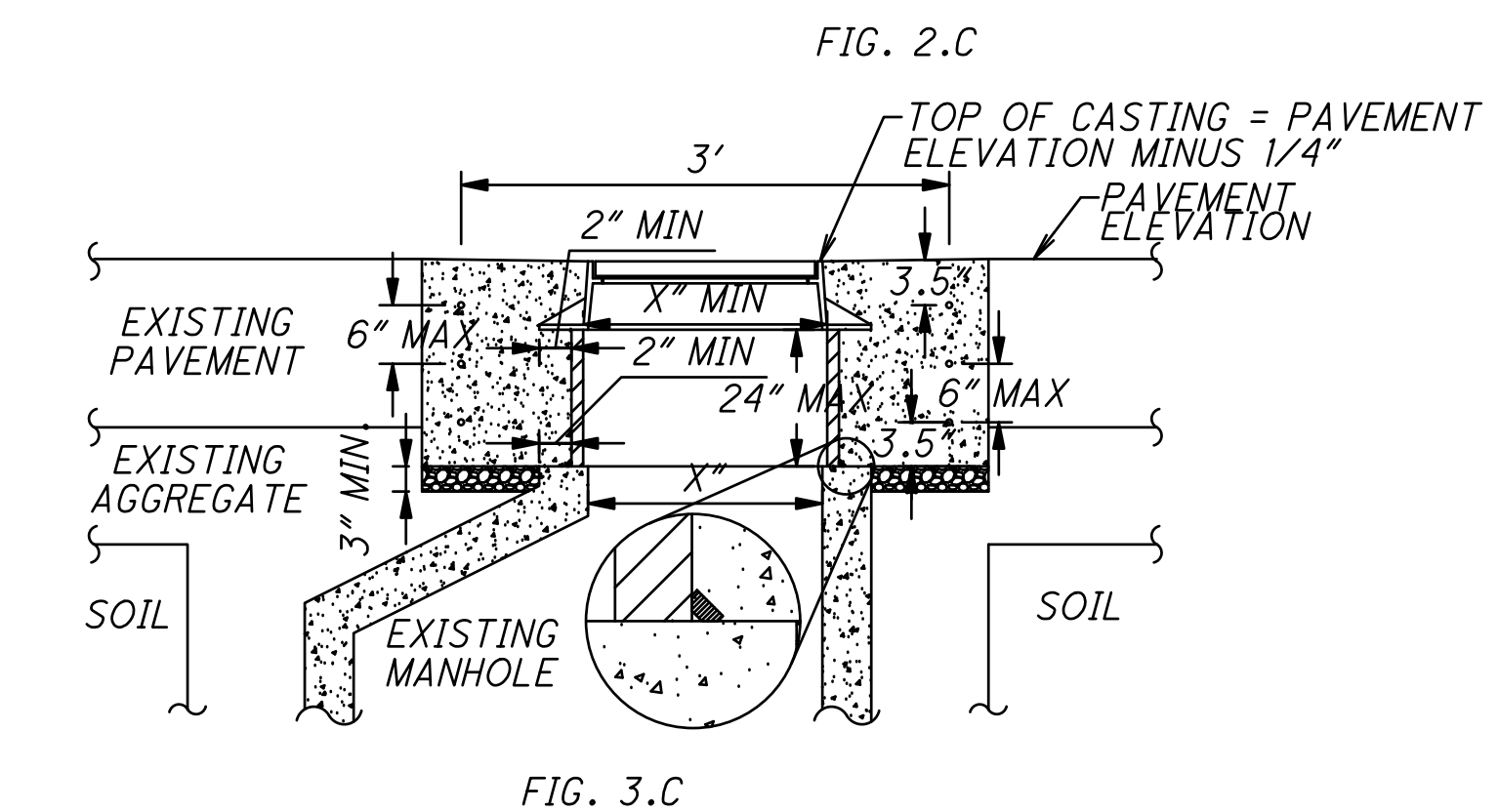
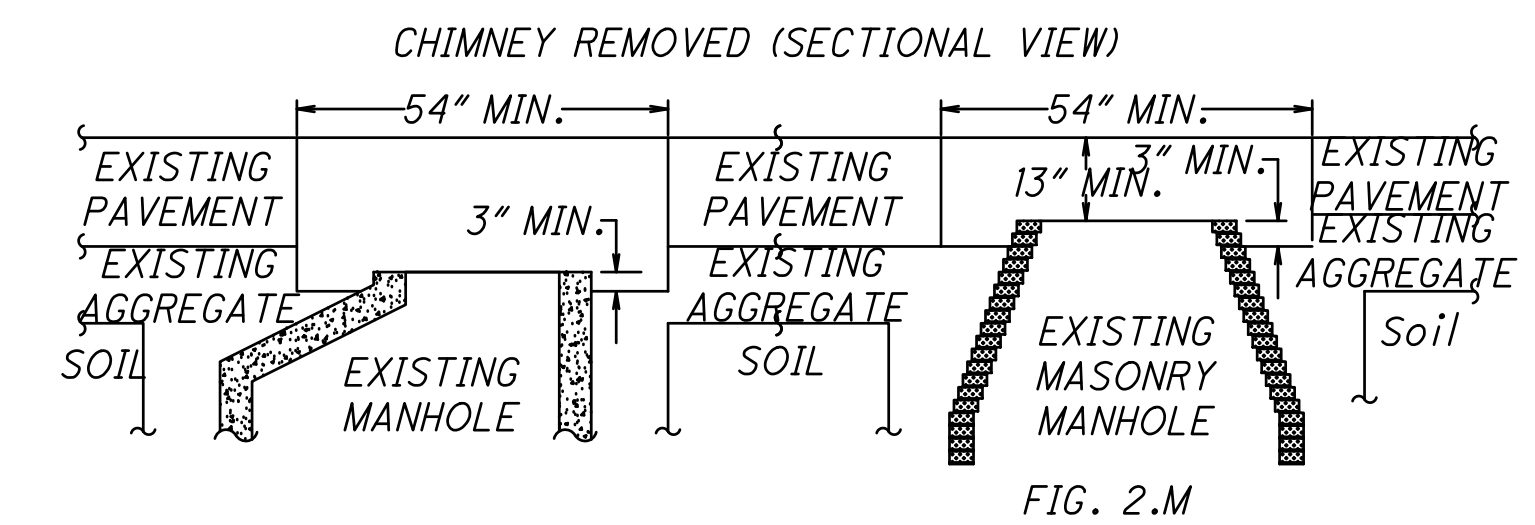
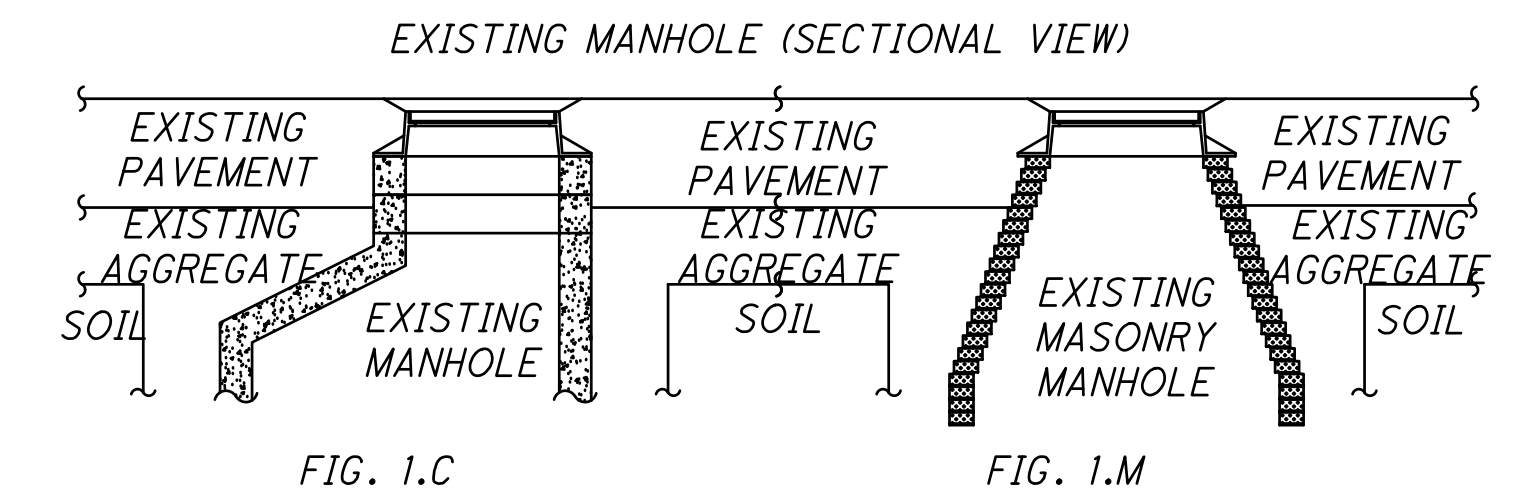
SPECIFIC GRAVITY - SHALL BE 1.55 +/- 5% WHEN TESTED IN ACCORDANCE WITH ASTM D-71.

VOLATILE MATTER - SHALL NOT EXCEED 1% WHEN TESTED IN ACCORDANCE WITH ASTM D-6.

APPLICATION TEMPERATURE - MUST BE ABLE TO BE APPLIED FROM -10 DEGREES F TO 125 DEGREES F AS A MINIMUM.

SERVICE TEMPERATURE - MUST BE ABLE TO FUNCTION PROPERLY IN SERVICE FROM -30 DEGREES F TO 180 DEGREES F AS A MINIMUM.

MANHOLE CHIMNEY RECONSTRUCTION DETAIL (<24")



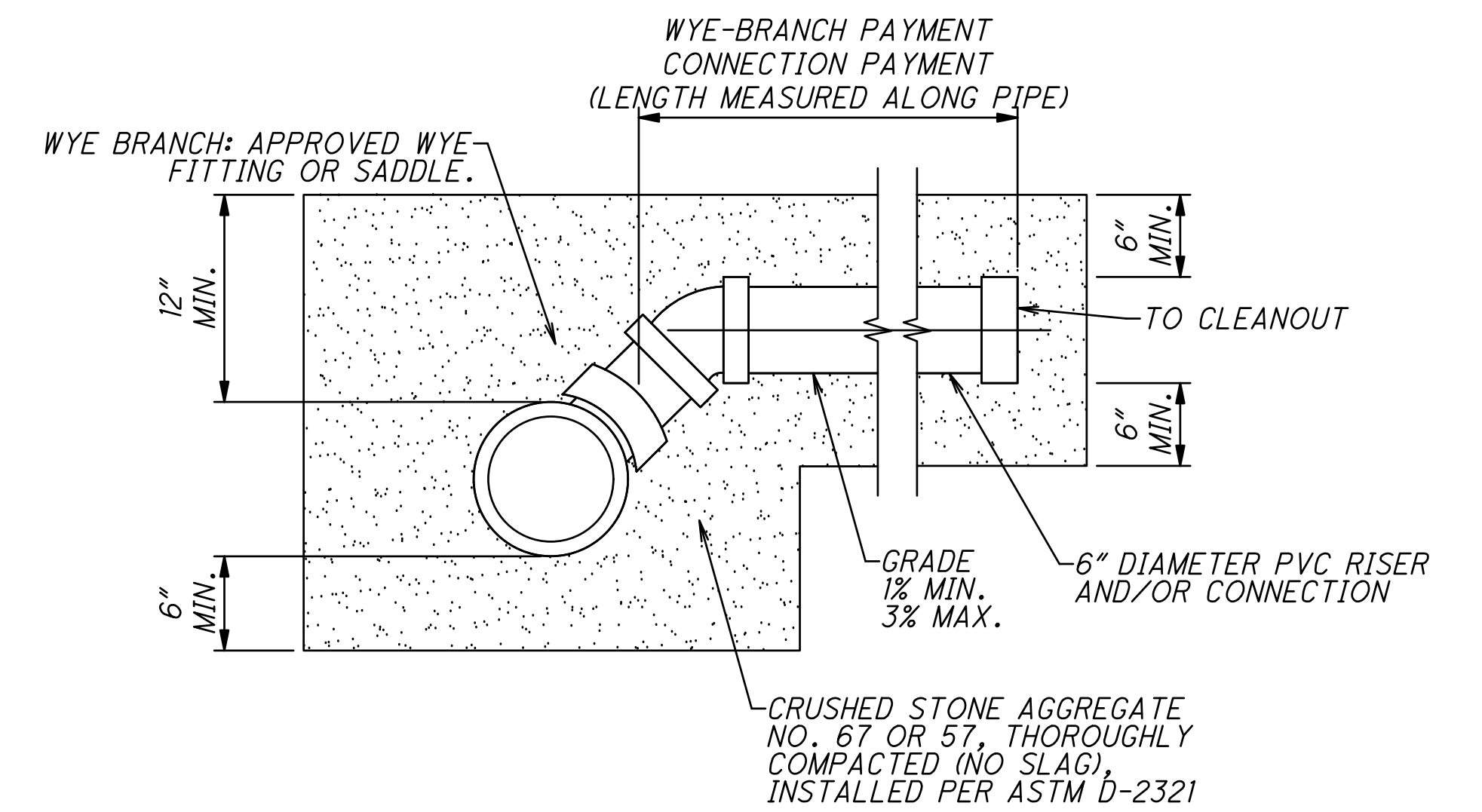
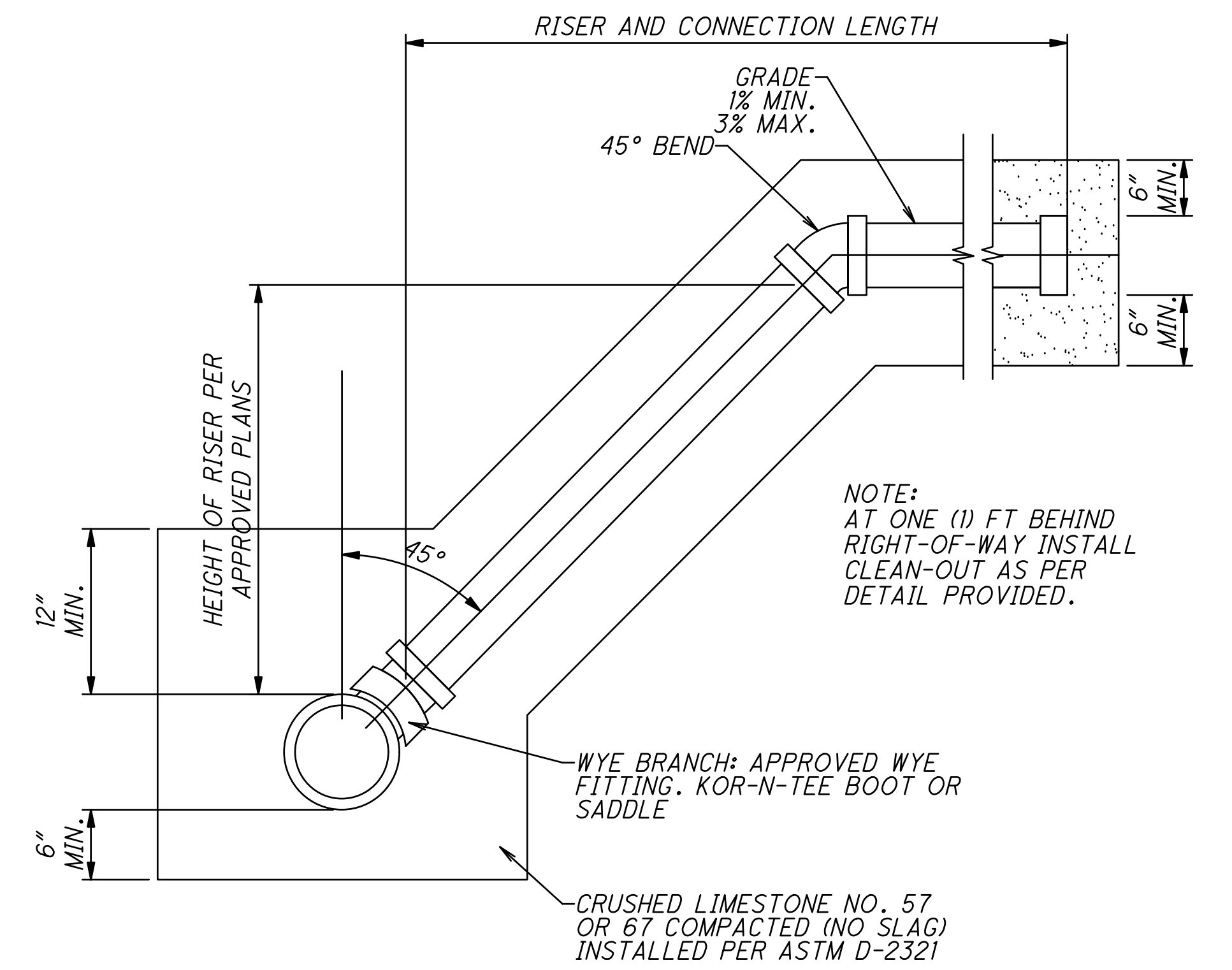
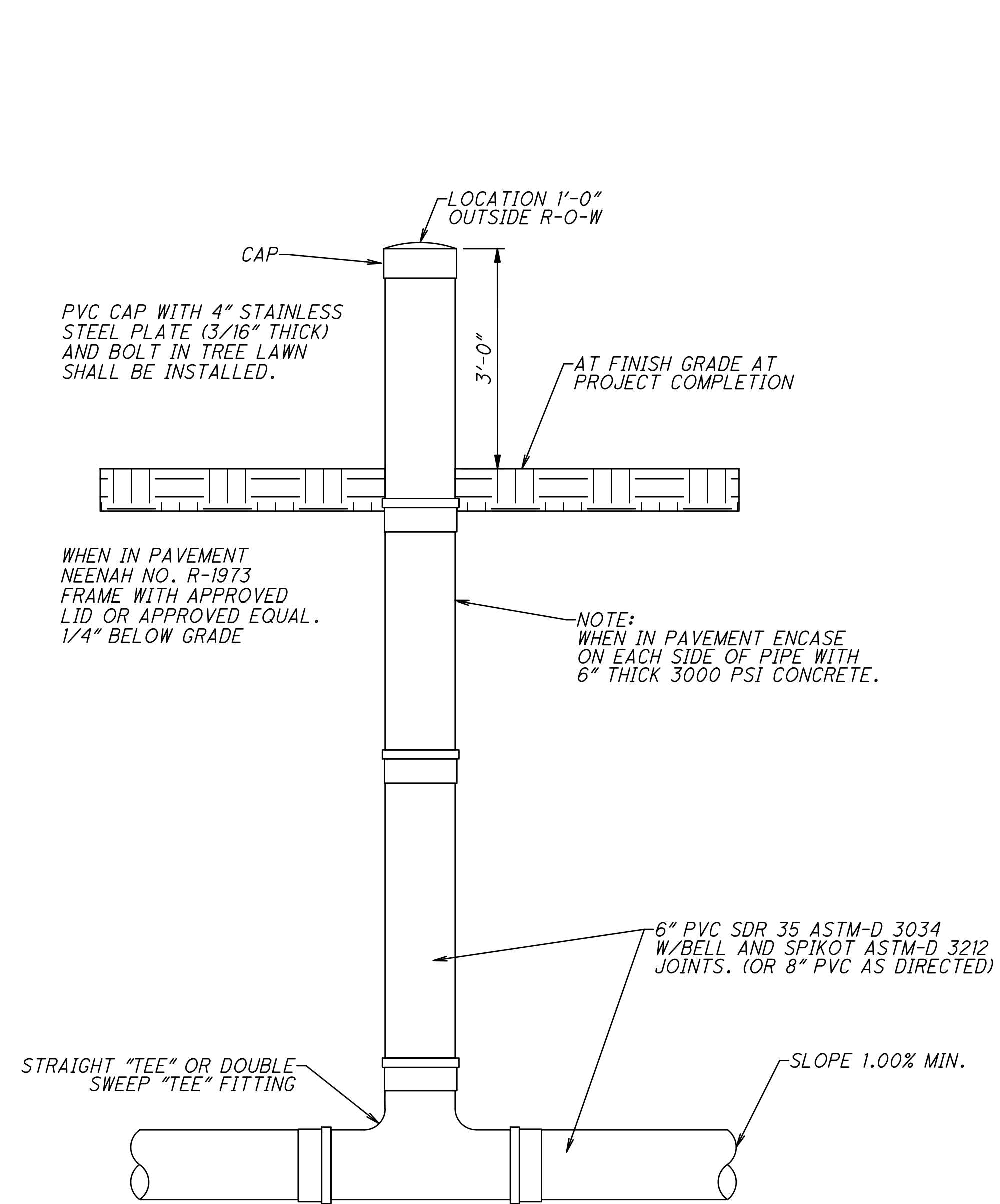
NOTE:  
THE CONTRACTOR SHALL REPLACE ALL CASTINGS, INCLUDING THE RIM AND LID WHEN THE ADJUSTMENT IS PERFORMED.

LEGEND

- [Concrete Pattern] = CONCRETE
- [Epoxy Coated #3 Rebar Pattern] = EPOXY COATED #3 REBAR
- [PVC Pipe Pattern] = PVC PIPE
- [ODOT #57 Aggregate Pattern] = ODOT #57 AGGREGATE
- [Waterstop Pattern] = WATERSTOP
- [Masonry Pattern] = MASONRY



1. STORM LATERALS



1. ALL CONSTRUCTION OF ANY PROJECT SHALL BE IN CONFORMANCE WITH CITY OF STREETSBORO'S CODIFIED ORDINANCE AND THE OHIO REVISED CODE
2. GENERAL
  - A. NO PERSON, FIRM, CORPORATION OR CONTRACTOR SHALL COMMENCE ANY WORK IN/ON THE PUBLIC RIGHT-OF-WAY WITHOUT FIRST FILING ALL PROPER PERMITS AND BONDS PER THE CITY OF STREETSBORO CODE.
  - B. ALL CONTRACTORS PERFORMING WORK ON WATER INFRASTRUCTURE MUST ABIDE BY ALL GENERAL NOTES THAT APPLY OF THE CITY STANDARDS AND/OR OTHER CITIES POLICIES AND PRACTICES DEEMED TO BE RELEVANT AND ACCEPTABLE BY THE CITY OF STREETSBORO ENGINEER OR THEIR REPRESENTATIVE.
  - C. THE CITY OF STREETSBORO RESERVES THE RIGHT TO INSPECT BY ANY MEANS, INCLUDING BUT NOT LIMITED TO, BACTERIA TESTS, FLOW TESTS AND PRESSURE TESTING ALL WATER LINES CONNECTING TO OR BECOMING AN ADDITION OF THE CITY OF STREETSBORO OWNED/MAINTAINED WATER DISTRIBUTION SYSTEM. THE CITY OF STREETSBORO IS NOT ACCOUNTABLE OR RESPONSIBLE FOR ANY LOSS INCLUDING TIME, MATERIALS, COSTS, OR CORRECTIONS REQUIRED AS A RESULT OF INSPECTIONS. PRIOR TO ACCEPTANCE WATERLINE SHALL BE PRESSURE TESTED (AWWA C-600, C-605) AND DISINFECTED (AWWA C-651). NO TAPS SHALL BE MADE UNTIL ACCEPTANCE BY THE CITY OF STREETSBORO. WATER SAMPLES FOR BACTERIOLOGICAL TESTS SHALL BE TAKEN BY THE CITY OF STREETSBORO WATER DEPARTMENT. THE CONTRACTOR WILL BE CHARGED FOR TESTING COSTS AFTER 2 FAILED SETS OF TESTS.
  - D. THE CITY OF STREETSBORO IS NOT ACCOUNTABLE OR RESPONSIBLE FOR ANY LOSS INCLUDING TIME, MATERIALS, COSTS, OR CORRECTIONS REQUIRED AS A RESULT OF INSPECTIONS. PRIOR TO INSTALLATION OF THE WATER HOUSE LINE, THE APPLICATION FOR WATER SERVICE MUST HAVE BEEN COMPLETED. WHERE NECESSARY, BUILDING, AND/OR SITE PLANS MUST BE SUBMITTED AT THE TIME OF MAKING APPLICATION FOR THE PURPOSE OF DETERMINING MINIMUM SIZE AND LOCATION. IT MAY BE NECESSARY TO MEET ON THE BUILDING SITE WITH THE OWNER AND/OR BUILDER TO REVIEW INSTALL LOCATIONS.
  - E. THE CITY OF STREETSBORO RESERVES THE RIGHT TO REFUSE A SUPPLY OF WATER TO PREMISES ON WHICH THE PLUMBING DOES NOT MEET THE REQUIREMENTS OF THE CITY OF STREETSBORO, THE BUILDING DEPARTMENT AND BOARD OF HEALTH OF THE POLITICAL SUBDIVISION.
  - F. THE CITY OF STREETSBORO MAY PERMIT PRIVATE CONTRACTORS TO INSTALL, MAINTAIN, AND REPAIR WATER MAINS WITHIN THE CITY WHICH MAY REQUIRE AN EXECUTION OF A PERFORMANCE CONTRACT DOCUMENT.
  - G. ALL WATER MAINS SHALL BE INSTALLED, MAINTAINED, AND REPAIRED UNDER THE SUPERVISION AND INSPECTION OF THE CITY OF STREETSBORO.
  - H. ALL WATER MAINS CONSTRUCTED, MAINTAINED, AND REPAIRED AT THE REQUEST OF AN OWNER/DEVELOPER SHALL BE CONSTRUCTED FROM THE EXISTING WATER MAIN TO THE END OF THE OWNER/DEVELOPER'S PROPERTY (ONE SIDE FOR CORNER PROPERTY) TO BE SERVED.
  - I. IT IS THE INTENT AND EXPECTATION OF THE CITY OF STREETSBORO THAT ALL WATER MAINS WILL BE CONSTRUCTED, REPAIRED, AND MAINTAINED IN ACCORDANCE WITH THE LATEST EDITIONS OF:
    - "RECOMMENDED STANDARDS FOR WATERWORKS - TEN STATE STANDARDS"
    - AWWA C651-14 DISINFECTING WATER MAINS

L. PAVEMENT DISTURBED DURING WATER MAIN INSTALLATION SHALL BE RESTORED AND REPAIRED AS SHOWN ON CITY OF STREETSBORO CITY DEVELOPMENT STANDARDS SHEETS PR-1 & TR-1.

2. WATER MAIN PIPE OPTIONS
  - A. DUCTILE IRON PIPE
    - MUST CONFORM TO - AWWA C-600 INSTALLATION OF DUCTILE-IRON MAINS AND THEIR APPURTENANCES
    - CLASS 53 WITH PUSH ON JOINTS PER AWWA C-151
    - CEMENT-LINED PER AWWA C-104
    - GASKET AND LUBRICANTS FOR PUSH ON JOINTS PER AWWA C-111
  - B. PLASTIC C909 PIPE
    - AWWA C605-13 UNDERGROUND INSTALLATION OF POLYVINYL CHLORIDE (PVC) AND MOLECULARLY ORIENTED POLYVINYL CHLORIDE (PVCO) PRESSURE PIPE AND FITTINGS
    - MOLECULARLY ORIENTED POLYVINYL CHLORIDE (PVCO) PRESSURE PIPE C-909 DR-18
    - EQUALS OR EXCEEDS ASTM D1784 CELL CLASS I2454 WITH PUSH ON JOINTS
    - PRESSURE CLASS 235
  - C. NOT PERMITTED - GRAY IRON PIPE AND FITTINGS WILL NOT BE PERMITTED
  - D. CONTRACTOR SHALL USE DOMESTIC MADE, AWWA APPROVED MATERIAL AT ALL TIMES, UNLESS OTHERWISE APPROVED BY THE CITY OF STREETSBORO.

3. MECHANICAL JOINT DUCTILE IRON RESTRAINING GLANDS
  - A. THE RESTRAINING GLANDS SHALL BE EBAA IRON, INC., SERIES 1100 OR EQUAL
  - B. EACH RESTRAINING GLAND SHALL:
    - HAVE THE FOLLOWING WEIGHTS
    - HAVE NO LESS THAN THE FOLLOWING NUMBER OF WEDGES WITH THE AUTO-TORQUEING HEADS
    - BE PACKED WITH T-HEAD BOLTS OF THE FOLLOWING LENGTHS

DIAMETER (IN.)	T-HEAD BOLT WEIGHT (LBS)	WEDGES	MINIMUM CONSTRUCTION LENGTH (IN.)
4	GRADE ALLOY CORE TEN STEEL	3	3 1/2
6	10	3	4
8	14	4	4 1/2
10	24	6	4 1/2
12	32	8	4 1/2

- D. T-HEAD BOLTS SHALL BE 1/2" LONGER THAN THE LENGTH SPECIFIED FOR AWWA C-153 FITTINGS TO ACCOMMODATE THE ZINC ANODE NUT.
- E. ZINC ANODE CAPS SHALL BE THREADED ONTO EVERY OTHER T-HEAD BOLT. ZINC ANODE CAPS SHALL WEIGH 6 OUNCES EACH AND UNIFORM TO THE CHEMICAL REQUIREMENTS OF ASTM B418-88.
- F. MECHANICAL JOINT GASKETS PER AWWA C-111
4. VALVES
  - A. ALL VALVES 4" THROUGH 12" SHALL BE RESILIENT WEDGE, MECHANICAL JOINT GATE VALVES WITH DUCTILE IRON BODIES PER AWWA C-515.
  - B. THE VALVES SHALL OPEN TO THE RIGHT AND INCLUDE A COMPLETE VALVE BOX.
5. FIRE SERVICE SIZE (WATER SERVICES)
  - A. UNLESS SPECIFICALLY APPROVED BY THE CITY OF STREETSBORO, THE LARGEST WATER SERVICE ALLOWED FOR FIRE OR SPRINKLER SYSTEMS IS 8 INCHES. THESE 8-INCH SERVICES WILL BE ALLOWED ON MAINS 10 INCHES AND LARGER ONLY. NO CONNECTION LARGER THAN 6 INCHES WILL BE ALLOWED ON 8-INCH MAINS, AND 4 ON 6-INCH MAINS.
6. FIRE HYDRANTS
  - A. ALL PUBLIC HYDRANTS WITHIN THE CITY SHALL BE UNDER THE JOINT SUPERVISION OF THE CITY OF STREETSBORO AND THE STREETSBORO FIRE DEPARTMENT. ADEQUACY OF OPERATION AND INSPECTION OF HYDRANTS IS THE SOLE RESPONSIBILITY OF THE STREETSBORO FIRE & WATER DEPARTMENTS FOR THOSE HYDRANTS IN STREETSBORO.
  - B. FIRE HYDRANT ASSEMBLIES SHALL BE INSTALLED PER THE CITY OF STREETSBORO STANDARDS.
  - C. ALL HYDRANTS SHALL CONFORM TO AWWA C-502, WITH MECHANICAL JOINT HUBS AND OPEN LEFT (COUNTER-CLOCKWISE).
  - D. ALL HOSE CONNECTIONS SHALL BE 4" STORZ CONNECTIONS..
  - E. HYDRANTS SHALL BE PLACED A MINIMUM OF THREE (3) FEET FROM THE FACE OF THE CURB OR EDGE OF THE PAVEMENT.
  - F. BREAKAWAY SAFETY FLANGE SHALL BE 2-4" ABOVE FINISHED GRADE.
  - G. THE FOLLOWING ARE A CURRENT LIST OF ACCEPTABLE FIRE HYDRANTS:

- MUELLER CENTURION MODEL A-423
  - EAST JORDAN IRON WORKS 6" BR
  - AMERICAN-DARLING B84B 5 1/4"
- H. ALL EXISTING HYDRANTS TO BE REMOVED ARE THE PROPERTY OF THE CITY OF STREETSBORO.
  - I. MINIMUM 4' AND MAXIMUM OF 8' BETWEEN WATCH VALVE AND HYDRANT. SECTION BETWEEN TEE AND HYDRANT MUST BE CONSTRUCTED WITH ANCHOR PIPE AND FITTINGS.
  7. SPECIAL CASTINGS (FITTINGS)
    - A. SPECIAL CASTINGS SHALL BE DUCTILE IRON MECHANICAL JOINT PER AWWA C-153.
    - B. SPECIAL CASTINGS SHALL BE CEMENT-LINED PER AWWA C-104.
  8. ANCHOR PIPE
    - A. WHERE ANCHOR PIPES ARE USED IN LIEU OF RESTRAINING GLANDS, THE T-HEAD BOLTS AND ZINC ANODE CAPS MUST BE USED AS SPECIFIED ABOVE.
  9. THRUST BLOCKING
    - A. BLOCKING MUST TAKE PLACE IN AN AREA WHERE THE SUPPORTING WALL HAS BEEN UNDISTURBED.
    - B. ALL FITTINGS 6" AND LARGER SHALL HAVE POURED CONCRETE THRUST BLOCKS, ALL VERTICAL BENDS SHALL HAVE POURED CONCRETE THRUST BLOCKS.
    - C. CONCRETE SHALL NOT COME IN CONTACT WITH THE JOINT (PIPE PROTECTED WITH A POLYETHYLENE ENCASEMENT) AND MUST LEAVE ROOM FOR ACCESS TO NUTS AND BOLTS.
    - D. FIRE HYDRANTS MAY BE BLOCKED WITH HARD WOOD.
    - E. ALL BENDS AND FITTINGS LESS THAN 6" MAY BE BLOCKED WITH HARDWOOD.

WATER MAIN DETAILS

REVISION DATE  
7-18-2022

CITY OF STREETSBORO



10. INSTALLING WATER MAIN & SERVICES

- A. THE SYSTEM SHALL BE DESIGNED TO MAINTAIN A MINIMUM PRESSURE OF 20 PSI (140 KPA) AT GROUND LEVEL AT ALL POINTS IN THE DISTRIBUTION SYSTEM UNDER ALL CONDITIONS OF FLOW.
- B. BOOSTER PUMPS SHALL NOT BE ALLOWED FOR ANY SERVICE CONNECTIONS FROM THE PUBLIC SUPPLY MAIN.
- C. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND ELEVATION OF THE WATER LINE AT ALL PROPOSED SEWER AND UTILITY CROSSINGS PRIOR TO ANY WATER LINE CONSTRUCTION AND IS RESPONSIBLE FOR CONTACTING OUPS (OHIO UTILITY PROTECTION SERVICES) PRIOR TO ANY EXCAVATION OR SURVEYING.
- D. THE CONTRACTOR SHALL ESTABLISH AND STAKE OUT THE WATER MAIN ALIGNMENT FOR CONSTRUCTION FROM THE HORIZONTAL CONTROL AS NOTED ON THE PLANS.
- E. WATER MAINS AND SERVICES SHALL BE LAID WITH PIPE AXIS FIVE (5) FEET BELOW THE TOP OF THE CURB OR FINISHED GRADE, UNLESS SPECIFIED OTHERWISE ON THE PLANS.
- F. THE MAXIMUM TRENCH OPENING SHALL NOT EXCEED 200 LINEAR FEET USING TRADITIONAL EXCAVATION METHODS OR 500 LINEAR FEET USING A TRENCHER. WHERE ACCESS TO DRIVES AND PARKING LOTS IS HINDERED OR BLOCKED FOR AN EXTENDED PERIOD OF TIME, THE CONTRACTOR SHALL PROVIDE TEMPORARY ACCESS USING COMPACTED GRAVEL. AT NO TIME, SHALL THE CONTRACTOR USE PLATING AS A SOLE MEANS OF PROVIDING ACCESS IN ANY PAVED OR NON-PAVED AREA. THE CONTRACTOR SHALL KEEP ALL WORK WITHIN THE RIGHT-OF-WAY, EASEMENTS, AND CONSTRUCTION LIMITS SHOWN ON THE PLANS.
- G. NO OPEN TRENCHES WILL BE PERMITTED OVERNIGHT. FENCES MAY BE REQUIRED AT THE DISCRETION OF THE CITY TO PROTECT PEDESTRIAN TRAFFIC.
- H. WHEN EXCAVATING THE TRENCH IN ROCK (AS DETERMINED BY THE ENGINEER/CITY), THE TRENCH SHALL BE EXCAVATED AN ADDITIONAL SIX (6) INCHES BELOW THE PROPOSED GRADE OF THE BOTTOM OF THE PIPE AND BROUGHT BACK TO PROPOSED GRADE WITH FILL SAND AND BE TAMPED TO SUPPORT THE PIPE ALONG ITS ENTIRE LENGTH.
- I. UNSTABLE OR UNSUITABLE MATERIAL ENCOUNTERED AT THE TRENCH BOTTOM AS DETERMINED BY THE ENGINEER SHALL BE REMOVED TO A DEPTH SPECIFIED BY THE ENGINEER/CITY, AND THE TRENCH REFILLED TO THE PROPOSED GRADE WITH BEDDING MATERIAL AS SPECIFIED ABOVE.
- J. TRENCH EXCAVATION FOR WATER MAIN INSTALLATION SHALL BE RESTORED AS SHOWN ON TR-1
- K. RESTRAINED JOINTS CREATED BY THE USE OF RESTRAINING GASKETS MAY BE REQUIRED AS FIELD CONDITIONS DICTATE AS DIRECTED BY THE ENGINEER/CITY.
- L. ANY CHEMICAL, LUBRICANT, OR GREASE USED TO ASSEMBLE THE WATER MAIN OR CONNECTING FITTURE/FITTINGS SHALL BE FOOD GRADE AND MUST MEET REQUIREMENTS THAT ARE SAFE FOR POTABLE DRINKING WATER AND NONTOXIC FOR HUMAN CONSUMPTION.
- M. WHERE THE WATER MAIN PIPE CHANGES IN MATERIAL, THE TRANSITION COUPLING PLUS THE NEXT JOINT IN

BOTH DIRECTIONS SHALL BE RESTRAINED OR ANCHORED PER THE CITY OF STREETSBORO.

- N. IN ADDITION TO THRUST BLOCKING, RESTRAINED JOINT SHALL BE USED AT ALL FITTINGS OR CHANGES IN PIPE ALIGNMENT EQUAL OR GREATER THAN 11.25° (11.25 DEGREES).
- O. PIPE JOINTS SHALL BE DEFLECTED, OR FITTINGS SHALL BE PROVIDED TO MAINTAIN HORIZONTAL ALIGNMENT AND VERTICAL ELEVATIONS SHOWN. DEFLECTIONS ARE TO BE MAXIMUM OF ONE-HALF THE MANUFACTURER'S RECOMMENDATION. IF THE CONTRACTOR CHOOSES TO USE FITTINGS TO OBTAIN THE ALIGNMENT SHOWN, IT SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.
- P. A 10-FOOT MINIMUM HORIZONTAL CLEARANCE SHALL BE MAINTAINED FROM THE EDGE OF THE WATER MAIN PIPES TO THE EDGE OF THE ANY OTHER UTILITY LINE SUCH AS SANITARY SEWER, FORCE MAIN PIPE AND STORM SEWER.
- Q. A 5-FOOT MINIMUM HORIZONTAL CLEARANCE FROM EDGE OF WATERLINE TO EDGE OF GAS LINE, ELECTRIC LINE, COMMUNICATION LINE ETC.
- R. AN 18-INCH MINIMUM VERTICAL CLEARANCE SHALL BE MAINTAINED FROM THE EDGE OF ALL WATER MAIN PIPES TO THE EDGE OF ANY OTHER UTILITY LINE SUCH AS SANITARY SEWER, FORCE MAIN PIPE OR STORM SEWER. INSTALL MONOLITHIC CRADLE WHERE LESS THAN 18-INCH VERTICAL CLEARANCE EXISTS.
- S. WHERE WATER MAINS CROSS SEWER TRENCHES, THE PROPOSED WATER MAIN TRENCH IS TO BE BACKFILLED BY REFILLING THE TRENCH 14" - 18" ABOVE TOP OF PIPES AND FITTINGS WITH CLEAN FILL SAND. COMPLETE THE TRENCH WITH 8" LIFTS OF COMPACTED 304 OR CDF WHERE REQUIRED BY THE CITY OF STREETSBORO.
- T. ALL EXCAVATION WITHIN EXISTING PAVEMENT SHALL BE FILLED WITH CONTROL DENSITY FILL (LOW STRENGTH MORTAR) PER ODOT CMS.
- U. REFER TO TW-2 FOR INSTALLING DETECTABLE TRACER WIRE AND COMPONENTS. ALL TRACER WIRE AND COMPONENTS SHALL BE "COPPERHEAD INDUSTRIES" BRAND AS DETAILED OR AN APPROVED EQUAL. THE CONTRACTOR SHALL INSTALL BOTH DETECTABLE TRACER TAPE AND ONE NO. 12 GAUGE HIGH STRENGTH INSULATED STRANDED COPPER WIRE IN ALL OPEN CUT TRENCHES FOR ALL WATER MAINS AND WATER SERVICES. DIRECTIONALLY DRILLED LINE SHALL USE NO. 10 GAUGE EXTRA HIGH STRENGTH INSULATED STRANDED COPPER WIRE. TRACER TAPE SHALL BE 3" WIDE, BLUE CODED POTABLE WATER ON BOTH SIDES. TRACER TAPE SHALL BE ALARMGUARD OR LINEGUARD OR EQUAL. NO. 12 WIRE WILL BE CONNECTED TO VALVE BOXES, SERVICE METER PITS, AND HYDRANTS AT A MAXIMUM SPACING OF 5,000 FEET. THE COST OF THE TAPE AND WIRE SHALL BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF THE WATER MAIN.
- V. IN ALL CASES, THE WATER MAIN, ALL FITTINGS, AND OTHER CONSTRUCTION METHOD/MATERIALS AS SEEN NECESSARY BY THE CITY OF STREETSBORO MUST BE INSPECTED AND APPROVED BY THE CITY OF STREETSBORO PRIOR TO BACKFILLING AND/OR TURNING THE WATER SUPPLY ON FOR USE.
- W. WITHIN A SPECIFIED TIME PERIOD, FROM THE DATE OF APPROVAL OF CONSTRUCTION TO, MAINTENANCE OF OR REPAIR OF WATER MAINS BY THE SERVICE DIRECTOR, THE APPLICANT SHALL COMPLETE, OR CAUSE TO BE COMPLETED, THE FOLLOWING WORK:
- X. ANY EXISTING HYDRANTS, VALVES, VALVE BOXES,

METER PITS, SERVICE LINES, CURB BOXES, OR WATER MAINS THAT ARE DAMAGED OR MUST BE ADJUSTED AND/ OR MOVED MUST BE REPAIRED, ADJUSTED, MOVE AND OR REPLACED AT THE CONTRACTOR'S EXPENSE. CONTACT THE CITY OF STREETSBORO WATER DEPARTMENT TO SCHEDULE THIS WORK.

- Y. ANY PORTION OF THE CONSTRUCTION, MAINTENANCE, OR REPAIR NOT MEETING SPECIFICATIONS OF THE CITY OF STREETSBORO OR FAILING THE PRESSURE TEST OR BACTERIA TEST WILL BE REPLACED OR CORRECTED BY THE APPLICANT.
- Z. THE APPLICANT AND/OR HIS CONTRACTOR SHALL ABIDE BY ALL CITY, STATE AND FEDERAL LAWS, RULES AND REGULATIONS APPLICABLE TO THE WORK TO BE PERFORMED.
- AA. THE CONTRACTOR SHALL SUPPLY A TEMPORARY SAFE WATER SERVICE TO ANY CUSTOMER THAT WILL HAVE AN INTERRUPTION OF SERVICE DUE TO THIS PROJECT. CONTRACTOR MUST NOTIFY ANY PARTIES OR RESIDENTS 24 HOURS IN ADVANCE OF AN ANTICIPATED INTERRUPTION DUE TO CONSTRUCTION.
  - A MINIMUM OF 35 PSI PRESSURE SHALL BE MAINTAINED TO THE CURB STOP DURING NORMAL OPERATING CONDITIONS.
  - THE CITY OF STREETSBORO WATER DEPARTMENT WILL OPERATE ALL VALVES AND DETERMINE THE DATE AND THE TIME OF ANY WATER TURN OFFS.

II. WATER LATERALS (HOUSE LINES)

- A. NO PERSON, FIRM, CORPORATION OR CONTRACTOR SHALL COMMENCE ANY WORK IN/ON THE PUBLIC RIGHT-OF-WAY WITHOUT FIRST FILING ALL PROPER PERMITS AND BONDS PER THE CITY OF STREETSBORO CODE.

TYPE OF CONNECTION	CONNECTION	SIZE OF SERVICE PIPE
CORPORATION STOP	1 1/2"	1 1/2" TO PROPERTY LINE
CORPORATION STOP	2"	2" TO PROPERTY LINE
TEE OR CUTTING IN GATE VALVE	4"	4" TO PROPERTY LINE
TEE OR CUTTING IN GATE VALVE	6"	6" TO PROPERTY LINE
TEE OR CUTTING IN GATE VALVE	8"	8" TO PROPERTY LINE

THE MAXIMUM AND MINIMUM SIZE OF THE SERVICE SUPPLYING WATER TO A PREMISE SHALL BE DETERMINED BY THE CITY OF STREETSBORO BUT SHALL BE LIMITED TO ONE STANDARD PIPE SIZE SMALLER THAN THE MAIN.

- C. WATER LATERALS (HOUSE LINES) SHALL BE OF SUFFICIENT SIZE TO GIVE ADEQUATE SERVICE AT ANY FITTURE WITH PRESSURE OF 25 PSI AT THE CURB LINE. WATER HOUSE LINES FROM 2 INCHES AND SMALL SERIES TO THE CONTROL VALVE IN THE BUILDING SHALL BE NOT THAN THAT SPECIFIED FOR SERVICES.
- D. ALL HOUSE LINES 2 INCHES AND SMALLER, SHALL BE TYPE "K" SOFT COPPER. FITTINGS MAY BE OF BRASS, COPPER, OR DUCTILE IRON. FITTINGS FOR COPPER PIPE SHALL BE FLARED OR COMPRESSION TYPE WITH SAFETY LOCKS.
- E. WATER HOUSE LINES LARGER THAN 2 INCHES SHALL BE DUCTILE IRON OR PVC, C909. FITTINGS FOR DUCTILE AND PVC PIPE SHALL BE MECHANICAL WITH STAINLESS STEEL BOLTS.

- F. WATER HOUSE LINES TO INTERIOR METER SETTINGS IN THE REAR OF THE BUILDING SHALL BE LAID OUTSIDE THE BUILDING FOUNDATION.
- G. A WATER HOUSE LINE SERVING AN INTERIOR METER SETTING MUST BE INSTALLED IN A SUITABLE CONDUIT FROM ONE FOOT OUTSIDE THE BUILDING FOOTER TO 1 INCH ABOVE THE SURFACE OF THE FLOOR.
- H. IF A WATER HOUSELINE MUST BE LAID UNDERNEATH A CONCRETE OR ASPHALT SURFACE, THEN IT SHALL ALSO BE INSTALLED IN A SUITABLE CONDUIT WHEN THE WATER HOUSELINE IS 2 INCHES OR SMALLER. NO COUPLINGS OR CONNECTIONS WILL BE PERMITTED WITHIN ANY CONDUIT UNLESS APPROVED BY THE CITY OF STREETSBORO.
- I. A 10-FOOT MINIMUM HORIZONTAL CLEARANCE SHALL BE MAINTAINED FROM THE EDGE OF THE WATER LATERAL PIPES TO THE EDGE OF THE ANY OTHER UTILITY LINE SUCH AS SANITARY SEWER, FORCE MAIN PIPE AND STORM SEWER.
- J. A 5-FOOT MINIMUM HORIZONTAL CLEARANCE FROM EDGE OF WATERLINE TO EDGE OF GAS LINE, ELECTRIC LINE, COMMUNICATION LINE ETC.
- K. AN 18-INCH MINIMUM VERTICAL CLEARANCE SHALL BE MAINTAINED FROM THE EDGE OF ALL WATER LATERAL PIPES TO THE EDGE OF ANY OTHER UTILITY LINE SUCH AS SANITARY SEWER, FORCE MAIN PIPE OR STORM SEWER. INSTALL MONOLITHIC CRADLE WHERE LESS THAN 18-INCH VERTICAL CLEARANCE EXISTS.
- L. WHERE WATER LATERALS CROSS SEWER TRENCHES, THE PROPOSED WATER LATERAL TRENCH IS TO BE BACKFILLED BY REFILLING THE TRENCH 14" - 18" ABOVE TOP OF PIPES AND FITTINGS WITH CLEAN FILL SAND. COMPLETE THE TRENCH WITH 8" LIFTS OF COMPACTED 304 OR CDF WHERE REQUIRED BY THE CITY OF STREETSBORO.
- M. ALL EXCAVATION WITHIN EXISTING PAVEMENT SHALL BE FILLED WITH CONTROL DENSITY FILL (LOW STRENGTH MORTAR) PER ODOT CMS.
- N. HOUSE LINES THAT ARE NOT ABLE TO MEET WATER MAIN RULES 13 "LAID AT 5 FOOT DEPTHS" WHEN LAID WITH LESS FOR SOME UNMANAGEABLE REASON, SHALL BE PROTECTED BY A COVERING OF 1 INCH FELT AND WATER-PROOFED CANVAS OR OTHER SUITABLE WATER-PROOFING MATERIAL, OR OTHERWISE PROTECTED AS DIRECTED BY THE CITY OF STREETSBORO. ALL PIPE AND FITTURES SHALL BE EFFECTIVELY PROTECTED AGAINST DAMAGE BY FREEZING.
- O. NO ATTACHMENT FOR WITHDRAWING WATER SHALL BE MADE TO THE WATER SERVICE OR HOUSE LINE BETWEEN THE MAIN AND THE METER.

11. WATER LATERALS (HOUSE LINES) CONTINUED

- P. ALL BUILDINGS SUPPLIED BY A WATER SERVICE 1 INCH AND UNDER, WHERE THE METER IS LOCATED IN THE BUILDING, SHALL HAVE AN APPROVED FULL FLOW-THROUGH TYPE VALVE INSTALLED ON THE INLET AND OUTLET SIDE OF THE METER. THE INLET VALVE SHALL BE INSTALLED WITHIN ONE FOOT OF THE ENTRANCE OF THE HOUSE LINE TO THE BASEMENT. THE VALVES SHALL BE EASILY ACCESSIBLE AND SO INSTALLED THAT THE WATER CAN BE SHUT OFF TO THE PREMISES AND MUST BE NO SMALLER THAN THE HOUSELINE PIPE.
- Q. LARGER WATER SERVICES SHALL HAVE VALVES AND METER SETTINGS INSTALLED IN ACCORDANCE, WITH THE MAIN VALVE IN THE BASEMENT WITHIN THREE (3) FEET OF THE OUTSIDE BUILDING WALL MEASURED ALONG THE PIPE. THESE VALVING REQUIREMENTS APPLY TO ALL NEW CONSTRUCTION AND REPLACEMENTS.
- R. ALL VALVES MUST BE ACCESSIBLE, AND EACH UNDERGROUND VALVE SHALL MEET THE SPECIFICATIONS SHALL HAVE A STANDARD VALVE BOX SIMILAR TO AND INTERCHANGEABLE WITH THE BOXES USED BY THE CITY OF STREETSBORO.
- S. PROVISIONS MUST BE MADE IN ALL PIPING FOR THE INSTALLATION OF A METER IN ACCORDANCE WITH THESE CITY STANDARDS.
- T. IF ORDERED BY THE CITY OF STREETSBORO, WATER SERVICES SUPPLYING PUMPS SHALL HAVE SUCTION TANKS OR OTHER PROTECTIVE DEVICES INSTALLED ON THE LINE. LIKEWISE, THE CITY OF STREETSBORO MAY ORDER AIR CHAMBERS OR OTHER PROTECTIVE DEVICES TO BE INSTALLED TO REDUCE WATER HAMMER CAUSED BY QUICK-CLOSING DEVICES INSTALLED BY THE CONSUMER. IT SHALL BE THE DUTY OF THE WATER CONSUMER TO MAINTAIN SUCH PROTECTIVE DEVICES IN PROPER WORKING ORDER AND TO CERTIFY TO THE CITY OF STREETSBORO AT LEAST ONCE A YEAR THAT THE PROTECTIVE DEVICES HAVE BEEN TESTED AND ARE OPERATING PROPERLY. CONNECTIONS OF WATER HOUSE LINES TO EXISTING SERVICES SHALL BE MADE AT THE CURB STOP, OR METER PIT.
- U. IN ALL CASES, THE WATER HOUSE LINE, ALL FITTINGS, AND OTHER CONSTRUCTION METHOD/MATERIALS AS SEEN NECESSARY BY THE CITY OF STREETSBORO MUST BE INSPECTED AND APPROVED BY THE CITY OF STREETSBORO PRIOR TO BACKFILLING AND/OR TURNING THE WATER SUPPLY ON FOR USE.
- V. THE CITY OF STREETSBORO MAY REQUIRE THE INSTALLATION OF A BACKFLOW PREVENTION DEVICE ON ANY WATER SERVICE.

12. WATER SERVICES AND METER PITS

- A. WATER SERVICES AND METER PITS SHALL BE INSTALLED PER THE CITY OF STREETSBORO STANDARDS.
- B. ALL WATER SERVICES SHALL BE 1" MINIMUM.
- C. ALL CURB METER SETTINGS FOR 5/8, 3/4 AND 1-INCH METERS SHALL BE INSTALLED BY THE STREETSBORO WATER DEPARTMENT (UNLESS NEW ALLOTMENT) AT THE EXPENSE OF THE OWNER.
- D. WATER SERVICE MATERIAL THAT WILL BE SUPPLIED BY THE CITY OF STREETSBORO AT THE EXPENSE OF THE OWNER:
  - METER SETTING, METER, METER PIT AND

CASTINGS

- E. THE CONTRACTOR WILL PERFORM THE EXCAVATION AND BACKFILL NECESSARY TO INSTALL WATER SERVICES.
- F. THE WATER SERVICE LINE MUST BE RUN STRAIGHT FROM THE HOUSE TO THE DITCH OR CURB LINE, CURLED UP TO GRADE LEVEL.
- G. THE MINIMUM DEPTH FOR WATER SERVICES WILL BE 5 FEET FROM FINISHED GRADE.
- H. THE DEVELOPER OR HIS CONTRACTOR SHALL MARK THE LOCATION AND FINISHED GRADE OF THE METER PIT. ANY NEEDED RELOCATION (VERTICAL OR HORIZONTAL) OF THE METER PITS WILL BE AT THE DEVELOPER'S EXPENSE.
- I. COPPER SHALL EXTEND HIGH ENOUGH INSIDE METER PIT TO ALLOW FOR A FINISHED METER HEIGHT OF 16"-18" BELOW FINISHED GRADE.
- J. THE COST OF WATER SERVICE PERMIT SHALL BE OBTAINED AT THE CITY WATER DEPARTMENT AND PAID PRIOR TO COMMENCEMENT OF WATER SERVICE WORK.
- K. METER INSTALLATION FOR INTERIOR LOCATIONS MUST MEET THE FOLLOWING:
  - EASILY ACCESSIBLE WITH ADEQUATE HEADROOM.
  - INSTALLED IN A HORIZONTAL POSITION 1 FOOT OFF INTERIOR WALL AND 1-3 FEET ABOVE THE FLOOR.
  - THE METER MUST BE SUPPORTED SO THE WEIGHT OF THE METER IS NOT JUST SUPPORTED BY PIPING.
  - PROPERLY HEATED FOR METER PROTECTION.
  - ADEQUATE DRAINAGE MUST INCLUDE A SUITABLE FLOOR DRAIN OR SUMP PUMP LOCATED WITHIN FIVE FEET OF THE METER.
- L. A METER MAY BE SET IN A BUILDING WITHOUT A BASEMENT PROVIDED IT MEETS ALL (L.) ABOVE.
- M. ALL INSIDE METER SETTINGS AND METERS LARGER THAN 2" MUST MEET THE STANDARD SET FORTH BY THE CITY OF STREETSBORO WATER DEPARTMENT.
- N. INSPECTIONS MUST BE COMPLETED BY THE CITY OF STREETSBORO PRIOR TO THE METER BEING PUT INTO SERVICE.

- O. METERS WHICH BURST DUE TO FREEZING SHALL NOT BE REMOVED FROM PIPING EXCEPT BY THE CITY OF STREETSBORO OR ITS AGENTS.

13. WATER OUTAGES

- A. THE CONTRACTOR SHALL SUPPLY A TEMPORARY SAFE WATER SERVICE TO ANY CUSTOMER THAT WILL HAVE AN INTERRUPTION OF SERVICE DUE TO THIS PROJECT. CONTRACTOR MUST NOTIFY ANY PARTIES OR RESIDENTS 24 HOURS IN ADVANCE OF AN ANTICIPATED INTERRUPTION DUE TO CONSTRUCTION.
- B. A MINIMUM OF 35 PSI PRESSURE SHALL BE MAINTAINED TO THE CURB STOP DURING NORMAL OPERATING CONDITIONS.
- C. THE CITY OF STREETSBORO WATER DEPARTMENT WILL OPERATE ALL VALVES AND DETERMINE THE DATE AND TIME OF ANY WATER TURN OFFS.

14. TESTING & INSPECTIONS

- A. PRIOR TO ACCEPTANCE, THE WATERLINE SHALL BE PRESSURE TESTED (AWWA C-600, C-605) AND DISINFECTED (AWWA C-651).
- B. NO TAPS SHALL BE MADE UNTIL ACCEPTANCE BY THE CITY OF STREETSBORO WATER DEPARTMENT.
- C. WATER SAMPLES FOR BACTERIOLOGICAL TEST SHALL BE TAKEN BY THE CITY OF STREETSBORO WATER DEPARTMENT.
- D. THE MAXIMUM LENGTH OF PIPE TO BE TESTED AT ONE TIME IS 600 FEET
- E. THE CONTRACTOR WILL BE CHARGED FOR TESTING COSTS AFTER TWO FAILED SETS OF TESTS.
- F. THE STREETSBORO WATER DEPARTMENT RESERVES THE RIGHT TO INSPECT BY ANY MEANS, INCLUDING BUT NOT LIMITED TO, BACTERIA TESTS, FLOW TESTS AND PRESSURE TESTING ON ALL WATER LINES CONNECTING TO OR BECOMING AN ADDITION OF THE CITY OF STREETSBORO OWNED/MAINTAINED WATER DISTRIBUTION SYSTEM.
- G. THE STREETSBORO WATER DEPARTMENT IS NOT ACCOUNTABLE OR RESPONSIBLE FOR ANY LOSS INCLUDING TIME, MATERIALS, COSTS, OR CORRECTIONS REQUIRED AS A RESULT OF INSPECTIONS.

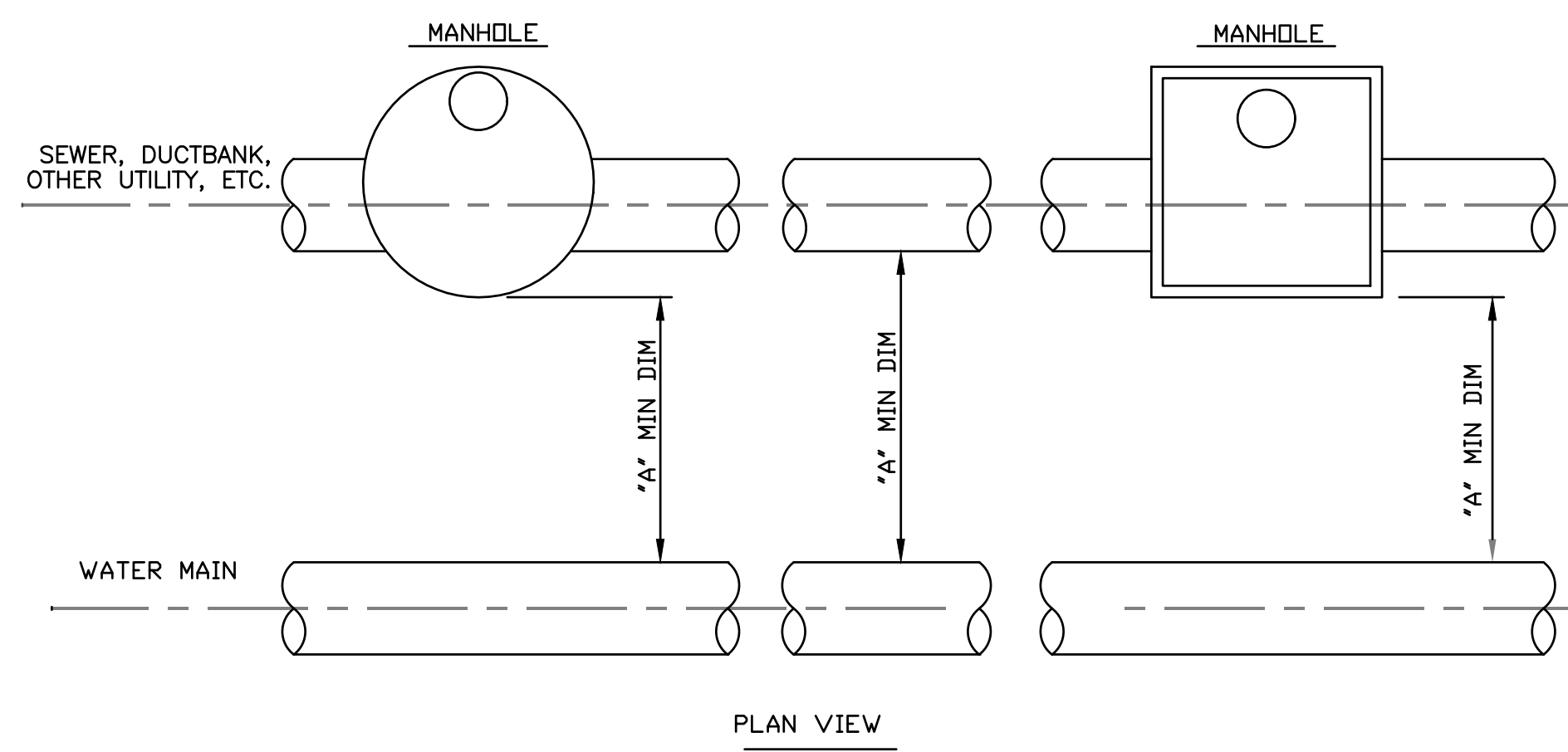
SIZING SCHEDULE		BEARING FACE (X Y) IN SQ. FT. CONCRETE VOLUME IN CU. YD.				
PIPE SIZE	22-1/2° BEND			45° BEND		
	SOIL BEARING CAPACITY			SOIL BEARING CAPACITY		
	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.
4	1.40	0.46	0.26	2.70	0.90	0.54
	0.14	0.09	0.06	0.12	0.06	0.06
6	2.80	0.93	0.56	5.50	1.83	1.10
	1.15	0.10	0.07	0.15	0.10	0.07
8	4.80	1.60	0.96	9.60	3.20	1.92
	0.20	0.13	0.09	0.23	0.15	0.09
10	7.90	2.63	1.96	15.70	5.23	3.14
	0.53	0.34	0.22	0.34	0.20	0.13
12	11.30	3.76	2.26	22.30	7.43	4.46
	0.62	0.40	0.26	0.75	0.49	0.32
14	15.30	5.10	3.06	30.20	10.06	6.04
	0.74	0.48	0.31	0.98	0.64	0.42
16	19.80	6.60	3.96	39.10	13.03	7.82
	1.17	0.76	0.49	1.21	0.79	0.51

SIZING SCHEDULE		BEARING FACE (X Y) IN SQ. FT. CONCRETE VOLUME IN CU. YD.				
PIPE SIZE	90° BEND			TEE OR DEAD END		
	SOIL BEARING CAPACITY			SOIL BEARING CAPACITY		
	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.
4	4.90	1.63	0.96	3.50	1.16	0.70
	0.14	0.09	0.06	0.12	0.06	0.06
6	10.20	3.40	2.04	7.20	2.40	1.44
	0.22	0.14	0.09	0.17	0.11	0.07
8	17.70	5.54	3.54	12.50	4.16	2.50
	0.35	0.23	0.15	0.25	0.16	0.14
10	28.90	9.60	5.76	20.40	6.80	4.06
	0.54	0.35	0.23	0.38	0.25	0.16
12	41.10	13.70	8.22	29.10	9.70	5.82
	1.31	0.85	0.55	0.97	0.63	0.42
14	55.80	18.60	11.16	39.50	13.16	7.90
	1.70	1.11	0.72	1.22	0.79	0.51
16	72.20	24.06	14.44	51.20	17.03	10.22
	2.14	1.39	0.90	1.54	1.00	0.65

NOTE:

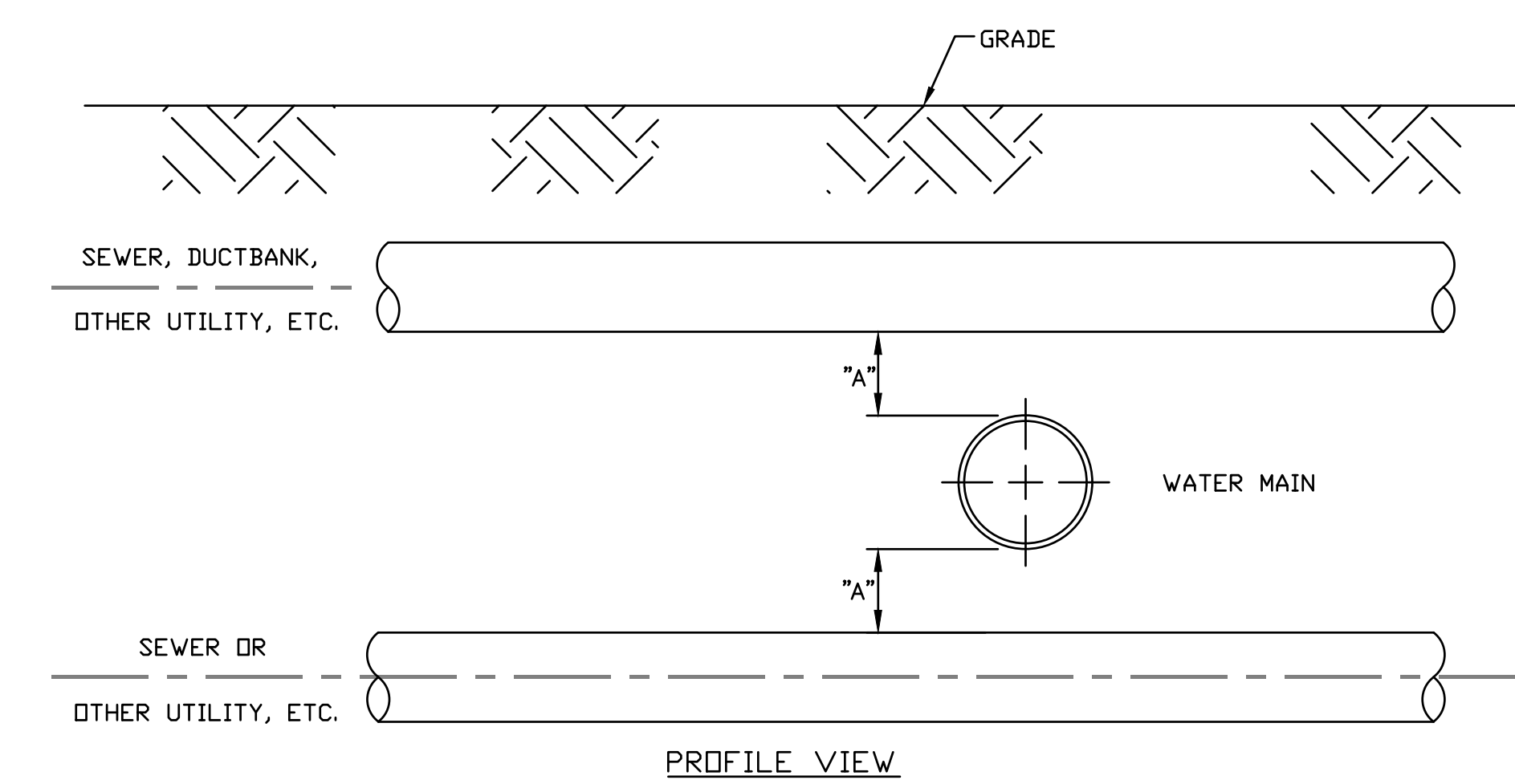
- ALL CONCRETE BLOCKING MUST HAVE ITS ENTIRE FACE (X & Y) BEARING SURFACE AGAINST UNDISTURBED SOIL AND ALL VERTICAL NON-BEARING SURFACES SHALL BE FORMED SO AS TO KEEP CONCRETE FROM JOINTS.
- BLOCKING DESIGN BASED ON COMBINED WORKING PRESSURE PLUS WATER HAMMER OF 240 PSI AND FOR BEARING CAPACITY FOR SAND - 1000 PSF, SAND AND GRAVEL - 3000 PSF, SHALE - 5000 PSF.





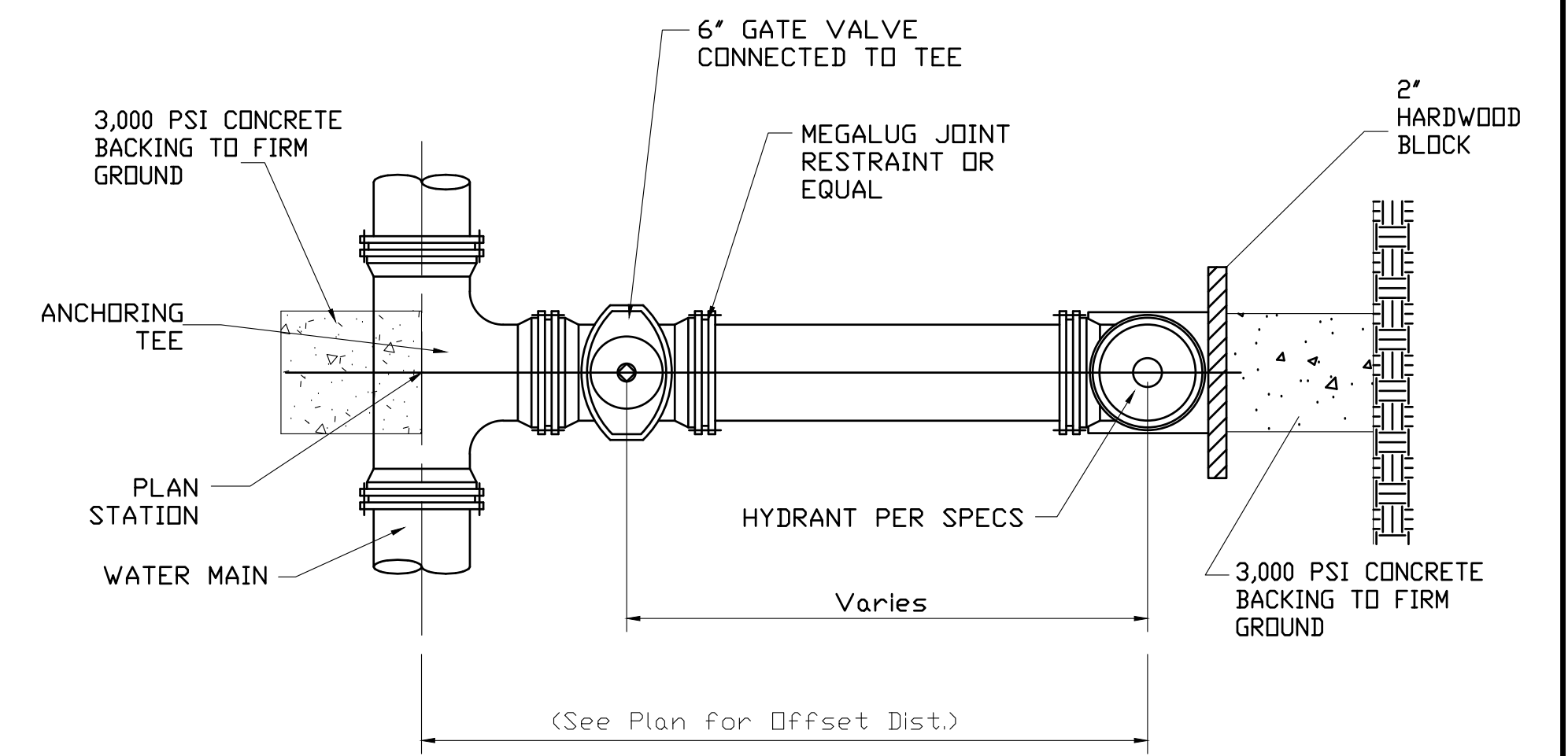
HORIZONTAL CLEARANCE	STORM SEWER	SANITARY SEWER	GAS, DUCTBANK, OTHER UTILITY, ETC.
"A"	10'-0" MIN.	10'-0" MIN.	5'-0" MIN.

**HORIZONTAL CLEARANCE FOR UTILITIES**  
N.T.S.

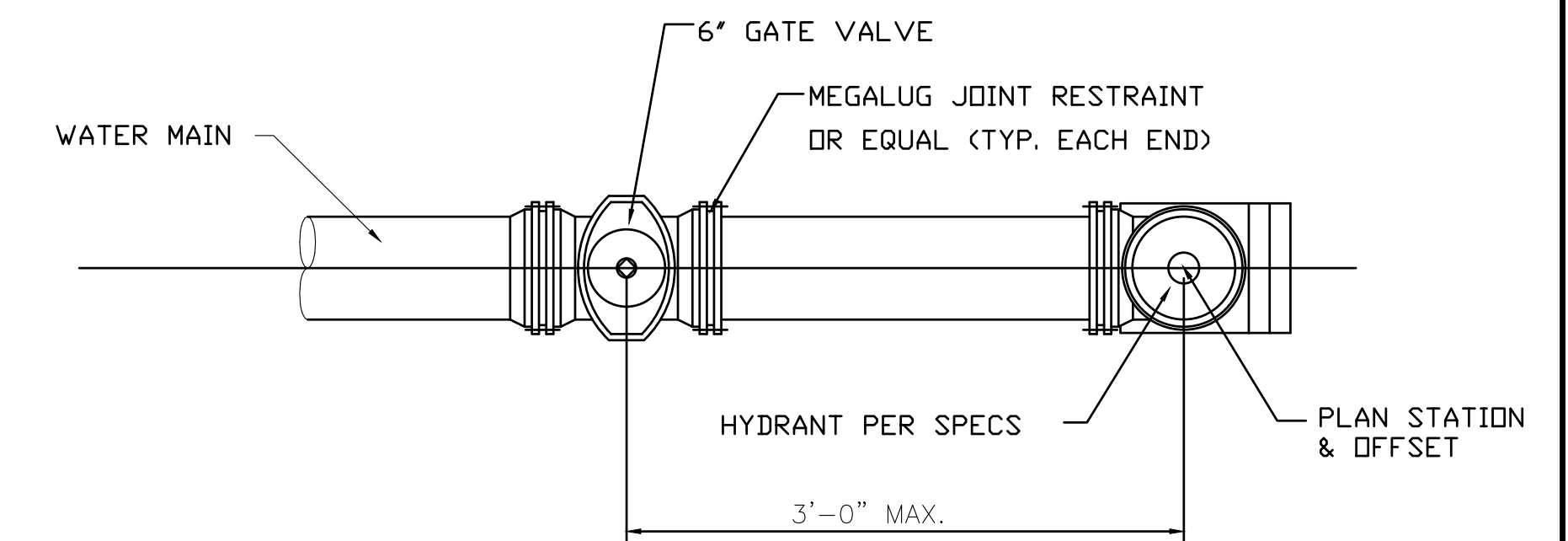


VERTICAL CLEARANCE	SANITARY SEWER LESS THAN 24"	SANITARY SEWER 24" & LARGER	STORM SEWER, DUCTBANK, GAS, OTHER UTILITY LESS THAN 24"	STORM SEWER, DUCTBANK, GAS, OTHER UTILITY 24" & LARGER	REMARKS
"A"	18" MIN.	18" MIN.	18" MIN.	18" MIN.	IF CANNOT ACHIEVE MIN. CLEARANCE WATER MAIN TO BE LOWERED

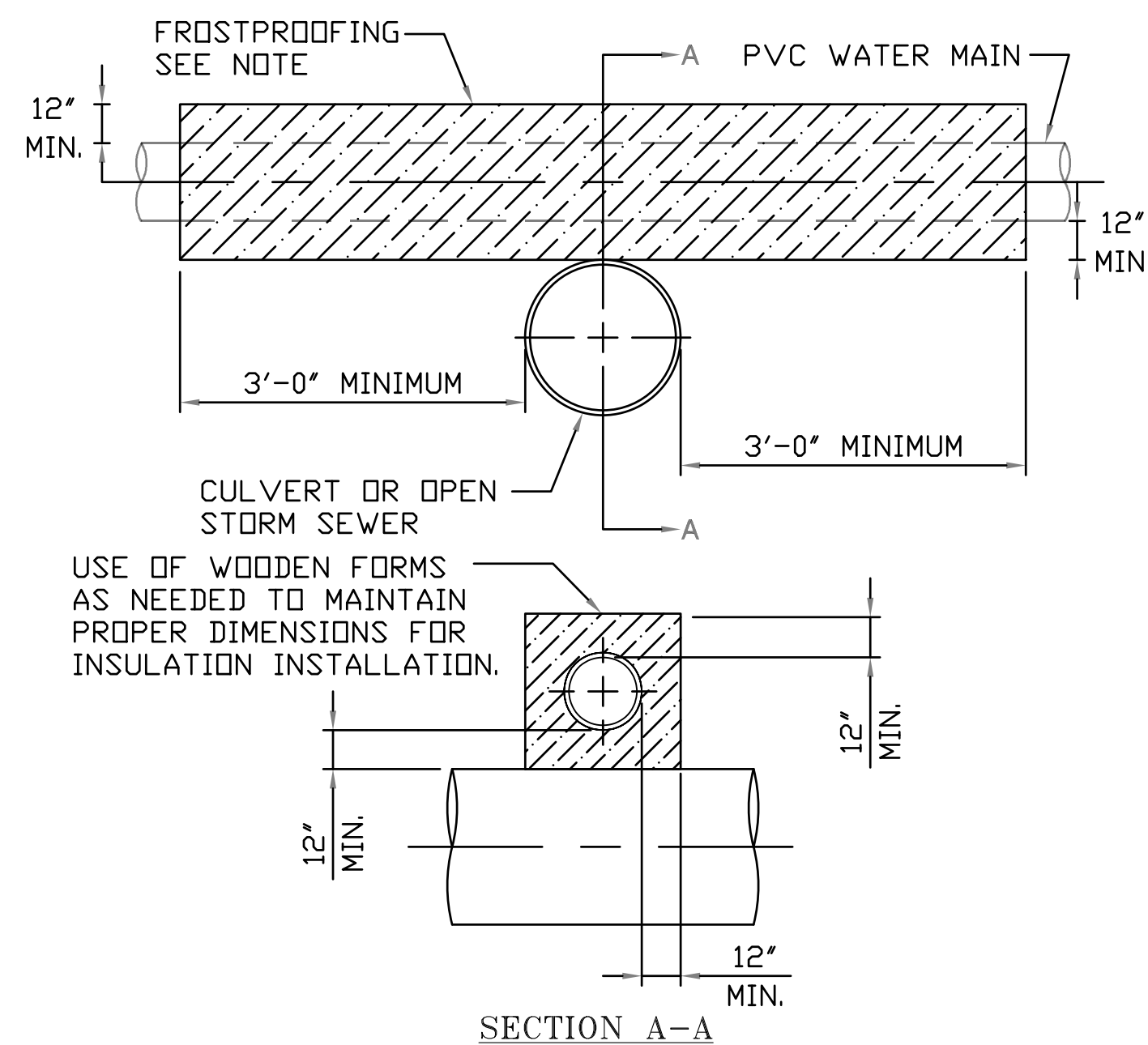
**VERTICAL CLEARANCE FOR UTILITIES**  
N.T.S.



**TYPICAL FIRE HYDRANT ASSEMBLY DETAIL**  
N.T.S.



**END OF LINE FIRE HYDRANT ASSEMBLY DETAIL**  
N.T.S.



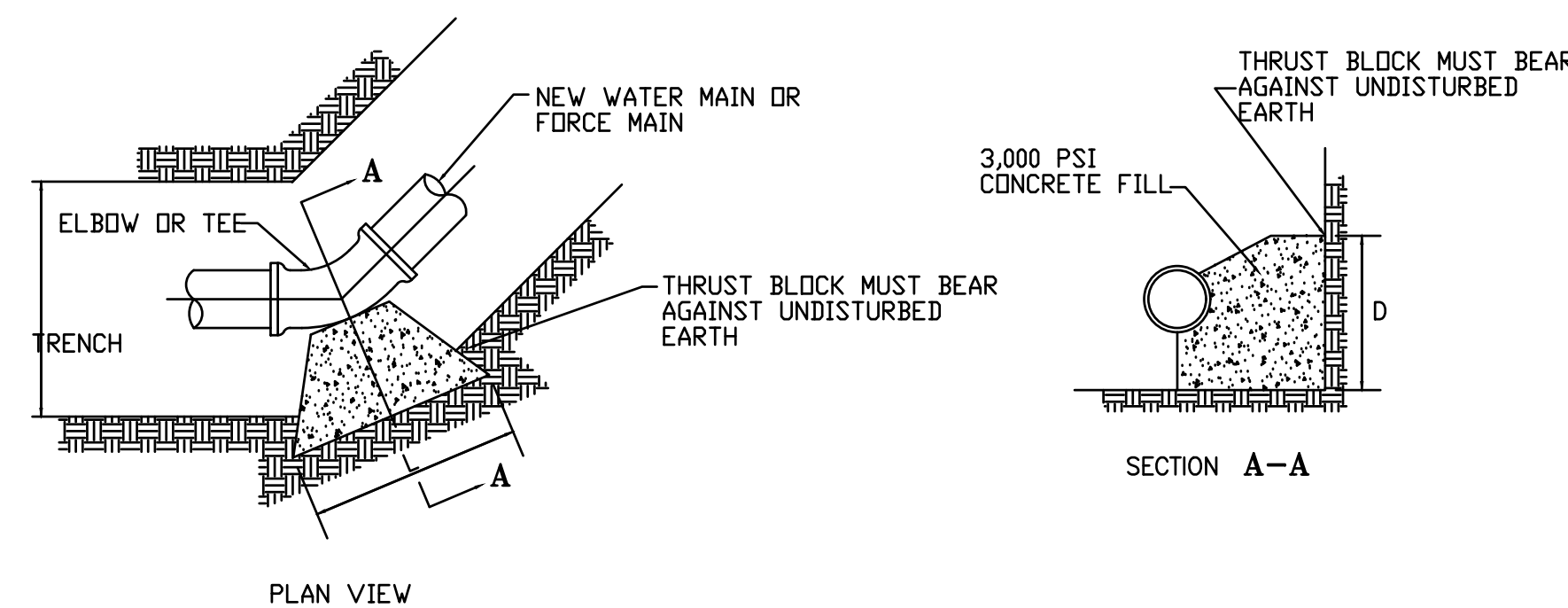
MINIMUM ONE (1) FOOT FROST PROOFING INSULATION ENVELOPE REQUIRED WITH WATER MAIN LAID WITH LESS THAN FIVE (5) FT. COVER; CROSSING OVER STORM SEWERS 24" AND LARGER; OR CROSSING UNDER OPEN END CULVERTS, OR OTHERWISE DIRECTED BY THE OWNER.

IN NO CASE SHALL THE MAINS BE LAID WITH LESS THAN 4' OF COVER IN UNPAVED AREAS.

NOTE: COMPACTED "WITCOLITE" INSULATION AS MANUFACTURED BY PIONEERS PRODUCTS, DIVISION OF WITCO CHEMICAL COMPANY, INC. OR APPROVED EQUAL.

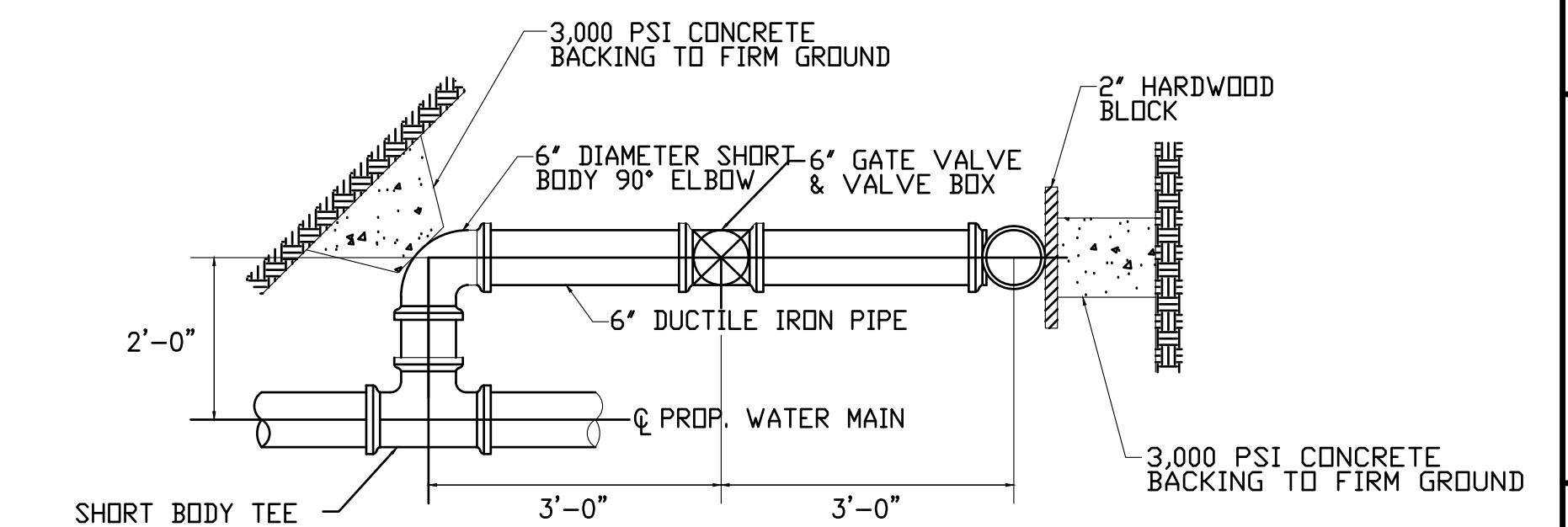
**TYPICAL FROST PROOFING DETAIL**  
N.T.S.

MINIMUM AREA (L x D) TO BE PROVIDED (IN SQUARE FEET)													
PIPE SIZES	6"	8"	10"	12"	14"	16"	PIPE SIZES	6"	8"	10"	12"	14"	16"
TEES	2.2	3.8	5.9	8.5	11.6	15.1	30' ELBOWS	1.3	2.0	3.0	4.3	5.8	7.8
90° ELBOWS	3.3	5.3	8.0	11.8	16.0	21.0	22.5' ELBOWS	0.9	1.5	2.3	3.3	4.5	5.8
45° ELBOWS	1.8	2.9	4.5	6.3	8.8	11.6	11.25' ELBOWS	0.5	0.8	1.2	1.7	2.3	3.0



**TYPICAL CONCRETE THRUST BLOCK DETAIL**  
FOR WATER MAIN & SANITARY FORCE MAIN

NOT TO SCALE

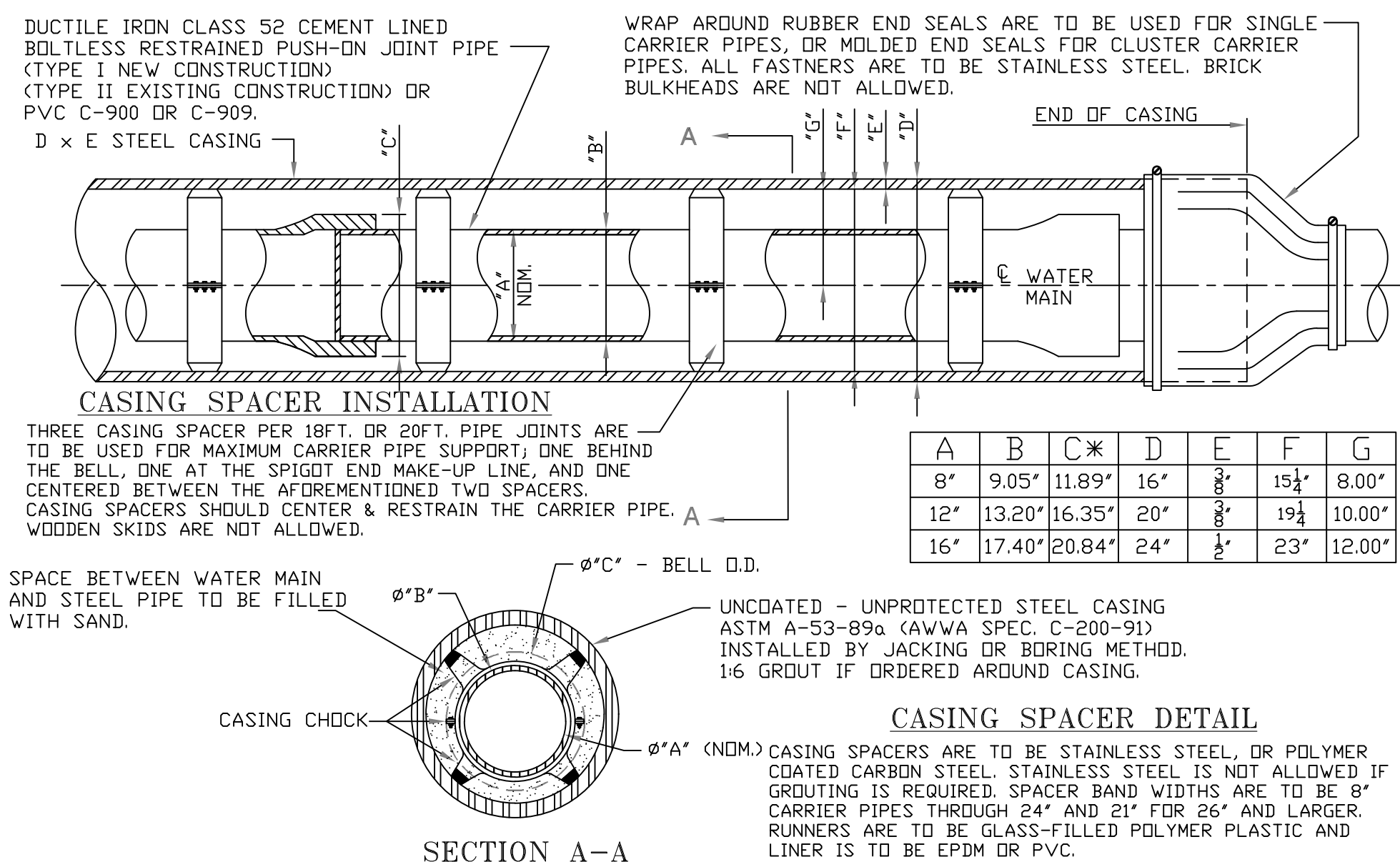


**OFFSET FIRE HYDRANT**  
N.T.S.

AT HYDRANT BASE, PROVIDE 1/2 C.Y. MIN. OF #8 WASHED PEA GRAVEL FOR FULL TRENCH WIDTH & 12" MIN. OVER HYDRANT DRAIN

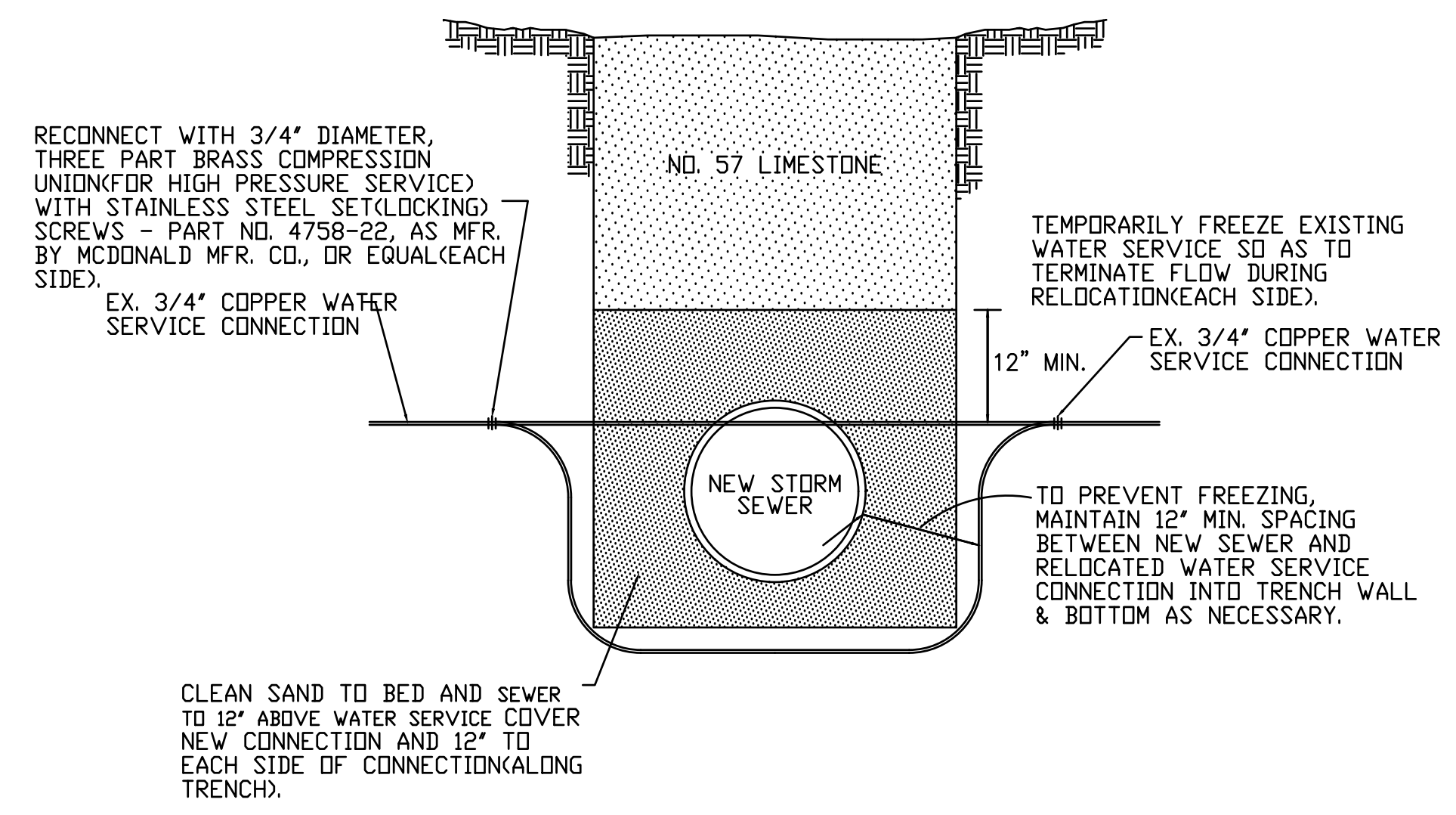
**NOTES:**

1. THE TEE, ELBOW, VALVE AND HYDRANT ARE TO HAVE MECHANICAL JOINTS.
2. A BRICK BASE BEDDING IS TO BE PROVIDED FOR THE VALVE AND HYDRANT.
3. ALL MECHANICAL JOINTS AND DIP PIPE SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH A.W.W.A. C-105/421 82 CLASS "C" METHOD "C."
4. ALL BOLTS AND NUTS FURNISHED WITH MECHANICAL JOINTS OR RESTRAINED MECHANICAL JOINTS INCLUDING RETAINER OR WEDGE ACTION TYPE GLANDS SHALL BE STAINLESS CORROSION RESISTANT STEEL AND HAVE ONE(1) COAT OF BITUMASTIC PAINTING PRIOR TO POLYETHYLENE WRAPPING.
5. HYDRANTS SHALL BE MUELLER # A423, AMERICAN DARLING #B-84(5 1/4"), OR APPROVED EQUAL.
6. THE TWO(2) 2 1/2" HOSE NOZZLE THREADS ARE TO BE NATIONAL STANDARD. THE 4" PUMPER NOZZLE SHALL HAVE A 4" "STORZ" FITTING AND CAP IN PLACE OF THE PUMPER NOZZLE. THE HYDRANT AND VALVE ARE TO OPEN TO THE LEFT.
7. HYDRANTS SHALL BE FACTORY PRIMED WITH SHERWIN WILLIAMS MACROPOXY 646. AFTER INSTALLATION, CONTRACTOR SHALL PAINT THE HYDRANTS WITH SHERWIN WILLIAMS B54TZ404 INDUSTRIAL ENAMEL HS AS FOLLOWS: BODY - 'INDIGO' (SW6531), BONNET - YELLOW (B54Y2437)

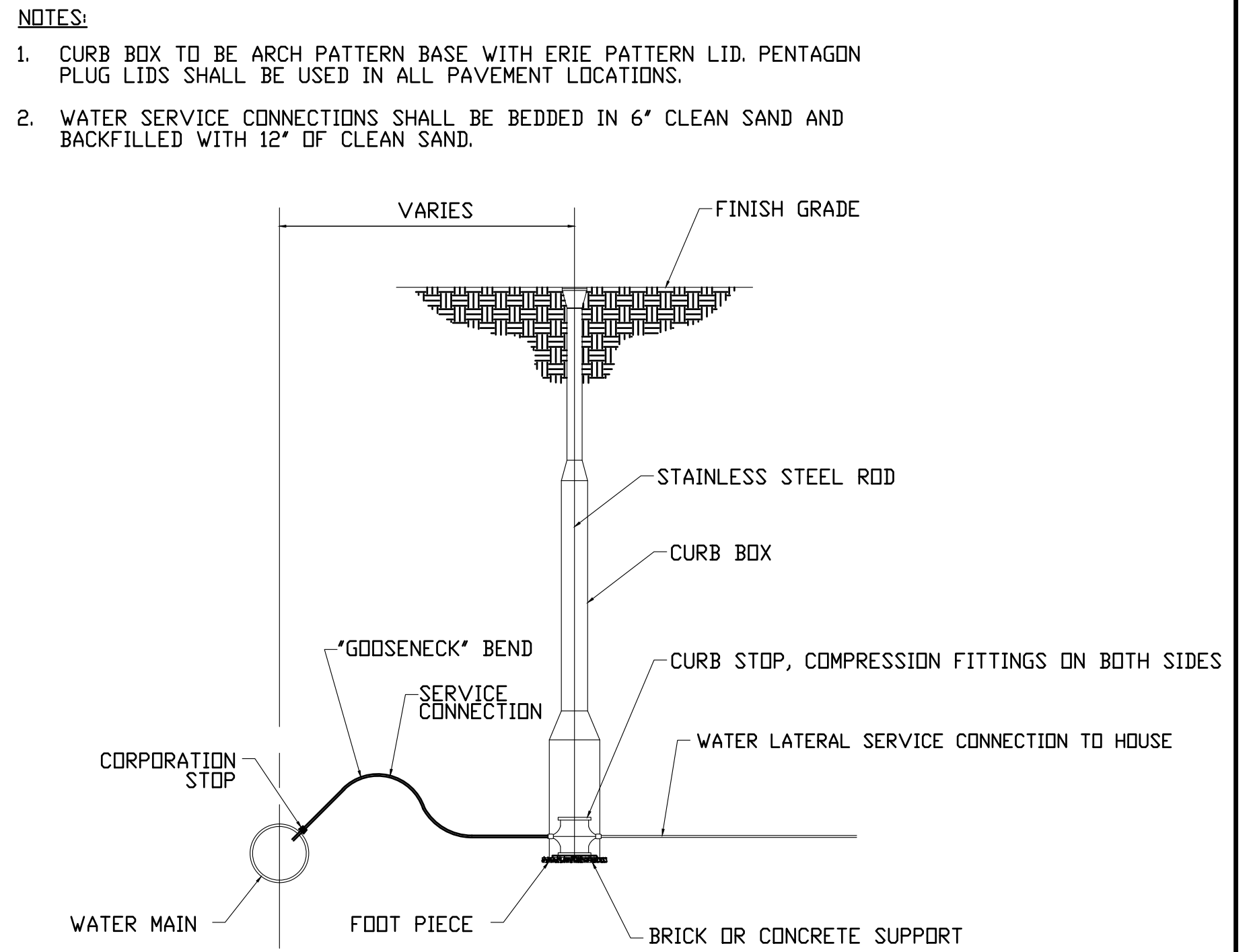


NOTES:  
 1. CONTRACTOR'S FAILURE TO MAINTAIN THE CASING PIPE ON THE LINE AND GRADE AS SHOWN OR DIRECTED, RESULTING IN THE USE OF ADDITIONAL PIPE AND/OR FITTINGS TO MAKE CONNECTIONS TO EXISTING WATER MAIN WILL BE CAUSE FOR REJECTION OF CASING INSTALLATION.  
 \*2. OUTSIDE DIAMETER OF BELL OF BOLTLESS RESTRAINED PIPE MAY VARY WITH MANUFACTURE, THEREFORE, CONTRACTOR SHALL VERIFY D.D. OF BELL AND INCREASE SIZE OF STEEL CASING AS REQUIRED.

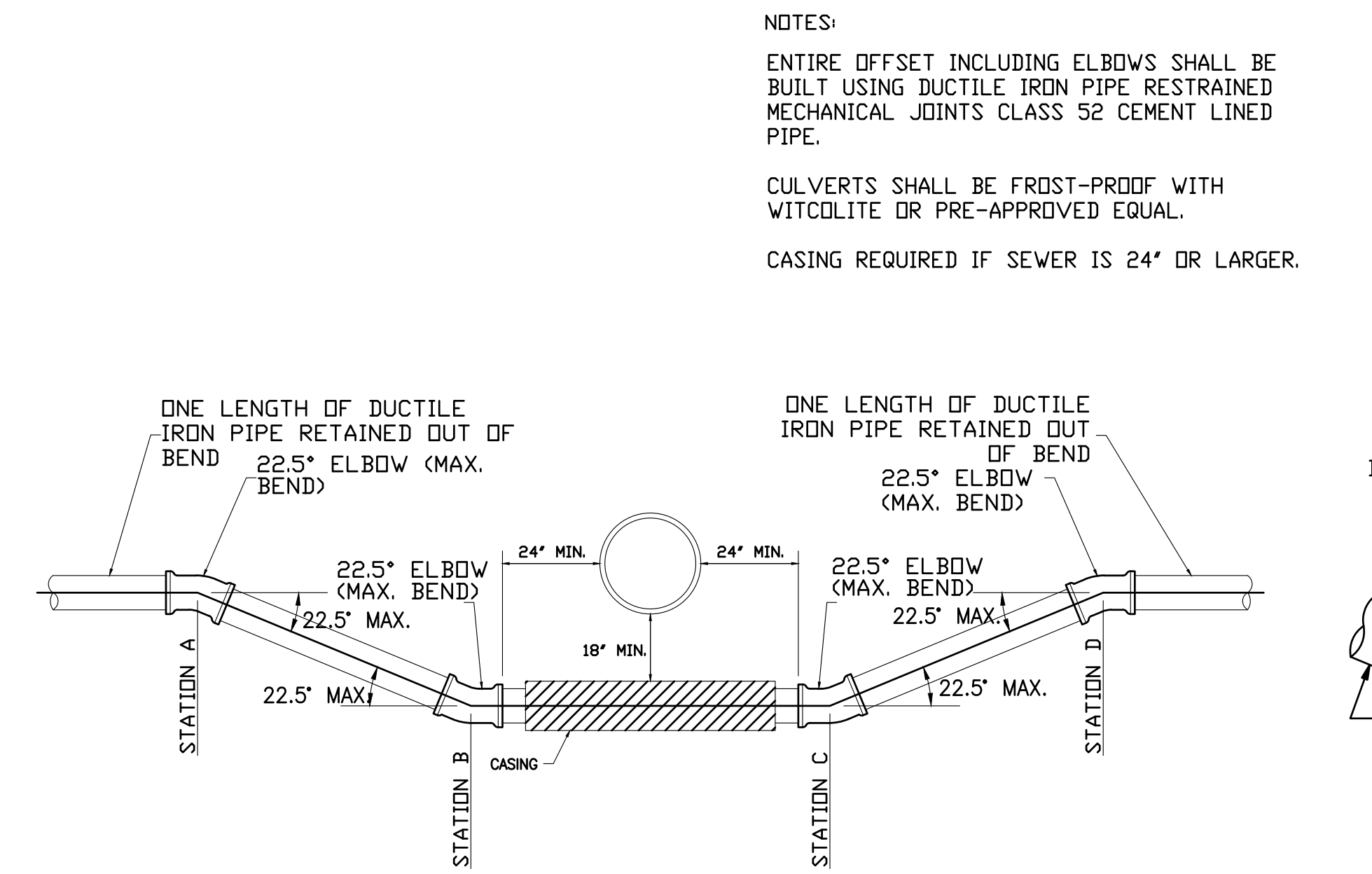
**CASING DETAIL**  
N.T.S.



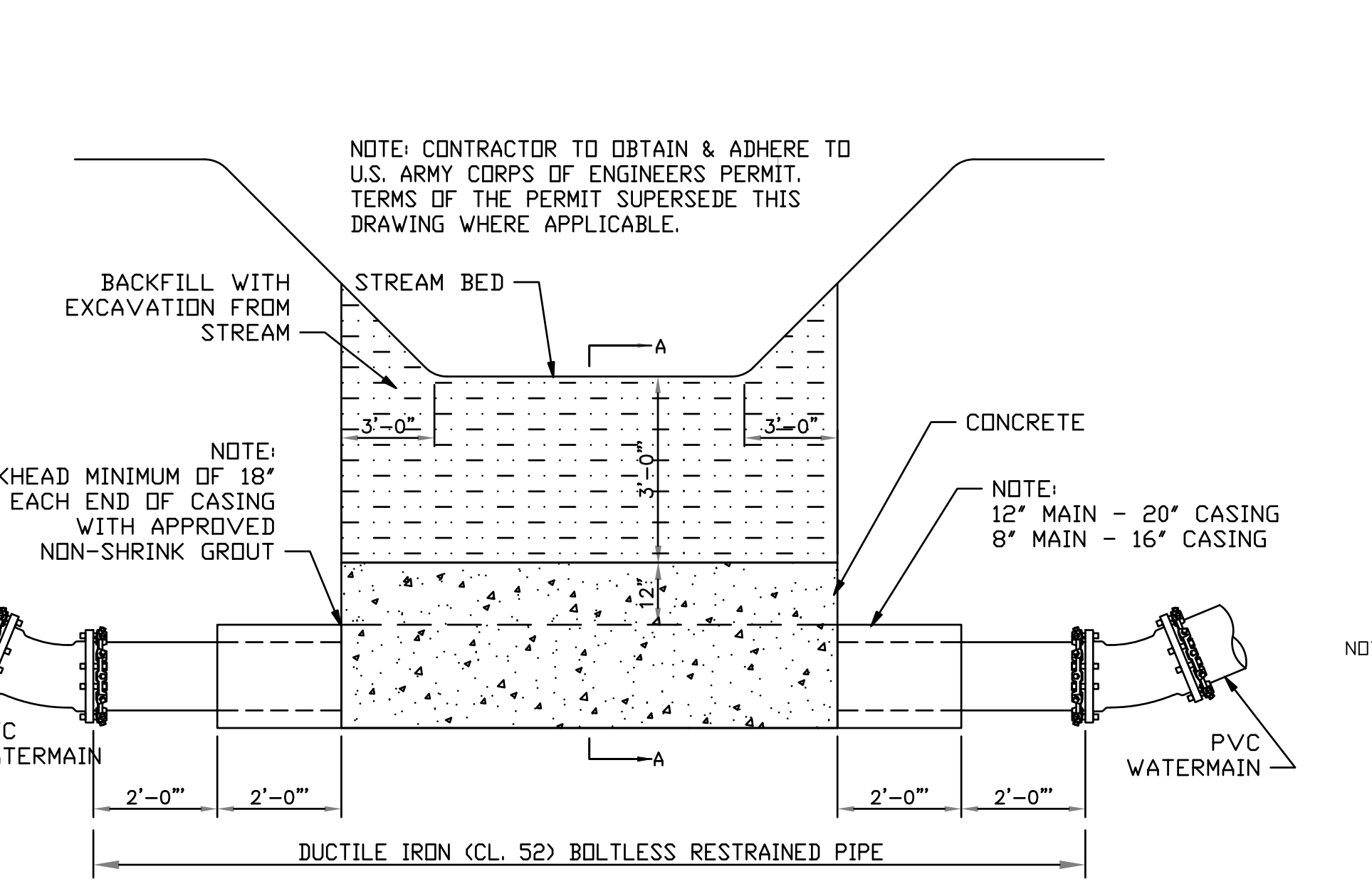
**EXISTING WATER SERVICE RELOCATION DETAIL**  
NOT TO SCALE



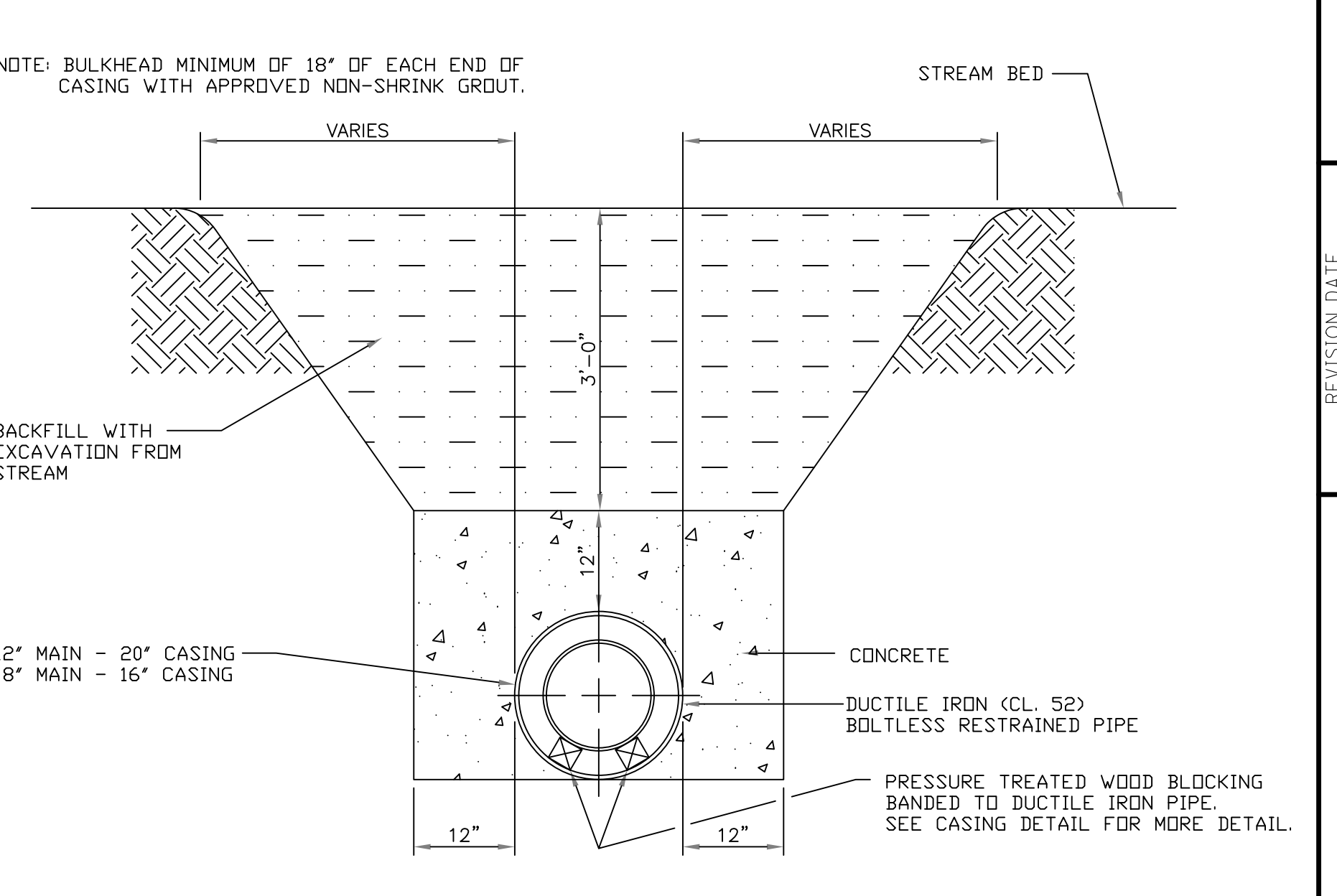
**PROPOSED WATER LATERAL SERVICE CONNECTION**  
NOT TO SCALE



**TYPICAL WATER MAIN OFFSET BENDS FOR CULVERTS AND SEWERS**  
N.T.S.

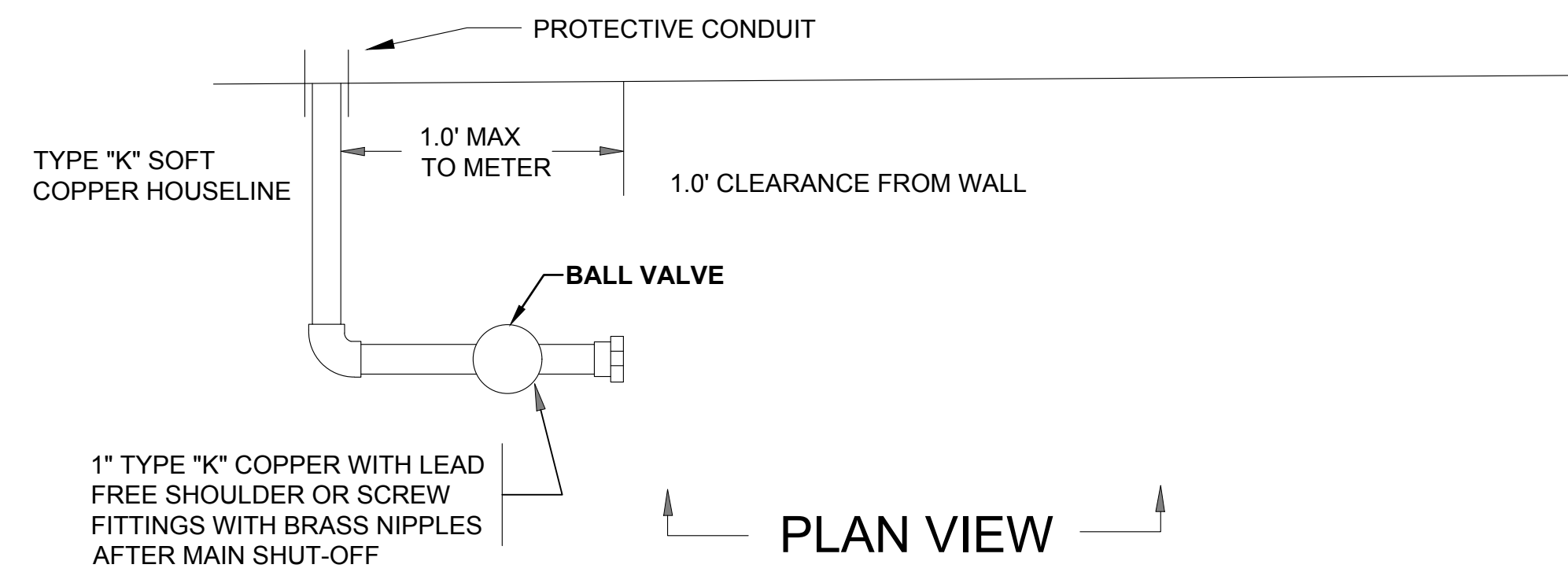


**CROSSING LARGE DITCHES OR SMALL STREAMS**  
N.T.S.



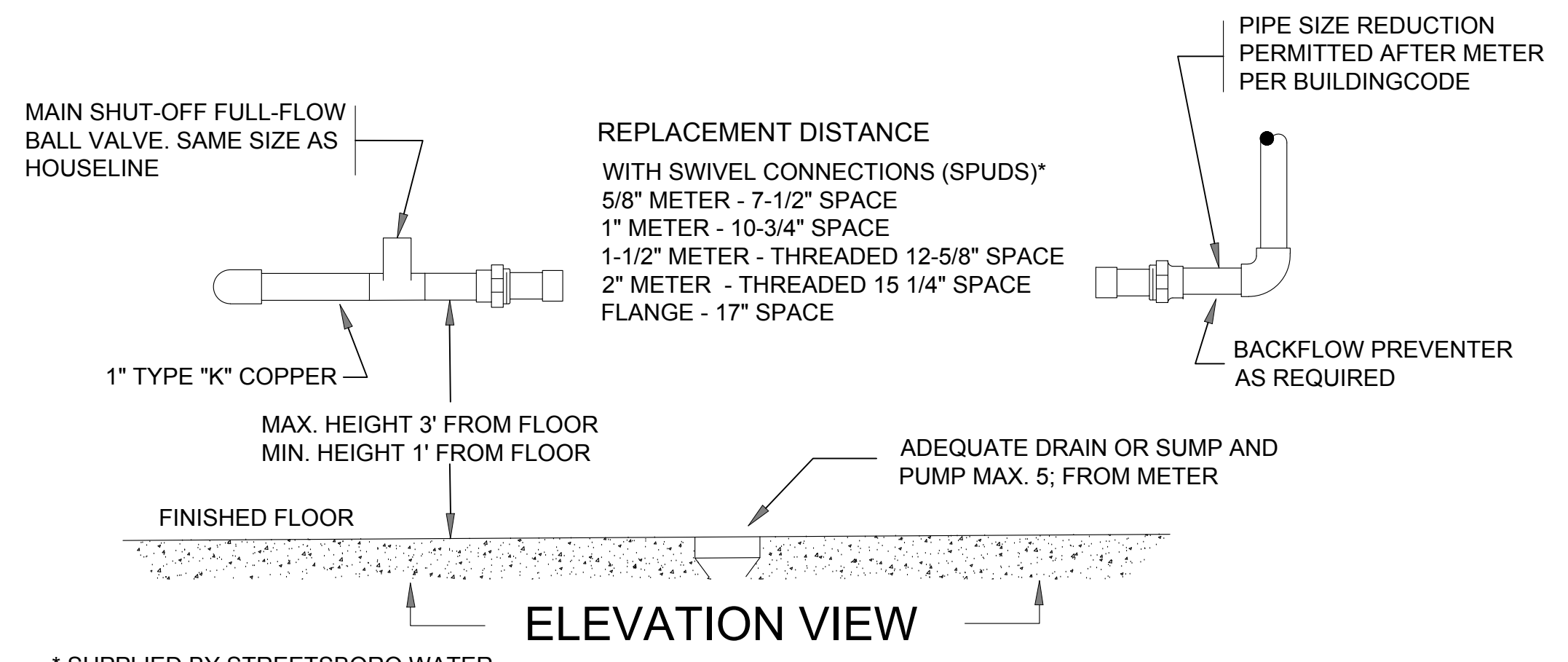
**CROSSING LARGE DITCHES OR SMALL STREAMS SECTION A-A**  
N.T.S.

NOTES:  
 1. CURB BOX TO BE ARCH PATTERN BASE WITH ERIE PATTERN LID. PENTAGON PLUG LIDS SHALL BE USED IN ALL PAVEMENT LOCATIONS.  
 2. WATER SERVICE CONNECTIONS SHALL BE BEDDED IN 6" CLEAN SAND AND BACKFILLED WITH 12" OF CLEAN SAND.



1" TYPE "K" COPPER WITH LEAD FREE SHOULDER OR SCREW FITTINGS WITH BRASS NIPPLES AFTER MAIN SHUT-OFF

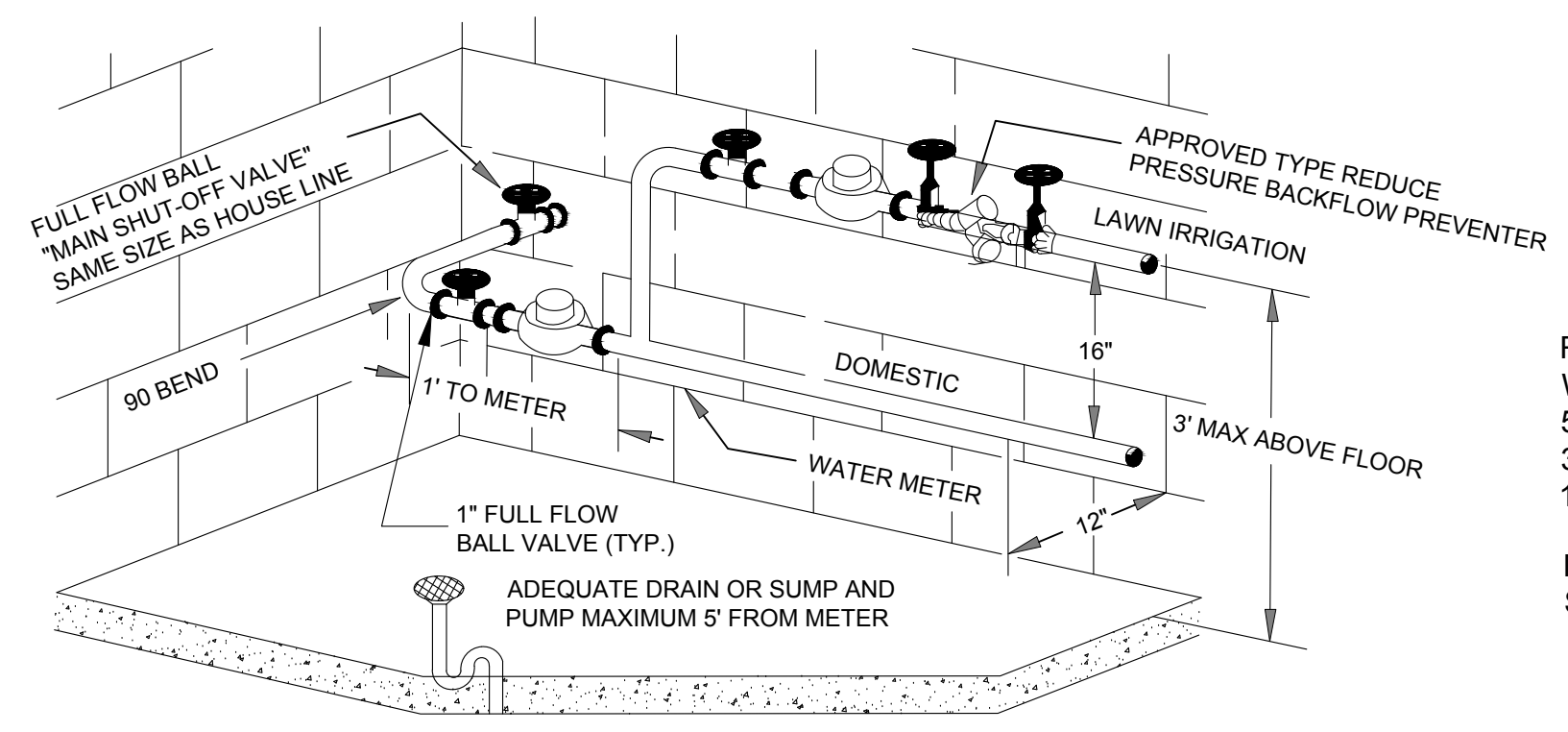
PLAN VIEW



ELEVATION VIEW

\* SUPPLIED BY STREETSBORO WATER  
MINIMUM AREA REQUIRED FOR METER SETTING 4' W. x 6' L. x 6' H.

**STANDARD METER SETTINGS**  
**5/8" - 2" DISC METERS**



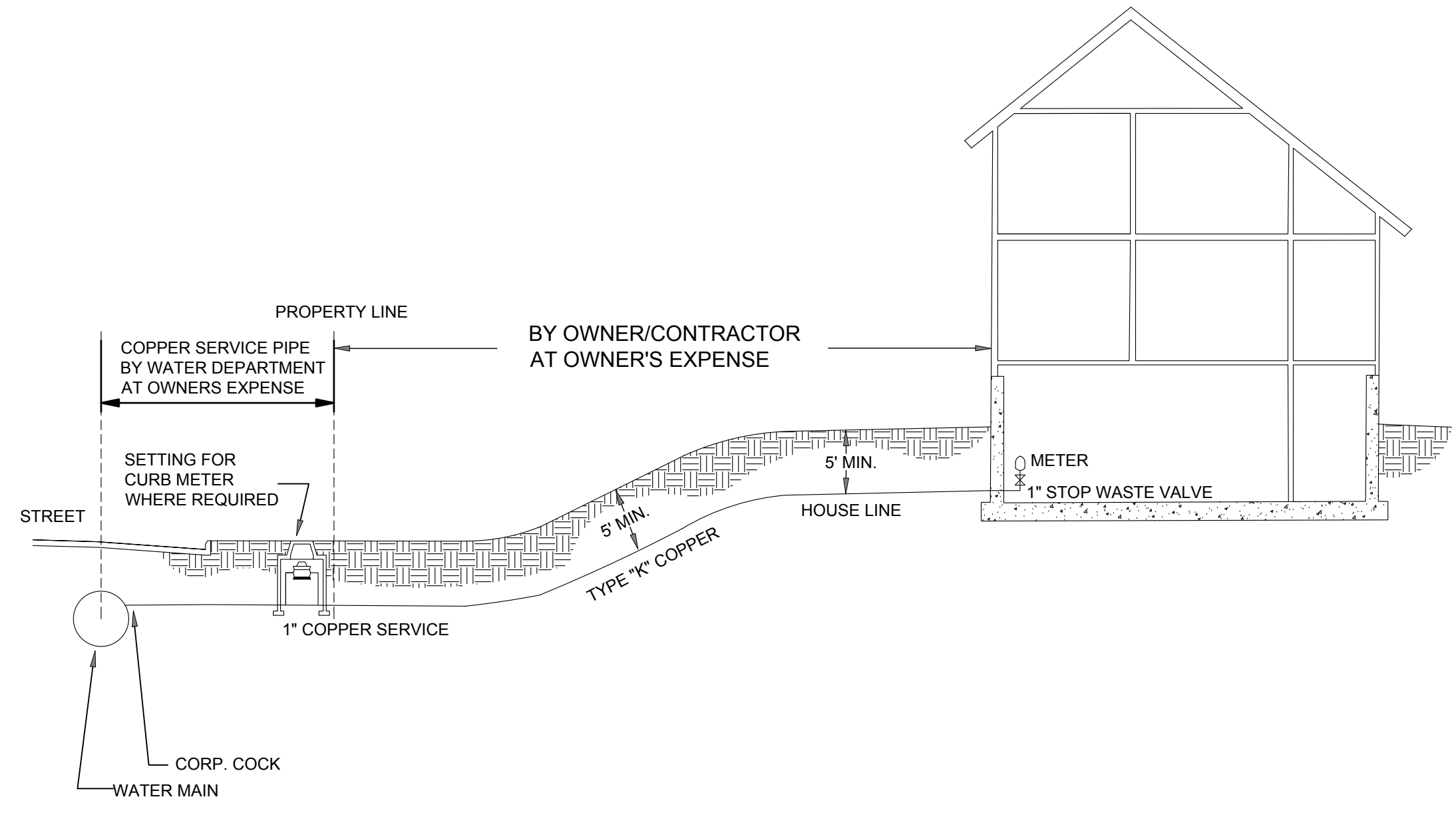
METER SETTING  
LAWN IRRIGATION

Pipe size reduction permitted after meter.

REPLACEMENT DISTANCE WITH SWIVEL CONNECTIONS (SPUDS)  
5/8" METER - 7-1/2" SPACE  
3/4" METER - 9" SPACE  
1" METER - 10-3/4" SPACE

MINIMUM AREA REQUIRED FOR METER SETTING 4' W. X 6' L. X 6' H.

**STANDARD DEDUCT METER SETTING**  
**5/8" AND 1" DISC METERS**





1. GENERAL

- A. ALL SYSTEM COMPONENTS, INCLUDING TRACER WIRE, CONNECTORS, GROUND RODS AND ACCESS POINTS, MUST BE COMPATIBLE.
- B. ALL TRACER WIRE SHALL HAVE HDPE (HIGH DENSITY POLYETHYLENE) INSULATION FOR DIRECT BURY, COLOR CODED PER APWA STANDARD FOR THE SPECIFIC UTILITY BEING MARKED.

2. TRACER WIRE AND INSULATION

- A. TRACER WIRE SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS AS APPLICABLE:
  - B1010/B1010M - STANDARD SPECIFICATION FOR COPPER-CLAD STEEL ELECTRICAL CONDUCTOR FOR TRACER WIRE APPLICATIONS
  - B910/B910M - STANDARD SPECIFICATION FOR ANNEALED COPPER-CLAD STEEL WIRE
  - B227 - STANDARD SPECIFICATION FOR HARD-DRAWN COPPER-CLAD STEEL WIRE
  - B170 - STANDARD SPECIFICATION FOR OXYGEN-FREE ELECTROLYTIC COPPER-REFINERY SHAPES
  - D1248 - STANDARD SPECIFICATION FOR POLYETHYLENE PLASTICS EXTRUSION MATERIALS FOR WIRE AND CABLE
- B. DOCUMENTATION VERIFYING THAT TRACER WIRE IS 100% MADE IN THE USA.
- C. IF TRACER WIRE MANUFACTURER HAS NOT COMPLETED A 5-YEAR CORROSION TEST, A 5-YEAR WARRANTY MUST BE PROVIDED.
- D. OPEN TRENCH / OPEN CUT - TRACER WIRE SHALL BE COPPERHEAD® (OR EQUAL) COPPER-CLAD STEEL 12-AWG HIGH STRENGTH, HIGH CARBON WITH MINIMUM 450 LB. BREAK LOAD, MINIMUM 30 MIL HDPE INSULATION (1230\*-HS-\*\*).
- E. DIRECTIONAL DRILLING/BORING - TRACER WIRE SHALL BE COPPERHEAD® (OR EQUAL) COPPER-CLAD STEEL 12-AWG EXTRA HIGH STRENGTH WITH MINIMUM 1,150 LB. BREAK LOAD, MINIMUM 45 MIL HDPE INSULATION (1245\*-EHS-\*\*).
- F. PIPE BURSTING - TRACER WIRE SHALL BE COPPERHEAD® (OR EQUAL) 7X7 STRANDED COPPER-CLAD STEEL SOLOSHOT (TM) XTREME STRENGTH WITH 4,700 LB. BREAK LOAD, MINIMUM 50 MIL HDPE INSULATION (PBX-50\*-\*\*).

3. CONNECTORS

- A. ALL MAINLINE TRACER WIRES SHALL BE INTERCONNECTED AT INTERSECTIONS, AT MAINLINE TEES AND MAINLINE CROSSES. AT TEES, THE THREE WIRES SHALL BE JOINED USING A SINGLE, THREE-WAY SNAKEBITE (TM) LOCKING CONNECTOR (LSCI230C) OR EQUAL. AT CROSSES, THE FOUR WIRES SHALL BE JOINED USING TWO, THREE-WAY COPPERHEAD SNAKEBITE (TM) LOCKING CONNECTORS (LSCI230C) OR EQUAL WITH A SHORT JUMPER WIRE BETWEEN THEM.
- B. DIRECT BURY WIRE CONNECTORS SHALL INCLUDE THREE-WAY LOCKABLE COPPERHEAD SNAKEBITE (TM) LOCKING CONNECTORS (LSCI230C) AND COPPERHEAD MAINLINE-TO-SERVICE CONNECTORS (3WB- 01) OR EQUAL SPECIFICALLY MANUFACTURED FOR USE IN UNDERGROUND TRACER WIRE INSTALLATION. CONNECTORS SHALL BE DIELECTRIC SILICONE FILLED TO SEAL OUT MOISTURE AND CORROSION AND SHALL BE INSTALLED IN A MANNER AS TO PREVENT ANY UNINSULATED WIRE EXPOSURE.
- C. NON-LOCKING, FRICTION FIT OR TAPED CONNECTORS ARE PROHIBITED.

4. GROUNDING

- A. TRACER WIRE MUST BE PROPERLY GROUNDED AT ALL DEAD-ENDS/STUBS.
- B. GROUNDING OF TRACER WIRE SHALL BE ACHIEVED BY USING A DRIVE-IN, MAGNESIUM GROUND ROD WITH A MINIMUM 20- FEET, #12 RED HDPE INSULATED COPPER-CLAD STEEL WIRE CONNECTED TO THE ROD SPECIFICALLY MANUFACTURED

FOR THIS PURPOSE.

5. TERMINATION/ACCESS

- A. ALL TRACER WIRE TERMINATION POINTS MUST PROVIDE A DIRECT CONNECTION POINT TO THE TRACER WIRE BY A UTILITY LOCATE TRANSMITTER (ABOVE GROUND OR AT GRADE) SPECIFICALLY MANUFACTURED FOR LITE DUTY, CONCRETE/DRIVEWAY, OR ROADWAY APPLICATIONS.
- B. ALL AT-GRADE ACCESS POINTS SHALL BE APPROPRIATELY IDENTIFIED WITH "SEWER" OR "WATER" ON THE CAP AND BE COLOR CODED PER AMERICAN PUBLIC WORKS (APWA) STANDARDS.
- C. ALL TWO-TERMINAL TRACER WIRE ACCESS POINTS MUST INCLUDE A MANUALLY INTERRUPTIBLE CONDUCTIVE/CONNECTIVE LINK BETWEEN THE TERMINAL FOR THE TRACER WIRE CONNECTION AND THE TERMINAL FOR THE GROUND ROD WIRE CONNECTION.
- D. ALL TWO-TERMINAL TRACER WIRE ACCESS POINTS MUST HAVE EXTERNAL DIRECT CONNECTION POINTS TO BOTH THE TRACER WIRE AND GROUND ROD WIRE FROM TOP OF LID.
- E. ALL AT-GRADE ACCESS POINTS SHALL INCLUDE AN ENCAPSULATED MAGNET MOLDED INTO THE TOP PORTION OF THE TUBE, TO ALLOW FOR DETECTION BY A FERROUS METAL DETECTOR.
- F. ALL AT-GRADE ACCESS POINTS SHALL BE SUPPLIED WITH ANTI-CORROSION WAX/GEL TO PROTECT WIRES.
- G. SERVICE LATERALS ON PUBLIC PROPERTY - TRACER WIRE SHALL TERMINATE AT AN APPROVED AT-GRADE ACCESS POINT LOCATED AT THE EDGE OF THE ROAD RIGHT-OF-WAY, AND OUT OF THE ROADWAY. APPROVED AT-GRADE ACCESS POINTS SHALL HAVE A TWO-TERMINAL EXTERNALLY SWITCHABLE LID, WHERE THERE IS A DIRECT CONNECTION POINT FOR A LOCATE TRANSMITTER AND AN EXTERNAL SWITCH TO TURN "GROUND" ON AND OFF FROM THE TOP OF THE LID. ACCEPTABLE ACCESS POINTS WITH TWO-TERMINAL, EXTERNALLY SWITCHABLE LIDS INCLUDE COPPERHEAD'S SNAKEPIT (R) LITE DUTY (LD14\*2T- SW), LITE DUTY ADJUSTABLE (LD14\*2T-ADJ-SW), LITE DUTY XL (LDXL36\*2T-SW), OR CONCRETE/DRIVEWAY (CD14\*2TP-SW) OR EQUAL.
- H. HYDRANTS - TRACER WIRE SHALL TERMINATE AT AN APPROVED ABOVE-GRADE COPPERHEAD COBRA (TM) ACCESS POINT (OR EQUAL) PROPERLY AFFIXED TO THE HYDRANT-GRADE FLANGE. AFFIXING WITH TAPE OR PLASTIC TIES SHALL NOT BE ACCEPTABLE. TRACER WIRE MAY ALSO TERMINATE AT AN APPROVED AT- GRADE COPPERHEAD SNAKEPIT (R) LITE DUTY (LD14\*2T-SW), LITE DUTY ADJUSTABLE (LD14\*2T-ADJ- SW), LITE DUTY XL (LDXL36\*2T-SW), OR CONCRETE/DRIVEWAY (CD14\*2TP-SW) ACCESS POINT (OR EQUAL).

6. TESTING

- A. ALL NEW TRACER WIRE INSTALLATIONS SHALL BE LOCATED USING TYPICAL LOW FREQUENCY (512 HZ) LINE TRACING EQUIPMENT, WITNESSED BY THE CONTRACTOR, ENGINEER AND FACILITY OWNER AS APPLICABLE, PRIOR TO ACCEPTANCE OF OWNERSHIP.
- B. THIS VERIFICATION SHALL BE PERFORMED UPON COMPLETION OF ROUGH GRADING AND AGAIN PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
- C. CONTINUITY TESTING IN LIEU OF ACTUAL LINE TRACING SHALL NOT BE ACCEPTED.

\* DENOTES COLOR

\*\* SPOOL SIZE (500', 1000', 2500')

TRACER WIRE INSTALLATION

1. GENERAL

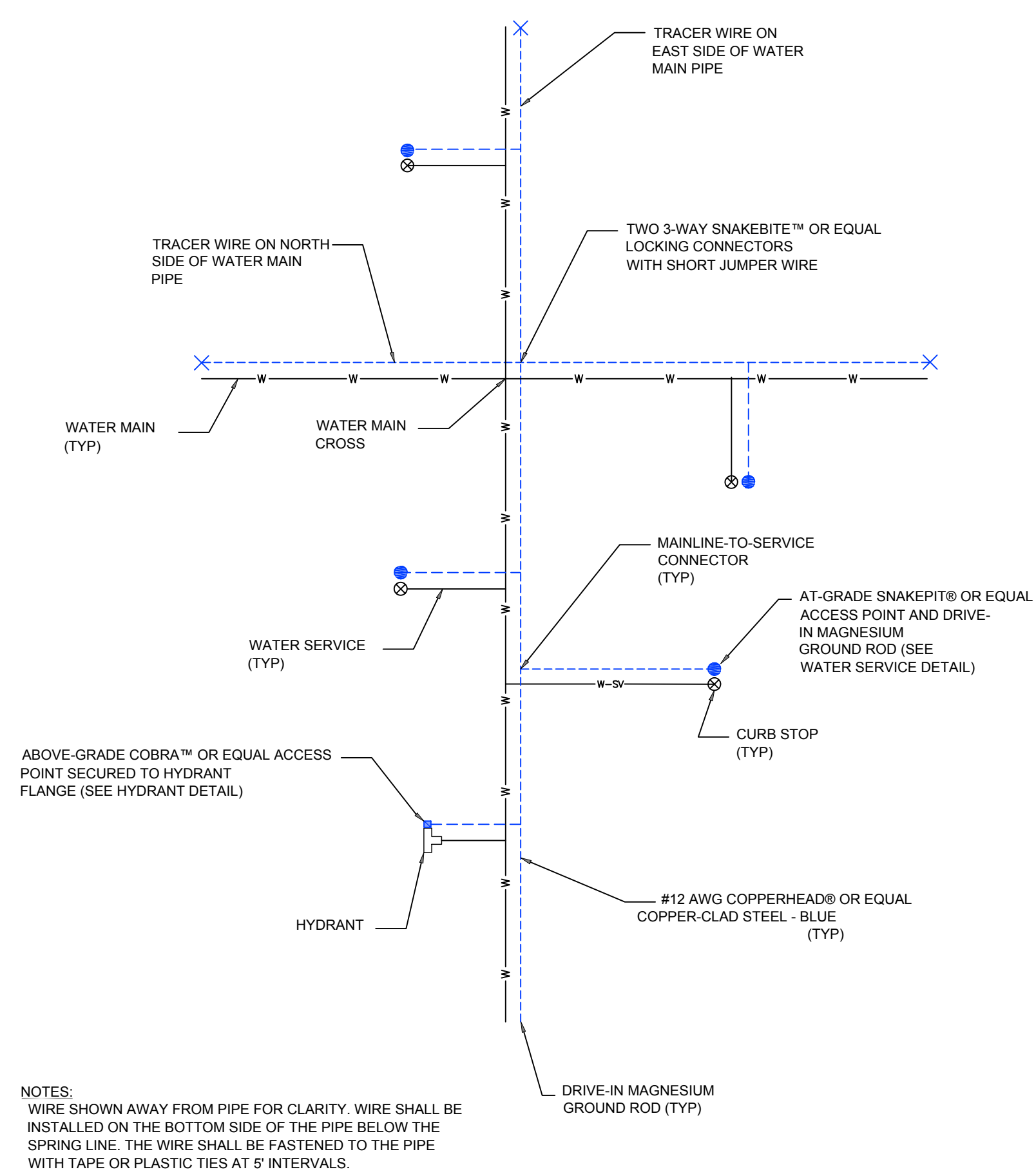
- A. TRACER WIRE INSTALLATION SHALL BE PERFORMED IN SUCH A MANNER THAT ALLOWS PROPER ACCESS FOR CONNECTION OF LINE TRACING EQUIPMENT, PROPER LOCATING OF WIRE WITHOUT LOSS OR DETERIORATION OF LOW FREQUENCY (512 HZ) SIGNAL, AND WITHOUT DISTORTION OF SIGNAL CAUSED BY MORE THAN ONE WIRE BEING INSTALLED IN CLOSE PROXIMITY TO ONE ANOTHER.
- B. TRACER WIRE SYSTEMS MUST BE INSTALLED AS A SINGLE CONTINUOUS WIRE, EXCEPT WHERE USING APPROVED CONNECTORS. NO LOOPING OR COILING OF WIRE IS ALLOWED.
- C. ANY DAMAGE OCCURRING DURING INSTALLATION OF THE TRACER WIRE MUST BE IMMEDIATELY REPAIRED BY REMOVING THE DAMAGED WIRE AND INSTALLING A NEW SECTION OF WIRE WITH APPROVED CONNECTORS. TAPING AND/OR SPRAY COATING SHALL NOT BE ALLOWED.
- D. TRACER WIRE SHALL BE INSTALLED AT THE BOTTOM HALF OF THE PIPE AND SECURED (TAPED/TIED) AT 5- FOOT INTERVALS.
- E. MAINLINE TRACER WIRE SHALL NOT BE CONNECTED TO EXISTING CONDUCTIVE PIPES. TREAT AS A MAINLINE DEAD-END GROUND USING AN APPROVED WATERPROOF CONNECTOR TO A GROUND ROD DRIVEN INTO VIRGIN SOIL BENEATH AND IN LINE WITH THE UTILITY.
- F. ALL SERVICE LATERAL TRACER WIRE SHALL BE A SINGLE WIRE, CONNECTED TO THE MAINLINE TRACER WIRE USING A THREE-WAY MAINLINE-TO-SERVICE CONNECTOR, INSTALLED WITHOUT CUTTING/SPLICING THE MAINLINE TRACER WIRE.
- G. IN OCCURRENCES WHERE AN EXISTING TRACER WIRE IS ENCOUNTERED ON AN EXISTING UTILITY THAT IS BEING EXTENDED OR TIED INTO, THE NEW TRACER WIRE AND EXISTING TRACER WIRE SHALL BE CONNECTED USING APPROVED CONNECTORS.
- H. TRACER WIRE ON ALL SERVICE LATERALS/STUBS MUST TERMINATE AT AN APPROVED TRACER WIRE ACCESS POINT LOCATED DIRECTLY ABOVE THE UTILITY, AT THE EDGE OF THE ROAD RIGHT-OF-WAY, BUT OUT OF THE ROADWAY.
- I. ONE FOOT OF EXCESS/SLACK WIRE IS REQUIRED IN ALL TRACER WIRE ACCESS POINTS AFTER MEETING FINAL ELEVATION.
- J. TRACER WIRE MUST BE PROPERLY GROUNDED AS SPECIFIED.
- K. AT ALL MAINLINE DEAD-ENDS, TRACER WIRE SHALL GO TO GROUND USING AN APPROVED CONNECTION TO A 1.5-LB., DRIVE-IN, MAGNESIUM GROUND ROD.
- L. WHEN GROUNDING THE TRACER WIRE AT DEAD-ENDS/STUBS, THE GROUND ROD SHALL BE DRIVEN INTO VIRGIN SOIL DIRECTLY BENEATH AND IN LINE WITH THE UTILITY.
- M. GROUND ROD WIRE SHALL BE CONNECTED TO THE GROUND ROD TERMINAL ON THE TWO-TERMINAL SNAKEPIT (R) ACCESS POINT LID OR TO THE BOTTOM TERMINAL ON THE TWO-TERMINAL COBRA (TM) ACCESS POINT.
- N. WHERE THE GROUND ROD WIRE WILL BE CONNECTED TO A TRACER WIRE ACCESS POINT, ONE FOOT OF EXCESS/SLACK WIRE IS REQUIRED AFTER MEETING FINAL ELEVATION.

3. WATER SYSTEM

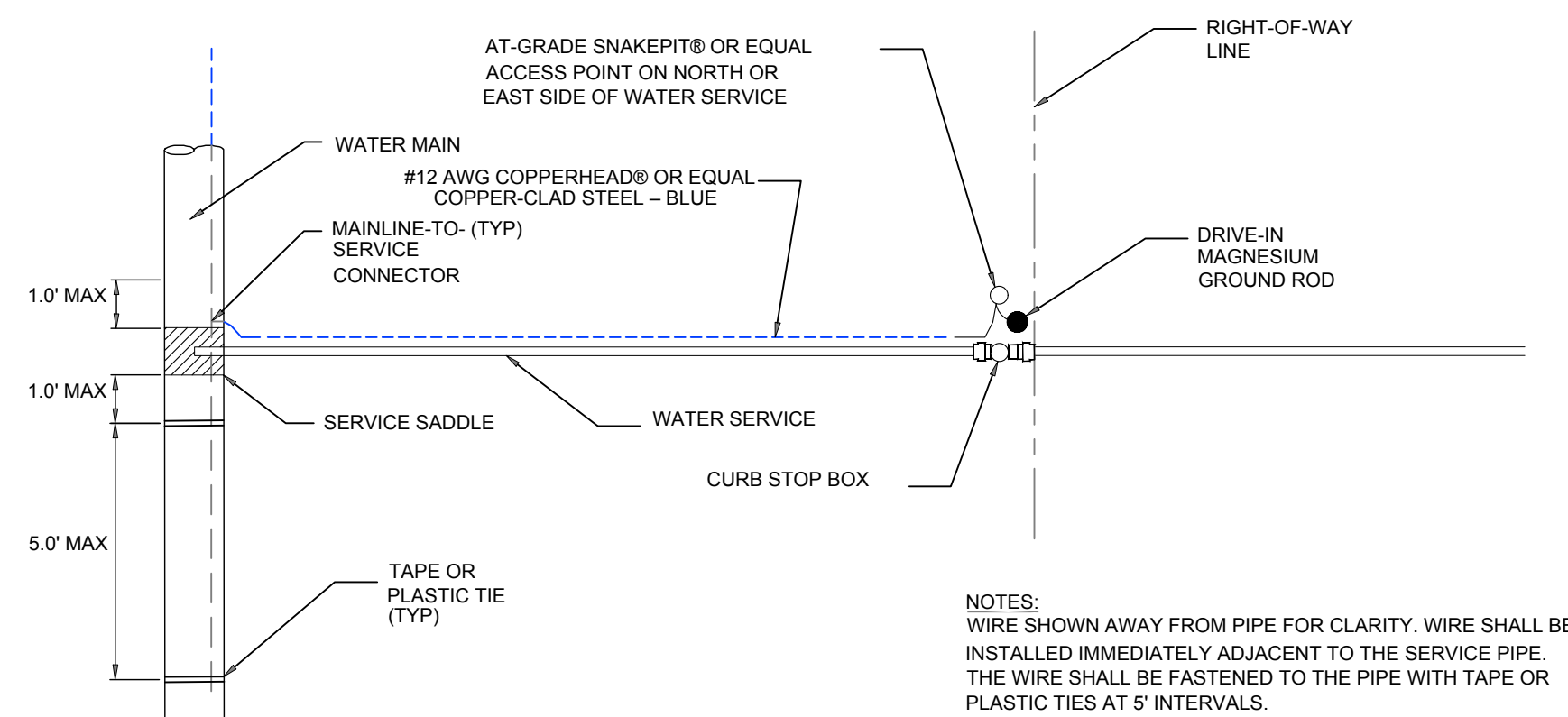
- A. A MAINLINE TRACER WIRE MUST BE INSTALLED, WITH ALL SERVICE LATERAL TRACER WIRES PROPERLY CONNECTED TO THE MAINLINE TRACER WIRE, TO PROMOTE TRACING/LOCATING CAPABILITIES FROM A SINGLE CONNECTION POINT.
- B. LAY MAINLINE TRACER WIRE CONTINUOUSLY, BY-PASSING AROUND THE OUTSIDE OF VALVES AND FITTINGS ON THE NORTH OR EAST SIDE.
- C. A SINGLE TRACER WIRE ONLY SHALL BE INSTALLED ON ALL WATER SERVICE LATERALS AND MUST TERMINATE AT AN APPROVED TRACER WIRE ACCESS POINT, COLOR CODED BLUE AND LOCATED DIRECTLY ABOVE THE SERVICE LATERAL AT THE EDGE OF ROAD RIGHT-OF-WAY.

- D. TRACER WIRE ACCESS POINTS WILL BE INSTALLED AT ALL FIRE HYDRANTS.
  - E. ALL CONDUCTIVE AND NON-CONDUCTIVE SERVICE LINES SHALL INCLUDE TRACER WIRE.
4. STORM SEWER SYSTEM
- A. IF THE STORM SEWER SYSTEM INCLUDES SERVICE LATERALS FOR CONNECTION OF PRIVATE DRAINS AND TILE LINES. A MAINLINE TRACER WIRE MUST BE INSTALLED, WITH ALL SERVICE LATERAL TRACER WIRES PROPERLY CONNECTED TO THE MAINLINE TRACER WIRE, TO PROMOTE TRACING/LOCATING CAPABILITIES FROM A SINGLE CONNECTION POINT.
  - B. LAY MAINLINE TRACER WIRE CONTINUOUSLY, BY-PASSING AROUND THE OUTSIDE OF MANHOLES/STRUCTURES ON THE NORTH OR EAST SIDE.
  - C. TRACER WIRE ON ALL STORM SERVICE LATERALS MUST TERMINATE AT AN APPROVED TRACER WIRE ACCESS POINT AND LOCATED DIRECTLY ABOVE THE SERVICE LATERAL AT THE EDGE OF ROAD RIGHT-OF-WAY.
  - D. ALL TRACER WIRE AND COMPONENTS SHALL BE "COPPERHEAD INDUSTRIES" BRAND AS DETAILED OR EQUAL. THE CONTRACTOR SHALL INSTALL BOTH DETECTABLE TRACER TAPE AND ONE NO. 12 GAUGE HIGH STRENGTH INSULATED STRANDED COPPER WIRE IN ALL OPEN CUT TRENCHES FOR ALL WATER MAINS AND WATER SERVICES. DIRECTIONALLY DRILLED LINE SHALL USE NO. 10 GAUGE EXTRA HIGH STRENGTH INSULATED STRANDED COPPER WIRE. NO. 6 WIRE WILL BE CONNECTED TO MANHOLES AT A MAXIMUM SPACING OF 5,000 FEET. THE COST OF THE TAPE AND WIRE SHALL BE INCLUDED IN THE PRICE BID PER LINEAR FOOT.
- PROHIBITED PRODUCTS AND METHODS  
THE FOLLOWING PRODUCTS AND METHODS SHALL NOT BE ALLOWED OR ACCEPTABLE:

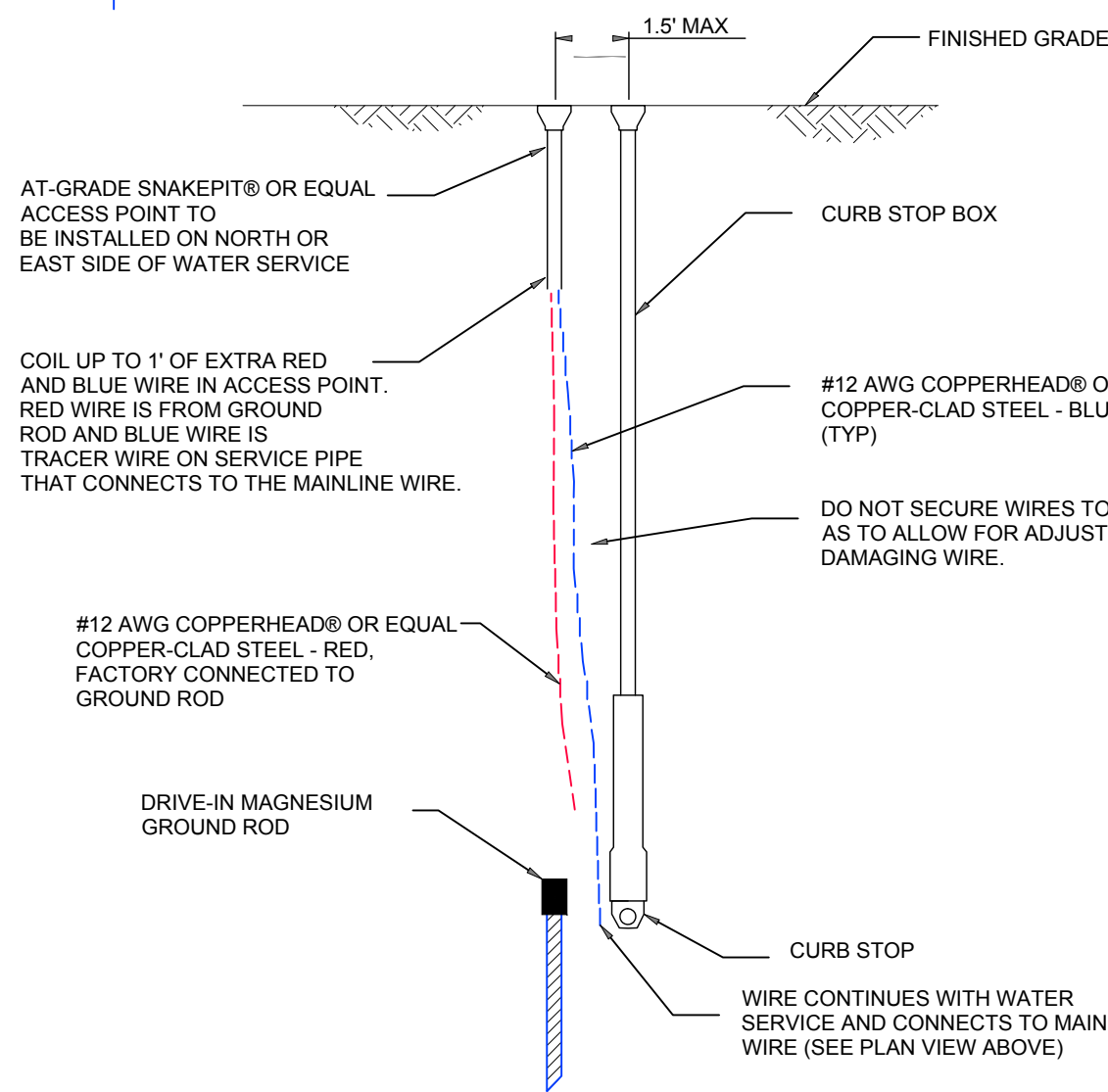
- A. NON-AMERICAN-MADE PRODUCTS
- B. UNINSULATED TRACER WIRE
- C. STAINLESS STEEL TRACER WIRE
- D. TRACER WIRE INSULATIONS OTHER THAN HDPE
- E. TRACER WIRE NOT DOMESTICALLY MANUFACTURED
- F. BRASS OR COPPER GROUND RODS
- G. WIRE CONNECTIONS UTILIZING TAPING OR SPRAY-ON WATERPROOFING
- H. LOOPED WIRE OR CONTINUOUS WIRE INSTALLATIONS THAT HAVE MORE THAN ONE WIRE LAID SIDE-BY- SIDE OR IN CLOSE PROXIMITY TO ONE ANOTHER
- I. TRACER WIRE WRAPPED AROUND THE CORRESPONDING UTILITY
- J. BRASS FITTINGS WITH TRACER WIRE CONNECTION LUGS
- K. WIRE TERMINATIONS WITHIN THE ROADWAY IN VALVE BOXES, CLEANOUTS, MANHOLES, ETC.
- L. CONNECTING TRACER WIRE TO EXISTING CONDUCTIVE UTILITIES



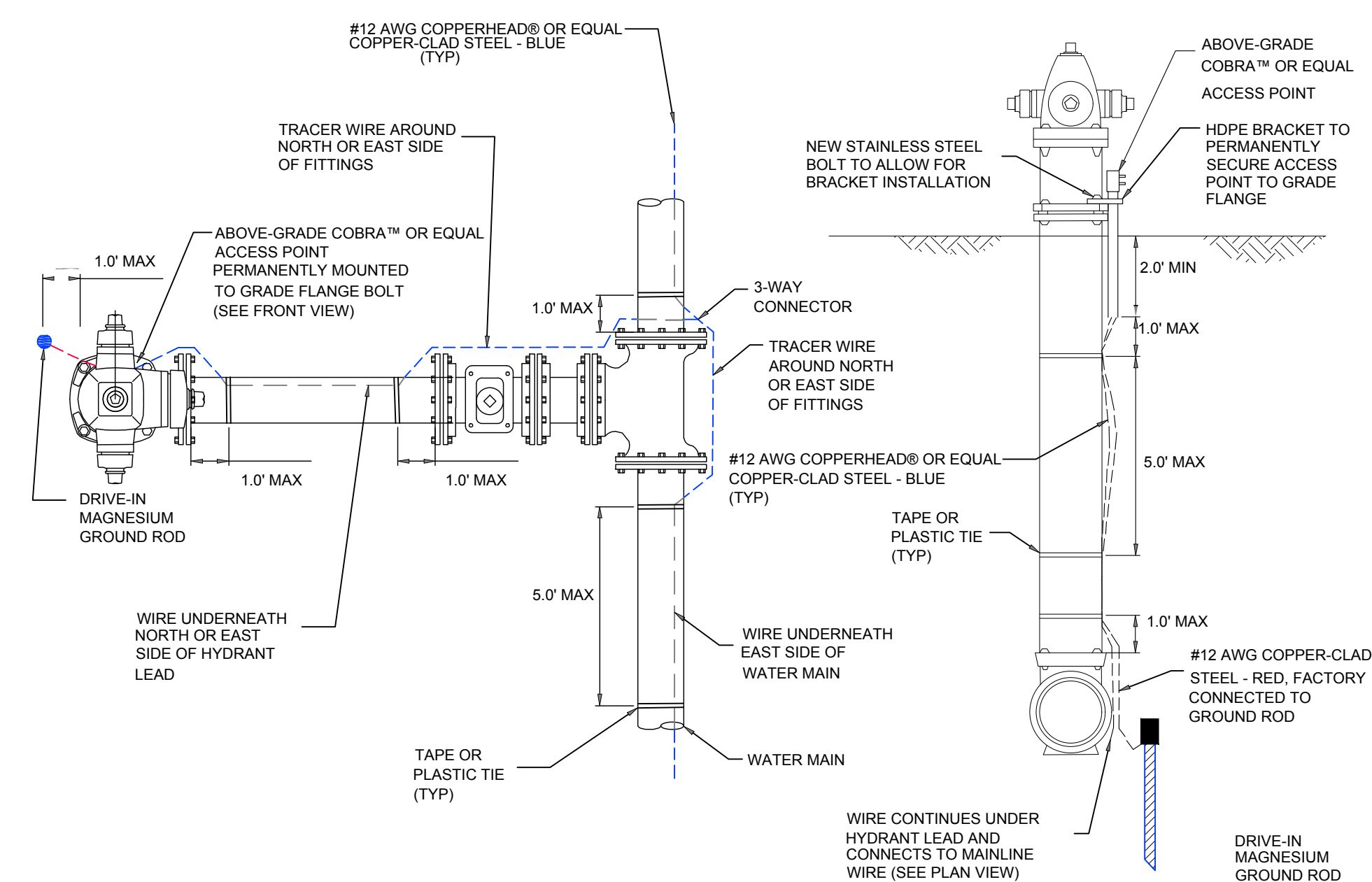
SAMPLE PLAN (WATER)  
NO SCALE



WATER SERVICE - PLAN VIEW  
NO SCALE



WATER SERVICE - SECTION VIEW  
NO SCALE

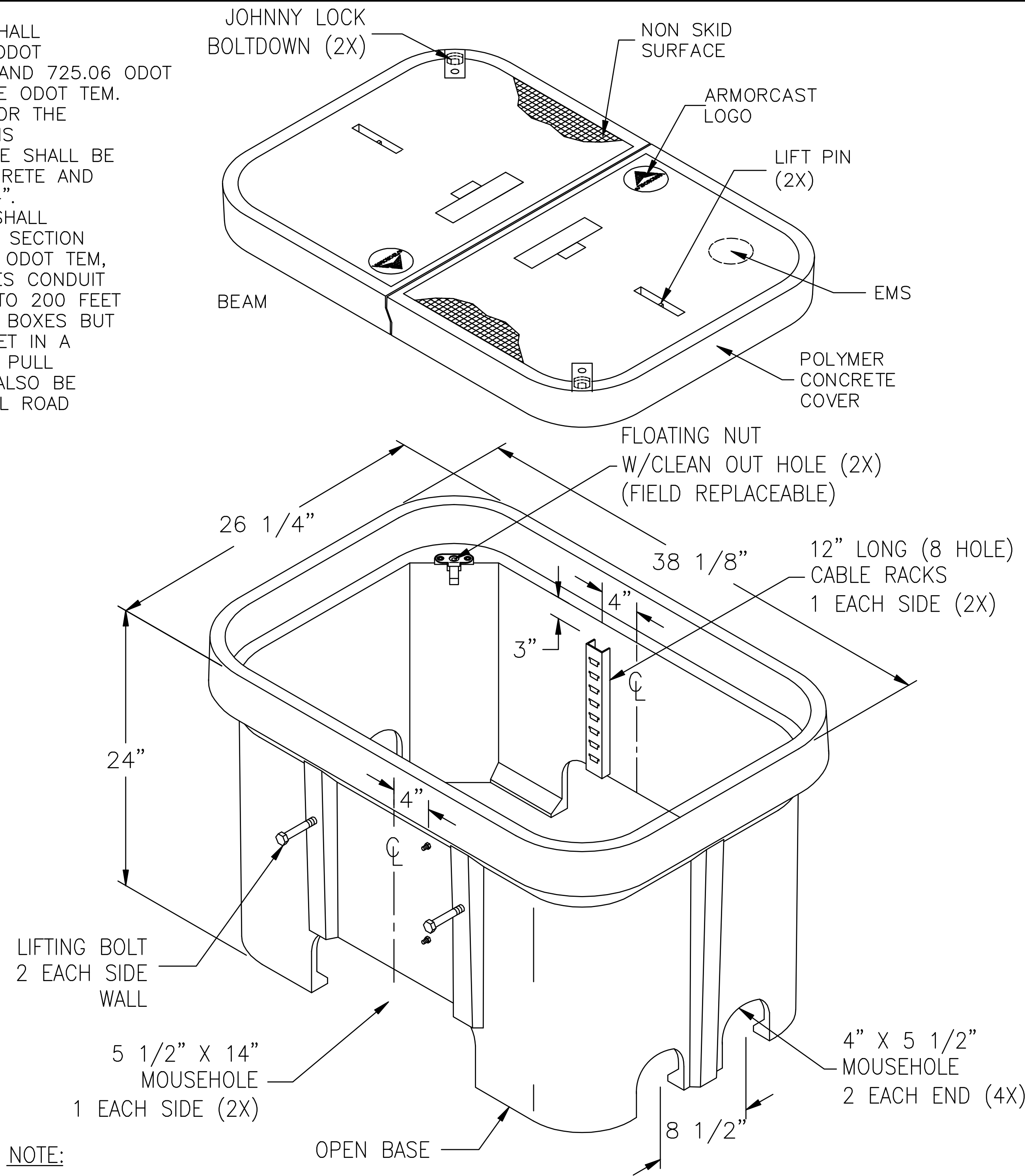


HYDRANT - PLAN VIEW  
NO SCALE

HYDRANT - SECTION VIEW  
NO SCALE



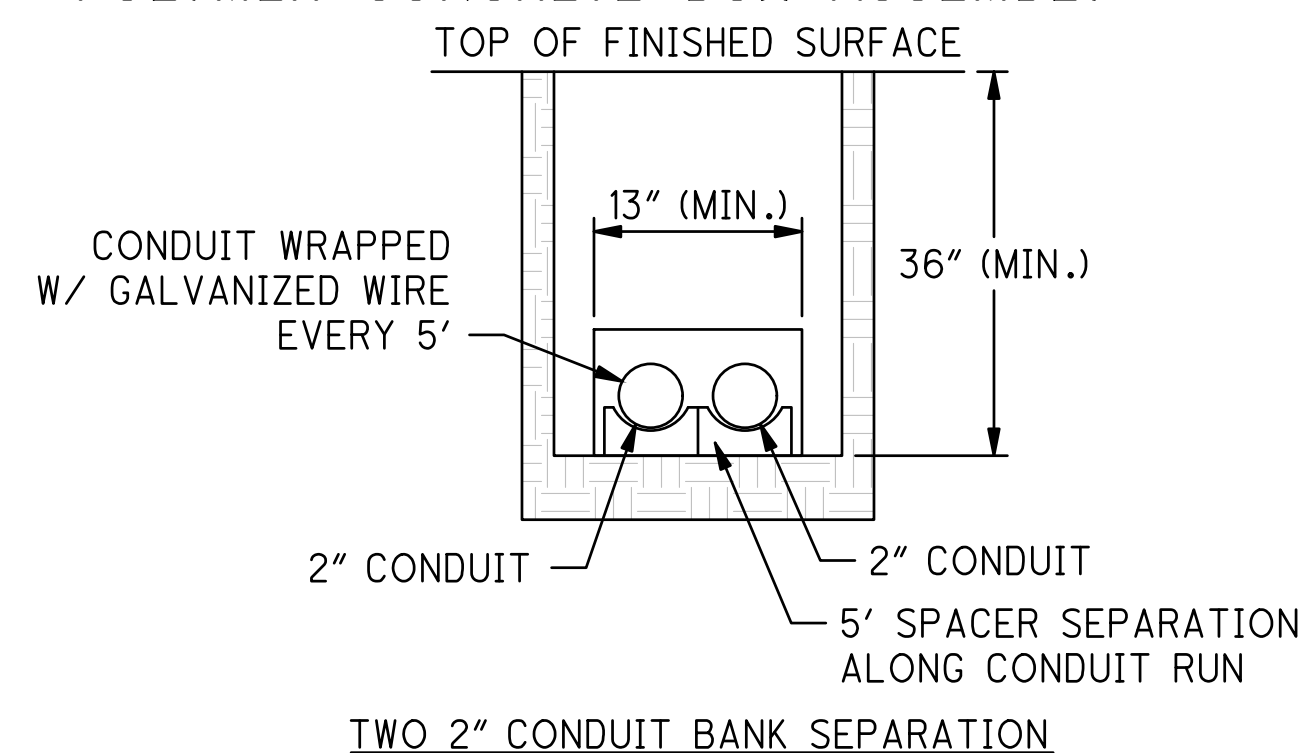
1. PULL BOXES SHALL COMPLY WITH ODOT C&MS 625.11 AND 725.06 ODOT SCD'S, AND THE ODOT TEM.
2. PULL BOXES FOR THE COMMUNICATIONS INFRASTRUCTURE SHALL BE POLYMER CONCRETE AND 24" X 36" X 24".
3. THE SPACING SHALL CONFORM WITH SECTION 441-5 IN THE ODOT TEM, WHICH REQUIRES CONDUIT RUNS LIMITED TO 200 FEET BETWEEN PULL BOXES BUT UP TO 400 FEET IN A STRAIGHT RUN. PULL BOXES SHALL ALSO BE LOCATED AT ALL ROAD CROSSINGS.



**NOTE:**  
BOX AND COVER ASSEMBLY MEET ANSI/SCTE 77 TIER 15 LOADING

**24" X 36" X 24" POLYMER CONCRETE BOX ASSEMBLY**

AS-BUILT AUTOCAD AND PDF DRAWINGS SHALL BE SUBMITTED TO THE CITY WITHIN 60 DAYS AFTER IMPROVEMENTS HAVE BEEN COMPLETED. ELECTRONIC FORMATS SHALL INCLUDE PROFESSIONAL SURVEY P.S. STAMP AND SIGNATURE ON COVER PAGE. CONTACT STREETSBORO ENGINEERING DEPARTMENT CONCERNING REQUIREMENTS. SURVEYOR SHALL ALSO PROVIDE A SEPARATE LIST OF ALL SURVEY MONUMENTS FOUND AND/OR USED WITH THEIR RESPECTIVE COORDINATES.



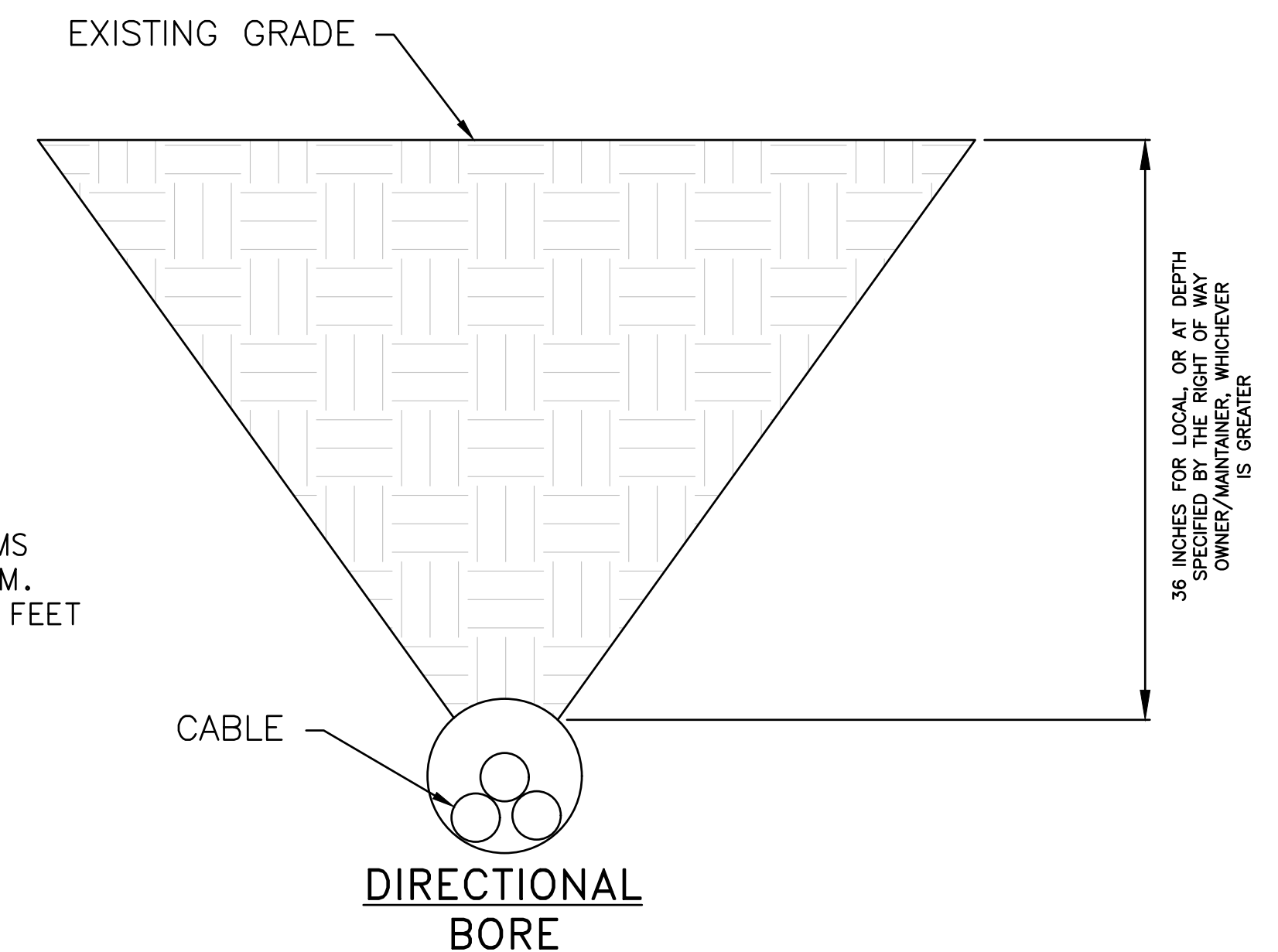
**CONSTRUCTION NOTES:**

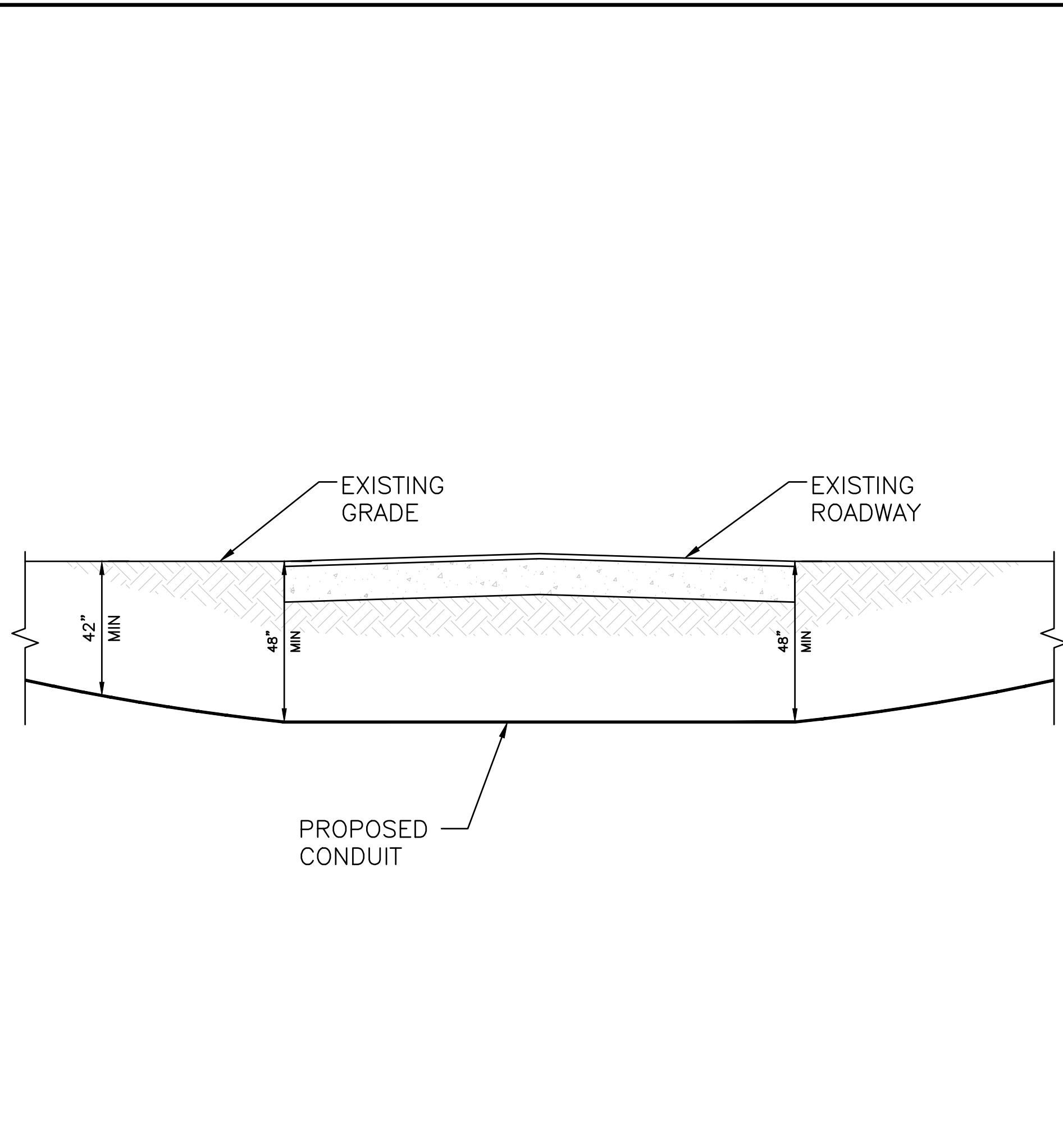
1. ALL CONSTRUCTION OF ANY PROJECT SHALL BE IN CONFORMANCE WITH CITY OF STREETSBORO'S CODIFIED ORDINANCE AND THE OHIO REVISED CODE
2. CALL FOR UTILITY LOCATES AT LEAST 48 HOURS IN ADVANCE OF ANY CONSTRUCTION FOR MARKINGS. VERIFICATION OF LOCATION OF EXISTING UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
3. ALL WORK WILL COMPLY WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATORY AGENCIES, INCLUDING, BUT NOT LIMITED TO, OSHA, NESC, DOT, ETC
4. THE CONTRACTOR WILL NOTIFY (IF APPLICABLE) THE ADJACENT PROPERTY OWNERS A MINIMUM OF 24 HOURS IN ADVANCE OF CONSTRUCTION.
5. ALL TRAFFIC CONTROL DEVICES WILL BE IN PLACE PRIOR TO CONSTRUCTION. DEVICES NO LONGER NEEDED WILL BE REMOVED AS QUICKLY AS POSSIBLE. CONTRACTOR SHALL PROVIDE A MAINTENANCE OF TRAFFIC PLAN FOR APPROVAL TO CITY ENGINEER PRIOR COMMENCE OF WORK IN RIGHT OF WAY.
6. PEDESTRIAN TRAFFIC AREAS MUST BE MAINTAINED AT ALL TIMES. PEDESTRIANS WILL NOT BE ROUTED ON TO PRIVATE PROPERTY.
7. NO EQUIPMENT OR MATERIALS WILL BE STORED ON ROAD SURFACE OR SIDEWALKS. EXCAVATION MATERIALS WILL BE STORED AWAY FROM PAVED ROADWAYS.
8. TWO INCH DIAMETER CONDUIT WILL BE USED FOR ALL FIBER WITH THE EXCEPTION OF 1 INCH DIAMETER CONDUIT FOR DROPS WITH A MAXIMUM OF (4) DROPS PER CONDUIT.
9. ALL PERMITS, FEES, PROPOSED CONSTRUCTION PLANS OR OTHER AS NOTED IN PERMIT PROCESS MUST BE PROVIDED TO THE CITY ENGINEER FOR APPROVAL PRIOR TO COMMENCE OF WORK ACTIVITIES.
10. UNDERGROUND UTILITIES: UTILITIES INCLUDING GAS PIPES, COMMUNICATION, ELECTRICAL POWER, STREET LIGHTING CABLES OR OTHER ARE RECOMMENDED TO BE UNDERGROUND. WHEN ELECTRICAL POWER CABLES ARE INSTALLED UNDERGROUND IN A SUBDIVISION, ELECTRICAL STREET LIGHTING CABLES MAY ALSO BE INSTALLED, WHETHER FOR PRESENT OR FUTURE USE. UNUSED WIRES AND CABLES SHALL BE DE-ENERGIZED AND PROTECTED AGAINST PHYSICAL DAMAGE. ALL TRENCH BACKFILL IN PAVEMENT AREAS SHALL BE ODOT ITEM #304 AGGREGATE BASE COMPACTED BY VIBRATORY OR MECHANICAL TAMPING IN EIGHT (8) INCH LAYERS. ALL WIRING AND CABLES WITHIN CONDUIT AND DIRECT BURIED SHALL HAVE THEIR LOCATIONS MARKED WITH TECTO-TAPE OR FACSIMILE TWELVE (12) INCH ABOVE SUCH DIRECT BURIED WIRING OR CABLE.
11. ALL CONSTRUCTION OF UTILITY PIPE, CONDUIT, CABLE, WIRES, VAULTS AND PERTINENT EQUIPMENT SHALL COMPLY WITH THE CURRENT REGULATIONS OF THE PUBLIC UTILITIES COMMISSION OF OHIO AND WITH THE REQUIREMENTS OF THE UTILITIES INVOLVED. ALL LOCATION AND DETAIL DRAWINGS OF THE UTILITIES PREPARED BY THE DEVELOPER AND/OR THE UTILITIES COMPANIES SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.

**RESTORATION NOTES:**

1. REMOVE AND STORE ALL SHRUBBERY TO BE REPLACED.
2. RESTORE ALL DISTURBED AREAS TO THEIR ORIGINAL OR BETTER CONDITION.
3. ALL DISTURBED EARTH SHALL BE REPLACED WITH SOD IMMEDIATELY FOLLOWING INSTALLATION AND ANY SOIL STOCKPILES SHALL BE STABILIZED WITH TEMPORARY VEGETATION.
4. DIRECTIONAL BORE DRILLING FLUIDS AND LOOSE MUD SHALL BE REMOVED FROM POTHOLES/BORING PITS, BE DISPOSED OF PROPERLY AND REPLACED WITH ENGINEERING APPROVED BACKFILL.

1. CONDUIT SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ODOT C&MS 625.12 AND 725.051, ODOT SCD'S AND THE ODOT TEM.
2. ALL CONDUITS SHALL BE AT A MINIMUM DEPTH OF 3 FEET BELOW THE PAVEMENT SURFACE.
3. TRACER WIRE SHALL BE INSTALLED IN CONDUIT

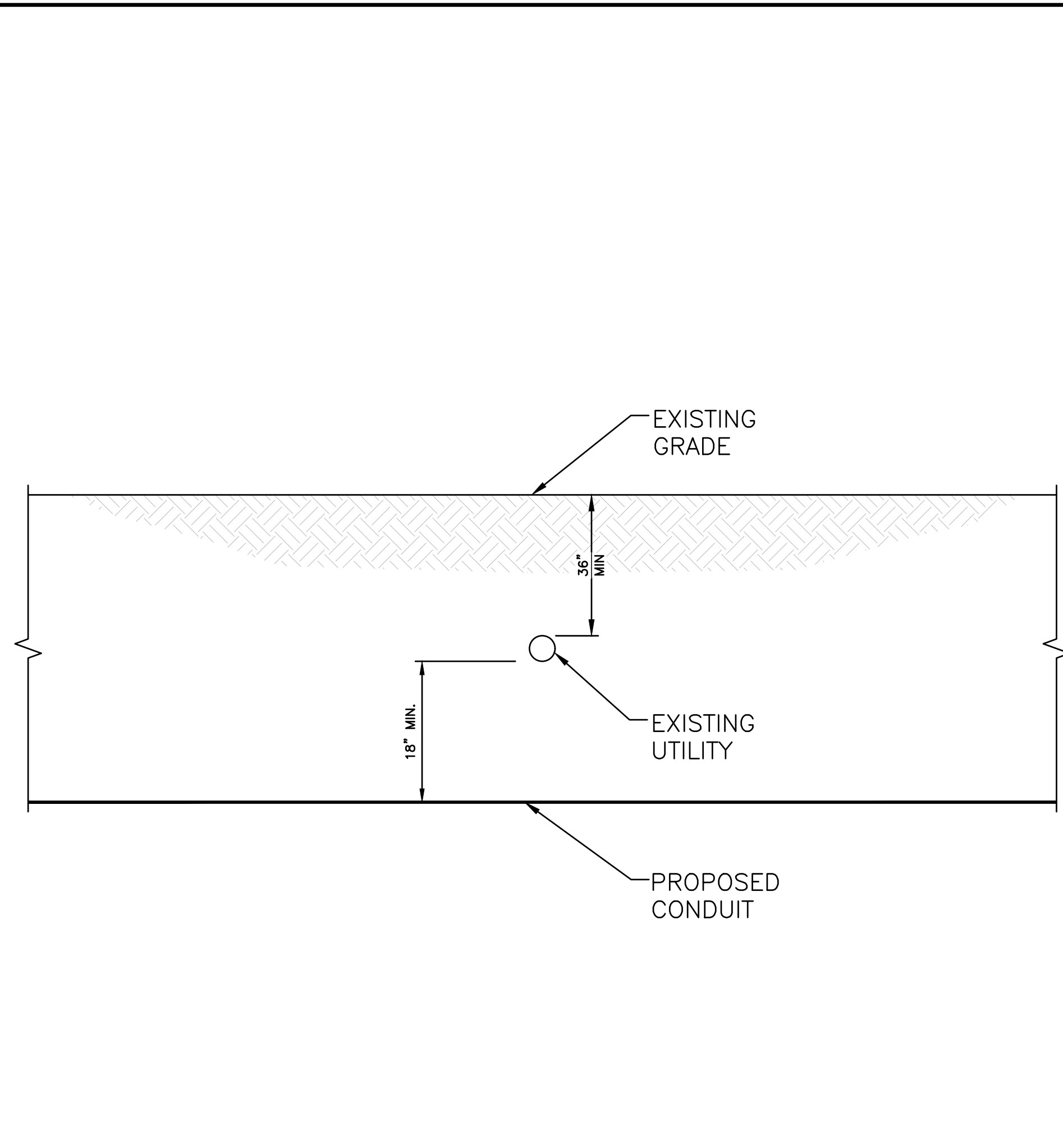




TYPICAL ROADWAY CROSSING

NO SCALE

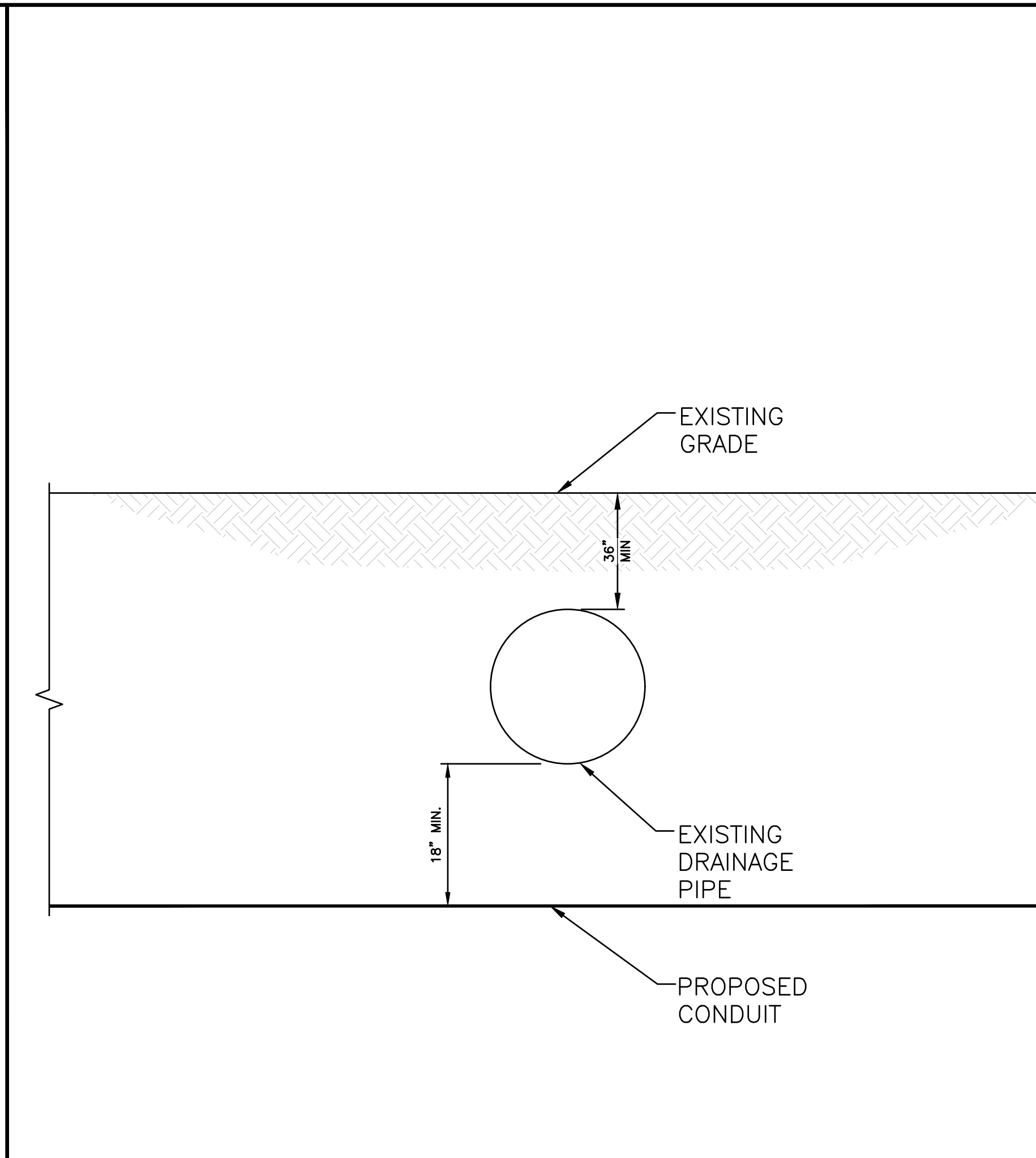
A



TYPICAL UTILITY CROSSING

NO SCALE

B



TYPICAL CULVERT CROSSING

NO SCALE

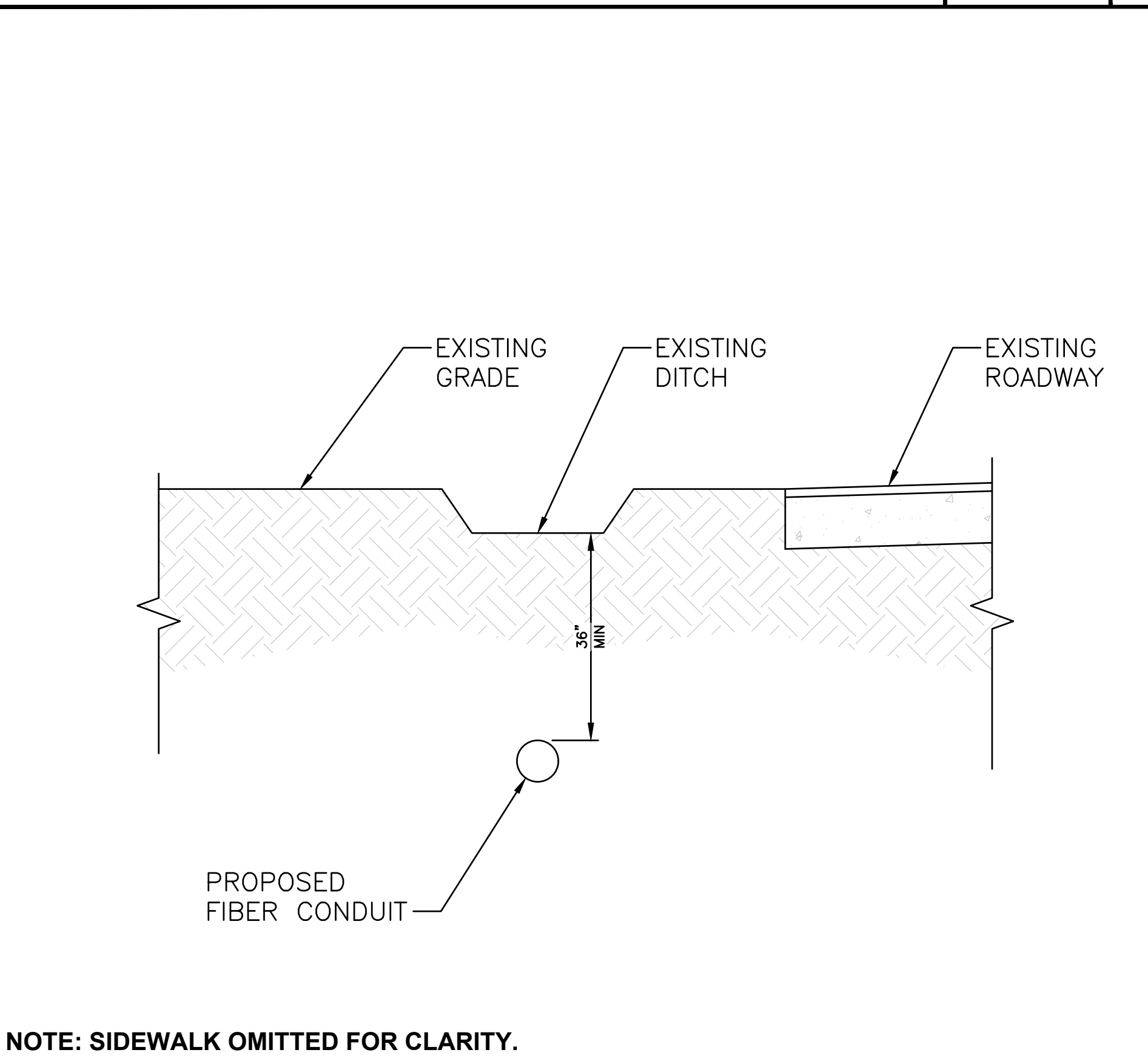
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FIBER CONDUIT DETAILS

REVISION DATE  
7-18-2022

CITY OF STREETSBORO

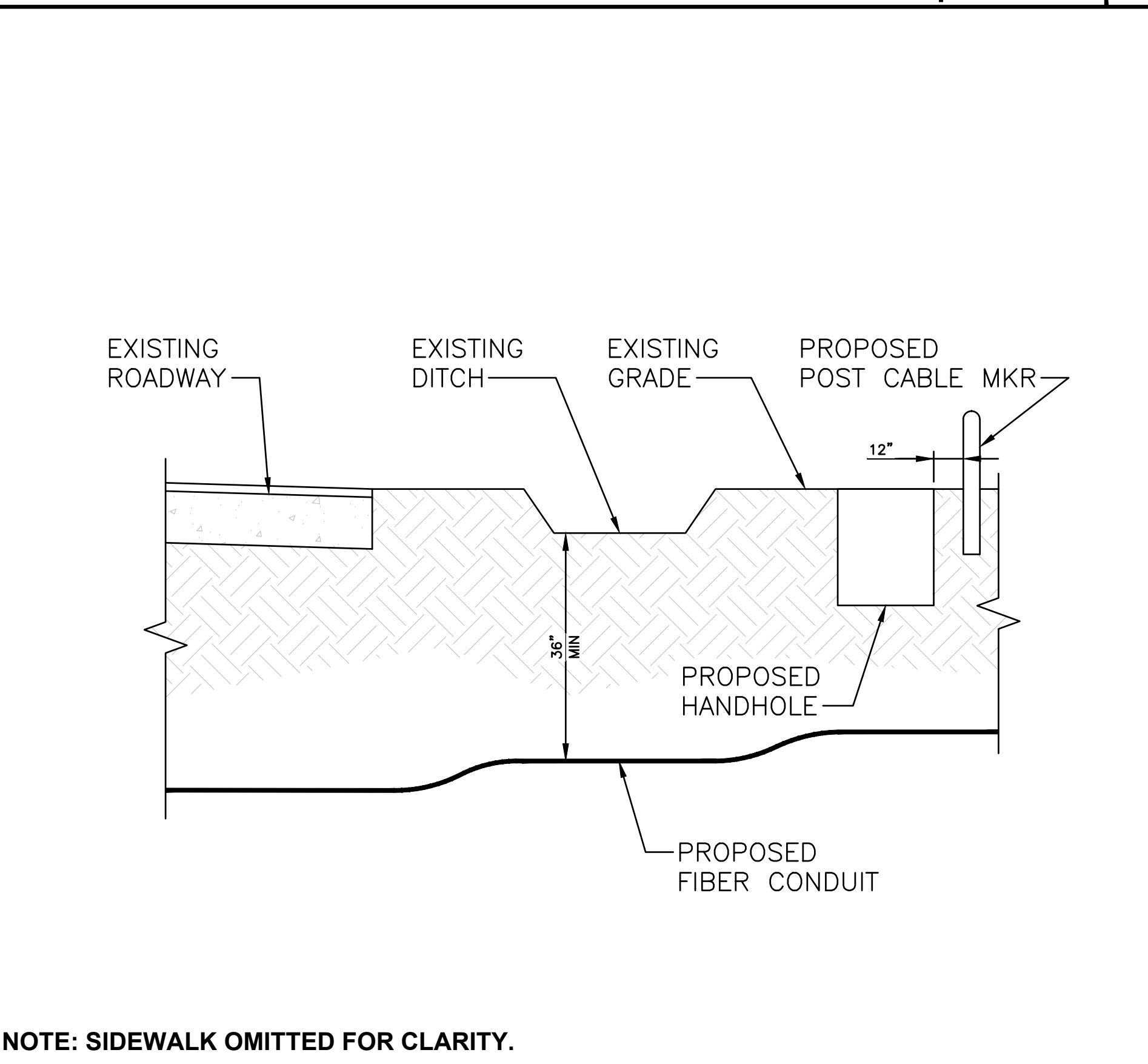
FO-1



TYPICAL DITCH VERTICAL ALIGNMENT

NO SCALE

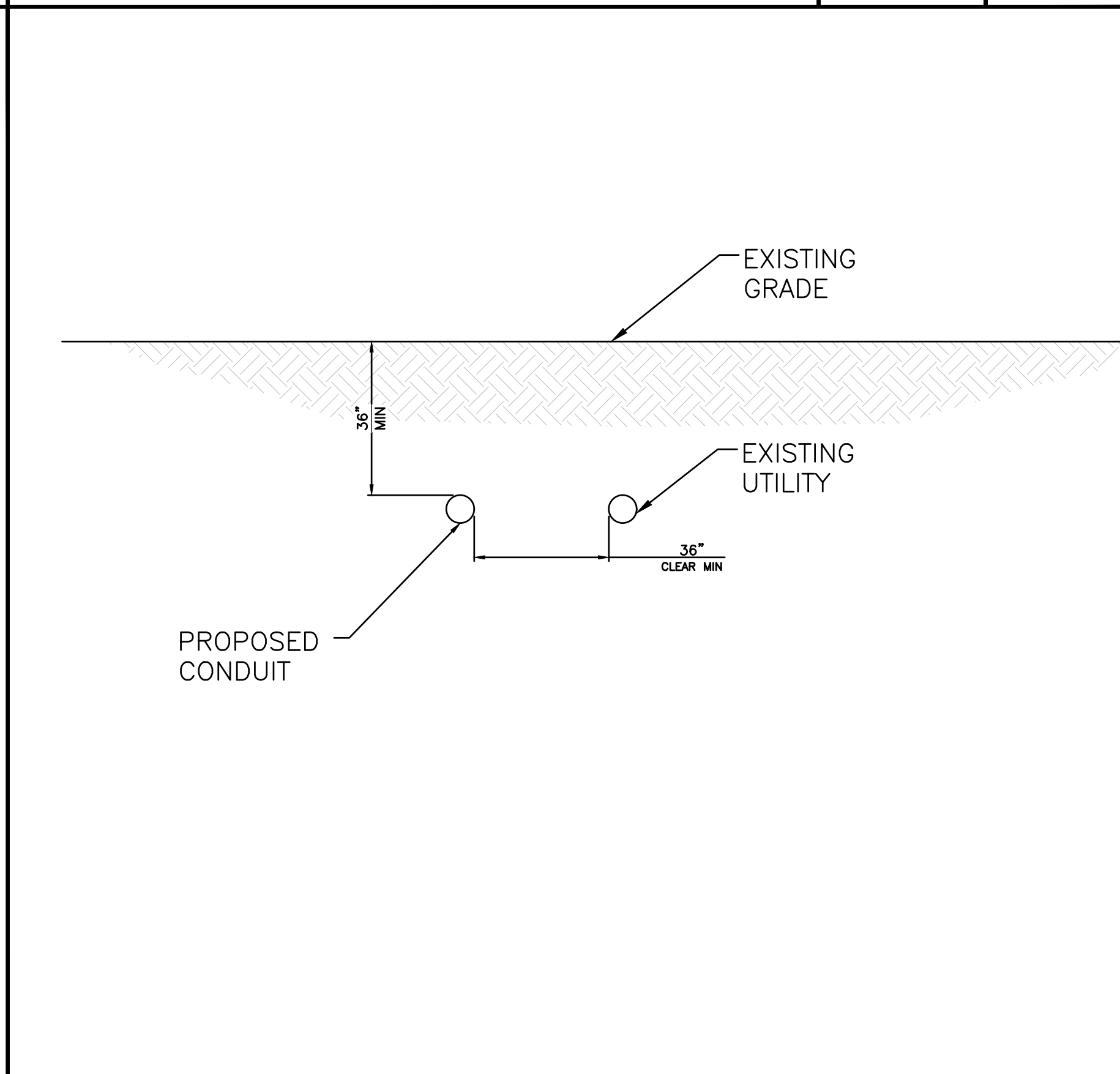
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TYPICAL DITCH VERTICAL ALIGNMENT

NO SCALE

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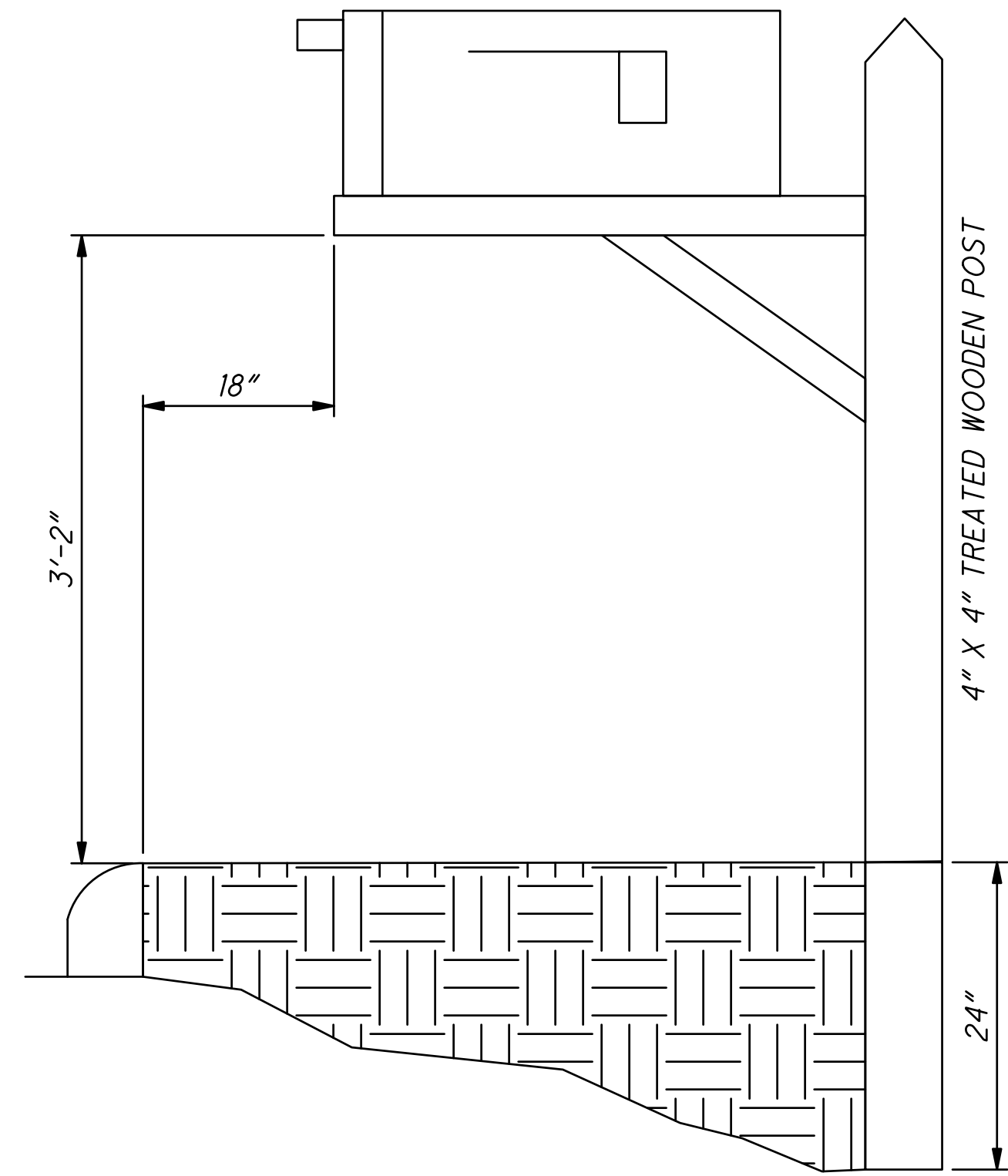


TYPICAL UTILITY DETAIL

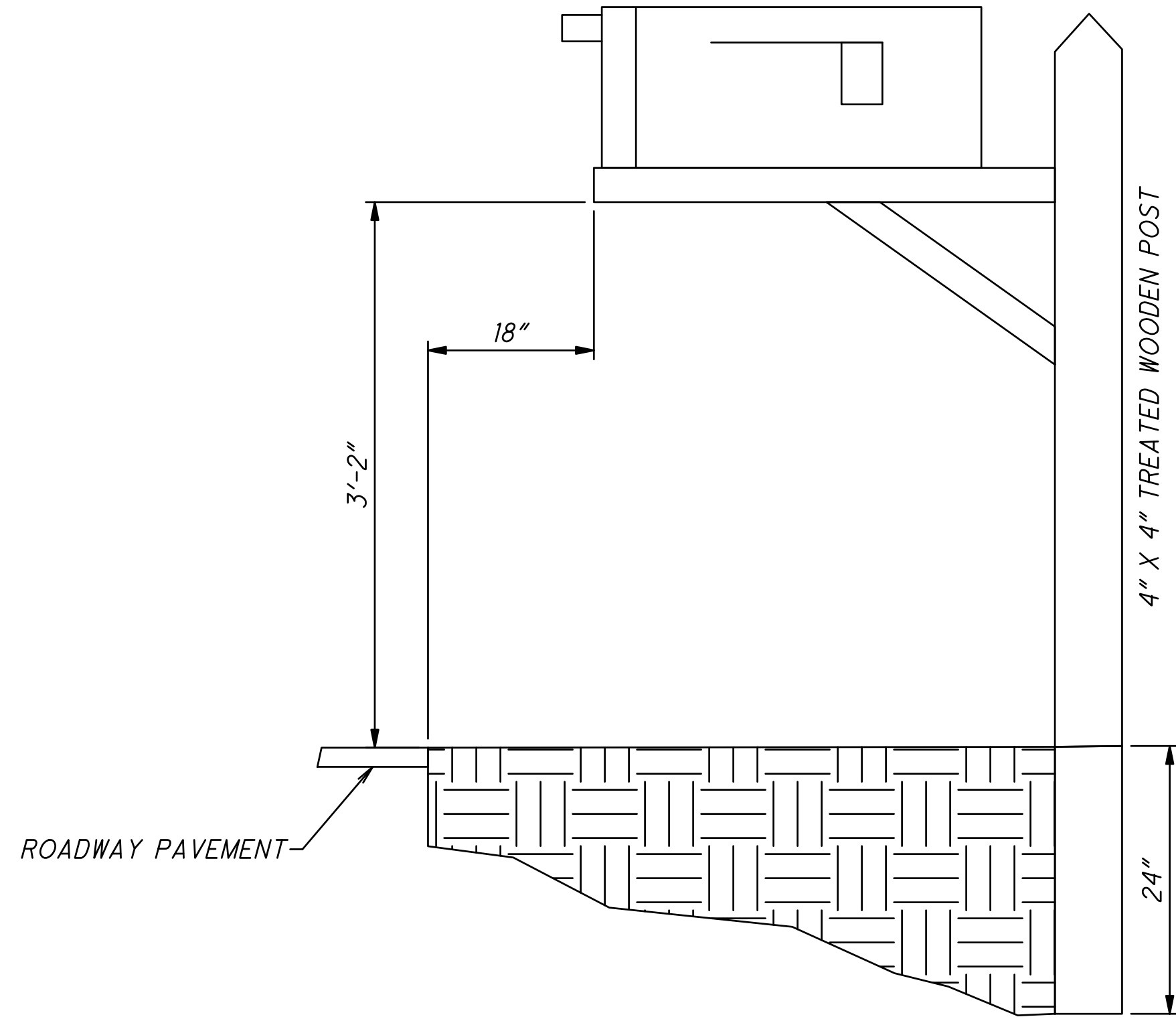
NO SCALE

F





THE FACE OF MAILBOX SHALL BE EQUAL TO 12" FROM BACK OF CURB OR EQUAL TO 18" FROM EDGE OF PAVEMENT. A 4" BY 4" TREATED WOODEN POST SHALL BE BURIED EQUAL TO 24" DEPTH WITHOUT USE OF CONCRETE FOR BREAKAWAY USE.



ALL MAILBOX UNITS, ATTACHMENTS, DECALS, SUPPORTS AND INSTALLATION THEREOF ARE TO BE IN ACCORDANCE WITH THE UNITED STATES POSTAL REGULATIONS. INSTALLATION PER THE STATE AND FEDERAL HIGHWAY ADMINISTRATION SHALL BE FOLLOWED. MAILBOXES NOT IN COMPLIANCE ARE SAFETY HAZARDS AND SHALL BE REMOVED.