

100 - GENERAL PROVISIONS

GENERAL NOTES 1	100-1
GENERAL NOTES 2	100-2
TRENCH DETAIL	100-3
TRENCHLESS PIPE INSTALLATION	100-4
MAINTENANCE OF TRAFFIC	100-5
VISION CLEARANCE ON CORNER LOTS	100-6
RECORD DRAWING FOR SERVICE CONNECTIONS	100-7

300 - ROADWAYS

MISCELLANEOUS ROADWAY NOTES	300-1
TYPICAL SECTIONS AND ASPHALT PAVEMENT COMPOSITION	300-2
ACCESS CONTROL STANDARDS	300-3
TEMPORARY DEAD-END STREETS	300-4
ASPHALT OVERLAY	300-5
PARKING LOT DETAIL 1	300-6
PARKING LOT DETAIL 2	300-7
SIDEWALK DETAIL	300-8
GUIDELINES FOR REPLACEMENT OF SIDEWALKS	300-9
CURB RAMPS 1	300-10
CURB RAMPS 2	300-11
CURB RAMPS 3	300-12
CURB DETAILS	300-13
DRIVE APPROACH	300-14
DRIVE APPROACH AND SIDEWALK WITH NO CURB LAWN	300-15

600 - STORM DRAINAGE

MISCELLANEOUS STORM NOTES	600-1
TYPE 3 STORM MANHOLE	600-2
TYPE 3 STORM MANHOLE DETAILS	600-3
TYPE 1 CATCH BASIN	600-4
TYPE 1A CATCH BASIN	600-4A
TYPE 2-2B CATCH BASIN	600-5
YARD DRAINS	600-6
STORM LATERAL DETAIL	600-7
REPAIR OF EXISTING FIELD TILE OR STORM PIPE DETAIL	600-8
FULL-HEIGHT HEADWALL	600-9
HALF-HEIGHT HEADWALL	600-10
DETENTION/RETENTION BASIN DETAILS	600-11
EROSION CONTROL NOTES	600-12
TEMPORARY EROSION CONTROL 1	600-13
TEMPORARY EROSION CONTROL 2	600-14

800 - WATER DISTRIBUTION

MISCELLANEOUS WATER NOTES 1	800-1
MISCELLANEOUS WATER NOTES 2	800-2
FIRE HYDRANT DETAIL	800-3
RESTRAINING JOINTS AND TAPPING SLEEVE FOR WATER MAINS	800-4
TRACER WIRE DETAIL	800-5
WATER MAIN SERVICE CONNECTION - OUTSIDE	800-6
1" AND SMALLER METER PIT DETAIL	800-7
1 1/2" AND GREATER METER PIT DETAIL	800-8

900 - SANITARY SEWERS

MISCELLANEOUS SANITARY SEWER NOTES 1	900-1
MISCELLANEOUS SANITARY SEWER NOTES 2	900-2
MISCELLANEOUS SANITARY SEWER NOTES 3	900-3
TYPE 3 SANITARY MANHOLE	900-4
TYPE D SANITARY DROP MANHOLE	900-5
SANITARY INSIDE DROP CONNECTION	900-5A
REPAIR OF EXISTING SANITARY SEWER PIPE DETAIL	900-6
BUILDING CONNECTION DETAIL	900-7
SERVICE RISER AND SERVICE LATERAL	900-8
SANITARY SEWER SADDLE DETAILS	900-9

901 - LIFT STATIONS

TYPICAL WET WELL AND VALVE VAULT PLAN VIEW	901-11
TYPICAL WET WELL AND VALVE VAULT SECTION VIEW	901-12
TYPICAL LIFT STATION SITE PLAN	901-13

CITY OF TROY



TABLE OF CONTENTS

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
INDEX

MODIFICATIONS

ANY MODIFICATIONS TO THE SPECIFICATIONS OR CHANGES TO THE WORK AS SHOWN ON THE DRAWINGS MUST HAVE PRIOR WRITTEN APPROVAL BY THE CITY.

SEEDING

ALL AREAS DESIGNATED FOR SEEDING SHALL HAVE A MINIMUM OF 3" OF TOPSOIL OVER THE ENTIRE AREA. THE AREA SHALL BE RAKED, ROLLED, AND DRESSED READY FOR SEEDING. NO STONE OVER 1" IN SIZE PERMITTED.

ALL UNPAVED AREAS WITHIN THE STREET RIGHT-OF-WAY SHALL BE SEEDED WITHIN 48 HOURS AFTER THE CURB IS BACKFILLED. STAKED STRAW BALES MAY BE REQUIRED IN ADDITION TO SEEDING TO CONTROL EROSION IF REQUESTED BY THE CITY.

TREE PLANTING IN PUBLIC RIGHT-OF-WAY

ALL TREES PLANTED IN THE PUBLIC RIGHT-OF-WAY SHALL HAVE THEIR TYPE AND LOCATION APPROVED BY THE CITY.

UTILITY SEPARATION

ANY UNDERGROUND UTILITIES SUCH AS GAS, ELECTRIC, CABLE TV, TELEPHONE, ETC., SHALL HAVE 10' SEPARATION FROM ANY CITY UTILITY UNLESS OTHERWISE APPROVED.

UTILITIES

THE MAXIMUM LENGTH OF ANY UTILITY TRENCH TO BE OPEN AT ANY TIME SHALL BE 100' UNLESS OTHERWISE APPROVED.

ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR THE DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT RECEIVES FINAL APPROVAL FROM THE CITY.

RECORD DRAWINGS

THE CONTRACTOR SHALL PROVIDE RECORD DRAWINGS TO THE CITY WITHIN 30 DAYS OF PROJECT COMPLETION. RECORD DRAWINGS SHALL BE PROVIDED IN ELECTRONIC AND HARD COPY FORMAT ACCEPTABLE TO THE CITY. THESE DRAWINGS SHALL SHOW ALL CHANGES TO THE ORIGINAL DRAWINGS. FOR EXAMPLE: ALL MANHOLE AND CATCH BASIN LOCATIONS AND INVERTS, ALL LATERAL LOCATIONS AND DEPTHS, ALL LOCATIONS AND DEPTHS OF EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION, AND ALL OTHER PERTINENT DATA TO THE IMPROVEMENTS.

SUBCONTRACTOR SUPERVISION

THE CONTRACTOR IS REQUIRED TO HAVE A PROJECT SUPERVISOR ON-SITE TO SUPERVISE THE SUBCONTRACTOR FOR QUALITY CONTROL PURPOSES AND TO PROVIDE ANY NECESSARY ASSISTANCE TO THE SUBCONTRACTOR TO ENSURE QUALITY WORK.

SAFETY

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE, AND LOCAL SAFETY REQUIREMENTS TOGETHER WITH EXERCISING PRECAUTIONS AT ALL TIMES FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT IS ALSO THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INITIATE, MAINTAIN, AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS, AND PROGRAMS IN CONNECTION WITH THE WORK.

MUD

THE TRACKING OR SPILLING OF MUD, DIRT, OR DEBRIS UPON CITY STREETS IS PROHIBITED, AND ANY SUCH OCCURRENCE SHALL BE CLEANED UP IMMEDIATELY BY THE CONTRACTOR.

PROPERTY POINTS AND SURVEY MONUMENTS

CARE SHALL BE TAKEN BY THE CONTRACTOR TO SAFEGUARD ANY PROPERTY POINTS OR OTHER SURVEY REFERENCE MARKS ENCOUNTERED DURING CONSTRUCTION OF THE PROJECT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RESET ANY PROPERTY POINT OR SURVEY MONUMENT WHICH IS DISTURBED AS A RESULT OF CONSTRUCTION OF THIS PROJECT. THE PROPERTY POINTS AND SURVEY MONUMENTS SHALL BE RESET UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL SURVEYOR.

NONRUBBER TIRE VEHICLES

NO NONRUBBER TIRE VEHICLES SHALL BE MOVED ON CITY STREETS. EXCEPTIONS MAY BE GRANTED BY THE CITY WHERE SHORT DISTANCES AND SPECIAL CIRCUMSTANCES ARE INVOLVED. GRANTING OF EXCEPTIONS MUST BE IN WRITING AND ANY RESULTING DAMAGE MUST BE IN WRITING AND ANY RESULTING DAMAGE MUST BE REPAIRED TO THE SATISFACTION OF THE CITY. THE CONTRACTOR SHALL USE EXTREME CARE WHEN OPERATING NONRUBBER TIRE VEHICLES ON STREETS OR DRIVEWAYS TO AVOID MARKING OR DAMAGING THE PAVEMENT. PROTECTION OF THE PAVEMENT FROM DAMAGE RESULTING FROM THE TRACKS OF NONRUBBER TIRE VEHICLES UTILIZED IN TRENCH EXCAVATION SHALL BE REQUIRED. A WOOD PLANK SYSTEM, USED TIRES, RUBBER MATS, OR OTHER MEANS AS APPROVED BY THE CITY'S REPRESENTATIVES SHALL BE USED TO PROTECT THE PAVEMENT.

CONSTRUCTION NOISE

IN ORDER TO MINIMIZE ANY ADVERSE CONSTRUCTION NOISE IMPACTS, ANY POWER-OPERATED CONSTRUCTION-TYPE DEVICES SHALL NOT BE OPERATED BETWEEN THE HOURS OF 7:00 PM AND 7:00 AM. IN ADDITION, ANY SUCH DEVICE SHALL NOT BE OPERATED AT ANY TIME IN SUCH A MANNER THAT THE NOISE CREATED SUBSTANTIALLY EXCEEDS THE NOISE CUSTOMARILY AND NECESSARILY ATTENDANT TO THE REASONABLE AND EFFICIENT PERFORMANCE OF SUCH EQUIPMENT.

HAUL ROADS

WHEN PICKING A DUMP SITE, CONTRACTOR IS TO TAKE INTO CONSIDERATION THE HAUL ROAD ROUTE AND ANY NECESSARY ROADWAY REPAIR CAUSED BY HAULING TO THE DUMP SITE.

PRIOR TO HAULING EQUIPMENT OR MATERIALS, THE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO THE CITY OF THE SPECIFIC ROADS OR STREETS ON THE HAUL ROUTES. IF THE HAUL ROUTE INCLUDES ROADS AND STREETS THAT ARE NOT UNDER THE JURISDICTION AND CONTROL OF THE CITY OR OF THE STATE, THE CONTRACTOR MUST USE LOCAL ROADS AND STREETS THAT ARE NOT RESTRICTED BY LOCAL AUTHORITIES. IF IT IS DETERMINED BY THE CITY THAT THE HAUL ROADS USED TO HAUL EQUIPMENT AND MATERIALS TO THE DUMP SITE WERE DAMAGED FROM THIS OPERATION, THE CITY WILL ORDER THE CONTRACTOR TO PERFORM IMMEDIATE AND PRACTICAL REPAIRS TO ENSURE REASONABLY NORMAL TRAVELING CONDITIONS AND BRING PAVEMENT CONDITIONS BACK TO CONDITIONS EQUAL OR BETTER THAN PRE-OPERATION CONDITIONS AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL TAKE ALL THIS INTO CONSIDERATION WHEN PICKING A DUMP SITE.

THE CONTRACTOR SHALL NOT FILE A CLAIM FOR DELAYS OR OTHER IMPACTS TO THE WORK CAUSED BY DISPUTE WITH THE LOCAL AUTHORITIES REGARDING THE USE OF LOCAL ROADS OR STREETS AS HAUL ROADS. THE CONTRACTOR SHALL SAVE THE CITY AND THE STATE HARMLESS FOR ANY CLOSURES OR HAULING RESTRICTION OUTSIDE THE PROJECT LIMITS BEYOND THE CONTROL OF THE CITY OR ODOT.

DROP-OFF IN WORK ZONES

THE BASE WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 3" BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY. CONTRACTOR SHALL HAVE ONSITE STEEL PLATES FOR MAINTENANCE OF TRAFFIC AS DEEMED NECESSARY BY THE CITY IF THE 3" TOLERANCE IS NOT MET. CONTRACTOR SHALL ALSO PROVIDE ANY DRIVEWAY RAMPING NEEDED DURING PAVEMENT REMOVAL.

CITY OF TROY



GENERAL NOTES 1

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
100-1

GRAFFITI AND VANDALISM

THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF ANY CONCRETE WORK, ETC. WHICH IS DEEMED UNACCEPTABLE BY THE CITY DUE TO GRAFFITI OR VANDALISM DAMAGE.

CONTROL OF SPILLS

BEST CONSTRUCTION PRACTICES ARE TO BE IMPLEMENTED TO MINIMIZE WATER QUALITY IMPACTS. IDLE EQUIPMENT, PETROCHEMICALS, AND TOXIC/HAZARDOUS MATERIALS SHALL NOT BE STORED NEAR DRAINAGE WAYS, DITCHES, OR STREAMS. REFUELING SHALL NOT BE UNDERTAKEN NEAR DRAINAGE WAYS, DITCHES, OR STREAMS. A SPILL CONTAINMENT KIT IS TO BE MAINTAINED ONSITE THROUGHOUT CONSTRUCTION ACTIVITIES. SPILLS OF FUELS, OILS, CHEMICALS, OR OTHER MATERIALS WHICH COULD POSE A THREAT TO GROUNDWATER SHALL BE CLEANED UP IMMEDIATELY. IF THE SPILL IS A REPORTABLE AMOUNT, THE LOCAL FIRE DEPARTMENT IS TO BE CONTACTED.

WORK LIMITS

ALL WORK SHALL BE WITHIN EXISTING RIGHT-OF-WAY AND/OR CONSTRUCTION LIMITS UNLESS OTHERWISE INSTRUCTED BY THE CITY.

THE WORK LIMITS (IF SHOWN) ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL DEVICES REQUIRED FOR THE CONSTRUCTION SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

SEALING COMPOUND

ALL EXPOSED CONCRETE SHALL HAVE A CURING AND SEALING COMPOUND APPLIED. THE CURING AND SEALING COMPOUND SHALL BE APPLIED IN 2 COATS. CURING AND SEALING COMPOUND COLOR TO BE APPROVED BY THE CITY.

DOMESTIC STEEL

DOMESTIC STEEL USE REQUIREMENTS AS SPECIFIED IN SECTION 153.011 OF THE OHIO REVISED CODE APPLY TO THIS PROJECT. COPIES OF SECTION 153.011 OF THE OHIO REVISED CODE CAN BE OBTAINED FROM OF THE DEPARTMENT OF ADMINISTRATIVE SERVICES.

ASPHALT

ALL ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS SHALL APPLY TO CITY PROJECTS, EXCLUDING THE BINDER PRICE ADJUSTMENT PER ODOT 401.20. ALL ASPHALT DELIVERED SHALL BE ACCOMPANIED WITH A LOAD TICKET AS PER ITEM 401.21.

TESTING AND CERTIFICATION

THE CONTRACTOR SHALL PROVIDE TESTING AND CERTIFICATION THAT THE MATERIAL SUPPLIED FOR CONSTRUCTION MEETS THE PROJECT SPECIFICATIONS, AS REQUIRED.

POTENTIAL ITEMS FOR TESTING CONSIST OF TRENCH BACKFILL, EMBANKMENT, AND CONCRETE, WHICH MAY BE PERFORMED BY THE CITY IF THEY SUSPECT DEFECTIVE WORK OR MATERIALS.

COST OF ANY TESTING BY A TESTING LAB CONTRACTED BY THE CITY SHALL BE BORNE BY THE CITY, UNLESS THE TEST DOES NOT MEET PROJECT SPECIFICATIONS OR WORK IS FOUND TO BE DEFECTIVE, AT WHICH, THE CONTRACTOR SHALL PAY THE EXPENSES FOR TESTING.

EXISTING TILE HOOK-UPS

ANY DRAINAGE TILE DAMAGED BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR TO A CONDITION EQUAL TO OR BETTER THAN ITS ORIGINAL CONDITION. ALL TILE REMOVED, REPLACED, AND/OR CONNECTED TO THE STORM SEWER SHALL BE NOTED ON THE RECORD DRAWINGS AND SHALL BE INSPECTED BY THE COUNTY BEFORE THEY ARE COVERED.

ALL FIELD OR STORM DRAINS WHICH ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS OR PLUGGED AS APPROVED AND DIRECTED BY THE COUNTY. COST OF ALL THE ITEMS ABOVE SHALL BE INCIDENTAL TO THE PROJECT.

WATER MAIN CROSSING SEPARATION

WHENEVER A SANITARY SEWER AND WATER LIEN MUST CROSS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18" BELOW THE BOTTOM OF THE WATER LINE. IF IT IS ABSOLUTELY IMPOSSIBLE TO MAINTAIN THE 18" VERTICAL SEPARATION, THE SANITARY SEWER SHALL BE CONSTRUCTED WITH A WATER LINE TYPE MATERIALS WHICH WILL WITHSTAND A 50 PSI PRESSURE TEST. THESE REQUIREMENT WILL EXTEND FOR A DISTANCE OF 10 FEET, MEASURE PERPENDICULAR ON BOTH SIDES OF THE WATER LINE. AT CROSSING THE WATER MAIN SHALL HAVE A MINIMUM VERTICAL DISTANCE OF 18" FROM STORM AND SANITARY SEWER. ALSO ONE FULL LENGTH OF WATER MAIN SHALL BE LOCATED SO THE JOINTS ARE AS FAR FROM THE STORM AND SANITARY SEWER AS POSSIBLE.

TRAFFIC CONTROL DEVICE NOTES

ALL TRAFFIC CONTROL DEVICES SHALL BE PER THE LATEST REVISION OF THE OHIO DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND APPROVED BY THE CITY BEFORE INSTALLATION.

ALL SIGN POSTS SHALL BE STANDARD STEEL POST UNLESS OTHERWISE APPROVED BY THE CITY.

ALL STREET NAME SIGNS SHALL BE GREEN IN COLOR WITH WHITE LETTERING UNLESS OTHERWISE APPROVED BY THE CITY.

DEMOLITION

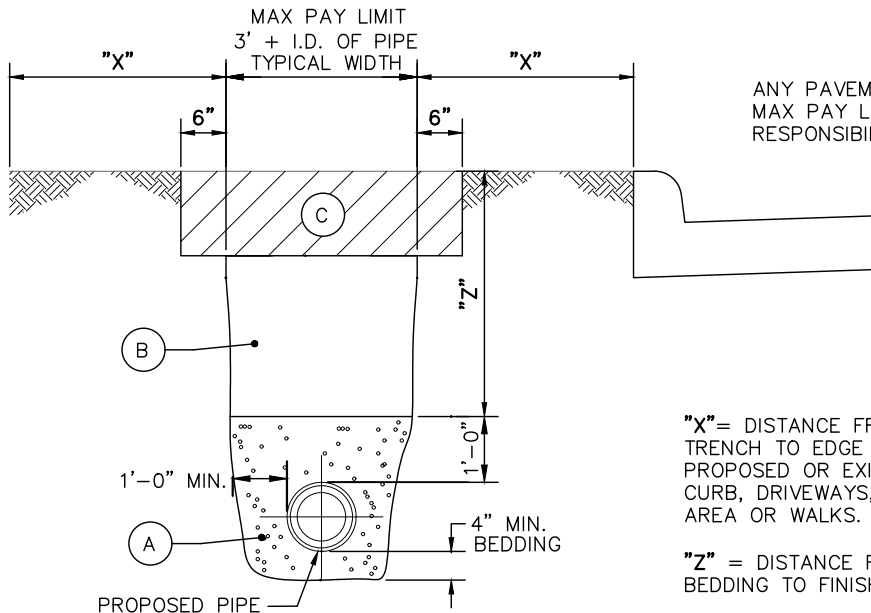
CONTRACTOR SHALL RECEIVE A DEMOLITION PERMIT FROM THE CITY. WATER SERVICES SHALL BE REMOVED/ABANDONED AT THE WATER MAIN AND THE SANITARY SEWER LATERAL SHALL BE REMOVED/ABANDONED TO THE EDGE OF THE RIGHT-OF-WAY. 48 HOURS ADVANCED NOTICE IS REQUIRED FOR INSPECTION OF THE SERVICE ABANDONMENT.

CITY OF TROY



GENERAL NOTES 2

REVISIONS:	DATE
	APPROVED:
	NOV 2017
	PAGE No.
	100-2



ANY PAVEMENT REPAIR BEYOND THE MAX PAY LIMIT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR

"X" = DISTANCE FROM EDGE OF TRENCH TO EDGE OF CLOSEST PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS.

"Z" = DISTANCE FROM TOP OF BEDDING TO FINISH SURFACE.

TRENCH DETAIL

NOTES

A. STRUCTURAL BEDDING SHALL BE CRUSHED STONE OR GRAVEL, ODOT #57 OR #8'S, OR OTHER APPROVED EQUIVALENT. STRUCTURAL BEDDING FOR WATER MAIN AND WATER SERVICES SHALL BE NATURAL WASHED GRAVEL (NO LIMESTONE) ODOT #57 OR #8'S.

B. ALL TRENCHES WHERE "X" IS GREATER THAN "Z" FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE CITY. NO MATERIAL SHALL BE USED FOR BACK FILLING THAT CONTAINS STONE, ROCKS, ETC., GREATER THAN 3" DIAMETER.

ALL TRENCHES WHERE "Z" IS GREATER THAN "X" FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS SHALL BE COMPACTED WITH STRUCTURAL BACKFILL MATERIAL ODOT 703.11 TYPE 1 OR TYPE 2 OR ODOT 304'S (PREVIOUSLY ODOT 310'S), IN 6" MAXIMUM LIFTS OR LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613 TYPE 1 UNTIL THE TOP OF THE COMPACTED STRUCTURAL BACKFILL OR LOW STRENGTH MORTAR BACKFILL IS HIGH ENOUGH WHERE "X" IS GREATER THAN "Z".

A DENSITY TEST ON STRUCTURAL BACKFILL OF 98% OF ASTM D698 STANDARD PROCTOR CURVE MAY BE REQUIRED TO BE PERFORMED BY A COMMERCIAL TESTING LAB SATISFACTORY TO THE CITY.

TRENCH COMPACTION METHODS

A. FLOODING SHALL NOT BE PERMITTED.

B. MECHANICAL DEVICES, HAND DEVICES, VIBRATING PLATES OR OTHER EQUIPMENT APPROVED BY THE CITY ARE ACCEPTABLE 1' ABOVE PIPE IN UNIFORM LIFTS OF 12" (LOOSE DEPTH) OF EXISTING NATIVE MATERIAL AND 6" OF STRUCTURAL BACKFILL. THE HEIGHT OF LIFTS WILL DEPEND UPON THE TYPE OF MECHANICAL EQUIPMENT BEING USED. THE HEIGHT WILL BE 6" FOR HAND OPERATED TOOLS AND UP TO 12" ON EQUIPMENT MOUNTED TOOLS. THE COMPACTION EQUIPMENT SHALL BE CAPABLE OF COMPACTING THE MATERIAL UNDER THE HAUNCH OF THE PIPE.

C. DENSITY FOR THE ABOVE METHODS SHALL BE NO LESS THAN THAT OF THE SURROUNDING GROUND UNLESS OTHERWISE SPECIFIED.

C. OFF-PAVEMENT AREAS SHALL BE PROVIDED WITH A MINIMUM OF 12" OF TOPSOIL OVER THE COMPACTED MATERIAL AND THEN SEEDED AND MULCHED PER ODOT ITEM 659 AND 100-1.

IN-PAVEMENT AREAS SHALL MATCH EXISTING ASPHALT SECTION OR FOLLOW TYPICAL PAVEMENT RESTORATION DETAILS, WHICHEVER IS MORE RESTRICTIVE. SEE BUTT JOINT DETAIL ON ASPHALT OVERLAY SHEET FOR JOINING TO EXISTING PAVEMENT.

ALL JOINTS SHALL BE SEALED.

D. THE LAYING OF PIPE ON EXISTING DIRT WITH THE BELLS CUT OUT SHALL NOT BE PERMITTED.

E. THE OPEN ENDS OF ALL PIPES AND SPECIAL CASTINGS SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE CITY BEFORE LEAVING THE WORK FOR THE NIGHT.

CITY OF TROY



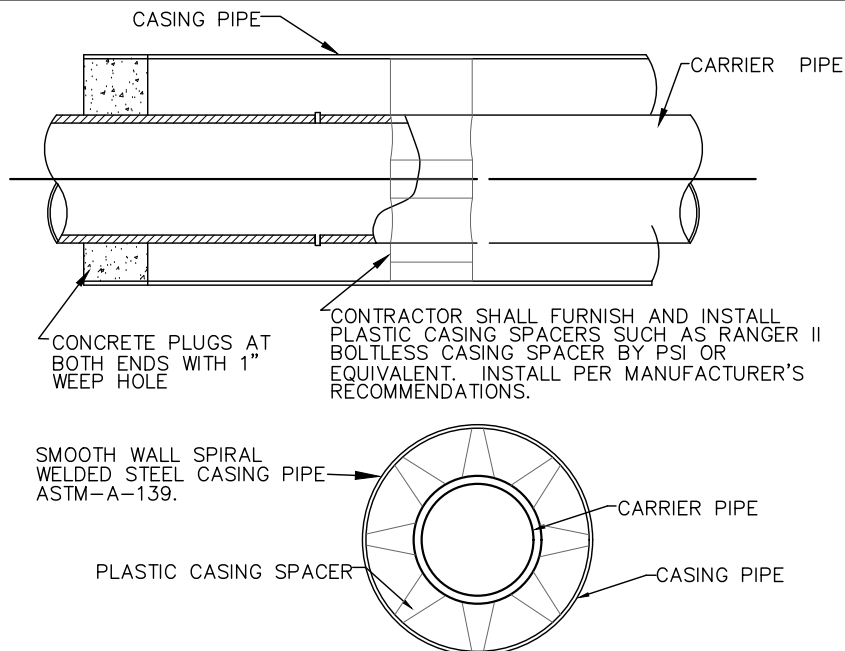
TRENCH DETAIL

REVISIONS:
DEC 2019
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
100-3

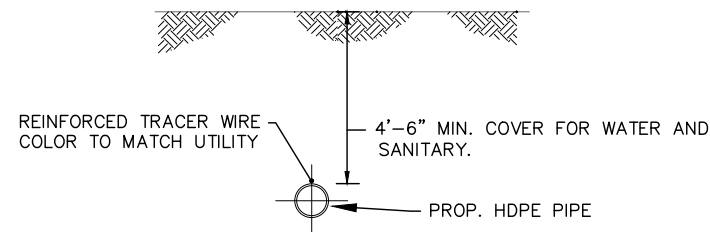
CASING PIPE Ø	CASING PIPE THICKNESS
10 & UNDER	0.188
12 & 14	0.250
16	0.281
18	0.312
20 & 22	0.344
24	0.375
26	0.406
28	0.438
30	0.469
32	0.500
34 & 36	0.532
38	0.562
40	0.594
42	0.625
44 & 46	0.657
48	0.688
50	0.719
52	0.750
54	0.781
56 & 58	0.812
60	0.844
62	0.875
64	0.906
66 & 68	0.938
70	0.969
72	1.000



JACK AND BORE BORING DETAIL

NOTES

- A.** MATERIALS – CASING PIPE SHALL BE WELDED STEEL PIPE CONFORMING TO AWWA C-202.
- B.** INSTALLATION (CASING PIPE)
 1. FURNISH PROCEDURE METHODS TO THE CITY FOR APPROVAL.
 2. ALL METHODS AND PROCEDURES SHALL BE APPROVED BY THE CITY PRIOR TO CONSTRUCTION.
 3. ADEQUATELY SUPPORT ALL TRENCHES AND BORING/JACKING PITS.
- C.** INSTALLATION (CARRIER PIPE)
 1. PLACE CONDUITS IN CASING PIPE TO SAME RELATIVE POSITIONS AS ADJACENT DUCT BY USE OF SPACERS.
 2. FILL THE SPACE BETWEEN CONDUITS INSIDE THE CASING PIPE WITH CLEAN SAND OR OTHER APPROVED MATERIALS AS APPROVED BY THE CITY.



HORIZONTAL DIRECTIONAL BORING DETAIL

NOTES

- A.** THE HORIZONTAL DIRECTIONAL DRILLING (HDD) SHALL BE IN ACCORDANCE WITH ASTM F-1962. THE FORCEMAIN SHALL BE HDPE PIPE OR APPROVED EQUAL THAT MEETS ASTM F-714 AND SHALL BE MANUFACTURED WITH A COLOR STRIPE. PIPE-FUSING SHALL BE IN ACCORDANCE WITH ASTM F-2620.

STEEL CASING PIPE NOTES

- A.** STEEL CASING PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.
- B.** JOINTS BETWEEN THE SECTIONS OF PIPE SHALL BE FULLY WELDED AROUND THE COMPLETE CIRCUMFERENCE OF THE PIPE.

TRACER WIRE NOTES

- A.** DIRECTIONAL DRILL CONSTRUCTION: TRACER WIRE SHALL BE COPPERHEAD SOLOSHOT EHS REINFORCED TRACER WIRE MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC. OR COUNTY APPROVED EQUIVALENT..
- B.** TRACER WIRE MUST BE RUN ON TOP OF THE PIPE CONTINUOUSLY FOR THE FULL LENGTH OF THE PIPE.
- C.** TRACER WIRE WILL COME TO THE SURFACE AT EVERY TRACER WIRE STATION, MANHOLE, OR VALVE AND TIE TO THE TERMINALS PER MANUFACTURER'S RECOMMENDATIONS.
- D.** TRACER WIRE THAT MUST BE SPLICED SHALL USE SNAKEBITE TRACER WIRE CONNECTORS MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC OR APPROVED EQUIVALENT.
- E.** TRACER WIRE SHALL BE TAPED TO THE PIPE USING 1 1/2" POLYETHYLENE TAPE WRAPPED TWICE AROUND THE PIPE.

CITY OF TROY



TRENCHLESS PIPE INSTALLATION

REVISIONS:

DATE
APPROVED:
NOV 2017
PAGE No.
100-4

MAINTENANCE OF TRAFFIC

REQUIREMENTS FOR MAINTAINING TRAFFIC AS SPECIFIED IN THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" (CURRENT EDITION, LATEST REVISION), PERTINENT PROVISIONS OF THE "OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS" (INCLUDING SUPPLEMENTAL SPECIFICATIONS) AND APPLICABLE STANDARD CONSTRUCTION DRAWINGS SHALL APPLY TO ALL CONSTRUCTION.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SAFE AND EFFECTIVE VEHICULAR TRAFFIC CONTROL 24 HOURS A DAY FOR THE DURATION OF THE PROJECT. THIS WILL INCLUDE PROVIDING, PLACING, MAINTAINING AND SUBSEQUENTLY REMOVING ALL NECESSARY TRAFFIC CONTROL MEASURES FOR ALL PROPOSED CONSTRUCTION OPERATIONS.

BEFORE THE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE CITY THE NAME(S) AND TELEPHONE NUMBER(S) OF A PERSON OR PERSONS WHO CAN BE CONTACTED TWENTY-FOUR (24) HOURS A DAY BY THE CITY, OR ANY OTHER INTERESTED POLICE AGENCY.

THIS PERSON OR PERSONS SHALL BE RESPONSIBLE FOR REPAIRING AND/OR REPLACING ALL TRAFFIC CONTROL DEVICES NEEDED TO MAINTAIN THE SAFETY OF THE TRAVELED PAVEMENT FOR THE DURATION OF THE PROJECT. THIS PERSON SHALL HAVE AVAILABLE ALL MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY TO PERFORM THE REQUIRED REPAIRS WITHIN A REASONABLE PERIOD OF TIME AS PER C.M.S. 614.04.

THE CONTRACTOR SHALL ALSO SUBMIT A CONSTRUCTION SEQUENCING SCHEDULE PRIOR TO WORK BEGINNING FOR APPROVAL BY THE CITY. THE CONSTRUCTION SEQUENCING SCHEDULE SHALL TAKE INTO CONSIDERATION ALL ASPECTS OF THE PROJECT INCLUDING, HOW LOCAL TRAFFIC TO THE BUSINESSES WILL BE MAINTAINED. THE CONSTRUCTION SEQUENCE WILL NEED TO BE APPROVED BY THE CITY PRIOR TO ANY COMMENCEMENT OF WORK.

ACCESS TO AND FROM ALL LOCAL RESIDENTIAL AND BUSINESS DRIVES WITHIN THE LIMITS OF THE PROJECT SHALL BE MAINTAINED AT ALL TIMES (24 HOURS A DAY) BY USING THE EXISTING PAVEMENT, TEMPORARY PAVEMENT, AND THE PROPOSED PAVEMENT UNLESS OTHERWISE DIRECTED BY THE CITY. IT IS THE CONTRACTORS RESPONSIBILITY TO SEQUENCE HIS WORK TO HELP MINIMIZE THE NEED FOR TEMPORARY AGGREGATE PAVEMENT. TEMPORARY AGGREGATE PAVEMENT CAN BE ASPHALT GRINDINGS OR OTHER AGGREGATE APPROVED BY THE CITY.

WHERE MORE THAN ONE ACCESS TO A BUSINESS OR RESIDENCE EXISTS, ONLY ONE ACCESS NEEDS TO BE MAINTAINED AT A TIME. WHERE ONLY ONE DRIVE EXISTS, ACCESS SHALL BE MAINTAINED AT ALL TIMES BY CONSTRUCTION OF ONE-HALF OF THE DRIVEWAY AT ONE TIME SUBJECT TO THE APPROVAL OF THE CITY.

TEMPORARY ACCESS SHALL BE PROVIDED TO ALL DRIVEWAYS AND ALLEYS WITH A CHANGE IN ELEVATION FROM DRIVEWAY ACCESS TO TEMPORARY DRIVE RAMP NOT TO EXCEED 1-1/2".

THE CONTRACTOR SHALL GIVE THE CITY OF TROY A MINIMUM OF 3 CALENDAR DAYS NOTICE PRIOR TO CLOSING ANY ROAD OR MOVEMENT TO TRAFFIC.

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ANY DAMAGE TO MAINTENANCE OF TRAFFIC EQUIPMENT SUCH AS SIGNS, BARRELS, ETC. SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

THE CONTRACTOR WILL BE REQUIRED TO PROVIDE, ERECT, MAINTAIN (IN PROPER POSITION, CLEAN AND LEGIBLE, AND IN GOOD WORKING CONDITION) AND SUBSEQUENTLY REMOVE ALL LIGHTS, SIGNS, CONES, BARRICADES, EXISTING PAVEMENT MARKINGS, AND ANY OTHER TRAFFIC CONTROL DEVICES NECESSARY FOR THE MAINTENANCE OF TRAFFIC.

THE CONTRACTOR SHALL ADJUST THE LOCATION AND/OR SPACING OF ALL TRAFFIC CONTROL CHANNELING DEVICES AS DICTATED BY THE PROGRESS OF THE REQUIRED WORK TO ALLOW CONSTRUCTION ACCESS TO WORK AREAS WHILE MAINTAINING SAFE AND EFFECTIVE TRAFFIC CONTROL DURING ALL CONSTRUCTION OPERATIONS. THE ORIGINAL LOCATION, PLACEMENT, SPACING AND SUBSEQUENT RELOCATION OR REMOVAL OF ALL TRAFFIC CONTROL DEVICES SHALL BE SUBJECT TO THE CITY'S APPROVAL.

IT IS INTENDED THAT THE LOCAL TRAFFIC NOT BE SUBJECTED TO ANY LANE CLOSURES UNLESS ACTIVE WORK IS BEING PERFORMED IN OR IMMEDIATELY ADJACENT TO THE CLOSED LANE. THE ROADWAY SHALL NOT BE RESTRICTED TO ANY LANE CLOSURE DURING PERIODS OF INTERMITTENT OR IRREGULAR WORK, NOR CLOSED SOLELY FOR THE CONVENIENCE OF THE CONTRACTOR. THE CITY SHALL MAKE THE FINAL DETERMINATION AS TO WHAT CONSTITUTES ACTIVE WORK AND WHETHER OR NOT THE LANE CLOSURE IS JUSTIFIED.

IF, IN THE OPINION OF THE CITY, THE LANE CLOSURE IS NOT JUSTIFIED, THEY MAY ORDER ALL OR PART OF THE LANE CLOSURE REOPENED TO LOCAL TRAFFIC (UNTIL SUCH TIME THIS CONDITION IS CORRECTED.)

THE CONTRACTOR SHALL NOTIFY THE CITY OF ANY INTENDED CHANGES TO ANY EXISTING OR TEMPORARY TRAFFIC CONTROL DEVICES AND SHALL OBTAIN THE CITY'S APPROVAL PRIOR TO MAKING THE CHANGES. THE CONTRACTOR SHALL ALSO NOTIFY THE CITY AND LOCAL NEWSPAPER FORTY-EIGHT (48) HOURS IN ADVANCE OF ANY INTENDED LANE CLOSURES.

NOTICES OF THE DETOURS WILL BE POSTED IN THE LOCAL MEDIA PRIOR TO THE ROAD CLOSURES AND EMERGENCY SERVICES WILL ALSO BE NOTIFIED. ACCESS FOR LOCAL TRAFFIC WILL BE PROVIDED AT ALL TIMES DURING THE ROAD CLOSURES.

THE CONTRACTOR SHALL INSTALL ADVANCE WARNING SIGNS PER STANDARD DRAWING MT-101.60.

ACCESS TO ALL INTERSECTIONS SHALL BE MAINTAINED 24 HOURS A DAY. DURING CONSTRUCTION OF UTILITY CROSSINGS, ONE-WAY TRAFFIC SHALL BE MAINTAINED WITH FLAGGER PER THE REQUIREMENTS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES WITH THE APPROVAL OF THE ENGINEER WITH A MINIMUM OF A 11 FOOT WIDE LANE WITH ADEQUATE (30 FOOT) RADII FOR TURNING.

DETOUR LIMITATIONS

IF THROUGH TRAFFIC IS TO BE DETOURED. THE CONTRACTOR SHALL FOLLOW THE LATEST EDITION OF THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES". THE CONTRACTOR SHALL PROVIDE, ERECT, AND SUBSEQUENTLY REMOVE THE FOLLOWING:

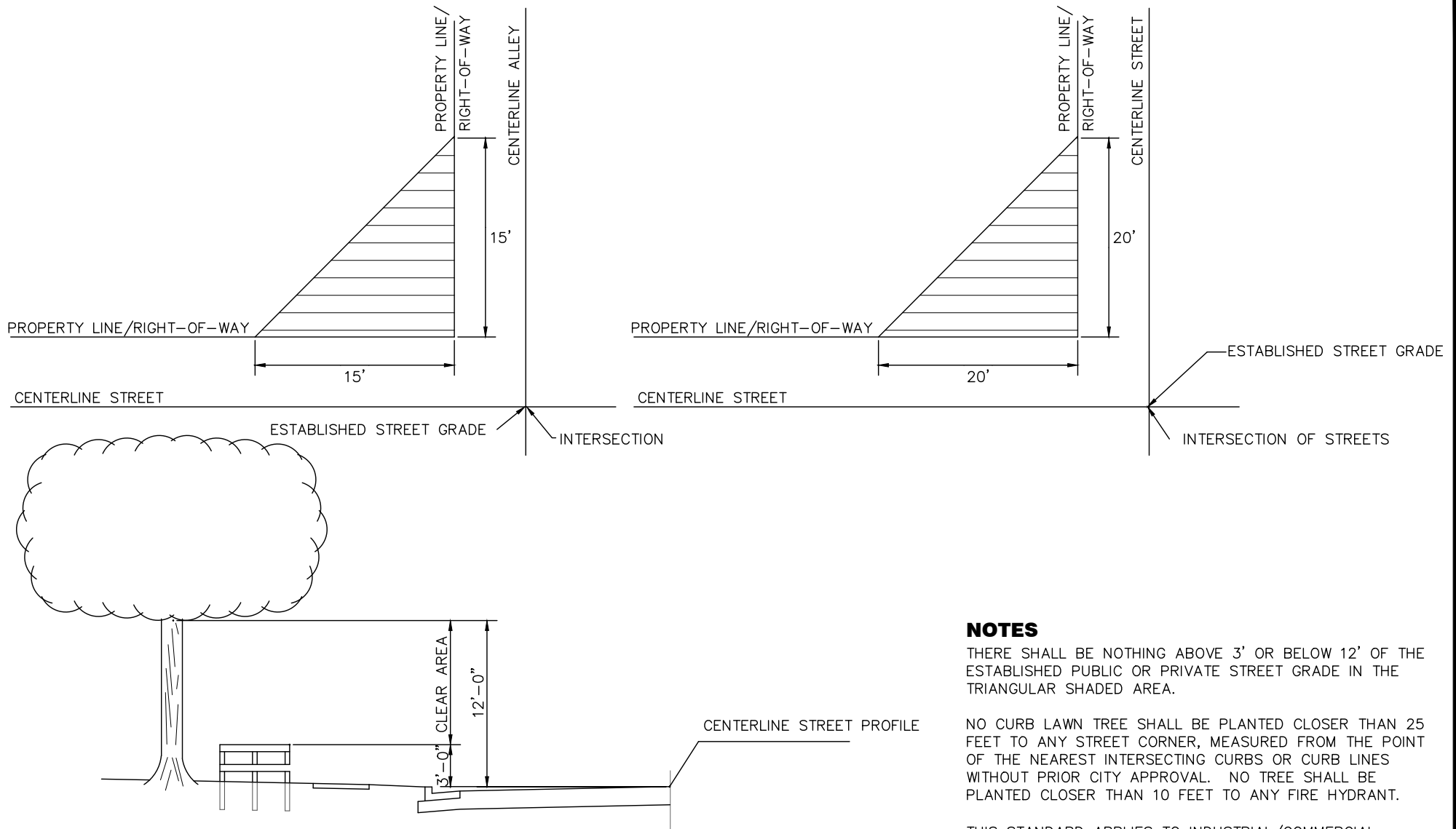
- 1) STANDARD 48"x30", R11-2 (ROAD CLOSED) SIGNS, BARRICADES, AND LIGHTS ON BOTH SIDES OF THE CLOSURE.
- 2) NOTICE OF CLOSURE SIGNS (W20-H13), PLACED AT LEAST ONE WEEK IN ADVANCE OF THE SCHEDULED ROAD CLOSURE. THESE SIGNS SHALL BE ERECTED ON THE RIGHT HAND SIDE OF THE ROAD FACING TRAFFIC AT THE POINTS OF CLOSURE. THE SIGNS SHALL BE ERECTED SO AS NOT TO INTERFERE WITH ANY PERMANENT SIGNS.

CITY OF TROY



MAINTENANCE OF TRAFFIC

REVISIONS:	DATE
	APPROVED:
	NOV 2017
	PAGE No.
	100-5



NOTES

THERE SHALL BE NOTHING ABOVE 3' OR BELOW 12' OF THE ESTABLISHED PUBLIC OR PRIVATE STREET GRADE IN THE TRIANGULAR SHADED AREA.

NO CURB LAWN TREE SHALL BE PLANTED CLOSER THAN 25 FEET TO ANY STREET CORNER, MEASURED FROM THE POINT OF THE NEAREST INTERSECTING CURBS OR CURB LINES WITHOUT PRIOR CITY APPROVAL. NO TREE SHALL BE PLANTED CLOSER THAN 10 FEET TO ANY FIRE HYDRANT.

THIS STANDARD APPLIES TO INDUSTRIAL/COMMERCIAL, COLLECTOR, AND LOCAL STREETS. THOROUGHFARES SHALL FOLLOW THE SIGHT DISTANCE GUIDELINES SET FORTH IN THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

VISION CLEARANCE EXHIBIT

CITY OF TROY

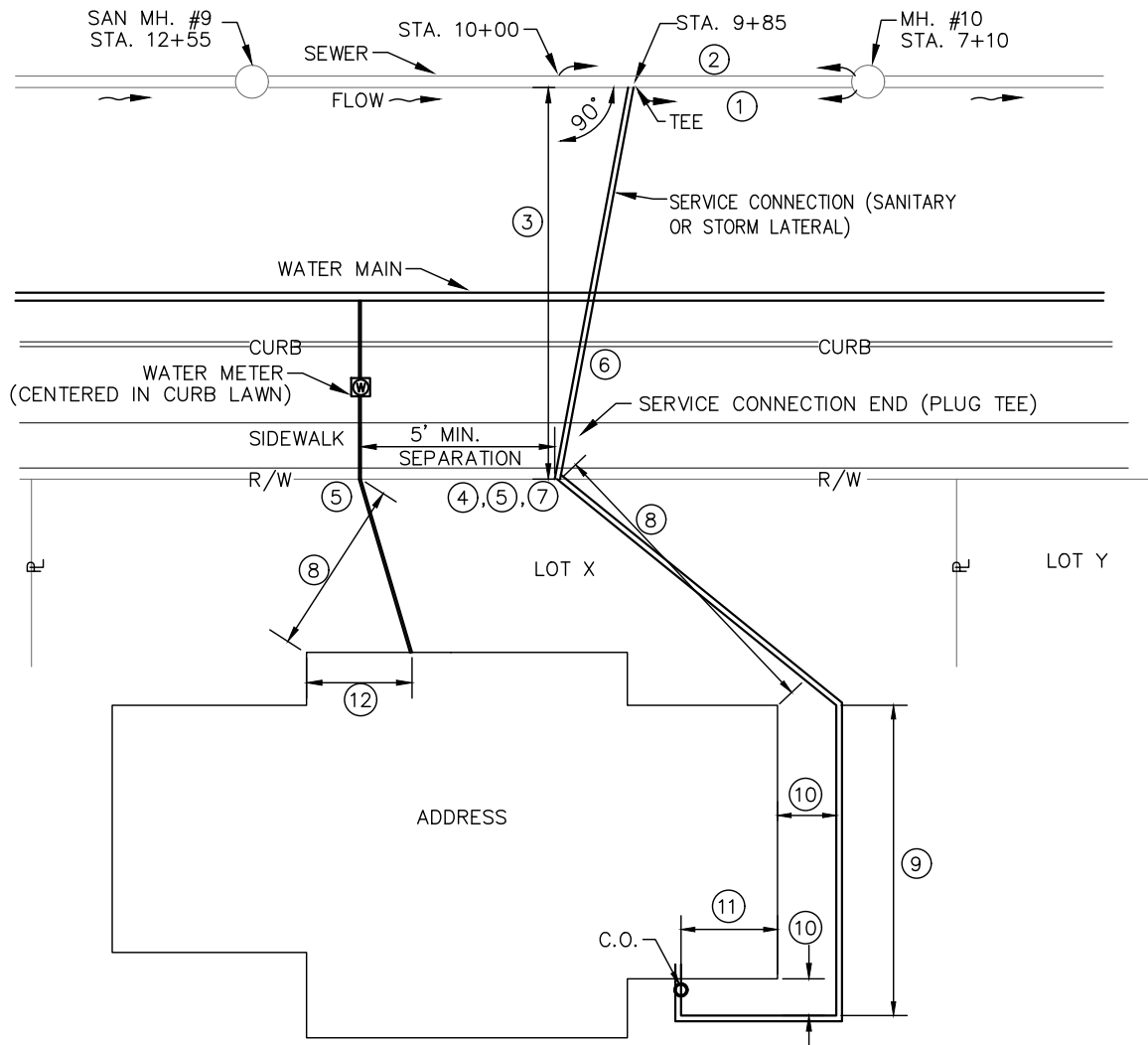


VISION CLEARANCE ON CORNER LOTS

REVISIONS:

DATE
APPROVED:
NOV 2017

PAGE No.
100-6



SAMPLE SITE SKETCH

THE CONTRACTOR SHALL SUPPLY THE FOLLOWING INFO TO THE SATISFACTION OF THE CITY

- ① HORIZONTAL DISTANCE OF TEE TO DOWNSTREAM MANHOLE.
- ② HORIZONTAL DISTANCE OF SERVICE CONNECTION END TO DOWNSTREAM MANHOLE ALONG SEWER.
- ③ PERPENDICULAR DISTANCE FROM SEWER TO SERVICE CONNECTION END.
- ④ DEPTH OF SERVICE CONNECTION END, FLOW LINE TO ORIGINAL GROUND.
- ⑤ ELEVATION OF SERVICE CONNECTION END FLOW LINE.
- ⑥ ELEVATION OF BACK OF CURB OR SOME OTHER REFERENCE POINT ABOVE LATERAL.
- ⑦ LOCATE PLUGGED END OF LATERAL USING STATE PLANE COORDINATES (NAD 83, CORS96).

TO BE COMPLETED BY THE CITY INSPECTOR FOR EACH BUILDING

- ⑧ DISTANCE FROM PLUGGED END TO CORNER OF BUILDING
- ⑨ DISTANCE FROM CORNER OF BUILDING TO REAR
- ⑩ DISTANCE FROM FACE OF BUILDING
- ⑪ DISTANCE FROM CLEANOUT FROM EDGE OF BUILDING
- ⑫ DISTANCE FROM EDGE OF BUILDING TO HOUSE ENTRY

CITY OF TROY



**RECORD DRAWING FOR
SERVICE CONNECTIONS**

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
100-7

GENERAL

A. ALL STREET CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH ODOT SPECIFICATIONS, LATEST REVISION AND TO THE CITY SPECIFICATIONS WHICHEVER IS MORE STRINGENT SHALL PREVAIL UNLESS OTHERWISE APPROVED.

B. CONTRACTOR MUST APPLY FOR NECESSARY PERMITS, FEES, ETC. WITH THE CITY BEFORE CONSTRUCTION OR DEMOLITION BEGINS.

C. NO CITY STREET OR ALLEY SHALL BE CLOSED WITHOUT PERMISSION FROM THE ENGINEERING DEPARTMENT. APPROVAL MUST BE OBTAINED 48 HOURS IN ADVANCE OF CLOSURE FOR A NON-EMERGENCY SITUATION. ADVANCED PUBLIC NOTIFICATION AND PUBLISHING SHALL BE A MINIMUM OF 24 HOURS PRIOR TO CLOSURE.

TRAFFIC CONTROL

A. THE CONTRACTOR SHALL MAINTAIN TRAFFIC CONTROL AT ALL TIMES WITH THE PROPER BARRICADES AS PER THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. THESE CONTROL DEVICES SHALL BE IN PLACE PRIOR TO ANY WORK COMMENCING.

B. TRAFFIC SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE APPROVED BY THE CITY.

PAVEMENT (ASPHALT)

A. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE CITY. COLD PATCH ALL TRENCHES TO 1 1/2" TO 2" WHEN FINAL ASPHALT WILL NOT BE REPLACED WITHIN 24 HOURS.

B. IMMEDIATELY AFTER PLACEMENT OF BACKFILL IN EXISTING STREETS, A TEMPORARY PAVEMENT SHALL BE INSTALLED AND THE STREET OPENED. TEMPORARY PAVEMENT SHALL CONSIST OF 8" OF COMPACTED ODOT SPECIFICATION 411 OR 304 BASE AND A SURFACE COURSE OF ODOT SPECIFICATION 405, 409 OR COLDMIX. THE SURFACE SHALL BE KEPT FLUSH WITH THE EXISTING STREET.

C. PERMANENT PAVEMENT REPLACEMENT SHALL EQUAL OR EXCEED THE EXISTING PAVEMENT THICKNESS.

D. ANY SETTLEMENT OF A TRENCH CAUSING A DEPRESSION SHALL BE REFILLED AS REQUIRED AT THE CONTRACTOR'S EXPENSE. THIS PROVISION APPLIES FOR A ONE-YEAR PERIOD AFTER WORK IS ACCEPTED BY THE CITY.

E. PATCHED AREAS SHALL BE SEALED ON THE PERIMETER OF THE PATCH WITH ASPHALT CEMENT.

F. ALL UTILITY ADJUSTMENTS; MANHOLES, WATER VALVES, BOXES, ETC., SHALL BE ADJUSTED PER CITY STANDARDS.

G. ASPHALT CEMENT SHALL BE USED NEXT TO THE LIP OF GUTTER PRIOR TO THE FINAL ASPHALT LIFT BEING PLACED. (SS-1 TACK OR PG64-22 SEAL.)

H. NO ASPHALT SHALL BE PLACED OVER EXCAVATED TRENCHES UNLESS TRENCHES HAVE BEEN COMPACTED AS PER CITY CONSTRUCTION STANDARDS & DRAWINGS

I. ALL EDGES TO BE TRIMMED BACK TO SOLID MATERIAL AND BE STRAIGHT AND NEAT AS PER THE CITY'S INSTRUCTIONS.

PERMIT FOR WORK IN PUBLIC RIGHT-OF-WAY

A. A PUBLIC RIGHT-OF-WAY OPENING PERMIT TO PERFORM ANY WORK ON OR WITHIN A PUBLIC RIGHT-OF-WAY, (STREET, ALLEY, ETC.) IS REQUIRED. A PERMIT IS REQUIRED FOR ANY ITEMS INCLUDING BUT NOT LIMITED TO TUNNEL, SIDEWALK, DRIVEWAY, OPENING OR EXCAVATION UNDER OR IN THE RIGHT-OF-WAY OF PUBLIC GROUNDS.

B. PERMIT FORMS ARE AVAILABLE FROM THE CITY ENGINEERING DEPARTMENT. THE PERMIT FORM WILL BE COMPLETED BY THE PERSON OR FIRM PLANNING THE WORK WITHIN THE RIGHT-OF-WAY. ALL APPROVALS MUST BE OBTAINED BEFORE ANY WORK IS STARTED. 24 HOUR LEAD TIME IS REQUIRED.

C. THE APPLICANT SHALL HAVE SUFFICIENT BARRICADES, WARNING SIGNS, AND LIGHTS DURING THE ENTIRE PERIOD THAT THE WORK IS BEING PERFORMED AND SHALL ADHERE TO APPLICABLE SECTION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

D. THE EXISTING PAVEMENT SHALL BE NEATLY SAWCUT PRIOR TO EXCAVATION. ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM THE JOB SITE. THE APPLICANT IS RESPONSIBLE FOR ALL PAVEMENT DAMAGED OUTSIDE THE TRENCH AREA.

E. REFER TO CITY CONSTRUCTION STANDARD TRENCH DETAIL FOR ALL EXCAVATIONS.

F. SIDEWALKS, CURBS AND DRIVEWAYS SHALL BE REPLACED IN ACCORDANCE WITH NEW CONSTRUCTION IN COMPLIANCE WITH THESE STANDARDS. CONTRACTOR SHALL NOTIFY THE CITY ENGINEERING DEPARTMENT FOR INSPECTION AFTER FORMS ARE SET AND BEFORE CONCRETE IS ORDERED.

RIGHT OF WAY/ROADWAY TESTING

A. ALL CONSTRUCTION METHODS AND MATERIALS SHALL COMPLY WITH THE CITY ENGINEERING STANDARDS OR ODOT WHICHEVER IS MORE RESTRICTIVE.

B. ALL ROADWAY AND TRENCH COMPACTION SHALL MEET THE CITY REQUIREMENTS. IF TESTING OF COMPACTED AREAS IS REQUESTED BY THE CITY, SAID TESTING SHALL BE PERFORMED AT THE EXPENSE OF THE DEVELOPER/CONTRACTOR.

C. DEVELOPER/CONTRACTOR SHALL UTILIZE PROOF ROLLING TECHNIQUES TO DETERMINE THE NEED FOR UNDERCUTTING. THE ENTIRE SUBGRADE SHALL BE PROOF ROLLED WITH A FULLY LOADED TANDEM AXLE (OR LARGER) DUMP TRUCK DRIVEN ACROSS THE SUBGRADE AS DIRECTED BY THE CITY INSPECTOR ON SITE. SUBGRADE WILL NOT BE APPROVE UNTIL NO DEFLECTION OR TIRE INDENTATION IN SUBGRADE MATERIAL IS PRESENT. IF ANY DEFLECTION IS OBSERVED THE SUBGRADE SHALL BE STABILIZED BY EITHER UNDERCUTTING, USING 304 OR BY UTILIZING TENSAR OR OTHER APPROVED SOIL STABILIZATION METHODS.

D. ALL EMBANKMENT AND SUBGRADE AREAS SHALL BE COMPACTED TO A MINIMUM OF 95% OF ASTM D698 STANDARD PROCTOR CURVE AND TESTED TO REPRESENT A DEPTH OF 12" UNLESS OTHERWISE SPECIFIED BY THE CITY.

E. ALL UNPAVED AREAS WITHIN THE STREET RIGHT-OF-WAY SHALL BE SEEDED WITHIN 48 HOURS AFTER THE CURB IS BACKFILLED. FILTER FABRIC FENCE OR DITCH CHECKS MAY BE REQUIRED IN ADDITION TO SEEDING TO CONTROL EROSION IF REQUESTED BY THE CITY.

CITY OF TROY

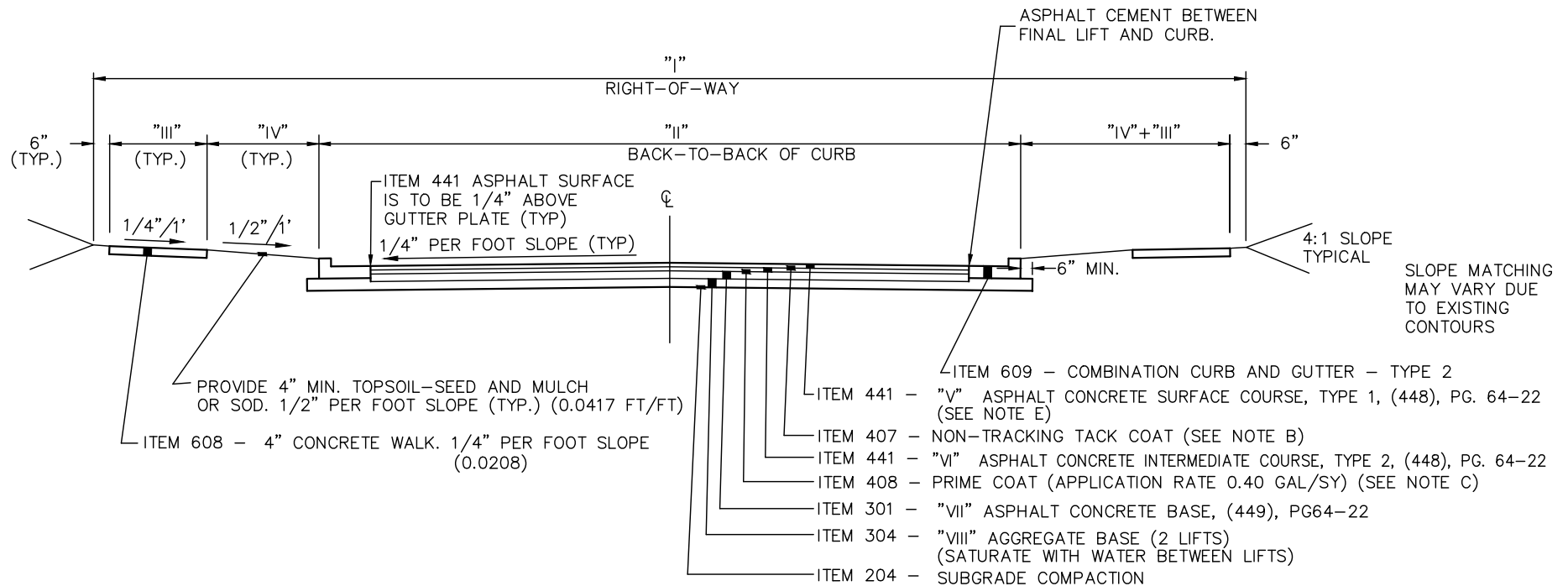


MISCELLANEOUS ROADWAY NOTES

REVISIONS:
OCT 2018
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
300-1



MINIMUM STANDARDS

ITEM	DESCRIPTION	ARTERIAL	COLLECTOR		LOCAL
			COMM.&IND.	RESIDENTIAL	
I	RIGHT-OF-WAY	100-80	60	60	50
II	B\B CURB	60	41	37	35
III	SIDEWALK WIDTH	5'	5'	5'	4'
IV	CURB LAWN WIDTH	*	4'	6'	3'
V	SURFACE COURSE	1-1/4"	1-1/4"	1-1/4"	1-1/4"
VI	INTERMEDIATE COURSE	1-3/4"	1-3/4"	2-3/4"	2-1/4"
VII	ASPHALT BASE COURSE	7"	3"	—	—
VIII	AGGREGATE BASE COURSE (2 LIFTS)	6"	9"	9"	9"

* SEE DESIGN CRITERIA AND CITY ENGINEER

NOTES

A. ALL WORK TO CONFORM TO ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS LATEST REVISION UNLESS OTHERWISE SPECIFIED.

B. ITEM 407 TACK COAT SHALL BE REQUIRED BETWEEN LIFTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER. APPLICATION RATE IS 0.10 GALLON PER SQUARE YARD. TACK COAT SHALL BE APPLIED PRIOR TO THE PLACEMENT OF THE FINAL LIFT OF ASPHALT IF THE EXISTING ASPHALT LIFT IS DIRTY OR AFTER TEN DAYS UNLESS, OTHERWISE APPROVED. TEMPERATURE MUST BE 50°F OR HIGHER.

C. ITEM 408 PRIME COAT SHALL BE APPLIED ON NEW AGGREGATE WHEN TEMPERATURE IS 50°F OR HIGHER. ALL DRIVEWAYS SHALL BE PRIMED PRIOR TO PLACEMENT OF ASPHALT UNLESS OTHERWISE APPROVED.

D. ALL BUTT JOINTS WITH EXISTING PAVEMENT SHALL BE SEALED WITH PG 64-22 HOT JOINT SEALER WITHIN 24 HOURS AFTER PLACEMENT OF ITEM 441.

E. IN AREAS WITH HIGH POTENTIAL OF PUSHING, SHOVING OR HEAVING, USE ITEM 441 ASPHALT CONCRETE SURFACE COURSE TYPE 1 H, PG. 70-22. IN SMALL QUANTITY AREAS USE TYPE 1, PG 64-22 WITH GILSONITE ADDITIVE.

F. IF COMPREHENSIVE PLAN OR COMPLETE STREET MAP SHOWS A DEDICATED RECREATION TRAIL, ADDITIONAL PAVEMENT WIDTH SHALL BE CONSIDERED.

CITY OF TROY



TYPICAL SECTIONS AND ASPHALT PAVEMENT COMPOSITION

REVISIONS:
OCT 2018
AUG 2024

DATE
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NOV 2017

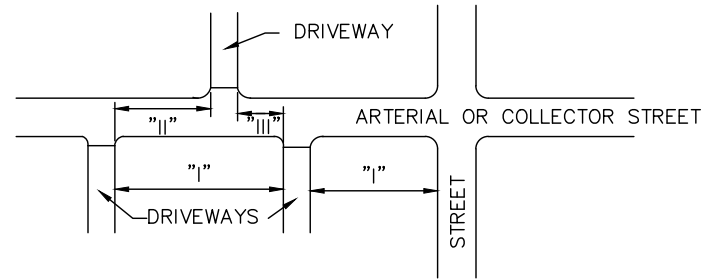
PAGE No.
300-2

ACCESS CONTROL STANDARDS (COMMERCIAL/INDUSTRIAL)

A. ACCESS CONTROL AS SHOWN ON THE TABLE BELOW SHALL APPLY TO INDUSTRIAL AND COMMERCIAL DRIVEWAYS OR LOCAL STREETS ON ARTERIAL OR COLLECTOR STREETS WITHIN THE CITY.

MINIMUM SPACING
OF ACCESS POINTS.

ITEM	DISTANCE IN FEET
I.	200
II.	120
III.	50



B. THE DISTANCE BETWEEN ACCESS POINTS IS MEASURED TO THE NEAREST CURB OR EDGE LINE.

C. NO MORE THAN ONE (1) ACCESS POINT (UNLESS THERE IS A SEPARATE ENTRANCE AND EXIT ACCESS) PER COMMERCIAL PROPERTY IS PERMITTED WITH THE EXCEPTION THAT AN ACCESS POINT ON EACH ROADWAY OF A CORNER PROPERTY IS PERMITTED AND PROPERTIES WITH FRONTAGES EXCEEDING 300' MAY BE PERMITTED IF THE NEED IS CLEARLY SHOWN FOR MORE THAN ONE DRIVEWAY WITH A MAXIMUM OF TWO.

D. THE DISTANCE BETWEEN INDUSTRIAL AND COMMERCIAL DRIVEWAYS ON LOCAL STREETS MUST BE 100' OR GREATER.

E. THE MINIMUM SPACING BETWEEN A COMMERCIAL DRIVEWAY AND/OR STREET WHICH INTERSECTS AN ARTERIAL OR COLLECTOR STREET SHALL BE 200'. THIS DISTANCE SHALL BE MEASURED FROM THE POINT FORMED BY THE INTERSECTION OF THE EXTENDED CURB LINES OF EACH DRIVEWAY OR STREET.

F. DRIVEWAYS OR MINOR STREETS SHALL BE DIRECTLY OPPOSITE OR SHALL BE OFFSET BY THE DIMENSIONS SHOWN ON THE TABLE ABOVE UNDER ITEM A.

G. DRIVEWAY OPENING WIDTHS SHALL ADHERE TO THE CITY CONSTRUCTION STANDARDS AND DRAWINGS.

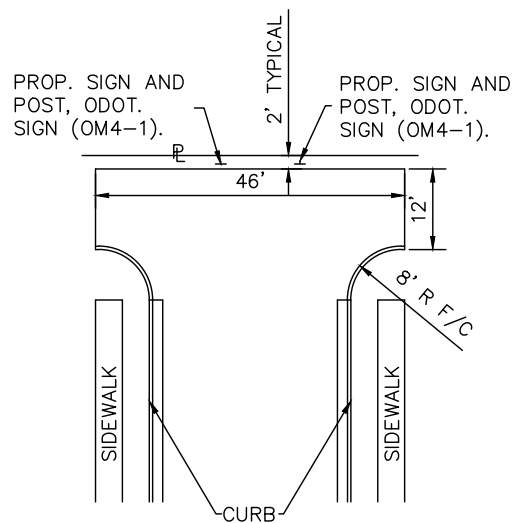
H. IN SPECIAL OR UNIQUE SITUATIONS WHERE STRICT APPLICATION OF THESE STANDARDS WOULD CAUSE UNDUE HARDSHIP UPON THE PROPERTY OWNER, THE CITY ADMINISTRATOR MAY GRANT A VARIANCE TO SAID STANDARDS.

I. DRIVEWAY OPENINGS SHALL BE AT LEAST 40' FROM INTERSECTION OF LOCAL STREETS.

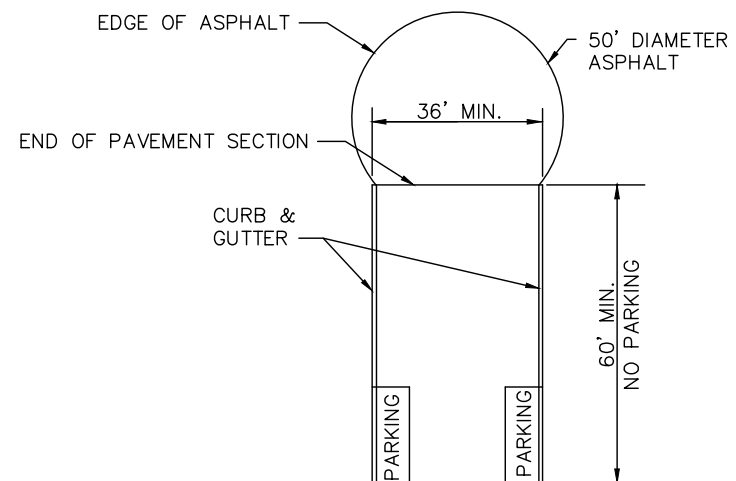
J. AN ACCESS POINT MUST BE A MINIMUM OF 60' FROM THE ADJACENT PROPERTY LINE; SHARED DRIVEWAYS WILL BE ENCOURAGED.

K. ALL DEFINITIONS SHALL BE AS PER THE OHIO MANUAL OF UNIFORM TRAFFIC DEVICES LATEST REVISIONS.

L. ALL DRIVEWAYS AND LOCAL STREET ACCESS POINTS TO COLLECTOR AND ARTERIAL STREETS MUST BE APPROVED BY THE CITY.



TEMPORARY HAMMER HEAD



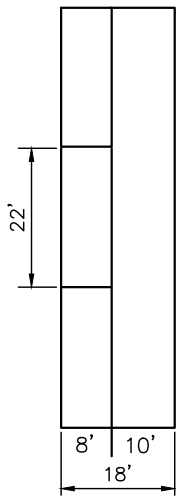
TEMPORARY CUL-DE-SAC

NOTES

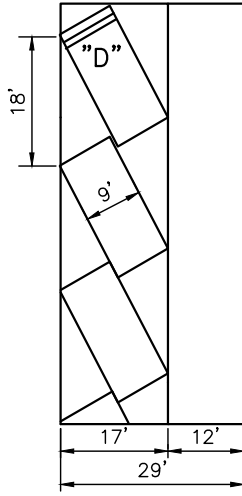
A. TEMPORARY ASPHALT CUL-DE-SAC IS REQUIRED TO BE INSTALLED AND MAINTAINED UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.



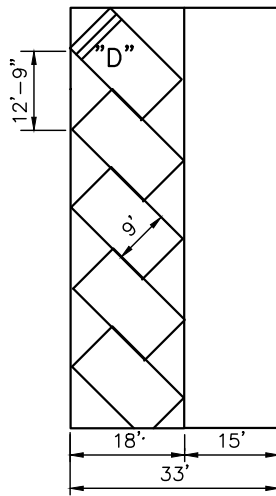
MANHOLES ADJUSTED TO GRADE FOR OVERLAYS



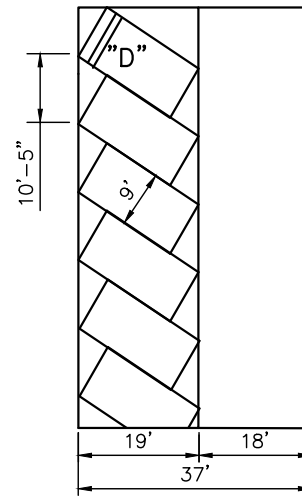
PARALLEL



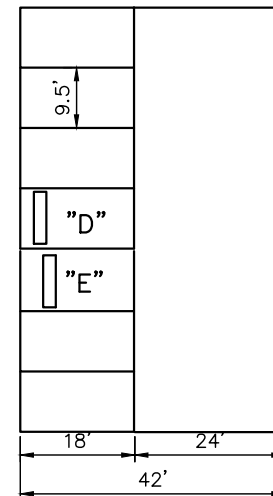
30 DEG. ANGLE



45 DEG. ANGLE

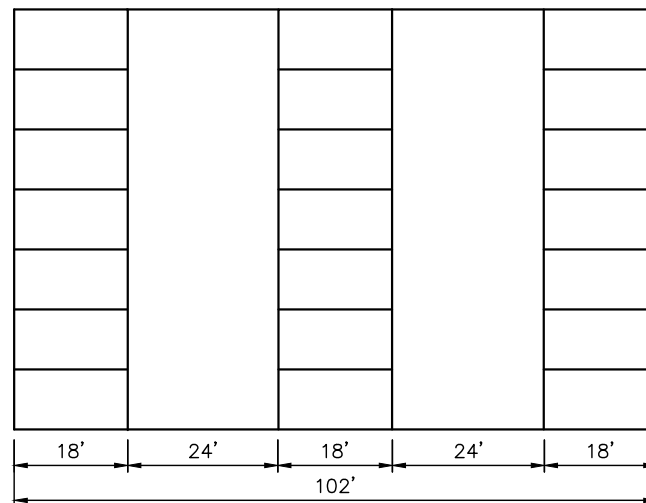


60 DEG. ANGLE



RIGHT ANGLE

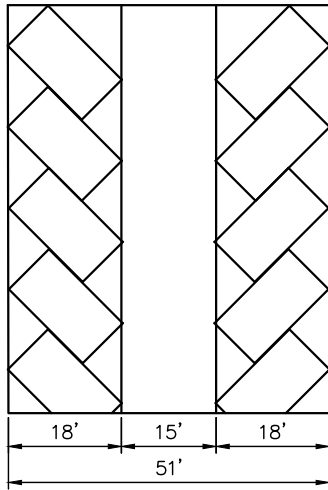
TRIPLE RIGHT



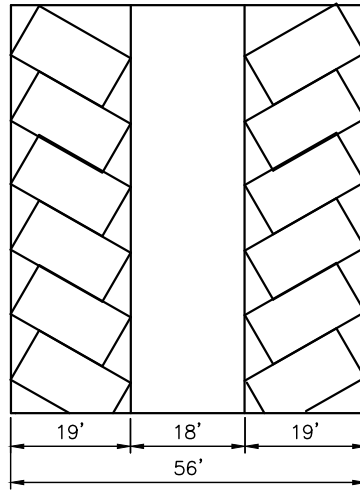
NOTES

- A.** ALL PARKING STALLS LINES SHALL BE 4" WIDE WHITE PAINTED LINES.
- B.** IF PARKING BLOCKS ARE USED THEY SHALL BE SECURED IN PLACE BY AN 18" LONG 5/8" DIAMETER REINFORCING STEEL BAR DRIVEN FLUSH TO THE SURFACE OF THE PARKING BLOCK.
- C.** ALL PARKING LOTS SHALL BE DUST FREE WITH A SURFACE OF ASPHALT OR CONCRETE.
- D.** TYPICAL PARKING BLOCKS TO BE PLACED 2' FROM THE END LINE.
- E.** TYPICAL PARKING BLOCKS TO BE PLACED 4' FROM END LINE FOR BACK-IN PARKING.
- F.** SEE PLANNING AND ZONING CODE FOR ADDITIONAL REQUIREMENTS. (LANDSCAPING, ADA, ETC.)
- G.** RIGHT ANGLE PARKING IS PREFERRED.

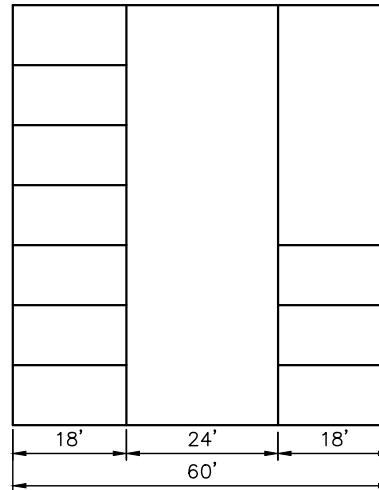
DOUBLE 45 DEG.



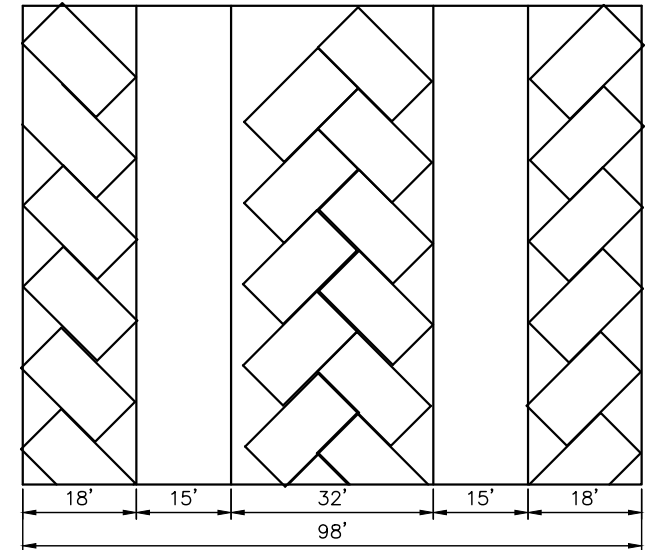
DOUBLE 60 DEG.



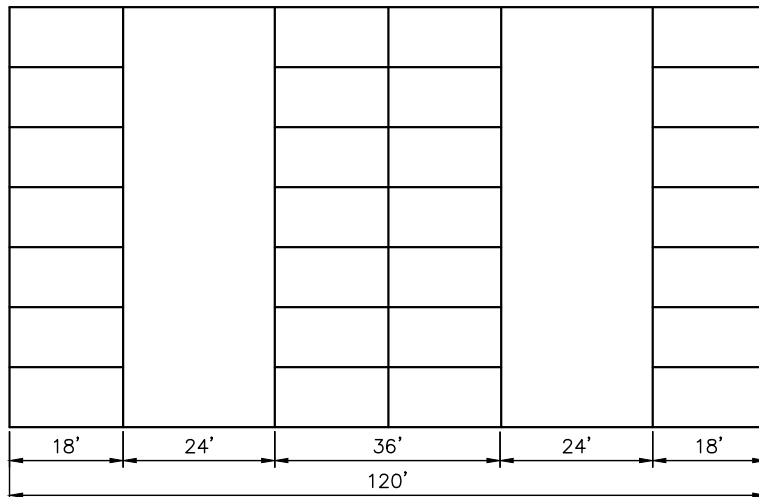
DOUBLE RIGHT



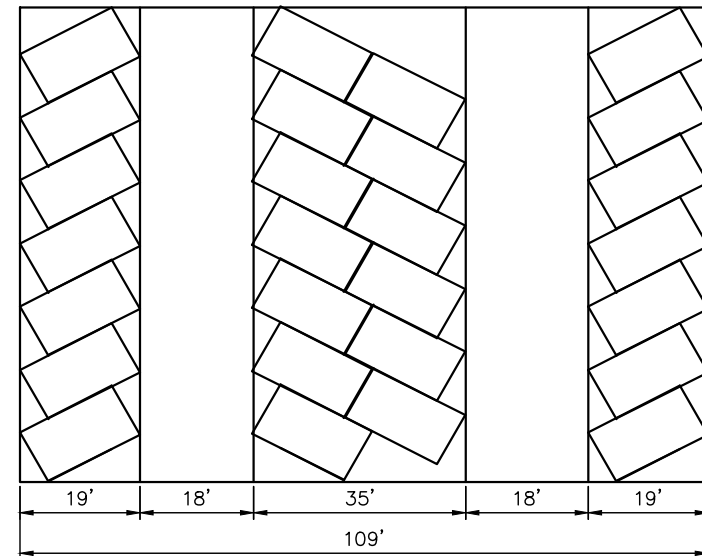
45 DEG. HERRINGBONE

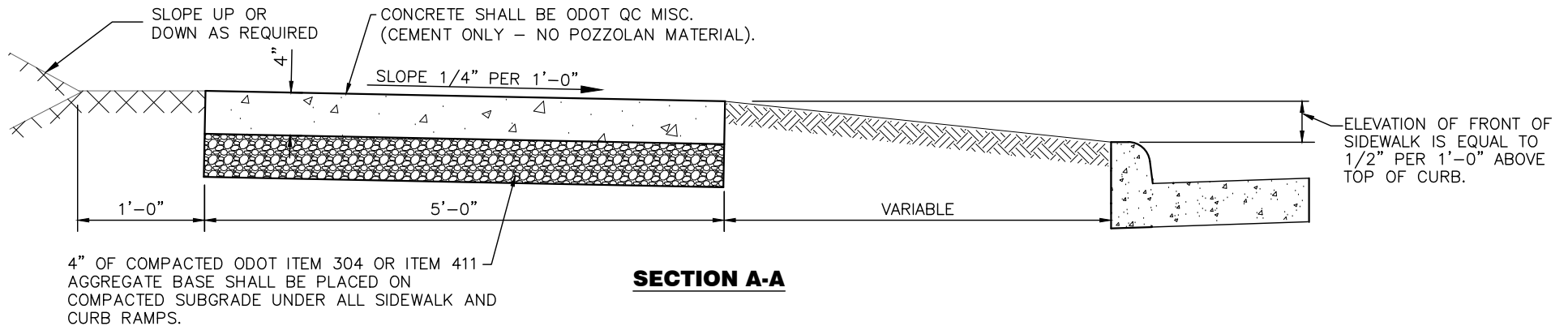
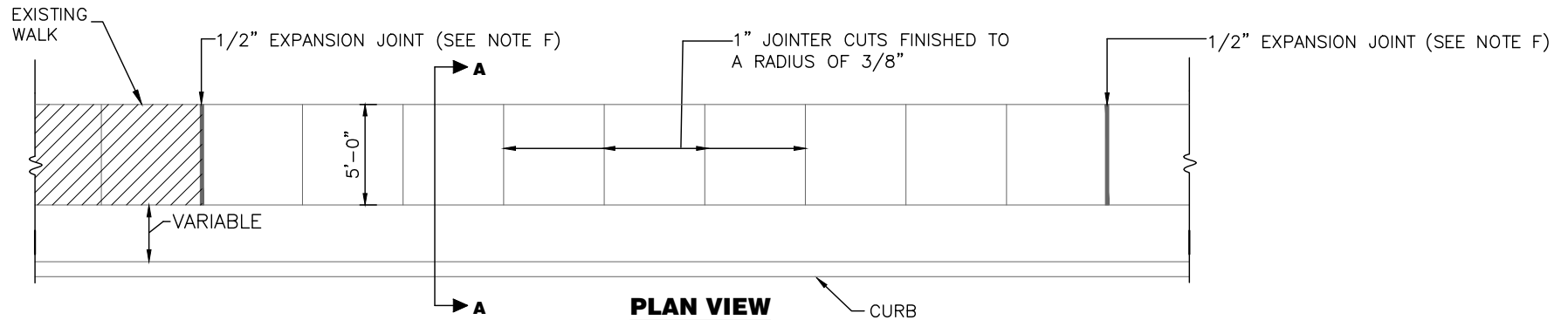


RIGHT ANGLE + 4 ROWS



60 DEG. INTERMESHD





NOTES

A. FORMS SHALL BE INSPECTED BY THE CITY OF TROY ENGINEER FOR PROPER BASE, GRADE AND ALIGNMENT BEFORE PLACING CONCRETE.

B. THE TOP 4" OF MATERIAL IN THE CURB LAWN SHALL BE ORGANIC TOPSOIL.

C. ALL WALK AND CURB SHALL HAVE A BROOM FINISH.

D. WHERE ASPHALTIC CONCRETE PAVEMENT IS DISTURBED, THE ASPHALT SHALL BE REPLACED AS DIRECTED BY THE CITY.

E. A CONCRETE SEALER SHALL BE APPLIED TO ALL SURFACES WITHIN 24 HOURS.

F. EXPANSION JOINTS SHALL BE 1/2" PREMOLDED AND REQUIRED AT THE END OF EACH POUR, AT EACH SIDE OF A TREE, DRIVEWAY OR ANY FIXED STRUCTURE AND AT A MINIMUM OF EVERY 50'.

G. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO RESET ANY PROPERTY POINTS OR SURVEY MONUMENT WHICH ARE DISTURBED AS A RESULT OF CONSTRUCTION. THE PROPERTY POINTS AND SURVEY MONUMENTS SHALL BE RESET UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL SURVEYOR.

CITY OF TROY



SIDEWALK DETAIL

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
300-8

EXAMPLE: 3/4 INCH TRIP HAZARD



ADJOINING BLOCKS OR PORTIONS THEREOF WHOSE EDGES DIFFER VERTICALLY BY MORE THAN 3/4 INCH.



EXAMPLE: DETERIORATION



ANY SIDEWALK THAT IS DETERIORATED OR SHOWS SURFACE SPALLING, LEAVING IT VERY ROUGH, UNSAFE, OR WITH AGGREGATE PROTRUDING.

EXAMPLE: ABRUPT SLOPE



BLOCKS, OR PORTION OF BLOCKS, THAT CAUSE AN ABRUPT CHANGE OF 1 INCH PER FOOT (OR MORE) IN ANY DIRECTION OF THE SIDEWALK.



EXAMPLE: PLATES, COVERS, ETC.



METAL OR OTHER PLATES, COVERS, OR GRATINGS THAT ARE NOT FLUSH (3/4 INCH OR MORE VERTICAL DIFFERENCE) WITH THE ADJOINING SIDEWALK SURFACE, ARE STRUCTURALLY UNSAFE, OR CAUSE A NUISANCE DUE TO SLIPPERY SURFACES ETC.

EXAMPLE: CRACKS



ANY SIDEWALK BLOCK (BASED ON 20 SQ. FT.) HAVING A CRACK OR CRACKS IN IT OF AT LEAST 1/2 INCH WIDE WITH A MINIMUM OF 4 LINEAR FEET IN ONE BLOCK. (VARIOUS SIZE BLOCKS WILL BE EVALUATED PROPORTIONALLY.)



PERMITS, INSPECTION, AND WORK RULES

- A.** NO PERSON SHALL TEAR UP OR DIG INTO ANY PUBLIC RIGHT-OF-WAY OR STREET FOR THE PURPOSE OF CONSTRUCTING OR REPAIRING THE SIDEWALK, CURBING, OR GUTTERS THEREON OR FOR ANY OTHER PURPOSE, WITHOUT HAVING FIRST OBTAINED A PERMIT FROM THE ENGINEERING DEPARTMENT TO DO SO.
- B.** THE CONTRACTOR OR OWNER MUST CALL THE CITY FOR AN INSPECTION AT LEAST 24 HOURS BEFORE POURING CONCRETE OR MAKING ANY REPAIRS TO THE SIDEWALK. THE CONTRACTOR OR HIS FOREMAN MUST BE PRESENT WHEN THE INSPECTOR ARRIVES. IF, DUE TO WEATHER CONDITIONS OR FOR SOME OTHER REASON IT NOT BE POSSIBLE TO HAVE A PERSON ON THE JOB, THE CONTRACTOR IS REQUIRED TO CALL AND CANCEL THE INSPECTION. ANY WALKS REPAIRED OR PLACED WITHOUT PRIOR INSPECTIONS WILL NOT BE ACCEPTED BY THE CITY.
- C.** THE CONTRACTOR IS CAUTIONED AGAINST ORDERING CONCRETE BEFORE THE INSPECTION IS MADE DUE TO POSSIBLE CORRECTION OF FORMS OR GRADE.
- D.** THE CONTRACTOR SHALL PROVIDE PROTECTION AND TRAFFIC CONTROL BARRICADES, LIGHTS, SIGNS, AND OTHER DEVICES AS HEREIN SPECIFIED TO PROVIDE WARNING AND PROTECTION FOR VEHICULAR TRAFFIC, PEDESTRIANS, AND THE WORK DURING THE REMOVAL, CONSTRUCTION AND CURING OF SIDEWALK, CURB AND GUTTER, AND DRIVEWAY APRONS.
- E.** THE CONTRACTOR WILL BE RESPONSIBLE FOR AN IMMEDIATE REMOVAL AND CLEANUP OF ALL EXCAVATED MATERIAL. NO EXCAVATED MATERIAL SHALL BE STORED ON THE PAVEMENT.
- F.** ALL CONTRACTORS INSTALLING NEW CURB ARE CAUTIONED THAT IT IS THEIR RESPONSIBILITY TO REPAIR THE STREET PER CITY SPECIFICATIONS BEFORE REMOVING YOUR BARRICADES.
- G.** OWNER/CONTRACTOR SHALL REMOVE ALL FORMS, BACKFILL AND SEED OR SOD AREA WITHIN 72 HOURS OF POURING CONCRETE. THE CURB LAWN SHALL HAVE 4" OF TOPSOIL.

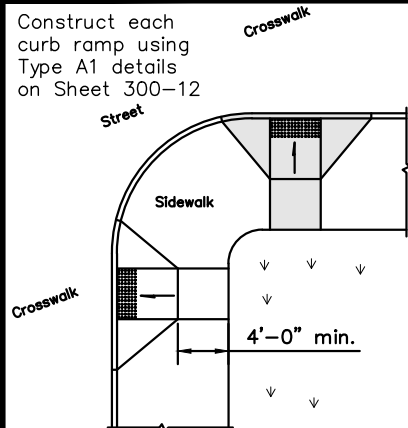
CITY OF TROY



GUIDELINES FOR REPLACEMENT OF SIDEWALKS

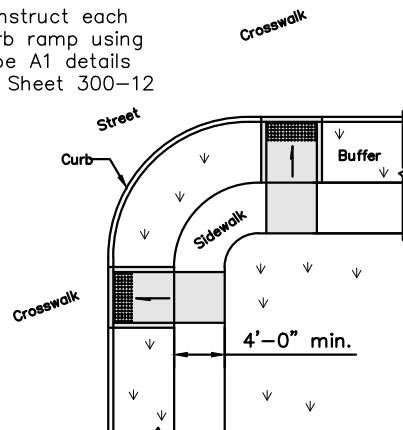
REVISIONS:	DATE
	APPROVED:
	NOV 2017
	PAGE No.
	300-9

Construct each curb ramp using Type A1 details on Sheet 300-12



Use curb ramps with flared sides at locations with wide sidewalks.

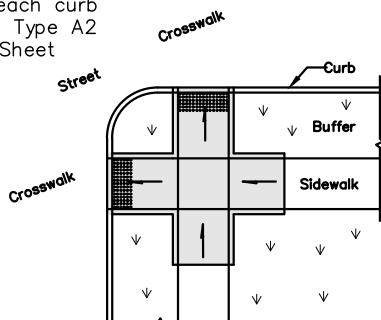
Construct each curb ramp using Type A1 details on Sheet 300-12



Use curb ramps with returned curbs where buffer is wide enough to accommodate ramp slope.

PERPENDICULAR CURB RAMPS

Construct each curb ramp using Type A2 details on Sheet 300-12



Work beyond the shaded ramp/landing area is paid for as curb (609) and walk (608). Removal of existing curb, walk (or existing curb ramps) are paid under ITEM 202.

PREFERRED CONSTRUCTION PLACEMENT

NOTES

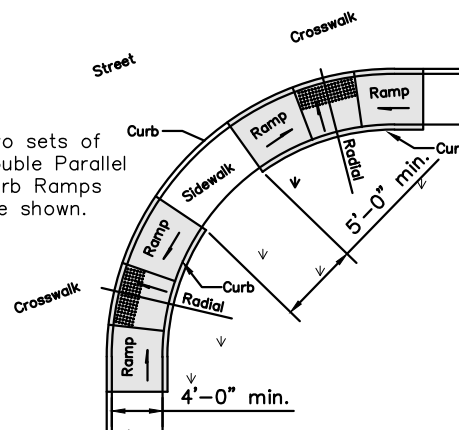
GENERAL: This drawing shows curb ramp type details and placement examples for curb ramp construction, including the installation of detectable warnings.

Curb ramp types are shown on Sheet 300-12 and include Perpendicular, Parallel and Combined types as specified to be constructed in the locations shown on the project plans.

Curb ramps added to an existing intersection or walk should be individually detailed on the project plans to assure that the design is appropriate for site constraints and all items can be constructed to ADA standards. The contractor may adjust the placement of curb ramps if existing field conditions warrant, with the approval of the City Engineer.

PAYMENT: Measure and pay for the ramp area within the shaded limits of this drawing as ITEM 608 CURB RAMP, S.F. This includes the cost of any curb or gutter, detectable warnings, landing areas and any additional materials, installation, grading, forming, and finishing required within the shaded area.

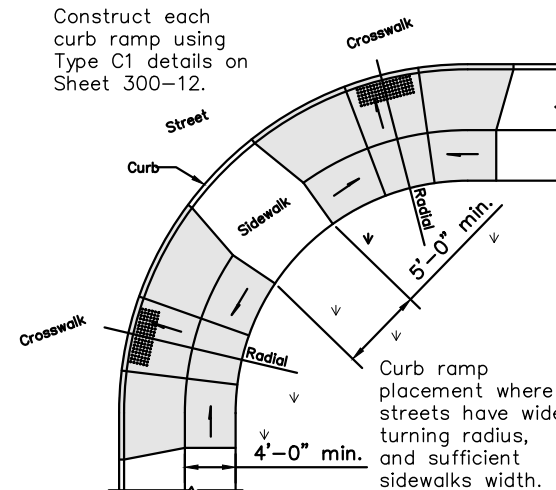
Two sets of Double Parallel Curb Ramps are shown.



Place on streets having wide turning radii and where sidewalks are narrow.

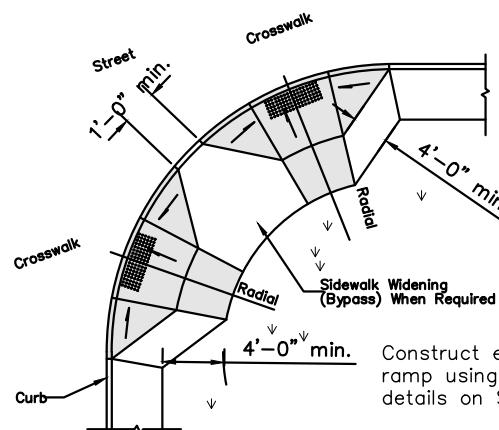
PARALLEL CURB RAMPS

Construct each curb ramp using Type C1 details on Sheet 300-12.



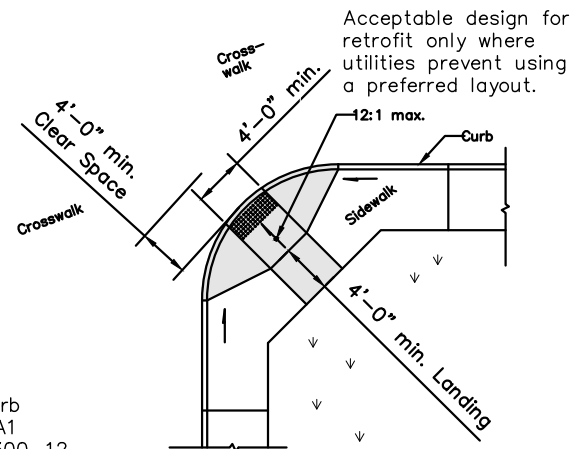
Curb ramp placement where streets have wide turning radius, and sufficient sidewalks width.

COMBINATION CURB RAMPS



Acceptable design on corners with wide turning radius where user is able to maneuver within crosswalk limits so as not to encroach into adjacent traveled lanes.

PERPENDICULAR RAMPS



Use this design only for existing walks, and when site constraints prohibit other designs. The diagonal Type D ramp may be constructed as either a Perpendicular, Parallel or Combination curb ramp type. Avoid using where curb radii are less than 20'-0".

DIAGONAL RAMP (Type D)

ACCEPTABLE CONSTRUCTION PLACEMENT

CITY OF TROY

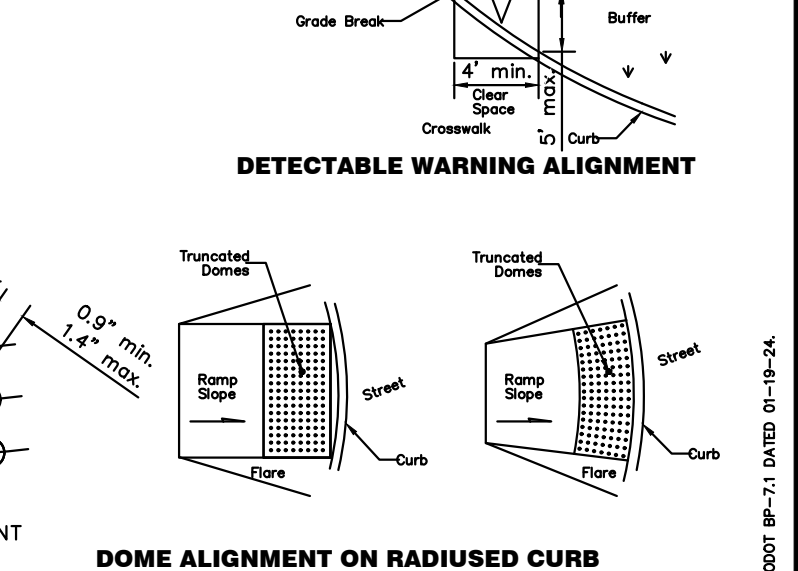
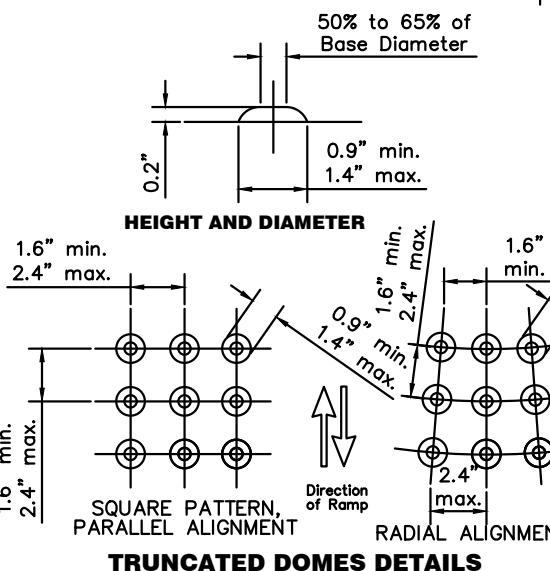
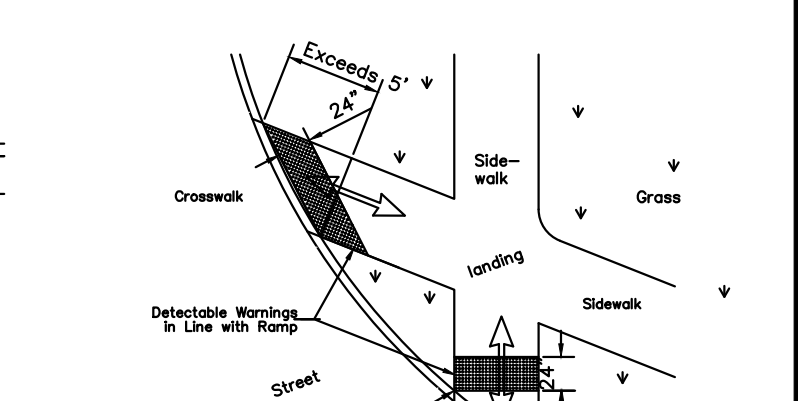
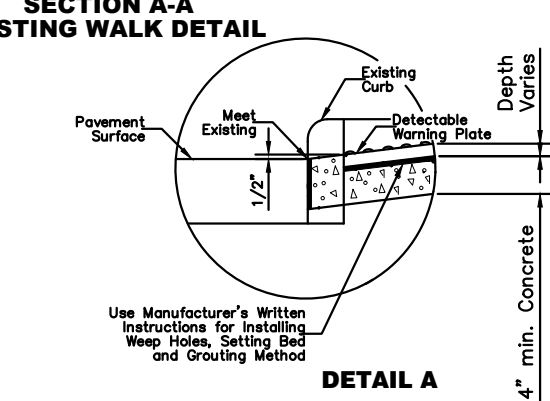
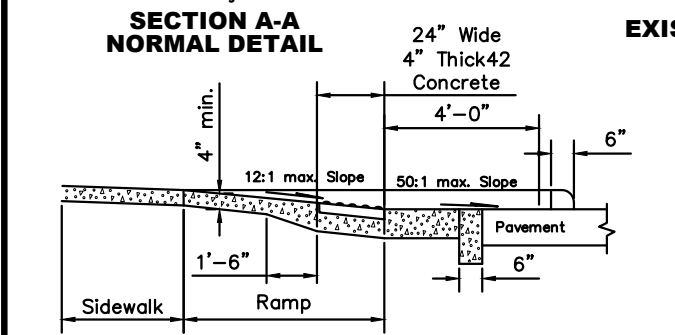
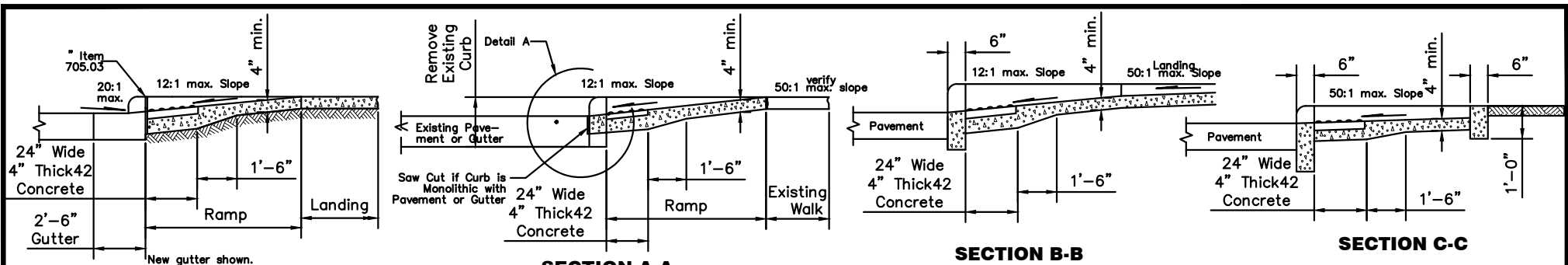


CURB RAMPS 1

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
300-10



SECTION D-D

*Where possible, pour ramp area integral with the curb, otherwise use 6" thick walk.

DETECTABLE WARNINGS NOTES

GENERAL: Detectable Warnings are a distinctive surface pattern of truncated domes which are detectable by cane or underfoot to alert people with vision impairments of their approach to streets and hazardous drop-offs.

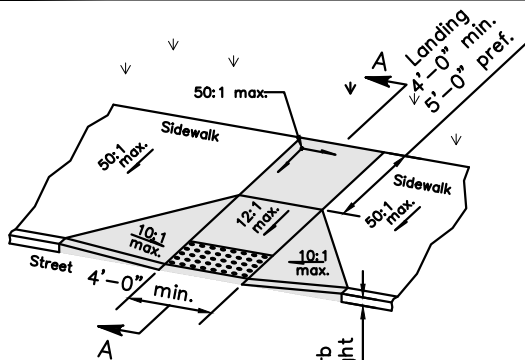
PLACEMENT: Detectable warnings are to be installed at any location where pedestrians might cross paths with vehicular traffic lanes, such as the base of curb ramps or at blended curbs. A 24" strip of domes is to be installed for the full width of the ramp or walk. Typical street corner placement locations are shown on 300-10.

The depth of concrete underneath detectable warning products shall be a minimum of 4". See DETAIL A.

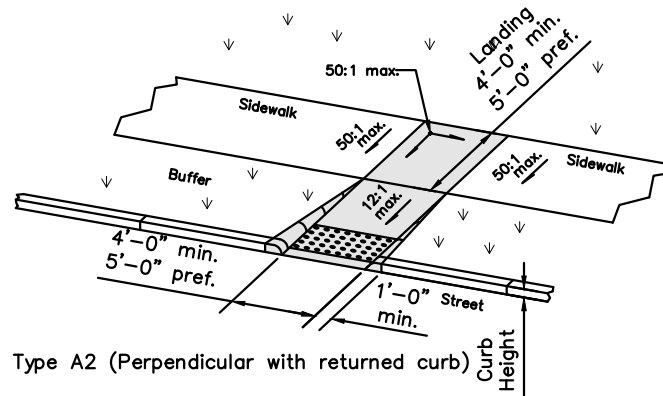
ALIGNMENT: Truncated domes should be aligned with the primary direction of the ramp as shown on the DETECTABLE WARNING ALIGNMENT Detail. Normally the detectable warnings should be flush with the back of the curb, but for skewed conditions see DETECTABLE WARNING ALIGNMENT Detail. For non-standard layouts, detectable warning materials may have to be mitered and placed segmentally.

PRODUCTS & COLORS: Color of the detectable warnings should contrast with surrounding concrete walk and ramp and shall be red unless otherwise approved. Black is not an acceptable color. Detectable warnings shall be cast in place manufactured by ADA Solutions, Inc. or City of Troy Approved equal.

000T BP-7.1 DATED 01-19-24.

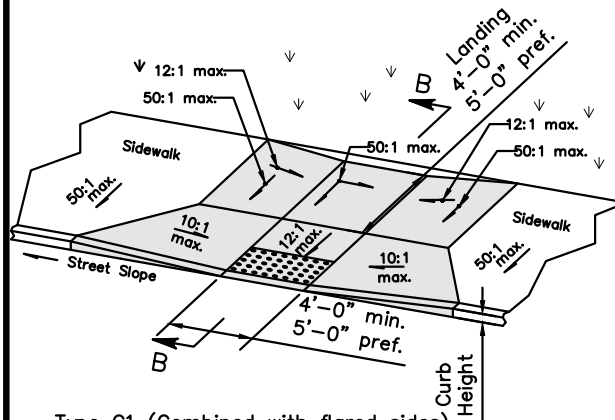


Type A1 (Perpendicular with flared sides)

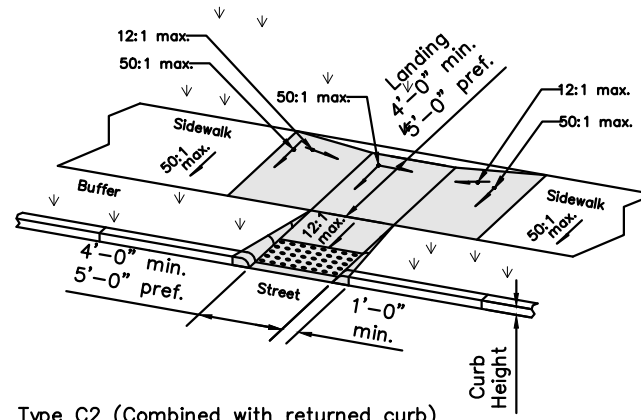


Type A2 (Perpendicular with returned curb)

PERPENDICULAR CURB RAMP DETAILS

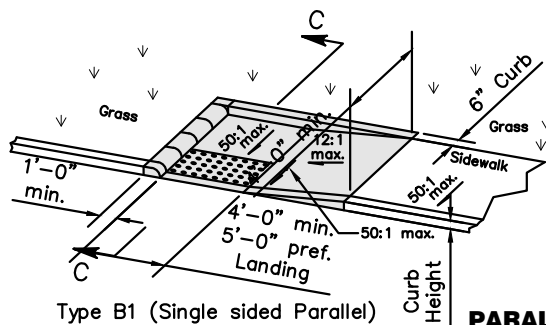


Type C1 (Combined with flared sides)

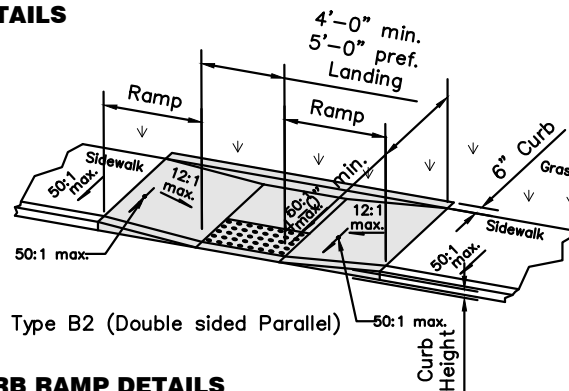


Type C2 (Combined with returned curb)

COMBINED CURB RAMP DETAILS



Type B1 (Single sided Parallel)



Type B2 (Double sided Parallel)

PARALLEL CURB RAMP DETAILS

NOTES

The running slope of the ramp is preferred to be 12:1 or flatter. In existing sidewalks, where the maximum ramp slope is not feasible due to site constraints (e.g. utility poles or vaults, right-of-way limits) it may be reduced as follows:

- A) 10:1 for a max. rise of 6"
- B) 8:1 for a max. rise of 3"
- C) 6:1 over a max. run of 2'-0" for historic areas where a flatter slope is not feasible.

To prevent chasing the grade indefinitely, the transition from existing sidewalk to the shaded curb ramp area is not required to exceed 15 feet in length.

While ramps may be skewed to the crosswalk, the entire lower landing area must fall within the cross walk that the ramp serves and cannot be located in the traveled lane of opposing traffic.

The counter slope of the gutter or street at the foot of a curb ramp, landing, or blended transitions shall be 20:1 or flatter.

The bottom edge of the ramp shall change planes perpendicular to the landing.

The edge of the curb shall be flush with the edge of the adjacent pavement and gutter and surface slopes that meet grade breaks shall also be flush.

Ramp landings shall be 4' min. x 4' min. with a 50:1 or flatter cross slope and running slope.

Provide 24" wide level strip if the algebraic difference between the ramp slope and the street exceeds 11%.

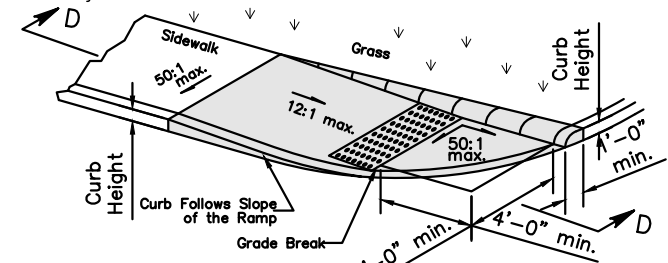
DETECTABLE WARNINGS: Install Detectable Warnings on each curb ramp with approved materials, as shown on 300-11. Install these proprietary products as per manufacturer's written instructions.

BLENDED TRANSITIONS: Blended Transitions do not require a landing since the slopes shall not exceed 5%.

DRAINAGE: Contractor is to ensure the base of each constructed curb ramp allows for proper drainage, without exceeding allowable cross slope or ramp slopes. Vertical change in level exceeding 1/8" between the 1) pavement and gutter, and 2) gutter and ramp, are not allowed.

SURFACE TEXTURE: Texture concrete surfaces by coarse brooming transverse to the ramp slopes to be rougher than the adjacent walk.

JOINTS: Provide expansion joints in the curb ramp as extensions of walk joints and consistent with 300-8.



Type B3 (Single sided Parallel)

CITY OF TROY



CURB RAMPS 3

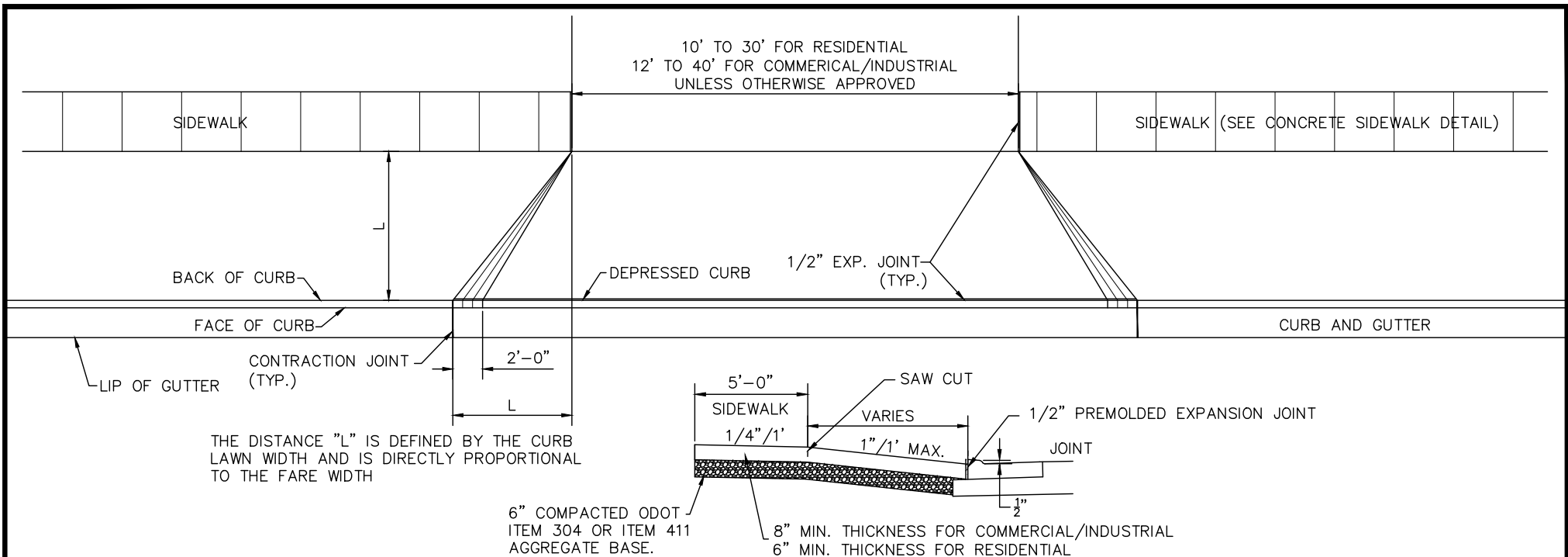
REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
300-12



J. IF A SECTION OF CURB IS REMOVED THAT CONTAINS A UTILITY STAMP, A NEW STAMP SHALL BE PLACED IN THE NEW CONCRETE.



NOTES

- A.** THIS STANDARD DRAWING IS FOR GUIDELINE PURPOSES. EACH INDIVIDUAL DRIVE WILL NEED TO BE DESIGNED AND SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL.
- B.** DRIVE APPROACHES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 452 AND 499 CAST IN PLACE CONCRETE. CONCRETE SHALL BE ODOT QC MISC. (CEMENT ONLY – NO POZZOLAN MATERIAL).
- C.** CITY PROJECTS REQUIRE HIGH-EARLY ON ALL DRIVES.
- D.** MAXIMUM JOINT SPACING SHALL BE 10' LONGITUDINALLY AND TRANSVERSELY WITH JOINTS AT TAPERS.
- E.** DRIVE APPROACHES SHALL BE KEYED AT ALL CONSTRUCTION JOINTS.
- F.** EXPANSION MATERIAL SHALL BE 1/2" PREMOLDED.
- G.** PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

- H.** WHERE CURB AND GUTTER HAS NOT BEEN DROPPED AT DRIVE APPROACHES, THE CURB SHALL BE REMOVED AND REPLACED WITH DEPRESSED CURB.
- I.** WHERE ASPHALTIC CONCRETE PAVEMENT IS DISTURBED, THE ASPHALT SHALL BE REPLACED AS DIRECTED BY THE CITY.
- J.** JOINTS SHALL BE CLEANED AND EDGED BY A 1/4" RADIUS EDGER. LONGITUDINAL JOINTS SHALL BE AS DIRECTED BY THE CITY. EXPANSION JOINTS SHALL BE OF SUCH DIMENSIONS AS SHOWN ON STANDARD DRAWINGS FOR CONSTRUCTION JOINTS.
- K.** IF A SECTION OF CURB IS REMOVED THAT CONTAINS A UTILITY STAMP, A NEW IN-KIND STAMP SHALL BE REPLACED IN THE NEW CONCRETE.
- L.** WHEN CURB IS REMOVED AND REPLACED DURING DRIVEWAY CONSTRUCTION, JOINTS BETWEEN EXISTING AND NEW CURB ARE TO BE 1/2" EXPANSION JOINTS.

- M.** ALL NEW CONSTRUCTION OR MODIFICATIONS OF DRIVE APPROACHES REQUIRE A CONCRETE OR ASPHALT APPROACH, REGARDLESS OF WHETHER THERE IS A SIDEWALK OR NOT. THE NEW APPROACH IS TO GO FROM EDGE OF EXISTING STREET TO BACK OF SIDEWALK.
- N.** DRAINAGE ISSUES WILL HAVE TO BE ADDRESSED, WHEN A DRIVEWAY IS INSTALLED OR MODIFIED.
- O.** PRECAUTIONS SHALL BE TAKEN TO PROTECT EXISTING CONCRETE, BRICK, ETC. FROM TIRE MARKS AND DAMAGE DURING CONSTRUCTION.
- P.** A CONCRETE SEALER SHALL BE APPLIED TO ALL SURFACES WITHIN 24 HOURS.
- Q.** CURBLAWN SHALL CONTAIN A MINIMUM OF 4" TOPSOIL AND SEEDS.

CITY OF TROY



DRIVE APPROACH

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
300-14

NOTES

- A.** NO WORK SHALL BE APPROVED OR ACCEPTED BY THE CITY UNLESS 2 WORKING DAYS NOTICE OF COMMENCING WORK IS GIVEN TO THE CITY.
- B.** ALL FIELD OR STORM DRAINS WHICH ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE REPAIRED AND PROVIDED WITH UNOBSTRUCTED OUTLETS AS APPROVED AND DIRECTED BY THE CITY AND MARKED ON THE RECORD DRAWINGS.
- C.** ALL STORM SEWER CONSTRUCTION SHALL ADHERE TO ODOT SPECIFICATIONS LATEST REVISION OR WITH THE CITY STORM SEWER SPECIFICATIONS, WHICHEVER IS APPLICABLE AND MORE RESTRICTIVE.
- D.** MASTIC MATERIAL IS REQUIRED ON ALL NON O-RING STORM SEWER AND MANHOLES, UNLESS OTHERWISE APPROVED.
- E.** WHEN A CASTING IS REMOVED IT REMAINS CITY PROPERTY AND TO BE DELIVERED TO THE CITY SERVICE CENTER, UNLESS OTHERWISE APPROVED.
- F.** ANY DETAILS OR NOTES NOT DIRECTLY ADDRESSED IN THESE ENGINEERING STANDARDS SHALL BE COORDINATED WITH THE CITY ENGINEERING DEPARTMENT.
- G.** ALL STORM SEWER SHALL BE INSTALLED USING A PIPE LASER, INSIDE THE PIPE IF POSSIBLE, FOR GRADE AND ALIGNMENT.
- H.** WHERE THE PLANS PROVIDE FOR PROPOSED CONDUIT TO BE CONNECTED TO, OR TO CROSS EITHER OVER OR UNDER AN EXISTING SEWER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED CONDUIT.
- I.** CITY RESERVES THE RIGHT TO REQUIRE CONTRACTOR TO THOROUGHLY CLEAN STORM SEWER SYSTEM OF ALL FOREIGN MATTER BY USE OF A SEWER-JET OR EQUAL TYPE OF EQUIPMENT AND/OR TELEVISION STORM SEWER SYSTEM IF DEFICIENCIES OR IRREGULARITIES ARE NOTED. THIS WORK SHALL BE AT CONTRACTORS EXPENSE.

STORM SEWER PIPE

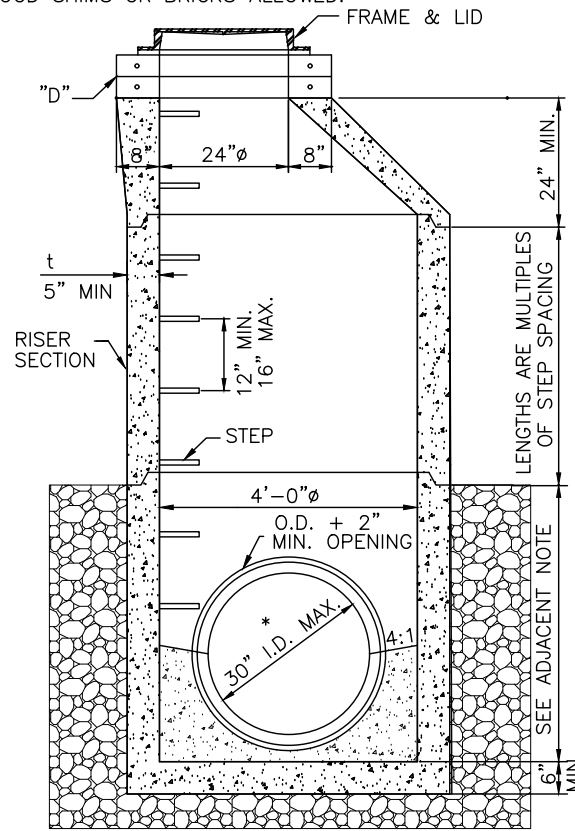
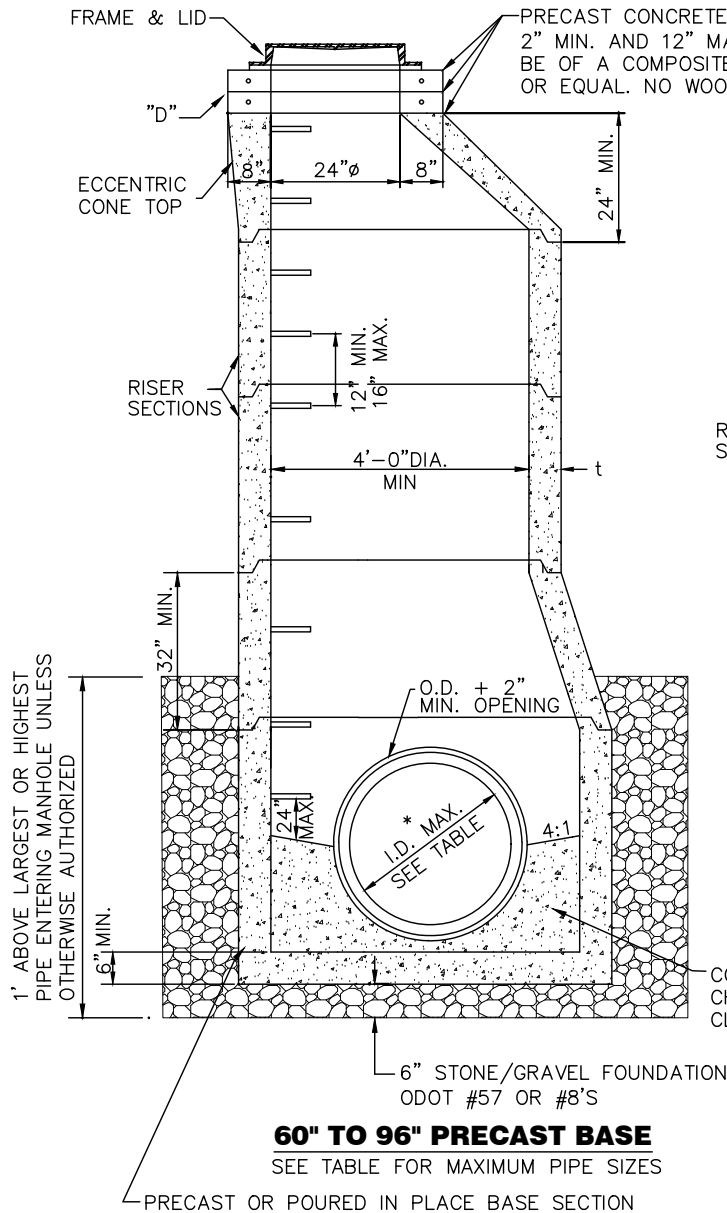
- A.** ALL STORM SEWER PIPE SHALL HAVE A MINIMUM DIAMETER OF 12", UNLESS OTHERWISE APPROVED.
- B.** ALL PIPE MATERIALS SHALL BE INSTALLED PER THE MANUFACTURES RECOMMENDATIONS FOR DEPTH AND COVER.
- C.** TYPES OF PIPE PERMITTED:
- | <u>PIPE MATERIAL, GREATER THAN 2 FEET OF COVER</u> | <u>ODOT CMS NUMBER</u> |
|--|------------------------|
| REINFORCED CONCRETE CIRCULAR PIPE | 706.02 |
| REINFORCED CONCRETE ELLIPTICAL PIPE | 706.04 |
| * CORRUGATED POLYETHYLENE SMOOTH-LINED PIPE (N-12) (TYPE C) | 707.33 |
| POLYVINYL CHLORIDE CORRUGATED SMOOTH INTERIOR PIPE (TYPE C) | 707.42 |
| CORRUGATED POLYETHEYLENE SMOOTH-LINED PIPE (ADS-HP) (TYPE B) | 707.65 (12"-30") |
| POLYPROPYLENE TRIPLE WALL (ADS-SaniTite) (TYPE B) | 707.65 (36"-60") |
- | <u>PIPE MATERIAL, LESS THAN 2 FEET OF COVER</u> | <u>ODOT CMS NUMBER</u> |
|---|------------------------|
| REINFORCED CONCRETE CIRCULAR PIPE | 706.02 |
| REINFORCED CONCRETE ELLIPTICAL PIPE | 706.04 |
| TYPE B CONDUIT - CONDUIT UNDER PAVEMENT | |
| TYPE C CONDUIT - CONDUIT NOT UNDER PAVEMENT | |
- * CORRUGATED POLYETHYLENE SMOOTH-LINED PIPE (N-12), 703.3, CAN ONLY BE USED OUTSIDE OF THE RIGHT-OF-WAY.
- D.** THE CITY RESERVES THE RIGHT TO REJECT THE TYPE OF PIPE MATERIAL SUBMITTED IF THEY SO CHOOSE.

CITY OF TROY



MISCELLANEOUS STORM NOTES

REVISIONS:	DATE
OCT 2018	APPROVED:
DEC 2019	NOV 2017
AUG 2024	PAGE No.
	600-1



48" PRECAST BASE FOR 30" & SMALLER PIPE

* BASE I.D.	MIN "t"	MAX. PIPE SIZE
60"	5"	36"
72"	6"	48"
84"	7"	54"
90"	7 1/2"	60"
96"	8"	60"

*DUE TO PIPE ORIENTATION, A LARGER DIAMETER BASE THAN WHAT IS SPECIFIED MAY BE REQUIRED TO ACCEPT PIPE.

NOTES

FRAME AND LID

- LOCATE THE CENTERLINE OF MANHOLE CONES OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.
 - STORM MANHOLE FRAME AND COVER SHALL BE EJ IRON WORKS NO. 1600 FOR HEAVY TRAFFIC, OR EQUAL. ALL COVER LIDS SHALL BE HEAVY DUTY AND MARKED "STORM". ALL LIDS SHALL BE VENTED WITH HOLES.
 - CONSEAL CS-102 FLEXIBLE BUTYL RESIN SEALANT OR EQUIVALENT SHALL BE 3/8" X 1" MINIMUM STRIPS UNDER GRADE RINGS AND CASTING.
 - AFTER FINAL ALIGNMENT AND ADJUSTMENTS OF THE MANHOLE CASTING AND RISER RINGS, ALL CONCRETE RISER RINGS ARE REQUIRED TO HAVE THE LIFTING WIRES REMOVED AND THE INSIDE JOINTS SEALED WITH A TYPE S CONCRETE MIX AND A SMOOTH BROOM FINISH.
- ### MANHOLE JOINTS
- JOINTS BETWEEN SECTIONS TO BE BITUMINOUS PIPE JOINT FILLER (ODOT 706.10)

STEPS

- MANHOLE STEPS SHALL BE SECURELY INSTALLED INTO EACH MANHOLE SECTION, BY THE MANUFACTURER, PRIOR TO DELIVERY TO THE JOB SITE
- MANHOLE STEPS SHALL BE PF-1 STEP BY M.A. INDUSTRIES OR EQUIVALENT. STEPS SHALL BE INSTALLED IN ALL NEW MANHOLES TO ALLOW FOR ANCHORING FLOW METERING EQUIPMENT AND SAMPLING EQUIPMENT.

STRUCTURE

- SECTIONS OF THE PRECAST MANHOLE SHALL BE CAST AND ASSEMBLED WITH EITHER ALL TONGUE OR ALL GROOVE ENDS UP. LIFT HOLES MAY BE PROVIDED IN EACH SECTION FOR HANDLING.
- TOP AND TRANSITION (OR REDUCER) SECTIONS MAY BE EITHER ECCENTRIC CONE OR FLAT SLAB.
- THE FLOW CHANNEL THROUGH MANHOLES SHALL BE MADE TO CONFORM IN SHAPE, SLOPE AND SMOOTHNESS TO THAT OF THE SEWERS.
- MATERIALS FOR BASES AND OTHER PRECAST SECTIONS, INCLUDING REINFORCEMENT SHALL COMPLY WITH ODOT REQUIREMENT OF 706.13 (ASTM C-478).
- MAXIMUM SPACING SHALL BE 350'.

PIPE CONNECTIONS

- FOR PIPE SIZES LARGER THAN 60", REFER TO ODOT TYPE 4 TO 5 MANHOLE.
- NO LATERALS MAY PROTRUDE INTO THE INTERNAL MANHOLE.
- OPENINGS IN RISER SECTIONS FOR 18" AND SMALLER INLET PIPES MAY BE PREFABRICATED OR CUT IN THE FIELD PROVIDED THE SIDES OF THE PIPE AT THE SPRING LINE DO NOT PROJECT INTO THE MANHOLE.
- PIPE PENETRATIONS SHALL BE CUT WITH A CORE DRILL OR CAST IN PLACE WHILE CASTING CONCRETE BASIN. PIPE TO INTRUDE INTO CATCH BASIN 1" AND PIPE MUST BE CUT PARALLEL TO CATCH BASIN. ALL PIPES SHALL BE SEALED AND CONNECTED PER DETAIL 600-15.

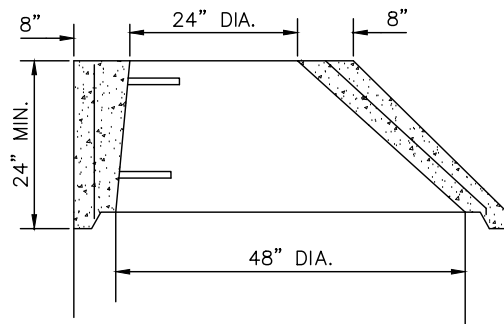
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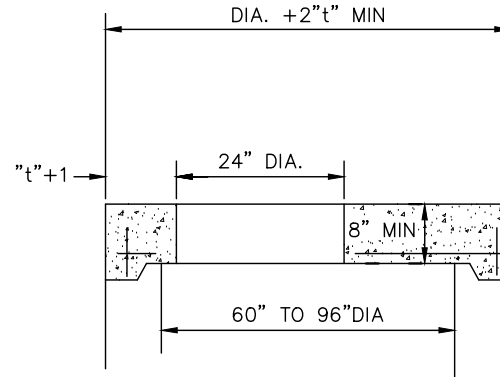
TYPE 3 STORM MANHOLE

REVISIONS:
AUG 2024

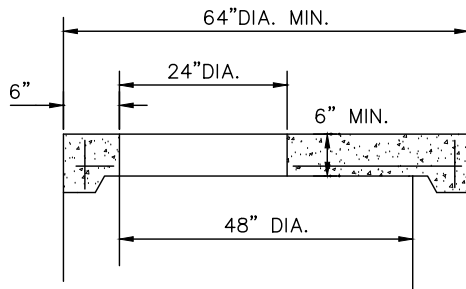
DATE
APPROVED:
NOV 2017
PAGE No.
600-2



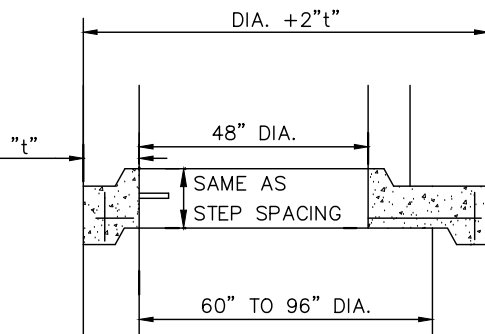
ECCENTRIC CONE TOP



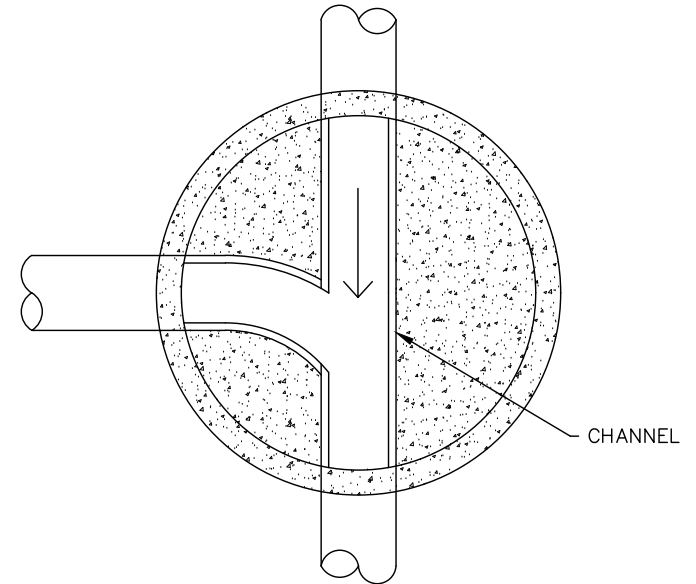
FLAT SLAB TOP



FLAT SLAB TOP



FLAT SLAB TRANSITION



SECTIONAL PLAN

NOTE

ALL INVERTS TO BE CHanneled FOR OPTIMUM FLOW.

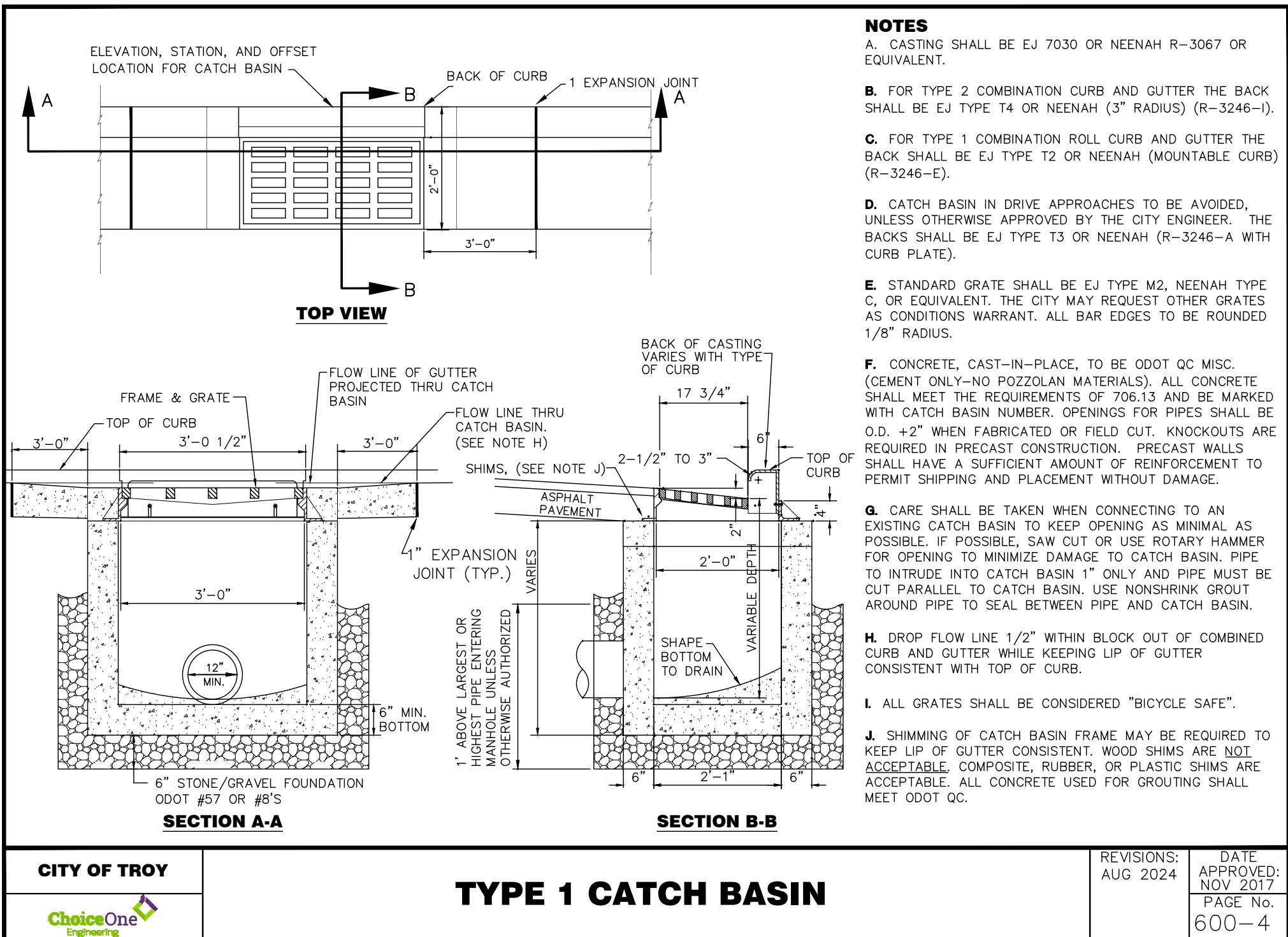
CITY OF TROY



TYPE 3 STORM MANHOLE DETAILS

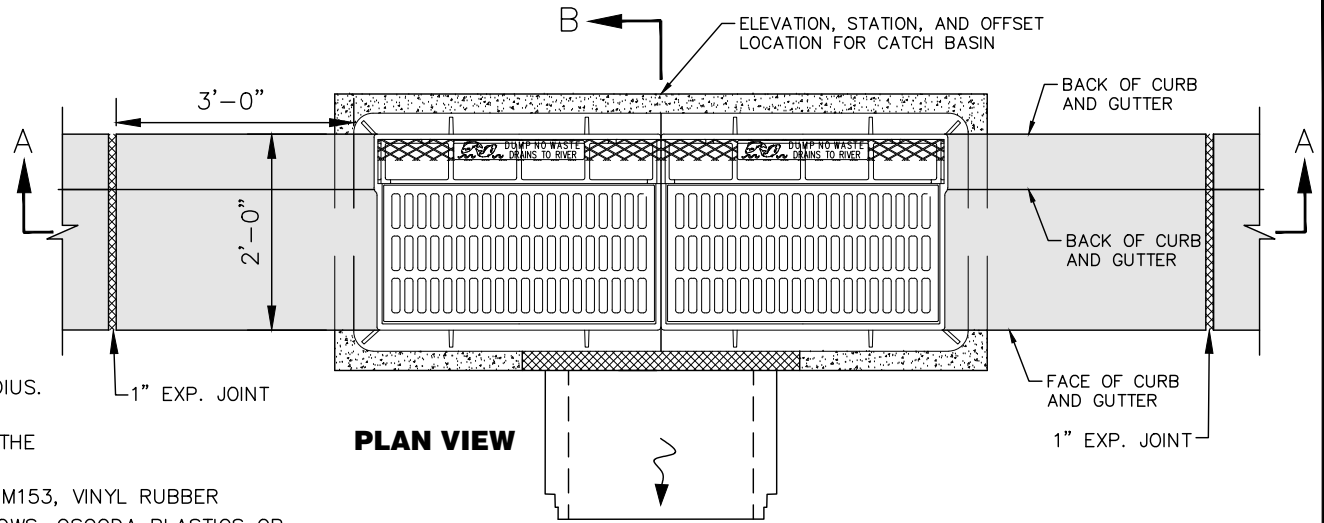
REVISIONS:

DATE
APPROVED:
NOV 2017
PAGE No.
600-3

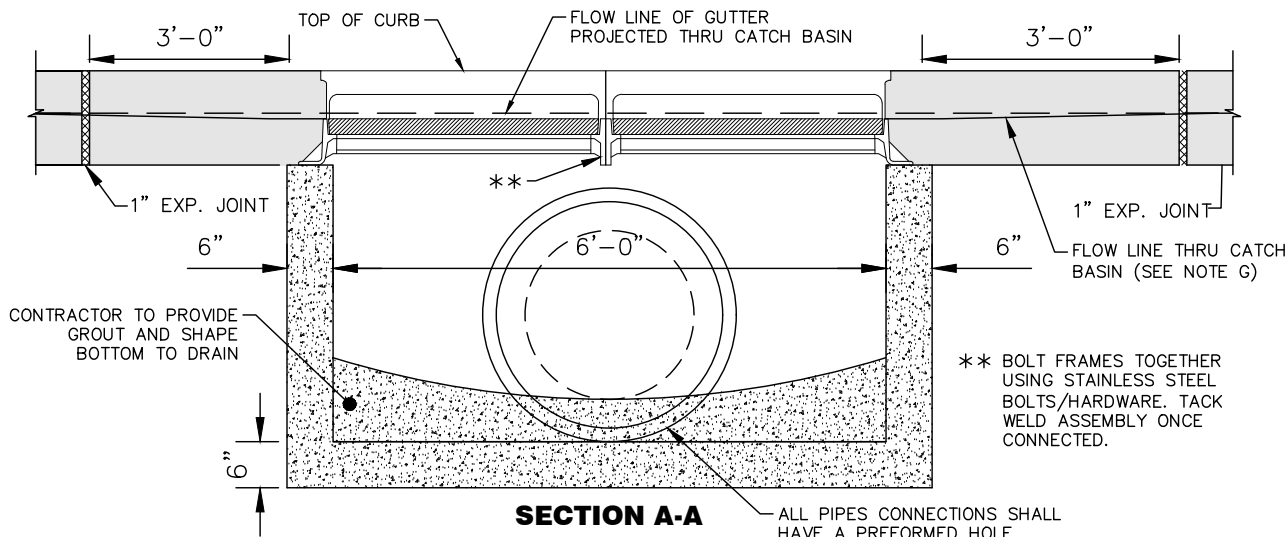


NOTES

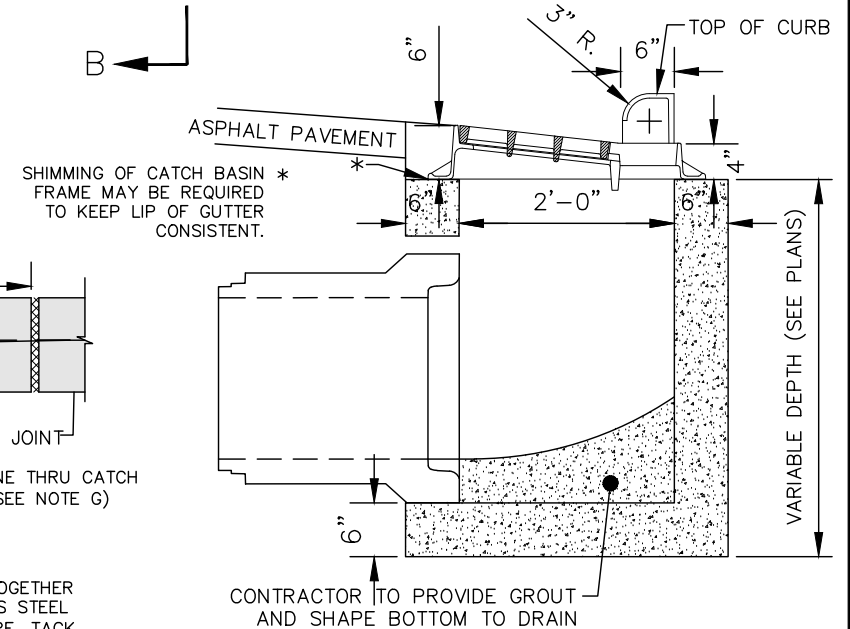
- INLET FRAME SHALL BE EJ IRON WORKS 7031Z1 (LH) AND (RH) OR NEENAH R-3295-2 OR EQUIVALENT.
- CURB BOX/HOOD, FOR TYPE 2 COMBINATION CURB AND GUTTER, SHALL BE NEENAH (3" RADIUS) R-3067 OR EJ IRON WORKS TYPE T4.
- CURB BOX/HOOD FOR CATCH BASINS IN DRIVE APPROACHES (TO BE AVOIDED, IF POSSIBLE) SHALL BE EJ IRON WORKS TYPE T3 OR NEENAH (R-3067-R FRAME) OR APPROVED EQUAL.
- STANDARD GRATE SHALL BE NEENAH TYPE A, OR EQUIVALENT. ALL BAR EDGES TO BE ROUNDED 1/8" RADIUS.
- CONCRETE, CAST-IN-PLACE, TO BE ODOT QC 1. PRECAST CONSTRUCTION PERMITTED AND CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13.
- EXPANSION JOINTS SHALL BE PER ODOT 705.03, AASHTO M153, VINYL RUBBER MATERIAL MANUFACTURED BY RIGHT/POINTE, W.R. MEADOWS, OSCODA PLASTICS OR EQUAL AND BE INSTALLED AS INDICATED IN THE DETAIL.
- PIPE TO INTRUDE INTO CATCH BASIN 1" MAXIMUM AND PIPE MUST BE CUT PARALLEL TO CATCH BASIN. USE NON-SHRINK GROUT AROUND PIPE TO SEAL BETWEEN PIPE AND CATCH BASIN.
- DROP FLOW LINE 1/2" WITHIN BLOCK OUT OF COMBINED CURB AND GUTTER WHILE KEEPING LIP OF GUTTER CONSISTENT WITH TOP OF CURB.
- ALL GRATES SHALL BE BICYCLE SAFE.



PLAN VIEW



SECTION A-A



SECTION B-B

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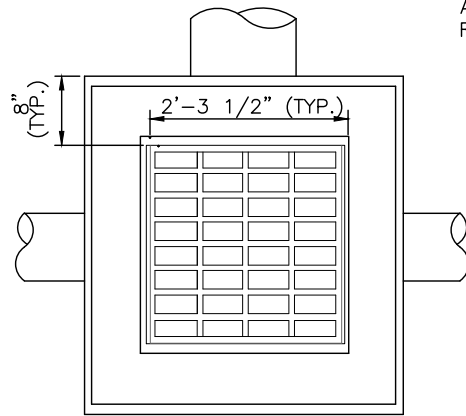


TYPE 1A CATCH BASIN

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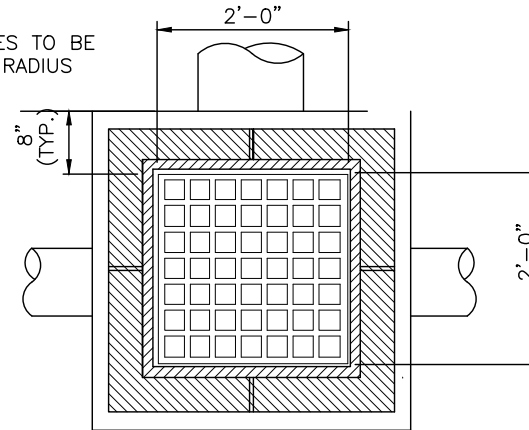
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NOV 2017

PAGE No.
600-4A

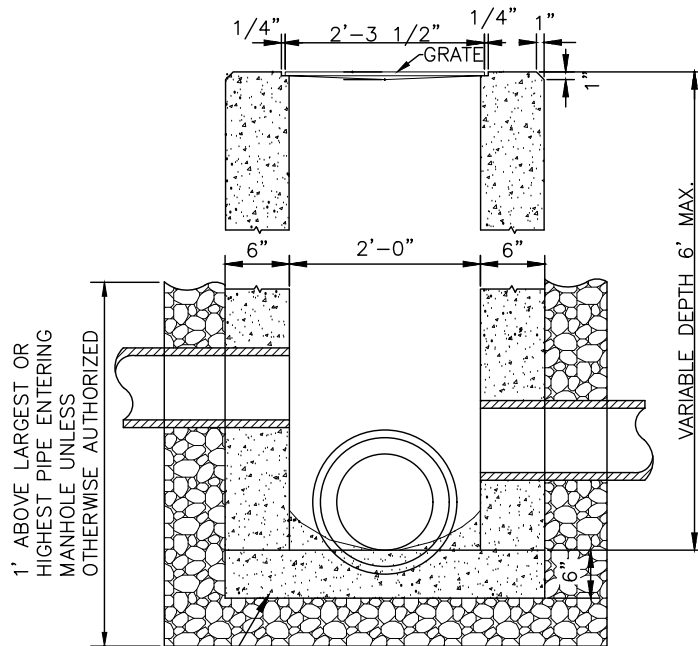


PLAN

ALL GRATE EDGES TO BE
ROUNDED 1/4" RADIUS

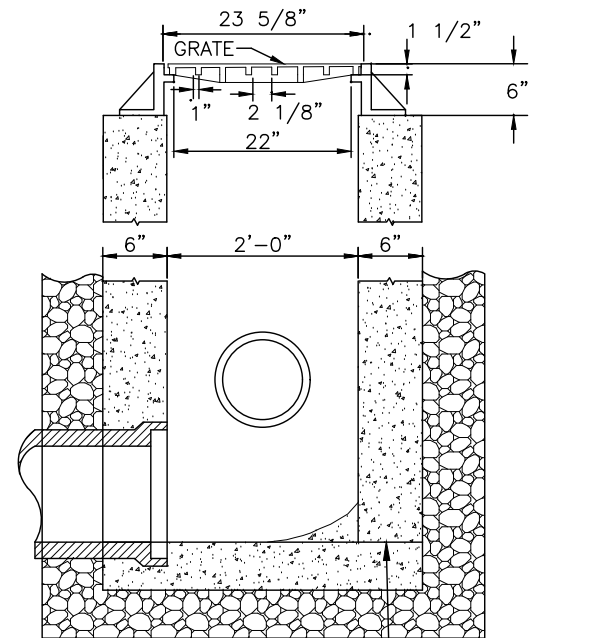


PLAN



BOTTOM SLAB MAY BE CAST SEPARATELY
AND THE OUTLET PIPE PLACED ON TOP OF
IT WITH THE BOTTOM SHAPED TO DRAIN.

NONPAVED AREAS



PERMISSIBLE
CONSTRUCTION JOINT
6" STONE/GRAVEL FOUNDATION
ODOT #57 OR #8'S

PAVED AREAS

NOTES

A. LOCATION AND ELEVATIONS WHEN GIVEN ON THE PLANS IS TOP CENTER OF THE GRATE. WHEN SIDE OPENINGS ARE PROVIDED, ELEVATION SHALL BE THE FLOW LINE OF THE SIDE INLET.

B. GRATE FOR NONPAVED AREAS SHALL BE EJ IRON WORKS 5110 TYPE M3 GRATES OR NEENAH CATALOG NO. R-4859-C OR EQUIVALENT.

C. GRATE ELEVATION TO BE PLACED 4" TO 6" BELOW NORMAL DITCH RETURNING TO NORMAL 10' EACH SIDE OF BASIN.

D. PRECAST CONSTRUCTION IS REQUIRED, UNLESS OTHERWISE APPROVED, AND CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13 WITH $6 \pm 2\%$ AIR VOID CONTENT IN THE HARDENED CONCRETE. KNOCKOUTS SHALL BE PROVIDED IN PRECAST CONSTRUCTION. PRECAST WALLS SHALL HAVE A SUFFICIENT AMOUNT OF REINFORCEMENT TO PERMIT SHIPPING AND PLACEMENT WITHOUT DAMAGE.

E. CATCH BASINS NOT PERMITTED IN PAVEMENT AREAS UNLESS USING A FRAME AND GRATE EQUIVALENT TO NEENAH CATALOG NO. R-3405 OR EJ IRON WORKS NO. 5250Z. ALL GRATES TO BE BICYCLE SAFE.

F. FOR PIPES OVER 18" REFER TO ODOT CATCH BASIN 2-3 AND 2-4. FOR SIDE INLETS REFER TO ODOT CATCH BASIN 2-2-A.

G. CARE SHALL BE TAKEN WHEN CONNECTING TO AN EXISTING CATCH BASIN TO KEEP OPENING AS MINIMAL AS POSSIBLE. IF POSSIBLE, SAW CUT OR USE ROTARY HAMMER FOR OPENING TO MINIMIZE DAMAGE TO CATCH BASIN. PIPE TO INTRUDE INTO CATCH BASIN 1" ONLY AND PIPE MUST BE CUT PARALLEL TO CATCH BASIN. USE NONSHRINK GROUT AROUND PIPE TO SEAL BETWEEN PIPE AND CATCH BASIN.

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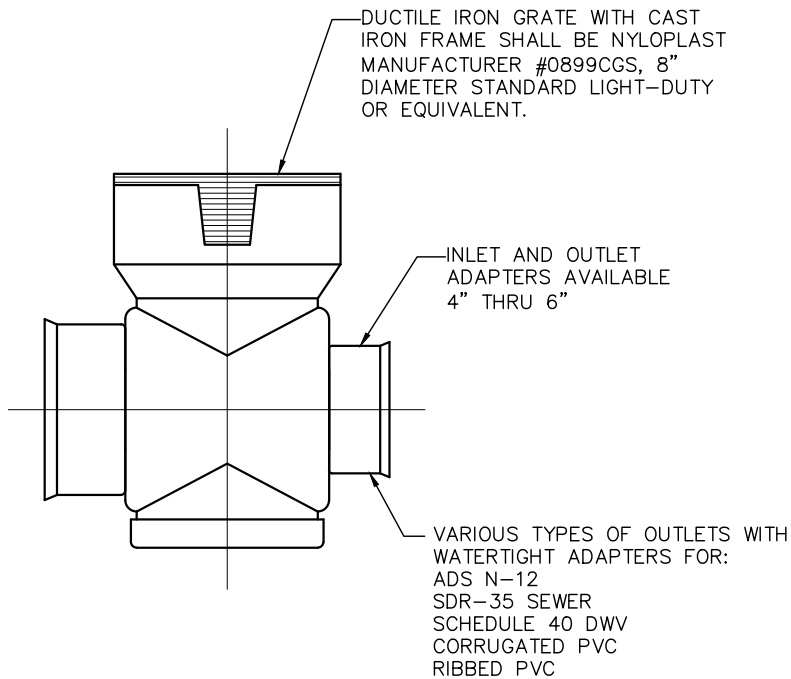


TYPE 2-2B CATCH BASIN

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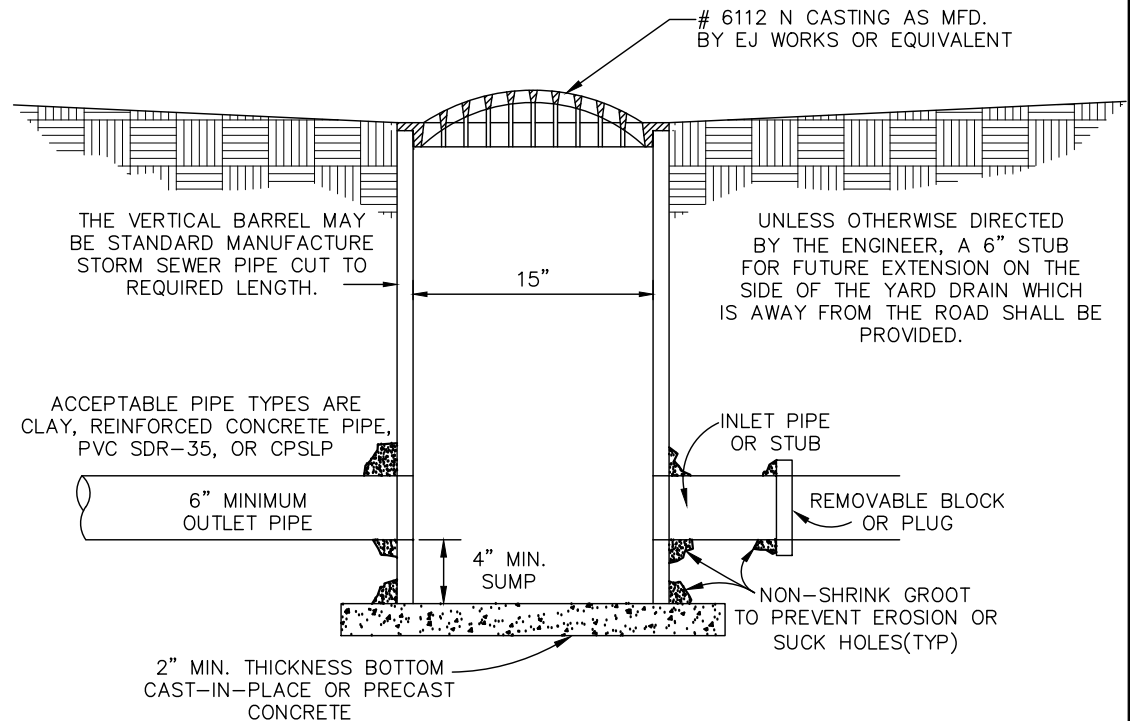
PAGE No.
600-5



TYPE 2 YARD DRAIN

—STANDARD OR CUSTOM DRAIN BASIN FOR VARIABLE INLET HEIGHT SHALL BE NYLOPLAST MANUFACTURER #2808AG OR EQUAL.

—CONTRACTOR TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS.



TYPE 3 YARD DRAIN

MAX DISTANCE FROM MANHOLE OR CATCH BASIN= 300'

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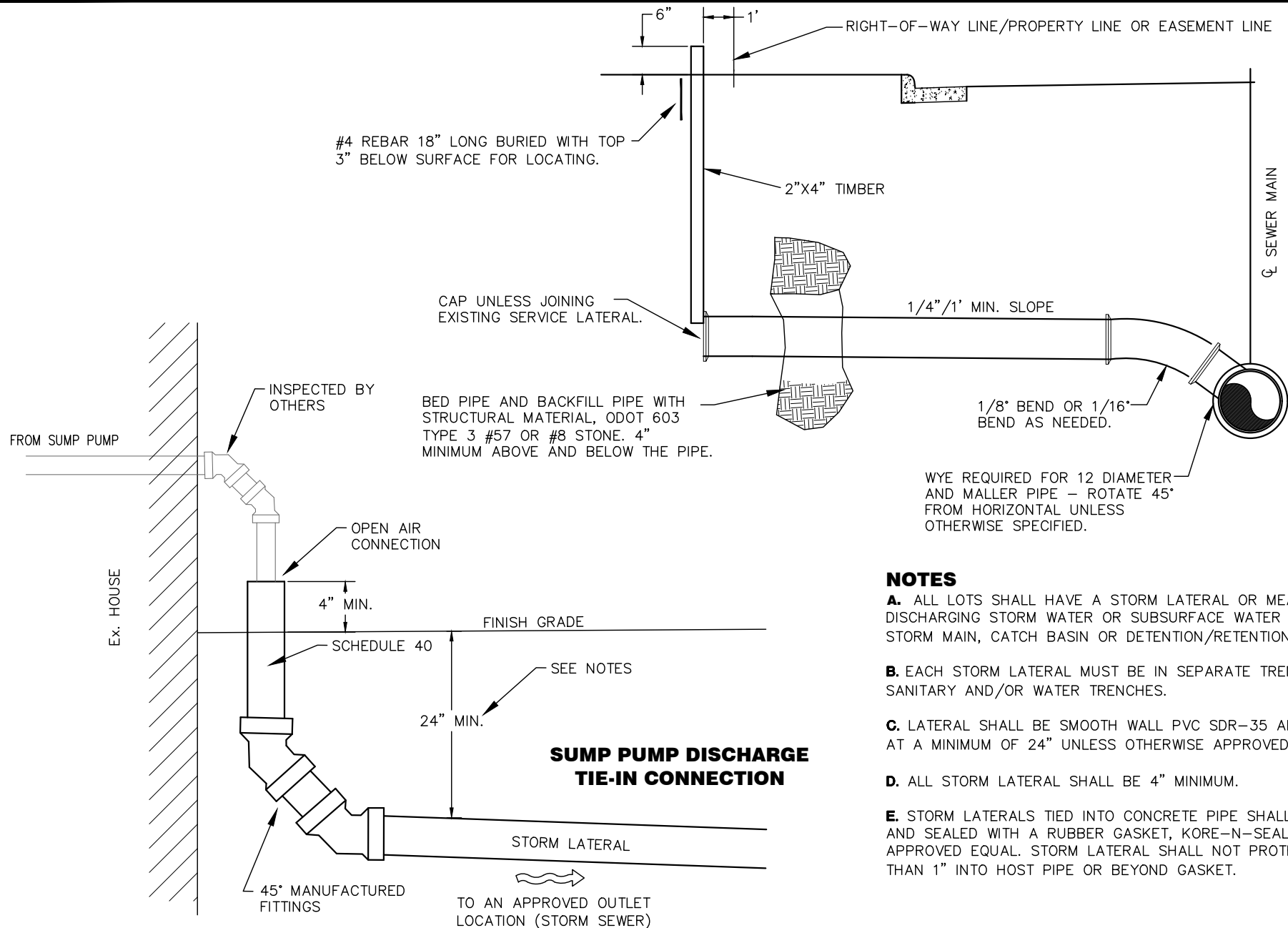


YARD DRAINS

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
600-6



NOTES

- A.** ALL LOTS SHALL HAVE A STORM LATERAL OR MEANS OF DISCHARGING STORM WATER OR SUBSURFACE WATER TO THE STORM MAIN, CATCH BASIN OR DETENTION/RETENTION POND.
- B.** EACH STORM LATERAL MUST BE IN SEPARATE TRENCHES FROM SANITARY AND/OR WATER TRENCHES.
- C.** LATERAL SHALL BE SMOOTH WALL PVC SDR-35 AND BURIED AT A MINIMUM OF 24" UNLESS OTHERWISE APPROVED.
- D.** ALL STORM LATERAL SHALL BE 4" MINIMUM.
- E.** STORM LATERALS TIED INTO CONCRETE PIPE SHALL BE CORED AND SEALED WITH A RUBBER GASKET, KORE-N-SEAL OR APPROVED EQUAL. STORM LATERAL SHALL NOT PROTRUDE MORE THAN 1" INTO HOST PIPE OR BEYOND GASKET.

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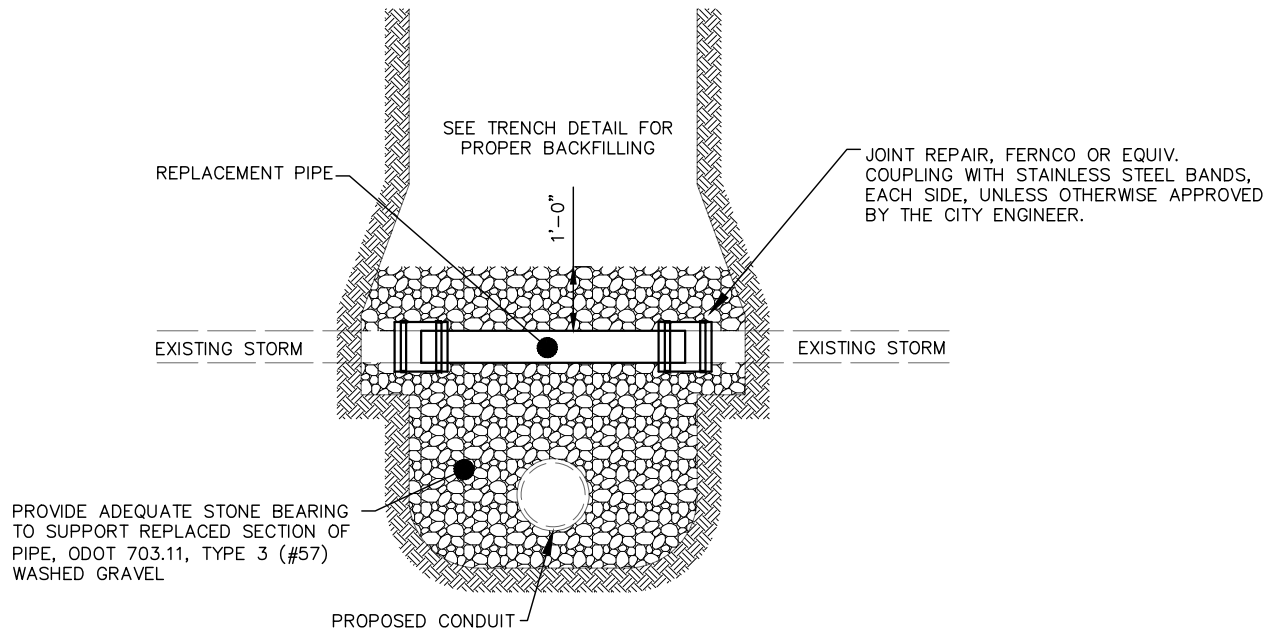


STORM LATERAL DETAIL

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
600-7



REPAIR OF EXISTING FIELD TILE OR STORM PIPE DETAIL

NOTES

- A.** CONCRETE REPAIRS OR PATCHES ARE UNACCEPTABLE.
- B.** ANY DRAINAGE TILE DAMAGED BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR TO A CONDITION EQUAL TO OR BETTER THAN ITS ORIGINAL CONDITION. ANYTHING REMOVED, REPLACED, AND/OR CONNECTED TO THE STORM SEWER SHALL BE NOTED ON THE AS-BUILT DRAWINGS AND SHALL BE INSPECTED BY THE INSPECTOR BEFORE THEY ARE COVERED.
- C.** ALL FIELD OR STORM DRAINS WHICH ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS OR PLUGGED AS APPROVED AND DIRECTED BY THE CITY.

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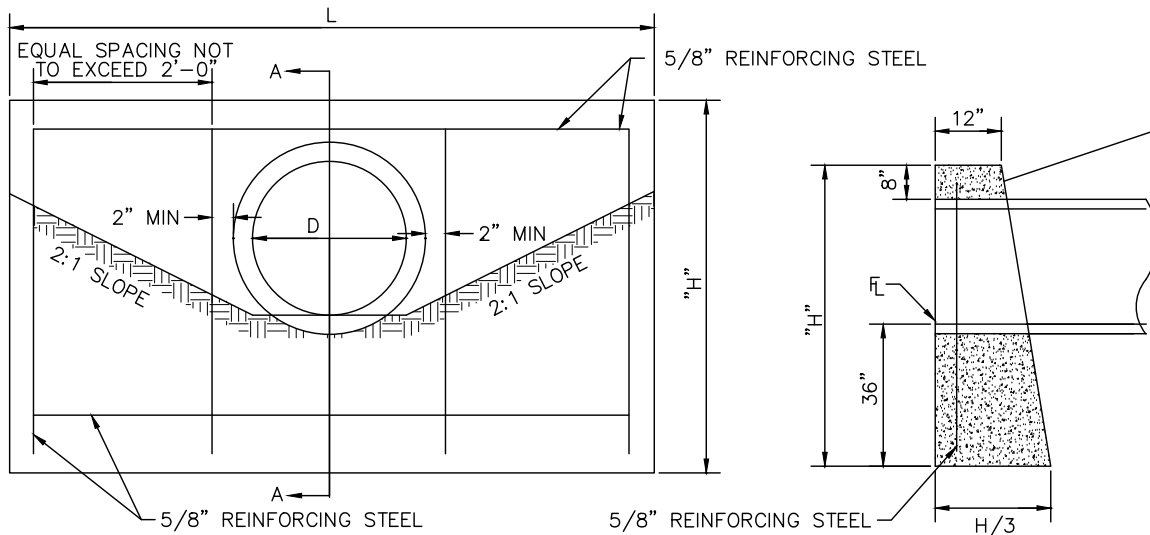


REPAIR OF EXISTING FIELD TILE OR STORM PIPE DETAIL

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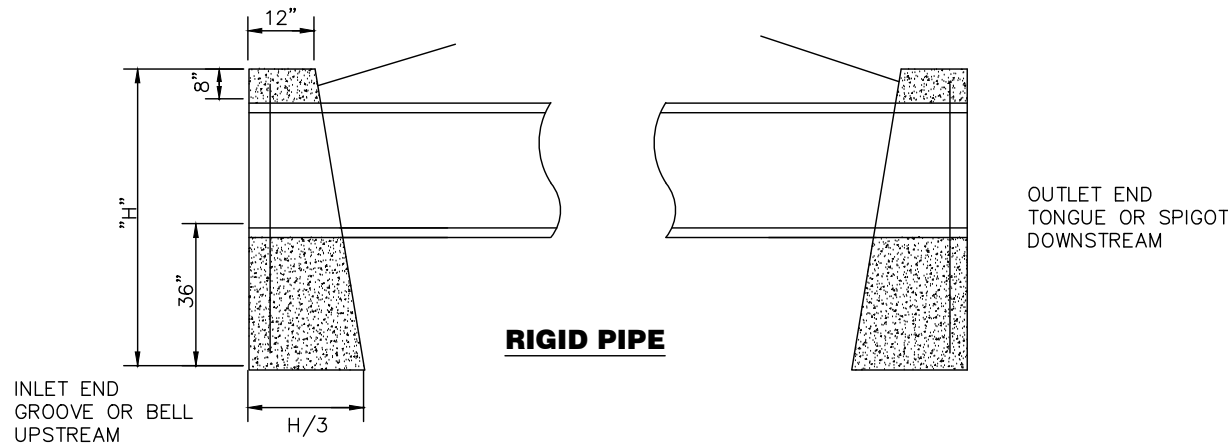
DATE
APPROVED:
NOV 2017

PAGE No.
600-8



ELEVATION

SECTION A-A



RIGID PIPE

NOTES

- A.** THESE FULL HEIGHT HEADWALLS ARE FOR NONSKEWED CULVERTS HAVING A DIAMETER OR RISE OF 36" OR LESS.
- B.** CONCRETE SHALL BE ODOT CLASS QC. REINFORCED STEEL BARS SHALL BE 5/8" ROUND.
- C.** DIMENSIONS AND QUANTITIES ARE SHOWN FOR CIRCULAR SECTIONS ONLY. IT WILL BE NECESSARY TO DETERMINE DIMENSIONS FOR THE HW-1 HEADWALL REQUIRED FOR REINFORCED ELLIPTICAL CONCRETE PIPE OR CORRUGATED METAL PIPE ARCHES IN ACCORDANCE WITH THE EQUATIONS LISTED ON THIS DRAWING.
- D.** CHAMFER ALL EXPOSED CORNERS 3/4".
- E.** WHERE THE SOIL BORINGS INDICATE A BEARING CAPACITY OF LESS THAN 2600 LBS. PER SQUARE FOOT, IT WILL BE NECESSARY TO INCREASE THE WIDTH OF THE BASE.
- F.** MINIMUM COVER FOR REINFORCING STEEL SHALL BE 2".
- G.** FOR PIPES HAVING A DIAMETER OR RISE OVER 36", REFERENCE ODOT HW-3 HEADWALLS FOR FULL HEIGHT HEADWALL.
- H.** FOR SKEWED CULVERTS HAVING A DIAMETER OR RISE OF 36" OR LESS, REFERENCE ODOT HW-2 HEADWALLS.
- I.** HEADWALLS MAY BE PRECAST CONCRETE CONSTRUCTED TO THE ABOVE REQUIREMENTS. GROUT AROUND PIPE AFTER INSTALLATION.

DIMENSIONS			QUANTITIES ONE HEADWALL	
DIAMETER	HEIGHT	LENGTH	CONCRETE C.Y.	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

- L CIRCULAR SECTIONS = $5D + 4T$
 L ELLIPTICAL OR PIPE-ARCH = $4R + 4T + S$
 H CIRCULAR SECTIONS = $D + T + 44"$
 H ELLIPTICAL OR PIPE-ARCH = $R + T + 44"$

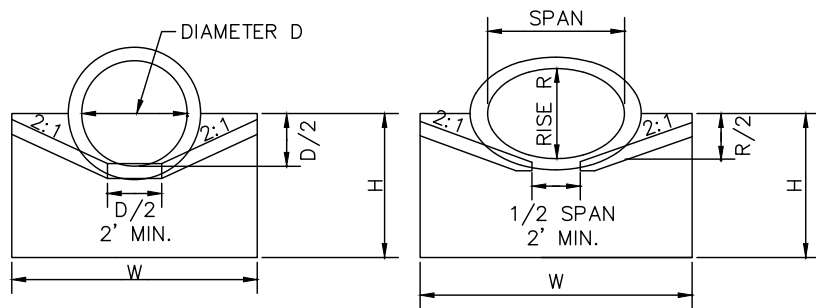
D = DIAMETER OF PIPE
 R = RISE OF PIPE
 S = SPAN OF PIPE
 T = THICKNESS OF BARREL
 L = LENGTH OF HEADWALL
 H = HEIGHT OF HEADWALL

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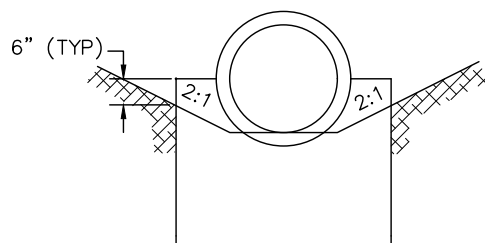
FULL-HEIGHT HEADWALL

REVISIONS:
 DATE APPROVED: NOV 2017
 PAGE No. 600-9

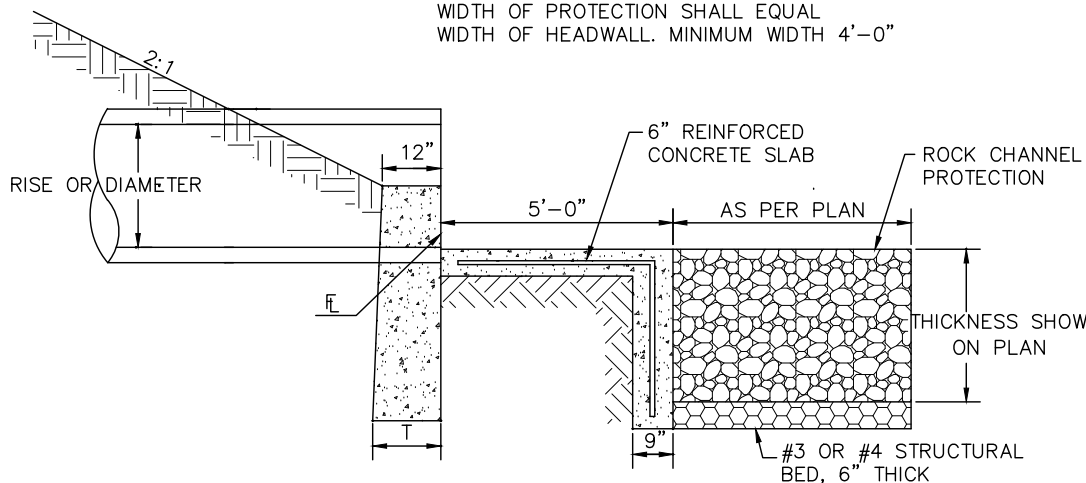


CIRCULAR

ELLIPTICAL



WIDTH OF PROTECTION SHALL EQUAL
WIDTH OF HEADWALL. MINIMUM WIDTH 4'-0"

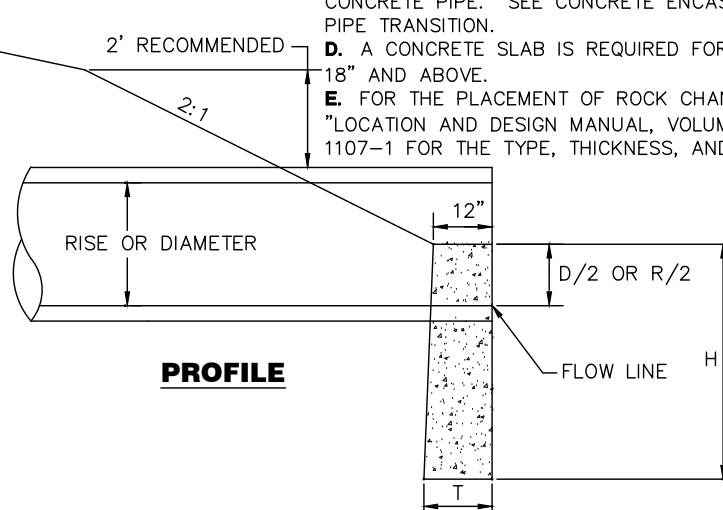


OUTLET CHANNEL PROTECTION DETAIL

(CUTOFF WALL DEPTH 2'-6" MINIMUM IS VARIABLE TO MATCH REQUIRED THICKNESS OF ROCK.)

NOTES

- CONCRETE FOR HEADWALLS SHALL BE ODOT CLASS QC. CONCRETE QUANTITIES ARE BASED ON HEADWALLS ONLY.
- HEADWALLS MAY BE PRECAST CONCRETE CONSTRUCTED TO THE ABOVE REQUIREMENTS. GROUT AROUND PIPE AFTER INSTALLATION.
- LAST 20'± OF PIPE BEFORE HEADWALL SHALL BE REINFORCED CONCRETE PIPE. SEE CONCRETE ENCASEMENT DETAIL, 600-9 FOR PIPE TRANSITION.
- A CONCRETE SLAB IS REQUIRED FOR PIPES WITH A DIAMETER OF 18" AND ABOVE.
- FOR THE PLACEMENT OF ROCK CHANNEL PROTECTION SEE ODOT "LOCATION AND DESIGN MANUAL, VOLUME 2, DRAINAGE DESIGN" TABLE 1107-1 FOR THE TYPE, THICKNESS, AND LENGTH.



PROFILE

HEADWALL FOR CONCRETE PIPE

CIRCULAR				CONC. C.Y.	ELLIPTICAL					CONC. C.Y.
D	W	H	T		SPAN	RISE	W	H	T	
12"	2'-0"	3'-0"	12"	.20	23"	14"	3'-0"	3'-2"	12"	.29
15"	2'-6"	3'-2"	12"	.25	30"	19"	3'-7"	3'-4"	12"	.35
18"	3'-0"	3'-3"	12"	.31	34"	22"	3'-11"	3'-5"	12"	.38
21"	3'-6"	3'-4"	12"	.37	38"	24"	4'-6"	3'-6"	12"	.44
24"	4'-0"	3'-6"	12"	.43	42"	27"	4'-8"	3'-7"	12"	.45
27"	4'-6"	3'-8"	12"	.49	45"	29"	5'-2"	3'-8"	12"	.49
30"	5'-0"	3'-9"	12"	.56	49"	32"	5'-5"	3'-10"	12"	.52
33"	5'-6"	3'-10"	12"	.62	53"	34"	5'-11"	4'-0"	14"	.66
36"	6'-0"	4'-0"	12"	.69	60"	38"	6'-10"	4'-2"	14"	.82
39"	6'-6"	4'-2"	12"	.77	68"	43"	8'-0"	4'-4"	16"	1.01
42"	7'-0"	4'-3"	12"	.84	76"	48"	9'-2"	5'-0"	16"	1.34
48"	8'-0"	4'-6"	14"	1.09	83"	53"	10'-4"	5'-2"	18"	1.65
54"	9'-3"	4'-9"	14"	1.32	91"	58"	11'-6"	5'-5"	18"	1.97
60"	10'-6"	5'-6"	16"	1.93	98"	63"	12'-7"	5'-7"	20"	2.38
66"	11'-9"	5'-9"	18"	2.42	106"	68"	13'-9"	5'-10"	20"	2.69
72"	13'-0"	6'-0"	18"	2.77	113"	72"	14'-9"	6'-0"	22"	3.14
78"	14'-3"	6'-3"	20"	3.37	121"	77"	15'-11"	6'-3"	22"	3.49
84"	15'-6"	6'-6"	22"	4.05	128"	82"	17'-0"	6'-5"	24"	4.04

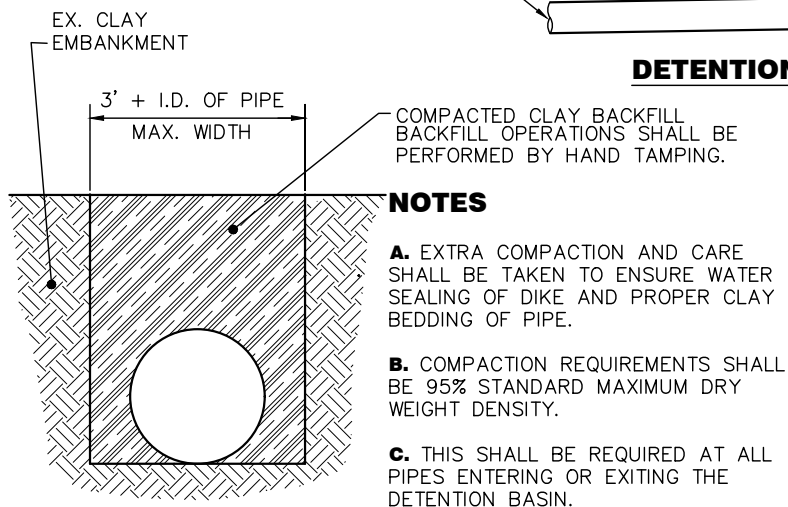
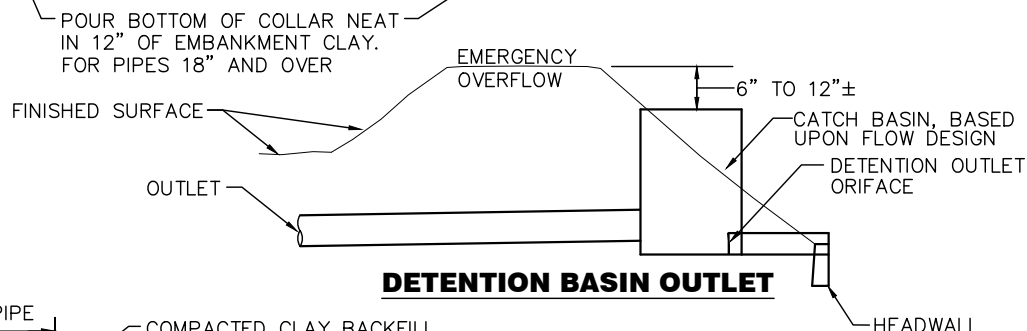
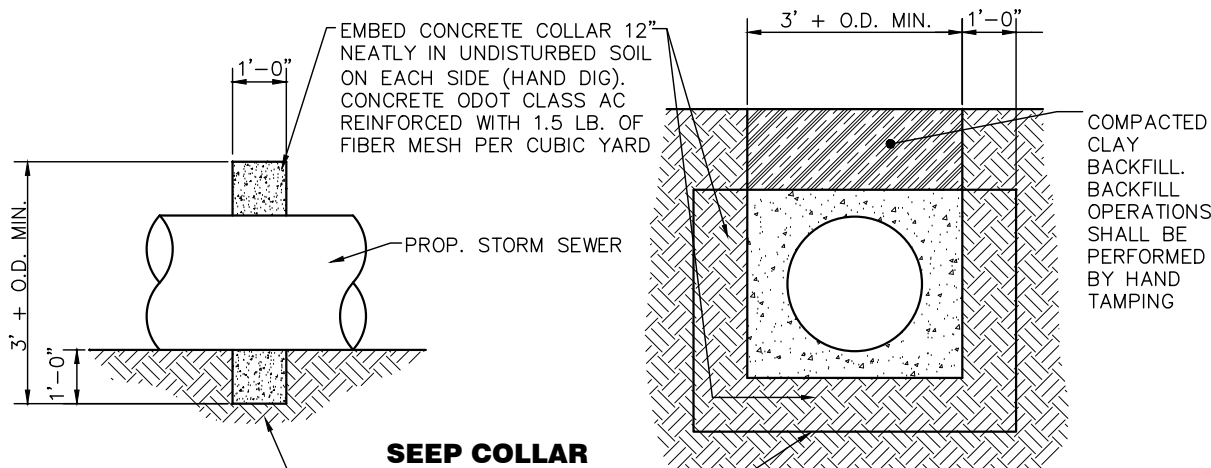
CITY OF TROY



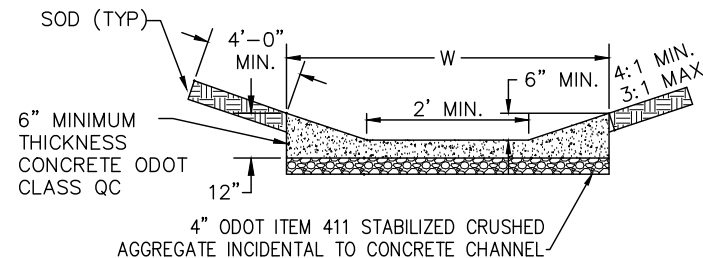
HALF-HEIGHT HEADWALL

REVISIONS:

DATE
APPROVED:
NOV 2017
PAGE No.
600-10



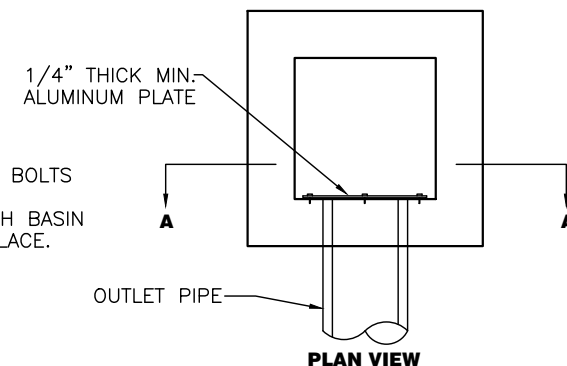
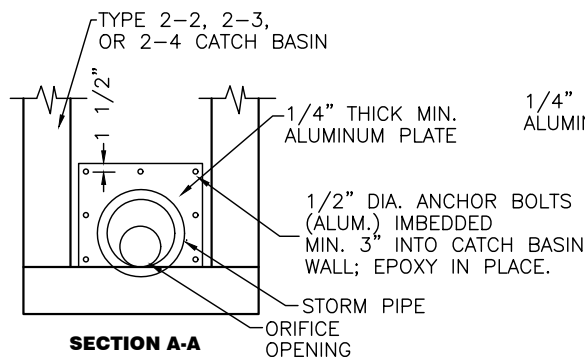
**CLAY TRENCH DETAIL
THROUGH DETENTION BASIN**



PAVED CONCRETE CHANNEL DETAIL

NOTES

- ALL DETENTION BASINS WITH SLOPES LESS THAN 1% REQUIRE CONCRETE CHANNEL.
- "W" SHALL BE DESIGNED FOR A 25 YEAR STORM AND CHECKED FOR A 100 YEAR STORM.
- TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED AT 10', CUT TO A DEPTH OF 1 INCH. EXPANSION JOINTS EVERY 100'.
- BOTTOM OF DRAINAGE DITCH SHALL BE FORMED BEFORE PLACING CONCRETE. ALL FORMS SHALL BE SET TO GRADE AND ALIGNMENT AND BE INSPECTED AND APPROVED BY THE CITY BEFORE POURING CONCRETE.
- RIP RAP SHALL BE USED ON EMERGENCY OVERFLOWS WHEN THE VELOCITY OF WATER WILL SCOUR THE SOIL, OR AS REQUIRED BY ENGINEER.



DETENTION/RETENTION OUTLET ORIFICE

CITY OF TROY



DETENTION/RETENTION BASIN DETAILS

REVISIONS:

DATE
APPROVED:
NOV 2017
PAGE No.
600-11

NOTES

A. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED FOR ALL CONSTRUCTION PROJECTS HAVING SIGNIFICANT GRADING. THE CONTROLS ARE PROVIDED DURING CONSTRUCTION TO PREVENT SOIL ERODED FROM THE CONSTRUCTION AREA FROM ENTERING ADJACENT WATERWAYS AND PROPERTIES.

B. CONSTRUCTION ITEMS INCLUDE SEDIMENT BASINS, SEDIMENT DAMS, DIVERSION DIKES AND/OR DITCHES AND STRAW BALES OR OTHER FILTER DIKES SHOWN ON ODOT STANDARD DRAWING MC-11. OTHER MISCELLANEOUS EROSION CONTROL MEASURES INCLUDE REPAIR TOPSOIL, SEEDING AND MULCHING, COMMERCIAL FERTILIZER, WATER AND MOWING AND ROCK CHANNEL PROTECTION, COVERED IN ODOT SPECIFICATION ITEMS 601, 653 AND 659.

C. THE SIZE OF THE ENTIRE DRAINAGE AREA CONTRIBUTING FLOW IS USED TO DETERMINE THE MOST EFFECTIVE EROSION CONTROL METHOD. IN MANY CASES, THE MAJOR PORTION OF THE CONTRIBUTING AREA WILL BE BEYOND THE PROJECT LIMITS, AND FOR THOSE CASES IT WILL BE NECESSARY TO CONTROL THE FLOW FROM OUTSIDE BEFORE IT REACHES THE AREA DISTURBED BY PROJECT CONSTRUCTION. FLOW FROM THE AREA DISTURBED BY CONSTRUCTION SHALL BE TREATED PRIOR TO COMBINING IT WITH OFF-PAVEMENT DRAINAGE.

D. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED FOR ALL SUBDIVISIONS AND INDIVIDUAL SITES UNLESS OTHERWISE APPROVED. THE CONTROL MEASURES ARE TO BE PROVIDED DURING CONSTRUCTION TO PREVENT EROSION FROM ENTERING ADJACENT WATERWAYS AND PROPERTIES.

E. THERE SHALL BE ONLY ONE CONSTRUCTION ENTRANCE OFF THE SITE, ENTRANCE TO BE CONSTRUCTED OF 8" OF #2 STONE, 75' LONG BY 20' WIDE. CONTRACTOR TO KEEP MUD OFF EXISTING STREETS, NO EQUIPMENT TO BE PARKED ON EXISTING STREETS. MORE THAN ONE ENTRANCE MUST BE APPROVED BY THE CITY.

PLAN SUBMITTAL

A. ALL SITE PLANS SHALL INCLUDE APPROPRIATE EROSION AND SEDIMENT CONTROL DEVICES AND SHALL BE SUBMITTED TO THE CITY FOR APPROVAL PRIOR TO COMMENCEMENT OF ANY WORK UNLESS OTHERWISE APPROVED. ALL PROJECTS WHICH DISTURB 5 ACRES OR MORE MUST HAVE OEPA EROSION CONTROL APPROVALS.

CONSTRUCTION

A. ALL EROSION AND SEDIMENT CONTROL DEVICES MUST BE INSPECTED AND APPROVED BY THE CITY UNLESS OTHERWISE APPROVED.

STORM WATER PERMITS

A. STORM WATER POLLUTION PREVENTION SHOULD BE A HIGH PRIORITY ON ALL CONSTRUCTION PROJECTS. ALL PROJECTS WHICH DISTURB AT LEAST 1 ACRE OF SOIL, A NPDES PERMIT IS REQUIRED FROM OEPA AND A COPY OF THE PERMIT MUST BE ON FILE AT THE CITY BEFORE CONSTRUCTION BEGINS.

B. EROSION CONTROL SUBMITTALS SHALL BE AS PER THE CURRENT STORM WATER MANAGEMENT ORDINANCE.

CONTROL MEASURES

A. DISTURB ONLY THE AREAS NEEDED FOR CONSTRUCTION.

B. REMOVE ONLY THOSE TREES, SHRUBS, AND GRASSES THAT MUST BE REMOVED FOR CONSTRUCTION; PROTECT THE REST TO PRESERVE THEIR AESTHETIC AND EROSION-CONTROL VALUES.

C. INSTALL SEDIMENT BASINS AND DIVERSION DIKES BEFORE DISTURBING THE LAND THAT DRAINS INTO THEM.

D. INSTALL EROSION AND SEDIMENT CONTROL PRACTICES AS INDICATED IN THE PLAN. THE PRACTICES ARE TO BE MAINTAINED IN EFFECTIVE WORKING CONDITION DURING CONSTRUCTION AND UNTIL THE DRAINAGE AREAS HAVE BEEN PERMANENTLY STABILIZED.

E. TEMPORARILY STABILIZE EACH SEGMENT, GRADED OR OTHERWISE DISTURBED LAND, INCLUDING THE SEDIMENT-CONTROL DEVICES NOT OTHERWISE STABILIZED, BY SEEDING AND MULCHING OR BY MULCHING ALONE. AS CONSTRUCTION IS COMPLETED, PERMANENTLY STABILIZE EACH SEGMENT WITH PERENNIAL VEGETATION AND STRUCTURAL MEASURES.

F. LEVEL DIVERSION DIKES, SEDIMENT BASINS, AND SILT TRAPS AFTER AREAS THAT DRAIN INTO THEM ARE STABILIZED. ESTABLISH PERMANENT VEGETATION ON THESE AREAS. SEDIMENT BASINS THAT ARE TO BE RETAINED FOR STORM WATER DETENTION MAY BE SEED TO PERMANENT VEGETATION AFTER THEY ARE BUILT.

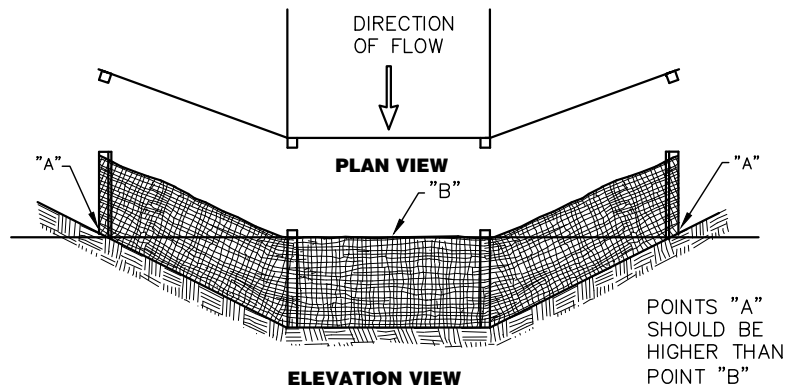
G. DISCHARGE WATER FROM OUTLET STRUCTURES AT NON-EROSIVE VELOCITIES.

CITY OF TROY

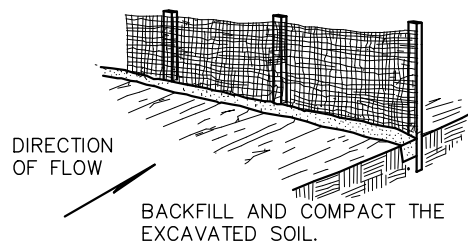
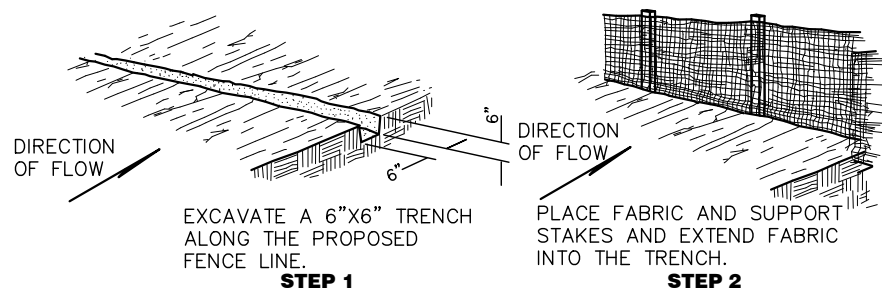


EROSION CONTROL NOTES

REVISIONS:	DATE
	APPROVED:
	NOV 2017
	PAGE No.
	600-12



PLACEMENT AND CONSTRUCTION OF DITCH CHECK FILTER FABRIC FENCE



PLACEMENT AND CONSTRUCTION OF PERIMETER FILTER FABRIC FENCE

CONSTRUCTION OF A FILTER BARRIER (SILT FENCE)

- A. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
- B. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS WHICH MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
- C. TO PREVENT WATER PONDED BY THE SILT FENCE FROM FLOWING AROUND THE ENDS, EACH END SHALL BE CONSTRUCTED UPSLOPE SO THAT THE ENDS ARE AT A HIGHER ELEVATION.
- D. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
- E. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FEET (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
- F. THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
- G. THE SILT FENCE SHALL BE PLACED IN A TRENCH CUT A MINIMUM OF 6 INCHES DEEP. THE TRENCH SHALL BE CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE WHICH WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
- H. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE AND SO THAT 8 INCHES OF CLOTH IS BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6 INCH DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED.
- I. SEAMS BETWEEN SECTIONS OF SILT FENCE SHALL BE OVERLAPPED WITH THE END STAKES OF EACH SECTION WRAPPED TOGETHER BEFORE DRIVING INTO THE GROUND.
- J. MAINTENANCE – SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. ALL THE GAPS AND TEARS IN THE FENCE MUST BE ELIMINATED AND REPAIRED. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER OR AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE: 1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED, 2) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR 3) OTHER PRACTICES SHALL BE INSTALLED.

CRITERIA FOR SILT FENCE MATERIAL

- A. FENCE POSTS – THE LENGTH SHALL BE A MINIMUM OF 32 INCHES LONG. WOOD POSTS WILL BE 2"x2" HARDWOOD OF SOUND QUALITY. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FEET.
- B. SILT FENCE FABRIC SHALL BE ODOT TYPE C GEOTEXTILE FABRIC OR AS DESCRIBED BY THE CHART BELOW:

FABRIC PROPERTIES	
MINIMUM TENSILE STRENGTH	120 LBS.
MAXIMUM ELONGATION AT 60 LBS	50%
MINIMUM PUNCTURE STRENGTH	50 LBS.
MINIMUM TEAR STRENGTH	40 LBS.
MINIMUM BURST STRENGTH	200 PSI
APPARENT OPENING SIZE	≤ 0.84mm
MINIMUM PERMITTIVITY	1X10 ⁻² sec. ⁻¹
ULTRAVIOLET EXPOSURE STRENGTH RETENTION	70%

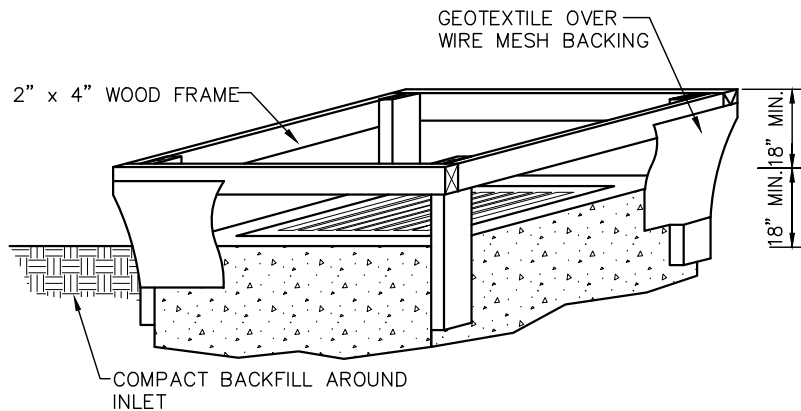
CITY OF TROY



TEMPORARY EROSION CONTROL 1

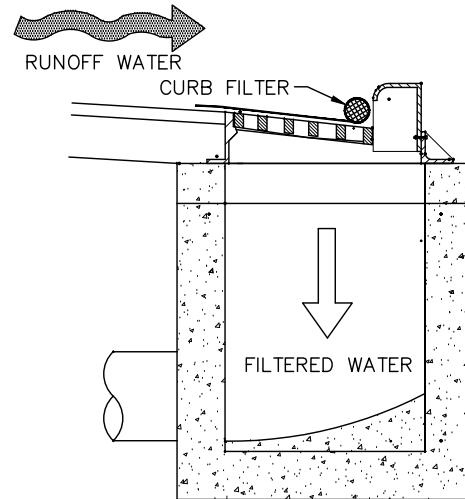
REVISIONS:

DATE
APPROVED:
NOV 2017
PAGE No.
600-13



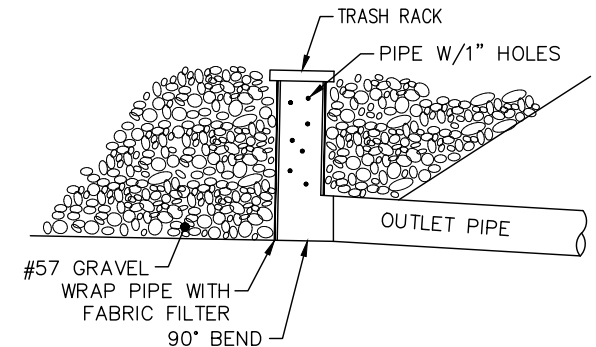
INLET PROTECTION IN SWALES, DITCH LINES OR YARD INLETS

- A. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE STORM DRAIN BECOMES OPERATIONAL.
- B. THE EARTH AROUND THE INLET SHALL BE EXCAVATED COMPLETELY TO A DEPTH A LEAST 18 INCHES.
- C. THE WOODEN FRAME SHALL BE CONSTRUCTED OF 2 INCH BY 4 INCH CONSTRUCTION GRADE LUMBER. THE 2' X 4' POST SHALL BE DRIVEN 1' INTO THE GROUND AT FOUR CORNERS OF THE INLET AND AND THE TOP PORTION OF 2" X 4" FRAME ASSEMBLED USING THE OVERLAP JOINT SHOWN. THE TOP OF THE FRAME SHALL BE AT LEAST 6" BELOW ADJACENT ROAD, IF PONDED WATER WOULD POSE A SAFETY HAZARD TO TRAFFIC.
- D. WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC WITH WATER FULLY IMPOUNDED AGAINST IT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY TO THE FRAME.
- E. GEOTEXTILE SHALL HAVE AN EQUIVALENT OPENING SIZE OF 20-40 SIEVE AND BE RESISTANT TO SUNLIGHT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY. IT SHALL EXTEND FROM THE TOP OF THE FRAME TO 18" BELOW THE INLET NOTCH ELEVATION. THE GEOTEXTILE SHALL OVERLAY ACROSS ONE SIDE OF THE INLET SO THE ENDS OF THE CLOTH ARE NOT FASTENED TO THE SAME POST.
- F. BACKFILL SHALL BE PLACED AROUND THE INLET IN COMPACTED 6" LAYERS UNTIL THE EARTH IS EVEN WITH NOTCH ELEVATION ON ENDS AND TOP ELEVATION ON SIDES.
- G. A COMPACTED EARTH DIKE OR A CHECK DAM SHALL BE CONSTRUCTED IN THE DITCH LINE BELOW THE INLET IF THE INLET IS NOT IN A DEPRESSION, AND IF RUNOFF BY PASSING THE INLET WILL NOT FLOW TO A SETTING POND, THE TOP OF EARTH DIKES SHALL BE AT LEAST 6" HIGHER THAN THE TOP OF THE FRAME.



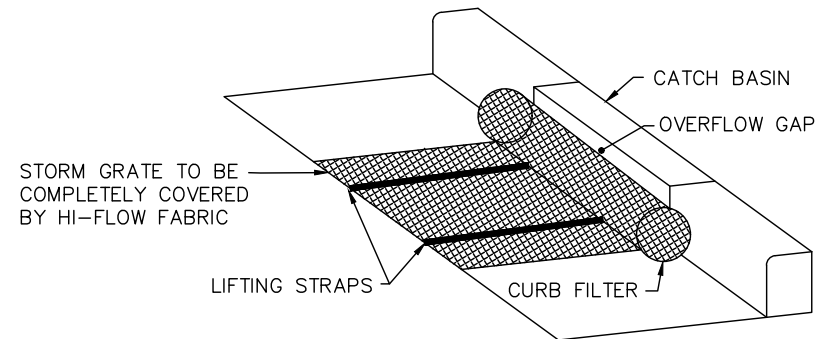
CURB INLET SEDIMENT FILTER

(AS REQUIRED BY THE CITY)



SEDIMENT BASIN OUTLET

TEMPORARILY LOCATED AT BASIN NOT TO BE REMOVED UNTIL SITE HAS BEEN STABILIZED



CURB INLET SEDIMENT FILTER NOTES

- A. DANDY CURB BAG, SEDIGUARD, OR EQUIVALENT MAY BE USED.
- B. REMOVE SEDIMENT FROM CURB INLET PROTECTION BEFORE IT HINDERS THE FILTERING CAPACITY.
 - DANDY CURB BAG: LIFT GRATE AND REMOVE DANDY BAG, CLEAN ACCUMULATED SEDIMENT AND REPLACE BAG AS REQUIRED BY MANUFACTURER.
 - SEDIGUARD: CLEAN SEDIGUARD ONCE IT IS DRY WITH A STIFF BROOM AFTER EVERY RAIN.
- C. INLET PROTECTION SHOULD NEVER INTERFERE WITH SAFETY OF ACTIVE TRAFFIC.

CITY OF TROY



TEMPORARY EROSION CONTROL 2

REVISIONS:	DATE
	APPROVED:
	NOV 2017
	PAGE No.
	600-14

NOTES

A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE CITY UNLESS 2 WORKING DAYS NOTICE OF COMMENCING WORK IS GIVEN TO THE CITY.

B. THE MINIMUM LENGTH OF PIPE NIPPLES SHALL BE 18" UNLESS OTHERWISE APPROVED BY THE CITY.

C. ALL CUSTOMERS SHALL MEET BACKFLOW PREVENTION REQUIREMENTS AS PER LOCAL, STATE, AND FEDERAL REGULATIONS.

D. ALL WATERLINE CONSTRUCTION INCLUDING EXTENSIONS ON PRIVATE PROPERTY SHALL FOLLOW THE CITY STANDARDS, ODOT ITEM 638, AND AWWA STANDARDS WHICHEVER IS MORE RESTRICTIVE AS DETERMINED BY THE CITY.

E. OPERATION OF CITY FIRE HYDRANTS, VALVES, METERS, SERVICES, STOPS, AND ALL OTHER MECHANICAL INFRASTRUCTURE ITEMS IS STRICTLY PROHIBITED.

F. ALL WATER MAINS SHALL HAVE A MINIMUM DEPTH OF 4'-6" AND A MAXIMUM DEPTH OF 6'-0" FROM TOP OF PIPE TO SURFACE, UNLESS OTHERWISE APPROVED FOR DESIGN.

MINIMUM SEPARATION

3/4" - 1"	18"
2"	24"
3" & GREATER	10'

G. ALL TAPS INTO EXISTING WATER MAIN SHALL BE INSTALLED OR OBSERVED BY CITY OF TROY.

H. ALL SERVICE CONNECTIONS REQUIRE A METER.

I. A REPRESENTATIVE FROM THE PROPERTY OWNER OR DEVELOPER SHALL BE RESPONSIBLE FOR PAYING TAP-IN FEE AND SIGNING UP FOR ACCOUNT IN ORDER FOR A METER TO BE SET.

J. DEAD-ENDS ARE NOT PERMITTED AND MUST BE LOOPED UNLESS THEY ARE DEEMED UNPRACTICAL BY THE CITY ENGINEERING DEPARTMENT AFTER A REVIEW OF A WATER MAIN DESIGN. WHEN APPROVED THEY SHALL BE TERMINATED WITH A FIRE HYDRANT AT THE END.

ABANDONED WATER MAIN

DURING THE CONSTRUCTION OF THIS PROJECT, IF THERE ARE CONFLICTS THAT ARISE BETWEEN PROPOSED CONSTRUCTION AND THE PROPOSED ABANDONED WATER MAIN, THE CONTRACTOR MAY CUT AND REMOVE THE EXISTING WATER MAIN AND PLUG THE OPEN ENDS ONLY AFTER THE EXISTING WATER MAIN IS COMPLETELY ABANDONED. THE CONTRACTOR SHALL CLOSE ALL ABANDONED VALVES, REMOVE THE VALVE BOX, AND PLACE CONCRETE TO SECURE VALVE IN THE CLOSED POSITION WHEN SYSTEM IS APPROVED, THEN TRANSFER TO NEW WATER MAIN. THE ABOVE WORK IS INCIDENTAL TO ITEM 638 WATER

MATERIAL SPECIFICATIONS

A. DOMESTIC STEEL: ALL FITTINGS, PIPE, AND VALVES SHALL MEET DOMESTIC STEEL USE REQUIREMENTS AS SPECIFIED IN SECTION 153.011 OF OHIO REVISED CODE.

B. WATER MAIN SHALL BE AWWA C-151 DUCTILE IRON PIPE CLASS 52, WITH SLIP-ON JOINTS AND RUBBER GASKETS. ALL WATER MAIN SHALL BE A MINIMUM OF 8" IN DIAMETER FOR RESIDENTIAL AND 10" FOR COMMERCIAL AND INDUSTRIAL.

C. BELL JOINT RESTRAINTS - USE FIELD LOCK BY U.S. PIPE OR APPROVED EQUIVALENT.

D. MECHANICAL JOINT RESTRAINTS - EBAA IRON MEGALUG RETAINER GLAND OR EQUIVALENT.

E. FIRE HYDRANTS - SEE FIRE HYDRANT DETAIL.

F. GATE VALVES - GATE VALVES SHALL BE AWWA C-515, RESILIENT WEDGE, NONRISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, OPEN LEFT WITH ARROW INDICATING OPEN DIRECTION, MUELLER, AMERICAN ALPHA, AMERICAN FLOW CONTROL, OR CLOW.

G. VALVE BOXES SHALL BE 3-PIECE, ADJUSTABLE 36" TO 48", 5.25" DIAMETER NOMINAL, ADJUSTABLE SCREW TYPE, COVER MARKED "WATER", DOMESTIC MADE ONLY.

H. TRACER WIRE IS REQUIRED OVER ALL WATER MAIN REGARDLESS OF PIPE TYPE. SEE TRACER WIRE DETAIL.

FITTINGS, VALVES AND HYDRANTS

A. FITTINGS OR SPECIALS IN SIZES 12" THROUGH 48" SHALL CONFORM TO ALL REQUIREMENTS OF AWWA C-153. FITTINGS AND SPECIALS 12" AND SMALLER SHALL BE CLASS 250. LARGER FITTINGS AND SPECIALS SHALL BE CLASS 150. FITTINGS AND SPECIALS SHALL HAVE MECHANICAL JOINTS AND SHALL BE DUCTILE IRON. CLUSTER VALVES WHENEVER POSSIBLE UNLESS APPROVED BY THE CITY.

MAXIMUM SPACING UNLESS OTHERWISE APPROVED		
	HYDRANTS	VALVES
SINGLE & TWO FAMILY RESIDENTIAL	500'	800'
INDUSTRIAL, COMMERCIAL & MULTI-FAMILY	300'	500'

C. ALL TEES AND CROSSES SHALL BE VALVED IN EACH DIRECTION UNLESS OTHERWISE APPROVED.

D. NO VALVE SHALL BE OPERATED BY PERSONNEL OTHER THAN A REPRESENTATIVE EMPLOYED BY THE CITY.

CITY OF TROY



MISCELLANEOUS WATER NOTES 1

REVISIONS:	DATE
OCT 2018	APPROVED:
DEC 2019	NOV 2017
AUG 2024	PAGE No.
	800-1

DISINFECTION

A. DISINFECTION TESTING SHALL BE PERFORMED PRIOR TO HYDROSTATIC TESTING. COORDINATE WITH CITY OF TROY TO PERFORM ALL WATER MAIN TESTING. THE COMPLETED WATER WORK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C-651.

B. DISINFECTION OR STERILIZATION OF NEW MAINS AND SERVICES, AS REQUIRED BY THE OEPA, SHALL BE COORDINATED THROUGH THE CITY ENGINEER OR CITY ENGINEER'S REPRESENTATIVE. THE CITY ENGINEER OR CITY ENGINEER'S REPRESENTATIVE RESERVES THE RIGHT TO REQUIRE STRICTER CHLORINE RESIDUAL REQUIREMENTS ON A CASE-BY-CASE BASIS.

C. MAINTAIN PIPES FREE OF DIRT AND FOREIGN MATTER DURING CONSTRUCTION BY DEWATERING TRENCH AND SEALING OPEN PIPE BARRELS. SWAB EACH LENGTH OF PIPE AS IT IS INSTALLED. UPON COMPLETION OF MAIN, ISOLATE MAIN SEGMENTS AND FLUSH PIPE AT 2 FPS VELOCITY.

D. STERILIZE MAIN IN ACCORDANCE WITH AWWA C-651. INJECT 3% TO 5% HYPO CHLORITE SOLUTION TO PROVIDE 50 TO 60 MG PER LITER CONCENTRATION IN MAIN. CHLORINE MAY BE PLACED IN EACH SECTION OF PIPE AT THE TIME OF INSTALLATION. SAMPLE WATER AT EACH HYDRANT OR IF NO HYDRANT IS AVAILABLE, A SAMPLE TAP SHALL BE INSTALLED BY CONTRACTOR EVERY 1200 FT.. ANALYZE SAMPLE USING ORTHOTOLIDINE REAGENT TO VERIFY FREE CHLORINE CONCENTRATION. MAINTAIN CONCENTRATION IN MAIN FOR 24 HOURS. SAMPLE HYDRANTS AT COMPLETION OF STERILIZATION VERIFYING MINIMUM CHLORINE RESIDUAL OF 20 MG PER LITER.

E. CONTRACTOR SHALL ACCOMMODATE FLUSHING AND SAMPLE LOCATIONS

F. WATER SAMPLES – BACTERIOLOGICAL TEST PER AWWA C-651. TEST TO BE COLLECTED AND PERFORMED BY THE CITY.

HYDROSTATIC TEST

A. AFTER THE PIPE HAS BEEN LAID AND BACKFILLED, ALL NEWLY LAID PIPE OR VALVED SECTION SHALL BE SUBJECTED TO HYDROSTATIC PRESSURE AND LEAKAGE TEST. ALL WATER MAINS MUST BE HYDROSTATICALLY TESTED (AWWA C-605). THE LEAKAGE TEST PRESSURE SHALL BE NOT LESS THAN 150 PSI FOR 30 MINUTES FOR DOMESTIC WATER MAIN. THE TEST SHALL NOT BE LESS THAN 200 PSI FOR 2 HOURS AND SHALL BE IN ACCORDANCE TO THE REQUIREMENT OF THE CITY'S FIRE DEPARTMENT FOR FIRE WATER MAIN. HYDROSTATIC PRESSURE SHALL BE APPLIED BY MEANS OF A PUMP TAKING WATER FROM AN AUXILIARY SUPPLY. ALL PIPING MUST BE PROPERLY FILLED AND FLUSHED TO DISPEL ALL AIR BEFORE THE TEST IS MADE USING POTABLE WATER.

A BURIED FIRE WATER MAIN SHALL BE PERMITTED BY THE MIAMI COUNTY DEVELOPMENT DEPARTMENT, CONTACT AT (937) 440-8121. A BURIED FIRE WATER MAIN IS LOCATED BETWEEN THE MASTER METER PIT AND THE RISER INSIDE THE BUILDING.

B. WITNESS TESTING FOR DOMESTIC AND IRRIGATION WATER MAIN SHALL BE BY THE CITY'S ENGINEERING DEPARTMENT AT (937) 339-2641. WITNESS TESTING FOR FIRE WATER MAIN SHALL BE BY THE CITY OF TROY'S FIRE DEPARTMENT AT (937) 335-5678.

C. LEAKAGE IS DEFINED AS THE QUANTITY OF WATER TO BE SUPPLIED INTO THE NEWLY LAID PIPE, OR ANY VALVED SECTION THEREOF, NECESSARY TO MAINTAIN THE SPECIFIED LEAKAGE TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR EXPELLED.

D. NO PIPE INSTALLATION WILL BE ACCEPTED IF THE LEAKAGE EXCEEDS THE LEAKAGE DETERMINED BY THE FOLLOWING FORMULA:

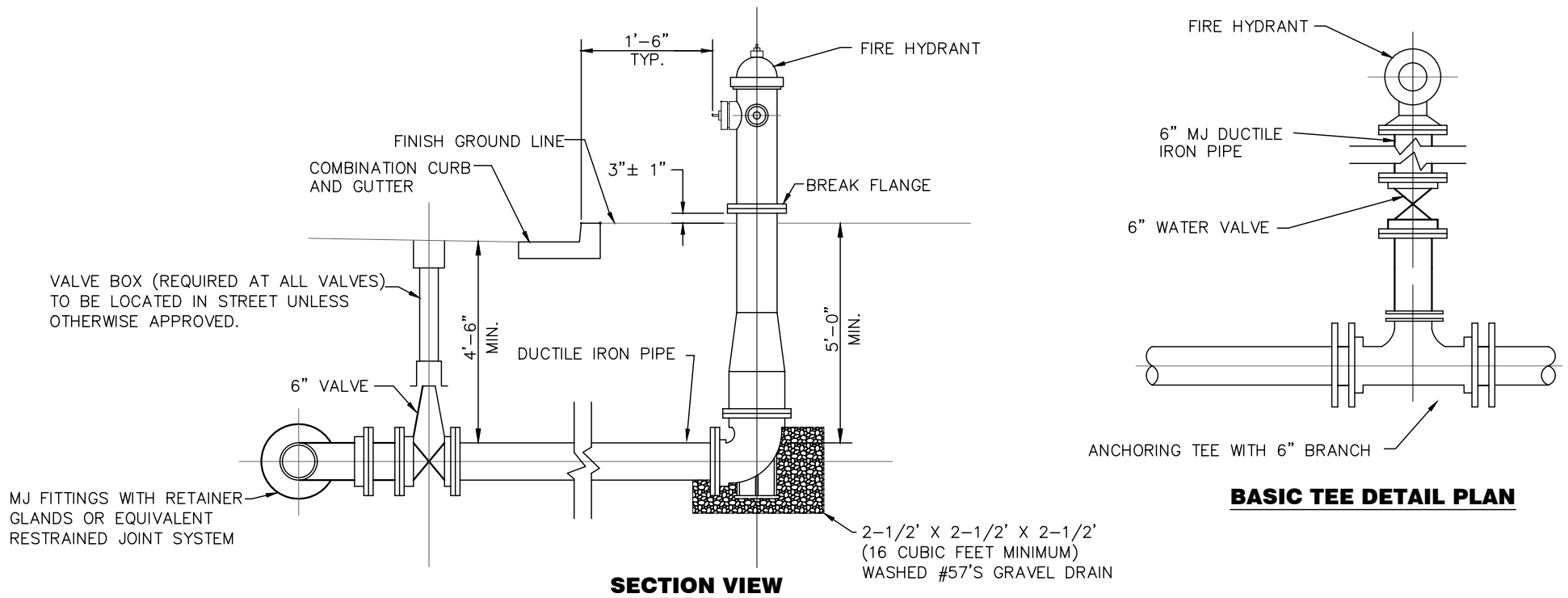
Where: S = length of pipe tested, in ft. $L = \frac{S * D * \sqrt{P}}{148,000}$
D = pipe diameter, in inches
P = average test pressure
L = allowable leakage per hour

E. DURING THE HYDROSTATIC TEST, A THOROUGH EXAMINATION OF ALL PIPING, FITTINGS, VALVES, HYDRANTS, ETC. SHALL BE PERFORMED. LEAKING JOINTS SHALL BE TIGHTENED, AND CRACKED OR OTHERWISE DEFECTIVE MATERIAL SHALL BE REMOVED AND REPLACED AND THE TEST SHALL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED.

BELOW IS A TABLE WHICH REPRESENTS THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR.

ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE

Avg. Test Pressure psi(bar)	NOMINAL PIPE DIAMETER— INCHES					
	3	4	6	8	10	12
450(31)	0.43	0.57	0.86	1.15	1.43	1.72
400(28)	0.41	0.54	0.81	1.08	1.35	1.62
350(24)	0.38	0.51	0.76	1.01	1.26	1.52
300(21)	0.35	0.47	0.70	0.94	1.17	1.40
275(19)	0.34	0.45	0.67	0.90	1.12	1.34
250(17)	0.32	0.43	0.64	0.85	1.07	1.28
225(16)	0.30	0.41	0.61	0.81	1.01	1.22
200(14)	0.29	0.38	0.57	0.76	0.96	1.15
150(10)	0.25	0.33	0.50	0.66	0.83	0.99
175(12)	0.27	0.36	0.54	0.72	0.89	1.07



NOTES

- A.** FIRE HYDRANTS – AMERICAN DARLING B84B; TWO 2-1/2" HOSE NOZZLE WITH DAYTON THREAD CONNECTIONS; ONE 4" I.D (4-1/2" O.D.) WITH 5" STORZ PUMPER NOZZLE, NOT NATIONAL STANDARD THREADS (NST); CONFORMING TO AWWA; CCW TO OPEN; SELF-DRAINING; BREAK FLANGES 3" ABOVE GRADE. 5" STORZ MUST HAVE 90° AND 22.5° BEND.
- B.** FIRE HYDRANT BASES – HYDRANT INLET SHALL BE DESIGNED FOR MULTI-PURPOSE MATERIAL USE WITH A WIDE RANGE OF PIPE OUTSIDE DIAMETERS (O.D.), INLET SHALL INCORPORATE A STAB-FIT DESIGN REQUIRING THE USE OF ONLY ONE TYPE 304 STAINLESS STEEL FASTENER, RESTRAINT ACCESSORIES SHALL BE FACTORY INSTALLED AND ALL HYDRANT INLETS SHALL BE ALPHA DESIGN FURNISHED BY AMERICAN FLOW CONTROL.
- C.** GATE VALVES SHALL BE AWWA C-515, RESILIENT WEDGE, NONRISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, CCW TO OPEN WITH ARROW INDICATING OPEN DIRECTION, MUELLER, AMERICAN ALPHA OR EQUIVALENT. DOMESTIC MADE ONLY. VALVE SHALL BE PLACED AS CLOSE TO THE WATER MAIN AS POSSIBLE.
- D.** VALVE BOXES SHALL BE 3-PIECE, ADJUSTABLE 36" TO 48", 5.25" DIAMETER NOMINAL, ADJUSTABLE SCREW TYPE, COVER MARKED "WATER", DOMESTIC MADE ONLY.
- E.** ALL FITTINGS TO BE RESTRAINED AND AWWA C-153 DUCTILE IRON, COMPACT.
- F.** ALL VALVES AND HYDRANTS SHALL OPEN LEFT BY TURNING IN A COUNTER-CLOCKWISE DIRECTION.
- G.** CONTRACTOR TO FACE HYDRANT AS REQUIRED BY THE CITY.
- H.** HYDRANT BODY SHALL BE YELLOW AND DOME SHALL BE WHITE.
YELLOW– DOPANI YELLOW 3186 OR APPROVED EQUAL.
WHITE– POLAR WHITE WITH REFLECTIVE CLEAR COAT 822900

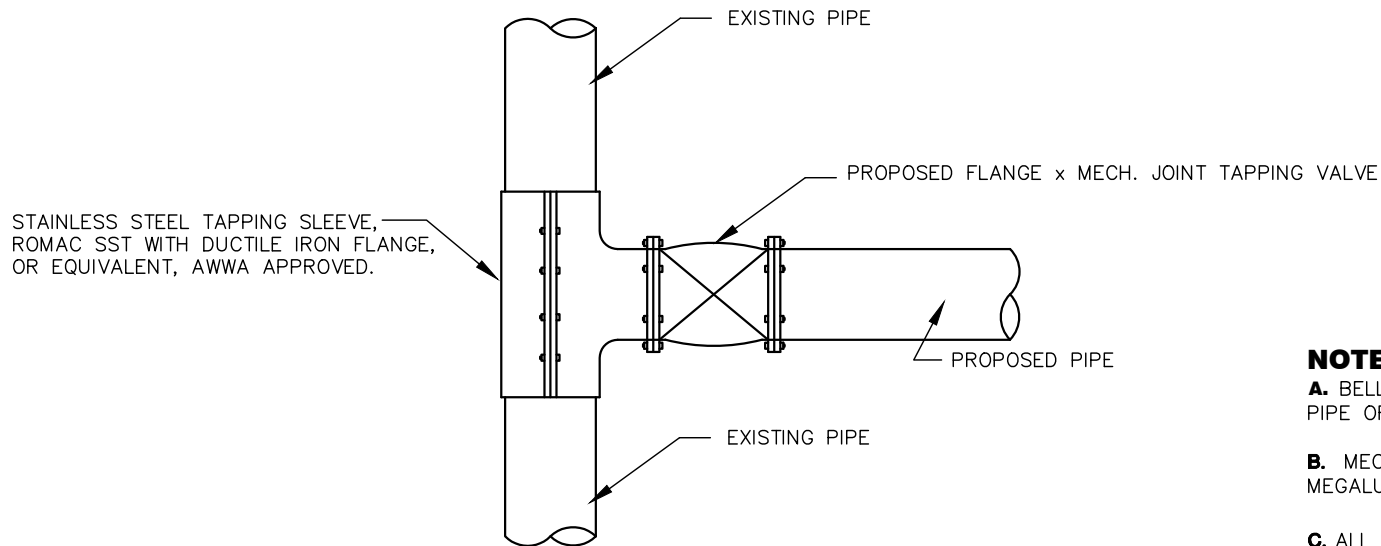
CITY OF TROY



FIRE HYDRANT DETAIL

REVISIONS:
OCT 2018
DEC 2019
AUG 2024

DATE
APPROVED:
NOV 2017
PAGE No.
800-3



TAPPING SLEEVE AND VALVE DETAIL

NOTES

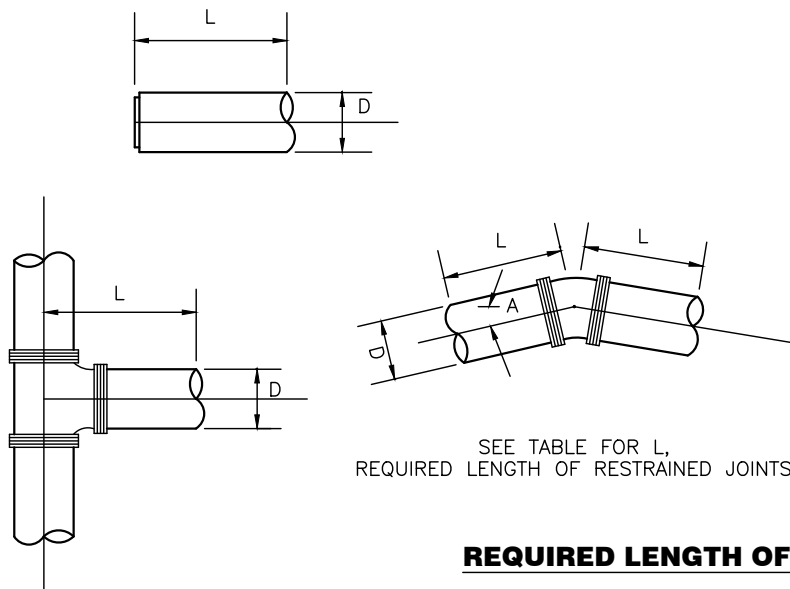
A. BELL JOINT RESTRAINTS – USE FIELD LOCK BY U.S. PIPE OR APPROVED EQUIVALENT.

B. MECHANICAL JOINT RESTRAINTS – EBAA IRON MEGALUG RETAINER GLAND OR EQUIVALENT.

C. ALL MECHANICAL BENDS, TEES, ETC., SHALL BE RESTRAINED USING MECHANICAL RESTRAINING JOINTS.

D. TEST SLEEVE TO 150 PSI(200 PSI FOR FIRE LINE) PRIOR TO CUTTING IN COVING PIPE

E. TAPPING SLEEVE AND VALVE SHALL BE PROVIDED BY CONTRACTOR WHEN TYING INTO THE EXISTING WATER MAIN.



	D-DIAMETER OF PIPE							
	4"	6"	8"	10"	12"	16"	20"	24"
11-1/4°	4	5	7	8	9	11	14	16
22-1/2°	7	10	13	15	18	23	27	32
45°	14	20	26	31	36	47	57	66
90°	34	47	62	74	87	112	136	160
TEE	34	47	62	74	87	112	136	160
END	34	47	62	74	87	112	136	160

A ~ DEGREE OF DEFLECTION

*REQUIRED RESTRAINED JOINT AT FITTING AND ONE BELL JOINT FROM FITTING MINIMUM.

DESIGN PARAMETERS FOR RESTRAINED JOINT TABLE

LAYING CONDITIONS – TYPE 2
SOIL DESIGNATION – SILT
DEPTH OF COVER – 5'-0"
DESIGN PRESSURE – 150 PSI
SAFETY FACTOR – 1.50
POLYWRAPPED PIPE
IF WORST CONDITIONS EXIST, ADDITIONAL RESTRAINTS WILL BE NECESSARY.

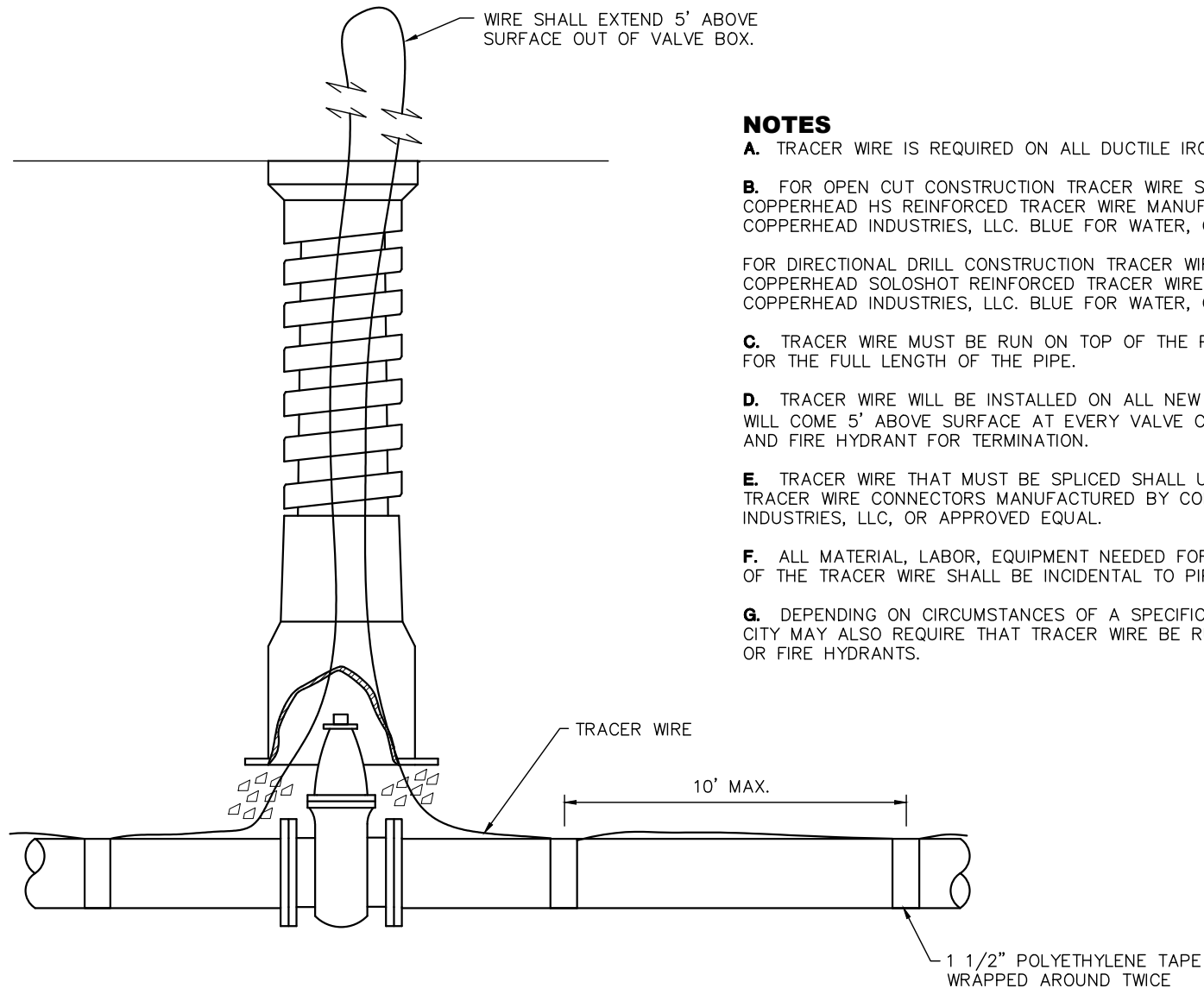
REQUIRED LENGTH OF RESTRAINED JOINTS FOR WATER MAINS

CITY OF TROY



**RESTRAINING JOINTS AND
TAPPING SLEEVE FOR WATER MAINS**

REVISIONS: DATE
APPROVED:
NOV 2017
PAGE No.
800-4



NOTES

- A.** TRACER WIRE IS REQUIRED ON ALL DUCTILE IRON WATER MAIN.
- B.** FOR OPEN CUT CONSTRUCTION TRACER WIRE SHALL BE COPPERHEAD HS REINFORCED TRACER WIRE MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC. BLUE FOR WATER, OR APPROVED EQUAL.

FOR DIRECTIONAL DRILL CONSTRUCTION TRACER WIRE SHALL BE COPPERHEAD SOLOSHOT REINFORCED TRACER WIRE MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC. BLUE FOR WATER, OR APPROVED EQUAL.
- C.** TRACER WIRE MUST BE RUN ON TOP OF THE PIPE CONTINUOUSLY FOR THE FULL LENGTH OF THE PIPE.
- D.** TRACER WIRE WILL BE INSTALLED ON ALL NEW INSTALLATION AND WILL COME 5' ABOVE SURFACE AT EVERY VALVE CHAMBER, VALVE BOX, AND FIRE HYDRANT FOR TERMINATION.
- E.** TRACER WIRE THAT MUST BE SPLICED SHALL USE SNAKEBITE TRACER WIRE CONNECTORS MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC, OR APPROVED EQUAL.
- F.** ALL MATERIAL, LABOR, EQUIPMENT NEEDED FOR THE INSTALLATION OF THE TRACER WIRE SHALL BE INCIDENTAL TO PIPE INSTALLATION.
- G.** DEPENDING ON CIRCUMSTANCES OF A SPECIFIC INSTALLATION, THE CITY MAY ALSO REQUIRE THAT TRACER WIRE BE RUN TO CURB BOXES, OR FIRE HYDRANTS.

CITY OF TROY

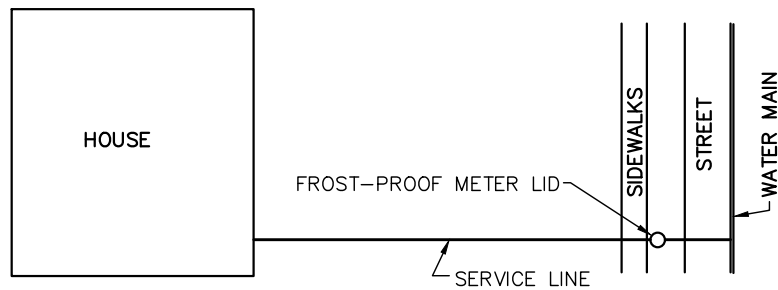
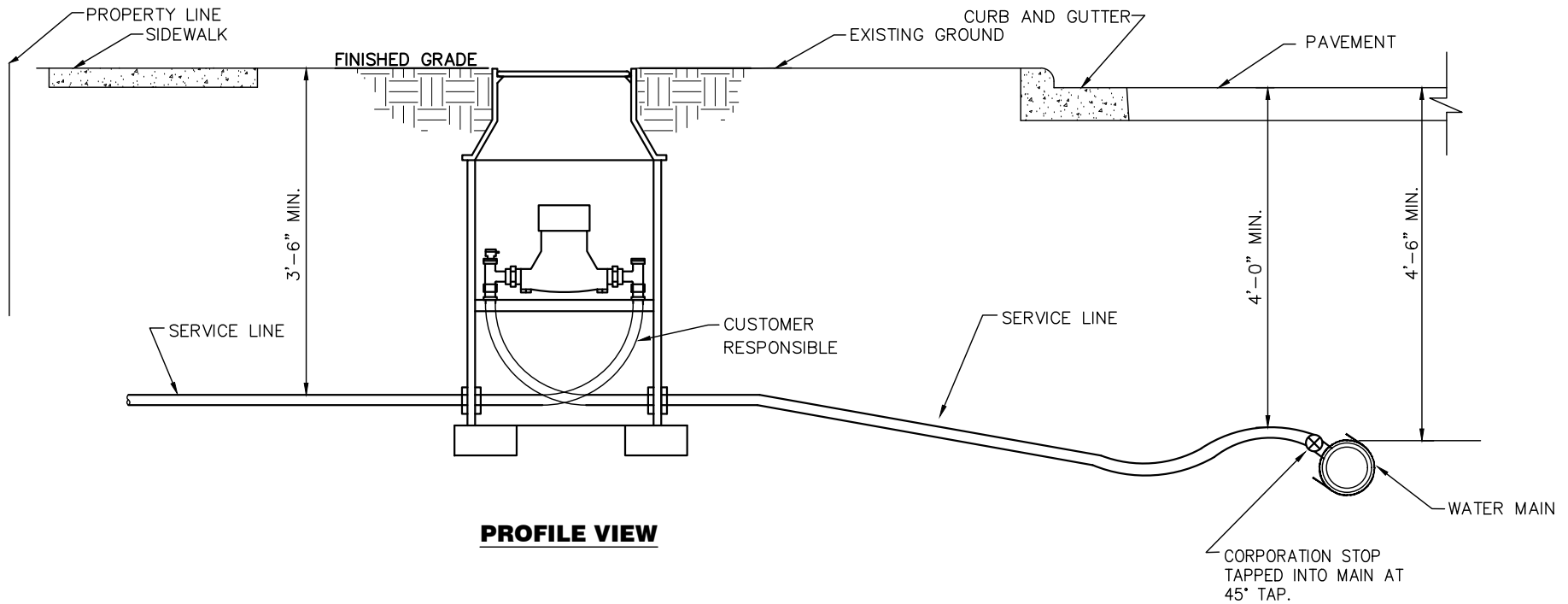


TRACER WIRE DETAIL

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
800-5



NOTES

- A.** ALL WATER SERVICE LINES SHALL BE LOCATED BETWEEN THE CURB AND SIDEWALK WITHIN 4' OF THE PROPERTY LINE. METER PIT TO BE PLACED BETWEEN CURB AND SIDEWALK.
- B.** METER PIT PROVIDED BY CITY ONLY FOR NEW HOME CONSTRUCTION.
- C.** UNSATISFACTORY INSTALLATION WILL RESULT IN WATER NOT BEING TURNED ON.
- D.** SERVICE LINE IS TO BE BEDDED IN 4" AND COVERED WITH 12" OF NATURAL OR STRUCTURAL MATERIAL(NO LIMESTONE) FROM WATER MAIN TO HOUSE.
- E.** SERVICE LINE FROM METER PIT OR CURB STOP TO INSIDE BUILDING – TYPE "K" COPPER TUBE WITH COMPRESSION FITTINGS OR SDR-9 200 PSI AWWA C-901 OR APPROVED EQUAL.
- F.** CAP REQUIRED AT TEMPORARY END OF RESIDENTIAL SIDE.

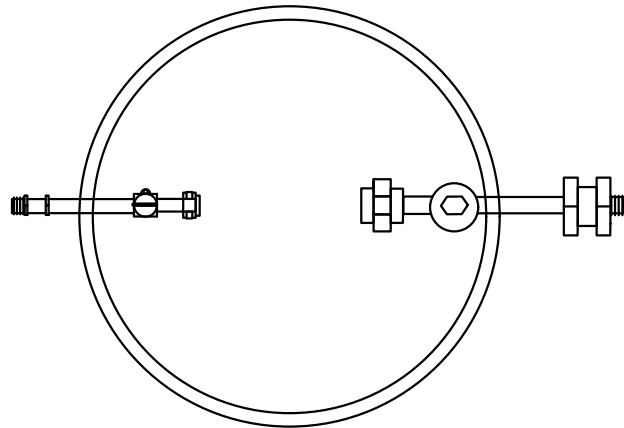
CITY OF TROY



WATER MAIN SERVICE CONNECTION - OUTSIDE

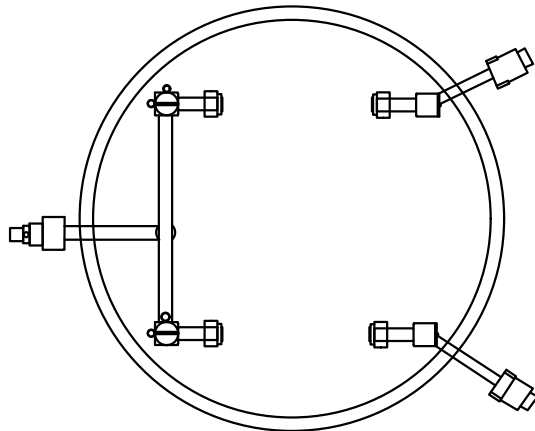
REVISIONS:
OCT 2018
DEC 2019
AUG 2024

DATE
APPROVED:
NOV 2017
PAGE No.
800-6



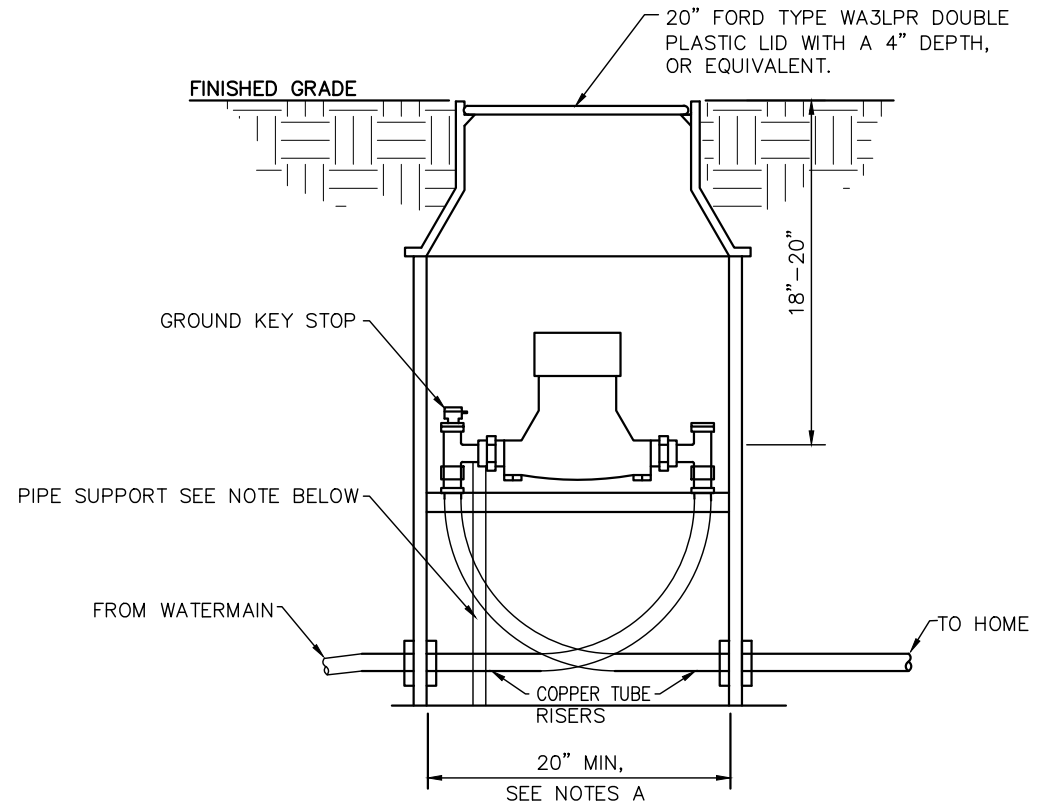
TOP VIEW SINGLE METER SETTING

SINGLE 5/8" METER



TOP VIEW DOUBLE METER SETTING

DOUBLE 5/8" OR 1" METER



PROFILE VIEW

NOTES

- A.** 20" I.D. PLASTIC TILE FOR 5/8" METERS OR 24" I.D. (BULLET-STYLE) PLASTIC TILE FOR 1" METER OR DOUBLE 5/8" METERS. ALL OTHERS MUST BE APPROVED PRIOR TO INSTALLATION.
- B.** METER PIT LID MUST BE FLUSH OR 1" BELOW FINISHED GRADE.
- C.** SERVICE LINE FROM MAIN TO METER PIT OR CURB STOP SHALL BE 1" TYPE K COPPER.
- D.** IF SERVICE FROM METER PIT TO HOUSE IS PLASTIC, THE CUSTOMER SHALL PROVIDE PIPE SUPPORT IN METER PIT.
- E.** ALL PIPES SHALL ENTER METER PIT FROM THE BOTTOM OF METER BOX. NO HOLES SHALL BE CUT INTO THE SIDEWALL(S).

CITY OF TROY

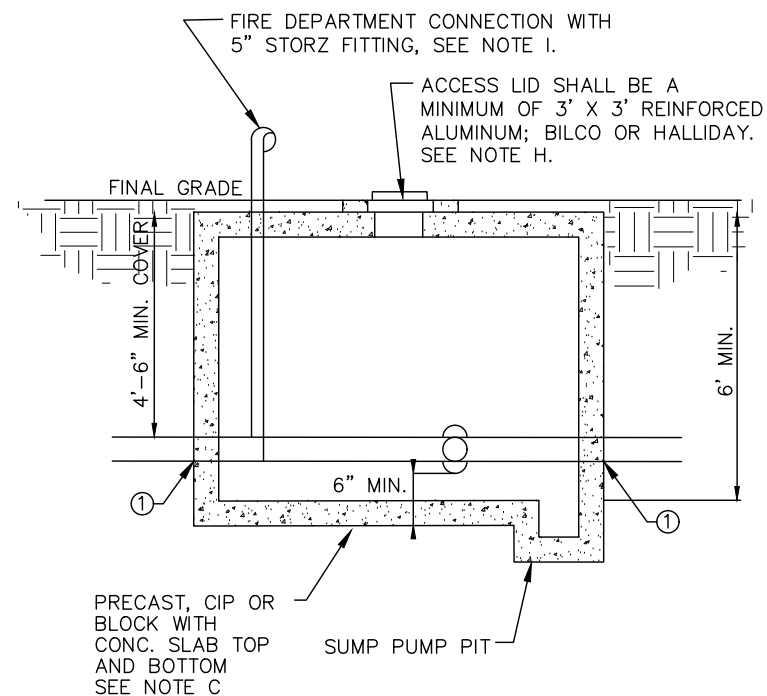
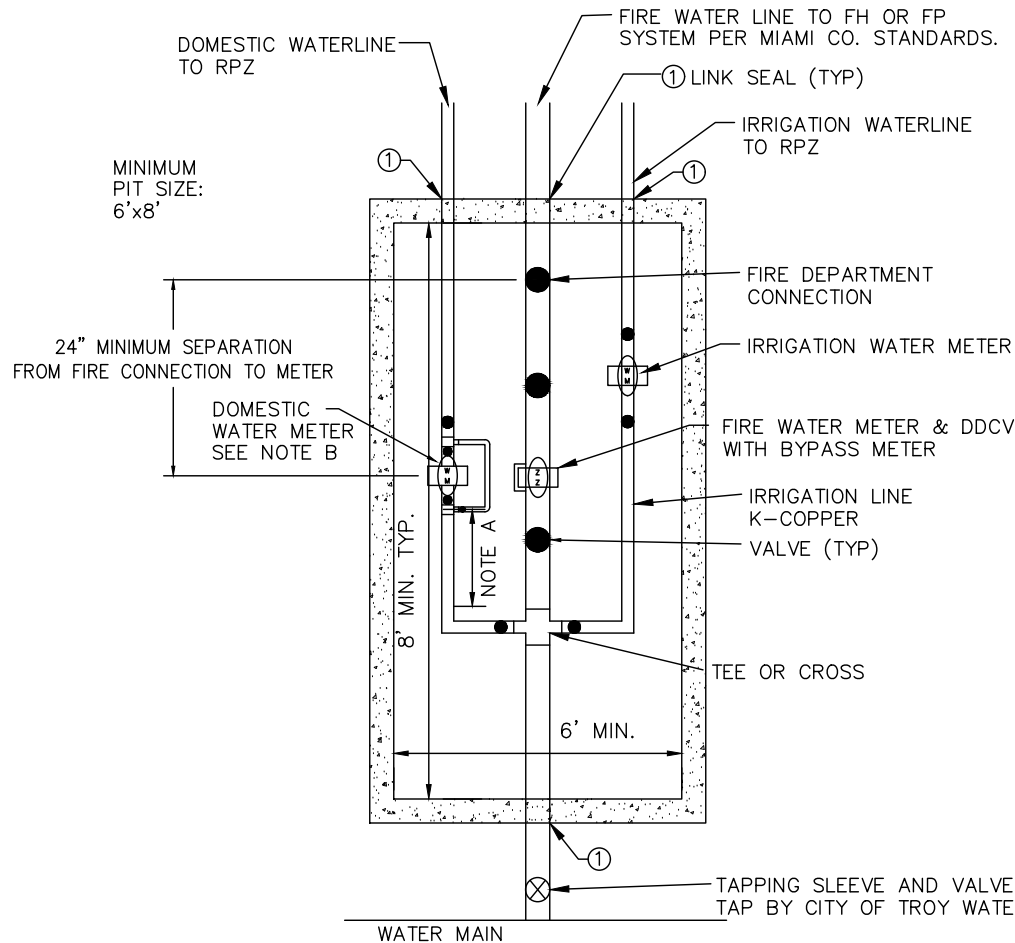


1" AND SMALLER METER PIT DETAIL

REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

PAGE No.
800-7



LEGEND

RPZ = REDUCED PRESSURE BACKFLOW PREVENTER.
 FH = FIRE HYDRANT
 FP = FIRE PREVENTION
 DDCV = DOUBLE DETECTOR CHECK VALVE.
 DIP = DUCTILE IRON PIPE CLASS 52
 • = VALVE UNLESS OTHERWISE NOTED
 CIP = CAST IN PLACE
 ① = LINK SEAL (TYP)

NOTES

A. DIMENSION SHALL BE A MIN. OF 5 TIMES THE PIPE DIAMETER BETWEEN METER AND UPSTREAM FITTING.
B. THE CITY OF TROY SHALL PROVIDE THE WATER METERS, GASKETS AND BOLTS; ALL OTHER MATERIALS AND SUPPLIES TO BE PROVIDED BY THE CONTRACTOR. UNIFLANGE OR HYMAX CONNECTION AND ALL OTHER PARTS SHALL BE SUPPLIED BY THE CONTRACTOR. FORD CUSTOM SETTER ON COPPER SERVICES OR DIP BYPASS ON 4 INCH AND LARGER LINES. METER SETTER TO BE VBB76-13B-44-66-NL FOR 1-1/2" AND VBB77-12B-44-77-NL FOR 2".
C. SUMP PUMP PIT IS TO BE CONNECTED TO A STORM OUTLET.

D. PIT SIZE AND ACTUAL CONFIGURATION TO MEET CITY'S APPROVAL PRIOR TO INSTALLATION. NO STEPS ARE REQUIRED. FOR PITS WITH ONLY 1-1/2' OR 2" METERS AND NO IRRIGATION METER, A 48" DIAMETER MANHOLE WITH A 36" X36" BILCO OR HALLIDAY LID IS ACCEPTABLE. THE CURB BOX AND VALVE SHALL BE INSTALLED ON THE CITY SIDE OF THE MANHOLE. ALL PIPING TO BE AT A MINIMUM OF 12" FROM THE FLOOR AND 12" MINIMUM FROM WALLS.
E. BACKFLOW DEVICES INSTALLED TO MEET RULES AND REGULATIONS OF OHIO EPA AS DEFINED IN OAC 3745-95.
F. IF 6" METER OR LARGER, PROVIDE A 4'x4' BILCO LID.

G. ALL FLUSHING, PRESSURE AND BACTERIOLOGICAL TESTING SHALL BE PERFORMED BY THE CITY OF TROY UTILITIES DEPARTMENT.
H. 2-1/2" AND SMALLER PIPE SHALL BE "K" COPPER WITH FLARED OR COMPRESSION FITTINGS. 3" AND LARGER PIPE SHALL BE DUCTILE IRON CLASS 52 AND EXTEND AT LEAST 4' OUTSIDE THE PIT.
I. FIRE DEPARTMENT CONNECTION (FDC) SHALL RISE 3' ABOVE SURFACE AND HAVE A 5" STORZ FITTING, 90° PLUS 30° BEND DOWN.
J. ALL 1-1/2" - 2" VALVES SHALL BE BRASS BALL VALVES. VALVES 3" OR GREATER SHALL BE GATE VALVES.

CITY OF TROY



1-1/2" AND GREATER METER PIT DETAIL

REVISIONS:
 OCT 2018
 DEC 2019
 AUG 2024

DATE
 APPROVED:
 NOV 2017
 PAGE No.
 800-8

NOTES

A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE CITY UNLESS 2 WORKING DAYS NOTICE OF COMMENCING WORK IS GIVEN TO THE CITY.

B. ROOF DRAINS, FOUNDATION DRAINS, SUMP PUMPS, AND ALL OTHER CLEAR WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.

C. WHEN A SEWER IS TO BE EXTENDED AT THE DOWNSTREAM MANHOLE OR FIRST MANHOLE IN THE NEW LINE, IT SHALL BE PLUGGED BEFORE CONSTRUCTION BEGINS. IF THE SEWER IS SMALLER OR EQUAL TO 12" DIAMETER, IT SHALL BE PLUGGED BY PLACING A POLY-ETHYLENE BAG APPROXIMATELY 6" INTO THE SEWER PIPE. SIZES LARGER THAN 12" WILL BE PLUGGED BY OTHER APPROVED METHODS. NO PLUGS SHALL BE REMOVED UNTIL CONSTRUCTION IS COMPLETED AND SOIL IS STABILIZED AND THEN ONLY AS DIRECTED BY THE CITY.

D. WHEN A NEW CASTING OR OTHER PUBLIC PROPERTY IS ABANDONED IT REMAINS CITY PROPERTY, UNLESS OTHERWISE DIRECTED.

E. NEW SEWERS OR ANY SEWER THAT IS RELOCATED OR RESIZED MUST HAVE EPA PLAN APPROVAL PRIOR TO CONSTRUCTION.

F. THE ENDS OF ALL SERVICE LINES OR TEES SHALL BE ACCURATELY LOCATED, MAPPED, AND GIVEN TO THE CITY WITHIN 15 DAYS OF INSTALLATION.

G. IN THE DEMOLITION OF AN EXISTING BUILDING, ALL ABANDONED SEWER LATERALS SHALL BE COORDINATED WITH THE CITY AND CAPPED AT THE OWNER'S EXPENSE.

PIPE

A. ALL MAINLINE PIPE AND FITTINGS SHALL BE PVC SDR-35 UNLESS OTHERWISE APPROVED BY THE CITY. MINIMUM DIAMETER OF PIPE SHALL BE 8".

B. DUCTILE IRON PIPE WILL BE USED IN STREAM CROSSINGS AND WHERE MAXIMUM SEPARATION CANNOT BE MAINTAINED OR WHEN DEPTH OF SEWER EXCEEDS 25 FEET.

C. ALL JOINTS SHALL BE OF THE BELL AND SPIGOT TYPE, THE BELLS BEING FORMED INTEGRALLY WITH THE PIPE. THE BELL SHALL CONTAIN A FACTORY INSTALLED ELASTOMETRIC GASKET IN ACCORDANCE WITH ASTM D3212 OR ANSI A21.11/AWWA C111 AND IS POSITIVELY RETAINED. NO SOLVENT CEMENT JOINTS WILL BE PERMITTED IN FIELD CONSTRUCTION EXCEPT AS SPECIFICALLY AUTHORIZED BY THE CITY.

<u>FLEXIBLE PIPES</u>	<u>MATERIAL SPECIFICATIONS</u>	<u>ACCEPTABLE DEPTH TO INVERT</u>
POLYVINYL CHLORIDE	ASTM D-3034	SDR-35($\leq$ 15 FT) SDR-26($>$ 15 FT)
DUCTILE IRON	ANSI A-21.51 & AWWA C-151	ALL

1. SDR = OUTSIDE DIAMETER DIVIDED BY WALL THICKNESS.

2. THE SPECIFICATIONS ABOVE SHALL BE THOSE MOST RECENTLY ADOPTED BY THE APPROPRIATE STANDARDS SETTING ORGANIZATIONS.

D. LOCATOR WIRE SHALL BE REQUIRED TO BE INSTALLED ON FORCEMAIN SANITARY SEWERS.

EXCAVATION AND PIPE LAYING

A. THE LAYING OF THE PIPE SHALL COMMENCE AT THE LOWEST POINT, WITH THE BELL END LAID UPGRADE. THE PIPE SHALL BE CENTERED IN THE TRENCH AND ALL PIPE SHALL BE LAID WITH ENDS ABUTTING AND TRUE TO LINE AND GRADE.

B. LASER SHALL BE USED INSIDE THE PIPE WHENEVER POSSIBLE UNLESS OTHERWISE APPROVED.

TESTING REQUIREMENTS

A. BEFORE ANY SEWER LINE IS PLACED INTO SERVICE OR ACCEPTED BY THE CITY, IT SHALL BE SUBJECTED TO AND PASS LOW PRESSURE AIR TEST. EACH RUN BETWEEN MANHOLES, WITH ALL SERVICE LATERALS STUBBED INTO PROPERTY LINES, SHALL BE TESTED BEFORE BEING ACCEPTED. THE CONTRACTOR OR DEVELOPER SHALL FURNISH ALL EQUIPMENT AND MATERIAL NECESSARY TO CONDUCT THIS TEST. THE TRENCH SHALL BE COMPLETELY BACKFILLED BEFORE TESTING.

B. BEFORE FINAL ACCEPTANCE BY THE CITY AND BEFORE ANY SERVICE LINE IS PUT INTO USE, ALL SANITARY SEWERS AND MANHOLES SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATTER BY USE OF A SEWER-JET OR EQUAL, TYPE OF EQUIPMENT BY THE CONTRACTOR. SEWER-JET PROCEDURE MUST BE PERFORMED BEFORE CONTRACTOR T.V. TESTS THE PIPE.

C. THE CITY RESERVES THE RIGHT TO A FINAL TELEVISION AT THE CONTRACTOR'S EXPENSE IF DEFICIENCIES OR IRREGULARITIES ARE NOTED DURING CONSTRUCTION.

IN THIS CASE, THE CITY WILL NOT PASS OR ACCEPT THE SANITARY SEWER FOR FINAL PAYMENT WITHOUT HAVING A PASSING VIDEO AND LOG OF THE SANITARY SEWER TELEVISION FOLLOWING THE STANDARDS PREVIOUSLY DESCRIBED.

CITY OF TROY



MISCELLANEOUS SANITARY SEWER NOTES 1

REVISIONS:
OCT 2018
DEC 2019

DATE
APPROVED:
NOV 2017

PAGE No.
900-1

TESTING REQUIREMENTS CONTINUED

ALL SEWER LINES ARE TO BE FLUSHED AND CLEANED OUT PRIOR TO TESTING

LOW PRESSURE AIR TEST

A. AFTER BACKFILLING, THE AIR TEST SHALL BE CONDUCTED BETWEEN TWO CONSECUTIVE MANHOLES. ALL PIPE OUTLETS MUST BE PLUGGED IN THE SECTION BEING TESTED WITH SUITABLE TEST PLUGS. ONE OF THE PLUGS USED AT A MANHOLE MUST BE TAPPED AND EQUIPPED FOR AN AIR INLET CONNECTION FOR FILLING THE LINE FROM THE AIR COMPRESSOR. AIR SHALL BE SUPPLIED SLOWLY TO THE TEST SECTION UNTIL THE INTERNAL PRESSURE REACHES APPROXIMATELY 4 PSI. IF THE PIPE IS BELOW EXISTING GROUNDWATER LEVEL, THE INTERNAL PRESSURE SHALL BE INCREASED BY THE AVERAGE BACK PRESSURE OF ANY GROUNDWATER THAT MAY BE OVER THE PIPE, BUT IN NO CASE SHOULD THE INTERNAL PRESSURE EVER EXCEED 5 PSI.

B. AT LEAST 2 MINUTES SHALL BE ALLOWED FOR THE AIR PRESSURE TO STABILIZE. WHEN THE PRESSURE HAS STABILIZED AND IS AT OR ABOVE 3.5 PSI, THE AIR SUPPLY SHALL BE DISCONNECTED AND TIMING SHALL BEGIN WITH A STOP WATCH. THE STOP WATCH SHALL BE ALLOWED TO RUN UNTIL THE PRESSURE HAS DROPPED 1.0 PSI. IF THE TIME SHOWN ON THE STOP WATCH IS GREATER THAN THE SPECIFIED MINIMUM TIME, THE SECTION SHALL BE CONSIDERED TO HAVE PASSED THE TEST. TIME MAY BE INTERPOLATED FROM THE FIGURES LISTED BELOW.

PIPE DIA. (IN.)	Time for Longer Length (sec)	Specified Minimum for Length (L) Shown (min:sec)						
		100 FT.	150 FT.	200 FT.	250 FT.	300 FT.	350 FT.	400 FT.
4	0.380L	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	0.854L	5:40	5:40	5:40	5:40	5:40	5:40	5:42
8	1.520L	7:34	7:34	7:34	7:34	7:36	8:52	10:08
10	2.374L	9:26	9:26	9:26	9:53	11:52	13:51	15:49
12	3.418L	11:20	11:20	11:24	14:15	17:05	19:56	22:47
15	5.342L	14:10	14:10	17:48	22:15	26:42	31:09	35:36
18	7.692L	17:00	19:13	25:38	32:03	38:27	44:52	51:16
21	10.470L	19:50	26:10	34:54	43:37	52:21	61:00	69:48
24	13.674L	22:47	34:11	45:34	56:58	68:22	79:46	91:10

SPECIFICATION TIME FOR LENGTH (L) SHOWN (MIN:SEC)

*ALL TESTS SHALL BE WITNESSED BY A CITY OF TROY ENGINEERING DEPARTMENT REPRESENTATIVE.

DEFLECTION TEST

A. DEFLECTION TESTS SHALL BE PERFORMED BY THE CONTRACTOR ON ALL FLEXIBLE PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS TO PERMIT STABILIZATION OF THE SOIL-PIPE SYSTEM.

B. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. IF DEFLECTION EXCEEDS 5%, REPLACEMENT OR CORRECTION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE REQUIREMENTS OF APPROVING AGENCY.

C. THE RIGID BALL OR MANDREL USED FOR THE DEFLECTION TEST SHALL HAVE A DIAMETER NOT LESS THAN 95% OF THE BASE INSIDE DIAMETER OR AVERAGE INSIDE DIAMETER OF THE PIPE DEPENDING ON WHICH IS MANUFACTURED. THE PIPE SHALL BE MEASURED IN COMPLIANCE WITH ASTM D-2122 STANDARD TEST METHOD OF DETERMINING DIMENSIONS OF THERMOPLASTIC PIPE AND FITTINGS. THE TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES.

DIAMETER, INCHES			
DEPTH (FT.)	48	60	72
	TIME, SECONDS		
8 OR LESS	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

MINIMUM TEST TIMES FOR VARIOUS MANHOLE DIAMETERS

MANHOLE VACUUM TEST

ALL SANITARY SEWER MANHOLES SHALL BE VACUUM TESTED BY THE CONTRACTOR USING THE FOLLOWING PROCEDURES FROM ASTM C-1244.

A. PREPARATION OF THE MANHOLE

1. ALL LIFT HOLES SHALL BE PLUGGED.
2. ALL PIPES ENTERING THE MANHOLE SHALL BE TEMPORARILY PLUGGED TAKING CARE TO SECURELY BRACE THE PIPES AND PLUGS TO PREVENT THEM FROM BEING DRAWN INTO THE MANHOLE.

B. PROCEDURE

1. THE FIRST HEAD SHALL BE PLACED AT THE TOP OF THE MANHOLE IN THE CASTING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

2. A VACUUM OF 10" OF MERCURY (4.9 PSI) SHALL BE DRAWN ON THE MANHOLE, THE VALVE ON THE VACUUM LINE OF THE TEST HEAD CLOSED, AND THE VACUUM PUMP SHUT OFF. THE TIME SHALL BE MEASURED FOR THE VACUUM TO DROP TO 9" OF MERCURY (4.4 PSI).

3. THE MANHOLE SHALL PASS IF THE TIME FOR THE VACUUM READING TO DROP FROM 10" OF MERCURY (4.9 PSI) TO 9" OF MERCURY (4.4 PSI) MEETS OR EXCEEDS THE VALUES INDICATED ON THE TABLE.

4. IF THE MANHOLE FAILS THE INITIAL TEST, NECESSARY REPAIRS SHALL BE MADE BY AN APPROVED METHOD. THE MANHOLE SHALL THEN BE RETESTED UNTIL A SATISFACTORY TEST IS OBTAINED.

CITY OF TROY



MISCELLANEOUS SANITARY SEWER NOTES 2

REVISIONS:
DEC 2019

DATE
APPROVED:
NOV 2017

PAGE No.
900-2

SEWER TELEVISION STANDARDS

A. ALL SEWER TELEVISION CONTRACTORS SHALL BE CERTIFIED BY NASSCO FOR PIPELINE ASSESSMENT AND CERTIFICATION. SANITARY TELEVISION WORK SHALL COMPLY WITH NASSCO STANDARDS.

B. ANY SEWER JETTING OR OTHER CLEANING ASSOCIATED WITH A PASSING RECORDING IS THE RESPONSIBILITY OF THE CONTRACTOR.

C. ALL TELEVISION WORK SHALL BE DONE IN COLOR WITH THE PROPER AMOUNT OF ILLUMINATION TO CLEARLY SHOW THE ENTIRE PIPE DIAMETER.

D. THE CAMERA SHALL BE OF THE PAN AND TILT TYPE.

E. THE TELEVISION CONTRACTOR SHALL USE A CD-ROM OR DATA DVD TO PROVIDE THE ENTIRE RECORDING PROCESS IN EITHER MPEG II OR MPEG IV FORMAT.

F. AT THE START OF THE RECORDING PROCESS, THE VIDEO SHALL RECORD THE FOLLOWING:

- DATE/TIME
- OPERATOR AND COMPANY NAME
- SEWER PROJECT NAME
- ADDRESS OR INTERSECTION OF MANHOLE WORKING ON
- DIRECTION ON TELEVISION
- FOOTAGE COUNTER

G. THE VIDEO MUST SHOW THE COUNTER RECORDING THROUGHOUT THE RECORDING PROCESS.

H. THE VIDEO SHALL SHOW THE CLOCK POSITION AND DISTANCE FROM THE MANHOLE FOR EACH LATERAL. THE CONTRACTOR SHALL ALSO SUPPLY A WRITTEN COPY OF ALL LATERAL LOCATIONS.

I. THE OPERATOR SHALL PAN EACH SEWER JOINT AND NOTE ANY DEFICIENCIES ON THE VIDEO.

J. THE OPERATOR SHALL PAN AND TILT EACH LATERAL AND SHALL POSITION THE CAMERA TO LOOK UP EACH LATERAL CONNECTION.

K. AT NO TIME SHALL THE OPERATOR ALLOW THE CAMERA HEAD TO BE SUBMERGED.

L. THE OPERATOR SHALL NOTE ANY DEFICIENCIES ON THE MAIN SCREEN.

M. THE OPERATOR SHALL KEEP AN ACCURATE LOG CONSISTING OF THE FOLLOWING:

- DIAGRAM OF SEWER FROM MANHOLE TO MANHOLE SHOWING DIRECTION OF FLOW.
- SHALL NOTE ALL SEWER LATERALS WITH CLOCK POSITIONS AND DISTANCE FROM MANHOLES.
- DEFICIENCIES IN THE SEWER PIPE INCLUDING BELLIES.
- SPECIAL NOTES DESCRIBING AREAS OF CONCERN.
- ANY DEFICIENCIES NOTED SHALL ACCOMPANY A DIGITAL PHOTO ATTACHED OR INCLUDED IN THE REPORT.

STANDARDS FOR BELLIES/DIPS IN SEWER MAINS

SANITARY SEWERS SHALL BE DECLARED AS "NOT APPROVED" IF BELLIES/DIPS IN THE MAIN LINE EXCEEDS THE FOLLOWING CRITERIA:

PIPE SIZES

SLOPE	8"	10"	12"	15"	18"	21"	24"	>27"
0.10%	2"	2.5"	3"	4"	4"	4"	4.5"	5"
0.12%	2"	2.5"	3"	4"	4"	4"	5"	5"
0.15%	2"	2.5"	3"	3.5"	3.5"	4"	4"	4"
0.22%	2"	2.5"	3"	3"	3.5"	3.5"	3.5"	4"
0.28%	2"	2"	2"	2"	2.5"	2.5"	3"	3"
0.40%	2"	2"	2"	2"	2"	2.5"	2.5"	2.5"
0.60%	1"	1"	1"	1"	1"	1"	1"	1"
1.00%	0"	0"	0"	0"	0"	0"	0"	0"

MAXIMUM ALLOWABLE BELLIES IN PIPE (INCHES)

SEWER TELEVISION PROCEDURES FOR NEW SEWER CONSTRUCTION

A. THE SANITARY SEWER SHALL BE COMPLETELY CLEAN AND FREE OF DEBRIS USING A HIGH PRESSURE JET RODDER CAPABLE OF SCOURING THE PIPE WALLS.

B. ALL DEBRIS SHALL BE VACUUMED OUT OF THE SEWER MAIN.

C. ONCE CLEANING HAS BEEN COMPLETED, THE CONTRACTOR SHALL RUN CLEAR WATER IN THE NEW SEWER MAIN TO FILL ANY POTENTIAL BELLIES IN THE LINE. THE CONTRACTOR SHALL CALCULATE THE VOLUME GALLON CAPACITY OF THE SEWER MAIN AND SHALL USE THAT MUCH WATER TO FILL POTENTIAL BELLIES/DIPS.

D. THE CONTRACTOR MAY RENT A WATER HYDRANT METER FROM THE CITY TO PERFORM THIS TASK.

E. THE CONTRACTOR SHALL MAKE SURE THAT THERE IS NO FLOW EMANATING UPSTREAM. IF SO, THE CONTRACTOR SHALL STOP THIS FLOW DURING THE TELEVISION.

F. THE CONTRACTOR SHALL TELEVISION THE SEWER FOLLOWING THE TELEVISION STANDARDS.

SEWER TELEVISION PROCEDURES FOR SEWER RECONSTRUCTION PROJECTS

A. BEFORE COMMENCEMENT OF THE CLEANING PROCESS, THE TELEVISION CONTRACTOR SHALL NOTIFY ADJACENT AND AFFECTED PROPERTY OWNERS BY GOING DOOR-TO-DOOR AND NOTIFYING THEM OF THE POSSIBILITY OF SEWER BACKUP DURING THE CLEANING PROCESS.

B. THE SANITARY SEWER SHALL BE COMPLETELY CLEANED AND FREE OF DEBRIS USING A HIGH PRESSURE JET RODDER.

C. ALL DEBRIS SHALL BE VACUUMED OUT OF THE SEWER MAIN.

D. ONCE CLEANING HAS BEEN COMPLETED, THE CONTRACTOR SHALL BAG THE UPSTREAM MANHOLE AND PUMP THE SEWAGE FLOW DOWNSTREAM AND SHALL MAINTAIN PUMPING DURING THE TELEVISION PROCESS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWER FLOODING AS A RESULT OF THEIR ACTIVITIES.

E. AFTER THE PUMP BYPASS HAS BEEN ESTABLISHED, THE CONTRACTOR SHALL RUN CLEAR WATER IN THE RECONSTRUCTED SEWER MAIN TO FILL ANY POTENTIAL BELLIES IN THE LINE. THE CONTRACTOR SHALL CALCULATE THE VOLUME GALLON CAPACITY OF THE SEWER MAIN AND SHALL USE THAT MUCH WATER TO FILL POTENTIAL BELLIES/DIPS.

F. THE CONTRACTOR MAY RENT A WATER HYDRANT METER FROM THE CITY TO PERFORM THIS TASK.

G. THE CONTRACTOR SHALL TELEVISION THE SEWER FOLLOWING THE TELEVISION STANDARDS.

CITY OF TROY



MISCELLANEOUS SANITARY SEWER NOTES 3

REVISIONS:	DATE
	APPROVED:
	NOV 2017
	PAGE No.
	900-3

NOTES

FRAME AND LID

- A.** LOCATE THE CENTERLINE OF MANHOLE COVERS OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.
- B.** FINAL GRADING IS TO BE 1/4"–1/2" BELOW FINAL SURFACE OF IN PAVEMENT AREAS. OFF PAVEMENT AREAS SHALL BE 3" ABOVE EXISTING GROUND SURFACE.
- C.** SANITARY MANHOLE FRAMES AND COVERS SHALL BE EJ IRON WORKS NO. 1600 FOR HEAVY TRAFFIC OR EQUAL. LID SHALL BE SANITARY LETTERED, VENTED WITH HOLES, SELF-SEALING AND NON-BOLTED LIDS. NON VENTED LIDS ARE REQUIRED AT LOCATIONS THAT ARE SUBJECT TO INFLOW FROM SURFACE WATER.
- D.** FOUR (4) 3/4" DIA. STAINLESS STEEL ANCHOR BOLTS AND NUTS TO FASTEN MANHOLE FRAME TO MANHOLE CONE OR FLAT LID SECTION WHEN REQUIRED BY THE CITY ENGINEER.
- E.** PRECAST CONCRETE ADJUSTING RING 2" MIN. AND 12" MAX. THICKNESS. RINGS LESS THAN 2" SHALL BE A OF A COMPOSITE PLASTIC MATERIAL. NO WOOD SHIMS OR BRICKS ALLOWED.
- F.** AFTER FINAL ALIGNMENT AND ADJUSTMENTS OF THE MANHOLE CASTING AND RISER RINGS, ALL CONCRETE RISER RINGS ARE REQUIRED TO HAVE THE LIFTING WIRES REMOVED AND THE INSIDE JOINTS SEALED WITH A TYPE S CONCRETE MIX AND A SMOOTH BROOM FINISH.
- G.** CONSEAL CS-102 FLEXIBLE BUTYL RESIN SEALANT OR EQUIVALENT SHALL BE 3/8"X 1" MINIMUM STRIPS UNDER GRADE RINGS AND CASTING.

MANHOLE JOINTS

- A.** O-RING JOINT MUST MEET ASTM SPEC. 443. ALL JOINTS MUST BE KEPT AT A MINIMUM.
- B.** IN HIGH WATER TABLE SITUATIONS USE CRETEX OR EQUAL 9" WIDE JOINT WRAPS TO ALL JOINTS ON THE OUTSIDE OF THE MANHOLE

STEPS

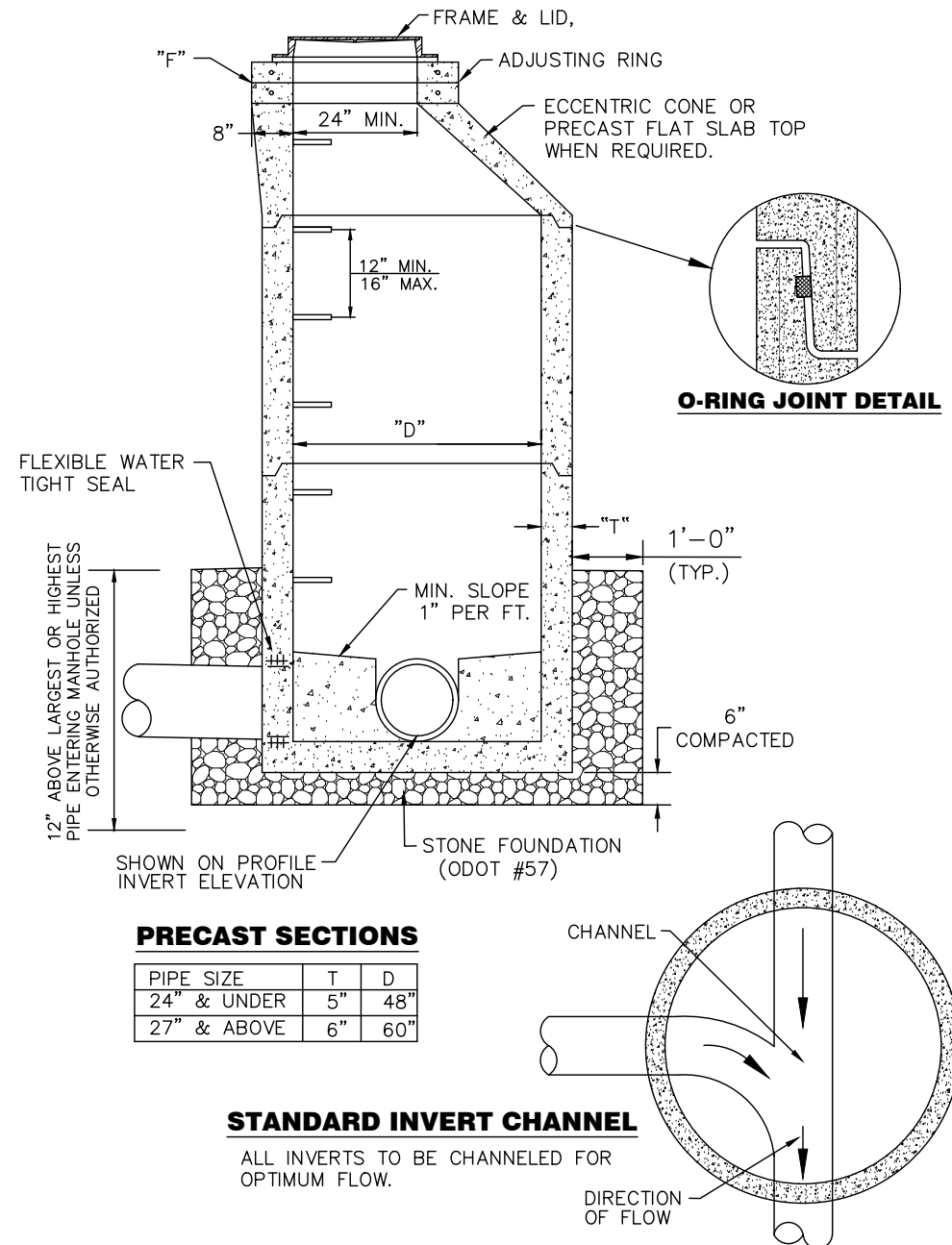
- A.** MANHOLE STEPS SHALL BE SECURELY INSTALLED INTO EACH MANHOLE SECTION, BY THE MANUFACTURER, PRIOR TO DELIVERY TO THE JOB SITE
- B.** MANHOLE STEPS SHALL BE PF-1 STEP BY M.A. INDUSTRIES OR EQUIVALENT. STEPS SHALL BE INSTALLED IN ALL NEW MANHOLES TO ALLOW FOR ANCHORING FLOW METERING EQUIPMENT AND SAMPLING EQUIPMENT.

STRUCTURE

- A.** MATERIALS FOR BASES, RISERS, AND OTHER PRECAST SECTIONS, INCLUDING REINFORCEMENTS SHALL COMPLY WITH ASTM C-478.
- B.** MAXIMUM SANITARY MANHOLE SPACING SHALL BE 350'.
- C.** THE FLOW CHANNEL THROUGH MANHOLES SHALL BE MADE TO CONFORM IN SHAPE, SLOPE AND SMOOTHNESS TO THAT OF THE SEWERS.
- D.** ODOT CLASS "QC" CONCRETE.

PIPE CONNECTIONS

- A.** PIPE CONNECTIONS SHALL HAVE A FLEXIBLE WATERTIGHT JOINT SEAL MEETING ASTM 923-79, A-LOK OR EQUIVALENT.
- B.** TO CONNECT INTO EXISTING MANHOLE, THE MANHOLE SHALL BE CORED AND AN A-LOK XP SERIES FLEXIBLE CONNECTOR OR EQUIVALENT SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. NON-SHRINK GROUT ALTERNATIVE MAY BE USED IN SPECIAL CIRCUMSTANCES WHEN PREVIOUSLY APPROVED BY CITY.
- C.** NO LATERALS SHALL PROTRUDE INTO THE INTERIOR MANHOLE.
- D.** CUT PIPE SHALL NOT EXTEND BEYOND THE INSIDE FACE OF THE MANHOLE WALL.
- H.** CONCRETE PLACED INSIDE THE MANHOLE SHALL NOT BE PLACED BETWEEN THE PIPE AND THE OPENING SO AS TO INTERFERE IN ANY WAY WITH THE FLEXIBILITY OF THE JOINT.



CITY OF TROY



TYPE 3 SANITARY MANHOLE

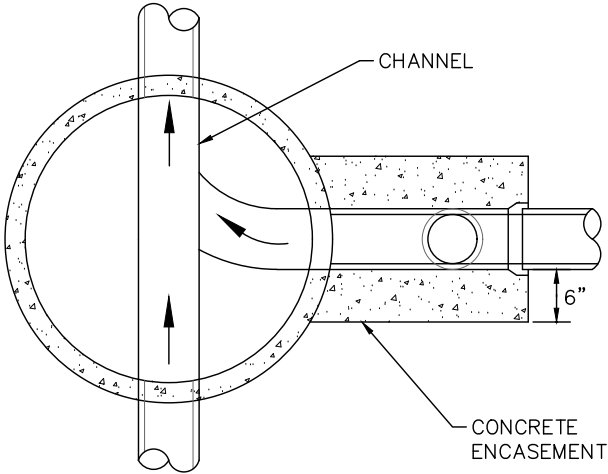
REVISIONS:
OCT 2018
AUG 2024

DATE
APPROVED:
NOV 2017
PAGE No.
900-4

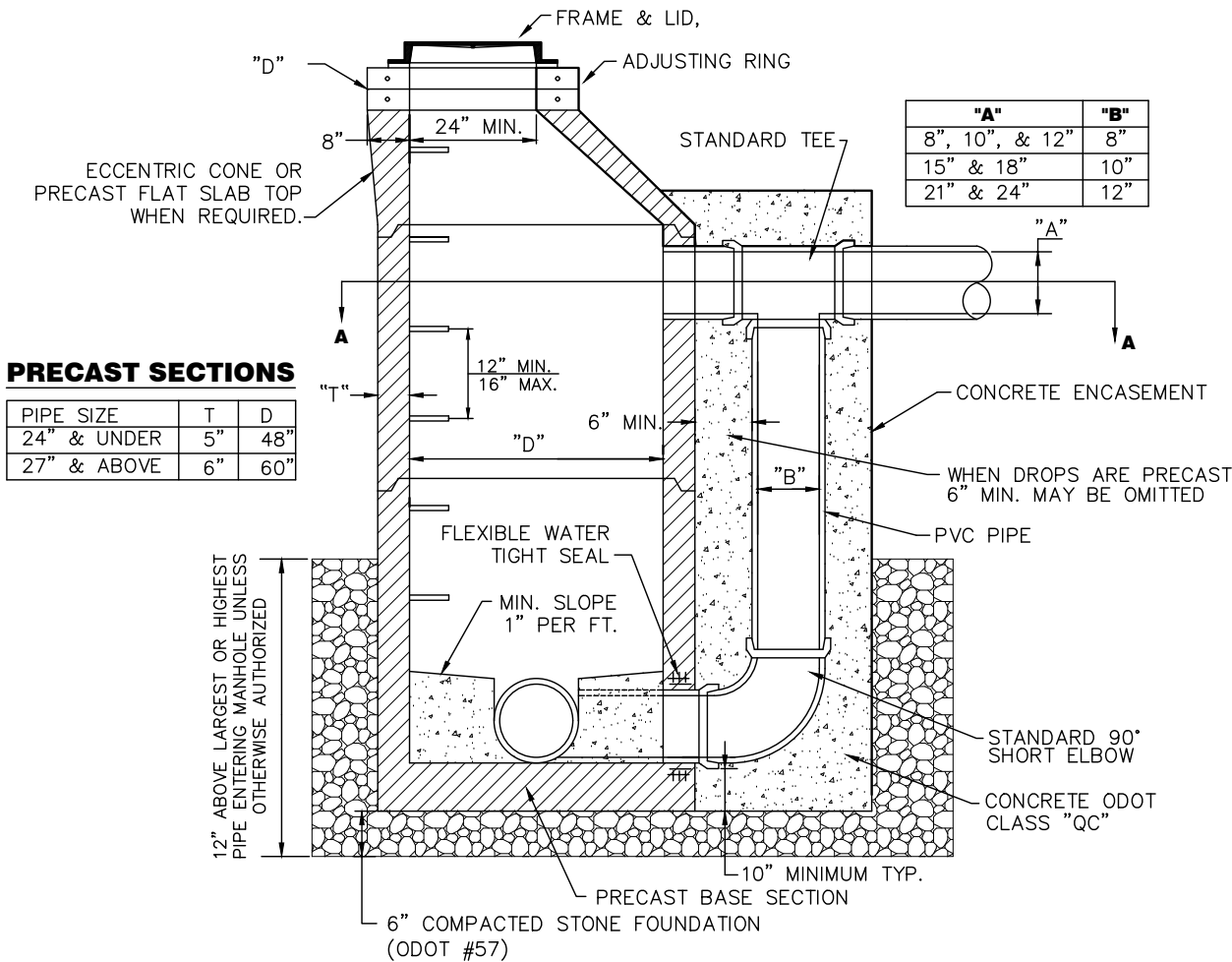
DROP STRUCTURE ON EXISTING MANHOLES

NOTES

- A. IF A DROP STRUCTURE IS NECESSARY THE CONTRACTOR SHALL NOTIFY THE CITY PRIOR TO ORDERING ANY MATERIALS.
- B. CORE EXISTING MANHOLE AND CONNECT WITH FLEXIBLE CONNECTOR OR EQUIVALENT.
- C. DROP PIPE IS TO BE ANCHORED TO THE OUTSIDE OF THE EXISTING MANHOLE USING STAINLESS STEEL RETAINING STRAPS (12 GAUGE MINIMUM) SECURED WITH STAINLESS STEEL FASTENERS, AT 4' INTERVALS (MIN. OF 2).
- D. AFTER FINAL ALIGNMENT AND ADJUSTMENTS OF THE MANHOLE CASTING AND RISER RINGS, ALL CONCRETE RISER RINGS ARE REQUIRED TO HAVE THE LIFTING WIRES REMOVED AND THE INSIDE JOINTS SEALED WITH A TYPE S CONCRETE MIX AND A SMOOTH BROOM FINISH.



SECTION A-A



NOTES

- A. TYPE D MANHOLE SHALL BE USED WHERE THE DIFFERENCE IN INVERT ELEVATIONS IS GREATER THAN 2'-0".
- B. ALL NOTES AND ASTM REFERENCES ON THE TYPE 3 SANITARY MANHOLE SHALL APPLY ON THE TYPE D SANITARY DROP MANHOLE.
- C. INSIDE DROP MANHOLE PROHIBITED UNLESS OTHERWISE APPROVED BY CITY ENGINEER.

CITY OF TROY

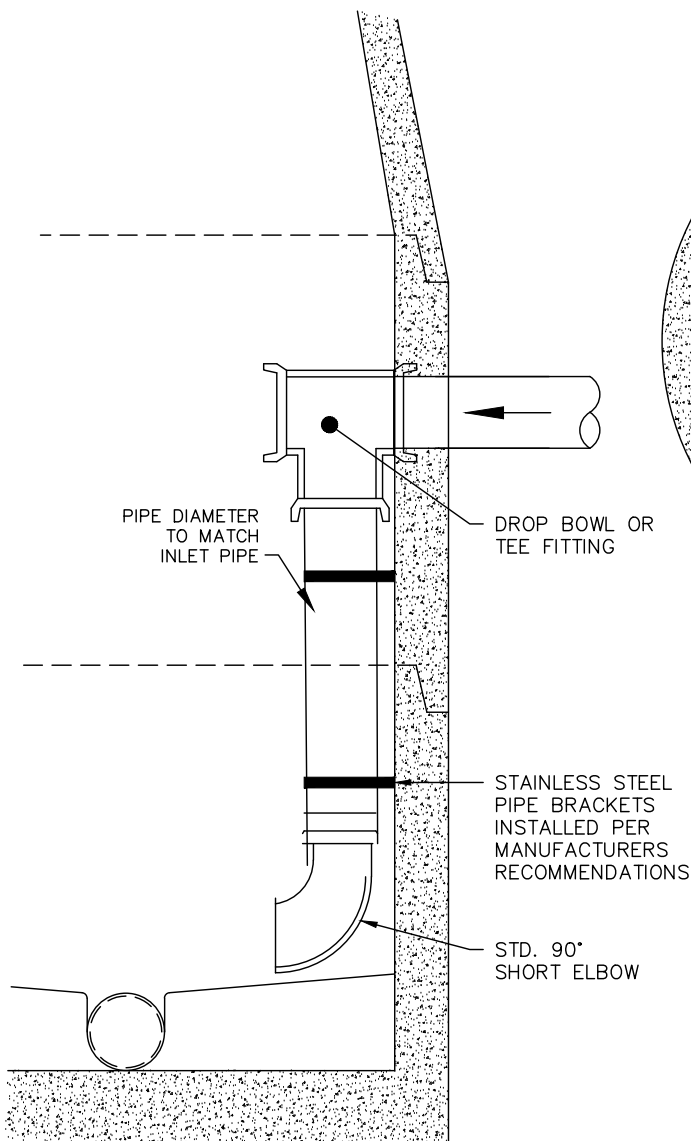


TYPE D SANITARY DROP MANHOLE

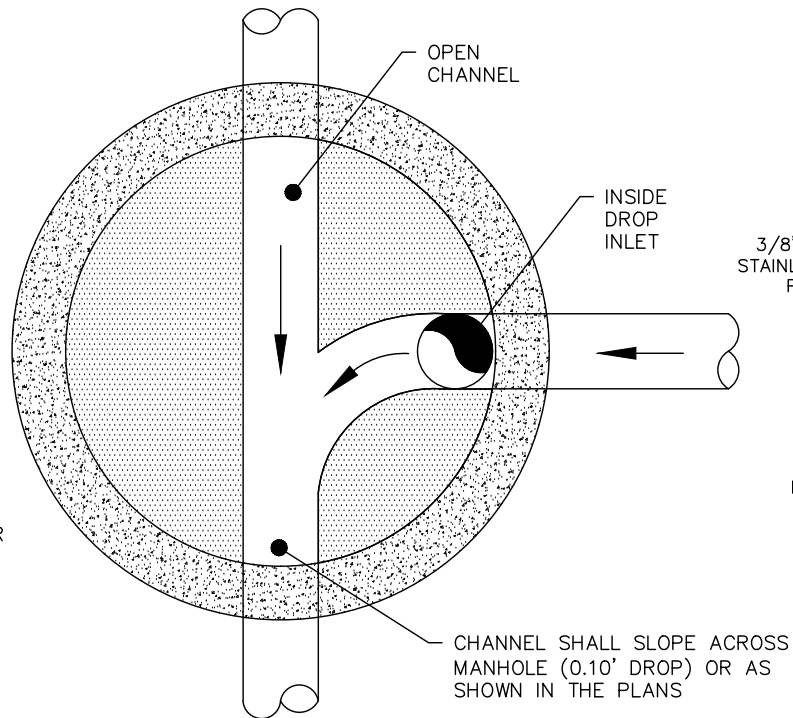
REVISIONS:
AUG 2024

DATE
APPROVED:
NOV 2017

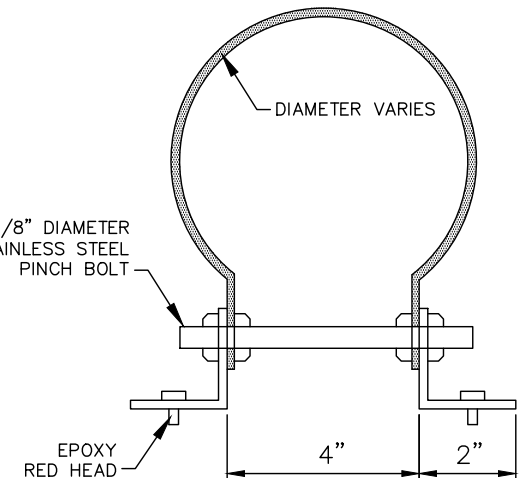
PAGE No.
900-5



**INSIDE DROP INLET
PROFILE**



MANHOLE PLAN VIEW



PIPE BRACKET DETAIL

NOTES

- A. TO BE USED ON NEW CONSTRUCTION OR WHEN EXTERNAL DROP IS TO BE ABANDONED.
- B. NOT RECOMMENDED FOR USE IN AREAS WITH HIGH HYDROGEN SULFIDE OR HIGH FLOW/VELOCITY.

MATERIALS

- C. CONNECTOR PIPE SHALL BE OF SAME DIAMETER AS SEWER PIPE.
- D. ALL PIPE AND FITTINGS SHALL BE PVC SDR-35 PER ASTM 3034.
- E. A TEE CAN BE INSTALLED IN LIEU OF A DROP BOWL.

CONSTRUCTION

- F. STANDARD BRACKET SIZES TO FIT PVC SEWER PIPE SDR-35 AND SPACED EVERY 4 FEET. ALL HARDWARE AND BRACKETS SHALL BE 304 STAINLESS STEEL.

REFERENCE

- G. SEE DETAIL 900-5 FOR MANHOLE CONSTRUCTION DETAILS.

CITY OF TROY

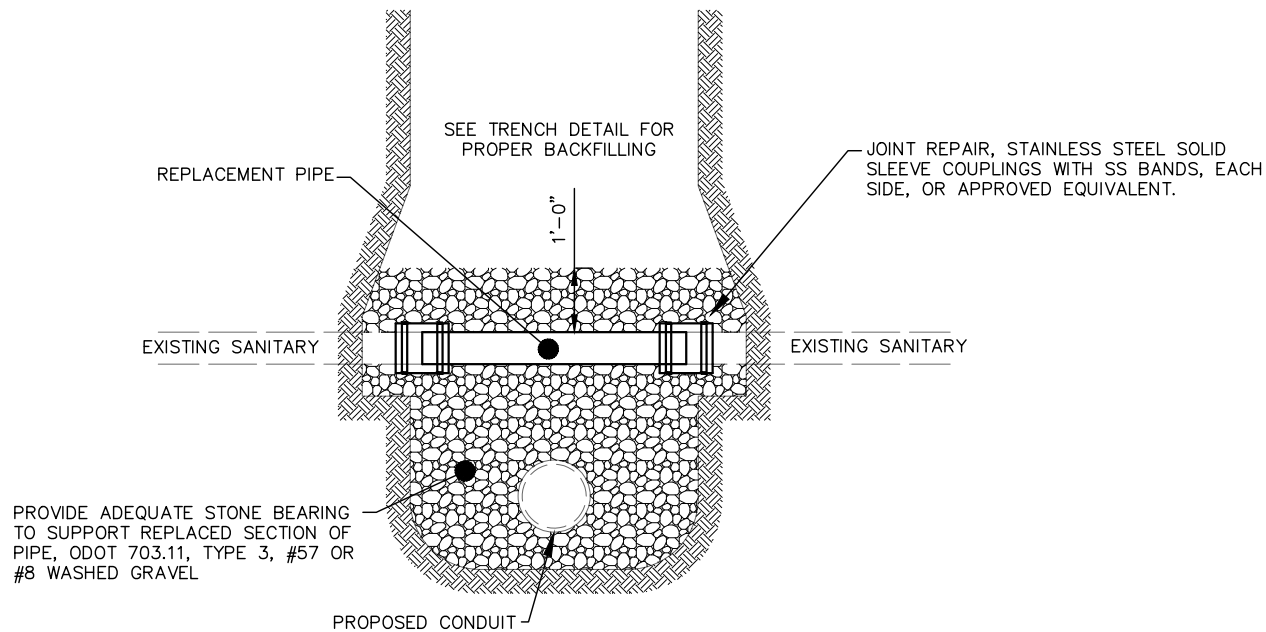


SANITARY INSIDE DROP CONNECTION

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DATE
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PAGE No.
900-5A



SANITARY SEWER REPAIR DETAIL

NOTES

A. CONCRETE REPAIRS OR PATCHES ARE UNACCEPTABLE.

B. ANY SANITARY SEWER DAMAGED BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR TO A CONDITION EQUAL TO OR BETTER THAN ITS ORIGINAL CONDITION. ALL REPAIRS SHALL BE NOTED ON THE AS-BUILT DRAWINGS AND SHALL BE INSPECTED BY THE INSPECTOR BEFORE THEY ARE COVERED.

CITY OF TROY

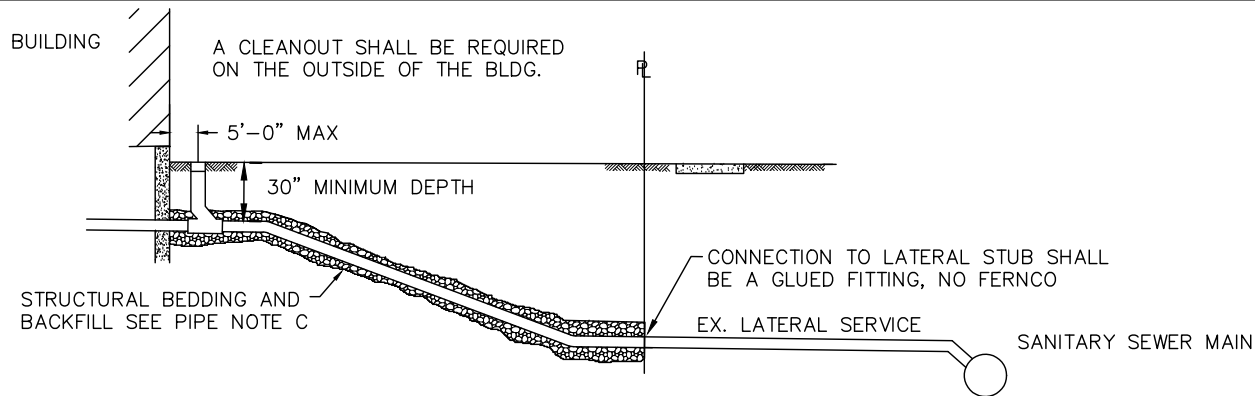


REPAIR OF EXISTING SANITARY SEWER PIPE DETAIL

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PAGE No.
900-6



NOTES

- A.** SEPTIC TANKS SHALL BE ABANDONED IN ACCORDANCE WITH MIAMI COUNTY PUBLIC HEALTH DEPARTMENT.
- B.** ROOF DOWNSPOUTS, EXTERIOR FOUNDATION DRAINS, AREAWAY DRAINS OR OTHER SURFACE RUNOFF OR GROUNDWATER SHALL NOT BE CONNECTED TO THE SANITARY SEWER MAIN. BASEMENTS MUST HAVE A FLOOR DRAIN AND BE CONNECTED TO THE STORM SEWER (SUMP PUMP).
- C.** BEFORE BEGINNING WORK, A SEWER TAP PERMIT MUST BE OBTAINED.
- D.** WHEN THE BUILDING CONNECTION MUST ENTER INTO A PAVED PORTION OF THE STREET OR ALLEY, A RIGHT OF WAY PERMIT MUST BE OBTAINED BEFORE BEGINNING WORK.
- E.** WATER SERVICES SHALL BE A MINIMUM OF 5' MEASURED HORIZONTALLY FROM THE SEWER SERVICE AND SHALL BE A MINIMUM OF 18" ABOVE THE CROWN (WHENEVER POSSIBLE) OF THE SANITARY SEWER MAIN WHERE THE WATER SERVICE CROSSES THE SEWER MAIN.
- F.** CLEANOUTS ARE REQUIRED EVERY 100'.
- G.** NO SERVICE LINE SHALL BE ALLOWED TO CONNECT DIRECTLY INTO A MANHOLE, SUBJECT TO APPROVAL BY THE CITY IN SPECIFIC CASES.

PIPE

- A.** THE PIPE MATERIAL SHALL BE PVC SDR 35 OR SCHEDULE 40, UTILIZING PURPLE PRIMER, OR AN APPROVED EQUIVALENT.
- B.** PIPE SIZES FOR BUILDING CONNECTIONS SHALL BE 4" MINIMUM FOR SINGLE RESIDENCE AND 6" MINIMUM FOR ALL OTHER USES. THE LATERALS SHALL BE RAN TO WITHIN 3' OF THE OUTSIDE OF THE BUILDING.
- C.** THE PIPE SHALL BE BEDDED ON 4" MINIMUM STRUCTURAL BEDDING, ODOT 57'S OR 8'S, AND BACKFILLED PER THE TRENCH DETAIL.

PIPE LAYING

- A.** THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE CITY BEFORE LEAVING THE WORK SITE FOR THE NIGHT.
- B.** THE JOINING OF PIPE WITH CONCRETE SHALL NOT BE ACCEPTED.
- C.** BEFORE MAKING A CONNECTION TO AN EXISTING SEWER OR SERVICE LATERAL, THE CONTRACTOR SHALL CHECK THE EXISTING PIPE BY UTILIZING A SEWER EEL, STRAP, OR SEWER ROD TO SEE THAT THE EXISTING PIPE IS CONNECTED TO THE SANITARY SEWER MAIN.
- D.** IN THE CASE WHERE A 90° CORNER IS REQUIRED IN THE BUILDING CONNECTION LINE, 2 45° BENDS SHALL BE USED IN LIEU OF A 90° BEND. A CLEANOUT WILL BE REQUIRED.
- E.** THE BUILDING CONNECTION LINE SHALL BE LAID IN AS STRAIGHT A LINE, FROM THE BUILDING TO THE EXISTING LATERAL, AS POSSIBLE.
- F.** ANY TWO-FAMILY RESIDENCE THAT HAS AN EXISTING 4" LATERAL AVAILABLE TO THE LOT SHALL BE REQUIRED TO SEPARATE THE 4" COMMON LATERAL INTO INDIVIDUAL LATERALS, WITH CLEANOUTS, ON THE OUTSIDE OF THE BUILDING UNLESS OTHERWISE APPROVED.
- G.** ALL NEW CONSTRUCTION SHALL HAVE SANITARY LATERALS INSTALLED.
- H.** DRAWINGS SHOWING LATERAL LOCATIONS SHALL BE SUBMITTED WITH A ZONING PERMIT.
- I.** MINIMUM SLOPE OF SANITARY LATERAL SHALL BE 1/4" PER FOOT. (2% GRADE)

TESTING

- A.** PIPE SHALL BE FLUSHED AND CLEANED PRIOR TO TESTING
- B.** THE OUTSIDE PLUMBER SHALL BE RESPONSIBLE FOR THE SCHEDULING THE TESTING (VISUAL OR OTHER, AS REQUIRED) SHALL BE SCHEDULED WITH THE ENGINEERING DEPARTMENT.
- C.** ALL NEW BUILDING CONNECTIONS SHALL BE BY AIR WITH 4 PSI PRESSURE.

- D.** THE SEWER TEST SHALL BE FROM THE CLEANOUT TO THE PROPERTY LINE CONNECTION OR TO THE MAIN SEWER, WHICHEVER IS APPLICABLE.
- E.** WHEN A SUBSTANTIAL AMOUNT OF AN EXISTING LATERAL IS REPLACED, THE NEW PORTION OF THE LATERAL SHALL REQUIRE A TEST UNLESS OTHERWISE APPROVED.
- F.** A TEST TEE MAY BE REQUIRED DEPENDING ON EXISTING CONDITIONS. THE TEST TEE SHALL BE CUT OFF AND CAPPED BELOW GRADE AFTER SUCCESSFUL TESTING.

INSPECTION

- A.** A TAP INSPECTION SHALL BE REQUIRED ON ALL NEW BUILDING CONNECTIONS AND ALSO ON THE REPLACEMENT OF EXISTING BUILDING CONNECTIONS.
- B.** WHEN THE BUILDING SEWER IS READY FOR INSPECTION, THE CITY SHALL BE GIVEN 24 HOURS ADVANCE NOTICE. THE PIPE SHALL BE LEFT UNCOVERED UNTIL AN INSPECTION HAS BEEN MADE AND APPROVED.
- C.** ANY NEW BUILDING CONNECTION INSTALLED WITHOUT AN INSPECTION SHALL RESULT IN NO ISSUANCE OF A WATER METER FOR THE BUILDING. IF THIS OCCURS, THE ENTIRE LATERAL SHALL BE UNCOVERED SO THAT A PROPER INSPECTION CAN BE MADE.
- D.** NO TAP FEE IS REQUIRED IF AN OLD BUILDING SEWER IS TO BE REUSED. AN INSPECTION WILL BE REQUIRED. THE PUBLIC UTILITY DEPT. SHALL INSPECT THE ENTIRE BUILDING CONNECTION FROM THE CLEANOUT TO THE PROPERTY LINE CONNECTION OR TO THE MAIN SEWER, WHICHEVER IS APPLICABLE.
- E.** WHEN A SADDLE IS TO BE INSTALLED, THE INSPECTOR SHALL BE PRESENT WHILE THE SANITARY SEWER MAIN IS BEING CUT INTO. A SADDLE MAY BE USED WHERE A TEE OR WYE IS NOT PRESENT FOR LATERAL CONNECTION AND WHERE FLOW IS TO GREAT TO ALLOW THE MAIN TO BE CUT. ALWAYS COMPLETELY ENCASE CONNECTIONS AT ANY DEPTH. (12" AND OVER AS APPROVED BY THE CITY.)
- F.** BEFORE MAKING A CONNECTION TO AN EXISTING SEWER TAP OR SEWER LATERAL, THE CONTRACTOR SHALL CHECK THE EXISTING PIPE BY UTILIZING A SEWER EEL, STRAP, OR SEWER ROD TO SEE THAT THE EXISTING PIPE IS CONNECTED TO THE MAIN SEWER. IF NEEDED, THE CONTRACTOR MAY NEED TO USE A HYDRAULIC SEWER CLEANER.

CITY OF TROY

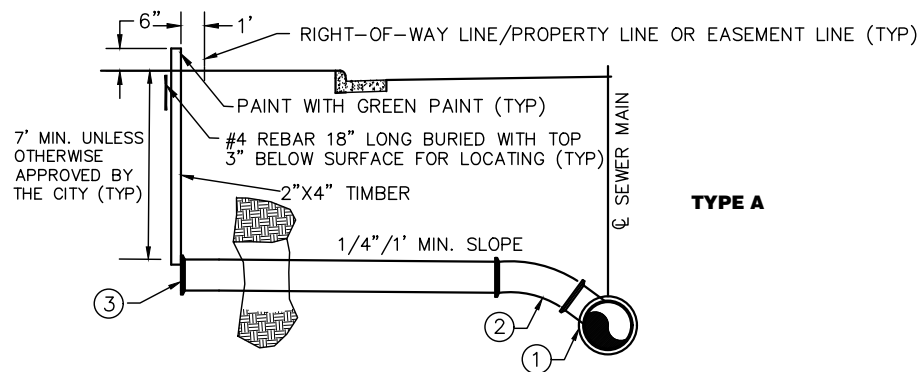


BUILDING CONNECTION DETAIL

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DATE
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PAGE No.
900-7



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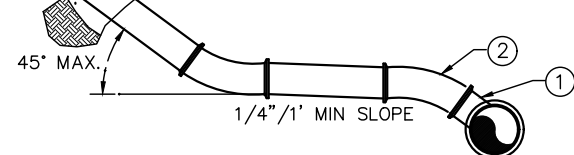
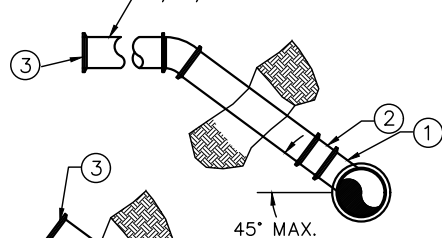
A. RISER PIPE TO BE BEDDED SOLIDLY AGAINST UNDISTURBED GROUND. ALSO, TEE MAY BE SUBSTITUTED FOR WYE BRANCH IF SPECIFIED.

B. RISER PIPE TO BE INSTALLED SO THAT CONNECTING SERVICE SHALL HAVE A MINIMUM DEPTH OF 7' AT THE PROPERTY LINE, UNLESS OTHERWISE DIRECTED BY THE CITY.

C. EACH SANITARY LATERAL MUST BE IN SEPARATE TRENCHES FROM STORM, WATER OR OTHER CONDITIONS.

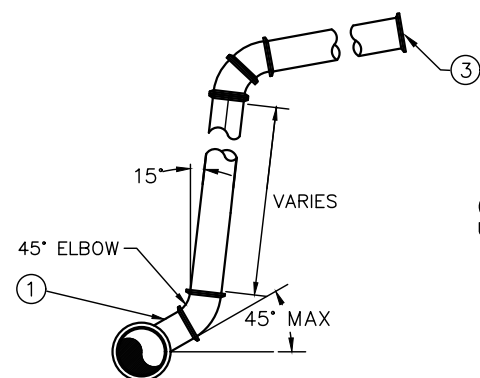
D. EXACT MEASUREMENT MUST BE PROVIDED SHOWING DISTANCE FROM NEAREST MANHOLE, LENGTH OF LATERAL, LOCATION OF BENDS, AND THE END OF LATERAL. THE ELEVATION OF INVERT RELATIVE TO THE BACK OF CURB ELEVATION OR SOME OTHER REFERENCE POINT EASILY RECOVERED IS ALSO REQUIRED. ALL INFORMATION SHALL BE GIVEN TO THE CITY WITHIN 15 DAYS AFTER INSTALLATION.

1/4" / 1' MIN. SLOPE



LEGEND

- ① WYE—ROTATE 45° FROM HORIZONTAL, UNLESS OTHERWISE SPECIFIED.
- ② 1/8° BEND OR 1/16° BEND AS NEEDED.
- ③ CAP UNLESS JOINING EXISTING SERVICE LATERAL. SEE SANITARY SEWER DETAIL TO CONNECT TO AN EXISTING MAIN.



(ONLY APPROVED BY CITY ENGINEER UNLESS OTHER APPROVAL)

CITY OF TROY



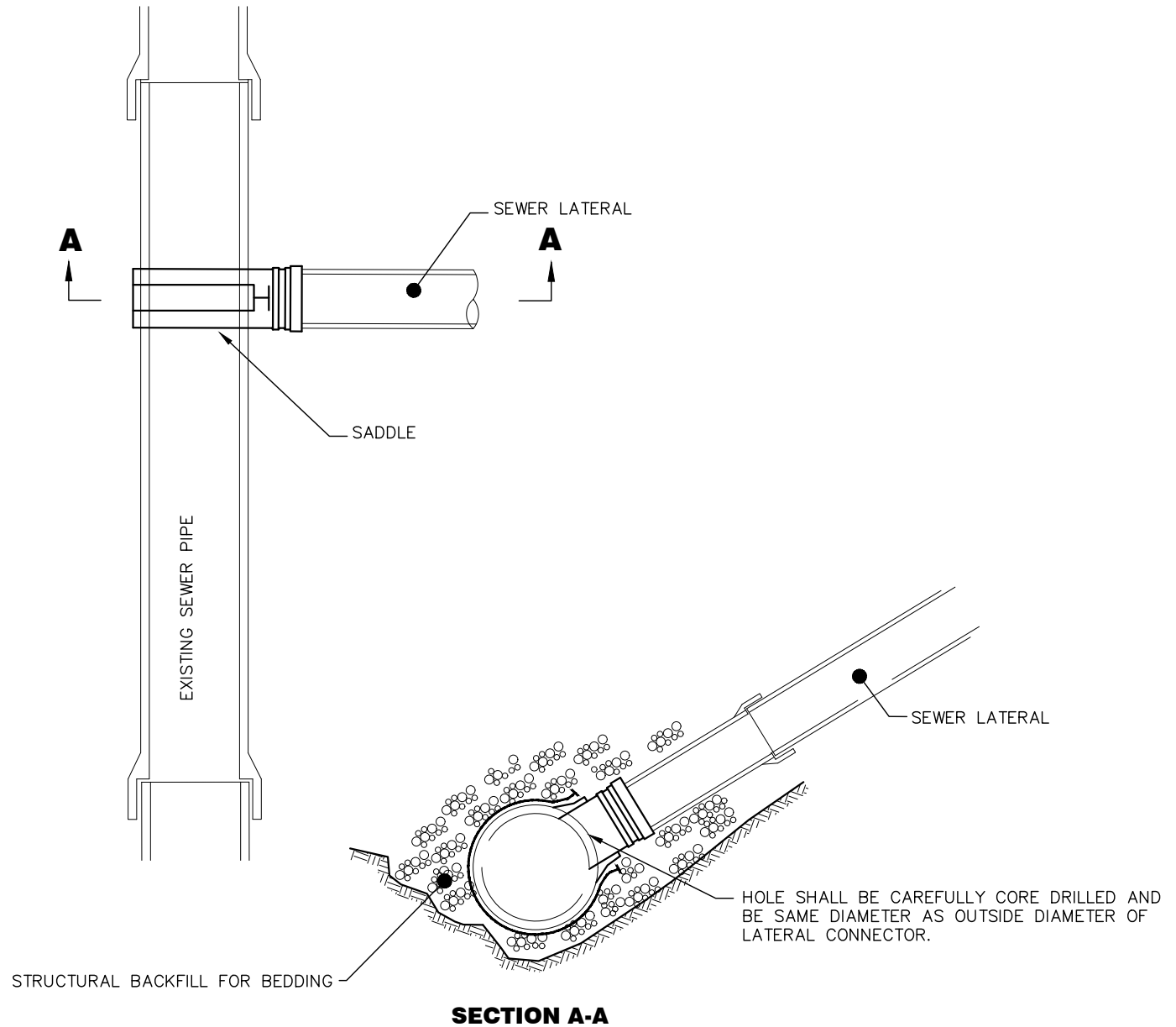
SERVICE RISER AND SERVICE LATERAL

REVISIONS:

DATE
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NOV 2017
PAGE No.
900-8

NOTES

- A.** IF A WYE CAN NOT BE CUT INTO THE MAIN LINE A SADDLE TYPE CONNECTION MAY BE USED WITH CITY APPROVAL.
- B.** NO SADDLES ARE TO BE INSTALLED ON CLAY OR CONCRETE SANITARY MAINS WITHOUT PRIOR APPROVAL FROM THE CITY ENGINEER.
- C.** SADDLE SHALL BE ROMAC CB-4.63UN, OR APPROVED EQUAL.
- D.** VITRIFIED CLAY PIPE SHALL BE CAREFULLY TAPPED AND BE SAME DIAMETER AS LATERAL CONNECTOR.
- E.** SEE TRENCH DETAIL FOR BACKFILL AND BEDDING REQUIREMENT.
- F.** ALL BOLTS, WASHERS, NUTS, HOSE CLAMPS AND STRAPS SHALL BE STAINLESS STEEL AND MEET ASTM STANDARDS.
- G.** ALL TAPS MUST BE INSPECTED AND APPROVED BY THE CITY PRIOR TO BACKFILLING.
- H.** OTHER SADDLE TYPES THAT MAY BE APPROVED ON CASE-BY-CASE BASIS DEPENDING ON SITUATIONS ARE ROMAC STYLE "CB" SEWER SADDLE AND DFW/HPI FLEXIBLE SADDLE.



CITY OF TROY



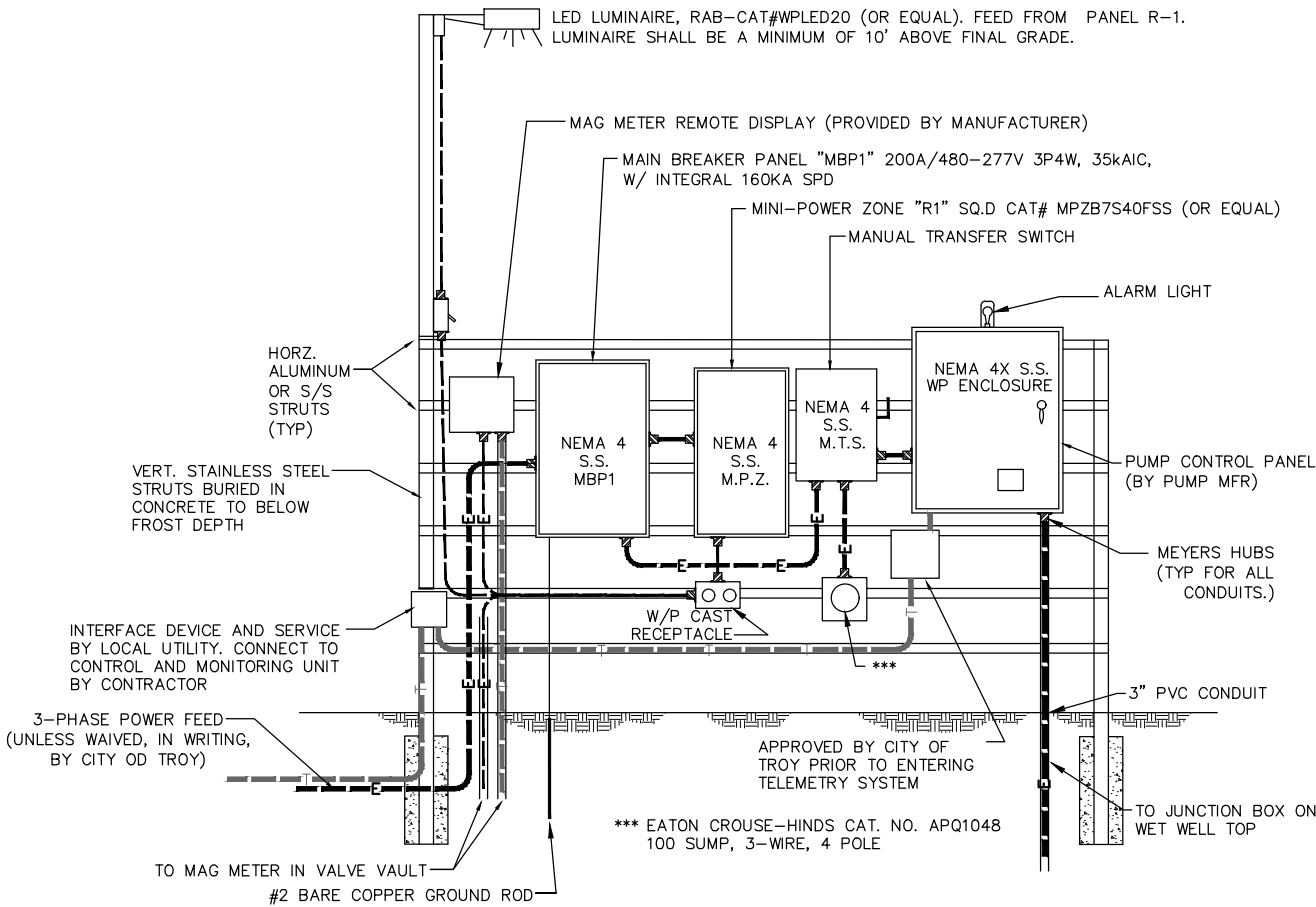
SANITARY SEWER SADDLE DETAILS

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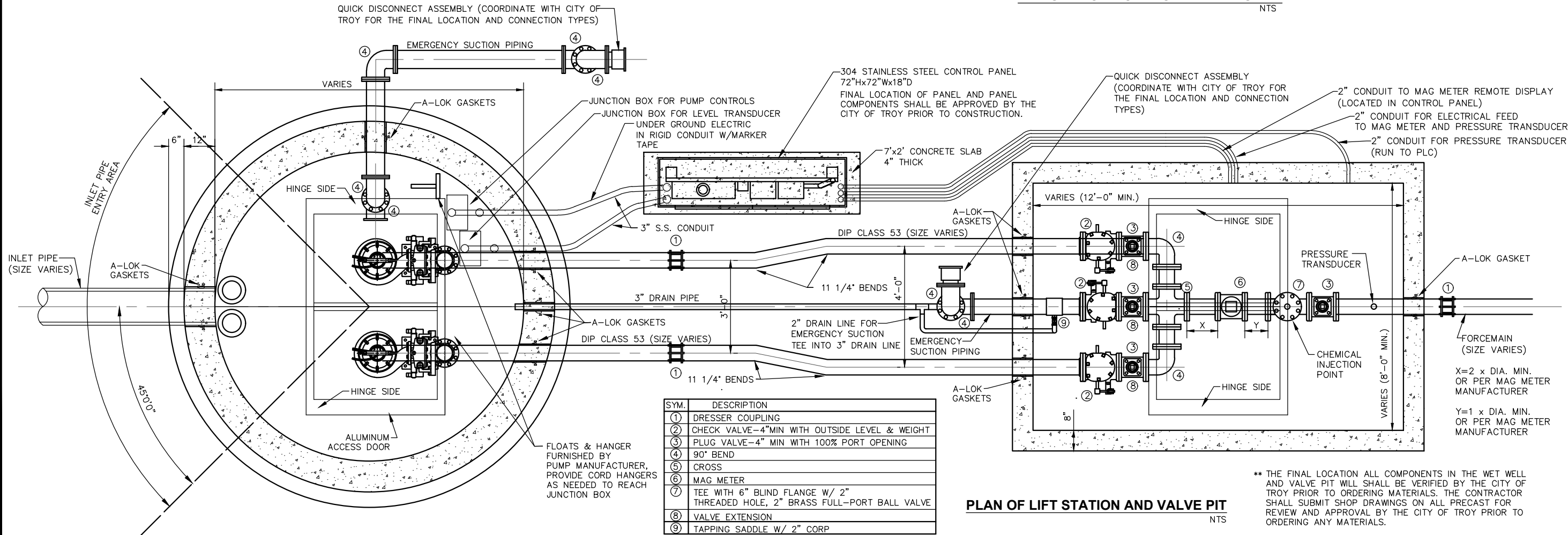
DATE
APPROVED:
NOV 2017
PAGE No.
900-9

PUMP STATION NOTES

1. ALL DUCTILE IRON PIPE AND FITTINGS TO BE PROTECTO 401 LINED. ALL PIPE WITHIN THE WET WELL AND VALVE VAULT SHALL HAVE FLANGED JOINTS.
2. THE PRECAST CONCRETE WET WELL AND FIRST UPSTREAM RECEIVING PRECAST CONCRETE MANHOLE SHALL RECEIVE A CRYSTALLINE WATERPROOFING ADMIXTURE. THE ADMIXTURE SHALL BE ADMIX C-500 MANUFACTURED BY XYPEX.
3. THE PRECAST CONCRETE WET WELL AND FIRST UPSTREAM RECEIVING MANHOLE SHALL RECEIVE A URETHANE/MICACEOUS IRON OXIDE CORROSION RESISTANT COATING SYSTEM. THE COATING SYSTEM SHALL BE MC-TAR 100 MANUFACTURED BY WASSER HIGH TECH COATINGS.
4. SITE IS TO BE ACCESSIBLE DURING THE 100 YEAR FLOOD EVENT. THE SITE GRADE IS TO BE AT OR ABOVE THE 100 YEAR FLOOD ELEVATION THROUGHOUT THE SITE. THE WET WELL AND VALVE VAULT TOP ELEVATIONS ARE TO BE A MINIMUM OF 1' ABOVE THE 100 YEAR FLOOD ELEVATION.
5. TWO PUMPS ARE REQUIRED IN THE WET WELL. EACH PUMP SHALL BE IDENTICAL. THE PUMPS SHALL BE EXPLOSION PROOF, GRINDERS OR CHOPPER TYPE.
6. ONE SPARE PUMP SHALL BE PROVIDED.
7. ALL VALVES TO BE CAST IRON WITH EPOXY COATING.
8. THE CONTRACTOR SHALL PROVIDE ONE HARD COPY AND ONE ELECTRONIC COPY OF THE PUMP STATION AS-BUILT PLANS AND SPECIFICATIONS, ONE COPY OF THE PUMP STATION OWNERS MANUAL, AND ONE COPY OF THE PUMP STATION START-UP INFORMATION PRIOR TO ACCEPTANCE BY THE CITY OF TROY.
9. SUBMITTALS FOR THE LIFT STATION DESIGN INCLUDE:
 - DETAILED LIFT STATION PLAN FOR EACH LIFT STATION
 - LIFT STATION SECTION DETAIL, INCLUDING WET WELL LEVEL SETTINGS
 - LIFT STATION SITE PLAN
 - DESIGN CALCULATIONS
 - PUMP SPECIFICATIONS, INCLUDING PUMP CURVES
 - BUOYANCY CALCULATIONS FOR THE WET WELL AND VALVE VAULTSITE PLAN MUST CONFORM TO LOCAL ZONING REGULATIONS.
10. SCADA REQUIRED EQUIPMENT:
 - GE MDS SD9 & ANTENNA BROADBAND SERIAL RADIO
 - ALLEN BRADLEY MICROLOGIX 1100 OR 1400
 - SIGMA CONTROLS MODEL 6100MP, WASTE WATER MICROPROCESSOR BASED SUBMERSIBLE LEVEL TRANSMITTER
11. THE CITY RESERVES THE RIGHT TO IMPLEMENT ADDITIONAL REQUIREMENTS OR VARY FROM THESE STANDARDS FOR SPECIFIC NEEDS.

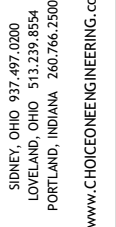


LIFT STATION CONTROL PANEL BOARD
NTS



PLAN OF LIFT STATION AND VALVE PIT
NTS

** THE FINAL LOCATION ALL COMPONENTS IN THE WET WELL AND VALVE PIT WILL SHALL BE VERIFIED BY THE CITY OF TROY PRIOR TO ORDERING MATERIALS. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS ON ALL PRECAST FOR REVIEW AND APPROVAL BY THE CITY OF TROY PRIOR TO ORDERING ANY MATERIALS.



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THIS DOCUMENT SHOWS GENERAL REQUIREMENTS AND GUIDANCE FOR THE DESIGN OF LIFT STATIONS. EXACT SIZE AND LAYOUT OF STRUCTURES AND COMPONENTS WILL BE DETERMINED BY DESIGN REQUIREMENTS AND DETAILED ON THE SITE PLAN SUBMITTAL.

