

GREENWOOD AVENUE STORM DRAIN SYSTEM IMPROVEMENT
CITY OF TAKOMA PARK, MARYLAND

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LEGEND

	EXISTING	AS BUILT
IMBRICATED RIP RAP		
RIVER JACK ROCK/ RIP RAP		
#57 STONE		
BRICK		
CONCRETE		
EARTH		
MULCH		
C-33 / SAND		
BIO PLANTING SOIL		

LEGEND

AS BUILT LINES	
AS BUILT LINES	
PROPOSED LINES	
PROPOSED HIDDEN LINES	
LIMIT OF DISTURBANCE	
GAS LINE	
WATER LINE	
SEWER LINE	
GEO FABRIC	

GENERAL NOTES

STORM DRAIN INSTALLATION

- A pre-construction conference shall be held prior to the start of construction. The details of construction shall be discussed; and the contractor shall be prepared to furnish the necessary equipment, material, and labor to accomplish the task.
- Before any construction may occur, the contractor shall have plans which have been signed and approved by the City of Takoma Park Public Works Department, obtained all City, county, state, federal and other required permits, and have posted all required bonds.
- All storm drainage improvements shall be designed and constructed in accordance with the latest edition of the City of Takoma Park Public Works Pre-Approved Plans and Policies and the Standard Specifications for Road, Bridge and Municipal Construction.
- Any deviation from the approved plans will require written approval, all changes shall be submitted to the City.
- A copy of the approved storm water plans must be on the job site whenever construction is in progress.
- All disturbed areas shall be seeded and mulched or similarly stabilized to the satisfaction of the City of Takoma Park Department of Public Works for the prevention of on-site erosion after the completion of construction.
- Minimum cover over storm drainage pipes in ROW or vehicular path shall be 18 inches, unless other design is approved.
- Steel pipe shall have Asphalt Treatment #1 or better inside and outside.
- All catch basins with a depth of over five feet (5') to the pipe invert shall have a standard ladder installed.
- All storm drainage main extensions within the public right-of-way or in easements must be staked for line and grade prior to starting construction.
- Rock for erosion protection of roadway ditches, where required, must be of sound quarry rock, placed to a depth of one foot (1') and must meet the following specifications: 4"-8" rock/40%-70% passing; 2"-4" rock/30%-40% passing; 2"-minus rock/10%-20% passing. Recycled concrete shall not be used for erosion protection, including for construction entrance or temporary stabilization elsewhere on site.
- All pipe, manholes, catch basins, and appurtenances shall be laid on a properly prepared foundation in accordance with the current Montgomery County and City of Takoma Park Standard specifications for road and bridge construction. This shall include necessary leveling of the trench bottom or the top of the foundation material as well as placement and compaction of required bedding material to uniform grade so that the entire length of the pipe will be supported on a uniformly dense, unyielding base. If the native material in the bottom of the trench meets the requirements for "gravel backfill for pipe bedding," the first lift of pipe bedding may be omitted provided the material in the bottom of the trench is loosened, regraded, and compacted to form a dense unyielding base. All pipe bedding shall be #57 stone, pea gravel or better. Pipe shall not be installed on sod, frozen earth, large boulders, or rock. Pipe bedding for flexible pipes shall be pea gravel or # 57 stone to the spring line of the pipe.
- Construction of dewatering discharges shall always meet The State of Maryland Surface Water Quality Standard. Temporary discharges to sanitary sewer require prior authorization and permit and notification to the City of Takoma Park Public Works.
- All trench backfill shall be compacted to 95 percent density in roadways, roadway shoulders, roadway prism and driveways, and 85 percent density in unpaved areas. All pipe zone compaction shall be 95 percent.
- The Contractor shall be responsible for providing adequate safeguards, safety devices, protective equipment, confined space protection, flaggers, and any other needed actions to protect the life, health, and safety of the public, and to protect property in connection with the performance of work covered by the contract. Any work within the traveled right-of-way that may interrupt normal traffic flow shall require a Traffic Control Plan approved by the City of Takoma Park.

SHEET
No. 1
OF 10

DRAWING
NUMBER

SW-1

DESIGNED BY: A. Khalilian, P.E.
DRAWN BY: Z. Mathewos
APPROVED BY: A. Khalilian, P.E.
DATE APPROVED: August 2, 2018
SCALE: NTS

PROJECT TYPE:
STORM DRAIN SYSTEM
IMPROVEMENT

PROJECT TITLE:
TITLE AND GENERAL NOTES

PROJECT NAME:
GREENWOOD AVENUE
STORM DRAIN SYSTEM IMPROVEMENT

CITY OF TAKOMA PARK
DEPARTMENT OF PUBLIC WORKS
MONTGOMERY COUNTY, MARYLAND



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& Structural Engineering
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16. No final cut or fill slope shall exceed slopes of two (2) horizontal to one (1) vertical without stabilization by rockery or by a structural retaining wall.
17. All manhole ladders shall be firmly attached and extend to within 1' of the bottom of the structure.
18. Approximate locations of existing utilities have been obtained from available records and are shown for convenience. The Contractor shall be responsible for verification of existing utility locations whether or not these utilities are shown on the plans. The Contractor shall exercise all care to avoid damage to any utility. If conflicts with existing utilities arise during construction, the contractor shall notify the City Construction Inspector and any changes required shall be approved by the City Engineer prior to commencement of related construction on the project.
19. The underground utility location service shall be contacted for field location of existing utilities prior to any construction. The owner or his representative shall be contacted if a utility conflict exists. The Contractor is responsible to ensure that utility locates are maintained throughout the life of the project.
20. The Contractor shall verify the locations, widths, thicknesses, and elevations of all existing pavements and structures that are to interface with new work. Provide all trimming, cutting, saw cutting, grading, leveling, sloping, coating, and other work, including materials as necessary, to cause the interface with existing works to be proper, acceptable to the Engineer and the City of Takoma Park, complete in place and ready to use.
21. All inlet, manhole, and catch basin frames and grates shall not be adjusted to grade until immediately prior to final paving. All catch basin grates shall be set 0.10' below pavement level.
22. Open cut road crossings for utility trenches on existing traveled roadway shall be backfilled only with 5/8" minus crushed rock and mechanically compacted (unless otherwise approved by the City). Cuts into the existing asphalt shall be neat line cut with saw or jackhammer in a continuous line. A temporary cold mix patch must be placed immediately after backfill and compaction. A permanent hot mix patch shall be placed within 30 days and shall be a minimum of 1" thicker than the original asphalt with a minimum thickness of 2".
23. All damages incurred to public and/or private property by the contractor during the course of construction shall be promptly repaired to the satisfaction of the City Construction Inspector.
24. Grout all seams and openings in all inlets, catch basins, and manholes. Jet set grout is NOT allowed.
25. When widening an existing roadway where an existing Type I catch basin will remain in the travel lane, the existing frame and cover shall be replaced with a round, locking frame and cover.
26. Recycled concrete shall not be used around stormwater facilities.

CONCRETE WORKS

1. **MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF CONCRETE:**
For structural walls, foundations, and all other concrete not expose to weather: 3000psi
For structural walls with lateral soil pressure exposed to weather: 3500 psi
For beams and above grade slabs exposed to traffic: 4000 psi
2. **MINIMUM REQUIREMENT FOR CONCRETE TESTING**
Taking sample for strength tests shall be performed in accordance with ASTM C 172
Mold and standard curing for strength testing shall be done in accordance with ASTM C 31
Test cylinders in accordance with ASTM C 39
As per ACI 318, section 26.12.1.1, strength tests shall be the average of the strength of at least two 6 by 12 inch or three 4 by 8 inch cylinders made from the same sample of concrete tested at 28 days

STRUCTURAL MASONRY

1. Load bearing masonry walls are considered to be structural masonry.
2. **REQUIRED COMPRESSIVE STRENGTH OF MASONRY UNITS:**
Solid clay units _____ 6200 psi
Concrete units _____ 1900 psi
3. Concrete masonry units (CMU) shall be grade N, conforming to ASTM C 90. Refer to architectural drawings and specifications for unit size.
4. Mortar: Type S, ASTM C 270
5. Grout for reinforced masonry: Fine grout, ASTM C 476 with minimum 28 days compressive strength of 2000 psi

SHEET
No. 2
OF 10

DRAWING
NUMBER

SW-2

DESIGNED BY: A. Khalilian, P.E.
DRAWN BY: Z. Mathewos
APPROVED BY: A. Khalilian, P.E.
DATE APPROVED: August 2, 2018
SCALE: NTS

PROJECT TYPE:
STORM DRAIN SYSTEM
IMPROVEMENT

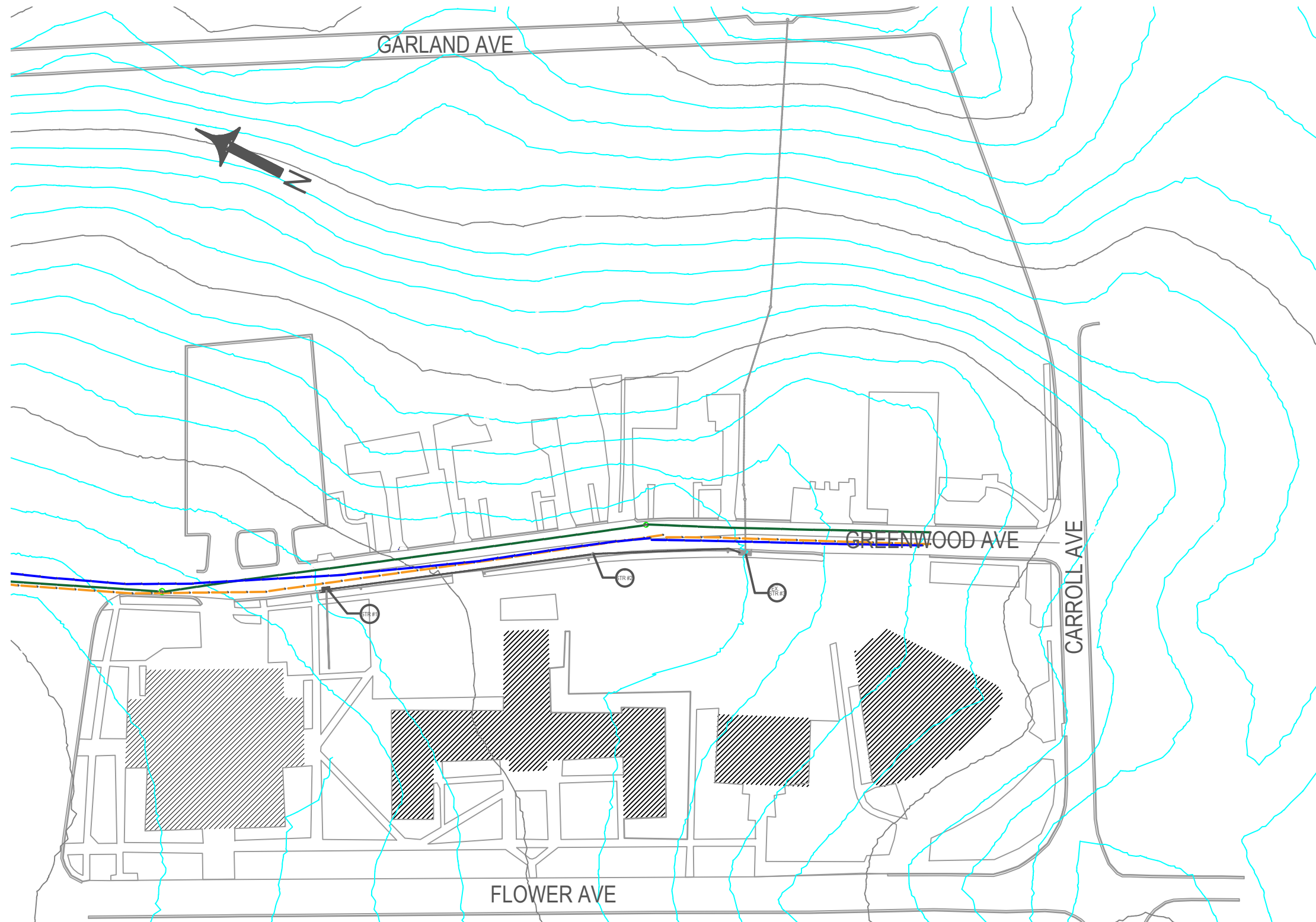
PROJECT TITLE:
CONSTRUCTION NOTES

PROJECT NAME:
GREENWOOD AVENUE
STORM DRAIN SYSTEM IMPROVEMENT

CITY OF TAKOMA PARK
DEPARTMENT OF PUBLIC WORKS
MONTGOMERY COUNTY, MARYLAND


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1
SW-3

STORM DRAIN SITE PLAN

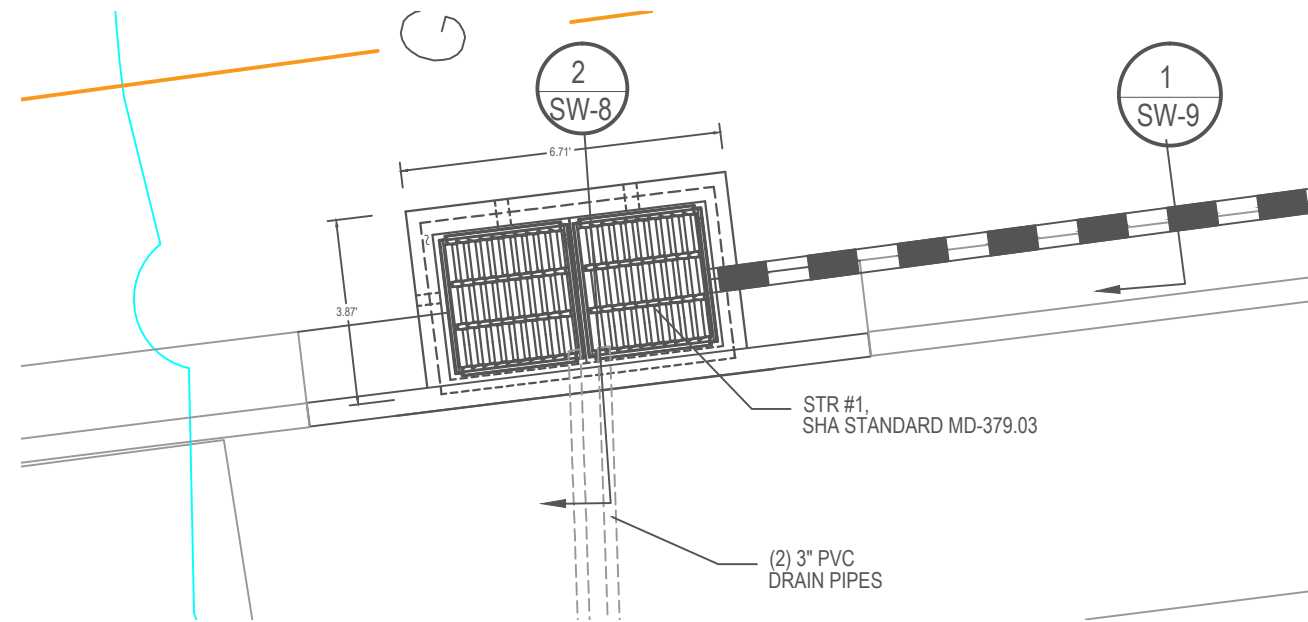
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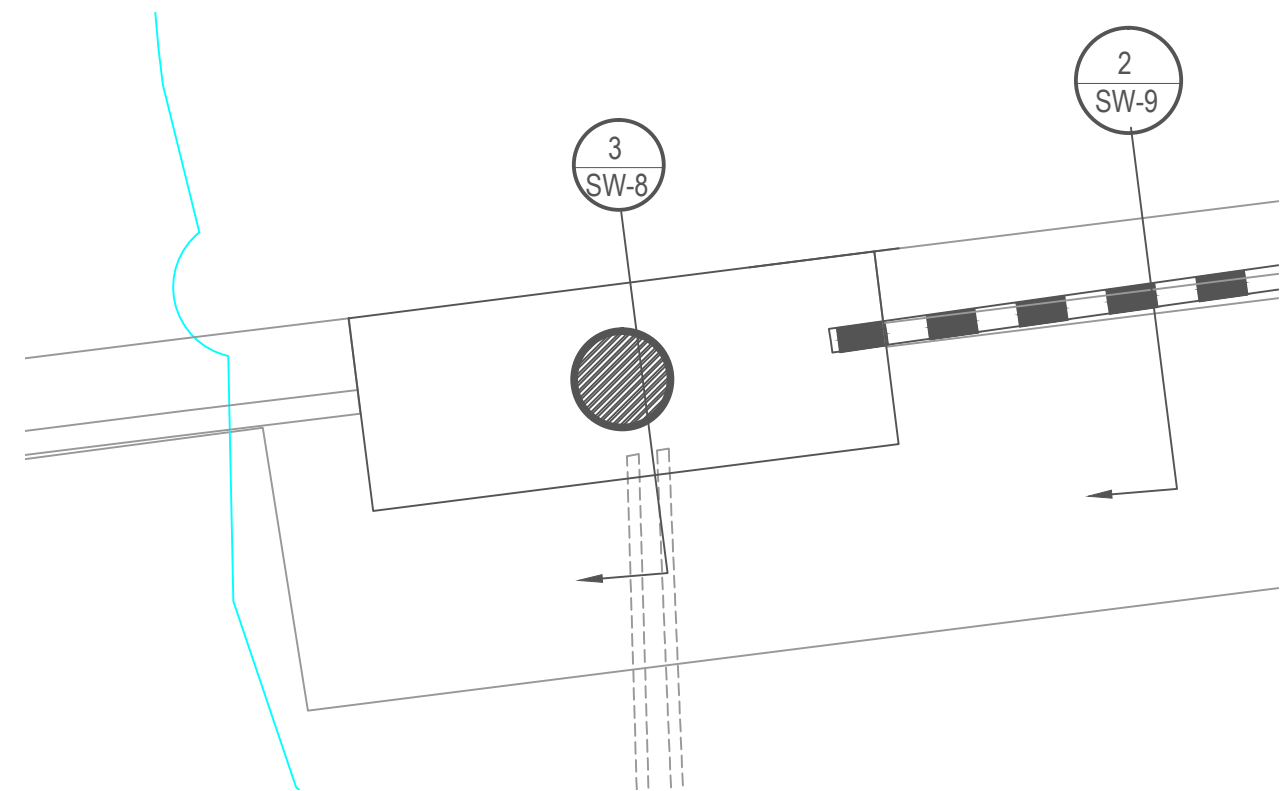
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SW-4

STORM DRAIN SYSTEM (STR-1 THRU STR-3) PLAN

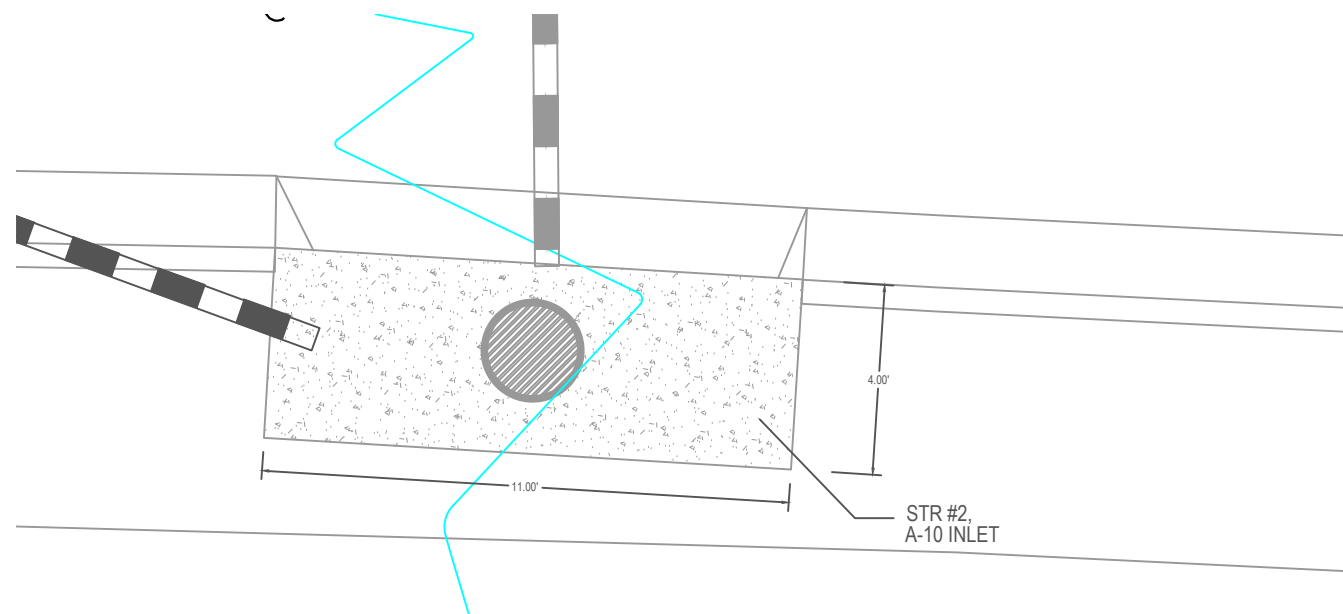
SCALE: 1" = 30'-0"



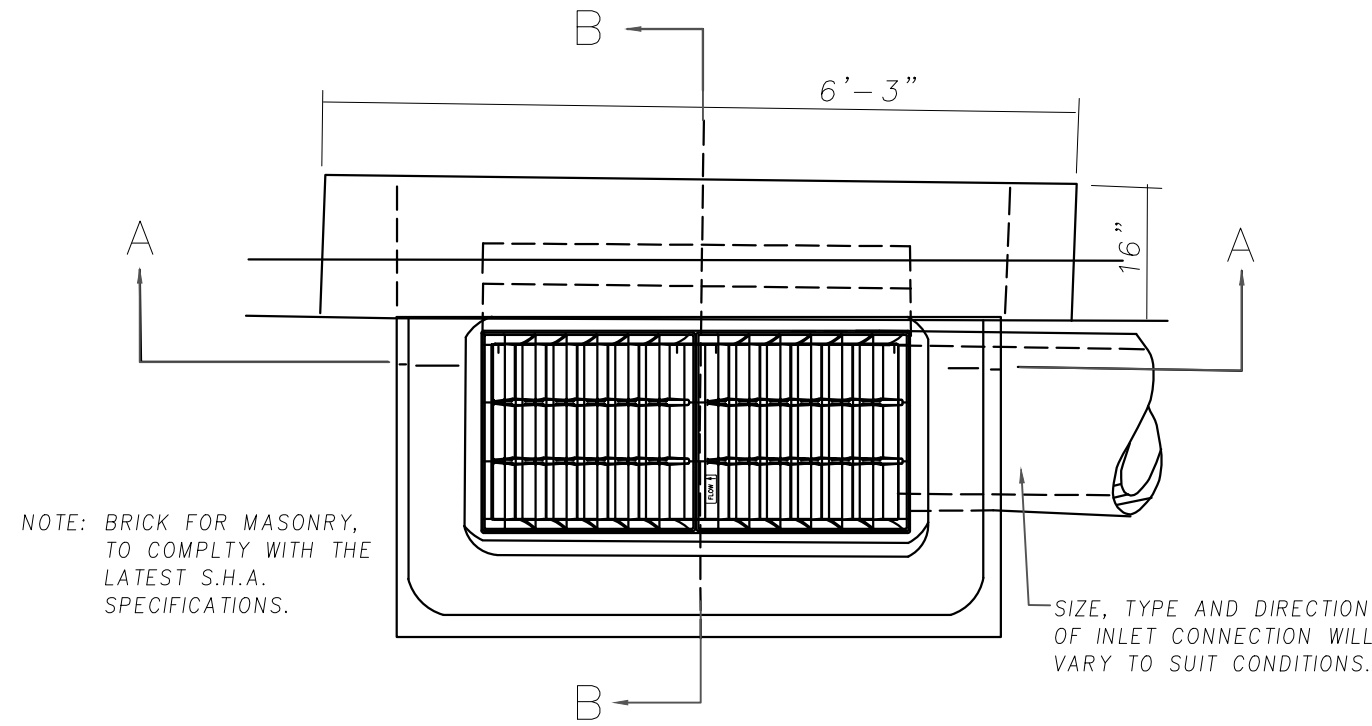
1
SW-5
 (STR-1, OPTION 1, MD-376.21) OR
 (STR-1, OPTION 2, MC-505.02) **PLAN**
 SCALE: 1" = 4'-0"



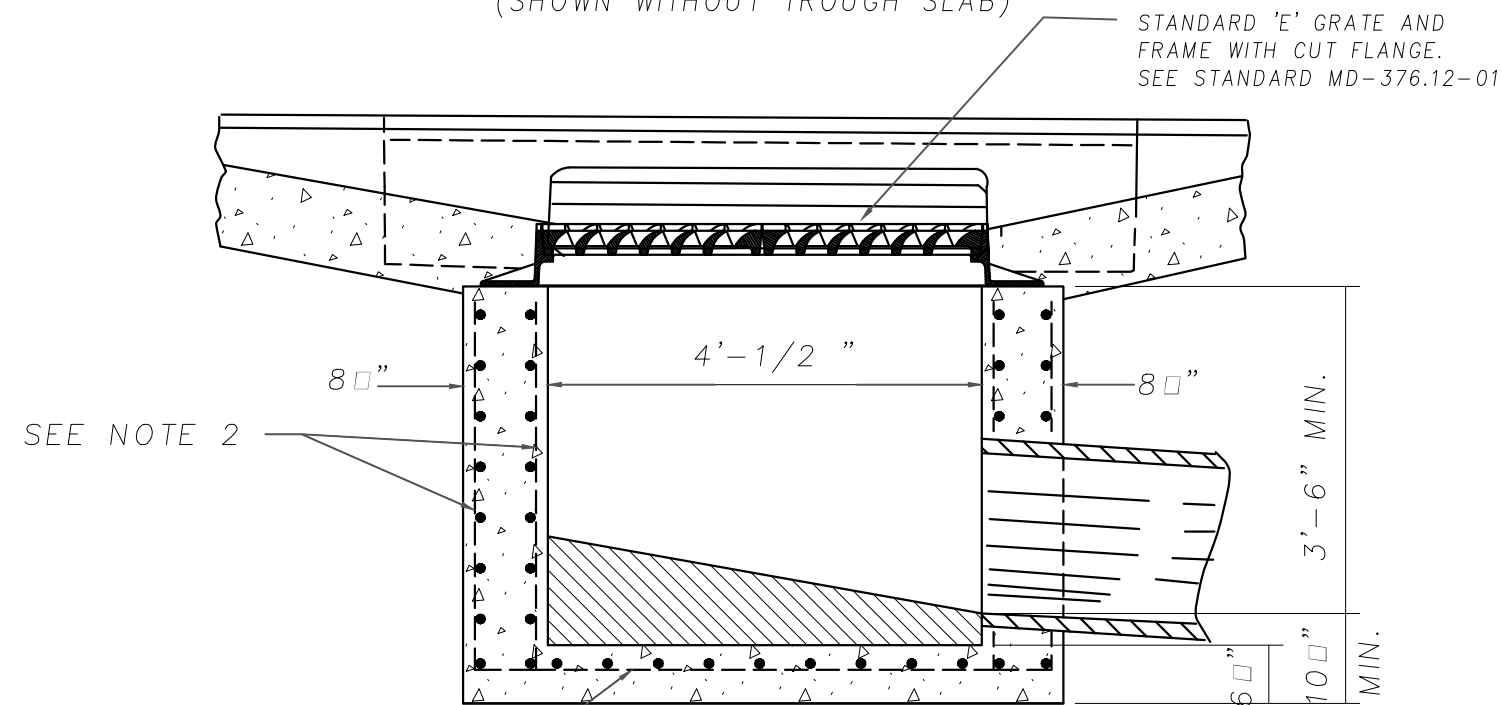
2
SW-5
 (STR-1, OPTION 3, A-10 INLET) **PLAN**
 SCALE: 1" = 4'-0"



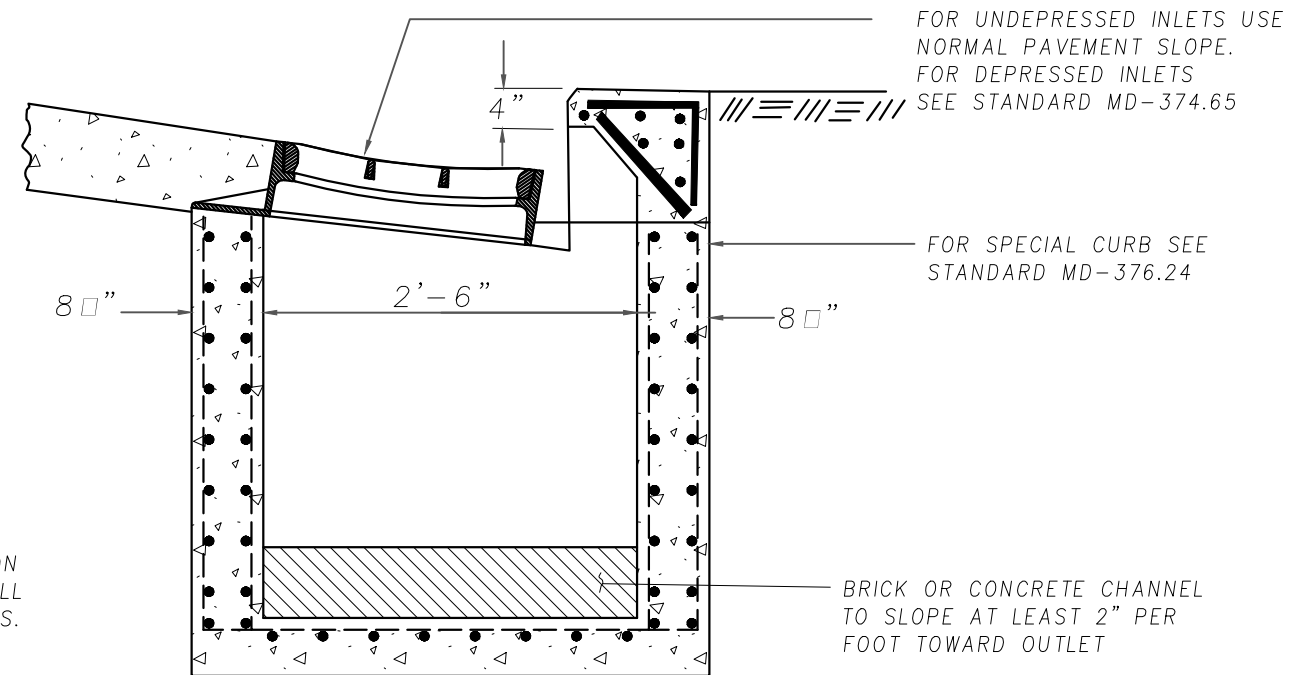
3
SW-5
EXISTING STR-3 PLAN
 SCALE: 1" = 4'-0"



PLAN
(SHOWN WITHOUT TROUGH SLAB)



SECTION A-A



SECTION B-B

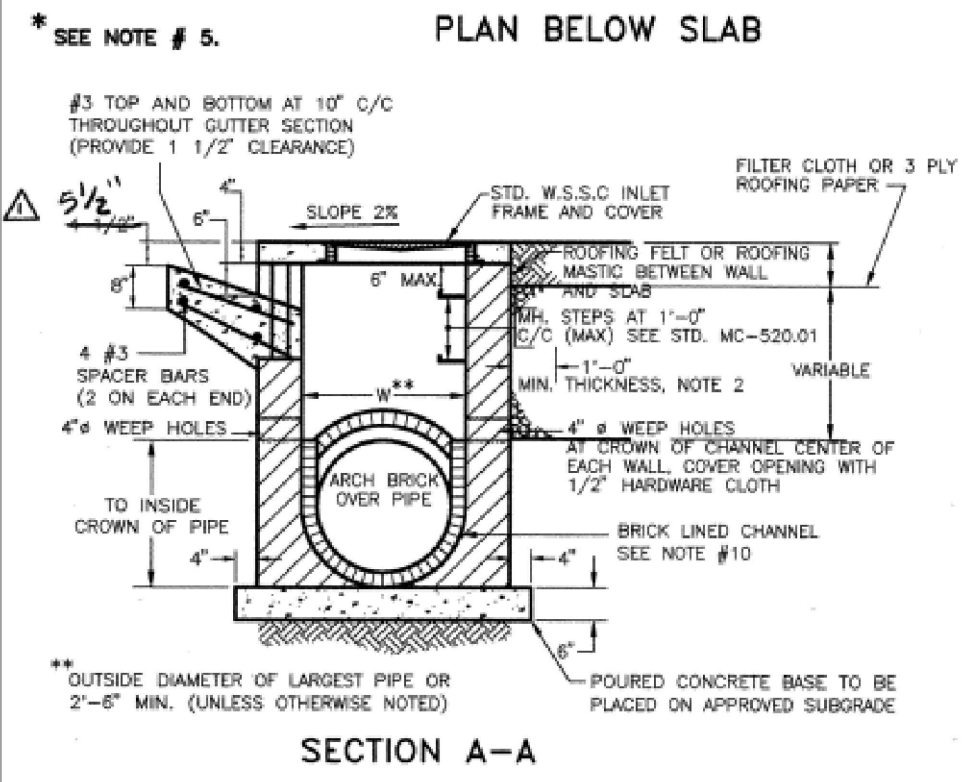
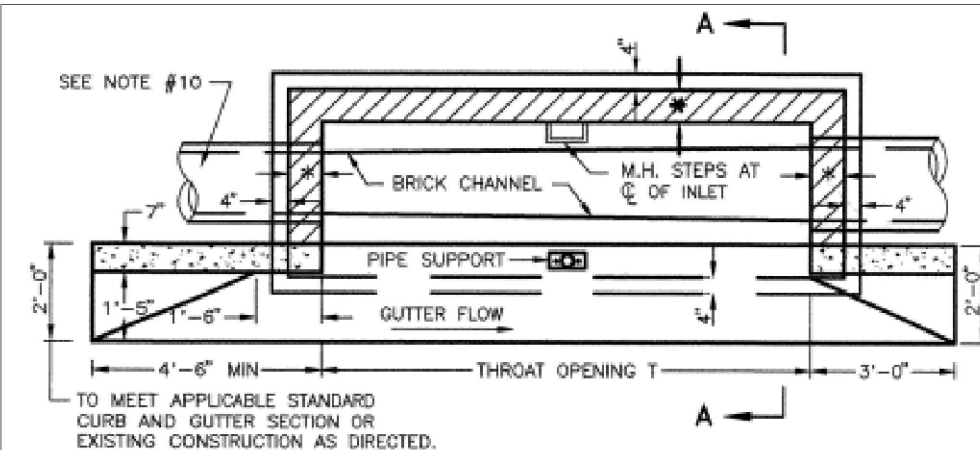
GENERAL NOTES:

1. INLET SHALL BE CONSTRUCTED OF REINFORCED CONCRETE MIX NO. 2 (3,000 PSI).
2. WHEN DEPTH IS LESS THAN 7'-0", WALL REINFORCEMENT SHALL BE ONE LAYER OF NO. 4 DEFORMED BARS @ 6" C/C, TWO WAYS, AND HAVE 3" COVER ON INSIDE. WHEN DEPTH IS GREATER THAN 7'-0" AND LESS THAN 15'-0", WALL REINFORCEMENT TO BE TWO LAYERS OF NO. 4 DEFORMED BARS @ 6" C/C, TWO WAYS, ON INSIDE AND OUTSIDE OF WALL WITH 2" COVER.
3. BASE REINFORCEMENT SHALL BE ONE LAYER OF NO. 4 DEFORMED BARS @ 6" C/C, TWO WAYS, WITH 2" COVER FROM TOP OF BASE.
4. FROM CURBLINE/SIDEWALK, INLET HAS BEEN DESIGNED FOR HS-25 LOADING, ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND FOR A MAXIMUM DEPTH OF 15'-0".



MD 376.21 (STR-1, OPTION 1) DETAILS

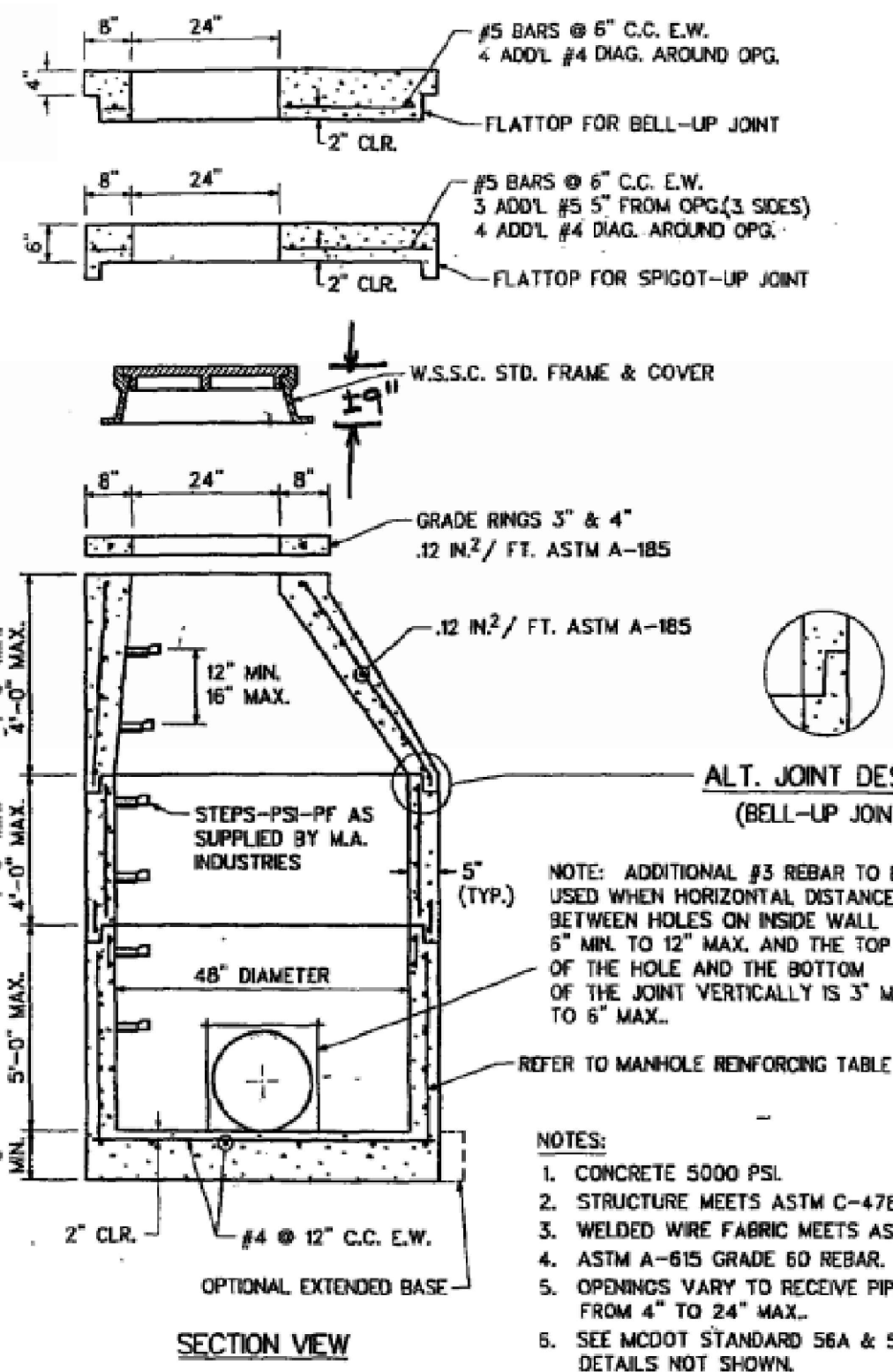
SCALE: 1" = 2'-0"



- ### GENERAL NOTES
1. USE SOLID MASONRY (BRICK OR CONCRETE BLOCK) OR POURED CONCRETE FOR WALLS.
 2. INSTALL FOUNDATION DRAINAGE MATERIAL AROUND STRUCTURE FROM BOTTOM OF WEEP HOLES TO WITHIN 8" OF SURFACE.
 3. MORTAR SHALL CONFORM TO ASTM SPECIFICATION C 270 TYPE M.
 4. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION FOR MATERIALS AND METHODS OF CONSTRUCTION.
 5. WALL THICKNESS WILL BE THE FOLLOWING:
8" THICK WALLS FOR THE FIRST 8'-0" OF DEPTH, 12" THICK WALLS BETWEEN 8'-0" AND 12'-0" OF DEPTH, 16" THICK WALLS FOR DEPTH GREATER THAN 12'-0" DEPTH TO BE MEASURED FROM TOP OF CURB TO CROWN OF OUTGOING PIPE.
 6. $f_c = 3500$ PSI AT 28 DAYS.
 7. ALL REINFORCING STEEL TO BE ASTM A615, GR 60.
 8. FOR PIPES 30" AND LARGER, PROVIDE STEPS IN CHANNELS OR STRUCTURES. SEE STANDARD MC-520.02
 9. ON TERMINAL INLETS, THE INLET BOTTOM SHALL BE SLOPED TO OUTLET PIPE WITH SEWER BRICK OR CONCRETE, 9" MIN. FALL.
 10. FOR ACTUAL PIPE LOCATIONS, REFER TO STORM DRAIN PLANS AND CONSTRUCT BRICK CHANNEL TO PIPE CONFIGURATIONS BRICK CHANNEL SHALL BE SEWER BRICK ON EDGE AND BUILT TO THE CROWN OF THE PIPE.

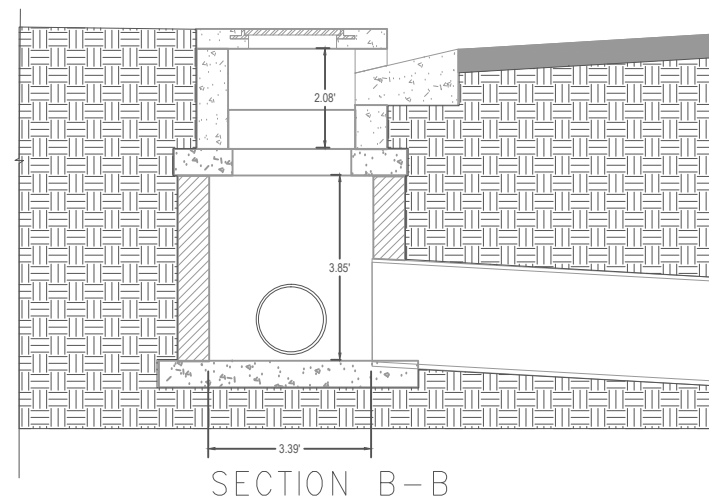
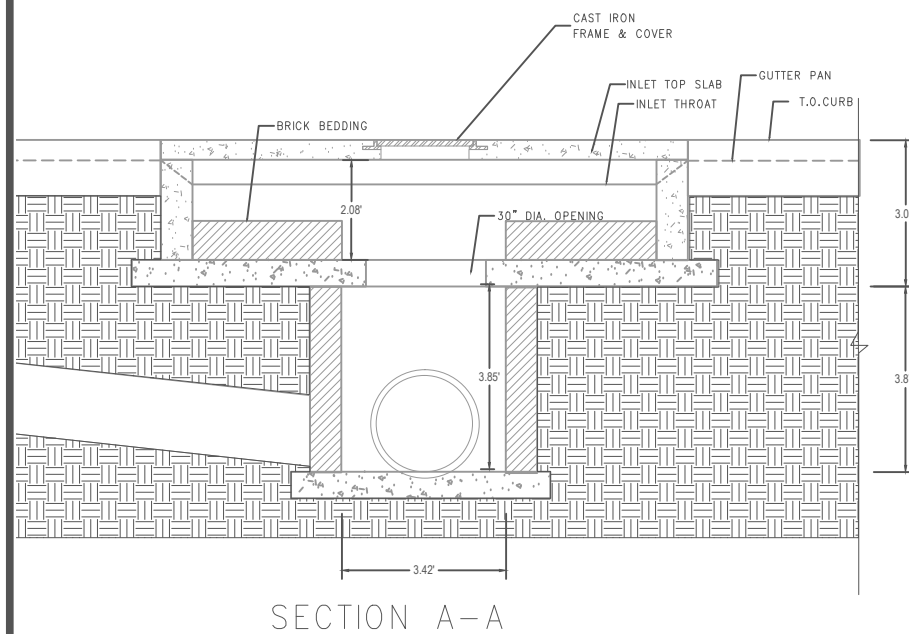
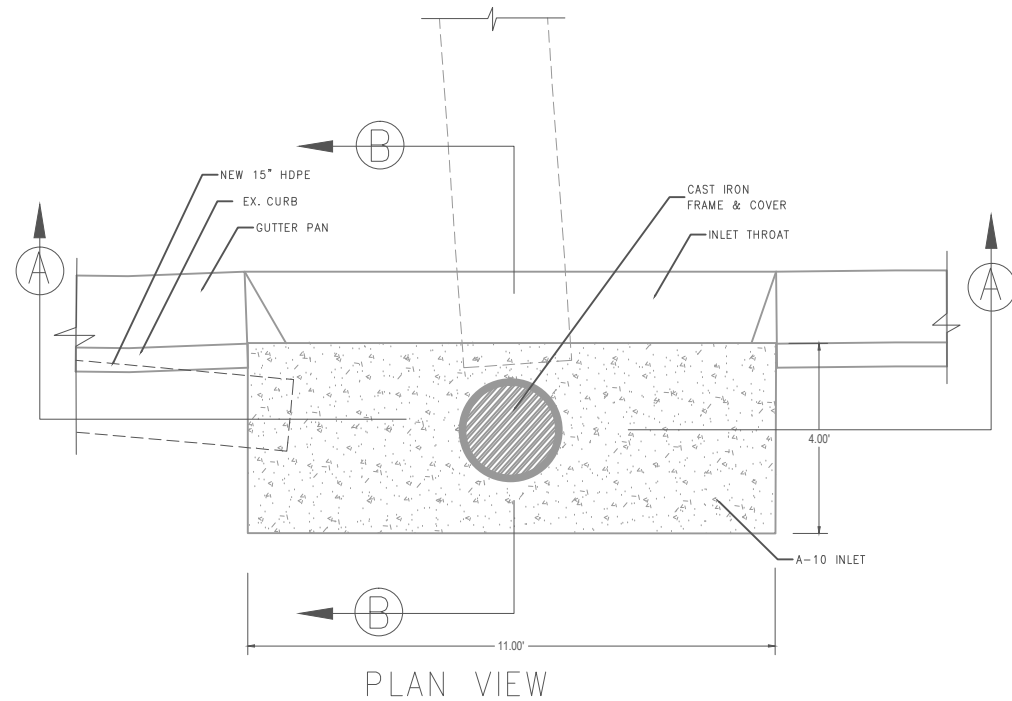
DESIGNATION	T THROAT OPENING	NUMBER OF PIPE SUPPORTS
A-5	5'-0"	0
A-10	10'-0"	1
A-15	15'-0"	2
A-20	20'-0"	3

PIPE SUPPORTS TO BE SPACED AT 5'-0" C/C

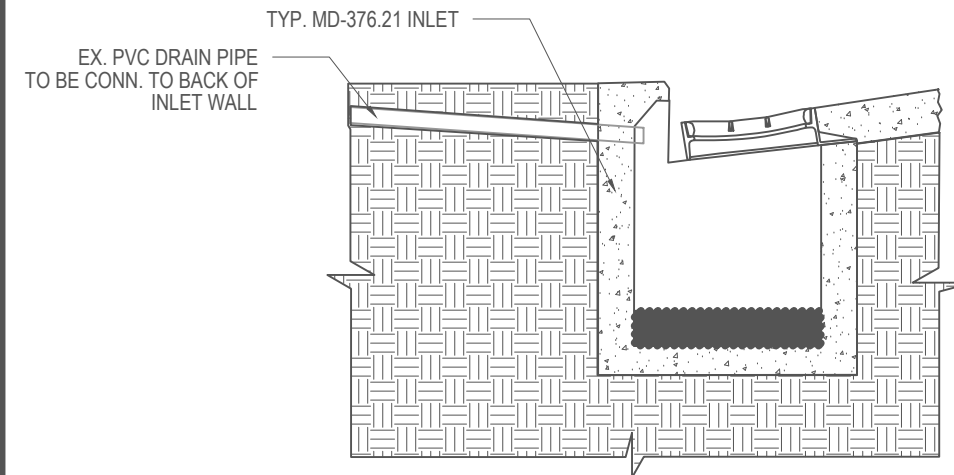


1 MC 501.01 (STR-1, OPTION 3) DETAILS
SW-7 SCALE: 1" = 4'-0"

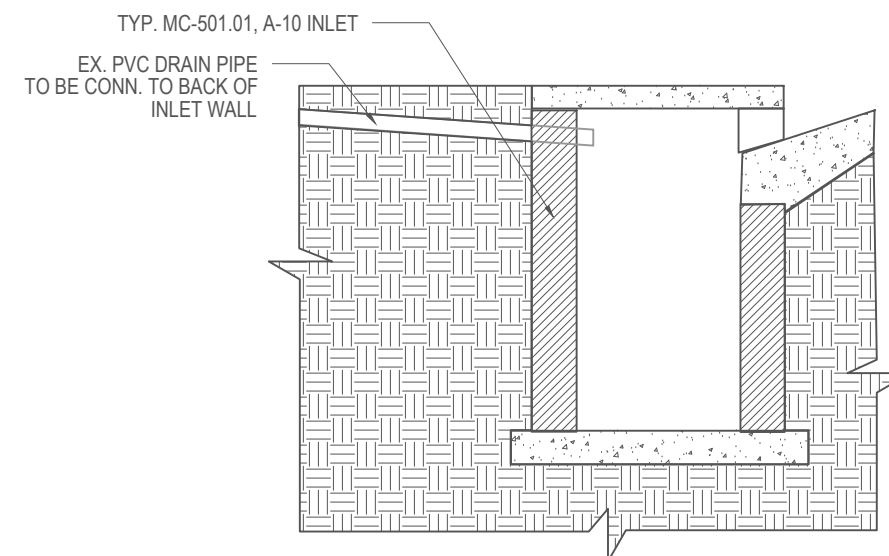
1 MC 48" DIAMETER MANHOLE DETAILS
SW-7 SCALE: NTS



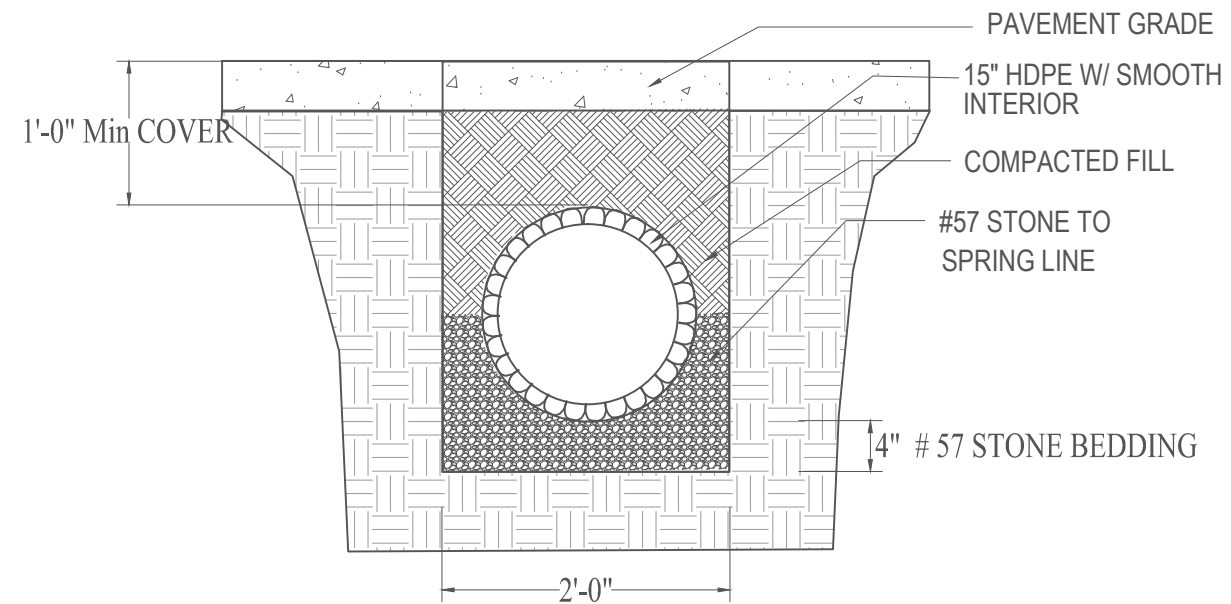
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STR-3 DETAILS
SW-8 SCALE: 1" = 4'-0"



2
MD 376.21 (STR-1, OPTION 1) PVC CONN. DETAILS
SW-8 SCALE: 1" = 4'-0"



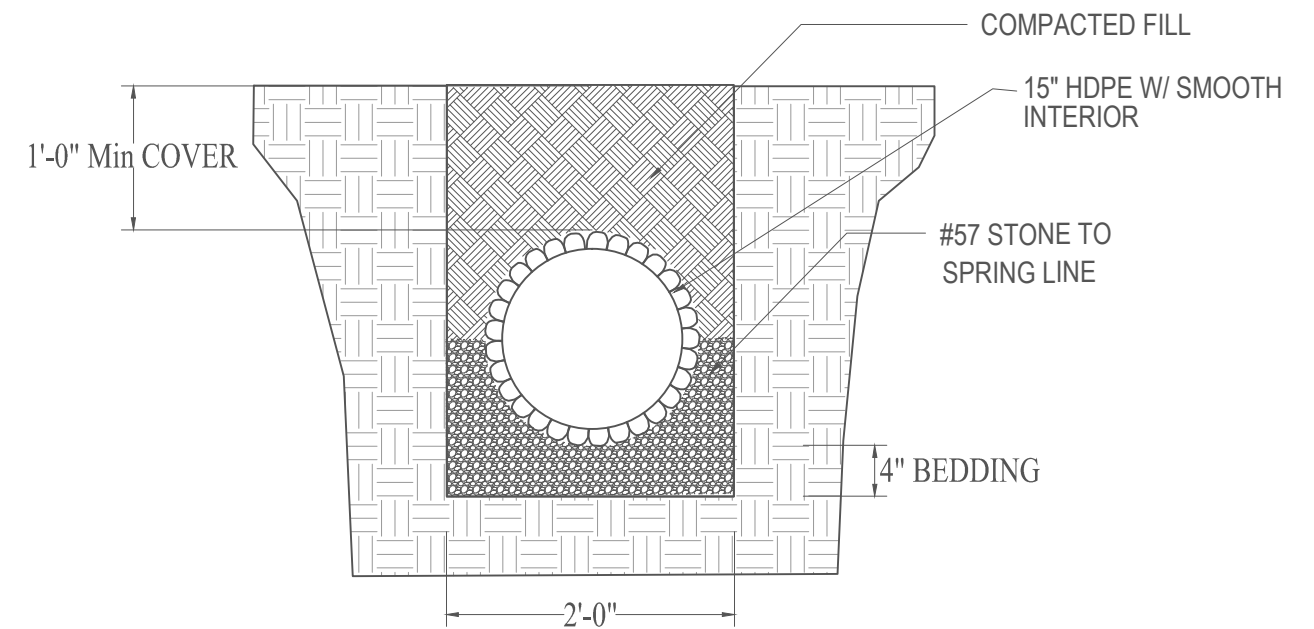
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MC 501.01 (STR-1, OPTION 3) PVC CONN. DETAILS
SW-8 SCALE: 1" = 4'-0"



1
SW-9

TYP. PIPE TRENCH SECTION AT PAVED AREA

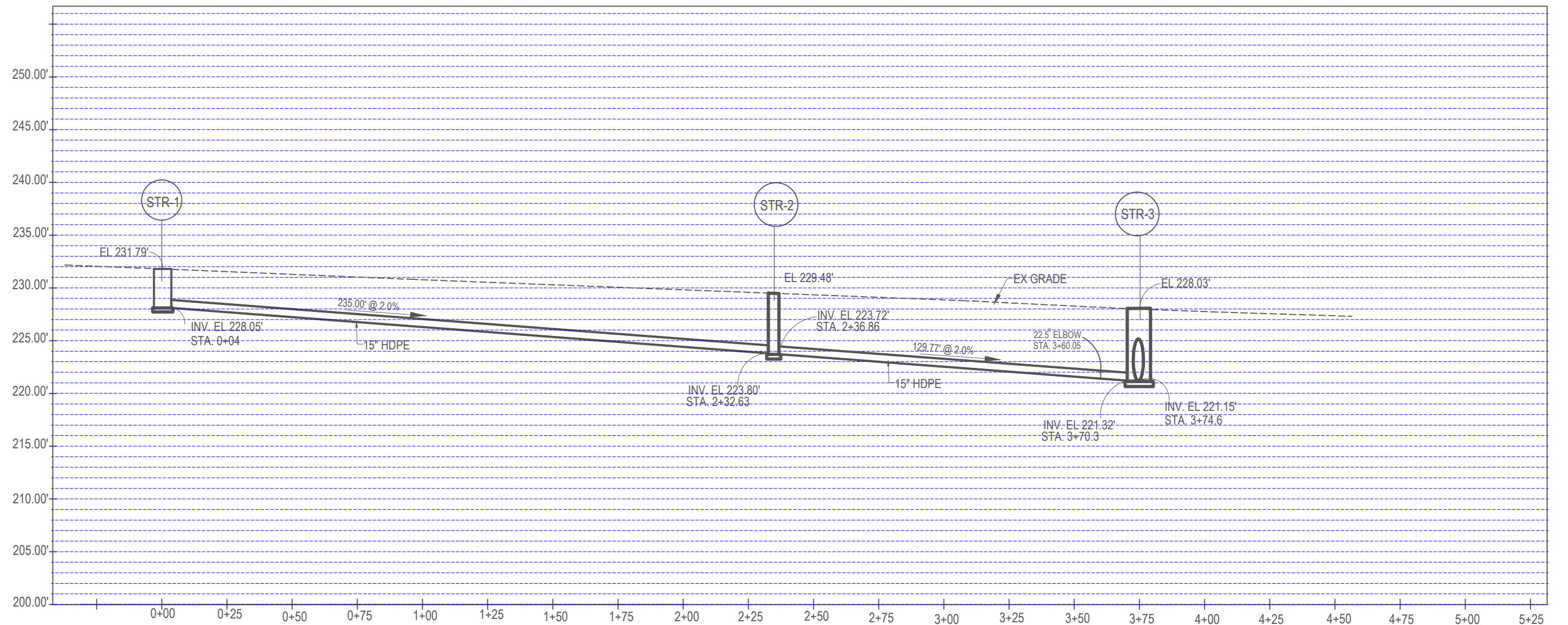
SCALE: 3/4" = 1'-0"



2
SW-9

TYP. PIPE TRENCH SECTION AT GREEN AREA

SCALE: 3/4" = 1'-0"



1 STR-1 THRU STR-3 STORM DRAIN PROFILE
SW-10 SCALE: HORI 1" = 40'-0"
VERT 1" = 10'-0"