

PROJECT

Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

ENGINEER

AECOM TECHNICAL SERVICES, INC.
9 JONATHAN BOURNE DRIVE
POCASSET, MA 02659
PHONE: (508) 833-8950
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CONSULTANTS

REGISTRATION

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60476644

Designed By:	M. CURRAN
Drawn By:	M. CURRAN
Dept Check:	T. PARECE
Proj Check:	M. DONOGHUE
Date:	MARCH 2019
Scale:	AS NOTED

DISCIPLINE

GENERAL SHEET TITLE

COVER SHEET AND INDEX OF DRAWINGS

SHEET NUMBER

00 G-001

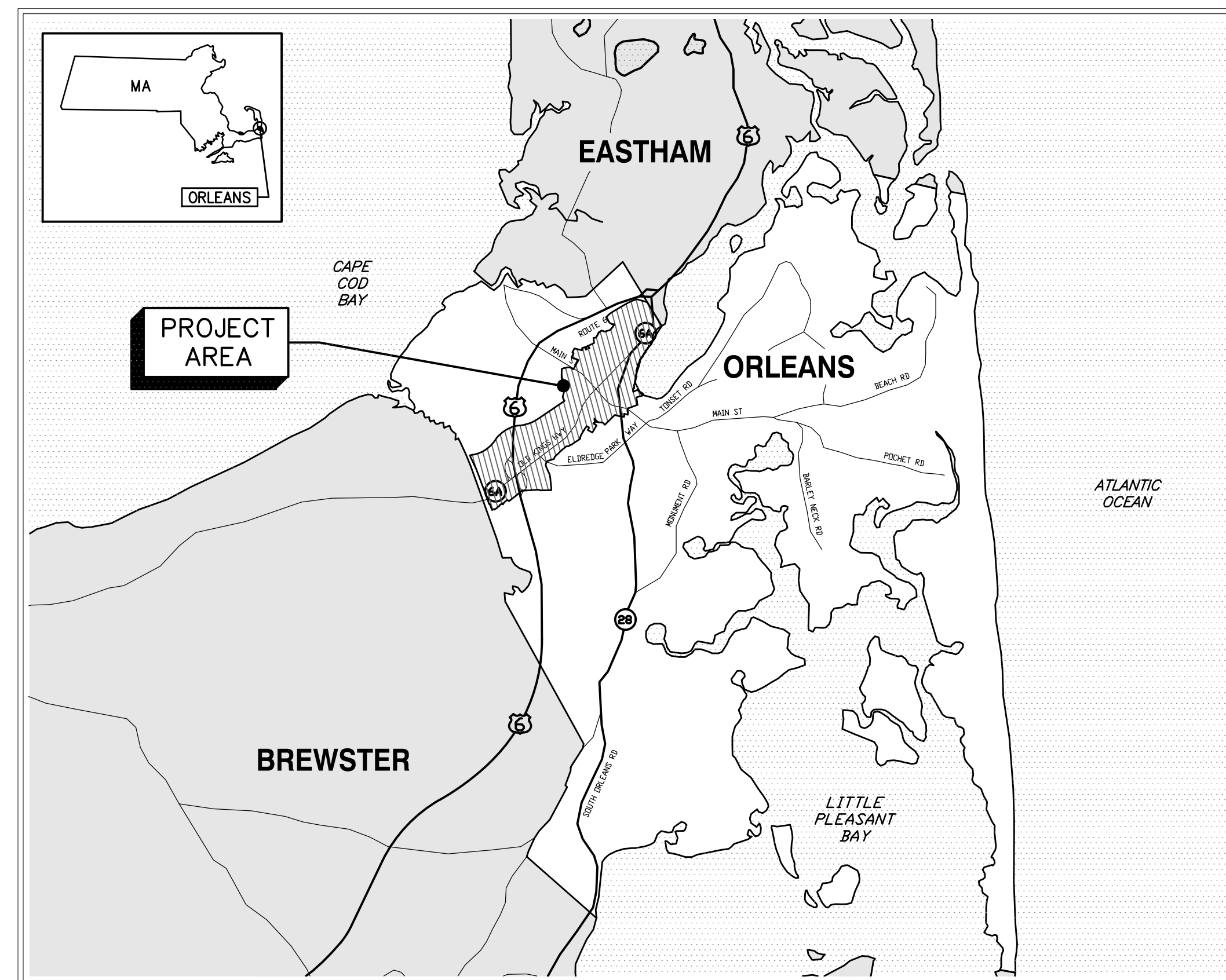
TOWN OF ORLEANS, MA

DOWNTOWN AREA COLLECTION SYSTEM AND PUMP STATIONS

CONTRACT NO. 2019-02
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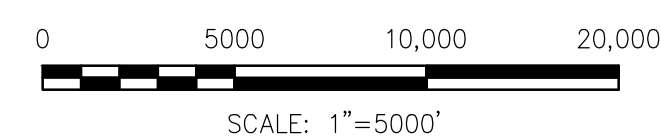
INDEX OF DRAWINGS

SHEET NO.	TITLE	SHEET NO.	TITLE
GENERAL		CIVIL (CONTINUED)	
00 G-001	COVER SHEET AND INDEX OF DRAWINGS	03 C-110	PLAN AND PROFILE SEWER CROSS COUNTRY I
00 G-002	SHEET KEY PLAN	03 C-111	PLAN AND PROFILE SEWER CROSS COUNTRY II
CIVIL		03 C-112	PLAN AND PROFILE SEWER CRANBERRY HIGHWAY I
00 C-001	GENERAL NOTES, LEGENDS AND ABBREVIATIONS	03 C-113	PLAN AND PROFILE SEWER CRANBERRY HIGHWAY II
01 C-101	PLAN AND PROFILE SEWER LOTS HOLLOW RD I	03 C-114	PLAN AND PROFILE SEWER CRANBERRY HIGHWAY III
01 C-102	PLAN AND PROFILE SEWER LOTS HOLLOW ROAD II	03 C-115	PLAN AND PROFILE SEWER COUNTY ROAD
01 C-103	PLAN AND PROFILE SEWER WEST ROAD I	03 C-116	PLAN AND PROFILE SEWER SOUTH ORLEANS ROAD
01 C-104	PLAN AND PROFILE SEWER WEST ROAD II	03 C-117	PLAN AND PROFILE SEWER COTTAGE & NORTH COTTAGE STREET
01 C-105	PLAN AND PROFILE SEWER ROUTE 6 CROSSING	03 C-401	PUMP STATION NO. 3 SITE PLAN
01 C-106	PLAN AND PROFILE SEWER OLD COLONY WAY I	99 C-501	DETAILS I
01 C-107	PLAN AND PROFILE SEWER OLD COLONY WAY II	99 C-502	DETAILS II
01 C-108	PLAN AND PROFILE SEWER OLD COLONY WAY III	99 C-503	DETAILS III
01 C-109	PLAN AND PROFILE SEWER OLD TOTE ROAD	99 C-504	DETAILS IV
01 C-110	PLAN AND PROFILE SEWER CRANBERRY HIGHWAY	99 C-505	DETAILS V
01 C-401	PUMP STATION NO. 1 SITE PLAN	99 C-601	TRAFFIC MANAGEMENT TYPICAL APPLICATIONS I
02 C-101	PLAN AND PROFILE SEWER CRANBERRY HIGHWAY II	99 C-602	TRAFFIC MANAGEMENT TYPICAL APPLICATIONS II
02 C-102	PLAN AND PROFILE SEWER CRANBERRY HIGHWAY III	99 C-603	TRAFFIC MANAGEMENT DETAILS & TEMPORARY SIGN SUMMARY
02 C-103	PLAN AND PROFILE SEWER CRANBERRY HIGHWAY IV	MECHANICAL PROCESS	
02 C-104	PLAN AND PROFILE SEWER BREWSTER CROSSROAD I	00 D-001	GENERAL NOTES, LEGENDS AND ABBREVIATIONS
02 C-105	PLAN AND PROFILE SEWER BREWSTER CROSSROAD II	00 D-002	SCHEDULES
02 C-106	PLAN AND PROFILE SEWER SOUTH ORLEANS ROAD	00 D-101	TYPICAL PUMP STATION PLAN, SECTION AND SCHEDULES
02 C-107	PLAN AND PROFILE SEWER COVE ROAD	99 D-501	DETAILS I
02 C-108	PLAN AND PROFILE SEWER DOANE AND CUMMINGS ROAD	INSTURMENTATION	
02 C-109	PLAN AND PROFILE SEWER CENTER PLACE	00 DI-001	LEGEND, SYMBOLS AND GENERAL NOTES
02 C-110	PLAN AND PROFILE SEWER COVE ROAD EXT.	00 DI-601	P & ID
02 C-401	PUMP STATION NO. 2 SITE PLAN	ELECTRICAL	
03 C-101	PLAN AND PROFILE SEWER MAIN STREET	00 E-001	GENERAL NOTES, LEGENDS AND ABBREVIATIONS
03 C-102	PLAN AND PROFILE SEWER LOCUST ROAD I	00 E-601	PUMP STATION - SINGLE LINE DIAGRAM
03 C-103	PLAN AND PROFILE SEWER LOCUST ROAD II	99 E-001	DETAILS
03 C-104	PLAN AND PROFILE SEWER LOCUST ROAD III		
03 C-105	PLAN AND PROFILE SEWER JONES ROAD		
03 C-106	PLAN AND PROFILE SEWER LIBERTY LANE		
03 C-107	PLAN AND PROFILE SEWER CANAL ROAD I		
03 C-108	PLAN AND PROFILE SEWER CANAL ROAD II		
03 C-109	PLAN AND PROFILE SEWER CANAL ROAD III		



LOCATION PLAN

APPROXIMATE SCALE: 1" = 5000'



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SHEET KEY PLAN

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00 G-002



PUMP STATION DESIGNATION

- 01 PUMP STATION NO. 1
- 02 PUMP STATION NO. 2
- 03 PUMP STATION NO. 3

SHEET CODE



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GENERAL NOTES

- 1. HORIZONTAL DATUM IN U.S. SURVEY FEET IS REFERENCED TO THE MASSACHUSETTS STATE PLANE, MAINLAND COORDINATE SYSTEM (NAD83).
2. VERTICAL DATUM IN U.S. SURVEY FEET IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. THE INFORMATION SHOWN HEREON IS BASED ON THE REFERENCED DATA ACCUMULATION PLANS. THESE PLANS DO NOT REPRESENT A PROPERTY OR BOUNDARY SURVEY...
4. SIDELINES OF RIGHTS OF WAY AND PROPERTY LINES ARE AS SHOWN ON PLANS PREPARED BY SMC SURVEYING AND MAPPING CONSULTANTS...
5. BUILDING LOCATIONS SHOWN HEREON ARE AS SHOWN ON PLANS PREPARED BY SMC SURVEYING AND MAPPING CONSULTANTS...
6. SUPPLEMENTAL TOPOGRAPHIC SURVEY BY COASTAL ENGINEERING COMPANY, INC (CEC) IS BASED ON AERIAL SURVEY PERFORMED BY JW SEWALL AND SUPPLEMENTAL FIELD SURVEY BY CEC...
7. LOCATION OF WATER, SEWER, TELEPHONE, ELECTRIC, AND GAS LINES ARE APPROXIMATE, BASED UPON RECORD LOCATION INFORMATION PROVIDED TO COASTAL ENGINEERING COMPANY, INC. AND FOR REFERENCE ONLY.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AT NO ADDITIONAL COST TO THE OWNER.
9. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE STATE STATUES AND U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS (O.S.H.A.)...
10. THE CONTRACTOR SHALL HAVE A HEALTH AND SAFETY PLAN AND SHALL PROVIDE COPIES OF SAME TO THE ENGINEER.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES AND SHALL PROVIDE ALL NECESSARY CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL OPEN EXCAVATIONS AT THE COMPLETION OF EACH DAY'S WORK.
12. CONTRACTOR SHALL FOLLOW ALL REQUIREMENTS OF THE LOCAL MUNICIPALITY AND THE STATE WHEN WORKING IN THEIR RIGHTS OF WAY.
13. NO WORK, STORAGE, OR TRESPASS SHALL BE PERMITTED BEYOND THE BOUNDARIES OF ANY EASEMENTS WITHOUT WRITTEN PERMISSION OF THE PROPERTY OWNER.
14. ALL CONSTRUCTION ACTIVITY SHALL BE CONFINED TO THE AREA WITHIN THE LIMIT OF WORK AS SHOWN ON THE PLANS. LIMIT OF WORK SHALL BE DEFINED AS THE SERVICE RECIPIENTS PROPERTY LINE AND THE ADJACENT RIGHT-OF-WAY...
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING A SITE FOR DISPOSAL OF ALL EXCAVATED UNACCEPTABLE MATERIAL THAT IS UNSUITABLE FOR USE AS BACKFILL AND ALL OTHER EXCESS EXCAVATED MATERIALS...
16. IF AT ANY TIME THE CONSTRUCTION EXCAVATION REVEALS ANY ARTICLE OF HISTORIC OR ARCHEOLOGICAL SIGNIFICANCE, WORK AT THE LOCATION WILL CEASE AND THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.
17. THE CONTRACTOR SHALL COORDINATE ALL WORK AS NECESSARY WITH MASSDOT AND THE TOWN OF ORLEANS AND/OR ITS REPRESENTATIVES.
18. WORKING HOURS WITHIN THE TOWN ARE 7:00 A.M. TO 5:00 P.M., MONDAY THROUGH SATURDAY OR AS SPECIFIED IN THE MASSDOT PERMIT AND SPECIFICATIONS...
19. EXISTING VALVES OR HYDRANTS SHALL BE OPERATED BY THE MUNICIPAL OWNER. THE CONTRACTOR SHALL COORDINATE WITH THE MUNICIPAL OWNER OF THE WATER SYSTEM.
20. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL WORK AS INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER IN CONFORMANCE WITH ALL APPLICABLE CODES AND IN A PROPER AND WORKMANLIKE MANNER.
21. CONTRACTOR TO SUBMIT WORK SCHEDULE INCLUDING NECESSARY UTILITY RELOCATIONS BASED ON RESULTS OF TEST PITS. NO PIPE INSTALLATION SHALL OCCUR PRIOR TO APPROVAL OF THE SCHEDULE AND COMPLETION OF TEST PITS.
22. THE CONTRACTOR IS RESPONSIBLE FOR SEQUENCING OF ALL WORK TO AVOID CONFLICTS BETWEEN ALL NEW WORK.
23. THE CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC MANAGEMENT PLAN FOR ALL WORK PRIOR TO THE START OF CONSTRUCTION TO SHOW HOW TRAFFIC FLOW WILL BE MAINTAINED DURING CONSTRUCTION...
24. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH LOCAL AND STATE GUIDELINES.
25. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY THE WORK AT ALL TIMES. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AN EMERGENCY RESPONSE PLAN. THIS PLAN SHALL BE COORDINATED WITH THE ENGINEER, THE TOWN AND ALL EMERGENCY DEPARTMENTS.
26. PRIOR TO CLOSING ANY ROADWAY (PARTIALLY OR COMPLETELY), MUNICIPAL POLICE, THE TOWN AND LOCAL FIRE OFFICIALS SHALL BE NOTIFIED. THE CONTRACTOR SHALL COMPLY WITH ANY CONDITIONS SET BY THE PUBLIC SAFETY OFFICIALS, IN CONJUNCTION WITH THE OWNER AND ENGINEER.
27. CONTRACTOR TO PROVIDE AND MAINTAIN SEDIMENTATION AND EROSION CONTROL MEASURES TO PROTECT ALL CATCH BASINS, DRAINAGE INLETS AND SWALES IN THE CONSTRUCTION ZONE.
28. ALL EROSION CONTROL MEASURES FOR THE WORK ZONE SHALL BE IN PLACE PRIOR TO THE START OF CONSTRUCTION.
29. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF THE EXISTING FEATURES AND STRUCTURES WITHIN AND ADJACENT TO THE WORK. CONTRACTOR SHALL BOX ALL TREES, SHRUBS, FLOWER BOXES, AND HEDGES BEFORE PLACING EARTH AGAINST OR NEAR THEM...
30. EXCAVATION OF ANY TYPE SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT UNDERGROUND UTILITIES OR STRUCTURES ARE NOT DAMAGED. ALL ROADWAYS, PARKING AREAS, SIDEWALKS AND OTHER STRUCTURES DISTURBED BY CONSTRUCTION IN OR OUTSIDE THE PROJECT AREA SHALL BE RETURNED TO THEIR ORIGINAL CONDITION OR BETTER...
31. CONTRACTOR SHALL SAW-CUT ALL PAVEMENT, ROADS, AND DRIVEWAYS TO BE DISTURBED DURING CONSTRUCTION.
32. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING PROPER AND ADEQUATE TRENCH SHORING AND BRACING AT ALL TIMES IN ACCORDANCE WITH REQUIRED SAFETY STANDARDS.
33. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING SEWER SERVICE CONNECTIONS PRIOR TO CONSTRUCTING REPLACEMENT SERVICE CONNECTIONS WHEN REQUIRED.
34. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS AT EACH SITE RECEIVING SEWER SERVICE, INCLUDING BUT NOT LIMITED TO, INVERT ELEVATIONS AT EACH MANHOLE, DEPTH AND LOCATION OF EXISTING PIPING TO ON-SITE WASTE DISPOSAL SYSTEMS (OWDS) AND THE LOCATION OF EXISTING OWDS.
35. ALL NEW GRAVITY SEWER SERVICES SHALL BE 6" DIAMETER PVC UNLESS OTHERWISE NOTED. ALL NEW LOW PRESSURE SEWER SERVICES SHALL BE 1-1/4" DIAMETER UNLESS OTHERWISE NOTED.
36. ALL NEW PRECAST SEWER MANHOLE INVERTS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH DETAILS.

GENERAL NOTES - (CONT.)

- 37. ALL UNEXCAVATED ROCK WITHIN 3"-0" HORIZONTALLY OF THE ENDS OF BUILDING CONNECTIONS, BRANCHES AND STUBS, AND DOWN TO A HORIZONTAL PLANE 6-INCHES BELOW THE BOTTOMS OF SUCH CONNECTIONS, BRANCHES AND STUBS, SHALL BE REMOVED.
38. ROCK REMOVAL BY THE MECHANICAL METHOD SHALL CONSIST OF CUTTING AWAY ROCK AT TRENCH BOTTOM TO FORM A LEVEL BEARING SURFACE 6" BELOW INVERT ELEVATION OF PIPE.
39. NO TREES OR TREE LIMBS ALONG THE ENTIRE ROUTE OF CONSTRUCTION ON PUBLIC WAYS SHALL BE CUT UNLESS OTHERWISE DIRECTED BY THE ENGINEER AND APPROVED BY THE TOWN.
40. THE CONTRACTOR SHALL EXERCISE CARE TO PREVENT DAMAGE TO ROOT SYSTEMS OF EXISTING TREES OR SHRUBS IN LOCATIONS OF NEW SEWER LINES.
41. THE LOCATIONS OF UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE WITH THE TOWN AND UTILITY COMPANIES INVOLVED TO VERIFY IN THE FIELD THE EXACT LOCATION, SIZE, AND MATERIAL OF CONSTRUCTION OF MAINS AND SERVICES TO PREVENT DAMAGE, LOSS OF SERVICE DURING CONSTRUCTION AND FOR REPLACEMENT OF SERVICES. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" 72-HOURS PRIOR TO ANY EXCAVATION.
42. THE CONTRACTOR IS RESPONSIBLE TO VERIFY THE DEPTH OF EXISTING UTILITY CROSSINGS EITHER BELOW OR ABOVE THE NEW SANITARY PIPING. METHODS FOR DETERMINING DEPTHS TO UTILITIES WILL BE BY TEST PITS OR BY VACUUM EXCAVATION, WHICHEVER IS DEEMED ACCEPTABLE AT THE SPECIFIC LOCATION.
43. EXISTING UTILITIES TO REMAIN IN SERVICE DURING CONSTRUCTION. ANY INTERRUPTION OF SERVICE SHALL BE COORDINATED WITH THE ENGINEER AND APPROVED BY THE TOWN.
44. EXISTING UTILITIES INTERFERING WITH THE WORK SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER.
45. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ALL ARRANGEMENTS FOR ANCHORING, SUPPORTING AND/OR RELOCATING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION. ALL COSTS SHALL BE INCLUDED IN THE UNIT PRICES BID. IN THE EVENT OF DAMAGE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF ALL REPAIRS.
46. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL EXISTING FIRE HYDRANTS AT ALL TIMES. SHOULD AN EXISTING HYDRANT NEED TO BE TAKEN OUT OF SERVICE, THE CONTRACTOR SHALL NOTIFY THE LOCAL FIRE DEPARTMENT 24 HOURS PRIOR TO TAKING IT OUT OF SERVICE.
47. IF WATER MAINS NEED TO BE RE-LAYED AS A RESULT OF NEW PIPELINE CONSTRUCTION, THE WATER MAINS SHALL BE LAID A MINIMUM OF 10- FEET HORIZONTALLY FROM AN EXISTING SEWER OR STORM SEWER, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. WHEN WATER MAINS MUST CROSS ABOVE A SEWER, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE TOP OF THE SEWER IS AT LEAST 18-INCHES BELOW THE BOTTOM OF THE WATER MAIN. WHERE RE-LAYED WATER MAINS ARE SHOWN TO CROSS SEWERS, THE RE-LAYED WATER MAIN SHALL BE INSTALLED SO THAT A FULL LENGTH OF WATER MAIN CROSSES THE SEWER MIDWAY BETWEEN THE JOINTS OF THE WATER MAIN.
48. CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS TO OBTAIN WATER FOR FLUSHING, CHLORINATION, AND TESTING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, INSTALLING, AND REMOVING ALL NECESSARY MATERIAL (TAPS, CORPORATIONS, AND SERVICE PIPE) REQUIRED FOR PROPER TESTING AND CHLORINATION OF WATER MAINS.
49. AFTER TESTING, ALL CORPORATIONS INSTALLED FOR TESTING AND CHLORINATION SHALL BE REMOVED AND REPLACED WITH BRASS PLUGS. WATER TIGHTNESS OF BRASS PLUGS SHALL BE OBSERVED VISUALLY UNDER PRESSURE.
50. ALL ROAD CUTS SHALL BE RESTORED WITH SUB-BASE MATERIAL AT THE END OF EACH WORK DAY. CONTRACTOR SHALL MAINTAIN ROAD CUTS UNTIL THE TEMPORARY/PERMANENT PAVEMENT IS INSTALLED.
51. TEMPORARY TRENCH PAVEMENT SHALL BE INSTALLED AT THE END OF EACH WORK DAY UNLESS OTHERWISE DIRECTED BY THE OWNER.
52. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO PRE-CONSTRUCTION GRADES UPON COMPLETION OF SEWER CONSTRUCTION, EXCEPT WHERE PERMANENT GRADE CHANGES ARE SPECIFICALLY NOTED OR ORDERED.
53. ALL ROADS AND DRIVEWAYS SHALL BE REPLACED TO COMPLY WITH THE MASSDOT AND TOWN OF ORLEANS SPECIFICATIONS AS APPLICABLE.
54. ALL PAVED GUTTERS (ASPHALT WING), ALL STONE CURBS, AND ALL CONCRETE CURB ALONG ROADWAYS DISTURBED BY CONSTRUCTION SHALL BE REPLACED IN KIND AT NO ADDITIONAL COST TO THE OWNER.
55. ALL EXISTING FRAMES, COVERS, BOXES, ETC. SHALL BE RAISED TO FINISH GRADES PRIOR TO PLACEMENT OF PAVEMENT WEARING COURSE.
56. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL WASTE BUILDING MATERIAL, CONCRETE, MASONRY, TREES, SHRUBS, DEBRIS AND OTHER MATERIALS NECESSARY FOR THE SATISFACTORY COMPLETION OF THE WORK AND AS REQUIRED BY THE OWNER. CONSTRUCTION DEBRIS SHALL BE DISPOSED OF IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL LAWS.
57. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS CLEANING OF MUD, DIRT AND DEBRIS OFF STREETS, WHEN SUCH MUD, DIRT OR DEBRIS IS DEPOSITED THERE AS A RESULT OF HIS CONSTRUCTION ACTIVITY. ANY DEBRIS, MUD, OR DELETERIOUS MATERIAL FROM THE PROJECT WILL BE REMOVED FROM THE STREET AND SURROUNDING STREETS BY CONTRACTOR AT THE END OF EACH WORKING DAY, OR BEFORE, IF DIRECTED BY THE OWNER OR ENGINEER.
58. USE WATER SPRINKLING, TEMPORARY ENCLOSURES AND OTHER SUITABLE METHODS TO LIMIT DUST AND DIRT RISING AND SCATTERING IN THE AIR.
59. CONTRACTOR IS RESPONSIBLE FOR REPLACING ALL EXISTING PAVEMENT MARKINGS INCLUDING CENTER LINES, EDGE LINES, STOP LINES, CROSSLANES AND LETTERING FOLLOWING RESTORATION OF PAVEMENT OR AS DIRECTED BY THE ENGINEER.

ABBREVIATIONS

Table with 4 columns: Abbreviation, Description, Abbreviation, Description. Includes entries like B.B. BITUMINOUS BERM, INV INVERT, BIT. CURB BITUMINOUS CURB, LP LOW PRESSURE, BIT. CONC. BITUMINOUS CONCRETE, LSA LANDSCAPED AREA, B.O.E. BOTTOM OF EXPLORATION, MB MAIL BOX, BM BENCH MARK, MIN MINIMUM, CB CATCH BASIN, NTS NOT TO SCALE, CI CAST IRON, PL PLASTIC, CIL CEMENT LINED CAST IRON, PVC POLYVINYL CHLORIDE, CMP CORRUGATED METAL PIPE, PVMT PAVEMENT, CONC. CONCRETE, PWW PAVED WATERWAY, CONN. CONNECT, R RIM, CS CARBON STEEL, RCP REINFORCED CONCRETE PIPE, DI DUCTILE IRON, S SLOPE, DICL DUCTILE IRON CEMENT LINED, SMH SEWER MANHOLE, DMH DRAINAGE MANHOLE, SWL SINGLE WHITE LINE, DOE DEPTH OF EXPLORATION, SYL SINGLE YELLOW LINE, DYL DOUBLE YELLOW LINE, STA STATION, ELEC ELECTRICAL, TBM TEMPORARY BENCHMARK, EL ELEVATION, TMH TELEPHONE MANHOLE, EOP EDGE OF PAVEMENT, T.O.P. TOP OF PIPE, EP EXISTING PAVEMENT, TRANS TRANSFORMER, EXIST. EXISTING, TYP TYPICAL, FT FEET, UE UNDERGROUND ELECTRIC, FM FORCE MAIN, UP UTILITY POLE, G GAS, VCP VITRIFIED CLAY PIPE, GAR GARAGE, WFC WATERTIGHT FRAME AND COVER, GC GRANITE CURB, W/ WITH, HDPE HIGH DENSITY POLYETHYLENE, WF WETLAND FLAG

LEGEND

Legend table with columns: EXISTING, NEW. Lists symbols for various utilities and structures like CONCRETE BOUND WITH DRILL HOLE, SEWER MANHOLE, CATCH BASIN, TEST PIT, STATIONING, GRAVITY SEWER, SEWER SERVICE LINE, SEWER FORCEMAIN, PROJECT PAVEMENT RESTORATION LIMITS, etc.

REFERENCES

APPROVAL PENDING - WATER QUALITY IMPROVEMENTS, TOWN OF ORLEANS, MA BREWSTER CROSS ROAD SITE PLAN AND DETAILS DRAWING 111-44280-C02, REV. A



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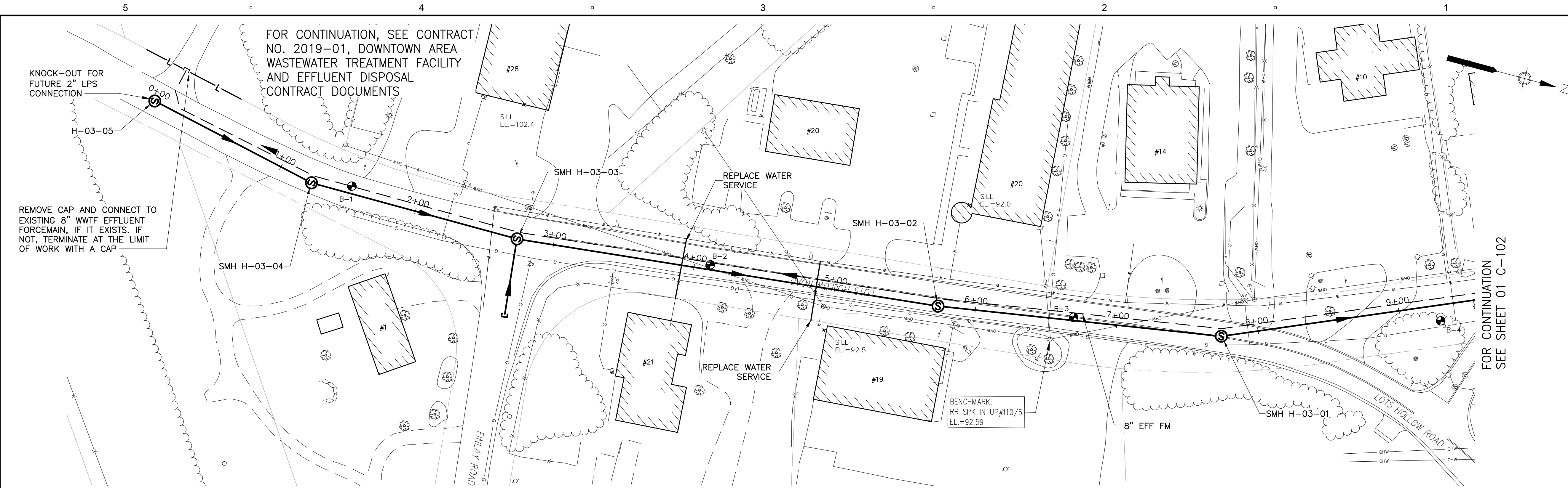
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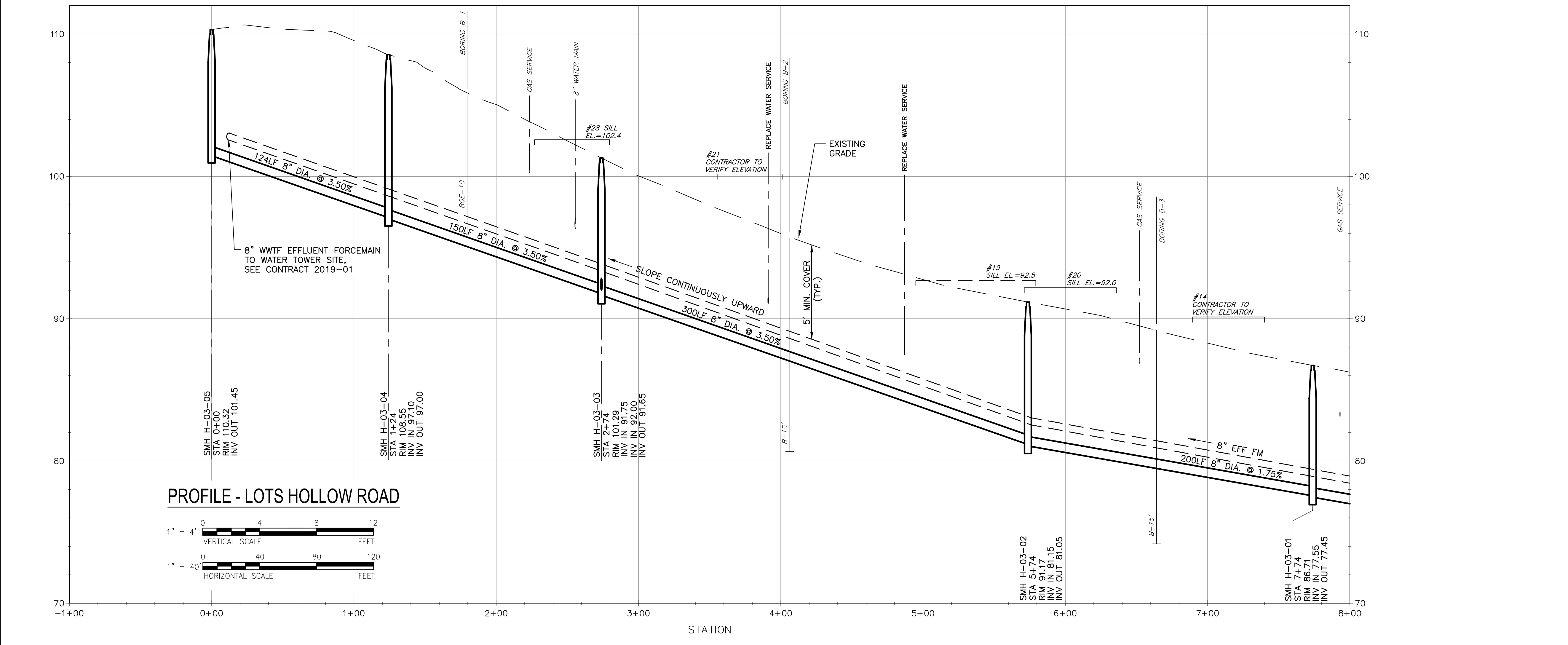
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**PLAN AND PROFILE SEWER
 LOTS HOLLOW ROAD I**

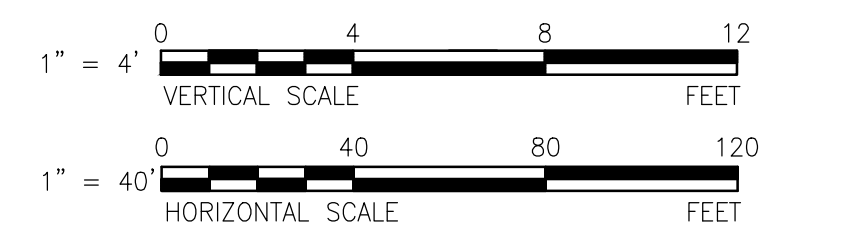
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PLAN - LOTS HOLLOW ROAD
 SCALE: 1"=40'

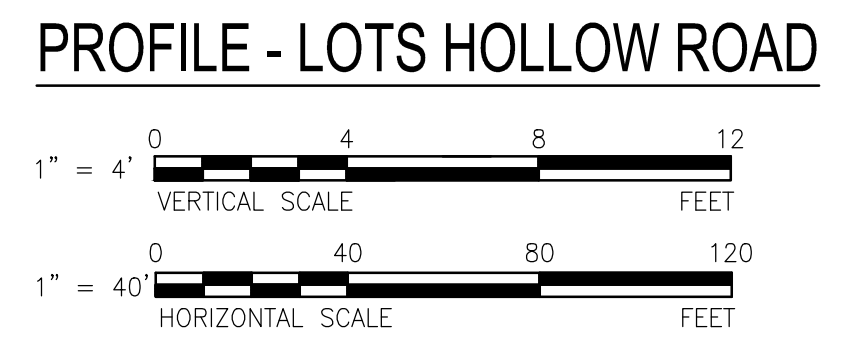
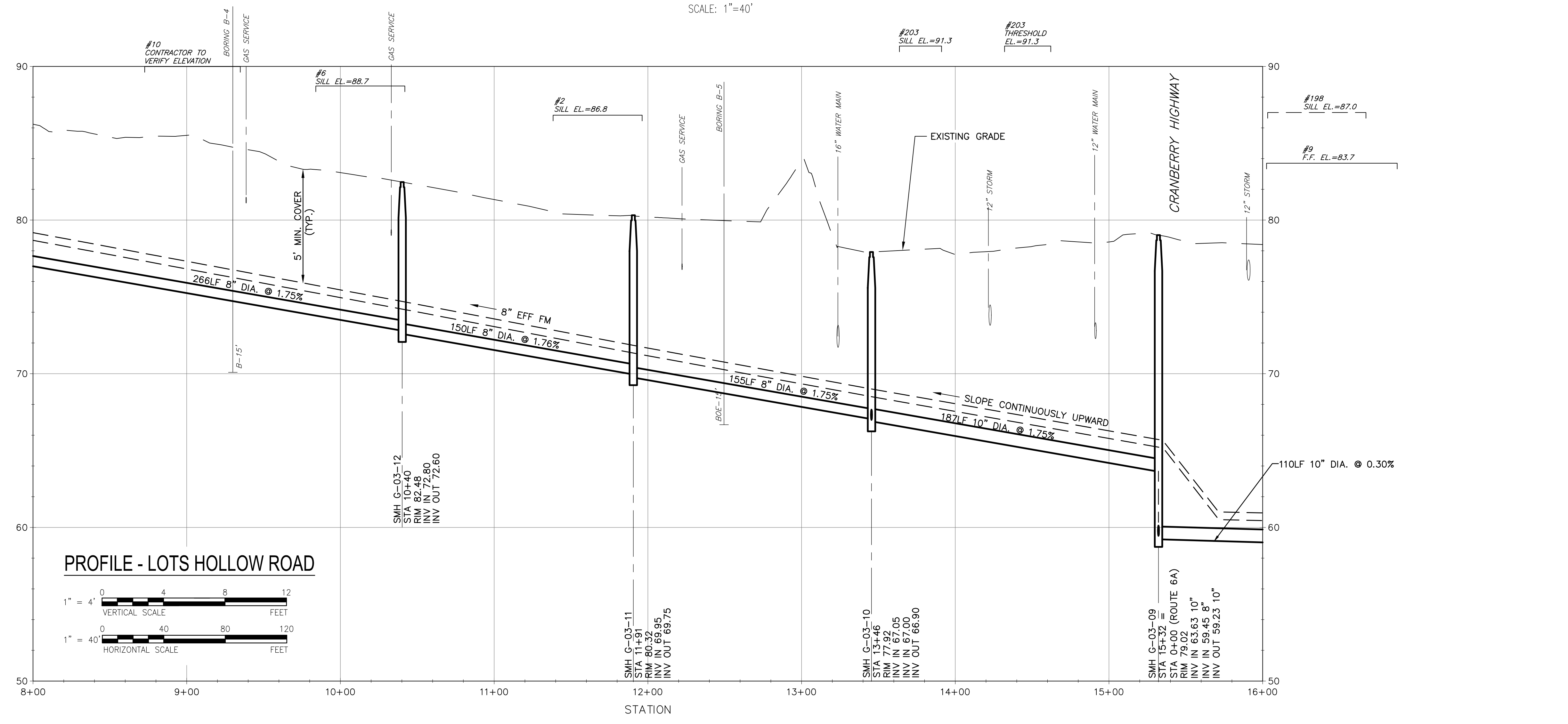
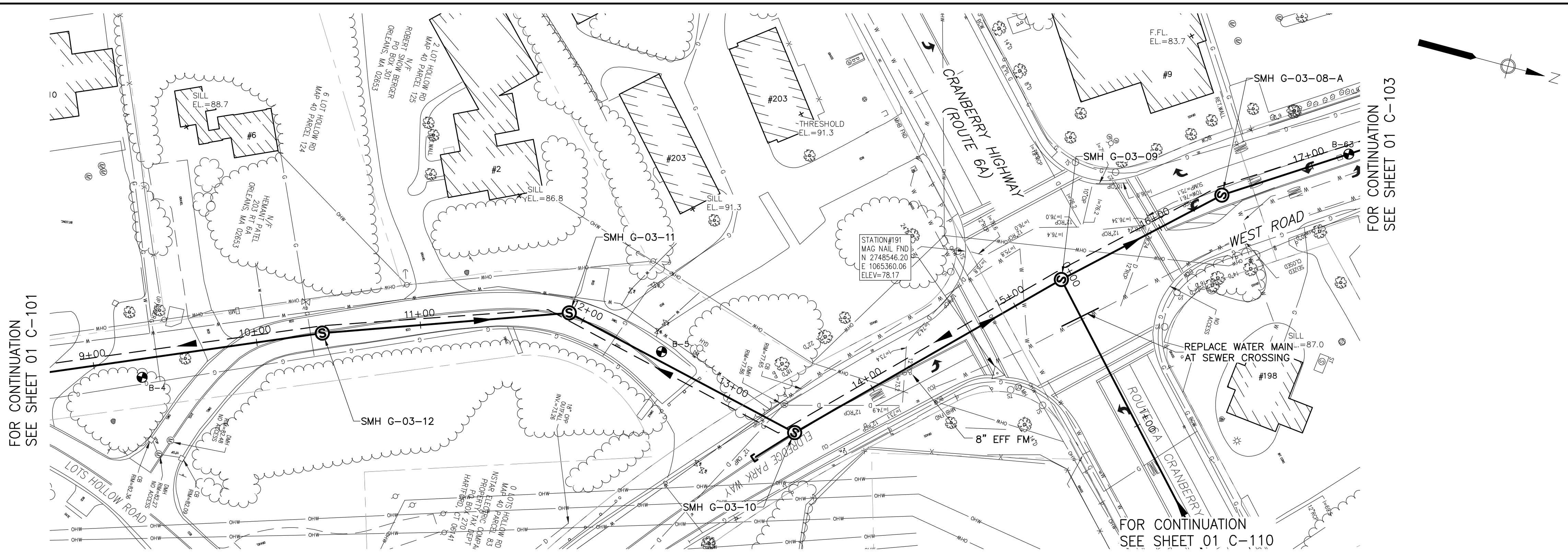


PROFILE - LOTS HOLLOW ROAD



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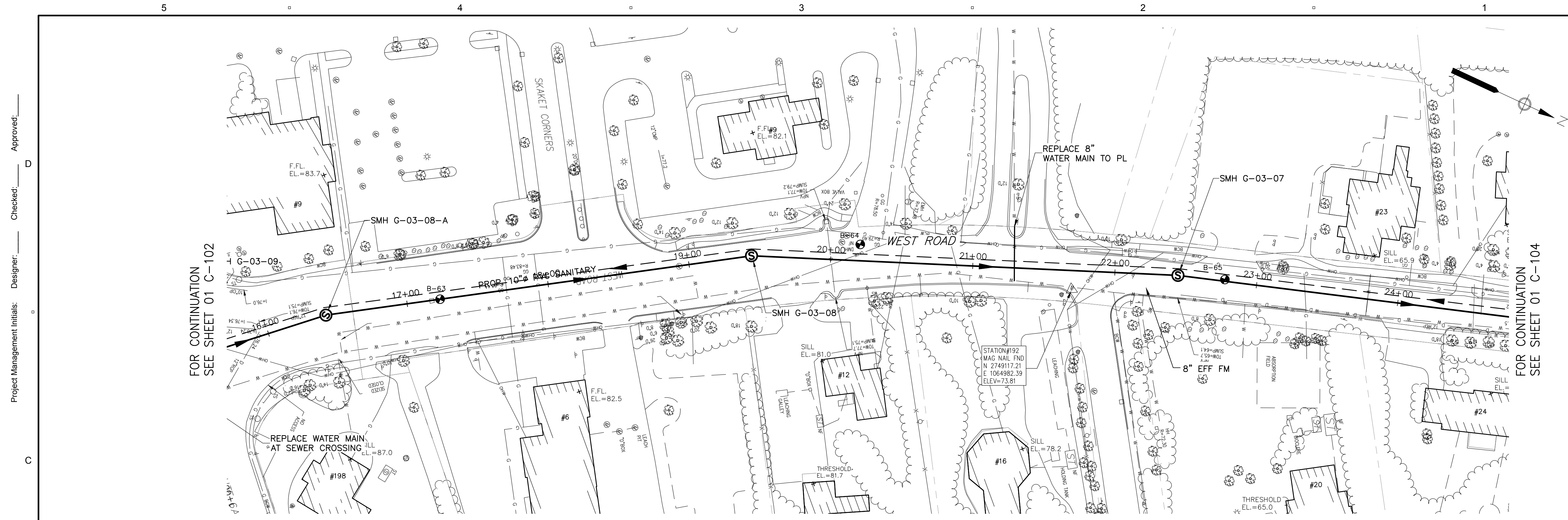
I/R	DATE	DESCRIPTION

PROJECT NUMBER
 60476644
 Designed By: **M. CURRAN**
 Drawn By: **M. CURRAN**
 Dept Check: **T. PARECE**
 Proj Check: **M. DONOGHUE**
 Date: **MARCH 2019**
 Scale: **AS NOTED**

DISCIPLINE
 CIVIL
SHEET TITLE

**PLAN AND PROFILE SEWER
 LOTS HOLLOW ROAD II**

SHEET NUMBER
01 C-102



PLAN - WEST ROAD

SCALE: 1"=40'

FOR CONTINUATION
SEE SHEET 01 C-102

FOR CONTINUATION
SEE SHEET 01 C-104

Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____



PROJECT
Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT
Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

ENGINEER
AECOM TECHNICAL SERVICES, INC.
9 JONATHAN BOURNE DRIVE
POCASSET, MA 02559
PHONE: (508) 833-6950
www.aecom.com

CONSULTANTS

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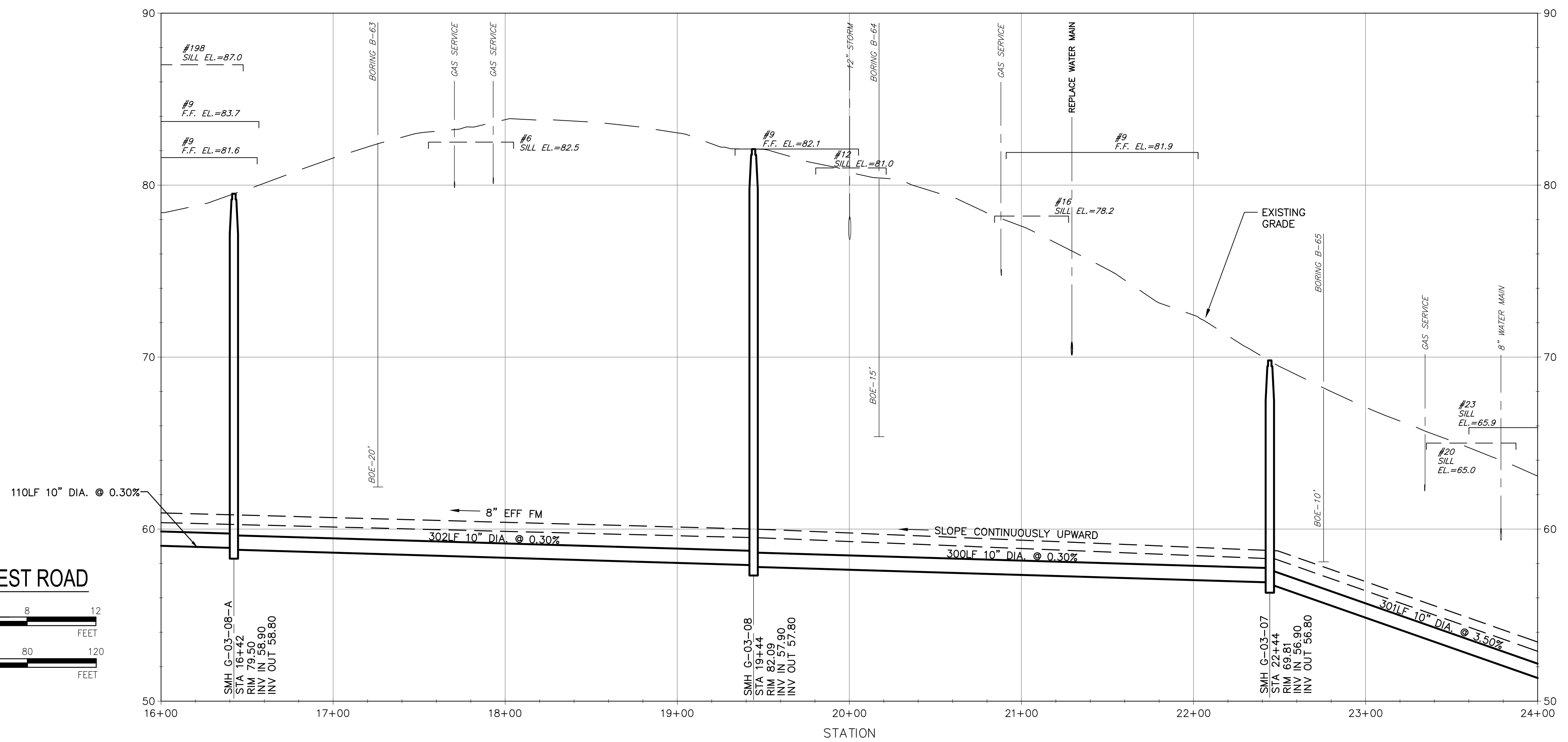
PROJECT NUMBER
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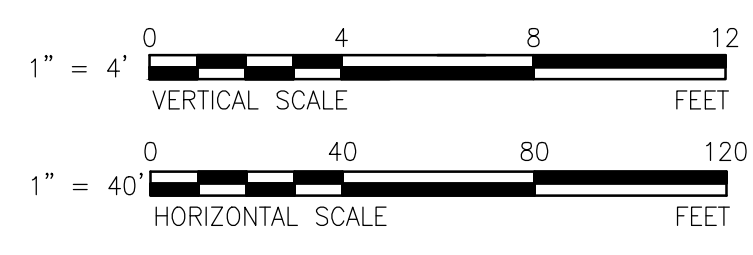
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CIVIL
SHEET TITLE
PLAN AND PROFILE SEWER
WEST ROAD I

SHEET NUMBER
01 C-103

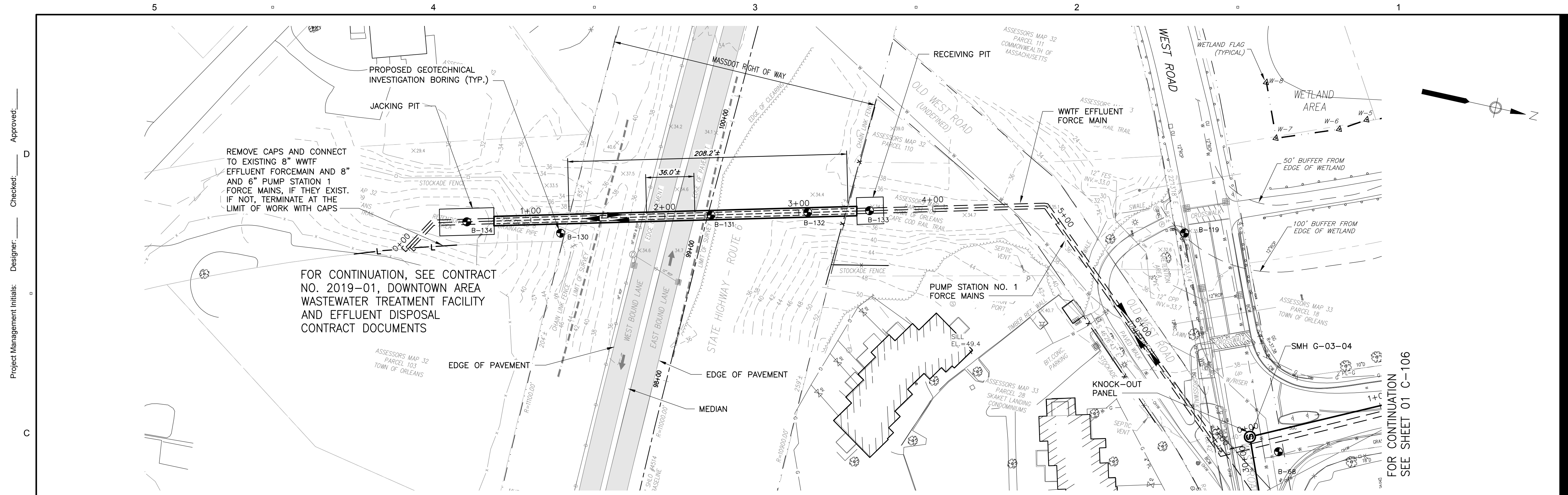
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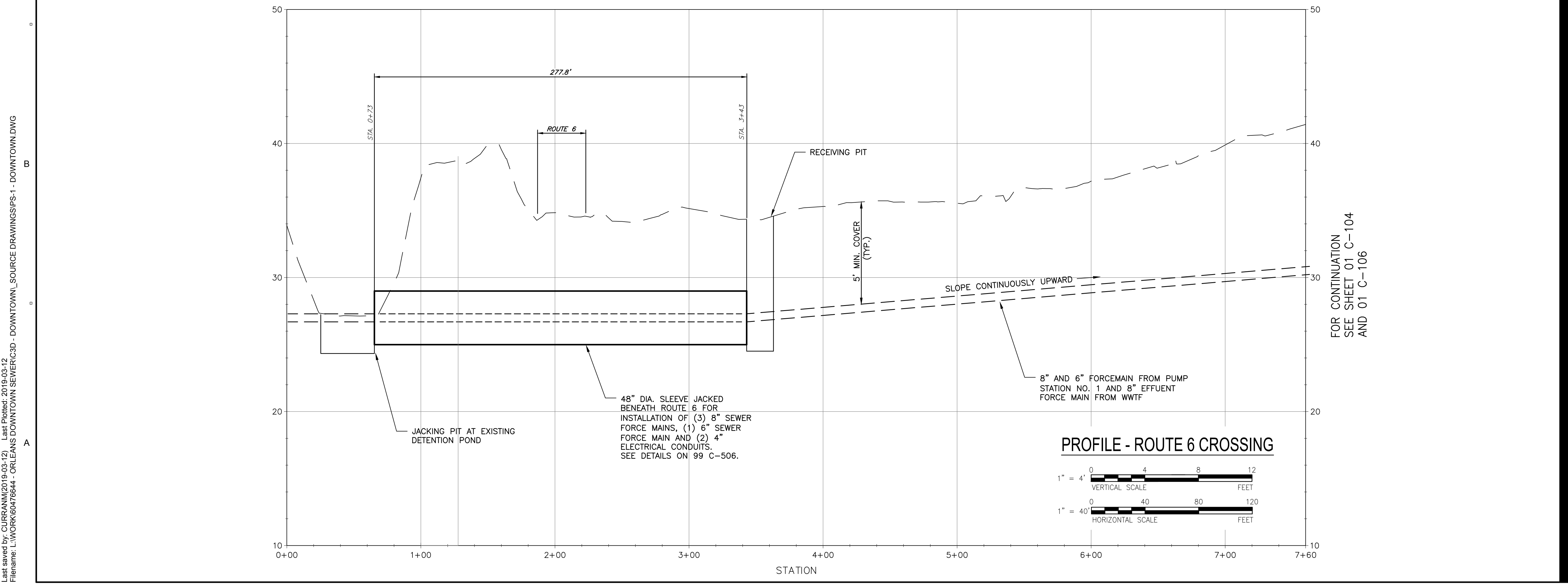
PROFILE - WEST ROAD



A B C D



PLAN - ROUTE 6 CROSSING
SCALE: 1"=40'



PROJECT
Downtown Area
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DISCIPLINE
CIVIL
SHEET TITLE
PLAN AND PROFILE SEWER
ROUTE 6 CROSSING

SHEET NUMBER
01 C-105

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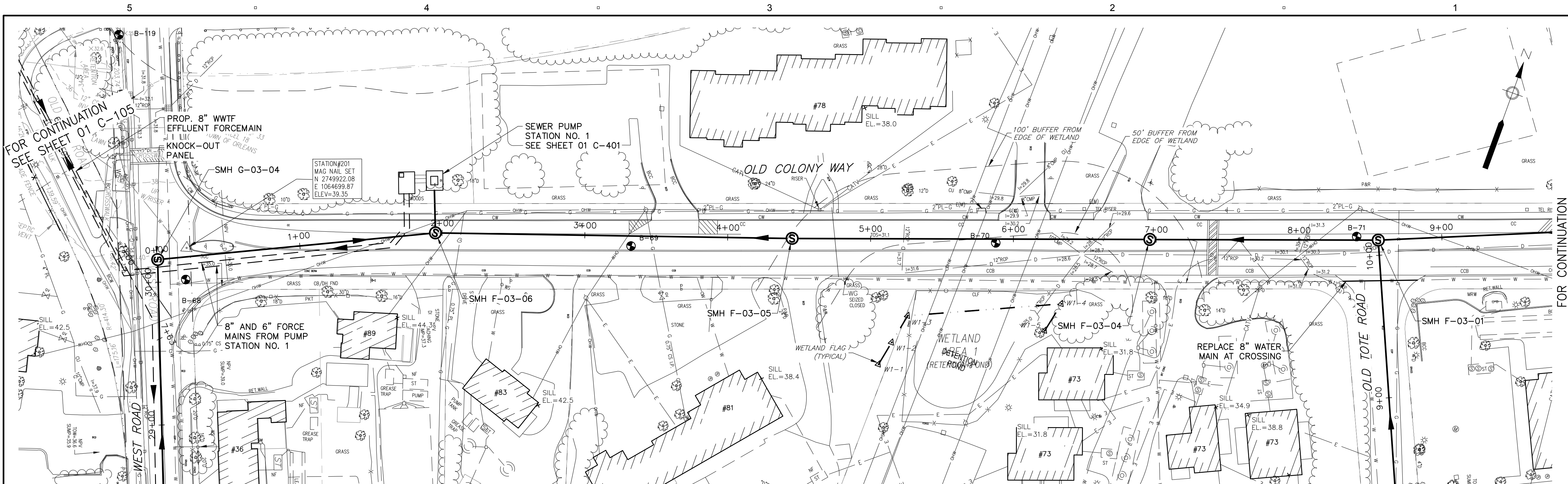
Date: **MARCH 2019**

Scale: **AS NOTED**

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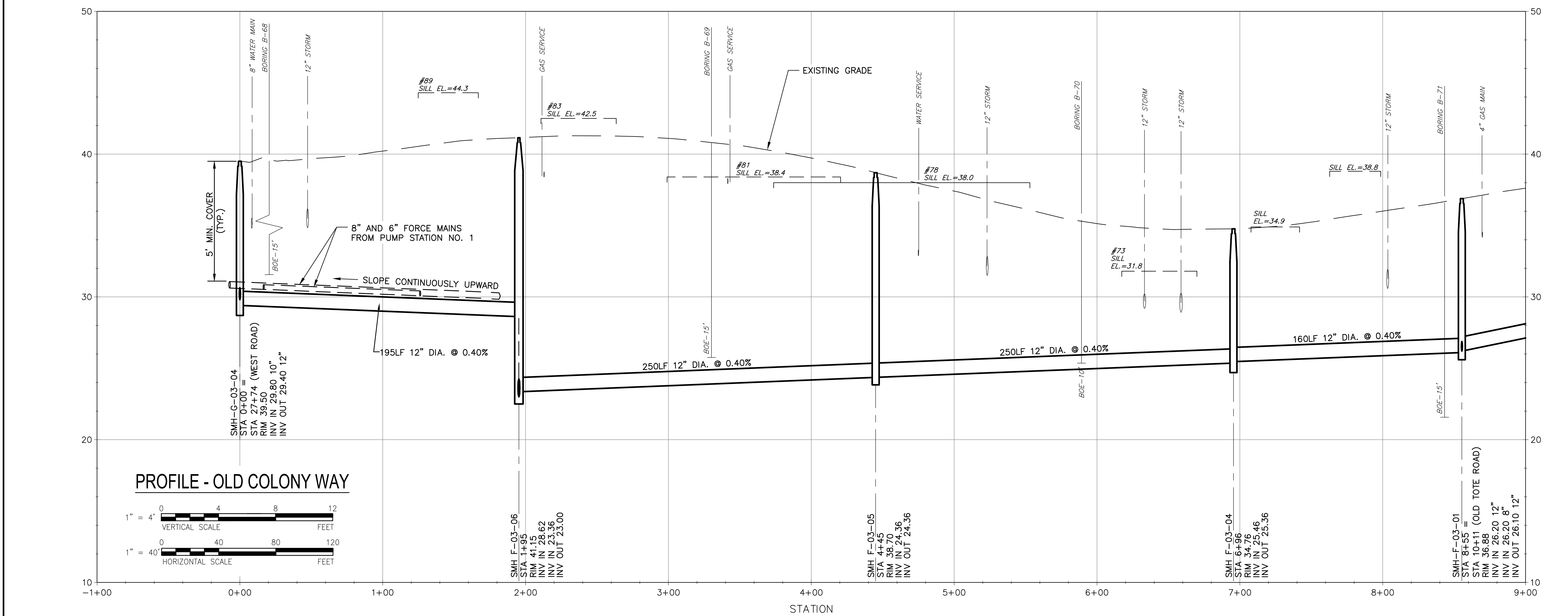
**PLAN AND PROFILE SEWER
 OLD COLONY WAY I**

01 C-106

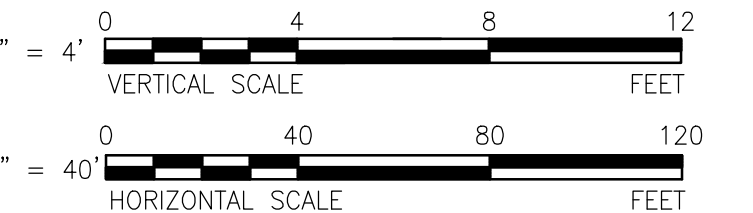


PLAN - OLD COLONY WAY

SCALE: 1"=40'

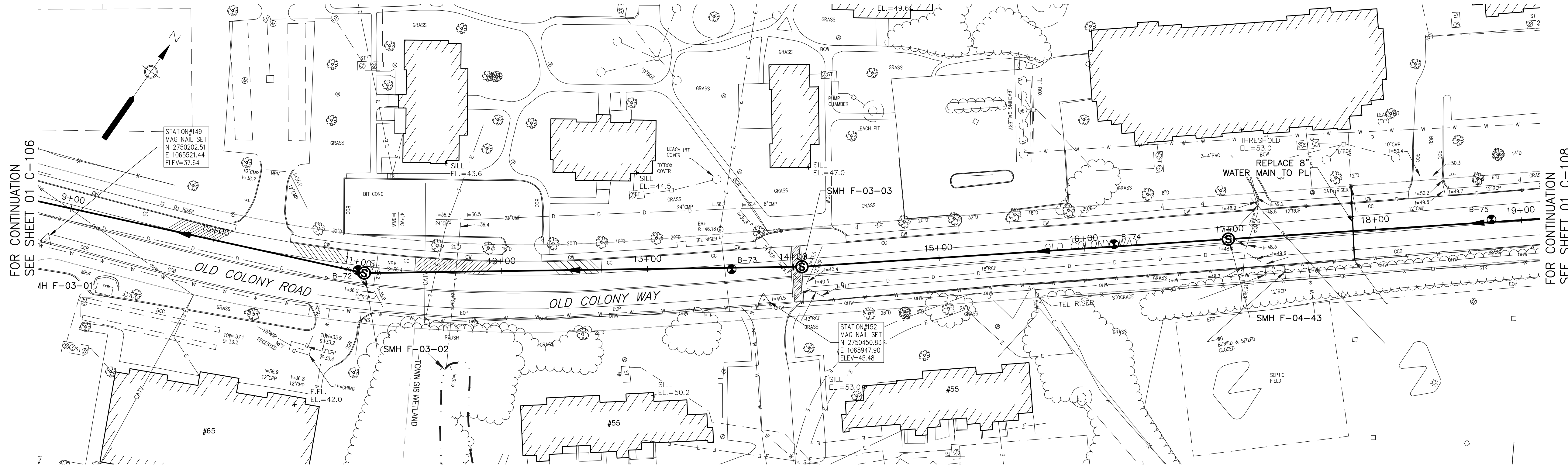


PROFILE - OLD COLONY WAY



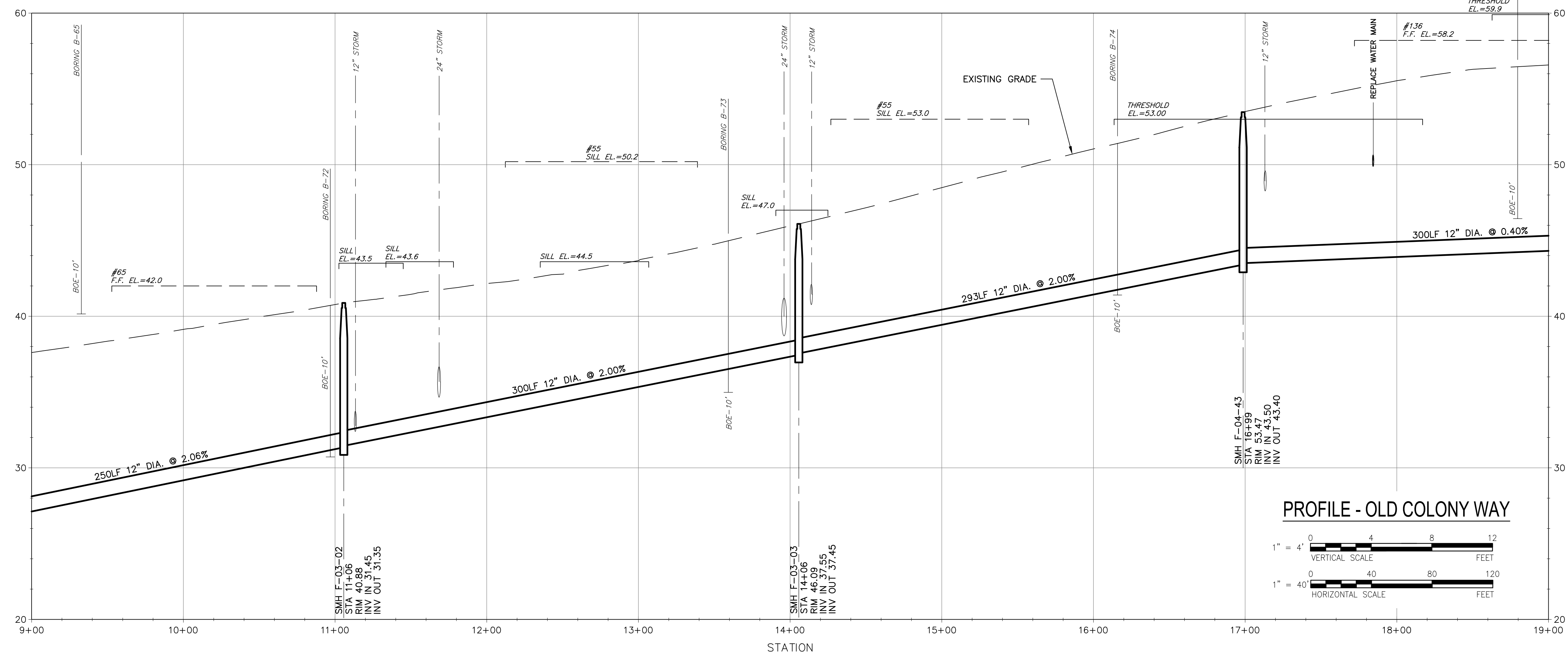
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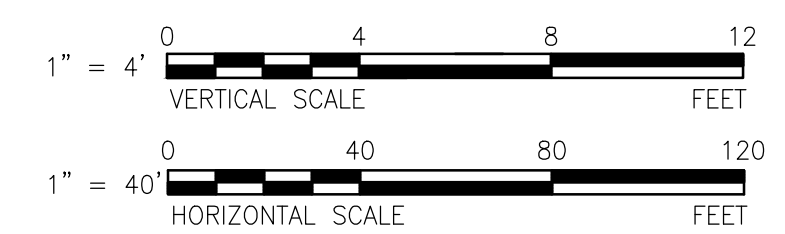


PLAN - OLD COLONY WAY

SCALE: 1"=40'



PROFILE - OLD COLONY WAY



Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____
 Last saved by: CURRANM(2019-03-12) Last Plotted: 2019-03-12
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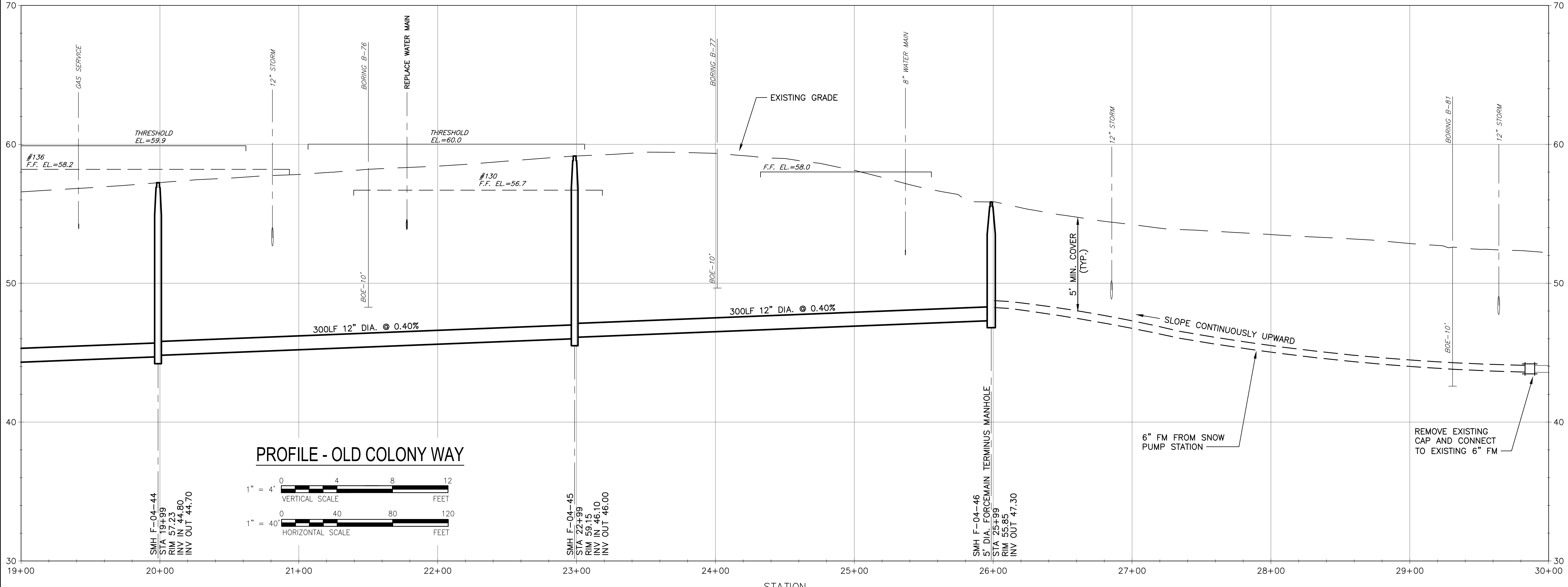
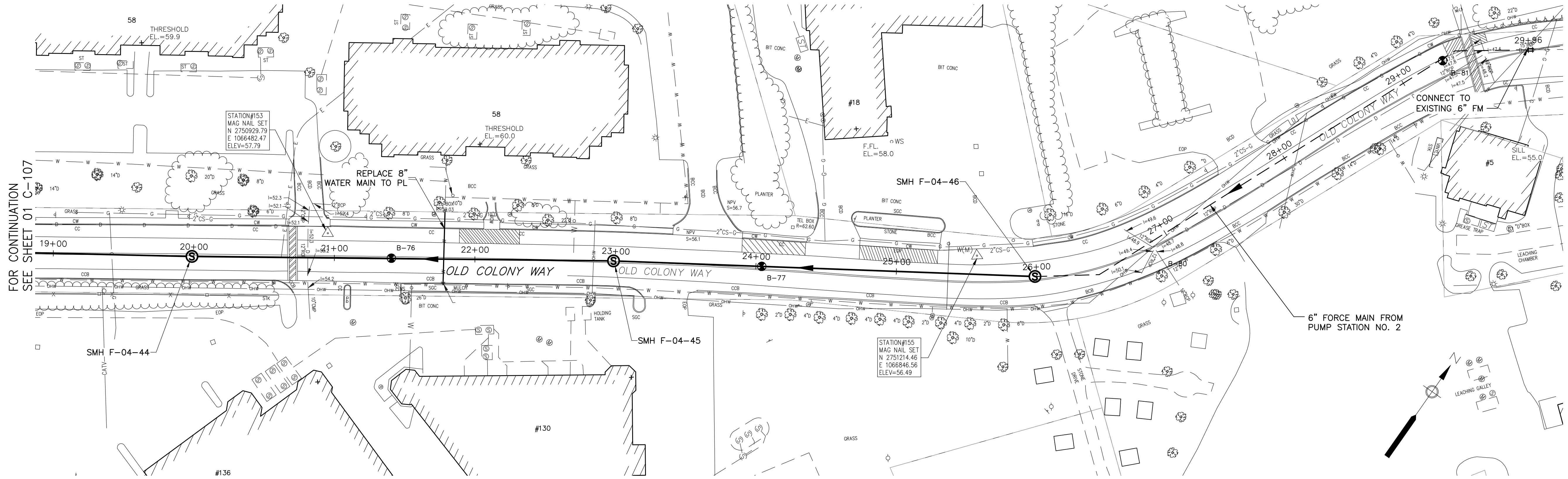
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CIVIL

PLAN AND PROFILE SEWER
 OLD COLONY WAY III

01 C-108



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Dept Check: **T. PARECE**

Proj Check: **M. DONOGHUE**

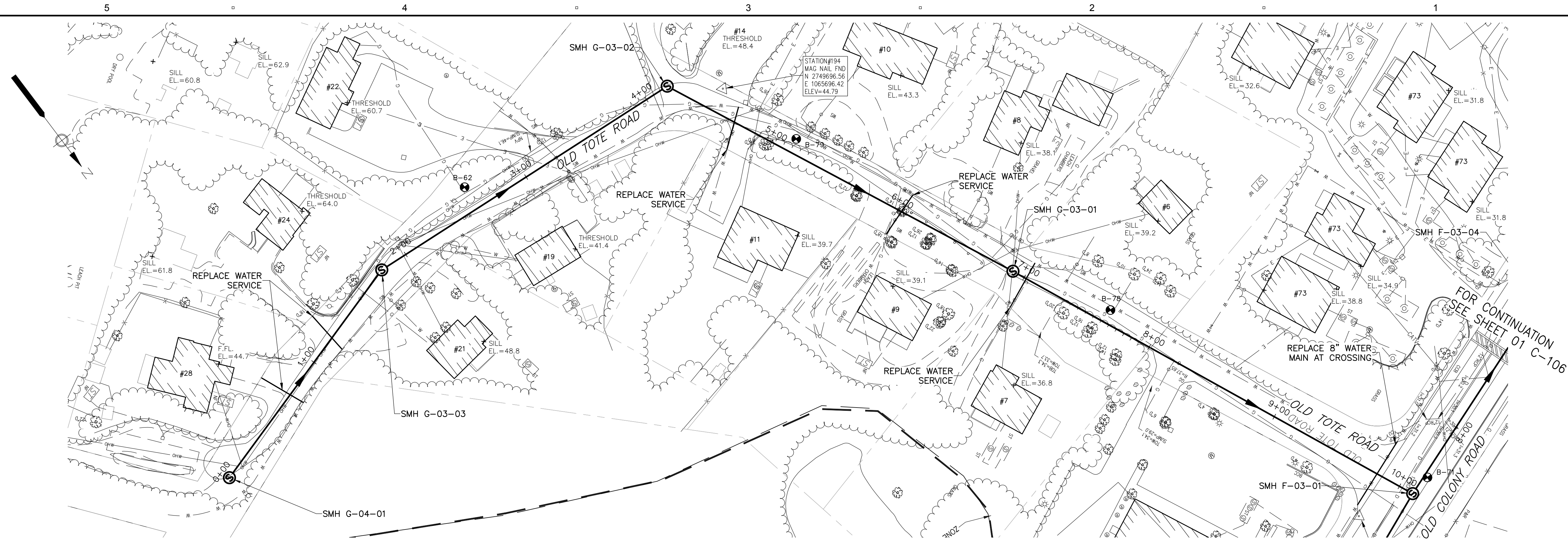
Date: **MARCH 2019**

Scale: **AS NOTED**

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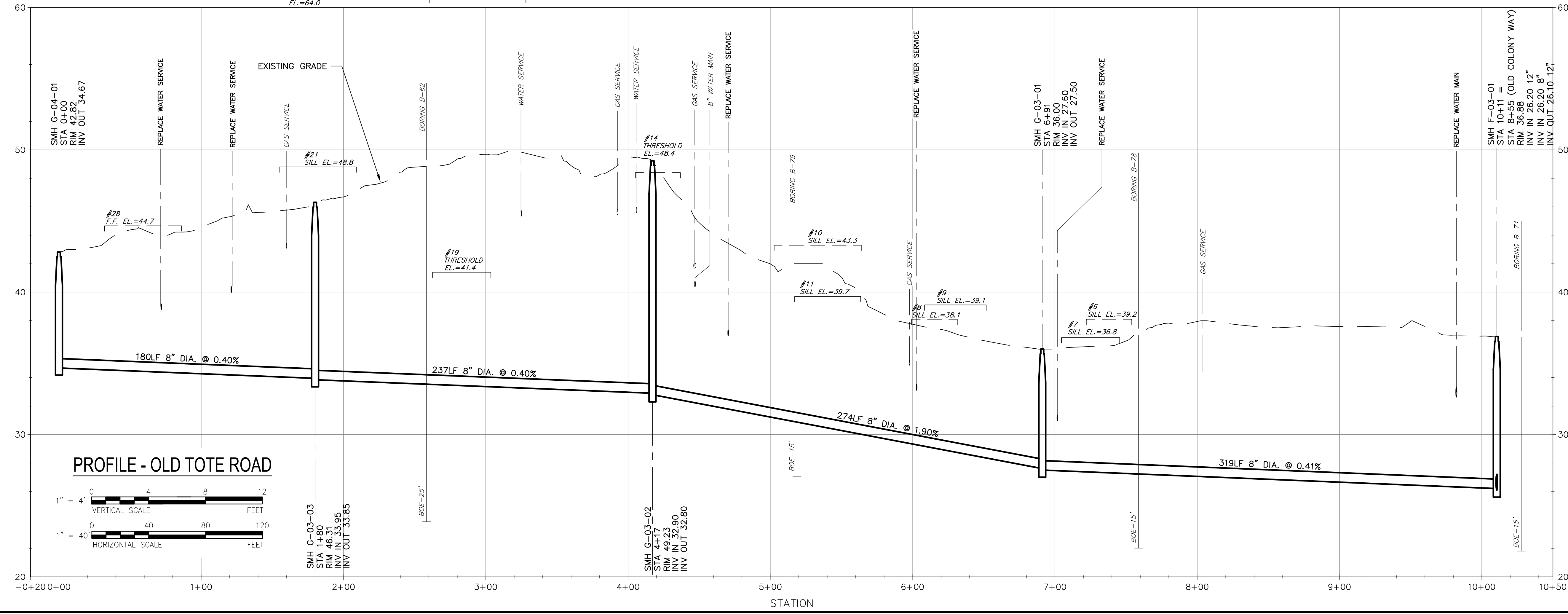
**PLAN AND PROFILE SEWER
 OLD TOTE ROAD**

01 C-109

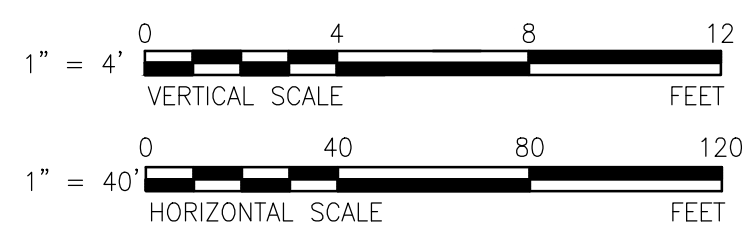


PLAN - OLD TOTE ROAD

SCALE: 1"=40'



PROFILE - OLD TOTE ROAD



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 Last saved by: CURRANM(2019-03-12) Last Plotted: 2019-03-12
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PROJECT

Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

ENGINEER

AECOM TECHNICAL SERVICES, INC.
9 JONATHAN BOURNE DRIVE
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PROJECT NUMBER

60476644

Designed By: **M. DONOGHUE**

Drawn By: **M. CURRAN**

Dept Check: **T. PARECE**

Proj Check: **M. DONOGHUE**

Date: **MARCH 2019**

Scale: **AS NOTED**

DISCIPLINE

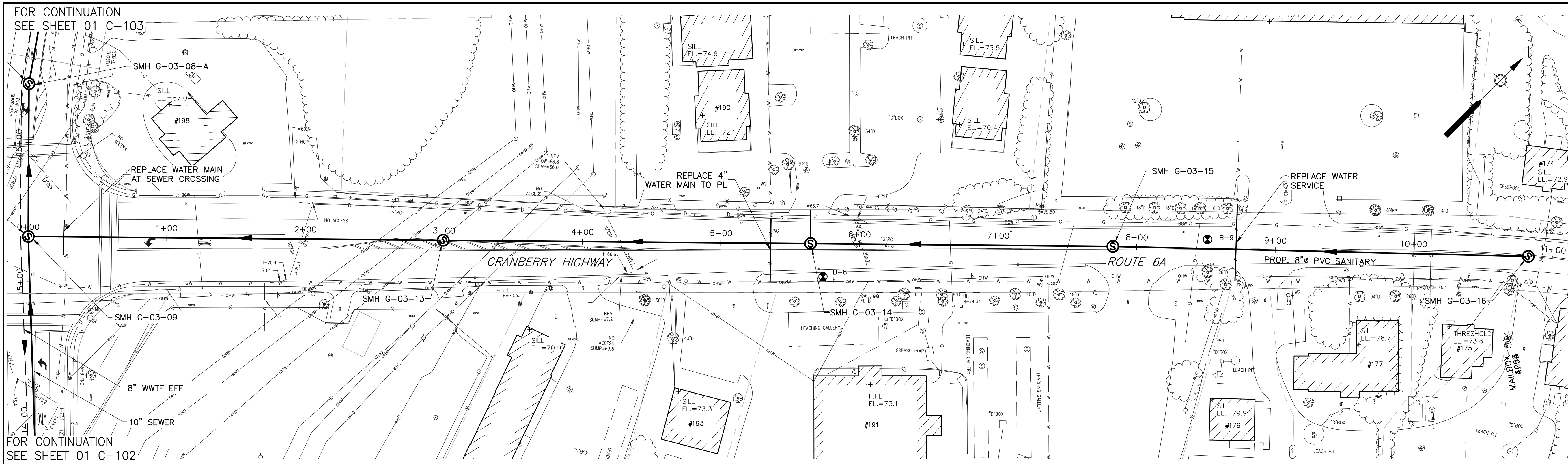
CIVIL

SHEET TITLE

**PLAN AND PROFILE SEWER
CRANBERRY HIGHWAY**

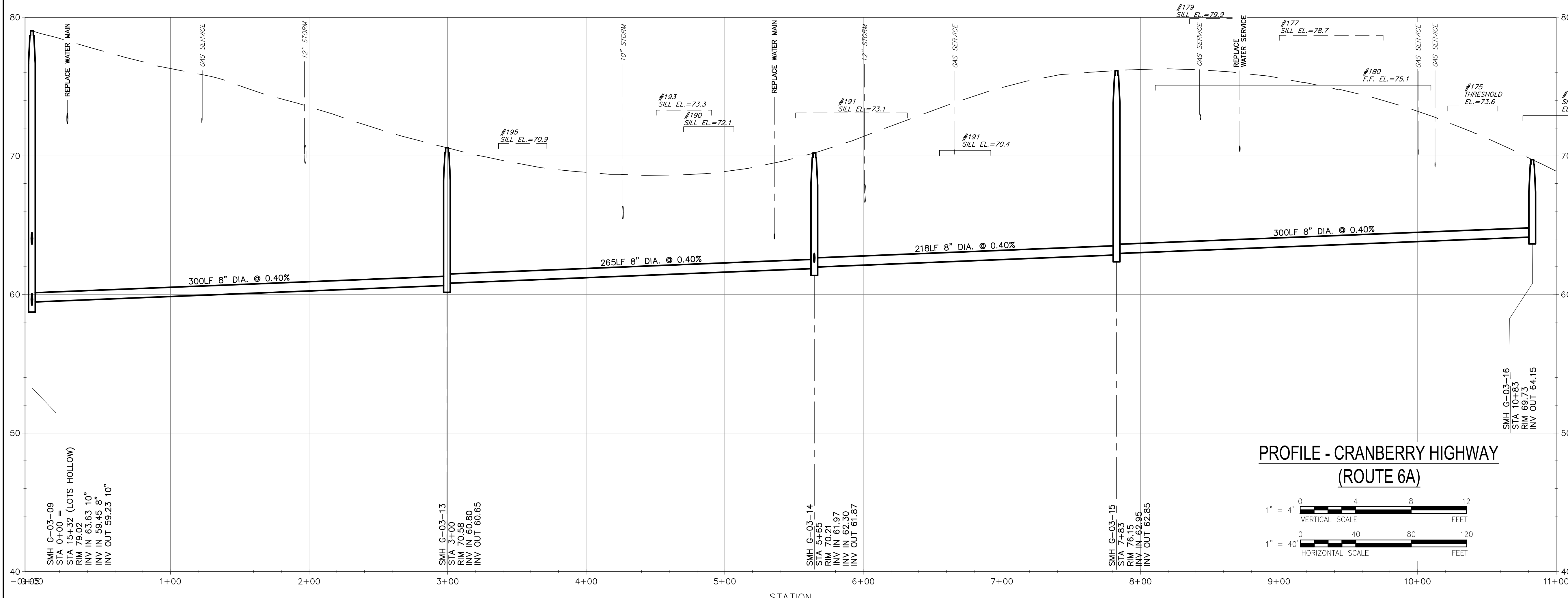
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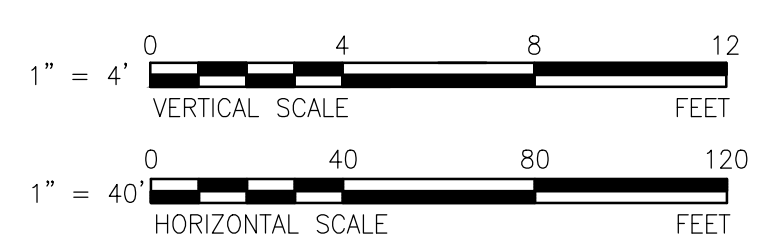


PLAN - CRANBERRY HIGHWAY (ROUTE 6A)

SCALE: 1"=40'

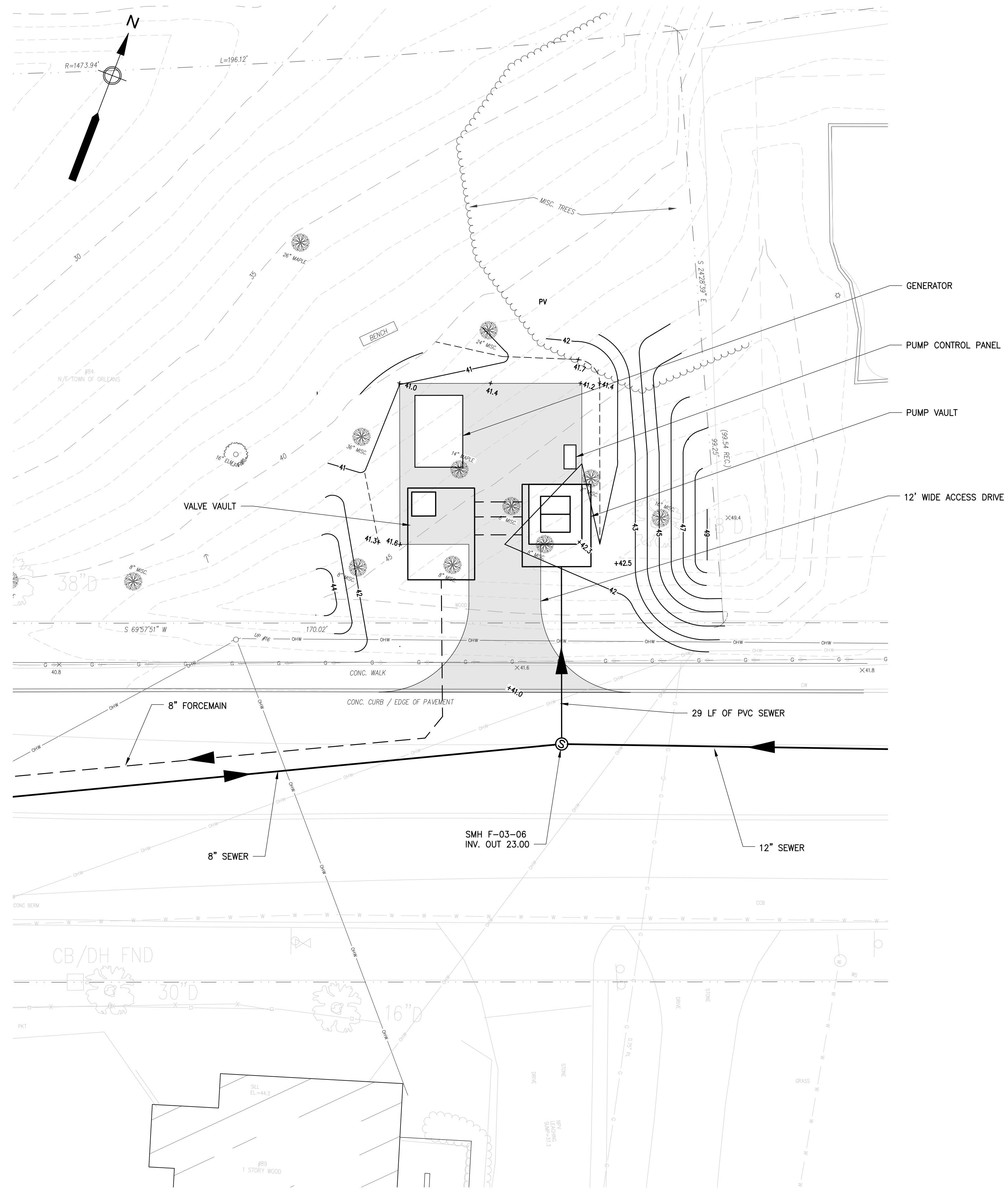


**PROFILE - CRANBERRY HIGHWAY
(ROUTE 6A)**



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Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____
 D
 C
 B
 A



SITE PLAN
SCALE: 1" = 10'-0"

REFERENCE
 SURVEY FOR THIS SITE PROVIDED BY COASTAL ENGINEERING COMPANY, INC., 260 CRANBERRY HIGHWAY, ORLEANS, MA 02653.
 PROJECT "AECOM - 84 OLD COLONY WAY"
 PROJECT NO. C18686.01
 SHEET TITLE "PLAN SHOWING EXISTING SITE CONDITIONS"
 SHEET NO. C1.2.1



PROJECT

Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

ENGINEER

AECOM TECHNICAL SERVICES, INC.
9 JONATHAN BOURNE DRIVE
POCASSET, MA 02559
PHONE: (508) 833-6950
www.aecom.com

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I/R	DATE	DESCRIPTION

PROJECT NUMBER

60476644

Designed By:	M. CURRAN
Drawn By:	M. CURRAN
Dept Check:	T. PARECE
Proj Check:	M. DONOGHUE
Date:	MARCH 2019
Scale:	AS NOTED

DISCIPLINE

CIVIL
SHEET TITLE

**PUMP STATION NO. 1
SITE PLAN**

SHEET NUMBER

01 C-401

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PROJECT

Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

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DISCIPLINE

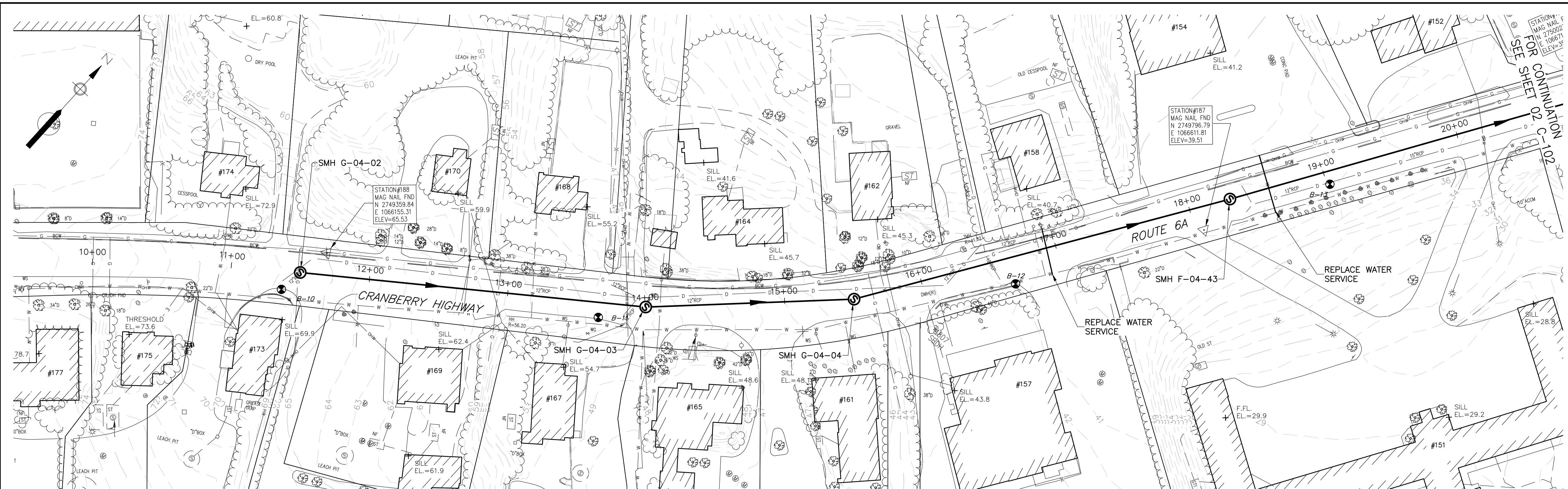
CIVIL

SHEET TITLE

**PLAN AND PROFILE SEWER
CRANBERRY HIGHWAY II**

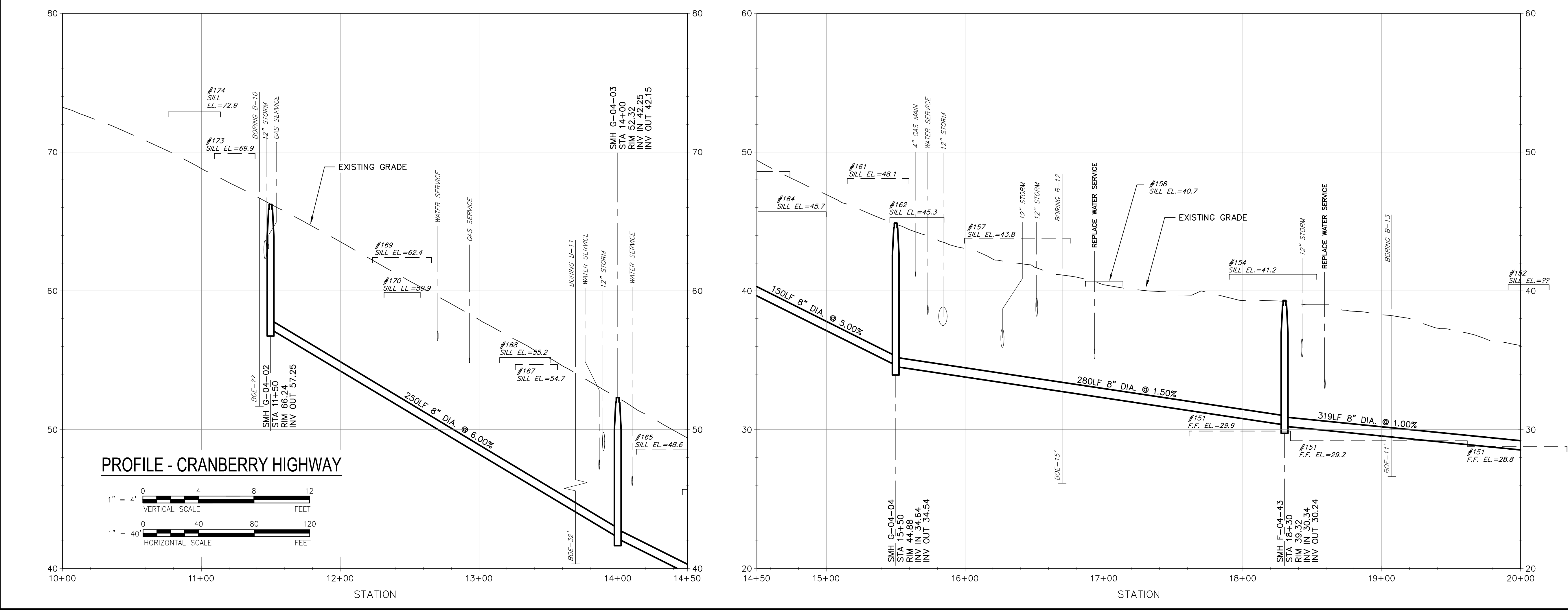
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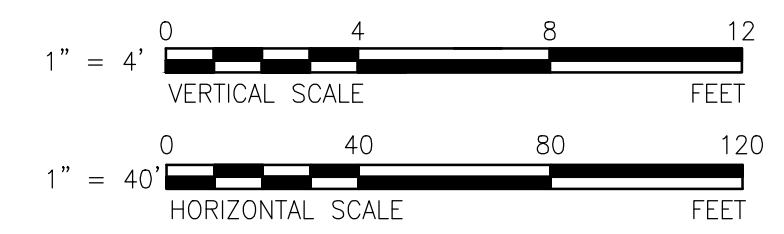


PLAN - CRANBERRY HIGHWAY

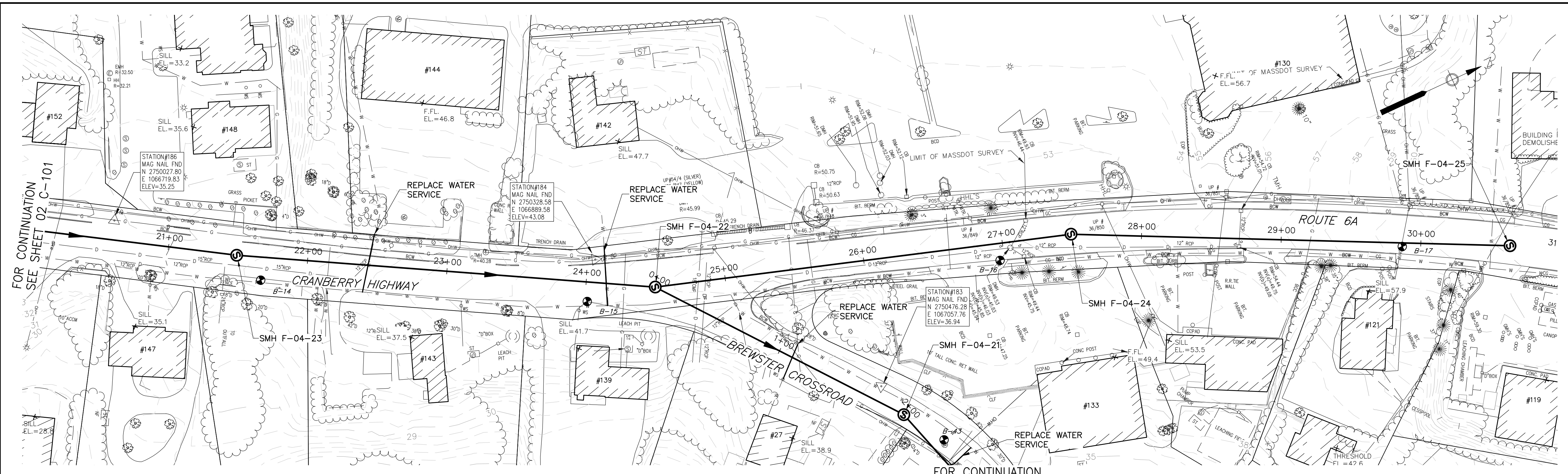
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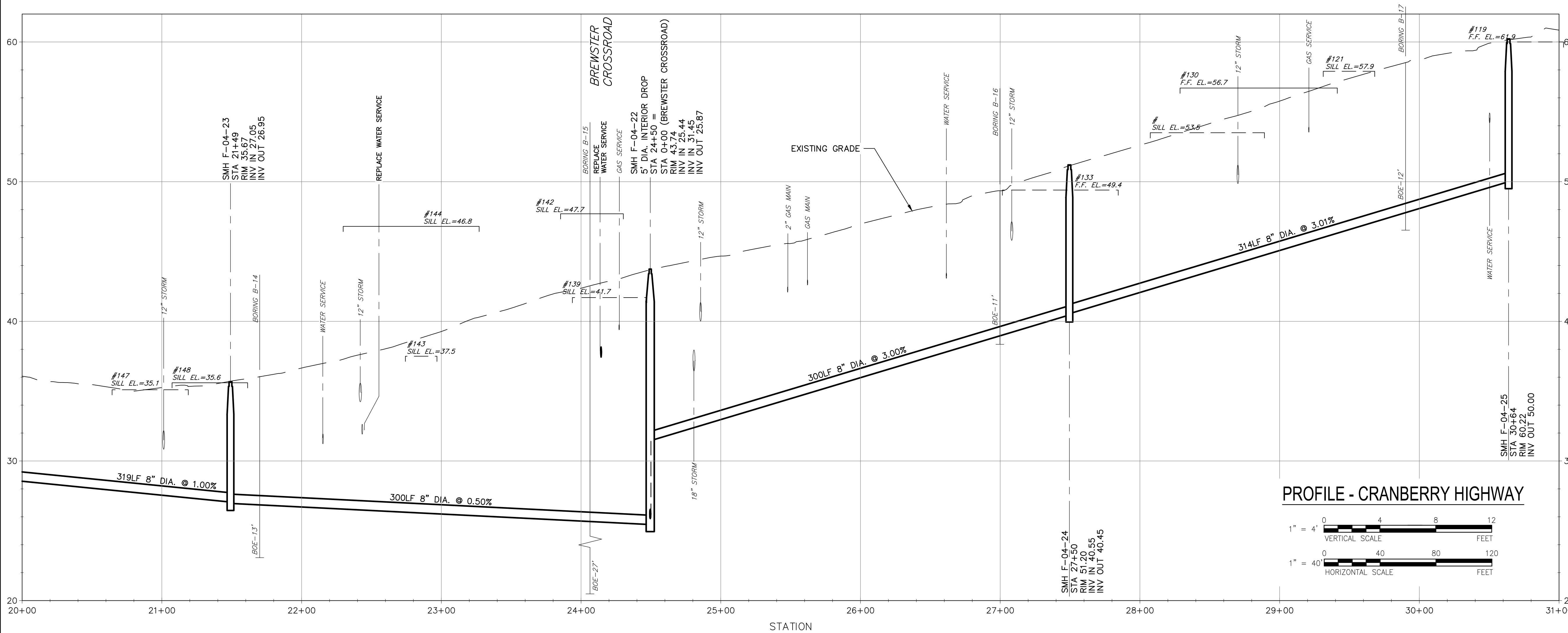
PROFILE - CRANBERRY HIGHWAY



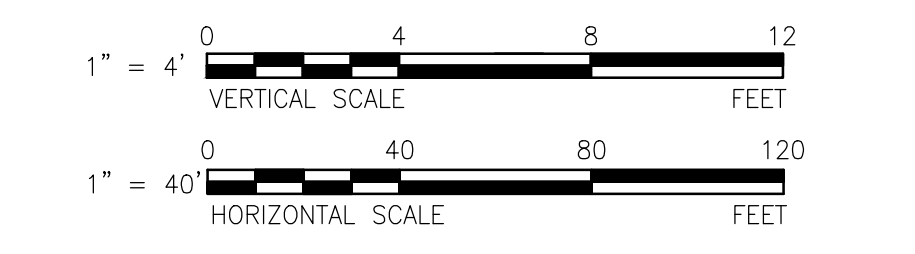
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 Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____



PLAN - CRANBERRY HIGHWAY
SCALE: 1"=40'



PROFILE - CRANBERRY HIGHWAY



PROJECT
Downtown Area
Collection System and
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CLIENT
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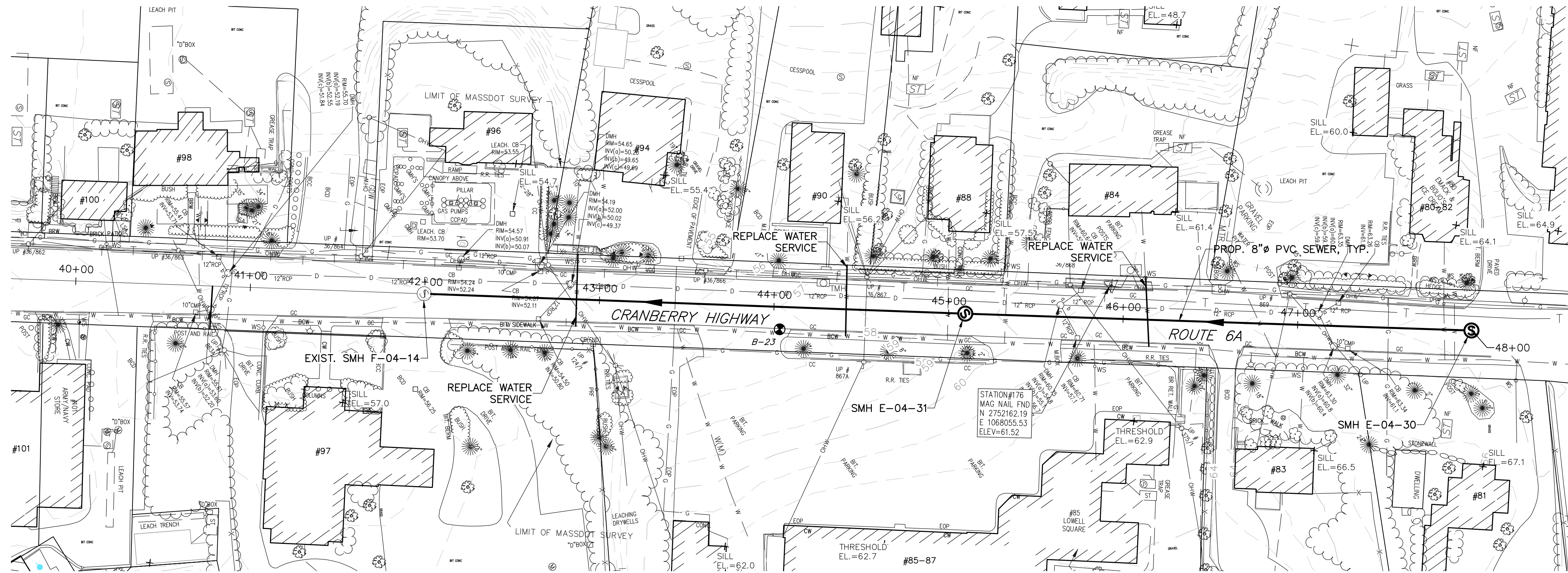
PROJECT NUMBER

60476644
 Designed By: **M. CURRAN**
 Drawn By: **M. CURRAN**
 Dept Check: **T. PARECE**
 Proj Check: **M. DONOGHUE**
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DISCIPLINE
CIVIL
SHEET TITLE

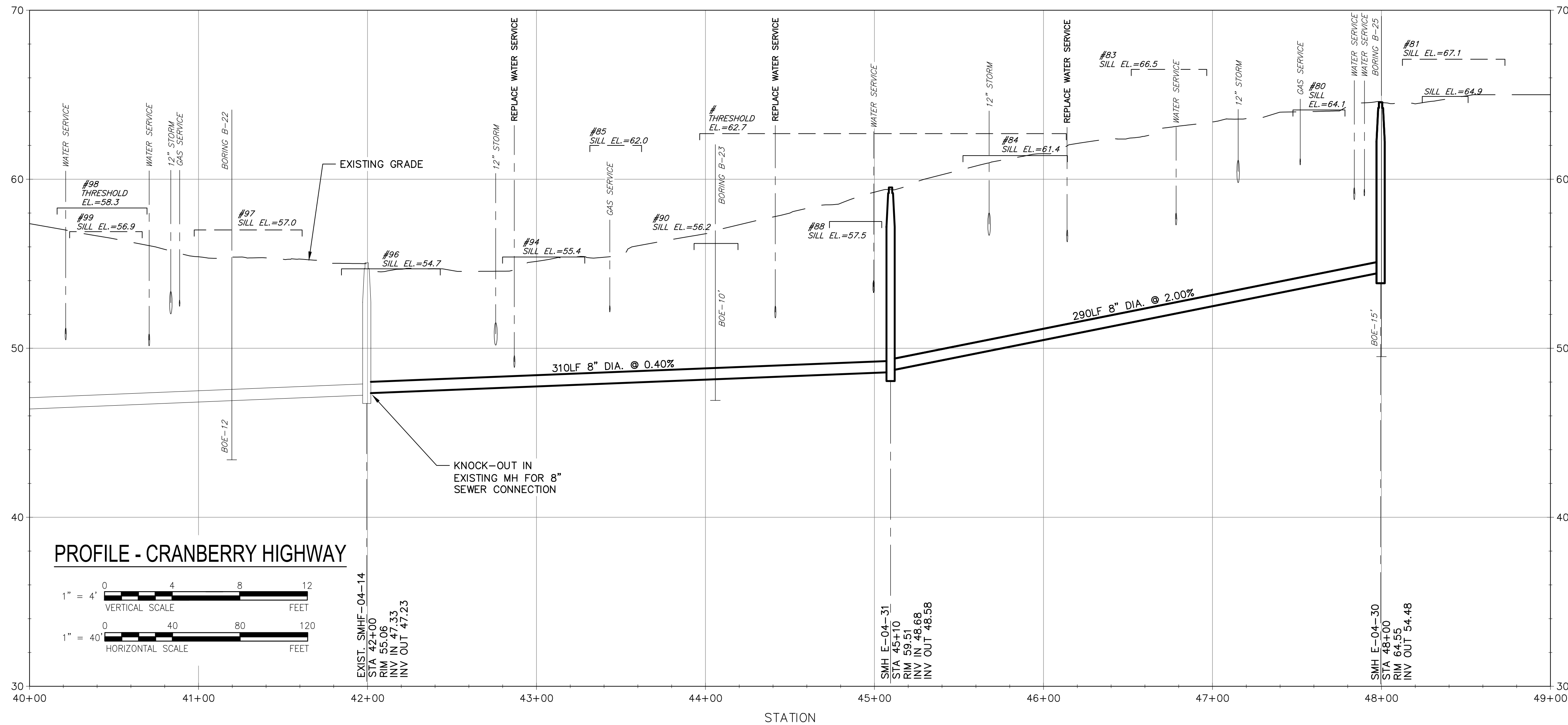
**PLAN AND PROFILE SEWER
CRANBERRY HIGHWAY III**

SHEET NUMBER
02 C-102

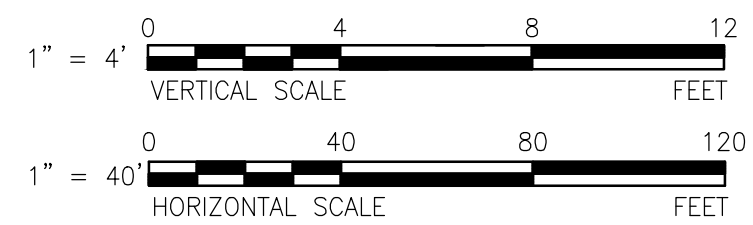


PLAN - CRANBERRY HIGHWAY

SCALE: 1"=40'



PROFILE - CRANBERRY HIGHWAY



EXIST. SMH E-04-14
 STA 42+00
 RIM 55.06
 INV IN 47.33
 INV OUT 47.23

SMH E-04-31
 STA 45+10
 RIM 59.51
 INV IN 48.68
 INV OUT 48.58

SMH E-04-30
 STA 48+00
 RIM 64.55
 INV OUT 54.48



PROJECT

Downtown Area
 Collection System and
 Pump Stations

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DISCIPLINE

CIVIL

SHEET TITLE

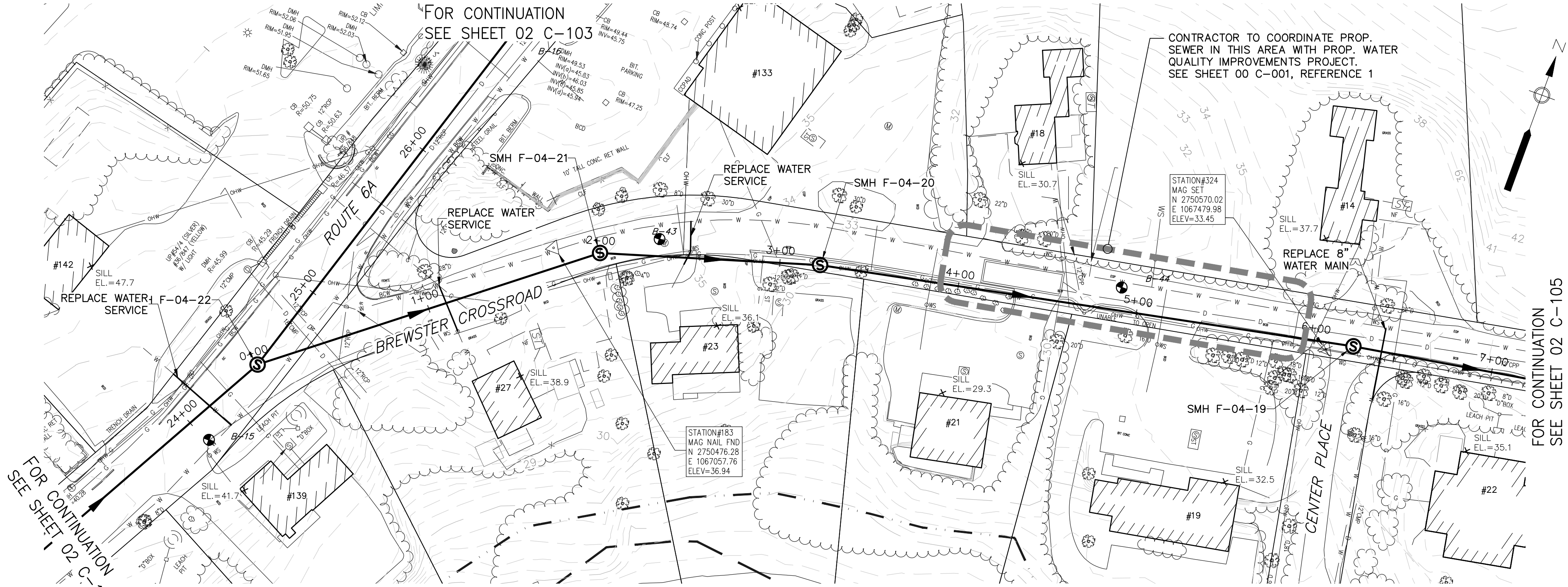
PLAN AND PROFILE SEWER
 CRANBERRY HIGHWAY IV

SHEET NUMBER

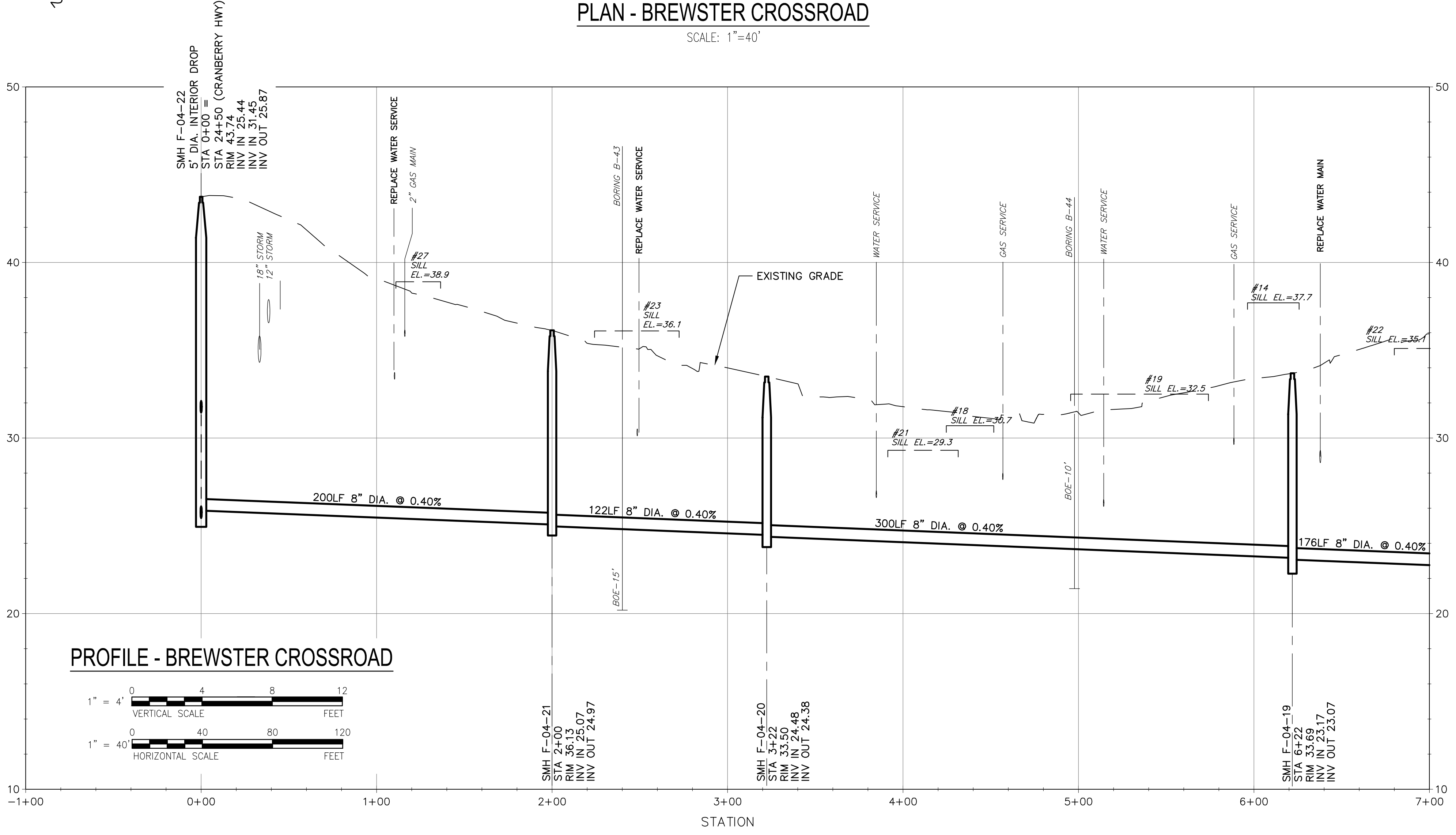
02 C-103

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 Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____
 D
 C
 B
 A



PLAN - BREWSTER CROSSROAD
SCALE: 1"=40'



PROFILE - BREWSTER CROSSROAD
 1" = 4' VERTICAL SCALE
 1" = 40' HORIZONTAL SCALE



PROJECT
 Downtown Area
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 Pump Stations

Contract No. 2019-02
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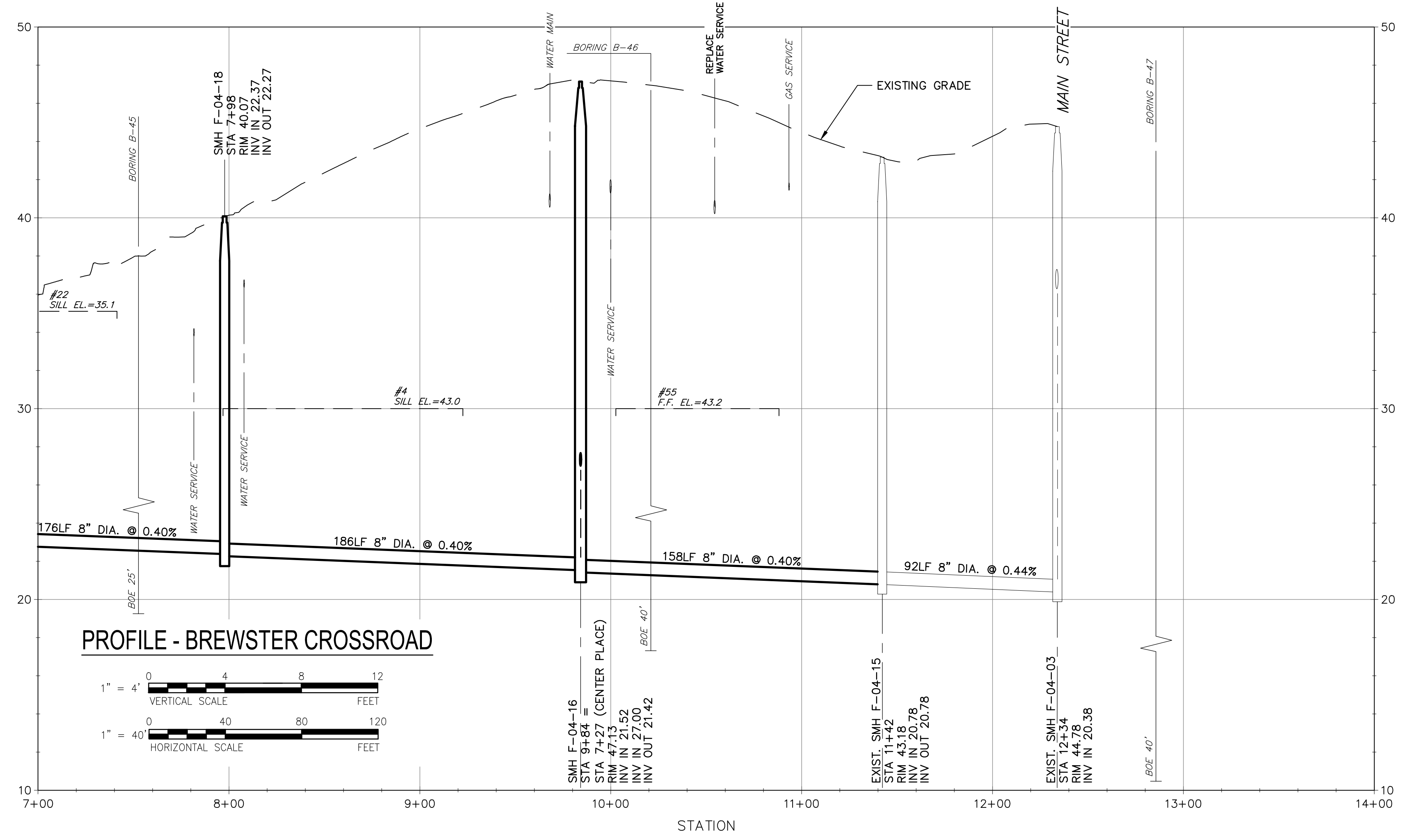
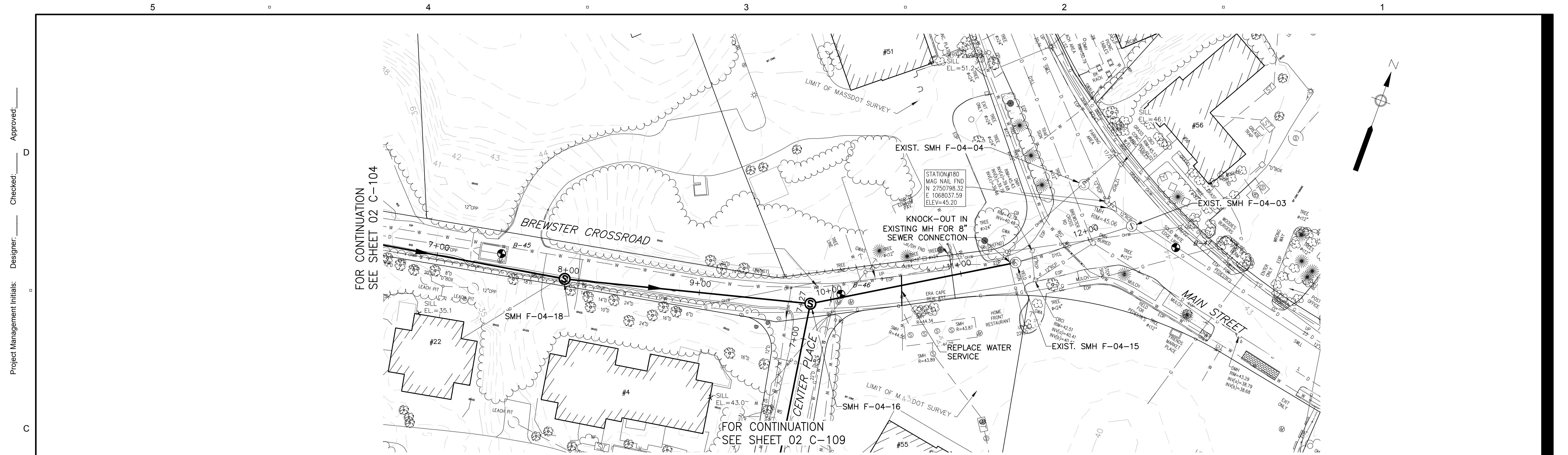
PROJECT NUMBER
 60476644

Designed By: **M. CURRAN**
 Drawn By: **M. CURRAN**
 Dept Check: **T. PARECE**
 Proj Check: **M. DONOGHUE**
 Date: **MARCH 2019**
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DISCIPLINE
 CIVIL
SHEET TITLE

**PLAN AND PROFILE SEWER
 BREWSTER CROSSROAD I**

SHEET NUMBER
02 C-104



PROJECT
Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT
Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
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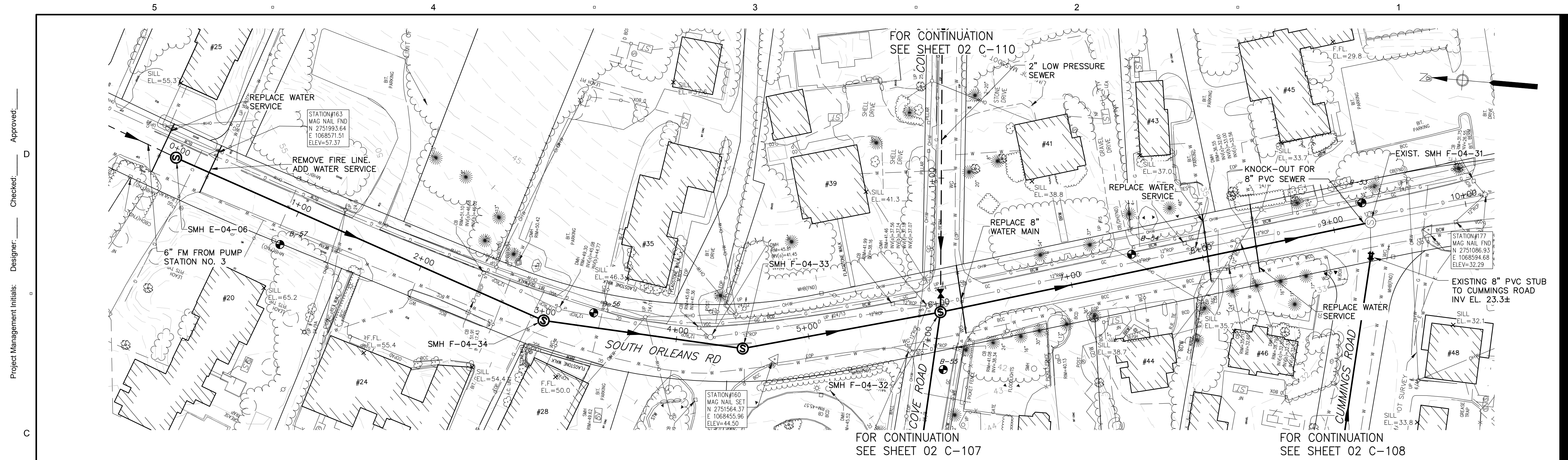
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DISCIPLINE
CIVIL
SHEET TITLE
PLAN AND PROFILE SEWER
BREWSTER CROSSROAD II

SHEET NUMBER
02 C-105

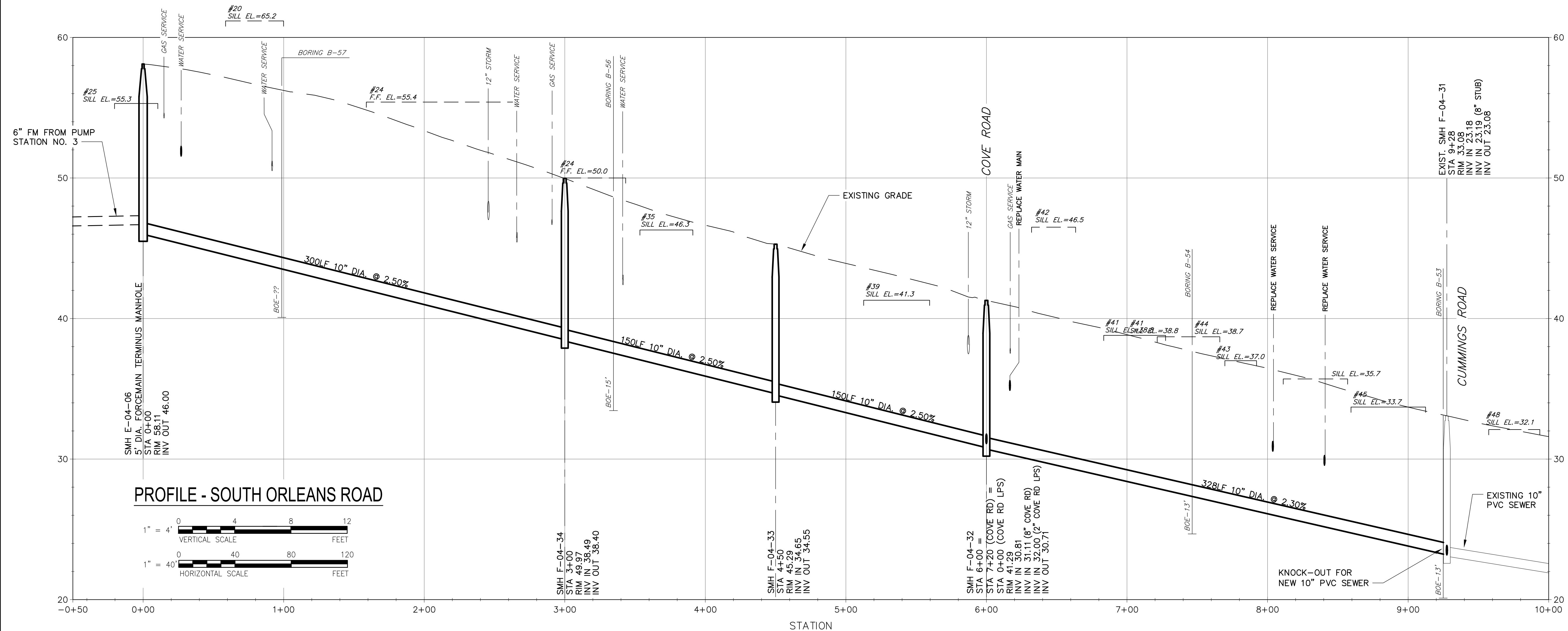
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PLAN - SOUTH ORLEANS ROAD

SCALE: 1"=40'



PROJECT

Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

ENGINEER

AECOM TECHNICAL SERVICES, INC.
9 JONATHAN BOURNE DRIVE
POCASSET, MA 02559
PHONE: (508) 833-6950
www.aecom.com

CONSULTANTS

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ISSUE/REVISION

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PROJECT NUMBER

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Designed By:	M. CURRAN
Drawn By:	M. CURRAN
Dept Check:	T. PARECE
Proj Check:	M. DONOGHUE
Date:	MARCH 2019
Scale:	AS NOTED

DISCIPLINE

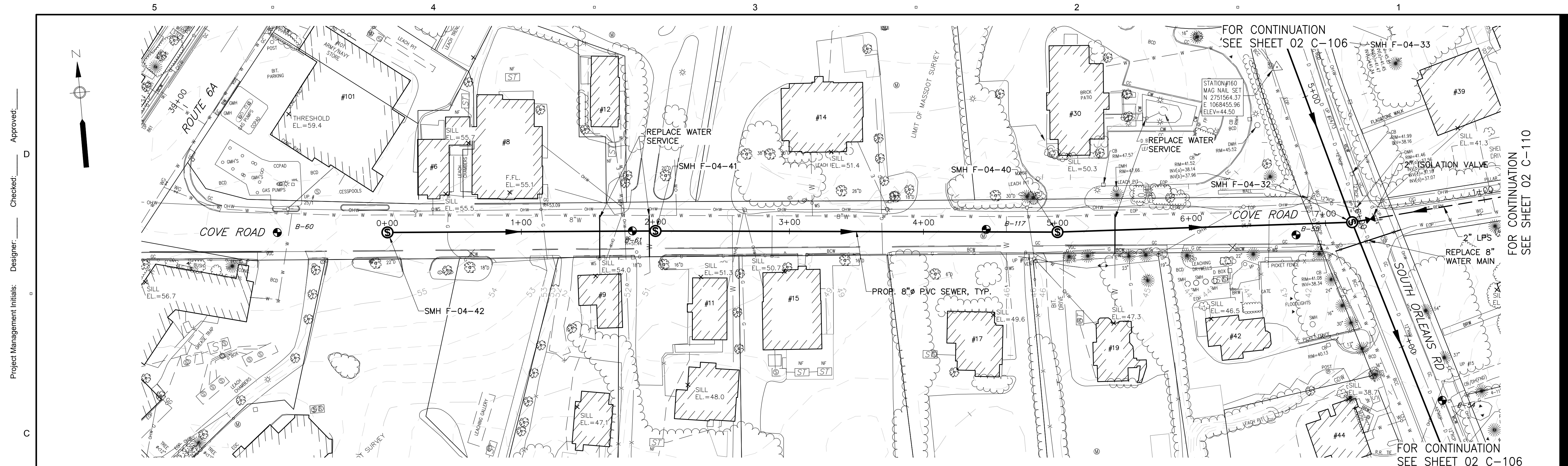
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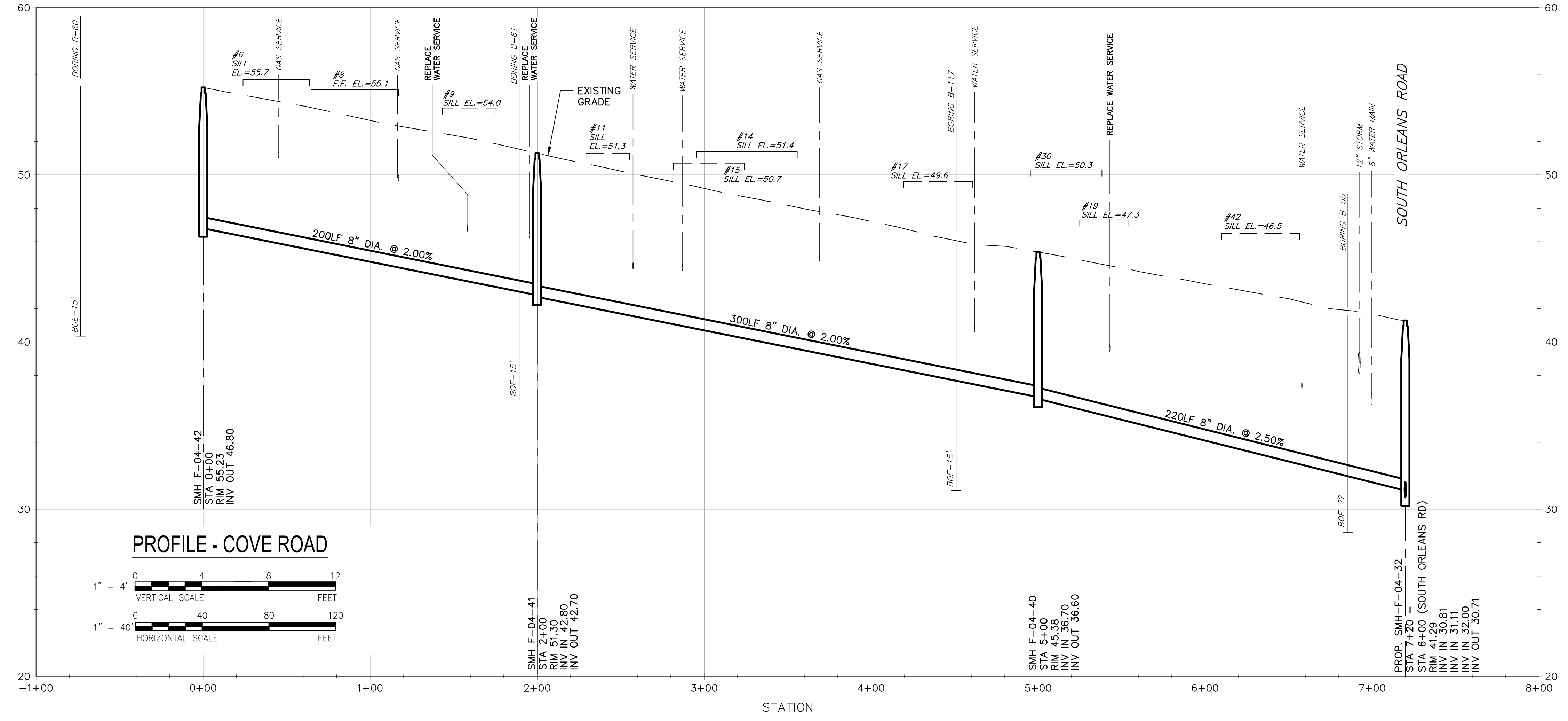
PLAN AND PROFILE SEWER
SOUTH ORLEANS ROAD

SHEET NUMBER

02 C-106



PLAN - COVE ROAD
SCALE: 1"=40'



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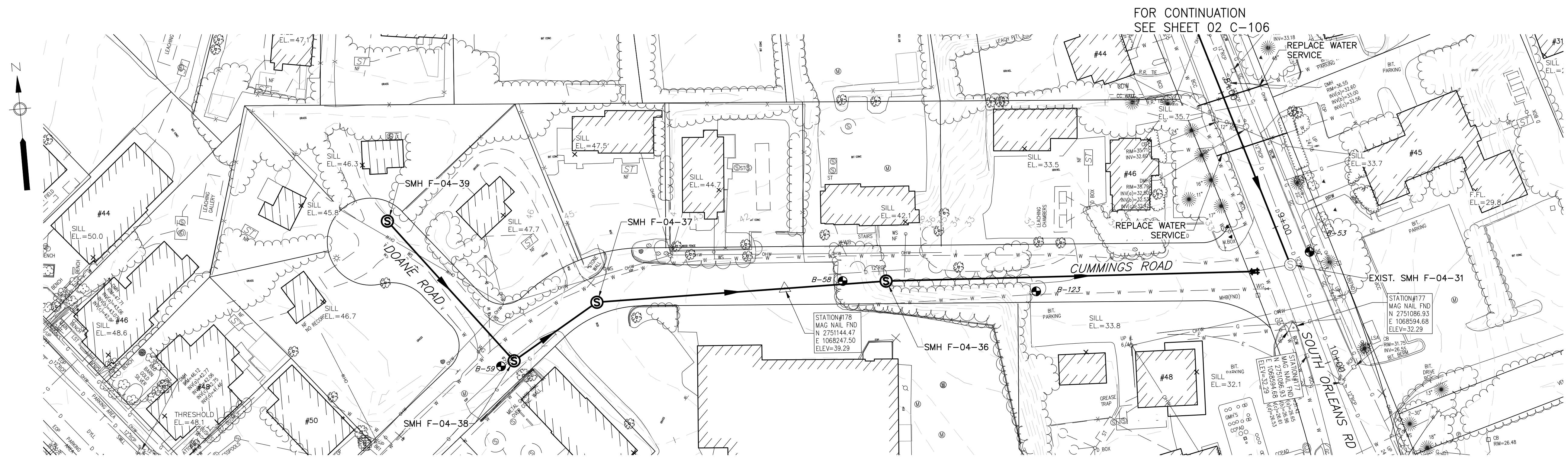
Designed By: **M. CURRAN**
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 Proj Check: **M. DONOGHUE**
 Date: **MARCH 2019**
 Scale: **AS NOTED**

DISCIPLINE
 CIVIL

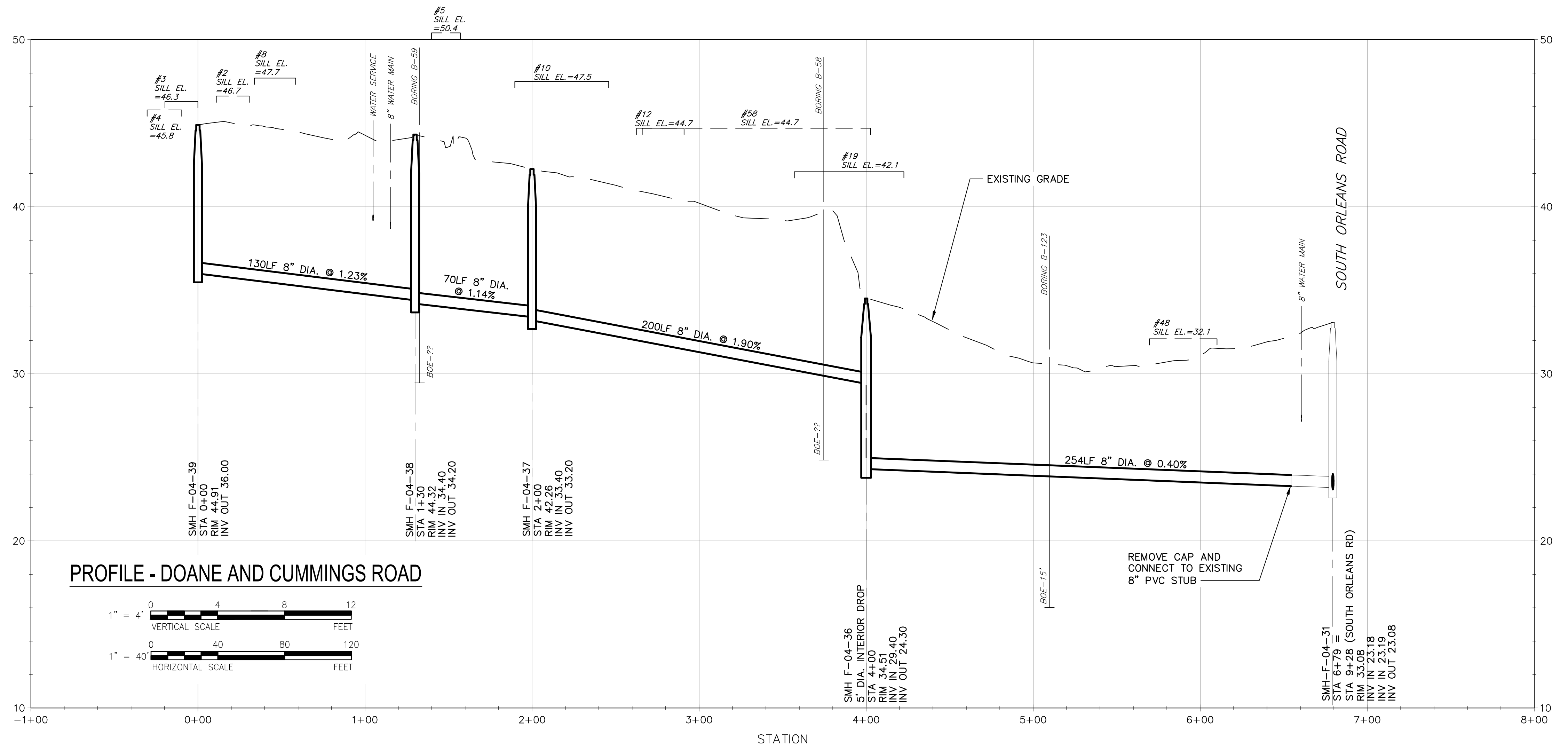
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 PLAN AND PROFILE SEWER
 COVE ROAD

SHEET NUMBER
 02 C-107

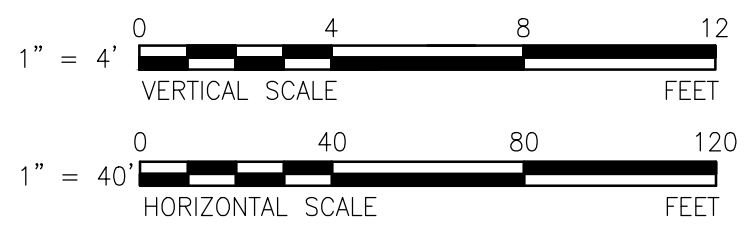
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PLAN - DOANE AND CUMMINGS ROAD
 SCALE: 1"=40'



PROFILE - DOANE AND CUMMINGS ROAD



FOR CONTINUATION
SEE SHEET 02 C-106



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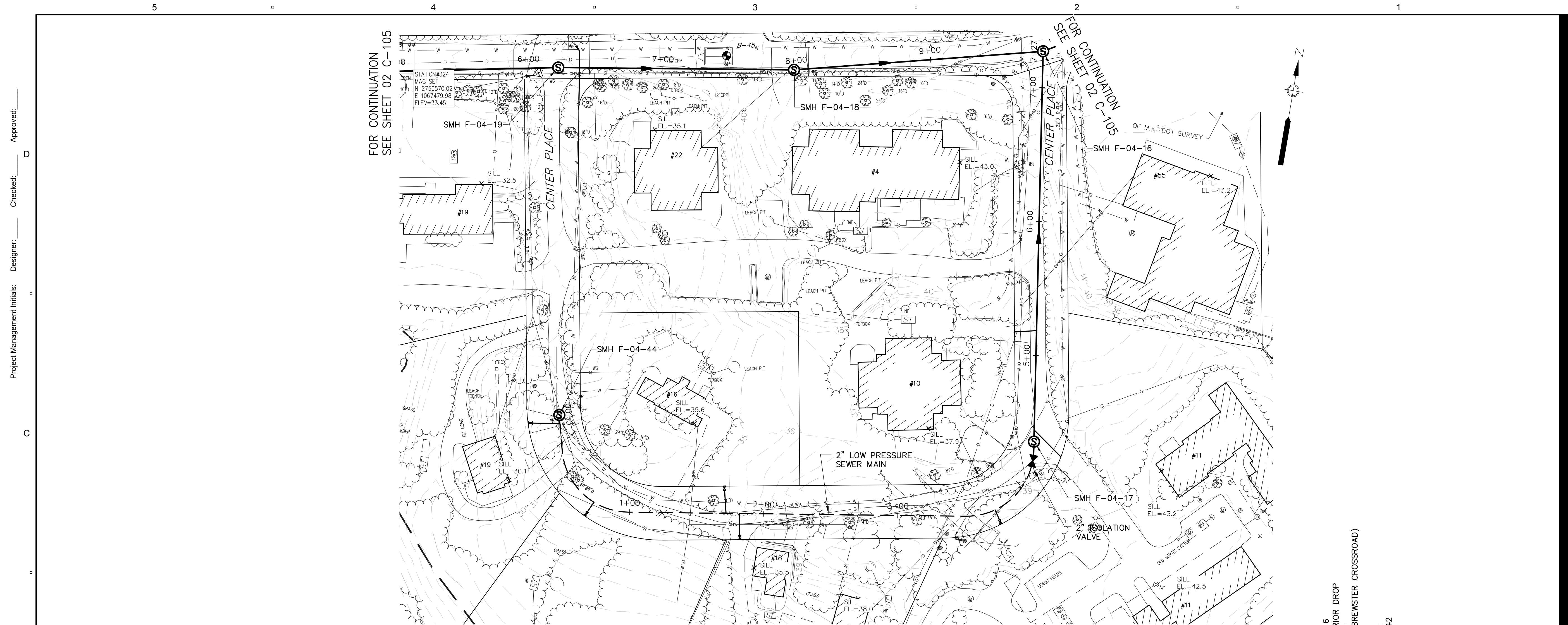
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PROJECT NUMBER
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 Dept Check: **T. PARECE**
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DISCIPLINE
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SHEET TITLE

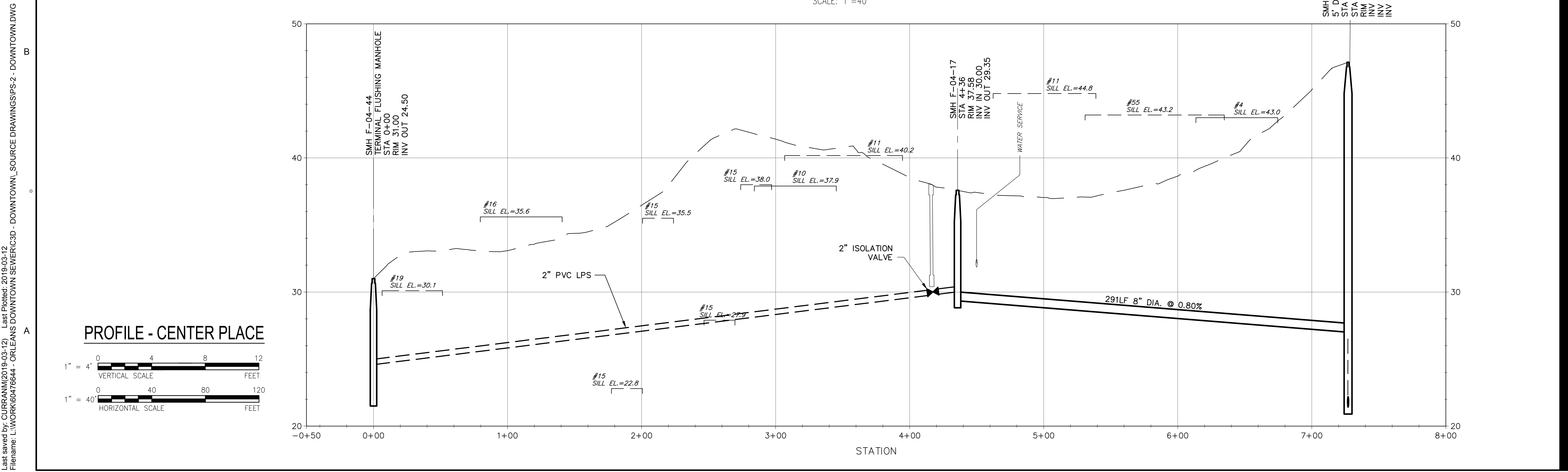
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DOANE AND CUMMINGS
ROAD
SHEET NUMBER

02 C-108

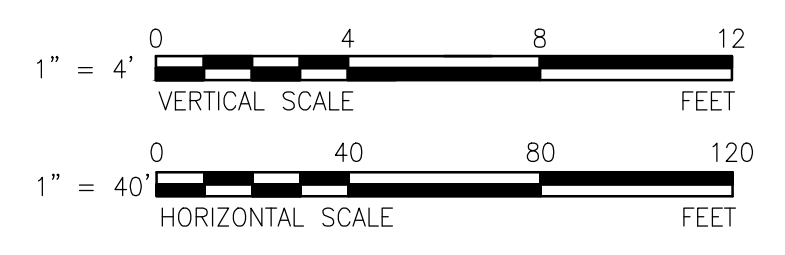


PLAN - CENTER PLACE
SCALE: 1"=40'

SMH F-04-16
5' DIA. INTERIOR DROP
STA 7+27.4
STA 6+84
R/W 87.13
INV IN 27.00
INV OUT 21.42



PROFILE - CENTER PLACE



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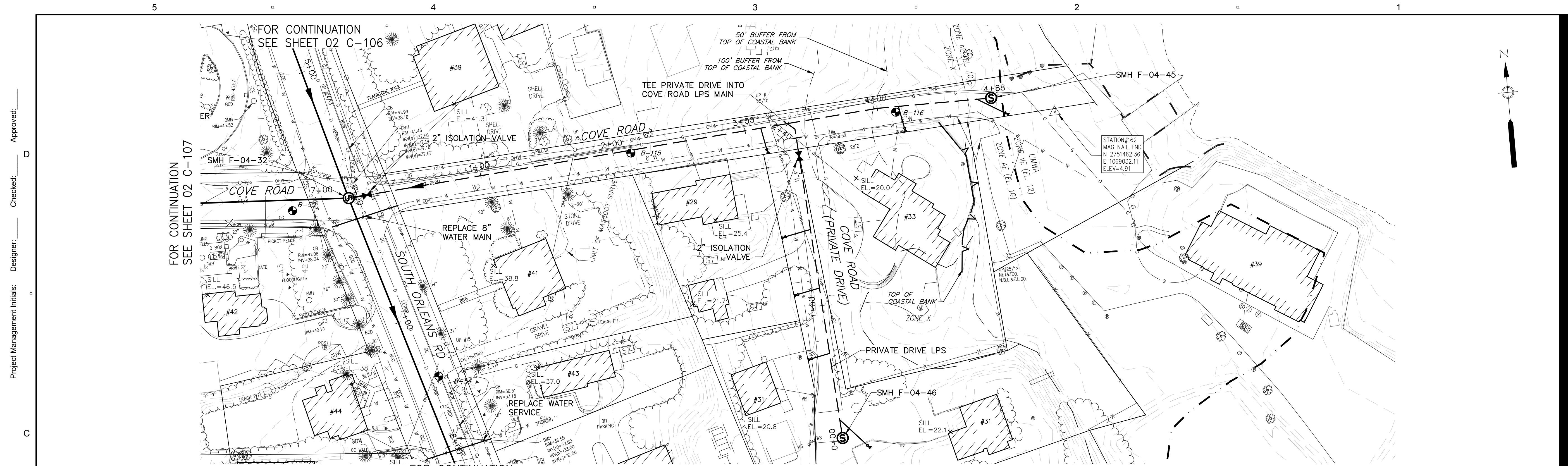
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PROJECT NUMBER
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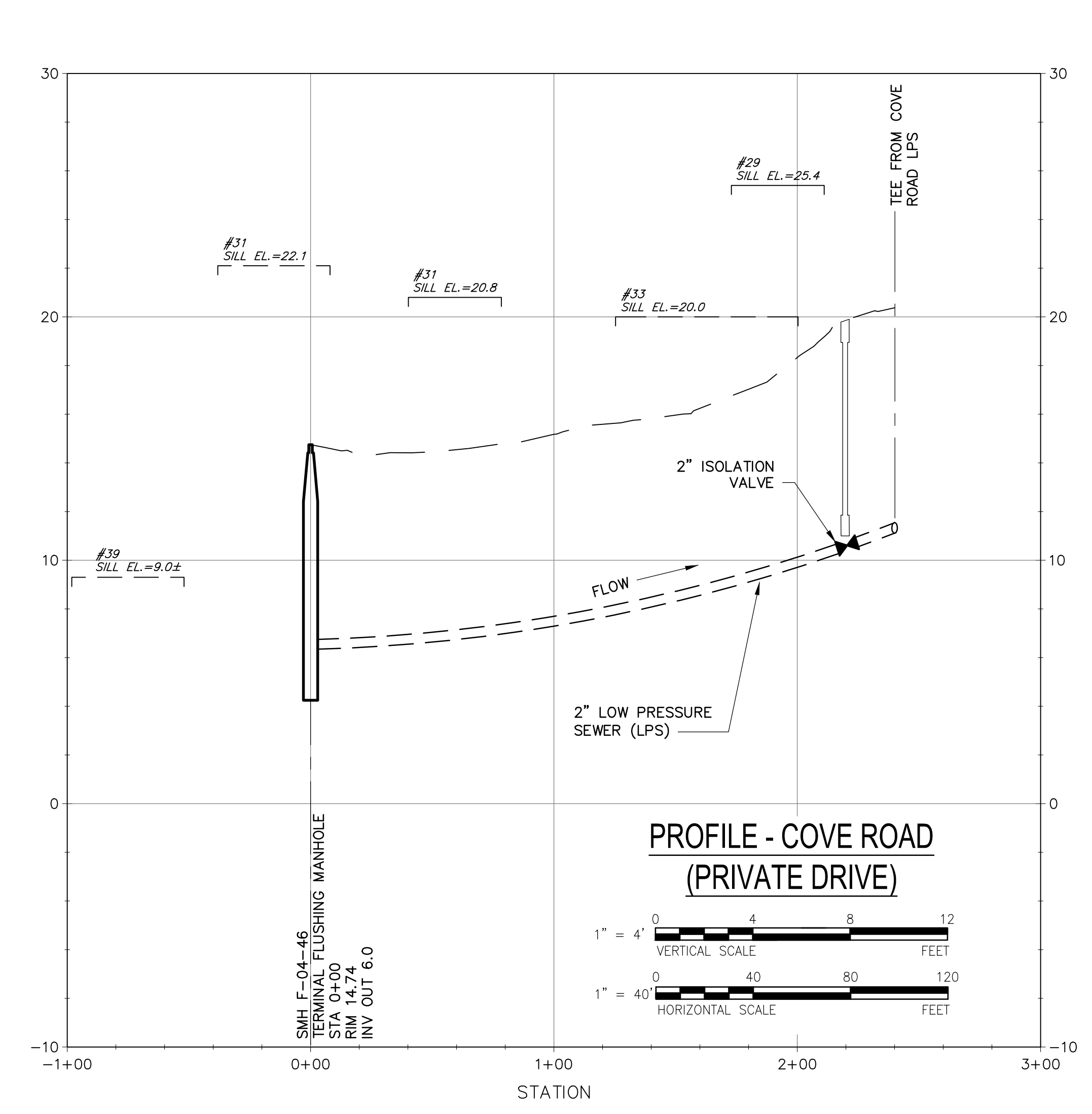
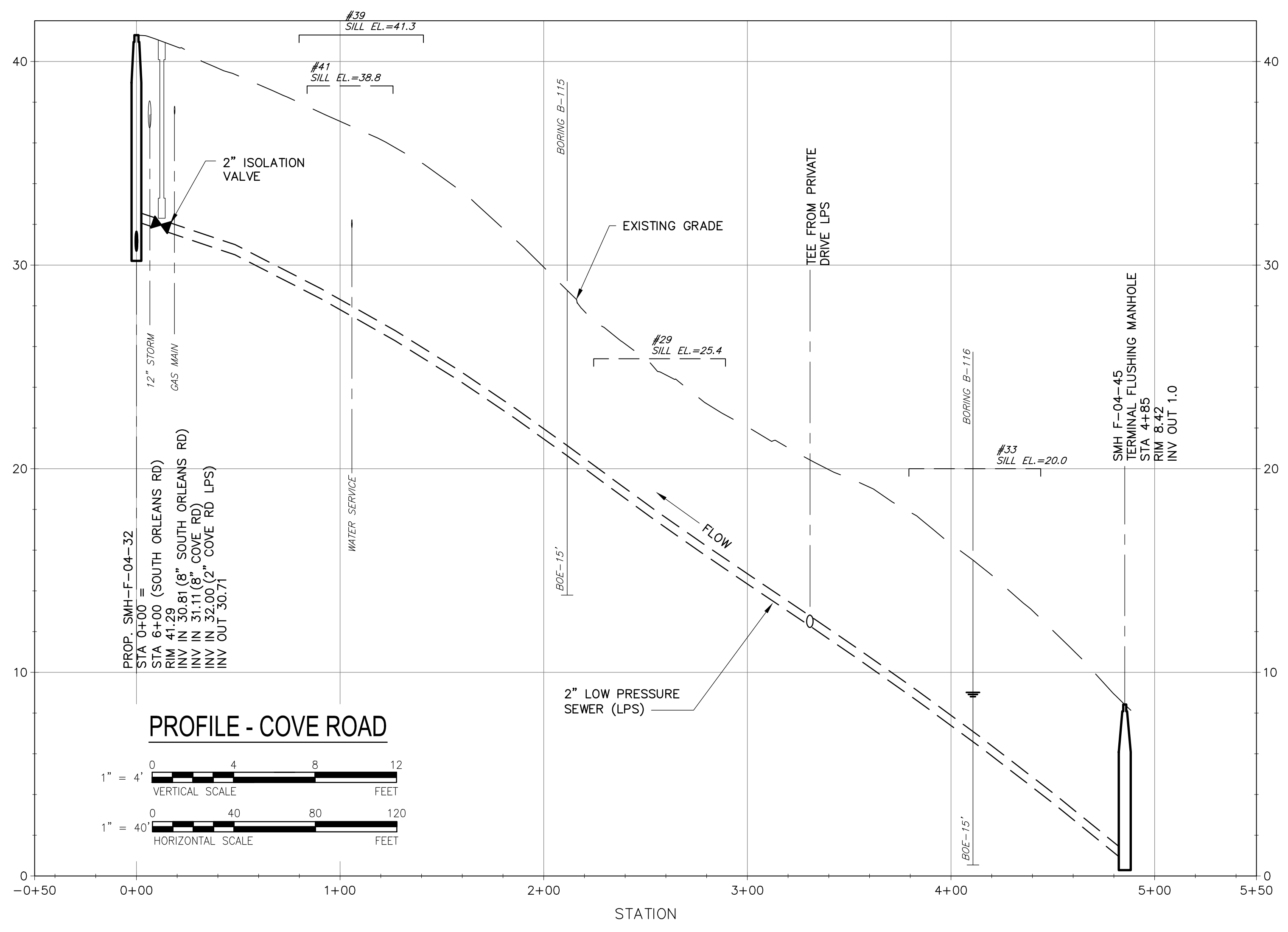
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Dept Check: **T. PARECE**
Proj Check: **M. DONOGHUE**
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Scale: **AS NOTED**

DISCIPLINE
CIVIL
SHEET TITLE
PLAN AND PROFILE SEWER
CENTER PLACE

SHEET NUMBER
02 C-109



PLAN - COVE ROAD
SCALE: 1"=40'



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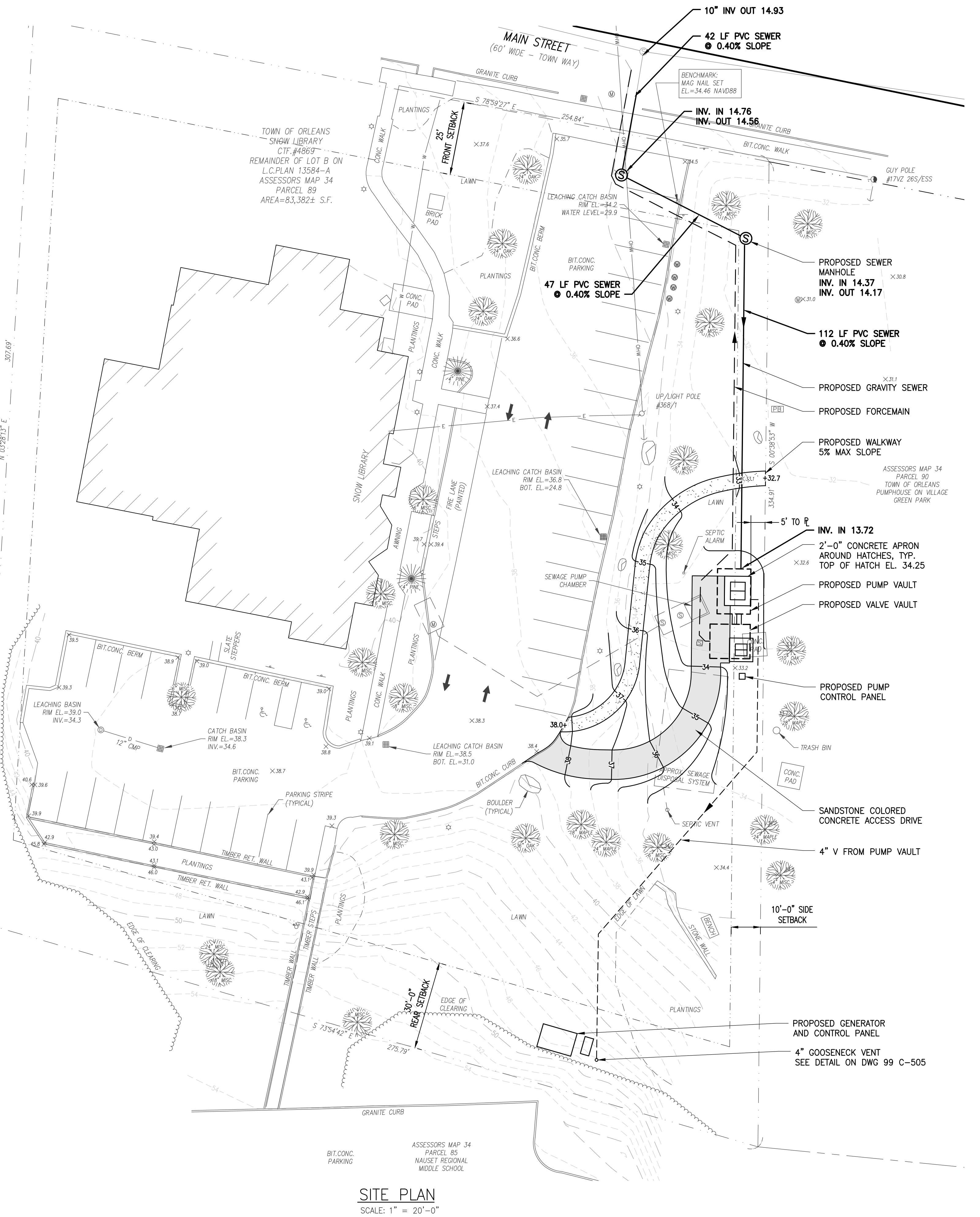
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 Proj Check: **M. DONOGHUE**
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DISCIPLINE
CIVIL
SHEET TITLE
PLAN AND PROFILE SEWER
COVE ROAD II

SHEET NUMBER
02 C-110

LEGEND

■ BOUND	▣ CATCH BASIN
--- PROPERTY LINE	⊙ DRAIN MANHOLE
— MISC. SIGN	— D — DRAIN LINE
— OHW — OVERHEAD UTILITY LINE	— W — WATER LINE
⊙ UTILITY POLE	⊙ MANHOLE
⊙ GUY POLE	⊙ SEWER MANHOLE
⊙ GUY WIRE	⊙ TREE
⊙ LIGHTPOST	— 40 — EXISTING CONTOUR
⊙ PULL BOX	X 31.0 EXISTING SPOT GRADE
⊙ MONITORING WELL	— 40 — PROPOSED CONTOUR



AECOM

PROJECT
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Date: **MARCH 2019**
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DISCIPLINE
CIVIL
SHEET TITLE
PUMP STATION NO. 2
SITE PLAN

SHEET NUMBER
02 C-401

REFERENCE SURVEY
SURVEY FOR THIS SITE PROVIDED BY COASTAL ENGINEERING COMPANY, INC, 260 CRANBERRY HIGHWAY, ORLEANS, MA 02653.
PROJECT "AECOM - SNOW LIBRARY"
PROJECT NO. C18686.01
SHEET TITLE "PLAN SHOWING EXISTING SITE CONDITIONS"
SHEET NO. C1.2.1 REV 1

SITE PLAN
SCALE: 1" = 20'-0"

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DISCIPLINE

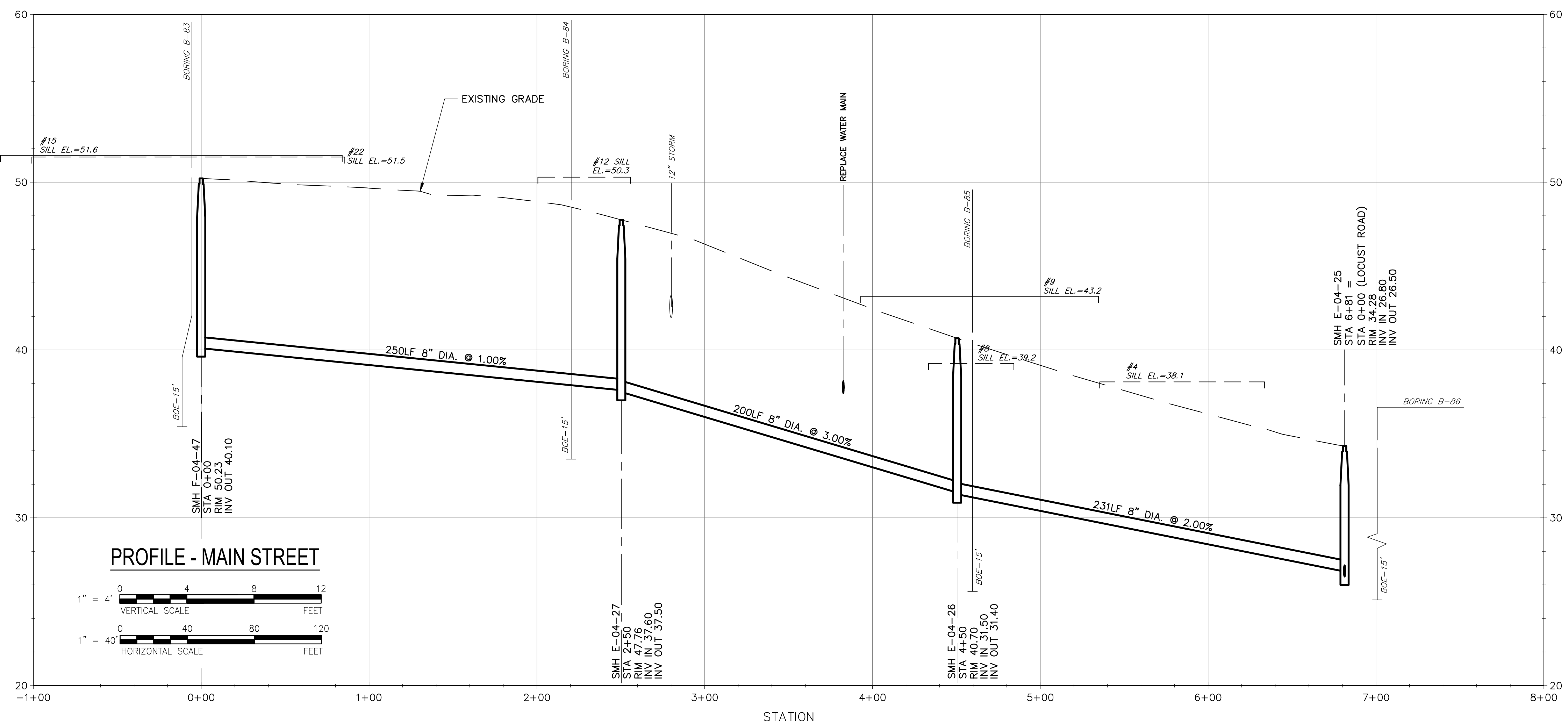
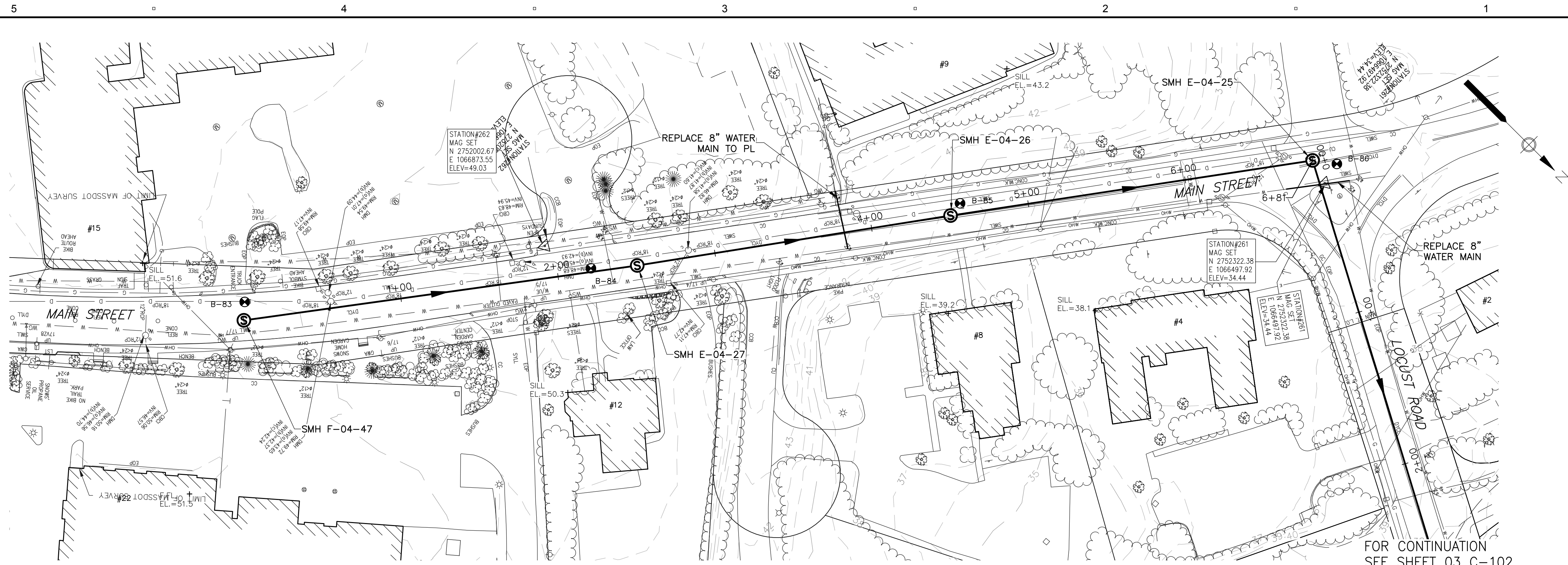
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SHEET TITLE

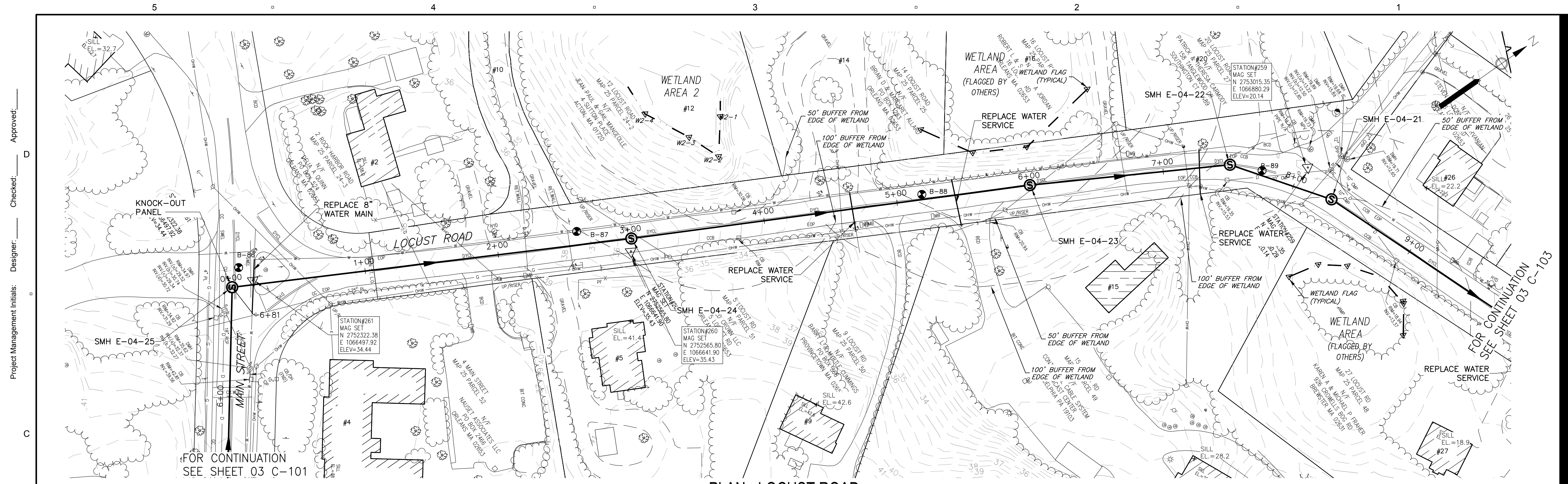
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MAIN STREET**

SHEET NUMBER

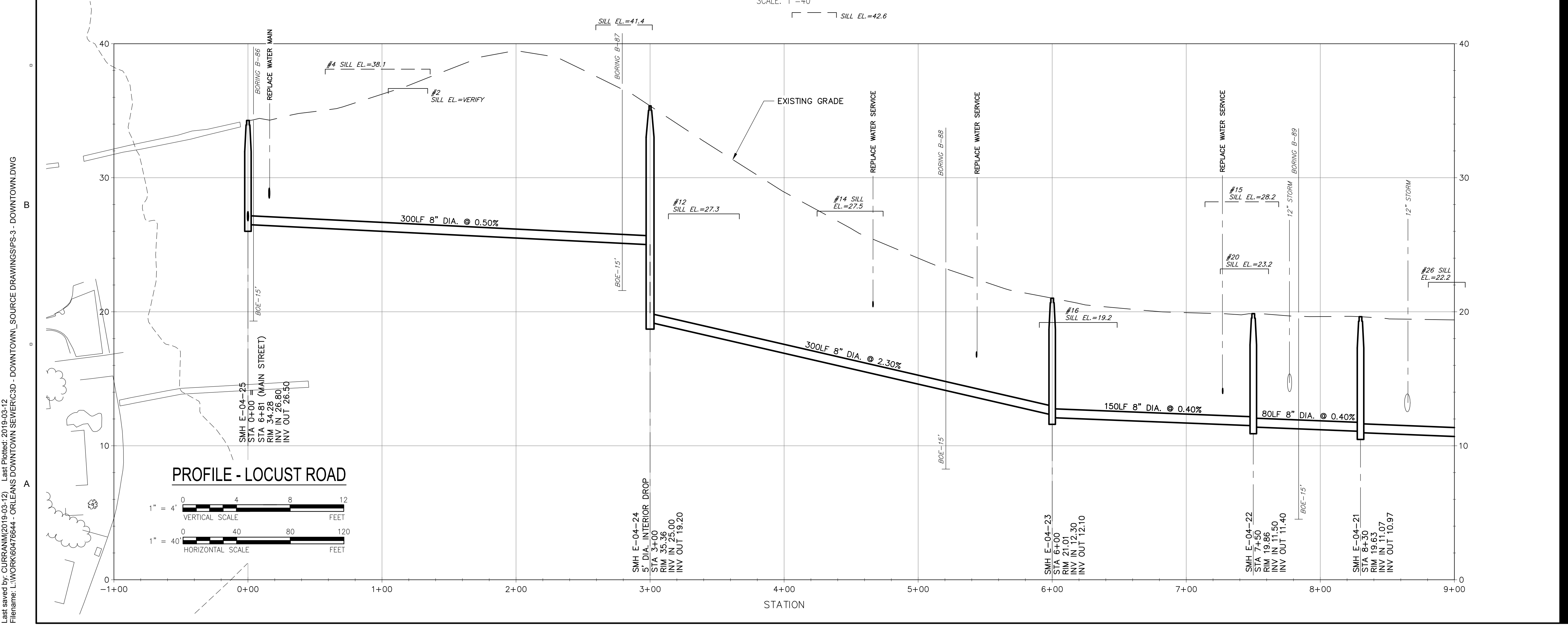
03 C-101



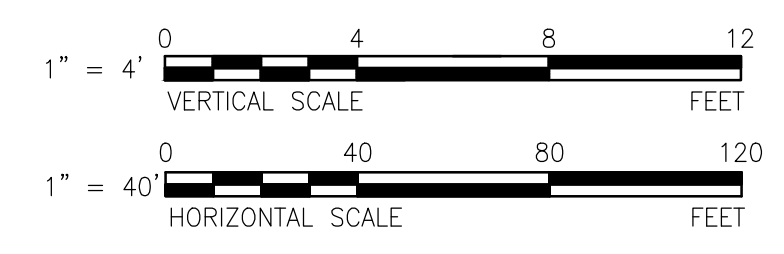
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PLAN - LOCUST ROAD
SCALE: 1"=40'



PROFILE - LOCUST ROAD



PROJECT

Downtown Area
Collection System and
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CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
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SHEET TITLE

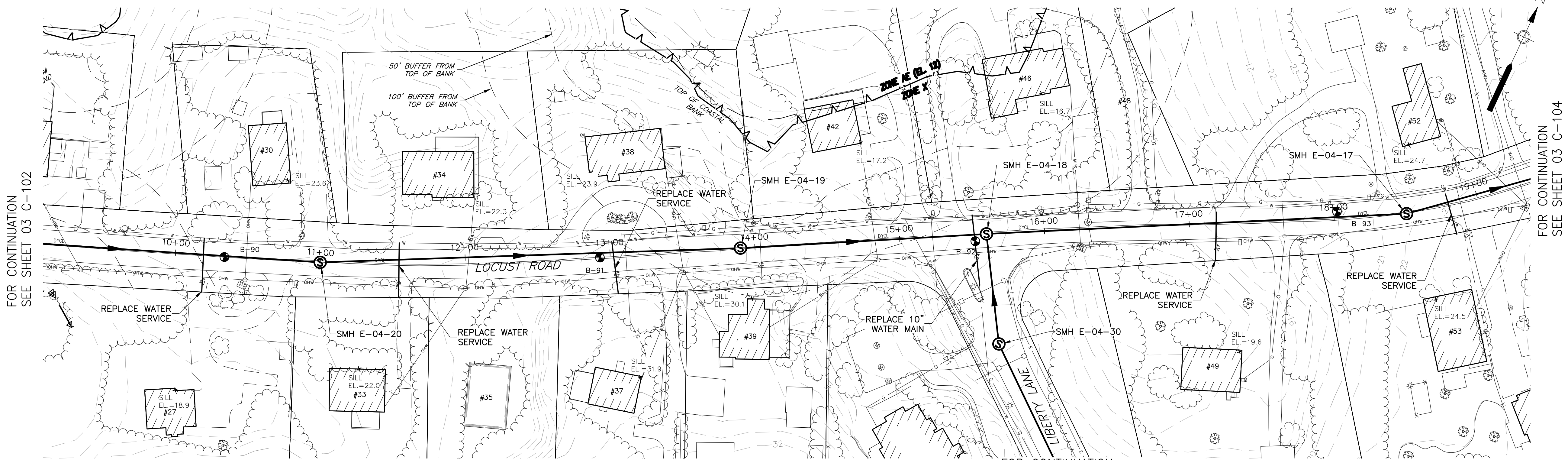
PLAN AND PROFILE SEWER
LOCUST ROAD I

SHEET NUMBER

03 C-102

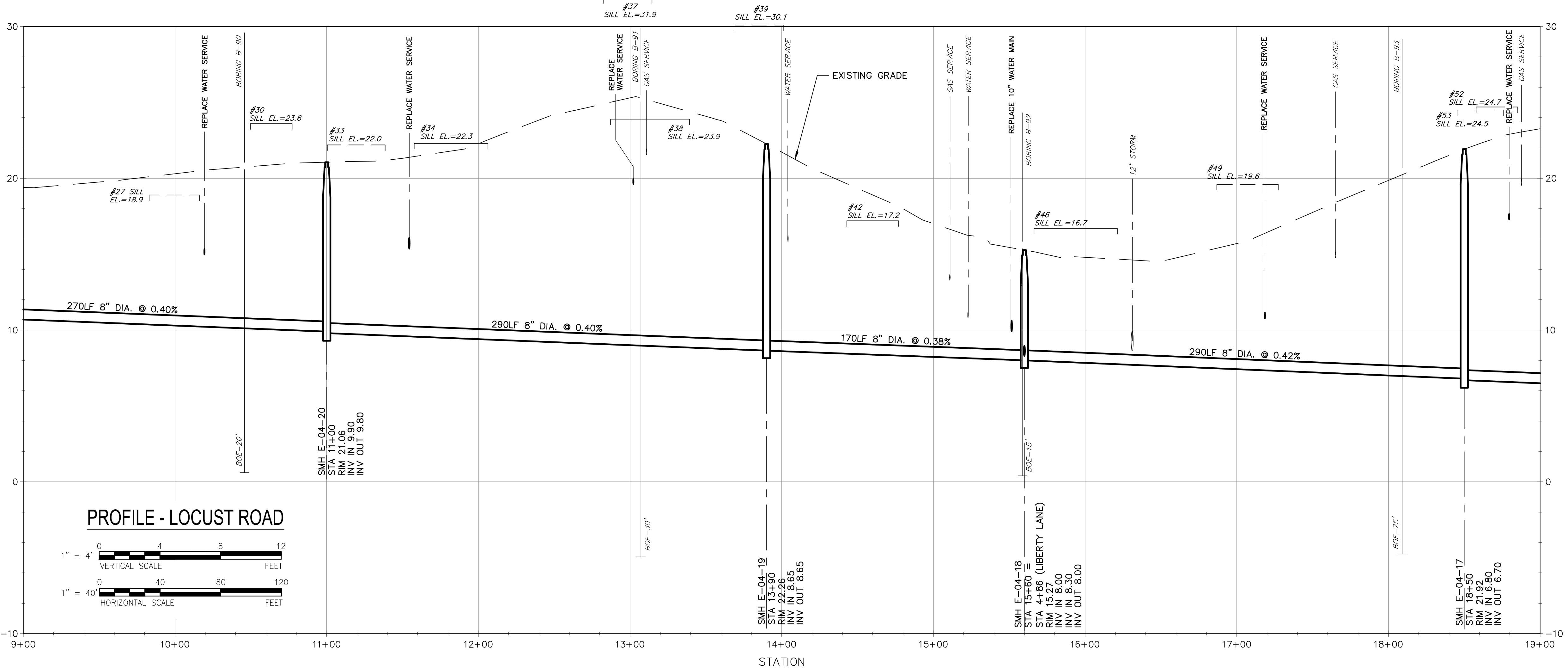
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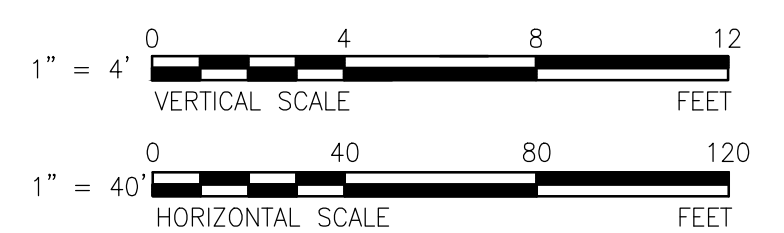


PLAN - LOCUST ROAD

SCALE: 1"=40'



PROFILE - LOCUST ROAD



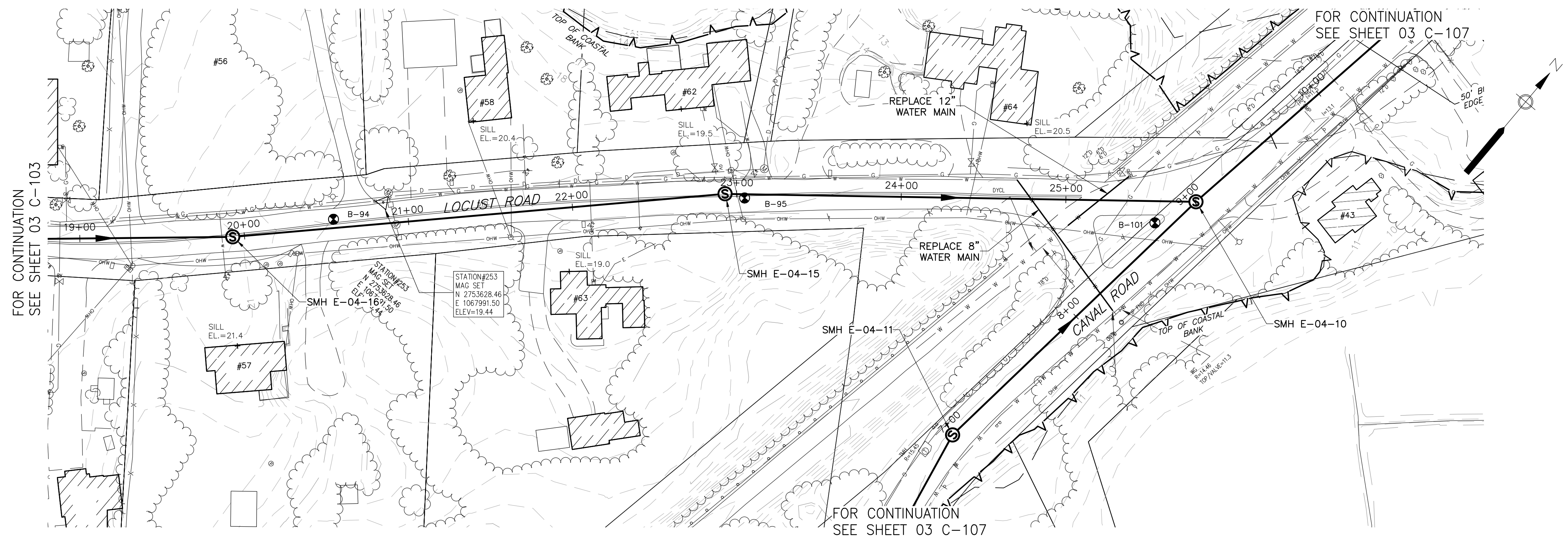
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SEE SHEET 03 C-102

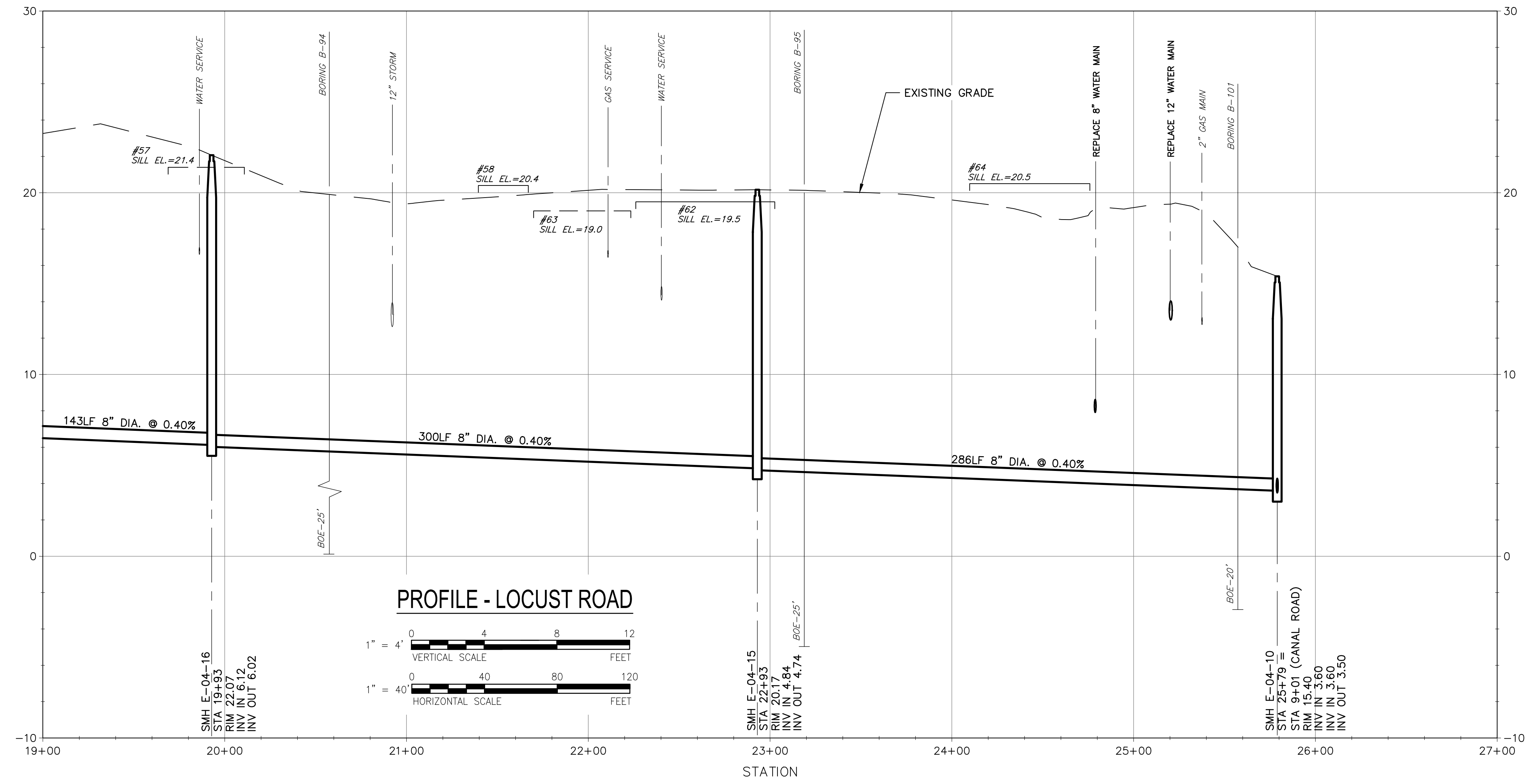
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SEE SHEET 03 C-104

FOR CONTINUATION
SEE SHEET 03 C-106

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 C
 B
 A



PLAN - LOCUST ROAD
SCALE: 1"=40'



PROJECT
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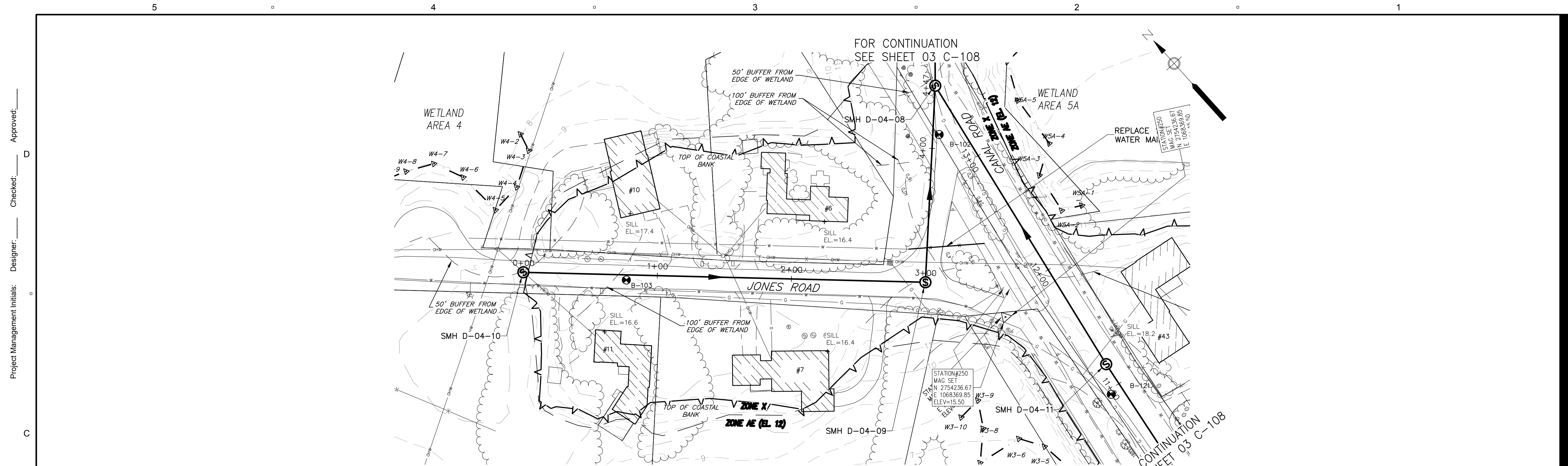
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 Dept Check: **T. PARECE**
 Proj Check: **M. DONOGHUE**
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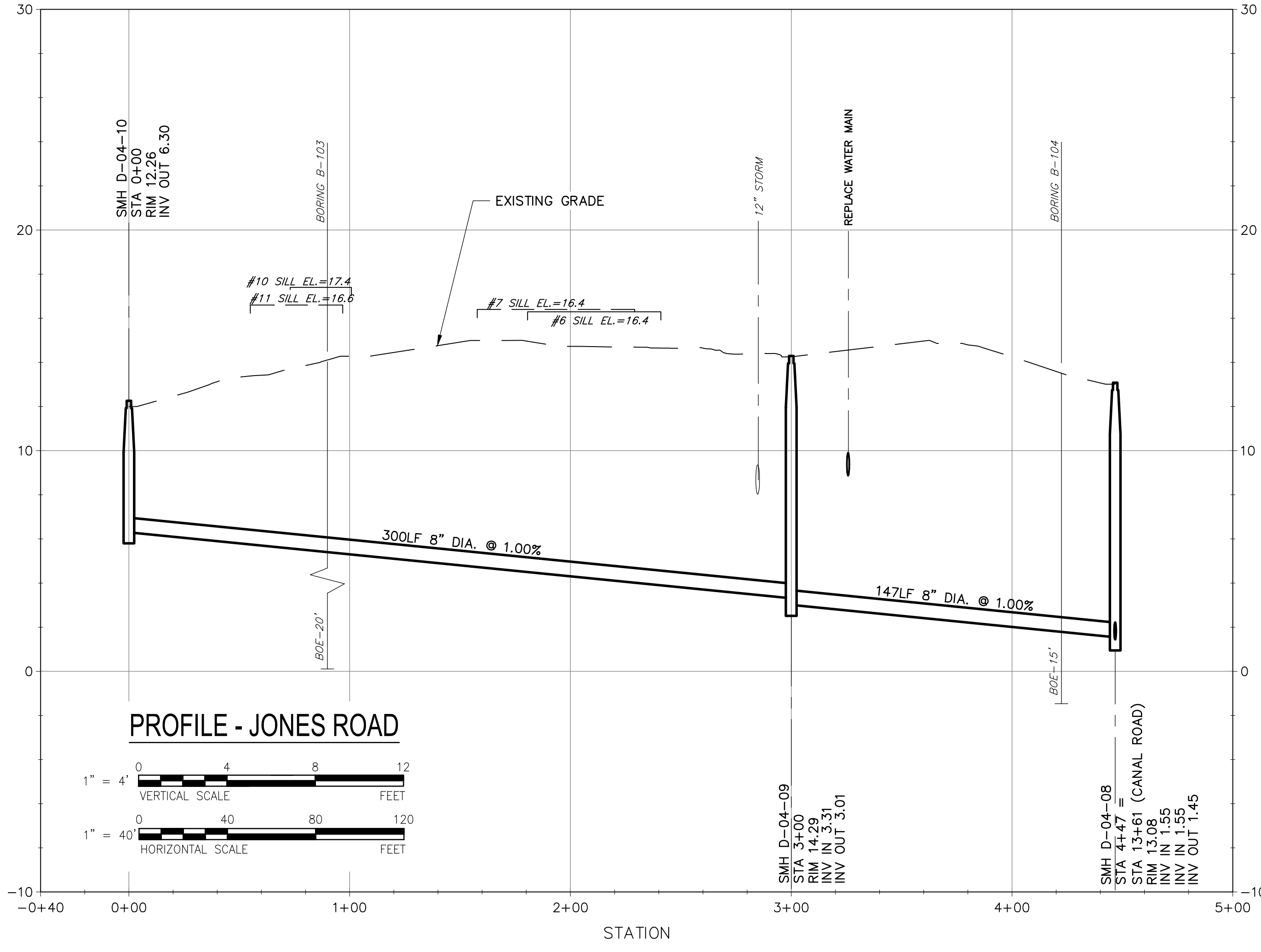
DISCIPLINE
CIVIL

SHEET TITLE
PLAN AND PROFILE SEWER LOCUST ROAD III

SHEET NUMBER
03 C-104



PLAN - JONES ROAD
SCALE: 1"=40'



PROFILE - JONES ROAD



PROJECT

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CIVIL

SHEET TITLE

PLAN AND PROFILE SEWER
JONES ROAD

SHEET NUMBER

03 C-105

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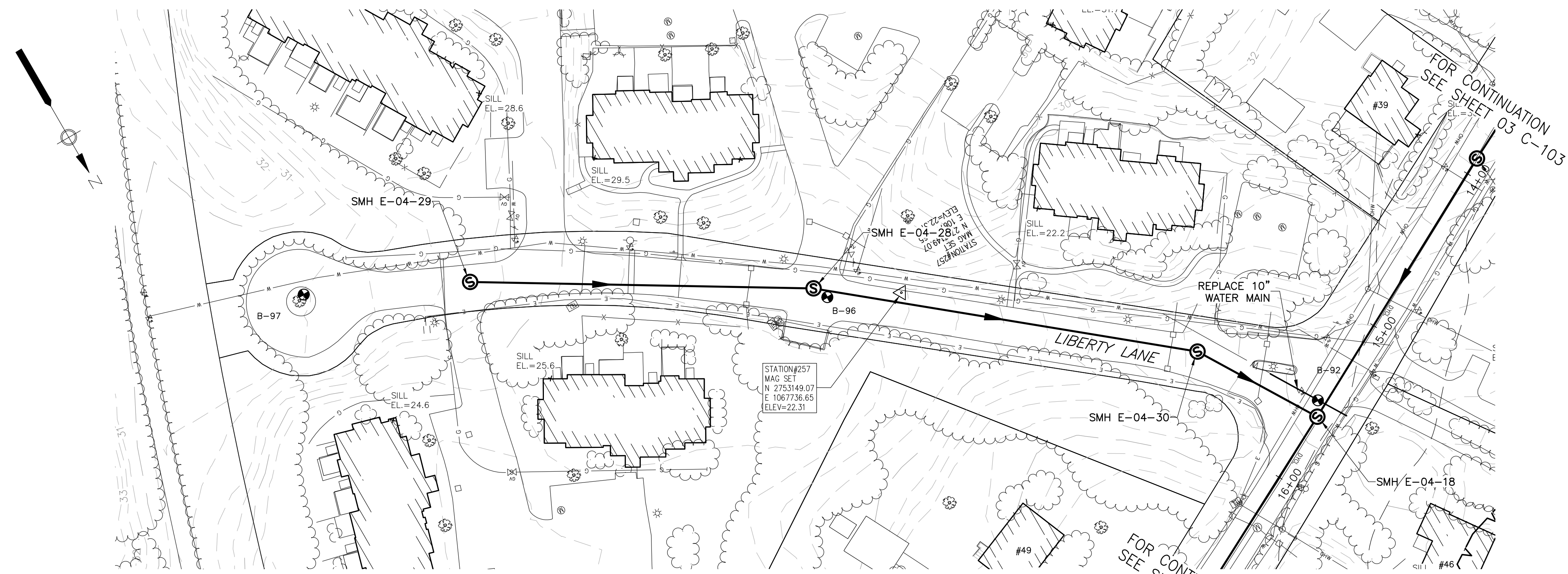
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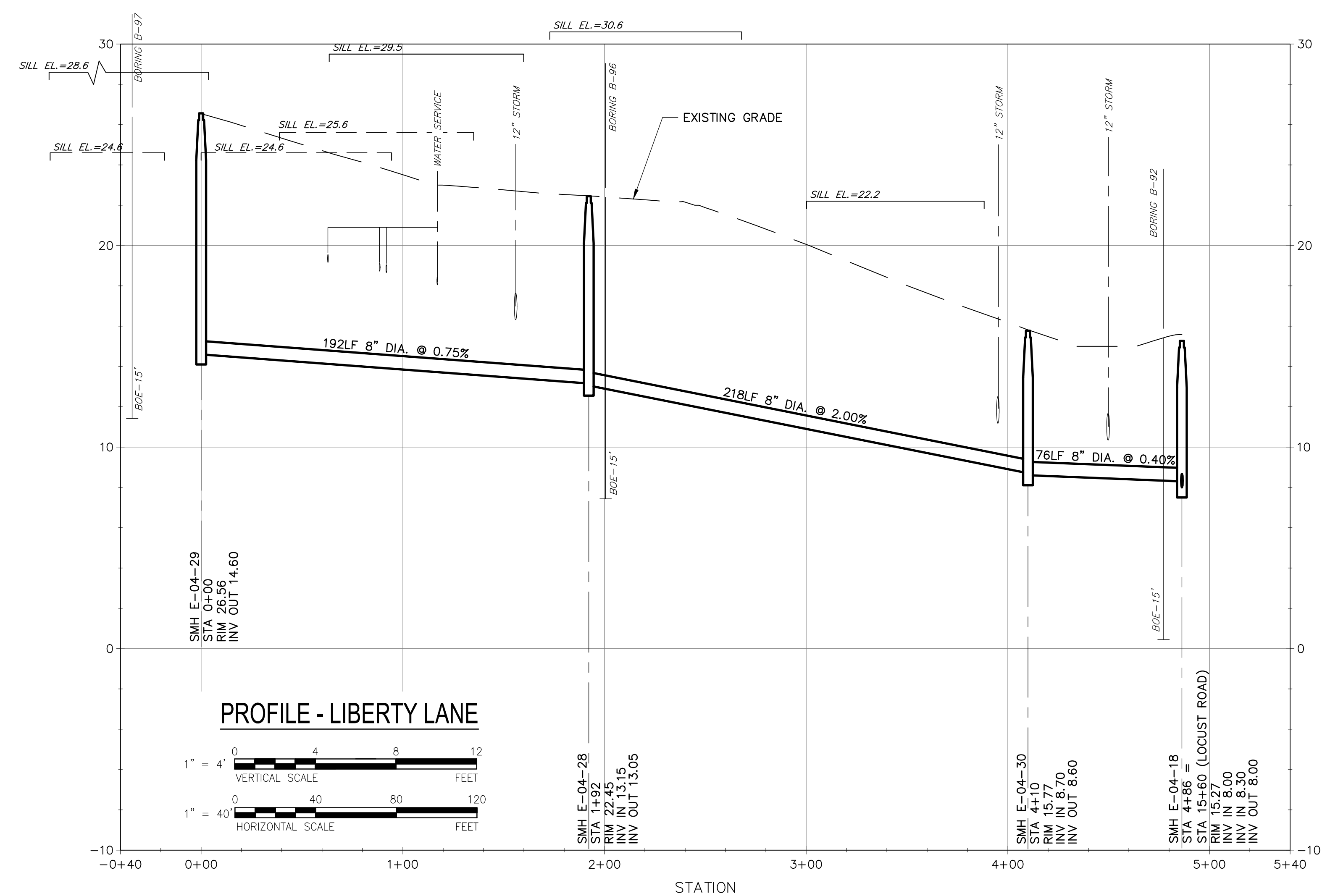
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LIBERTY LANE**

SHEET NUMBER

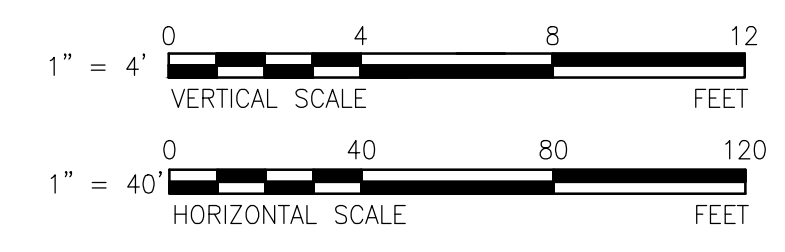
03 C-106



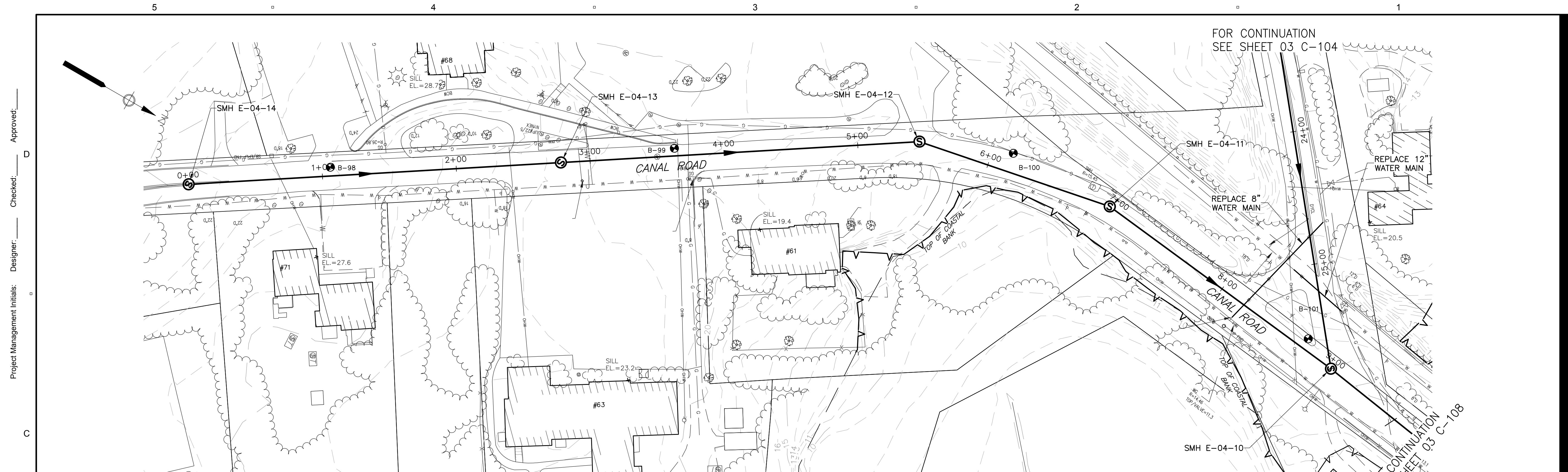
PLAN - LIBERTY LANE
SCALE: 1"=40'



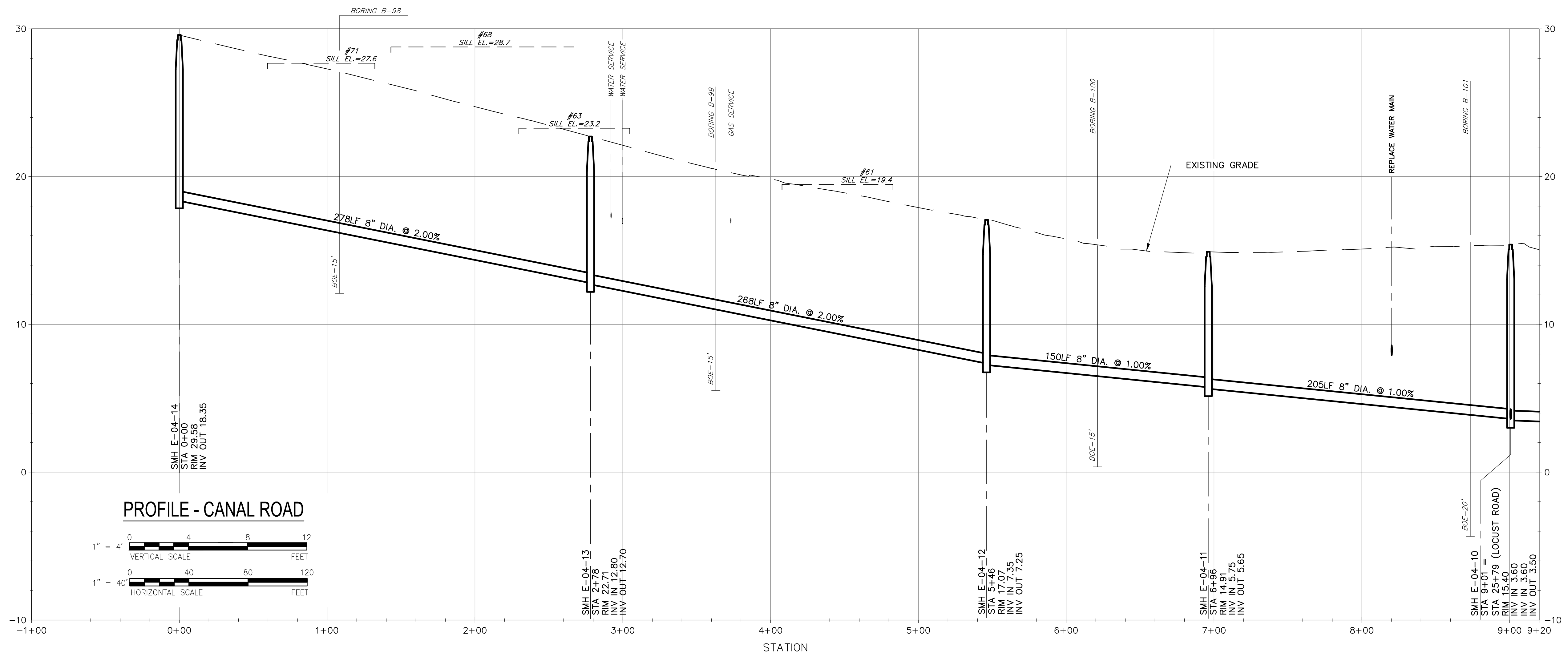
PROFILE - LIBERTY LANE



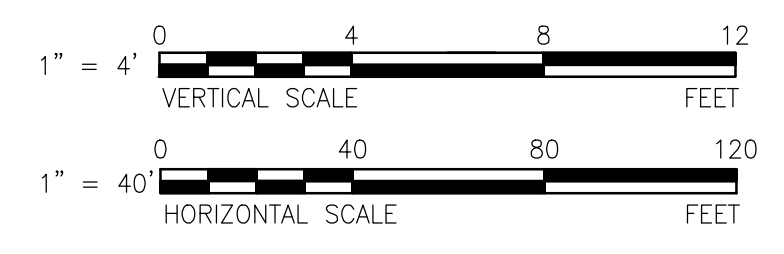
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 A B C D



PLAN - CANAL ROAD
SCALE: 1"=40'



PROFILE - CANAL ROAD



PROJECT

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ENGINEER

AECOM TECHNICAL SERVICES, INC.
9 JONATHAN BOURNE DRIVE
POCASSET, MA 02559
PHONE: (508) 833-6950
www.aecom.com

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60476644

Designed By:	M. CURRAN
Drawn By:	M. CURRAN
Dept Check:	T. PARECE
Proj Check:	M. DONOGHUE
Date:	MARCH 2019
Scale:	AS NOTED

DISCIPLINE

CIVIL

SHEET TITLE

**PLAN AND PROFILE SEWER
CANAL ROAD I**

SHEET NUMBER

03 C-107

Last saved by: CURRANM(2019-03-12) Last Plotted: 2019-03-12
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Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____

PROJECT

Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

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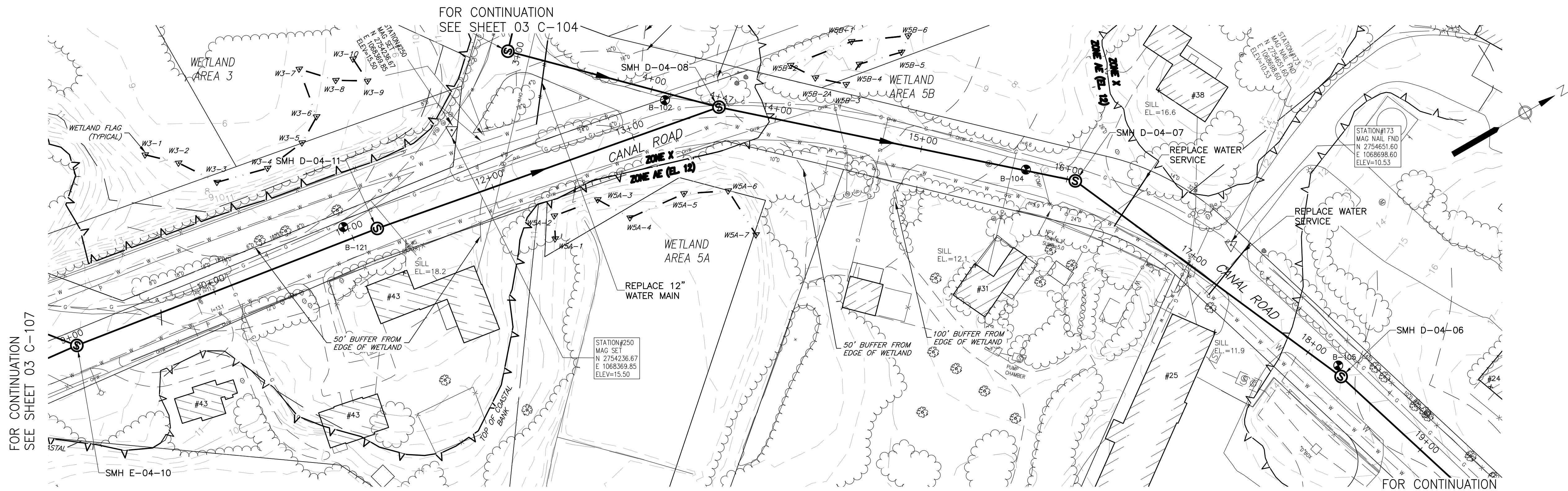
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SHEET TITLE

**PLAN AND PROFILE SEWER
CANAL ROAD II**

SHEET NUMBER

03 C-108

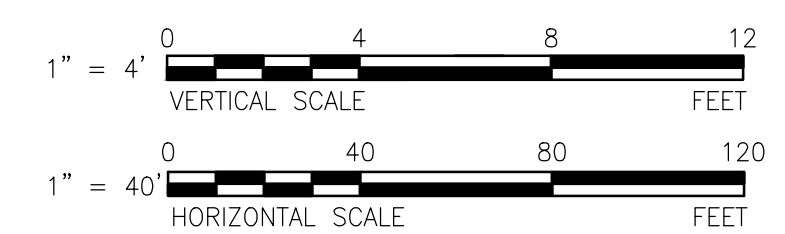


PLAN - CANAL ROAD

SCALE: 1"=40'



PROFILE - CANAL ROAD



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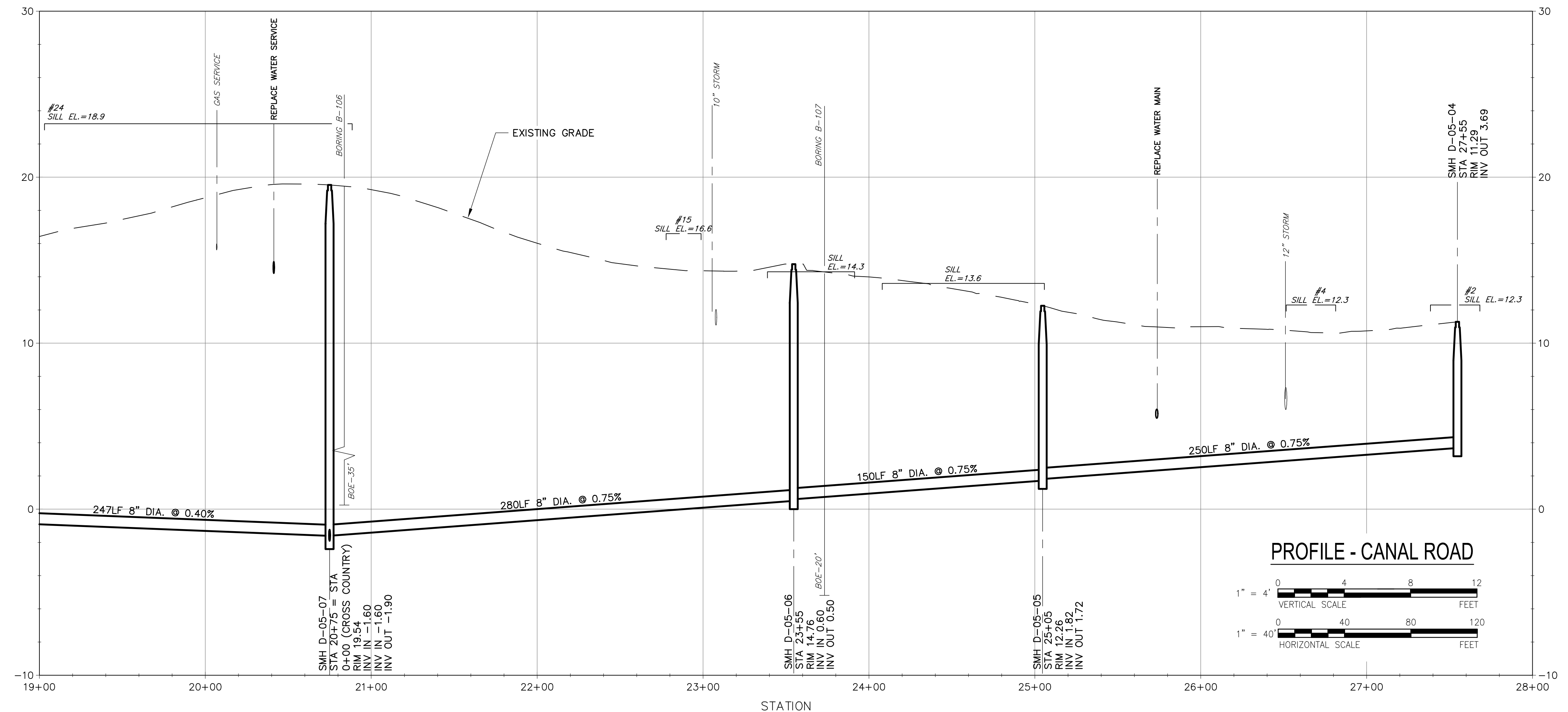
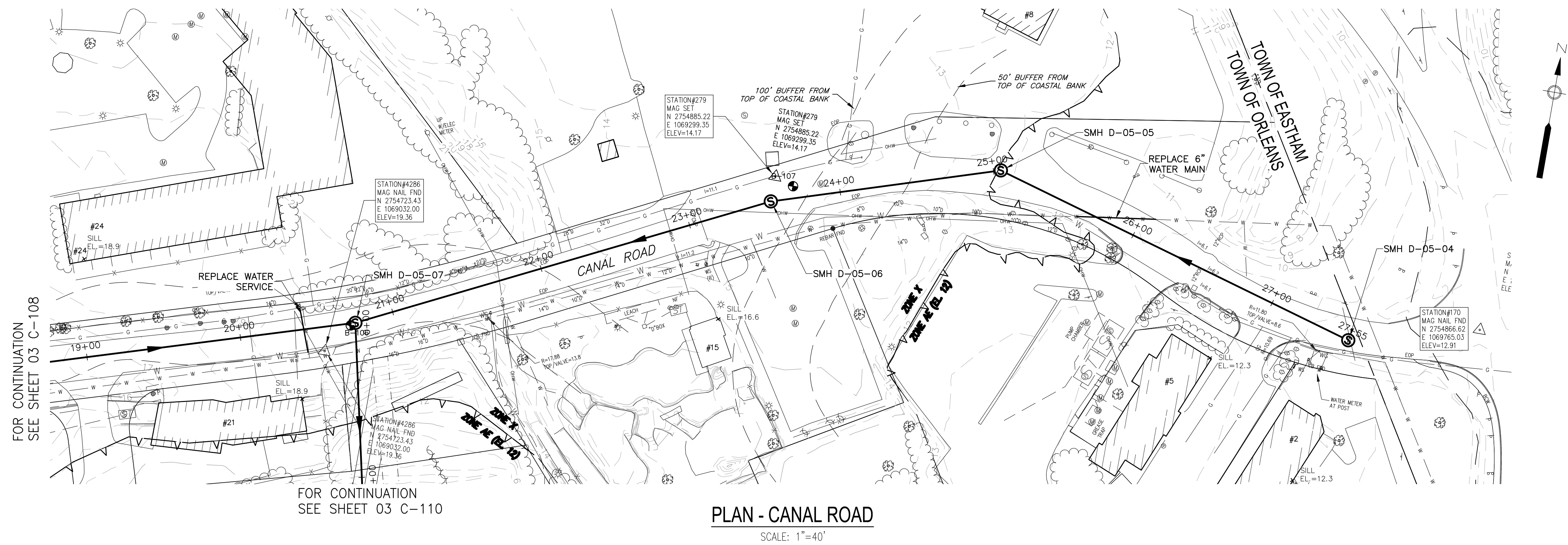
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SHEET TITLE

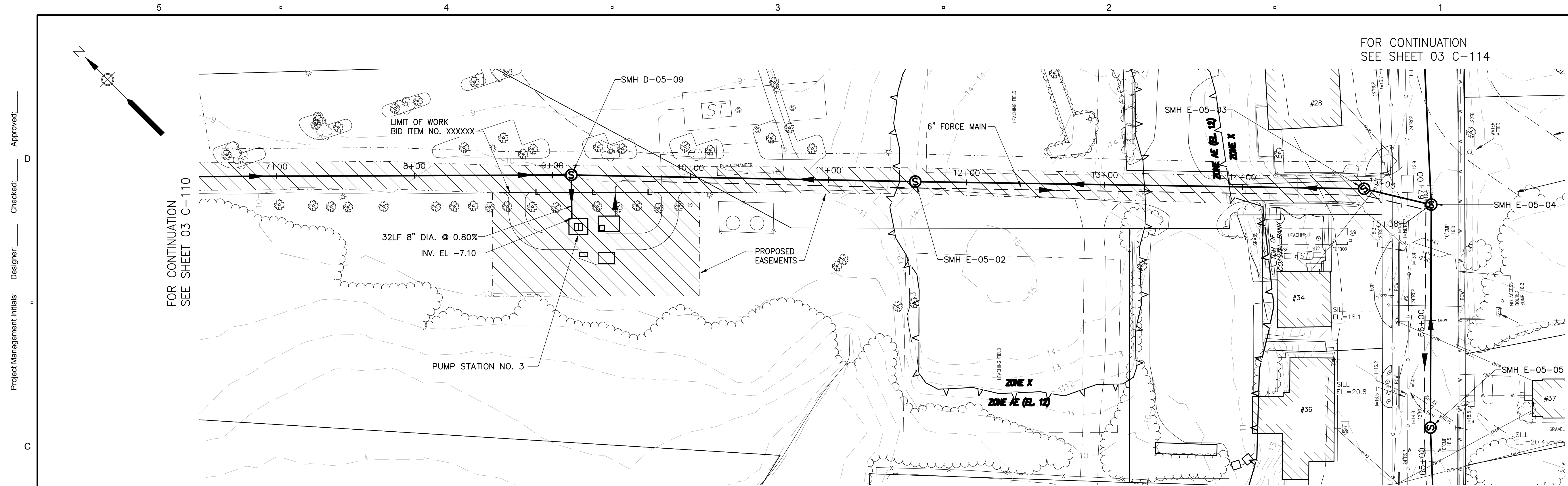
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CANAL ROAD III**

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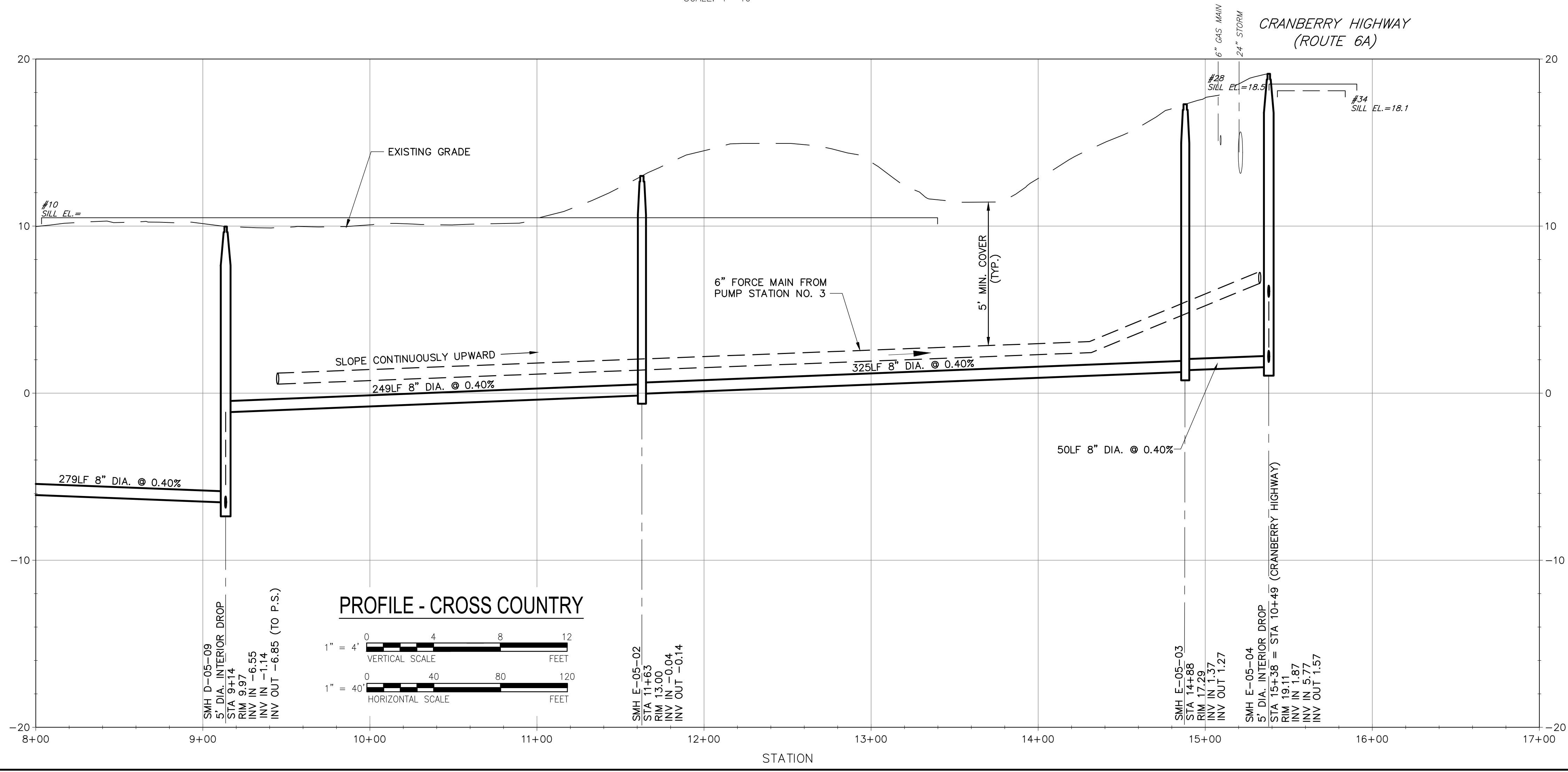
03 C-109



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PLAN - CROSS COUNTRY
SCALE: 1"=40'



PROFILE - CROSS COUNTRY
VERTICAL SCALE: 1" = 4' FEET
HORIZONTAL SCALE: 1" = 40' FEET

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FOR CONTINUATION
SEE SHEET 03 C-114

FOR CONTINUATION
SEE SHEET 03 C-114



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Scale:	AS NOTED

DISCIPLINE

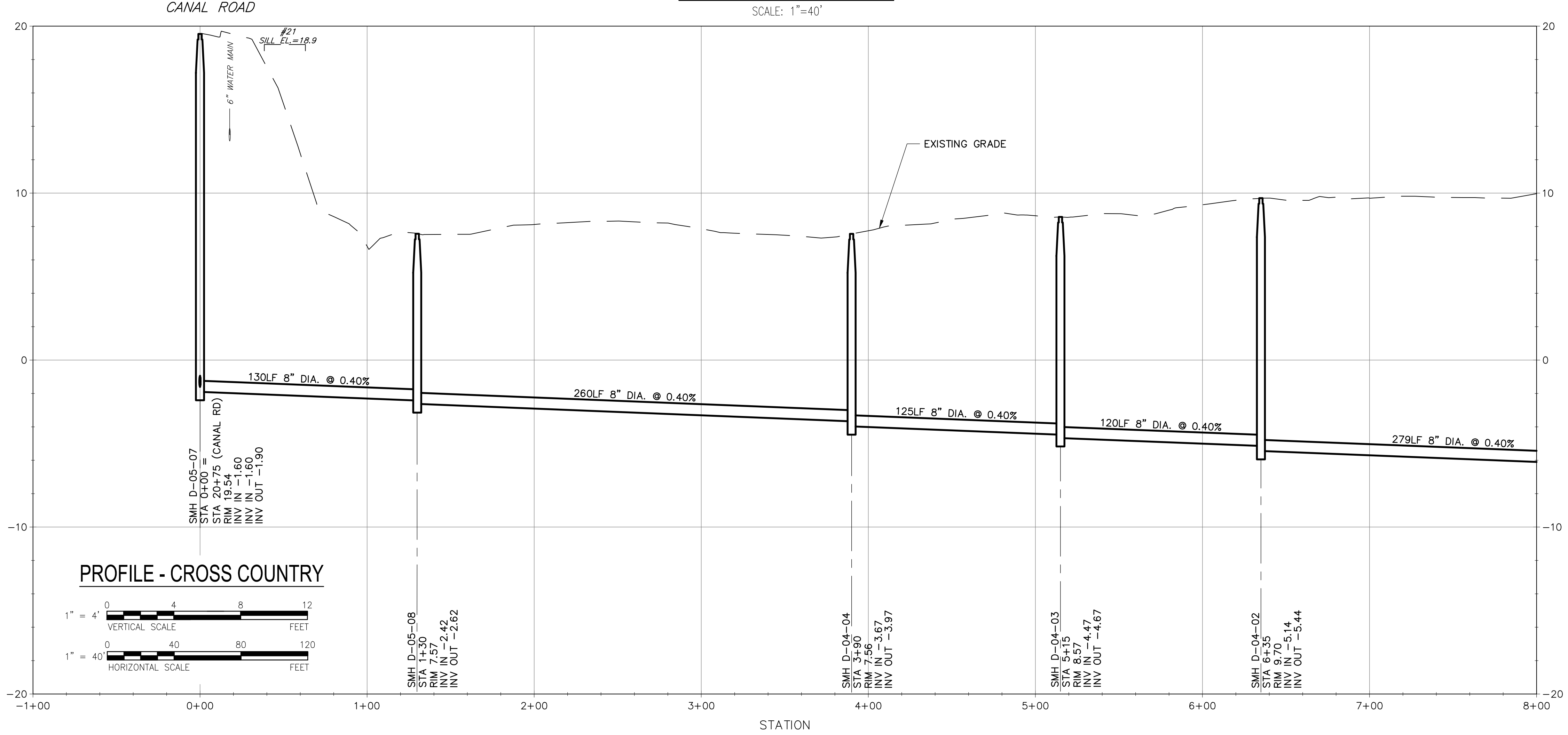
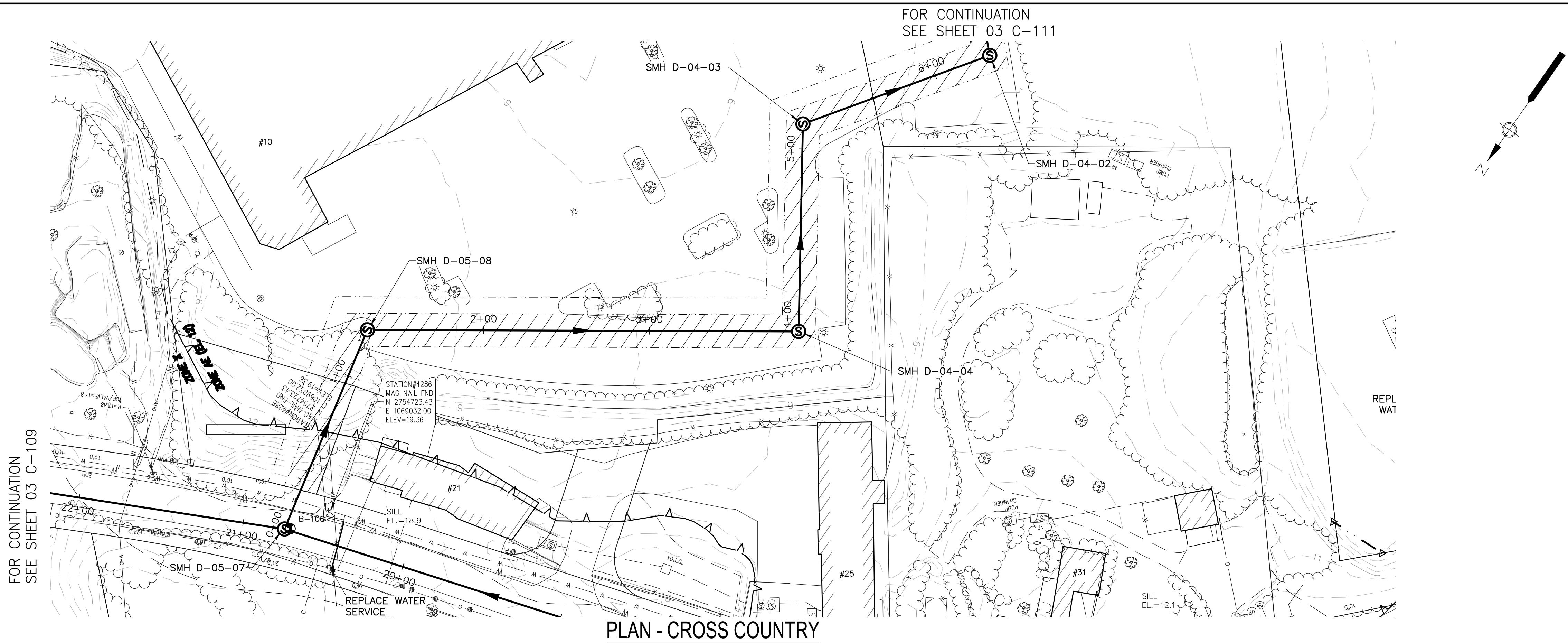
CIVIL
SHEET TITLE

PLAN AND PROFILE SEWER CROSS COUNTRY II

SHEET NUMBER

03 C-111

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PROJECT
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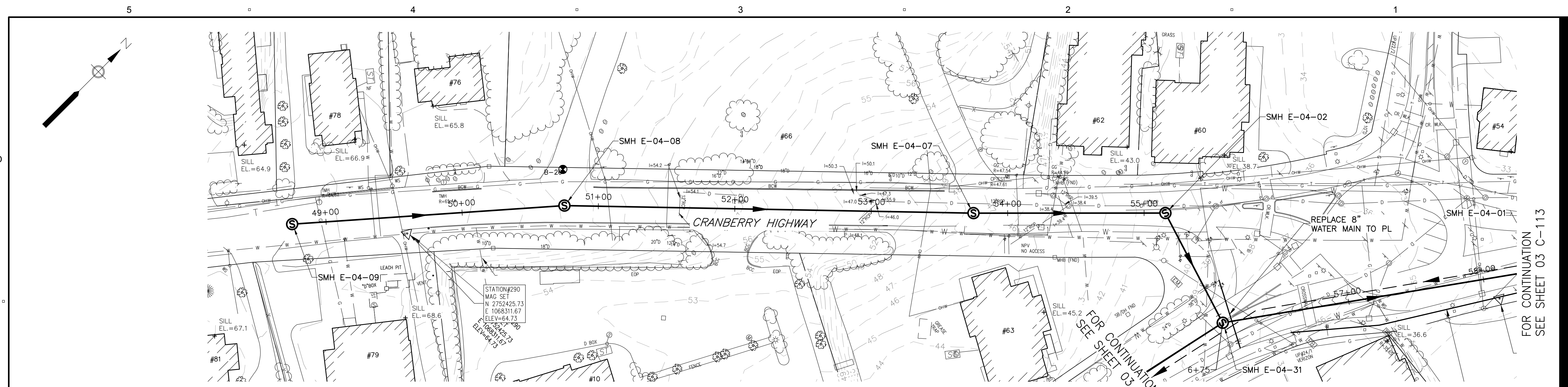
60476644
 Designed By: **M. CURRAN**
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 Dept Check: **T. PARECE**
 Proj Check: **M. DONOGHUE**
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DISCIPLINE
 CIVIL
SHEET TITLE

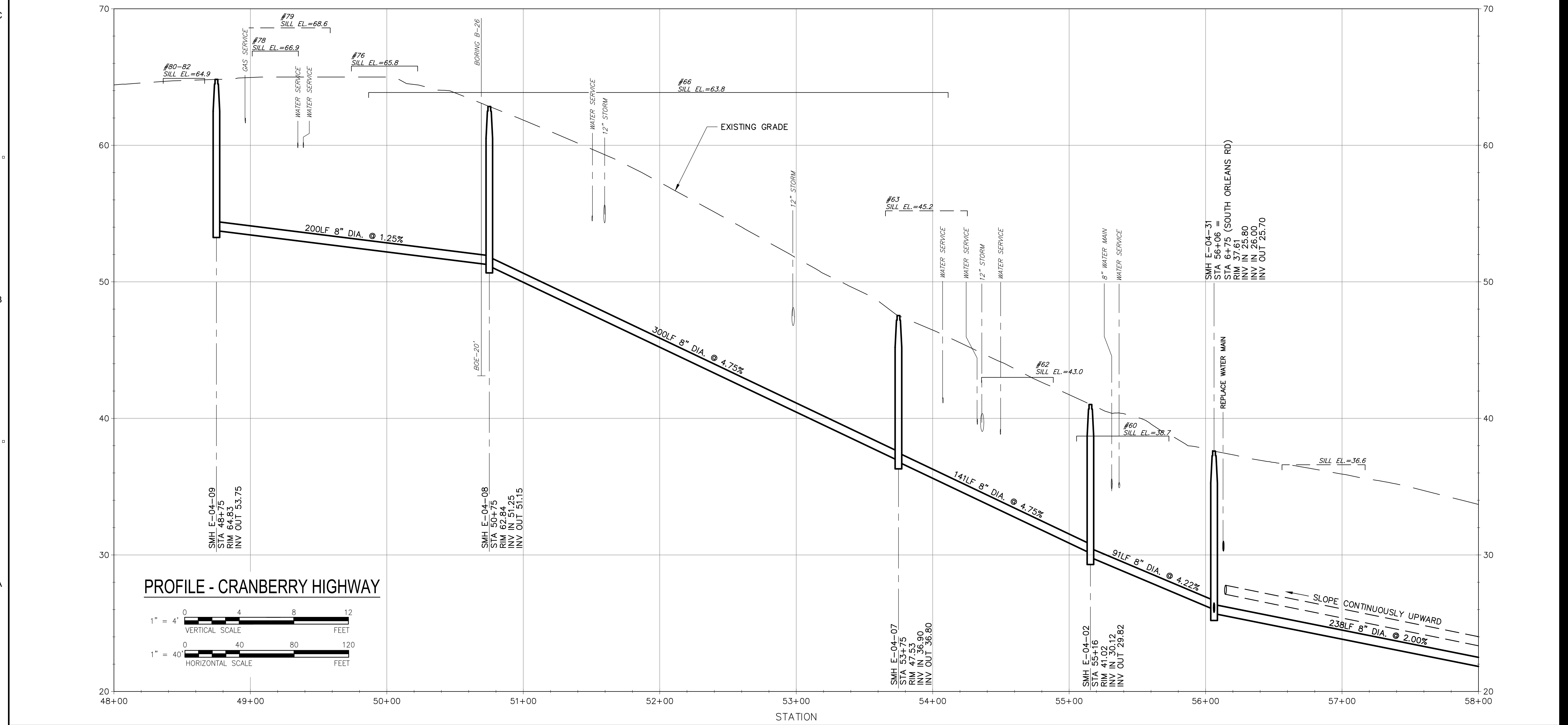
**PLAN AND PROFILE SEWER
 CROSS COUNTRY I**

SHEET NUMBER
03 C-110

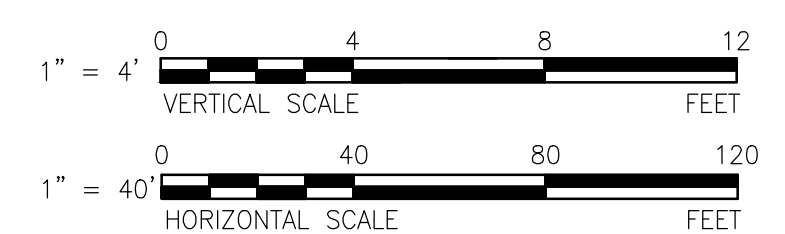
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PLAN - CRANBERRY HIGHWAY
SCALE: 1"=40'



PROFILE - CRANBERRY HIGHWAY



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 Proj Check: **M. DONOGHUE**
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DISCIPLINE
CIVIL

SHEET TITLE
PLAN AND PROFILE SEWER
CRANBERRY HIGHWAY I

SHEET NUMBER
03 C-112

I/R	DATE	DESCRIPTION

60476644

Designed By: **M. CURRAN**

Drawn By: **M. CURRAN**

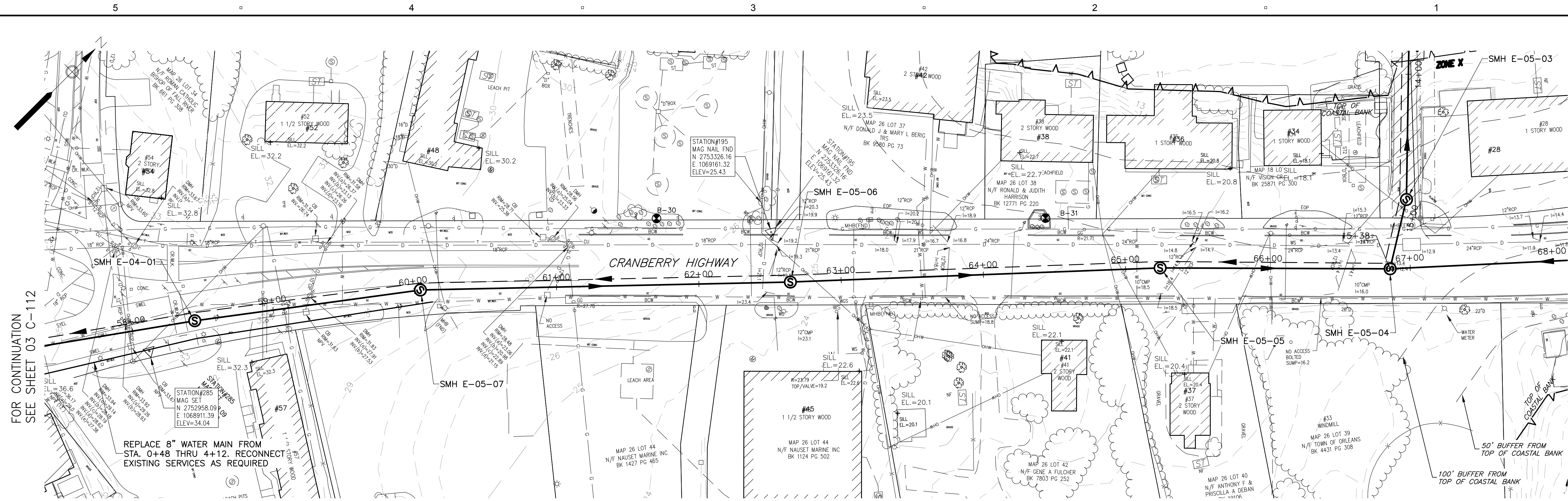
Dept Check: **T. PARECE**

Proj Check: **M. DONOGHUE**

Date: **MARCH 2019**

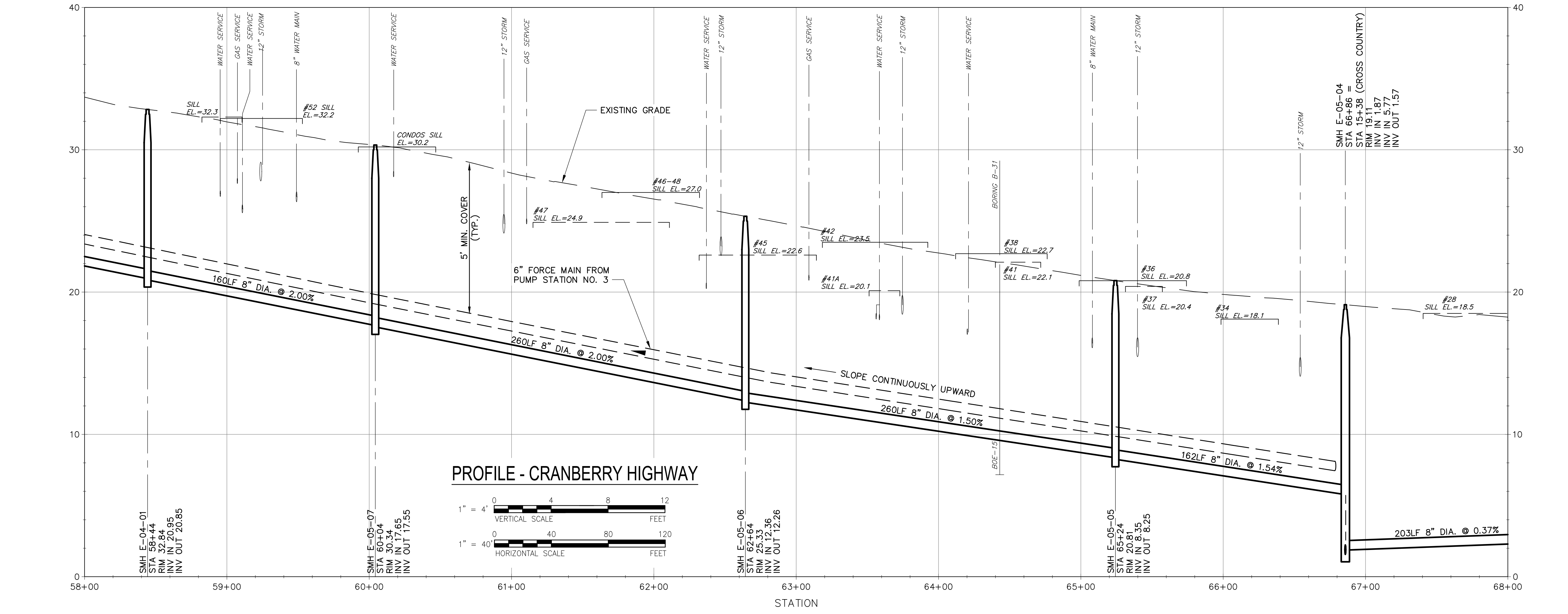
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CIVIL

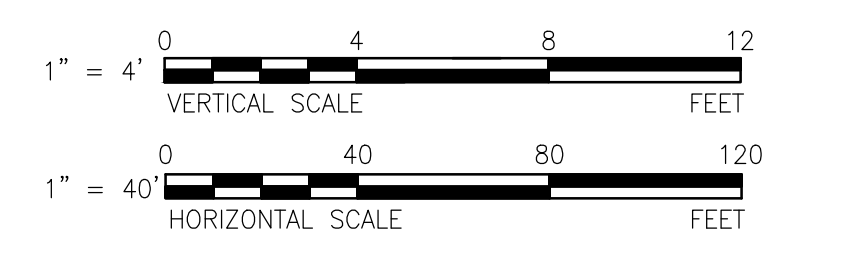


PLAN - CRANBERRY HIGHWAY

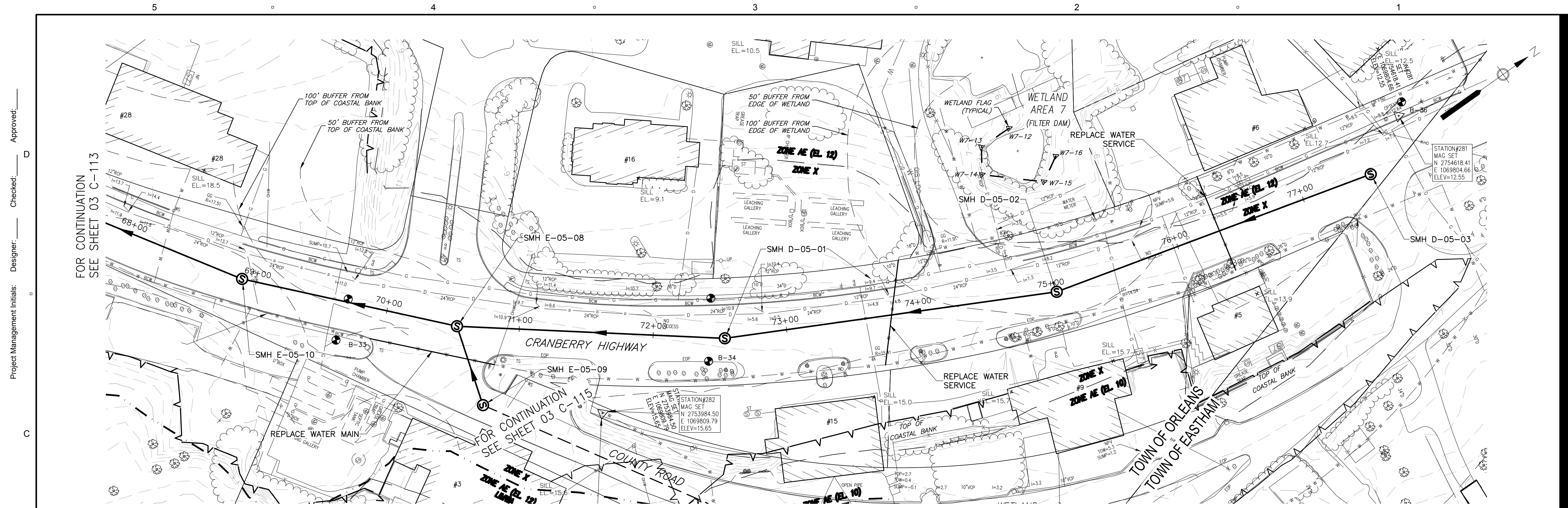
SCALE: 1"=40'



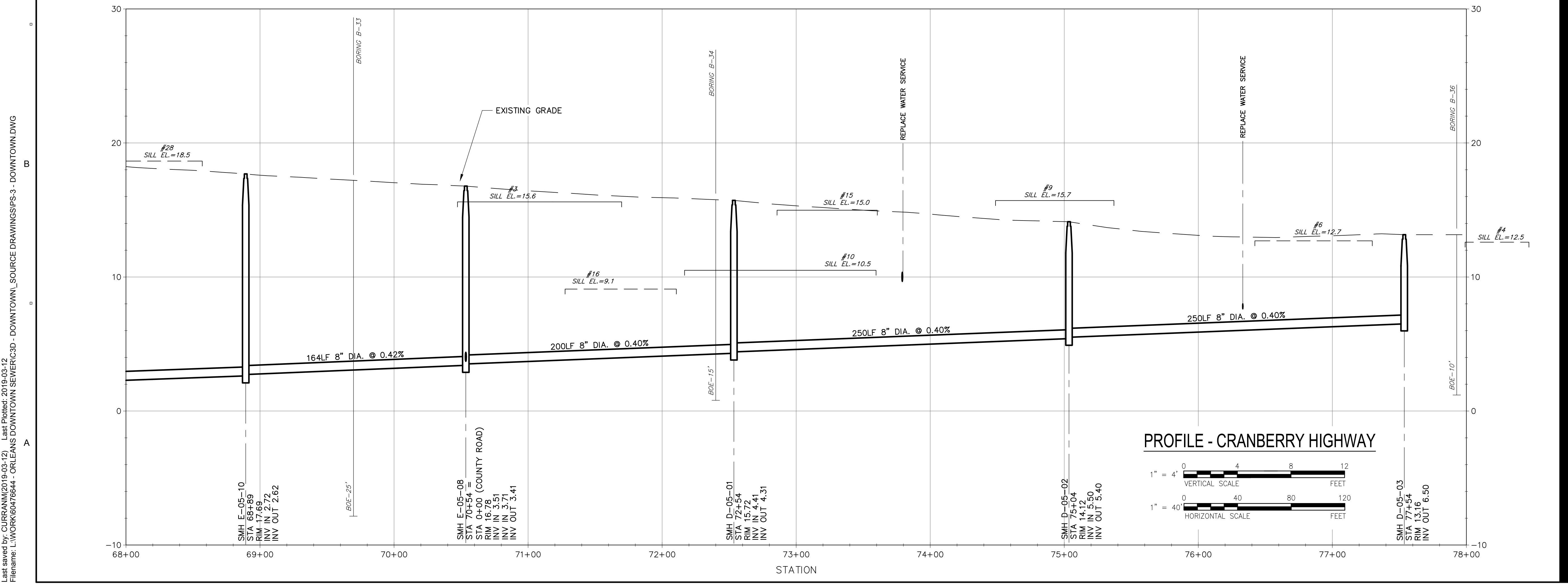
PROFILE - CRANBERRY HIGHWAY



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 FOR CONTINUATION SEE SHEET 03 C-112
 FOR CONTINUATION SEE SHEET 03 C-114
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PLAN - CRANBERRY HIGHWAY
SCALE: 1"=40'



PROFILE - CRANBERRY HIGHWAY
1" = 4' VERTICAL SCALE
1" = 40' HORIZONTAL SCALE



PROJECT

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CLIENT

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19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

ENGINEER

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9 JONATHAN BOURNE DRIVE
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Proj Check:	M. DONOGHUE
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DISCIPLINE

CIVIL

SHEET TITLE

PLAN AND PROFILE SEWER
CRANBERRY HIGHWAY III

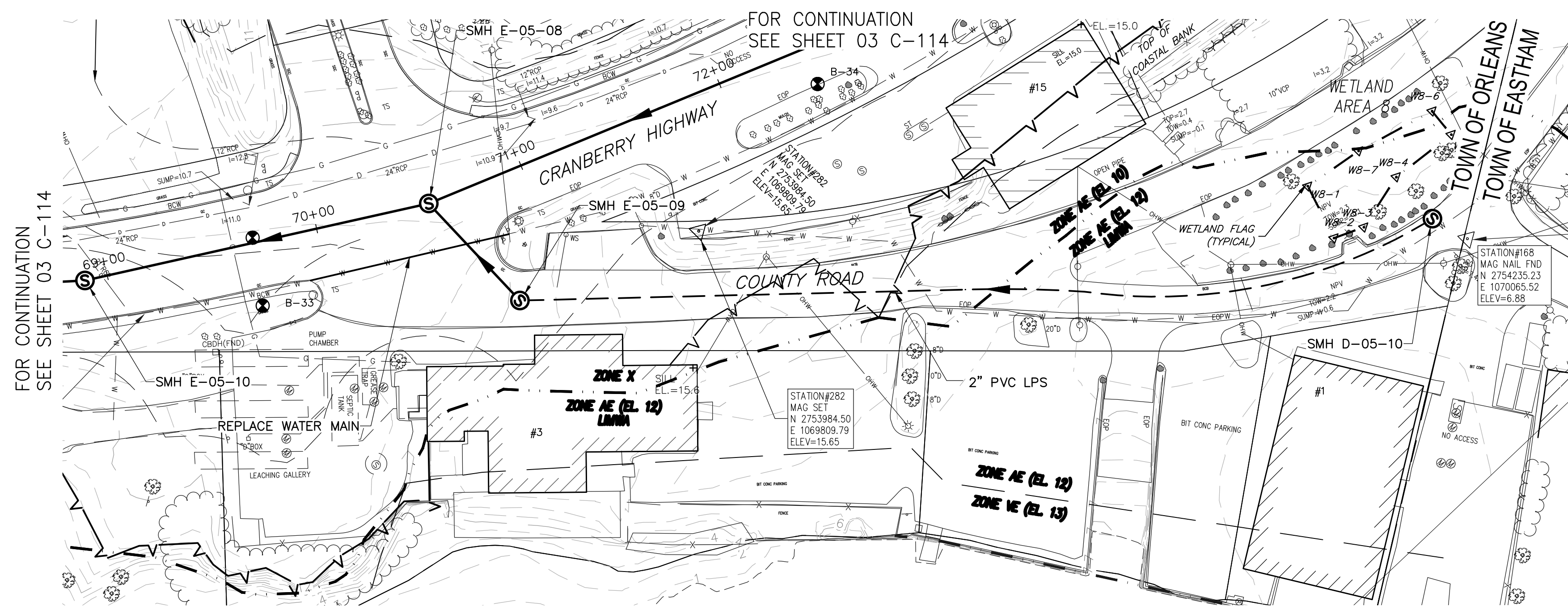
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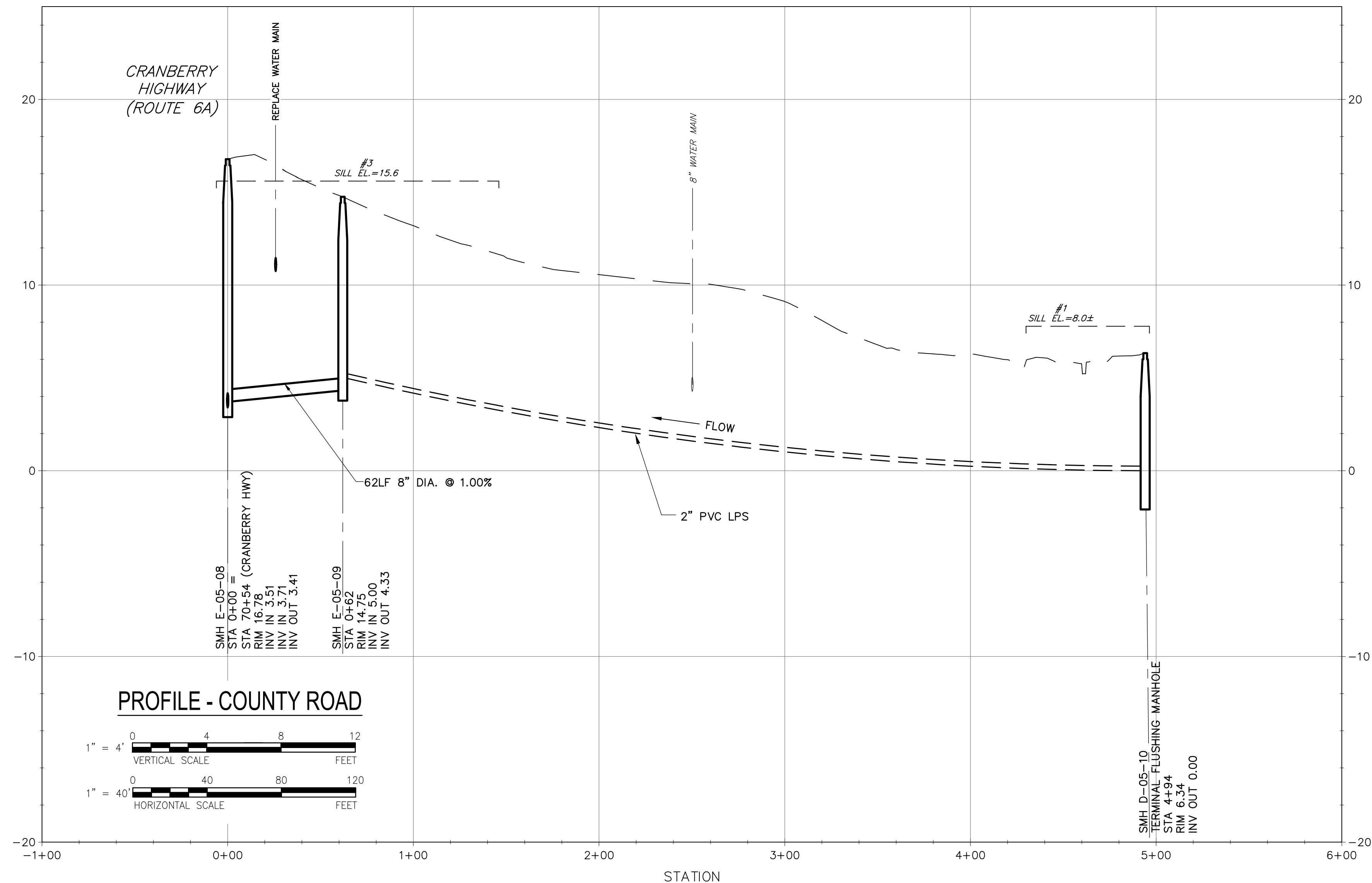
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 B
 A



PLAN - COUNTY ROAD
SCALE: 1"=40'



PROFILE - COUNTY ROAD



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Downtown Area
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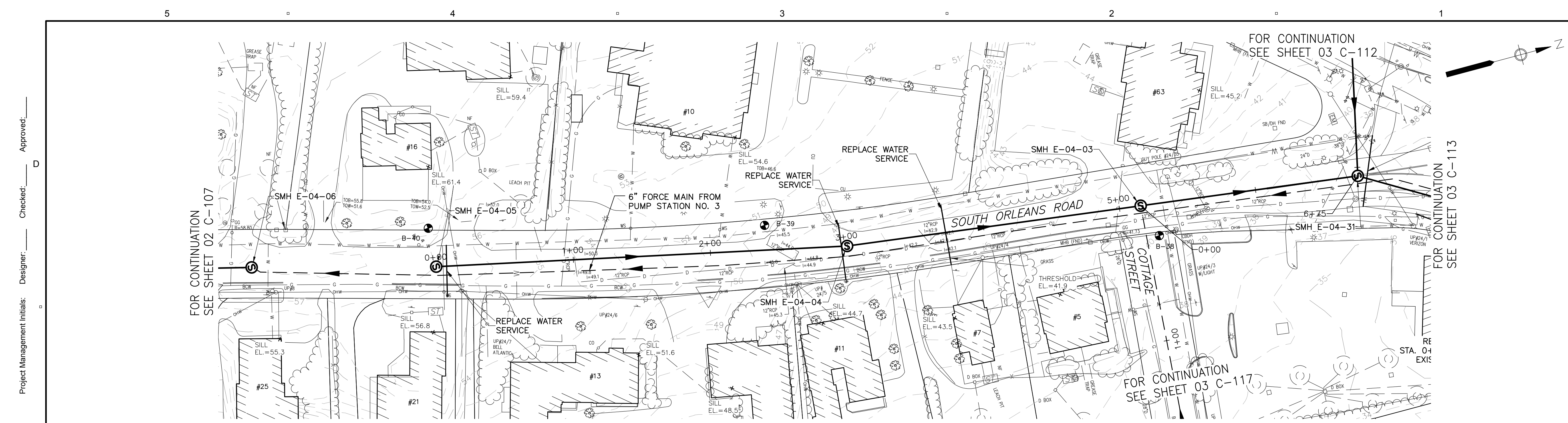
PROJECT NUMBER
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 Drawn By: **M. CURRAN**
 Dept Check: **T. PARECE**
 Proj Check: **M. DONOGHUE**
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DISCIPLINE
CIVIL

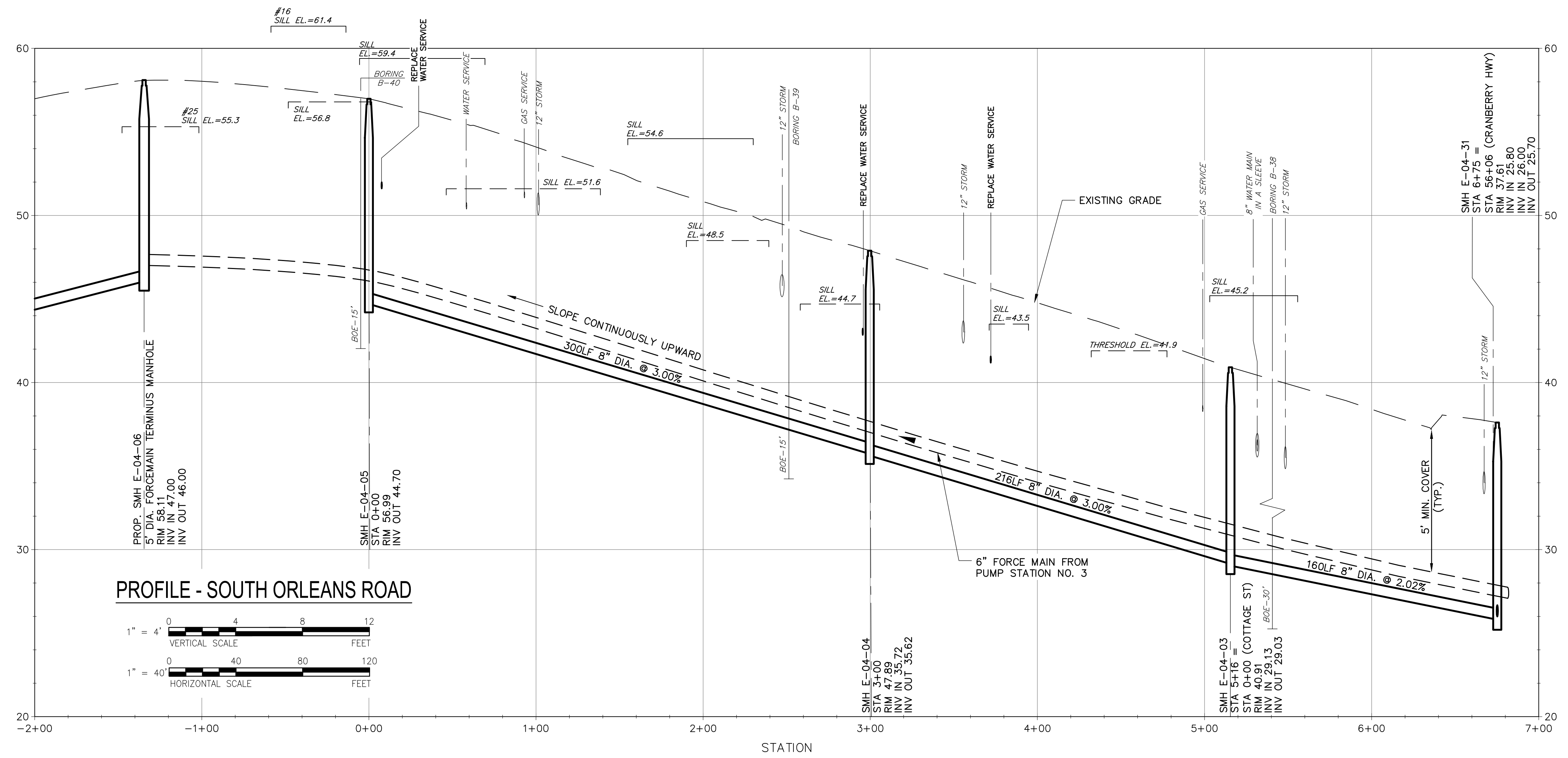
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PLAN AND PROFILE SEWER
COUNTY ROAD

SHEET NUMBER
03 C-115

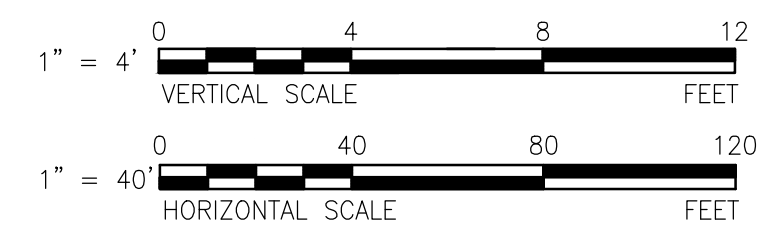


PLAN - SOUTH ORLEANS ROAD

SCALE: 1"=40'



PROFILE - SOUTH ORLEANS ROAD



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Contract No. 2019-02
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SHEET TITLE
 PLAN AND PROFILE SEWER
 SOUTH ORLEANS RD

SHEET NUMBER
 03 C-116



PROJECT
 Downtown Area
 Collection System and
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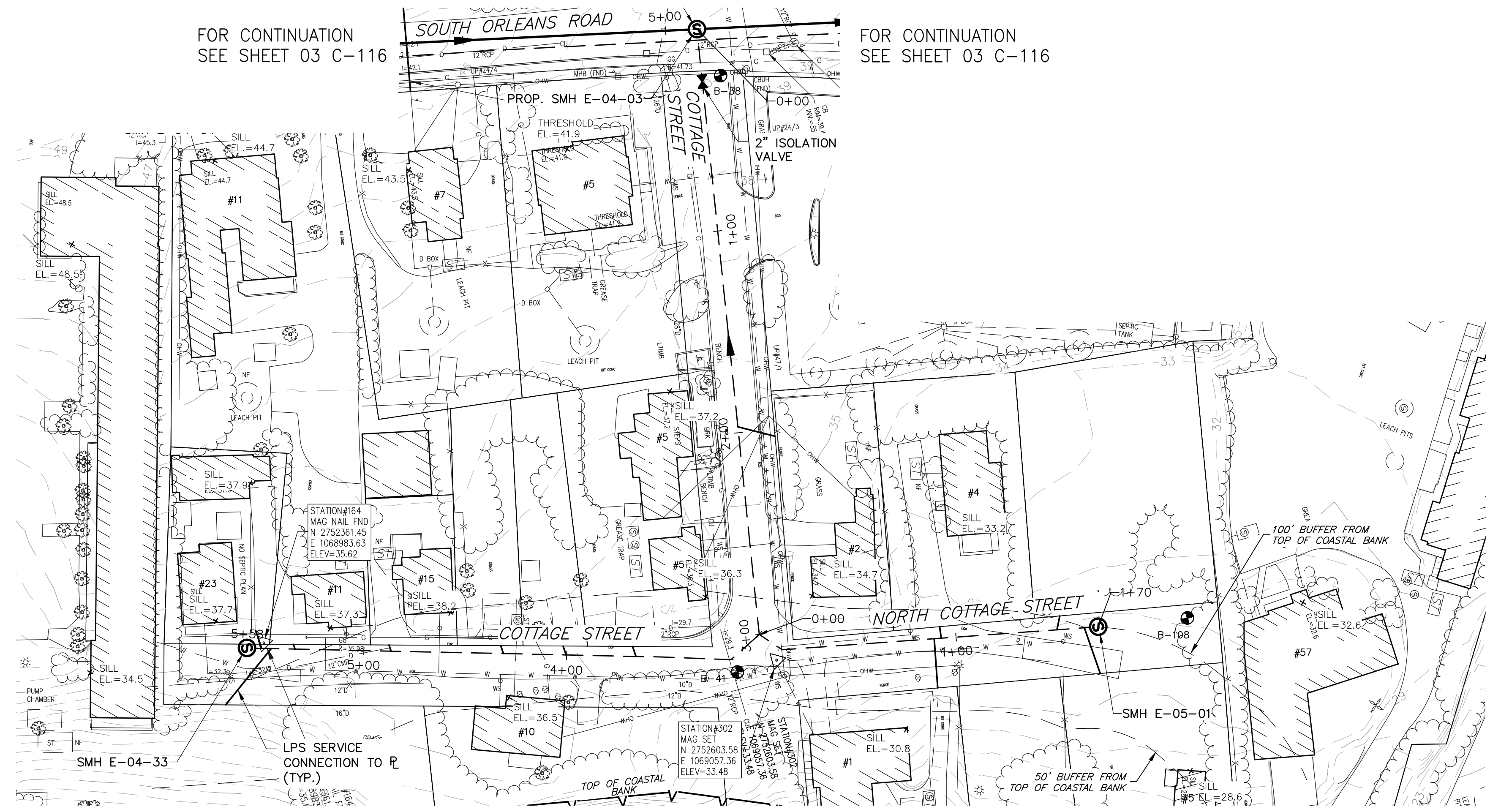
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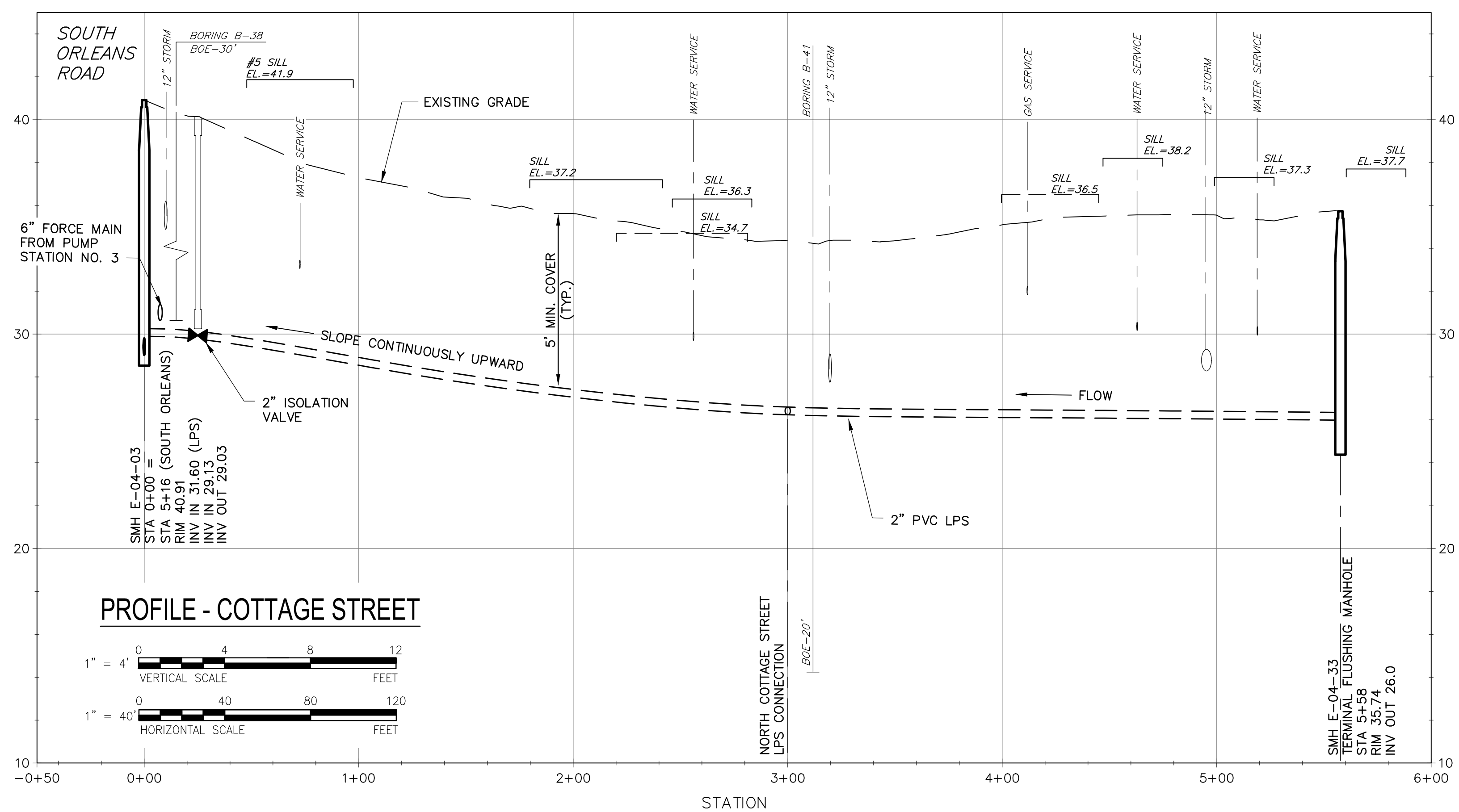
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 Designer: _____
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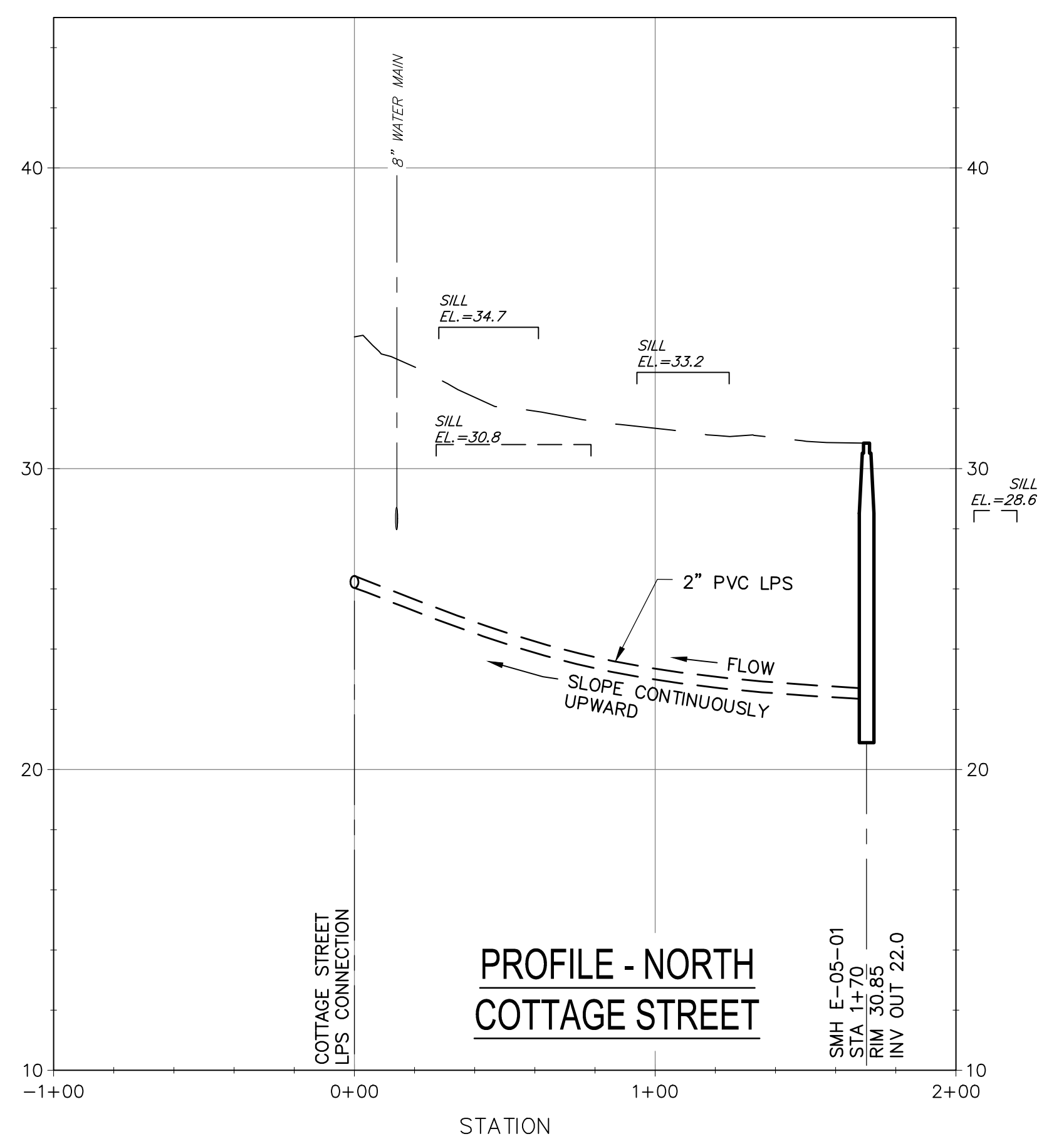
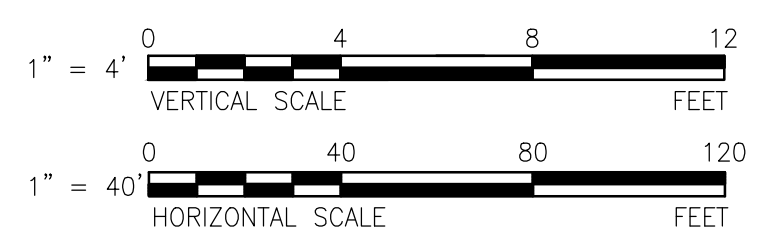


PLAN - COTTAGE AND NORTH COTTAGE STREET

SCALE: 1"=40'



PROFILE - COTTAGE STREET



PROFILE - NORTH COTTAGE STREET

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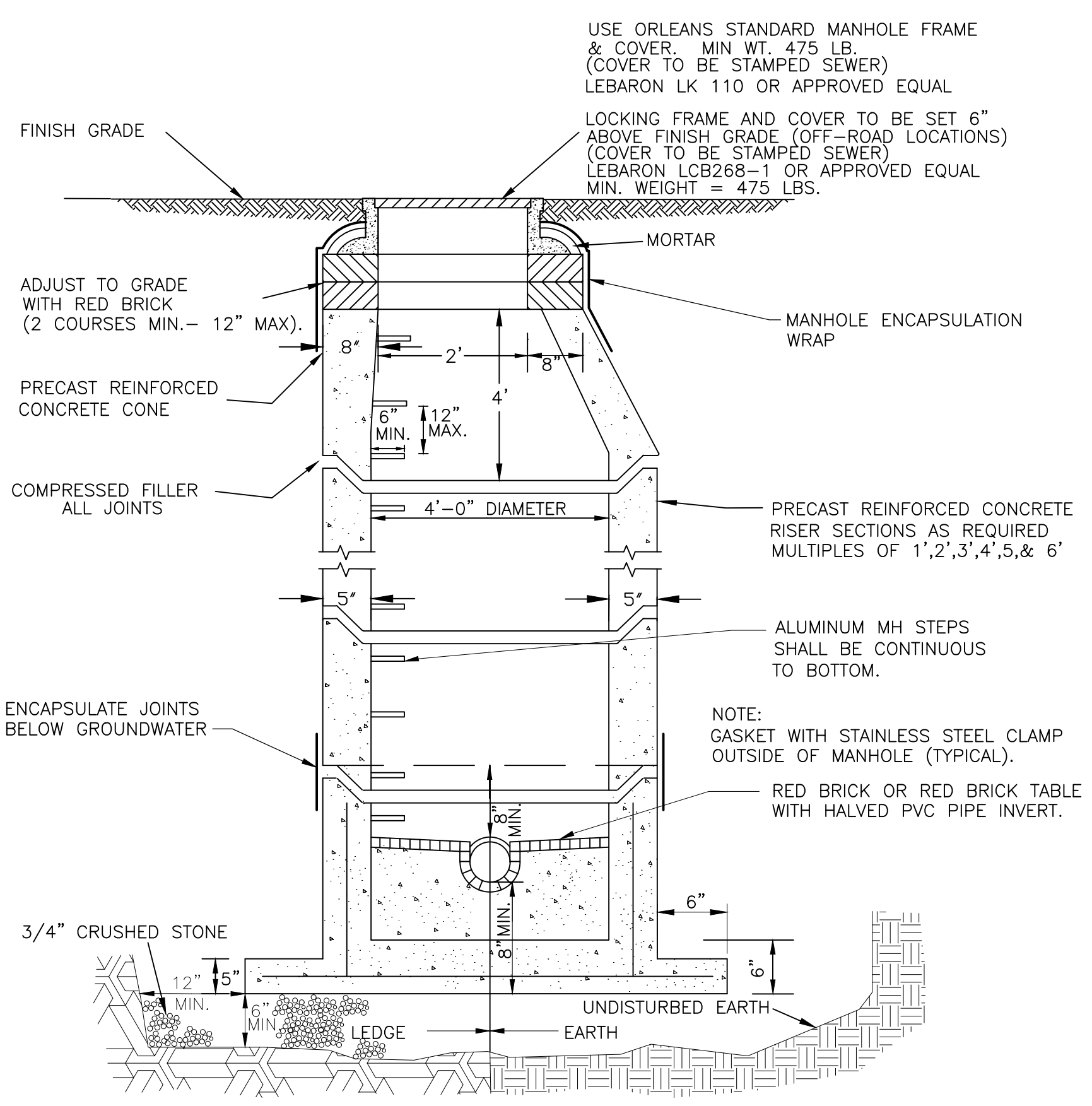
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Proj Check:	M. DONOGHUE
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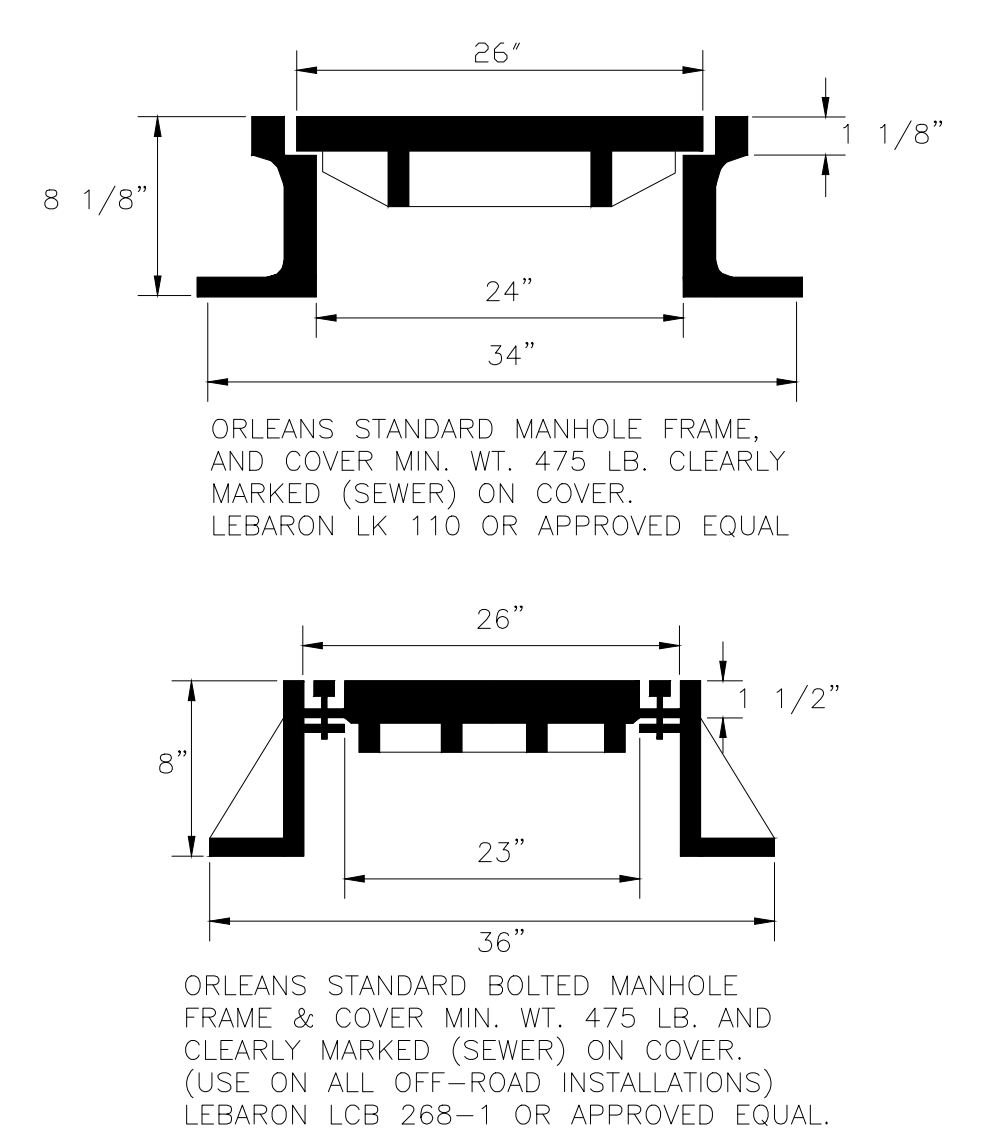
SHEET TITLE
 PLAN AND PROFILE SEWER
 COTTAGE STREET AND
 NORTH COTTAGE STREET

SHEET NUMBER
 03 C-117

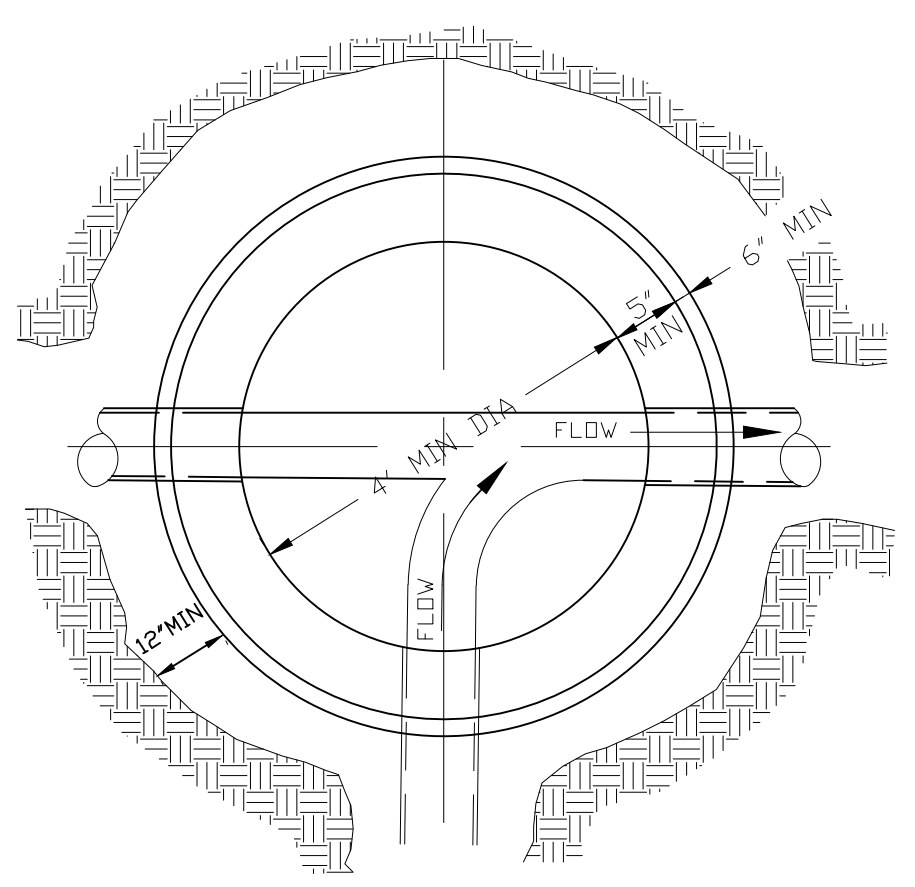
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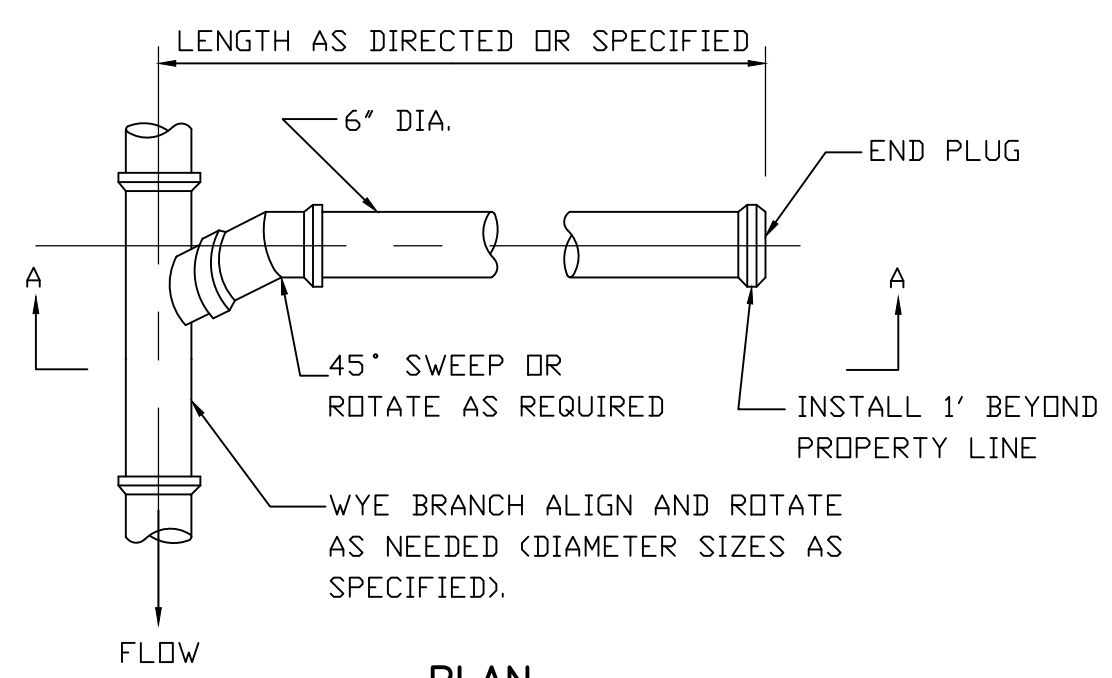
TYPICAL PRECAST CONCRETE SEWER MANHOLE
(NOT TO SCALE)



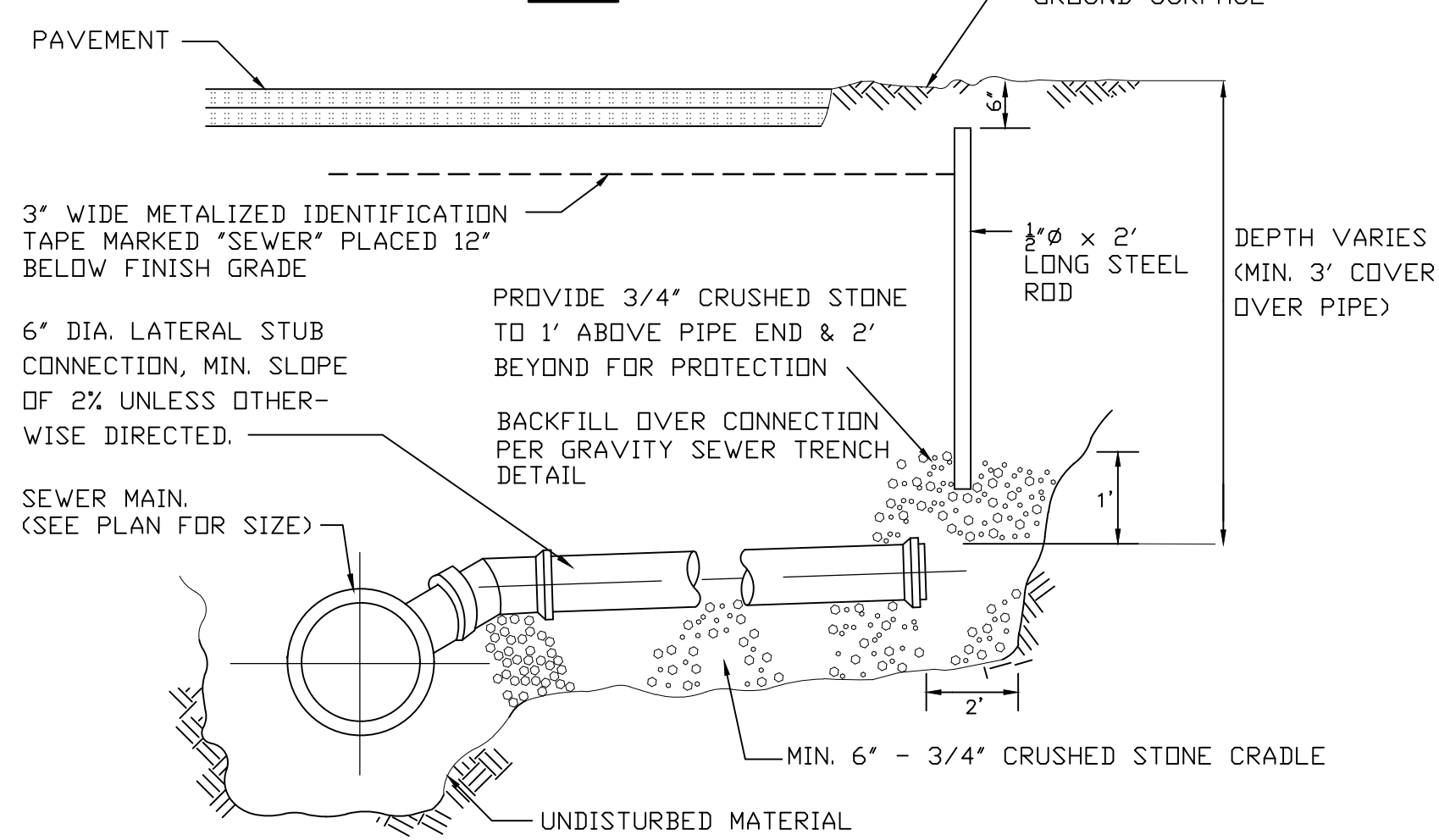
STANDARD SEWER MANHOLE FRAMES & COVERS
(NOT TO SCALE)



**TOP VIEW
INVERT TABLE PLAN**
(NOT TO SCALE)



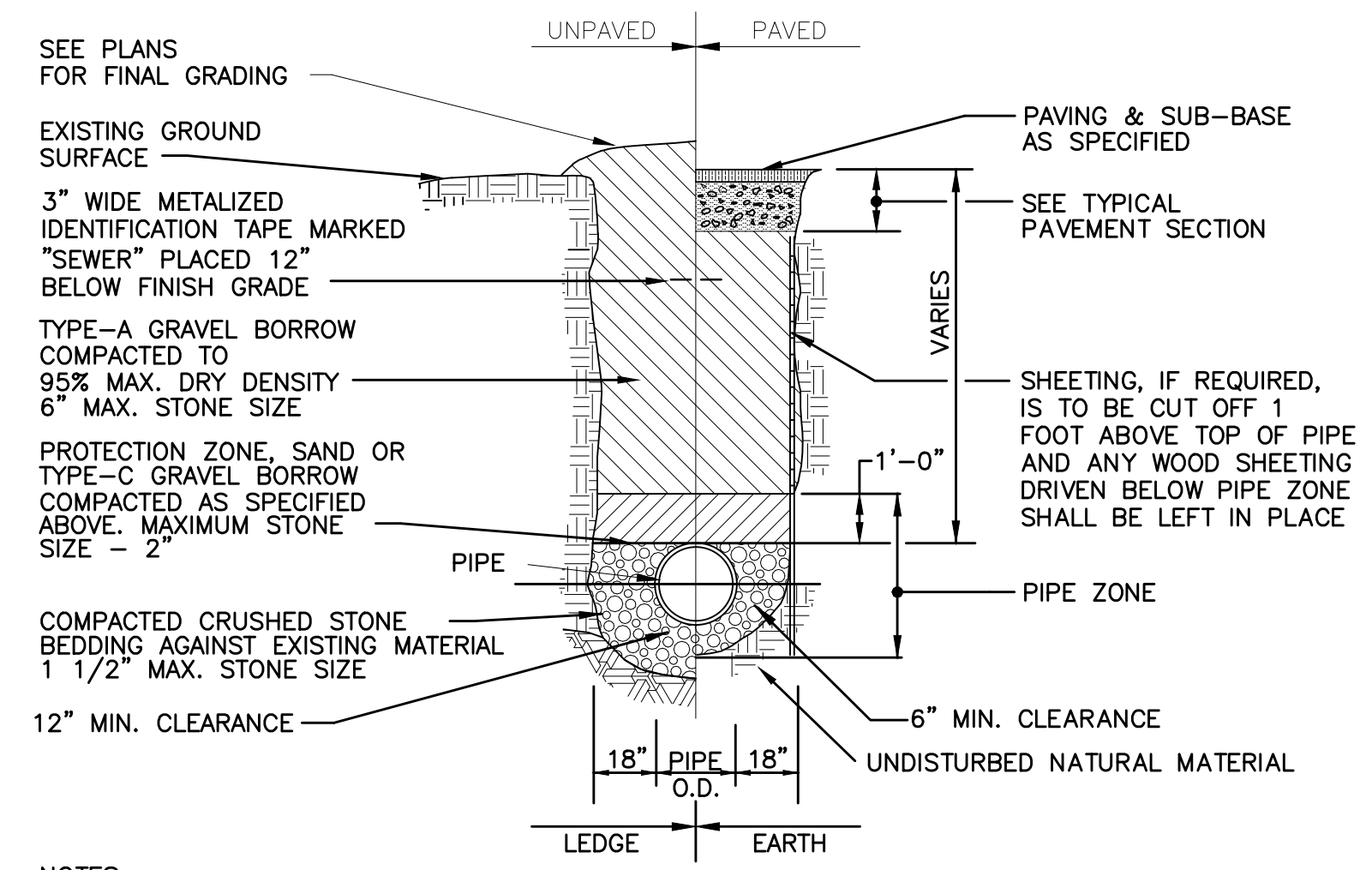
PLAN



SECTION A-A

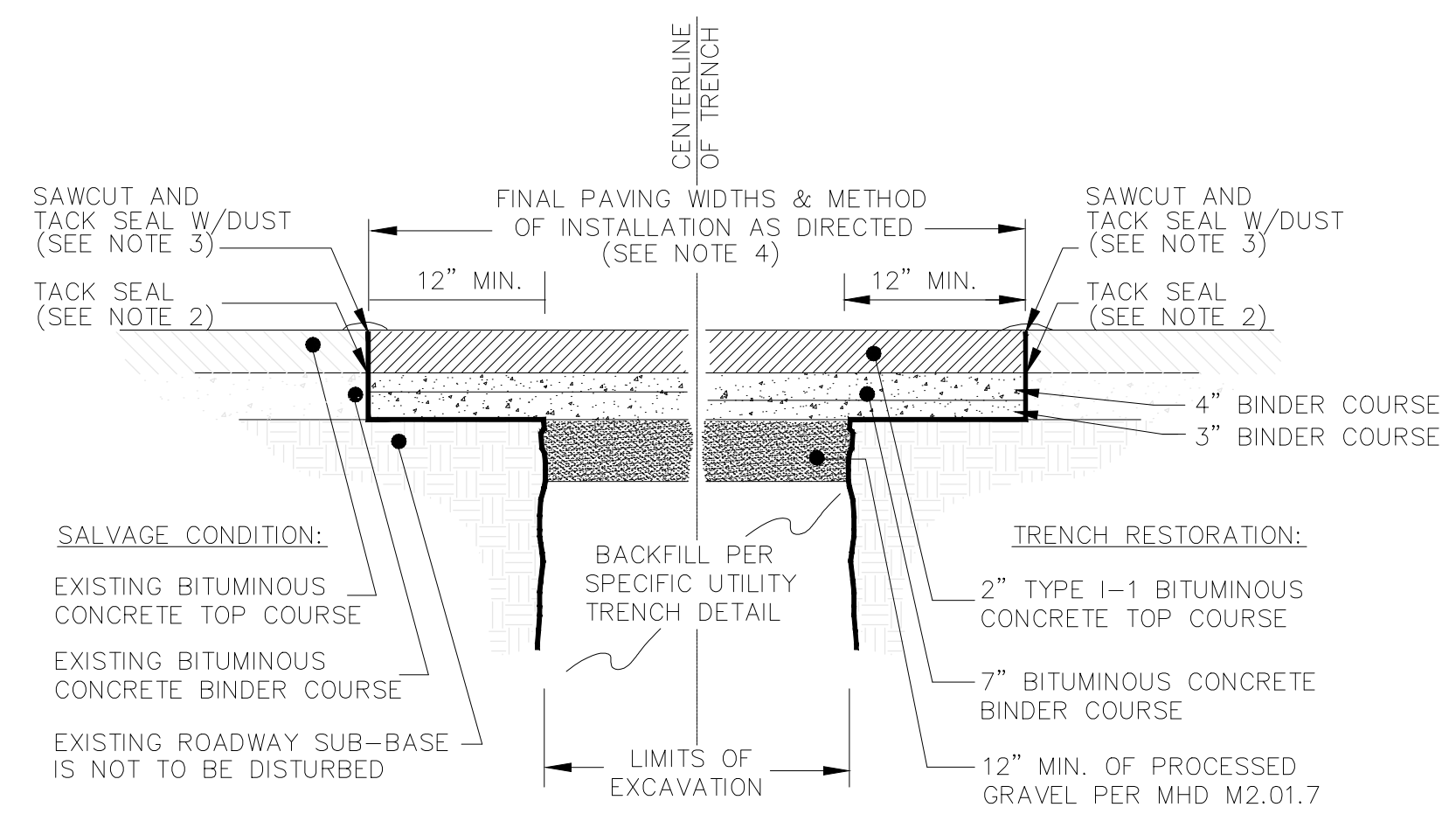
LATERAL CONNECTION MANHOLE
WHERE REQUIRED, A MANHOLE TO BE CONSTRUCTED ON A LATERAL CONNECTION. THIS MANHOLE SHALL CONFORM TO THE SAME STANDARDS AS THE MAIN SEWER MANHOLES. (SEE SEWER MANHOLE DETAILS.)

TYPICAL LATERAL STUB CONNECTION
(NOT TO SCALE)



- NOTES:**
- GRAVEL BORROW SHALL CONFORM TO MASS HIGHWAY SPECIFICATION M1.03.0
 - CRUSHED STONE BEDDING SHALL CONFORM TO MASS HIGHWAY SPECIFICATION M2.01.1

GRAVITY SEWER/FORCE MAIN TRENCH DETAIL
(NOT TO SCALE)



- SALVAGE CONDITION:**
- EXISTING BITUMINOUS CONCRETE TOP COURSE
 - EXISTING BITUMINOUS CONCRETE BINDER COURSE
 - EXISTING ROADWAY SUB-BASE IS NOT TO BE DISTURBED
- TRENCH RESTORATION:**
- 2" TYPE I-1 BITUMINOUS CONCRETE TOP COURSE
 - 7" BITUMINOUS CONCRETE BINDER COURSE
 - 12" MIN. OF PROCESSED GRAVEL PER MHD M2.01.7

TYPICAL TRENCH REPAIR & PAVEMENT SECTION DETAIL
(NOT TO SCALE)



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NOTE: This document is preliminary only and is not intended for any purpose except review and comment.

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60476644

Designed By:	M. CURRAN
Drawn By:	M. CURRAN
Dept Check:	T. PARECE
Proj Check:	M. DONOGHUE
Date:	MARCH 2019
Scale:	AS NOTED

DISCIPLINE

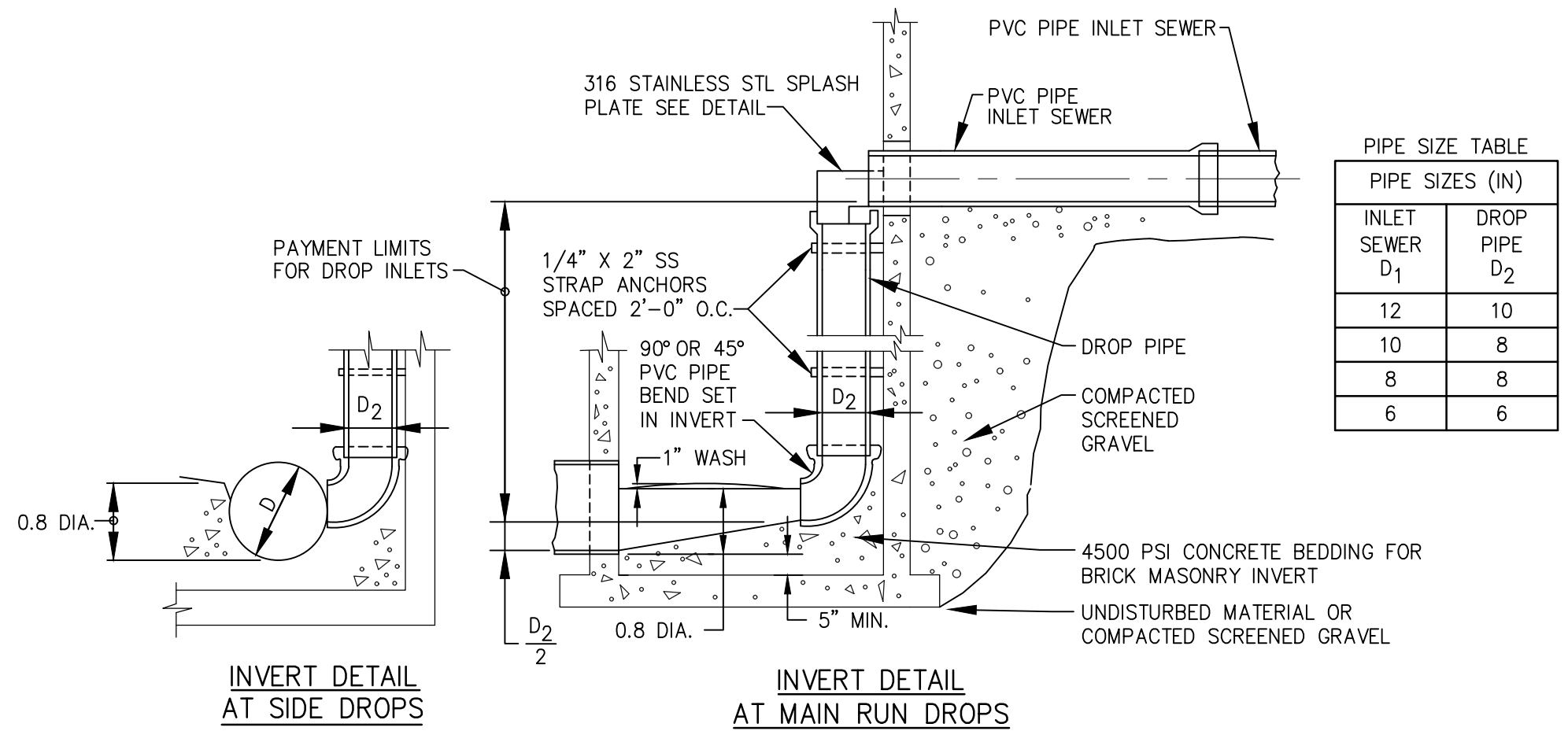
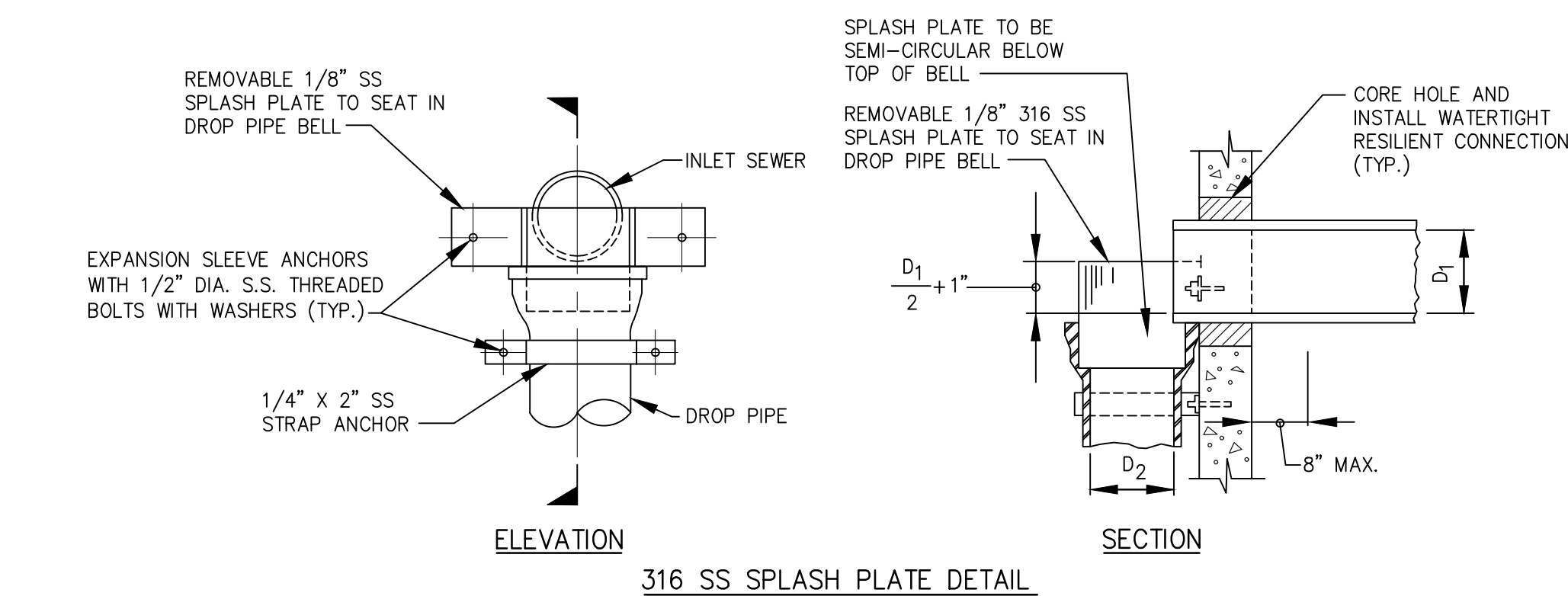
CIVIL
SHEET TITLE

DETAILS I

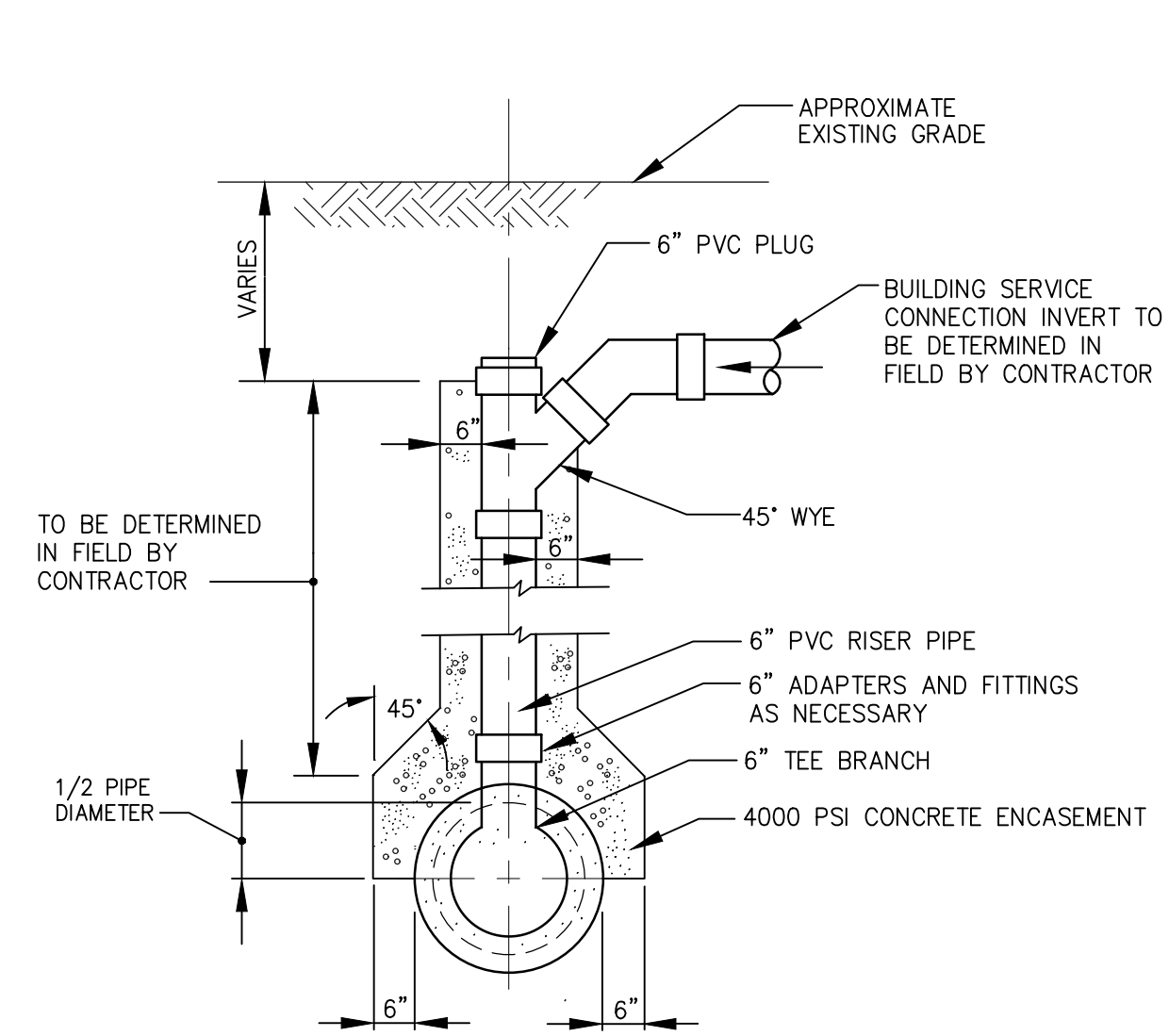
SHEET NUMBER

99 C-501

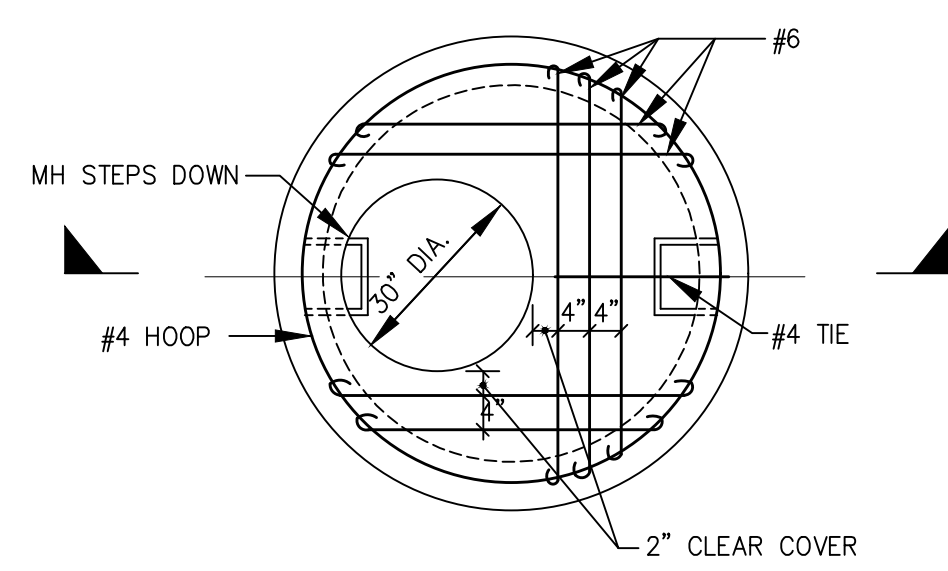
I/R	DATE	DESCRIPTION



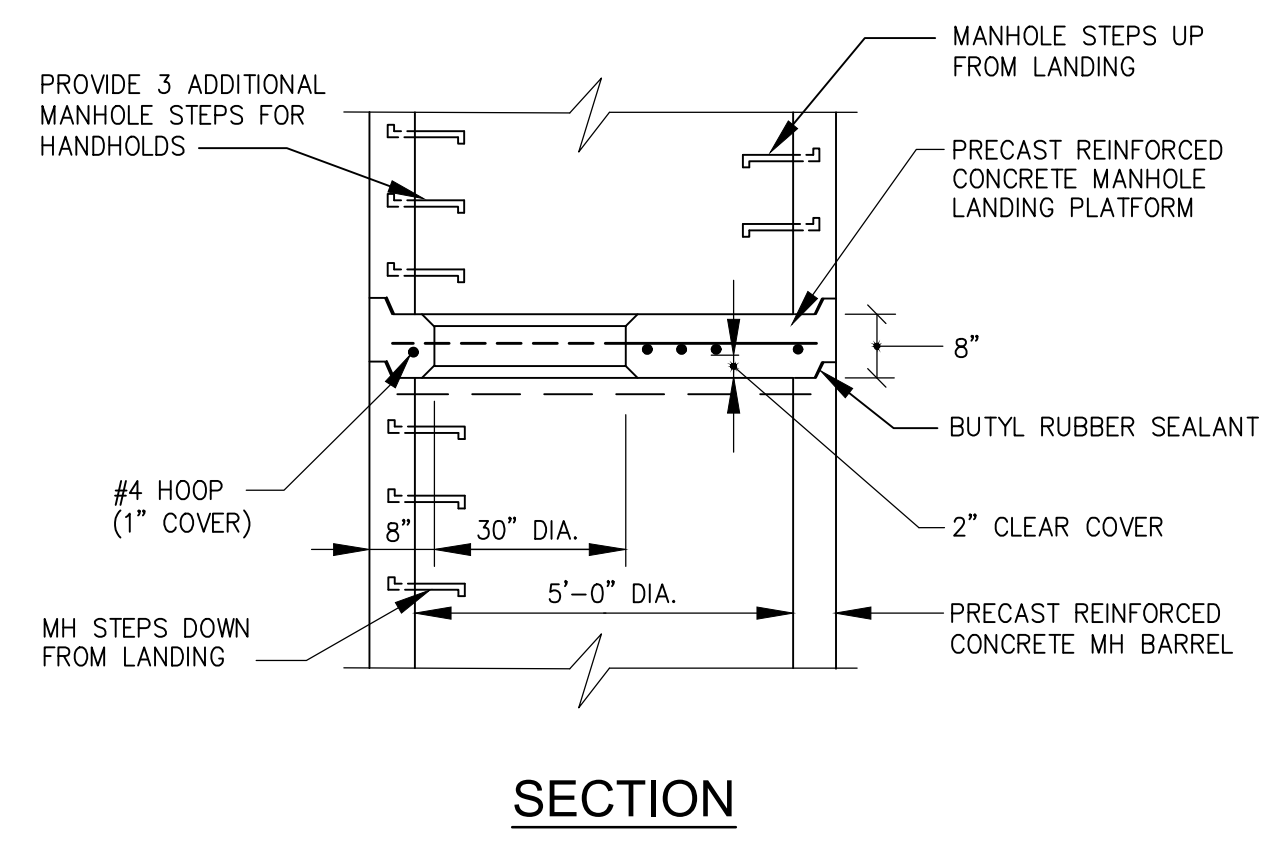
PIPE SIZES (IN)	
INLET SEWER D ₁	DROP PIPE D ₂
12	10
10	8
8	8
6	6



TYPICAL CHIMNEY DETAIL FOR SEWER CONNECTION
NOT TO SCALE

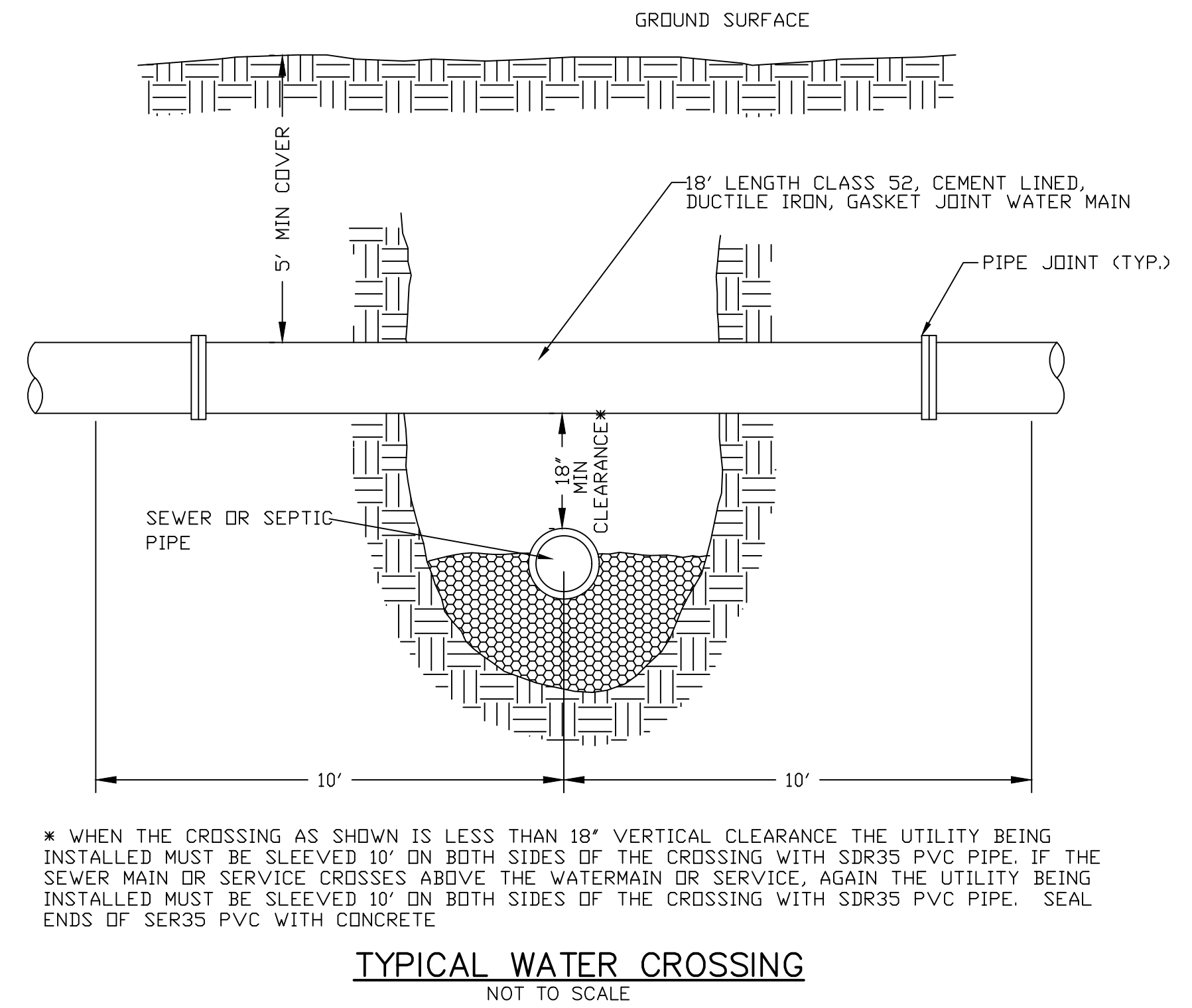


PLAN OF PRECAST SLAB
NOT TO SCALE



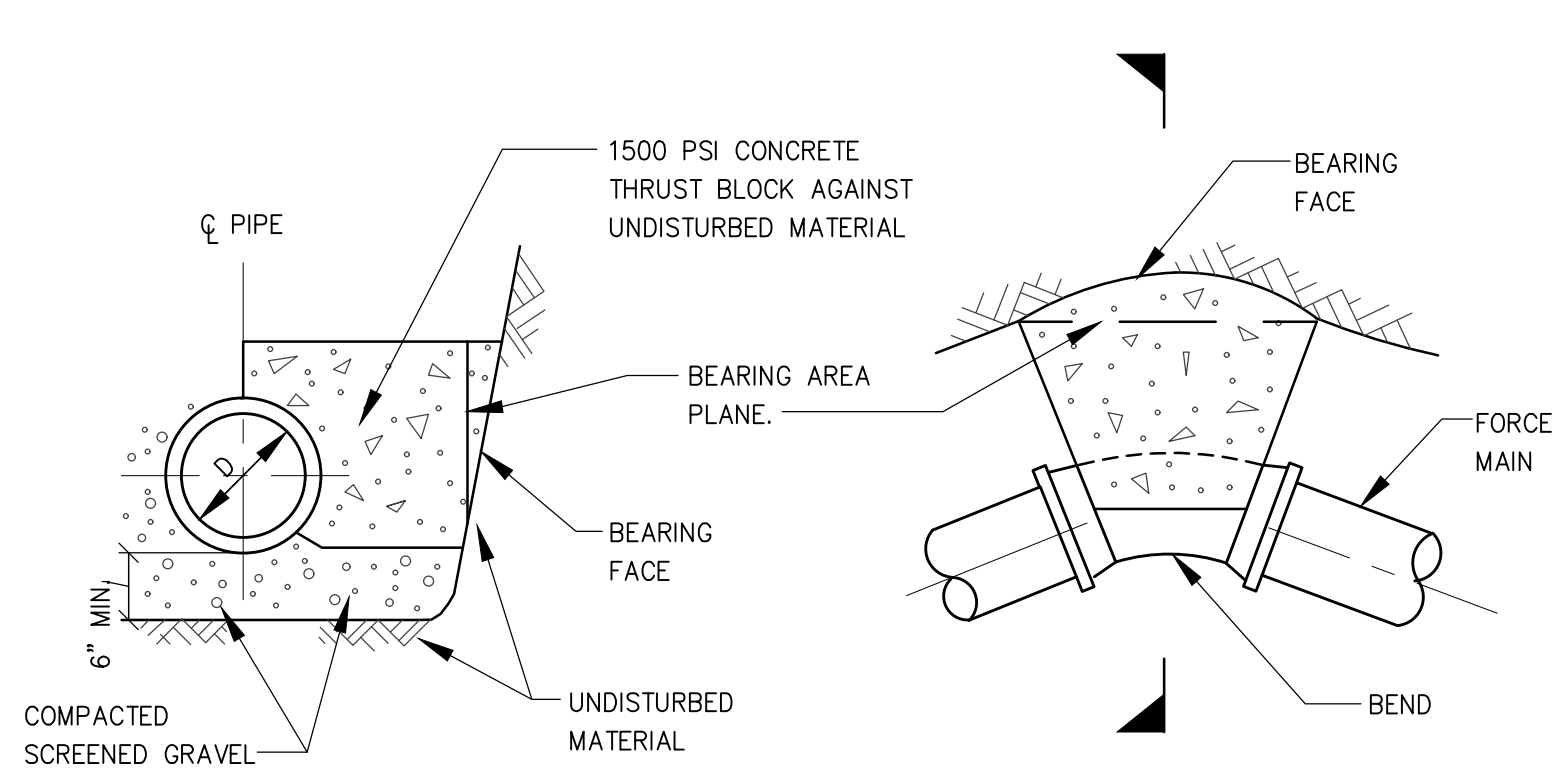
NOTE:
LANDING PLATFORMS ARE TO BE INSTALLED AT THE MIDPOINT OF MANHOLES EXCEEDING 20' IN DEPTH.

PRECAST MANHOLE LANDING PLATFORM
NOT TO SCALE



* WHEN THE CROSSING AS SHOWN IS LESS THAN 18' VERTICAL CLEARANCE THE UTILITY BEING INSTALLED MUST BE SLEEVED 10' ON BOTH SIDES OF THE CROSSING WITH SDR35 PVC PIPE. IF THE SEWER MAIN OR SERVICE CROSSES ABOVE THE WATERMAIN OR SERVICE, AGAIN THE UTILITY BEING INSTALLED MUST BE SLEEVED 10' ON BOTH SIDES OF THE CROSSING WITH SDR35 PVC PIPE. SEAL ENDS OF SER35 PVC WITH CONCRETE

TYPICAL WATER CROSSING
NOT TO SCALE



FORCE MAIN THRUST BLOCK
NOT TO SCALE

TABLE OF MINIMUM BEARING AREAS IN SQ. FT. AGAINST UNDISTURBED MATERIAL FOR WATER MAIN FITTINGS

PIPE SIZE	BEND	PRESSURE 150 PSI						
		TYPE OF SOIL CONDITION						
		A	B	C	D	E	F	G
6"	TEES & PLUGS	8.5	4.5	3	2.5	1.5	1.5	1
	90	12	6	4	3	2	1.5	1.5
	45	6.5	3.5	2.5	2	1.5	1	1
8"	TEES & PLUGS	15.5	8	5.5	4	3	2	1.5
	90	21.5	11	7.5	5.5	4	3	2.5
	45	12	6	4	3	2	1.5	1.5
12"	TEES & PLUGS	34	17	11.5	8.5	6	4.5	3.5
	90	48	24	16	12	8	6	5
	45	26	13	9	6.5	4.5	3.5	3
16"	TEES & PLUGS	60.5	30.5	20.5	15.5	10.5	8	6.5
	90	85.5	43	28.5	21.5	14.5	11	9
	45	46.5	23.5	15.5	12	8	6	5

TYPE OF SOIL CONDITION	LATERAL BEARING PRESSURE (LBS PER SQ. FT.)
A - SOFT CLAY; FINE LOOSE SAND	500
B - SAND & CLAY; MIXED OR IN LAYERS; FINE CONFINED SAND	1000
C - HARD DRY CLAY	1500
D - COARSE SAND	2000
E - GRAVEL	3000
F - SOFT ROCK	4000
G - HARD PAN	5000

- NOTES:
- FOR FITTINGS WITH LESS THAN 22 1/2 DEFLECTION USE BEARING AREAS FOR 22 1/2 BEND.
 - JOINTS SHALL NOT BE ENCASED IN CONCRETE. BEARING AREAS MAY BE DISREGARDED FOR TRENCHES IN ROCK WHERE THE TOP OF THE ROCK FACE IS AT OR ABOVE THE CROWN OF THE PIPE. HOWEVER, CONCRETE BACKING SHALL BE PLACED BETWEEN THE PIPE AND ROCK FACE.
 - THE CONTRACTOR SHALL SUBMIT, 2-WEEKS IN ADVANCE OF PLACEMENT, WORKING DRAWINGS FOR EACH THRUST BLOCK, TO THE ENGINEER, FOR APPROVAL PRIOR TO INSTALLATION.
 - BEARING AREAS FOR THRUST BLOCKS FOR PIPE LARGER THAN 24 IN. SHALL BE DESIGNED BASED ON SOIL BORING DATA.
 - ACTUAL FIELD CONDITIONS SHALL BE VERIFIED DURING INSTALLATION.

CONCRETE THRUST BLOCK BEARING AREAS FOR WATER MAIN
NOT TO SCALE

Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____
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PROJECT

Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

ENGINEER

AECOM TECHNICAL SERVICES, INC.
9 JONATHAN BOURNE DRIVE
POCASSET, MA 02559
PHONE: (508) 833-6950
www.aecom.com

CONSULTANTS

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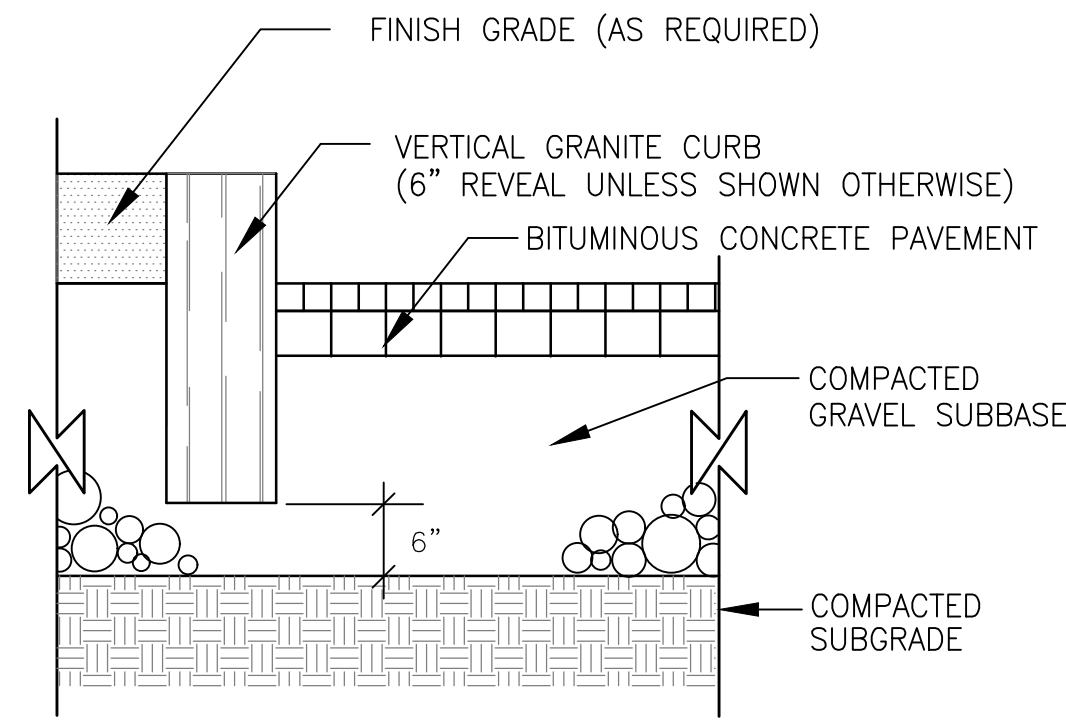
CIVIL

SHEET TITLE

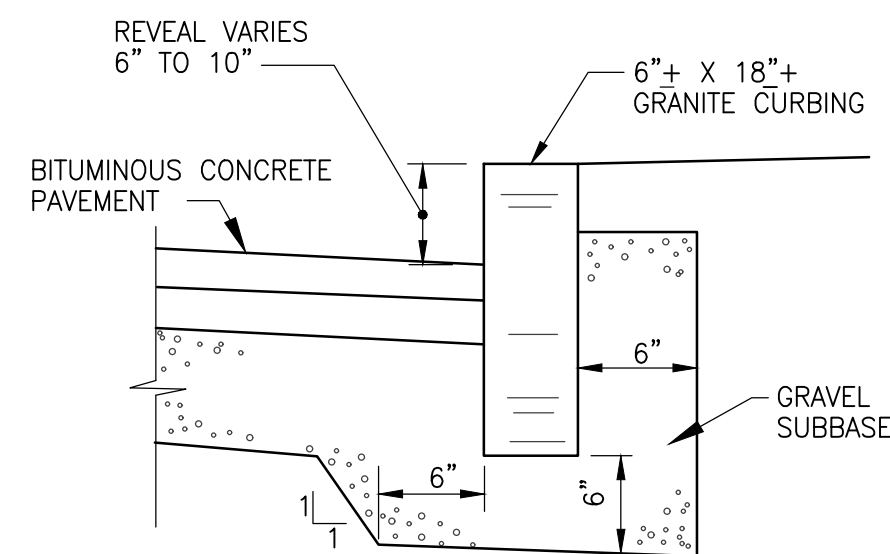
DETAILS III

SHEET NUMBER

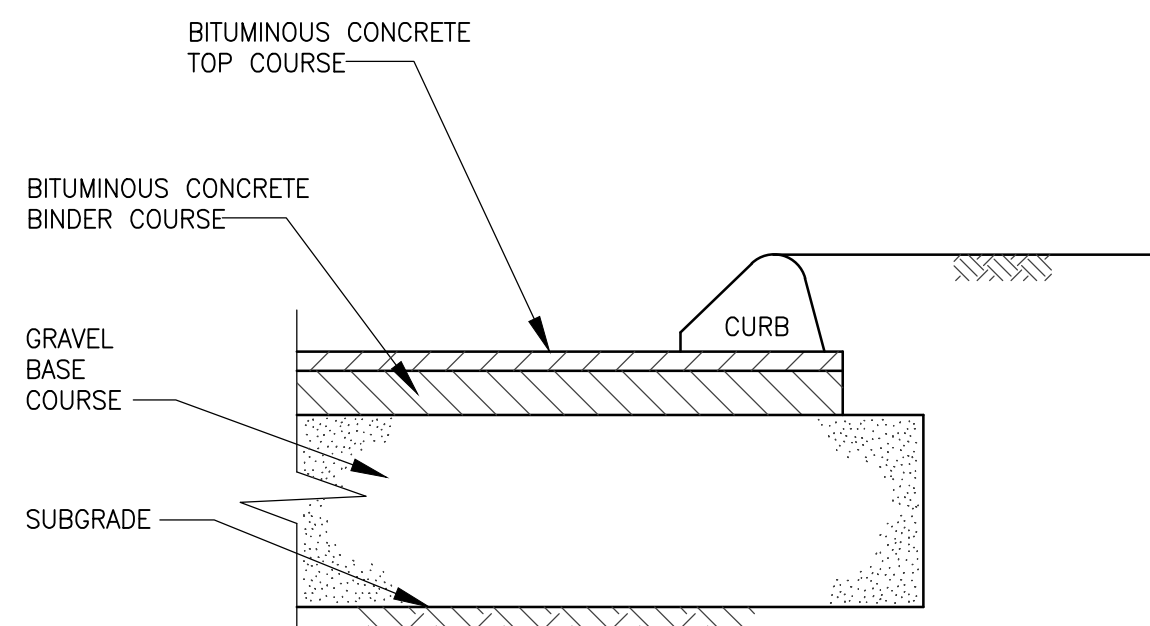
99 C-503



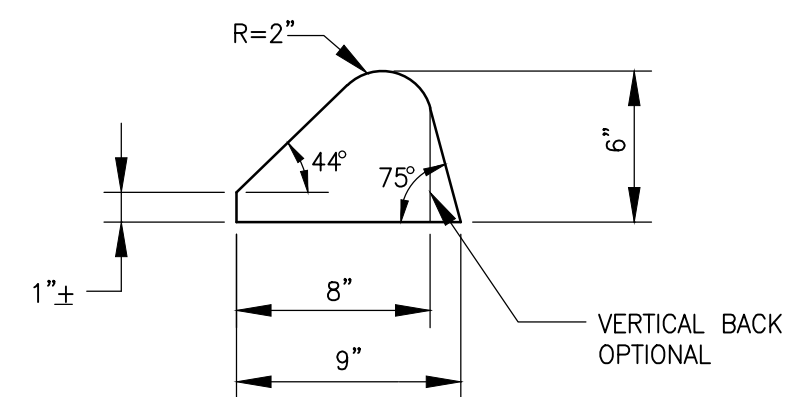
VERTICAL GRANITE CURBING
NOT TO SCALE



GRANITE CURB
NOT TO SCALE



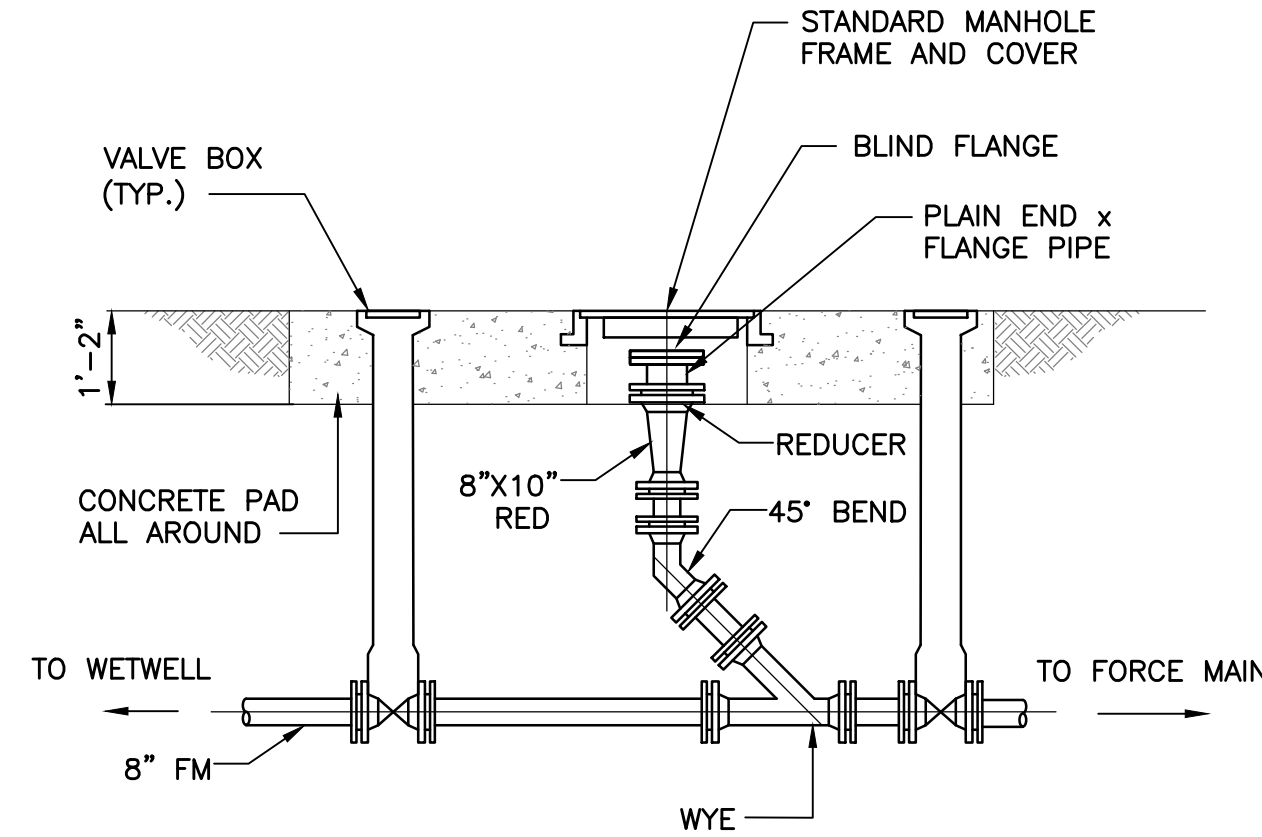
METHOD OF SETTING



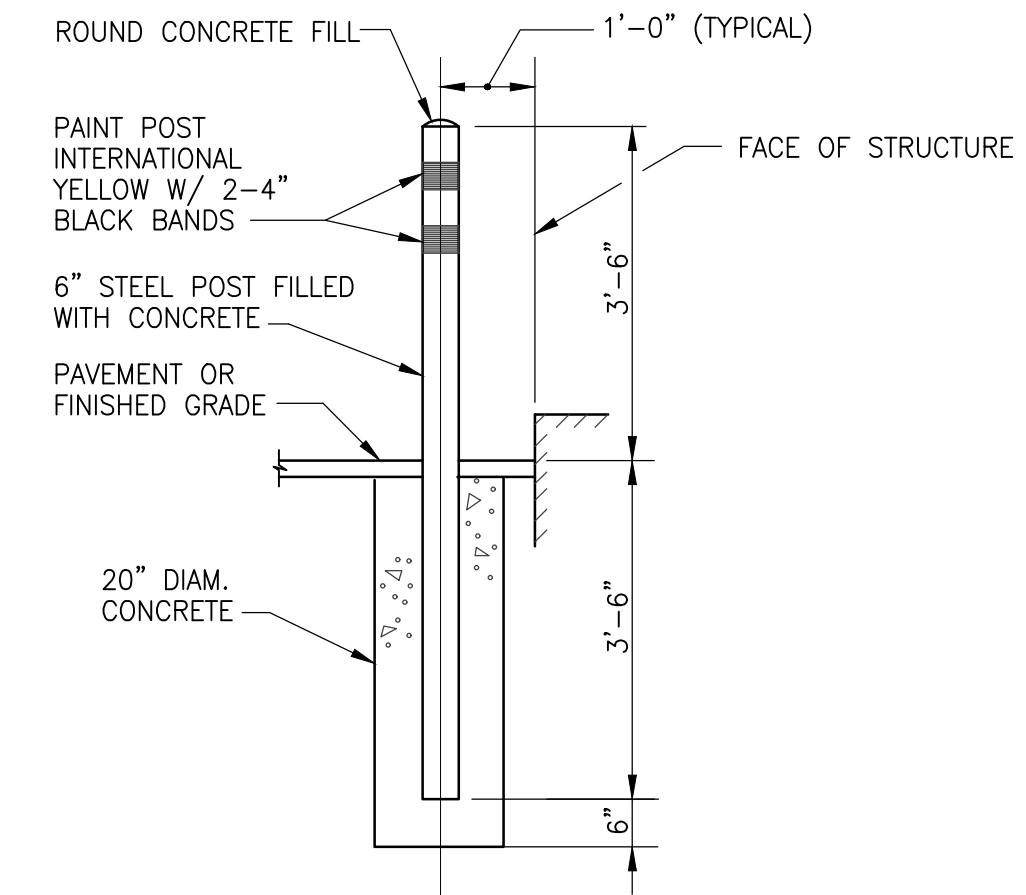
CURB DIMENSIONS

BITUMINOUS CURB

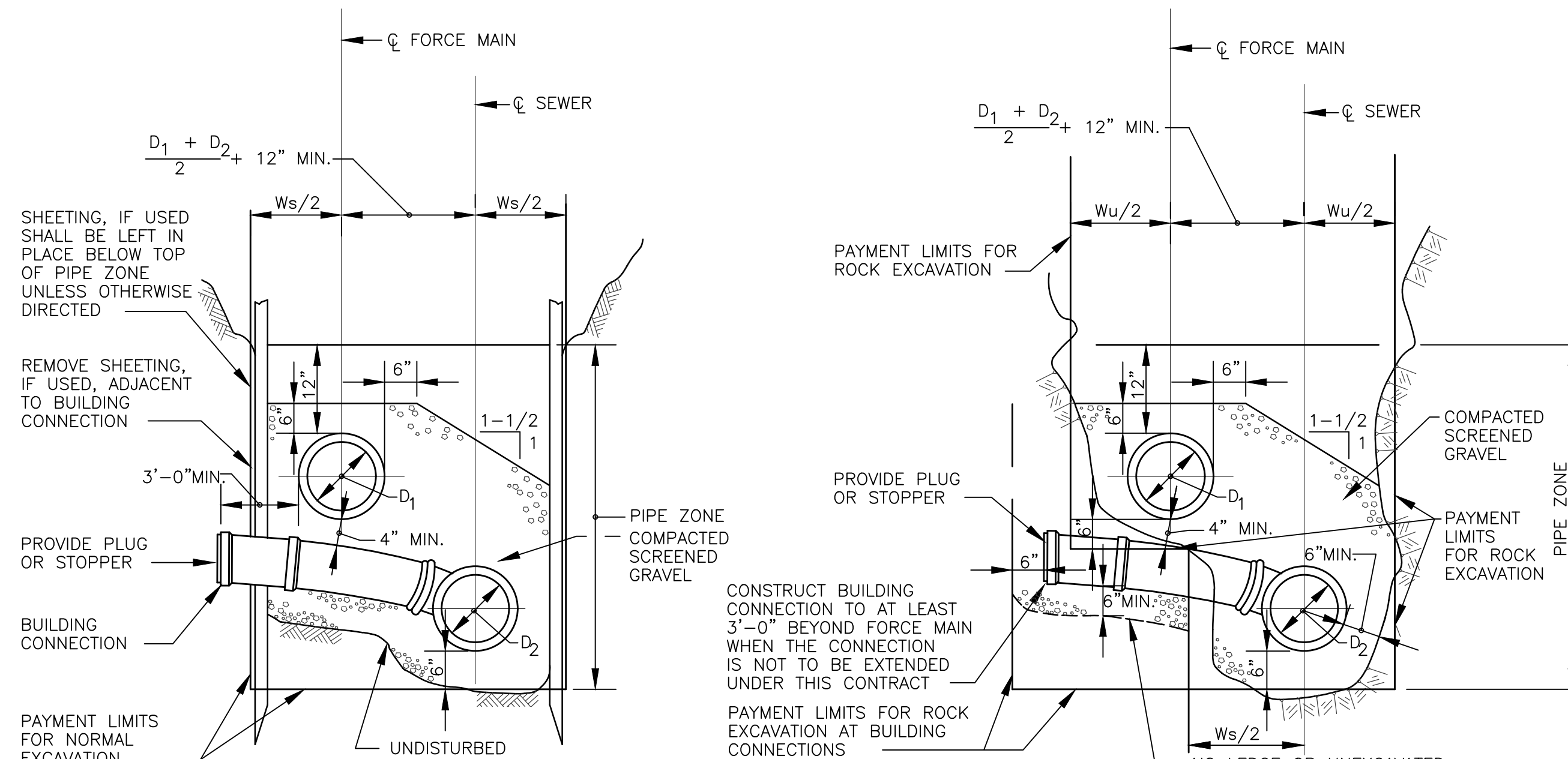
NOT TO SCALE
2-1.42.3 (REV. 12-15-94)



PIG LAUNCHING ASSEMBLY DETAIL
NOT TO SCALE



GUARD POST
NOT TO SCALE



IN EARTH

IN ROCK

**TRENCH SECTIONS FOR SEWER AND FORCE MAIN
IN SAME TRENCH**

NTS
2-1.1.22 (REV. 03-29-13)

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 Pump Stations

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CLIENT
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 ORLEANS, MA 02653
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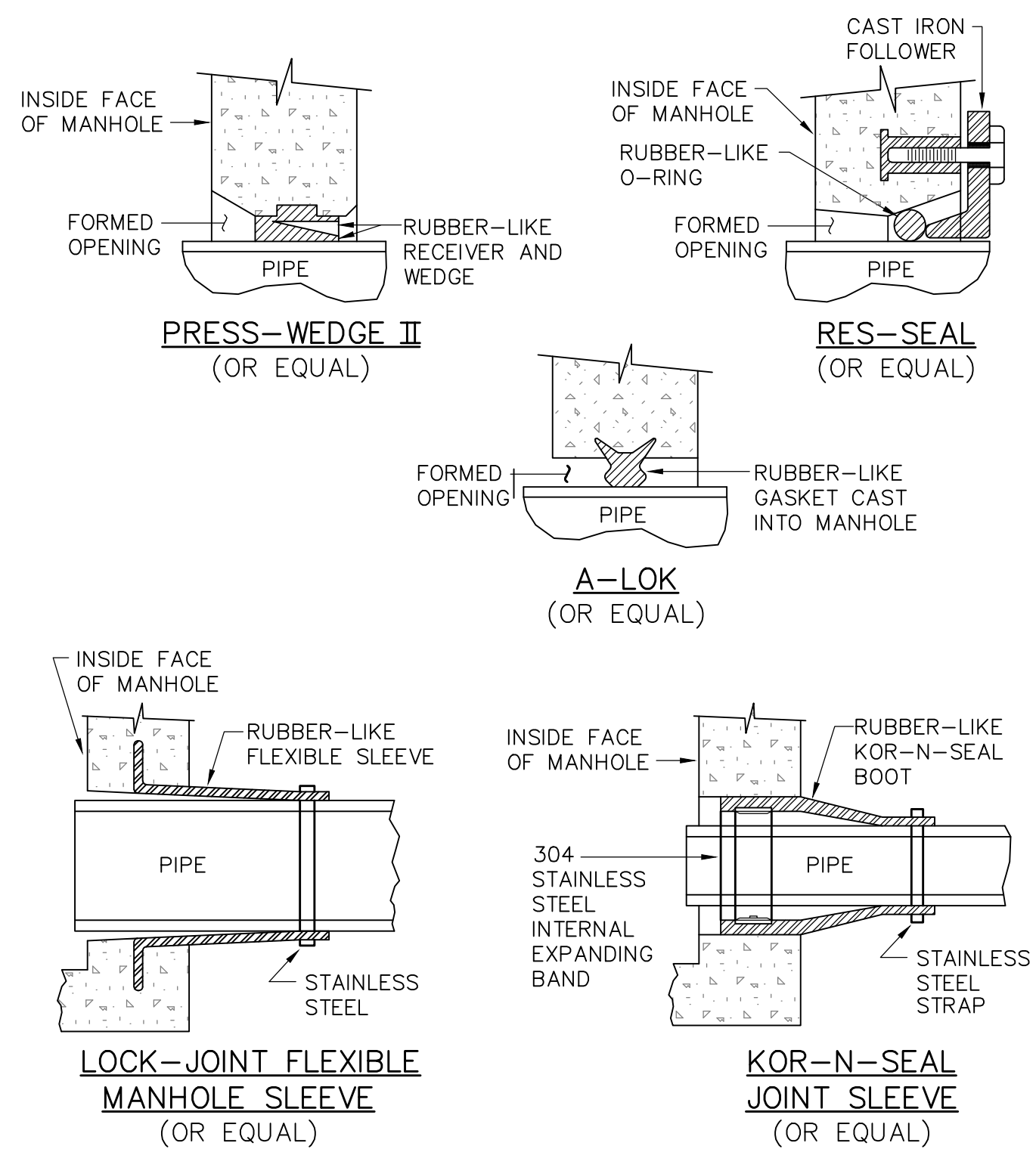
DISCIPLINE
 CIVIL
SHEET TITLE

DETAILS IV

SHEET NUMBER

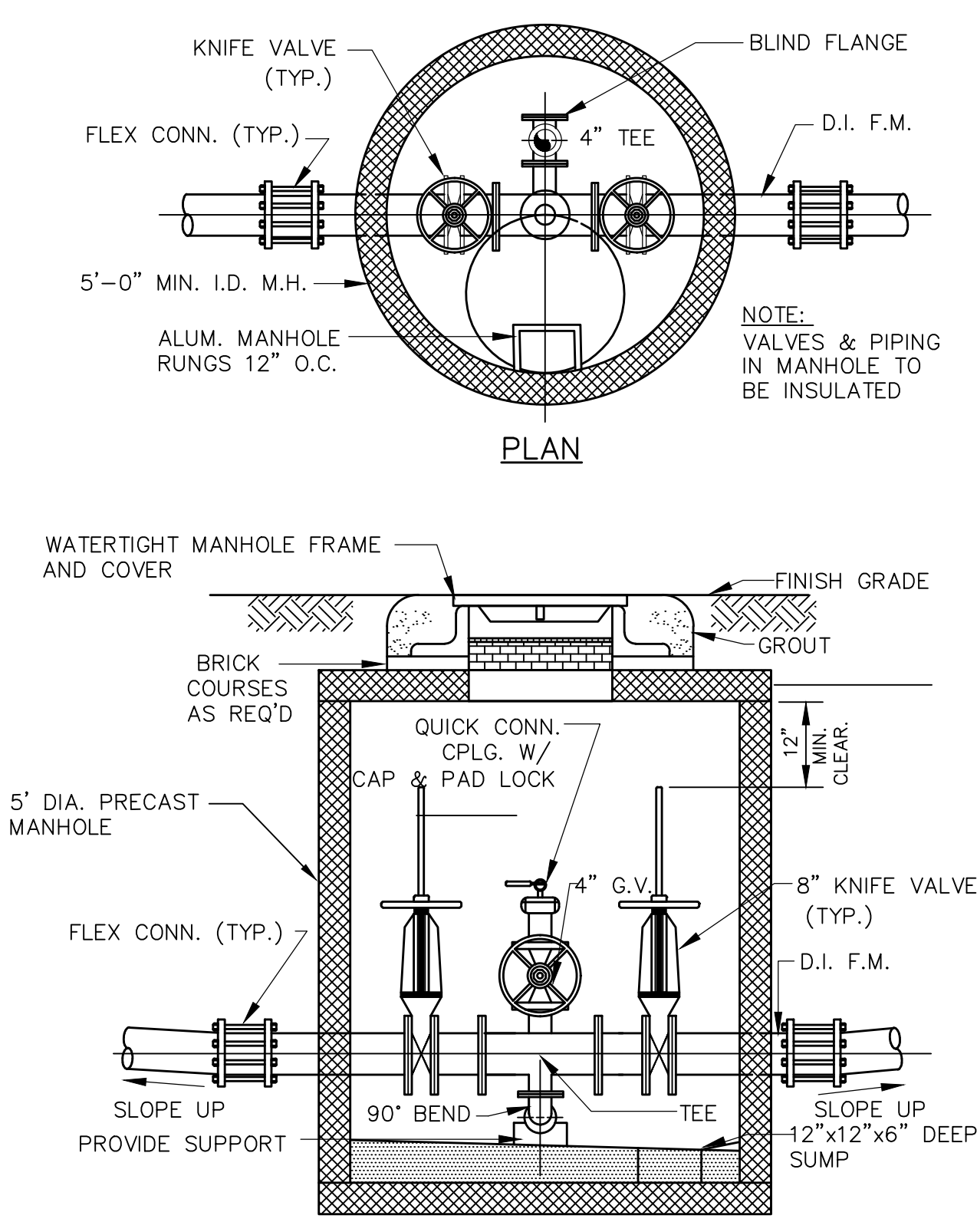
99 C-504

Approved: _____
 Checked: _____
 Designer: _____
 Project Management Initials: _____
 C
 B
 A
 Last saved by: CURRANM(2019-03-06) Last Plotted: 2019-03-12
 Filename: L:\WORK\60476644 - ORLEANS DOWNTOWN SEWERS\HEETS\C199 C-504.DWG

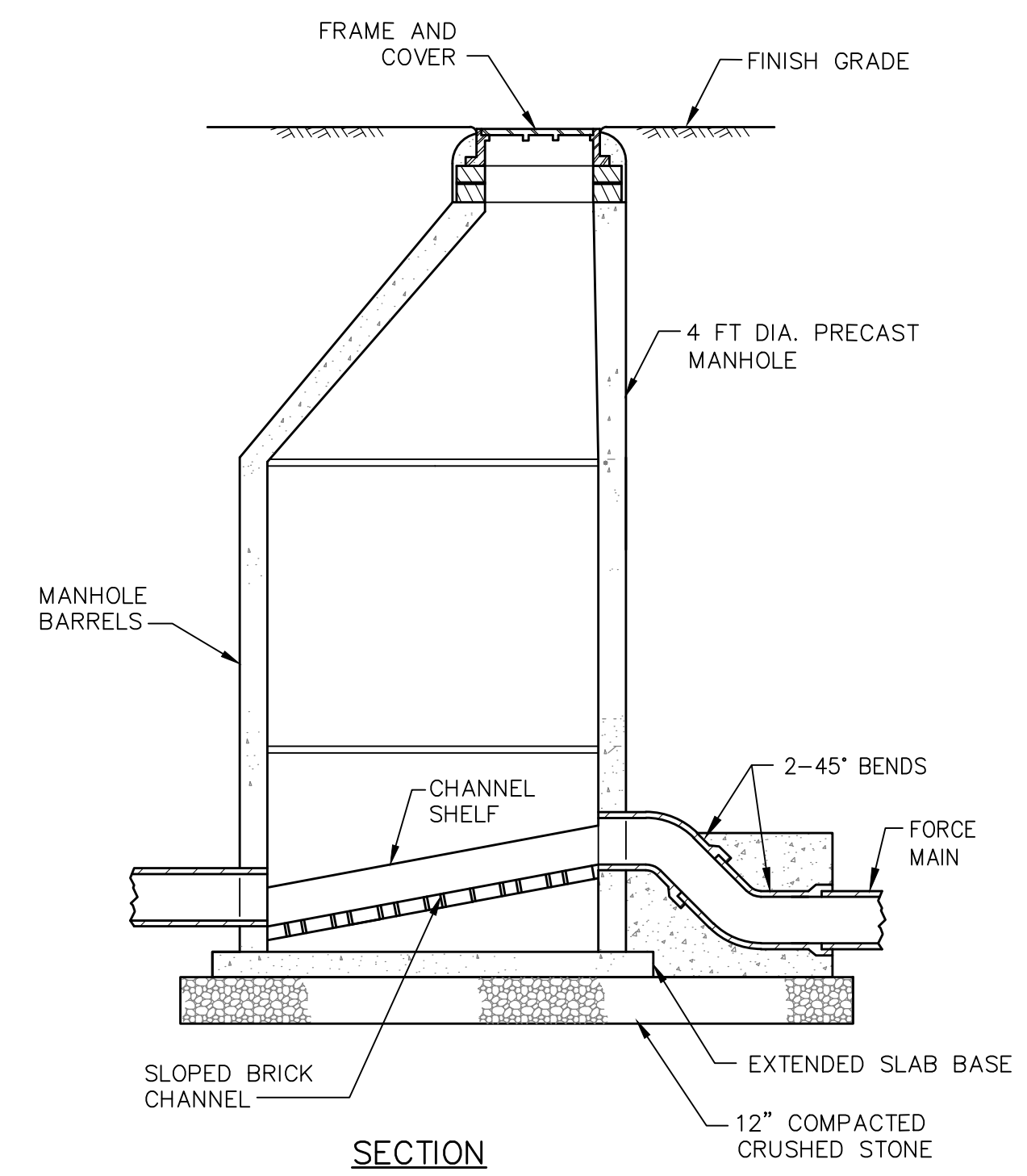


NOTE:
 ALL GASKETS, SEALANTS, MORTAR ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

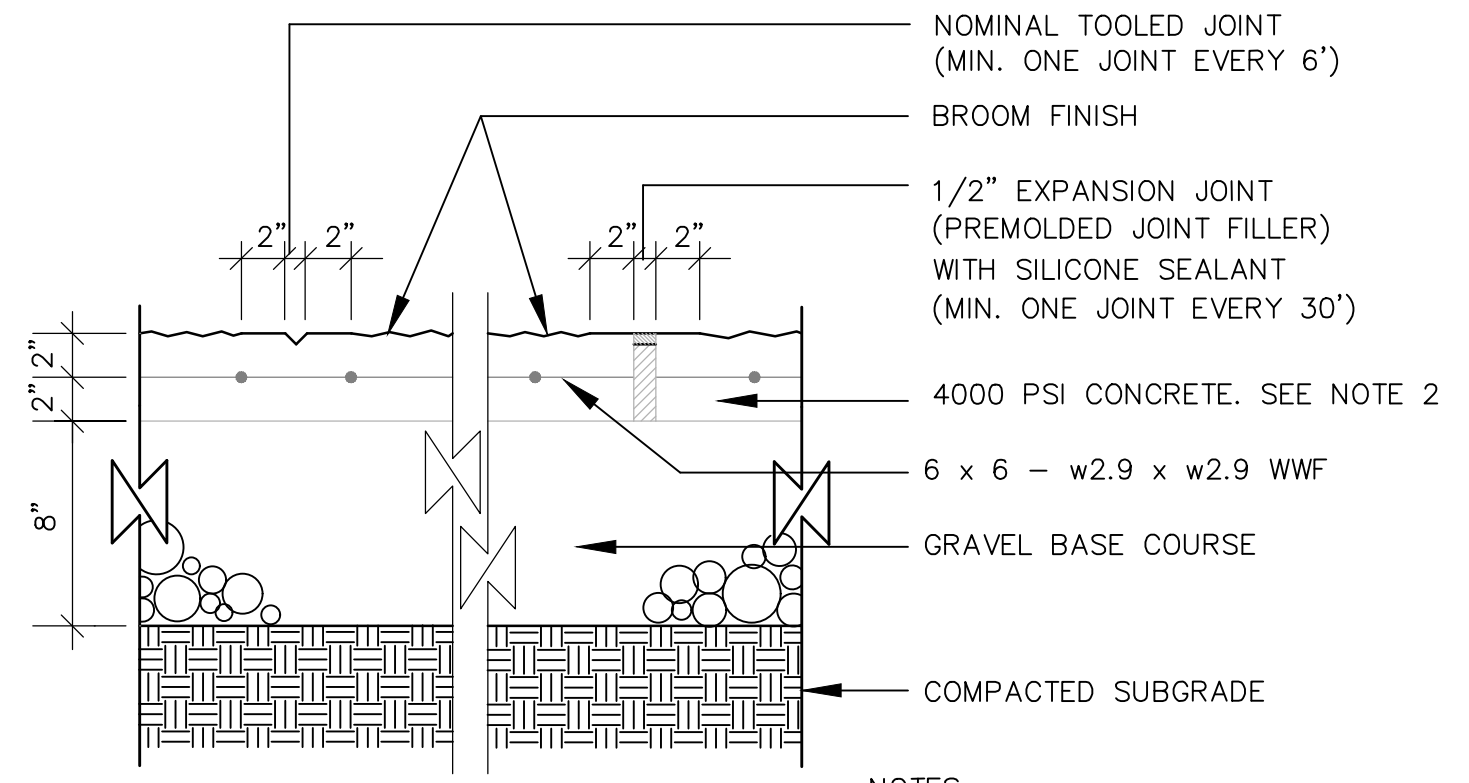
TYPICAL SLEEVE DETAILS
 NOT TO SCALE



FORCE MAIN DRAIN MANHOLE
 NOT TO SCALE

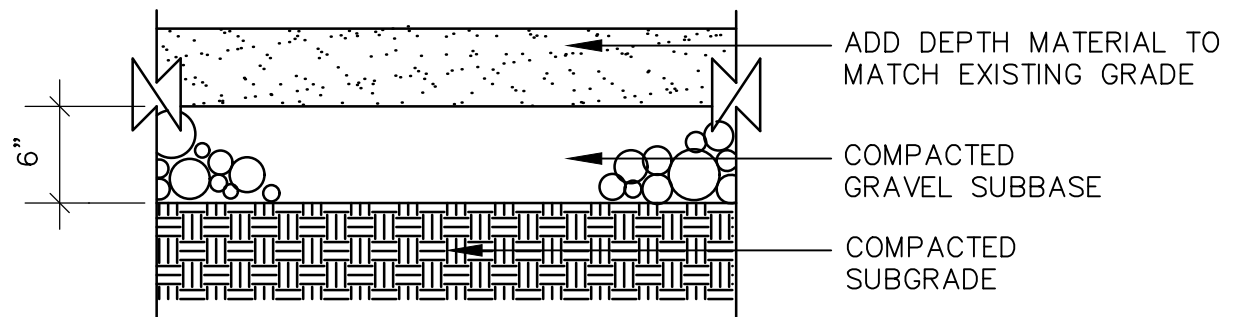


FORCE MAIN DISCHARGE INTO MANHOLE
 NOT TO SCALE



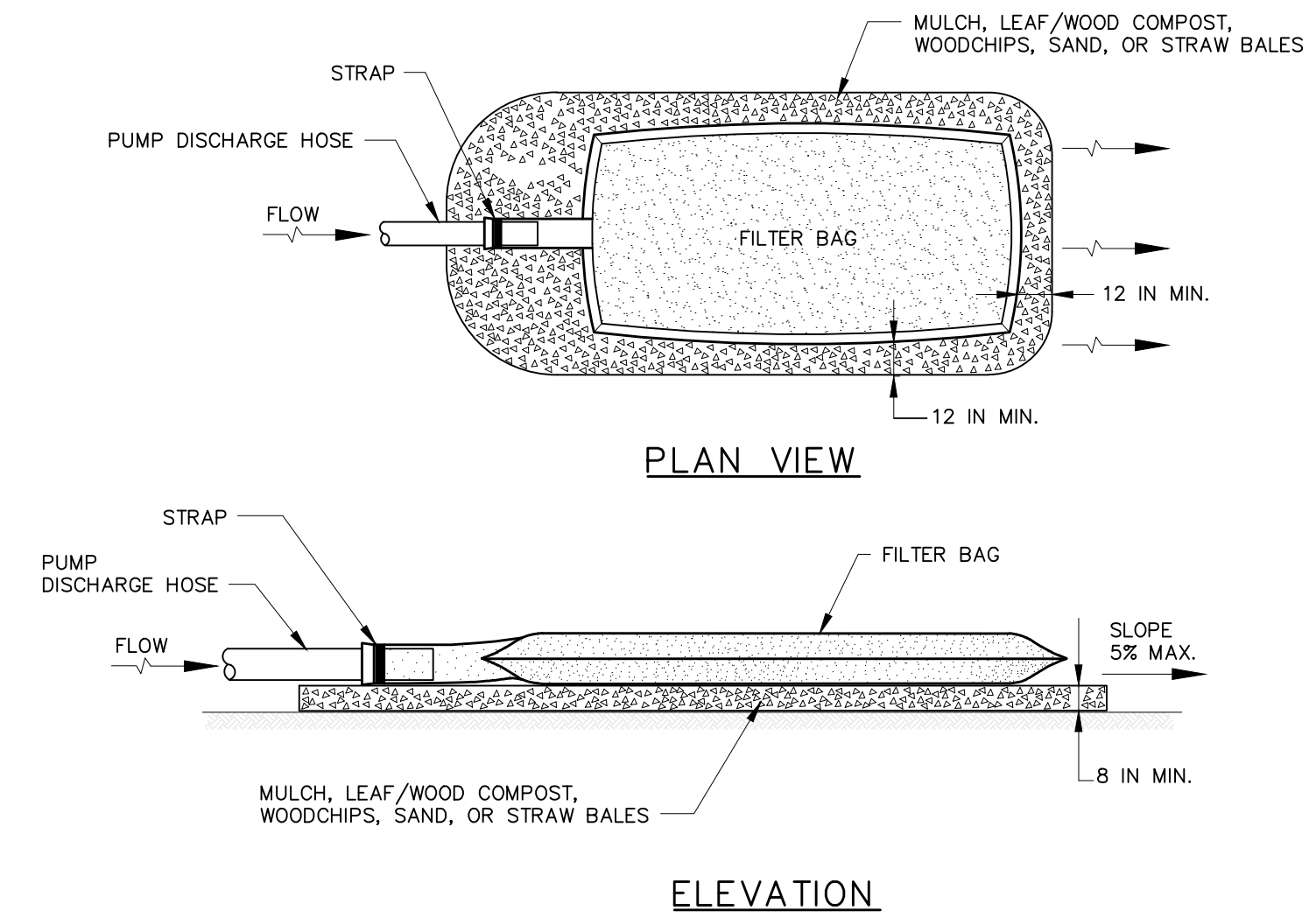
NOTES:
 1. BROOM FINISH TO 2" FROM ANY JOINT OR EDGE. PROVIDE EXPANSION JOINT WHEREVER SIDEWALK ABUTS EXISTING OR PROPOSED STRUCTURES, OR WHERE DIRECTED IN THE FIELD.
 2. CONCRETE WITH FIBERGLASS ADDITIVE MAY BE USED IN LIEU OF WIRE MESH WHEN APPROVED BY THE ENGINEER.

CONCRETE SIDEWALK
 NOT TO SCALE



DRIVEWAY DETAIL
 NOT TO SCALE

I/R	DATE	DESCRIPTION



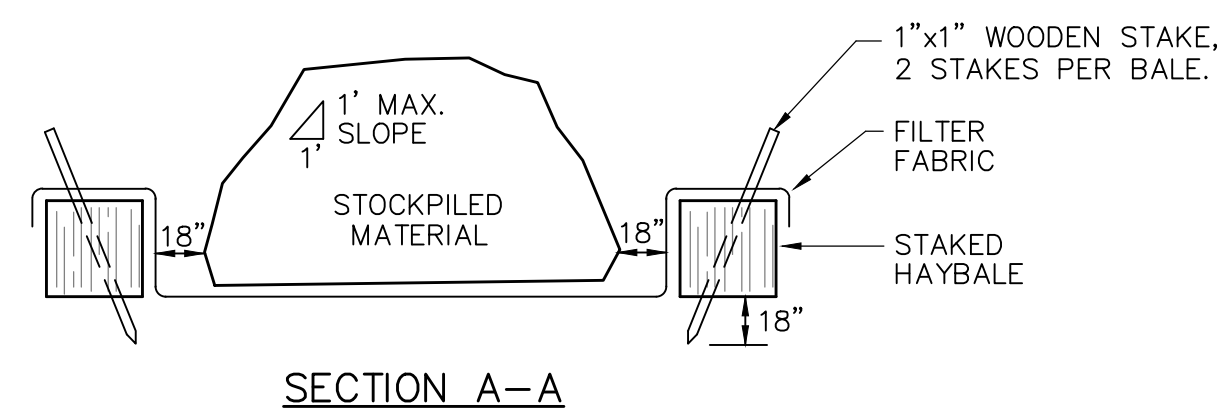
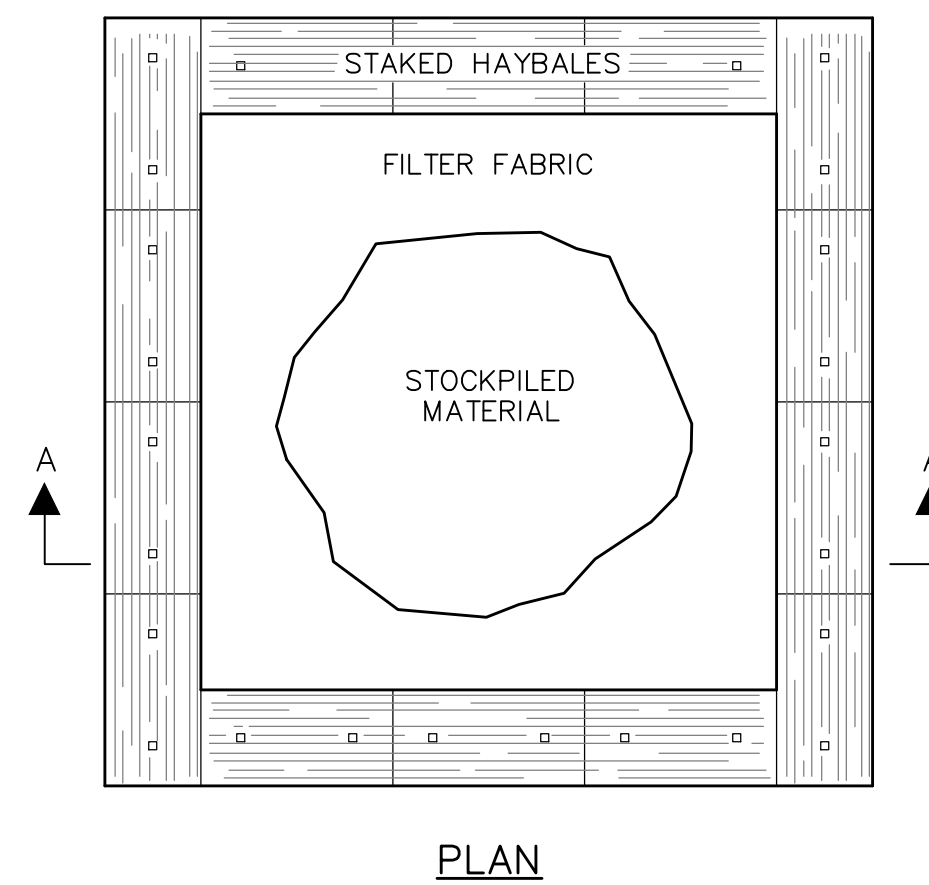
CONSTRUCTION SPECIFICATIONS

- TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
- PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
- CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
- REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
- USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT ²	ASTM D-4491
PERMITTIVITY (SEC ⁻¹)	1.2 SEC ⁻¹	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632
- REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

SEDIMENTATION FILTER BAG

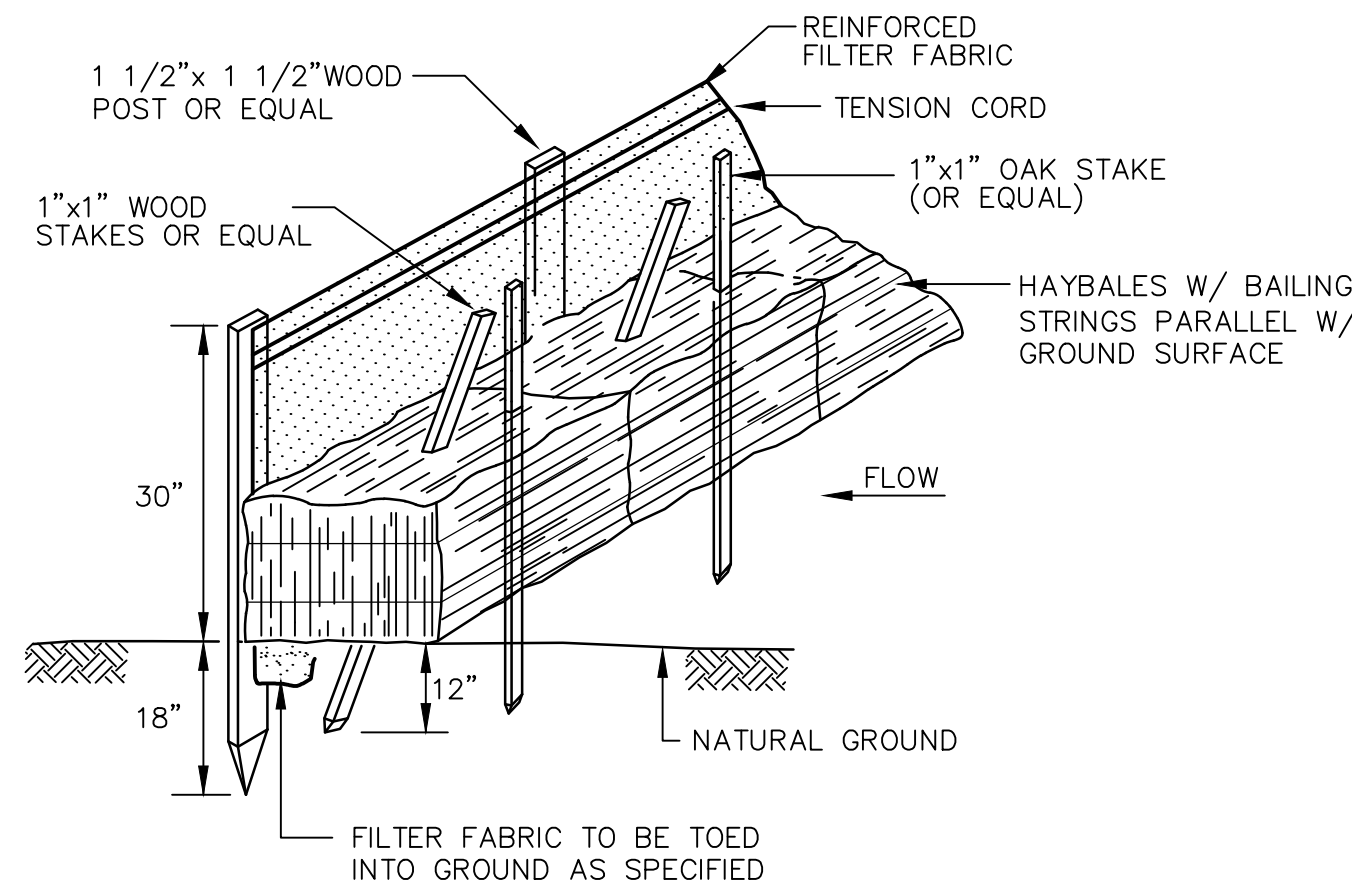
NOT TO SCALE



NOTE:
DIMENSIONS OF STOCKPILE AREA MAY VARY DEPENDING ON QUANTITY OF EXCAVATION. AVOID OVERTOPPING OR SLOPES IN EXCESS OF 1:1

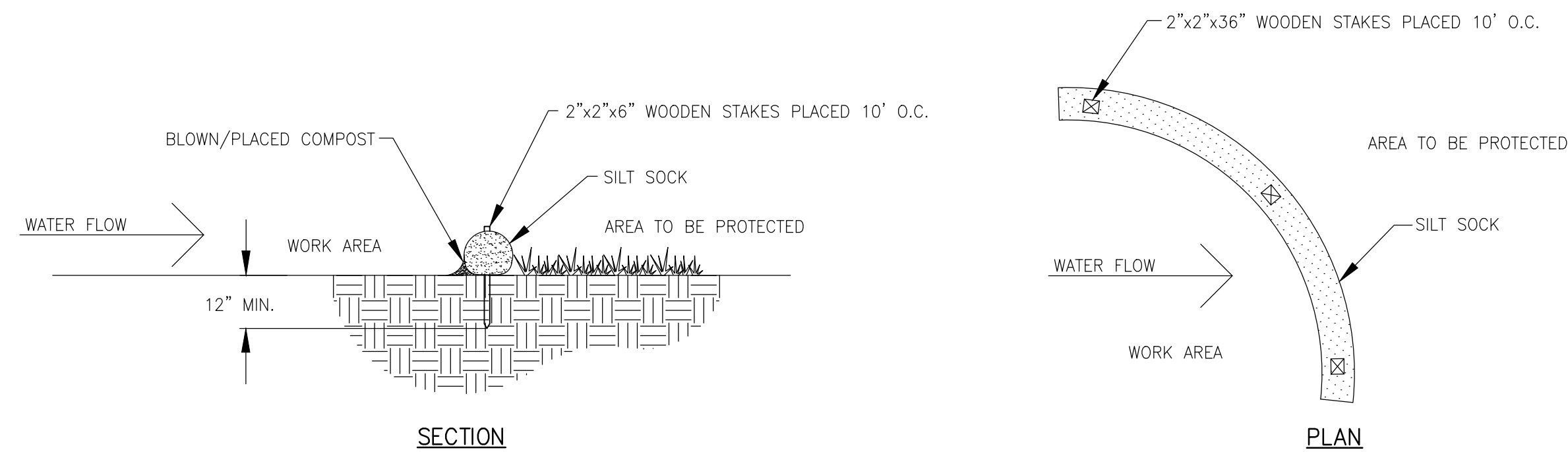
PLAN OF TEMPORARY STOCKPILE AREA

NOT TO SCALE



HAY BALES AND SILT FENCE

NOT TO SCALE



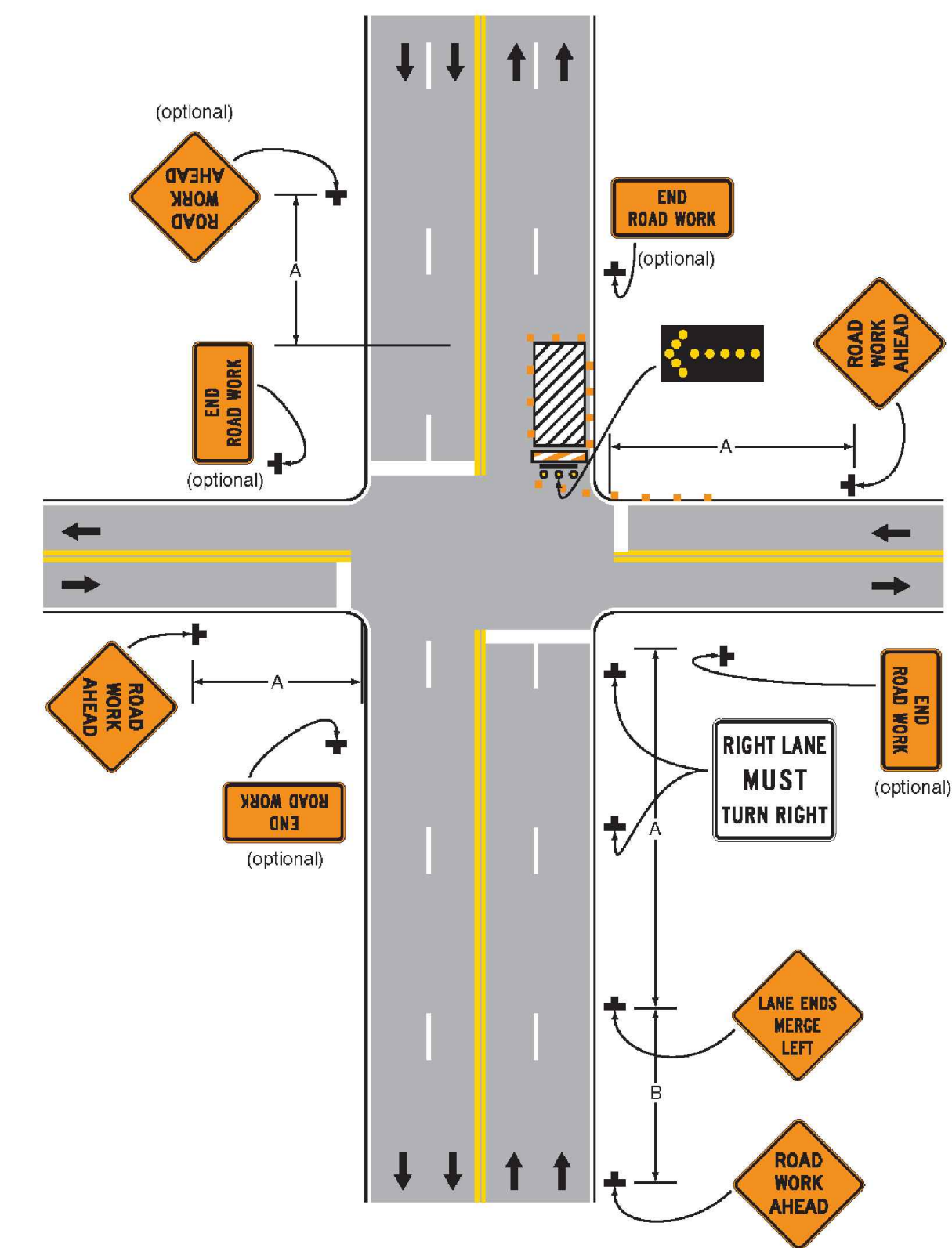
NOTES:

- SEE SPECIFICATIONS FOR SILT SOCK AND COMPOST FILL MATERIAL REQUIREMENTS.

COMPOST SILT SOCK

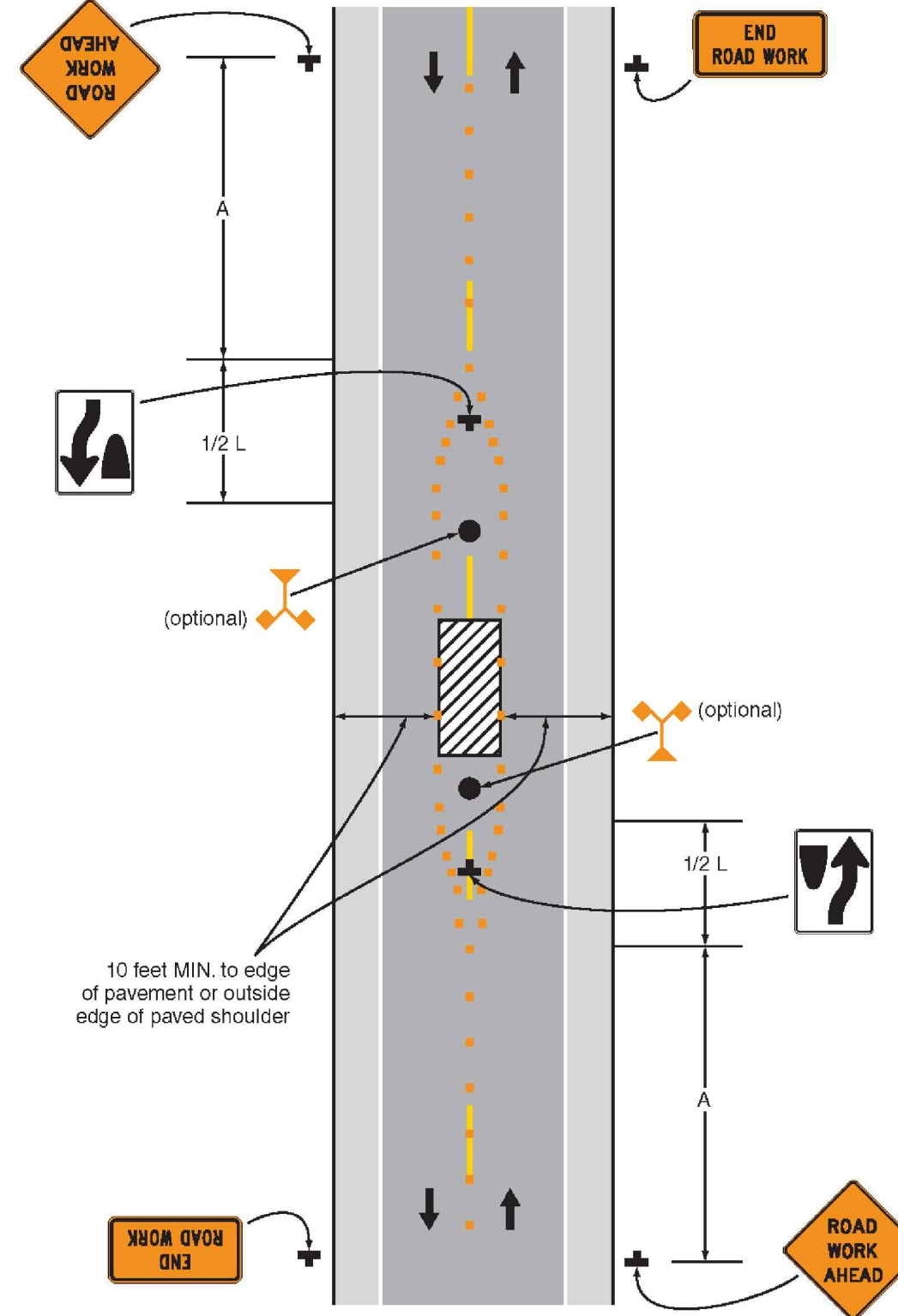
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I/R	DATE	DESCRIPTION



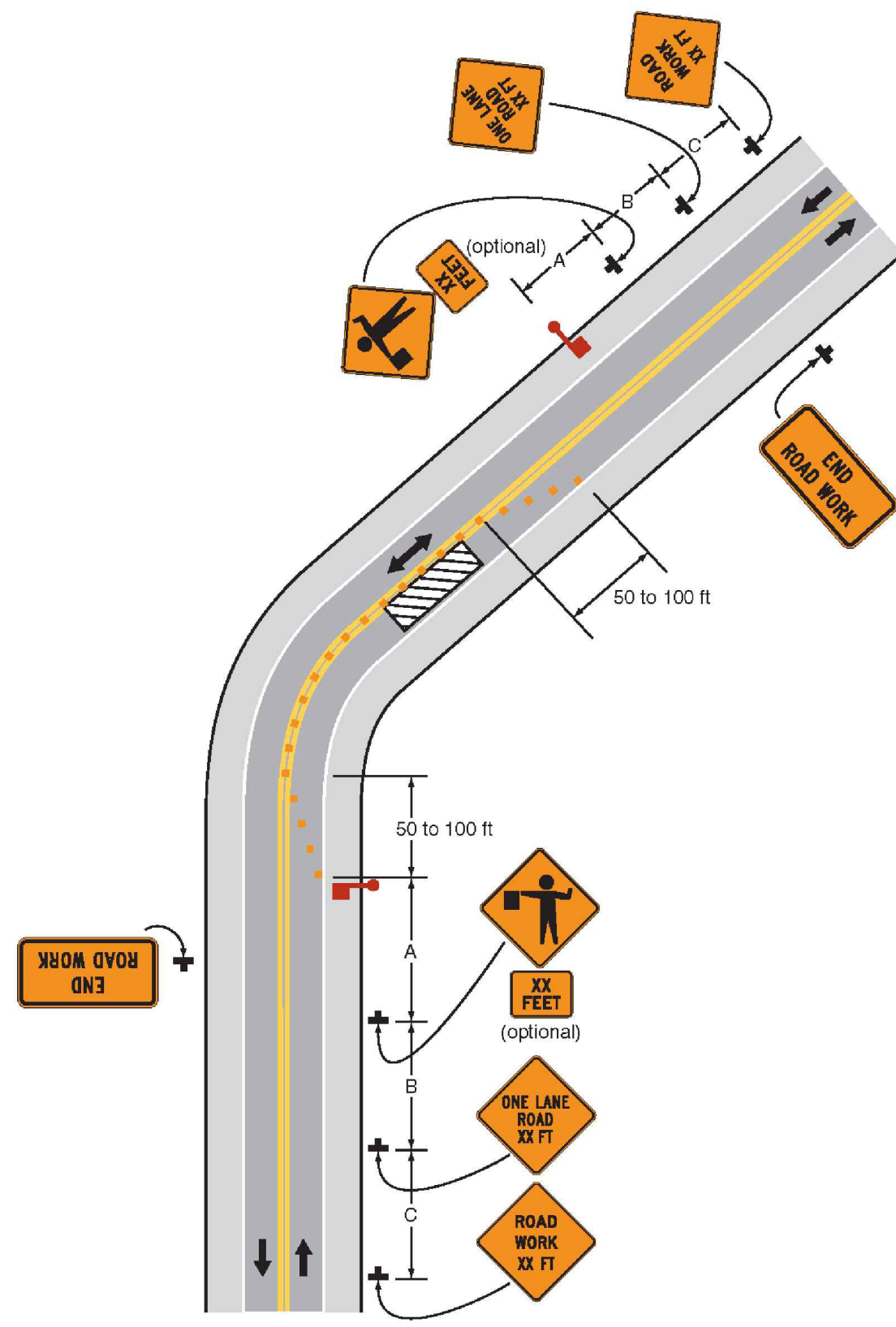
TYPICAL APPLICATION 22

RIGHT-HAND LANE CLOSURE ON THE FAR SIDE OF AN INTERSECTION



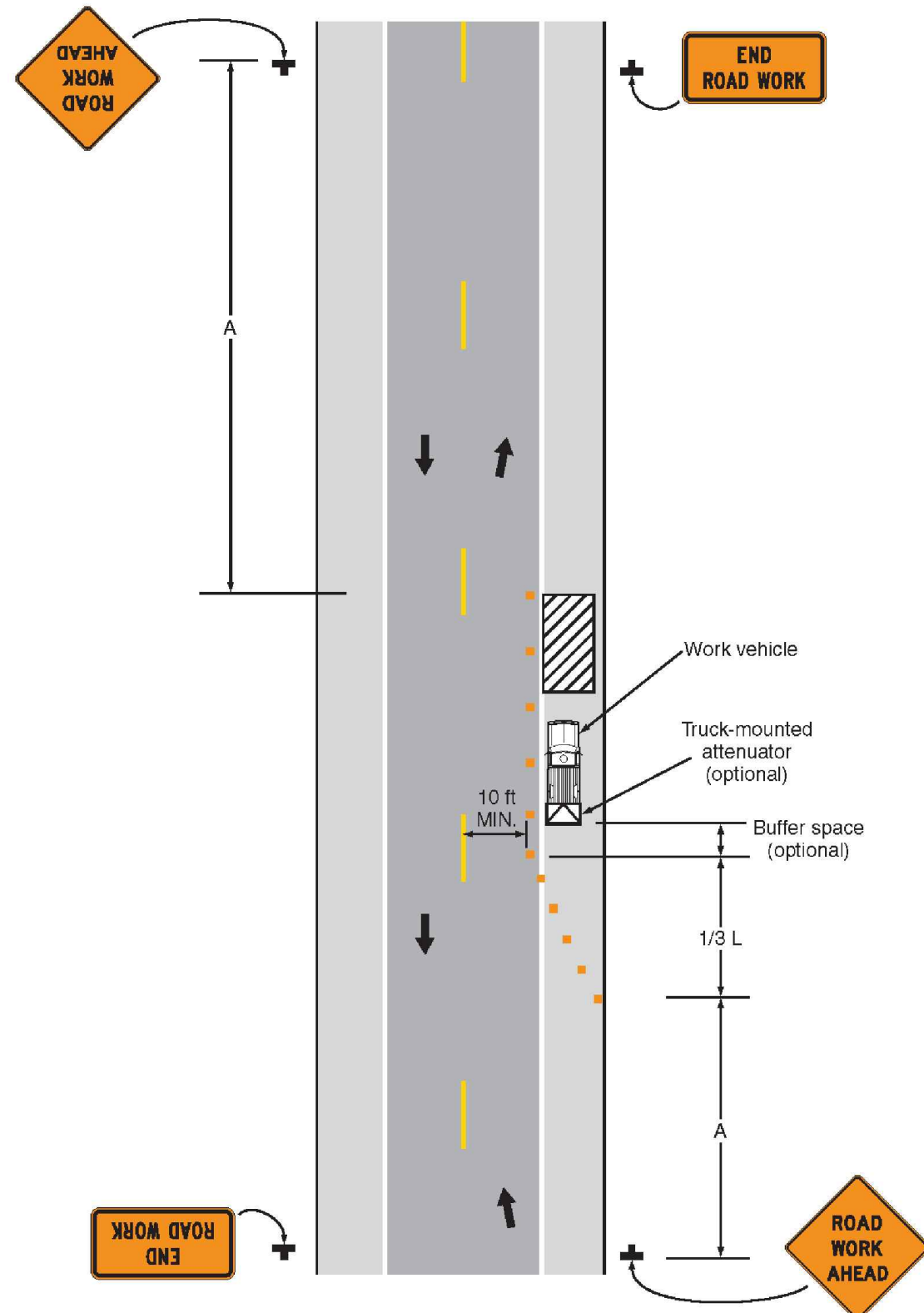
TYPICAL APPLICATION 15

WORK IN THE CENTER OF A ROAD WITH LOW TRAFFIC VOLUMES



TYPICAL APPLICATION 10

LANE CLOSURE ON A TWO-LANE ROAD USING FLAGGERS



TYPICAL APPLICATION 6

SHOULDER WORK WITH MINOR ENCROACHMENT

NOTES:

- SEE SHEET 99 C-603 FOR TEMPORARY SIGN SUMMARY AND MEANING OF SYMBOLS AND/OR LETTER CODES.

Project Management Initials: Designer: _____ Checked: _____ Approved: _____

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Filename: L:\WORK\60476644 - ORLEANS DOWNTOWN SEWERS\SEWERS\99 C-601.DWG

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Drawn By: **M. CURRAN**

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Proj Check: **M. DONOGHUE**

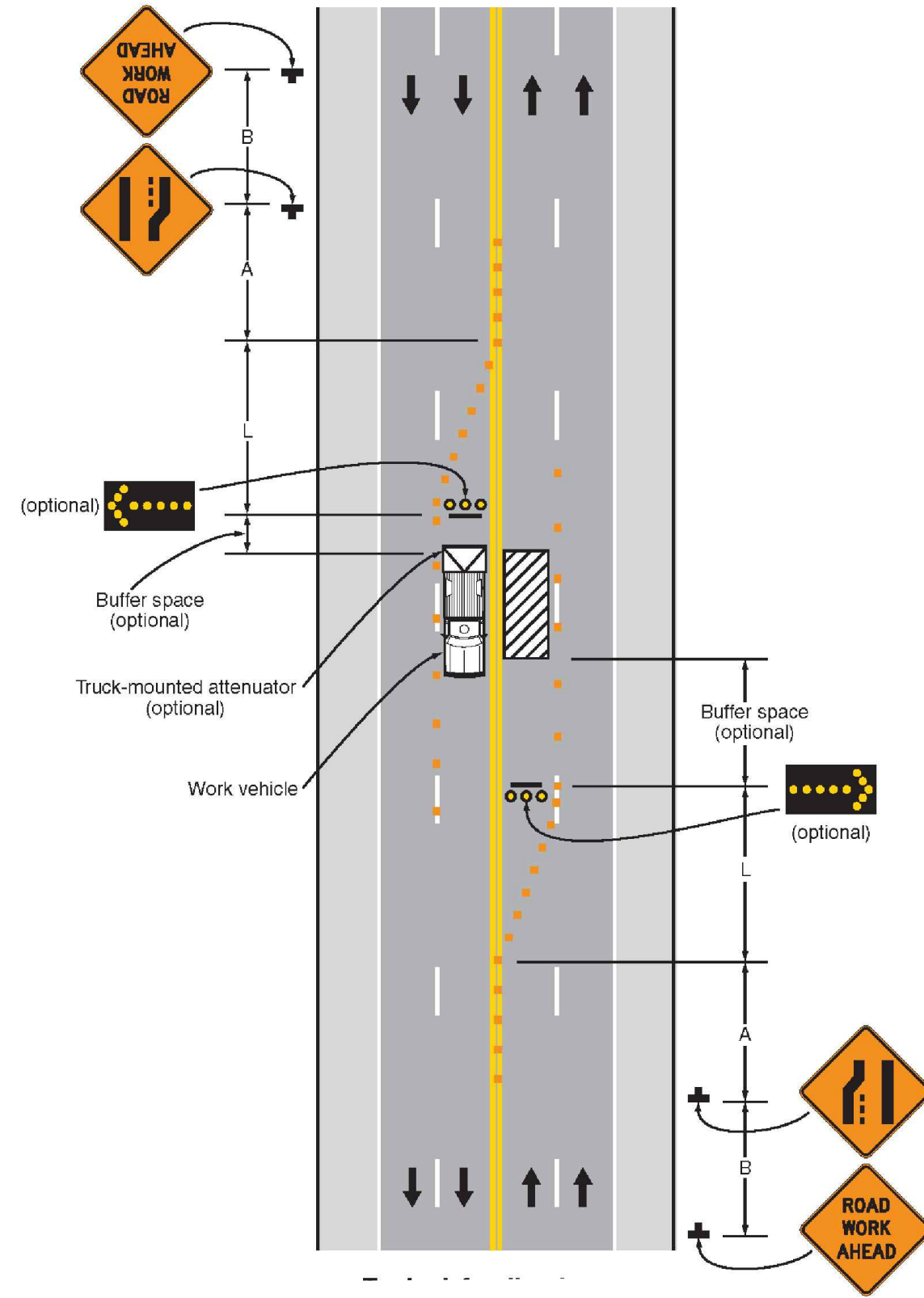
Date: **MARCH 2019**

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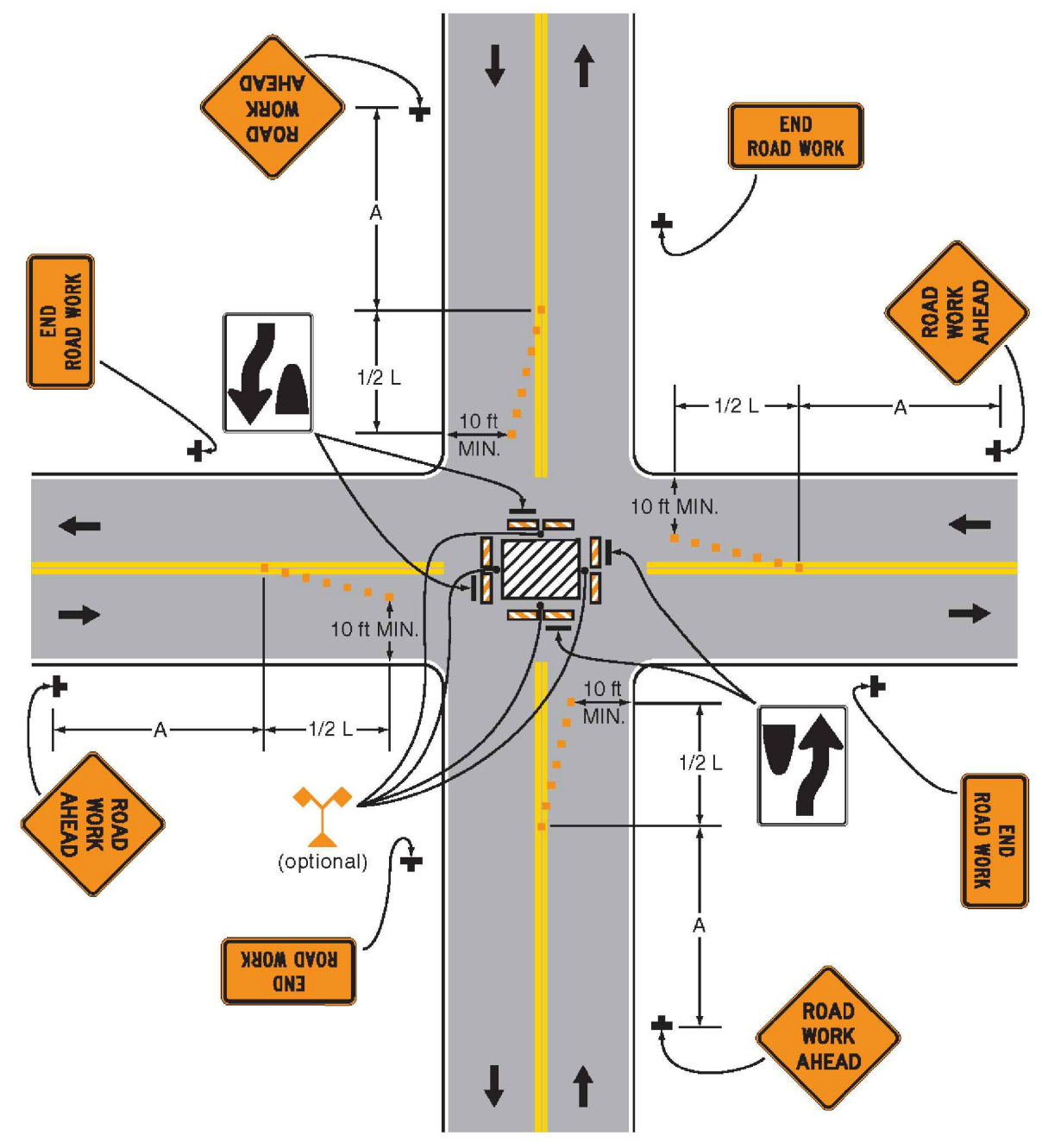
CIVIL

**TRAFFIC MANAGEMENT
 TYPICAL APPLICATIONS II**

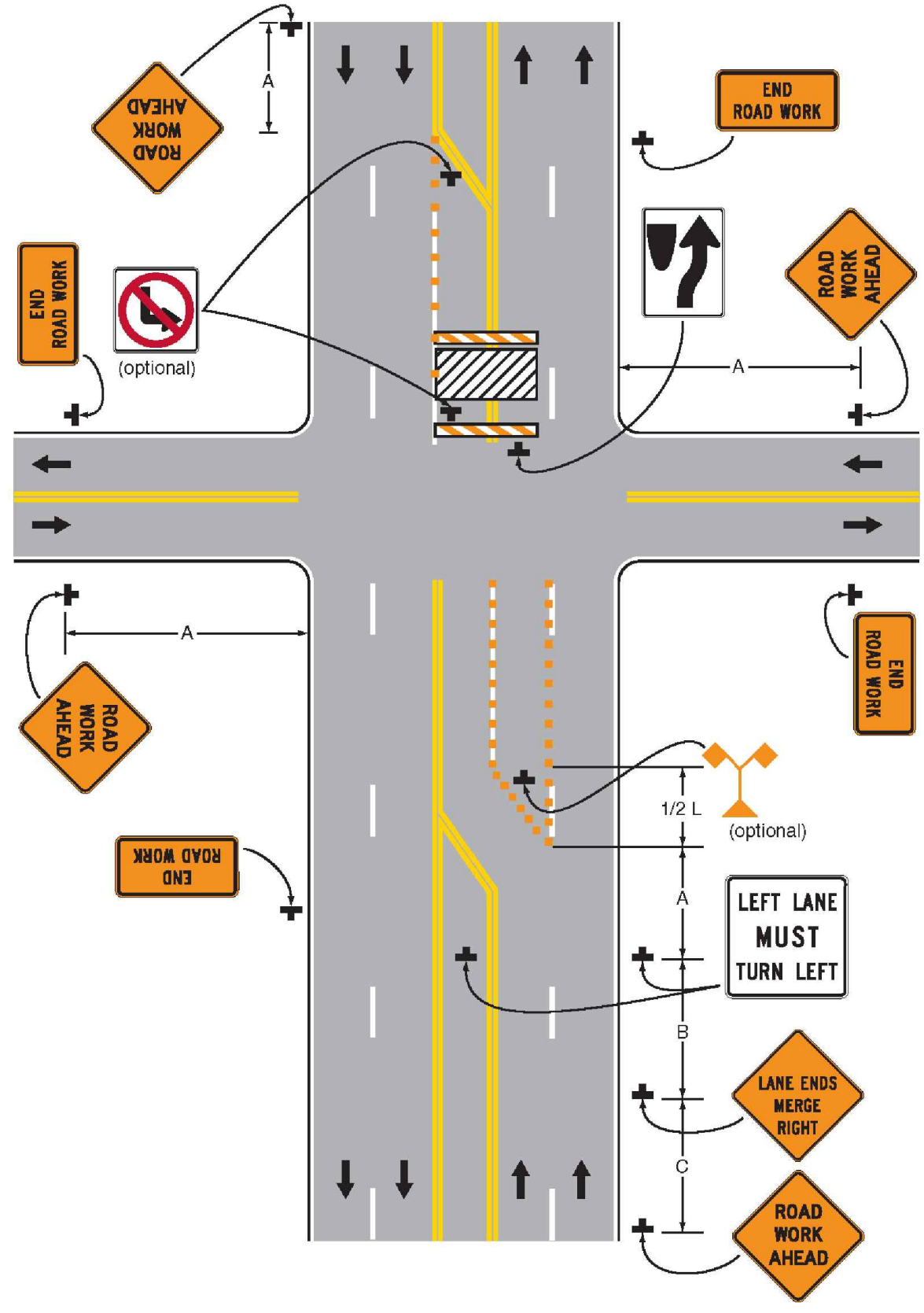
99 C-602



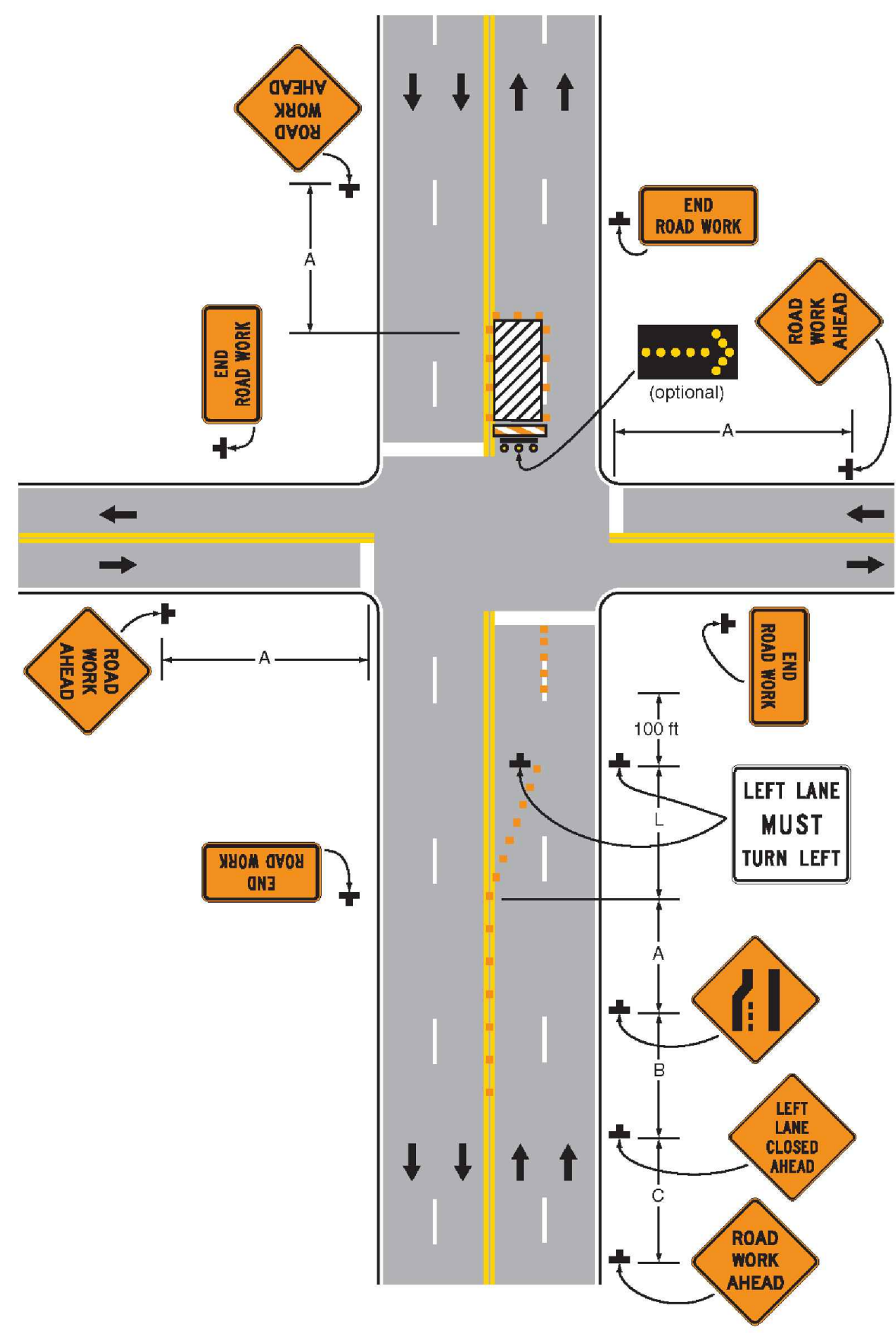
TYPICAL APPLICATION 30
 INTERIOR LANE CLOSURE ON A
 MULTI-LANE STREET



TYPICAL APPLICATION 26
 CLOSURE IN THE CENTER OF AN INTERSECTION



TYPICAL APPLICATION 25
 MULTIPLE LANE CLOSURES AT AN INTERSECTION



TYPICAL APPLICATION 23
 LEFT-HAND LANE CLOSURE ON THE
 FAR SIDE OF AN INTERSECTION

NOTES:
 1. SEE SHEET 99 C-603 FOR TEMPORARY SIGN SUMMARY AND MEANING OF SYMBOLS AND/OR LETTER CODES.

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 Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____

MEANING OF LETTER CODES ON TYPICAL APPLICATION DIAGRAMS			
ROAD TYPE	DISTANCE BETWEEN SIGNS**		
	A	B	C
URBAN (LOW SPEED)*	100 ft	100 ft	100 ft
URBAN (HIGH SPEED)*	350 ft	350 ft	350 ft
RURAL	500 ft	500 ft	500 ft
EXPRESSWAY/FREEWAY	1,000 ft	1,500 ft	2,640 ft

- NOTES:**
- * SPEED CATEGORY TO BE DETERMINED BY HIGHWAY AGENCY.
 - ** DISTANCES ARE SHOWN IN FEET. THE COLUMN HEADINGS A, B AND C ARE THE DIMENSIONS SHOWN ON SHEET 99 C-601 AND 99 C-602.
 - THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN.
 - THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS.
 - THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE THIRD SIGN IS THE FIRST ONE IN A THREE-SIGN SERIES ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL ZONE.)

FORMULAS FOR L ARE AS FOLLOWS:

FOR SPEED LIMITS OF 40 mph OR LESS:

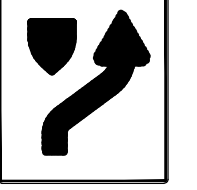
$$L = \frac{WS^2}{60}$$

FOR SPEED LIMITS OF 45 mph OR GREATER:

WHERE: L = TAPER LENGTH IN FEET


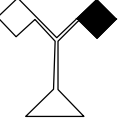


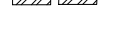



W = WIDTH OF OFFSET IN FEET

S = POSTED SPEED LIMIT, OR OFF-PEAK 85th-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN mph

TEMPORARY SIGN SUMMARY						
IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS	COLOR/LEGEND	NUMBER OF SIGNS REQUIRED*
	W	H				
G20-2	36"	18"		SEE MUTCD STANDARDS	ORANGE	2
R4-7	24"	30"		SEE MUTCD STANDARDS	WHITE	2
W4-2	36"	36"		SEE MUTCD STANDARDS	ORANGE	1
W9-2	36"	36"		SEE MUTCD STANDARDS	ORANGE	1
W20-5	36"	36"		SEE MUTCD STANDARDS	ORANGE	1
W20-3	36"	36"		SEE MUTCD STANDARDS	ORANGE	2
W20-4	36"	36"		SEE MUTCD STANDARDS	ORANGE	2
W20-7a	36"	36"		SEE MUTCD STANDARDS	ORANGE	2

* NUMBER OF SIGNS REQUIRED BASED ON ONE CREW WORKING. ADDITIONAL SIGNS MAY BE NECESSARY FOR MULTIPLE CREWS

MEANINGS OF SYMBOLS ON TYPICAL APPLICATION DIAGRAMS

-  WORK SPACE
-  HIGH-LEVEL WARNING DEVICE (FLAG TREE)
-  DIRECTION OF TRAFFIC
-  POLICE OFFICER
-  TYPE III BARRICADE
-  CHANNELIZING DEVICE
-  SIGN (SHOWN FACING LEFT)
-  ARROW BOARD



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DISCIPLINE

CIVIL

SHEET TITLE

TRAFFIC MANAGEMENT
DETAILS & TEMPORARY
SIGN SUMMARY

SHEET NUMBER

99 C-603



PROJECT

Downtown Area
Collection System and
Pump Stations

Contract No. 2019-02
SRF No. 4486

CLIENT

Town of Orleans, MA
19 SCHOOL ROAD
ORLEANS, MA 02653
(508) 240-3700

ENGINEER

AECOM TECHNICAL SERVICES, INC.
9 JONATHAN BOURNE DRIVE
POCASSET, MA 02559
PHONE: (508) 833-6950
www.aecom.com

CONSULTANTS

REGISTRATION

PRELIMINARY COPY

NOTE: This document is preliminary only and is not intended for any purpose except review and comment.

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60476644

Designed By:	M. CURRAN
Drawn By:	M. CURRAN
Dept Check:	T. PARECE
Proj Check:	M. DONOGHUE
Date:	MARCH 2019
Scale:	AS NOTED

DISCIPLINE

MECHANICAL PROCESS

SHEET TITLE

SCHEDULES

SHEET NUMBER

00 D-002

PROCESS PUMP SCHEDULE															
TAG NO.	NUMBER OF UNITS	NAME	TYPE	RATING POINT				MIN. SUCTION/DISCHARGE SIZE (IN.)	PUMP RPM MAX.	SEAL TYPE	MOTOR DATA			DRIVE TYPE	REMARKS
				CAPACITY (GPM)	HEAD (FEET)	MIN. EFF. %	SHUTOFF HEAD FT.				HP	RPM (MAX.)	ENCL. TYPE		
01 P-1 & 01 P-2	2	NAMSKAKET PUMP STATION	NON-CLOG SUBMERSIBLE	1,000	101	65	153	6/6	1770	TANDEM MECHANICAL	60	1800	EXPLOSION PROOF	DIRECT	SEE PROCESS PUMP NOTES
02 P-1 & 02 P-2	2	SNOW PUMP STATION	NON-CLOG SUBMERSIBLE	1,000	101	65	153	6/6	1770	TANDEM MECHANICAL	60	1800	EXPLOSION PROOF	DIRECT	SEE PROCESS PUMP NOTES
03 P-1 & 03 P-2	2	NAUSET PUMP STATION	NON-CLOG SUBMERSIBLE	1,000	101	65	153	6/6	1770	TANDEM MECHANICAL	60	1800	EXPLOSION PROOF	DIRECT	SEE PROCESS PUMP NOTES

WET WELL SCHEDULE										
LOCATION	INSIDE L X W	BOTTOM ELEVATION	TOP OF FILL ELEVATION	HATCH DIMENSIONS (L X W)	MAX. W.S. ELEVATION	MIN. W.S. ELEVATION	GRADE ELEVATION	INFLUENT SEWER DIAMETER	INFLUENT SEWER INV. EL.	REMARKS
PUMP STATION NO. 1	12' X 10'	13.5	13.75	72" X 60"	22.75	16.25	44.0		23.25	
PUMP STATION NO. 2							33.5		14.0	
PUMP STATION NO. 3							10.0		-8.0	

PROCESS PUMP NOTES:

- VARIABLE FREQUENCY DRIVE
- BASIS OF DESIGN: FLYGHT FP 3202 HT 3~ 460
- PUMP DESIGN BASED ON FUTURE PUMP FLOWS
- INITIAL PUMP CAPACITY SETTINGS TO BE ADJUSTED THROUGH THE VFD.
- INITIAL PUMP CAPACITY SETTINGS TO BE DETERMINED BASED ON DOWNSTREAM GRAVITY SEWER CAPACITY.
- MINIMUM SPEED RATING POINT: 450 GPM AT 50 FEET

WET WELL OPERATING LEVELS							
LOCATION	HIGH W.L. ALARM EL.	LAG PUMP START EL.	LEAD PUMP START EL.	LAG PUMP STOP EL.	LEAD PUMP STOP EL.	LOW W.L. ALARM EL.	REMARKS
PUMP STATION NO. 1	23.75	22.25	21.75	16.75	16.75	16.25	
PUMP STATION NO. 2							
PUMP STATION NO. 3							

Approved: _____
 Checked: _____
 Designer: _____
 Project Management Initials: _____
 A B C D

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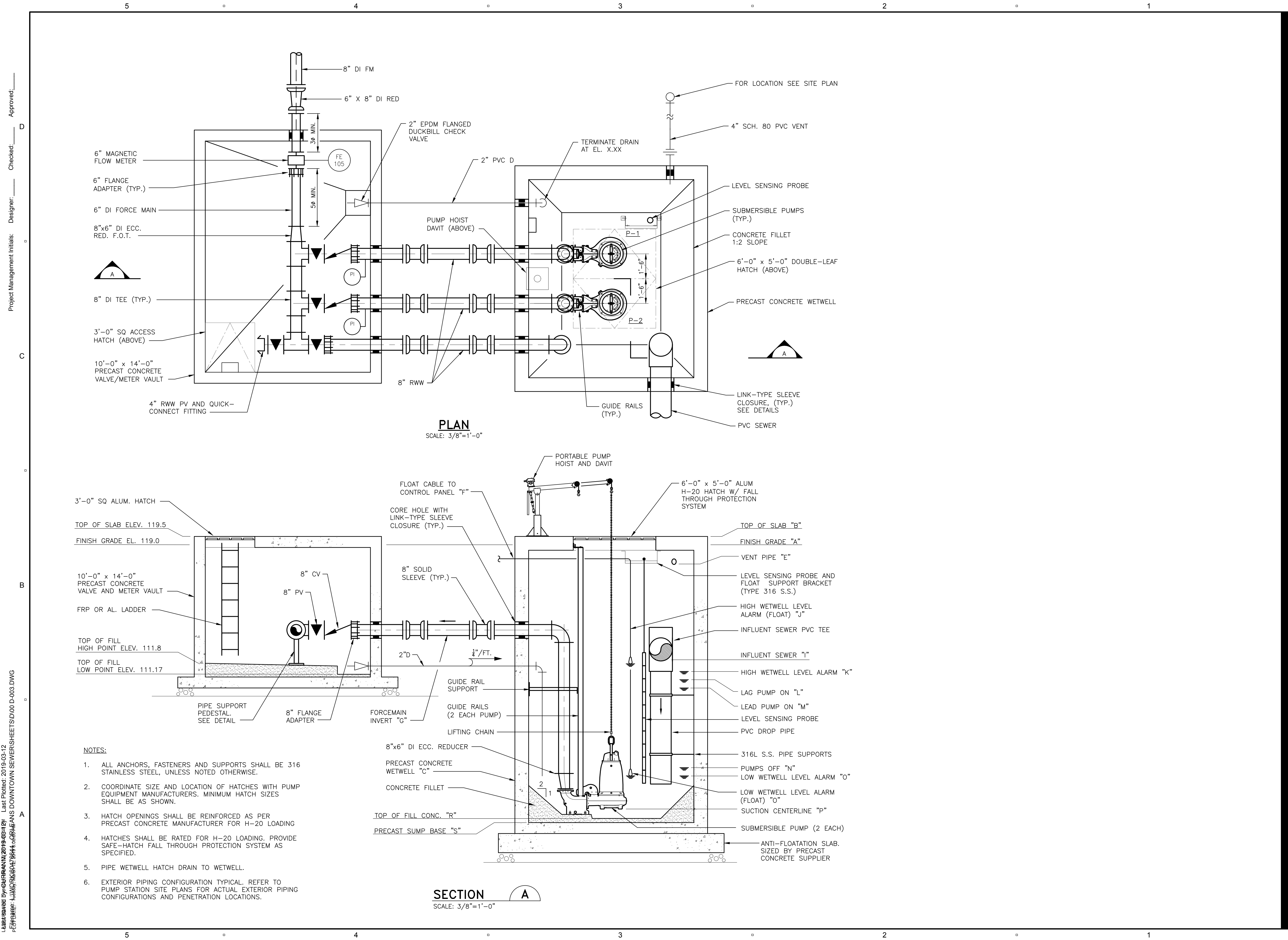
MECHANICAL PROCESS

SHEET TITLE

**TYPICAL PUMP STATION
PLAN AND SECTION**

SHEET NUMBER

00 D-003



PLAN
SCALE: 3/8"=1'-0"

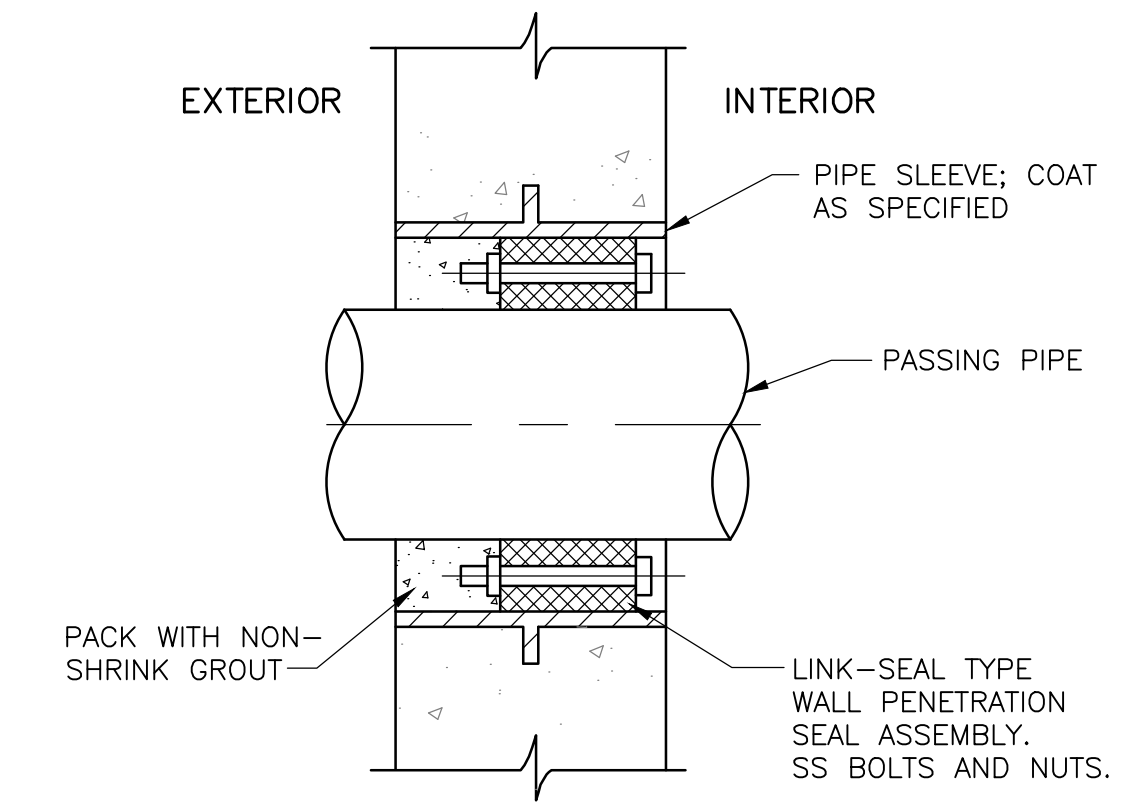
SECTION A
SCALE: 3/8"=1'-0"

- NOTES:**
- ALL ANCHORS, FASTENERS AND SUPPORTS SHALL BE 316 STAINLESS STEEL, UNLESS NOTED OTHERWISE.
 - COORDINATE SIZE AND LOCATION OF HATCHES WITH PUMP EQUIPMENT MANUFACTURERS. MINIMUM HATCH SIZES SHALL BE AS SHOWN.
 - HATCH OPENINGS SHALL BE REINFORCED AS PER PRECAST CONCRETE MANUFACTURER FOR H-20 LOADING
 - HATCHES SHALL BE RATED FOR H-20 LOADING. PROVIDE SAFE-HATCH FALL THROUGH PROTECTION SYSTEM AS SPECIFIED.
 - PIPE WETWELL HATCH DRAIN TO WETWELL.
 - EXTERIOR PIPING CONFIGURATION TYPICAL. REFER TO PUMP STATION SITE PLANS FOR ACTUAL EXTERIOR PIPING CONFIGURATIONS AND PENETRATION LOCATIONS.

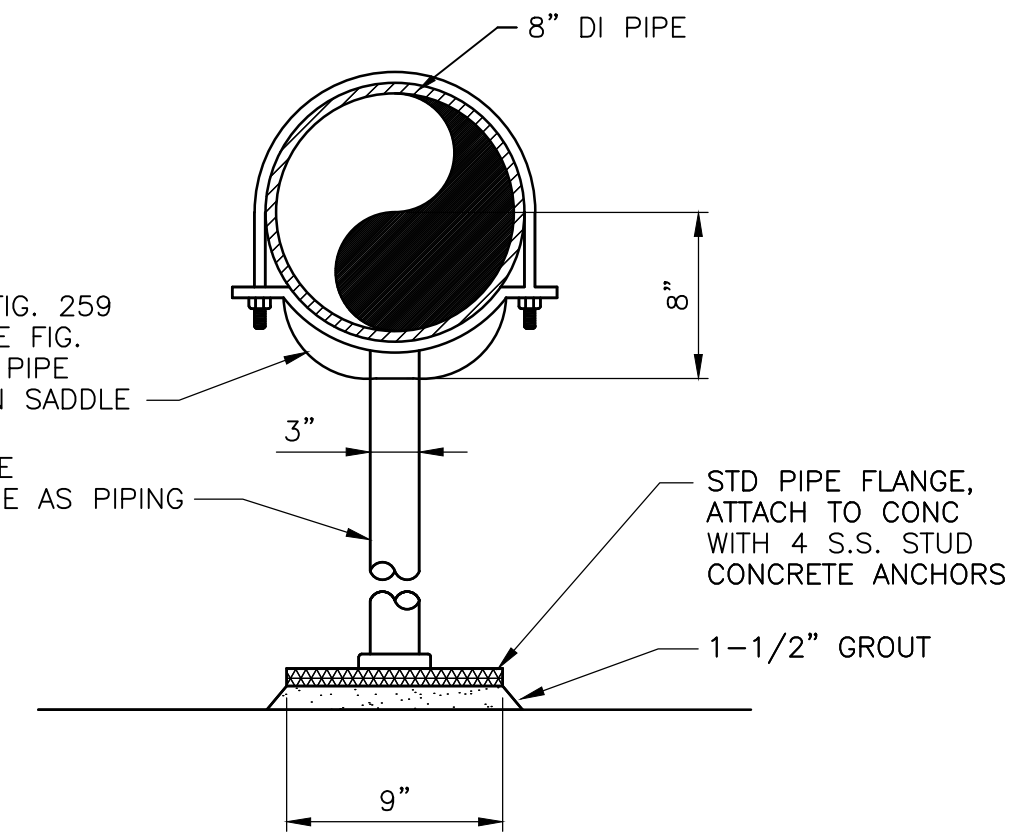
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 Project Management Initials: _____
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 DATE: 2019-03-12
 PLOT DATE: 2019-03-12

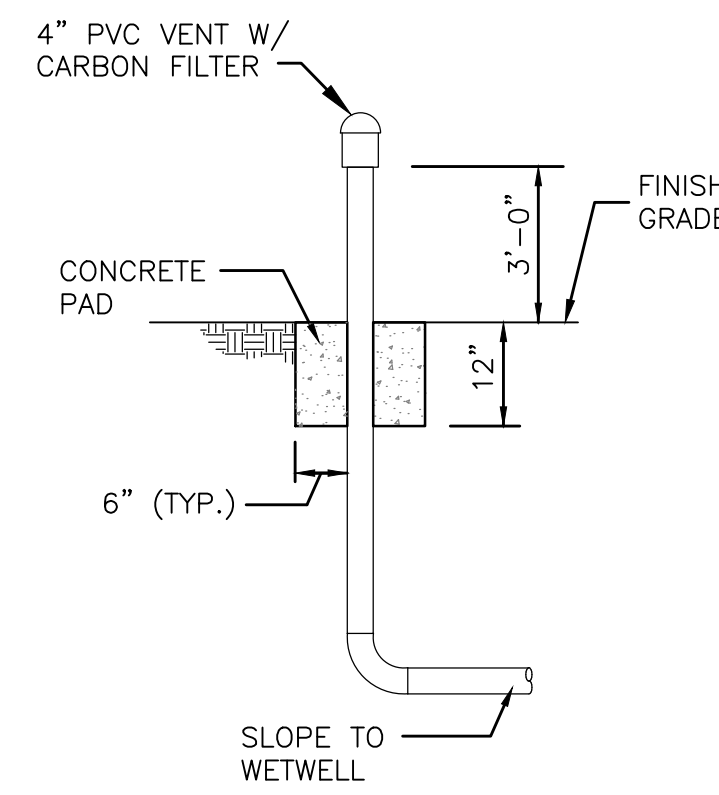
I/R	DATE	DESCRIPTION



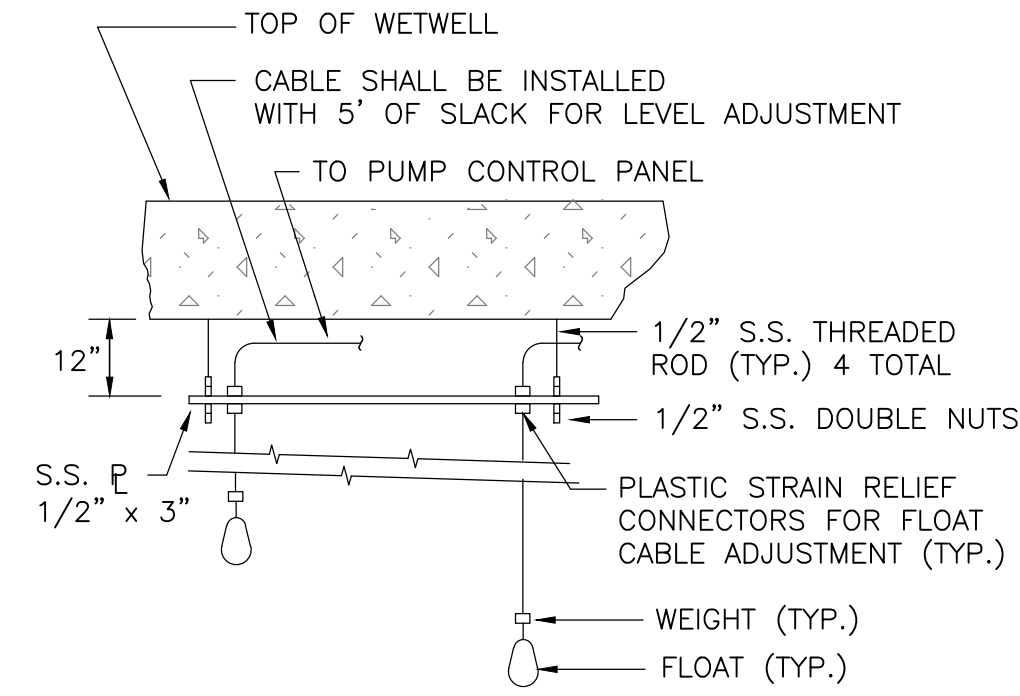
TYPICAL CONCRETE
WALL PENETRATION
NOT TO SCALE



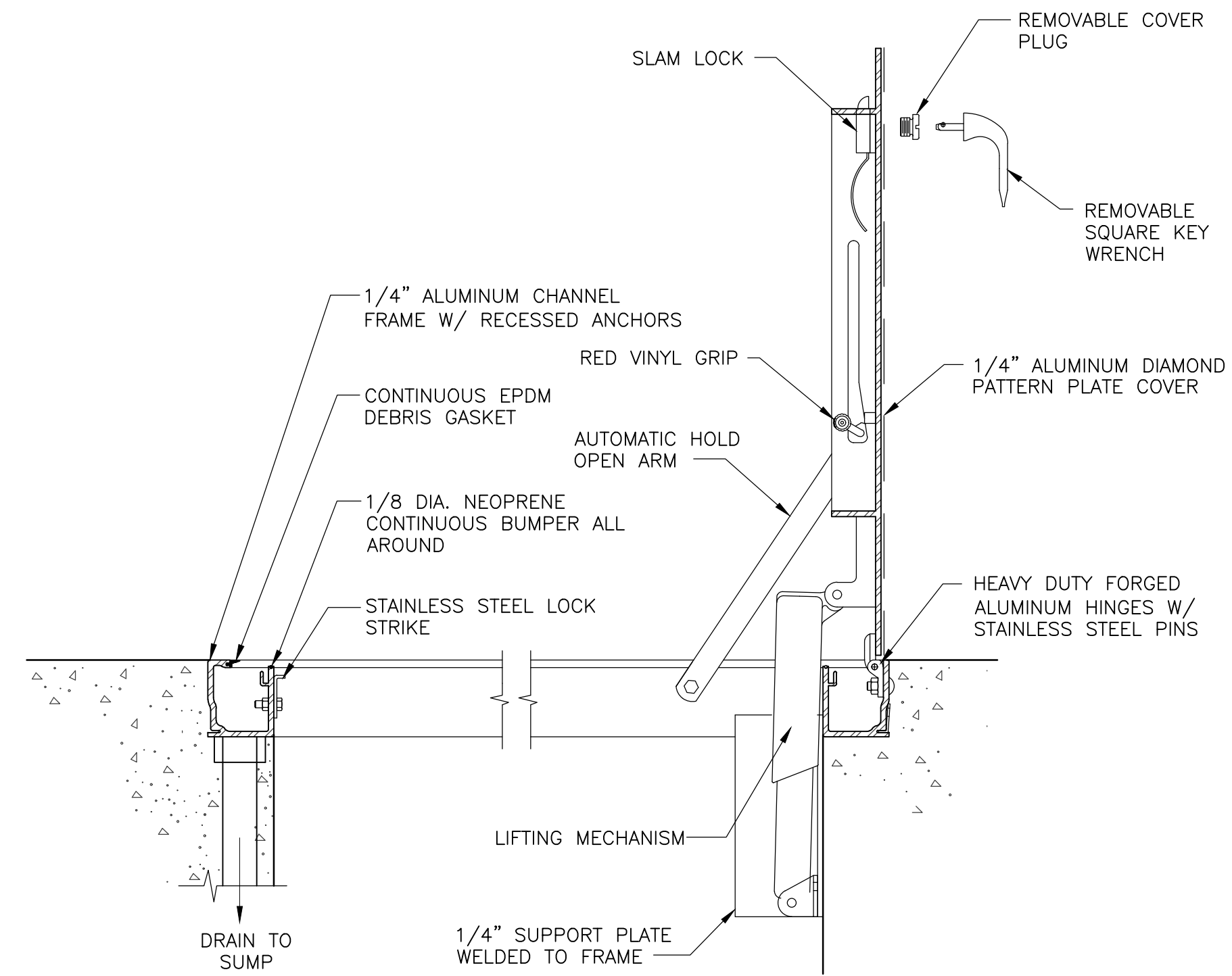
PIPE SUPPORT PEDESTAL
NOT TO SCALE



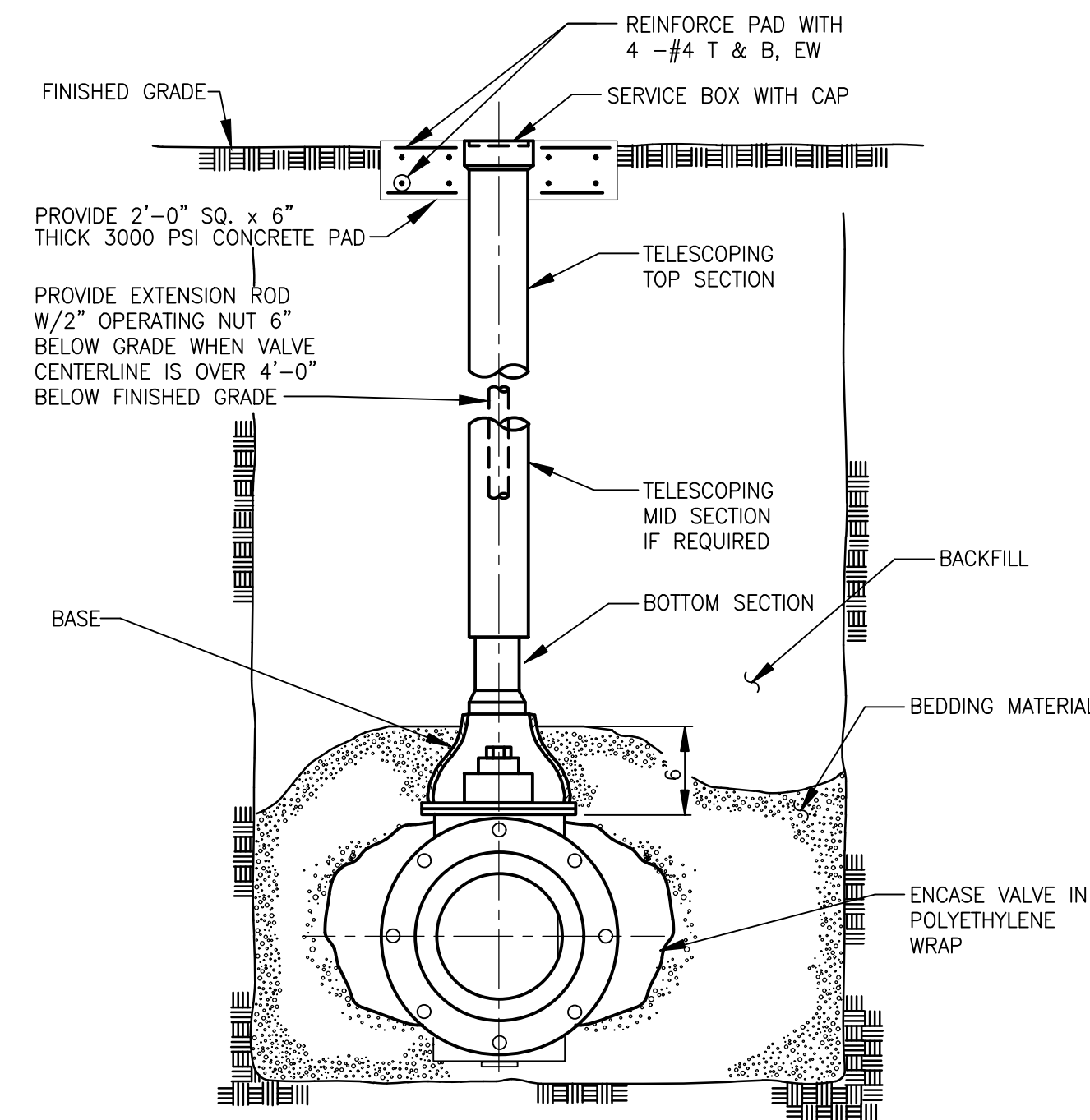
VENT DETAIL
NOT TO SCALE



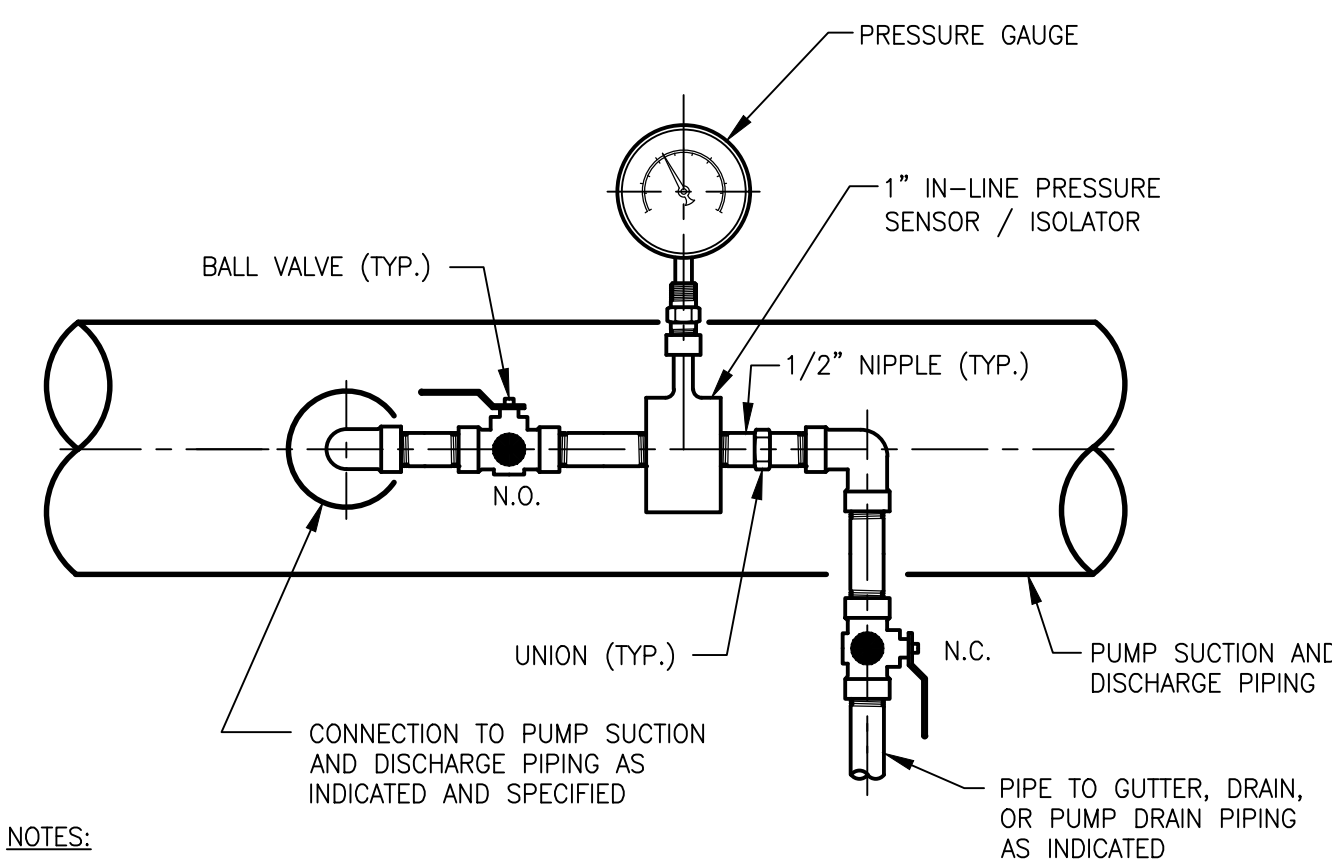
FLOAT SUPPORT DETAIL
NOT TO SCALE



SECTION
FLUSH MOUNTED ALUMINUM
ACCESS HATCH
NOT TO SCALE



BURIED GATE VALVE
NOT TO SCALE



PRESSURE GAUGE/ INSTRUMENT ASSEMBLY
NOT TO SCALE

- NOTES:
1. PIPING: TYPE 316L S.S.
 2. VALVES: TYPE 316 S.S.
 3. HARDWARE: TYPE 316 S.S.

Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____
 C
 B
 A
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INSTRUMENT TYPE IDENTIFICATION LETTERS

THIS TABLE APPLIES ONLY TO THE FUNCTIONAL IDENTIFICATION OF INSTRUMENTS

Table with columns: FIRST LETTER, MEASURED OR INITIATING VARIABLE, MODIFIER, SUCCEEDING LETTERS, READOUT OR PASSIVE FUNCTION, OUTPUT FUNCTION, MODIFIER. Rows include A (ANALYSIS), B (BURNER FLAME), C (CONDUCTIVITY), D (DENSITY), E (VOLTAGE), F (FLOW RATE), G (GAGING), H (HAND INITIATED), I (CURRENT), J (POWER), K (TIME SCHEDULE), L (LEVEL), M (MOISTURE), N (USER'S CHOICE), O (USER'S CHOICE), P (PRESSURE), Q (QUANTITY), R (RADIOACTIVITY), S (SPEED), T (TEMPERATURE), U (MULTIVARIABLE), V (VIBRATION), W (WEIGHT), X (UNCLASSIFIED), Y (USER'S CHOICE), Z (POSITION).

MISCELLANEOUS ABBREVIATIONS

Table of miscellaneous abbreviations: I/P (CURRENT TO PNEUMATIC CONVERTER), E/I (VOLTAGE TO CURRENT CONVERTER), Σ (ADD OR TOTALIZE), √ (SQUARE ROOT), X (MULTIPLY), ∅ (DIVIDE), > (HIGH SELECT), MV (MEASURED VARIABLE), < (LOW SELECT), S.P. (SET POINT), PLC (PROGRAMMABLE LOGIC CONTROLLER), f(x) (CHARACTERISTIC), P (PROPORTIONAL CONTROL MODE), D (DERIVATIVE), ∫ (INTEGRAL CONTROL MODE), ATS (AUTOMATIC TRANSFER SWITCH), DO (DISSOLVED OXYGEN), H2S (HYDROGEN SULFIDE), O2 (OXYGEN), pH (HYDROGEN ION CONCENTRATION), LP (LOCAL PANEL), VFD (VARIABLE FREQUENCY DRIVE), Δ (DIFFERENCE), I/O (INPUT/OUTPUT), ER (ELECTRICAL ROOM), LEL (LOWER EXPLOSIVE LIMIT), DW (DEWATERING), OC (ODOR CONTROL), RWW (RAW WASTE WATER), HMI (HUMAN MACHINE INTERFACE).

SYMBOLS

Grid of instrument symbols and their descriptions: HYDRAULIC CONTROL LINES, ELECTRIC INSTRUMENT LINES, PNEUMATIC SIGNAL, PROCESS FLOW, CAPILLARY TUBING, INTERNAL LINK SIGNAL, CONE CHECK VALVE, BALL VALVE, BALL CHECK VALVE, SWING CHECK VALVE, BUTTERFLY VALVE, DAMPER, OR LOUVER, PLUG VALVE, GATE VALVE, DIAPHRAGM VALVE, GLOBE VALVE, RESTRAINED FLEXIBLE COUPLING, FLOAT VALVE, 3-WAY MIX VALVE, 3-WAY DIVERTER VALVE, 3-WAY SOLENOID VALVE, 4-WAY MIX VALVE, 4-WAY SOLENOID VALVE, ANGLE VALVE, SOLENOID VALVE, SELF-OPERATING BACK PRESSURE REGULATOR VALVE, SELF-OPERATING PRESSURE REGULATOR VALVE, PRESSURE REDUCING REGULATOR VALVE W/EXTERNAL PRESSURE TAP, PRESSURE RELIEF VALVE, VACUUM RELIEF VALVE, KNIFE GATE VALVE, PINCH VALVE, STOP LOG, SLUICE GATE, PREFABRICATED SLIDE GATE, INSERTION MASS FLOW METER, ACCUMULATOR, AERATOR, BAR SCREEN, CALIBRATION STANDPIPE, CHEMICAL SEAL, IN LINE SEAL, CONCENTRIC REDUCER, DRAIN, DUPLEX FILTER, ECCENTRIC REDUCER, FLEXIBLE HOSE, GRINDER, LOAD CELL, MIXER, VERTICAL SHAFT MIXER, PULSATION DAMPENER, QUICK DISCONNECT, RADIO, ULTRASONIC, OR ACOUSTIC SIGNAL, RUPTURE DISC (PRESSURE RELIEF), RUPTURE DISC (VACUUM RELIEF), STRAINER, CONE CHECK VALVE, DOUBLE DISC CHECK VALVE, HOSE PUMP, DIFFUSER, STATIC MIXER, TANK VENT, UNION, WEIR, CYLINDER ACTUATOR, DIAPHRAGM ACTUATOR WITH POSITIONER, HAND OPERATOR, HYDRAULIC OPERATOR, MOTOR OPERATOR, PNEUMATIC OPERATOR, SOLENOID OPERATOR, TERMINAL STRIP IN LOCAL PANEL FOR INTERFACE WITH COMPUTER/MUX, FLOW RATE CONTROLLER, FLOW ELEMENT (VENTURI), INSERT FLOW ELEMENT (VENTURI), MAGNETIC FLOWMETER, ORIFICE PLATE, PARSHALL FLUME, ROTAMETER, ACOUSTIC OR DOPPLER INLINE FLOWMETER, "V" NOTCH WEIR, CENTRIFUGAL PUMP.

GENERAL NOTES

- 1. INSTRUMENT SUFFIX: NUMERIC SUFFIXES IDENTIFY INSTRUMENTS WITH DIFFERENT FUNCTIONS (E.G., A RUN AND AN OUT OF SERVICE LIGHT) ARE PRECEDED BY A DECIMAL POINT (E.G., AA-MIL-343.1 AND AA-MIL-343.2). ALPHABETIC SUFFIXES IDENTIFY MULTIPLE OCCURRENCES OF INSTRUMENTS WITH THE SAME FUNCTION (E.G., TWO VALVE INDICATORS IN DIFFERENT PANELS, (E.G. AA-ZIL-161.1A, AND AA-ZIL-161.1B)).
2. SEE MECHANICAL FOR ISOLATION RING DETAIL.

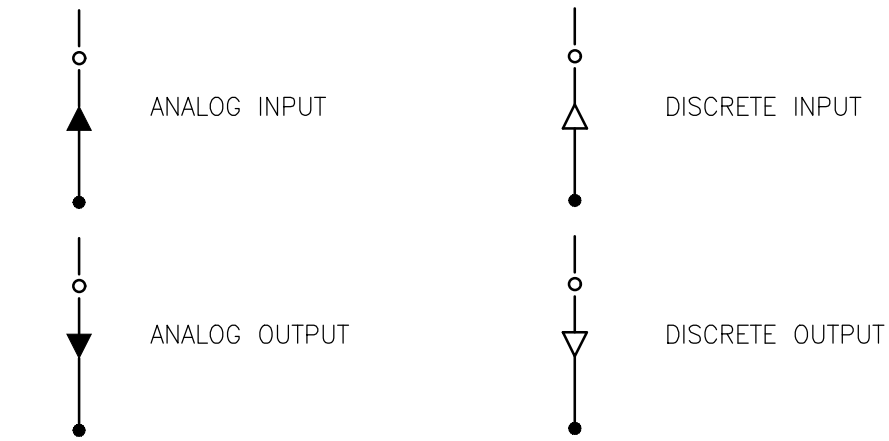
INSTRUMENT SYMBOLS

Diagram explaining instrument symbol components: INSTRUMENT TYPE (SEE IDENTIFICATION TABLE), FACILITY PREFIX, LOOP IDENTIFICATION NUMBER (SEE NOTE), ON/OFF, MODIFIER OR HAND SWITCH POSITION SYMBOL, INSTRUMENT LOCATION, SUPPLIER (IF OTHER THEN INSTRUMENT SUPPLIER), FRONT PANEL MOUNTED, PANEL INDICATION, REAR PANEL MOUNTED, FIELD MOUNTED, FIELD INDICATION, PICS CONFIGURABLE FUNCTION, CRT DISPLAY OF ALARMS & STATUS, PICS CONFIGURATION FUNCTION, CRT DISPLAY OF CONTROL & INDICATION, PICS CONFIGURABLE FUNCTION, NOT DISPLAYED ON CRT, INTERLOCK, SURGE PROTECTOR - SEE SPECIFICATION, REQUIRES 120 VAC POWER SUPPLY FROM PLC PANEL, FACILITY PREFIX, SPECIFIC LOOP NUMBER, DUPLICATE LOOP IDENTIFICATION SYMBOL, REFERENCE LOOP NUMBER, REFERENCE FACILITY.

SUPPLIERS

ALL INSTRUMENTS ARE SPECIFIED BY INSTRUMENTS UNLESS INDICATED BY: (E) SPECIFIED BY ELECTRICAL (X) EXISTING (M) SPECIFIED BY MECHANICAL (H) SPECIFIED BY HVAC (F) FURNISHED WITH EQUIPMENT (P) SPECIFIED BY PLUMBING. CONTRACTOR SHALL PROVIDE ALL INSTRUMENTS AS SPECIFIED ON DATA SHEETS ATTACHED TO SPECIFICATION SECTION 13300.

PLC OR DCS INPUT/OUTPUT SYMBOLS



HAND SWITCH POSITION SYMBOLS

Table of hand switch position symbols: A (AUTOMATIC), C (CLOSE), F (FAST OR FORWARD), H (HAND), J (JOG), L (LOCAL), M (MANUAL), O (OPEN OR OFF), R (RUN OR REMOTE), S/S (START/STOP), E/S (EMERGENCY STOP), SBY (STANDBY), F/R (FORWARD/REVERSE), L/R (LOCAL/REMOTE), L/S/R (LOCAL/STOP/REMOTE), HOR (HAND-OFF-REMOTE), ROA (RUN-OFF-AUTO), OSC (OPEN/STOP/CLOSE), FSR (FORWARD/STOP/REVERSE), TSM (THRU/STOP/MIX), OSF (OFF/SLOW/FAST), OTC (OPEN/TRAVEL/CLOSE).



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Contract No. 2019-02 SRF No. 4486

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ENGINEER

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Table with columns: I/R, DATE, DESCRIPTION.

PROJECT NUMBER

60476644

Table with columns: Designed By, Drawn By, Dept Check, Proj Check, Date, Scale. Values include M. CURRAN, M. DONOGHUE, MARCH 2019, AS NOTED.

DISCIPLINE

INSTRUMENTATION SHEET TITLE

LEGEND SYMBOLS AND GENERAL NOTES

SHEET NUMBER

00 DI-001

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Date:	MARCH 2019
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DISCIPLINE

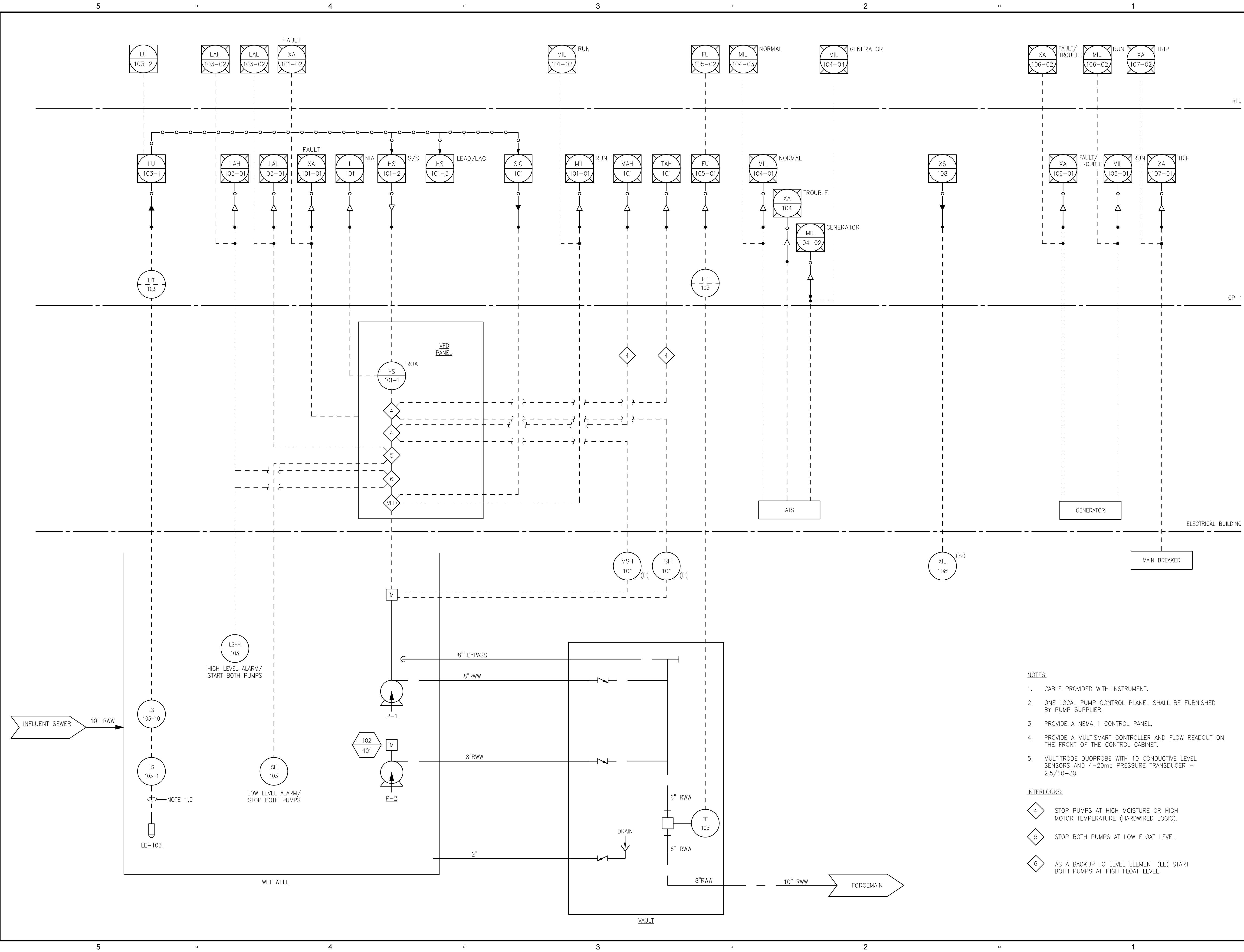
INSTRUMENTATION

SHEET TITLE

P & ID

SHEET NUMBER

00 DI-601



NOTES:

- CABLE PROVIDED WITH INSTRUMENT.
- ONE LOCAL PUMP CONTROL PANEL SHALL BE FURNISHED BY PUMP SUPPLIER.
- PROVIDE A NEMA 1 CONTROL PANEL.
- PROVIDE A MULTISMART CONTROLLER AND FLOW READOUT ON THE FRONT OF THE CONTROL CABINET.
- MULTITRODE DUOPROBE WITH 10 CONDUCTIVE LEVEL SENSORS AND 4-20ma PRESSURE TRANSDUCER - 2.5/10-30.

INTERLOCKS:

- 4 STOP PUMPS AT HIGH MOISTURE OR HIGH MOTOR TEMPERATURE (HARDWIRED LOGIC).
- 5 STOP BOTH PUMPS AT LOW FLOAT LEVEL.
- 6 AS A BACKUP TO LEVEL ELEMENT (LE) START BOTH PUMPS AT HIGH FLOAT LEVEL.

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Project Management Initials: Designer: _____ Checked: _____ Approved: _____

A

B

C

D

5

4

3

2

1

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Proj Check: **M. DONOGHUE**

Date: **MARCH 2019**

Scale: **AS NOTED**

DISCIPLINE

ELECTRICAL

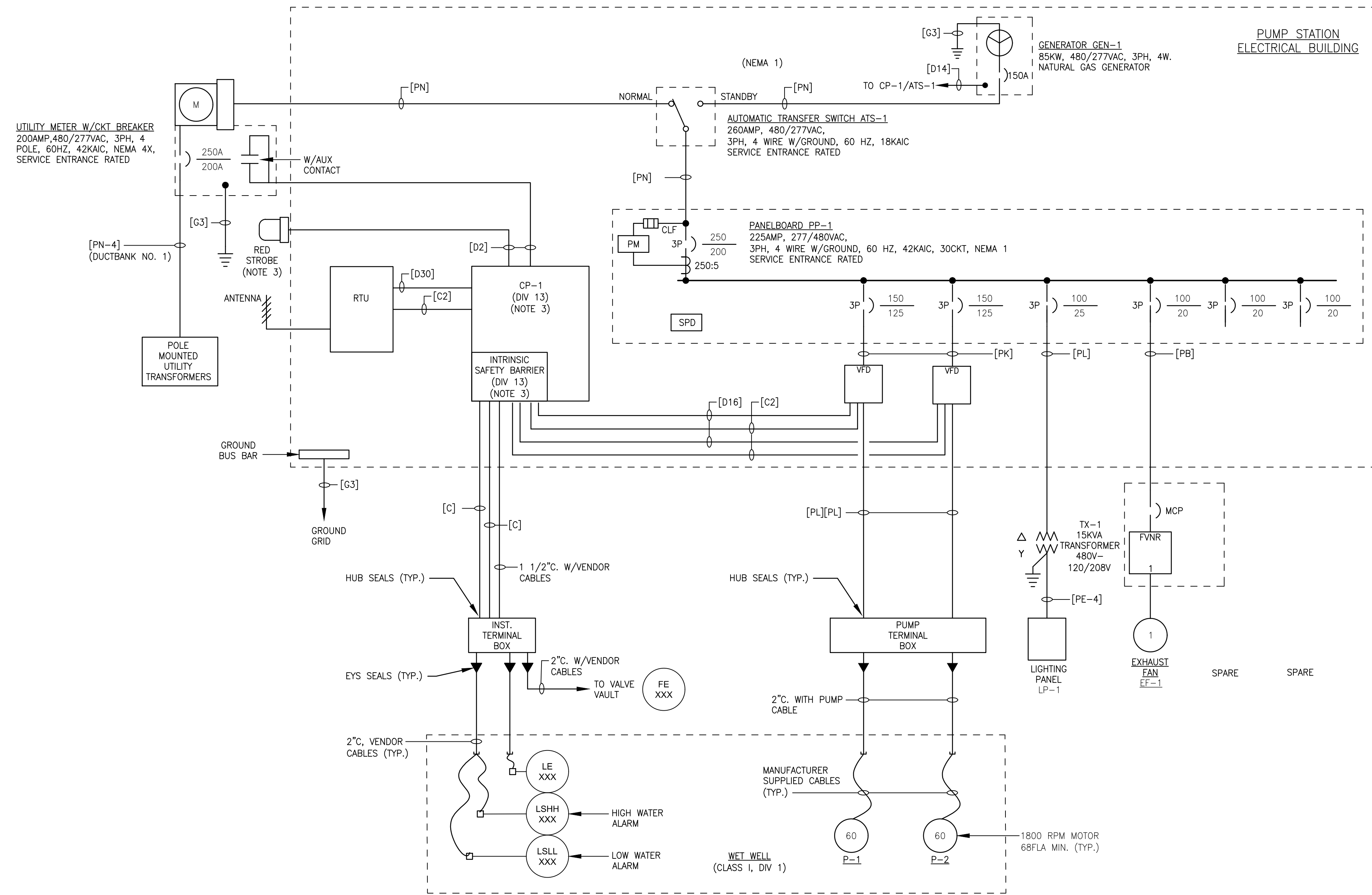
SHEET TITLE

**PUMP STATION - SINGLE
LINE DIAGRAM**

SHEET NUMBER

00 E-601

LOAD CALCULATIONS		
DESCRIPTION	CONNECTED LOAD AMPS @ 480V	DEMAND LOAD AMPS @ 480V
2 PUMPS AT 60 HP EACH	136	68
EXHAUST FAN 1 HP	2.1	2.1
25% OF LARGEST MOTOR	17	17
TOTAL MOTOR LOADS	155.1	87.1
TRANSFORMER LOAD	18	18
TOTAL LOAD	173.1	105.1
277/480V 3PH 4W SERVICE		



**TYPICAL PUMP STATION
ONE-LINE DIAGRAM**

AREA CLASSIFICATION SCHEDULE						
LOCATION	NEMA TYPE					
	1	3R	4	4X*	CLASS 1, DIV I	CLASS I, DIV 2
WET WELL					X	
VALVE VAULT						X
OUTDOORS				X		
IN BUILDING	X					

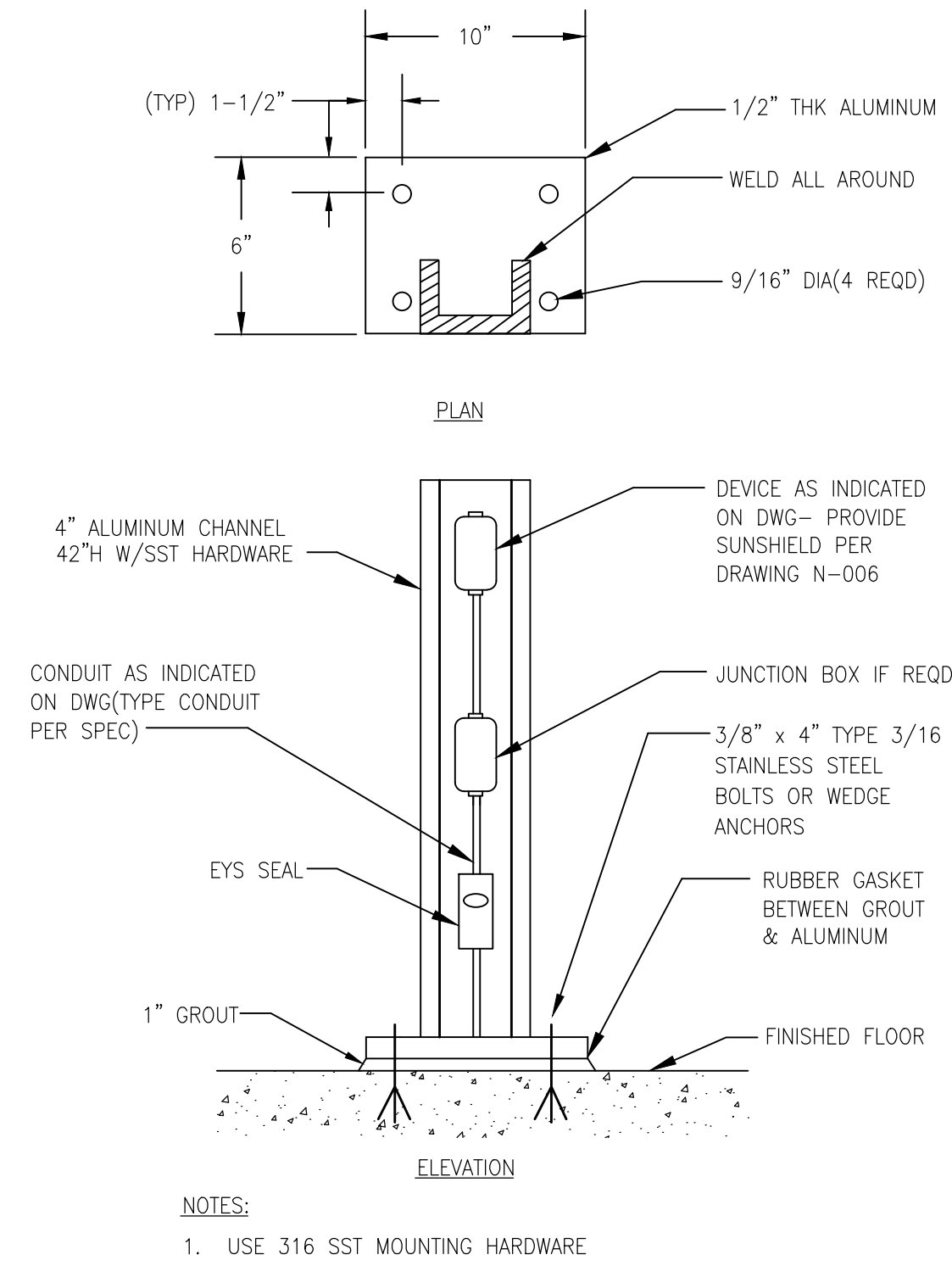
*NEMA-4X MATERIALS SHALL BE 304 STAINLESS STEEL

LP-1												
LOCATION		ELECTRICAL BUILDING						VOLTAGE				
PHASE A LOAD	3 KVA						120/208 3PH 4 W					
PHASE B LOAD	2 KVA						MAIN	50A				
PHASE C LOAD	2 KVA						SHORT CKT	10 KAIC				
TOTAL LOAD	8 KVA						ENCLOSURE	NEMA 1 - SURFACE				
NOTE: INTEGRAL SURGE PROTECTIVE DEVICE												
LOAD	VA	TRIP	POLES	CKT	PHASE	CKT	POLES	TRIP	VA	LOAD		
ELECTRICAL BUILDING LIGHTING	250	20	1	1	A	2	1	20	360	RECEPTACLES		
OUTSIDE LIGHTING	300	20	1	3	B	4	1	20	700	CP-1		
BATTERY CHARGER	1,000	20	1	5	C	6	1	20	700	RTU		
DAMPERS	1,000	20	1	7	A	8	1	20	1,000	GENERATOR CONTROL PANEL		
AUTOMATIC TEMP CONTROL PANEL	600	20	1	9	B	10	1	20	800	JACKET WATER HEATER		
ROOM UNIT HEATER GUH-1	100	20	1	11	C	12	1	20	600	ALTERNATOR SPACE HEATER		
OUTDOOR RECEPTACLE	180	20	1	13	A	14	1	20		SPARE		
SPACE				15	B	16	1	20		SPARE		
SPACE				17	C	18	1	20		SPARE		
SPACE				19	A	20	1	20		SPARE		
SPACE				21	B	22	1	20		SPARE		
SPACE				23	C	24	1	20		SPARE		

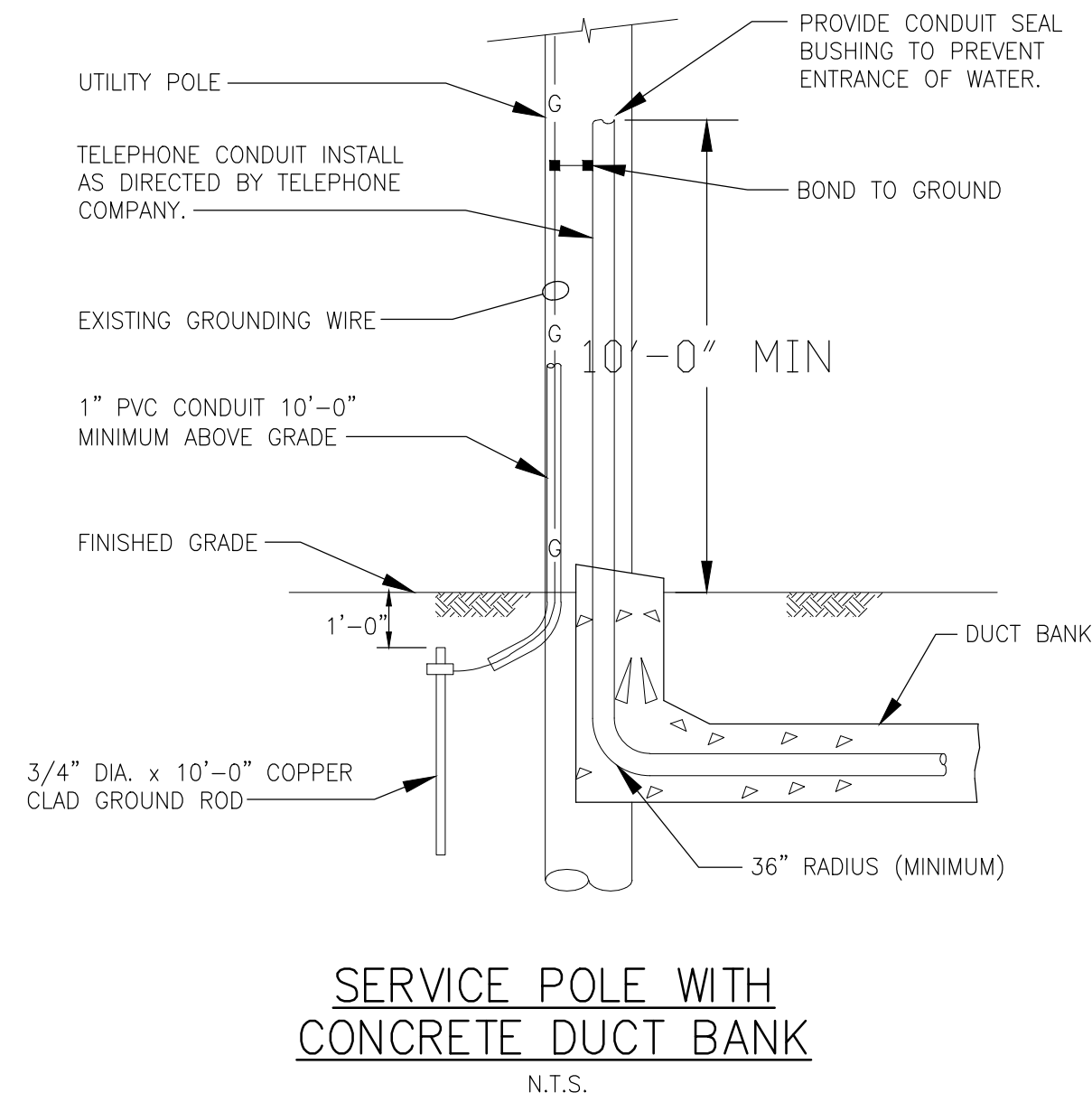
NOTES:

- ELECTRICAL COMPANY TO PROVIDE POLE MOUNTED TRANSFORMER WITH A 277/480VAC SECONDARY. ELECTRICAL CONTRACTOR TO PROVIDE SECONDARY RACEWAYS AND CONDUCTORS BETWEEN POLE, MAIN CIRCUIT BREAKER AND METER. TERMINATIONS AT THE POLE MOUNTED TRANSFORMER PROVIDED BY THE ELECTRICAL UTILITY. ELECTRICAL CONTRACTOR TO PROVIDE A METER SOCKET IN ACCORDANCE WITH ELECTRIC COMPANY STANDARDS. METER TO BE PROVIDED BY ELECTRIC COMPANY.
- CONTROL PANEL (CP-1) AND INTRINSIC SAFETY BARRIER PROVIDED UNDER DIVISION 13. CONTROL PANELS TO BE MOUNTED WITHIN BUILDING. REFER TO DIVISION 13 FOR CONTROL PANEL DETAILS, COORDINATE DIMENSIONS AND INSTALLATION REQUIREMENTS WITH THE GENERAL CONTRACTOR.
- PROVIDE FEDERAL SIGNAL 121A VITALITE ROTATING WARNING LIGHT OR EQUAL.
- FOR CONDUIT AND WIRE SCHEDULE SEE SHEET 00 E-00X

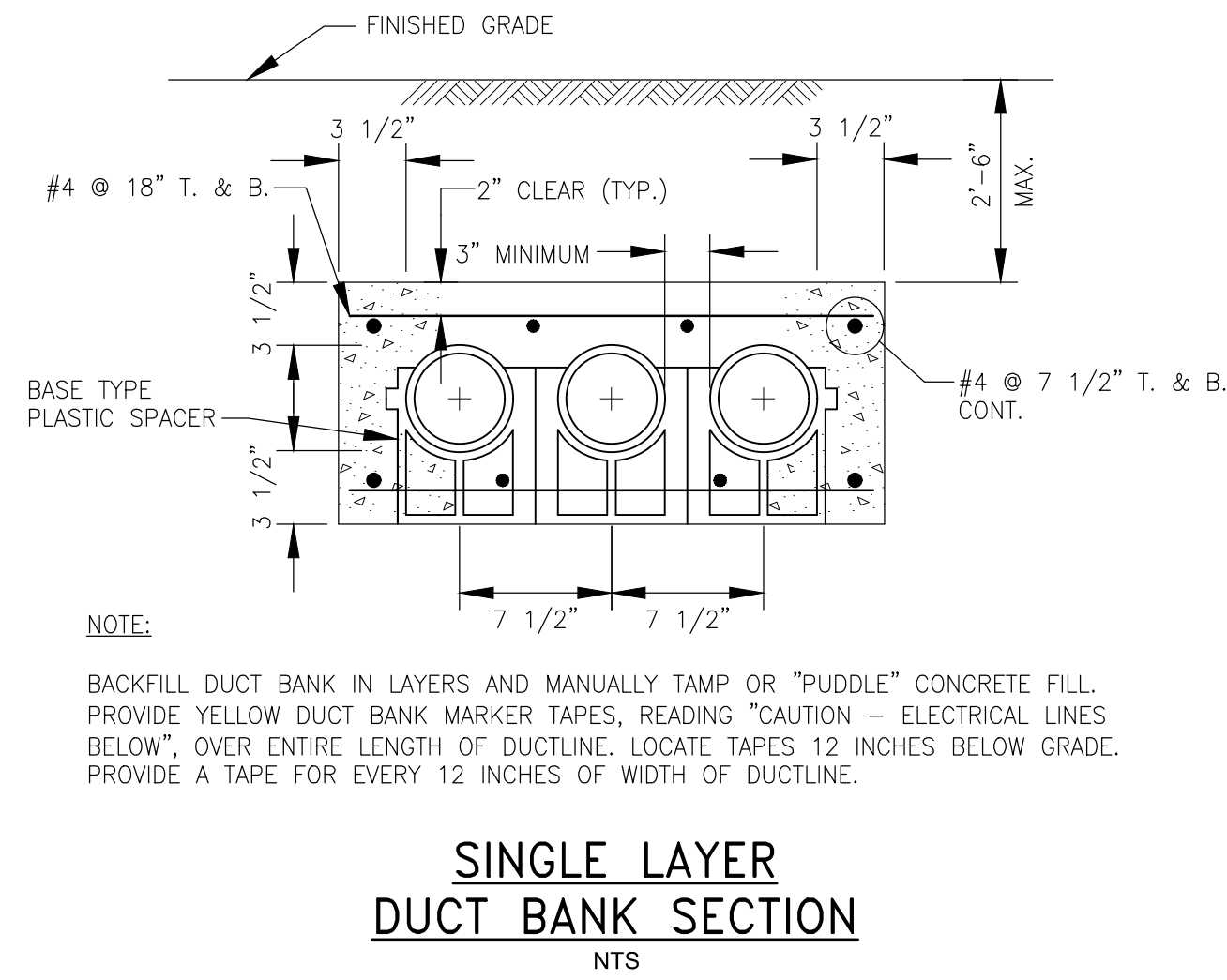
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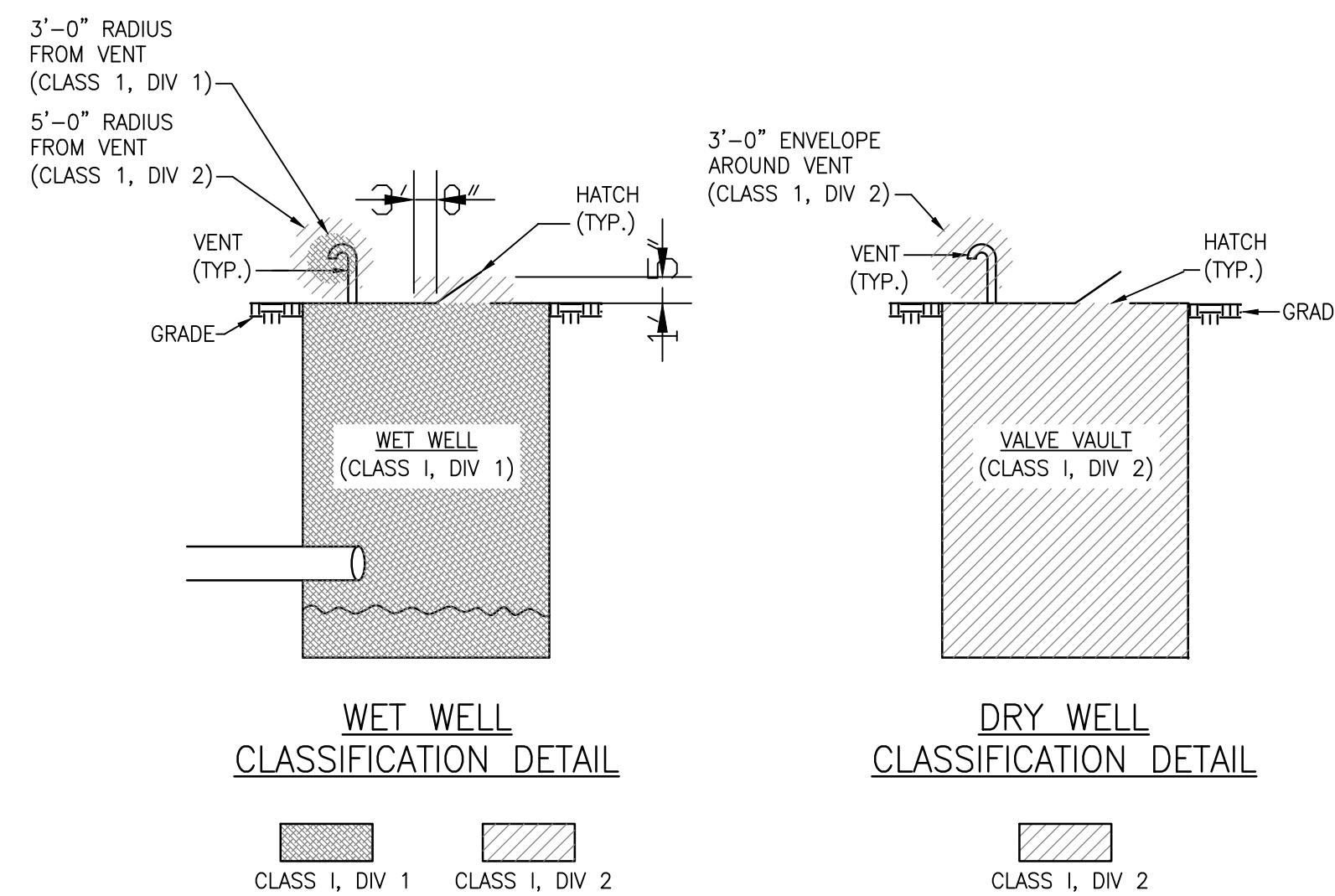
PEDESTAL MOUNTED DEVICE DETAIL



SERVICE POLE WITH CONCRETE DUCT BANK

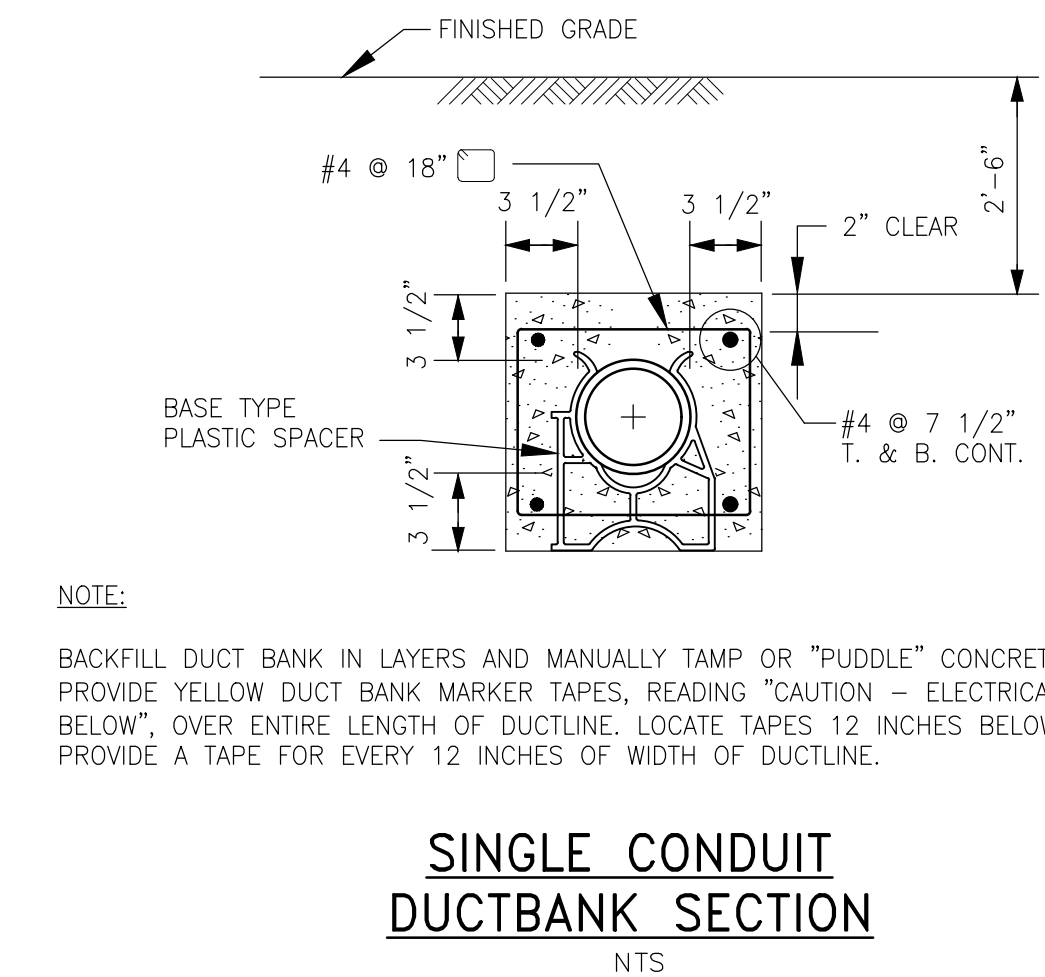


SINGLE LAYER DUCT BANK SECTION



WET WELL CLASSIFICATION DETAIL

DRY WELL CLASSIFICATION DETAIL



SINGLE CONDUIT DUCTBANK SECTION

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