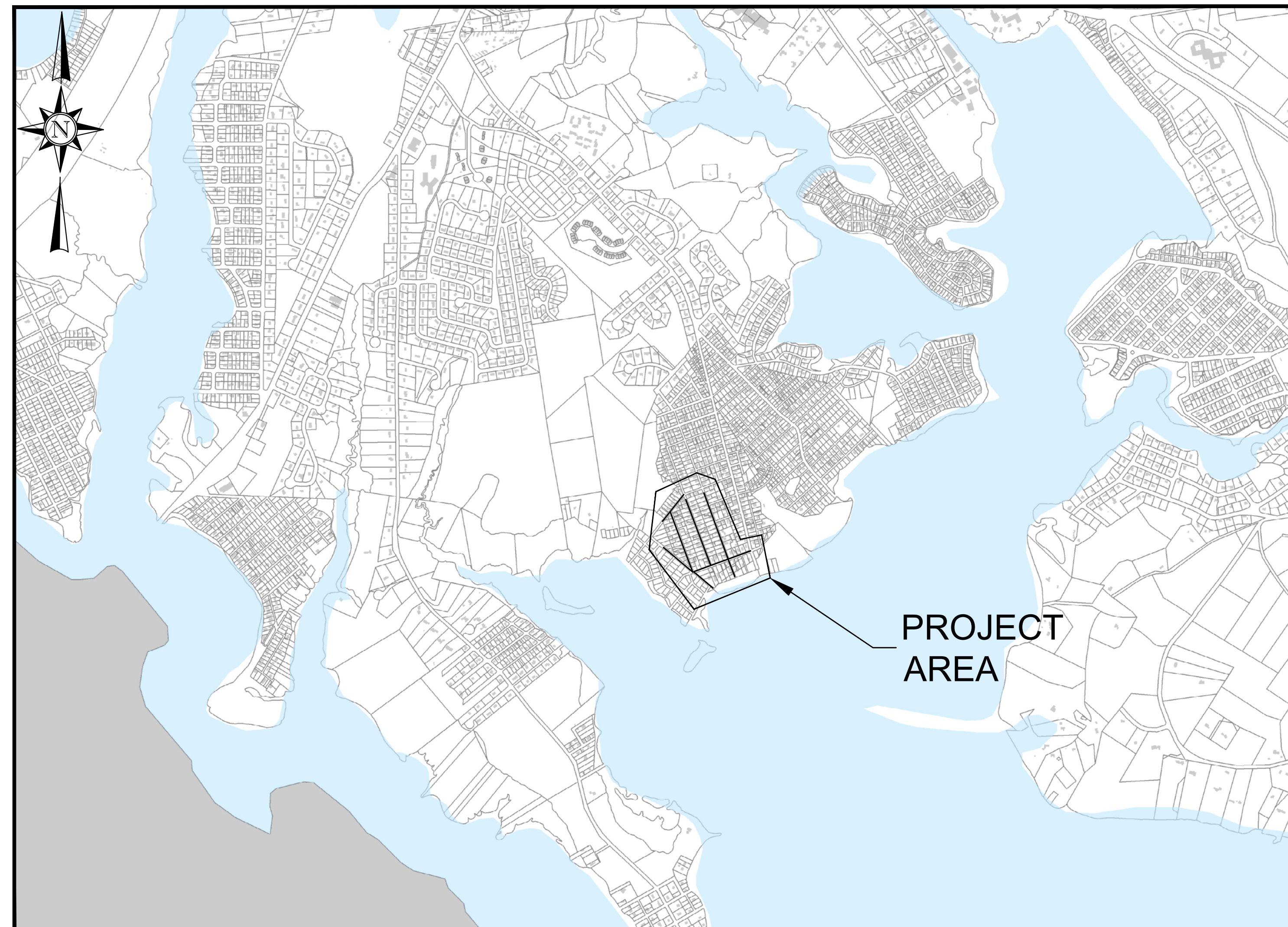


# TOWN OF WAREHAM, MASSACHUSETTS WAREHAM WATER POLLUTION CONTROL INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN CONTRACT NO. 2022-001



WAREHAM WATER POLLUTION CONTROL

GUY CAMPINHA, DIRECTOR OF WATER POLLUTION CONTROL



**LOCATION MAP**  
NOT TO SCALE

PREPARED BY:

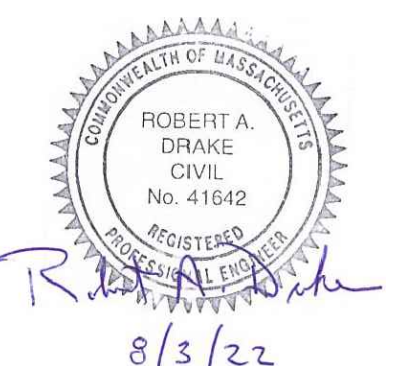


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ISSUE DATE: 8/3/2022

## PLAN INDEX

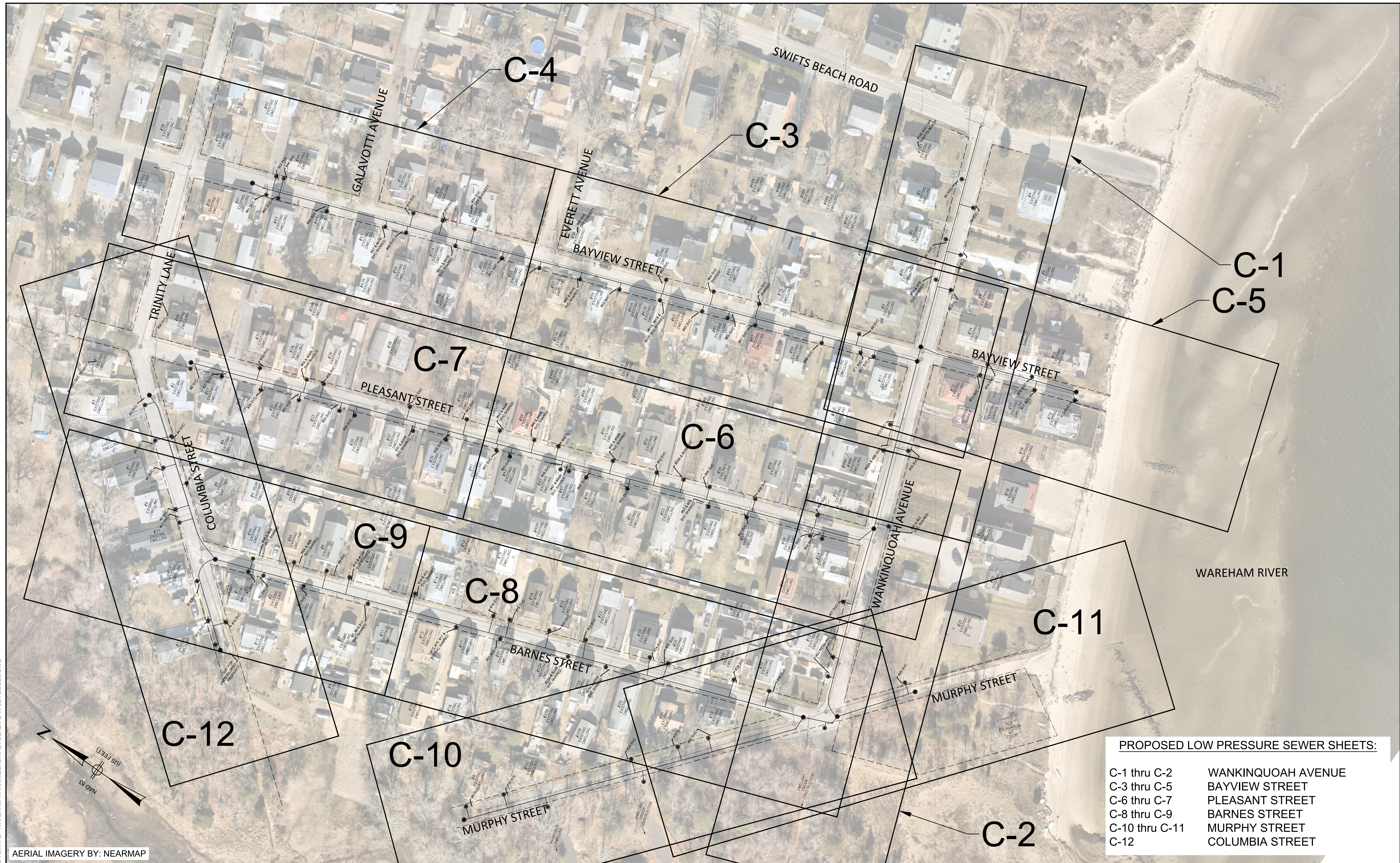
<u>SHEET NO.</u>	<u>DESCRIPTION</u>
G-1	LOCUS PLAN
G-2	LEGEND AND GENERAL NOTES
C-1 thru C-12	PROPOSED LOW PRESSURE SEWER FORCE MAIN
CD-1 thru CD-3	CONSTRUCTION DETAILS



REGISTERED PROFESSIONAL      DATE



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AERIAL IMAGERY BY: NEARMAP

PROPOSED LOW PRESSURE SEWER SHEETS:	
C-1 thru C-2	WANKINQUOAH AVENUE
C-3 thru C-5	BAYVIEW STREET
C-6 thru C-7	PLEASANT STREET
C-8 thru C-9	BARNES STREET
C-10 thru C-11	MURPHY STREET
C-12	COLUMBIA STREET

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:  
CD

DESIGNED BY:  
RG

CHECKED BY:  
RD

REGISTERED PROFESSIONAL

ROBERT A. DRAKE  
CIVIL  
No. 41642

8/3/22

PREPARED BY

**BETA**

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SUBCONSULTANT

SCALE

1"=50'

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**

LOCUS PLAN

BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. G-1



EXISTING

Table listing existing utilities and features with their corresponding symbols. Includes: WATER LINE, SEWER LINE, DRAIN LINE, GAS LINE, OVERHEAD WIRES, SEWER SERVICE LATERAL, SEWER MANHOLE, CAPPED SEWER SERVICE, SEWER SHUTOFF VALVE, DRAIN MANHOLE, CATCH BASIN, UTILITY POLE/LIGHT, FIRE HYDRANT, WATER GATE, WATER TEE, WATER CAP, WATER PIPE BEND, WATER PIPE REDUCER, CURB STOP, GAS GATE, GUY WIRE, TRAFFIC SIGN, CURBING, PROPERTY LINE, RIGHT OF WAY LINE, DRIVE, CONC. WALK, STONE WALL, FENCE, HOUSE / BUILDING STRUCTURE, DECIDUOUS TREE, TREE LINE, CONTOUR MAJOR, CONTOUR MINOR, SPOT ELEVATION, STONE BOUND/DRILL HOLE, IRON PIPE, TRAVERSE STATION.

PROPOSED

Table listing proposed utilities and features with their corresponding symbols. Includes: SAW CUT LINE, SEWER SERVICE DIG AND REPLACE, SEWER MAIN, DRAIN PIPE, ABANDON / FILL WITH CDF, MATERIAL, SEWER MANHOLE, SEWER SERVICE SHUTOFF, DRAIN MANHOLE, CATCH BASIN, SEWER / DRAIN BULKHEADS, GRINDER PUMP, STRAW WATTLE, DIRECTION OF FLOW (SEWER), LIMIT OF WORK.

ABBREVIATIONS

Table listing abbreviations for materials and structures. Includes: BIT BITUMINOUS, CB CATCH BASIN, CONC CONCRETE, CBDISC CONCRETE BOUND W/DISC, CBDH CONCRETE BOUND W/DRILLHOLE, CBN CONCRETE BOUND W/NO DH, CMP CORRUGATED METAL PIPE, DYL DOUBLE YELLOW LINE, DH DRILL HOLE, EOP EDGE OF PAVEMENT, EL ELEVATION, FNC FENCE, FFE FIRST FLOOR ELEVATION, GL GAS LATERAL, GPL GUY POLE, INV INVERT, IP IRON PIPE, IR IRON ROD, LCP LAND COURT PLAN, LE LATERAL ELEVATION, LPSS LOW PRESSURE SEWER SYSTEM, RCP REINFORCED CONCRETE PIPE, R RISER ON UTILITY POLE, SL SEWER LATERAL, SMH SEWER MANHOLE, SWL SOLID WHITE LINE, SYL SOLID YELLOW LINE, STKD STOCKADE, STL STOP LINE, UPL UTILITY POLE, ULT UTILITY POLE WITH LIGHT, VCP VERMICULITE CLAY PIPE, WL WATER LATERAL, PE POLYETHYLENE, M-C MAIN TO CURB, C-H CURB TO HOUSE, MTD MULTIPLE TILE DUCT, STD STEEL DUCT, GA GALVANIZED, CL CEMENT LINED STEEL, UNK UNKNOWN MATERIAL, CDF CONTROLLED DENSITY FILL, LDCC LOW DENSITY CELLULAR CONCRETE, SHLO STATE HIGHWAY LAYOUT, ABD ABANDON / ABANDONED, CTE CONNECT TO EXISTING, C-C CUT & CAP, R&D REMOVE AND DISPOSE, VIF VERIFY IN FIELD, MAT MATERIAL, GRAN GRANITE, PK PK NAIL, CI CAST IRON, VC, VCP VITRIFIED CLAY (PIPE), DI DUCTILE IRON, DICL DUCTILE IRON CEMENT-LINED, RC, RCP REINFORCED CONCRETE (PIPE), HDPE HIGH DENSITY POLYETHYLENE, CP, CPP CORRUGATED PLASTIC (PIPE), CLF CHAIN LINK FENCE, PROP PROPOSED, TYP TYPICAL, DYL DOUBLE YELLOW LINE, SWL SINGLE WHITE LIN, STB STOP BAR, HMC HOT MIX CURB.

GENERAL NOTES

GENERAL

- 1. THESE GENERAL NOTES ARE NOT INTENDED TO REPLACE THE SPECIFICATIONS FOR THIS CONTRACT. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS IN ADDITION TO THE GENERAL NOTES.
2. FOR ALL CONSTRUCTION, THE PUBLIC RIGHT-OF-WAY SHALL BE THE LIMIT OF DISTURBANCE. ALL SURFACES DAMAGED OUTSIDE OUTSIDE THE PUBLIC RIGHT-OF-WAY SHALL BE REPLACE IN KIND, AT THE CONTRACTORS EXPENSE.
3. THE CONTRACTOR SHALL CONFINE ALL ACTIVITIES FOR CONSTRUCTION PURPOSES WITHIN THE INDICATED LIMITS OF WORK AS SHOWN IN THE CONTRACT DRAWINGS. ALL SURFACES DAMAGED OUTSIDE THESE LIMITS BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT CONTRACTOR'S EXPENSE.
4. BASE MAPPING BASED ON GEOGRAPHIC INFORMATION SYSTEMS (GIS) DATA, DATA DIGITIZED FROM AERIAL, DATA COLLECTED VIA GPS AND SURVEY BY JC ENGINEERING, INC., 2854 CRANBERRY HIGHWAY, EAST WAREHAM, MA 02538.
5. VERTICAL DATUM IS NAVD88.
6. THE LOCATION, SIZE, AND MATERIAL OF EXISTING PIPES, DUCTS, CONDUITS AND OTHER UNDERGROUND STRUCTURES AND/OR UTILITIES SHOWN ON THESE PLANS ARE FROM THE BEST AVAILABLE SOURCES AND ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES, UTILITIES OR STRUCTURES ARE SHOWN. EXACT LOCATION TO BE DETERMINED BY CONTRACTOR IN FIELD.
7. EXISTING UTILITIES HAVE BEEN PLOTTED FROM THE BEST AVAILABLE DATA AND ARE APPROXIMATE ONLY. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES AND NOTIFY ALL UTILITY COMPANIES (PUBLIC AND PRIVATE). IN ADDITION, "DIG SAFE" MUST BE CONTACTED AT 1(888)-DIG-SAFE. CONTRACTOR TO CONTACT TOWN OF WAREHAM FOR THE LOCATION OF TOWN OF WAREHAM OWNED UTILITIES INCLUDING SEWER, WATER, DRAIN AND OTHER TOWN OWNED UTILITIES.
8. "AS-BUILT" DRAWINGS MAY BE EXAMINED AT THE TOWN OF WAREHAM ENGINEERING OFFICE. THE OWNER DOES NOT GUARANTEE THE CORRECTNESS OF THE CONTENTS OF THESE PLANS. THE CONTRACTOR IS CAUTIONED AGAINST RELYING SOLELY ON THE "AS-BUILTS" WITHOUT VERIFYING THE SAME BY FIELD INVESTIGATIONS.
9. PROPERTY LINES AND CITY/TOWN LINES ARE SHOWN FOR INFORMATION ONLY.

EXISTING UTILITIES

10. EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION SHALL BE PROTECTED AND SUPPORTED AT ALL TIMES BY THE CONTRACTOR. ALL EXISTING SERVICES TO BE MAINTAINED AT ALL TIMES. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS TO INTERFERE AS LITTLE AS POSSIBLE WITH EXISTING UTILITIES. PAYMENT FOR PROVIDING SAID PROTECTION AND SUPPORTS SHALL BE CONSIDERED A PART OF AND PAID FOR UNDER THE APPROPRIATE PIPE OR STRUCTURE ITEMS UNLESS OTHERWISE INDICATED AND/OR DIRECTED BY THE OWNER. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION BY REASON OF DELAY AND/OR INCONVENIENCE IN ADAPTING HIS OPERATIONS ACCORDINGLY.

11. CONTRACTOR IS RESPONSIBLE FOR REPAIR OF DAMAGED UTILITIES CAUSED BY THE CONTRACTORS OPERATIONS AT NO ADDITIONAL COST TO THE OWNER.

REMOVAL AND DISPOSAL

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND LEGALLY DISPOSING (R&D) ALL MATERIALS INDICATED ON THE PLANS INCLUDING BUT NOT LIMITED TO ALL GRIT AND DEBRIS FROM THE EXISTING STRUCTURES WHICH SHALL BE CONSIDERED 'SPECIAL WASTE' AND SHALL BE REMOVED AND DISPOSED OF AS INDICATED IN THE SPECIFICATIONS. ALL DEMOLITION MATERIAL INCLUDING CONCRETE, PIPE, AND BRICK THAT WAS IN CONTACT WITH SEWAGE SHALL BE CLEANED IN ACCORDANCE WITH MA DEP REQUIREMENTS AND DISPOSED OF ACCORDINGLY. ONCE CLEANED, DEMOLITION MATERIALS SHALL NOT BE CONSIDERED SPECIAL WASTE. NO TEMPORARY STORAGE WILL BE ALLOWED IN TOWN.

SITE RESTORATION

13. EXCEPT WHERE NOTED BY PROPOSED CONTOUR LINES, ALL FINAL CONTOUR LINE ELEVATIONS SHALL BE THE SAME AS EXISTING CONTOUR LINE ELEVATIONS.

14. JOINTS BETWEEN NEW BITUMINOUS CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDDED.

15. ALL CURBING DISTURBED BY CONSTRUCTION OPERATIONS SHALL BE RESET, RESTORED OR REPLACED IN KIND, IF DAMAGED, INCLUDING CEMENT CONCRETE, AS SPECIFIED IN MHD DETAIL 10.3.0, REGARDLESS OF ITS PROXIMITY TO THE DRAIN OR SEWER, AS DIRECTED BY THE OWNER/ENGINEER. PAYMENT SHALL BE CONSIDERED PART OF AND PAID FOR UNDER THE APPROPRIATE PIPE ITEMS AS APPLICABLE UNLESS OTHERWISE INDICATED ON PLANS.

16. ALL SIDEWALK AND WHEELCHAIR RAMP AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IN CONFORMANCE TO THE AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS AND THE ARCHITECTURAL ACCESS BOARD (AAB) REQUIREMENTS AT THE CONTRACTOR'S EXPENSE.

17. THE CONTRACTOR SHALL REMOVE AND RESET ALL SIGNS DISTURBED DURING CONSTRUCTION, IN CONFORMANCE WITH THE MASSACHUSETTS STANDARD SPECIFICATIONS AND CONSTRUCTION STANDARDS.

18. ALL GRASSED OR WOODED AREAS DISTURBED BY THE CONSTRUCTION OPERATIONS SHALL BE LOAMED AND SEEDED IN ACCORDANCE WITH THE SPECIFICATIONS. FINAL RESTORATION SHALL BE EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION AS DETERMINED SOLELY BY THE OWNER/ENGINEER. PAYMENT SHALL BE CONSIDERED PART OF AND PAID FOR UNDER THE APPROPRIATE PIPE ITEMS AS APPLICABLE UNLESS OTHERWISE INDICATED.

MAINTENANCE OF EXISTING FLOWS

19. FLOW IN ALL SANITARY SEWERS, COMBINED SEWERS AND DRAINS SHALL BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL PROVIDE BYPASS EQUIPMENT AS NECESSARY TO COMPLETE WORK. SEE SPECIFICATIONS.

20. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY EQUIPMENT, PIPING, FITTINGS AND APPURTENANCES NECESSARY TO COMPLETE THIS CONTRACT.

21. THE CONTRACTOR SHALL INSTALL AND MAINTAIN ALL TEMPORARY BYPASS-LINES UNTIL THE MODIFICATIONS AND CONSTRUCTION ARE COMPLETE.

EXCAVATION SUPPORT, DEWATERING

22. ALL CONSTRUCTION WORK SHALL BE PERFORMED IN THE DRY. THE CONTRACTOR SHALL PROVIDE, OPERATE AND MAINTAIN ALL PUMPS, DRAINS, WELL POINTS, SCREENS, OR OTHER FACILITIES NECESSARY TO CONTROL, COLLECT AND DISPOSE SURFACE AND SUBSURFACE WATER ENCOUNTERED IN THE PERFORMANCE OF THE WORK.

23. DISCHARGE FROM DEWATERING OPERATIONS SHALL NOT BE DIRECTLY DISCHARGED INTO THE SEWER OR DRAIN. ALL CONSTRUCTION DEWATERING SHALL HAVE SILT AND SEDIMENT REMOVED PRIOR TO DISCHARGE (SEE SPECIFICATIONS).

SOIL EROSION AND SEDIMENTATION CONTROL

24. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL SOIL EROSION AND SEDIMENT CONTROLS ON THE PROJECT SITE FOR THE ENTIRE DURATION OF THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL FOLLOW THE DIRECTION OF THE RESIDENT ENGINEER WITH REGARD TO INSTALLATION, MAINTENANCE, AND REPAIR OF ALL SOIL EROSION AND SEDIMENTATION CONTROLS ON THE PROJECT SITE. TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROLS (HAYBALES, SILT FENCE, ETC.) SHALL BE MAINTAINED UNTIL ALL EXPOSED SOILS ARE SATISFACTORILY STABILIZED.

25. ALL EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES SHALL BE INSTALLED BY THE CONTRACTOR AND INSPECTED BY THE ENGINEER PRIOR TO THE START OF CONSTRUCTION. THE E&S CONTROLS SHALL BE CLEANED AND MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION OPERATIONS AND UNTIL ALL DISTURBED AREAS ARE STABILIZED AFTER CONSTRUCTION IS COMPLETE. E&S CONTROLS SHALL BE INSPECTED AND CLEANED AFTER ALL STORM EVENTS AND UPON THE REQUEST OF THE OWNER OR ENGINEER. CONTRACTOR SHALL MAINTAIN AN ADEQUATE SUPPLY OF HAY BALES ON SITE TO BE INSTALLED IN AREAS WHERE EXISTING E&S CONTROLS HAVE FAILED OR AS DETERMINED NECESSARY BY THE ENGINEER. NO WORK OR STORAGE OF CONSTRUCTION EQUIPMENT WILL BE PERMITTED OUTSIDE THE LIMIT OF DISTURBANCE.

26. PROVIDE SOIL EROSION AND SEDIMENT CONTROL MEASURES AT PERIMETERS OF ALL EXCAVATION AREAS, DISTURBED SURFACES AND AT ALL CATCH

BASINS ADJACENT TO DISTURBED AREAS. PROVIDE SILT FENCING AND HAY BALES IN ACCORDANCE WITH DIVISION 2 SPECIFICATION REQUIREMENTS AND AS SHOWN ON THE CIVIL DETAIL DRAWINGS.

TREE PRESERVATION

27. PROTECT TREES WITHIN THE LIMITS OF WORK BY INSTALLING BLACK CORRUGATED PLASTIC AROUND TREES, AS INDICATED IN THE CONTRACT DRAWINGS.

28. PRIOR TO CONSTRUCTION DETERMINE REQUIRED CLEARANCES AND CONTRACT LICENSED ARBORIST TO PRUNE TREES.

29. BRANCHES OR LIMBS DAMAGED DURING CONSTRUCTION SHALL BE CUT BACK TO THE TRUNK OR A LATERAL BRANCH.

30. MAKE EVERY EFFORT TO MAINTAIN EXCAVATION ACTIVITIES OUTSIDE LIMITS OF THE TREE CANOPY.

31. ROOTS LARGER THAN 1.5" IN DIAMETER ENCOUNTERED IN EXCAVATIONS SHALL BE CUT OFF SQUARELY USING A SHARP ARBORIST SAW.

32. MAINTAIN STORAGE OF EQUIPMENT AND MATERIALS OUTSIDE THE DISTANCE OF THE RADIUS OF THE TREE CANOPY.

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Table for revision tracking with columns: NUMBER, DATE, MADE BY, CHECKED BY, REVISIONS.

Table for drawing personnel: DRAWN BY: CD, DESIGNED BY: RG, CHECKED BY: RD.

Professional Engineer seal for Robert A. Drake, Civil, No. 41642, State of Massachusetts, dated 8/3/22.



Table for project roles: REGISTERED PROFESSIONAL, PREPARED BY, SUBCONSULTANT.

Table for scale: SCALE NONE.

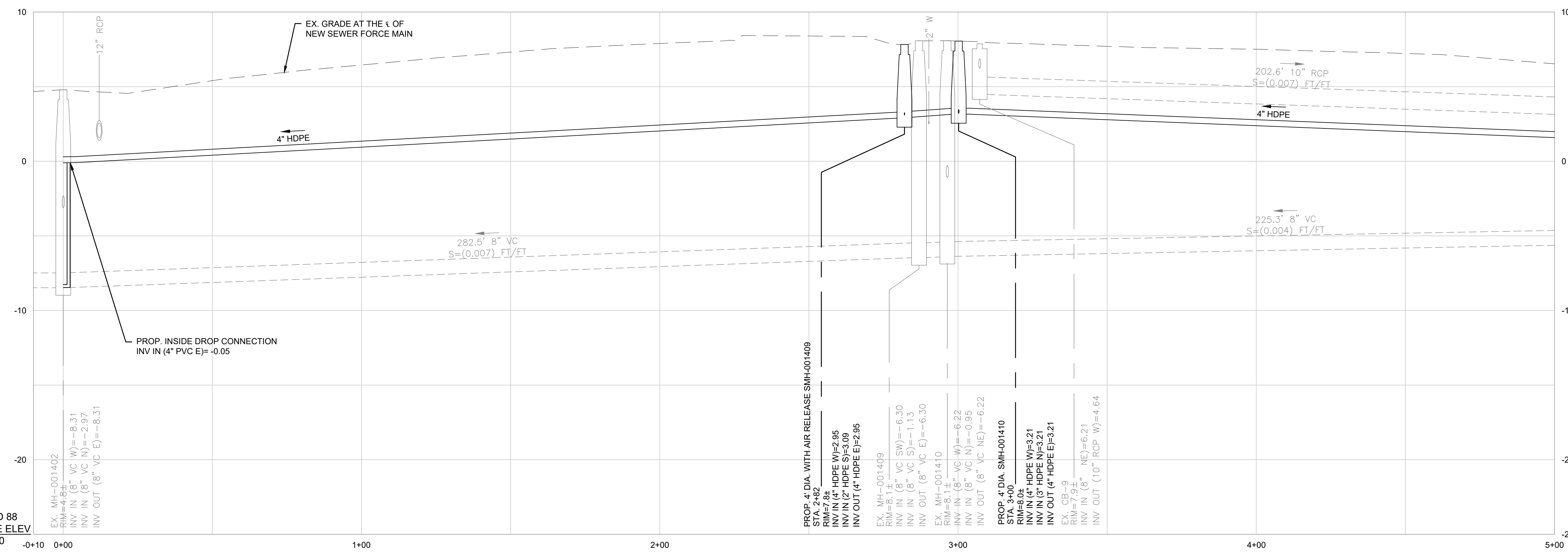
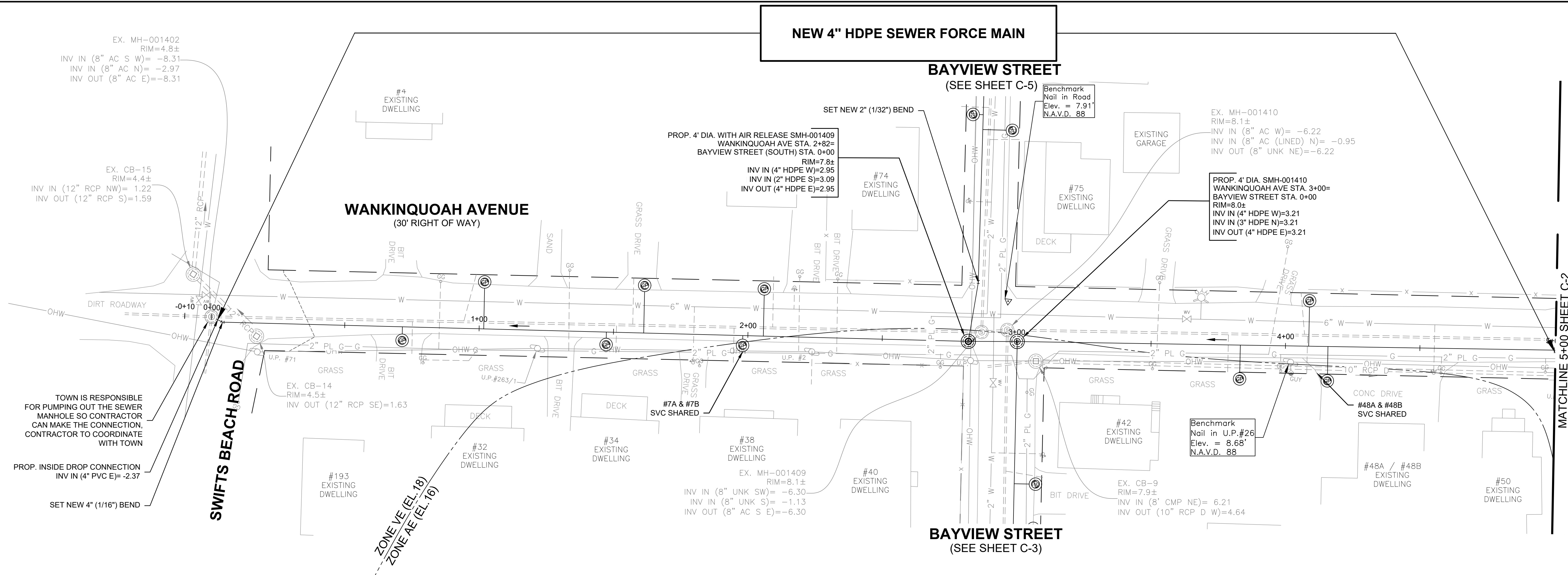
Table for project title: TOWN OF WAREHAM, MASSACHUSETTS INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN LEGEND AND GENERAL NOTES.

Table for project identification: BETA JOB NO. 10188, ISSUE DATE 8/3/2022, SHEET NO. G-2.

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION



**NEW 4" HDPE SEWER FORCE MAIN**



- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
  2. THE CONTRACTOR WILL BE REQUIRED TO INSTALL AND MAINTAIN EROSION CONTROL PROTECTION BAGS IN ALL CATCH BASINS WITHIN THE LIMITS OF WORK DURING CONSTRUCTION.
  3. THE CONTRACTOR SHALL ASSUME THAT ALL CATCH BASINS ARE ABOVE THE EXISTING WATER MAIN. ANY CATCH BASIN DAMAGED DURING CONSTRUCTION SHALL BE REPLACED STRUCTURE TO STRUCTURE AT HIS OWN EXPENSE WITH PVC PIPE OR AS DIRECTED BY THE ENGINEER.
  4. ALL EXISTING SEWERS ARE 8" DIAMETER.
  5. SEWER MATERIALS ARE EITHER AC OR UNKNOWN.
  6. SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  7. RIM ELEVATIONS FROM SURVEY.
  8. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
  9. EXISTING SEWER SERVICE LOCATIONS ARE FROM TOWN GIS OR TOWN SERVICE CARDS.
  10. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
  11. CONTRACTOR TO DOCUMENT HORIZONTAL LOCATION OF ALL EXISTING SEWER SERVICES, ELEVATION OF SERVICE, PIPE SIZE AND MATERIAL.
  12. GRINDER PUMP LOCATIONS DEPICTED ARE APPROXIMATE AND FOR BIDDING PURPOSES ONLY. CONTRACTOR TO COORDINATE GRINDER PUMP LOCATION WITH EXISTING SERVICE LOCATION, TOWN TO APPROVE GRINDER PUMP LOCATION PRIOR TO INSTALLATION. GRINDER PUMP CORES, ELECTRICAL, VENTING AND CONNECTION TO EXISTING GRAVITY SERVICE WILL BE COMPLETED BY OTHERS.

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NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:  
CD

DESIGNED BY:  
RG

CHECKED BY:  
RD

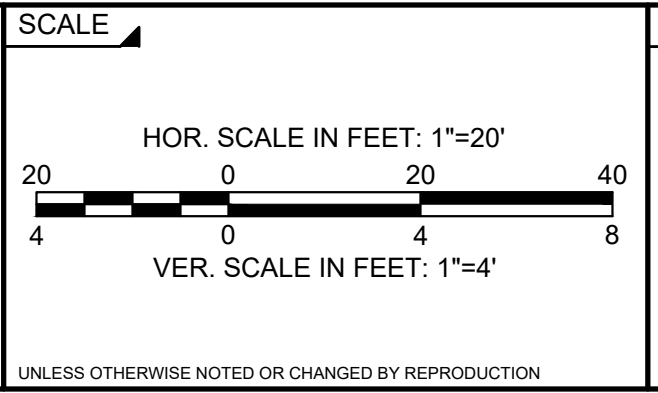
REGISTERED PROFESSIONAL

ROBERT A. DRAKE  
CIVIL  
No. 41642

8/3/22



PREPARED BY  
SUBCONSULTANT



TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**

**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**

PROPOSED LOW PRESSURE SEWER FORCE MAIN

WANKINQUOAH AVE PLAN & PROFILE STA. (0+00 TO 5+00)

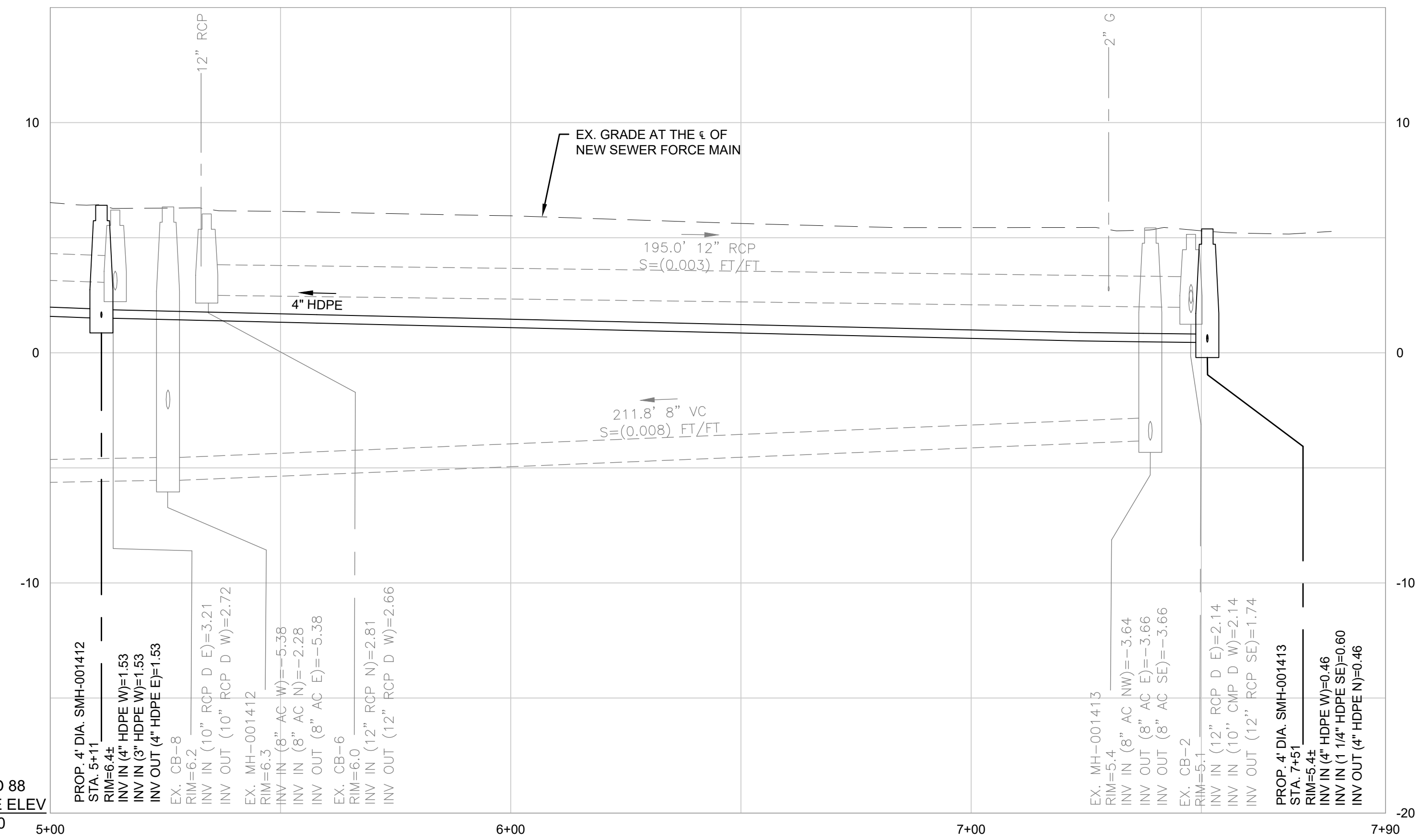
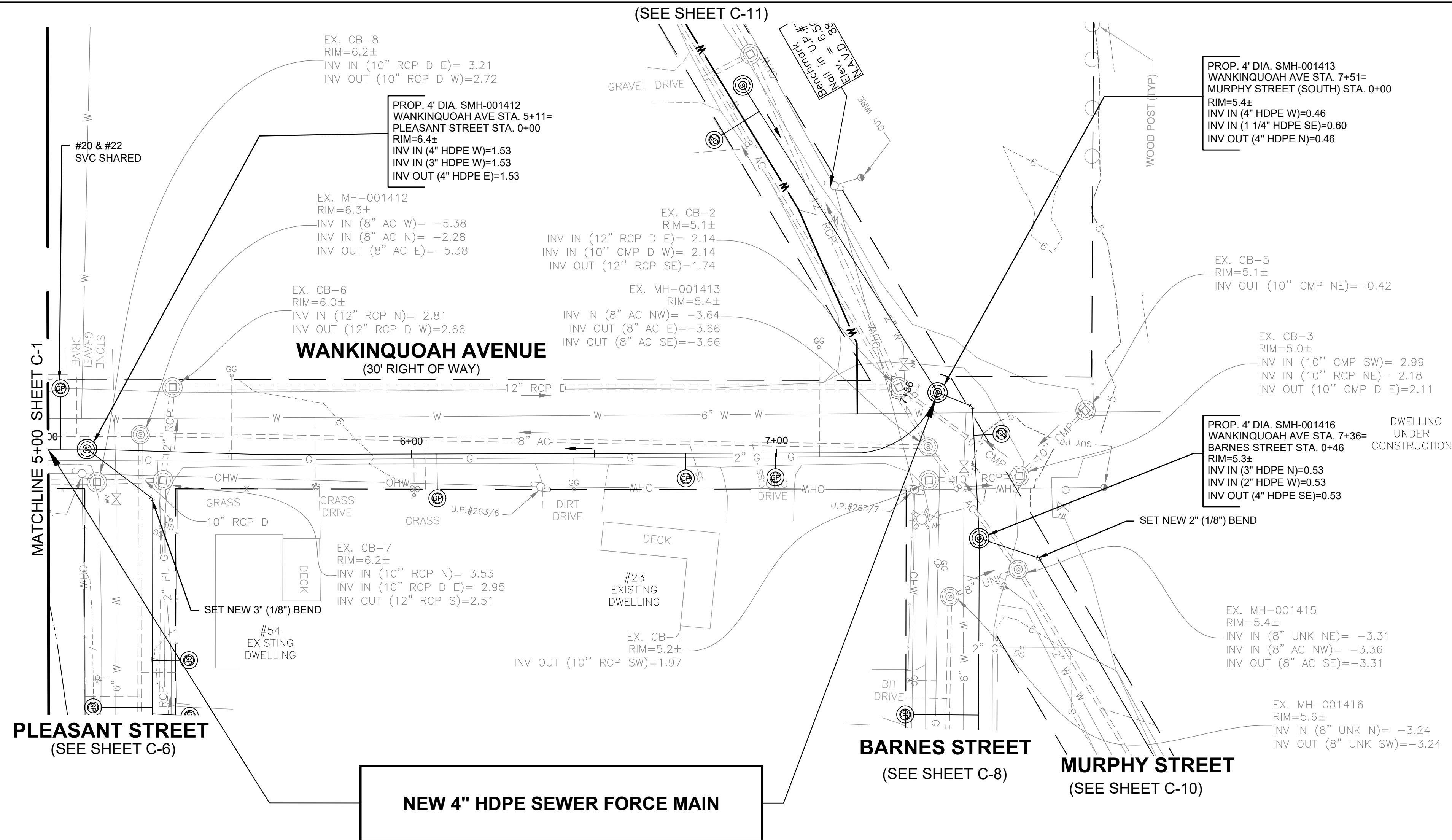
BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. C-1



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- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
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DRAWN BY:  
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DESIGNED BY:  
RG

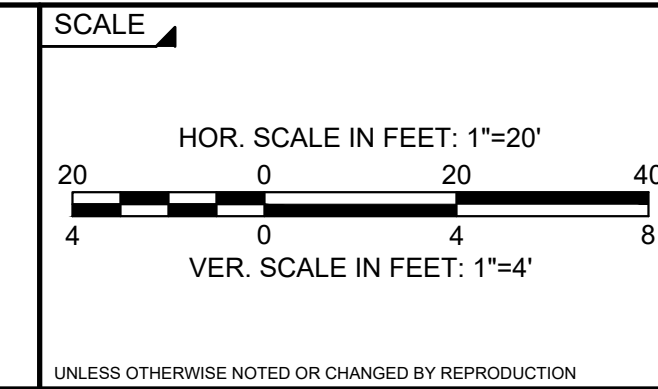
CHECKED BY:  
RD

REGISTERED PROFESSIONAL  
ROBERT A. DRAKE  
CIVIL  
No. 41642

PREPARED BY  
8/3/22



SUBCONSULTANT



TITLE  
**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**  
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
WANKINQUOAH AVE PLAN & PROFILE STA. (5+00 TO 7+82)

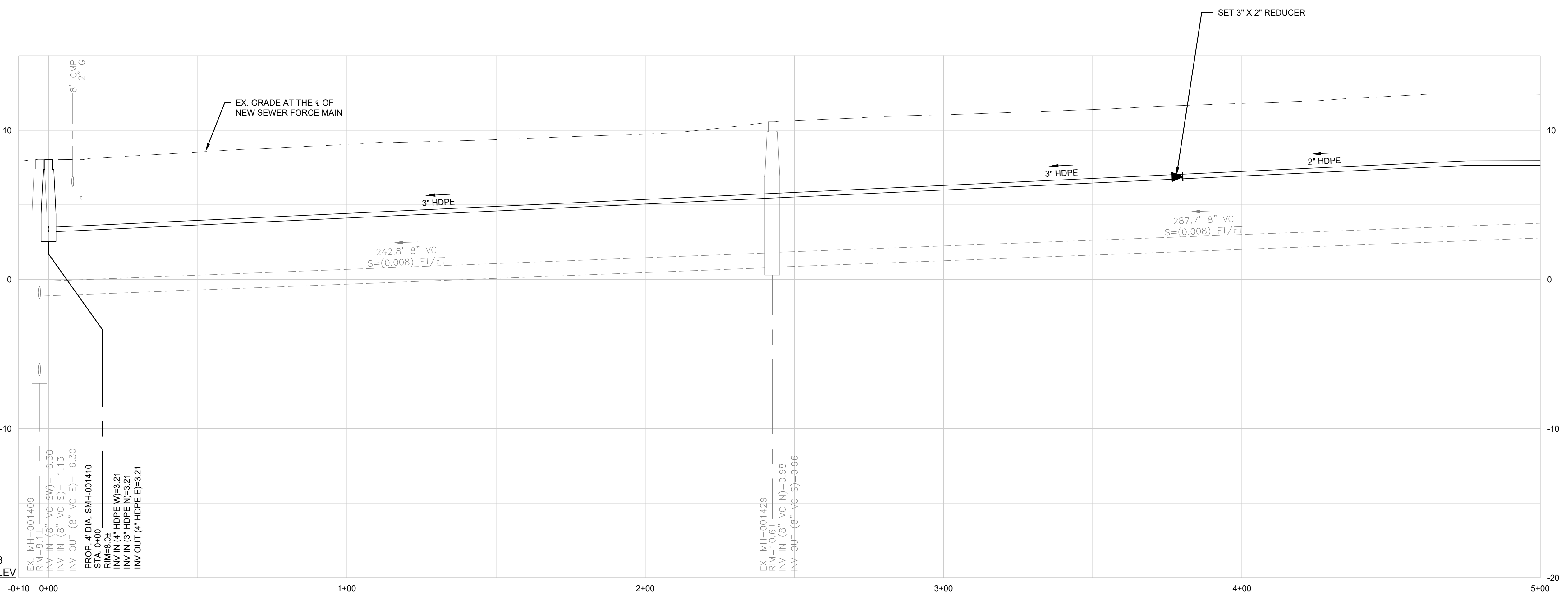
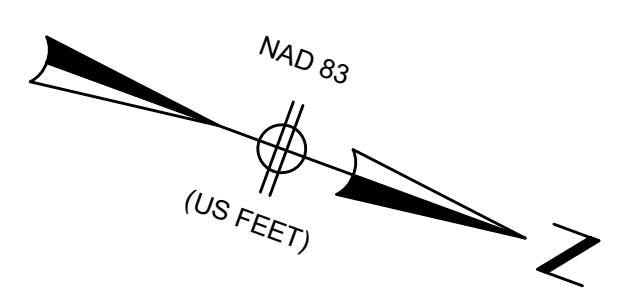
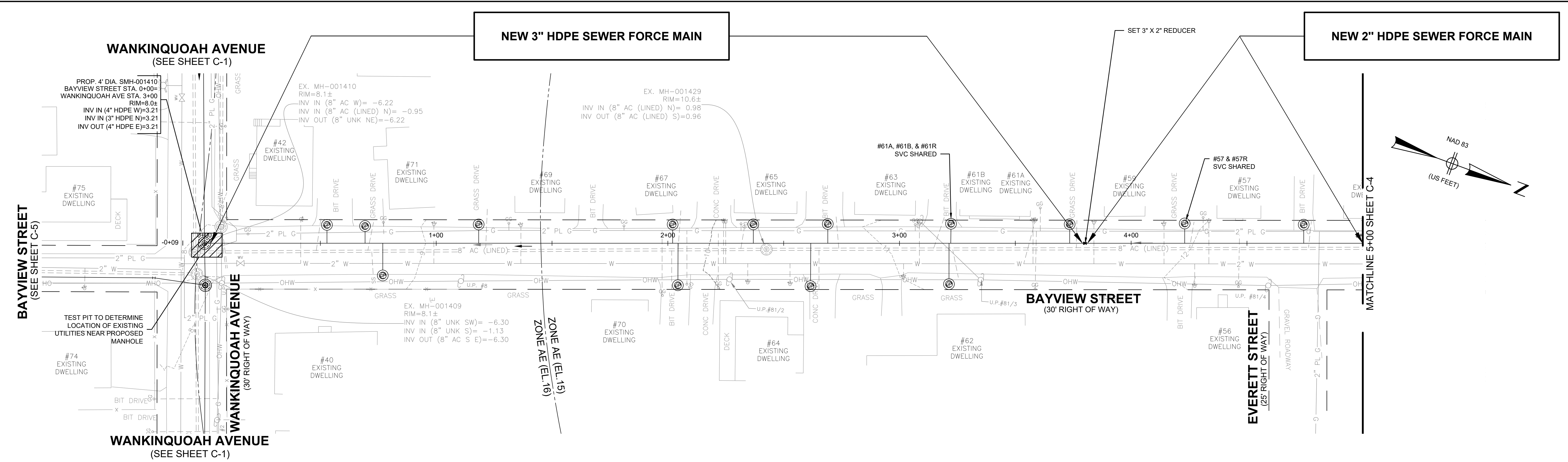
BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. C-2



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- NOTES:
- PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
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  - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
  - CONTRACTOR TO DOCUMENT HORIZONTAL LOCATION OF ALL EXISTING SEWER SERVICES, ELEVATION OF SERVICE, PIPE SIZE AND MATERIAL.
  - GRINDER PUMP LOCATIONS DEPICTED ARE APPROXIMATE AND FOR BIDDING PURPOSES ONLY. CONTRACTOR TO COORDINATE GRINDER PUMP LOCATION WITH EXISTING SERVICE LOCATION, TOWN TO APPROVE GRINDER PUMP LOCATION PRIOR TO INSTALLATION. GRINDER PUMP CORES, ELECTRICAL VENTING AND CONNECTION TO EXISTING GRAVITY SERVICE WILL BE COMPLETED BY OTHERS.

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:  
CD

DESIGNED BY:  
RG

CHECKED BY:  
RD

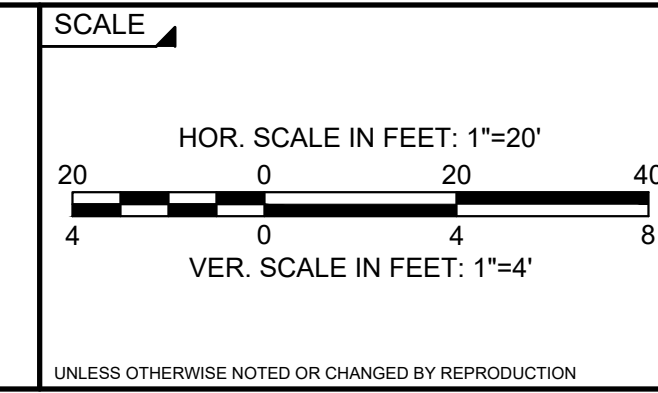
REGISTERED PROFESSIONAL  
ROBERT A. DRAKE  
CIVIL  
No. 41642

PREPARED BY  
BETA

8/3/22



SUBCONSULTANT



TITLE  
**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**  
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
BAYVIEW STREET PLAN & PROFILE STA. (-0+05 TO 5+00)

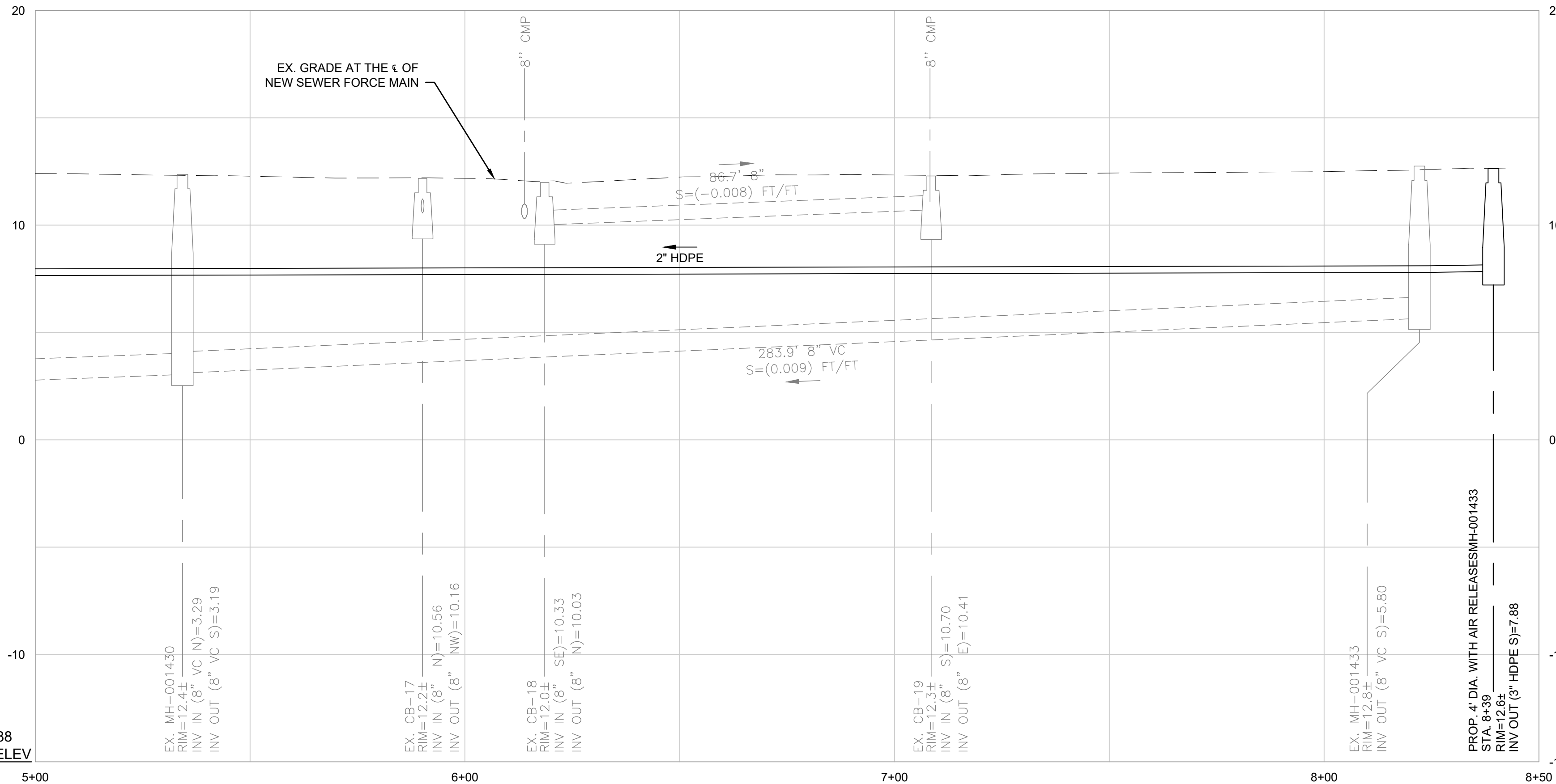
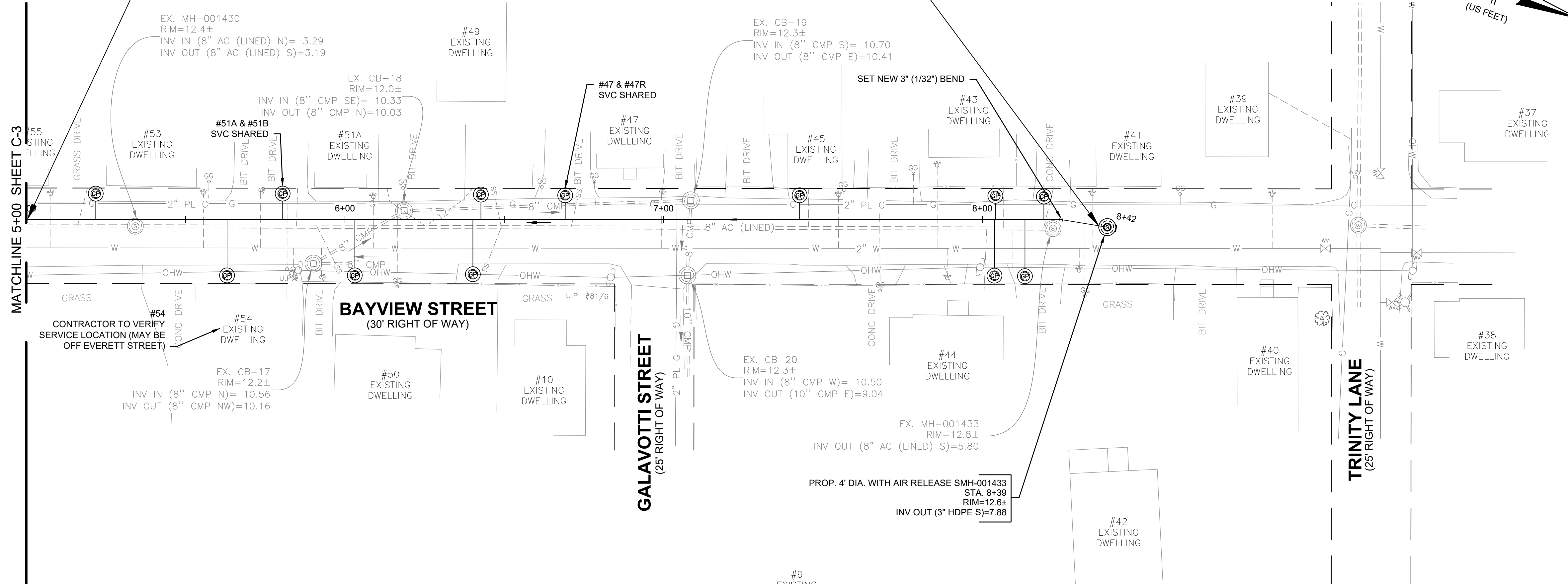
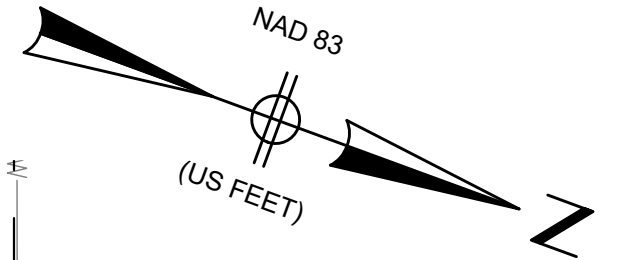
BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. C-3



**NEW 2" HDPE SEWER FORCE MAIN**



- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
  2. PROPOSED SEWER SERVICE LATERALS THAT CROSS OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
  3. THE CONTRACTOR WILL BE REQUIRED TO INSTALL AND MAINTAIN EROSION CONTROL PROTECTION BAGS IN ALL CATCH BASINS WITHIN THE LIMITS OF WORK DURING CONSTRUCTION.
  4. THE CONTRACTOR SHALL ASSUME THAT ALL CATCH BASINS ARE ABOVE THE EXISTING WATER MAIN. ANY CATCH BASIN DAMAGED DURING CONSTRUCTION SHALL BE REPLACED STRUCTURE TO STRUCTURE AT HIS OWN EXPENSE WITH PVC PIPE OR AS DIRECTED BY THE ENGINEER.
  5. ALL EXISTING SEWERS ARE 8" DIAMETER.
  6. SEWER MATERIALS ARE EITHER AC OR UNKNOWN.
  7. SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  8. RIM ELEVATIONS FROM SURVEY.
  9. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME.
  10. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
  11. EXISTING SEWER SERVICE LOCATIONS ARE FROM TOWN GIS OR TOWN SERVICE CARDS.
  12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
  13. CONTRACTOR TO DOCUMENT HORIZONTAL LOCATION OF ALL EXISTING SEWER SERVICES, ELEVATION OF SERVICE, PIPE SIZE AND MATERIAL.
  14. GRINDER PUMP LOCATIONS DEPICTED ARE APPROXIMATE AND FOR BIDDING PURPOSES ONLY. CONTRACTOR TO COORDINATE GRINDER PUMP LOCATION WITH EXISTING SERVICE LOCATION, TOWN TO APPROVE GRINDER PUMP LOCATION PRIOR TO INSTALLATION. GRINDER PUMP CORES, ELECTRICAL, VENTING AND CONNECTION TO EXISTING GRAVITY SERVICE WILL BE COMPLETED BY OTHERS.

8/2/2022 4:49 PM J:\21.10188 TOWN OF WAREHAM WANKINQUOAH\TOWN RECORD\SET\10188\_PRR\_PLAN 1.DWG

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

NAV D 88  
BASE ELEV  
-15.00

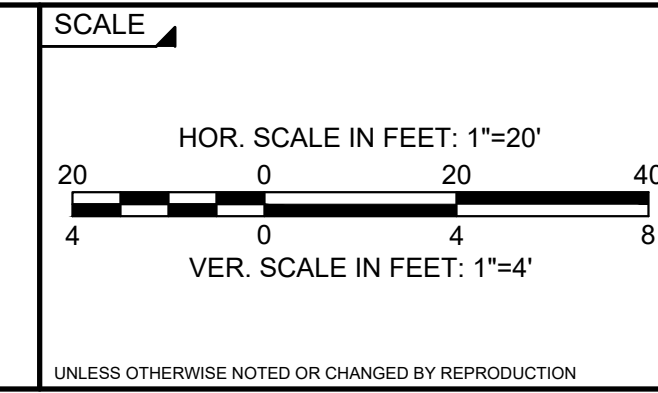
DRAWN BY: CD  
DESIGNED BY: RG  
CHECKED BY: RD

REGISTERED PROFESSIONAL  
ROBERT A. DRAKE  
CIVIL  
No. 41642

PREPARED BY: **BETA**  
www.BETA-inc.com

8/3/22

SUBCONSULTANT

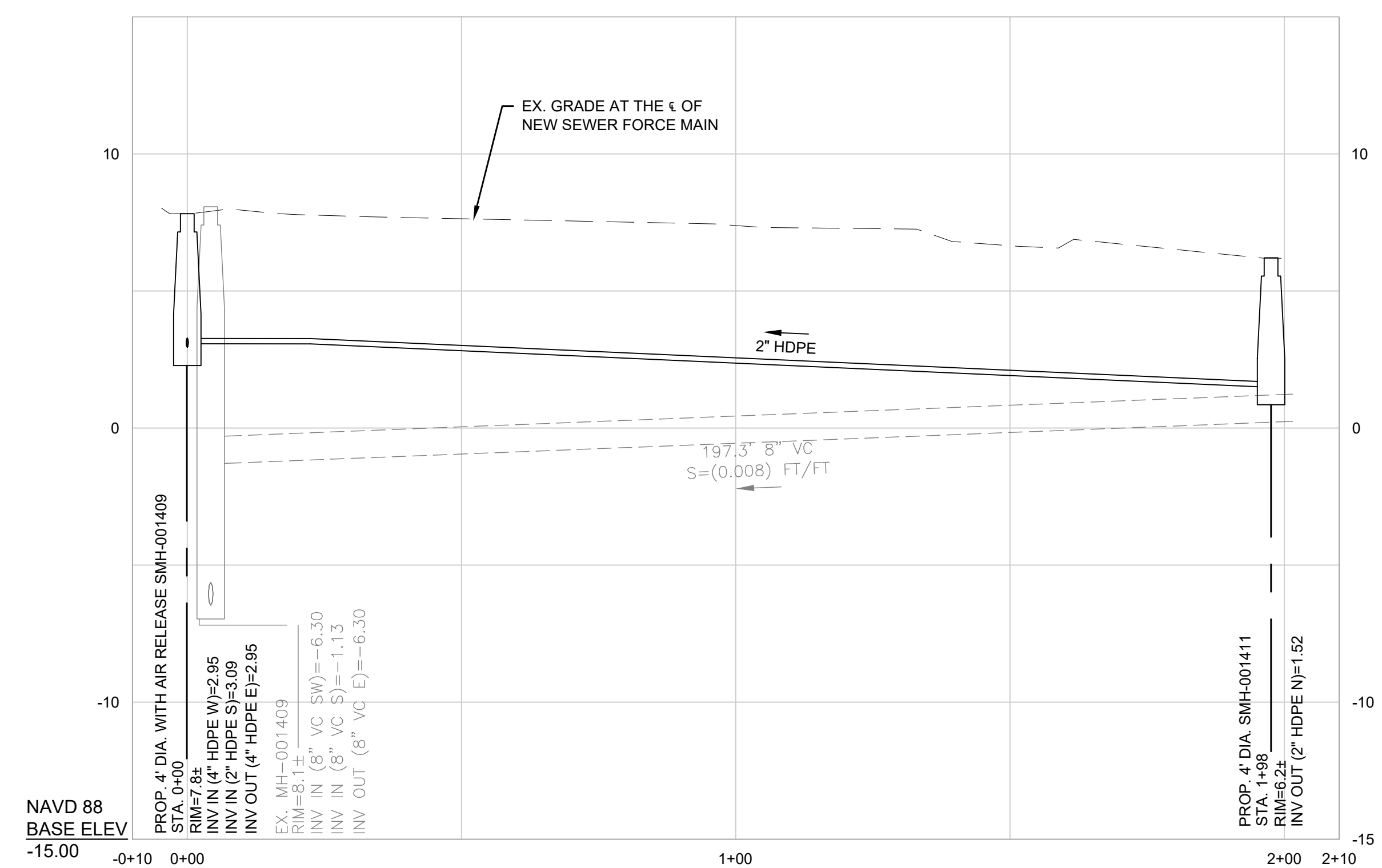
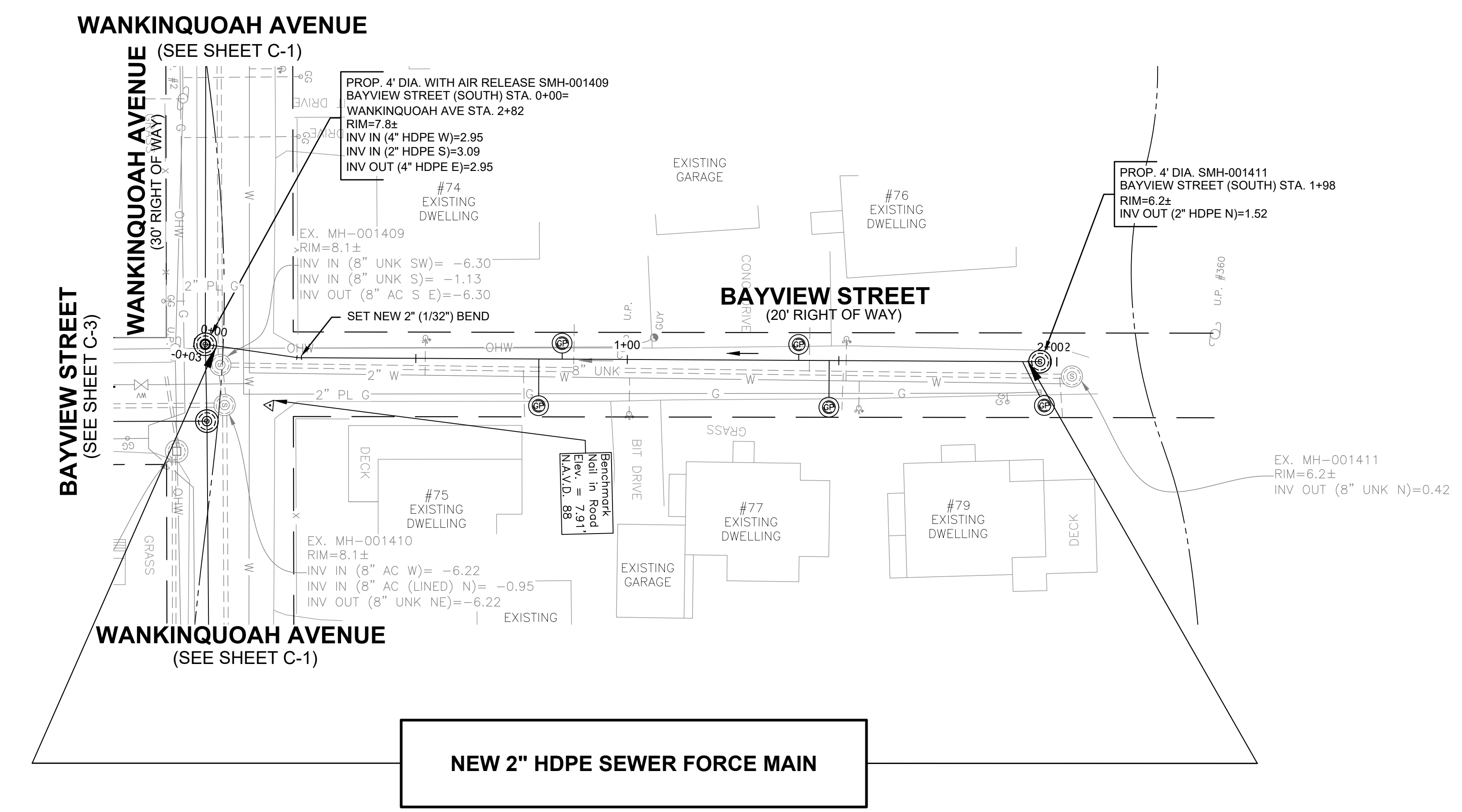
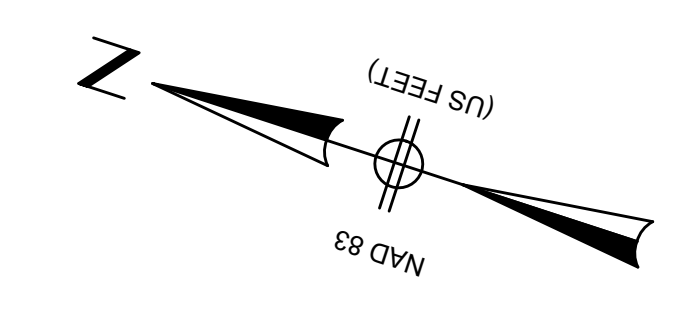


TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**  
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
BAYVIEW STREET PLAN & PROFILE STA. (5+00.00 TO 8+45)

BETA JOB NO. 10188  
ISSUE DATE 8/3/2022  
SHEET NO. C-4





- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
  2. PROPOSED SEWER SERVICE LATERALS THAT CROSS OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
  3. THE CONTRACTOR WILL BE REQUIRED TO INSTALL AND MAINTAIN EROSION CONTROL PROTECTION BAGS IN ALL CATCH BASINS WITHIN THE LIMITS OF WORK DURING CONSTRUCTION.
  4. THE CONTRACTOR SHALL ASSUME THAT ALL CATCH BASINS ARE ABOVE THE EXISTING WATER MAIN. ANY CATCH BASIN DAMAGED DURING CONSTRUCTION SHALL BE REPLACED STRUCTURE TO STRUCTURE AT HIS OWN EXPENSE WITH PVC PIPE OR AS DIRECTED BY THE ENGINEER.
  5. ALL EXISTING SEWERS ARE 8" DIAMETER.
  6. SEWER MATERIALS ARE EITHER AC OR UNKNOWN.
  7. SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  8. RIM ELEVATIONS FROM SURVEY.
  9. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
  10. EXISTING SEWER SERVICE LOCATIONS ARE FROM TOWN GIS OR TOWN SERVICE CARDS.
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8/2/2022 4:50 PM J:\21.10188 TOWN OF WAREHAM\WANKINQUOAH\TOWNSET\10188\_PPR\_PLAN 1.DWG

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

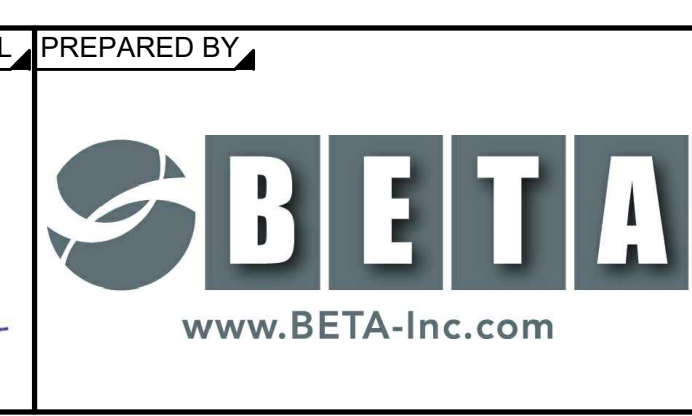
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DESIGNED BY:  
RG

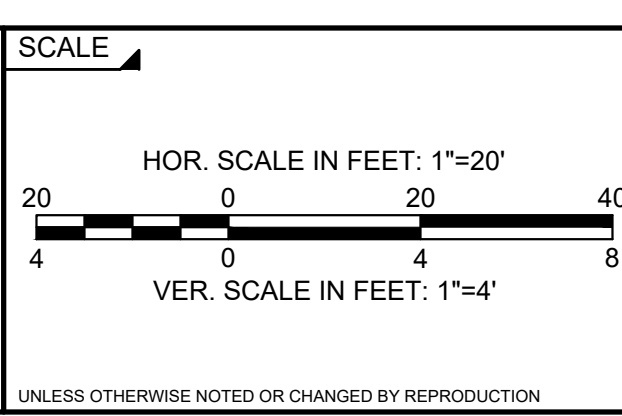
CHECKED BY:  
RD

REGISTERED PROFESSIONAL  
ROBERT A. DRAKE  
CIVIL  
No. 41642

8/3/22



SUBCONSULTANT



TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**

**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**

PROPOSED LOW PRESSURE SEWER FORCE MAIN  
BAYVIEW STREET (SOUTH) PLAN &  
PROFILE STA. (-0+05 TO 1+87)

BETA JOB NO. 10188

ISSUE DATE 8/3/2022

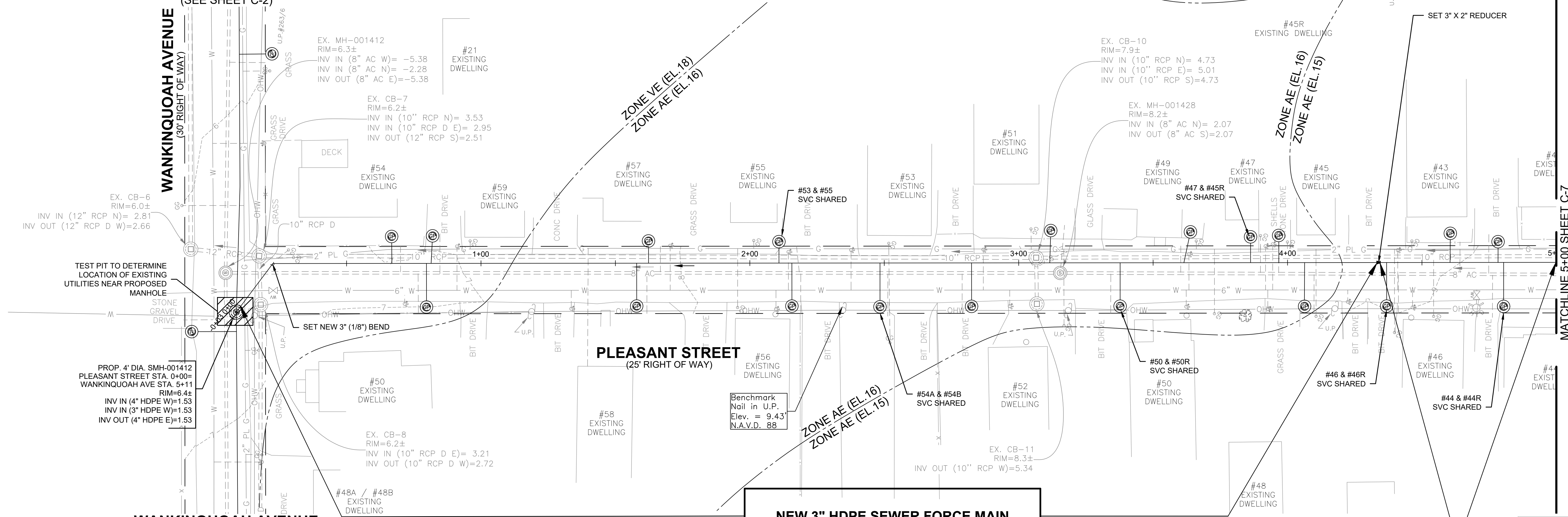
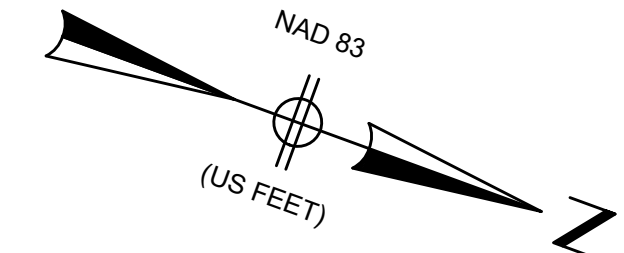
SHEET NO. C-5



**WANKINQUOAH AVENUE**  
(SEE SHEET C-2)

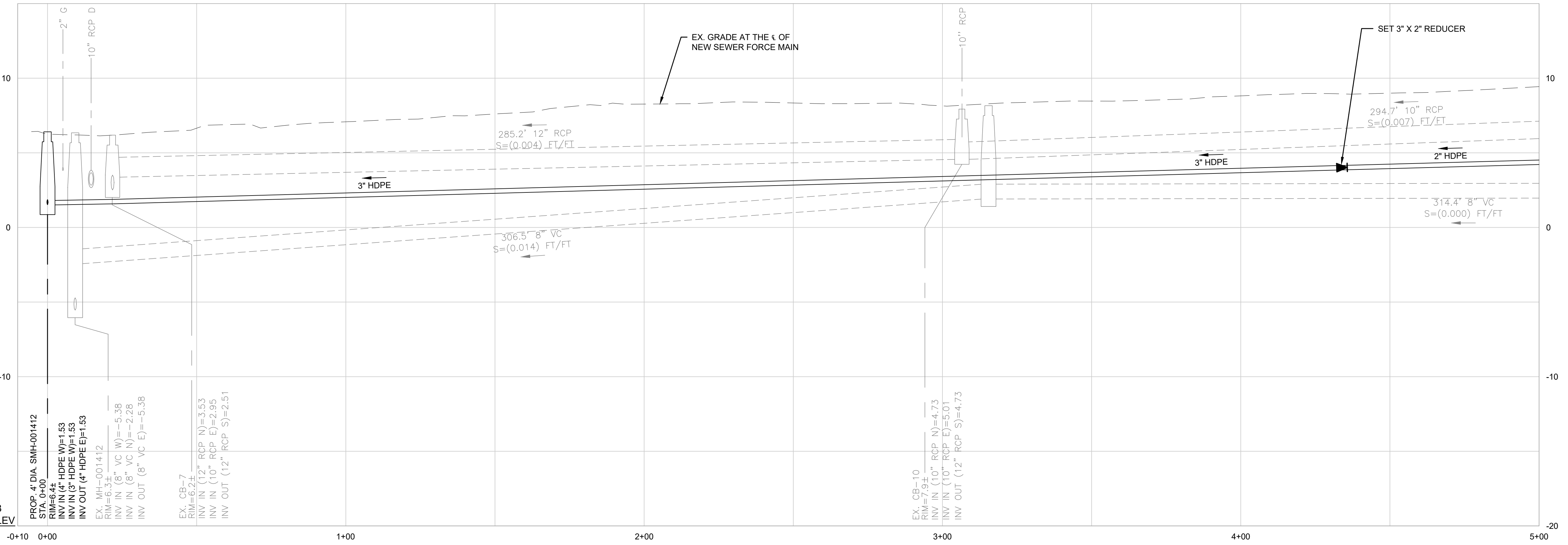
WANKINQUOAH AVENUE  
(30' RIGHT OF WAY)

WANKINQUOAH AVENUE  
(SEE SHEET C-2)



**NEW 3" HDPE SEWER FORCE MAIN**

**NEW 2" HDPE SEWER FORCE MAIN**



- NOTES:**
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
  2. PROPOSED SEWER SERVICE LATERALS THAT CROSS OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
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  5. ALL EXISTING SEWERS ARE 8" DIAMETER.
  6. SEWER MATERIALS ARE EITHER AC OR UNKNOWN.
  7. SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  8. RIM ELEVATIONS FROM SURVEY.
  9. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME.
  10. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
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8/2/2022 4:50 PM J:\21.10188 TOWN OF WAREHAM WANKINQUOAH\TOWN\SET\10188\_PPR\_PLAN 1.DWG

NAV D 88 BASE ELEV -20.00	PROP. 4" DIA. SMH-001412 STA. 0+00 RIM=6.4± HDPE W)=1.53 INV IN (3" HDPE W)=1.53 INV OUT (4" HDPE E)=1.53	EX. MH-001412 RIM=6.3± VC W)= -5.38 INV IN (8" VC N)= -2.28 INV OUT (8" VC E)= -5.38	EX. CB-7 RIM=6.2± INV IN (12" RCP N)= 3.53 INV IN (10" RCP E)= 2.95 INV OUT (12" RCP S)= 2.51	EX. MH-001428 RIM=8.2± INV IN (8" AC N)= 2.07 INV OUT (8" AC S)= 2.07	EX. CB-10 RIM=7.9± INV IN (10" RCP N)= 4.73 INV IN (10" RCP E)= 5.01 INV OUT (12" RCP S)= 4.73	EX. CB-11 RIM=8.3± INV OUT (10" RCP W)= 5.34
CD	RG	RD				

DRAWN BY:  
CD

DESIGNED BY:  
RG

CHECKED BY:  
RD

REGISTERED PROFESSIONAL

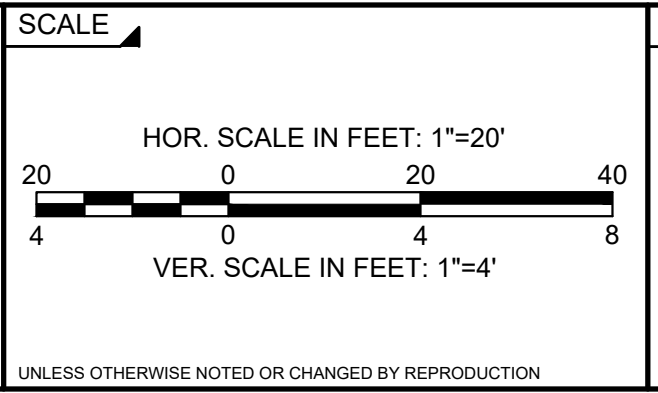
ROBERT A. DRAKE  
CIVIL  
No. 41542  
REGISTERED

8/3/22

PREPARED BY

**BETA**  
www.BETA-inc.com

SUBCONSULTANT



TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**  
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
PLEASANT STREET PLAN & PROFILE STA. (-0+05 TO 5+00)

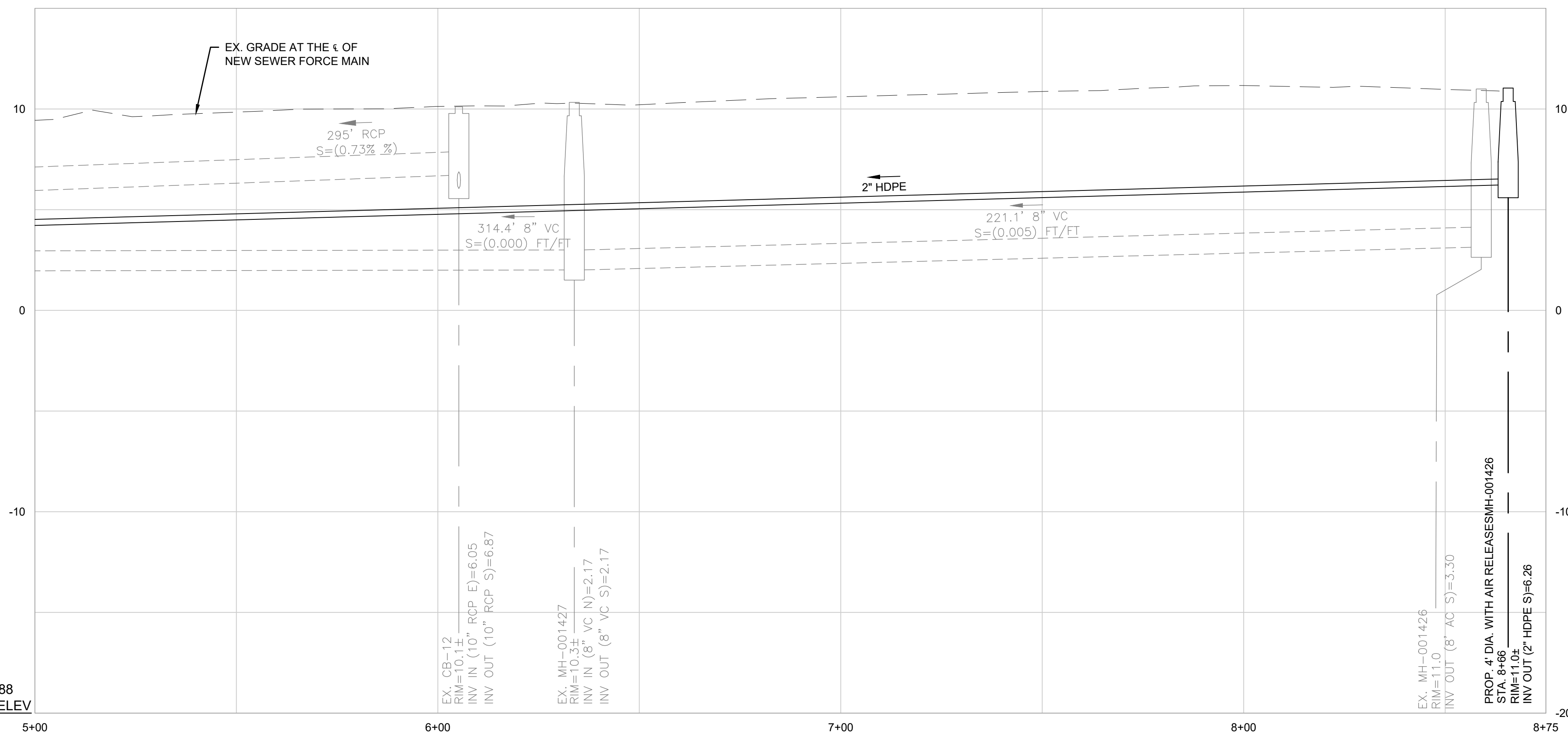
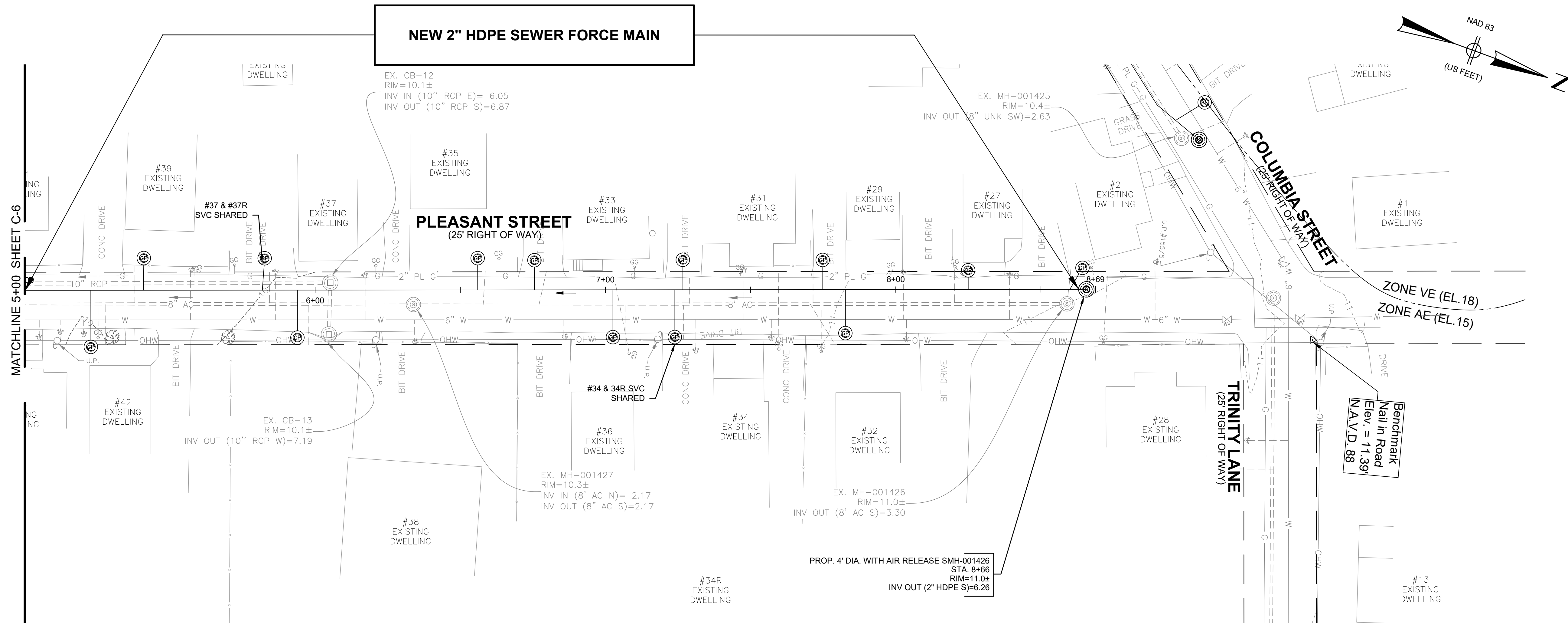
BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. C-6

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS





- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
  2. PROPOSED SEWER SERVICE LATERALS THAT CROSS OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
  3. THE CONTRACTOR WILL BE REQUIRED TO INSTALL AND MAINTAIN EROSION CONTROL PROTECTION BAGS IN ALL CATCH BASINS WITHIN THE LIMITS OF WORK DURING CONSTRUCTION.
  4. THE CONTRACTOR SHALL ASSUME THAT ALL CATCH BASINS ARE ABOVE THE EXISTING WATER MAIN. ANY CATCH BASIN DAMAGED DURING CONSTRUCTION SHALL BE REPLACED STRUCTURE TO STRUCTURE AT HIS OWN EXPENSE WITH PVC PIPE OR AS DIRECTED BY THE ENGINEER.
  5. ALL EXISTING SEWERS ARE 8" DIAMETER.
  6. SEWER MATERIALS ARE EITHER AC OR UNKNOWN.
  7. SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  8. RIM ELEVATIONS FROM SURVEY.
  9. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
  10. EXISTING SEWER SERVICE LOCATIONS ARE FROM TOWN GIS OR TOWN SERVICE CARDS.
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8/2/2022 4:50 PM J:\21.101188 TOWN OF WAREHAM WANKINQUOAH\TOWN SET\101188\_PFR\_PLAN 1.DWG

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:  
CD

DESIGNED BY:  
RG

CHECKED BY:  
RD

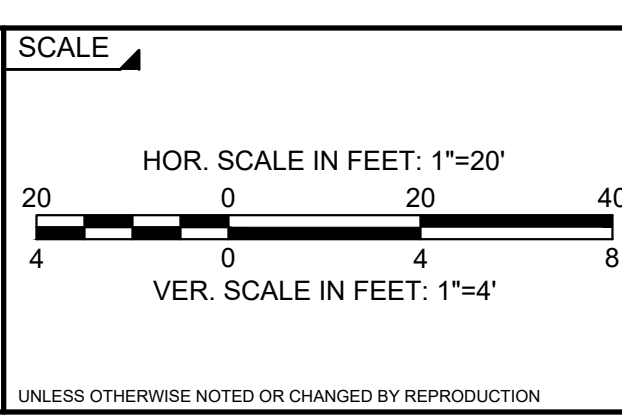
REGISTERED PROFESSIONAL

ROBERT A. DRAKE  
CIVIL  
No. 41642

8/3/22



PREPARED BY  
SUBCONSULTANT



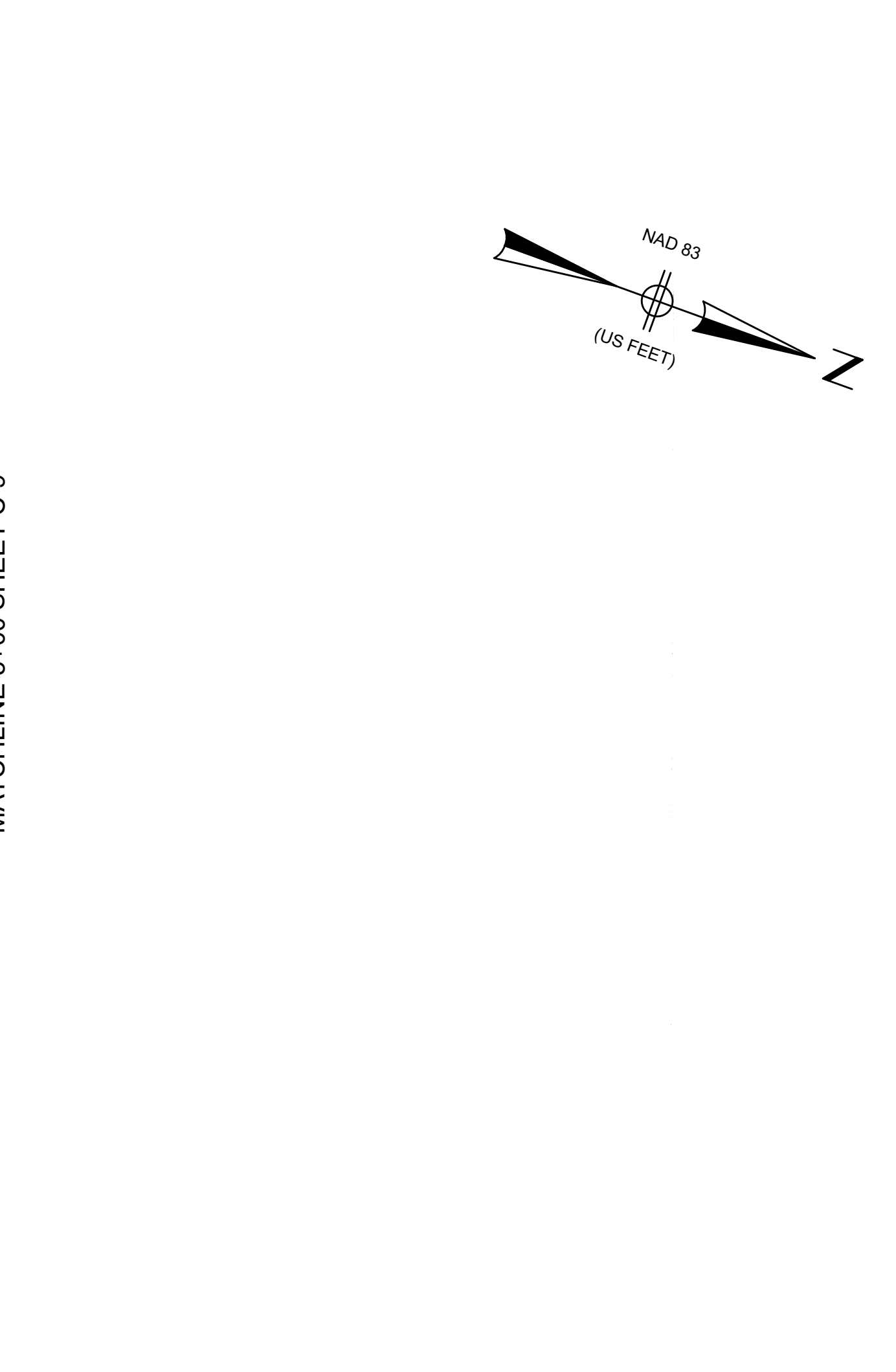
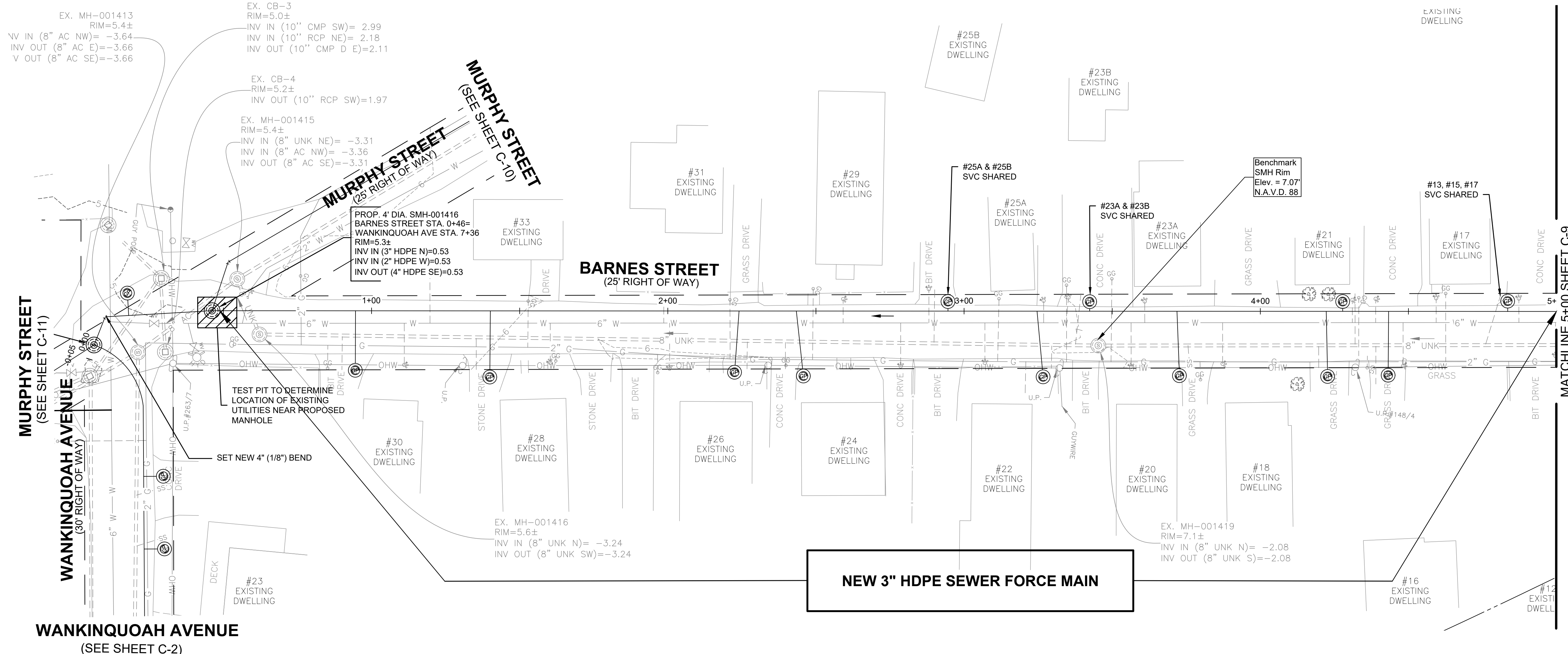
TITLE  
**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**  
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
PLEASANT STREET PLAN & PROFILE STA. (5+00 TO 8+75)

BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. C-7





- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
  2. PROPOSED SEWER SERVICE LATERALS THAT CROSS OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
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  7. SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  8. RIM ELEVATIONS FROM SURVEY.
  9. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
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8/2/2022 4:50 PM J:\21.101188 TOWN OF WAREHAM WANKINQUOAH\HAUTOCAD\PLAN SET\101188\_PFR\_PLAN 1.DWG

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:  
CD

DESIGNED BY:  
RG

CHECKED BY:  
RD

REGISTERED PROFESSIONAL

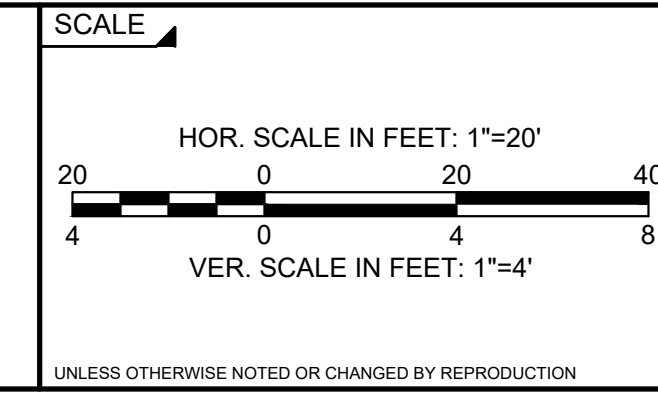
ROBERT A. DRAKE  
CIVIL  
No. 41642  
REGISTERED

8/3/22



PREPARED BY

SUBCONSULTANT



TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**

**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**

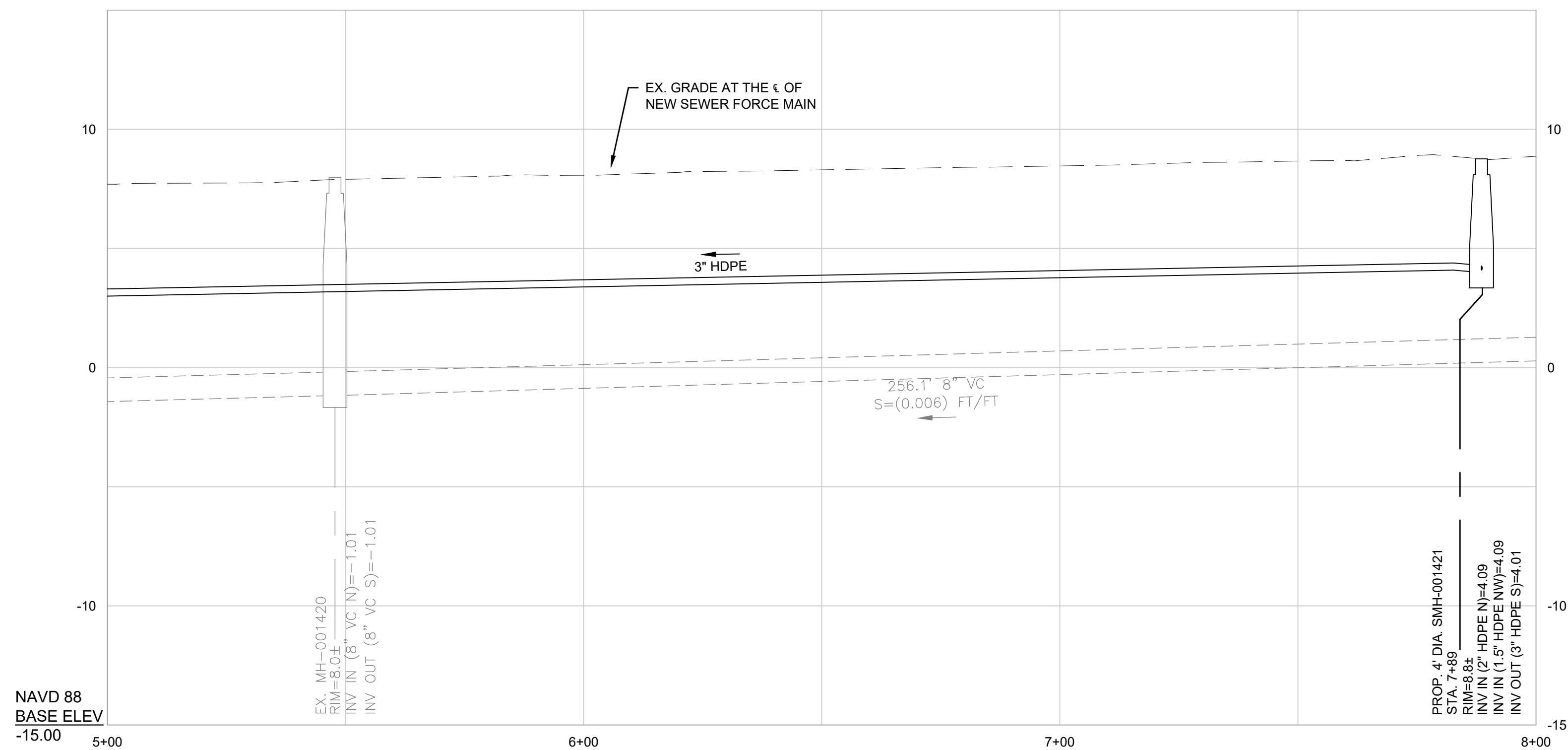
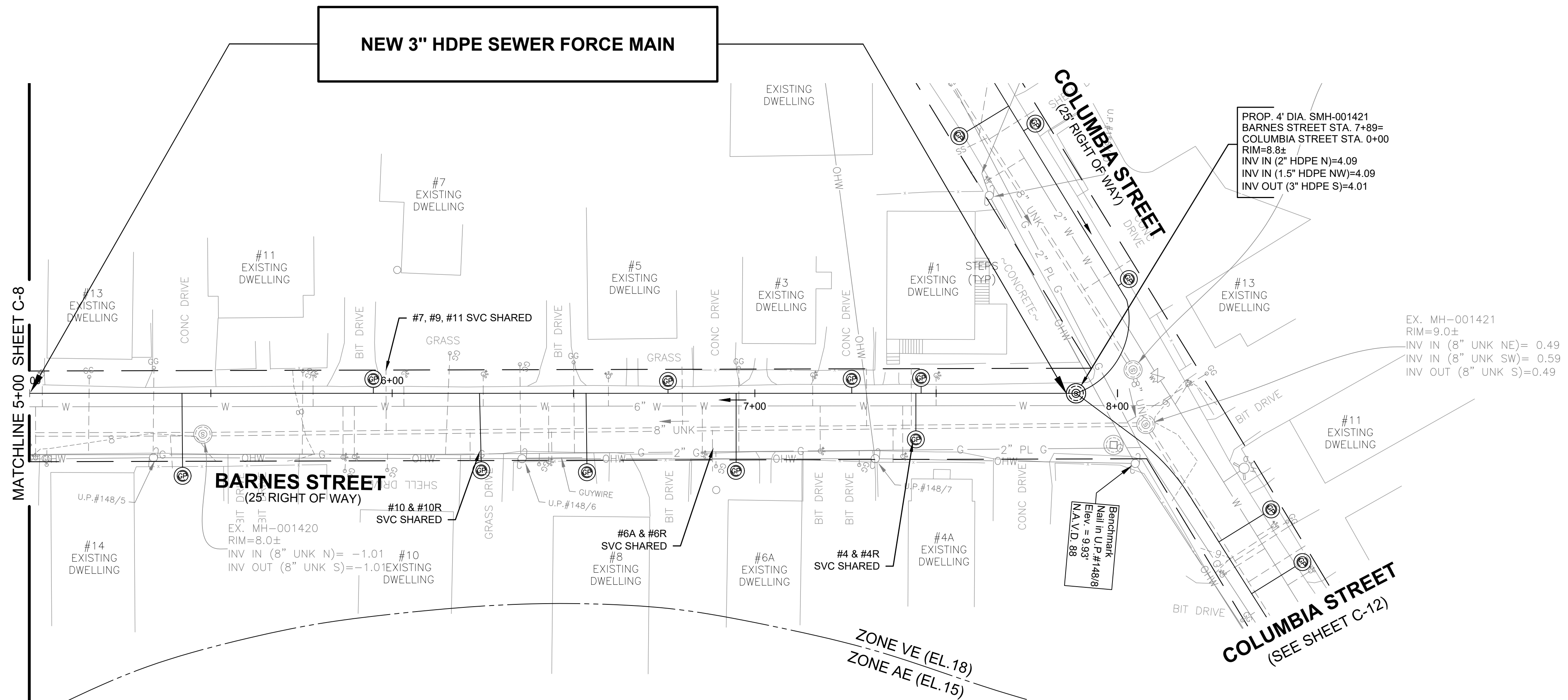
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
BARNES STREET PLAN & PROFILE STA. (-0+05 TO 5+00)

BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. C-8





- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
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  9. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
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  12. CONTRACTOR TO DOCUMENT HORIZONTAL LOCATION OF ALL EXISTING SEWER SERVICES, ELEVATION OF SERVICE, PIPE SIZE AND MATERIAL.
  13. GRINDER PUMP LOCATIONS DEPICTED ARE APPROXIMATE AND FOR BIDDING PURPOSES ONLY. CONTRACTOR TO COORDINATE GRINDER PUMP LOCATION WITH EXISTING SERVICE LOCATION, TOWN TO APPROVE GRINDER PUMP LOCATION PRIOR TO INSTALLATION. GRINDER PUMP CORES, ELECTRICAL, VENTING AND CONNECTION TO EXISTING GRAVITY SERVICE WILL BE COMPLETED BY OTHERS.

8/2/2022 4:50 PM J:\21.10188 TOWN OF WAREHAM WANKINQUOAH\TOWN SET\10188\_PRR\_PLAN 1.DWG

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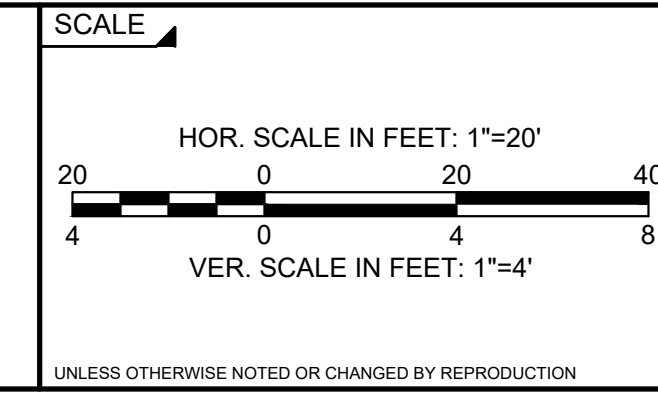
REGISTERED PROFESSIONAL

ROBERT A. DRAKE  
CIVIL  
No. 41642

8/3/22



PREPARED BY  
SUBCONSULTANT



TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**

**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**

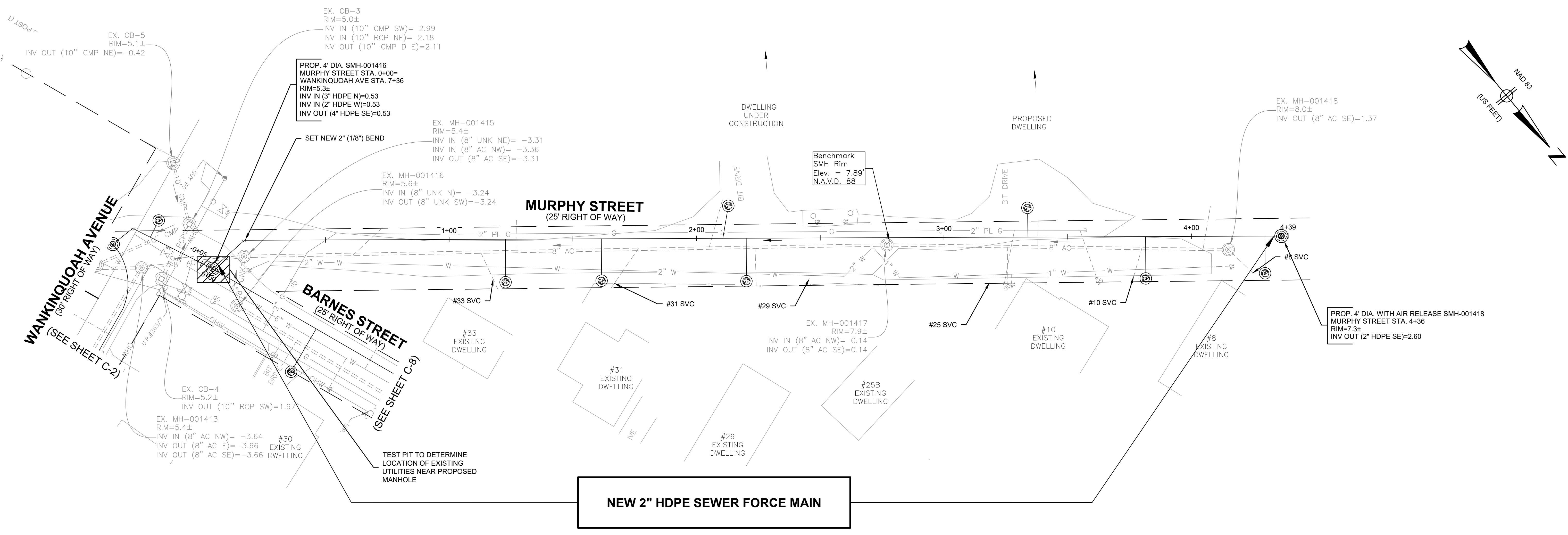
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
BARNES STREET PLAN & PROFILE STA. (5+00 TO 7+77)

BETA JOB NO. 10188

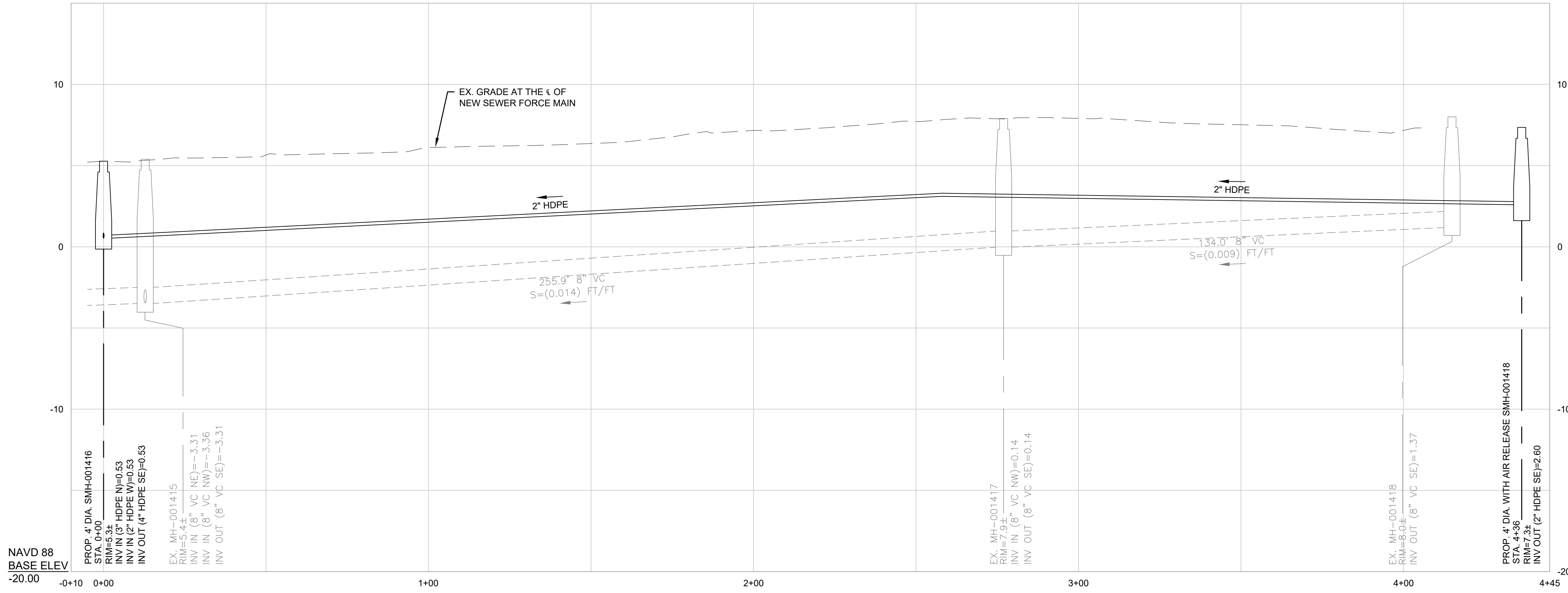
ISSUE DATE 8/3/2022

SHEET NO. C-9





**NEW 2" HDPE SEWER FORCE MAIN**



- NOTES:
- PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
  - PROPOSED SEWER SERVICE LATERALS THAT CROSS OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
  - THE CONTRACTOR WILL BE REQUIRED TO INSTALL AND MAINTAIN EROSION CONTROL PROTECTION BAGS IN ALL CATCH BASINS WITHIN THE LIMITS OF WORK DURING CONSTRUCTION.
  - THE CONTRACTOR SHALL ASSUME THAT ALL CATCH BASINS ARE ABOVE THE EXISTING WATER MAIN. ANY CATCH BASIN DAMAGED DURING CONSTRUCTION SHALL BE REPLACED STRUCTURE TO STRUCTURE AT HIS OWN EXPENSE WITH PVC PIPE OR AS DIRECTED BY THE ENGINEER.
  - ALL EXISTING SEWERS ARE 8" DIAMETER.
  - SEWER MATERIALS ARE EITHER AC OR UNKNOWN.
  - SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  - RIM ELEVATIONS FROM SURVEY.
  - INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME.
  - DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
  - EXISTING SEWER SERVICE LOCATIONS ARE FROM TOWN GIS OR TOWN SERVICE CARDS.
  - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
  - CONTRACTOR TO DOCUMENT HORIZONTAL LOCATION OF ALL EXISTING SEWER SERVICES, ELEVATION OF SERVICE, PIPE SIZE AND MATERIAL.
  - GRINDER PUMP LOCATIONS DEPICTED ARE APPROXIMATE AND FOR BIDDING PURPOSES ONLY. CONTRACTOR TO COORDINATE GRINDER PUMP LOCATION WITH EXISTING SERVICE LOCATION, TOWN TO APPROVE GRINDER PUMP LOCATION PRIOR TO INSTALLATION. GRINDER PUMP CORES, ELECTRICAL, VENTING AND CONNECTION TO EXISTING GRAVITY SERVICE WILL BE COMPLETED BY OTHERS.

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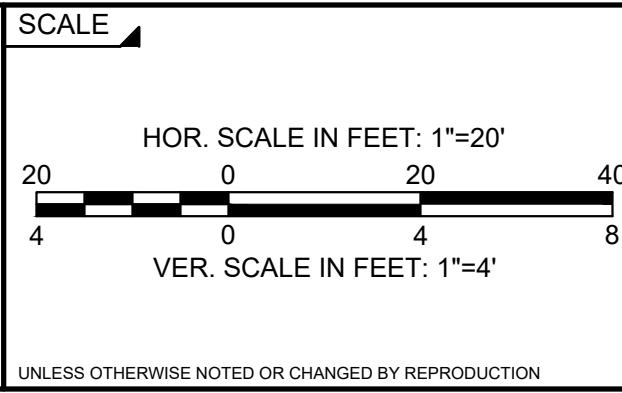
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ROBERT A. DRAKE  
CIVIL  
No. 41542

PREPARED BY  
BETA

8/3/22



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TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**

**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**

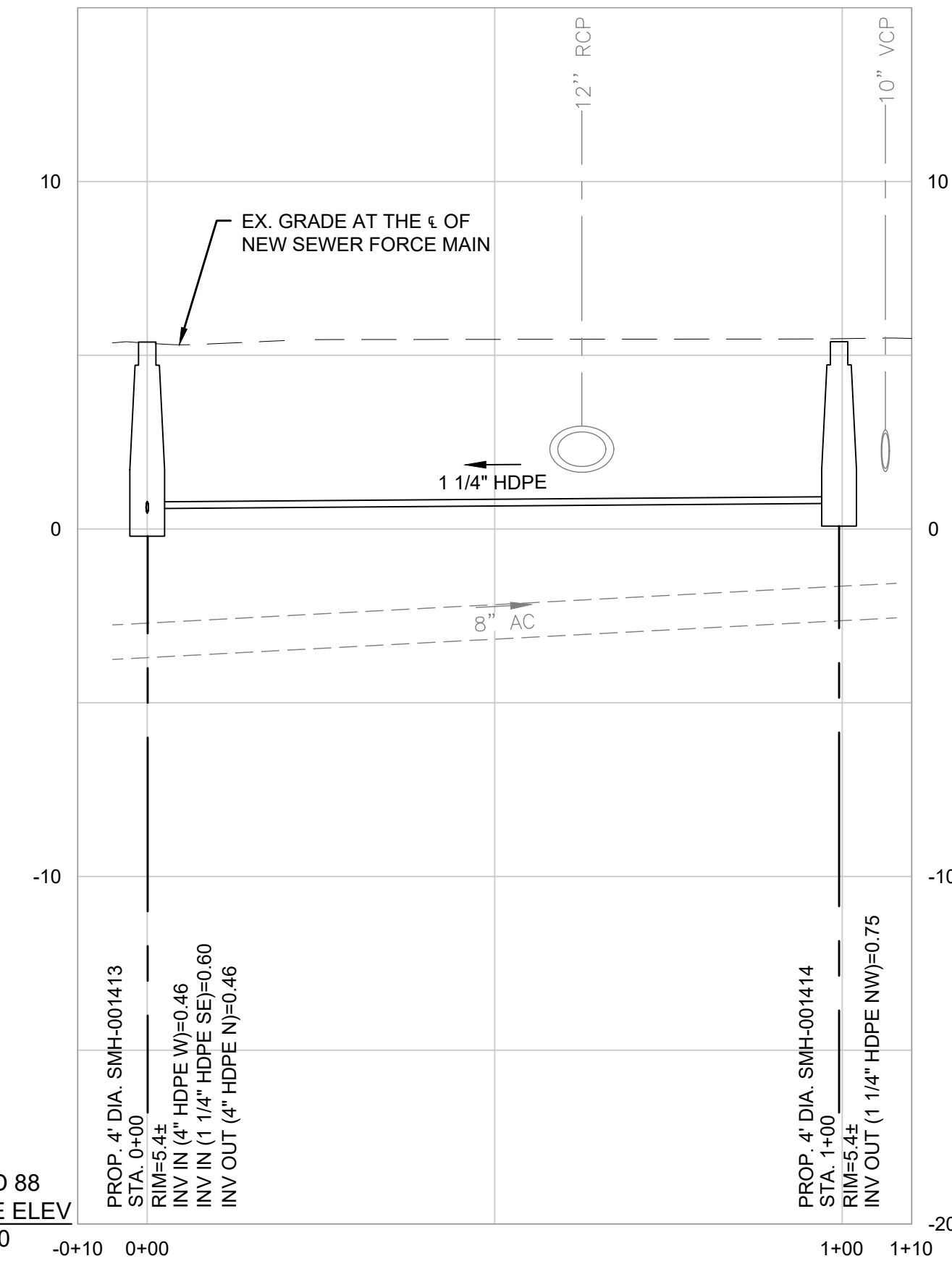
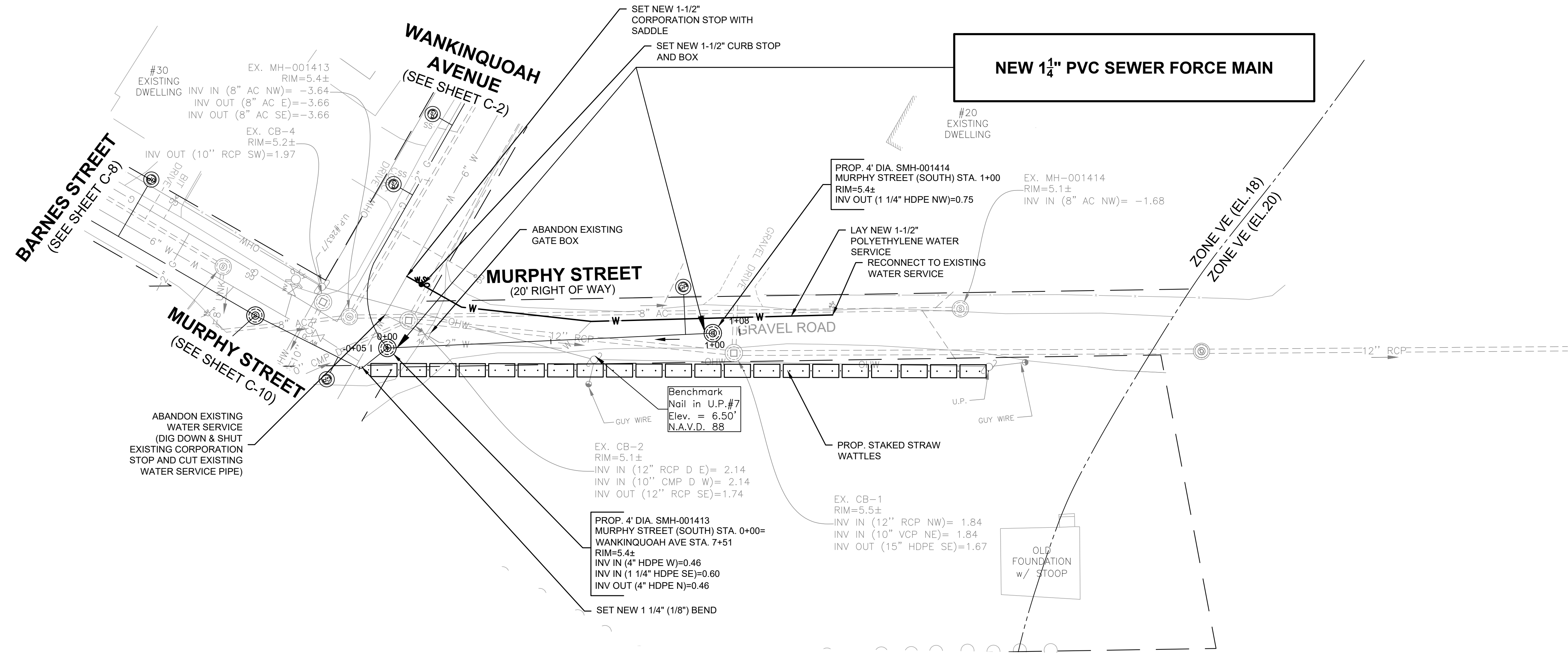
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
MURPHY STREET PLAN & PROFILE STA.  
(-0+05.00 TO 4+19)

BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. C-10





- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
  2. PROPOSED SEWER SERVICE LATERALS THAT CROSS OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
  3. THE CONTRACTOR WILL BE REQUIRED TO INSTALL AND MAINTAIN EROSION CONTROL PROTECTION BAGS IN ALL CATCH BASINS WITHIN THE LIMITS OF WORK DURING CONSTRUCTION.
  4. THE CONTRACTOR SHALL ASSUME THAT ALL CATCH BASINS ARE ABOVE THE EXISTING WATER MAIN. ANY CATCH BASIN DAMAGED DURING CONSTRUCTION SHALL BE REPLACED STRUCTURE TO STRUCTURE AT HIS OWN EXPENSE WITH PVC PIPE OR AS DIRECTED BY THE ENGINEER.
  5. ALL EXISTING SEWERS ARE 8" DIAMETER.
  6. SEWER MATERIALS ARE EITHER AC OR UNKNOWN.
  7. SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  8. RIM ELEVATIONS FROM SURVEY.
  9. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME.
  10. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
  11. EXISTING SEWER SERVICE LOCATIONS ARE FROM TOWN GIS OR TOWN SERVICE CARDS.
  12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
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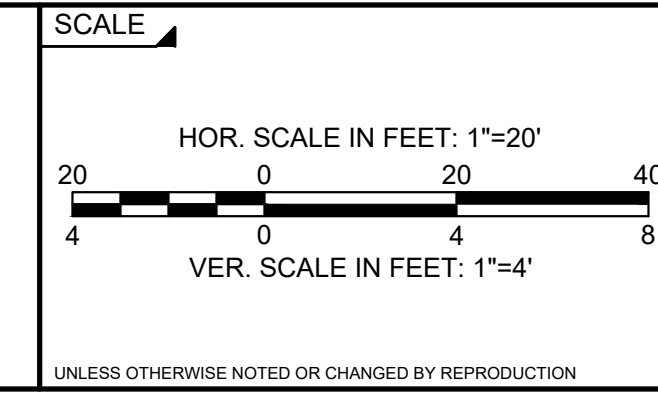
REGISTERED PROFESSIONAL

ROBERT A. DRAKE  
CIVIL  
No. 41542  
REGISTERED

8/3/22



PREPARED BY  
SUBCONSULTANT



TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**

**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**

PROPOSED LOW PRESSURE SEWER FORCE MAIN  
MURPHY STREET (SOUTH) PLAN &  
PROFILE STA. (-0+10 TO 1+10)

BETA JOB NO. 10188

ISSUE DATE 8/3/2022

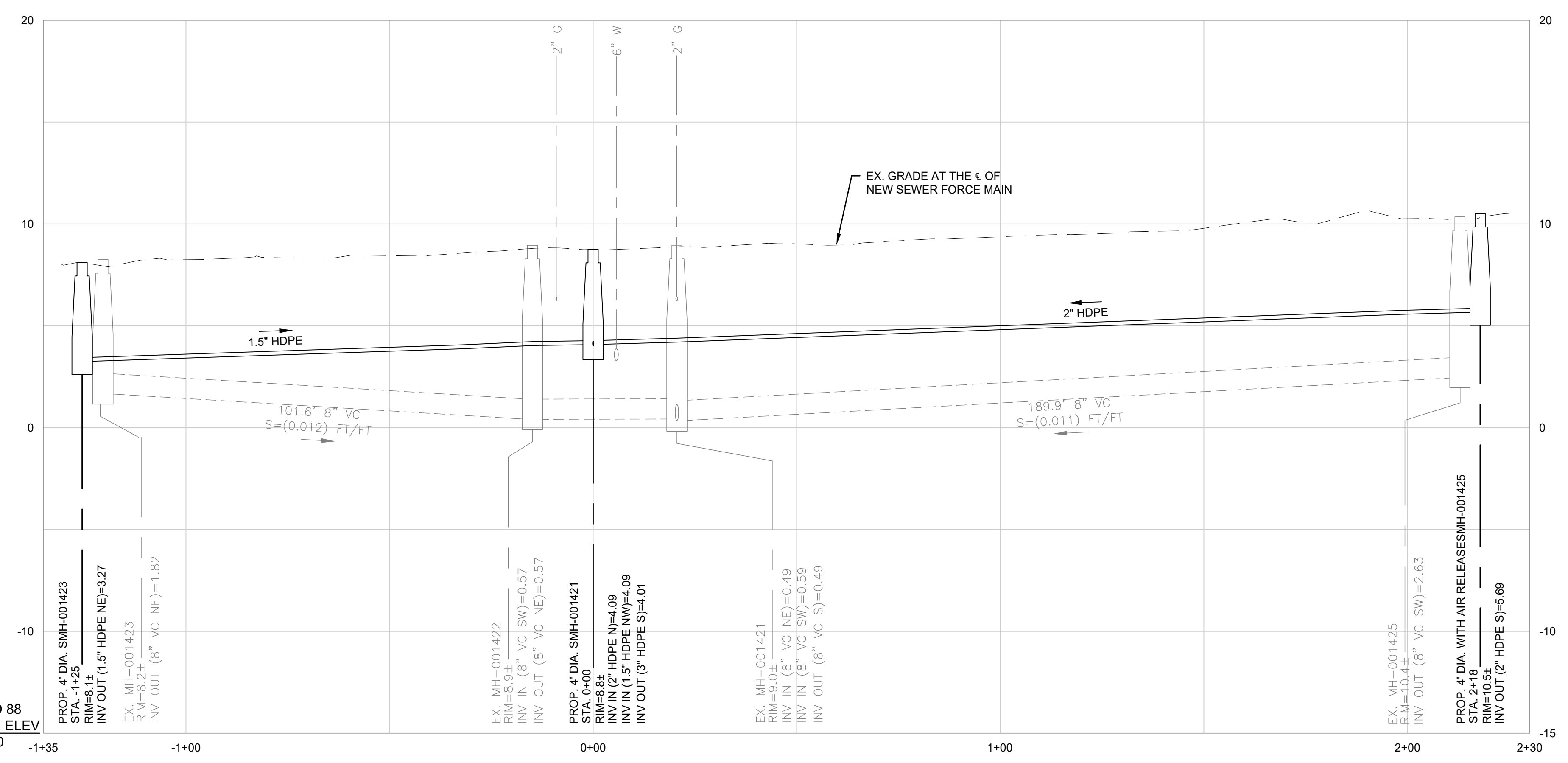
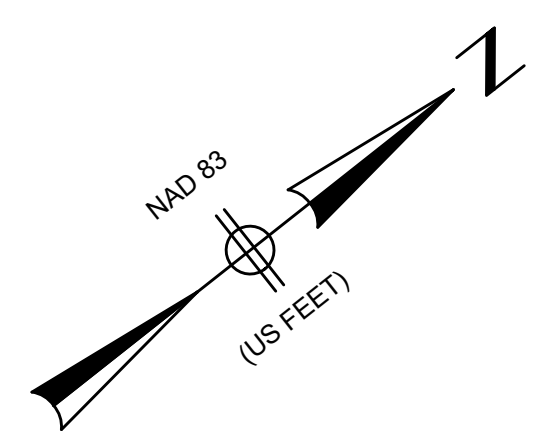
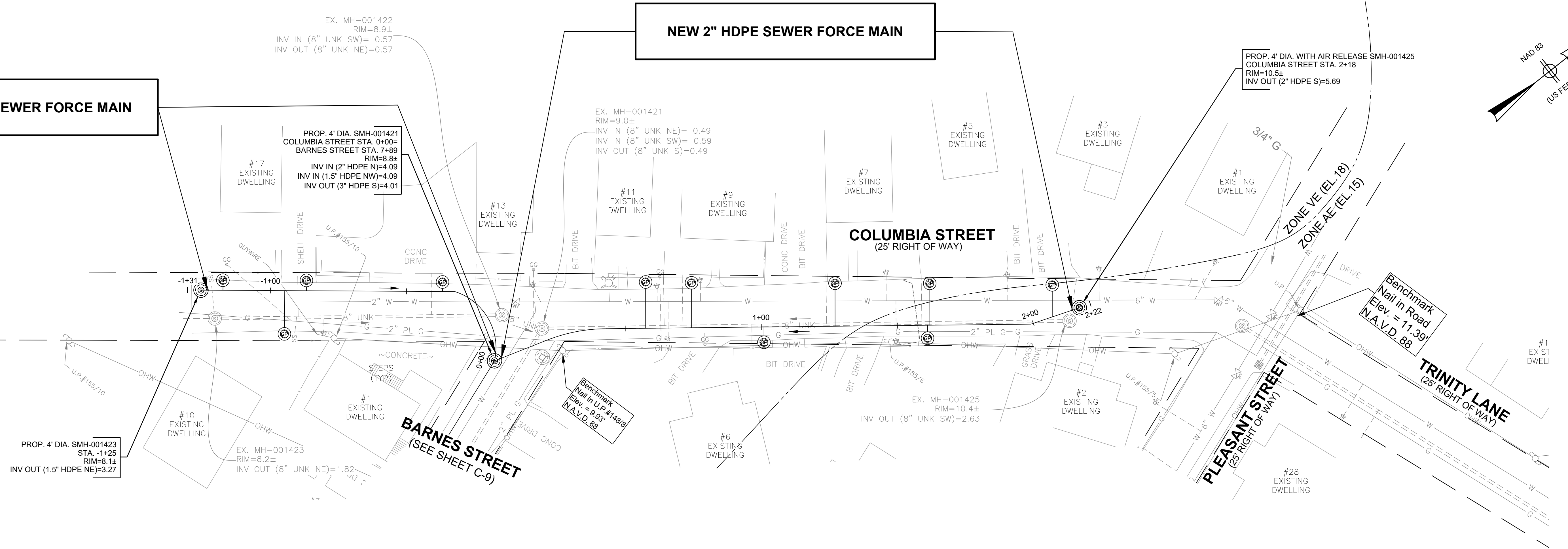
SHEET NO. C-11



8/2/2022 4:50 PM 0:21:10188 TOWN OF WAREHAM WANKINQUOAH UTILITY CAD/PLAN SET/10188\_PRR\_PLAN 1.DWG

**NEW 1.5" HDPE SEWER FORCE MAIN**

**NEW 2" HDPE SEWER FORCE MAIN**



- NOTES:
1. PROPOSED SEWER FORCE MAIN TO MAINTAIN 10 LF HORIZONTAL SEPARATION FROM WATER MAIN WHERE POSSIBLE. WHERE PROPOSED SEWER FORCE MAIN IS WITHIN 10 LF AND AT ALL WATER MAIN CROSSINGS PROPOSED SEWER FORCE MAIN SHALL BE SLEEVED.
  2. PROPOSED SEWER SERVICE LATERALS THAT CROSS OVER EXISTING WATER MAINS SHALL BE SLEEVED FROM THE PROPOSED GRINDER PUMP TO THE PROPOSED SEWER FORCE MAIN.
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  5. ALL EXISTING SEWERS ARE 8" DIAMETER.
  6. SEWER MATERIALS ARE EITHER AC OR UNKNOWN.
  7. SEWER ON WANKINQUOAH AVE AS WELL AS NORTH OF WANKINQUOAH AVE ON BAYVIEW AVE IS LINED AC.
  8. RIM ELEVATIONS FROM SURVEY.
  9. INVERT AND DROP ELEVATIONS IN ALL SEWER MANHOLES WERE FIELD MEASURED BUT SOME OF THE MANHOLES WERE SURCHARGED AT THE TIME. DRAIN PIPE CONNECTIVITY FROM TOWN RECORD PLANS AND FIELD INSPECTION.
  10. EXISTING SEWER SERVICE LOCATIONS ARE FROM TOWN GIS OR TOWN SERVICE CARDS.
  11. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
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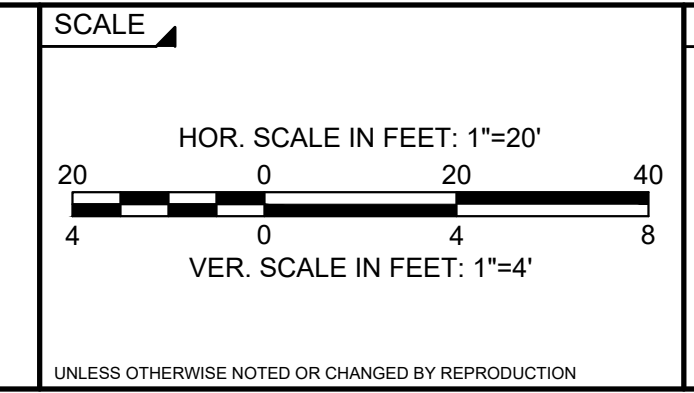
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REGISTERED PROFESSIONAL  
ROBERT A. DRAKE  
CIVIL  
No. 41642

PREPARED BY  
8/3/22



SUBCONSULTANT



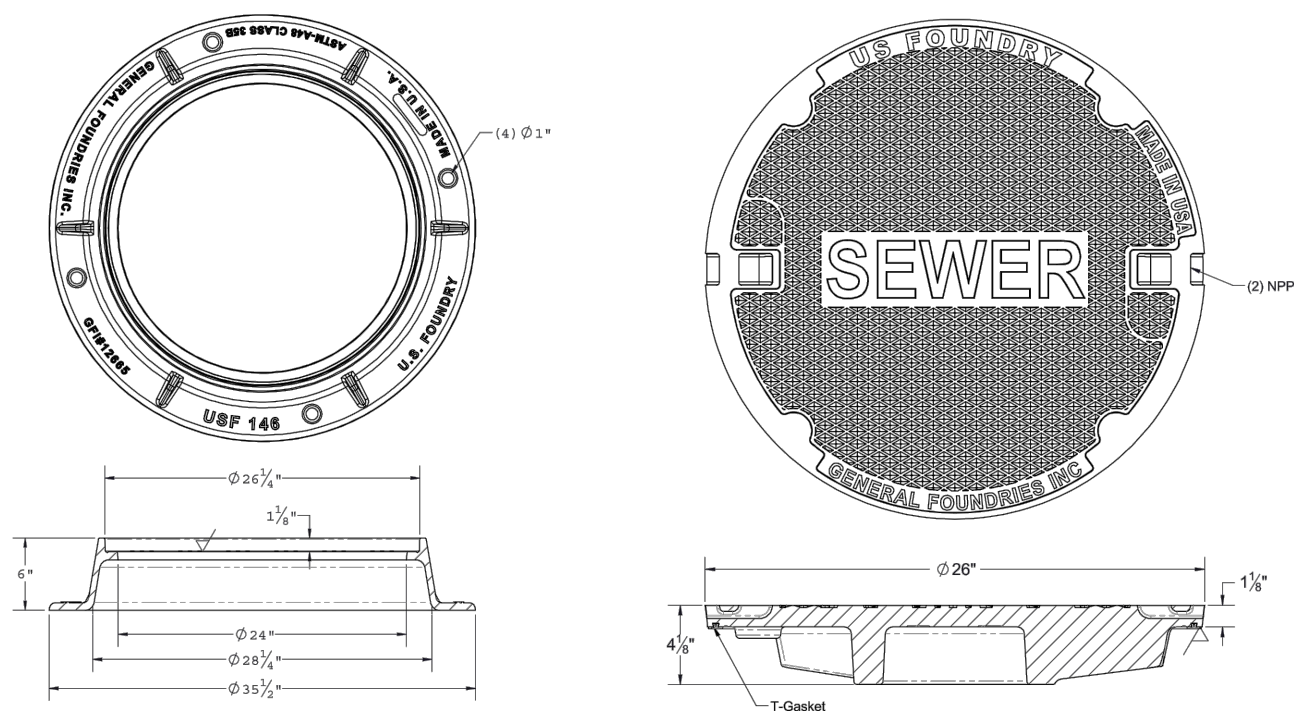
TITLE  
**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**  
PROPOSED LOW PRESSURE SEWER FORCE MAIN  
COLUMBIA STREET PLAN & PROFILE STA. (-0+93 TO 2+00)

BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. C-12



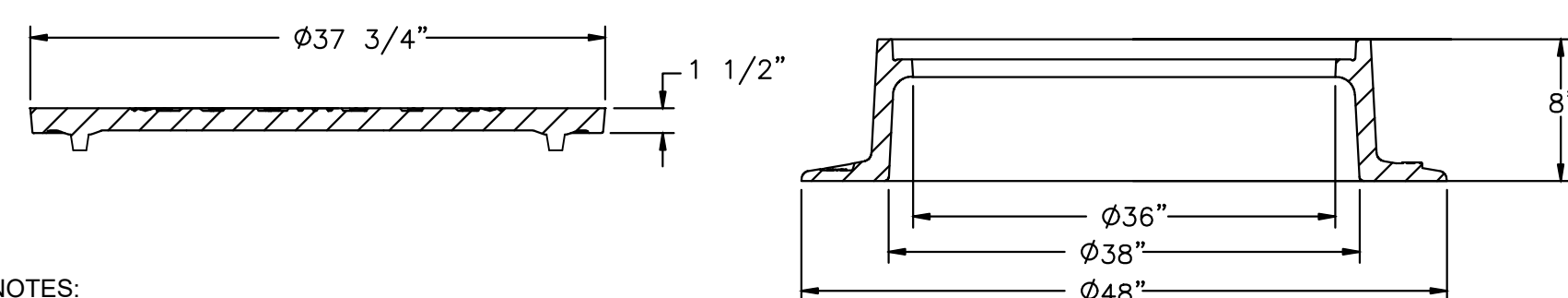


**NOTES:**

1. FRAME AND COVER SET FOR SEWER MANHOLES SHALL BE MODEL NOS. 8021904 / 8013697 AS MANUFACTURED BY GENERAL FOUNDRIES INC OR APPROVED EQUAL.
2. COVER CASTING SHALL CONFORM TO THE MUNICIPAL STANDARD (AS SHOWN) UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. COVER LETTERING DETAIL APPLIES TO ALL COVER SIZES AND WATERTIGHT MANHOLE COVERS IN ACCORDANCE WITH NOTES IN TYPICAL MANHOLE DETAIL.
4. FOR SHALLOW STRUCTURES 6" HIGH FRAMES MAY BE SUBSTITUTED FOR STANDARD 8" HIGH FRAMES FOR SHALLOW-PROFILE STRUCTURES AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. NO FRAMES LESS THAN 6" HIGH SHALL BE ALLOWED.
5. FRAME AND COVER SHALL BE SET IN FULL BED OF MORTAR ON A MINIMUM OF TWO COURSES OF BRICK.

**26-INCH SEWER MANHOLE FRAME AND COVER (FOR CLEANOUT AND AIR RELEASE STRUCTURES)**

NOT TO SCALE

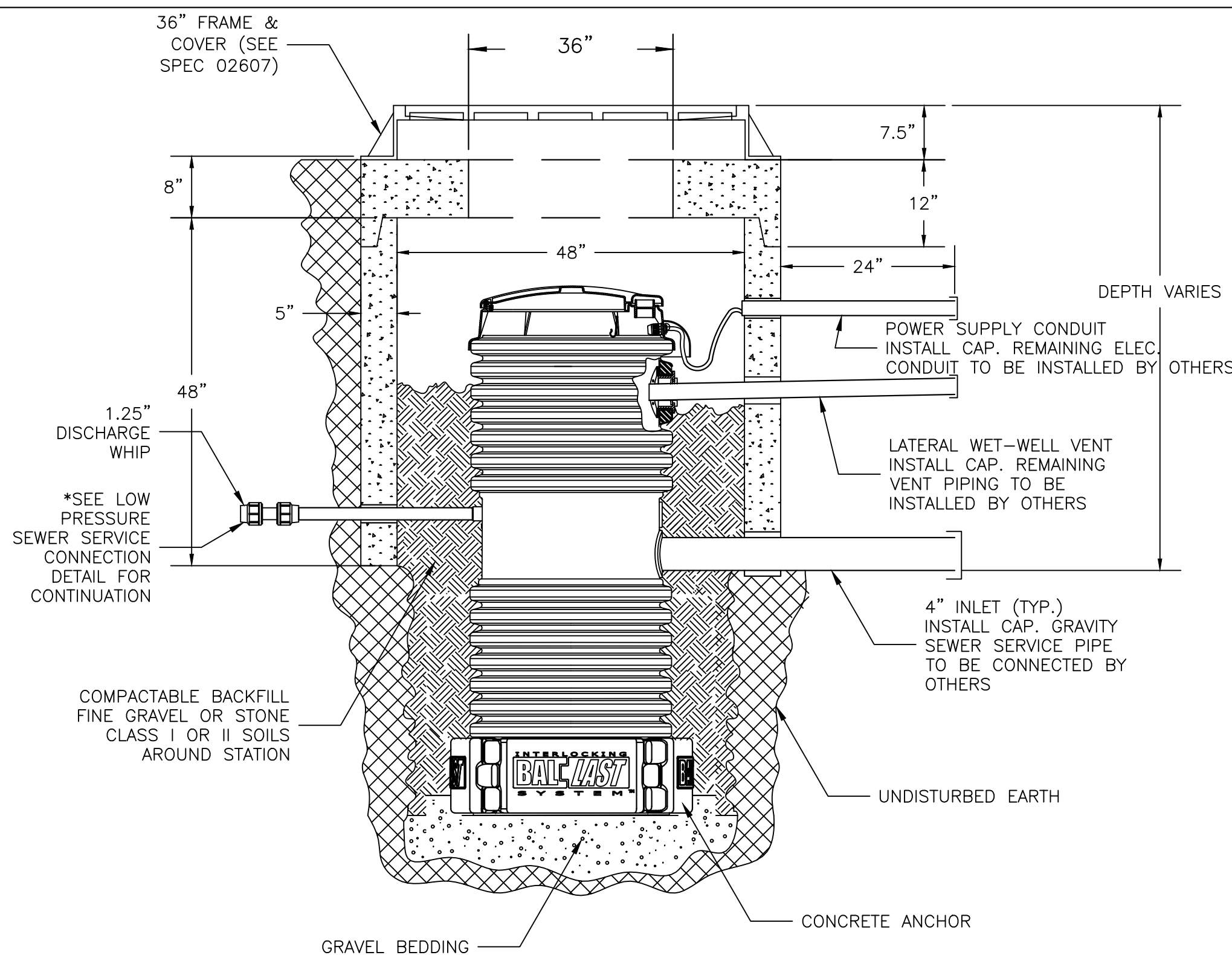


**NOTES:**

1. FRAME AND COVER SET FOR SEWER MANHOLES SHALL BE MODEL NOS. 13681 AS MANUFACTURED BY GENERAL FOUNDRIES INC OR APPROVED EQUAL.
2. COVER CASTING SHALL CONFORM TO THE MUNICIPAL STANDARD (AS SHOWN) UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. COVER LETTERING DETAIL APPLIES TO ALL COVER SIZES AND WATERTIGHT MANHOLE COVERS IN ACCORDANCE WITH NOTES IN TYPICAL MANHOLE DETAIL.

**36-INCH SEWER MANHOLE FRAME AND COVER (FOR GRINDER PUMP STRUCTURES)**

NOT TO SCALE

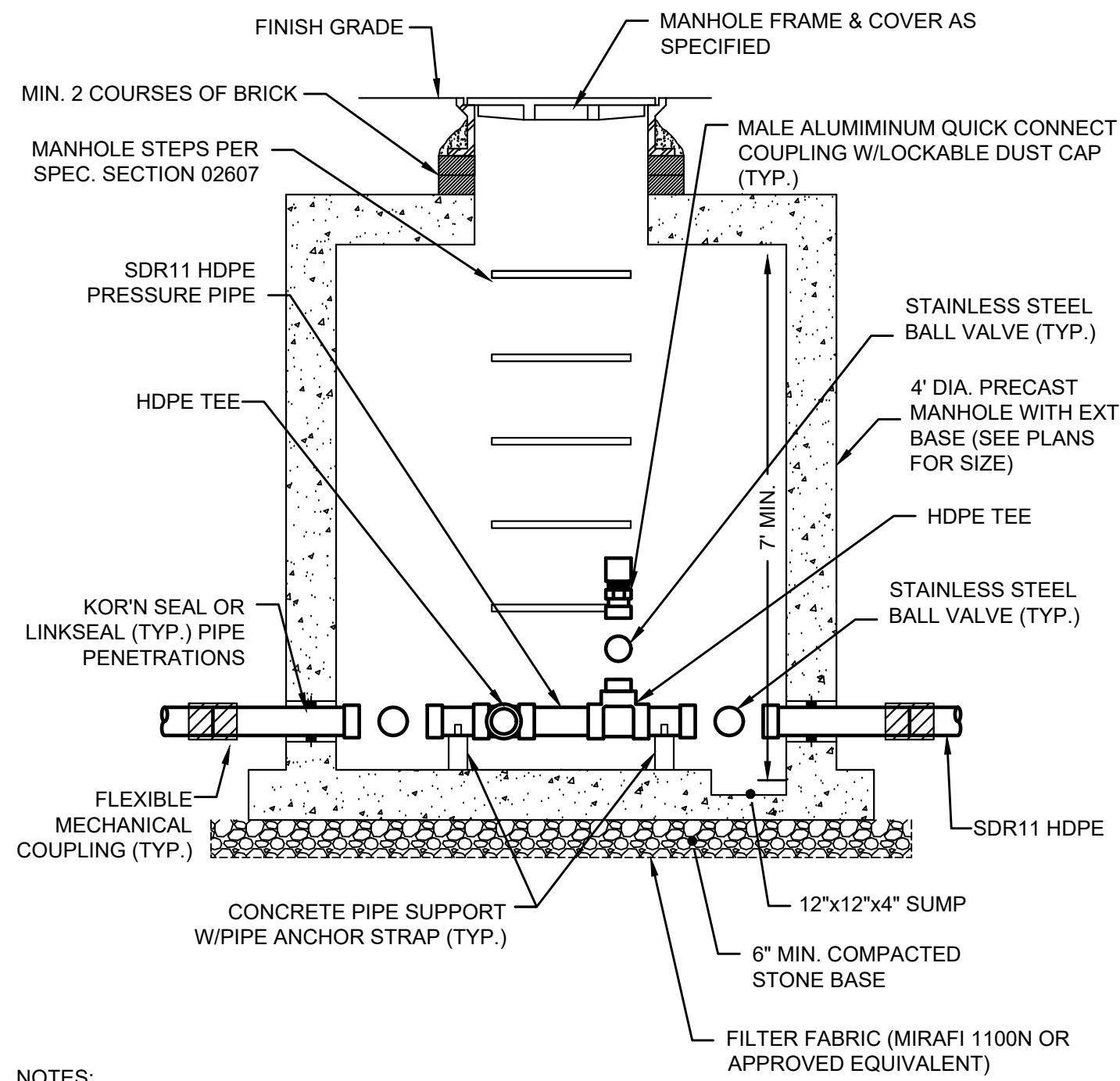


**NOTES:**

1. PUMP STATION TANK, STRUCTURE, CASTING, SERVICE PIPING, PIPE STUBS TO BE INSTALLED BY CONTRACTOR. PUMP CORES AND ALARM PANEL TO BE PURCHASED BY CONTRACTOR BUT INSTALLED BY OTHERS.
2. ALL EXISTING SHARED SEWER SERVICES ARE TO BE DUPLEX GRINDER PUMP STATIONS.

**GRINDER PUMP STATION DETAIL**

NOT TO SCALE

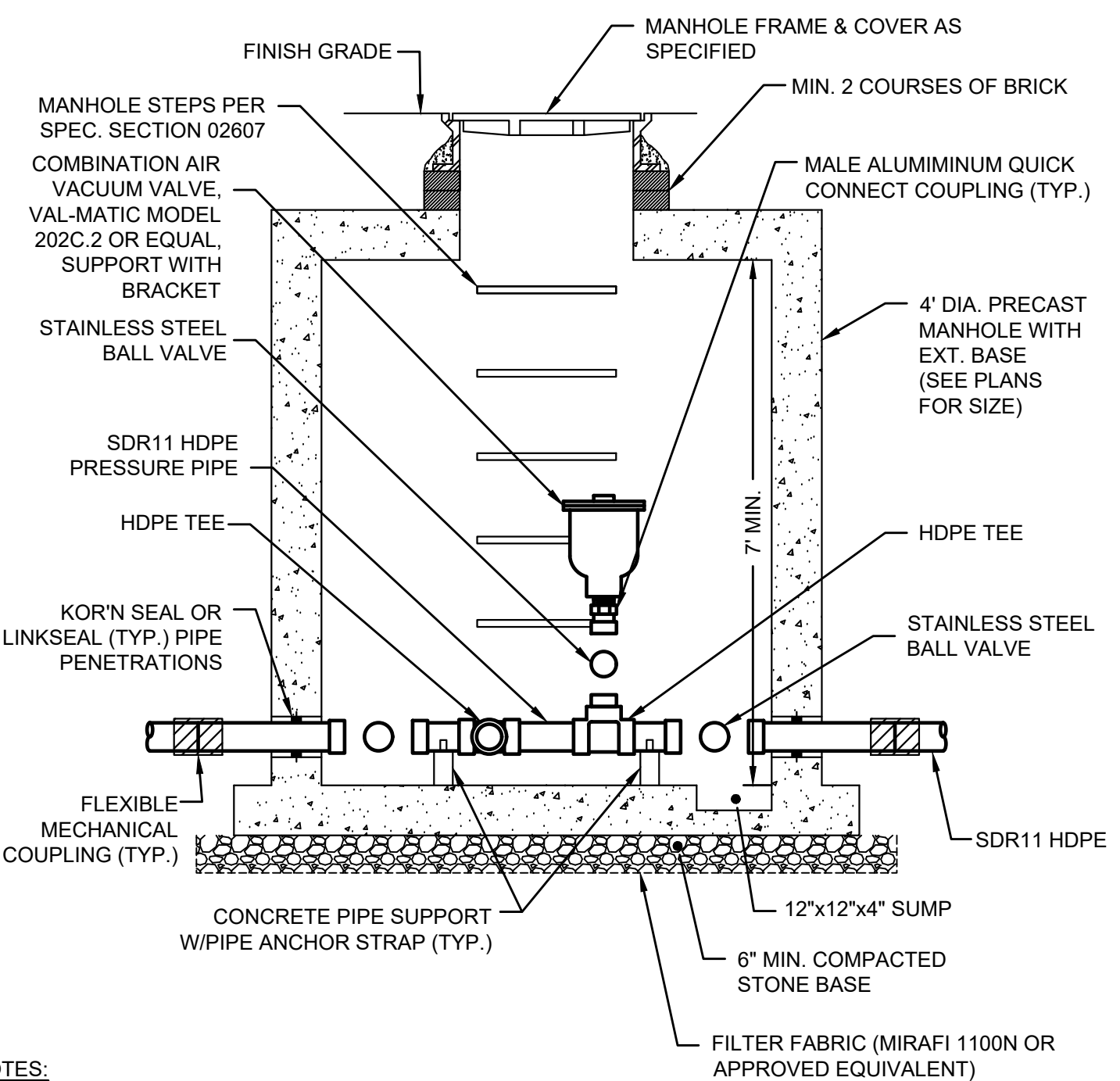


**NOTES:**

1. LOCATE FLUSHING QUICK CONNECT IN MANHOLE COVER OPENING.

**LOW PRESSURE IN-LINE (3-WAY) CLEANOUT STRUCTURE SECTION VIEW**

NOT TO SCALE

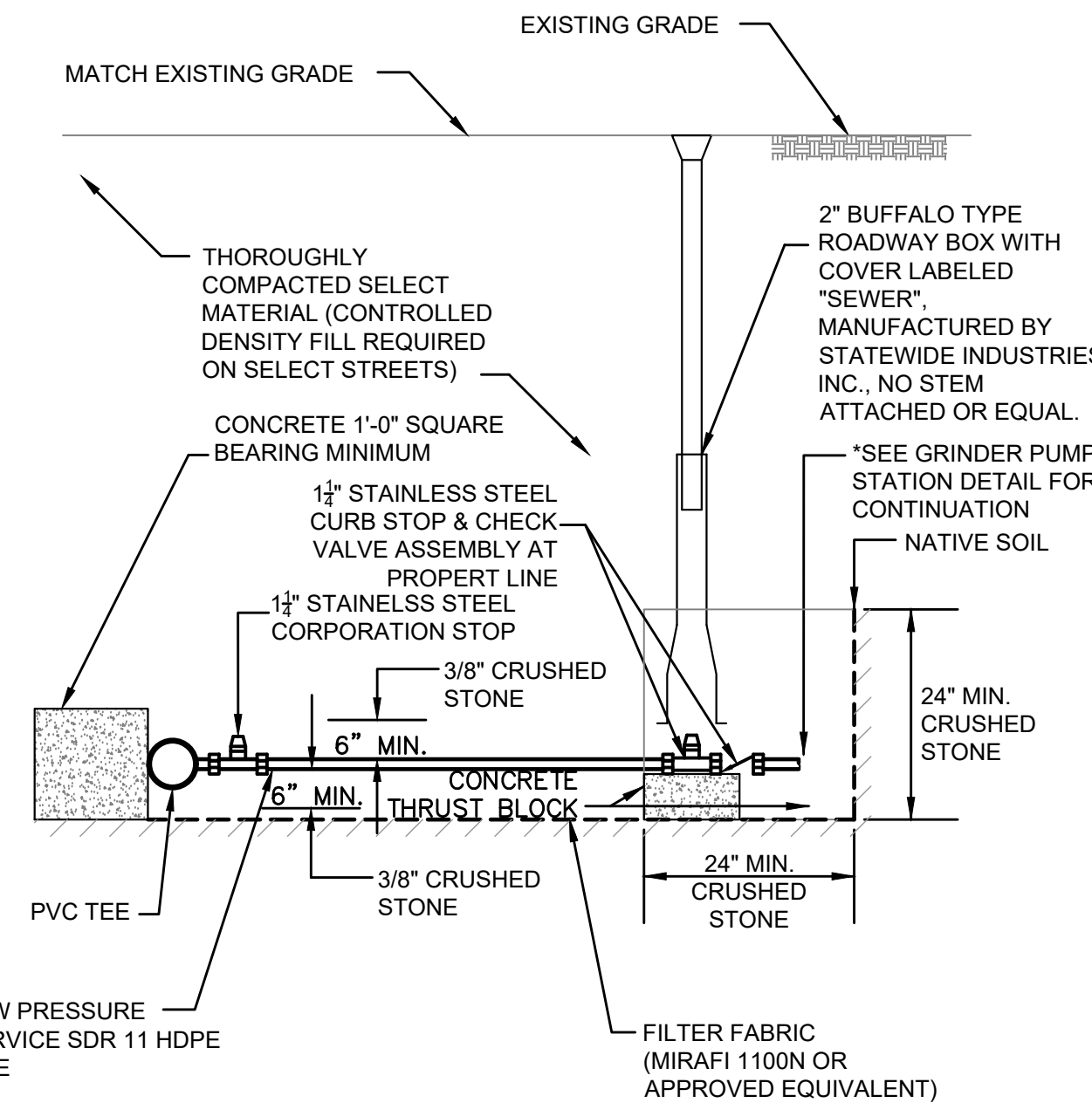


**NOTES:**

1. LOCATE COMBINATION AIR VALVE/FLUSHING QUICK CONNECT IN MANHOLE COVER OPENING.

**LOW PRESSURE IN-LINE (3-WAY) CLEANOUT / COMBINATION AIR VALVE STRUCTURE SECTION VIEW**

NOT TO SCALE



**NOTES:**

1. IF SERVICE PIPE LENGTH IS LESS THAN 5' LONG DO NOT INSTALL CORPORATION STOP

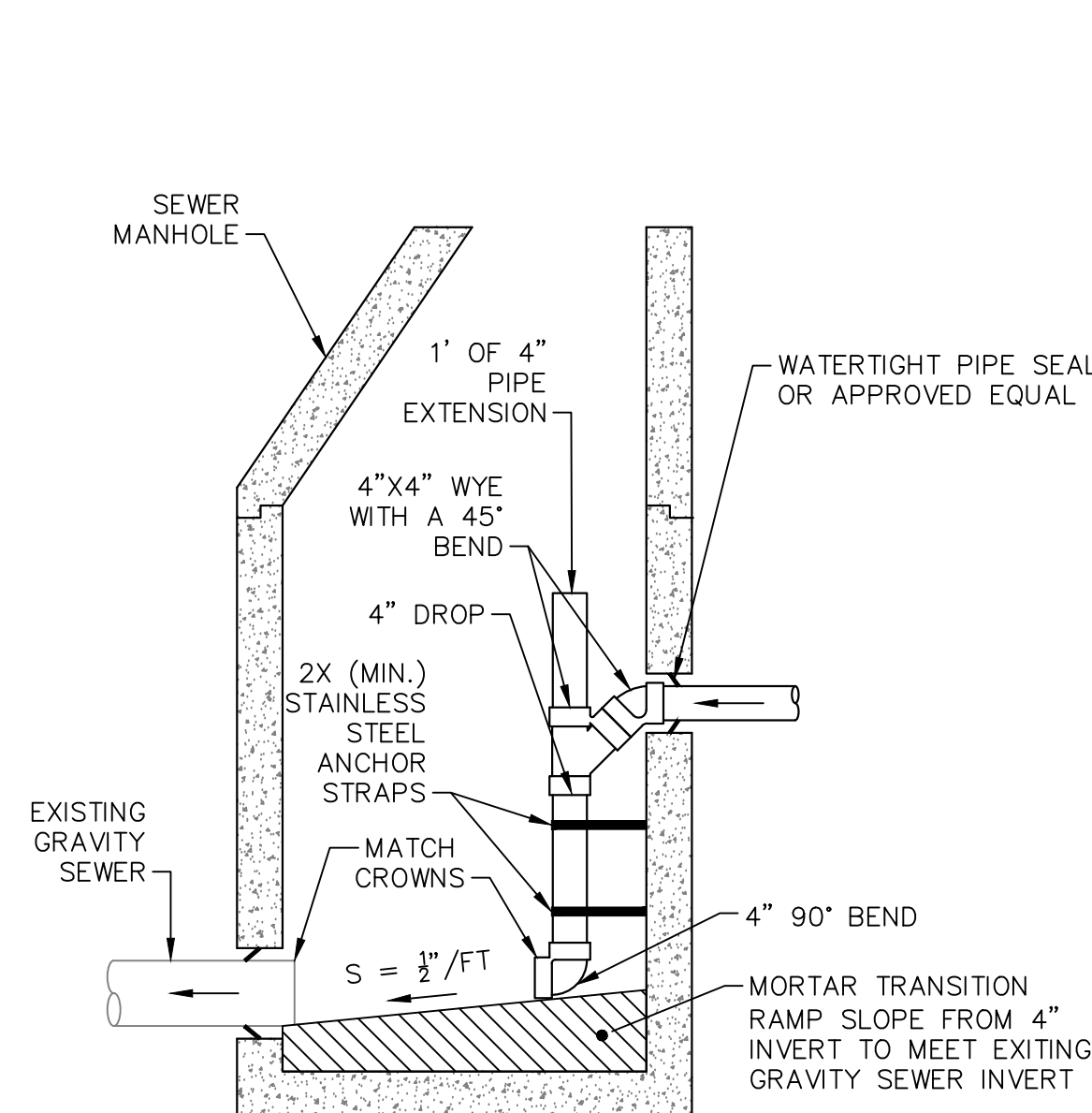
**LOW PRESSURE SEWER SERVICE CONNECTION**

NOT TO SCALE

DIAMETER OF PIPE D	TRENCH WIDTH Ws OR Wu	
	UNSHEETED	SHEETED
12" AND SMALLER	3'-0"	4'-2"
15"	3'-2"	4'-4"
18"	3'-6"	4'-8"
21"	3'-10"	5'-0"
24"	4'-2"	5'-4"

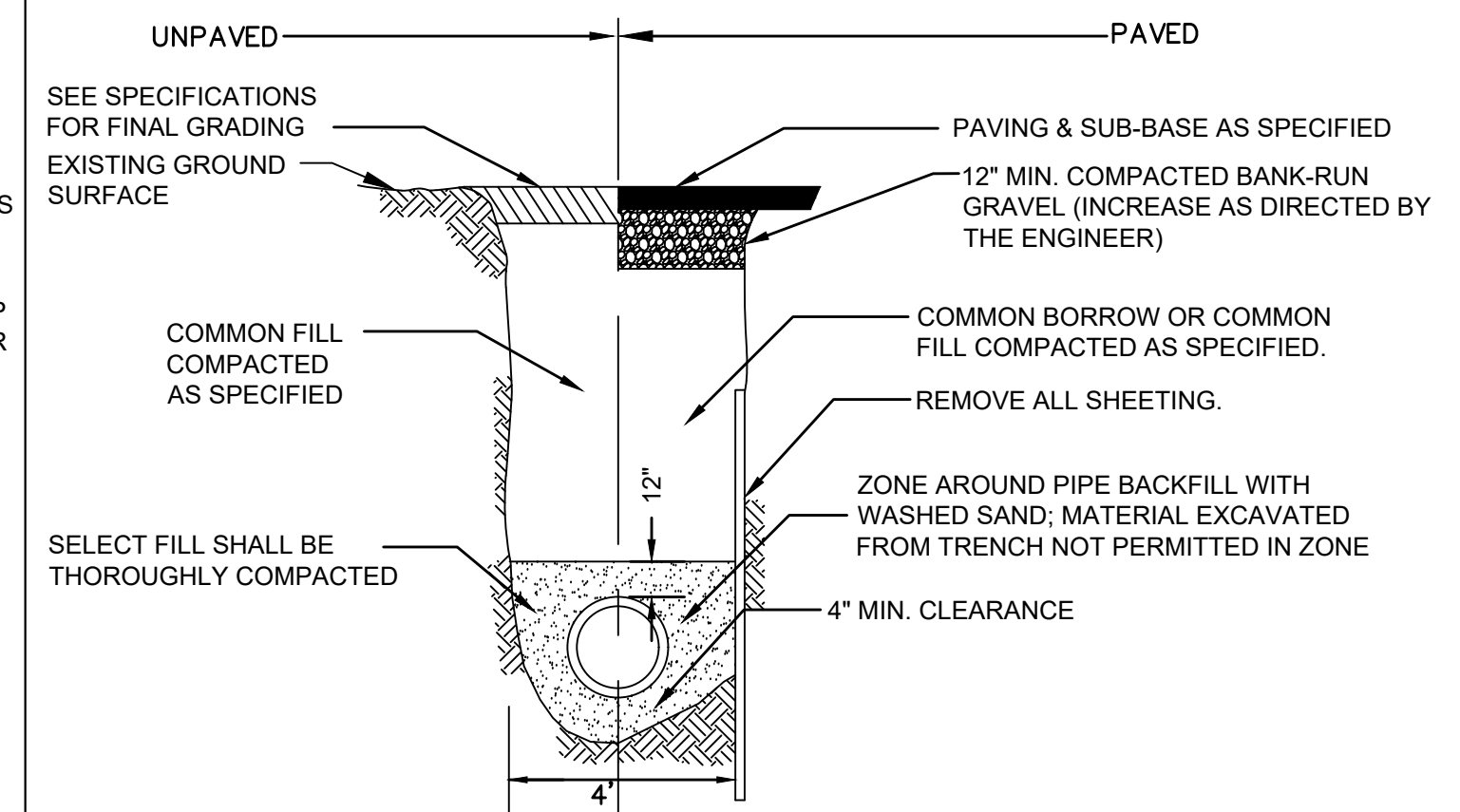
**TRENCH WIDTH TABLE**

NOT TO SCALE



**LOW PRESSURE SEWER DISCHARGE TO GRAVITY SEWER MANHOLE WITH INSIDE DROP**

NOT TO SCALE

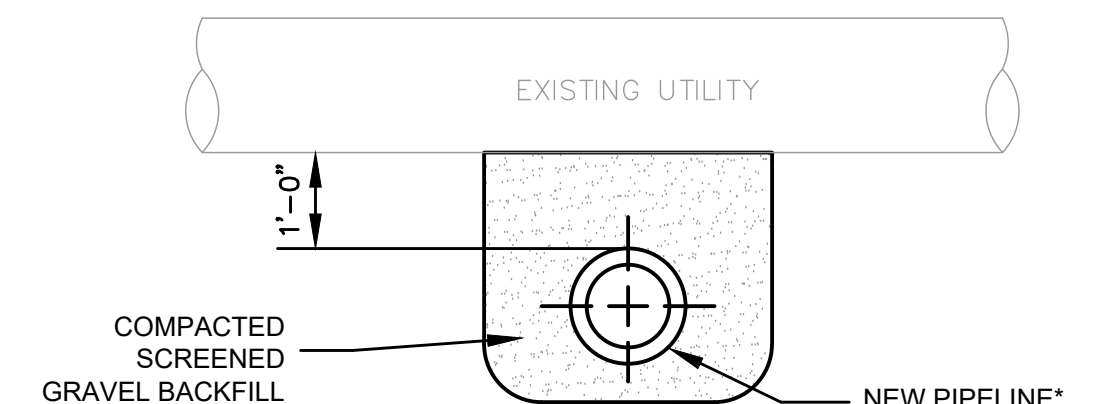


**NOTES:**

1. FOAM INSULATION TO BE USED IN TRENCH OVER BEDDED PIPE, IF LESS THAN 5' OF COVER TO PROTECT FROM FROST.

**FORCE MAIN TRENCH DETAIL**

NOT TO SCALE

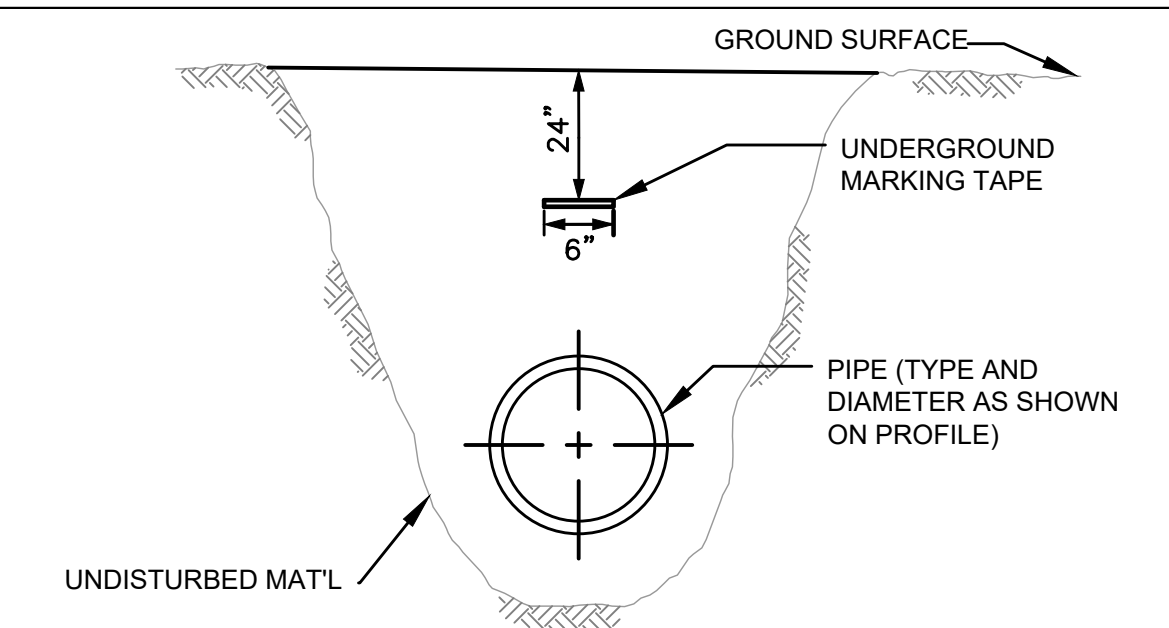


\* ONE FULL LENGTH OF PIPE CENTERED UNDER EXISTING PIPE OTHER THAN SEWERS

NOTE: DETAIL APPLICABLE FOR PIPE SECTIONS EXPOSED DURING CONSTRUCTION

**TYPICAL SECTION AT EXISTING UTILITIES**

NOT TO SCALE



**NOTES:**

1. MARKING TAPE TO BE INSTALLED OVER ALL PIPELINES AND CONDUITS INSTALLED UNDER THIS CONTRACT.
2. MARKING TAPE FOR NON-FERROUS PIPE OR CONDUITS TO BE DETECTABLE, MAGNETIC TYPE.
3. MARKING TAPE FOR FERROUS PIPE OF CONDUITS TO BE NON-DETECTABLE, NON-MAGNETIC TYPE.
4. MARKING TAPE IS TO BE 6-INCHES WIDE AND INSTALLED DIRECTLY ABOVE THE PIPE OR CONDUIT APPROXIMATELY 24-INCHES BELOW THE PROPOSED FINISHED GRADE.

**UNDERGROUND UTILITY MARKING TAPE DETAIL**

NOT TO SCALE

8/2/2022 4:51 PM J:\21.10188 TOWN OF WAREHAM WAREHAM\HAUTOCAD\PLAN SET\DETAILS.DWG

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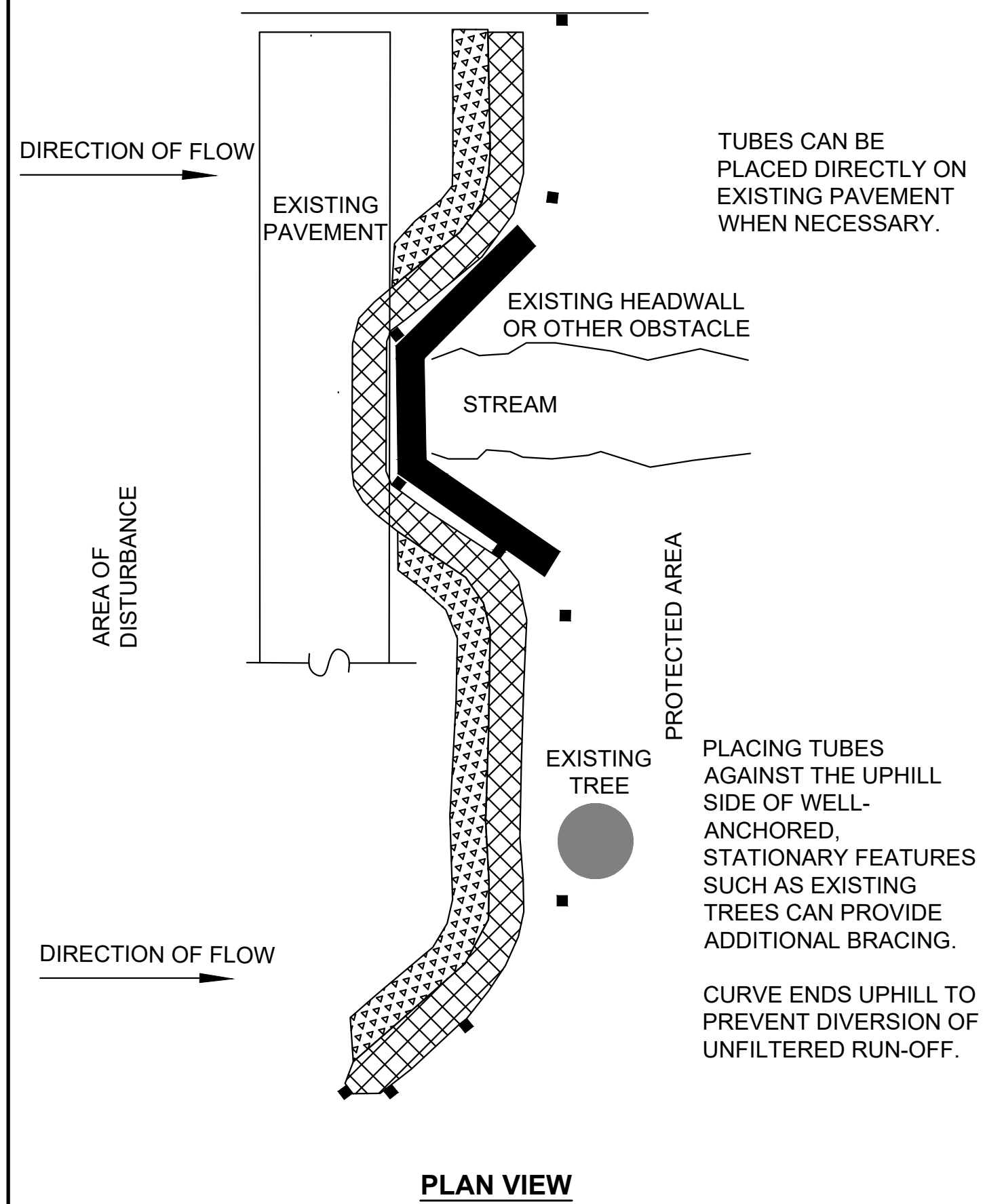
SCALE  
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TITLE  
**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**  
 CONSTRUCTION DETAILS 1

BETA JOB NO. 10188  
 ISSUE DATE 8/3/2022  
 SHEET NO. CD-1

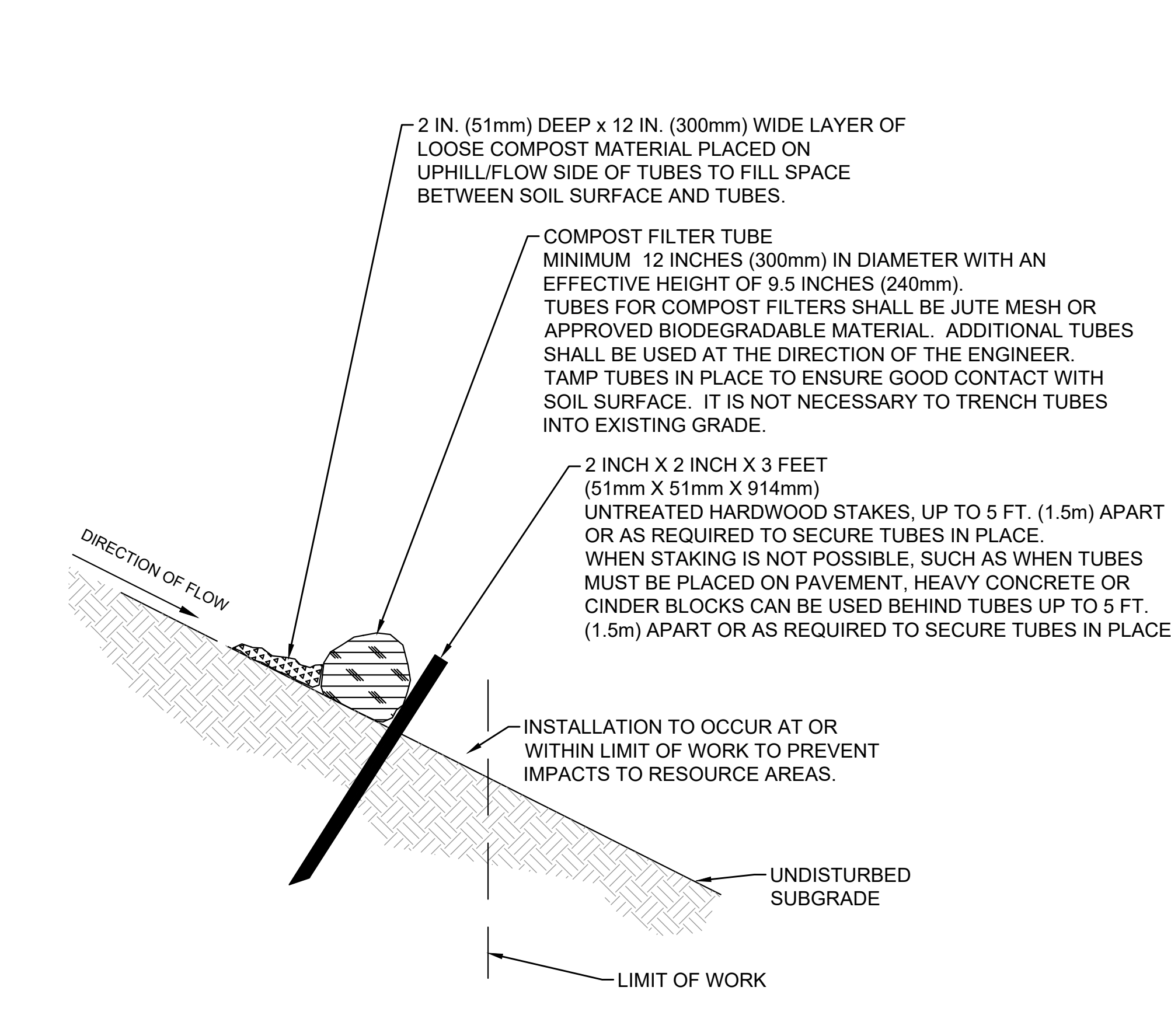
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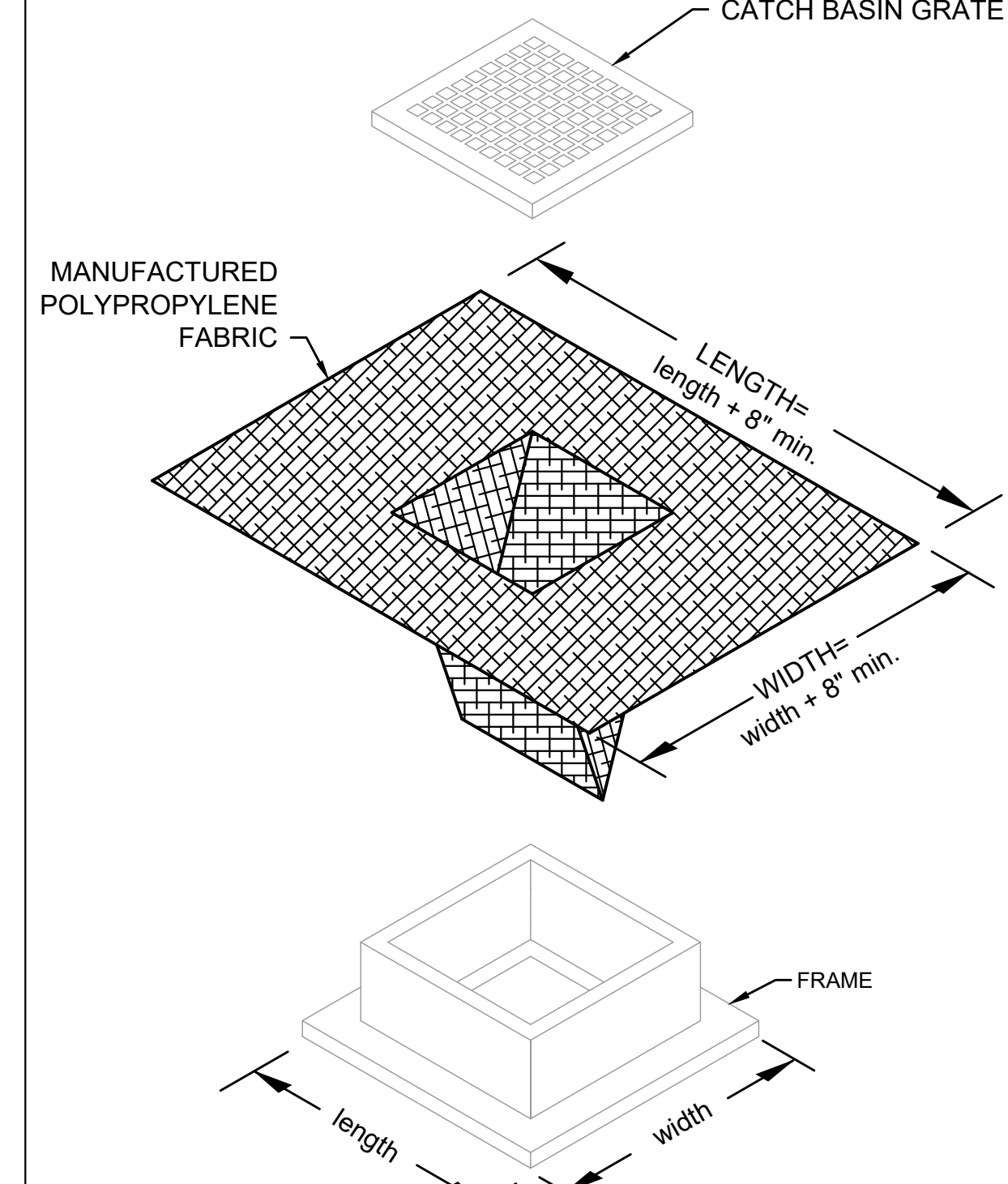


**PLAN VIEW**

- GENERAL NOTES:**
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES (300mm) FOR SLOPES UP TO 50 FEET (15.24m) IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
  2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
  3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
  4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.

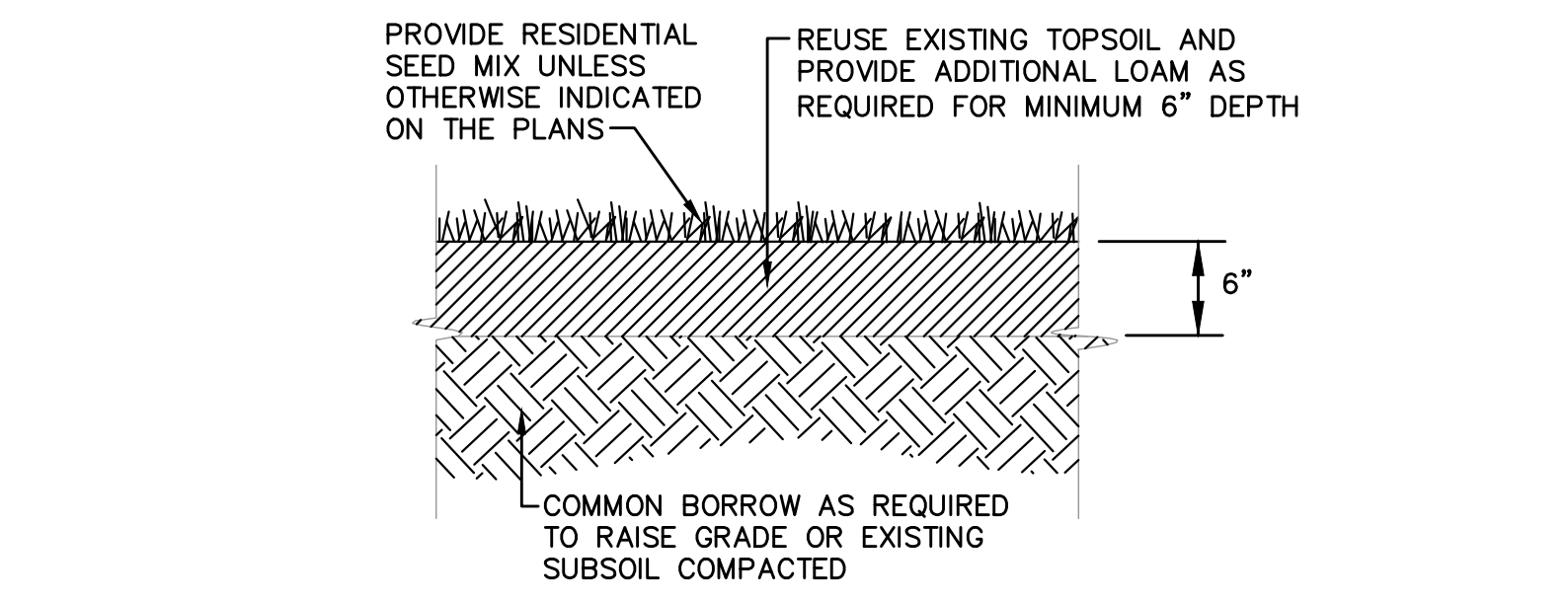


**COMPOST FILTER TUBE**  
NOT TO SCALE

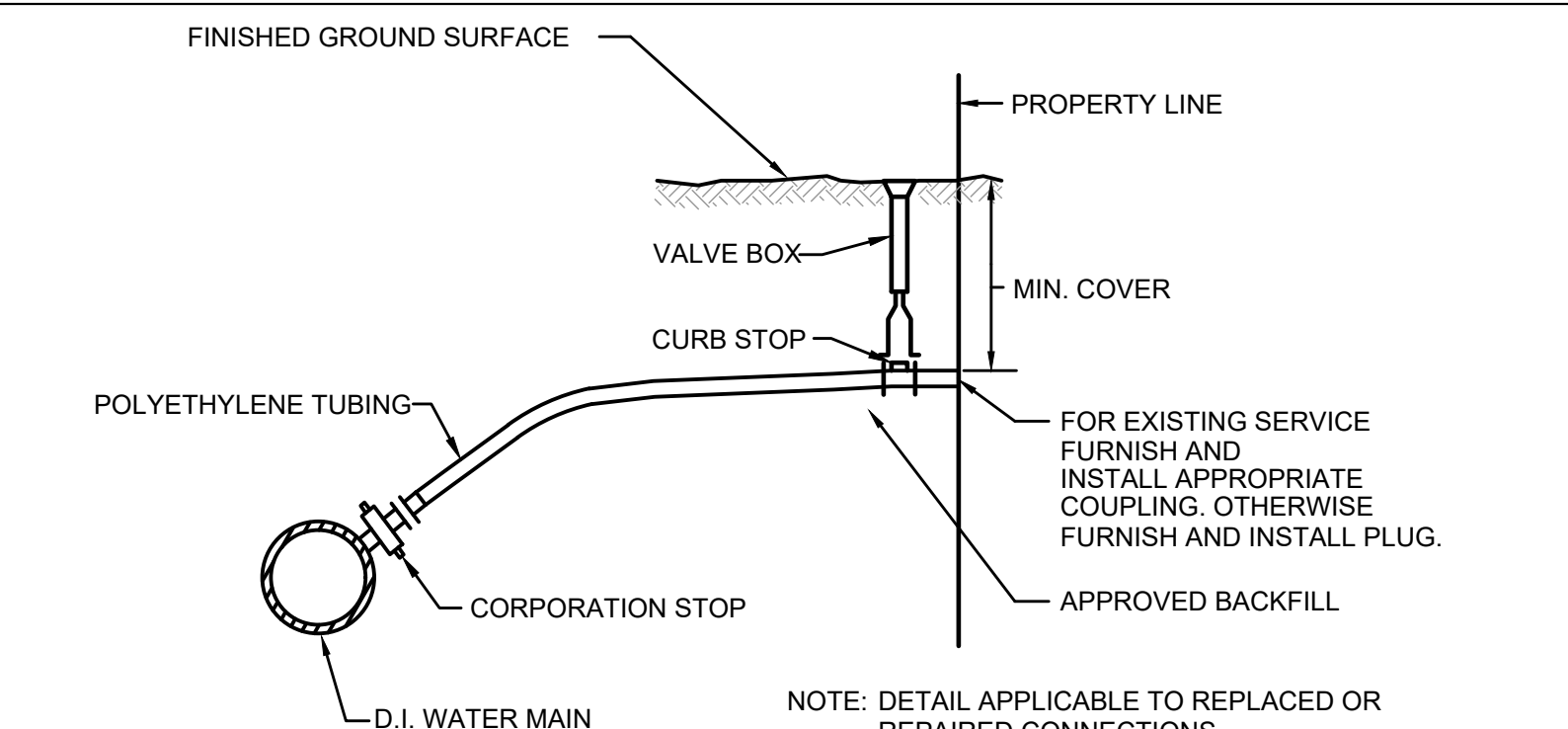


- NOTES**
1. LENGTH AND WIDTH OF POLYPROPYLENE FABRIC MUST EXCEED EXISTING CATCH BASIN FRAME DIMENSIONS BY A MINIMUM OF 8".
  2. REMOVE CATCH BASIN GRATE AND INSTALL POLYPROPYLENE FABRIC OVER CATCH BASIN FRAME. REPLACE CATCH BASIN GRATE TO SECURE POLYPROPYLENE FABRIC IN PLACE.

**TYPICAL CATCH BASIN EROSION CONTROL PROTECTION**  
NOT TO SCALE

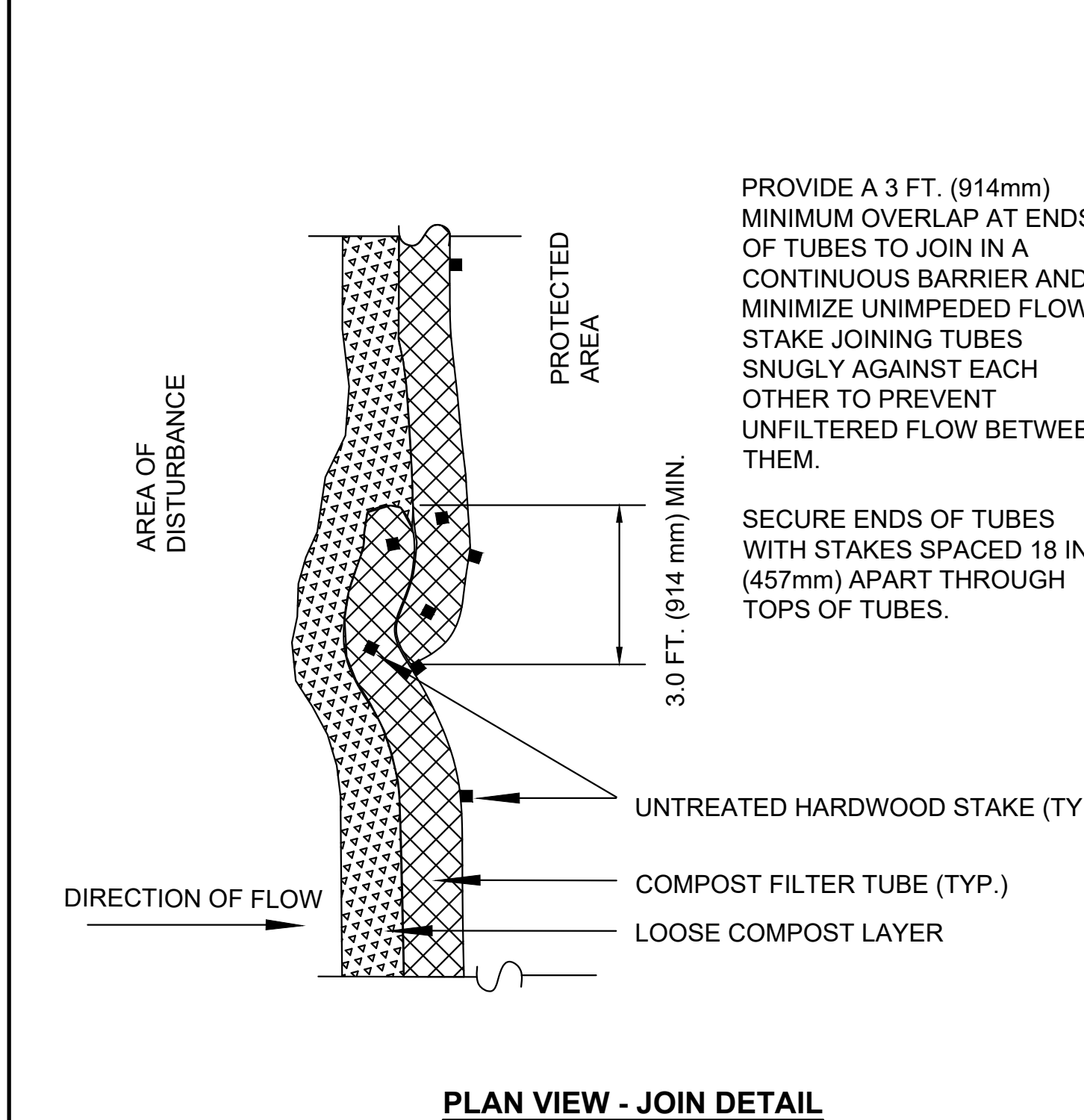


**LOAM AND SEED DETAIL**  
NOT TO SCALE



- NOTES**
1. SADDLES ARE REQUIRED WHEN TAPPING EXISTING CAST IRON PIPE

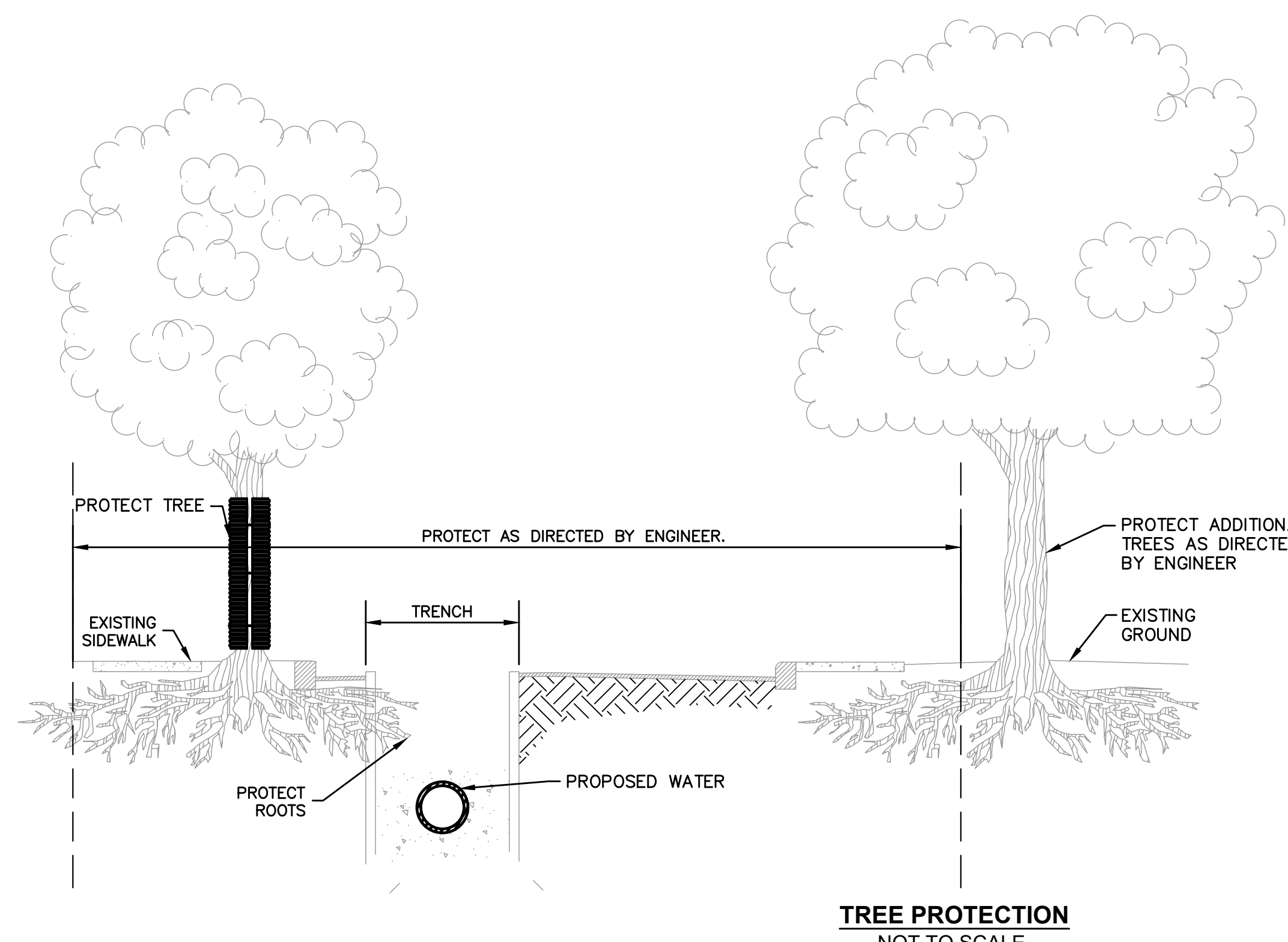
**TYPICAL COPPER WATER SERVICE CONNECTION (TYP.)**  
NOT TO SCALE



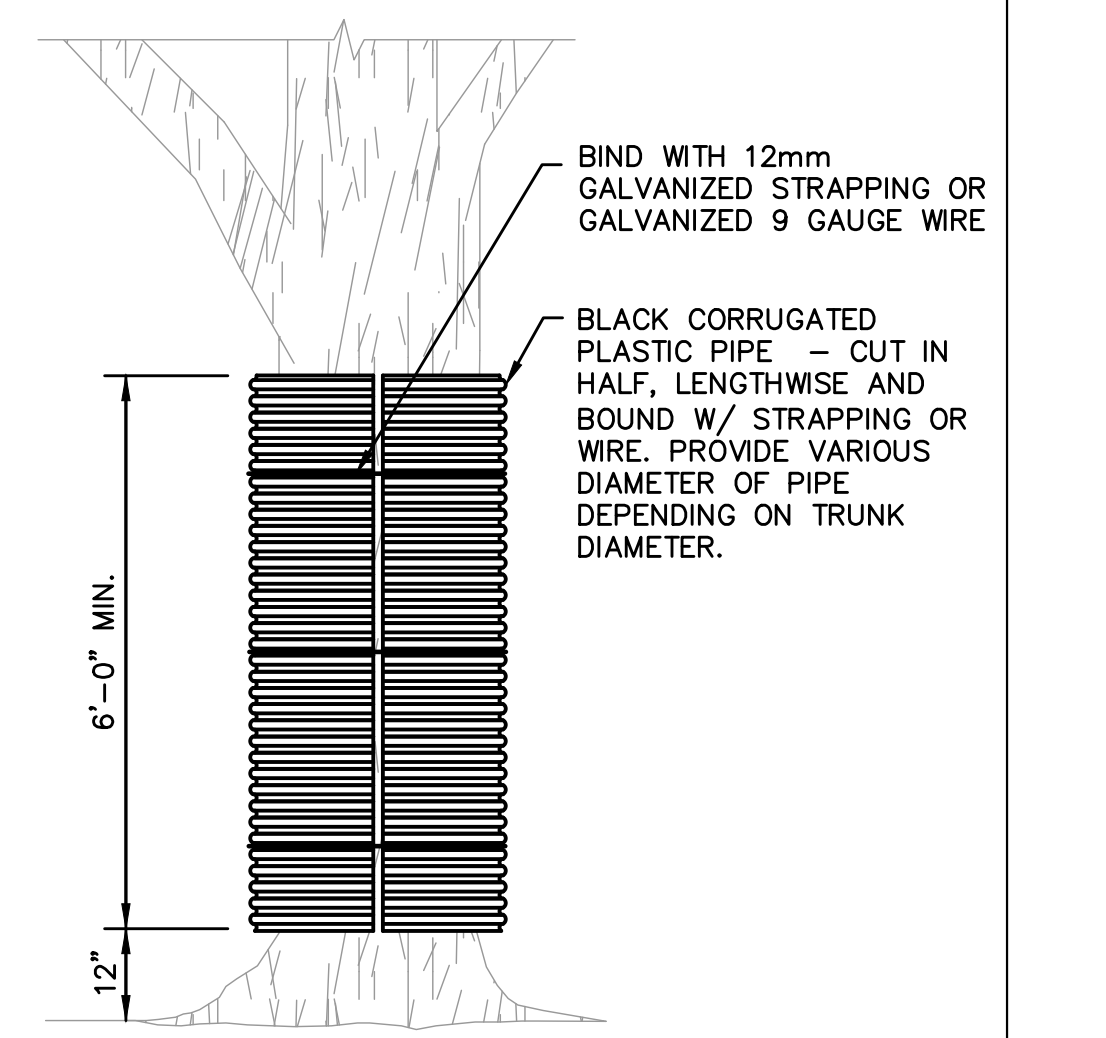
**PLAN VIEW - JOIN DETAIL**

PROVIDE A 3 FT. (914mm) MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.

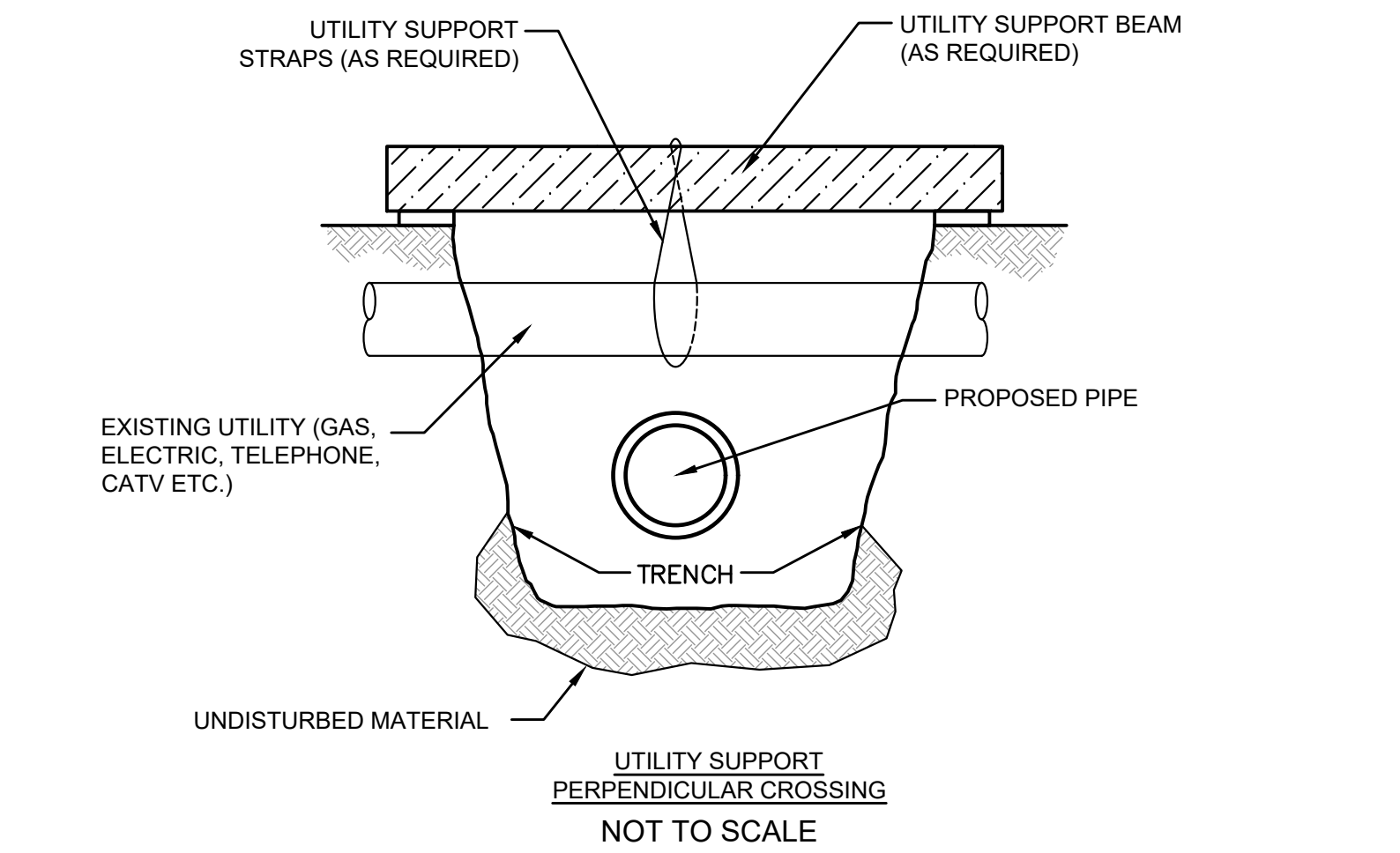
SECURE ENDS OF TUBES WITH STAKES SPACED 18 IN. (457mm) APART THROUGH TOPS OF TUBES.



**TREE PROTECTION**  
NOT TO SCALE



- NOTES:**
1. PROTECT TREES AS DIRECTED BY THE ENGINEER.



- NOTES:**
1. ALL UTILITIES SHALL BE SUPPORTED AS SHOWN WHEN EXPOSED AND THE POTENTIAL EXISTS FOR UNDERMINING BY THE CONSTRUCTION ACTIVITY. THE SUPPORT SYSTEM SHALL BE IN PLACE PRIOR TO UNDERMINING OF UTILITY. ALL SUPPORT SYSTEMS SHALL HAVE SUFFICIENT TENSION SO THAT NO DEFLECTION OF THE EXISTING UTILITY WILL OCCUR ONCE UNDERMINED. THE QUANTITY, PLACEMENT AND MATERIALS USED FOR THE SUPPORT SYSTEM SHALL BE SUFFICIENT IN STRENGTH SO THAT NO DEFLECTION OF THE EXISTING UTILITY WILL OCCUR.
  2. WHEN CONSTRUCTION ACTIVITY IS COMPLETED, THE TRENCH SHALL BE BACKFILLED WITH CRUSHED STONE AND/OR MATERIAL OTHERWISE REQUIRED BY THE AFFECTED UTILITY COMPANY AND COMPACTED AROUND THE EXISTING UTILITY PRIOR TO REMOVING THE SUPPORT MECHANISM.

**UTILITY SUPPORT**  
NOT TO SCALE

8/2/2022 6:13 PM J:\21.10188 TOWN OF WAREHAM\WAREHAM\JACHAU\TOCAD\PLAN SET\DETAILS.DWG

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:  
CD

DESIGNED BY:  
RG

CHECKED BY:  
RD

REGISTERED PROFESSIONAL

ROBERT A. DRAKE  
CIVIL  
No. 41642

8/3/22

PREPARED BY

**BETA**

www.BETA-inc.com

SUBCONSULTANT

SCALE

NONE

TITLE

**TOWN OF WAREHAM, MASSACHUSETTS**  
**INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN**  
**CONSTRUCTION DETAILS 2**

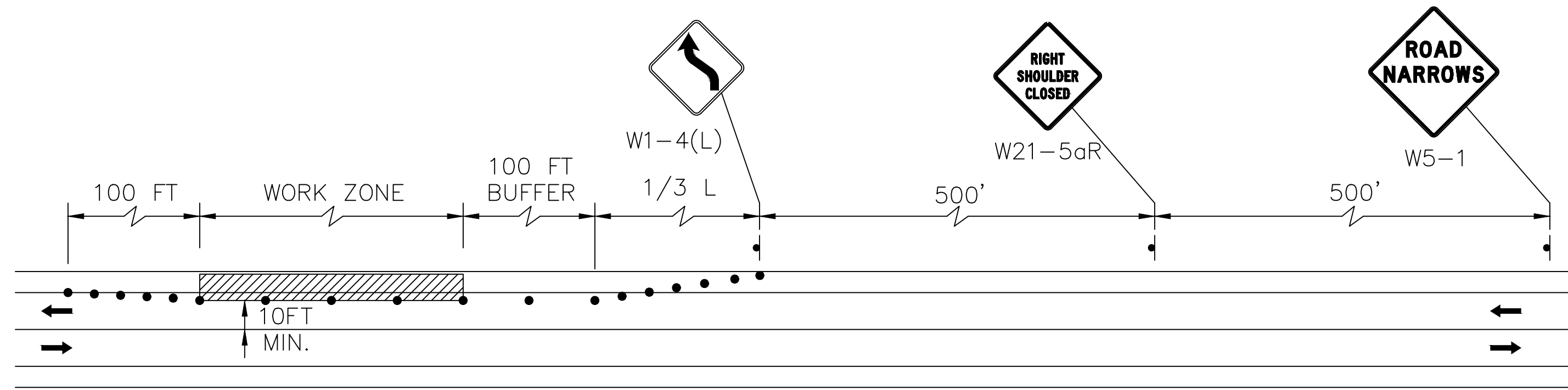
BETA JOB NO. 10188

ISSUE DATE 8/3/2022

SHEET NO. CD-2

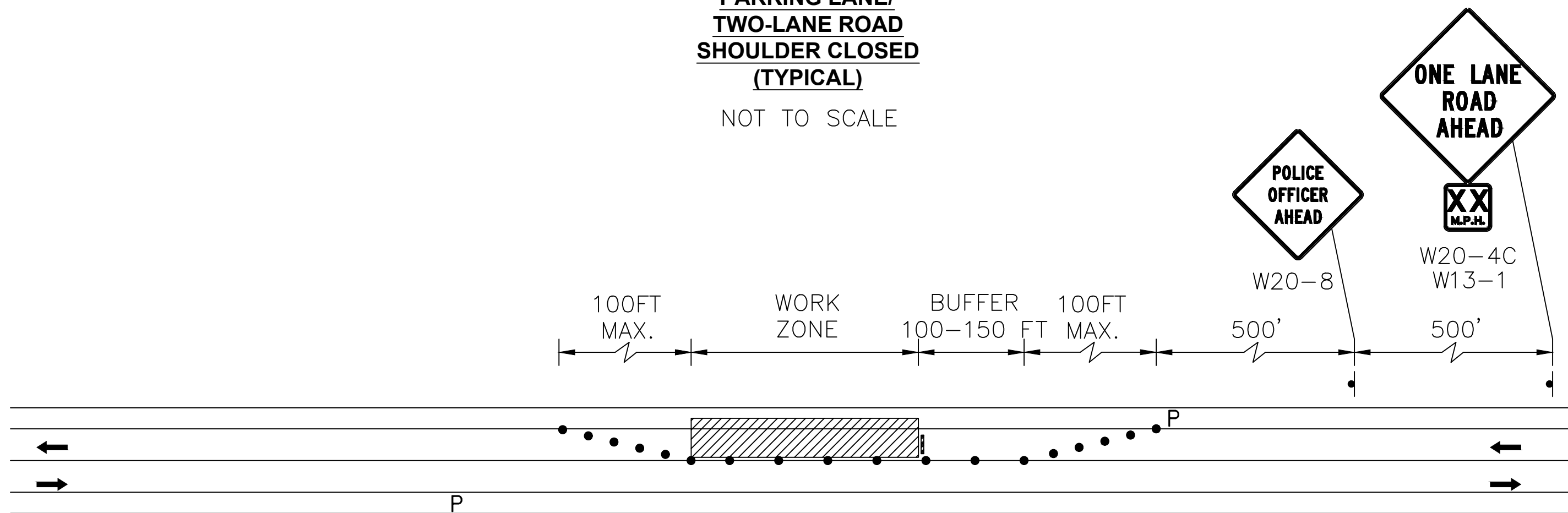
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION





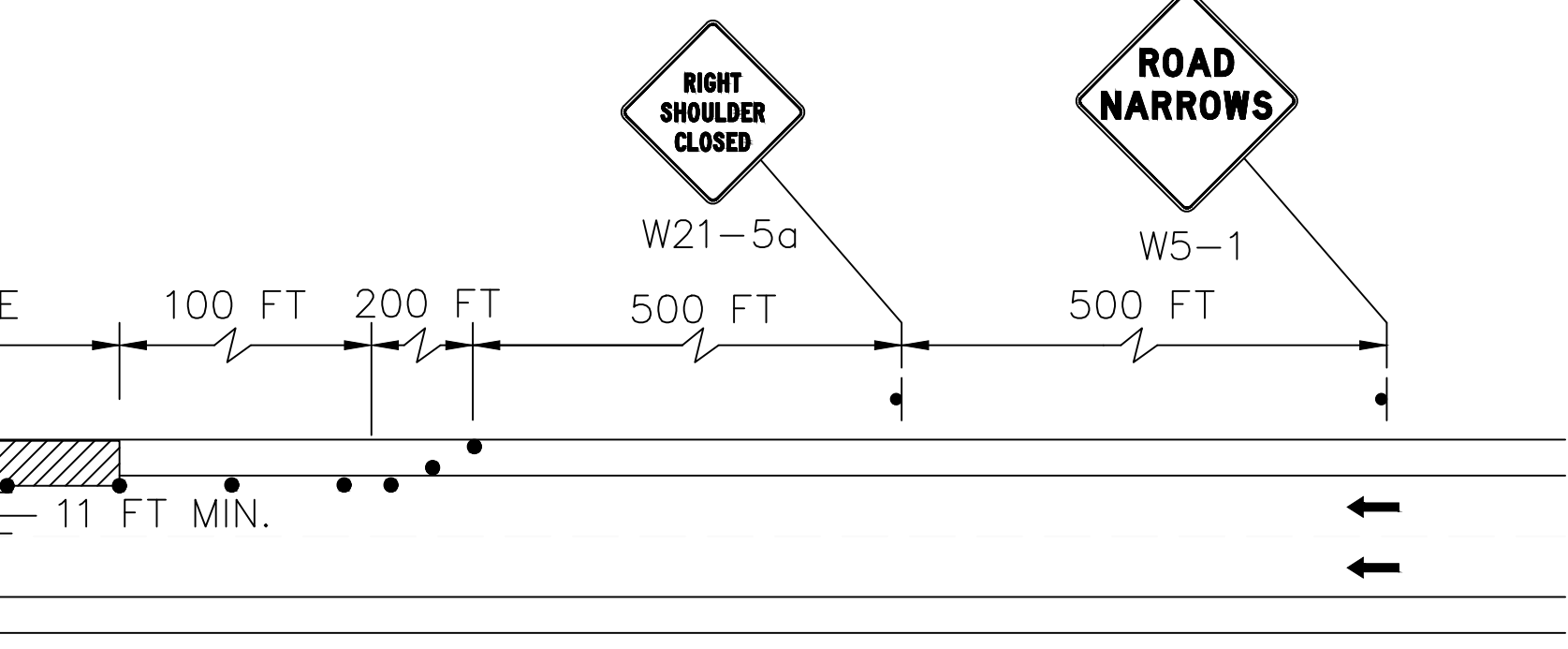
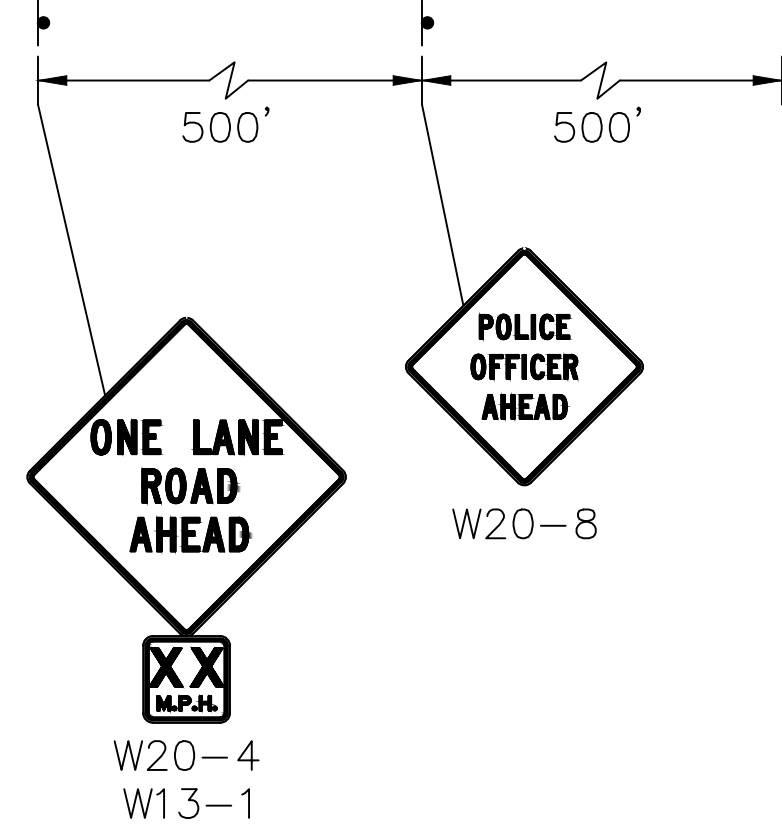
**PARKING LANE/  
TWO-LANE ROAD  
SHOULDER CLOSED  
(TYPICAL)**

NOT TO SCALE



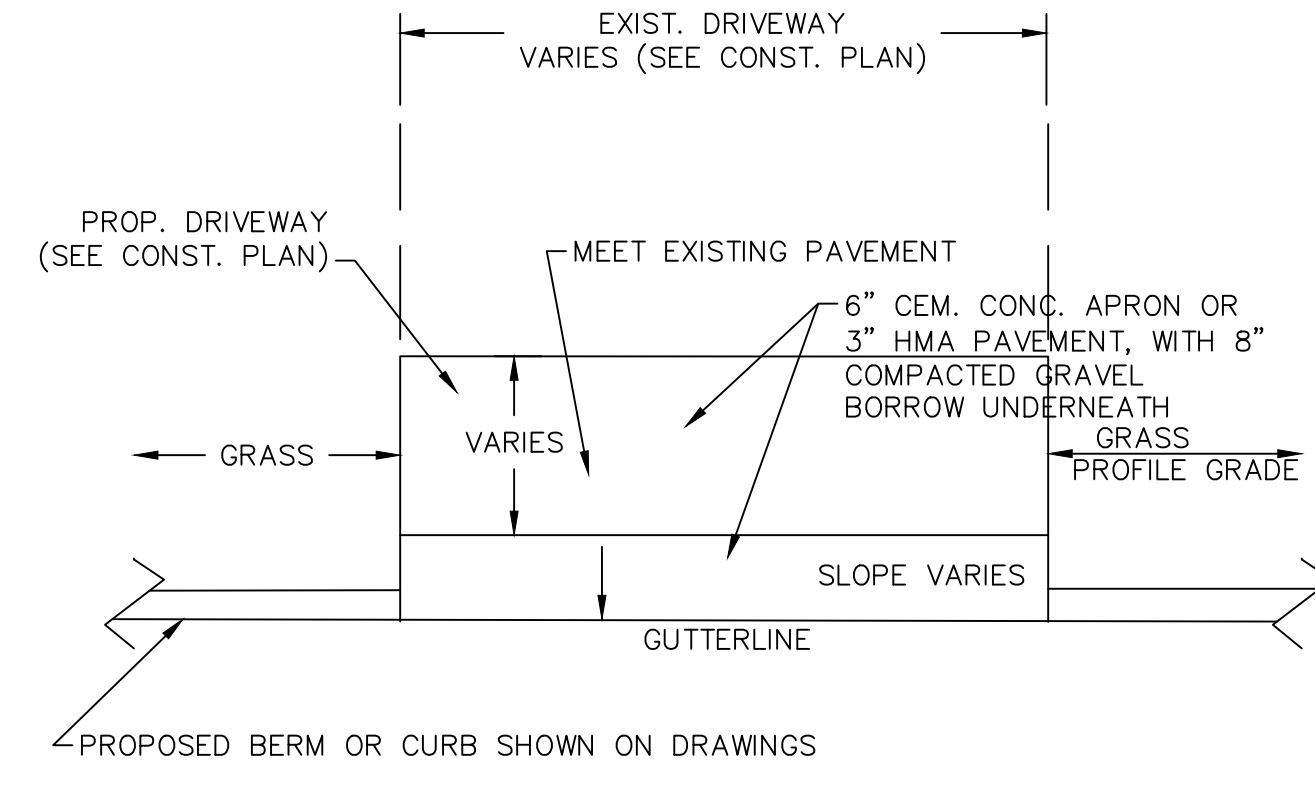
**TWO-LANE ROAD  
ONE LANE ALTERNATING TRAFFIC  
WITH POLICE DETAIL  
(TYPICAL)**

NOT TO SCALE



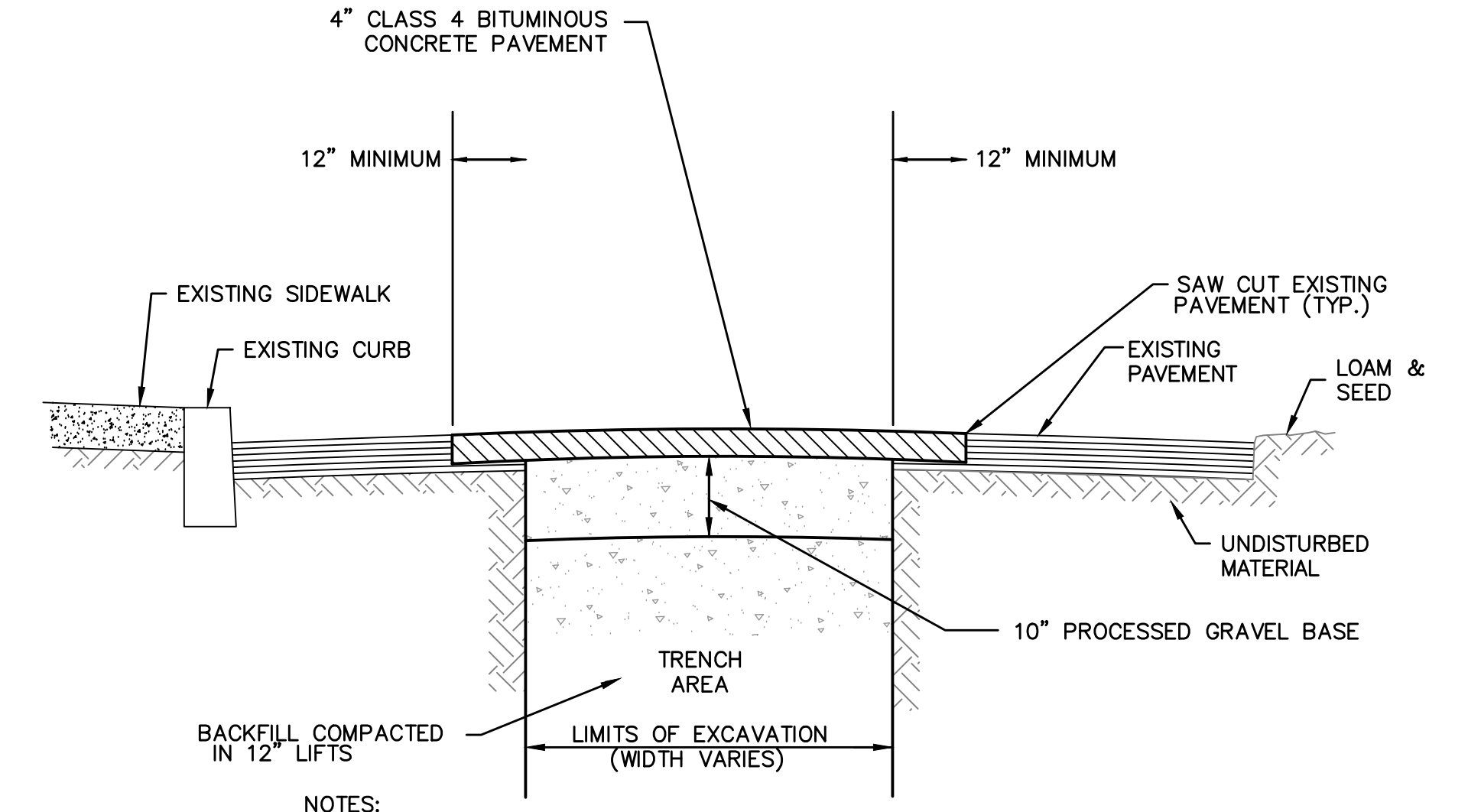
**SHOULDER CLOSED  
PARKING LANE**

NOT TO SCALE



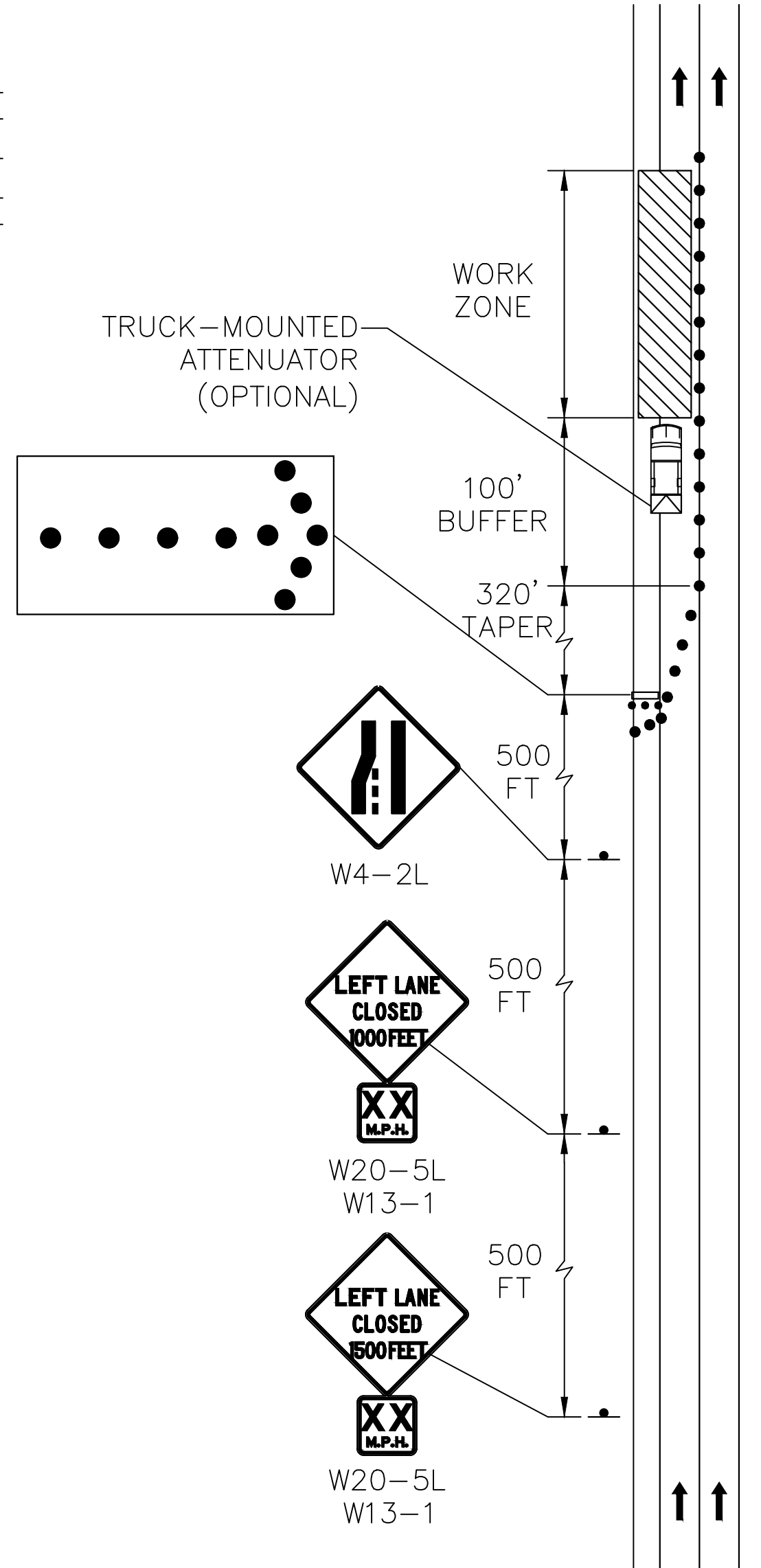
NOTES:  
1. FOR CONCRETE DRIVEWAY APRONS USE 6" x 6" - W4 x W4 WELDED WIRE MESH INSTALLED 3" BELOW THE SURFACE. TERMINATE WIRE MESH 2" FROM THE EDGE OF THE CONCRETE

**DETAIL FOR DRIVEWAY APRON  
WITHOUT SIDEWALK  
NOT TO SCALE**



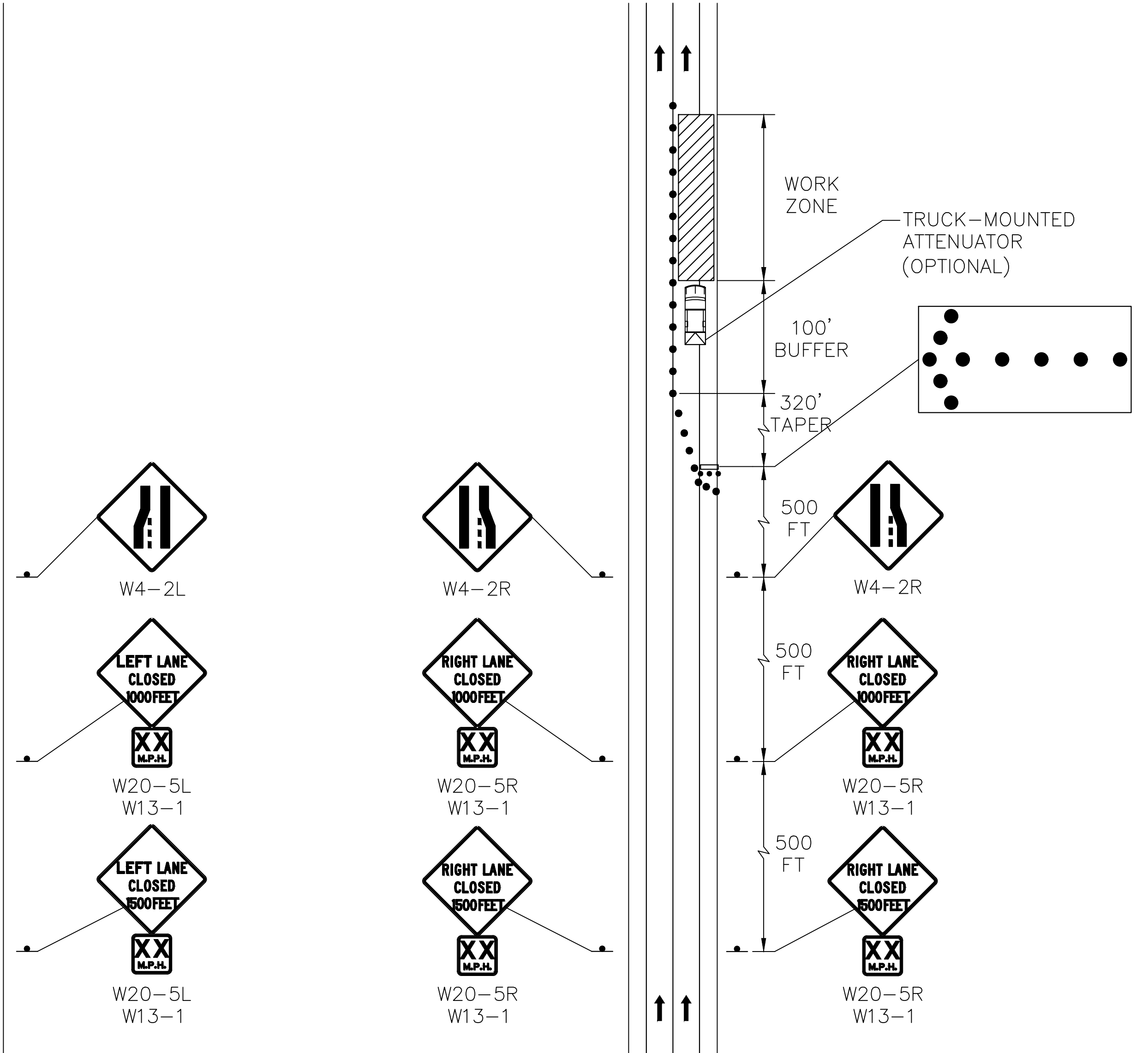
NOTES:  
1. CONTRACTOR TO VARY PAVEMENT THICKNESS TO MAINTAIN A MINIMUM CROSS SECTIONAL SLOPE EQUALING 0.02 FT/FT OR %.

**4" TEMPORARY TRENCH PAVEMENT  
RESTORATION FOR TOWN ROADS  
NOT TO SCALE**



**LEFT LANE CLOSURE (TYPICAL)**

NOT TO SCALE



**RIGHT LANE CLOSURE (TYPICAL)**

NOT TO SCALE

8/2/2022 4:51 PM J:\2110188 TOWN OF WAREHAM WANKINDUACHAU TOCAD\PLAN SET\DETAILS.DWG

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RG

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RD

REGISTERED PROFESSIONAL  
ROBERT A. DRAKE  
CIVIL  
No. 41642



PREPARED BY  
SUBCONSULTANT

SCALE  
NONE

TITLE  
**TOWN OF WAREHAM, MASSACHUSETTS  
INSTALLATION OF LOW-PRESSURE SEWER FORCE MAIN  
CONSTRUCTION DETAILS 3**

BETA JOB NO. 10188  
ISSUE DATE 8/3/2022  
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