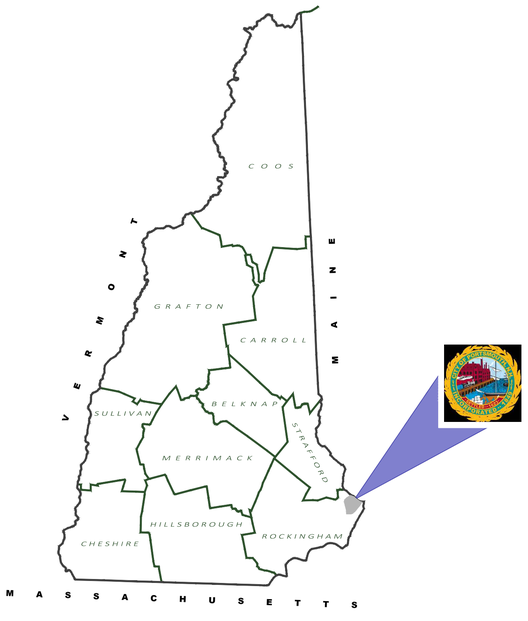
City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Issued for Bid
January 2023

Sheet Index

1.	Cover Sheet
2-3.	General Notes & Legend
4.	Typical Sections
5-9.	Existing Conditions Plan
10-11.	Utility Sequencing Plan
12-18.	General Plan and Profile
19-24.	Utility Plan and Profile
25	Limits of Construction for Bid Alternates
26	Middle Street Striping Plan Base Bid
27	Middle Street Striping Plan Bid Alternate D
28-34.	Typical Details
35-54.	Cross Sections



Locus Plan

Prepared For:

City of Portsmouth
Department of Public Works
680 Peverly Hill Road
Portsmouth, NH 03801

Prepared By:

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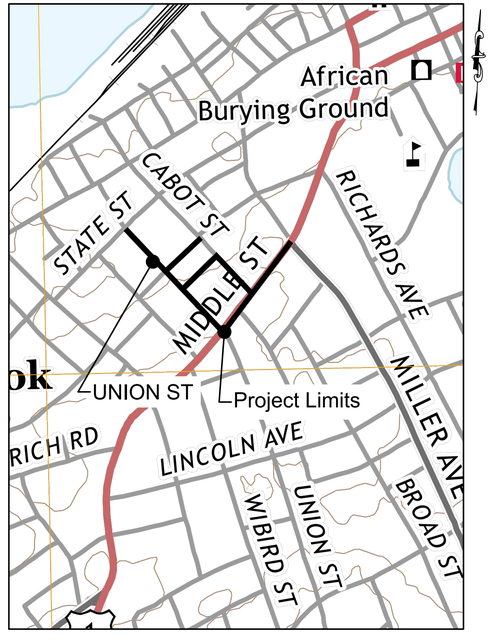

Project Location

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General Construction Notes:

1. All work shall be in conformance with current City of Portsmouth and NHDOT Standard Specifications and details. For standard plans, see "Standard Plans for Road and Bridge Construction" dated 2010 (a bound book).

2. The Engineer shall be defined as the Resident Engineer/Owner's Representative, who is responsible for engineering supervision of the construction and acting directly, or through, his duly authorized representatives on behalf of the City of Portsmouth.

3. The Contractor shall provide staging areas as required for staging, processing, and stock pile area as necessary. The Contractor shall prepare the area as necessary and install all erosion control devices to meet NHDES–WT standards. The Contractor shall stockpile, handle and transport materials to preserve their quality and fitness for the work. Materials shall also be stored to facilitate inspection and may be subject to inspection and retesting before incorporation in the work. Private property shall not be used for storage purposes without written permission of the property owner. If requested, copies of such written permission shall be furnished to the Owner. After completion of construction, the contractor shall return the staging area to preexisting conditions to the satisfaction of the property owner and the City.

4. The Contractor shall perform all required layout work with competent, qualified personnel in a manner consistent with the current survey/layout practices and acceptable to the Engineer. All this work is subject to checking, approval, and continuous observation by the Engineer. The Contractor shall provide the engineer with qualified persons to assist in this checking as needed and on request of the engineer. The Contractor shall perform all necessary layout work not specified above in order to construct all elements of the project as shown on the plans and specified in the contract. This work shall include, but shall not be limited to, stakeout necessary to establish lines and grades as earthwork operations progress; stakeout, layout and elevations as required for installing drain lines, sewer, water lines, and other items included in the work.

5. The Contractor is solely responsible for the accuracy of the work. The Engineer may check all or any portion of the layout, stake–out made by the Contractor. Any necessary correction to the work shall be made immediately by the contractor. Such checking by the engineer will not relieve the contractor of any responsibilities for the accuracy or completeness of the work. No claim will be considered because of alleged inaccuracies unless the contractor notifies the Engineer thereof in writing immediately upon discovery of the alleged inaccuracies and affords the Engineer opportunity to check or verify the control in question.

6. The Contractor shall be responsible for the preservation of all bench marks and control points. If any of the control points are disturbed by the Contractor during the construction, the Contractor shall replace them at no expense to the owner. Damaged or destroyed points, bench marks or stakes or any reference points damaged or made inaccessible by the progress of the construction shall be replaced or transferred by the Contractor, subject to verification by the engineer. Replacement of any layout points shall be performed by or under the direction of a NH licensed land surveyor.

7. Perform all work within the existing right–of–way or acquired temporary right of entry limits.

8. The Contractor shall protect private property and shall take all necessary measures and precautions to avoid damage to existing trees, shrubs, lawns, plantings, etc. This protection will include the trimming of trees prior to construction if necessary. The Contractor shall be responsible for repairs/replacement of all damaged items.

9. The Contractor shall be responsible for all methods and materials for construction of this project, including compliance with all applicable OSHA regulations. The Owner and Engineer will periodically review construction for compliance with the plans and specifications; such review does not imply approval of methods of construction.

10. All excavations shall be thoroughly secured (backfilled, no plates) on a daily basis by the Contractor at the completion of construction operations in the immediate area.

11. The Contractor shall set all manhole frames and covers, catch basin grates, and water valve covers to be flush with the base pavement grades, then raised to 1/4" below final pavement elevations during installation of the final wearing coarse.

12. Prior to the start of any new utility work, the Contractor shall verify all elevations of existing utilities in those areas. Notify the Engineer immediately of any discrepancies.

13. Pipe connections to replacement structures are subsidiary to the structure.

14. The Contractor shall be responsible for removal and relocation of all signs that conflict with the work (incidental to construction). Any signs damaged during construction shall be replaced at no additional cost to the Owner.

15. Final location of traffic signs and supports as shown in the plans shall be field–confirmed by the Contractor and accepted by the Engineer prior to installation.

16. Remove topsoil for its total depth within the limits of the slope lines. unless otherwise directed, stockpile topsoil and use it on this project as needed.

17. All disturbed areas not designated to be paved, landscaped, or otherwise shall have loam borrow placed and seeded. The loam borrow shall have a minimum depth of 4" and shall be placed flush with the top of adjacent curbing, edging, pavement millings, back of sidewalk or other paved edge.

18. The contractor shall be responsible for the site restoration and clean–up upon completion of the project.

Disposal of Material:

1. Unsuitable materials and boulders/rock/stones as defined by the specifications which are not acceptable as fill material shall be removed from the site. Disposal is the Contractor's responsibility.

2. Unless requested by the Town, all frames, covers, grates, valves and valve boxes, and curbing to be removed during the project shall become the property of the Contractor. All pavement, concrete and subgrade soils removed during construction to achieve proposed grades shall become the property of the Contractor. All sidewalk pavement, sidewalk brick, concrete or brick structures, sewer manholes, drainage, water and sewer pipe to be removed/demolished shall become the property of the Contractor.

3. If Asbestos Cement (AC) pipe is encountered, all work shall be done in accordance with Env–A 1800 Asbestos Management and Control. If the AC pipe is broken or requires cutting or breaking, a licensed abatement contractor must complete this work and properly bag and dispose of the pipe materials. All disposal shall be done in accordance with Env–A 1800 and Env–Sw 901. The Contractor shall be responsible for removing and disposing asbestos cement pipe, including service connections, within the limits of trench excavation. The Contractor shall maintain water service to users through the use of temporary bypass piping and valves.

4. Removal of existing drainage and sanitary sewer structures and pipe shall be subsidiary to proposed work items when the existing drainage and sewer items are located within the trench limits of the proposed drainage items as specified in Section 206 of the NHDOT standard specification.

Existing Utility Notes:

1. The Contractor is responsible for the location, protection and repair (if damaged) of all existing utility mains and services. The locations of known gas, water, and sewer mains shown on these drawings are approximate. Existing gas, water, and sewer service laterals may not be shown and the Contractor should anticipate their existence. The Contractor should consider conflicts, hand excavation, and decrease in production when preparing their bid.

2. The Contractor shall verify all existing utility locations, public or private, shown or not shown, on these plans prior to construction. The engineer shall be notified in writing of any utilities found interfering with the proposed construction and appropriate remedial action shall be taken before proceeding with the work. The Contractor shall notify Dig–Safe at 1–888–DIG–SAFE at least 72 hours prior to beginning work to confirm the location of underground utilities.

3. Overhead utility lines are located throughout the project with crossings at various locations and running along the road throughout the project. The Contractor is advised that extreme caution will be required in the operation of equipment, especially cranes.

4. Existing utility poles are being relocated for the project as noted in the drawings. The Contractor shall coordinate with the applicable utilities as necessary to hold/secure existing poles during the course of the construction, and for sequence and scheduling of pole installation following setting of new curbing.

5. Where required, the existing gas main is being relocated by Unitil. The Contractor shall coordinate with them for provision of temporary gas and main relocation, if necessary during construction. The location of the gas main shown on the drawings is approximate.

6. In the spring of 2023, Unitil plans to replace gas mains in the project that conflict with the proposed utilities, including:
   - 6.1. Union St between Middle St and Austin St, which is planned to be relocated under the sidewalk on the southwest side of the road.
   - 6.2. Austin St between Cabot St and Union St, which will be relocated under the sidewalk on the southwest side of the road.
   - 6.3. Coffins Ct, which will be relocated over the proposed water main after it is installed – see drain and sequencing requirements.

   The contractor shall coordinate construction sequencing with Unitil and accommodate this work.

Boring Notes:

1. Borings indicated thus (B–X) were made by S.W. Cole Engineering, Inc. in June 2022. Blow counts shown are the number of blows required to drive a 2" O.D. standard split spoon sampler 6" using a 140 lb weight falling 30" or a 300 lb weight falling 16".

2. Borings are for design purposes showing conditions at boring points only, and do not necessarily indicate material to be encountered during construction.

3. Water levels indicate thus ▽ were measured at the time of exploration. The water levels encountered during construction may vary considerably due to prevailing climate, rainfall, or other factors.

4. The Geotechnical investigation report has been prepared by S.W. Cole Engineering, Inc., and is provided in the contract documents.

Dewatering Notes :

1. Control of surface water is a critical requirement of the work. All necessary actions shall be taken to minimize the effect of precipitation and runoff on the work. Upgradient runoff shall be diverted from active or completed work areas, and all work shall be graded and crowned to promote controlled runoff. The Contractor shall prevent surface water and subsurface or groundwater from flowing into excavations or onto any work and from flooding the project site and surrounding area.

2. Water shall not accumulate in excavations. All pipe shall be laid "in the dry." New pipe shall not be used to dewater excavations. Contractor shall remove water to prevent softening of subgrades and soil changes detrimental to stability of the subgrade. The Contractor shall dewater excavated areas as required to perform the work, and in such a manner as to preserve the undisturbed state of subgrade material.

3. The Contractor will be responsible for all costs associated with dewatering the construction site. The Contractor shall provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations. Discharge of dewater lines shall be directed through a dewatering filter bag, Ultratech International or equal, to remove sediment prior to discharge into existing drainage basin or stabilized drainage swale.

4. The Contractor shall prevent migration of sediment in accordance with the erosion control requirements of this Contract.

5. Discharge of dewater lines shall not accumulate on the ground surface and shall be diverted using existing natural or man–made drainage–ways to receive and dispense with surface water runoff.

6. Discharged water shall be free of sediment and contaminants (bacteria, hydrocarbons, etc.).

Traffic Management and Signing Notes:

1. The Contractor shall prepare a Work Plan for the sequencing of the project and management of traffic in accordance with Section 01570. Plan shall include locations of construction signage and the variable message boards.

2. All traffic control devices shall conform with Sections 618 and 619 of the NHDOT Standard Specifications, the current editions of the MUTCD including all revisions, and the State of NH DOT Traffic Control Handbook.

3. The Contractor shall exercise caution and comply with all applicable traffic laws and regulations in the execution of work. The Contractor is to coordinate all work with the City of Portsmouth Public Works, Fire and Police Departments and Engineer at least 14 days prior to implementing any temporary road closures or temporary detours.

4. All costs for traffic control devices including placement, relocation, maintenance, and removal of signs shall be included in the Contractor's bid.

5. All permanent construction signing and warning devices shall be supplied, erected, maintained, and removed by the Contractor. Placement of permanent construction signs shall be coordinated with the Engineer and Public Works staff. The contractor shall bear all expense of maintaining the section of road undergoing improvement including all temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, garages, farms, and other features as may be necessary.

6. Access to existing drives shall be maintained at all times. In the event that major work must be done at drives that precludes full access, the Contractor is to coordinate the work with the Owners and the Engineer 24 hours in advance to minimize inconveniences.

7. Unless otherwise approved, the Contractor shall maintain a minimum of 14–feet of roadway access at all times to accommodate through traffic and local emergency access. Emergency vehicles shall be given priority.

8. All road openings shall be covered at the end of each work day to ensure safe vehicular and pedestrian travel. The Contractor shall maintain two lanes of traffic at the end of each work day.

9. Dust control operations shall be provided throughout the duration of the project, incidental to the work.

Survey Notes:

1. The existng conditions are based on a field survey performaed 6/2021–9/2021 by James Verra and Assoc., Inc. on site control established using survey grade GPS.
   Horizontal Datum: NAD 1983 (2011)(EPOCH2010.0000)
   Horizontal Basis: NGS "CORS" Stations: MASA, NHCO, NHUN, P776 & ZBW1
   Vertical Datum: NAVD 1988
   Vertical Basis: City Control Point "ROBE"

2. The relative error of closure was less than 1 foot in 15,000 feet

3. The location of all undeground utilities shown hereon are approximate and are based upon the field location of all visible structures (i.e. catch basins, manholes, water gates, etc.) and information compiled from plans provided by utility companies and governmental agencies. All contractors should notify, in writing, said agencies prior to any excavation work and call dig–safe @ 1–888–DIG–SAFE.

4. Engineer or contractor to verify site benchmarks by leveling between 2 benchmarks prior to the setting or establishment of any grades/elevation. Discrepencies are to be reported to James Verra and Assoc., Inc.

Reference Plans:

1. As Built Plan, 211 Union Street, LLC, Portsmouth, NH, Tax Map 135, Lot 70, Revised to 8/20/2018, by Ross Engineering.
2. City of Portsmouth, N.H., Record Drawings, Lincoln Area Sewer Separation, Contract 3b, dated 12/2014, by Underwood Engineers, Inc.
3. City of Portsmouth, N.H., Record Drawings, Lincoln Area Sewer Separation, Contract 3c, dated 12/2016, by Underwood Engineers, Inc.

Permit Notes :

1. The Contractor shall be responsible for obtaining all other construction permits, local and state, as well as from public utilities.

2. The Contractor shall obtain a project specific Stormwater Pollution Prevention Plan (SWPPP).

Legend:

PROPOSED

EDGE OF PAVEMENT	
SIGN	
6" WATER GATE VALVE	WV
8" WATER GATE VALVE	WV
CURB STOP	CS
HYDRANT	
CATCH BASIN	
DRAIN MANHOLE	
SEWER MANHOLE	S
6" WATER MAIN	PW–6
8" WATER MAIN	PW–8
1" COPPER WATER SERVICE	PWS
8" PVC SEWER MAIN	
6" PVC SEWER SERVICE	PSS
DRAIN PIPE	
FOUNDATION DRAIN	PD
TRENCH PATCH	
ROAD RECONSTRUCTION/TRENCH PATCH	
CONCRETE SIDEWALK	
BRICK SIDEWALK	
GRASS PANEL	
DRIVEWAY	

See Sheet ECP–1 for existing legend.

no.	revision	date	by
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STATE OF NEW HAMPSHIRE – PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 10' 20' Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

General Notes & Legend

drawing no. N-1

sheet: 2 of 54

Water Main Notes:

1. All materials and workmanship shall be in conformance with the City of Portsmouth's Construction Standards and Details, NH DES Env–Wq 700, and NH DES Env–Dw 405. The more stringent regulation shall apply.
2. All water mains shall be Class 52 Cement Lined Ductile Iron Pipe; and pipe shall meet, or exceed, current AWWA C151 specifications for ductile iron water pipe.
3. Water mains and services shall have a minimum cover of 5'. Where top of water main is less than 5'–0" below finished grade, the Contractor shall install rigid insulation in conformance with the typical water trench detail.
4. All water main shall be encased in polyethylene encasement (polywrap). See specification section 02080.
5. At pipe crossings, one full length of water pipe shall be located so both joints will be as far from the sewer/drain pipe as possible. Special structural supports for the water and sewer pipes may be required.
6. All materials coming in physical contact with drinking water must be certified to meet the ANSI/NSF Standard 61 by either the Underwriters Labs (UL) or the National Sanitation Foundation (NSF).
7. Disinfection and testing of water lines shall be done in accordance with City of Portsmouth and current AWWA standards.
8. All existing water mains and water services shall be removed and properly disposed of when encountered within the new excavation limits. This work shall be incidental to utility excavation and installation.
9. All existing water pipe outside of the new utility excavation limits shall be capped at all exposed ends and abandoned in place unless removal is required because of other interferences (incidental).
10. The contractor shall use restraint systems on all valves and fittings unless otherwise noted on the plans.
11. All gate valves shall have restrained mechanical joints and shall open right.
12. Existing curb box or and other castings disturbed or relocated by construction activities shall be adjusted to match final grade, unless otherwise directed by the Engineer (subsidiary).
13. Where water main is less than 6'–0" horizontally from a structure, the contractor shall install 2 inches of rigid insulation along the side wall of the water main trench a minimum of 10'–0" horizontally beyond the centerline of the structure in both directions to protect the water main from freezing.
14. Maintain a minimum of 10 feet horizontal distance between water main and sewer piping. Notify Engineers if any discrepancy.

Water Service Installation Notes:

1. The Contractor shall install the Water Service Connections (corporations, curb stop, curb box, and 1" copper service pipe, unless otherwise noted on the plans) and connect the existing water service to the new curb box. The new service shall be connected to the existing service pipe past the curb stop unless the existing water service pipe is galvanized cast iron, galvanized steel or lead; in this case, the Contractor shall notify the City and Engineer.
2. The Contractor shall maintain water service to residents at all times. If necessary the Contractor shall provide temporary potable water service to all existing service connections whose service is interrupted by construction activities for more than 4 hours. This work must be done in accordance with the project specifications and payment is subsidiary to water service installation.

Temporary Water Notes

1. The Contractor shall provide temporary potable water service to all existing service connections whose service is interrupted by construction activities. The Contractor shall engage a Professional Engineer, licensed in the State of New Hampshire, to design the temporary water service identifying size and materials for the system. The Contractor shall submit the temporary water service design to the Engineer and the Owner for review and coordination with the Water Department prior to installation.
2. The Contractor shall field–locate all affected services prior to connection to temporary water services and shall disinfect each temporary service connection prior to completing connection to user.
3. The Contractor shall be responsible for maintaining temporary water system and shall be available for 24–hour/day emergency repair service.
4. Contractor shall notify all affected residents a minimum of 48 hours prior to temporary disturbance of water service and comply with ENV–DW 503.12 Notice of Planned Outages.
5. Temporary water service shall be provided immediately upon disruption of existing water service.
6. Temporary water service shall not disrupt normal traffic flow.
7. Temporary water service, if connected to a fire hydrant, must have an approved back–flow prevention device.
8. The cost of repairing damage to a fire hydrant and related equipment or to the water system due to water hammer, or to careless or improper use of a fire hydrant or temporary water service equipment shall be paid for in full by the Contractor.
9. The Contractor shall maintain the temporary water supply without leaks and at the required pressures for the service area to meet potable water needs and fire supply service as follows:
   a. Static pressure shall be maintained at a minimum of 40 psi in the main as measured at the nearest tap or fire hydrant connection.
   b. Residual pressure must be maintained greater than 20 psi.
   c. Contractor shall fully decommission all temporary water service prior to freezing weather and restore permanent water supply and fire supply service within the project area before the winter shutdown period. The Contractor shall provide a minimum 48–hour notice to the Owner, and through the Engineer, to the property owners prior to decommissioning the temporary water service.
10. Once the project is complete, contractor is responsible for dismantling temporary water and reconnecting all shut offs and hose bibbs to each home according to pre–construction conditions.

Sewer Main Notes:

1. All sewer mains and fittings shall conform to ASTM D–3034 and shall be (unless otherwise noted) SDR 35. Pipe and pipe fittings between manholes are to be of the same manufacturer. Joint compression rings shall be of an oil resistant rubber type or flexible elastomeric seals conforming to ASTM D–3212. Manufacturer's certificate of compliance shall be furnished to the City prior to installation.
2. Pipe Lengths shown on plans are horizontal lengths, measured from center to center of the manhole.
3. Sewer manhole rims shall be set 1/4" below grade when in pavement.
4. Sewer mains and services constructed above or without adequate separation from water mains shall be constructed of PVC SDR 26 from manhole to manhole. Joints shall be water pressure rated with zero leakage when tested at 25 pounds per square inch for gravity sewers and 1½ times working pressure for force mains, and joints shall not be located within 9 feet of the crossing point. Adequate separation is defined as 10 feet of horizontal separation and 18 inches vertical separation below the water main. If the minimum 18–inch vertical separation is not achievable, a waiver from NHDES is required.
5. All pipe utilizing Bell and Spigot joints shall be laid with the spigot end downstream. Bells will not be permitted in structures.
6. Green detectable "sewer" tape shall be installed in the sewer trench on top of the 12–inch sand blanket on all sanitary sewer mains and services.
7. After taken out of service, existing sewer pipe or manholes exposed during excavation operations, shall be removed and disposed of properly. Dispose of any remaining waste material in accordance with NH DES regulations.
8. After taken out of service, sanitary sewer pipe and manholes within the project limits not removed during installation of new utilities shall be abandoned in place. Abandoning sewer manholes and pipes shall include (this work shall be incidental to utility excavation and installation):
   a. Remove manhole frame and cover and castings.
   b. Demolish and remove concrete adjustment rings and corner section or brick and mortar chimney and concrete manhole sections to a minimum depth of 4 feet below proposed grade.
   c. The resulting structure and trench shall then be backfilled and properly compacted using sand or flowable fill.
   d. Cut adjacent pipes two feet outside of manhole and plug with flowable fill.
   e. Cut and plug any exposed ends of sewer pipes with flowable fill.

Sewer Service Notes:

1. Existing service connections determined by the City or Engineer to be yard drains, foundation drains, or roof leaders, shall not be connected to the new sanitary sewer. The Contractor shall notify the Engineer of potential storm drains or subsurface drains encountered during construction.
2. Sewer service laterals are to be 6" SDR 35 pipe. Sewer service shall be constructed at a 1% minimum slope (1/8 inch per foot) unless otherwise approved by the Engineer (10% maximum).
3. For the connection at the sewer main, the Contractor shall excavate test pits to determine exact location of sewer service location size and elevation prior to construction of sewer main. Sewer laterals shall be installed to the property line (unless otherwise shown on the drawings). Any service work extending past the property line shall be approved by the property owner, the City, and the Engineer prior to starting the work. Copies of existing sewer television inspection logs completed by, and for, the City are included in Appendix B. Approximate sewer service locations are shown on the plans and were derived from the television inspection logs. Contractor to field verify the actual locations. All existing service laterals shall be removed to accommodate connection of new services in accordance with the drawings and specifications.
4. The Contractor shall determine locations of service laterals by video inspection and meeting with the property owner in the presence of the Engineer to confirm precise service locations, and shall identify the alignment prior to constructing individual building service laterals.
5. Some services may be connected to a parallel sewer main to the sewer main being replaced. The Contractor is responsible for locating these services and connecting them to the proposed sewer main.
6. Sewer services will not be allowed to have more than two angle points, or a total angular deviation of 180 degrees, unless a variance is granted by the City.
7. Service laterals shall not connect to manholes unless specified on plans.
8. Sewer service laterals shall be designed for a minimum of 4 feet of cover at the building. Insulation will be required should the sanitary sewer lateral be less than the required 4 feet deep (6 feet in paved areas).
9. The Sewer Service Reconstruction Schedule below lists the sewer services that require dye testing or replumbing based on the information provided to date.

Sewer Service Reconstruction Schedule

Drawing Number	House Number	Street	Comments
U1	846	State	Locate existing sewer service at main[1,2]
U2	188	Union	Replumb sewer to Union
U2	198/200	Union	Raise sewer in basement, replumb to Union, pump washer to drain.
U2	199	Union	Raise sewer in basement
U2	214	Union	Raise sewer in basement. Will require a pump for sewer.
U2	496	Middle	Locate existing sewer service at main[1,2]
U2	504	Middle	Locate existing sewer service at main[1,2]
U2	514	Middle	Locate existing sewer service at main[1,2]
U3	114	Austin	Locate existing sewer service at main[1,2]
U4	20	Coffins	Replumb sewer to Coffins
U4	30	Coffins	Replumb sewer to Coffins
U5	425	Middle	Locate existing sewer service at main[1,2]
U6	24/26	Cabot	Replumb sewer to Cabot
U6	34	Cabot	Replumb sewer to Cabot
U6	42	Cabot	Replumb sewer to Cabot
U6	46	Cabot	Replumb sewer to Cabot

[1] Dye Test to locate sewer service.
[2] Existing sewer service location unknown.

Temporary Bypass Pumping Notes:

1. See Sheets OSP–1 and OSP–2 for Utility Sequencing Notes for sewer and drain installation.
2. The bypass system shall be designed to handle the design flows and shall operate off of floats to turn pumps on and off automatically.
3. Contractor shall operate and maintain the bypass pump system until the new sewer services, sewer main, and drain pipes are fully operational and accepted by the owner and engineer.
4. Bypass pump system shall include a failure monitoring system which will notify the contractor of system failure. Contractor must respond (be on site) within 1–hour of notification of bypass pumping system failure to make repairs and restore pumping.

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STATE OF NEW HAMPSHIRE – PHILIP A. CORBETT No. 12271 – LICENSED PROFESSIONAL ENGINEER

date: January 2023
designed by: STF/WAB
project no: 1211
drawn by: WWG
checked by: PAC
approved by: PAC
scale: 0 10' 20' Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Utility Notes

drawing no. N-2

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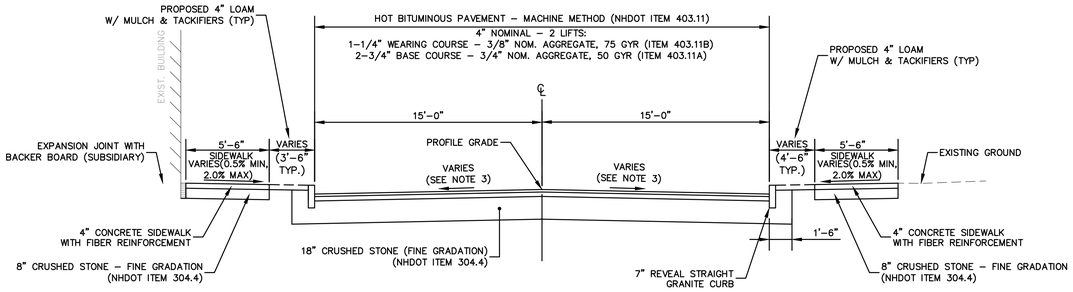
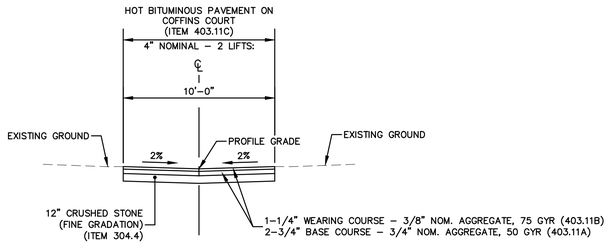


UNION STREET (BASE BID)

Not to Scale

Sta 104+26 TO 109+86



COFFINS COURT (BID ALTERNATE A)

Not to Scale

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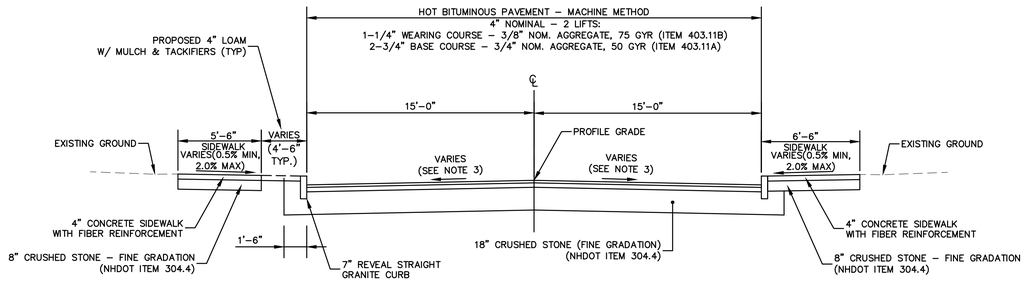
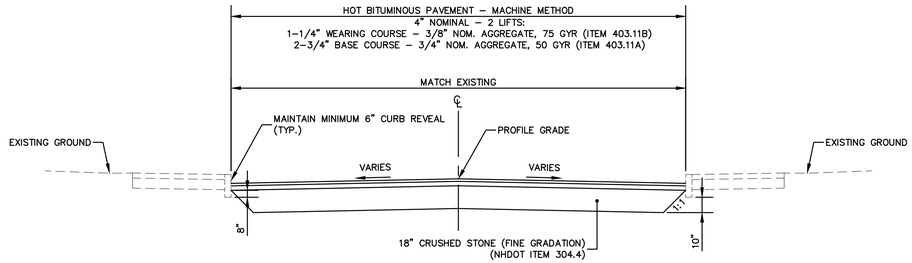


AUSTIN STREET (BID ALTERNATE C)

Not to Scale

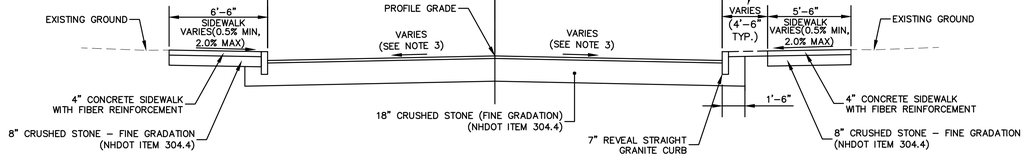
Sta 300+40 TO 303+40



CABOT STREET (BID ALTERNATE A)

Not to Scale

STA 600+27 TO 603+70



UNION STREET (BID ALTERNATE B)

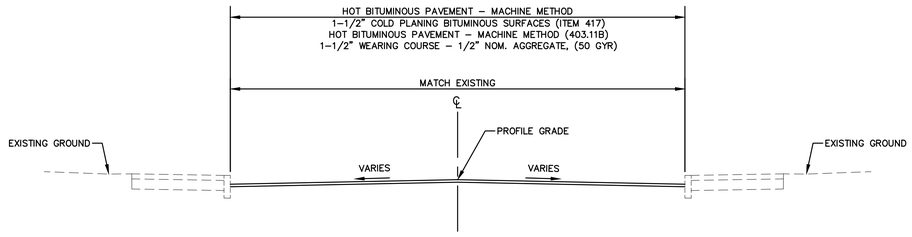
Not to Scale

Sta 100+00 TO 104+26

AUSTIN STREET (BID ALTERNATE C)

Not to Scale

Sta 300+40 TO 303+40



MIDDLE STREET (BID ALTERNATE D)

Not to Scale

STA 500+68 TO 504+75

NOTES:

1. Asphalt emulsion for tack coat shall be applied at the rate of 0.07 gal/sy for milled surfaces and 0.05 gal/sy for smooth paved surfaces, subsidiary to paving.
2. Pavement joint adhesive required on longitudinal joints (all lifts), subsidiary to paving.
3. See general plan profiles for superelevation transition sections. See cross sections for additional cross slope grades.

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

CMA ENGINEERS
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cmaengineers.com

designed by: STF/MAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Typical Sections

drawing no.
TS-1

sheet: 4 of 54

LEGEND:

- IRON ROD FOUND
- IRON PIPE FOUND
- GRANITE POST FOUND
- RAILROAD SPIKE FOUND
- SURVEY NAIL FOUND
- CHAIN LINK FENCE
- FENCE
- WOOD FENCE POST
- STEEL FENCE POST
- CC ... CONSOLIDATED COMMUNICATIONS
- FP ... FAIRPOINT
- NETT ... NEW ENGLAND TELEPHONE AND TELEGRAPH CO.
- PSNH ... PUBLIC SERVICE CO. OF NH
- VZ ... VERIZON
- EVS ... EVERSOURCE
- (A) ... SEE SIGNAGE TABLE
- RCRD ... ROCKINGHAM COUNTY REGISTRY OF DEEDS
- EOP ... EDGE OF PAVEMENT
- ETW ... EDGE OF TRAVELLED WAY
- VGC ... VERTICAL FACED GRANITE CURB
- RWB ... BRICK RETAINING WALL
- RWC ... CONCRETE RETAINING WALL
- RWM ... MORTARED RETAINING WALL
- RWS ... STONE RETAINING WALL
- RWW ... WOOD RETAINING WALL
- RWG ... GRANITE RETAINING WALL
- BOLLARD
- SIGN
- UTILITY POLE
- UTILITY POLE W/TRANSFORMER
- LIGHT POLE
- UTILITY POLE WITH ARM & LIGHT
- GUY
- ELECTRICAL CONDUIT
- ELECTRICAL PANEL
- ELECTRICAL BOX
- E ... ELECTRIC METER
- COMMUNICATIONS MANHOLE
- TELEPHONE MANHOLE
- GAS METER
- GAS SHUT OFF
- GAS VALVE
- WATER GATE VALVE
- WATER SHUT OFF VALVE
- HYDRANT
- FIRE CONNECTION
- CATCH BASIN
- CATCH BASIN
- DRAIN MANHOLE
- ROOF DOWNSPOUT
- SEWER MANHOLE
- SEWER CLEAN OUT
- BRUSH/HEDGE LINE
- CONIFEROUS TREE
- DECIDUOUS TREE
- CONIFEROUS SHRUB
- DECIDUOUS SHRUB
- — W — ... WATER LINE
- — S — ... SEWER LINE
- — D — ... DRAIN LINE
- — G — ... GAS LINE
- — FM — ... FORCE MAIN
- — UGC — ... UNDERGROUND COMMUNICATIONS
- — UGE — ... UNDERGROUND ELECTRIC
- CEMENT CONCRETE
- BRICK PAVERS
- CRUSHED STONE
- RETAINING WALL
- LA ... LANDSCAPED AREA
- ×12.5 ... SPOT GRADE

SEWER TABLE

SMH# 1
RIM EL= 14.88
(1) INV IN 6"PVC= 10.43
(2) INV IN 6"PVC= 10.46
(3) INV IN 6"PVC= 10.52
(4) INV IN 6"PVC= 10.48
(5) INV OUT 8"PVC= 10.30

SMH# 1272
RIM EL=20.06
(1) INV IN 8"PVC= 13.91
(2) INV IN 12"VCP= 13.84
(3) INV OUT "VCP= 13.75

SMH# 1273
RIM EL= 19.71
INV IN "VCP= 13.7
(1) INV IN 18"VCP= 5.96
INV IN 6"PVC= 12.33
(2) INV OUT 15"VCP= 6.16

SMH# 1353
RIM EL= 23.99
(1) INV IN 12"VCP= 15.04
(2) INV IN 15"VCP"= 14.58
(3) INV OUT 15"VCP= 14.51

SMH# 1354
RIM EL= 23.12
(1) INV IN 8"VCP= 16.52
(2) INV IN 8"VCP= 16.44
(3) INV OUT 8"VCP= 16.42

SMH# 1355
RIM EL= 14.15
(1) INV IN 8"VCP= 7.50
(2) INV IN 8"VCP= 7.50

SMH# 1356
RIM EL= 13.85
(1) INV IN 12"VCP= 8.33
(2) INV IN 12"= 7.28
(3) INV IN 15"VCP= 6.80
(4) INV OUT 18"= 6.76

SMH# 1357
RIM EL= 14.74
(1) INV IN 6"PVC= 10.24
(2) INV IN 12"VCP=
(3) INV IN 6"= 10.08
(4) INV IN 10"VCP=
(5) INV IN 8"PVC= 9.90
(6) INV OUT 12"VCP= 9.64

SMH# 1358
RIM EL= 14.39
(1) INV IN 6"VCP= 9.71
INV IN 10" VCP= 9.53
(2) INV OUT= 9.35
CL INVERT= 9.47

SMH# 1365
RIM EL= 16.47
(1) INV IN 12"VCP= 8.62
(2) INV IN 15"VCP= 6.50
(3) INV IN 12"VCP= 8.54
(4) INV IN 6"CI= 11.22
(5) INV OUT 15"VCP= 6.48

SMH# 1366
RIM EL= 26.43
(1) INV IN 6"VCP= 21.09
(2) INV IN 5"VCP= 21.26
(3) INV OUT 8"VCP= 20.83

SMH# 1367
RIM EL= 22.60
(1) INV IN 8"PVC= 16.27
(2) INV OUT 15"VCP= 15.50

SMH# 5800
RIM=19.09
(1) INV IN 21"PVC= 5.08
(2) INV OUT 21"PVC= 4.79
CL INV= 5.03

SMH# 5801
RIM EL= 17.57
(1) INV IN 21"PVC= 4.28
(2) INV OUT 21"PVC= 4.28
CL INV= 4.28

SMH# 5978
RIM EL=19.89
(1) INV IN 8"PVC= 14.54
(2) INV OUT 8"PVC= 14.39
CL INV= 14.49

SMH# 6056
RIM EL=13.71
(1) INV IN 15"PVC= 6.53
(2) INV OUT 15"PVC= 6.42

SMH# 6057
RIM EL=13.92
(1) INV IN 15"PVC= 6.48
(2) INV OUT 15"PVC= 6.42

SMH# 6058
RIM EL=14.03
(1) INV IN 15"PVC= 6.47
(2) INV OUT 15"PVC= 6.39

SMH# 6059
RIM EL=13.94
(1) INV IN 15"PVC= 6.45
(2) INV IN 15"PVC= 6.62
(3) INV IN 8"PVC= 7.02
(4) INV OUT 15"PVC= 6.43

SMH# 6060
RIM EL=14.02
(1) INV IN 6"PVC= 9.20
(2) INV OUT 8"PVC= 9.17

DRAIN TABLE

DMH# 4973
RIM EL= 23.85
(1) INV IN 12"CMP= 17.70
(2) INV IN 24"RCP= 16.40
(3) INV IN 12"CMP= 16.35
(4) INV OUT 12"CMP= 16.35

DMH# 5357
RIM EL= 13.64
(1)INV IN 12"CMP= 8.11
(2)INV IN 15"CMP= 9.26
(3)INV OUT 12"PVC= 8.37

DMH# 10264
RIM EL= 19.75
(1) INV IN 15"HDPE= 13.97
(2) INV OUT 15"HDPE=

DMH# 10265
RIM EL= 19.67
(1) INV IN 12"HDPE= 15.75
(2) INV IN 15"HDPE= 13.94
(3) INV OUT 15"HDPE= 13.85

DMH# 10726
RIM EL= 18.75
(1) INV IN 24"HDPE= 7.35
(2) INV OUT 24"HDPE= 7.21

CB# 1
RIM=19.93
(1) INV 4"PVC= 18.26
(2) INV 4"PVC= 18.13
(3) INV 4"PVC= 18.09
(4) INV 4"PVC= 18.09

CB# 68
RIM EL= 19.02
(1) INV IN 2"PVC= 17.00
(2) INV OUT 8"PVC= 16.54

CB# 1221
RIM EL= 13.47
(1) INV IN 6"HDPE= 10.71
(2) INV OUT 12"HDPE= 10.59

CB# 1222
RIM EL= 19.37
(1) INV OUT 12"RCP= 14.68

CB# 1223
RIM EL= 13.57
(1) INV IN 12"HDPE= 10.29
(2) INV IN 6"PVC= 10.52
(3) INV IN 2"CI= 10.74
(4) INV OUT 12"CMP= 8.37

CB# 1224
RIM EL= 13.42
(1) INV OUT 12"HDPE= 10.53

CB# 1225
RIM EL= 15.65
(1) INV IN 15"CMP= 10.90
(2) INV IN 12"CMP= 12.09
(3) INV OUT 15"CMP= 10.81

CB# 1226
RIM EL= 15.62
(1)INV OUT 12"CMP= 12.52

CB# 1228
RIM EL= 23.35
(1) INV IN 12"HDPE= 19.15
(2) INV OUT 12"HDPE= 18.57

CB# 1229
RIM EL= 21.23
(1) INV IN 12"HDPE= 17.81
(2) INV IN 12"HDPE= 17.93
(3) INV OUT 15"CMP= 15.53

CB# 1230
RIM EL= 21.23
(1) INV OUT 12"HDPE= 18.28

CB# 1231
RIM EL= 23.43
(1) INV OUT 12"CMP= 20.86

CB# 1232
RIM EL= 18.91
(1) INV IN 6"PVC= 14.99
(2) INV OUT 12"RCP= 13.96

CB# 1233
RIM EL= 19.11
(1) INV OUT 12"RCP= 13.70

CB# 1234
RIM EL= 15.14
(1) INV OUT 6"ACP= 11.44

CB# 1235
RIM EL= 15.20
(1) INV OUT 6"PVC= 12.54

CB# 1236
RIM EL= 19.02
(1) INV OUT 15"RCP= 13.92

CB# 1263
RIM EL= 22.98
(1) INV OUT 12"CMP= 19.33

CB# 1281
RIM EL= 21.39
(1) INV OUT 6"= 17.77

CB# 1286
RIM EL= 21.94
(1) INV OUT 6"VCP= 18.53

CB# 1287
RIM EL= 22.45
(1) INV OUT 24"RCP= 16.76

CB# 1288
RIM EL= 23.06
(1) INV IN 24"RCP= 16.57
(2) INV OUT 24"RCP= 16.51

CB# 1289
RIM EL= 22.68
(1) INV OUT 12"CMP= 18.53

CB# 1290
RIM EL= 22.08
(1) INV IN 12"CMP= 18.53
(2) INV IN 12"CMP= 18.50
(3) INV OUT 12"CMP= 18.50

CB# 1291
RIM EL= 21.63
(1) INV IN 6"PVC= 19.77
(2) INV OUT 12"CMP= 18.87

CB# 1346
RIM EL= 17.06
(1) INV OUT 6"ACP= 14.12

CB# 4239
RIM EL= 19.96
(1) INV IN 12"RCP= 14.74
(2) INV IN 12"RCP= 14.38
(3) INV OUT 15"HDPE= 14.31

CB# 4390
RIM EL= 18.57
(1) INV OUT 12"RCP= 12.36

CB# 4391
RIM EL= 18.80
(1) INV IN 18"RCP= 10.72
(2) INV IN 15"RCP= 11.34
(3) INV OUT 18"RCP= 10.58

CB# 4392
RIM EL= 19.34
(1) INV IN 15"RCP= 12.15
(2) INV IN 12"RCP= 12.65
(3) INV OUT 18"RCP= 12.11

CB# 4419
RIM EL= 16.83
(1) INV IN 15"RCP
(2) INV OUT 12"RCP
CL INV= 12.20

CB# 4421
RIM EL= 19.59
(1) INV IN 15"RCP= 13.69
(2) INV IN 12"RCP= 13.59
(3) INV OUT 18"RCP= 13.61

CB# 4425
RIM EL= 13.45
(1) INV IN 15"CMP= 10.21
(2) INV IN 12"HDPE= 10.18
(3) INV OUT 18"CMP= 10.10

CB# 4529
RIM=20.27
(1) INV IN 4"PVC= 17.34
(2) INV IN 4"PVC= 17.40
(3) INV OUT 4"PVC= 17.25

CB# 25787
RIM EL= 13.81
(1) INV IN 6"HDPE= 10.92
(2) INV OUT 6"HDPE= 10.75

CB# 25788
RIM=14.68
(1) INV IN 6"HDPE= 11.63
(2) INV OUT 6"HDPE= 11.48

CB# 25863
RIM EL= 19.86
(1) INV IN 15"RCP= 12.85
(2) INV IN 12"RCP= 12.93
(3) INV OUT 15"RCP= 19.85

CB# 25913
RIM EL= 24.19
(1) INV IN 12"HDPE= 20.90
(2) INV OUT 12"PVC= 20.69

NOTES:

1. THIS PLAN IS BASED ON A FIELD SURVEY PERFORMED 6/2021–9/2022 BY JAMES VERRA AND ASSOC., INC. ON SITE CONTROL ESTABLISHED USING SURVEY GRADE GPS.
HORIZONTAL DATUM: NAD 1983 (2011)(EPOCH2010.0000)
HORIZONAL BASIS: NGS "CORS" STATIONS: MASA, NHCO, NHUN, P776 & ZBW1
VERTICAL DATUM: NAVD 1988
VERTICAL BASIS: CITY CONTROL POINT "ROBE"
2. THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
3. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG–SAFE @ 1–888–DIG–SAFE.
4. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE SETTING OR ESTABLISHMENT OF ANY GRADES/ELEVATIONS. DICREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOC., INC.

REFERENCE PLANS:

1. AS BUILT PLAN, 211 UNION STREET, LLC, PORTSMOUTH, NH, TAX MAP 135, LOT 70, REVISED TO 8/20/2018, BY ROSS ENGINEERING.
2. CITY OF PORTSMOUTH, N.H., RECORD DRAWINGS, LINCOLN AREA SEWER SEPERATION, CONTRACT 3B, DATED 12/2014, BY UNDERWOOD ENGINEERS, INC.
3. CITY OF PORTSMOUTH, N.H., RECORD DRAWINGS, LINCOLN AREA SEWER SEPERATION, CONTRACT 3C, DATED 12/2016, BY UNDERWOOD ENGINEERS, INC.

PROJECT TEMPORARY BENCHMARKS

I.D.	DESCRIPTION	ELEV.
A	SPIKE SET IN UTILITY POLE PSNH 3 37 (1.0' ABOVE GROUND)	23.78
B	SPIKE SET IN UTILITY POLE EVS 25T (1.0' ABOVE GROUND)	24.27
C	SPIKE SET IN UTILITY POLE NETT 82 6 (1.0' ABOVE GROUND)	29.19
D	BOLT W/ "X" CUT HYDRANT TOP FLANGE	25.09
E	SPIKE SET IN UTILITY POLE EVS 51/9 (1.0' ABOVE GROUND)	16.55
F	SPIKE SET IN UTILITY POLE EVS 51/12 (1.0' ABOVE GROUND)	16.03
G	SPIKE SET IN UTILITY POLE (NO I.D.) (1.0' ABOVE GROUND)	21.99
H	SPIKE SET IN UTILITY POLE CC 21 (1.1' ABOVE GROUND)	20.37
I	BOLT W/ "X" CUT HYDRANT TOP FLANGE	22.44
J	SPIKE SET IN UTILITY POLE FP 17 (1.0' ABOVE GROUND)	20.95
K	BOLT W/ "X" CUT HYDRANT TOP FLANGE	21.59
L	SPIKE SET IN UTILITY POLE FP 2 (1.0' ABOVE GROUND)	19.40
M	BOLT W/ "X" CUT HYDRANT TOP FLANGE	28.60
N	SPIKE SET IN UTILITY POLE VZ 12 (1.0' ABOVE GROUND)	25.74
O	SURVEY SPIKE SET IN UTILITY POLE PSNH 44 6 (1.0' ABOVE GROUND)	24.72
P	SURVEY SPIKE SET IN 14" MAPLE (1.0' ABOVE GROUND)	14.20

SIGNAGE TABLE

I.D.	DESCRIPTION
A	DO NOT ENTER
B	NO PARKING
C	STOP
D	SPEED LIMIT 20
E	NO PARKING HERE TO CORNER
F	DO NOT BLOCK DRIVEWAY
G	BIKE ROUTE
H	SLOW CHILDREN AT PLAY
I	DOG WASTE PLEASE REMOVE ITS A LAW
J	BIKE LANE ENDS
K	BIKE ROUTE
L	BIKE MAY USE FULL LANE

REV. NO.	DATE	DESCRIPTION	APPR'D
2	10/6/2022	ADDITIONAL DETAIL ALONG CABOT STREET & ISSUE SHEET 6	JCS
1	8/15/2022	ADDITIONAL DETAIL ALONG MIDDLE STREET AS REQUESTED	JV

EXISTING CONDITIONS PLAN
UNION STREET IMPROVEMENT PROJECT
AUSTIN, CABOT, MIDDLE, UNION & STATE STREETS & COFFINS COURT
PORTSMOUTH, NEW HAMPSHIRE
for CMA ENGINEERS, INC.

JAMES VERRA and ASSOCIATES, INC.
101 SHATTUCK WAY
SUITE 8
NEWINGTON, N.H., 03801–7876
603–436–3557

JV/JCS — PROJECT MGR
JCS — DRAWN BY

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DATE:	3/21/2022
JOB NO:	23933
SCALE: 1" =	60'
DWG NAME:	23933
PLAN NO:	23933
SHEET:	1 OF 6

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

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CIVIL/ENVIRONMENTAL/STRUCTURAL
Portsmouth, NH • Manchester, NH • Portland, ME
603/431-6196 • 603/627-0708 • 207/541-4223
c m a e n g i n e e r s . c o m

STATE OF NEW HAMPSHIRE – PHILIP A. CORBETT NO. 12271 – LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 20' 40' Scale: 1" = 20'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Existing Conditions Plan

drawing no. ECP-1

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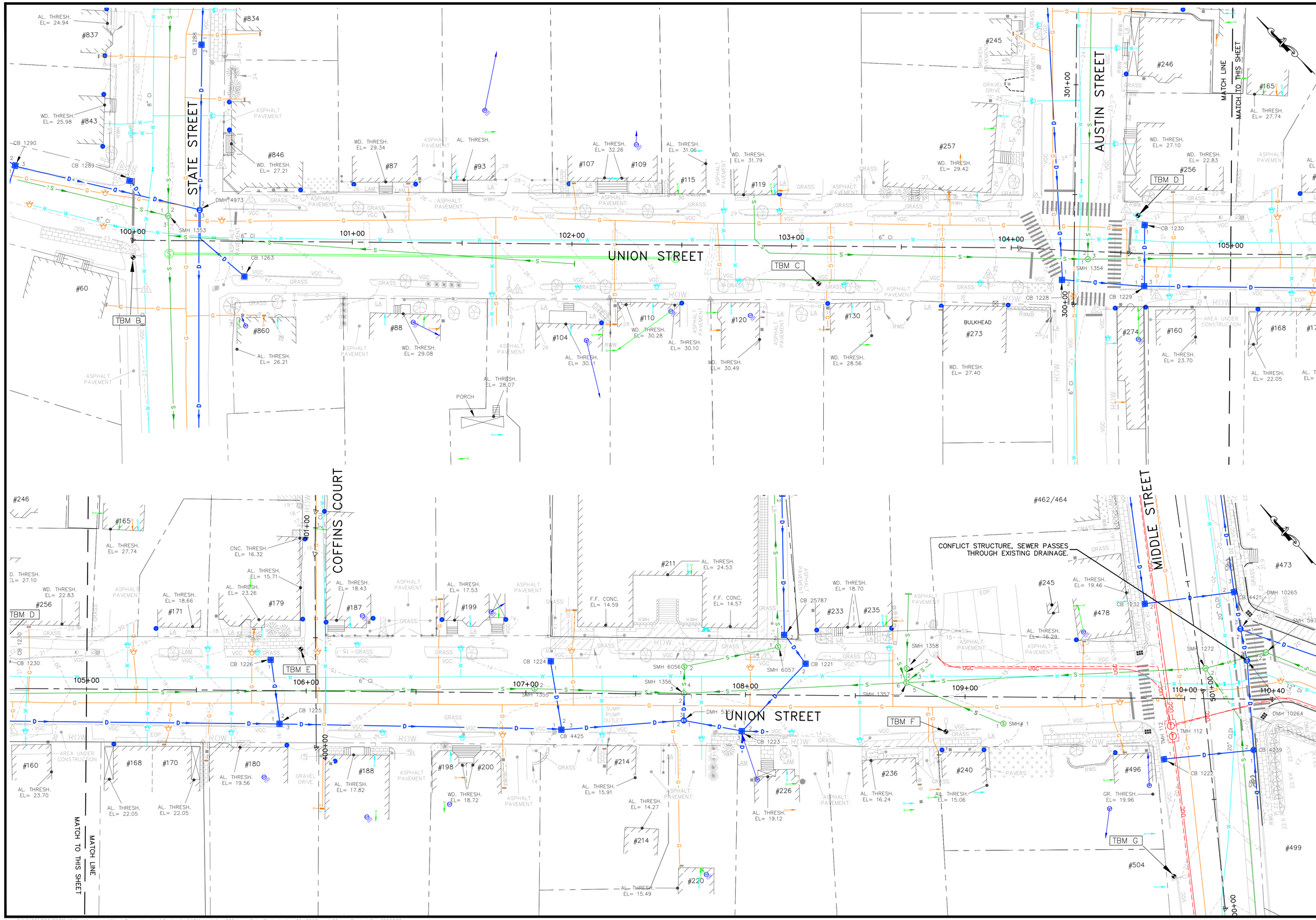

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c m a e n g i n e e r s . c o m

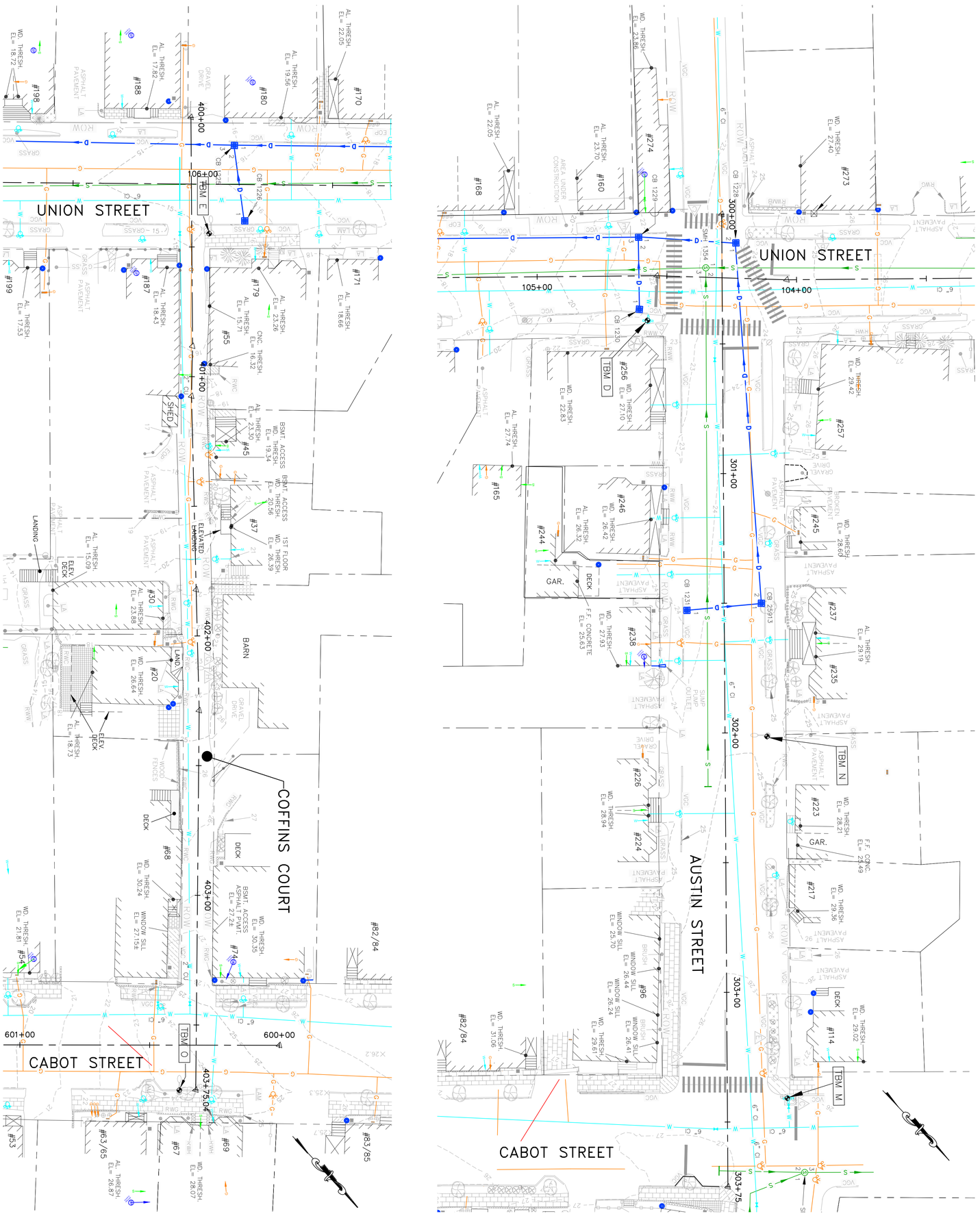
STATE OF NEW HAMPSHIRE PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 20' 40' Scale: 1" = 20'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Existing Conditions Plan

drawing no.
ECP-2

F:\CADD\PROJECTS\1211-Union and Willard Reconstruction\Production\1211 - Union ECP.dwg Date Plotted: Jan 09, 2023 - 4:50pm Plotted By: SFORTIER



sheet 7 of 54	drawing no. ECP-3	City of Portsmouth, New Hampshire Department of Public Works Union Street Area Improvement Project Existing Conditions Plan	date: January 2023 · designed by: STF/WAB project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 20' 40' Scale: 1" = 20'

STATE OF NEW HAMPSHIRE — PHILIP A. CORBETT NO. 12271 LICENSED PROFESSIONAL ENGINEER

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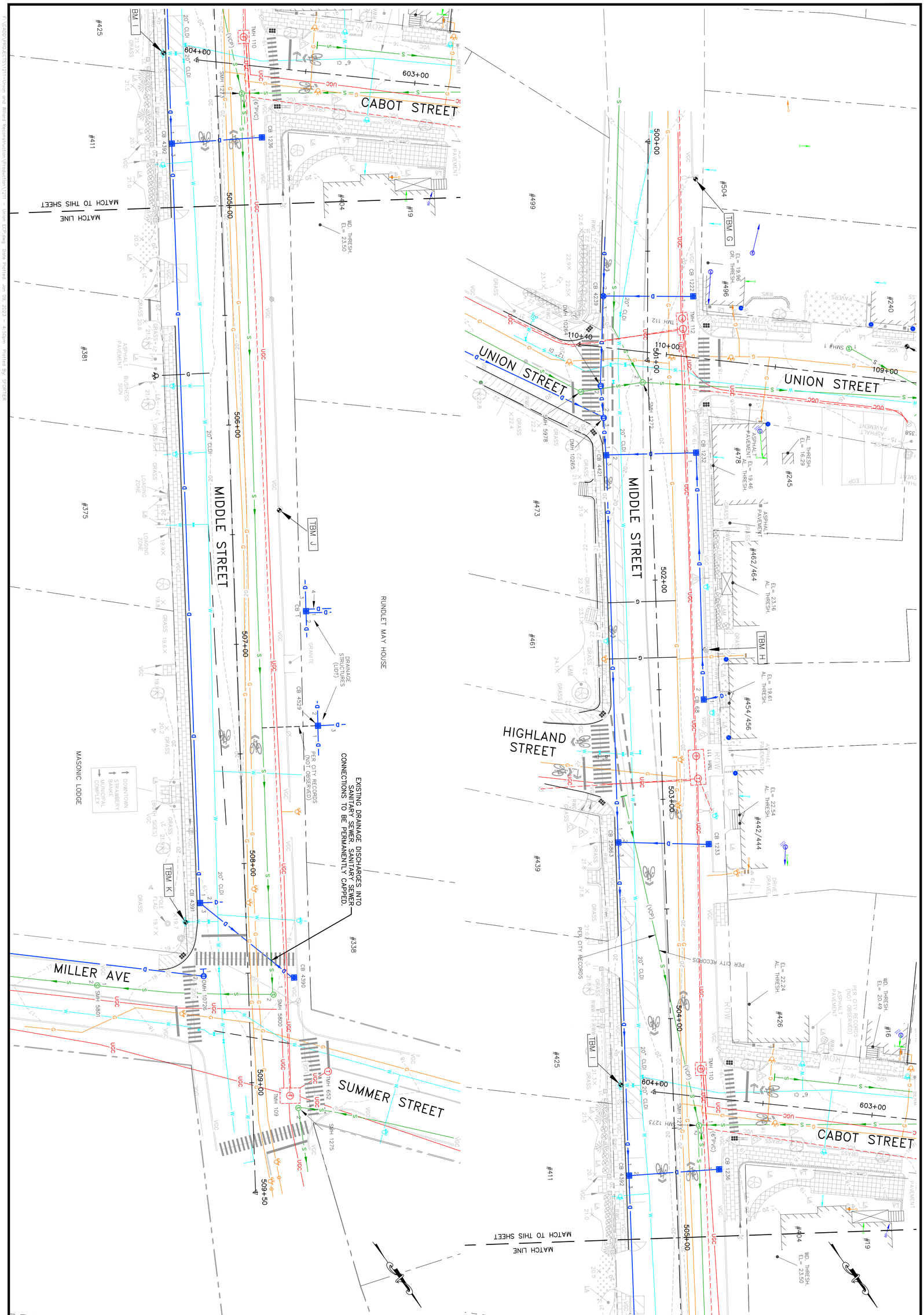
Portsmouth, NH 603/431-6196 • Manchester, NH 603/627-0708 • Portland, ME 207/541-4223
cmaengineers.com

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC



sheet 8 of 54	drawing no. ECP-4	City of Portsmouth, New Hampshire Department of Public Works Union Street Area Improvement Project Existing Conditions Plan	date: January 2023 · designed by: STF/WAB project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 20' 40' Scale: 1" = 20'

PHILIP R. CORDETT NO. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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no.	revision	date	by
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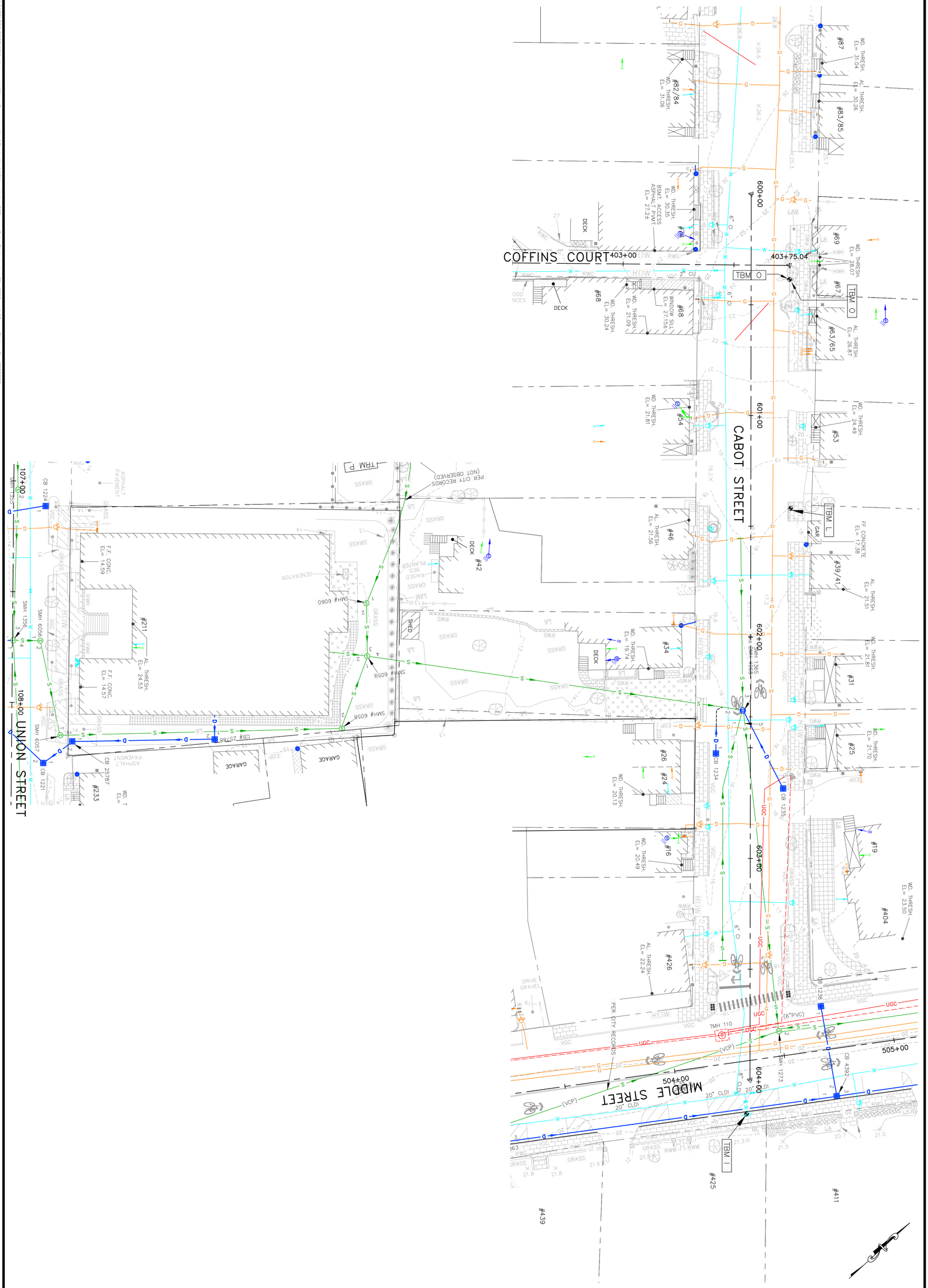

sheet 9 of 54	drawing no. ECP-5	City of Portsmouth, New Hampshire Department of Public Works Union Street Area Improvement Project Existing Conditions Plan	date: January 2023 · designed by: STF/WAB project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 20' 40' — Scale: 1" = 20'

PHILIP A. CORBETT NO. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

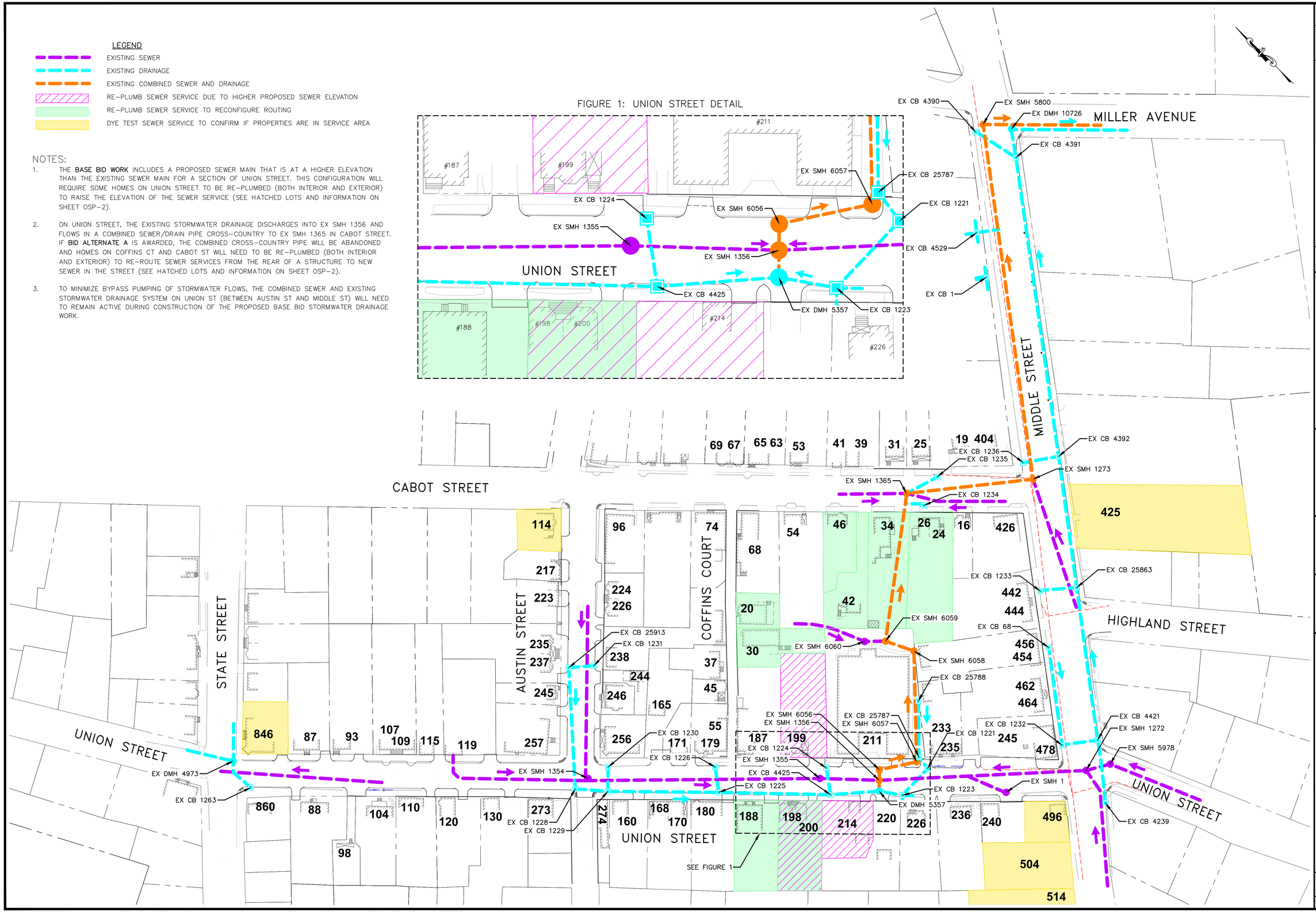
LEGEND

- EXISTING SEWER
- EXISTING DRAINAGE
- EXISTING COMBINED SEWER AND DRAINAGE
- RE-PLUMB SEWER SERVICE DUE TO HIGHER PROPOSED SEWER ELEVATION
- RE-PLUMB SEWER SERVICE TO RECONFIGURE ROUTING
- DYE TEST SEWER SERVICE TO CONFIRM IF PROPERTIES ARE IN SERVICE AREA

NOTES:

1. THE **BASE BID WORK** INCLUDES A PROPOSED SEWER MAIN THAT IS AT A HIGHER ELEVATION THAN THE EXISTING SEWER MAIN FOR A SECTION OF UNION STREET. THIS CONFIGURATION WILL REQUIRE SOME HOMES ON UNION STREET TO BE RE-PLUMBED (BOTH INTERIOR AND EXTERIOR) TO RAISE THE ELEVATION OF THE SEWER SERVICE (SEE HATCHED LOTS AND INFORMATION ON SHEET OSP-2).
2. ON UNION STREET, THE EXISTING STORMWATER DRAINAGE DISCHARGES INTO EX SMH 1356 AND FLOWS IN A COMBINED SEWER/DRAIN PIPE CROSS-COUNTRY TO EX SMH 1365 IN CABOT STREET. IF **BID ALTERNATE A** IS AWARDED, THE COMBINED CROSS-COUNTRY PIPE WILL BE ABANDONED AND HOMES ON COFFINS CT AND CABOT ST WILL NEED TO BE RE-PLUMBED (BOTH INTERIOR AND EXTERIOR) TO RE-ROUTE SEWER SERVICES FROM THE REAR OF A STRUCTURE TO NEW SEWER IN THE STREET (SEE HATCHED LOTS AND INFORMATION ON SHEET OSP-2).
3. TO MINIMIZE BYPASS PUMPING OF STORMWATER FLOWS, THE COMBINED SEWER AND EXISTING STORMWATER DRAINAGE SYSTEM ON UNION ST (BETWEEN AUSTIN ST AND MIDDLE ST) WILL NEED TO REMAIN ACTIVE DURING CONSTRUCTION OF THE PROPOSED BASE BID STORMWATER DRAINAGE WORK.

FIGURE 1: UNION STREET DETAIL



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STATE OF NEW HAMPSHIRE PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 50' 100' Scale: 1" = 50'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Utility Sequencing Plan

drawing no. OSP-1

sheet: 10 of 54

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LEGEND

- PROPOSED SEWER
- PROPOSED DRAIN
- EXISTING SEWER
- EXISTING DRAINAGE
- EXISTING COMBINED SEWER AND DRAINAGE
- MAINTAIN EXISTING SEWER FLOWS (SEE NOTE 4.2, THIS SHEET)
- REPLUMB SEWER SERVICE DUE TO RAISED SEWER
- REPLUMB SEWER SERVICE TO RECONFIGURE ROUTING
- DYE TEST SEWER SERVICE TO CONFIRM IF PROPERTIES ARE IN SERVICE AREA
- BASE BID WORK AREA LIMITS
- BID ALTERNATE WORK AREA LIMITS

UTILITY SEQUENCING NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SEWER, STORMWATER, AND COMBINED SEWER AND DRAINAGE FLOWS DURING CONSTRUCTION.
2. CONTRACTOR MUST SUBMIT A PROPOSED CONSTRUCTION SCHEDULE FOR APPROVAL BY THE CITY AND ENGINEER.
3. BYPASS PIPING AND PUMPING MAY BE REQUIRED DURING CONSTRUCTION TO MAINTAIN EXISTING SEWER AND STORMWATER DRAINAGE FLOWS.
4. THE FOLLOWING PRESENTS MAINTENANCE OF DRAIN AND SEWER FLOW CONSIDERATIONS AND RECOMMENDED SEQUENCING:
   - 4.1. TEMPORARY BYPASS WATER SHOULD BE INSTALLED PRIOR TO ANY UTILITY AND DRAIN CONSTRUCTION ON UNION ST, CABOT ST, COFFINS CT, AND AUSTIN ST.
   - 4.2. IN A SECTION OF UNION STREET (SMH 4 TO SMH 5), THE EXISTING SEWER MAIN AND SERVICES SHOULD REMAIN IN SERVICE (STA 106+00 TO EX SMH 1357) UNTIL THE PROPOSED SEWER MAIN AND SERVICES ARE ACTIVE AND THE HOMES IN THIS AREA ARE RE-PLUMBED.
   - 4.3 UNLESS STORMWATER IS BYPASS PUMPED, THE COMBINED SEWER AND THE EXISTING DRAINAGE SYSTEM ON UNION STREET BETWEEN MIDDLE STREET AND AUSTIN STREET MUST REMAIN ACTIVE UNTIL THE PROPOSED DRAINAGE SYSTEM IS ACTIVE FROM THE MILLER AVE/MIDDLE ST CONNECTION (DMH 101) TO THE AUSTIN ST/UNION ST INTERSECTION (DMH 113). THE EXISTING DRAINAGE SYSTEM CONNECTS TO THE COMBINED SEWER AND DRAINAGE SYSTEM AT EXISTING SMH 1356. THIS CONNECTION AND THE DOWNSTREAM COMBINED SEWER AND DRAINAGE SYSTEM MUST ALSO BE MAINTAINED TO PROVIDE GRAVITY FLOWS FOR THE DRAINAGE SYSTEM UNTIL THE PROPOSED DRAINAGE SYSTEM IS CONSTRUCTED FROM DMH 101 TO DMH 113.
   - 4.4 FOR HOMES THAT NEED TO BE RE-PLUMBED TO REROUTE THE SEWER SERVICE, THE PROPOSED SEWER MAINS AND SERVICES TO THE HOME SHOULD BE INSTALLED PRIOR TO RE-PLUMBING AND PRIOR TO DISCONNECTING EXISTING SEWER MAINS.
   - **4.5 NOTE: COMBINED SEWER AND DRAINAGE MUST BE SEPARATED BY OCTOBER 2023.**

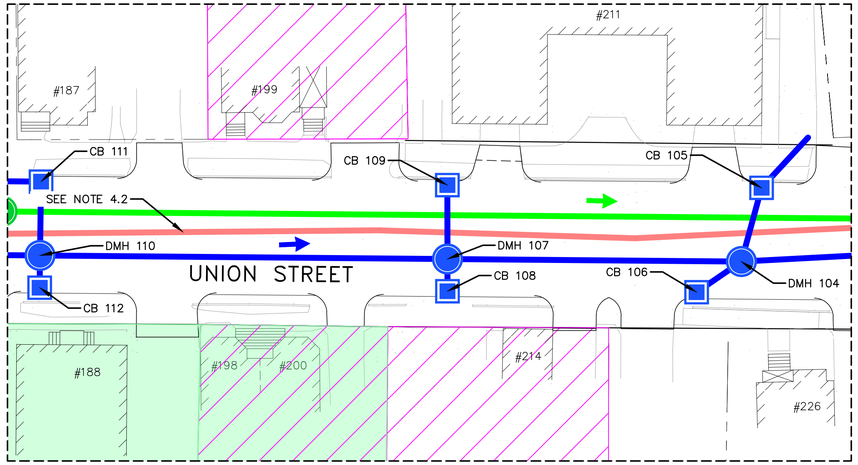
SEWER SERVICE RECONSTRUCTION NOTES:

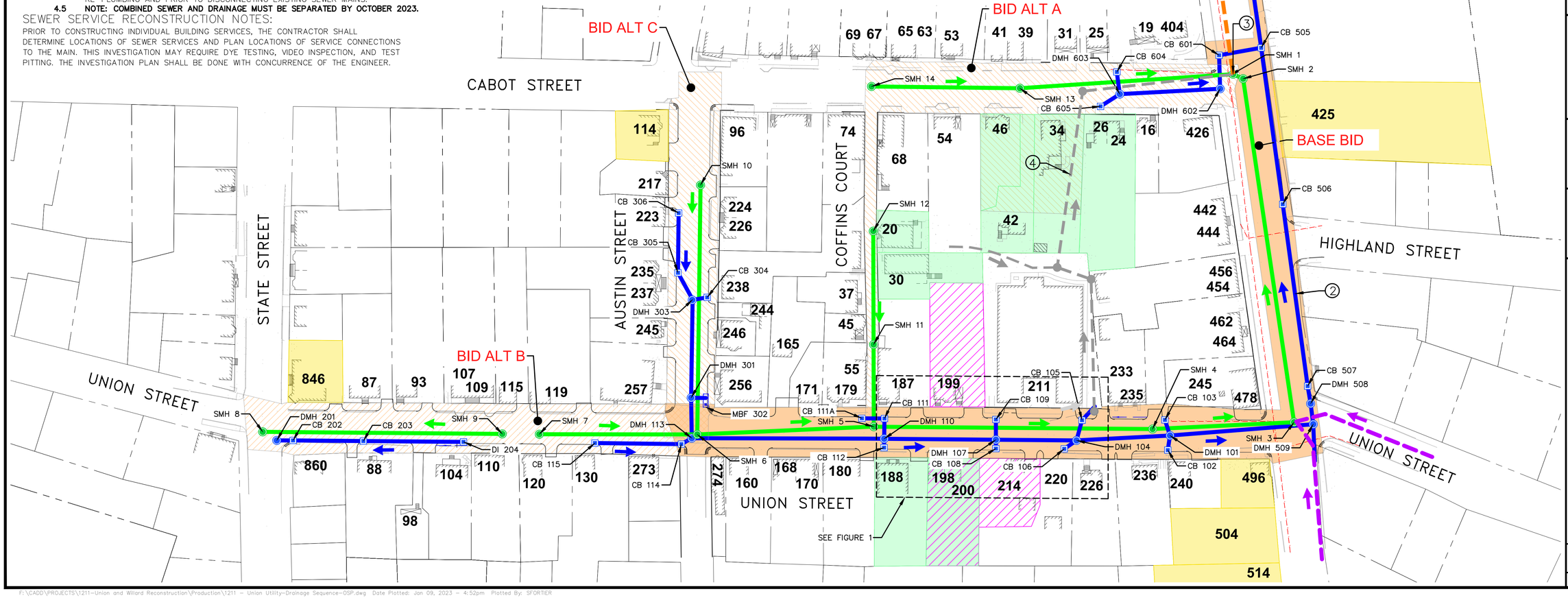
PRIOR TO CONSTRUCTING INDIVIDUAL BUILDING SERVICES, THE CONTRACTOR SHALL DETERMINE LOCATIONS OF SEWER SERVICES AND PLAN LOCATIONS OF SERVICE CONNECTIONS TO THE MAIN. THIS INVESTIGATION MAY REQUIRE DYE TESTING, VIDEO INSPECTION, AND TEST PITTING. THE INVESTIGATION PLAN SHALL BE DONE WITH CONCURRENCE OF THE ENGINEER.

PLAN NOTES:

1. THE PROPOSED DRAINAGE SYSTEM CONNECTS TO AN EXISTING DRAIN MANHOLE (DMH 501) AT THE INTERSECTION OF MIDDLE ST & MILLER AVE.
2. THE PROPOSED DRAINAGE IS CONSTRUCTED IN THE SAME LOCATION AS THE EXISTING DRAIN PIPE ON MIDDLE STREET, AT A DEEPER ELEVATION, WHICH WILL REQUIRE BYPASS PIPING AND/OR PUMPING TO MAINTAIN FLOWS.
3. THE PROPOSED SEWER SYSTEM CONNECTS TO THE OUTLET PIPE FOR EX SMH 1273.
4. IF BID ALTERNATE 1 IS SELECTED, THE BACKLOT CROSS-COUNTRY SEWER BETWEEN UNION ST AND CABOT ST WILL BE ABANDONED, WHICH WILL REQUIRE REROUTING SEWER SERVICES FOR THE HOMES THAT ARE CONNECTED TO THIS SEWER MAIN.

FIGURE 1: AREA WHERE PROPOSED SEWER IS HIGHER THAN EXISTING SEWER





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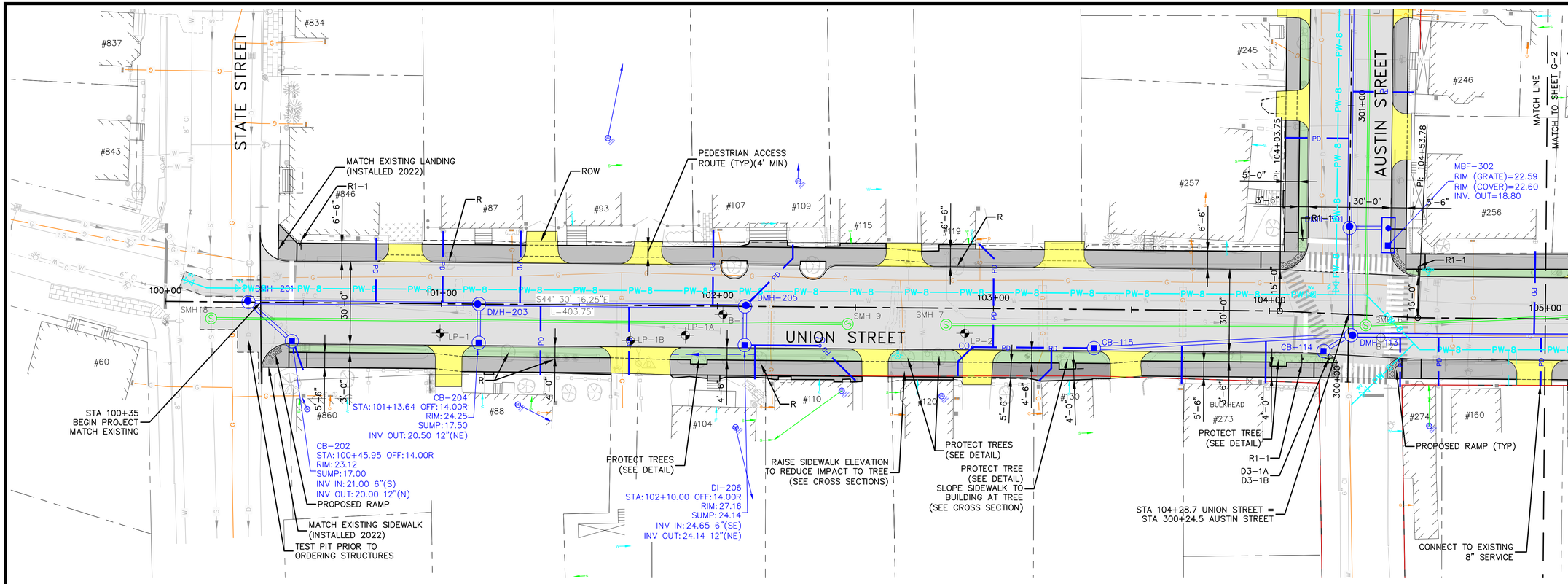
PHILIP A. CROCKER 10/1/2023 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

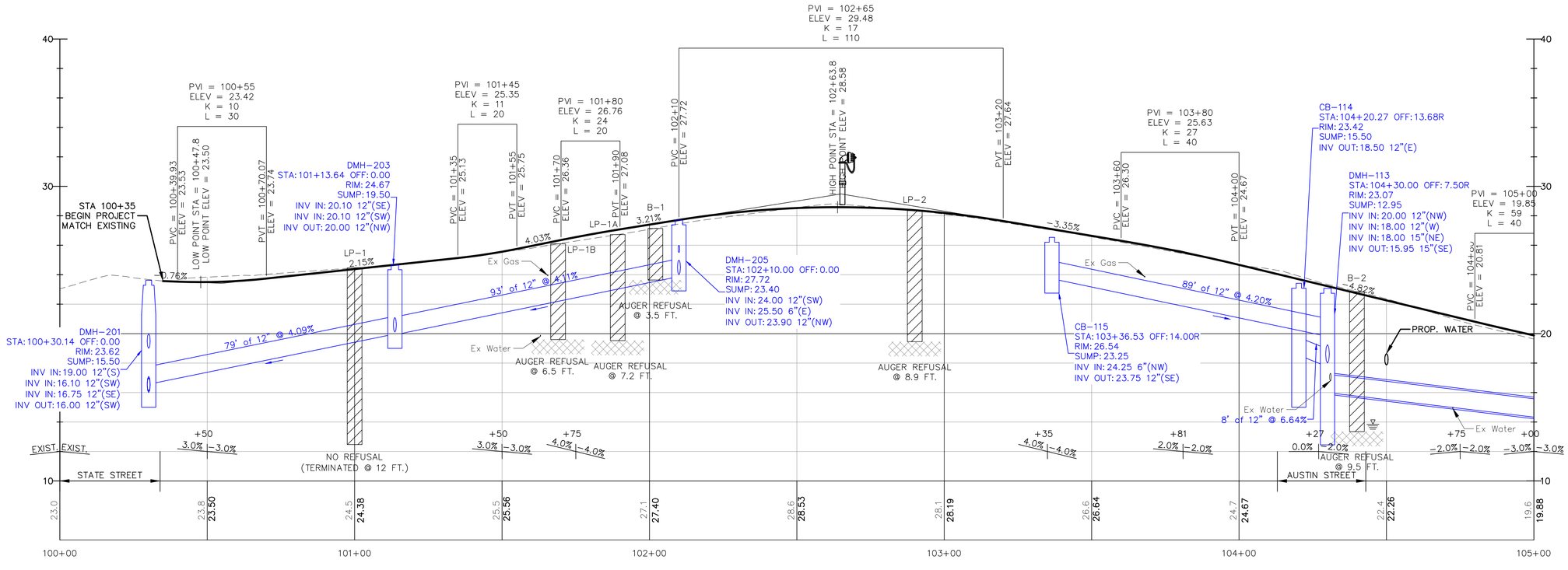
designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 1" = 50' (50' 0 100')

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Utility Sequencing Plan

drawing no. OSP-2

sheet: 11 of 54





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date: January 2023
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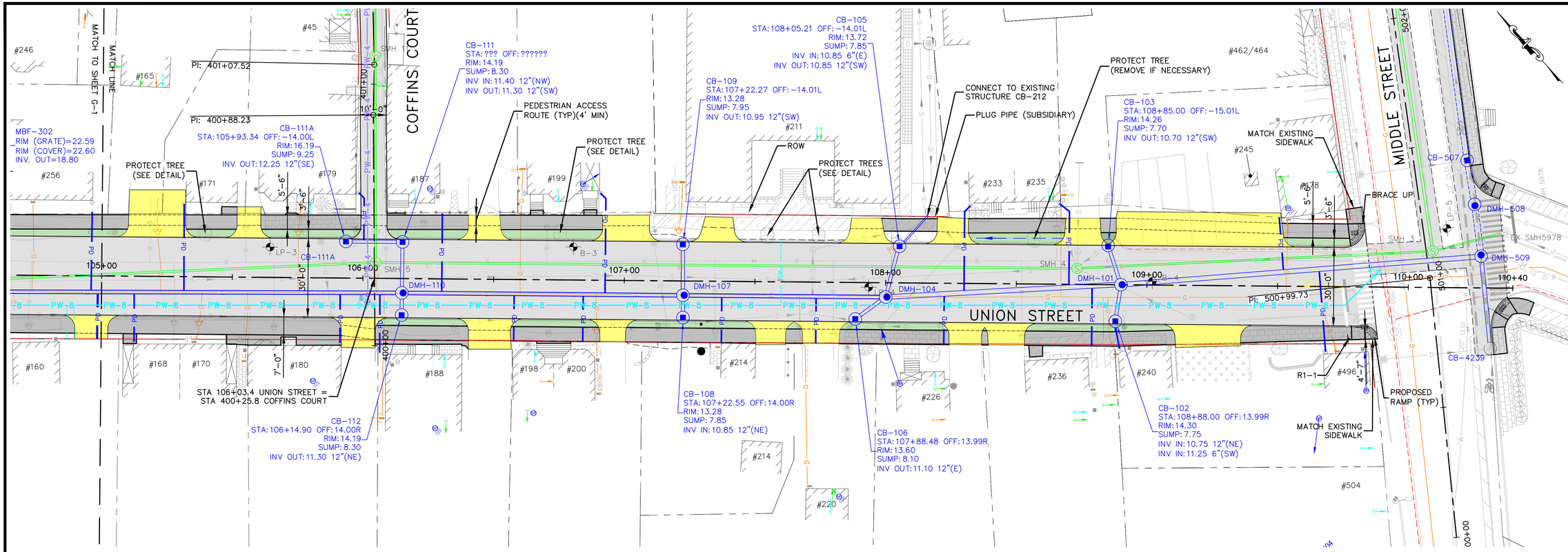
City of Portsmouth, New Hampshire
Department of Public Works

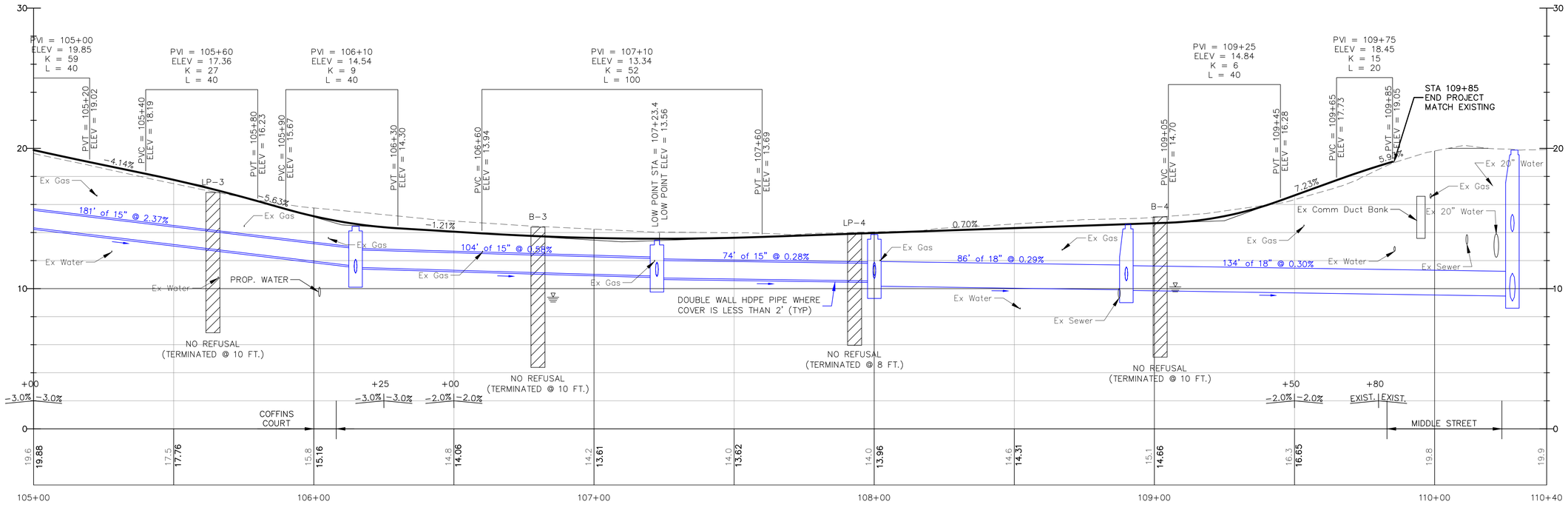
Union Street Area Improvement Project

Proposed Roadway & Drainage
Union Street STA 100+00 to STA 105+00

drawing no. G-1

sheet: 12 of 54





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NEW HAMPSHIRE - RESIDENTIAL LICENSED PROFESSIONAL ENGINEER
PHILIP A. CROCKER
NO. 12221

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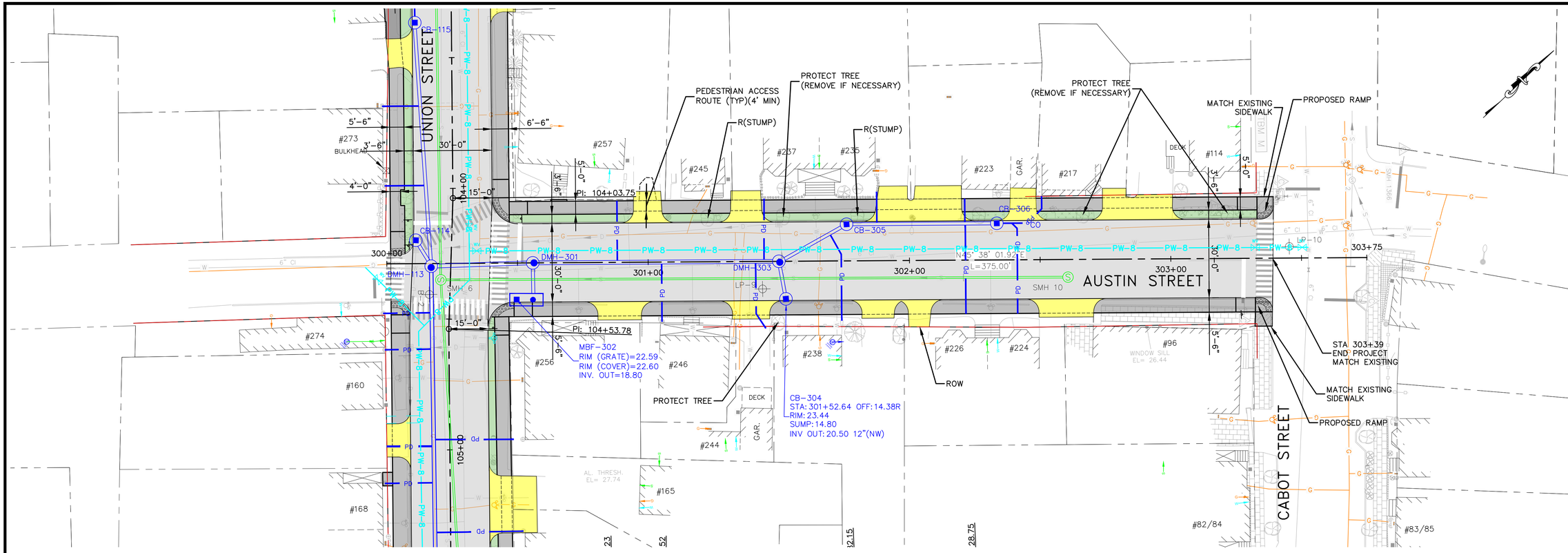
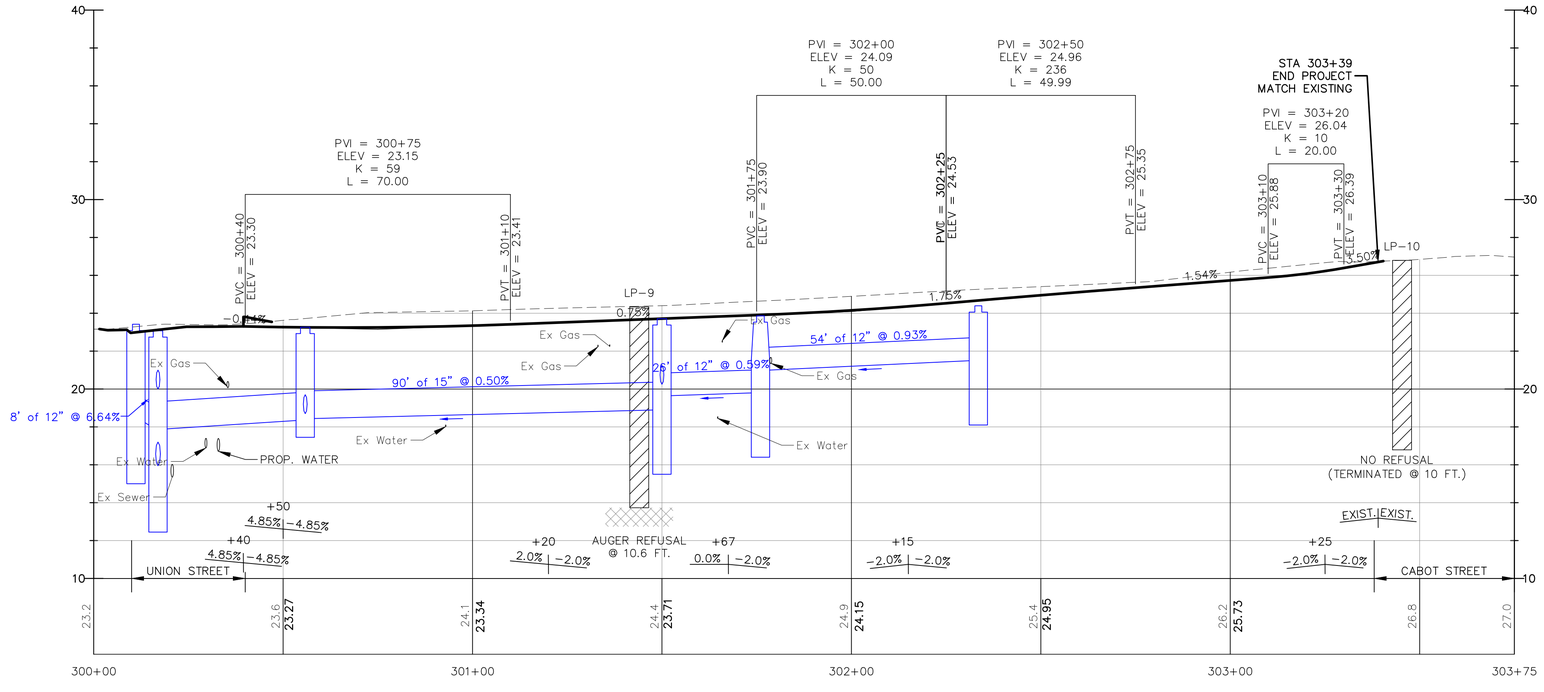
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 20' 0 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Proposed Roadway & Drainage
Union Street STA 105+00 to STA 110+30

drawing no.
G-2

sheet: 13 of 54





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STATE OF NEW HAMPSHIRE PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER

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drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 20' 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Proposed Roadway & Drainage
Austin Street STA 300+00 to STA 303+75

drawing no.
G-3

sheet: 14 of 54

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STF/MAB	WWG	PAC	20'

Scale: 1" = 20'H/4'V

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January 2023	1211	PAC

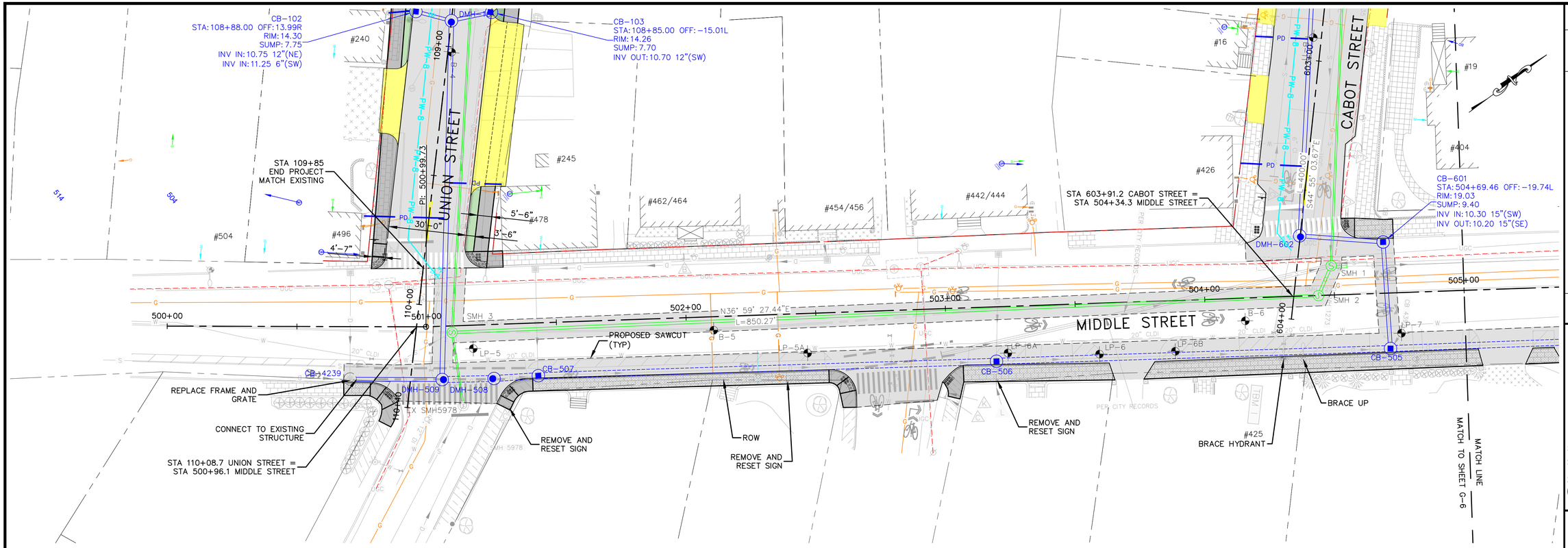
City of Portsmouth, New Hampshire
Department of Public Works

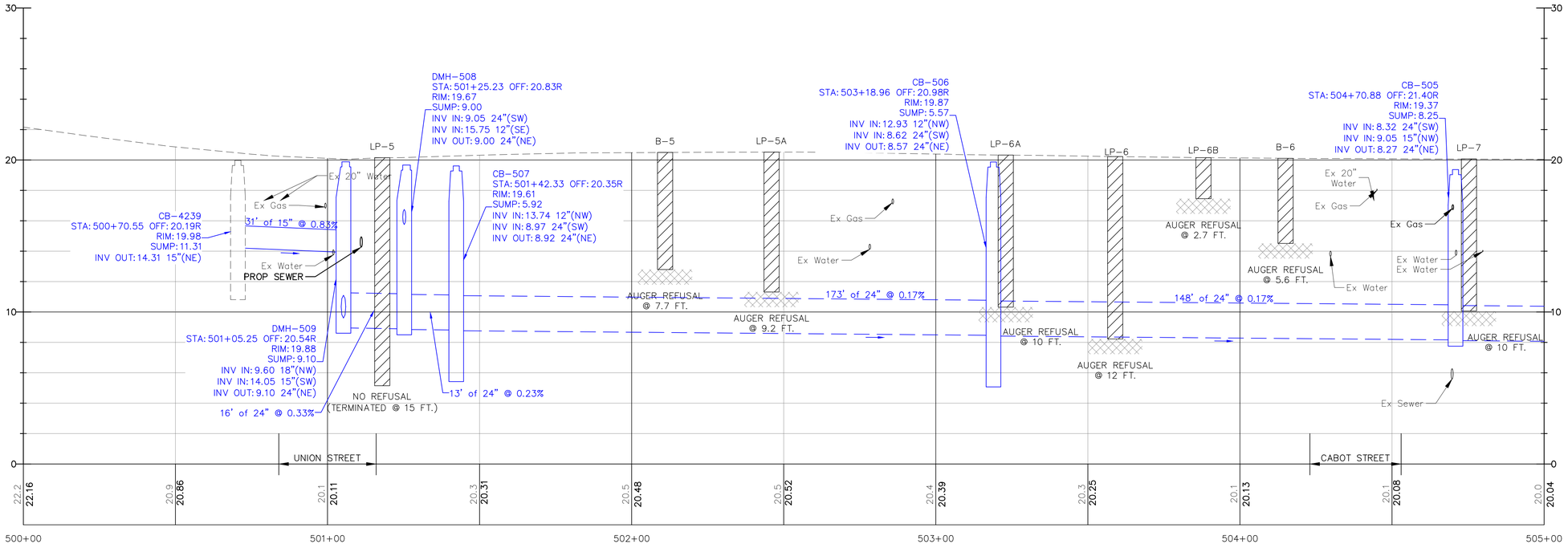
Union Street Area
Improvement Project

Proposed Roadway & Drainage
Coffins Court STA 400+00 to STA 403+75

drawing no.
G-4

sheet: 15 of 54





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Union Street Area
Improvement Project
Proposed Roadway & Drainage
Middle Street STA 500+00 to STA 505+00

drawing no. G-5

sheet: 16 of 54

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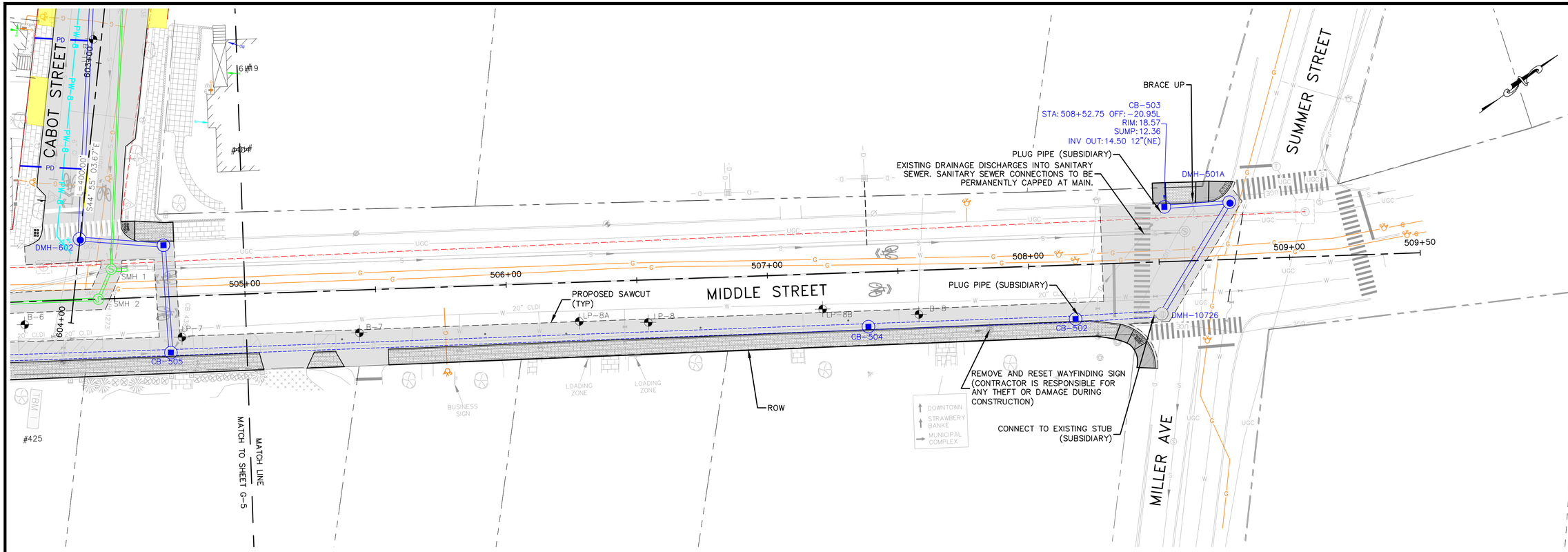

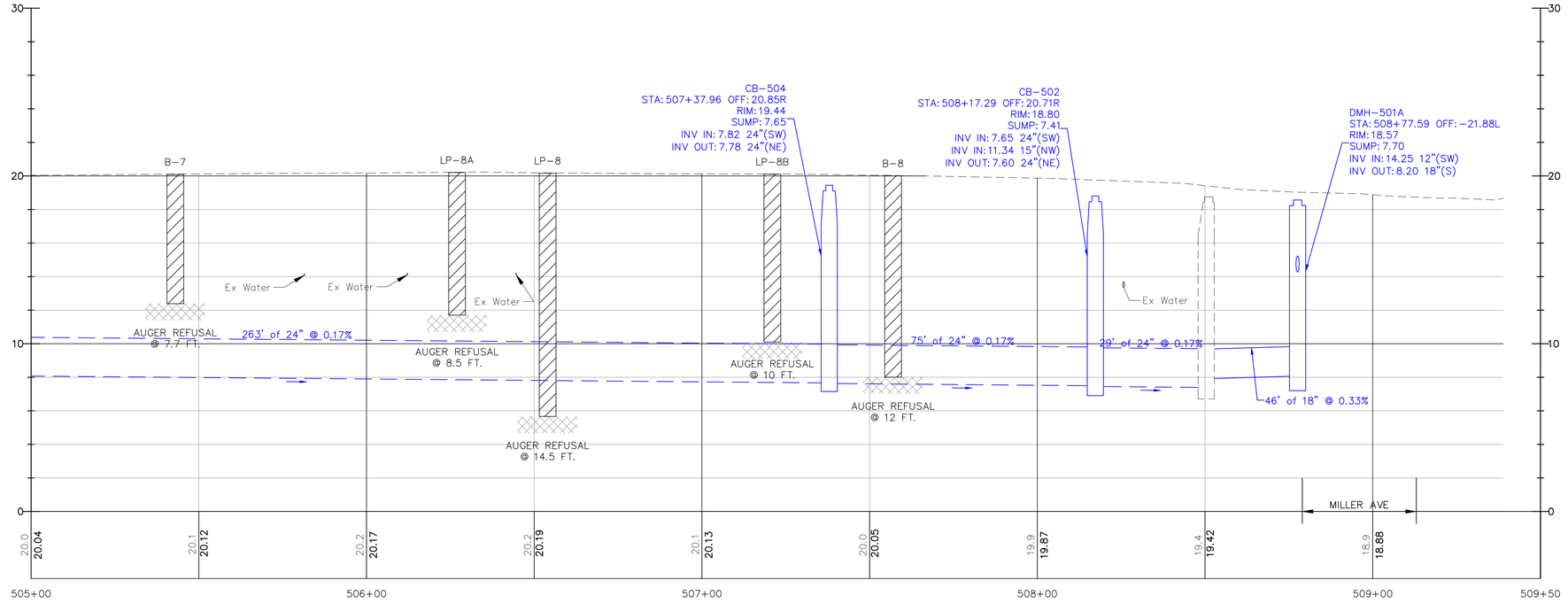

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project no: 1211
checked by: PAC
scale: 20' 0 40' Scale: 1" = 20'/1"V

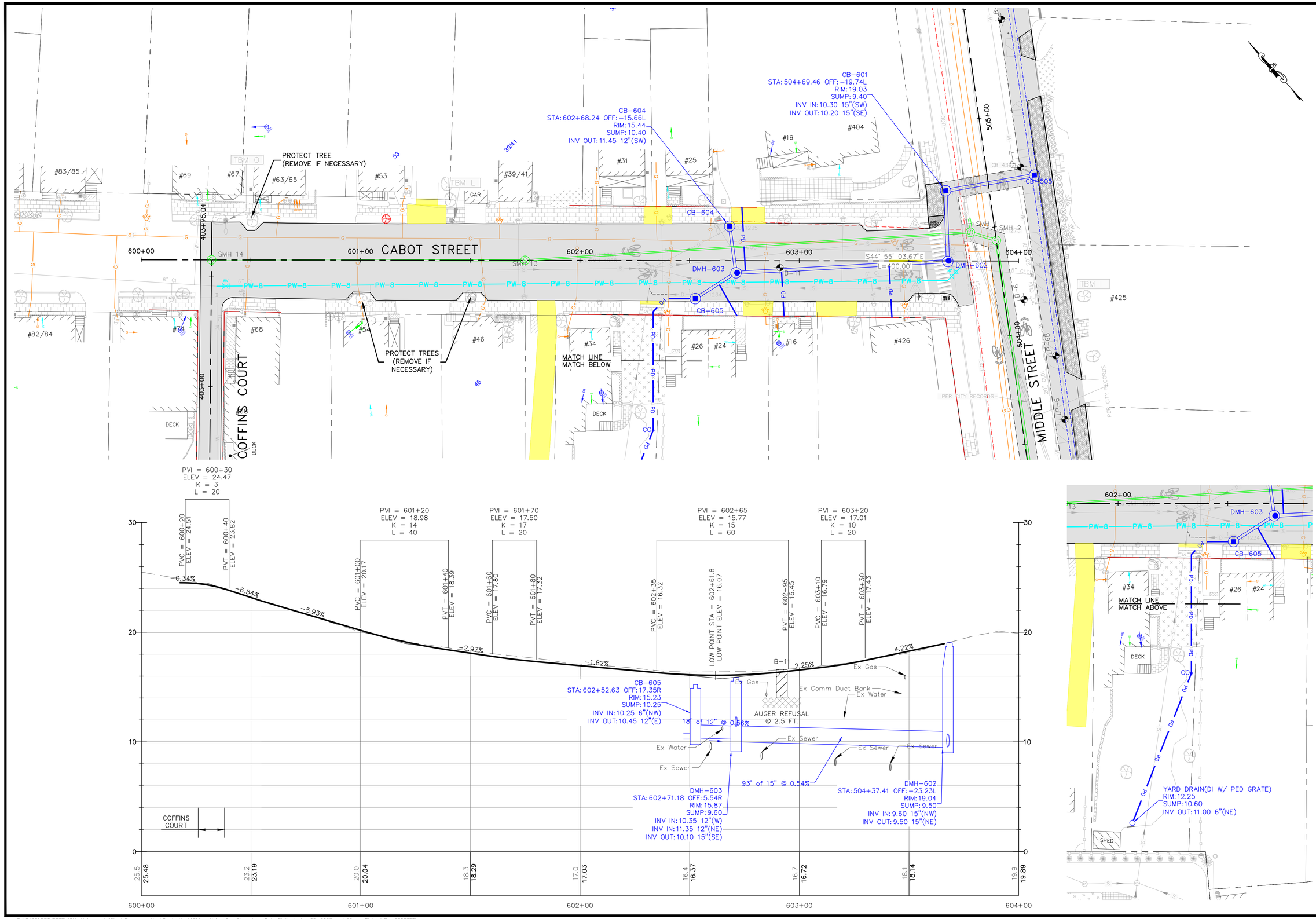
City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Proposed Roadway & Drainage
Middle Street STA 505+00 to STA 509+50

drawing no.
G-6

sheet: 17 of 54



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approved by: PAC
date: January 2023
project no: 1211
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scale: 0 20' 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Proposed Roadway & Drainage
Cabot Street STA 600+00 to STA 604+00

drawing no. G-7

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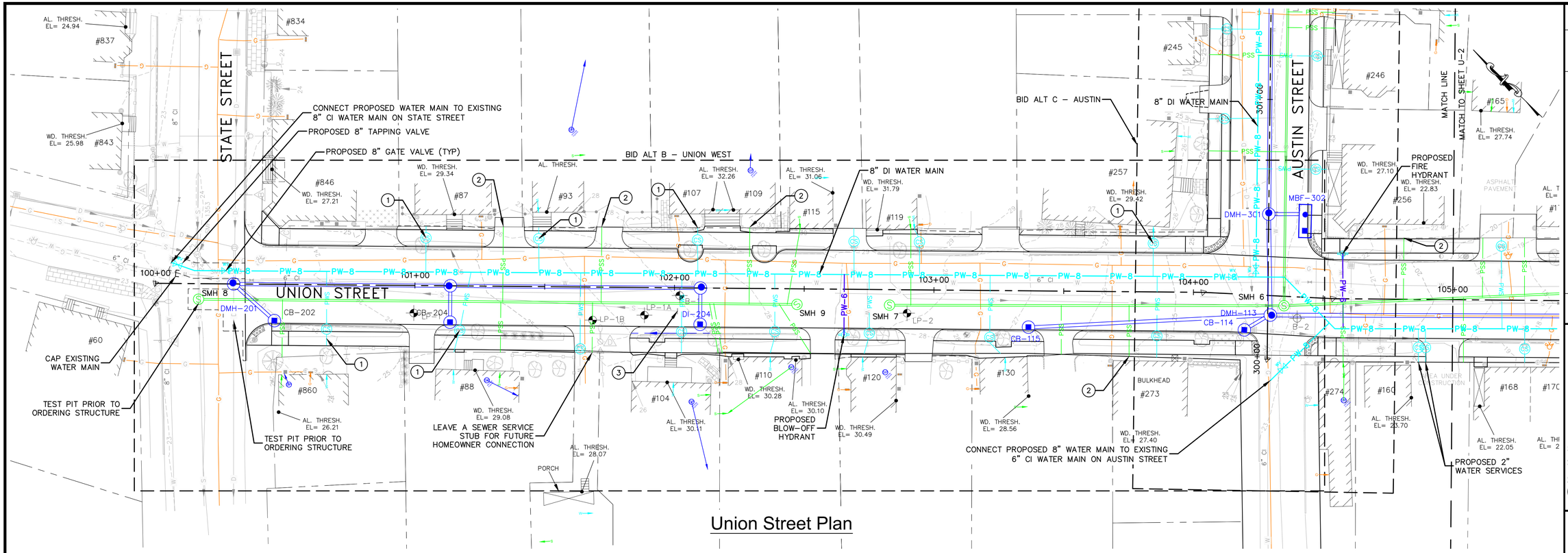
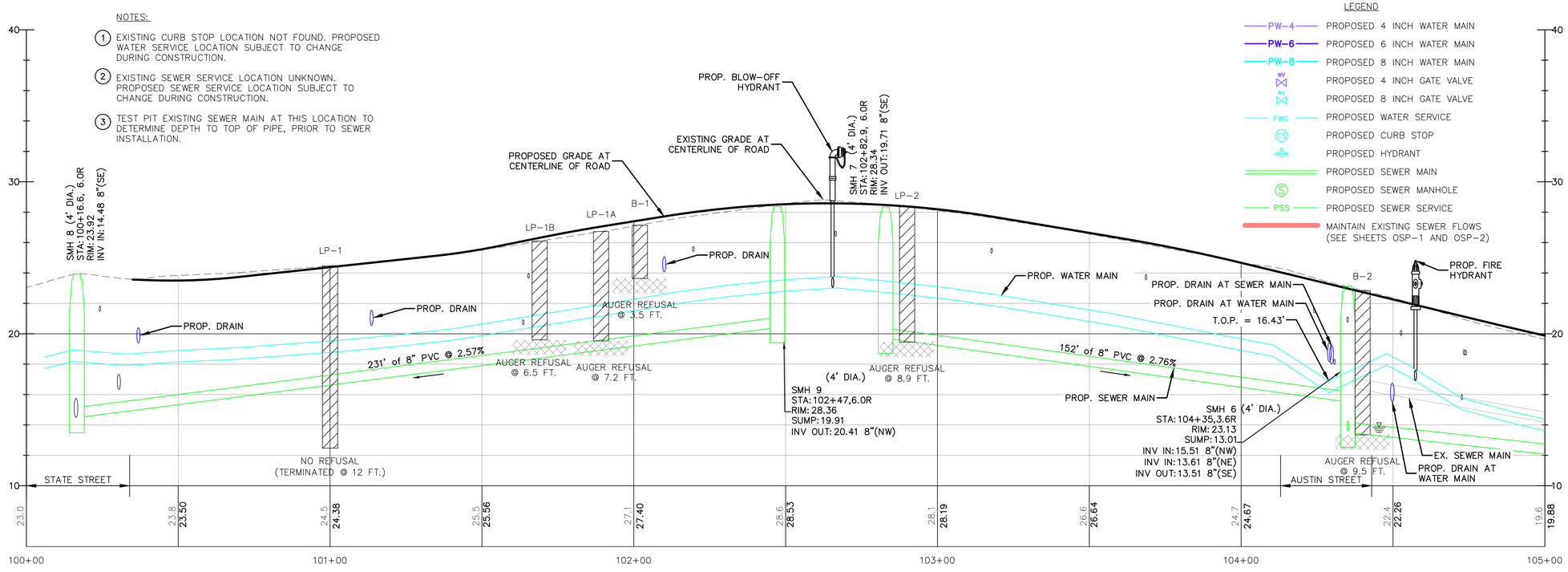


Union Street Plan

NOTES:

1. EXISTING CURB STOP LOCATION NOT FOUND. PROPOSED WATER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
2. EXISTING SEWER SERVICE LOCATION UNKNOWN. PROPOSED SEWER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
3. TEST PIT EXISTING SEWER MAIN AT THIS LOCATION TO DETERMINE DEPTH TO TOP OF PIPE, PRIOR TO SEWER INSTALLATION.



Union Street Profile Sta 100+00 To 105+00

LEGEND

- PW-4 — PROPOSED 4 INCH WATER MAIN
- PW-6 — PROPOSED 6 INCH WATER MAIN
- PW-8 — PROPOSED 8 INCH WATER MAIN
- PROPOSED 4 INCH GATE VALVE
- PROPOSED 8 INCH GATE VALVE
- PWS — PROPOSED WATER SERVICE
- CS — PROPOSED CURB STOP
- PROPOSED HYDRANT
- PROPOSED SEWER MAIN
- S — PROPOSED SEWER MANHOLE
- PSS — PROPOSED SEWER SERVICE
- MAINTAIN EXISTING SEWER FLOWS (SEE SHEETS OSP-1 AND OSP-2)

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approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 20' 0 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Proposed Water & Sewer
Union Street STA 100+00 to STA 105+00

drawing no. U-1

sheet: 19 of 54

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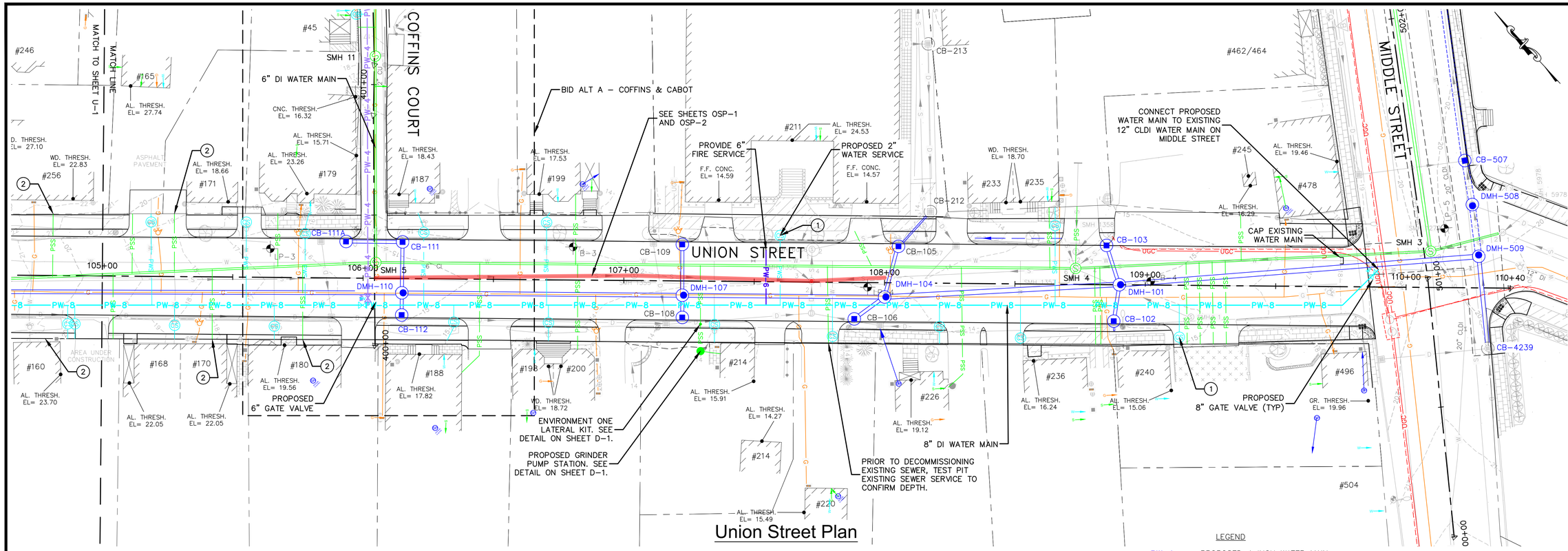
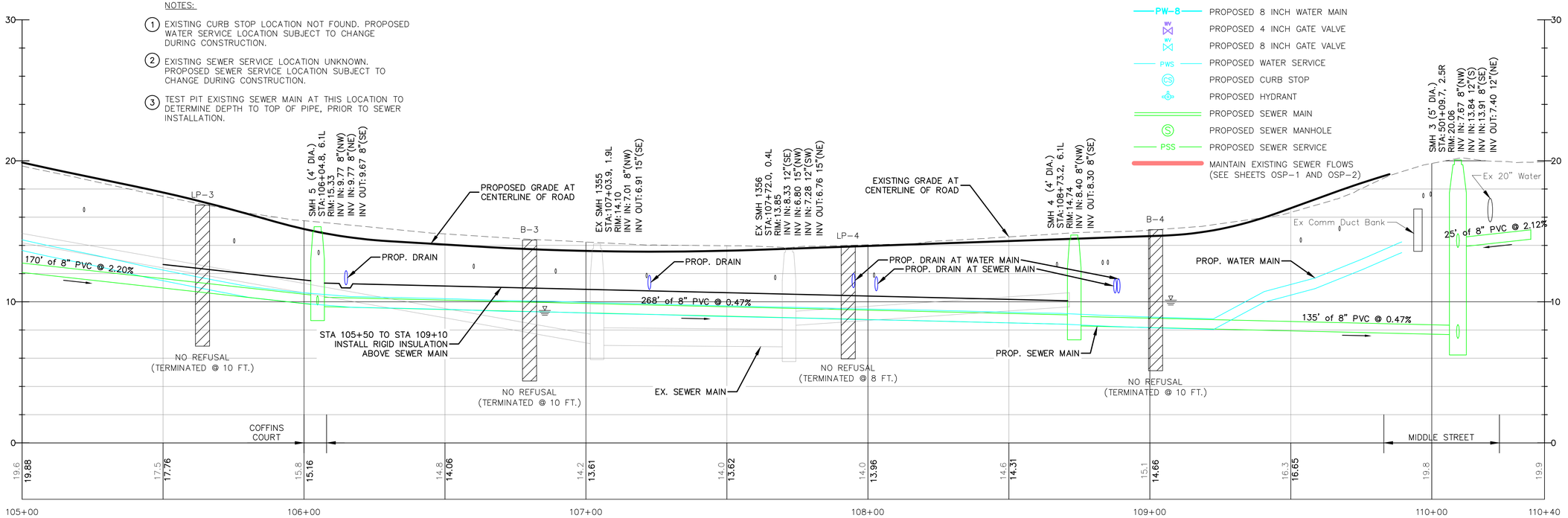


Union Street Plan

NOTES:

1. EXISTING CURB STOP LOCATION NOT FOUND. PROPOSED WATER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
2. EXISTING SEWER SERVICE LOCATION UNKNOWN. PROPOSED SEWER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
3. TEST PIT EXISTING SEWER MAIN AT THIS LOCATION TO DETERMINE DEPTH TO TOP OF PIPE, PRIOR TO SEWER INSTALLATION.



Union Street Profile Sta 105+00 To 110+30

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PHILIP A. CROBERT NO. 12821 STATE OF NEW HAMPSHIRE PROFESSIONAL ENGINEER

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drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 20' 0 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Proposed Water & Sewer
Union Street STA 105+00 to STA 110+30

drawing no. U-2

sheet: 20 of 54

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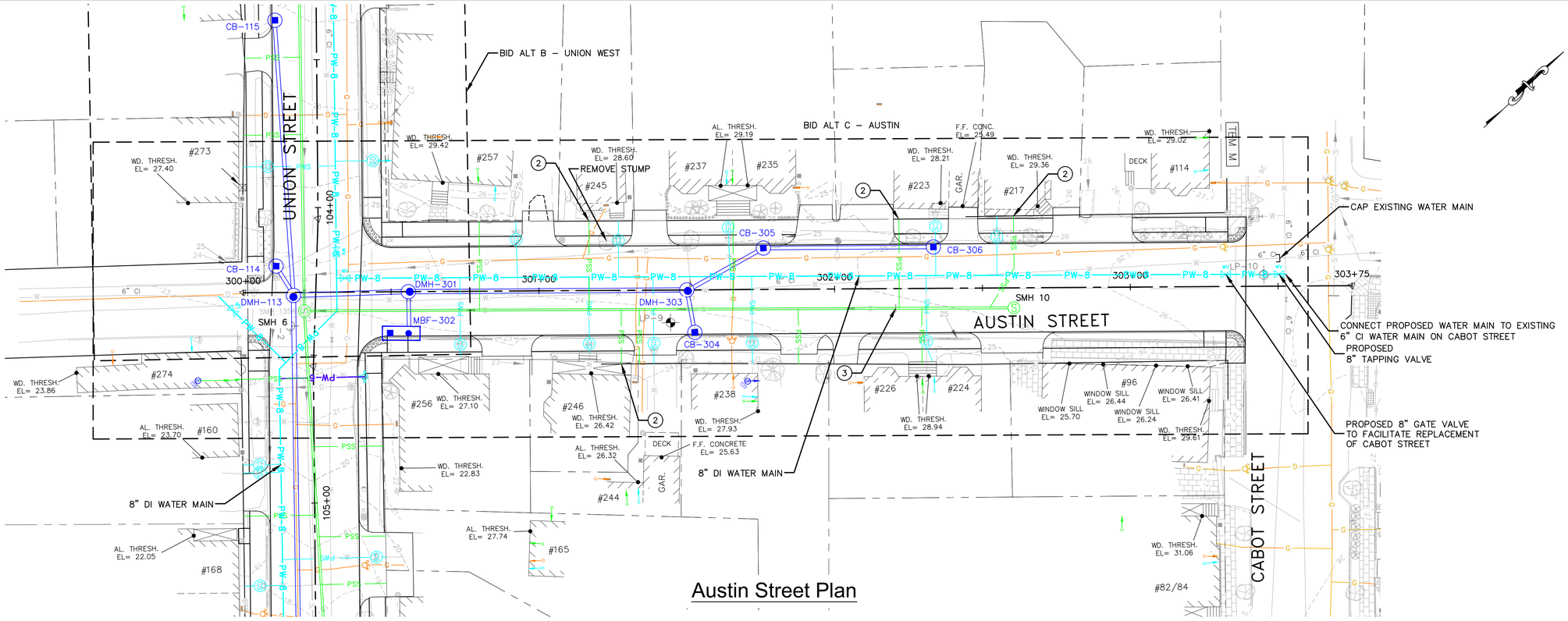
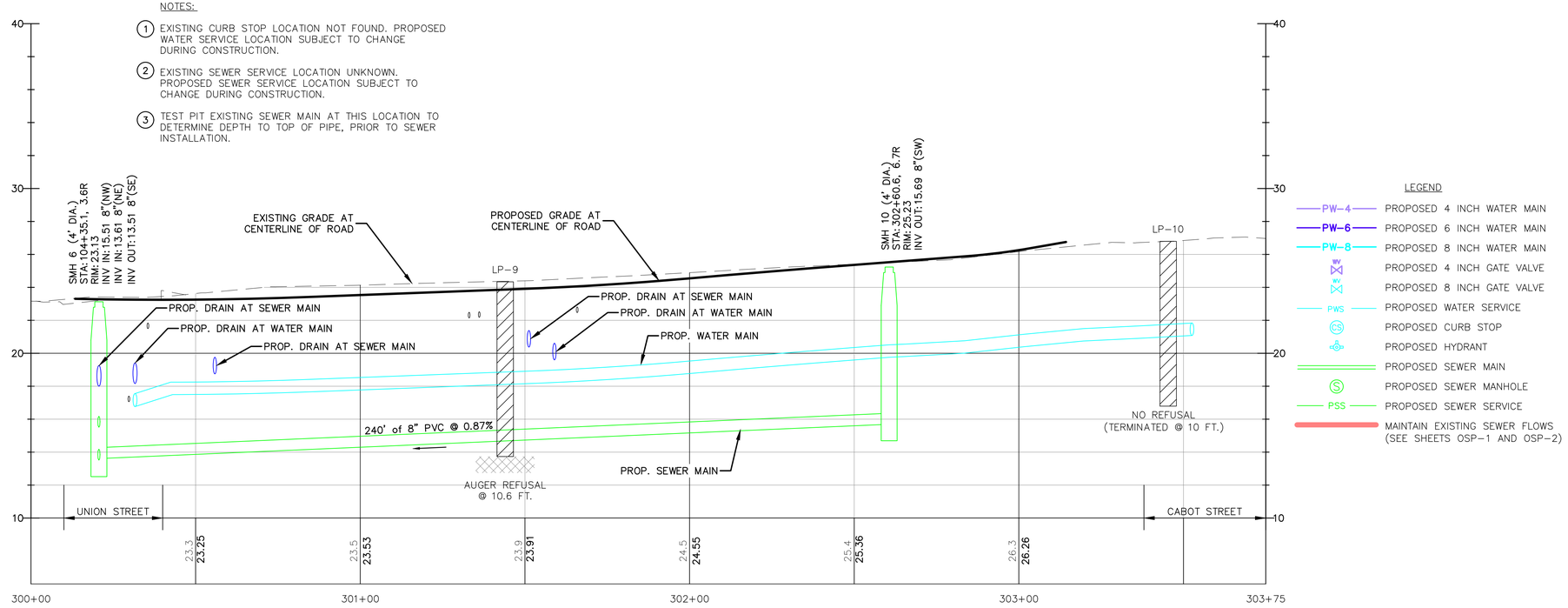


Austin Street Plan

NOTES:

1. EXISTING CURB STOP LOCATION NOT FOUND. PROPOSED WATER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
2. EXISTING SEWER SERVICE LOCATION UNKNOWN. PROPOSED SEWER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
3. TEST PIT EXISTING SEWER MAIN AT THIS LOCATION TO DETERMINE DEPTH TO TOP OF PIPE, PRIOR TO SEWER INSTALLATION.



LEGEND

- PW-4 — PROPOSED 4 INCH WATER MAIN
- PW-6 — PROPOSED 6 INCH WATER MAIN
- PW-8 — PROPOSED 8 INCH WATER MAIN
- PROPOSED 4 INCH GATE VALVE
- PROPOSED 8 INCH GATE VALVE
- PWS — PROPOSED WATER SERVICE
- PROPOSED CURB STOP
- PROPOSED HYDRANT
- PROPOSED SEWER MAIN
- PROPOSED SEWER MANHOLE
- PSS — PROPOSED SEWER SERVICE
- MAINTAIN EXISTING SEWER FLOWS (SEE SHEETS OSP-1 AND OSP-2)

Austin Street Profile

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

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STATE OF NEW HAMPSHIRE PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 20' 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Proposed Water & Sewer
Austin Street STA 300+00 to STA 303+75

drawing no. U-3

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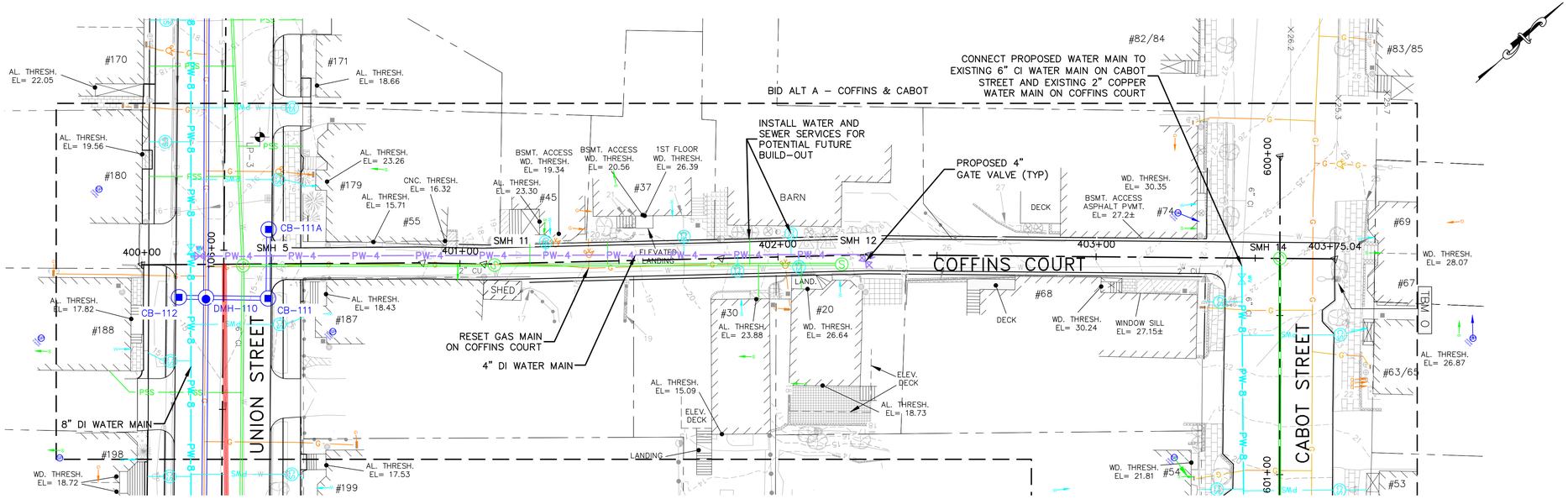
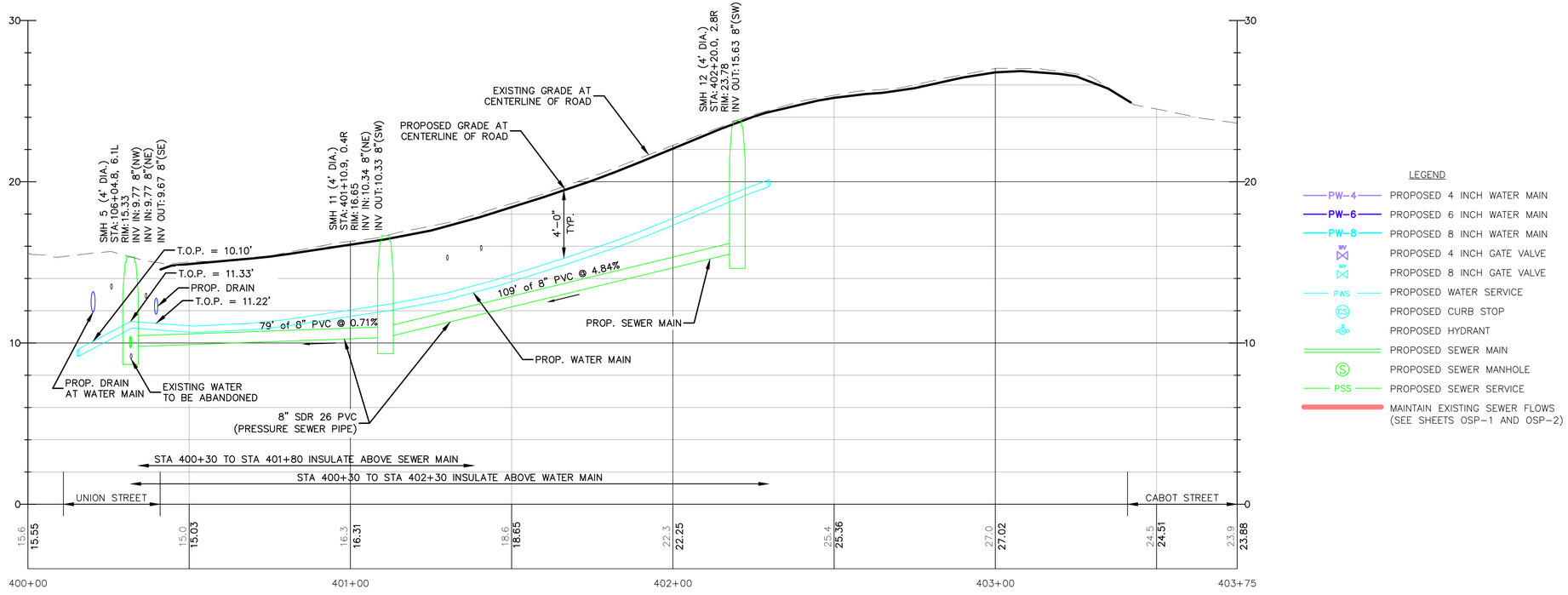


Coffins Court Plan



Coffins Court Profile

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

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designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 20' 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Proposed Water & Sewer
Coffins Court STA 400+00 to STA 403+75

drawing no. U-4

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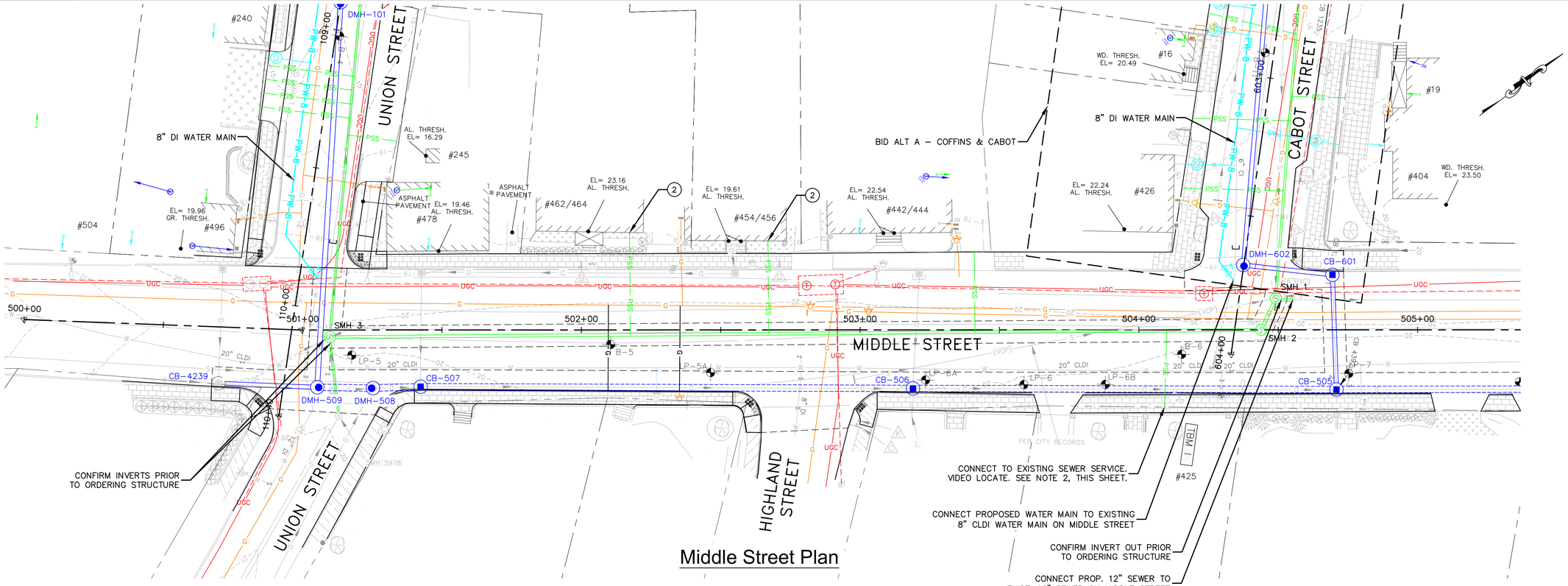


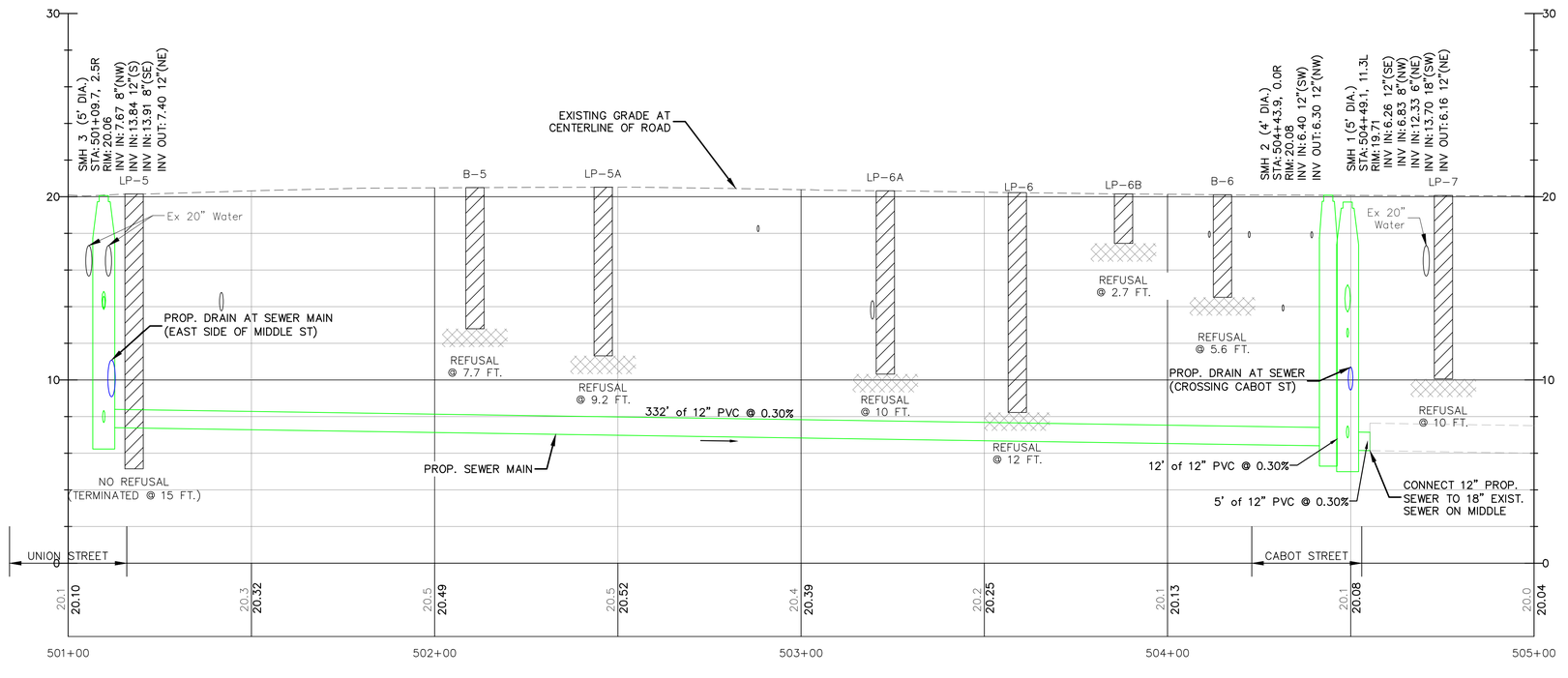
Middle Street Plan

NOTES:

1. EXISTING CURB STOP LOCATION NOT FOUND. PROPOSED WATER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
2. EXISTING SEWER SERVICE LOCATION UNKNOWN. PROPOSED SEWER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
3. TEST PIT EXISTING SEWER MAIN AT THIS LOCATION TO DETERMINE DEPTH TO TOP OF PIPE, PRIOR TO SEWER INSTALLATION.

LEGEND

- PW-4 — PROPOSED 4 INCH WATER MAIN
- PW-6 — PROPOSED 6 INCH WATER MAIN
- PW-8 — PROPOSED 8 INCH WATER MAIN
- PROPOSED 4 INCH GATE VALVE
- PROPOSED 8 INCH GATE VALVE
- PWS — PROPOSED WATER SERVICE
- CS — PROPOSED CURB STOP
- PROPOSED HYDRANT
- PROPOSED SEWER MAIN
- S — PROPOSED SEWER MANHOLE
- PSS — PROPOSED SEWER SERVICE
- MAINTAIN EXISTING SEWER FLOWS (SEE SHEETS OSP-1 AND OSP-2)



Middle Street Profile

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drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 20' 0 40' Scale: 1" = 20'/1"/4"V

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Proposed Water & Sewer
Middle Street STA 500+00 to STA 505+00

drawing no. U-5

sheet: 23 of 54

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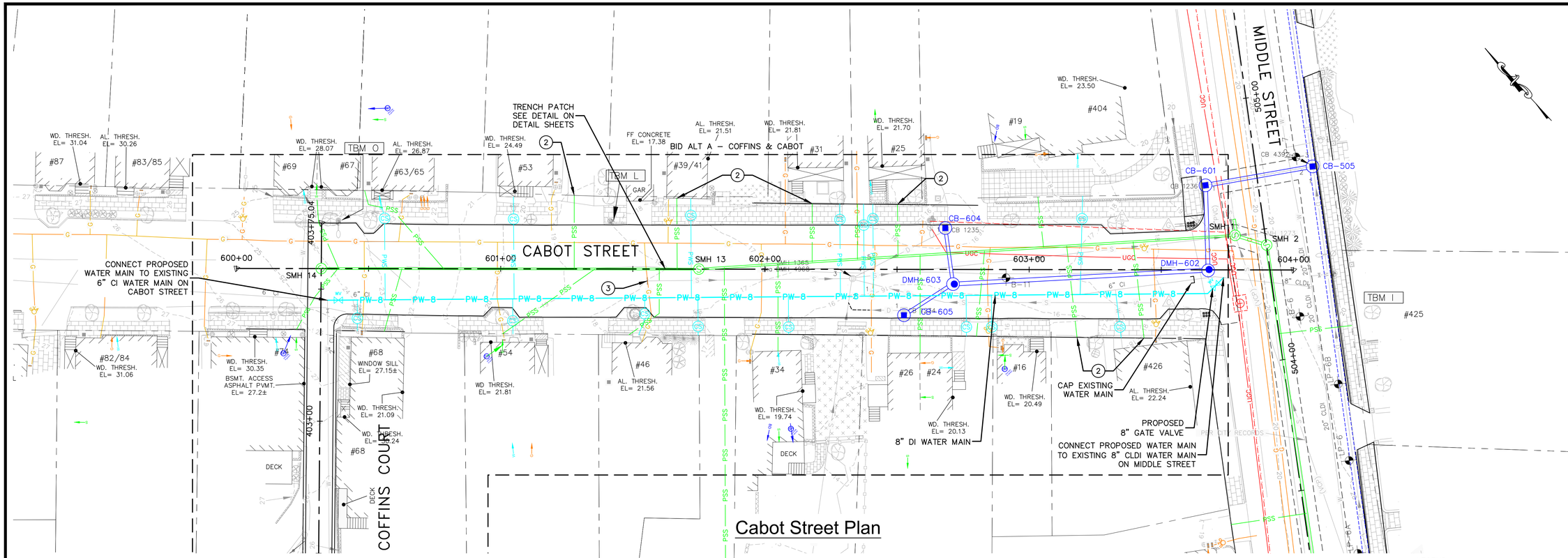

Cabot Street Plan

NOTES:

1. EXISTING CURB STOP LOCATION NOT FOUND. PROPOSED WATER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
2. EXISTING SEWER SERVICE LOCATION UNKNOWN. PROPOSED SEWER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
3. TEST PIT EXISTING SEWER MAIN AT THIS LOCATION TO DETERMINE DEPTH TO TOP OF PIPE, PRIOR TO SEWER INSTALLATION.

LEGEND

- PW-4 — PROPOSED 4 INCH WATER MAIN
- PW-6 — PROPOSED 6 INCH WATER MAIN
- PW-8 — PROPOSED 8 INCH WATER MAIN
- PROPOSED 4 INCH GATE VALVE
- PROPOSED 8 INCH GATE VALVE
- PWS — PROPOSED WATER SERVICE
- PROPOSED CURB STOP
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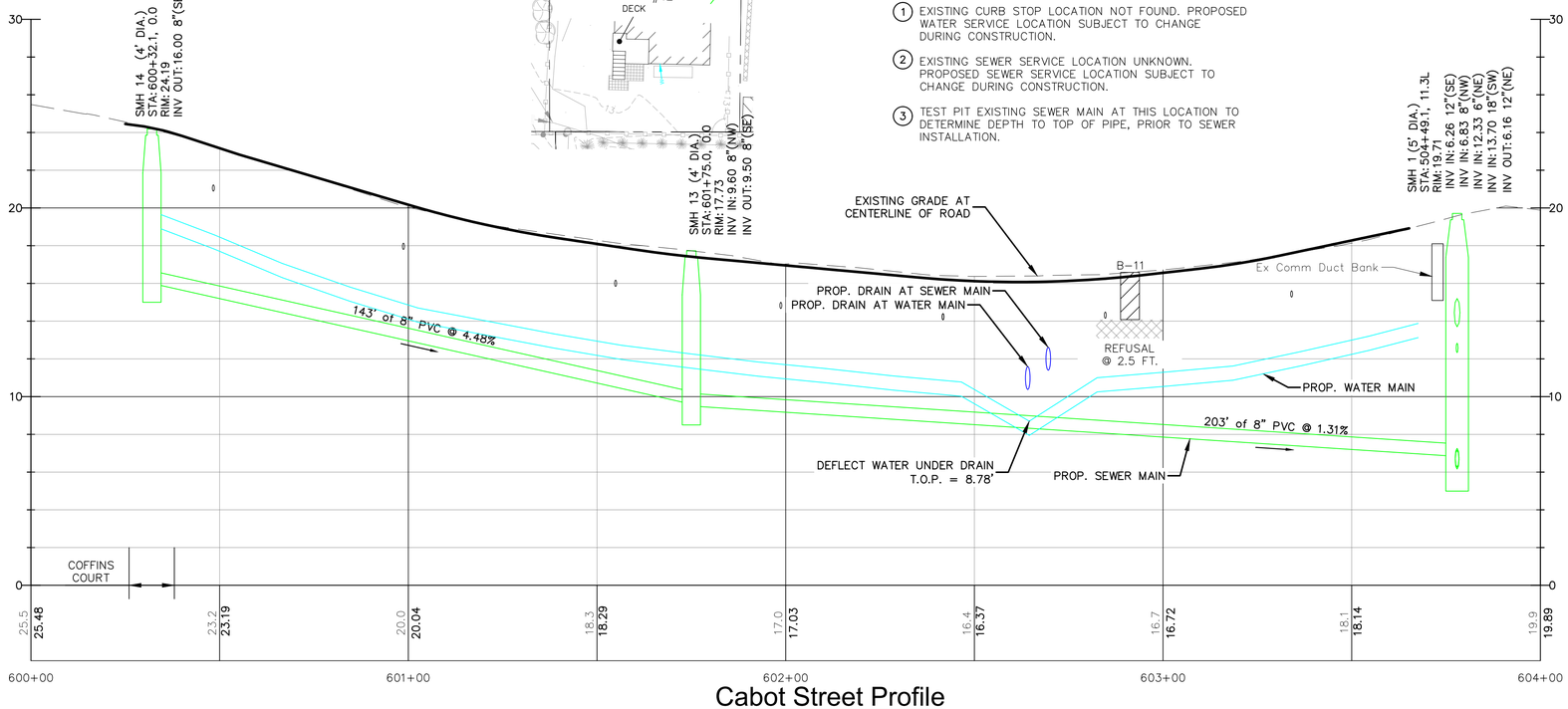
- PROPOSED SEWER MANHOLE
- PSS — PROPOSED SEWER SERVICE
- MAINTAIN EXISTING SEWER FLOWS (SEE SHEETS OSP-1 AND OSP-2)



Cabot Street Profile

no.	revision	date	by
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STATE OF NEW HAMPSHIRE PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 20' 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Proposed Water & Sewer
Cabot Street STA 600+25 to STA 604+00

drawing no. U-6

sheet: 24 of 54

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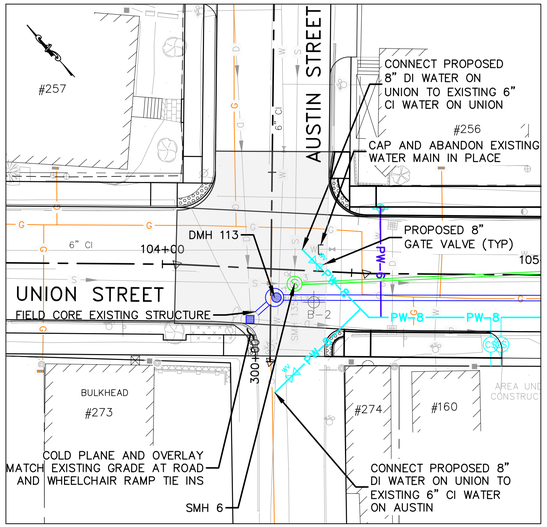
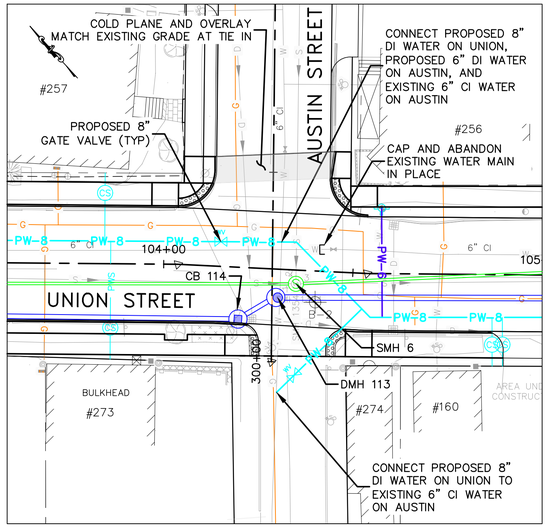
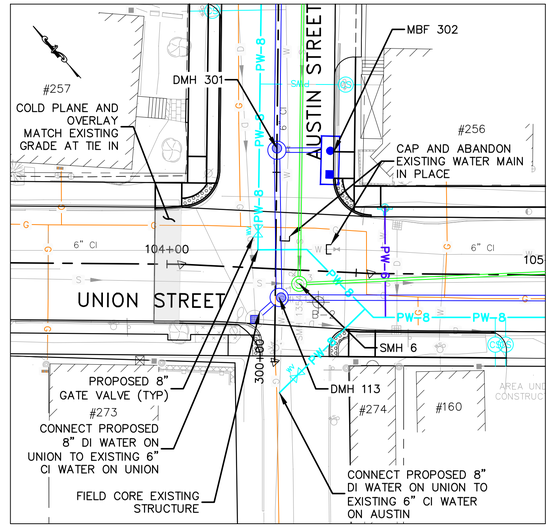


BASE BID AND BID ALTERNATE A

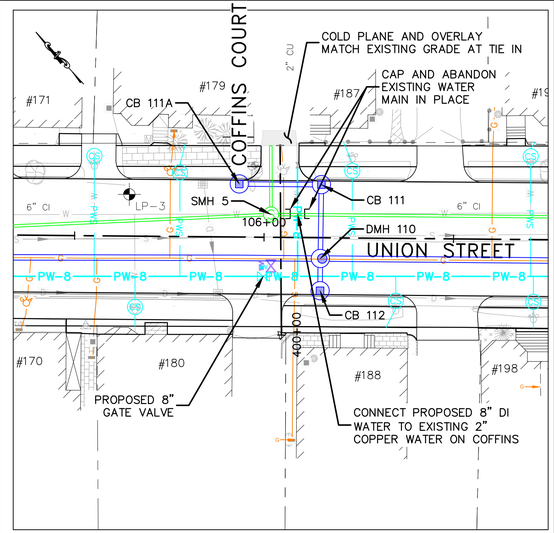


BASE BID AND BID ALTERNATE B



BASE BID AND BID ALTERNATE C

UNION AND AUSTIN INTERSECTION



BASE BID ONLY

UNION AND COFFINS INTERSECTION

WATER CONNECTION PHASING NOTES:

1. EXISTING PIPING CONFIGURATION SHOWN IS APPROXIMATE. PIPING CONFIGURATION MAY CHANGE DUE TO ACTUAL CONDITIONS.
2. ALL PROPOSED PIPING SHALL BE FULLY COORDINATED PRIOR TO TIE-IN AND SHALL BE PLANNED TO COMPLETE CONNECTIONS.

BASE BID

1. THE BASE BID INCLUDES PROPOSED WATER, DRAINAGE AND SEWER ON UNION STREET (AUSTIN TO MIDDLE), PROPOSED SEWER ON MIDDLE STREET (UNION TO CABOT), AND PROPOSED DRAINAGE ON MIDDLE STREET (UNION TO MILLER).
2. THE "BASE BID ONLY" AND "BASE BID AND BID ALTERNATE A" DIAGRAMS ON THIS SHEET INDICATE THE UTILITY CONNECTIONS IF ONLY THE BASE BID IS SELECTED.

BID ALTERNATE A

1. BID ALTERNATE A INCLUDES PROPOSED WATER, DRAINAGE AND SEWER ON CABOT STREET (COFFINS TO MIDDLE), AND PROPOSED WATER AND SEWER ON COFFINS COURT.
2. IF THE BASE BID AND BID ALTERNATE A ARE SELECTED, CONTRACTOR SHALL REFER TO THE PLANS FOR UTILITY LAYOUT AND CONNECTIONS ON CABOT STREET AND COFFINS COURT. THE CONTRACTOR SHALL REFER TO "BASE BID AND BID ALTERNATE A" DIAGRAM ON THIS SHEET FOR THE UTILITY CONNECTION AT THE UNION AND AUSTIN INTERSECTION.

BID ALTERNATE B

1. BID ALTERNATE B INCLUDES PROPOSED WATER, DRAINAGE AND SEWER ON UNION STREET (STATE TO AUSTIN).
2. IF THE BASE BID AND BID ALTERNATE B ARE SELECTED, CONTRACTOR SHALL REFER TO "BASE BID AND BID ALTERNATE B" DIAGRAM ON THIS SHEET FOR UTILITY CONNECTIONS.

BID ALTERNATE C

1. BID ALTERNATE C INCLUDES PROPOSED WATER, DRAINAGE AND SEWER ON AUSTIN STREET (CABOT TO UNION).
2. IF THE BASE BID AND BID ALTERNATE C ARE SELECTED, CONTRACTOR SHALL REFER TO "BASE BID AND BID ALTERNATE C" DIAGRAM ON THIS SHEET FOR UTILITY CONNECTIONS.

BID ALTERNATE D

1. BID ALTERNATE D INCLUDES COLD PLANING AND PAVEMENT OVERLAY ON MIDDLE STREET (CABOT TO UNION).
2. SEE MIDDLE STREET STRIPING PLAN – BID ALTERNATE D FOR PAVING LIMITS AND STRIPING LAYOUT.

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PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE – PHILIP A. CROWELL NO. 15521

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scales: 1" = 20' (Scale: 0, 20', 40')

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area Improvement Project

Limits of Construction for Bid Alternates

drawing no. U-7

sheet: 25 of 54

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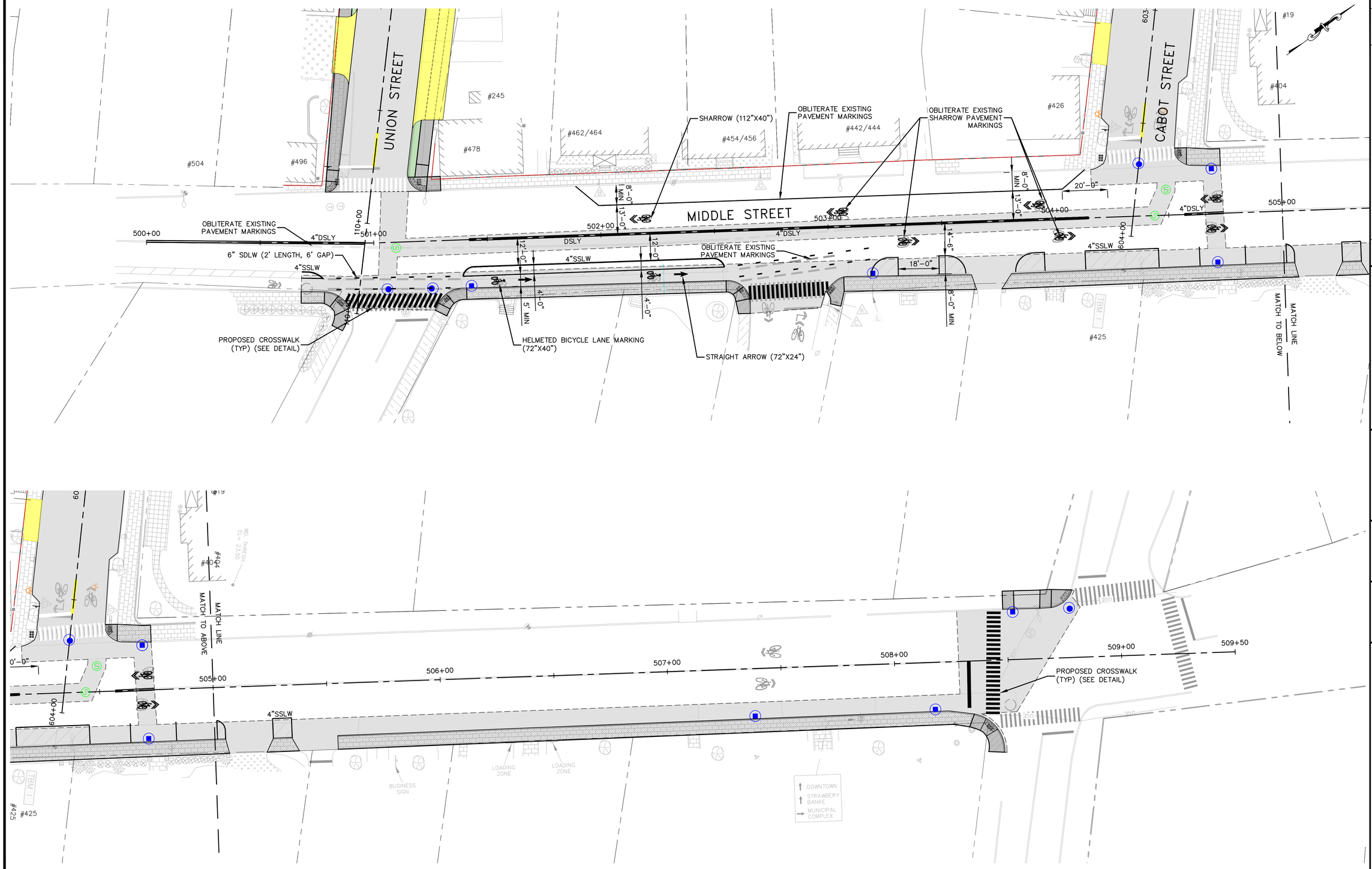

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STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 20' 40'
Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Middle Street Striping Plan
Base Bid

drawing no.
S-1

sheet: 26 of 54

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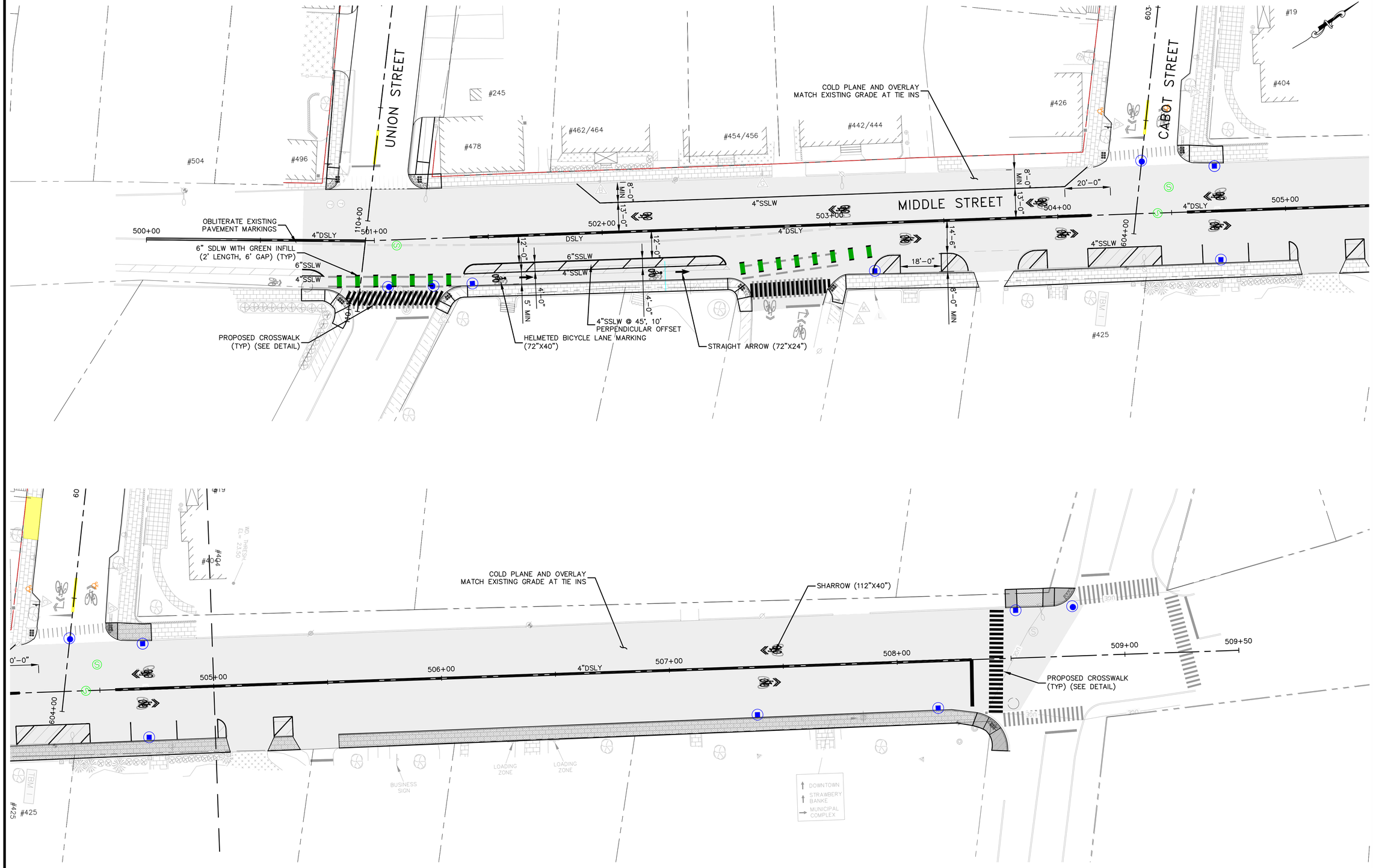

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STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
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scale: 0 20' 40'
Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Middle Street Striping Plan
Bid Alternate D

drawing no.
S-2

sheet: 27 of 54

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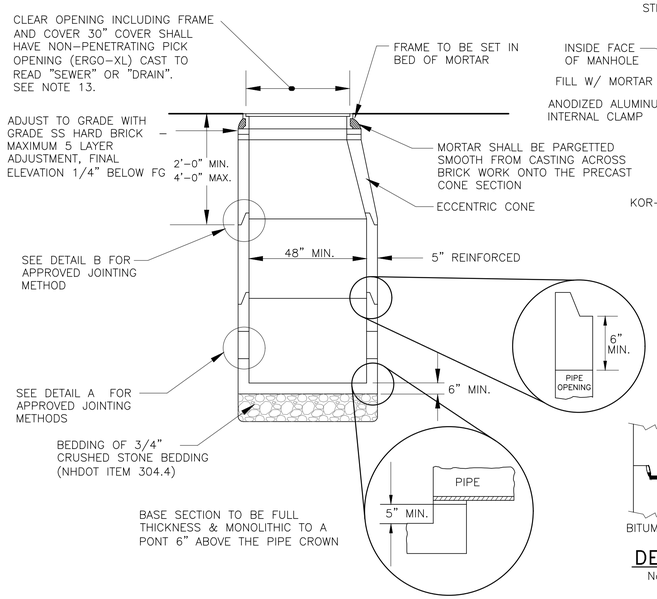
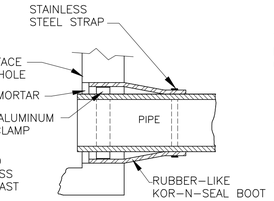


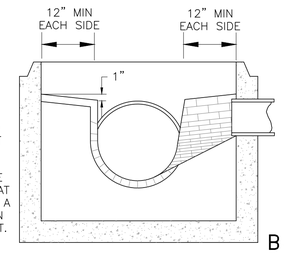


DETAIL A
Not to Scale

TOP OF SHELF SHALL BE 1" ABOVE CROWN OF HIGHEST PIPE

NOTE: INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST

NOTE: CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE



SECTION B – B
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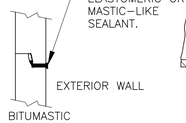
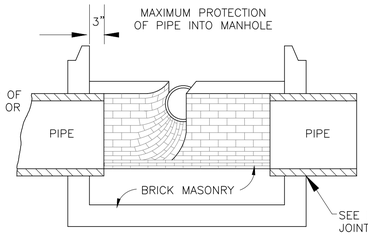


DETAIL-B
Not to Scale



SECTION A – A
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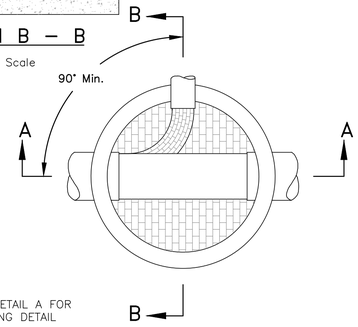
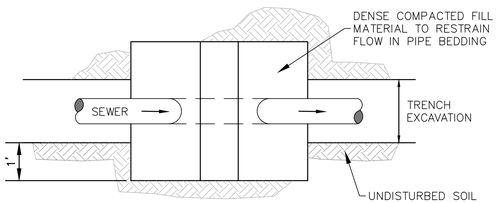


TYPICAL SEWER MANHOLE PLAN
Not to Scale

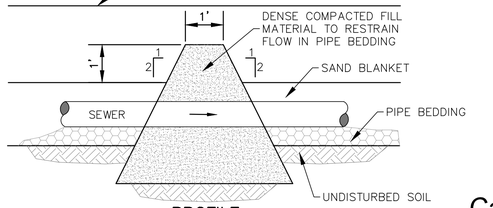
NOTES:

1. ALL SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (+-20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. MANHOLE BARRELS AND CONE SECTIONS SHALL BE PRECAST CONCRETE.
3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C 478.
4. LEAKAGE TEST SHALL BE PERFORMED PRIOR TO BACKFILL IN ACCORDANCE WITH THE SPECIFICATIONS.
5. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TO THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
6. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) "SEWER" OR "DRAIN" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
7. BEDDING: 3/4" CRUSHED STONE BEDDING (NHDOT ITEM 304.4).
8. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE ENGINEER, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON AN ELASTOMERIC OR MASTIC-LIKE GASKET APPLIED IN DOUBLE ROWS.
9. PIPE TO MANHOLE JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND IN GENERAL WILL DEPEND FOR WATERTIGHTNESS UPON EITHER AN APPROVED NON-SHRINKING MORTAR OR ELASTOMERIC SEALANT.
10. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY. APPROVED BITUMASTIC SEALANTS: RAM-NEK KENT SEAL NO. 2EZ
11. ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP-PROOFING COATING.
12. NO MANHOLE STEPS ARE ALLOWED.
13. THE CITY HAS THEIR OWN ERGO-XL COVERS. THE CONTRACTOR CAN PICK UP SEWER MANHOLE COVERS WITH NO CHARGE, BUT MUST PAY THE CITY FOR THE DRAINAGE MANHOLE COVERS.

Sewer or Drain Manhole Detail
Not to Scale



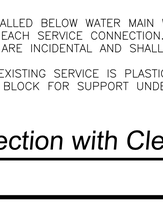
PLAN



PROFILE

NOTES:
TRENCH DRAINS TO BE AT LOCATIONS SHOWN ON THE PLAN OR AS DIRECTED TO CONTROL BACK WATER IN STONE BEDDING, SUBSIDARY.

Trench Dam
Not to Scale



Cast Iron Cleanout Covers
Not to Scale

NOTES:
1. ASSEMBLY PER MANUFACTURE'S RECOMMENDATIONS.
2. ASSEMBLY SHALL BE PRESSURE TESTED AND RATED TO 235 PSI
3. ENVIRONMENT ONE LATERAL KIT SHALL BE PLACED IN THE GRASS STRIP.

BAL-LAST 114C

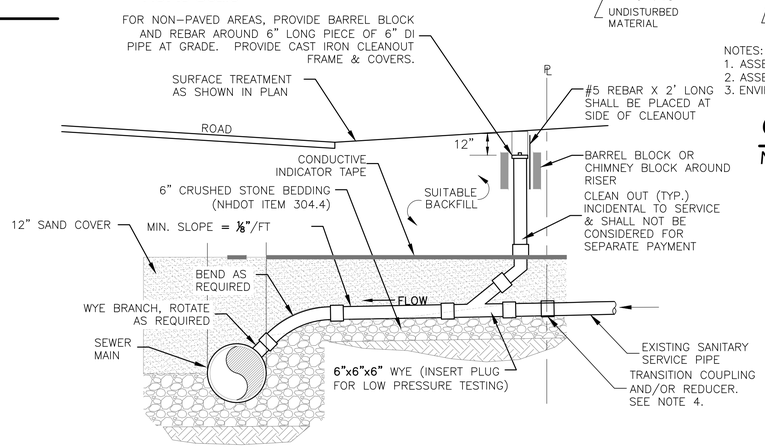
Grinder Pump Station Detail
Not to Scale

SCREENED GRAVEL BEDDING

PERCENT PASSING	SIEVE SIZE
100%	1"
90-100%	3/4"
20-55%	3/8"
0-10%	#4
0-5%	#8

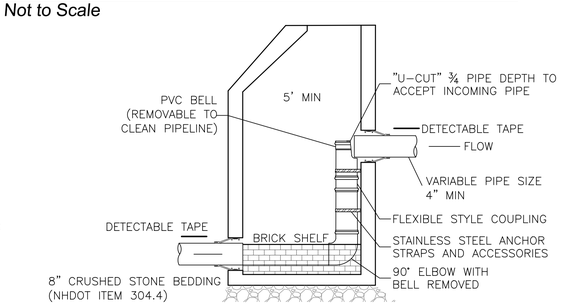
NOTES
1. SDR 26 SEWER PIPE SHALL BE USED WHERE LESS THAN 10-FOOT HORIZONTAL SEPARATION BETWEEN WATER AND SEWER LINE OCCURS.
2. WHERE WATER LINES CROSS OVER SEWER LINES, PROVIDE 22 1/2° MJ BENDS AND THRUST BLOCKS TO ADJUST WATER LINE PROFILE TO PROVIDE MINIMUM 18" VERTICAL SEPARATION.
3. WHERE LEDGE IS ENCOUNTERED, THE TRENCH SHALL BE EXCAVATED 12 INCHES BELOW THE BOTTOM OF THE PIPE.

Typical Sanitary Sewer and Drain Trench
Not to Scale



SEWER SERVICE NOTES:
1. SERVICE CONNECTION SHALL BE INSTALLED BELOW WATER MAIN WHERE POSSIBLE.
2. CLEANOUTS SHALL BE INSTALLED AT EACH SERVICE CONNECTION.
3. CLEANOUT RISER PIPE AND FITTINGS ARE INCIDENTAL AND SHALL NOT BE CONSIDERED FOR PAYMENT.
4. COUPLING TO BE GASKETED PVC IF EXISTING SERVICE IS PLASTIC. IF FERNCO COUPLINGS ARE USED, USE A PATIO BLOCK FOR SUPPORT UNDER THE COUPLING CONNECTION.

Sewer Service Connection with Cleanout
Not to Scale



NOTES:
1. DROP DIAMETER TO MATCH INLET DIAMETER
2. ANCHOR STRAPS (MINIMUM OF 2) AND BOLTS TO BE 304 OR 316 STAINLESS STEEL AND NOT MORE THAN 3' ON CENTER. SECURE AS DIRECTED: STRAPS – 1" WIDE, BOLTS – 3/8" X 2½" LONG

Drop Inlet Manhole Detail
Not to Scale

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

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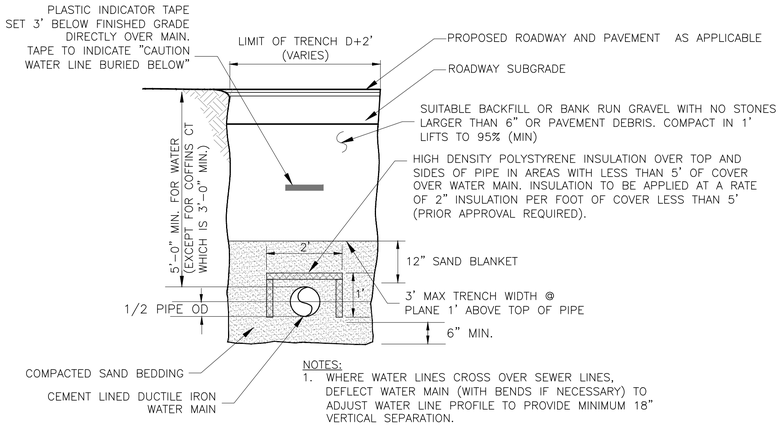
PHILIP A. CROTEAU 10,787 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

designed by: STF/MAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 10' 0 Scale: 1" = 10' 20'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Sewer Details

drawing no. D-1

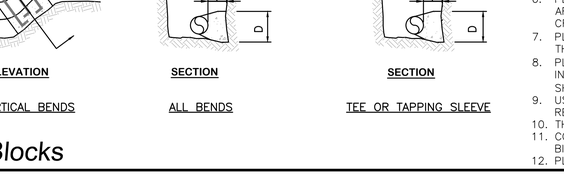
sheet: 28 of 54



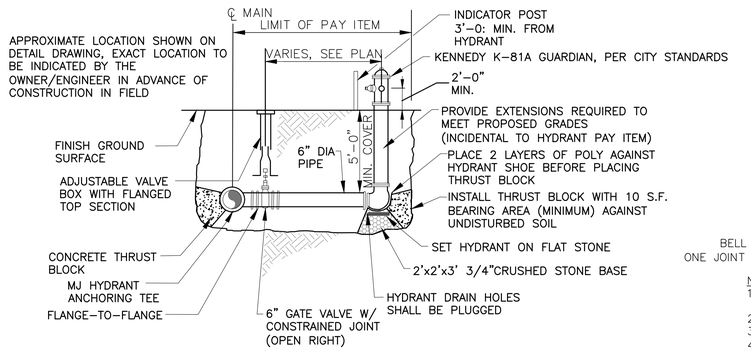
NOTES:
1. WHERE WATER LINES CROSS OVER SEWER LINES, DEFLECT WATER MAIN (WITH BENDS IF NECESSARY) TO ADJUST WATER LINE PROFILE TO PROVIDE MINIMUM 18" VERTICAL SEPARATION.

Typical Water Main Trench

Not to Scale

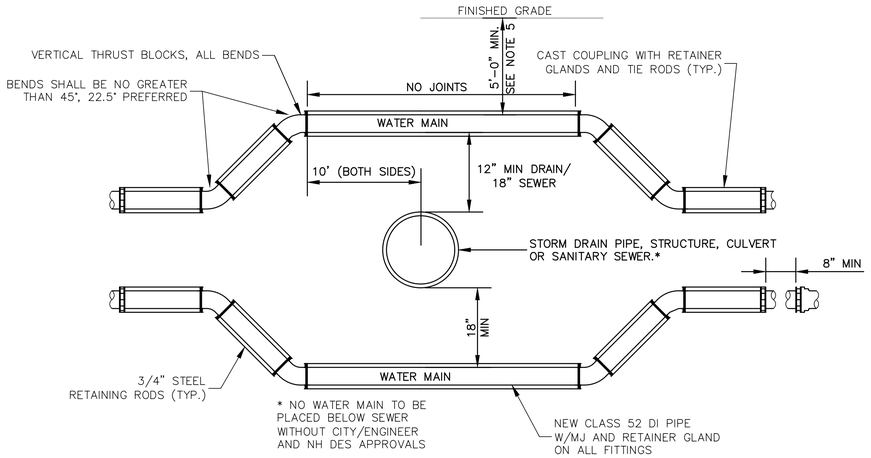


WATER MAIN INSTALLATION NOTES:
1. INSULATION TO BE USED WHERE VERTICAL PIPE SEPARATION IS 24" OR LESS.
2. INSTALL VERTICAL MJ BENDS WITH RESTRAINED JOINT FITTINGS OR SWEEP PIPE WITHIN THE SPECIFICATION LIMITS IF NECESSARY TO ADJUST WATER MAIN PROFILE TO GAIN MINIMUM VERTICAL SEPARATION ABOVE SEWER.
3. 2" OF INSULATION TO BE USED AROUND WATER SERVICE CONNECTIONS WHERE PIPE CROSSINGS OCCUR.
4. WHERE WATER MAIN CROSSES SEWER AT 45° TO 90° PROVIDE MAXIMUM SPACING OF PIPE JOINTS FROM CROSSING LOCATION FOR BOTH WATER MAIN AND SEWER PIPE.
5. IF LESS THAN 5' OF COVER, SEE INSULATION NOTE IN THE "TYPICAL WATER MAIN TRENCH DETAIL", THIS SHEET.



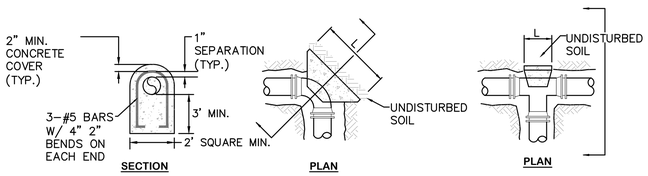
Hydrant Assembly

Not to Scale



Water/Utility Crossing

Not to Scale



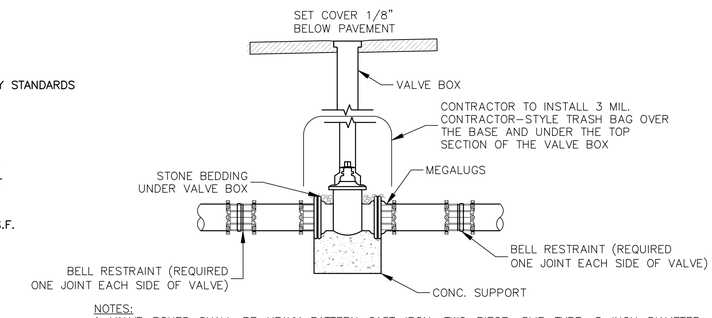
NOTES:
1. THRUST BLOCKS SHALL BE PRECAST CONCRETE, EXCEPT THRUST BLOCKS FOR VERTICAL BENDS CAN BE CIP CONCRETE.
2. THE MINIMUM BEARING AREAS SHOWN ABOVE ARE BASED ON A SYSTEM PRESSURE OF 100 PSI. IF THE SYSTEM PRESSURE IS ABOVE 100 PSI, INCREASE THE NOTED AREAS PROPORTIONAL TO THE ACTUAL SYSTEM PRESSURE. FOR EXAMPLE, IF THE ACTUAL SYSTEM PRESSURE IS 160 PSI, MULTIPLY THE ABOVE VALUES BY 160%.
3. PLACE THRUST BLOCKS SUCH THAT THE LENGTH (L) OF THE BLOCK IS APPROXIMATELY TWICE AS LONG AS THE DEPTH (D).
4. PLACE THRUST BLOCKS AGAINST UNDISTURBED SOIL.
5. PLACE THRUST BLOCKS ALONG THE FULL LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.
6. PLACE 2 LAYERS OF POLYETHYLENE OR ROOFING PAPER AROUND FITTINGS PRIOR TO PLACEMENT OF THE CONCRETE TO CREATE A BOND BREAK & PROTECT THE BOLTS.
7. PLACE A SOLID CONCRETE BLOCK BETWEEN CAP/PLUGS AND THRUST BLOCKS.
8. PLACE A 12" LONG STEEL HORSESHOE-SHAPED PICKUP HOOK IN ALL PLUG AND CAP THRUST BLOCKS. DIAMETER OF HOOK SHALL BE A MINIMUM OF 5/8".
9. USE OF THRUST BLOCKS DOES NOT ELIMINATE THE REQUIREMENT OF RETAINER GLANDS.
10. THRUST BLOCKS ARE REQUIRED ON ALL FITTINGS.
11. COAT ALL THREADED RODS, NUTS, AND BOLTS WITH BITUMINOUS PAINT.
12. PLACE ANTI-SEIZE LUBRICANT ON ALL BOLTS.

THRUST BLOCK SCHEDULE
MINIMUM BEARING AREA (SQUARE FEET)

Nominal Dia. (in)	PIPE SIZE 4	6	8
Tees, Caps, Plugs, & Tapping Sleeves	1.05	2.32	4.15
90 Degree Bends	1.48	3.29	5.86
45 Degree Bends	0.80	1.78	3.17
22-1/2 Degree Bends	0.41	0.91	1.62
11-1/4 Degree Bends	0.21	0.46	0.81
System Pressure: 100psi Safety Factor: 1.5 Soil Bearing Capacity: 2,000psf			

Thrust Blocks

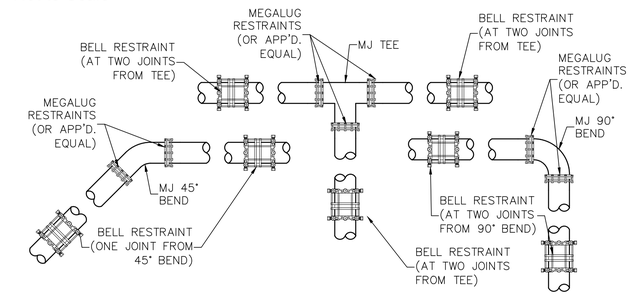
Not to Scale



NOTES:
1. VALVE BOXES SHALL BE HEAVY PATTERN CAST IRON, TWO PIECE, SLIP TYPE, 5-INCH DIAMETER SHAFT WITH EXTENSION PIECES TO ALLOW SUFFICIENT COVER.
2. THE UPPER SECTION OF THE BOX SHALL BE TOP-FLANGE TYPE TO PREVENT SETTLEMENT.
3. THE LOWER SECTION SHALL BE BELLED-TYPE TO ENCLOSE THE OPERATING NUT OF THE VALVE.
4. THE COVER SHALL BE CAST IRON WITH THE WORD "WATER" PLAINLY CAST THEREON.
5. GATE VALVES SHALL OPEN LEFT.
6. CONTRACTOR SHALL INSTALL 3 MIL CONTRACTOR STYLE TRASH BAG OVER THE BASE SECTION AND UNDER THE TOP SECTION OF THE VALVE BOX DURING INSTALLATION TO PREVENT BONDING OF THE UPPER AND LOWER VALVE BOXES.

Valve & Valve Box Detail

Not to Scale



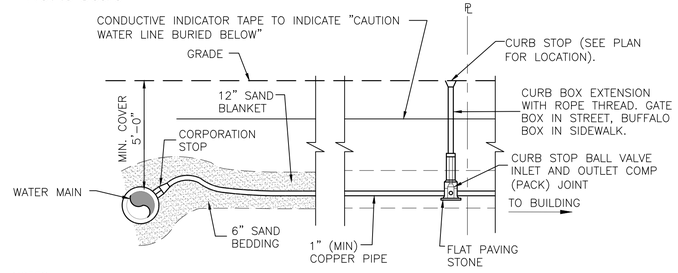
NOTES:
1. ALL BENDS AND TEES SHALL BE DUCTILE IRON FITTINGS.
2. JOINT RESTRAINT IS REQUIRED AT ALL FITTINGS PER THE ABOVE TABLE.

VALVE	RESTRAINED JOINTS
IN LINE VALVES	BELL RESTRT'S REQUIRED 1 JOINT EACH SIDE/VALVE

FITTING	RESTRAINED JOINTS
22.5° BEND	1 EACH SIDE
45° BEND	1 EACH SIDE
90° BEND	2 EACH SIDE
TEE	1 EA SIDE/RUN 2 ON BRANCH

Joint Restraint Detail

Not to Scale



NOTES:
1. TAPS TO BE MADE AT APPROX. 10:00 AND 2:00
2. PROVIDE FOR SERVICE LINE CONTRACTION AND EXPANSION BY INSTALLING "S" IN SERVICE LINE NEAR MAIN.
3. IF SERVICE IS INSTALLED WITH LESS THAN 5'-0" COVER, INSULATE OVER LINE.
4. REMOVE EXISTING CURB STOP AND REPLACE.
5. PRESSURE TEST, DISINFECT, AND FLUSH ALL WATER SERVICE CONNECTIONS.
6. MAINTAIN 18" SEPARATION BETWEEN THE NEW WATER SERVICE AND THE NEW SEWER MAIN (WATER SHALL BE OVER SEWER).
7. CONNECT CURB STOP TO EXISTING SERVICE AT PROPERTY LINE AFTER PRESSURE TESTING AND DISINFECTION. IF CURB STOP IS NOT AT THE PROPERTY LINE, EXTEND NEW PIPE BEYOND THE CURB STOP TO CONNECT TO EXISTING SERVICE AT PROPERTY LINE.
8. 2" SERVICE CONNECTIONS SHALL USE A STAINLESS STEEL SERVICE SADDLE.
9. CONTRACTOR SHALL COORDINATE SERVICE INSTALLATIONS WITH THE HOMEOWNERS AND NOTIFY HOMEOWNERS IF THE SERVICE LINES TO THE BUILDINGS ARE GALVANIZED.

Water Service Installation

Not to Scale

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PAUL A. CHESLEY 18,167 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
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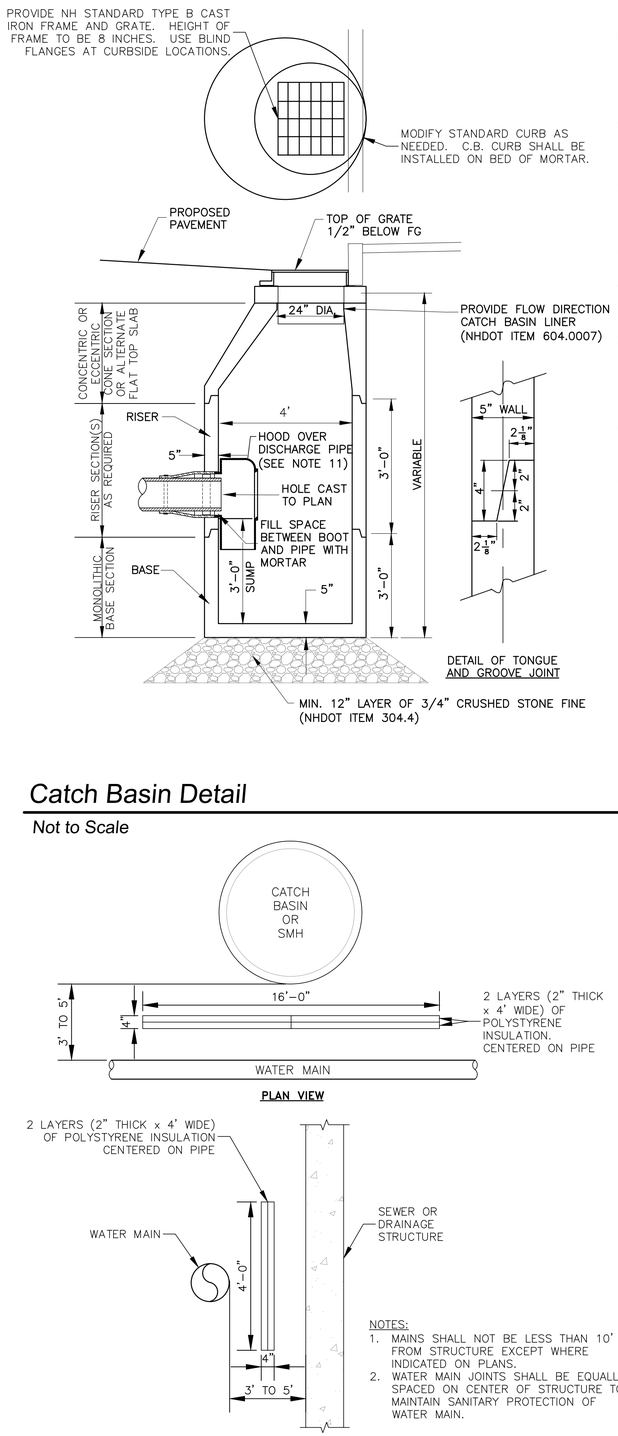
scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Water Details

drawing no. D-2

sheet: 29 of 54



NOTES:

1. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE ENGINEER, WHICH SHALL, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON AN ELASTOMERIC OR MASTIC–LIKE GASKET.
2. PIPE–TO–MANHOLE JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND IN GENERAL WILL DEPEND FOR WATERTIGHTNESS UPON EITHER AN APPROVED NON–SHRINKING MORTAR OR ELASTOMERIC SEALANT.
3. FOR BITUMASTIC TYPE JOINTS, THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY. APPROVED BITUMASTIC SEALANTS INCLUDE RAM–NEK, KENT SEAL NO. 2, EZ OR EQUAL.
4. ALL STRUCTURES SHALL MEET H–20 LOADING. CONCRETE SHALL BE 4,000 PSI AFTER 28 DAYS.
5. THE TONGUE OR THE GROOVE OF THE JOINT OF THE WALL SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ.IN. PER LINEAR FOOT.
6. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION.
7. CATCH BASIN GRATES TO BE NHDOT TYPE B OR TYPE E GRAY IRON. FOR TYPE B FRAME SHALL BE 3 FLANGE TYPE.
8. HOOD ON CATCH BASINS SHALL BE "THE ELIMINATOR" OIL AND FLOATING DEBRIS TRAP AS MANUFACTURED BY GROUNDWATER RESCUE, INC, OR APPROVED EQUAL.
9. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES.
10. ECCENTRIC CONES SHALL BE USED WHEN DEPTH TO CROWN OF SHALLOWEST PIPE EXCEEDS 30"; OTHERWIDE FLAT TOP SLABS SHALL BE USED. RISERS OF 12", 36" AND 48" CAN BE USED TO REACH THE DESIRED DEPTH.
11. HOOD ON CATCH BASINS SHALL BE "THE ELIMINATOR" OIL AND FLOATING DEBRIS TRAP AS MANUFACTURED BY GROUNDWATER RESCUE, INC OF QUINCY, MA OR APPROVED EQUAL. CONTRACTOR SHALL DRILL 1/4" VERTICAL HOLE AT TOP OF HOOD.
12. FRAME AND GRATES SHALL BE BROUGHT TO GRADE USING GRADE SS HARD BRICKS (2 COURSE MIN., 12" MAX.) LAID FLAT. FRAMES SHALL BE SET IN A FULL BED OF MORTAR AND SEALED WITH PORTLAND CEMENT.
13. ECCENTRIC CONES SHALL BE USED WHEN DEPTH TO CROWN OF SHALLOWEST PIPE EXCEEDS 30".

Catch Basin Detail

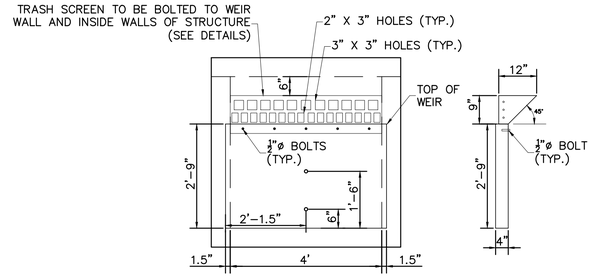
Not to Scale

NOTES:

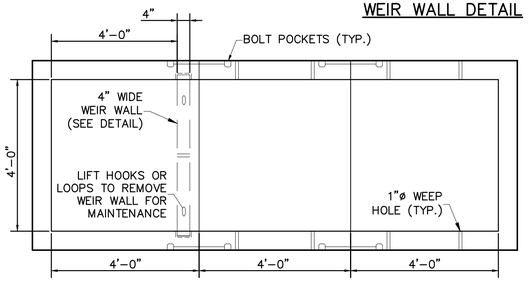
1. MAINS SHALL NOT BE LESS THAN 10' FROM STRUCTURE EXCEPT WHERE INDICATED ON PLANS.
2. WATER MAIN JOINTS SHALL BE EQUALLY SPACED ON CENTER OF STRUCTURE TO MAINTAIN SANITARY PROTECTION OF WATER MAIN.

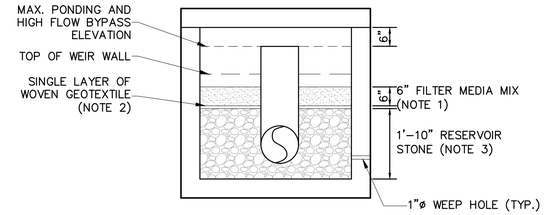
Water Main Insulation Detail

Not to Scale

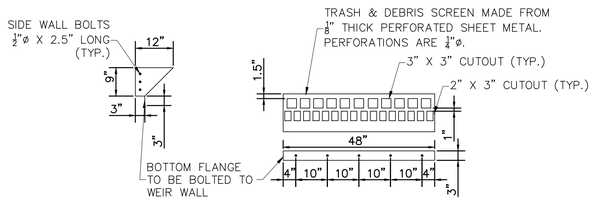


WEIR WALL DETAIL

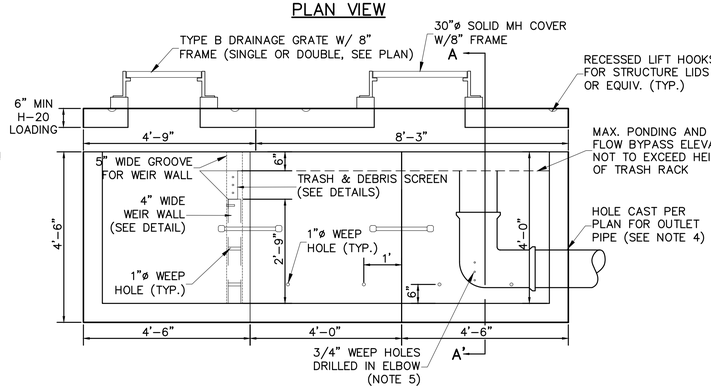




MEDIA FILTER SECTION A – A'



PLAN VIEW



SIDE VIEW CROSS–SECTION

SIDE VIEW

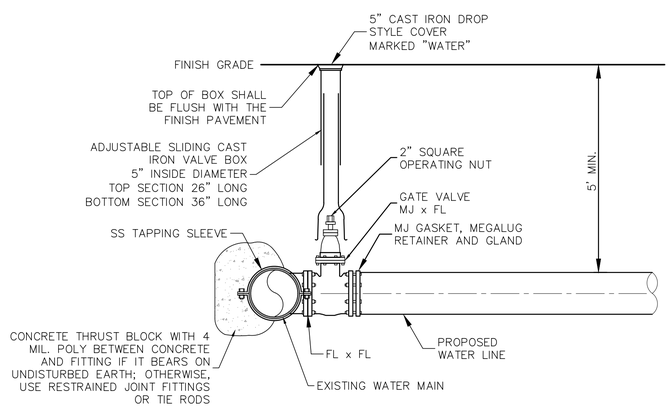
FRONT VIEW

NOTES:

1. FILTER MEDIA COMPOSITION IS MIXED BY TOTAL VOLUME REQUIRED
   1.1. 75–85% COARSE SAND (ASTM C–33 OR EQUIVALENT)
   1.2. 15–25% LOAM OR TOP SOIL
   1.3. 0–5% WATER TREATMENT RESIDUALS OR IRON FILLINGS
2. WOVEN GEOTEXTILE LAYER.
3. RESERVOIR STONE SHALL BE WASHED ¾" OR NO. 57 STONE.
4. SYSTEM OUTLET CONFIGURATION CONSISTS OF A 90° ELBOW AND SHORT STUB PIECES OF HDPE DOUBLE WALLED OR SDR 35.
5. DRAINAGE HOLES SHOULD SHOULD BE DRILLED IN THE OUTLET ELBOW.
6. PRECAST NOTES:
   A. PROVIDE UNIT AS MANUFACTURED BY SHEA CONCRETE PRODUCTS OR APPROVED EQUAL.
   B. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
   C. DESIGN PER ASTM C1433 SPECIFICATION FOR BOX CULVERT.
   D. ALL REINFORCEMENT PER ASTM A–615–75.
   E. DESIGNED FOR H–20 LOADING.
   F. FLAT TOP JOINTS TO BE SEALED WITH BUTYL RESIN.
   G. CONNECTION SECTIONS TO BE SEALED WITH CLOSED BUTYL MASTIC AND BOLT POCKET CONNECTORS.
   H. CONNECTION JOINTS TO BE MORTARED BY OTHERS DURING INSTALLATION.

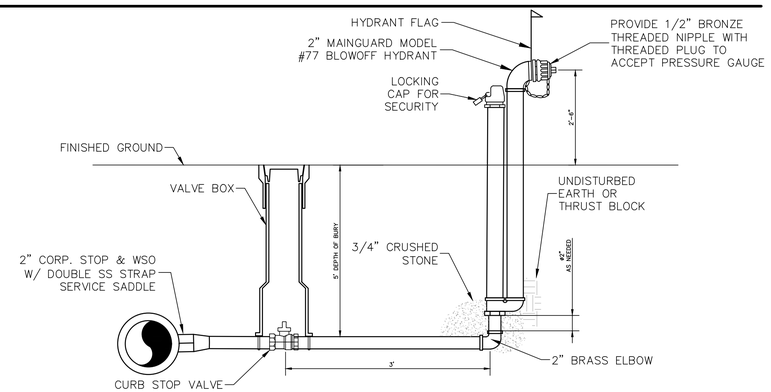
Media Box Filter

Not to Scale



Water Main Connection with Tapping Sleeve

Not to Scale



NOTE:

1. HYDRANTS SHALL BE MAINGUARD #77 AS MANUFACTURED BY JOHN C. KUPFERLE FOUNDRY COMPANY, OR ENGINEER APPROVED EQUAL.
2. HYDRANTS ARE POST TYPE WITH 2" FIP INLET AND 2 1/2" NST NOZZLE.
3. HYDRANTS SHALL BE MANUALLY OPERATED FROM THE TOP AND SHALL OPEN LEFT.
4. THE HYDRANT SHALL BE SELF–DRAINING, NON–FREEZING TYPE.
5. ALL OPERATING PARTS OF THE HYDRANT SHALL BE OF BRONZE–TO–BRONZE DESIGN AND SHALL BE SERVICED OR REPLACED WITHOUT DIGGING UP OR DISTURBING THE SUPPLY LINE CONNECTION.

Blowoff Detail

Not to Scale

no.	revision	date	by
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PHILIP A. CROSBY 16,163 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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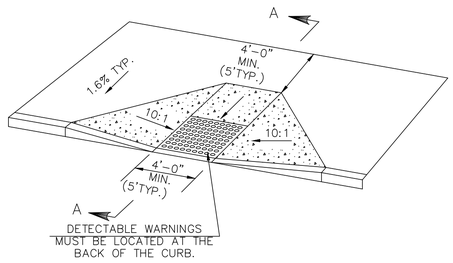
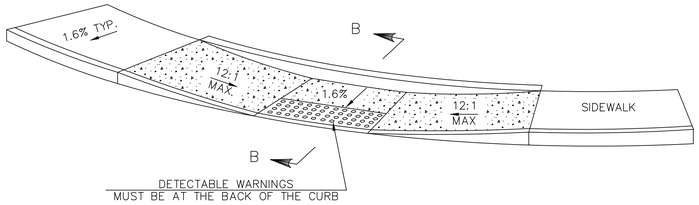
City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Roadway Details

drawing no. D-3

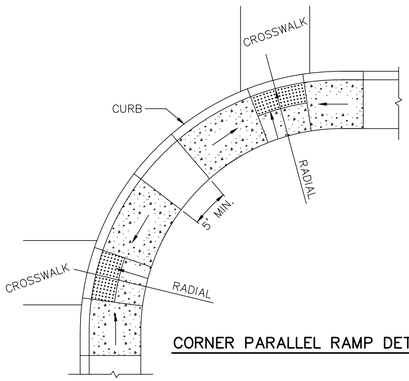
sheet: 30 of 54



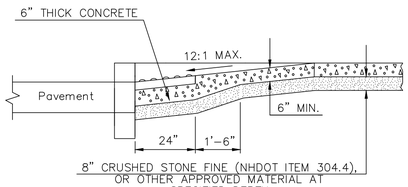
PERPENDICULAR CURB RAMP DETAIL



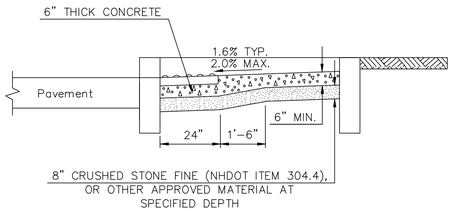
PARALLEL CURB RAMP DETAIL



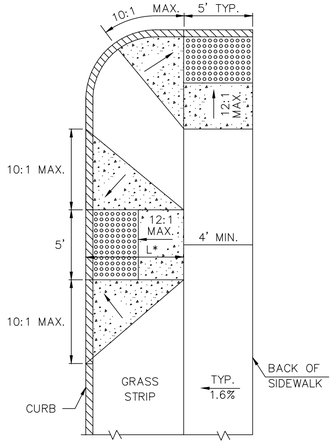
CORNER PARALLEL RAMP DETAIL



SECTION A–A

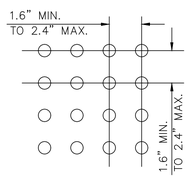


SECTION B–B

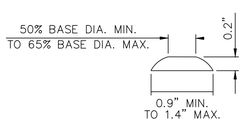


PERPENDICULAR RAMP WITH GRASS PANEL

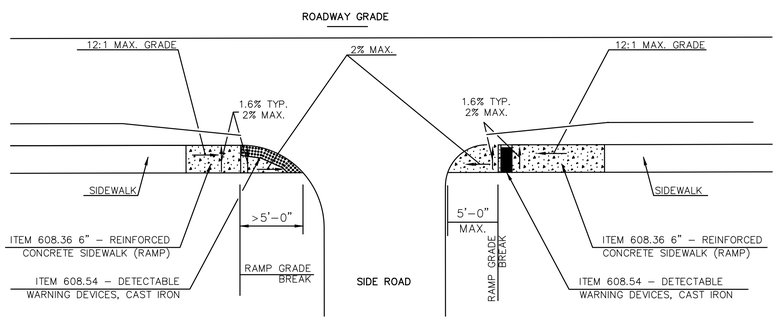
* LENGTH OF RAMP VARIES WITH SLOPE & WIDTH OF GRASS PANEL



DOME SPACING



DOME SECTION



PLAN VIEW

THE ORDER OF PREFERENCE FOR LOCATION OF CORNER RAMPS:

1. TWO SEPARATE RAMPS LOCATED ON TANGENT SIDEWALK AREA IMMEDIATELY OUTSIDE OF CORNER RADIUS.
2. TWO SEPARATE RAMPS SEPARATED BY 5' MINIMUM AS SHOWN ABOVE.
3. SINGLE RAMP SERVING TWO CROSSWALKS.

GENERAL NOTES

1. THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK CURB RAMP IS 12:1, THE MAXIMUM CROSS SLOPE IS 2%. THE SLOPE OF THE LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION. RAMP RUNNING SLOPE EXCEPTION: A GREATER THAN 8.33% RAMP RUNNING GRADE IS ALLOWED WHERE THE ROADWAY AND THE SIDEWALK(S) ARE PARALLEL AND VERY CLOSE TOGETHER, WITH THE SAME GRADE, AND USING A GRADE OF 8.33% WOULD RESULT IN A RAMP LENGTH LONGER THAN 15'. IN THOSE CIRCUMSTANCES USE A MAXIMUM RAMP LENGTH OF 15' AND THE ALLOWABLE RUNNING SLOPE OF THE RAMP(S) IS GREATER THAN 8.33%
2. TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 5% (FULL WIDTH) FOR A DISTANCE OF 2 FT. FROM THE ROADWAY CURB LINE.
3. INTERCEPT DRAINAGE ALONG THE CURB IN ADVANCE OF SIDEWALK CURB RAMPS OR LANDINGS. CATCH BASINS, MANHOLES, ETC. SHALL NOT BE LOCATED IN, OR AT THE BASE OF, SIDEWALK CURB RAMPS OR LANDINGS.
4. THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.
5. THE SURFACE OF A PERPENDICULAR SIDEWALK CURB RAMP OR THE LANDING OF A PARALLEL SIDEWALK CURB RAMP SHALL CONTRAST VISUALLY WITH THE ADJOINING SIDEWALK SURFACE, EITHER ASPHALT/LIGHT–COLORED CONCRETE OR LIGHT–COLORED CONCRETE/DARK–STAINED CONCRETE. THE CONCRETE SURFACE SHALL BE SLIP RESISTANT.
6. DETECTABLE WARNING PANELS SHALL BE THE FULL WIDTH OF THE LANDING, BLENDED TRANSITION, OR CURB RAMP THEY ARE A PART OF AND SHALL BE A MINIMUM OF 2 FEET IN DEPTH. THE ROWS OF TRUNCATED DOMES SHALL BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP, BLENDED TRANSITION, OR LANDING AND THE STREET.

TRANSITION RAMPS:

BLENDED TRANSITIONS HAVE A RUNNING SLOPE GREATER THAN 2% BUT LESS THAN 5%. CURB RAMPS HAVE A RUNNING SLOPE OF 5% MIN. TO 8.33% MAX. SIDEWALK, BLENDED TRANSITIONS, AND CURB RAMPS HAVE A MAX. CROSS SLOPE OF 2%.

ALL GRADE BREAKS BETWEEN LANDINGS, RAMPS, AND BLENDED TRANSITIONS SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL.

IF IT IS NECESSARY TO USE SIDEWALK WIDTHS 5'–0" OR LESS, PROVIDE A WIDENED AREA A MINIMUM OF 5'–0" WIDE BY 5'–0" LONG SPACED AT INTERVALS OF 200' MAXIMUM TO ALLOW FOR USERS TO PASS EACH OTHER.

PROVIDE DETECTABLE WARNING SURFACES ANYTIME THAT A CURB RAMP, BLENDED TRANSITION, OR LANDING CONNECTS TO A STREET. PLACEMENT FOR DETECTABLE WARNING SURFACES ARE AS FOLLOWS:

PERPENDICULAR CURB RAMPS:

WHERE BOTH ENDS OF THE BOTTOM GRADE ARE LESS THAN 5'– 0" FROM THE BACK OF THE CURB, LOCATE THE DETECTABLE WARNING PANELS ON THE RAMP SURFACE AT THE BOTTOM OF THE RAMP. WHERE EITHER END OF THE BOTTOM GRADE IS GREATER THAN 5'–0" FROM THE BACK OF THE CURB, LOCATE THE DETECTABLE WARNINGS AT THE BOTTOM OF THE LANDING.

PARALLEL CURB RAMPS:

LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB ALONG THE EDGE OF THE LANDING.

FOR BLENDED TRANSITIONS AND LANDINGS:

LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB.

Sidewalk & Curb Ramp Details

Not to Scale

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

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PHILIP A. CROWELL JR. 9881 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

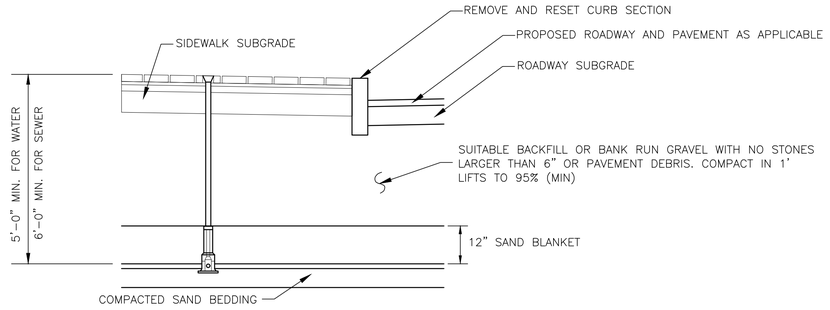
designed by: STF/WAB | drawn by: WWG | approved by: PAC | scale: 0 10' 20' Scale: 1" = 10'

date: January 2023 | project no: 1211 | checked by: PAC

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Sidewalk Details

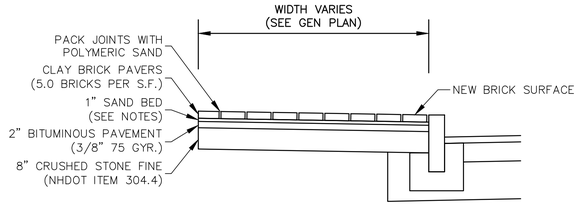
drawing no. D-4

sheet: 31 of 54



Sidewalk Repair Detail

Not to Scale

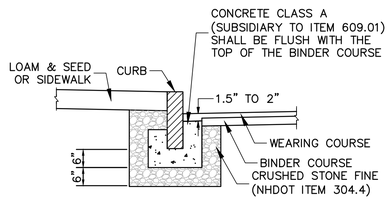


NOTES:

1. PINE HALL BRICK PAVERS, TRADITIONAL EDGE, FULL RANGE 4"x8"x2.25" ARE REQUIRED. CONTRACTOR SHALL SUBMIT SAMPLE OF BRICKS FOR APPROVAL BY THE CITY OF PORTSMOUTH.
2. IN AREAS WHERE BRICK DOES NOT ABUT CURBING, EDGING SHALL BE INSTALLED TO HOLD BRICKS IN PLACE.
3. SAND BEDDING: 3 PARTS SAND TO 1 PART PORTLAND CEMENT TYPE S.
4. BRICKS SHALL BE CLASS SX, TYPE 1, APPLICATION PX. BRICKS SHALL BE NO.1, WIRE CUT FOR PAVING WITH COMPRESSIVE STRENGTH OF 6,000psi (MIN.). BRICKS SHALL NOT BE CORED OR HAVE FROGS.
5. SUB-GRADE SHALL BE COMPACTED PRIOR TO PLACEMENT OF CRUSHED STONE BASE.
6. CRUSHED STONE BASE MATERIAL SHALL BE COMPACTED WITH JUMPING JACK ALONG BACK SIDE OF CURB PRIOR TO PLACEMENT OF ASPHALT PAVEMENT. CRUSHED STONE SHALL BE COMPACTED TO 95% PROCTOR.
7. BRICK SHALL BE SET IN SAND/CEMENT MIX, CUT PIECES PLACED, LOCKED IN, AND COMPACTED AT THE END OF EACH DAY UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER.

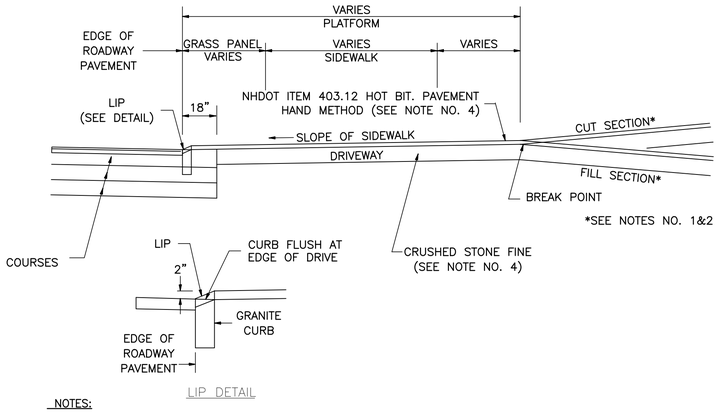
Brick Sidewalk

Not to Scale



Granite Curb w/ Concrete Backing

Not to Scale



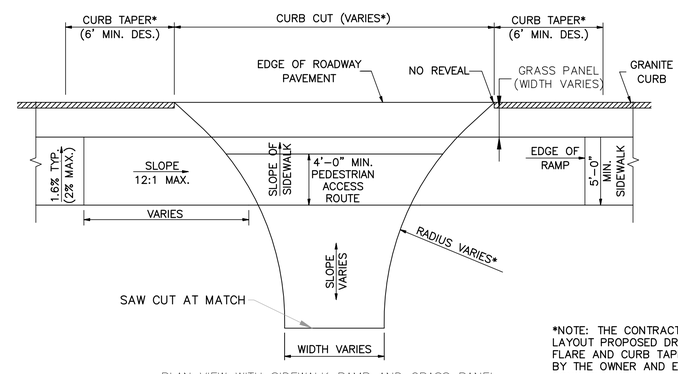
LIP DETAIL

NOTES:

1. GRADES OF MAJOR ENTRANCES BEYOND THE PLATFORM SHOULD NOT EXCEED 8%.
2. GRADES OF OTHER DRIVES BEYOND THE PLATFORM SHOULD NOT EXCEED 15%.
3. THE ALGEBRAIC DIFFERENCE BETWEEN TWO ADJACENT GRADES SHOULD NOT EXCEED 10%.
4. PAVEMENT & BASE COURSE DEPTHS FOR RESIDENTIAL DRIVES SHALL BE 8" CRUSHED STONE FINE (NHDOT ITEM 304.4) WITH TWO COURSES OF HOT BITUMINOUS PAVEMENT (HAND METHOD) TOTALING BETWEEN 2.75" AND 3". CURBING CAN BE FLARED TO FIT DRIVE RADII IF APPROPRIATE OR ENDED AS DETAILED ABOVE.
5. FOR UNPAVED DRIVES, THE PAVED APRON NORMALLY ENDS AT THE RADIUS TANGENT POINT.
6. SEE SHEET D-4 FOR NHDOT STANDARD RAMP DETAILS.
7. THE CONTRACTOR SHALL LAYOUT PROPOSED DRIVEWAY RADIUS, FLARE, AND CURB TAPERS FOR REVIEW BY THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION.

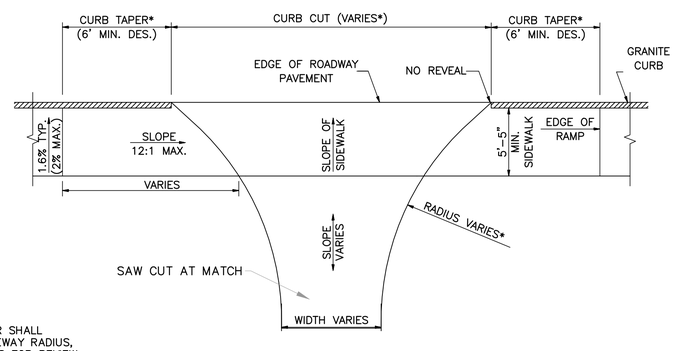
Typical Driveway Section

Not to Scale

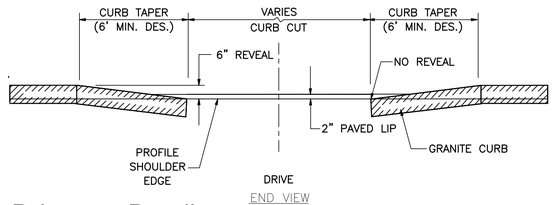


PLAN VIEW WITH SIDEWALK RAMP AND GRASS PANEL

*NOTE: THE CONTRACTOR SHALL LAYOUT PROPOSED DRIVEWAY RADIUS, FLARE AND CURB TAPERS FOR REVIEW BY THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION.



PLAN VIEW WITH SIDEWALK RAMP AND NO GRASS PANEL



END VIEW

Driveway Detail

Not to Scale

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

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PHILIP A. CROCKETT 10857 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 10' 20' Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area
Improvement Project
Roadway and Sidewalk Details

drawing no. D-5

sheet: 32 of 54

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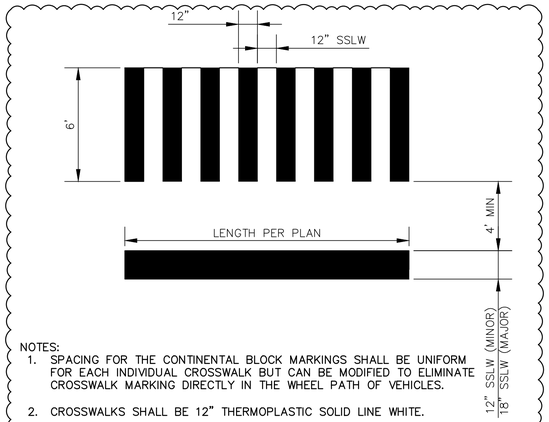


2

NOTES:
1. SPACING FOR THE CONTINENTAL BLOCK MARKINGS SHALL BE UNIFORM FOR EACH INDIVIDUAL CROSSWALK BUT CAN BE MODIFIED TO ELIMINATE CROSSWALK MARKING DIRECTLY IN THE WHEEL PATH OF VEHICLES.
2. CROSSWALKS SHALL BE 12" THERMOPLASTIC SOLID LINE WHITE.
3. STOP LINE SHALL BE PLACED 4' IN ADVANCE OF CROSSWALKS.
4. STOP LINE SHALL BE THERMOPLASTIC SOLID LINE WHITE. WIDTH OF STOP LINE SHALL BE 12" ON MINOR STREETS, 18" ON MAJOR STREETS.

Crosswalk and Stop Line Detail

Not to Scale

SIGNING NOTES:

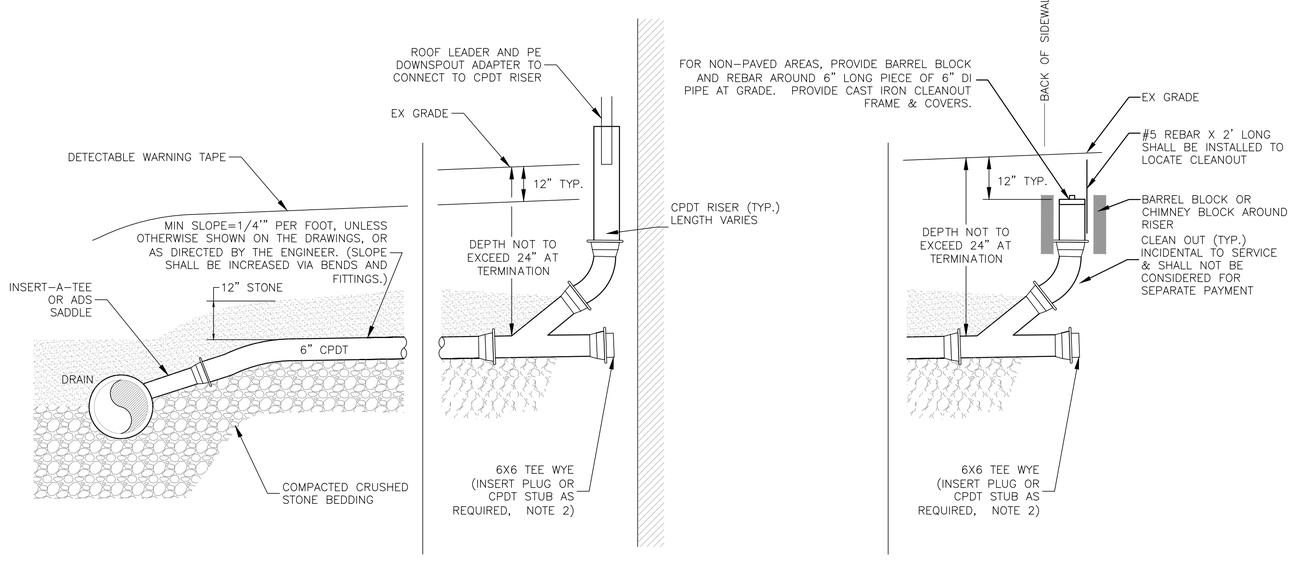
1. EXISTING SIGNS THAT CONFLICT WITH THE PROPOSED LAYOUT SHALL BE REMOVED OR RELOCATED AS DIRECTED BY THE ENGINEER. THIS WORK PAID UNDER CONTRACT ITEMS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND RELOCATION OF ALL ROADWAY SIGNS. ANY SIGNS DAMAGED DURING THE COMPLETION OF WORK SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.
3. NOTE NEW REFLECTIVITY REQUIREMENTS IN THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 718 PUBLISHED BY THE NHDOT.
4. REFER TO THE 2016 STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION AS PUBLISHED BY THE NHDOT FOR EXACT DETAILS OF PERMANENT SIGNING STANDARDS AND NHDOT SPECIFIC SIGNS.
5. REFER TO THE LATEST EDITION OF THE STANDARD HIGHWAY SIGNS MANUAL AS PUBLISHED BY THE USDOT–FHWA FOR EXACT DETAILS OF BORDERS, ETC.
6. THE MINIMUM SIGN HEIGHT FOR A ROAD SIGN SHALL BE 7–FEET WHERE PEDESTRIANS ARE PRESENT. ALL OTHER SIGN HEIGHTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD.
7. ALL WARNING SIGNS SHALL HAVE TYPE IV BACKGROUND SHEETING UNLESS OTHERWISE SPECIFIED.
8. ALL EXISTING SIGNS THAT ARE REMOVED ARE TO BE STORED BY THE CONTRACTOR AND RESET AS DIRECTED. ANY EXISTING SIGNS TO BE RESET THAT ARE DAMAGED BY THE CONTRACTOR'S OPERATIONS ARE TO BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CITY.
9. WHERE NEEDED, SIGNS POSTS SHALL BE U–CHANNEL, DIRECT BURIED, SINGLE POST.

SIGN TABLE (ITEM 2.42)

IDENT #	SIGN SIZE		TEXT	TEXT DIMENSIONS			SHIELD SIZE (INCH)	ARROW (INCH)	NUMERAL (INCH)	# SIGNS REQ'D	SIGN AREA (SQ. FT)	
	WIDTH (INCH)	HEIGHT (INCH)		LETTER HEIGHT (INCH)							NOM. AREA	TOTAL AREA
				UC	LC	CAPS						
R1–1	30	30	STOP			10C				BASE BID = 2 BID ALT A = 0 BID ALT B = 2 BID ALT C = 2 BID ALT D = 0	6.25	12.5 0 12.5 12.5 0
D3–1A	42	8	Union St	6D	4.5D					1	2.33	2.33
D3–1B	42	8	Austin St	6D	4.5D					1	2.33	2.33

Sign Table

Not to Scale



RISER FOR ROOF LEADER CONNECTION

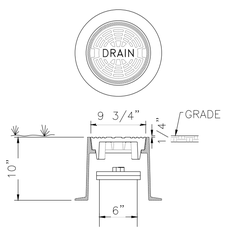
RISER FOR FUTURE ROOF LEADER CONNECTION

NOTES:

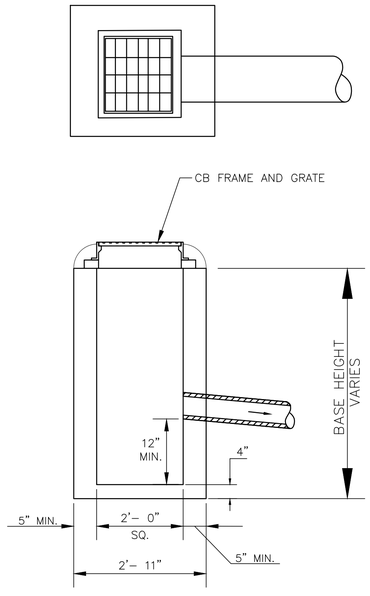
1. PROVIDE ROOF LEADER CONNECTIONS AT EXISTING DOWNSPOUTS. AT ADJACENT BUILDING CORNERS, TWO DOWNSPOUTS MAY BE CONNECTED TO ONE LATERAL USING APPROPRIATE WYE (AND OTHER) FITTING(S).
2. EACH PROPERTY SHALL BE PROVIDED A DRAIN LATERAL TO FACILITATE PRIVATE SUMP CONNECTIONS WHERE ROOF LEADER CONNECTIONS ARE PROVIDED, ONE PER PROPERTY WILL INCLUDE A 6" CPDT STUB FROM THE TEE–WYE FOR THE PURPOSE OF SUMP PUMP CONNECTIONS.
3. DRAIN SERVICE LATERALS WILL BE PROVIDED AT EACH DOWNSPOUT OR AS DIRECTED BY THE ENGINEER. ONE SERVICE PROVIDED FOR DOWNSPOUTS WILL INCLUDE A 6" STUB FOR EACH PROPERTY TO FACILITATE PRIVATE SUMP PUMP/DRAIN SERVICE CONNECTIONS.
4. CDPT DOWNSPOUT RISER PIPE, FITTINGS, AND CLEANOUTS ARE INCIDENTAL TO ITEM 603.8126 AND WILL NOT BE CONSIDERED FOR PAYMENT.
5. SERVICE TEES SHALL BE ORIENTED @ 10:30 OR 1:30 (TYP.). UNDER NO CIRCUMSTANCES SHALL SERVICES BE LOCATED BETWEEN 3:00 AND 9:00.
6. 8" PIPE AND FITTINGS SHALL BE USED TO TIE INTO EXISTING 8" SERVICES.

Drain Lateral and Roof Leader Connection

Not to Scale



CAST IRON CLEANOUT COVER



NOTES:

1. CONCRETE: 5,000 PSI AT 28 DAYS.
2. REINFORCING: 1 LAYER OF 4x4/4/x4 W.W.M.
3. TO ACCOMMODATE A 24" SQ. C.I. FRAME AND GRATE.

Drop Inlet Detail

Not to Scale

no.	revision	date	by
1	Issued for Bid	1/17/2023	PAC

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PHILIP A. CROSBY No. 12620 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 10' 20' Scale: 1" = 10'

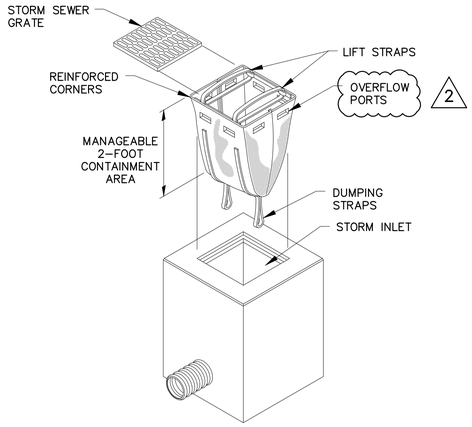
City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area Improvement Project

Roadway and Drainage Details

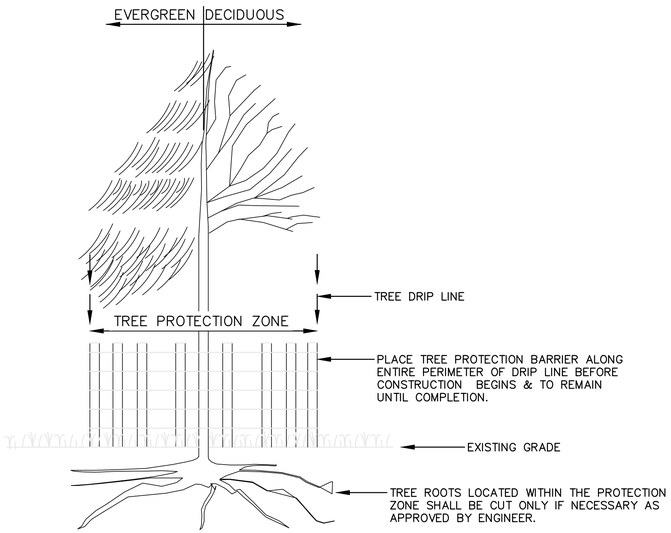
drawing no. D-6

sheet: 33 of 54



"Silt Sack" Sediment Control Device for Inlet Protection

Not to Scale



Temporary Tree Protection

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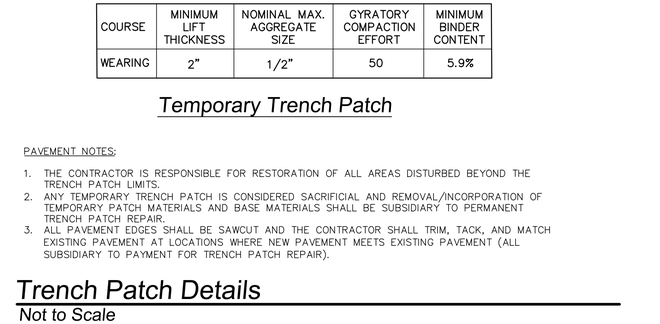
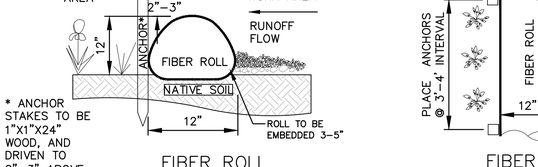


Permanent Trench Patch

PAVEMENT COURSES:

ROADS	COURSE	MINIMUM LIFT THICKNESS	NOMINAL MAX. AGGREGATE SIZE	GYRATORY COMPACTION EFFORT	MINIMUM BINDER CONTENT
SIDE ROADS	WEARING	1-1/2"	3/8"	75	5.9%
	BASE	2-1/2"	3/4"	50	5.3%
MIDDLE STREET	WEARING	1-1/2"	1/2"	50	5.9%
	BASE	2-1/2"	3/4"	50	5.3%



PAVEMENT COURSE:

COURSE	MINIMUM LIFT THICKNESS	NOMINAL MAX. AGGREGATE SIZE	GYRATORY COMPACTION EFFORT	MINIMUM BINDER CONTENT
WEARING	2"	1/2"	50	5.9%

Temporary Trench Patch

PAVEMENT NOTES:

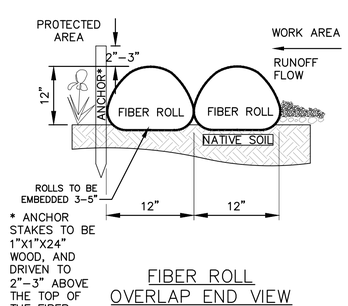
1. THE CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ALL AREAS DISTURBED BEYOND THE TRENCH PATCH LIMITS.
2. ANY TEMPORARY TRENCH PATCH IS CONSIDERED SACRIFICIAL AND REMOVAL/INCORPORATION OF TEMPORARY PATCH MATERIALS AND BASE MATERIALS SHALL BE SUBSIDIARY TO PERMANENT TRENCH PATCH REPAIR.
3. ALL PAVEMENT EDGES SHALL BE SAWCUT AND THE CONTRACTOR SHALL TRIM, TACK, AND MATCH EXISTING PAVEMENT AT LOCATIONS WHERE NEW PAVEMENT MEETS EXISTING PAVEMENT (ALL SUBSIDIARY TO PAYMENT FOR TRENCH PATCH REPAIR).

Trench Patch Details

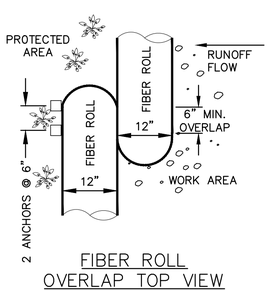
Not to Scale

EROSION CONTROL NOTES:

1. PERIMETER CONTROLS TO BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
2. PRIOR TO CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NECESSARY. THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. WHEN LAND IS EXPOSED DURING DEVELOPMENT, THE EXPOSURE SHOULD BE KEPT TO THE SHORTEST PRACTICAL PERIOD OF TIME. LAND SHOULD NOT BE LEFT EXPOSED DURING THE WINTER MONTHS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL REMEDIAL WORK REQUIRED TO REPAIR AREAS WHICH ARE DAMAGED BY EROSION.
3. CATCH BASIN INSERTS, MIRAFI DANDY SACK OR EQUAL, SHALL BE INSTALLED AND MAINTAINED AT CATCH BASINS UNTIL PAVEMENT IS INSTALLED. SEDIMENT AND DEBRIS SHALL BE REMOVED FOLLOWING EACH STORM EVENT.
4. HAY BALE BARRIERS SHALL BE INSTALLED AND MAINTAINED AT DRAIN INLETS AND OUTLETS (NOT PLACED CLOSER THAN 25-FEET) AND ALONG LIMITS OF WORK WHERE NECESSARY. ADDITIONAL HAY BALES SHALL BE ADDED AS REQUIRED BY THE ENGINEER. HAY BALES WILL BE STAKED AND MAINTAINED PRIOR TO AND DURING CONSTRUCTION UNTIL DISTURBED AREAS HAVE ESTABLISHED A HEALTHY STAND OF GRASS. BALED HAY AND MULCH SHALL BE MOWINGS OF ACCEPTABLE HERBACEOUS GROWTH, FREE FROM NOXIOUS WEEDS OR WOODY STEMS AND SHALL BE DRY WHEN PLACED.
5. ALL DISTURBED AREAS AND SIDE SLOPES WHICH ARE FINISH GRADED WITH NO FURTHER CONSTRUCTION TO TAKE PLACE SHALL BE SEEDED AND MULCHED. ALL DISTURBED AREAS OUTSIDE LIMITS OF BUILDING, AND PAVEMENT SHALL BE STABILIZED WITH LOAM AND SEED. ALL SEED, LIME AND FERTILIZER PROGRAMS SHALL CONFORM TO ALL APPLICABLE SECTIONS OF THE SPECIFICATIONS.
6. ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, OR LONGER THAN TWO WEEKS AND WHICH WILL BE RE-GRADED LATER DURING CONSTRUCTION, SHALL BE TEMPORARILY SEEDED AND MACHINE STRAW MULCHED AT A RATE OF 1.5 TONS/ACRE.
7. AVOID USE OF UNDISTURBED AREAS WHEREVER POSSIBLE DURING CONSTRUCTION. CONSTRUCTION TRAFFIC SHALL TRAVEL THE ROADBEDS OF EXISTING AND FUTURE ROADS AND SHALL BE LIMITED TO WITHIN THE LIMITS OF CONSTRUCTION NOTED ON THE PLANS.
8. IF SILT FENCES ARE TO BE USED, THEY SHALL BE MINIMUM OF 36 INCHES HIGH WITH THE BOTTOM OF THE CLOTH KEYED INTO THE GROUND (SEE DETAIL). POSTS SHALL BE OF WOOD OR STEEL. SILT FENCE SHALL BE INSTALLED AND MAINTAINED AS NEEDED TO PREVENT SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. ADDITIONAL SILT FENCE MAY BE ADDED AS REQUIRED BY THE ENGINEER PRIOR TO ANY ON-SITE GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL. IT SHOULD BE MAINTAINED DURING AND AFTER DEVELOPMENT TO REMOVE SEDIMENT FROM RUNOFF WATER AND FROM LAND UNDERGOING DEVELOPMENT. WHERE POSSIBLE NATURAL DRAINAGE WAYS SHOULD BE UTILIZED AND LEFT OPEN TO REMOVE CLEAN EXCESS SURFACE WATER. THE SILT FENCE IS TO BE MAINTAINED AND CLEANED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
9. EROSION CONTROL DEVICES SHOWN REPRESENT MINIMUM MEASURES REQUIRED FOR EROSION CONTROL. THE CONTRACTOR SHALL TAKE ANY AND ALL NECESSARY MEASURES TO PREVENT TRANSPORTATION OF SEDIMENT BEYOND THE WORK AREA.
10. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED AND ACCUMULATED SEDIMENT DISPOSED OF AT THE CONTRACTOR'S EXPENSE.
11. ALL ROADWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
12. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
13. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY 0.5" OF RAINFALL.
14. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    - BASE COURSE STONE HAS BEEN INSTALLED IN AREAS TO BE PAVED
    - A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
    - A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
    - EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
15. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
16. TEMPORARY SEEDING (IF USED) SHALL BE PERENNIAL RYE GRASS, SPREAD 0.7LB/1000 SQ. FT.
17. WINTER CONSTRUCTION NOTES
    - ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
    - ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
    - AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
18. AFTER CONSTRUCTION IS COMPLETE, THE CONTRACTOR SHALL REMOVE THE STABILIZED CONSTRUCTION ENTRANCE AND REPLACE WITH THE IMPROVED GRAVEL SECTION PER THE NOTES AND DETAIL.

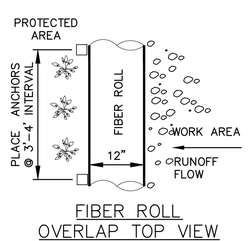


FIBER ROLL
OVERLAP END VIEW



FIBER ROLL
OVERLAP TOP VIEW

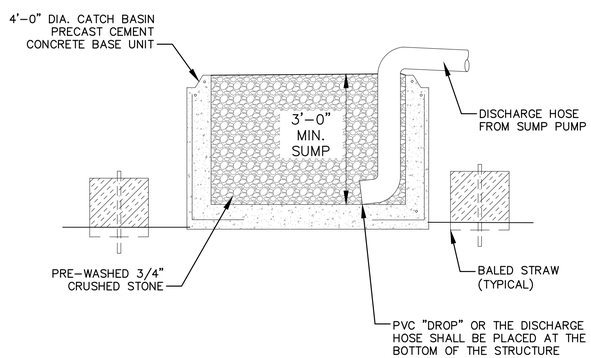
FIBER ROLL
OVERLAP SECTION VIEW



FIBER ROLL
OVERLAP TOP VIEW

Erosion Control Fiber Roll

Not to Scale



Dewatering Basin (Section)

Not to Scale

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drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 10' 0 20' Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works
Union Street Area Improvement Project
Erosion Control Details

drawing no. D-7

sheet: 34 of 54

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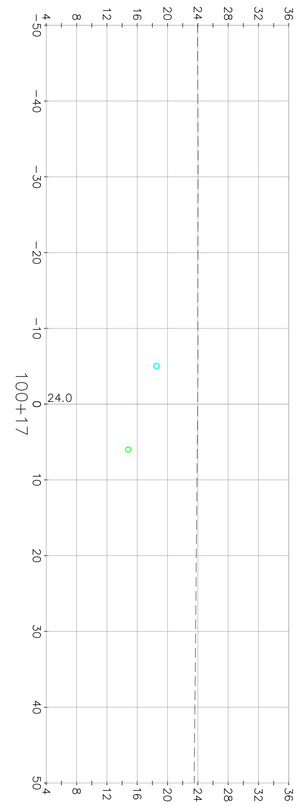

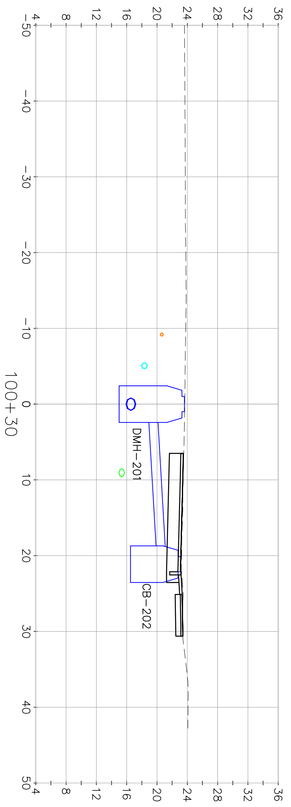

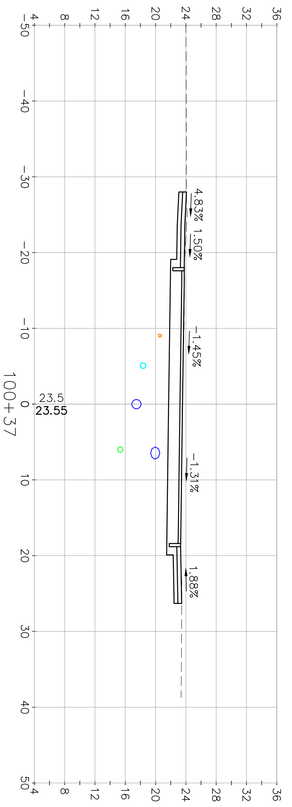

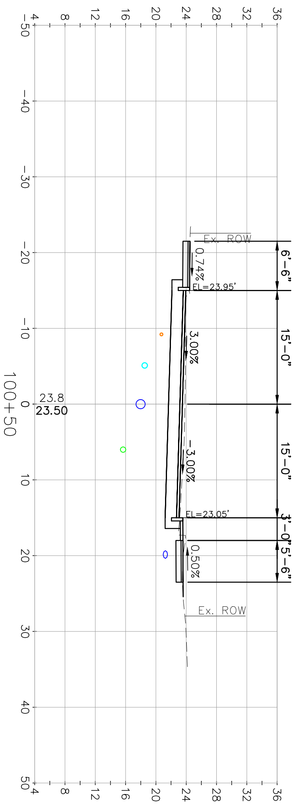

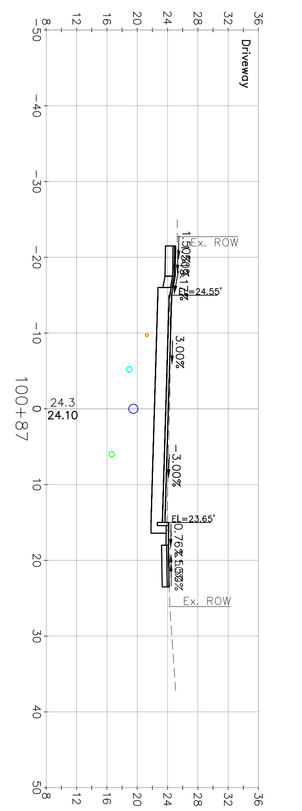

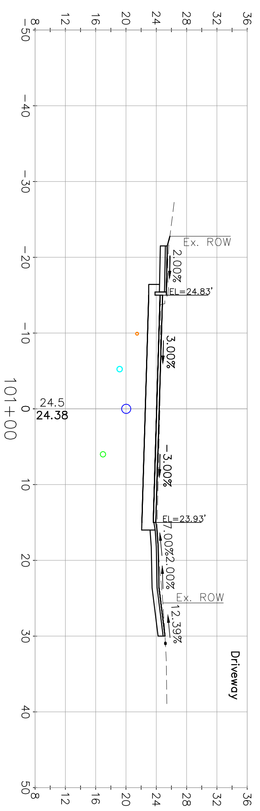

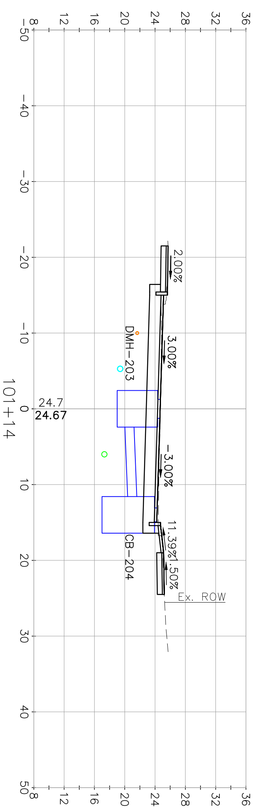

sheet 35 of 54	drawing no. XS-1	City of Portsmouth, New Hampshire Department of Public Works	
		Union Street Area Improvement Project	
		Cross Sections Union Street	

date: January 2023	designed by: STF/WAB
project no: 1211	drawn by: WWG
checked by: PAC	approved by: PAC

scale: 0 10' 20' Scale: 1" = 10'

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drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 1" = 10'
0 10' 20'

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area Improvement Project

Cross Sections Union Street

drawing no.
XS-2

sheet: 36 of 54

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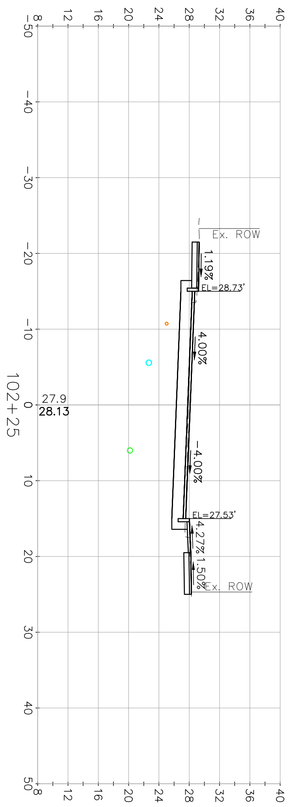

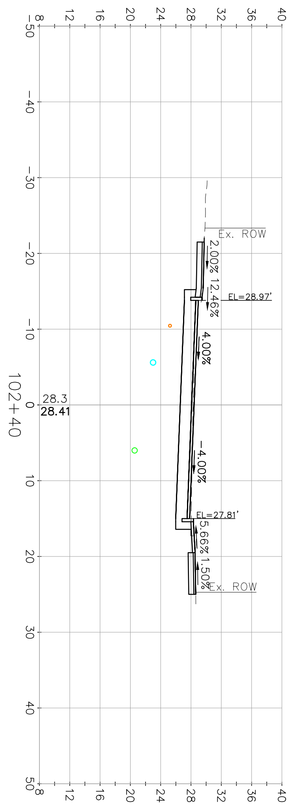

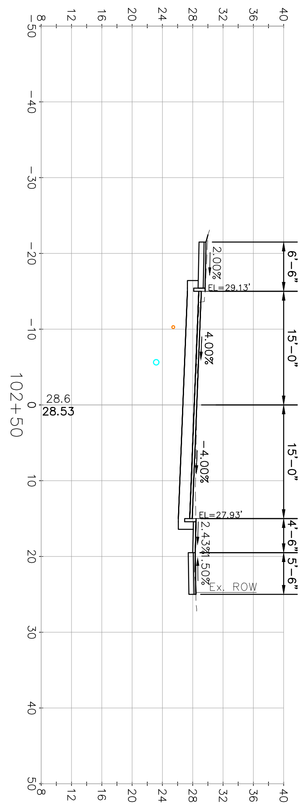

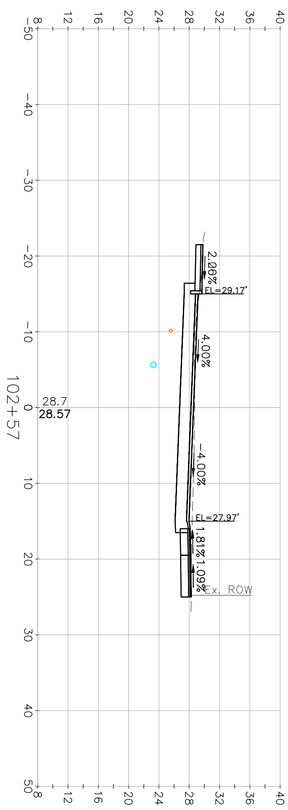

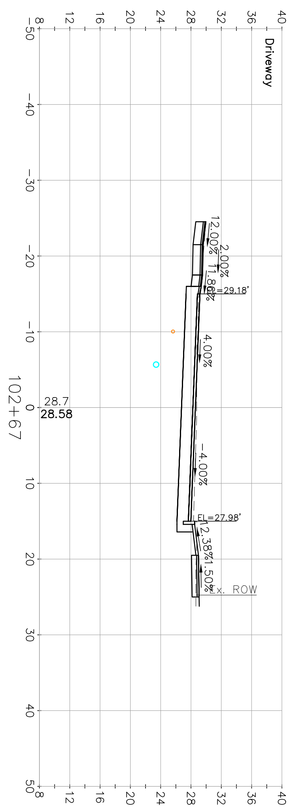

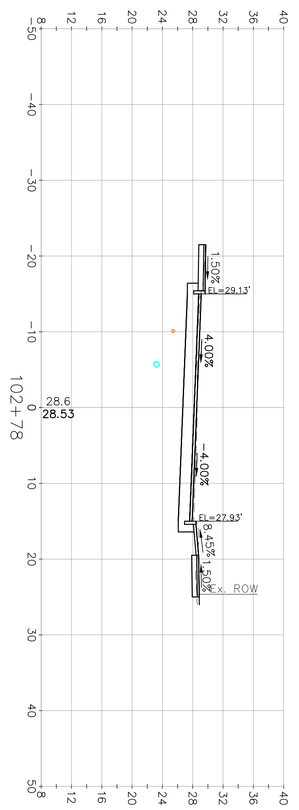

sheet 37 of 54	drawing no. XS-3	City of Portsmouth, New Hampshire Department of Public Works Union Street Area Improvement Project Cross Sections Union Street	date: January 2023 · designed by: STF/WAB project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 10' 20' Scale: 1" = 10'

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approved by: PAC
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project no: 1211
checked by: PAC
scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area Improvement Project

Cross Sections Union Street

drawing no. XS-4

sheet: 38 of 54

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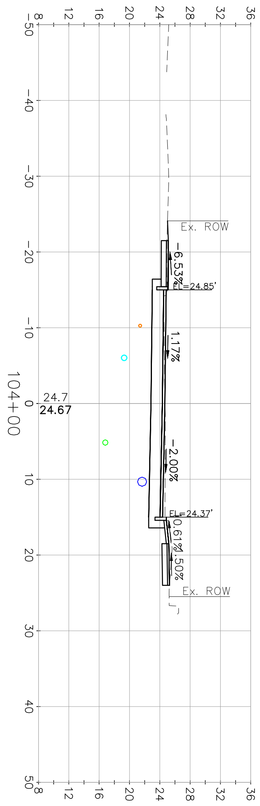

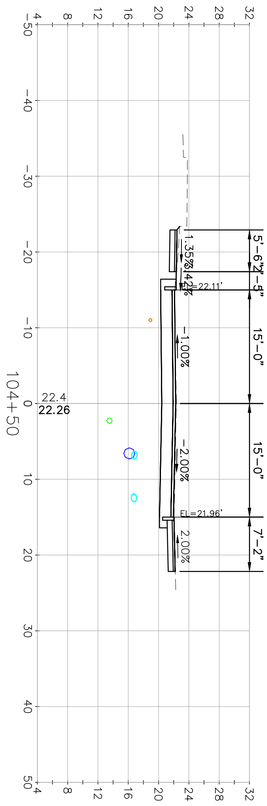

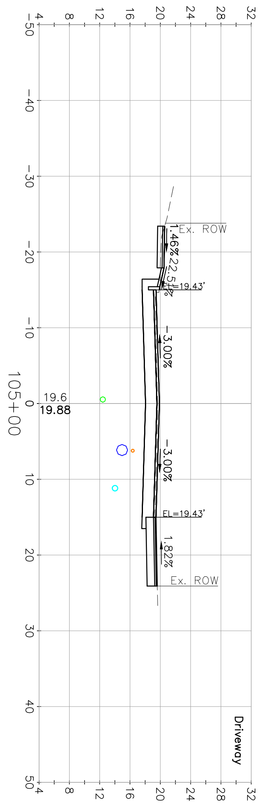

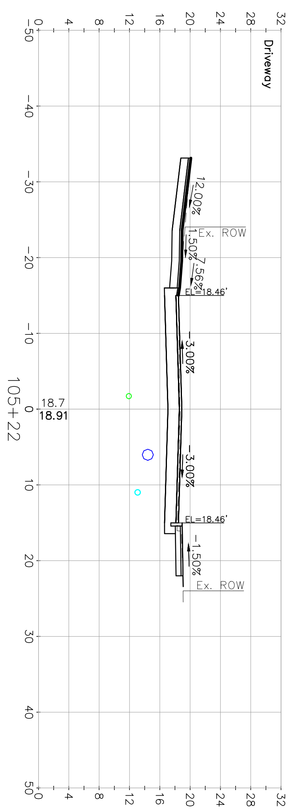

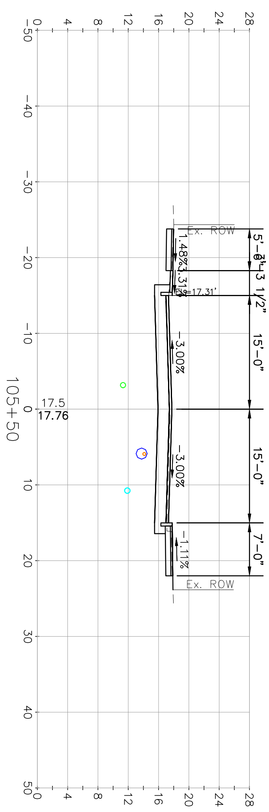

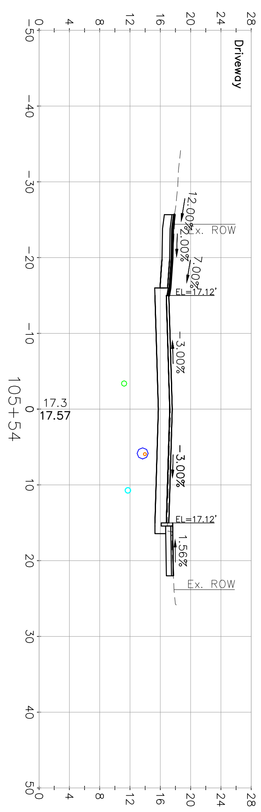

sheet 39 of 54	drawing no. XS-5	City of Portsmouth, New Hampshire Department of Public Works Union Street Area Improvement Project Cross Sections Union Street	date: January 2023 · designed by: STF/WAB project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 10' 20' — Scale: 1" = 10'

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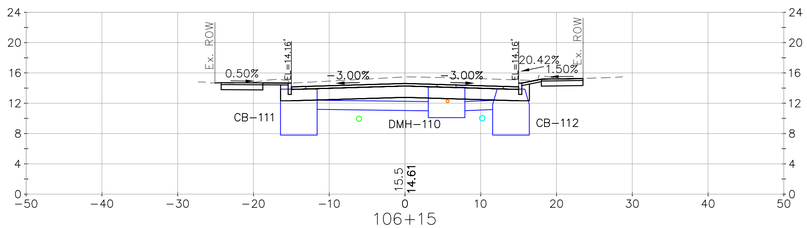

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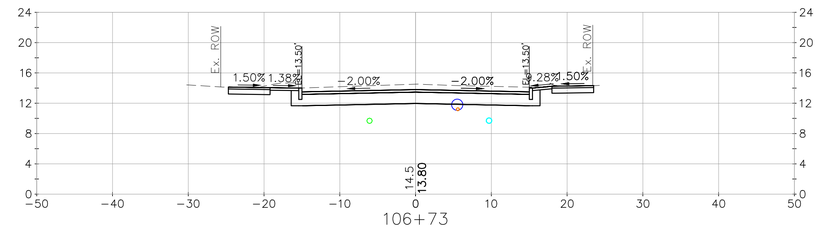

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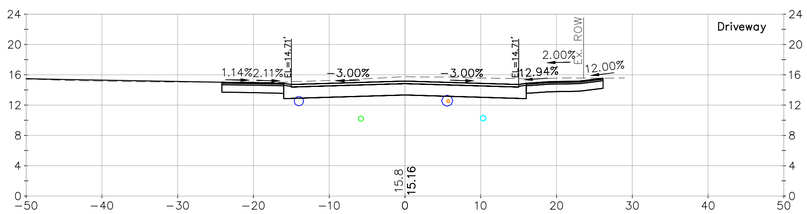

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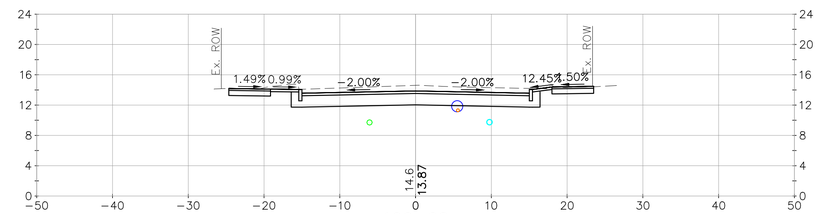

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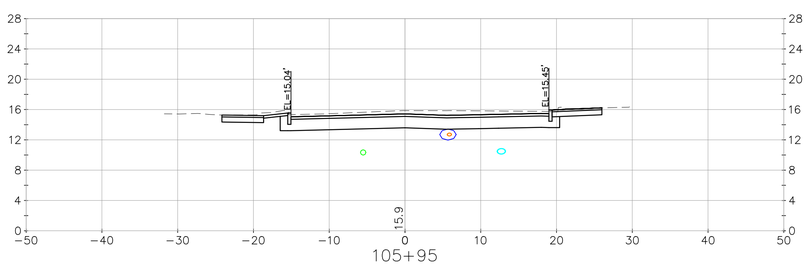

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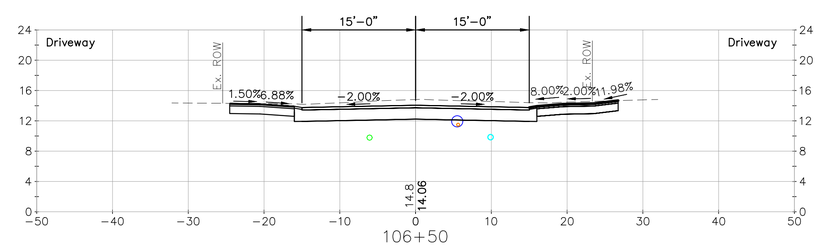

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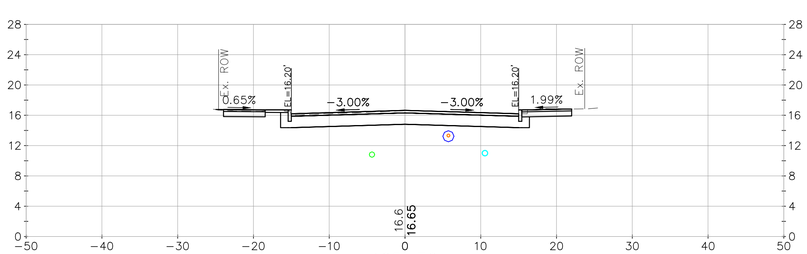

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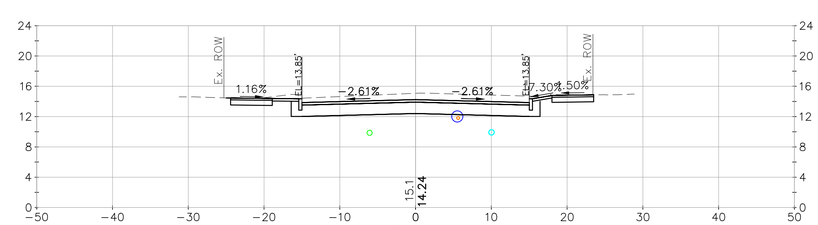

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STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 10' 20'
Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Cross Sections
Union Street

drawing no.
XS-6

sheet: 40 of 54

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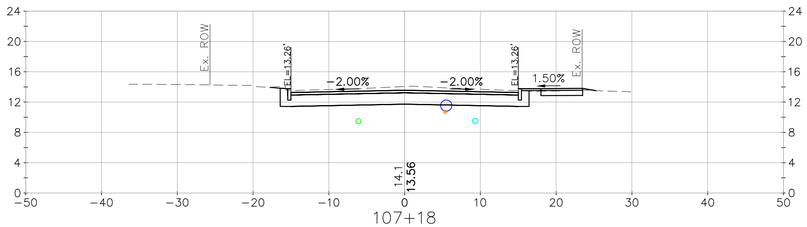

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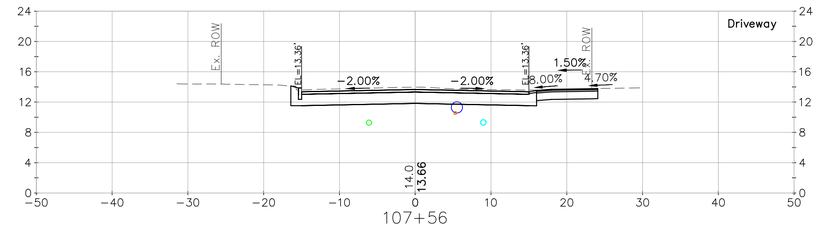

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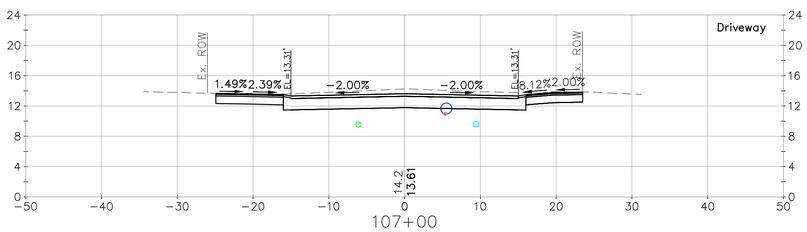

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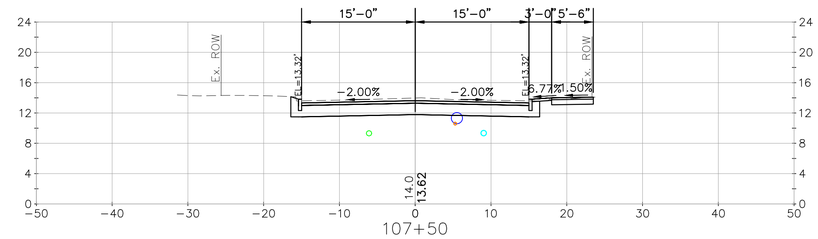

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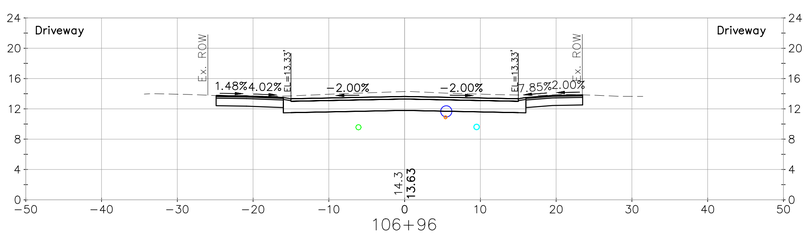

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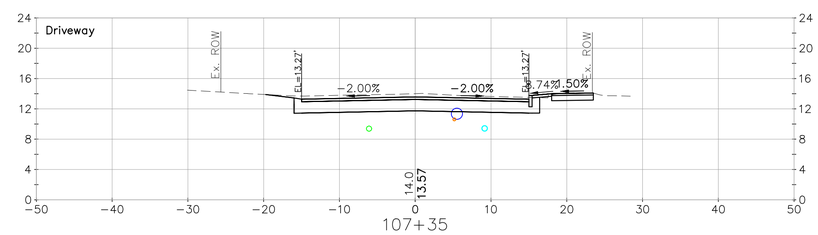

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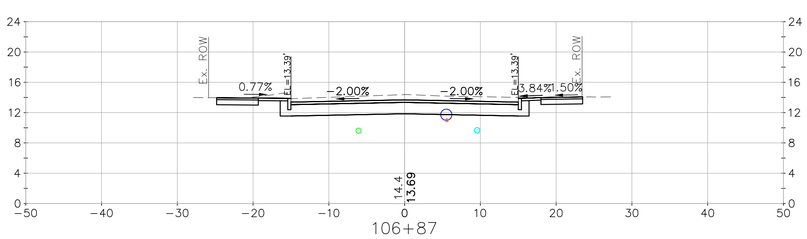

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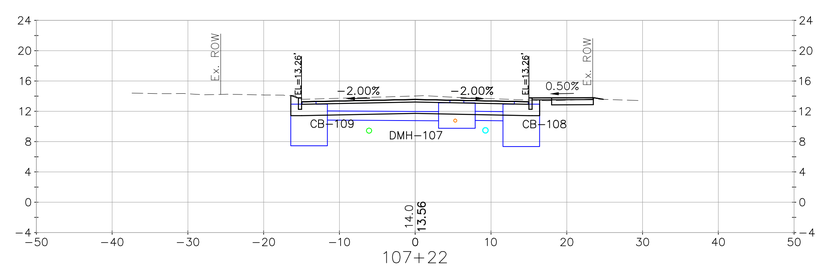

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STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 10' 20'
Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Cross Sections
Union Street

drawing no.
XS-7

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approved by: PAC
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project no: 1211
checked by: PAC
scale: 0 10' 20' Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area Improvement Project

Cross Sections Union Street

drawing no. XS-8

sheet: 42 of 54

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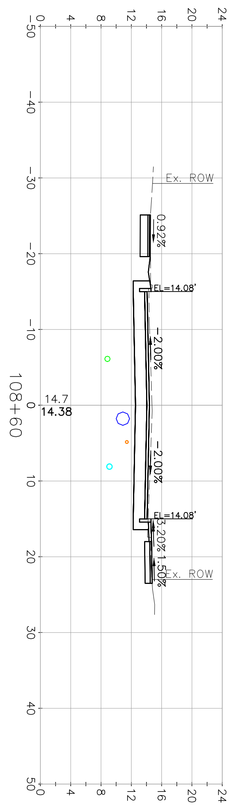

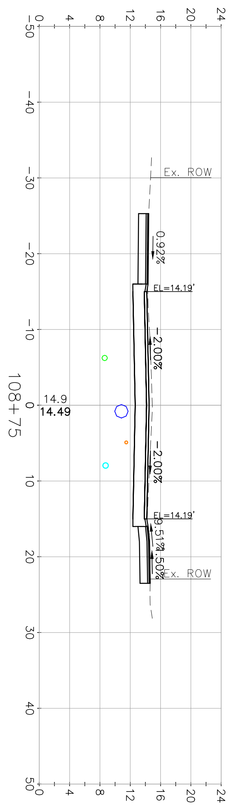

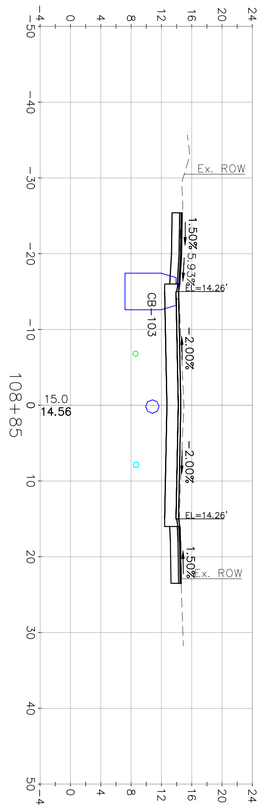

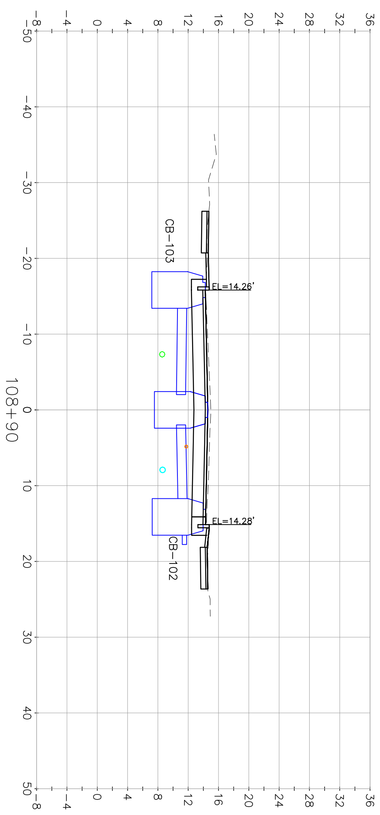

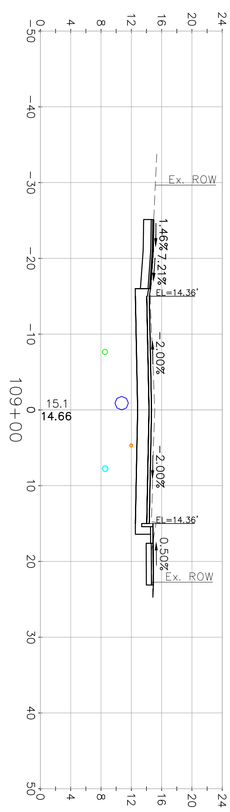

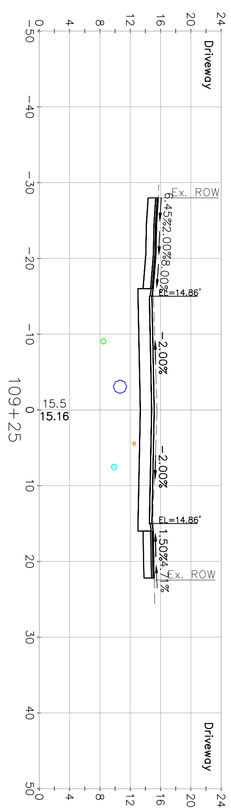

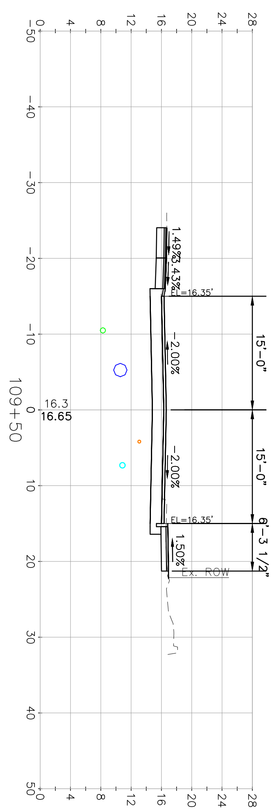

sheet 43 of 54	drawing no. XS-9	City of Portsmouth, New Hampshire Department of Public Works	date: January 2023 / designed by: STF/WAB
		Union Street Area Improvement Project	project no: 1211 / drawn by: WWG
		Cross Sections Union Street	checked by: PAC / approved by: PAC
			scale: 0 10' 20' — Scale: 1" = 10'

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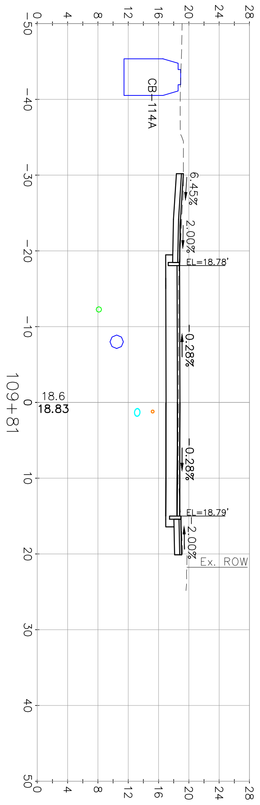

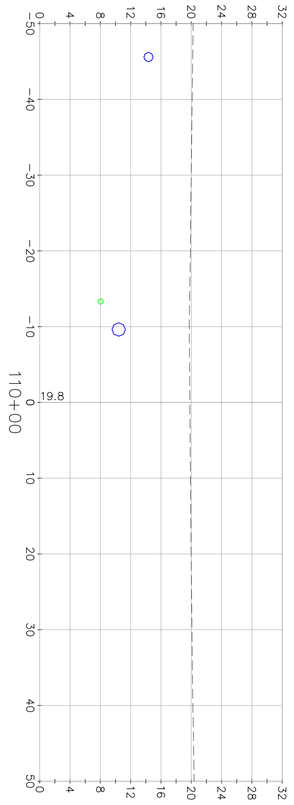

sheet: 44 of 54	drawing no.: XS-10	City of Portsmouth, New Hampshire Department of Public Works	date: January 2023
			designed by: STF/WAB
		Union Street Area Improvement Project	project no: 1211
			drawn by: WWG
			checked by: PAC
			approved by: PAC
		Cross Sections Union Street	scale: 0 10' 20' Scale: 1" = 10'

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designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 10' 20' Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Cross Sections
Austin Street

drawing no.
XS-11

sheet: 45 of 54

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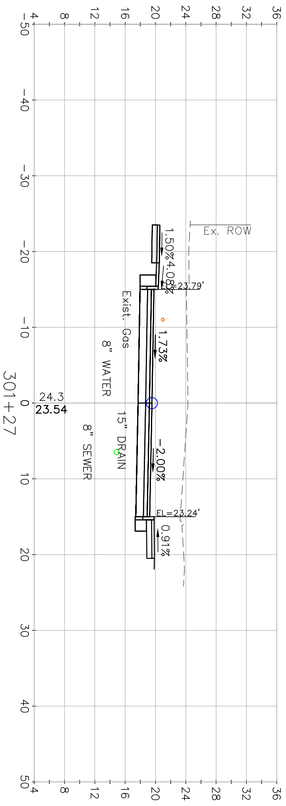

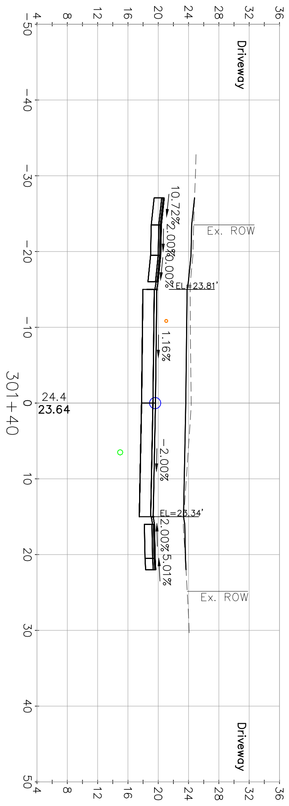

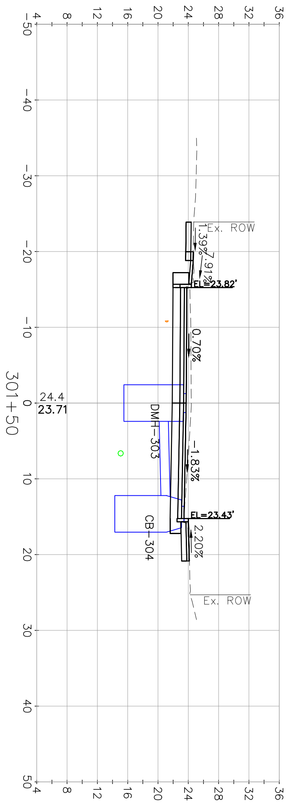

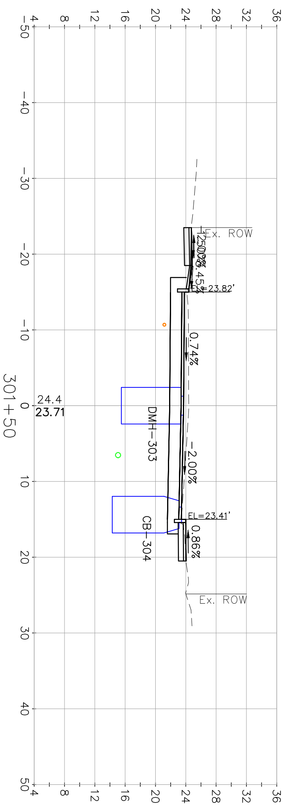

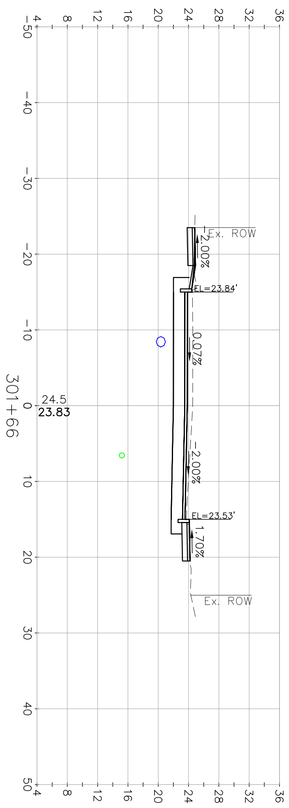

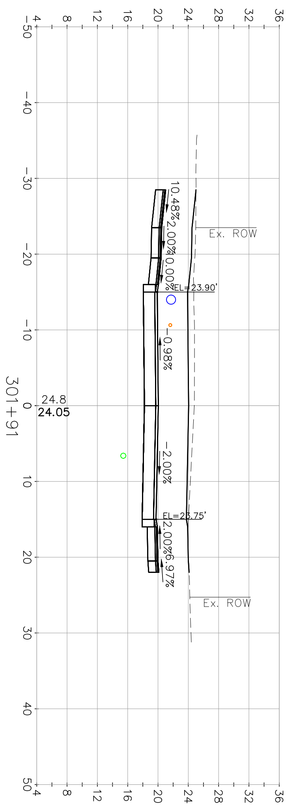

sheet 46 of 54

drawing no. XS-12

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Cross Sections
Austin Street

date:	designed by:
January 2023	STF/WAB
project no: 1211	drawn by: WWG
checked by: PAC	approved by: PAC

scale: 0 10' 20'
Scale: 1" = 10'

STATE OF NEW HAMPSHIRE
PHILIP A. CROBETT
NO. 12271
LICENSED PROFESSIONAL ENGINEER

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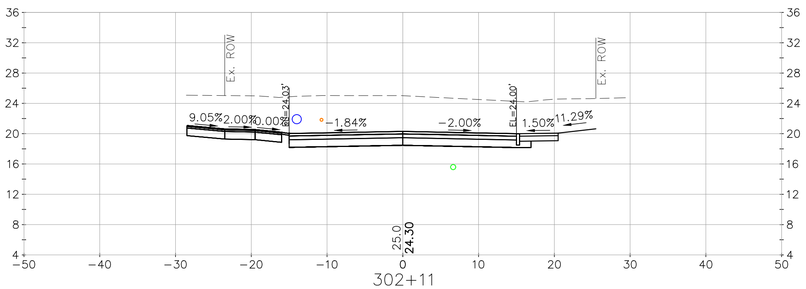

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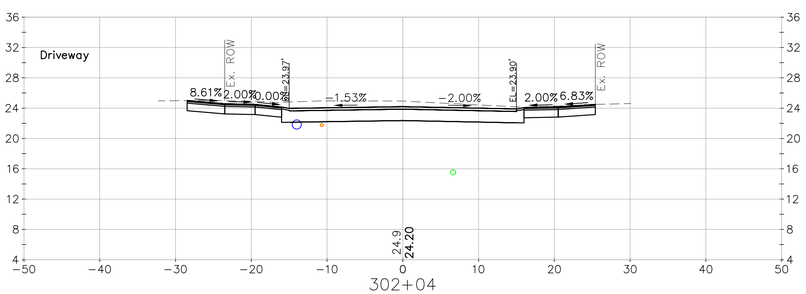

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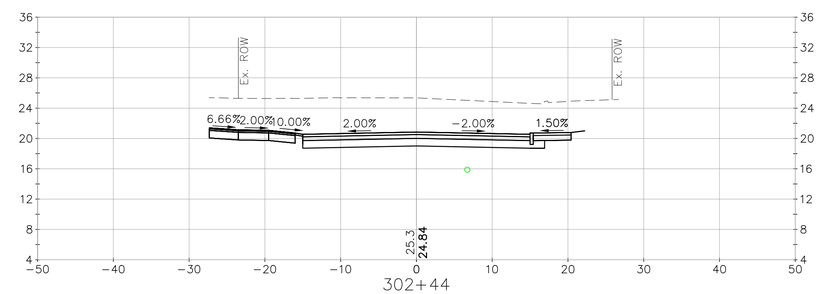

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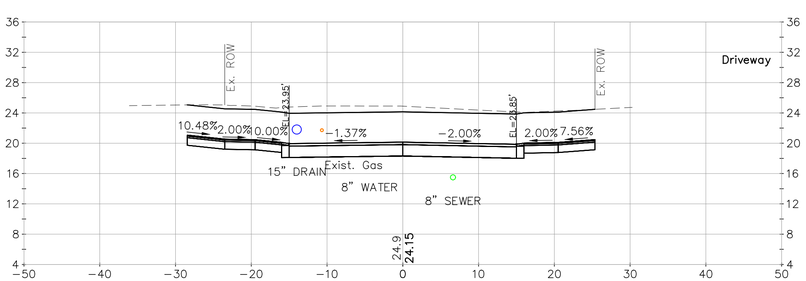

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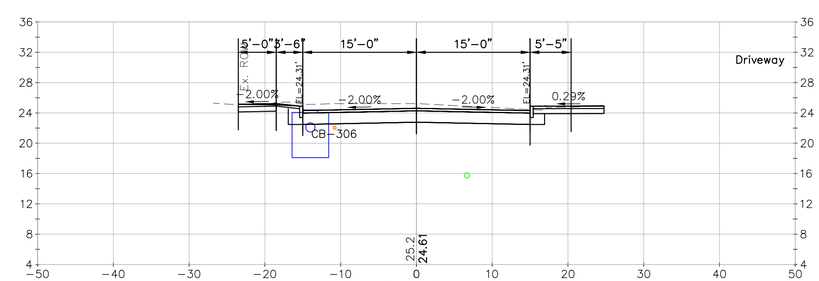

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PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER

designed by: STF/WAB
drawn by: WWG
approved by: PAC
date: January 2023
project no: 1211
checked by: PAC
scale: 0 10' 20'
Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Cross Sections
Austin Street

drawing no.
XS-13

sheet: 47 of 54

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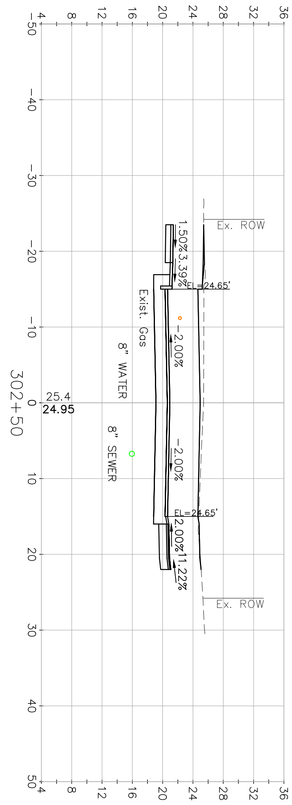

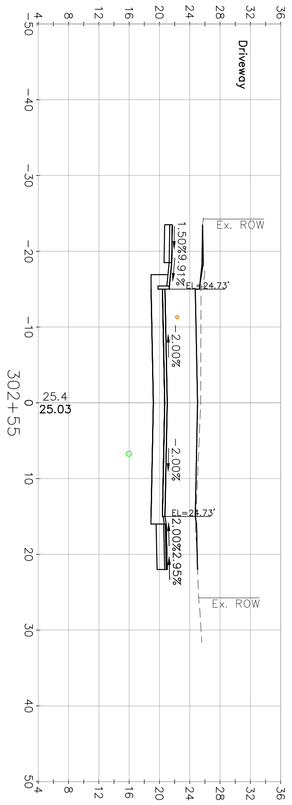

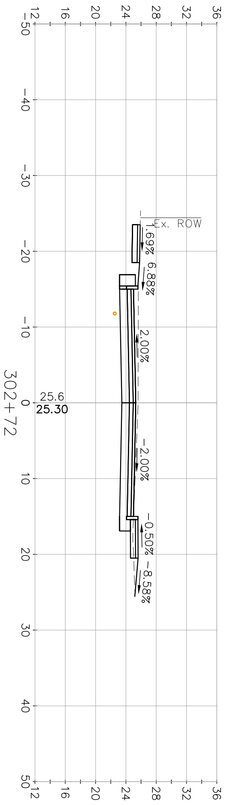

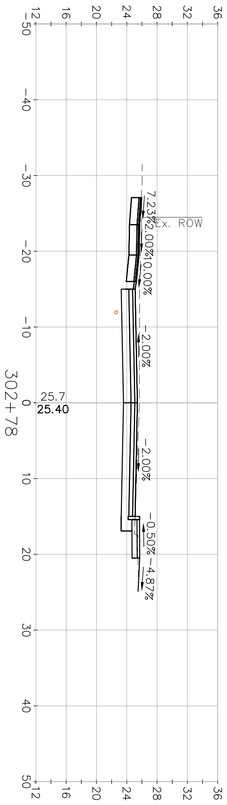

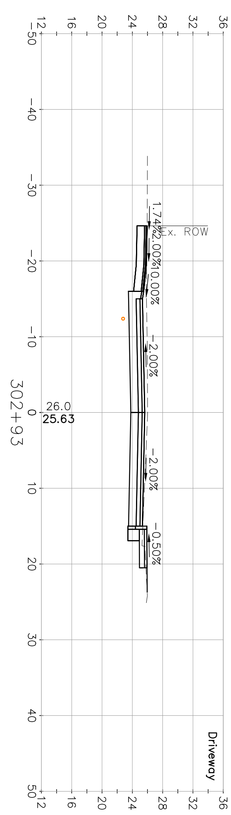

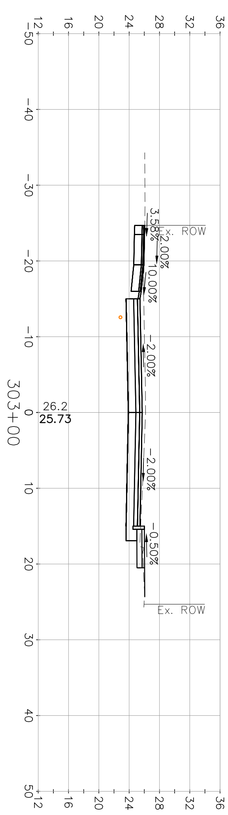

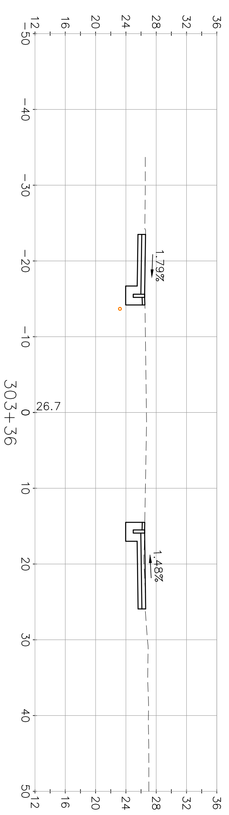

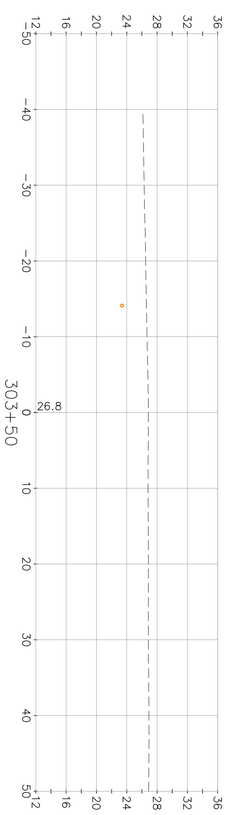

sheet 48 of 54	drawing no. XS-14	City of Portsmouth, New Hampshire Department of Public Works Union Street Area Improvement Project Cross Sections Austin Street	date: January 2023 / designed by: STF/WAB project no: 1211 / drawn by: WWG checked by: PAC / approved by: PAC scale: 0 10' 20' Scale: 1" = 10'

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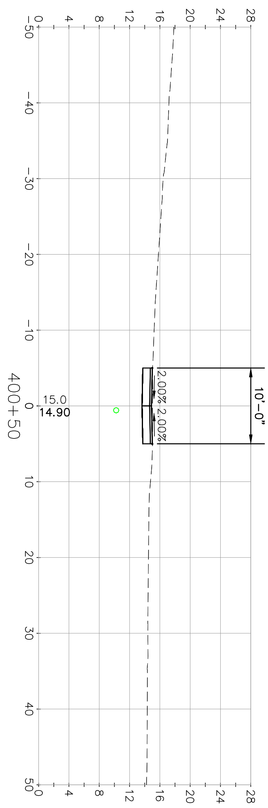

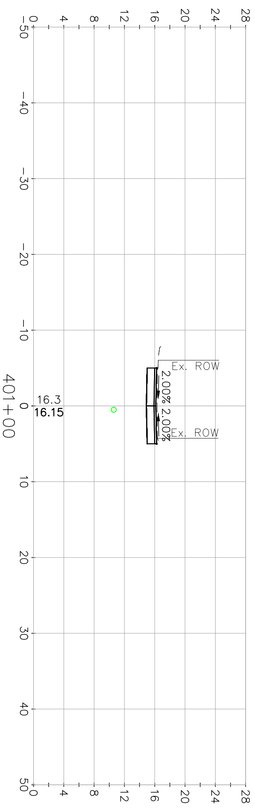

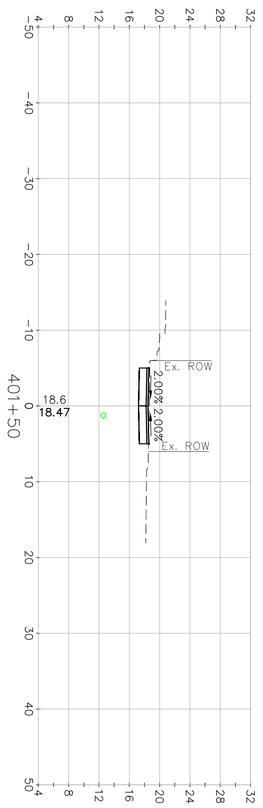

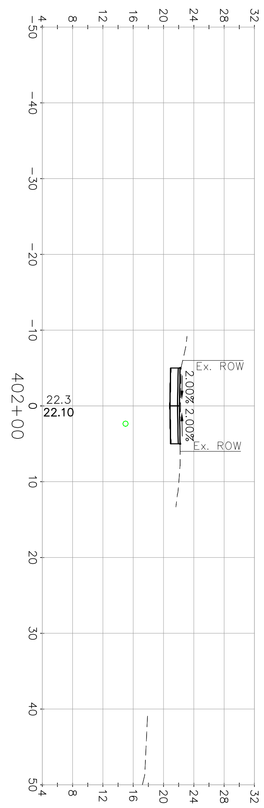

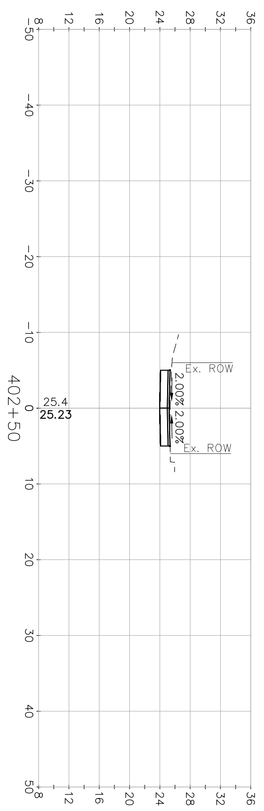

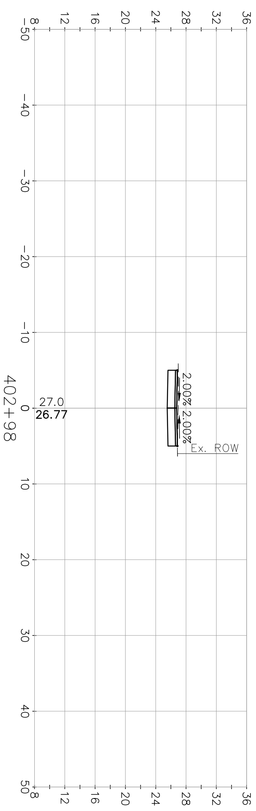

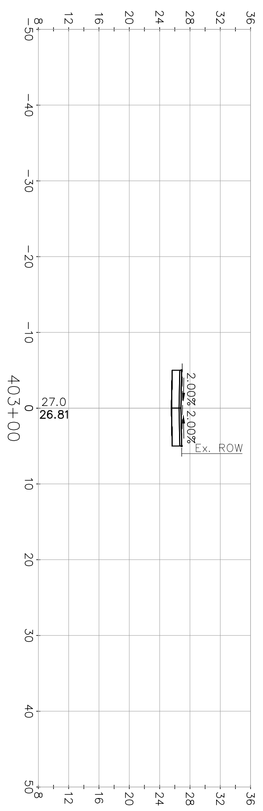

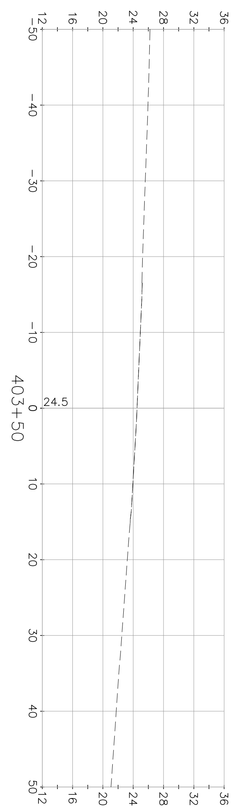

sheet 49 of 54	drawing no. XS-15	City of Portsmouth, New Hampshire Department of Public Works	date: January 2023 / designed by: STF/WAB
		Union Street Area Improvement Project	project no: 1211 / drawn by: WWG
		Cross Sections Coffins Court	checked by: PAC / approved by: PAC
			scale: 0 10' 20' — Scale: 1" = 10'

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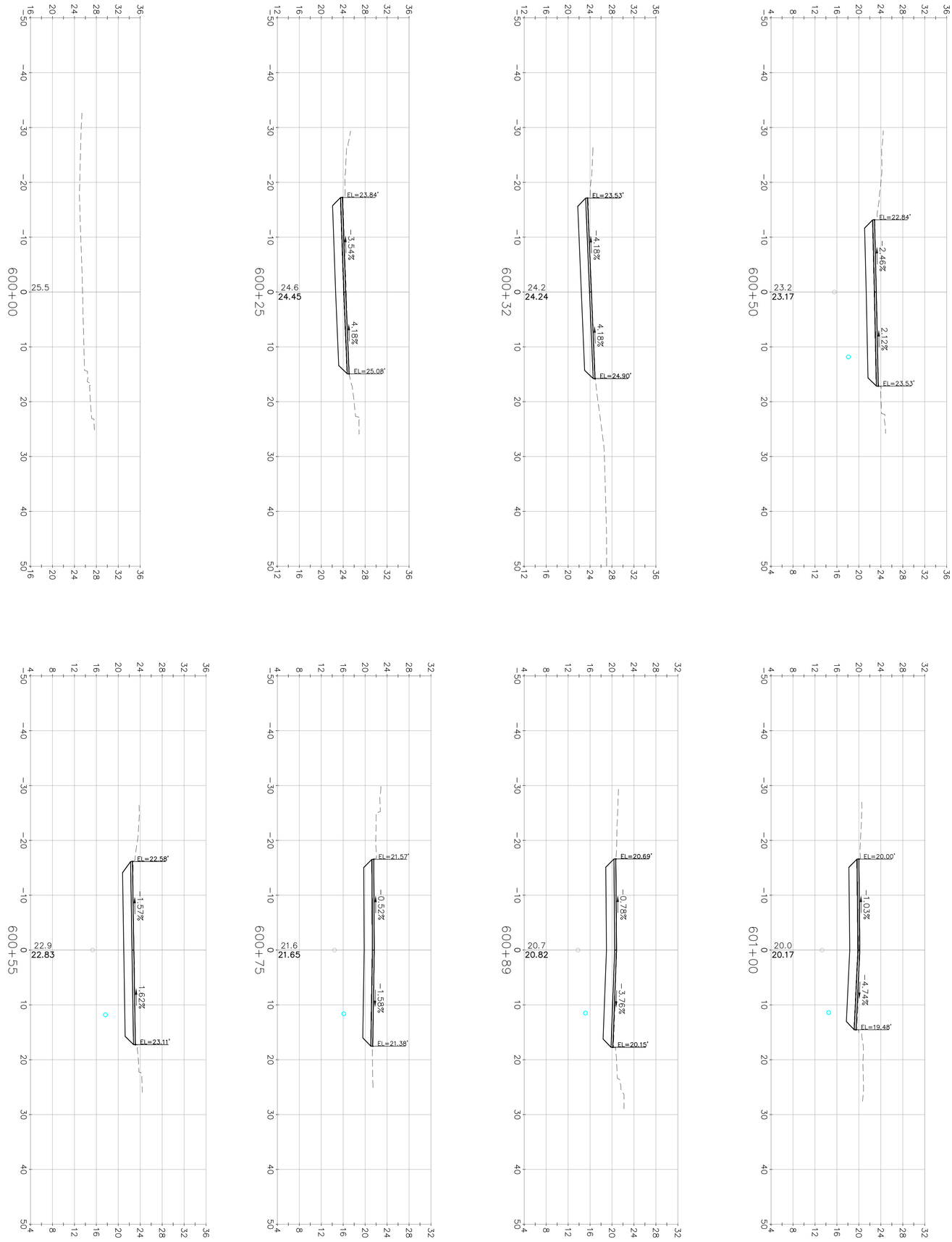

City of Portsmouth, New Hampshire
Department of Public Works

Union Street Area
Improvement Project

Cross Sections
Cabot Street

date:	designed by:
January 2023	STF/WAB
project no: 1211	drawn by: WWG
checked by: PAC	approved by: PAC

scale: 0 10' 20'
Scale: 1" = 10'

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drawing no. XS-16

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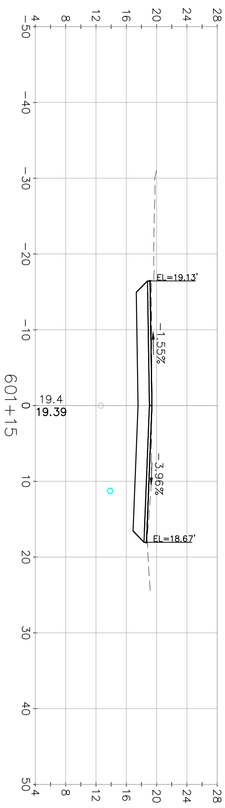

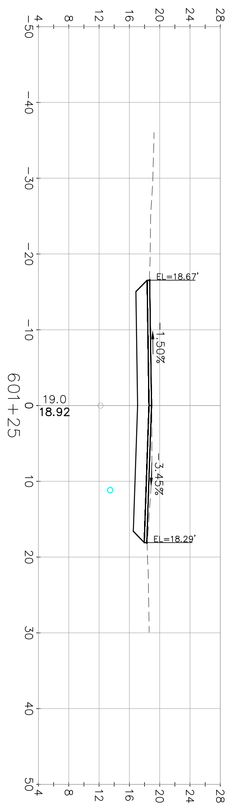

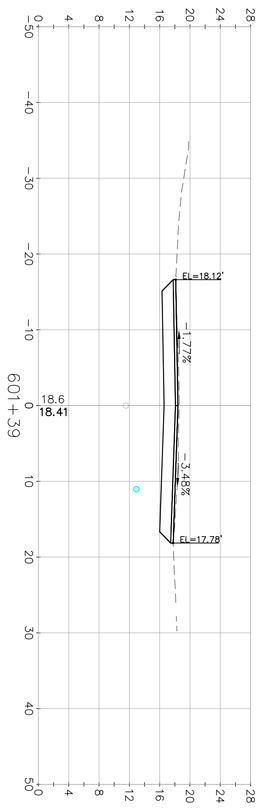

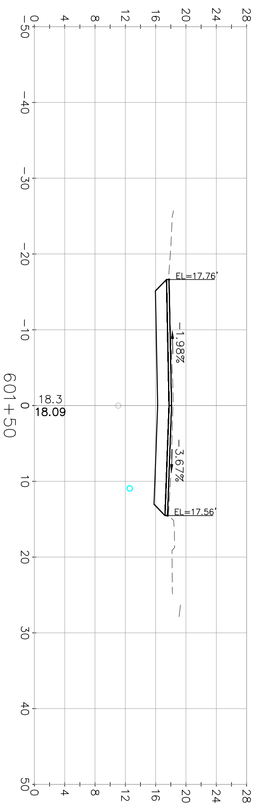

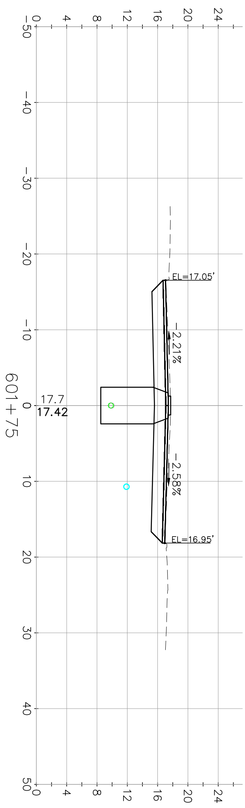

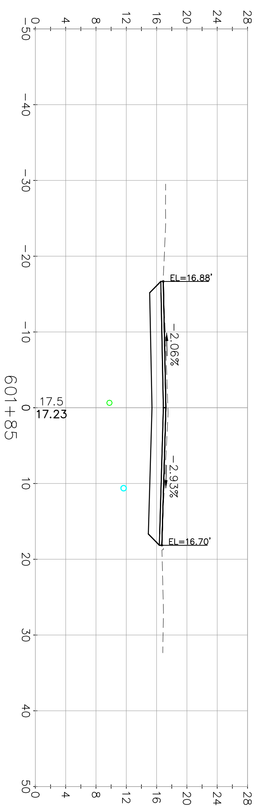

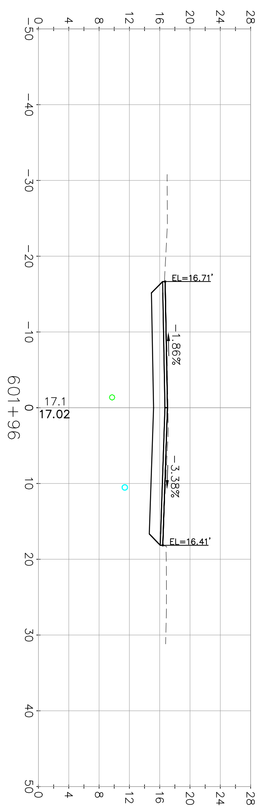

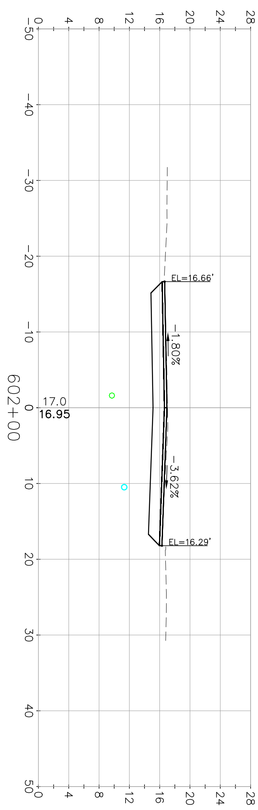

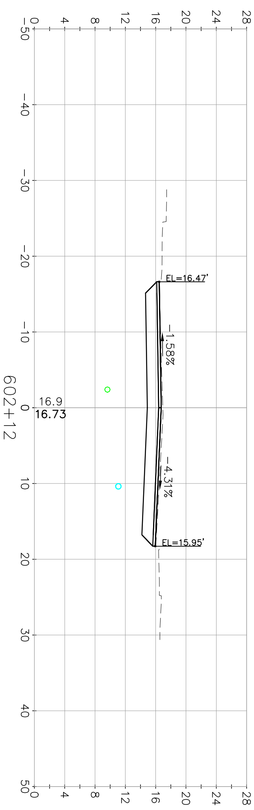

sheet 51 of 54	drawing no. XS-17	City of Portsmouth, New Hampshire Department of Public Works	date: January 2023 / designed by: STF/WAB
		Union Street Area Improvement Project	project no: 1211 / drawn by: WWG
		Cross Sections Cabot Street	checked by: PAC / approved by: PAC

scale: 0 10' 20' — Scale: 1" = 10'

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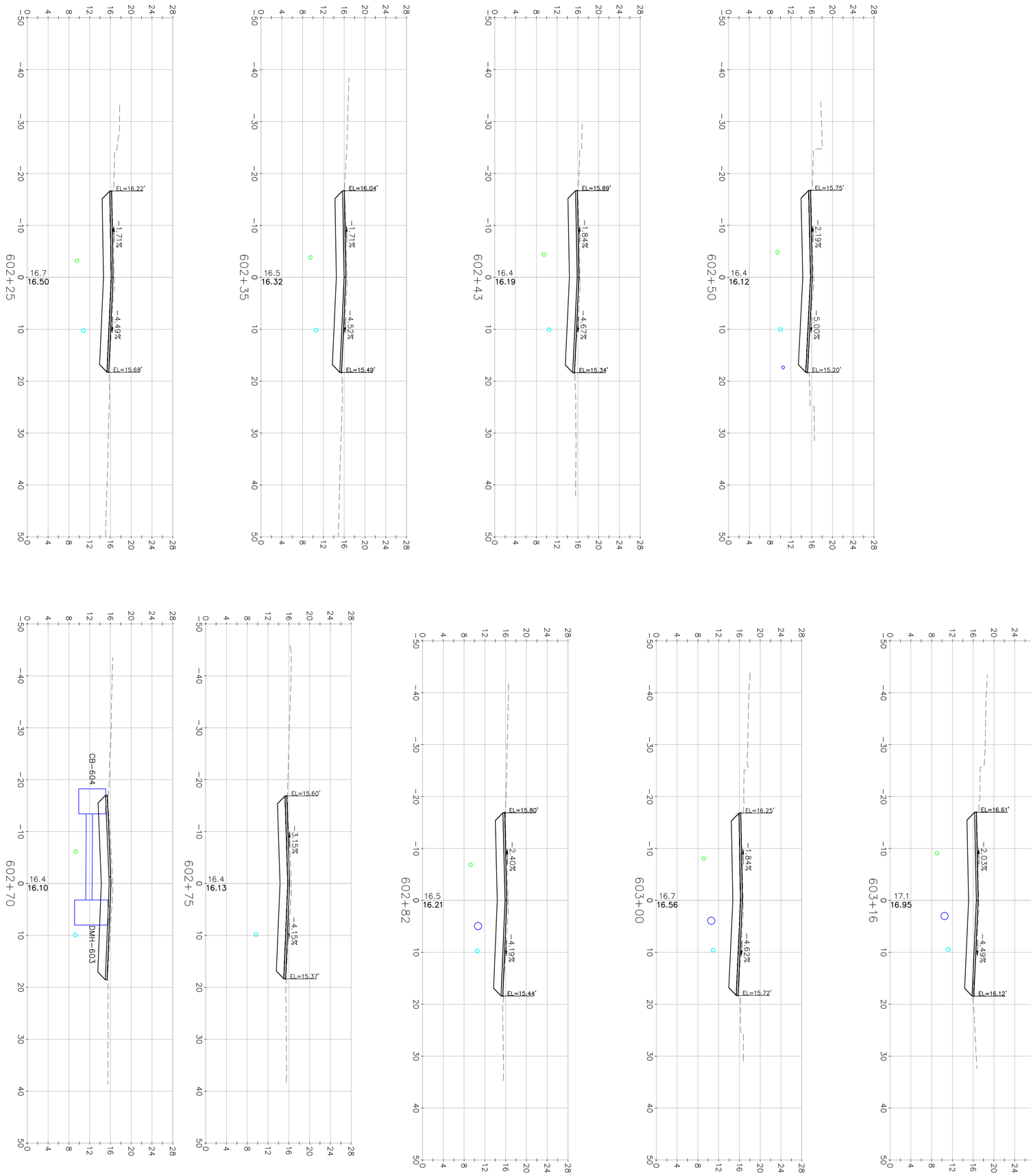

City of Portsmouth, New Hampshire Department of Public Works	date: January 2023	designed by: STF/WAB	
Union Street Area Improvement Project	project no: 1211	drawn by: WWG	
Cross Sections Cabot Street	checked by: PAC	approved by: PAC	
	scale: 0 10' 20' Scale: 1" = 10'		

drawing no. XS-18

sheet: 52 of 54

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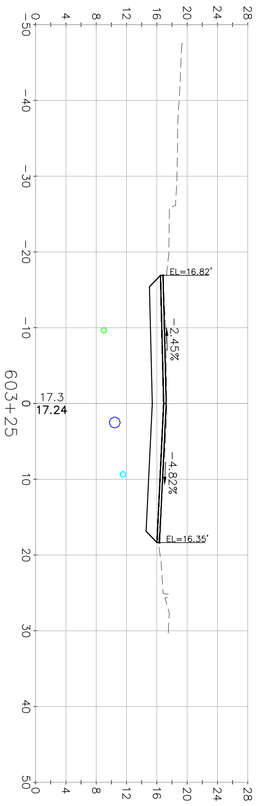
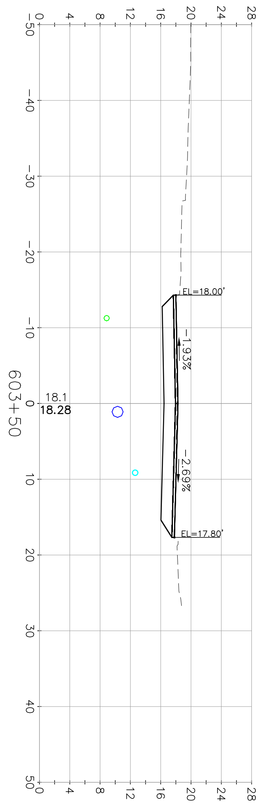
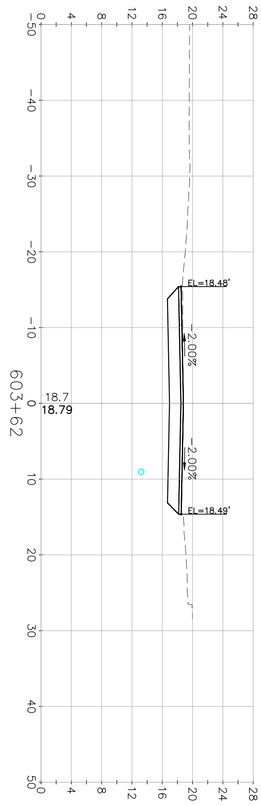
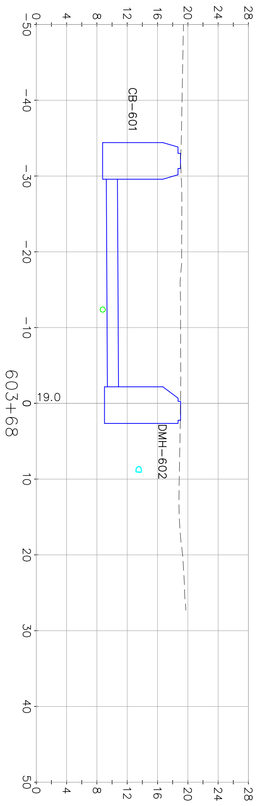
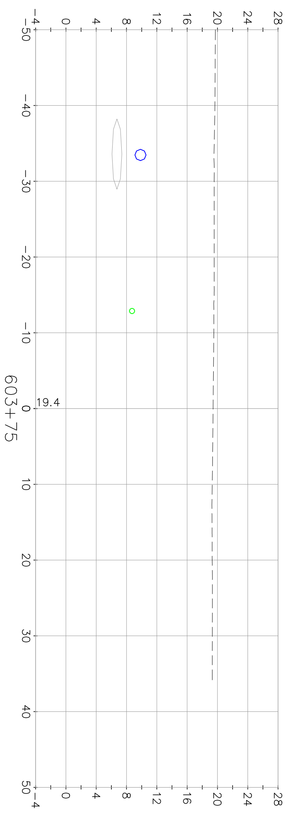
F:\CADD\PROJECTS\1211-Union and Willard Reconstruction\Production\1211 - Union Sections.dwg Date Plotted: Jan 09, 2023 - 5:00pm Plotted By: SPORTER











sheet 53 of 54	drawing no. XS-19	City of Portsmouth, New Hampshire Department of Public Works Union Street Area Improvement Project Cross Sections Cabot Street	date: January 2023 · designed by: STF/WAB project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 10' 20' — Scale: 1" = 10'

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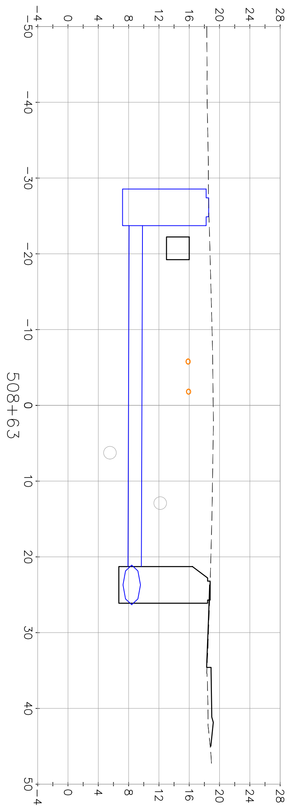
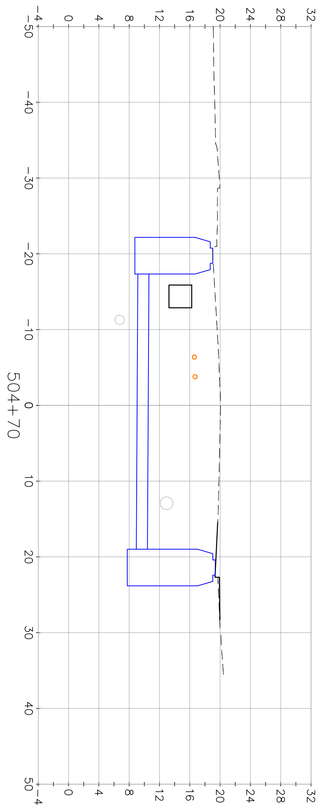
F:\CADD\PROJECTS\271-Union and Willard Reconstruction\Production\271 - Union Sections.dwg Date Plotted: Jan 09, 2023 - 5:00pm Plotted By: SPORTER





sheet: 54 of 54	drawing no: XS-20	City of Portsmouth, New Hampshire Department of Public Works	date: January 2023
			designed by: STF/WAB
			project no: 1211
			drawn by: WWG
		Union Street Area Improvement Project	checked by: PAC
			approved by: PAC
		Cross Sections Middle Street	scale: 0 10' 20' Scale: 1" = 10'

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