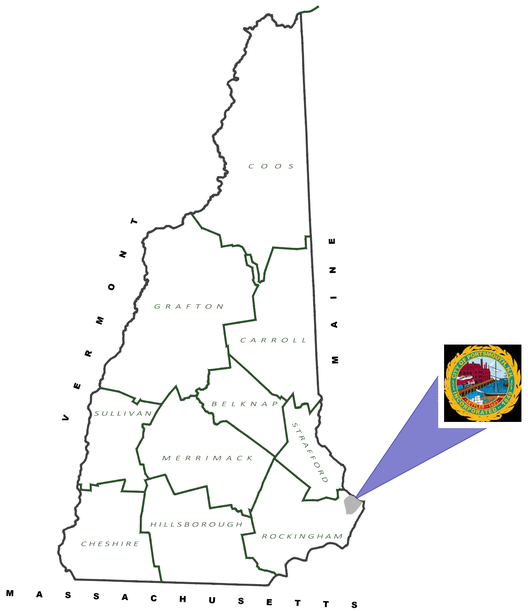
City of Portsmouth, New Hampshire
Department of Public Works
Willard Avenue Area Improvement Project

Issued for Bid

February 2024

Sheet Index



Locus Plan

Prepared For:

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

Prepared By:

CMA ENGINEERS
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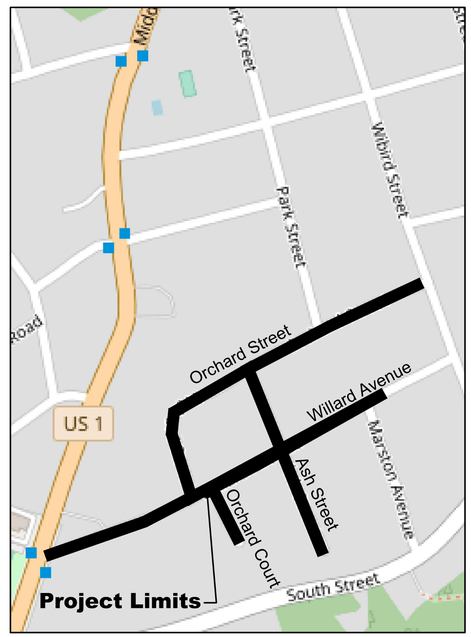
2/2/2024



Project Location

0 40 80 Feet

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 Department of Transportation Webstite at: https://www.dot.nh.gov/doing-business-nhdot/contractors/standard-plans-road-construction

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, sewer cleanouts, catch basin grates, gas valve covers, and water valve covers to be flush with the base pavement grades, then raised to 1/4" below final pavement elevations prior to installation of the final wearing course.

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.

Repair, Removal & Decommissioning of Existing Utilities:

1. For utilities that are to remain in service, the contractor shall repair existing utilities and structures damaged or removed by the contractor's operations.

2. The existing water mains, water services, sewer pipes and sewer 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.

3. Dispose of any remaining waste material in accordance with nh des regulations. If asbestos pipe is encountered, work shall be conducted 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 services 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. After taken out of service, sanitary sewer pipe and manholes within the property limits not removed during installation of new utilities shall be abandoned in place. Abandoning sewer manholes and pipes shall include:
   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 of 3 feet below proposed grade.
   c. The resulting structure and trench shall then be backfilled with sand and properly compacted.
   d. Cut adjacent pipe two feet outside of manhole and plug with flowable fill.

5. Existing underground water mains and sewer pipes that are outside of the new utility excavation limits shall be abandoned in-place. end caps shall be installed at the limits of abandoned sections.

6. Existing drainage pipes and structures within the excavation limits of the proposed utilities shall be removed. The work shall be incidental to the utility excavation and installation. all corrugated metal pipe located within the limits of the paved roadway shall be removed. The remainder of the existing drainage being replaced shall be filled and abandoned.

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.

Boring Notes:

1. Borings indicated thus B-X were made by S.W. Cole Engineering, Inc. in March 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. City of Portsmouth, N.H., Record Drawings, Lincoln Area Sewer Separation, Contract 3b, dated 12/2014, by Underwood Engineers, Inc.
2. 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 (W)
- 8" WATER GATE VALVE (W)
- CURB STOP (CS)
- HYDRANT
- CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE (S)
- 4" WATER MAIN — PW-4
- 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
- PERFORATED DRAIN PIPE
- FOUNDATION DRAIN — PD
- TRENCH PATCH
- ROAD RECONSTRUCTION/TRENCH PATCH
- CONCRETE SIDEWALK
- BRICK SIDEWALK
- GRASS PANEL

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PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF | drawn by: WWG | approved by: PAC | scale:
date: February 2024 | project no: 1211 | checked by: PAC

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
General Notes & Legend

drawing no. N-1

sheet: 2 of 55

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 404. 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 PVC. 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. Where reflected on approved drawings, sewer mains and sewer 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. Constructing water and sewer with less than these separations requires NHDES waiver, pursued through the engineer of record. Notify the engineer prior to construction of any such deviations from these separation requirements.
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 manholes within the project limits not removed during installation of new utilities shall be abandoned in place. Abandoning sewer manholes shall include:
   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 in 8" lifts.
   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.
9. After taken out of service, sanitary sewer pipe within the project limits not removed during installation of new utilities shall be abandoned in place. Abandoning sewer pipe shall include:
   a. All pipe to be abandoned in place and shall be cut & plugged at both ends, subsidiary.
   b. Pipes exceeding 12–inch diameter, VCP pipes, and other pipes as directed by the engineer, to be abandoned, will be filled 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. 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).

Temporary Bypass Pumping Notes:

1. The Contractor shall provide a bypass pumping system as necessary to maintain continuous sewer service. The Contractor shall be responsible for providing whatever is necessary to allow for continuation of sewage flow from upstream and adjacent to the construction work area. The flow shall be maintained with a round–the–clock fail–safe sewer service which shall not result in any spills.
2. See sheet OSP–1, OSP–2 and technical specification for more information and requirements.

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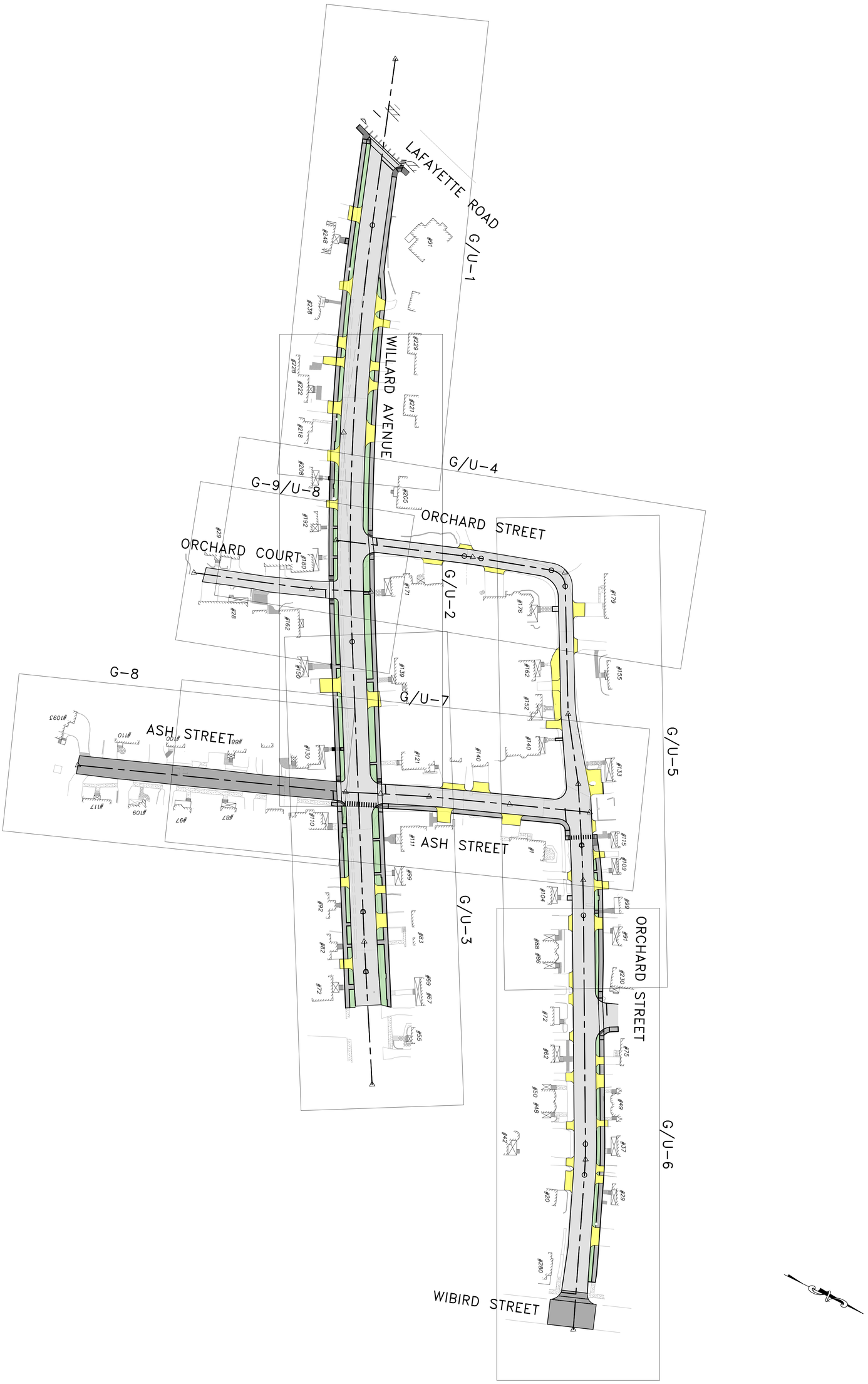
checked by: PAC

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area
Improvement Project
Utility Notes

drawing no. N-2

sheet: 3 of 55



sheet 4 of 55	City of Portsmouth, New Hampshire Department of Public Works	date: February 2024	designed by: CFC/STF
drawing no. N-3	Willard Ave Area Improvement Project	project no: 1211	drawn by: WWG
	Sheet Index	checked by: PAC	approved by: PAC
		scale: 0 60' 120' Scale: 1" = 60'	

2/2/2024

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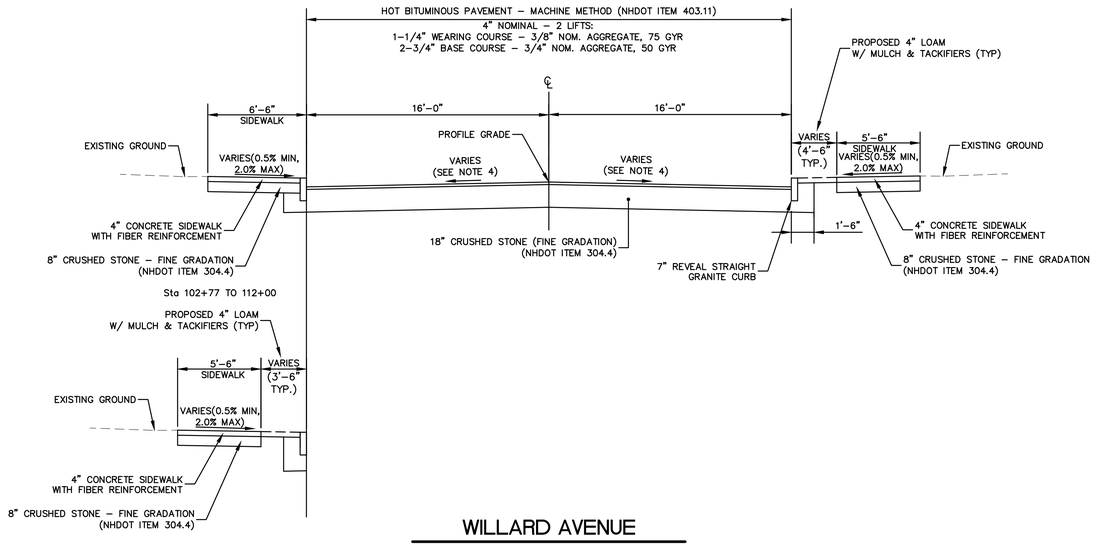

WILLARD AVENUE

Not to Scale

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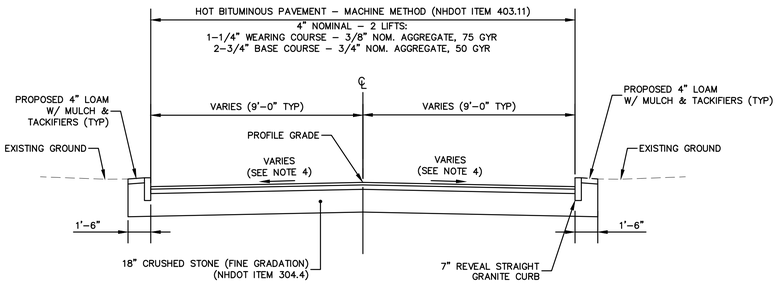

ORCHARD STREET

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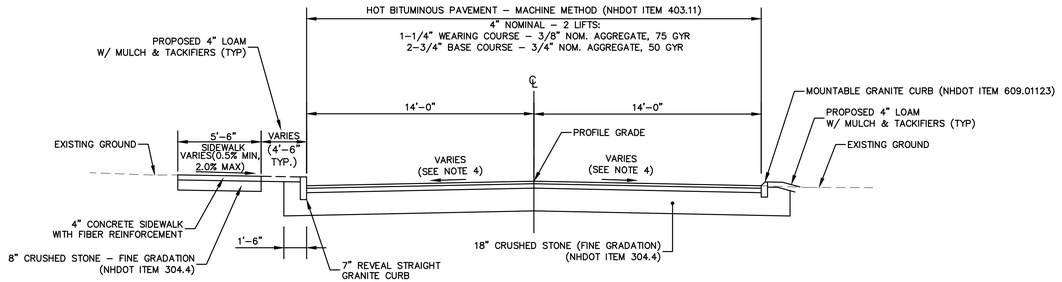
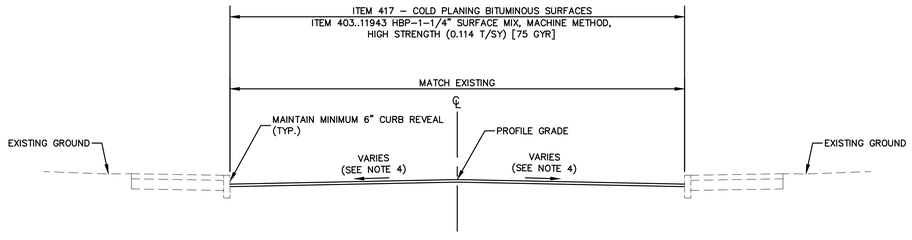


ORCHARD STREET

Not to Scale

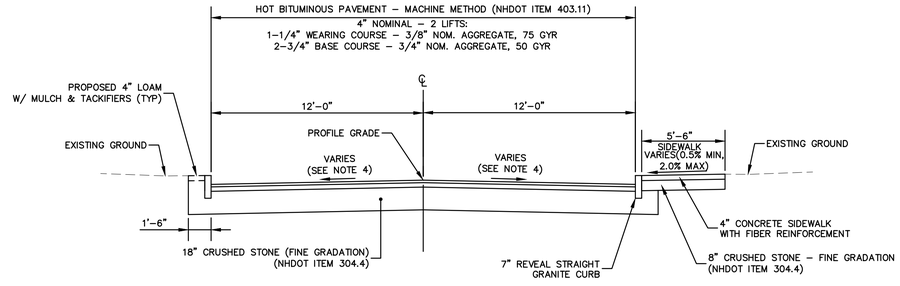
Sta 206+20 TO 211+97



ASH STREET SOUTH

Not to Scale

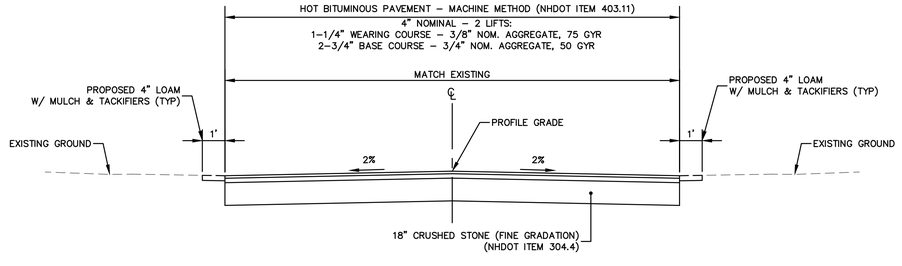
Sta 400+00 TO 403+40



ASH STREET NORTH

Not to Scale

Sta 403+80 TO 406+20



ORCHARD COURT

Not to Scale

Sta 300+13 TO 301+73

NOTES:

1. The 18" crushed stone roadway base shall be compacted in two 9" lifts.
2. 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.
3. Pavement joint adhesive required on longitudinal joints (all lifts), subsidiary to paving.
4. See general plan profiles for superelevation transition sections. See cross sections for additional cross slope grades.

no.	revision	date	by
1	Issued for Bid	2/2/2024	PAC

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

2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Typical Sections

drawing no.
TS-1

sheet: 5 of 55

F:\CADD\PROJECTS\1211-Union and Willard Reconstruction\Production\1211 – Willard Typicals.dwg Date Plotted: Feb 02, 2024 – 12:34pm Plotted By: WCHAMBERLAIN

LEGEND:

- IRON ROD FOUND
- IRON PIPE FOUND
- GRANITE POST FOUND
- RAILROAD SPIKE FOUND
- SURVEY NAIL FOUND
- CHAIN LINK FENCE
- FENCE
- FENCE
- 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
- 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
- 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
- STUMP
- 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
- MISC STONE PAVERS
- LA — LANDSCAPED AREA
- ×12.5 — SPOT GRADE
- GCS — GRANITE COBBLE STONES
- ETW — EDGE OF TRAVELED WAY
- COVERED PORCH
- LIMTS OF PAVEMENT CUT
- PROPERTY LINES

SEWER MANHOLES

SMH# 847
RIM= 47.48
(1) INV IN 16"AC= 39.59
(2) INV OUT 15"VCP= 39.58

SMH #848
RIM EL= 47.01
(1) INV IN 12"VCP= 35.40
(2) INV IN 15"VCP= 35.39
(3) INV OUT 15"VCP= 35.31

SMH# 849
RIM EL= 46.22
(1) INV IN 15"VCP= 34.94
(2) INV OUT 15"VCP= 34.93
18" CMP OVERFLOW= 35.04

SMH# 850
RIM EL= 35.55

SMH# 851
RIM EL= 35.64
(1) INV IN 6" = 30.08
(2) INV IN 15" = 29.76
(3) INV IN 12"VCP= 29.15
(4) INV IN 15"VCP= 29.64
(5) INV IN 10"PVC= 30.10
(6) INV IN 6"= 30.29
(7) INV IN 18"ACP= 28.46
(8) INV OUT 18"ACP= 28.44

SMH# 852
RIM EL= 33.88
(1) INV IN 6" = 30.03
(2) INV IN 18"VCP= 28.31
(3) INV IN 8" = 30.38
(4) INV IN 6" = 30.30
(5) INV OUT 18'VCP= 28.18

SMH# 853
RIM EL= 36.29
(1) INV IN 18" = 27.76
(2) INV OUT 18" = 27.78

SMH# 1125
RIM EL= 41.62
(1) N/A
(2) N/A
CL INVERT= 32.28

SMH# 1265
RIM EL= 47.09
(1) INV IN 12"VCP= 36.98
(2) INV IN 10"ACP= 37.20
(3) INV OUT 12"VCP= 36.90

SMH# 2225
RIM EL= 35.20

SMH# 5030
RIM EL= 47.22
INACCESSIBLE

SMH# 5779
RIM EL= 35.89
(1) INV IN 6"PVC= 24.77
(2) INV IN 24"PVC= 23.85
(3) INV OUT 24"PVC= 23.70

SMH# 5982
RIM EL= 35.39
(1) INV IN 18"PVC= 24.87
(2) INV IN 18"PVC= 24.79
(3) INV OUT 24"PVC= 23.85

SMH# 5992
RIM EL= 39.88
(1) INV IN 8"PVC
(2) INV OUT 8"PVC
CL INVERT= 32.46

SMH# 5993
RIM EL= 39.57
(1) INV IN 10"PVC
(2) INV OUT 8"PVC
CL INVERT= 33.64
NO FLOW

DRAIN MANHOLES

DMH# 5332
RIM EL= 40.45
(1) INV IN 8"CI= 37.27
(2) INV IN 18"ACP= 32.73
(3) INV IN 8"ACP= 37.26
(4) INV OUT 18"ACP= 32.66

DMH# 5346
RIM EL= 36.34
(1) INV IN 10"CI= 31.99
(2) INV IN 18"ACP= 30.01
(3) INV OUT 18"ACP= 29.95

DMH# 5350
RIM EL= 36.86
(1) INV IN 18"ACP= 28.54
(2) INV OUT 18"ACP= 28.46

DMH# 5351
RIM EL= 36.10
(1) INV IN 18"ACP= 28.40
(2) INV OUT 18"ACP= 28.31
TOP OF 18"VCP SEWER = 29.62

DMH# 5352
RIM EL= 35.89
(1) INV IN 18"ACP= 27.60
(2) INV IN 10"ACP= 31.54
(3) INV OUT 18"ACP= 27.55

DMH# 5354
RIM EL= 36.39
(1) INV IN 12"HDPE= 29.45
(2) INV IN 18"= 29.80
(3) INV IN 18"= 26.85
(4) INV OUT 24"= 26.75

DMH# 5422
RIM EL= 45.50
(1) INV IN 8"PVC= 38.98
(2) INV IN 18"CMP= 34.70
(3) INV OUT 18"_= 34.62

DHM# 25390
RIM EL= 35.79
(1) INV IN 18"ACP= 27.00
(2) INV IN 12"HDPE= 30.24
(3) INV OUT 18"_= 34.62

DMH# 25397
RIM EL= 39.55
(1) INV IN 6"HDPE= 35.40
(2) INV IN 12"HDPE= 35.15
(3) INV OUT 12"HDPE= 35.07

DHM# 25410
RIM EL= 39.85
(1) INV IN 15"HDPE= 34.30
(2) INV IN 12"HDPE= 33.90
(3) INV OUT 18" = 33.45

DMH# 25414
RIM EL= 35.89
(1) INV IN 18"ACP= 29.79
(2) INV IN 10"= 31.59
(3) INV OUT 18"ACP= 29.69

DMH# 26288
RIM EL= 36.16
(1) INV IN 10"ACP= 29.41
(2) INV IN 18"ACP= 29.26
(3) INV OUT 18"ACP= 29.21

DMH# 26289
RIM EL= 35.56
(1) INV IN 18"VCP= 28.85
(2) INV OUT 18"VCP= 28.91
TOP OF 15" SEWER = 29.98

CATCH BASINS

CB# 1074
RIM EL= 47.00
(1) INV OUT 15"RCP= 43.00

CB# 1075
RIM EL= 46.92
(1) INV OUT 6"=42.13

CB# 4137
RIM EL= 39.45
(1) INV OUT 8"PVC= 37.08

CB# 4138
RIM EL= 35.94
(1) INV OUT 6" = 33.17

CB# 4139
RIM EL= 35.08
(1) INV OUT 8"PVC= 31.91

CB# 4140
RIM EL= 34.70
(1) INV OUT 4"PVC= 32.38

CB# 4141
RIM EL= 35.29
(1) INV OUT 8"PVC= 32.60

CB# 4142
RIM EL= 35.71
(1) INV IN 4"PVC= 33.48
(2) INV OUT 8"PVC= 33.28

CB# 4143
RIM EL= 34.19
(1) INV IN 10" = 31.78
(2) INV IN 3"PVC= 33.01
(3) INV IN RUBBER HOSE= 33.09
(4) INV OUT 6"PVC= 31.97

CB# 4144
RIM EL= 39.96
(1) N/A
WATER= 36.01

CB# 4145
RIM EL= 34.63
(1) INV OUT 10"ACP= 32.28

CB# 4146
RIM EL= 33.58
(1) INV IN 8"PVC= 31.19
(2) INV IN 6"PVC= 30.09
(3) INV OUT 4"PVC= 29.88

CB# 4147
RIM EL= 33.69
(1) INV OUT 10"ACP= 30.85

CB# 4148
RIM EL= 35.24
(1) INV OUT 8"PVC= 32.97
(2) INV OUT 4"PVC= 32.72

CB# 4149
RIM EL= 35.98
(1) INV OUT 6"PVC= 33.63

CB# 4150
RIM EL= 35.47
(1) INV OUT 6"PVC= 33.29

CB# 4151
RIM EL=34.87
(1) INV OUT 8"PVC= 32.34

CB# 4156
RIM EL= 34.98
(1) INV OUT 10"ACP= 33.84

CB# 4157
RIM EL= 35.44
(1) INV IN 10"ACP= 31.11
(2) INV OUT 10"ACP= 30.94

CB# 4158
RIM EL= 35.43
(1) INV OUT 10"ACP= 33.13

CB# 4163
RIM EL= 34.90
(1) SNOUT

CB# 4410
RIM EL= 39.74
(1) INV OUT 8"PVC= 37.47

CB# 4411
RIM EL= 34.95
(1) INV OUT 10"= 32.07

CB# 4688
RIM EL= 45.45
(1) INV IN 6"= 42.93
(2) INV OUT 10"= 42.73

CB# 4689
RIM EL= 44.51
(1) INV OUT 10"PVC= 42.60

CB# 4691
RIM EL= 46.84
(1) INV OUT 6"PVC= 42.43

CB# 10299
RIM EL= 35.90
(1) INV IN 6"PVC= 31.69
(2) INV OUT SNOUT

CB# 10300
RIM EL= 36.53
(1) INV IN 12"HDPE= 31.99
(2) INV OUT SNOUT

CB# 1266
RIM EL= 47.47
(1) CL INV 6"ACP= 41.10

CB# 1267
RIM EL= 45.79
(1) INV IN 6"VCP= 38.14
(2) INV IN 12"HDPE= 39.25
(3) INV OUT 6"VCP= 38.10

CB# 25398
RIM EL= 39.42
(1) INV IN 15"HDPE= 35.83
(2) INV IN 12"HDPE= 35.14
(3) INV OUT 15"HDPE= 34.92

CB# 25399
RIM EL= 39.40
(1) INV IN 6" = 36.20
(2) INV OUT 12"HDPE= 36.20

CB# 1
RIM EL= 45.60
(1) INV IN 12"HDPE= 40.85
(2) INV IN 6"HDPE= 40.85
(3) INV OUT 12"HDPE= 40.85

CB# 2
RIM EL= 45.90
(1) INV IN 12"HDPE = 39.75
(2) INV OUT 12"HDPE= 39.95

NOTES:

1. THIS PLAN IS BASED ON A FIELD SURVEY PERFORMED 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)
   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. ENGINEER OR 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.

PROJECT TEMPORARY BENCHMARKS

I.D.	DESCRIPTION	ELEV.
A	SURVEY NAIL SET IN UTILITY POLE PSNH 119 2 (1.0' ABOVE GROUND)	37.12
B	SURVEY NAIL SET IN UTILITY POLE PSNH 119 3 (1.0' ABOVE GROUND)	37.02
C	SPIKE SET IN UTILITY POLE NETT 6 (1.0' ABOVE GROUND)	41.03
D	SPIKE SET IN UTILITY POLE PSNH 119 7 (1.0' ABOVE GROUND)	43.07
E	SURVEY NAIL SET IN UTILITY POLE PSNH 120 9 (1.0' ABOVE GROUND)	38.02
F	SURVEY NAIL SET IN UTILITY POLE PSNH 120 7 (1.0' ABOVE GROUND)	37.78
G	TOP FLANGE BOLT ON HYDRANT	41.71
H	SMALL SURVEY NAIL SET ON GRANITE CURB	36.42
I	SURVEY NAIL SET IN UTILITY POLE PSNH 120 11 (1.0' ABOVE GROUND)	38.40
J	SURVEY NAIL SET IN UTILITY POLE PSNH 120 14 (1.0' ABOVE GROUND)	46.93
K	SURVEY NAIL SET IN UTILITY POLE PSNH 122 3 (1.0' ABOVE GROUND)	53.10

REV. NO.	DATE	DESCRIPTION	APPR'D

EXISTING CONDITIONS PLAN
WILLARD AVENUE IMPROVEMENT PROJECT
WILLARD AVENUE, ORCHARD & ASH STREETS & ORCHARD COURT
PORTSMOUTH, NEW HAMPSHIRE
CMA ENGINEERS, INC.

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

JV — PROJECT MGR
GTD — DRAWN BY

DATE: PRELIMINARY
JOB NO: 23944
SCALE: 1" = 20'
DWG NAME: 23944
PLAN NO: 23944
SHEET: 6 OF 6

no.	revision	date	by
1	Issued for Bid	2/2/2024	PAC

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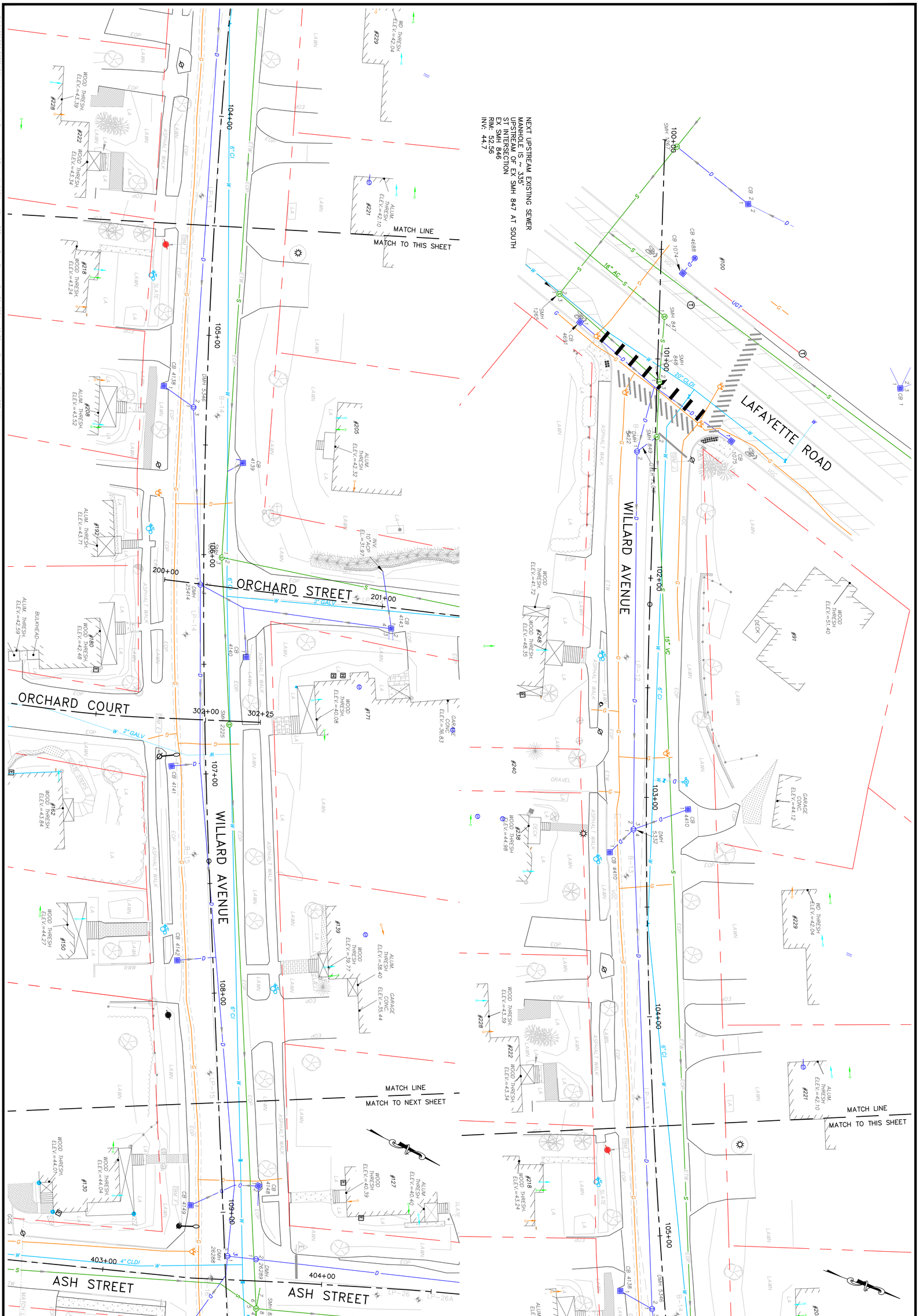
designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 0 20' 40' — Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Existing Conditions Plan

drawing no.
ECP-1

sheet: 6 of 55



sheet: 7 of 55	drawing no. ECP-2	City of Portsmouth, New Hampshire Department of Public Works Willard Ave Area Improvement Project Existing Conditions Plan	date: February 2024 · designed by: CFC/STF project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 20' 40' Scale: 1" = 20'

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MATCH LINE
MATCH TO PREVIOUS SHEET

WILLARD AVENUE

ASH STREET

ASH STREET

ORCHARD STREET

WILLARD AVENUE

ORCHARD COURT

MATCH LINE
MATCH TO NEXT SHEET

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approved by: PAC
scale: 40' 20' 0 Scale: 1" = 20'

date: February 2024
project no: 1211
checked by: PAC

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area Improvement Project

Existing Conditions Plan

drawing no. ECP-3

sheet: 8 of 55

MATCH LINE
MATCH TO PREVOUS SHEET

MATCH LINE
MATCH TO THIS SHEET

MATCH LINE
MATCH TO THIS SHEET

ORCHARD STREET

ASH STREET

WIBIRD STREET

203+00
204+00
205+00
206+00
207+00
208+00
209+00
210+00
211+00
212+00
212+45
406+00
406+50

BRICK PLANTER
ALUM. THRESH. ELEV.=51.33
#179
CONC. ELEV.=48.57
SMH #1125
2" GALV
CB 4144
WD THRESH ELEV.=45.63
#176
WOOD THRESH. ELEV.=43.42
#162
#152
WOOD THRESH ELEV.=43.09
WOOD THRESH ELEV.=43.31
#140
ALUM. THRESH. ELEV.=35.33
WOOD THRESH. ELEV.=47.86
#155
ALUM. THRESH. ELEV.=47.44
#133
#115
WOOD THRESH. ELEV.=39.91
WOOD THOLD. ELEV.=39.92
#109
#99
WOOD THRESH. ELEV.=40.45
WOOD THRESH. ELEV.=40.43
#91
WOOD THRESH. ELEV.=39.59
#230
ASPHALT WALK
CB
SMH 853
6" CI
DMH 5350
DMH 5351
CB 4145
STEEL RETAINING WALL
#1
ALUM. THRESH. ELEV.=39.44
SECOND STORY
#104
ALUM. THRESH. ELEV.=40.43
#88
#86
WOOD THRESH. ELEV.=40.18
4" CI
8" DI

#99
WOOD THRESH. ELEV.=40.45
WOOD THRESH. ELEV.=40.43
#91
WOOD THRESH. ELEV.=39.59
#230
2 STONE STEPS
CB 4411
ALUM. THRESH. ELEV.=39.90
#75
FF. CNC. ELEV.=36.80
AL. THRESH. ELEV.=43.27
#49
WOOD THRESH ELEV.=41.99
#37
WOOD THLD ELEV.=40.89
#29
CB 4158
CB 4156
CB 4157
DMH 5352
#88
#86
WOOD THRESH. ELEV.=40.18
#72
WOOD THRESH. ELEV.=40.50
#62
WOOD THRESH. ELEV.=40.31
#50
#48
ALUM. THRESH. ELEV.=41.92
#20
ALUM. THRESH. ELEV.=36.88
#42
WOOD THRESH ELEV.=40.03
CB 416.3
SMH 5982
SMH 5779
DMH 5354
CB 25390
#280
WOOD THRESH. ELEV.=40.85
CB 10300
CB 10299
TBM H

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drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 0 20' 40' Scale: 1" = 20'

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Existing Conditions Plan

drawing no.
ECP-4

sheet: 9 of 55

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designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: Scale: 1" = 20'
0 20' 40'

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Existing Conditions Plan

drawing no.
ECP-5

sheet: 10 of 55

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LEGEND

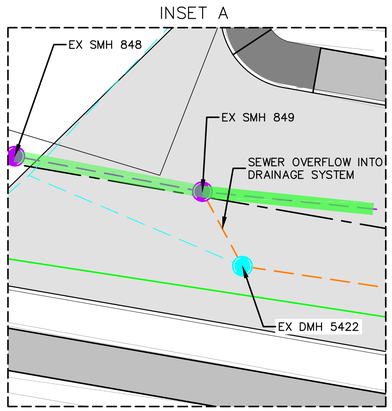
- EXISTING SEWER
- HIGH WASTEWATER FLOW SEWER CONVEYANCE MAINS (LAFAYETTE RD PUMP STATION FLOWS)
- EXISTING DRAINAGE
- EXISTING COMBINED SEWER AND DRAINAGE
- REPLUMB SEWER SERVICE TO RECONFIGURE ROUTING
- CONFIRM SEWER SERVICE LOCATION AND CONNECTION POINT TO EXISTING SEWER MAIN

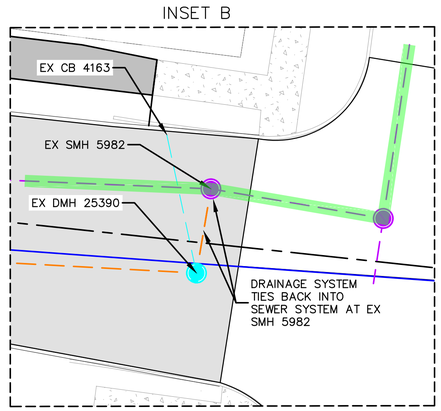
EXISTING UTILITY NOTES:

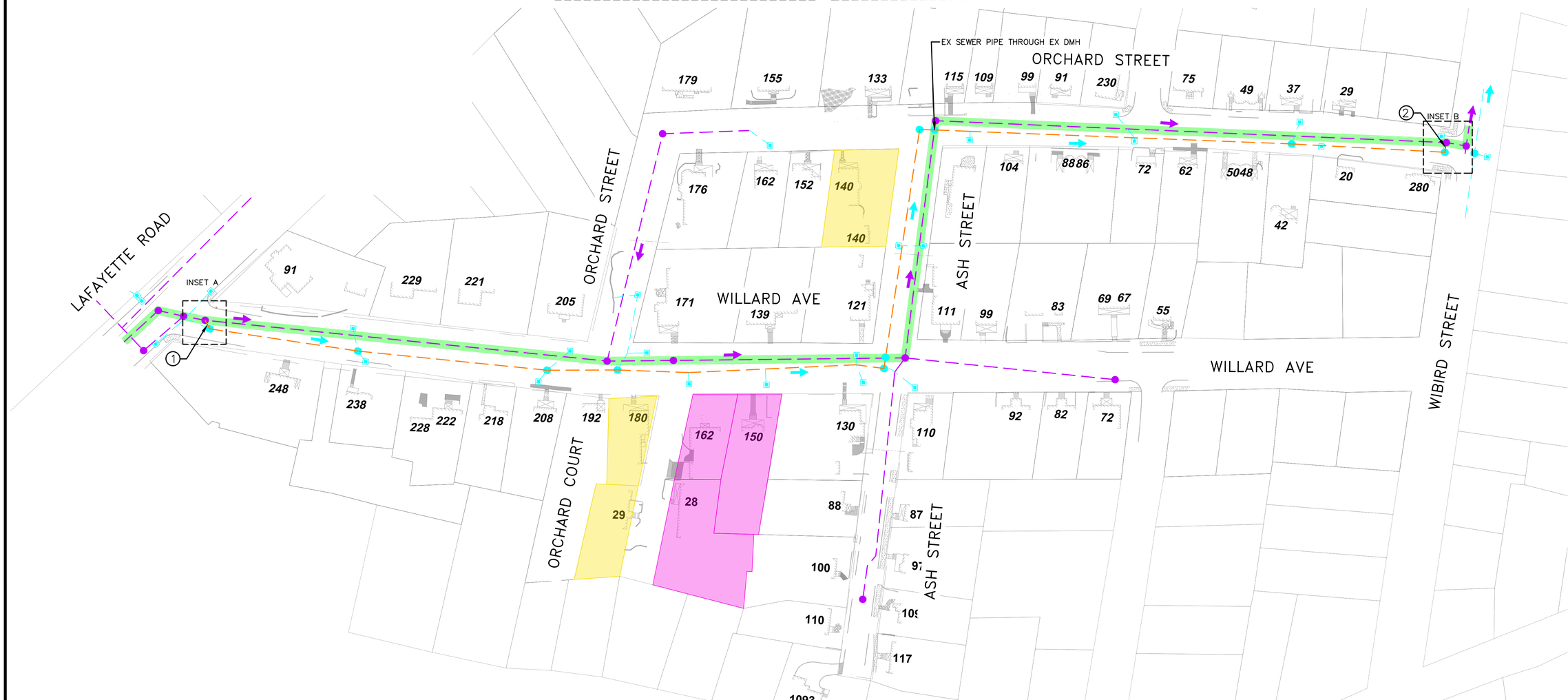
1. SEWER MAINS ON WILLARD AVE, ASH ST, AND ORCHARD ST CONVEY SIGNIFICANT WASTEWATER FLOWS FROM LARGE SEWERSHEDS SOUTH OF THE PROJECT AREA INCLUDING THE LAFAYETTE ROAD PUMP STATION. SEE "HIGH WASTEWATER FLOW CONVEYANCE SEWER MAINS" IN THE LEGEND AND ON THE PLAN.
2. DURING PEAK FLOW EVENTS, THE EXISTING SEWER MAIN SURCHARGES AND FLOWS ARE DIVERTED INTO THE EXISTING DRAINAGE SYSTEM AT EX SMH 849. THE EXISTING DRAINAGE SYSTEM TIES BACK INTO THE EXISTING SEWER SYSTEM AT EX SMH 5982.
3. SEE SECTION 01535 – TEMPORARY BYPASS PUMPING SYSTEM IN THE SPECIFICATIONS FOR ESTIMATED PEAK FLOW RATE DATA AND BYPASS REQUIREMENTS.

PLAN NOTES:

1. THE EXISTING SEWER CONNECTS TO THE EXISTING DRAINAGE FOR SEWER OVERFLOWS AT THIS LOCATION. EX SMH 849 IS A WEIR MANHOLE AND WASTEWATER OVERFLOWS INTO THE DRAINAGE SYSTEM WHEN WASTEWATER FLOWS EXCEED THE CAPACITY OF THE DOWNSTREAM SEWER PIPE.
2. THE EXISTING DRAINAGE SYSTEM TIES BACK INTO THE SEWER SYSTEM AT EX SMH 5982. THE STORMWATER DRAINAGE AND WASTEWATER (DURING OVERFLOW EVENTS) ARE DISCHARGED INTO THE SEWER SYSTEM AT EX SMH 5982.







no.	revision	date	by
1	Issued for Bid	2/2/2024	PAC

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PHILIP A. DORBERT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 1" = 50'

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Utility Sequencing Plan Existing

drawing no. OSP-1

sheet: 11 of 55

LEGEND

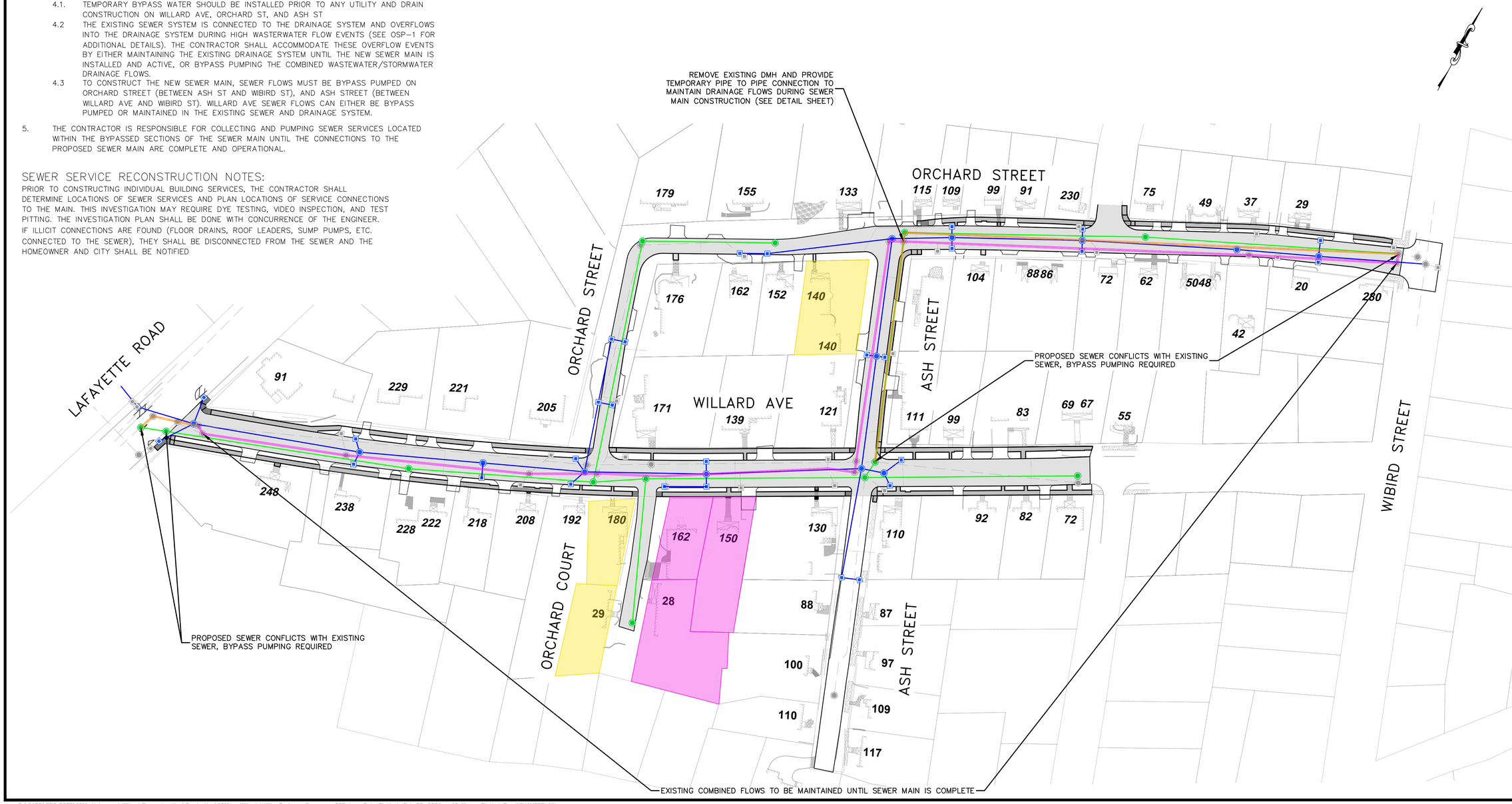
- PROPOSED SEWER
- PROPOSED DRAIN
- EXISTING SEWER SEGMENTS REQUIRING BYPASS PUMPING
- EXISTING DRAINAGE TO BE MAINTAINED UNTIL SEWER MAIN IS COMPLETED
- REPLUMB SEWER SERVICE TO RECONFIGURE ROUTING
- CONFIRM SEWER SERVICE LOCATION AND CONNECTION POINT TO EXISTING

UTILITY SEQUENCING NOTES:

1. THE CONTRACTOR SHALL MAINTAIN 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 WILL BE REQUIRED DURING CONSTRUCTION TO MAINTAIN EXISTING SEWER AND STORMWATER DRAINAGE FLOWS.
4. THE FOLLOWING PRESENTS MAINTENANCE OF DRAIN AND SEWER FLOW CONSIDERATIONS AND SUGGESTED SEQUENCING:
   - 4.1. TEMPORARY BYPASS WATER SHOULD BE INSTALLED PRIOR TO ANY UTILITY AND DRAIN CONSTRUCTION ON WILLARD AVE, ORCHARD ST, AND ASH ST
   - 4.2 THE EXISTING SEWER SYSTEM IS CONNECTED TO THE DRAINAGE SYSTEM AND OVERFLOWS INTO THE DRAINAGE SYSTEM DURING HIGH WASTERWATER FLOW EVENTS (SEE OSP–1 FOR ADDITIONAL DETAILS). THE CONTRACTOR SHALL ACCOMMODATE THESE OVERFLOW EVENTS BY EITHER MAINTAINING THE EXISTING DRAINAGE SYSTEM UNTIL THE NEW SEWER MAIN IS INSTALLED AND ACTIVE, OR BYPASS PUMPING THE COMBINED WASTEWATER/STORMWATER DRAINAGE FLOWS.
   - 4.3 TO CONSTRUCT THE NEW SEWER MAIN, SEWER FLOWS MUST BE BYPASS PUMPED ON ORCHARD STREET (BETWEEN ASH ST AND WIBIRD ST), AND ASH STREET (BETWEEN WILLARD AVE AND WIBIRD ST). WILLARD AVE SEWER FLOWS CAN EITHER BE BYPASS PUMPED OR MAINTAINED IN THE EXISTING SEWER AND DRAINAGE SYSTEM.
5. THE CONTRACTOR IS RESPONSIBLE FOR COLLECTING AND PUMPING SEWER SERVICES LOCATED WITHIN THE BYPASSED SECTIONS OF THE SEWER MAIN UNTIL THE CONNECTIONS TO THE PROPOSED SEWER MAIN ARE COMPLETE AND OPERATIONAL.

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. IF ILLICIT CONNECTIONS ARE FOUND (FLOOR DRAINS, ROOF LEADERS, SUMP PUMPS, ETC. CONNECTED TO THE SEWER), THEY SHALL BE DISCONNECTED FROM THE SEWER AND THE HOMEOWNER AND CITY SHALL BE NOTIFIED



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PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 1" = 50' (0, 50', 100')

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area
Improvement Project
Utility Sequencing Plan
Proposed

drawing no. OSP-2
sheet: 12 of 55

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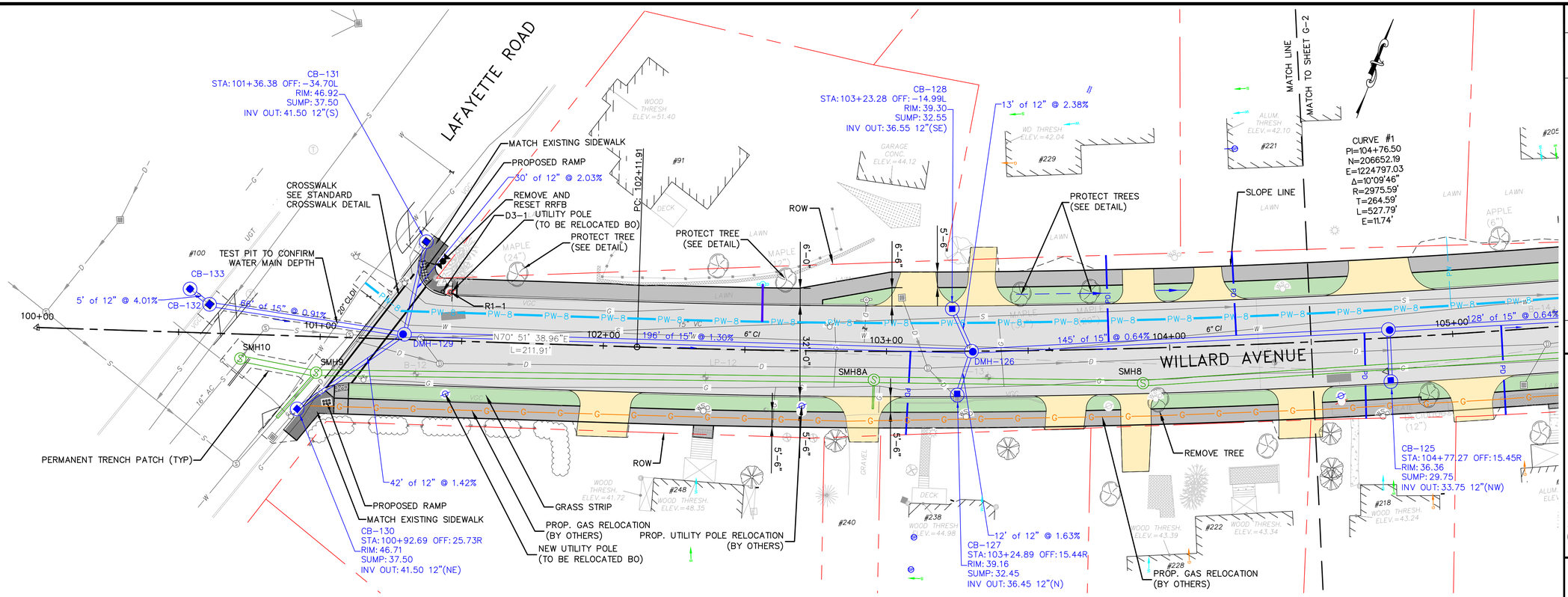

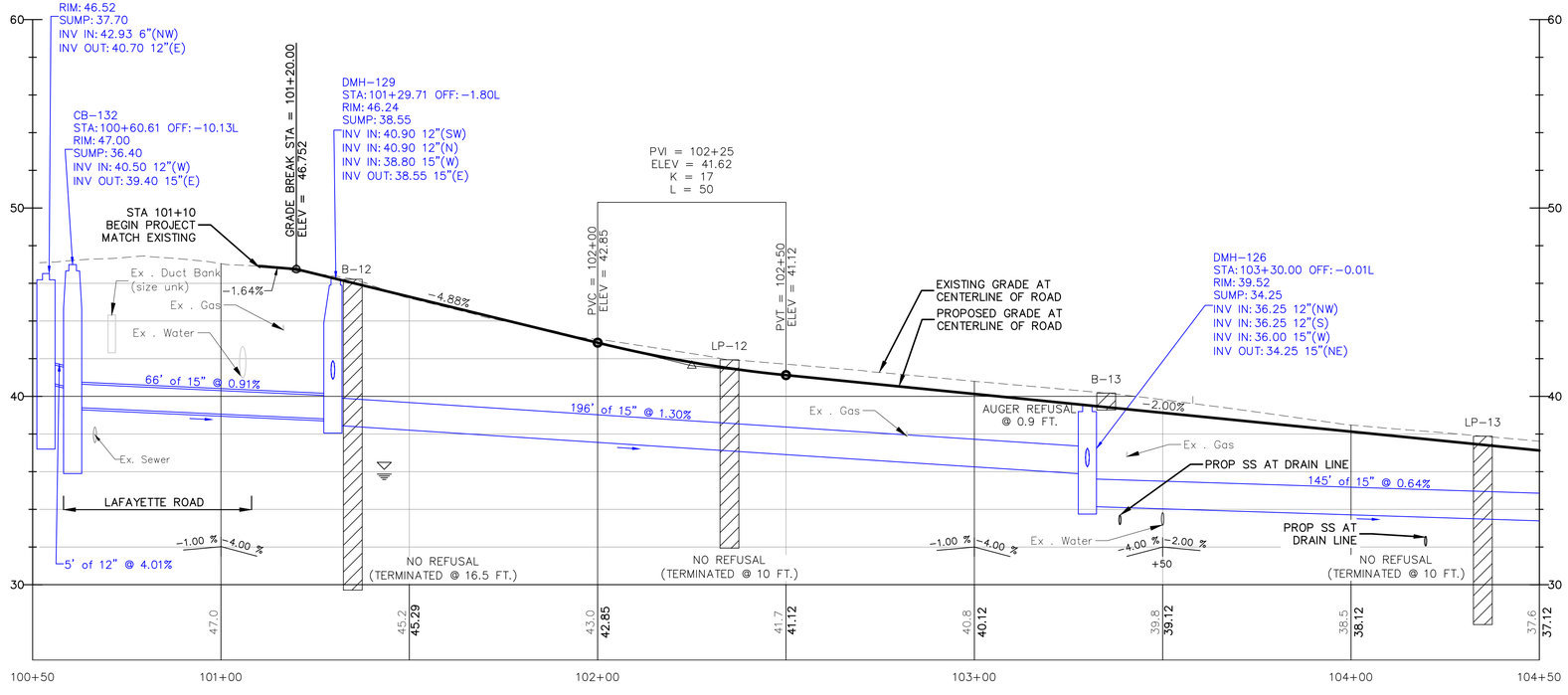

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STATE OF NEW HAMPSHIRE
PHILIP A. CORDEIRO No. 12271 LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 40' 20' 0 Scale: 1" = 20'H/4'V

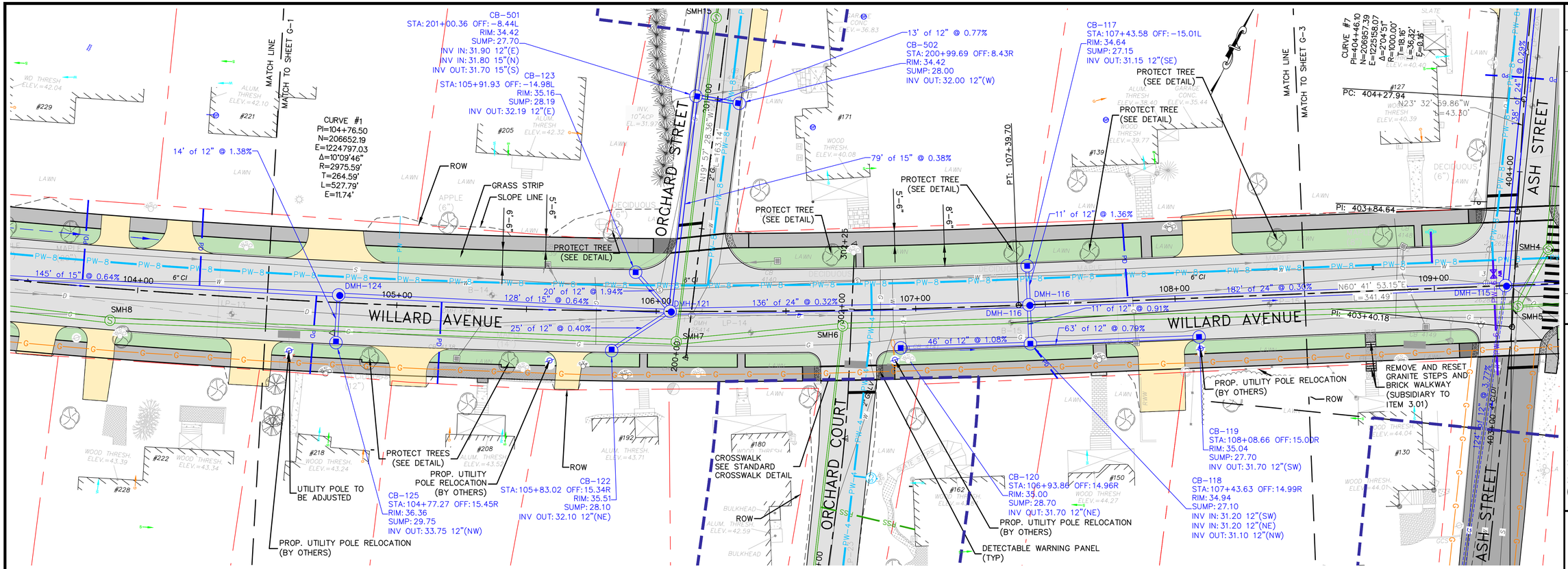
City of Portsmouth, New Hampshire
Department of Public Works

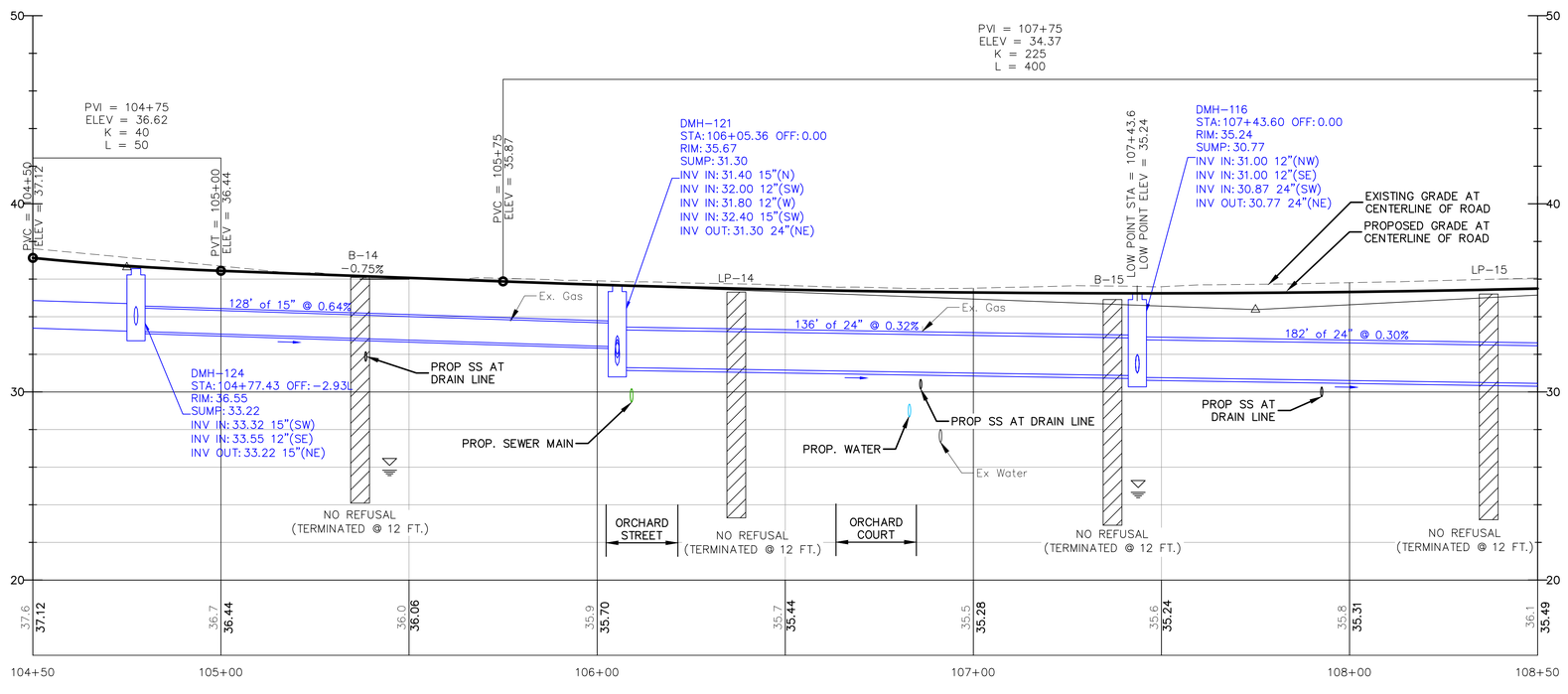
Willard Ave Area
Improvement Project

Proposed Roadway & Drainage
Willard Ave STA 101+00 to STA 104+50

drawing no.
G-1

sheet: 13 of 55





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PHILIP A. GORDER No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF	drawn by: WWG	approved by: PAC	scale: 0 20' 40' Scale: 1" = 20'H/4'V
date: February 2024	project no: 1211	checked by: PAC	

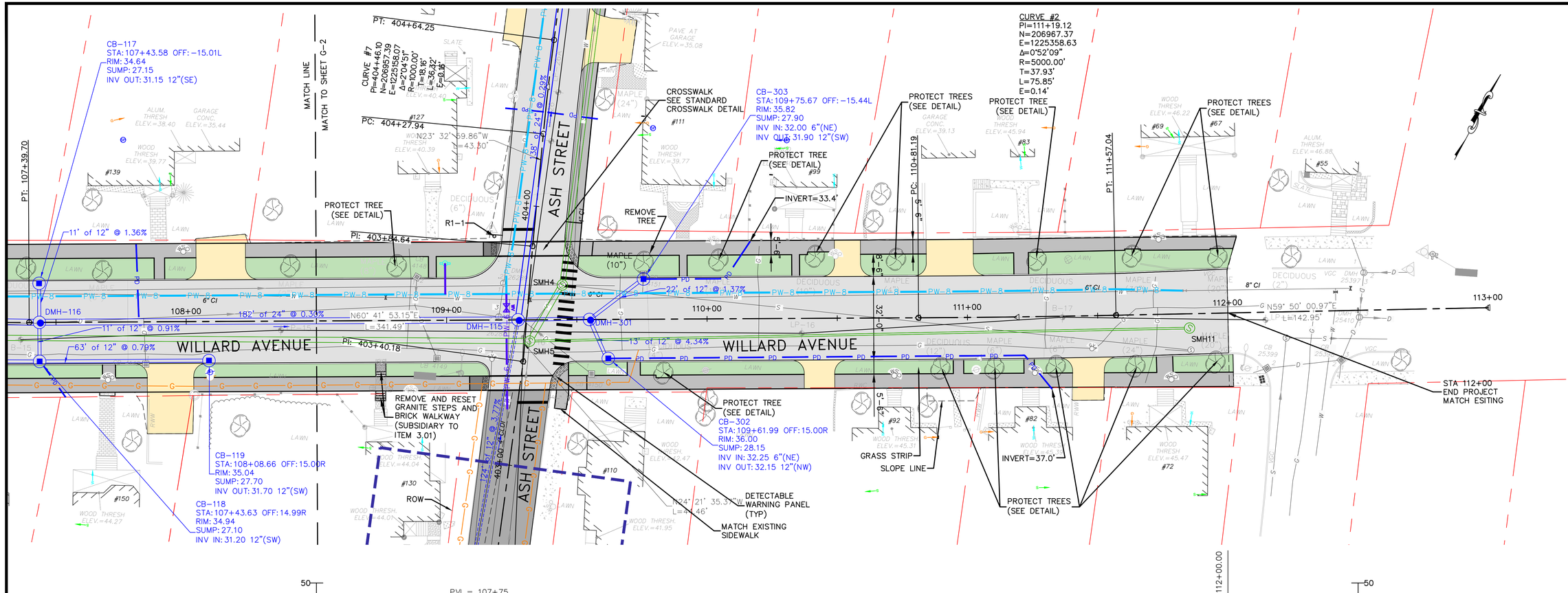
City of Portsmouth, New Hampshire
Department of Public Works

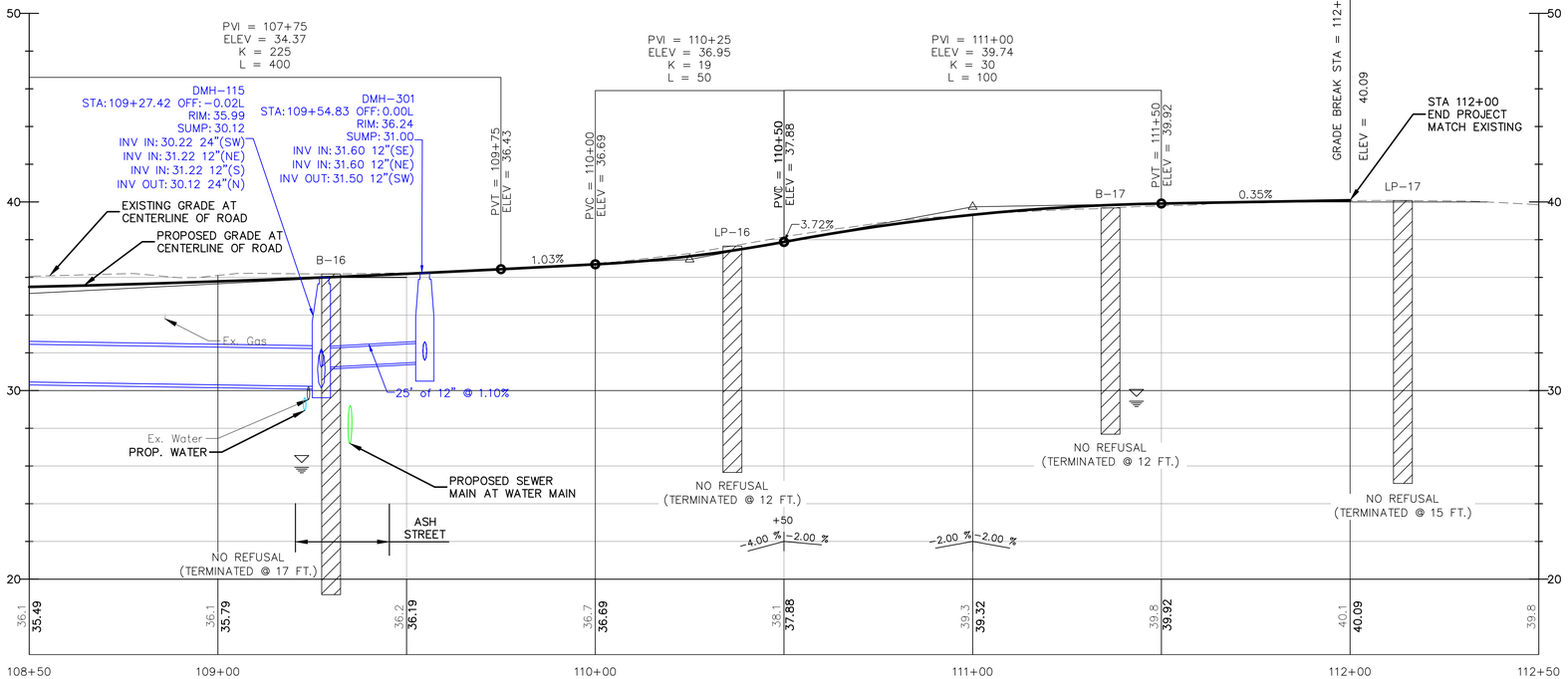
Willard Ave Area
Improvement Project

Proposed Roadway & Drainage
Willard Ave STA 104+50 to STA 108+50

drawing no.
G-2

sheet: 14 of 55





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PHILIP A. J. GORDEY No. 12271 LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by:	drawn by:	approved by:	scale:
CFC/STF	WWG	PAC	40' 20' 0 Scale: 1" = 20'H/4'V

date:	project no:	checked by:
February 2024	1211	PAC

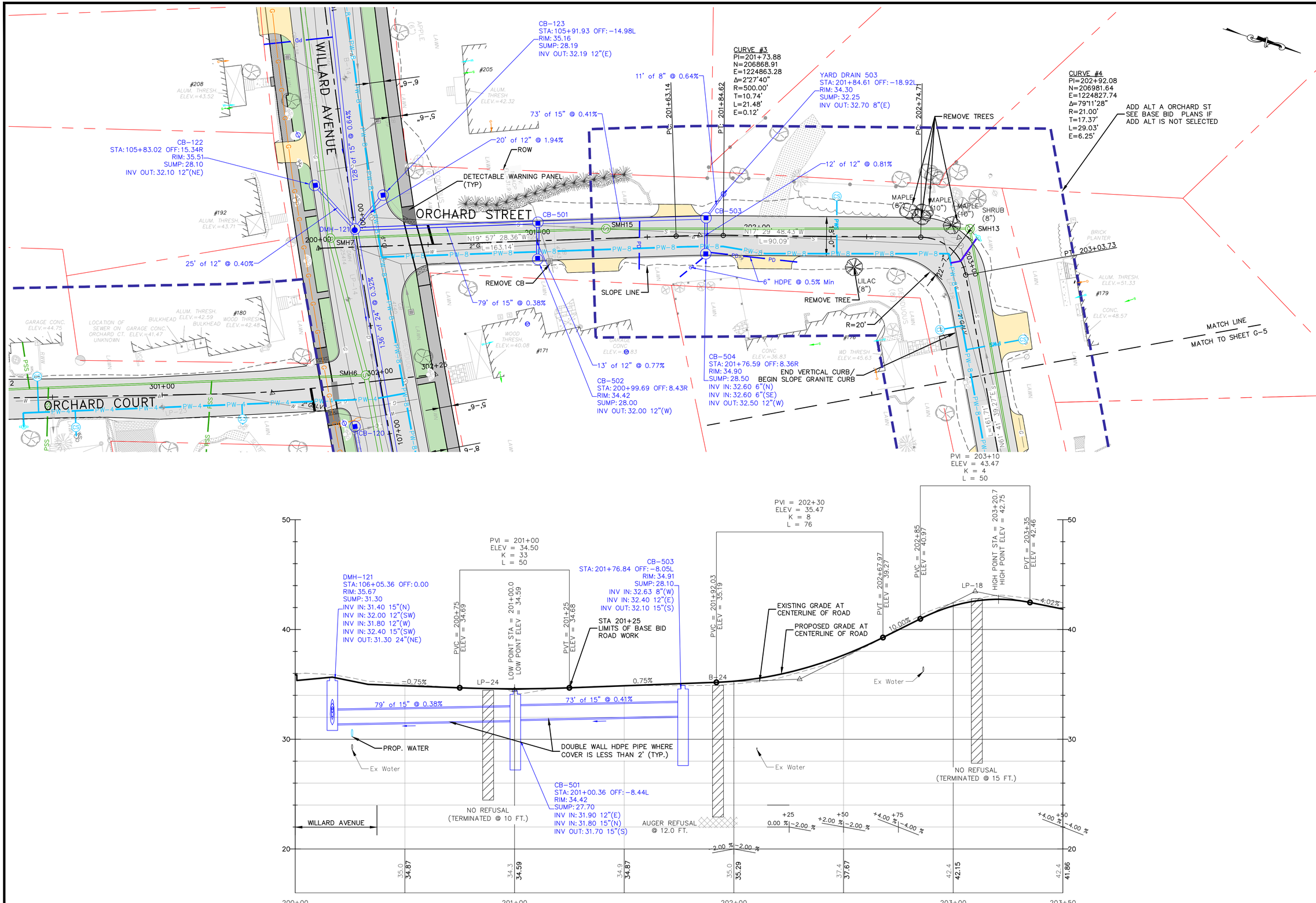
City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area Improvement Project

Proposed Roadway & Drainage
Willard Ave STA 108+50 to STA 112+50

drawing no.
G-3

sheet: 15 of 55



no.	description	date	by
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PHILIP A. GORDEY No. 12271 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF	drawn by: WWG	approved by: PAC	scale: 20' 0 40' Scale: 1" = 20'H/4'V
date: February 2024	project no: 1211	checked by: PAC	

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Proposed Roadway & Drainage
Willard Ave STA 200+00 to STA 203+50

drawing no.
G-4

sheet: 16 of 55

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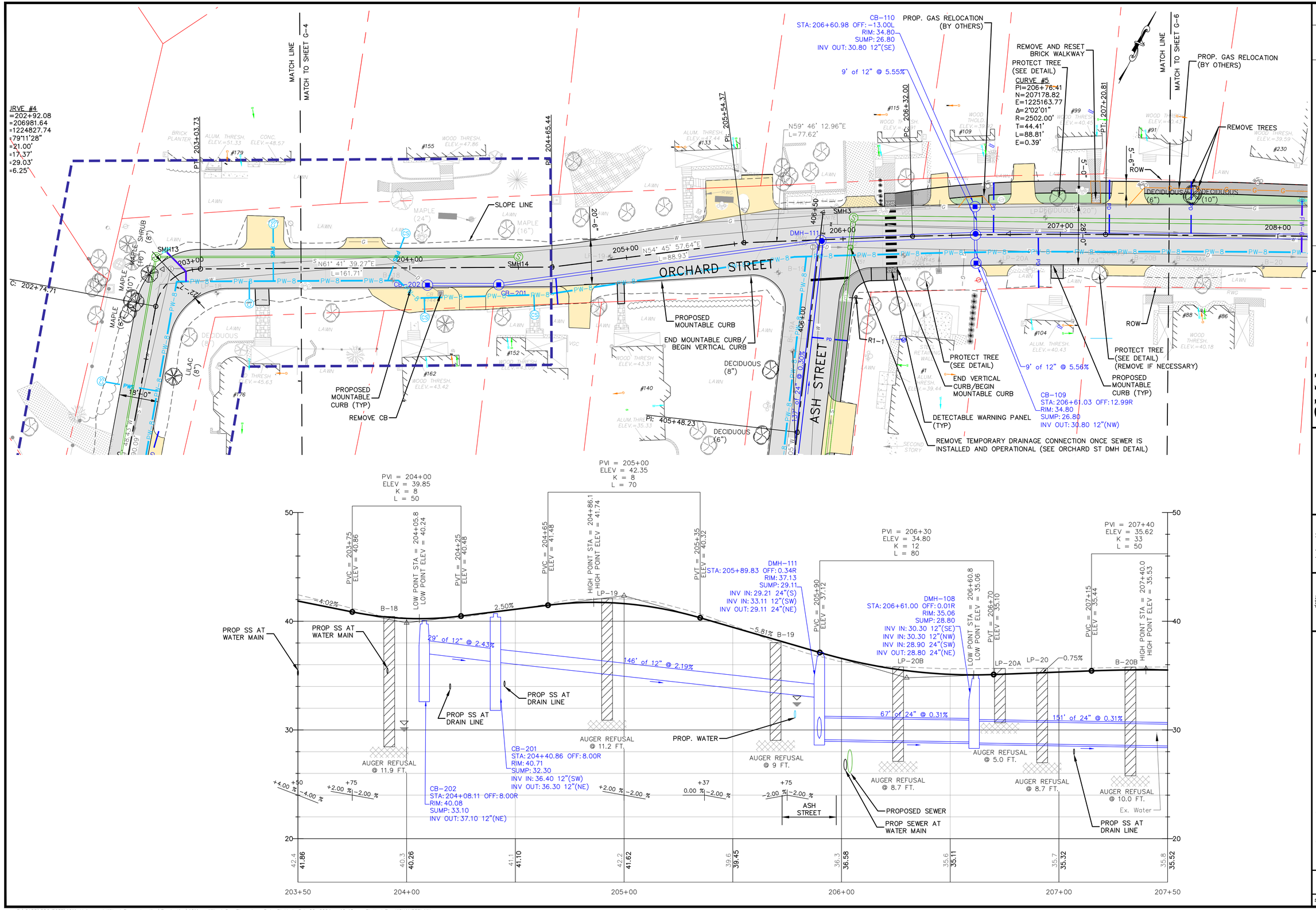

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PHILIP A. GORDER No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

2/2/2024

designed by:	drawn by:	approved by:	scale:
CFC/STF	WWG	PAC	40' 20' 0 Scale: 1" = 20'h/4'v

date:	project no:	checked by:
February 2024	1211	PAC

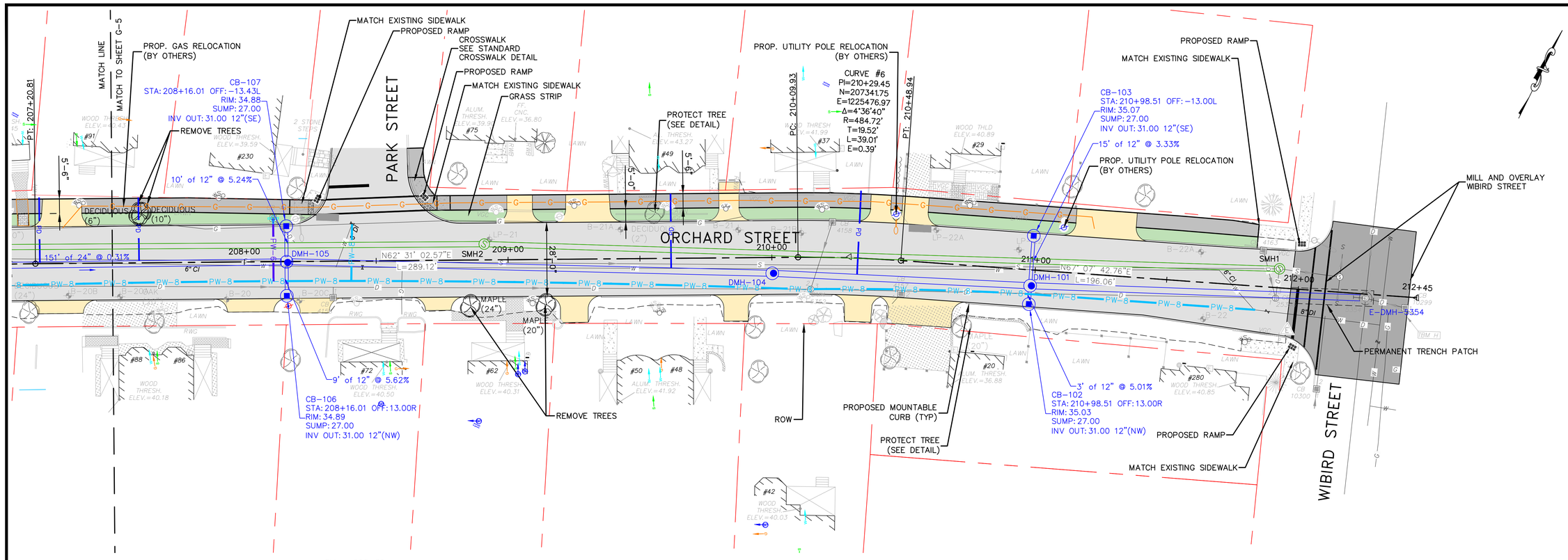
City of Portsmouth, New Hampshire
Department of Public Works

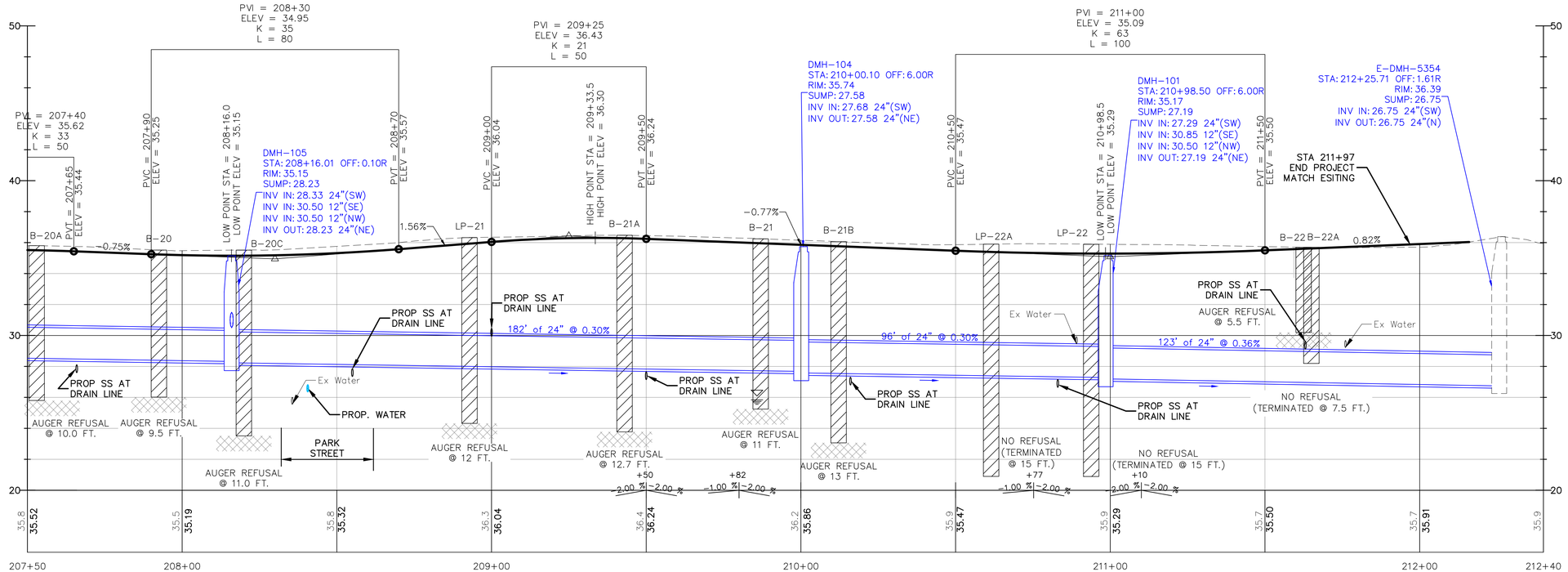
Willard Ave Area
Improvement Project

Proposed Roadway & Drainage
Orchard St STA 203+50 to STA 207+50

drawing no.
G-5

sheet: 17 of 55





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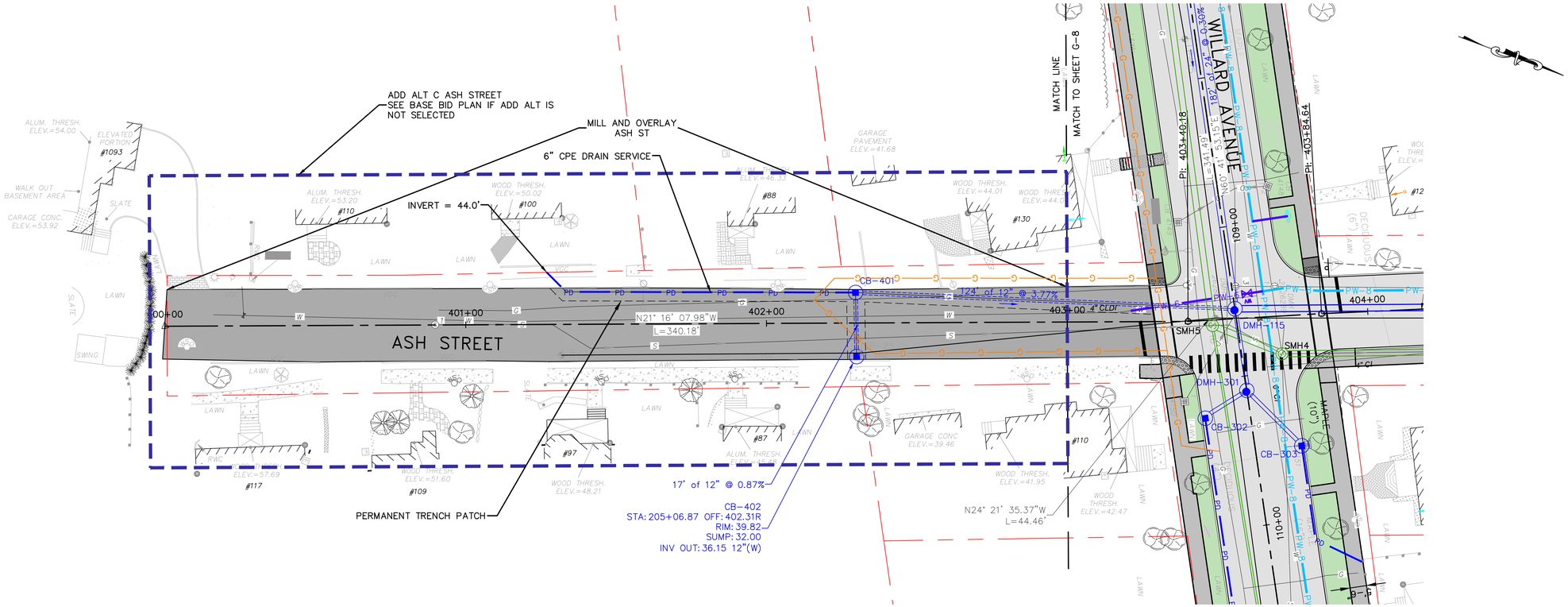
PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
2/2/2024

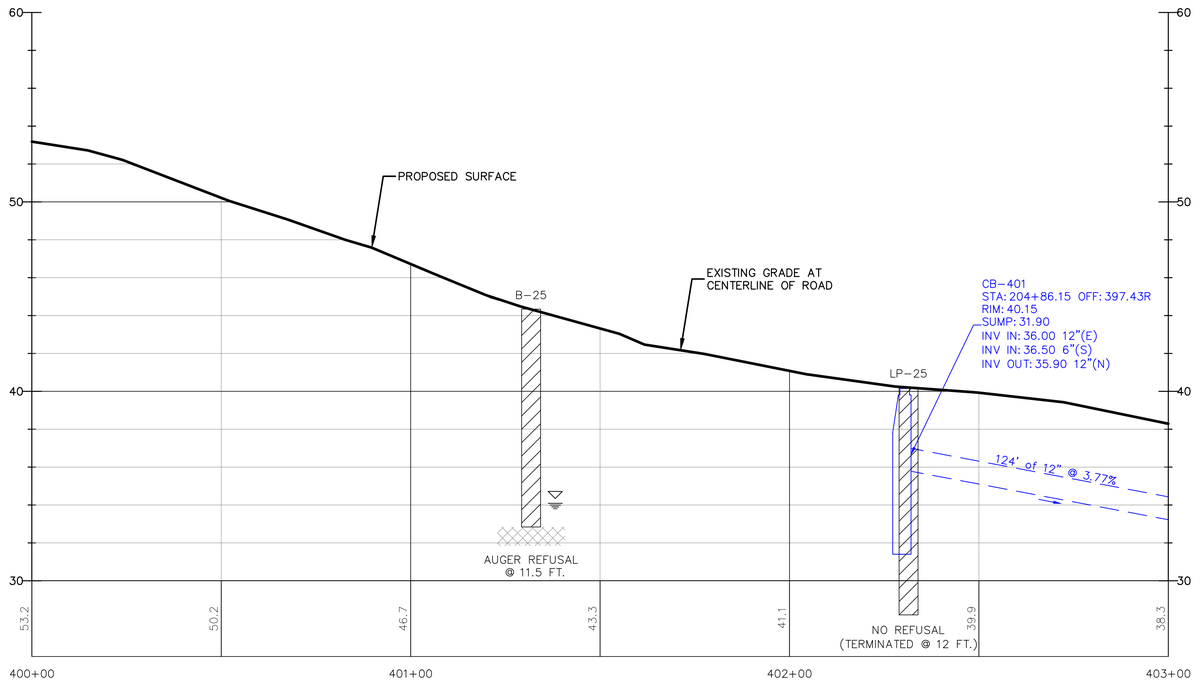
designed by: CFC/STF	drawn by: WWG	approved by: PAC	scale: 20' 40' Scale: 1" = 20'/1"/4"V
date: February 2024	project no: 1211	checked by: PAC	

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Proposed Roadway & Drainage
Orchard St STA 207+50 to STA 212+40

drawing no. G-6

sheet: 18 of 55





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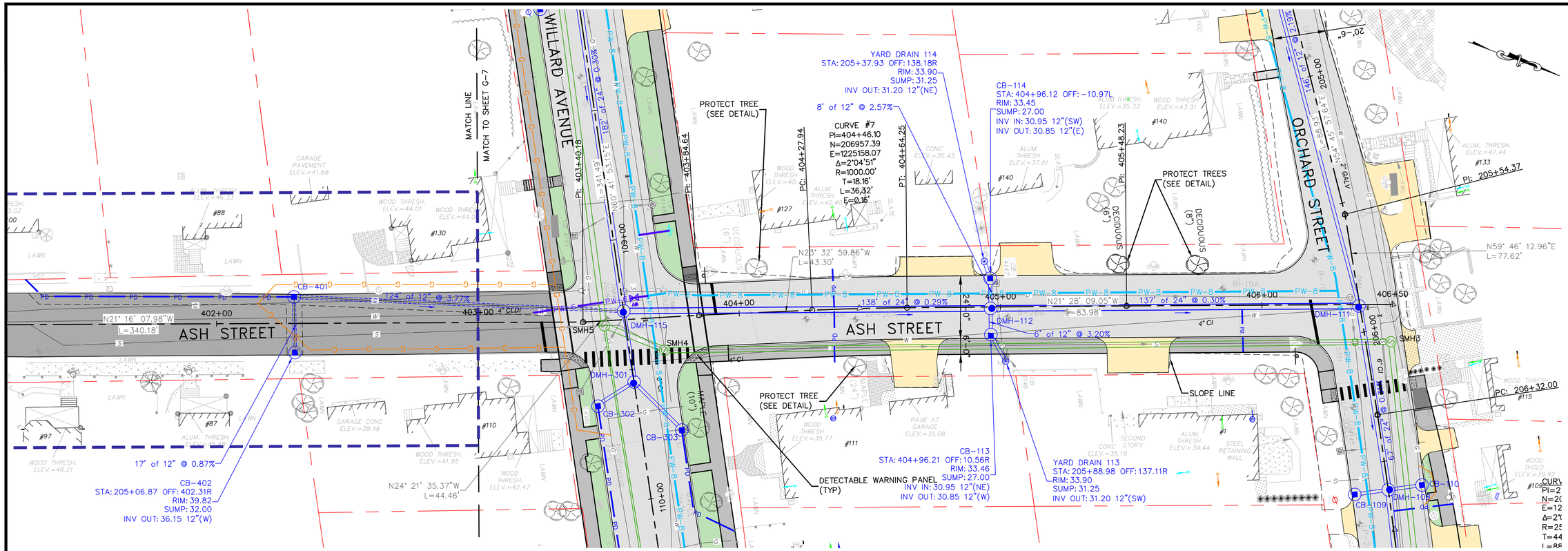
STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED
PROFESSIONAL ENGINEER
2/2/2024

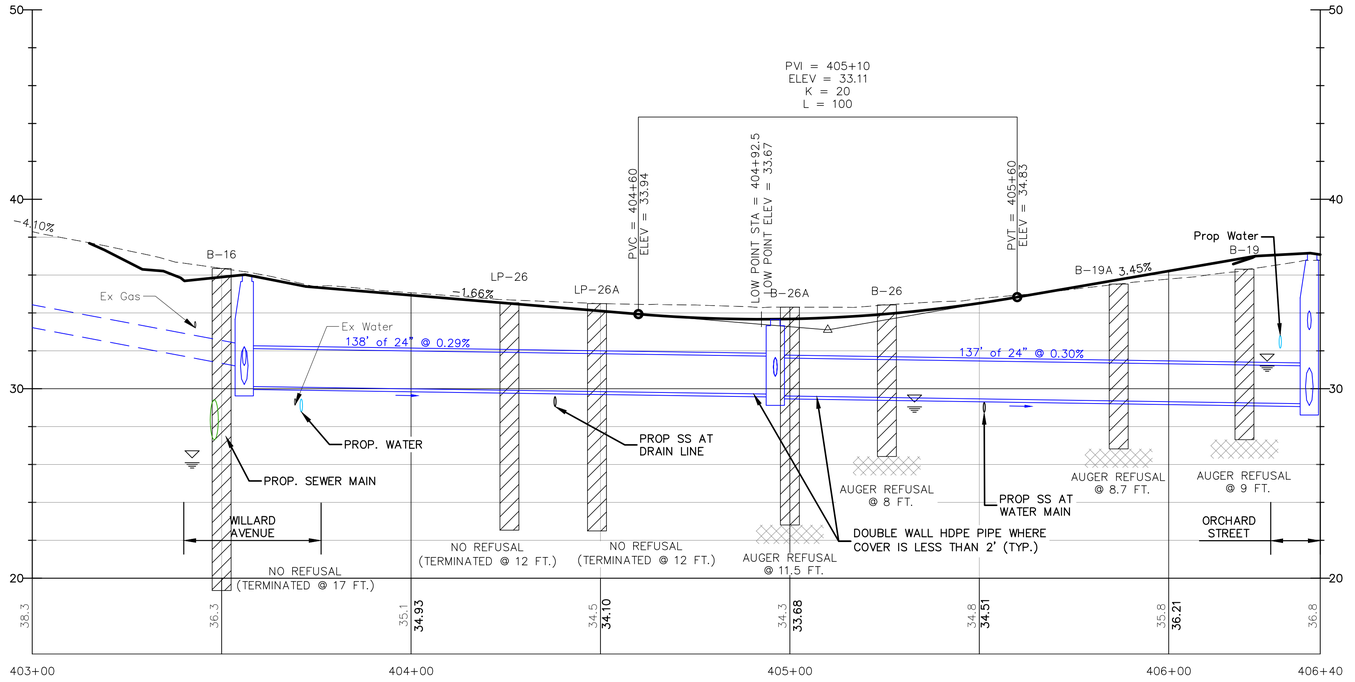
designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scales: 20' Scale: 1" = 20'h/4'v 40'

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area
Improvement Project
Proposed Roadway & Drainage
Ash St STA 400+00 to STA 403+00

drawing no.
G-7

sheet: 19 of 55





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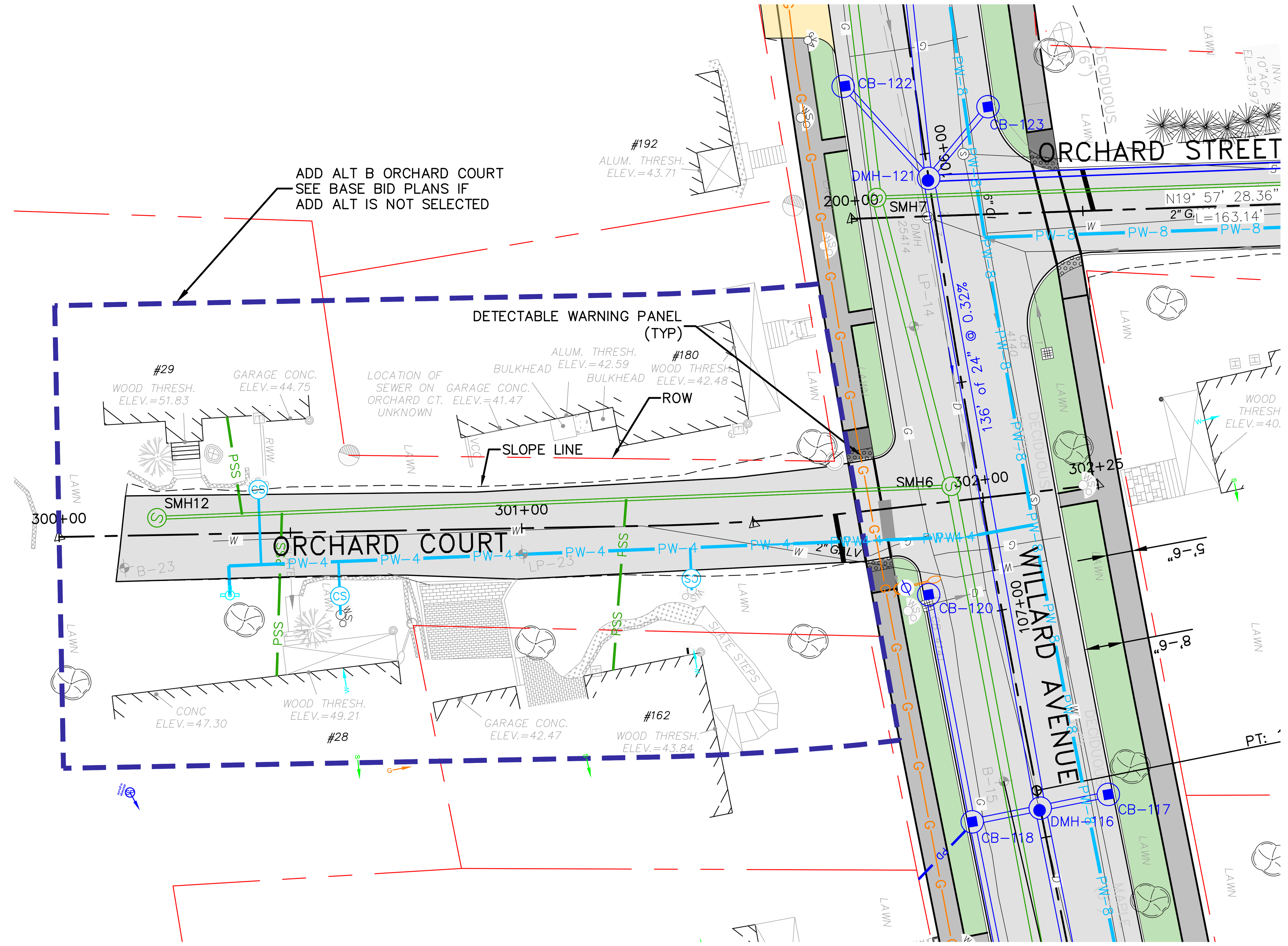
PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

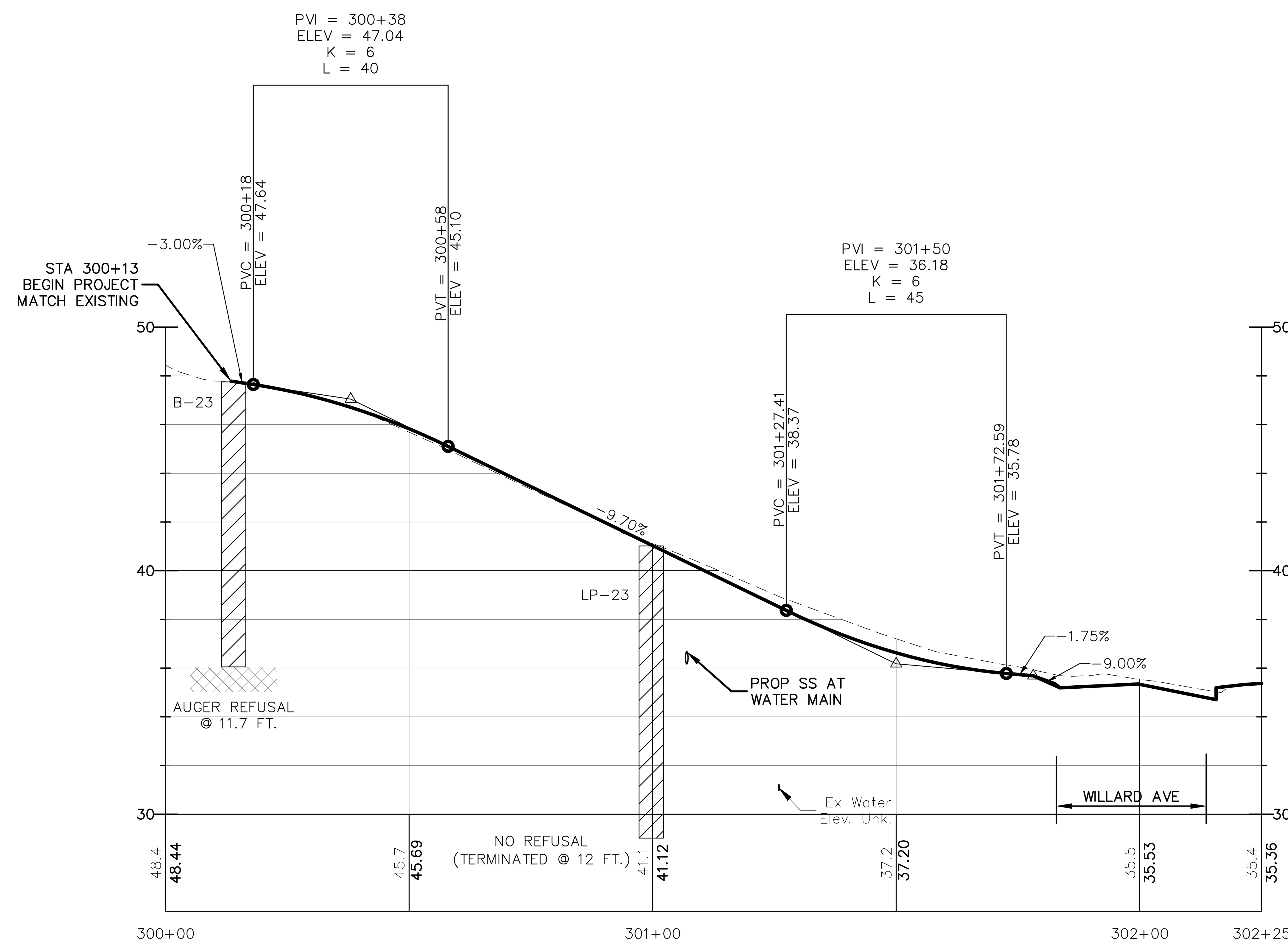
designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scales: 20' 0 40' Scale: 1" = 20'h/1"v

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Proposed Roadway & Drainage
Ash St STA 403+00 to STA 406+40

drawing no. G-8

sheet: 20 of 55





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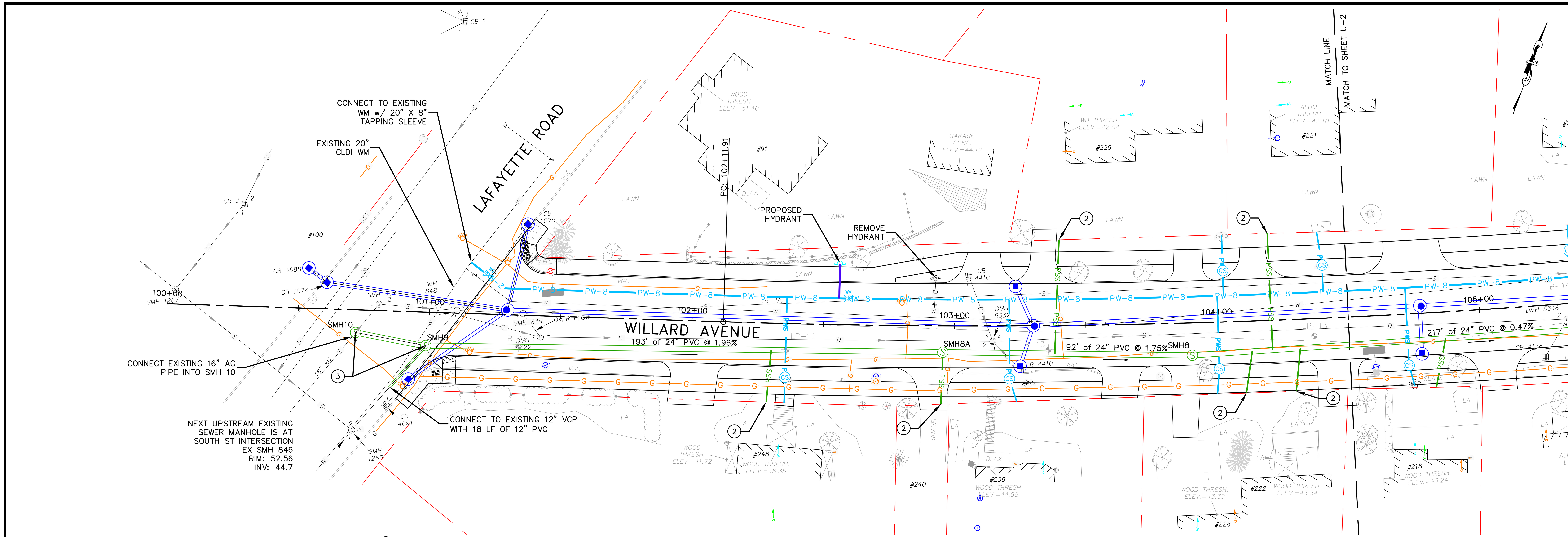
STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area
Improvement Project
Proposed Roadway & Drainage
Orchard Ct STA 300+00 to STA 302+25

drawing no.
G-9



NOTES:

1. EXISTING CURB STOP LOCATION NOT FOUND. PROPOSED WATER SERVICE LOCATION SUBJECT TO CHANGE DURING CONSTRUCTION.
2. 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.
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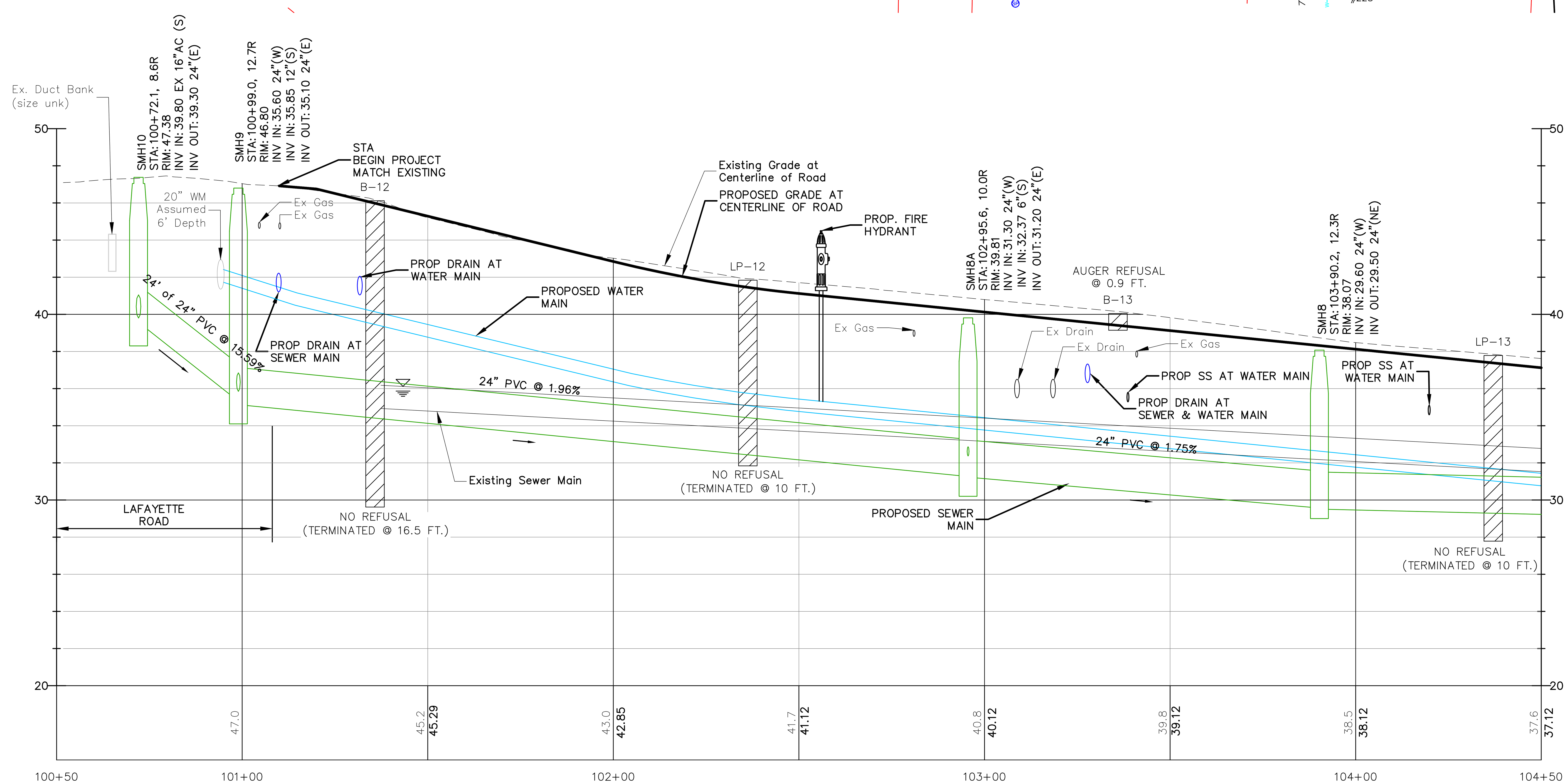
4. SEE ROADWAY CROSS SECTIONS FOR SEWER SERVICE CONSTRUCTION DETAILS.



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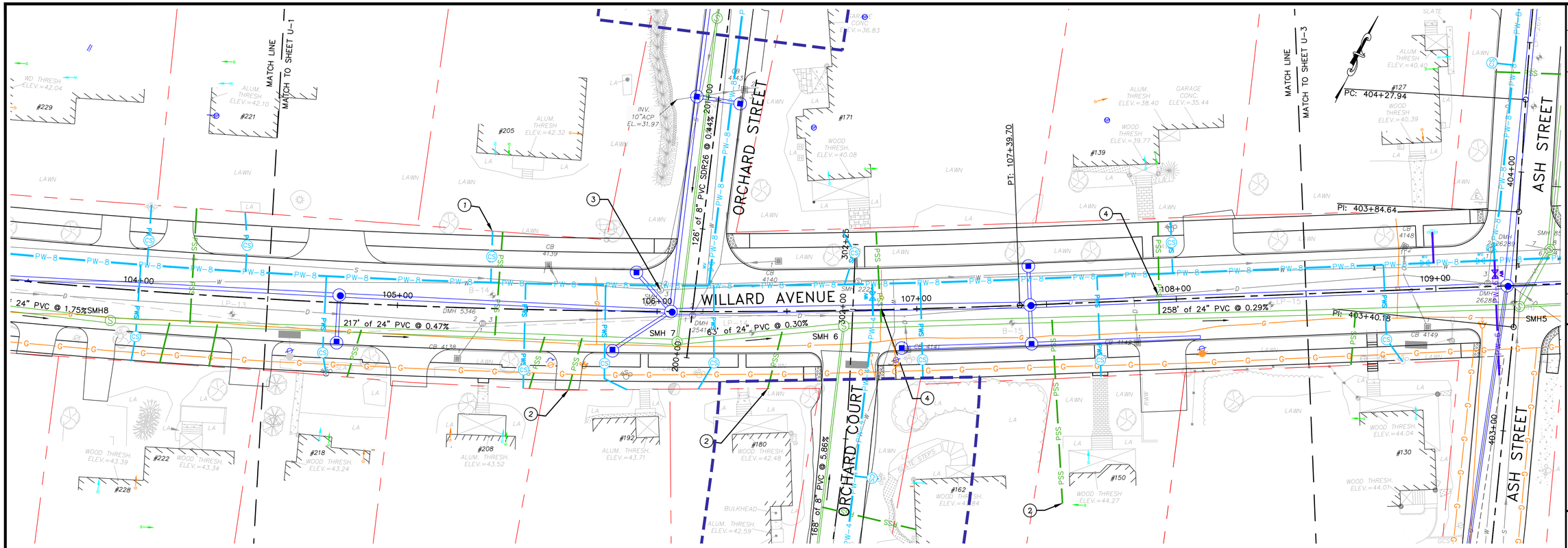
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Proposed Utility Plans
Willard Ave STA 101+00 to STA 104+50

drawing no. U-1



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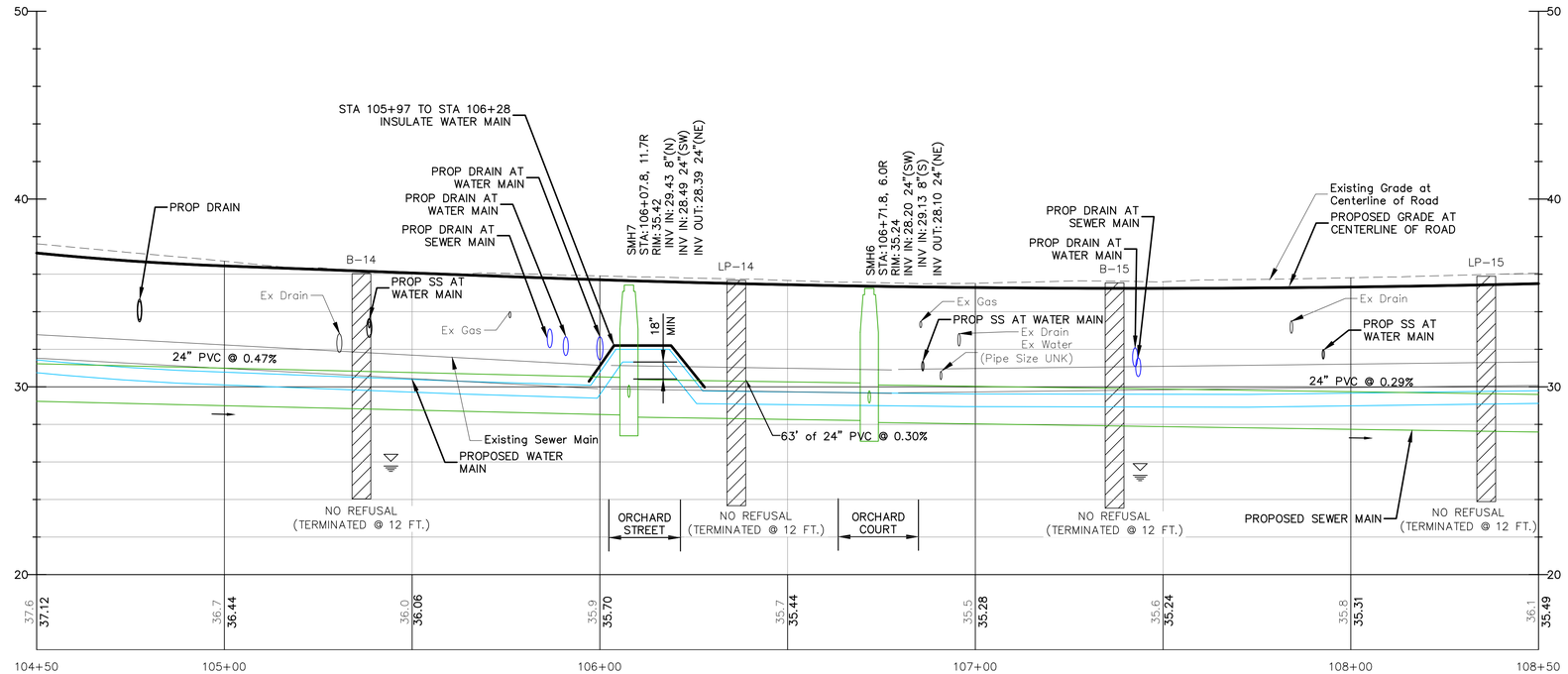

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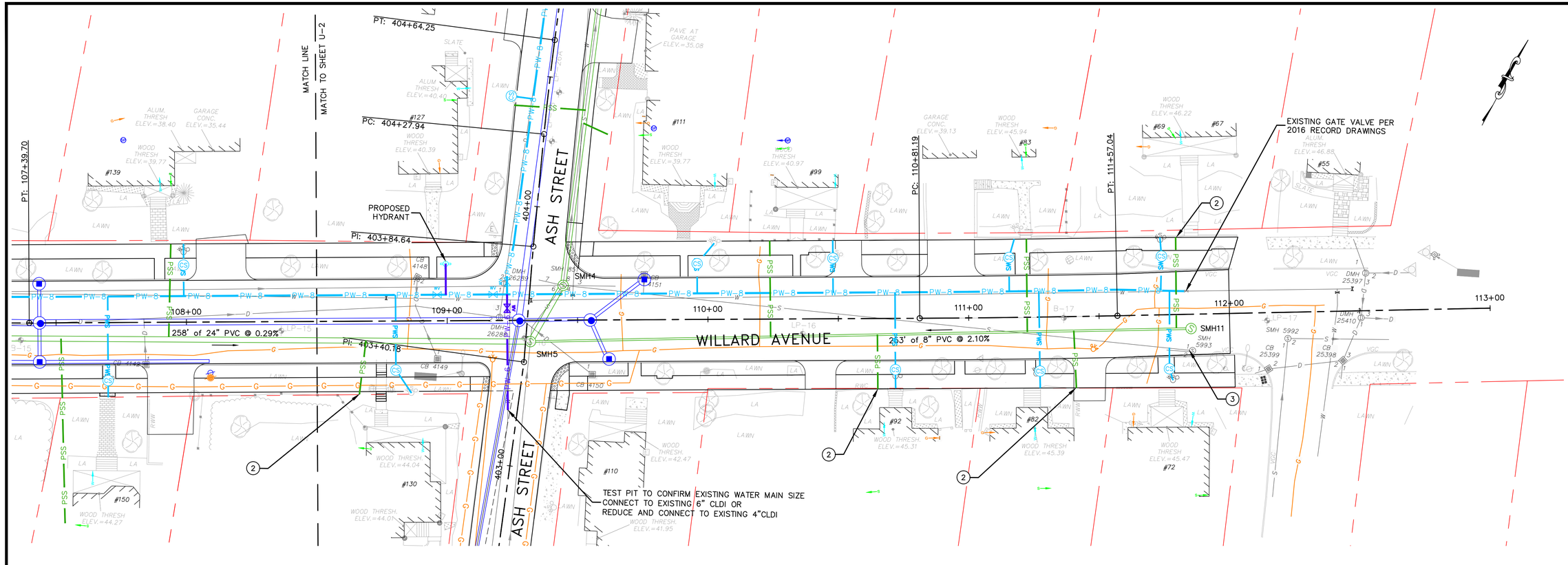
PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 1" = 20'H/4'V (0, 20', 40')

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Proposed Utility Plans
Willard Ave STA 104+50 to STA 108+50

drawing no. U-2
sheet: 23 of 55



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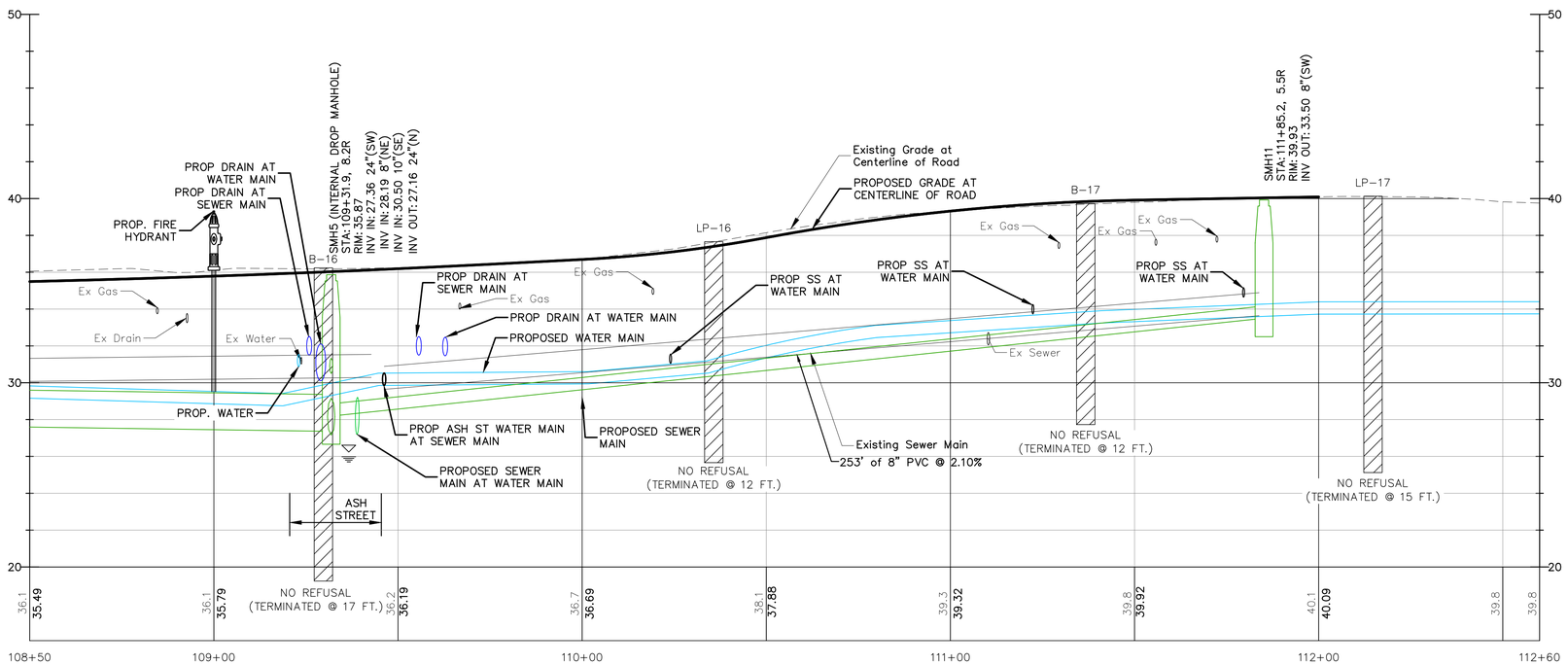

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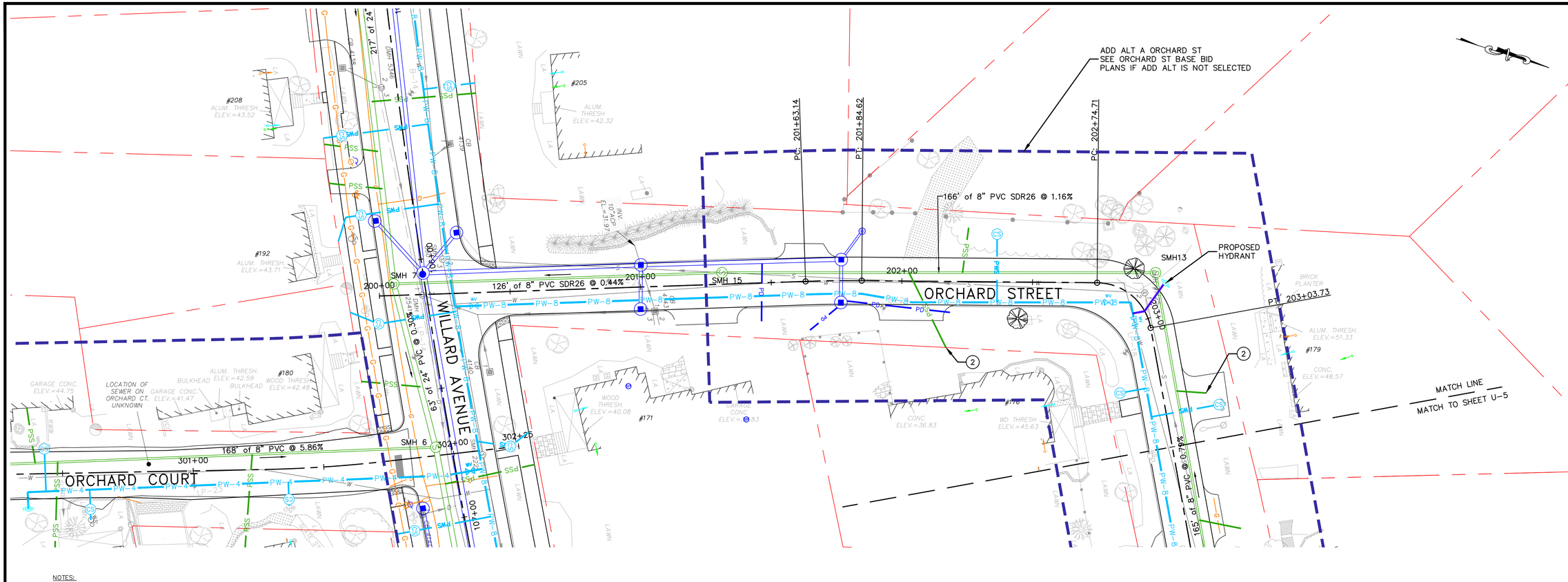
PHILIP A. GORDEN No. 12271 LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
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
Willard Ave Area Improvement Project
Proposed Utility Plans
Willard Ave STA 108+50 to STA 112+57

drawing no. U-3
sheet: 24 of 55



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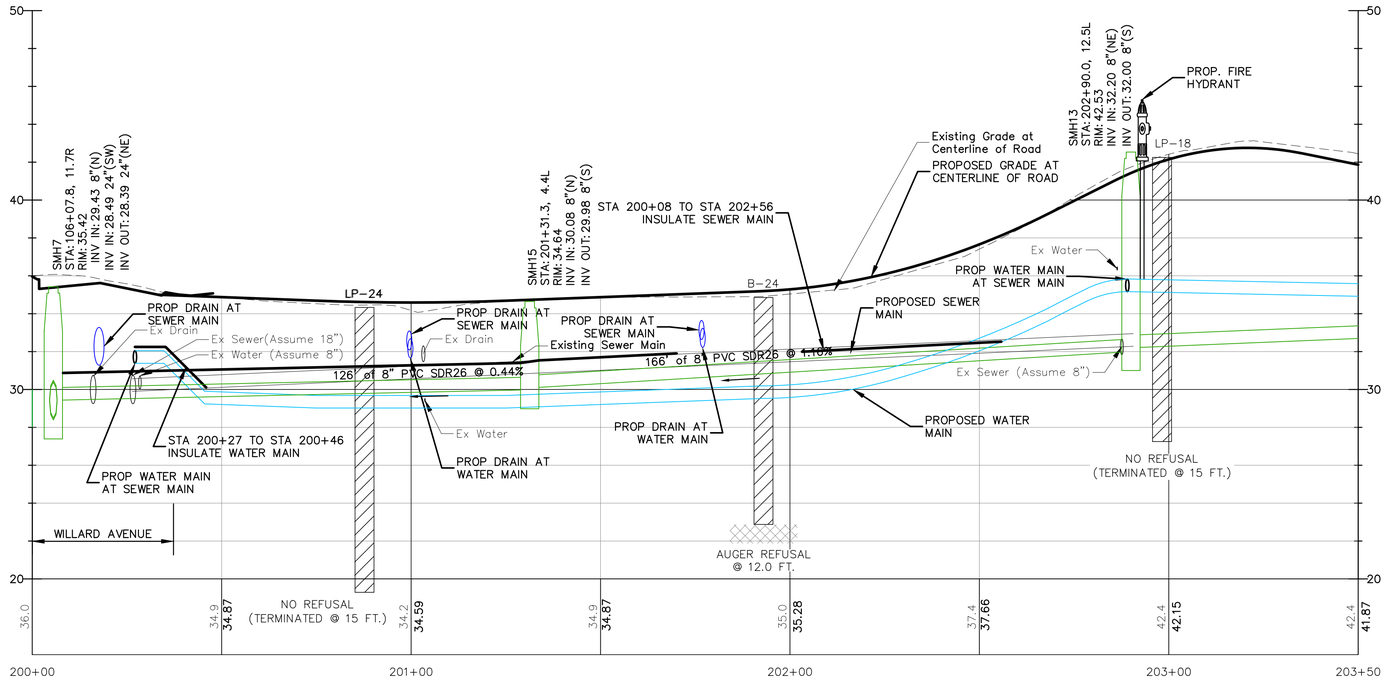

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STATE OF NEW HAMPSHIRE
PHILIP A. GORDEN No. 12271 LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by:	drawn by:	approved by:	scale:
CFC/STF	WWG	PAC	40' 20' 0 Scale: 1" = 20'H/4'V
date: February 2024	project no: 1211	checked by: PAC	

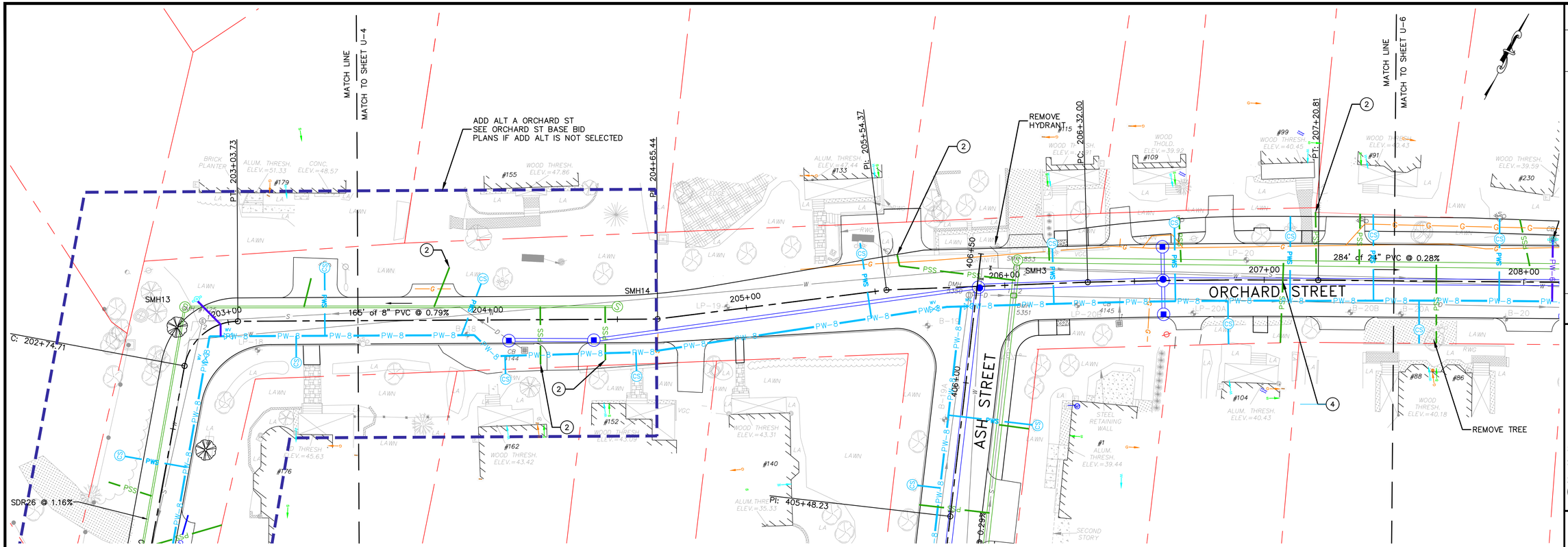
City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area Improvement Project

Proposed Utility Plans
Orchard St STA 202+00 to STA 203+50

drawing no. U-4

sheet: 25 of 55



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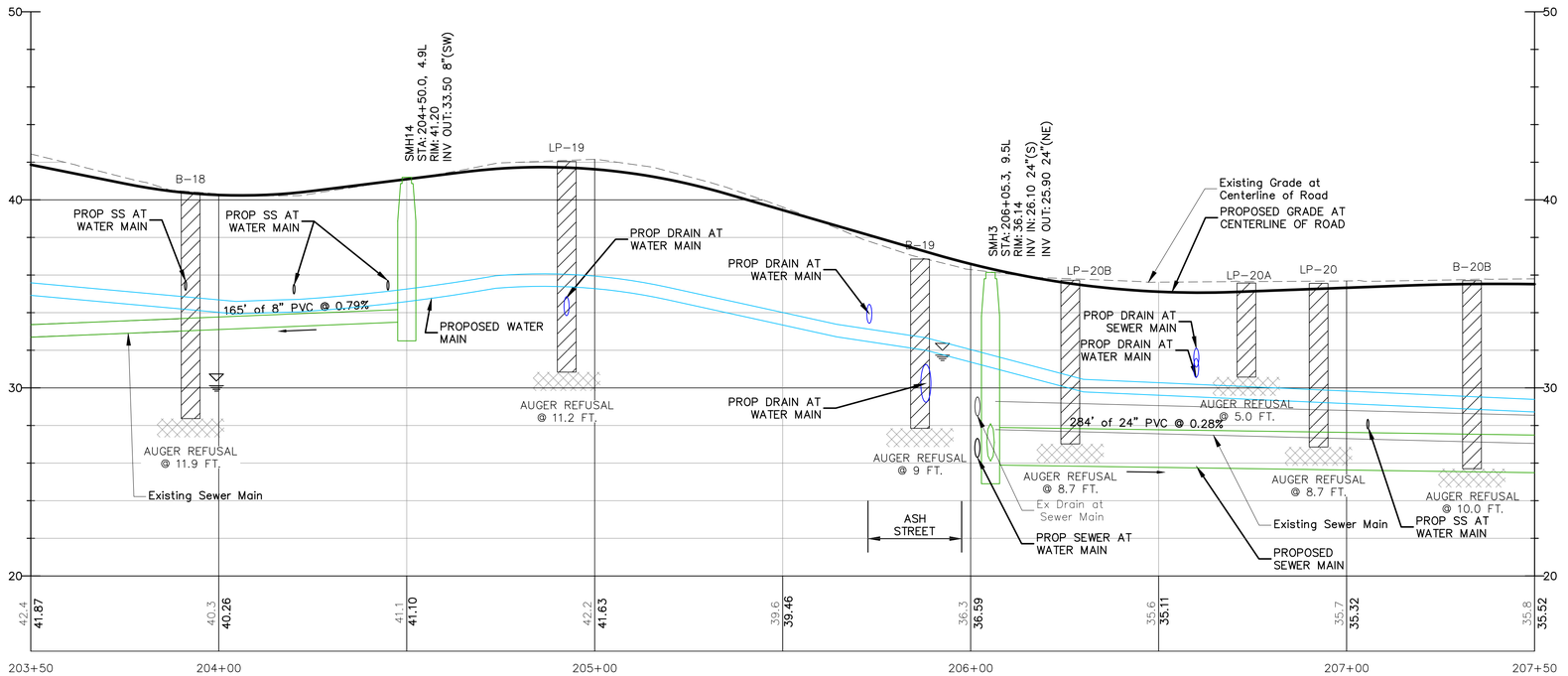

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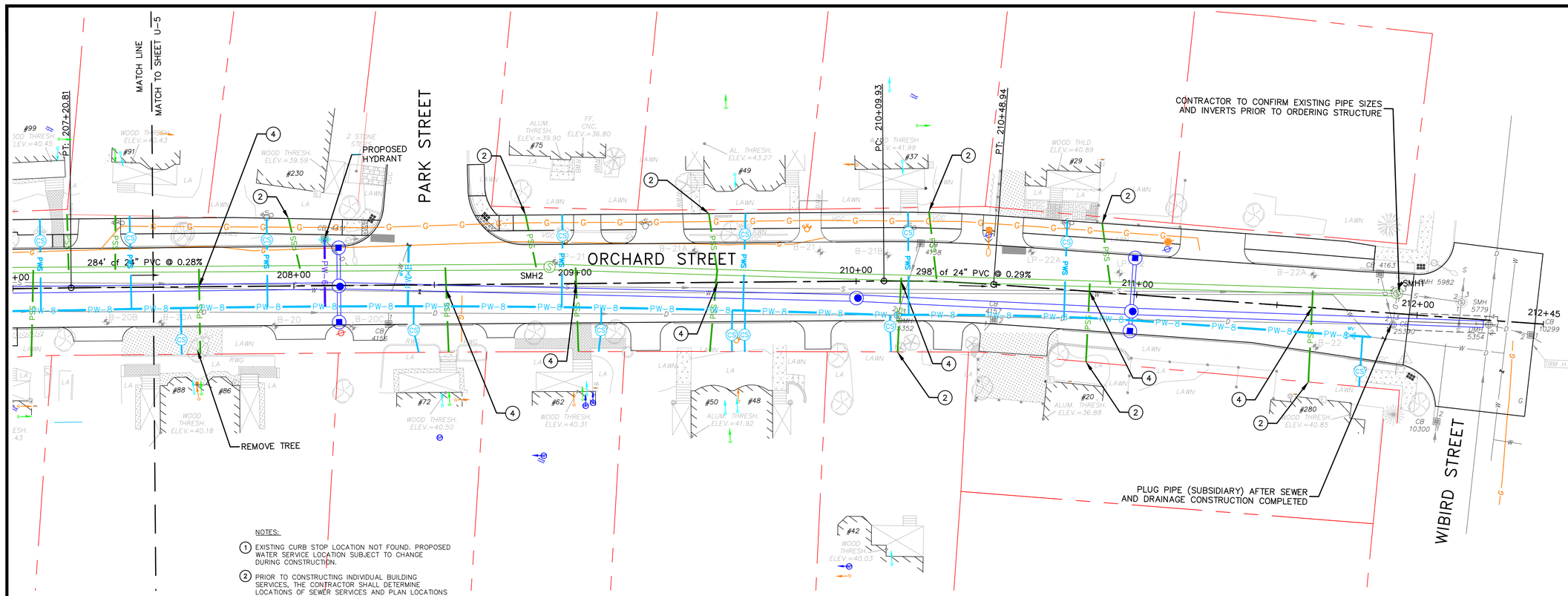
City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Proposed Utility Plans
Orchard St STA 203+50 to STA 207+50

drawing no. U-5
sheet: 26 of 55



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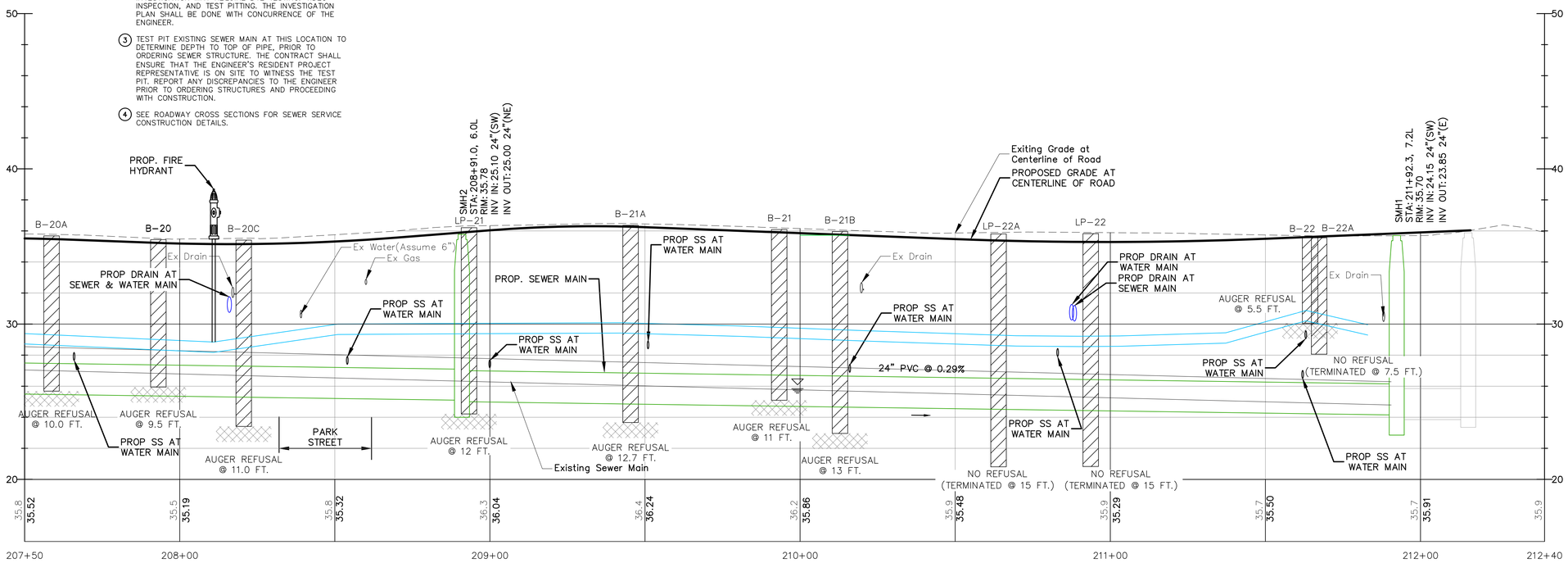

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2/2/2024

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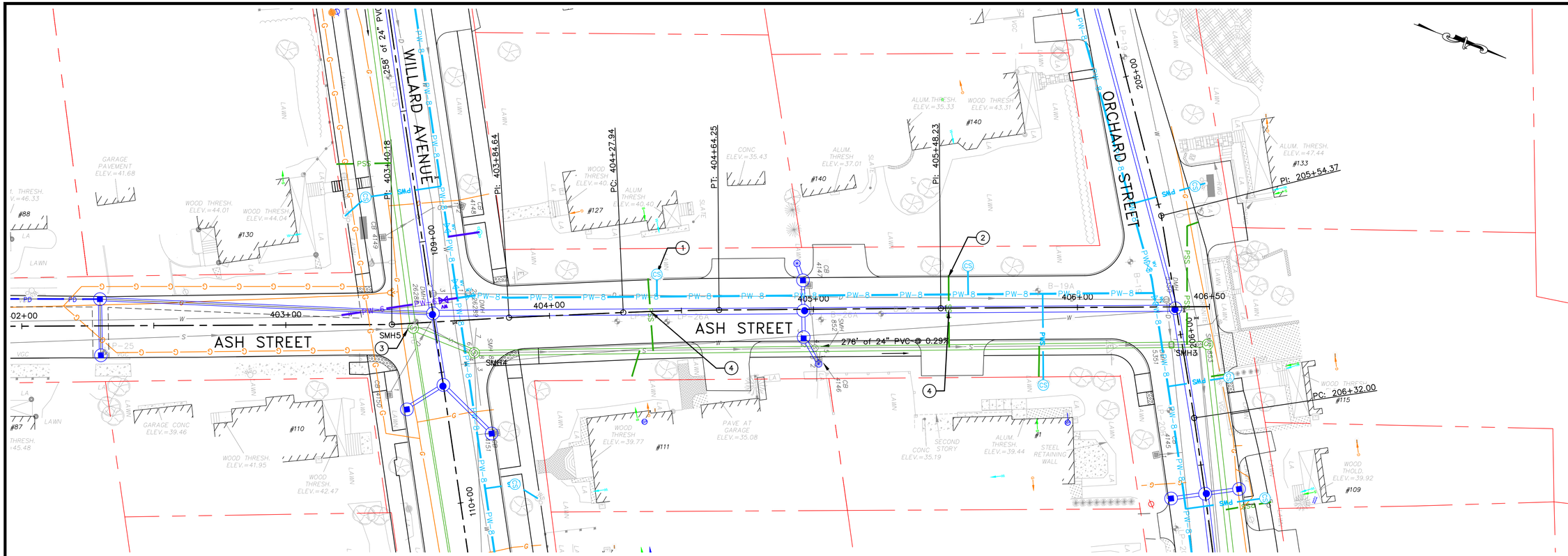
scale: 20' 40' Scale: 1" = 20'H/4'V

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Proposed Utility Plans
Orchard St STA 207+50 to STA 212+00

drawing no. U-6

sheet: 27 of 55



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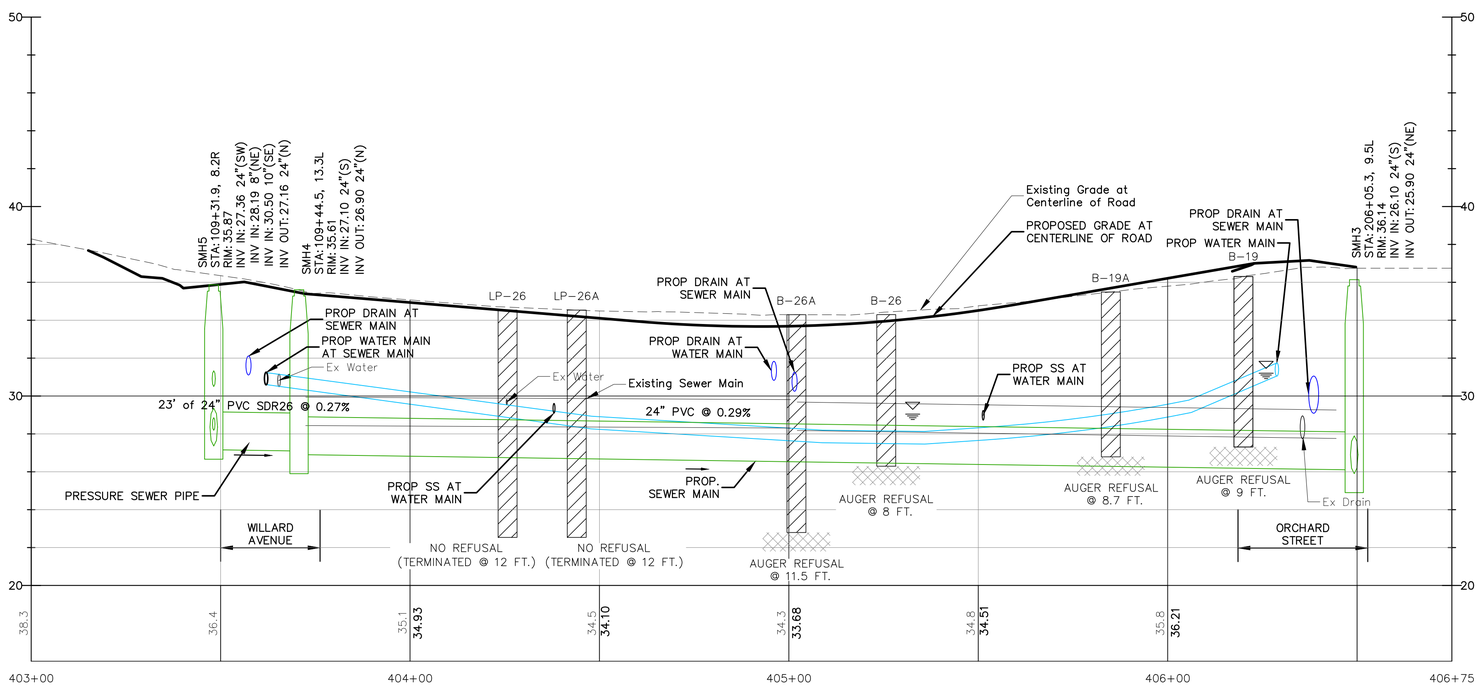

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STATE OF NEW HAMPSHIRE
PHILIP A. GORDEN No. 12271 LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by: CFC/STF	drawn by: WWG	approved by: PAC	scale: 20' 0 40' Scale: 1" = 20'H/4'V
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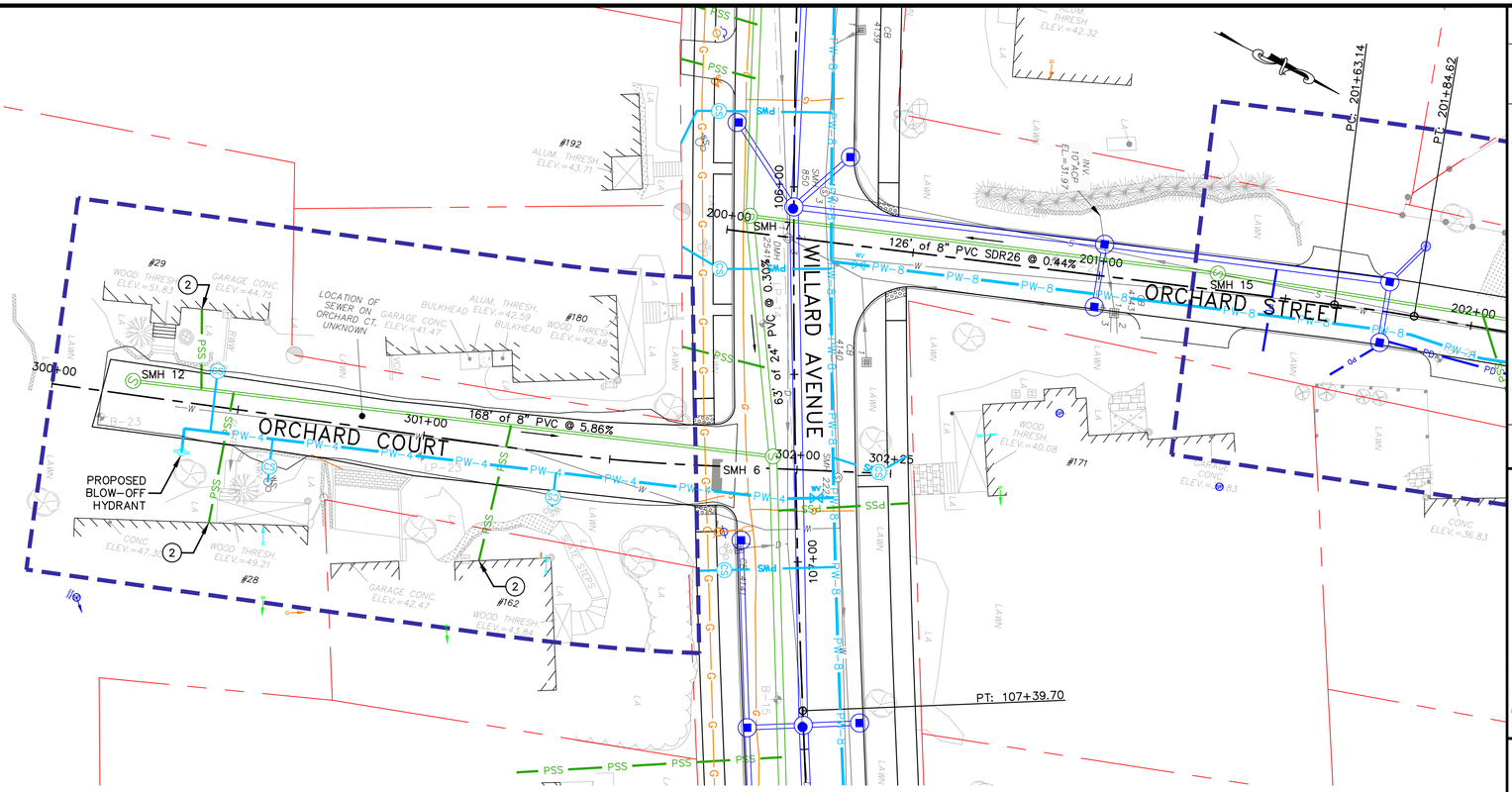
City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Proposed Utility Plans
Ash St STA 403+00 to STA 406+75

drawing no. U-7

sheet: 28 of 55



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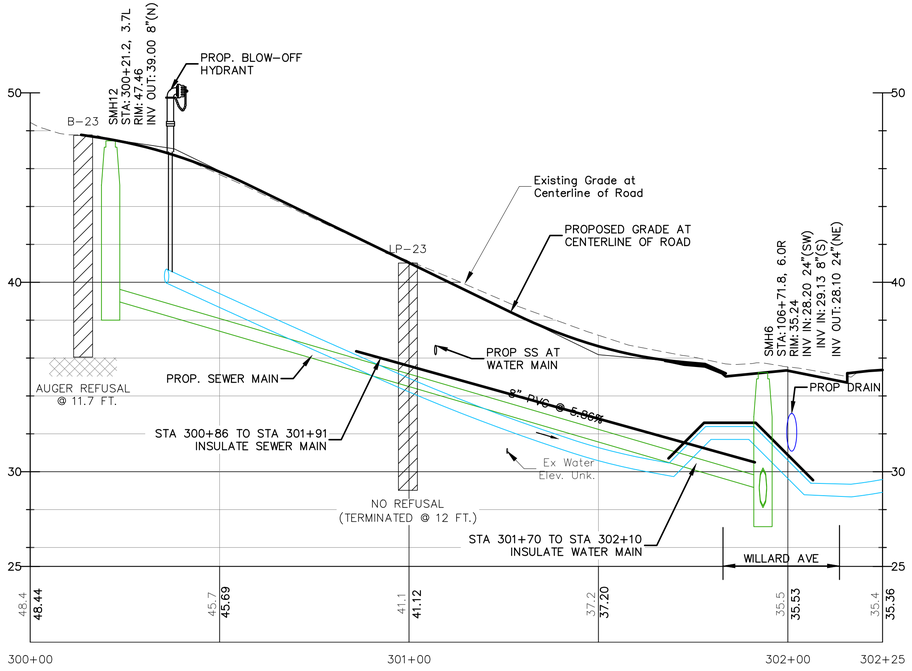

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PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

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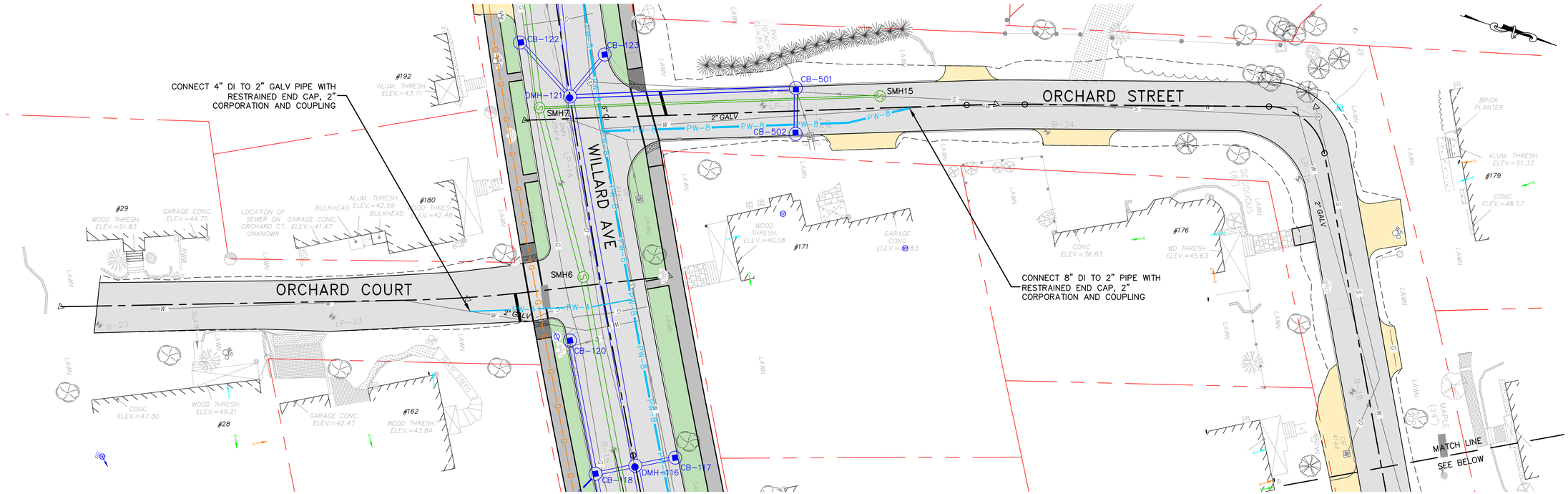
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scales: 20' 0 40' Scale: 1" = 20'H/4'V

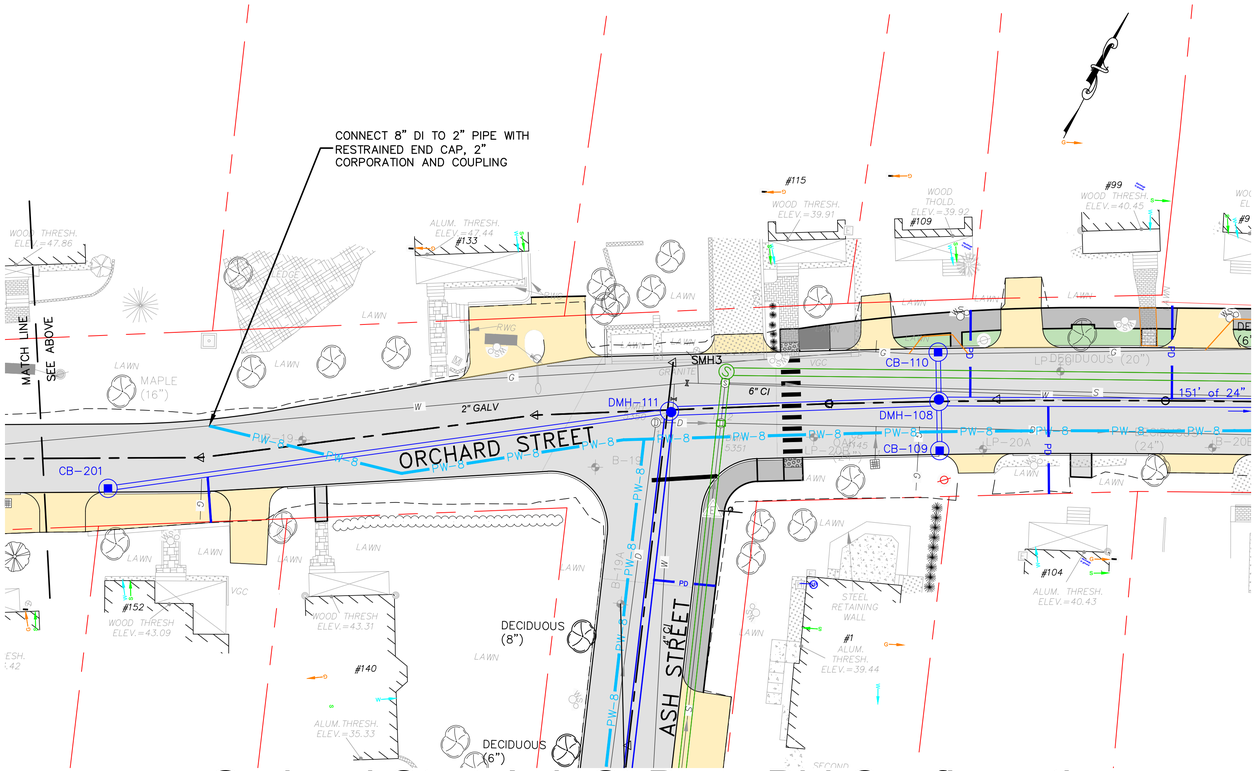
City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Proposed Utility Plans
Orchard Ct STA 300+00 to STA 302+00

drawing no. U-8

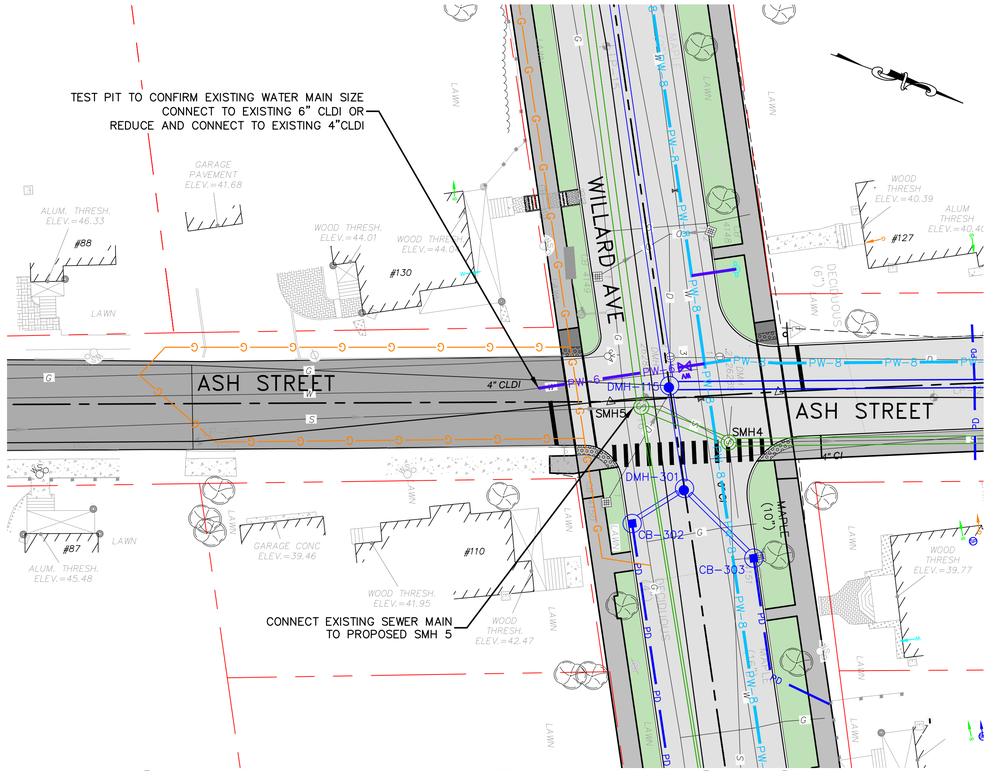
sheet: 29 of 55



Orchard Ct & Orchard St at Willard Ave Base Bid Configuration



Orchard St at Ash St Base Bid Configuration



Ash St at Willard Ave Base Bid Configuration

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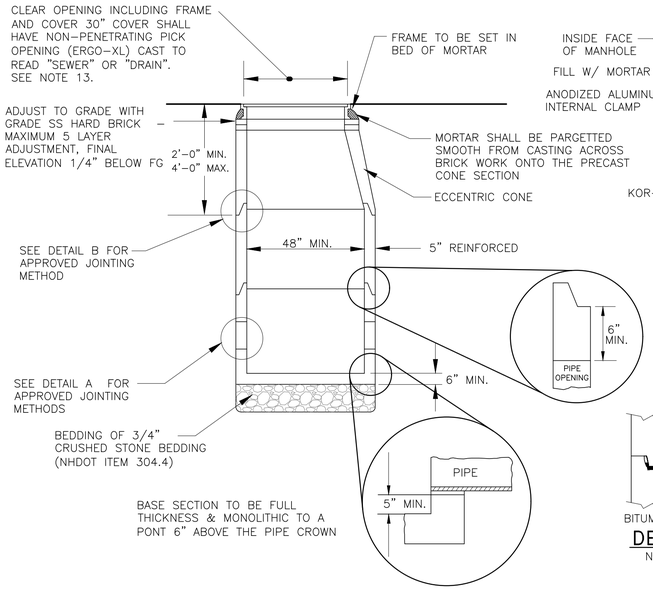
2/2/2024

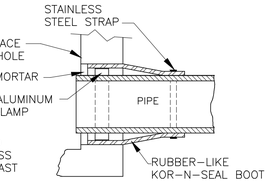
designed by: CFC/STF	drawn by: WWG	approved by: PAC	scale: 0 20' 40' Scale: 1" = 20'H/4'V
date: February 2024	project no: 1211	checked by: PAC	

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Base Bid Configurations

drawing no. B-1

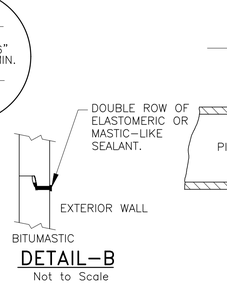
sheet: 30 of 55





DETAIL A

Not to Scale



DETAIL-B

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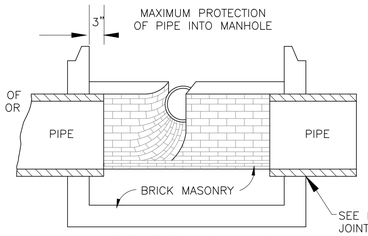


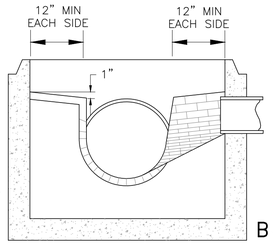
SECTION A – A

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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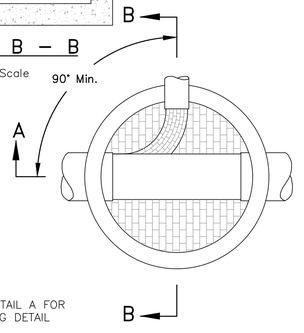


TYPICAL SEWER MANHOLE PLAN

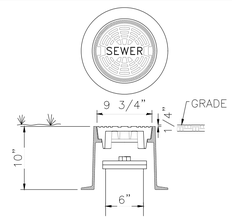
Not to Scale

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 (H-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.

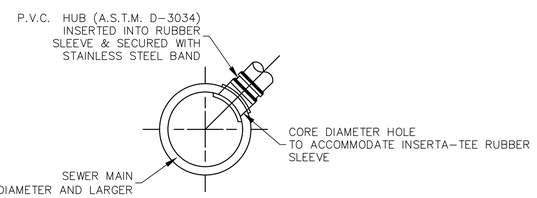
Sewer or Drain Manhole Detail

Not to Scale



Cast Iron Cleanout Covers

Not to Scale

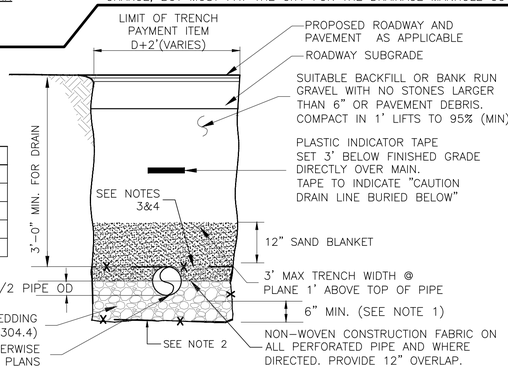


Inserta - Tee

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

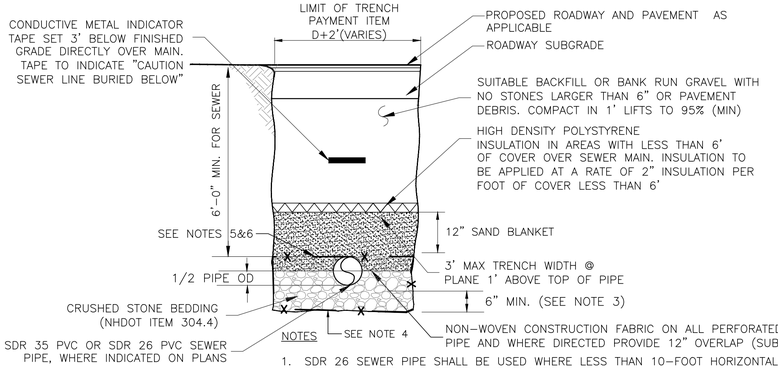


Typical Drain Trench

Not to Scale

NOTES

1. WHERE LEDGE IS ENCOUNTERED, THE TRENCH SHALL BE EXCAVATED 12 INCHES BELOW THE BOTTOM OF THE PIPE.
2. WHERE UNSUITABLE MATERIAL IS ENCOUNTERED, THE TRENCH SHALL BE EXCAVATED 12 INCHES BELOW THE BOTTOM OF PIPE. CRUSHED STONE BEDDING SHALL BE WRAPPED IN NON-WOVEN CONSTRUCTION FABRIC AS SHOWN IN THE DETAIL. ADDITIONAL UNSUITABLE MATERIAL REMOVAL, CRUSHED STONE BEDDING, AND NON-WOVEN CONSTRUCTION FABRIC SHALL BE PAID FOR UNDER ITEM 203.42 UTILITY TRENCH 6" OVEREXCAVATION W/ STONE & FABRIC.
3. FOR PIPE GREATER THAN 18 INCH DIAMETER, BED IN STONE TO TOP OF PIPE AND LINE TOP OF STONE WITH GEOTEXTILE FABRIC.
4. FOR PIPE EQUAL TO OR LESS THAN 18 INCH DIAMETER, BED PIPE IN STONE TO SPRING LINE, AS SHOWN IN DETAIL.



SCREENED GRAVEL BEDDING

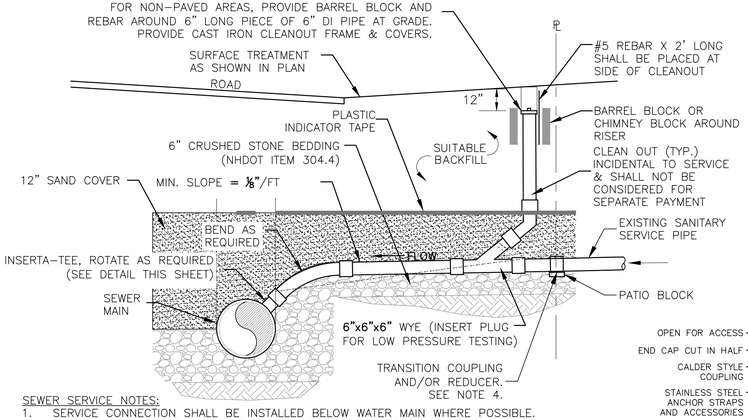
PERCENT PASSING	SIEVE SIZE
100%	1"
90-100%	3/4"
20-55%	3/8"
0-10%	#4
0-5%	#8

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.
4. WHERE UNSUITABLE MATERIAL IS ENCOUNTERED, THE TRENCH SHALL BE EXCAVATED 12 INCHES BELOW THE BOTTOM OF PIPE. CRUSHED STONE BEDDING SHALL BE WRAPPED IN NON-WOVEN CONSTRUCTION FABRIC AS SHOWN IN THE DETAIL. ADDITIONAL UNSUITABLE MATERIAL REMOVAL, CRUSHED STONE BEDDING, AND NON-WOVEN CONSTRUCTION FABRIC SHALL BE PAID FOR UNDER ITEM 203.42 UTILITY TRENCH 6" OVEREXCAVATION W/ STONE & FABRIC.
5. FOR PIPE GREATER THAN 18 INCH DIAMETER, BED IN STONE TO TOP OF PIPE AND LINE TOP OF STONE WITH GEOTEXTILE FABRIC.
6. FOR PIPE EQUAL TO OR LESS THAN 18 INCH DIAMETER, BED PIPE IN STONE TO SPRING LINE, AS SHOWN IN DETAIL.

Typical Sanitary Sewer Trench

Not to Scale

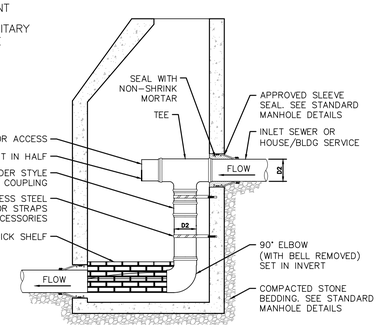


SEWER SERVICE NOTES:

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.
5. FOR SEWER MAINS 20" DIAMETER AND LARGER, USE "INSERTA-TEE" SERVICE CONNECTION. SEE DETAIL ON THIS SHEET.

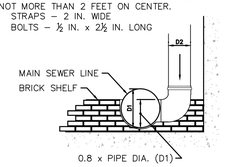
Sewer Service Connection with Cleanout

Not to Scale



INLET DROP MANHOLE NOTES:

1. DROP DIAMETER (D2) TO MATCH INLET DIAMETER (D2)
2. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH NHDES STANDARDS FOR SANITARY MANHOLE CONSTRUCTION.
3. INSIDE DROP MANHOLES SHALL HAVE A MINIMUM 5'-0" INSIDE DIAMETER.
4. DROP REQUIRED WHEN INVERT DIFFERENTIAL EXCEEDS 2 VERTICAL FEET.
5. ANCHOR STRAPS AND BOLTS TO BE STAINLESS STEEL AND NOT MORE THAN 2 FEET ON CENTER.
   STRAPS – 2 IN. WIDE
   BOLTS – ½ IN. x 2½ IN. LONG



INVERT DETAIL AT SIDE DROPS

Sewer Drop Inlet Manhole Detail

Not to Scale

no.	revision	date	by
1	Issued for Bid	2/2/2024	PAC

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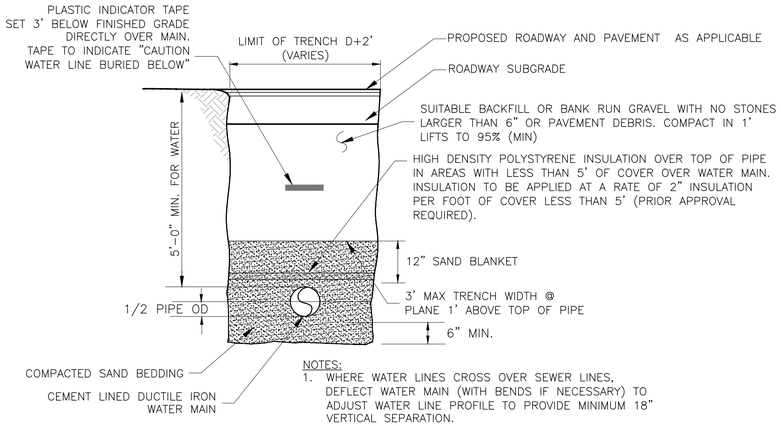
PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
scale: 0 10' 20' Scale: 1" = 10'
date: February 2024
project no: 1211
checked by: PAC

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Sewer Details

drawing no. D-1
sheet: 31 of 55

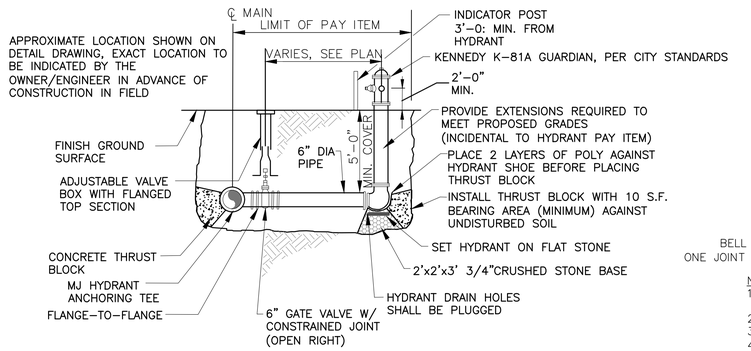


NOTES:
1. WHERE WATER LINES CROSS OVER SEWER LINES, DEFLECT WATER MAIN (WITH BENDS IF NECESSARY) TO ADJUST WATER LINE PROFILE TO PROVIDE MINIMUM 18" VERTICAL SEPARATION.

Typical Water Main Trench

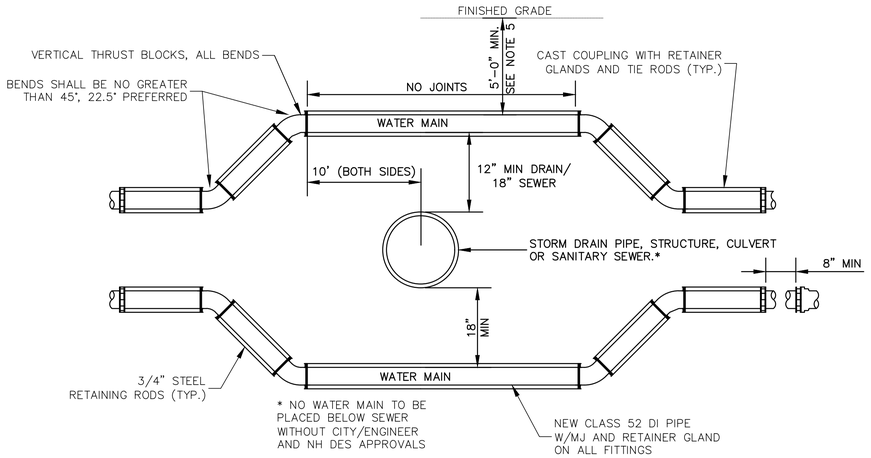
Not to Scale

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.



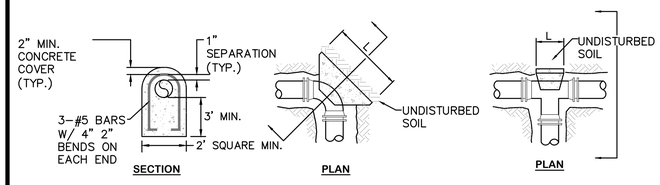
Hydrant Assembly

Not to Scale



Water/Utility Crossing

Not to Scale



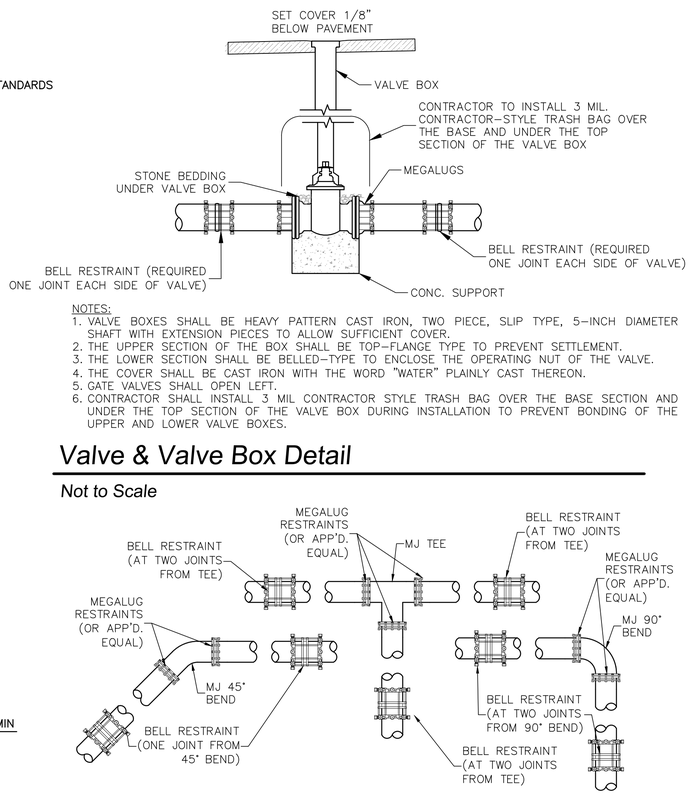
NOTES:
1. THRUST BLOCKS SHALL BE PRECAST CONCRETE, EXCEPT THRUST BLOCKS FOR VERTICAL BENDS CAN BE CIP CONCRETE.
2. THE MINIMUM BEARING AREAS SHOWN ABOVE ARE BASED ON A SYSTEM PRESSURE OF 100 PSI. IF THE SYSTEM PRESSURE IS ABOVE 100 PSI, INCREASE THE NOTED AREAS PROPORTIONAL TO THE ACTUAL SYSTEM PRESSURE. 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

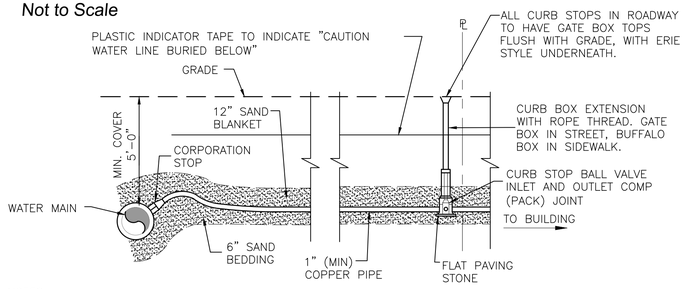
NOTES:
1. ALL BENDS AND TEES SHALL BE DUCTILE IRON FITTINGS.
2. JOINT RESTRAINT IS REQUIRED AT ALL FITTINGS PER THE ABOVE TABLE.

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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STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by: CFC/STF
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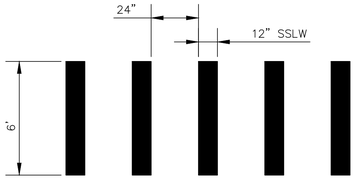
date: February 2024
project no: 1211
checked by: PAC
scale: 1" = 10'
0 10' 20'

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Water Details

drawing no. D-2
sheet: 32 of 55

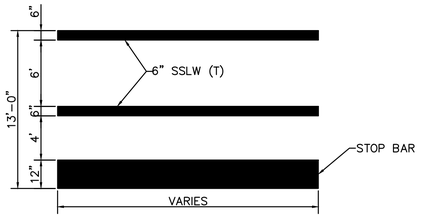
F:\CADD\PROJECTS\1211-Union and Willard Reconstruction\Production\1211 - Willard Details.dwg Date Plotted: Feb 02, 2024 - 1:02pm Plotted By: WCHAMBERLAIN



NOTE: 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.

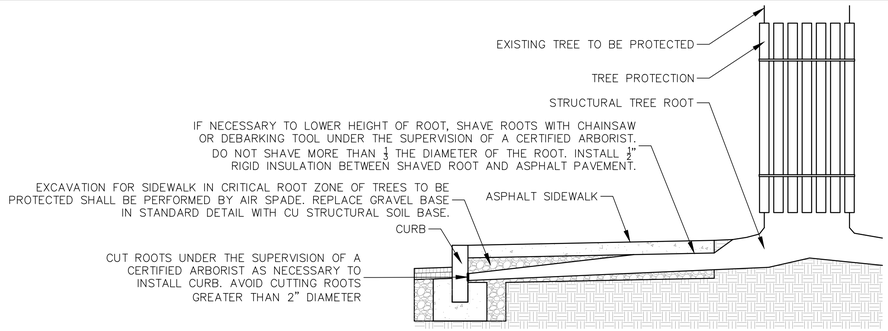
Continental Block Marking Detail

Not to Scale



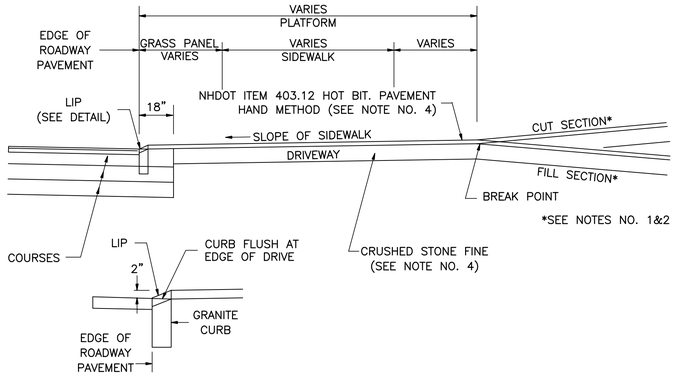
Standard Crosswalk Detail

Not to Scale



Sidewalk at Existing Tree to be Protected

Not to Scale



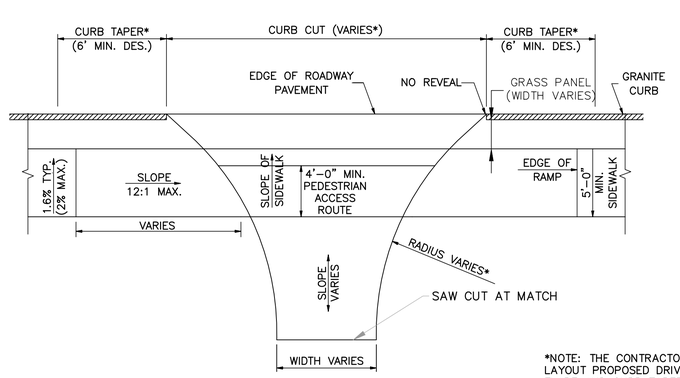
LIP DETAIL

NOTES:

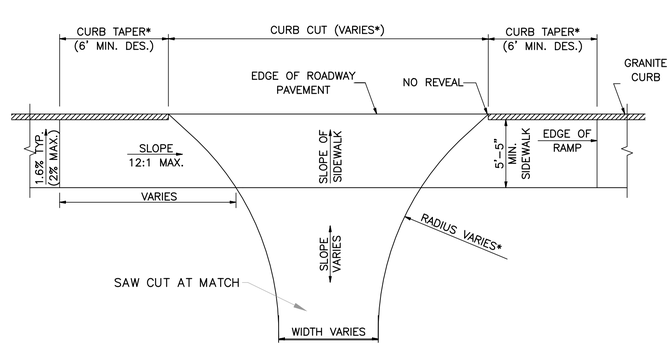
1. GRADES OF MAJOR ENTRANCES BEYOND THE PLATFORM SHOULD NOT EXCEED 8%.
2. GRADES OF OTHER DRIVES BEYOND THE PLATFORM SHOULD NOT EXCEED 15%.
3. THE ALGEBRAIC DIFFERENCE BETWEEN TWO ADJACENT GRADES SHOULD NOT EXCEED 10%.
4. PAVEMENT & BASE COURSE DEPTHS FOR RESIDENTIAL DRIVES SHALL BE 8" CRUSHED STONE FINE (NHDOT ITEM 304.4) WITH 3" H.B.P. (HAND METHOD) SINGLE COURSE.
5. CURBING CAN BE FLARED TO FIT DRIVE RADII IF APPROPRIATE OR ENDED AS DETAILED ABOVE.
6. FOR UNPAVED DRIVES, THE PAVED APRON NORMALLY ENDS AT THE RADIUS TANGENT POINT.
7. SEE SHEET D-4 FOR NHDOT STANDARD RAMP DETAILS.
8. 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

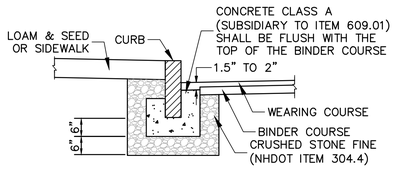


PLAN VIEW WITH SIDEWALK RAMP AND GRASS PANEL



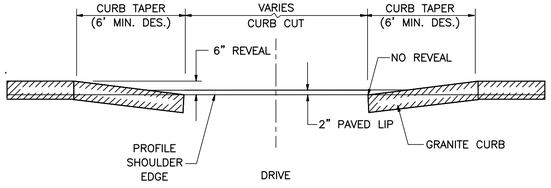
PLAN VIEW WITH SIDEWALK RAMP AND NO GRASS PANEL

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



Granite Curb w/ Concrete Backing

Not to Scale



END VIEW

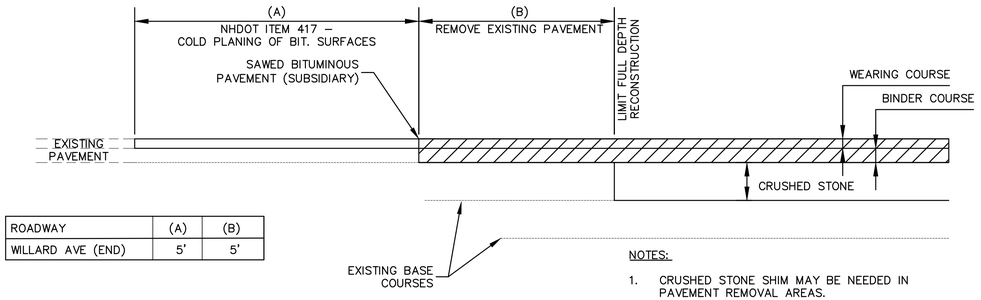
Driveway Detail

Not to Scale

ITEM #	IDENT #	SIGN SIZE		TEXT	TEXT DIMENSIONS			SHIELD SIZE (INCH)	ARROW (INCH)	NUMERAL (INCH)	# SIGNS REQ'D	SIGN AREA (SQ. FT)		POSTS PER SIGN				REMARKS
		WIDTH (INCH)	HEIGHT (INCH)		LETTER HEIGHT (INCH)							NOM. AREA	TOTAL AREA	BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" O.D. ALUMINUM U-CHANNEL GALV.	
					UC	LC	CAPS											
615.0301	R1-1	36	36	STOP			12C				3	9.00	27.00				1	WHITE/RED
615.0301	D3-1	42	12	WILLARD AVE							1	3.50	3.50				1	GREEN/WHITE

Sign Text Layout

Not to Scale



ROADWAY	(A)	(B)
WILLARD AVE (END)	5'	5'

NOTES:

1. CRUSHED STONE SHIM MAY BE NEEDED IN PAVEMENT REMOVAL AREAS.
2. SEE TYPICALS FOR WEARING AND BINDER DEPTHS.

Pavement and Base Course Transitions

Not to Scale

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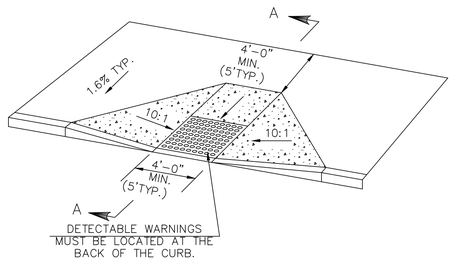
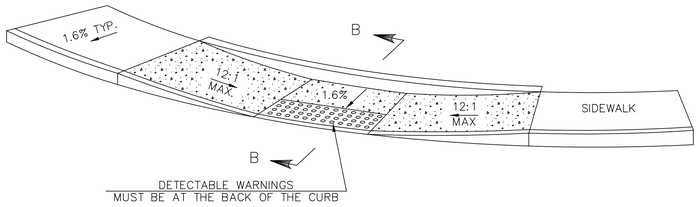
City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Roadway Details

drawing no. D-3

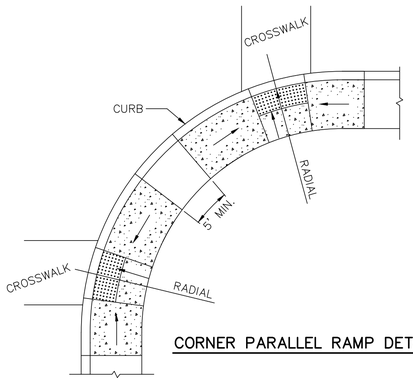
sheet: 33 of 55



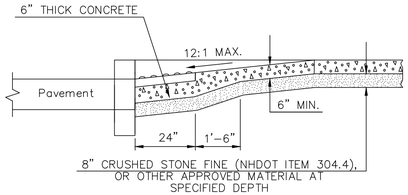
PERPENDICULAR CURB RAMP DETAIL



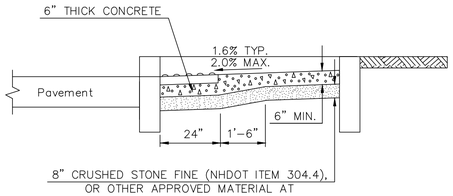
PARALLEL CURB RAMP DETAIL



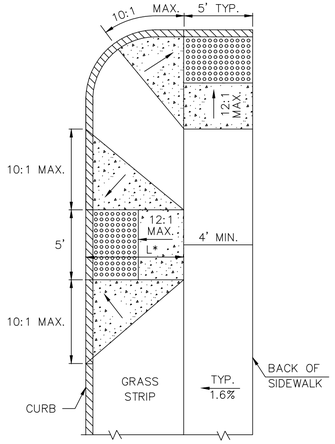
CORNER PARALLEL RAMP DETAIL



SECTION A–A



SECTION B–B



PERPENDICULAR RAMP WITH GRASS PANEL

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

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:

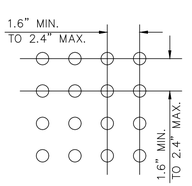
WHERE BOTH ENDS OF THE BOTTOM GRADE ARE LESS THAN 5'- 0" FROM THE BACK OF THE CURB, LOCATE THE DETECTABLE WARNING PANELS ON THE RAMP SURFACE AT THE BOTTOM OF THE RAMP. WHERE EITHER END OF THE BOTTOM GRADE IS GREATER THAN 5'-0" FROM THE BACK OF THE CURB, LOCATE THE DETECTABLE WARNINGS AT THE BOTTOM OF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

PARALLEL CURB RAMPS:

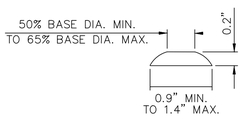
LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB ALONG THE EDGE OF THE LANDING.

FOR BLENDED TRANSITIONS AND LANDINGS:

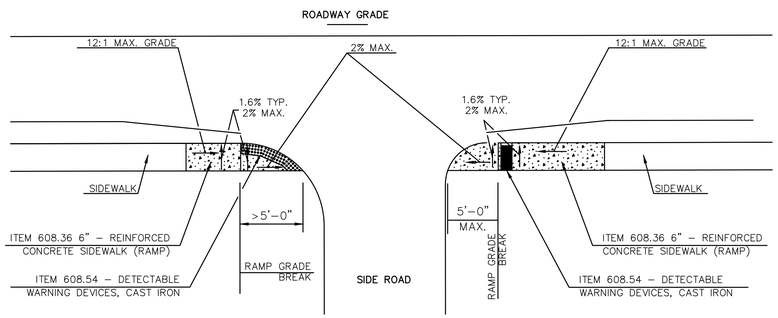
LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB.



DOME SPACING



DOME SECTION



PLAN VIEW

Sidewalk & Curb Ramp Details

Not to Scale

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1	Issued for Bid	2/2/2024	PAC

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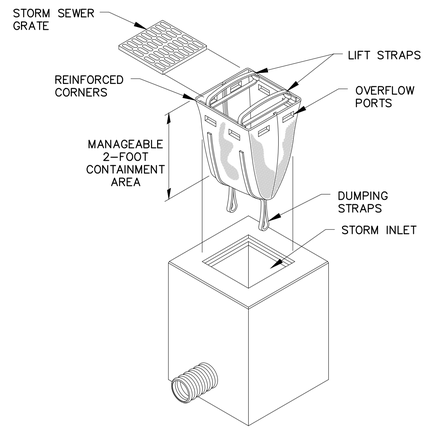
PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 0 10' 20' Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Sidewalk Details

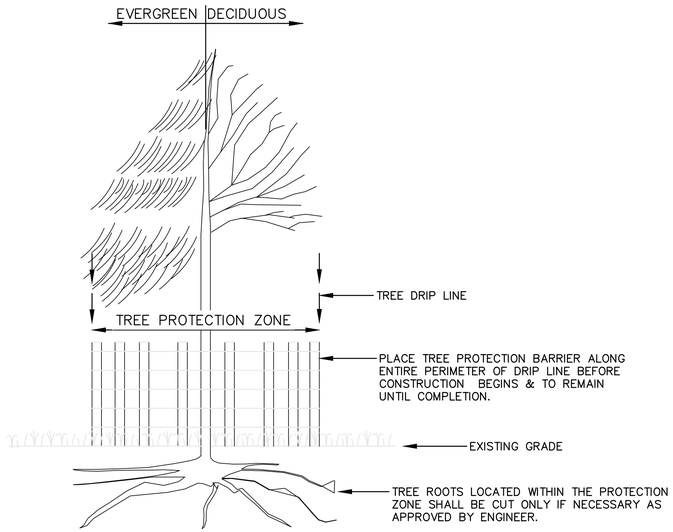
drawing no. D-4

sheet: 34 of 55



"Silt Sack" Sediment Control Device for Inlet Protection

Not to Scale



Temporary Tree Protection

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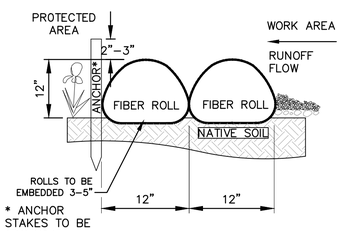
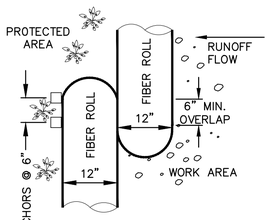
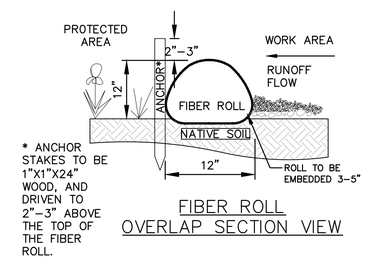


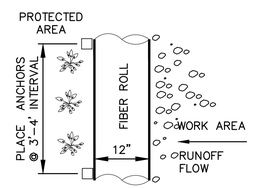
FIBER ROLL
OVERLAP END VIEW



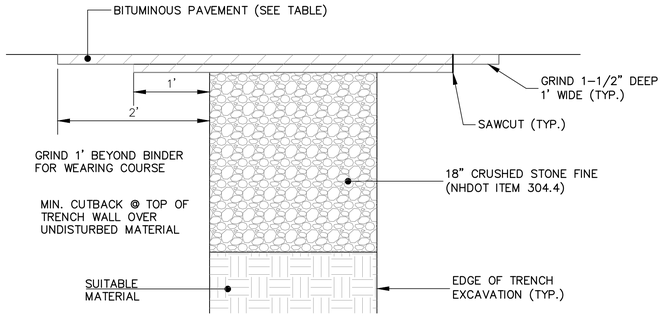
FIBER ROLL
OVERLAP TOP VIEW



FIBER ROLL
OVERLAP SECTION VIEW



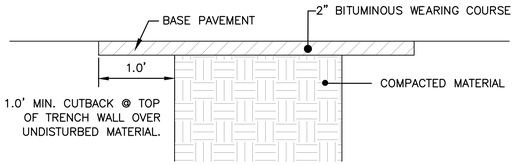
FIBER ROLL
OVERLAP TOP VIEW



Permanent Trench Patch

PAVEMENT COURSES:

ROADS	COURSE	MINIMUM LIFT THICKNESS	NOMINAL MAX. AGGREGATE SIZE	GYRATORY COMPACTION EFFORT	MINIMUM BINDER CONTENT
RESIDENTIAL ROADS	WEARING	1–1/2"	3/8"	75	5.9%
	BASE	2–1/2"	3/4"	50	5.3%
LAFAYETTE ROAD	WEARING	1–1/2"	1/2"	50	5.9%
	BASE	4–1/2"	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:

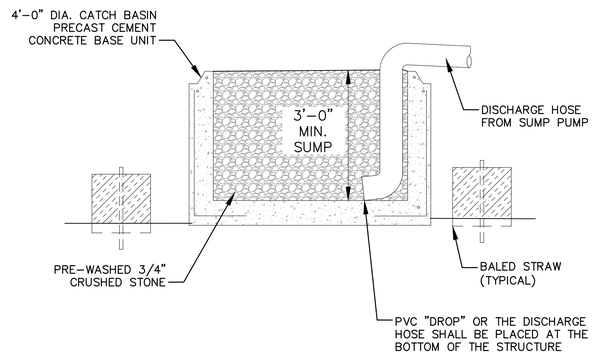
1. THE CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ALL AREAS DISTURBED BEYOND THE TRENCH PATCH LIMITS.
2. ANY TEMPORARY TRENCH PATCH IS CONSIDERED SACRIFICIAL AND REMOVAL/INCORPORATION OF TEMPORARY PATCH MATERIALS AND BASE MATERIALS SHALL BE SUBSIDIARY TO PERMANENT TRENCH PATCH REPAIR.
3. ALL PAVEMENT 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.



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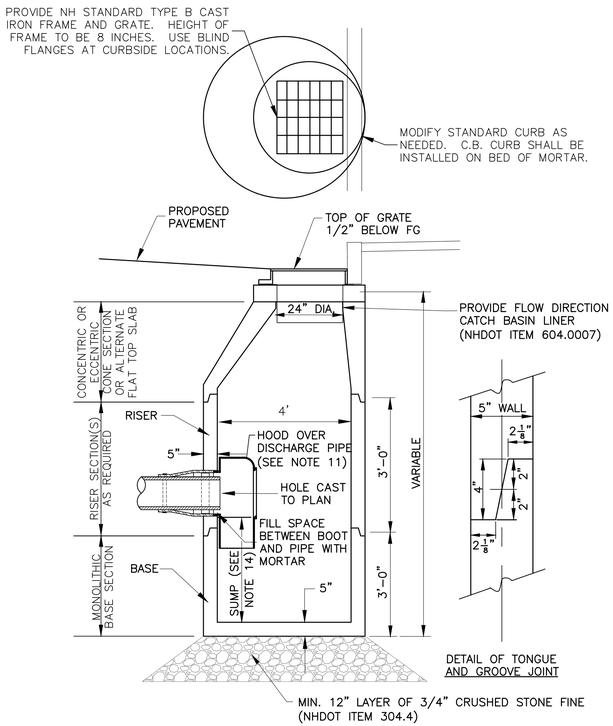
PHILIP A. CORBETT NO. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Erosion Control Details

drawing no. D-5

sheet: 35 of 55

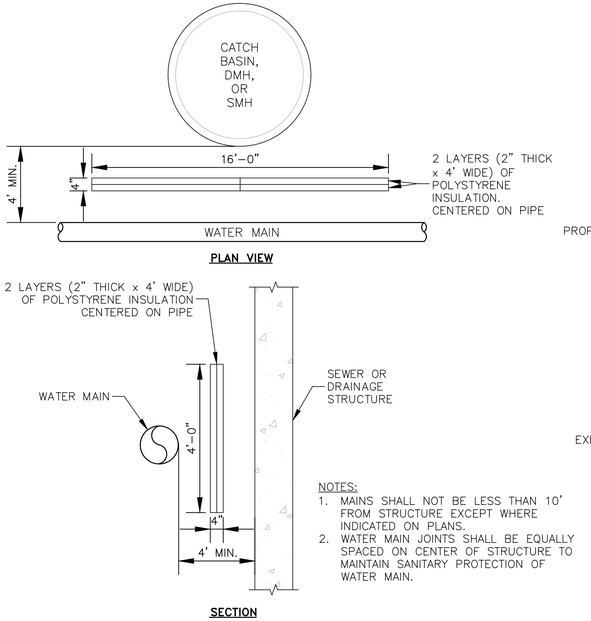


NOTES:

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".
14. ALL CATCH BASINS SHALL HAVE A 4' SUMP.

Catch Basin Detail

Not to Scale

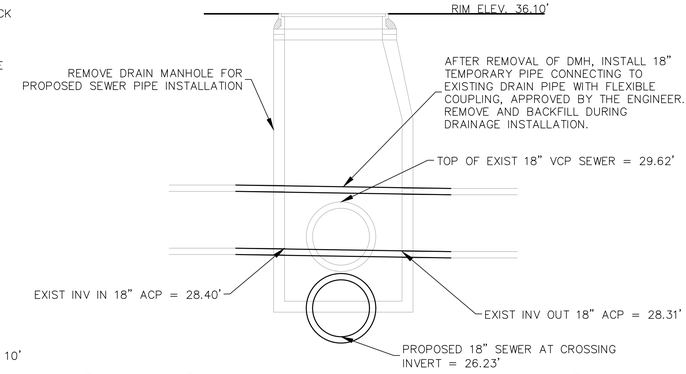


NOTES:

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



Orchard Street Drain Manhole Detail with Sewer

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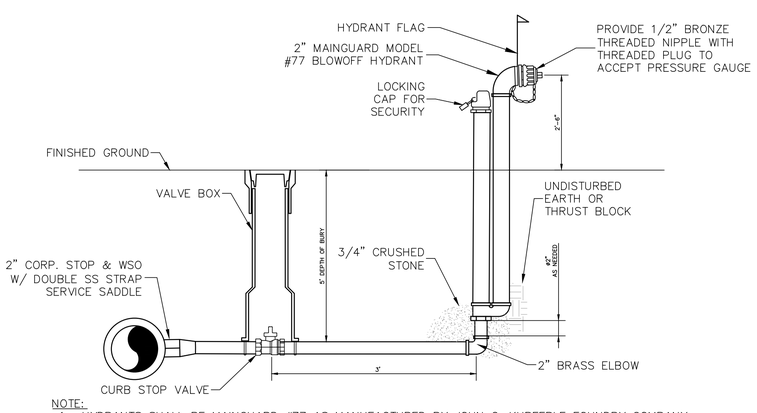
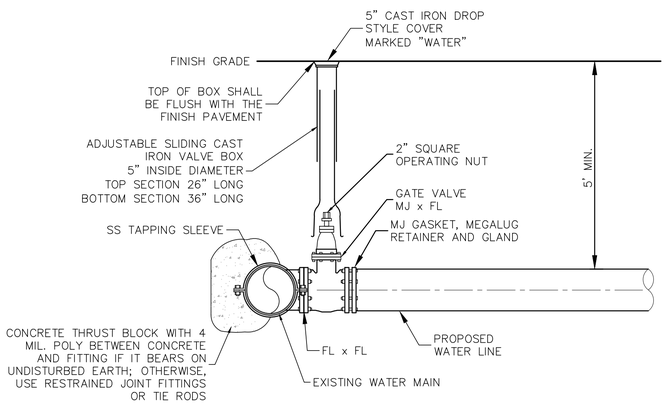


NOTE:

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.

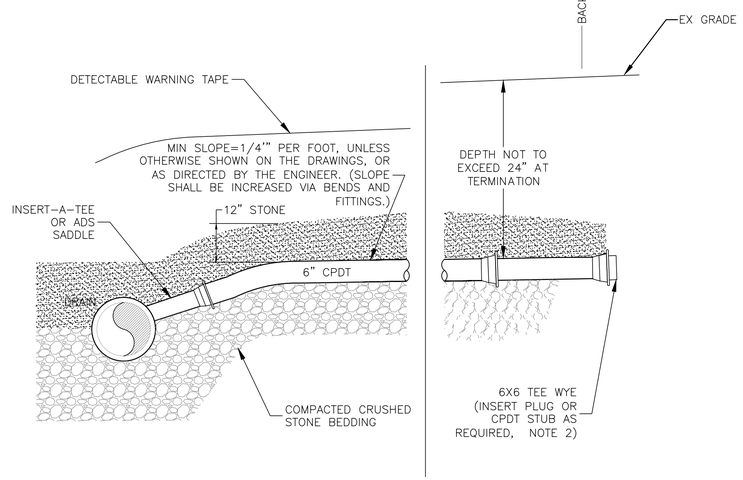
Blowoff Detail

Not to Scale



Water Main Connection with Tapping Sleeve

Not to Scale



NOTES:

1. CDPT RISER PIPE, FITTINGS, AND CLEANOUTS ARE INCIDENTAL TO ITEM 603.8126 AND WILL NOT BE CONSIDERED FOR PAYMENT.
2. SERVICE TEES SHALL BE ORIENTED @ 10:30 OR 1:30 (TYP.). UNDER NO CIRCUMSTANCES SHALL SERVICES BE LOCATED BETWEEN 3:00 AND 9:00.
3. 8" PIPE AND FITTINGS SHALL BE USED TO TIE INTO EXISTING 8" SERVICES.

Drain Lateral and Roof Leader Connection

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City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area Improvement Project
Water and Drainage Details

drawing no. D-6

sheet: 36 of 55

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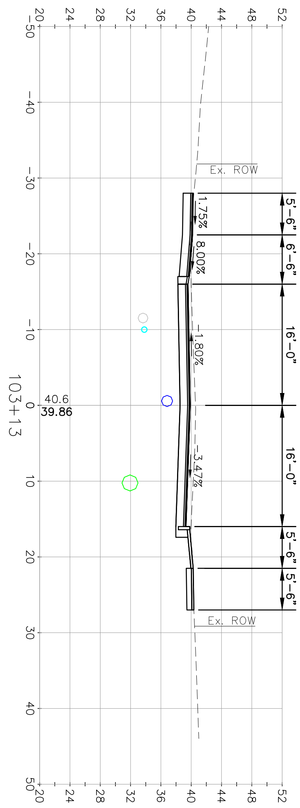
City of Portsmouth, New Hampshire
Department of Public Works

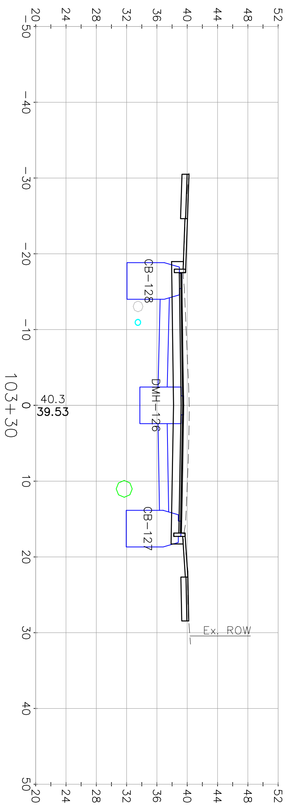
Willard Ave Area Improvement Project

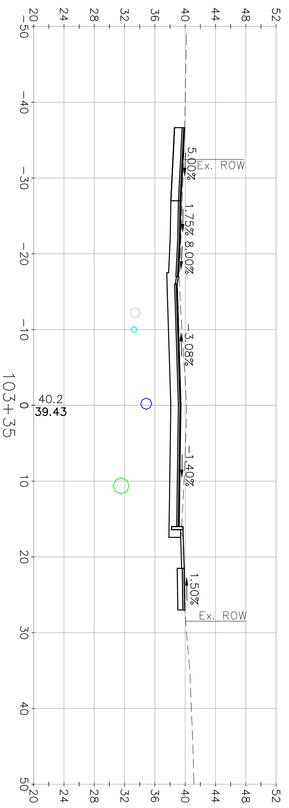
Cross Sections Willard Ave

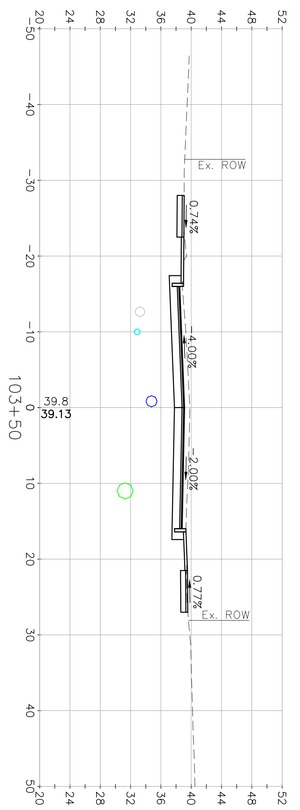
drawing no.
XS-1

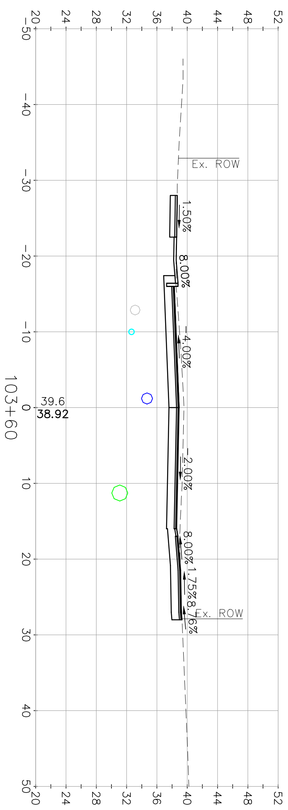
sheet: 37 of 55

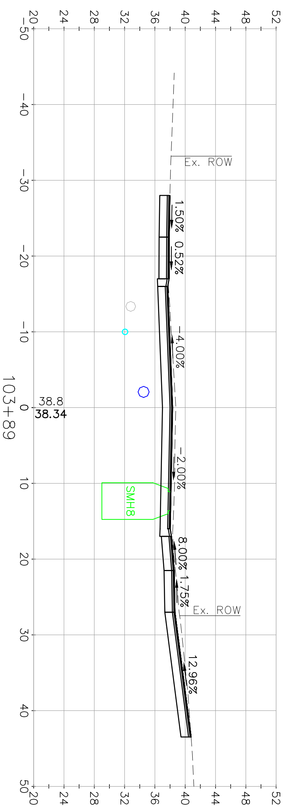


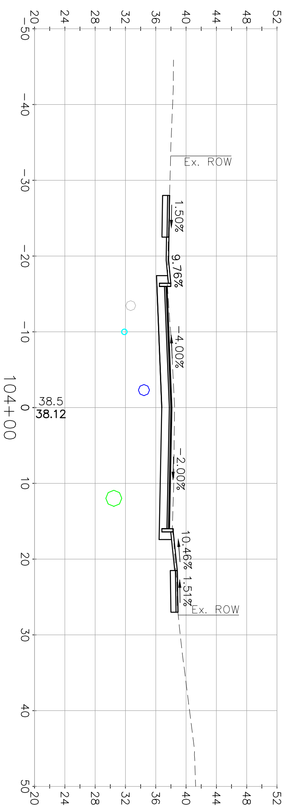












sheet 38 of 55	drawing no. XS-2	City of Portsmouth, New Hampshire Department of Public Works Willard Ave Area Improvement Project Cross Sections Willard Ave	date: February 2024 · designed by: CFC/STF project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 10' 20' — Scale: 1" = 10'

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
2/2/2024

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1	Issued for Bid	2/2/2024	PAC

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PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF	drawn by: WWG	approved by: PAC	scale: 1" = 10'
date: February 2024	project no: 1211	checked by: PAC	0 10' 20' Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area
Improvement Project
Cross Sections
Willard Ave

drawing no.
XS-3

sheet: 39 of 55

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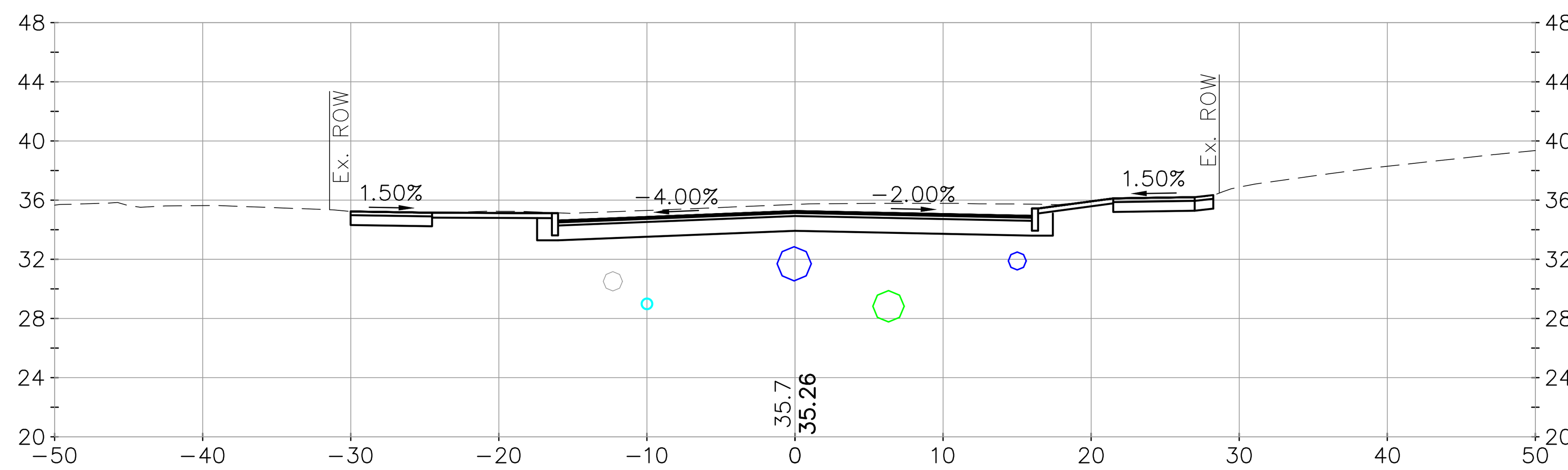
STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by:	drawn by:	approved by:	scale:
CFC/STF	WWG	PAC	20' 10' 0 Scale: 1" = 10'
date: February 2024	project no: 1211	checked by: PAC	

City of Portsmouth, New Hampshire
Department of Public Works
Willard Ave Area
Improvement Project
Cross Sections
Willard Ave

drawing no.
XS-4

sheet: 40 of 55



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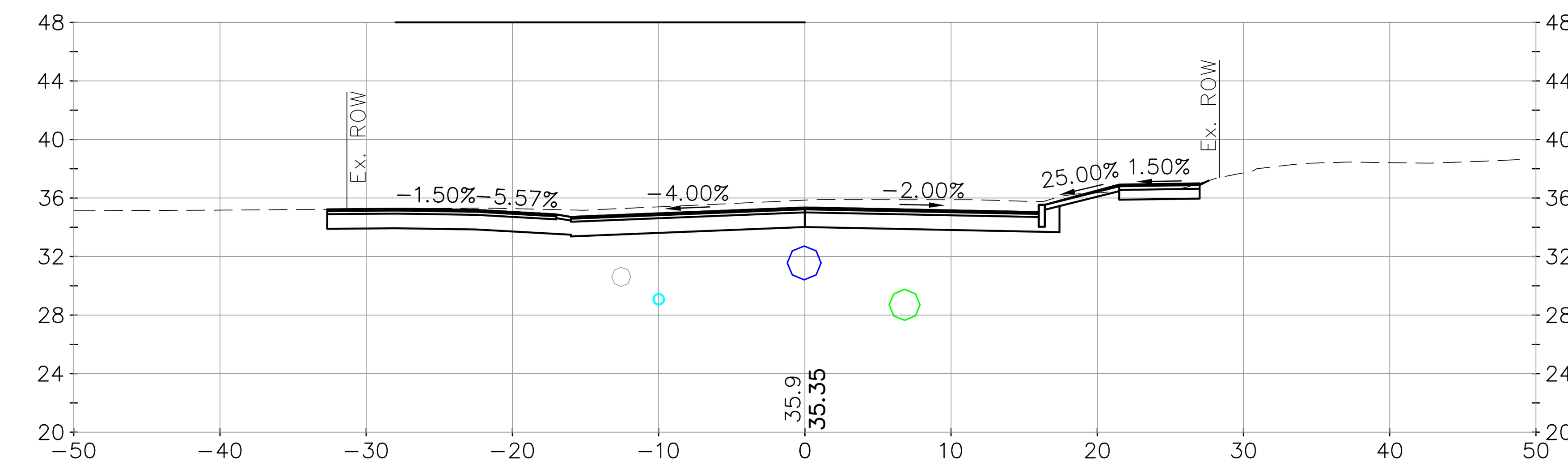

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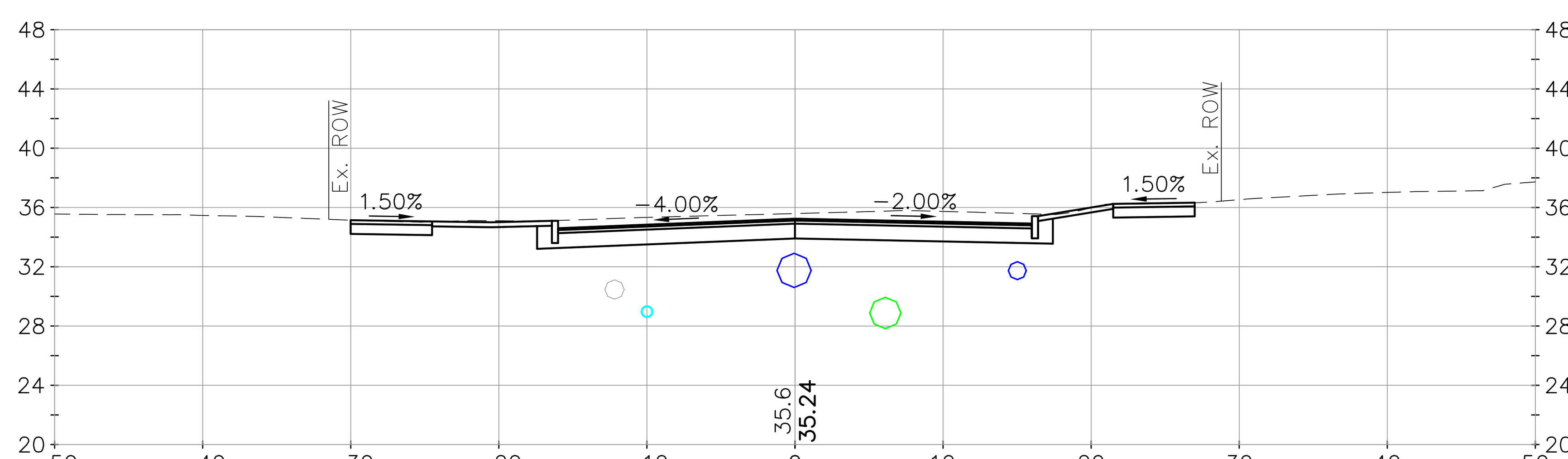

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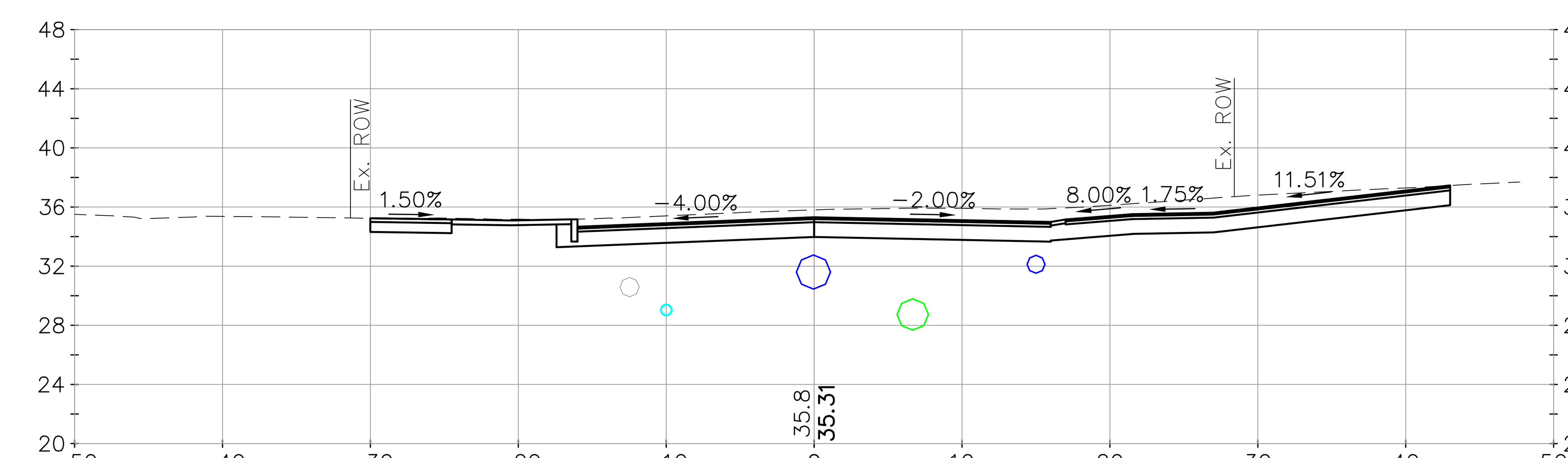

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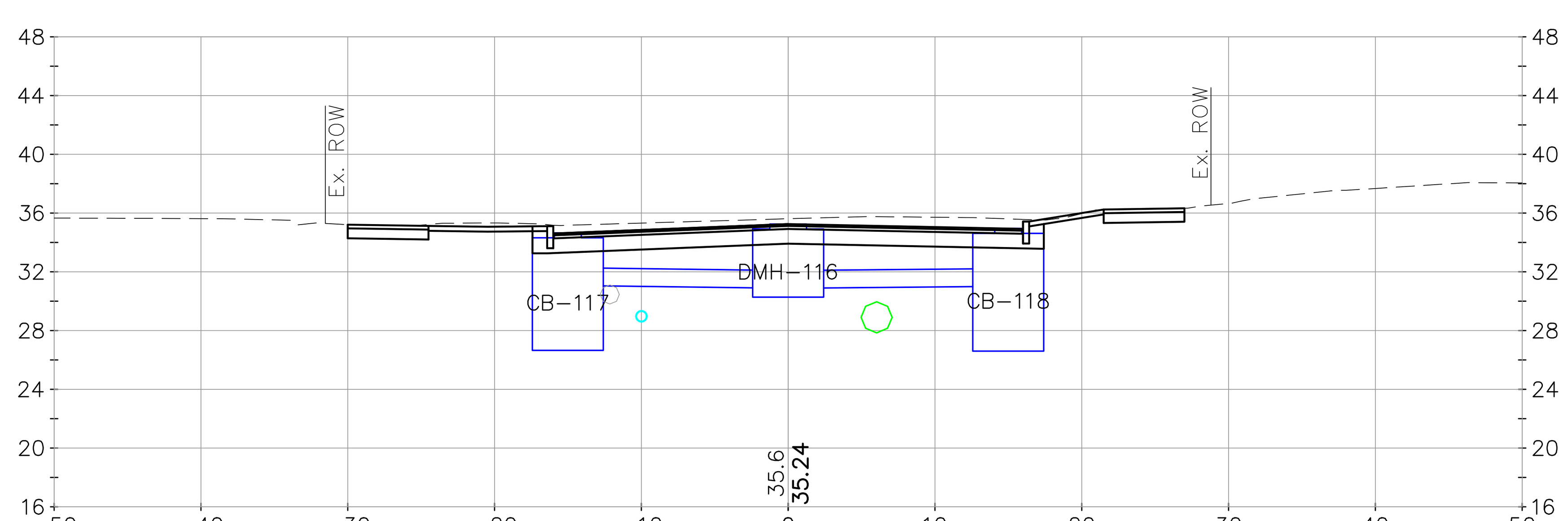

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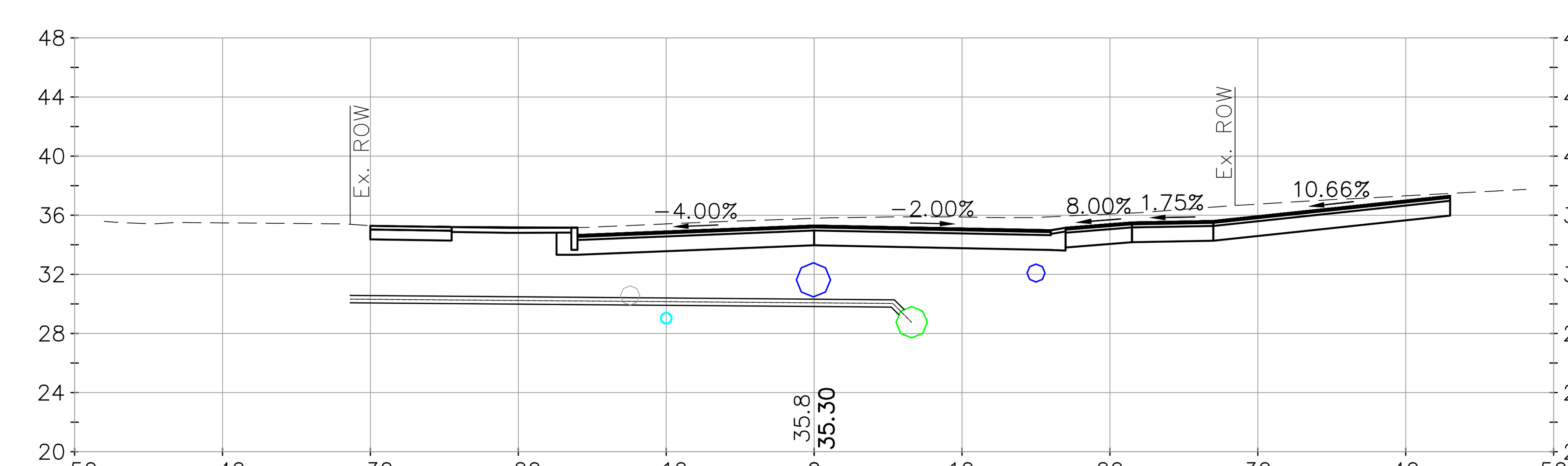

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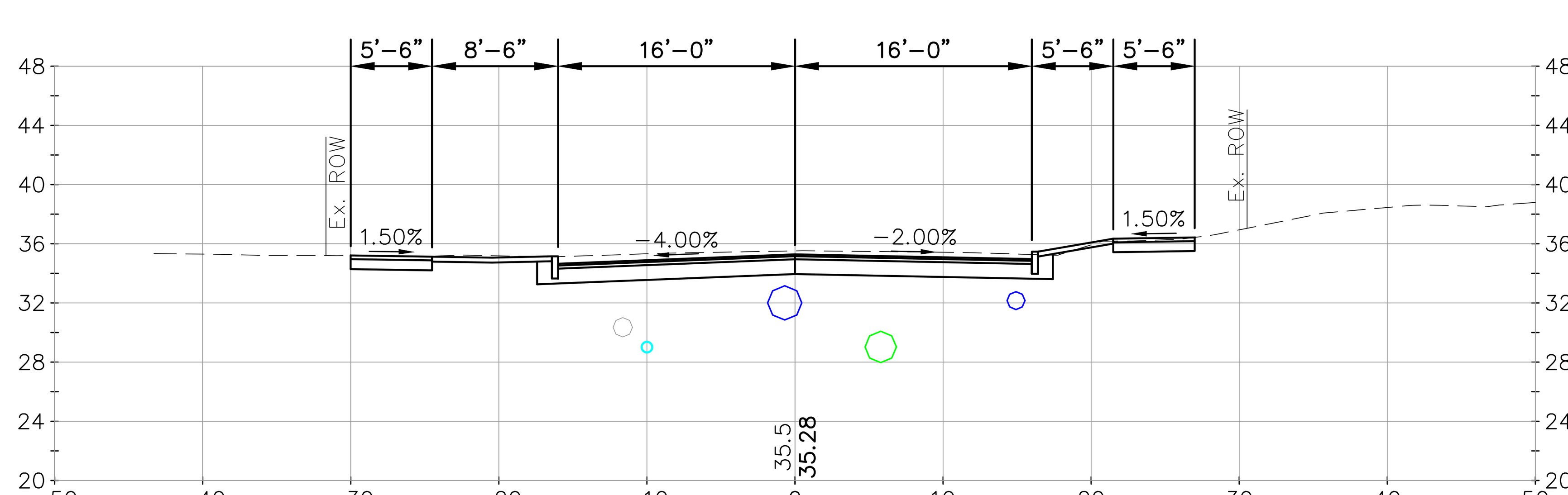

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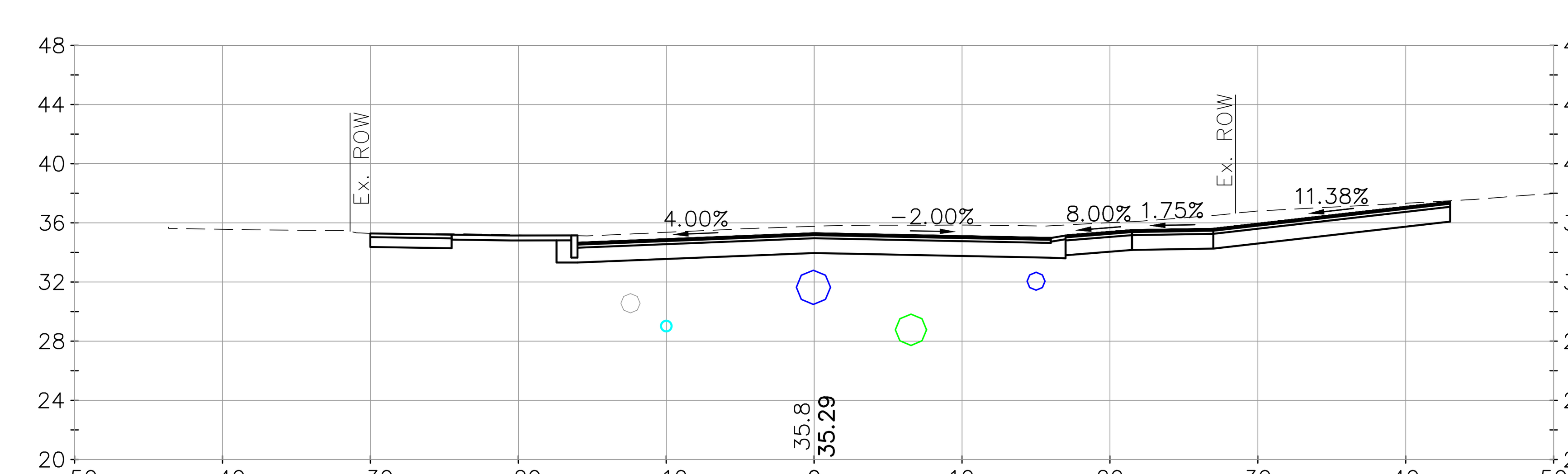

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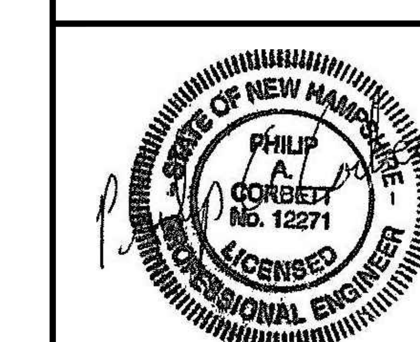

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drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Cross Sections
Willard Ave

drawing no. XS-5

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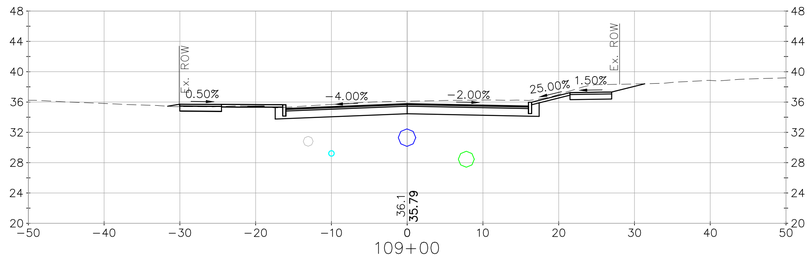

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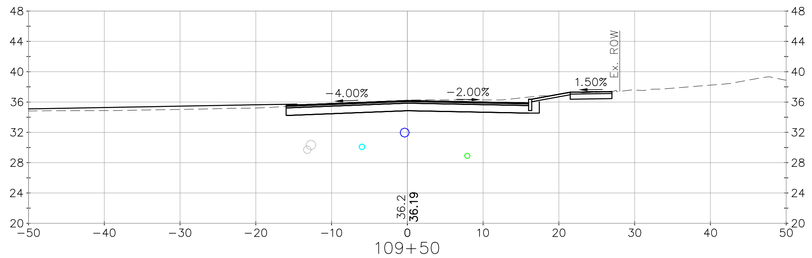

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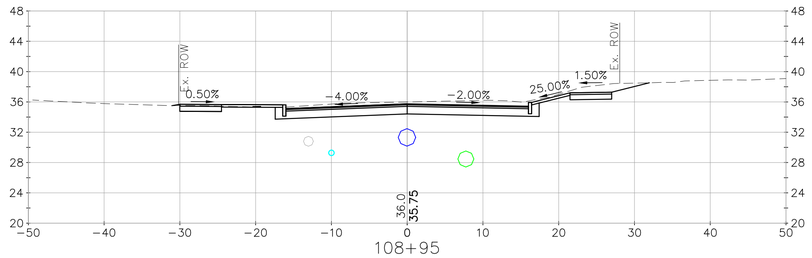

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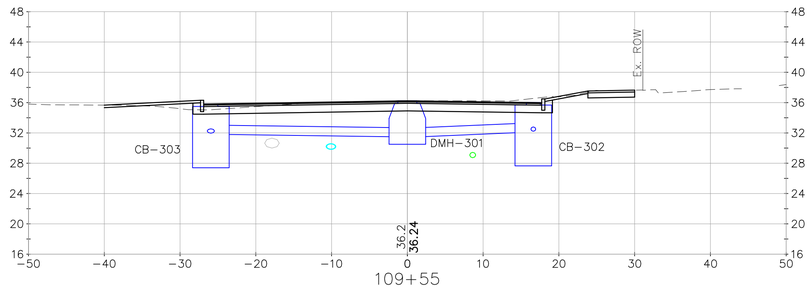

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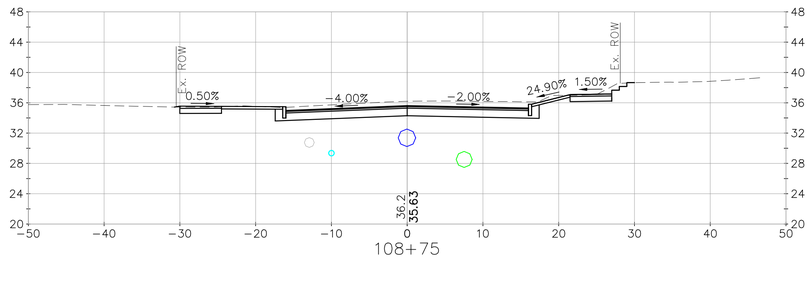

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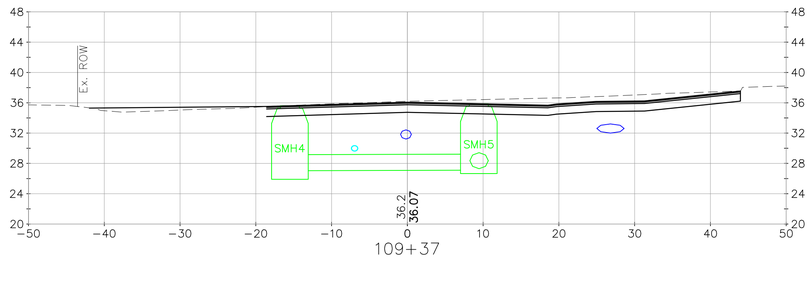

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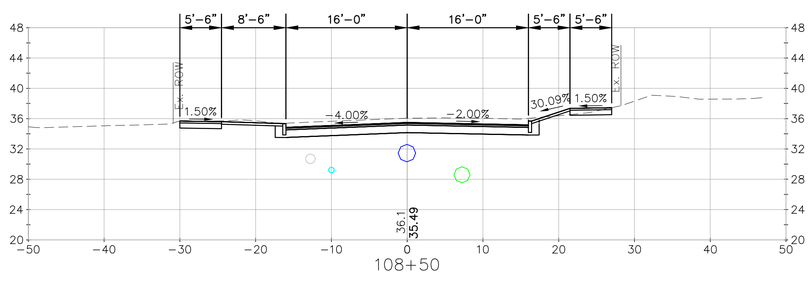

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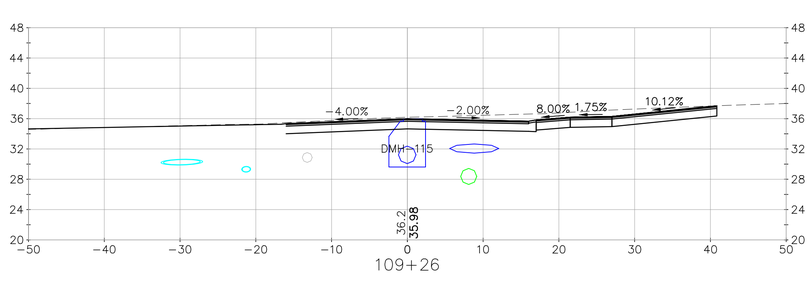

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PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF	drawn by: WWG	approved by: PAC	scale: 20' 10' 0 Scale: 1" = 10'
date: February 2024	project no: 1211	checked by: PAC	

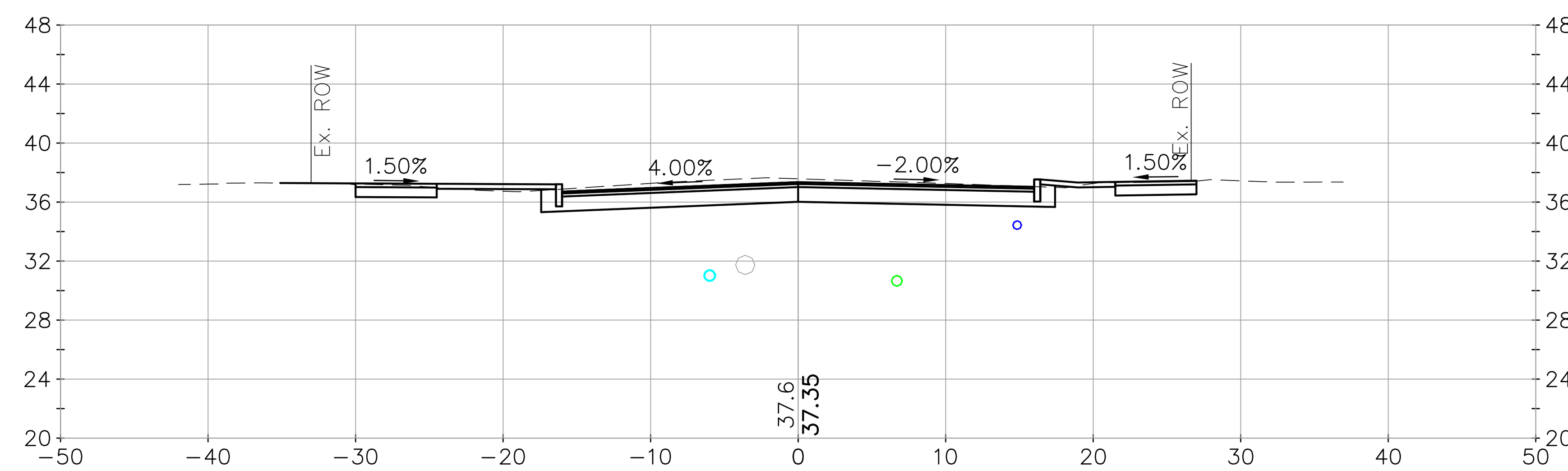
City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area Improvement Project

Cross Sections Willard Ave

drawing no.
XS-6

sheet: 42 of 55



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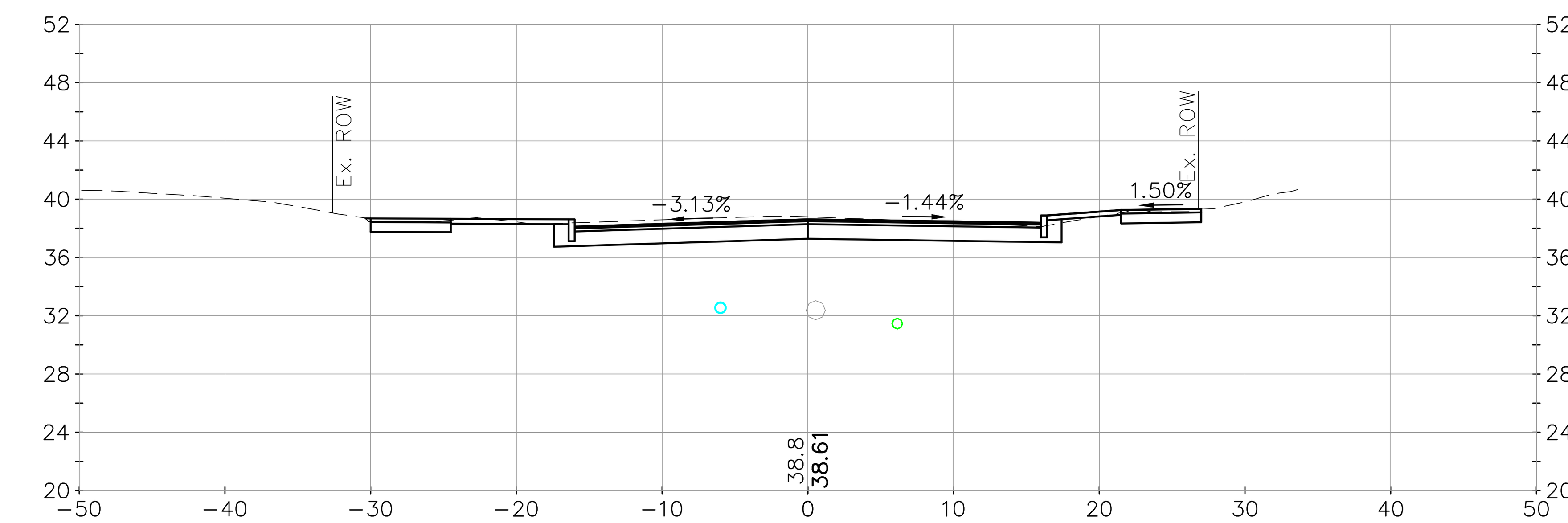

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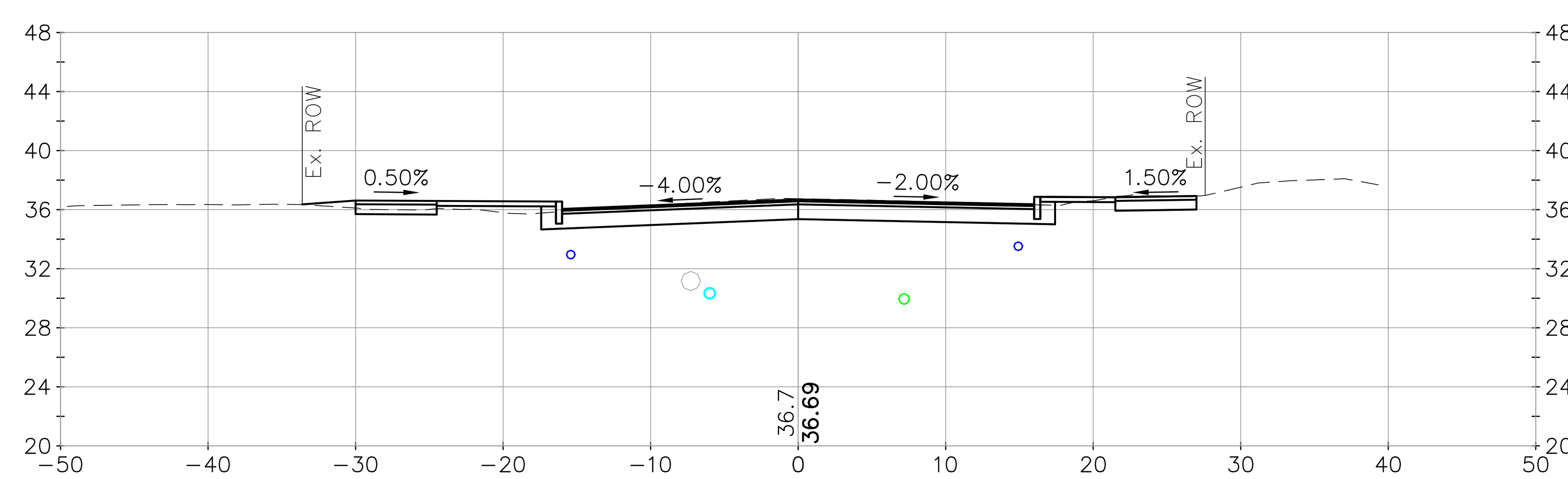

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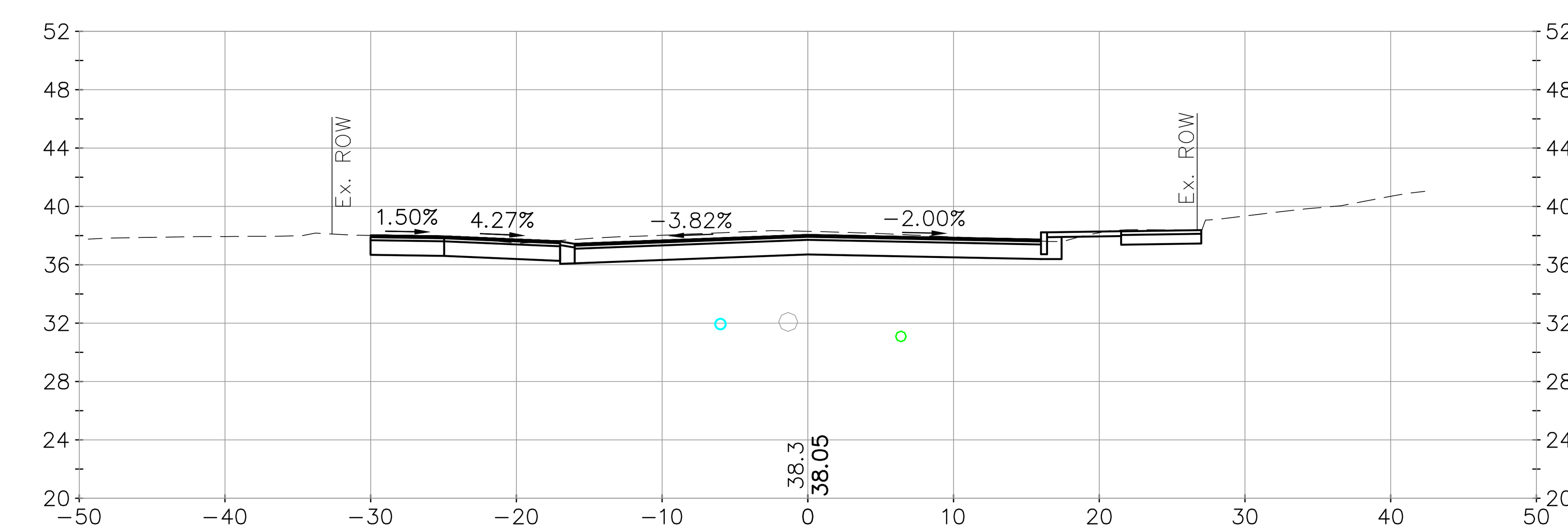

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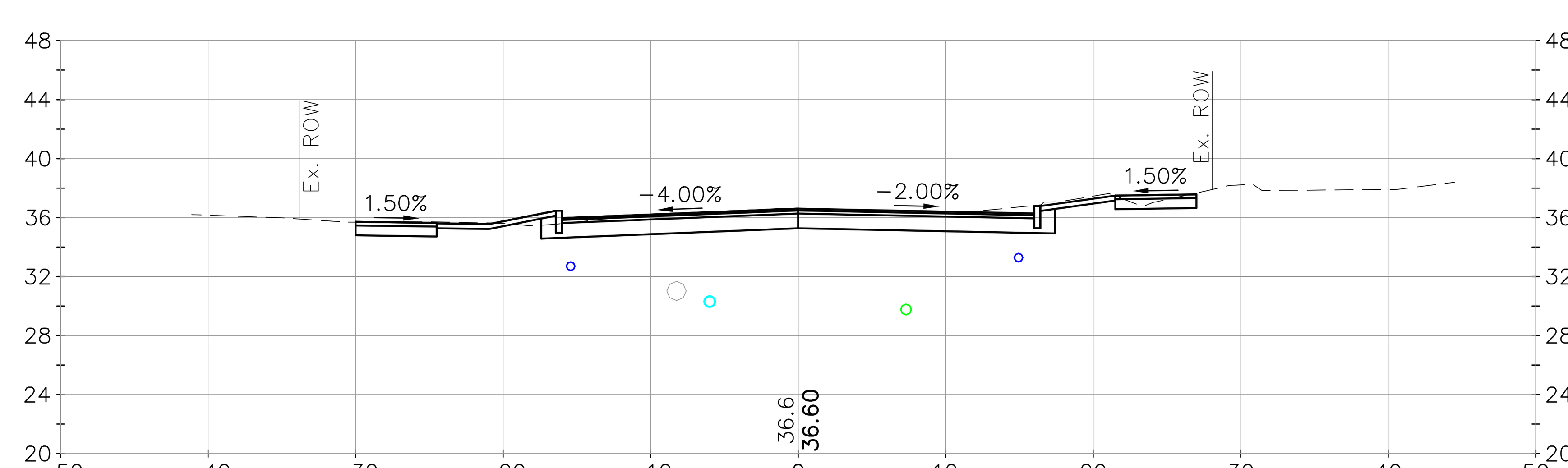

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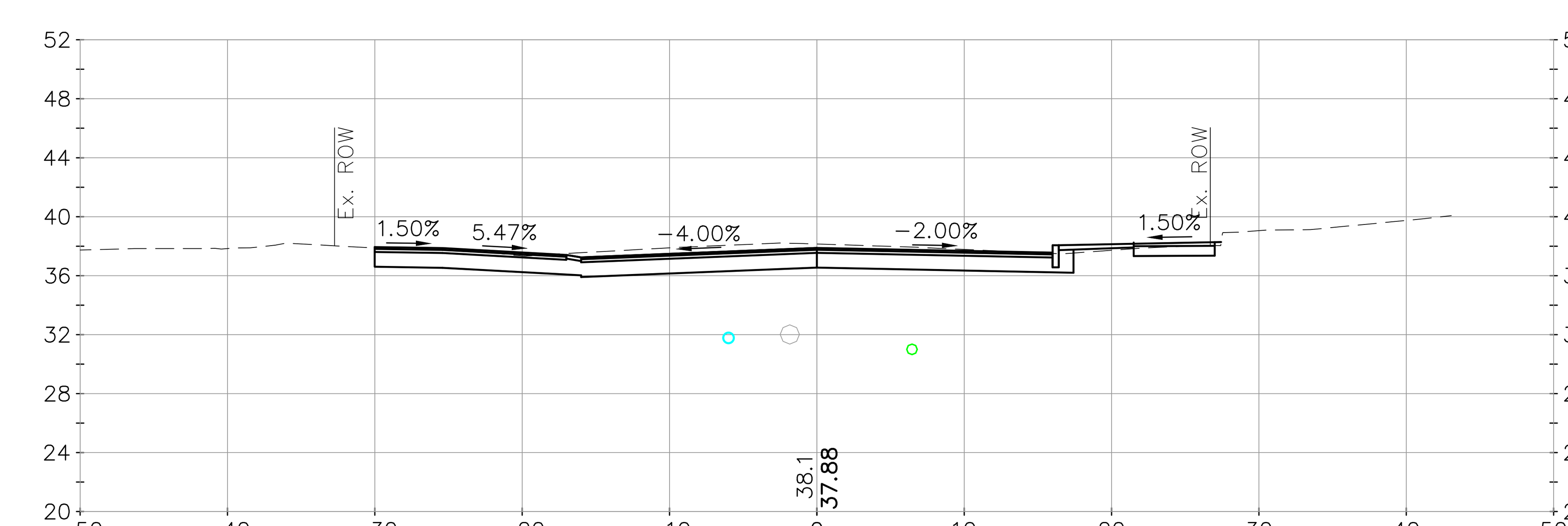

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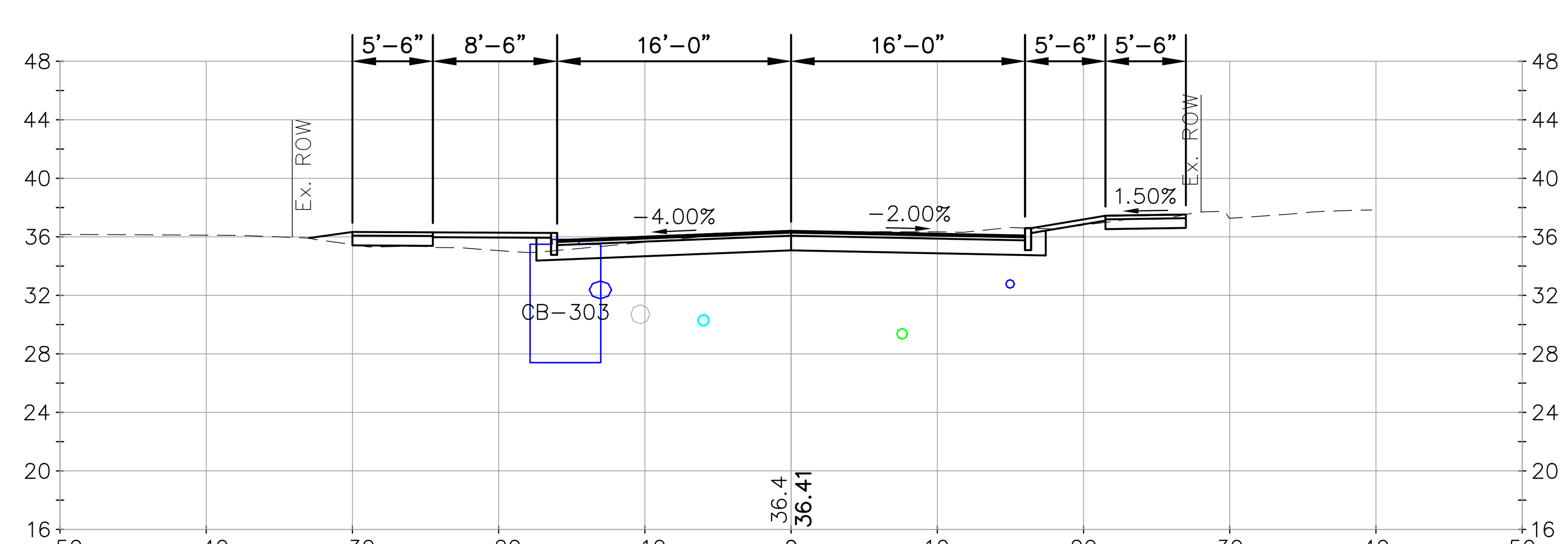

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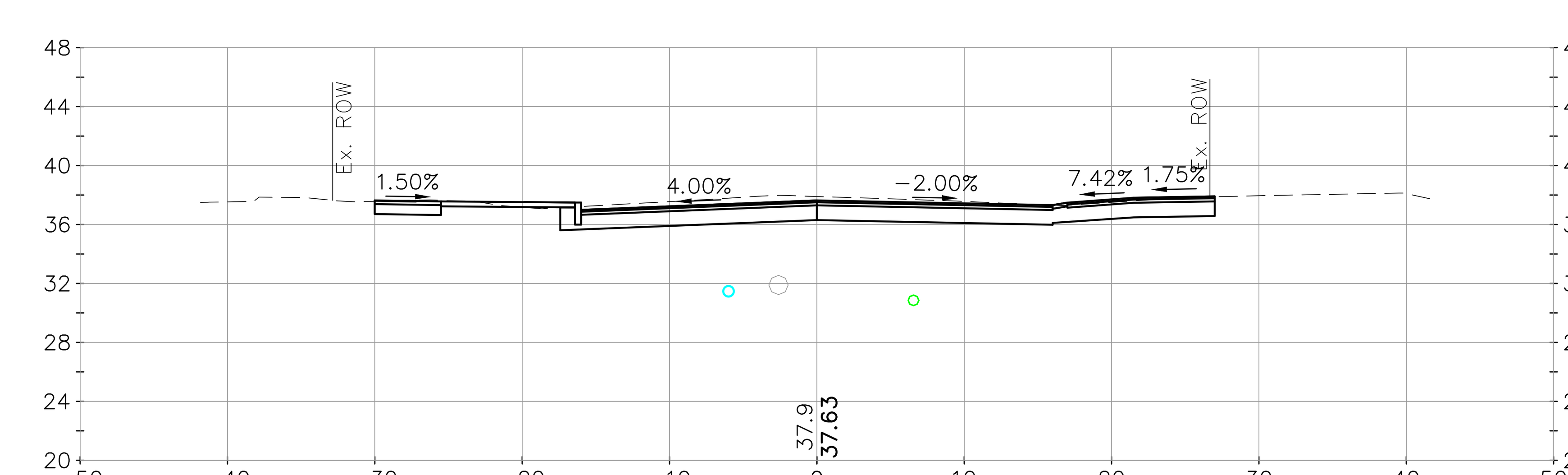

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2/2/2024

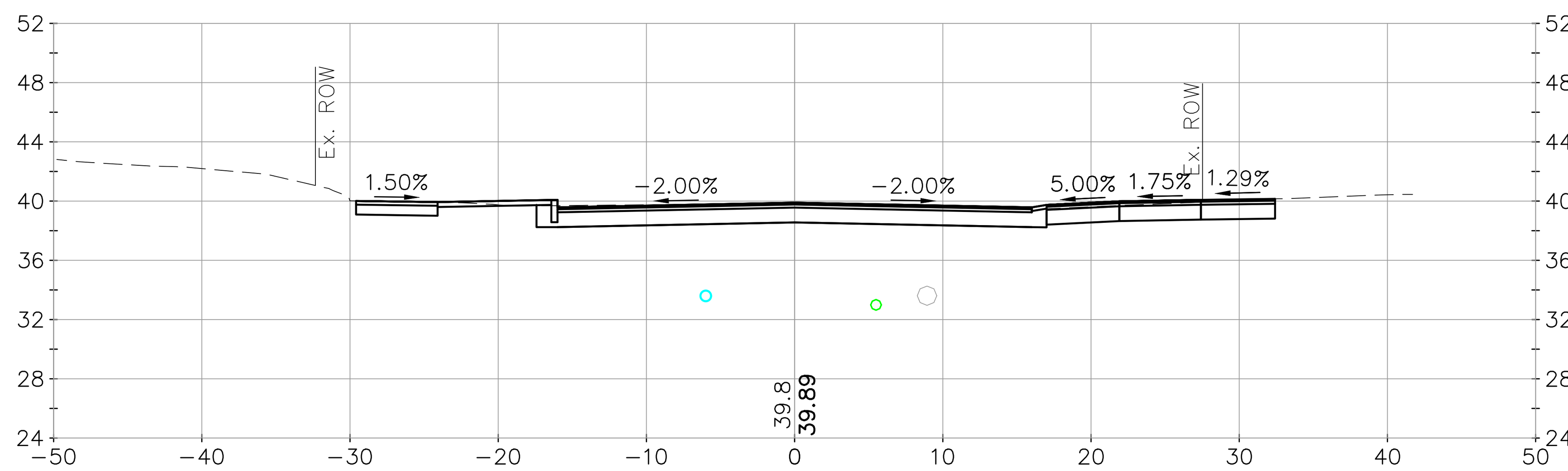
designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Cross Sections
Willard Ave

drawing no. XS-7



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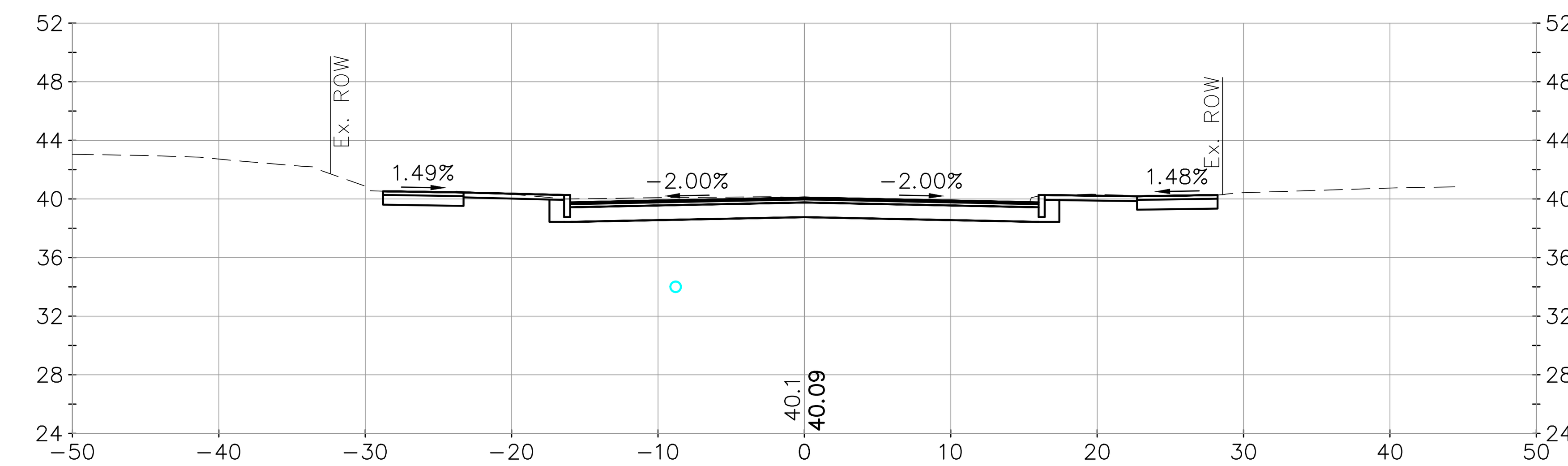

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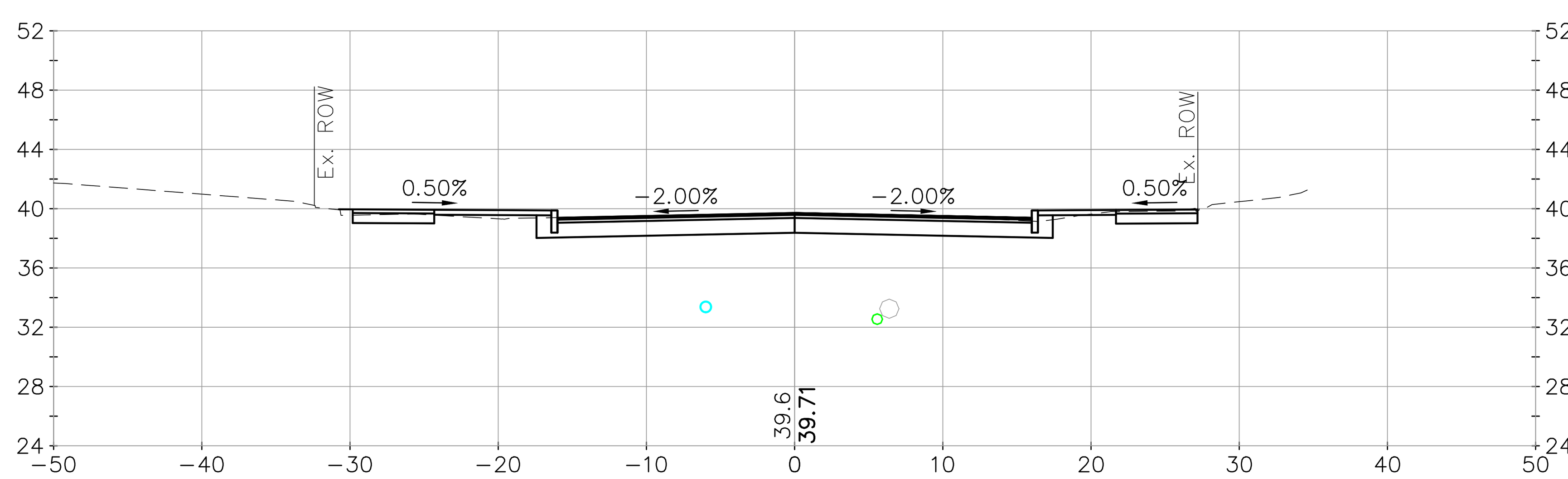

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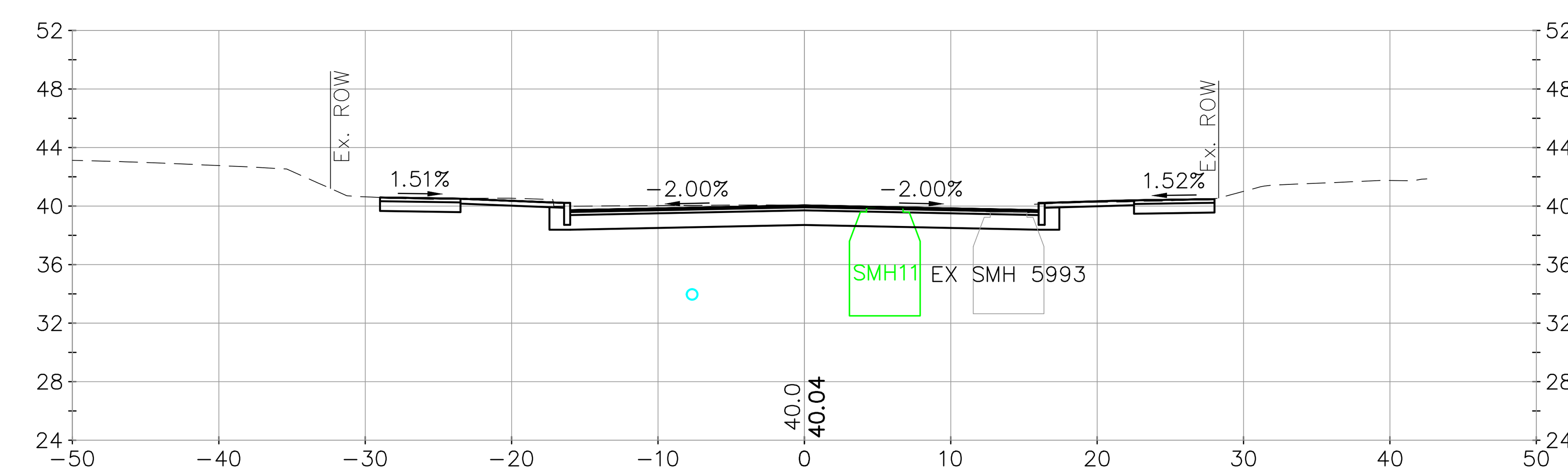

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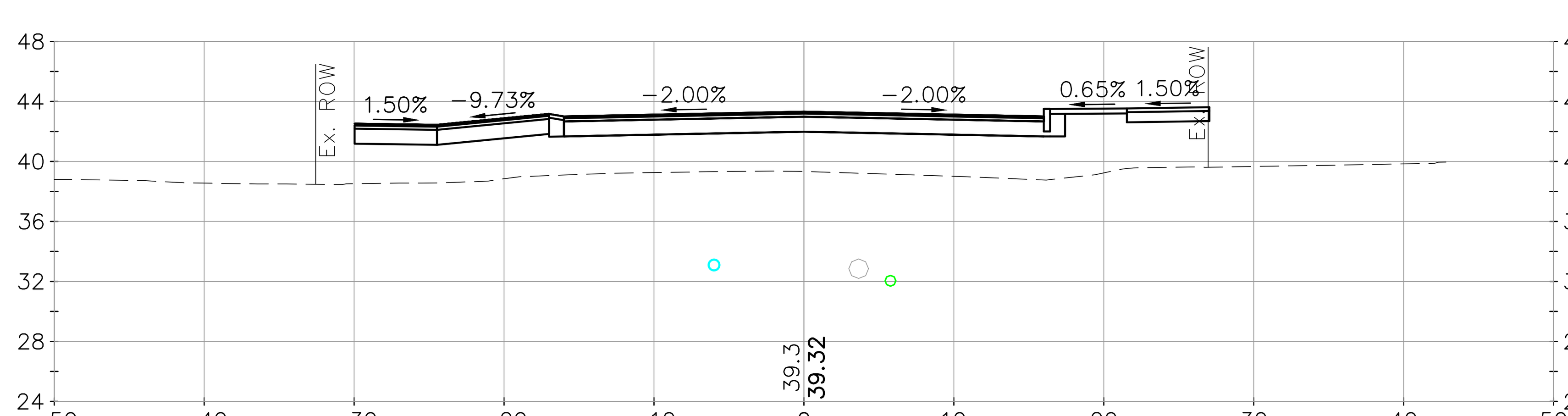

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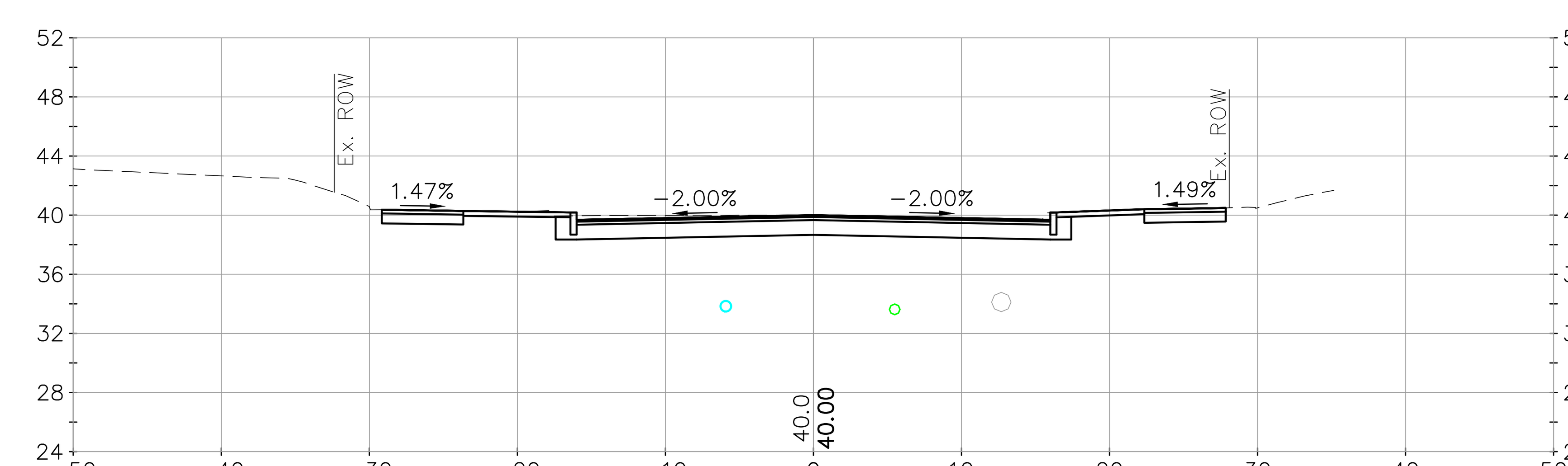

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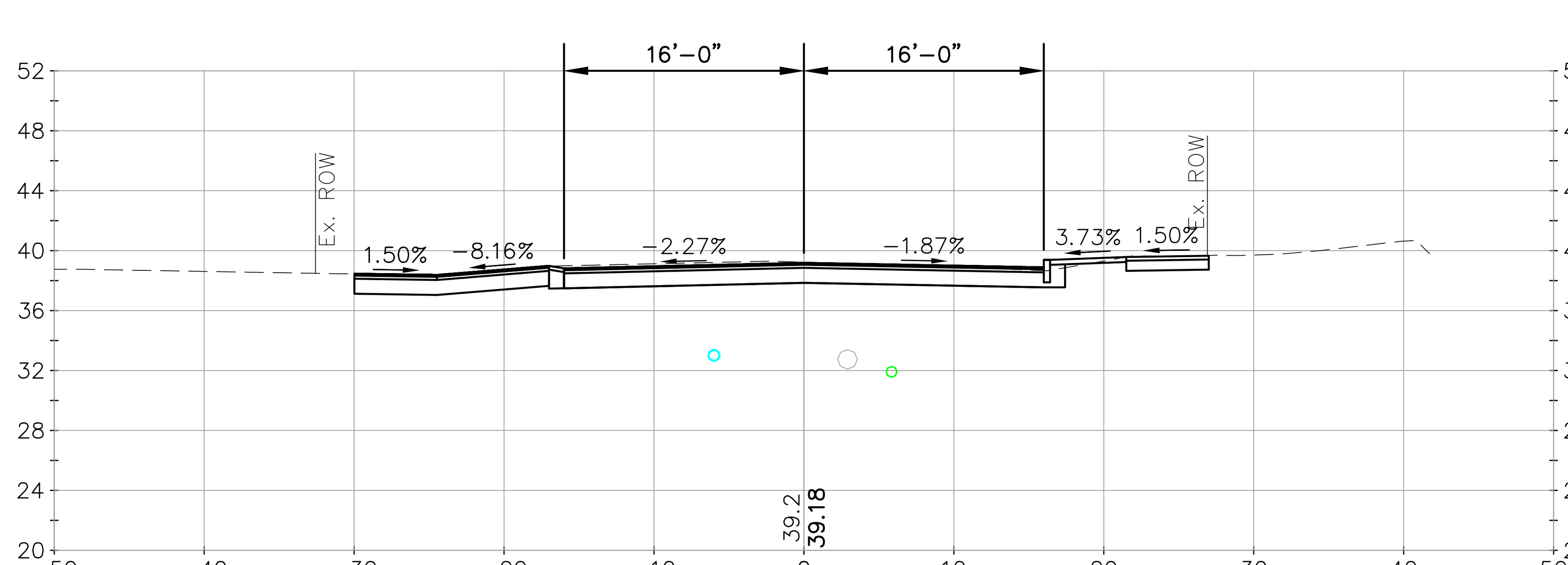

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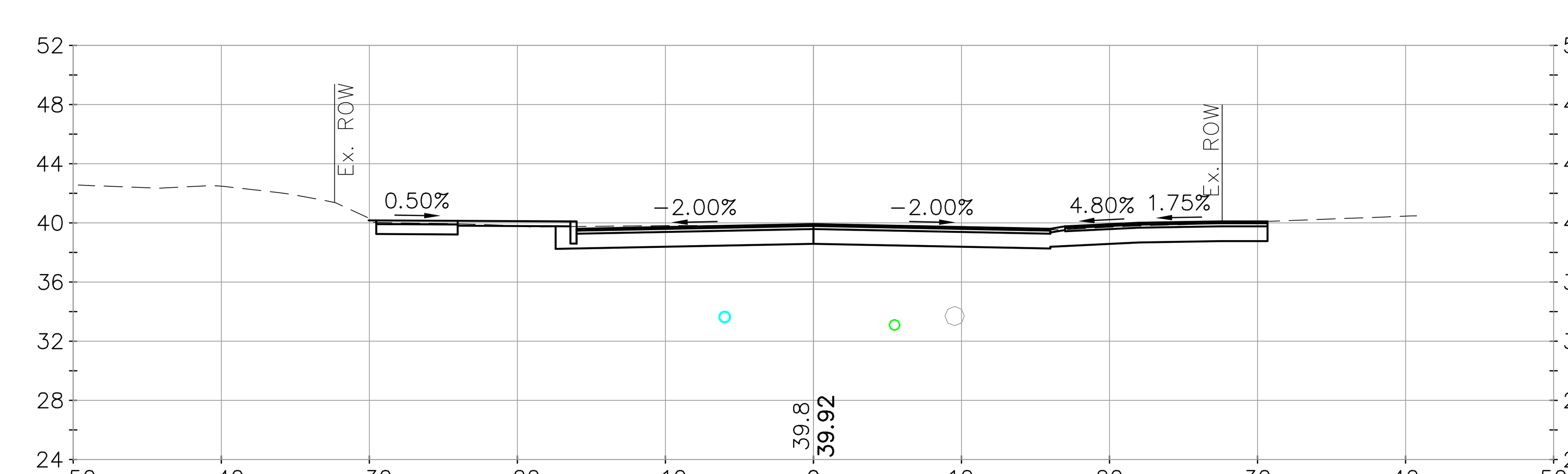

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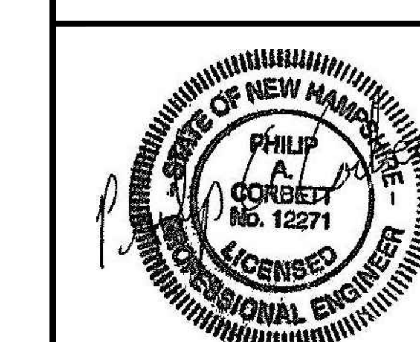


2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: Scale: 1" = 10'

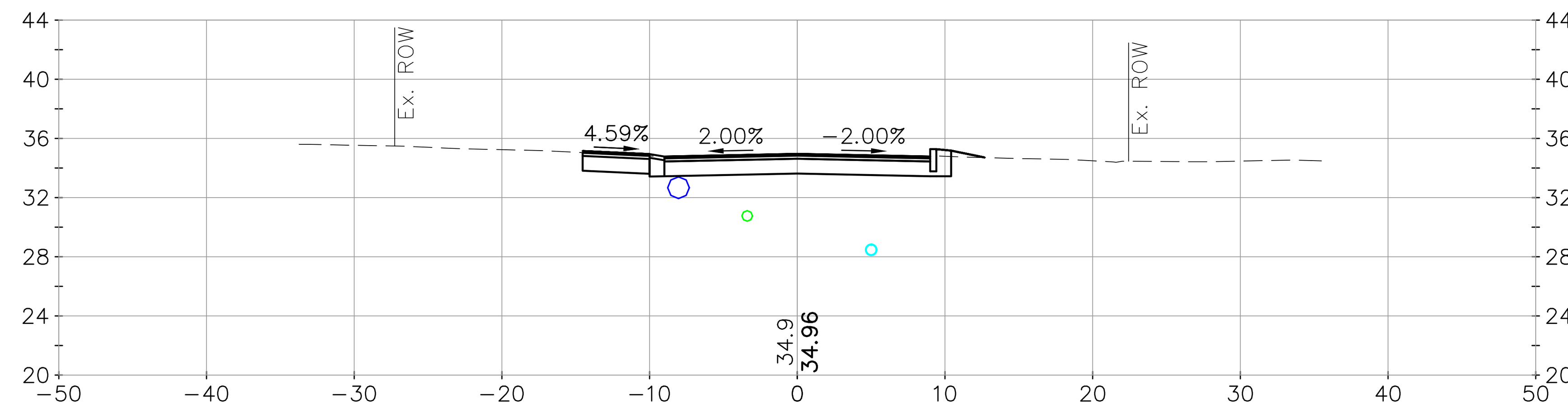
City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area Improvement Project

Cross Sections
Willard Ave

drawing no. XS-8

sheet: 44 of 55



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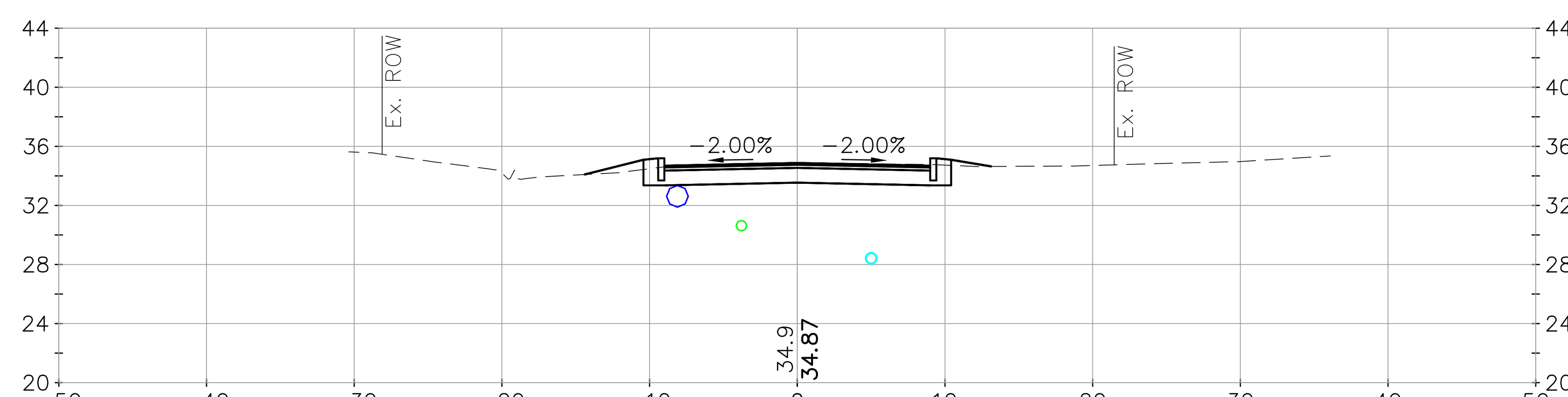

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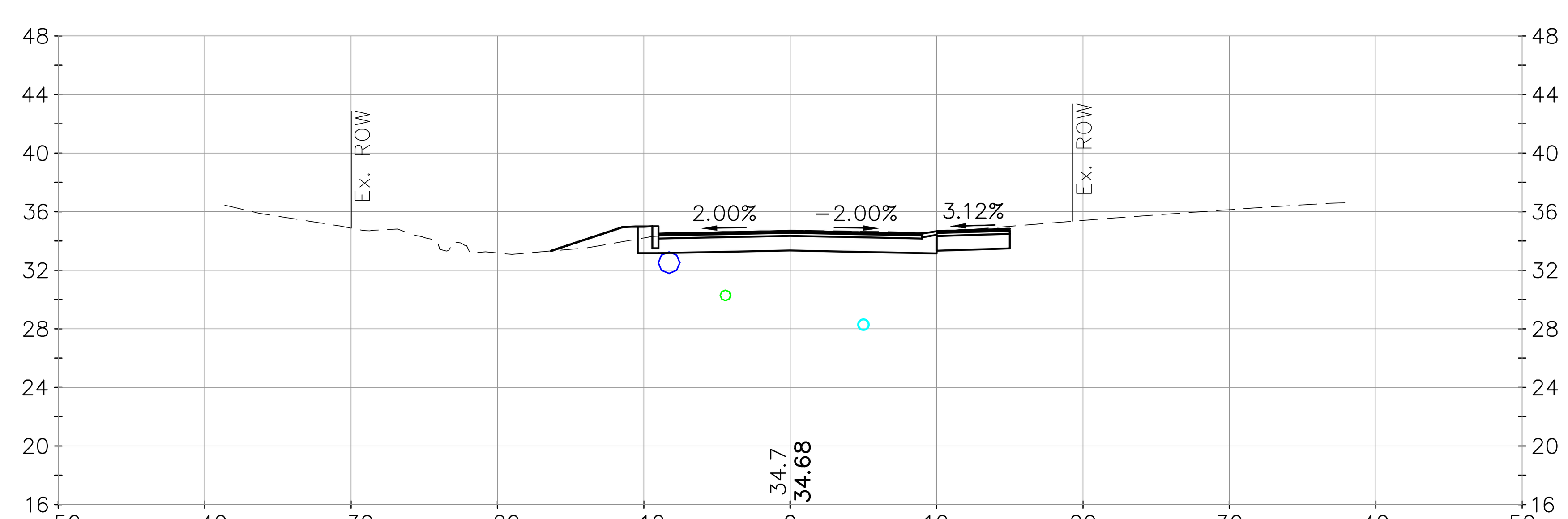

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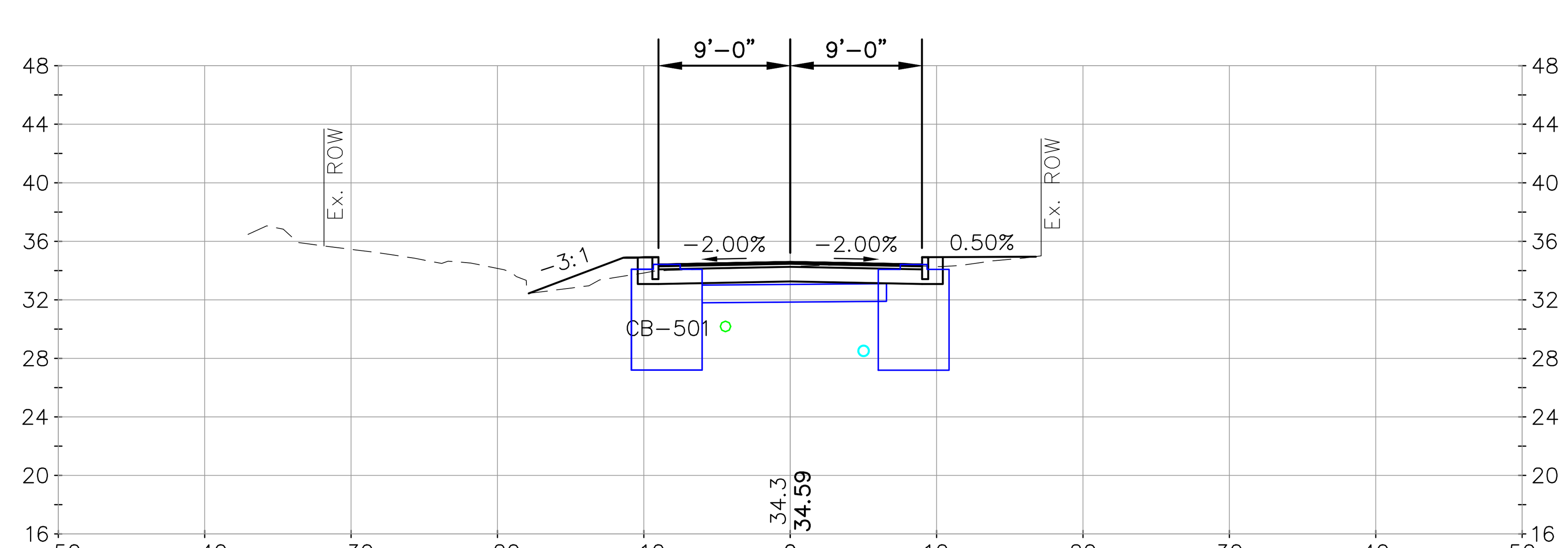

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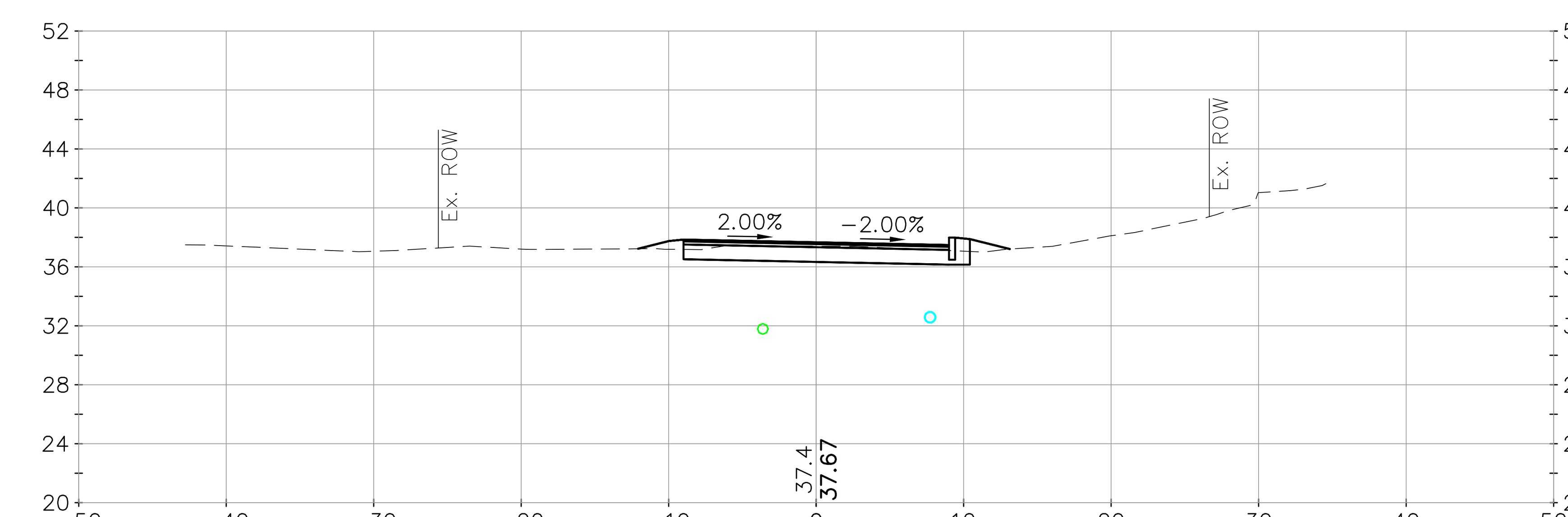

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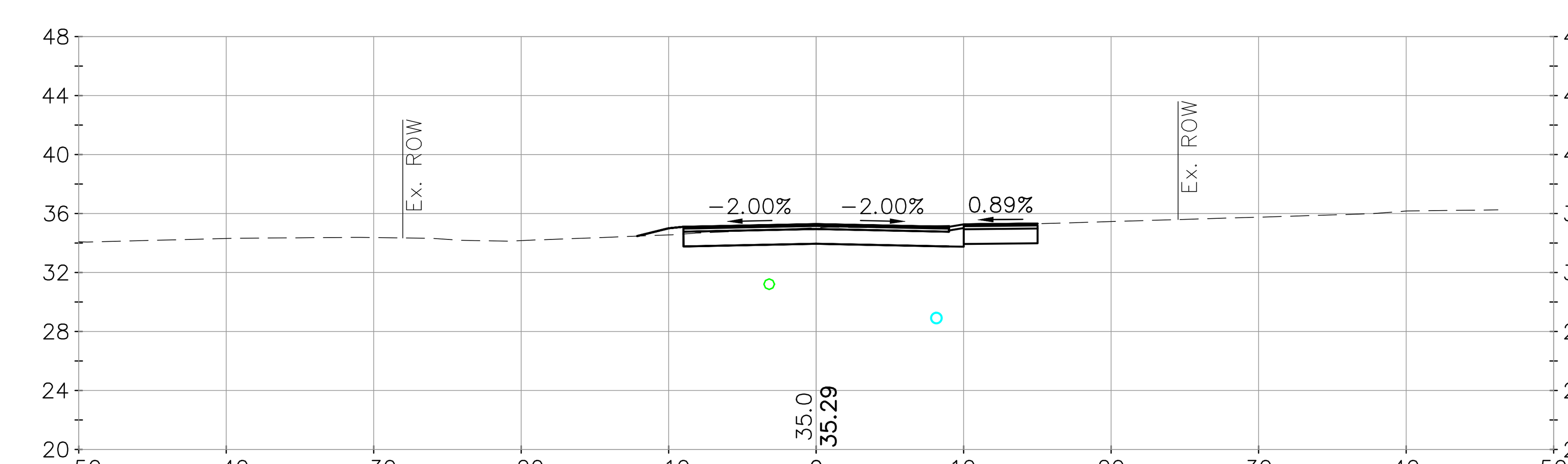

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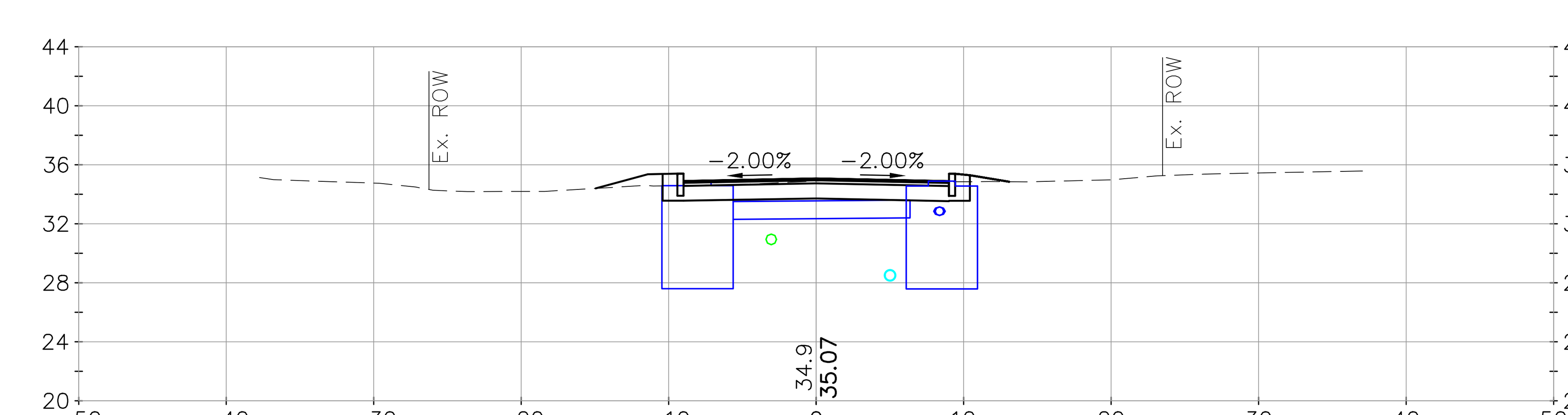

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STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER
2/2/2024

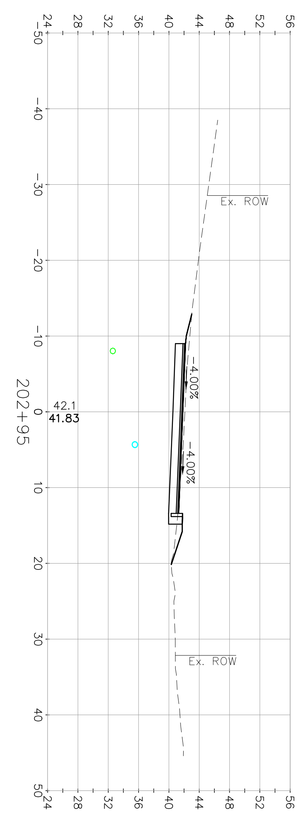
designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: Scale: 1" = 10'

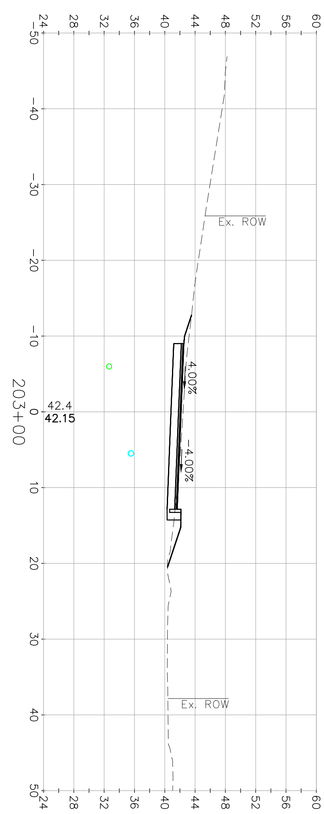
City of Portsmouth, New Hampshire
Department of Public Works

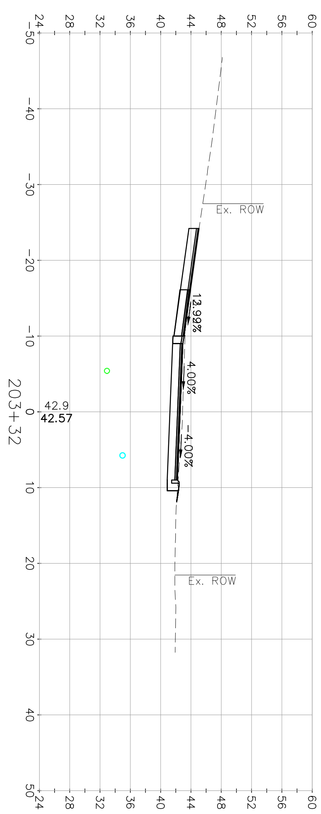
Willard Ave Area
Improvement Project

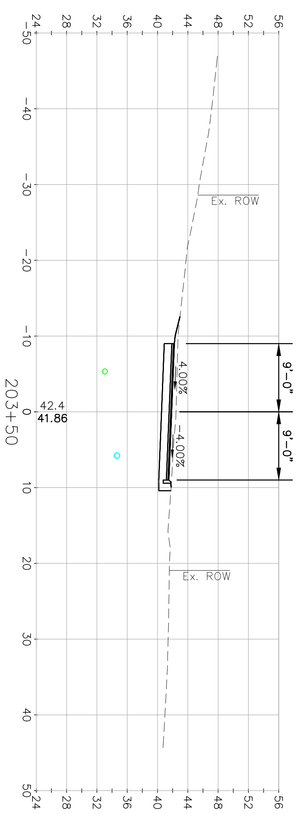
Cross Sections
Orchard Street

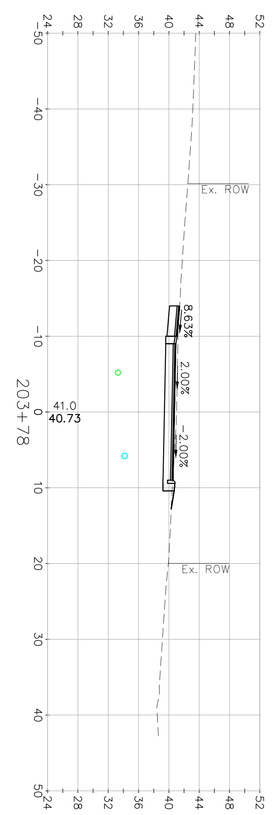
drawing no.
XS-9

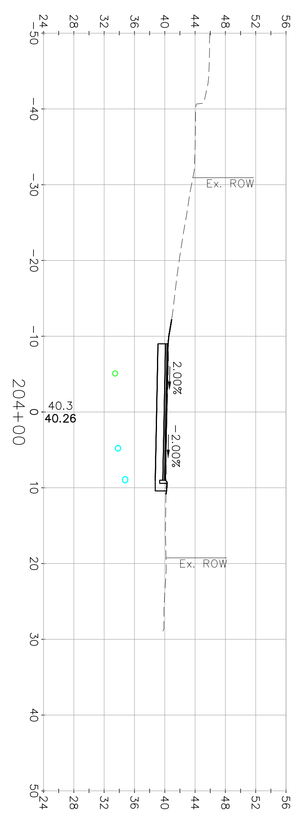


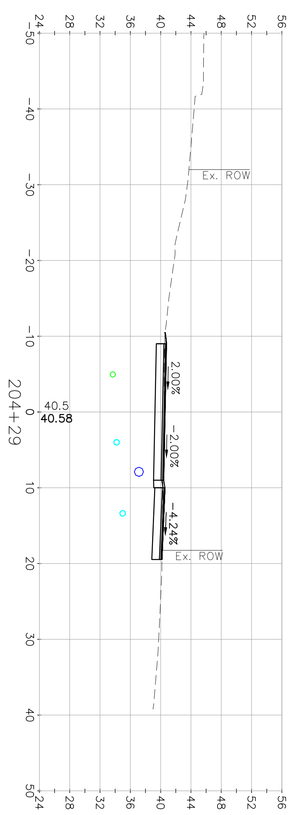


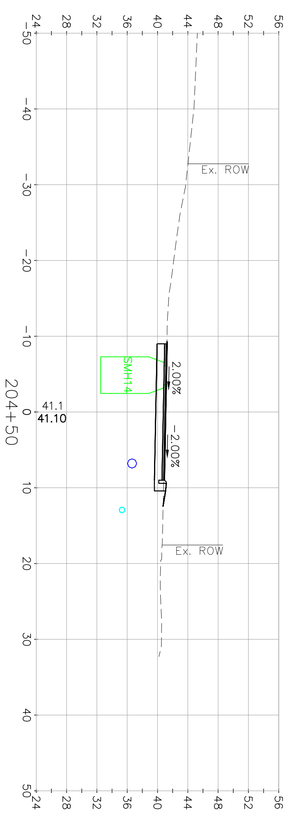












sheet 46 of 55	drawing no. XS-10	City of Portsmouth, New Hampshire Department of Public Works Willard Ave Area Improvement Project Cross Sections Orchard Street	date: February 2024 · designed by: CFC/STF project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 10' 20' — Scale: 1" = 10'

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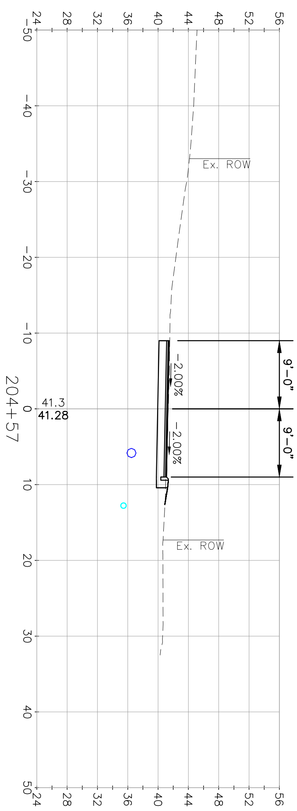

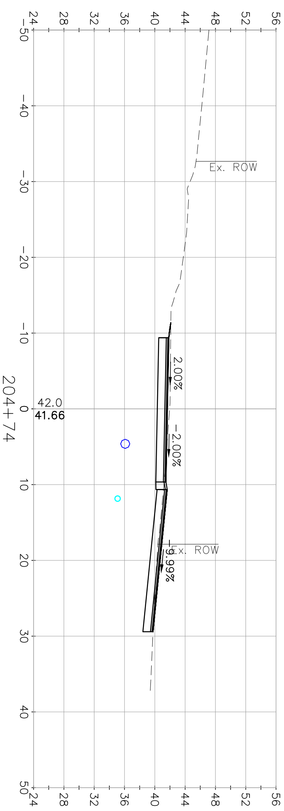

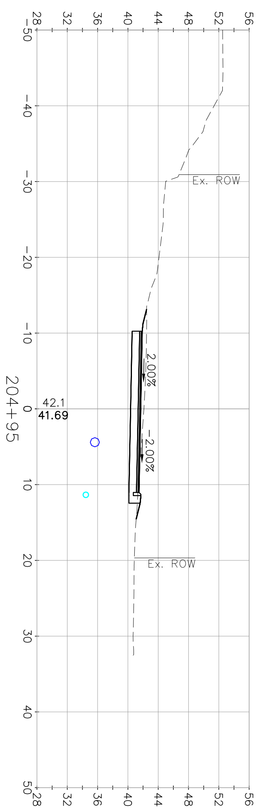

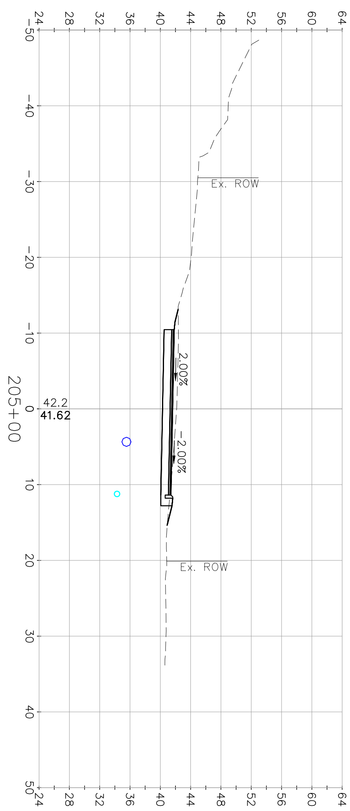

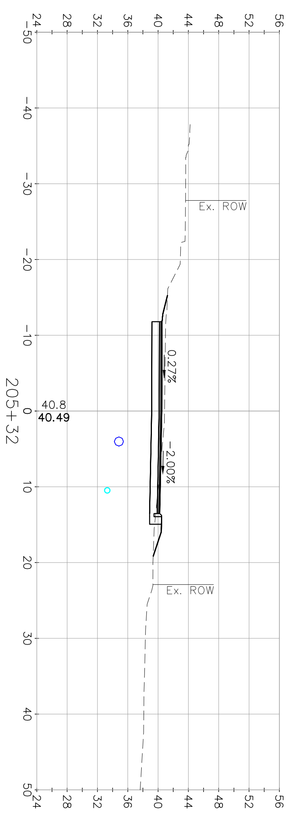

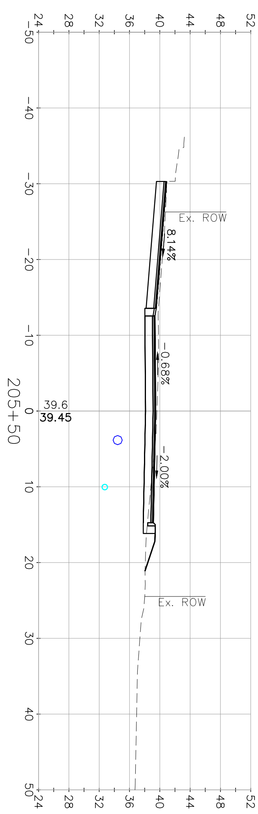

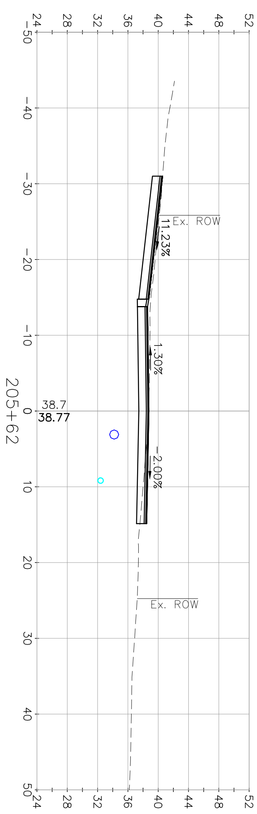

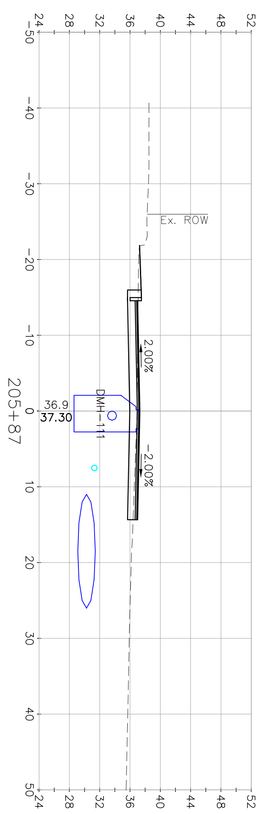

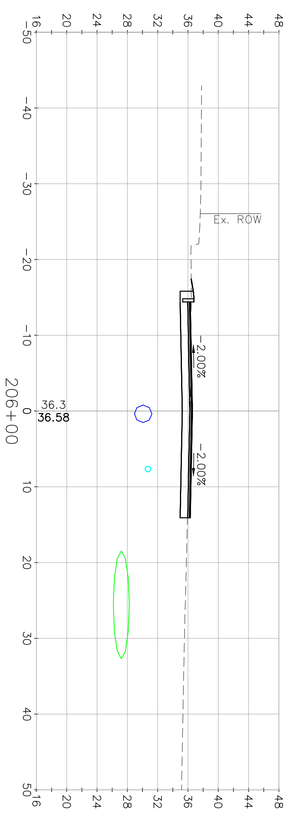

sheet 47 of 55	drawing no. XS-11	City of Portsmouth, New Hampshire Department of Public Works Willard Ave Area Improvement Project Cross Sections Orchard Street	date: February 2024 · designed by: CFC/STF project no: 1211 · drawn by: WWG checked by: PAC · approved by: PAC scale: 0 10' 20' Scale: 1" = 10'

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STATE OF NEW HAMPSHIRE
PHILIP A. CORBETT
No. 12271
LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by: CFC/STF	drawn by: WWG	approved by: PAC	scale: 1" = 10'
date: February 2024	project no: 1211	checked by: PAC	0 10' 20'

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Cross Sections
Orchard Street

drawing no.
XS-12

sheet: 48 of 55

207+50

208+50

207+41

208+16

207+31

208+00

207+07

207+84

207+15

207+66

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designed by:	drawn by:	approved by:	scale:
CFC/STF	WWG	PAC	1" = 10'
date:	project no:	checked by:	
February 2024	1211	PAC	

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Cross Sections
Orchard Street

drawing no.
XS-13

sheet: 49 of 55

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PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: 1" = 10'
Scale: 0 10' 20'

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area Improvement Project

Cross Sections Orchard Street

drawing no.
XS-14

sheet: 50 of 55

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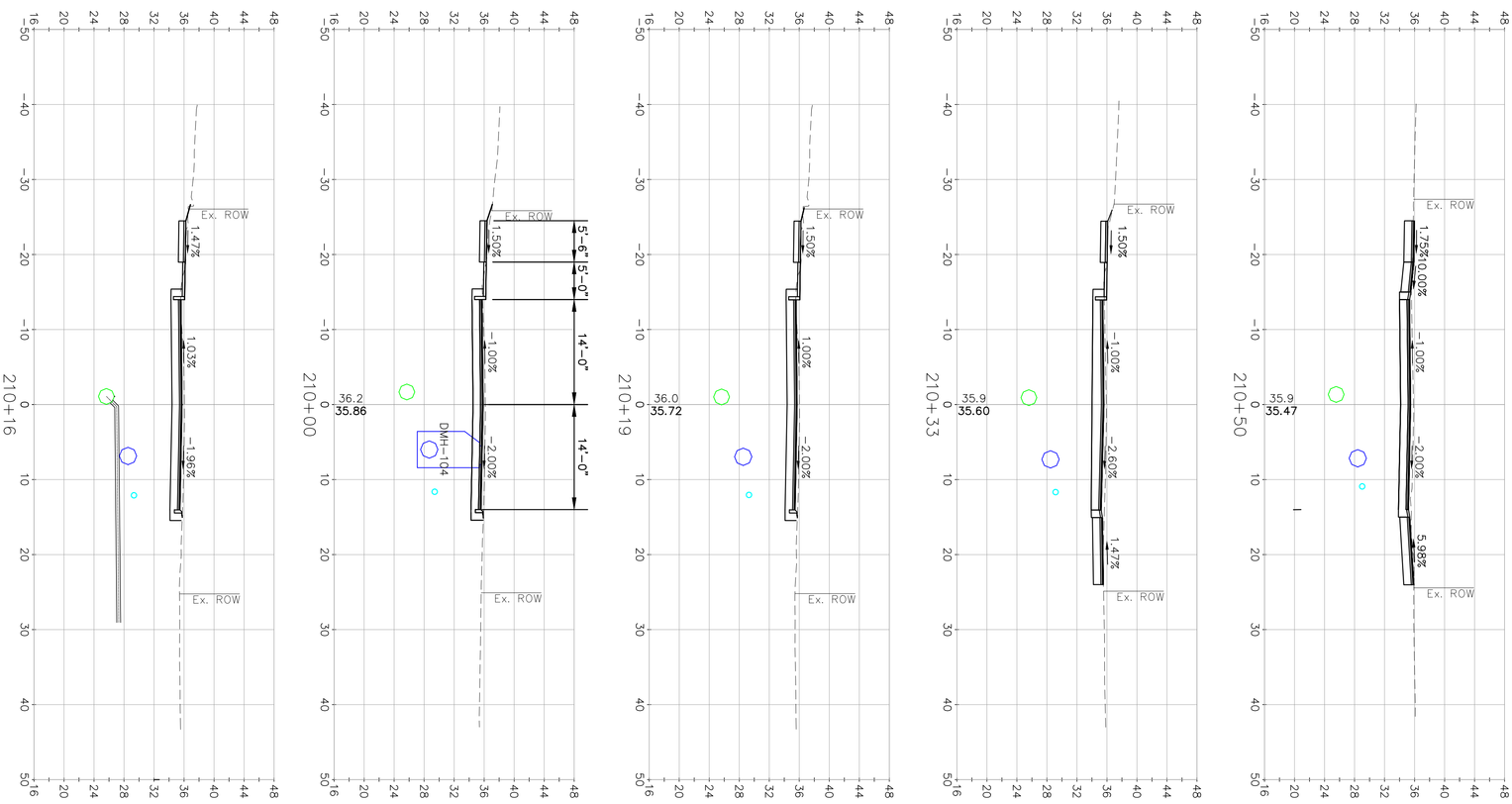

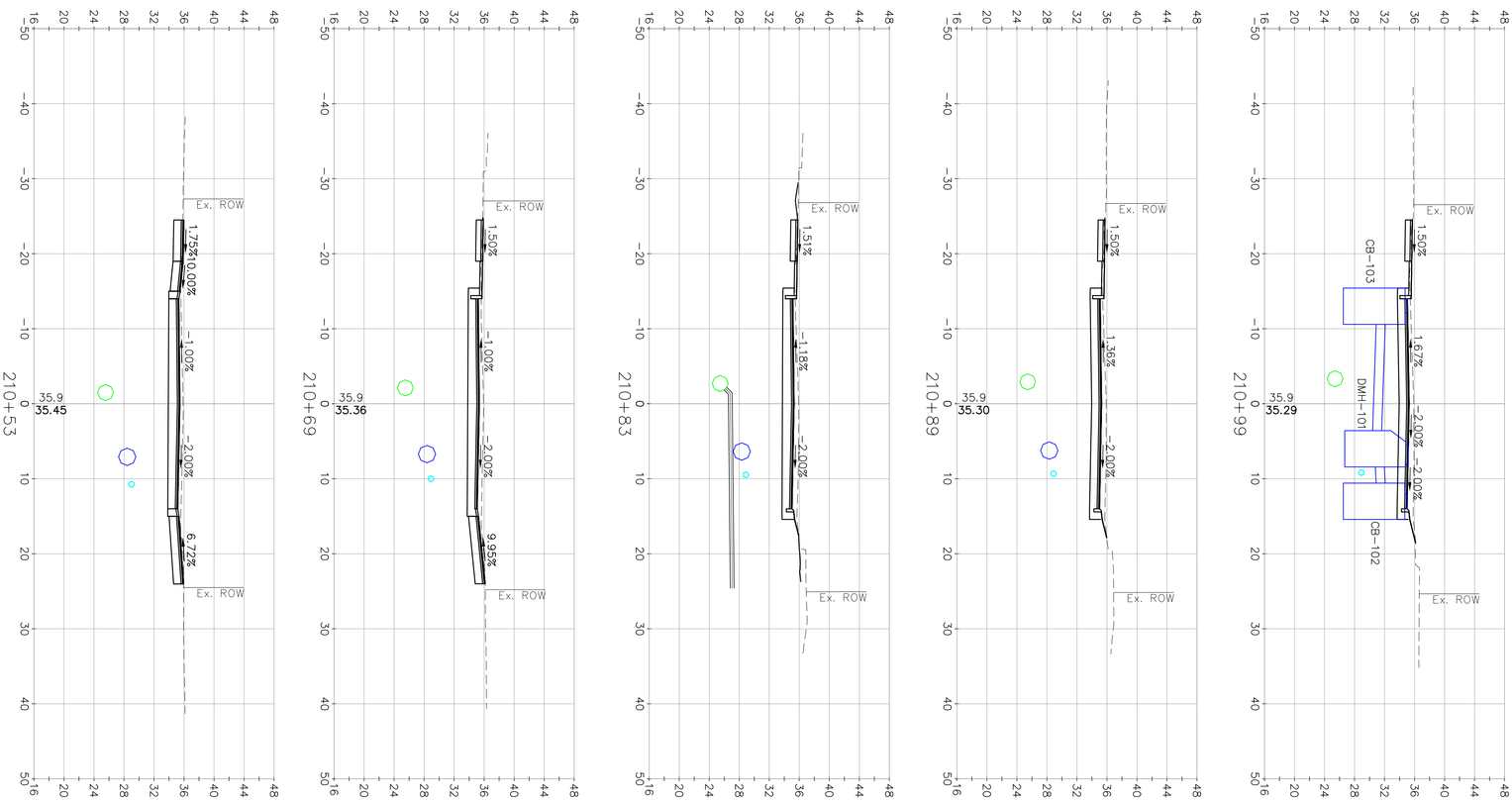

sheet 51 of 55	drawing no. XS-15	City of Portsmouth, New Hampshire Department of Public Works	date: February 2024
			designed by: CFC/STF
		Willard Ave Area Improvement Project	project no: 1211
			drawn by: WWG
			checked by: PAC
			approved by: PAC
		Cross Sections Orchard Street	scale: 0 10' 20' Scale: 1" = 10'

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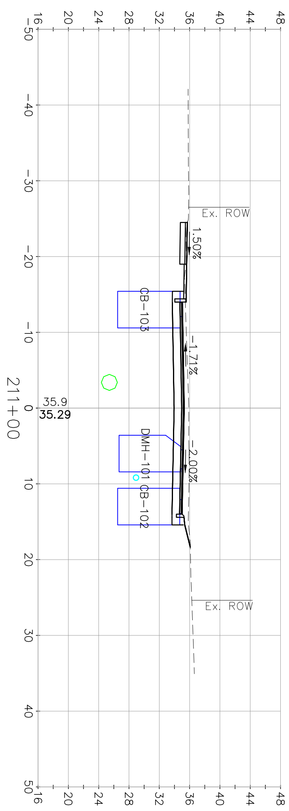

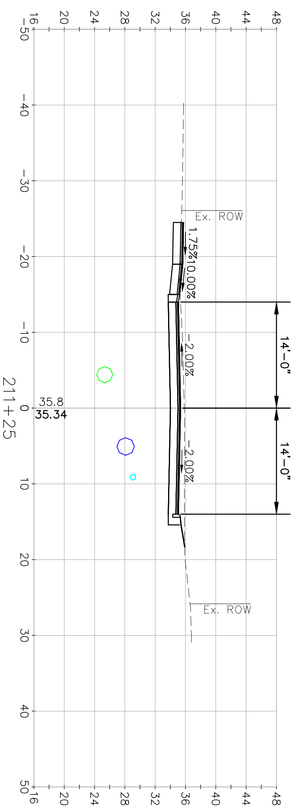

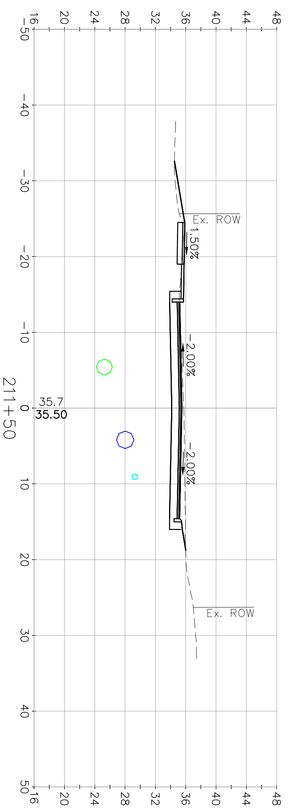

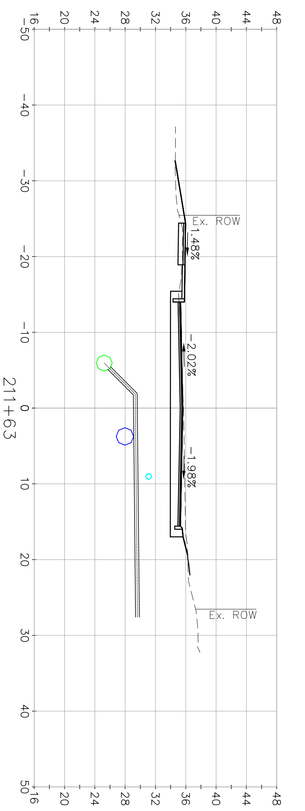

sheet 52 of 55	drawing no. XS-16	City of Portsmouth, New Hampshire Department of Public Works Willard Ave Area Improvement Project Cross Sections Orchard Street	date: February 2024 / designed by: CFC/STF project no: 1211 / drawn by: WWG checked by: PAC / approved by: PAC scale: 0 10' 20' Scale: 1" = 10'

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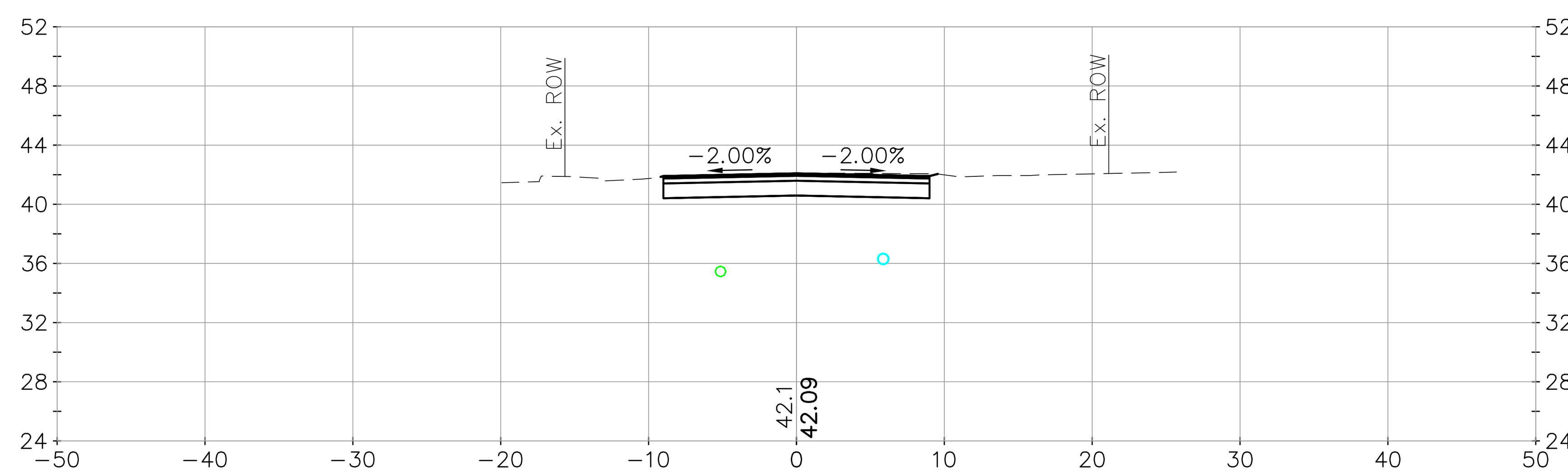

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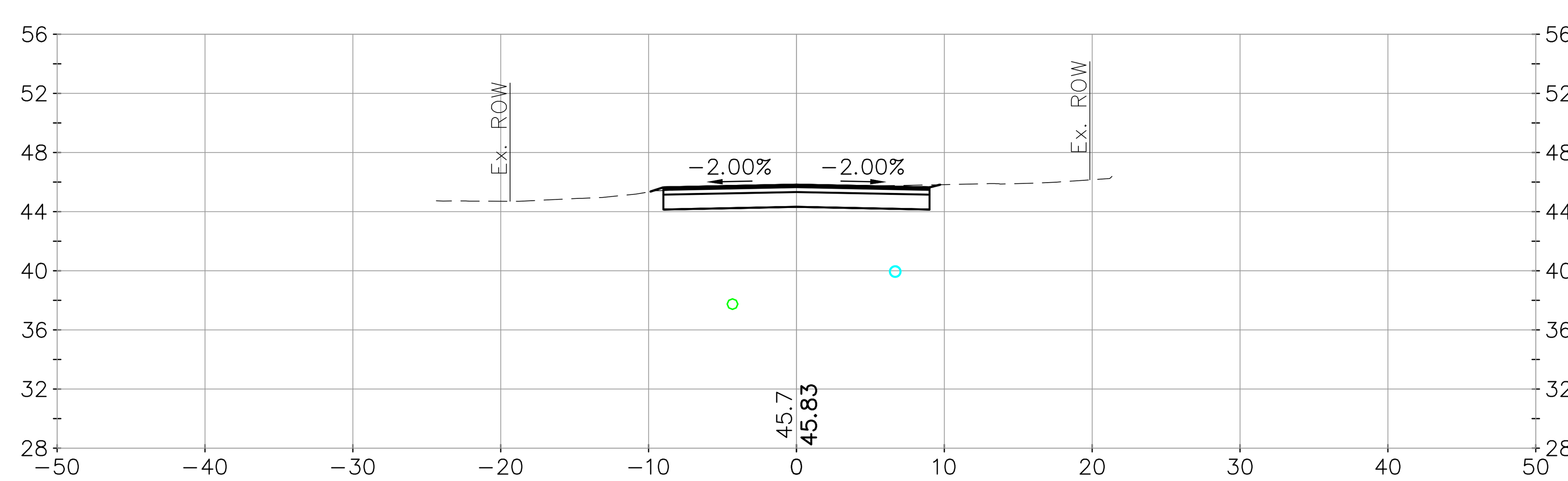

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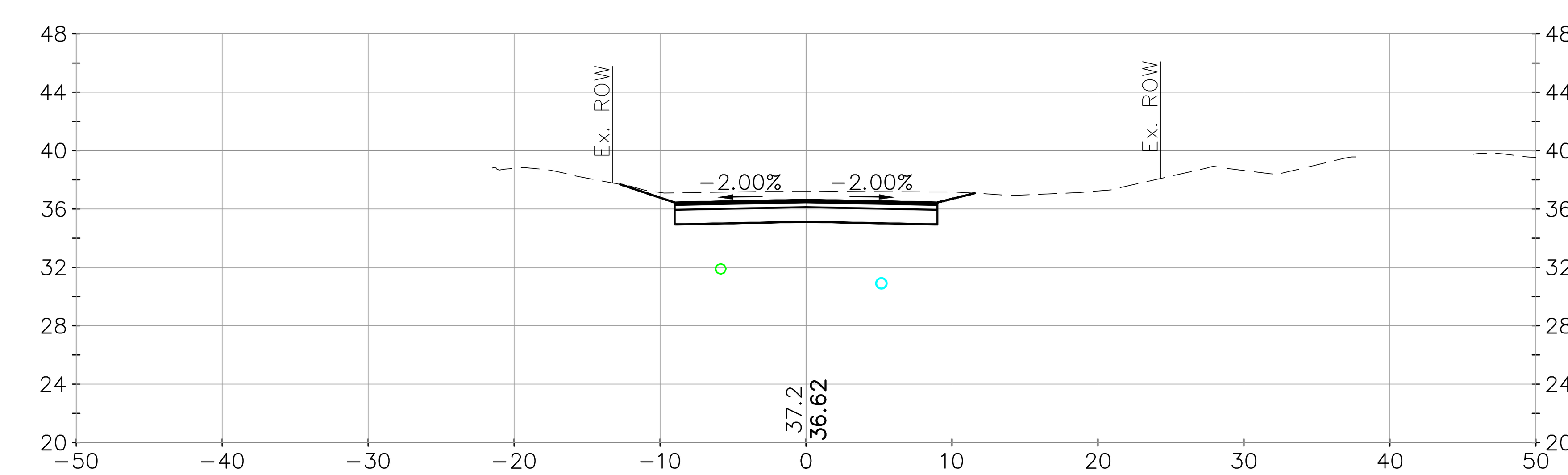

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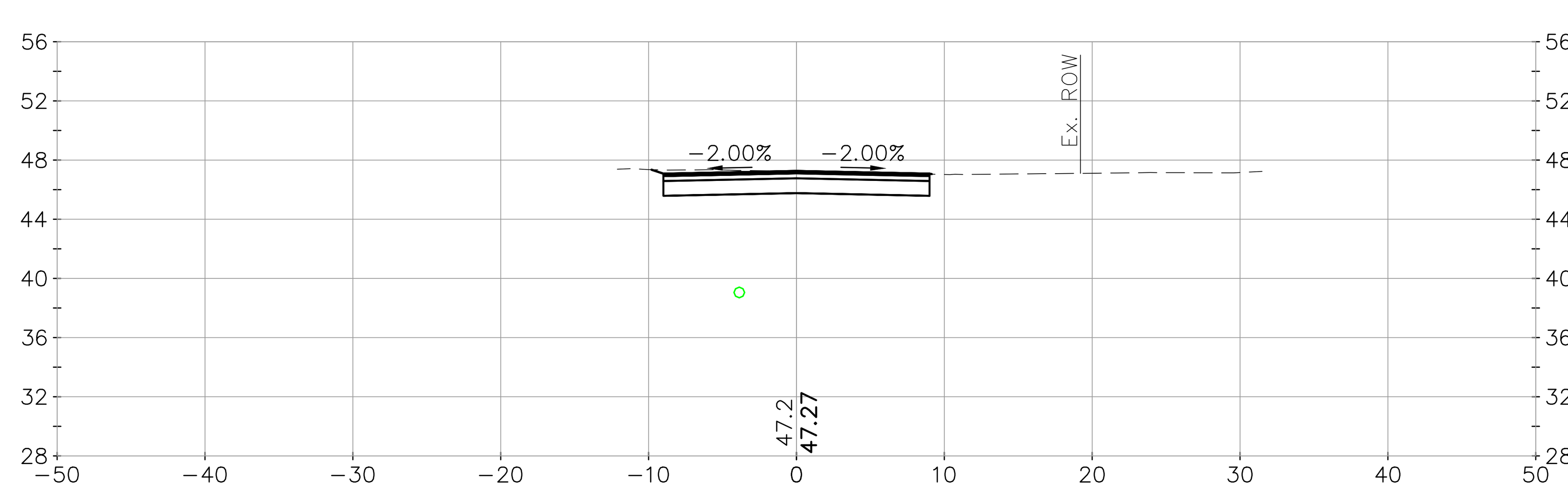

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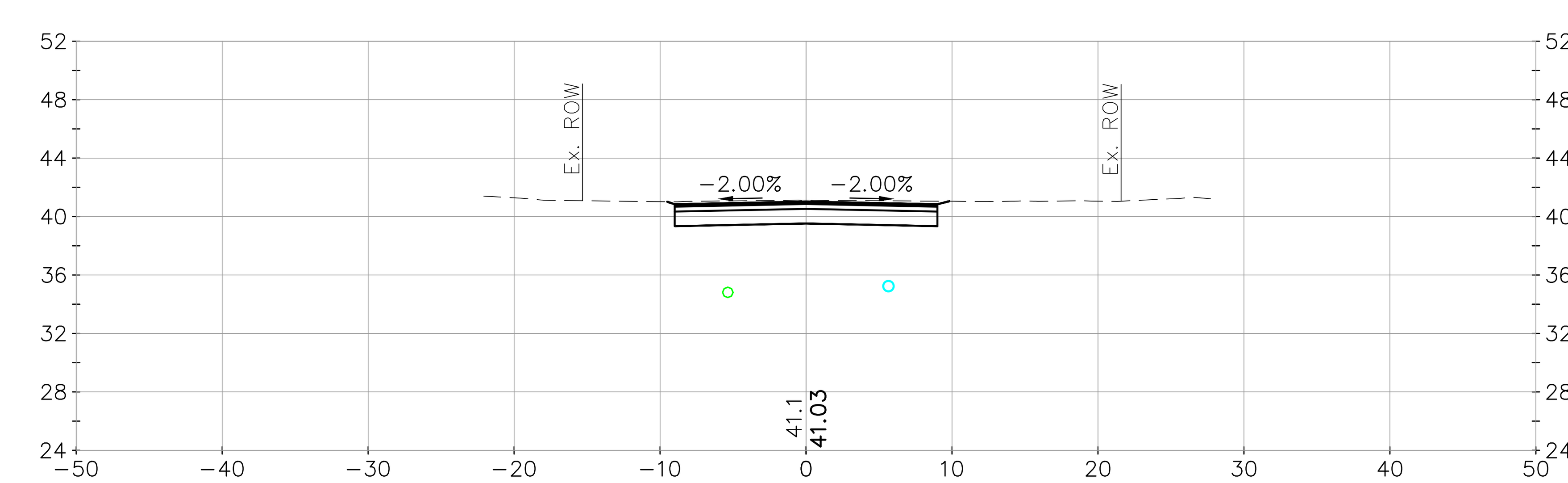

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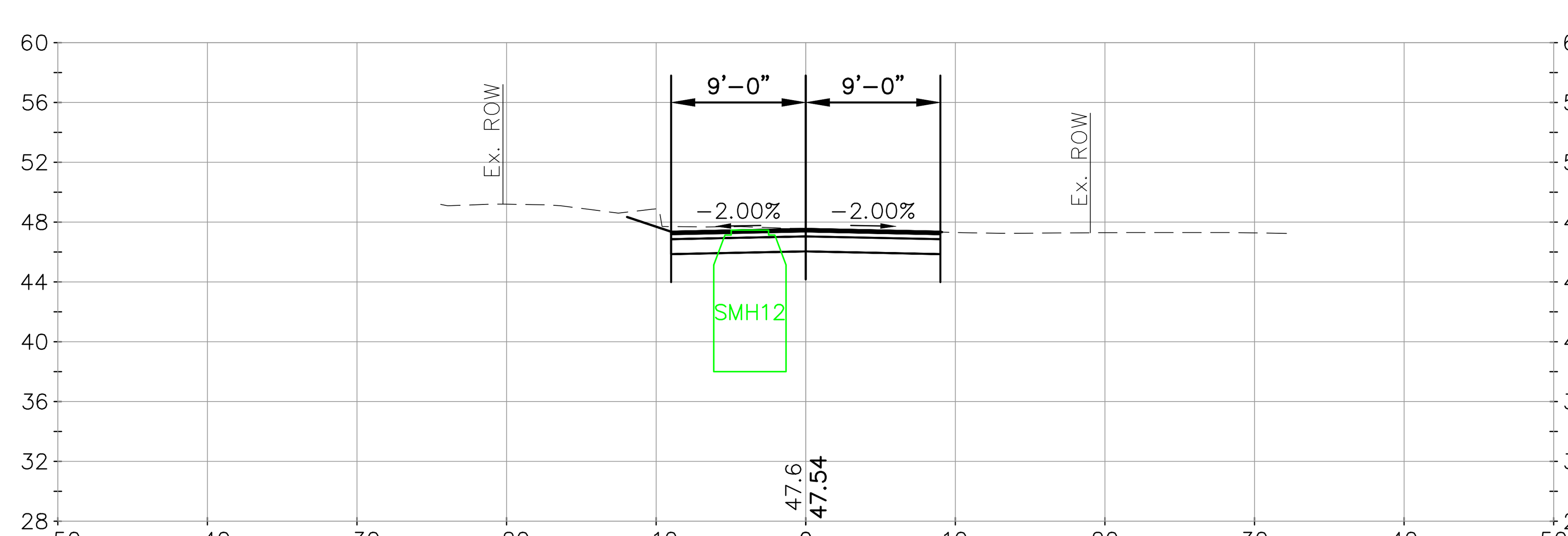

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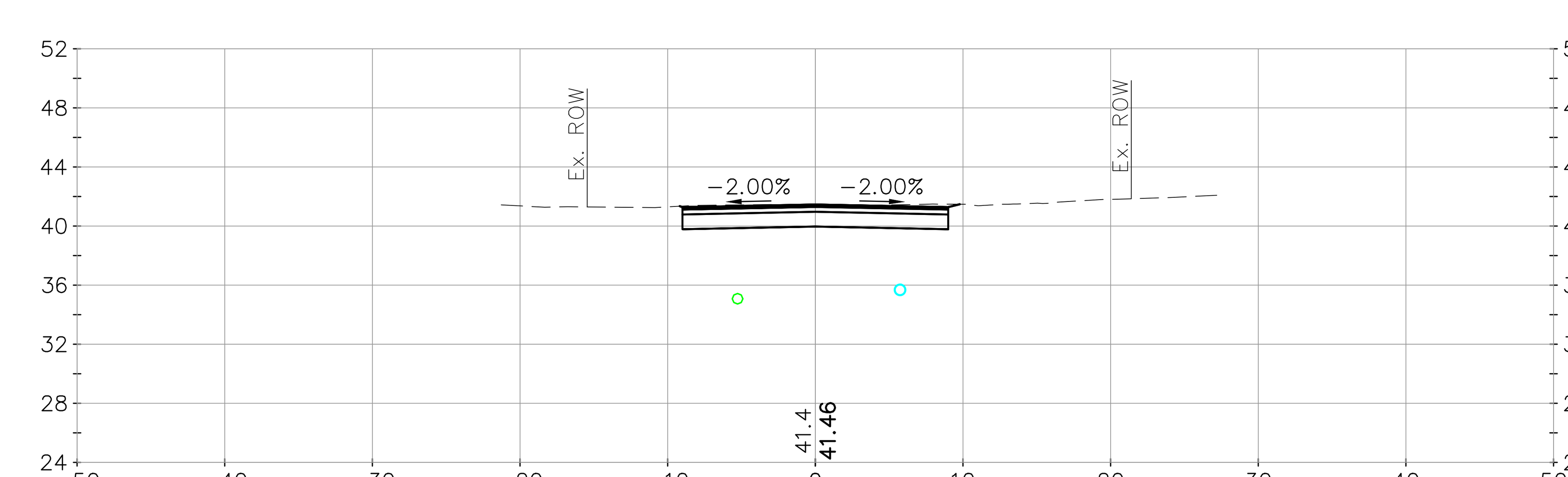

300+96

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STATE OF NEW HAMPSHIRE PHILIP A. CORBETT No. 12271 LICENSED PROFESSIONAL ENGINEER
2/2/2024

designed by: CFC/STF
drawn by: WWG
approved by: PAC
date: February 2024
project no: 1211
checked by: PAC
scale: Scale: 1" = 10'

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Cross Sections
Orchard Court

drawing no. XS-17

sheet: 53 of 55

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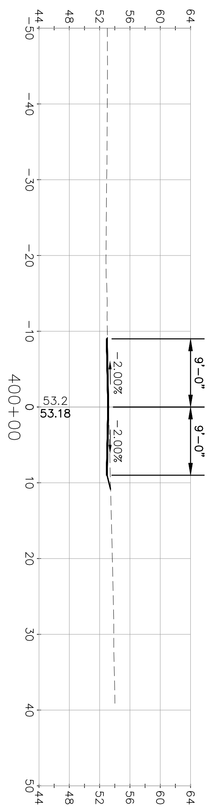

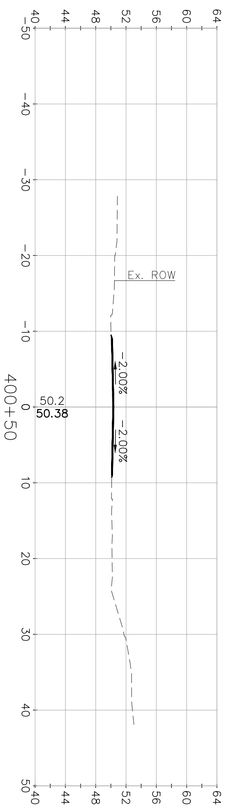

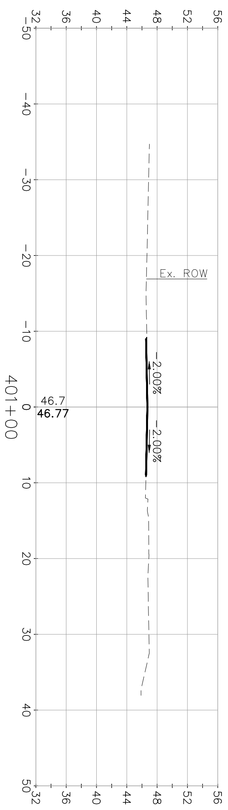

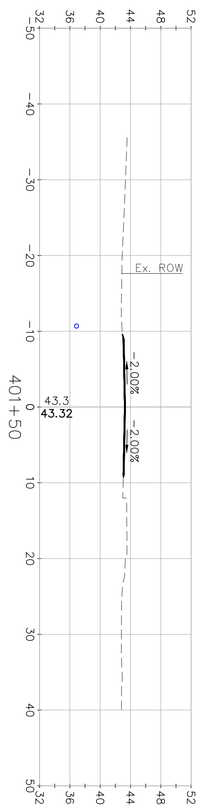

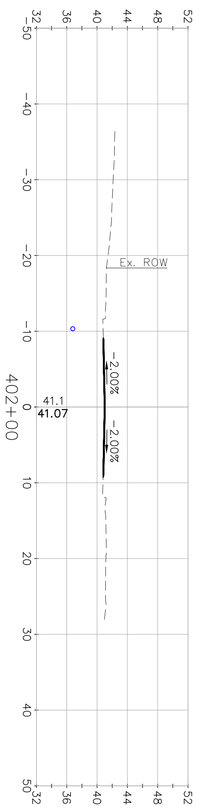

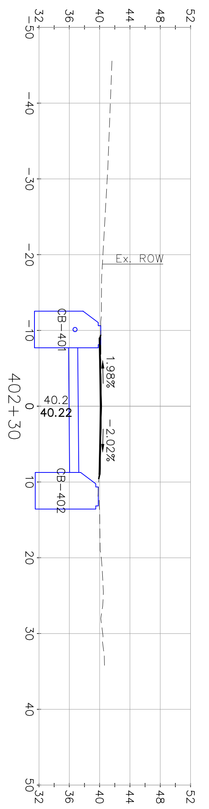

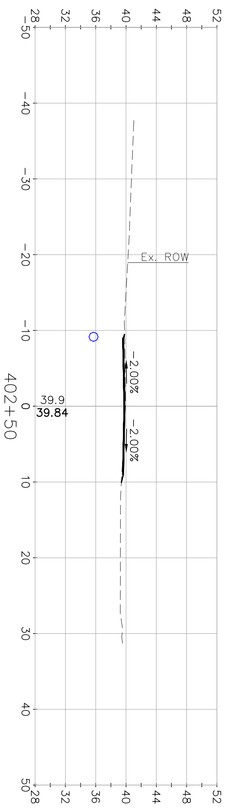

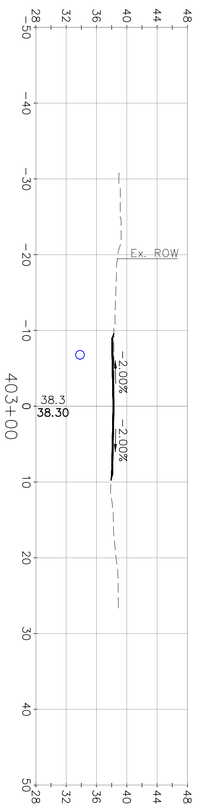

sheet: 54 of 55	drawing no.: XS-18	City of Portsmouth, New Hampshire Department of Public Works	date: February 2024
			designed by: CFC/STF
		Willard Ave Area Improvement Project	project no: 1211
			drawn by: WWG
			checked by: PAC
			approved by: PAC
		Cross Sections Ash Street	scale: 0 10' 20' Scale: 1" = 10'

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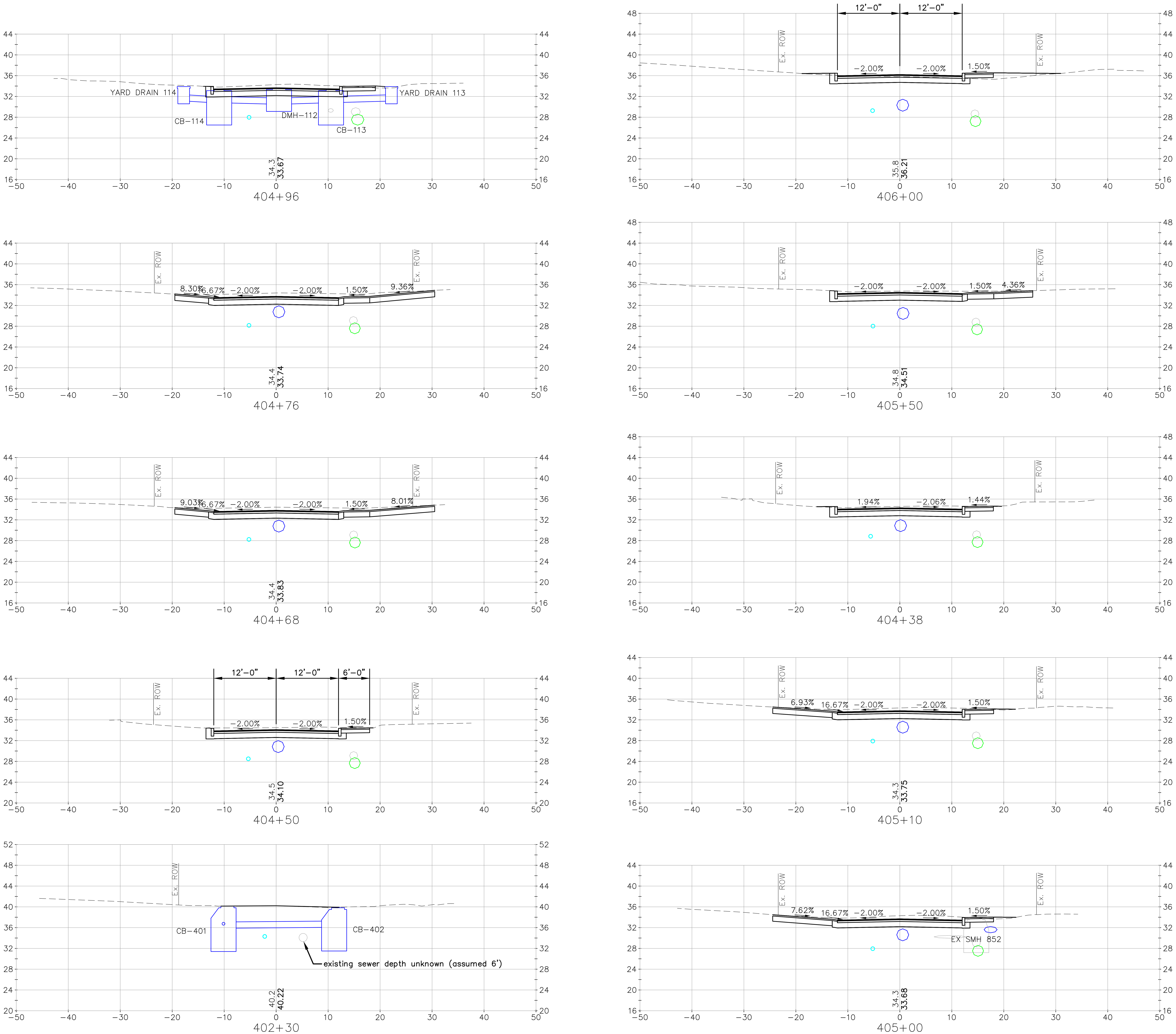

City of Portsmouth, New Hampshire
Department of Public Works

Willard Ave Area
Improvement Project

Cross Sections
Ash Street

date: February 2024	designed by: CFC/STF
project no: 1211	drawn by: WWG
checked by: PAC	approved by: PAC

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

drawing no. XS-19

sheet: 55 of 55

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PHILIP A. CORBETT
No. 12271
LICENSED
PROFESSIONAL ENGINEER
2/2/2024

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