SEWER SPECIFICATIONS

SEWER MANHOLES

A. All component parts shall have the strength, leak resistance, and space necessary for the intended service.
B. Manhole structures shall have a life in excess of 25 years.
C. Manhole structures shall be designed to withstand H-20 loading and shall not leak in excess of one gallon per day per vertical foot of manhole for the life of the structure.
D. Barrels and cone sections shall be constructed of precast reinforced concrete, or cast-in-place reinforced concrete.
E. Base sections shall be of monolithic construction to a point 6" above the crown of the incoming pipe.
F. Horizontal joints between sections of precast concrete barrels shall be of an overlapping type, which shall depend for water-tightness using a double row of an elastomeric or mastic-like sealant.
G. Pipe to manhole joints shall be as follows:
1. Elastomeric, rubber sleeve with watertight joints at the manhole opening and pipe surfaces;
2. Cast into the wall or secured with stainless steel clamps;
3. Elastomeric sealing ring cast in the manhole opening with seal formed on the surface of the pipe by compression or the ring; and
4. Non-shrink grouted joints where watertight bonding to the manhole and pipe can be obtained.
H. Manhole cone sections shall be eccentric in shape.
I. All precast sections and bases shall have the date of manufacture and the name or trademark of the manufacturer impressed or indelibly marked on the inside wall.
J. Pipe supports shall be constructed from materials intended to withstand corrosion in a wet environment. They must be able to resist concentrated stress loads from maintenance activities and prevent excessive pipe deflection or damage to pipe fittings. Pipe bearing surfaces shall be free of rough surfaces or sharp edges, and must not restrict linear movement of the pipe caused by expansion or contraction.
K. Materials of construction for manholes shall be as follows:
1. Concrete for cast-in-place bases or complete manholes shall conform to the requirements for class AA concrete in the New Hampshire Department of Transportation's standard specifications for road and bridge construction;
2. Reinforcing steel for cast-in-place concrete shall conform to the requirements for billet-steel bars and welded steel wire fabric in the New Hampshire Department of Transportation's standard specifications for road and bridge construction;
3. Precast concrete barrel sections, cones, and bases shall conform to ASTM C478 except as may be otherwise shown in these rules;
4. The manhole frame and cover shall provide a 30" diameter clear opening;
5. The manhole cover shall have the word "SEWER" in 3" tall letters cast into the top surface;
6. The castings shall be of even-grained cast iron, smooth and free from scale, lumps, blisters, sand holes and defects;
7. Contact surfaces of covers and frames shall be machined at the foundry to prevent rocking of covers in any orientation;
8. Castings shall be equal to class 30, conforming to ASTM A48/48M-03;
9. Coatings for frames and covers shall be specified in the construction specifications;
10. Brick masonry for grade adjustment shall comply with ASTM C32-05, clay or shale, for grade SS hard brick:
11. Mortar shall be composed of portland cement and sand with or without hydrated lime addition;
12. Proportions in mortar of parts by volumes shall be:
a. 4.5 parts sand and 1.5 parts cement; or
b. 4.5 parts sand, one part cement and 0.5 part hydrated lime;
13. Cement shall be type II portland cement conforming to ASTM C150-05;
14. Hydrated lime shall be type S conforming to ASTM C207-06 "Standard Specifications for Hydrated Lime for Masonry Purposes";
15. Sand shall consist of inert natural sand conforming to the ASTM C33-03 "Standard Specifications for Concrete, Fine Aggregates";
16. When manhole depth is less than 6 feet, a reinforced concrete slab cover may by used in lieu of a cone section. Slab shall have an eccentric entrance opening and be capable of supporting H-20 loads.
L. Manholes shall be installed at the end of each sewer line, at all intersections, and at all changes in grade, size or alignment. In no case shall the distance between manholes be greater than 500 feet for sewers up to and including 48" in diameter.
M. Watertight manhole covers shall be used wherever the manhole tops may be flooded by street runoff or high water.
N. Precast bases shall be placed on a 6" layer of compacted bedding material. Bedding shall conform to ASTM C33 No. 67 stone. The excavation shall be properly dewatered while placing bedding material and setting the base or pouring concrete. Water-stops shall be used at the horizontal joint of cast-in-place manholes.
O. Inlet and outlet stubs shall be connected and sealed in accordance with the manufacturer's recommended procedure, or cast integrally with the poured base.
P. A leakage test shall be performed.

LOW PRESSURE SEWER PIPING

A. Low pressure sewers shall be constructed of PVC material. Resin compound shall conform to ASTM D1784;
B. Joint gaskets for PVC pipe shall be oil resistant compression rings of rubber material conforming to ASTM D1869 and shall be push-on, bell-and-spigot type;
C. PVC pipe used for low pressure sewers shall conform to ASTM D2241-05 or ASTM D1785-05;
D. Low pressure sewers shall be designed to withstand hydrostatic pressures of at least 2.5 times the design total dynamic head.

SEWER PIPING FITTINGS

Each group of shut off valves, curb boxes, ball valves, check valves, and air release valves shall be manufactured by one manufacturer. Products are to have been proven to be reliable in similar installations over a reasonable number of years. All couplings and connectors shall have a minimum pressure rating equal to that of the pipe line in which they are installed.
A. Ball valves shall be full ported with minimal pressure drop.
B. Curb boxes shall have a cast iron base piece, steel upper, cast iron lid, and threaded bronze plug with a pentagon nut (Rope Thread); extension type and arch pattern base with ⅝" diameter, minimum, 30" stationary rod.
C. Air release valves shall be specifically designed for pressure sewer applications, to prevent contamination and mechanical fouling due to solids entering the valve.
D. Flushing and cleanout connections in manholes shall be equipped with a nipple and threaded cap facing upwards for ease of operations.

TRENCHING

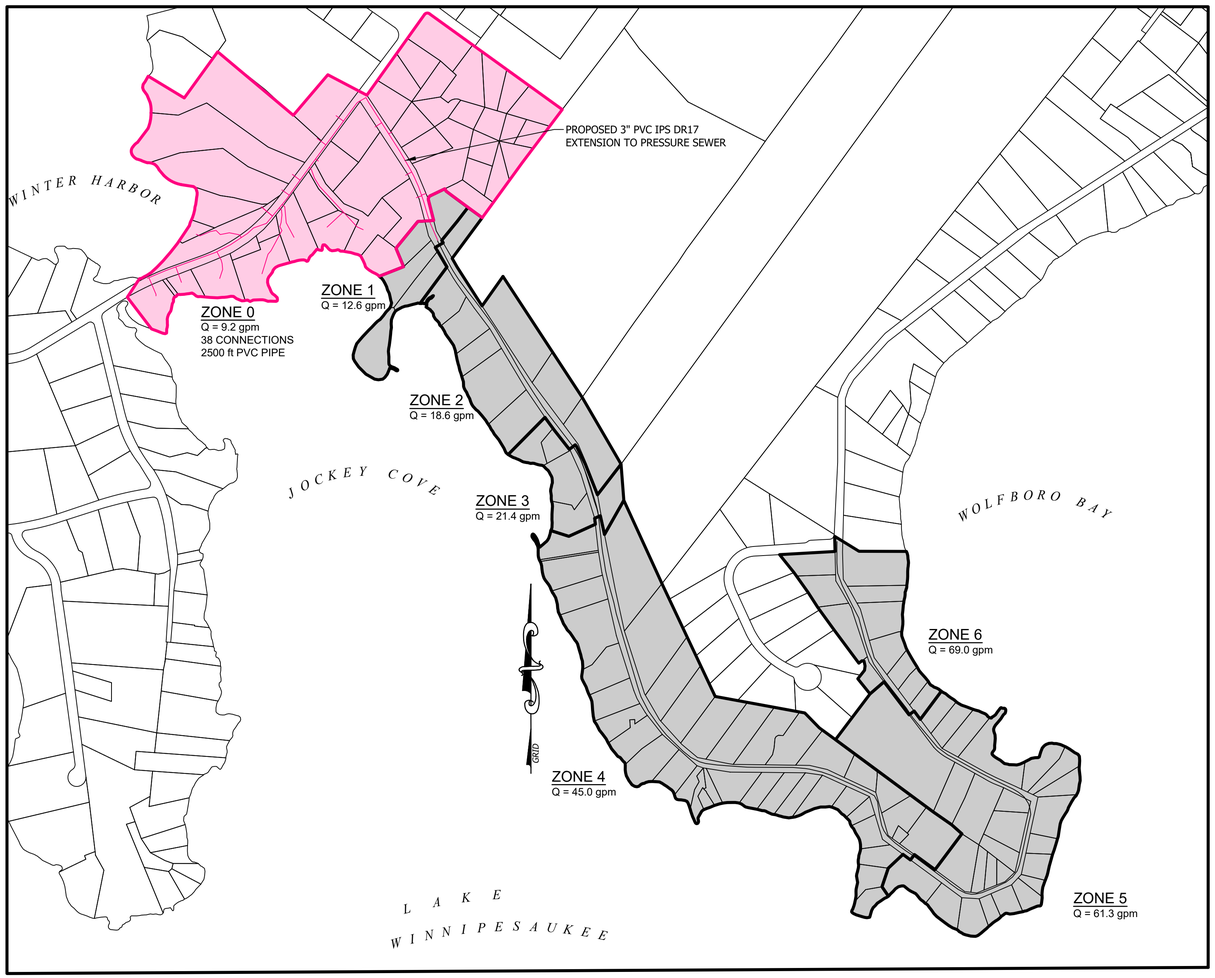
A. Pipe trench bedding material and fill material shall be screened gravel or crushed stone to ASTM C33 stone size No. 67.
B. Pipe sand blanket material shall be graded sand free from organic materials, so graded that 90% to 100% passes a ½ inch sieve and a maximum of 15% passes a #200 sieve. The sand blanket shall cover the pipe to a depth of 12".
C. Pipe bedding material shall extend from a horizontal plane through the pipe axis to 6" below the bottom of the pipe outside surface.
D. Pipe sand blanket material shall cover the pipe a minimum of 12" above the crown of the outside surface.
E. Compaction shall be in 12" layers for bedding and blanket materials.
F. Backfill material shall be compacted in 36" layers to the ground surface except for road construction where the final 3' shall be compacted in 12" layers to the road base surface.
G. Trench backfill material in roadway locations shall be natural materials excavated from the trench during construction, excluding:
1. Debris;
2. Pieces of pavement;
3. Organic matter;
4. Top soil;
5. Wet or soft muck;
6. Peat or clay;
7. Excavated ledge material;
8. Rocks over 6" in the largest dimension; and
9. any material not approved by the engineer
H. Trench backfill at cross-country locations shall be as described in G above, except that top soil, loam, muck or peat may be used provided the completed construction will be stable, and provided that access to the sewer for maintenance and reconstruction is preserved.
I. Backfill at cross-country locations shall be mounded 6" above original ground.
J. Base course for trench repair shall meet the requirements of section 300 of the standard specifications for road and bridge construction for the New Hampshire Department of Transportation.
K. Where sheeting is placed alongside the pipe and extends below mid-diameter, it shall be cut of and left in place to an elevation not less than 12" above the top of the pipe. Where sheeting is to be left in place, it shall be cut off at least 3' below finished grade, but not less than 12" above the top of the pipe.
L. For sewer pipe up to 15" in diameter, allowable trench width at plane 12" above pipe shall be no more than 36".
M. Trenches for sewer pipes with slopes over .08 feet per foot shall have trench dams installed at locations indicated on the profiles, to lower possible groundwater flow velocity and potential disturbance to pipe zone materials. Trench dams shall be equivalent to Ripley's ABS dam, installed per manufacturer's recommendations with an appropriately sized Ferrco type flexible adapter tightened to create a seal between the pipe and dam neck.

WATERLINE SEPARATION

A. Sewers shall be located during design at least 10' horizontally from any existing or proposed water main.
B. Whenever sewers must cross water mains, the sewer shall be constructed as follows:
1. Sewer pipe joints shall be located at least 6' horizontally from the water main;
2. Vertical separation of the sewer and water main shall be not less than 18", with water above sewer.

SEWER COMPONENT TESTING

A. Low pressure sewers shall be tested in accordance with Section 4 of AWWA C600-05 "Installation of Cast Iron Water Mains and Their Appurtenances", at a pressure equal to the greater of 150% of the design operating total dynamic head or at least 100 psi.
B. Manholes shall be tested for leakage using a vacuum test.
C. The manhole vacuum test shall conform to the following:
1. The initial vacuum gauge test pressure shall be 10" Hg; and
2. The minimum acceptable test hold time for a 1" Hg pressure drop to 9" Hg shall be:
a. Not less than 2 minutes for manholes less than 10' in depth;
b. Not less than 2 ½ minutes for manholes 10'-15' deep; and
c. Not less than 3 minutes for manholes more than 15' deep.
D. The manhole shall be repaired and retested if the test hold times fail to achieve the acceptance limits specified in C above.
E. Following completion of the leakage test, the frame and cover shall be placed on the top of the manhole or some other means used to prevent accidental entry by unauthorized persons, children, or animals, until the contractor is ready to make final adjustment to grade.



SEWALL-FOREST PRESSURE SEWER SYSTEM OVERVIEW

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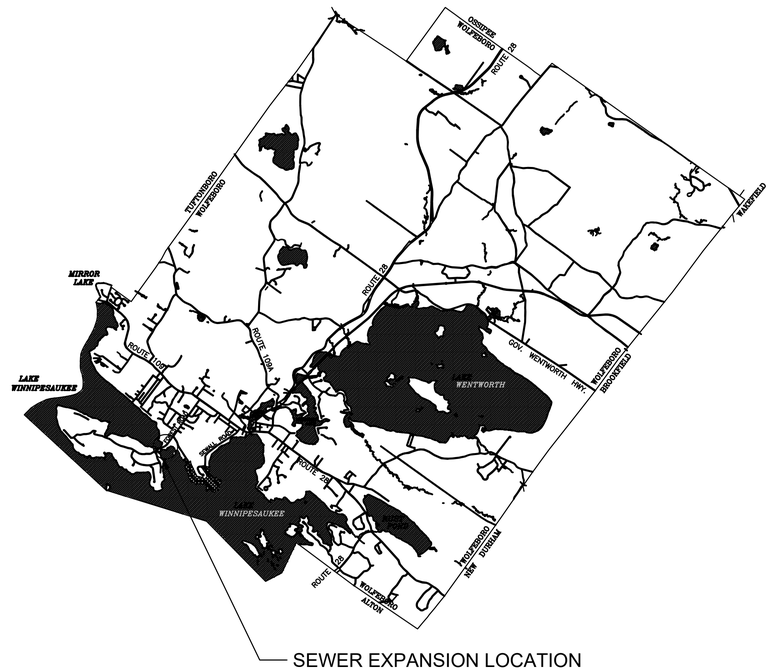

WOLFEBORO LOCATION MAP

SCALE 1 : 75000

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TOWN OF WOLFEBORO

PRESSURE SEWER EXTENSION
FOREST STREET
WOLFEBORO, NEW HAMPSHIRE

PRESSURE SEWER SYSTEM
OVERVIEW PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: 2023-02-01	PROJECT #: 220367
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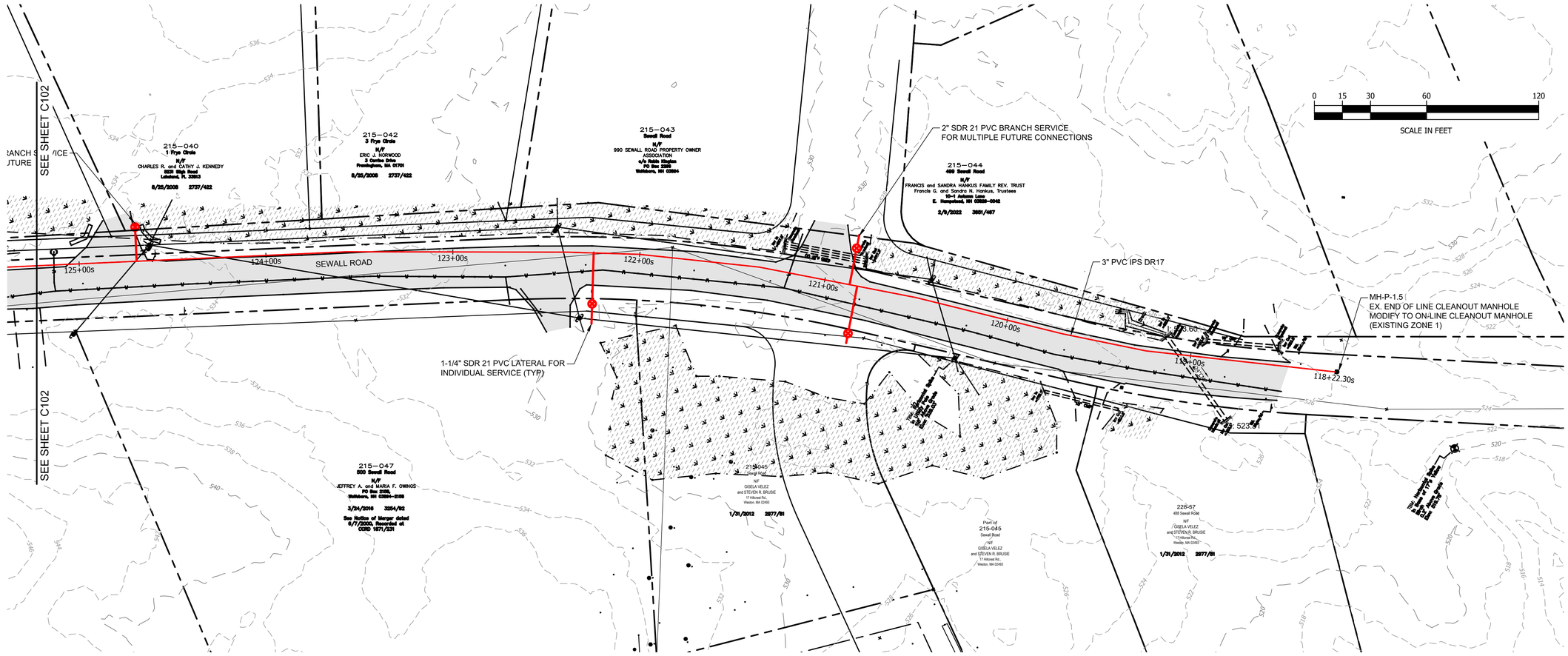

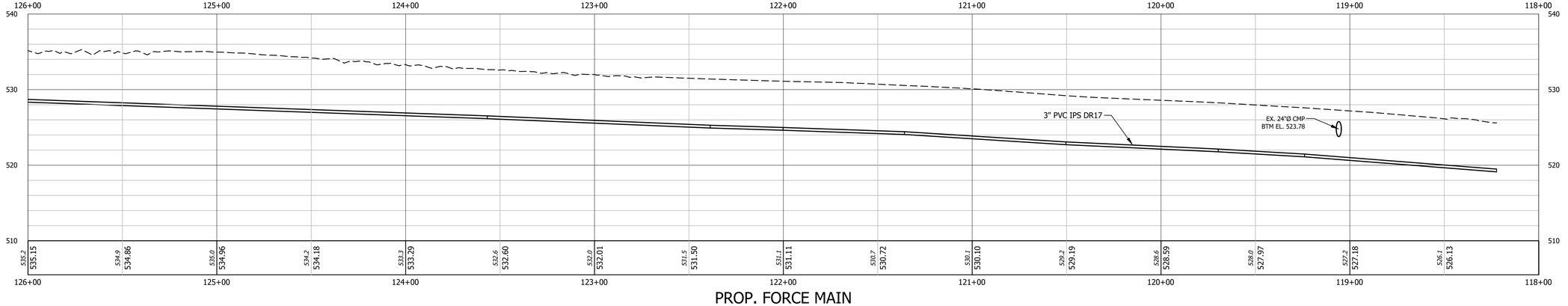

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SEWALL & FOREST ROAD
WOLFEBORO, NEW HAMPSHIRE

PLAN AND PROFILE
STA. 118+00 TO 126+00

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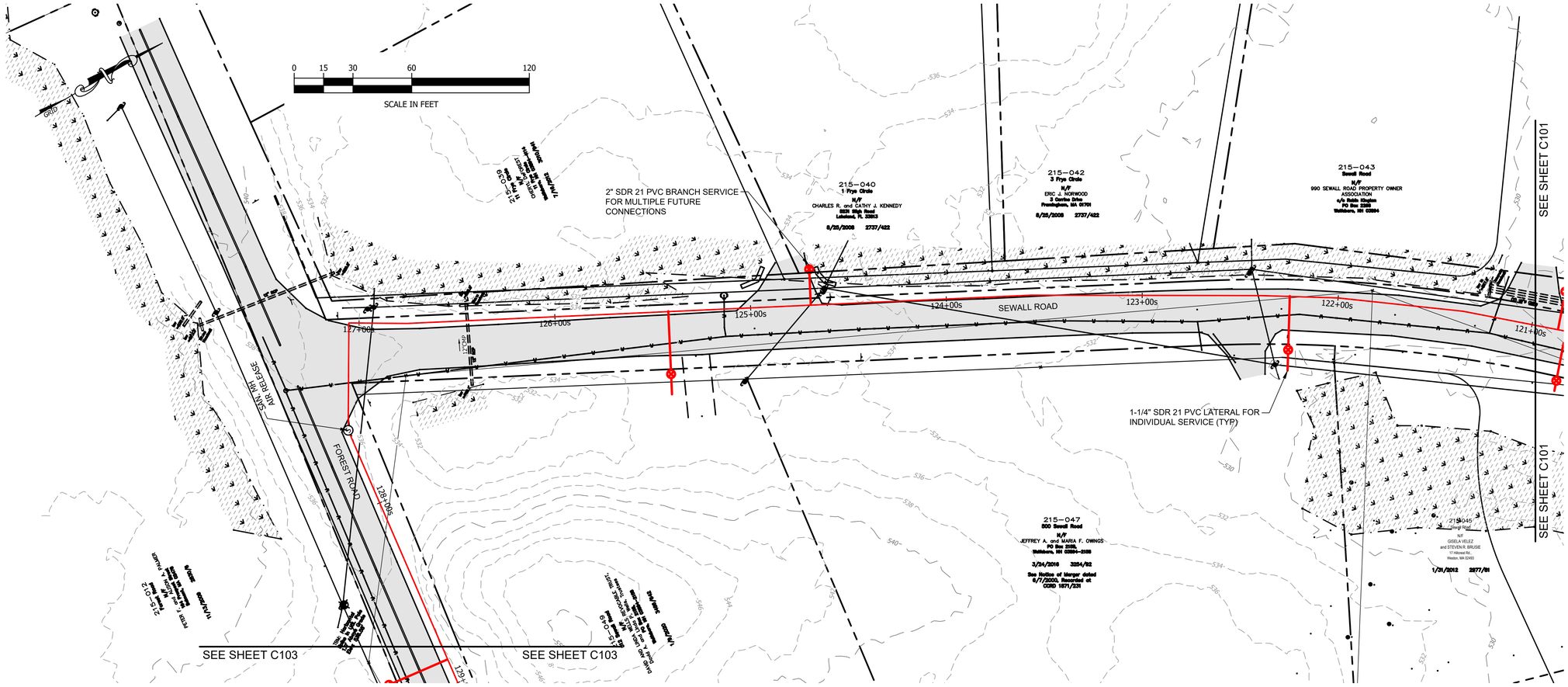

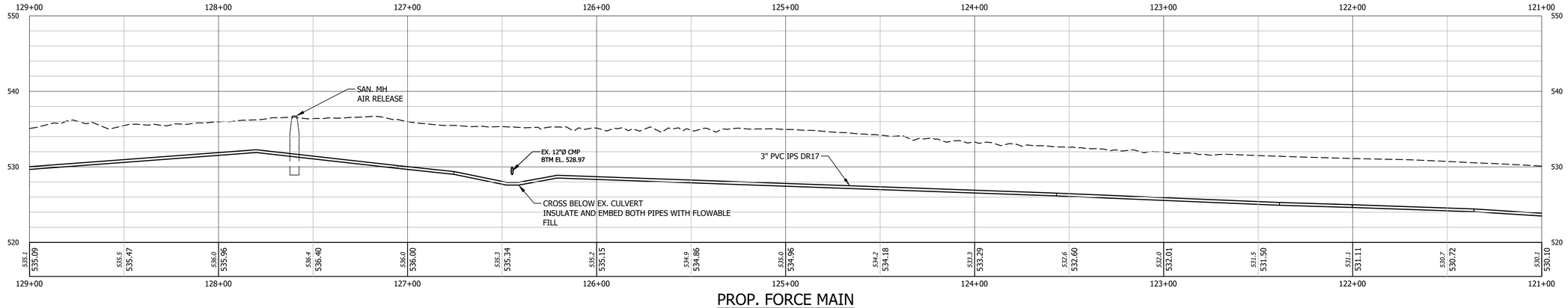

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WOLFEBORO, NEW HAMPSHIRE

PLAN AND PROFILE
STA. 122+00 TO 129+00

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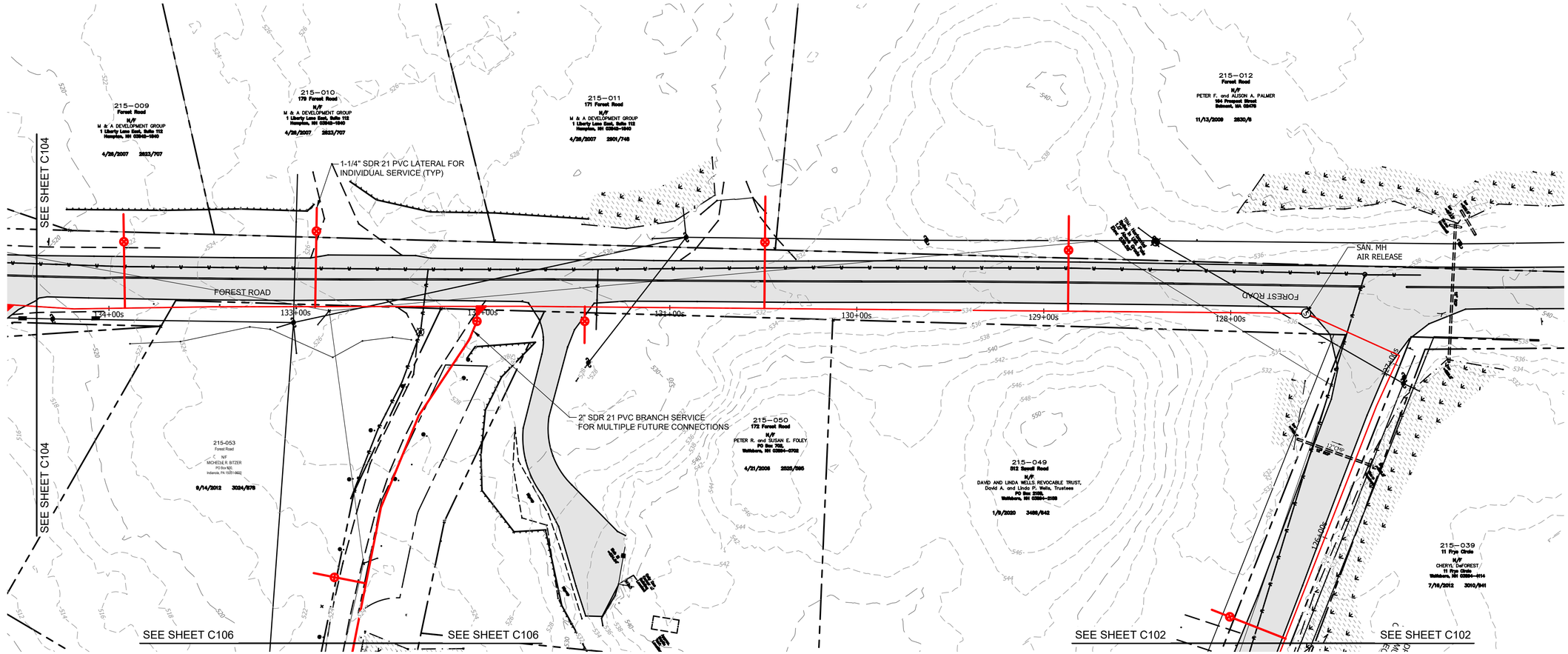

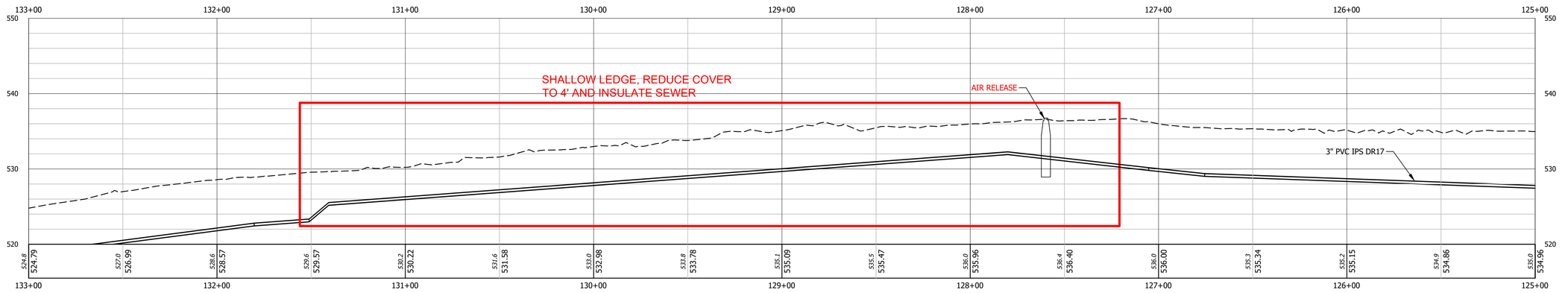

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PLAN AND PROFILE
STA. 125+00 TO 133+00

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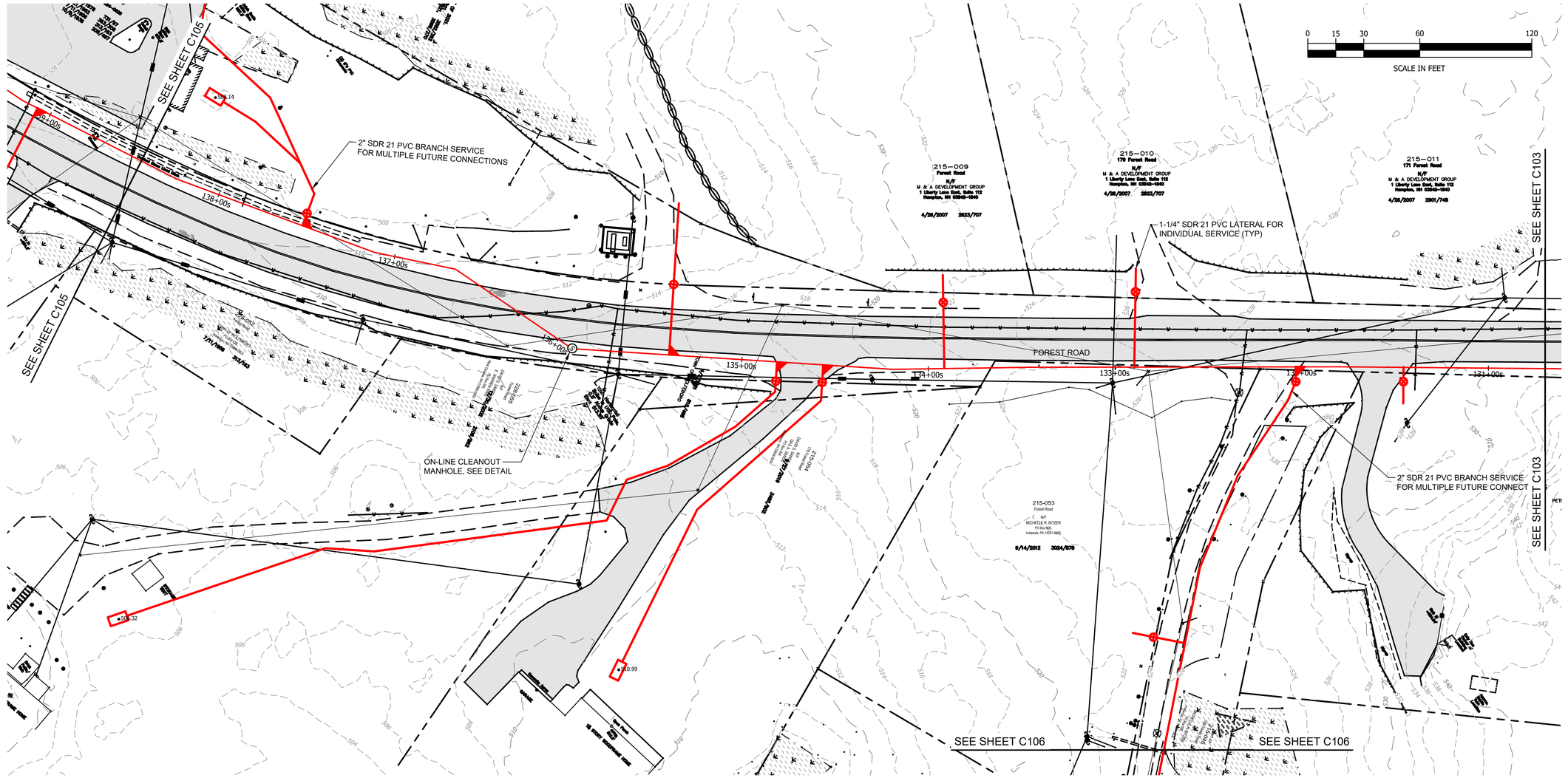
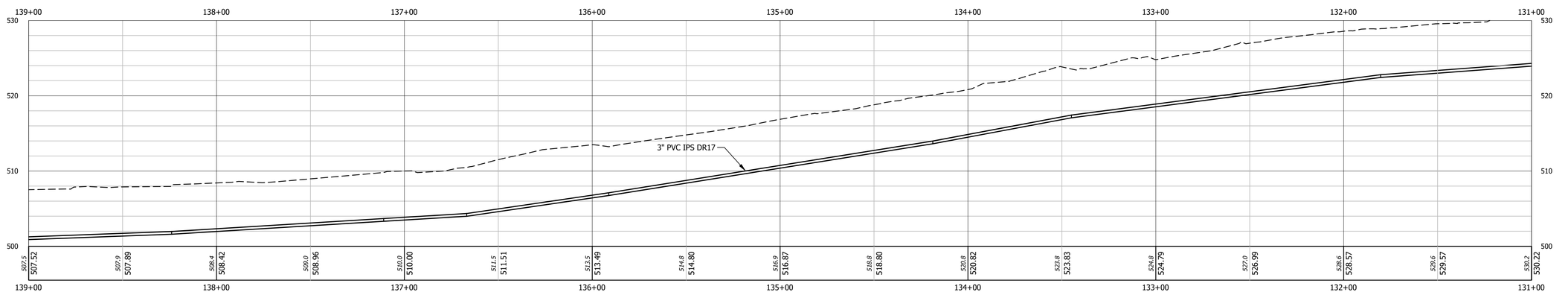
C103





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SEWALL & FOREST ROAD
WOLFEBORO, NEW HAMPSHIRE

PLAN AND PROFILE
STA. 131+00 TO 139+00

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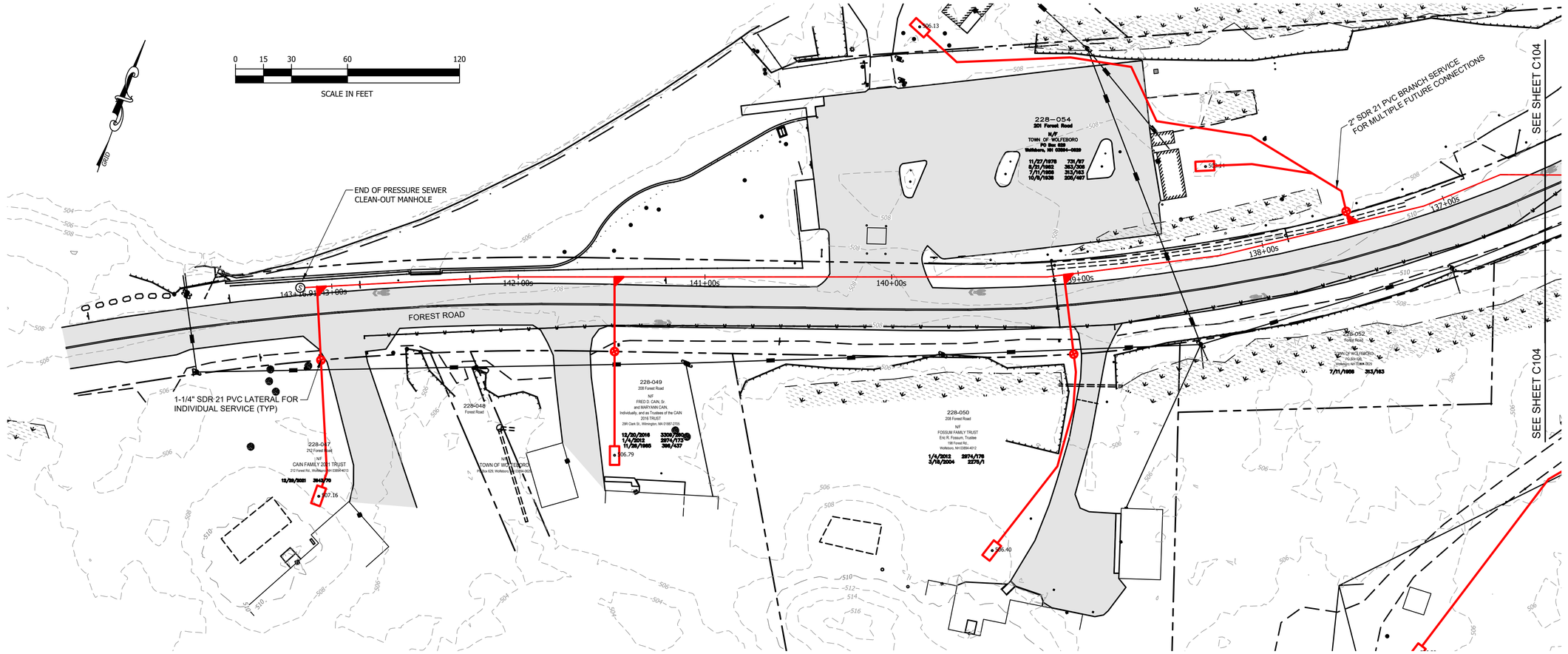

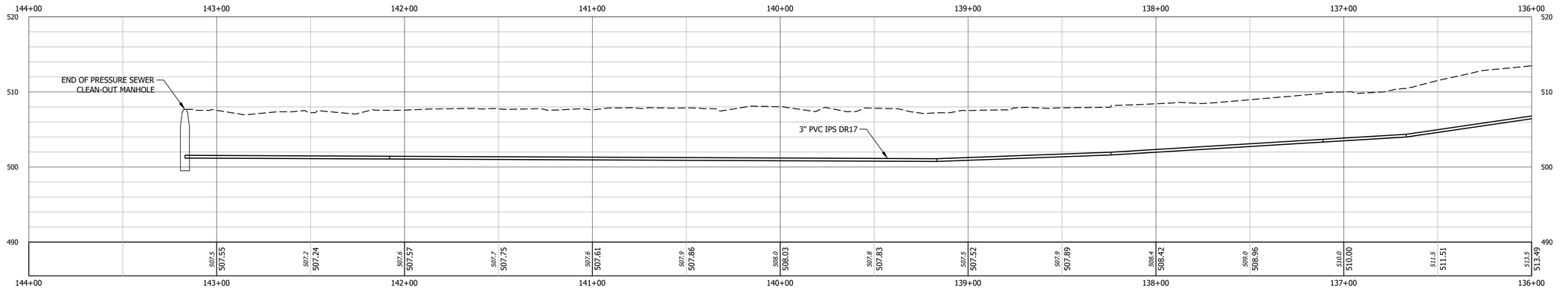

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WOLFEBORO, NEW HAMPSHIRE

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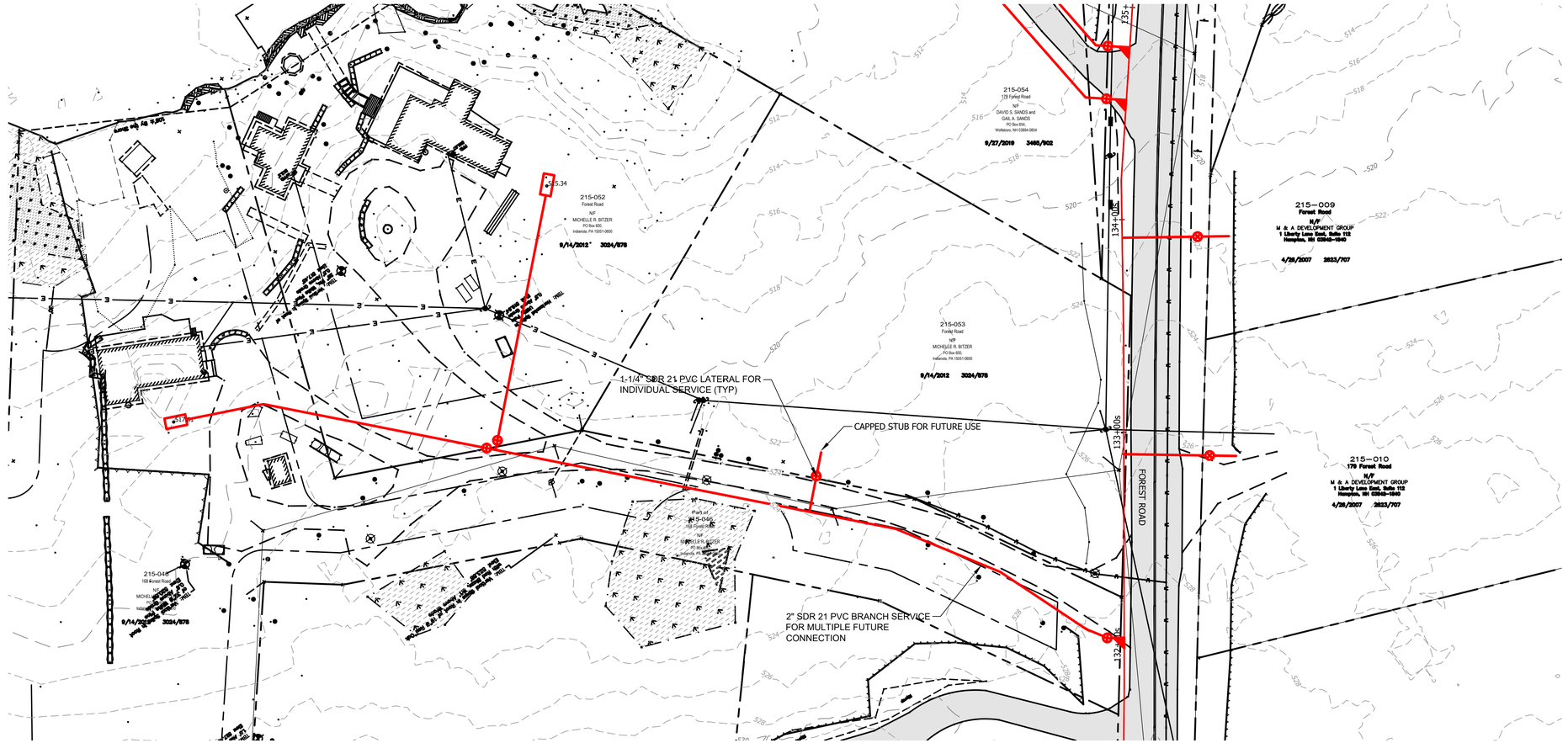

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TOWN OF WOLFEBORO

PRESSURE SEWER EXTENSION
SEWALL & FOREST ROAD
WOLFEBORO, NEW HAMPSHIRE

SITE PLAN
SERVICE CONNECTION AT 132+00

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

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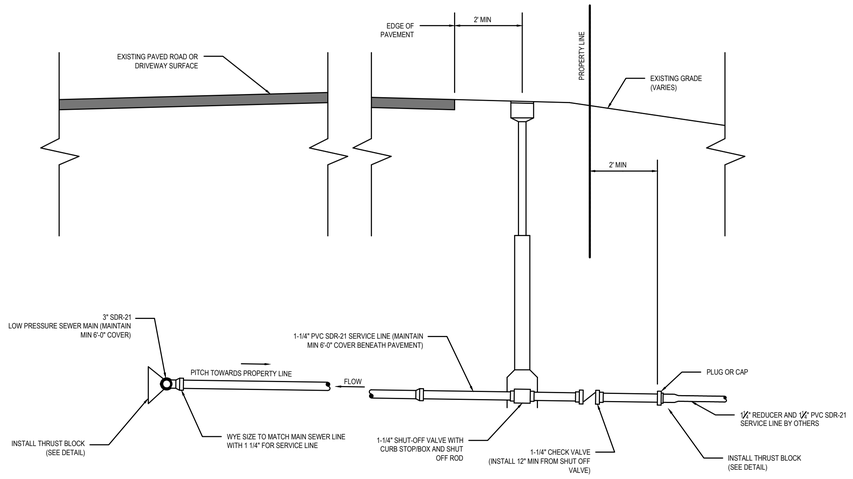
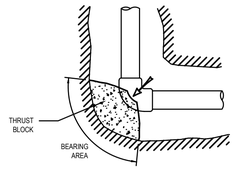


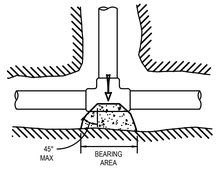
TYPICAL SERVICE CONNECTION DETAIL FOR SERVICE TO INDIVIDUAL LOTS

NO SCALE

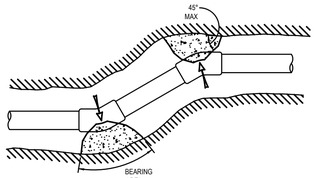
SEE PLAN VIEW FOR SERVICE CONNECTION SIZES



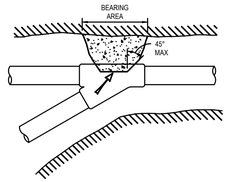
TYPICAL ELBOW - PLAN



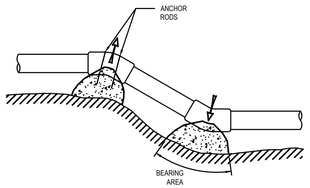
TYPICAL TEE - PLAN



TYPICAL BEND - PLAN

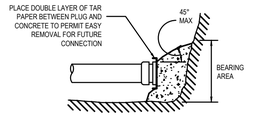


TYPICAL WYE - PLAN



TYPICAL VERTICAL BEND - ELEVATION

(TYPICALLY USED AT WATER AND SEWER PIPE CROSSINGS)

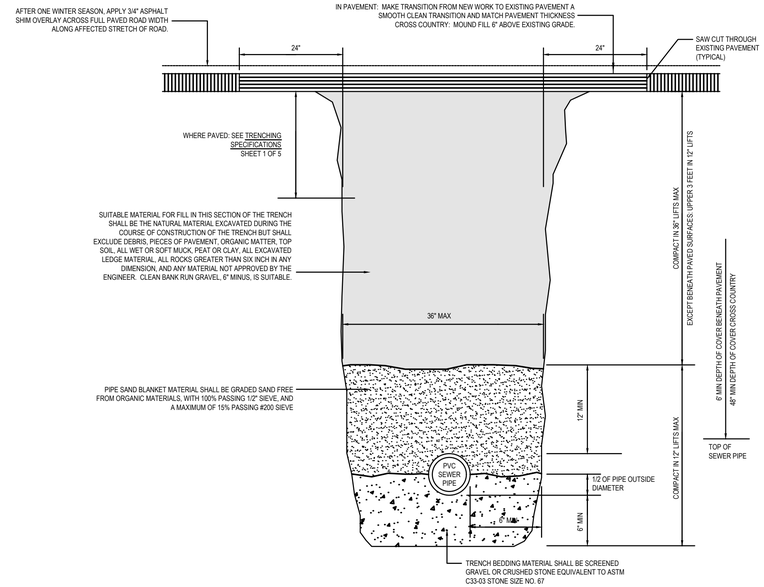


TYPICAL PLUG - ELEVATION

THRUST BLOCK DETAILS

NO SCALE

A. PRE-CAST OR CAST-IN-PLACE CONCRETE THRUST BLOCKS SHALL BE INSTALLED ALONG THE SEWER LINE IN LOCATIONS WHERE A BEND, WYE, ELBOW, TEE, OR PLUG IS INSTALLED.
B. THRUST BLOCKS SHOULD BE POSITIONED AS SHOWN IN THE ABOVE DIAGRAMS.
C. BLOCKS INSTALLED TO REDUCE VERTICAL THRUST SHALL HAVE ANCHOR RODS INSTALLED AND EMBEDDED INTO THE CONCRETE.
D. THE MINIMUM THICKNESS OF THE BLOCK SHALL BE 12" AND BE CAST OF CLASS A CONCRETE. THE MINIMUM BEARING AREA OF THE BLOCK (AREA AGAINST UNDISTURBED SOIL OF THE TRENCH SIDE) IS LISTED BELOW FOR VARIOUS FITTINGS.
   1. WYES, PLUGS, TEES: 2.0 SF
   2. 90° BENDS: 3.0 SF
   3. 45° TO 11.25° BENDS: 1.5 SF



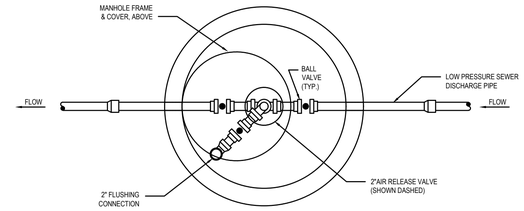
SEWER PIPE TRENCH SECTION

NO SCALE

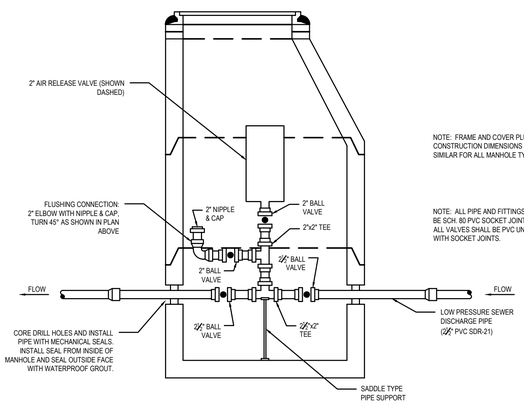
LOW PRESSURE SEWER PIPE SHALL BE SOLID WALL SDR 21 PVC PIPE

WATER and SEWER PIPE CROSSING DETAIL

NO SCALE



PLAN VIEW



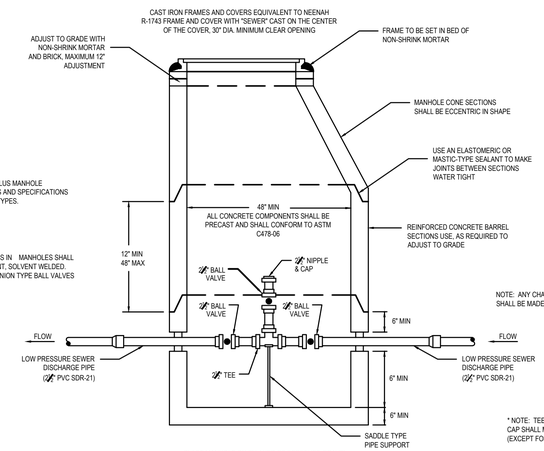
PROFILE VIEW

AIR RELEASE VALVE MANHOLE

NO SCALE

NOTE: FRAME AND COVER PLUS MANHOLE CONSTRUCTION DIMENSIONS AND SPECIFICATIONS SIMILAR FOR ALL MANHOLE TYPES.

NOTE: ALL PIPE AND FITTINGS IN MANHOLES SHALL BE SCH. 80 PVC SOCKET JOINT, SOLVENT WELDED. ALL VALVES SHALL BE PVC UNION TYPE BALL VALVES WITH SOCKET JOINTS.



PROFILE VIEW

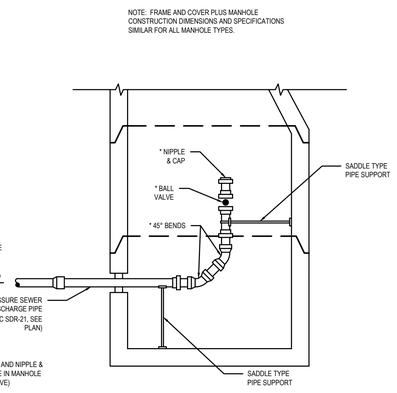
ON-LINE CLEANOUT MANHOLE

NO SCALE

NOTE: ANY CHANGE IN PIPE SIZE SHALL BE MADE OUTSIDE MANHOLE

* NOTE: TEES, BENDS, VALVES, AND NIPPLE & CAP SHALL MATCH SIZE OF PIPE IN MANHOLE (EXCEPT FOR AIR RELEASE VALVE)

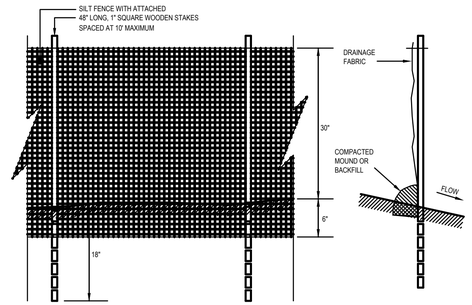
NOTE: FRAME AND COVER PLUS MANHOLE CONSTRUCTION DIMENSIONS AND SPECIFICATIONS SIMILAR FOR ALL MANHOLE TYPES.



PROFILE VIEW

END-OF-LINE CLEANOUT MANHOLE

NO SCALE



ELEVATION CROSS-SECTION

INSTALLATION

A. DIG OR PLOUGH A 4" TO 6" TRENCH* ALONG THE INTENDED FENCE LINE, AS SHOWN IN PLAN VIEW.
B. LAY OUT SILT FENCE ALONG THE INTENDED FENCE LINE.
C. STRETCH SILT FENCE AS TIGHTLY AS IS PRACTICABLE.
D. WITH POSTS AT THE "BACKSIDE" OF THE FENCE LINE, DRIVE ALL POSTS INTO THE GROUND, AS SHOWN.
E. LAY BOTTOM 6" OF SILT FENCE INTO TRENCH*, BACKFILL WITH SOIL AND TAMP TO COMPACT.
* ALTERNATIVE TO TRENCHING ONLY IF TRENCHING IS NOT PHYSICALLY POSSIBLE: MOUND SOIL ALONG UPHILL SIDE OF THE INSTALLED FENCE. TAMP TO COMPACT. ENSURE SOLID CONTACT WITH FILL AND GROUND.

MATERIAL

A. SILT FENCE SHALL BE EQUIVALENT TO AMOCO 2130 SELF SUPPORTING UV STABILIZED POLYPROPYLENE SILT FENCE WITH ATTACHED WOODEN STAKES.
B. SILT FENCE SHALL MEET THE FOLLOWING MINIMUM PHYSICAL PROPERTIES INDICATED:

GRAB TENSILE – WARP 125# <> FILL 100#
U.V. RESISTANCE – 70% @ 500
APPARENT OPENING SIZE – 0.60 mm
PERMITIVITY – 0.05

SILT FENCE DETAIL

NO SCALE

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TOWN OF WOLFEBORO

PRESSURE SEWER EXTENSION
SEWALL & FOREST ROAD
WOLFEBORO, NEW HAMPSHIRE

CONSTRUCTION DETAILS

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: 2023-02-01	PROJECT #: 220367
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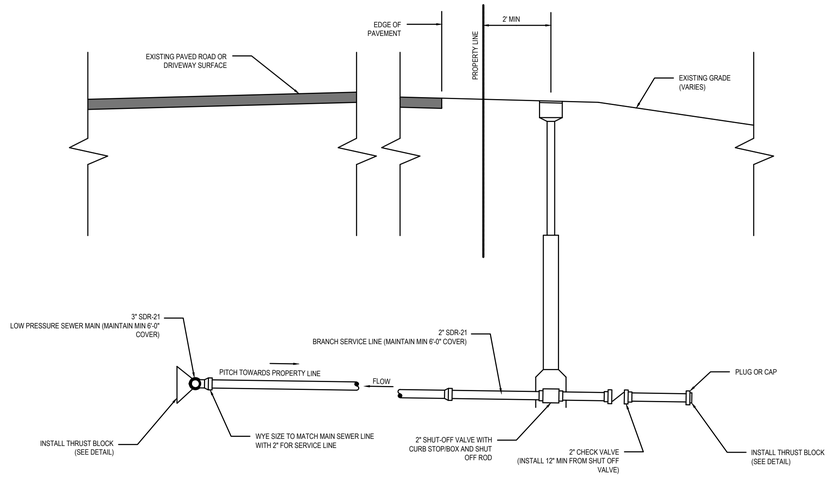
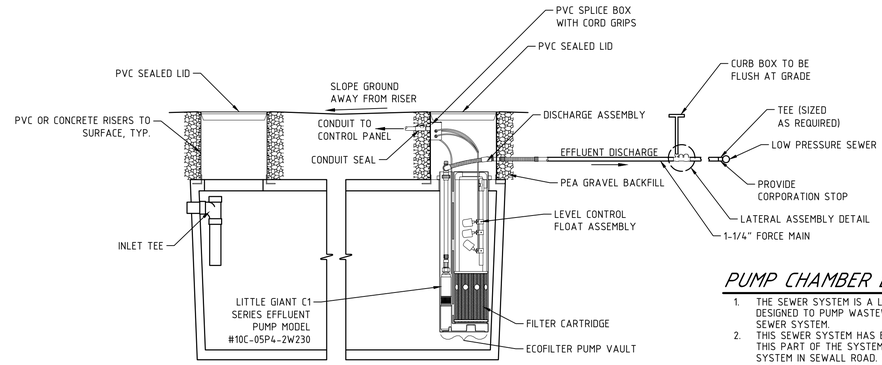


TYPICAL BRANCH SERVICE CONNECTION DETAIL FOR SERVICE TO FUTURE MULTIPLE CONNECTIONS

NO SCALE

SEE PLAN VIEW FOR SERVICE CONNECTION SIZES



NOTES

1. SEPTIC TANK MUST BE AT LEAST 1250 GAL + 500 GAL

PROPOSED SEPTIC AND PUMP DETAIL

N.T.S.

PUMP CHAMBER DESIGN SPECIFICATIONS

1. THE SEWER SYSTEM IS A LOW PRESSURE FORCE MAIN SEWER SYSTEM. THE SYSTEM IS DESIGNED TO PUMP WASTEWATER EFFLUENT FROM EACH LOT TO THE CITY MUNICIPAL SEWER SYSTEM.
2. THIS SEWER SYSTEM HAS BEEN DESIGNED USING THE ECOFILTER EFFLUENT PUMP SYSTEM. THIS PART OF THE SYSTEM IS AN EXPANSION FRO AN EXISTING LOW PRESSURE SEWER SYSTEM IN SEWALL ROAD. THERE WILL BE NO SUBSTITUTIONS FOR ALTERNATIVE PUMPS FOR THIS SYSTEM WITHOUT ADDITIONAL APPROVAL.
3. EACH UNIT WILL BE CONSTRUCTED WITH A 2-COMPARTMENT SEPTIC/PUMP TANK AS SHOWN. EACH OWNER WILL BE RESPONSIBLE TO PUMP THEIR SEPTIC TANK TO INSURE THAT SLUDGE DOES NOT ACCUMULATE TO GRATER THAN 1/4 THE DEPTH OF THE TANK. THIS IS APPROXIMATELY ONCE EVERY 3 YEARS.
4. PUMP CHAMBER ELEVATIONS AND PUMP "ON", "OFF", AND "ALARM" ELEVATIONS TO BE SET BASED ON EXACT PUMP CHAMBER LOCATIONS (TO BE DETERMINED DURING UNIT BUILD OUT).
5. CONTACT MIKE CARLTON AT WATER INDUSTRIES FOR EQUIPMENT, SPECIFICATIONS AND INSTALLATION REQUIREMENTS.

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