Weston & Sampson

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Progress Documents

October 2025

New Drinking Well

22 + 24 Meetinghouse Road
Truro, Massachusetts 02666

TOWN OF
Truro
MASSACHUSETTS

G3010 Water Supply

A. Supply Well and Water System

The water supply well (MassDEP 4300041-02G; aka the Boyd Well) currently used for drinking water for the existing Town of Truro Municipal Building and abutting Department of Public Works (DPW) facility needs to be abandoned in order to accommodate the construction of a new DPW/Town Hall complex (the Complex) located at the Town's currently utilized property between Meetinghouse Road and Bridge Street. In order to meet the potable water demands of the Complex, along with regular DPW vehicle washing needs (non-potable), the installation of a new well is being pursued by the Town on two adjoining parcels (Parcel ID's 46_254_0 and M46_255_0, respectively) with a combined area of approximately 3-acres of undeveloped land which are owned by the Truro Conservation Trust (the Site Property). The Site Property (corresponds to Town addresses of 22 and 24 Meetinghouse Road, respectively) is situated diagonally opposite of the existing DPW facility, on the northwestern side of Meetinghouse Road. The Property is bounded to the north and accessed by a Town-owned recreational property identified as Snows Field. The adjoining land to the west and east of the Property consist of private residential parcels with addresses of 6 Tryworks Way and 5 Grandpas Road, respectively.

The combination of potable and non-potable water demands for the Complex is currently anticipated to be less than 1,000 gallons per day (gpd) though the actual average instantaneous pumping of the well could be as high as about 5 gallons per minute (gpm). Given the anticipated potable water demands for the proposed Complex, the minimum MassDEP required Zone 1 radius for the proposed well (based on the total daily use of less than 1,000 gpd) is calculated to be 100 feet, though a future increase in the daily demand to upwards of 1,400 gpd may be considered by the Town (requiring a Zone I radius of about 120 feet). The Town anticipates that the land use/activities and land ownership within the corresponding Zone I area will need to be consistent with the respective MassDEP protection requirements associated with the drinking water use of the well. The currently proposed site for the new well is expected to be in an area where the Town has ownership and/or control of the future land use conditions as required by the MassDEP. Water pumped from the new well will need to be routed to a future treatment and storage facility, along with the installation of a future pipeline that is routed to the proposed Complex. At this time, the future treatment and storage facilities for the proposed well will be located within the footprint of the proposed Complex.

Proposed Replacement Well Considerations

Based on prior reviews of the existing well system and currently proposed Complex layout, as well as subsequent discussions with the MassDEP Southeast Regional Office (Lakeville), it is assumed that the existing well will need to be abandoned in accordance with applicable MassDEP requirements and replaced by the new well to be installed at the proposed location on land owned by the Truro Conservation Trust (the Site Property). Given the current proposed Complex layout and historically based daily demand numbers, several locations at the northern end of the Site Property (staked locations designated 1A through 3A on the attached map) have been selected for the possible new well installation (Figure 1). Each of the designated potential locations meet the minimum 100-foot radius setback corresponding to the Zone I associated with a daily demand of 1,000 gpd, while staked locations 2B and 2C meet the Zone I setback radius associated with a daily demand of 1,400 gpd.

The installation of at least one (1) well (combined drinking water and vehicle washing water supplies) and installation of necessary ancillary equipment (e.g., valving, meters, tanks, piping, possible treatment) should be pursued at the selected location indicated on the Schematic Site Plan (Figure 1). The installation of a possible backup well at one of the remaining staked locations should be considered by the Town as part of this work or future work activities. Given that the Town does not own the Site Property, and the future potable well will be installed at a location proximal to nearby off-site areas know to be associated with groundwater quality concerns, the Town will need to review the proposed well installation with the MassDEP as part of the permitting process (BRP WS-13 and BRP WS-15).

Upon completion of well installation, permitting, and connection to the Complex, and assuming no need to retain it for other purposes, the existing Boyd Well should be sealed in accordance with applicable MassDEP requirements including the in-filling/cementing of the borehole and removal/sealing of the well casing, following removal of all in-well equipment and valving. It should be noted that there are two supply wells located in the vicinity of the grass island between the drive accessed off the north side of Meetinghouse Road and the DPW facility, and which correspond to the mapped Boyd Well location. The two wells are about 15 feet apart, with one of the wells reportedly completed with a six-inch diameter casing while the other is reportedly completed with a four-inch diameter casing. The appropriate abandonment documentation should be submitted to the MassDEP by the selected licensed drilling contractor.

New Potable Supply Well Installation

The specifications presented below are intended for use by the Town for the determination of estimated costs and scheduling impacts associated with the installation, testing, connection, and permitting of the proposed well (Figure 2). The proposed well is intended to be constructed with components and setting depths (adjusted for topographic differences between the respective sites) like those of the existing well (the Boyd Well). As such, the proposed well will tap the same unconsolidated sand and gravel (outwash) aquifer and rely on a submersible pump to route water to the Complex.

Specifications: General

1.01 Work Included:

A. Furnish all labor, materials, equipment, and incidentals necessary to construct and develop one screened water well (for potable purposes) complete and as specified herein, including test pumping and all accessories or related items required for proper installation and development.

B. The proposed permanent well design will include a minimum 6-inch diameter PVC casing and stainless-steel, wire-wrapped screen (or approved equivalent) set in unconsolidated sand and gravel. Well depth shall be approximately 160 feet below the existing ground surface (ft bgs). Casing will be installed to a depth of approximately 140 to 150 ft bgs based on the depth of the encountered groundwater surface and composition of the underlying unconsolidated deposits. The screen interval is estimated to be installed from about 150 ft bgs to 160 ft bgs. The depths will be determined from an examination of the subsurface materials and assessment made by the driller and the Town Representative/Hydrogeologist. Final physical specifications for well depth and screen

slot size and length will be based on the grain-size characteristics of the penetrated aquifer materials and their corresponding potential to yield the required minimum production rate of 5 to 10 gpm.

C. The Contractor shall also furnish, install, and later remove temporary discharge piping suitable for conveying water pumped from the well during the construction, development, and testing. The discharge location shall be designated by the Client. Environmental protection measures, site restoration and stabilization shall be performed by the Contractor.

1.02 Submittals

A. Prior to use of any materials in the construction and development of this well, the Contractor shall provide to the Town Representative the following submittals:
   1. A bill of lading or other approved evidence identifying the casing pipe, screen, and sanitary seal material (e.g., grout). All pipes installed shall be new and free from defects and connected using threaded connectors.
   2. A construction plan generally describing the methods, techniques, material, and changes or deviations from the work as described herein.

PART 2: Components

2.01 Permanent Casings

A. The permanent casing and screen to be incorporated as a permanent part of the well structure shall be new pipe, undamaged and conforming to the appropriate NSF and/or ANSI and/or AWWA (Standard A100) and/or ASTM (Standard F-480) specifications for potable water PVC (Thermoplastic) pipe. A schematic of the construction for the well is attached as Figure 2.

2.02 Well Borehole Advancement

A. An oversized borehole will be advanced to a depth of about 30 ft bgs to accommodate the necessary surface seal (minimum cement grout thickness of 2 inches). The remaining borehole will be advanced to a depth of about 160 ft bgs or until a sufficient thickness of groundwater bearing sand and/or gravel is encountered as determined by the driller and Town Representative/Hydrogeologist. The completed borehole shall be a minimum of 6-inches in diameter and as plumb and straight as possible under the encountered conditions. Drilling using either hollow stem auger (HSA) or mud-rotary techniques or sonic/continuous coring is preferred, unless otherwise approved by the Town Representative.

PART 3: Execution

3.01 Excavation:

A. Any excavation for the initial drilling and installation of temporary and permanent

casings shall be completed with a well-drilling rig acceptable to the Town Representative. The casing shall be excavated/installed and grouted to a depth of 30 ft bgs.

B. The casings shall be installed plumb, and sufficient checks shall be made during drilling to assure that it is plumb.

3.02 Drilling and Casing Installations

A. The Contractor shall drill the well at the location designated by the Owner or the Town Representative as staked in the field.

B. The Contractor shall employ the HSA or mud rotary or sonic method for advancement of the well borehole unless the use of other drilling methods is approved by the Town Representative.

C. The Contractor shall be fully responsible for drilling and installing the casing pipes to construct the well in the configuration shown on attached Figure 2. Unless otherwise approved, casings are to be joined by threaded couplings. The Contractor shall be held fully responsible for any failure in materials, workmanship or well completion as described in this paragraph or other paragraphs of these specifications.

Cuttings are to be shoveled and contained in a hay-bale bermed/silt-fence bounded area or flushed into a cloth containment bag within the work area, unless otherwise pre-approved by the Town and the/or the Town Representative. Any water associated with the cuttings shall be allowed to filter through the containment materials. Settled drill cuttings will be removed from the containment area and disposed of off-site or as directed by the Town.

3.03 Cuttings Sampling

A. Cutting samples should be collected and staged on site for subsequent inspection beginning at about 5 ft bgs and at a minimum of every 20 feet thereafter to a depth of about 130 ft bgs. From a depth of about 130 ft bgs to the completion depth of the borehole (about 160 ft bgs) cutting samples shall be collected by the driller at a minimum of every five feet and bagged and labeled for future inspection by the Town Hydrogeologist. A stratigraphic log shall be prepared to accompany the sampled cuttings, noting not only depth, strata thickness, color, material classification, but include special notes such as water production/loss rate, heaving, and iron staining. Full description notes of all conditions encountered while drilling are to be recorded by the driller on this log.

3.04 Well Development

A. The Contractor shall submit the method of well development to the Town Representative/Hydrogeologist, which he proposes to use. No development work shall be started until the Town Representative has approved the proposed method, equipment, and materials, which are to be used in this work. Chemicals shall not be used unless specifically approved by the Town Representative. In general the well shall be developed either by

mechanical or airlift techniques.

B. Development of the well shall proceed until the discharge water is sediment free and developed to its maximum yield. The development for maximum yield shall continue until no increase in yield (as reflected by corresponding specific capacity measurements) has been recorded for a period of at least 2 hours or as directed by the Town Representative.

C. A sediment-free condition shall be one in which no more than 1 or 2 grains of sand are present in a gallon sample of water. In addition, the well discharge shall be free of color or suspended solids.

3.05 Well Testing

A. The pumping rate at which the test pumping shall be carried out will be about 1.5 times the expected yield in gallons per minute (gpm), or about 8 to 10 gpm. Pumping shall be maintained at a constant rate for a period of not less than 48 hours, consistent with MassDEP requirements for permitting of proposed NTNC Well Supplies. The pumping shall be immediately followed by a 2-hour period of water level recovery measurements. Drawdown and recovery measurements shall be monitored under a schedule provided by the Town Representative.

B. The Contractor shall provide all the material and equipment necessary for testing as approved by the Town Representative. The material and equipment shall be in good condition and shall include but not necessarily be limited to an adequately sized discharge pipe, orifice and/or in-line flow meter, a valve to regulate flow, a sampling port, and a tube to allow access for water level measurement equipment. Towards the end of the pumping test, the Contractor shall assist the Town Representative with the collection of one sample from the proposed potable well for submittal for analyses in accordance with appropriate MassDEP requirements as indicated by the Town Representative.

3.06 Well Completion

A. Upon completion of all other work under this Contract, the Contractor shall cut or extend the casing to the height above grade as shown on the appended detail provided on Figure 2 and secure a tamper-proof/locking well cap with a continuous watertight seal.

Records & Drawing

A. Records to be prepared by the Contractor shall consist of at least one original and three copies and shall be transmitted to the Town Representative within 14 days of the well completion along with the MassDEP well drillers report. These records shall include the date and time and shall consist of:

1. Drillers Report

a. A location sketch, including distances to water supply well from two existing fixed features.
b. The reference point for all depth measurements.
c. The depth at which each change of formation occurs.
d. The depth at which the first water was encountered.

e. The depth at which each stratum was encountered.
f. The thickness of each stratum.
g. The identification of the encountered geologic materials of which each stratum is composed, such as:
   (1) clay
   (2) sand or silt
   (3) sand and gravel - indicate whether gravel is loose, tight, angular, or smooth, color
   (4) bedrock type (e.g., granite).
h. Depth or location of any lost drilling fluids, drilling materials, tools, etc.
i. The total depth of the drilling.
j. Drilling penetration rate.
k. Water production rate every 20 feet of open borehole.
l. Copies of applied for and received drilling permits

2. Construction Report

   a. Diameter of casing and screen.
   b. Length of casing and screen.
   c. Screen materials and slot size.
   d. Grout operation & interval.
   e. Development work, time and well capacity measurements.
   f. Disinfection details.

3. Water levels, water samples taken, miscellaneous.

4. Pumping Test Report

   a. The pumping test report shall be on forms as approved by the Town Representative on which shall be recorded clock time, elapsed time, orifice reading, discharge rate and depth to water. Depth to water shall be collected using an electronic water level at the following time intervals: 1-minute intervals for the first 10 minutes, 2-minute intervals for the following 15 minutes, 5-minute intervals from 25- 90 minutes and hourly intervals thereafter or as directed by the Town Representative.

   b. Also, each separate form on which the above information is recorded shall also record general data as follows: page number, well designation number, location description (name), date, time of start, time of completion, estimated sand content in grains by volume, specific conductance measured at end of first hour of pumping, orifice pipe and opening size, sounded well depth, test pump (make and model), and any observation well measurements.

B. Record Drawing

   a. A Record Drawing and/or construction diagram shall be prepared by the Contractor for the well which shall show in pictorial format the depth for each change of formation (strata), a description of each formation, static

water level and appropriate remarks on subsurface conditions as may be appropriate. Also, the record drawing shall show all details of construction but with actual length and materials as installed for the well.

Typical Bid Breakdown

The following table provides a summary of the typical tasks expected to be associated with the installation of the 160-foot-deep well at the Site Property, and that will require costs from the bidding contractor:

Item No.	Description	Quantity	Units	Unit Cost	Total
1	Mobilization/Demobilization	1	LS		
2	Min. 8" Drilling (Overburden)	30	FT		
3	Install temporary surface casing (Overburden)	30	FT		
4	Cement Grout between temporary surface casing and 6” Permanent Casing	30	FT		
5	Drill minimum 6” Borehole and sample	160	FT		
6	Install 6” PVC threaded and coupled Casing	150			
7	Install 6” stainless steel, wire-wrapped screen	10			
8	Development (air lift)	4	HRS		
9	Pumping Test/Rate Test (48-hr minimum)	48	HRS		
10	Pitless Adaptor w/ Install & Connect	1	EA		
11	Submersible Pump & Wiring	1	EA		
12	Pump Column/Pipe w/ Connections	150	FT		
13	Wellhead completion w/ cap	1	EA		
14	HDPE Piping and connections from well to Complex	See Below	FT		
15	In-line flow meter with totalizer, shutoff valve, sampling tap, and vault	1	EA		
16	Abandonment of existing Boyd Well(s)	1 (2)	LS		

New Water Supply System Components for New Supply Wells

Besides the new proposed wells, piping, valving, treatment, and other components related to connecting them to the respective tanks will be required. Since the actual yield, locations, and water quality for the proposed well cannot be established until it is installed and tested, distances of about 800 to 2,600 feet, respectively, from the identified potable well location to the proposed Complex site should be assumed for piping costs assuming two possible piping options from the well to the Complex. The two options (Figures 3 and 4) illustrate a direct route following the slope of the Site topography and the more indirect route that follows the grade of the local roadways, respectively. A significant difference between the two options consists of the excavation methodologies that may be need to be utilized, with the more direct route potentially needing to involve directional drilling in

order to address potential slope stability issues between the proposed well and Meetinghouse Road, and the more conventional trench box/cut and cover use being used to route piping along Snows Field Road and Meetinghouse Road. Though the Town has indicated that the Truro Conservation Trust has agreed to allow it to route the service piping and power/control wiring beneath slope bordering Meetinghouse Road, it may find the potential for land and vegetation disruption to not be acceptable.

Costs for the route should be developed based on the above distances, and assuming:

1. Rock excavation and disposal along the entire route will not be required based on the reported geologic conditions for the site area. Assumed minimum piping installation depths of about five feet at all locations.
2. Cuttings and mud control may be necessary if directional drilling is utilized.
3. Installation of at least one 2-inch blow-off should be assumed to be installed along the piping route to allow for air release and provide an avenue for flushing.
4. An in-line gate valve will be required between the well and respective storage tank/treatment system at the proposed Complex site.
5. A booster pump may be needed as part of the downstream (from treatment) service line distribution system
6. One (1) to three (3) test pits may be required during construction to assess actual conditions for all options.
7. Assume that all soil is suitable for backfill.
8. Contingencies related to mobilization, construction, and engineering services will need to be assumed.
9. A structure to house pump controls, sampling, valving, and treatment near the existing tanks will be required.
10. The only treatment currently anticipated is chlorination for the potable well supply only (assumes well yield of 5 to 10 gpm)
11. A backup electrical supply may be required (ex. natural gas-powered generator).

The breakdown of corresponding costs to be considered for main installation, related valving, relief valves, treatment and are compared as follows:

Item No.	Description	Quantity	Units	Unit Cost	Total
1	Mobilization/Demobilization	1	LS	15,000	15,000
2	Controls (in building/structure)	1	LS	30,000	30,000
3	Mechanical Components (in building/structure)	1	LS		
4	Building/Structure (vault or shed)	1	LS		
5	Electrical	1	LS	50,000	50,000
6	Treatment – Chlorination for potable only	1	LS		
7	Backup generator – propane or natural gas	1	LS	46,000	46,000
8	3-inch HDPE pipe & fittings from the well to Complex with trenching costs (Pipe Trench Installation)	2,600	LF	205	533,000

9	3-inch HDPE pipe & fittings from the well to Complex (Horizontal Directional Drill Installation) (Does not include total costs of drilling contractor, only the installation of 3" HDPE pipe with carrier sleeve)	800	LF	350	280,000
10	Hydrant	2	EA	6,000	12,000
11	2-inch blow off	2 to 3	EA	2,500	7,500
12	3-inch gate valve	2 to 3	EA	2,250	6,750
13	Test pits	3	EA	350	1,050

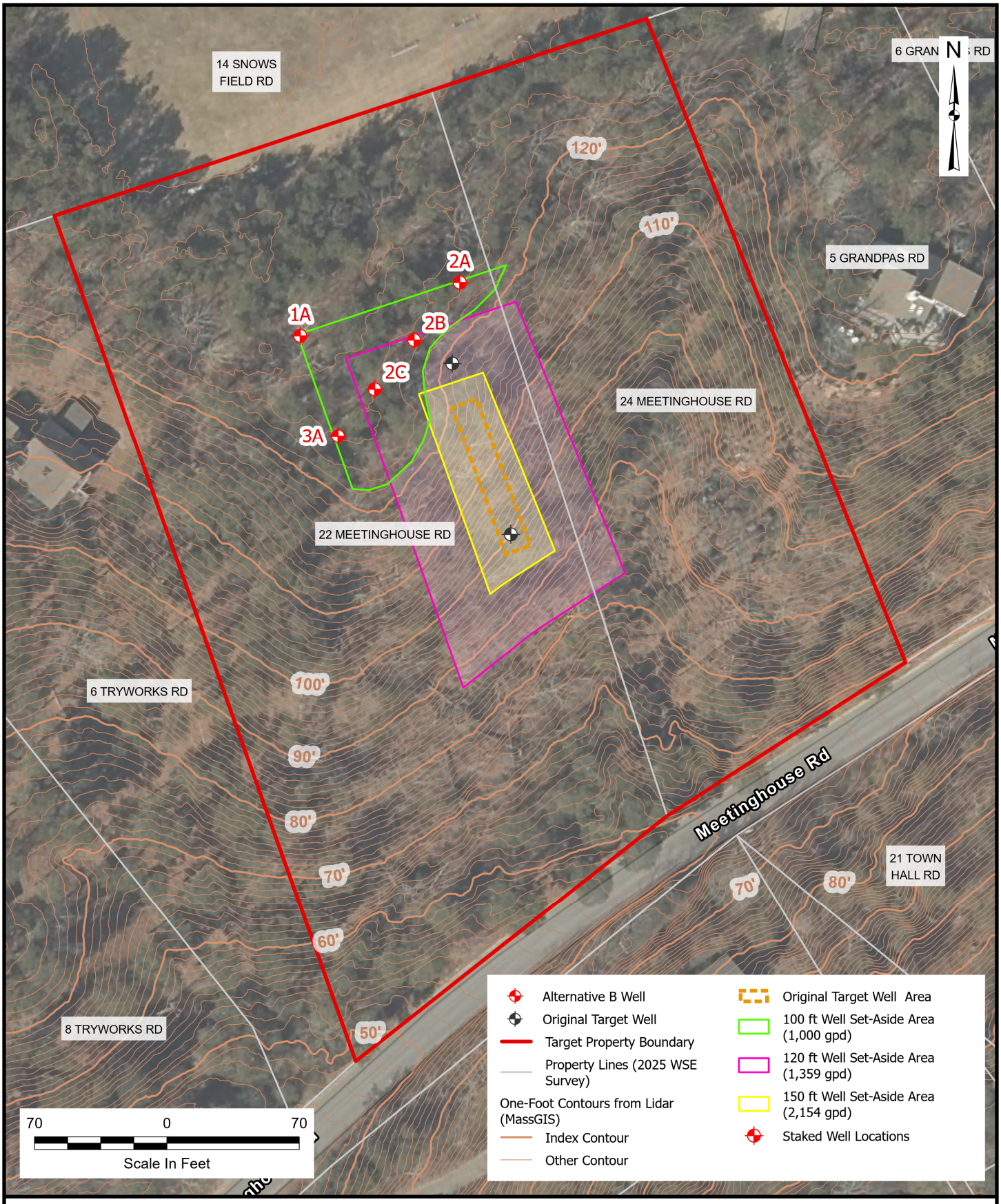

FIGURE 1
TOWN OF TRURO, MA

PROPOSED TEST WELL LOCATIONS

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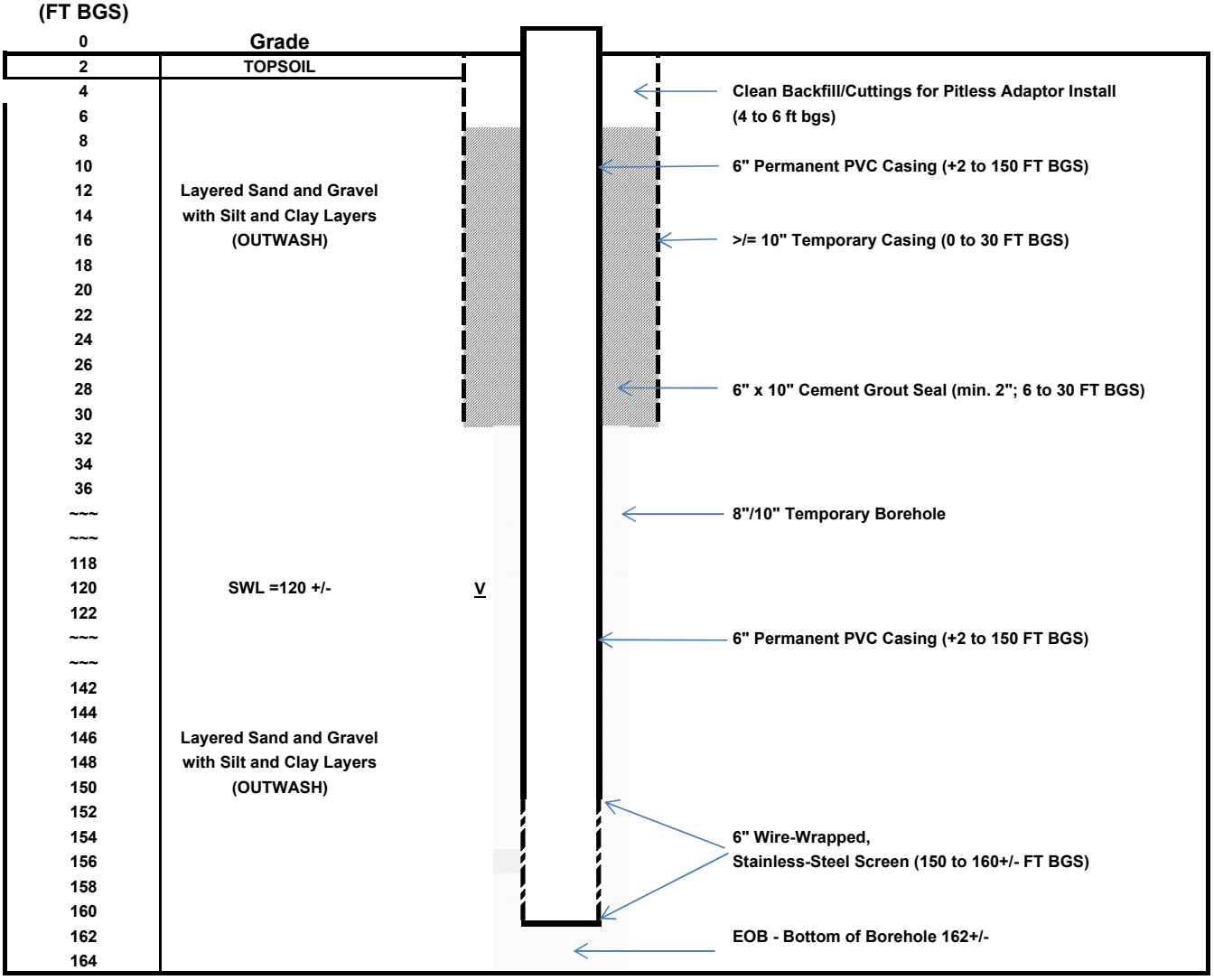
Path: \\wse03.local\WSE\Projects\MA\Truro MA\ENG24-1552_Truro Public Works Facility\08-GIS\02-MapFiles\0001_ZonelPermitting_20251003\TruroPWF_ZonelBuffer.aprx **Map:** Map **User:** Leidinger.Sarah **Saved:** 10/8/2025 4:47 PM **Opened:** 10/8/2025 4:50 PM

WATER SUPPLY WELL CONSTRUCTION DIAGRAM
FOR PROPOSED MUNICIPAL/DPW COMPLEX
TOWN OF TRURO, MASSACHUSETTS



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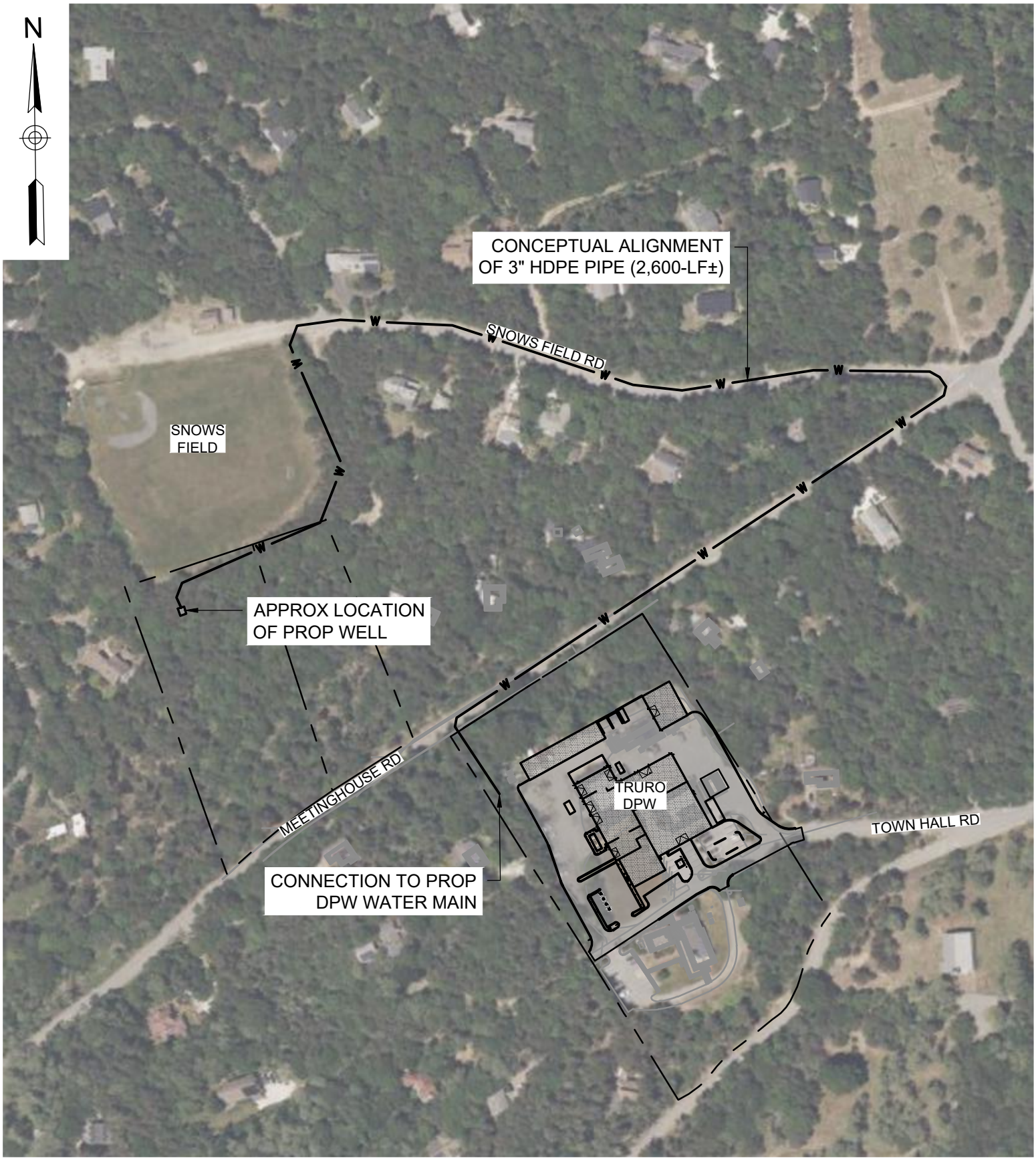

200 100 0 200

SCALE 1"= 200

FIGURE 3

UTILITY TRENCH PIPE INSTALLATION

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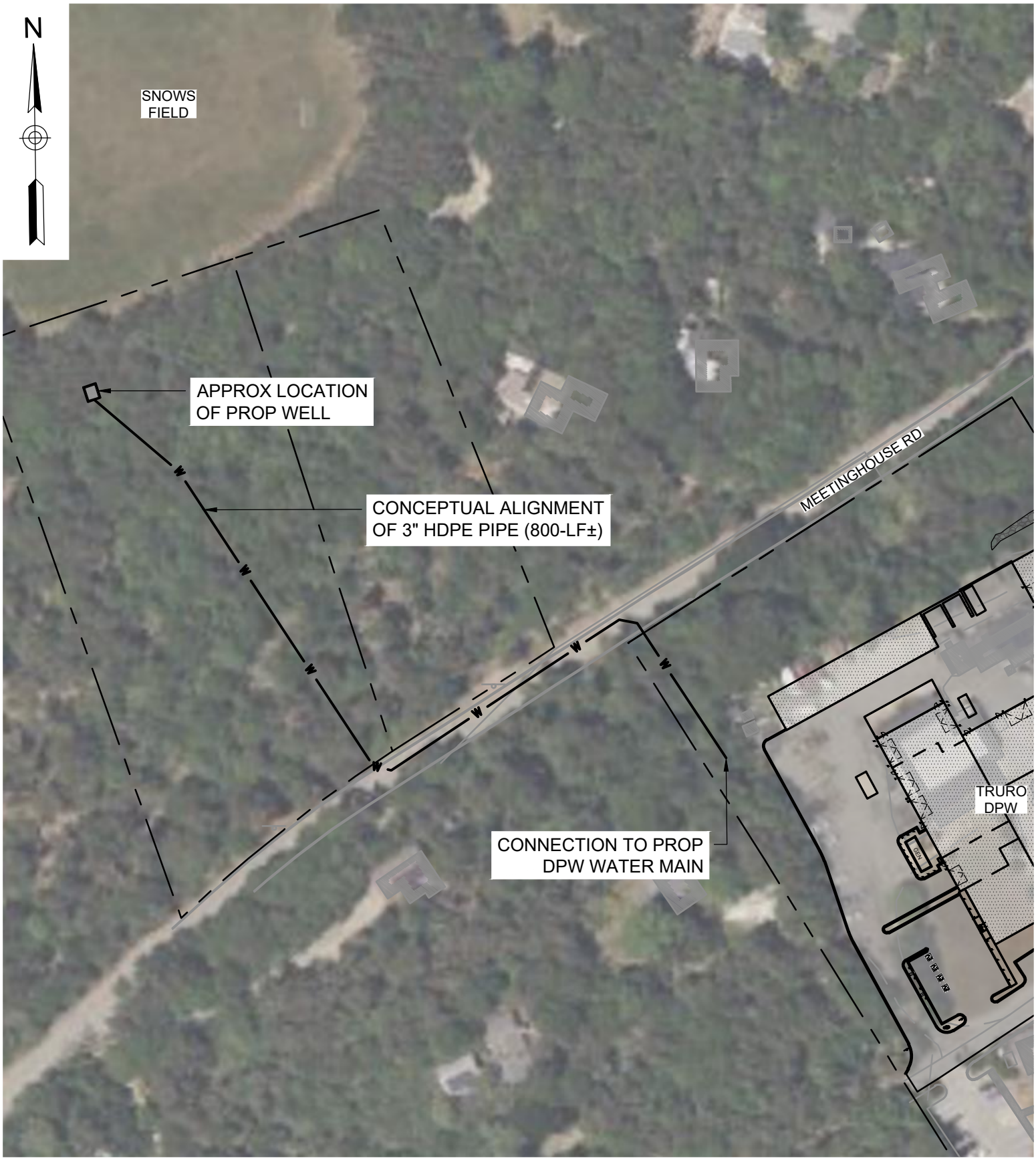

100 50 0 100

SCALE 1"= 100

FIGURE 4

HDD PIPE INSTALLATION

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