



Tyco Fire Products LP
One Stanton Street
Marinette, WI 54143

August 28, 2024

Via Email

Kleinberg.Andrew@epa.gov

Andrew Kleinberg
Project Manager – Geologist
RCRA Corrective Action Section 2
Land, Chemicals & Redevelopment Division, Region 5, EPA
77 West Jackson Blvd. (LR-16J)
Chicago, IL 60604

Re: Design for New Extraction Wells EW-15, HW-3 and HW-4
Tyco Fire Products LP, Stanton Street Property
EPA ID No. WID006125215

Dear Mr. Kleinberg:

Tyco Fire Products LP (Tyco) plans to upgrade the groundwater extraction network to enhance groundwater recovery capabilities at the property at One Stanton Street, Marinette, Wisconsin (site). We have enclosed for review by U.S. Environmental Protection Agency and Wisconsin Department of Natural Resources (WDNR), design drawings and specifications for the project, that have been prepared by Endpoint Solutions Corporation (Design Documents).

A. Overall Project

The project involves the following work:

1. Install an additional vertical extraction well immediately beyond the vertical barrier wall in the northwestern corner of the site (EW-15).
2. Install two new horizontal extraction wells within the Main Plant Area (HW-3 and HW-4) to replace existing EW-4.
3. Install new monitoring well nest MW132S and MW132M near EW-15.

Groundwater extracted from the proposed extraction wells (HW-3, HW-4 and EW-15) will be conveyed to the existing groundwater collection and treatment system (GWCTS) for treatment and discharge to the Menominee River.

1. New Vertical Extraction Well EW-15

A new vertical extraction well (EW-15) in the northwestern corner of the site will extract groundwater outside the vertical barrier wall to limit the discharge of groundwater to the river. This well will be located near the existing monitoring well nest MW003. EW-15 has been designed to capture overburden groundwater (shallow- and medium-depth groundwater, above the glacial till) that contains site-related constituents, including arsenic and PFAS, potentially migrating toward the Menominee River immediately outside the barrier wall.

The Design Documents detail that the EW-15 well design will be similar to the existing vertical extraction wells (typically 10 to 15-foot-long by 6-inch-diameter stainless-steel 0.010-inch slot wire-wrapped screen) with an estimated bottom of screen depth of 21 feet below ground surface (bgs) and the final construction to be determined during installation.

After installation, the extraction well will be developed by the driller using standard development techniques (such as double surge block with air lift pumping). Well development will include periodic specific capacity testing to assess well performance and development effectiveness. Development will continue until testing shows that further development will not improve well yield. A permanent pump and connections to the existing treatment system will then be made once it is confirmed that the extraction will achieve extraction rates that are effective at limiting discharge of groundwater to the river in this area. Details related to hydraulic testing and integration of the extraction well into the GWCTS will be then provided as part of ongoing Resource Conservation and Recovery Act activities.

2. New Horizontal Extraction Wells HW-3 and HW-4

Additional extraction capacity in the northeastern corner of the Main Plant will support more efficient management of groundwater in this portion of the contained area. Existing extraction well EW-4, in the northeastern corner of the Main Plant containment area, has a limited capacity, typically 0.5 gallon per minute (gpm) or less, and frequently runs dry. As such, EW-4 is not typically operated, and the focus of operations in the Main Plant is at extraction wells EW-5, EW-6, and EW-7. Presently, water levels in this area can be managed only by the extraction wells that are a significant distance away in the northwestern (EW-7) and south central (EW-5 and EW-6) portions of the Main Plant. The limited capacity at EW-4 is due to the limited thicknesses of water-bearing soils in this area. Replacement or addition of another vertical extraction well is unlikely to provide the additional extraction capacity needed. Targeting the key water-bearing zone in this area with a directionally drilled well screen will significantly improve the chances of achieving a higher capacity installation. This approach was successful in the former Salt Vault where the former vertical extraction well network capacity was limited. The two horizontal wells (HW-1 and HW-2) installed in this area have significantly improved the pumping capacity and in turn the overall performance of the Pump Down Program.

The Design Documents detail the new horizontal extraction wells (HW-3 and HW-4) that will replace the existing vertical extraction well EW-4. HW-3 would be installed in the area between EW-4 and Building 40, and HW-4 would be installed between EW-4 and Building 18. This alignment would also allow for reusing the existing electrical and conveyance line to the GWCTS associated with EW-4. On May 28, 2024, Endpoint oversaw the advancement of Geoprobe soil borings in the anticipated alignment of the new horizontal extraction wells (HW-3 and HW-4). Four borings were advanced along the proposed alignment from EW-4 toward Building 40 to collect lithology and waste characterization data.

Based on the data collected, and to maximize yield, the horizontal extraction wells will be installed to approximately 6 feet bgs to intersect the relatively more permeable zone that is found in this area of the site as noted in the Design Documents. It is anticipated that groundwater would be extracted at a combined rate between 2 and 12 gpm from the new installations, similar to the other Main Plant wells. With the ability to extract groundwater at higher rates within this area, the system will be able to more efficiently react to increased water levels in this portion of the Main Plant.

3. New Monitoring Wells MW132S and MW132M

Two additional monitoring wells (MW132S and MW132M noted in the Design Documents) to the north of EW-15 and just south of Building 86 will also be installed and, along with monitoring well nest MW003, will be used to monitor water levels and track the effects of pumping at EW-15.

The existing monitoring well network within the Main Plant will be used to monitor water levels and track the effects of pumping at HW-3 and HW-4.

B. Future Submissions

Tyco will submit an application to add HW-3, HW-4 and EW-15 to the site extraction well system high capacity well permit.

There are two existing high capacity well numbers approved by WDNR on June 10, 2016. The existing high capacity well numbers are 91784 and 91791 and include extraction wells EW-1 through EW7 and EW-8 through EW-14, respectively.

Tyco is preparing high capacity well application documents that will be submitted separately to WDNR, to add HW-3, HW-4 and EW-15 to the extraction well system.

In addition, the high capacity well application documents will update the extraction well system as follows:

1. Remove EW-2. Existing extraction well EW-2 in the former 8th Street Slip has a limited capacity and is no longer operational; therefore, EW-2 is no longer being used and has been replaced with EW-8 and EW-9. EW-2 will be removed from the high capacity well permit (EW-8 and EW-9 are already included as part of the permit).
2. Remove EW-3 and replace it with HW-1 and HW-2. Extraction well EW-3 in the former Salt Vault has a limited capacity and is no longer operational; therefore, EW-3 is no longer being used and has been replaced with HW-1 and HW-2 in the former Salt Vault. These two horizontal extraction wells were installed in December 2020 and put into operation in spring/summer 2021 with the pump down program system and ultimately connected to the modified GWCTS in spring 2023. EW-3 will be removed and HW-1 and HW-2 be added to the high capacity well permit.

Mr. Andrew Kleinberg
August 28, 2024

C. Schedule

The estimated schedule for the above activities is as follows:

- August 28, 2024 – Submit the extraction well design for EW-15, HW-3 and HW-4
- By August 30, 2024 – Submit the high capacity well permit documents
- Week of September 9, 2024 – Install vertical extraction well EW-15 and two monitoring wells (MW132S and MW132M)
- September 2024 – After installation and development, conduct hydraulic/specific capacity testing at EW-15
- October 2024 – Install horizontal wells HW-3 and HW-4
- October and November 2024 – Install permanent pumps and make connections to the existing GWCTS and integration of the extraction wells into the GWCTS

The information presented within should provide the information required for reviewing the proposed extraction well design and installation activities detailed in the Design Documents. Please contact me at 651-280-7259 if you have any questions.

Sincerely,



Denice K. Nelson
Senior Director – Remediation & Strategy

Enclosures

Copies to: Ryan Suennen/Johnson Controls Inc.
Kirk Kapfhammer/Endpoint
Heather Ziegelbauer/Jacobs
Angela Carey/WDNR
Sarah Krueger/WDNR

MEMORANDUM

Date:	August 28, 2024	From:	Mr. Kirk Kapfhammer / Mr. Wade Wollermann
RE:	New Extraction Wells – EW-15 & Horizontal Wells HW-3 and HW-4 Installation		
To:	Ms. Denice Nelson		
Company:	Tyco Fire Products LP		
Address:	One Stanton Street Marinette, WI 54143		

We are providing this information along with the associated design drawings about the proposed installation of additional groundwater extraction wells at the Tyco Fire Products LP (Tyco) property located at One Stanton Street, Marinette, Wisconsin (the “Property”).

EW-15

The proposed scope of work includes the installation of an additional extraction well (EW-15) in the northwest portion of the Property. The well will be located outside of the vertical barrier wall in close proximity to the boundaries of the Property. **See Sheet 1.** EW-15 will be completed as a six-inch vertically drilled well advanced to a depth of approximately 24 feet below ground surface (bgs) with a screened interval of approximately six (6) to twenty-one (21) feet bgs using a 0.010 stainless steel well screen. Above the well screen, the well casing will be completed with a pitless adapter to allow for the subsequent installation of a pump discharge line which will be used for conveyance of extracted waters to the groundwater treatment plant at the Property. Well construction details are presented on **Sheet 2** and are consistent with previously installed extraction wells at the Property. Following installation, the well will be properly developed with all resulting waters containerized for either onsite treatment or offsite disposition.

To facilitate the completion of the extraction portion of the system, the well head will be completed with a 2’x2’ traffic rated well vault and a new electric submersible pump, which will match the existing pumps in the Property groundwater extraction system, will be installed. This newly installed pump and associated discharge line will be connected via a pitless adapter to a 1.5-inch HDPE underground conveyance line that will be extended to an existing pipe bridge at which point the line will be extended aboveground along the pipe bridge and into Building B14 and the existing Property groundwater treatment operations. The piping will surface to the existing pipe bridge prior to the barrier wall (**Sheet 1**); therefore no barrier wall perforations will occur as part of these activities. All outdoor aboveground piping will be double walled and will be insulated and heat traced to prevent freezing during cold winter months. The operational characteristics of the pump will match up with the existing installation and will include associated controls, flow meter/totalizer, isolation valve, etc. and will be connected to the existing groundwater extraction network header located in building B14. The header feeds the existing influent tank in the treatment building which is used to store groundwater until it can be treated. It is anticipated that pumping rates will vary depending on subsurface conditions and the goals of the groundwater extraction system with the pump capable of pumping at a rate of up to 20 gallons per minute.

All drilling and excavated spoils/soils generated during the installation of the well and associated conveyance line and vault will be immediately containerized for off-site disposition in accordance with the Property Soil Management Plan (SMP). Any disturbed surface areas will be restored to match current existing conditions.

HW-3 & HW-4

Additionally, it is the intention to install (2) shallow (approximately four (4) to six (6) feet bgs) horizontally drilled wells in the north central portion of the Property. **See Sheet 3.** The purpose of these wells will be to enhance groundwater collection in this area of the Property and supplement the existing extraction well network to provide a more sustainable path forward for the Property.

Horizontal well (HW-3) will originate from the approximate location of existing vertical extraction EW-4 (which will also be abandoned as part of these installation activities due to low productivity) and extend approximately 250 feet to the northwest toward building B40. Horizontal well (HW-4) will also originate from the approximate location of existing vertical extraction EW-4 and extend approximately 150 feet to the south toward building B18. In each case, the wells will be located at a depth of approximately six (6) feet bgs. The horizontal well alignment within these depth intervals was selected based on the more permeable geology in this area of the Property (**Sheets 4 and 5**). The wells will allow for gravity drainage over the surrounding area back to the co-located well heads that will be terminated within a single concrete access vault. Borings will be installed via directional boring to minimize surface disturbance, waste soil handling and disposal. All drilling spoils generated during the installation of the wells will be immediately containerized for off-site disposition in accordance with the Property SMP. Any disturbed surface areas will be restored to match current existing conditions.

The wells will be constructed using four (4) inch diameter HDPE pipe. The screen portions of the wells will consist of slotted HDPE drain piping. To facilitate the completion of the extraction portion of the system, a new electric submersible pump, which will match the existing pumps in the Property groundwater extraction system, will be installed within the concrete vault. This newly installed pump will be connected to the existing conveyance line associated with extraction well EW-4 to facilitate the transfer of water to the Property groundwater treatment operations. The operational characteristics of the pump will match up with the existing installation and will include associated controls, flow meter/totalizer, isolation valve, etc. and will be connected to the existing groundwater extraction network header located in building B14. The header feeds the existing influent tank in the treatment building which is used to store groundwater until it can be treated. It is anticipated that pumping rates will vary depending on subsurface conditions and the goals of the groundwater extraction system with the pump capable of pumping at a rate of up to 20 gallons per minute.

P:\Tyco - 415\CAD\EW-15 Figures\005-018\FIG 01_415-005_Proposed Piping Layout.dwg



APPROXIMATE LOCATION OF PROPOSED MW132S/M WELL NEST

UNDERGROUND INSULATED SINGLE WALL PIPING

APPROXIMATE LOCATION OF EW-15

APPROXIMATE LOCATION OF EXISTING MW003 WELL NEST

EXISTING VERTICAL BARRIER CONTAINMENT WALL

OUTDOOR INSULATED DOUBLE WALL PIPING WITH HEAT TRACE
EXISTING PIPE BRIDGE

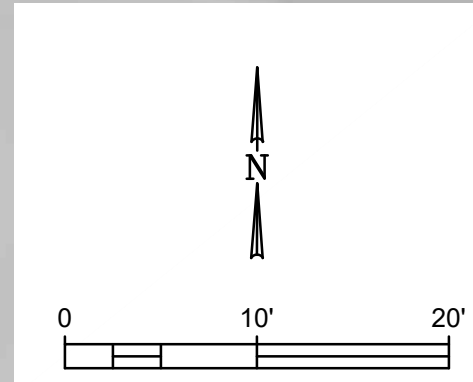
5

APPROXIMATE INDOOR SINGLE WALL PIPING

TEE INTO EXISTING CONVEYANCE LINE FROM PDP

APPROXIMATE LOCATION OF EXISTING MW106 WELL NEST

— OUTDOOR DOUBLE WALL INSULATED PIPE
 — INDOOR SINGLE WALL PIPE



REV	DATE
0	
1	
2	
3	
4	
5	
6	

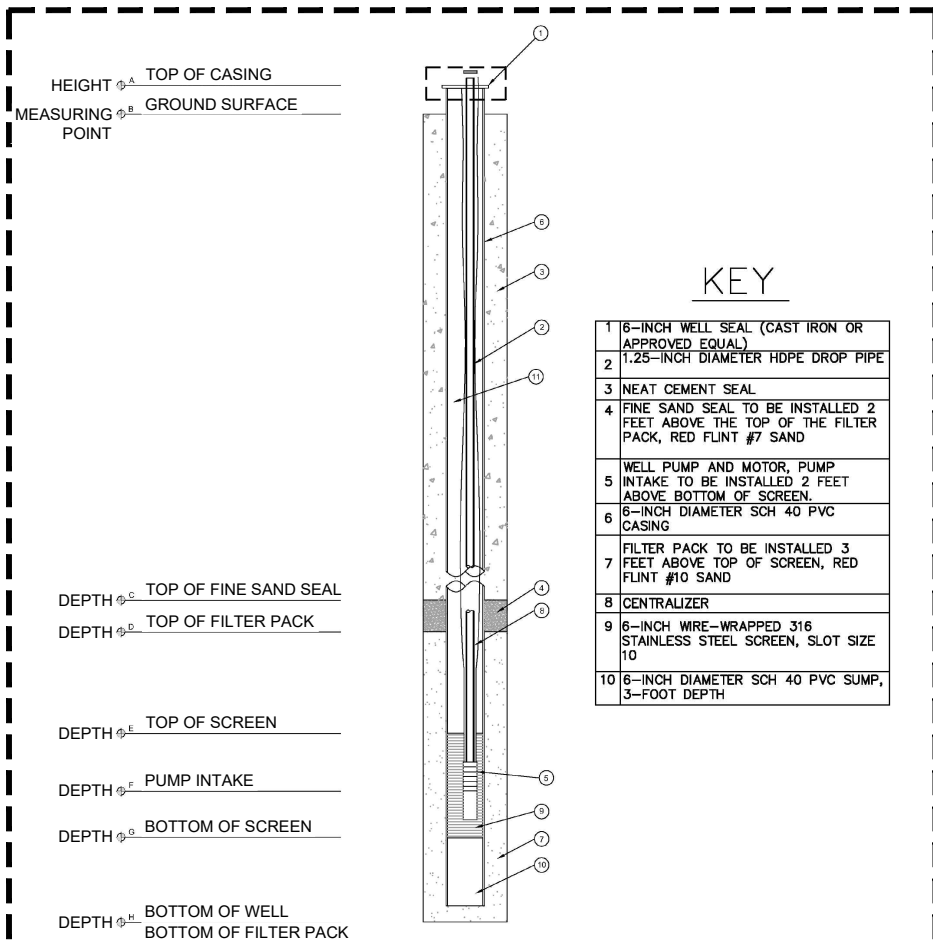
Endpoint Solutions
 6871 S. LOVERS LANE
 FRANKLIN, WI 53132
 PHONE: (414) 427-1200

TYCO EW-15 PIPING INSTALL
PROPOSED PIPING LAYOUT
 ONE STANTON STREET
 MARINETTE, WISCONSIN 54143

DRAWN BY: MLP DATE:
 CHECKED BY: WCW 07/24/2024
 APPROVED BY: WCW

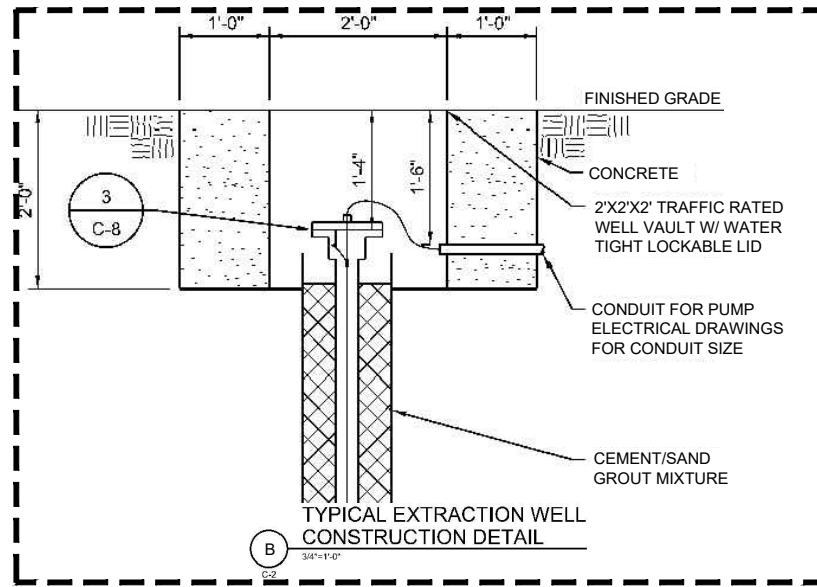
PROJECT NO. 415-005

THIS BAR REPRESENTS 1/2 INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE.
 SHEET NO. **1**



KEY

- 1 6-INCH WELL SEAL (CAST IRON OR APPROVED EQUAL)
- 2 1.25-INCH DIAMETER HDPE DROP PIPE
- 3 NEAT CEMENT SEAL
- 4 FINE SAND SEAL TO BE INSTALLED 2 FEET ABOVE THE TOP OF THE FILTER PACK, RED FLINT #7 SAND
- 5 WELL PUMP AND MOTOR, PUMP INTAKE TO BE INSTALLED 2 FEET ABOVE BOTTOM OF SCREEN.
- 6 6-INCH DIAMETER SCH 40 PVC CASING
- 7 FILTER PACK TO BE INSTALLED 3 FEET ABOVE TOP OF SCREEN, RED FLINT #10 SAND
- 8 CENTRALIZER
- 9 6-INCH WIRE-WRAPPED 316 STAINLESS STEEL SCREEN, SLOT SIZE 10
- 10 6-INCH DIAMETER SCH 40 PVC SUMP, 3-FOOT DEPTH



EXTRACTION WELL CONSTRUCTION SCHEDULE

WELL ID	A*	B	C	D	E	F	G	H	
EW-15	3'	AGS	0	2	4	6	19	21	24

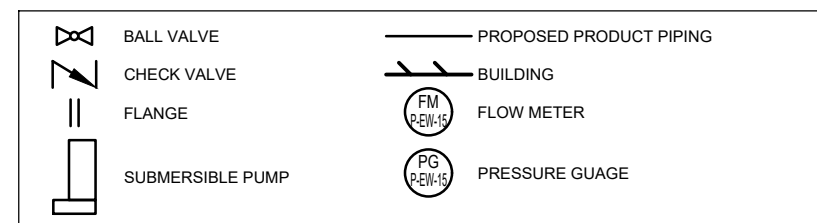
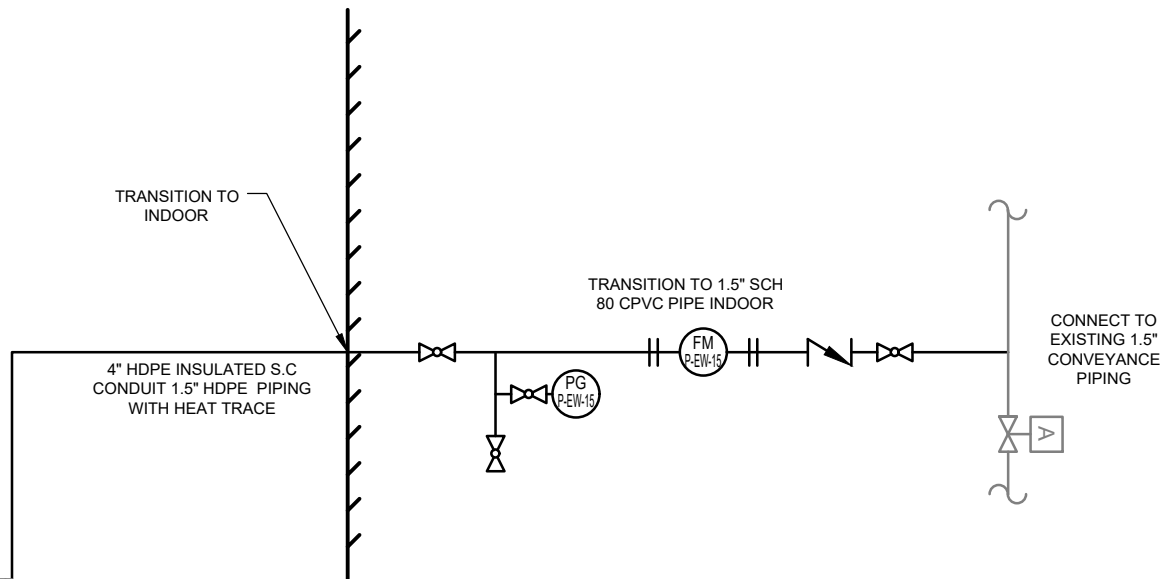
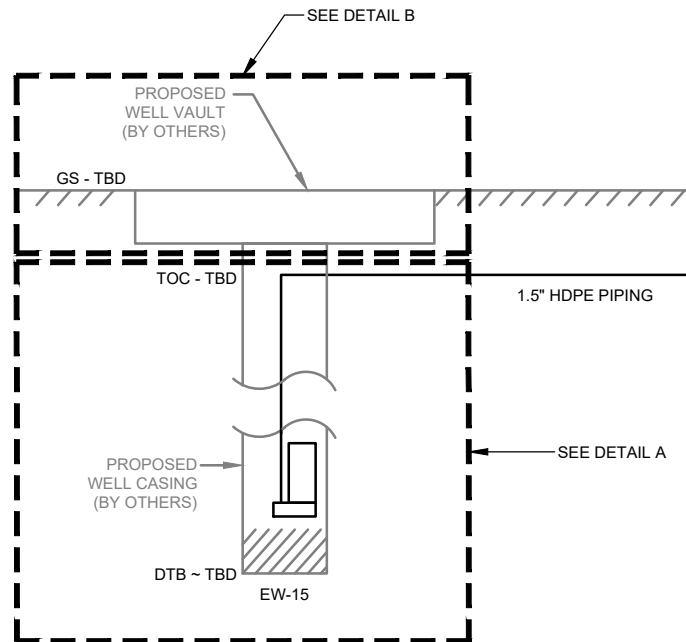
* "A" MEASUREMENTS ARE APPROXIMATE

NOTES

- GENERIC DESIGN SPECIFIC FOR EW-15 SUPPLEMENTAL WELL INSTALL. ALL MEASUREMENTS REFERENCE APPROXIMATE DEPTH BELOW GROUND SURFACE UNLESS OTHERWISE NOTED. FINAL CONSTRUCTION OF EW-15 IS TO BE DETERMINED WITH AN ESTIMATED DEPTH OF 21 FEET BGS.
- EXTRACTION WELLS SHALL BE TEMPORARILY COMPLETED AS EITHER STICK-UPS (APPROX. 2 TO 3 FEET ABOVE GRADE) WITH LOCKING COVERS, OR WITH A TRAFFIC-RATED FLUSH MOUNTED LOCKING COVER WITH A CONCRETE PAD AS DIRECTED BY THE ENGINEER.
- PLACEMENT OF PUMP INTAKE TO BE 2 FEET ABOVE BOTTOM OF SCREEN.
- 15-FOOT LONG JOHNSON STAINLESS STEEL WIRE-WRAP 0.010-SLOT SCREENS TO BE USED IN EXTRACTION WELLS.
- NEAT CEMENT SEAL TO BE COMPLETED WITH WDNR APPROVED SITE SPECIFIC GROUT AS FOLLOWS - 1 BAG (94 LBS) PLC TYPE II, 4.5 GAL WATER AND 2 CUBIC FEET OF FINE GRAINED SAND. UP TO 1 PINT OF SUPER PLASTICIZER MAY BE USED PER BAG OF CEMENT TO AID IN INSTALLATION (BY INCREASING THE FLUIDITY OF THE GROUT FOR PUMPING INTO THE BOREHOLE).

EXTRACTION WELL EW-15 CONSTRUCTION

(PRIOR TO CUTTING CASING FOR VAULT CONSTRUCTION)
NOT TO SCALE



REV	DATE
6	
5	
4	
3	
2	
1	
0	

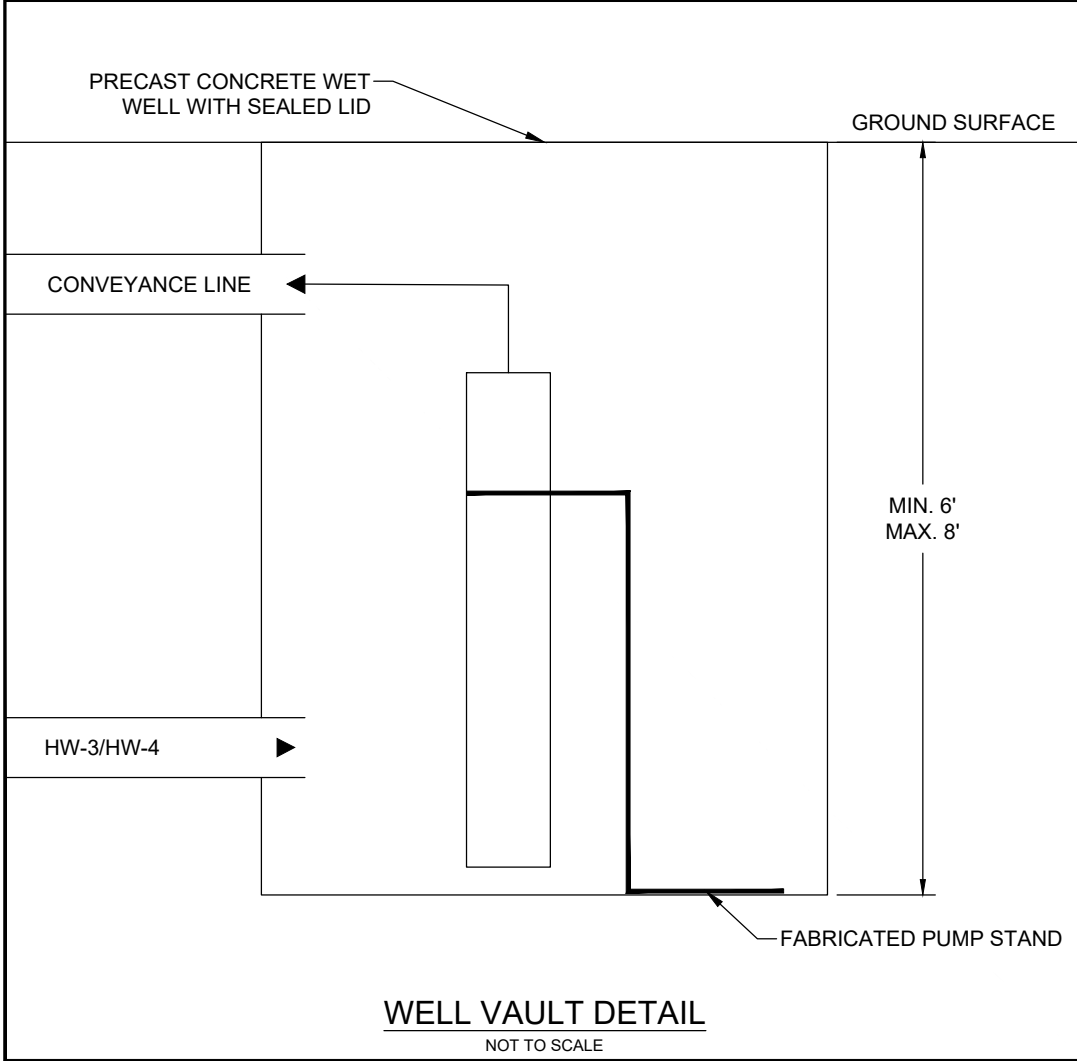
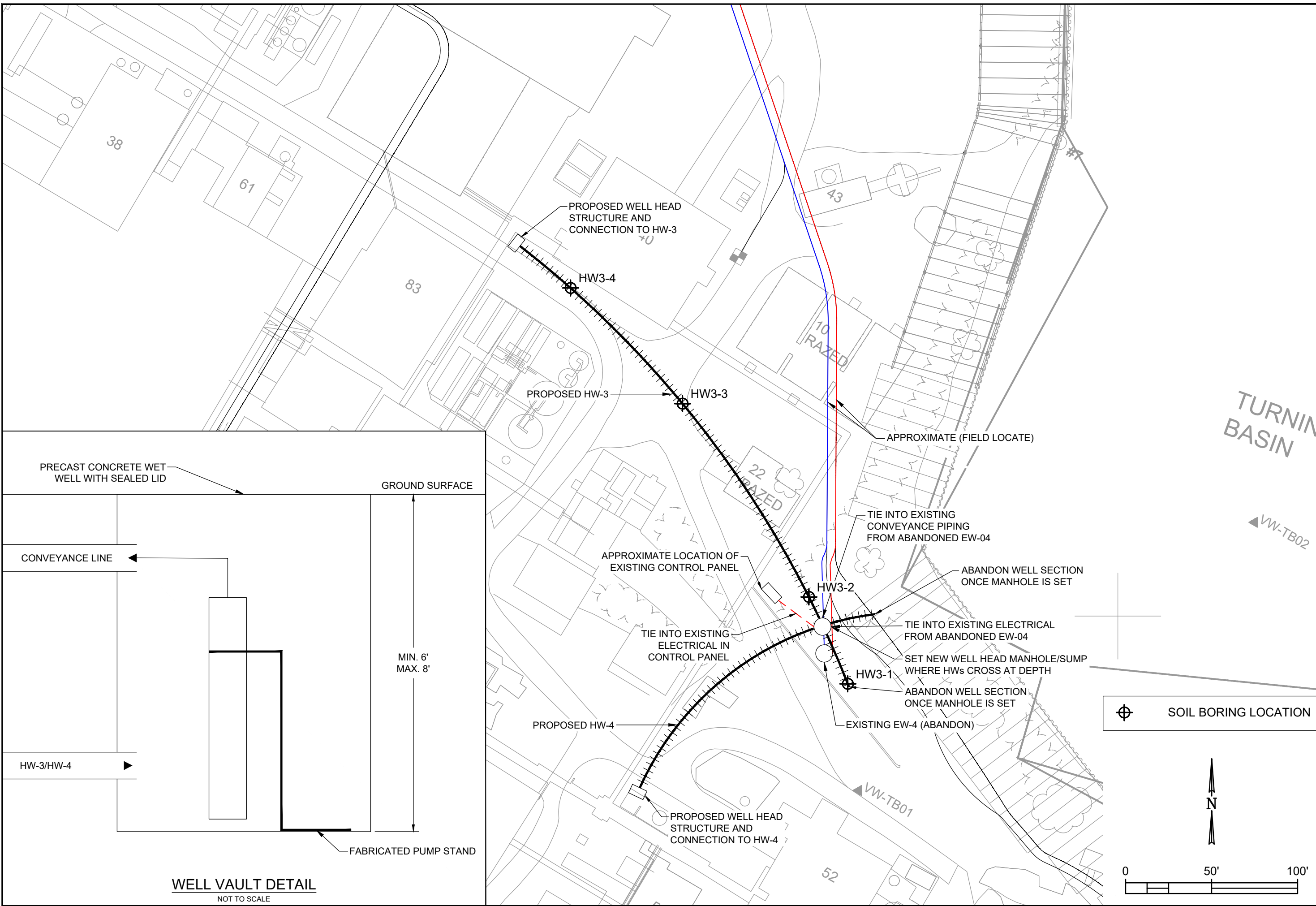
Endpoint Solutions
6871 S. LOVERS LANE
FRANKLIN, WI 53132
PHONE: (414) 427-1200

**TYCO EW-15 PIPING INSTALL
PROPOSED PROCESS &
INSTRUMENTATION DIAGRAM (P&ID)**
ONE STANTON STREET
MARINETTE, WISCONSIN 54143

DRAWN BY: MLP DATE:
CHECKED BY: WCW 07/24/2024
APPROVED BY: WCW
PROJECT NO. 415-005

THIS BAR REPRESENTS 1/2 INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE.
SHEET NO.
2

P:\tyco - 415\CAD\HW-3 Figure\FIG 02_415-005_Proposed Site Layout.dwg



REV	DATE								
0									
1									
2									
3									
4									
5									
6									

Endpoint Solutions
6871 S. LOVERS LANE
FRANKLIN, WI 53132
PHONE: (414) 427-1200

PROPOSED SITE LAYOUT
TYCO HW-3 & HW-4 INSTALL
ONE STANTON STREET
MARINETTE, WISCONSIN 54143

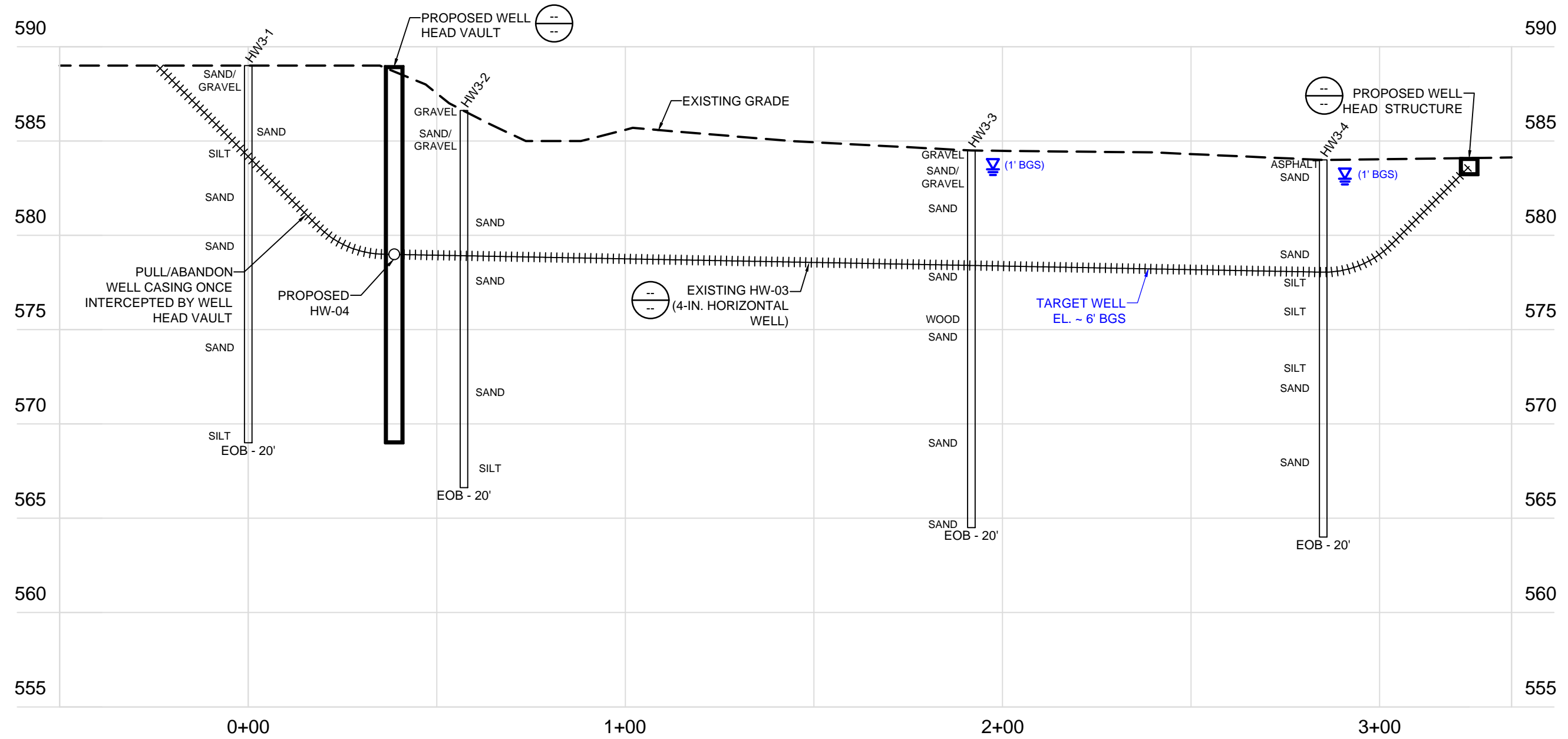
DRAWN BY: MLP DATE:
CHECKED BY: WCW 08/14/2024
APPROVED BY: WCW

PROJECT NO. 415-005

THIS BAR REPRESENTS 1/2 INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE.

SHEET NO. **3**

P:\Tyco - 415\CAD\HW-3 Figure\FIG 00_415-005 HW-03 Cross Section.dwg



REV	DATE
6	
5	
4	
3	
2	
1	
0	

Endpoint Solutions
 6871 S. LOVERS LANE
 FRANKLIN, WI 53132
 PHONE: (414) 427-1200

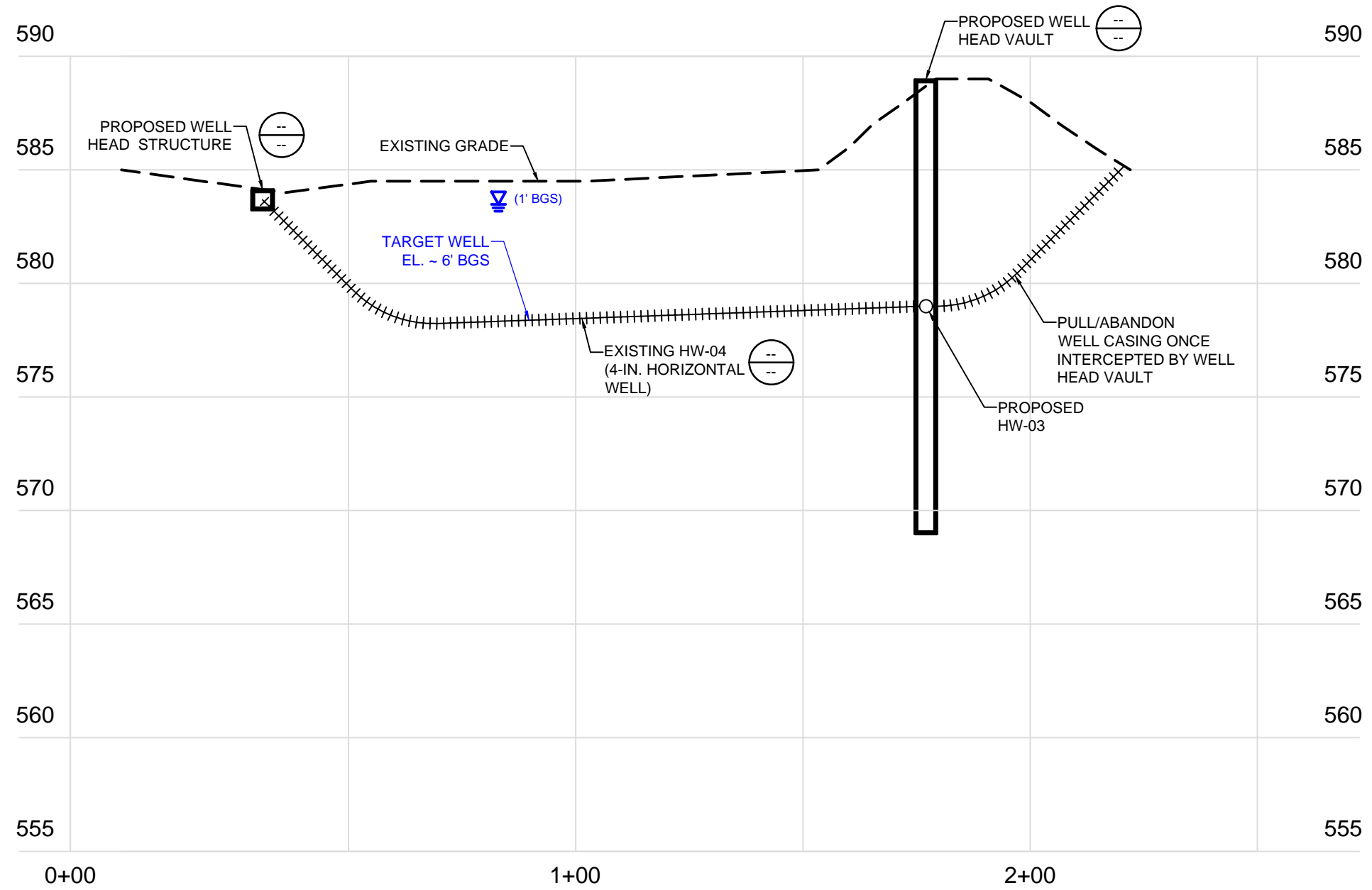
TYCO HW-3 & HW-4 INSTALL
HORIZONTAL WELL
HW-03 CROSS SECTION
 ONE STANTON STREET
 MARINETTE, WISCONSIN 54143

DRAWN BY: MLP DATE:
 CHECKED BY: WCW 08/28/2024
 APPROVED BY: WCW

PROJECT NO. 415-005

THIS BAR REPRESENTS 1/2 INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE.
 SHEET NO.
4

P:\Tyco - 415\CAD\HW-3 Figure\FIG 00_415-005 HW-04 Cross Section.dwg



REV	DATE
6	
5	
4	
3	
2	
1	
0	

Endpoint Solutions
 6871 S. LOVERS LANE
 FRANKLIN, WI 53132
 PHONE: (414) 427-1200

TYCO HW-3 & HW-4 INSTALL
HORIZONTAL WELL
HW-04 CROSS SECTION
 ONE STANTON STREET
 MARINETTE, WISCONSIN 54143

DRAWN BY: MLP DATE:
 CHECKED BY: WCW 08/28/2024
 APPROVED BY: WCW

PROJECT NO. 415-005

THIS BAR REPRESENTS 1/2 INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE.

SHEET NO.
5