ADDENDUM NO. 2
TO THE
BIDDING REQUIREMENTS AND CONTRACT DOCUMENTS
FOR THE
DIV IV DRY WEATHER PUMP STATION AND FORCE MAIN REHABILITAITON

OWNER: **City of Anderson**

ISSUED BY/ENGINEER: Egis Group
8320 Craig Street
Indianapolis, Indiana 46250

ISSUED TO: All Plan and Specifications Holders of Record

ISSUE DATE: December 24, 2025

BID DATE: January 13, 2026

This Addendum No. 2 shall clarify, correct, or change the Bidding Requirements or the proposed Contract Documents. This Addendum is a part of the Bidding Requirements and the proposed Contract Documents and shall govern in the performance of the Work.

PART 1 - PROJECT MANUAL

1.1 ADDED SPECIFICATION SECTIONS

A. 01210 – ALLOWANCES has been added to the Technical Manual. This specification will only be utilized if Mandatory Alternate Number 5 is selected by Anderson.

1.2 REVISED SPECIFICATION SECTIONS

A. 01220 – MEASUREMENT AND PAYMENT has been updated to remove the individual payment items of Structural Fill, Flowable Fill, Lift Station Instrumentation and Controls, Asphalt Pavement Repairs, and Concrete Sidewalk and Ramp Repairs.

B. 00410 Bid Form Attachment A has been updated to remove Structural Fill, Flowable Fill, Lift Station Instrumentation and Controls, Asphalt Pavement Repairs, and Concrete Sidewalk and Ramp Repairs and add Mandatory Alternate Number 5 Allowance in the amount of $25,000.

PART 2 – DRAWINGS

2.1 ITEM NO. 1 – REISSUED SHEETS

A. Sheet C107 – Additional details have been added to Sheet C107.

B. Sheet I106 – Additional information has been added to Sheet I106.

2.2 ITEM NO. 2 – ADDED SHEETS

A. Sheet C108 – Bypass Pumping Plan – This sheet is added to include additional information in support of the Mandatory Alternates 3, 4, and 5.

B. Sheet E104A – Dry Weather Pump Station Electrical One-Line Diagram – New – This sheet has been added to the plan set.

2.3 ITEM NO. 3 – CLARIFICATIONS

A. Sheet E102 – Dry Weather Pump Station - New Work – Note 35 should read:

Install removed, protected submersible level sensor in existing, relocated stilling tube.

B. Sheet E103 – Dry Weather Pump Station Electrical One-Line Diagram – Demo Work – Clarification to the Existing 480V Switch Gear SWGR-1 Front Elevation. Area 6D should have been marked with keynote 9.

C. Sheet E104 – Dry Weather Pump Station Electrical One-Line Diagram – New – Clarification to the Existing 480V Switch Gear SWGR-1 Front Elevation. Area 6D should have been marked with keynote 1 and area 7C should have been labeled “Spare”.

D. Sheet E104A – Dry Weather Pump Station Electrical One-Line Diagram – New – Clarification to the Existing 480V Switch Gear SWGR-1 Front Elevation. Area 6D should have been marked with keynote 1 and area 7C should have been labeled “Spare”.

E. The unbordered sheet between sheets E108 and E109 provides no additional information to this sheet set and will be removed as part of the future conformed sheet set post bid.

PART 3 – ADDITIONAL TECHNICAL INFORMATION

The following technical information is not part of the Contract Documents, but Bidder is entitled to rely upon this “technical data” as provided in Paragraph 5.02 of the General Conditions. Bid-

der is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions or information contained in such information.

3.1 ITEM NO. 3 – QUESTIONS

A. What type of repair sleeves are expected for pit locations?

Response: Most access points will be made where bends and other fittings are located on the existing 36-inch ductile iron force main. There are a few straight-line locations that will require access. In those locations if cuts are required to the force main, repairs should be made with repair sleeves such as the Meuller HyMax Lug Clamp 510 Series, JCM Model 132 or 169, or equal. Contractor must submit a show drawing for repair sleeves to be utilized for review and approval.

B. The specifications indicate that the owner is supplying the pumps, VFDs, and instrumentation/programming. The electrical drawings indicate that the VFDs are furnished by the contractors. Please confirm that the specifications are correct.

Response: The specification is correct. Anderson will be providing the VFDs and panels. Information on sheet E108 is shown for information only at this time.

C. The specifications indicate to utilize HDPE fittings with the same pressure class as the pipe. For fittings of this size HDPE fittings will be mitered and are typically derated by one pressure class, so for DR11 pipe the mitered fittings would be made from DR9 pipe. Which pressure rating of fittings are to be used?

Response: Fittings should have an equivalent dimension ratio (EDR) to the pipe they will be used on, in the case an EDR of 11 which equates to 200 psi.

D. When transitioning over the wall on C100 it 30" DI fittings are shown. Could HDPE fittings be utilized to reduce cost?

Response: HDPE pipe and fittings could be utilized for the section of temporary piping into the nose of the PTF.

E. Can you identify where Bid item 3 (Structure Backfill over Sewer Forcemain and Laterals) and Item 4 Flowable Backfill) are intended to be utilized? We could not identify where these items may be required on the plans. Can the locations be identified for more accurate pricing?

Response: Reference the Trench Detail on sheet C300. Item 3 is utilized for all pits and pipe related excavations under pavement and within 5 feet of the edge of pavement, paved paths and sidewalks. This bid item however has been eliminated from the bid tab as it should be included in the line item CIPP Lining. As noted in the Specification 01220 – Measurement and Payment Section 3.1 CIPP Pipeline Rehabilitation is to include all work related to access and retrieval pits including restoration, which would

include any fill. The referenced trench detail should be followed for fill material requirements for closing pits.

F. The bid form contains items with quantities for Asphalt Pavement Repair (Item 9) and Sidewalk and Ramps Repairs (Item 10). We did not see on the drawings specific repairs identified. Where are these repairs anticipated?

Response: There is a minimum of 5 lining pits that will impact asphalt as well as relocating the light pole at the Dewey Street campus. The base bid quantity has been adjusted. Please see the reissued Bid Form Attachment A. As noted above, asphalt repair associated with the access and retrieval pits should be included with the CIPP Pipe Rehabilitation line item. Asphalt repair associated with the Light Pole Relocation, including stone fill and asphalt to restore previous pole location, should be included in that line item. Therefore, that item has been removed.

Sidewalk repair was anticipated between the electrical building and the pump station wet well. This item has been removed and any damaged concrete will be at the Contractor's expense.

G. Mandatory Alternate #5 requires the contractor to provide Wet Weather bypassing during the work. Is there a specific location where the owner wants the wet weather pumps to be located? The bypass pump specification does not provide anticipated flow rates for wet weather flow rates the system would need to handle? In this alternate where will the wet weather system discharge to?

Response: See sheet C108. All questions should be answered with information provided on that sheet.

H. It appears the seal water piping (2") will run across the surface of the pump station. Are any walk over ramps required or other mitigation measures for potential trip hazards?

Response: The Owner will provide any walkover ramps if needed at a future date.

I. What size is the seal water line?

Response: The seal water line is shown as a 2" line. It will split to each pump 1" to go to each pump and transition to a ½" existing flow meter. See the provided seal water system documentation for the Wet Weather Pumps.

J. Are there any submittals available for the Owner provided pumps or other items?

Response: No submittals are available at the time of Addendum #2 for any of the Owner provided items. The specifications have been left in the technical specifications and drawings for informational purposes for the Contractor's benefit to see what the Owner is securing.

K. When will pumps be ordered? Please confirm lead time and confirm if lead time includes shop drawing approval. Also, please clarify if Contractor will be compensated if pump deliver is delayed and equipment is already on site.

Response: The supplier stated the lead time is currently estimated to be 22 weeks, including submittals. Drawings have been requested and full requisition is being made prior to Christmas. Please refer to the contract documents regarding Contractor compensation due to delays.

L. Who is the system supplier?

Response: Anderson WPCF staff will perform their own systems integration.

M. Please clarify which I&C components will be the contractor's responsibility to furnish and/or install.

Response: Anderson will provide and install all I&C components except for the float switches and relocation of the level transducers.

N. Is there anticipated to be any impacted soil on this project?

Response: All soils information known to the parties has been provided. Bidders are invited to perform their own investigations. Any investigations performed must be shared with the Owner per the contract documents.

O. The Right of Entry for the Newsom property. Will the Contractor be expected to incur any costs for this? Has anyone contacted the property owner so far, and have there been any issues with this property owner in the past?

Response: Anderson has requested Egis make first contract with the property owner.

P. Mandatory Alternate by bypass pumping: please clarify what is included and what will be provided by the Owner.

Response: Please refer to added sheet C108. If Mandatory Alternate Number 5 (MA #5) is selected, the Contractor would provide the equipment and piping to meet the requirements included in the Bypass Pumping specification and C108. If the Alternate is not selected, the Owner will be providing all items associated with MA #3.

Q. What will happen if pumping rates of the Dry Weather Pump Station are still not 26 MGD post construction? Any liability for the Contractor?

Response: Contractor is encouraged to review the contract documents for information regarding fully executed project per contract documents.

R. Wet Weather Bypass Pumping: please confirm total volume of flow or duration of pumping at a specified rate so bidders can be equivalent.

Response: Owner nor Engineer can predict total volume or duration of pumping for the Wet Weather Bypass Pumping due to weather. An allowance to be used for fuel has been established within MA #5. If MA #5 is selected the Contractor will need to provide material and markup calc sheets as supporting documentation to utilize the money within the allowance. Contractor would need to ensure that diesel can be delivered any time needed when Anderson staff may call.

S. Can a graphic or P&ID-style illustration be provided for the bypass pumping configurations? This would help more than the text narrative of the constrained activities.

Response: Please see added sheet C108.

T. Please provide the Engineer's Estimate for reference.

Response: Base bid without Mandatory Alternates: $4.1 - $4.5M. With Mandatory Alternates: $5.9 - $6.5M.

U. Will there be any Indiana Bat habitat restrictions for CIPP pit installations or overland bypass piping?

Response: While there are no state or federal permits required on this project with bat habitat restrictions, Anderson does want to be good environmental stewards. There are areas where brush removal may be required to make a clear space for overland pipe. Contractor would have 3 weeks following NTP to complete said clearing if required.

There is only one lining pit location that might require some brush or tree clearing based upon our initial layouts. It is recommended that the Awarded Contractor work with their lining provider to determine if that location is actually required.

V. Salvage materials: does Anderson want right of first refusal for salvaged items, or should all items be disposed of by the Contractor?

Response: The list of materials that Anderson has requested for salvage and return to the Owner is listed in the contract documents.

W. Please clarify the top slab demolition; what is the thickness of the top slab that will be replaced?

Response: Refer to S301 for top slab demolition thickness as well as wall demolition thickness. The thickness between hatches is listed as 1'-0" and the thickness at the walls is listed as 1'-4". The thickness on the rightmost wall is obscured by the wall. It is legible by zooming in on the digital pdf. This will be updated on the conformed set.

X. Anderson mentioned that concrete fill was poured around the existing force mains west of the Dry Weather Pump Station. Is concrete fill required again, or can gravel backfill be used?

Response: Refer to the trench detail on C300 for trench/pit backfill requirements and C108 for area of concrete fill.

Y. Is UV-Cured the only acceptable CIPP liner. Traditional felt liner could minimize costs and quantity of pits. Has the designer considered upsizing the proposed pumps so that felt CIPP liner could be used?

Response: At this time, base bid remains a UV cured, fiberglass liner. Numerous scenarios were explored including multiple pumping configurations. The base bid pumps are the largest the existing station could accommodate with access and other considerations.

Z. Is sound attenuation required for bypass pumps? There may be a cost savings if not.

Response: Sound attenuation is not required.

AA. Is temporary fence required when installing the overland pipe?

Response: Anderson will not require temporary fencing. Any fence that is taken down during the project should be set aside and replaced once the construction activities are complete.

BB. There is a pile of cold patch asphalt material in the way of the temporary overland bypass pipe. Who will move this material?

Response: The Contractor should plan on moving material and concrete bin blocks.

Encls.: 01210 – Allowances
01220 – Measurement and Payment
00410 – Bid Form Attachment A
Sheets C107, C108, E104A, and I106
Meeting Minutes and Sign-up Sheets
1938 30” Forcemain Plan Sheets
1974 36” Forcemain Plan Sheets
2012 36” Forcemain Plan Sheets
Wet Weather Pump Curve
Wet Weather Pump Seal Water System
Smartball Report

SECTION 01210
ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation.

2. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances may include the following:

1. Lump-sum allowances.

2. Unit-cost allowances.

3. Quantity allowances.

4. Contingency allowances.

5. Testing and inspecting allowances.

C. Related Sections include the following:

1. Section 00631 – Change Order Form for forms to submit documentation for allowances.

2. Section 01220 – Measurement and Payment for payment procedures.

3. Section 01260 – Contract Modification Procedures for procedures for submitting and handling Change Orders for allowances.

4. Divisions 2 through 16 Sections for items of Work covered by allowances.

1.2 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Engineer of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

1. Provide a minimum of thirty (30) days for Engineer's selection decision.

B. At Engineer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Engineer from the designated supplier.

1.3 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances using the form specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.4 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.5 LUMP-SUM, UNIT-COST, AND QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner under allowance and shall include taxes, freight, special warranties, and delivery to Project site.

B. Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.6 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Engineer for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.7 TESTING AND INSPECTING ALLOWANCES

A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.

B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.

C. Costs of services not required by the Contract Documents are not included in the allowance.

D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.8 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.

2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.

3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.

4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.

2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.9 UNUSED MATERIALS

A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

B. If requested by Engineer, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Engineer, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: MA #5 Fuel Contingency Allowance: Include a contingency allowance of <Insert amount> for use according to Owner's instructions.

END OF SECTION 01210

SECTION 01220
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Administrative and procedural requirements for measurement and payment.

B. Related sections include the following:

1. Section 01001 – General Administrative Requirements for information on processing of pay requests and related information.

2. Section 01210 – Allowances, where applicable, for procedures for using unit prices to adjust quantity allowances.

3. Section 01260 – Contract Modification Procedures for procedures for submitting and handling Change Orders.

4. Section 01290 – Payment Procedures for procedures for submitting and handling pay requests.

1.2 DEFINITIONS

A. Lump Sum (LS): The total amount for a defined component, system, or structure of the Project, complete. Lump sum prices may be further allocated based on an approved Schedule of Values.

B. Each (EA): A Unit Price Pay Item for each of several similar or identical defined components or structures of the Project, complete.

C. Pay Item: A specifically described unit of work for which a price is provided in the contract.

D. INDOT SS: Indiana Department of Transportation Standard Specifications.

1.3 SUBMITTALS

A. Action Submittals

1. Submit three (3) signed original copies of Contractor's Application for Payment on forms provided.

B. Informational Submittals

1. Labor Standards Documentation

a. Certified Payroll for period of pay request.
b. Other documentation required by the Labor Standards provisions.

2. Stored Materials

a. Bill of Sale, Invoice, or other documentation warranting the Owner has received the materials and equipment free and clear of all Liens.
b. If stored off Project site:
1) Evidence of receipt of materials and equipment by Contractor and that product is suitably stored.
2) Evidence that the materials and equipment are covered by appropriate property insurance.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Price. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Engineer, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Pay sewer service use charges for sewer usage by all entities for construction operations where not available from Owner’s existing sewer system.

1. For plant and water storage tankage filling, testing, and startup, sewer service use charges from Owner’s existing sewer system shall be waived for volumes equal to one and one-half of the tank volume. Additional volumes shall be paid at Owner’s standard charges.

C. Water Service: Pay water service use charges for water used by all entities for construction operations where not available from Owner’s existing water system.

1. For plant and water storage tankage filling, testing, and startup, water service use charges from Owner’s existing water system shall be waived for volumes equal to one and one-half of the tank volume. Additional volumes shall be paid at Owner’s standard charges.

D. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations where not available from Owner’s existing electric system.

E. Owner’s Sewer Service: Sewer service from Owner's existing sewer system, where available, shall be provided to Contractor for use without payment of use charges.

F. Owner’s Water Service: Water from Owner's existing water system, where available, shall be provided to Contractor for use without metering and without payment of use charges.

G. Owner's Electric Power Service: Electric power from Owner's existing system, where available, shall be provided to Contractor for use without metering and without payment of use charges.

1.5 PROCEDURES

A. Pay Items include all necessary material, plus cost for delivery, installation, insurance, overhead, and profit.

B. Pay Items include all Work necessary or incidental to the satisfactory completion and commissioning of the facility or structure, including as applicable but not limited to:

1. Management and supervision of the Work.
2. Construction engineering.
3. Clearing and grubbing.
4. Site preparation.
5. Sediment and erosion control.
6. Dust control.
7. Weather protection.
8. Temporary fencing, signage, supports, working platforms, and barricades.
9. Temporary shoring and structure support.
10. Excavation, including rock excavation, unless specifically classified by a pay item.
11. Excavation and trench protection.
12. Dewatering, unless specifically classified by a pay item.
13. Bedding and foundation or trench bottom support.
14. Backfill, unless specifically classified by a pay item.
15. Unauthorized excavation, as well as remedial work directed by Engineer.
16. Utility services and connections.
17. Deposits and delivery, fuel, setup, and similar charges.
18. Site utilities, including application and connection fees, unless specifically classified as a pay item.
19. Site and surface restoration, unless specifically classified by a pay item.

20. Testing and commissioning.

21. Demonstration and training.

22. All other Work not otherwise included as a Pay Item incidental or necessary to the completion of the Work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 LIST OF PAY ITEMS

A. Pay Item No. 1 – Mobilization/Demobilization

1. Pay Item Type: Lump Sum.

2. Description: Payment for:

   a. Purchase of required insurance and bonds.
   b. Plan of work and other preliminary project coordination.
   c. Coordination with suppliers and subcontractors.
   d. Coordination with property owners for temporary use of property.
   e. Identification of fill material and disposal sites.
   f. Preliminary construction engineering prior to moving onto project site.
   g. Pre-construction and post-construction audio-video surveys.
   h. Movement of workers and equipment to and from the Site.

3. Unit of Measurement: No measurement.

4. Payment: Mobilization/Demobilization shall not exceed five percent (5%) of the Base Bid.

   a. Bonds and mobilization shall be paid in the amount of sixty percent (60%) of the Pay Item amount with the first Pay Estimate.
   b. Demobilization shall be paid in the amount of forty percent (40%) of the Pay Item amount with the Pay Estimate at Substantial Completion.

B. Pay Item No. 2 – Erosion and Sediment Control

1. Pay Item Type: Lump Sum.

2. Description: Installation of erosion control elements as indicated in the plans.

3. Unit of Measurement: No measurement.

4. Payment: In approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

C. Pay Item No. 3 – Seal Water Line

1. Pay Item Type: Unit Price.

   Description: Installation of seal water lines, including pipe, fittings, pipe supports, fittings to connect to existing water service, fittings to connect to exiting seal water system at each wet weather pump and all other items to restore seal water system to function as intended under current operating conditions, classified by:
   a. Service line size.

2. Unit of Measurement: Lineal foot, measured in a straight line from the connection at the water main to the end of the installation at the meter connection or connection to existing service line.

3. Payment: Upon completion of installation and successful testing of water service.

D. Pay Item No. 4– CIPP Pipeline Rehabilitation

1. Pay Item Type: Unit Price.

2. Description: Installation of CIPP lining in sewers and force mains, including any required cleaning, televising, launch, retrieval and access pits and pit restoration, including any necessary backfill as outlined in the trench details and any required pavement restoration, classified by:
   a. Nominal pipe size.

3. Unit of Measurement: Lineal foot, measured along the centerline of the pipe from start of lining to ending of lining.

4. Payment:
   a. Upon completion of installation and successful testing of CIPP lining.

E. Pay Item No. 5.01 - Lift Station Structural: Slab Replacement and Hatches

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to the structural improvements, slab replacement, pump bases, baffle plate, and new hatches for the Dry Weather Pump Station.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

F. Pay Item No. 5.02 - Lift Station Piping

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to the new wet well discharge piping, including all fittings, necessary supports and anchors.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

G. Pay Item No. 5.03 - Lift Station Submersible Pumps, Slide Rails, Startup

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to, installation and startup for three submersible pumps.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

H. Pay Item No. 5.04 - Lift Station Electrical

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to the electrical upgrades indicated in the contract drawings and specifications.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

I. Pay Item No. 5.05 - Wet Weather Pump Seal Water Heat Trace and Insulation

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to the heat trace system and pipe insulation for the wet weather pump seal water system, including all ancillary components to fully protect the heat trace and insulation as shown in the drawings.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

J. Pay Item No. 5.06 - Demo of Existing Dry Weather Pump Station

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to the demolition of the existing pump station building, dry weather pumps and discharge piping, seal water system, wet well interior grout and top slab.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

K. Pay Item No. 5.07 - Dry Weather Pump Station Wet Well/Valve Vault Penetration

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to the new wet well penetrations, modular pipe seals, and all ancillary work required to accomplish these penetrations.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

L. Pay Item No. 5.08 - Monorail Crane

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to the monorail crane, hoist and trolly.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

M. Pay Item No. 5.09 - Relocate Light Pole

1. Pay Item Type: Lump Sum.

2. Description: Payment for the Work related to the existing light pole to eliminate conflict with the monorail crane, including restoring area vacated by pole and any damage made installing new pole.

3. Unit of Measurement: In accordance with accepted Schedule of Values.

4. Payment: Lump sum payment for this pay item shall be made in approximate proportion to the percent of Work completed in accordance with the accepted Schedule of Values.

5. Unit of Measurement: Square yard, measured:

   a. By area of repair.

6. Payment: Upon completion of installation and successful testing of sidewalk repair area.

N. Pay Item No. 6 - Lawns and Grasses

1. Pay Item Type: Unit Price.

2. Description: Establishment of lawns and grasses at completion of work in an area, categorized by method of establishment.

   Pay item does not include lawns and grasses over water services, sewer laterals, sewer force mains, low pressure sewers, or other pay items in which lawns and grasses are included in the pay item description.

3. Unit of Measurement: Square yards.

4. Payment: Upon acceptable establishment of vegetation.

3.2 OTHER MATTERS

A. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

B. Where rock excavation is not specifically included as a pay item, all excavation shall be unclassified.

C. Where rock excavation is a pay item, excavation shall be classified. Rock excavation shall include the removal and satisfactory off-site disposal of rock materials. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract time may be authorized for rock excavation.

D. Where underground storage tanks or hazardous environmental conditions are shown or indicated to be removed, the removal and disposal of materials or contents, removal of tanks, assessments, and tank closures shall be without additional compensation where not specifically included as a pay item.

E. INDOT SS: Where INDOT SS are referenced, the intent of the reference is not to incorporate or apply INDOT SS measurement requirements or pay items into these Contract Documents.

F. Overdue or Non-Compliant Submittals

1. Owner will retain 25 percent of the amount due on any pay application during each period in which Contractor fails to submit any of the required submittals or fails to comply with the submittal requirements, as determined by the Engineer.

   a. On subsequent pay applications in which the submittal non-conformance continues, the percentage the Owner will retain will be increased for each pay application by the rate of 25 percent per pay application.

2. Retainage for this non-conformance will be released during payment for the next pay application following the date the submittal information is brought back into compliance.

3. Retainage due to this non-conformance shall be in addition to all other retainages.

END OF SECTION 01220

BID FORM ATTACHMENT A - BID PRICES
OWNER: City of Anderson
PROJECT: Div IV Dry Weather Pump Station and Force Main Rehab

	Estimated Quantity	Unit Type	Unit Price	Estimated Price
Bidder will complete the Work for the following Unit price(s):				
Administrative				
1 Mobilization/Demobilization *(not to exceed 5% of base bid)*	1	LS		
Sitework				
2 Erosion Control	1	LS		
3 Seal Water Line				
3.01 2-inch Seal Water Line	100	LF		
Sewer Rehabilitation				
4 CIPP Lining				
4.01 36-inch Forcemain	3,125	LF		
Lift Stations and Force Mains				
5 Lift Stations				
5.01 Lift Station Structural: Slab Replacement and Hatches	1	LS		
5.02 Lift Station Piping	1	LS		
5.03 Lift Station Submersible Pumps, Slide Rails, Startup	1	LS		
5.04 Lift Station Electrical	1	LS		
5.05 Wet Weather Pump Station Heat Trace/Insulation (No Building)	1	LS		
5.06 Demo of Existing Dry Weather Pump Station	1	LS		
5.07 Dry Weather Pump Station Wet Well/Valve Vault Penetration	4	EA		
5.08 Monorail Crane	1	LS		
5.09 Relocate Light Pole	1	LS		
Lawns and Grasses				
6 Lawns and Grasses				
6.01 Seeding	1,250	SY		

Total Unit Price Base Bid Amount, inclusive of all Pay Items:

_____ $ _____

(words) *(numerals)*

Mandatory Alternate #1: Clean and Televise 30" RCP Force Main	1,350	LF		
Mandatory Alternate #2: Test 30" RCP Force Main	1,350	LF		
Mandatory Alternate #3: 30" RCPP Connection	1	LS		
Mandatory Alternate #4: Install 30" DI Connection	1	LS		
Mandatory Alternate #5: Bypass Pumping	9	MO		
				$25,000
Allowance #1 - MA #5 Fuel Contingency			$25,000	

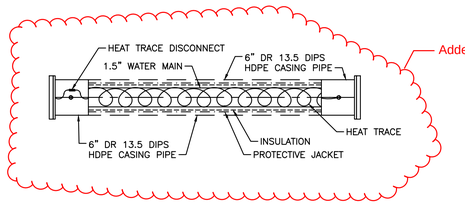
Bidder: _____ Date:

By: _____
(Signature of Bid Form Signatory)

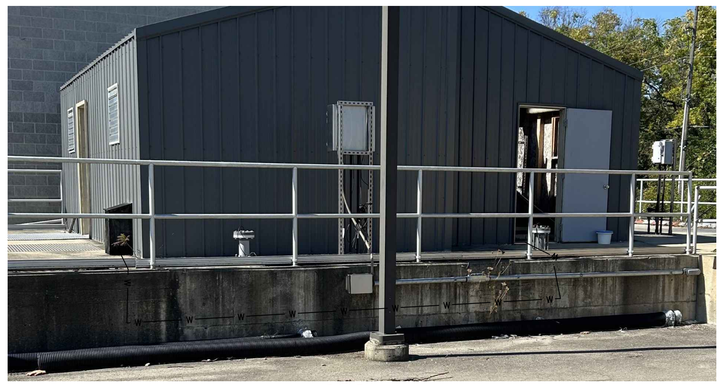
Name (typed or printed): _____

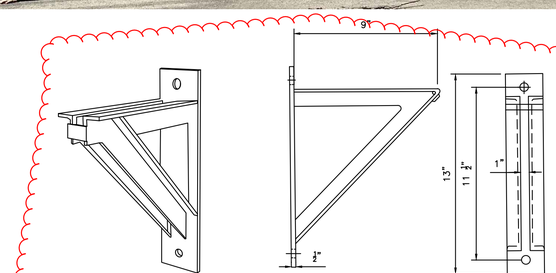
CONSTRUCTION NOTES

1. NEW SUBMERSIBLE 240 HP WASTEWATER PUMP.
2. SEE PUMP BASE GROUT DETAIL ON SHEET C301
3. NEW 16–INCH DUCTILE IRON DISCHARGE PIPE SUPPORTED TO WET WELL AT 10' ON CENTER SPACING.
4. NEW ECCENTRIC 20"X16" DIP REDUCER WITH 20" DIP ELBOW AND 20" TO CONNECT TO EXISTING FLANGE IN VALVE VAULT.
5. PROVIDE NEW 90"X60" OUTSIDE DIMENSION HATCH WITH A CLEAR OPENING OF NO LESS THAN 80"X53". HATCHES SHOULD HAVE DOUBLE DOORS, HINGED ON THE 60" AND BE EQUIPPED WITH SAFETY GRATES. SEE SPECIFICATION 07721 FOR ADDITIONAL INFORMATION.
6. VENTS SHALL HAVE FLAT COVERS. TWO 8" INTAKES AND DISCHARGE POINTS MUST BE PROVIDED AS SHOWN.
7. PROVIDE 316 STAINLESS STEEL BAFFLE PLATE SUPPORTED AT BOTH WALLS WITH 316 STAINLESS STEEL FASTENERS. SEE DETAILS SHEET C301
8. INSTALL SEAL WATER TO EXISTING WET WEATHER PUMPS. MAINTAIN 60" COVER DEPTH OUTSIDE OF PUMP STATION. EXPOSED PIPING IN VALVE VAULT AND ABOVE GRADE SHALL BE INSULATED AND HEAT TRACED. CORE CONCRETE AND PROVIDE INBOARD AND OUTBOARD MECHANICAL SEALS AT EACH VALVE VAULT PENETRATION.
9. HEAT TRACE AND INSULATION MUST CONTINUE TO A POINT NO LESS THAN 1–FOOT BEYOND FREEZE CONCERN. IN THIS CASE, THAT MAY BE IN A CONFINED LOCATION. INSULATION AND HEAT TRACE MUST BE PROTECTED BUT STILL BE EASILY REMOVED BY OWNER IF NEEDED. SEE ADDITIONAL HEAT TRACE AND INSULATION INFORMATION INCLUDED IN SPECIFICATION 02510. INSULATED SEAL WATER LINE TO BE SUPPORTED WITH SHOE STYLE SUPPORTS ON SLAB EVERY 6 FEET OR AT BENDS. ALONG WALL, SEAL WATER LINE TO BE SUPPORTED WITH ANGLE SUPPORTS EVERY 8 FEET AND WITHIN 6 INCHES OF BENDS. U–CLAMPS SHOULD BE UTILIZED TO HELP PROTECT PIPE FROM MOVEMENT ON ANGLE SUPPORTS.
10. EXISTING LEVEL TRANSDUCER AND FLOAT SWITCH.
11. RELOCATE LEVEL TRANSDUCER. SEE ELECTRICAL SHEETS FOR NEW LOCATION.
12. EXISTING ELECTRICAL PANEL RELOCATED, SEE ELECTRICAL SHEET FOR ADDITIONAL INFORMATION.



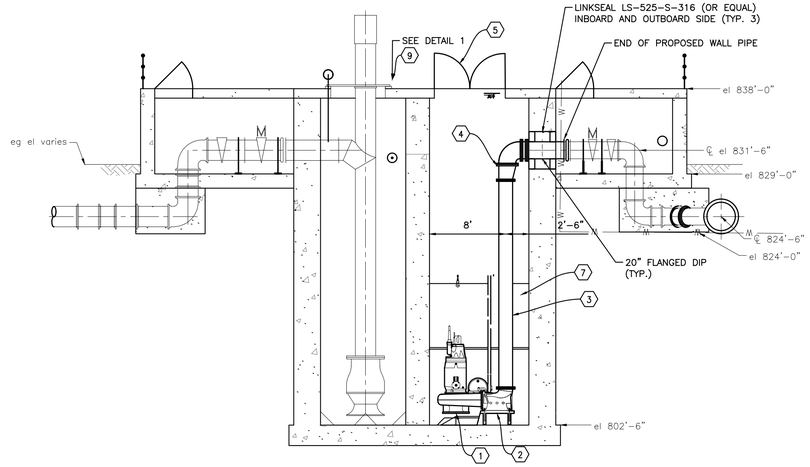
Addendum 2



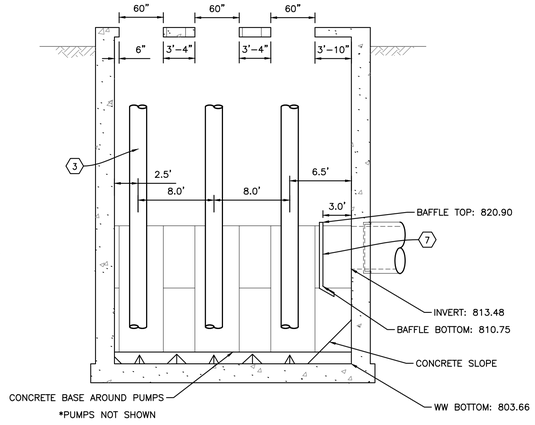


PIPE SUPPORT WALL MOUNT DETAIL

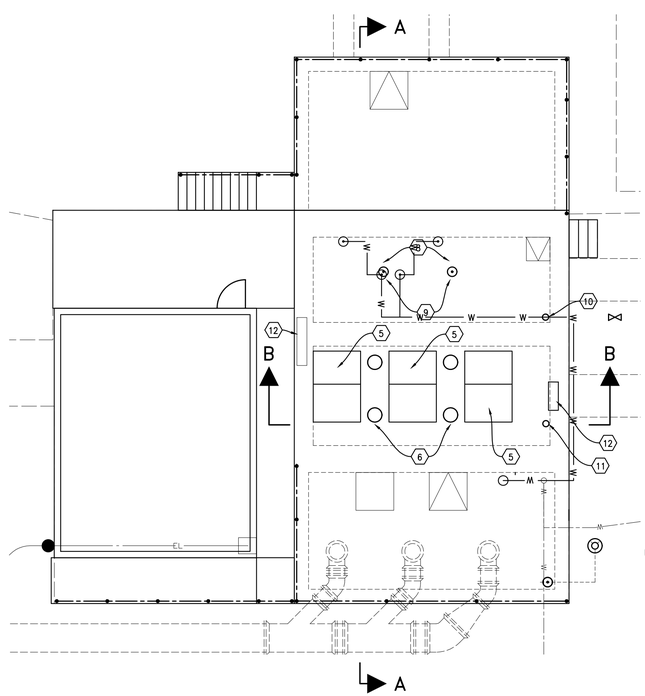
Addendum 2

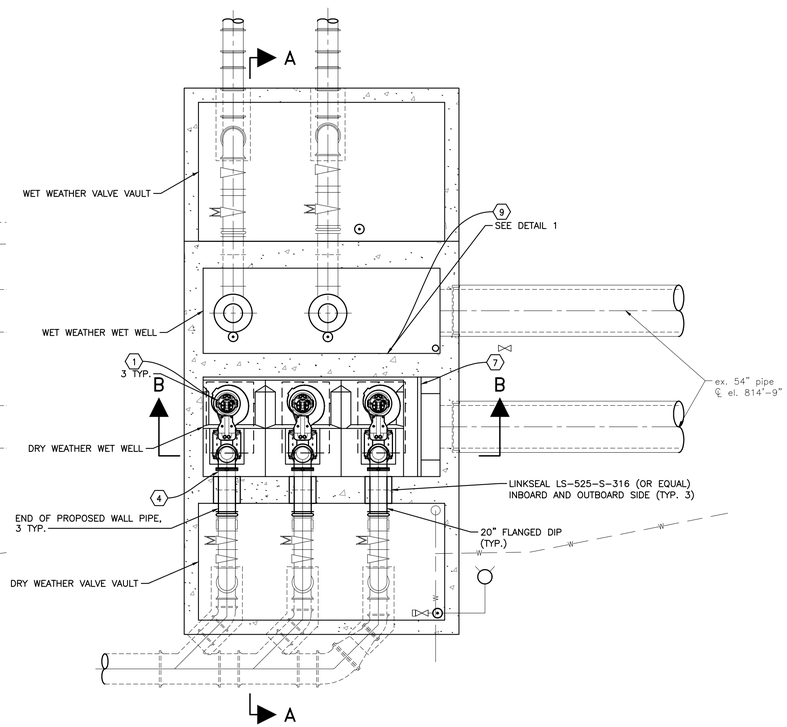


SECTION A–A



SECTION B–B





PLAN

DRY WEATHER PUMP STATION
SCALE: ⅛" = 1'–0"

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egis

REVISIONS AND ISSUES	DATE	BY
4		

RENEE LYNN COPE
REGISTERED
No. 10403860
STATE OF INDIANA
PROFESSIONAL ENGINEER
DATE: 6/26/2025

CONSTRUCTION PLANS FOR:
DRY WEATHER PS AND FM REHAB
2801 Gene Gustin Way, Anderson, Madison, Indiana 46011 S 10, T 19 N, R 7 E

DEPARTMENT OF WATER POLLUTION CONTROL
2801 Gene Gustin Way

DRY WEATHER PUMPS PROPOSED

PLAN DATE: 12/1/2025

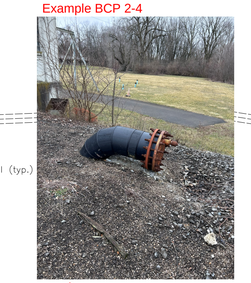
DESIGN:	CHECK:	DRAWN:
PRW	BAB	DCW

PROJECT NO. 120046

SHEET NO. C107

PRIMARY EFFLUENT BYPASS
pipe with flap gate

Example BCP 2-4



CLOSED CSO 006
108" dia. pipe with flap gate

approx. location of the edge of white river

conc. wingwall (typ.)

CSO 007
84" dia. cmp

16" wide conc. wingwall

Buried concrete in this general area. Purpose and exact limits unknown.

wooded area

56000

30" 45° BEND
30" 45° BEND
30" 45° BEND
30" MJ PLUG VALVE
PROPOSED BYPASS CONNECTION
WWBP-1
30" MJ PLUG VALVE
WW-1
30" DI WET WEATHER FORCEMAIN
1357
57000
1356
structure (conc. block)
BYPASS CONNECTIONS BPCs-2-4
RCF-1
EXISTING VALVE

30" FM TO GENE GUSTIN WAY PRIMARY TANKS (INACTIVE)

36" 90° WITH 24" REDUCER TURNED UP AND CAPPED

231+00
231+50

RAW SEWAGE PUMP STATION (ABANDONED)
conc. block building
top ffe=835.94
bottom ffe=807.44

WET WEATHER PUMP STATION

GENERATOR PAD
1358

JUNCTION CHAMBER

APPROXIMATE HATCH LOCATIONS. SEE PHOTOGRAPH BELOW.

utility manhole
wires run west & south

EXISTING SCREEN STRUCTURE

EXISTING DRY WEATHER PUMP STATION

1000

(concrete)

EXISTING VALVE DW-3
EXISTING VALVE DW-1
EXISTING VALVE DW-2
METER PIT
BYPASS CONNECTION BPC-1
36" DI DRY WEATHER FORCE MAIN

ELECTRICAL BUILDING

(gravel)

ex. chain link fence

STORAGE AREA

Wet Weather Bypass Pumping Notes:
1) If Mandatory Alternate for Bypass Pumps is selected: Pumps must be diesel powered, submersible pumps. Pumps to be placed in the existing screen structure. Existing gates can be utilized to isolate the Dry Weather Pump Station wet well for pump replacement.
2) Wet Weather Pumps must be able to pump up to 22 MGD during wet weather events.
3) Connection point for Wet Weather Bypass to be existing Bypass Connection 1 (BPC-1) (Photo shown). For this point to be used as a Wet Weather Bypass, the valves indicated as DW-1 and DW-2 must be opened and the valves indicated as DW-3, RCF-1, and WW-1 must be closed. The valves in the Dry Weather Pump Station Valve Vault should also be closed.
4) If for some reason the Owner's preferred connection point of BPC-1 cannot be utilized, BCP 2-4 could be utilized. Contractor must coordinate closely with Owner all bypass pumping connections and operations to ensure NO DRY weather bypasses occur and all wet weather bypasses are minimized as much as possible from CSO 007.

Dry Weather Bypass Pumping Notes:
1) The existing Wet Weather Pumps are to be utilized as dry weather bypass pumps during construction. The wet weather pump curves and O&M/Original Construction Record Information has been shared as part of the Addendum #1. These pumps were originally design to pump up to 20 MGD to the top of the Biotowers at Gene Gustin. For bypass pumping purposes, these pumps will need to pump up to 26 MGD to the nose of the PTF. For this purpose, two pumps will be needed due to friction losses in the combination of piping and fittings.
2) The wet weather forcemain will be utilized to the new above ground fitting. Above ground piping will be needed to the connection noted from the 2011 plans as a 36" 90 with and 24" reducer turned up and capped. The existing 30" RCPP will be utilized to the connection shown on C103 where flow will again move above ground to a HDPE pressure pipe to the nose of the PTF as shown on sheet C100.
3) For the dry weather bypass scenario valves WW-1 will be closed and WWBP-1 will be open.

DRY WEATHER PUMP STATION SEQUENCING NOTES
1. CLOSE EXISTING GATE TO DRY WEATHER PUMP STATION.
2. COMPLETE DRY WEATHER PUMP STATION REHABILITATION.
3. INSTALL SEAL WATER TO EXISTING WET WEATHER PUMPS. PROPOSED LINE MUST BE HEAT TRACED AND INSULATED AS REQUIRED PER 02510. RELOCATED SEAL WATER LINE TO BE SUPPORTED OFF OUTSIDE TANK WALL WITH METAL ANGLE SUPPORTS. SEE DETAILS SHEET C107.

0 20' 40'
SCALE: 1"=20'

egis

BY	DATE	REVISIONS AND ISSUES

RENEE LYNN GOFF
REGISTERED
No. 10403860
STATE OF INDIANA
PROFESSIONAL ENGINEER
DATE: 12/16/2025
Renee Lynn Goff

CONSTRUCTION PLANS FOR:
DRY WEATHER PS AND FM REHAB
2801 Gene Gustin Way, Anderson, Madison, Indiana 46011 S 10, T 19 N, R 7 E
DEPARTMENT OF WATER POLLUTION CONTROL
2801 Gene Gustin Way
BYPASS PUMPING PLAN

PLAN DATE: **12/16/2025**

DESIGN:	CHECK:	DRAWN:
PRW	BAB	DCW

PROJECT NO. **120046**

SHEET NO. **C108**

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GENERAL NOTES:

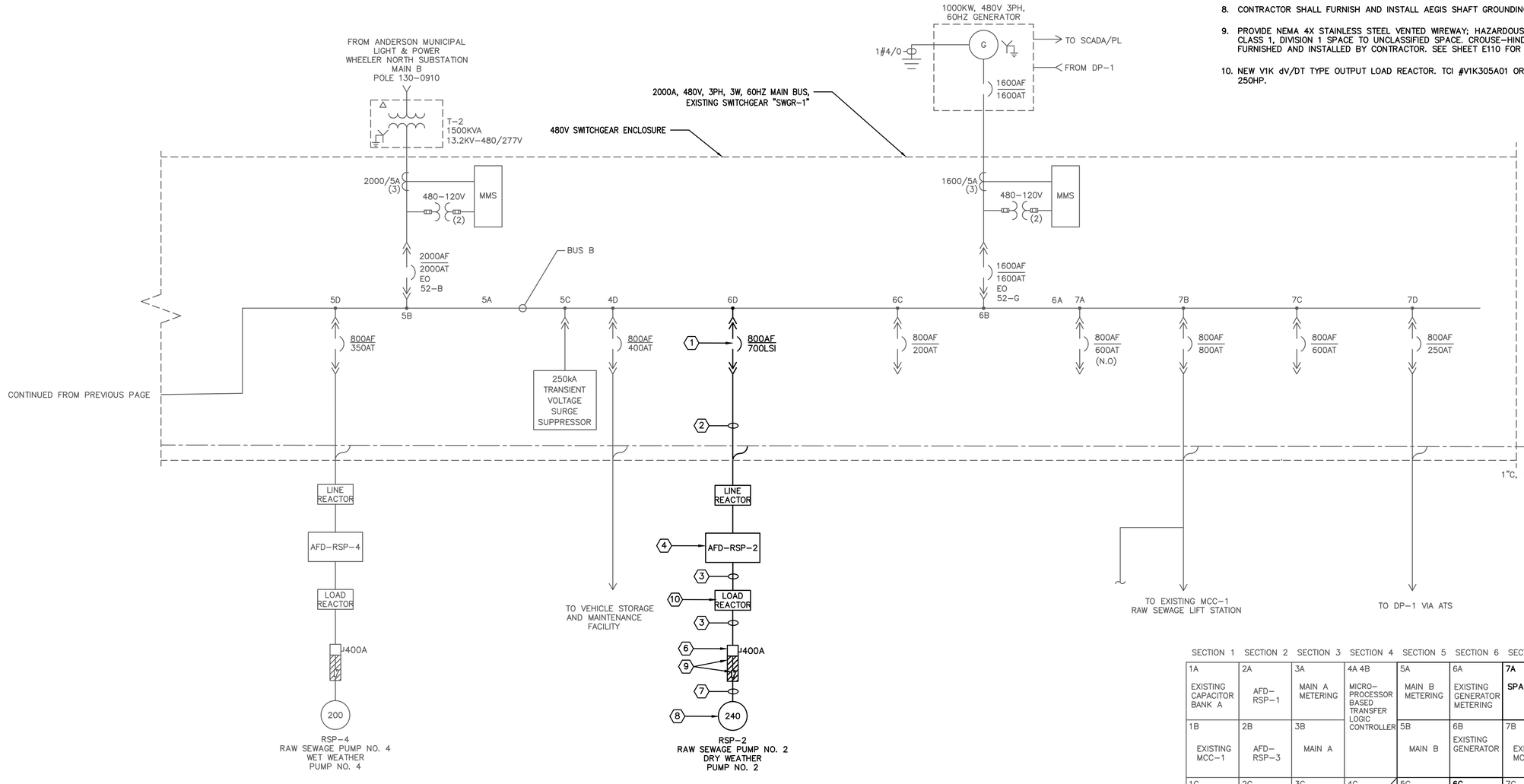
A. DISPOSE OF REMOVED ELECTRICAL EQUIPMENT AT THE DISCRETION OF THE OWNER. THE OWNER HAVE FIRST OF REFUSAL FOR ALL EQUIPMENT THAT IS REMOVED.

B. LOCATE ALL EXISTING PIPING AND UTILITIES BEFORE INSTALLING OR REMOVING UNDERGROUND CONDUITS; PROTECT ALL EXISTING INSTALLATIONS.

C. CONTRACTOR SHALL VERIFY FINAL EQUIPMENT LOCATION BEFORE DEMOLITION. THIS IS AN OVERALL EXISTING ELECTRICAL ONE-LINE DIAGRAM AS PER PREVIOUS PLANS. FINAL LAYOUT MAY NOT MATCH WITH THE DRAWING.

ELECTRICAL KEYED NOTES: ⬡

1. PROGRAM EXISTING BREAKERS FOR NEW LOADS.
2. (2) SETS OF 3-#4/0 CU, 1-#2 CU GND, 2-1/2" C EACH.
3. (2) SETS OF 3-#4/0 CU XHHW-2, 1-#2 CU THWN-2 GND, 2-1/2" C EACH.
4. NEW 300HP VFD CONTROL PANEL. FURNISHED AND INSTALLED BY CONTRACTOR. SEE SHEET E109 FOR ADDITIONAL DETAILS.
5. NOT USED.
6. NEW NEMA 4X STAINLESS STEEL ENCLOSURE NON-FUSED 400A, 600V LOCAL DISCONNECT SWITCH. FURNISHED AND INSTALLED BY CONTRACTOR.
7. PUMP CABLE IN 4" C. PUMP CABLE FURNISHED BY PUMP MANUFACTURER AND INSTALLED BY CONTRACTOR.
8. CONTRACTOR SHALL FURNISH AND INSTALL AEGIS SHAFT GROUNDING RINGS.
9. PROVIDE NEMA 4X STAINLESS STEEL VENTED WIREWAY; HAZARDOUS SEAL OFF FOR TRANSITION FROM CLASS 1, DIVISION 1 SPACE TO UNCLASSIFIED SPACE. CROUSE-HINDS #EYSER OR APPROVED EQUAL. FURNISHED AND INSTALLED BY CONTRACTOR. SEE SHEET E110 FOR GENERAL DETAILS.
10. NEW V1K dV/DT TYPE OUTPUT LOAD REACTOR. TCI #V1K305A01 OR APPROVED EQUAL RATED FOR 250HP.



SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	SECTION 7
1A EXISTING CAPACITOR BANK A	2A AFD-RSP-1	3A MAIN A METERING	4A 4B MICRO-PROCESSOR BASED TRANSFER LOGIC CONTROLLER	5A MAIN B METERING	6A EXISTING GENERATOR METERING	7A SPARE
1B EXISTING MCC-1	2B AFD-RSP-3	3B MAIN A		5B MAIN B	6B EXISTING GENERATOR	7B EXISTING MCC-1
1C DP-2	2C AFD-RSP-5	3C TVSS	4C TIE	5C TVSS	6C SPARE	7C EXISTING ECC-2
1D DP-1	2D SPACE	3D SPACE	4D MAINT. BLDG.	5D AFD-RSP-4	6D ⬡1 AFD-RSP-2	7D DP-1
1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"

8'-0"

12'-10"

4" CONCRETE PAD

EXISTING 480V SWITCHGEAR SWGR-1
FRONT ELEVATION
NOT TO SCALE

DRY WEATHER PUMP STATION ELECTRICAL ONE-LINE DIAGRAM - NEW WORK CONT.

NOT TO SCALE

egis

SIMS-DURKIN ASSOCIATES ENGINEERING COMPANY
5750 WEST 74TH STREET INDIANAPOLIS, IN 46278
PHONE 317-209-4035
WEB: WWW.SIMS-DURKIN.COM
SDA PROJECT NUMBER: 2021151

REVISIONS AND ISSUES	DATE	BY
CONFORMED SET	12/01/2025	JAK

JOHN A. KASSEBAUM REGISTERED NO PE10504714 STATE OF INDIANA PROFESSIONAL ENGINEER
CERTIFYING ELECTRICAL ONLY

CONSTRUCTION PLANS FOR:
DRY WEATHER PS AND FM REHAB
2801 Gene Gustin Way, Anderson, Madison, Indiana 46011 S 10, T 19 N, R 7 E

DEPARTMENT OF WATER POLLUTION CONTROL
2801 Gene Gustin Way

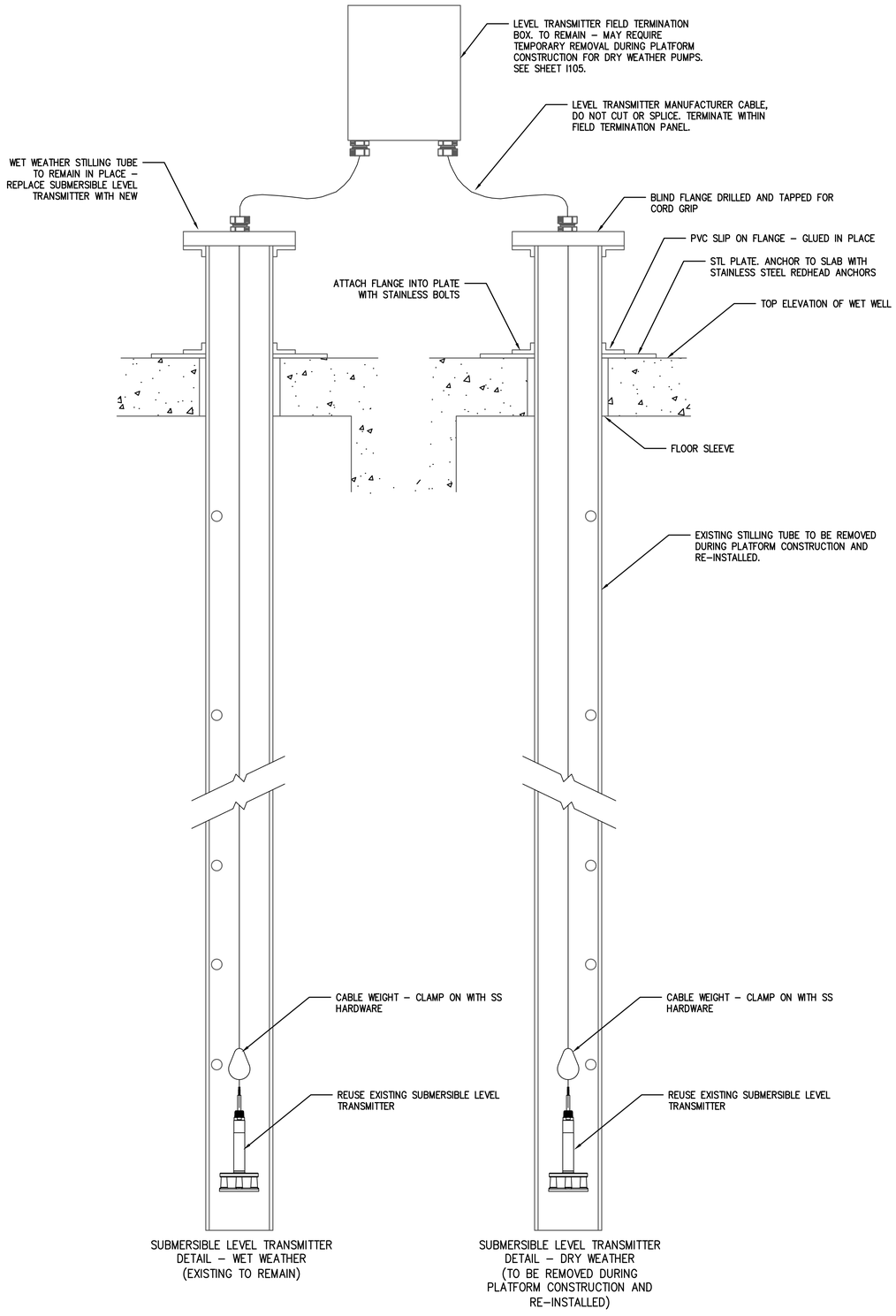
DRY WEATHER PUMP STATION ELECTRICAL ONE-LINE DIAGRAM - NEW

PLAN DATE: 12/01/2025

DESIGN:	CHECK:	DRAWN:
JWS/JAK	JWS/JAK	TEAM

PROJECT NO. 120046

SHEET NO. E104A

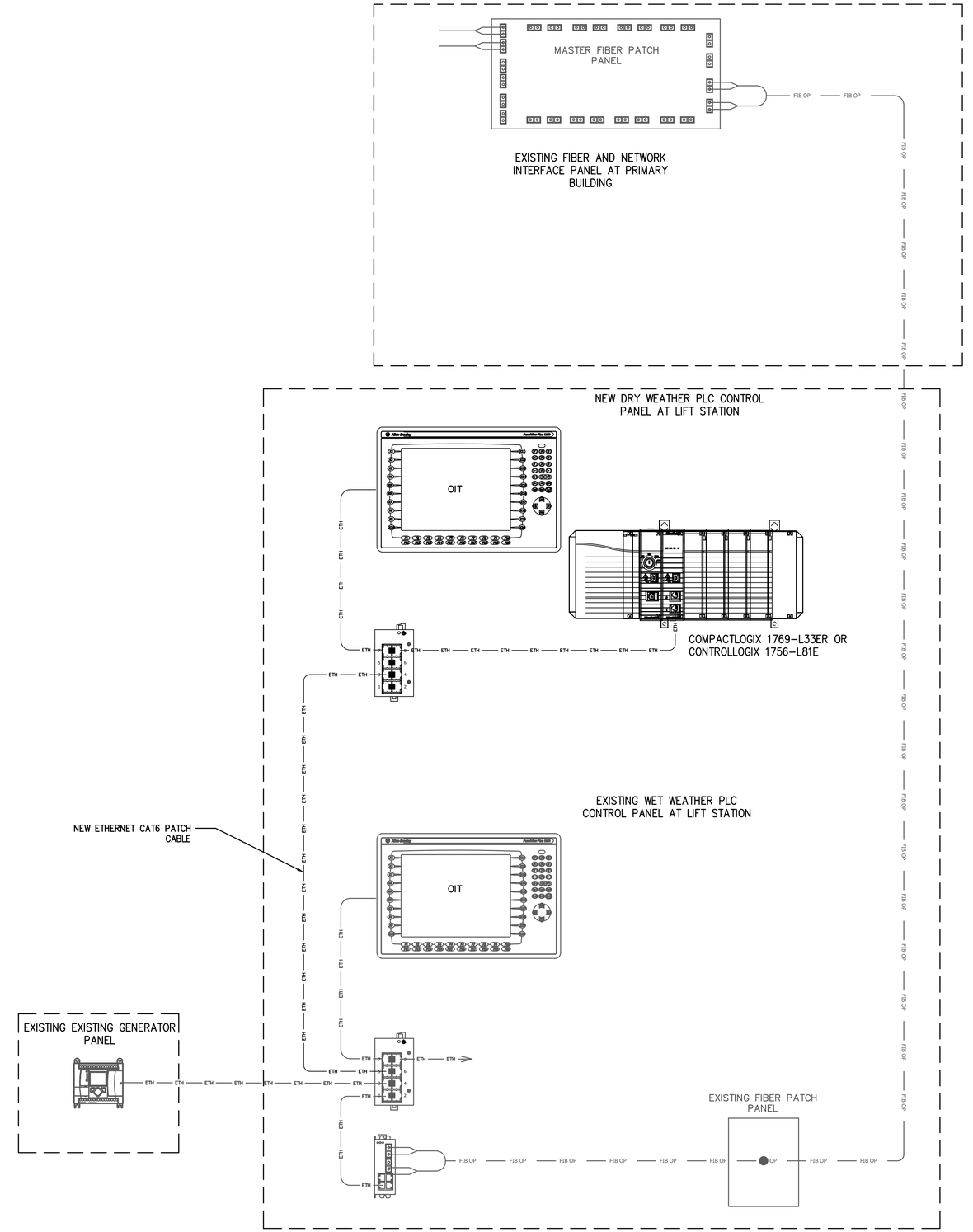


SUBMERSIBLE LEVEL TRANSMITTER DETAIL – WET WEATHER (EXISTING TO REMAIN)

SUBMERSIBLE LEVEL TRANSMITTER DETAIL – DRY WEATHER (TO BE REMOVED DURING PLATFORM CONSTRUCTION AND RE–INSTALLED)

SUBMERSIBLE LEVEL TRANSMITTER STILLING WELL DETAIL

NOT TO SCALE



SCADA NETWORK DETAILS

NOT TO SCALE

EXISTING FIELD TERMINATION PANEL MODIFICATION DETAILS

NOT TO SCALE

egis

SIMS-DURKIN ASSOCIATES ENGINEERING COMPANY
5750 WEST 74TH STREET INDIANAPOLIS, IN 46278
PHONE 317-209-4035
WEB: WWW.SIMS-DURKIN.COM
SDA PROJECT NUMBER: 2021151

REVISIONS AND ISSUES	DATE	BY
CONFORMED SET	12/01/2025	JAK

JOHN A. KASSELBAUM
REGISTERED NO PE10504714 STATE OF INDIANA
PROFESSIONAL ENGINEER
CERTIFYING ELECTRICAL ONLY

CONSTRUCTION PLANS FOR:
DRY WEATHER PS AND FM REHAB
2801 Gene Gustin Way, Anderson, Madison, Indiana 46011 S 10, T 19 N, R 7 E
DEPARTMENT OF WATER POLLUTION CONTROL
2801 Gene Gustin Way
INSTRUMENTATION DETAILS

PLAN DATE: 12/01/2025

DESIGN:	CHECK:	DRAWN:
JWS/JAK	JWS/JAK	TEAM

PROJECT NO. 120046

SHEET NO. I106

IMAGINE. CREATE. ACHIEVE.
a sustainable future

Pre-Bid Meeting
City Of Anderson Water Pollution Control
Dry Weather Pump Station and Forcemain Rehabilitation Project
December 18, 2025

Meeting Location: **Dewey Street Wastewater Treatment Plant, 2104 W 8th Street, Anderson, IN 46016**
Time: **9:00 AM, LOCAL TIME**

1. **SIGN ATTENDANCE SHEET**

2. **INTRODUCTION OF RESPONSIBLE PERSONNEL**
   2.1 City of Anderson Water Pollution Control
      A. Ryan Paschal, Superintendent
         i. Phone: 765-648-6565
         ii. Email: rpaschal@cityofanderson.com

   2.2 Egis BLN USA, Inc.
      A. Renee Goff, P.E. and Pete Wamsley, P.E.
         i. Phone: 317-806-4341 and 317-806-6021
         ii. Email: renee.goff@egis-group.com and pete.wamsley@egis-group.com

3. **PROJECT SCOPE**
   3.1 Dry Weather Pump Station and Force Main Rehabilitation
      A. CIPP lining approximately 3,600 linear feet of 36" ductile iron force main.
      B. Installation of new submersible dry weather pumps at Dewey Street Pump Station.
      C. Existing building demolition, wet well top slab reconstruction, electrical and controls upgrades, and monorail crane installation.

4. **PROJECT OVERVIEW**
   4.1 Funding and Agency Requirements
      A. Project is locally funded through bonds.

   4.2 Project Schedule and Time for Completion
      A. Project is anticipated to be awarded in Jan/Feb 2026 with an NTP to follow.
      B. Substantial Completion is 407 days, and Final Completion is 468 days.

4.3 Preceding Work

A. There is no preceding work.

4.4 Owner-Provided Products

A. Three new Dry Weather Pumps and accessories.
B. All I&C components, rebuilt control panel back planes, and programming.
C. New VFDs.

4.5 Concurrent Work

A. There is no other concurrent work known at this time.

4.6 Work Restrictions

A. 7:00 a.m. to 6:00 p.m. Monday through Friday
B. Saturday: 8:00 a.m. to 4:00 p.m.
C. Sunday: no work
D. No early morning Work without Owner's prior written authorization.
E. Limit utility shutdowns to 8:00 a.m. to 4:00 p.m. Monday through Thursday.
F. Limit noisy activities to weekdays from 8:00 a.m. to 5:00 p.m.
G. No nighttime Work without Owner's prior written authorization.

4.7 Utilities

A. This is a congested site for buried utilities. The utilities and other buried features shown on the drawings are from previous plan sets and have not been potholed. Contractors should anticipate some potholing or other non-destructive exploration methods may need to be utilized to facilitate exact location of existing utilities and buried features.

4.8 Permits – Owner-Obtained

A. IDEM Construction Stormwater General Permit
    i. Provided by Owner but may have to be modified with the assistance of the Contractor. Contractor shall install, maintain, and repair all required erosion control measures for implementation. Quality Deficiencies for not maintaining BMPs, causing illicit discharges, and other inactions as described in 01571 Temporary Sediment and Erosion Control Section 1.3.B-D.
B. IDEM Wastewater Construction Permit

4.9 Geotechnical

A. All available geotechnical information available to the design team is available in the bid documents.

4.10 Status of Land Acquisition

A. Contractor is responsible for coordinating with the property owner for right of entry to easement on the Newsom property.

4.11 Traffic Control

A. There is no traffic control on this project.

4.12 Constrained Activities

A. Constrained Activity No. 1: 30" Wet Weather Force Main Connection
   i. A permanent bypass connection point is to be installed on the 30" Wet Weather force main. The 30" Wet Weather force main conveys flows from the Wet Weather Pump Station to the Primary Clarifiers/Settling Tanks. The proposed bypass point will allow Wet Weather Pump Station flows to be diverted to either the existing 30" concrete force main or the existing 36" dry weather force main for future bypass needs.
   ii. Activity Start and End
   iii. Start: Isolation of Wet Weather Pump Station to remove from service by Owner.
   iv. End: Restoration of Wet Weather Pump Station to normal service.
   v. Preceding Work
   vi. Coordinate with and obtain approval from the Owner at least 48-hours prior to start of activity.
   vii. Install new conduit and electrical cable to relocated pull box location for wet weather pumps. Have all terminations completed such that switch over can be completed quickly when wet weather pumps are able to come offline.
   viii. Wet Weather bypass plan must be approved and installed to allow wet weather to be offline. Bypass shall use the existing on-site bypass piping and begin at the Screening Structure.
   ix. During Wet Weather bypass, complete switch over of electrical connections for all wet weather panel relocations.
   x. Install new seal water supply piping to wet weather pumps.
   xi. Install bypass connection to the 30" wet weather force main.

B. Constrained Activity No. 2: 36" Dry Weather Force Main Connection
   i. A permanent bypass connection point is to be installed on the 36" Dry Weather force main. The 36" Dry Weather force main conveys flows from the Dewey Street Plant to the Preliminary Treatment Facility at the Gene Gustin Plant. The Wet Weather Pump Station is to be used as the bypass pumps for the Dry Weather Pump Station.
   ii. Activity Start and End:
   iii. Start: Redirection of dry weather pump station flows to 30" force main to allow 36" force main to be taken out of service.

iv. End: Restoration of discharging flows to the 36” force main.
v. Preceding Work
vi. Coordinate with and obtain approval from the Owner at least 24-hours prior to start of activity.
vii. Obtain Owner’s approval of receiving manhole for waste hauling necessitated by force main Work.
viii. Activity Limitations
ix. Install 30” bypass connection point on the 30” concrete force main at 6th and Gene Gustin Way. This force main is not currently in service.
x. Install the 30” overland bypass piping to the nose of the PTF. Secure to minimize movement or splashing.

5. ADDENDA

5.1 Addendum #1

A. Issued 12/17/2025 with additional information for the prebid meeting.

5.2 Addendum #2

A. To be issued 12/22/ 2025 with additional information including bidder questions received with answers.

6. PRE-BID ISSUES

6.1 Access to sites

A. Bidders are responsible for visiting the project site(s) to familiarize themselves with field conditions that may affect their bid.

6.2 Last Day for Questions: January 6, 2026

6.3 Final Addendum: January 8, 2026

7. BID TYPE

7.1 Unit Price

8. ITEMS TO BE SUBMITTED WITH BIDS

8.1 Bid Form (Section 00410)

A. Acknowledge addenda on page 00410-02

8.2 Bid Form Attachment A (Section 00410A)

8.3 Bid Proposal Form 96 (Section 00411)

8.4 Bid Security (Bid Bond form in Section 00431)

8.5 Required Bidder Qualification Statement with Supporting Data

8.6 Evidence to do business in the state of Indiana or written covenant to obtain such authority within the time of acceptance of Bids

Due within 5 days of bid opening if requested by Owner and become a condition of the bid:

8.7 List of Proposed Subcontractors

8.8 List of Proposed Suppliers

8.9 Affirmative Action Plan

8.10 Company Wide/Project Workforce Breakdown Forms

8.11 Non-Discrimination Affidavit

9. BID DATE

9.1 Bid Opening: January 13, 2026 at 1:30 pm local time; as part of the Board of Works meeting

9.2 Bids Due: January 13, 2026 at 1:15 pm local time (The gap is to allow time for staff to walk to the meeting room. Bids will remain sealed until they are opened during the advertised public meeting.)

9.3 Location: City of Anderson Board of Public Works, 120 East 8th Street, Anderson, IN 46018

10. BID HOLDING

10.1 Held 90 days

10.2 All but lowest 3 bids will be returned

11. OTHER COMMENTS AND QUESTIONS

11.1 See Addendum #2 for a list of questions asked during the open discussion portion of the meeting.

City Of Anderson Water Pollution Control
Dry Weather Pump Station and Forcemain Rehabilitation Project

December 18, 2025 @ 9:00 AM Local Time

SIGN-IN SHEET

NAME	COMPANY	PHONE	E-MAIL
Matt Olivieri	E Tank E Pump	937-601-6603	molivieri@etank.net
Andrew Morris	E-Tank E-Pump	317-670-0021	amorris@etank.net
Derek Davidson	Wilhelm Construct.	317-690-7456	Derek Davidson@wilhelm.com
Jonathan Bray	Patterson Horth	317-526-7088	jbray@pattersonhorth.com
Andrew Blanford	Ottenweller Contracting	812-569-3130	andrew.blanford@ottenweller.com
Matthew Ottenweller	Ottenweller Contracting	260-466-1212	Matthew.ottenweller@ottenweller.com
Dillon Carpenter	Thieneman Construction	765-760-5946	dillon.carpenter@t-c-i.net

City Of Anderson Water Pollution Control
Dry Weather Pump Station and Forcemain Rehabilitation Project

December 18, 2025 @ 9:00 AM Local Time

SIGN-IN SHEET

NAME	COMPANY	PHONE	E-MAIL
Carl Terry	Reliant Electric	765-660-1108	info@reliantelectric.com
Drew Wilson	Egis	765-480-8849	drew.wilson@egis-group.com
Aaron Haskett	Simms Painting Co INC	812-870-1386	aaron.haskett@simmspainting.com

2

591

CONCRETE

Sta 2+00

Sta 2+40

WHITE

FLOW

RIVER

DRIVE

DRIVE

Sta 2+40

R=150'
T=150'

PT
Sta 3+30

30" FORCE MAIN

Sta 3+40

PAVEMENT

DRIVE

Sta 3+40

30" Conc. Pipe Force Main

SECONDARY AERATOR

SECONDARY CLARIFIER

SLUDGE TREATMENT WORKS

FINAL CHLORINE CONTACT

TRICKLING FILTER

ADMINISTRATION BUILDING

HEATING PLANT

PRIMARY SETTLING TANKS

Sta 3+30

DRIVE

75' RAD.

P.C. Sta 3+25

Sta 3+40

DRIVE

41.8 Water

41.8 Water

Spoil Bank

LANDS

Spoil Bank

LANDS OF ELMER BLAIR

OLD STONE QUARRY

NOTE

FOR PROFILE OF FORCE MAIN
FROM Sta 2+00 TO Sta 3+30
SEE SHEET NO 3

REVISIONS.	
DATE.	BY.

GENERAL LAYOUT PLAN - 30" FORCE MAIN AND SEWAGE TREATMENT WORKS
INTERCEPTING SEWERS. ANDERSON, IND.

SCALE: 1" = 50'-0" PROJECT NO: 3812.
DATE: APRIL 1938 DRN: S & J. CHK: PHM.
RUSSELL B. MOORE CO., CONSULTING ENGRS.,
INDIANAPOLIS, INDIANA. THIS DRAWING CERTIFIED: R.B. Moore

WHITE RIVER

WHITE RIVER

Sta 23+00 Match Mark Sheet No 3

Sta 20+08.0 T=51.0 R=500'

P.T. 20+15.7

P.C. 19+15.7

8" Pipe Survey Line

P.T. 18+72 = 18+77

Sta 21+22.5

P.T. 22+22.5

Sta 21+50

P.C. 21+22.5

P.T. 20+15.7

Sta 20+08.0

P.C. 19+15.7

T=50'0 R=1000'

T=51.0' R=500'

MOSS ISLAND ROAD - CONCRETE

30" Conc. Force Main

8" Pipe Sewer Line

15

SHUTTERS

MOSS ISLAND ROAD Conc.

Sta 17+00

T=50'

R=500'

30" Conc. Force Main

15

8" Pipe Survey Line

Match Mark Sheet "5"

50.0

40.0

30

Present Ground

Present Ground

30 in. Concrete Force Main.

11.50

11.50

Vert. Curve

Vert. Curve

Slope 1.6' per 100'

36" Conc. Force Main.

Elev 31.40

Sta 23+00 Sta 22+00 Sta 21+00 Sta 20+00 Sta 19+00 Sta 18+00 Sta 17+00

Revisions
Date By

30" Concrete Force Main
Sta 17+00 to Sta 23+00
Intercepting Sewer Anderson, Ind

Scale Horiz 1"=100'
Vert 1"=10'
Project No. 3812

Date April 1938 De Wire Jr. Pm
Russell B. Moore Consulting Engr
Indianapolis

This Drawing Certified
RBMoore

5

3

WHITE

RIVER

R to 1000'
I = 4°18
T = 41.61

12" CONC. CULVERT

CONCRETE

PAVEMENT

PC STA 1+34.41

PT STA 2+16.21

EL 450

30" FORCE MAIN

LANE TO QUARRY LANE

FENCE
REMOVE AND REPLACE.

FENCE

30

30+45.0

10°-0'

EDGE OF CURB
120.0'
TANGENT 150'

PC STA 1+17.58

STA 29+80 ±

NOTE

FOR LOCATION OF FORCE MAIN
STA 29+80 TO STA 33+30 SEE
SHEET NO 2

30" FORCE MAIN TO JOIN SEE SHEET NO 2.

MATCH MARK SEE SHEET NO 4

TOP OF MASONRY ELEV 58.00

PRESENT GROUND LINE

PRIMARY SETTLING TANK

50

40

INVERT ELEVATION 48.00

VERT. CURVE

ELEV 48.00

SLOPE 3.167 '/100'

12" CONC. CULVERT

30 in Concrete Force Main

VERT. CURVE

ELEVATION 41.50

REVISIONS	
DATE	BY

30" CONCRETE FORCE MAIN
STA 33+00 TO STA 33+30
INTERCEPTING SEWERS ANDERSON, IND

SCALE HORIZ 1"=40'
VERT 1"=8'
PROJECT NO 3612

DATE APRIL 1938
RUSSELL B. MOORE & CONSULTING ENGRS
INDIANAPOLIS

DE WWS CH PHL

THIS DRAWING CERTIFIED
INDIANA

5
WHITE
RIVER
BELT
RAILROAD
34.0± Normal River Level
FL. 34.74
BM 45.19 N.W. Cor. H.W.
Match Mark See Sheet #4
10
Remove and Replace Fence
Base Survey Line
30" Conc. Force Main
5
Remove and Replace Fence
Pump Station
Suction Pit
Chamber and Suction Pit
For Construction Details See Sheets # to #
Grit Remover & Washer
Grit Chamber
Disc Frame
Communitor Chamber
P.T. Sta 2+52.08
T= 46.78
R= 200'
Sta 21+85
Remove and Replace Fence
P.C. Sta 1+18.72
54" Conc Pipe
V= 2.8 cfs
Q= 28 MGD.
Manhole #1+07.5
For Details of Inter Chamber See Sheet # 25
96" Dewey St. Sewer S=.2%
Sta 0+87.5
Sta -0+21
48" Conc. Intercepter S=.05%
Q= 20 MGD
V= 2.6 cfs
Base Survey Line
Survey Line
Sta 0+00
50
40
30
R.R. Siding
Present Ground
Present Ground
Present Ground
30in Concrete Force Main
33.50
Pump Sta Super Structure
Pumping Station and Screen
Grit Remover and Washing Equip
Grit Chamber
Communitor Chamber
Super Structure
Inv. 30.83
MH 1+07.5
96" Dewey St Sewer.
Remove Lower portion of 96" Sewer Pipe Class "D" Conc. Under 96" Sewer and over 48" Conc Pipe
Elev Top of Weir 36.20
Inv. 96" Sewer 35.03
Inv. 34.85
54" Conc Pipe. Cl "B" S=.05%
Inv. 33.00
Cl B 48" Conc Pipe S=.05%
Inv. 48" Conc Pipe Elev 31.36
Inv. 31.35
Inv. 30.91
Sta 21+85
Revisions
Date By
30" Conc. Force Main - 54" and 48" Conc Sewer
Sta 4+00 To Sta 11+00 And Sta 0+18.75 To St
Intercepting Sewer Anderson, Ind
Scale Horiz 1"=40'0 Vert 1"=4'
Project No 3812
Date April 1938 Dr WWS Ch PHJ
Russell B. Moore Co. Consulting Engrs
Indianapolis Indiana
This Drawing Certified

CITY OF ANDERSON, INDIANA

WATER QUALITY CONTROL PROJECT

HONORABLE ROBERT L. ROCK, MAYOR

BOARD OF PUBLIC WORKS

CHESTER LAWRENCE-CHAIRMAN
RAYMOND NUCE - MEMBER
LLOYD MELLENTHIN - MEMBER

DIVISION II

WASTEWATER FORCE MAIN

HENRY B. STEEG & ASSOCIATES

A DIVISION OF

HOWARD NEEDLES TAMMEN & BERGENDOFF

ENGINEERS

INDIANAPOLIS, INDIANA

CERTIFIED
HENRY B. STEEG & ASSOCIATES
A DIVISION OF HOWARD NEEDLES TAMMEN & BERGENDOFF
BY:

GEORGE K. ERGANIAN, PARTNER
REGISTERED ENGINEER NO. 4439
STATE OF INDIANA

GEORGE K. ERGANIAN — REGISTERED — No. 4439 — STATE OF INDIANA — PROFESSIONAL ENGINEER

APPROVED July 22, 1974
BOARD OF PUBLIC WORKS
ANDERSON, INDIANA
ROBERT L. ROCK - MAYOR

BY _____
CHESTER T. LAWRENCE - CHAIRMAN

BY _____
RAYMOND H. NUCE

BY _____
LLOYD R. MELLENTHIN

BY _____
LLOYD LINE - ACTING CITY ENGINEER

BY _____
A.E. HOLLENBECK - SUPERINTENDENT

SET NO. [redacted]

MARBAUGH (Borders Only)

MOSS ISLAND ROAD PLANT

N

WHITE RIVER

WHITE RIVER

New Clean-Out

Existing 30" Force Main Approx. Cover 4'-6"

Concrete Pavement Rd.

Existing 6" C.I.

Slope To Drain

Digester Control Building

Air Relief

New Clean-Out

Water Level 833.8

Waste Pond

Tank

Existing 36" Force Main Approx. Cover 7'-0"

New Clean-Out

Pavement Repair

Air Relief

Repair Lawns & Dones

Replace Fences

New Clean-Out

P.R. Crossing Air Relief

Existing 30" Force Main Approx. Cover 6'-0"

New Clean-Out

Proposed 36" D.I. Force Main

Existing 6" C.I.

Proposed 36" D.I. Force Main

Water Level 829.8

Raible Ave.

8th St.

St. Rd.

488,000 E

488,500 E

487,000 E

486,500 E

486,000 E

DEWEY STREET PLANT

CITY OF ANDERSON, INDIANA
WATER QUALITY CONTROL PROJECT

WASTEWATER FORCE MAIN

LOCATION PLAN

JOB NO. 109900

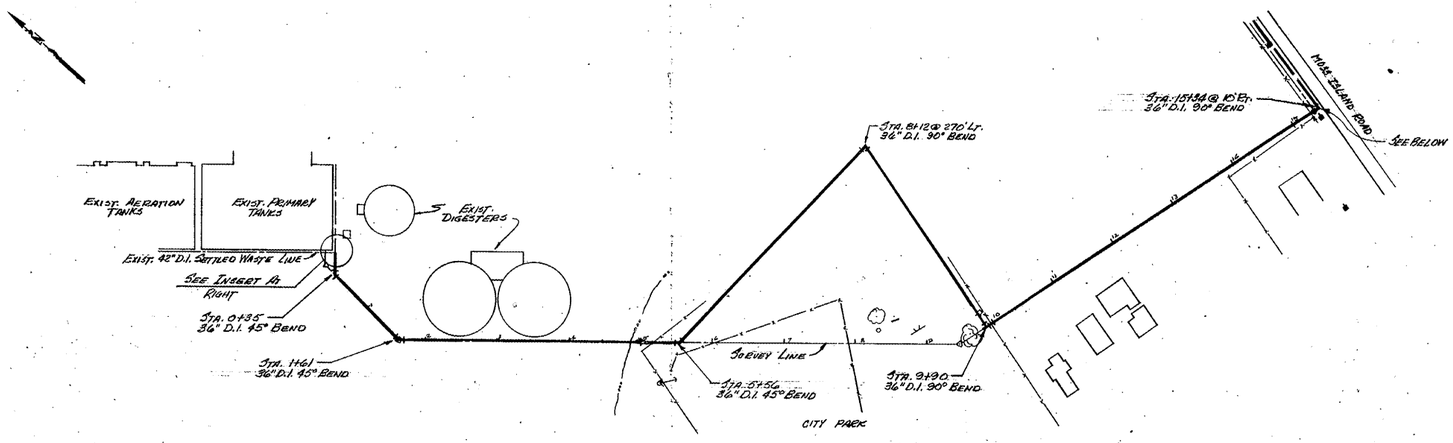
DIV. II

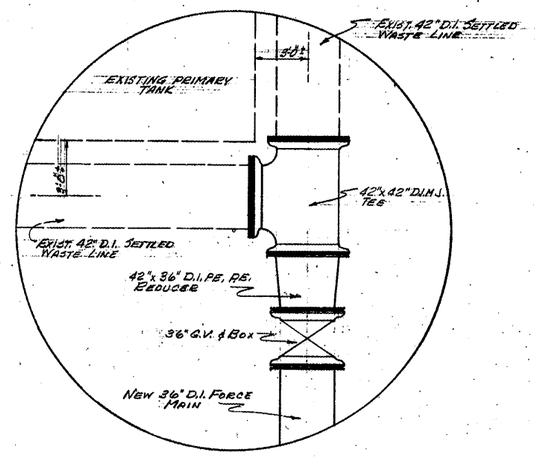
DATE 6-3-77

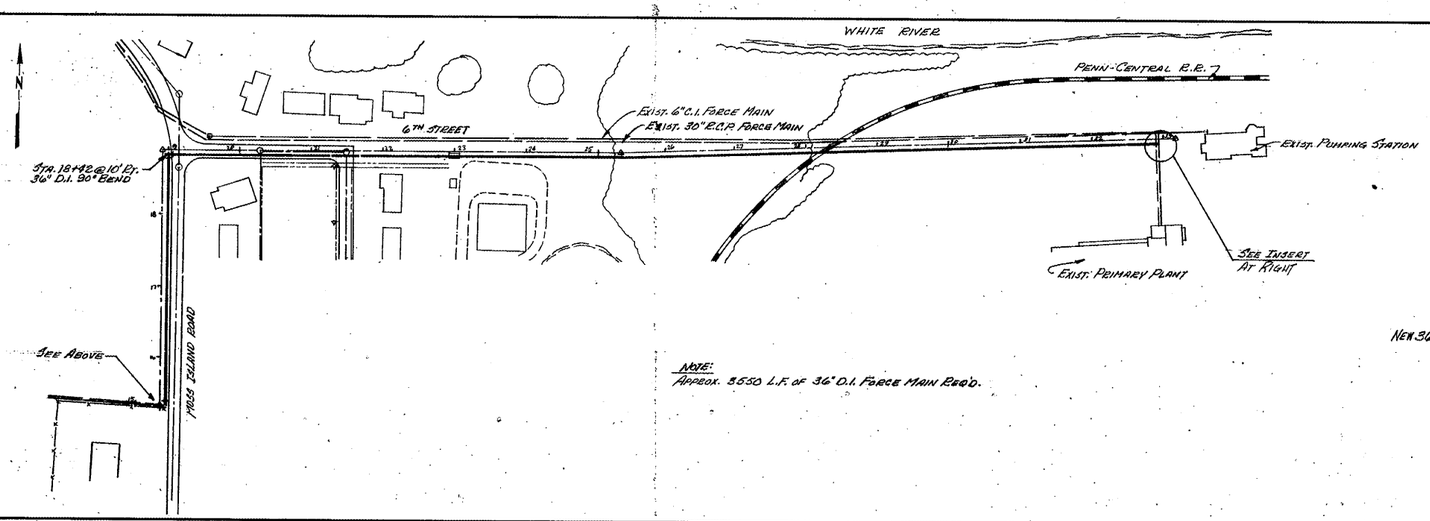
HENRY B. STEEG & ASSOCIATES, INC.
ENGINEERS
4650 NORTH PENNSYLVANIA STREET
INDIANAPOLIS, INDIANA

SHEET NO. 1

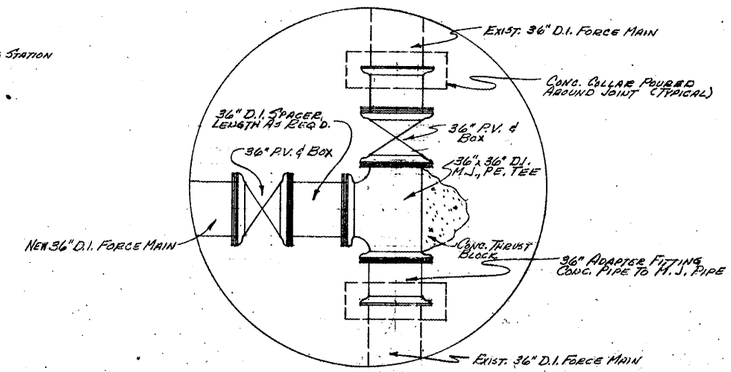
SCALE 1"=100'

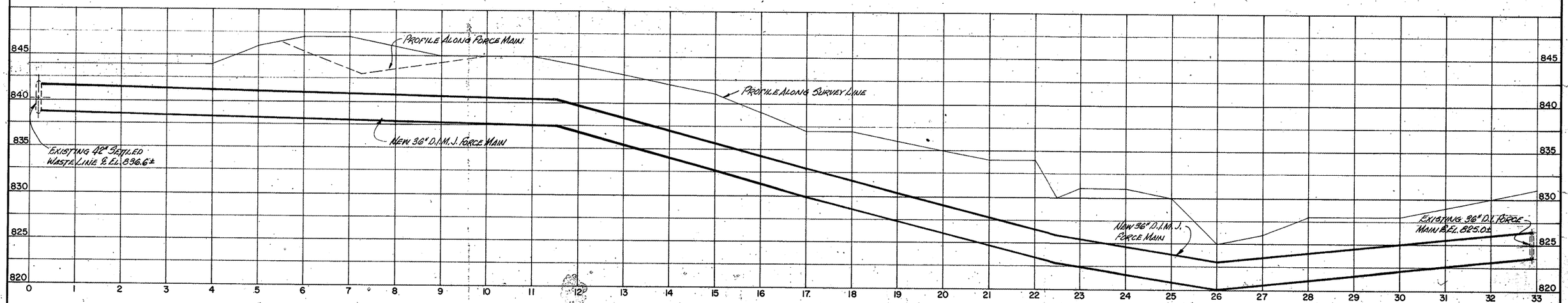






NOTE:
APPROX. 3550 L.F. OF 36" D.I. FORCE MAIN REQ'D.





SYMBOL	REVISIONS	BY	DATE	APPROVED

DESIGNED	
DRAWN	
TRACED	
CHECKED	
CERTIFIED	DATE
BY	

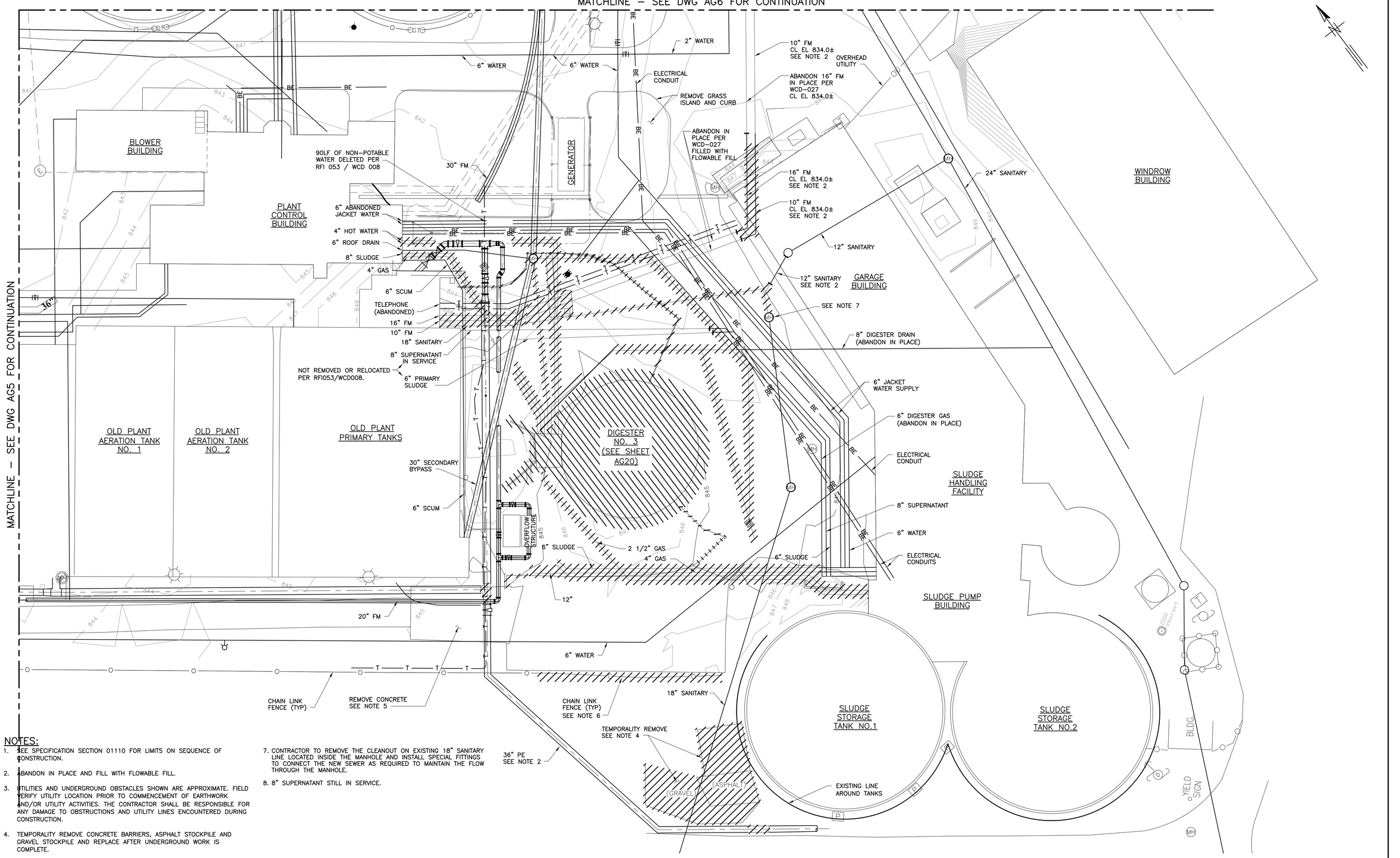
Henry B. Steeg & Associates, inc.
Engineers
4930 NORTH PENNSYLVANIA STREET
INDIANAPOLIS, INDIANA 46205

JOB NO. 109900
DIV. II
DATE 6-21-73

CITY OF ANDERSON, INDIANA
WATER QUALITY CONTROL PROJECT
WASTEWATER FORCE MAIN
FORCE MAIN
PLAN & DETAILS

SHEET NO. 2
SCALE 1"=100'

MARBAUGH-10-9136



NOTES:

1. SEE SPECIFICATION SECTION 01110 FOR LIMITS ON SEQUENCE OF CONSTRUCTION.
2. ABANDON IN PLACE AND FILL WITH FLOWABLE FILL.
3. UTILITIES AND UNDERGROUND OBSTACLES SHOWN ARE APPROXIMATE. FIELD VERIFY UTILITY LOCATION PRIOR TO COMMENCEMENT OF EARTHWORK AND/OR UTILITY ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION.
4. TEMPORALITY REMOVE CONCRETE BARRIERS, ASPHALT STOCKPILE AND GRAVEL STOCKPILE AND REPLACE AFTER UNDERGROUND WORK IS COMPLETE.
5. REMOVE CONCRETE SLAB AND RESTORE AFTER UNDERGROUND WORK IS COMPLETE.
6. REMOVE CHAIN LINK FENCE AND RESTORE NEW AFTER SITE WORK IS COMPLETE.
7. CONTRACTOR TO REMOVE THE CLEANOUT ON EXISTING 18" SANITARY LINE LOCATED INSIDE THE MANHOLE AND INSTALL SPECIAL FITTINGS TO CONNECT THE NEW SEWER AS REQUIRED TO MAINTAIN THE FLOW THROUGH THE MANHOLE.
8. 8" SUPERNATANT STILL IN SERVICE.

GENE GUSTIN WAY –ENLARGED EXISTING AND ULTILITY DEMOLITION PLAN 3

SCALE: 1"=20'

RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
7820 Innovation Boulevard, Suite 150
INDIANAPOLIS, INDIANA 46278

DESIGNED	KLC
DRAWN	WAL
CHECKED	GED
APPROVED	

NO.	DATE	APPD	REVISION
2	12/2013	KLC	RECORD DRAWING REVISIONS

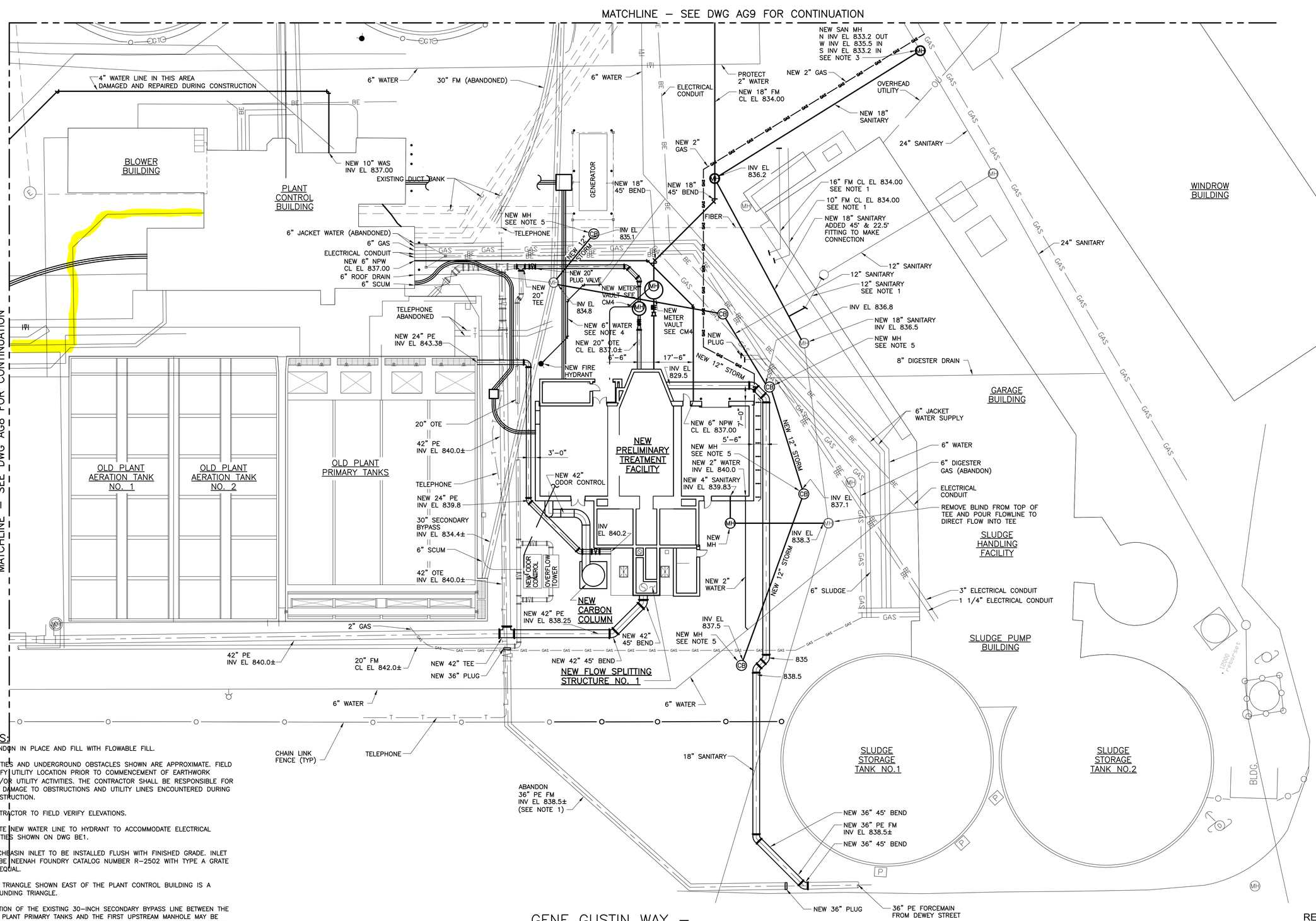
SCALE
20 0 20 40 FT
1"=20'

CITY OF ANDERSON, INDIANA
WATER POLLUTION CONTROL PLANT
FACILITY IMPROVEMENTS
DIVISION II

GENERAL
GENE GUSTIN WAY
ENLARGED EXISTING SITE AND UTILITY DEMOLITION PLAN 3

FILE NAME 01798FAG07.DWG
DWG AG7
SHEET 7 OF 186
DATE SEPTEMBER 2011 REV 2

FILE: J:\Projects\01798F Anderson WPC Improvements – Div 2\21 CADD Files\21.110 Conformed Drawings\01798FAG07 1:1 01/27/12 14:53 GH-H



NOTES:

1. ABANDON IN PLACE AND FILL WITH FLOWABLE FILL.
2. UTILITIES AND UNDERGROUND OBSTACLES SHOWN ARE APPROXIMATE. FIELD VERIFY UTILITY LOCATION PRIOR TO COMMENCEMENT OF EARTHWORK AND/OR UTILITY ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION.
3. CONTRACTOR TO FIELD VERIFY ELEVATIONS.
4. ROUTE NEW WATER LINE TO HYDRANT TO ACCOMMODATE ELECTRICAL UTILITIES SHOWN ON DWG BE1.
5. CATCHBASIN INLET TO BE INSTALLED FLUSH WITH FINISHED GRADE. INLET TO BE NEENAH FOUNDRY CATALOG NUMBER R–2502 WITH TYPE A GRATE OR EQUAL.
6. THE TRIANGLE SHOWN EAST OF THE PLANT CONTROL BUILDING IS A GROUNDING TRIANGLE.
7. PORTION OF THE EXISTING 30–INCH SECONDARY BYPASS LINE BETWEEN THE OLD PLANT PRIMARY TANKS AND THE FIRST UPSTREAM MANHOLE MAY BE ABANDONED TO FACILITATE CONSTRUCTION OF NEW PRELIMINARY TREATMENT FACILITY. CONTRACTOR TO VERIFY NO LIVE CONNECTIONS IN SECTION TO BE ABANDONED. PLUG THE LINE AT FIRST UPSTREAM MANHOLE AND FILL SECTIONS REMAINING WITH FLOWABLE FILL.

GENE GUSTIN WAY – ENLARGED NEW SITE AND UTILITY PLAN 3

SCALE: 1"=20'

RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

FILE: J:\Projects\01798F Anderson WPC Improvements – Div 2\21 CADD Files\21.110 Conformed Drawings\01798FAG10 1:1 01/27/12 15:10 GH–H

GREELEY AND HANSEN
7820 Innovation Boulevard, Suite 150
INDIANAPOLIS, INDIANA 46278

DESIGNED KLC
DRAWN WAL
CHECKED GED

APPROVED

NO.	DATE	APPD	REVISION
2	12/2013	KLC	RECORD DRAWING REVISIONS

SCALE
20 0 20 40 FT
1"=20'

CITY OF ANDERSON, INDIANA
WATER POLLUTION CONTROL PLANT
FACILITY IMPROVEMENTS
DIVISION II

GENERAL
GENE GUSTIN WAY
ENLARGED
NEW SITE AND UTILITY PLAN 3

FILE NAME 01798FAG10.DWG
DWG AG10
SHEET 10 OF 186
DATE SEPTEMBER 2011 REV 2

2 Wet Weather Pumps

Pump Data Sheet - Fairbanks Morse Pump, 60 Hz

Company: BBC Pump & Equipment
Name: Rick Littlepage
Date: 8/8/2013

Fairbanks Morse
Pentair Water

Wet Weather

Pump:

Size: 24"VTSH (B)
Type: VTSH
Synch speed: 720 rpm
Speed: 705 rpm
Dia: 22.0625 in
Curve: 902410B
Impeller: V24B1A
Specific Speeds:
Ns: 3308
Nss: 7646
Dimensions:
Suction: ---
Discharge: 24 in

Pump Limits:

Temperature: 160 °F
Pressure: ---
Sphere size: 6 in
Power: ---
Eye area: ---

Search Criteria:

Flow: 14000 US gpm
Head: 45 ft

Fluid:

Water
Density: 62.25 lb/ft³
Viscosity: 1.105 cP
Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a
NPSHa: ---

Motor:

Standard: NEMA
Enclosure: TEFC

Speed: ---
Frame: ---
Sizing criteria: Max Power on Design Curve

---- Data Point ----

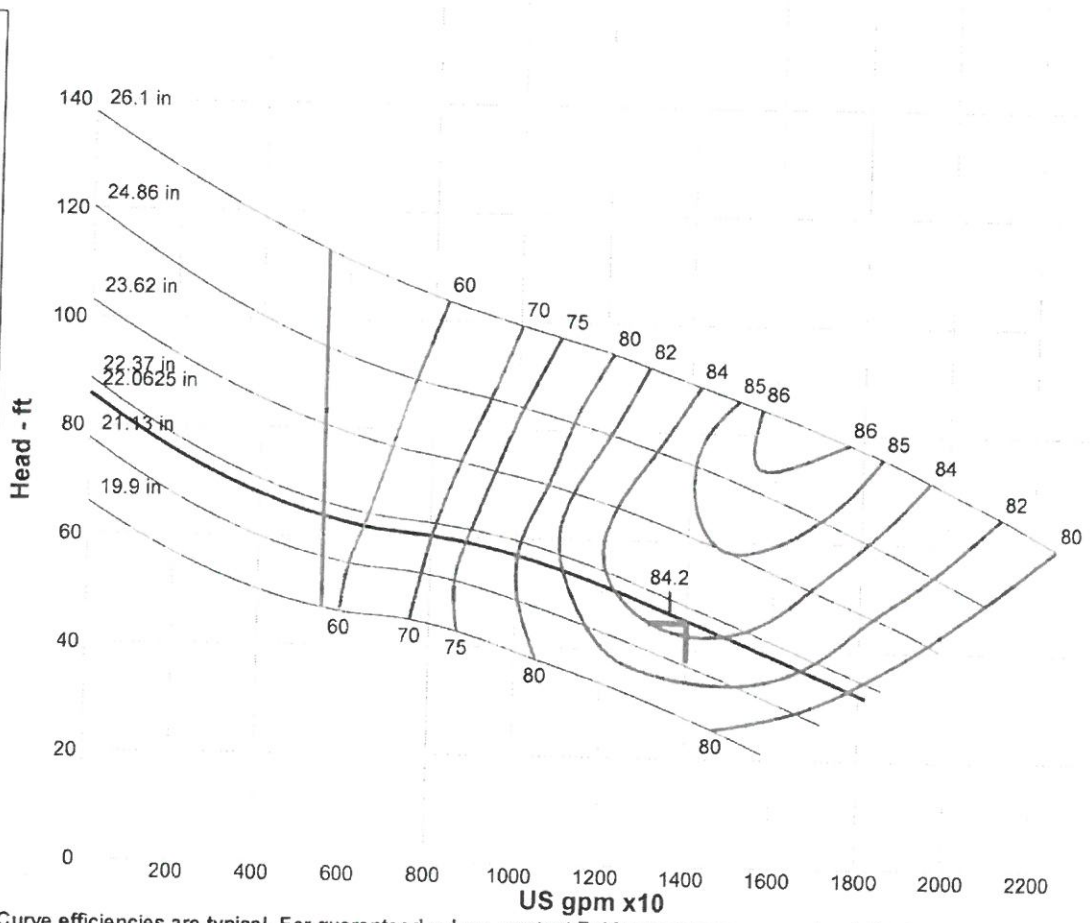
Flow:	14000 US gpm
Head:	45.4 ft
Eff:	84%
Power:	190 hp
NPSHr:	20.3 ft

---- Design Curve ----

Shutoff head:	85.9 ft
Shutoff dP:	37.1 psi
Min flow:	5500 US gpm
BEP:	84% @ 13587 US gpm
NOL power:	191 hp @ 14845 US gpm

-- Max Curve --

Max power: 424 hp @ 21207 US gpm



Curve efficiencies are typical. For guaranteed values, contact Fairbanks Morse or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Fairbanks Morse o a su distribuidor local.

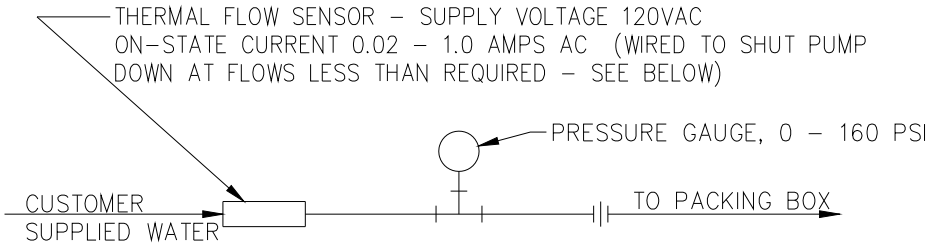
Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
16800	705	36.2	82	188	26.9
14000	705	45.4	84	190	20.3
11200	705	53.9	82	186	18
8400	705	59.8	72	175	18
5600	705	65.1	55	165	18

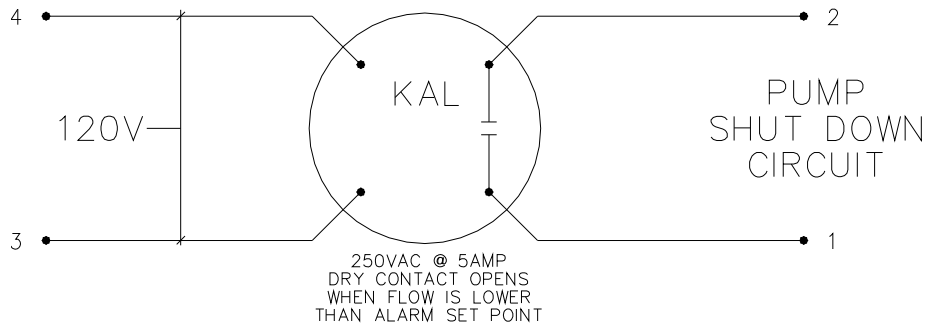
Selected from catalog: Fairbanks Morse Centrifugal.60 Vers: 3

Fairbanks Morse Pump

Seal Water Schematic



Flow Meter Wiring Diagram[1]

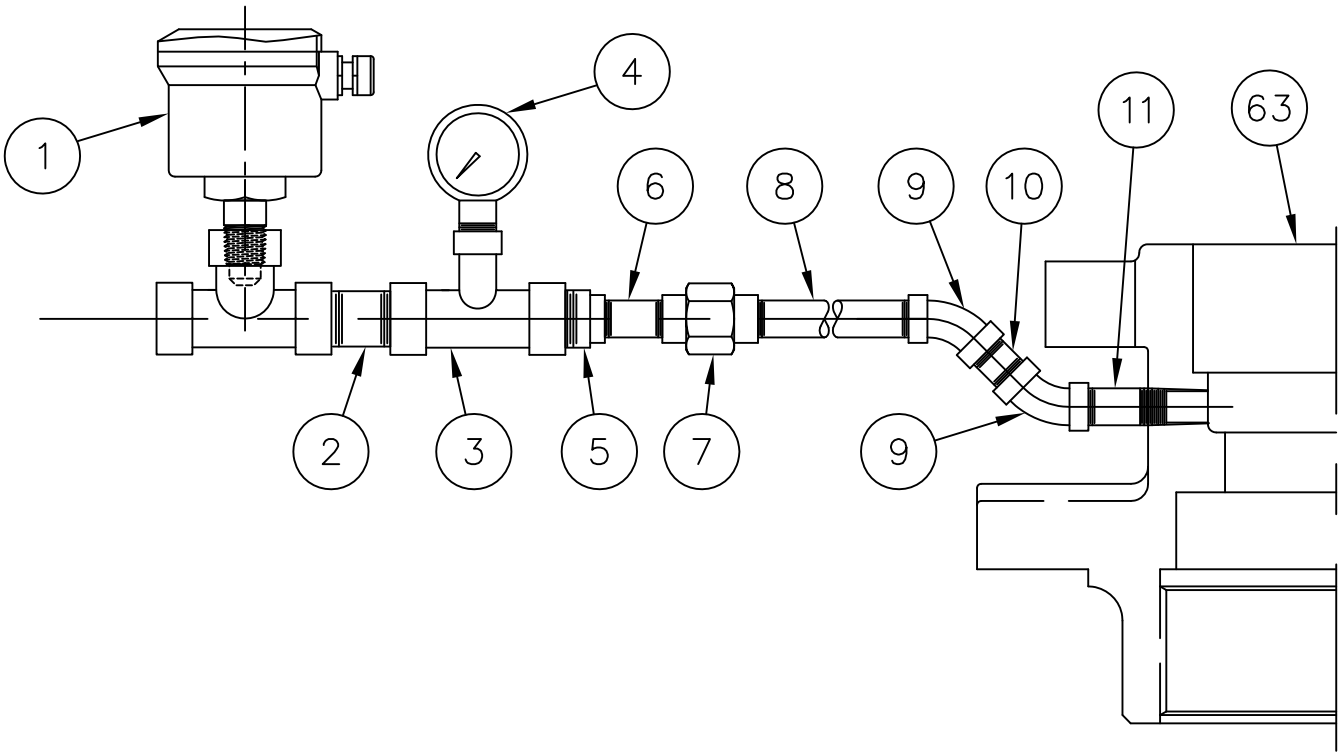


Specifications

1. The following water quality standard is recommended as a minimum for water used to flush the bearing system of this VTSH pump.
   - pH Value: 6.0-8.0
   - Solids Content:
     Dissolved: 500 PPM (MG/L)
     Suspended: 30 PPM (MG/L)
   - Maximum Particle Size: 60 Microns
   - Maximum Individual Dissolved Ions:
     Hardness: (Ca^{+}, Mg^{+}) 220 PPM (MG/L)
     Calcium Carbonate ($CaCO_3$): 10PPM (MG/L)
     Sulfate (SO_4): 50PPM (MG/L)
   - Temperature Range: 35°F - 100°F.
2. The flush water system is to be operated as follows:
   - Rubber Bowl Bearings
     1. For moderate service, the bearings must be flushed for a minimum of 5 minutes before starting the pump, continuously while in operation and at least 15 minutes after the pump is stopped.
     2. Continuous fresh water flushing is required for applications where the fluid may included an excessive amount of abrasive fines, sand or grit.
3. Flow Requirements

Pump Size	Nominal Flow (GPM)	Alarm Flow (GPM)	Minimum Pressure (PSI)
24”	1.2	0.5	50

[1] Wiring and hook up of flow switch not by Fairbanks Morse



ITEM	QTY	P/N or MATERIAL CODE	DESCRIPTION
63	1	H7x7037xx-0220-F	VTSH PACKING BOX
11	1	20FM6A0098-7380-F	3/8" PIPE NIPPLE X 2 1/4"LG
10	1	20FM6A0093-7380-F	3/8" CLOSE NIPPLE
9	2	20FM3B0003-0008-F	3/8" X 45° ELBOW
8	1	20FM6A0127-7380-F	3/8" PIPE NIPPLE X 9 1/2"LG
7	1	20FM8B0002-0008-F	3/8" UNION
6	1	20FM6A0096-7380-F	3/8" PIPE NIPPLE X 1 3/4"LG
5	1	20FM2A0004-0008-F	BUSHING 1/2" X 3/8"
4	1	HYD13S-9906-F	160# PSI PRESSURE GAUGE
3	1	20FM9A0014-0008-F	TEE 1/2" X 1/2" X 1/4"
2	1	20FM6A0141-7380-F	1/2" PIPE NIPPLE X 2"LG
1	1	HYD13V2-9906-F	* FLOWMETER

* KOBOLD KAL-K FLOW METER
MODEL NO. KAL-4215-P03R

24" VTSH SEAL WATER ASSEMBLY

Fairbanks Morse Pump Corporation

DWG. NO. VTSH-WTRFLUSH | REV NO 0

SmartBall® PWA Inspection Report

of the Dewey Street Force Main

Report Prepared for:

The City of Anderson Water Pollution Control
2801 Gene Gustin Way
Anderson, Indiana 46011

By:

Pure Technologies U.S. Inc.
(July 2015)

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July 2015

Quality Assurance/Quality Control Statement

By my signature I attest that this report has been prepared and reviewed in accordance with Pure Technologies U.S. Inc.'s Quality Assurance/Quality Control procedures:

7/10/2015

Matthew Roth, Project Manager Date

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Executive Summary

The City of Anderson Water Pollution Control (Anderson) retained the services of Pure Technologies U.S. Inc. (Pure Technologies) to perform an inspection of the Dewey Street Force Main (Dewey Force Main). The purpose of the inspection was to detect and locate leaks, gas pockets, and stress anomalies within the force main at the time of the inspection. This inspection was completed using the SmartBall® Pipe Wall Assessment (PWA) free swimming inspection system. The inspection was performed on February 25, 2015. The Dewey Force Main is comprised of 3,596 feet of 36-inch ductile iron pipe (DIP) that transfers wastewater from the Dewey Street Pump Station to Gene Gustin Treatment Facility.

The SmartBall PWA tool was inserted into the pipeline through a 4-inch air release valve located on the grounds of the Dewey Street Pump Station. The SmartBall PWA tool collected acoustic and PWA data from within the pipeline, while the SmartBall Receivers (SBR) collected tracking data which was used to locate the inspection findings. This data has been evaluated to identify and locate areas of interest along the Dewey Force Main. Details of the Dewey Force Main are provided in Table ES.1.

Table ES.1: Pipeline Details	
Total Length of Pipe Inspected:	3,596 feet
Pipe Material:	DIP
Diameter of Pipe:	36 inch
Fluid Conveyed:	Wastewater

No leaks or stationary gas pockets were detected during the inspection of the Dewey Force Main. However, two (2) gas slugs and eight (8) PWA anomalies were found during the time of the inspection. The results of the inspection are summarized in Table ES.2.

Table ES.2: Summary of Inspection Results	
Acoustic Anomalies Characteristic of Leaks:	0
Acoustic Anomalies Characteristic of Pockets of Trapped Gas:	0
Acoustic Anomalies Characteristic of Gas Slugs:	2
Pipe Wall Anomalies:	8
Duration of Inspection:	52 minutes
Average SmartBall Velocity:	1.2 feet/sec

Gas slugs are transient accumulations of gas that move through the pipeline with flow and are expelled through air release valves. Providing that all air release valve are functioning and there are no localized high points without air release valves, gas slugs are typically not of concern.

PWA anomalies likely indicate areas of increased stress in the pipe wall. Causes for increased stress may include reduced wall thickness due to corrosion, bending moments, point loading, and cracking. Further investigation such as an external visual inspection and ultrasonic thickness measurements is needed to determine the cause of the eight (8) PWA anomalies.

During the analysis of the data obtained during the inspection, Pure Technologies identified discrepancies between the velocity profile of the SmartBall tool and the drawings provided by Anderson. Due to these discrepancies Pure Technologies has less confidence in the reported location of the PWA anomalies and the gas slugs detected. Prior to any additional condition assessment including excavations to investigate these results, the discrepancies need to be resolved.

Based on the inspections of the Dewey Force Main, Pure Technologies concludes the following:

1. The average velocity of the SmartBall PWA tool during the inspection was estimated to be 1.2 ft/sec.
2. There were no leaks or gas pockets detected in the force main at the time of inspection.
3. There were two (2) gas slugs detected during the inspection. Gas slugs are transient conditions and are not typically of concern.
4. Eight (8) PWA anomalies were detected in the force main, two (2) were classified as small and six (6) were classified as medium. Additional investigation is needed to determine the cause of the PWA anomalies. Pure recommends test pitting to determine the source and severity of the stress at these locations.
5. A discrepancy between the velocity profile of the SmartBall PWA device and the distances between features indicated on the provided drawings of the Dewey Force Main was identified during data analysis. This discrepancy results in less confidence in the reported location of gas slugs and PWA anomalies. Additional distance measurements are need to more accurately locate the inspection results.

1. Introduction and Background

1.1 Project Background

On February 25, 2015, Pure Technologies conducted a SmartBall PWA inspection of the 36-inch Dewey Force Main located in Anderson, Indiana. The Dewey Force Main is comprised of 36-inch DIP and was constructed in July, 1974. The force main conveys combined wastewater and storm water and flows westerly along the White River.

The inspection proceeded approximately 3,596 feet from the Dewey Street Pump Station to the Gene Gustin Treatment Facility. For the entirety of the inspection the Dewey Street Pump Station ran only Pump RSP-3 which provided an operational pressure of approximately 17.5 psi.

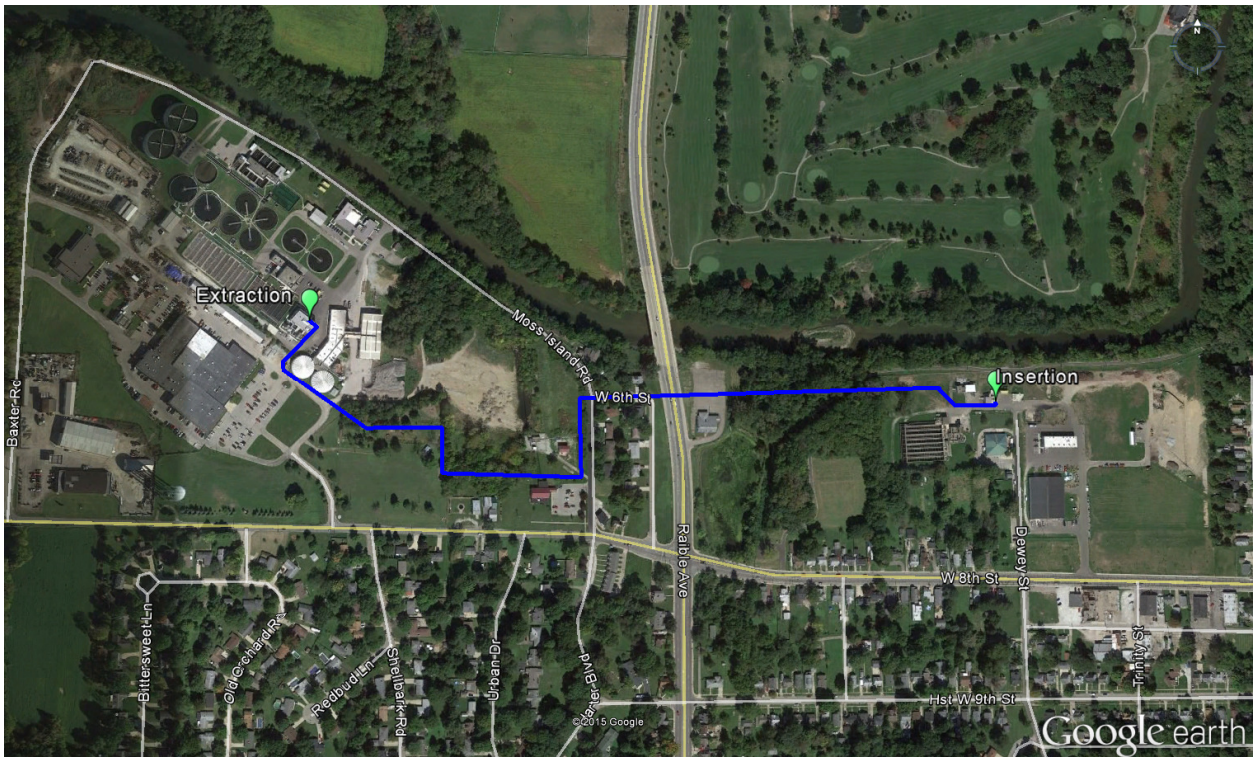


Figure 1.1: Approximate Location of the Dewey Force Main

1.2 Project Scope

The scope of this project was to inspect for leaks, gas pockets, and pipe wall anomalies occurring in the Dewey Force Main. This report provides the results of the inspection. The assessment of the Dewey Force Main utilized SmartBall leak and gas pocket detection technology with pipe wall assessment. This report details the results and provides information to assist Anderson in their management of the Dewey Force Main.

1.3 Reviewed Documents

To complete the assessment of the Dewey Force Main, Pure Technologies reviewed the following documents:

- Henry B. Steeg & Associates A Division of Howard Needles Tammen & Bergendoff Engineers. *Division II Wastewater Force Main, Force Main Plan and Details, City of Anderson, Indiana Water Quality Control Project.* September 1968.
- Greeley and Hansen. *Drawing G6, General Dewey Street New Piping Plan, City of Anderson, Indiana Water Pollution Control Plant Facility Improvements Division I.* July 17, 2009.
- Greeley and Hansen. *Drawing AM1, Piping and Equipment Lift Station, Screen Structure & Junction Chamber Sect Plan. City of Anderson, Indiana Water Pollution Control Plant Facility Improvements Division I.* July 17, 2009.
- Greeley and Hansen. *Drawing AM3, Piping and Equipment Lift Station and Screen Structure Sections, City of Anderson, Indiana Water Pollution Control Plant Facility Improvements Division I.* July 17, 2009.
- Greeley and Hansen. *Drawing AG10. City of Anderson, Indiana Water Pollution Control Plant Facility Improvements Division II, General Gene Gustin Way, Enlarged New Site and Utility Plan*. September 2011.
- Greeley and Hansen. *Drawing BM2, Enlarged New Site and Utility Plan, City of Anderson, Indiana Water Pollution Control Plant Facility Improvements Division II, General Gene Gustin Way.* September 2011.

1.4. Inspection and Failure History

Pure Technologies was not made aware of any prior inspections of the Dewey Force Main. Additionally, Pure Technologies is not aware of any past failures of the Dewey Force Main.

Although two sections of the pipeline were replaced. These have been replaced within the last eight years. The first of which was replaced on the site of the Dewey Street Pump Station for the first few hundred feet. The second of which was replaced from just upstream of the air release valve location on the Gene Gustin Treatment Facility up to the treatment plant. Drawings of the replaced section of the pipeline were not available, which may have affected the accuracy of the inspection data.

2. Description of SmartBall Technology

2.1 Overview

Pure Technologies' SmartBall leak and gas pocket detection system is a free-swimming, acoustic-based technology that detects acoustic activity associated with leaks or gas pockets as well as stress in pressurized pipelines. Advantages and limitations of the SmartBall tool can be referenced in Appendix B. The SmartBall core is comprised of a water-tight aluminum alloy shell that contains a power source, electronic components, and instrumentation including an acoustic sensor, accelerometer, magnetometer, ultrasonic transmitter, and a temperature sensor. The aluminum core is encapsulated by a protective foam shell. The foam outer shell provides a larger surface area by which the device is pushed by the flow of the fluid conveyed while reducing low frequency ambient noise that is typically present in a pipeline. The SmartBall tool is deployed into the flow of a pipeline, traverses the pipeline, and is captured and extracted

at a point downstream. During the inspection, the SmartBall tool's location is tracked at known points along the pipeline to correlate the inspection data with the inspected distance.

2.2 Identifying Leaks and Gas Pockets

2.2.1 Acoustic Anomalies Representing Leaks

A leak inside a pressurized pipeline produces sound as the fluid escapes into the lower pressure atmosphere outside the pipeline. While a SmartBall tool traverses a pipeline, it continuously records acoustic data, which is later evaluated to identify acoustic anomalies consistent with leaks. As the SmartBall tool is rolling along the bottom of a pipeline, it will always pass within one (1) pipe diameter of a leak.

As the SmartBall tool moves toward a leak the amplitude of the sound created increases, peaking at the exact location of the leak, and then diminishes as the tool travels away. The increase and decrease of the amplitude of the audio data is critical to precisely locate leaks. Figure 2.1 depicts the audio data of a leak when viewed in the leak and gas pocket detection analysis software.

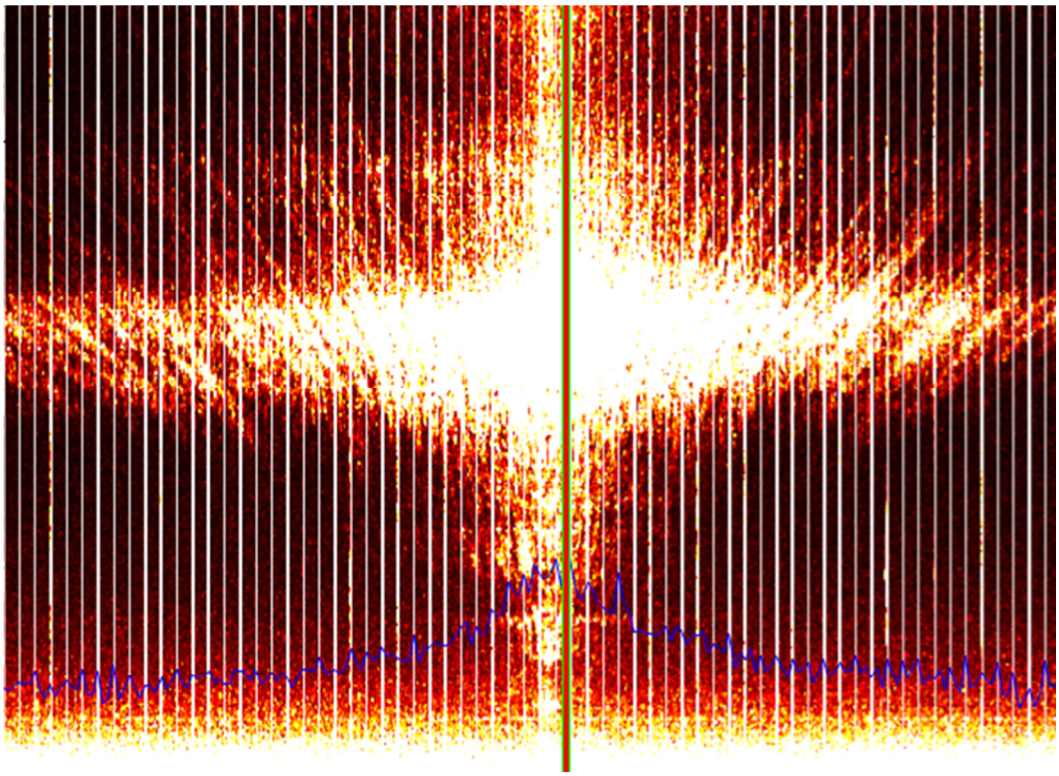


Figure 2.1 : Leak detected in Analysis Software

During the data analysis process, the acoustic properties of potential leaks are evaluated to estimate their magnitude. Pure Technologies reports leaks in three (3) categories: small, medium and large. Small leaks are estimated to be in the range of 0 - 2 gallons per minute (GPM). Medium leaks are estimated to be in the range of 2 - 10 GPM and large leaks are estimated to be greater than 10 GPM.

Pure Technologies has invested heavily into identifying the characteristics of an acoustic anomaly that would be representative of a leak. The characteristics typical of a leak include:

- The range of frequencies present increases as the ball approaches the leak
- The frequencies that appear first intensify as the SmartBall tool approaches the leak
- The frequencies that indicate a leak are consistent as the SmartBall tool approaches the leak

2.2.2 Acoustic Anomalies Representing Gas Pockets

Gas trapped in a pipeline may present itself as entrained gas, gas slugs/developing gas pockets, or fully developed gas pockets. Each of these distinct forms of gas accumulations have acoustic signals that can be detected using the SmartBall tool.

A gas pocket inside a pipeline generates a distinct acoustic signal that is detectable using the SmartBall leak and gas pocket detection system. Gas pockets in pressure pipes are typically found at high points in the pipeline often due to malfunctioning or misplaced air release valves. The acoustic signal is created by the liquid turbulence at the air/water interface. In full, pressurized pipes, this turbulence is not present.

Entrained Gas

Entrained gas is characterized by small bubbles within the pipeline moving with flow. Entrained gas is not typically static in force mains and frequently migrates with the flow. These small moving pockets of gas can be introduced at the pumping station as a result of air becoming entrained in the sewage as it enters the wet well, or by inefficiencies within pump stations. Entrained gas can also be created at the tail of a hydraulic jump at the end of a fully developed gas pocket whereby small pockets of gas diffuse into the liquid and are carried downstream with the flow. Lastly, entrained gas may be created by the biochemical processes inherent to sewage mains. A depiction of entrained gas can be seen in Figure 2.2.

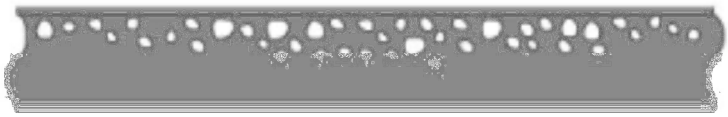


Figure 2.2: Entrained Gas (Pothof, 2011)

Slug or Developing Gas Pockets

A gas slug can be characterized as small pockets of trapped gas that often develop when entrained gas amalgamates, or are introduced via air release valves or vacuum breaks. Slugs can be either static or migratory. If they are detected at a localized high point they are likely static, if detected elsewhere they are likely migrating towards a high point. A diagram of gas slug is provided in Figure 2.3.

Figure 2.3 : Gas Slugs (Pothof, 2011)

Fully Developed Gas Pockets

Gas pockets are generally located at localized high points along a force main. These develop as a result of slugs that have accumulated at a high point, and have extended into the downward slope of the pipe. A fully developed gas pocket typically has a hydraulic jump prior to the point where the pipeline resumes full flow which creates an area of turbulent flow and gas dissolution into the liquid phase. Due to the turbulent nature of the hydraulic jump and frequent wet/dry cycles at these locations, these areas are at a higher risk of failure than other portions of the gas pocket. An illustration of a fully developed gas pocket and hydraulic jump is provided in Figure 2.4. Figure 2.5 depicts the audio data of a gas pocket when viewed in the leak and gas pocket detection analysis software.

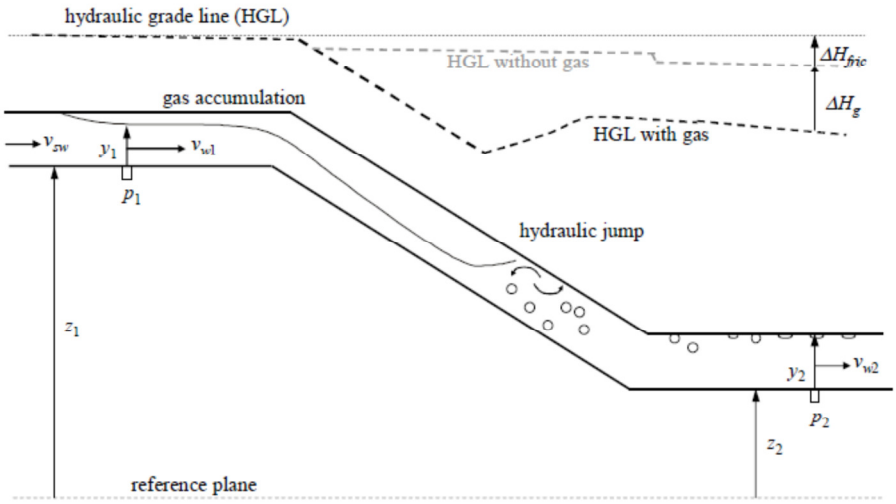


Figure 2.4: Diagram of a fully developed gas pocket (Pothof, 2011)

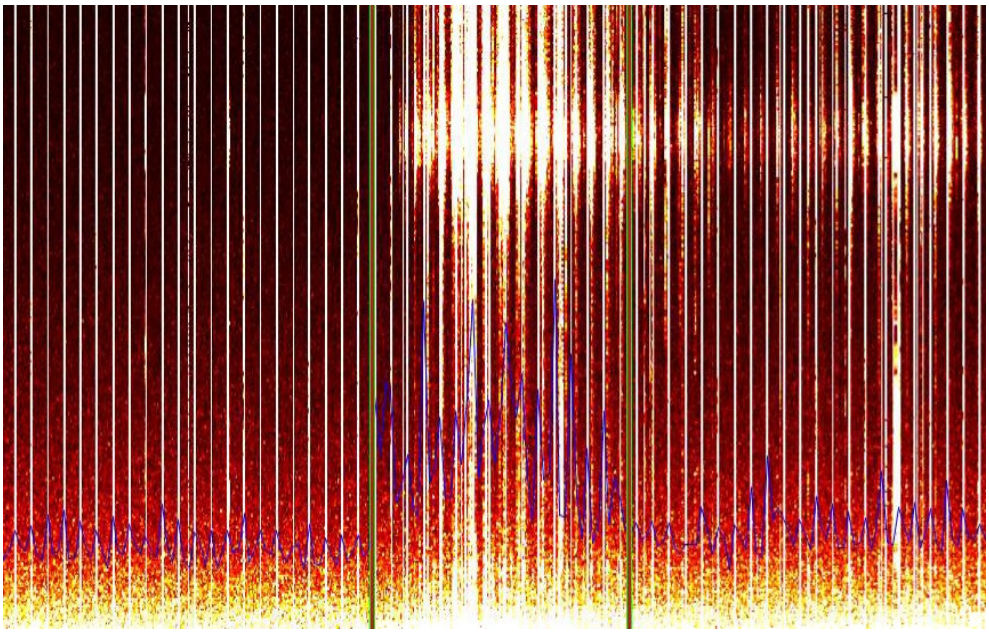


Figure 2.5: Gas Pocket detected in Analysis Software

2.3 Pipe Wall Assessment

Pure Technologies SmartBall PWA technology is used to evaluate metallic pipelines by detecting and measuring the changing levels of stress in the pipe wall. PWA technology is a screening tool that provides a low-resolution indication of the condition of the pipe. The technology can be used as a first stage of pipeline condition assessment to help make informed decisions to focus higher resolution investigations, inspection, data collection and subsequent management or rehabilitation.

The PWA technology measures the change in the self-generated magnetic field produced by ferromagnetic materials in stress. The level of stress and amount of material under that stress is proportional to the change in the magnetic field measured by the SmartBall PWA tool. The data is collected using Pure Technologies' SmartBall PWA tool which rolls through the pipeline, thus, the sensors are never more the one pipe diameter from the pipe wall. The SmartBall PWA tool's sensors sample data hundreds of time per second gathering detailed data over each pipe section (joint to joint). Data analysts then carefully analyze the signal response, measure these changes and report the location and relative size of anomalies. Figure 2.6 shows metallic materials in stress change the magnetic field produced.

Stress in metallic pipe is increased wherever the wall is thinned, where cracks have developed even if they are not through the wall, where the pipe has been damaged or pitted externally or internally, where the pipe is under severe bending, compressive, tensile, or torsional stress, where the original construction of the pipe wall is anomalously thin, or where a pipe is under-designed for its current loading conditions. Figure 2.6 shows metallic materials in stress change the magnetic field produced. The instrument can detect joints, material changes, some appurtenances, and many other features relevant to the operation and mapping of the pipe. Currently, it is not possible to distinguish the cause of stress, for example between wall loss and point loading, as our data dictionary is still being populated. It is important to consider when excavating pipes for validation of SmartBall PWA data that if the stress is caused by bending or

overloading, it may be difficult to confirm or measure the impact of the stress in these locations when the earth loads have been removed. With further validations on this pipeline, a better understanding can be gained of the correlation between the anomalies identified in the data and the actual conditions causing the stress on the pipeline.

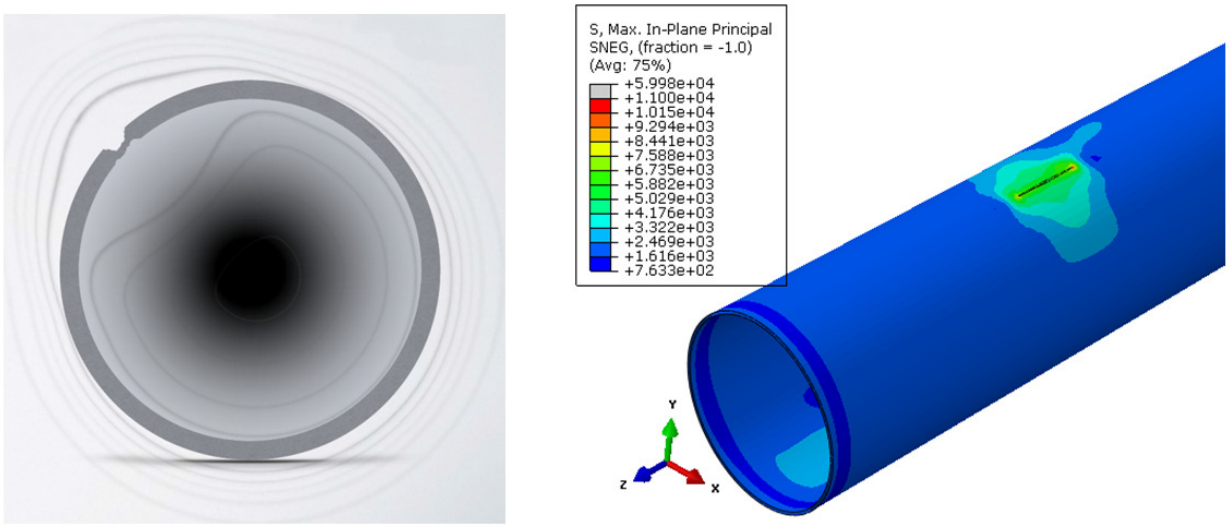


Figure 2.6: Example of Metallic Materials in Stress

Figure 2.7 and 2.8 are examples of SmartBall PWA data collected. Distance is represented on the x-axis and magnetic field on the y-axis. Joints produce a visible signature in the data as they produce a large response in the data (seen aligning with the ends of the pipes in the figures below). Figure 2.7 shows the PWA data for a nominal pipe, the large response at the left and right of the trace are the joints. Across the barrel of the nominal pipe, there is minimal response indicating minimal change in the magnetic field and therefore minimal change in the stress present in the wall of the pipeline. Figure 2.8 shows the data response to damage in the barrel of the pipe. The damage causes stress in the pipeline, which produces a change in the self-generated magnetic field in that area. The SmartBall PWA tool measures this change in the magnetic field and a stress anomaly is indicated.

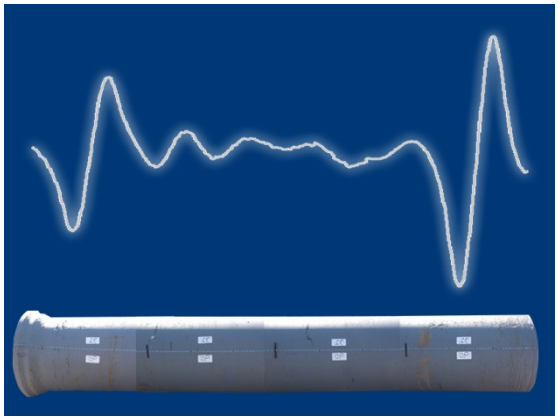


Figure 2.7: PWA Data for Nominal Pipe

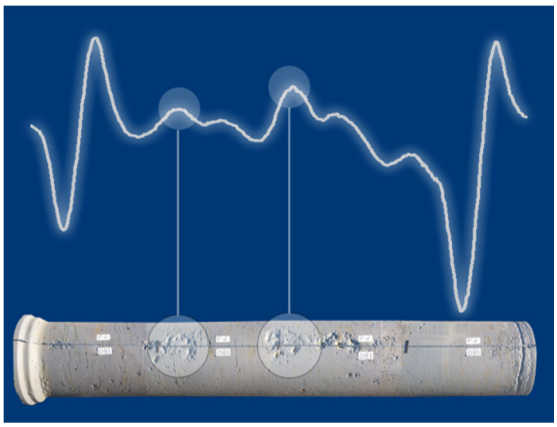


Figure 2.8: PWA Data for Pipe with damage

Once PWA data is collected and analyzed, it can provide semi-quantitative information regarding the condition of each pipe section (joint to joint). The size of the anomaly (change in the magnetic field) may not be indicative of the size/severity of the source of stress in the pipe wall. Further investigation is recommended to understand the conditions of the pipeline that create the stress anomalies found. Having this understanding will guide the next steps of assessment or rehabilitation. Anomalies are reported based on a distance from a known appurtenance or from the start of the inspection.

Turbulence in the pipe from open channel flow, bends, gas pockets or pump cycling can introduce noise into the PWA data. Advanced filtering and algorithms are used to reduce the effect of the noise in the data; however, under some conditions noise levels in the data may mask defects. These areas are identified in the pipe list.

2.4 SmartBall Tracking

The on-board accelerometer records the rotation of the SmartBall tool whereby this data can be translated to a rate of rotation and from there, to a velocity profile of the device as it travels the entire length of the pipeline. This data is aligned with the acoustic recordings to give a precise location of any recorded anomaly. To correlate the accelerometer data to an absolute position and time, a reference point is required. Tracking the position of the SmartBall tool via SBR provides a time and position to be stamped on the velocity profile, resulting in a position versus time relationship for the entire run of the device that is used to report the location of the leak or gas pocket.

The SBR is a device that is used to track the position of the SmartBall tool as it traverses the pipeline. The SBR is comprised of a surface mounted sensor (SMS), GPS receiver, and a processing computer. Both the SmartBall tool and the SBR are synchronized to standard GPS time.

Figure 2.9: SMS Adhered to Flange

An SMS is mounted to the pipeline at planned locations and is connected to an SBR via a coaxial cable. The SBR and SMS combination detect ultrasonic pulses emitted from the SmartBall tool. The SBRs determine the time taken for the pulse to travel from the SmartBall tool to the SBR, and calculate the location of the SmartBall tool at any given time.

This locational data is paralleled with the data extracted from the SmartBall tool which is then used to identify the locations of leaks and gas pockets. Figure 2.9 shows an SMS, which is typically mounted to the pipeline itself or pipeline appurtenance.

3. Inspection Methodology and Results

3.1 SmartBall Inspection Methodology

SmartBall Tool Insertion

The SmartBall PWA tool was inserted through a 4-inch air release valve at the Dewey Street Pump Station. The air release valve was removed from the pipeline and replaced with a custom SmartBall insertion assembly. A photograph of the insertion point is provided in Figure 3.1.

Figure 3.1: Insertion Site

SmartBall Tracking

Two (2) SMSs were attached to the Dewey Force Main to track the progress of the SmartBall PWA tool during the inspection. The SBRs were connected to the SMSs attached to the pipeline. The location of the tracking points, and the times the tool passed, is provided in Table 3.1. Additional information on the tracking locations is provided in Appendix A.

Table 3.1: SmartBall Tracking Locations				
Tracking Location	**Passage Time Run 1 (hh:mm:ss)**	**Distance from Insertion (ft)**	**SBR No.**	**Approximate GPS Location**
Insertion	9:31:00	0	N/A	40° 6'36.17"N 85°42'24.06"W
1	9:32:44	164	SBR #1	40° 6'36.02"N 85°42'25.87"W
2	10:18:27	3,217	SBR #2	40° 6'38.12"N 85°42'59.62"W
Extraction	10:22:00	3,596	N/A	40° 6'39.32"N 85°42'58.79"W

During the inspection the average velocity of the SmartBall PWA tool was 1.2 ft/sec.

SmartBall Extraction

The SmartBall PWA tool was extracted at Fine Screen #2 in the Gene Gustin Treatment Plant. Flow was diverted to Fine Screen #2, and the tool was removed using the automatic rake. A photograph of the SmartBall tool extraction site is provided in Figure 3.2.

Figure 3.2: Extraction Site

3.2 Leak and Gas Pocket Inspection Results

Immediately following the inspection, the data collected was downloaded, verified for quality, and sent to Pure Technologies' analysis team for review. The data collected was internally peer reviewed to verify that all acoustic anomalies detected were analyzed and accurately classified. During the analysis process, the anomalies detected were located by correlating the inspection results to the drawings provided by Anderson. The accuracy of the reported anomaly locations is directly affected by the accuracy of the provided drawings.

Though no leaks or pockets of gas were detected, two (2) acoustic anomalies consistent with gas slugs were found during the inspection. Table 3.2 summarizes the gas slugs found during the inspection. Additional details on each of these anomalies are presented in Appendix C.

Table 3.2: Gas Slug Results of the Inspection

Distance from Insertion (Start)	Distance from Insertion (End)	Length	SmartBall Passage Time (Beginning)	Description	Approximate GPS Location (Start)
67 feet	108 feet	41 Feet	10:02:32 AM	Gas Slug (~41ft)	40.1100, -85.7069
3,198 feet	3,222 feet	24 Feet	10:14:33 AM	Gas Slug (~24ft)	40.1102, -85.7165

Gas Slug #1 was located 67 feet to 108 feet from insertion, just outside the pump station. The start of the gas slug is 97 feet before the first tracking location at the meter vault. Figure 3.3 provides the location of the gas slug identified during analysis.

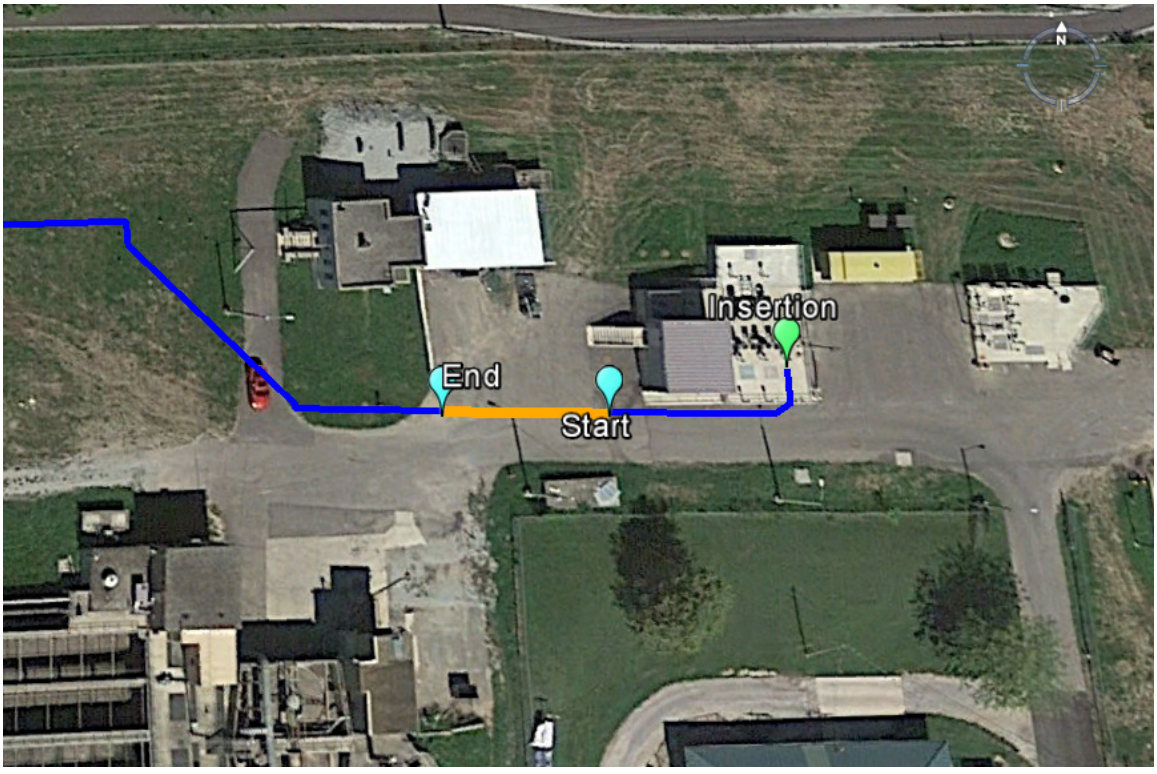


Figure 3.3: Approximate Location of Gas Slug #1

Gas Slug #2 was located 3,198 feet to 3,222 feet from insertion on the grounds of the Gene Gustin Treatment Facility. Figure 3.4 shows the location of the gas slug detected.

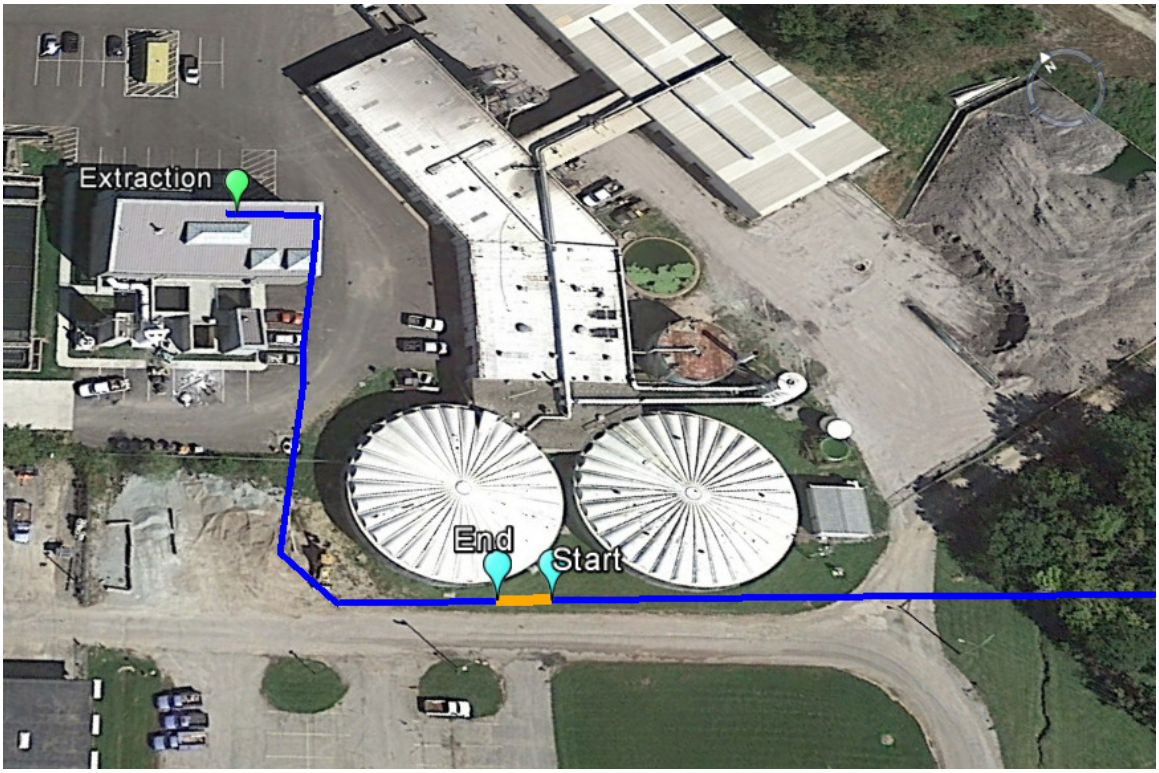


Figure 3.4: Approximate Location of Gas Slug #2

The locations of the gas slugs found in the Dewey Force Main are determined using the tracking data gathered during the inspection and the distances provided in the pipeline drawings provided to Pure Technologies by Anderson. Any inaccuracies in the drawings may create error in the reported locations of anomalies.

3.3 PWA Inspection Results

The analysis of the SmartBall PWA data determined the presence of eight (8) small to medium pipe wall anomalies in the Dewey Force Main that are indicative of a change in stress. Table 3.3 summarizes the anomalies and features identified during the inspection. A full list of PWA collected can be found in Appendix C.

Table 3.3: PWA Distance Discrepancies

Distance from Insertion (ft)	Classification	Size	Comments
164	Feature	N/A	Meter vault (SBR1)
248	Feature	N/A	45 degree bend
339	Anomaly	Medium	
1071	Anomaly	Small	Inconsistent PWA readings at joints
1333	Anomaly	Medium	
1620	Feature	N/A	90 degree bend

Table 3.3: PWA Distance Discrepancies			
Distance from Insertion (ft)	**Classification**	**Size**	**Comments**
1698	Anomaly	Medium	
1889	Anomaly	Medium	
1941	Feature	N/A	90 degree bend
1963	Anomaly	Medium	Possible turbulence in pipeline
2127	Anomaly	Medium	
2374	Anomaly	Small	
2522	Feature	N/A	90 degree bend
2648	Feature	N/A	Short pipe
2674	Feature	N/A	90 degree bend
3148	Feature	N/A	Short pipe
3158	Feature	N/A	Short pipe
3304	Feature	N/A	45 degree bend
3320	Feature	N/A	45 degree bend
3381	Feature	N/A	Air release valve (SBR2)
3482	Feature	N/A	45 degree bend
3490	Feature	N/A	45 degree bend
3538	Feature	N/A	Possible interference after this point

Figure 3.5 below, shows the PWA data collected on a nominal pipe from the Dewey Force Main. Distance is plotted on the x-axis and the magnetic field on the y-axis. Joints are marked by the vertical blue lines. There is minimal response in the data across the barrel of the pipe indicating minimal change in the magnetic field and therefore minimal change in the stress in the pipe wall.

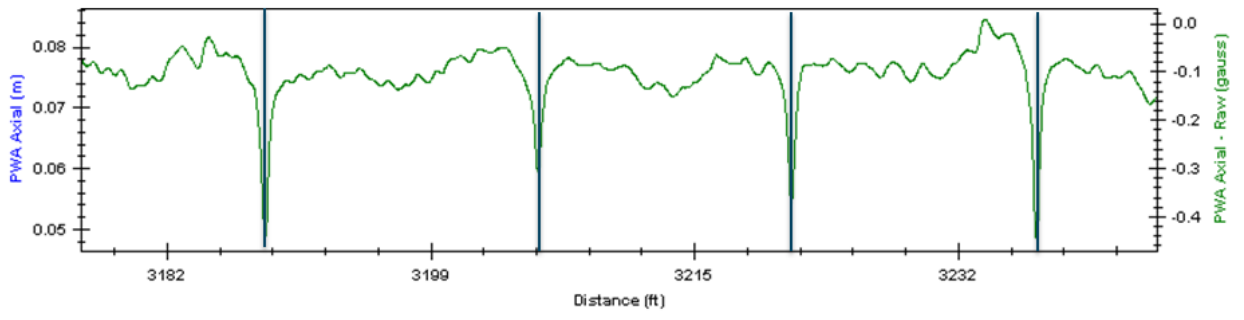


Figure 3.5: Nominal PWA Signal

Figure 3.6 shows the data for pipe with a small anomaly while Figure 3.7 shows a medium anomaly. The joints are visible and marked by vertical blue lines. The anomaly is marked with a vertical green line where the data indicates a change in the magnetic field and therefore a change in the stress in the pipe at this location.

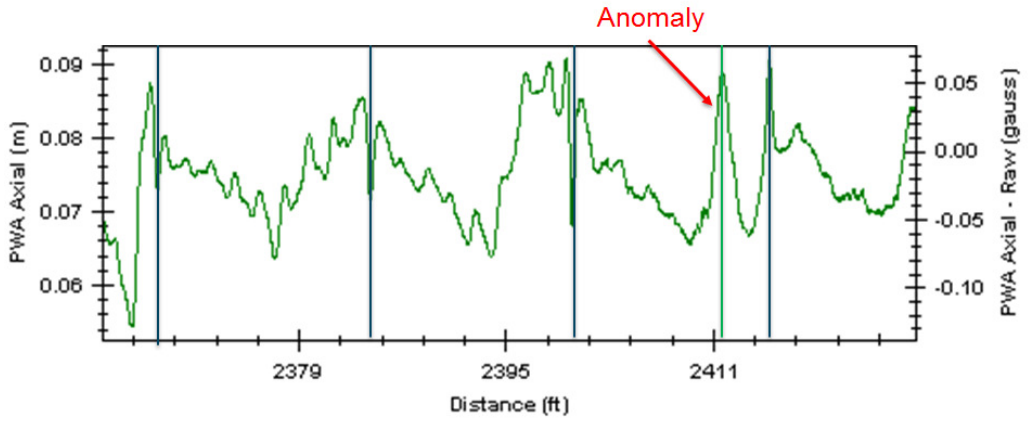


Figure 3.6: PWA Anomaly Classified as Small

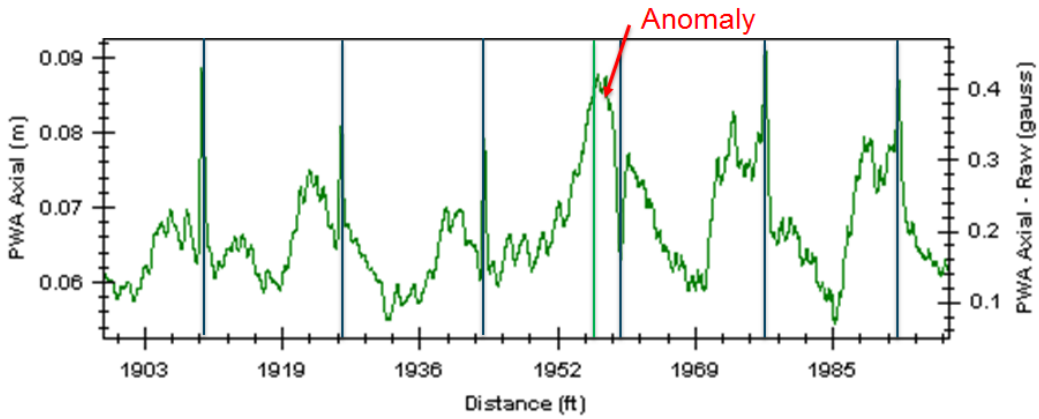


Figure 3.7: PWA Anomaly Classified as Medium

4. Analysis and Discussion

No acoustic anomalies consistent with leaks or gas pockets were detected during the SmartBall PWA inspection of the Dewey Force Main. Two (2) gas slugs were identified, as were eight (8) pipe wall anomalies.

4.1 Gas Slugs Detected

Two (2) acoustic anomalies consistent with gas slugs were identified during the inspection of the force main. Gas slugs are transients that move through the pipeline with flow, and are typically expelled at air release valves. It is possible that the gas slugs detected during the inspection were introduced into the pipeline when the 4-inch air release valve was replaced with the SmartBall tool insertion assembly. Gas slugs are typically not of concern providing that all air release valves are functioning properly and there are no localized high points without air release valves. Additional details on the gas slugs detected are located in Appendix D.

4.2 Pipes with PWA Anomalies

In total eight (8) PWA anomalies were present in the Dewey Force Main during the SmartBall PWA inspection. Two (2) of these anomalies are classified as small and six (6) are classified as medium. PWA anomalies indicate areas of increased stress in the pipe wall. Causes for increased stress may include reduced wall thickness due to corrosion, bending moments, point loading, and cracking. Further investigation such as an external visual inspection and ultrasonic thickness measurements is needed to determine the cause of the eight (8) PWA anomalies.

4.3 Locating Detected Anomalies in the Dewey Force Main

During the analysis of the SmartBall inspection data, discrepancies were identified between the data collected from the SmartBall PWA sensors and the provided drawings of the Dewey Force Main. Using the approximate distance of the pipeline and the duration of the inspection, the SmartBall tool was calculated to move at approximately 1.2 feet per second. One of the sensors onboard the SmartBall tool indicated that the rolling rate was consistent during the inspection. The consistent rolling rate was expected because the Dewey Street Pump Station provided a constant flow rate during the inspection. Consistent rolling rates and consistent flow rates both indicate that the tool moved at constant velocity during the inspection.

The SmartBall tool also has sensors that detect when the tool passes elbows and changes direction. When applying the distances between the elbows provided by the drawings to the direction changes in the data there was considerable variation in the calculated velocity between the elbows. As the rolling rate and flow rate of the pipeline were consistent during the inspection, it is possible that there is some error in the provided drawings.

Table 4.1 highlights the discrepancies between the data collected and the drawings that were provided. A table in Appendix E shows a review of all drawings used to reference a total distance of the pipeline for the SmartBall inspection.

Table 4.1: PWA Distance Discrepancies

Feature and Associated Station Number[1]	Distance from Insertion of Feature on Drawings	Distance from Insertion of Feature Determined by Gyroscope of the SmartBall PWA Tool	Discrepancy Between the Drawings and SmartBall PWA Results
90 Degree Elbow STA. # 18+42	1,700 feet	1,620 feet	80 feet
90 Degree Elbow STA. # 15+34	2,008 feet	1,941 feet	67 feet
90 Degree Elbow STA. # 9+90	2,552 feet	2,522 feet	30 feet
90 Degree Elbow STA. # 8+12	2,730 feet	2,674 feet	56 feet

[1] *All stations referenced in above table were derived from Henry B. Steeg and Associates, Inc. Force Main Plan and Details Sheet 2.*

Due to these discrepancies Pure Technologies has less confidence in the reported location of the PWA anomalies and the gas slugs detected. Prior to any additional condition assessment

including excavations to investigate these results, the discrepancies need to be resolved. Accurate measurements between the elbows in Table 4.1 need to be taken. One way to obtain more accurate measurements is to locate the elbows above ground and take Global Positioning System (GPS) points of their exact location. With additional analysis, the distances obtained from the new GPS coordinates can then be incorporated into the SmartBall PWA results.

5. Conclusions

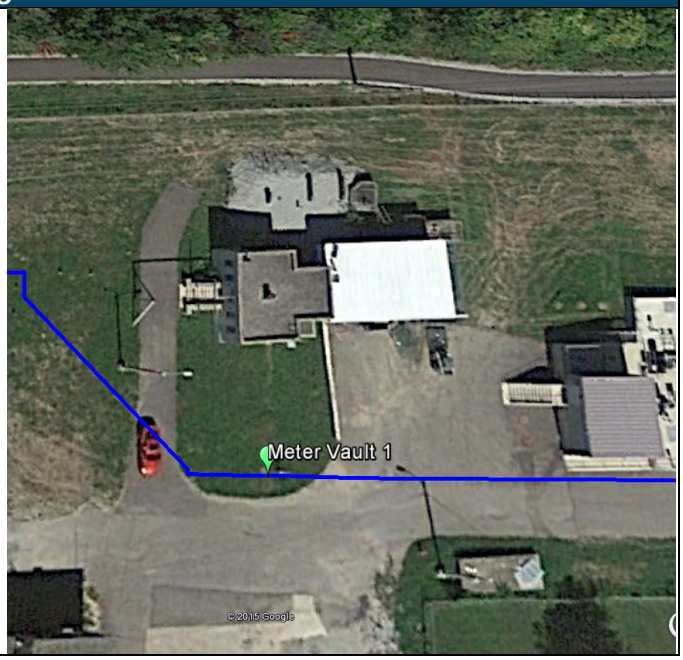
Based on the inspections of the Dewey Force Main, Pure Technologies concludes the following:

1. The average velocity of the SmartBall PWA tool during the inspection was calculated to be 1.2 ft/sec.
2. There were no leaks or gas pockets detected in the force main at the time of inspection.
3. There were two (2) gas slugs detected during the inspection. Gas slugs are transient conditions and are not typically of concern.
4. Eight (8) PWA anomalies were detected in the force main, two (2) were classified as small and six (6) were classified as medium. Additional investigation is needed to determine the cause of the PWA anomalies. Pure recommends test pitting to determine the source and severity of the stress at these locations.
5. A discrepancy between the velocity profile of the SmartBall PWA device and the distances between features indicated on the provided drawings of the Dewey Force Main was identified during data analysis. This discrepancy results in less confidence in the reported location of gas slugs and PWA anomalies. Additional distance measurements are need to more accurately locate the inspection results.

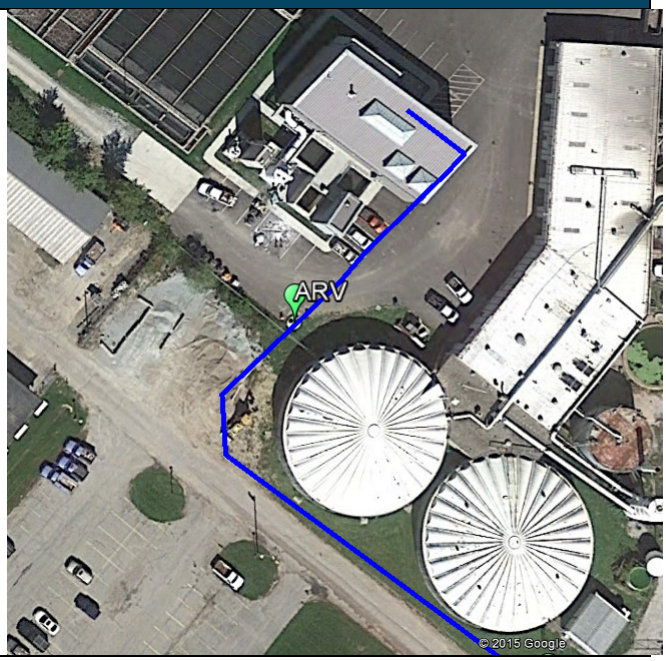
APPENDIX A

Tracking Points Used

Tracking Location 1	
Distance from Launch	164 feet
Feature	Meter Vault
Latitude, Longitude	40° 6'36.02"N 85°42'25.87"W
Traffic Control	NO



Tracking Location 2	
Distance from Launch	3,381 feet
Feature	Air Release Valve
Latitude, Longitude	40° 6'38.12"N 85°42'59.62"W
Traffic Control	NO



APPENDIX B

Advantages and Limitations of the SmartBall Tool

The SmartBall technology acquires high quality acoustic data which is then evaluated to identify leaks and pockets of trapped gas. While other leak detection techniques such as noise loggers and correlators may identify a single leak or gas pocket between each sensor, they cannot accurately locate the limits of the anomaly nor identify multiple anomalies, whereas the SmartBall tool travels directly past each acoustic anomaly of interest, and thus significant advantages are recognized:

- Medium and Large Diameter Pipe: SmartBall technology has successfully inspected and detected leaks on a wide range of medium and large diameter pipelines (greater than 12 inches and over 96-inch diameter) . Many conventional leak detection technologies (e.g., correlators) have limitations that preclude their use on medium and large diameter pipe.

- Pipe Material: The SmartBall tool's leak detection ability is not affected by pipe material. Because the tool passes by the point at which the acoustic event is being created, the pipe wall is not relied on to transmit the acoustic event through the line to a sensor located far away from the actual event of interest. This greatly increases the SmartBall tool's sensitivity and ability to distinguish between separate acoustic events.

- Sensitivity: The sensitivity of all leak detection technologies is a function of several variables and as a result, no resolute thresholds can be established. However, the acoustic sensor inside the SmartBall tool always passes within one (1) pipe diameter of an acoustic anomaly and therefore, it can be used to identify very small leaks due to the proximity of the SmartBall tool to the leak. It should be noted, the SmartBall technology cannot differentiate between a true leak, a simulated leak, and the potential noise of a pressure reducing valve. As such, the acoustic anomalies corresponding to features on the main should be investigated further in the field.

- Length of Survey: SmartBall technology has the ability to record acoustic data for over 12 hours. Depending on flow rates, the tool can inspect long lengths of pipe during a single deployment. The longest single recording within a water pipeline with a single deployment had the SmartBall tool record acoustic data and inspect a length of pipeline exceeding 30 miles.

All non-destructive testing technologies have unique capabilities and limitations that affect the accuracy and efficacy of the technology. The SmartBall tool has the following limitations:

- Minimum Pressure: The acoustic activity associated with a leak is derived from the pressure differential across the pipe wall. With little to no pressure differential, the SmartBall tool will not detect leakage as there will be no associated acoustic activity. Pure Technologies recommends a minimum pressure of 15 pounds per square inch (psi) for leak detection inspections however, under ideal conditions leaks have been detected in pipelines with pressures as low as 5 psi. There is no minimum pressure recommendation for the detection of areas of trapped gas.

- Ambient Noise: The SmartBall technology detects and reports anomalies that have acoustic characteristics similar to leaks on pressurized pipelines. However, other forms of ambient noise may be identified during the data analysis. For medium and large leaks, there is very little that can match these acoustic characteristics and therefore, these

events are certainly leaks. For small leaks, there may be other forms of ambient noise that are difficult to evaluate. Pure Technologies has invested significant resources into characterizing acoustic anomalies and consequently believes leaks described in this report are leaks, unless otherwise noted. However, unknown pressure reducing valves, cracked valves in close proximity, interconnected pipelines that have not been completely isolated, and leaks in pipelines immediately adjacent to the subject pipe do contain a similar acoustic signature and could be reported as leaks in this report. Cars, pumps, boat traffic, and other forms of common ambient noise should not be reported as leaks as they contain different acoustic signatures.

- Reported Locations: Reported locations contained in this report are believed to be accurate to within +/- 100 feet. This estimation is based on project experience and the limitations of the technologies used to calculate location. This is also due to known station numbering for tracking locations. There are also several other factors that would decrease the accuracy of locating leaks and gas pockets: if SBR devices are more than 3,300 feet apart (pipe distance/station numbers), the location/station of SBRs are unknown, or the drawings or dimensions provided by the client are incorrect.

APPENDIX C

PWA Data List

PWA Data List				
Distance from Insertion (ft)	**Classification**	**Size**	**Time SmartBall passed Anomaly**	**Comments**
164	Feature	N/A	9:32:33	Meter vault (SBR1)
248	Feature	N/A	9:33:42	45 degree bend
339	Anomaly	Medium	9:34:59	
1071	Anomaly	Small	9:45:30	Inconsistent PWA readings at joints
1333	Anomaly	Medium	9:49:24	
1620	Feature	N/A	9:53:37	90 degree bend
1698	Anomaly	Medium	9:54:43	
1889	Anomaly	Medium	9:57:27	
1941	Feature	N/A	9:58:13	90 degree bend
1963	Anomaly	Medium	9:58:32	Possible turbulence in pipeline
2127	Anomaly	Medium	10:00:51	
2374	Anomaly	Small	10:04:30	
2522	Feature	N/A	10:06:33	90 degree bend
2648	Feature	N/A	10:08:21	Short pipe
2674	Feature	N/A	10:08:41	90 degree bend
3148	Feature	N/A	10:15:12	Short pipe
3158	Feature	N/A	10:15:20	Short pipe
3304	Feature	N/A	10:17:28	45 degree bend
3320	Feature	N/A	10:17:41	45 degree bend
3381	Feature	N/A	10:18:30	Air release valve (SBR2)
3482	Feature	N/A	10:20:23	45 degree bend
3490	Feature	N/A	10:20:31	45 degree bend
3538	Feature	N/A	10:21:23	Possible interference after this point

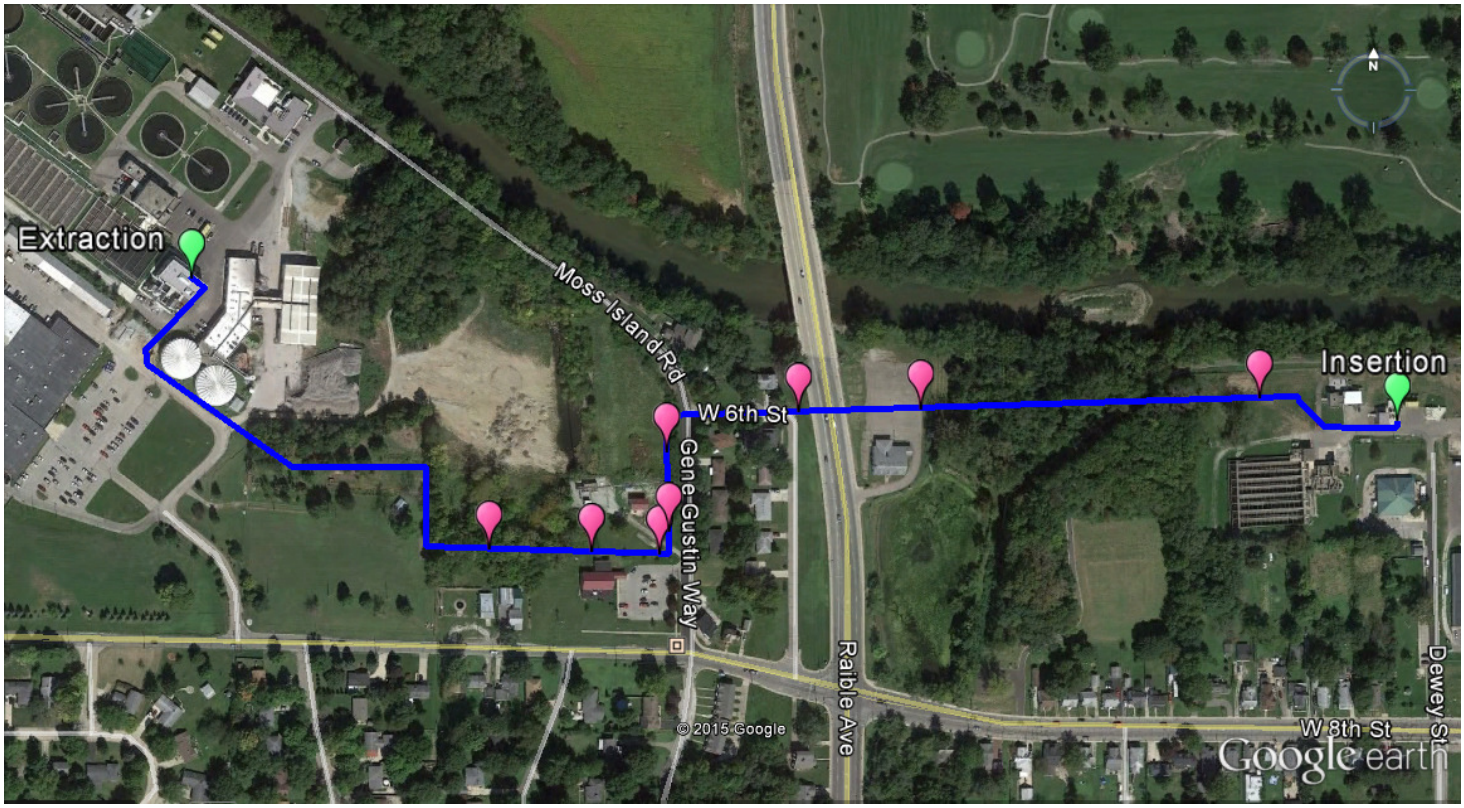


Figure C.1: Appoximate locations of PWA anomalies, additional surveying/ locating of the Dewey Street Force Main's key features is needed to accurately locate PWA anomalies.

APPENDIX D

Gas Slugs Sites of Interest Details

Details on acoustic anomalies of interest that were detected during the SmartBall survey are provided below.

Site of Interest #1 - Gas Slug	
Start of Gas Slug:	67 feet
End of Gas Slug:	108 feet
Distance to Nearest Sensor (Start Pocket):	97 feet before SBR 1
Time Since Insertion (Start Pocket):	00:01:13
Time Since Insertion (End Pocket):	00:01:52
Time of SmartBall Pass (GMT-5:00) (Start Pocket)	09:32:24 AM
Time of SmartBall Pass (GMT-5:00) (End Pocket):	09:33:03 AM
Approximate Location (Start Pocket):	40° 6'36.01"N, 85°42'24.84"W
Approximate Location (End Pocket):	40° 6'36.01"N, 85°42'25.55"W
Estimated Size:	~ 41feet

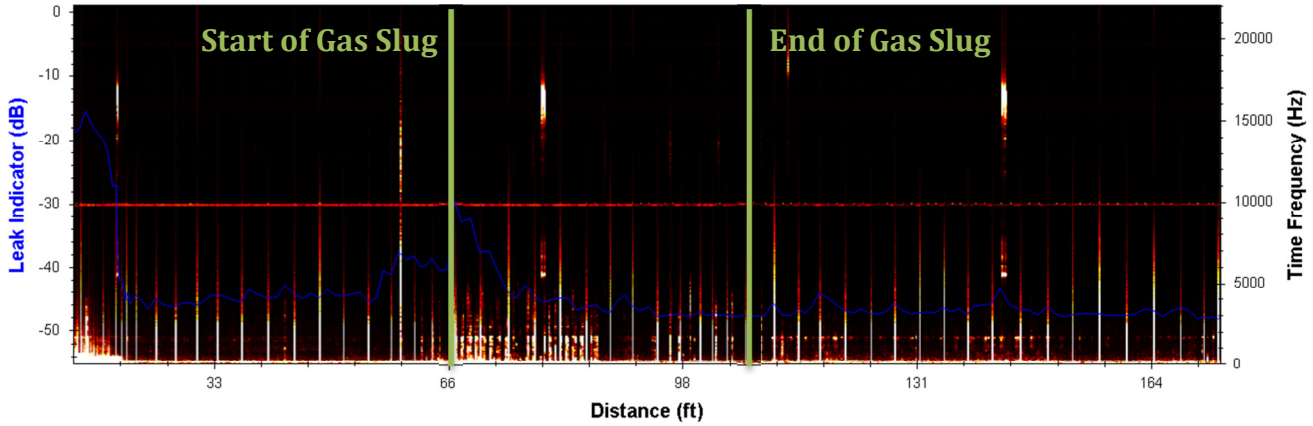


Figure 1: Acoustic Intensity of Gas Slug #1 Anomaly

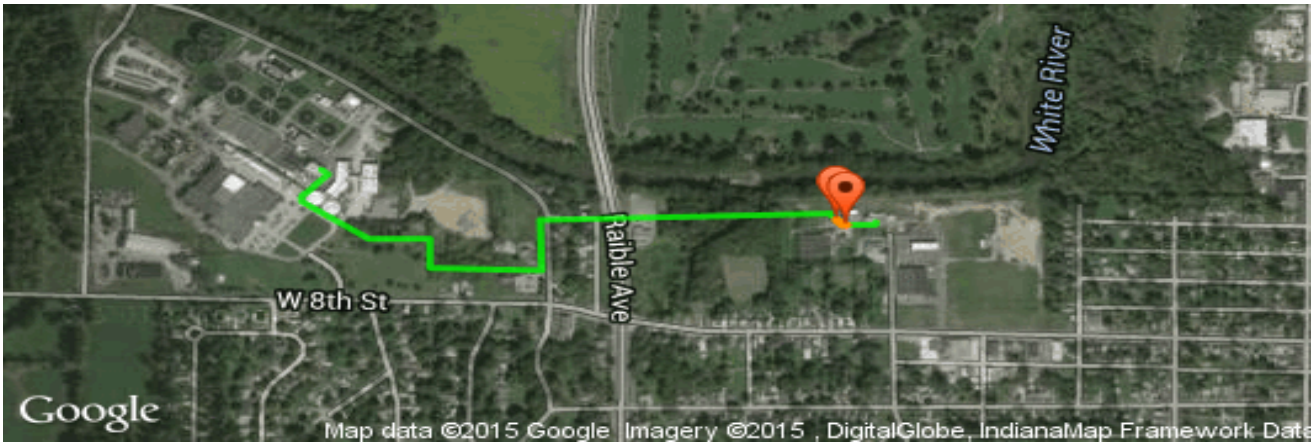


Figure 2: Approximate Location of Gas Slug #1 Acoustic Anomaly

Site of Interest #2 - Gas Slug	
Start of Gas Slug:	3,198 feet
End of Gas Slug:	3,222 feet
Distance to Nearest Sensor (Start Pocket):	182.6 feet before SBR 2
Time Since Insertion (Start Pocket):	00:44:54
Time Since Insertion (End Pocket):	00:45:14
Time of SmartBall Pass (GMT-5:00) (Start Pocket)	10:16:05 AM
Time of SmartBall Pass (GMT-5:00) (End Pocket):	10:16:24 AM
Approximate Location (Start Pocket):	40° 6'36.91"N, 85°42'59.13"W [I]
Approximate Location (End Pocket):	40° 6'37.03"N, 85°42'59.37"W [I]
Estimated Size:	~ 24feet

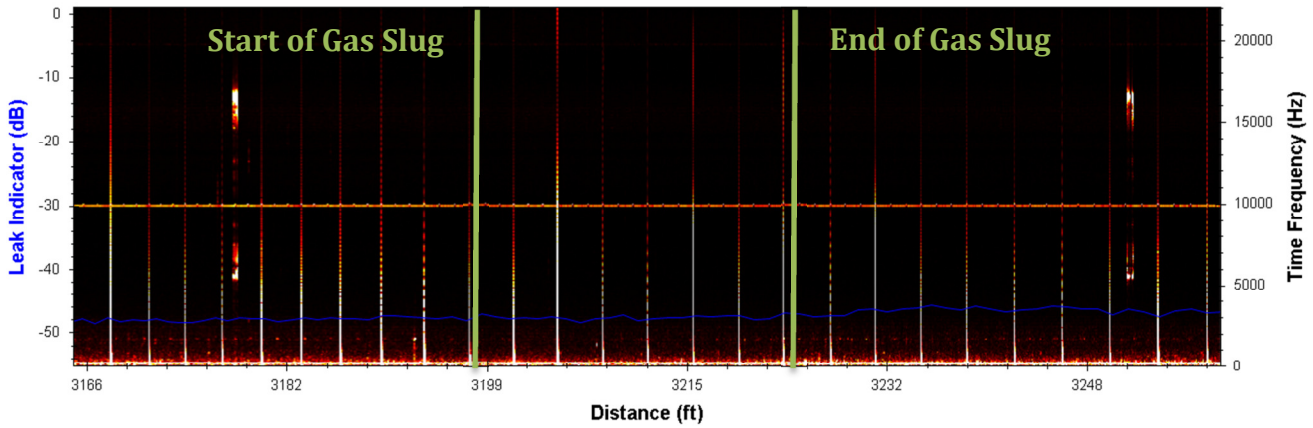


Figure 3: Acoustic Intensity of Anomaly Gas Slug #2

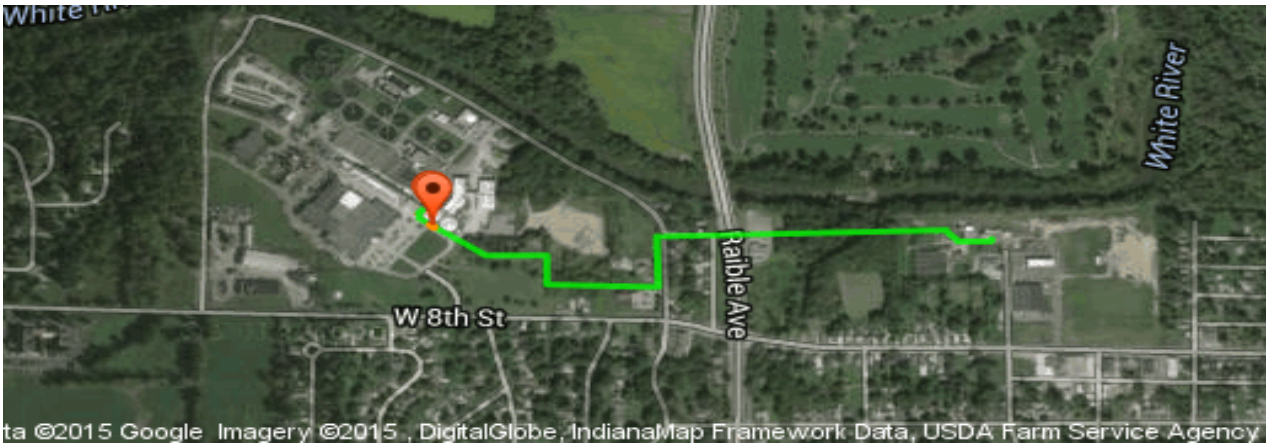


Figure 4: Approximate Location of Gas Slug #2 Acoustic Anomaly

[I] *Based on data obtained through Google Earth*

APPENDIX E

Drawing Review

Drawing Review of 36-inch Dewey Street Force Main							
Diameter	**Drawing Referenced**	**Station**	**Feature**	**Description**	**Total (ft)**	**Total (mi)**	**Notes**
24"	FM3	0+00.00	ARV	4-inch ARV with pipe access	0	0.00	**Insertion**
24"	FM3	0+15.00	EL	Vertical 90 degree	15	0.00	
24"	FM3	0+22.00	EL	Vertical 90 degree	22	0.00	
24"	Sectional Plan	0+27.00	EL	45 degree	27	0.01	
24"	Sectional Plan	0+34.00	EL	45 degree	34	0.01	
36"	Sectional Plan	0+51.00	Tye In	End of Page	51	0.01	
36"	AG16	1+42.00	RE	Reducer	142	0.03	
36"	AG16	1+64.00	Meter	Metering Device	164	0.03	**SBR 1**
36"	AG16	1+82.00	RE	Reducer	182	0.03	
36"	AG16	1+93.00	Tee	Tee	193	0.04	
36"	AG16	1+95.00	EL	45 Degree	195	0.04	
36"	AG16	2+75.00	EL	45 Degree	275	0.05	
36"	AG16	2+84.00	EL	45 Degree	284	0.05	**Station Equation where it is assumed to tie into Drawings**
36"	2	32+58.00	Start	Start Prints Page 2	284	0.05	
36"	2	18+42.00	EL	90 Degree	1700	0.32	
36"	2	15+34.00	EL	90 Degree	2008	0.38	
36"	2	9+90.00	EL	90 Degree	2552	0.48	
36"	2	8+12.00	EL	90 Degree	2730	0.52	
36"	2	5+56.00	EL	45 Degree	2986	0.57	
36"	2	2+41.00	End	45 Degree	3301	0.63	**Station Equation where it is assumed to tie into Drawings**
36"	AG10	0+00.00	EL	45 Degree	3301	0.63	
36"	AG10	0+30.00	EL	45 Degree	3331	0.63	
36"	AG10	0+80.00	ARV	4-inch ARV	3381	0.64	**SBR2**
36"	AG10	1+04.00	EL	45 Degree	3405	0.64	
36"	AG10	1+08.00	EL	Vertical 90 degree	3409	0.65	
36"	AG10	1+09.00	EL	Vertical 90 degree	3410	0.65	
36"	AG10	2+24.00	EL	45 Degree	3525	0.67	
36"	AG10	2+32.00	EL	45 Degree	3533	0.67	
36"	AG10	2+70.00	Wall	Tank Wall	3571	0.68	
36"	AG10	2+80.00	EL	Vertical 90 degree	3581	0.68	
36"	BM4	2+95.00	End of Pipe	End of Pipe	3596	0.68	**Extraction**

Drawing Review Key	
Color	**Referenced in Table**
Blue	Start & End on Inspection
Yellow	SBR Locations
Green	Station Equations