

HYBRID PVC MANHOLE SUBMITTAL

Prepared by: PREDL Systems, North America

Submittal Part 4 of 4



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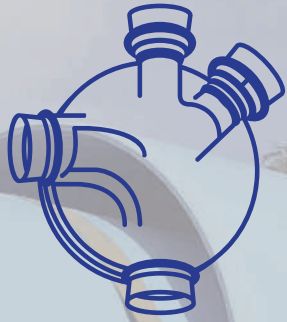
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Bench-Up Rehabilitation Installation with PVC Manhole

Presentation



PREDL systems
CONCRETE PROTECTIVE LINER EXPERTS

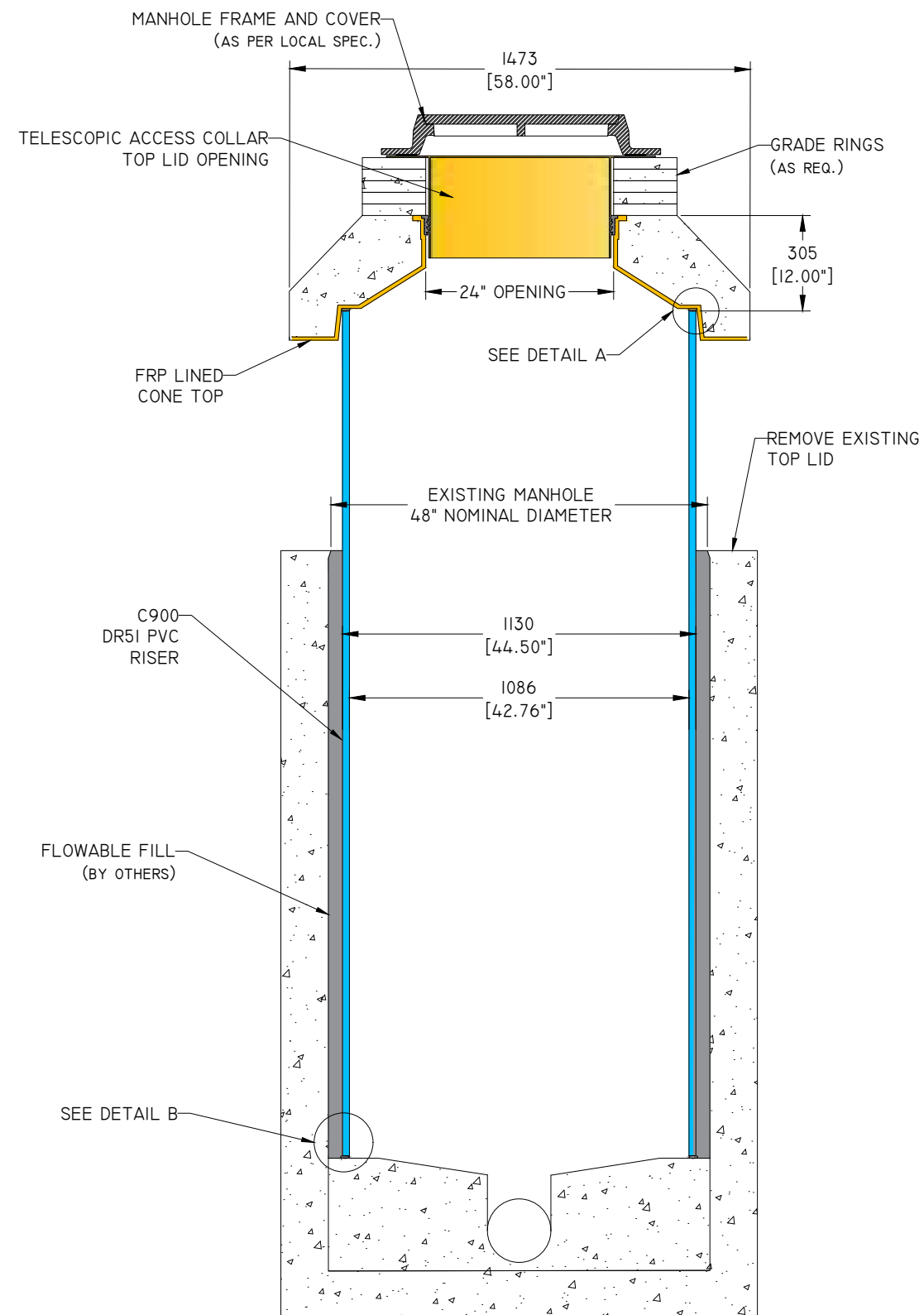
PVC MANHOLE BENCH-UP (LIVE FLOW REHAB)



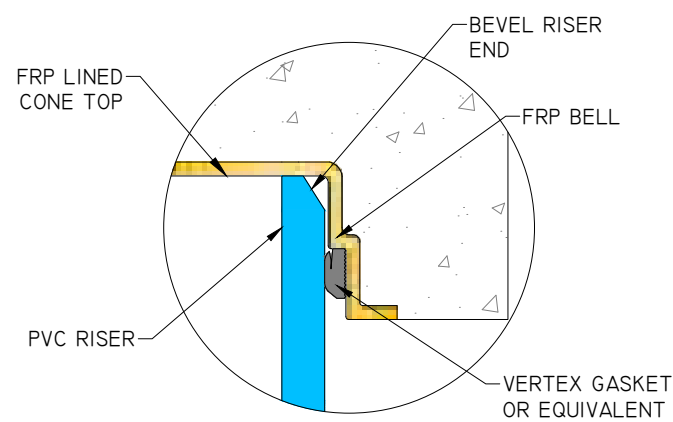
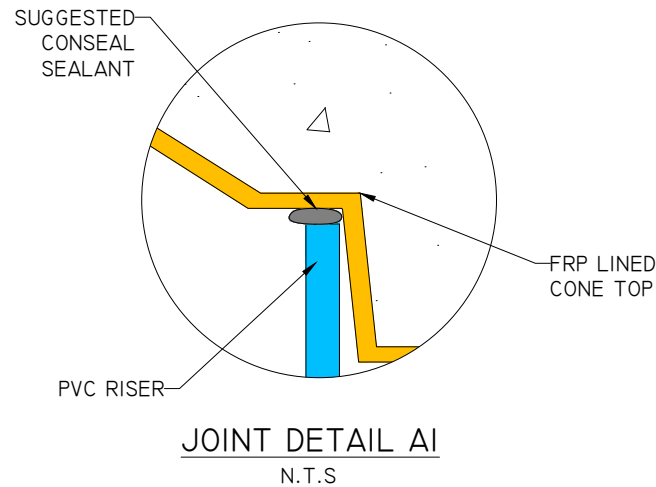
FEATURES & BENEFITS

- ASTM C478 Lid (H20 load rated)
- AWWA C900 Riser
- ASTM C990 Joint Sealant
- Corrosion resistant riser and lid
- Ability to connect high laterals
- Live flow rehabilitation, no costly bypass required
- Restore structural integrity with structural riser insert
- Field adjustment of height with grade rings
- Quick and easy to install
- 55 year warranty
- Riser factory cut to length (Optional)
- Factory installed ladder (Optional)

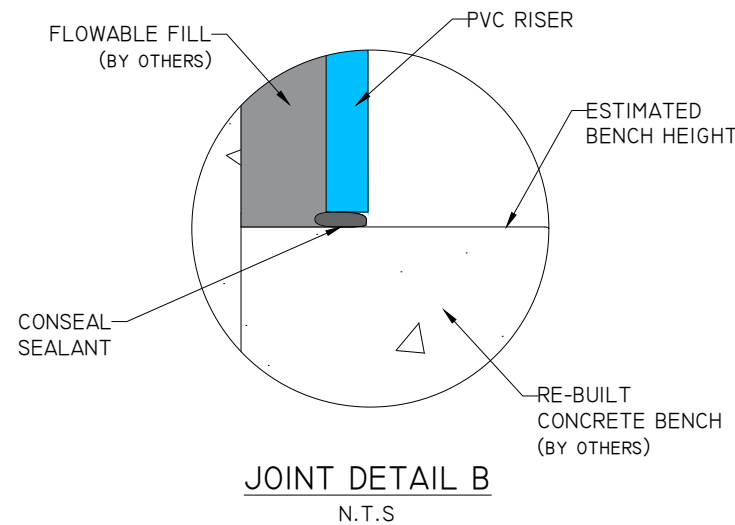
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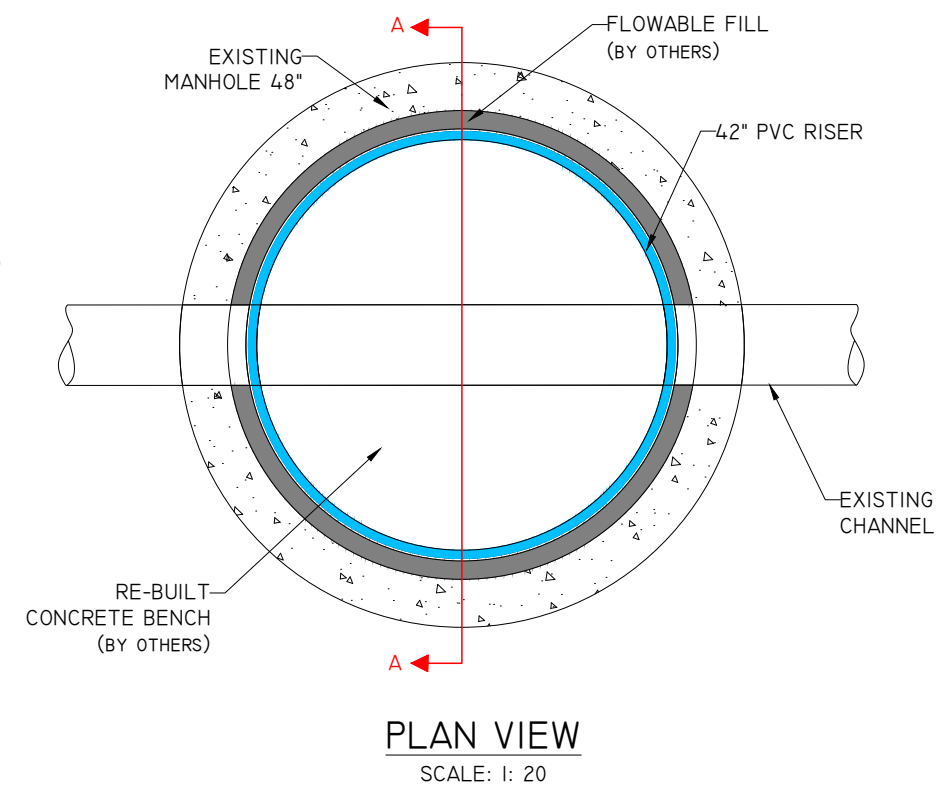
SECTION A-A
 SCALE: 1:20



JOINT DETAIL A2 (OPTIONAL)
 N.T.S.



JOINT DETAIL B
 N.T.S.



PLAN VIEW
 SCALE: 1: 20

PREDL PVC MANHOLE INSTALLATION INSTRUCTIONS

1. BASE SHALL BE CLEAN AND FREE OF LOOSE MATERIAL.
2. BENCH TO BE LEVELED AND RESTORED TO A SIZE THAT'S CAPABLE OF ACCEPTING THE RISER SECTION.
3. PLACE ASTM C990 BUTYL RUBBER MH JOINT SEALANT MASTIC ONTO TOP JOINT OF MANHOLE BASE.
4. PLACE PVC RISER, ENSURING RISER IS PLUMB AND SEATED ON TO JOINT.
5. FILL VOID BETWEEN PVC RISER AND EXISTING STRUCTURE WITH FLOWABLE FILL, AS SPECIFIED IN THE PROJECT DOUMENTS.
6. PLACE ASTM C990 BUTYL RUBBER MH JOINT SEALANT MASTIC ONTO TOP OF PVC RISER.
7. ASTM C443 GASKET MAY BE USED AS AN ALTERNATE FOR SEALING JOINT CONTACT SURFACES. SET GASKET INTO GASKET SEAT.
8. PLACE FRP LINED PRECAST LID ONTO PVC RISER.
9. APPLY PRIMER AND EXTERNAL JOINT WRAP AROUND RISER TO LID JOINT.
10. TELESCOPIC ACCESS COLLAR (TAC) MUST BE INSTALLED WITH PREDL TAC GASKET AND IN ACCORDANCE WITH INSTALLATION GUIDE. WWW.PREDLSYSTEMS.COM/WP-CONTENT/UPLOADS/2015/06/PREDL-SYSTEMS-TAC.PDF
11. BRING TO GRADE WITH GRADE RINGS AND CASTING (NOT SUPPLIED BY PREDL)
12. INSTALL LADDER IF REQUIRED.
13. PREDL TECHNICIAN ONLY ENTERS THE MANHOLE FOR INSPECTION, WELDING AND TESTING.
14. FOR REHABILITATION OF EXISTING STRUCTURE, CONTRACTOR IS RESPONSIBLE FOR: REMOVAL OF EXISTING LADDER RUNGS, WASHING OF EXPOSED STRUCTURE WALLS, PROVIDING INTERNAL SHORING, INSTALLING PREDL CONCRETE PROTECTIVE LINER (CPL) & PVC LINER, GROUTING ANNULAR SPACE BETWEEN CPL/PVC AND EXISTING STRUCTURE, WIRE MESH REBAR INSTALLATION, EXCAVATION AND ANY/ALL ADDITIONAL REQUIRED WORK TO BE PERFORMED BY THE CONTRACTOR.
15. PREDL'S ROLE IS LIMITED TO PROVIDE INSTALLATION ADVISE, AND ANY/ALL STEPS REQUIRED TO ASSURE THE LINER'S PERFORMANCE ARE MET. PREDL IS NOT A PRIME CONTRACTOR OR SUBCONTRACTOR TO THIS PROJECT, UNLESS OTHERWISE NOTED.
16. DOCUMENTATION OF SUCCESSFUL COMPLETION OF ASTM C1244 REQUIRED.
17. MANHOLE STRUCTURE INTERIOR MUST BE CLEAN, DRY AND MINIMUM 10° C (50° F) PRIOR TO ON-SITE FABRICATION OR REPAIR OF FRP LINER.
18. CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF ALL JOB SITE WORKERS AT ALL TIMES.
19. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL CONFINED SPACE AND/OR H2S SAFETY EQUIPMENT UNLESS OTHERWISE NOTED.
20. ALL CONFINED SPACE AND/OR H2S EQUIPMENT, PROCEDURES AND PERSONNEL CERTIFICATIONS ARE MANDATORY IN ACCORDANCE TO LOCAL GOVERNING BODY STANDARDS.

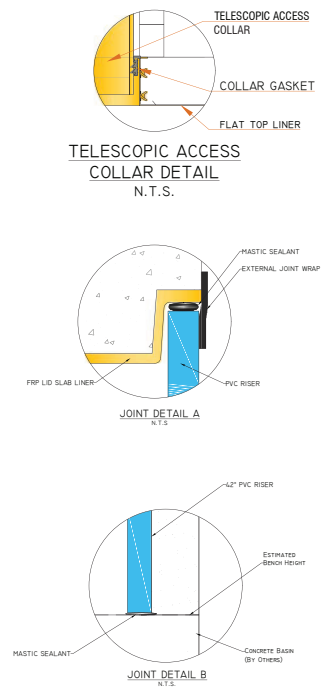
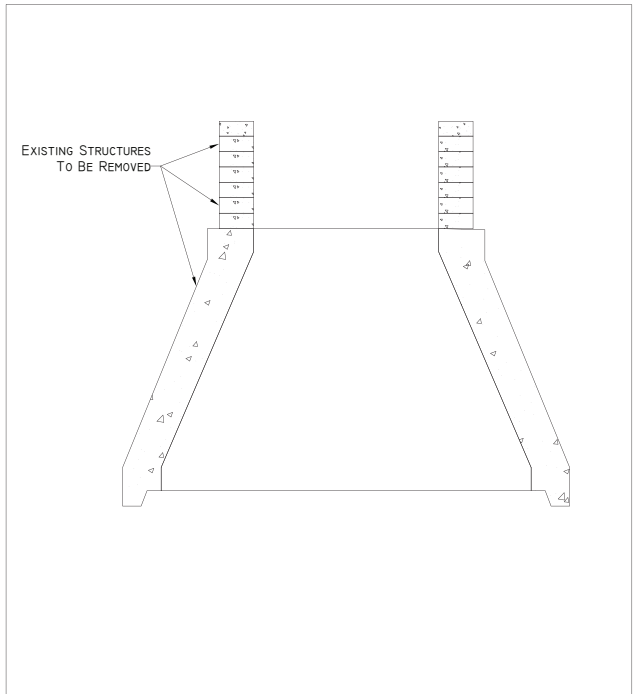
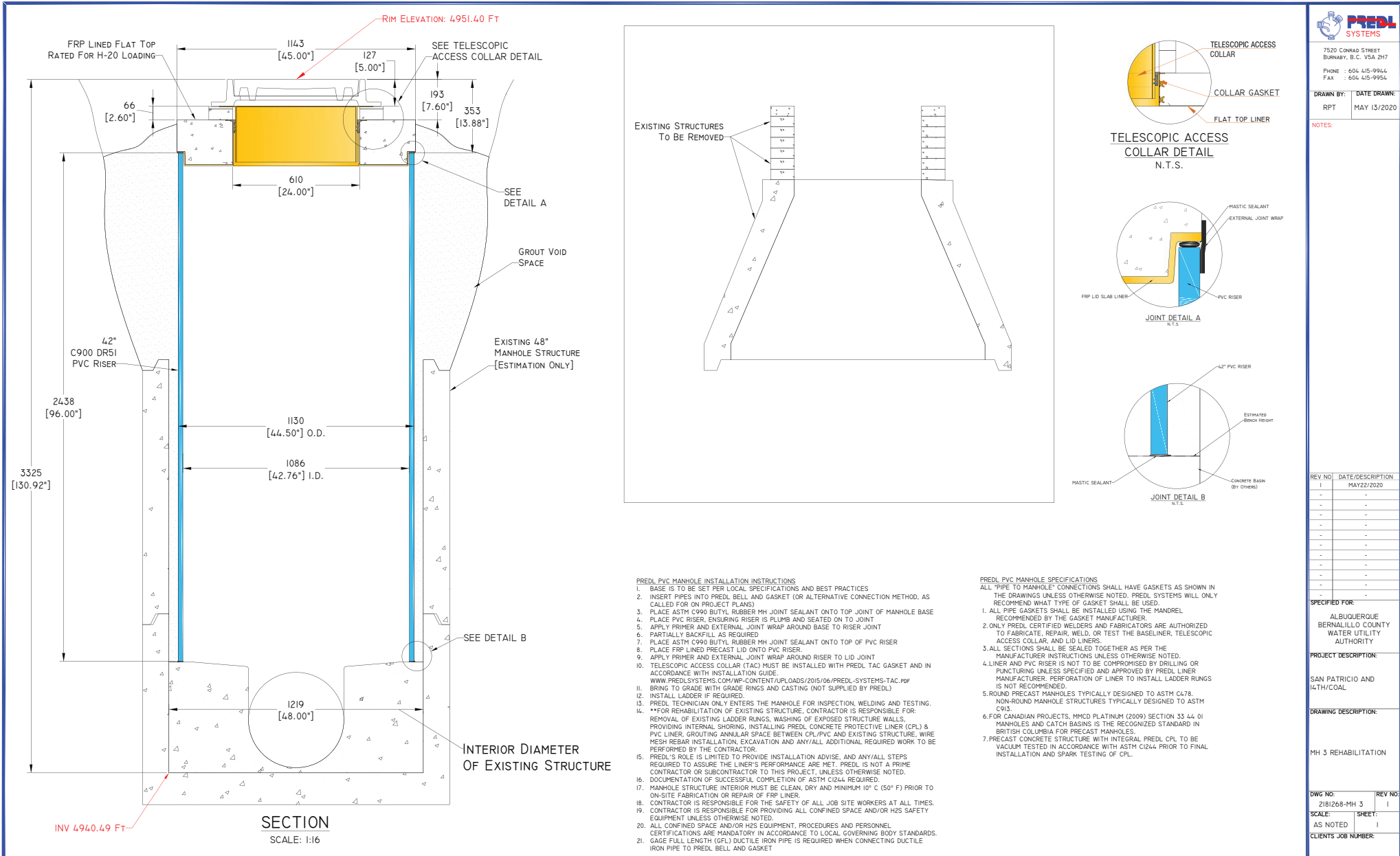
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SPECIFIED FOR:
 HILLSBOROUGH COUNTY, FL

PROJECT DESCRIPTION:
 SAMPLE MANHOLE BENCH-UP REHAB

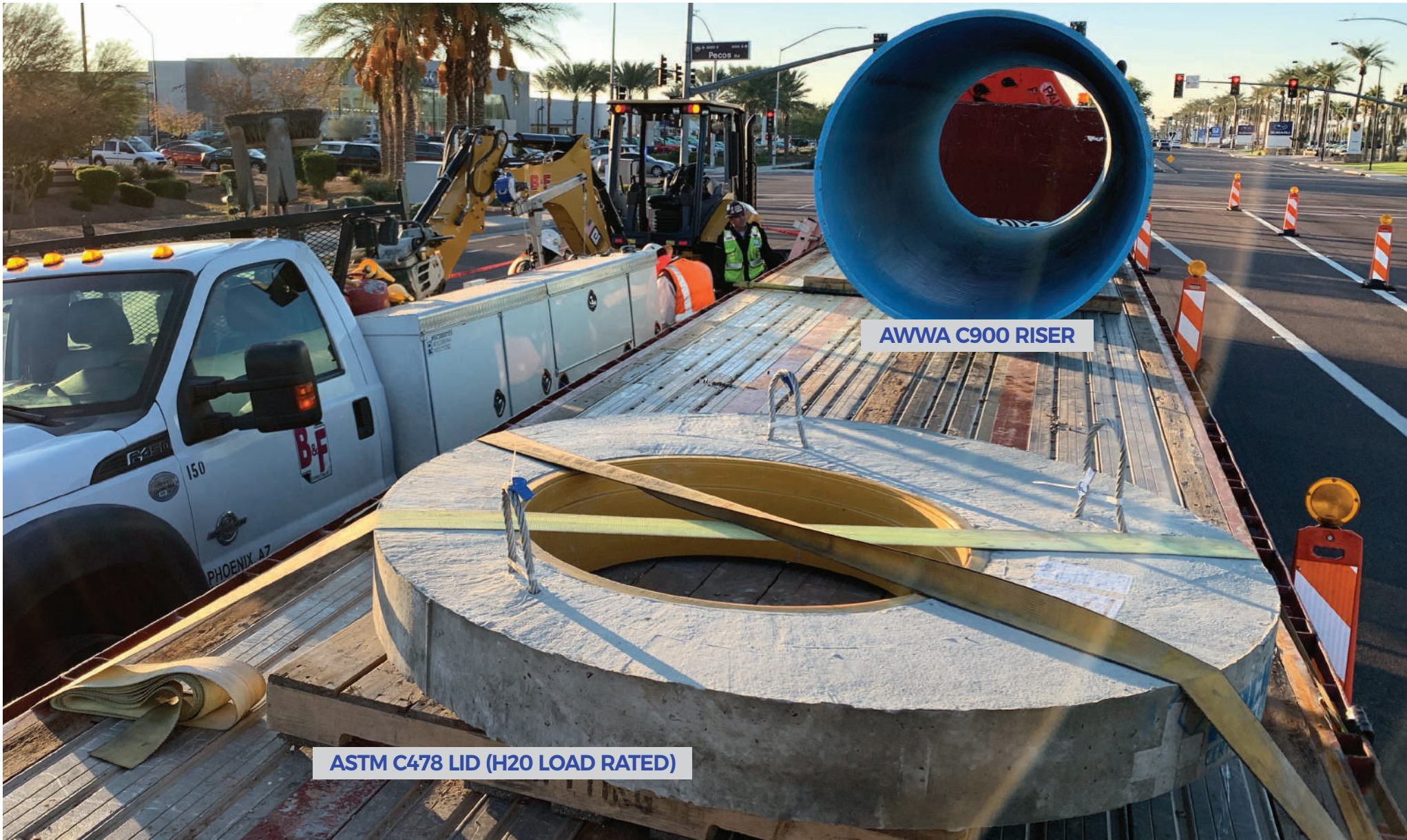
DRAWING DESCRIPTION:
 42" PVC FOR INSERTION INTO 48" MANHOLE

DRAWINGS



 7520 CONRAD STREET BURNABY, B.C. V5A 2H7 PHONE : 604.415-9944 FAX : 604.415-9954	
DRAWN BY:	DATE DRAWN:
RPT	MAY 13/2020
NOTES:	
REV. NO.	DATE/DESCRIPTION
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SPECIFIED FOR:	
ALBUQUERQUE	
BERNALILLO COUNTY	
WATER UTILITY	
AUTHORITY	
PROJECT DESCRIPTION:	
SAN PATRICIO AND	
14TH/COAL	
DRAWING DESCRIPTION:	
MH 3 REHABILITATION	
DWG NO:	REV NO:
2181268-MH 3	1
SCALE:	SHEET:
AS NOTED	1
CLIENTS JOB NUMBER:	

INSTALLATION



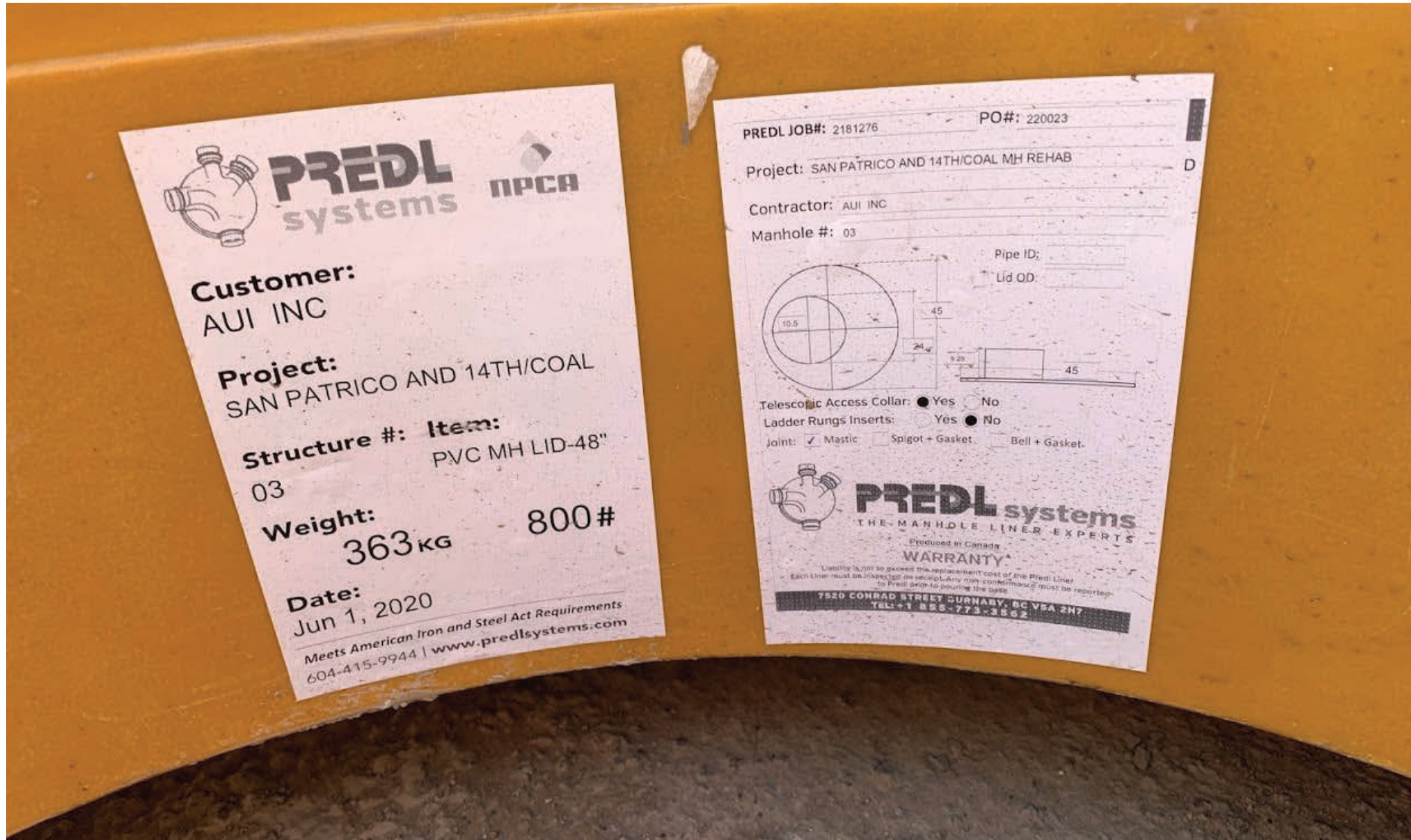
MATERIALS ARRIVE

INSTALLATION



ALL COMPONENTS LABELED

INSTALLATION



ALL COMPONENTS LABELED

INSTALLATION



CLEAN EXISTING STRUCTURE, REMOVE DAMAGED AND EXCESS MATERIALS

INSTALLATION



REBUILT BENCH



ASSURING THE RISER FIT THE REBUILT BENCH

INSTALLATION



ASSURING THE RISER FIT THE REBUILT BENCH

INSTALLATION



CORROSION RESISTANT RISER



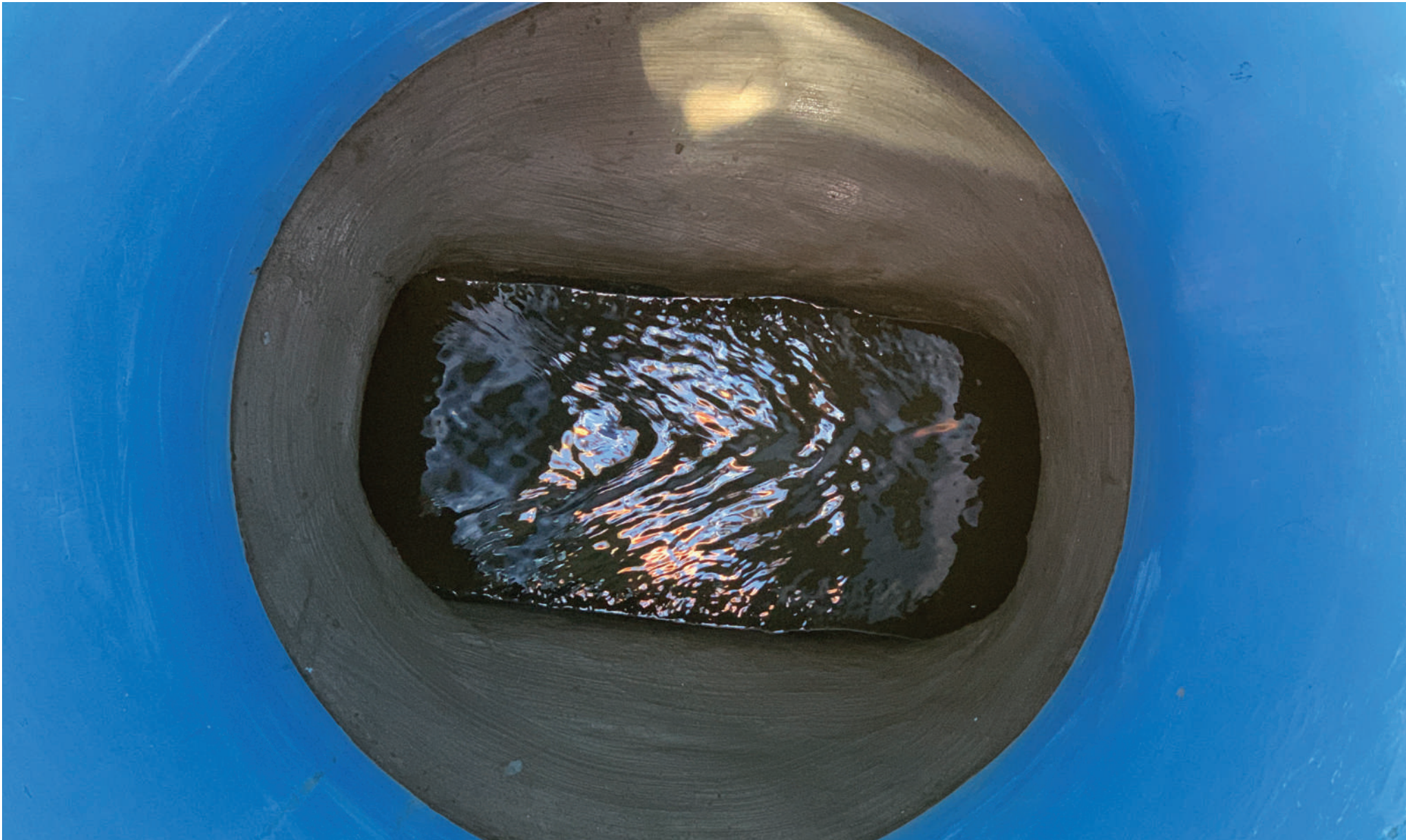
LOWER AWWA C900 RISER ONTO BASE

INSTALLATION



SETTING THE MASTIC ON THE BENCH TO RECEIVE THE PVC RISER

INSTALLATION



BENCH TO RISER AFTER TRIMMING THE MASTIC & CLEANING THE BENCH OF CONSTRUCTION DEBRIS

INSTALLATION



INSTALLATION



BACKFILL

INSTALLATION



INSTALLATION WITH CONCRETE GRADE RINGS



INSTALLATION WITH HDPE GRADE RINGS

FIELD ADJUSTMENT OF HEIGHT WITH GRADE RINGS

INSTALLATION



MASTIC SET ALL AROUND

REFERENCE PROJECTS

PROJECT: CANDLEWOOD GILBERT REHAB - GILBERT, AZ

CONTRACTOR: B&F CONTRACTING

**PROJECT: SAN PATRICIO & 14TH/COAL MANHOLE REHAB
ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY, NM**

CONTRACTOR: AUI INC.

ENGINEER: GARVER ENGINEERING

OWNER: CITY OF ALBUQUERQUE



Predl Systems PVC Manhole Installation Video

See the links below for brief video presentations of PREDL® Hybrid PVC manhole installation on site.

New PVC Manhole: <https://www.youtube.com/watch?v=uVMShAEHrBo>

Rehab PVC Manhole: <https://photos.app.goo.gl/sdXhB1jzGtwTkonH6>

Visit <http://pvcmanhole.com/>, for more information.

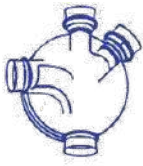
SECTION I

Additional Information

Attachments

Product Warranty

PVC Manhole System



55 Year Corrosion Resistance Warranty

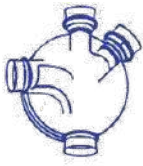
1. **Warranty:** Predl Systems North America warrants that if any PVC Hybrid Manhole product corrodes due to H₂S exposure within a fifty-five (55) year period, it is subject to warranty review. For purposes of this warranty, "PVC Hybrid Manhole Products" shall mean any product provided by PREDL containing fiber reinforced polymer (FRP) or polyvinyl chloride (PVC) and installed under normal operating conditions found in residential and commercial sanitary sewers.

PREDL further warrants that its PVC Hybrid Manhole Products will be free from defect in material or workmanship. This warranty is limited to twelve (12) months from the date of original installation, whether or not actual use begins on that date, or twelve (12) months from the date of shipment by PREDL, whichever occurs first.

"PREDL Products" shall mean any PVC Hybrid Manhole Product, or any Rehabilitation PVC Hybrid Manhole Product, or any New Structure.

2. **Claim Notice:** All claims under the warranty provided herein shall be made in writing to PREDL within sixty (60) days from the date of discovery of the defect or condition. With its written claim, Customer shall include, if possible, photos of the PVC Hybrid Manhole Products, showing in as much detail as possible, any product failure or covered condition, as well as a copy of this Warranty. Failure to notify PREDL in writing within sixty (60) days from the date of discovery of the failure or covered condition voids PREDL's obligations hereunder.
3. **Inspection:** PREDL shall have the right to inspect, at its own expense, any PREDL Product upon which a written claim against this warranty is made on site within sixty (60) days of receiving the written claim. PREDL shall have the right to verify, at its own expense, the failure or covered condition identified in the written notification. This warranty shall be void if PREDL is not provided with the opportunity to inspect and verify the PREDL Product within the time frame established herein. Owner shall answer, in full, any questions asked by PREDL, and shall reveal without prompting whether any use of the PREDL Product beyond Normal Operating Conditions has occurred.
4. **Remedies:** At its sole discretion, PREDL will repair or replace any PREDL Product covered under this warranty at no cost to customer. At its sole discretion, PREDL will also (a) pay up to \$2,500 towards labor and materials for re-installing a repaired or replacement PREDL Product, or (b) re-install a repaired or replacement PREDL Product at its own expense.





- Exclusions:** PREDL's obligations under this warranty and the sole remedy for its breach are limited to the remedies set forth above. This warranty does not apply to failures or covered conditions caused by anything other than what is explicitly set forth above, and any basis for any claim under this warranty is hereby excluded from coverage except as provided above, and the following specific exclusions set forth below are included by way of example and not by way of limitation.

This warranty does not cover damage to any PREDL Product caused by leaks, infiltration or exfiltration.

This warranty does not cover product failure of any PREDL Product for any wrongly installed, or failed joint attachments (or joint wrap), or backfill.

This warranty does not cover damage to any PREDL Product that occurs during installation, improper installation, handling, transportation, backfilling, mishandling, misuse, accident, neglect, improper care, intentional acts, etc. For Example and not by way of limitation, any lifting or handling of the PREDL Product that is not performed in accordance with PREDL lifting and handling procedures, is not covered under this warranty. Improper lifting or handling can cause injury or death.

This warranty does not cover any PREDL Product subject to unauthorized modifications. This warranty does not cover any PREDL Product installed or used outside of the product specifications as established by PREDL.

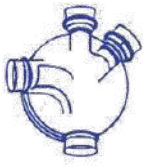
This warranty does not cover any PREDL Product that is not installed and/or operated in compliance with applicable codes and statutes.

This warranty does not cover damage to PREDL Product caused by fire, flood, earthquake, natural disasters or other acts of God, defective subsurface (ground shifting or collapse) or engineering.

PREDL shall not be liable for any loss, cost, damage, or expense of any kind arising out of a breach of the warranty.

This warranty does not cover any PREDL Product subject to any loading applied to the product beyond Normal Operating Conditions, nor shall this warranty cover any PREDL Product subject to any treatment in excess of Initial Engineering Parameters.





PREDL shall not be liable for any incidental, consequential, exemplary, special, or punitive damages, nor for any loss of revenue, profit or use, arising out of a breach of this warranty or in connection with the sale, maintenance, use, installation, operation or repair of any PREDL Product. PREDL shall not be liable for any incidental, consequential, exemplary, special, or punitive damages that are allegedly caused, or caused in fact, by any failure of any PREDL Product.

In no event will PREDL be liable for any amount greater than the purchase price of a PREDL Product.

- 6. Exclusive Warranty:** THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY FOR ANY PREDL PRODUCT, AND IS IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES. PREDL SPECIFICALLY DISCLAIMS ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No person or entity is authorized to bind PREDL to any other warranty, obligation or liability for any PREDL Product. Installation, operation or use of the Predl Product for which this warranty is issued shall constitute acceptance of the terms hereof.



Summary of Additional Reports

1. EVALUATION OF A PREDL BASE LINER AFTER 20 YEARS OF SERVICE

Evaluation of a PREDL manufactured FRP baseliner was conducted by Polymer Engineering Company (PEC) after 20 years of service. The baseliner was installed in 1993 by South Okanagan Concrete Products of Osoyoos, BC. After its removal in 2013, material samples were taken to determine the composition of the FRP material, analyze the physical and mechanical properties of the base after 20 years of contact with sewer water and compare the old material with newly developed FRP material technology. For testing, samples were taken from three areas of the base including – channel invert, bench and gasket. Based on the test results, the old sample was in excellent condition after 20 years without any signs of aging or degradation. It also exhibited good mechanical properties such as tensile, flexural and impact resistance. Although the new FRP material is similar in composition to the 20 year old sample, it has 40% higher tensile strength and flexural yield as well as decreased water absorption.

Link to full report: <http://www.predlsystems.com/wp-content/uploads/2014/01/18-Evaluation-of-PREDL-Base-Liner-After-20-Years-Oct-2013.pdf>

2. RAINFALL DERIVED INFILTRATION INFLOW (RDII) REPORT

PREDL's pipe specific bell design with compression seal gasket ensures a watertight connection between base liner and pipe system eliminating a major source of infiltration and inflow. PREDL manufactured base liners have been in operation in Pierce County's sewer system since 1989. To evaluate the effectiveness of Pierce County's ongoing efforts in eliminating RDII, reducing peak flows and save capacity of the treatment plant, PREDL conducted a study to quantify the magnitude of RDII. Data was collected from flow monitors and rain gauges operating throughout the County's sewer during the entire year of 2011. Results from the study showed that RDII rates were quite low and none of the basins exceeded 10% threshold level. In comparison with other sewer systems, average RDII into Pierce County was 71% lower than the next tightest sewer system. Based on the data analyzed, no additional SSES or flow monitoring was recommended for Pierce County and so the cost of reducing RDII was \$0.00 at the time of the report.

Link to full report: <http://www.predlsystems.com/i&i.pdf>