ADDENDUM NO. 2
to
CITY OF CRYSTAL FALLS

RD Sanitary Sewer Improvements

GEI PROJECT #1803991

GEI CONSULTANTS OF MICHIGAN, P.C.
990 LALLEY ROAD
IRON RIVER, MICHIGAN 49935

DATE: May 23, 2022

BID DATE: **June 2, 2022 at 10:00 a.m. Local Time**

TO ALL BIDDERS BIDDING ON THE ABOVE PROJECT:

All Bidders submitting a Bid on the above Contract shall carefully read this Addendum and give it consideration in the preparation of their Bid.

Contractor shall list all addendums on the Bid Form to ensure conformity in the bid.

Drawings, Specifications and/or Proposals are herein amended, expanded and/or modified, as hereinafter described, and become a part of the Contract Documents with same force and affect as if incorporated, therein, originally. Any contrary provisions contained, or referred to, in Drawings and/or Specifications, shall remain applicable unless overridden by this Addendum. Revised or contrary provisions herein shall not affect any other part of Contract Documents and any deletions, additions, substitutions and/or revisions mentioned, shall include all labor, materials, methods, modifications, etc. required for complete performance of the work.

I. The following is revisions to the Contract Documents:

1. BID SCHEDULE:

   Replace all 4 pages of the Base Bid Schedule and replace with the attached 4 pages which have been revised.

2. BID SCHEDULE OF ALTERNATE ADDS:

   Replace all 26 pages of the Base Bid Schedule and replace with the attached 26 pages which have been revised.

3. APPENDIX C TO PROJECT MANUAL:

   Replace the document titled “Pipeline Crossing and Encroachment Procedure U.S. and Mexico” in its entirety and replace with the attached document titled “TEP-IN-CROSS-GL Pipeline Crossing and Encroachment Procedure (US)” in Appendix C.

II. The following are revisions to the Technical Specifications:

1. SECTION 01200 – MEASUREMENT AND PAYMENT

   A. Add the following new Pay Item LN-4050; Site Clearing and Grubbing:

"ITEM LN-4050; SITE CLEARING AND GRUBBING:

1. Measurement for Site Clearing and Grubbing shall be by the unit "Acre" as measured in the field by the Engineer.

2. Payment shall be by the Contract Unit Price per "Acre" as provided on the Bid Schedule. The Unit Price payment shall be compensation in full for all labor, tools, equipment and materials necessary to properly complete this item of construction in accordance with the Contract Documents, standard details as specified herein, and at the locations indicated on the Drawings or at a location identified in the field by the Engineer and shall include, but not limited to: cutting, removing from the ground, and disposing of all trees, stumps, brush, roots, logs, surface debris, other vegetation, and inclusive of all incidental items necessary for completion of the prescribed item. Limits for this item of construction shall be within the limits as indicated on the Drawings."

2. SECTION 01760 – UTILITY COORDINATION

A. Add the following after Paragraph 1.03.B:

"C. Requirements for Crossing TC Energy Pipelines:

1. Stakeout requests/reports are only valid for 14 days.
2. The Contractor shall be required to complete and submit to TC Energy the buried utilities agreement along with the stakeout report prior to any excavation.
3. Directional boring beneath the TC Energy pipelines shall be a minimum of 36"-40" below the pipelines.
4. Directional boring beneath the pipelines will require the Contractor to submit to TC Energy boring plans for their engineers to review and approve before directional boring can commence.
5. For both directional boring and open cut, both pipelines will need to be exposed by hand-digging or hydro-vac by the Contractor a minimum of two (2) locations on each pipeline to establish a line of sight.
6. TC Energy will provide personnel onsite at their own cost during any excavation within the TC Energy Right-of-Way.
7. Pipelines will need to be supported if excavation exposes more than 34-feet of pipeline.
8. MDOT Class II Backfill will be required beneath the TC Energy pipelines.
9. See TC Energy Pipeline Crossing documents included in Appendix C.
10. Contact Todd Williams with TC Energy for project coordination and any questions at 906-250-3612."

3. SECTION 06660 – GEOSYNTHETIC CLAY LINER

1. Add the following new Paragraph after Paragraph 3.04.B:

"C. Contractor shall maintain 48-inches minimum MDOT Class II sand thickness over the GCL when running wheeled equipment over the liner. Contractor shall add sand to repair rutting as needed to maintain the minimum 48-inches of cover over the GCL. Larger tracked equipment shall maintain a minimum of 24-inches of sand thickness over the GCL."

III. <u>The following are revisions to the Drawings:</u>

1. DRAWINGS 110-C-46 THROUGH 110-C-48

Delete Drawings 110-C-46 through 110-C-48 and replace with the attached which have been revised (3 Drawings Total).

2. DRAWINGS 02-C-100 THROUGH 02-C-105

   Delete Drawings 02-C-100 through 02-C-105 and replace with the attached which have been revised (6 Drawings Total).

3. DRAWING 02-C-201

   Delete Drawing 02-C-201 and replace with the attached which have been revised.

4. DRAWINGS 02-C-206 THROUGH 02-C-209

   Delete Drawings 02-C-206 through 02-C-209 and replace with the attached which have been revised (4 Drawings Total).

5. DRAWING 130-C-01

   Delete Drawing 130-C-01 and replace with the attached which have been revised.

6. DRAWING 130-C-08

   Delete Drawing 130-C-08 and replace with the attached which have been revised.

In addition to the above addendum Contract modifications, the following information is provided as clarification following questions following the issuance of Addendum No. 1 until the date of this Addendum:

A. The Main Lift Station Generator will not require a sound shield enclosure.

B. The Main Lift Station Generator Automatic Transfer Switch does not require bypass isolation.

C. The Main Lift Station interior walls do not get coated (painted).

D. For Alternate Add N, wastewater liquid can be transferred from existing Wastewater Cell No. 1 to new Facultative Lagoon No. 2 and/or Polishing Pond.

E. Rapid Infiltration Basins shall be graded to existing sand material and filled with MDOT Class III material as needed. There is no liner in the Rapid Infiltration Basins.

Bidder shall acknowledge receipt of this Addendum by inserting the date and the number in the spaces provided in the Bid Form.

GEI Consultants of Michigan, P.C.
Iron River, Michigan

Craig Richardson, P.E.
Senior Project Manager

Robb Anderson, P.E.
Senior Project Engineer

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BASE BID SCHEDULE - ADDENDUM NO. 2

BIDDER: _____

GEI Project #1803991

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
M-0110	Mobilization	1	LSUM	$	$
M-0210	Contractor Staking	1	LSUM	$	$
M-0320	Maintaining Traffic	1	LSUM	$	$
M-0410	Utility Exploration	7	EACH	$	$
M-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
M-0520	Site Stormwater Operator Inspection	60	EACH	$	$
M-0610	Utility Pole Bracing	2	EACH	$	$
M-0810	Directional Bore Mobilization/Demobilization	1	EACH	$	$
M-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
M-1200	Rock Excavation - Boulders	50	CYD	$	$
LN-0100	Remove Fence	4,750	LFT	$	$
LN-0110	Remove Existing Site Piping	4,000	LFT	$	$
LN-0120	Remove Existing Structures	20	EACH	$	$
LN-0130	Transfer Wastewater Lagoon Biosolids	1	LSUM	$	$
LN-0140	Topsoil Stripping	154,000	SYD	$	$
LN-0150	Earth Excavation	55,000	CYD	$	$
LN-0160	Embankment	64,000	CYD	$	$
LN-0165	Borrow (CIP)	7,000	CYD	$	$
LN-0170	Lagoon Liner Sand Backfill	98,000	CYD	$	$
LN-0180	Level Marker	51	EACH	$	$
LN-0190	Concrete Slab	1,350	SFT	$	$

CITY OF CRYSTAL FALLS

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BASE BID SCHEDULE - ADDENDUM NO. 2

BIDDER: _____

GEI Project #1803991

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
LN-0200	Influent Valve Structure	1	LSUM	$	$
LN-0300	Decant Structure 1	1	LSUM	$	$
LN-0400	Decant Structure 2	1	LSUM	$	$
LN-0500	Decant Structure 3	1	LSUM	$	$
LN-0600	Parshall Flume Structure	1	LSUM	$	$
LN-0700	Rapid Infiltration Basin Structure	1	LSUM	$	$
LN-0800	60 mil HDPE Geomembrane	1	LSUM	$	$
LN-0900	Geosynthetic Clay Liner (GCL)	1	LSUM	$	$
LN-1000	Extend Existing Monitoring Well	13	VFT	$	$
LN-3000	12" Ductile Iron Decant Piping	55	LFT	$	$
LN-3010	16" Ductile Iron Decant Piping	650	LFT	$	$
LN-3020	18" Ductile Iron Decant Piping	40	LFT	$	$
LN-3030	18" SDR-35 PVC Bypass Piping	2,900	LFT	$	$
LN-3040	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	4	EACH	$	$
LN-3050	Drainage Structure Cover	4	EACH	$	$
LN-4000	6' Chain Link Fence	7,860	LFT	$	$
LN-4005	NO TRESSPASSING' Fence Sign	16	EACH	$	$
LN-4010	Single Access Gate	4	EACH	$	$
LN-4015	Sliding Gate	1	EACH	$	$
LN-4020	Aggregate Surface Course, MDOT 23A, 6" (CIP)	6,300	SYD	$	$
LN-4025	3" Topsoil, Seed, Fertilizer, and Mulch	6,400	CYD	$	$
LN-4030	Silt Fence	3,800	LFT	$	$

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RD SANITARY SEWER IMPROVEMENTS

BASE BID SCHEDULE - ADDENDUM NO. 2

BIDDER: _____

GEI Project #1803991

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
LN-4040	***RIB Discharge Ditch Rip-Rap***	***580***	***SYD***	***$***	***$***
LN-4050	***Site Clearing and Grubbing***	***4***	***ACRES***	***$***	***$***
FM-1000	Site Clearing and Grubbing	2	ACRE	$	$
FM-1001	Force Main Bypass Pumping / Dewatering	1	LSUM	$	$
FM-1002	Rock Excavation - Blasting Method	20	CYD	$	$
FM-1003	Aggregate Surface Course, MDOT 23A, 6" (CIP)	2,850	SYD	$	$
FM-1004	Silt Fence	1,400	LFT	$	$
FM-1006	12" SDR-17 HDPE Sanitary Forcemain	7,600	LFT	$	$
FM-1007	Directional Bore 12" SDR-11 HDPE Sanitary Forcemain	400	LFT	$	$
FM-1008	Air Release Manhole	1	EACH	$	$
FM-1009	Drainage Structure Cover	1	EACH	$	$
FM-1010	Remove Existing Manhole	1	EACH	$	$
FM-1011	Flowable Fill	210	CYD	$	$
FM-1020	Monument Box and Marker Post	8	EACH	$	$
ML-1000	Main Lift Station Removal	1	LSUM	$	$
ML-1001	Main Lift Station Site Work and Restoration	1	LSUM	$	$
ML-1002	Main Lift Station Bar Screen	1	LSUM	$	$
ML-1003	Main Lift Station Structural	1	LSUM	$	$
ML-1004	Main Lift Station Mechanical	1	LSUM	$	$
ML-1005	Main Lift Station HVAC	1	LSUM	$	$

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BASE BID SCHEDULE - ADDENDUM NO. 2

BIDDER: _____

GEI Project #1803991

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
ML-1006	Main Lift Station Electrical and Controls	1	LSUM	$	$
ML-1007	Main Lift Station Site Electrical (Allowance)	1	LSUM	$ 15,000.00	$ 15,000.00
ML-1008	Main Lift Station SCADA	1	LSUM	$	$
ML-1009	Main Lift Station Generator	1	LSUM	$	$
ML-1010	Main Lift Station Natural Gas Service (Allowance)	1	LSUM	$ 2,000.00	$ 2,000.00
ML-1011	15" SDR-26 PVC Sanitary Sewer Main	80	LFT	$	$
ML-1012	Grit Manhole	1	EACH	$	$
ML-1013	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	1	EACH	$	$
ML-1014	Drainage Structure Cover	1	EACH	$	$
ML-1015	Connect to Existing Sanitary Sewer Main	1	EACH	$	$
ML-1016	Main Lift Station Dewatering	1	LSUM	$	$
ML-1017	Hazardous Material Investigation and Testing (Allowance)	1	LSUM	$ 2,000.00	$ 2,000.00
SC-1000	DPW Garage SCADA	1	LSUM	$	$
SC-1001	Western Lift Station SCADA	1	LSUM	$	$
SC-1002	Elevated Storage Tank SCADA	1	LSUM	$	$
TP-1000	US-2 Lift Station Pump Replacement	1	LSUM	$	$
TP-1001	Odgers Lift Station Pump Replacement	1	LSUM	$	$
TP-1002	Bristol Lift Station Pump Replacement	1	LSUM	$	$

TOTAL BASE BID ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'A' - WATERWORKS LIFT STATION (SEE DRAWINGS 105-R-01, 105-C-01, 105-CM-01, 105-E-01):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MA-0110	Mobilization	1	LSUM	$	$
MA-0210	Contractor Staking	1	LSUM	$	$
MA-0320	Maintaining Traffic	1	LSUM	$	$
MA-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MA-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MA-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RA-0220	Subbase, MDOT Class II, 12" (CIP)	90	SYD	$	$
RA-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	90	SYD	$	$
RA-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	10	TON	$	$
RA-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	10	TON	$	$
SA-0110	8" SDR-26 PVC Sanitary Sewer Main	40	LFT	$	$
SA-0215	4" SDR-17 HDPE Sanitary Forcemain	50	LFT	$	$
SA-0420	6" SDR-26 PVC Sanitary Sewer Lateral	25	LFT	$	$
SA-0525	8"x6" Wye	1	EACH	$	$

CITY OF CRYSTAL FALLS

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ALTERNATE ADD 'A' - WATERWORKS LIFT STATION (SEE DRAWINGS 105-R-01, 105-C-01, 105-CM-01, 105-E-01):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
SA-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	3	EACH	$	$
SA-0910	Drainage Structure Cover	3	EACH	$	$
SA-1010	Connect to Existing Sanitary Sewer Lateral	1	EACH	$	$
SA-1020	Connect to Existing Sanitary Sewer Main	1	EACH	$	$
SA-1030	Connect to Existing Sanitary Sewer Forcemain	1	EACH	$	$
SA-1220	Post-Construction Sanitary Sewer Televising	40	LFT	$	$
WW-1000	Waterworks Road Lift Station Removal	1	LSUM	$	$
WW-1001	Waterworks Road Lift Station Site Work and Restoration	1	LSUM	$	$
WW-1002	Waterworks Road Lift Station Wet Well and Valve Vault	1	LSUM	$	$
WW-1003	Waterworks Road Lift Station Pumps and Mechanical	1	LSUM	$	$
WW-1004	Waterworks Road Lift Station Electrical and Controls	1	LSUM	$	$
WW-1005	Waterworks Road Lift Station Site Electrical (Allowance)	1	LSUM	***$ 500.00***	***$ 500.00***
WW-1006	Waterworks Road Lift Station SCADA	1	LSUM	$	$

TOTAL ALTERNATE ADD 'A' ==> $ _____

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BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

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SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'B' - OSWALD STREET (SEE DRAWING 02-C-100):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MB-0110	Mobilization	1	LSUM	$	$
MB-0210	Contractor Staking	1	LSUM	$	$
MB-0320	Maintaining Traffic	1	LSUM	$	$
MB-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MB-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MB-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RB-0220	Subbase, MDOT Class II, 12" (CIP)	60	SYD	$	$
RB-0310	Aggregate Base Under Bit., MDOT 22A, 6" (CIP)	60	SYD	$	$
RB-0740	2" Bituminous Driveway Approach, MDOT LVSP	10	TON	$	$
RB-0830	Aggregate Surface Course, MDOT 23A, 6" (CIP)	105	SYD	$	$
RB-1095	***Pavement Removal***	***60***	***SYD***	***$***	***$***

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BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'B' - OSWALD STREET (SEE DRAWING 02-C-100):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
SB-0110	8" SDR-26 PVC Sanitary Sewer Main	170	LFT	$	$
SB-0155	8" Cured-In-Place (CIP) Pipe 8" Sanitary Sewer Lining	530	LFT	$	$
SB-0420	6" SDR-26 PVC Sanitary Sewer Lateral	45	LFT	$	$
SB-0525	8"x6" Wye	3	EACH	$	$
SB-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	2	EACH	$	$
SB-0910	Drainage Structure Cover	2	EACH	$	$
SB-1010	Connect to Existing Sanitary Sewer Lateral	3	EACH	$	$
SB-1020	Connect to Existing Sanitary Sewer Main	1	EACH	$	$
SB-1140	Insulating Sewer	350	SFT	$	$
SB-1220	Post-Construction Sanitary Sewer Televising	700	LFT	$	$

TOTAL ALTERNATE ADD 'B' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order.'

ALTERNATE ADD 'C' - MAPLE STREET (SEE DRAWING 02-C-101):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MC-0110	Mobilization	1	LSUM	$	$
MC-0210	Contractor Staking	1	LSUM	$	$
MC-0320	Maintaining Traffic	1	LSUM	$	$
MC-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MC-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MC-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RC-0110	Remove Concrete Sidewalk, Ramp & Drive Approach	50	SYD	$	$
RC-0120	Remove Concrete Curb and/or Gutter	100	LFT	$	$
RC-0220	Subbase, MDOT Class II, 12" (CIP)	1,220	SYD	$	$
RC-0310	***Aggregate Base Under Bit., MDOT 22A, 6" (CIP)***	***1,220***	***SYD***	***$***	***$***
RC-0410	***Imported Trench Backfill, (CIP)***	***400***	***CYD***	***$***	***$***
RC-0710	***1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course***	***105***	***TON***	***$***	***$***
RC-0720	***1-1/2" Bituminous Mixture, MDOT LVSP - Top Course***	***105***	***TON***	***$***	***$***

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order.'

ALTERNATE ADD 'C' - MAPLE STREET (SEE DRAWING 02-C-101):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
RC-0910	Concrete Sidewalk, 4"	450	SFT	$	$
RC-0940	Concrete Curb & Gutter	100	LFT	$	$
RC-1095	Pavement Removal	1,220	SYD	$	$
SC-0110	8" SDR-26 PVC Sanitary Sewer Main	355	LFT	$	$
SC-0420	6" SDR-26 PVC Sanitary Sewer Lateral	300	LFT	$	$
SC-0525	8"x6" Wye	10	EACH	$	$
SC-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	2	EACH	$	$
SC-0810	Add'l Depth 4' Dia. Precast Conc. Std. San. MH (Over 8')	1	VFT	$	$
SC-0910	Drainage Structure Cover	2	EACH	$	$
SC-1010	Connect to Existing Sanitary Sewer Lateral	10	EACH	$	$
SC-1040	Connect to Existing Sanitary Sewer Manhole	1	EACH	$	$
SC-1220	Post-Construction Sanitary Sewer Televising	355	LFT	$	$

TOTAL ALTERNATE ADD 'C' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'D' - US-2 / SOUTH 5TH STREET - SOUTH 4TH STREET ALLY (SEE DRAWING 02-C-102):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MD-0110	Mobilization	1	LSUM	$	$
MD-0210	Contractor Staking	1	LSUM	$	$
MD-0320	Maintaining Traffic	1	LSUM	$	$
MD-0410	Utility Exploration	2	EACH	$	$
MD-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MD-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MD-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RD-0110	Remove Concrete Sidewalk, Ramp & Drive Approach	14	SYD	$	$
RD-0220	Subbase, MDOT Class II, 12" (CIP)	1,700	SYD	$	$
RD-0310	Aggregate Base Under Bit., MDOT 22A, 6" (CIP)	400	SYD	$	$
RD-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	1,300	SYD	$	$
RD-0410	Imported Trench Backfill, (CIP)	1,850	CYD	$	$
RD-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	115	TON	$	$
RD-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	115	TON	$	$

CITY OF CRYSTAL FALLS

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BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'D' - US-2 / SOUTH 5TH STREET - SOUTH 4TH STREET ALLY (SEE DRAWING 02-C-102):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
RD-0740	2" Bituminous Driveway Approach, MDOT LVSP	45	TON	$	$
RD-0830	Aggregate Surface Course, MDOT 23A, 6" (CIP)	50	SYD	$	$
RD-1095	***Pavement Removal***	***1,700***	***SYD***	***$***	***$***
SD-0110	8" SDR-26 PVC Sanitary Sewer Main	630	LFT	$	$
SD-0420	6" SDR-26 PVC Sanitary Sewer Lateral	165	LFT	$	$
SD-0525	8"x6" Wye	17	EACH	$	$
SD-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	3	EACH	$	$
SD-0810	Add'l Depth 4' Dia. Precast Conc. Std. San. MH (Over 8')	8	VFT	$	$
SD-0910	Drainage Structure Cover	3	EACH	$	$
SD-1010	Connect to Existing Sanitary Sewer Lateral	17	EACH	$	$
SD-1020	Connect to Existing Sanitary Sewer Main	1	EACH	$	$
SD-1220	Post-Construction Sanitary Sewer Televising	630	LFT	$	$

TOTAL ALTERNATE ADD 'D' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'E' - MICHIGAN AVENUE (SEE DRAWING 02-C-103):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
ME-0110	Mobilization	1	LSUM	$	$
ME-0210	Contractor Staking	1	LSUM	$	$
ME-0320	Maintaining Traffic	1	LSUM	$	$
ME-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
ME-0520	Site Stormwater Operator Inspection	6	EACH	$	$
ME-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RE-0110	Remove Concrete Sidewalk, Ramp & Drive Approach	85	SYD	$	$
RE-0120	Remove Concrete Curb and/or Gutter	440	LFT	$	$
RE-0210	Subbase, MDOT Class II, 6" (CIP)	35	SYD	$	$
RE-0220	Subbase, MDOT Class II, 12" (CIP)	755	SYD	$	$
RE-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	755	SYD	$	$
RE-0410	Imported Trench Backfill, (CIP)	650	CYD	$	$
RE-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	65	TON	$	$
RE-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	65	TON	$	$
RE-0910	Concrete Sidewalk	450	SFT	$	$

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'E' - MICHIGAN AVENUE (SEE DRAWING 02-C-103):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
RE-0930	Concrete Driveway Approach, 6"	295	SFT	$	$
RE-0940	Concrete Curb & Gutter	440	LFT	$	$
RE-1095	***Pavement Removal***	***755***	***SYD***	***$***	***$***
SE-0110	8" SDR-26 PVC Sanitary Sewer Main	325	LFT	$	$
SE-0420	6" SDR-26 PVC Sanitary Sewer Lateral	285	LFT	$	$
SE-0525	8"x6" Wye	9	EACH	$	$
SE-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	1	EACH	$	$
SE-0910	Drainage Structure Cover	1	EACH	$	$
SE-1010	Connect to Existing Sanitary Sewer Lateral	9	EACH	$	$
SE-1020	Connect to Existing Sanitary Sewer Main	1	EACH	$	$
SE-1040	Connect to Existing Sanitary Sewer Manhole	2	EACH	$	$
SE-1220	Post-Construction Sanitary Sewer Televising	325	LFT	$	$

TOTAL ALTERNATE ADD 'E' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'F' - EAST GRANT STREET (SEE DRAWING 02-C-104):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MF-0110	Mobilization	1	LSUM	$	$
MF-0210	Contractor Staking	1	LSUM	$	$
MF-0320	Maintaining Traffic	1	LSUM	$	$
MF-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MF-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MF-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RF-0110	Remove Concrete Sidewalk, Ramp & Drive Approach	50	SYD	$	$
RF-0120	Remove Concrete Curb and/or Gutter	40	LFT	$	$
RF-0210	Subbase, MDOT Class II, 6" (CIP)	50	SYD	$	$
RF-0220	Subbase, MDOT Class II, 12" (CIP)	950	SYD	$	$
RF-0310	***Aggregate Base Under Bit., MDOT 22A, 6" (CIP)***	***55***	***SYD***	***$***	***$***
RF-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	925	SYD	$	$
RF-0410	Imported Trench Backfill, (CIP)	925	CYD	$	$
RF-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	85	TON	$	$
RF-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	85	TON	$	$
RF-0740	2" Bituminous Driveway Approach, MDOT LVSP	10	TON	$	$

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'F' - EAST GRANT STREET (SEE DRAWING 02-C-104):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
RF-0930	Concrete Driveway Approach, 6"	440	SFT	$	$
RF-0940	Concrete Curb & Gutter	40	LFT	$	$
RF-1095	***Pavement Removal***	***980***	***SYD***	***$***	***$***
SF-0110	8" SDR-26 PVC Sanitary Sewer Main	625	LFT	$	$
SF-0420	6" SDR-26 PVC Sanitary Sewer Lateral	105	LFT	$	$
SF-0525	8"x6" Wye	4	EACH	$	$
SF-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	2	EACH	$	$
SF-0910	Drainage Structure Cover	2	EACH	$	$
SF-1010	Connect to Existing Sanitary Sewer Lateral	4	EACH	$	$
SF-1020	Connect to Existing Sanitary Sewer Main	1	EACH	$	$
SF-1110	Remove Existing Manhole	2	EACH	$	$
SF-1120	Sewer Bulkhead	8	EACH	$	$
SF-1220	Post-Construction Sanitary Sewer Televising	625	LFT	$	$

TOTAL ALTERNATE ADD 'F' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'G' - WEST GRANT STREET (SEE DRAWING 02-C-105):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MG-0110	Mobilization	1	LSUM	$	$
MG-0210	Contractor Staking	1	LSUM	$	$
MG-0320	Maintaining Traffic	1	LSUM	$	$
MG-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MG-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MG-0610	Utility Pole Bracing	1	EACH	$	$
MG-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RG-0110	Remove Concrete Sidewalk, Ramp & Drive Approach	40	SYD	$	$
RG-0120	Remove Concrete Curb and/or Gutter	325	LFT	$	$
RG-0220	Subbase, MDOT Class II, 12" (CIP)	525	SYD	$	$
RG-0310	Aggregate Base Under Bit., MDOT 22A, 6" (CIP)	45	SYD	$	$
RG-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	525	SYD	$	$
RG-0410	Imported Trench Backfill, (CIP)	400	CYD	$	$
RG-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	40	TON	$	$
RG-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	40	TON	$	$

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'G' - WEST GRANT STREET (SEE DRAWING 02-C-105):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
RG-0740	2" Bituminous Driveway Approach, MDOT LVSP	10	TON	$	$
RG-0830	Aggregate Surface Course, MDOT 23A, 6" (CIP)	55	SYD	$	$
RG-0911	Remove and Replace Concrete Stairs	2	CYD	***$***	***$***
RG-0940	Concrete Curb & Gutter	325	LFT	$	$
RG-1095	***Pavement Removal***	***520***	***SYD***	***$***	***$***
SG-0110	8" SDR-26 PVC Sanitary Sewer Main	250	LFT	$	$
SG-0420	6" SDR-26 PVC Sanitary Sewer Lateral	125	LFT	$	$
SG-0525	8"x6" Wye	4	EACH	$	$
SG-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	2	EACH	$	$
SG-0810	Add'l Depth 4' Dia. Precast Conc. Std. San. MH (Over 8')	1	VFT	$	$
SG-0910	Drainage Structure Cover	2	EACH	$	$
SG-1010	Connect to Existing Sanitary Sewer Lateral	4	EACH	$	$
SG-1020	Connect to Existing Sanitary Sewer Main	2	EACH	$	$
SG-1220	Post-Construction Sanitary Sewer Televising	250	LFT	$	$

TOTAL ALTERNATE ADD 'G' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'H' - CRYSTAL FALLS TOWNSHIP EASEMENT (SEE DRAWINGS 02-C-201, 02-C-202 & 02-C-203):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MH-0110	Mobilization	1	LSUM	$	$
MH-0210	Contractor Staking	1	LSUM	$	$
MH-0320	Maintaining Traffic	1	LSUM	$	$
MH-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MH-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MH-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RH-0220	Subbase, MDOT Class II, 12" (CIP)	325	SYD	$	$
RH-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	325	SYD	$	$
RH-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	30	TON	$	$
RH-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	30	TON	$	$
RH-1095	***Pavement Removal***	***325***	***SYD***	***$***	***$***

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'H' - CRYSTAL FALLS TOWNSHIP EASEMENT (SEE DRAWINGS 02-C-201, 02-C-202 & 02-C-203):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
SH-0120	10" SDR-26 PVC Sanitary Sewer Main	20	LFT	$	$
SH-0160	10" Cast-In-Place (CIP) Pipe 10" Sanitary Sewer Lining	165	LFT	$	$
SH-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	1	EACH	$	$
SH-0750	Rehabilitate Existing Sanitary Sewer Manhole	50	VFT	$	$
SH-0810	Add'l Depth 4' Dia. Precast Conc. Std. San. MH (Over 8')	3	VFT	$	$
SH-0910	Drainage Structure Cover	1	EACH	$	$
SH-1220	Post-Construction Sanitary Sewer Televising	185	LFT	$	$

TOTAL ALTERNATE ADD 'H' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'I' - MEDICARE (SEE DRAWINGS 02-C-204 & 02-C-205):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MI-0110	Mobilization	1	LSUM	$	$
MI-0210	Contractor Staking	1	LSUM	$	$
MI-0320	Maintaining Traffic	1	LSUM	$	$
MI-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MI-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MI-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
SI-0155	8" Cured-In-Place (CIP) Pipe 8" Sanitary Sewer Lining	1,155	LFT	$	$
SI-0750	Rehabilitate Existing Sanitary Sewer Manhole	1	VFT	$	$
SI-0910	Drainage Structure Cover	5	EACH	$	$
SI-1220	Post-Construction Sanitary Sewer Televising	1,155	LFT	$	$

TOTAL ALTERNATE ADD 'I' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'J' - SHELDON ROAD (SEE DRAWING 02-C-206):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MJ-0110	Mobilization	1	LSUM	$	$
MJ-0210	Contractor Staking	1	LSUM	$	$
MJ-0320	Maintaining Traffic	1	LSUM	$	$
MJ-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MJ-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MJ-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RJ-0220	Subbase, MDOT Class II, 12" (CIP)	40	SYD	$	$
RJ-0310	Aggregate Base Under Bit., MDOT 22A, 6" (CIP)	40	SYD	$	$
RJ-0410	Imported Trench Backfill, (CIP)	305	CYD	$	$
RJ-0740	2" Bituminous Driveway Approach, MDOT LVSP	5	TON	$	$
RJ-0830	Aggregate Surface Course, MDOT 23A, 6" (CIP)	70	SYD	$	$
RJ-1095	***Pavement Removal***	***40***	***SYD***	***$***	***$***

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'J' - SHELDON ROAD (SEE DRAWING 02-C-206):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
SJ-0110	8" SDR-26 PVC Sanitary Sewer Main	190	LFT	$	$
SJ-0420	6" SDR-26 PVC Sanitary Sewer Lateral	30	LFT	$	$
SJ-0525	8"x6" Wye	3	EACH	$	$
SJ-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	1	EACH	$	$
SJ-0910	Drainage Structure Cover	1	EACH	$	$
SJ-1010	Connect to Existing Sanitary Sewer Lateral	3	EACH	$	$
SJ-1040	Connect to Existing Sanitary Sewer Manhole	1	EACH	$	$
SJ-1220	Post-Construction Sanitary Sewer Televising	190	LFT	$	$

TOTAL ALTERNATE ADD 'J' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'K' - SHELDON ROAD NORTH (SEE DRAWING 02-C-207):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MK-0110	Mobilization	1	LSUM	$	$
MK-0210	Contractor Staking	1	LSUM	$	$
MK-0320	Maintaining Traffic	1	LSUM	$	$
MK-0410	Utility Exploration	2	EACH	$	$
MK-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MK-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MK-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RK-0220	Subbase, MDOT Class II, 12" (CIP)	50	SYD	$	$
RK-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	50	SYD	$	$
RK-0410	Imported Trench Backfill, (CIP)	310	CYD	$	$
RK-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	6	TON	$	$
RK-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	6	TON	$	$

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'K' - SHELDON ROAD NORTH (SEE DRAWING 02-C-207):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
RK-1095	***Pavement Removal***	***50***	***SYD***	***$***	***$***
SK-0110	8" SDR-26 PVC Sanitary Sewer Main	140	LFT	$	$
SK-0155	8" Cured-In-Place (CIP) Pipe 8" Sanitary Sewer Lining	195	LFT	$	$
SK-0420	6" SDR-26 PVC Sanitary Sewer Lateral	40	LFT	$	$
SK-0525	8"x6" Wye	2	EACH	$	$
SK-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	3	EACH	$	$
SK-0910	Drainage Structure Cover	3	EACH	$	$
SK-1010	Connect to Existing Sanitary Sewer Lateral	2	EACH	$	$
SK-1040	Connect to Existing Sanitary Sewer Manhole	1	EACH	$	$
SK-1220	Post-Construction Sanitary Sewer Televising	335	LFT	$	$

TOTAL ALTERNATE ADD 'K' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.

"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order.'

ALTERNATE ADD 'L' - TOBIN STREET (SEE DRAWING 02-C-208):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
ML-0110	Mobilization	1	LSUM	$	$
ML-0210	Contractor Staking	1	LSUM	$	$
ML-0320	Maintaining Traffic	1	LSUM	$	$
ML-0410	Utility Exploration	1	EACH	$	$
ML-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
ML-0520	Site Stormwater Operator Inspection	6	EACH	$	$
ML-0614	***Remove and Replace Fence***	***20***	***LFT***	***$***	***$***
ML-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RL-0120	Remove Concrete Curb and/or Gutter	20	LFT	$	$
RL-0220	Subbase, MDOT Class II, 12" (CIP)	75	SYD	$	$
RL-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	75	SYD	$	$
RL-0321	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	76	SYD	$	$
RL-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	8	TON	$	$
RL-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	8	TON	$	$

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.

"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order.'

ALTERNATE ADD 'L' - TOBIN STREET (SEE DRAWING 02-C-208):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
RL-0940	Concrete Curb & Gutter	20	LFT	$	$
RL-1095	***Pavement Removal***	***75***	***SYD***	***$***	***$***
SL-0110	8" SDR-26 PVC Sanitary Sewer Main	230	LFT	$	$
SL-0155	8" Cured-In-Place (CIP) Pipe 8" Sanitary Sewer Lining	210	LFT	$	$
SL-0420	6" SDR-26 PVC Sanitary Sewer Lateral	40	LFT	$	$
SL-0525	8"x6" Wye	4	EACH	$	$
SL-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	1	EACH	$	$
SL-0910	Drainage Structure Cover	1	EACH	$	$
SL-1010	Connect to Existing Sanitary Sewer Lateral	4	EACH	$	$
SL-1040	Connect to Existing Sanitary Sewer Manhole	1	EACH	$	$
SL-1220	Post-Construction Sanitary Sewer Televising	440	LFT	$	$

TOTAL ALTERNATE ADD 'L' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'M' - ZAVADA DRIVE (SEE DRAWING 02-C-209):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
MM-0110	Mobilization	1	LSUM	$	$
MM-0210	Contractor Staking	1	LSUM	$	$
MM-0320	Maintaining Traffic	1	LSUM	$	$
MM-0510	Soil Erosion and Sedimentation Control	1	LSUM	$	$
MM-0520	Site Stormwater Operator Inspection	6	EACH	$	$
MM-0610	Utility Pole Bracing	1	EACH	$	$
MM-1110	Pre-Construction Surface Videotaping	1	LSUM	$	$
RM-0220	Subbase, MDOT Class II, 12" (CIP)	145	SYD	$	$
RM-0310	Aggregate Base Under Bit., MDOT 22A, 6" (CIP)	75	SYD	$	$
RM-0320	Aggregate Base Under Bit., MDOT 22A, 8" (CIP)	70	SYD	$	$
RM-0710	1-1/2" Bituminous Mixture, MDOT LVSP - Leveling Course	8	TON	$	$
RM-0720	1-1/2" Bituminous Mixture, MDOT LVSP - Top Course	8	TON	$	$

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'M' - ZAVADA DRIVE (SEE DRAWING 02-C-209):

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
RM-0740	2" Bituminous Driveway Approach, MDOT LVSP	10	TON	$	$
RM-0830	Aggregate Surface Course, MDOT 23A, 6" (CIP)	35	SYD	$	$
RM-1095	***Pavement Removal***	***145***	***SYD***	***$***	***$***
SM-0110	8" SDR-26 PVC Sanitary Sewer Main	200	LFT	$	$
SM-0420	6" SDR-26 PVC Sanitary Sewer Lateral	20	LFT	$	$
SM-0525	8"x6" Wye	2	EACH	$	$
SM-0710	4' Dia. Precast Concrete Standard Sanitary Manhole (0'-8')	1	EACH	$	$
SM-0910	Drainage Structure Cover	1	EACH	$	$
SM-1010	Connect to Existing Sanitary Sewer Lateral	2	EACH	$	$
SM-1040	Connect to Existing Sanitary Sewer Manhole	1	EACH	$	$
SM-1220	Post-Construction Sanitary Sewer Televising	200	LFT	$	$

TOTAL ALTERNATE ADD 'M' ==> $ _____

CITY OF CRYSTAL FALLS

RD SANITARY SEWER IMPROVEMENTS

BID SCHEDULE OF ALTERNATE ADDS **BIDDER:** _____

GEI Project #1803991

SCHEDULE OF ALTERNATE ADDS:

See Section 01130 - Alternate Bid Items for Detailed Descriptions of Alternate Deducts.
"Project will be awarded based upon the lowest responsible TOTAL BASE BID. If alternate adds and/or deducts are considered and implemented, they may be implemented in any order."

ALTERNATE ADD 'N' - REMOVE WASTEWATER LAGOON BIOSOLIDS:

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Extension
LN-0135	Remove Wastewater Lagoon Biosolids	1	LSUM	$	$

TOTAL ALTERNATE ADD 'N' ==> $ _____

The Contract Price of this Aternate Add is the additional cost (not total cost) to remove the wastewater lagoon biosolids by pumping and hauling to an approved upland site for land application in accordance with all federal, state, and local laws, rules, and regulations. The cost of this Alternate will be added to the Cost of Base Bid Item LN-0130.

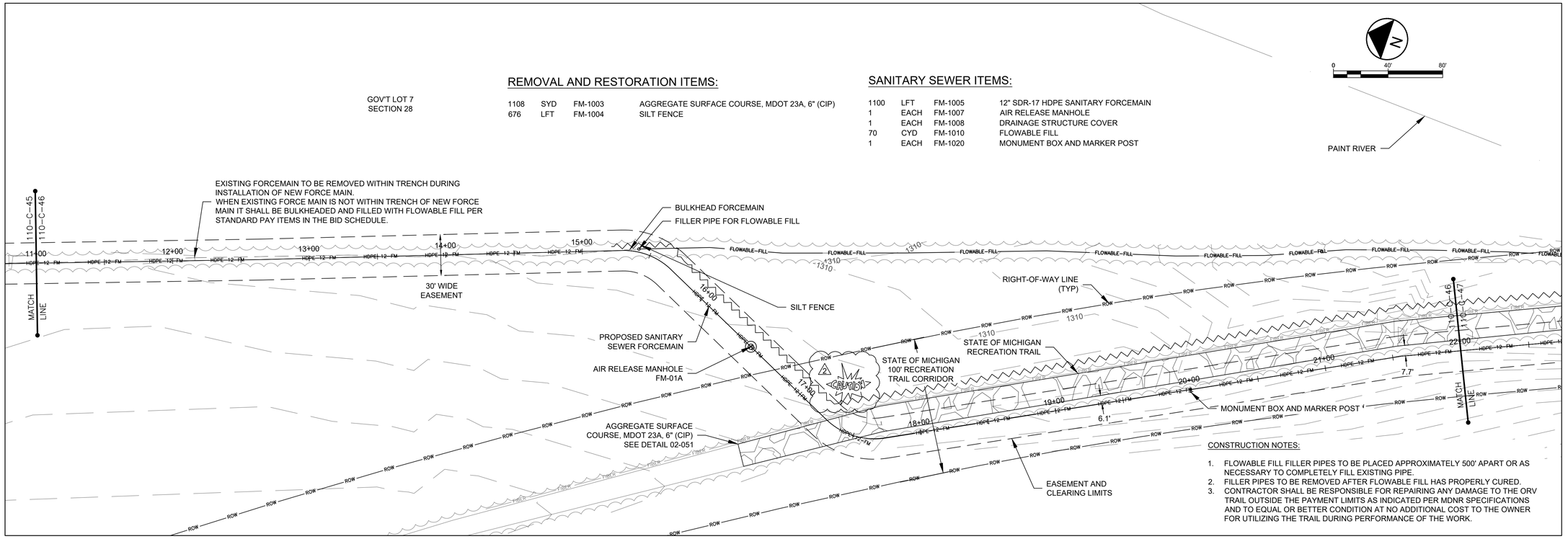
GOV'T LOT 7
SECTION 28

REMOVAL AND RESTORATION ITEMS:

1108	SYD	FM-1003	AGGREGATE SURFACE COURSE, MDOT 23A, 6" (CIP)
676	LFT	FM-1004	SILT FENCE

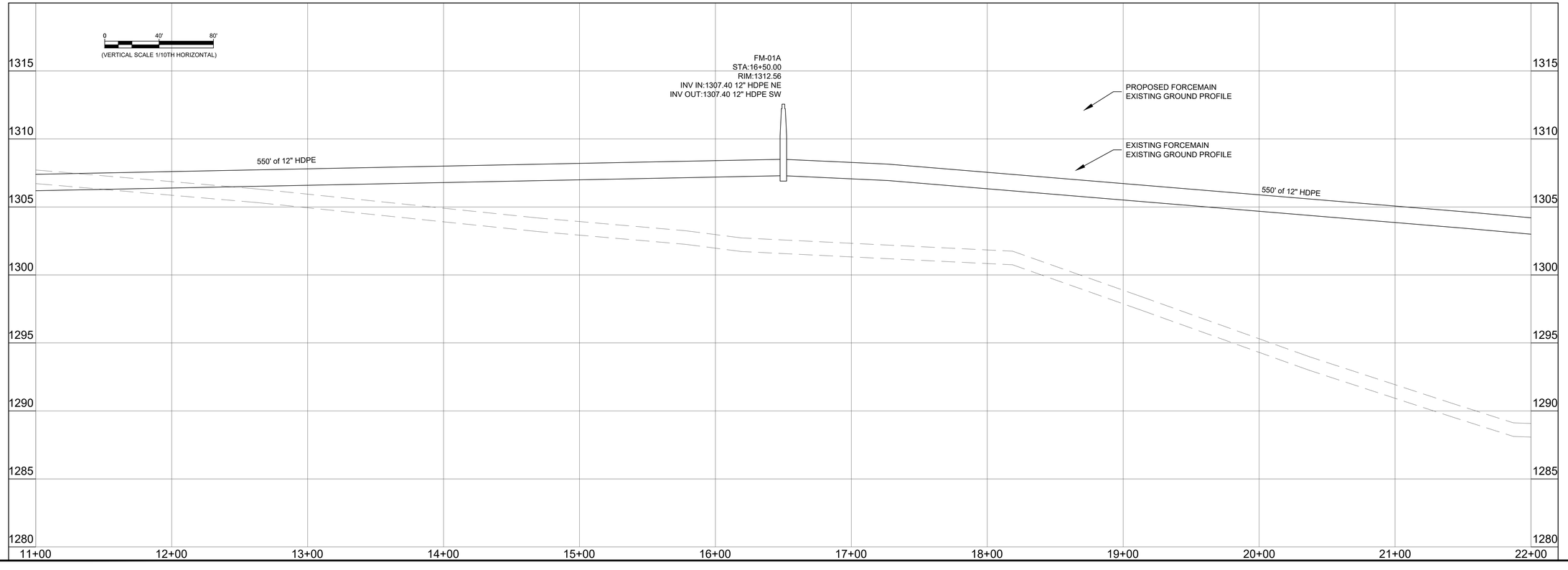
SANITARY SEWER ITEMS:

1100	LFT	FM-1005	12" SDR-17 HDPE SANITARY FORCEMAIN
1	EACH	FM-1007	AIR RELEASE MANHOLE
1	EACH	FM-1008	DRAINAGE STRUCTURE COVER
70	CYD	FM-1010	FLOWABLE FILL
1	EACH	FM-1020	MONUMENT BOX AND MARKER POST



CONSTRUCTION NOTES:

1. FLOWABLE FILL FILLER PIPES TO BE PLACED APPROXIMATELY 500' APART OR AS NECESSARY TO COMPLETELY FILL EXISTING PIPE.
2. FILLER PIPES TO BE REMOVED AFTER FLOWABLE FILL HAS PROPERLY CURED.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO THE ORV TRAIL OUTSIDE THE PAYMENT LIMITS AS INDICATED PER MDNR SPECIFICATIONS AND TO EQUAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE OWNER FOR UTILIZING THE TRAIL DURING PERFORMANCE OF THE WORK.



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

PLAN AND PROFILE
FORCEMAIN
STA 11+00 TO STA 22+00

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

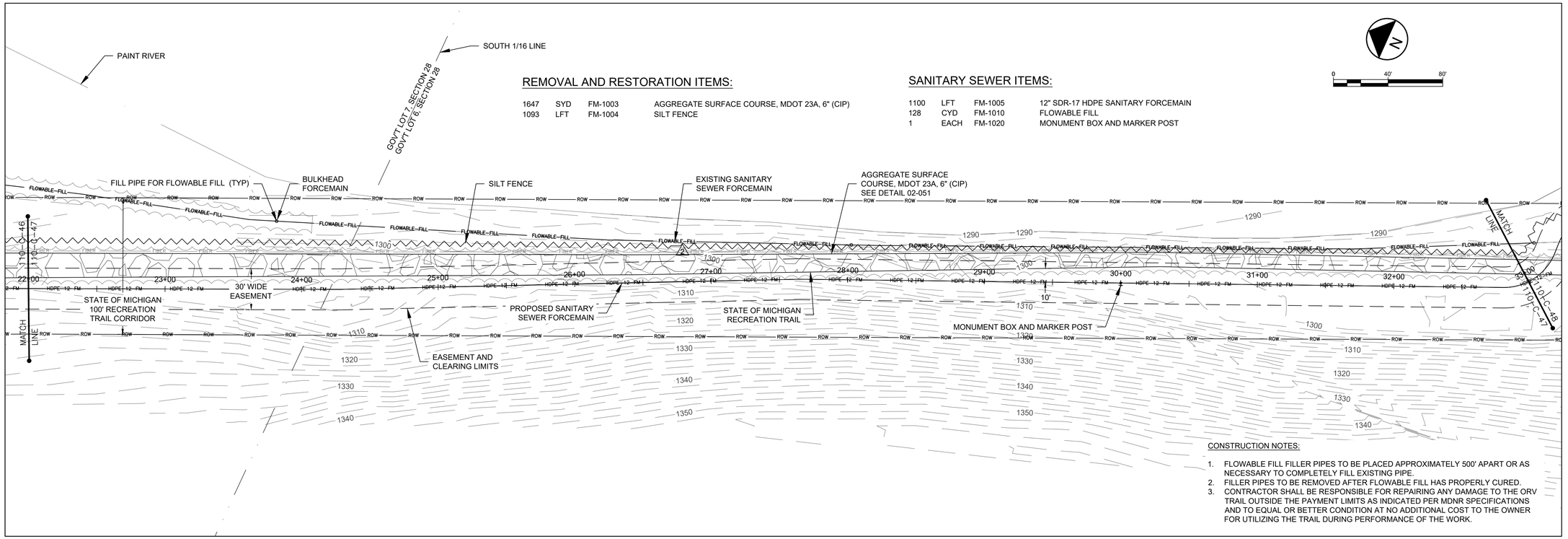
GEI PROJECT: 1803991

DWG. NO.
110-C-46

SHEET #32

ARCHIVE # 91 0066249

K:\Crystal_Falls_City\1803991-R0_Sanitary_Sewer_Improvements\CAD\Sheets\1803991-02-C-FORCEMAIN.dwg, 5/23/2022 8:08:17 AM, ANDERSON, BRAD, GEI.stb



REMOVAL AND RESTORATION ITEMS:

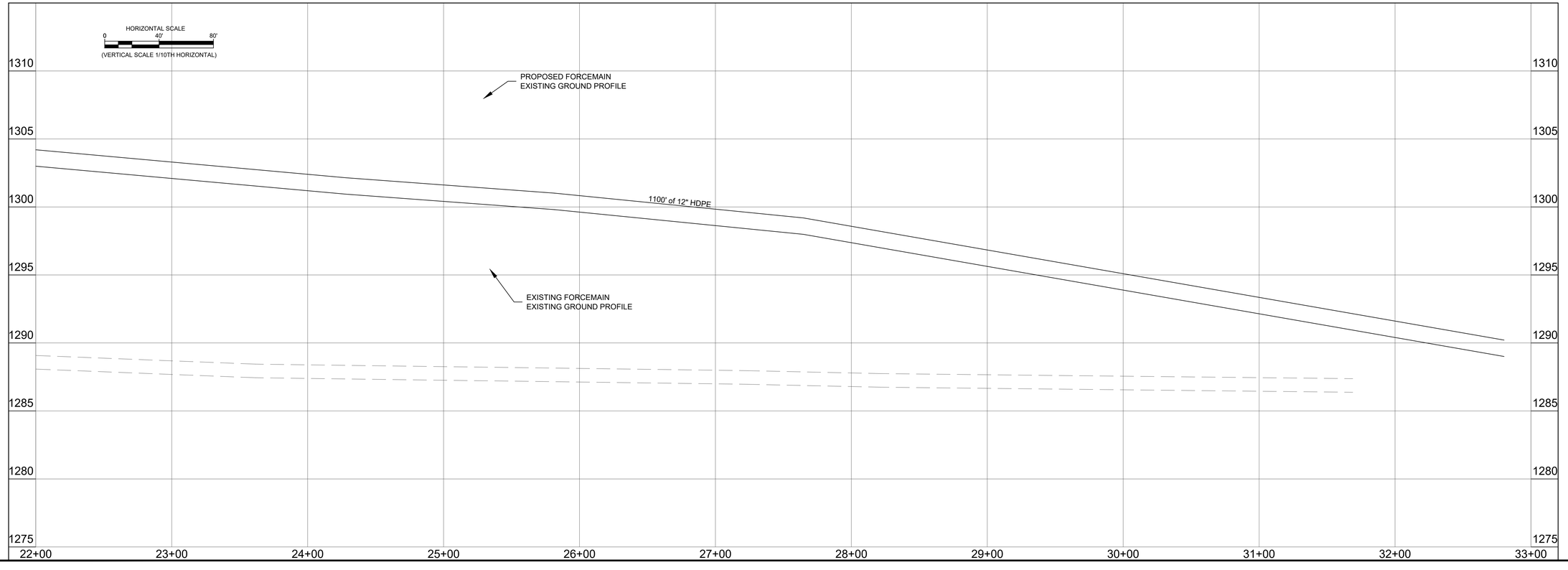
1647	SYD	FM-1003	AGGREGATE SURFACE COURSE, MDOT 23A, 6" (CIP)
1093	LFT	FM-1004	SILT FENCE

SANITARY SEWER ITEMS:

1100	LFT	FM-1005	12" SDR-17 HDPE SANITARY FORCEMAIN
128	CYD	FM-1010	FLOWABLE FILL
1	EACH	FM-1020	MONUMENT BOX AND MARKER POST

CONSTRUCTION NOTES:

1. FLOWABLE FILL FILLER PIPES TO BE PLACED APPROXIMATELY 500' APART OR AS NECESSARY TO COMPLETELY FILL EXISTING PIPE.
2. FILLER PIPES TO BE REMOVED AFTER FLOWABLE FILL HAS PROPERLY CURED.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO THE ORV TRAIL OUTSIDE THE PAYMENT LIMITS AS INDICATED PER MDNR SPECIFICATIONS AND TO EQUAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE OWNER FOR UTILIZING THE TRAIL DURING PERFORMANCE OF THE WORK.



GEI Consultants
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RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

PLAN AND PROFILE
FORCEMAIN
STA 22+00 TO STA 33+00

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
110-C-47

SHEET #33

ARCHIVE # 91 0066250

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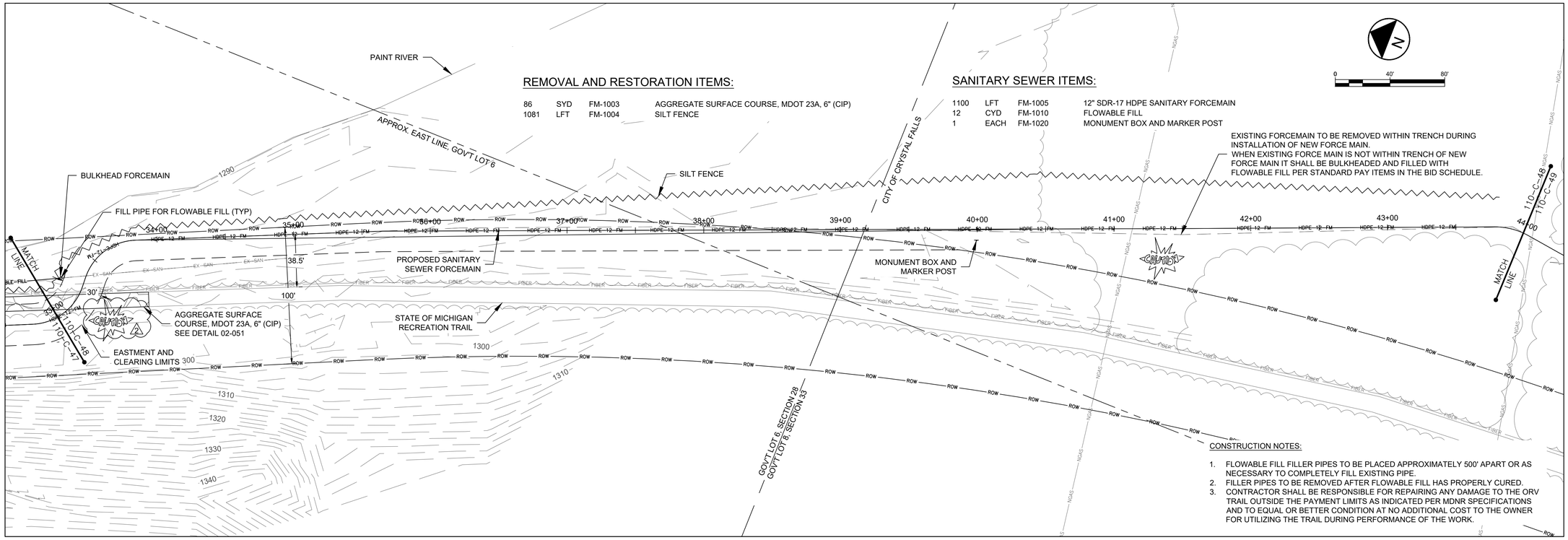
REMOVAL AND RESTORATION ITEMS:

86	SYD	FM-1003	AGGREGATE SURFACE COURSE, MDOT 23A, 6" (CIP)
1081	LFT	FM-1004	SILT FENCE

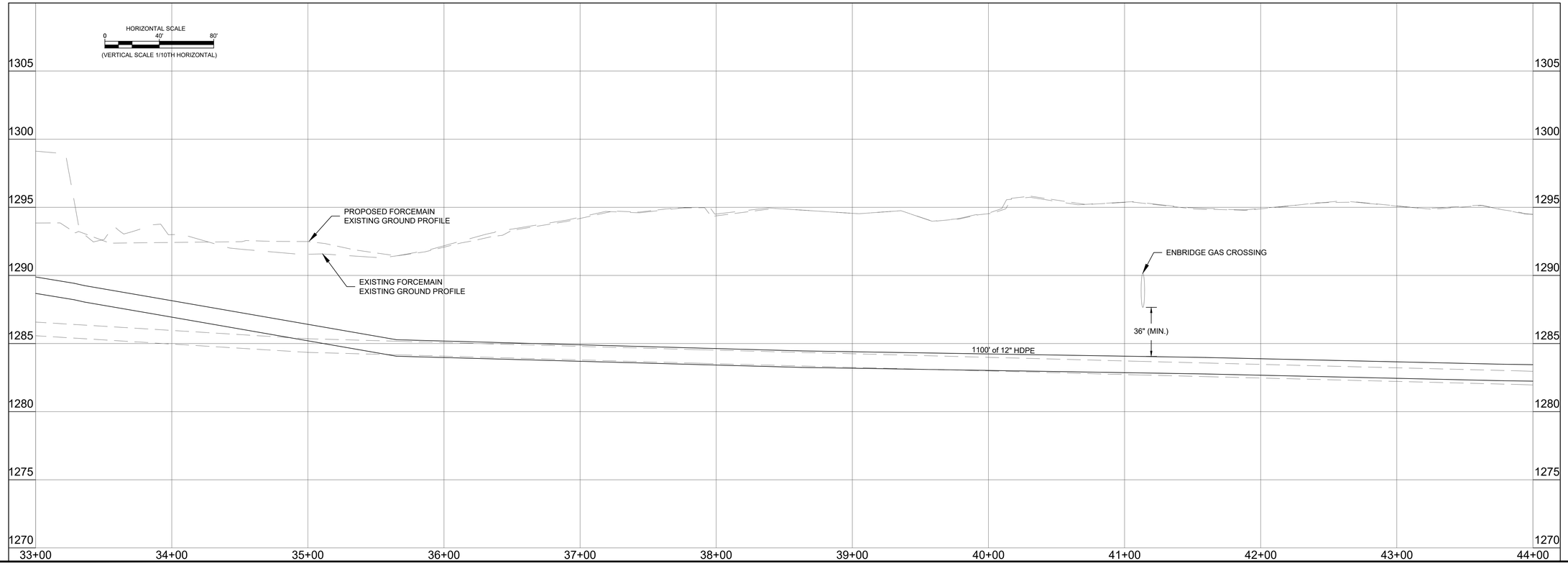
SANITARY SEWER ITEMS:

1100	LFT	FM-1005	12" SDR-17 HDPE SANITARY FORCEMAIN
12	CYD	FM-1010	FLOWABLE FILL
1	EACH	FM-1020	MONUMENT BOX AND MARKER POST



CONSTRUCTION NOTES:

1. FLOWABLE FILL FILLER PIPES TO BE PLACED APPROXIMATELY 500' APART OR AS NECESSARY TO COMPLETELY FILL EXISTING PIPE.
2. FILLER PIPES TO BE REMOVED AFTER FLOWABLE FILL HAS PROPERLY CURED.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO THE ORV TRAIL OUTSIDE THE PAYMENT LIMITS AS INDICATED PER MDNR SPECIFICATIONS AND TO EQUAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE OWNER FOR UTILIZING THE TRAIL DURING PERFORMANCE OF THE WORK.



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Iron River, MI 49935
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RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

PLAN AND PROFILE FORCEMAIN STA 33+00 TO STA 44+00

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
110-C-48

SHEET #34

ARCHIVE # 91 0066251

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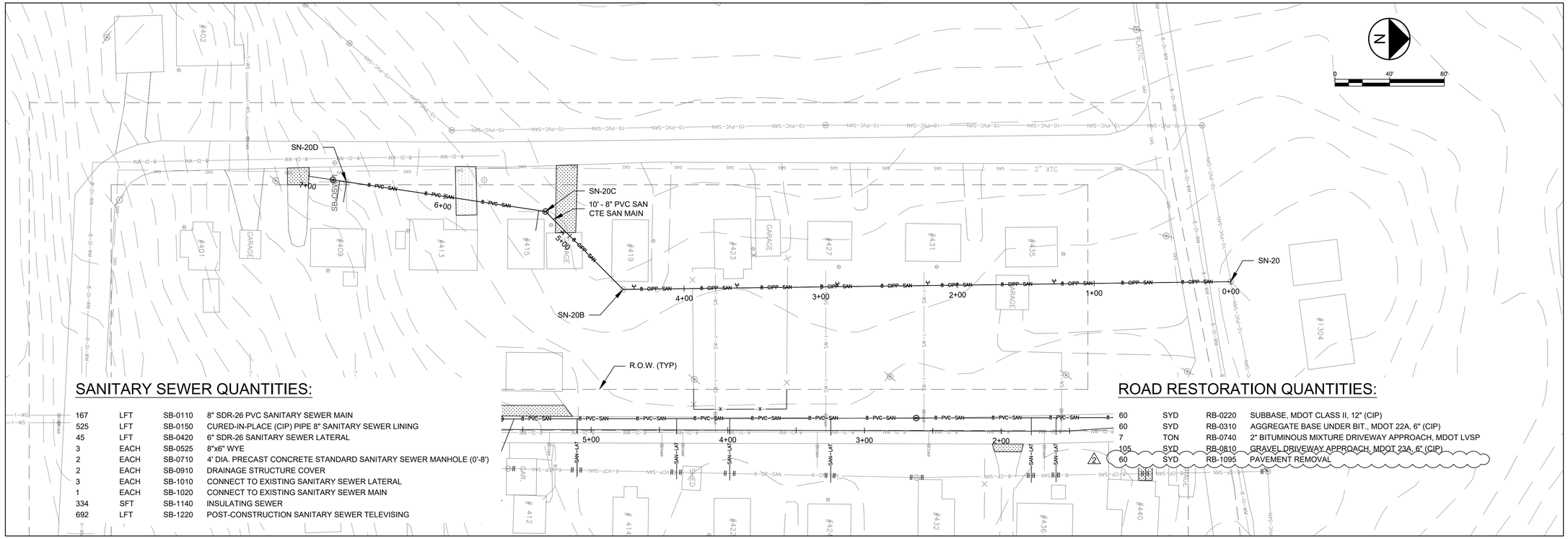
FAIRBANKS MINE ROAD



SANITARY SEWER QUANTITIES:

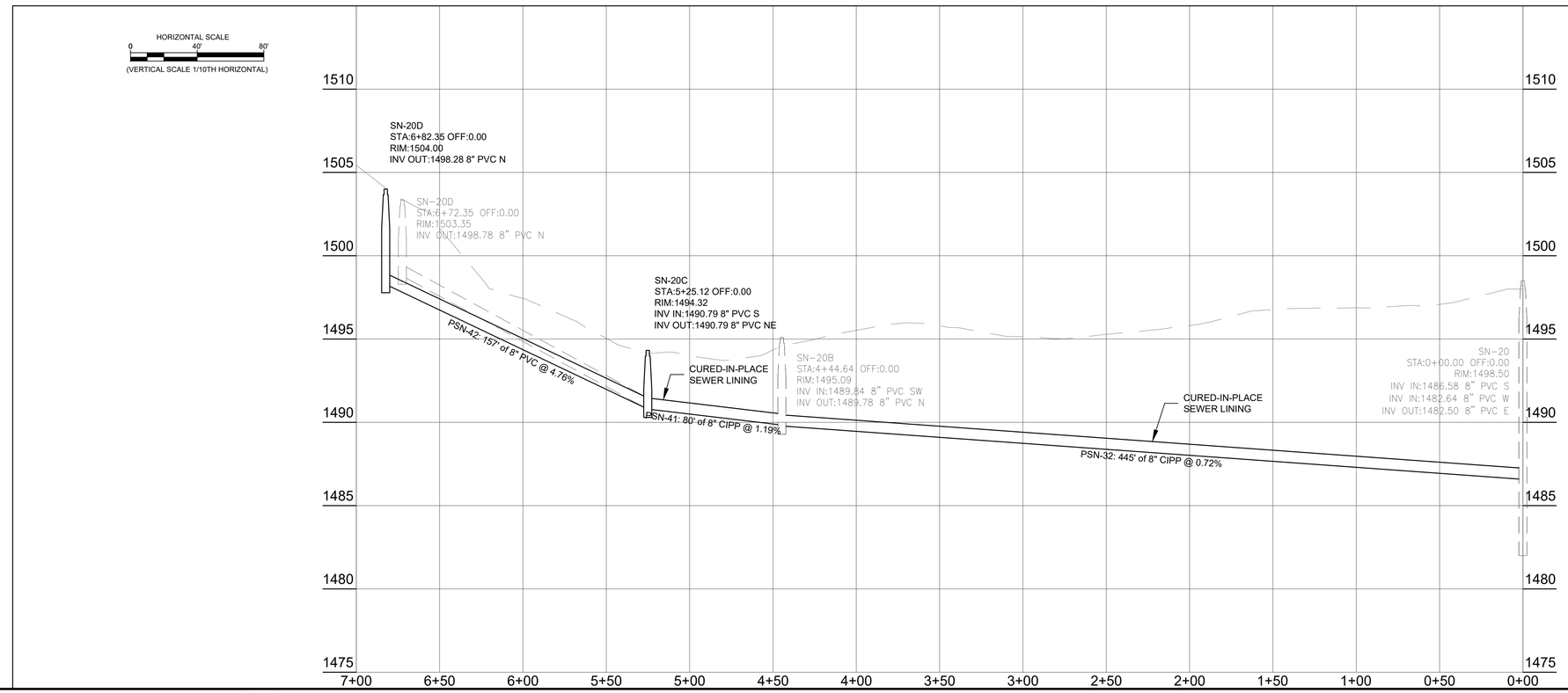
167	LFT	SB-0110	8" SDR-26 PVC SANITARY SEWER MAIN
525	LFT	SB-0150	CURED-IN-PLACE (CIP) PIPE 8" SANITARY SEWER LINING
45	LFT	SB-0420	6" SDR-26 SANITARY SEWER LATERAL
3	EACH	SB-0525	8"x6" WYE
2	EACH	SB-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY SEWER MANHOLE (0'-8')
2	EACH	SB-0910	DRAINAGE STRUCTURE COVER
3	EACH	SB-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SB-1020	CONNECT TO EXISTING SANITARY SEWER MAIN
334	SFT	SB-1140	INSULATING SEWER
692	LFT	SB-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

ROAD RESTORATION QUANTITIES:

60	SYD	RB-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
60	SYD	RB-0310	AGGREGATE BASE UNDER BIT., MDOT 22A, 6" (CIP)
7	TON	RB-0740	2" BITUMINOUS MIXTURE DRIVEWAY APPROACH, MDOT LVSP
105	SYD	RB-0810	GRAVEL DRIVEWAY APPROACH, MDOT 23A, 6" (CIP)
2 60	SYD	RB-1095	PAVEMENT REMOVAL

OSWALD STREET

FAIRBANKS MINE ROAD



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906-214-4140

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City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'B' PLAN AND PROFILE OSWALD STREET

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-100
SHEET #63
ARCHIVE #

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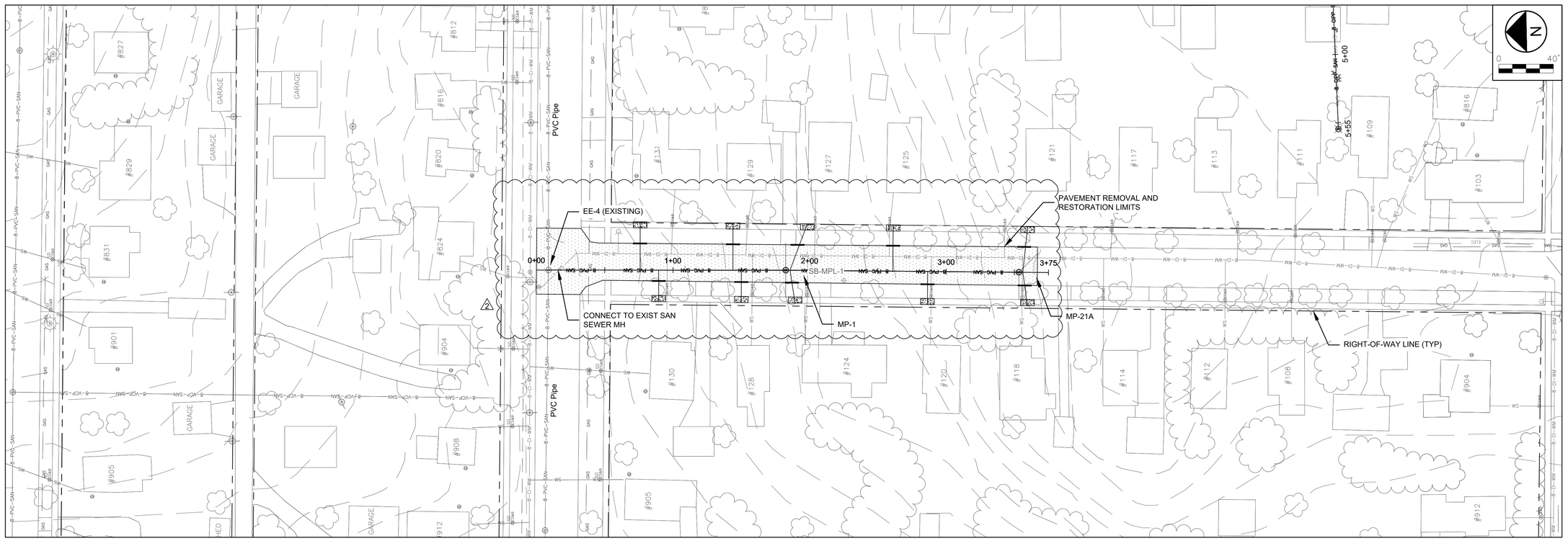

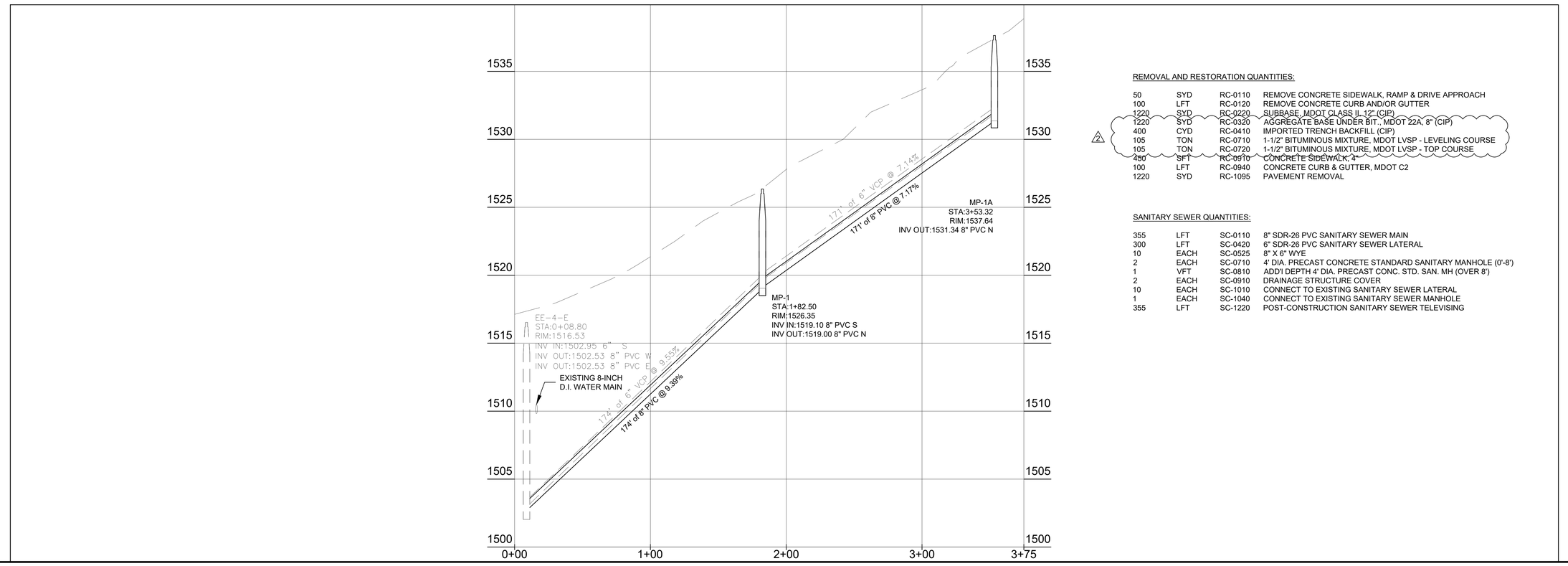

REMOVAL AND RESTORATION QUANTITIES:

50	SYD	RC-0110	REMOVE CONCRETE SIDEWALK, RAMP & DRIVE APPROACH
100	LFT	RC-0120	REMOVE CONCRETE CURB AND/OR GUTTER
1220	SYD	RC-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
1220	SYD	RC-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 8" (CIP)
400	CYD	RC-0410	IMPORTED TRENCH BACKFILL (CIP)
105	TON	RC-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE
105	TON	RC-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE
450	SFT	RC-0910	CONCRETE SIDEWALK, 4"
100	LFT	RC-0940	CONCRETE CURB & GUTTER, MDOT C2
1220	SYD	RC-1095	PAVEMENT REMOVAL

SANITARY SEWER QUANTITIES:

355	LFT	SC-0110	8" SDR-26 PVC SANITARY SEWER MAIN
300	LFT	SC-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
10	EACH	SC-0525	8" X 6" WYE
2	EACH	SC-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY MANHOLE (0'-8')
1	VFT	SC-0810	ADD'I DEPTH 4' DIA. PRECAST CONC. STD. SAN. MH (OVER 8')
2	EACH	SC-0910	DRAINAGE STRUCTURE COVER
10	EACH	SC-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SC-1040	CONNECT TO EXISTING SANITARY SEWER MANHOLE
355	LFT	SC-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

GEI Consultants
990 Lalley Road
Iron River, MI 49935
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RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'C'
PLAN AND PROFILE
MAPLE STREET

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By: BCA
Checked By: CAR
Drawn By: BCA
Approved By: CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-101

SHEET #64

ARCHIVE #

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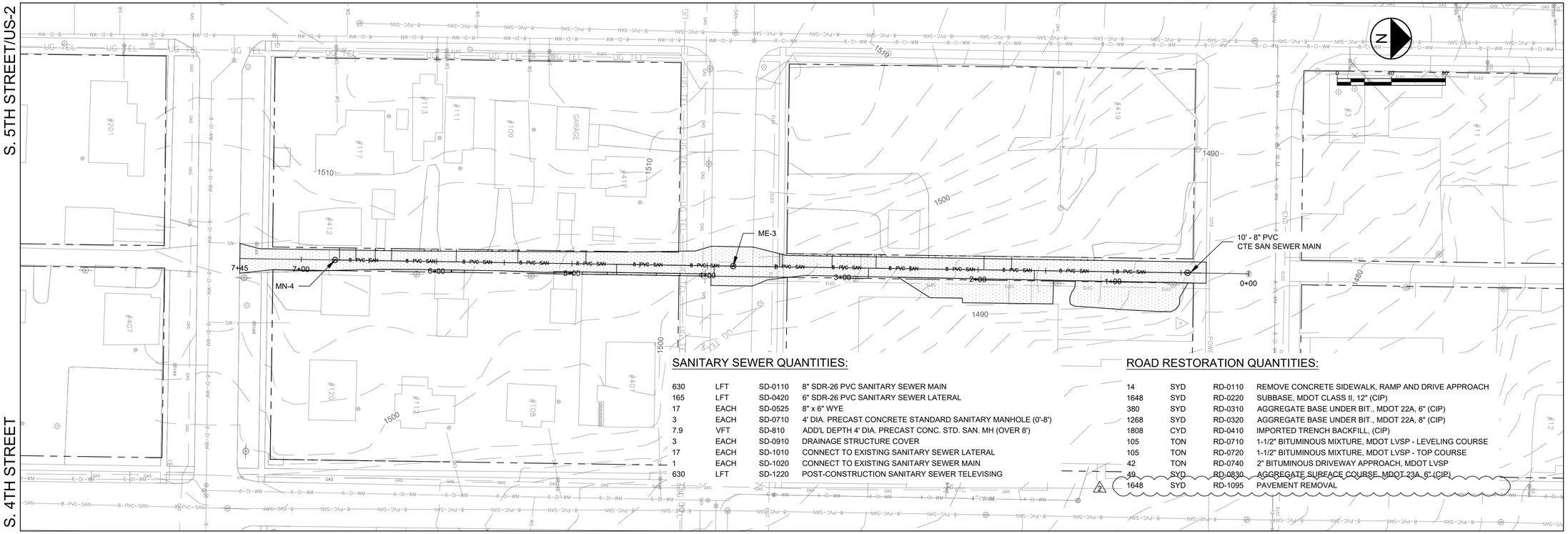
MICHIGAN AVENUE | MARQUETTE AVENUE | SUPERIOR AVENUE

S. 5TH STREET/US-2

S. 4TH STREET

N. 5TH STREET/US-2

N. 4TH STREET



SANITARY SEWER QUANTITIES:

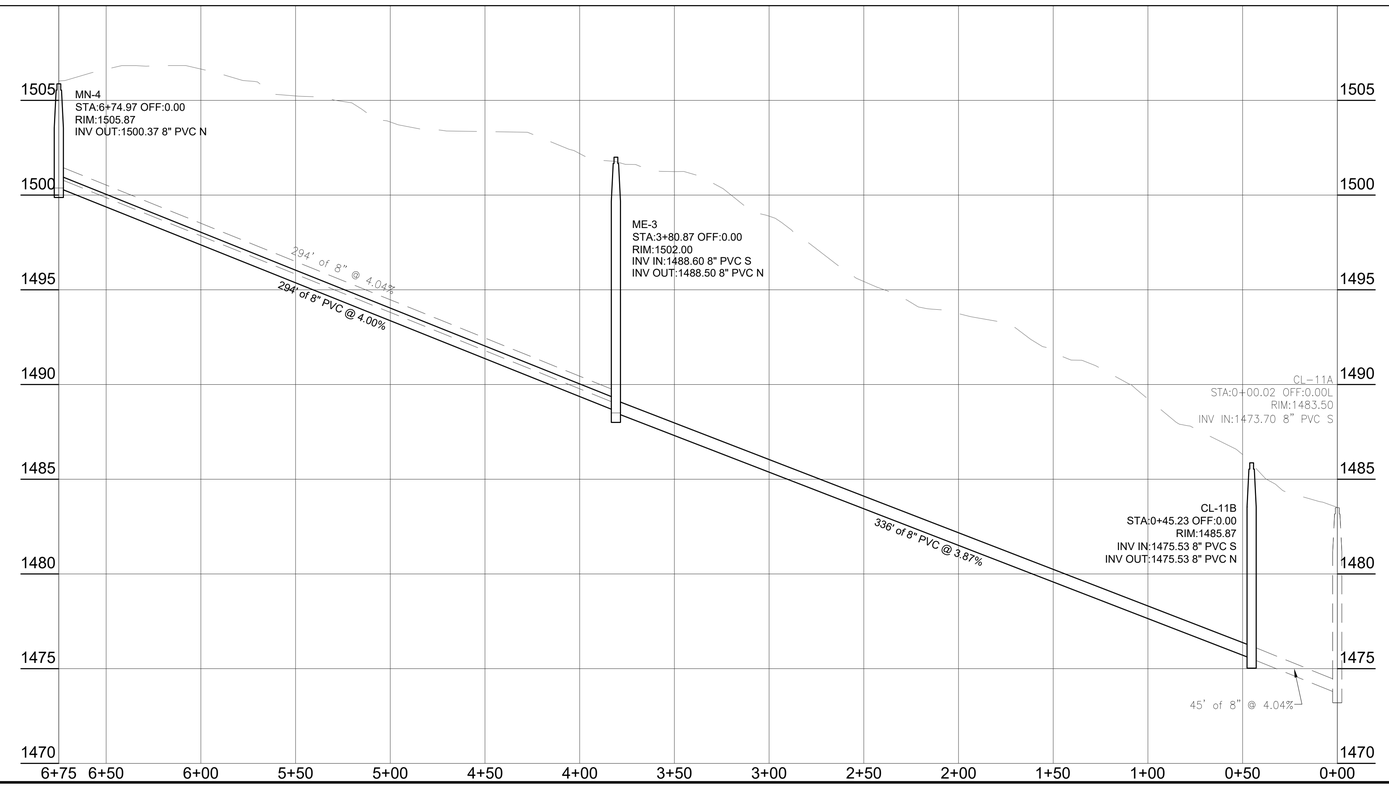
630	LFT	SD-0110	8" SDR-26 PVC SANITARY SEWER MAIN
165	LFT	SD-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
17	EACH	SD-0525	8" x 6" WYE
3	EACH	SD-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY MANHOLE (0'-8')
7.9	VFT	SD-810	ADD'L DEPTH 4' DIA. PRECAST CONC. STD. SAN. MH (OVER 8')
3	EACH	SD-0910	DRAINAGE STRUCTURE COVER
17	EACH	SD-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SD-1020	CONNECT TO EXISTING SANITARY SEWER MAIN
630	LFT	SD-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

ROAD RESTORATION QUANTITIES:

14	SYD	RD-0110	REMOVE CONCRETE SIDEWALK, RAMP AND DRIVE APPROACH
1648	SYD	RD-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
380	SYD	RD-0310	AGGREGATE BASE UNDER BIT., MDOT 22A, 6" (CIP)
1268	SYD	RD-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 8" (CIP)
1808	CYD	RD-0410	IMPORTED TRENCH BACKFILL, (CIP)
105	TON	RD-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE
105	TON	RD-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE
42	TON	RD-0740	2" BITUMINOUS DRIVEWAY APPROACH, MDOT LVSP
49	SYD	RD-0830	AGGREGATE SURFACE COURSE, MDOT 23A, 6" (CIP)
1648	SYD	RD-1095	PAVEMENT REMOVAL

MICHIGAN AVENUE | MARQUETTE AVENUE | SUPERIOR AVENUE

HORIZONTAL SCALE
0 40' 80'
(VERTICAL SCALE 1/10TH HORIZONTAL)



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'D' PLAN AND PROFILE US-2/SOUTH 5TH STREET AND SOUTH 4TH STREET ALLEY

Attention: 0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-102
SHEET #65
ARCHIVE #

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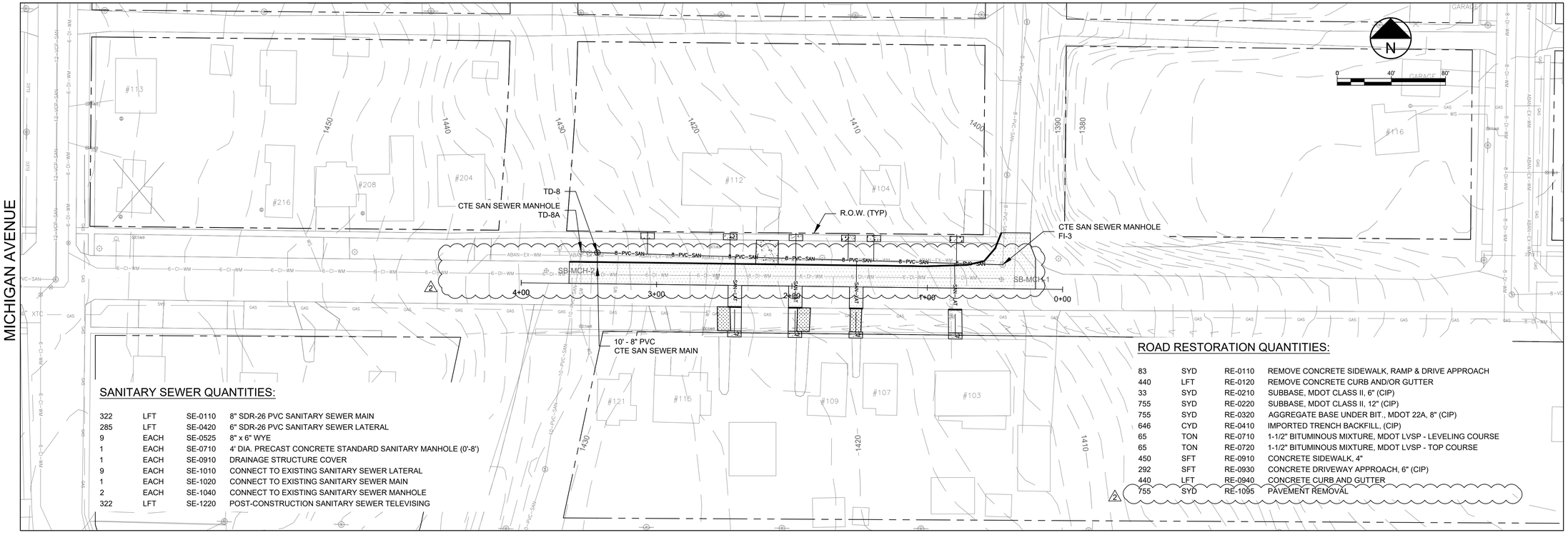
1ST STREET

RIVER AVENUE

MICHIGAN AVENUE

MICHIGAN AVENUE



SANITARY SEWER QUANTITIES:

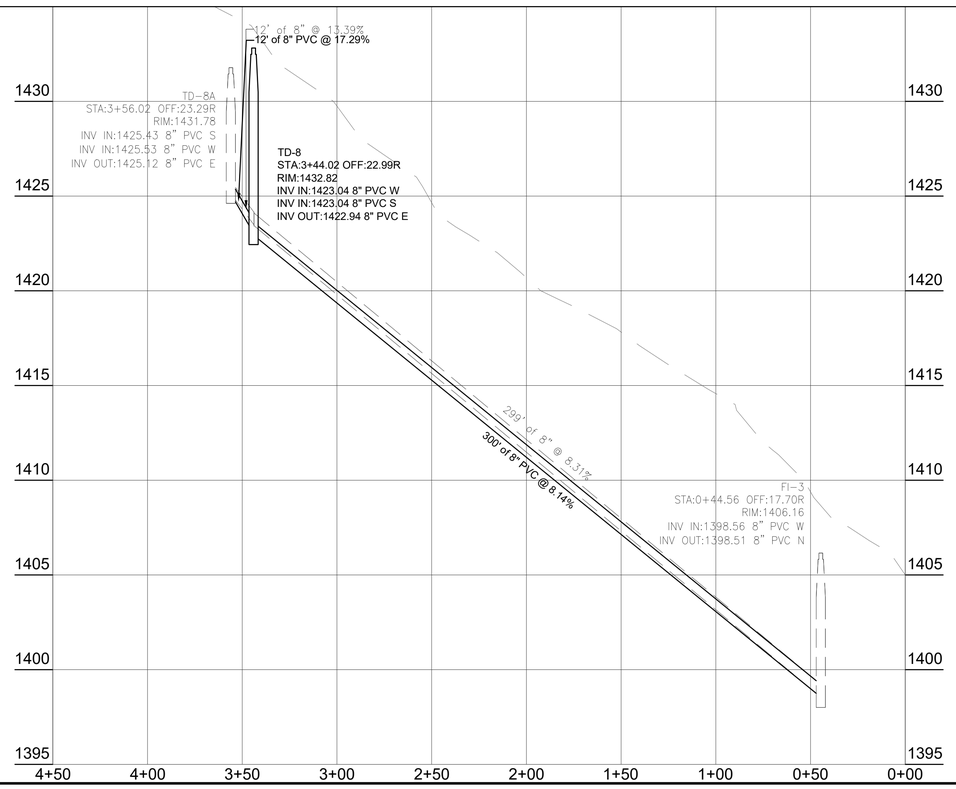
322	LFT	SE-0110	8" SDR-26 PVC SANITARY SEWER MAIN
285	LFT	SE-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
9	EACH	SE-0525	8" x 6" WYE
1	EACH	SE-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY MANHOLE (0'-8')
1	EACH	SE-0910	DRAINAGE STRUCTURE COVER
9	EACH	SE-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SE-1020	CONNECT TO EXISTING SANITARY SEWER MAIN
2	EACH	SE-1040	CONNECT TO EXISTING SANITARY SEWER MANHOLE
322	LFT	SE-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

ROAD RESTORATION QUANTITIES:

83	SYD	RE-0110	REMOVE CONCRETE SIDEWALK, RAMP & DRIVE APPROACH
440	LFT	RE-0120	REMOVE CONCRETE CURB AND/OR GUTTER
33	SYD	RE-0210	SUBBASE, MDOT CLASS II, 6" (CIP)
755	SYD	RE-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
755	SYD	RE-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 8" (CIP)
646	CYD	RE-0410	IMPORTED TRENCH BACKFILL, (CIP)
65	TON	RE-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE
65	TON	RE-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE
450	SFT	RE-0910	CONCRETE SIDEWALK, 4"
292	SFT	RE-0930	CONCRETE DRIVEWAY APPROACH, 6" (CIP)
440	LFT	RE-0940	CONCRETE CURB AND GUTTER
755	SYD	RE-1095	PAVEMENT REMOVAL

3RD STREET

HORIZONTAL SCALE
0 40' 80'
(VERTICAL SCALE 1/10TH HORIZONTAL)



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'E' PLAN AND PROFILE MICHIGAN AVENUE

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-103

SHEET #66

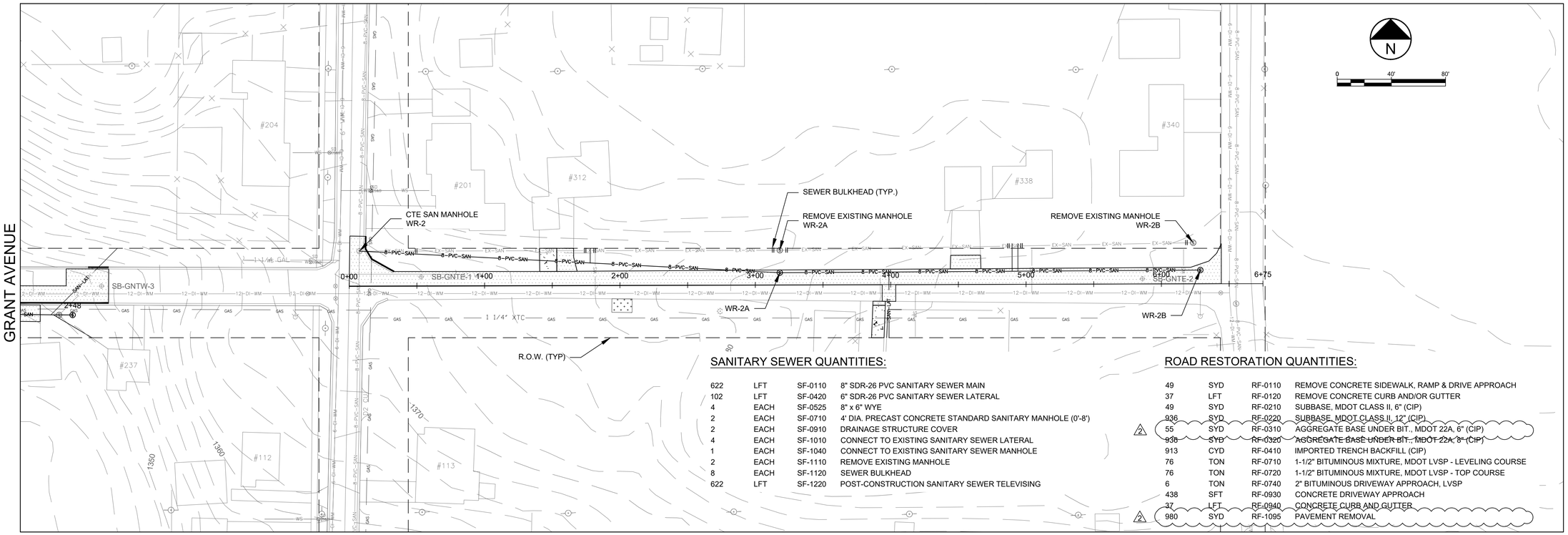
ARCHIVE #

K:\Crystal_Falls_City\1803991-RD_Sanitary_Sewer_Improvements\CAD\Sheets\1803991-02-C-MICH.dwg, 5/23/2022 8:39:48 AM, ANDERSON, BRAD, GEI.stb

WAGNER STREET

LOGAN STREET

GRANT AVENUE



SANITARY SEWER QUANTITIES:

622	LFT	SF-0110	8" SDR-26 PVC SANITARY SEWER MAIN
102	LFT	SF-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
4	EACH	SF-0525	8" x 6" WYE
2	EACH	SF-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY MANHOLE (0'-8')
2	EACH	SF-0910	DRAINAGE STRUCTURE COVER
4	EACH	SF-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SF-1040	CONNECT TO EXISTING SANITARY SEWER MANHOLE
2	EACH	SF-1110	REMOVE EXISTING MANHOLE
8	EACH	SF-1120	SEWER BULKHEAD
622	LFT	SF-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

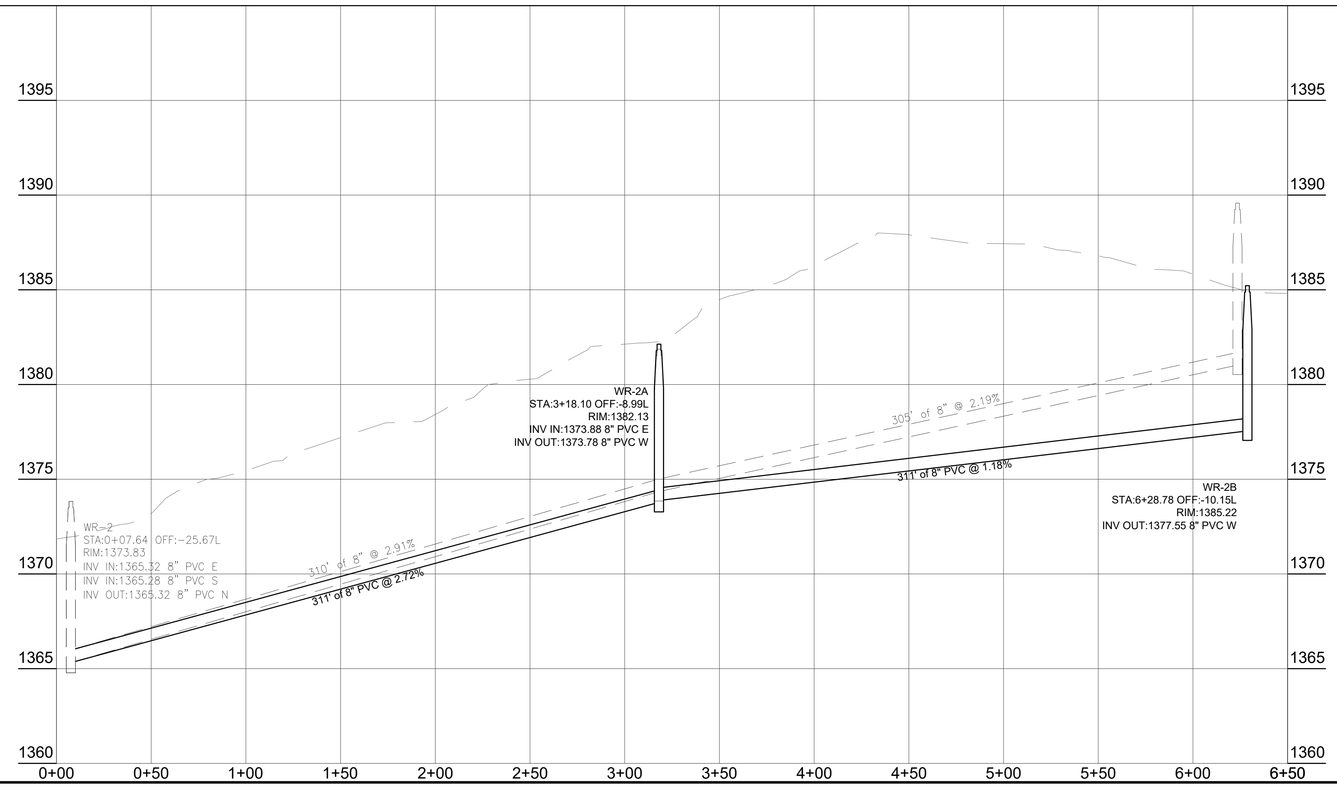
ROAD RESTORATION QUANTITIES:

49	SYD	RF-0110	REMOVE CONCRETE SIDEWALK, RAMP & DRIVE APPROACH	
37	LFT	RF-0120	REMOVE CONCRETE CURB AND/OR GUTTER	
49	SYD	RF-0210	SUBBASE, MDOT CLASS II, 6" (CIP)	
936	SYD	RF-0220	SUBBASE, MDOT CLASS II, 12" (CIP)	
55	SYD	RF-0310	AGGREGATE BASE UNDER BIT., MDOT 22A, 6" (CIP)	2
936	SYD	RF-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 8" (CIP)	
913	CYD	RF-0410	IMPORTED TRENCH BACKFILL (CIP)	
76	TON	RF-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE	
76	TON	RF-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE	
6	TON	RF-0740	2" BITUMINOUS DRIVEWAY APPROACH, LVSP	
438	SFT	RF-0930	CONCRETE DRIVEWAY APPROACH	
37	LFT	RF-0940	CONCRETE CURB AND GUTTER	
980	SYD	RF-1095	PAVEMENT REMOVAL	2

WAGNER STREET

LOGAN STREET

HORIZONTAL SCALE
0 40' 80'
(VERTICAL SCALE 1/10TH HORIZONTAL)



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'F'
PLAN AND PROFILE
EAST GRANT AVENUE

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By: BCA
Checked By: CAR
Drawn By: BCA
Approved By: CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-104

SHEET #67

ARCHIVE #

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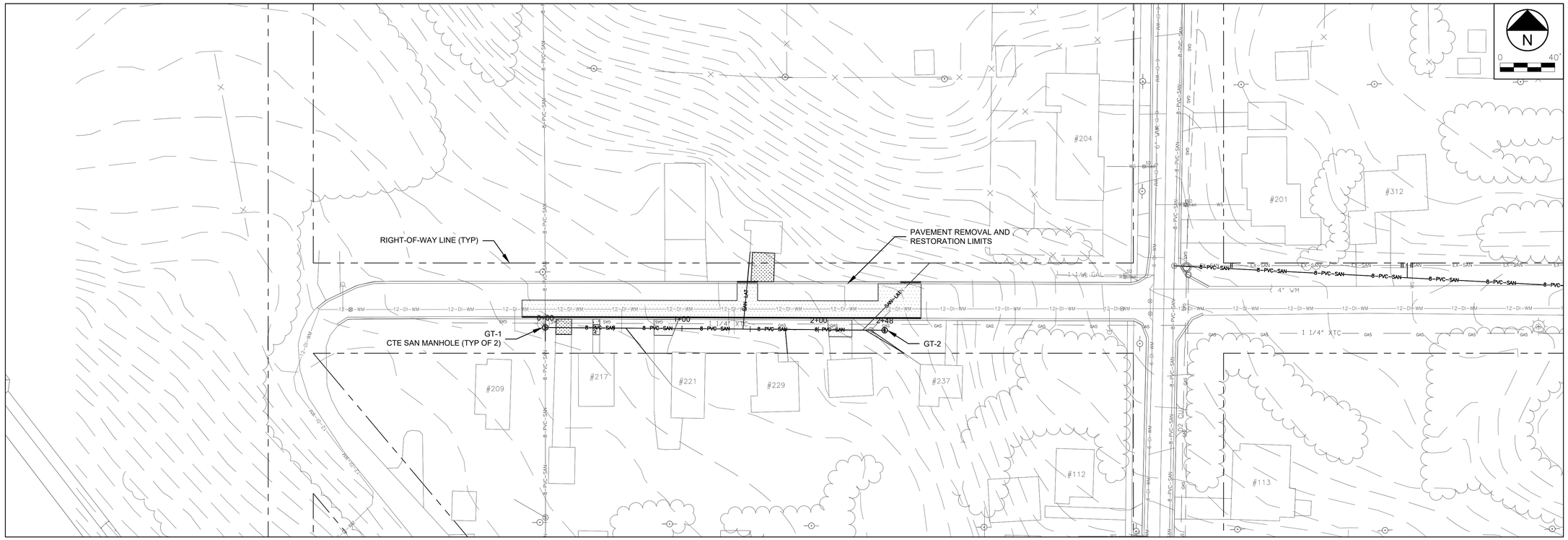

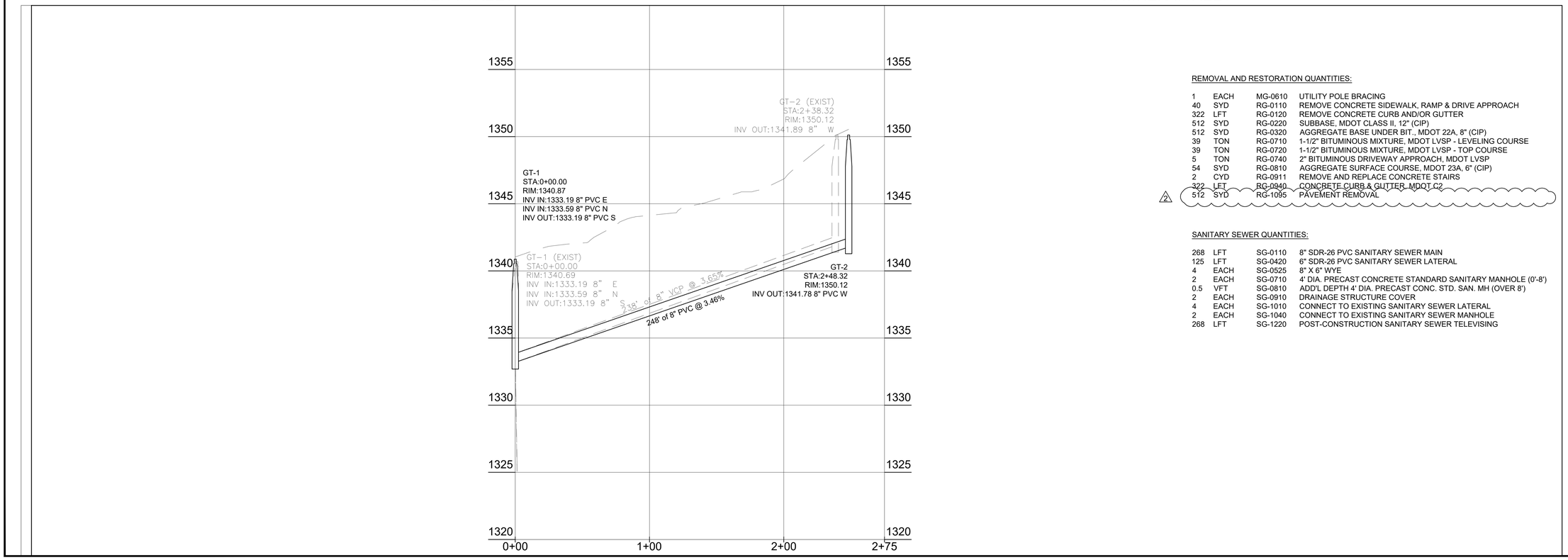

REMOVAL AND RESTORATION QUANTITIES:

1	EACH	MG-0610	UTILITY POLE BRACING
40	SYD	RG-0110	REMOVE CONCRETE SIDEWALK, RAMP & DRIVE APPROACH
322	LFT	RG-0120	REMOVE CONCRETE CURB AND/OR GUTTER
512	SYD	RG-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
512	SYD	RG-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 8" (CIP)
39	TON	RG-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE
39	TON	RG-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE
5	TON	RG-0740	2" BITUMINOUS DRIVEWAY APPROACH, MDOT LVSP
54	SYD	RG-0810	AGGREGATE SURFACE COURSE, MDOT 23A, 6" (CIP)
2	CYD	RG-0911	REMOVE AND REPLACE CONCRETE STAIRS
322	LFT	RG-0940	CONCRETE CURB & GUTTER, MDOT C2
512	SYD	RG-1055	PAVEMENT REMOVAL

2

SANITARY SEWER QUANTITIES:

268	LFT	SG-0110	8" SDR-26 PVC SANITARY SEWER MAIN
125	LFT	SG-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
4	EACH	SG-0525	8" X 6" WYE
2	EACH	SG-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY MANHOLE (0'-8')
0.5	VFT	SG-0810	ADD'L DEPTH 4' DIA. PRECAST CONC. STD. SAN. MH (OVER 8')
2	EACH	SG-0910	DRAINAGE STRUCTURE COVER
4	EACH	SG-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
2	EACH	SG-1040	CONNECT TO EXISTING SANITARY SEWER MANHOLE
268	LFT	SG-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'G'
PLAN AND PROFILE
WEST GRANT AVENUE

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By: BCA
Checked By: CAR
Drawn By: BCA
Approved By: CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-105

SHEET #68

ARCHIVE #

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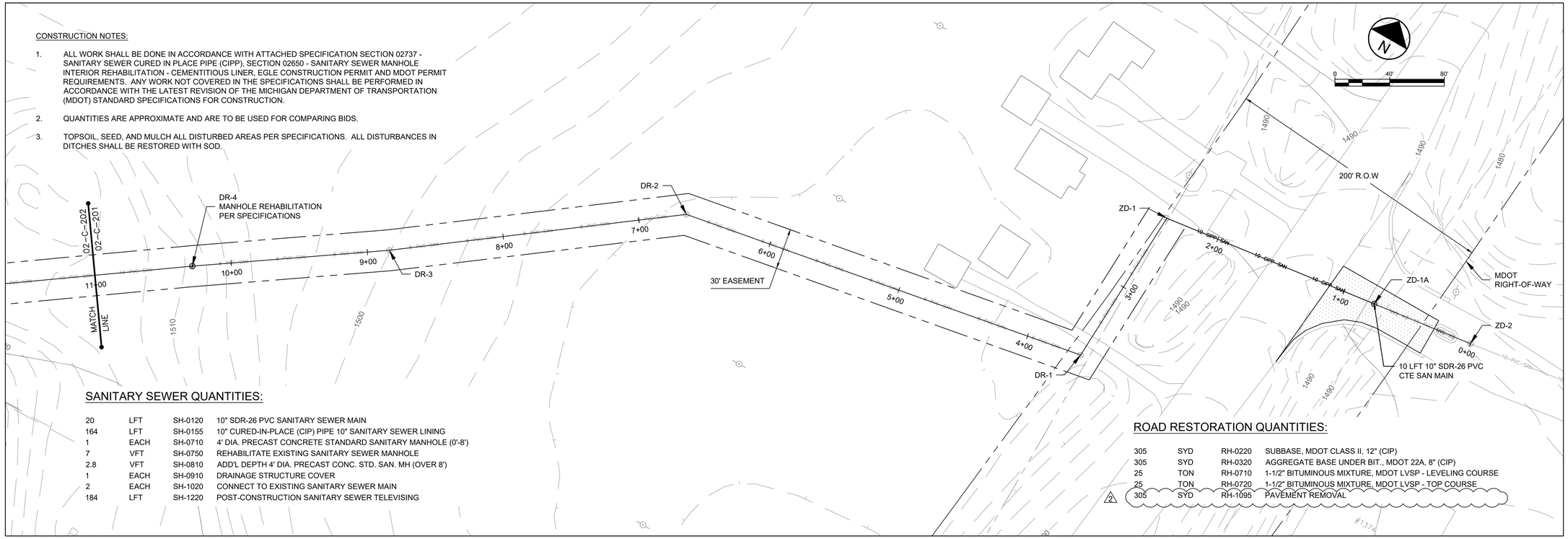
CONSTRUCTION NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ATTACHED SPECIFICATION SECTION 02737 - SANITARY SEWER CURED IN PLACE PIPE (CIPP), SECTION 02650 - SANITARY SEWER MANHOLE INTERIOR REHABILITATION - CEMENTITIOUS LINER, EGLE CONSTRUCTION PERMIT AND MDOT PERMIT REQUIREMENTS. ANY WORK NOT COVERED IN THE SPECIFICATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION.
2. QUANTITIES ARE APPROXIMATE AND ARE TO BE USED FOR COMPARING BIDS.
3. TOPSOIL, SEED, AND MULCH ALL DISTURBED AREAS PER SPECIFICATIONS. ALL DISTURBANCES IN DITCHES SHALL BE RESTORED WITH SOD.

US-141



SANITARY SEWER QUANTITIES:

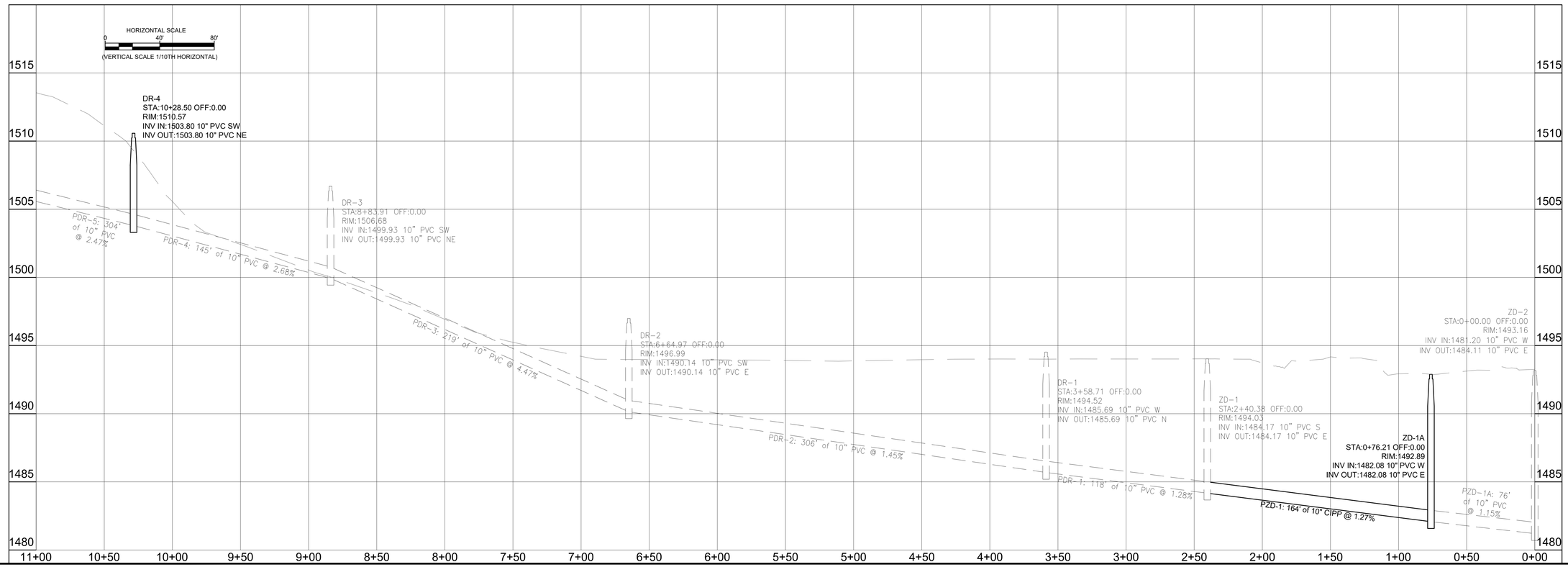
20	LFT	SH-0120	10" SDR-26 PVC SANITARY SEWER MAIN
164	LFT	SH-0155	10" CURED-IN-PLACE (CIP) PIPE 10" SANITARY SEWER LINING
1	EACH	SH-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY MANHOLE (0'-8')
7	VFT	SH-0750	REHABILITATE EXISTING SANITARY SEWER MANHOLE
2.8	VFT	SH-0810	ADD'L DEPTH 4' DIA. PRECAST CONC. STD. SAN. MH (OVER 8')
1	EACH	SH-0910	DRAINAGE STRUCTURE COVER
2	EACH	SH-1020	CONNECT TO EXISTING SANITARY SEWER MAIN
184	LFT	SH-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

ROAD RESTORATION QUANTITIES:

305	SYD	RH-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
305	SYD	RH-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 8" (CIP)
25	TON	RH-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE
25	TON	RH-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE
305	SYD	RH-1095	PAVEMENT REMOVAL

(2)

US-141



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

INDUSTRIAL PARKWAY

ALTERNATE ADD 'H'
PLAN AND PROFILE
CRYSTAL FALLS TOWNSHIP EASEMENT

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-201

SHEET #69

ARCHIVE #

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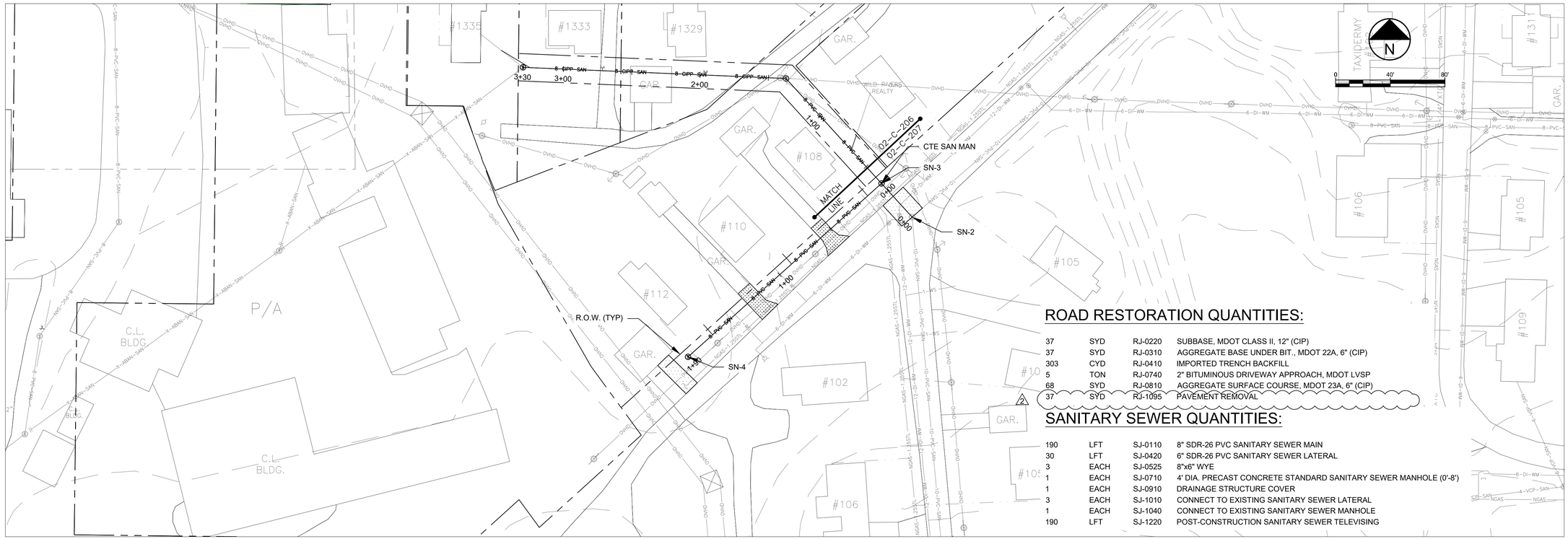
SHELDON ROAD

OSWALD STREET



FOREST PARKWAY

ROAD RESTORATION QUANTITIES:

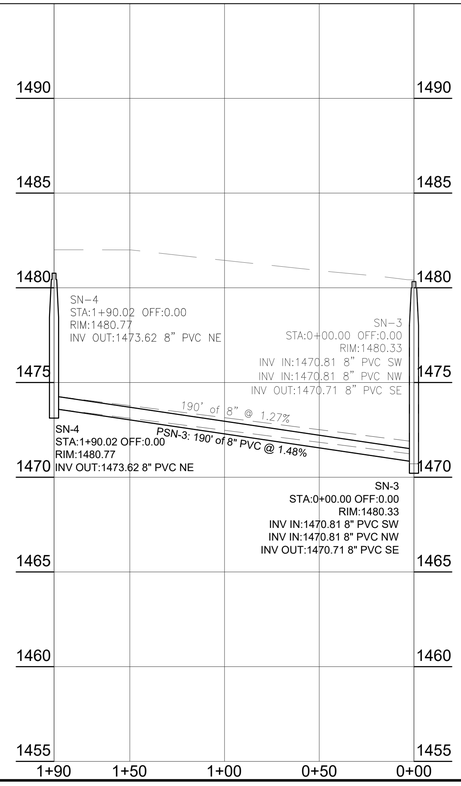
37	SYD	RJ-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
37	SYD	RJ-0310	AGGREGATE BASE UNDER BIT., MDOT 22A, 6" (CIP)
303	CYD	RJ-0410	IMPORTED TRENCH BACKFILL
5	TON	RJ-0740	2" BITUMINOUS DRIVEWAY APPROACH, MDOT LVSP
68	SYD	RJ-0810	AGGREGATE SURFACE COURSE, MDOT 23A, 6" (CIP)
37	SYD	RJ-1095	PAVEMENT REMOVAL

SANITARY SEWER QUANTITIES:

190	LFT	SJ-0110	8" SDR-26 PVC SANITARY SEWER MAIN
30	LFT	SJ-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
3	EACH	SJ-0525	8"x6" WYE
1	EACH	SJ-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY SEWER MANHOLE (0'-8')
1	EACH	SJ-0910	DRAINAGE STRUCTURE COVER
3	EACH	SJ-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SJ-1040	CONNECT TO EXISTING SANITARY SEWER MANHOLE
190	LFT	SJ-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

BATES STREET

HORIZONTAL SCALE
0 40' 80'
(VERTICAL SCALE 1/10TH HORIZONTAL)



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'J'
PLAN AND PROFILE
SHELDON ROAD

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By: BCA
Checked By: CAR
Drawn By: BCA
Approved By: CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-206

SHEET #74

ARCHIVE #

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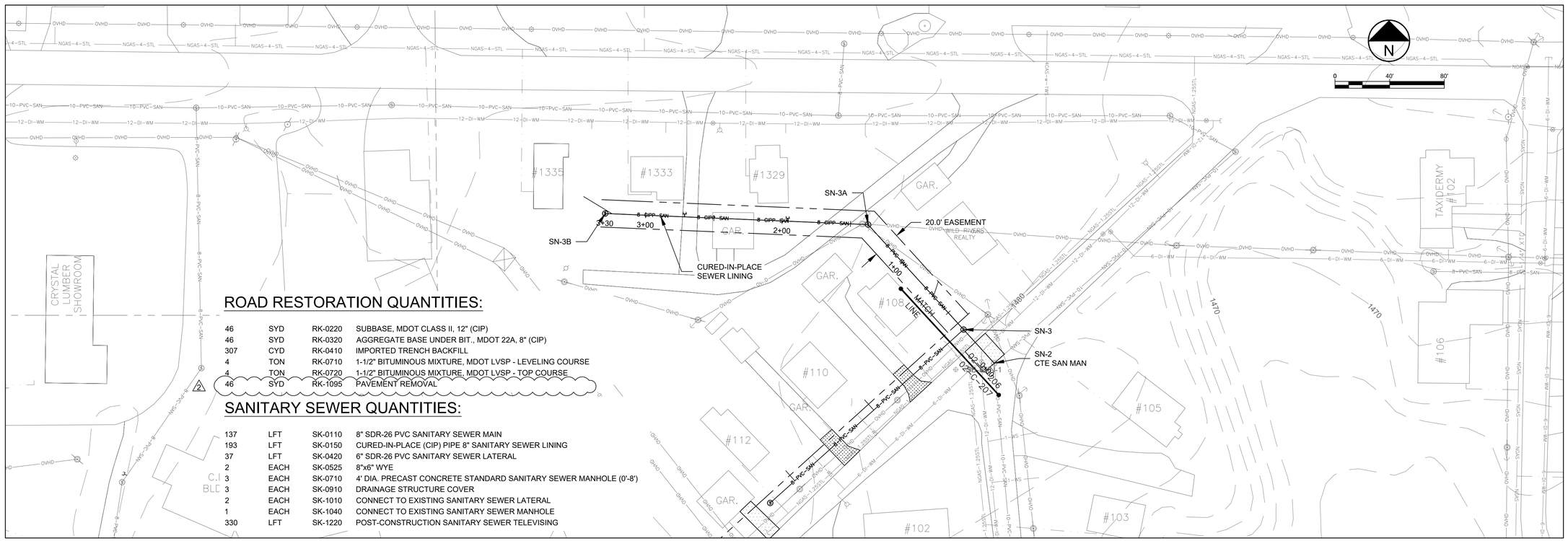


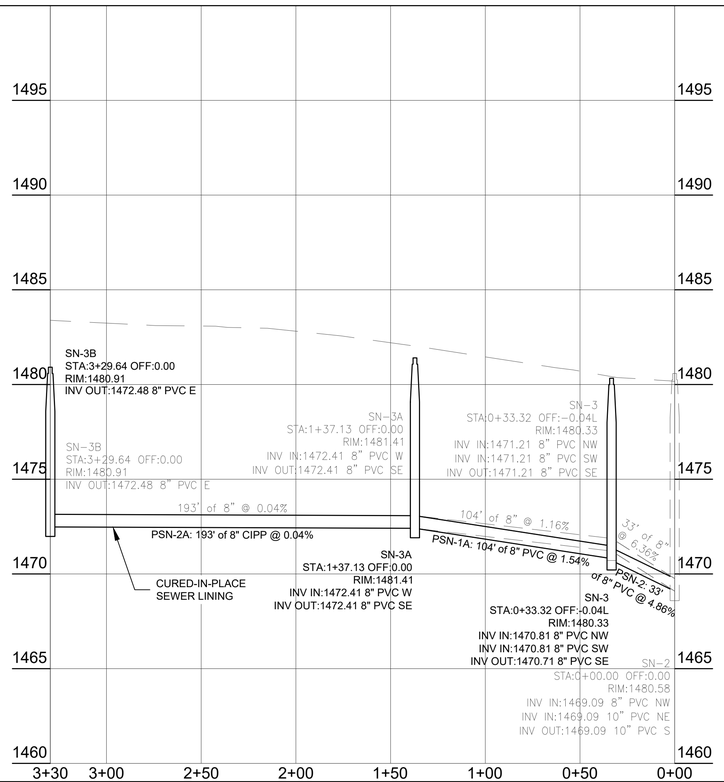
ROAD RESTORATION QUANTITIES:

46	SYD	RK-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
46	SYD	RK-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 8" (CIP)
307	CYD	RK-0410	IMPORTED TRENCH BACKFILL
4	TON	RK-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE
4	TON	RK-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE
46	SYD	RK-1095	PAVEMENT REMOVAL

SANITARY SEWER QUANTITIES:

137	LFT	SK-0110	8" SDR-26 PVC SANITARY SEWER MAIN
193	LFT	SK-0150	CURED-IN-PLACE (CIP) PIPE 8" SANITARY SEWER LINING
37	LFT	SK-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
2	EACH	SK-0525	8"x6" WYE
3	EACH	SK-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY SEWER MANHOLE (0'-8')
3	EACH	SK-0910	DRAINAGE STRUCTURE COVER
2	EACH	SK-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SK-1040	CONNECT TO EXISTING SANITARY SEWER MANHOLE
330	LFT	SK-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

HORIZONTAL SCALE
0 40' 80'
(VERTICAL SCALE 1/10TH HORIZONTAL)



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'K'
PLAN AND PROFILE
SHELDON ROAD - NORTH

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-207

SHEET #75

ARCHIVE #

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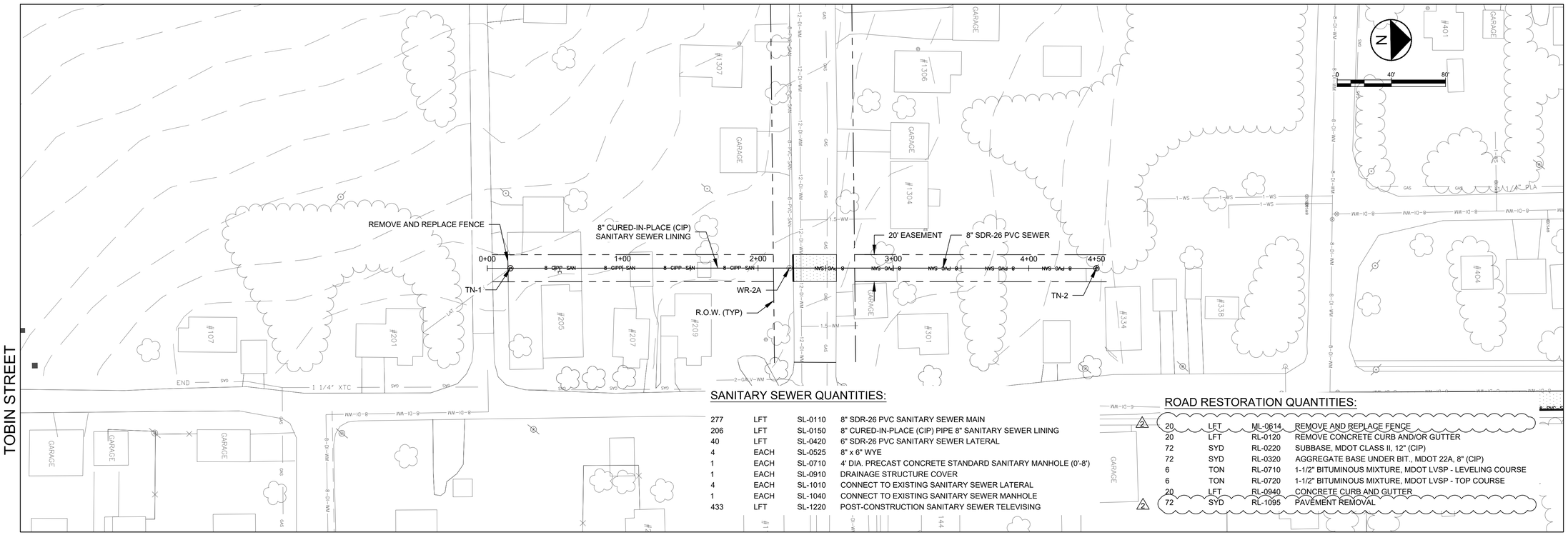


SANITARY SEWER QUANTITIES:

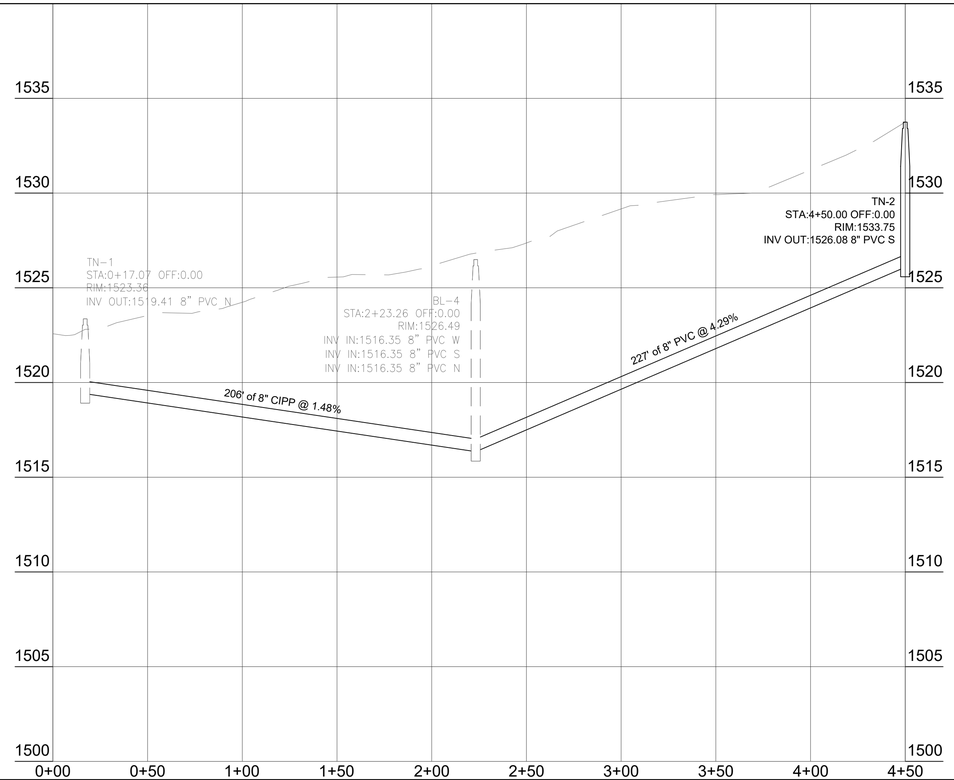
277	LFT	SL-0110	8" SDR-26 PVC SANITARY SEWER MAIN
206	LFT	SL-0150	8" CURED-IN-PLACE (CIP) PIPE 8" SANITARY SEWER LINING
40	LFT	SL-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
4	EACH	SL-0525	8" x 6" WYE
1	EACH	SL-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY MANHOLE (0'-8')
1	EACH	SL-0910	DRAINAGE STRUCTURE COVER
4	EACH	SL-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SL-1040	CONNECT TO EXISTING SANITARY SEWER MANHOLE
433	LFT	SL-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

ROAD RESTORATION QUANTITIES:

20	LFT	ML-0614	REMOVE AND REPLACE FENCE
20	LFT	RL-0120	REMOVE CONCRETE CURB AND/OR GUTTER
72	SYD	RL-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
72	SYD	RL-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 8" (CIP)
6	TON	RL-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE
6	TON	RL-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE
20	LFT	RL-0940	CONCRETE CURB AND GUTTER
72	SYD	RL-1095	PAVEMENT REMOVAL

ERIE AVENUE HARRISON AVENUE MORTON AVENUE

HORIZONTAL SCALE
0 40' 80'
(VERTICAL SCALE 1/10TH HORIZONTAL)



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'L'
PLAN AND PROFILE
CRYSTAL FALLS TOWNSHIP - TOBIN STREEET

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-208

SHEET #76

ARCHIVE #

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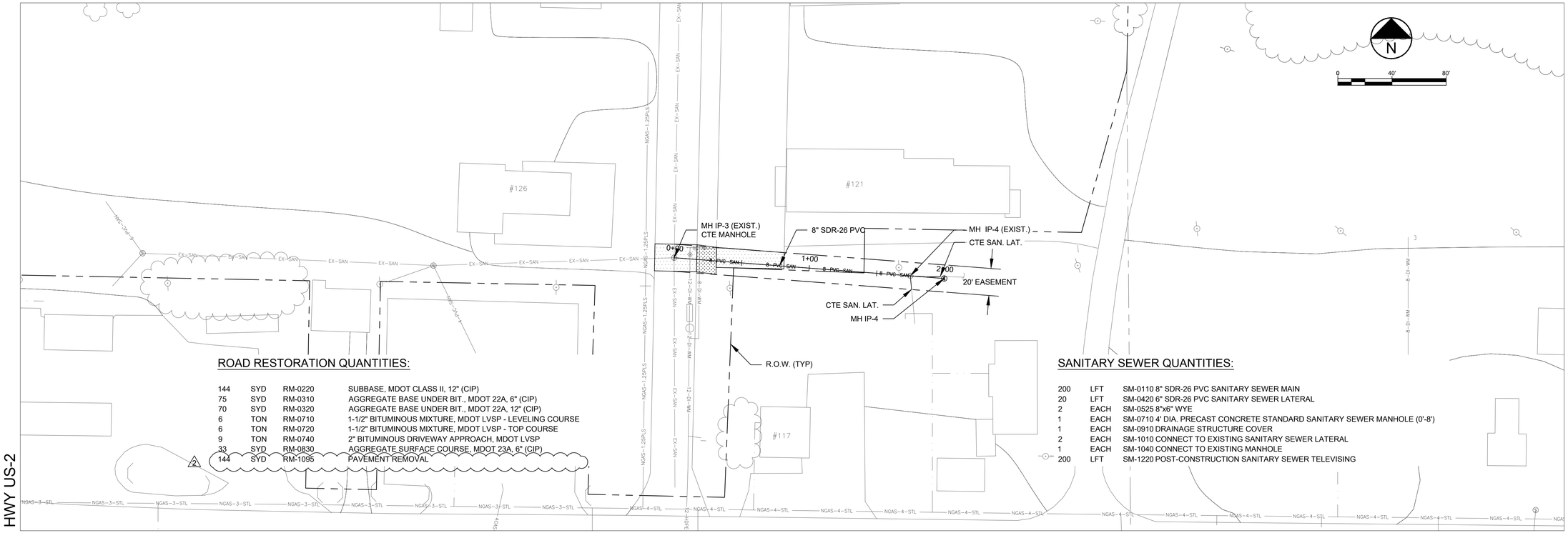
ZAVADA DRIVE

KREMPASKY ROAD



ROAD RESTORATION QUANTITIES:

144	SYD	RM-0220	SUBBASE, MDOT CLASS II, 12" (CIP)
75	SYD	RM-0310	AGGREGATE BASE UNDER BIT., MDOT 22A, 6" (CIP)
70	SYD	RM-0320	AGGREGATE BASE UNDER BIT., MDOT 22A, 12" (CIP)
6	TON	RM-0710	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - LEVELING COURSE
6	TON	RM-0720	1-1/2" BITUMINOUS MIXTURE, MDOT LVSP - TOP COURSE
9	TON	RM-0740	2" BITUMINOUS DRIVEWAY APPROACH, MDOT LVSP
33	SYD	RM-0830	AGGREGATE SURFACE COURSE, MDOT 23A, 6" (CIP)
2 144	SYD	RM-1095	PAVEMENT REMOVAL

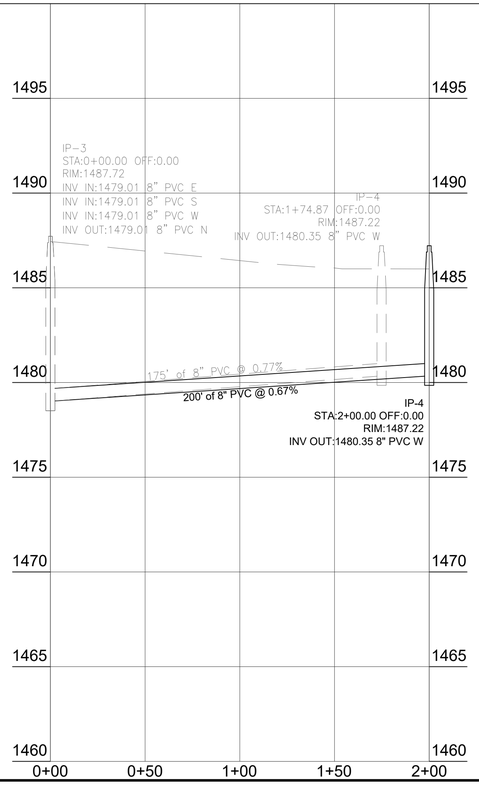
SANITARY SEWER QUANTITIES:

200	LFT	SM-0110	8" SDR-26 PVC SANITARY SEWER MAIN
20	LFT	SM-0420	6" SDR-26 PVC SANITARY SEWER LATERAL
2	EACH	SM-0525	8"x6" WYE
1	EACH	SM-0710	4' DIA. PRECAST CONCRETE STANDARD SANITARY SEWER MANHOLE (0'-8')
1	EACH	SM-0910	DRAINAGE STRUCTURE COVER
2	EACH	SM-1010	CONNECT TO EXISTING SANITARY SEWER LATERAL
1	EACH	SM-1040	CONNECT TO EXISTING MANHOLE
200	LFT	SM-1220	POST-CONSTRUCTION SANITARY SEWER TELEVISING

ZAVADA DRIVE

KREMPASKY ROAD

HORIZONTAL SCALE
0 40' 80'
(VERTICAL SCALE 1/10TH HORIZONTAL)



GEI Consultants
990 Lalley Road
Iron River, MI 49935
906-214-4140

RD Sanitary Sewer Improvements
City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

ALTERNATE ADD 'M'
PLAN AND PROFILE
CRYSTAL FALLS TOWNSHIP - ZAVADA DRIVE

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
B	7/9/2021
EGLE PERMIT REVISIONS	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
02-C-209

SHEET #77

ARCHIVE #

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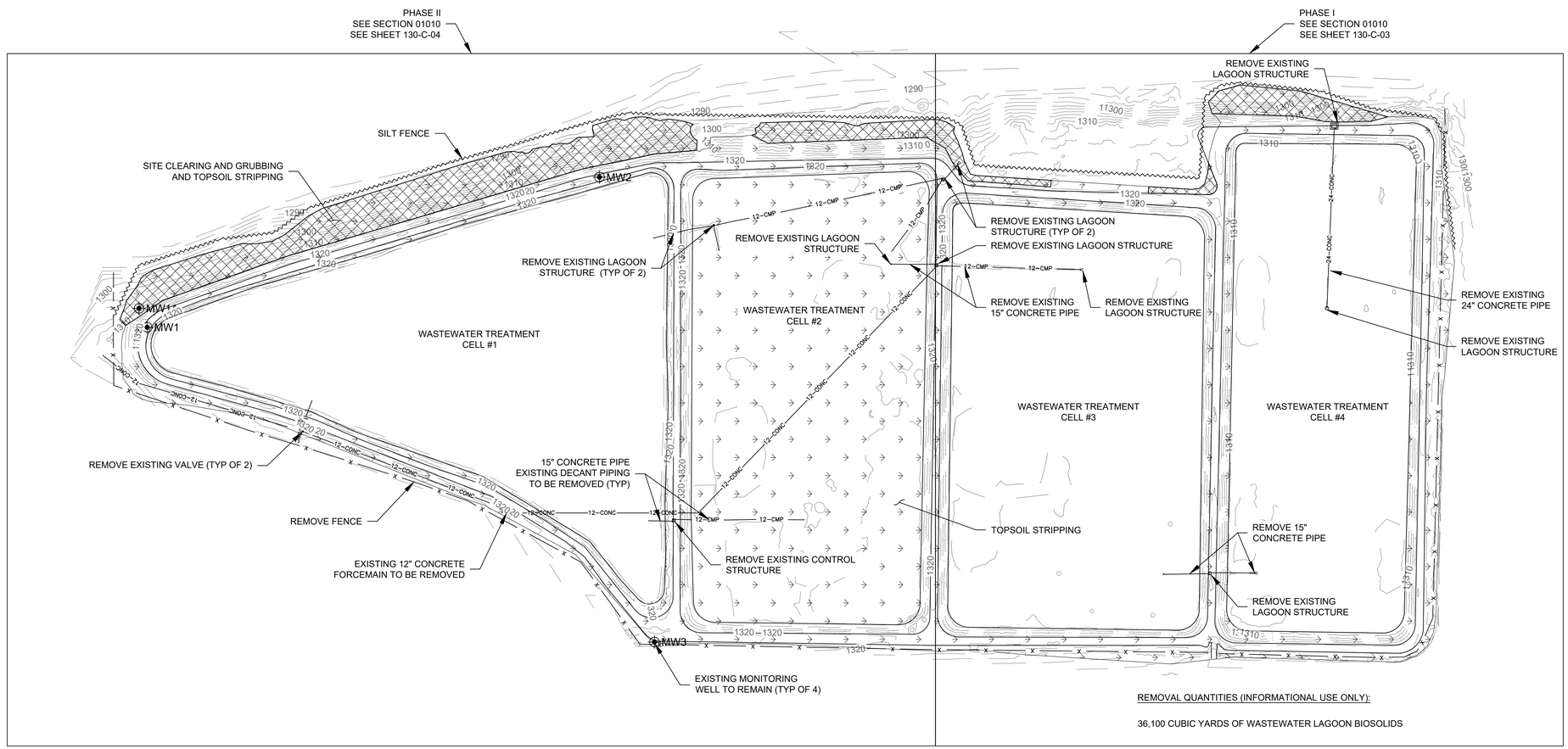

REMOVAL QUANTITIES (INFORMATIONAL USE ONLY):

36,100 CUBIC YARDS OF WASTEWATER LAGOON BIOSOLIDS

REMOVAL QUANTITIES:

4,736	LFT	LN-0100	REMOVE EXISTING FENCE
3,933	LFT	LN-0110	REMOVE EXISTING SITE PIPING
20	EACH	LN-0120	REMOVE EXISTING CONTROL STRUCTURES
1	LSUM	LN-0130	TRANSFER WASTEWATER LAGOON BIOSOLIDS
154,000	SYD	LN-0140	TOPSOIL STRIPPING
3,800	LFT	LN-4035	SILT FENCE
2 3.6	ACRES	LN-4050	SITE CLEARING AND GRUBBING

ALTERNATE ADD 'N' QUANTITIES:

1	EACH	LN-0135	REMOVE WASTEWATER LAGOON BIOSOLIDS

2 TOPSOIL STRIPPING

SITE CLEARING AND GRUBBING AND TOPSOIL STRIPPING

CONSTRUCTION NOTES:

1. TOPSOIL STRIPPING QUANTITIES ASSUME A REMOVAL DEPTH OF 3".

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City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

WASTEWATER TREATMENT EXISTING CONDITIONS SITE AND REMOVAL PLAN

Attention: 0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/11/2022
ADDENDUM 1	
F	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
130-C-01
SHEET #42
ARCHIVE # 91 0066259

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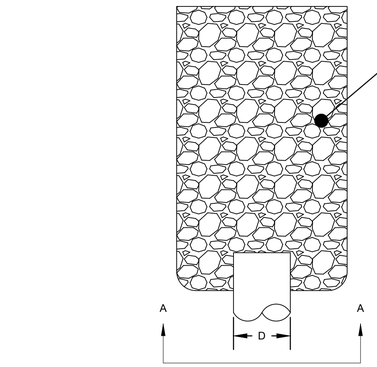
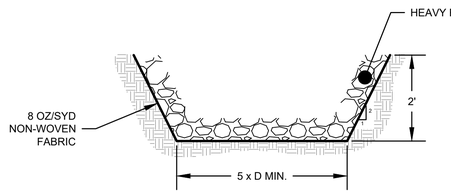


PLAN



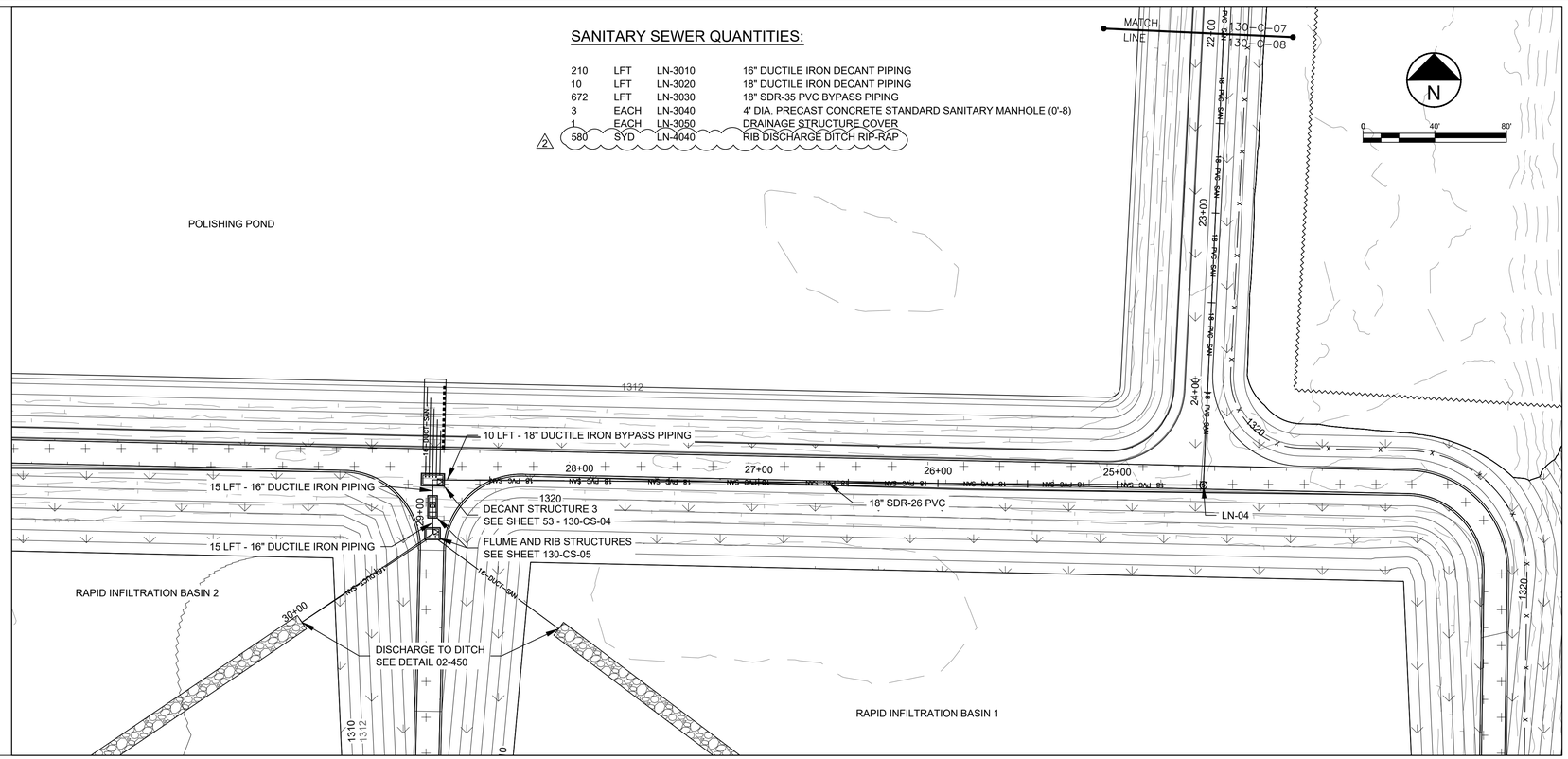
SECTION

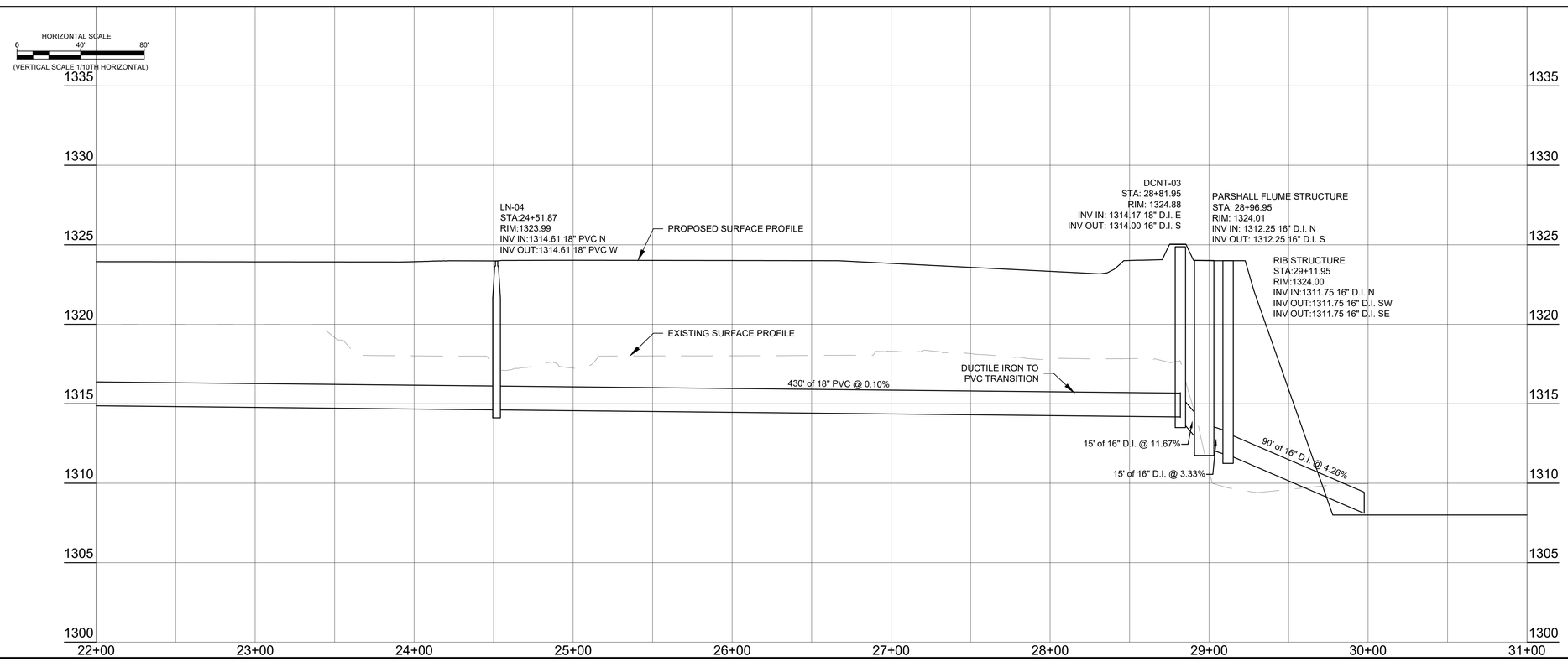
02-450 DISCHARGE TO DITCH

NO SCALE

SANITARY SEWER QUANTITIES:

210	LFT	LN-3010	16" DUCTILE IRON DECANT PIPING
10	LFT	LN-3020	18" DUCTILE IRON DECANT PIPING
672	LFT	LN-3030	18" SDR-35 PVC BYPASS PIPING
3	EACH	LN-3040	4' DIA. PRECAST CONCRETE STANDARD SANITARY MANHOLE (0'-8)
1	EACH	LN-3050	DRAINAGE STRUCTURE COVER
2 580	SYD	LN-4040	RIB DISCHARGE DITCH RIP-RAP





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City of Crystal Falls
401 Superior Avenue
Crystal Falls, MI 49920

WASTEWATER TREATMENT
PIPING PLAN AND PROFILE

Attention:
0 1"
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
DESCRIPTION	
C	9/17/2021
EGLE PERMIT REVISIONS	
D	4/20/2022
FOR BID	
E	5/11/2022
ADDENDUM 1	
F	5/23/2022
ADDENDUM 2	

Designed By:	BCA
Checked By:	CAR
Drawn By:	BCA
Approved By:	CAR

GEI PROJECT: 1803991

DWG. NO.
130-C-08

SHEET #49

ARCHIVE #

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APPENDIX C

PURPOSE

This Procedure is issued for protecting the integrity of Company natural gas, liquified natural gas, and hazardous liquid pipelines and facilities from Third Party encroachments or Crossings in accordance with 49 CFR Part 192, 49 CFR Part 193, 49 CFR Part 195, and *US-GAS-IMP US Onshore Gas Pipeline Integrity Management Program (US)* (Item ID 003892898). This Procedure covers design, engineering, and construction of Crossings across Company buried facilities (including abandoned and discontinued pipelines) ROW. Requirements are provided for:

- processing and assessing Crossing and encroachment applications
- documenting, reviewing, and approving *Crossing* and *Encroachment Agreements* and supporting forms or permits
- adhering to Crossing and construction guidelines

Following this Procedure will:

- reduce the risk of damage to pipeline facilities
- ensure unencumbered access to the Company ROW and related pipeline facilities
- maintain the ability to drill, operate and maintain storage wells safely, efficiently, and legally
- provide for maximum use of workspace for routine maintenance, inspection, or repair work
- ensure effective pipeline CP

SCOPE

This Procedure applies to all natural gas, liquified natural gas, and hazardous liquid pipeline assets operated by the Company in the U.S.

The term 'Crossing' as referred to herein, must be defined as any line or facility that crosses above or under a pipeline or encroaches the ROW.

This Procedure does not apply to Crossings where the provisions of an applicable land rights document conflicts with the requirements in this Procedure. In this case, the land rights document must supersede the requirements in this Procedure.

This Procedure is intended for internal use.

Within an Engineering Standards Collection document, the following terms and definitions apply for requirements:

- 'Company' means the TC Energy entity for whom work, services and/or materials are being provided.

- 'Must' or a similar term (e.g., 'must') is used to express a mandatory requirement. All statements in this document must be interpreted as mandatory requirements unless clearly stated as optional. A formally-approved Variance Request is required to deviate from a mandatory requirement.
- 'Should' or 'may' is used to express an optional recommendation or that which is advised or permissible but not required.

Wherein governmental or regulatory requirements conflict with this Procedure, the more stringent requirement must govern except in cases where use of an alternate requirement is mandated by regulation.

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1 GLOSSARY

Term	Definition
AC	Alternating Current
Boring or Directional Drilling	Type of trenchless installation that may employ a variety of cutting, jetting, boring, reaming or jacking techniques to install an underground facility but without the use of an open trench. The technique involves opening holes at either end of the installation and using different types of equipment to create a tunnel, shaft or bore underground between the two points.
CP	Corrosion Protection
Crossing	Any line or facility that crosses above or under a pipeline or encroaches the Company ROW.
Crossing Agreement	*Major Crossing Agreement* – crossing by a Third Party which requires an engineering review. Third Party is responsible for acquiring additional rights from the landowner. *Minor Crossing Agreement* – crossing by a Third Party which may or may not require an engineering review and is administered by Operations. Land Services is not involved in the administration.
Damage Prevention	Program to protect underground infrastructure with consideration for public awareness, hazard management (including but not limited to Ground Disturbance), surveillance, monitoring, and Crossings.
DC	Direct Current
Encroachment Agreement	Agreement between the owner of the land and/or another Third Party and the Company that is administered by Land Services for any exception to the existing easement agreement.
EHSM	Environment, Health & Safety Management relational database that records and manages the corresponding process for Incident events including assign accountabilities, establish target resolution dates and communicates status and findings through supporting documents and creates automated e-mail notifications.
Excavation	Daylighting of buried pipe to investigate, assess as required, and remediate pipe coating and defects. Any work, operation, or activity that results in a disturbance of the earth including, without limitation, hand Excavation, trenching, pile driving, drilling, tunneling, backfilling, blasting, or topsoil stripping.
GIS	Geographic Information System
Ground Disturbance	Any work, operation or activity that results in a disturbance of the earth. This includes, without limitation, excavating, trenching, pile driving, drilling, tunneling, backfilling, blasting, topsoil stripping.
Hand Excavation	Excavation by hand shovels, hydro probe, water (e.g., hydrovac), or air jets to expose buried pipeline, such as communication or electrical cables or pipelines.

Term	Definition
Heavy Equipment	Heavy-duty vehicles that weigh more than 16,000 lbs, specially designed for executing construction tasks, most frequently, ones involving earthwork operations. The following construction equipment is typical of what is considered Heavy Equipment: • wheel loaders • scrapers • excavators • bulldozers • road graders • dump trucks • logging trucks • logging forwarders
HDD	Horizontal Directional Drilling
IES	Integrity Engineering Services
Locate	Indication of the existence of a line or facility by establishing a mark using stakes, paint, flagging, whiskers, or some other customary manner that approximately determines the location of a line or facility. (*Common Ground Alliance*)
Permitted Parking Area	Marked parking area that does not encroach upon the right-of-way unless designed/altered so as not to impact the safe and reliable operation and maintenance of Company pipelines. Parking area designed such that vehicles are not allowed to park directly over or within ten feet of a pipeline.
PPV	Peak Particle Velocity
PVC	Polyvinyl Chloride
RW	Public Road Right-of-Way that is a strip of land paralleling a public road where a pipeline is installed on a permit basis for crossing the public road.
ROW	Right-of-way is a strip of land over and around pipelines where some of the property owner's legal rights have been granted to a pipeline company.
Storage Well	Any active, special or storage observation well located within the protective boundaries of an underground natural gas storage field. The protective boundary is also known as the buffer zone.
Temporary Crossing	Where an individual, company or landowner will traverse over an existing pipeline for a short period with a vehicle or Heavy Equipment.
Trenchless Excavation	Excavation that does not involve direct Excavation including HDD and horizontal punch and bore of the trench through the ROW, banks and bed of a watercourse or body of water).

2 GENERAL REQUIREMENTS

2.1 General

2.1.1 Crossing and encroachment requests must be reviewed by the Company to determine the applicability of requirements as outlined in this Procedure and in applicable appendices.

2.1.2 The Third Party has 12 months (365 days) to complete the Crossing or encroachment from the date of the executed *Agreement*, after which time the *Agreement* becomes void.

2.1.3 If the Third Party requires an extension of the *Agreement* to complete the Crossing or encroachment, they must apply to the Company for an approval of the extension.

2.1.4 Third Party facilities must cross the ROW as near 90 deg as possible. In no case must a new facility be permitted to cross the ROW at an angle less than 45 deg.

2.1.5 Crossings by vehicles and equipment during the construction of any facility across Company pipelines must be addressed in the *Agreement*.

2.2 Safety Requirements

The following safety requirements must be met.

2.2.1 Monitor pipeline safety and integrity during Crossing or encroachment construction and stop work where necessary if an unsafe condition exists. The Company, however, must not direct or supervise a Third Party.

2.2.2 Notify IES of any activity caused or observed during the construction or installation of a facility that may be considered potentially hazardous (e.g., controlled burning) to, or could cause damage to the pipeline.

2.3 Training and Qualifications Requirements

Operation Managers must ensure the following training and qualifications requirements are met.

2.3.1 Third Party and Company personnel performing Covered Tasks must be qualified in accordance with *Operator Qualifications Program* (Item ID 004504739) and have all current certifications.

2.3.2 Company employees conducting or supervising Ground Disturbance or Excavation must be verified as qualified or trained as defined in the Company Learning Management System.

3 CROSSING AND ENCROACHMENT APPLICATION REQUESTS REQUIRING A CROSSING AGREEMENT

3.1 Crossing Agreement Required and Administered by Land Services

3.1.1 Land Services must administer Third Party Crossing and encroachment requests listed in Table 3-1 that require a *Crossing or Encroachment Agreement.* See also Appendix A.

Table 3-1: Requiring a Crossing and/or Encroachment Agreement

Request Types	
Aggregate development (rock quarry)	Parking lots
Blasting within 325 ft of a buried pipeline	Pipeline Crossings
Buried power cables over 600 V	Power line paralleling ROW
Commercial and residential development	Private roads including industry (new, widening, upgrade) permanent or temporary
Drainage systems	Public roads (new, widening, upgrade)
Golf courses	Railway
Highways (new, widening, upgrade)	Seismic (geophysical) activities
Irrigation canals and/or systems	Temporary access on ROW (must not cross buried facility)
Landscaping	Temporary use of ROW or sites (e.g., workspace not Crossing buried facility)
Logging (high impact requiring multiple Crossing of buried pipelines at unimproved Crossing locations)	Use of Company owned access roads
Organized recreational areas (e.g., snowmobile clubs, parks, ball diamonds, playgrounds)	Waterways
Overhead power lines	

3.2 Minor Crossing Agreement Required and Administered by the Region

3.2.1 The Operations Manager must approve *Minor Crossing Agreements* listed in Table 3-2. See also Appendix A.

3.2.2 Operations can consult IES as required for assistance in evaluating Crossings or encroachment requests.

Table 3-2: Crossings Requests Requiring Operations Approval

Request Types	
Agriculture low spots (farmers maintaining, draining, or filling low spots in fields)	Irrigation pivot tracer wires
Buried residential cables (e.g., telephone, power, cable)	Livestock feeders
Buried residential utility lines (e.g., gas, water, sanitary sewer, storm drains)	Minor landscaping
Ditch (road, highway, other) and road maintenance provided original cover is maintained	One-time Temporary Crossing of Heavy Equipment (see section 6)
Driveways	Sub-soiling (deep tillage)
Fences	Temporary structures
Field drain tile	Undeveloped road allowances

3.3 Minor Crossing Agreement or Approval Not Required

3.3.1 Blasting greater than 325 ft from a buried pipeline does not require a *Minor Crossing Agreement*.

3.3.2 See Appendix A for other uses of the Company ROW (e.g., hiking, horseback riding, lawns) that do not require a *Minor Crossing Agreement* or approval.

4 PROCEDURES FOR MAJOR CROSSING OR ENCROACHMENT AGREEMENTS AND APPROVALS

4.1 Crossing or Encroachment Agreements Administered by Land Services

Applications for installation of a Crossing or encroachment may be received from the Third Party, regional office who receives a request, or One Call tickets.

4.1.1 Land Services must administer *Crossing or Encroachment Agreements* applicable to Table 3-1.

4.1.2 Land Services must provide the *TEF-IN-CROSS-GL Application to Work on or Within 100 ft of TC Energy ROW (US)* (Item ID 1013361828) to the Third Party for completion. The form should include the following information:

- applicant's contact information
- Crossing type
- drawing of proposed installation
- encroaching pipeline specifications (e.g., plastic, steel, aluminium, size, product)
- geographic location (latitude, longitude), street address, or legal location (short legal description)
- installation method
- overhead power line specifications (e.g., transmission, distribution, voltage)
- proposed date of construction
- total equipment and load weight used to construct the Crossing
- total equipment and load weight used to cross after construction

4.1.3 Land Services must review and distribute applications and *Agreements* as follows:

1. For vehicle and Heavy Equipment Crossings, forward a completed *Heavy Equipment Crossing Information Form* (Item ID 003677225) to IES.
2. If applicable, provide the Third Party with *Guidelines for Construction of Crossings*.
3. Review the *TEF-IN-CROSS-GL Application to Work on or Within 100 ft of TC Energy ROW (US)* (Item ID 1013361828) (refer to Application in this Procedure) for completeness.
4. Circulate the *Application* to the IES Crossing Engineer for comments and conditions as identified in this Procedure.
5. Submit *Encroachment Agreements* to the Operations Director and Technical Operations Services Director for approval prior to distribution.
6. Submit the *Major Crossing Agreement* to IES to provide and approve technical requirements as shown in Exhibit A and Exhibit B of the *Agreement*.
7. Attach approved drawings and construction requirements (Exhibit A and Exhibit B of the *Agreement*) received from IES to the *Major Crossing Agreement*.
8. Submit approved drawings and construction requirements for *Major Crossing Agreements* to Operations for informational purposes.
9. Issue the signed *Major Crossing Agreement* and obtain the Third Party signature (applicable to the pipeline system) with all terms and conditions to the applicant (see Appendix A).

10. Distribute the signed *Major Crossing Agreement* with all terms and conditions to the field office.

11. File the fully executed *Encroachment Agreement* with the county registrar.

12. Maintain electronic signed documents in the Tract file database.

4.1.4 If required, the Operations Manager will provide comments, applicant information, location (e.g., latitude and longitude, legal description) of Company facilities, and other relevant information required by Land Services.

4.2 Minor Crossing Agreements Administered by Operations

Applications for installation of a Crossing or encroachment may be received via verbal requests or written applications from a Third Party or One Call tickets.

4.2.1 The Operations Representative must administer *Minor Crossing Agreements* applicable to Table 3-2 as follows:

1. Complete the *Stakeout Report and Ground Disturbance Approval (US)* (Item ID 1012902944) (see *One Call Locating and Marking Procedure (US)* (Item ID 1012902942)).

Note:

The *Stakeout Report and Ground Disturbance Approval (US)* (Item ID 1012902944)form must be used for the *Minor Crossing Agreement*.

2. Verify that all the relevant information required to complete the *Minor Crossing Agreement* has been received or confirmed. This includes the location (e.g., latitude/longitude or legal description) of any affected Company facilities and other relevant information.

3. Consult with IES or Land Services as necessary (e.g., load calculation).

4. Obtain the signature of the applicant complete with all terms and conditions.

Note:

If the applicant refuses to sign, Operations personnel should note refusal in the applicant signature block of the *Minor Crossing Agreement*.

5. Submit the *Minor Crossing Agreement* to the Operations Manager for approval.

6. Provide the *Minor Crossing Agreement* to the Integrity and Operations Services - Document and Research Group and Land Services Tract file for permanent retention.

4.2.2 The Operations Manager reviews and approves the *Minor Crossing Agreement* complete with all terms and conditions.

5 CROSSING OR ENCROACHMENT CONSTRUCTION REQUIREMENTS

5.1 Pre-construction

5.1.1 The Operations Manager must verify that Company personnel conducting or supervising Ground Disturbance or Excavation activities are qualified or trained for the applicable covered tasks in accordance with the *Operator Qualifications Program* (Item ID 004504739) and have all current certifications.

5.1.2 Prior to work commencing, the Operations Representative must verify that the Company copy of the fully executed and applicable *Agreement* is on-site.

5.1.3 The Operations Representative (Minor Crossing Agreement) or Land Services (Major Crossing/Encroachment Agreement) must verify that the Third Party has a fully executed copy of the applicable *Agreement*.

5.2 Monitoring

5.2.1 The Operations Representative must monitor pipeline safety and integrity during Crossing or encroachment construction and stop work where necessary if an unsafe condition exists. The Company, however, must not direct or supervise a Third Party.

Note:

When Crossing the pipeline with Heavy Equipment the potential for damage to the pipe is increased, especially where the trench has previously been backfilled with rock. Other methods of protecting the pipeline should be considered such as ramping, bridging, or removal of rock backfill. Requirements are detailed in Exhibit A and Exhibit B of the *Major or Minor Crossing Agreement*.

5.2.2 The Operations Representative must maintain an on-site presence at all times during Excavation on the pipeline ROW, or within 25 ft of the closest pipeline unless otherwise authorized by the Company.

5.2.3 The Operations Representative must verify compliance with the *Major or Minor Crossing Agreement or Encroachment Agreement* conditions.

5.3 Construction Requirements

Unless otherwise specified, the Operations Representative must adhere to construction requirements in this section.

5.3.1 Ensure all Company facilities and boundaries are located and marked per *One Call Locating and Marking Procedure (US)* (Item ID 1012902942).

5.3.2 If changes to the *Major Crossing or Encroachment Agreement* are required, work must be stopped, and the change request submitted to Land Services. Work must not resume until the change request is approved.

5.3.3 Verify that all Excavation is performed in accordance with this Procedure.

5.3.4 Ensure that backfilling is performed in accordance with *TES-CT-GEN-G Pipeline Construction Specification (US-MEX)* (Item ID 1013154643) or *TES-CT-GEN-L Pipeline Construction Specification* (US) (Item ID 005408266).

5.3.5 Notify IES of any activity caused or observed during the construction or installation of a facility that may be considered potentially hazardous (e.g., controlled burning) or could cause damage to the pipeline.

5.3.6 Document and submit an EHSM report for damage to any pipeline caused or observed during the construction or installation of a facility in accordance with the *Incident Management Program (CAN-US-MEX)* (Item ID 008945995).

5.3.7 Provide all required documentation for a final Crossing or encroachment as indicated in section 18.1.

5.4 Construction Induced Vibrations

5.4.1 Construction activities that generate ground vibrations, including but not limited to, pile driving, sheet driving, soil compaction work, jack hammering or ramming, must require review and approval by the Company on a case-by-case basis.

5.4.2 Ground vibration must be limited to that permitted by the state's blasting regulations where the Company pipeline is located, or 2 in./sec PPV for welded steel pipelines or 1.25 in./sec PPV for coupled or screwed pipelines, or whichever is less.

5.4.3 The Third Party may be required to monitor and record PPV at the facilities.

5.5 Geophysical and Blasting Activities

5.5.1 If a geophysical company wishes to cross the pipeline, refer to section 6 for Heavy Equipment Crossing requirements.

5.5.2 Geophysical companies requiring access to a Company pipeline ROW, must obtain approval from the Operations Representative.

5.5.3 A blasting plan must be submitted to the Company 10 business days (excludes Saturday, Sunday, or federal holiday) in advance of any blasting proposed within 325 ft of a Company pipeline.

5.5.4 Blasting must not commence without prior review and approval from the Company.

5.5.5 Any modifications to the blasting plan must be submitted to the Company for prior review and approval.

5.5.6 The Third Party must conduct and submit to the Company a three-axis seismic survey that must be conducted for each blast event within 325 ft of a Company pipeline, unless otherwise permitted by the Company.

5.5.7 Seismic monitoring equipment must be placed over the pipeline at the nearest point to the blast activities when the blast is within 325 ft of a Company pipeline. One of the axis must be aligned parallel to the pipeline and another axis perpendicular to the pipeline.

5.5.8 Storage of explosive and other equipment on the ROW is strictly prohibited. Explosives must not be stored within 1,000 ft of the ROW.

5.5.9 For additional requirements for blasting near a Company ROW, refer to the *Explosive Blasting near TransCanada Facilities* (Item ID 005376913).

5.5.10 Ensure locations of shot holes comply with the approved site-specific blasting plan.

5.5.11 Following the blasting, Operations must complete a leakage survey per *Explosive Blasting near TransCanada Facilities* (Item ID 005376913).

6 HEAVY EQUIPMENT CROSSING

The Operations Representative will conduct the following procedures for one-time or multiple Heavy Equipment Crossings.

6.1.1 Review Crossing information received from One Call ticket or field observation.

6.1.2 Provide the *Heavy Equipment Crossing Information Form* (Item ID 003677225) to the Third Party for completion which will be submitted and approved by the Company. The Company must perform load calculation analysis to determine Crossing requirements.

6.1.3 The maximum combined stress must not exceed 90% of specified minimum yield strength.

6.1.4 Prior to Heavy Equipment Crossing, verify that the soil is dry and well compacted.

6.1.5 Monitor the Crossing to ensure significant rutting does not occur.

6.1.6 Consult IES for any other potential hazards or conditions that could result in damage.

6.1.7 If the Crossing will be permanent, consult Land Services.

7 PIPELINE CROSSING

7.1.1 The on-site Operations Representative must ensure the Crossing is completed in accordance with the *Encroachment Agreement.*

7.1.2 Excavation must be performed in accordance with this Procedure. At a minimum, the following Damage Prevention practices must be performed or monitored by the Operations Representative:

- Company buried pipeline must be excavated by hand or hydrovac, prior to use of mechanical Excavation equipment within 15 ft on either side of the pipeline.
  - Where hand Excavation or hydrovac is not possible or practical as the pipeline is too deep, under water, or in a rock ditch, develop a site-specific procedure.
  - The site-specific procedure must be developed by the Third Party and approved by the Operations Manager in consultation with IES.
- At no time must any part of mechanical equipment come within 36 in. of the pipe.
- Equipment buckets (or any attachment or load) are prohibited from traversing over the pipe where there is less than 24 in. of remaining cover.
- Side cutters must not be used on equipment buckets.
- Crossing trench depth must be maintained at the same depth for the full width of the ROW.
- Minimum vertical separation between the Company and Third Party pipeline must be 24 in.
- Notify the Corrosion Technician to attach CP test leads to the Company pipe where required and ensure test leads are attached to the Third Party pipe.

Note:

If pipeline coating material is removed or comes off the pipeline, and asbestos material is identified (or is suspected), the *Asbestos Management Procedures U.S.* (Item ID 003864096) must be followed.

8 STORAGE WELLS

8.1.1 Any Third Party activity or development must not impede the Company's ability to safely, efficiently, and legally access, drill, operate, or maintain storage wells. Activity near storage wells must adhere to the guidelines in this section and:

- Lease Agreement or applicable land rights document
- *TEP-PR-RESTS-G Storage Well Site Selection, Spacing Layout and Safety Procedure (CAN-US-MEX)* (Item ID 008372565)

8.1.2 Where the requirements in this Procedure conflict with *TEP-PR-RESTS-G Storage Well Site Selection, Spacing Layout and Safety Procedure (CAN-US-MEX)* (Item ID 008372565) the requirements in *TEP-PR-RESTS-G Storage Well Site Selection, Spacing Layout and Safety Procedure (CAN-US-MEX)* (Item ID 008372565) must apply.

8.1.3 Where this Procedure or *TEP-PR-RESTS-G Storage Well Site Selection, Spacing Layout and Safety Procedure (CAN-US-MEX)* (Item ID 008372565) conflicts with an existing lease agreement, the requirements of the lease agreement must apply.

8.1.4 Except as otherwise provided in the applicable lease agreement or land rights document, aboveground or belowground construction activities or placement of objects must not be allowed by the Third Party within 200 ft in any direction from a wellhead.

Note:

Distances may be adjusted in either direction based on a risk assessment (see *TEP-PR-RESTS-G Storage Well Site Selection, Spacing Layout and Safety Procedure (CAN-US-MEX)* (Item ID 008372565).

8.1.5 A minimum distance of 1,320 ft should be maintained between a storage well and surface mining, quarrying, or pit operations.

8.1.6 The Third Party must submit any proposed aboveground or belowground construction activities, or placement of objects closer than 330 ft in any direction of a wellhead to the Company's Land Service representative for review and approval by the Operation's Manager and the Storage Technical Services Engineer. Notification must include a full description of the proposed construction or placement of objects, complete with dimensions, location, and distance from the wellhead.

8.1.7 When certain topographical and/or safety conditions exist, the Company reserves the right to object to such construction activities or placement of objects closer than 330 ft from any wellhead. These topographical features and permanent structures include, but are not limited to:

- wellheads situated near significant changes in elevation
- rivers
- ponds
- streams
- existing roads
- railroad ROW
- power line ROW
- high pressure wells

8.1.8 Additional distances over 330 ft may be required for certain activities, including but not limited to:

- presence of hydrogen sulfide
- flaring of wells
- horizontal or directional drilling
- drilling of multiple wells from a single location
- salt cavern development
- aquifer storage development
- high pressure and high deliverability wells

8.1.9 Construction induced vibration and blasting requirements applies to activities near a Company storage well (see sections 5.4 and 5.5).

9 UTILITY CROSSINGS

The on-site Operations Representative must adhere to the requirements in this section for utility Crossings and document the utility Crossing in the *Stakeout Report and Ground Disturbance Approval (US)* (Item ID 1012902944) and the *Facility Crossing As-Built Information (T-Form)*.

9.1 General Requirements

9.1.1 The procedures in this section apply to the following utility Crossings:

- natural gas and liquid pipelines
- water
- electrical
- sewer and/or storm drains
- television cable
- telephone
- fibre optic communications
- all other metallic or non-metallic line Crossings

9.1.2 Utilities must cross the ROW as near 90 deg as possible. Under no circumstance, must a utility be permitted to cross the ROW at an angle less than 45 deg.

9.1.3 Utilities must not be installed longitudinally within the ROW.

9.1.4 Utilities must cross beneath the pipeline with a minimum vertical clearance of 24 in. for open cut and 36 in. for trenchless installations.

9.1.5 For circumstances where less than 36 in. of cover exists, the Company may require additional clearance when Crossing beneath the pipeline.

9.1.6 Under certain circumstances, the Company may permit a Crossing above the pipeline while maintaining a vertical clearance of at least 24 in. These circumstances include excessively deep pipelines (5 ft or more), the presence of consolidated rock, or for service entrances to single-family dwellings.

9.1.7 Earthen fill, or other Company permitted isolation material must be placed between the pipeline and the utility.

9.1.8 The following, but not limited to, must be placed outside the ROW:

- water valves
- curb boxes
- manholes
- sprinkler heads
- splice boxes
- service risers
- energized equipment
- poles
- towers
- guy wires
- mechanical supports
- ground rods
- anchors and similar structures

9.1.9 Sprinkler systems must be limited to a single line Crossing unless otherwise permitted by the Company.

9.1.10 Except for trenchless Excavation installations, warning tape that is per APWA Uniform Color Code (see Table 9-1), must be placed above the utility, 12 in. below ground, and across the ROW.

9.1.11 All permitted underground utility Crossings must be marked with signage that complies with the authorities having jurisdiction at the edge of each ROW boundary. Exceptions may include agriculture land or open waters.

9.1.12 Permitted utility Crossings must be marked according to the APWA Uniform Color Code (see Table 9-1).

Table 9-1: APWA Uniform Color Code

Color Code	Applicability
RED	Electric power lines, cables, conduit, and lighting cables
ORANGE	Fiber optic communication, alarm or signal lines, cables, or conduit
GREEN	Sewers and drain lines
PINK	Temporary survey markings, unknown or unidentified facilities
YELLOW	Gas, oil, steam, petroleum, or gaseous material
BLUE	Potable water
WHITE	Proposed Excavation limits or route
PURPLE	Reclaimed water, irrigation, and slurry lines

9.2 Overhead Power Transmission Lines

9.2.1 Overhead power transmission lines must be installed with a minimum of 33 ft clearance between the transmission line and the ground for the full width of the Company ROW. Marker balls must be installed at each edge of the Company ROW and at 15 ft intervals within the total width of the Company ROW.

9.2.2 Overhead power transmission lines that parallel the pipeline, must be assessed by Corrosion Services for unacceptable levels of AC or DC stray current caused by the installation of a Third Party overhead power line.

Note:

Overhead power transmission line Crossings must not be constructed within 200 ft of a Company blowdown assembly.

9.2.3 Refer to the *Overhead Power Lines Procedure* (Item ID 003672640) for additional requirements.

9.3 Buried Cable

The Operations Representative must ensure the requirements for buried cable in this section are met.

Crossings Below Pipeline

9.3.1 All permitted cables or wire utilities Crossing below pipelines include, but are not limited to, fiber optic, electric, telephone and television (excluding single telephone and single television drops).

9.3.2 Buried cable or wire Crossing below pipelines, must be encased with 2 in. minimum diameter Schedule 40 PVC pipe, or equivalent, for the complete width of the ROW, regardless of the installation method used.

9.3.3 Electric (less than 600 V) and fiber optic lines Crossing below Company pipelines must **also** be surrounded with a minimum of 6 in. of colored concrete in accordance with APWA Uniform Color Code (see Table 9-1) or 4 in. minimum diameter, standard inch wall thickness, coated steel pipe across the entire width of the ROW.

9.3.4 For trenchless installations or where the top of the conduit used for the Crossing is at least 36 in. below the Company pipeline, concrete is not required.

9.3.5 Electric lines energized to equal to or greater than 600 V using open cut installation, must cross a minimum of 36 in. below the pipeline.

- Open cut installations must be encased in concrete and color coded red or installed in 4 in. minimum diameter, standard inch walk thickness, coated steel pipe across the entire width of the ROW.
- Electric line Crossings must be clearly and permanently marked at the edge of each ROW boundary, except for areas located in agriculture land and open water.
- Consult Corrosion Services (Cathodic Protection) for potential AC interference issues.

9.3.6 Where the utility will be installed deeper than 5 ft below the bottom of a pipeline, the additional requirement for colored concrete and 4 in. minimum coated steel pipe may be waived.

Crossings Above Pipeline

9.3.7 All underground cable or wire utilities permitted by the Company to cross above the pipeline (excluding single telephone and single television drops), must be encased in:

- 2 in. minimum diameter Schedule 40 PVC pipe and installed in a 4 in. minimum diameter standard wall thickness, coated steel pipe; or
- 2 in. minimum diameter Schedule 40 PVC pipe and installed in a 4 in. Schedule 40 PVC pipe across the full width of the ROW

9.3.8 Concrete encasing must not be used for Crossings above the pipeline.

9.3.9 Consult Corrosion Services (Cathodic Protection) for potential AC interference issues.

9.4 Spare Conduit Installation

9.4.1 Only conduits that can be identified for future use and are approved by the Company must be installed. Spare conduits must be installed at the same depth as the main conduit.

9.4.2 Conduits must be installed and marked to meet all requirements of the specific type of approved Crossing (e.g., tracer wire, warning tape).

9.5 Metallic Utility Crossings

9.5.1 CP materials must be installed where necessary and at the Company's sole determination. CP materials include but are not limited to:

- bonds
- test leads
- test stations
- magnesium anode current drains
- permanent reference electrodes

9.5.2 Minimum CP material requirements must be as follows:

- installation of test leads on both the Company pipeline and the Third Party's Crossing structure
- installation of a permanent Copper-Copper Sulfate (Cu-CuSO4) reference cell between the pipeline and the Crossing structure

9.5.3 Utilities must be coated with a non-conductive coating for the entire width of the ROW.

9.6 Non-metallic utilities

9.6.1 Utilities must be installed with tracer wire for the full width of the ROW unless otherwise permitted by the Company. At locations where tracer wire is installed, tracer wire must be raised to the ground surface and connected to a monitoring test station located outside the ROW.

9.6.2 Natural gas (or other industrial gases) line permitted by the Company to cross **below** the pipeline must either be encased in a 6 in. envelope of yellow 2,000 psi concrete or encased in 4 in. minimum diameter, standard inch wall thickness, coated steel pipe across the entire width of the ROW.

9.6.3 Natural gas (or other industrial gases) lines permitted by the Company to cross **above** the pipeline must be encased in 4 in. minimum diameter, standard inch wall thickness, coated steel pipe across the entire width of the ROW. Concrete encasing must not be used for Crossings above the pipeline.

10 TRENCHLESS EXCAVATION – HORIZONAL BORED CROSSINGS

Horizontal bored Crossings for cables, pipes, drains, etc., are acceptable for constructing a Crossing of a Company pipeline providing the conditions in this section are met. Unless otherwise specified in this section, the Operations Representative is responsible for monitoring trenchless Excavations for adherence to the following requirements and in accordance with the *Excavation Procedure* (Item ID 003672343) unless otherwise specified.

10.1.1 Trench top, side (side closest to the drill), and 36 in. below Company pipelines must be excavated by hand or hydrovac.

10.1.2 IES Crossing Engineer must obtain a drilling plan and drawing (profile) from the Third Party or drilling company. The plan must include the following:

- total length of bore
- depth of cover on each buried pipeline
- depth to bottom of each buried pipeline
- size and type of each buried pipeline
- clearance between new and existing buried pipeline
- expected centerline of bore

10.1.3 Sight inspection holes must be excavated as follows to prevent the drill bit from coming in contact with the pipeline:

- minimum of 5 ft and a maximum of 10 ft from the side (nearest to the drill) of each buried pipeline
- depth at least 36 in. below the bottom of the pipe
- sight inspection holes parallel to the pipeline, a minimum of 10 ft long, and sufficiently wide to provide visual confirmation of the borehead
- where the sight inspection hole is not practical, additional requirements may apply, including but not limited to additional vertical clearance

10.1.4 Centerline of the bore must be marked.

10.1.5 Spoil piles must not be placed over the bore path as this increases the depth of cover.

10.1.6 Any bore pits required to set up and stage equipment must be located outside of the ROW.

10.1.7 New facilities must maintain continuous depth and horizontal alignment as it is installed across the full width of the ROW.

- Any deviation (Field Change) resulting in less than 36 in. of vertical separation, must first be approved by the Operations Manager.
- Vertical separation must not be less than 24 in.

10.1.8 Tracking equipment is required to track the location of the drill head and must be:

- verified for operability within tolerances
- field tested on site to confirm operation (the test should be documented by the Third Party and approved on-site by the Operations Representative)

10.1.9 Continuously monitor the progress of the drill head and ensure it can be visually seen entering the sight inspection holes at the expected depth and location.

10.1.10 If the drill head does not enter the sight inspection hole at the expected depth and location, stop the drill and reassess the bore. Confirm that there are no hazards prior to re-commencing bore. This may require:

- adjusting the drill head
- reconfirming the expected centerline of the drill head entry at sight inspection holes
- enlarging or lengthening sight inspection holes
- pulling back and restarting the bore where required

10.1.11 Verify that the drill head will cross the Company pipeline or facility with a minimum clearance of 36 in.

10.1.12 If the utility is non-metallic, the Third Party must attach the tracer wire to the Third Party utility.

10.1.13 Request the Company Corrosion Technician attach the CP test leads to the Company pipeline where required and ensure the Third Party attaches test leads to the Third Party pipeline where required. If separate test lead posts are installed, note the locations on the as-built drawing.

10.1.14 Where a sight inspection hole cannot be used, the Operations Representative must contact the IES Crossing Engineer to obtain a safe and reasonable clearance between the Company pipeline and the Third Party facility to protect the Company pipeline. The Crossing Engineer must submit a variance request from the Drilling Plan to the Company per section 15.

11 ROADS, DRIVEWAYS, SIDEWALKS, PARKING AREAS, AND WALKING OR CYCLING PATHS

11.1 General Requirements

11.1.1 The proposed road must be analyzed to assess its effects on the integrity of the existing pipeline being crossed.

11.1.2 The Operations Representative must monitor road, driveway, sidewalk, parking, and walking or cycling path Crossings for adherence to the requirements in clauses 11.1.3 to 11.1.7.

11.1.3 Permitted roads, driveways, or sidewalks must cross the ROW at as near to 90 deg as possible. Crossings at less than 45 deg are prohibited.

11.1.4 Roads, driveways, and concrete sidewalks must not be permitted to be installed longitudinally within the ROW.

11.1.5 Venting systems must not be used to extend crossovers or vent parking lots.

11.1.6 The use of alternative paving material designs (other than asphalt or concrete) must be reviewed by the Crossing Engineer on a case-by-case basis.

11.1.7 Cul-de-sacs must not be permitted within the ROW area.

11.2 Concrete Roads, Driveways, and Sidewalks

11.2.1 Continuously poured, steel reinforced concrete must not be permitted within the ROW.

11.2.2 Concrete sidewalks and/or curbs, which cross the pipeline, must have expansion joints installed 5 ft on either side of the pipeline (see Appendix B and Appendix Figure B 1 and Appendix Figure B 2).

11.3 Asphalt Roads and All Parking Areas

11.3.1 Asphalt roads must not be greater than 25 ft in width.

11.3.2 Permitted Parking Areas (see Glossary definition), including but not limited to asphalt and gravel parking areas must not be installed within 10 ft of pipeline facilities.

11.3.3 Parking lot crossovers may be permitted and must not be greater than 25 ft in width. Parking lot crossovers must be spaced at a minimum of 50 ft intervals (measured from the edge of the crossover).

11.3.4 Asphalt pavement must not be permitted closer than 5 ft from the pipeline except in the case of roadway, driveway, or parking lot crossovers. Where parking areas are permitted within the ROW, barriers must be installed on the edge of the parking area closest to the pipeline.

11.4 Walking or Bicycling Paths

11.4.1 Walking or bicycling paths must be constructed at the outside edge of the permanent ROW area. Path width within the ROW must be designed to not exceed 6 ft.

11.4.2 Paths must cross the pipeline as close to 90 deg as possible, but in no case less than 45 deg.

11.4.3 Motorized vehicles of any type, other than power driven wheelchairs, must not be permitted to use paths, which run longitudinally inside the ROW.

11.4.4 Paving must be restricted to asphalt only.

11.4.5 Landowner must be responsible for maintaining the path to prevent ROW damage (e.g., including erosion, illegal dumping). Any change in grade or modifications to the existing grade required to control erosion must be approved by the Company.

12 TEMPORARY ACCESS ROADS FOR HEAVY EQUIPMENT CROSSINGS

Unless otherwise specified, the Operations Representative must monitor installation or construction of temporary access roads for adherence to the following requirements.

12.1.1 The Operations Representative may authorize a temporary Heavy Equipment Crossing without engineering review for air-gap bridge Crossings only if they meet the following requirements:

- support materials for the bridge must be installed at least 36 in. away from the pipeline on each side
- visible air space must always be maintained between the bridge material and the ground directly above the pipeline
- Operations Representative must be on-site to witness construction or placement of the temporary bridge. See Appendix Figure C 1.

12.1.2 IES must perform external load evaluations for all other proposed temporary access road Crossings for Heavy Equipment to determine if additional protective measures are required (see section 6).

12.1.3 Prior to Crossing, or during these Crossing activities, earthen ramps, swamp mats, reinforced concrete slabs, steel plates, bridges or other protective materials may be required.

12.1.4 During the use of a permitted temporary access road, the Third Party must maintain the integrity of the permitted crossing protection such as those in clause 12.1.3. The Operations Representative must inspect the Crossing weekly and may require the Third Party to provide additional protective measures deemed necessary by the Company to prevent damage to the pipeline or ROW.

12.1.5 The Company must limit to pre-selected sites the number of Third Party constructed temporary access roads.

Note:

Crossings must be clearly defined and marked. Random Crossings must not be permitted.

13 DREDGING

13.1.1 When notification has been received of an upcoming dredging operation near a Company buried pipeline, the Operations Representative will arrange to meet with the Corps of Engineers representative to review the Dredging Plan.

13.1.2 The Company pipeline must be located, surveyed across the width of the waterway, and marked on both sides of the water Crossing.

13.1.3 The Operations Representative must conduct an on-site review of the Dredging Plan with the Corps of Engineers representative and a representative from the Dredging Operator.

13.1.4 An Operations Representative must be on board the barge when the dredging operation is within 500 ft of the nearest pipeline.

13.1.5 The Operations Representative must ensure the safety and integrity of the pipeline, stopping work if an unsafe condition exists, however they must not direct or supervise the Dredging Operator.

13.1.6 Dredging Operator must lock or chain the cutter head within the limits of the Company ROW.

14 CROSSING WITH ANCORS, BARGES, OR DRILLING RIGS

14.1.1 The Third Party must provide the Company with an Anchor Plan for review and approval by the IES Crossing Engineer. IES may support the review process when requested by the IES Crossing Engineer.

14.1.2 Whenever activities such as anchor Crossings, barges or rigs cross Company pipelines, the Company pipeline must be located and marked by a Company approved survey company.

14.1.3 If the location is to be crossed with barges or a drilling rig, the Crossing area determined by the survey will be verified for water depth and pipeline cover. In addition, the Third Party must provide the water draft of the vessel crossing, along with all anchor handling vessels to determine the feasibility of the Crossing.

14.1.4 If the activity requires the placement of lift barge cans, the Operations Representative must coordinate the locating and marking by the survey company of pipelines in the vicinity of the barge cans with reflectors which must remain in place while the activity is in progress. The lift barge cans, or spuds must not be placed inside the ROW.

14.1.5 If anchors will be deployed across the pipeline, the Operations Representative must verify that a minimum distance of 1,000 ft from the pipeline is established. If the anchor is not Crossing the pipeline but will be dropped short of the pipeline, it must be at a distance of 500 ft as established by the Company approved survey company.

15 VARIANCES

Any deviation from this Procedure's requirements must follow the Company *Controlled Document Library Variance Procedure (CDN-US-MEX)* (Item ID 007728702). To initiate a variance request Third Parties must contact the Company for variance approval.

16 ROLES AND RESPONSIBILITIES

Table 16-1 lists the roles and responsibilities required for the use of this Procedure.

Table 16-1: Roles and Responsibilities

Role	Responsibilities
Land Services	• Process and review major Crossing and encroachment applications administered by Land Services. • Submit major Crossing and encroachment applications for review and approval by IES. • Submit approved *Major Crossing* or *Encroachment Agreements* to the Third Party for signature. • File fully executed *Encroachment Agreements* with the county registrar. • Issue fully executed *Encroachment Agreements*. • Record the Encroachment Agreement in the Land Services database.
Operations Manager	Maintain an on-site presence at all times unless otherwise authorized during Excavation on the pipeline ROW or within 25 ft of the closest facility, or as stipulated by authorities having jurisdiction and ensures the following are performed by the responsible person: • Ensure construction requirements adhere to the *Minor Crossing Agreement* and this Procedure. • Verify qualification and training requirements of Company employees conducting or supervising Ground Disturbance or Excavation. • Reviews and approves *Minor Crossing Agreements* and conditions. • Verifies qualifications of personnel performing Covered Tasks and Company employees conducting or supervising Ground Disturbance or Excavation activities. • Provides comments, applicant information, location (e.g., latitude and longitude, legal description) of Company facilities, and other relevant information required by Land Services upon request.

Operations Representative	• Issue *Minor Crossing Agreements* for crossings or encroachments administered by the Region.
	• Complete *Stake-Out Report, Ground Disturbance Approval, Heavy Equipment Crossing Information* forms and submit to the IES Crossing Engineer for approval.
	• Maintain readily accessible copy of *Encroachment Agreement* on-site.
	• Monitor construction or installation (including Excavation) of a Crossing or encroachment in adherence with the *Encroachment Agreement* and this Procedure including:
	  • locating and marking Company pipelines and facilities
	  • Excavation
	  • trenching
	  • cathodic protection
	  • coating
	  • backfilling
	  • confirming operation and pre-test of drill heads
	  • installation of HDD
	  • drilling plan variance requests
	  • dredging operation
	  • water depth and pipeline cover for Crossings with anchors, barges, or drilling rigs
	• Consult with Corrosion Services for CP requirements (e.g., test leads).
	• Submit *Geophysical and Blasting* form to the geophysical company for completion per *Explosive Blasting near TransCanada Facilities* (Item ID 005376913).
	• Verify that shot hole locations comply with *Explosive Blasting near TransCanada Facilities* (Item ID 005376913) Procedure.
	• Conduct leakage survey when required.
	• Complete the *Pipeline Inspection Report Form (PIRF)* where required per *TES-IN-FDATA-GL Pipeline Integrity Field Data Specification (CAN-US-MEX)* (Item ID 006807037).
	• Document and submit EHSM reports for any potential hazards.
	• Submit all Crossing information to Technical Operations Services for entry into the Facilities Data Management system.
	• Complete and submit to IES the *Stakeout Report and Ground Disturbance Approval (US)* (Item ID 1012902944).
	• Document the final Crossing or encroachment in the *Stakeout Report and Ground Disturbance Approval (US)*

Role	Responsibilities
	(Item ID 1012902944) form and redline drawing and forward a copy to GIS.
IES Crossing Engineer	• Process and review Crossing applications for completeness and accuracy and consult Land Services and IES as required. • Review *Heavy Equipment Crossing Information Form* (Item ID 003677225) form for adherence to this Procedure and crossing requirements. • Consult Land Services for permanent Crossings. • Determine safe location, clearance, casing, and marking for Third Party Crossings or encroachments. • Consult with Corrosion Services for Cathodic Protection requirements (e.g., AC interference). • Process and approve geophysical and blasting requests per *Explosive Blasting near TransCanada Facilities* (Item ID 005376913). • Obtain Drilling Plans from Third Party or drilling company and verify completeness. • Review and approve Anchor and Dredging Plans and assess feasibility of Crossing. • Approve the technical requirements for *Encroachment Agreements*.
IES	• Perform external load evaluations for all other proposed temporary Crossings to determine if additional protective measures are required. • Assist the IES Crossing Engineer as required in the review of Crossing plans.
Storage Technical Services Engineer	• Evaluating storage well site encroachments
Technical Operations Services	• Verify that drawings (pipeline and station) used to document new data related to the encroachment or Crossing are as-built drawings. • Update the master drawing in GIS with red-line drawing Crossing information provided by the Operations Representative.

17 REFERENCES

This document relies on a number of references to regulation, industry codes and standards, general industry guidance as well as internal references. These documents are listed in Table 17-1, Table 17-2 and Table 17-3. Use the latest document revision, unless otherwise approved by Company.

Table 17-1: Regulatory References

Organization	Title
U.S. Department of Transportation	49 CFR Part 192 *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*
	49 CFR Part 193 *Liquified Natural Gas Facilities – Federal Safety Standards*
	49 CFR Part 195 *Transportation of Hazardous Liquids by Pipeline: Minimum Federal Safety Standards*

Table 17-2: External Industry References

Organization	Title
American Public Works Association (APWA)	APWA *Uniform Color Code*
Common Ground Alliance	*Best Practices Guide*
INGAA Foundation Inc.	INGAA *Guidance Documents for Construction – Natural Gas Pipeline Crossings*

Table 17-3: Internal References

Item ID	Title
1013361828	*TEF-IN-CROSS-GL Application to Work on or Within 100 ft of TC Energy ROW (US)*
003864096	*Asbestos Management Procedures U.S.*
007728702	*Controlled Document Library Variance Procedure (CDN-US-MEX)*
003672343	*Excavation Procedure*
005376913	*Explosive Blasting near TransCanada Facilities*
N/A	*Facility Crossing As-Built Information (T-Form)*
003677225	*Heavy Equipment Crossing Information Form*
008945995	*Incident Management Program (CAN-US-MEX)*

Item ID	Title
1012902942	*One Call Locating and Marking Procedure (US)*
004504739	*Operator Qualifications Program*
003672640	*Overhead Power Lines Procedure*
N/A	*Pipeline Inspection Report Form (PIRF T-Form)*
1016680973	*Project Documentation Integrity Requirements Plan*
1012902944	*Stakeout Report and Ground Disturbance Approval (US)*
008372565	*TEP-PR-RESTS-G Storage Well Site Selection, Spacing, Layout and Safety Procedure (CAN-US-MEX)*
1013154643	*TES-CT-GEN-G Pipeline Construction Specification (US-MEX)*
005408266	*TES-CT-GEN-L Pipeline Construction Specification (US)*
006807037	*TES-IN-FDATA-GL Pipeline Integrity Field Data Specification (CAN-US-MEX)*
003892898	*US-GAS-IMP US Onshore Gas Pipeline Integrity Management Program (US)*

18 DOCUMENTATION AND RECORDKEEPING

Due to the broad range of data types that may be required in support of this Procedure, there are a number of repositories that may need to be utilized for documentation purposes. A summary of key data repositories appears in Table 18-1.

18.1 Applications and Agreements

18.1.1 The following records in Table 18-1 established under this Procedure for documenting requests and approvals must be maintained per the *Project Documentation Integrity Requirements Plan* (Item ID 1016680973).

18.2 Documenting Final Crossing or Encroachment Details

18.2.1 The Operations Representative completes the *Pipeline Inspection Report Form (PIRF)* where required per *TES-IN-FDATA-GL Pipeline Integrity Field Data Specification (CAN-US-MEX)* (Item ID 006807037).

18.2.2 After construction is completed, the Operations Representative must document the final crossing or encroachment details on the *Stakeout Report and Ground Disturbance Approval (US)* (Item ID 1012902944) form.

18.2.3 Complete and submit the *Facility Crossing As-Built Information (T-Form)* which is to include any attached redline drawings.

18.2.4 The Operations Representative also submits a copy of the *Stakeout Report and Ground Disturbance Approval (US)* (Item ID 1012902944) for filing in the Operations Crossing file and to Land Services.

Table 18-1: Documentation Requirements

Documentation Description	Repository
TEF-IN-CROSS-GL Application to Work on or Within 100 ft of TC Energy ROW (US) (Item ID 1013361828)	Tract file database
Encroachment Agreement	Tract file database
Facility Crossing As-Built Information (T-Form)	T-form database…
Heavy Equipment Crossing Information Form (Item ID 003677225)	Tract file database
Major Crossing Agreement	Tract file database
Minor Crossing Agreement	Tract file database
Pipeline Inspection Report Form (PIRF T-Form)	T-form database…
Redline drawing	Attach to Facility Crossing As-Built Information (T-Form)

Documentation Description	Repository
Stakeout Report and Ground Disturbance Approval (US) (Item ID 1012902944) **Note:** Stakeout Report and Ground Disturbance Approval is completed for Major and Minor Crossing Agreements and Encroachments Agreements. For Minor Crossing Agreements, Stakeout Report and Ground Disturbance Approval form will be used as the Minor Crossing Agreement documentation.	Minor Crossing Agreement Tract file database/Project Pulse

19 DOCUMENT HISTORY

Rev.		
08	**Description**	**Effective Date**
	TOP Pipeline Crossing and Encroachment Procedure (US) EDMS #: 003858625 was converted to a TEP	2021-May-03
	Rationale Statement	**Approving Engineer**
	This document was revised in order to address the following requirements: • Harmonize CPG and TC procedures • Review content for required updates	Lawrence Jaskowiec
	Impact Assessment Summary	**Document Owner**
	Revised document will require LMS training for IES, Land Services, USGO, Corrosion Services, Integrity and Operations Services (IOS) personnel.	Michael Kubincanek
07	**Description**	**Effective Date**

Rev.		
	Updated with new TOP contact. Periodic review done for TOP document for all aspects of the periodic review requirements. Below are items which were reviewed. 1. Regulatory section of TOPs database was reviewed for accuracy and any new or outdated items. Consulted with the U.S. and Mexico Compliance Departments and made sure we have a common understanding of expectation for the regulatory references. 2. Reviewed for feedback for TOP none entered. 3. Reviewed for IITs, Service Bulletins none. 4. Checked associated form. 5. Reviewed learning resource W08263 and no identified requirements or changes. 6. Updated impact assessment form.	2020-Jan-02
	Rationale Statement	**Approving Engineer**
	Better balance of workload within department as per manager of department.	Lawrence Jaskowiec
	Impact Assessment Summary	**Document Manager Owner**
	No field impact.	Michael Wong

20 DESCRIPTION OF CHANGE

Section	Description of Change
Regulatory	
N/A	N/A
Industry Standards	
N/A	N/A

Section	Description of Change
General	

N/A	• This document was converted from a TOP to a TEP.
	• Distinguished difference between Major and Minor Crossing Agreement and Encroachment Agreements to replace Letter of Consent and area of responsibility (Land Services vs Operations)
	• Identified applicable Crossing types applicable to Major and Minor Crossing Agreements.
	• Separated and expanded upon the application and approval process for Major and Minor Crossing Agreements.
	• Use of Stakeout Report as Minor Crossing Agreement.
	• Added the following:
	  • qualifications for Covered Tasks and employees conducting or supervising Ground Disturbance or Excavation
	  • EHSM
	  • Third Party may be required to monitor and record PPV at the facilities
	  • information pertaining to blasting plan requirement for three-axis seismic survey for each blast event changed to 325 ft from 300 ft
	  • load calculations analysis
	  • Storage Well section
	  • Roads, Driveways, Sidewalks, Parking Areas, and Walking or Cycling Path section
	  • lift barge cans or spuds placement requirement outside of ROW
	  • requirement for *Facility Crossing As-Built Information (T-Form)* and *Pipeline Inspection Report Form (PIRF T-Form)*
	  • Construction Induced Vibration section
	  • drawings to Appendix

21 APPROVALS

APPROVALS	
Document Contact	Lawrence Jaskowiec Integrity Engineer, Mainline Support USGO Integrity Engineering Services L.J. Jaskowiec 4/21/2021
Document Owner Manager	Michael Kubincanek Manager USGO Integrity Engineering Services
Discipline Checker	Darren Duhon Principal Integrity Engineer USGO Integrity Engineering Services
Discipline Checker	Brian Yeung, Pipeline Integrity Engineer Canada Liquids – Technical Support
Discipline Checker	Alex Osborne Manager US Land Management Services TC West
Discipline Checker	Stan Tumoth Technologist, Damage Prevention Canada Gas Pipeline Integrity
Discipline Checker	Chuck McCreery, Sr. Legal Counsel Legal Litigation
Approving Engineer	Lawrence Jaskowiec Integrity Engineer, Mainline Support USGO Integrity Engineering Services L.J. Jaskowiec 4/21/2021 Signature/Date

APPENDIX A GUIDELINE FOR ACCEPTABLE USE OF COMPANY ROW

The table below provides a list of crossing or encroachment requests that are acceptable or not acceptable along with specific requirements. Where the request is covered in more detail within this Procedure, a reference to that section is provided.

The table serves as a guideline, however, there may be exceptions allowed based on Land Services, Engineering, and Operations review and approval (Encroachment Agreement).

Use	Acceptable?	Remarks/Requirements
Agriculture	Yes Consent may be required	Activities related to the growing of crops or the raising of animals does not require consent, provided the activity does not involve: • deep tilling practices • installation of permanent structures • increase or decrease in the pipeline cover Facilities such as underground and overhead irrigation systems must be reviewed by IES.

Airports – Private	Yes
	Consent required
		• Permission to cross the ROW for an air strip may be granted, provided it is for **private** use of the property owner, and does not:
		  • involve any increase or decrease in the pipeline cover
		  • installation of any permanent structures on the ROW
		• Plans must be approved by IES.

Airports – Public	No	Pipeline re-route will be required.
All Terrain Vehicle (ATV) Trails	Yes Consent required	Casual use of the ROW for recreational ATV driving does not require permission from the Company. However, care should be taken to avoid formal or informal designation of the ROW as an ATV trail. Physical barricades and visual screening of the ROW at access points should be utilized as necessary to discourage such use.
Automobile Wrecking Yards	No	
Blasting	No	See section 5.5
Buildings	No	Permanent structures of any type are not permitted. See also Structures.
Canal	Yes Consent required	Canals or ditches may be built across the Company ROW subject to engineering review.
Campsites	No	
Canopies	No	
Carports	No	
Catch Basins	No	
Cathodic Protection Devices	Yes	See section 9.5
Christmas Trees	No	See Tree Farms
Concrete Slabs for Pipeline Protection	Yes Consent required	

Use	Acceptable?	Remarks/Requirements
Conduits or Fiber Optics	Yes Consent required	See sections 9.3 and 9.4
Construction Equipment	Yes Consent required	See section 6
Cross Streets	Yes Consent required	See section 11
Culverts	Yes Consent required	Provided 24 in. of separation is maintained between the pipeline and culvert and with the culvert above the pipeline.
Curbs and Gutters		See clause 11.2.2
Cuts and Fills	Yes Consent required	Cutting and filling may be permitted over the pipeline provided: • cover is not reduced to less than 36 in. • cover is not increased to the point where a pipe exceeds acceptable stress levels
Dams (includes structures and the dam water)	No	
Deep Tilling	Yes Consent required	See Sub-soiling
Ditches	Yes Consent required	See Canal
Docks	No	
Drains	Yes Consent required	See Culverts
Driveways	Yes Consent required	See section 11
Electric Fences	Yes Consent required	• Insulated handled gate required. • Conductors must not be placed within 15 ft of any Company above grade piping.
Electric Lines	Yes Consent required	See section 9
Equipment	Yes Consent required	See Construction Equipment

Use	Acceptable?	Remarks/Requirements
Erosion Control	Yes Consent required	Structures (e.g., berm) or materials to prevent soil erosion due to wind or water may be located on the pipeline ROW provided the structure or materials: • do not interfere with the installation, operation, or maintenance of the pipeline • take into account the effect on the environment in the area
Exploration – Geological and Geophysical	No within ROW Yes - outside of ROW Consent required	See section 5.5
Fences	Yes Consent required	• Provided adequate access to the ROW is maintained. • Company retains the right to install a gate in the fence with a corporation lock where necessary to maintain such access. • Company must install its own locks in any manner that allows the Company unimpeded access without limiting the Third Party's access. • Gates should be at least 16 ft wide. • Company must have access through all gates within the ROW. • Fence posts must not be installed within 5 ft of the pipeline. • Fences installed longitudinally to the pipeline may not be permitted. • Fence or hedge height may not exceed 5 ft. • Commercial chain link fences used for security protection or other business requirements may exceed 5 ft. • Masonry brick or stone walls are not allowed within the ROW.
Fiber Optic Cable	Yes Consent required	See section 9

Use	Acceptable?	Remarks/Requirements
Field Drain Tile (plastic)	Yes Consent required	• Unless provided for in the *Minor Crossing Agreement*, new terra cotta field tile must not be placed within the ROW. • Permitted field tile or drainage pipe must cross the pipeline ROW at or as near to 90 deg as possible with a minimum clearance of 12 in. above or below the pipeline. • Crossings less than 45 deg are not permitted. Field tile must not drain onto a ROW. Longitudinal runs of field tile must not be closer than 15 ft from Company pipelines.
Flood Control	Yes Consent required	See Erosion Control, Canal, Dams
Fuel Pump Islands	No	
Fuel Pumps	No	
Golf Courses	Yes Consent required	See Landscaping
Greenbelts	Yes Consent required	See Landscaping
Hiking Trails	Yes	Provided reasonable access to facilities is maintained. See Landscaping and Cuts and Fills.
Horseback Riding Trails	Yes	Provided adequate access to facilities is maintained. See Cuts and Fills.
Horticulture	Yes	See Agriculture
Incinerators	No	
Irrigation Lines	Yes Consent required	See Agriculture and Canals
Junk Yards	No	
Lakes	No	
Landfill	No	
Landscaping	Yes Consent may be required	Provided reasonable access to facilities is maintained. • See Cuts and Fills for earthwork requirements. • Shrubs or ornamental plantings must not be permitted within 10 ft of the pipeline. • Plantings outside of 10 ft of the pipeline must be maintained at 5 ft in height or less. • Raised beds greater than 10 ft from the pipeline are permissible provided they are not installed or anchored below grade.

Use	Acceptable?	Remarks/Requirements
Launching Ramps	No	
Lawns	Yes Consent required	See Cuts and Fills and Sprinkler Systems
Leach Fields	No	Piping leading to a leach field may cross a Company pipeline. Entire leach field must be outside of ROW. Before granting *Encroachment Agreement* for piping, owner must show proof of Health permit that installation will meet all applicable State and local regulations and water quality requirements. See section 7.
Loading Ramps	No	
Logging	Yes	See section 6
Marinas	No	Marinas may not be installed on Company ROW.
Masonry Work (e.g., pavers)	Yes Consent required	Provided adequate access to facilities is maintained and Cuts and Fills criteria is maintained.
Mini Golf Courses	No	
Mining	Yes Consent required	Provided adequate precautionary measures are taken.
Mobile Homes	No	
Mobile Home Park	Yes Consent required	Mobile homes are not allowed on Company ROW.
Orchards	No	
Overhead Power Lines	Yes Consent required	See section 9.2
Parking	Yes Consent required	See section 11
Parks	Yes Consent required	ROW may be used as part of a park area, but permanent structures must not be located on the ROW. See Landscaping, Orchards and Trees.
Patios	No	
Pipelines	Yes Consent required	See section 7
Playground Equipment	Yes Consent required	Permanent playground structures must not be installed on ROW. Play equipment without embedded footings or foundations are allowed.

Use	Acceptable?	Remarks/Requirements
Playgrounds	Yes Consent required	See Parks
Ponds	No	
Porches	No	
Power Lines	Yes Consent required	See section 9
Private Landowner Utility Crossing of Pipeline	Yes Consent required	Where a private landowner crosses the Company pipeline with a buried structure, a *Minor Crossing Agreement* is required. The minimum vertical clearance of 24 in. above or below the Company pipeline must be maintained across the entire ROW.
Quarries	No	Quarrying activities within 1,000 ft of the ROW requires IES review for assessment of potential impacts to the integrity of the ROW and Company facilities.
Railroads	Yes Consent required	Railroad Crossings are permitted.
Recreation Areas	Yes Consent required	Pipeline ROW may be used for general recreation that does not require the use of any permanent structures or facilities.
Reservoirs	No	
Retaining Walls	No	
Rifle Ranges	No	
Road Crossings-Private	Yes Consent required	See section 11
Road Crossings-Public	Yes Consent required	See section 11
Road Ditches	Yes Consent required	Any new ditches or re-working of ditches must be approved by IES. If cover is requested to be reduced below 36 in. then culverts, or concrete pads may be considered.
Road Parallel	No	See section 11
Septic Tanks	No	
Sewer Lines	Yes Consent required	See section 9
Shrubs (ornamental)	Yes Consent required	See Landscaping

Use	Acceptable?	Remarks/Requirements
Sidewalks	Yes Consent required	See section 11
Signs	No	
Spoil Piles (storage of dirt)	Yes Consent required	See Cuts and Fills
Sprinkler Systems (underground)	Yes Consent required	Crossings of pipeline must be kept to a minimum. Consideration must be given to cathodic protection interference.
Storage	Permanent – No Temporary Yes – Consent required	The pipeline ROW must not be designated as a storage area, however, small amounts of non-combustible materials or equipment, not otherwise prohibited, may be stored on the ROW by the property owner provided it does not interfere with access to the pipeline.
Storm Drains	Yes Consent required	See Culverts
Structures	No	Permanent structures (i.e., any facility or structure, the foundation, or any other portion of which lies below the ground surface), are not allowed.
Sub-soiling (Deep Tilling)	Yes Consent required	• Sub-soiling is not allowed **within 5 ft** of either side of edge of pipeline. • If the area where sub-soiling will be done is **greater than 5 ft, but less than 15 ft** from edge of pipeline, the pipeline must be: • located electronically at sufficient intervals to mark the horizontal position and alignment of the pipeline • daylighted at the beginning and end of the section, at any bend or deviation, and at appropriate intervals sufficient to confirm the location of the pipe (e.g., 500 ft) • **Greater than 15 ft** from edge of pipeline, the pipeline must be located electronically at sufficient intervals to mark the horizontal position and alignment of the pipeline (including any bend or deviation).
Swimming Pools	No	
Tanks	No	Above or under ground not allowed.
Telephone Cable	Yes Consent required	See section 9
Tennis Courts	No	

Use	Acceptable?	Remarks/Requirements
Trails (except motorized)	Yes Consent required	Subject to engineering review. Trails should not be hard surface and erosion prevention measures must be in place. See Cuts and Fills.
Trash Burners	No	
Tree Farms	No	
Trees	No	
TV Cable	Yes Consent required	See section 9
Utilities	Yes Consent required	See section 9
Underground Structure	No	Other than pipelines and related facilities.
Vaults	No	
Wells	No	

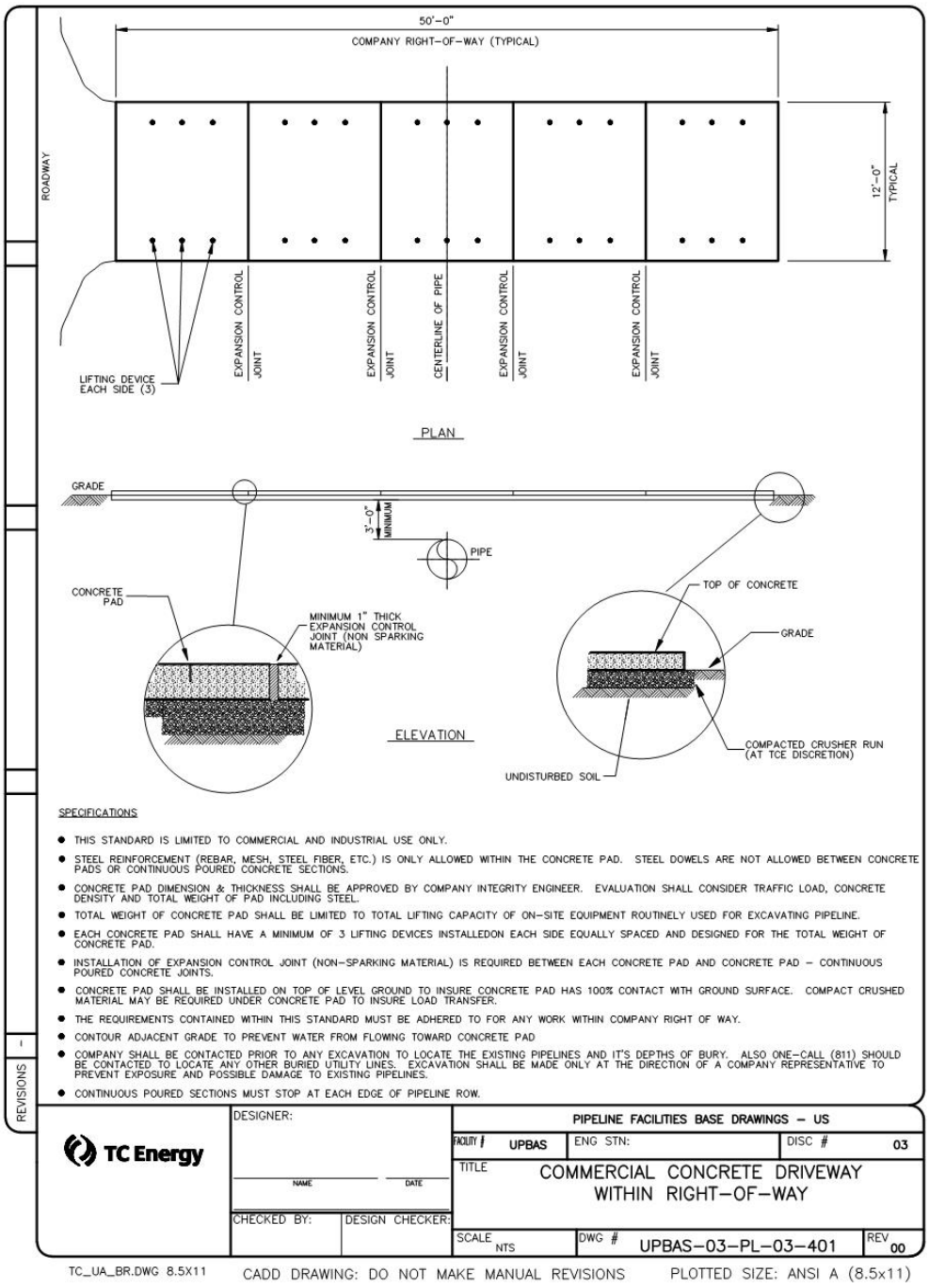
APPENDIX B RESIDENTIAL OR COMMERCIAL CONCRETE DRIVEWAY WITHIN ROW

Control Joint Depth: Joints can be constructed either by forming, hand-tooling them in fresh concrete, or cutting them into cured concrete with a saw. The width of these joints should be between 1/16 in. and 1/4 in., depending on the method used to form joints.

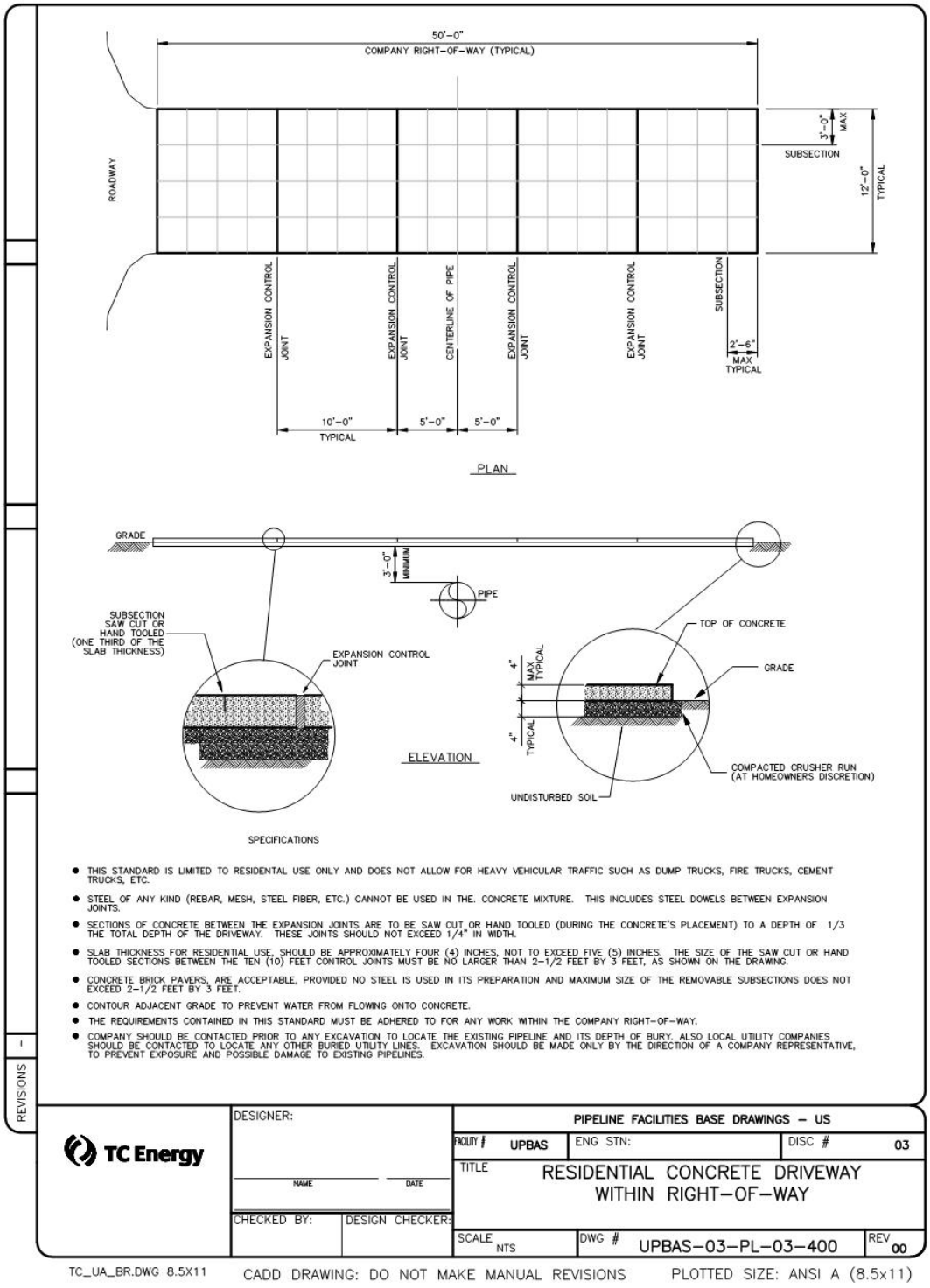
Subsection Size: Each concrete subsection is 2.5 ft x 3 ft and approximately 4 in. thick (not to exceed 5 in. thick). This yields a total volume equal to 2.5 cubic ft. Assume cured concrete weighs approximately 150 lbs. per cubic foot; with a subsection weight of approximately 375 lbs.

Specifications provided in the drawings must be followed by the Third Party unless otherwise permitted by the Company.

Appendix Figure B 1 Commercial Concrete Driveway Within ROW

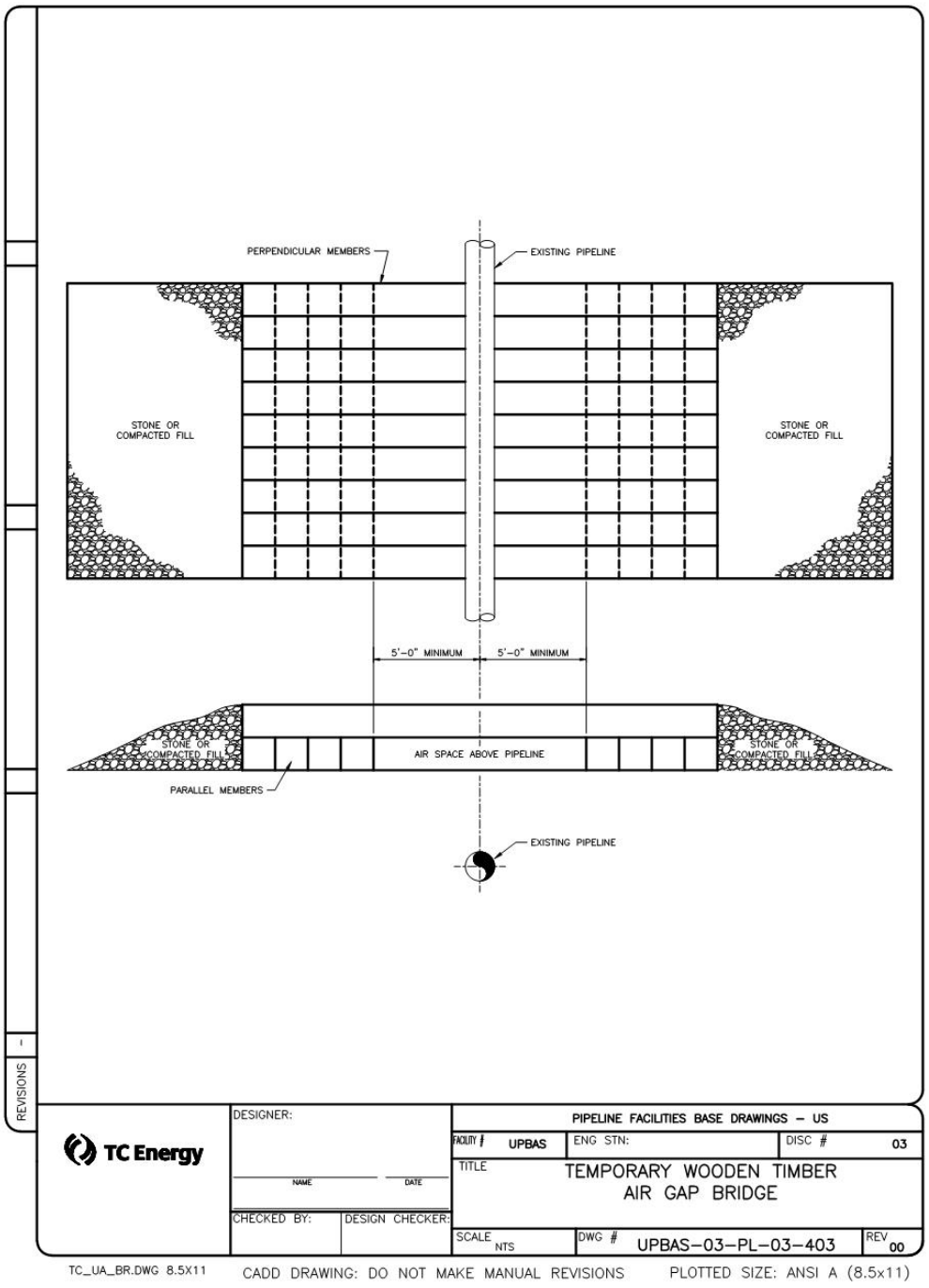
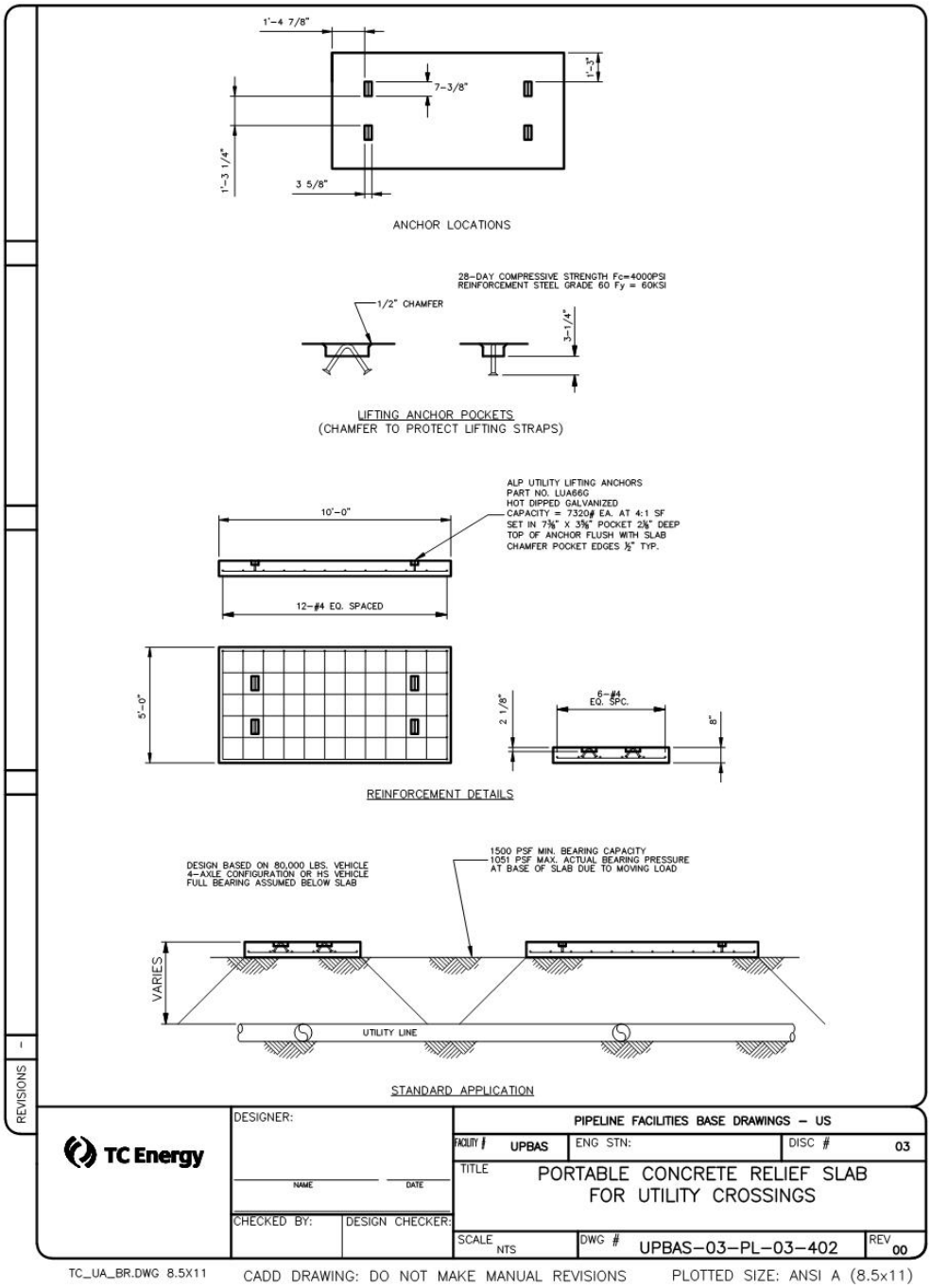


Appendix Figure B 2 Example - Residential Concrete Driveway Within ROW



APPENDIX C TEMPORARY OR PERMANENT CROSSINGS

Appendix Figure C 1 Example – Temporary Wooden Timber Air Gap Bridge



Appendix Figure C 2 Example Portable Concrete Relief Slab for Utility Crossings