INFRASTRUCTURE CONDITIONS ASSESSMENT

AMERICA'S CENTRAL PORT

MADISON, VENICE, AND GRANITE CITY, ILLINOIS

Juneau Project No. E211303

Report Coordinated and Assembled By:

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Prepared for:

AMERICA'S CENTRAL PORT

America's Central Port
1635 West First Street
Granite City, IL 62040

December 30, 2021

JUNEAU ASSOCIATES, INC., P.C.
ENGINEERING & LAND SURVEYING

Visu-Sewer
Inspect. Maintain. Rehabilitate.

DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY

INFRASTRUCTURE CONDITIONS ASSESSMENT
AMERICA'S CENTRAL PORT
MADISON, VENICE, AND GRANITE CITY, ILLINOIS

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

America's Central Port (ACP) is a 1,200-acre multi-modal business and industrial campus located in the municipalities of Madison, Venice, and Granite City, Illinois. Created in 1959, the Port provides access to three major freight transportation modes, including river, rail, and roadway. It is home to numerous manufacturers, suppliers, and other industrial and transportation-related businesses. It features the third largest inland port in the country, and access to four interstates and six Class 1 railroads.

In 2021, ACP received grant funding from the Illinois Department of Transportation (IDOT) to conduct an infrastructure assessment of its rail, road, and sewer/stormwater infrastructure to enable the Port to better manage these assets and make strategic capital investments. Juneau Associates, Inc., P.C. (JAIPC) subsequently contracted with ACP to conduct this assessment, with the assistance of two subcontractor team members - Visu-Sewer, Inc. and Design Nine, Inc. – who were responsible for completing evaluations of the sewer and rail infrastructure respectively.

This report presents the results of that assessment.

2.0 EXISTING FACILTIES

With the exception of buildings and freight loading facilities, ACP-owned infrastructure at the subject location consists of three major components: pipe sewers (including pump stations), roadways, and railways. Each of these components requires specialized inspection and evaluation.

2.1 Pipe Sewers

JAIPC's subcontractor, Visu-Sewer, Inc., was tasked with performing a field conditions assessment of the sanitary, storm, and combined sewer system serving the ACP facility. Internal inspections were conducted in sewer pipes and structures utilizing video cameras to identify and document defects and failures along the individual pipe runs. While not every linear foot of sewer was inspected, a sufficient portion of the system was evaluated to determine the sewer line conditions. Visu-Sewer and JAIPC worked directly with ACP

staff to select representative pipe runs, concentrating on areas of past sewer failures, capacity limitations, and locations where future development is expected.

As part of the inspection process, Visu-Sewer was responsible for cleaning the existing sewer systems and removing excess rock and debris where encountered to allow for improved flow conditions and to permit detailed inspection of the pipes and connections. While the project scope did not include removal of all debris and cleaning of every sewer line, ACP should note a substantial improvement in flow capacity and a reduction in flooding occurrence during heavier storm events.

Visu-Sewer cleaned and inspected more than 5.8 miles of sewer as part of this project and provided photographic and video records of their assessments to JAIPC for delivery to ACP. Pipes encountered ranged in size from 8-inches to 42-inches in diameter, and included reinforced concrete (RCP), vitrified clay (VCP), and polyvinyl chloride (PVC) pipes of varying ages and conditions.

2.1.1 Pump Station

Although not part of the infrastructure assessment project, the pump station located in the southeast quadrant of the intersection of 4th and D Streets is a critical part of the Port's sewer system and should be included in future maintenance and rehabilitation programs. This station was upgraded in 2009, including new pumps, accessories, and some structural elements as well. The plans for these upgrades are included with this report as Exhibit E.

2.2 Roadways

JAIPC conducted a road surface condition survey of the America's Central Port's 21 miles of roadway during three separate site visits. The survey was conducted by driving each roadway and taking photos of areas of distress that were representative of the general condition of the road. These photos and notes were then logged into a GIS map for the Port's records.

Included in the report are roadway condition ratings, notes on the deficiencies of each roadway, recommended repair or maintenance work, and estimated unit costs associated with completing the work. (Reference Exhibit F.)

2.3 Railways

The scope of work assigned to Design Nine, Inc. included a conditions assessment of

approximately 14.2 miles of rail track separated into two regions with a dividing line along Niedringhaus Avenue that runs in the West and East direction. The Madison Harbor is located South of Niedringhaus Avenue and Granite City Harbor located North of Niedringhaus Avenue. The assessment includes ratings, photographs, finding notes, recommended treatment, and recommended treatment schedule. The recommended treatments and improvements will aid the Port in the scheduling of future repairs and maintenance. (Reference Exhibit G.)

3.0 PIPE SEWER INVENTORY AND ASSESSMENT

As previously noted, Visu-Sewer, Inc. cleaned and inspected almost 31,000 linear feet of sanitary, storm, and combined sewer lines as part of this project. The data was entered into their Pipeline Assessment Certification Program (PACP) software, a software certification, inspection protocol, and coding protocol for pipe defects. Data is provided on all defects and observations, and each pipe is graded for structural, operational, and maintenance integrity and condition.

A summary of the results of the pipe inspections and printouts of data from the final PACP report is included with report as Exhibit A.

4.0 FIELD SURVEY

JAIPC survey personnel located each sewer manhole identified as part of the ACP system, basing their search on the existing available record data. The survey was conducted based on ACP's internal coordinate system using their network of ground control point. The survey data was then converted to Illinois West - State Plane Coordinate system and the NAD83 vertical datum for transfer into the ArcGIS mapping developed as part of this project.

Design Nine, Inc., completed most of their inventory and assessment work using the existing data they developed during the design of the expanded rail system over the past 10 years, supplementing, and expanding this information with new field survey when necessary to update the existing mapping to reflect current conditions.

5.0 ROADWAY INFRASTRUCTURE INVENTORY AND ASSESSMENT

Included in the report are roadway condition ratings, notes on the deficiencies of each roadway, recommended repair or maintenance work, and estimated unit costs associated with completing the work.

The purpose of this report is to provide the Port with the following:

- A detailed inventory of the Port road system.
- Documented conditions of each road on a GIS mapping system.
- Maintenance or repair method recommendations appropriate to each road.
- Estimated costs of each maintenance and repair method.

Exhibit F includes a full copy of JAIPC's final report with all relevant exhibits and estimates of cost.

6.0 RAILROAD INFRASTRUCTURE INVENTORY AND ASSESSMENT

Design Nine, Inc. was hired as a subconsultant to JAIPC, and was tasked with developing a report that strictly addresses the assessment of the rail infrastructure. The final deliverables of the assessment include a written report of findings and the JAIPC-provided GIS data for each infrastructure system in shapefile format.

Exhibit G includes a full copy of Design Nine's final report with all relevant exhibits and estimates of cost.

7.0 COST ESTIMATES

Each sub-section of the report includes estimates of costs for recommended repair and replacement work identified as part of this assessment. As these estimates are highly specific to each type of infrastructure and depend greatly upon decisions made by ACP administrators, this report does not include a summary of all the cost estimates, and instead leaves them in their original format in the individual reports included in the various exhibits.

8.0 INVENTORY MANAGEMENT TOOLS

JAIPC and their subcontractors have endeavored to make the data and assessments collected as part of this project as accessible to ACP personnel as possible. The infrastructure observations, recommendations, and cost estimates have been assembled in ArcGIS format for easy viewing and querying of data. This material will allow ACP administrators to select projects and seek funding for necessary repairs and improvements and allow them to focus available resources in the most critical areas and maximize the cost-efficiency of their project.

As noted elsewhere in this report, Visu-Sewer has provided ACP with their inspection database in an interactive spreadsheet. The spreadsheet can be searched by choosing a selection or selections of variables, and generate cost estimates of possible repair and/or replacement scenarios based on the variables selected.

9.0 CONCLUSIONS

The findings of this assessment indicate that a number of major and minor rehabilitation and reconstruction projects will be necessary over the coming years. Some improvements are more critical in nature and should be addressed as soon as possible to maintain the Port's operating capacity and minimize disruptions to shipping and transportation activities. This report provides the basic methodology for prioritizing these improvements, budget line estimates for maximizing the cost-effectiveness of proposed projects, and a framework for tracking and updating records to ensure Port personnel can keep this critical facility operating well into the 21st Century.

EXHIBIT A

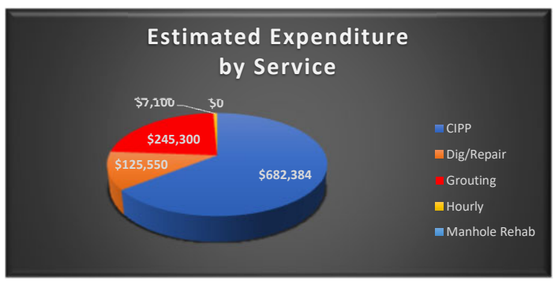
PIPE INSPECTION REPORTS

Visu-Sewer
Inspect. Maintain. Rehabilitate.

Data At A Glance

America's Central Port - 2021

Line	Service	Units	U/M	Price	Total	Category
1	**Mobilization - CIPP**	1	LS	$ 7,500.00	$ **7,500**	CIPP
2	CIPP 8" x 6.0mm	1,597	LF	$ 26.00	$ **41,509**	CIPP
3	CIPP 10" x 6.0mm	1,081	LF	$ 32.00	$ **34,579**	CIPP
4	CIPP 12" x 6.0mm	4,189	LF	$ 36.00	$ **150,815**	CIPP
5	CIPP: 15"x 7.5mm	4,156	EA	$ 45.00	$ **187,038**	CIPP
6	CIPP 18" x 7.5mm	2,182	LF	$ 55.00	$ **120,010**	CIPP
7	CIPP 24" x 9.0mm	806	LF	$ 75.00	$ **60,435**	CIPP
8	CIPP 30" x 10.5MM	768	LF	$ 95.00	$ **72,998**	CIPP
9	CIPP: Bypass Pumping per 1,000 GPM Per Occurrence Per Day	5	DAY	$ 1,500.00	$ **7,500**	CIPP
10	**Mobilization - Dig and Repair**	1	LS	$ 7,500.00	$ **7,500**	Dig/Repair
11	Dig/Repair: MH, New	-	EA	$ 250.00	$ -	Dig/Repair
12	Dig/Repair: MH, RTG/Uncover	1	EA	$ 50.00	$ **50**	Dig/Repair
13	Dig/Repair: MH, New	-	EA	$ 2,500.00	$ -	Dig/Repair
14	Dig/Repair: Pipe, Point Repair - 6" - 12"	24	LF	$ 2,000.00	$ **48,000**	Dig/Repair
15	Dig/Repair: Pipe, Point Repair - 15" - 42"	18	LF	$ 3,500.00	$ **63,000**	Dig/Repair
16	Dig/Repair: Tap, New	2	EA	$ 3,500.00	$ **7,000**	Dig/Repair
17	**Mobilization - Grouting**	1	LS	$ 3,500.00	$ **3,500**	Grouting
18	Grouting: Joints - Sealing 8"	-	EA	$ 5.00	$ -	Grouting
19	Grouting: Joints - Testing 10"	-	EA	$ 70.00	$ -	Grouting
20	Grouting: Joints - Sealing 10"	-	EA	$ 7.00	$ -	Grouting
21	Grouting: Joints - Testing 12"	-	EA	$ 80.00	$ -	Grouting
22	Grouting: Joints - Sealing 12"	-	EA	$ 8.00	$ -	Grouting
23	Grouting: Laterals	268	EA	$ 850.00	$ **227,800**	Grouting
24	Excess Grout	1,000	GAL	$ 14.00	$ **14,000**	Grouting
25	**Mobilization - Hourly Work**	1	EA	$ 3,000.00	$ **3,000**	Hourly
26	Hourly Work: T/M	5	EA	$ 820.00	$ **4,100**	Hourly
27	MH Rehab: Bench/Channel	-	EA	$ 1,000.00	$ -	Manhole Rehab
28	MH Rehab: Lining Additional VF	-	EA	$ 500.00	$ -	Manhole Rehab
29	MH Rehab: Other	-	VF	$ 1,000.00	$ -	Manhole Rehab
30	MH Rehab: Coating	-	EA	$ 150.00	$ -	Manhole Rehab
	Estimated Total				**$1,060,334**	

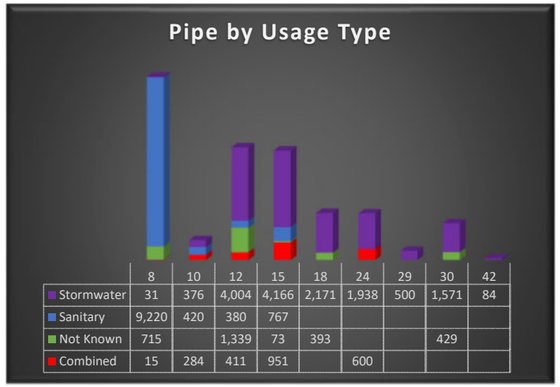


Category: CIPP, Dig/Repair, Grouting, Hourly, Manhole Rehab

$1,060,334 Estimated Expenditures Using These

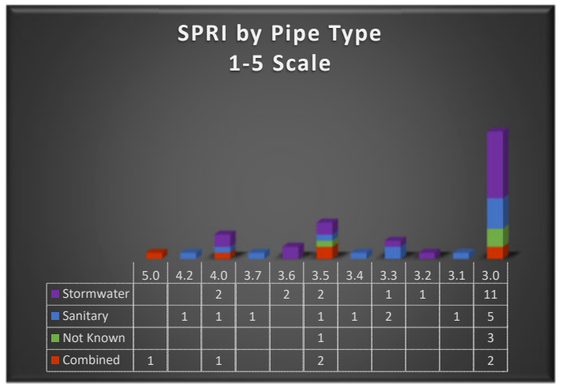
Quick Facts:

1. **Approximately 30,000 LF of pipe was inspected.**
2. **It is estimated over 14,000 LF of CIPP is needed.**
3. **412 Service connections or taps were identified.**
4. **42 point repairs are recommended.**
5. **$1.1 million of repairs are estimated.**



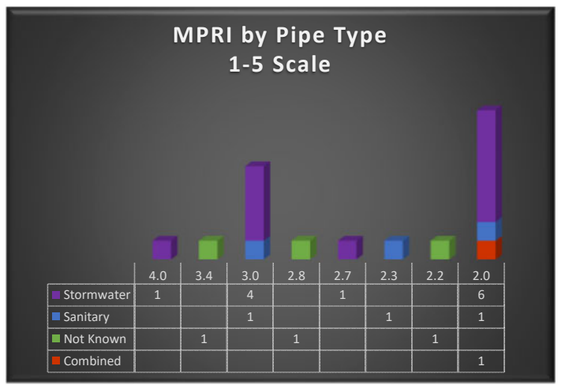
Diameter: 8, 10, 12, 15, 18, 24, 29, 30, 42

Pipe Usage: Combined, Not Known, Sanitary, Stormwater



SPRI: 5.0, 4.2, 4.0, 3.7, 3.6, 3.5, 3.4, 3.3, 3.2, 3.1, 3.0, 2.9

Pipe Usage: Combined, Not Known, Sanitary, Stormwater



MPRI: 4.0, 3.4, 3.0, 2.8, 2.7, 2.3, 2.2, 2.0, 1.5, 1.2, 1.0, 0.0

Pipe Usage: Combined, Not Known, Sanitary, Stormwater

Compiled by: Barry Howell

CCTV Analysis 2021 - America's Central Port

Collected Data																			Calculated Data						Analysis and Planning					
Survey Data									Manhole #'s		Pipe Data					Tap Data				Ratings and Indices						Observations and Recommendations					
1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
ID	PSR	Date	Weather	Pre-Cleaning	Survey Direction	Street	Location	Pipe Usage	Upstream Manhole #	Downstream Manhole #	Diameter	Material	Length	Surveyed	Estimated Joints	Active	Defective	Capped	Abandoned	QSR	QMR	SPRI	MPRI	OPRI	LOF	Notes	Rec1	Rec2	Rec3	Rec4	Rec5
1	x SW-9	08-Jul-21	Light Rain	Heavy	Downstream	1st	Easement/ROW	Stormwater	220D	237D ?	18	VCP	545.0	444.5	89	3	0	0	0	3424	3O11	2.5	3.0	2.9	3.3	CM x4. CL x4. DAE 46.8 - 445.5 continuous. RFJ 365.8. MATCH WITH ID2	Dig/Repair: MH, RTG/Uncover	CIPP: Line Segment	Grouting: Laterals	None	None
2	x SW-9	07-Jul-21	Dry	Heavy	Downstream	1st	Easement/ROW	Stormwater	220D	237D	18	VCP	545.0	7.3	1	0	0	0	0	2100	0000	2.0	0.0	2.0	1.8	MSA 7.3 surcharged.	Hourly Work: T/M	None	None	None	None
3	x SW-8	06-Jul-21	Dry	Heavy	Downstream	1st	Easement/ROW	Stormwater	209D	220D	15	VCP	189.0	189.0	38	1	0	0	0	3421	4121	2.8	3.0	2.9	3.4	CM x3. JSM 179.9. CL 18.2. IRB 179.9 (at JSM). DAE 18.6 (10%). MATCH WITH ID1	CIPP: Line Segment	Grouting: Laterals	None	None	None
4	x SW-49	14-Jul-21	Light Rain	None	Upstream	1st	Easement/ROW	Combined	230D	365D	12	VCP	2.0	34.8	7	1	0	0	0	0000	2100	0.0	2.0	2.0	1.8	DAE 11.0 (10%)	None	None	None	None	None
5	x SW-44	09-Jul-21	Not Recorded	Light	Upstream	1st	Local Street	Stormwater	210D	209D	12	VCP	13.0	1.0	0	0	0	0	0	3100	0000	3.0	0.0	3.0	2.6	CM 1.0. MSA 1.0	Dig/Repair: Pipe, Point Repair	None	None	None	None
6	x SS-8	09-Jul-21	Dry	Light	Downstream	1st	Easement/ROW	Sanitary	229S	233S	10	VCP	232.0	231.6	46	0	0	0	0	5141	0000	2.7	0.0	2.7	4.3	HSV 150.5. FM 194.7. CM x3. CS x6.	CIPP: Line Segment	None	None	None	None
7	x SS-5	09-Jul-21	Dry	Not Known	Downstream	1st	Easement/ROW	Sanitary	223S	229S	10	VCP	190.0	188.8	38	0	0	0	0	3823	1100	2.7	1.0	2.6	3.2	CM x7. FS 183.3. CL x3. IS 165.2.	CIPP: Line Segment	None	None	None	None
8	x SS-4 REST	08-Jul-21	Dry	Heavy	Upstream	1st	Easement/ROW	Sanitary	DEAD END	223SA	8	VCP		0.0	0	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	AEP 0.0.	None	None	None	None	None
9	x SS-4	08-Jul-21	Dry	Heavy	Downstream	1st	Easement/ROW	Sanitary	223SA	223S	8	VCP	174.0	142.9	29	5	0	0	0	3500	4121	3.0	2.3	2.8	3.4	CM x5. IR 34.2. RTJ 34.2. RFJ 42.9. TFA 17.4 (90% roots); 41.1 (90% roots); 119.2 (100% roots).	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals
10	x SS-24	14-Jul-21	Dry	Light	Downstream	1st	Local Street	Combined	261C	259C	10	VCP	114.0	111.7	22	1	0	0	0	3200	0000	3.0	0.0	3.0	2.7	CM 89.8. JOM 99.0. MMC 99.0 (PVC).	CIPP: Line Segment	Grouting: Laterals	None	None	None
11	x SS-22	14-Jul-21	Dry	Light	Downstream	1st	Easement/ROW	Combined	259C	259CA	10	VCP	174.0	172.5	35	2	0	0	0	4100	0000	4.0	0.0	4.0	3.4	MWLS 172.5 (100%). MMC 41.3, 43.2.	CIPP: Line Segment	Grouting: Laterals	None	None	None
12	x SS-18	08-Jul-21	Not Recorded	Not Known	Downstream	Niedringhaus	Easement/ROW	Sanitary	249C	78" RCP SS	8	VCP	18.0	11.5	2	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
13	x SS-17	08-Jul-21	Not Recorded	Light	Downstream	East	Easement/ROW	Not Known	247C	249C	8	PVC	133.0	133.2	10	0	0	0	0	4131	4334	3.5	3.4	3.4	3.7	JOL 55.7. JOM 77.1 (deflected). IR 15.3, 28.0. IRJ 117.4. RTJ x4.	Dig/Repair: Pipe, New Complete Length	None	None	None	None
14	x HOUSING 5 ; HOUSING 6	08-Sep-21	Dry	Light	Downstream	Sullivan	Easement/ROW	Sanitary	HOUSING 5	HOUSING 6	8	PVC	182.0	182.4	14	4	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
15	x HOUSING 3 ; HOUSING 2	07-Sep-21	Dry	Light	Downstream	McIntosh	Local Street	Sanitary	HOUSING 3	HOUSING 2	8	PVC	161.7	160.7	12	0	0	0	0	2100	0000	2.0	0.0	2.0	1.8	MWLS 76.6 (25%).	None	None	None	None	None
16	x HOUSING 2 ; HOUSING 4	07-Sep-21	Dry	Light	Downstream	McIntosh	Local Street	Sanitary	HOUSING 2	HOUSING 4	8	PVC		129.7	10	0	0	0	0	2200	0000	2.0	0.0	2.0	1.8	MWLS 25.5 (25%), 76.7 (20%).	None	None	None	None	None
17	x HOUSING 1 ; HOUSING 2	07-Sep-21	Dry	Light	Downstream	Fisher	Local Street	Sanitary	HOUSING 1	HOUSING 2	8	PVC	360.4	357.6	28	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
18	x DEAD END ; 366S	20-Oct-21	Dry	Light	Upstream	1st	Easement/ROW	Sanitary	DEAD END	366S	8	VCP	233.0	93.0	19	2	0	0	0	5431	2100	4.2	2.0	3.9	4.5	HSV 24.5. DFBI 92.2, 92.4. X 92.2. CM 91.0. CS 49.8. DAE 16.8.	Dig/Repair: Pipe, New Complete Length	None	None	None	None
19	x DEAD END ; 212S	20-Oct-21	Dry	Light	Upstream	1st	Easement/ROW	Sanitary	DEAD END	212S	8	VCP	179.0	181.0	36	7	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
20	x DEAD END ; 205S	20-Oct-21	Dry	Light	Upstream	1st	Easement/ROW	Sanitary	DEAD END	205S	8	VCP	203.0	203.2	41	8	0	0	0	4232	3100	3.5	3.0	3.4	3.5	FM 170.0, 178.6 (at tap). JOM 20.6. CM 168.9. RMJ 187.3.	CIPP: Line Segment	Grouting: Laterals	None	None	None
21	x CY-5 ; YMCA	08-Sep-21	Dry	Heavy	Downstream	4th	Local Street	Not Known	CY-5	YMCA	12	PVC		133.6	10	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
22	x CY-4 ; CY-5	31-Aug-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	CY-4	CY-5	12	VCP		183.7	37	1	0	0	0	5141	0000	3.0	0.0	3.0	4.3	HSV 182.3. JOL 57.0. FS 57.0, 60.9 (at tap?). CL x3. TB 60.9.	CIPP: Line Segment	Grouting: Laterals	None	None	None
23	x CY-3 ; CY-4	30-Aug-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	CY-3	CY-4	12	VCP		306.0	61	4	0	0	0	3723	1100	2.7	1.0	2.5	3.1	FM x7. CL 45.7, 82.5, 247.6. RFJ 167.9. TBA x3.	CIPP: Line Segment	Grouting: Laterals	None	None	None
24	x CY-2 ; CY-3	30-Aug-21	Dry	Heavy	Downstream	3rd	Local Street	Not Known	CY-2	CY-3	12	VCP		274.8	55	2	1	0	0	413A	4129	2.8	2.2	2.6	3.5	FM 220.4. CM x10. JOM x3. CL x4, continuous 217.5 - 223.9. TBD 6.0. DAE x3 (5-10%). RFJ 263.2, 251.4 - 274.8 continuous.	Dig/Repair: Tap, New	CIPP: Line Segment	Grouting: Laterals	None	None
25	x CY-1 ; CY-2	24-Aug-21	Dry	Heavy	Downstream	2nd	Local Street	Combined	CY-1	CY-2	24	VCP		212.3	42	5	0	0	0	4131	0000	3.5	0.0	3.5	3.4	H 184.1. CM 64.4. TBA x4 (139.4 100% mud). MSA 212.3 mud.	Hourly Work: T/M	Dig/Repair: Pipe, Point Repair	None	None	None
26	x CY-1 ; 400-4	25-Aug-21	Dry	Heavy	Downstream	2nd	Local Street	Stormwater	CY-1	400-4	15	VCP		351.7	70	5	0	0	0	423P	2115	2.9	1.2	2.8	3.5	H 69.5, 185.6. CM x19. JSM 24.0, 27.0; 30.1 - 351.7 continuous. CL x13. TBA x4 (140.7 full of mud). IW 69.5. RFJ x5.	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals	None	None
27	x 875 TO 873	04-Nov-21	Not Recorded	Heavy	Downstream	E	Easement/ROW	Stormwater	875	873	30	Concrete		179.3	22	0	0	0	0	2800	0000	2.0	0.0	2.0	2.3	CM 12.3 - 53.9 continuous	CIPP: Line Segment	None	None	None	None
28	x 873 TO 869	04-Nov-21	Not Recorded	Heavy	Downstream	E	Easement/ROW	Stormwater	873	869	30	Concrete		174.1	22	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
29	x 869 TO 866	04-Nov-21	Not Recorded	Light	Downstream	E	Easement/ROW	Stormwater	869	866	30	Concrete		121.9	15	0	0	0	0	2100	0000	2.0	0.0	2.0	1.8	CL 2.6 - 9.4 continuous.	CIPP: Line Segment	None	None	None	None
30	x 866 TO 858	04-Nov-21	Not Recorded	Light	Downstream	E	Easement/ROW	Stormwater	866	858	30	Concrete		256.9	32	0	0	0	0	2100	0000	2.0	0.0	2.0	1.8	CL 99.8.	None	None	None	None	None
31	x 833 ; 826	21-Oct-21	Not Recorded	Light	Downstream	Sullivan	Easement/ROW	Sanitary	833	826	8	PVC		358.9	28	5	0	0	0	4231	0000	3.7	0.0	3.7	3.5	JOL 68.3, 114.9. JOM 118.1. TFA x5.	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	None	None
32	x 829 ; 826	21-Oct-21	Not Recorded	Light	Downstream	McIntosh	Easement/ROW	Sanitary	829	826	8	PVC		85.8	7	1	0	1	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
33	x 828 ; 829	21-Oct-21	Not Recorded	Light	Downstream	McIntosh	Easement/ROW	Sanitary	828	829	8	PVC		157.8	12	4	0	1	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
34	x 824 ; 821	21-Oct-21	Not Recorded	Light	Downstream	Garber	Easement/ROW	Sanitary	824	821	8	PVC		238.3	18	6	0	0	0	2100	0000	2.0	0.0	2.0	1.8	MWLS 161.2 (15%).	None	None	None	None	None
35	x 823 ; 822	21-Oct-21	Not Recorded	Light	Downstream	Garber	Easement/ROW	Sanitary	823	822	8	PVC	157.0	157.0	12	4	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
36	x 822 ; 821	21-Oct-21	Not Recorded	Light	Downstream	Garber	Easement/ROW	Sanitary	822	821	8	PVC		115.9	9	3	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
37	x 728 ;	07-Oct-21	Dry	Heavy	Downstream	A	Local Street	Stormwater	728	?	15	Concrete		8.2	1	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
38	x 727 ; 728	07-Oct-21	Dry	Heavy	Downstream	A	Local Street	Stormwater	727	728	15	Concrete		109.2	14	6	0	4	0	4300	2100	4.0	2.0	3.5	3.6	H 32.9, 39.1, 44.9. (lift holes?). ISZ 5.7 (tar or mastic?). TBA x6. TBC x4.	CIPP: Line Segment	Grouting: Laterals	None	None	None
39	x 726 ; 727	07-Oct-21	Dry	Heavy	Downstream	A	Local Street	Stormwater	726	727	15	Concrete		98.8	12	3	0	0	0	2F00	0000	2.0	0.0	2.0	2.5	CL 8.3 - 98.4 continuous. TBA x3.	CIPP: Line Segment	Grouting: Laterals	None	None	None
40	x 725 ; 724	07-Oct-21	Dry	Heavy	Downstream	A	Parking Lot	Stormwater	725	724	15	VCP		85.0	17	0	0	0	0	422A	0000	2.3	0.0	2.3	3.5	FM 8.0, 79.6. CL 44.4, 15.8 - 58.6 continuous.	CIPP: Line Segment	None	None	None	None
41	x 724 ; 723	07-Oct-21	Dry	Heavy	Downstream	A	Local Street	Stormwater	724	723	15	Concrete		31.6	4	0	0	0	0	3100	0000	3.0	0.0	3.0	2.6	CM 5.4.	Dig/Repair: Pipe, Point Repair	None	None	None	None
42	x 723 ; 726	07-Oct-21	Dry	Heavy	Downstream	A	Local Street	Not Known	723	726	15	Concrete		73.0	9	4	0	0	0	3200	3722	3.0	2.8	2.8	3.3	CM 15.4, 27.8. ISGT x2, continuous 37.2 - 73.0. TBA x4.	CIPP: Line Segment	Grouting: Laterals	None	None	None
43	x 649D ; 649D-A	06-Oct-21	Dry	Heavy	Downstream	A	Easement/ROW	Stormwater	649D	649D-A	15	VCP		208.0	42	0	0	0	0	4131	0000	2.3	0.0	2.3	3.4	FM 32.6. FS 147.3. CL x3. CS 183.1. CL 13.6 - 28.8 continuous, 112.3 - 121.9 continuous.	CIPP: Line Segment	None	None	None	None
44	x 607 ; 605	05-Oct-21	Dry	Heavy	Downstream	R	Easement/ROW	Sanitary	607	605	12	VCP	158.4	156.8	31	5	0	0	0	2100	0000	2.0	0.0	2.0	1.8	MWLS 87.3 (15%). TBA x2.	None	None	None	None	None
45	x 605 ; 603	05-Oct-21	Dry	Heavy	Downstream	R	Easement/ROW	Combined	605	603	15	VCP		185.0	37	0	0	0	0	5133	0000	3.5	0.0	3.5	4.3	H 174.9. CM x3. MGO 33.8 (asphalt in bottom).	CIPP: Line Segment	None	None	None	None
46	x 580 ; 585	08-Sep-21	Dry	Light	Downstream	7th	Easement/ROW	Sanitary	580	585	8	PVC		255.3	20	5	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
47	x 5-8 ; 5-7	15-Jul-21	Dry	Light	Downstream	1st	Local Street	Stormwater	5-8	5-7	15	VCP		374.4	75	10	0	1	0	3426	0000	2.4	0.0	2.4	2.8	CM x3. JOM 154.0. CL x6. TBA 255.7. TFC 80.3.	CIPP: Line Segment	Grouting: Laterals	None	None	None
48	x 5-7 ; 5-3	19-Jul-21	Dry	Heavy	Upstream	1st	Local Street	Stormwater	5-7	5-3	15	VCP		9.1	2	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
49	x 557 ; 565	31-Aug-21	Dry	Light	Downstream	Kennedy	Local Street	Sanitary	557	565	8	VCP		317.7	64	0	0	1	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
50	x 555 ; 557	31-Aug-21	Dry	Light	Downstream	Kennedy	Local Street	Sanitary	555	557	8	VCP		83.0	17	0	0	0	0	3A22	0000	2.8	0.0	2.8	3.3	CM x10. JOM 5.1. CL 18.5, 53.6.	CIPP: Line Segment	None	None	None	None

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Collected Data																			Calculated Data						Analysis and Planning					
Survey Data									Manhole #'s		Pipe Data					Tap Data				Ratings and Indices						Observations and Recommendations					
1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
ID	PSR	Date	Weather	Pre-Cleaning	Survey Direction	Street	Location	Pipe Usage	Upstream Manhole #	Downstream Manhole #	Diameter	Material	Length	Surveyed	Estimated Joints	Active	Defective	Capped	Abandoned	QSR	QMR	SPRI	MPRI	OPRI	LOF	Notes	Rec1	Rec2	Rec3	Rec4	Rec5
51	x 548 ; 555	31-Aug-21	Dry	Light	Downstream	Kennedy	Local Street	Sanitary	548	555	8	VCP	480.0	471.5	94	9	0	0	0	5245	1100	3.1	1.0	3.0	4.3	BSV 1.5, 36.0. FM x3. JOL 297.4, 309.4. CM x12. JOM x2. CL x7. RFJ 17.8. MMC to/from PVC 297.4 - 309.4.	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals	
52	x 541 ; 548	31-Aug-21	Dry	Heavy	Downstream	Kennedy	Local Street	Sanitary	541	548	8	VCP		242.6	49	2	0	0	0	514B	3113	3.4	1.5	3.2	4.3	H 230.0. FM 98.9 - 151.3 continuous; FM x3. JOL 238.7. CM x3. CL x4. MWLS 230.2 - 238.7 continuous (15%). RMJ 124.8. RFJ x3.	CIPP: Line Segment	Grouting: Laterals	None	None	None
53	x 531 TO 878	03-Nov-21	Not Recorded	Heavy	Downstream	E	Easement/ROW	Stormwater	531	878	30	Concrete		156.8	20	0	0	0	0	2A00	0000	2.0	0.0	2.0	2.5	CL 5.0 - 75.1 continuous.	CIPP: Line Segment	None	None	None	None
54	x 5-3 ; 5-1	21-Jul-21	Dry	Heavy	Downstream	1st	Local Street	Stormwater	5-3	5-1	18	VCP	260.0	250.2	50	7	0	1	0	3100	0000	3.0	0.0	3.0	2.6	CM 136.5. TBA x5. TBC 42.7.	Dig/Repair: Pipe, Point Repair	None	None	None	None
55	x 529 TO 531	02-Nov-21	Not Recorded	Heavy	Downstream	E	Easement/ROW	Stormwater	529	531	30	Concrete		310.4	39	0	0	0	0	2I00	0000	2.0	0.0	2.0	2.5	CL 7.8 - 141.8 continuous. CL 148.3 - 277.8 continuous.	CIPP: Line Segment	None	None	None	None
56	x 527D ; 529D	19-Oct-21	Dry/Wet Ground	Heavy	Downstream	E	Easement/ROW	Stormwater	527D	529D	30	Concrete	432.9	0.0	0	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No data.	None	None	None	None	None
57	x 527 TO 529	01-Nov-21	Not Recorded	Heavy	Downstream	E	Parking Lot	Not Known	527	529	30	Concrete		428.9	54	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
58	x 525D ; 527D	12-Oct-21	Dry/Wet Ground	Heavy	Downstream	E And 4th	Easement/ROW	Stormwater	525D	527D	30	Concrete	372.9	372.0	47	0	0	0	0	0000	4121	0.0	3.0	3.0	3.4	OBS 101.7. OBN 104.6 (concrete).	None	None	None	None	None
59	x 5-10 ; 5-8	15-Jul-21	Dry	Light	Downstream	1st	Local Street	Stormwater	5-10	5-8	12	VCP	383.0	382.0	76	9	0	1	0	2100	2400	2.0	2.0	2.0	2.1	CL 25.0. DAE 10.5, 246.1, 46.1 - 56.4 continuous.	None	None	None	None	None
60	x 5-1 ; 345C	21-Jul-21	Dry	Heavy	Downstream	1st	Local Street	Stormwater	5-1	345C	18	Concrete		138.1	17	1	0	0	0	4131	0000	3.5	0.0	3.5	3.4	RPZD 56.1. TBA 57.5. CM 114.6.	CIPP: Line Segment	Grouting: Laterals	None	None	None
61	x 490 ; 350C	20-Aug-21	Dry	Heavy	Downstream	3rd	Local Street	Not Known	490	350C	18	Concrete	393.0	393.0	49	11	0	0	0	352A	0000	2.3	0.0	2.3	2.9	MATCH WITH ID62. CM x5. CL x7, 170.7 - 185.6 continuous, 306.0 - 313.9 continuous, 321.9 - 333.4 continuous, 351.6 - 357.1. TBA x7.	CIPP: Line Segment	Grouting: Laterals	None	None	None
62	x 490 ; 350C	19-Aug-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	490	350C	18	VCP	393.0	2.0	0	1	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MATCH WITH ID61.	None	None	None	None	None
63	x 455 ; 490	19-Aug-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	455	490	15	VCP	401.0	394.9	79	13	0	0	0	3824	0000	2.7	0.0	2.7	3.2	CM x6. JOM 238.5, 344.8. CL x4. TBA x2.	CIPP: Line Segment	Grouting: Laterals	None	None	None
64	x 447D ; 394D	20-Sep-21	Dry	Heavy	Downstream	1st	Local Street	Stormwater	447D	394D	18	Concrete	387.0		17	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MATCH WITH ID 65.	None	None	None	None	None
65	x 447D ; 394D	17-Sep-21	Dry	Light	Upstream	1st	Local Street	Stormwater	447D	394D	18	Concrete	387.0	122.3	15	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MATCH WITH ID 64. No defects noted; footage is shorter?	None	None	None	None	None
66	x 447D ; 349D	08-Oct-21	Dry	Light	Downstream	1st	Local Street	Stormwater	447D	349D	18	Concrete	387.0	387.4	48	13	0	0	0	5141	0000	3.6	0.0	3.6	4.3	HVV 148.1 (next to tap). FM 354.7. CM x3. TBA x13.	CIPP: Line Segment	Grouting: Laterals	None	None	None
67	x 443 ; 352	11-Aug-21	Dry	Light	Downstream	1st And D	Local Street	Stormwater	443	352	15	VCP		387.0	77	3	0	0	0	5241	0000	3.3	0.0	3.3	4.3	HSV 165.2, 300.9. FM 300.9. CM x9. CL 136.9. TBA x3.	CIPP: Line Segment	Grouting: Laterals	None	None	None
68	x 440 ; 443	10-Aug-21	Dry	Light	Downstream	4th	Local Street	Stormwater	440	443	15	VCP	601.0	600.0	120	1	0	0	0	3100	0000	3.0	0.0	3.0	2.6	CM 58.8.	Dig/Repair: Pipe, Point Repair	None	None	None	None
69	x 439 ; 443	06-Aug-21	Dry	Light	Downstream	4th	Local Street	Stormwater	439	443	15	VCP	601.0	112.4	22	0	0	0	0	3200	3221	3.0	2.7	2.8	2.8	CM 27.5, 61.2. ID 34.4. DAE 69.8 (15%), 82.2 (5%). MSA 112.4 remainder does not exist?	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	None	None	None
70	x 437SB ; 446S	04-Oct-21	Dry	Heavy	Downstream	4th	Easement/ROW	Sanitary	437SB	446S	8	PVC	400.0	0.0	0	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No access; asphalt.	None	None	None	None	None
71	x 437S ; 437SA	24-Sep-21	Dry	Light	Downstream	4th	Easement/ROW	Sanitary	437S	437SA	8	PVC	388.0	388.4	30	1	0	0	0	5131	0000	3.3	0.0	3.3	4.3	H 122.7. JSM 21.0. MWLS 139.9 (25%). MATCH WITH ID 72.	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	None	None
72	x 437S ; 437SA	23-Sep-21	Dry	Light	Downstream	4th	Easement/ROW	Sanitary	437S	437SA	8	PVC		388.1	30	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MATCH WITH ID71.	None	None	None	None	None
73	x 435 ; 440	06-Aug-21	Dry	Light	Downstream	4th	Easement/ROW	Stormwater	435	440	12	VCP	600.0	600.0	120	1	0	0	0	3222	0000	2.5	0.0	2.5	2.7	MATCH WITH ID 74; IDENTICAL DATA.	None	None	None	None	None
74	x 435 ; 440	06-Aug-21	Dry	Light	Downstream	4th	Easement/ROW	Stormwater	435	440	12	VCP	600.0	600.0	120	1	0	0	0	3222	0000	2.5	0.0	2.5	2.7	CM 7.6, 413.6. CL 338.8, 347.0. TFA 297.0 full of mud.	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	None	None	None
75	x 431 ; 427	03-Sep-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	431	427	12	VCP	384.4	384.0	77	10	0	1	0	4131	0000	2.8	0.0	2.8	3.4	MATCH WITH ID 76. JOL 355.3. CM 148.7. CL 128.0. MWLS 373.4 (15%). TBA 152.8. TFC 210.5. TFA 245.9 full of rock.	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals	None	None
76	x 431 ; 427	02-Sep-21	Dry	Heavy	Downstream	3rd	Local Street	Sanitary	431	427	12	VCP	384.4	223.2	45	5	0	0	0	3100	0000	3.0	0.0	3.0	2.6	MATCH WITH ID75 (THIS IS A PARTIAL INSPECTION).	None	None	None	None	None
77	x 430S ; 427S	22-Sep-21	Dry	Light	Downstream	3rd	Easement/ROW	Sanitary	430S	427S	8	PVC		164.1	13	0	0	0	0	5131	0000	4.0	0.0	4.0	4.3	H 22.4. JSM 48.2.	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	None	None	None
78	x 427S ; 425S	22-Sep-21	Dry	Light	Downstream	3rd	Easement/ROW	Not Known	427S	425S	8	PVC		183.2	14	0	0	0	0	2100	0000	2.0	0.0	2.0	1.8	MWLS 73.9.	None	None	None	None	None
79	x 427 ; 423	09-Sep-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	427	423	18	VCP	383.5	370.1	74	10	0	3	0	453B	0000	3.2	0.0	3.2	3.8	MATCH WITH ID80. FM x5. CM x15. CL 250.9. TBA x10.	CIPP: Line Segment	Grouting: Laterals	None	None	None
80	x 427 ; 423	03-Sep-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	427	423	12	VCP	383.5	10.0	2	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MATCH WITH ID79. MSA surcharged.	None	None	None	None	None
81	x 425S ; 422S	22-Sep-21	Dry	Light	Downstream	3rd	Local Street	Sanitary	425S	422S	8	PVC	375.0	367.2	28	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
82	x 423 ; 421	14-Sep-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	423	421	24	VCP	384.0	382.8	77	11	0	0	0	4A3A	0000	2.4	0.0	2.4	4.2	H 217.7. FM x9. CM x11. CL x9, continuous 205.1 - 354.8, 296.1 - 354.8 continuous. TBA x10. TB 354.8. TBA 276.2 broken	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals	None	None
83	x 422S ; 420S	22-Sep-21	Dry	Light	Downstream	3rd	Local Street	Sanitary	422S	420S	8	PVC	367.0	360.1	28	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
84	x 421 ; 420	15-Sep-21	Dry	Heavy	Downstream	3rd	Local Street	Stormwater	421	420	24	VCP	384.0	384.0	77	9	0	0	1	5241	2100	2.3	2.0	2.3	4.3	DR 287.7. HSV 292.3. FM 40.6. CM 58.4. FL 70.8. CM 263.7 - 325.5 continuous. CL 8.0 - 33.7 continuous; 8.0 - 52.7 continuous; 73.5 - 103.9 continuous; 215.8 - 384.0 continuous. DAE 37.7 (10%). TBB 150.9. TBA x8. TB 132.9	CIPP: Line Segment	Grouting: Laterals	None	None	None
85	x 420S ; 419S	22-Sep-21	Dry	Light	Downstream	3rd And D	Local Street	Sanitary	420S	419S	8	PVC	142.0	135.3	10	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
86	x 418 ; 415	15-Sep-21	Dry	Heavy	Downstream	2nd	Ditch	Stormwater	418	415	15	VCP		270.2	54	7	0	0	0	3226	2100	2.3	2.0	2.2	2.7	CM 10.1. JOM 265.3. CS x6. DAE 69.7. TBA x2.	CIPP: Line Segment	Grouting: Laterals	None	None	None
87	x 416 TO 414	31-Aug-21	Not Recorded	Heavy	Downstream	2nd	Local Street	Combined	416	414	15	Concrete	385.0	381.9	48	9	0	0	0	3C00	0000	3.0	0.0	3.0	3.3	JOM 70.6 - 176.9 continuous. CM 74.0. TFA x9 (182.8 has rocks in tap).	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals	None	None
88	x 415 TO 413	03-Sep-21	Not Recorded	Heavy	Downstream	2nd	Local Street	Sanitary	415	413	15	Concrete	389.0	384.8	48	9	0	0	0	322D	0000	2.1	0.0	2.1	2.7	JOM 21.1. CM 204.1. CL 36.6 - 168.6 continuous; 328.6 - 334.3 continuous.	CIPP: Line Segment	Grouting: Laterals	None	None	None
89	x 414 TO 412	02-Sep-21	Not Recorded	Heavy	Downstream	2nd	Local Street	Combined	414	412	15	Concrete	385.0	383.7	48	8	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
90	x 413 ; 348	16-Sep-21	Dry	Heavy	Downstream	2nd	Ditch	Stormwater	413	348	18	VCP			0	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No data.	None	None	None	None	None
91	x 412 TO 410	02-Sep-21	Not Recorded	Heavy	Downstream	2nd	Local Street	Sanitary	412	410	15	Concrete	277.0	278.6	35	8	0	0	0	0000	0000	0.0	0.0	0.0	0.0	TFA x7; TBA 278.6	None	None	None	None	None
92	x 410S ; 419S	21-Sep-21	Dry	Light	Downstream	2nd And D	Easement/ROW	Sanitary	410S	419S	8	PVC		261.9	20	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
93	x 410 TO 349	02-Sep-21	Not Recorded	Heavy	Downstream	2nd	Local Street	Sanitary	410	349	15	Concrete	100.0	103.2	13	0	0	0	0	5136	0000	3.3	0.0	3.3	4.3	HVV 96.5. CM 13.9,47.6; 17.9 - 30.4 continuous; 50.2 - 55.2 continuous.	CIPP: Line Segment	None	None	None	None
94	x 408S ; 407S	20-Sep-21	Dry	Light	Downstream	1st	Local Street	Sanitary	408S	407S	8	PVC		41.8	3	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
95	x 407S ; 405S	20-Sep-21	Dry	Light	Downstream	1st	Local Street	Sanitary	407S	405S	8	PVC		207.9	16	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None

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Collected Data																			Calculated Data						Analysis and Planning					
Survey Data									Manhole #'s		Pipe Data					Tap Data				Ratings and Indices						Observations and Recommendations					
1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
ID	PSR	Date	Weather	Pre-Cleaning	Survey Direction	Street	Location	Pipe Usage	Upstream Manhole #	Downstream Manhole #	Diameter	Material	Length	Surveyed	Estimated Joints	Active	Defective	Capped	Abandoned	QSR	QMR	SPRI	MPRI	OPRI	LOF	Notes	Rec1	Rec2	Rec3	Rec4	Rec5
96	x 405S ; 402S	20-Sep-21	Dry	Light	Downstream	1st	Local Street	Sanitary	405S	402S	8	PVC	358.3	352.7	27	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
97	x 404D ; 447D	16-Sep-21	Dry	Light	Downstream	1st	Local Street	Stormwater	404D	447D	15	VCP		373.6	75	10	0	1	0	3129	0000	2.1	0.0	2.1	2.6	JOM 30.6. CL 169.8, 260.7. CS x7. TFA x8 (297.5 possibly defective; 336.7 ?)	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals	None	None
98	x 402S ; 401S	20-Sep-21	Dry	Light	Downstream	1st	Local Street	Sanitary	402S	401S	8	PVC		175.3	13	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
99	x 401S ; 400S	20-Sep-21	Dry	Light	Downstream	1st	Local Street	Sanitary	401S	400S	8	PVC		184.0	14	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
100	x 400S ; 399S	20-Sep-21	Dry	Light	Downstream	1st	Easement/ROW	Sanitary	401S	399S	8	PVC		45.1	3	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
101	x 400-9 ; 400-5	26-Aug-21	Dry	Heavy	Upstream	2nd	Local Street	Stormwater	400-9	400-5	10	Concrete		0.0	0	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No data.	None	None	None	None	None
102	x 400-7 ; 400-5	27-Aug-21	Dry	Heavy	Upstream	2nd	Local Street	Stormwater	400-7	400-5	10	VCP		376.0	75	14	1	0	0	5241	3123	3.6	2.0	3.0	4.3	DFBI 118.6. BSV 93.6. JSL 167.9. CM x4. JOM x2. TBD 339.7. DAE x3 (5-10%). RFJ 263.4. TBA x9 (115.6 full of mud).	Dig/Repair: Tap, New	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals	None
103	x 400-5 ; 400-11	27-Aug-21	Dry	Heavy	Downstream	2nd	Local Street	Stormwater	400-5	400-11	18	Concrete		180.5	23	1	0	0	0	382A	0000	2.3	0.0	2.3	3.2	JSM 12.3. CM x7. CL x4. CL 21.2 - 72.4 continuous. CC x2. TBA 55.7.	CIPP: Line Segment	Grouting: Laterals	None	None	None
104	x 400-4 ; 400-5	26-Aug-21	Dry	Heavy	Downstream	2nd	Local Street	Stormwater	400-4	400-5	18	Concrete		148.4	19	3	0	0	0	3A2A	0000	2.5	0.0	2.5	3.3	CM x7; 15.2 - 27.2 continuous. JSM 24.5 - 30.4 continuous. CL x10. TBA x3 (43.9 50% mud).	Dig/Repair: Pipe, Point Repair	CIPP: Line Segment	Grouting: Laterals	None	None
105	x 400-3 ; 400-4	24-Aug-21	Dry	Heavy	Downstream	A	Local Street	Combined	400-3	400-4	12	VCP		44.0	9	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
106	x 400-2 ; 400-3	24-Aug-21	Dry	Heavy	Downstream	A	Local Street	Combined	400-2	400-3	12	VCP		163.0	33	3	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
107	x 400-11 ; 400-6	30-Aug-21	Dry	Heavy	Downstream	2nd	Local Street	Stormwater	400-11	400-6	18	Concrete		120.0	15	0	0	0	0	413C	0000	3.0	0.0	3.0	3.4	FM 55.4. CM x4; 24.2 - 120.0 continuous. MWLS 94.0 (25%).	CIPP: Line Segment	None	None	None	None
108	x 400-1 ; 400-2	24-Aug-21	Dry	Heavy	Downstream	A	Local Street	Combined	400-1	400-2	12	VCP	169.0	169.2	34	2	0	0	0	2100	0000	2.0	0.0	2.0	1.8	CL 115.1.	Dig/Repair: Pipe, Point Repair	None	None	None	None
109	x 399S ; 393S	20-Sep-21	Dry	Light	Downstream	1st	Easement/ROW	Sanitary	399S	393S	8	PVC		209.0	16	0	0	0	0	2100	0000	2.0	0.0	2.0	1.8	MWLS 116.3 (20%).	None	None	None	None	None
110	x 393S ; 388S	21-Sep-21	Dry	Light	Downstream	1st	Easement/ROW	Sanitary	393S	388S	8	PVC		374.6	29	1	0	0	0	2100	0000	2.0	0.0	2.0	1.8	MWLS 277.0. TBA 120.9 (has a hole).	Dig/Repair: Pipe, Point Repair	None	None	None	None
111	x 388S ; 410S	21-Sep-21	Dry	Light	Downstream	1st And D	Easement/ROW	Sanitary	388S	410S	8	PVC		369.0	28	0	0	0	0	2200	0000	2.0	0.0	2.0	1.8	MWLS 23.4 (20%), 330.0 (30%).	None	None	None	None	None
112	x 375S ; 374S	22-Sep-21	Dry	Light	Downstream	3rd	Local Street	Not Known	375S	374S	8	PVC	397.0	398.7	31	1	0	0	0	3100	0000	3.0	0.0	3.0	2.6	JOM 181.2.	Dig/Repair: Pipe, Point Repair	None	None	None	None
113	x 374S ; 373S	23-Sep-21	Dry	Light	Downstream	3rd	Local Street	Sanitary	374S	373S	8	PVC	403.0	400.0	31	1	0	0	0	3100	0000	3.0	0.0	3.0	2.6	JOM 248.1.	Dig/Repair: Pipe, Point Repair	None	None	None	None
114	x 373S ; 301C	23-Sep-21	Dry	Light	Downstream	3rd	Local Street	Sanitary	373S	301C	8	PVC	403.0	396.6	31	1	0	0	0	3100	0000	3.0	0.0	3.0	2.6	JOM 74.4.	Dig/Repair: Pipe, Point Repair	None	None	None	None
115	x 372C ; 455	18-Aug-21	Dry	Light	Downstream	3rd	Local Street	Stormwater	372C	455	12	VCP		549.4	110	17	0	0	0	3400	0000	3.0	0.0	3.0	2.8	CM x4. TBA x2.	CIPP: Line Segment	Grouting: Laterals	None	None	None
116	x 359D ; 348C	12-Aug-21	Dry	Light	Downstream	2nd	Local Street	Stormwater	359D	348C	12	VCP		465.1	93	11	0	0	0	3400	0000	3.0	0.0	3.0	2.8	CM x4.	CIPP: Line Segment	Grouting: Laterals	None	None	None
117	x 358D ; 349C	12-Aug-21	Dry	Light	Downstream	2nd	Local Street	Not Known	358D	349C	12	VCP		524.4	105	12	0	0	0	3923	0000	2.8	0.0	2.8	3.3	CM x9. CL x3. TFA x12.	CIPP: Line Segment	Grouting: Laterals	None	None	None
118	x 357 ; 359	16-Sep-21	Dry	Heavy	Downstream	3rd	Ditch	Stormwater	357	359	15	VCP		376.0	75	9	0	0	0	2300	3100	2.0	3.0	2.3	2.6	CS 62.7, 322.7. CL 222.5. DAE 11.1. TBA 21.4. TFA x8 (5 are "full of rock").	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair	Dig/Repair: Pipe, Point Repair
119	x 355D ; 358D	12-Aug-21	Dry	Light	Downstream	2nd	Local Street	Stormwater	355D	358D	12	VCP	496.0	496.0	99	12	0	0	0	3822	0000	2.8	0.0	2.8	3.0	CM x6. CL x2.	CIPP: Line Segment	Grouting: Laterals	None	None	None
120	x 352C-4 ; 352C-5	05-Aug-21	Dry	Light	Downstream	D	Easement/ROW	Stormwater	352C-4	352C-5	29	Concrete		111.9	14	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
121	x 352C-3 ; 352C-4	05-Aug-21	Dry	Light	Downstream	D	Easement/ROW	Stormwater	352C-3	352C-4	29	Concrete		70.7	9	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
122	x 352C-2 ; 352C-3	05-Aug-21	Dry	Light	Downstream	D	Easement/ROW	Stormwater	352C-2	352C-3	29	Concrete		188.0	24	0	0	0	0	0000	2100	0.0	2.0	2.0	1.8	DAE 134.0 deposits have a brick attached/within.	Hourly Work: T/M	None	None	None	None
123	x 352C-1 ; 352C-2	04-Aug-21	Dry	Light	Downstream	D	Easement/ROW	Stormwater	352C-1	352C-2	29	Concrete		0.5	0	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MSA 0.5 surcharged.	None	None	None	None	None
124	x 352C ; 352C-1	04-Aug-21	Dry	Heavy	Downstream	D	Easement/ROW	Stormwater	352C	352C-1	29	Concrete		128.5	16	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
125	x 352 ; ?	11-Aug-21	Dry	Light	Upstream	4th	Local Street	Stormwater	?	352	12	VCP		16.3	3	1	0	0	0	3100	0000	3.0	0.0	3.0	2.6	CM 12.0. MSA 16.3 can't make turn (line left up LLU).	Dig/Repair: Pipe, Point Repair	None	None	None	None
126	x 350C ; 352C	03-Aug-21	Dry	Heavy	Downstream	D	Easement/ROW	Stormwater	350C	352C	24	Concrete		307.1	38	5	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MATCH WITH ID127; DUPLICATE SURVEY.	None	None	None	None	None
127	x 350C ; 352C	03-Aug-21	Dry	Heavy	Downstream	D	Easement/ROW	Stormwater	350C	352C	24	Concrete		307.1	38	5	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted. MATCH WITH ID 126.	None	None	None	None	None
128	x 349C ; 350C	03-Aug-21	Dry	Heavy	Downstream	D	Easement/ROW	Stormwater	349C	350C	24	Concrete		251.9	31	1	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MATCH WITH ID 129. DUPLICATE SURVEY.	None	None	None	None	None
129	x 349C ; 350C	03-Aug-21	Dry	Heavy	Downstream	D	Easement/ROW	Stormwater	349C	350C	24	Concrete		251.9	31	1	0	0	0	0000	0000	0.0	0.0	0.0	0.0	MATCH WITH ID 128. No defects noted.	None	None	None	None	None
130	x 348C ; 349C	29-Jul-21	Dry	Heavy	Downstream	D	Easement/ROW	Stormwater	348C	349C	24	Concrete	32.0	39.0	5	0	0	0	0	3122	0000	2.3	0.0	2.3	2.6	CM 30.2. CL 15.5, 23.8.	CIPP: Line Segment	None	None	None	None
131	x 345C ; 348C	21-Jul-21	Dry	Heavy	Downstream	D	Easement/ROW	Stormwater	345C	348C	24	Concrete	231.0	14.6	2	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	Survey abandoned 14.6 large deposits.	Hourly Work: T/M	None	None	None	None
132	x 316C ; 310C	20-Aug-21	Dry	Heavy	Downstream	1st	Local Street	Not Known	316C	310C	12	Concrete		405.9	51	14	0	0	0	3C00	0000	3.0	0.0	3.0	3.3	CM 192.9 - 288.0 continuous; CM 214.8, 221.5. TBA x14.	CIPP: Line Segment	Grouting: Laterals	None	None	None
133	x 310C ; 299C	23-Aug-21	Dry	Heavy	Downstream	1st	Local Street	Combined	310C	299C	24	Concrete		269.8	34	1	0	0	0	5100	0000	5.0	0.0	5.0	4.3	Pipe appears to have a liner? Original material unknow. X at 257.8 pipe is deflected 45%. Also appears to have continuous LFDC (lining feature discoloration) throughout.	Dig/Repair: Pipe, Point Repair	Hourly Work: T/M	None	None	None
134	x 301C ; INTO 108" RCP	23-Sep-21	Dry	Light	Downstream	C	Easement/ROW	Combined	301C	108" RCP	8	PVC	25.0	14.5	1	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
135	x 299C ; DEAD END	23-Aug-21	Dry	Heavy	Downstream	2nd And C	Local Street	Combined	299C	DEAD END	24	Other		118.0	9	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted.	None	None	None	None	None
136	x 254D ; 240D	14-Jul-21	Dry	Light	Downstream	1st	Easement/ROW	Stormwater	254D	240D	8	PVC		30.8	2	0	0	0	0	4100	0000	4.0	0.0	4.0	3.4	JOLD 31.4. Survey abandoned.	Dig/Repair: Pipe, Point Repair	None	None	None	None
137	x 240D ; 239D	14-Jul-21	Dry	Light	Downstream	1st	Easement/ROW	Stormwater	240D	239D	12	VCP		10.5	2	0	0	0	0	0000	0000	0.0	0.0	0.0	0.0	No defects noted	None	None	None	None	None
138	x 239D ; MGC-516	14-Jul-21	Dry	Light	Downstream	1st	Easement/ROW	Stormwater	239D	MGC-516	15	VCP		186.7	37	2	0	0	0	5133	4100	3.5	4.0	3.6	4.3	H 143.7. CM 84.8; 91.1 - 100.2 continuous. TBA x2.	CIPP: Line Segment	Grouting: Laterals	None	None	None
139	x 212S ;223S	20-Oct-21	Dry	Light	Downstream	1st	Easement/ROW	Sanitary	212S	223S	8	VCP	273.0	265.2	53	0	0	0	0	5343	1100	3.0	1.0	3.0	4.4	H 2.7. HSV 223.2. BSV 181.6. B x2. FM 174.8. CM x6. FL 2.7. CL 112.9. CS x7. RFJ 142.4.	CIPP: Line Segment	None	None	None	None
140	x 205S ; 212S	20-Oct-21	Dry	Light	Downstream	1st	Easement/ROW	Sanitary	205S	212S	8	VCP	193.0	188.1	38	0	0	0	0	5132	1100	2.7	1.0	2.5	4.3	HVV 182.6. CM 83.8, 139.9. CS x3. CL 131.3. RFJ 139.9.	CIPP: Line Segment	None	None	None	None
141	x 118 ; 97	30-Aug-21	Dry	None	Downstream	D	Local Street	Stormwater	118	97	42	Concrete		83.9	10	0	0	0	0	3100	0000	3.0	0.0	3.0	2.6	MWLS 27.5 (40%).	Dig/Repair: Pipe, Point Repair	None	None	None	None
141														30837		394	2	15	1											

ID	Distance	Code	PACP Defects or Observations	Continuous	Tap Dia.	2nd Value	% of Pipe	Clock Start	Clock End	Remarks	Structural Grade	O/M Grade
1	0.0	AMH	Manhole							Starting manhole: 220D		
1	0.0	MWL	Miscellaneous Water Level				5					
1	46.8	DAE	Deposits Attached Encrustation	S01			15	4	8			3
1	121.7	CL	Crack Longitudinal					9			2	
1	131.2	TFA	Tap Factory Activity		8			3				
1	140.3	CL	Crack Longitudinal					12			2	
1	169.3	TBA	Tap Break-in Activity		5			12				
1	216.2	TBA	Tap Break-in Activity		4			12				
1	217.9	CM	Crack Multiple					7	5		3	
1	263.8	MGO	Miscellaneous General Observation							MH NOT ON MAP 220E		
1	273.2	CM	Crack Multiple					12	5		3	
1	286.5	CM	Crack Multiple					11	6		3	
1	325.0	CM	Crack Multiple					7	5		3	
1	346.1	CL	Crack Longitudinal					12			2	
1	365.8	RFJ	Roots Fine Joint					5	7			1
1	391.8	CL	Crack Longitudinal					5			2	
1	444.5	MGO	Miscellaneous General Observation							LINE RUNS INTO 42 INCH LINE		
1	444.5	DAE	Deposits Attached Encrustation	F01			15	4	8			3
1	444.5	AEP	Access Point End of Pipe							Finishing manhole: 237D ?		
2	0.0	AMH	Manhole							Starting manhole: 220D		
2	0.0	MWL	Miscellaneous Water Level				10					
2	4.0	CL	Crack Longitudinal					3			2	
2	7.3	MSA	Miscellaneous Survey Abandoned							Inspection abandoned: Surcharged/Debris		
3	0.0	AMH	Manhole							Starting manhole: 209D		
3	0.0	MWL	Miscellaneous Water Level				5					
3	9.6	CM	Crack Multiple					4	10		3	
3	18.2	CL	Crack Longitudinal					1			2	
3	18.6	DAE	Deposits Attached Encrustation				10	4	8			2
3	33.0	CM	Crack Multiple					7	5		3	
3	79.4	TFA	Tap Factory Activity		15			3				
3	156.3	MWL	Miscellaneous Water Level				20					
3	166.2	CM	Crack Multiple					9	3		3	
3	179.9	JSM	Joint Separated Medium								3	
3	179.9	IRB	Infiltration Runner Barrel					1	5			4
3	189.0	AMH	Manhole							Finishing manhole: 220D		
4	0.0	AMH	Manhole							Starting manhole: 365D		
4	0.0	MWL	Miscellaneous Water Level				0					
4	8.0	TFA	Tap Factory Activity		10			9				
4	11.0	DAE	Deposits Attached Encrustation				10	4	8			2
4	34.8	AMH	Manhole							Finishing manhole: 230D		
5	0.0	AMH	Manhole							Starting manhole: 209D		
5	0.0	MWL	Miscellaneous Water Level				0					
5	1.0	CM	Crack Multiple					6	5		3	
5	1.0	MGO	Miscellaneous General Observation							CAN"T TV UPHILL		
5	1.0	AZ	Access Point Other							Finishing manhole: 210D		
6	0.0	AMH	Manhole							Starting manhole: 229S		
6	0.0	MWL	Miscellaneous Water Level				10					
6	2.6	CS	Crack Spiral					6	5		2	
6	10.8	CS	Crack Spiral					3	7		2	
6	17.4	CS	Crack Spiral					4	10		2	
6	35.1	CS	Crack Spiral					3	7		2	
6	50.0	CS	Crack Spiral					7	11		2	
6	103.4	CS	Crack Spiral					12	8		2	
6	150.5	HSV	Hole Soil Visible					10	1		5	
6	156.4	CM	Crack Multiple					6	5		3	
6	165.3	CM	Crack Multiple					4	8		3	
6	194.7	FM	Fracture Multiple					6	5		4	
6	221.7	CM	Crack Multiple					6	10		3	
6	231.6	AMH	Manhole							Finishing manhole: 233S		
7	0.0	AMH	Manhole							Starting manhole: 223S		
7	0.0	MWL	Miscellaneous Water Level				10					
7	25.4	CM	Crack Multiple					8	5		3	
7	49.5	CL	Crack Longitudinal					9			2	
7	64.3	CL	Crack Longitudinal					8			2	
7	76.4	CL	Crack Longitudinal					5			2	
7	88.1	CM	Crack Multiple					3	8		3	
7	91.0	CM	Crack Multiple					3	9		3	
7	100.0	CM	Crack Multiple					2	9		3	
7	114.9	CM	Crack Multiple					5	9		3	
7	147.2	CM	Crack Multiple					9	2		3	
7	165.2	IS	Infiltration Stain					2	5			1
7	165.2	CM	Crack Multiple					3	9		3	
7	183.3	FS	Fracture Spiral					3	9		3	
7	188.8	MGO	Miscellaneous General Observation							CRACKS JUST ABOUT EVERY JOINT		
7	188.8	AMH	Manhole							Finishing manhole: 229S		
8	0.0	AMH	Manhole							Starting manhole: 223SA		
8	0.0	MWL	Miscellaneous Water Level				5			DEAD ENDS		
8	0.0	AEP	Access Point End of Pipe							Finishing manhole: DEAD END		
9	0.0	AMH	Manhole							Starting manhole: 223SA		
9	0.0	MWL	Miscellaneous Water Level				10					
9	3.0	CM	Crack Multiple					3	7		3	
9	17.4	TFA	Tap Factory Activity		4			3		90% ROOTS		
9	31.4	CM	Crack Multiple					6	8		3	
9	34.2	RTJ	Roots Tap Joint				5	12	2			2
9	34.2	IR	Infiltration Runner					12	2			4
9	37.3	CM	Crack Multiple		1	3		4	7		3	
9	41.1	TFA	Tap Factory Activity		4			3		90% ROOTS		
9	42.9	RFJ	Roots Fine Joint					12	2			1
9	65.2	TFA	Tap Factory Activity		4			3				
9	82.0	CM	Crack Multiple					12	5		3	
9	92.1	TFA	Tap Factory Activity		4			3				
9	119.2	TFA	Tap Factory Activity		4			3		100% ROOTS		
9	130.2	CM	Crack Multiple					9	3		3	
9	142.9	AMH	Manhole							Finishing manhole: 223S		

ID	Distance	Code	PACP Defects or Observations	Continuous	Tap Dia.	2nd Value	% of Pipe	Clock Start	Clock End	Remarks	Structural Grade	O/M Grade
10	0.0	AMH	Manhole							Starting manhole: 261C		
10	0.0	MWL	Miscellaneous Water Level				0					
10	70.5	TFA	Tap Factory Activity		6			3				
10	89.8	CM	Crack Multiple					4	9		3	
10	99.0	MMC	Miscellaneous Material Change							Material changes TO PVC		
10	99.0	JOM	Joint Offset Medium								3	
10	111.7	AMH	Manhole							Finishing manhole: 259C		
11	0.0	AMH	Manhole							Starting manhole: 259C		
11	0.0	MWL	Miscellaneous Water Level				35					
11	41.3	MMC	Miscellaneous Material Change							Material changes TO CT		
11	42.4	TF	Tap Factory		8			9				
11	43.2	MMC	Miscellaneous Material Change							Material changes TO PVC		
11	59.0	TFA	Tap Factory Activity		6			12				
11	172.5	MGO	Miscellaneous General Observation							WATER 100%		
11	172.5	MWLS	Miscellaneous Water Level Sag				100				4	
11	172.5	AMH	Manhole							Finishing manhole: 259CA		
12	0.0	AMH	Manhole							Starting manhole: 249C		
12	0.0	MWL	Miscellaneous Water Level				10					
12	11.5	AMH	Manhole							Finishing manhole: 78" RCP SS		
13	0.0	AMH	Manhole							Starting manhole: 247C		
13	0.0	MWL	Miscellaneous Water Level				75					
13	15.3	IR	Infiltration Runner					11	2			4
13	28.0	IR	Infiltration Runner					12	10			4
13	55.7	JOL	Joint Offset Large		2	2					4	
13	64.6	RTJ	Roots Tap Joint				10	12	1			3
13	77.1	JOM	Joint Offset Medium		1	1				EGG SHAPED	3	
13	99.9	RTJ	Roots Tap Joint				20	11	12			3
13	104.7	RTJ	Roots Tap Joint				10	11	1			3
13	117.4	RTJ	Roots Tap Joint				15	12	5			3
13	117.4	IRJ	Infiltration Runner Joint					12	3			4
13	133.2	AMH	Manhole							Finishing manhole: 249C		
14	0.0	AMH	Manhole							Starting manhole: HOUSING 5		
14	0.0	MWL	Miscellaneous Water Level				5					
14	37.3	TFA	Tap Factory Activity		4			9				
14	75.8	TFA	Tap Factory Activity		4			9				
14	126.9	TFA	Tap Factory Activity		4			9				
14	165.4	TFA	Tap Factory Activity		4			9				
14	165.4	MWL	Miscellaneous Water Level				25					
14	182.4	AMH	Manhole							Finishing manhole: HOUSING 6		
15	0.0	AMH	Manhole							Starting manhole: HOUSING 3		
15	0.0	MWL	Miscellaneous Water Level				20					
15	76.6	MWLS	Miscellaneous Water Level Sag				25				2	
15	82.5	MWL	Miscellaneous Water Level				10					
15	160.7	AMH	Manhole							Finishing manhole: HOUSING 2		
16	0.0	AMH	Manhole							Starting manhole: HOUSING 2		
16	0.0	MWL	Miscellaneous Water Level				15					
16	25.5	MWLS	Miscellaneous Water Level Sag				25				2	
16	37.4	MWL	Miscellaneous Water Level				10					
16	76.7	MWLS	Miscellaneous Water Level Sag				20				2	
16	129.7	AMH	Manhole							Finishing manhole: HOUSING 4		
17	0.0	AMH	Manhole							Starting manhole: HOUSING 1		
17	0.0	MWL	Miscellaneous Water Level				15					
17	110.4	MWM	Miscellaneous Water Mark				25					
17	357.6	AMH	Manhole							Finishing manhole: HOUSING 2		
18	0.0	AMH	Manhole							Starting manhole: 366S		
18	0.0	MWL	Miscellaneous Water Level				5					
18	16.8	DAE	Deposits Attached Encrustation				10	9	11			2
18	24.5	HSV	Hole Soil Visible					6	5		5	
18	49.8	TFA	Tap Factory Activity		5			9				
18	49.8	CS	Crack Spiral					3	5		2	
18	73.8	TFA	Tap Factory Activity		5			9				
18	91.0	CM	Crack Multiple					6	5		3	
18	92.2	DFBI	Deformed Flexible Bulging Inverse Curvature				40	7	6		5	
18	92.2	X	Collapse				45				5	
18	92.4	DFBI	Deformed Flexible Bulging Inverse Curvature				40	9	3		5	
18	93.0	AZ	Access Point Other							Finishing manhole: DEAD END		
19	0.0	AMH	Manhole							Starting manhole: 212S		
19	0.0	MWL	Miscellaneous Water Level				5					

ID	Distance	Code	PACP Defects or Observations	Continuous	Tap Dia.	2nd Value	% of Pipe	Clock Start	Clock End	Remarks	Structural Grade	O/M Grade
19	23.8	TFA	Tap Factory Activity		5			3				
19	50.8	TFA	Tap Factory Activity		5			3				
19	78.0	TFA	Tap Factory Activity		4			3				
19	101.9	TFA	Tap Factory Activity		5			3				
19	125.7	TFA	Tap Factory Activity		5			3				
19	152.8	TFA	Tap Factory Activity		5			3				
19	176.4	TFA	Tap Factory Activity		5			3				
19	176.4	MGO	Miscellaneous General Observation							MUD COMING IN AT END OF LINE		
19	181.0	AMH	Manhole							Finishing manhole: DEAD END		
20	0.0	AMH	Manhole							Starting manhole: 205S		
20	0.0	MWL	Miscellaneous Water Level				5					
20	20.6	JOM	Joint Offset Medium								3	
20	25.8	TFA	Tap Factory Activity		5			9				
20	52.9	TFA	Tap Factory Activity		5			9				
20	76.8	TFA	Tap Factory Activity		5			9		GREASE IN TAP		
20	103.8	TFA	Tap Factory Activity		5			9				
20	127.5	TFA	Tap Factory Activity		5			9				
20	151.4	TFA	Tap Factory Activity		5			9		GREASE IN TAP		
20	168.9	CM	Crack Multiple					10	7		3	
20	170.0	FM	Fracture Multiple					3	9		4	
20	178.5	TFA	Tap Factory Activity		5			9				
20	178.6	FM	Fracture Multiple					8	12	AT TAP	4	
20	187.3	RMJ	Roots Medium Joint				10	10	12			3
20	202.2	TFA	Tap Factory Activity		5			9				
20	203.2	AMH	Manhole							Finishing manhole: DEAD END		
21	0.0	AMH	Manhole							Starting manhole: CY-5		
21	0.0	MWL	Miscellaneous Water Level				10					
21	133.6	AMH	Manhole							Finishing manhole: YMCA		
22	0.0	AMH	Manhole							Starting manhole: CY-4		
22	0.0	MWL	Miscellaneous Water Level				5					
22	25.4	CL	Crack Longitudinal					1			2	
22	28.8	CL	Crack Longitudinal					12			2	
22	57.0	FS	Fracture Spiral					6	5		3	
22	57.0	JOL	Joint Offset Large								4	
22	60.9	TB	Tap Break-in/Hammer		6			12				
22	60.9	FS	Fracture Spiral					6	5		3	
22	69.2	CL	Crack Longitudinal					8			2	
22	182.3	HSV	Hole Soil Visible		5	7		2	9		5	
22	183.7	AMH	Manhole							Finishing manhole: CY-5		
23	0.0	AMH	Manhole							Starting manhole: CY-3		
23	0.0	MWL	Miscellaneous Water Level				10					
23	45.7	CL	Crack Longitudinal					12			2	
23	49.2	CM	Crack Multiple					7	4		3	
23	55.3	CM	Crack Multiple					5	9		3	
23	56.5	TBA	Tap Break-in Activity		4			3				
23	76.2	CM	Crack Multiple					4	8		3	
23	82.5	CL	Crack Longitudinal					11			2	
23	98.7	TBA	Tap Break-in Activity		2			2				
23	125.3	CM	Crack Multiple					2	8		3	
23	143.3	CM	Crack Multiple					12	7		3	
23	159.7	TBA	Tap Break-in Activity		4			2				
23	167.9	RFJ	Roots Fine Joint					4	7			1
23	202.5	TFA	Tap Factory Activity		4			12				
23	222.7	CM	Crack Multiple					4	11		3	
23	247.6	CL	Crack Longitudinal					7			2	
23	284.5	CM	Crack Multiple					4	9		3	
23	306.0	AMH	Manhole							Finishing manhole: CY-4		
24	0.0	AMH	Manhole							Starting manhole: CY-1		
24	0.0	MWL	Miscellaneous Water Level				5					
24	6.0	TBD	Tap Break-in/Hammer Defective		2	2		12				4
24	26.9	DAE	Deposits Attached Encrustation				5	4	8			2
24	29.9	CM	Crack Multiple					10	3		3	
24	32.6	CM	Crack Multiple					6	5		3	
24	39.1	DAE	Deposits Attached Encrustation				10	4	8			2
24	54.7	DAE	Deposits Attached Encrustation				5	5	7			2
24	59.2	TBA	Tap Break-in Activity		4			12				
24	115.9	CM	Crack Multiple					6	5		3	
24	122.3	CM	Crack Multiple					8	5		3	
24	140.6	CM	Crack Multiple					1	6		3	
24	159.1	JOM	Joint Offset Medium		1	1					3	
24	162.4	JOM	Joint Offset Medium		2	2					3	
24	165.2	CM	Crack Multiple					9	3		3	
24	168.4	CL	Crack Longitudinal					4			2	
24	171.4	CL	Crack Longitudinal					10			2	
24	174.3	CL	Crack Longitudinal					4			2	
24	176.2	TBA	Tap Break-in Activity		4			12				
24	180.4	CM	Crack Multiple					8	11		3	
24	198.8	CL	Crack Longitudinal					6			2	
24	202.2	CM	Crack Multiple					6	10		3	
24	214.7	CM	Crack Multiple					4	8		3	

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24	217.5	CL	Crack Longitudinal	S01				6			2	
24	220.4	FM	Fracture Multiple					3	9		4	
24	223.9	CL	Crack Longitudinal	F01				6			2	
24	251.4	RFC	Roots Fine Connection	S02				6	8			2
24	261.0	JOM	Joint Offset Medium								3	
24	263.1	CM	Crack Multiple					3	10		3	
24	263.2	RFC	Roots Fine Connection					4	6			2
24	274.8	RFC	Roots Fine Connection	F02				6	8			2
24	274.8	AMH	Manhole							Finishing manhole: CY-3		
25	0.0	AMH	Manhole							Starting manhole: CY-1		
25	0.0	MWL	Miscellaneous Water Level				20					
25	64.4	CM	Crack Multiple					11	6		3	
25	97.4	TBA	Tap Break-in Activity		4			2				
25	117.9	TBA	Tap Break-in Activity		4			11				
25	139.4	TBA	Tap Break-in Activity		4			2		100% MUD		
25	145.6	TBA	Tap Break-in Activity		4			2				
25	184.1	H	Hole					12		PATCHED	4	
25	190.3	TBA	Tap Break-in Activity		4			12				
25	212.3	MSA	Miscellaneous Survey Abandoned							Inspection abandoned: Surcharged/Debris MUD HALF PIPE		
26	0.0	AMH	Manhole							Starting manhole: CY-1		
26	0.0	MWL	Miscellaneous Water Level				15					
26	24.0	JSM	Joint Separated Medium								3	
26	27.0	JSM	Joint Separated Medium								3	
26	30.1	JSM	Joint Separated Medium	S01							3	
26	45.2	CL	Crack Longitudinal					4			2	
26	60.3	CL	Crack Longitudinal					4			2	
26	66.3	CM	Crack Multiple					6	5		3	
26	69.5	H	Hole		1	1		12			4	
26	69.5	IW	Infiltration Weeper					12	1			2
26	84.6	CL	Crack Longitudinal					1			2	
26	87.8	CL	Crack Longitudinal					12			2	
26	99.0	TBA	Tap Break-in Activity		4			2				
26	102.6	CM	Crack Multiple					7	5		3	
26	105.8	CM	Crack Multiple					4	7		3	
26	119.3	TFA	Tap Factory Activity		4			10				
26	120.8	CM	Crack Multiple					4	8		3	
26	130.1	CM	Crack Multiple					7	5		3	
26	136.0	CL	Crack Longitudinal					7			2	
26	140.7	TBA	Tap Break-in Activity		4			3		100% FULL OF MUD		
26	146.7	TBA	Tap Break-in Activity		4			3		10% MUD		
26	148.1	CM	Crack Multiple					6	5		3	
26	154.3	CM	Crack Multiple					4	8		3	
26	160.2	CL	Crack Longitudinal					5			2	
26	163.0	CM	Crack Multiple					4	9		3	
26	166.1	CL	Crack Longitudinal					6			2	
26	172.2	CL	Crack Longitudinal					8			2	
26	185.6	H	Hole					12	1	PATCHED	4	
26	185.6	CM	Crack Multiple					10	2		3	
26	191.4	TBA	Tap Break-in Activity		4			12				
26	196.2	CM	Crack Multiple					6	9		3	
26	217.3	RFJ	Roots Fine Joint					7	8			1
26	220.2	CM	Crack Multiple					11	4		3	
26	226.2	CL	Crack Longitudinal					6			2	
26	238.2	RFJ	Roots Fine Joint					6	7			1
26	241.4	CL	Crack Longitudinal					5			2	
26	241.4	RFJ	Roots Fine Joint					4	5			1
26	244.4	CL	Crack Longitudinal					9			2	
26	253.6	RFJ	Roots Fine Joint					6	7			1
26	253.6	RFJ	Roots Fine Joint					5	6			1
26	259.6	CM	Crack Multiple					12	1		3	
26	262.5	CM	Crack Multiple					4	8		3	
26	265.9	CL	Crack Longitudinal					5			2	
26	277.7	CM	Crack Multiple					4	10		3	
26	292.8	CM	Crack Multiple					4	10		3	
26	295.5	CM	Crack Multiple					4	9		3	
26	298.7	CM	Crack Multiple					5	9		3	
26	301.6	CM	Crack Multiple					5	11		3	
26	304.8	CL	Crack Longitudinal					5			2	
26	334.9	CM	Crack Multiple					4	7		3	
26	351.7	JSM	Joint Separated Medium	F01							3	
26	351.7	AMH	Manhole							Finishing manhole: 400-4		
27	0.0	AMH	Manhole							Starting manhole: 875		
27	0.0	MWL	Miscellaneous Water Level				10					
27	12.3	CL	Crack Longitudinal	S01				12			2	
27	53.9	CL	Crack Longitudinal	F01				12			2	
27	179.3	AMH	Manhole							Finishing manhole: 873		
28	0.0	AMH	Manhole							Starting manhole: 873		
28	0.0	MWL	Miscellaneous Water Level				10					
28	174.1	AMH	Manhole							Finishing manhole: 869		
29	0.0	AMH	Manhole							Starting manhole: 869		
29	0.0	MWL	Miscellaneous Water Level				10					
29	2.6	CL	Crack Longitudinal	S01				12			2	
29	9.4	CL	Crack Longitudinal	F01				12			2	
29	121.9	AMH	Manhole							Finishing manhole: 866		
30	0.0	AMH	Manhole							Starting manhole: 866		
30	0.0	MWL	Miscellaneous Water Level				10					
30	99.8	CL	Crack Longitudinal					12			2	
30	256.9	AMH	Manhole							Finishing manhole: 858		
31	0.0	AMH	Manhole							Starting manhole: 833		
31	0.0	MWL	Miscellaneous Water Level				5					
31	66.9	TFA	Tap Factory Activity		5			2				
31	68.3	JOL	Joint Offset Large								4	
31	114.9	JOL	Joint Offset Large								4	
31	118.1	JOM	Joint Offset Medium								3	
31	255.6	TFA	Tap Factory Activity		5			9				
31	281.5	TFA	Tap Factory Activity		5			3				
31	307.4	TFA	Tap Factory Activity		5			9				
31	333.0	TFA	Tap Factory Activity		5			9				
31	358.9	AMH	Manhole							Finishing manhole: 826		

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32	0.0	AMH	Manhole							Starting manhole: 829		
32	0.0	MWL	Miscellaneous Water Level				10					
32	10.6	TFA	Tap Factory Activity		5			9				
32	22.2	TFC	Tap Factory Capped		5			9				
32	85.8	AMH	Manhole							Finishing manhole: 826		
33	0.0	AMH	Manhole							Starting manhole: 828		
33	0.0	MWL	Miscellaneous Water Level				5					
33	13.7	TFA	Tap Factory Activity		5			9				
33	39.7	TFA	Tap Factory Activity		5			9				
33	41.2	TFC	Tap Factory Capped		5			9				
33	80.7	TFA	Tap Factory Activity		5			9				
33	132.0	TFA	Tap Factory Activity		5			9				
33	157.8	AMH	Manhole							Finishing manhole: 829		
34	0.0	AMH	Manhole							Starting manhole: 824		
34	0.0	MWL	Miscellaneous Water Level				10					
34	3.0	TFA	Tap Factory Activity		5			9				
34	33.7	TFA	Tap Factory Activity		5			9				
34	85.9	TFA	Tap Factory Activity		5			9				
34	131.5	TFA	Tap Factory Activity		5			9				
34	161.2	MWLS	Miscellaneous Water Level Sag				15				2	
34	179.6	TFA	Tap Factory Activity		5			9				
34	218.7	TFA	Tap Factory Activity		5			9				
34	238.3	AMH	Manhole							Finishing manhole: 821		
35	0.0	AMH	Manhole							Starting manhole: 823		
35	0.0	MWL	Miscellaneous Water Level				5					
35	9.8	TFA	Tap Factory Activity		5			3				
35	29.1	TFA	Tap Factory Activity		5			3				
35	80.2	TFA	Tap Factory Activity		5			3				
35	131.4	TFA	Tap Factory Activity		5			3				
35	157.0	AMH	Manhole							Finishing manhole: 822		
36	0.0	AMH	Manhole							Starting manhole: 822		
36	0.0	MWL	Miscellaneous Water Level				5					
36	0.0	AMH	Manhole							Starting manhole: 822		
36	0.0	MWL	Miscellaneous Water Level				5					
36	32.5	TFA	Tap Factory Activity		5			3				
36	58.1	TFA	Tap Factory Activity		5			3				
36	103.2	TFA	Tap Factory Activity		5			3				
36	115.9	AMH	Manhole							Finishing manhole: 821		
37	0.0	AMH	Manhole							Starting manhole: 728		
37	0.0	MWL	Miscellaneous Water Level				5					
37	8.2	AMH	Manhole							Finishing manhole: ? DROPS INTO 84 INCH PIPE		
38	0.0	AMH	Manhole							Starting manhole: 727		
38	0.0	MWL	Miscellaneous Water Level				5					
38	5.7	ISZ	Intruding Sealing Material Other				10	4	8	LOOKS LIKE TAR		2
38	14.2	TBA	Tap Break-in Activity		5			11				
38	21.3	TBC	Tap Break-in Capped		6			12				
38	27.0	TBC	Tap Break-in Capped		6			12				
38	32.9	H	Hole					12			4	
38	39.1	H	Hole					12		LOOK AT THESE THEY ARE A LOT	4	
38	44.9	H	Hole					12			4	
38	50.4	TBC	Tap Break-in Capped		6			12				
38	63.3	TBC	Tap Break-in Capped		6			12				
38	69.4	TBA	Tap Break-in Activity		6			11				
38	74.9	TBA	Tap Break-in Activity		6			11				
38	97.7	TBA	Tap Break-in Activity		6			10				
38	98.0	TBA	Tap Break-in Activity		6			10				
38	104.4	TBA	Tap Break-in Activity		6			10				
38	109.2	AMH	Manhole							Finishing manhole: 728		
39	0.0	AMH	Manhole							Starting manhole: 726		
39	0.0	MWL	Miscellaneous Water Level				5					
39	8.3	CL	Crack Longitudinal	S01				1			2	
39	8.3	CL	Crack Longitudinal	S02				1			2	
39	35.8	TBA	Tap Break-in Activity		5			11				
39	52.1	TBA	Tap Break-in Activity		6			11				
39	62.0	TBA	Tap Break-in Activity		4			11				
39	98.4	CL	Crack Longitudinal	F02				1			2	
39	98.4	CL	Crack Longitudinal	F01				1			2	
39	98.8	AMH	Manhole							Finishing manhole: 727		
40	0.0	AMH	Manhole							Starting manhole: 725		
40	0.0	MWL	Miscellaneous Water Level				5					
40	8.0	FM	Fracture Multiple					6	5		4	
40	15.8	CL	Crack Longitudinal	S01				1			2	
40	44.4	CL	Crack Longitudinal					7			2	
40	58.6	CL	Crack Longitudinal	F01				1			2	
40	79.6	FM	Fracture Multiple					6	5		4	
40	85.0	AMH	Manhole							Finishing manhole: 724		
41	0.0	AMH	Manhole							Starting manhole: 724		
41	0.0	MWL	Miscellaneous Water Level				5					
41	5.4	CM	Crack Multiple					7	6		3	
41	31.6	AMH	Manhole							Finishing manhole: 723		
42	0.0	AMH	Manhole							Starting manhole: 723		
42	0.0	MWL	Miscellaneous Water Level				5					
42	6.0	TBA	Tap Break-in Activity		6			10				
42	7.4	ISGT	Intruding Sealing Material Grout				10	4	8			2
42	12.6	ISGT	Intruding Sealing Material Grout				10	5	7			2
42	15.4	CM	Crack Multiple					5	4		3	
42	26.1	TBA	Tap Break-in Activity		6			11				
42	27.8	TBA	Tap Break-in Activity		6			11				
42	27.8	CM	Crack Multiple					6	5		3	
42	37.2	ISGT	Intruding Sealing Material Grout	S01			15	4	8			3
42	46.5	TBA	Tap Break-in Activity		6			11				
42	73.0	ISGT	Intruding Sealing Material Grout	F01			15	4	8			3
42	73.0	AMH	Manhole							Finishing manhole: 726		
43	0.0	AMH	Manhole							Starting manhole: 649D		
43	0.0	MWL	Miscellaneous Water Level				10					
43	13.6	CL	Crack Longitudinal	S01				1			2	
43	28.8	CL	Crack Longitudinal	F01				1			2	
43	32.6	FM	Fracture Multiple					6	5		4	
43	60.4	CL	Crack Longitudinal					1			2	
43	74.4	CL	Crack Longitudinal					1			2	
43	108.5	CL	Crack Longitudinal					7			2	

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43	112.3	CL	Crack Longitudinal	S02				7			2	
43	121.9	CL	Crack Longitudinal	F02				7			2	
43	147.3	FS	Fracture Spiral					7	6		3	
43	183.1	CS	Crack Spiral					6	5		2	
43	208.0	AMH	Manhole							Finishing manhole: 649D-A		
44	0.0	AMH	Manhole							Starting manhole: 607		
44	0.0	MWL	Miscellaneous Water Level				5					
44	18.4	TBA	Tap Break-in Activity		6			12				
44	42.5	TFA	Tap Factory Activity		6			1				
44	63.9	TFA	Tap Factory Activity		6			2				
44	85.6	TBA	Tap Break-in Activity		6			10		PVC		
44	87.3	MWLS	Miscellaneous Water Level Sag				15				2	
44	103.2	TFA	Tap Factory Activity		6			2				
44	156.8	AMH	Manhole							Finishing manhole: 605		
45	0.0	AMH	Manhole							Starting manhole: 605		
45	0.0	MWL	Miscellaneous Water Level				10					
45	33.8	MGO	Miscellaneous General Observation							ASPHALT STUCK TO BOTTOM		
45	150.0	CM	Crack Multiple					9	3		3	
45	150.0	CM	Crack Multiple					6	5		3	
45	174.9	H	Hole					11	1		5	
45	179.1	CM	Crack Multiple					8	4		3	
45	185.0	AMH	Manhole							Finishing manhole: 603		
46	0.0	AMH	Manhole							Starting manhole: 580		
46	0.0	MWL	Miscellaneous Water Level				5					
46	10.1	TFA	Tap Factory Activity		4			9				
46	50.0	TFA	Tap Factory Activity		4			9				
46	97.8	TFA	Tap Factory Activity		4			9				
46	97.8	MWL	Miscellaneous Water Level				20					
46	101.1	MWL	Miscellaneous Water Level				5					
46	180.7	TFA	Tap Factory Activity		4			9				
46	180.7	MWL	Miscellaneous Water Level				20					
46	184.0	MWL	Miscellaneous Water Level				5					
46	228.3	TFA	Tap Factory Activity		4			9				
46	228.3	MWL	Miscellaneous Water Level				15					
46	231.2	MWL	Miscellaneous Water Level				5					
46	255.3	AMH	Manhole							Finishing manhole: 585		
47	0.0	AMH	Manhole							Starting manhole: 5-8		
47	0.0	MWL	Miscellaneous Water Level				20					
47	16.5	TFA	Tap Factory Activity		5			9				
47	58.8	TFA	Tap Factory Activity		5			9				
47	80.3	TFC	Tap Factory Capped		5			9		LOOK AT		
47	90.4	CM	Crack Multiple					9	3		3	
47	98.2	TFA	Tap Factory Activity		5			9				
47	100.0	CL	Crack Longitudinal					5			2	
47	126.7	CM	Crack Multiple					11	2		3	
47	139.0	CL	Crack Longitudinal					1			2	
47	140.3	TFA	Tap Factory Activity		5			9				
47	154.0	JOM	Joint Offset Medium								3	
47	169.4	CL	Crack Longitudinal					10			2	
47	182.3	TFA	Tap Factory Activity		5			9				
47	211.5	CL	Crack Longitudinal					4			2	
47	218.7	TFA	Tap Factory Activity		4			9				
47	235.9	CL	Crack Longitudinal					4			2	
47	254.7	TFA	Tap Factory Activity		4			9				
47	255.7	TBA	Tap Break-in Activity		6			12				
47	296.9	TFA	Tap Factory Activity		5			9				
47	308.0	CM	Crack Multiple					7	12		3	
47	320.0	CL	Crack Longitudinal					5			2	
47	336.0	TFA	Tap Factory Activity		4			9				
47	355.9	MGP	Miscellaneous General Photograph					6	5			
47	374.4	AMH	Manhole							Finishing manhole: 5-7		
48	0.0	AMH	Manhole							Starting manhole: 5-3		
48	0.0	MWL	Miscellaneous Water Level				5					
48	9.1	AMH	Manhole							Finishing manhole: 5-7		
49	0.0	AMH	Manhole							Starting manhole: 557		
49	0.0	MWL	Miscellaneous Water Level				5					
49	60.1	TFC	Tap Factory Capped		4			3				
49	317.7	AMH	Manhole							Finishing manhole: 565		
50	0.0	AMH	Manhole							Starting manhole: 555		
50	0.0	MWL	Miscellaneous Water Level				25					
50	4.0	CM	Crack Multiple					9	3		3	
50	5.1	JOM	Joint Offset Medium								3	
50	18.5	CL	Crack Longitudinal					12			2	
50	23.9	CM	Crack Multiple					3	10		3	
50	24.5	CM	Crack Multiple					2	9		3	
50	32.9	CM	Crack Multiple					3	8		3	
50	33.0	CM	Crack Multiple					12	9		3	
50	42.0	CM	Crack Multiple					5	1		3	
50	42.3	CM	Crack Multiple					4	10		3	
50	53.6	CL	Crack Longitudinal					6			2	
50	65.2	CM	Crack Multiple					12	6		3	
50	74.2	CM	Crack Multiple					10	5		3	
50	77.3	CM	Crack Multiple					2	6		3	
50	83.0	AMH	Manhole							Finishing manhole: 557		
51	0.0	AMH	Manhole							Starting manhole: 548		
51	0.0	MWL	Miscellaneous Water Level				5					
51	1.5	FM	Fracture Multiple					6	5		4	
51	1.5	BSV	Broken Soil Visible					6	5		5	
51	9.0	JOM	Joint Offset Medium								3	
51	17.8	RFJ	Roots Fine Joint					6	5			1
51	32.9	CM	Crack Multiple					3	6		3	
51	36.0	BSV	Broken Soil Visible					6	5		5	
51	38.9	FM	Fracture Multiple					8	4		4	
51	41.9	FM	Fracture Multiple					6	5		4	
51	44.9	CM	Crack Multiple					9	4		3	
51	51.2	CL	Crack Longitudinal					11			2	
51	57.5	CM	Crack Multiple					3	6		3	
51	60.2	CM	Crack Multiple					2	6		3	
51	64.2	TFA	Tap Factory Activity		6			3				

ID	Distance	Code	PACP Defects or Observations	Continuous	Tap Dia.	2nd Value	% of Pipe	Clock Start	Clock End	Remarks	Structural Grade	O/M Grade
51	75.0	CL	Crack Longitudinal					6			2	
51	87.2	CL	Crack Longitudinal					6			2	
51	94.3	TFA	Tap Factory Activity		6			9				
51	96.5	CM	Crack Multiple					7	11		3	
51	120.1	CM	Crack Multiple					5	11		3	
51	138.2	JOM	Joint Offset Medium								3	
51	138.2	CM	Crack Multiple					7	2		3	
51	150.5	CM	Crack Multiple					9	2		3	
51	175.1	TFA	Tap Factory Activity		6			9				
51	192.1	CM	Crack Multiple					9	3		3	
51	231.5	CL	Crack Longitudinal					6			2	
51	244.4	TFA	Tap Factory Activity		6			9				
51	268.5	TFA	Tap Factory Activity		6			3				
51	291.5	CL	Crack Longitudinal					8			2	
51	297.4	JOL	Joint Offset Large								4	
51	297.4	MMC	Miscellaneous Material Change							Material changes TO PVC		
51	308.2	TFA	Tap Factory Activity		6			9				
51	309.4	MMC	Miscellaneous Material Change							Material changes TO CT		
51	309.4	JOL	Joint Offset Large								4	
51	315.6	CL	Crack Longitudinal					12			2	
51	351.1	CM	Crack Multiple					2	9		3	
51	376.4	TFA	Tap Factory Activity		6			9				
51	390.7	CM	Crack Multiple					3	9		3	
51	424.5	TFA	Tap Factory Activity		6			3		LOOK AT TAP		
51	435.7	CL	Crack Longitudinal					5			2	
51	441.6	CM	Crack Multiple					2	6		3	
51	441.6	MWL	Miscellaneous Water Level				25					
51	457.4	TFA	Tap Factory Activity		6			9		LOOK AT TAP		
51	471.5	AMH	Manhole							Finishing manhole: 555		
52	0.0	AMH	Manhole							Starting manhole: 541		
52	0.0	MWL	Miscellaneous Water Level				5					
52	10.8	CL	Crack Longitudinal					9			2	
52	0.0	MWL	Miscellaneous Water Level				5					
52	10.8	CL	Crack Longitudinal					9			2	
52	58.9	CM	Crack Multiple					3	9		3	
52	66.3	CL	Crack Longitudinal					2			2	
52	72.0	CL	Crack Longitudinal					8			2	
52	89.3	CL	Crack Longitudinal					2			2	
52	95.8	FM	Fracture Multiple					4	9		4	
52	98.9	FM	Fracture Multiple	S01				4	8		4	
52	111.2	TFA	Tap Factory Activity		8			9				
52	124.8	RMJ	Roots Medium Joint				5	2	10			3
52	128.3	RFJ	Roots Fine Joint					9	3			1
52	134.0	RFJ	Roots Fine Joint					8	12			1
52	139.7	RFJ	Roots Fine Joint					9	3			1
52	151.3	FM	Fracture Multiple	F01				4	8		4	
52	158.1	CM	Crack Multiple					1	4		3	
52	176.4	FM	Fracture Multiple					2	9		4	
52	184.7	CM	Crack Multiple					2	6		3	
52	209.4	TFA	Tap Factory Activity		8			9				
52	214.4	FM	Fracture Multiple					3	9		4	
52	230.0	H	Hole					5	7		5	
52	230.2	MWLS	Miscellaneous Water Level Sag	S02			15				2	
52	238.7	MWLS	Miscellaneous Water Level Sag	F02			15				2	
52	238.7	JOL	Joint Offset Large								4	
52	242.6	AMH	Manhole							Finishing manhole: 548		
53	0.0	AMH	Manhole							Starting manhole: 531		
53	0.0	MWL	Miscellaneous Water Level				15					
53	5.0	CL	Crack Longitudinal	S01				12			2	
53	75.1	CL	Crack Longitudinal	F01				12			2	
53	156.8	AMH	Manhole							Finishing manhole: 878		
54	0.0	AMH	Manhole							Starting manhole: 5-3		
54	0.0	MWL	Miscellaneous Water Level				10					
54	18.2	TFA	Tap Factory Activity		6			9				
54	42.7	TBC	Tap Break-in Capped		6			9		LOOK AT		
54	57.0	TBA	Tap Break-in Activity		6			9				
54	99.1	TBA	Tap Break-in Activity		6			9				
54	136.5	CM	Crack Multiple					4	8		3	
54	141.0	TBA	Tap Break-in Activity		6			9				
54	177.0	TBA	Tap Break-in Activity		6			9				
54	177.0	TBA	Tap Break-in Activity		6			9				
54	215.5	TFA	Tap Factory Activity		6			9				
54	215.5	TFA	Tap Factory Activity		6			9				
54	215.9	TBA	Tap Break-in Activity		6			2				
54	250.2	AMH	Manhole							Finishing manhole: 5-1		
55	0.0	AMH	Manhole							Starting manhole: 529		
55	0.0	MWL	Miscellaneous Water Level				25					
55	7.8	CL	Crack Longitudinal	S01				12			2	
55	141.8	CL	Crack Longitudinal	F01				12			2	
55	148.3	CL	Crack Longitudinal	S02				12			2	
55	277.8	CL	Crack Longitudinal	F02				12			2	
55	310.4	AMH	Manhole							Finishing manhole: 531		
57	0.0	AMH	Manhole							Starting manhole: 527		
57	0.0	MWL	Miscellaneous Water Level				20					
57	428.9	AMH	Manhole							Finishing manhole: 529		
58	0.0	AMH	Manhole							Starting manhole: 525D		
58	0.0	MWL	Miscellaneous Water Level				25					
58	101.7	OBS	Obstruction Built Into Structure				30	10	2			4
58	104.6	OBN	Obstruction Construction Debris				10	4	8	CONCRETE IN BOTTOM		2
58	372.0	AMH	Manhole							Finishing manhole: 527D		
59	0.0	AMH	Manhole							Starting manhole: 5-10		
59	0.0	MWL	Miscellaneous Water Level				10					
59	10.5	DAE	Deposits Attached Encrustation				5	5	7			2
59	25.0	CL	Crack Longitudinal					2			2	
59	41.2	TFA	Tap Factory Activity		4			9				
59	46.1	DAE	Deposits Attached Encrustation	S01			5	4	7			2
59	56.4	DAE	Deposits Attached Encrustation	F01			5	4	7			2
59	80.4	TFA	Tap Factory Activity		6			10				
59	104.4	TFC	Tap Factory Capped		6			9		LOOK AT		
59	119.5	TFA	Tap Factory Activity		5			9				
59	158.4	TFA	Tap Factory Activity		5			9				
59	203.7	TFA	Tap Factory Activity		5			9				
59	246.1	TFA	Tap Factory Activity		5			9				
59	246.1	DAE	Deposits Attached Encrustation				10	5	7			2

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59	279.0	TFA	Tap Factory Activity		5			9				
59	318.2	TFA	Tap Factory Activity		5			9				
59	360.7	TFA	Tap Factory Activity		5			9				
59	382.0	AMH	Manhole							Finishing manhole: 5-9		
60	0.0	AMH	Manhole							Starting manhole: 5-1		
60	0.0	MWL	Miscellaneous Water Level				10					
60	56.1	RPZD	Point Repair Other Defective							LOOK AT	4	
60	57.5	TBA	Tap Break-in Activity		6			12				
60	114.6	CM	Crack Multiple					5	8		3	
60	138.1	AMH	Manhole							Finishing manhole: 345C		
61	0.0	AMH	Manhole							Starting manhole: 490		
61	0.0	MWL	Miscellaneous Water Level				5					
61	27.7	TFA	Tap Factory Activity		6			10				
61	67.2	TFA	Tap Factory Activity		6			10				
61	109.6	TFA	Tap Factory Activity		6			10				
61	112.4	TFA	Tap Factory Activity		6			10				
61	148.7	TBA	Tap Break-in Activity		6			10				
61	148.7	CM	Crack Multiple					9	11	at tap	3	
61	153.1	CL	Crack Longitudinal					1			2	
61	159.7	CM	Crack Multiple					10	2		3	
61	170.7	CL	Crack Longitudinal	S01				1			2	
61	185.6	CL	Crack Longitudinal	F01				1			2	
61	185.6	TBA	Tap Break-in Activity		6			2				
61	188.2	TBA	Tap Break-in Activity		6			10				
61	225.6	CL	Crack Longitudinal					4			2	
61	229.7	TBA	Tap Break-in Activity		6			10				
61	229.7	CL	Crack Longitudinal					1			2	
61	244.0	CM	Crack Multiple					7	5		3	
61	255.3	CL	Crack Longitudinal					12			2	
61	260.0	TBA	Tap Break-in Activity		6			10				
61	282.4	CL	Crack Longitudinal					1			2	
61	284.2	TBA	Tap Break-in Activity		6			10				
61	306.0	CL	Crack Longitudinal	S02				1			2	
61	313.9	CL	Crack Longitudinal	F02				1			2	
61	317.4	CL	Crack Longitudinal					1			2	
61	321.9	CL	Crack Longitudinal	S03				1			2	
61	326.2	TBA	Tap Break-in Activity		6			10				
61	333.4	CL	Crack Longitudinal	F03				1			2	
61	351.6	CL	Crack Longitudinal	S04				1			2	
61	357.1	CL	Crack Longitudinal	F04				1			2	
61	360.7	CM	Crack Multiple					5	6		3	
61	363.8	CL	Crack Longitudinal					3			2	
61	383.4	CM	Crack Multiple					6	5		3	
61	393.0	AMH	Manhole							Finishing manhole: 350C		
62	0.0	AMH	Manhole							Starting manhole: 490		
62	0.0	MWL	Miscellaneous Water Level				5					
62	2.0	MSA	Miscellaneous Survey Abandoned							Inspection abandoned: Surcharged/Debris		
62	20.8	TFA	Tap Factory Activity		6			10				
62	21.0	MSA	Miscellaneous Survey Abandoned							debris in pipe		
63	0.0	AMH	Manhole							Starting manhole: 455		
63	0.0	MWL	Miscellaneous Water Level				5					
63	26.5	TFA	Tap Factory Activity		5			10				
63	65.3	CL	Crack Longitudinal					10			2	
63	65.8	TFA	Tap Factory Activity		6			10				
63	83.1	CM	Crack Multiple					4	10		3	
63	105.1	TFA	Tap Factory Activity		5			10				
63	142.8	TBA	Tap Break-in Activity		6			1				
63	143.7	TFA	Tap Factory Activity		6			10				
63	169.5	CM	Crack Multiple					9	3		3	
63	182.7	TFA	Tap Factory Activity		6			10				
63	207.4	TFA	Tap Factory Activity		6			10				
63	224.6	TFA	Tap Factory Activity		6			10				
63	238.5	JOM	Joint Offset Medium		1	2					3	
63	244.3	CM	Crack Multiple					9	3		3	
63	259.7	CM	Crack Multiple					4	8		3	
63	263.5	TFA	Tap Factory Activity		6			10				
63	268.9	CM	Crack Multiple					8	4		3	
63	277.4	CM	Crack Multiple					4	9		3	
63	280.8	CL	Crack Longitudinal					6			2	
63	289.9	CL	Crack Longitudinal					5			2	
63	308.4	TFA	Tap Factory Activity		6			10				
63	319.7	CL	Crack Longitudinal					11			2	
63	344.8	JOM	Joint Offset Medium		1	1					3	
63	350.2	TFA	Tap Factory Activity		6			10		MUD IN TAP		
63	363.4	TBA	Tap Break-in Activity		6			12				
63	383.5	TFA	Tap Factory Activity		6			10				
63	401.2	AMH	Manhole							Finishing manhole: 490		
65	0.0	AMH	Manhole							Starting manhole: 447D		
65	0.0	MWL	Miscellaneous Water Level				10					
65	122.3	AMH	Manhole							Finishing manhole: 447D		
66	0.0	AMH	Manhole							Starting manhole: 447D		
66	0.0	MWL	Miscellaneous Water Level				5					
66	40.0	TBA	Tap Break-in Activity		6			10				
66	60.8	TBA	Tap Break-in Activity		6			10				
66	75.6	TBA	Tap Break-in Activity		6			10				
66	84.4	TBA	Tap Break-in Activity		6			12				
66	117.5	TBA	Tap Break-in Activity		6			10				
66	148.1	TBA	Tap Break-in Activity		10			12				
66	148.1	HVV	Hole Void Visible					11		NEXT TO TAP	5	
66	162.3	TBA	Tap Break-in Activity		6			10				
66	204.6	TBA	Tap Break-in Activity		6			10				
66	240.5	TBA	Tap Break-in Activity		6			10				
66	278.0	CM	Crack Multiple					7	11		3	
66	280.1	TBA	Tap Break-in Activity		6			10				
66	315.9	TBA	Tap Break-in Activity		6			10		50% FULL OF MUD		
66	341.4	CM	Crack Multiple					3	7		3	
66	347.4	CM	Crack Multiple					4	8		3	
66	354.6	TBA	Tap Break-in Activity		6			10				
66	354.7	FM	Fracture Multiple					8	7		4	

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66	357.5	TBA	Tap Break-in Activity		6			1				
66	387.4	AMH	Manhole							Finishing manhole: 394D		
67	0.0	AMH	Manhole							Starting manhole: 443		
67	0.0	MWL	Miscellaneous Water Level				15					
67	39.6	CM	Crack Multiple					11	4		3	
67	136.9	CL	Crack Longitudinal					5			2	
67	156.8	CM	Crack Multiple					9	3		3	
67	164.6	CM	Crack Multiple					6	5		3	
67	165.2	HSV	Hole Soil Visible		2	2		12	1		5	
67	206.4	CM	Crack Multiple					6	5		3	
67	260.5	CM	Crack Multiple					12	4		3	
67	267.1	CM	Crack Multiple					6	5		3	
67	292.7	TBA	Tap Break-in Activity		8			3				
67	294.3	CM	Crack Multiple					10	2		3	
67	298.3	TBA	Tap Break-in Activity		6			3				
67	300.9	FM	Fracture Multiple					4	8		4	
67	300.9	HSV	Hole Soil Visible					5	7		5	
67	303.1	CM	Crack Multiple					9	3		3	
67	312.1	TBA	Tap Break-in Activity		8			12				
67	360.0	CM	Crack Multiple					10	2		3	
67	387.0	AMH	Manhole							Finishing manhole: 352		
68	0.0	AMH	Manhole							Starting manhole: 440		
68	0.0	MWL	Miscellaneous Water Level				15					
68	58.8	CM	Crack Multiple					6	5		3	
68	293.1	TFA	Tap Factory Activity		6			2				
68	600.0	AMH	Manhole							Finishing manhole: 443		
69	0.0	AMH	Manhole							Starting manhole: 439		
69	0.0	MWL	Miscellaneous Water Level				20					
69	27.5	CM	Crack Multiple					8	2		3	
69	34.4	ID	Infiltration Dripper					2	6			3
69	61.2	CM	Crack Multiple					8	4		3	
69	69.8	DAE	Deposits Attached Encrustation				15	6	9			3
69	82.2	DAE	Deposits Attached Encrustation				5	2	5			2
69	112.4	MSA	Miscellaneous Survey Abandoned							Inspection abandoned: Does Not Exist		
70	0.0	AMH	Manhole							Starting manhole: 437SB		
70	0.0	MWL	Miscellaneous Water Level				10					
70	0.0	MGO	Miscellaneous General Observation							LOOKS LIKE ASPHALT AS FAR AS I CAN SEE		
70	0.0	AZ	Access Point Other							CANT DO ASPHALF IN ABOUT 20 OR 30 FEET		
71	0.0	AMH	Manhole							Starting manhole: 437S		
71	0.0	MWL	Miscellaneous Water Level				10					
71	21.0	JSM	Joint Separated Medium								3	
71	103.2	MWL	Miscellaneous Water Level				25					
71	122.7	H	Hole					5	7		5	
71	139.9	MWLS	Miscellaneous Water Level Sag				25				2	
71	222.5	TFA	Tap Factory Activity		6			2				
71	388.4	AMH	Manhole							Finishing manhole: 437SA		
72	0.0	AMH	Manhole							Starting manhole: 437S		
72	0.0	MWL	Miscellaneous Water Level				10					
72	388.1	AMH	Manhole							Finishing manhole: 446S		
73	0.0	AMH	Manhole							Starting manhole: 435		
73	0.0	MWL	Miscellaneous Water Level				20					
73	7.6	CM	Crack Multiple					4	8		3	
73	297.0	TFA	Tap Factory Activity		4			2		FULL OF MUD		
73	338.8	CL	Crack Longitudinal					7			2	
73	347.0	CL	Crack Longitudinal					3			2	
73	413.6	CM	Crack Multiple					6	5		3	
73	492.0	MGO	Miscellaneous General Observation							GENERATOR SHUT DOWN		
73	600.0	AMH	Manhole							Finishing manhole: 439		
74	0.0	AMH	Manhole							Starting manhole: 435		
74	0.0	MWL	Miscellaneous Water Level				20					
74	7.6	CM	Crack Multiple					4	8		3	
74	297.0	TFA	Tap Factory Activity		4			2		FULL OF MUD		
74	338.8	CL	Crack Longitudinal					7			2	
74	347.0	CL	Crack Longitudinal					3			2	
74	413.6	CM	Crack Multiple					6	5		3	
74	492.0	MGO	Miscellaneous General Observation							GENERATOR SHUT DOWN		
74	600.0	AMH	Manhole							Finishing manhole: 439		
75	0.0	AMH	Manhole							Starting manhole: 431		
75	0.0	MWL	Miscellaneous Water Level				5					
75	38.1	TFA	Tap Factory Activity		5			2				
75	77.3	TFA	Tap Factory Activity		5			2				
75	110.6	TFA	Tap Factory Activity		5			2				
75	128.0	CL	Crack Longitudinal					5			2	
75	148.7	CM	Crack Multiple					11	5		3	
75	152.8	TBA	Tap Break-in Activity		5			2				
75	198.1	TFA	Tap Factory Activity		5			2				
75	210.5	TFC	Tap Factory Capped		5			2		LOOK AT		
75	233.9	TFA	Tap Factory Activity		5			2				
75	245.9	TFA	Tap Factory Activity		5			10		FULL ROCK		
75	275.8	TFA	Tap Factory Activity		5			2				
75	315.1	TFA	Tap Factory Activity		5			2				
75	353.8	TFA	Tap Factory Activity		5			2				
75	355.3	JOL	Joint Offset Large								4	
75	373.4	MWLS	Miscellaneous Water Level Sag				15				2	
75	384.0	AMH	Manhole							Finishing manhole: 427		
76	0.0	AMH	Manhole							Starting manhole: 431		
76	0.0	MWL	Miscellaneous Water Level				5					
76	24.9	JOM	Joint Offset Medium								3	
76	36.0	TFA	Tap Factory Activity		5			3				
76	75.4	TFA	Tap Factory Activity		5			2				
76	108.5	TFA	Tap Factory Activity		5			2				
76	150.5	TFA	Tap Factory Activity		5			2				
76	196.2	TFA	Tap Factory Activity		5			2				
76	223.2	MSA	Miscellaneous Survey Abandoned							Inspection abandoned: Surcharged/Debris		
77	0.0	AMH	Manhole							Starting manhole: 430S		
77	0.0	MWL	Miscellaneous Water Level				5					
77	22.4	H	Hole					5	7		5	

ID	Distance	Code	PACP Defects or Observations	Continuous	Tap Dia.	2nd Value	% of Pipe	Clock Start	Clock End	Remarks	Structural Grade	O/M Grade
77	48.2	JSM	Joint Separated Medium								3	
77	164.1	AMH	Manhole							Finishing manhole: 427S		
78	0.0	AMH	Manhole							Starting manhole: 427S		
78	0.0	MWL	Miscellaneous Water Level				5					
78	73.9	MWM	Miscellaneous Water Mark				20					
78	73.9	MWLS	Miscellaneous Water Level Sag				20				2	
78	183.2	AMH	Manhole							Finishing manhole: 425S		
79	0.0	AMH	Manhole							Starting manhole: 427		
79	0.0	MWL	Miscellaneous Water Level				15					
79	10.4	TBA	Tap Break-in Activity		6			2				
79	17.1	CM	Crack Multiple					11	4		3	
79	43.2	TBA	Tap Break-in Activity		6			2				
79	45.0	CM	Crack Multiple					10	7		3	
79	66.2	CM	Crack Multiple					6	5		3	
79	75.4	CM	Crack Multiple					6	5		3	
79	78.3	CM	Crack Multiple					7	4		3	
79	85.8	TBA	Tap Break-in Activity		6			2				
79	85.8	CM	Crack Multiple					9	5		3	
79	125.2	TBA	Tap Break-in Activity		6			2				
79	125.2	CM	Crack Multiple					10	5		3	
79	129.1	CM	Crack Multiple					7	5		3	
79	150.8	FM	Fracture Multiple					6	5		4	
79	158.1	TFC	Tap Factory Capped		6			12				
79	158.5	TBA	Tap Break-in Activity		6			10				
79	167.3	TBA	Tap Break-in Activity		6			2				
79	168.6	CM	Crack Multiple					11	6		3	
79	179.8	TFC	Tap Factory Capped		6			2				
79	189.1	TBC	Tap Break-in Capped		6			3		LOOK AT		
79	190.1	FM	Fracture Multiple					6	5		4	
79	197.0	CM	Crack Multiple					8	5		3	
79	202.2	CM	Crack Multiple					6	5		3	
79	206.4	TBA	Tap Break-in Activity		6			2				
79	220.8	CM	Crack Multiple					4	9		3	
79	241.8	CM	Crack Multiple					2	6		3	
79	246.2	TBA	Tap Break-in Activity		6			2				
79	250.9	CL	Crack Longitudinal					9			2	
79	260.2	CM	Crack Multiple	S01				7	5		3	
79	268.7	CM	Crack Multiple	F01				7	5		3	
79	275.4	FM	Fracture Multiple					10	5		4	
79	285.9	TBA	Tap Break-in Activity		6			2				
79	302.7	CM	Crack Multiple					5	3		3	
79	325.3	TBA	Tap Break-in Activity		6			2				
79	333.1	FM	Fracture Multiple					6	5		4	
79	348.6	FM	Fracture Multiple					8	4		4	
79	354.4	CM	Crack Multiple					6	5		3	
79	370.1	AMH	Manhole							Finishing manhole: 423		
80	0.0	AMH	Manhole							Starting manhole: 427		
80	0.0	MWL	Miscellaneous Water Level				10					
80	10.0	MSA	Miscellaneous Survey Abandoned							Inspection abandoned: Surcharged/Debris		
81	0.0	AMH	Manhole							Starting manhole: 425S		
81	0.0	MWL	Miscellaneous Water Level				10					
81	367.2	AMH	Manhole							Finishing manhole: 422S		
82	0.0	AMH	Manhole							Starting manhole: 423		
82	0.0	MWL	Miscellaneous Water Level				5					
82	15.4	FM	Fracture Multiple					10	2		4	
82	18.5	CM	Crack Multiple					10	2		3	
82	24.5	CM	Crack Multiple					8	3		3	
82	38.0	TBA	Tap Break-in Activity		6			3				
82	42.3	CM	Crack Multiple					6	5		3	
82	45.4	CM	Crack Multiple					6	5		3	
82	74.1	TBA	Tap Break-in Activity		6			3				
82	84.6	FM	Fracture Multiple					8	3		4	
82	85.9	TBA	Tap Break-in Activity		6			10				
82	99.9	CM	Crack Multiple					9	2		3	
82	111.9	CL	Crack Longitudinal					8			2	
82	116.4	TBA	Tap Break-in Activity		6			2				
82	123.1	CL	Crack Longitudinal					2			2	
82	136.0	CL	Crack Longitudinal					12			2	
82	151.4	CM	Crack Multiple					7	1		3	
82	158.7	TBA	Tap Break-in Activity		6			2				
82	163.4	FM	Fracture Multiple					6	5		4	
82	173.5	TBA	Tap Break-in Activity		6			3		LOOK AT		
82	174.8	CL	Crack Longitudinal					1			2	
82	177.3	CM	Crack Multiple					8	5		3	
82	181.4	CM	Crack Multiple					9	4		3	
82	187.5	CM	Crack Multiple					9	2		3	
82	197.6	TBA	Tap Break-in Activity		6			2				
82	202.3	CL	Crack Longitudinal					2			2	
82	205.1	CL	Crack Longitudinal	S01				8			2	
82	211.4	CM	Crack Multiple					7	5		3	
82	217.7	H	Hole		2	2		11			4	
82	217.8	FM	Fracture Multiple					9	2		4	
82	236.9	TBA	Tap Break-in Activity		6			2				
82	248.0	CL	Crack Longitudinal					4			2	
82	254.1	CL	Crack Longitudinal					5			2	
82	276.2	TBA	Tap Break-in Activity		6			2		LOOK AT BROKE INSIDE		
82	296.1	CL	Crack Longitudinal	S02				12			2	
82	315.5	TBA	Tap Break-in Activity		6			2				
82	320.5	MGO	Miscellaneous General Observation							STAINING ON WALLS		
82	320.9	FM	Fracture Multiple					6	5		4	
82	323.5	FM	Fracture Multiple					7	6	OPEN UP MORE	4	
82	332.7	FM	Fracture Multiple					6	5		4	
82	335.5	FM	Fracture Multiple					7	6		4	
82	347.5	CL	Crack Longitudinal					10			2	
82	350.7	FM	Fracture Multiple					7	6		4	
82	354.8	TB	Tap Break-in/Hammer		6			3				
82	354.8	CL	Crack Longitudinal	F02				12			2	
82	354.8	CL	Crack Longitudinal	F01				8			2	
82	366.1	CL	Crack Longitudinal					1			2	

ID	Distance	Code	PACP Defects or Observations	Continuous	Tap Dia.	2nd Value	% of Pipe	Clock Start	Clock End	Remarks	Structural Grade	O/M Grade
82	375.1	CM	Crack Multiple					9	2		3	
82	382.8	AMH	Manhole							Finishing manhole: 421		
83	0.0	AMH	Manhole							Starting manhole: 422S		
83	0.0	MWL	Miscellaneous Water Level				5					
83	360.1	AMH	Manhole							Finishing manhole: 420S		
84	0.0	AMH	Manhole							Starting manhole: 421		
84	0.0	MWL	Miscellaneous Water Level				15					
84	8.0	TBA	Tap Break-in Activity		6			2				
84	8.0	CL	Crack Longitudinal	S01				1			2	
84	8.0	CL	Crack Longitudinal	S02				7			2	
84	12.8	CL	Crack Longitudinal					4			2	
84	33.7	CL	Crack Longitudinal	F01				1			2	
84	37.7	DAE	Deposits Attached Encrustation				10	7	10			2
84	40.6	FM	Fracture Multiple					7	1		4	
84	47.7	TBA	Tap Break-in Activity		6			2				
84	52.7	CL	Crack Longitudinal	F02				7			2	
84	58.4	CM	Crack Multiple					9	3		3	
84	70.8	FL	Fracture Longitudinal					6			3	
84	73.5	CL	Crack Longitudinal	S03				6			2	
84	93.3	TBA	Tap Break-in Activity		6			2				
84	97.2	CL	Crack Longitudinal					1			2	
84	103.9	CL	Crack Longitudinal	F03				6			2	
84	109.9	CL	Crack Longitudinal					6			2	
84	132.9	TB	Tap Break-in/Hammer		6			2				
84	150.9	TBB	Tap Break-in Abandoned		6			9				
84	172.0	TBA	Tap Break-in Activity		6			3				
84	173.3	CL	Crack Longitudinal					7			2	
84	195.8	CL	Crack Longitudinal					1			2	
84	211.4	TBA	Tap Break-in Activity		6			3				
84	212.0	CL	Crack Longitudinal					1			2	
84	215.8	CL	Crack Longitudinal	S04				1			2	
84	254.1	TBA	Tap Break-in Activity		6			3				
84	258.4	CL	Crack Longitudinal					5			2	
84	263.7	CM	Crack Multiple	S05				6	5		3	
84	287.7	DR	Deformed Rigid				10				5	
84	292.3	HSV	Hole Soil Visible					8	11	look at this	5	
84	302.5	TBA	Tap Break-in Activity		6			9				
84	302.5	MGO	Miscellaneous General Observation							LOOK AT THIS SPOT GOOD		
84	321.6	TBA	Tap Break-in Activity		6			12				
84	325.5	CM	Crack Multiple	F05				6	5		3	
84	384.0	CL	Crack Longitudinal	F04				1			2	
84	384.0	AMH	Manhole							Finishing manhole: 420		
85	0.0	AMH	Manhole							Starting manhole: 420S		
85	0.0	MWL	Miscellaneous Water Level				10					
85	135.3	AMH	Manhole							Finishing manhole: 419S		
86	0.0	AMH	Manhole							Starting manhole: 418		
86	0.0	MWL	Miscellaneous Water Level				5					
86	10.1	CM	Crack Multiple					8	5		3	
86	29.0	TBA	Tap Break-in Activity		6			3				
86	39.7	CS	Crack Spiral					10	5		2	
86	48.6	CS	Crack Spiral					11	4		2	
86	68.4	TFA	Tap Factory Activity		6			3				
86	69.7	DAE	Deposits Attached Encrustation				10	5	8			2
86	107.4	TBA	Tap Break-in Activity		6			3				
86	146.4	TFA	Tap Factory Activity		6			3				
86	177.8	CS	Crack Spiral					11	5		2	
86	181.1	CS	Crack Spiral					4	8		2	
86	188.5	TFA	Tap Factory Activity		6			3				
86	208.7	CS	Crack Spiral					10	5		2	
86	230.9	TFA	Tap Factory Activity		6			3				
86	265.3	CS	Crack Spiral					3	9		2	
86	265.3	JOM	Joint Offset Medium								3	
86	266.7	TFA	Tap Factory Activity		6			3				
86	270.2	AMH	Manhole							Finishing manhole: 415		
87	0.0	AMH	Manhole							Starting manhole: 416		
87	0.0	MWL	Miscellaneous Water Level				20					
87	20.7	TFA	Tap Factory Activity		6			10				
87	60.5	TFA	Tap Factory Activity		6			10				
87	70.6	JOM	Joint Offset Medium	S01	1						3	
87	74.0	CM	Crack Multiple					10	12		3	
87	103.1	TFA	Tap Factory Activity		6			10				
87	142.9	TFA	Tap Factory Activity		6			10				
87	176.9	JOM	Joint Offset Medium	F01	1						3	
87	182.8	TFA	Tap Factory Activity		6			10		ROCKS INSIDE TAP		
87	222.6	TFA	Tap Factory Activity		6			10				
87	261.9	TFA	Tap Factory Activity		6			10				
87	304.4	TFA	Tap Factory Activity		6			10				
87	346.7	TFA	Tap Factory Activity		6			10				
87	381.9	AMH	Manhole							Finishing manhole: 414		
88	0.0	AMH	Manhole							Starting manhole: 415		
88	0.0	MWL	Miscellaneous Water Level				5					
88	21.1	JOM	Joint Offset Medium								3	
88	36.3	TFA	Tap Factory Activity		6			2				
88	36.6	CL	Crack Longitudinal	S01				12			2	
88	76.0	TFA	Tap Factory Activity		6			2				
88	115.3	TFA	Tap Factory Activity		6			2				
88	157.7	TFA	Tap Factory Activity		6			2				
88	168.6	CL	Crack Longitudinal	F01				12			2	
88	197.5	TFA	Tap Factory Activity		6			2				
88	204.1	CM	Crack Multiple					9	12		3	
88	239.8	TFA	Tap Factory Activity		6			2				
88	279.2	TFA	Tap Factory Activity		6			2				
88	318.3	TFA	Tap Factory Activity		6			2				
88	328.6	CL	Crack Longitudinal	S02				12			2	
88	334.3	CL	Crack Longitudinal	F02				12			2	
88	358.1	TFA	Tap Factory Activity		6			2				
88	384.8	AMH	Manhole							Finishing manhole: 413		
89	0.0	AMH	Manhole							Starting manhole: 414		
89	0.0	MWL	Miscellaneous Water Level				40					

ID	Distance	Code	PACP Defects or Observations	Continuous	Tap Dia.	2nd Value	% of Pipe	Clock Start	Clock End	Remarks	Structural Grade	O/M Grade
89	43.6	TFA	Tap Factory Activity		6			10				
89	83.0	TFA	Tap Factory Activity		6			10				
89	122.9	TFA	Tap Factory Activity		6			10				
89	162.1	TFA	Tap Factory Activity		6			10				
89	204.7	TFA	Tap Factory Activity		6			10				
89	244.7	TFA	Tap Factory Activity		6			10				
89	284.4	TFA	Tap Factory Activity		6			10				
89	323.5	TFA	Tap Factory Activity		6			10				
89	383.7	AMH	Manhole							Finishing manhole: 412		
91	0.0	AMH	Manhole							Starting manhole: 412		
91	0.0	MWL	Miscellaneous Water Level				25					
91	18.1	TFA	Tap Factory Activity		6			10				
91	58.2	TFA	Tap Factory Activity		6			10				
91	98.1	TFA	Tap Factory Activity		6			10				
91	137.1	TFA	Tap Factory Activity		6			10				
91	176.9	TFA	Tap Factory Activity		6			10				
91	219.8	TFA	Tap Factory Activity		6			10				
91	259.7	TFA	Tap Factory Activity		0			10				
91	278.6	TBA	Tap Break-in Activity		8			12		INTRUDING TAP		
91	278.6	AMH	Manhole							Finishing manhole: 410		
92	0.0	AMH	Manhole							Starting manhole: 410S		
92	0.0	MWL	Miscellaneous Water Level				10					
92	261.9	AMH	Manhole							Finishing manhole: 419S		
93	0.0	AMH	Manhole							Starting manhole: 410		
93	0.0	MWL	Miscellaneous Water Level				5					
93	13.9	CM	Crack Multiple					8	4		3	
93	17.9	CM	Crack Multiple	S01				8	4		3	
93	30.4	CM	Crack Multiple	F01				8	4		3	
93	47.6	CM	Crack Multiple					9	3		3	
93	50.2	CM	Crack Multiple	S02				8	4		3	
93	55.2	CM	Crack Multiple	F02				8	4		3	
93	96.5	HVV	Hole Void Visible					4	7	WAS PULLING MATERIAL OUT OF IT WITH NOZZLE	5	
93	103.2	AMH	Manhole							Finishing manhole: 349		
94	0.0	AMH	Manhole							Starting manhole: 408S		
94	0.0	MWL	Miscellaneous Water Level				10					
94	41.8	AMH	Manhole							Finishing manhole: 407S		
95	0.0	AMH	Manhole							Starting manhole: 407S		
95	0.0	MWL	Miscellaneous Water Level				20					
95	207.9	AMH	Manhole							Finishing manhole: 405S		
96	0.0	AMH	Manhole							Starting manhole: 405S		
96	0.0	MWL	Miscellaneous Water Level				15					
96	352.7	AMH	Manhole							Finishing manhole: 402S		
97	0.0	AMH	Manhole							Starting manhole: 404D		
97	0.0	MWL	Miscellaneous Water Level				5					
97	10.4	CS	Crack Spiral					9	11		2	
97	17.1	TFA	Tap Factory Activity		6			9				
97	30.6	JOM	Joint Offset Medium								3	
97	59.5	TFA	Tap Factory Activity		6			9				
97	80.7	TBC	Tap Break-in Capped		6			9		LOOK AT		
97	85.7	CS	Crack Spiral					2	5		2	
97	98.7	TFA	Tap Factory Activity		6			9				
97	100.4	CS	Crack Spiral					2	5		2	
97	141.0	TFA	Tap Factory Activity		6			9				
97	155.2	CS	Crack Spiral					1	4		2	
97	169.8	CL	Crack Longitudinal					9			2	
97	183.2	TF	Tap Factory		6			9				
97	219.5	TFA	Tap Factory Activity		6			9				
97	236.2	CS	Crack Spiral					6	11		2	
97	256.4	TBA	Tap Break-in Activity		6			12				
97	256.4	TFA	Tap Factory Activity		6			9				
97	260.7	CL	Crack Longitudinal					11			2	
97	297.5	TFA	Tap Factory Activity		6			10		LOOK AT LOOKS BROKEN		
97	308.5	CS	Crack Spiral					8	12		2	
97	320.8	CS	Crack Spiral					1	7		2	
97	336.7	TFA	Tap Factory Activity		6			9		LOOK AT		
97	373.6	AMH	Manhole							Finishing manhole: 447D		
98	0.0	AMH	Manhole							Starting manhole: 402S		
98	0.0	MWL	Miscellaneous Water Level				10					
98	175.3	AMH	Manhole							Finishing manhole: 401S		
99	0.0	AMH	Manhole							Starting manhole: 401S		
99	0.0	MWL	Miscellaneous Water Level				10					
99	184.0	AMH	Manhole							Finishing manhole: 400S		
100	0.0	AMH	Manhole							Starting manhole: 401S		
100	0.0	MWL	Miscellaneous Water Level				15					
100	19.0	MWL	Miscellaneous Water Level				25					
100	45.1	AMH	Manhole							Finishing manhole: 399S		
102	0.0	AMH	Manhole							Starting manhole: 400-5		
102	0.0	MWL	Miscellaneous Water Level				20					
102	32.0	JOM	Joint Offset Medium		1	1					3	
102	44.8	JOM	Joint Offset Medium								3	
102	68.5	TBA	Tap Break-in Activity		6			12				
102	80.2	DAE	Deposits Attached Encrustation				10	5	7			2
102	89.8	CM	Crack Multiple					1	7		3	
102	93.1	TBA	Tap Break-in Activity		6			1				
102	93.6	BSV	Broken Soil Visible		2	1		4	8		5	
102	115.6	TBA	Tap Break-in Activity		8			3		100% FULL OF MUD		
102	118.5	CM	Crack Multiple					8	4		3	
102	118.6	DFBI	Deformed Flexible Bulging Inverse Curvature				10	9	3		5	
102	143.1	TBA	Tap Break-in Activity		6			10				
102	152.5	CM	Crack Multiple					9	3		3	
102	167.9	JSL	Joint Separated Large		1	1					4	
102	170.3	TBA	Tap Break-in Activity		6			11				
102	191.6	TBA	Tap Break-in Activity		6			11				
102	214.5	TBA	Tap Break-in Activity		6			1				
102	214.5	CM	Crack Multiple					11	4		3	
102	217.5	TFA	Tap Factory Activity		6			11				

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102	238.5	TBA	Tap Break-in Activity		6			11				
102	242.3	DAE	Deposits Attached Encrustation				10	5	7			2
102	263.4	RFJ	Roots Fine Joint					7	9			1
102	265.7	TFA	Tap Factory Activity		6			12				
102	286.8	TFA	Tap Factory Activity		6			11				
102	312.6	TBA	Tap Break-in Activity		6			11				
102	333.7	TFA	Tap Factory Activity		6			11				
102	336.7	DAE	Deposits Attached Encrustation				5	4	6			2
102	339.7	TBD	Tap Break-in/Hammer Defective		2	4		1				3
102	360.2	TFA	Tap Factory Activity		6			11				
102	376.0	AMH	Manhole							Finishing manhole: 400-7		
103	0.0	AMH	Manhole							Starting manhole: 400-5		
103	0.0	MWL	Miscellaneous Water Level				15					
103	12.3	JSM	Joint Separated Medium								3	
103	12.3	CL	Crack Longitudinal					6			2	
103	18.4	CL	Crack Longitudinal					6			2	
103	21.2	CL	Crack Longitudinal	S01				6			2	
103	39.3	CM	Crack Multiple					12	5		3	
103	55.7	TBA	Tap Break-in Activity		6			2				
103	72.4	CM	Crack Multiple					2	7		3	
103	72.4	CL	Crack Longitudinal	F01				6			2	
103	78.3	CM	Crack Multiple					8	5		3	
103	93.5	CL	Crack Longitudinal					7			2	
103	105.4	CM	Crack Multiple					6	5		3	
103	123.4	CL	Crack Longitudinal					7			2	
103	130.0	CC	Crack Circumferential					4	9		1	
103	136.1	CM	Crack Multiple					3	10		3	
103	138.6	CM	Crack Multiple					7	5		3	
103	154.2	CC	Crack Circumferential					6	5		1	
103	162.7	CM	Crack Multiple					4	9		3	
103	180.5	AMH	Manhole							Finishing manhole: 400-11		
104	0.0	AMH	Manhole							Starting manhole: 400-4		
104	0.0	MWL	Miscellaneous Water Level				20					
104	0.8	CL	Crack Longitudinal					12			2	
104	1.4	CM	Crack Multiple					10	1		3	
104	9.4	CM	Crack Multiple					12	6		3	
104	12.3	CL	Crack Longitudinal					1			2	
104	15.2	CM	Crack Multiple	S01				6	5		3	
104	20.8	TBA	Tap Break-in Activity		4			12				
104	24.5	JSM	Joint Separated Medium	S02							3	
104	27.2	CM	Crack Multiple	F01				6	5		3	
104	30.4	JSM	Joint Separated Medium	F02							3	
104	30.4	CL	Crack Longitudinal					12			2	
104	39.1	CM	Crack Multiple					11	7		3	
104	42.0	CL	Crack Longitudinal					6			2	
104	43.9	TBA	Tap Break-in Activity		8			10		50% FULL OF MUD		
104	47.8	CM	Crack Multiple					12	6		3	
104	54.1	CM	Crack Multiple					11	6		3	
104	60.2	CL	Crack Longitudinal					12			2	
104	69.9	TBA	Tap Break-in Activity		4			1				
104	81.0	CL	Crack Longitudinal					1			2	
104	96.3	CL	Crack Longitudinal					6			2	
104	105.3	CL	Crack Longitudinal					12			2	
104	111.4	CM	Crack Multiple					11	5		3	
104	132.4	CM	Crack Multiple					8	4		3	
104	138.4	CL	Crack Longitudinal					10			2	
104	141.6	CL	Crack Longitudinal					1			2	
104	148.4	AMH	Manhole							Finishing manhole: 400-5		
105	0.0	AMH	Manhole							Starting manhole: 400-3		
105	0.0	MWL	Miscellaneous Water Level				10					
105	44.0	AMH	Manhole							Finishing manhole: 400-4		
106	0.0	AMH	Manhole							Starting manhole: 400-2		
106	0.0	MWL	Miscellaneous Water Level				5					
106	53.4	TFA	Tap Factory Activity		4			12				
106	107.6	TFA	Tap Factory Activity		4			12				
106	128.5	TFA	Tap Factory Activity		4			12				
106	150.7	MWL	Miscellaneous Water Level				20					
106	163.0	AMH	Manhole							Finishing manhole: 400-3		
107	0.0	AMH	Manhole							Starting manhole: 400-11		
107	0.0	MWL	Miscellaneous Water Level				15					
107	1.1	CM	Crack Multiple					6	5		3	
107	3.6	CM	Crack Multiple					6	5		3	
107	11.7	CM	Crack Multiple					6	5		3	
107	15.1	CM	Crack Multiple					6	5		3	
107	24.2	CM	Crack Multiple	S01				6	5		3	
107	55.4	FM	Fracture Multiple					4	8		4	
107	94.0	MWLS	Miscellaneous Water Level Sag				25				2	
107	120.0	CM	Crack Multiple	F01				6	5		3	
107	120.0	AMH	Manhole							Finishing manhole: 400-6		
108	0.0	AMH	Manhole							Starting manhole: 400-1		
108	0.0	MWL	Miscellaneous Water Level				5					
108	67.2	TFA	Tap Factory Activity		4			12				
108	115.1	CL	Crack Longitudinal					6			2	
108	142.4	TFA	Tap Factory Activity		4			12				
108	169.2	AMH	Manhole							Finishing manhole: 400-2		
109	0.0	AMH	Manhole							Starting manhole: 399S		
109	0.0	MWL	Miscellaneous Water Level				15					
109	116.3	MWLS	Miscellaneous Water Level Sag				20				2	
109	209.0	AMH	Manhole							Finishing manhole: 393S		
110	0.0	AMH	Manhole							Starting manhole: 393S		
110	0.0	MWL	Miscellaneous Water Level				15					
110	120.9	TBA	Tap Break-in Activity		6			9		GOT HOLE AT BOTTOM OF TAP		
110	277.0	MWLS	Miscellaneous Water Level Sag				20				2	
110	374.6	AMH	Manhole							Finishing manhole: 388S		
111	0.0	AMH	Manhole							Starting manhole: 388S		
111	0.0	MWL	Miscellaneous Water Level				15					
111	23.4	MWLS	Miscellaneous Water Level Sag				20				2	
111	330.0	MWLS	Miscellaneous Water Level Sag				30				2	
111	369.0	AMH	Manhole							Finishing manhole: 410S		
112	0.0	AMH	Manhole							Starting manhole: 375S		

ID	Distance	Code	PACP Defects or Observations	Continuous	Tap Dia.	2nd Value	% of Pipe	Clock Start	Clock End	Remarks	Structural Grade	O/M Grade
112	0.0	MWL	Miscellaneous Water Level				10					
112	181.2	JOM	Joint Offset Medium								3	
112	193.8	MGO	Miscellaneous General Observation							LOOK AT LOOKS LIKE HOLE		
112	278.5	TFA	Tap Factory Activity		4			3				
112	398.7	AMH	Manhole							Finishing manhole: 374S		
113	0.0	AMH	Manhole							Starting manhole: 374S		
113	0.0	MWL	Miscellaneous Water Level				5					
113	239.1	TFA	Tap Factory Activity		4			3				
113	248.1	JOM	Joint Offset Medium								3	
113	280.0	MWM	Miscellaneous Water Mark				35					
113	400.0	AMH	Manhole							Finishing manhole: 373S		
114	0.0	AMH	Manhole							Starting manhole: 373S		
114	0.0	MWL	Miscellaneous Water Level				15					
114	74.4	JOM	Joint Offset Medium								3	
114	137.2	TFA	Tap Factory Activity		8			12				
114	396.6	AMH	Manhole							Finishing manhole: 301C		
115	0.0	AMH	Manhole							Starting manhole: 372C		
115	0.0	MWL	Miscellaneous Water Level				15					
115	23.0	CM	Crack Multiple					3	7		3	
115	32.8	TFA	Tap Factory Activity		6			10				
115	74.8	TFA	Tap Factory Activity		6			9				
115	93.4	TFA	Tap Factory Activity		6			10				
115	111.1	TF	Tap Factory		6			10				
115	153.2	TFA	Tap Factory Activity		6			10				
115	198.6	TFA	Tap Factory Activity		6			10				
115	237.9	TFA	Tap Factory Activity		6			10				
115	252.8	TBA	Tap Break-in Activity		6			2				
115	270.9	TFA	Tap Factory Activity		6			10				
115	276.0	CM	Crack Multiple					6	5		3	
115	313.2	TFA	Tap Factory Activity		6			10				
115	352.3	TFA	Tap Factory Activity		6			10				
115	394.5	TFA	Tap Factory Activity		6			9				
115	414.2	TFA	Tap Factory Activity		6			10				
115	450.8	CM	Crack Multiple					4	12		3	
115	451.7	TFA	Tap Factory Activity		6			10				
115	470.6	TBA	Tap Break-in Activity		6			12				
115	493.7	CM	Crack Multiple					8	2		3	
115	499.7	TFA	Tap Factory Activity		6			10				
115	532.9	TFA	Tap Factory Activity		6			10				
115	549.4	AMH	Manhole							Finishing manhole: 455		
116	0.0	AMH	Manhole							Starting manhole: 359D		
116	0.0	MWL	Miscellaneous Water Level				10					
116	8.7	TFA	Tap Factory Activity		4			10				
116	47.9	TFA	Tap Factory Activity		5			10				
116	52.9	CM	Crack Multiple					3	8		3	
116	87.1	TFA	Tap Factory Activity		5			10				
116	126.0	TFA	Tap Factory Activity		5			10				
116	165.0	TFA	Tap Factory Activity		4			10				
116	207.2	TFA	Tap Factory Activity		4			10				
116	249.2	TFA	Tap Factory Activity		4			10				
116	251.1	CM	Crack Multiple					3	6		3	
116	254.3	CM	Crack Multiple					2	7		3	
116	288.6	TFA	Tap Factory Activity		4			10				
116	327.4	TFA	Tap Factory Activity		4			10				
116	329.4	CM	Crack Multiple					2	8		3	
116	360.2	TFA	Tap Factory Activity		4			10				
116	399.1	TFA	Tap Factory Activity		4			10				
116	465.1	AMH	Manhole							Finishing manhole: 348C		
117	0.0	AMH	Manhole							Starting manhole: 358D		
117	0.0	MWL	Miscellaneous Water Level				5					
117	2.4	CM	Crack Multiple					11	6		3	
117	30.0	CM	Crack Multiple					9	1		3	
117	43.5	TFA	Tap Factory Activity		5			3				
117	70.4	TFA	Tap Factory Activity		5			3				
117	95.7	CM	Crack Multiple					9	3		3	
117	109.0	TFA	Tap Factory Activity		5			3				
117	149.4	CM	Crack Multiple					3	8	AT TAP	3	
117	150.7	TFA	Tap Factory Activity		5			3				
117	152.3	CM	Crack Multiple					10	2		3	
117	176.5	CM	Crack Multiple					8	3		3	
117	189.6	TFA	Tap Factory Activity		5			3				
117	194.1	CM	Crack Multiple					8	4		3	
117	225.2	TFA	Tap Factory Activity		5			3				
117	261.0	TFA	Tap Factory Activity		5			3				
117	271.9	CL	Crack Longitudinal					11			2	
117	306.3	TFA	Tap Factory Activity		5			3				
117	342.6	TFA	Tap Factory Activity		4			3				
117	369.5	CM	Crack Multiple					8	11		3	
117	381.4	TFA	Tap Factory Activity		5			3				
117	381.7	CL	Crack Longitudinal					3		AT TAP	2	
117	421.8	TFA	Tap Factory Activity		5			3				
117	426.1	CM	Crack Multiple					7	2		3	
117	458.6	TFA	Tap Factory Activity		5			3				
117	466.3	CL	Crack Longitudinal					11			2	
117	524.4	AMH	Manhole							Finishing manhole: 349C		
118	0.0	AMH	Manhole							Starting manhole: 357		
118	0.0	MWL	Miscellaneous Water Level				5					
118	11.1	DAE	Deposits Attached Encrustation				15	5	7			3
118	21.4	TBA	Tap Break-in Activity		6			10				
118	60.6	TFA	Tap Factory Activity		6			9				
118	62.7	CS	Crack Spiral					10	6		2	
118	103.0	TFA	Tap Factory Activity		6			9		FULL OF ROCK		
118	142.4	TFA	Tap Factory Activity		6			9		FULL OF ROCK		
118	181.6	TFA	Tap Factory Activity		6			9		FULL OF ROCK		
118	220.7	TFA	Tap Factory Activity		6			9				
118	222.5	CL	Crack Longitudinal					5			2	
118	260.0	TFA	Tap Factory Activity		6			9				
118	299.4	TFA	Tap Factory Activity		6			9		FULL OF ROCK		
118	322.7	CS	Crack Spiral					8	11		2	

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118	341.6	TFA	Tap Factory Activity		6			9		FULL OF ROCK		
118	376.0	AMH	Manhole							Finishing manhole: 359		
119	0.0	AMH	Manhole							Starting manhole: 355D		
119	0.0	MWL	Miscellaneous Water Level				0					
119	8.4	CM	Crack Multiple					10	2		3	
119	12.7	TFA	Tap Factory Activity		4			3				
119	17.9	CL	Crack Longitudinal					1			2	
119	47.4	CL	Crack Longitudinal					2			2	
119	58.1	TFA	Tap Factory Activity		4			3				
119	68.5	CM	Crack Multiple					11	6		3	
119	77.8	CM	Crack Multiple					6	5		3	
119	94.0	TFA	Tap Factory Activity		5			3				
119	107.6	CM	Crack Multiple					6	1		3	
119	129.1	CM	Crack Multiple					9	3		3	
119	136.5	TFA	Tap Factory Activity		5			3				
119	161.8	CM	Crack Multiple					8	4		3	
119	175.4	TFA	Tap Factory Activity		5			3				
119	214.3	TFA	Tap Factory Activity		5			3				
119	253.4	TFA	Tap Factory Activity		5			3				
119	295.5	TFA	Tap Factory Activity		5			3				
119	334.5	TFA	Tap Factory Activity		5			3				
119	373.4	TFA	Tap Factory Activity		6			3				
119	412.4	TFA	Tap Factory Activity		5			3				
119	451.3	TFA	Tap Factory Activity		5			3				
119	496.0	AMH	Manhole							Finishing manhole: 358D		
120	0.0	AMH	Manhole							Starting manhole: 352C-4		
120	0.0	MWL	Miscellaneous Water Level				10					
120	23.8	MGO	Miscellaneous General Observation							BOLTS OUT SIDE OF PIPE		
120	111.9	AMH	Manhole							Finishing manhole: 352C-5		
121	0.0	AMH	Manhole							Starting manhole: 352C-3		
121	0.0	MWL	Miscellaneous Water Level				10					
121	70.7	AMH	Manhole							Finishing manhole: 352C-4		
122	0.0	AMH	Manhole							Starting manhole: 352C-2		
122	0.0	MWL	Miscellaneous Water Level				10					
122	134.0	DAE	Deposits Attached Encrustation				10	4	8	HAS BRICK IN IT		2
122	188.0	AMH	Manhole							Finishing manhole: 352C-3		
123	0.0	AMH	Manhole							Starting manhole: 352C-1		
123	0.0	MWL	Miscellaneous Water Level				10					
123	0.5	MSA	Miscellaneous Survey Abandoned							Inspection abandoned: Surcharged/Debris		
124	0.0	AMH	Manhole							Starting manhole: 352C		
124	0.0	MWL	Miscellaneous Water Level				15					
124	128.5	AMH	Manhole							Finishing manhole: 352C-1		
125	0.0	AMH	Manhole							Starting manhole: 352		
125	0.0	MWL	Miscellaneous Water Level				0					
125	12.0	CM	Crack Multiple					4	8		3	
125	16.3	MSA	Miscellaneous Survey Abandoned							Inspection abandoned: No Access CAN"T MAKE TURN		
125	17.1	TBA	Tap Break-in Activity		6			12				
125	17.2	AMH	Manhole							?		
126	0.0	AMH	Manhole							Starting manhole: 350C		
126	0.0	MWL	Miscellaneous Water Level				5					
126	41.2	TBA	Tap Break-in Activity		8			12				
126	86.4	TBA	Tap Break-in Activity		8			3				
126	114.1	TBA	Tap Break-in Activity		8			10				
126	137.5	TBA	Tap Break-in Activity		8			12				
126	302.2	TBA	Tap Break-in Activity		6			2				
126	307.1	AMH	Manhole							Finishing manhole: 352C		
127	0.0	AMH	Manhole							Starting manhole: 350C		
127	0.0	MWL	Miscellaneous Water Level				5					
127	41.2	TBA	Tap Break-in Activity		8			12				
127	86.4	TBA	Tap Break-in Activity		8			3				
127	114.1	TBA	Tap Break-in Activity		8			10				
127	137.5	TBA	Tap Break-in Activity		8			12				
127	302.2	TBA	Tap Break-in Activity		6			2				
127	307.1	AMH	Manhole							Finishing manhole: 352C		
128	0.0	AMH	Manhole							Starting manhole: 349C		
128	0.0	MWL	Miscellaneous Water Level				5					
128	133.0	TBA	Tap Break-in Activity		8			12				
128	251.9	AMH	Manhole							Finishing manhole: 350C		
129	0.0	AMH	Manhole							Starting manhole: 349C		
129	0.0	MWL	Miscellaneous Water Level				5					
129	133.0	TBA	Tap Break-in Activity		8			12				
129	251.9	AMH	Manhole							Finishing manhole: 350C		
130	0.0	AMH	Manhole							Starting manhole: 348C		
130	0.0	MWL	Miscellaneous Water Level				20					
130	15.5	CL	Crack Longitudinal					5			2	
130	23.8	CL	Crack Longitudinal					1			2	
130	30.2	CM	Crack Multiple					7	5		3	
130	39.0	AMH	Manhole							Finishing manhole: 349C		
131	0.0	AMH	Manhole							Starting manhole: 345C		
131	0.0	MWL	Miscellaneous Water Level				10					
131	14.6	AZ	Access Point Other							Finishing manhole: 348C		
132	0.0	AMH	Manhole							Starting manhole: 316C		
132	0.0	MWL	Miscellaneous Water Level				10					
132	22.2	TBA	Tap Break-in Activity		6			9				
132	61.4	TBA	Tap Break-in Activity		6			9				
132	100.6	TBA	Tap Break-in Activity		6			9				
132	140.0	TBA	Tap Break-in Activity		6			9				
132	164.8	TBA	Tap Break-in Activity		6			9				
132	182.4	TBA	Tap Break-in Activity		6			9				
132	192.9	CM	Crack Multiple	S01				7	5		3	
132	206.7	TBA	Tap Break-in Activity		6			3				
132	207.2	TBA	Tap Break-in Activity		6			3				
132	214.8	CM	Crack Multiple					8	5		3	
132	221.5	TBA	Tap Break-in Activity		6			9				
132	221.5	CM	Crack Multiple					7	4		3	
132	222.0	TBA	Tap Break-in Activity		5			9				
132	264.2	TBA	Tap Break-in Activity		6			9				
132	288.0	CM	Crack Multiple	F01				7	5		3	

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132	300.6	TBA	Tap Break-in Activity		6			9				
132	342.8	TBA	Tap Break-in Activity		6			9				
132	381.7	TBA	Tap Break-in Activity		6			9				
132	405.9	AMH	Manhole							Finishing manhole: 310C		
133	0.0	AMH	Manhole							Starting manhole: 310C		
133	0.0	MWL	Miscellaneous Water Level				10					
133	196.8	TBA	Tap Break-in Activity		4			12				
133	233.4	MWM	Miscellaneous Water Mark				75					
133	233.4	MGO	Miscellaneous General Observation							HOLDS WATER 35%		
133	257.8	X	Collapse				45			IT IS LINED BUT IS EGG SHAPED	5	
133	269.8	AMH	Manhole							Finishing manhole: 299C		
134	0.0	AMH	Manhole							Starting manhole: 301C		
134	0.0	MWL	Miscellaneous Water Level				5					
134	14.5	AMH	Manhole							Finishing manhole: 108" RCP		
135	0.0	AMH	Manhole							Starting manhole: 299C		
135	0.0	MWL	Miscellaneous Water Level				10					
135	118.0	AMH	Manhole							Finishing manhole: DEAD END		
136	0.0	AMH	Manhole							Starting manhole: 254D		
136	0.0	MWL	Miscellaneous Water Level				0					
136	30.8	AMH	Manhole							OFFSET JOINT CANT MAKE IT UP		
136	31.4	JOLD	Joint Offset Large Defective		3	2					4	
137	0.0	AMH	Manhole							Starting manhole: 240D		
137	0.0	MWL	Miscellaneous Water Level				5					
137	10.5	AMH	Manhole							Finishing manhole: 239D		
138	0.0	AMH	Manhole							Starting manhole: 239D		
138	0.0	MWL	Miscellaneous Water Level				5					
138	72.4	TBA	Tap Break-in Activity		8			9				
138	84.8	CM	Crack Multiple					6	5		3	
138	91.1	CM	Crack Multiple	S01				6	5		3	
138	95.4	IRB	Infiltration Runner Barrel					11	3			4
138	100.2	CM	Crack Multiple	F01				6	5		3	
138	109.1	TBA	Tap Break-in Activity		6			2				
138	143.7	H	Hole					4	8		5	
138	186.7	AMH	Manhole							Finishing manhole: MGC-516		
139	0.0	AMH	Manhole							Starting manhole: 212S		
139	0.0	MWL	Miscellaneous Water Level				10					
139	2.7	H	Hole		2	2		4	7		5	
139	2.7	FL	Fracture Longitudinal					7			3	
139	11.5	CS	Crack Spiral					2	8		2	
139	38.9	CM	Crack Multiple					9	3		3	
139	41.5	CS	Crack Spiral					6	1		2	
139	59.5	CS	Crack Spiral					2	5		2	
139	65.5	CS	Crack Spiral					3	6		2	
139	71.2	CM	Crack Multiple					5	7		3	
139	77.6	CM	Crack Multiple					3	7		3	
139	92.1	CM	Crack Multiple					3	9		3	
139	98.7	CM	Crack Multiple					3	8		3	
139	101.0	CS	Crack Spiral					2	7		2	
139	112.9	CL	Crack Longitudinal					6			2	
139	119.0	B	Broken					4	7		4	
139	142.4	RFJ	Roots Fine Joint					9	3			1
139	174.8	FM	Fracture Multiple					5	10		4	
139	181.6	BVV	Broken Void Visible					6	5		5	
139	190.1	CS	Crack Spiral					5	9		2	
139	199.0	CM	Crack Multiple					6	5		3	
139	208.2	CS	Crack Spiral					6	5		2	
139	211.3	B	Broken					6	5		4	
139	223.2	HVV	Hole Void Visible		3	4		4	7	BOTTOM OF PIPE GONE	5	
139	265.2	AMH	Manhole							Finishing manhole: 223S		
140	0.0	AMH	Manhole							Starting manhole: 205S		
140	0.0	MWL	Miscellaneous Water Level				5					
140	9.0	CS	Crack Spiral					7	6		2	
140	83.8	CM	Crack Multiple					7	9		3	
140	86.3	CS	Crack Spiral					4	8		2	
140	125.1	CS	Crack Spiral					3	9		2	
140	131.3	CL	Crack Longitudinal					6			2	
140	139.9	RFJ	Roots Fine Joint					3	9			1
140	139.9	CM	Crack Multiple					3	9		3	
140	182.6	HVV	Hole Void Visible		2	2		4	5		5	
140	188.1	AMH	Manhole							Finishing manhole: 212S		
141	0.0	AMH	Manhole							Starting manhole: 118		
141	0.0	MWL	Miscellaneous Water Level				5					
141	27.5	MWLS	Miscellaneous Water Level Sag				40				3	
141	83.9	AMH	Manhole							Finishing manhole: 97		

Estimated Budget - America's Central Port

Line	Service	Units	U/M	Price	Total	Category
1	**Mobilization - CIPP**	1	LS	$ 7,500.00	$ **7,500**	CIPP
2	CIPP 8" x 6.0mm	1,597	LF	$ 26.00	$ **41,509**	CIPP
3	CIPP 10" x 6.0mm	1,081	LF	$ 32.00	$ **34,579**	CIPP
4	CIPP 12" x 6.0mm	4,189	LF	$ 36.00	$ **150,815**	CIPP
5	CIPP: 15"x 7.5mm	4,156	EA	$ 45.00	$ **187,038**	CIPP
6	CIPP 18" x 7.5mm	2,182	LF	$ 55.00	$ **120,010**	CIPP
7	CIPP 24" x 9.0mm	806	LF	$ 75.00	$ **60,435**	CIPP
8	CIPP 30" x 10.5MM	768	LF	$ 95.00	$ **72,998**	CIPP
9	CIPP: Bypass Pumping per 1,000 GPM Per Occurrence Per Day	5	DAY	$ 1,500.00	$ **7,500**	CIPP
10	**Mobilization - Dig and Repair**	1	LS	$ 7,500.00	$ **7,500**	Dig/Repair
11	Dig/Repair: MH, New	-	EA	$ 250.00	$ -	Dig/Repair
12	Dig/Repair: MH, RTG/Uncover	1	EA	$ 50.00	$ **50**	Dig/Repair
13	Dig/Repair: MH, New	-	EA	$ 2,500.00	$ -	Dig/Repair
14	Dig/Repair: Pipe, Point Repair - 6" - 12"	24	LF	$ 2,000.00	$ **48,000**	Dig/Repair
15	Dig/Repair: Pipe, Point Repair - 15" - 42"	18	LF	$ 3,500.00	$ **63,000**	Dig/Repair
16	Dig/Repair: Tap, New	2	EA	$ 3,500.00	$ **7,000**	Dig/Repair
17	**Mobilization - Grouting**	1	LS	$ 3,500.00	$ **3,500**	Grouting
18	Grouting: Joints - Sealing 8"	-	EA	$ 5.00	$ -	Grouting
19	Grouting: Joints - Testing 10"	-	EA	$ 70.00	$ -	Grouting
20	Grouting: Joints - Sealing 10"	-	EA	$ 7.00	$ -	Grouting
21	Grouting: Joints - Testing 12"	-	EA	$ 80.00	$ -	Grouting
22	Grouting: Joints - Sealing 12"	-	EA	$ 8.00	$ -	Grouting
23	Grouting: Laterals	268	EA	$ 850.00	$ **227,800**	Grouting
24	Excess Grout	1,000	GAL	$ 14.00	$ **14,000**	Grouting
25	**Mobilization - Hourly Work**	1	EA	$ 3,000.00	$ **3,000**	Hourly
26	Hourly Work: T/M	5	EA	$ 820.00	$ **4,100**	Hourly
27	MH Rehab: Bench/Channel	-	EA	$ 1,000.00	$ -	Manhole Rehab
28	MH Rehab: Lining Additional VF	-	EA	$ 500.00	$ -	Manhole Rehab
29	MH Rehab: Other	-	VF	$ 1,000.00	$ -	Manhole Rehab
30	MH Rehab: Coating	-	EA	$ 150.00	$ -	Manhole Rehab
	Estimated Total				**$ 1,060,334**	

General Pipe Survey Information

Diameter					
	Combined	Not Known	Sanitary	Stormwater	Total
8	15	715	9,220	31	9,981
10	284		420	376	1,081
12	411	1,339	380	4,004	6,134
15	951	73	767	4,166	5,956
18		393		2,171	2,564
24	600			1,938	2,539
29				500	500
30		429		1,571	2,000
42				84	84
Total	2,260	2,949	10,787	14,841	30,837

Structural Pipe Rating by Pipe Type

# of SPRI	Pipe Usage				
SPRI	Combined	Not Known	Sanitary	Stormwater	Totals
5.0	1				1
4.2			1		1
4.0	1		1	2	4
3.7			1		1
3.6				2	2
3.5	2	1	1	2	6
3.4			1		1
3.3			2	1	3
3.2				1	1
3.1			1		1
3.0	2	3	5	11	21
Totals	6	4	13	19	42

Maintenance Pipe Rating by Pipe Type

# of MPRI	Pipe Usage				
MPRI	Combined	Not Known	Sanitary	Stormwater	Totals
4.0				1	1
3.4		1			1
3.0			1	4	5
2.8		1			1
2.7				1	1
2.3			1		1
2.2		1			1
2.0	1		1	6	8
Totals	1	3	3	12	19

Overall Rating Ratings by Pipe Type

# of OPRI	Pipe Usage				
OPRI	Combined	Not Known	Sanitary	Stormwater	Totals
5.0	1				1
4.0	1		1	1	3
3.9			1		1
3.7			1		1
3.6				2	2
3.5	2			2	4
3.4		1	1		2
3.3			2	1	3
3.2			1	1	2
3.0	2	2	5	12	21
2.9				2	2
2.8		2	2	4	8
2.7			1	1	2
2.6		1	1		2
2.5			1	4	5
2.4				2	2
2.3		1		6	7
2.2				1	1
2.1			1	1	2
2.0	2	1	7	9	19
0.0	5	2	24	20	51
Totals	13	10	49	69	141

Likelihood of Failure Pipe Rating by Pipe Type

# of LOF	Pipe Usage				
LOF	Combined	Not Known	Sanitary	Stormwater	Totals
4.5			1		1
4.4			1		1
4.3			1	3	4
4.3	2		6	3	11
4.2				1	1
3.8				1	1
3.7		1			1
3.6				1	1
3.5		1	2	2	5
3.4	2		1	7	10
3.3	1	3	1	2	7
3.2			1	2	3
3.1				1	1
3.0				1	1
2.9		1			1
2.8				4	4
2.7	1		1	3	5
2.6		1	3	9	13
2.5				3	3
2.3				1	1
2.1				1	1
1.8			2		2
1.8	2	1	5	4	12
0.0	5	2	24	20	51
Totals	13	10	49	69	141

Total Observations or Defects

PACP Defects or Observations	# of Defects/Observations
Manhole	261
Tap Factory Activity	245
Crack Multiple	236
Crack Longitudinal	166
Miscellaneous Water Level	151
Tap Break-in Activity	143
Fracture Multiple	34
Crack Spiral	33
Joint Offset Medium	24
Deposits Attached Encrustation	21
Miscellaneous Water Level Sag	17
Roots Fine Joint	15
Miscellaneous General Observation	15
Hole	13
Joint Separated Medium	10
Miscellaneous Survey Abandoned	9
Tap Factory Capped	8
Joint Offset Large	8
Tap Break-in Capped	7
Hole Soil Visible	6
Roots Tap Joint	5
Miscellaneous Material Change	5
Miscellaneous Water Mark	4
Access Point Other	4
Fracture Spiral	4
Intruding Sealing Material Grout	4
Hole Void Visible	4
Infiltration Runner	3
Roots Fine Connection	3
Tap Break-in/Hammer	3
Broken Soil Visible	3
Deformed Flexible Bulging Inverse Curvature	3
Tap Factory	3
Collapse	2
Broken	2
Roots Medium Joint	2
Access Point End of Pipe	2
Infiltration Runner Barrel	2
Crack Circumferential	2
Tap Break-in/Hammer Defective	2
Fracture Longitudinal	2
Intruding Sealing Material Other	1
Joint Separated Large	1
Obstruction Built Into Structure	1
Point Repair Other Defective	1
Tap Break-in Abandoned	1
Infiltration Dripper	1
Miscellaneous General Photograph	1
Joint Offset Large Defective	1
Obstruction Construction Debris	1
Infiltration Weeper	1
Infiltration Stain	1
Infiltration Runner Joint	1
Broken Void Visible	1
Deformed Rigid	1
Totals	**1,500**

Top 10 Observations or Defects

PACP Defects or Observations	# of Defects/Observations
Manhole	261
Tap Factory Activity	245
Crack Multiple	236
Crack Longitudinal	166
Miscellaneous Water Level	151
Tap Break-in Activity	143
Fracture Multiple	34
Crack Spiral	33
Joint Offset Medium	24
Deposits Attached Encrustation	21
Totals	**1,314**

Tap Information

PACP Defects or Observations	# of Defects/Observations
Tap Factory Activity	245
Tap Break-in Activity	143
Tap Factory Capped	8
Tap Break-in Capped	7
Tap Factory	3
Tap Break-in/Hammer	3
Tap Break-in/Hammer Defective	2
Tap Break-in Abandoned	1
Totals	**412**

Structural Observations or Defects

PACP Defects or Observations	# of Defects/Observations
Crack Multiple	236
Crack Longitudinal	166
Fracture Multiple	34
Crack Spiral	33
Joint Offset Medium	24
Miscellaneous Water Level Sag	17
Hole	13
Joint Separated Medium	10
Joint Offset Large	8
Hole Soil Visible	6
Hole Void Visible	4
Fracture Spiral	4
Broken Soil Visible	3
Deformed Flexible Bulging Inverse (	3
Broken	2
Fracture Longitudinal	2
Crack Circumferential	2
Collapse	2
Broken Void Visible	1
Point Repair Other Defective	1
Deformed Rigid	1
Joint Separated Large	1
Joint Offset Large Defective	1
Totals	**574**

O/M Observations or Defects

PACP Defects or Observations	# of Defects/Observations
Deposits Attached Encrustation	21
Roots Fine Joint	15
Roots Tap Joint	5
Intruding Sealing Material Grout	4
Infiltration Runner	3
Roots Fine Connection	3
Roots Medium Joint	2
Infiltration Runner Barrel	2
Infiltration Weeper	1
Infiltration Stain	1
Infiltration Dripper	1
Infiltration Runner Joint	1
Obstruction Construction Debris	1
Intruding Sealing Material Other	1
Obstruction Built Into Structure	1
Totals	**62**

Project Rehabilitation Totals

Rec1	CIPP: Line Segment
Rec2	All
Rec3	All
Rec4	All
Rec5	All
Diameter	**Total LF**
8	982
10	705
12	2,931
15	3,049
18	1,589
24	423
30	768
Totals	**10,447**

Rec1	Dig/Repair: MH, RTG/Uncover
Rec2	All
Rec3	All
Rec4	All
Rec5	All
Diameter	**# of MH**
18	1
Totals	**1**

Rec1	Dig/Repair: Pipe, New Complete Length
Rec2	All
Rec3	All
Rec4	All
Rec5	All
Diameter	**Est. LF**
8	226
Totals	**226**

Rec1	All
Rec2	CIPP: Line Segment
Rec3	All
Rec4	All
Rec5	All
Diameter	**Total LF**
12	1,259
15	1,107
18	593
24	383
Totals	**3,342**

Rec1	All
Rec2	All
Rec3	CIPP: Line Segment
Rec4	All
Rec5	All
Diameter	**Total LF**
8	472
10	376
Totals	**848**

Rec1	All
Rec2	All
Rec3	All
Rec4	CIPP: Line Segment
Rec5	All
Diameter	**Total LF**
8	143
Totals	**143**

Project Rehabilitation Totals

Rec1	Dig/Repair: Pipe, Point Repair
Rec2	All
Rec3	All
Rec4	All
Rec5	All
Diameter	**# of Repairs**
8	10
12	5
15	7
18	2
24	2
42	1
Totals	**27**

Rec1	All
Rec2	Dig/Repair: Pipe, Point Repair
Rec3	All
Rec4	All
Rec5	All
Diameter	**# of Repairs**
8	5
10	1
15	2
24	1
Totals	**9**

Rec1	All
Rec2	All
Rec3	Dig/Repair: Pipe, Point Repair
Rec4	All
Rec5	All
Diameter	**# of Repairs**
8	3
15	1
Totals	**4**

Rec1	All
Rec2	All
Rec3	All
Rec4	Dig/Repair: Pipe, Point Repair
Rec5	All
Diameter	**# of Repairs**
15	1
Totals	**1**

Rec1	All
Rec2	All
Rec3	All
Rec4	All
Rec5	Dig/Repair: Pipe, Point Repair
Diameter	**# of Repairs**
15	1
Totals	**1**

Rec1	Dig/Repair: Tap, New
Rec2	All
Rec3	All
Rec4	All
Rec5	All
Diameter	**# of Defective**
10	1
12	1
Totals	**2**

Rec1	Hourly Work: T/M
Rec2	All
Rec3	All
Rec4	All
Rec5	All
Diameter	**# of Segments**
18	1
24	2
29	1
Totals	**4**

Rec1	All
Rec2	Hourly Work: T/M
Rec3	All
Rec4	All
Rec5	All
Diameter	**# of Segments**
24	1
Totals	**1**

Project Rehabilitation Totals

Rec1	All
Rec2	Grouting: Laterals
Rec3	All
Rec4	All
Rec5	All
Diameter	**# of Laterals**
8	10
10	3
12	71
15	58
18	36
24	9
Total LF	**187**

Rec1	All
Rec2	All
Rec3	Grouting: Laterals
Rec4	All
Rec5	All
Diameter	**# of Laterals**
12	12
15	24
18	6
24	11
Total LF	**53**

Rec1	All
Rec2	All
Rec3	All
Rec4	Grouting: Laterals
Rec5	All
Diameter	**# of Laterals**
8	9
10	14
Total LF	**23**

Rec1	All
Rec2	All
Rec3	All
Rec4	All
Rec5	Grouting: Laterals
Diameter	**# of Laterals**
8	5
Total LF	**5**

Code	Description
ACB	Access Point Catch Basin
ACOH	Access Point Cleanout House
ACOM	Access Point Cleanout Mainline
ACOP	Access Point Cleanout Propertyline
ADP	Access Point Discharge Point
AEP	Access Point End of Pipe
AJB	Access Point Junction Box
AM	Access Point Meter
AMH	Access Point Manhole
AOC	Access Point Special Chamber
ATC	Access Point Tee Connection
AWA	Access Point Wastewater Access Device
AWW	Access Point Wet Well
AZ	Access Point Other
B	Broken
BSV	Broken Soil Visible
BVV	Broken Void Visible
CC	Crack Circumferential
CH2	Crack Longitudinal Hinge, 2
CH3	Crack Longitudinal Hinge, 3
CH4	Crack Longitudinal Hinge, 4
CL	Crack Longitudinal
CM	Crack Multiple
CS	Crack Spiral
DAE	Deposits Attached Encrustation
DAGS	Deposits Attached Grease
DAR	Deposits Attached Ragging
DAZ	Deposits Attached Other
DB	Displaced Brick
DFBI	Deformed Flexible Bulging Inverse Curvature
DFBR	Deformed Flexible Bulging Round
DFC	Deformed Flexible Creasing
DFE	Deformed Flexible Elliptical
DI	Brickwork Dropped Invert
DNF	Deposits Ingress Fine
DNGV	Deposits Ingress Gravel
DNZ	Deposits Ingress Other
DR	Deformed Rigid
DSC	Deposits Settled Hard/Compacted
DSF	Deposits Settled Fine
DSGV	Deposits Settled Gravel
DSZ	Deposits Settled Other
DTBI	Deformed Brick Bulging Inverse Curvature
DTBR	Deformed Brick Bulging Round
FC	Fracture Circumferential
FH2	Fracture Longitudinal Hinge, 2
FH3	Fracture Longitudinal Hinge, 3
FH4	Fracture Longitudinal Hinge, 4
FL	Fracture Longitudinal
FM	Fracture Multiple
FS	Fracture Spiral
GRT	Grout at a Location
GTFJ	Grout Test Fail Joint
GTFL	Grout Test Fail Lateral
GTPJ	Grout Test Pass Joint
GTPL	Grout Test Pass Lateral
GTUJ	Grout Test Unable to Test Joint
GTUL	Grout Test Unable to Test Lateral
H	Hole

Code	Description
HSV	Hole Soil Visible
HVV	Hole Void Visible
ID	Infiltration Dripper
IDB	Infiltration Dripper Barrel
IDC	Infiltration Dripper Connection
IDJ	Infiltration Dripper Joint
IDL	Infiltration Dripper Lateral
IG	Infiltration Gusher
IGB	Infiltration Gusher Barrel
IGC	Infiltration Gusher Connection
IGJ	Infiltration Gusher Joint
IGL	Infiltration Gusher Lateral
IR	Infiltration Runner
IRB	Infiltration Runner Barrel
IRC	Infiltration Runner Connection
IRJ	Infiltration Runner Joint
IRL	Infiltration Runner Lateral
IS	Infiltration Stain
ISB	Infiltration Stain Barrel
ISC	Infiltration Stain Connection
ISGT	Intruding Sealing Material Grout
ISJ	Infiltration Stain Joint
ISL	Infiltration Stain Lateral
ISSR	Intruding Sealing Material Sealing Ring
ISSRB	Intruding Sealing Material Sealing Ring Broken
ISSRH	Intruding Sealing Material Sealing Ring Hanging
ISSRL	Intruding Sealing Material Sealing Ring Loose/Poorly Fitting
ISZ	Intruding Sealing Material Other
IW	Infiltration Weeper
IWB	Infiltration Weeper Barrel
IWC	Infiltration Weeper Connection
IWJ	Infiltration Weeper Joint
IWL	Infiltration Weeper Lateral
JAL	Joint Angular Large
JAM	Joint Angular Medium
JAS	Joint Angular Small
JOL	Joint Offset Large
JOLD	Joint Offset Large Defective
JOM	Joint Offset Medium
JOMD	Joint Offset Medium Defective
JOS	Joint Offset Small
JOSD	Joint Offset Small Defective
JSL	Joint Separated Large
JSM	Joint Separated Medium
JSS	Joint Separated Small
LD	Line Down
LFAC	Lining Feature Abandoned Connection
LFAS	Lining Feature Annular Space
LFB	Lining Feature Blistered
LFCS	Lining Feature Service Cut Shifted
LFD	Lining Feature Detached
LFDC	Lining Feature Discoloration
LFDE	Lining Feature Defective End
LFDL	Lining Feature Delaminating
LFOC	Lining Feature Overcut Service
LFRS	Lining Feature Resin Slug
LFUC	Lining Feature Undercut Service
LFW	Lining Feature Wrinkled
LFZ	Lining Feature Other

Code	Description
LL	Line Left
LLD	Line Left Down
LLU	Line Left Up
LR	Line Right
LRD	Line Right Down
LRU	Line Right Up
LU	Line Up
MB	Missing Brick
MCU	Miscellaneous Camera Underwater
MGO	Miscellaneous General Observation
MGP	Miscellaneous General Photo
MJL	Miscellaneous Pipe Joint Length Change
MLC	Miscellaneous Lining Change
MMC	Miscellaneous Material Change
MML	Missing Mortar Large
MMM	Missing Mortar Medium
MMS	Missing Mortar Small
MSA	Miscellaneous Abandoned Survey
MSC	Miscellaneous Shape/Size Change
MWL	Miscellaneous Water Level
MWLS	Miscellaneous Water Level Sag
MWM	Miscellaneous Water Mark
MYN	Miscellaneous Dye Test Not Visible
MYV	Miscellaneous Dye Test Visible
OBB	Obstruction Brick or Masonry
OBC	Obstruction Thru Connection
OBI	Obstruction Intruding Through Wall
OBJ	Obstruction Wedged In The Joint
OBM	Obstruction Pipe Material in Invert
OBN	Obstruction Construction Debris
OBP	Obstruction External Pipe or Cable
OBR	Obstruction Rocks
OBS	Obstruction Built Into Structure
OBZ	Obstruction Other
RBB	Roots Ball Barrel
RBC	Roots Ball Connection
RBJ	Roots Ball Joint
RBL	Roots Ball Lateral
RFB	Roots Fine Barrel
RFC	Roots Fine Connection
RFJ	Roots Fine Joint
RFL	Roots Fine Lateral
RMB	Roots Medium Barrel
RMC	Roots Medium Connection
RMJ	Roots Medium Joint
RML	Roots Medium Lateral
RPL	Point Repair Liner
RPLD	Point Repair Liner Defective
RPP	Point Repair Patch
RPPD	Point Repair Patch Patch Defective
RPR	Point Repair Replacement
RPRD	Point Repair Defective Replacement
RPZ	Point Repair Other
RPZD	Point Repair Other Defective
RTB	Roots Tap Barrel
RTC	Roots Tap Connection
RTJ	Roots Tap Joint
RTL	Roots Tap Lateral
SAM	Surface Damage Aggregate Missing

Code	Description
SAP	Surface Damage Aggregate Projecting
SAV	Surface Damage Aggregate Visible
SCP	Surface Damage Corrosion
SMW	Surface Damage Missing Wall
SRC	Surface Damage Reinforcement Corroded
SRI	Surface Damage Roughness Increased
SRP	Surface Damage Reinforcement Projecting
SRV	Surface Damage Reinforcement Visible
SSC	Surface Spalling of Damage Coating
SSS	Surface Damage Surface Spalling
SZ	Surface Damage Other
TB	Tap Break-in/Hammer
TBA	Tap Break-in Activity
TBB	Tap Break-in Abandoned
TBC	Tap Break-in Capped
TBD	Tap Break-in/Hammer Defective
TBI	Tap Break-in Intruding
TF	Tap Factory
TFA	Tap Factory Activity
TFB	Tap Factory Abandoned
TFC	Tap Factory Capped
TFD	Tap Factory Defective
TFI	Tap Factory Intruding
TR	Tap Rehabilitated
TRA	Tap Rehabilitated Activity
TRB	Tap Rehabilitated Abandoned
TRC	Tap Rehabilitated Capped
TRD	Tap Rehabilitated Defective
TRI	Tap Rehabilitated Intruding
TS	Tap Saddle
TSA	Tap Saddle Activity
TSB	Tap Saddle Abandoned
TSC	Tap Saddle Capped
TSD	Tap Saddle Defective
TSI	Tap Saddle Intruding
VC	Vermin Cockroach
VR	Vermin Rat
VZ	Vermin Other
WFC	Weld Failure Circumferential
WFL	Weld Failure Longitudinal
WFM	Weld Failure Multiple
WFS	Weld Failure Spiral
WFZ	Weld Failure Other
X	Collapse

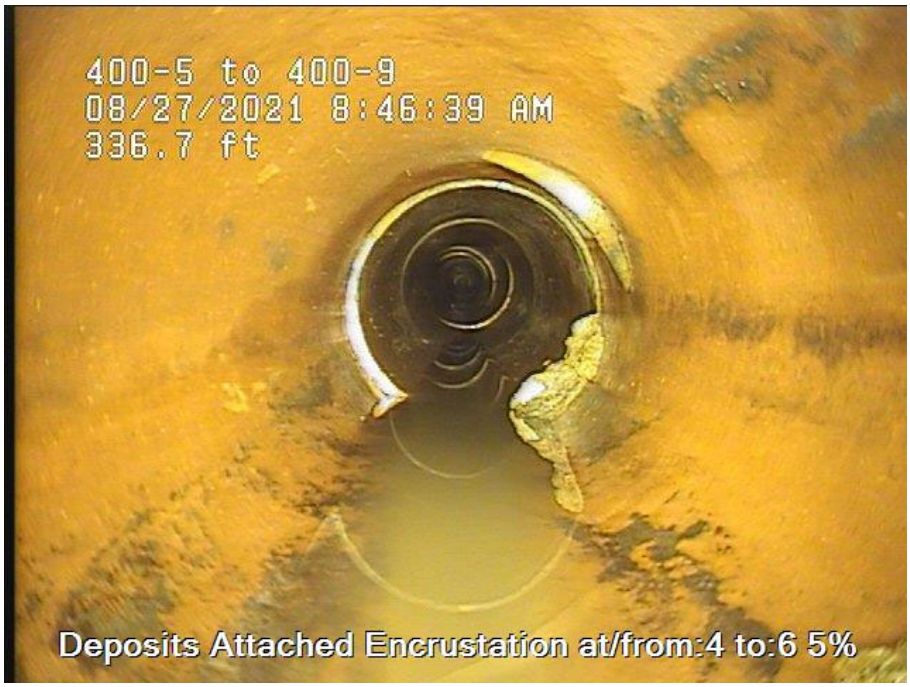
EXHIBIT B

PIPE INSPECTION REFERENCE PHOTOGRAPHS

Example: Multiple Cracks

Example: Multiple Cracks

Example: Deposits with Attached Encrustation



Example: Deposits with Attached Encrustation

Example: Broken Pipe

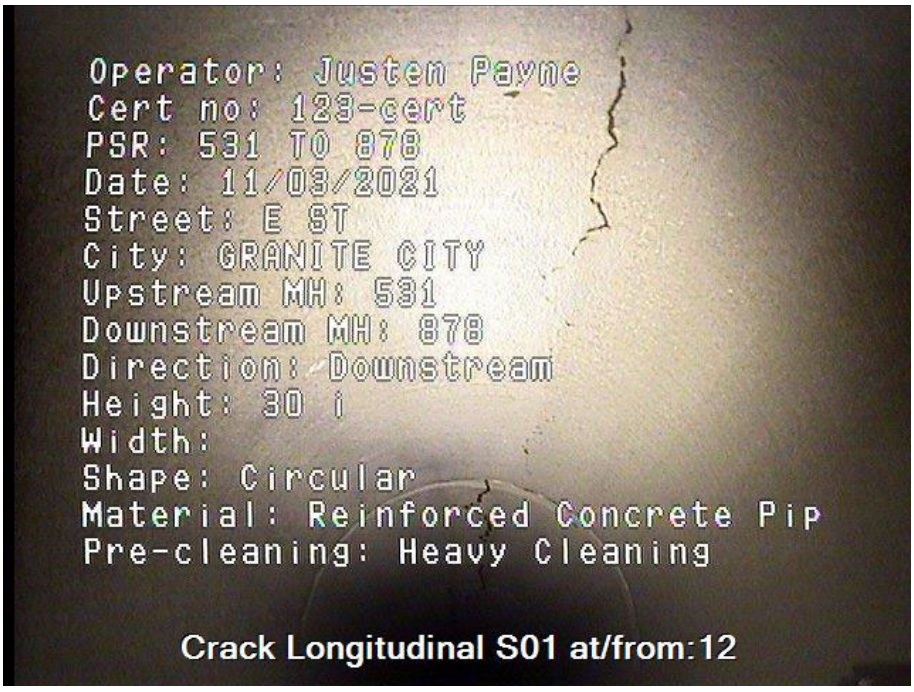
Example: Broken Pipe – Void Visible

Example: Joint Offset – Large

Example: Joint Offset Medium

Example: Spiral Crack

Example: Spiral Crack



Example: Longitudinal Crack

Example: Longitudinal Crack

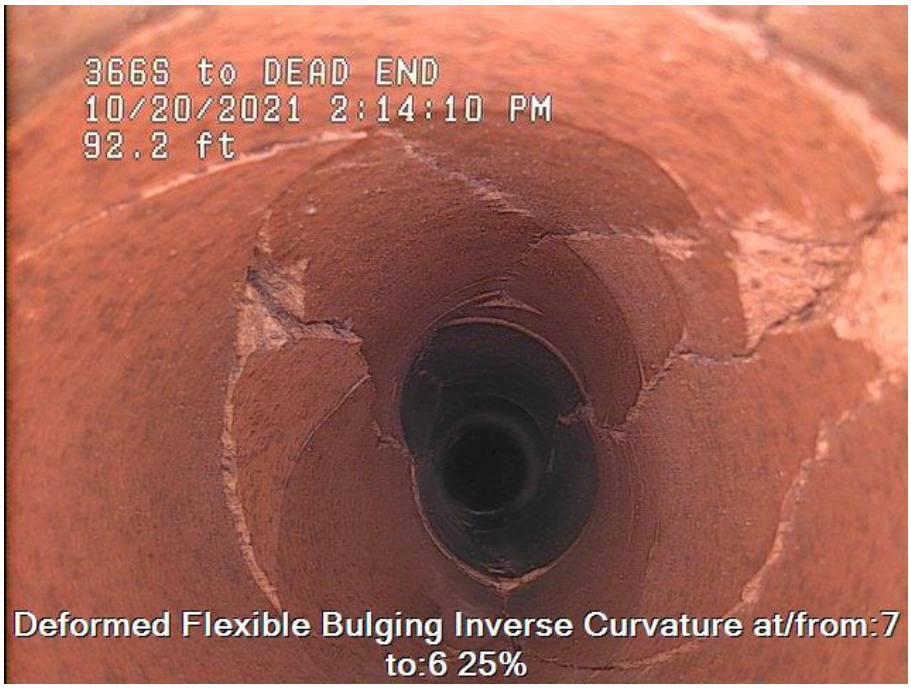
Example: Tap Break-In Activity

Example: Tap – Factory Capped

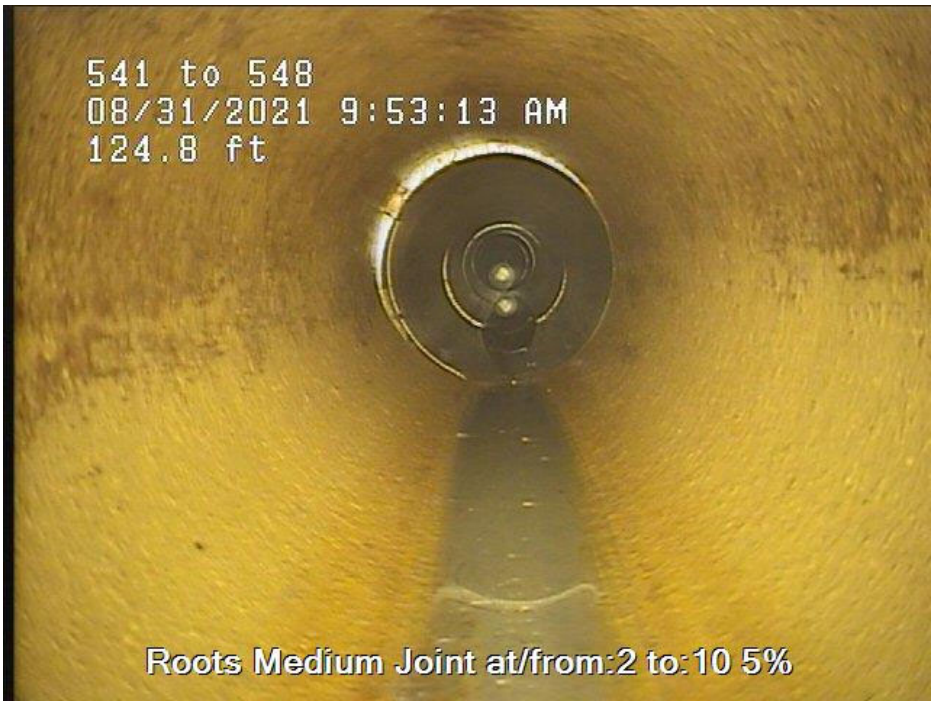
Example: Factory Tap - Intruding on Pipe Area

Example: Hole / Void

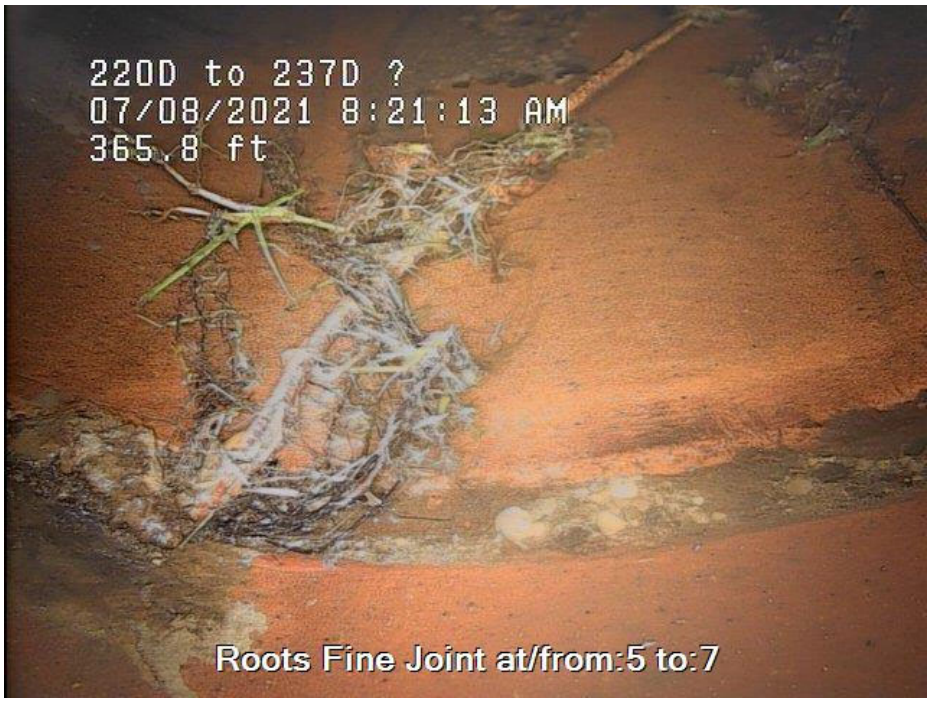
Example: Deformed Pipe (Rigid)



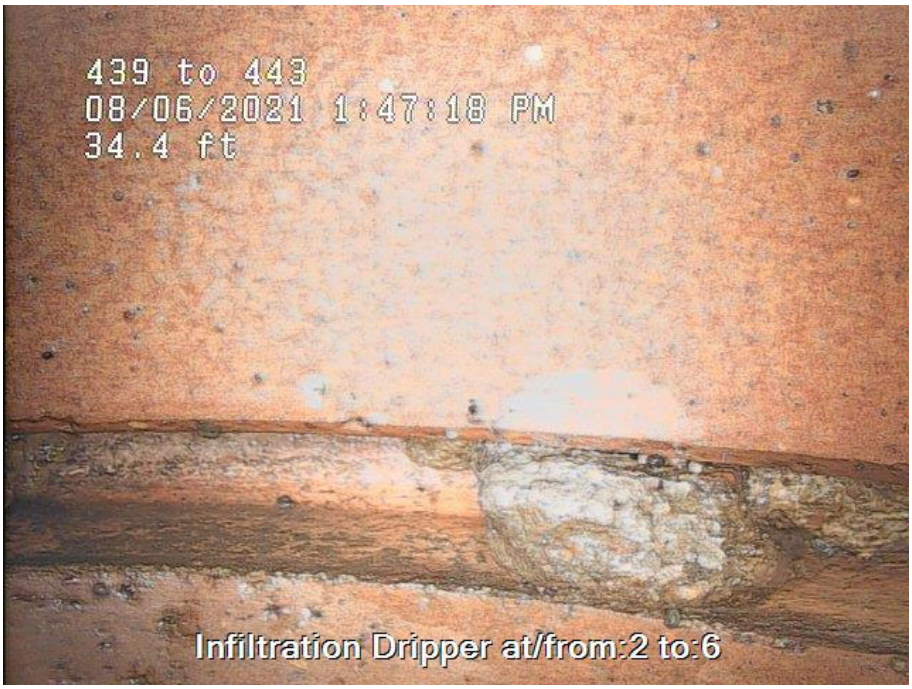
Example: Deformed Pipe (Rigid)



Example: Root Infiltration



Example: Root Infiltration



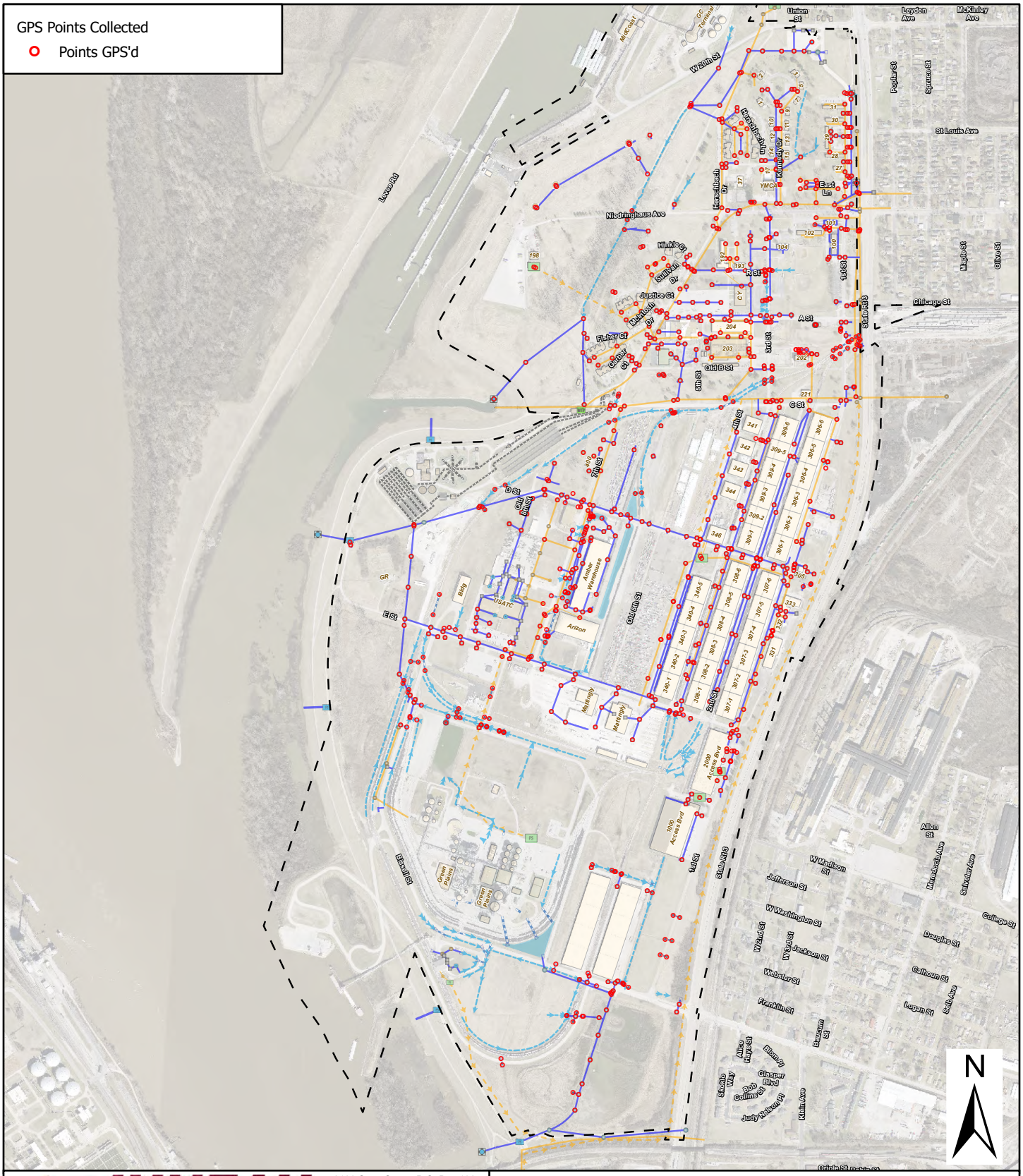
Example: Infiltration / Dripping

Example: Surcharge Debris

Example: Obstruction Built into Structure

EXHIBIT C

PIPE INSPECTION MAPPING



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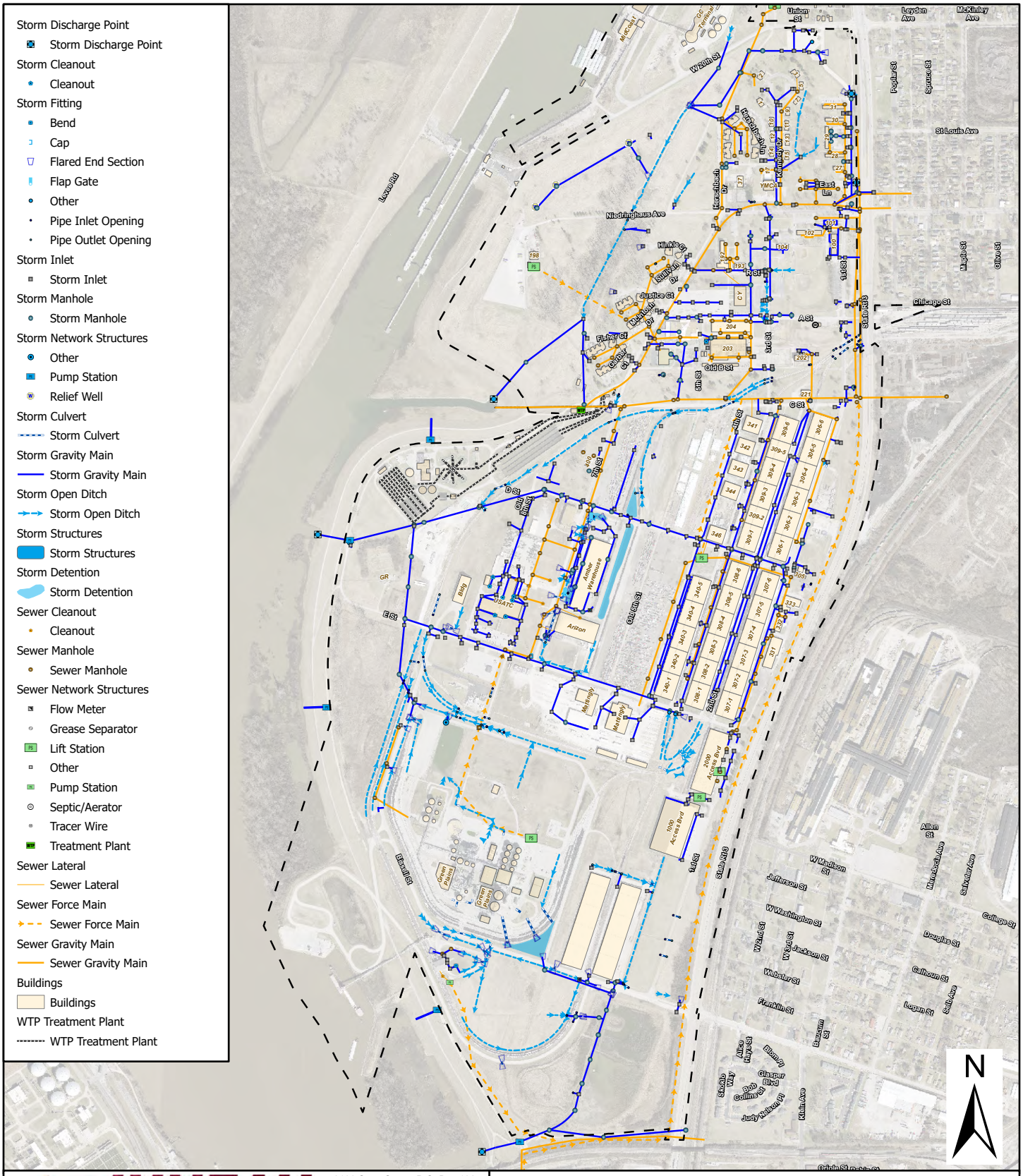
1111 Burlington Ave, Suite 100
Lisle, IL 60532

SCALE: 1 inch = 1,300 ft	
DRWN. BY: JAC	DATE: 1/31/2022
CHK'D:	DATE:
JOB NO: E211303	MAP DOCUMENT: Sewer Map GPS Points

Sanitary Sewer and Storm Sewer System Structure GPS Point Map

America's Central Port - Granite City, Illinois



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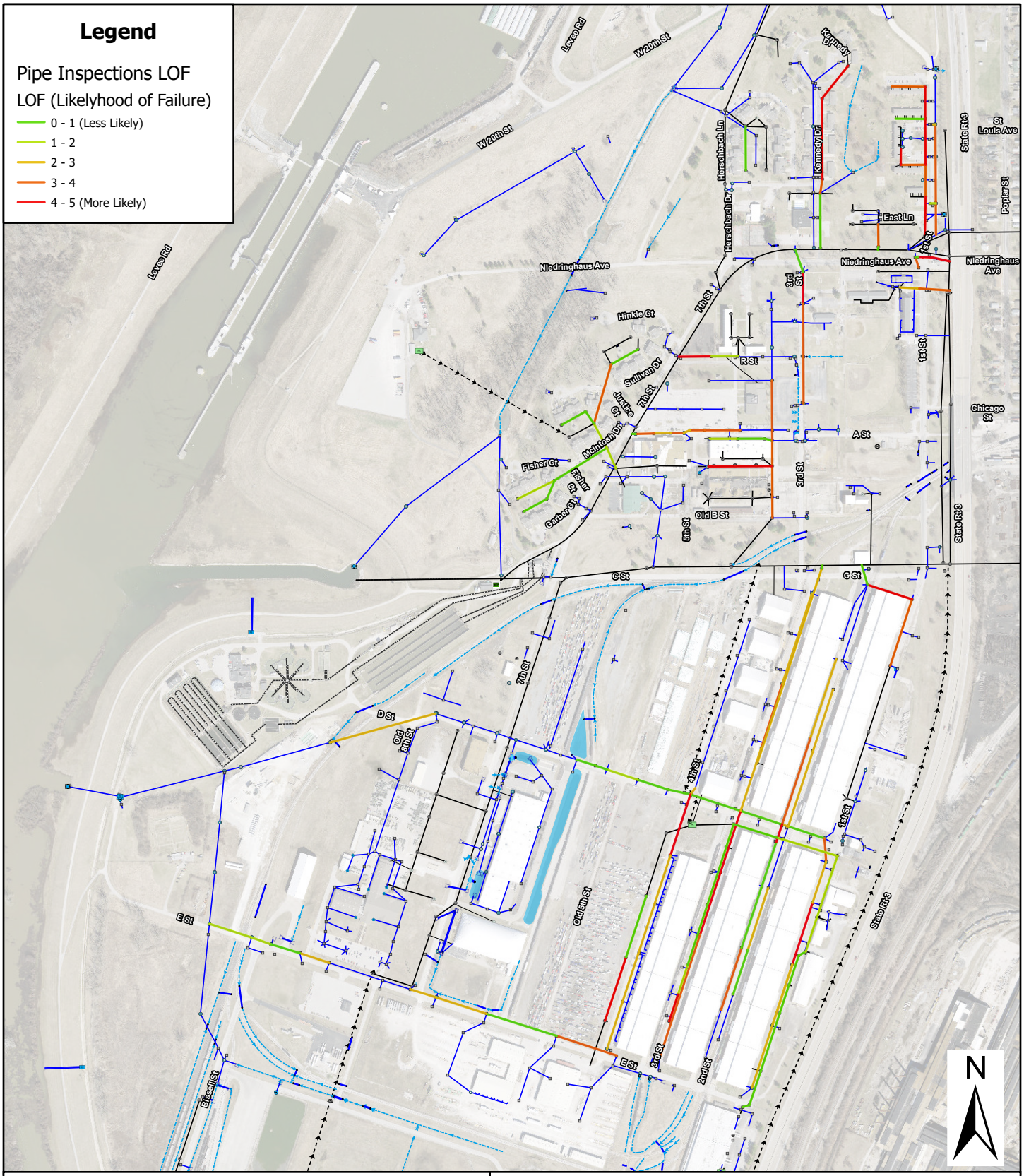
Sanitary Sewer and Storm Sewer System Map

America's Central Port - Granite City, Illinois

SCALE: 1 inch = 1,300 ft		
DRWN. BY: JAC	DATE: 1/31/2022	
CHK'D:	DATE:	
JOB NO: E211303	MAP DOCUMENT: Sewer Map LetterSize	



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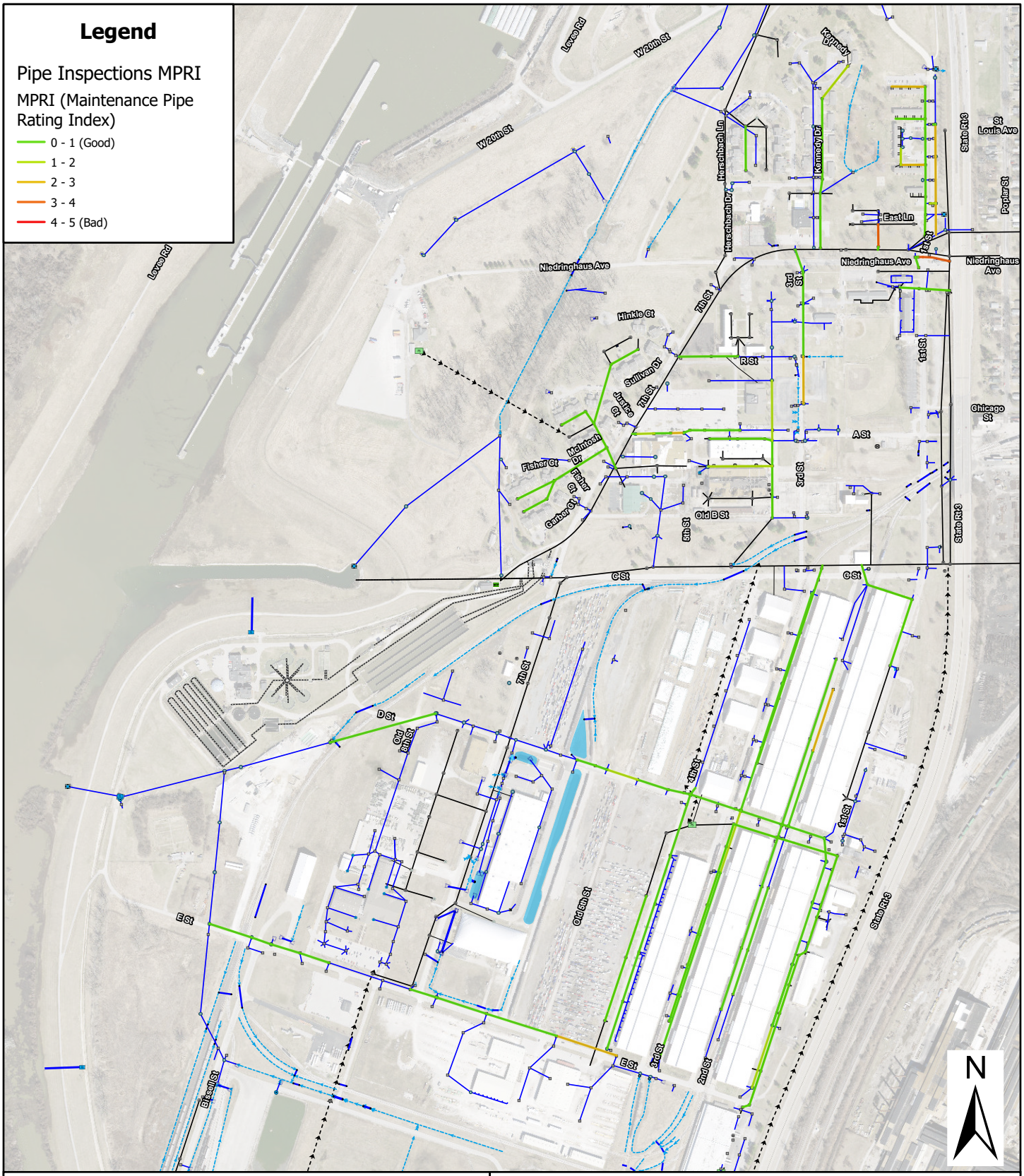
Visu-Sewer Inspection Results
Likelyhood of Failure Rating

America's Central Port - Granite City, Illinois

SCALE: 1 inch = 800 ft		
DRWN. BY: JAC	DATE: 1/28/2022	
CHK'D:	DATE:	
JOB NO: E211303	MAP DOCUMENT: Visu-Sewer Inspections LOF	



N

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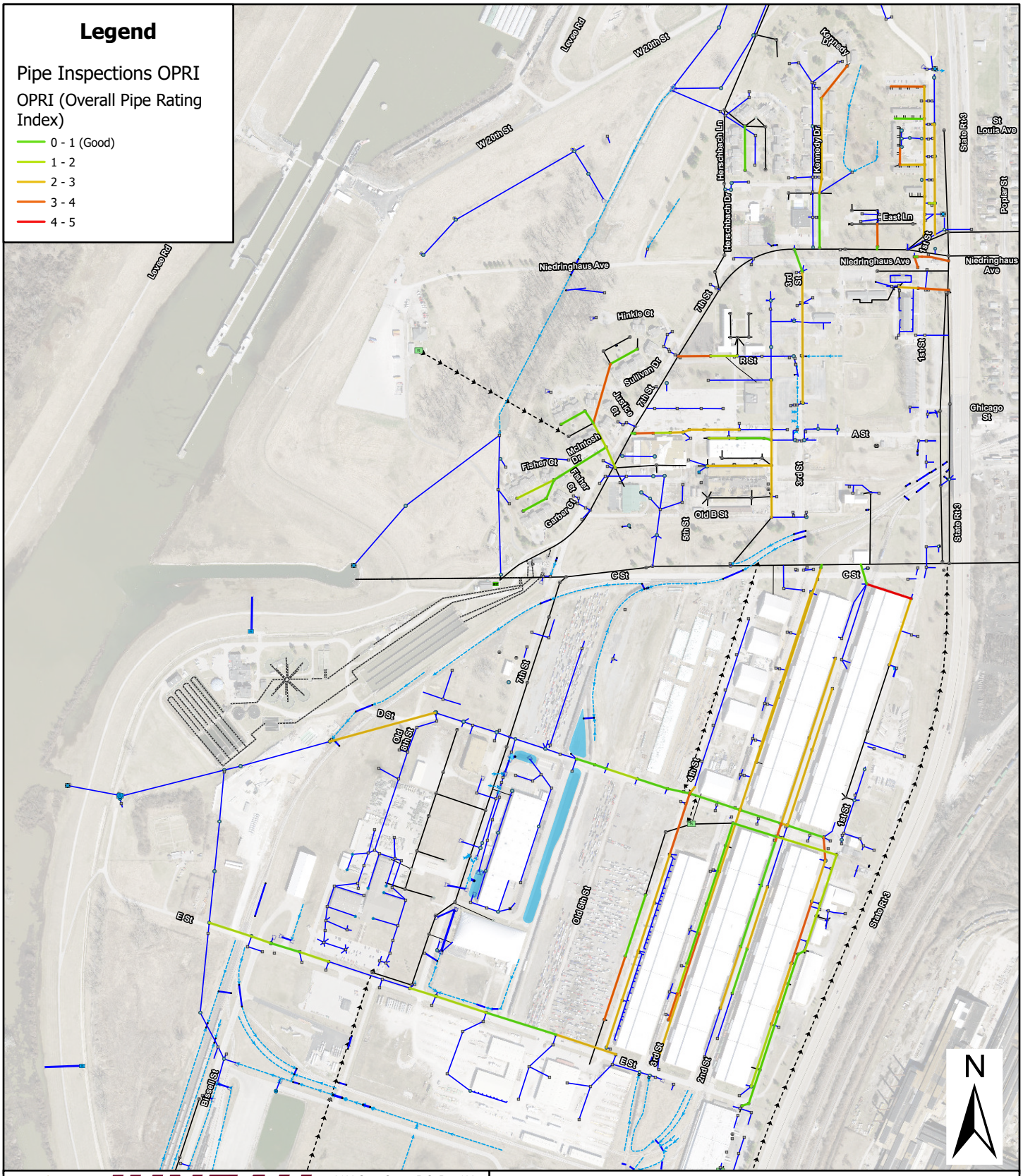
SCALE: 1 inch = 800 ft		
DRWN. BY: JAC	DATE: 1/28/2022	
CHK'D:	DATE:	
JOB NO: E211303	MAP DOCUMENT: Visu-Sewer Inspections MPRI	

Visu-Sewer Inspection Results
Maintenance Pipe Rating Index

America's Central Port - Granite City, Illinois



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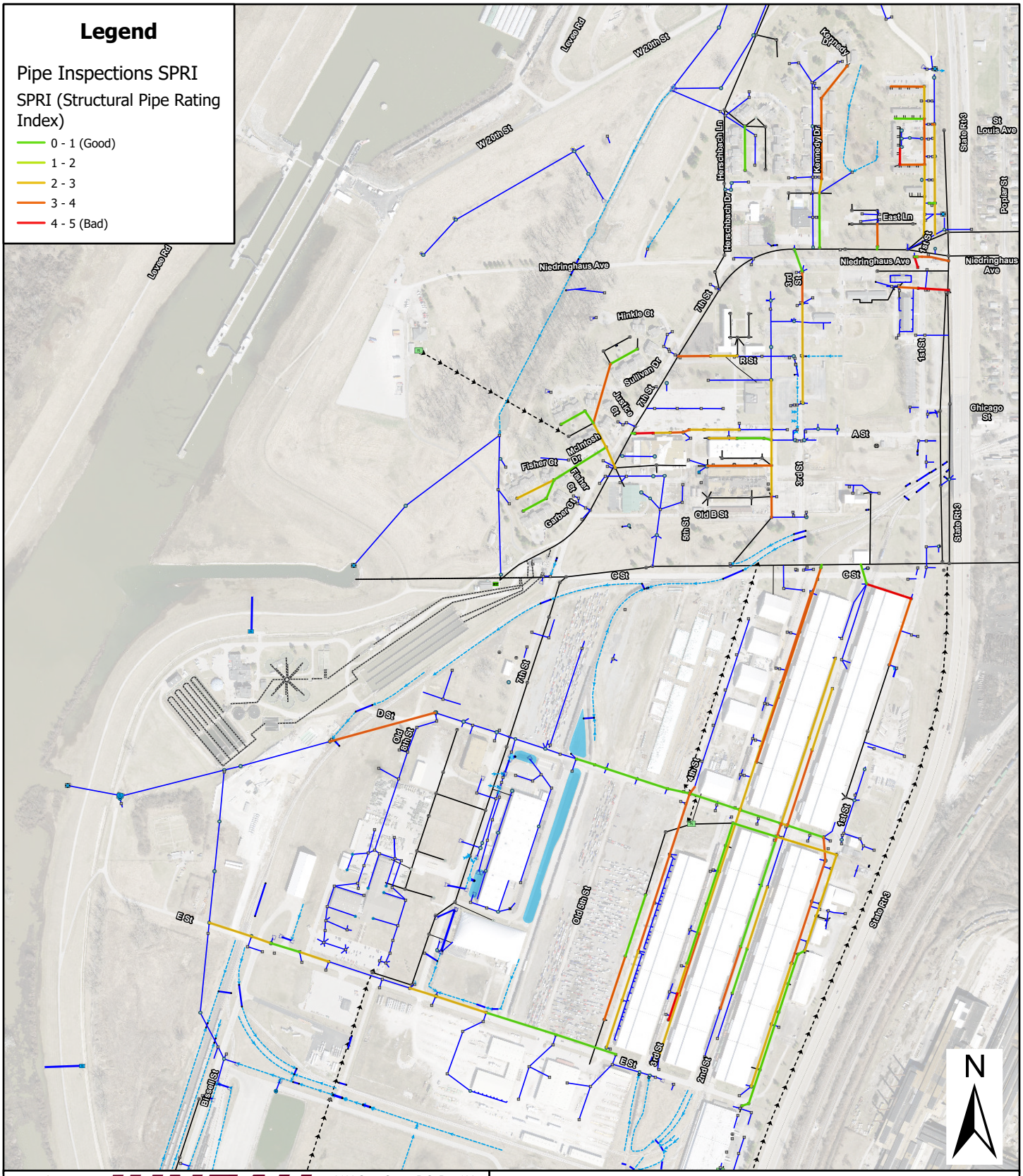
Lisle, IL 60532

SCALE: 1 inch = 800 ft	
DRWN. BY: JAC	DATE: 1/28/2022
CHK'D:	DATE:
JOB NO: E211303	MAP DOCUMENT: Visu-Sewer Inspections OPRI

Visu-Sewer Inspection Results
Overall Pipe Rating Index

America's Central Port - Granite City, Illinois



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1111 Burlington Ave, Suite 100
Lisle, IL 60532

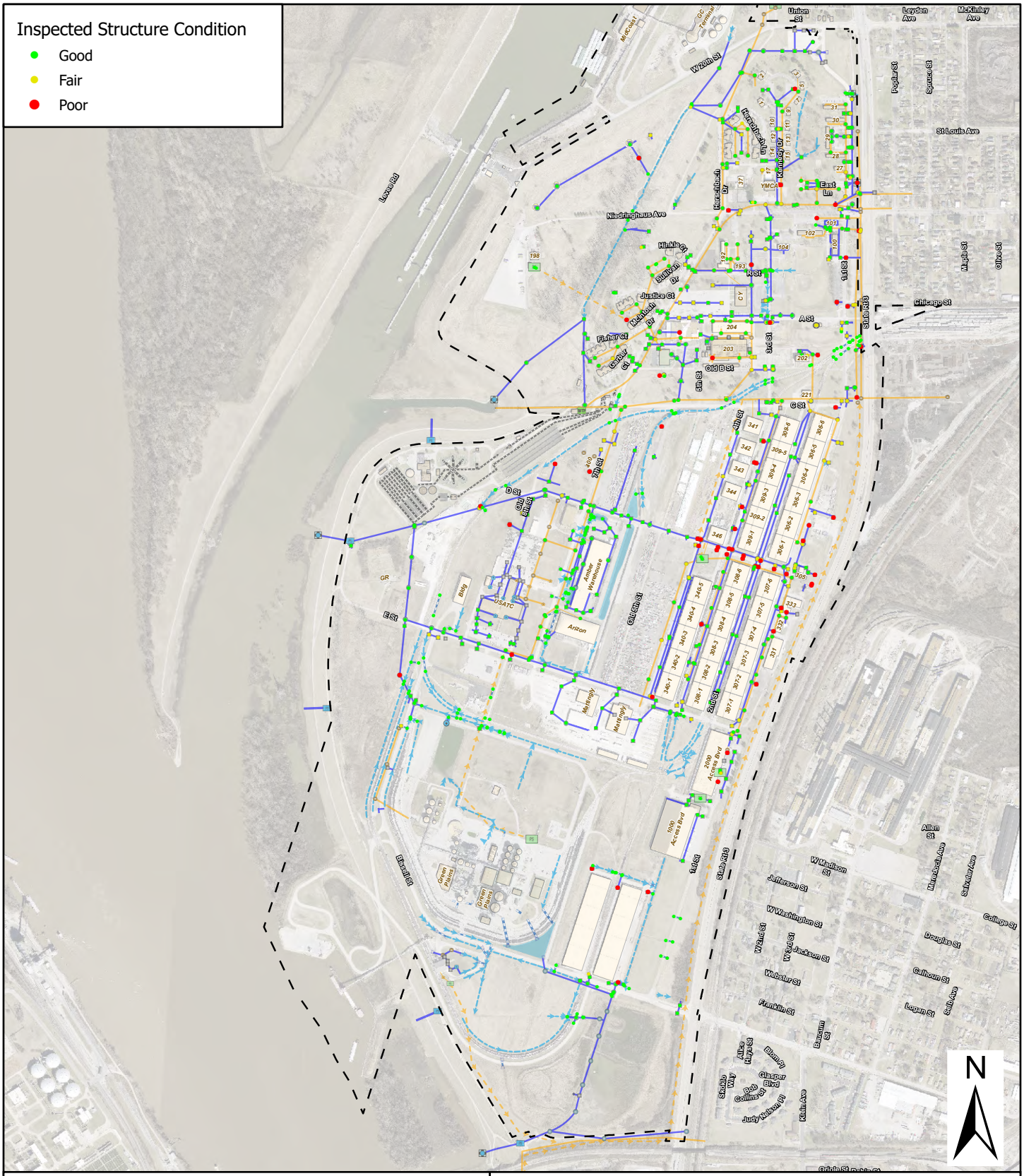
SCALE: 1 inch = 800 ft		
DRWN. BY: JAC	DATE: 1/28/2022	
CHK'D:	DATE:	
JOB NO: E211303	MAP DOCUMENT: Visu-Sewer Inspections SPRI	

Visu-Sewer Inspection Results
Structural Pipe Rating Index

America's Central Port - Granite City, Illinois

EXHIBIT D

MANHOLE INSPECTIONS



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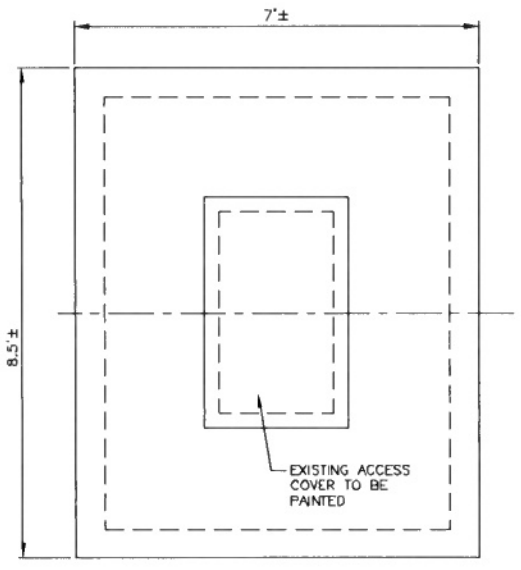
SCALE: 1 inch = 1,300 ft	
DRWN. BY: JAC	DATE: 1/31/2022
CHK'D:	DATE:
JOB NO: E211303	MAP DOCUMENT: Manhole Inspections

Sanitary Sewer and Storm Sewer System Structure Inspection Map

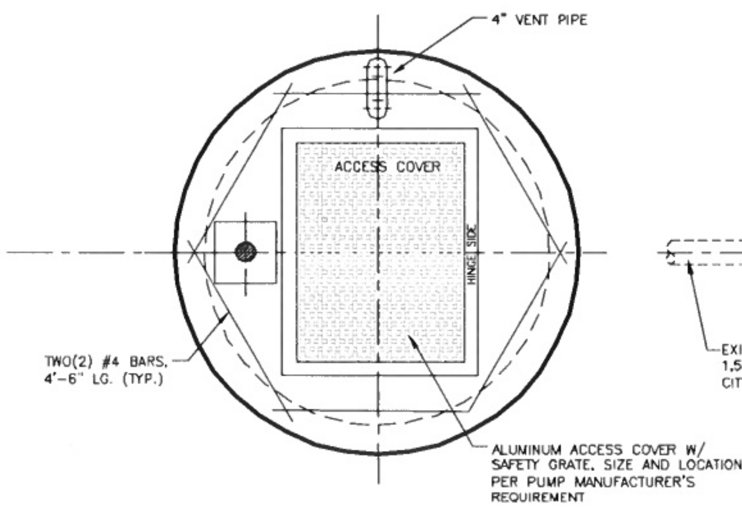
America's Central Port - Granite City, Illinois

EXHIBIT E

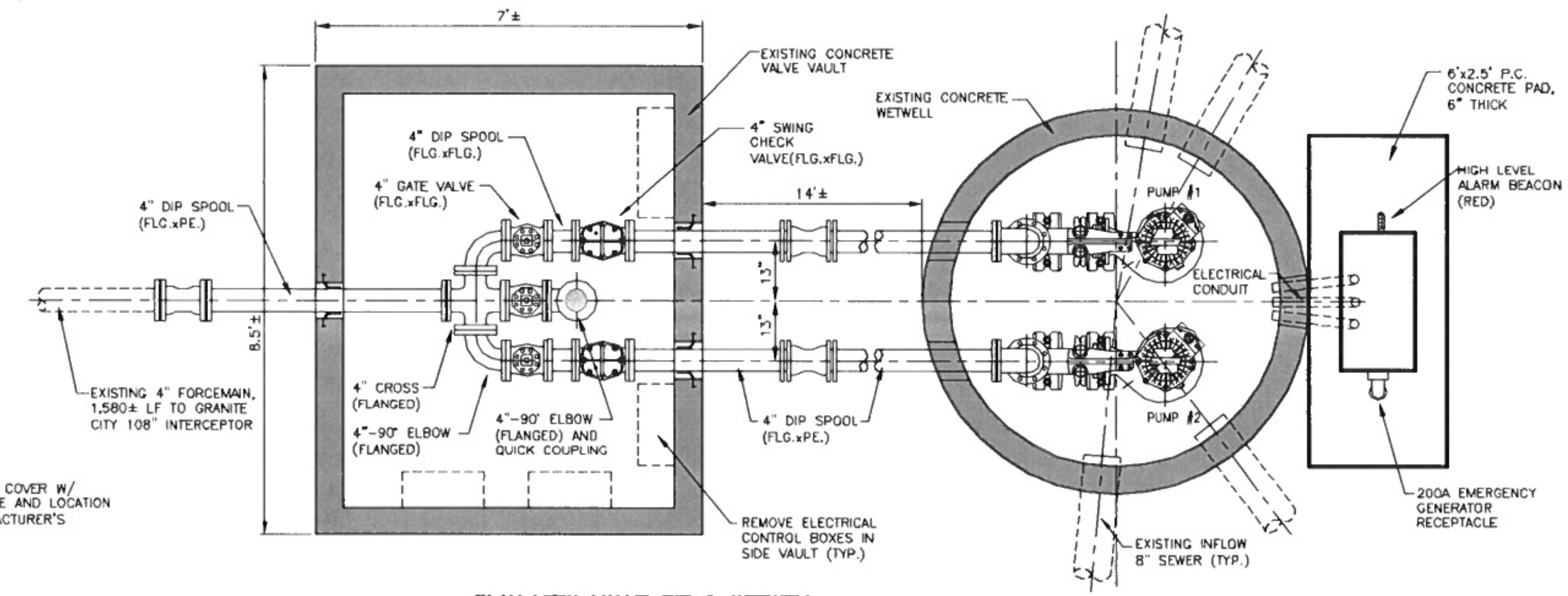
PUMP STATION PLANS
4TH AND D STREETS



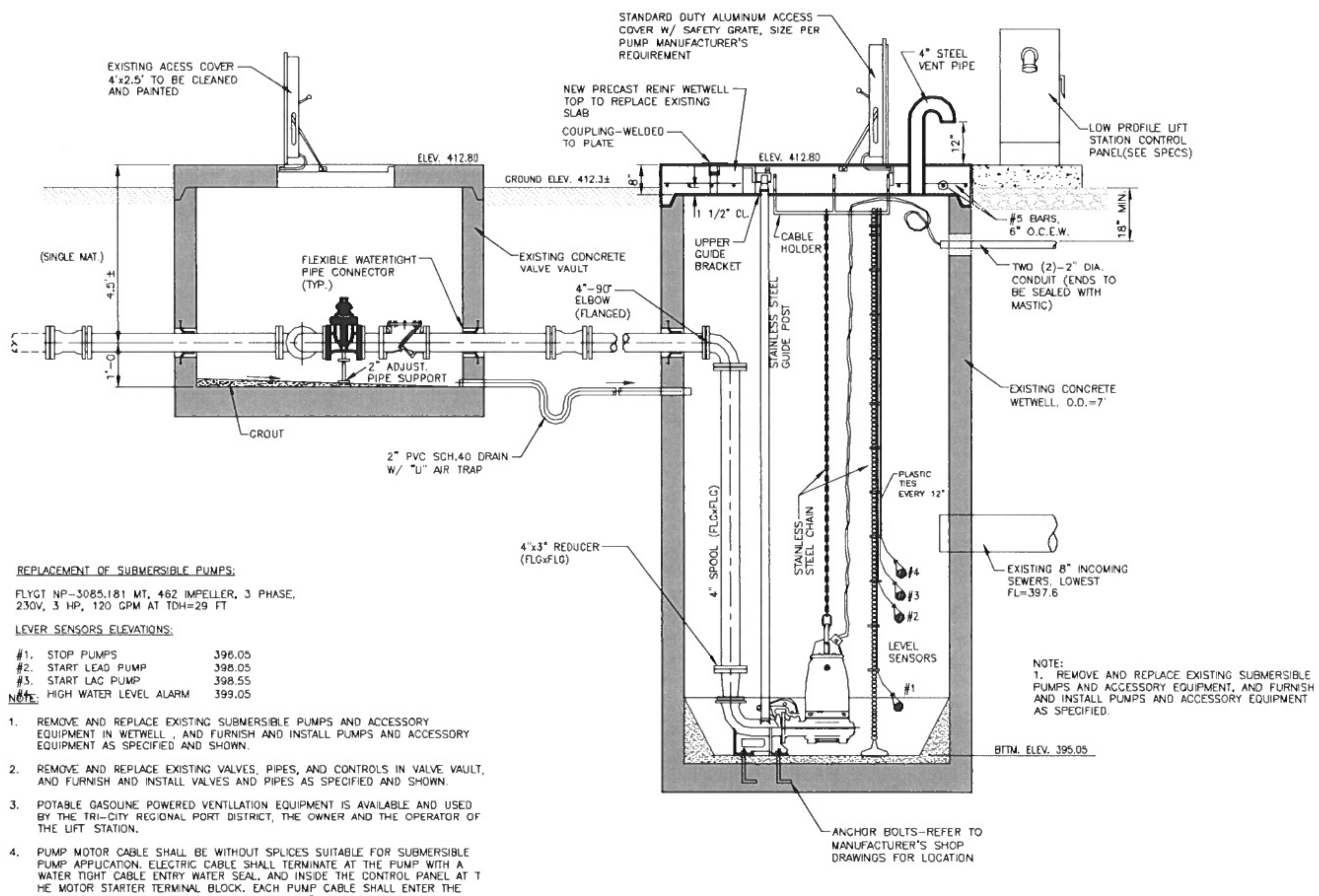
PLAN VIEW – EXISTING VALVE VAULT TOP
N.T.S.



PLAN VIEW – WETWELL TOP
N.T.S.



PLAN VIEW–VALVE PIT & WETWELL
N.T.S.



NOTE:
1. REMOVE AND REPLACE EXISTING SUBMERSIBLE PUMPS AND ACCESSORY EQUIPMENT, AND FURNISH AND INSTALL PUMPS AND ACCESSORY EQUIPMENT AS SPECIFIED.

SECTION THROUGH VALVE PIT AND WETWELL
N.T.S.

REPLACEMENT OF SUBMERSIBLE PUMPS:

FLYGT NP-3085.181 MT, 462 IMPELLER, 3 PHASE, 230V, 3 HP, 120 GPM AT TDH=29 FT

LEVER SENSORS ELEVATIONS:

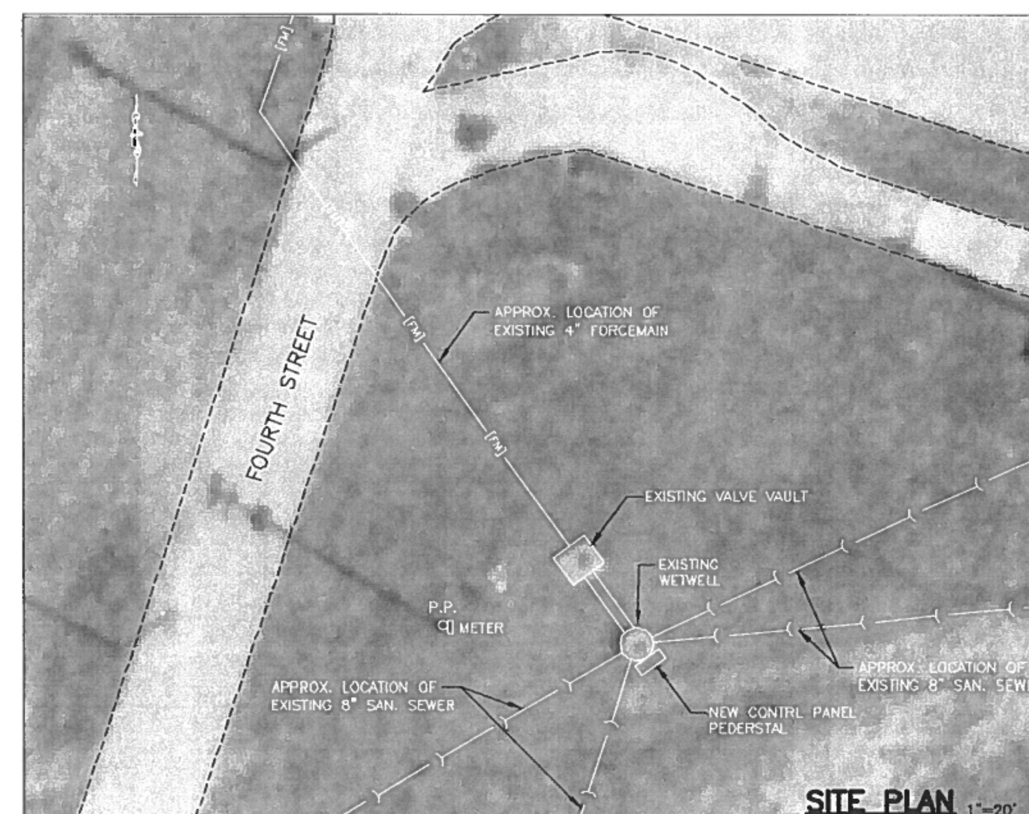
#1.	STOP PUMPS	396.05
#2.	START LEAD PUMP	398.05
#3.	START LAG PUMP	398.55
#4.	HIGH WATER LEVEL ALARM	399.05

NOTE:

1. REMOVE AND REPLACE EXISTING SUBMERSIBLE PUMPS AND ACCESSORY EQUIPMENT IN WETWELL , AND FURNISH AND INSTALL PUMPS AND ACCESSORY EQUIPMENT AS SPECIFIED AND SHOWN.
2. REMOVE AND REPLACE EXISTING VALVES, PIPES, AND CONTROLS IN VALVE VAULT, AND FURNISH AND INSTALL VALVES AND PIPES AS SPECIFIED AND SHOWN.
3. POTABLE GASOLINE POWERED VENTILLATION EQUIPMENT IS AVAILABLE AND USED BY THE TRI-CITY REGIONAL PORT DISTRICT, THE OWNER AND THE OPERATOR OF THE LIFT STATION.
4. PUMP MOTOR CABLE SHALL BE WITHOUT SPLICES SUITABLE FOR SUBMERSIBLE PUMP APPLICATION. ELECTRIC CABLE SHALL TERMINATE AT THE PUMP WITH A WATER TIGHT CABLE ENTRY WATER SEAL, AND INSIDE THE CONTROL PANEL AT T HE MOTOR STARTER TERMINAL BLOCK. EACH PUMP CABLE SHALL ENTER THE MOTOR CONTROL PANEL THROUGH A SEPARATE 2" CONDUIT. THE PUMP ELECTRIC CABLE SHALL BE REMOVED WITH THE SUBMERSIBLE PUMP WITH THE CABLE DISCONNECT MADE AT THE MOTOR STARTER TERMINAL STRIP.
5. 4" VENT PIPE AND PUMP GUIDE POSTS SHALL BE GALVANIZED STEEL.
6. ALL EXPOSED CONCRETE EDGES SHALL HAVE A 3/4" CHAMFER.

ELECTRICAL NOTES:

1. CONNECT GROUND BUS INSIDE THE PANEL WITH 2/0 BARE COPPER. CADWELD CONNECTED TO A 3/4"-10' COPPER CLAD GROUND ROD BURIED 2' BELOW GRADE.
2. ELECTRICAL SERVICE TO LIFT STATION CONTROL PANEL FROM POWER POLE SHALL BE RUN UNDERGROUND.
3. CONTRACTOR SHALL PROVIDE 1" CONDUIT FOR TELEPHONE CABLE.
4. ALL ENCLOSURES AND POWER SUPPLIES REQUIRING GROUNDING INSIDE THE PANEL ARE TO BE CONNECTED TO THE GROUND BUS BY GREEN INSULATED CABLE (MIN. #12 AWG).
5. SIZE STARTERS, BREAKERS, WIRES, AND CONDUITS BASED UPON ACTUAL MOTOR NAMEPLATE AMPS IN ACCORDANCE WITH THE LATEST NATIONAL ELECTRIC CODE.
6. STATOR TEMPERATURE SWITCHES ARE TO BE WIRED WHEN SUPPLIED WITH PUMP MOTOR.
7. TAPE AND TIE BACK UNUSED CONDUCTORS.
8. ESTIMATED MOTOR HP. GET ACTUAL HP FROM PUMP MANUFACTURER.



SITE PLAN 1"=20'

REVISIONS

NO.	DATE	BY	REMARKS

Juneau Associates, Inc. P.C.
CONSULTING ENGINEERS AND LAND SURVEYORS

CLIENT/PROJECT:
SEVENTH ST. SANITARY SEWER EXTENSION AND DRAINAGE IMPROVEMENT TCRPD, GRANITE CITY, ILLINOIS

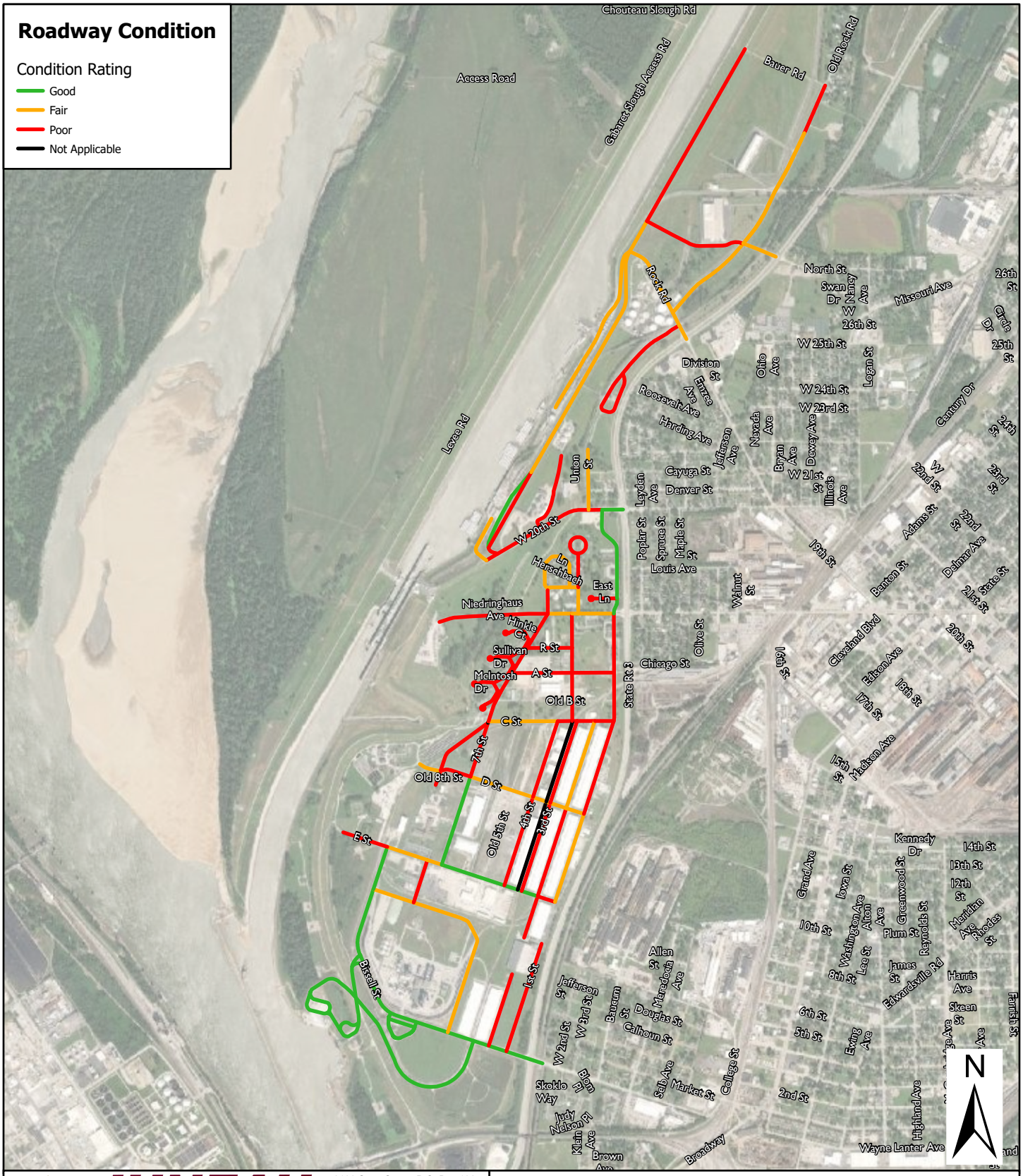
LIFT STATION #323 IMPROVEMENT

DSN. BY:	YGZ
DWN. BY:	YGZ
CHK. BY:	RLM
JOB NO.	E071324
DATE:	08-12-2009
SCALE:	AS SHOWN

SHEET No.
S4
OF 12 SHEETS

EXHIBIT F

INVENTORY AND CONDITION ASSESSMENT OF ROAD SURFACES



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SCALE: 1 inch = 3,000 ft	
DRWN. BY: JAC	DATE: 2/8/2022
CHK'D:	DATE:
JOB NO: E211303	MAP DOCUMENT: Roadway Assessment 2021

Exhibit F
Inventory & Condition Assessment of Roadway Surfaces
America's Central Port - Granite City, Illinois

INVENTORY AND CONDITION ASSESSMENT OF ROAD SURFACES

America's Central Port

October 2021

Table of Contents

Appendices

1. Introduction

Juneau Associates, Inc., P.C. has conducted road surface condition survey of the America's Central Port's 21 miles of roadway during three separate site visits. The survey was conducted by driving each roadway and taking photos of areas of distress that were representative of the general condition of the road. These photos and notes were then logged into a GIS map for the Port's records.

Included in the report are roadway condition ratings, notes on the deficiencies of each roadway, recommended repair or maintenance work, and estimated unit costs associated with completing the work.

The purpose of this report is to provide the Port with the following:

- A detailed inventory of the Port road system.
- Documented conditions of the each road on a GIS mapping system.
- Maintenance or repair method recommendations appropriate to each road.
- Estimated costs of each maintenance and repair method.

2. General Roadway Information

Roadways can last up to 30 years, however, the lifespan is directly related to its construction, foundation, climate, drainage, and traffic. Depending on these factors a roadway may only last a few years.

Roadways consist of various elements including the surface type, subbase materials, cross slope, crown, width, shoulders, curbs, and drainage. Surface types are either rigid or flexible. Concrete roads are considered rigid, asphalt roads or concrete roads with an asphalt overlay are considered flexible. Road surface material is typically selected based on traffic volume, soil characteristics, weather, initial cost, overall annual maintenance and service-life cost. All of the Port roads are asphalt, Oil & Chip, or concrete. In some cases, unsuitable material below the roadway causes failure of the roadway.

The condition of a street is affected by a number of factors, including:

- Surface condition (roughness, cracking)
- Drainage (street profile, cross section, storm sewer)
- Street section (Pavement and base course thickness)
- Subgrade soil (sand, clay, silt)
- Traffic characteristics and loading
- Age
- Maintenance Program (Crack/Joint seal, microsurfacing, etc.)

3. Road Condition Survey

3.1 Inventory of Port Roads

The purpose of the inventory was to assess all the roads in the Port and identify various deficiencies with the roadway surface. Each road was then graded using the Pavement Surface Evaluation and Rating (PASER) system based on the severity of the deficiencies observed. The PASER ratings were then used to recommend various maintenance or improvement options. These recommendations are meant to be a guide for the Port, and used in conjunction with the Port's priorities and budget to determine the best course of action to extend the life of the road surface. Only Port maintained roads were included. Private roads were not inventoried.

3.2 Evaluating Roads

The roads were evaluated and graded using the PASER system for asphalt and concrete surfaces. PASER uses visual inspection to identify different types of pavement distress. There are four major categories of common concrete and asphalt distresses as shown below.

A. Concrete Surface Distress

1.) Surface Defects: Wearing and Polishing, Map Cracking, Pop-outs, Scaling, Shallow Reinforcing, and Spalling.
2.) Joint Failure: Transverse and Longitudinal
3.) Pavement Cracks: Transverse Slab Crack, D-Cracking, Corner Cracking and Meander Cracking
4.) Pavement Deformation: Blow Ups, Faulting, Pavement Settlement or Heave, Utility Repairs, Patches and Potholes, Manhole and Inlet Cracking, and Curb or Shoulder Deformation

B. Asphalt Surface Distress

1.) Surface Defects: Raveling, Flushing, and Polishing
2.) Surface Deformation: Rutting, Rippling, Shoving, Settling, and Frost Heave
3.) Cracks: Transverse, Reflection, Slippage, Longitudinal, Block, and Alligator cracks
4.) Patches and Potholes

Examples of the various distresses are provided in Appendix A

The PASER system rates roads on a scale of 1-10. We used a simplified version of this by grading each road as Poor (1-3), Fair (4-7), or Good (8-10).

4. Maintenance and Repair Alternatives

There are three categories of maintenance/repairs available for maintaining roadway infrastructure: Preventative Maintenance, Road Rehabilitation, and Road Reconstruction. A brief overview of each category is followed by a more detailed description of the individual alternatives and their estimated costs.

1. Preventive Maintenance: Preventative maintenance is appropriate for roads in good condition. Preventative maintenance includes microsurfacing, patching, and crack/joint sealing, of roads that are in good condition to prevent or slow further deterioration. This is a relatively inexpensive repair that will extend the life of the road surface 2-7 years.

2. Rehabilitation: Rehabilitation is appropriate for roads in fair condition, or roads in poor condition that don't appear to have extensive base failure. Rehabilitation are major repairs of the road surface without changing the subgrade. This includes the removal of the existing road surface and overlaying with a Hot-Mix asphalt surface course. For cost estimating purposes a 2 inch milling and overlay were assumed. Rehabilitation can extend the life of the existing roadway 10-15 years.

3. Reconstruction: Reconstruction is appropriate for roads in Poor condition with extensive base failure. Reconstruction consists of complete replacement of the road subbase and surface. Reconstruction can also include lane widening, alignment or profile adjustments, and changes to address surface drainage issues. Reconstruction is the most expensive repair alternative, and the service life of a new pavement structure is 30 years.

4.1 Alternatives

Crack/Joint Sealing – Concrete (Preventative Maintenance)

Description: This process involves cleaning and routing cracks and/or joints and then filling them with hot rubber sealing compound. Sealing the cracks and/or joints inhibits water from penetrating the cracks, freezing and expanding and causing the pavement to fail.

Cost: An estimate of cost for this alternative is $1.00 per square yard of roadway to be maintained, but will vary with the severity of cracking and joint spacing.

Figure 1 - Joint Sealing Concrete

Crack Sealing – Asphalt (Preventative Maintenance)

Description: This process involves using a mechanical device to rout each crack in order to widen, cut, and clean the cracks prior to filling with bituminous materials. The bituminous materials fill the entire volume of the crack providing structural integrity to the pavement while also preventing moisture from entering the pavement structure.

Cost: An estimate of cost for this alternative is $1.00 per square yard of roadway to be maintained, but will vary with the severity of cracking.

Figure 2- Crack Routing & Sealing

Microsurfacing – Asphalt (Preventative Maintenance)

Description: This process uses a mixture of polymer modified emulsified asphalt, aggregate, mineral filler, water, and other additives. A specialized machine mixes and evenly spreads a thin layer of the composite material over the existing road surface. This preventative maintenance treatment fills in small cracks and helps preserve surfaces suffering from oxidation, loss of skid resistance, and raveling.

Cost: An estimate of cost for a one pass Microsurfacing treatment is $4.25 per square yard.

Figure 3 - Microsurfacing

Mill and Overlay, 2” – Asphalt (Rehabilitation)

Description: Milling is a process by which the top section of pavement is milled off and discarded. This results in a rough surface to which and additional layer of pavement can be applied. This treatment can be used to remedy substantial surface defects as long as extensive base failure is not present.

Cost: An estimate of cost for milling and placing 2” of Hot Mix Asphalt is approximately $20 per square yard.

Figure 4 - Mill and Overlay

Pavement Patching

Description: Pavement patching can be used to fix failed areas of concrete or asphalt pavement when a complete reconstruction is not necessary. When patching concrete pavement the full slab depth of the failed area is removed and replaced and the surrounding joints are resealed. When patching asphalt the pavement structure (pavement surface and base) is removed and replaced with a full depth asphalt patch. Asphalt patching is usually used in conjunction with a mill and overlay or other rehabilitation/preservation treatment to spot fix failed areas that can not be addressed by the main treatment.

Cost: An estimate of cost for concrete pavement patching is $125.00 per square yard, and 6” asphalt patches are $65.00 per square yard.

Figure 5 - Concrete and Asphalt Patches

Full Re-Construction

Description: Re-Construction consists of the removal of the entire pavement structure (pavement surface and subbase) and installation of new aggregate subbase and pavement. The new pavement surface could be asphalt or concrete depending on the amount of traffic and the kind of loads the pavement will see. This option is the most expensive and will only be necessary when subbase failure is too extensive to make rehabilitation feasible.

Cost: An estimate of cost for this alternative is $ 175.00 per square yard for 10” PCC Pavement. This cost includes the removal and replacement of the existing subbase and pavement surface as well as all ancillary work typical with a full reconstruction.

APPENDIX A

SURFACE DEFECTS

Raveling

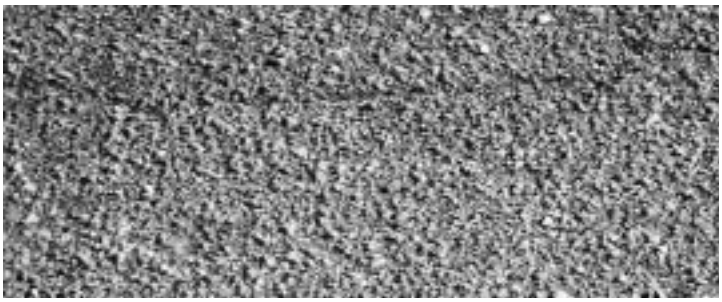
Raveling is progressive loss of pavement material from the surface downward, caused by: stripping of the bituminous film from the aggregate, asphalt hardening due to aging, poor compaction especially in cold weather construction, or insufficient asphalt content. Slight to moderate raveling has loss of fines. Severe raveling has loss of coarse aggregate. Raveling in the wheelpaths can be accelerated by traffic. Protect pavement surfaces from the environment with a sealcoat or a thin overlay if additional strength is required.

Flushing

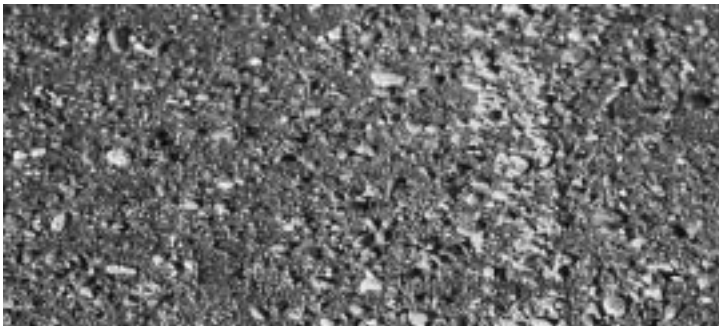
Flushing is excess asphalt on the surface caused by a poor initial asphalt mix design or by paving or sealcoating over a flushed surface. Repair by blotting with sand or by overlaying with properly designed asphalt mix.

Polishing

Polishing is a smooth slippery surface caused by traffic wearing off sharp edges of aggregates. Repair with sealcoat or thin bituminous overlay using skid-resistant aggregate.



◄ **Slight raveling. Small aggregate particles have worn away exposing tops of large aggregate.**

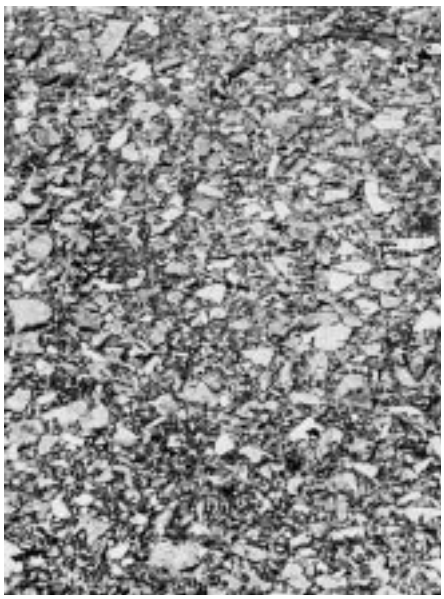


◄ **Moderate to severe raveling. Erosion further exposes large aggregate.**

◄ **Severe raveling and loss of surface material.**

Polished, worn aggregate needs repair. ▼

► **Flushing. Dark patches show where asphalt has worked to surface.**



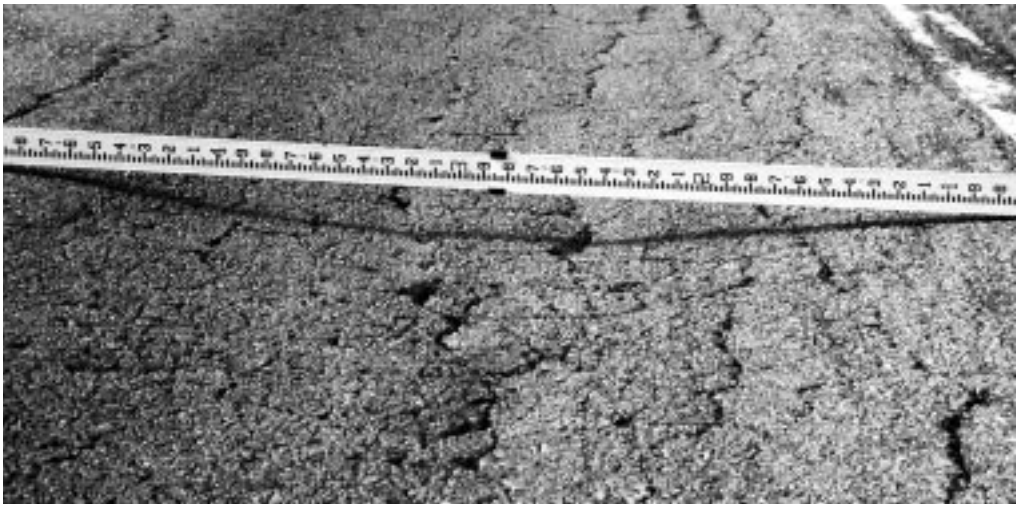
SURFACE DEFORMATION

Rutting

Rutting is displacement of material, creating channels in wheelpaths. It is caused by traffic compaction or displacement of unstable material. Severe rutting (over 2") may be caused by base or subgrade consolidation. Repair minor rutting with overlays. Severe rutting requires milling the old surface or reconstructing the roadbed before resurfacing.

◄ **Even slight rutting is evident after a rain.**

◄ **Severe rutting over 2" caused by poor mix design.**



◄ **Severe rutting caused by poor base or subgrade.**

Distortion

Shoving or rippling is surfacing material displaced crossways to the direction of traffic. It can develop into washboarding when the asphalt mixture is unstable because of poor quality aggregate or improper mix design. Repair by milling smooth and overlaying with stable asphalt mix.

Other pavement distortions may be caused by settling, frost heave, etc. Patching may provide temporary repair. Permanent correction usually involves removal of unsuitable subgrade material and reconstruction.

▼ **Heavy traffic has shoved pavement into washboard ripples and bumps.**

► **Severe settling from utility trench.**

► **Frost heave damage from spring break-up.**

▼ **Widely spaced, well-sealed cracks.**

CRACKS

Transverse cracks

A crack at approximately right angles to the center line is a transverse crack. They are often regularly spaced. The cause is movement due to temperature changes and hardening of the asphalt with aging.

Transverse cracks will initially be widely spaced (over 50'). Additional cracking will occur with aging until they are closely spaced (within several feet). These usually begin as hairline or very narrow cracks; with aging they widen. If not properly sealed and maintained, secondary or multiple cracks develop parallel to the initial crack. The crack edges can further deteriorate by raveling and eroding the adjacent pavement.

Prevent water intrusion and damage by sealing cracks which are more than ¼" wide.

◄ **Sealed cracks, a few feet apart.**

▲ **Tight cracks less than ¼" in width.**

▲ **Open crack – ½" or more in width.**

▲ **Water enters unsealed cracks softening pavement and causing secondary cracks.**

▲ **Pavement ravels and erodes along open cracks causing deterioration.**

Reflection cracks

Cracks in overlays reflect the crack pattern in the pavement underneath. They are difficult to prevent and correct. Thick overlays or reconstruction is usually required.

► **Concrete joints reflected through bituminous overlay.**

Slippage cracks

Crescent or rounded cracks in the direction of traffic, caused by slippage between an overlay and an underlying pavement. Slippage is most likely to occur at intersections where traffic is stopping and starting. Repair by removing the top surface and resurfacing using a tack coat.

► **Crescent-shaped cracks characteristic of slippage.**

► **Loss of bond between pavement layers allows traffic to break loose pieces of surface.**

Centerline crack (still tight). ►

Edge cracking from weakened subbase and traffic loads. ▼

Longitudinal cracks

Cracks running in the direction of traffic are longitudinal cracks. Center line or lane cracks are caused by inadequate bonding during construction or reflect cracks in underlying pavement. Longitudinal cracks in the wheel path indicate fatigue failure from heavy vehicle loads. Cracks within one foot of the edge are caused by insufficient shoulder support, poor drainage, or frost action. Cracks usually start as hairline or vary narrow and widen and erode with age. Without crack filling, they can ravel, develop multiple cracks, and become wide enough to require patching.

Filling and sealing cracks will reduce moisture penetration and prevent further subgrade weakening. Multiple longitudinal cracks in the wheel path or pavement edge indicate a need for strengthening with an overlay or reconstruction.

► First stage of wheelpath cracking caused by heavy traffic loads.

Load-related cracks in wheel path plus centerline cracking. ▼

Multiple open cracks at center line, wheelpaths and lane center. ▼

Block cracks

Block cracking is interconnected cracks forming large blocks. Cracks usually intersect at nearly right angles. Blocks may range from one foot to approximately 10′ or more across. The closer spacing indicates more advanced aging caused by shrinking and hardening of the asphalt over time. Repair with sealcoating during early stages to reduce weathering of the asphalt. Overlay or reconstruction required in the advanced stages.

► **Large blocks, approximately 10′ across.**

► **Intermediate-size block cracking, 1′-5′ across with open cracks.**

▲ **Extensive block cracking in an irregular pattern.**

► **Severe block cracking – 1′ or smaller blocks. Tight cracks with no raveling.**

Alligator cracks

Interconnected cracks forming small pieces ranging in size from about 1" to 6". This is caused by failure of the surfacing due to traffic loading (fatigue) and very often also due to inadequate base or subgrade support. Repair by excavating localized areas and replacing base and surface. Large areas require reconstruction. Improvements in drainage may often be required.

◄
Alligator crack pattern. Tight cracks and one patch.

◄
Characteristic "chicken wire" crack pattern shows smaller pavement pieces and patching.

◄
Open raveled alligator cracking with settlement along lane edge most likely due to very soft subgrade.

PATCHES AND POTHOLES

Patches

Original surface repaired with new asphalt patch material. This indicates a pavement defect or utility excavation which has been repaired. Patches with cracking, settlement or distortions indicate underlying causes still remain. Recycling or reconstruction are required when extensive patching shows distress.

► **Typical repair of utility excavation. Patch in fair to good condition.**

► **Edge wedging. Pavement edges strengthened with wedges of asphalt. Patch is in very good condition.**

► **Extensive patching in very poor condition.**

Potholes

Holes and loss of pavement material caused by traffic loading, fatigue and inadequate strength. Often combined with poor drainage. Repair by excavating or rebuilding localized potholes. Reconstruction required for extensive defects.

◄
Small pothole where top course has broken away.

◄
Multiple potholes show pavement failure, probably due to poor subgrade soils, frost heave, and bad drainage.

◄
Large, isolated pothole, extends through base. Note adjacent alligator cracks which commonly deteriorate into potholes.

SURFACE DEFECTS

Wear and polishing

A worn or polished surface may appear from traffic wearing off the surface mortar and skid resistant texture. Extensive wear may cause slight ruts where water can collect and cause hydroplaning. Sometimes traffic may polish aggregates smooth, causing the surface to be slippery. An asphalt overlay or grinding of the concrete surface can restore skid resistance and remove ruts.

► **Surface mortar worn away exposing larger aggregate. Accidents or friction testing may indicate a slippery surface in need of improved texture.**

▲ **Close-up of a polished pavement surface.**

Map cracking

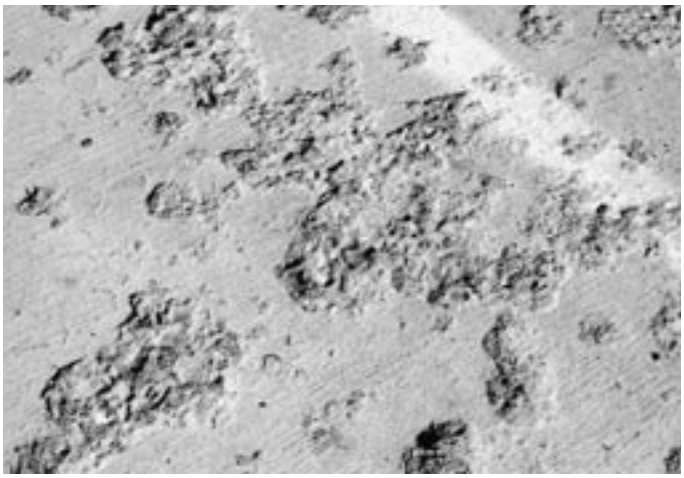
A pattern of fine cracks usually spaced within several inches is called map cracking. It usually develops into square or other geometrical patterns. Can be caused by improper cure or overworking the surface during finishing. If severe, cracks may spall or surface may scale. Repair is usually limited to very severe conditions. An asphalt overlay or partial depth patching may then be necessary.

◄ **Hairline surface cracks, probably shallow in depth. May not cause any long term performance problems.**

Pop-outs

Individual pieces of large aggregate may pop out of the surface. This is often caused by chert or other absorbent aggregates that deteriorate under freeze-thaw conditions. Surface patching can be done temporarily with asphalt. For severe areas, a more permanent partial depth concrete patch may be necessary.

◄ **Extensive pop-outs of large aggregate from surface. Pop-outs alone have not affected pavement serviceability.**



► **Moderate surface scaling. Loss of mortar and fines from the surface beginning to expose larger aggregate.**

► **Severe scaling. Some larger aggregate is loose.**

Reinforcing bar exposed. Shallow concrete cover caused large spall to develop around it. ▼

Scaling

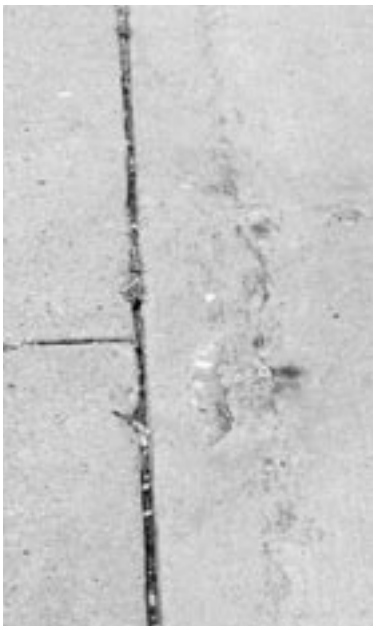
Scaling is surface deterioration that causes loss of fine aggregate and mortar. More extensive scaling can result in loss of large aggregate. Often caused by using concrete which has not been air-entrained, the surface becomes susceptible to freeze-thaw damage. Scaling is also aggravated by the use of deicing chemicals.

Scaling can occur as a general condition over a large area or be isolated to locations where poor quality concrete or improper finishing techniques caused loss of air entrainment. In severe cases, deterioration can extend deep into the concrete. Traffic action may accelerate scaling in the wheel paths.

Grinding may remove poor quality surface concrete. Asphalt overlays or a bonded concrete resurfacing can prolong the life of the pavement. Partial depth patching of isolated areas may also be used.

Shallow reinforcing

If the steel reinforcing bar or mesh is placed too close to the concrete surface it will lead to concrete spalling. Corrosion of the steel creates forces that break and dislodge the concrete. Often you can see rust stains in the surface cracks before spalling occurs. Can be temporarily patched with asphalt. Permanent repairs are difficult and usually involve replacing the steel and making a partial depth or full depth concrete repair.



◄ **Wire reinforcing mesh placed close to surface. Corrosion of the reinforcing steel causes the surface mortar to spall. Very difficult to patch and repair.**

◄ **Surface stain parallel to joint. Indicates reinforcing steel too close to surface.**

Spalling

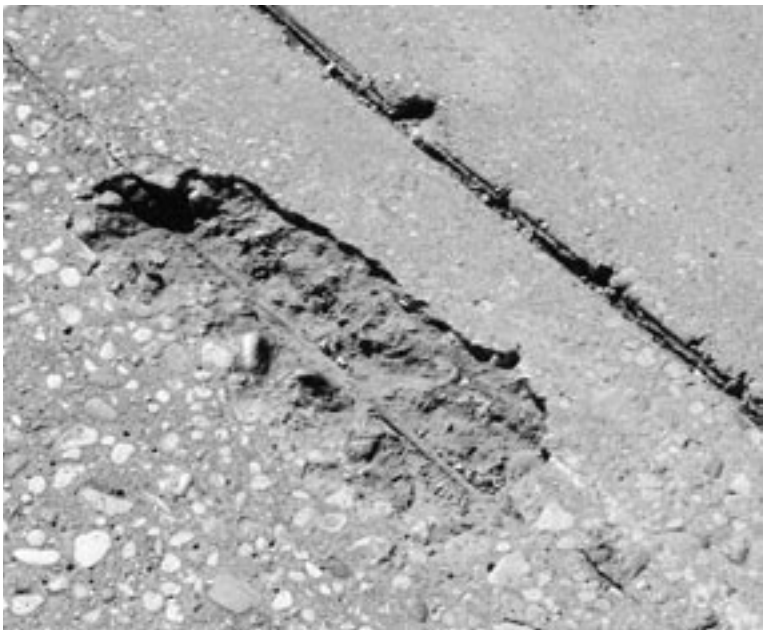
Spalling is the loss of a piece of the concrete pavement from the surface or along the edges of cracks and joints. Cracking or freeze-thaw action may break the concrete loose, or spalling may be caused by poor quality materials. Spalling may be limited to small pieces in isolated areas or be quite deep and extensive.

Repair will depend on the cause. Small spalled areas are often patched. Spalling at joints may require full depth joint repair.

► **Small surface spalls that have been patched.**

► **Spalling along longitudinal joints.**

▼ **A severely spalled crack.**



Spalling over ► shallow reinforcing.

▲ **Joint open about ½".**

◄ **New, well-sealed longitudinal joint.**

JOINTS

Longitudinal joints

Longitudinal paving joints are constructed to be narrow in width and usually well sealed. As pavements age and materials deteriorate, joints may open and further deteriorate. Cracks parallel to the initial joint may develop and accelerate into spalling or raveling of the longitudinal joint. Settlement, instability, or pumping of the subgrade soil can cause longitudinal joints to fault. One common cause of cracks parallel to the longitudinal joints is waiting too long after the pour to saw the joint. Then, during initial cure the slab will crack roughly parallel (but not exactly) to the sawn joint.

Maintaining a tight joint seal can prevent intrusion of water and reduce freeze-thaw damage and pumping. Severe joint deterioration may require full depth patching and replacement of the joint.

▲ **Additional joint cracking, spalling, and broken pavement. Full depth repair is needed.**

▲ **Faulted longitudinal joint (over ½") with slight edge spalling.**

Transverse joints

Transverse joints are constructed in concrete pavements to permit movement of the concrete slabs. Some joints are constructed with load transfer dowels. If the pavement has poor subsurface drainage, traffic may eventually create voids under the joints due to pumping and cause the slabs to settle or fault. Freeze-thaw deterioration at the joint can cause spalling and create additional cracks parallel to the joint. Load transfer bars may corrode, creating expansive forces that further deteriorate the concrete at the joint.

Occasionally, severe joint deterioration may develop from poor quality aggregate and so-called D-cracking. Joint sealing will help, but complete replacement is usually necessary.

Overall, lack of joint maintenance and rehabilitation is a common problem. Maintaining a tight, well sealed joint can reduce water intrusion and thereby reduce freeze-thaw damage, pumping, blow-ups, D-cracking, and spalling. Early repair of minor defects can often reduce the need for complete joint repair or replacement.

▼ **New, well-sealed transverse joint.**

▼ **Transverse joint has slight faulting and spalling.**

► **Severe spalling of a transverse joint.**

►► **Cracks parallel to joint. Dark color next to transverse joint likely indicates D-cracking and additional deterioration. Full depth repair required.**

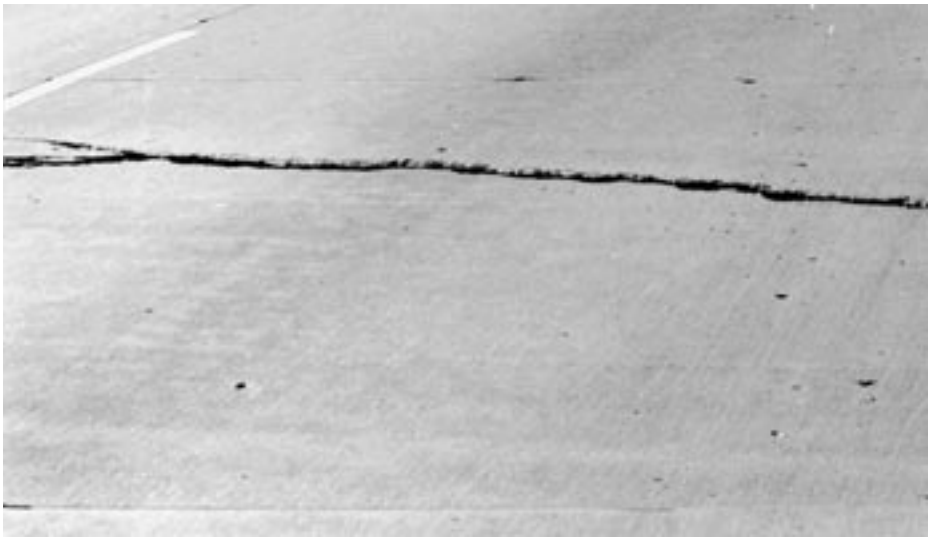
► **Severe spalling has required temporary patching. Complete joint replacement is necessary.**

PAVEMENT CRACKS

Transverse slab cracks

Transverse cracks may appear parallel to joints and can be caused by thermal stresses, poor subgrade support, or heavy loadings. They are sometimes related to slabs having joints spaced too widely. Joints spaced more than 15′ apart commonly develop mid-slab transverse cracks.

◄ **Transverse, open crack.**



◄ **Faulted transverse crack with slight edge spalling.**

As with joints, these cracks may deteriorate further if not sealed well. Slabs can fault at cracks which can spall and develop additional parallel cracking. Severe deterioration may require patching individual cracks. Multiple transverse cracks in individual slabs indicate further deterioration. Extensive transverse cracking indicates pavement failure and the need for complete replacement.

◄ **Closely spaced, hairline transverse cracks. Indicates slab is broken and in need of replacement.**

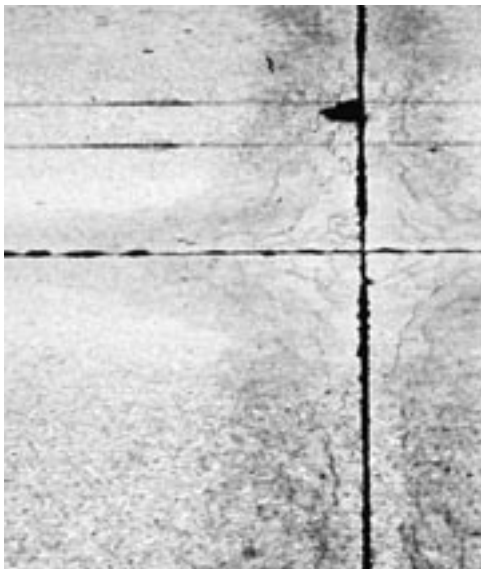
D-cracks

Occasionally, severe deterioration may develop from poor quality aggregate. So called D-cracking develops when the aggregate is able to absorb moisture. This causes the aggregate to break apart under freeze-thaw action which leads to deterioration. Usually, it starts at the bottom of the slab and moves upward.

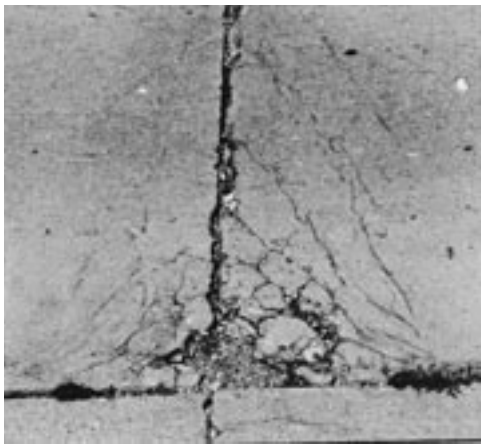
Fine cracking and a dark discoloration adjacent to the joint often indicate a D-cracking problem. Once this is visible on the surface the pavement material is usually severely deteriorated and complete replacement is required.

Joint or crack sealing helps slow D-cracking deterioration. This is a serious defect because it may indicate a material quality problem throughout the pavement.

Surface discoloration near joints and cracks indicates D-cracking and severe slab deterioration.
▼ ►



►
Multiple crack patterns adjacent to joints. Common D-cracking pattern.



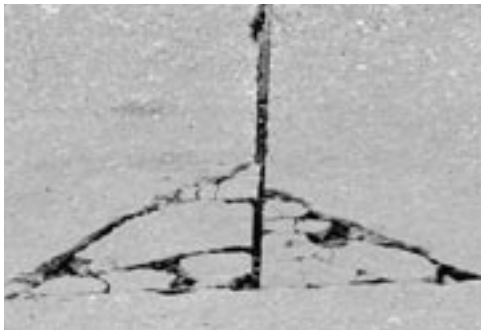
Corner cracks

Diagonal cracks near the corner of a concrete slab may develop, forming a triangle with a longitudinal and transverse joint. Usually these cracks are within one foot of the corner of the slab. They are caused by insufficient soil support or concentrated stress due to temperature related slab movement. The corner breaks under traffic loading. They may begin as hairline cracks.

Some corner cracks extend the full depth of the slab while others start at the surface and angle down toward the joint. With further deterioration, more cracking develops; eventually the entire broken area may come loose. This may be a localized failure or may point to widespread maintenance problems.

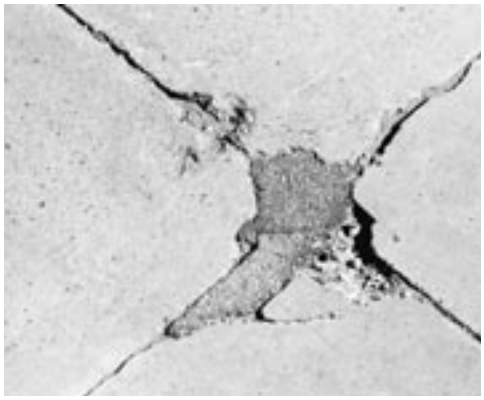
Partial or full depth concrete patching or full depth joint replacement may be necessary when corner cracking is extensive.

Corner cracking with ► broken concrete pieces.



▲ First signs of corner cracking.

►
Severely spalled corner crack with missing pieces and patching.



Meander cracks

Some pavement cracks appear to wander randomly. They may cross a slab diagonally or meander like a serpent. Meander cracks may be caused by settlement due to unstable subsoil or drainage problems, or by utility trench settlement. Frost heave and spring thaw can also cause them. They are often local in nature and may not indicate general pavement problems.

Minor cracks may benefit from sealing to minimize water intrusion. Extensive or severe meander cracking may require replacing the slab, stabilizing the subsurface, or improving drainage.

◄ **Meander crack roughly parallel to longitudinal joint.**

◄ **Meander crack caused by settlement. Lack of maintenance allows water to intrude and debris to collect in crack.**

◄ **Faulting and spalling of a meander crack.**

PAVEMENT DEFORMATION

Blowups

Concrete slabs may push up or be crushed at a transverse joint. This is caused by expansion of the concrete where incompressible materials (sand, etc.) have infiltrated into poorly sealed joints. As a result, there is no space to accommodate expansion. It is more common in older pavements with long joint spacing. Pressure relief joints can be installed and blowup areas must be patched or reconstructed.

Faulting

Joints and cracks may fault or develop a step between adjacent slabs. Faulting is caused by pumping of subgrade soils and creation of voids. Heavy truck or bus traffic can rapidly accelerate faulting. Longitudinal joints may fault due to settlement of an adjacent slab.

Faulting creates a poor ride and may cause slab deterioration. Minor faulting can be corrected by surface grinding. Voids can be subsealed, or slabs mud jacked back to level position. Severe cases may need joint replacement.

◄ **Internal pressure has partially raised slab at the joint. Complete replacement is required.**

A pavement blowup in progress. Concrete is crushed and slabs buckled. ▼

▲ **Faulted longitudinal joint.**

► **Severely faulted joint. Slab jacking is necessary.**

▲ **Minor faulting of transverse joints. Aggravated by heavy traffic. Surface grinding will improve ride.**

APPENDIX B

INVENTORY AND CONDITION ASSESSMENT OF ROAD SURFACES
AMERICA'S CENTRAL PORT
OCTOBER 2021

ROAD	CONDITION	LENGTH (FT)	RECCOMENDATION
20th Street	Poor	233	2" Mill and Fill or Complete Reconstruction
20th Street	Poor	849	2" Mill and Fill or Complete Reconstruction
20th Street	Poor	917	2" Mill and Fill or Complete Reconstruction
20th Street	Poor	234	2" Mill and Fill or Complete Reconstruction
20th Street	Good	360	None or Joint Sealing
A Street	Poor	1,042	2" Mill and Fill
A Street	Poor	725	2" Mill and Fill
Access Boulevard	Poor	1,953	2" Mill and Fill or Complete Reconstruction
Bissell Street	Good	1,258	Joint Sealing
Bissell Street	Good	470	Joint Sealing
Bissell Street	Good	2,189	Joint Sealing
Bissell Street	Good	1,184	Joint Sealing
Bissell Street	Good	769	Joint Sealing
C Street	Fair	1,201	2" Mill and Fill
C Street	Poor	250	2" Mill and Fill
C Street	Poor	83	2" Mill and Fill
C Street	Poor	307	2" Mill and Fill
C Street	Poor	328	2" Mill and Fill
D Street	Poor	537	2" Mill and Fill or Complete Reconstruction
D Street	Fair	1,140	Crack Sealing
D Street	Fair	384	Crack Sealing
D Street	Fair	319	Joint Sealing & Patching as needed
D Street	Fair	291	Joint Sealing & Patching as needed
D Street	Fair	72	Joint Sealing & Patching as needed
D Street	Fair	244	Joint Sealing & Patching as needed
E Street	Poor	316	2" Mill and Fill
E Street	Poor	800	2" Mill and Fill or Complete Reconstruction
E Street	Good	291	Crack Seal
E Street	Good	72	Crack Seal
E Street	Good	244	Crack Seal
E Street	Good	1,140	Crack Seal
E Street	Fair	259	Crack Sealing
E Street	Fair	732	Crack Sealing
East Lane	Poor	604	2" Mill and Fill
Fisher Court	Poor	61	2" Mill and Fill
Fisher Court	Poor	661	2" Mill and Fill
Garber Court	Poor	246	2" Mill and Fill
Garber Court	Poor	342	2" Mill and Fill
Herschbach Drive	Fair	1,375	Crack Sealing or 2" Mill and Fill
Hinkle Court	Poor	58	2" Mill and Fill
Hinkle Court	Poor	631	2" Mill and Fill
Justice Court	Poor	55	2" Mill and Fill
Justice Court	Poor	643	2" Mill and Fill

Kennedy Drive	Poor	1,463	2" Mill and Fill
Kennedy Drive	Fair	455	Crack Seal or Microsurfacing
Levee Road	Poor	205	2" Mill and Fill
Levee Road	Poor	1,497	2" Mill and Fill
Levee Road	Fair	4,247	Crack Sealing or Microsurfacing
Levee Road	Fair	600	Crack Sealing or Microsurfacing
Levee Road	Poor	3,416	Crack Sealing or Microsurfacing on Asphalt sections
Levee Road	Good	7	None
Madison Harbor Road	Good	3,300	Joint Sealing
Madison Harbor Road	Good	1,243	Joint Sealing
Madison Harbor Road	Good	990	Joint Sealing
McIntosh Drive	Poor	474	2" Mill and Fill
Niedringhaus Avenue	Poor	1,887	2" Mill and Fill or Complete Reconstruction
Niedringhaus Avenue	Fair	419	Crack Sealing or 2" Mill and Fill
Niedringhaus Avenue	Fair	111	Crack Sealing or 2" Mill and Fill
Niedringhaus Avenue	Fair	613	Crack Sealing or 2" Mill and Fill
North Street	Poor	1,777	2" Mill and Fill or Complete Reconstruction
North Street	Fair	607	Microsurfacing or 2" Mill and Fill
Old Rock Road	Poor	898	2" Mill and Fill or Complete Reconstruction
Old Rock Road	Fair	1,712	Crack Sealing
Old Rock Road	Fair	2,182	Crack Sealing or Microsurfacing
Red Dock Road	Poor	2,918	2" Mill and Fill or Complete Reconstruction
Rock Road	Fair	251	Crack Sealing or Microsurfacing
Rock Road	Fair	1,331	Crack Sealing or Microsurfacing
Rock Road	Fair	266	Joint Sealing & Patching as needed
South Harbor Terminal Road	Good	84	Joint Sealing
South Harbor Terminal Road	Good	762	Joint Sealing
South Harbor Terminal Road	Good	472	Joint Sealing
South Harbor Terminal Road	Good	105	Joint Sealing
Sullivan Drive	Poor	485	2" Mill and Fill
Union Street	Fair	1,040	Microsurfacing or 2" Mill and Fill
West 1st Street	Fair	1,597	Complete Reconstruction Scheduled
West 1st Street	Poor	1,686	Complete Reconstruction Scheduled
West 1st Street	Poor	832	2" Mill and Fill or Complete Reconstruction
West 1st Street	Poor	1,020	2" Mill and Fill or Complete Reconstruction
West 1st Street	Good	271	Crack Seal
West 1st Street	Good	1,626	None or Crack Sealing
West 2nd Street	Poor	1,597	2" Mill and Fill
West 2nd Street	Fair	1,583	2" Mill and Fill
West 3rd Street	Poor	1,597	2" Mill and Fill or Complete Reconstruction
West 3rd Street	Poor	1,486	2" Mill and Fill or Complete Reconstruction
West 3rd Street	Poor	831	2" Mill and Fill or Complete Reconstruction

West 3rd Street	Poor	432	2" Mill and Fill or Complete Reconstruction
West 3rd Street	Poor	588	2" Mill and Fill or Complete Reconstruction
West 4th Street	Poor	1,597	Complete Reconstruction Scheduled
West 4th Street	Poor	1,382	Complete Reconstruction Scheduled
West 7th Street	Poor	976	2" Mill and Fill
West 7th Street	Poor	930	2" Mill and Fill
West 7th Street	Poor	136	2" Mill and Fill
West 7th Street	Poor	371	2" Mill and Fill
West 7th Street	Poor	139	2" Mill and Fill
West 7th Street	Poor	550	2" Mill and Fill
West 7th Street	Poor	406	2" Mill and Fill
West 7th Street	Fair	407	Crack Seal & Patching as needed
West 7th Street	Fair	150	Crack Seal & Patching as needed
West 7th Street	Good	1,597	None
Wharf Road	Good	441	Joint Sealing
Wharf Road	Good	310	Joint Sealing
Wharf Road	Good	78	Joint Sealing
Wharf Road	Good	71	Joint Sealing
Wharf Road	Good	948	Joint Sealing
Wharf Road	Good	544	Joint Sealing
Wharf Road	Good	238	Joint Sealing
Wharf Road	Good	248	Joint Sealing
White Dock Road	Fair	3,046	Crack Sealing or Microsurfacing

APPENDIX C

Examples of "Good" Road Condition

Examples of "Fair" Road Condition

Examples of "Poor" Road Condition

EXHIBIT G

CONDITIONS ASSESSMENT OF RAIL INFRASTRUCTURE
DESIGN NINE, INC.

AMERICA'S CENTRAL PORT

RAIL INFRASTRUCTURE

CONDITIONS ASSESSMENT

~2021~

1635 West First Street
Granite City, IL 62040

GRANITE CITY HARBOR & MADISON HARBOR
GRANITE CITY, MADISON COUNTY, ILLINOIS

Prepared by:

DESIGN NINE, INC.
ENGINEERING SERVICES FOR
RAILROADS AND INDUSTRY

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(314) 729-7600

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List of Appendices included in this report:

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AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

I. Introduction

1. America's Central Port ("Port") has grown to be one of the largest freight hubs in the Midwest with two (2) multimodal harbors containing development ready sites and industrial real estate with rail access.

2. These multimodal harbors have seen substantial volume growth utilizing the rail infrastructure from both existing and new tenants who have developed rail-served facilities.

3. With increase in rail car volume the Port has implemented standards that meet or exceed FRA Class I railroad standards. The implementation of these standards is apparent throughout the Port as the original rail infrastructure is replaced and rehabilitated and the new rail infrastructure is placed in-service.

4. While performing this rail infrastructure assessment it is apparent that the current maintenance program is being successfully executed on a regularly scheduled basis with repairs being made on a time basis as required to properly maintain the infrastructure exceeding the Federal Railroad Administration Class 1 Track Safety Standards pursuant to 49 C.F. R. Part 213.

II. Background

1. The Port, more recently known as the Tri-City Regional Port District, is a municipal corporation of the State of Illinois created in 1959 to promote economic development and transportation in Southwestern Illinois. The Port manages a 1,200-acre industrial park in the cities of Granite City, Madison, and Venice, Illinois, approximately ten (10) minutes north of downtown St. Louis, Missouri. Originally the Port was a U.S. Army Depot and Melvin Price Support Center.

2. The Port has received grant funding from the Illinois Department of Transportation (IDOT) to conduct an infrastructure conditions assessment of its rail, roadway, and sewer/stormwater infrastructure to enable the Port to adequately manage the assets while making strategic capital investments.

3. Design Nine, Inc. is a subconsultant to Juneau Associates, Inc., P.C. (Juneau) and was assigned a Subcontract to develop a report addressing the rail infrastructure conditions assessment.

4. Assessment was performed by Michael P. Atzert and Eric M. Gerecke, Design Nine, Inc., between July and December 2021.

5. The scope of this report includes a conditions assessment of approximately 14.2 miles of track separated into two (2) regions with a dividing line along Niedringhaus Avenue that runs in the East and West direction. The Madison Harbor is located South of Niedringhaus Avenue and Granite City Harbor located North of Niedringhaus Avenue. The assessment report includes ratings of the existing conditions of the rail facilities, photographs, inspection notes, recommended treatment(s) along with a recommended treatment schedule. This condition assessment will aid the Port in the scheduling of repairs and continued maintenance of the facility.

6. Rail assets located on the property but presumed to be maintained by other parties have not been included in this report. The exact location of rail asset ownership and maintenance has not been defined by the Port. The limits of the rail assets evaluated for this report were defined in the Juneau supplied Exhibit A.1 and Exhibit A.2 “America’s Central Port Railroad Inventory Map, City of Granite City, Illinois” dated 05/14/2021 attached as an Appendix.

7. Railroad automatic grade crossing warning signals and their associated equipment was not assessed.

8. The final deliverables of the rail condition assessment include this written report of findings and the Juneau created GIS data for the rail infrastructure system in shapefile format.

9. A schematic is attached as an Appendix to this report that identifies the tracks, turnouts, at-grade crossings, rail crossings and areas where there is direct fixation of

track. The first sheet is of the Madison Harbor and the second sheet is of the Granite City Harbor.

10. Madison Harbor has four (4) entities that own their own track and turnouts. At this time the Terminal Railroad Association of St. Louis (TRRA) interchanges with the Port Harbor Railroad (PHRR, a Class III common carrier). The interchange tracks are officially identified as Tracks C-18 and C-19 within the A&K Railroad Materials facility. The PHRR provides full service switching for all rail-served tenants at this location via published tariffs. The track owned and maintained by the Port has the trackage rights leased to the PHRR to service the customers. Of the tenants receiving rail services, there are four (4) that own and maintain their track and turnouts:

    a. Green Plains (GP): There is a west and east lead track for PHRR to enter this facility. All trackage within the derails and the GP fence line is owned and maintained by GP. GP does have a track mobile to maneuver rail cars within their plant as required.

    b. Mattingly Lumber (ML): The trackage within the ML fence line is owned and maintained by ML. ML does not have their own power at this time and all rail cars are constructively placed by PHRR.

    c. Airgas (AG): The turnout and trackage into and within the AG facility is owned and maintained by AG. AG does not have their own power and all rail cars are constructively placed by PHRR.

    d. St. Louis Screw & Bolt (STLSB): The track immediately behind and adjacent to their warehouse, as well as the turnout to access the cross-over at E Street (Turnout SB-01) is owned and maintained by STLSB. STLSB does not have their own power and all rail cars are constructively placed by PHRR.

11. Granite City Harbor has several entities that own or are contracted to maintain certain tracks and turnouts. At the time of this report, the Norfolk Southern Corporation (NS) is the serving railroad at the Granite City Harbor and is responsible for constructively placing all rail cars for each terminal. Of all the terminals, only SCF, Plateplus and US Steel have their own motive power to maneuver rail cars through their terminal facility after constructive placement. Tenants with their own motive power do not provide any switching service to any other tenant.

    a. Plateplus has a small track mobile that moves rail cars along their side tracks at both of their facilities. This track mobile does not operate past the point of derail of either facility, one is located north, and one is located south of the A-Lead Track.

    b. APEX Oil has the NS place their rail cars directly at the loadout racks and remove them upon their being released.

    c. SCF operates three (3) facilities within the Granite City Harbor; 1) Red Dock, 2) White Dock and 3) southern half of Bulkhead Dock.

d. Red Dock has their rail cars constructively placed by the NS onto the facility tracks. There is a cable pully system that can cycle rail cars through the unloading pit. SCF has an engine available for supplemental power as maybe required.

e. The White Dock has their rail cars constructively placed by the NS onto several tracks adjacent to the facility. SCF has an engine available for power to maneuver the train set through the unloading pit as required.

f. SCF (via Midcoast) operates on the southern half of the Bulkhead Dock for steel and fertilizer commodities in general (capability for other commodities as market(s) dictate). The NS constructively places rail cars on tracks adjacent to the facility and SCF has an engine available for power to maneuver rail cars through the facility.

g. US Steel, when operating at the harbor, has a lease for the north half of the Bulkhead Dock. Their rail cars are constructively placed by the NS to the tracks adjacent to the facility where they have their own engine as power to maneuver rail cars through the facility.

III. Definition

1. **Appendix** – Supplementary materials providing additional information to the main body of the report.

2. **Attachment** – Supplementary items or documents that is appended to the main body of the report.

3. **Battered Rail End** – Surface deformation, flattening and widening of the head of the rail in the immediate vicinity of the end of the rail. Proper maintenance of rail joints includes track alignment, surface, cross slotting and track bolt tightening.

4. **Continuous welded rail (CWR)** – Rail sections that are welded end to end into rail strings that result in a rail without rail joints exceeding four hundred (400) feet; also referred to as welded rail or ribbon rail. Rail installed as CWR remains CWR, regardless of whether a joint or plug is installed into the rail at a later time.

5. **Crushed Head / Flattened Rail** – A length of rail, not at a joint, which has flattened out across the width of the rail head to a depth of three-eighths (3/8) inch or more below the rest of the rail and eight (8) inches or more in length. Crushed heads can be the result of wheel impacts due to geometry cross level anomalies or excess elevation in curves resulting in defect development on the low rail. Proper track surfacing, curve super-elevation and maintenance grinding of rail lessens this occurrence.

6. **Engine/Wheel Burn** – Overheating of the rail generated by slipping locomotive wheels producing friction combined with rapid cooling creates untempered martensite and thermal cracking. The pounding of wheels over time at the burned area results in

a horizontal separation of the burned metal from the parent metal and a noticeable flat spot will develop. Proper locomotive engineer training, proper traction levels on grades and the use of sanding when wheel slippage occurs are the most effective ways to reduce engine burns.

7. **Field Side** – The side of rail head away from wheel flange or outside the tread.

8. **Gauge Face Wear (Side Wear)** – The difference in the horizontal dimension between the new rail section and the worn rail section at a prescribed depth (5/8-inch) below the top of rail centerline point.

9. **Gauge Flow (Lip)** – Gauge flow is measured horizontally from the gauge side of the rail 5/8-inch below the current top of rail centerline point to the extreme point on the gauge side.

10. **Gauge Side** – The side of rail head adjacent to the wheel flange or to the inside of the track.

11. **Head Checking** – Head checks are shallow surface or hairline cracks that appear in the gauge corner of the rail head, at any angle with the length of the rail.

12. **L/V Ratio** – Quotient for measuring dynamic loading in the field or from theoretical analysis. The ratio can provide an indication of potential failures of a vehicle-track system. This vehicle-track interaction is the combined effect of the lateral dynamic loadings (L) and the vertical dynamic loadings (V) imposed by the vehicle on the track.

13. **Rail Head Width** – The horizontal distance from the gauge side to the field side of the rail head at a stated depth (5/8-inch) below the top of rail centerline point.

14. **Rail Lip** – A length of rail steel material that has undergone plastic deformation to form a folded layer overhanging at the lower edge of the rail head. This condition is typically found on the high side of curves.

15. **Rail Neutral Temperature** – The rail temperature at which there are no axial thermal forces in the rail section.

16. **Rail Wear** – A reduction of the rail head as a result of abrasive action between the steel wheel on the steel rail.

17. **Rolling Contact Fatigue (RCF)** – A form of rail fatigue damage originating primarily from cyclic loading in the wheel/rail interface zone.

18. **Shelling** – A rail head condition consisting of progressive subsurface horizontal separations that my crack out on the gauge side of the rail head. Shelling normally occurs on the upper gauge face of the rail head, and extend longitudinally.

19. **Spalling** – Cracking and chipping of the rail surface as a progression of head checking and flaking from rolling contact fatigue (RCF) creating high horizontal wheel-rail creeping forces, transverse friction forces and extreme wheel-rail contact stresses.

Selection and maintenance of correct rail super-elevations to match train speeds is most important. Proper friction control and lubrication practices can reduce the occurrence of spalling in curved track areas.

20. **Vertical Head Wear (Top Wear)** - The difference in the vertical dimension between the new rail section and the worn rail section at the top of rail centerline point.

IV. Condition Assessment Grading Scale

1. A condition assessment grading scale was created and applied to each turnout, at-grade crossing, rail crossing and section of track.

2. Assessment methodology comprised of walking each rail infrastructure element, recording and photographing visible observations of exposed elements not buried in debris or aggregate that would require extraordinary effort to uncover, and measuring key rail infrastructure elements manually with a tape measure, track gauge measuring device or GPS survey equipment.

3. Rail measurements and cross level were taken at locations between turnouts, at the points within the switching limits of turnouts, at points of curves, mid-points of curves, points of tangent and periodically along tangent track.

4. Life expectancy and failure rates of rail infrastructure elements from the subgrade to individual components are subject to many variables including the quality and frequency of maintenance, track alignment and grades, traffic density and volume, climate conditions, and materials.

5. The assessment used subjective inspection techniques and engineering judgement. This assessment/inspection does not guarantee that all defective, poor or failing conditions have been identified. Conditions that are hidden, inaccessible, covered, internal or not visibly seen with ordinary effort may have not been discovered or located.

6. All recommendations and condition grades (ratings) are the result of good faith subjective judgements and experience of the inspector(s) based on conditions present at the time of the assessment, utilizing industry standards and procedures and information that was made available to the inspector(s) prior to the submission of this report.

7. Conditions and standards can and do change, so frequent re-inspections and re-assessments is recommended.

8. The focus of this assessment was on the major elements of the rail infrastructure. It is recognized that OTM (other track material) such as spikes, rail anchors, rail joints and other items play a critical role in maintaining an operable railroad, this report does not address the standards currently being applied at this facility. Recommend that ACP follow the standards of the serving Railroad at each harbor and at a minimum meet

the recommendations of the American Railway Engineering and Maintenance-of-Way Association (AREMA). This report does address where the OTM is not performing as designed leading to negative impacts on associated components where a treatment is recommended.

9. The following table provides an outline of the condition grades developed by ASCE – American Society of Civil Engineers that has been adapted and modified for the assessment of the rail infrastructure.

I.D.	Grade	Description
A	Very Good	*Exceptional, Fit for Purpose/Future*: The infrastructure in the system or network is generally in excellent condition, typically new or recently rehabilitated, and meets the capacity needs for the future. A few elements show signs of general deterioration that require attention. Facilities meet modern standards for functionality and are resilient to withstand anticipated annual rail tonnage. **Treatment:** Only normal scheduled maintenance is required.
B	Good	*Good, Adequate for Now*: The infrastructure in the system or network is in good to excellent condition; some elements show signs of general deterioration that require attention. A few elements exhibit significant deficiencies. Safe and reliable, with minimal capacity issues and minimal risk. **Treatment:** Some minor repairs as required; function is okay.
C	Fair	*Mediocre, Requires Attention*: The infrastructure in the system or network is in fair to good condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies in conditions and functionality, with increasing vulnerability to risk. **Treatment:** More minor repairs required; mostly functional.
D	Poor	*Poor, At Risk*: The infrastructure is in poor to fair condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. Condition and capacity are of serious concern with strong risk of failure. **Treatment:** Significant repairs required; system not fully functional for use; does not meet current standards.
E	Very Poor	*Failing/Critical, Unfit for Purpose*: The infrastructure in the system is in unacceptable condition with widespread advanced signs of deterioration. Many of the components of the system exhibit signs of imminent failure. **Treatment:** Major repair or replacement required to restore function; system unsafe. If repairs are not addressed, facilities to be taken out of service.

V. Assessment Criteria

1. The service life of rail infrastructure is influenced by a track maintenance program, speed and traction of power units, proper friction control, track geometry conditions and curvature, rail profile, rail weight and condition, size of tie plates, size and condition of cross ties, annual rail car tonnage (traffic density) and ballast type and condition. These all interact and factor into the development of defects, premature failure, reduced service life and need for increased frequency of track maintenance and replacement programs.

2. Track and turnout maintenance programs involve regularly scheduled maintenance procedures that ensure the rail infrastructure maintains adequate support of the rail traffic while maximizing the service life of the rail infrastructure.

3. The Federal Railroad Administration (FRA) provides minimum Track Safety Standards (TSS). The TSS classifies track solely on the basis of authorized speeds for freight and passenger trains. The only structural or geometry defect that is applicable on excepted track is gauge exceeding 4-feet 10 ¼ inches.

    a. The maximum allowable operating speed of the Port for freight trains is ten (10) miles per hour.

    b. There is no passenger rail service at the Port.

    c. All track and turnouts within the Port are categorized by the FRA TSS as either Excepted or Class I Track.

4. Unsafe Train Operations for FRA Class I Track.

    a. Track Gauge - Standard track gauge is 56 ½ inches measured 5/8 of an inch under the top of the ball of the rail. Wide track gauge is a measurement greater than 58 inches with narrow track gauge any measurement less than 56 inches. The track gauge measurement takes into consideration any movement of the rail in the tie plate when under load. When measurements are beyond these limiting values the track condition is considered unsafe for train operations.

    b. Alignment – A track alignment that has moved from its original uniform position more than five (5) inches in the middle of a sixty-two (62) foot long rail section is considered unsafe for train operations.

    c. Cross-level – The difference between opposing rails shall be zero (0) in tangent and one-half (½) inch in curves that is increased based on train speed and degree of curvature. If the difference in cross-level between any two (2) rails adjacent or within 62 feet of each other (warped) is greater than three (3) inches the condition is considered unsafe for train operations.

    d. Profile – The difference in the top of rail along a sixty-two (62) foot section

greater than three (3) inches the condition is considered unsafe for train operations.

e. Crossties – A minimum of every fourth tie shall be of good sound quality and at least one good crosstie within 48 inches of a rail joint to be considered safe for train operations. Defective crossties lack the qualities to hold track gauge and maintain track surface. The crosstie defects include those that are broken, split, and or deteriorated to where the spike holding capabilities allow over one-half (½) inch of movement in the tie plates or result in measurable plate cutting.

f. Rails Joints – Mismatch rail ends greater than one-quarter (¼) inch shall be corrected.

g. Switch Points – A worn switch point should be replaced if chipped deeper than seven-eights (7/8) inch below the top of the stock rail, three-quarters (¾) inch deep and is longer than four (4) inches, five-eights (5/8) inch deep and longer than seven (7) inches or chipped and has unprotected vertical surface that is five-sixteenths (5/16) inch or wider, three-quarters (3/4) inch below the top of the stock rail for a Samson point. Switch points and stock rails shall be replaced as a complete system.

h. Frog – Frog points chipped, broken or worn more than five-eights (5/8) inch down and six (6) inches back should be replaced.

VI. Recommended Treatments

1. Recommended treatments have been categorized based on industry standard work task items that are applied in maintenance and new construction. The description provides clarity to the circumstances requiring the treatment with a brief scope of work.

No.	Treatment Name	Description
1	Welding/grinding	Component to be cleaned and properly built-up by welding on additional material then grinding to original profile.
2	Surfacing and lining	Correct skewed cross ties. Furnish track ballast, tamp and raise track to restore original or best-fit horizontal and vertical alignment to establish a uniform and smooth rail profile with tie cribs full of track ballast. Switch ties along the length of switch rail and through the limits of the frog may require manual tamping to ensure tie plate is brought up to base of rail with compacted track ballast for support. Surfaced track and turnout(s) shall conform to the standard track ballast section establishing proper shoulders, walkways and broomed clear of debris.
3	Switch point guard	Replace when guard exhibits heavy amount of guard face wear. Install new or adjust switch point guard where switch points show

No.	Treatment Name	Description
		wear within six (6) inches of point of switch. Remove point protector(s) and install switch point guard(s).
4	Turnout maintenance	Replace/tighten missing and loose bolt assemblies, replacing if seized. Properly lubricate switch rail plates and grease switch stand. Tighten connecting rod jam nut. Replace missing/broken cotter keys. Correct switch stand handle position for each movement and ease of throw to establish proper tension on switch points with ordinary effort by a person of average weight. Correct target orientation. Properly crib along the switch rails, connecting rod and switch rods. Remove high spikes, insert treated tie plug and install new spike. Clear all flangeways, base of rails, tie plates and frog toe and heel free of debris. Adjust/tighten rail braces to properly hold and restrain track gauge. Install switch stand lock or hook latch to secure handle position. Crib switch rails.
5	Replace targets	Switch targets to be replaced with reflectorized green (straight movement) and red (diverge movement) targets.
6	Frog replacement	Frog to be replaced with either an SMSG or RBM frog. Guardrails to be included with RBM frogs. Replace all or select frog tie plates.
7	Switch tie renewal	Switch tie renewal shall be performed to maintain 30% or less of defective switch ties or at critical locations where other components are degraded by poor switch tie conditions.
8	Tie plate renewal	Replace deformed, bent, pitted or broken standard tie plates or switch tie plates with properly sized double shoulder tie plates.
9	Replace switch rails	Replace switch points and stocks rails as a set with new or quality relay rail that matches the existing rail, adjacent rails may need to be built up to match replacement rail.
10	Vegetation control	Treat entire track section width with formulated mixture to address seasonal spring growth, heavy woody brush and or general clean-up.
11	Rail relay	Properly disjoint and remove existing rail replacing it with new or quality secondhand AREMA Class I relay of matching size and perform rail end treatment if required.
12	Rail end treatment	Mismatch rail ends exceeding one-sixteenth (1/16) inch or rail end batter rail joints shall be built-up by welding and grinding to provide a smooth surface then cross-slotting closed joints. Rail joint bolt assemblies shall be tightened and replaced if seized. Broken or cracked joint bars to be replaced.
13	Subgrade stabilization	Areas identified from rail profile dips, shallow ballast tie cribs, track pumping, reverse superelevation in curves or high cross-level values shall have the subsurface investigated to determine treatment method (mechanical, chemical or full replacement) based on the soil

No.	Treatment Name	Description
		properties.
14	Geometry reconfiguration	Perform a detailed topographic location survey, engineer a design and stake the reconfiguration, and rehabilitate the track and turnout geometry condition to improve train handling and reduce track maintenance.
15	OTM per standards	Install spikes, rail anchors and bolt assemblies to meet current maintenance or new construction standards.
16	Renew typical section	Remove track section or element to permit excavation of poor in situ subgrade, replace with proper load-bearing fill, place geotextile fabric and geogrid below a sub-ballast layer, pre-ballast, re-install track section and place new track ballast.
17	Replace turnout	Replace entire turnout from the point of switch to the last long tie by removing the existing turnout, excavating to permit a minimum of six (6)-inches of new track ballast below the switch ties, place geotextile fabric and geogrid and pre-ballast, install the new turnout and place new track ballast.
18	Replace guardrail	Remove existing, if present, and install new guardrail.
19	Track ballast renewal	Remove track ballast by cribbing and excavating ballast shoulders or undercutting, placing new track ballast, tamping and surfacing the track.
20	Walkways	Install new or widen existing walkways to meet State and industry standards to provide a safe walking surface for train operators.
21	Out-of-Service	If turnout is out-of-service, it must have a clamp installed on switch points and switch stand locked and tagged. If track is out-of-service, it shall have derail installed with proper warning sign/flag.
22	Replace switch stand	Install new switch stand fully fastened to the headblock switch ties with correct color and properly orientated targets lined for the intended movement.
23	Replace heel block assemblies	Install new heel block assemblies with proper heel block, correct bolts, locking washers and castle head nuts with correct thimbles and cotter keys.
24	Cross/super-elevation	Establish zero (0) cross-level in tangent track and turnouts and calculated or field confirm super-elevation in the outside rail of horizontal curves.
25	Rail/wheel friction control	Install proper gauge face and or top of rail friction modifiers (lubrication) as recommended by a manufacturer based on existing rail wear, train speed, degree of curvature and traffic density.
26	Track maintenance	Replace/tighten missing and loose bolt assemblies, replacing if seized. Replace broken or cracked joint bars. Fully drive rail anchors to correct anchor pattern, replacing if missing, broken or loose. Remove high spikes, insert treated tie plug and install new spike.

No.	Treatment Name	Description
27	Full replacement	Remove existing grade crossing surface and track section to top of sub-ballast, install underdrains if warranted, install new track panel, place track ballast, surface and line track and install new grade crossing surface paving the roadway approaches. Extend crossing surface a minimum of three (3) feet beyond the travel-way.
28	Pavement repair	Remove failed section of pavement and replace with new.
29	Select crossing surface renewal	Replace select failed sections of crossing surface. Replace or repair failed flangeways of crossing surface. Extend crossing surface to extend three (3) feet beyond the travel-way. Repair pavement approaches as may be required.
30	Remove pedestrian crossing	Remove entire pedestrian crossing surface and restore typical track section by performing cross tie renewal, track ballast renewal and surfacing and lining.
31	Modify roadway	Adjust roadway approaches to establish a smooth surface free of humps or dips that meet federal, state and local standards and AREMA recommendations.
32	Track raise	Furnish ballast and raise track profile to meet original design elevation or to provide a smooth vehicle wheel transition from the roadway approach onto the crossing surface.
33	Replace roadway surface	Approach roadway surface to be removed and replaced to establish smooth surface free of humps or dips that meet federal, state and local standards and AREMA recommendations.
34	Realign	Realign track alignment to original design with proper super/cross-level.
35	Maintain track gauge	Re-establish standard track gauge of 56-1/2 inches.
36	Establish drainage	Investigate outfall location and elevations and establish drainage path of surface water to be directed outside the limits of the track section and all four (4) quadrants of a grade crossing. Remove debris blocking, fouling and obstructing the free flow of drainage from the track section.
37	Open tie cribs	Crib select locations to provide an outlet between cross ties to prevent holding water in track section and promote positive drainage.
38	Sign placement	Replace or install new roadway signage with correct signage meeting federal, state and local standards.
39	End of road treatment	Install proper DOT end of road barricades with signs and advance warnings.
40	Train handling	Review switching operation with locomotive engineers in areas with high frequency of engine rail burns and other problematic locations contributing to decreased service life of the rail.
41	Destress rail	Establish rail neutral temperature in jointed or continuously welded rail by allowing proper rail thermal adjustments.

No.	Treatment Name	Description
		Disassemble and lubricate joint bars and establish proper rail joint gap per AREMA recommendations. Properly destress rail per CWR program by adding or removing rail.
42	Anchor pattern	Install rail anchors to achieve every other tie being fully box anchored to decrease longitudinal rail movement (creep).
43	Standard EOT device	Replace and or install new bumping post. Restore earthen mound to standard.
44	Reset direct fixation	Remove existing bolt studs, patch damaged concrete and set new all-thread steel studs with appropriate epoxy.
45	Derail	Install new or adjust derail.
46	Tie renewal	Replace all cross ties throughout grade crossing surface plus ten (10) ties either side of grade crossing surface. Cross tie renewal shall be performed to maintain 30% or less of defective cross ties or at critical locations where other components are degraded by poor cross tie conditions.

VII. Condition Grades – Turnouts

1. Turnout assessments are limited to the components along the switch ties from the point of switch to the last long switch tie. Conditions outside these limits to be evaluated and graded separately.

2. Turnout identification is mapped on Attachment ‘B’ in a general track schematic and Attachment ‘C’ with color coded condition grades assigned.

3. Turnout overall grade condition developed from assessing the turnout as a complete functioning component. The turnout is further separated into four (4) secondary components that include 1) rail (stock, running and closure), 2) switch rails, 3) frog casting and 4) ties. Each of these secondary components are impacted by geometry, tonnage, speed, etc. independently and therefore are assigned grade conditions individually to better understand the overall turnout grade condition. The secondary components are also considered separate major work items typically performed during turnout rehabilitation and maintenance.

4. Switch tie renewals shown as a percentage (%) of total accumulated visible existing switch ties divided by the number of poor/very poor switch ties as observed from the surface. Switch tie quantity does not include any absent switch ties necessary to adhere to any switch tie pattern standard or switch ties covered by debris or those within the limits of a grade crossing surface.

5. Madison Harbor Turnout Table – Summary of Condition Grades.

    a. Turnouts GP-02 to GP-15 are owned and maintained by others and are not included in this summary of condition grades.

Turnout I.D. & Comp.	Grade	Finding Notes	Recommended Treatment
AK-01 Rail Switch Frog Ties	3 3 3 3 18%	1) Loose joint bar assemblies 2) Tie plates broken and worn 3) Switch stand hard to throw, loose jam nut and bolts, lacking proper lubrication/ grease, missing cotter keys, missing roller bolt, switch rod rubbing headblock tie, incorrect normal stand position 4) Diverging side has irregular surface 5) Frog has very poor tie plates 6) Switch point guard absent	1) Welding/grinding 2) Surfacing and lining 3) Switch point guard 4) Tie plate renewal 5) Turnout maintenance
AK-02 Rail Switch Frog Ties	3 3 3 4 20%	1) Alignment hook ahead and behind diverging side 2) Loose joint bar assemblies 3) Switch stand moderate throw, lacking proper cribbing, incorrect normal movement target color, incorrect normal stand position, loose jam nut and switch rail bolts, missing cotter keys and switch rail bolts 4) Frog guard rail flangeway obstructed with heavy wear 5) Curve alignment extends onto switch points causing severe switch rail wear 6) Turnout located within a grade crossing surface 7) Frog point chipped and deformed	1) Surfacing and lining 2) Turnout maintenance 3) Replace targets 4) Welding/grinding 5) Frog replacement 6) Switch point guard 7) Replace switch rails
AK-03 Rail Switch Frog Ties	3 3 4 3 23%	1) Rail has flow and flat spot marks 2) High spikes 3) Normal movement has white target 4) Switch rail chipped and worn with heavy wear on switch point guard and loose heel bolts, missing cotter keys 5) Frog has chipped point with moderately worn guard rail face 6) Switch stand loose from very poor headblock ties 7) Switch point guard absent	1) Switch point guard 2) Replace switch rails 3) Replace targets 4) Welding/grinding 5) Switch tie renewal 6) Turnout maintenance
AK-04 Rail Switch Frog Ties	3 3 2 2 32%	1) High spikes 2) Switch panel incorrect normal movement target color, missing and loose heel bolts, switch panel skewed, right switch rail is chipped 3) Rail has chipped ends at rail joints 4) Switch point guard heavily worn	1) Welding/grinding 2) Switch point guard 3) Turnout maintenance 4) Switch tie renewal 5) Surfacing and lining 6) Replace targets
AK-05	3	1) Switch panel has loose rail braces, incorrect normal stand position	1) Turnout maintenance 2) Switch tie renewal

Turnout I.D. & Comp.	Grade	Finding Notes	Recommended Treatment
Rail Switch Frog Ties	3 2 2 39%		
PH-01 Rail Switch Frog Ties	2 3 2 2 0%	1) Switch panel lacking proper cribbing, loose heel bolts, rail braces and jam nut, missing cotter keys 2) Switch point guard absent 3) Derail should be installed to protect Track C19(B) through rail traffic	1) Switch point guard 2) Turnout maintenance 3) Derail
PH-02 Rail Switch Frog Ties	2 3 2 2 0%	1) Switch panel lacking proper cribbing, loose jam nut and heel bolts 2) Switch point guard absent	1) Switch point guard 2) Turnout maintenance
GP-01 Rail Switch Frog Ties	2 2 2 2 0%	1) Switch panel lacking proper lubrication/grease	1) Turnout maintenance
SB-01 Rail Switch Frog Ties	4 4 2 2 30%	1) Joint bar assembly loose and broken 2) Switch stand non-functional with incorrect normal movement target color 3) Switch panel lacking proper lubrication/grease, loose jam nut, missing cotter keys, broken heel block with loose bolts 4) Moderate vegetation 5) Turnout located within a grade crossing surface 6) Switch point is not clamped and switch stand is not locked 7) Switch point guard absent	1) Switch point guard 2) Vegetation control 3) Turnout maintenance 4) Replace switch stand 5) Replace heel block assembly 6) Out-of-service 7) Replace targets 8) Replace heel block assemblies
SH-01 Rail Switch Frog Ties	3 3 2 3 4%	1) Profile dip ahead of the switch 2) High spikes 3) Switch panel lacking proper cribbing, loose rail braces 4) Frog point has flow 5) Turnout located within a grade crossing surface	1) Surfacing and lining 2) Welding/grinding 3) Turnout maintenance
SH-02 Rail	2 3	1) Switch panel lacks proper cribbing and lubrication/grease, incorrect normal switch stand position	1) Welding/grinding 2) Vegetation control 3) Switch point guard

Turnout I.D. & Comp.	Grade	Finding Notes	Recommended Treatment
Switch Frog Ties	2 3 0%	2) Turnout located within a grade crossing surface 3) Light vegetation 4) Frog point chipped and deformed 5) Fouled track ballast near grade crossing surface 6) Heavy wear on guardrail 7) Switch point guard absent	4) Turnout maintenance 5) Track ballast renewal
SH-03 Rail Switch Frog Ties	2 3 2 3 6%	1) Profile dip ahead of turnout 2) Light vegetation 3) Curve closure rail has one-eight (1/8) inch worn gauge face wear with other rail spalling marks 4) Joint bar assembly loose bolts 5) High spikes 6) Switch panel lacking proper cribbing, lubrication/ grease with incorrect normal stand position and loose heel block bolts 7) Frog has chipped and worn point with loose bolts and heavily worn guardrail 8) Alignment swing between SH-02 and SH-03 9) Right stock rail split longitudinally with measurable rail flow and spalling	1) Turnout maintenance 2) Welding/grinding 3) Vegetation control 4) Rail relay 5) Replace switch rails 6) Realign 7) Surfacing and lining
SH-04 Rail Switch Frog Ties	3 3 3 3 9%	1) Switch panel has incorrect diverging movement target color and stand not fully fastened 2) Rail has engine burns and flat spots 3) Frog point deformed and chipped 4) Alignment swing through switch panel 5) Rail flow on switch rail impeding proper closure of Samson switch points 6) Left switch point is chipped	1) Welding/grinding 2) Replace targets 3) Surfacing and lining 4) Turnout maintenance 5) Realign
SH-05 Rail Switch Frog Ties	2 2 2 3 5%	1) Switch panel has incorrect normal stand position 2) Joint bar installed incorrectly 3) Alignment hook along diverge side 4) Frog deformed	1) Welding/grinding 2) Surfacing and lining 3) Turnout maintenance
SH-06 Rail Switch Frog Ties	5 3 5 4 20%	1) Swing along and behind straight side with switch panel in a profile dip 2) Rail has visible flat spots, flow and engine burns 3) Rail joints have mismatch and closed joints 4) High spikes 5) Switch panel has incorrect normal stand	1) Surfacing and lining 2) Turnout maintenance 3) Welding/grinding 4) Vegetation control 5) Rail end treatment 6) Replace switch rails

Turnout I.D. & Comp.	Grade	Finding Notes	Recommended Treatment
		position, targets installed incorrectly, rail does not rest on plates 6) Frog is deformed 7) Moderate vegetation 8) Right switch and stock rail worn with switch point chipping and preventing full closure	
SH-07 Rail Switch Frog Ties	2 3 2 2 4%	1) Loose joint bars 2) High spikes 3) Switch panel has loose rail braces, missing cotter keys 4) Moderate vegetation 5) Switch point guard in poor condition with heavy wear 6) Mismatched rail ends	1) Turnout maintenance 2) Vegetation control 3) Switch point guard 4) Rail end treatment
SH-08 Rail Switch Frog Ties	2 2 2 2 19%	1) Alignment swing ahead of switch 2) Switch panel switch rails do not contact base plate, incorrect targets, loose jam nut 3) Turnout located within a grade crossing surface 4) Guardrail flangeways obstructed 5) Switch point is not clamped and switch stand is not locked and lined for normal movement only since Turnout SB-01 is out of service	1) Surfacing and lining 2) Replace targets 3) Turnout maintenance 4) Out-of-service (diverging movement)
SH-09 Rail Switch Frog Ties	3 3 2 2 12%	1) Alignment swing behind diverging movement 2) Switch rails do not contact plates, lack proper cribbing, incorrect targets and normal stand position 3) Turnout located within a grade crossing surface	1) Surfacing and lining 2) Turnout maintenance 3) Replace targets
SH-10 Rail Switch Frog Ties	3 3 2 3 10%	1) Switch panel lacks proper cribbing 2) Frog deformed and chipped 3) Light vegetation 4) Guardrail flangeways obstructed 5) Turnout located within a grade crossing surface	1) Welding/grinding 2) Turnout maintenance 3) Vegetation control
SH-11 Rail Switch Frog Ties	2 3 2 2 0%	1) Profile dip ahead/along switch panel and behind both legs of the turnout resulting in shallow ballast 2) High spikes 3) Turnout located within a grade crossing surface 4) Switch panel incorrect target color, loose jam nut, narrow gap in switch points 5) Rail has series of minor engine burns (wheel	1) Switch point guard 2) Surfacing and lining 3) Turnout maintenance 4) Subgrade stabilization 5) Replace targets

Turnout I.D. & Comp.	Grade	Finding Notes	Recommended Treatment
		slippage on diverging movement) 6) Switch point guard absent	
SH-12 Rail Switch Frog Ties	2 2 2 2 2%	1) Alignment swing on diverge side 2) Profile dip ahead and behind both legs of the turnout resulting in shallow ballast 3) Switch point guard has heavy wear	1) Surfacing and lining 2) Switch point guard 3) Subgrade stabilization
SH-13 Rail Switch Frog Ties	4 4 3 4 20%	1) High spikes 2) Every 4th tie anchored, should be fully anchored 3) Switch panel lacking proper cribbing, target partially damaged, incorrect normal stand position, missing cotter keys 4) Switch point guard has heavy wear 5) Frog casting smashed causing heavy flow with flange chipped with evidence of metal shavings 6) Right stock and curved closure rail heavily worn gauge face due to curvature ahead of turnout	1) OTM per standard 2) Switch point guard 3) Replace target 4) Replace switch rails 5) Welding/grinding 6) Replace frog 7) Rail relay 8) Turnout maintenance
SH-14 Rail Switch Frog Ties	3 3 2 2 0%	1) Minor rail end batter at rail joints 2) Mismatched rail ends 3) Switch panel has incorrect target colors	1) Rail end treatment 2) Replace targets
SH-15 Rail Switch Frog Ties	2 1 2 2 3%	1) Alignment swing behind straight side 2) Switch panel has loose roller wheel, lacking proper cribbing 3) Moderate vegetation 4) Turnout located within a grade crossing surface 5) Mismatch rail ends at heel and frog 6) Shallow tie cribs 7) Sink hole in southeast quadrant of grade crossing	1) Surfacing and lining 2) Turnout maintenance 3) Vegetation control 4) Rail end treatment 5) Subgrade stabilization
SH-16 Rail Switch Frog Ties	2 1 2 2 0%	1) Shallow tie cribs 2) Switch panel lacking proper cribbing, incorrect bolt position on connecting rod, loose switch rod connection at switch rail 3) Sinkhole near toe of frog and turnout PI along diverging side 4) Light vegetation 5) Rail has engine burns	1) Surfacing and lining 2) Turnout maintenance 3) Subgrade stabilization 4) Vegetation control

Turnout I.D. & Comp.	Grade	Finding Notes	Recommended Treatment
SL-01	2	1) Alignment kink behind diverging side and swing behind straight side 2) Switch panel lacking proper lubrication/grease 3) Missing e-clips at insulated joints	1) Surfacing and lining 2) Turnout maintenance
Rail	1		
Switch	1		
Frog	2		
Ties	0%		
SL-02	2	1) Switch panel missing cotter keys 2) Guardrail has broken clip	1) Turnout maintenance
Rail	2		
Switch	2		
Frog	2		
Ties	0%		
SL-03	2	1) Switch panel has incorrect normal stand position	1) Turnout maintenance
Rail	2		
Switch	2		
Frog	2		
Ties	0%		
SL-04	2	1) Switch panel has incorrect normal stand position	1) Turnout maintenance
Rail	2		
Switch	2		
Frog	2		
Ties	0%		
SL-05	1	1) Switch panel has incorrect normal stand position 2) Guardrail has no visible wear marks 3) Switch point guard absent	1) Switch point guard 2) Turnout maintenance
Rail	1		
Switch	1		
Frog	2		
Ties	0%		
SL-06	1	1) Switch panel has incorrect normal stand position	1) Turnout maintenance
Rail	1		
Switch	1		
Frog	1		
Ties	0%		
SL-07	1	1) Alignment has a hook on the diverging and straight movement behind the frog 2) Insulated joint E-clip plate has broken weld 3) Light vegetation 4) Switch panel has incorrect normal stand position	1) Surfacing and lining 2) Vegetation control 3) Turnout maintenance
Rail	1		
Switch	1		
Frog	1		
Ties	2%		

Turnout I.D. & Comp.	Grade	Finding Notes	Recommended Treatment
SL-08	1	1) Switch panel has loose jam nut 2) Guardrail not worn and not fully effective	1) Turnout maintenance
Rail	1		
Switch	1		
Frog	1		
Ties	0%		
SL-09	1	1) Switch panel lacks proper cribbing, missing cotter keys, loose roller nuts on switch rails 2) Moderate vegetation	1) Turnout maintenance 2) Vegetation control
Rail	1		
Switch	1		
Frog	1		
Ties	0%		
WH-01	1	1) Switch panel lacking proper lubrication/grease 2) Switch point guard not worn or effective 3) Loose insulated joint bar	1) Turnout maintenance 2) Switch point guard
Rail	2		
Switch	1		
Frog	1		
Ties	0%		
WH-02	1	1) Frog point has flow	1) Welding/grinding
Rail	1		
Switch	1		
Frog	2		
Ties	0%		
WH-03	1	1) Switch panel incorrect target colors, loose jam nut 2) Rail has engine burns 3) Alignment swing ahead of turnout in road crossing	1) Turnout maintenance 2) Replace targets 3) Surfacing and lining
Rail	1		
Switch	1		
Frog	1		
Ties	0%		
WH-04	1	1) Switch panel has incorrect normal stand position, loose heel bolts	1) Turnout maintenance
Rail	1		
Switch	2		
Frog	1		
Ties	0%		

6. Granite City Harbor Turnout Table – Summary of Condition Grades.

   a. Turnouts NH-10, NH-14 to NH-15 and NH-17 to NH-35 are owned and maintained by others and are not included in this summary of condition grades.

Turnout I.D.	Grade	Finding Notes	Recommended Treatment

Turnout I.D.	Grade	Finding Notes	Recommended Treatment
NH-01 Rail Switch Frog Ties	3 3 2 3 40%	1) Light vegetation 2) Rail has flow and is chipped with tight joints 3) Switch panel has moderate throw lacks proper lubrication/grease and cribbing with loose heel bolts and rail braces, cotter keys not properly bent, rail at heel blocks not properly aligned in the normal position 4) Switch stand loose from very poor headblock ties 5) Frog has worn and deformed point and wing rail with loose bolts 6) Switch point guard absent	1) Switch point guard 2) Turnout maintenance 3) Vegetation control 4) Switch tie renewal 5) Welding/grinding 6) Rail end treatment
NH-02	N/A	1) Removed from service	1) None
NH-03 Rail Switch Frog Ties	3 4 3 3 28%	1) Profile drops behind diverging side 2) Moderate vegetation 3) Rail has flow, spalling and flat spots with partial anchor pattern and pitted tie plates 4) Switch panel has easy throw, lacks proper lubrication/grease, cribbing and switch point guard with loose rail braces 5) Frog has chip wing rail and worn point with loose bolts	1) Switch point guard 2) Surfacing and lining 3) Turnout maintenance 4) Welding/grinding 5) Vegetation control 6) Tie plate renewal 7) OTM per standard
NH-04	N/A	1) Removed from service	None
NH-05 Rail Switch Frog Ties	3 3 2 2 5%	1) Irregular profile behind diverging side 2) Light vegetation 3) Rail has flow/lip and mismatch at the frog 4) Switch panel has moderate throw lacks proper lubrication/grease and cribbing with switch point not contacting base plate	1) Turnout maintenance 2) Vegetation control 3) Surfacing and lining 4) Rail end treatment
NH-06 Rail Switch Frog Ties	4 3 4 4 35%	1) Rail has flow/lippage 2) Turnout tie plates in very poor condition worn, broke and pitted 3) Switch panel has hard throw lacks proper grease and cribbing 4) Switch point guard heavily worn 5) Heel and frog bar assemblies loose 6) Frog is severely deformed with supporting HTTP in very poor condition 7) Improper switch rail tie plates	1) Turnout maintenance 2) Switch point guard 3) Frog replacement 4) Tie plate renewal 5) Switch tie renewal
NH-07 Rail Switch	4 3 2	1) Alignment has a swing ahead and behind the straight side and a hook behind the diverge side, generally the turnout lays like an irregular equilateral turnout	1) Switch point guard 2) Turnout maintenance 3) Geometry reconfiguration

Turnout I.D.	Grade	Finding Notes	Recommended Treatment
Frog Ties	3 31%	2) Rail has flow, spalling, and engine burns 3) Tie plates are worn and pitted 4) Point protector installed 5) Switch panel has a moderate throw, lacking hook/lock on stand, incorrect normal stand position, loose heel bolts and rail braces 6) Frog has loose bolts	4) Tie plate renewal 5) Surfacing and lining
NH-08 Rail Switch Frog Ties	4 3 3 5 10%	1) Rail has chip, engine burn and spalling marks with loose joint bar assemblies and no rail gaps 2) Tie plates are in poor condition 3) Switch panel lacking proper grease with hard throw and hook/lock absent 4) Switch point worn 5) Frog point, wing rail and throat severely deformed and chipped with rail ends mismatched and loose bolts 6) Gauge plate missing proper fasteners 7) Rail from point of and behind frog on diverge movement has heavy gauge face wear from reverse curve layout of crossover movement 8) Switch point guard absent	1) Turnout maintenance 2) Switch point guard 3) Frog replacement 4) Welding/grinding 5) Rail end treatment 6) Geometry reconfiguration 7) Rail relay 8) Surfacing and lining 9) Tie plate renewal Or 10) Turnout replacement
NH-09 Rail Switch Frog Ties	4 3 4 3 30%	1) Switch panel lacking proper lubrication/ grease and stand not fully fastened, loose rail braces 2) Right switch rail severely worn and gapped from possible weld build-up 3) Heel bar assemblies loose 4) Frog point and wing rails worn 5) Debris in guardrail flangeway 6) Switch point guard absent	1) Turnout maintenance 2) Replace switch rails 3) Switch point guard 4) Welding/grinding
NH-11 Rail Switch Frog Ties	3 2 2 2 20%	1) Light vegetation 2) Rail has engine burn and flow/lippage 3) Switch panel lacking proper lubrication/grease with moderate throw, hook absent, lacking proper cribbing, loose rail braces 4) Heel bar assemblies loose 5) Frog wing rail worn/deformed with moderate wear on guardrail gauge face 6) Rail end mismatch at heel block 7) Switch point guard absent	1) Vegetation control 2) Switch point guard 3) Turnout maintenance 4) Welding/grinding 5) Rail end treatment
NH-12 Rail Switch	2 3 3	1) Rail has measurable flow with excessive spalling along closed curvature 2) Switch panel lacking proper lubrication/ grease, absent with loose rail braces	1) Turnout maintenance 2) Welding/grinding 3) Switch point guard

Turnout I.D.	Grade	Finding Notes	Recommended Treatment
Frog Ties	2 20%	3) Loose heel and frog bolts 4) Switch and frog points worn 5) Switch point guard absent	
NH-13 Rail Switch Frog Ties	4 4 3 4 75%	1) Dip in track profile ahead of turnout 2) Rail has worn gauge face with high slant along curved closure and opposing rail with excessive flow 3) Fouled ballast with pumping and top surface covered 4) Joint, heel, and frog bar assemblies broken, missing and loose bolts with no gap (tight) 5) High spikes 6) Switch panel lacking proper cribbing, lubrication/ grease, hook absent with incorrect normal stand position and loose rail braces 7) Frog point heavily worn with casting broke at toe at curved closure rail 8) Rail anchors absent 9) Switch point guard absent	1) Switch tie renewal 2) OTM per standards 3) Turnout maintenance 4) Welding/grinding 5) Surfacing and lining 6) Switch point guard 7) Renew typical section 8) Subgrade stabilization 9) Track ballast renewal 10) Frog replacement Or 11) Replace turnout
NH-16 Rail Switch Frog Ties	3 4 3 3 55%	1) Alignment swing ahead of switch and behind straight side of frog 2) Rail has flow, top worn and gauge side angle worn (curved closure rail) 3) Joint bar assemblies loose 4) No anchors installed 5) Tie plates heavily worn, pitted and bent 6) Switch panel has loose/missing switch rail bolts, stand has no targets or latch/lock, jam nut loose, bolts incorrect in rods, lacking proper lubrication/grease and cribbing, loose heel bolts and rail braces 7) Frog has deformed, chipped and worn point 8) Track ballast is fouled 9) High spikes	1) Rail relay 2) Welding/grinding 3) Turnout maintenance 4) Surfacing and lining 5) Replace targets 6) OTM per standards 7) Tie plate renewal 8) Track ballast renewal 9) Switch tie renewal
NH-36 Rail Switch Frog Ties	3 3 3 3 4%	1) Rail has measurable flow 2) Track ballast shallow 3) Single shoulder tie plates used in poor condition 4) Switch panel hard to throw, missing targets, loose jam nut, stand not fully fastened, lacking proper cribbing, lubrication/ grease and loose rail braces 5) Heel block assemblies loose and missing	1) Turnout maintenance 2) Welding/grinding 3) Surfacing and lining 4) Replace targets 5) Replace guardrail 6) Replace switch rails 7) Tie plate renewal

Turnout I.D.	Grade	Finding Notes	Recommended Treatment
		6) Switch point worn and not contacting base plate 7) Frog wing rail worn and deformed with heavy wear on guardrail gauge face with flangeway obstructed 8) Right hand switch rail missing bolts and has broken base, left hand switch rail has vertical split in rail head 9) High spikes	
PP-01 Rail Switch Frog Ties	3 3 4 2 27%	1) Profile dip between the heel and frog 2) Light vegetation 3) Rail has measurable flow 4) Shallow ballast cribs 5) Switch panel hard to throw, incorrect fasteners at switch stand, lacking proper lubrication/grease, loose heel bolts and rail braces 6) Switch point severely worn 7) Switch point guard absent 8) Walkway surface absent	1) Replace switch rails 2) Turnout maintenance 3) Vegetation control 4) Surfacing and lining 5) Switch point guard 6) Walkways
PP-02 Rail Switch Frog Ties	3 3 3 2 27%	1) Profile dip behind diverge side 2) Moderate vegetation 3) Track ballast shoulder absent 4) Rail has measurable flow 5) High spikes 6) Tie plates are pitted 7) Switch panel hard to throw, lacking proper lubrication/grease, loose heel bolts and rail braces, switch rail does not contact base plates 9) Switch point guard absent 10) Walkway surface absent	1) Switch point guard 2) Turnout maintenance 3) Vegetation control 4) Surfacing and lining 5) Walkways 6) Tie plate renewal

VIII. Condition Grades – At-Grade Vehicular Crossings

1. At-grade vehicular crossing assessments were limited to the length of the grade crossing surface from end to end and approximately four (4) feet outside from the near rail along the roadway surface unless these are multiple tracks than roadway surface assessed to four (4) feet outside from the near rail of the outer tracks. Conditions outside these parameters to be evaluated and graded separately as either track, turnouts or roadway surface. The roadway surface assessment is being performed by Juneau Associates and it not included in this report.

2. At-grade vehicular crossing identification is mapped on Attachment ‘B’ in a general track schematic, Attachment ‘C’ with color coded condition grades assigned and

Attachment 'D' on an aerial background with DOT/AAR crossing number.

3. Tenant installed at-grade vehicular crossings and or landing pads have not been included in this assessment.

4. Active grade crossing signals that exist are not being assessed in this report. It is recommended that before any active grade crossing signal work is considered that a formal road diagnostic is performed with the Illinois Commerce Commission (ICC) and other regulatory agencies. This work would include any modifications to the existing or installation of new active grade crossing signals.

5. Madison Harbor At-Grade Vehicular Crossing Table – Summary of Condition Grades.

   a. At-grade vehicular crossings 12 and 32 to 33 are owned and maintained by others and are not included in this summary of condition grades.

Grade Crossing I.D.	Grade	Finding Notes	Recommended Treatment
10	4	1) Rail has flow and is heavily worn 2) Crossing timbers are heavily decayed with loss of material 3) Loose joint bar within crossing limits 4) Located within a turnout	1) Full replacement
11	3	1) Rail is moderately worn with flow and gauge face wear 2) Asphalt along southern track south approach has failed along the field side of the rail.	1) Pavement repair
12	N/A	1) Highway overpass	None
13	3	1) Loose crossing timbers under vehicle traffic 2) Pedestrian crossing not connected to sidewalks 3) Minor hump in south roadway approach	1) Select crossing surface renewal 2) Remove pedestrian crossing 3) Modify roadway
14	1	1) Pedestrian crossing not connected to sidewalks	1) Remove pedestrian crossing
15	3	1) Track profile 1"-2" lower than roadway approaches 2) Early indications of isolated pavement failure depressed at ends of crossing surface 3) Early indications of uneven wear on low and high rail 4) Inconsistent track gauge measures from 56-1/2 to 57-1/4 in sharp horizontal curve	1) Track raise 2) Replace roadway surface 3) Realign 4) Maintain track gauge
16	1	1) Track profile 1"-2" lower than roadway approaches	1) Track raise 2) Vegetation control

Grade Crossing I.D.	Grade	Finding Notes	Recommended Treatment
		2) Light vegetation	
17	1	1) Light vegetation	1) Vegetation control
18	2	1) Track profile 3”-4” lower than east concrete roadway approach. 2) Track settlement indications along SL#1 and SL#2 in comparison to track approaches 3) Light vegetation 4) Fouled track ballast with fines/sand at ends of crossing surface indicating poor drainage	1) Track raise 2) Subgrade stabilization 3) Establish drainage 4) Open tie cribs 5) Vegetation control
19	3	1) Rail has flow 2) Track ballast fouled along north approach from roadway surface with water falling into both track approaches 3) Incorrect advancing warning signs installed on both approaches, W10-12L sign should replace W10-12R sign 4) Superelevation performing well through curved crossing 5) Rubber flangeways have been damaged on concrete panels 6) Great Plains West Lead track profile sunken approximately 1”-2” with quick rise into the higher east track approach (derail), undercutting of private track recommended to maintain flat roadway profile across at-grade vehicular crossing 7) North Loop track profile sunken 3”-4” with notable distinction located at the east track approach	1) Establish drainage 2) Open tie cribs 3) Sign placement 4) Select crossing surface renewal 5) Track raise
20	5	1) Rail has flow 2) Crossing timbers have severe deterioration 3) Light vegetation	1) Vegetation control 2) Select crossing surface renewal
21-ML	3	1) Moderate vegetation 2) Rail is curve worn and has flow 3) Joint bar assembly loose	1) Vegetation control 2) Track maintenance
21-NL	5	1) Crossing surface removed with roadway approaches intact 2) Moderate vegetation 3) Joint bar assembly loose 4) Rail has spalling, flow and flat spot marks with heavy top and gauge side wear indicators	1) End of road treatment 2) Rail relay 3) Rail/wheel friction control 4) Vegetation control 5) Track maintenance
22A	1	1) Concrete panels have minor irregular surface	1) None

Grade Crossing I.D.	Grade	Finding Notes	Recommended Treatment
		caused by manufacturing/installation defect	
22B	4	1) Light vegetation 2) Crossing timbers have severe deterioration	1) Vegetation control 2) Select crossing surface renewal
23A	1	1) Concrete panels have minor irregular surface caused by manufacturing/installation defect	None
23B	4	1) Light vegetation 2) Crossing timbers have severe deterioration 3) Pedestrian crossing not connected to sidewalks 4) Narrow track gauge	1) Vegetation control 2) Select crossing surface renewal 3) Remove pedestrian crossing 4) Maintain track gauge
24	2	1) Early indications of isolated pavement failure on roadway approaches and through crossing 2) Light vegetation	1) Vegetation control
25	2	1) Light vegetation	1) Vegetation control
26 -SL#1	4	1) Profile has a dip primarily located on the southern half (eastbound lane) 2) Crossing is receiving heavy wheel impact on the eastbound lane approach as tractor trailers decelerate approaching the crossing with limited sight distance along the track approaches from buildings and stored rail cars 3) Rail is in good condition and can be reused	1) Full replacement 2) Subgrade stabilization 3) Track raise
26 -SL#2	3	1) None	None
26 -SL#3	5	1) Profile has a dip primarily located on the northern half (westbound lane) 2) Establish ditch section along track from crossing in northeast quadrant to culvert inlet 3) Crossing is receiving heavy wheel impact on the westbound lane approach as tractor trailers decelerate approaching the crossing with limited sight distance along the track approaches from buildings and stored rail cars 4) Rail is in good condition and can be reused	1) Full replacement 2) Subgrade stabilization 3) Establish drainage 4) Track raise
27	1	1) None	None
28	2	1) Early indications of pavement failure (depressed, transverse cracks) on roadway approaches and through crossing 2) Track profile 1” lower than roadway approaches	1) Modify roadway 2) Track raise 3) Vegetation control

Grade Crossing I.D.	Grade	Finding Notes	Recommended Treatment
		3) Minor hump in west roadway approach 4) Light vegetation 5) Roadway approaches require milling and re-surfacing	
29	3	1) All four quadrants covered with embankment material and vegetation 2) High rail has severe gauge face wear 3) With rail and track ballast conditions it is assumed ties are in poor condition 4)Wide track gauge 5) Track profile 2” lower than roadway approaches possibly from poor subgrade conditions	1) Establish drainage 2) Rail relay 3) Tie renewal 4) Subgrade stabilization 5) Open tie cribs 6) Track raise 7) Realign 8) Maintain track gauge 9) Vegetation control
30	2	1) Early indications of isolated pavement failure at south end of crossing surface	None
31	1	1) Engine burns on WRHS#1 multiple locations	1) Train handling
34	1	1) Minor heaving in roadway approach north end	1) Modify roadway
35	2	1) The north roadway approach is steep and could create a high-centering situation for long wheelbase vehicles or trailers with low ground clearance condition 2) W10-5 and W10-5P (Low Ground Clearance Grade Crossing) signs are warranted	1) Sign placement

6. Granite City Harbor At-Grade Vehicular Crossing Table – Summary of Condition Grades.

   a. At-grade vehicular crossings 4 to 9 are owned and maintained by others and are not included in this summary of condition grades.

Crossing I.D.	Grade	Finding Notes	Recommended Treatment
1	3	1) Track profile 1”-2” lower than roadway approaches 2) Irregular roadway surface between tracks 3) No roadway shoulders present	1) Track raise 2) Modify roadway 3) Select crossing surface renewal
2	4	1) High rail has severe gauge face wear from incorrect super-elevation and inconsistent horizontal curvature 2) Track pumping, loose gauge rod, high spikes and wide track gauge 3) Crossing timbers have severe deterioration 4) Minor hump in north roadway approach	1) Full replacement 2) Subgrade stabilization 3) Modify roadway 4) Realign 5) Maintain track gauge

Crossing I.D.	Grade	Finding Notes	Recommended Treatment
		5) High potential for out of cross level under traffic load 6) Inconsistent track gauge measures from 56-7/8 to 57-3/16 in sharp horizontal curve	
3	1	1) Underdrains not visible 2) ENS and advance warning signs absent	1) Establish drainage 2) Sign placement

IX. Condition Grades – Track

1. Track assessments were limited to the areas beyond any specialty trackwork elements including at-grade vehicular crossings, rail crossings, turnouts and direct fixation elements. Conditions within these specialty trackwork elements have been evaluated and graded separately.

2. Track section identification is mapped on Attachment 'C' with color coded condition grades assigned.

3. The assigned track Grades account for observed track usage that includes rail car storage, inbound/outbound movement, throughfare and intra-plant switching. The lowest track Grade within a section of track is provided in the table. This track Grade may not represent the track Grade of the entire section assessed and may only be assigned to a small portion of the particular track section.

4. Madison Harbor Track Table – Summary of Condition Grades.

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
C-19 (A) Ties	4 40%	1) Rail has flow, flat spots, curve worn ¼ inch, spalling, shelling, engine burns 2) Loose joint bars 3) Gauge rods installed every 5th tie in curve 4) Shallow ballast and skewed ties 5) Rail end batter 6) Profile is in a dip with a alignment hook into the grade crossing	1) Rail relay 2) Track maintenance 3) Rail/wheel friction control 4) Cross/super-elevation 5) Surfacing and lining 6) Tie renewal 7) Rail end treatment
C-19 (B) Ties	2 30%	1) Rail has flow up to ¼ inch, engine burns, spalling 2) Missing anchors 3) Reverse superelevation ½ inch 4) Rail end batter	1) Surfacing and lining 2) OTM per standards 3) Rail end treatment
C-18 (A) Ties	3 50%	1) Alignment is irregular and twisted profile with low spots 2) Heavily worn 8-inch single shoulder tie plates	1) Surfacing and lining 2) Rail relay 3) OTM per standards

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
		3) Gauge rods installed in curves 4) Toed joint bars loose/missing bolt assemblies 5) Rail 90lb rail dated 1907 has gauge face wear, rail end batter, spalling, shelling, corrugations, flow 6) Mismatched rail ends 7) Reverse ¼" superelevation in curve near AK-03	4) Cross/super-elevation 5) Tie renewal 6) Tie plate renewal 7) Rail end treatment
C-19L (A) Ties	2 20%	1) Zero superelevation in curve 2) Light gauge face wear on outside rail with head checks, inside rail has flow, rail end batter	1) Cross/super-elevation 2) Rail end treatment
C-18L (A) Ties	2 0%	1) None	None
C-18L (B) Ties	3 10%	1) Profile is low with an isolated hump area 2) Rail has ¼ inch gauge face wear on outside rail and flat spots with flow on inside rail from incorrect superelevation 3) Light vegetation	1) Rail/wheel friction control 2) Rail relay 3) Cross/super-elevation 4) Surfacing and lining 5) Vegetation control
PH-01 (A) Ties	2 0%	1) None	None
PH-01 (B) Ties	2 0%	1) None	None
PH-02 (A) Ties	2 0%	1) None	None
NL (A) Ties	2 20%	1) Profile has a hump and dips, low near east approach to Grade Crossing #15 2) Poor profile transition to rail direct fixation and Grade Crossing #15 3) Inside rail on curves has flow 4) Rail has engine burns 5) Select areas with shallow tie cribs	1) Surfacing and lining
NL (B) Ties	3 30%	1) Alignment is irregular with some swings and profile dips 2) Light vegetation 3) Empty tie cribs at joint bars 4) Very poor subgrade (sinkhole) in curve near SL-01 resulting in no ballast shoulders, empty tie cribs for approximately 50 feet, and ¼ inch gauge	1) Vegetation control 2) Surfacing and lining 3) Subgrade stabilization

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
		face wear on outside curve rail	
NL (C) Ties	4 70%	1) Light vegetation 2) Poor tie condition causing twisted irregular alignment 3) Rail has gauge face wear	1) Vegetation control 2) Surfacing and lining 3) Tie renewal
NL (D) Ties	4 40%	1) Curve is pushing outward causing rail kink at joints 2) Rail has 1/8 inch gauge face wear 3) Light vegetation	1) Vegetation control 2) Surfacing and lining 3) Tie renewal 4) Destress rail
NL (E) Ties	2 40%	1) Loose joint bars 2) New light vegetation growing below previously sprayed dead vegetation 3) Profile generally low could be raised 1 inch 4) Skewed cross ties 5) Rail has signs of being in state of compression	1) Vegetation control 2) Track maintenance 3) Surfacing and lining 4) Destress rail 5) Tie renewal
NL (F) Ties	4 10%	1) Track section between rail crossings has ¼ inch gauge face wear on outside rail with 5/8 inch super-elevation 2) Skewed cross ties 3) Super-elevation generally ¼ inch 4) Inside rail has flow and flat spots, outside rail has 5/16 inch gauge face wear 5) Every 4th tie box anchored 6) Light vegetation	1) Rail/wheel friction control 2) Rail relay 3) Cross/super-elevation 4) Surfacing and lining 5) Vegetation control 6) OTM per standards
SL#1 (A) Ties	1 10%	1) Rail creeping/pushing south creating voids in tie cribs 2) Light vegetation	1) Surfacing and lining 2) Anchor pattern 3) Vegetation control
SL#1 (B) Ties	2 20%	1) Skewed ties with rail creeping/pushing south creating voids in tie cribs 2) Anchor pattern every 3rd tie 3) Walkway gradation track ballast broken down with heavy volume of fines considered fouled with poor drainage qualities 4) Moderate vegetation 5) Alignment has 7/8 inch superelevation in the curve with 56-7/8 inch track gauge 6) Joint bars show ¼ inch of rail movement	1) Surfacing and lining 2) Anchor pattern 3) Vegetation control 4) Destress rail 5) Walkways
SL#1 (C) Ties	2 10%	1) Fines from Warehouse Building downspouts and roadway surface fouling track ballast 2) Sinkhole on east side of track for 15 track feet between SL#1 and SL#2 3) Profile dip in Grade Crossing #26	1) Establish drainage 2) Surfacing and lining 3) Subgrade stabilization 4) Track ballast renewal

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
SL#1 (D) Ties	1 20%	1) Alignment in curve is pushed outward on approaches to Rail Crossing #1 with a profile hump between Turnout SL-08 and SL-09 2) Rail Crossings in a depression with fouled track ballast 3) Light vegetation	1) Surfacing and lining 2) Vegetation control 3) Track ballast renewal 4) Destress rail
SL#1 (E) Ties	2 0%	1) Light vegetation 2) Rail alignment is 7/8 inch out of cross level (high west rail) behind Turnout SH-16	1) Surfacing and lining 2) Subgrade stabilization 3) Vegetation control 4) Cross/super-elevation
SL#2 (A) Ties	1 0%	1) Skewed ties with rail creeping/pushing south creating voids in tie cribs 2) Anchor pattern every 3rd tie	1) Surfacing and lining 2) Anchor pattern 3) Destress rail
SL#2 (B) Ties	1 10%	1) Skewed ties with rail creeping/pushing south creating voids in tie cribs 2) Anchor pattern every 3rd tie 3) Dip in Crossing #26 4) Alignment has 7/8 inch superelevation in the curve with 56-7/8 inch track gauge 5) Track ballast shoulders are slightly low	1) Surfacing and lining 2) Anchor pattern 3) Destress rail 4) Cross/super-elevation
SL#2 (C) Ties	1 0%	1) Sink hole between SL#2 and SL#3 with no track ballast shoulders on SL#2 for 10 track feet	1) Surfacing and lining 2) Subgrade stabilization 3) Track ballast renewal
SL#3 (A) Ties	4 0%	1) Alignment has a 50 foot misalignment and reduced superelevation from ½ inch to ¼ inch	1) Destress rail 2) Surfacing and lining 3) Cross/super-elevation
SL#3 (B) Ties	1 0%	1) Skewed ties with rail creeping/pushing south creating voids in tie cribs 2) Anchor pattern every 3rd tie 3) Dip in Grade Crossing #26 4) Poor drainage with fines in track ballast approach to Grade Crossing #26 5) Alignment has 3/8 inch superelevation in the curve with 57 inch track gauge 6) Light vegetation 7) Track ballast shoulders are slightly low	1) Surfacing and lining 2) Anchor pattern 3) Establish drainage 4) Vegetation control 5) Destress rail 6) Track ballast renewal 7) Cross/super-elevation
SL#3 (C) Ties	1 0%	1) Sink hole between SL#2 and SL#3 with no track ballast shoulders on SL#2 for 10 track feet 2) Dip in Grade Crossing #26	1) Surfacing and lining 2) Subgrade stabilization 3) Track ballast renewal
GPW (A) Ties	3 50%	1) Profile has a hump between Grade Crossing #19 and Grade Crossing #32 with a depression in and from Grade Crossing #19 to Turnout GP-01	1) Surfacing and lining 2) Vegetation control 3) Cross/super-elevation

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
		2) Light vegetation 3) Rail has 1/8 inch flow on outside rail 4) Alignment has ¼ inch reverse superelevation near Turnout GP-01	4) Tie renewal
GPE (A) Ties	3 20%	1) Alignment has ¾ inch reverse superelevation near Turnout SL-09 at Point of Curve 2) Light vegetation 3) Rail on inside of curve has 1/16 inch flow with outside rail having top wear	1) Surfacing and lining 2) Vegetation control 3) Cross/super-elevation
BD#1 (A) Ties	2 10%	1) Rail end batter 2) Both rails have flow 3) Sinkhole 10 feet along west rail near Warehouse Building #1 wall marker #4	1) Rail end treatment 2) Subgrade stabilization
BD#1 (B) Ties	2 0%	1) Both rails have 1/8 inch flow 2) Rail kink 60 feet ahead/north of stored rail cars with every 3rd tie fully box anchored 3) Shallow tie cribs	1) Destress rail 2) Surfacing and lining 3) Anchor pattern
BD#2 (A) Ties	4 10%	1) Alignment has minor twist 2) Cross level near 3/8 inch high east rail 3) Rail has engine burns, spalling, 1/8 inch flow 4) Skewed cross ties from improper anchor pattern 5) Profile run-off each approach to concrete direct fixation is abrupt 6) Turnout SH-11 turnback/return curve has 1-1/4 inch reverse superelevation with curve pushing/sliding outward, sinkhole extending 150 feet	1) Surfacing and lining 2) Track maintenance 3) Anchor pattern 4) Subgrade stabilization 5) Cross/super-elevation 6) Destress rail
BD#2 (B) Ties	3 0%	1) Alignment is irregular, and profile is in a depression 2) Track ballast shoulders heaved 18 inches for 50 feet with shallow tie cribs 3) Rail has corrugations and 1/8 inch flow 4) Cross level near 1/2 inch high west rail	1) Surfacing and lining 2) Subgrade stabilization 3) Cross/super-elevation
BD#2 (C) Ties	2 10%	1) Light vegetation 2) Alignment has swing into turnout SH-08 switch points and swing ahead of turnout SH-09 switch points 3) Rail has rail end batter, spalling, engine burns 4) Cross level near 3/8 inch high east rail	1) Vegetation control 2) Surfacing and lining 3) Rail end treatment 4) Cross/super-elevation
BD#3 (A) Ties	2 0%	1) Rail joints are tight 2) Alignment curve is pushing outward 3-5 inches with 1/8 inch gauge face wear on outside rail and	1) Destress rail 2) Surfacing and lining

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
		profile in curve is in a depression between direct fixation and Grade Crossing #24	
BD#3 (B) Ties	1 0%	1) None	None
BD#4 (A) Ties	4 50%	1) Alignment has a swing with low spots in profile which is exasperated within limits of the steel canopy 2) Rail is 2 inches out of cross-level along east rail possibly from poor subgrade condition 3) Steel canopy downspouts empty into track 4) Light vegetation	1) Tie renewal 2) Cross/super-elevation 3) Surfacing and lining 4) Establish drainage 5) Subgrade stabilization 6) Vegetation control
BD#4 (B) Ties	4 50%	1) Rail is 1-1/8 inch out of cross-level along east rail 2) Tie plates are 4-hole 9 inch single shoulder for 67 lb. rail dated 1899/1904 with 6-hole joint bars and 4-bolt assembly 3) Light vegetation 4) Mismatch rail ends at compromise joint bars	1) Tie renewal 2) Cross/super-elevation 3) Vegetation control 4) Rail end treatment 5) Relay rail 6) Tie plate renewal
BD#5 (A) Ties	4 40%	1) Rail in curve has flow on inside rail possibly from incorrect 7/8 inch superelevation 2) Light vegetation 3) Outside rail gauge side lubricator non-functioning 4) Rail head (less than 2-inches wide) in curve through Grade Crossing #29 to Turnout SH-13 5) Shallow tie cribs and 90RA rail that is pitted through limits of removed grade crossing and compromised to 112RE rail	1) Tie renewal 2) Cross/super-elevation 3) Rail/wheel friction control 4) Vegetation control 5) Surfacing and lining 6) Relay Rail
BD#5 (B) Ties	4 70%	1) Alignment is irregular with a rolling profile 2) Cross level is in excess of 1-1/4 inch 3) Heavy vegetation 4) Track ballast heavily fouled and partially buried 5) There is no evidence of positive drainage	1) Tie renewal 2) Cross/super-elevation 3) Vegetation control 4) Surfacing and lining 5) Establish drainage 6) Track ballast renewal
BD#5 (C) Ties	3 20%	1) Alignment irregular at rail joints 2) Single shoulder 9 inch tie plates 3) Wheel stops installed	1) Tie plate renewal 2) Surfacing and lining 3) Standard EOT device
BD#5 (D) Ties	1 0%	1) None	None
ML#1	2	1) Loose joint bar bolts	1) Track maintenance

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
(A) Ties	10%	2) Outside curved rail has visible gauge side wear	2) Cross/super-elevation
WH#1 (A) Ties	3 0%	1) Alignment curve has 5/8 inch reverse superelevation with signs of rail movement at tie ends 2) Rail on outside of curve has 1/8 inch gauge face wear	1) Cross/super-elevation 2) Destress rail
WH#1 (B) Ties	1 0%	1) None	None
WH#1 (C) Ties	1 0%	1) None	None
WH#2 (A) Ties	1 0%	1) None	None
WH#3 (A) Ties	1 0%	1) None	None
WH#4 (A) Ties	3 0%	1) Profile has dip hear Turnout WH-04 2) Alignment curve has 5/8 inch reverse superelevation with signs of rail movement at tie ends near Turnout WH-04 3) Alignment curve is pushing outward (rail kink) 6 inches with dip near Grade Crossing #34	1) Cross/super-elevation 2) Surfacing and lining 3) Destress rail
WH#4 (B) Ties	1 0%	1) Rail has 1/8 inch rail flow	None

5. Granite City Harbor Track Table – Summary of Condition Grades.

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
AL (A) Ties	4 70%	1) Alignment is in a twist and profile is low with a considerable low spot on east side of Grade Crossing #2 2) Rail has ¼ inch flow and heavily worn from rolling contact fatigue, ¼ inch gauge face wear near Grade Crossing #2 3) Track ballast is fouled with signs of pumping and shallow tie cribs east of Grade Crossing #1	1) Tie renewal 2) Surfacing and lining 3) Track maintenance 4) Tie plate renewal 5) Subgrade stabilization 6) Track ballast renewal 7) Cross/super-elevation 8) Rail end treatment

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
		and #2 4) Tie plates are heavily worn with wallowed spike holes 5) Gauge rods installed 6) Cross level measures 7/8 inch near Turnout NH-03 possibly from poor subgrade 7) Light rail end batter possibly from loose joint bar bolts under load 8) Profile has 2-1/4 inch superelevation on the outside rail near Grade Crossing #2 9) Vegetation recently sprayed with new growth	9) Vegetation control
AL (B) Ties	4 60%	1) Rail end batter possibly from loose joint bar bolts under load 2) Alignment is twisted with a rolling profile 3) Vegetation recently sprayed with new growth	1) Tie renewal 2) Rail end treatment 3) Track maintenance 4) Vegetation control 5) Surfacing and lining
AL (C) Ties	3 20%	1) Vegetation recently sprayed 2) Single shoulder 7 inch tie plates 3) Track ballast is lightly fouled 4) Alignment irregular ahead of Turnout NH-05 with contributions from turnout immediately behind Turnout NH-05 and within close proximity to Grade Crossing #3 5) Profile has low spot between Turnout NH-05 and Grade Crossing #3	1) Tie plate renewal 2) Surfacing and lining
AL (D) Ties	3 20%	1) Single shoulder 10 inch tie plates 2) Rail has flow and rolling contact fatigue with 1/8 inch gauge face wear on outside rail 3) Ponding water north of overhead pipe rack between track and toe of levee	1) Tie plate renewal 2) Establish drainage
AL (E) Ties	3 20%	1) Single shoulder 10 inch tie plates in poor condition 2) No anchors present 3) Rail 90 RA dated 1914 4) Rail joints are low or bent creating a poor rolling profile 5) Little to no tangent between reverse horizontal curves behind Turnout NH-06	1) Tie plate renewal 2) OTM per standards 3) Rail relay 4) Geometry reconfiguration
AL (F) Ties	3 30%	1) Rail is shelling with 1/8 inch flow 2) Turnback curve of Turnout NH-08 has ½ inch reverse elevation	1) Cross/super-elevation 2) Surfacing and lining
AL	3	1) Single shoulder 10 inch tie plates in poor	1) Tie plate renewal

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
(G) Ties	20%	condition	
AL (H) Ties	3 0%	1) Joints have 1 inch gap 2) Single shoulder 11 inch tie plates	1) Tie plate renewal 2) Track maintenance
PP#1 (A) Ties	3 20%	1) Alignment is irregular 2) Gauge rods installed every 6th tie	1) Surfacing and lining
PP#1 (B) Ties	3 10%	1) Lacking south track ballast shoulders 2) Restore earthen mound to standards 3) Moderate vegetation 4) Rail has shelling and 1/8 inch flow 5) Loose joint bars assemblies 6) Alignment has swing adjacent to building 7) Cross level near 1-1/4 inch near east end of building	1) Cross/super-elevation 2) Surfacing and lining 3) Track maintenance 4) Standard EOT device 5) Vegetation control
A1 (A) Ties	3 70%	1) Alignment has a twist with low spots at the rail joints 2) Cross level near ¾ inch in the west rail 3) No rail anchors present 4) Track ballast is fouled 5) Cross ties skewed 6) Loose joint bar assemblies 7) Rail has flow on inside rail and 1/8 inch gauge face wear on outside rail in turnback curve of Turnout NH-06 8) 115 lb. rail measures ½ inch height wear (AREMA Class 4)	1) Tie renewal 2) OTM per standard 3) Cross/super-elevation 4) Surfacing and lining 5) Track maintenance 6) Rail relay 7) Track ballast renewal
NH#1 (A) Ties	3 30%	1) Single shoulder 10 inch tie plates in poor condition 2) Near fouled ballast condition due to lack of proper outfall location of surface drainage from levee upslope	1) Tie plate renewal 2) Establish drainage 3) Track ballast renewal
NH #1 (B) Ties	5 50%	1) Alignment has a swing then twist and profile has a dip. A 62-foot chord measured a vertical top of rail difference greater than 3inches and a horizontal difference of 2-3/8 inches. The vertical profile exceeds the allowable criteria for an FRA Class 1 or excepted track and is considered unsafe for train operations. 2) Cross level measures 1-1/8 inch high on the east rail	1) Tie renewal 2) Surfacing and lining 3) Track maintenance 4) Subgrade stabilization 5) Track ballast renewal 6) Cross/super-elevation 7) OTM per standards 8) Establish drainage

Track Section I.D.	Grade	Finding Notes	Recommended Treatment
		3) Track ballast has pumping 4) No anchors present 5) Tie centers exceeded 25 inches 6) Near fouled ballast condition due to lack of proper outfall location of surface drainage from levee upslope	
XVR#4 (A) Ties	3 0%	1) Cross level measures 1-1/8 inch high on the east rail 2) Alignment curve extends onto Turnout NH-08 up to heel of frog with reverse superelevation contributing to heavy rail wear 2) Single shoulder 10 inch tie plates in poor condition	1) Cross/super-elevation 2) Tie plate renewal 3) Geometry reconfiguration 4) Surfacing and lining

X. Condition Grades – Rail Crossings

1. Assessment of the rail crossings was limited to the length of the casting as measured along the arms from rail joint to rail joint. Conditions outside these limits have been evaluated and graded separately.

2. Rail crossing identification is mapped on Attachment 'B' in a general track schematic and Attachment 'C' with color coded condition grades assigned.

3. Switch tie renewals shown as a percentage (%) of total accumulated visible existing switch ties under the rail crossing divided by the number of poor/very poor switch ties as observed from the surface. Switch tie quantity does not include any long ties on the low tonnage movement or approaches to the arms of the rail crossing casting.

4. Madison Harbor Rail Crossing Table – Summary of Condition Grades.

Rail Crossing I.D.	Grade	Finding Notes	Recommended Treatment
RX#1 Rail Frog Ties	3 1 2 64%	1) Profile in a dip along north-south movement 2) Alignment curves into rail crossing are shoved out 3) Light vegetation 4) Frog points have flow 5) Low rail inner guardrail has moderate face wear	1) Surfacing and lining 2) Vegetation control 3) Welding/grinding 4) Switch tie renewal
RX#2 Rail	2 1	1) Light vegetation	1) Vegetation control

Rail Crossing I.D.	Grade	Finding Notes	Recommended Treatment
Frog Ties	1 23%		
RX#3 Rail Frog Ties	3 1 2 54%	1) Profile in a dip along north-south movement 2) Light vegetation	1) Surfacing and lining 2) Vegetation control 3) Switch tie renewal
RX#4 Rail Frog Ties	2 1 2 37%	1) Low west side tonnage rail has gap between steel base and tie 2) Frog points have flow 3) Alignment is twisted in the north-south movement	1) Surface and lining 2) Welding/grinding 3) Switch tie renewal

XI. Condition Grades – Direct Fixation

1. Rail direct fixation assessments limited to the length along the entire structure that supports the rail that it is directly fixated. Conditions outside these parameters to be evaluated and graded separately.

2. Direct fixation identification is mapped on Attachment 'B' in a general track schematic and Attachment 'C' with color coded condition grades assigned.

3. Madison Harbor Direct Fixation Table – Summary of Condition Grades.

Direct Fixation I.D.	Grade	Finding Notes	Recommended Treatment
DF#01 Rail	2 2	1) Dip on both track approaches 2) Loose No. 64 clips	1) Surfacing and lining 2) Track maintenance
DF#02 Rail	2 1	1) Dip in both track approaches with slight alignment twist	1) Surfacing and lining
DF#03 Rail	2 2	1) Some loose concrete anchor bolts 2) Dip in both track approaches	1) Reset direct fixation 2) Surfacing and lining
DF#04 Rail	2 2	1) Some loose concrete anchor bolts 2) Dip in both track approaches	1) Reset direct fixation 2) Surfacing and lining
DF#05 Rail	3 3	1) Some loose concrete anchor bolts	1) Reset direct fixation

XII. Treatment Schedule

1. Recommend a detailed treatment schedule be developed in close coordination with the Port who shall confirm and identify current and future train movements and tonnage volumes. The treatment schedule shall take into consideration the current demand for rail operations, historical maintenance issues and forecasted rail volumes.

2. FRA TSS 49 C.F.R. Part 213 Subpart F – Inspection states

   a. Excepted track and Class 1 track shall be inspected monthly with at least 20 calendar days interval between inspections.

   b. Each switch, turnout and rail crossing, or other transition device shall be inspected on foot at least monthly (213.235).

3. The rail elements with a Grade of E should be inspected prior to the passage of any and every train and repaired as soon as possible with the highest of priority.

4. The rail elements with a Grade of D should be inspected every seven (7) calendar days with repairs being performed within six (6) months.

5. The rail elements with a Grade of C should be inspected basis with repairs performed within one (1) to two (2) calendar years. These actions will help prevent the development of additional deficiencies affecting the integrity of the existing rail structure. on a monthly

6. The rail elements with a Grade of B should be inspected on a monthly basis with repairs made within two (2) to three (3) calendar years. These actions would ensure the integrity of the existing rail structure and reduce future maintenance costs.

7. The rail elements with a Grade of A shall be inspected on a monthly basis with repairs made within three (3) to five (5) calendar years. These actions would ensure the integrity of the existing rail structure and reduce future maintenance costs.

XIII. Summary of Conditions

1. Select photos of the rail infrastructure assessed conditions that were recorded in the Finding Notes are illustrated in Attachment E for general reference.

2. **Rail:** The American Railway Engineering and Maintenance-A-Way Association (AREMA) recommends when new rail is required it be limited to 115 lb., 136 lb. and 141 pound rail sections. The majority of rail inspected appeared to be in fair and serviceable condition with rail weights ranging from 67 to 140 pound jointed and continuously welded. Locations were documented where the rail appeared to be reaching the end of its service life and visual indications of rail flaws that could lead to internal defects. As these rail flaws develop into rail defects the need for future replacement increases. Final determination of type and cause of rail defects should be

referred to a railroad industry expert or a laboratory with metallurgy and a rail defect expert. It is recommended that before any rail is replaced, that actions be taken to reduce the occurrence of these defects to prevent them from reoccurring. Items that contribute to the development of rail defects are illustrated in the photos referenced in the Attachment 'E' and include engine burns, pitting, battered ends, shelling, checking, vertical split heads, excessively top and gauge side wear, corrugations and transverse and longitudinal separation on the surface of the rail head. There was no visible evidence of compound fissures, flawed heads, split webs, detail fractures, horizontal split heads, pipe rail, shelling bends, or weeping cracks noted during this assessment.

3. **Cross Ties:** Wood cross ties generally measured 7"x 9"x 8'6" with a few being 6"x8"x8'6". The majority of the cross ties that were exposed were visibly inspected and deemed in good condition providing effective support and appearing to hold track gauge, providing support to the track surface and alignment. Recommendations on tie renewal has been estimated as a percentage based on a sample size of exposed ties determined to be in poor condition verses the total number of cross ties inspected. The average life expectancy of a hardwood tie under traffic ranges from eighteen (18) to twenty five (25) years depending on climate, traffic and track alignment and conditions. Recommend tie renewal continue on an annual basis to ensure the applied wheel load is spread through well maintained track minimizing the uplift wave effect beyond the point load distribution.

4. **Joint Bars:** Joint bars were predominately the "toeless" type, ranging from twenty-four (24) inches to thirty-six (36) inches in length with 4-hole to 6-hole punching providing a rail joint spacing ranging from zero (0) to five-eights (5/8) of an inch. Toed joint bars were located within the 90 lb. and lighter rail sections with rail gaps exceeding five-eights (5/8) of an inch. Almost all the bars were fully bolted with standard track bolts, locking washers and nuts uniformly staggered. Locations were identified that had missing or loose bolt assemblies in both the track and turnouts with particular attention to the bolts in the frog casting and heel blocks. Improper rail end gaps may result in excessive rail end chipping, batter and overflow that can develop into a split rail head. As this condition is found, recommend a replacement rail plug be installed at these locations to properly correct the rail joint gap width based on the ambient temperature as the rail is changed out.

5. **Tie Plates:** Tie plates located under the rail were primarily double shoulder with either a 6-hole or 8-hole rail spike hole punching measuring over eleven (11) inches in length between eleven (11) and fifteen (15) inches in length. A low percentage of the tie plates observed were of poor quality single and double shoulder with a length of less than eleven (11) inches and less than 6-hole punch pattern, still considered serviceable. Some of the single shoulder tie plates were identified as being in very poor condition by being severely bent, broken or containing excessive corrosion which was exasperated by poor tie and surfacing conditions resulting in substantial plate cutting or rail base cutting into the cross and switch tie. The single shoulder tie plates were primarily located below the 90 lb. and smaller rail sections. These tie

plates should be replaced with larger double shoulder tie plates that would improve track stability, especially through the horizontal curves. The larger tie plates distribute the wheel loads over a larger area of the cross tie reducing the amount of plate cutting into the cross tie and providing greater gauge holding control. Larger tie plates also more evenly distribute the wheel loads from the rail onto the cross ties into the ballast and subgrade, reducing subgrade pressures, one of the factors that causes track pumping and instability of the track structure. It is a current industry best practice to install curve block plates where a six (6) axle locomotive may traverse a horizontal curve that exceeds the serving railroad preferred standard of seven (7) to ten (10) degrees.

6. **Track Spikes:** Track spikes generally consist of two (2) per tie plate on tangent and three (3) to five (5) per tie plate in curved track and through the length of the turnouts. The track spikes all appear to be tight and properly driven. A consistent spiking pattern is recommended to provide uniform support to the rail while maintaining proper gauge by providing lateral resistance holding the tie plates in proper position. Horizontal curves that exceed the serving railroads standards and have six (6) axle locomotives operating over the track should consider a spiking pattern of five (5) to six (6) spikes per tie plate.

7. **Rail Anchors:** Rail anchors were observed in the majority of the heavier rail sections of the track at every other tie or eight (8) ties per 39 foot of rail. Turnouts were generally fully box anchored every switch tie including the track ahead and behind the turnout except where the 90 lb. and smaller rail sections were located. Special anchor pattern was observed on the downhill grade of the A-Lead track from top of the levee. Locations were noted where it is recommended that the rail anchor pattern be revised to address the visible signs of rail creeping by pushing the cross ties causing voids in the track ballast tie cribs and track misalignments. The primary function of rail anchors is to hold the rail in a fixed position with respect to the cross tie by restricting the longitudinal movement of the rail under traffic and thermal expansion/contraction. Inadequate rail restraint by the lack of rail anchors allows rail to creep which can lead to uneven rail wear, irregular gauge and excessive gaps at rail ends and bolts braking at the rail joints. Rail creep can also close some rail joint gaps while opening others and if severe enough, there is potential for the track to become misaligned. Rail creep can also cause the cross ties to skew resulting in narrow rail gauge and increased rail wear.

8. **Track Ballast:** The track ballast utilized appears to be a mix of limestone and trap rock with a mainline gradation except for sections of track where a walkway ballast gradation was placed. The track ballast was generally clean with some areas identified as being fouled either from fines of degraded track ballast or from inadequate drainage of the track section. Fouled track ballast lacks the qualities required to provide the proper track support and drainage. For the track structure to provide proper support and hold surface and alignment the ballast must be kept clean and free of fines. When fines are permitted to accumulate then mix with water forming mud which can act as a lubricant within the ballast section causing the ballast

to lose its ability to laterally restrain the track and distribute loads uniformly. This condition also has an adverse effect on the ability of the track to maintain proper cross level and surface, creating a cement-like mass that traps water around the cross ties leading to softened subgrade accelerating their deterioration.

9. **Track Gauge:** Track gauge was measured and generally within industry tolerance with the widest track gauge measured in the horizontal curves. This is an acceptable practice allowing the rail car wheels the flexibility in chording through the curves. Narrow track gauge was recorded, with gaps along the outside shoulder of the tie plates permitting proper track gauge under traffic (rails had room for lateral movement). This narrow gauge with plate movement condition will in time require the replacement of cross ties due to the spike and plate movement.

10. **Gauge Rods:** Gauge rods were noted at several locations in the track and turnouts. The use of gauge rods is not uncommon where small rail and single shoulder tie plates are located. Gauge rods may be eliminated when a good cross tie condition is maintained, properly sized double shoulder tie plates are present and adequate spiking is maintained. Gauge rods should primarily be used to temporarily maintain gauge in damaged or defective track. Gauge rods over time may become loose or bent resulting in them not performing as intended and causing undesirable stresses on the rail and increasing rail wear. If gauge rods are to be utilized, recommend utilizing double end gauge rods to protect against both narrow and wide gauge. They can be properly adjusted even if bent or otherwise damaged.

11. **Turnouts:** The turnouts inspected appeared to be regularly lubricated along the switch rails and greased at the switch stands. Turnouts were generally in good condition, measured to be number sevens (No. 7's), number eights (No. 8's) and number nines (No. 9's) with rail bolted, solid manganese self-guarded (SMSG) or rail-bound manganese (RBM) frog castings. Several minor maintenance items were observed that included the need to replace and tighten bolt assemblies, tightening the locking nut on the connecting rods, assuring all bolts that can receive a cotter key have a cotter key properly installed and building up and shaping of the switch and frog points by welding and grinding. Some switch rails appeared heavily worn particularly the curved closure rails where the gauge face of the rail heads have been worn down to an excessive slanted surface. Several switch stands need to be secured to the headblock ties and properly adjusted with target replaced with proper colors.

12. **Alignment:** Track alignment and surface was generally in good condition except at the noted locations where the track was misaligned contributing to the rail wear. There are portions of track that requires surfacing to correct poor cross level, and through several horizontal curves to establish proper super-elevation removing the reverse cross level that currently exists. There are numerous sink holes present within the track structure that appear to be contributing to a twisted rail profile and creating geometry misalignments. Track misalignments can be exasperated by the longer and heavier rail cars being utilized, heavier 6-axle locomotives and switching operations that involve sudden braking and acceleration when pushing and pulling loaded and empty rail cars. These effects are compounded when the track geometry includes

sharp and reverse horizontal curves within close proximity to one another. Track misalignments contribute to decreased life expectancy of a rail section and cross ties. Proper track alignment and tamping to re-consolidate the track ballast under the cross ties providing proper support to the rail joints improves train handling and decreases track maintenance.

13. **Grade Crossings:** The existing grade crossing surfaces varied from full depth asphalt, rubber rail seal with asphalt, solid timber, 4 to 8 board with asphalt and precast concrete panels. The roadway approaches to the grade crossing surfaces were relatively level which is a preferred condition. ACP prefers the grade crossing surfaces utilize a rubber rail seal with asphalt surface and asphalt roadway approaches. Several crossings had rail joints within the crossing surface, recommend when these crossings are upgraded to remove all joints through and within twenty (20) feet of a grade crossing surface. The four (4) quadrants of each grade crossing should be shaped to properly drain both the track ballast section and roadway surface water away from the track and roadway. Placement of underdrains under grade crossings and maintaining clean ballast through the crossing minimizes the trapping of water within the grade crossing.

14. **Rail Crossings:** The existing rail crossings were generally in good condition with even wear along the rail and frog points. The heavy haul tonnage routes were observed as contributing to a depression in one direction of the rail crossing profile and deterioration of the switch ties. Switch tie renewal and tamping to re-consolidate the track ballast under the switch ties to re-establish the original rail profile will provide long term benefits providing proper support to the rail crossing switch ties that will improve train handling and decrease maintenance while maximizing the service life of the custom rail crossings.

15. **Drainage:** Drainage around the track structure is always a concern and a leading cause of accelerated deterioration and wear of the track structure leading to decreased cross tie life, creating fouled ballast resulting in increased rail wear contributing to future maintenance and other service failures. The rail infrastructure generally had clean track ballast that was well drained. Ponding water was noted at several areas, but they were typically located away from the track ballast section. Any drainage work that can be performed to direct water away from the track structure by either an open ditch or underdrain system will have immediate and long-term benefits to the maintenance of the track structure.

XIV. Conclusion

The rail condition assessment results confirm that the Port has implemented industries best practices meeting and exceeding Class I railroad industrial standards in new construction and rehabilitation. It is apparent the Port has been regularly inspecting the rail infrastructure and performing maintenance in a timely manner to maintain the Class I railroad industrial standards while exceeding the Federal Railroad Administration Class 1 Track Safety Standards pursuant to 49 C.F. R. Part 213.

Recommend that in addition to the current maintenance program that the following programs be incorporated. These additional programs will result in a decrease in likelihood of regular problematic maintenance items that were listed in the Finding Notes and provide an increase in service life of the rail infrastructure.

1. Vegetation Control

    a. Vegetation control is necessary for proper track drainage, visibility for inspections and fire prevention, while reducing slips, trips and falls of those working along the track.

    b. Vegetation should be managed with an application of weed spray or other environmentally approved method on an annual basis or as site conditions require extending at a minimum of twelve (12) feet from centerline of track.

    c. A pre-emergent herbicide should be applied to eradicate weeds before they grow between the third week of March and end of April.

    d. A post-emergent herbicide can be applied beginning June 1 to eradicate plants that have sprouted and were not killed by a pre-emergent application. This application can be performed by spot spraying on an as-needed basis.

    e. Aggregate surfaces outside of the rail structure shall also have vegetation control which can include rip rap areas, around drainage structures such as inlets and pipe ends and at-grade vehicular crossings.

2. Track Surfacing

    a. Identify rail elements and sections of track of high, medium and low volume with consideration of track sections continuing extreme curvature, have experienced reverse cross level and super-elevation criteria or through areas where poor subgrade conditions exist. These sections of track should be assigned priority codes determining the frequency of surfacing.

    b. Develop a schedule to mobilize a tamper and regulator to surface and line track sections and rail elements on a rotating annual basis based on the assigned priority code. The surfacing equipment should be supported by a workforce to place track ballast and perform any quality assurance and quality control following completion of the surfacing work.

    c. Based on the available funding, work windows and other logistical constraints all rail elements and track sections should be incorporated into a schedule within a determined period of time (e.g., five (5) years).

    d. Regular surfacing and tamping of track sections and rail elements includes rail joints to ensure proper support decreasing the likelihood of rail end batter, bent rail ends, deterioration of joint components including loose and broken bolts, inability to hold gauge, uneven rail wear, deformation of the switch and frog points and wing-rails, low or pumping joints and holding proper cross-level and

super-elevation for improved train handling.

3. Rail Friction Modification (Lubrication)

   a. In coordination with a third party service and rail friction modifier (lubricator) supplier, complete an analysis of train handling performance to identify sections of track that would benefit from the installation of high rail gauge face and top-of-rail friction modification equipment.

   b. Areas of interest include sections of track of extreme horizontal curvature or short tangent lengths between reverse curves.

   c. High rail gauge face lubrication increased the required L/V ratio for a derailment and decreases the risk of derailment.

   d. Low rail top-of-rail lubrication reduces lateral wheel forces and derailment risk.

   e. Friction modification decreases rail wear and damage to rail and fasteners.

4. Subgrade Stabilization

   a. Perform a ground penetrating radar along sections of track that have current and have historically had sink holes.

   b. Identify extents of potential subgrade instability and develop alternatives for stabilization that may include the track being kept in-service or being removed and performed during a track outage.

   c. Develop a subgrade stabilization program with a firm specializing in repairing track embankment with poor soil conditions.

   d. Create a schedule to address these sections over time obtaining mitigation at those sites that require the most ‘on-going’ maintenance efforts.

5. Rail Relay

   a. Develop a rail relay program to replace all rail not currently meeting current AREMA recommendations. This includes replacing all 90lb and lighter rail size with 115lb or heavier rail section with AREMA Plan double shoulder tie plates. Tie plates shall have a minimum length of twice the width of the rail base in tangent track and at least thirteen (13) inch or fourteen (14) inch in the curves. It is recommended as best practice to have thirteen (13) inch tie plates be used in tangent track and a minimum of fourteen (14) inch tie plates for curves and turnouts. All plates shall meet AREMA Plan 7 or 8 for five and one half (5-1/2) inch base of rail or AREMA Plan 11 or 12 for six (6) inch base of rail.

   b. Rail relay shall be prioritized based on current and future rail traffic volume, track geometry, defects and historical maintenance records. Field notes indicate the Granite City Harbor being of high priority based on size and condition of the

existing rail, current and future switching of rail cars and track geometry.

c. Rail shall be relayed in suitable lengths with spot cross tie renewal to be effective in providing improved conditions.

d. Rail relay does not include rail through the limits of a turnout. Based on field observations any turnouts with 90lb or smaller rail should be replaced as a single unit when warranted.

6. Tie Renewal

a. Appears a tie renewal program has been implemented, recommend it be continued as funds allow based on an annual inspection and traffic volume.

b. Cross and switch tie renewal is an on-going effort in maintaining an applied load distribution through the track ballast section into the subgrade foundation. A wheel load can be distributed along up to nine (9) ties at standard heavy haul tie spacing. Ties adjacent to a failed or defective tie are forced to support an increased share of the vertical point and lateral wheel load, which increases the magnitude of the load applied to the non-failed/defective ties. The result is a decreased service life of a ‘good’ tie adjacent to a failed or defective tie.

7. Track and Turnout Inspection

a. In accordance with the FRA Track Safety Standards under 49 CFR 213.233 visual track inspections shall be performed on a prescribed frequency and manner. Visual track inspections include each switch, turnout and rail crossing.

b. Under subpart F, Excepted track and Class 1 track designated as “Other than main track and sidings” require a monthly visual track inspection with at least twenty (20) calendar days interval between inspections.

c. Under §213.239, extreme weather or seismic events, and any report that create a 'knowledge standard' from any source, may warrant special supplementary inspections.

AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Appendix A

America's Central Port Inventory of Turnouts

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	AK-01	AK-02	AK-03	AK-04	AK-05
Alignment:					
Ahead Switch	Straight	Curve	Curve	Straight	Curve
Behind LLT Straight Side	Straight	Straight	Straight	Curve	Straight
Behind LLT Diverge Side	Curve	Curve	Turnback	Straight	Straight
Manufacturer	Unknown	A&K	A&K	A&K	A&K
Rail Weight and Section	115 lb - RE	115 lb - RE	115 lb - RE	115 lb - RE	115 lb - OH
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	1954	1979	1990		
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless	Toeless
Insulated	None	None	None	None	None
Spike Type	Cut	Cut	Cut	Cut	Cut
Anchor Type	Unit	Unit	Unit	Unit	Unit
Tie Plate Type	Cut / Double	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	13 in	14 in	14 in	14 in	14 in
Switch Ties	Wood	Wood	Wood	Wood	Wood
Operation	Manual	Manual	Manual	Manual	Manual
Hand Throw	Right	Right	Left	Left	Left
Switch Stand Type	National 1003 ARS	National 1003 ARS	National 1003 ARS	National 1003 ARS	National 1003 ARS
Handle Type	Other	30 Degree	30 Degree	30 Degree	30 Degree
Target Straight Postion Color	Red	White	White	White	Green
Target Diverge Postion Color	Green	Red	Red	Red	Red
Switch Point Type	Samson	Samson	Samson	Samson	Samson
Magnesium Insert	No	No	No	No	No
Double Reinforced	Yes	Yes	Yes	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Absent	Adjustable	Adjustable	Adjustable	Adjustable
Heel Block	Rigid	Rigid	Rigid	Rigid	Rigid
Rail Braces	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Frog Size	9	8	8	8	8
Frog Type	RBM	RBM	RBM	RBM	RBM
Plate Type	HTTP	HTTP	HTTP	HTTP	HTTP
Spike Type	Cut	Cut	Cut	Cut	Cut
Rail Guard Length	11 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in
Fastener Type	Bolt	Bolt	Bolt	Bolt	Bolt
Adjustable	No	No	No	No	No
Ballast Type	Mix	Limestone	Limestone	Limestone	Limestone
Switch Tie Count Total	68	Unknown	57	61	57

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	PH-01	PH-02
Alignment:		
Ahead Switch	Straight	Straight
Behind LLT Straight Side	Straight	Straight
Behind LLT Diverge Side	Turnback	Turnback
Manufacturer	Unknown	A&K
Rail Weight and Section	115 lb - RE	112 lb - RE
Type of Rail Construction	6-Jointed	4-Jointed
Year	1945	1945
Joint Bar Assembly Type	Toeless	Toeless
Insulated	None	None
Spike Type	Cut	Cut
Anchor Type	Unit	Unit
Tie Plate Type	Cut / Double	Cut / Double
Length	11 in	11 in
Switch Ties	Wood	Wood
Operation	Manual	Manual
Hand Throw	Right	Right
Switch Stand Type	Racor 22E	Racor 22E
Handle Type	Bow	Bow
Target Straight Postion Color	Green	Green
Target Diverge Postion Color	Red Arrow	Red Arrow
Switch Point Type	Samson	Samson
Magnesium Insert	No	No
Double Reinforced	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Adjustable	Adjustable
Heel Block	Rigid	Rigid
Rail Braces	Adjustable	Adjustable
Frog Size	8	8
Frog Type	SMSG	RBM
Plate Type	Solid	HTTP
Spike Type	Cut	Cut
Rail Guard Length	None	13 ft - 0 in
Fastener Type		Bolt
Adjustable		No
Ballast Type	Limestone	Limestone
Switch Tie Count Total	63	57

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	PP-01	PP-02
Alignment:		
Ahead Switch	Straight	Straight
Behind LLT Straight Side	Straight	Straight
Behind LLT Diverge Side	Turnback	Turnback
Manufacturer	Koppers	Unknown
Rail Weight and Section	115 lb - RE	105 lb - OH
Type of Rail Construction	6-Jointed	6-Jointed
Year	1995	1995
Joint Bar Assembly Type	Toeless	Toed
Insulated	None	None
Spike Type	Cut	Cut
Anchor Type	Unit	Unit
Tie Plate Type	Cut / Double	Cut / Double
Length	13 in	11 in
Switch Ties	Wood	Wood
Operation	Manual	Manual
Hand Throw	Right	Left
Switch Stand Type	Racor 36E	Racor 36E
Handle Type	Bow	Bow
Target Straight Postion Color	Green	Red Arrow
Target Diverge Postion Color	Red Arrow	Green
Switch Point Type	Knife	Knife
Magnesium Insert	No	No
Double Reinforced	No	No
Length	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Absent	Absent
Heel Block	Rigid	Rigid
Rail Braces	Fixed	Fixed
Frog Size	8	8
Frog Type	RBM	RBM
Plate Type	HTTP	HTTP
Spike Type	Cut	Cut
Rail Guard Length	9 ft - 6 in	9 ft - 6 in
Fastener Type	Bolt	Bolt
Adjustable	No	No
Ballast Type	Limestone	Limestone
Switch Tie Count Total	61	56

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	NH-01	NH-03	NH-05	NH-06	NH-07	NH-08
Alignment:						
Ahead Switch	Straight	Straight	Straight	Straight	Straight	Straight
Behind LLT Straight Side	Straight	Straight	Curve	Straight	Turnout	Curve
Behind LLT Diverge Side	Curve	Curve	Turnout	Turnback	Turnback	Turnback
Manufacturer	Koppers	Unknown	Unitrac	Racor	Unknown	Unknown
Rail Weight and Section	115 lb - RE	115 lb - RE	112 lb - RE	115 lb - Unknown	115 lb - RE	115 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	1995	1949	1944	1979	1967 to 1985	1967
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless	Toeless	Toeless
Insulated	None	None	None	None	Partial	None
Spike Type	Cut	Cut	Cut	Cut	Cut	Cut
Anchor Type	Unit	Unit	Unit	Unit	Unit	Unit
Tie Plate Type	Cut / Double	Cut / Double	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	13 in	11 in	14 in	13 in	13 in	11 in - 13 in
Switch Ties	Wood	Wood	Wood	Wood	Wood	Wood
Operation	Manual	Manual	Manual	Manual	Manual	Manual
Hand Throw	Right	Left	Right	Right	Left	Left
Switch Stand Type	Racor 36E	National 1003 ARS	Racor 22E	National 1003 ARS	National 1003 ARS	National 1003 ARS
Handle Type	Bow	30 Degree	Bow	30 Degree	30 Degree	30 Degree
Target Straight Postion Color	Green Arrow	Green	Green	Green	Green	Green
Target Diverge Postion Color	Red Arrow	Red	Red Arrow	Red	Red	Red
Switch Point Type	Knife	Knife	Samson	Knife	Knife	Knife
Magnesium Insert	No	Yes	No	No	No	No
Double Reinforced	Yes	Yes	Yes	Yes	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Absent	Absent	Adjustable	Adjustable	Absent	Absent
Heel Block	Rigid	Rigid	Rigid	Rigid	Rigid	Rigid
Rail Braces	Fixed	Fixed	Adjustable	Fixed	Fixed	Fixed
Frog Size	10	8	9	10	8	9
Frog Type	RBM	SMSG	SMSG	SMSG	SMSG	SMSG
Plate Type	HTTP	HTTP	HTTP	HTTP	HTTP	HTTP
Spike Type	Cut	Cut	Cut	Cut	Cut	Cut
Rail Guard Length	9 ft - 6 in	None	None	None	None	None
Fastener Type	Bolt					
Adjustable	No					
Ballast Type	Limestone	Other	Limestone	Limestone	Limestone	Limestone
Switch Tie Count Total	62	54	58	71	58	57

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	NH-09	NH-11	NH-12	NH-13	NH-16	NH-36
Alignment:						
Ahead Switch	Straight	Straight	Straight	Straight	Turnout	Straight
Behind LLT Straight Side	Straight	Straight	Straight	Straight	Turnout	Straight
Behind LLT Diverge Side	Crossover	Turnback	Crossover	Turnout	Straight	Turnback
Manufacturer	Unitrac	Unitrac	Unitrac	Racor	Racor	A&K
Rail Weight and Section	112 lb - RE	115 lb - RE	112 lb - RE	115 lb - RE	115 lb - RE	115 lb - Unknown
Type of Rail Construction	4-Jointed	6-Jointed	4-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	1943	2008	1944	1966	1967 to 1985	1951
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless	Toeless	Toeless
Insulated	None	None	None	None	None	None
Spike Type	Cut	Cut	Cut	Cut	Cut	Cut
Anchor Type	Unit	Unit	Unit	Unit	None	Unit
Tie Plate Type	Cut / Double	Cut / Double	Cut / Double	Cut / Double	Cut / Double	Cut / Single
Length	11 in	14 in	11 in	11 in	11 in - 14 in	11 in
Switch Ties	Wood	Wood	Wood	Wood	Wood	Wood
Operation	Manual	Manual	Manual	Manual	Manual	Manual
Hand Throw	Left	Right	Left	Right	Left	Right
Switch Stand Type	Racor 22E	Racor 22E	Racor 22E	National 1003 ARS	Racor 20B	Racor 22E
Handle Type	Bow	Bow	Bow	30 Degree	Bow	Bow
Target Straight Postion Color	Green	Green	Green	Green	None	None
Target Diverge Postion Color	Red Arrow	Red Arrow	Red Arrow	Red	None	None
Switch Point Type	Knife	Samson	Knife	Samson	Knife	Knife
Magnesium Insert	No	No	No	Yes	No	No
Double Reinforced	Yes	Yes	Yes	Yes	Yes	No
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Absent	Absent	Absent	Absent	Absent	Adjustable
Heel Block	Rigid	Rigid	Rigid	Rigid	Rigid	Rigid
Rail Braces	Adjustable	Adjustable	Adjustable	Fixed	Fixed	Fixed
Frog Size	9	9	9	8	10	9
Frog Type	RBM	RBM	RBM	SMSG	RBM	RBM
Plate Type	HTTP	HTTP	HTTP	HTTP	HTTP	HTTP
Spike Type	Cut	Cut	Cut	Cut	Cut	Cut
Rail Guard Length	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in	None	8 ft - 6 in	11 ft - 0 in
Fastener Type	Bolt	Bolt	Bolt		Bolt	Bolt
Adjustable	No	No	No		No	No
Ballast Type	Limestone	Limestone	Limestone	Other	Limestone	Limestone
Switch Tie Count Total	58	62	51	56	60	58

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	SH-01	SH-02	SH-03	SH-04	SH-05	SH-06
Alignment:						
Ahead Switch	Curve	Straight	Straight	Straight	Straight	Straight
Behind LLT Straight Side	Curve	Straight	Curve	Straight	Straight	Straight
Behind LLT Diverge Side	Crossover	Crossover	Straight	Curve	Curve	Curve
Manufacturer	Nortrak	Nortrak	Unknown	Unknown	Unknown	A&K
Rail Weight and Section	140 lb - RE	140 lb - RE	140 lb - RE	115 lb - RE	136 lb - RE	115 lb - OH
Type of Rail Construction	CWR	CWR	CWR	6-Jointed	6-Jointed	6-Jointed
Year	1964	1987	1968	1953	2009	1978
Joint Bar Assembly Type	Other	Other	Other	Toeless	Toeless	Toeless
Insulated	Partial	Partial	Partial	None	Partial	None
Spike Type	Cut	Cut	Cut	Cut	Cut	Cut
Anchor Type	Unit	Unit	Unit	Unit	Unit	Unit
Tie Plate Type	Cut / Double	Cut Double	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	14 in	14 in 15 in	14 in	14 in 15 in	14 in 16 in	14 in
Switch Ties	Wood	Wood	Wood	Wood	Wood	Wood
Operation	Manual	Manual	Manual	Manual	Manual	Manual
Hand Throw	Right	Right	Left	Left	Right	Right
Switch Stand Type	National 1003 ARS	National 1003 ARS	National 1003 ARS	National 1003 ARS	National 1003 ARS	National 1003 ARS
Handle Type	30 Degree	30 Degree	30 Degree	30 Degree	30 Degree	30 Degree
Target Straight Postion Color	Green	Green	Green	Green	Green	Red
Target Diverge Postion Color	Red	Red	Red	Yellow	Red	Green
Switch Point Type	Samson	Samson	Samson	Samson	Samson	Samson
Magnesium Insert	Yes	Yes	Yes	No	No	No
Double Reinforced	Yes	Yes	Yes	No	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Heel Block	Rigid	Rigid	Rigid	Rigid	Rigid	Rigid
Rail Braces	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Frog Size	8	8	8	8	8	8
Frog Type	RBM	RBM	RBM	RBM	RBM	RBM
Plate Type	HTTP	HTTP	HTTP	HTTP	HTTP	HTTP
Spike Type	Cut	Cut	Cut	Cut	Cut	Cut
Rail Guard Length	9 ft - 6 in	9 ft - 6 in	9 ft - 6 in	13 ft - 0 in	9 ft - 6 in	13 ft - 0 in
Fastener Type	Bolt	Bolt	Bolt	Bolt	Bolt	Bolt
Adjustable	No	No	No	No	No	No
Ballast Type	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Switch Tie Count Total	51	Unknown	53	58	59	57

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	SH-07	SH-08	SH-09	SH-10	SH-11	SH-12
Alignment:						
Ahead Switch	Straight	Straight	Straight	Straight	Straight	Straight
Behind LLT Straight Side	Straight	Straight	Straight	Straight	Straight	Straight
Behind LLT Diverge Side	Curve	Crossover	Crossover	Straight	Turnback	Curve
Manufacturer	Unknown	A&K	A&K	A&K	Unknown	A&K
Rail Weight and Section	112 lb - RE	115 lb - RE	115 lb - RE	115 lb - OH	136 lb - RE	136 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed	6-Jointed	CWR	CWR
Year	1952	1951	1965	1980	2014	2014
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless	Other	Other
Insulated	Full	Full	None	None	Full	Full
Spike Type	Cut	Cut	Cut	Cut	Cut	Cut
Anchor Type	Unit	Unit	Unit	Unit	Unit	Unit
Tie Plate Type	Cut / Double	Cut / Double	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	15 in	14 in	14 in	14 in	14 in	14 in
Switch Ties	Wood	Wood	Wood	Wood	Wood	Wood
Operation	Manual	Manual	Manual	Manual	Manual	Manual
Hand Throw	Right	Left	Right	Right	Right	Right
Switch Stand Type	Racor 22E	National 1003 ARS	National 1003 ARS	Racor 22E	Racor 22E	Racor 22E
Handle Type	Bow	30 Degree	30 Degree	Bow	Bow	Bow
Target Straight Postion Color	Green	White	White	Green	Green	Green
Target Diverge Postion Color	Red Arrow	Red	Red	Red Arrow	Red Arrow	Red Arrow
Switch Point Type	Samson	Samson	Samson	Samson	Samson	Samson
Magnesium Insert	No	No	No	No	No	No
Double Reinforced	Yes	Yes	Yes	Yes	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Fixed	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Heel Block	Rigid	Rigid	Rigid	Rigid	Rigid	Rigid
Rail Braces	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Frog Size	8	8	8	8	9	9
Frog Type	RBM	RBM	RBM	RBM	RBM	RBM
Plate Type	HTTP	HTTP	HTTP	HTTP	E-Clip	E-Clip
Spike Type	Cut	Cut	Cut	Cut	Cut	Cut
Rail Guard Length	11 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in
Fastener Type	Bolt	Bolt	Bolt	Bolt	Bolt	Bolt
Adjustable	No	No	No	No	No	No
Ballast Type	Limestone	Limestone	Limestone	Limestone	Trap Rock	Trap Rock
Switch Tie Count Total	59	Unknown	Unknown	Unknown	Unknown	63

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	SH-13	SH-14	SH-15	SH-16
Alignment:				
Ahead Switch	Curve	Straight	Curve	Straight
Behind LLT Straight Side	Straight	Straight	Straight	Straight
Behind LLT Diverge Side	Turnback	Turnback	Straight	Curve
Manufacturer	Unknown	Unknown	Unknown	Unknown
Rail Weight and Section	110 lb - RE	112 lb - RE	136 lb - RE	136 lb - RE
Type of Rail Construction	4-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	1930	1945	2011	1979
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Insulated	None	None	Full	Full
Spike Type	Cut	Cut	Screw	Screw
Anchor Type	Unit	Unit	E-Clip	E-Clip
Tie Plate Type	Cut / Double	Cut / Double	E-Clip	E-Clip
Length	11 in	14 in	16 in	16 in
Switch Ties	Wood	Wood	Wood	Wood
Operation	Manual	Manual	Manual	Manual
Hand Throw	Left	Right	Left	Right
Switch Stand Type	Racor 22E	Racor 22E	National 1003 ARS	National 1003 ARS
Handle Type	Bow	Bow	30 Degree	30 Degree
Target Straight Postion Color	Green	White	Green	Green
Target Diverge Postion Color	Red	Red Arrow	Red	Red
Switch Point Type	Knife	Samson	Samson	Samson
Magnesium Insert	No	Yes	Yes	Yes
Double Reinforced	Yes	Yes	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	19 ft - 6 in
Switch Point Guard	Adjustable	Absent	Adjustable	Adjustable
Heel Block	Rigid	Rigid	Floating	Floating
Rail Braces	Fixed	Adjustable	Adjustable	Adjustable
Frog Size	8	9	9	11
Frog Type	SMSG	RBM	RBM	RBM
Plate Type	HTTP	HTTP	E-Clip	E-Clip
Spike Type	Cut	Cut	Screw	Screw
Rail Guard Length	None	13 ft - 0 in	13 ft - 0 in	19 ft - 6 in
Fastener Type		Bolt	E-Clip	E-Clip
Adjustable		No	Yes	Yes
Ballast Type	Mix	Limestone	Local	Local
Switch Tie Count Total	57	59	Unknown	77

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	SL-01	SL-02	SL-03	SL-04	SL-05	SL-06
Alignment:						
Ahead Switch	Straight	Straight	Straight	Straight	Straight	Straight
Behind LLT Straight Side	Straight	Straight	Straight	Straight	Straight	Straight
Behind LLT Diverge Side	Straight	Turnout	Crossover	Crossover	Crossover	Crossover
Manufacturer	PRS	PRS	PRS	PRS	PRS	PRS
Rail Weight and Section	136 lb - RE	136 lb - RE	136 lb - RE	136 lb - RE	136 lb - RE	136 lb - RE
Type of Rail Construction	CWR	CWR	CWR	CWR	CWR	CWR
Year	2015	2015	2016	2016	2016	2016
Joint Bar Assembly Type	Other	Other	Other	Other	Other	Other
Insulated	Full	Full	Full	Full	Full	Full
Spike Type	Screw	Screw	Screw	Screw	Screw	Screw
Anchor Type	E-Clip	E-Clip	E-Clip	E-Clip	E-Clip	E-Clip
Tie Plate Type	E-Clip	E-Clip	E-Clip	E-Clip	E-Clip	E-Clip
Length	16 in	16 in	16 in	16 in	16 in	16 in
Switch Ties	Wood	Wood	Wood	Wood	Wood	Wood
Operation	Manual	Manual	Manual	Manual	Manual	Manual
Hand Throw	Right	Left	Left	Left	Right	Right
Switch Stand Type	Racor 22E	Racor 22E	Racor 22E	Racor 22E	Racor 22E	Racor 22E
Handle Type	Bow	Bow	Bow	Bow	Bow	Bow
Target Straight Postion Color	Green	Green	Green	Green	Green	Green
Target Diverge Postion Color	Red Arrow	Red Arrow	Red Arrow	Red Arrow	Red Arrow	Red Arrow
Switch Point Type	Samson	Samson	Samson	Samson	Samson	Samson
Magnesium Insert	Yes	Yes	Yes	Yes	Yes	Yes
Double Reinforced	Yes	Yes	Yes	Yes	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Heel Block	Floating	Floating	Floating	Floating	Floating	Floating
Rail Braces	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Frog Size	9	9	9	9	9	9
Frog Type	RBM	RBM	RBM	RBM	RBM	RBM
Plate Type	E-Clip	E-Clip	E-Clip	E-Clip	E-Clip	E-Clip
Spike Type	Screw	Screw	Screw	Screw	Screw	Screw
Rail Guard Length	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in
Fastener Type	E-Clip	E-Clip	E-Clip	E-Clip	E-Clip	E-Clip
Adjustable	Yes	Yes	Yes	Yes	Yes	Yes
Ballast Type	Trap Rock	Trap Rock	Trap Rock	Trap Rock	Trap Rock	Trap Rock
Switch Tie Count Total	66	67	67	67	67	67

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	SL-07	SL-08	SL-09
Alignment:			
Ahead Switch	Straight	Straight	Straight
Behind LLT Straight Side	Turnout	Straight	Curve
Behind LLT Diverge Side	Straight	Straight	Straight
Manufacturer	PRS	PRS	PRS
Rail Weight and Section	136 lb - RE	136 lb - RE	136 lb - RE
Type of Rail Construction	CWR	CWR	6-Jointed
Year	2016	2016	2011
Joint Bar Assembly Type	Other	Other	Toeless
Insulated	Full	Full	Full
Spike Type	Screw	Screw	Screw
Anchor Type	E-Clip	E-Clip	E-Clip
Tie Plate Type	E-Clip	E-Clip	E-Clip
Length	16 in	16 in	16 in
Switch Ties	Wood	Wood	Wood
Operation	Manual	Manual	Manual
Hand Throw	Left	Left	Left
Switch Stand Type	Racor 22E	Racor 22E	National 1003 ARS
Handle Type	Bow	Bow	30 Degree
Target Straight Postion Color	Green	Green	Green
Target Diverge Postion Color	Red Arrow	Red Arrow	Red
Switch Point Type	Samson	Samson	Samson
Magnesium Insert	Yes	Yes	Yes
Double Reinforced	Yes	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Adjustable	Adjustable	Adjustable
Heel Block	Floating	Floating	Floating
Rail Braces	Adjustable	Adjustable	Adjustable
Frog Size	9	9	9
Frog Type	RBM	RBM	RBM
Plate Type	E-Clip	E-Clip	E-Clip
Spike Type	Screw	Screw	Screw
Rail Guard Length	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in
Fastener Type	E-Clip	E-Clip	E-Clip
Adjustable	Yes	Yes	Yes
Ballast Type	Trap Rock	Trap Rock	Local
Switch Tie Count Total	67	67	67

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	WH-01	WH-02	WH-03	WH-04
Alignment:				
Ahead Switch	Curve	Straight	Straight	Straight
Behind LLT Straight Side	Straight	Straight	Straight	Straight
Behind LLT Diverge Side	Curve	Turnback	Turnback	Curve
Manufacturer	A&K	A&K	A&K	A&K
Rail Weight and Section	136 lb - RE	136 lb - RE	136 lb - RE	136 lb - RE
Type of Rail Construction	CWR	CWR	CWR	6-Jointed
Year	2014	2014	2014	2017
Joint Bar Assembly Type	Other	Other	Other	Toeless
Insulated	Full	Full	Full	Partial
Spike Type	Cut	Cut	Cut	Cut
Anchor Type	Unit	Unit	Unit	Unit
Tie Plate Type	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	14 in	14 in	14 in	14 in
Switch Ties	Wood	Wood	Wood	Wood
Operation	Manual	Manual	Manual	Manual
Hand Throw	Left	Right	Left	Left
Switch Stand Type	Racor 22E	Racor 22E	National 1003 ARS	Racor 22E
Handle Type	Bow	Bow	30 Degree	Bow
Target Straight Postion Color	Green	Green	White	Green
Target Diverge Postion Color	Red Arrow	Red Arrow	Red	Red Arrow
Switch Point Type	Samson	Samson	Samson	Samson
Magnesium Insert	No	No	No	No
Double Reinforced	Yes	Yes	Yes	Yes
Length	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Adjustable	Adjustable	Adjustable	Adjustable
Heel Block	Rigid	Rigid	Rigid	Rigid
Rail Braces			Adjustable	Adjustable
Frog Size	9	9	9	9
Frog Type	RBM	RBM	RBM	RBM
Plate Type	E-Clip	E-Clip	E-Clip	HTTP
Spike Type	Cut	Cut	Cut	Cut
Rail Guard Length	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in	13 ft - 0 in
Fastener Type	Bolt	Bolt	Bolt	Bolt
Adjustable	No	No	No	No
Ballast Type	Trap Rock	Trap Rock	Trap Rock	Trap Rock
Switch Tie Count Total	63	63	56	63

AMERICA'S CENTRAL PORT INVENTORY OF TURNOUTS

Designation	GP-01	SB-01
Alignment:		
Ahead Switch	Straight	Straight
Behind LLT Straight Side	Straight	Straight
Behind LLT Diverge Side	Curve	Crossover
Manufacturer	PRS	Racor
Rail Weight and Section	140 lb - RE	90 lb - RA-A
Type of Rail Construction	6-Jointed	4-Jointed
Year	2011	1951
Joint Bar Assembly Type	Toeless	Toed
Insulated	Full	Full
Spike Type	Cut	Cut
Anchor Type	Unit	None
Tie Plate Type	Cut / Double	Cut / Single
Length	11 in - 13 in	8 in
Switch Ties	Wood	Wood
Operation	Manual	Manual
Hand Throw	Left	Left
Switch Stand Type	National 1003 ARS	Racor 20B
Handle Type	30 Degree	Other
Target Straight Postion Color	Green	White
Target Diverge Postion Color	Red	Red
Switch Point Type	Samson	Knife
Magnesium Insert	Yes	No
Double Reinforced	Yes	No
Length	16 ft - 6 in	16 ft - 6 in
Switch Point Guard	Adjustable	Absent
Heel Block	Floating	Rigid
Rail Braces	Adjustable	Fixed
Frog Size	8	8
Frog Type	RBM	RB
Plate Type	HTTP	HTTP
Spike Type	Cut	Cut
Rail Guard Length	13 ft - 0 in	8 ft - 0 in
Fastener Type	Bolt	Bolt
Adjustable	No	No
Ballast Type	Local	Limestone
Switch Tie Count Total	58	Unknown

AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

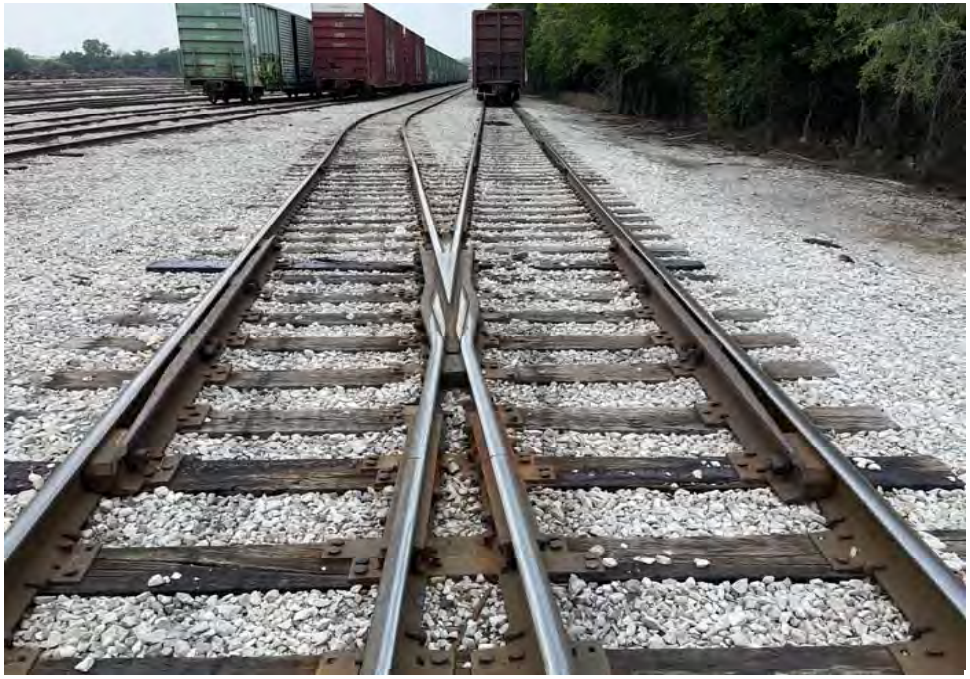
Appendix B

America's Central Port Photos of Turnouts

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. AK-01

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. AK-02

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. AK-03



AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. AK-04

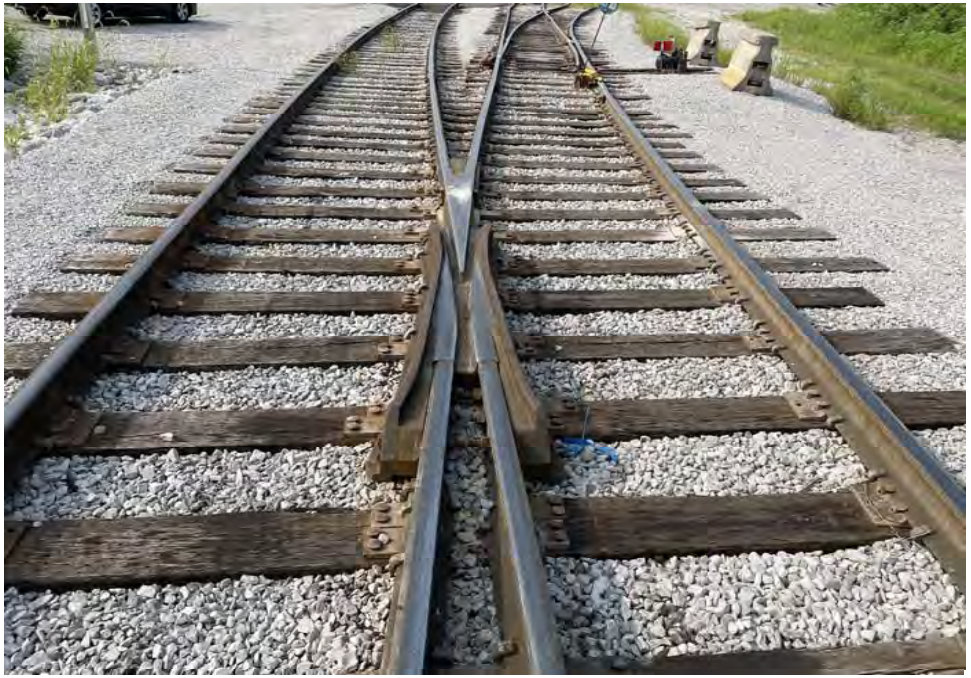
AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. AK-05

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. GP-01

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-01

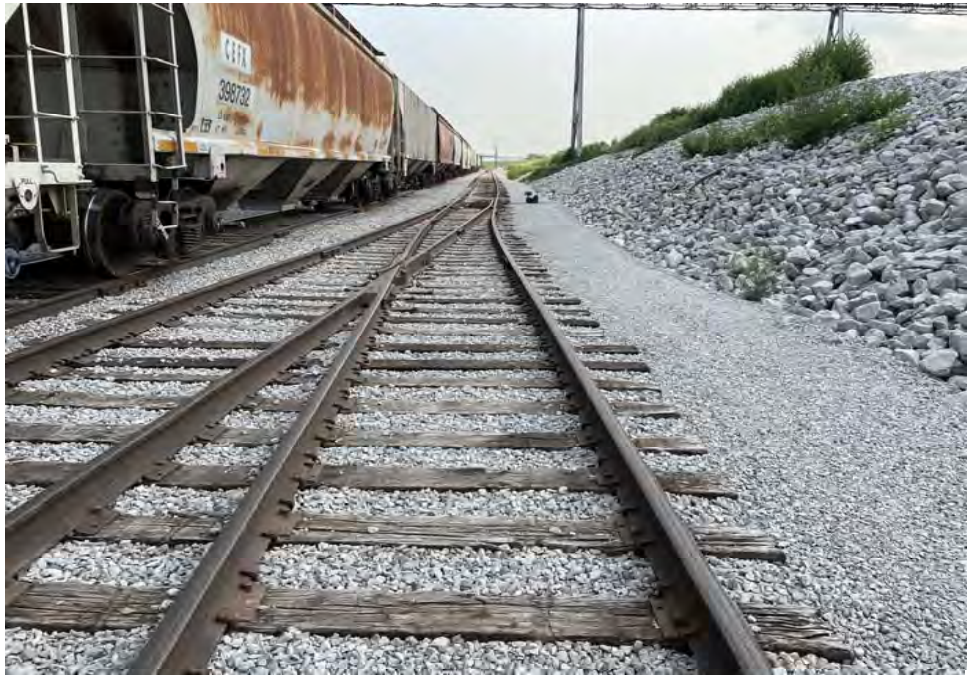
AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-03

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-05

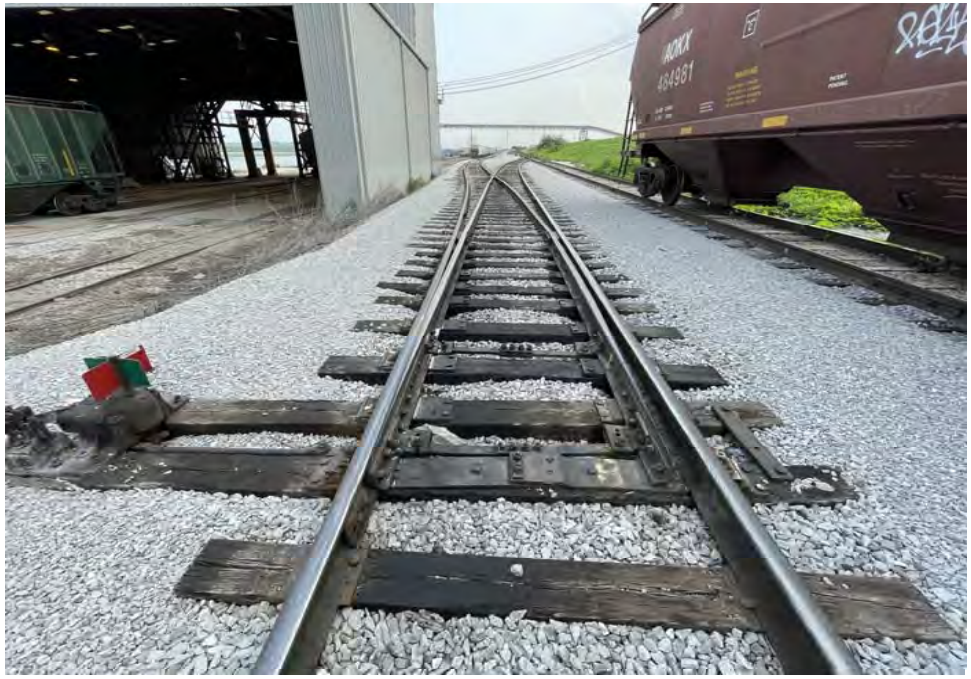


AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-06

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-07



AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-08



AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-09

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-11

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-12

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-13

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-16

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. NH-36

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. PH-01

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. PH-02

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. PP-01

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. PP-02

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SB-01

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-01

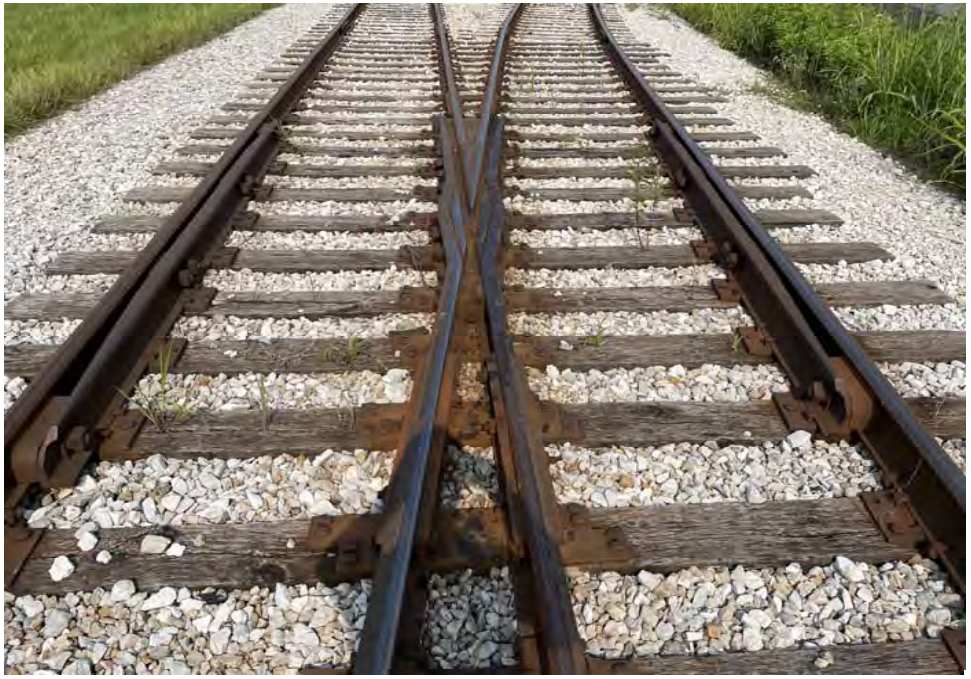
AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-02

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-03

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-04

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-05

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-06



AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-07

AMERICA'S CENTRAL PORT OF PHOTOS OF TURNOUTS - I.D. SH-08

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-09

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-10

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-11

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-12

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-13

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-14

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-15

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SH-16

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-01

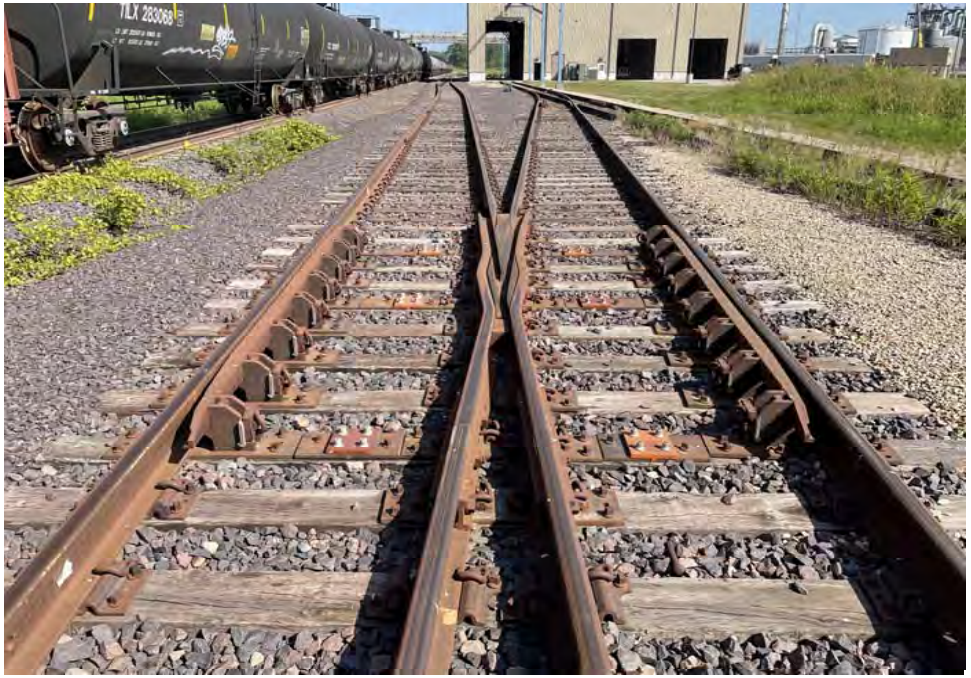
AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-02

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-03

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-04

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-05

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-06



AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-07

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-08

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. SL-09

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. WH-01

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. WH-02

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. WH-03

AMERICA'S CENTRAL PORT PHOTOS OF TURNOUTS - I.D. WH-04

AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Appendix C

America's Central Port

Inventory of At-Grade Railroad Crossings

LAST UPDATED: 12/29/2021

AMERICA'S CENTRAL PORT
INVENTORY OF AT-GRADE RAILROAD CROSSINGS

GRANITE CITY HARBOR AT- GRADE RAILROAD CROSSINGS

CROSSING NUMBER	AAR/DOT NUMBER	ICC REGISTERED	FRA REGISTERED	OWNER	MILEPOST	CROSSING TYPE	STREET NAME OR INTERSECTION	WARNING DEVICES	NUMBER OF TRACKS	CROSSING SURFACE TYPE	ENS SIGN	CROSSING INSTALL DATE	WIDTH/ LENGTH(S)	ROAD SPEED LIMIT	TRAINS/ DAY	ADVANCED WARNING & OTHER	PAVEMENT MARKINGS	LAT/LONG DECIMAL	TRAFFIC MEDIAN	CROSSING ILLUMINATED	AADT (YEAR)	% TRUCKS (YEAR)	TYPICAL SPEED RANGE (MAX TIMETABLE SPEED)	INTERSECTION WITHIN 500'	IF YES, DISTANCE	COMMERCIAL POWER	XING ANGLE (DEGREES)	ROAD SURFACE
1	955288X	Yes	Yes	NS	11.44	Public	Old Rock Road	Xbucks w/ yield, 2 Track [2]	2	Rubber Flangeway & Asphalt [2]	Yes [2]		43'/35', 37'	25		W10-1 [2]	None	38.7213N 90.1587W	No	Yes			5-10 mph (10 mph)	Yes	25'	Yes	60-90	Asphalt
2	955289E	Yes	Yes	NS	11.83	Private	Levee Road	Xbucks w/ yield [2]	1	Solid Timber	Yes [2] (7)		13'/51'	10		No	None	38.7208N 90.1658W	No	No			5-10 mph (10 mph)	Yes	320'	No	30-59	Aggregate
3	934481B	Yes	No	ACP	12.19	Private	White Dock Road	Xbuck w/yield, 3 Track [1]	3	Rubber Flangeway & Asphalt [1]	No	20-Nov	13'/92'	25		No	None	38.7161N 90.1682W	No	No			5-10 mph (10 mph)	No			0-29	Asphalt

MADISON HARBOR AT-GRADE RAILROAD CROSSINGS

CROSSING NUMBER	AAR/DOT NUMBER	ICC REGISTERED	FRA REGISTERED	OWNER	MILEPOST	CROSSING TYPE	STREET TYPE & NAME OR INTERSECTION	MAXIMUM WARNING DEVICES	NUMBER OF TRACKS	CROSSING SURFACE TYPE	ENS SIGN	CROSSING INSTALL DATE	WIDTH/ LENGTH(S)	ROAD SPEED LIMIT	TRAINS/ DAY	ADVANCED WARNING & OTHER	PAVEMENT MARKINGS	LAT/LONG DECIMAL	TRAFFIC MEDIAN	CROSSING ILLUMINATED	AADT (YEAR)	% TRUCKS (YEAR)	TYPICAL SPEED RANGE (MAX TIMETABLE SPEED)	INTERSECTION WITHIN 500'	IF YES, DISTANCE	COMMERCIAL POWER	XING ANGLE (DEGREES)	ROAD SURFACE
10	928968W	No	No	ACP	0.05	Private	LR, A&K Truck Access	Xbucks w/yield [2]	2	4 Board Timber & Asphalt	Yes [2]		18'/ 41', 43'	10	6	No	None	38.6989N 90.1614W	No	No			5-10 mph (10 mph)	No	-	No	30-59	Aggregate
11	972663P	No	No	ACP	0.38	Private	LR, A&K Main Access	Xbucks w/yield [2]	2	8 Board Timber & Asphalt, 4 Board Timber & Asphal	Yes [2]		28'/16' [2]	10	6	No	None	38.6983N 90.1672W	No	No			5-10 mph (10 mph)	Yes	90'	No	60-90	Asphalt
13	928850G	Yes	Yes	ACP	0.45	Private	LR, First Street, Track NL	Xbucks w/stop, 3 Track [2]	3	6 Board Timber/Rubber/Asphalt [2], Solid Timber [1]	Yes [2]	Nov-18	28'/ 49' [2], 57'	25	4	W10-1 [2]	None	38.6978N 90.1683W	No	Yes			5-10 mph (10 mph)	Yes	180'	Yes	60-90	Asphalt
14	928851N	Yes	Yes	ACP	0.6	Private	LR, W Third Street, Track NL	Xbucks w/yield [2]	1	Rubber Flangeway & Asphalt [1]	Yes [2]		13'/26'	25	4	W10-1 [2]	None	38.6970N 90.1710W	No	Yes			5-10 mph (10 mph)	Yes	125'	Yes	60-90	Asphalt
15	928852V	Yes	Yes	ACP	0.7	Private	LR, C Street, Track NL	Xbucks w/yield [2]	1	Rubber Flangeway & Asphalt [1]	Yes [2]	Nov-18	13'/130'	25	3	W10-1 [2]	None	38.6964N 90.1725W	No	No			5-10 mph (10 mph)	Yes	185'	Yes	30-59	Asphalt
16	928853C	Yes	Yes	ACP	0.9	Private	LR, W Seventh Street, Track NL	Xbucks w/yield [2]	1	Rubber Flangeway & Asphalt [1]	Yes [2]	Nov-18	13'/46'	25	2	W10-1 [2], W10-12L [2]	None	38.6960N 90.1762W	No	No			5-10 mph (10 mph)	Yes	60'	Yes	60-90	Asphalt
17	928854J	Yes	Yes	ACP	1.13	Private	LR, D Street at Sewer Plant, NL Track	Xbucks w/stop [2]	1	Rubber Flangeway & Asphalt [1]	Yes [2]	Nov-18	13'/34'	25	3	W10-1 [2]	None	38.6941N 90.1798W	No	Yes			5-10 mph (10 mph)	Yes	175'	No	60-90	Asphalt
18	928855R	Yes	Yes	ACP	1.43	Private	LR, E Street, Track NL, SL#2, SL#3	Xbucks w/yield, 3 Track [2]	3	Rubber Flangeway & Asphalt [3]	Yes [2]	Oct-16	43'/ 30', 31', 32'	25	5	W10-1 [2], W14-2 [2], W16-1 [1]	None	38.6903N 90.1822W	No	No			5-10 mph (10 mph)	Yes	75'	Yes	60-90	Concrete [1], Asphalt [1]
19	928856X	Yes	Yes	ACP	1.5	Public	LR, Bissell Street, South Loop and Ethanol Tracks	Xbucks w/yield, 2 Track [2]	2	Concrete	Yes [2]	May-09	166'/ 88', 85'	30	5	W10-12L [2]	Stop Lines, RR Xing Symbols	38.6893N 90.1827W	No	No			5-10 mph (10 mph)	Yes	40'	No	30-59	Concrete
20	928857E	Yes	Yes	ACP	1.66	Private	LR, W Eight Street, Track NL	Xbuck w/yield [2]	1	4 Board Timber & Asphalt	Yes [2]	Nov-18	13'/32'	25	3	W10-1 [2]	None	38.6881N 90.1805W	No	No			5-10 mph (10 mph)	Yes	110'	Yes	60-90	Asphalt
21	928970X	Yes	Yes	ACP	2.06	Private	LR, W Second Street, Mattingly Lumber and North Loop Tracks	Xbucks w/yield, 2 Track [2]	2	4 Board Timber & Asphalt	Yes [2]	Jun-05	158'/80'	25	4	No	None	38.6872N 90.1735W	No	Yes			5-10 mph (10 mph)	Yes	275'	Yes	30-59	Asphalt
22	928971E	Yes (945425A)	Yes	ACP	2.14	Public	LR, E Street near W Second Street, Track Bldng#1, Bldng#2, Bldng#3, SL#1, XVR#2	Xbucks, Flashing lights & gates, 5 Track [2]	5	Concrete [2], 4 Board Timber & Asphalt [3]	Yes [2]	Jan-13	92'/54'[2], 34' [3]	25	6	W10-1 [2], W14-3 [1]	None	38.6880N 90.1730W	No	Yes			5-10 mph (10 mph)	Yes	275'	Yes	60-90	Asphalt
23	928972L	Yes	Yes	ACP	2.44	Private	LR, D Street at W Second Street, Track Bldng#1, Bldng#2, Bldng#3, XVR#1	Xbucks w/stop, 4 Track [2]	4	4 Board Timber & Asphalt [3], Concrete [1]	Yes [2]	Dec-16	92'/ 32'[4]	25	6	W10-1 [2]	None	38.6922N 90.1713W	No	Yes			5-10 mph (10 mph)	Yes	110'	Yes	60-90	Concrete
24	972664W	Yes (928973T)	No	ACP	2.74	Private	LR, C Street at W Second Street, Track Bldng#1, Bldng#2, Bldng#3	Xbucks w/yield, 3 Track [2]	3	Rubber flangeway & Asphalt [3]	Yes [2]	Dec-16	36'/52', 50', 168'	25	5	W10-1 [2]	None	38.6961N 90.1694W	No	Yes			5-10 mph (10 mph)	Yes	95'	Yes	60-90	Asphalt
25	972665D	No	No	ACP	0.39	Private	LR, Wharf Road, South Loop Tracks	Xbucks w/stop, 3 Track [2]	3	Rubber flangeway & Asphalt	Yes [2]	Oct-15	54'/30', 36', 94', 88'	25	4	W10-1 [2], W10-3L [1], w10-3R [1]	RR Xing Symbols	38.6850N 90.1842W	Yes	No			5-10 mph (10 mph)	Yes	130'	Yes	60-90	Concrete
26	934477L	Yes	No	ACP	1.08	Public	LR, Bissell Street, South Loop Tracks	Flashing lights & gates, 3 Track [2]	3	Concrete [2], Rubber Flangeway & Asphalt [1]	Yes [2]	Mar-12	44'/ 48' [2], 50 [1]	30	4	W10-1 [2], W10-4L [1]	RR Xing Symbols	38.6814N 90.1772W	No	No			5-10 mph (10 mph)	Yes	60'	Yes	60-90	Concrete/ Asphalt
27	945425A	No	No	ACP	1.59	Public	LR, E Street at W Third Street, Track Bldng#5	Xbucks, Flashing lights & gates [2]	1	Concrete	Yes [2]	Jan-13	13'/49'	25	2	W10-1 [1], W14-3 [1]	RR Xing Symbols [1]	38.6693N 90.1722W	No	Yes			5-10 mph (10 mph)	Yes	40'	Yes	60-90	Concrete
28	928975G	Yes	Yes	ACP	1.9	Private	LR, D Street at W Third Street, Track Bldng#4	Xbucks w/stop [2]	1	Rubber flangeway & Asphalt	Yes [2]		13'/32'	25	1	W10-1 [1]	None	38.6925N 90.1725W	No	Yes			5-10 mph (10 mph)	Yes	40'	Yes	60-90	Concrete
29	928974A	Yes	Yes	ACP	2.17	Private	LR, C Street at W Third Street, Track Bldng#5	Xbucks w/yield [2]	1	Rubber flangeway & Asphalt	Yes [2]		13'/40'	25	20	W10-1 [2]	None	38.6964N 90.1709W	No	Yes			5-10 mph (10 mph)	Yes	30'	Yes	60-90	Asphalt
30	972667S	No	No	ACP	0.26	Private	LR, D Street, Track WRHS#1	Xbucks w/stop [2]	1	Rubber flangeway & Asphalt	Yes [2]	Dec-16	13'/40'	25	3	W10-1 [1]	None	38.6933N 90.1756W	No	No			5-10 mph (10 mph)	Yes	40'	Yes	60-90	Asphalt
31	972668Y	No	No	ACP	0.29	Private	LR, Private Drive, Track WRHS#1, WRHS#3	Xbuck w/stop, 2 Track [1]	2	Rubber flangeway & Asphalt	Yes [1]	Dec-16	24'/61', 58'	25	1	W10-3L [1], W10-3R [1]	None	38.6928N 90.1758W	No	No			5-10 mph (10 mph)	Yes	160'	Yes	60-90	Asphalt
34	TBD	No	No	ACP	0.26	Private	LR, D Street, Track WRHS#4	Xbucks w/stop [2]	1	Rubber flangeway & Asphalt	No		13'/40'	25	1	W10-1 [1]	None	38.6932N 90.1753W	No	No			5-10 mph (10 mph)	Yes	98'	Yes	60-90	Asphalt
35	972672N	No	No	ACP	0.34	Private	LR, A&K Truck Access	Xbucks w/yield, 2 Track [2]	2	Rubber flangeway & Asphalt	Yes [2]		32'/24' [2]	25	1	No	None	38.6989N 90.1668W	No	No			5-10 mph (10 mph)	Yes	49'	Yes	60-90	Asphalt

Notes
(1) [#] - Number of locations.
(2) NS = Norfolk Southern
(3) ACP = America's Central Port
(4) "Length" – The length of the crossing surface is measured in feet parallel to the tracks, along the improved surface of the crossing, which may extend beyond the edges of highway pavement and any sidewalks that may be present. In general, the crossing surface material will extend approximately 3 feet on each side beyond the roadway/pathway.
(5) "Width" – The width of the crossing surface is measured in feet perpendicular to the railroad tracks and is the distance between the outermost edges of the crossing surface (including multiple tracks if present). In the event that the crossing surface is indistinguishable from the roadway approach, the width is the distance between the outermost rails of the crossing plus 4 feet.
(6) "Commercial Power" - Enter a check to indicate whether there is commercial electric power available within 500 feet of the crossing. This field is optional.
(7) Location has NS ENS 3280684 sign installed at 2 separate posts.

AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Appendix D

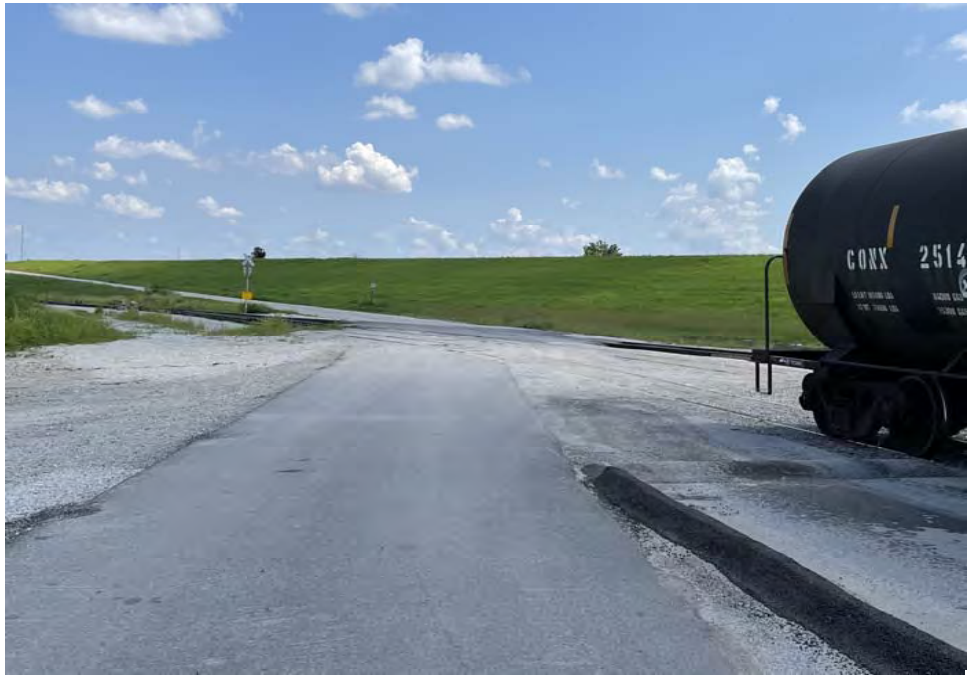
America's Central Port

Photos of At-Grade Railroad Crossings

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 01

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 02

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 03



AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 10

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 11

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 13

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 14

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 15

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 16

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 17

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 18

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 19

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 19

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 20

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 21

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 21

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 22

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 22

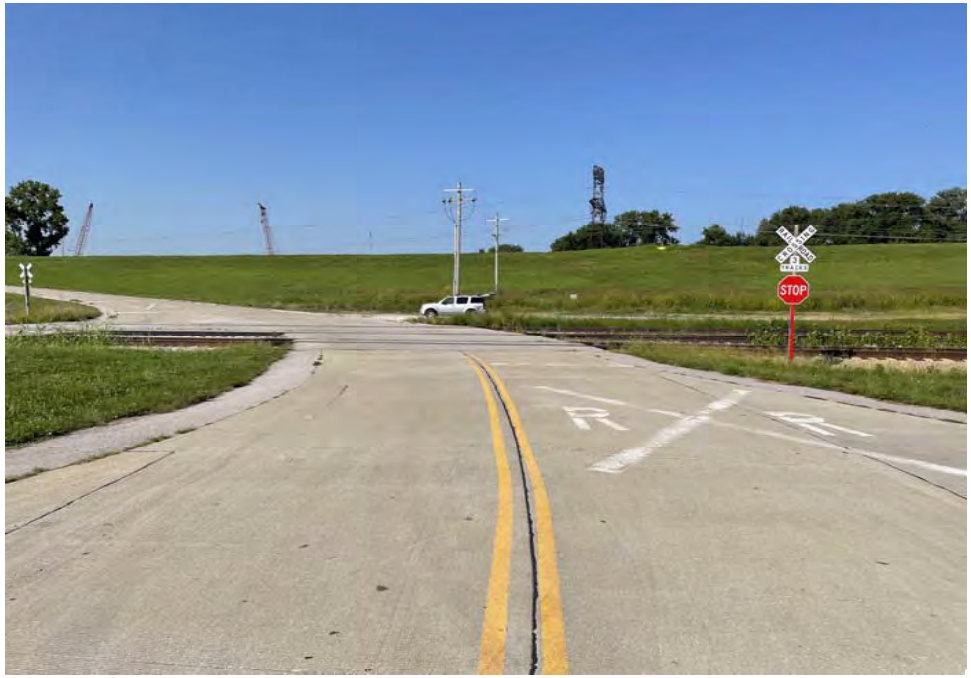
AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 23

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 23

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 24

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 24

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 25



AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 25

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 26

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 27

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 28

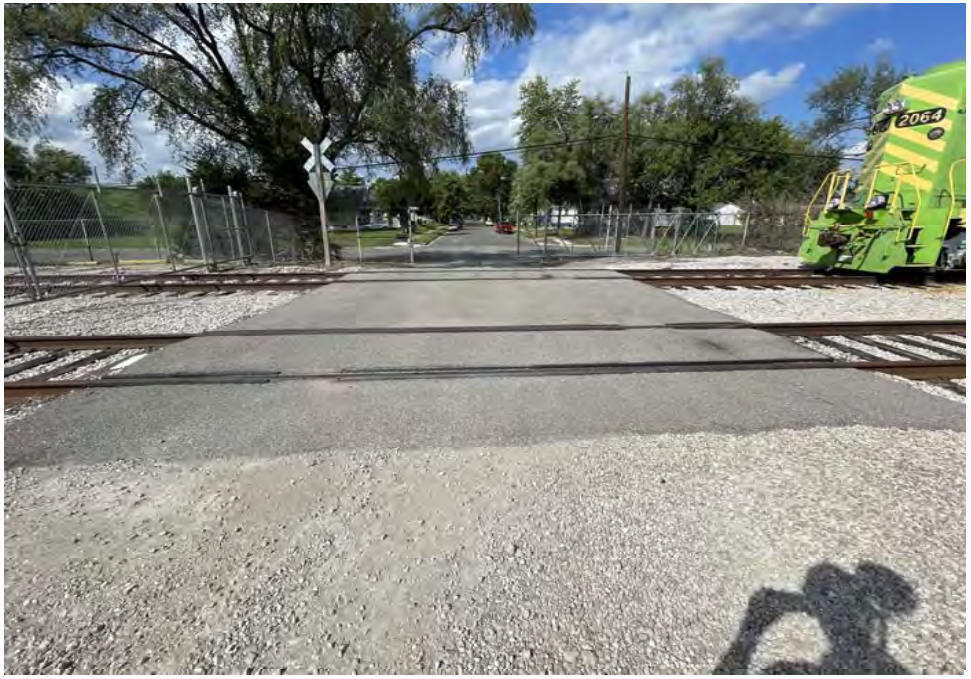
AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 29

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 30

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 31

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 34

AMERICA'S CENTRAL PORT PHOTOS OF AT-GRADE RAILROAD CROSSINGS - I.D. 35



AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Appendix E

America's Central Port Inventory of Track

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	AL(A)	AL(B)	AL(C)	AL(D)
Alignment	Tangent / Curved	Tangent / Curved	Tangent / Curved	/ Curved
Track Gauge	56 1/4" to 57 1/2"	56 1/4" to 56 7/8"	56 1/4" to 56 1/2"	to 56 1/4"
Rail Weight and Section	115 lb - RE	112 lb - RE	115 lb - RE	112 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	4-Jointed	4-Jointed
Year	to 1977	to 1940	1949 to 1974	to 1952
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Rail Weight and Section	112 lb - RE	115 lb - RE	N/A	N/A
Type of Rail Construction	4-Jointed	6-Jointed	N/A	N/A
Year	to 1944	to 1977	N/A	N/A
Joint Bar Assembly Type	Toeless	Toeless	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Single / Double	Cut / Single
Length	14 in to 14 in	to 14 in	10 in to 11 in	to 10 in
Hole Pattern	5 to 8	to 8	7 to 8	to 4
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	2 to 5	2 to 5	to 3	to 3
Anchor Type	Unit	Channel	Unit	Unit
Pattern Every Tie	3rd to Full	to Full	to Full	to Full
Cross Tie Type	Timber	Timber	Timber	Timber
Width	to 9 in	to 9 in	to 9 in	to 9 in
Length	to 8'-6"	to 8'-6"	to 8'-6"	to 8'-6"
Spacing	19 in to 26 in	21 in to 26 in	21 in to 28 in	17 in to 24 in
Ballast Type	Limestone	Limestone	Limestone	Limestone
Gauge Rods	Yes			Yes

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	AL(E)	AL(F)	AL(G)	AL(H)
Alignment	Tangent /	Tangent / Curved	Tangent /	Tangent /
Track Gauge	56 3/8" to	56 1/8" to	to 56 1/2"	to 56 5/8"
Rail Weight and Section	90 lb - RA	115 lb - RE	115 lb - RE	115 lb - RE
Type of Rail Construction	4-Jointed	4-Jointed	6-Jointed	4-Jointed
Year	to 1914	to 1967	to 1955	to 2000
Joint Bar Assembly Type	Toed	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Single	Cut / Double	Cut / Single	Cut / Single
Length	to 10 in	to 11 in	to 10 in	to 11 in
Hole Pattern	to 6	to 4	to 4	to 4
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	2 to	2 to	2 to	2 to
Anchor Type	None	Unit	Unit	Unit
Pattern Every Tie	to	to 4th	to 4th	to 3rd
Cross Tie Type	Timber	Timber	Timber	Timber
Width	to 9 in	8 in to	8 in to	to 9 in
Length	to 8'-6"	8'-6" to	8'-6" to	to 8'-6"
Spacing	20 in to 22 in	18 in to 22 in	19 in to 22 in	20 in to 23 in
Ballast Type	Limestone	Limestone	Limestone	Limestone
Gauge Rods		Yes		

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	BD#1(A)	BD#1(B)	BD#2(A)	BD#2(B)
Alignment	Tangent /	Tangent /	Tangent / Curved	Tangent /
Track Gauge	to 56"	56 1/4" to 56 5/8"	56 6/25" to	56 3/8" to
Rail Weight and Section	112 lb - RE	112 lb - RE	112 lb - RE	112 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	to 1946	to 1952	to	1960 to
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	to 13 in	to 13 in	to 13 in	to 13 in
Hole Pattern	to 8	to 8	to 8	to 8
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	2 to	2 to	to 4	2 to
Anchor Type	Unit	Unit	Unit	Unit
Pattern Every Tie	to 3rd	to 3rd	to 3rd	to Full
Cross Tie Type	Timber	Timber	Timber	Timber
Width	8 in to	8 in to	8 in to	8 in to
Length	8'-6" to	8'-6" to	8'-6" to	8'-6" to
Spacing	19 in to 22 in	17 in to 22 in	18 in to 24 in	18 in to 22 in
Ballast Type	Limestone	Limestone	Limestone	Limestone
Gauge Rods				

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	BD#2(C)	BD#3(A)	BD#3(B)	BD#4(A)
Alignment	Tangent /	Tangent / Curved	Tangent /	Tangent /
Track Gauge	56 1/4" to	to 56 5/8"	56 1/4" to	56 1/4" to
Rail Weight and Section	112 lb - RE	136 lb - RE	136 lb - RE	112 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	1952 to	to 2016	to 2016	1945 to 1948
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	to 13 in	to 14 in	to 14 in	to 14 in
Hole Pattern	to 8	to 8	to 8	to 8
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	2 to	2 to	2 to	2 to
Anchor Type	Channel	Unit	Unit	Unit
Pattern Every Tie	to Full	to 2nd	to 2nd	to 3rd
Cross Tie Type	Timber	Timber	Timber	Timber
Width	8 in to	to 9 in	to 9 in	8 in to
Length	8'-6" to	to 8'-6"	to 8'-6"	8'-6" to
Spacing	18 in to 21 in	18 in to 21 in	19 in to 22 in	18 in to 22 in
Ballast Type	Limestone	Trap Rock	Trap Rock	Limestone
Gauge Rods				

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	BD#4(B)	BD#5(A)	BD#5(B)	BD#5(C)
Alignment	Tangent /	/ Curved	Tangent /	Tangent /
Track Gauge	56 1/8" to	55 7/8" to 56 5/8"	56 1/8" to	to 56 3/4"
Rail Weight and Section	67 lb - Unknown	110 lb - OH	85 lb - Unknown	67 lb - Unknown
Type of Rail Construction	4*6-Jointed	4-Jointed	4-Jointed	4*6-Jointed
Year	1899 to 1904	to 1930	to 1903	to 1899
Joint Bar Assembly Type	Other	Toeless	Toed	Toed
Rail Weight and Section	N/A	112 lb - RE	110 lb - RE	N/A
Type of Rail Construction	N/A	6-Jointed	4-Jointed	N/A
Year	N/A	to 1945	to 1930	N/A
Joint Bar Assembly Type	N/A	Toeless	Toeless	N/A
Tie Plate Type / Shoulder	Cut / Single	Cut / Double	Cut / Double	Cut / Single
Length	to 9 in	11 in to 11 in	to 10 in	to 9 in
Hole Pattern	to 4	4 to 8	to 4	to 3
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	2 to	2 to 3	2 to	2 to
Anchor Type	None	Unit	Unit	None
Pattern Every Tie	to	4th to Full	to 4th	to
Cross Tie Type	Timber	Timber	Timber	Timber
Width	to 9 in	8 in to	to 9 in	8 in to
Length	to 8'-6"	8'-6" to	to 8'-6"	8'-6" to
Spacing	22 in to 26 in	18 in to 22 in	14 in to 22 in	22 in to 28 in
Ballast Type	Limestone	Limestone	Limestone	Limestone
Gauge Rods				

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	**BD#5(D)**
Alignment	Tangent /
Track Gauge	to 56 5/8"
Rail Weight and Section	136 lb - RE
Type of Rail Construction	6-Jointed
Year	to 2010
Joint Bar Assembly Type	Toeless
Rail Weight and Section	N/A
Type of Rail Construction	N/A
Year	N/A
Joint Bar Assembly Type	N/A
Tie Plate Type / Shoulder	Cut / Double
Length	to 14 in
Hole Pattern	to 8
Spike Type	Cut
No. Spikes	to 3
Anchor Type	Unit
Pattern Every Tie	to Full
Cross Tie Type	Timber
Width	to 9 in
Length	to 8'-6"
Spacing	19 in to 21 in
Ballast Type	Limestone
Gauge Rods	

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	C18(A)	C18L(A)	C18L(B)
Alignment	Tangent / Curved	Tangent / Curved	/ Curved
Track Gauge	56 1/4" to 57 1/8"	56 1/8" to 56 1/2"	to 57 1/8"
Rail Weight and Section	90 lb - RA-A	112 lb - RE	112 lb - RE
Type of Rail Construction	4-Jointed	6-Jointed	6-Jointed
Year	1907 to 1950	to 1935	to 1945
Joint Bar Assembly Type	Other	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A
Year	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Single	Cut / Double	Cut / Double
Length	9 in to 10 in	to 13 in	to 13 in
Hole Pattern	4 to 8	to 8	to 8
Spike Type	Cut	Cut	Cut
No. Spikes	2 to 3	2 to	to 4
Anchor Type	Unit	Unit	Unit
Pattern Every Tie	None to Full	to Full	to Full
Cross Tie Type	Timber	Timber	Timber
Width	8 in to 9 in	8 in to	8 in to
Length	8'-6" to 8'-6"	8'-6" to	8'-6" to
Spacing	17 in to 26 in	18 in to 21 in	18 in to 20 in
Ballast Type	Limestone	Limestone	Limestone
Gauge Rods	Yes		Yes

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	C19(A)	C19(B)	C19L(A)
Alignment	/ Curved	Tangent / Curved	Tangent / Curved
Track Gauge	56 1/2" to 57"	56 1/8" to 56 1/2"	55 7/8" to 57 3/8"
Rail Weight and Section	112 lb - RE	112 lb - RE	112 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed
Year	1952 to	1935 to 1960	1958 to 1960
Joint Bar Assembly Type	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	140 lb - RE
Type of Rail Construction	N/A	N/A	CWR
Year	N/A	N/A	to 1968
Joint Bar Assembly Type	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double
Length	to 13 in	13 in to 14 in	13 in to 14 in
Hole Pattern	to 8	8 to 8	8 to 8
Spike Type	Cut	Cut	Cut
No. Spikes	to 4	2 to 4	2 to 4
Anchor Type	Unit	Unit	Unit
Pattern Every Tie	to Full	3rd to Full	None to Full
Cross Tie Type	Timber	Timber	Timber
Width	8 in to 9 in	8 in to	8 in to 9 in
Length	8'-6" to 8'-6"	8'-6" to	8'-6" to 8'-6"
Spacing	18 in to 21 in	18 in to 21 in	18 in to 21 in
Ballast Type	Limestone	Limestone	Limestone
Gauge Rods	Yes		

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	NH#1(A)	NH#1(B)
Alignment	Tangent /	Tangent /
Track Gauge	to 56 1/2"	56 1/4" to
Rail Weight and Section	115 lb - RE	115 lb - RE
Type of Rail Construction	4-Jointed	4*6-Jointed
Year	to 1960	to 2000
Joint Bar Assembly Type	Toeless	Toeless
Rail Weight and Section	N/A	N/A
Type of Rail Construction	N/A	N/A
Year	N/A	N/A
Joint Bar Assembly Type	N/A	N/A
Tie Plate Type / Shoulder	Cut / Single	Cut / Double
Length	to 10 in	to 11 in
Hole Pattern	to 4	to 4
Spike Type	Cut	Cut
No. Spikes	2 to	2 to
Anchor Type	Unit	None
Pattern Every Tie	to 4th	to
Cross Tie Type	Timber	Timber
Width	to 9 in	8 in to
Length	to 8'-6"	8'-6" to
Spacing	22 in to 24 in	20 in to 25 in
Ballast Type	Limestone	Limestone
Gauge Rods		

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	NL(A)	NL(B)	NL(C)	NL(D)
Alignment	/ Curved	Tangent / Curved	Tangent /	/ Curved
Track Gauge	56 1/4" to 56 3/8"	56" to 56 7/8"	to 56 3/4"	to 56 1/2"
Rail Weight and Section	140 lb - RE	140 lb - RE	140 lb - RE	140 lb - RE
Type of Rail Construction	CWR	CWR	CWR	CWR
Year	1964 to 1968	1964 to 1968	to 1979	to 1964
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	to 14 in	to 14 in	to 14 in	to 15 in
Hole Pattern	to 8	to 8	to 8	to 8
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	2 to 4	to 4	2 to	to 4
Anchor Type	Unit	Unit	Unit	Unit
Pattern Every Tie	to Full	2nd to Full	to Full	to Full
Cross Tie Type	Timber	Timber	Timber	Timber
Width	to 9 in	to 9 in	to 9 in	to 9 in
Length	to 8'-6"	to 8'-6"	to 8'-6"	to 8'-6"
Spacing	18 in to 22 in	19 in to 23 in	18 in to 20 in	19 in to 23 in
Ballast Type	Limestone	Limestone	Limestone	Limestone
Gauge Rods				

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	NL(E)	NL(F)
Alignment	Tangent /	/ Curved
Track Gauge	56 1/4" to	to 56 7/8"
Rail Weight and Section	112 lb - RE	112 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed
Year	to 1960	to 1952
Joint Bar Assembly Type	Toeless	Toeless
Rail Weight and Section	N/A	N/A
Type of Rail Construction	N/A	N/A
Year	N/A	N/A
Joint Bar Assembly Type	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double
Length	to 13 in	to 13 in
Hole Pattern	to 8	to 8
Spike Type	Cut	Cut
No. Spikes	to 2	to 4
Anchor Type	Unit	Unit
Pattern Every Tie	to 3rd	to 2nd
Cross Tie Type	Timber	Timber
Width	8 in to	8 in to
Length	8'-6" to	8'-6" to
Spacing	18 in to 21 in	19 in to 20 in
Ballast Type	Limestone	Limestone
Gauge Rods		

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	PH#01(A)	PH#01(B)	PH#02(A)
Alignment	/ Curved	Tangent / Curved	Tangent / Curved
Track Gauge	to 56 1/4"	to 56 3/8"	to 56 3/8"
Rail Weight and Section	112 lb - RE	112 lb - RE	112 lb - RE
Type of Rail Construction	4-Jointed	4-Jointed	4-Jointed
Year	to 1947	to 1947	to 1942
Joint Bar Assembly Type	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A
Year	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double
Length	to 11 in	to 11 in	to 11 in
Hole Pattern	to 6	to 6	to 6
Spike Type	Cut	Cut	Cut
No. Spikes	to 3	to 2	to 2
Anchor Type	Unit	Unit	Unit
Pattern Every Tie	to Full	to 4th	to 4th
Cross Tie Type	Timber	Timber	Timber
Width	to 9 in	to 9 in	to 9 in
Length	to 8'-6"	to 8'-6"	to 8'-6"
Spacing	20 in to 24 in	20 in to 22 in	19 in to 22 in
Ballast Type	Limestone	Limestone	Limestone
Gauge Rods			

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	PP#1(A)	PP#1(B)
Alignment	/ Curved	Tangent /
Track Gauge	to 56 1/2"	56 1/8" to
Rail Weight and Section	115 lb - RE	105 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed
Year	to 1995	to 1927
Joint Bar Assembly Type	Toeless	Toeless
Rail Weight and Section	N/A	N/A
Type of Rail Construction	N/A	N/A
Year	N/A	N/A
Joint Bar Assembly Type	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double
Length	to 13 in	to 13 in
Hole Pattern	to 8	to 8
Spike Type	Cut	Cut
No. Spikes	to 5	2 to
Anchor Type	Unit	Unit
Pattern Every Tie	to Full	to 3rd
Cross Tie Type	Timber	Timber
Width	to 9 in	8 in to
Length	to 8'-6"	8'-6" to
Spacing	19 in to 22 in	19 in to 21 in
Ballast Type	Limestone	Limestone
Gauge Rods	Yes	Yes

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	SL#1(A)	SL#1(B)	SL#1(C)	SL#1(D)
Alignment	Tangent / Curved	Tangent / Curved	Tangent / Curved	Tangent / Curved
Track Gauge	56 3/8" to 57"	56 1/4" to 56 7/8"	to 56 3/4"	56 3/8" to 57"
Rail Weight and Section	136 lb - RE	136 lb - RE	136 lb - RE	136 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	to 2010	2010 to 2011	to 2010	2010 to 2011
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	to 14 in	to 14 in	to 14 in	14 in to 15 in
Hole Pattern	to 8	to 8	to 8	8 to 8
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	3 to 4	3 to 4	2 to	2 to 4
Anchor Type	Unit	Unit	Unit	Unit
Pattern Every Tie	3rd to Full	3rd to Full	3rd to Full	to Full
Cross Tie Type	Timber	Timber	Timber	Timber
Width	to 9 in	to 9 in	to 9 in	to 9 in
Length	to 8'-6"	to 8'-6"	to 8'-6"	to 8'-6"
Spacing	18 in to 21 in	18 in to 21 in	16 in to 21 in	18 in to 21 in
Ballast Type	Local	Local	Local	Local
Gauge Rods				

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	SL#1(E)	SL#2(A)	SL#2(B)	SL#2(C)
Alignment	Tangent /	Tangent / Curved	Tangent / Curved	Tangent /
Track Gauge	56 1/4" to	56 3/8" to 56 3/4"	56 1/2" to 56 7/8"	to 56 3/4"
Rail Weight and Section	136 lb - RE	136 lb - RE	136 lb - RE	136 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	2010 to	2015 to 2016	2015 to 2016	to 2015
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	to 14 in	to 14 in	to 14 in	to 14 in
Hole Pattern	to 8	to 8	to 8	to 8
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	2 to	2 to 4	3 to 3	to 3
Anchor Type	Unit	Unit	Unit	Unit
Pattern Every Tie	to Full	3rd to Full	3rd to Full	3rd to Full
Cross Tie Type	Timber	Timber	Timber	Timber
Width	to 9 in	to 9 in	8 in to 9 in	8 in to 9 in
Length	to 8'-6"	to 8'-6"	8'-6" to 8'-6"	8'-6" to 8'-6"
Spacing	20 in to 21 in	19 in to 20 in	17 in to 23 in	18 in to 24 in
Ballast Type	Local	Trap Rock	Trap Rock	Trap Rock
Gauge Rods				

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AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	SL#3(A)	SL#3(B)	SL#3(C)
Alignment	Tangent / Curved	Tangent / Curved	Tangent /
Track Gauge	56 1/4" to 57"	56 3/8" to 57"	to 56 3/4"
Rail Weight and Section	136 lb - RE	136 lb - RE	136 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed
Year	2010 to 2016	to 2015	to 2015
Joint Bar Assembly Type	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A
Year	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double
Length	to 14 in	to 14 in	to 14 in
Hole Pattern	to 8	to 8	to 8
Spike Type	Cut	Cut	Cut
No. Spikes	2 to 4	3 to 4	to 3
Anchor Type	Unit	Unit	Unit
Pattern Every Tie	3rd to Full	3rd to Full	to 3rd
Cross Tie Type	Timber	Timber	Timber
Width	8 in to 9 in	8 in to 9 in	to 9 in
Length	8'-6" to 8'-6"	8'-6" to 8'-6"	to 8'-6"
Spacing	18 in to 21 in	18 in to 20 in	18 in to 21 in
Ballast Type	Trap Rock	Trap Rock	Trap Rock
Gauge Rods			

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	WH#1(A)	WH#1(B)	WH#1(C)	WH#2(A)
Alignment	/ Curved	Tangent /	Tangent /	Tangent /
Track Gauge	to 57"	to 56 1/2"	56 3/8" to	56 1/2" to
Rail Weight and Section	136 lb - RE	136 lb - RE	136 lb - RE	133 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed	6-Jointed
Year	to 2012	to 2014	to 2014	to 2014
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	to 14 in	to 14 in	to 14 in	to 14 in
Hole Pattern	to 8	to 8	to 8	to 8
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	to 4	2 to	2 to	2 to
Anchor Type	Unit	Unit	Unit	Unit
Pattern Every Tie	to Full	to Full	2nd to	to Full
Cross Tie Type	Timber	Timber	Timber	Timber
Width	to 9 in	to 9 in	to 9 in	to 9 in
Length	to 8'-6"	to 8'-6"	to 8'-6"	to 8'-6"
Spacing	18 in to 20 in	19 in to 24 in	19 in to 23 in	19 in to 24 in
Ballast Type	Trap Rock	Trap Rock	Trap Rock	Trap Rock
Gauge Rods				

12/30/2021

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	WH#3(A)	WH#4(A)	WH#4(B)
Alignment	Tangent /	/ Curved	Tangent / Curved
Track Gauge	56 1/4" to	to 56 5/8"	56 3/8" to 56 1/2"
Rail Weight and Section	136 lb - RE	136 lb - RE	119 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed	6-Jointed
Year	to 2014	to 2014	1979 to 1981
Joint Bar Assembly Type	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	119 lb - RE	N/A
Type of Rail Construction	N/A	6-Jointed	N/A
Year	N/A	to 1981	N/A
Joint Bar Assembly Type	N/A		N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double
Length	to 14 in	to 14 in	to 14 in
Hole Pattern	to 8	to 8	to 8
Spike Type	Cut	Cut	Cut
No. Spikes	2 to	to 4	2 to 4
Anchor Type	Unit	Unit	Unit
Pattern Every Tie	2nd to	to Full	3rd to Full
Cross Tie Type	Timber	Timber	Timber
Width	to 9 in	to 9 in	8 in to 9 in
Length	to 8'-6"	to 8'-6"	8'-6" to 8'-6"
Spacing	19 in to 21 in	17 in to 21 in	17 in to 21 in
Ballast Type	Trap Rock	Trap Rock	Trap Rock
Gauge Rods			

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

Track Designation	A1(A)	GPW(A)	GPE(A)	ML(A)
Alignment	Tangent / Curved	/ Curved	/ Curved	/ Curved
Track Gauge	56 1/2" to 56 1/2"	to 56 1/8"	to 56 1/4"	to 57 3/8"
Rail Weight and Section	115 lb - RE	140 lb - RE	140 lb - RE	112 lb - RE
Type of Rail Construction	6-Jointed	CWR	CWR	6-Jointed
Year	1954 to 1959	to 1961	to 1968	to 1946
Joint Bar Assembly Type	Toeless	Toeless	Toeless	Toeless
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Cut / Double	Cut / Double	Cut / Double	Cut / Double
Length	11 in to 13 in	to 14 in	to 14 in	to 14 in
Hole Pattern	4 to 6	to 8	to 8	to 8
Spike Type	Cut	Cut	Cut	Cut
No. Spikes	2 to 3	to 4	to 4	to 4
Anchor Type	None	Unit	Unit	Unit
Pattern Every Tie	to	to Full	to Full	to Full
Cross Tie Type	Timber	Timber	Timber	Timber
Width	8 in to	to 9 in	to 9 in	8 in to
Length	8'-6" to	to 8'-6"	to 8'-6"	8'-6" to
Spacing	16 in to 25 in	19 in to 22 in	19 in to 20 in	16 in to 21 in
Ballast Type	Limestone	Limestone	Limestone	Limestone
Gauge Rods	Yes			

12/30/2021

AMERICA'S CENTRAL PORT INVENTORY OF TRACK

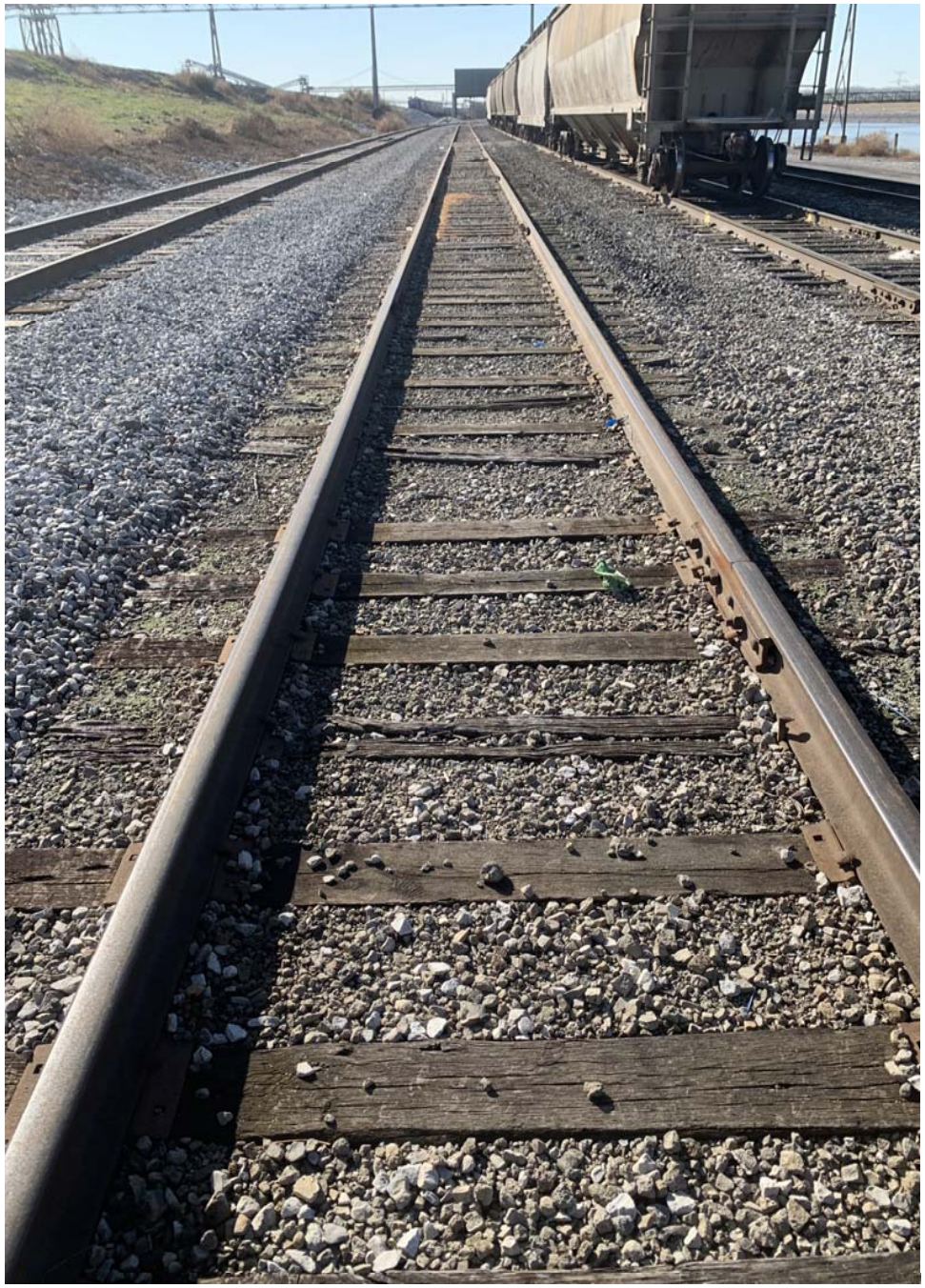
Track Designation	**XVR#4(A)**
Alignment	/ Curved
Track Gauge	to 56 3/4"
Rail Weight and Section	115 lb - RE
Type of Rail Construction	6*8-Jointed
Year	to 1956
Joint Bar Assembly Type	Toeless
Rail Weight and Section	N/A
Type of Rail Construction	N/A
Year	N/A
Joint Bar Assembly Type	N/A
Tie Plate Type / Shoulder	Cut / Single
Length	to 10 in
Hole Pattern	to 4
Spike Type	Cut
No. Spikes	to 2
Anchor Type	Unit
Pattern Every Tie	to Full
Cross Tie Type	Timber
Width	8 in to
Length	8'-6" to
Spacing	18 in to 20 in
Ballast Type	Limestone
Gauge Rods	Yes

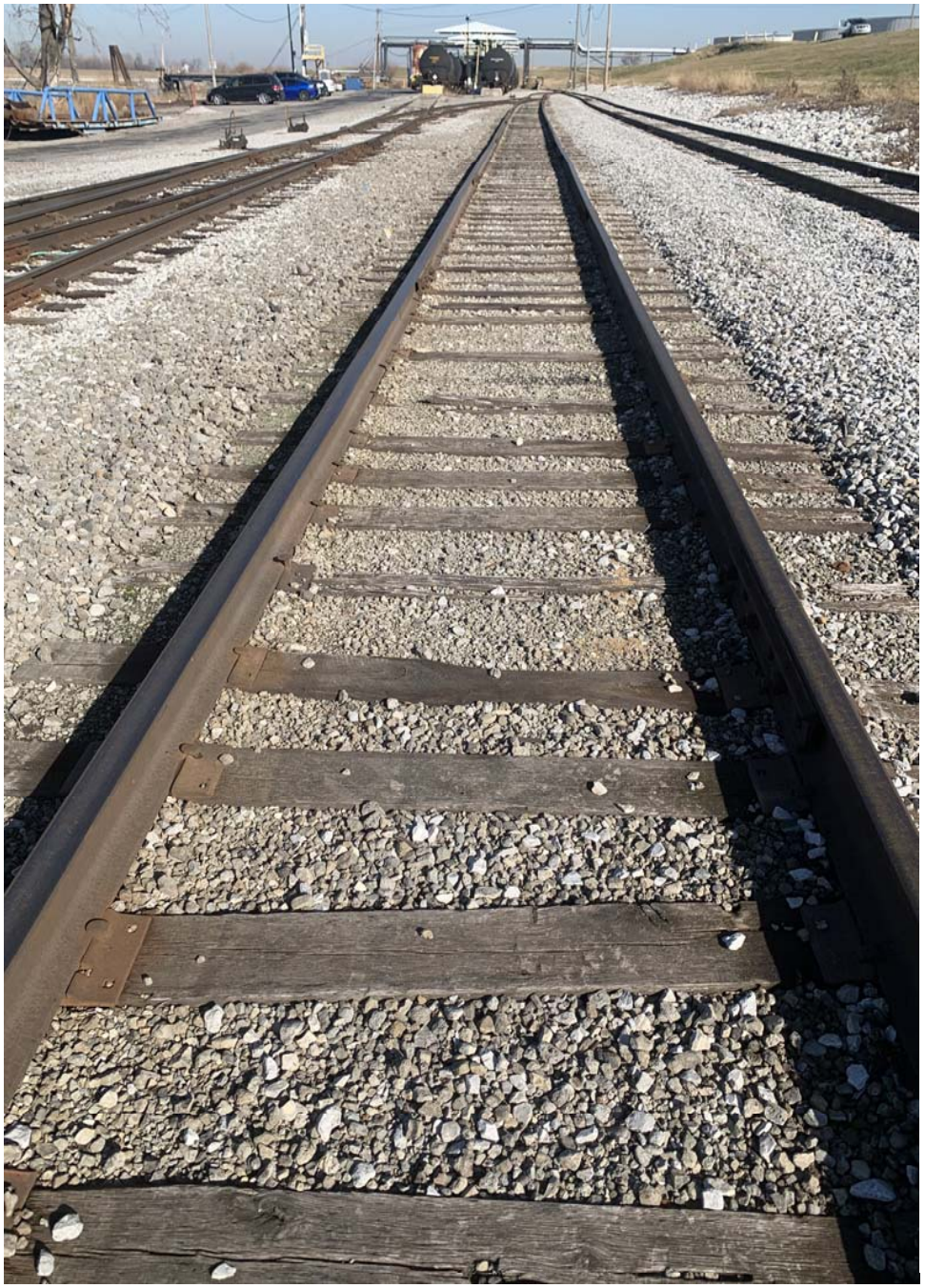
AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Appendix F

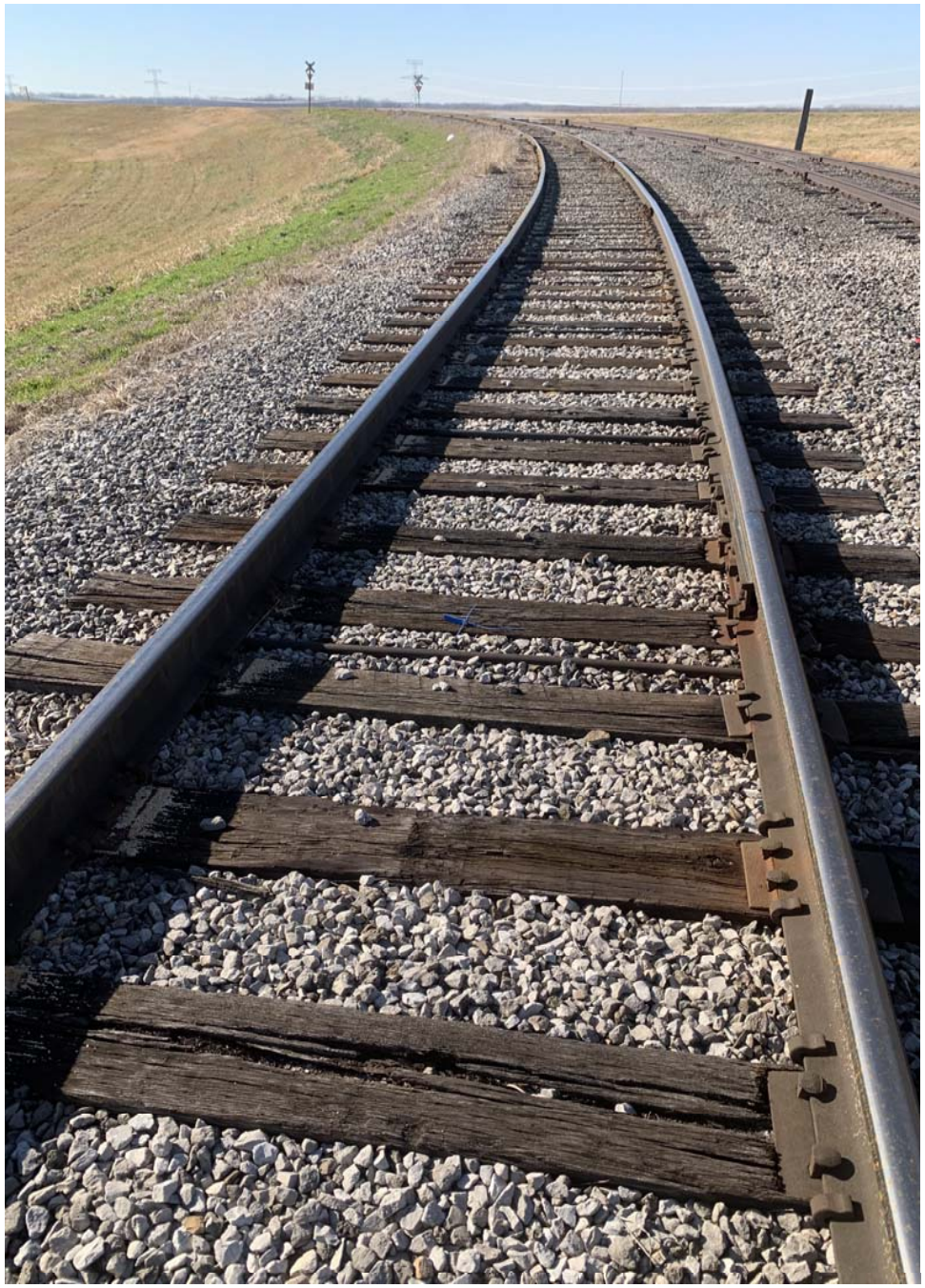
America's Central Port Photos of Track Section

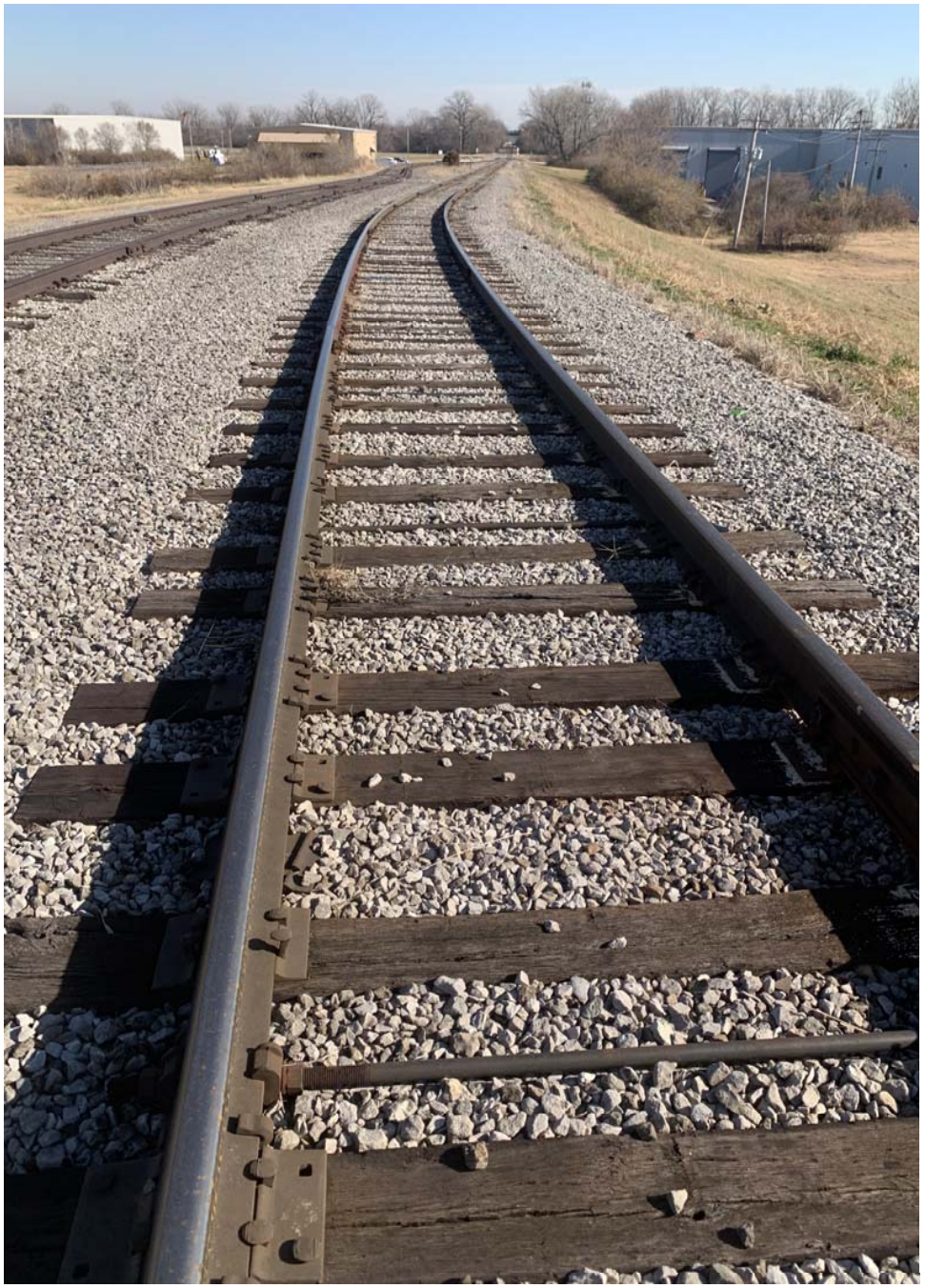
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. A1(A)



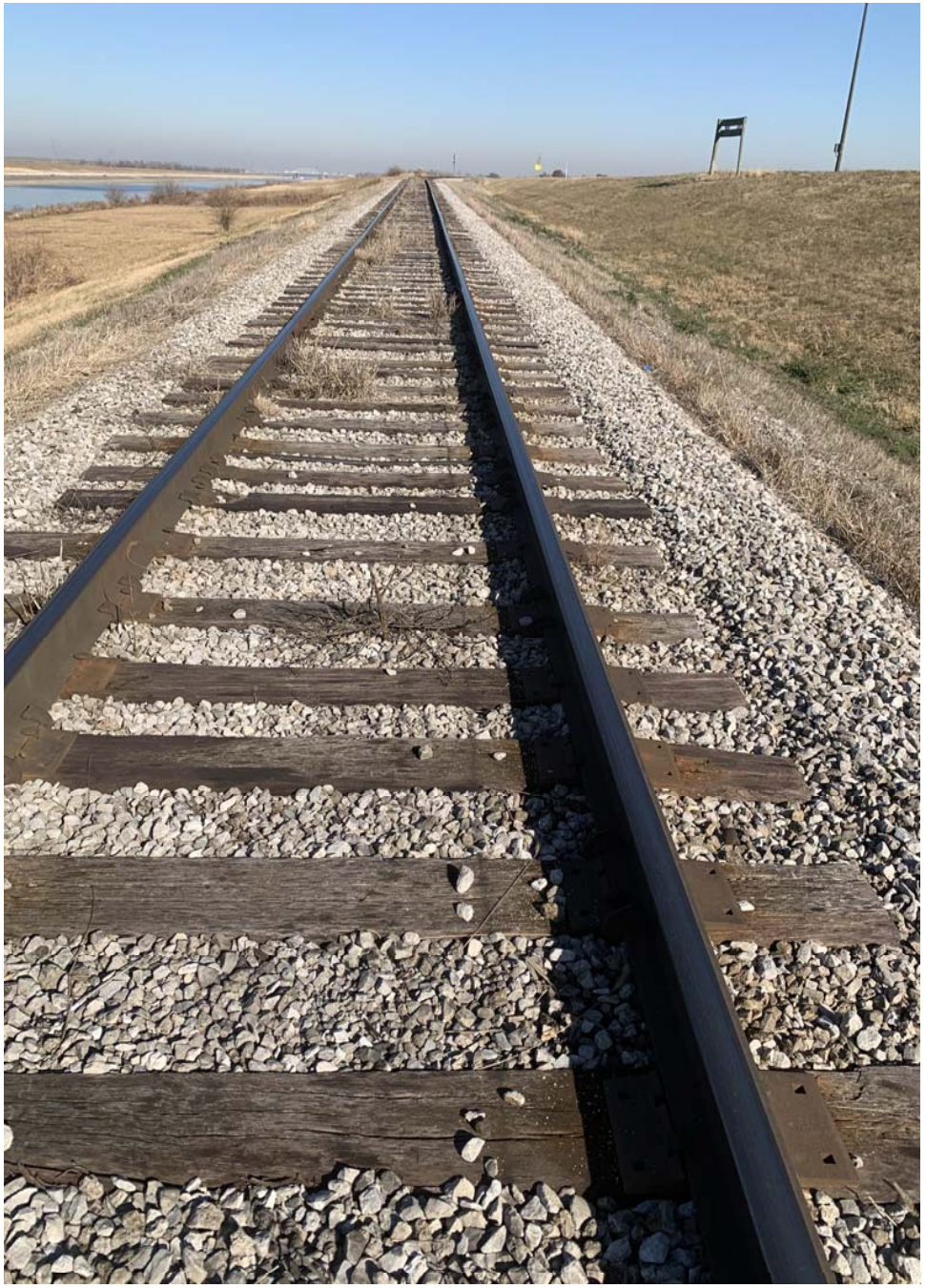


AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. AL(A)

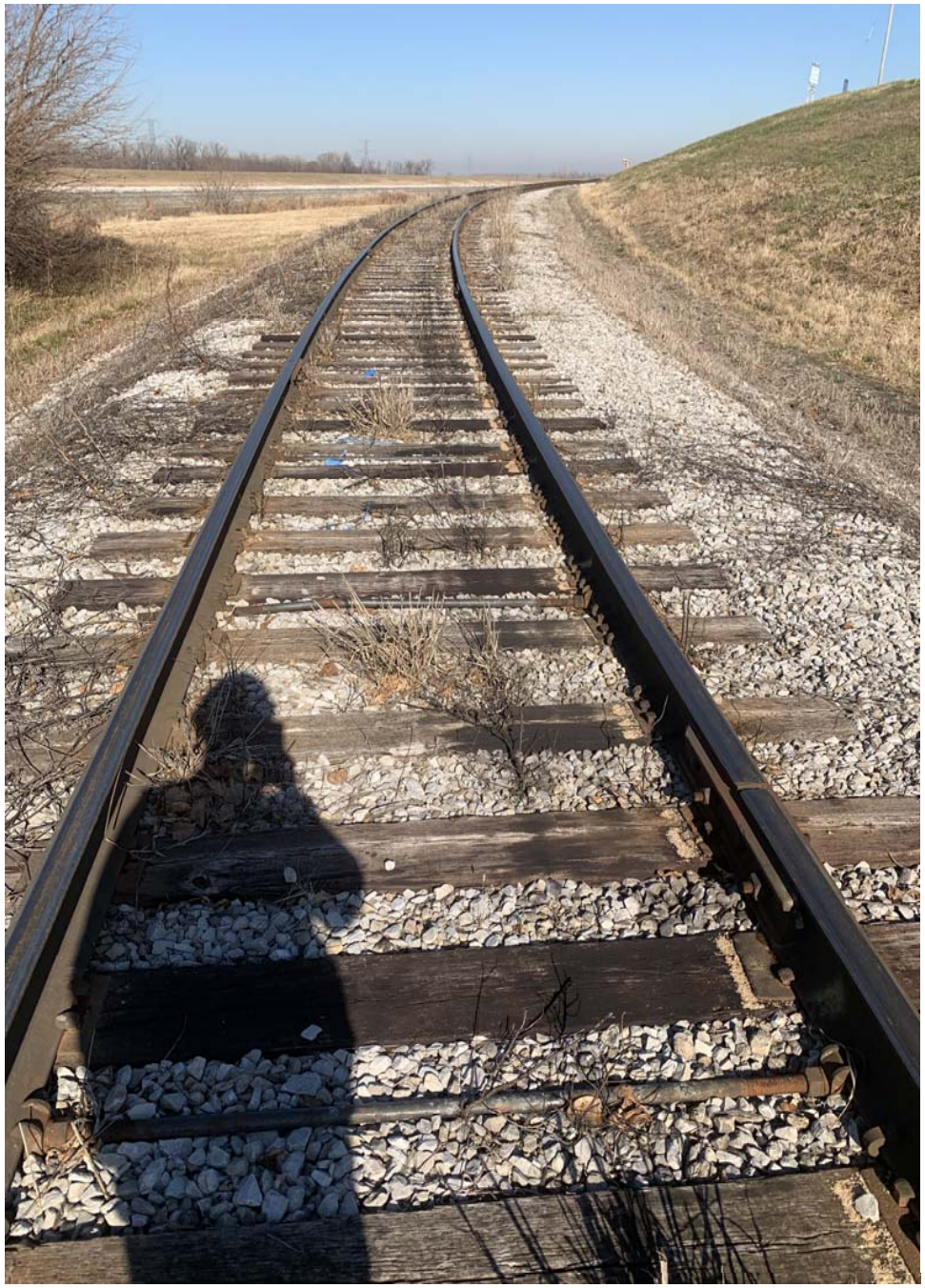


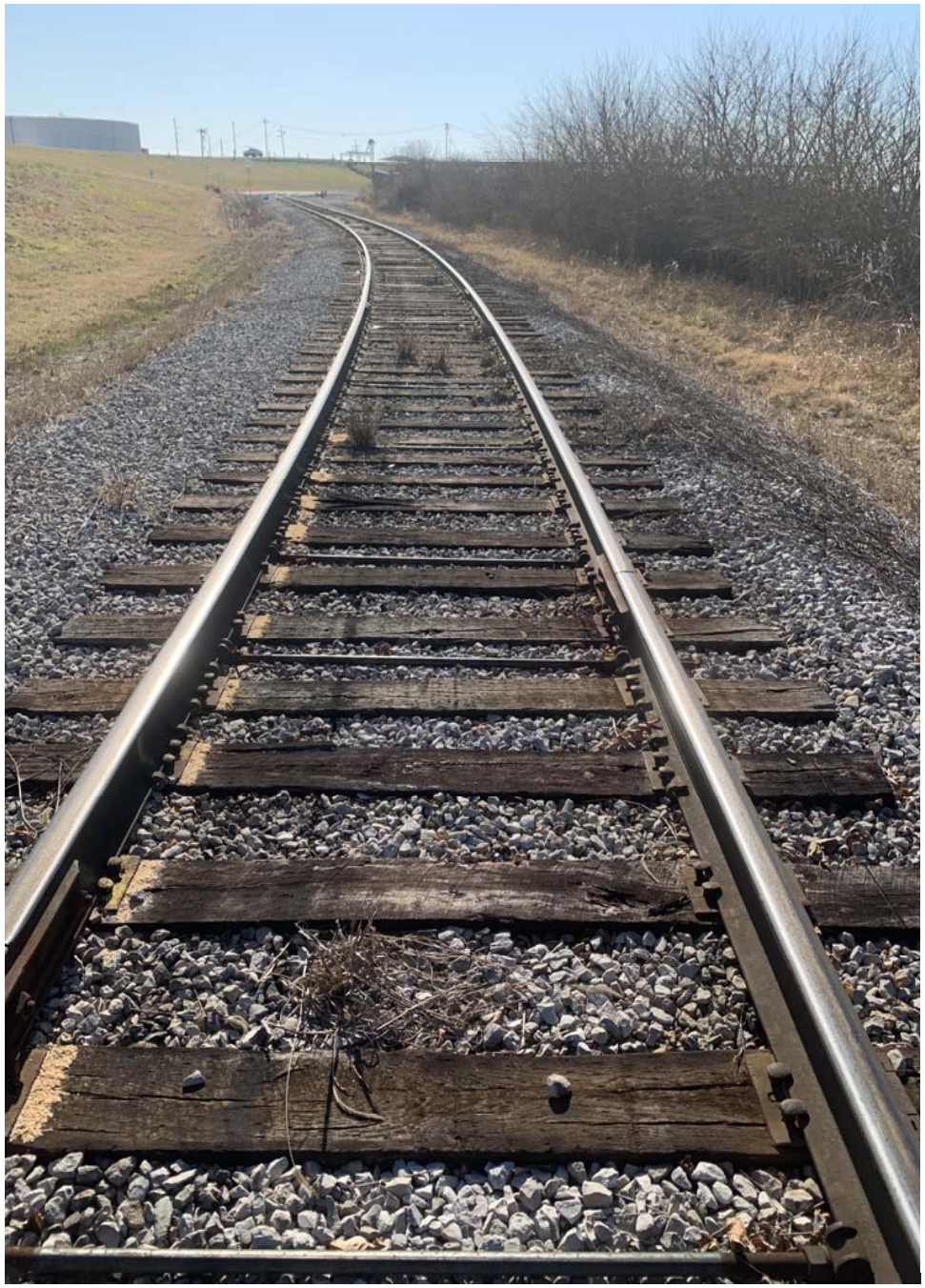


AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. AL(B)



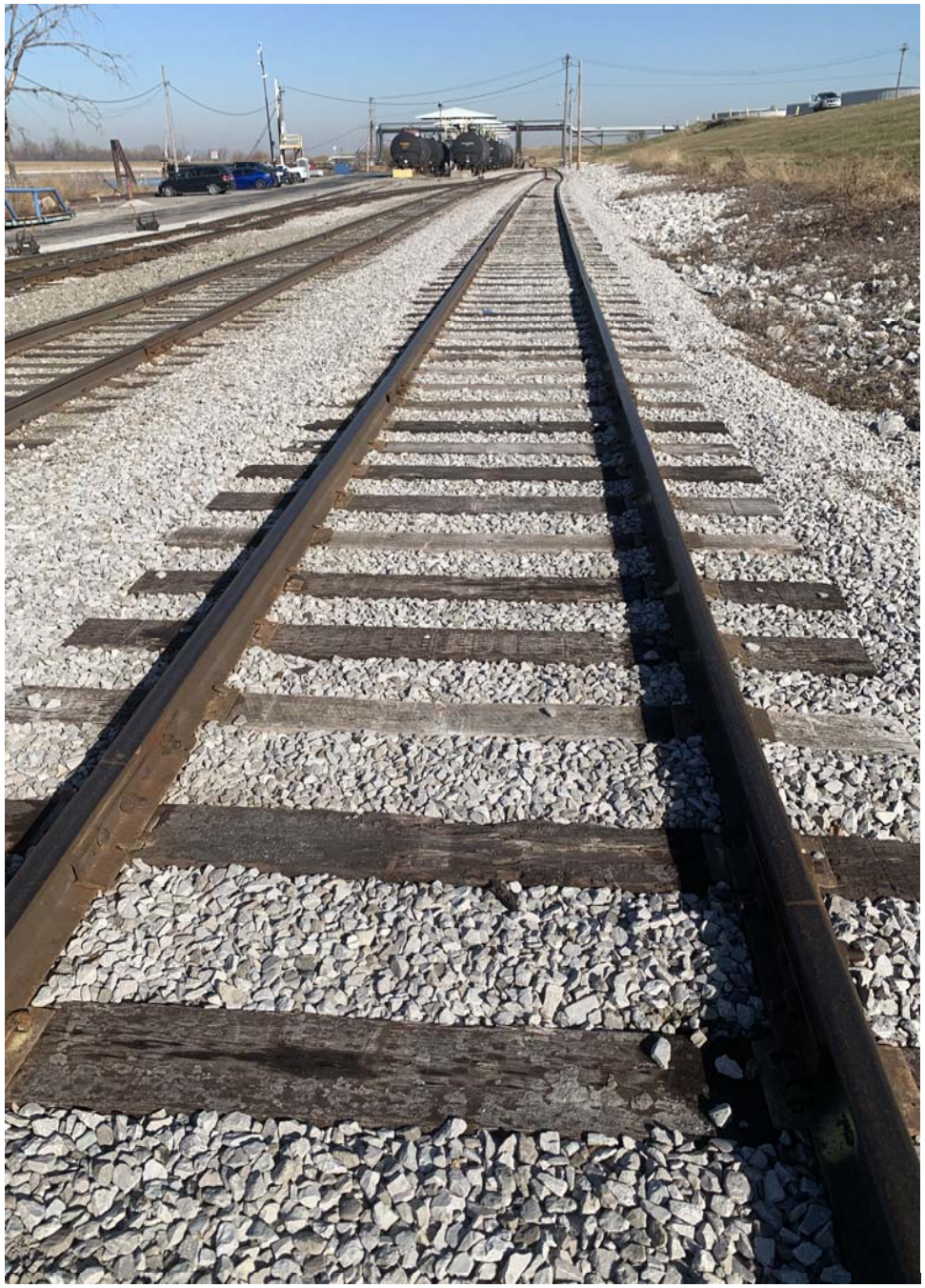
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. AL(C)

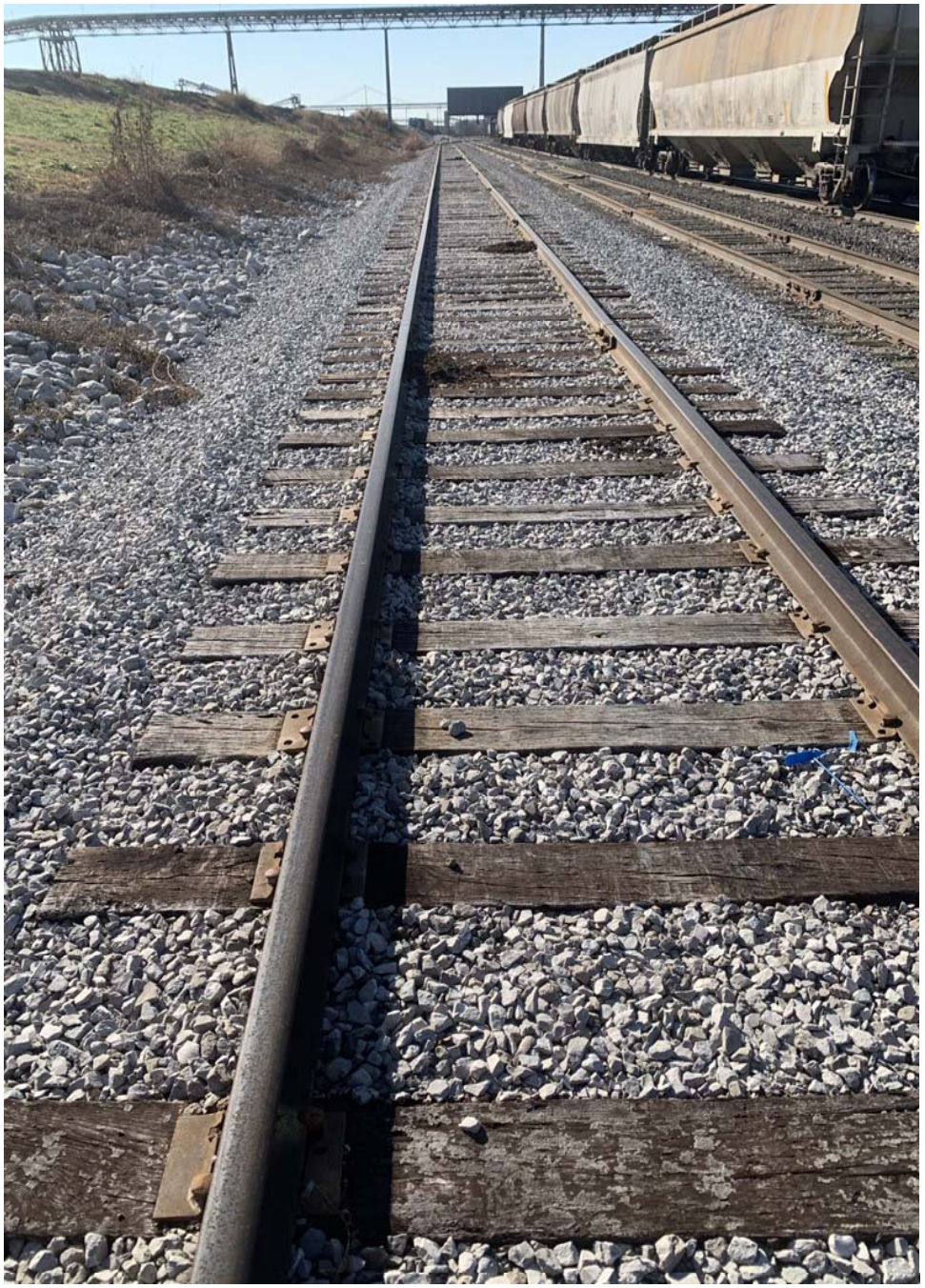




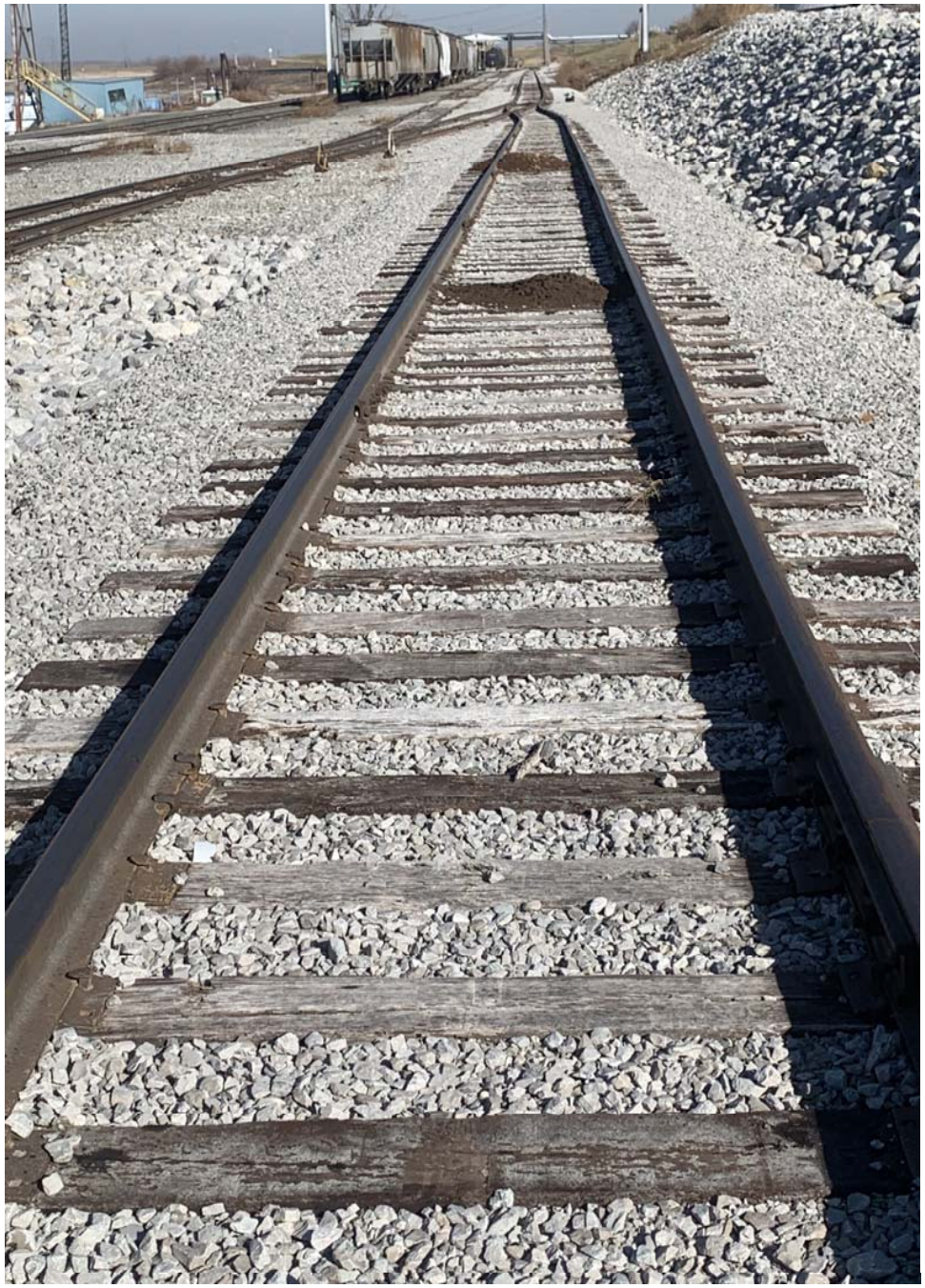
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. AL(D)

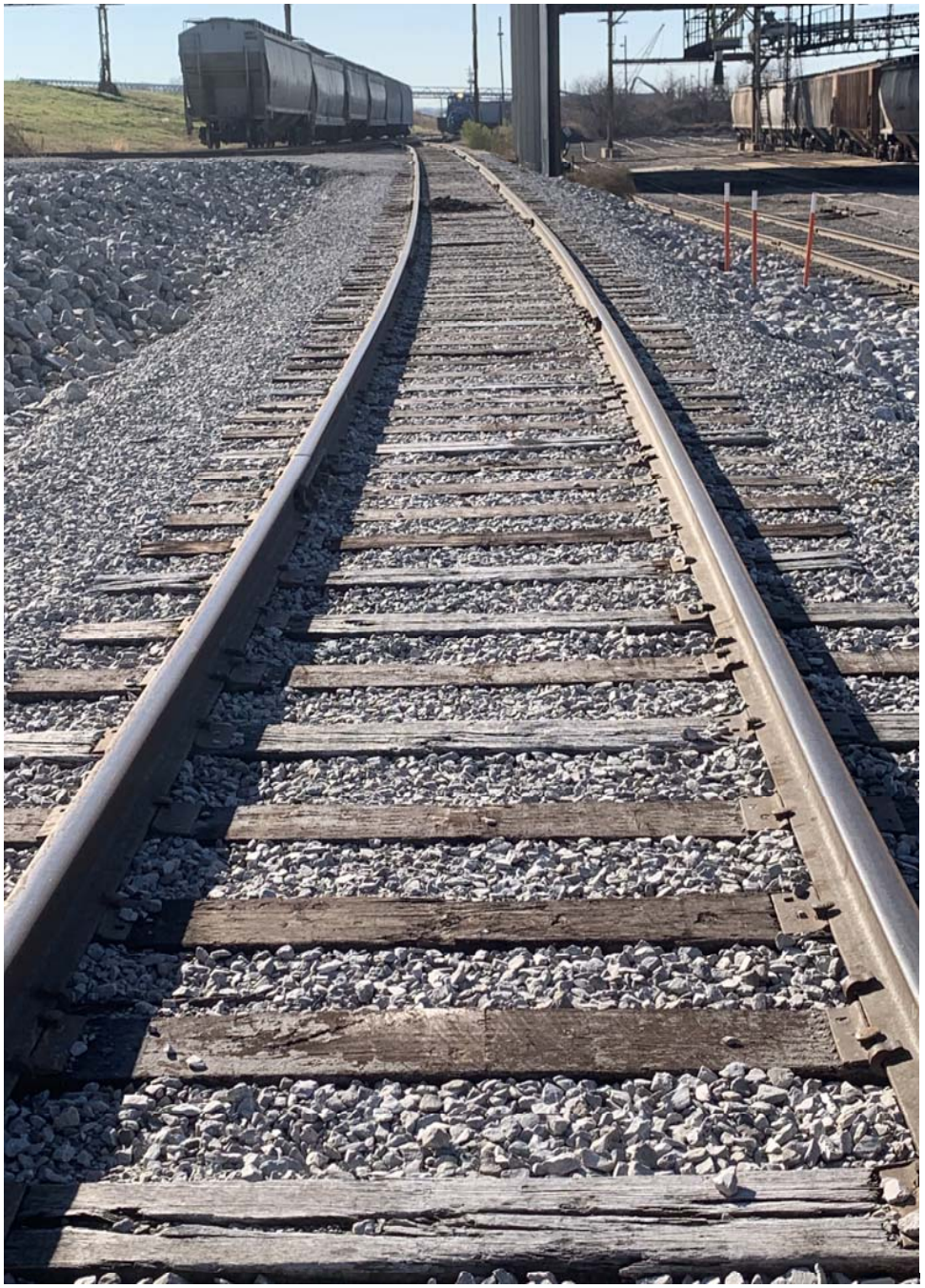
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. AL(E)





AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. AL(F)





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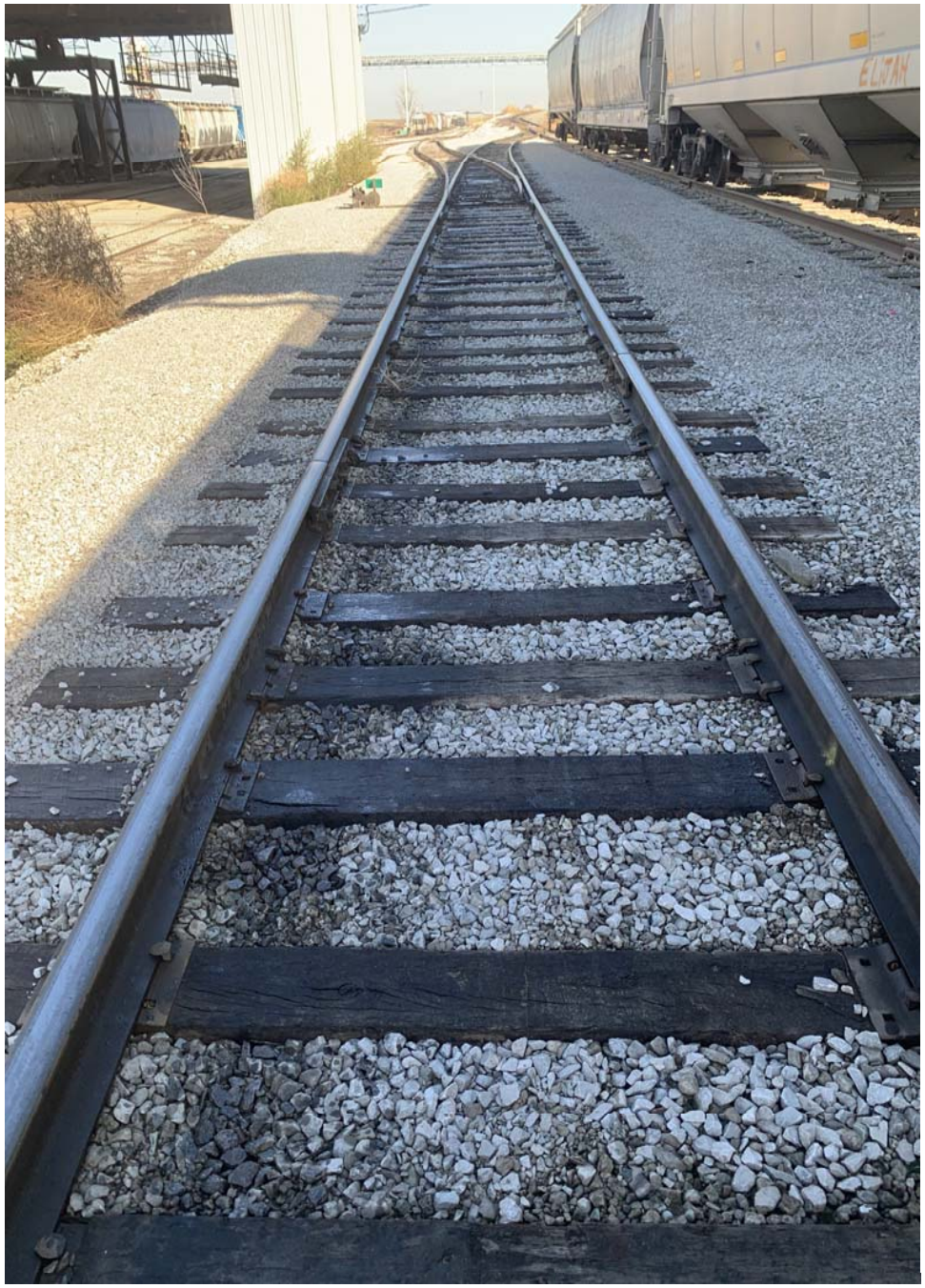

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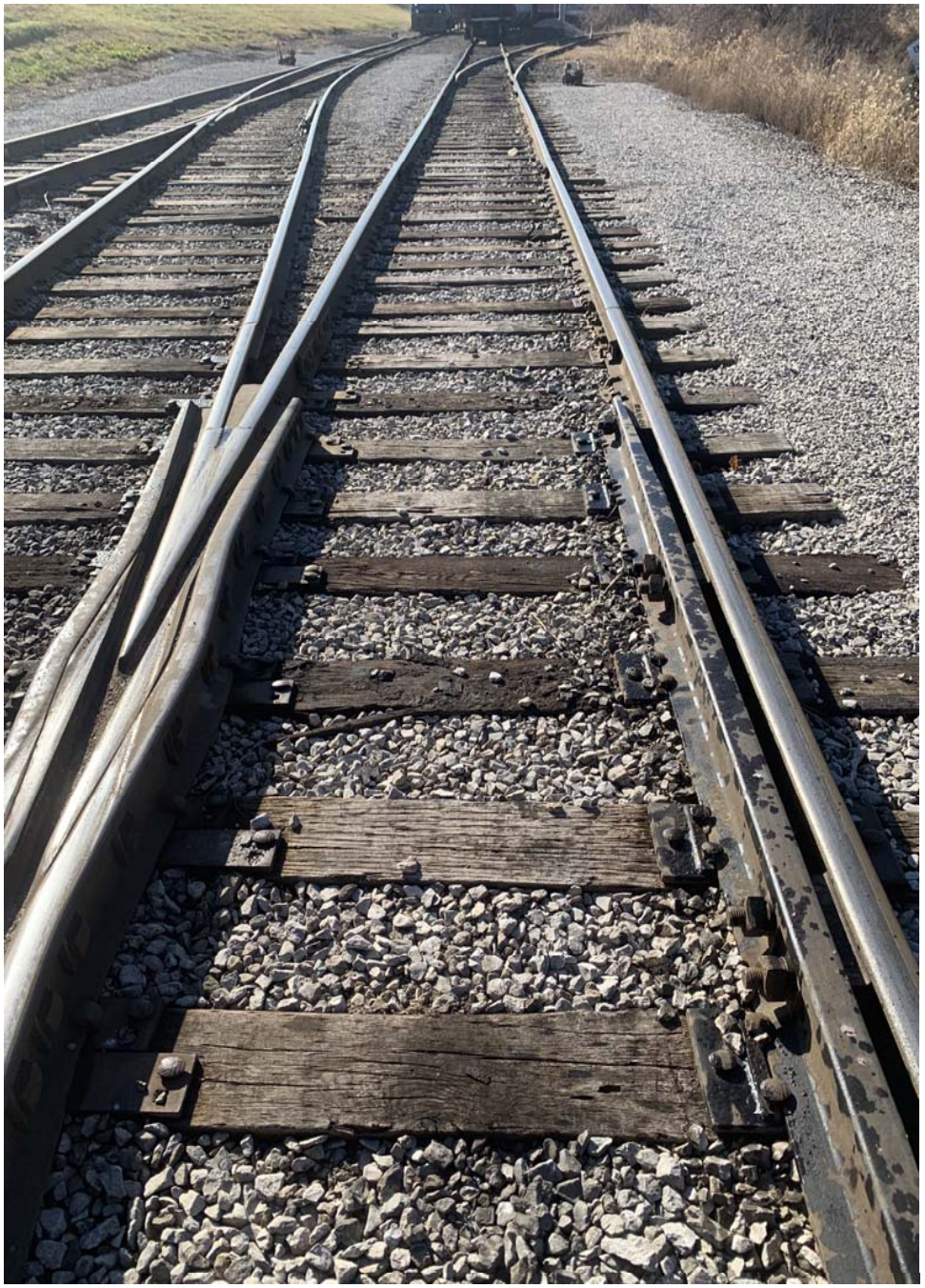
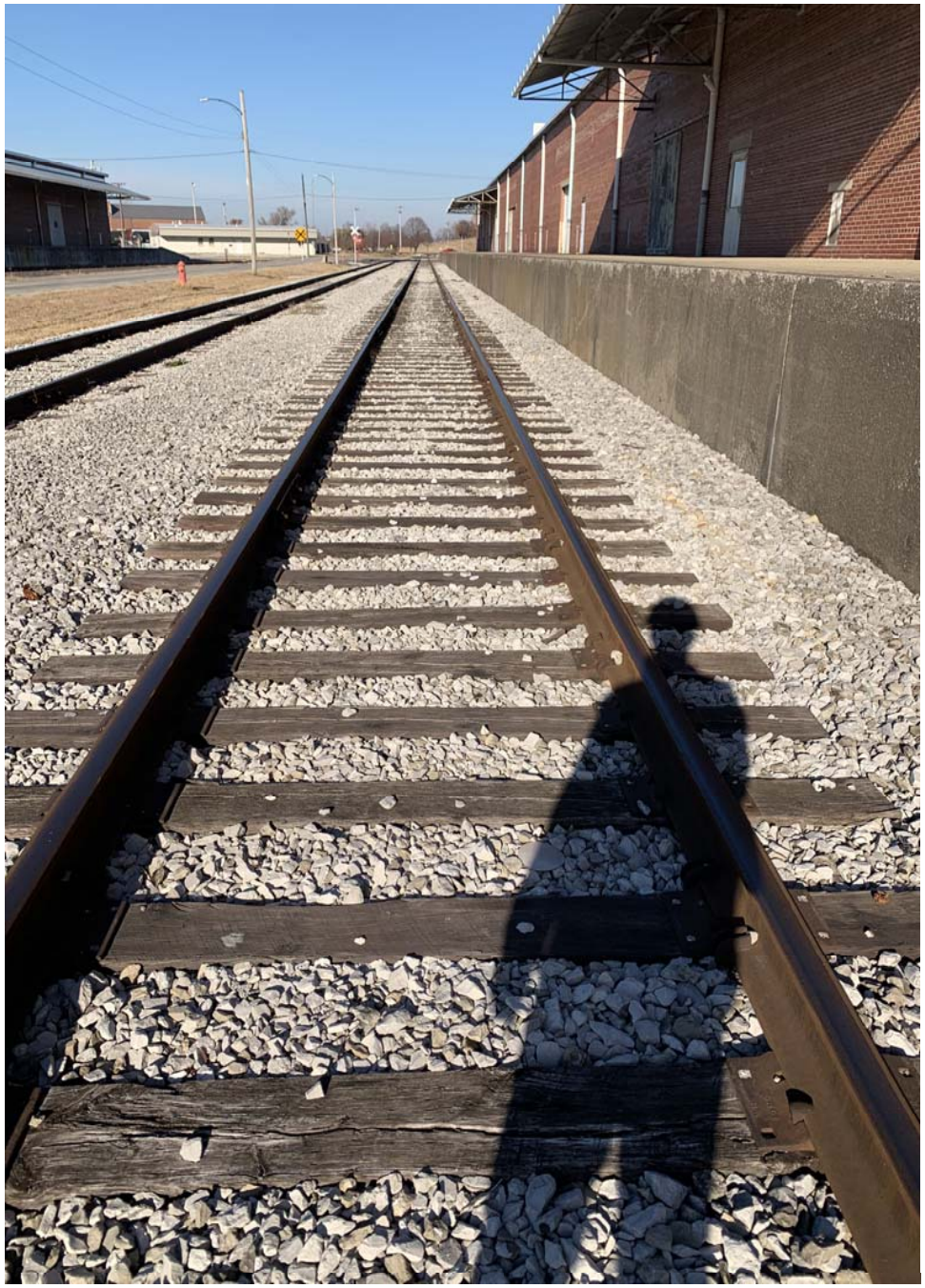
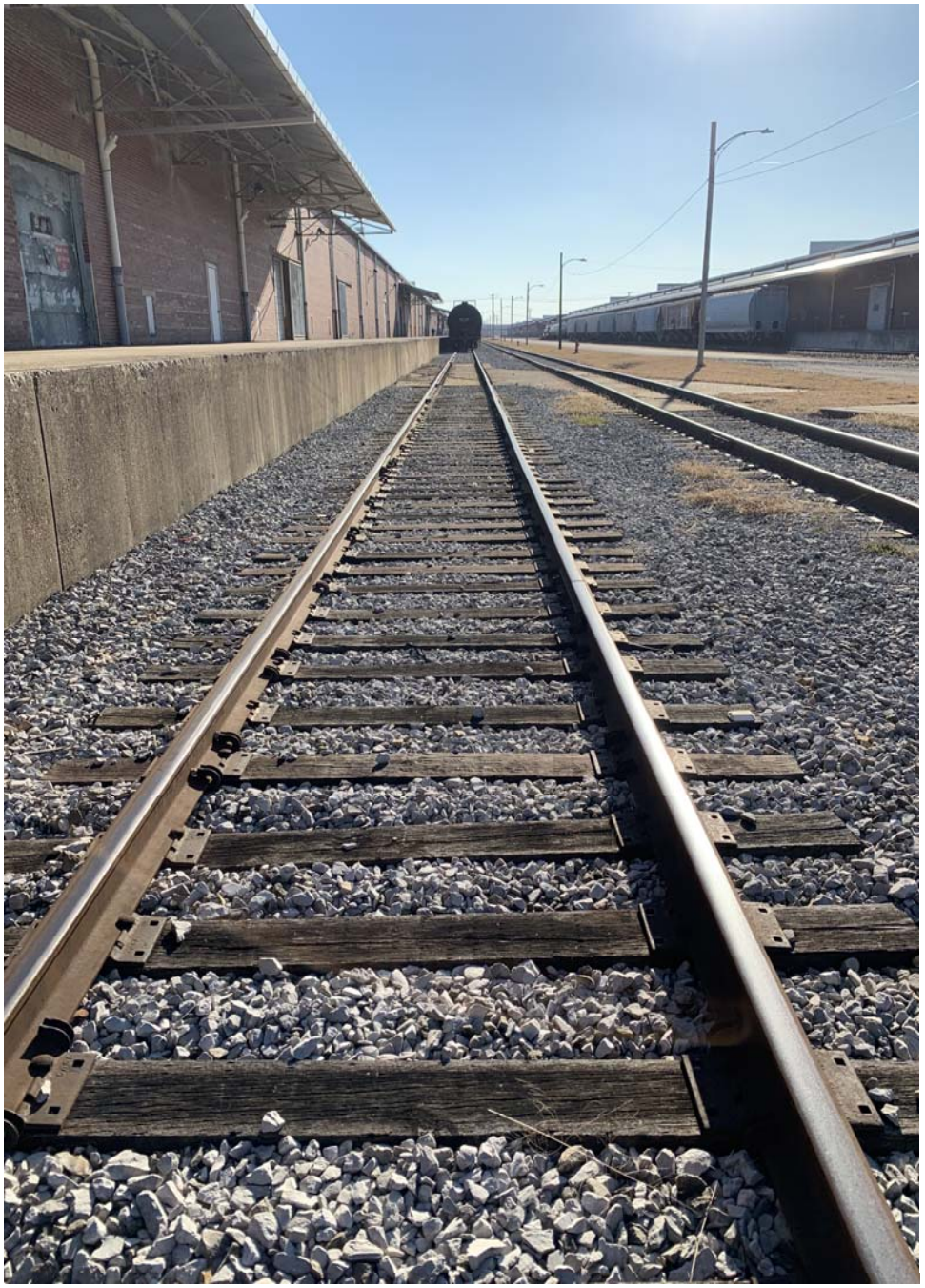
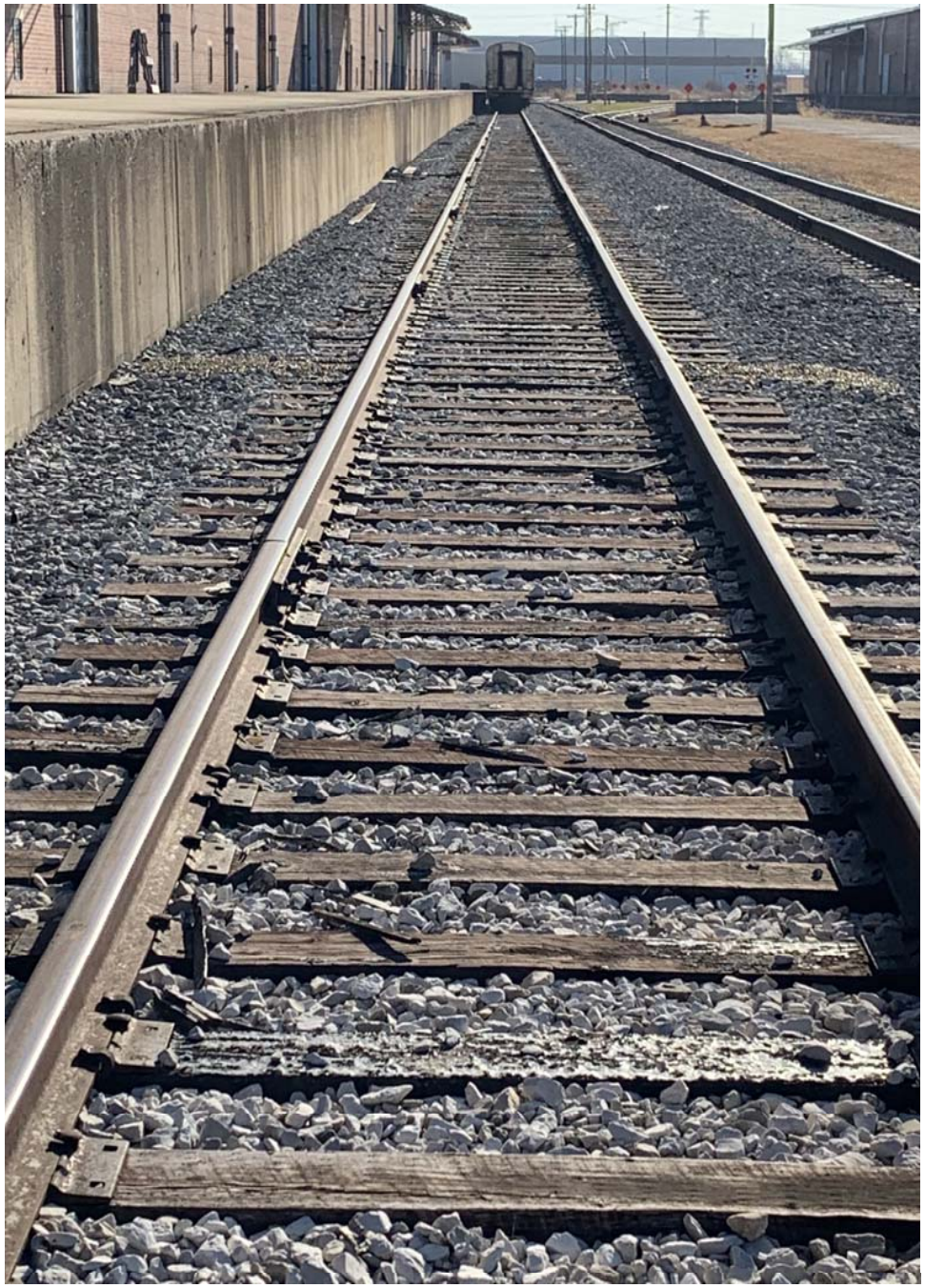


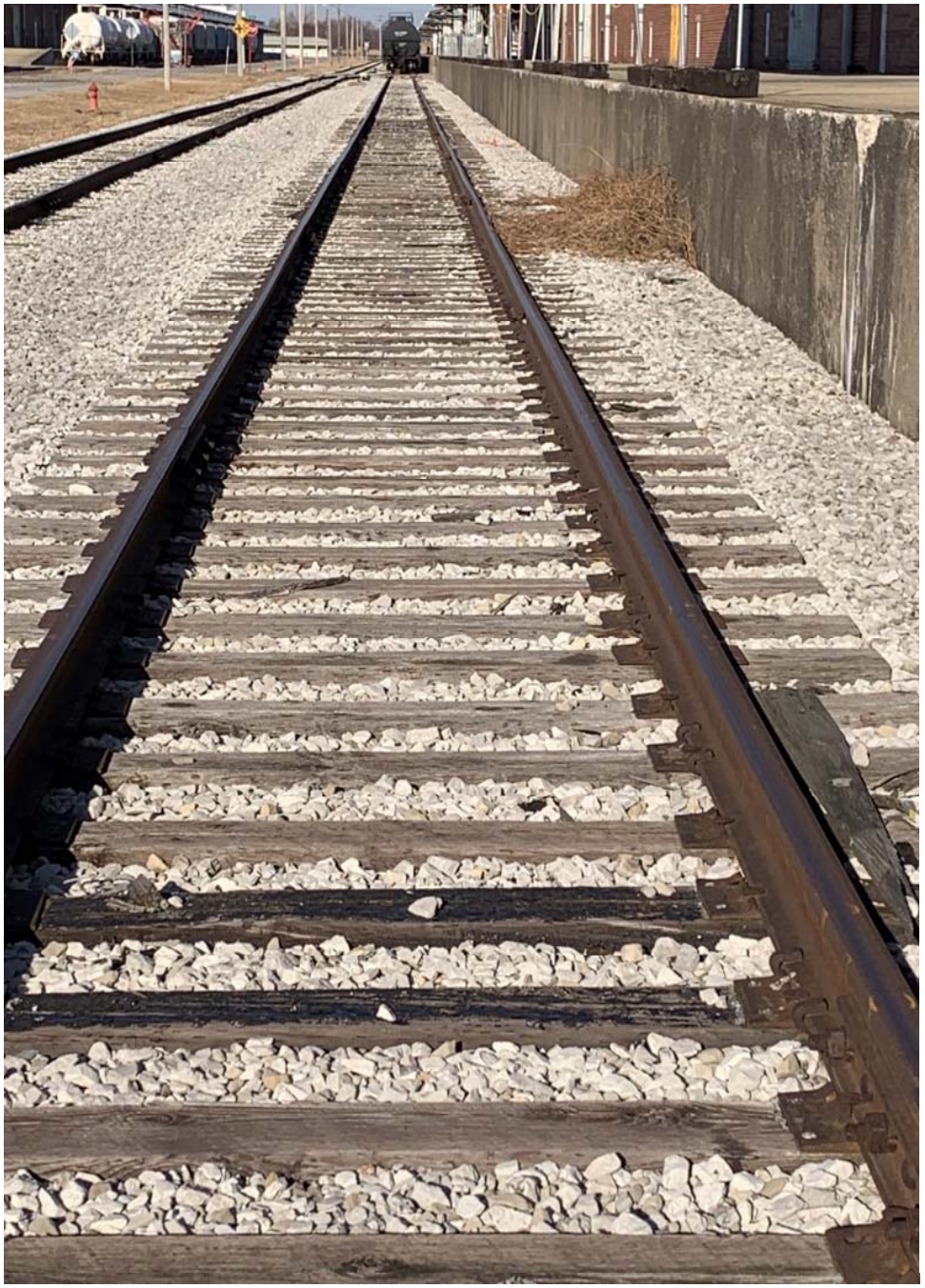
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. BD#1(A)



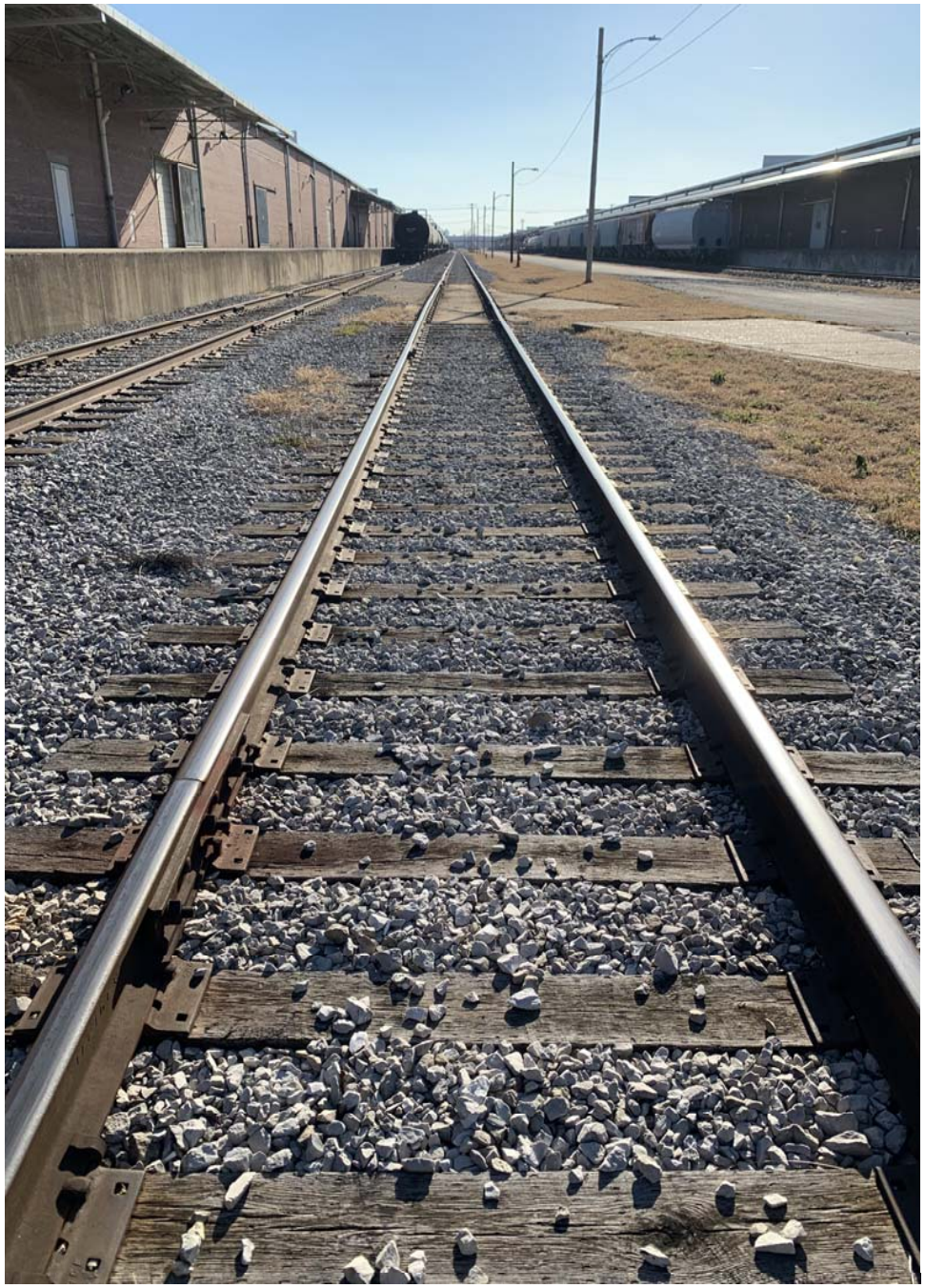


AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. BD#1(B)





AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. BD#2(A)



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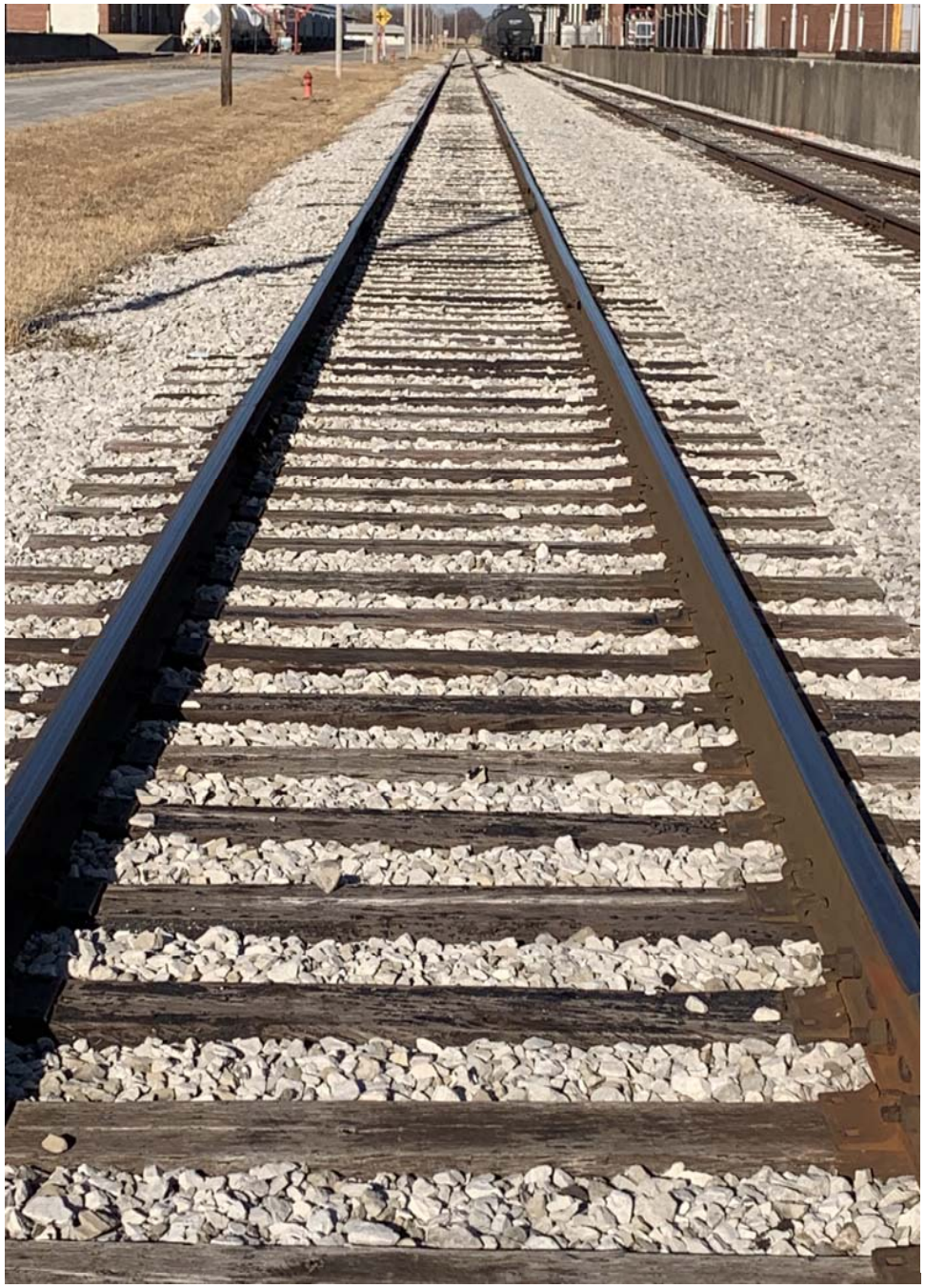
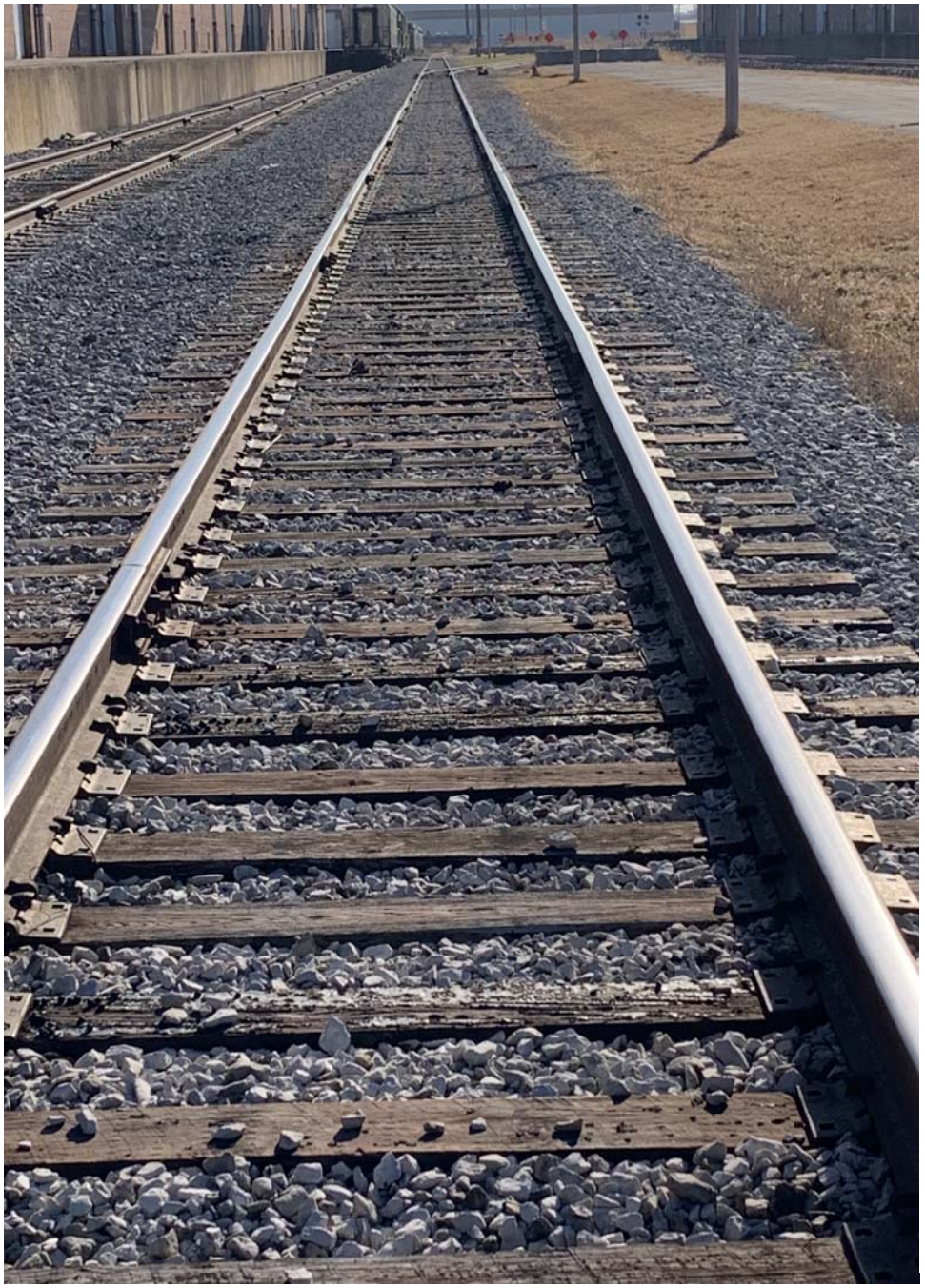
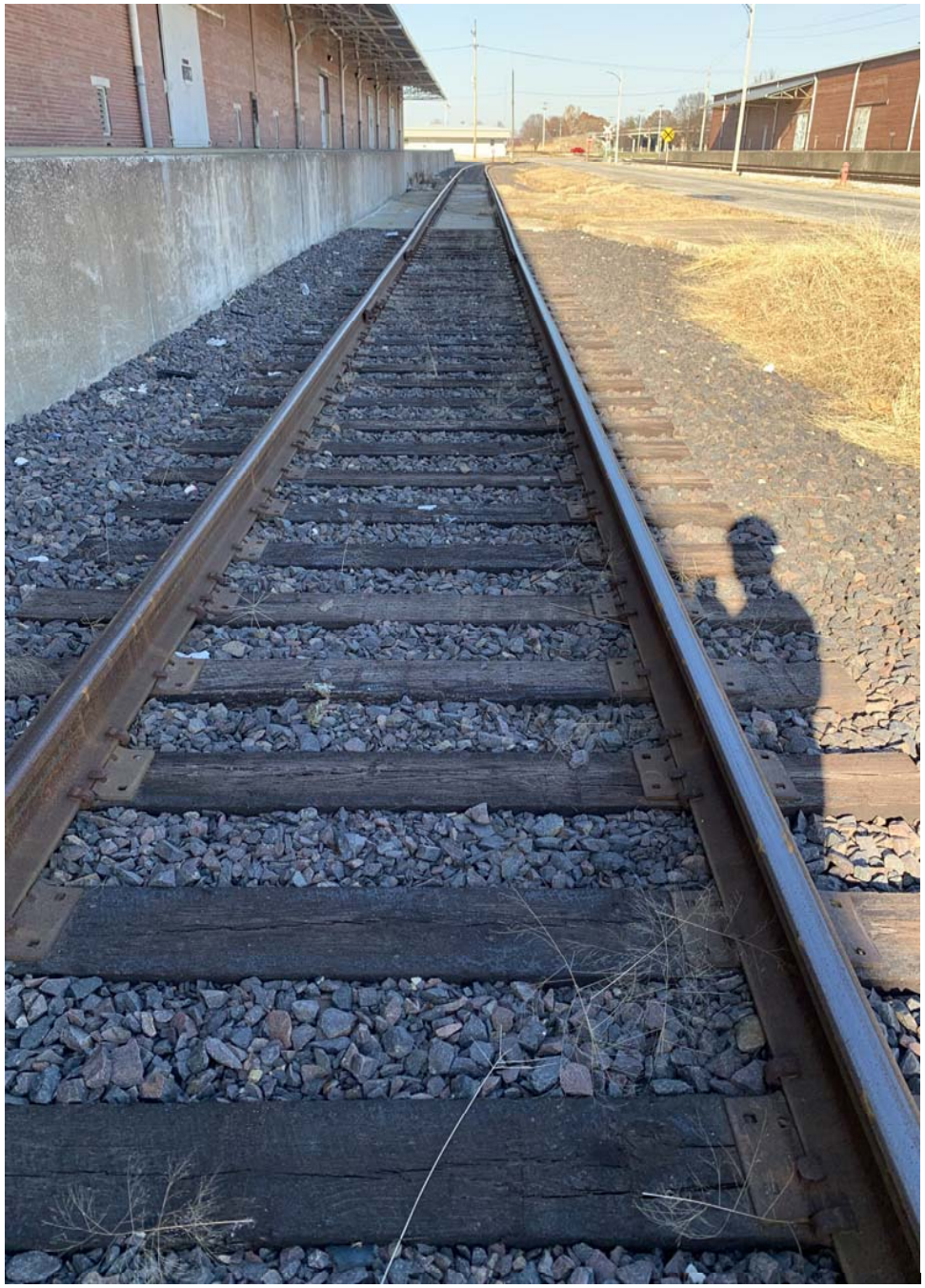
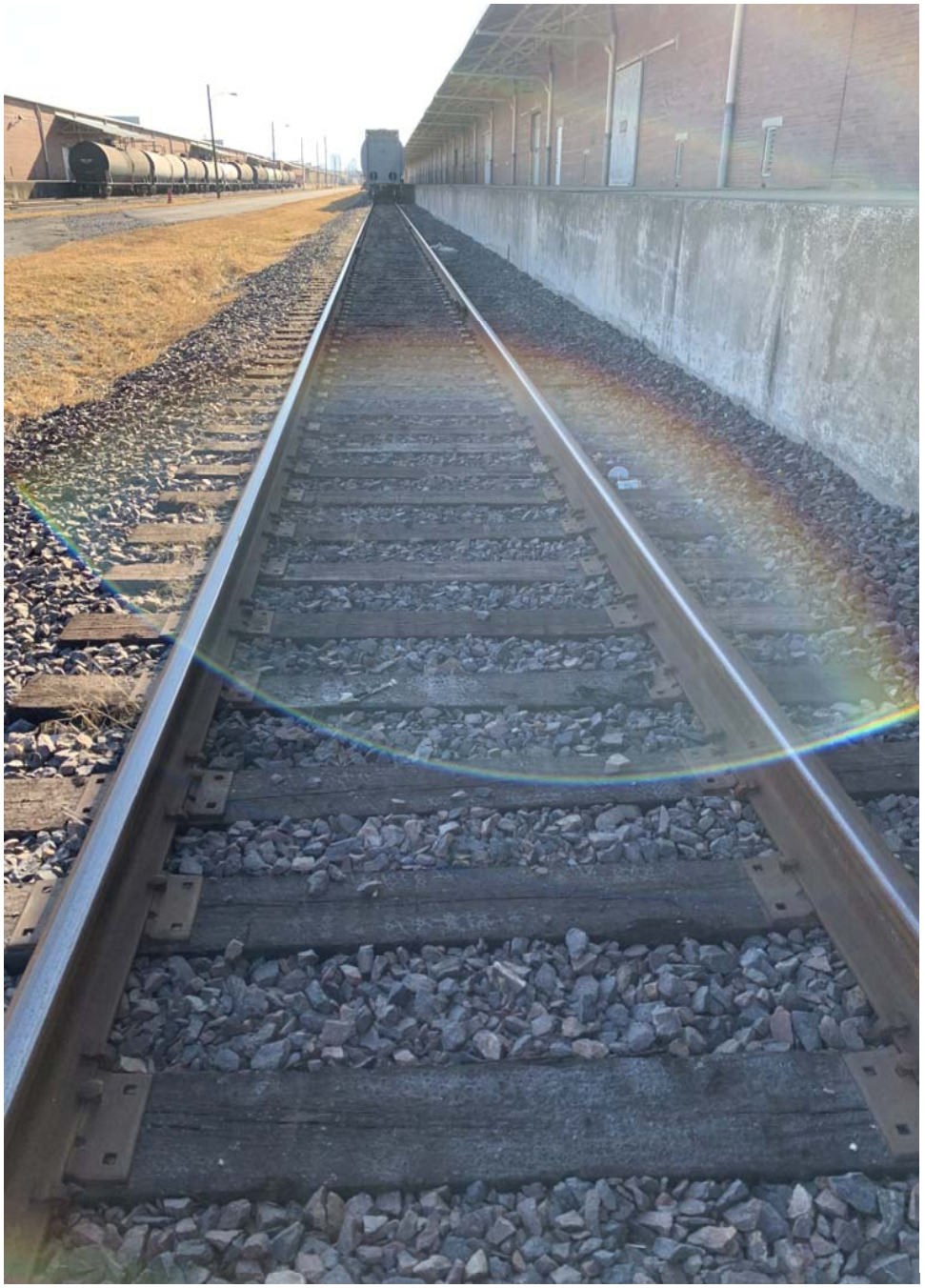




AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. BD#2(C)

AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. BD#3(A)





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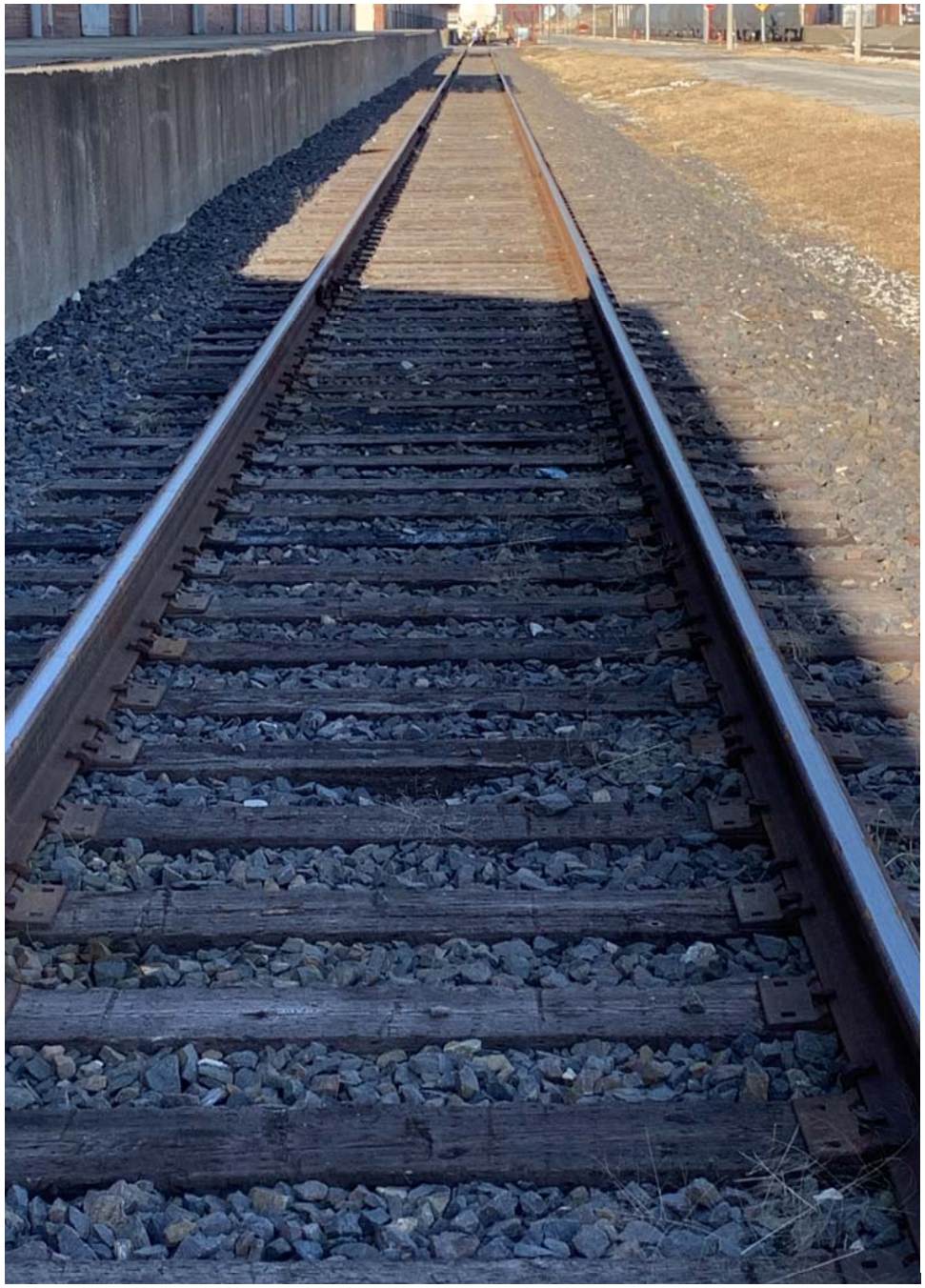

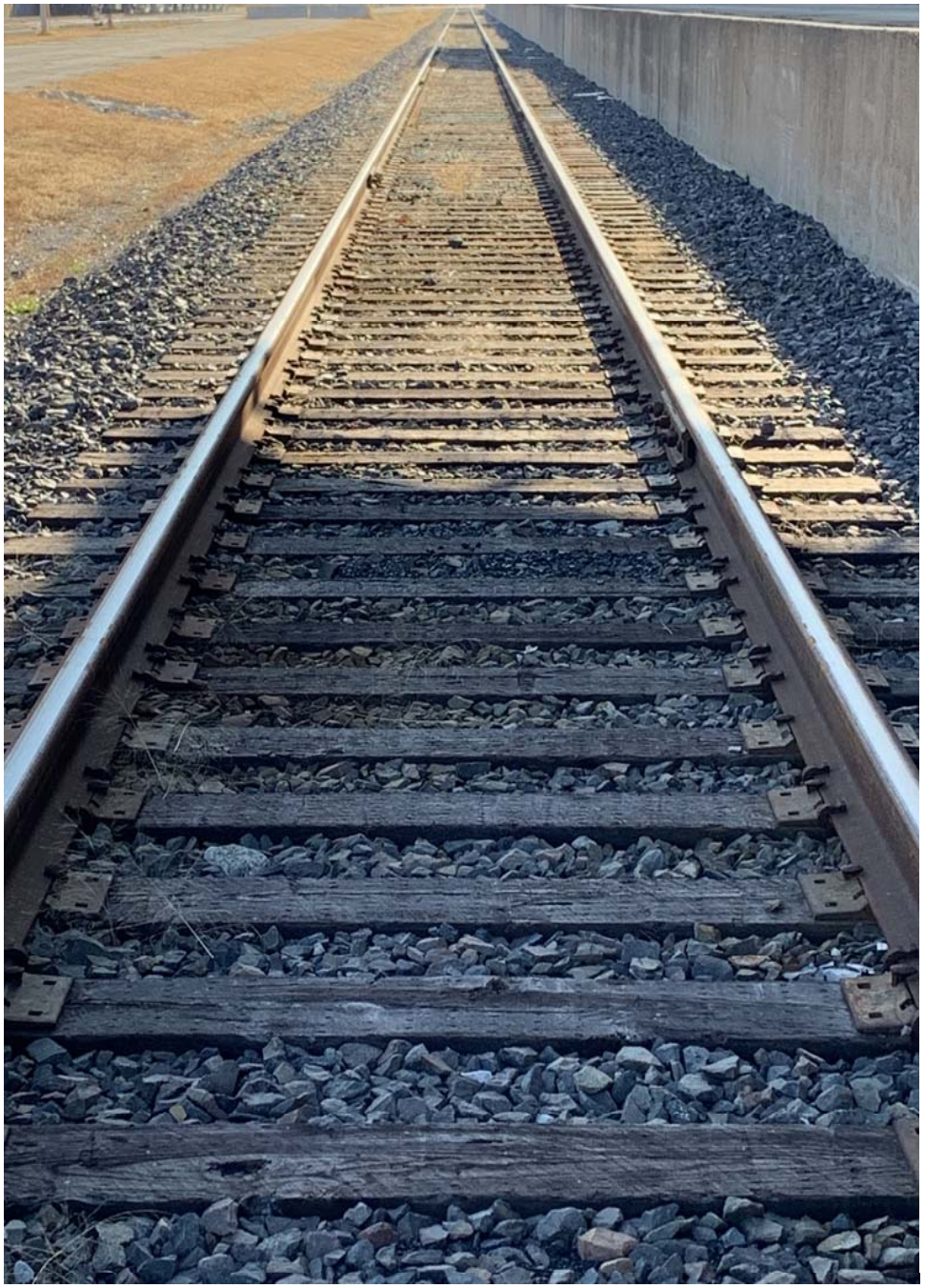

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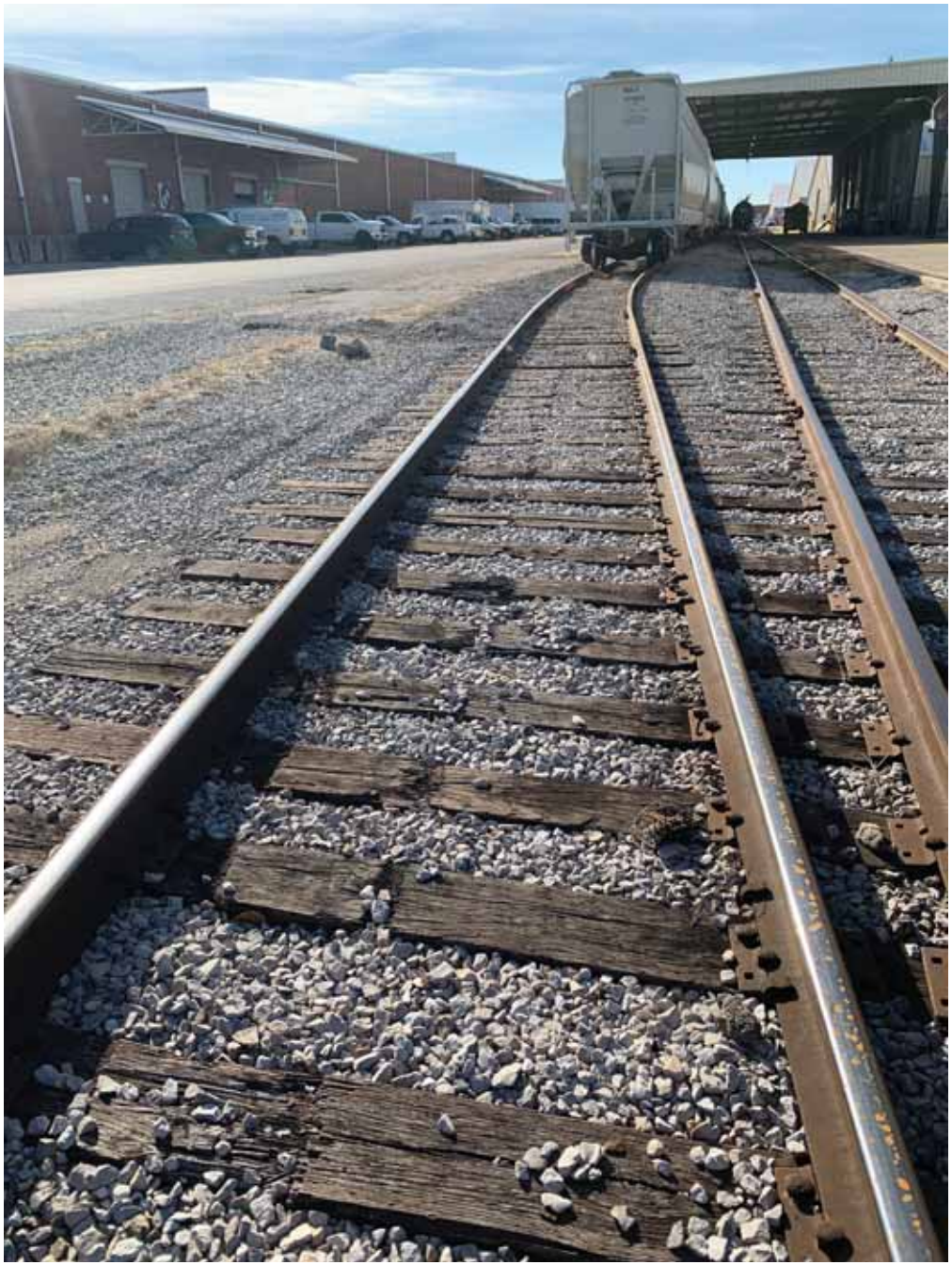

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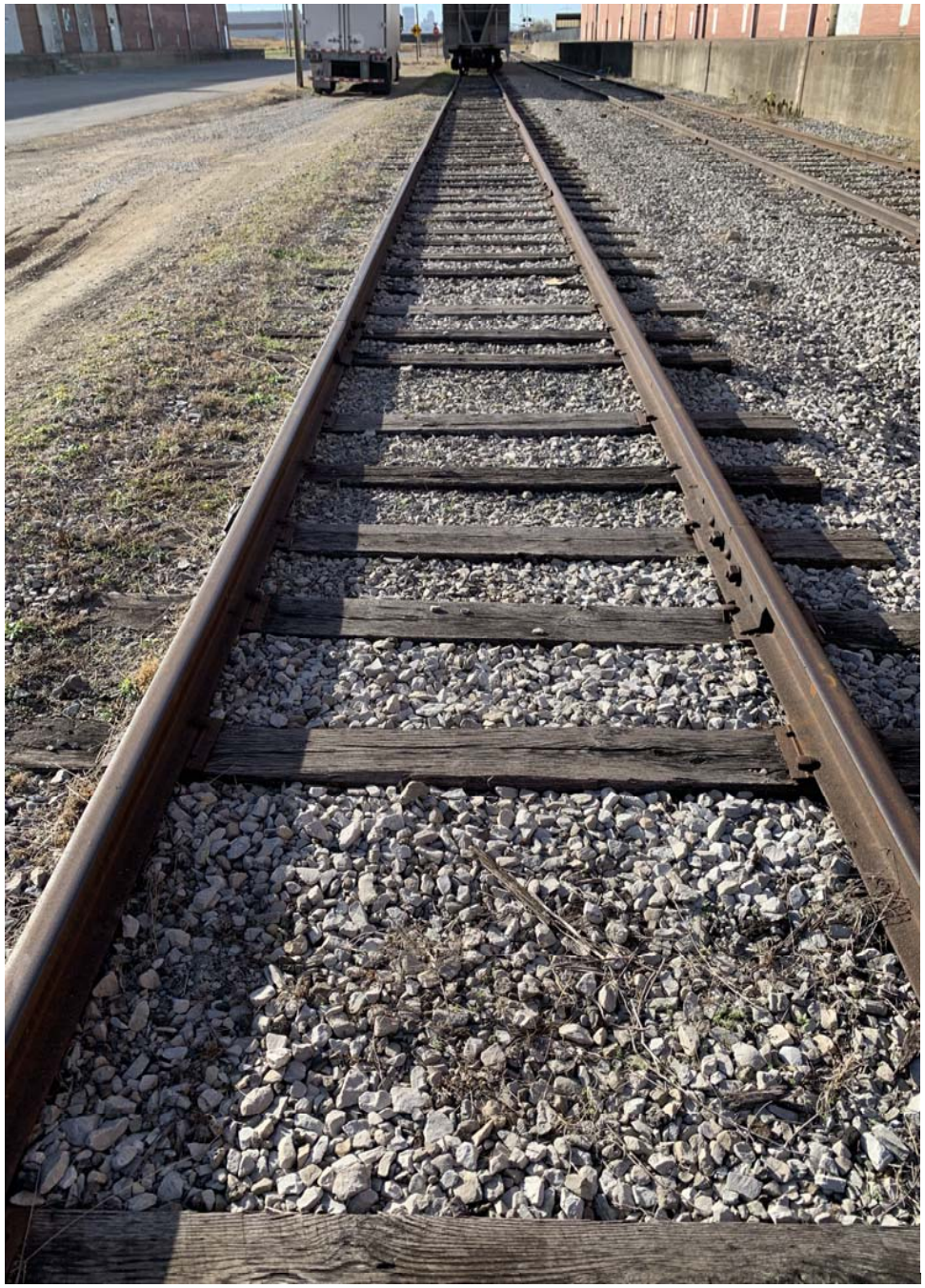

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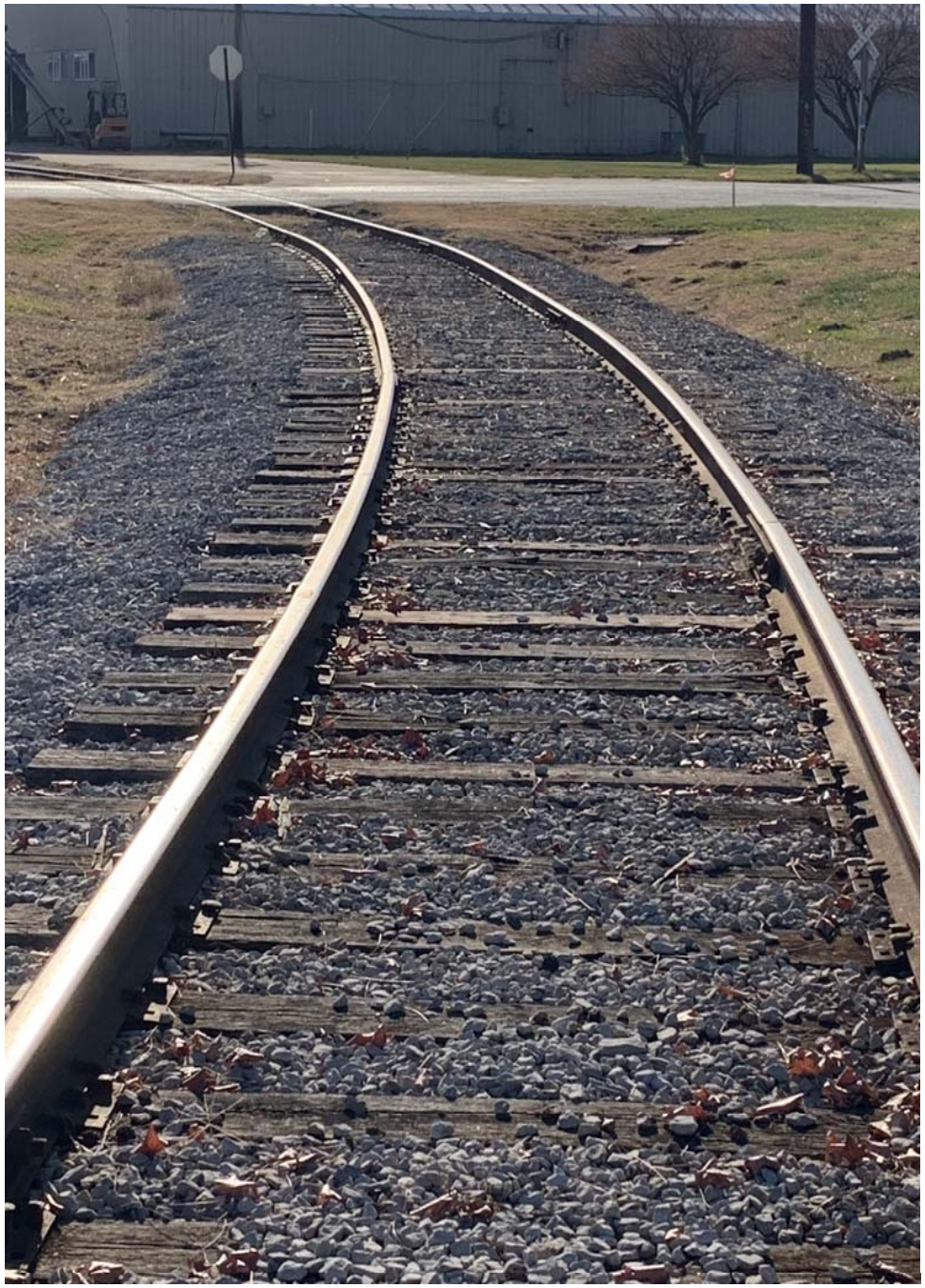

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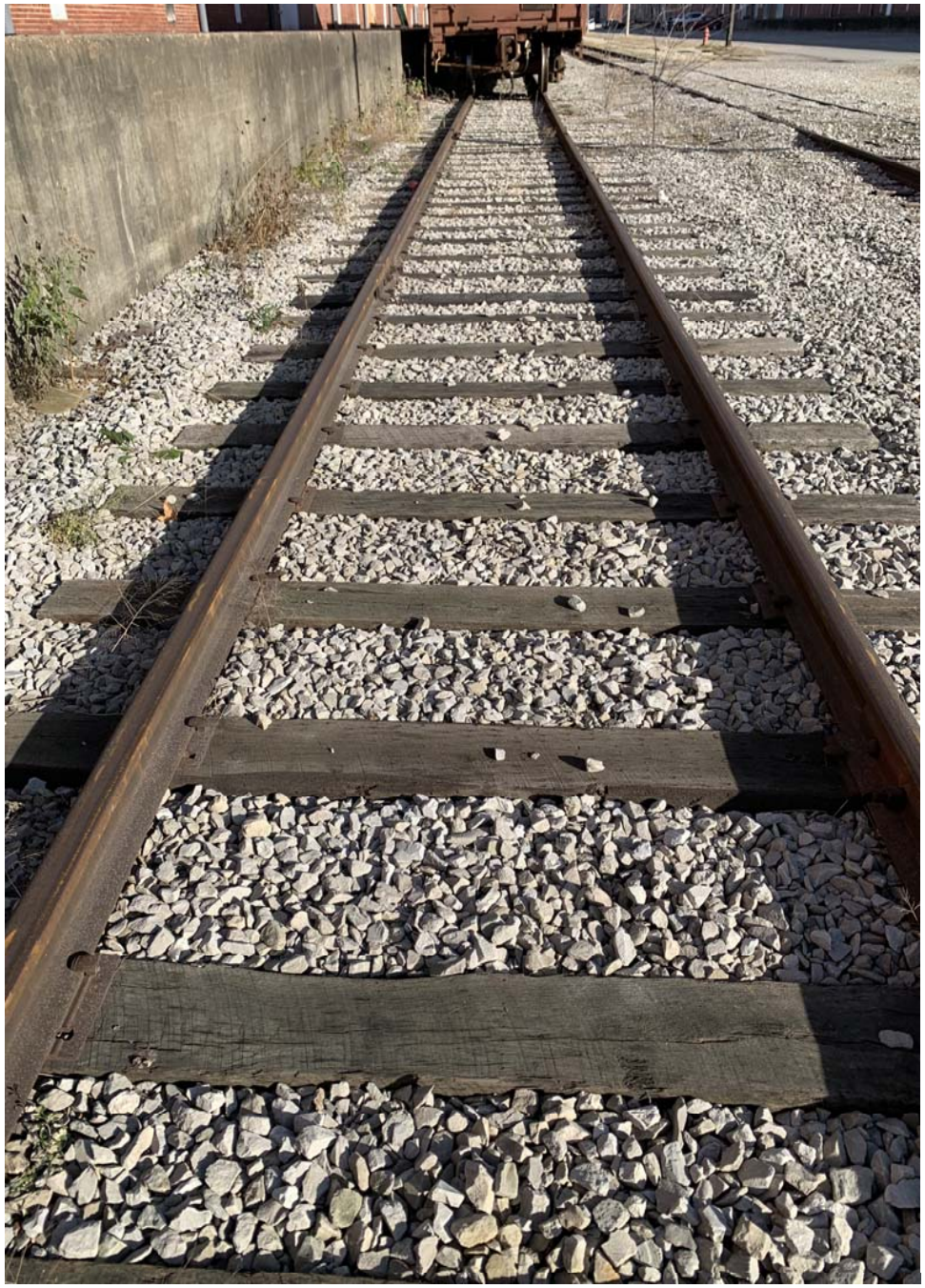

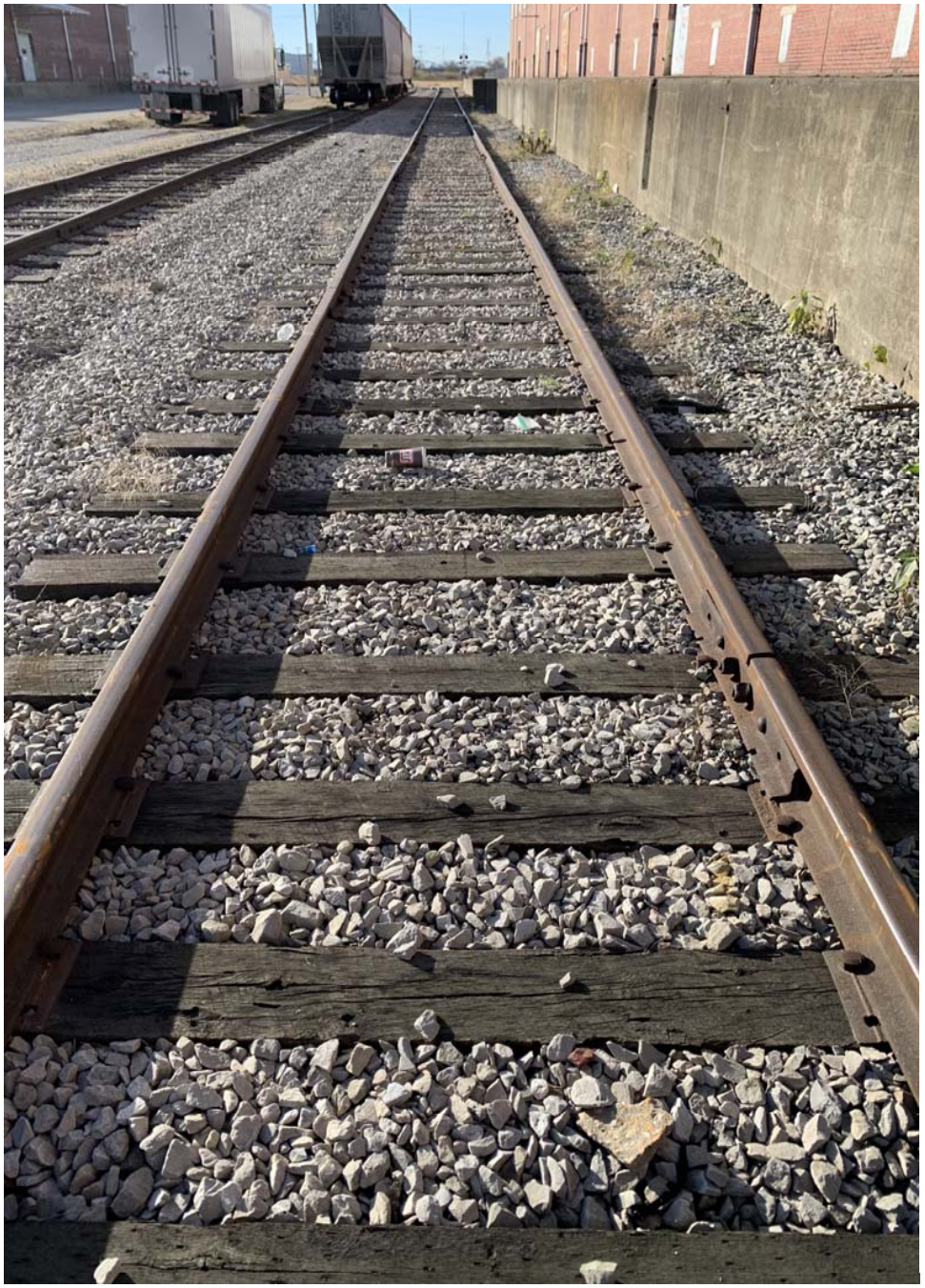

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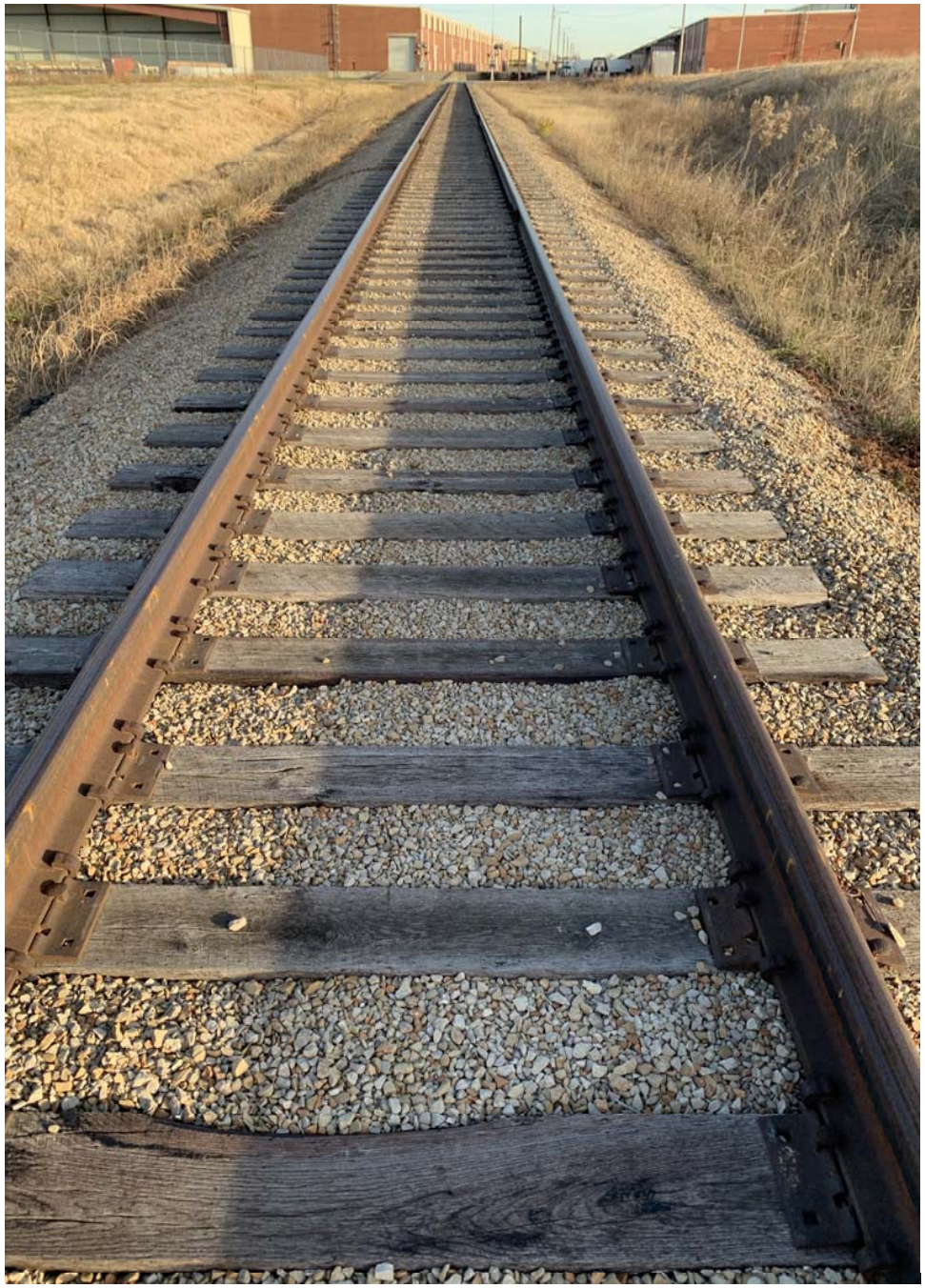
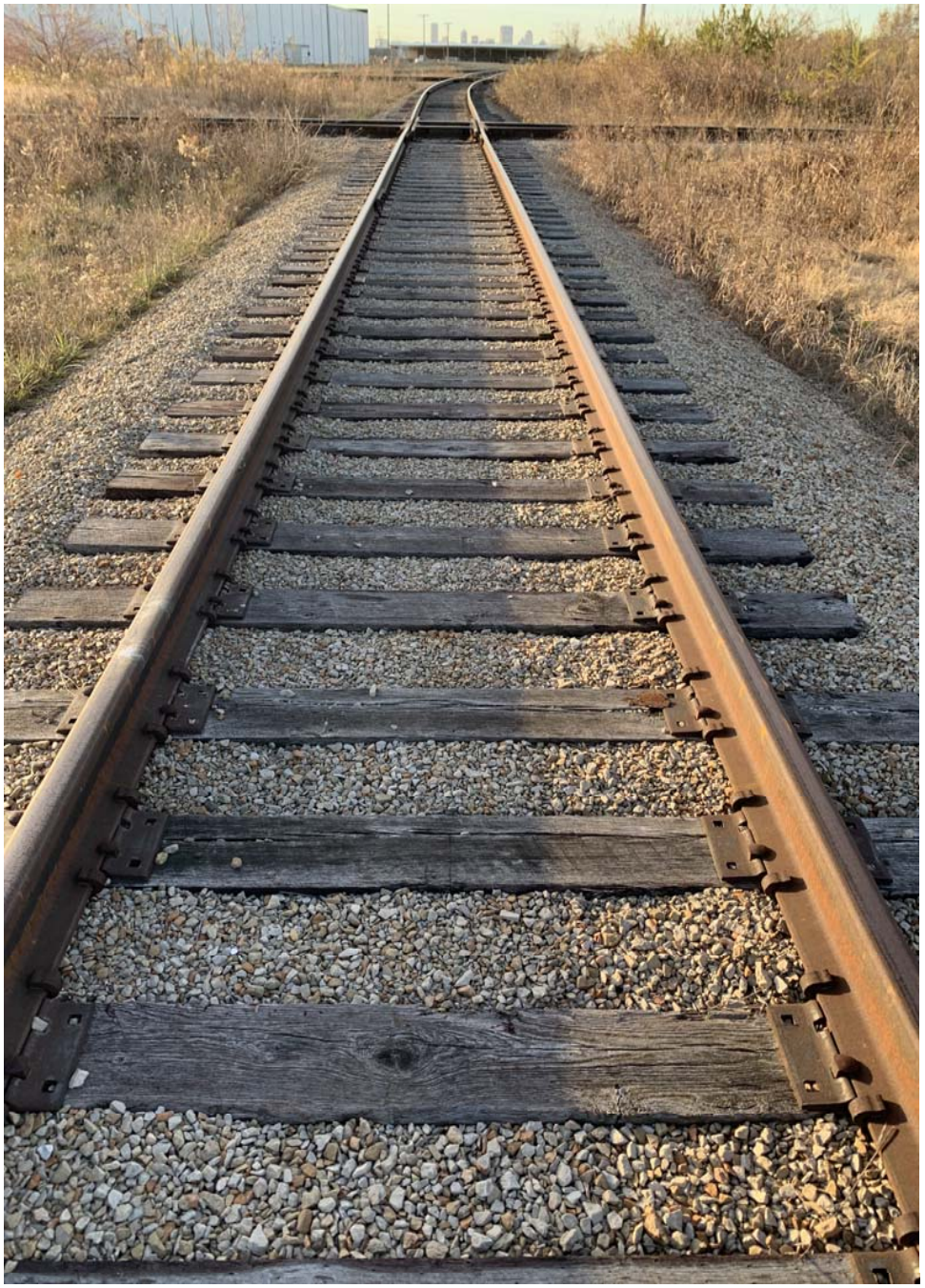
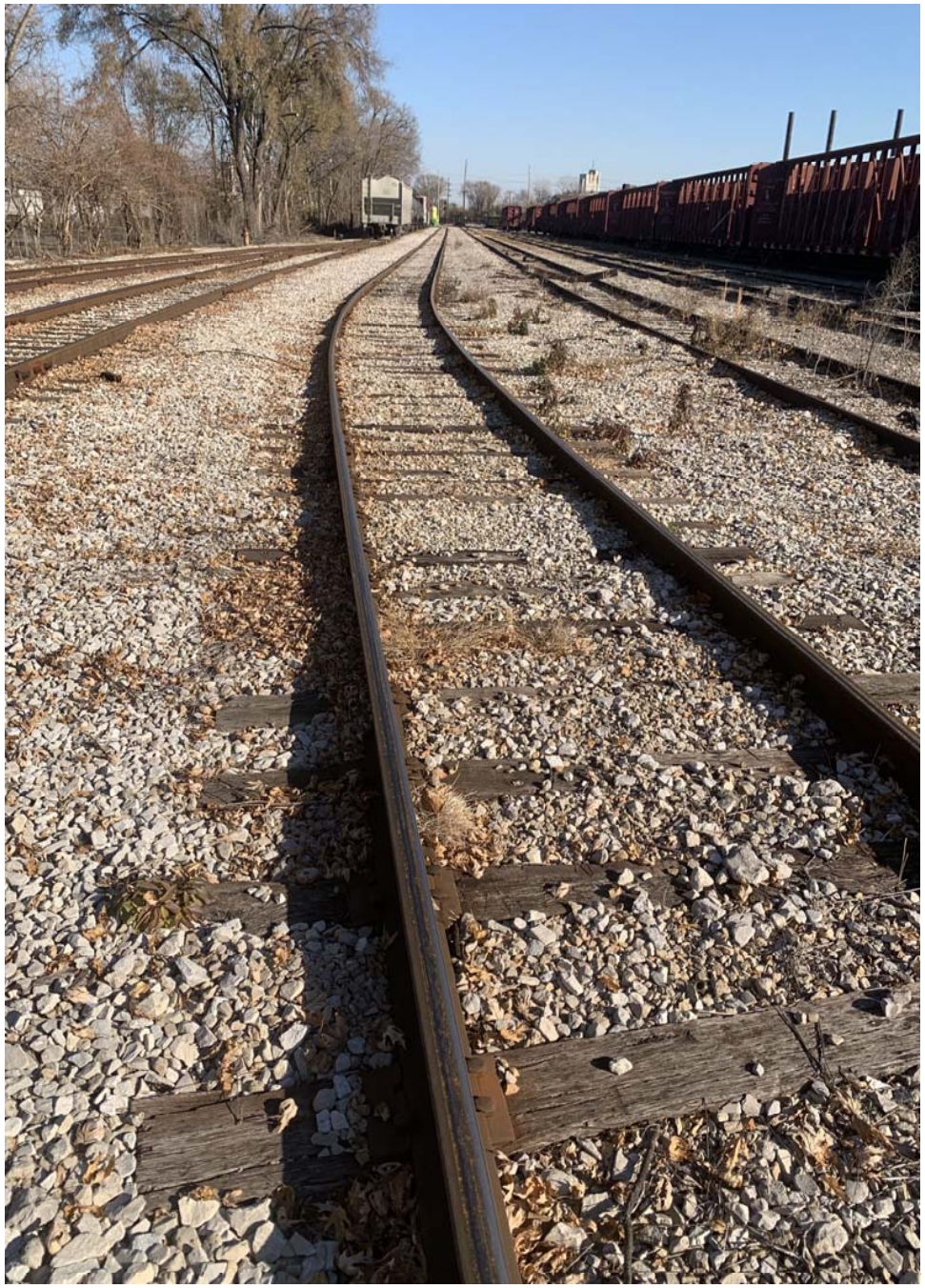




AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. C18(A)



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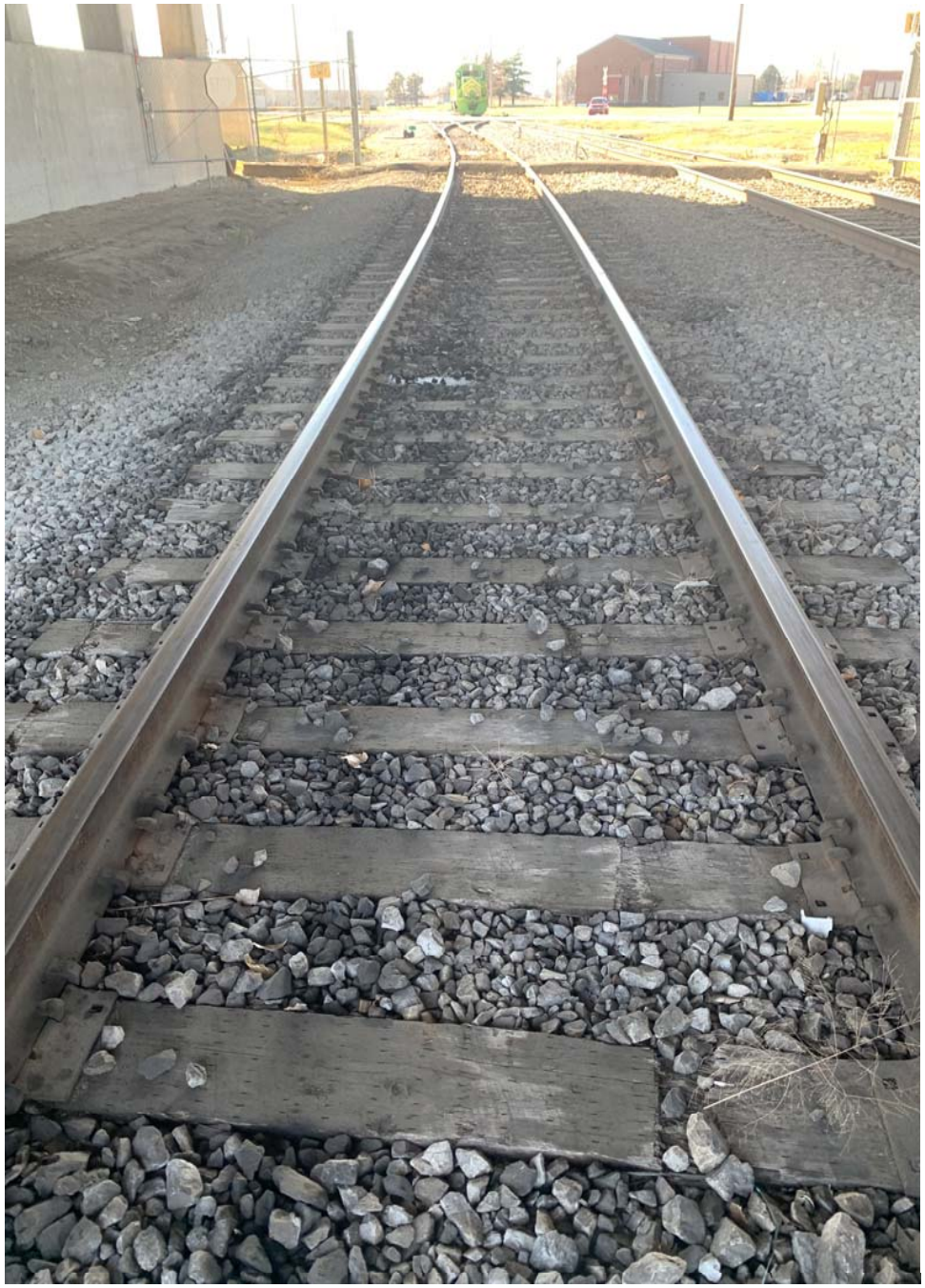

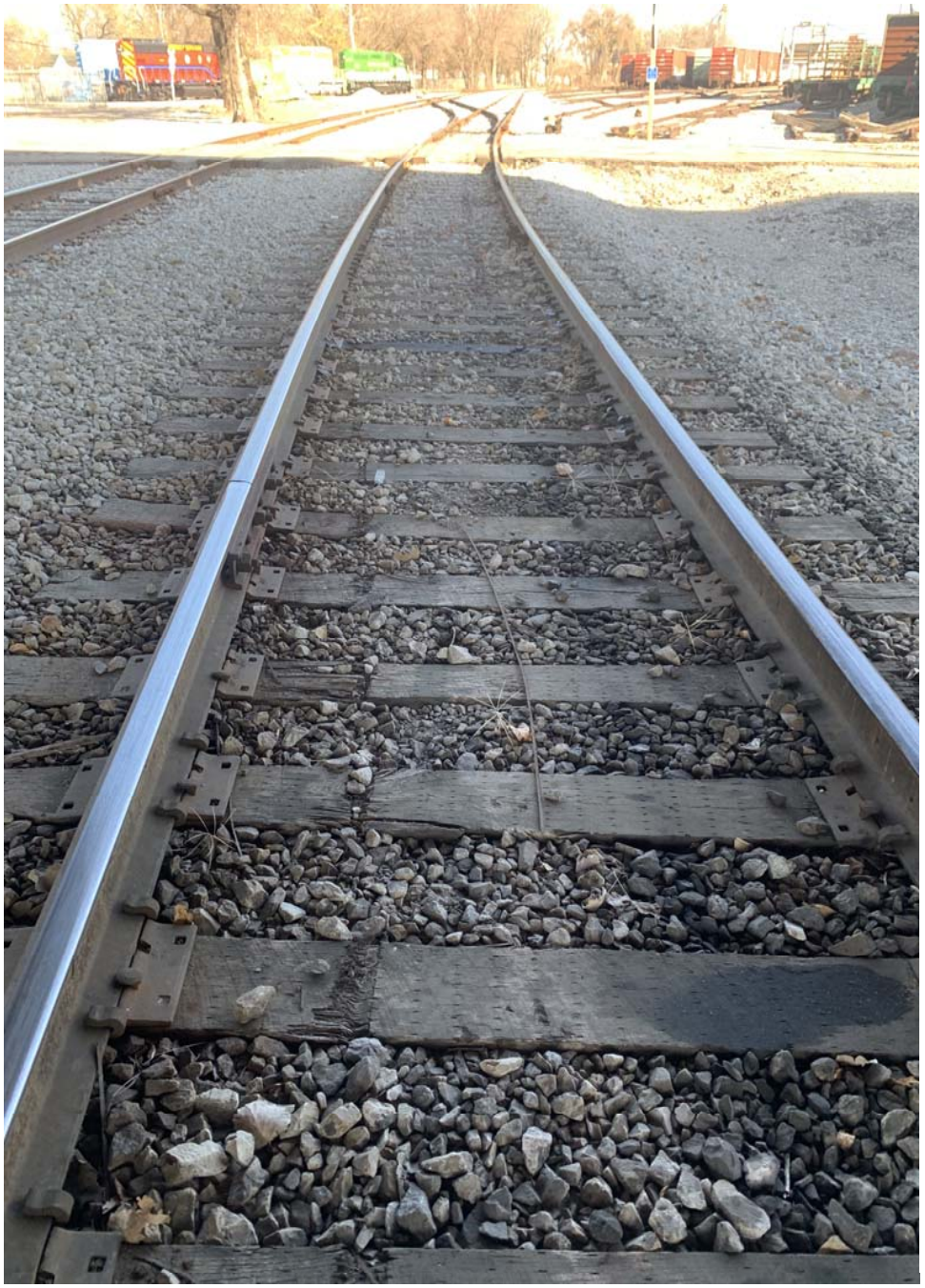

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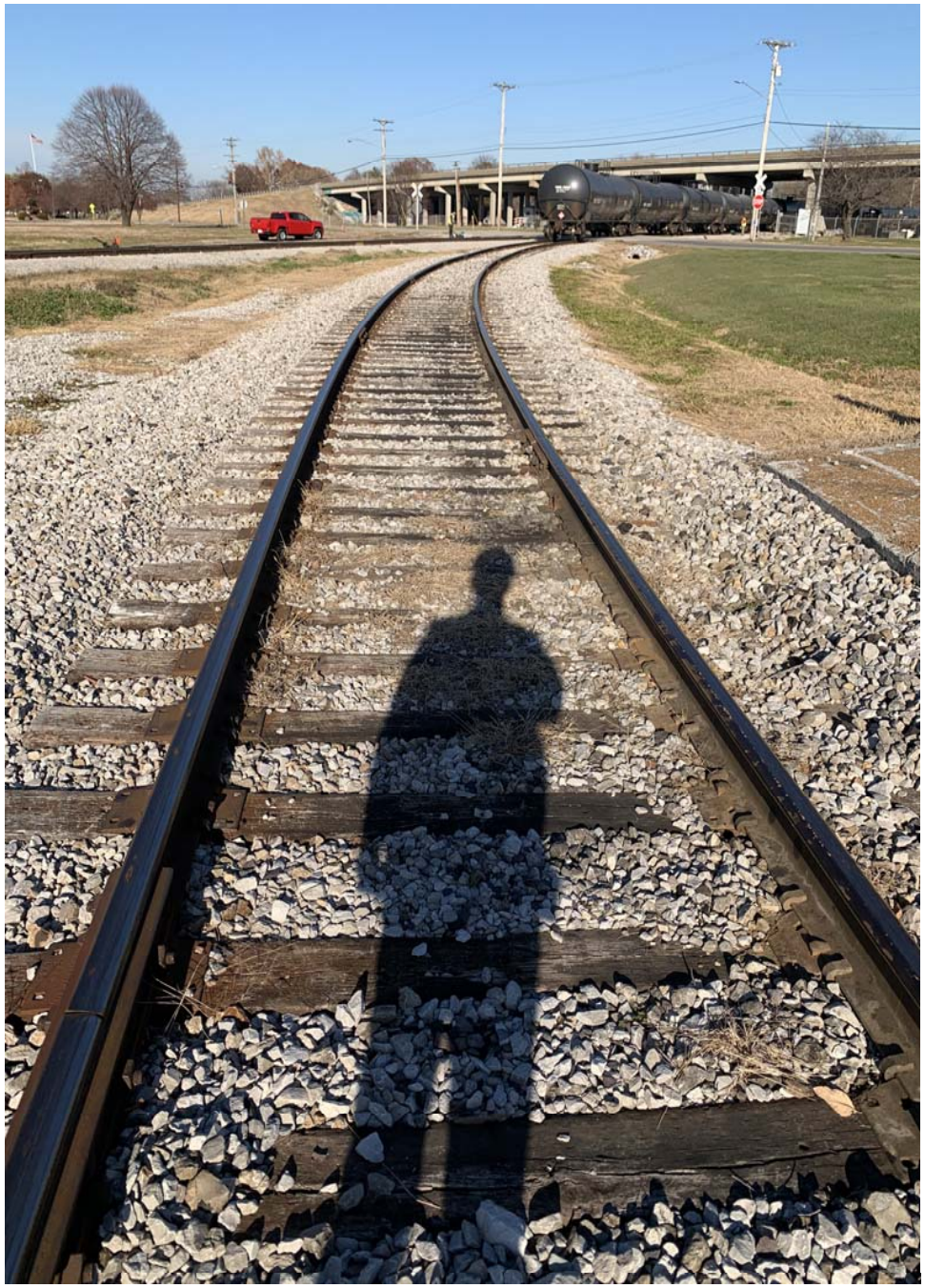

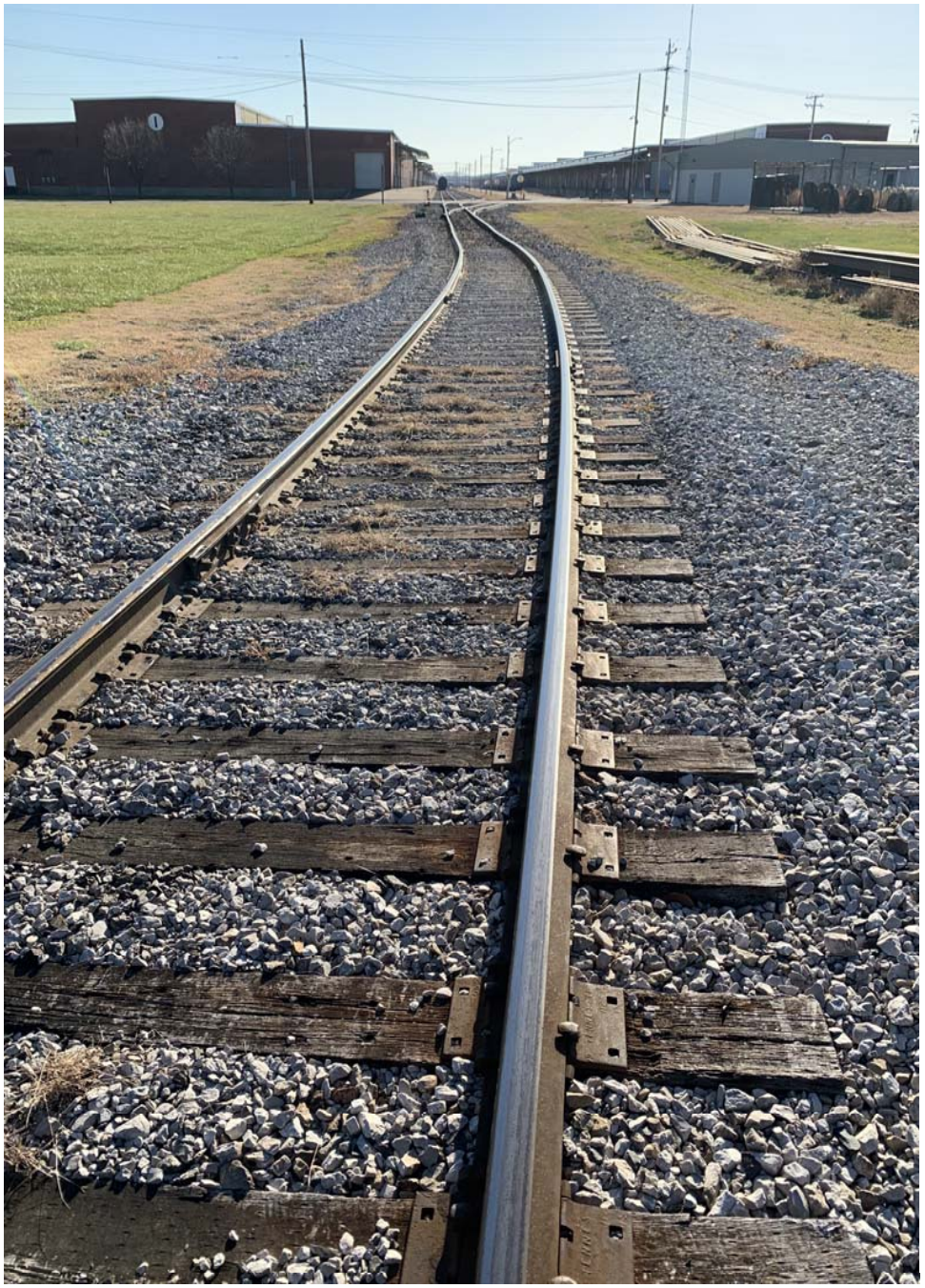

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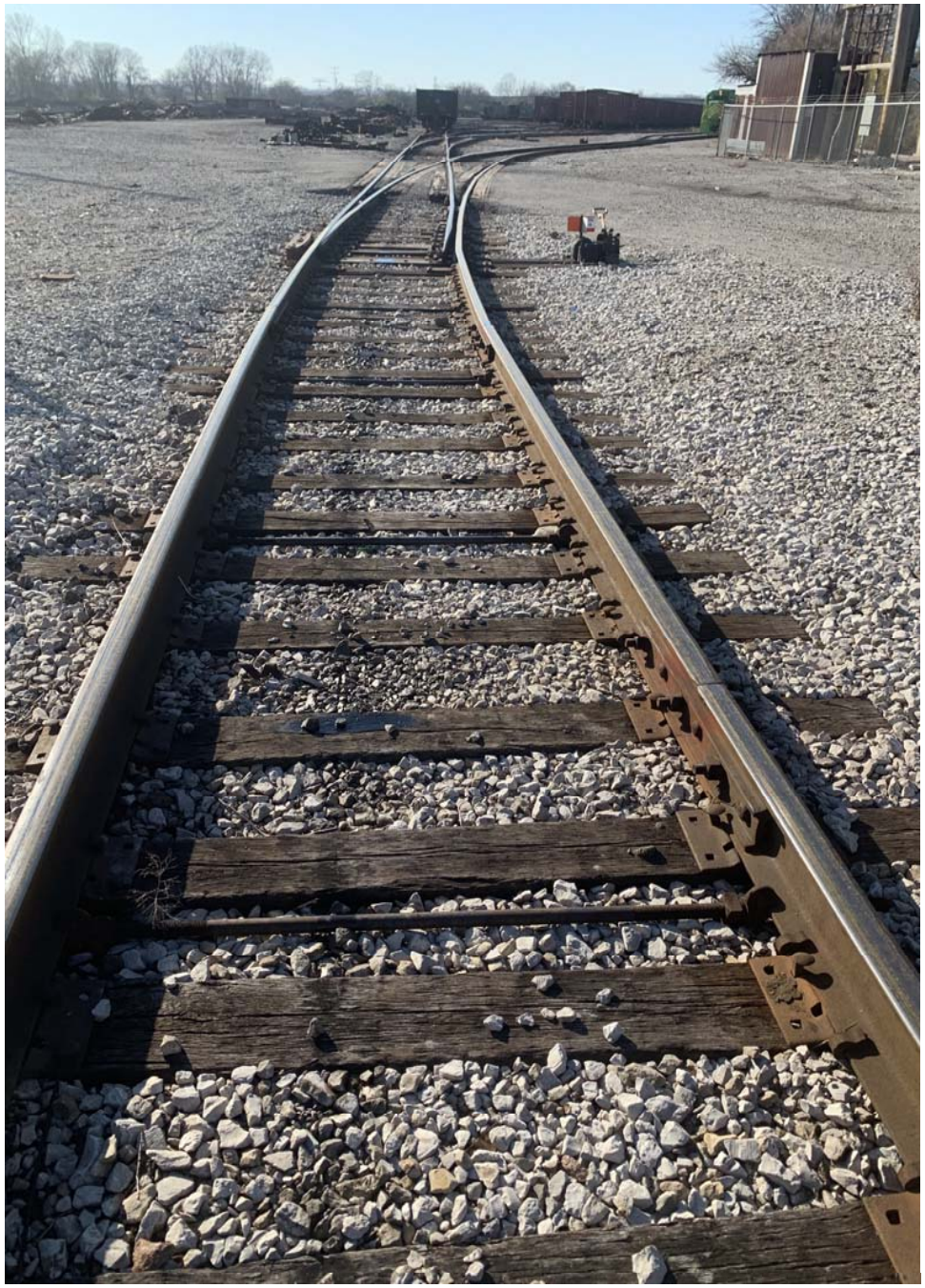

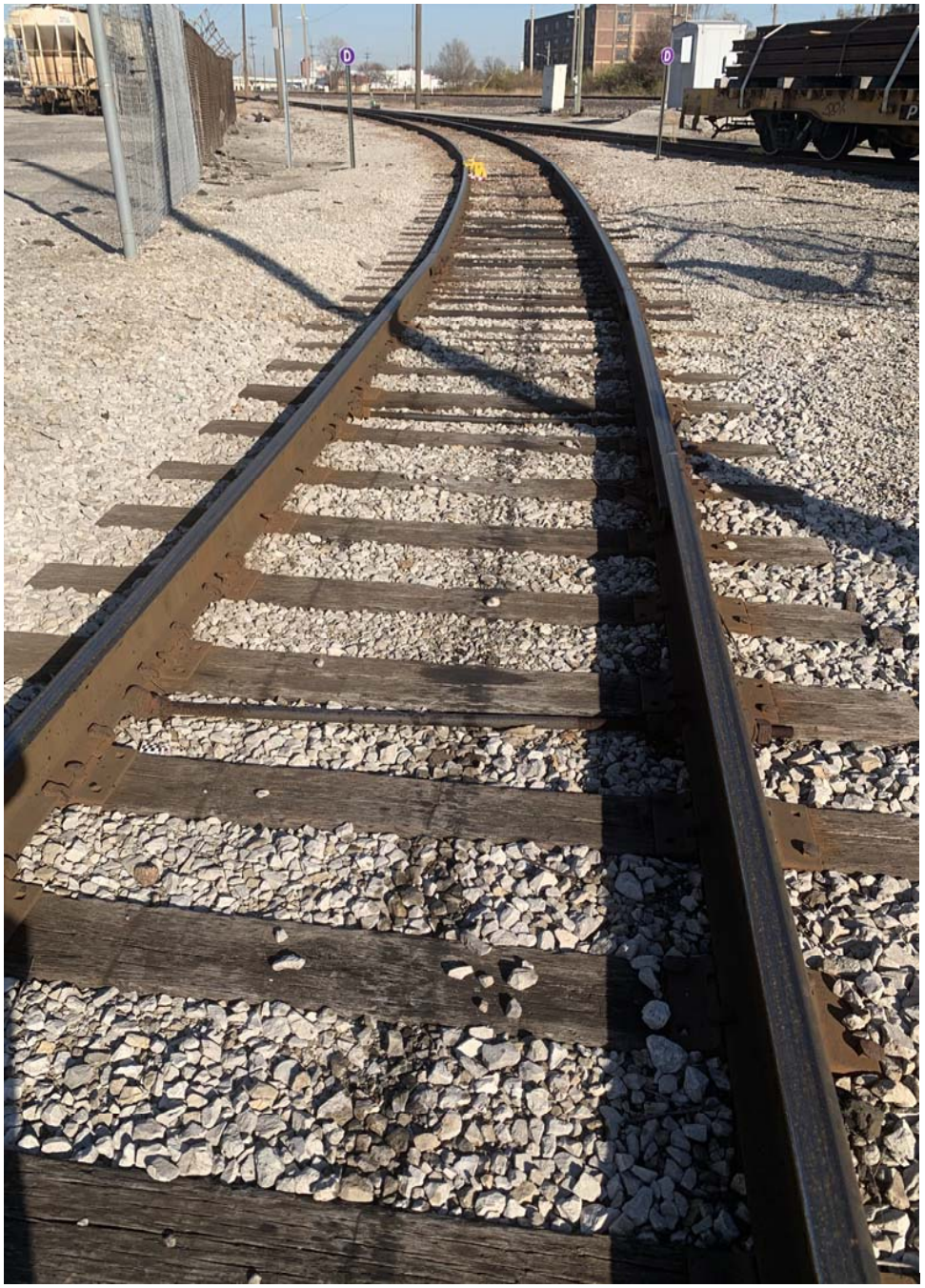

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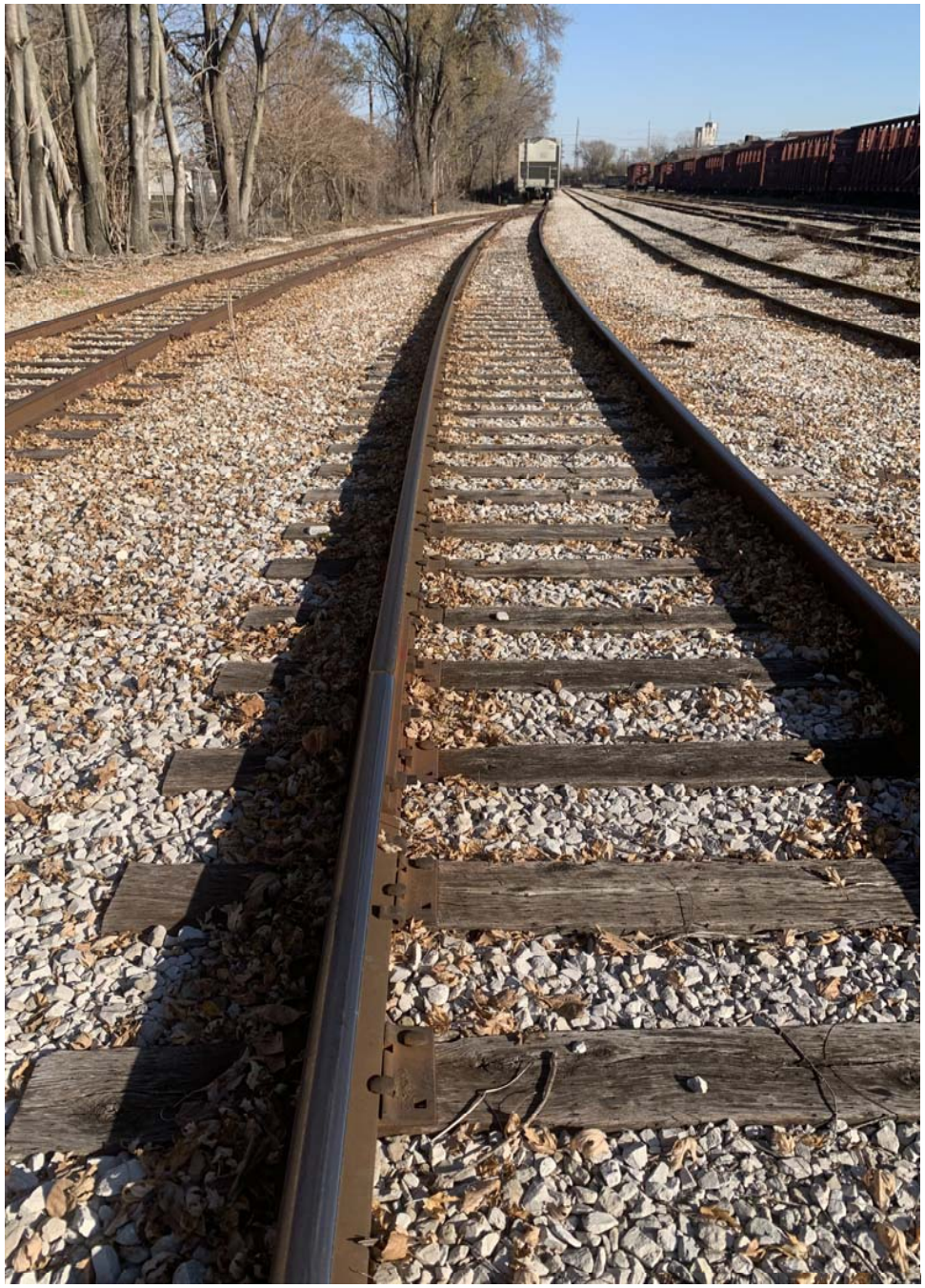

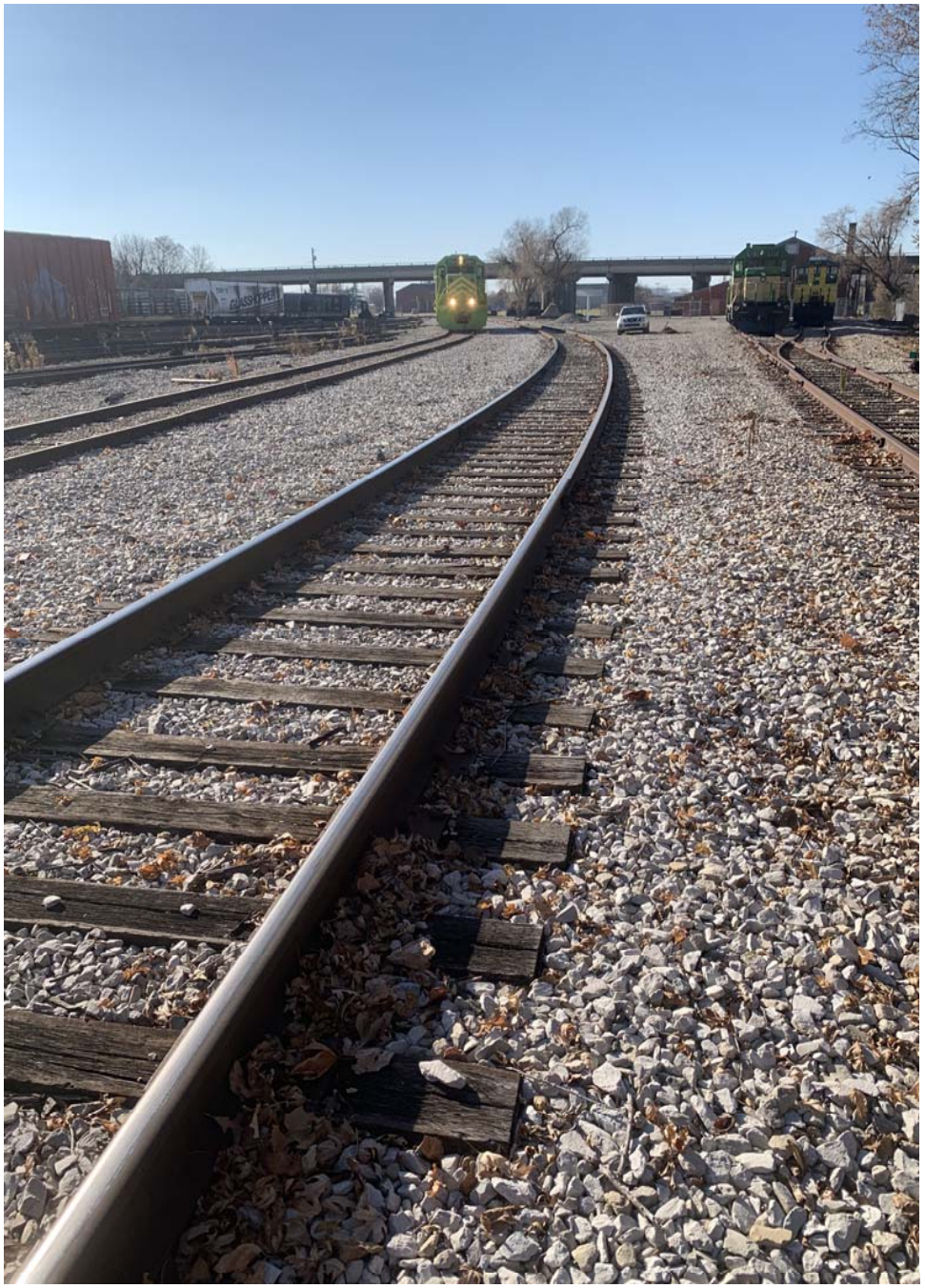

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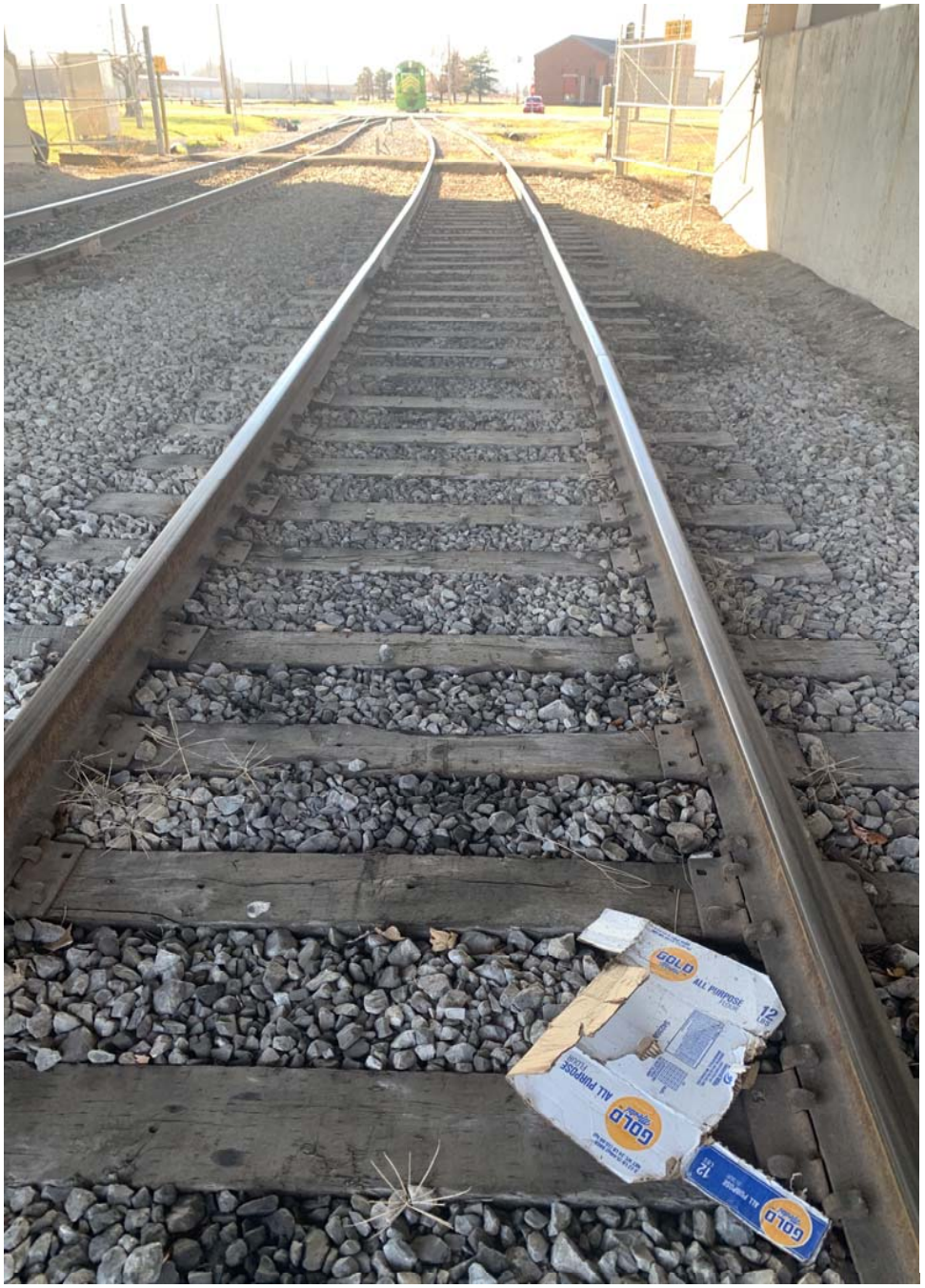
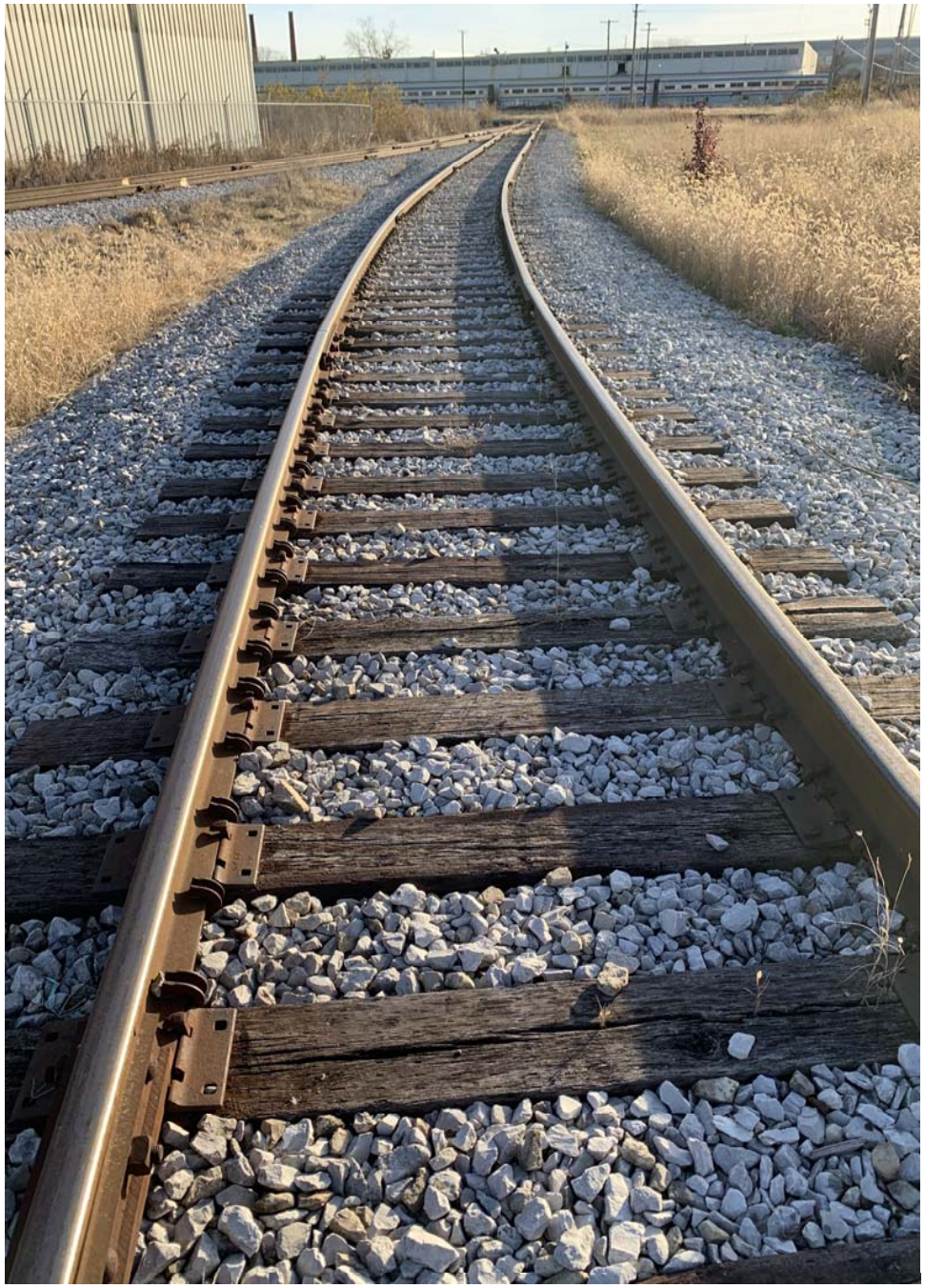
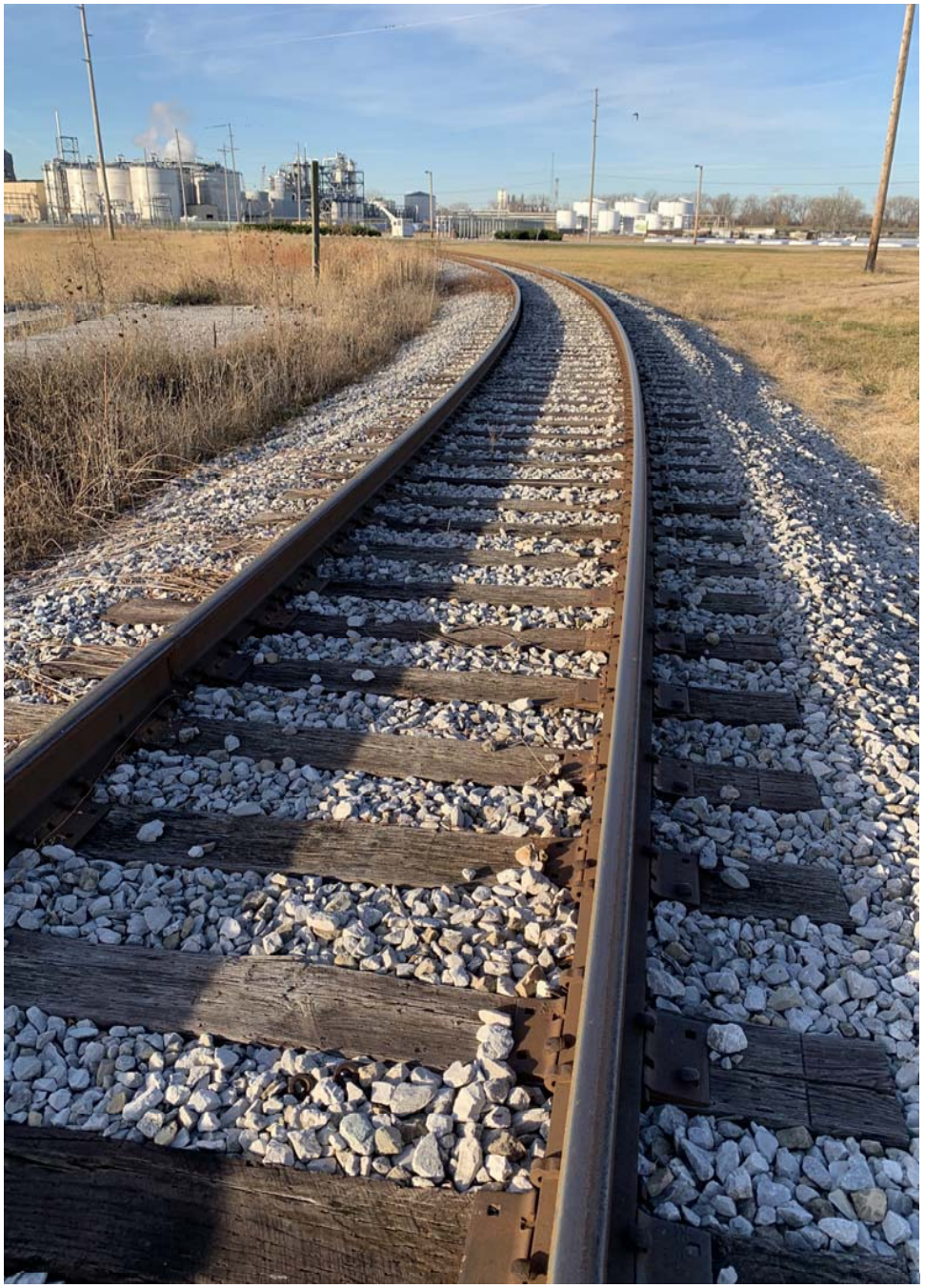


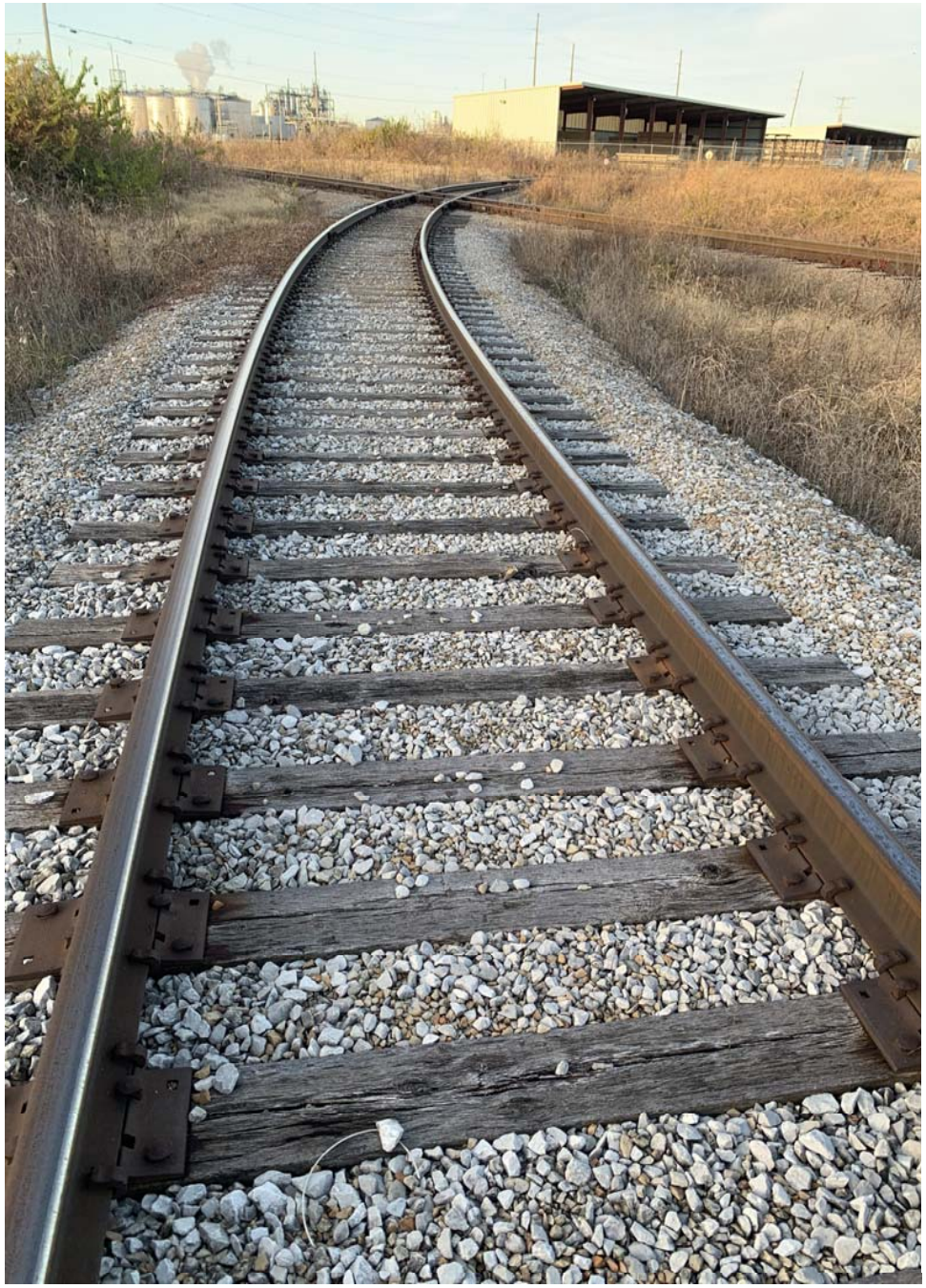
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. GPE(A)

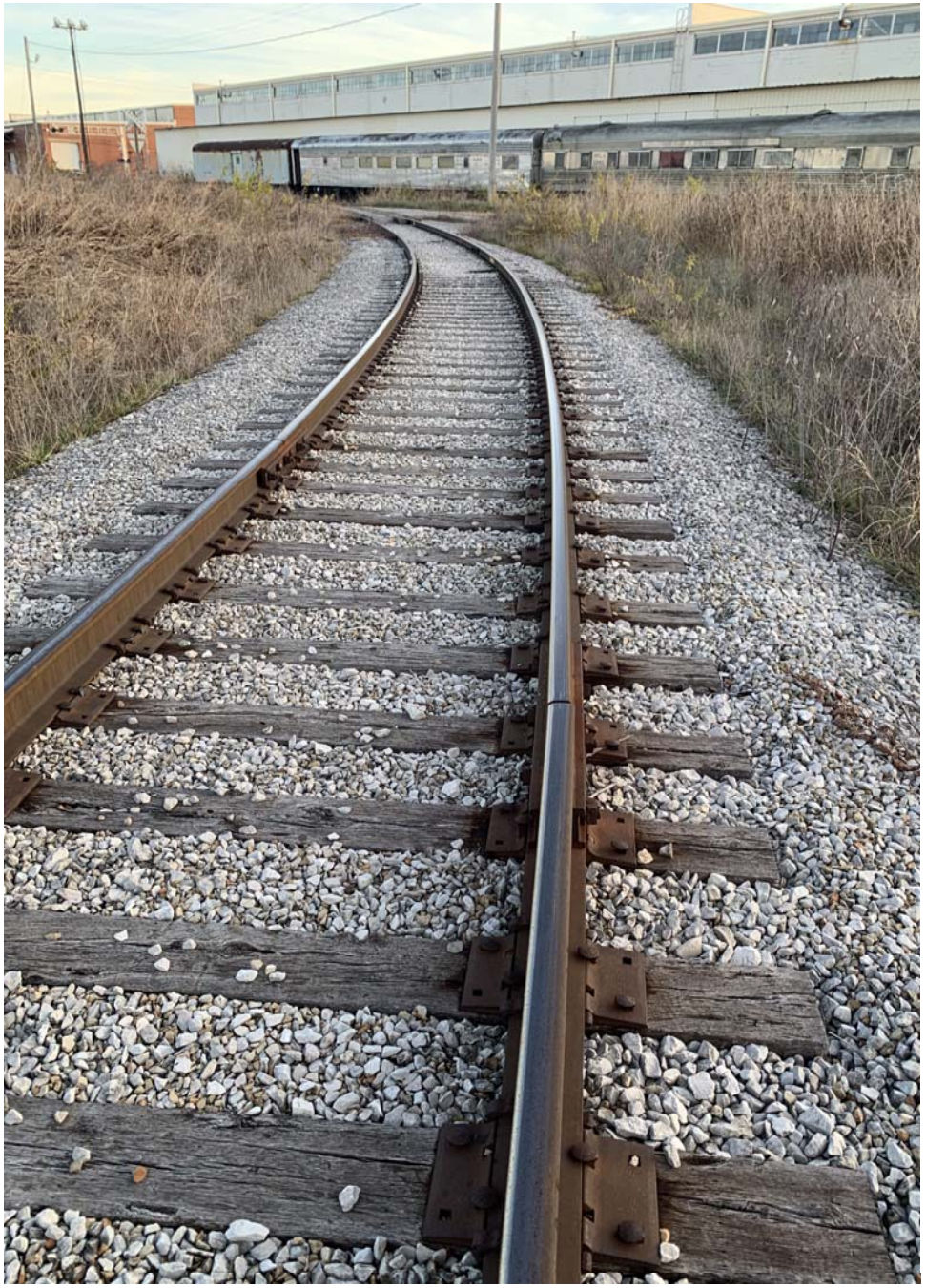




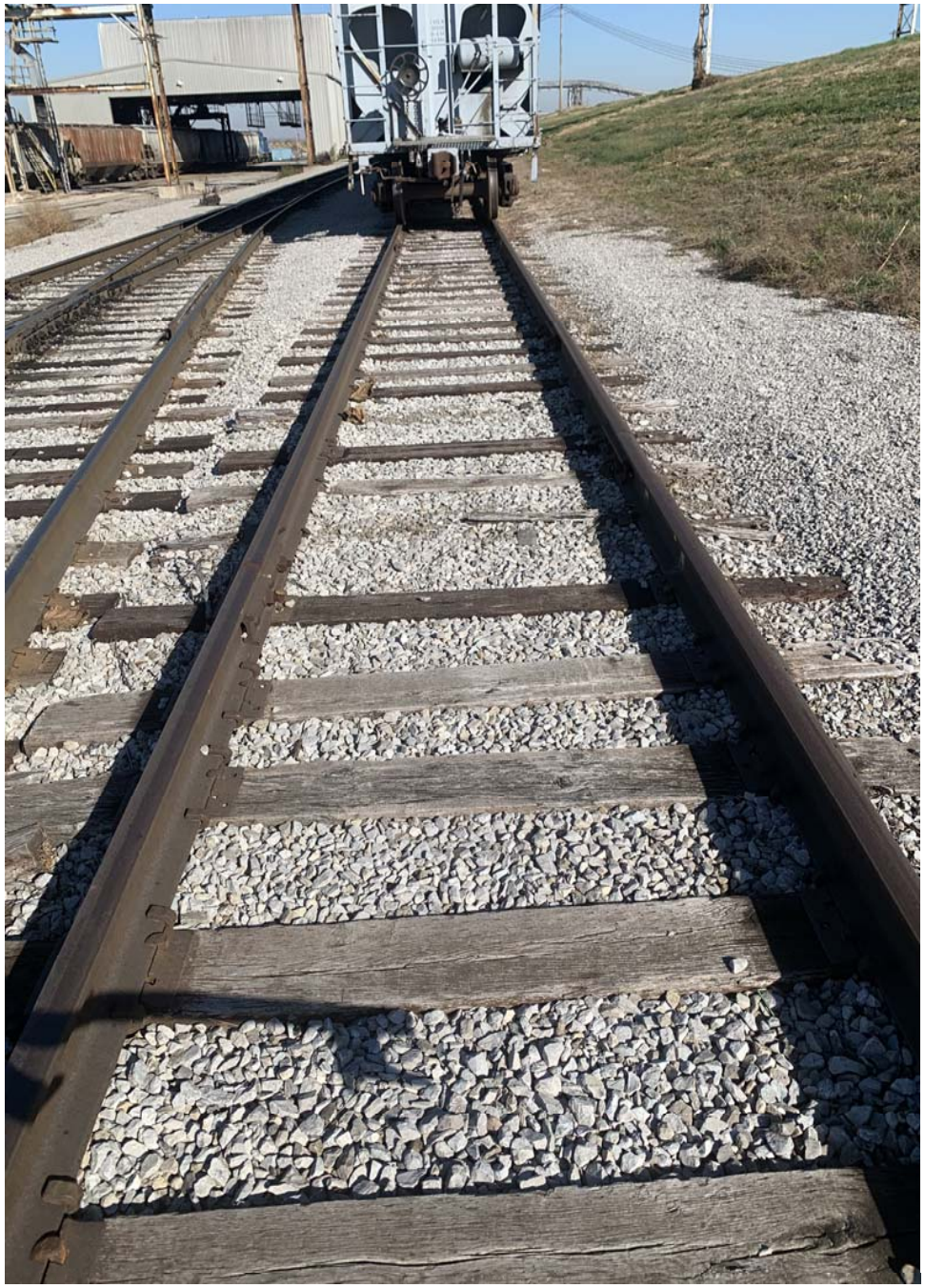
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. GPW(A)

AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. ML(A)





AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. NH#1(A)



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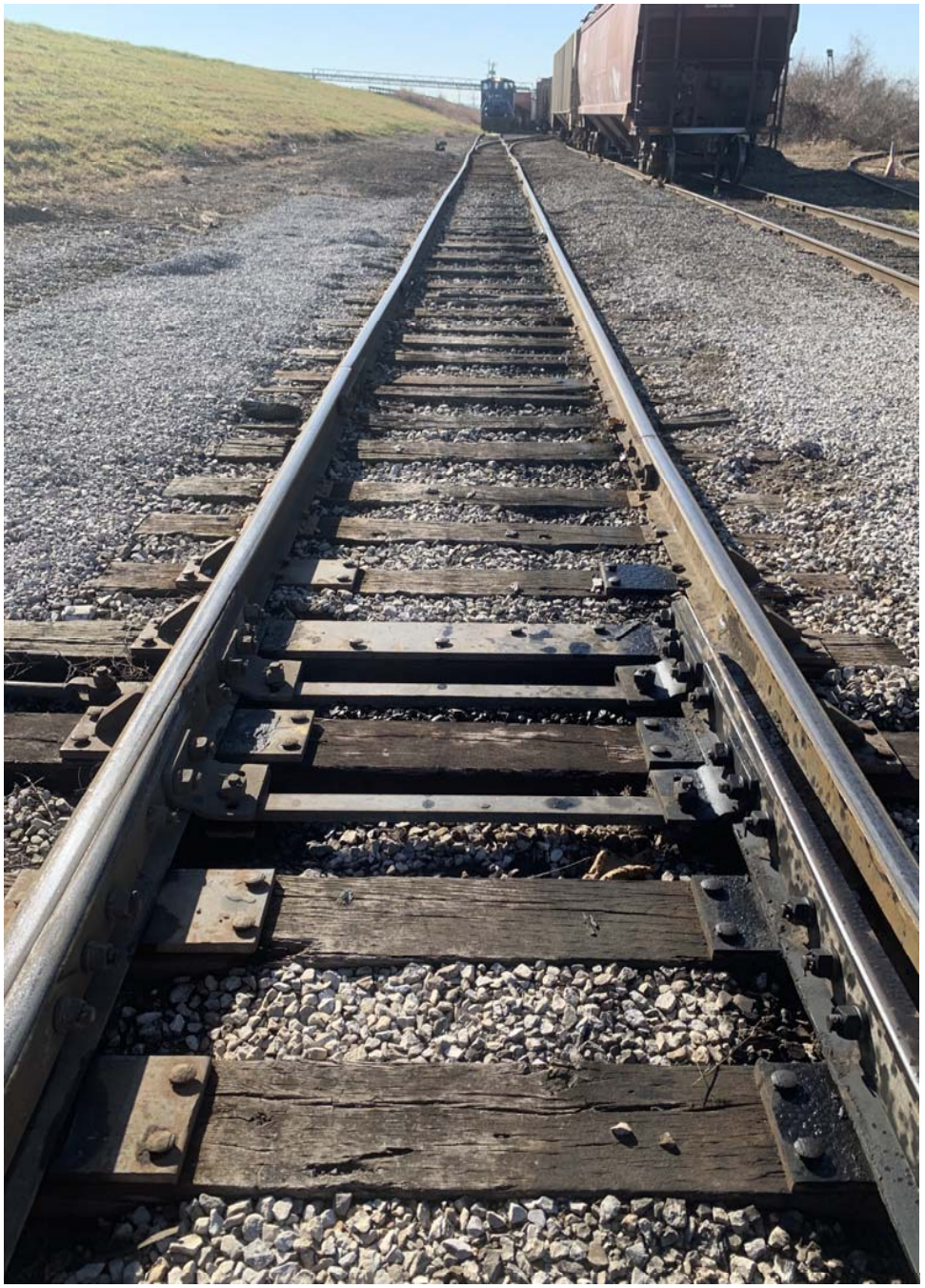

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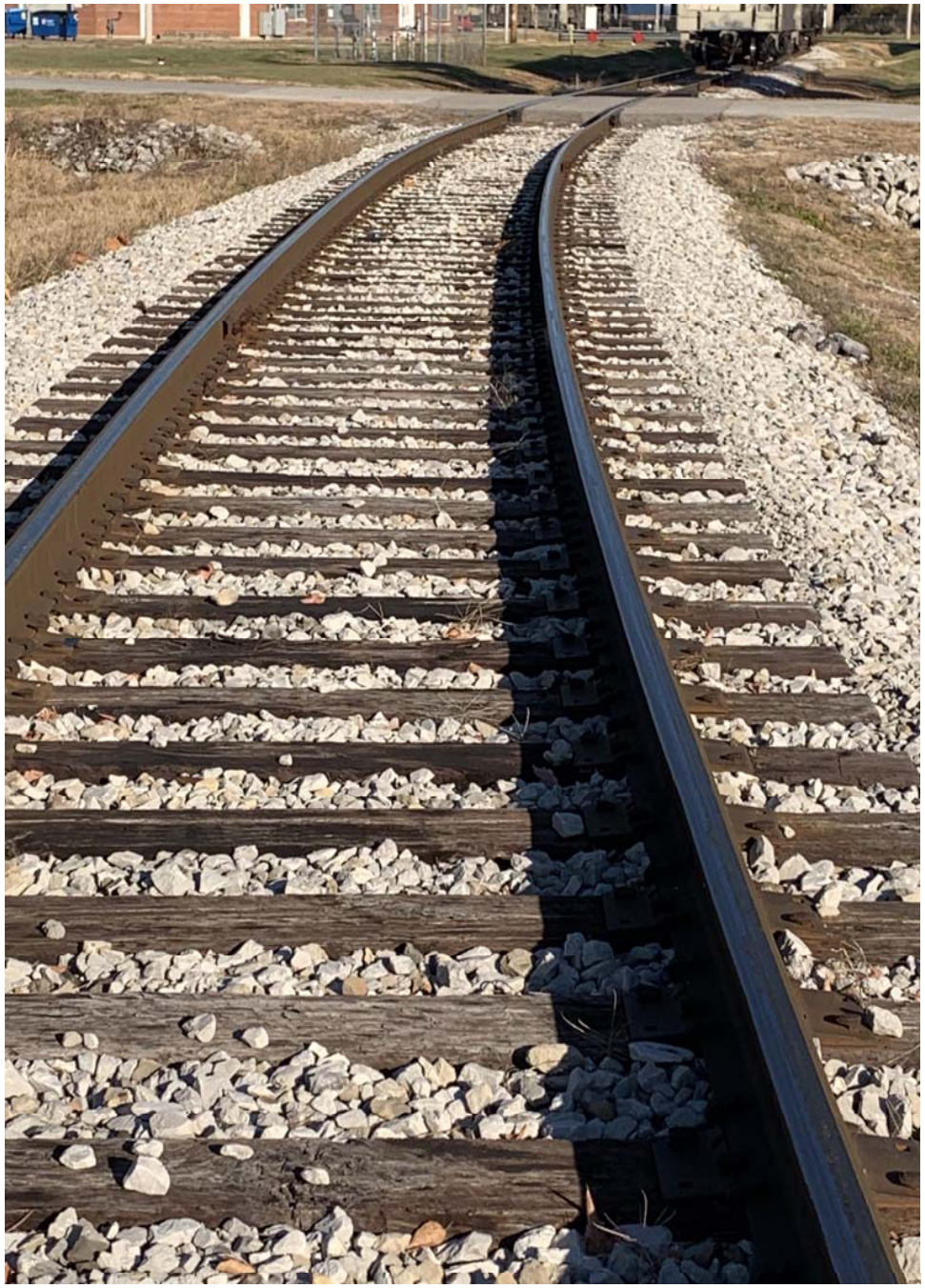

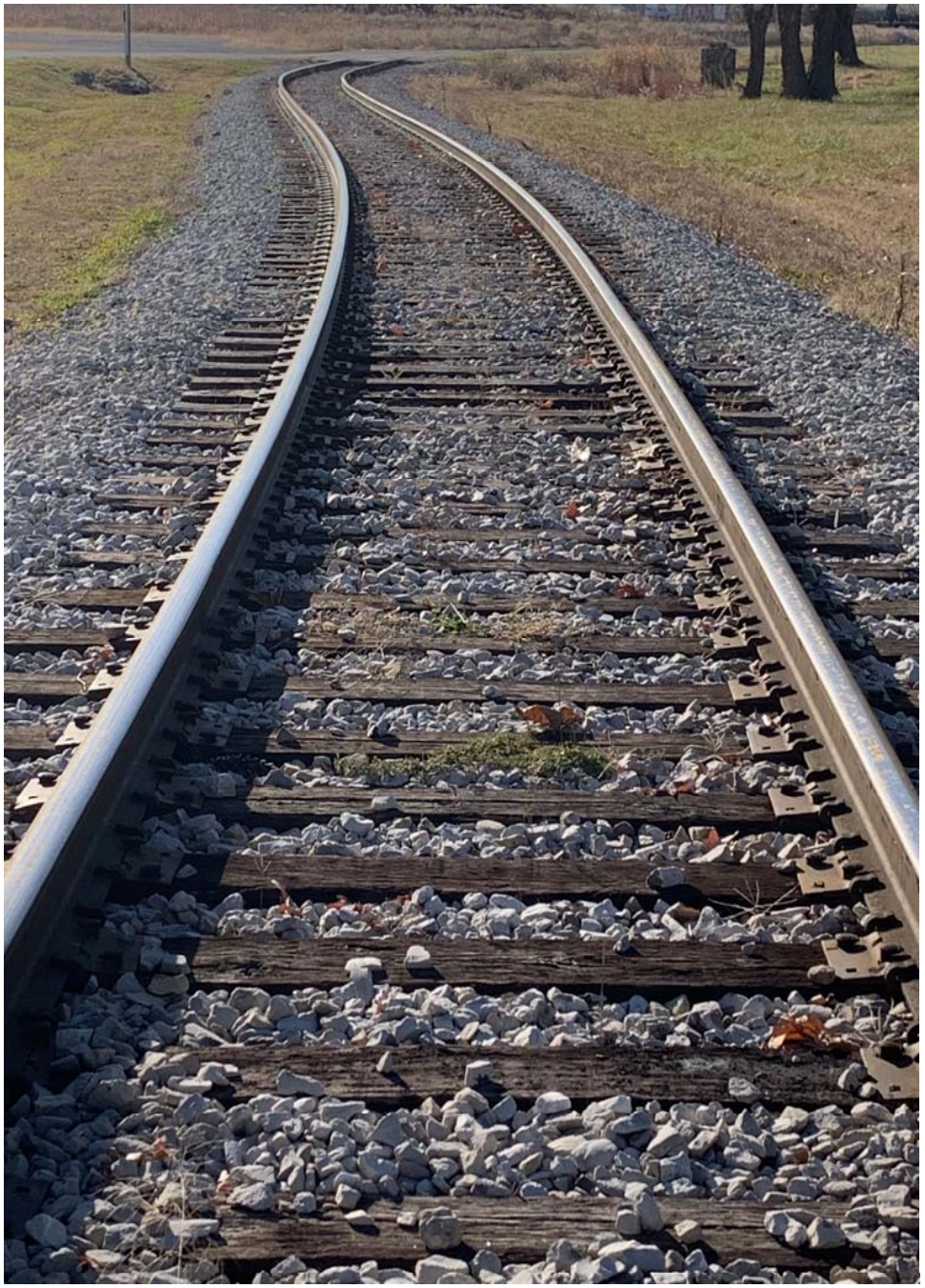

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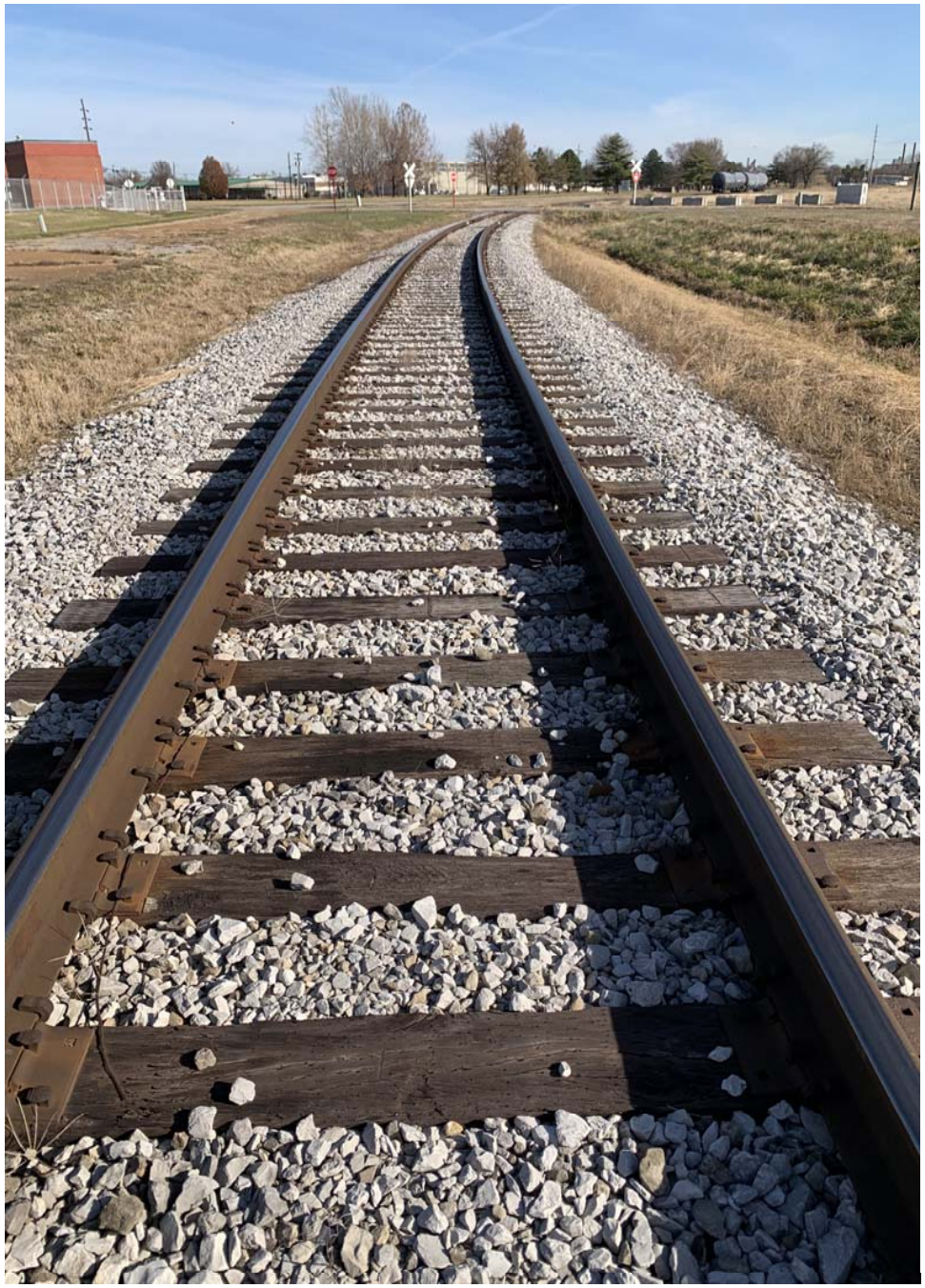
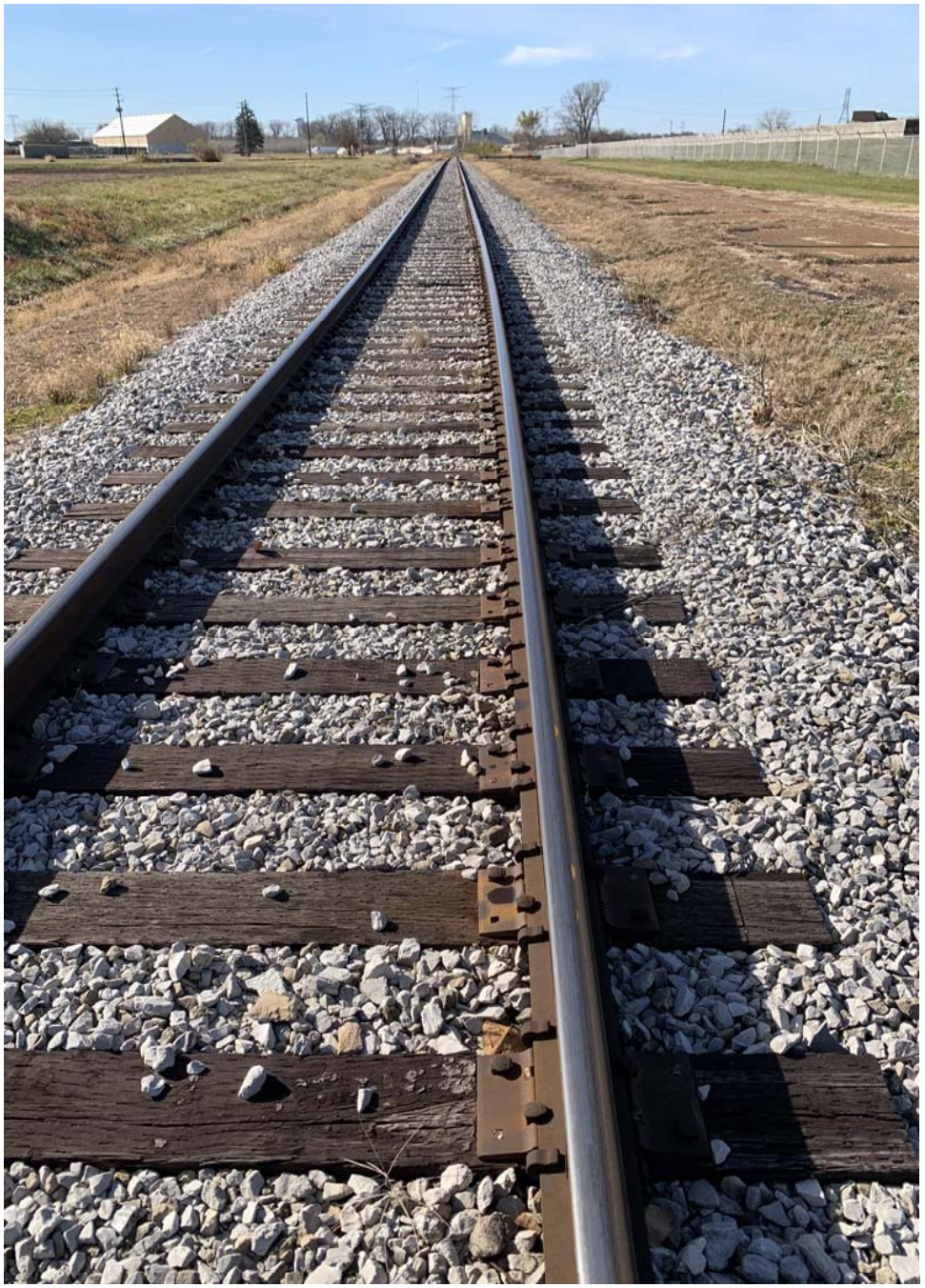
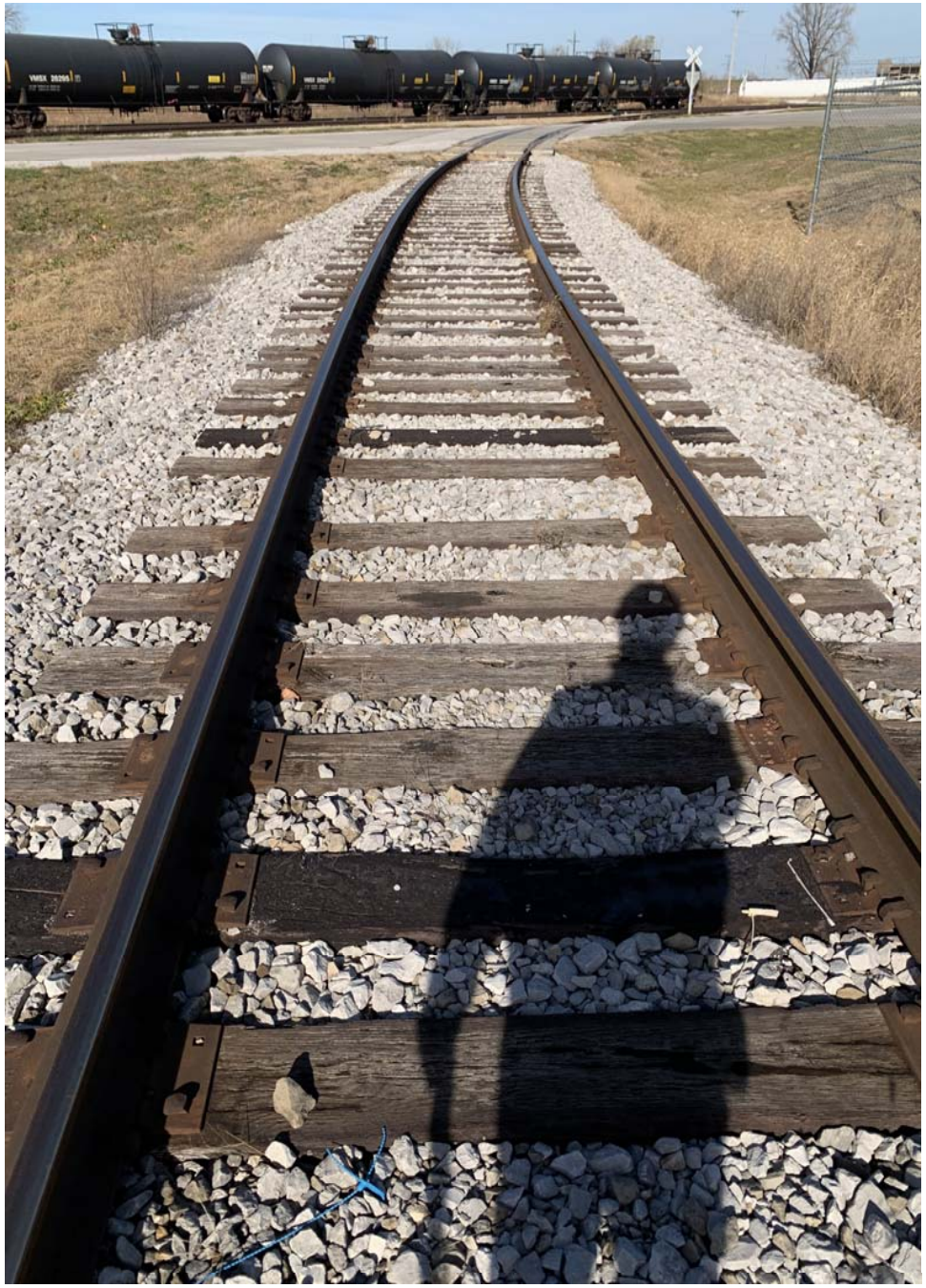
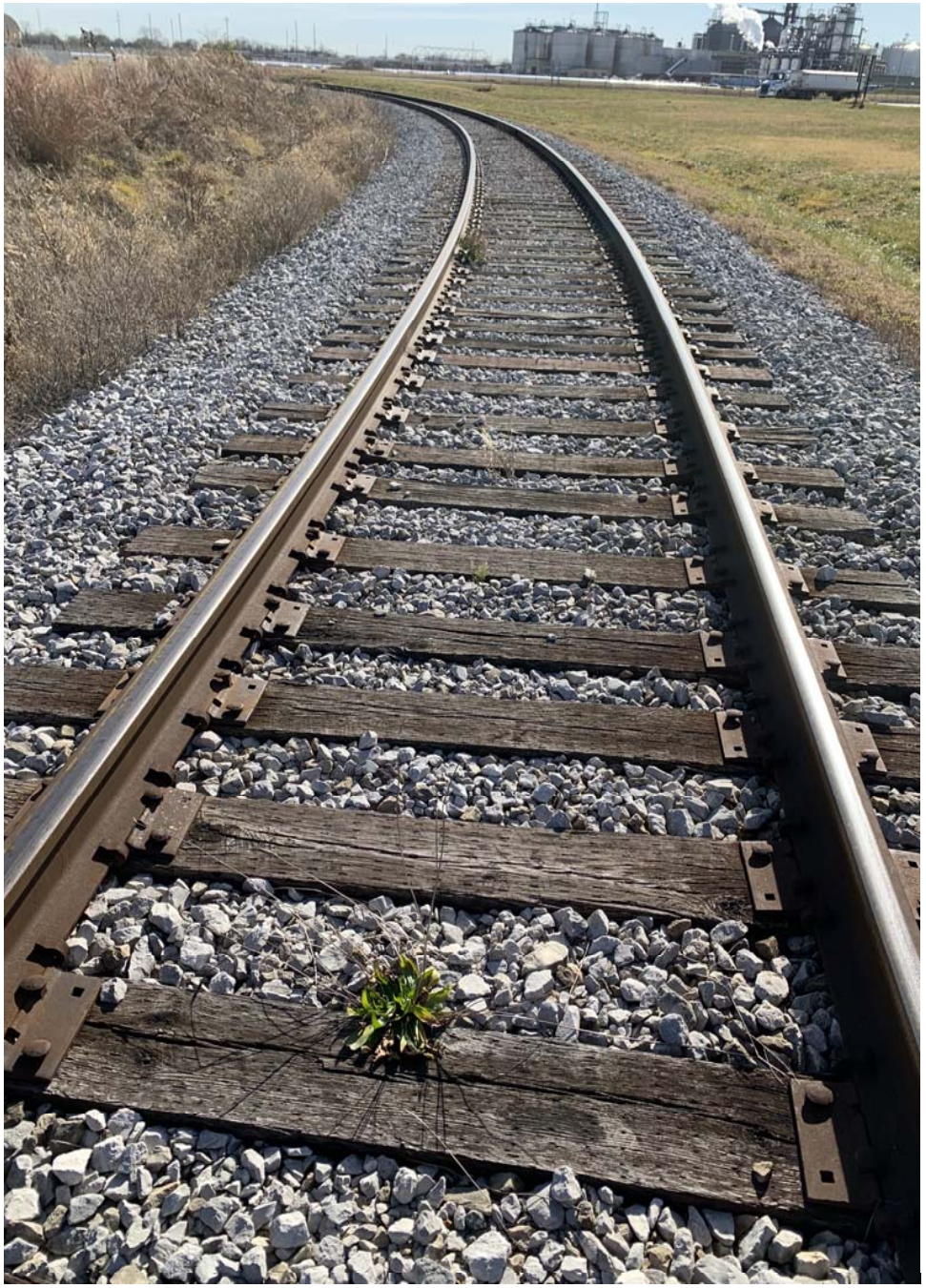




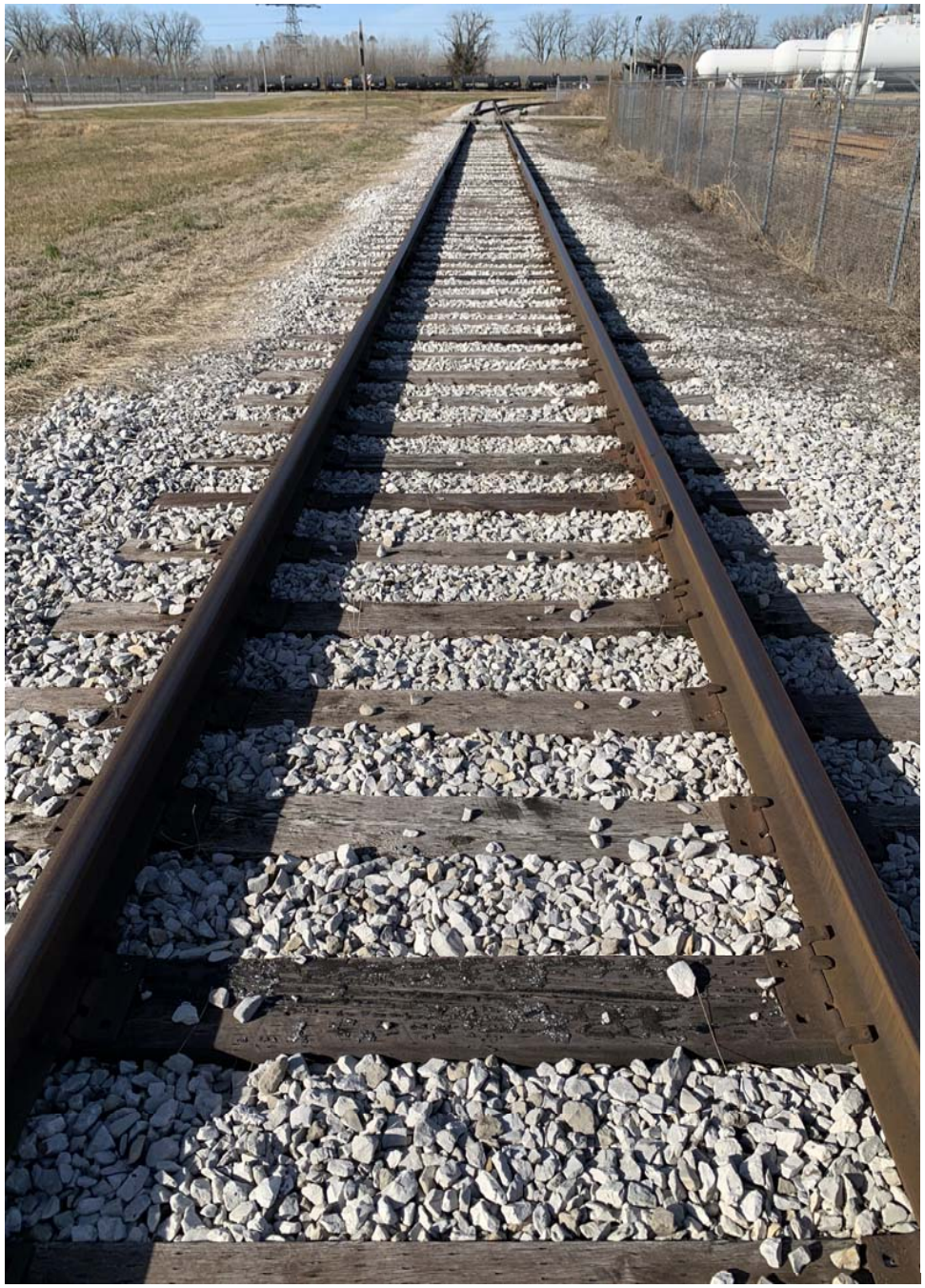
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. NL(C)

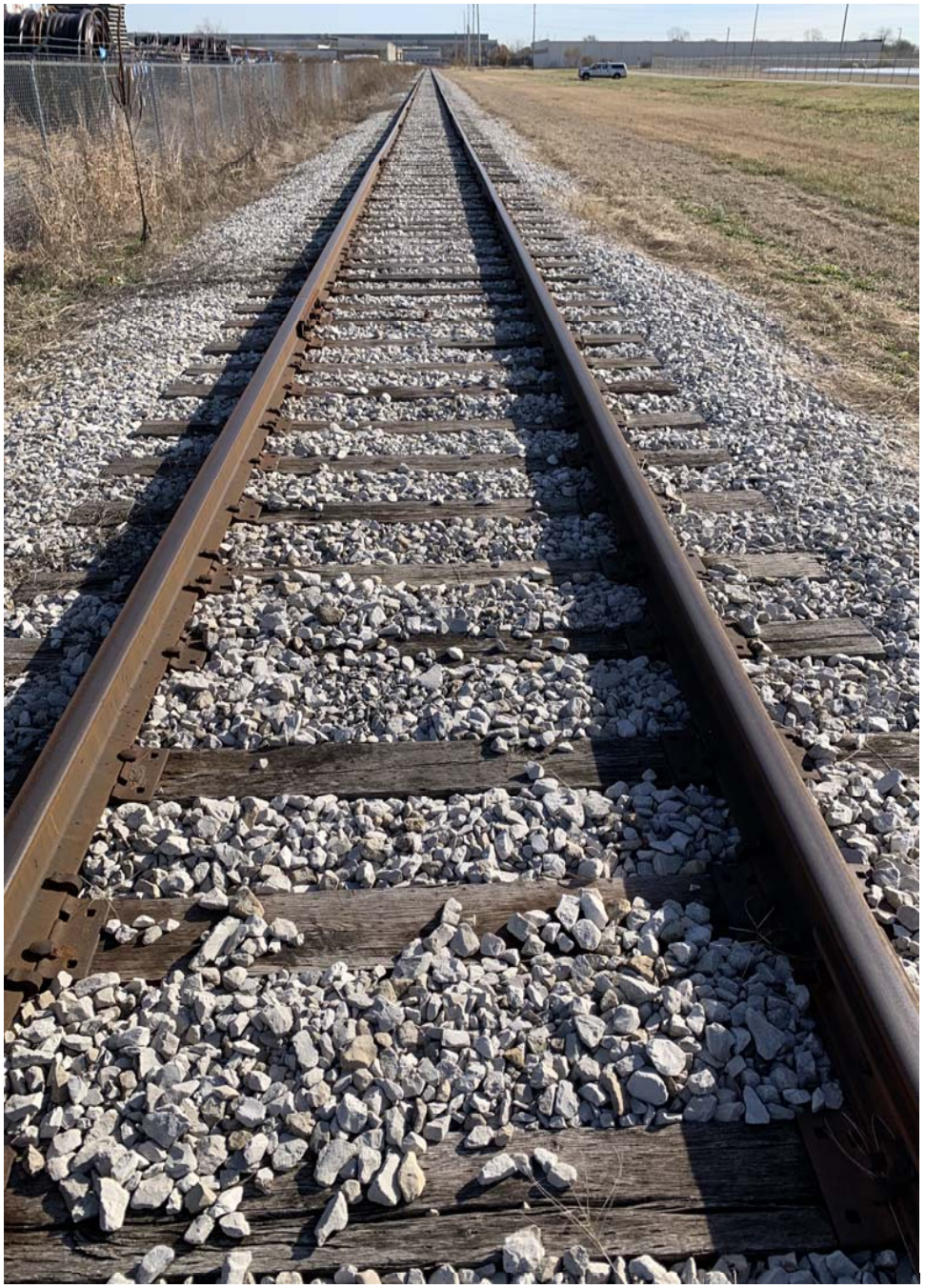
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. NL(D)



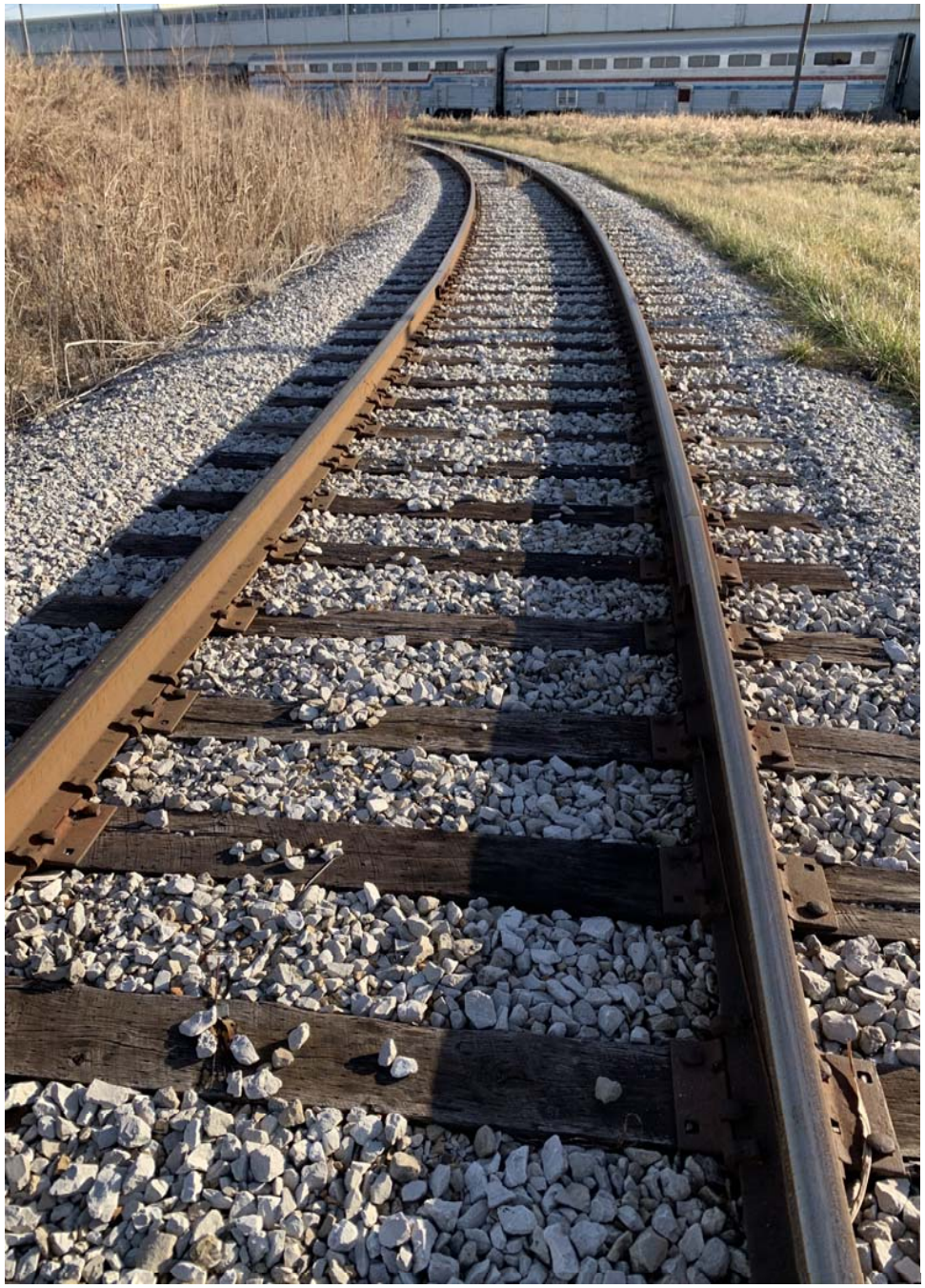


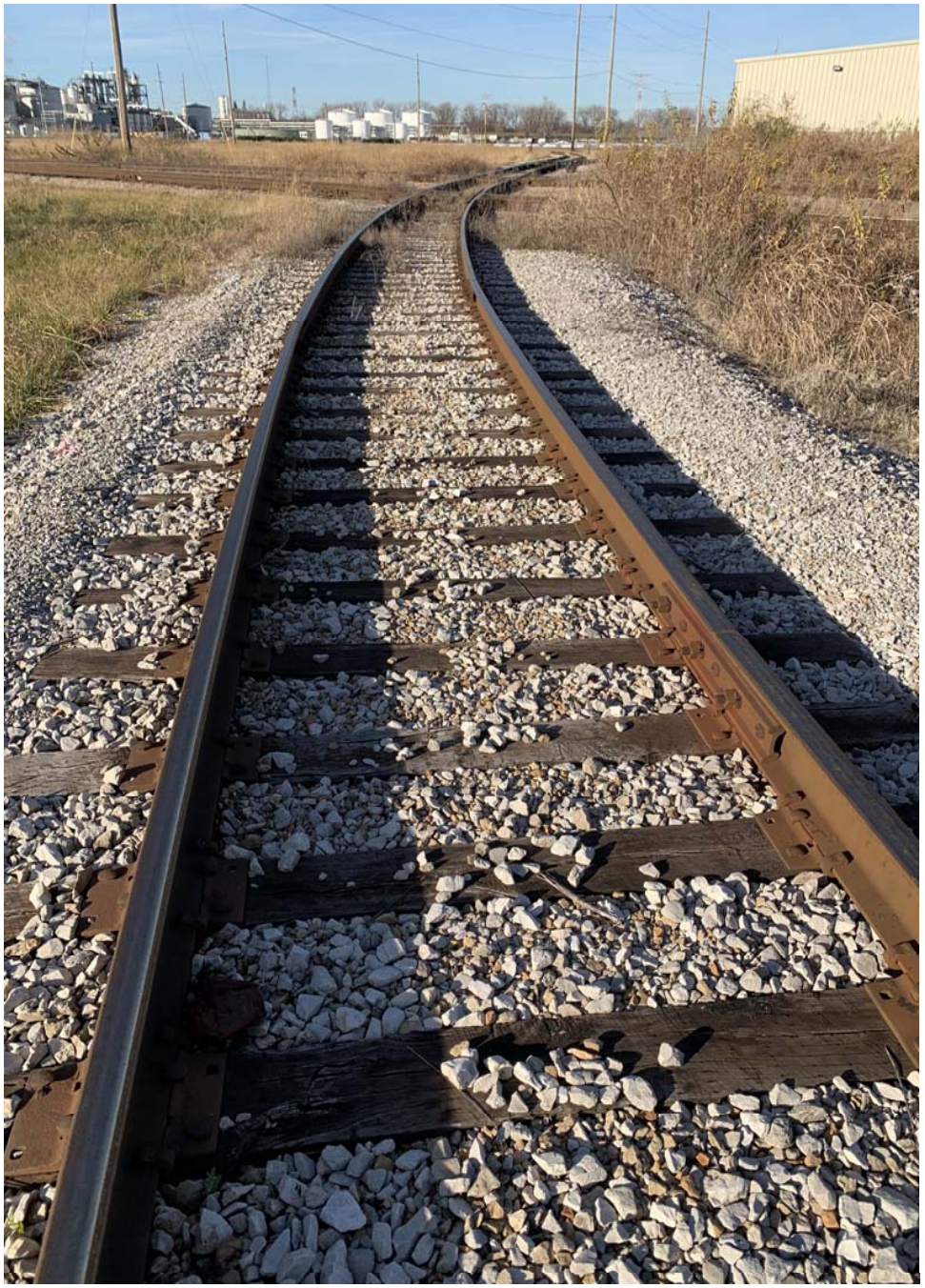
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. NL(E)



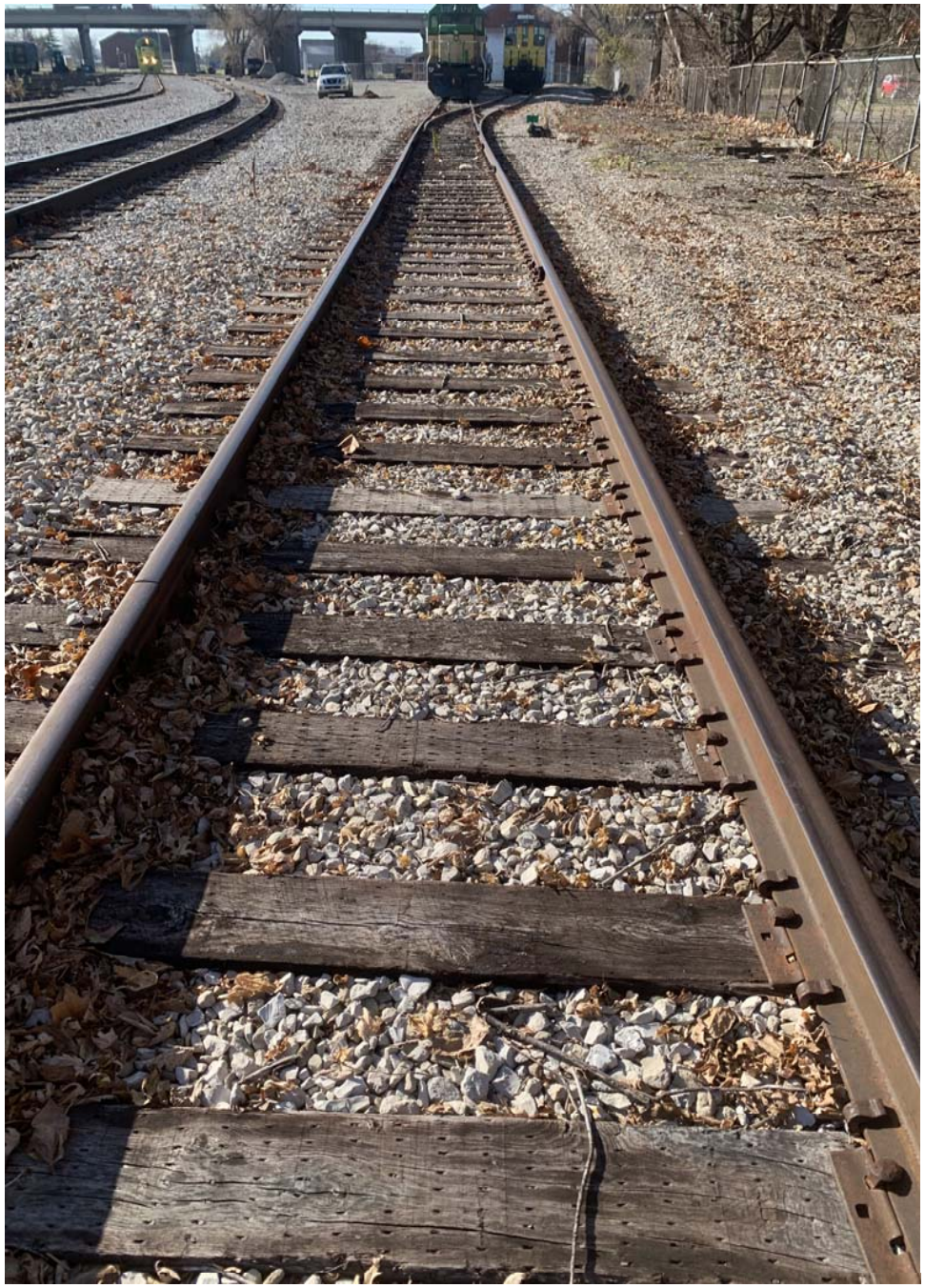


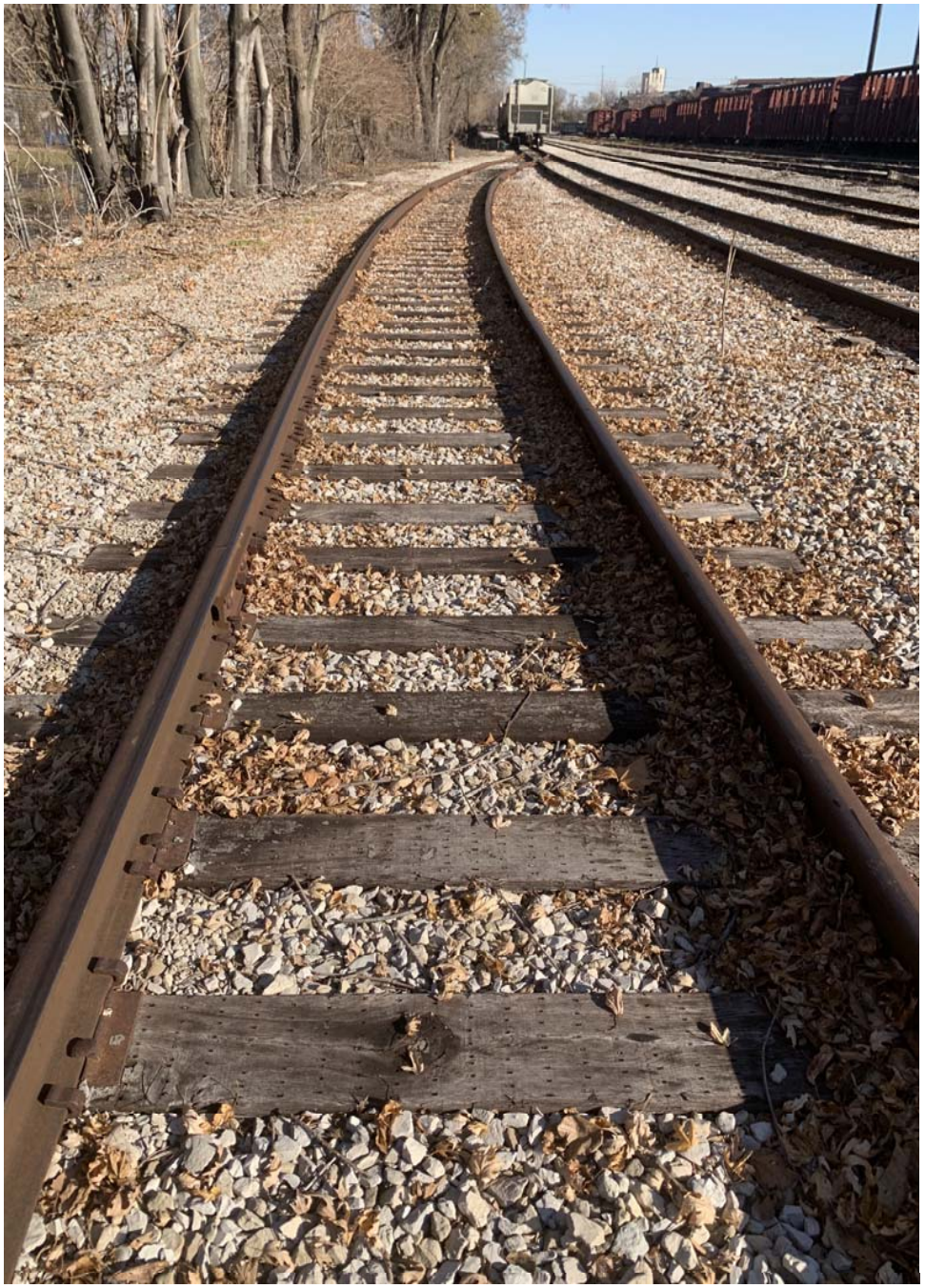
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. NL(F)





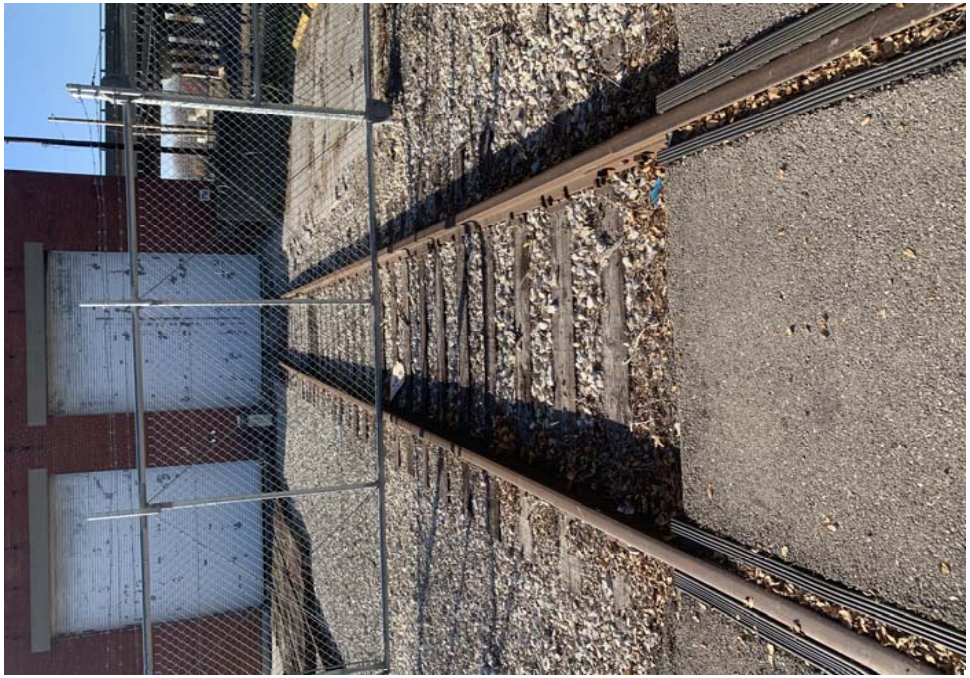
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. PH#01(A)



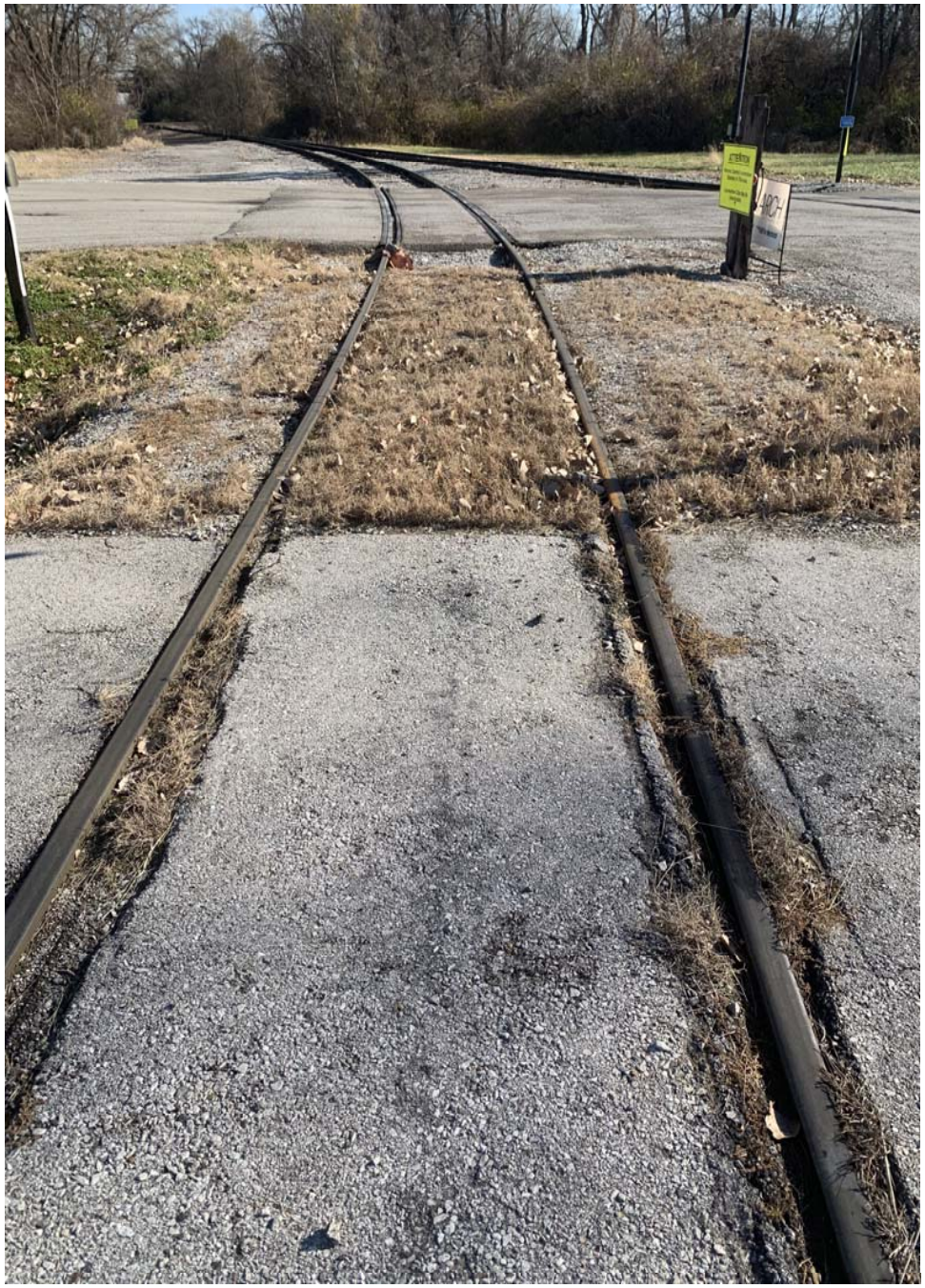


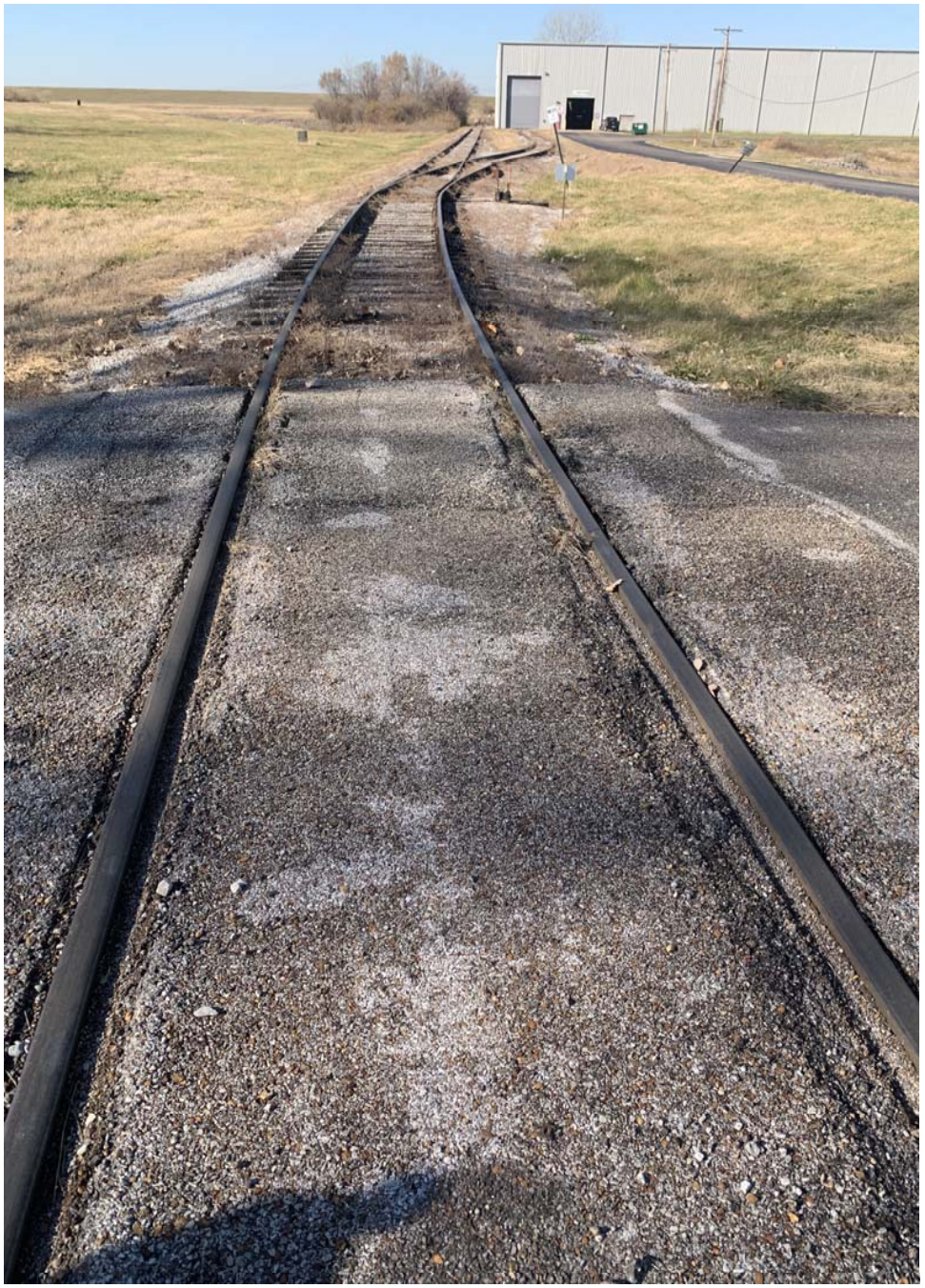
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. PH#01(B)

AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. PH#02(A)



AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. PP#1(A)





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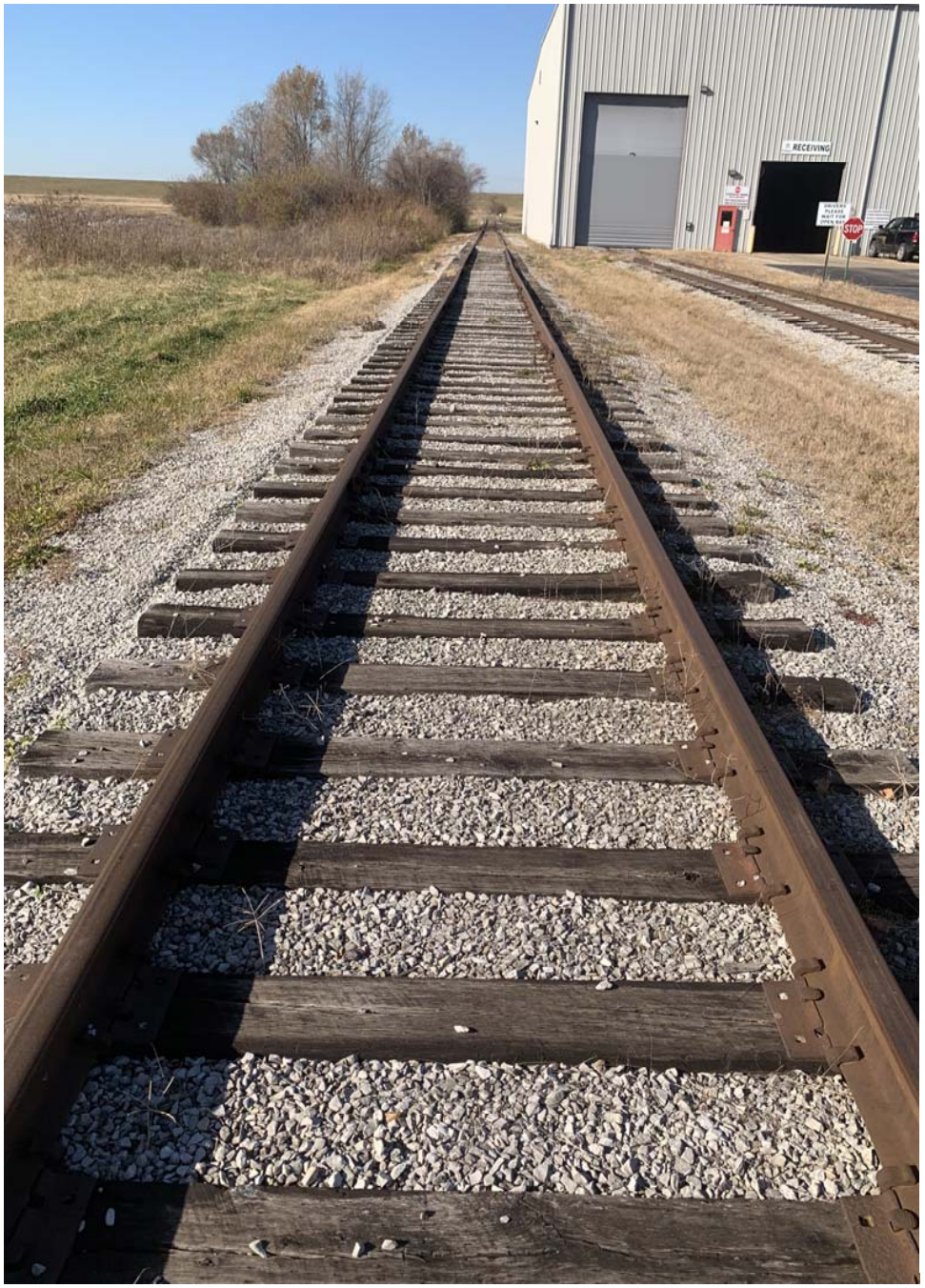

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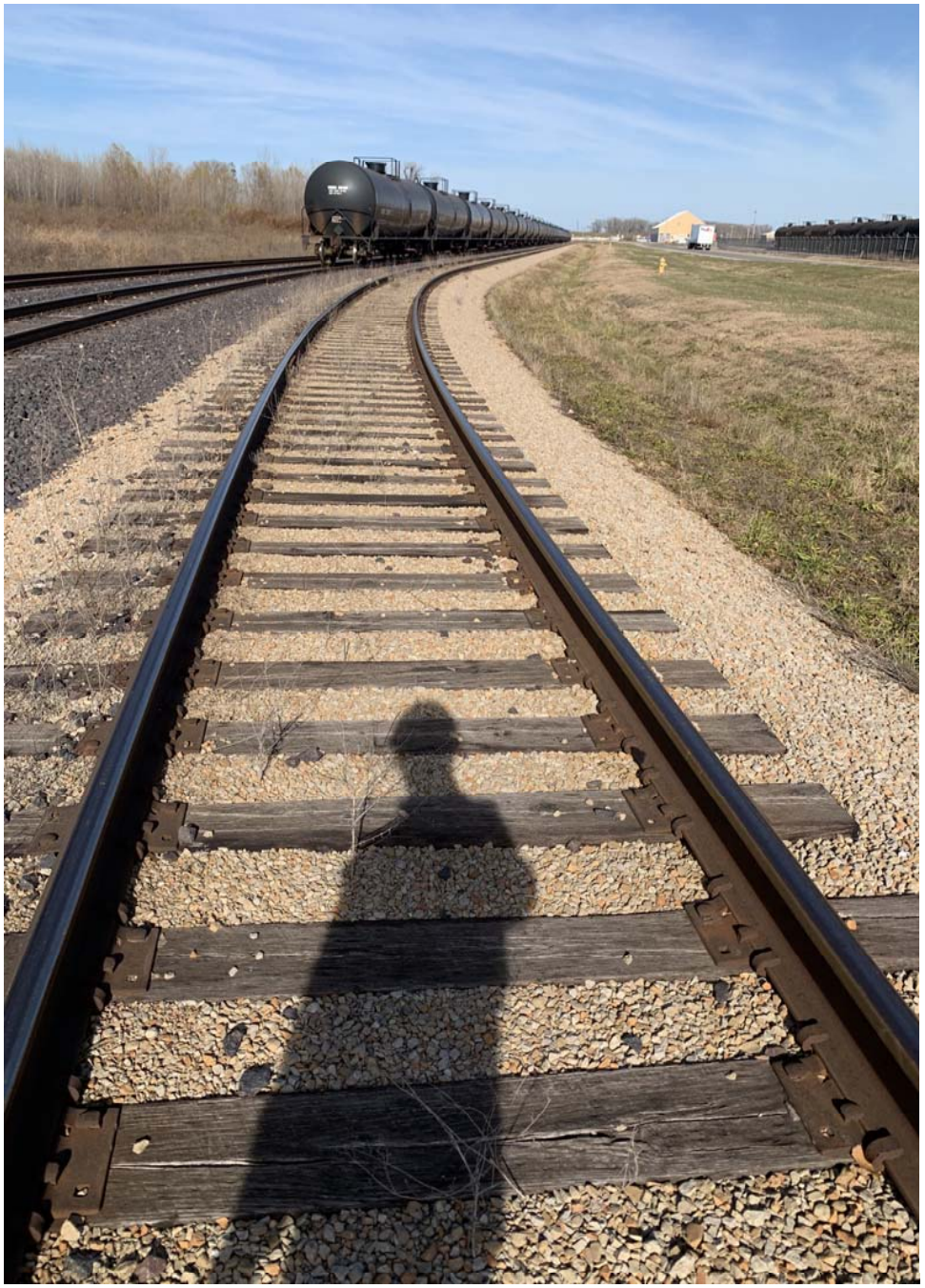

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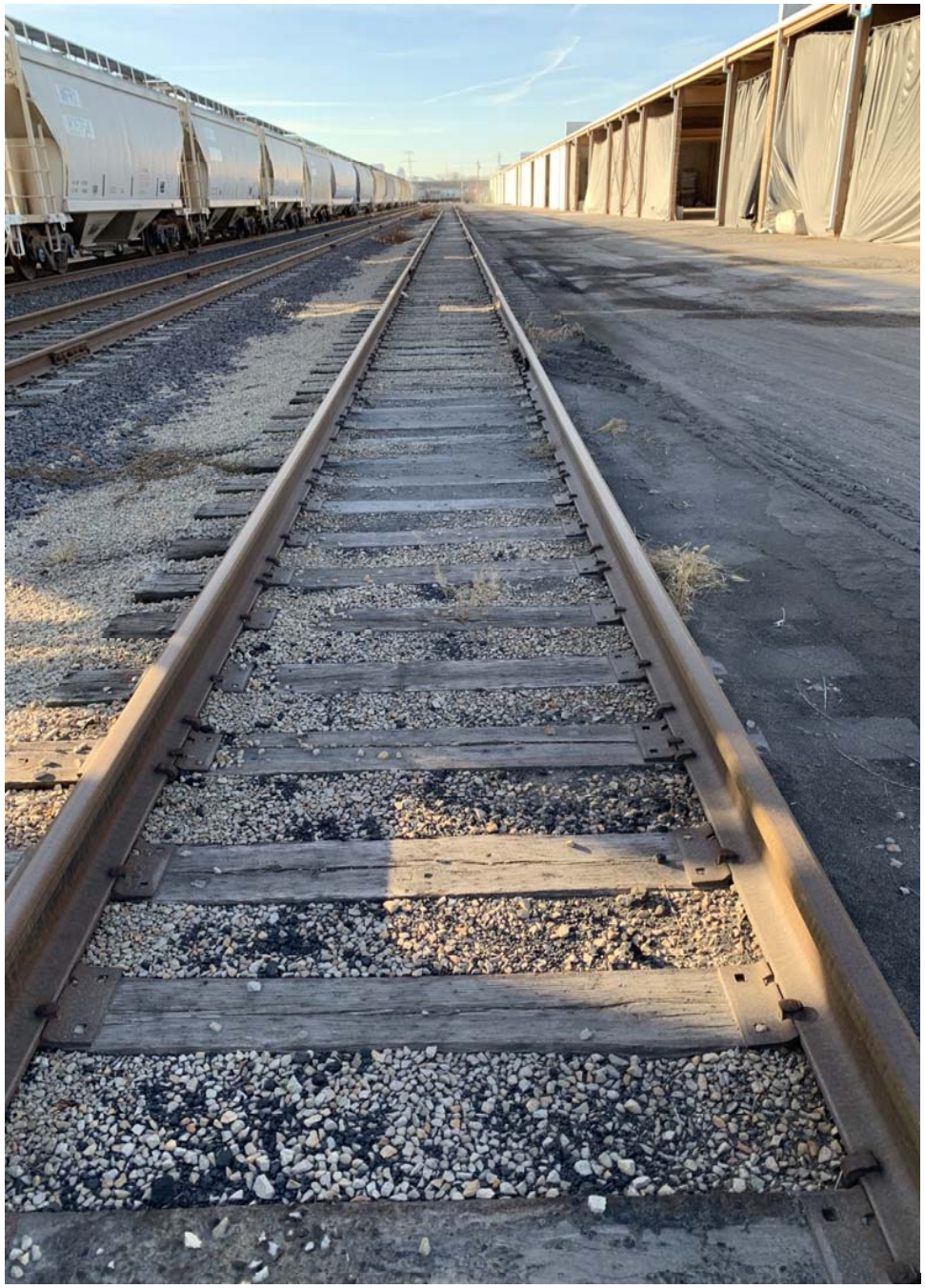
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. SL#1(C)



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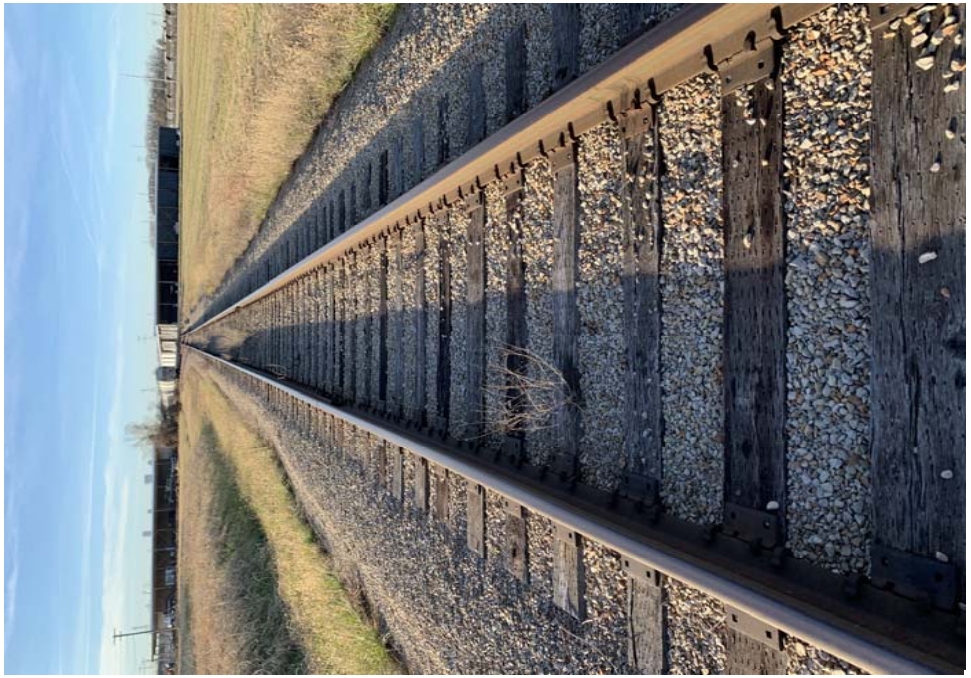

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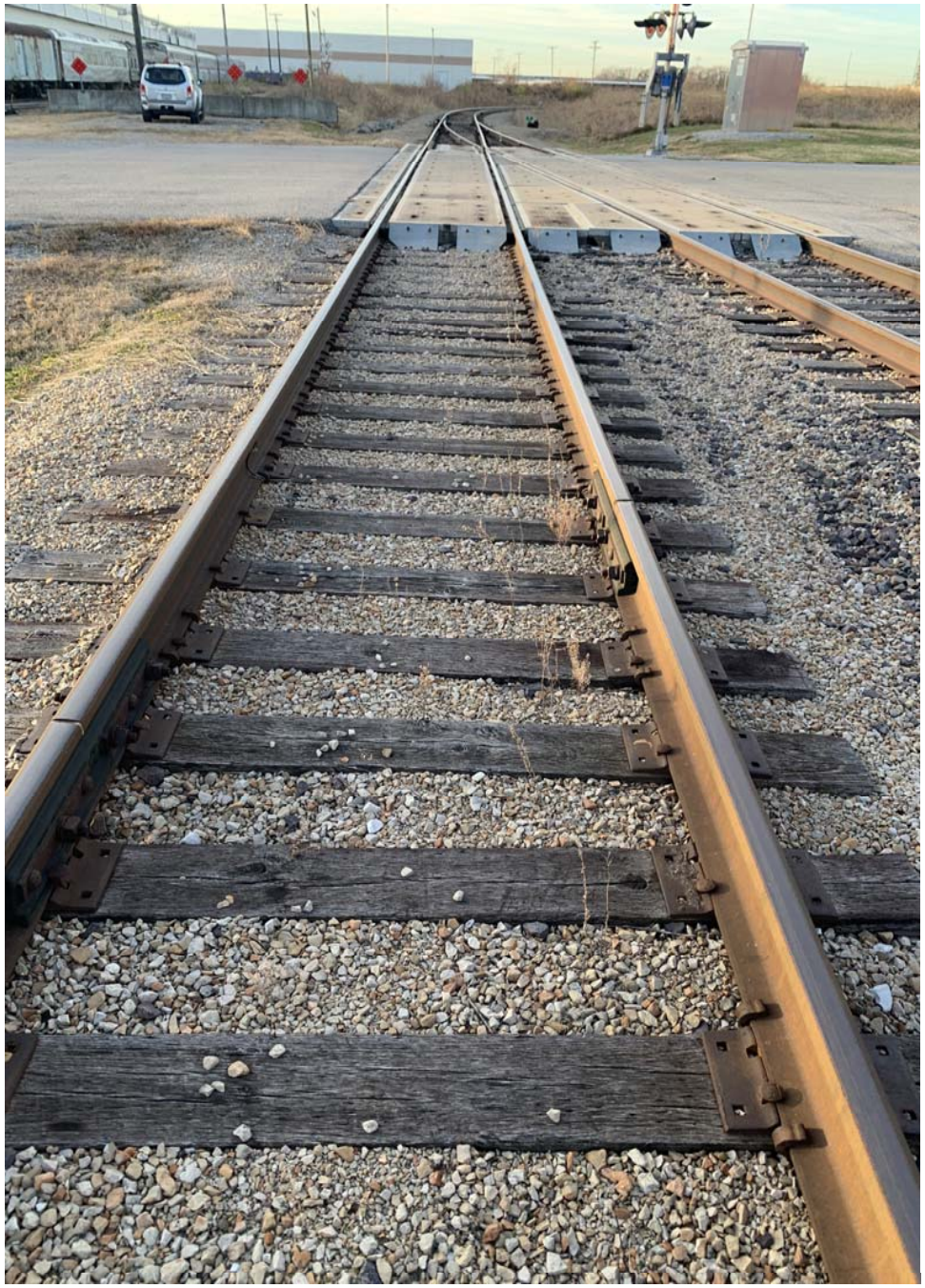
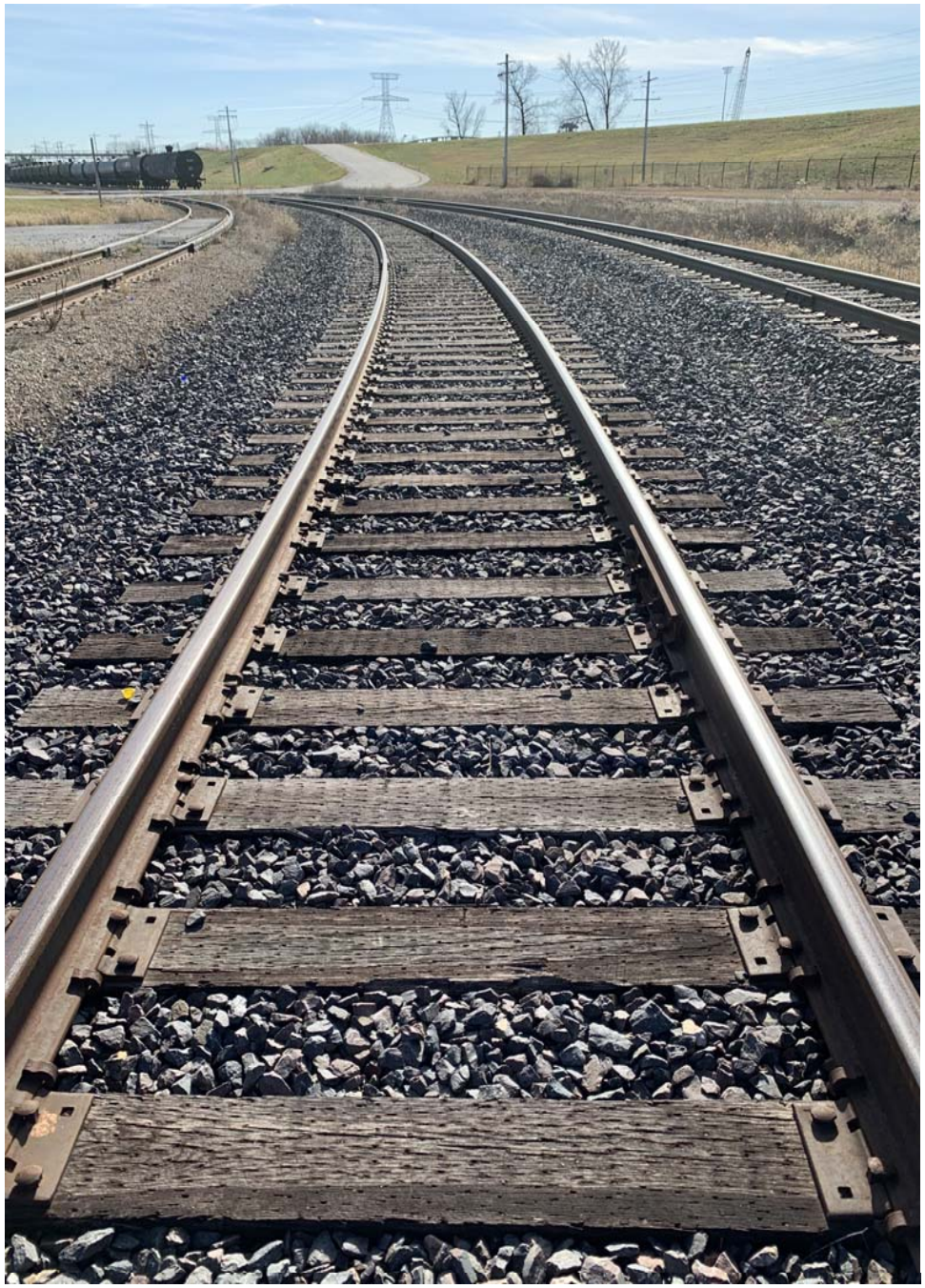
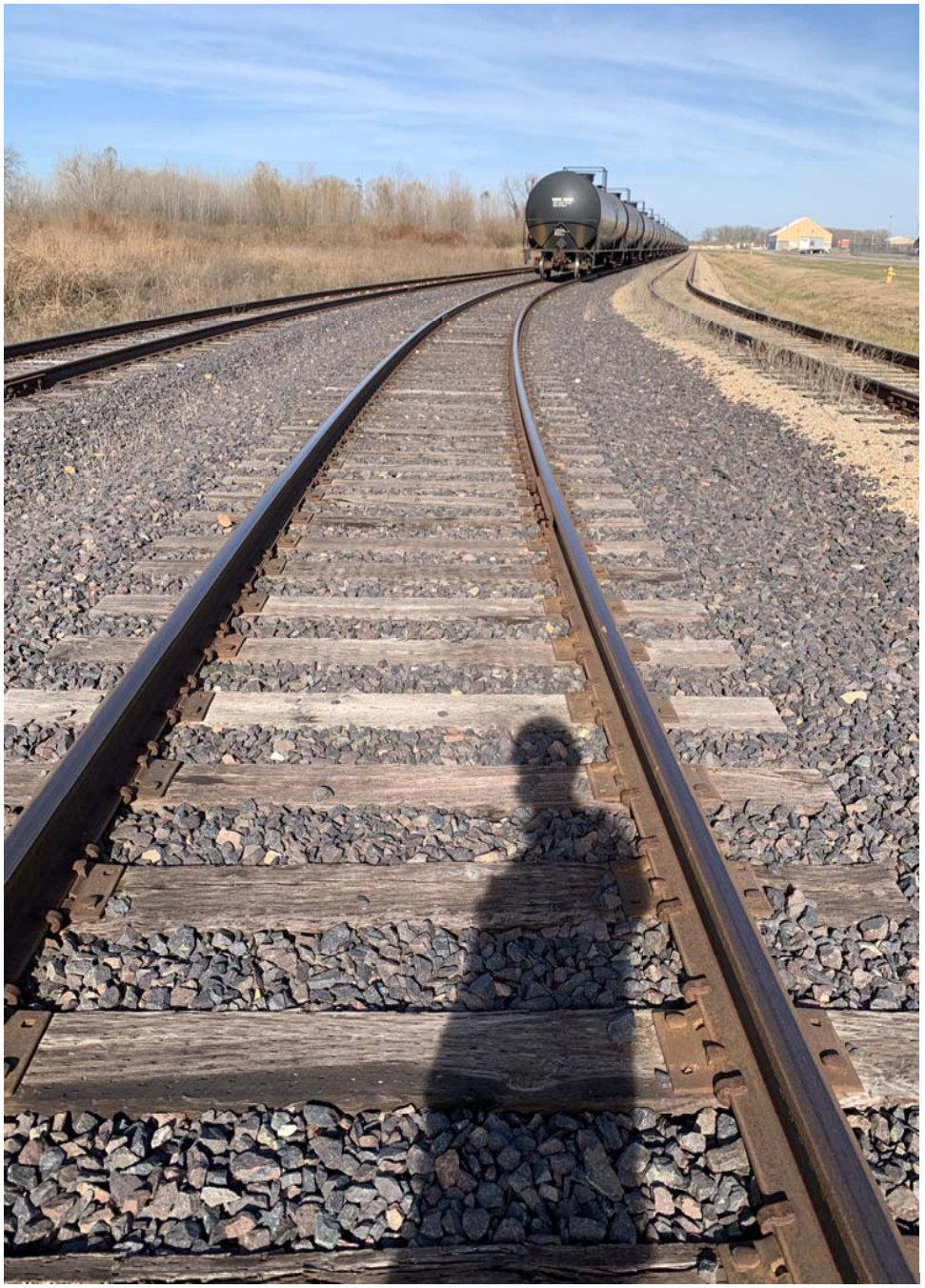


AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. SL#2(A)





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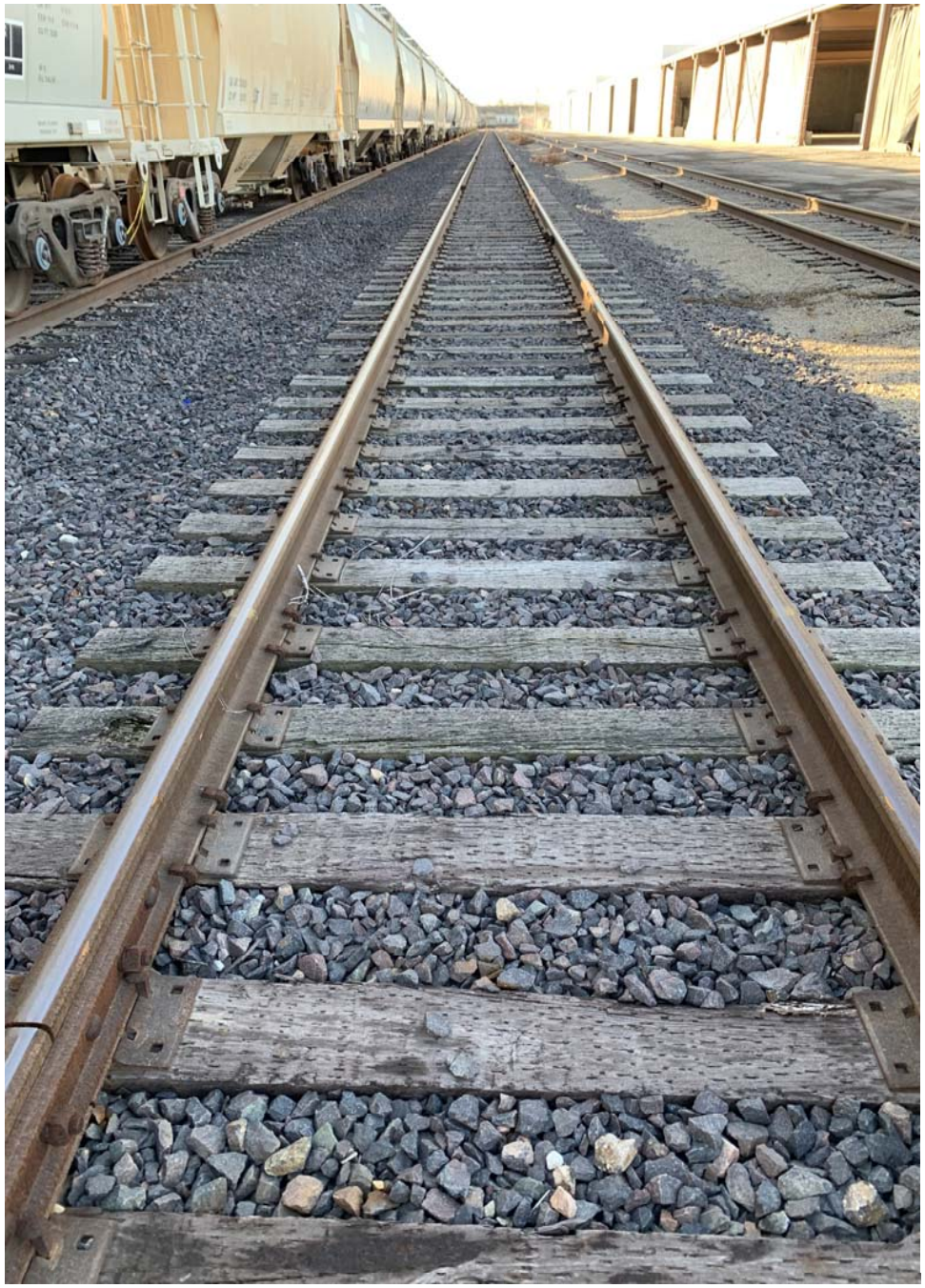
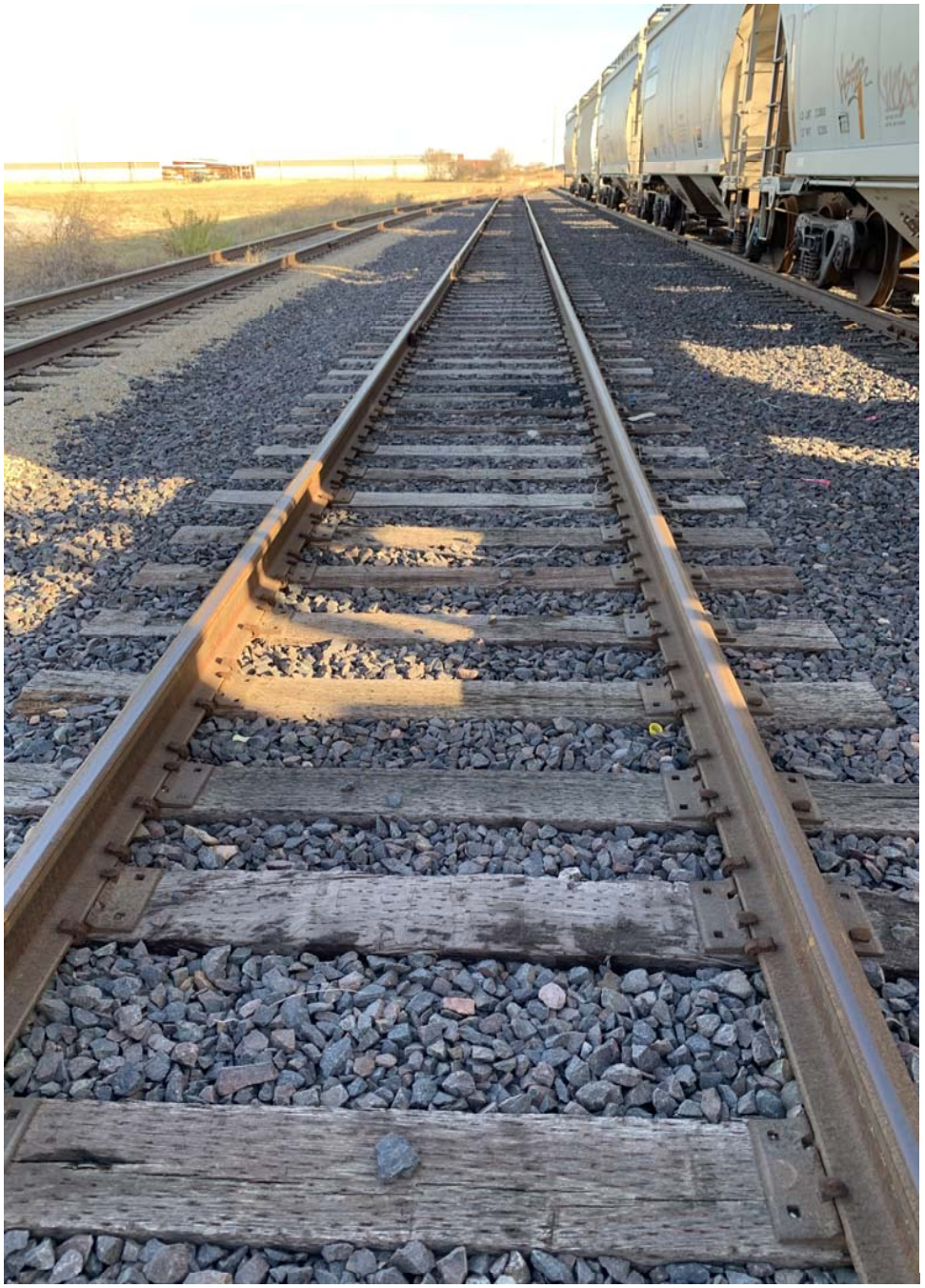
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. SL#2(C)

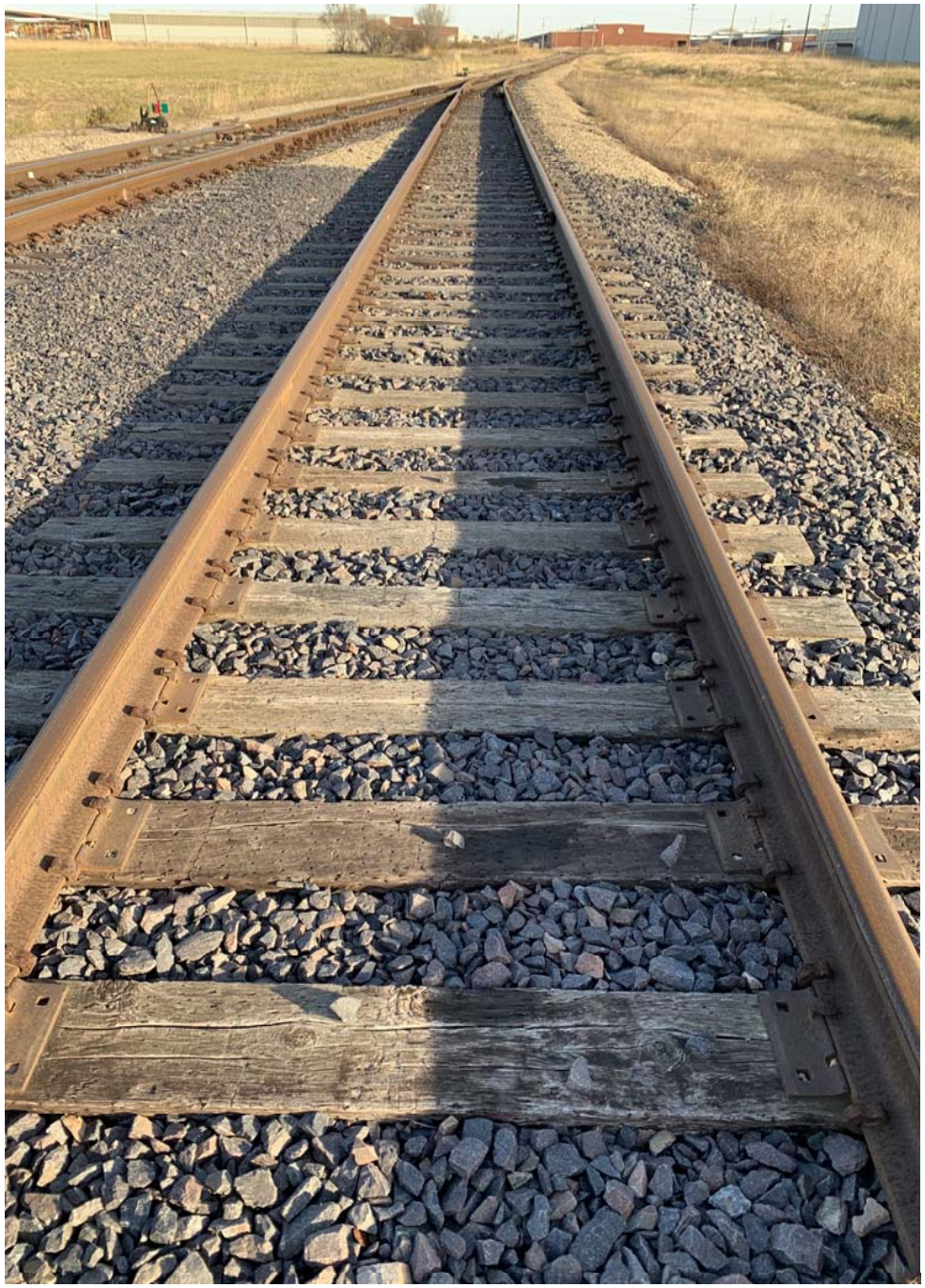


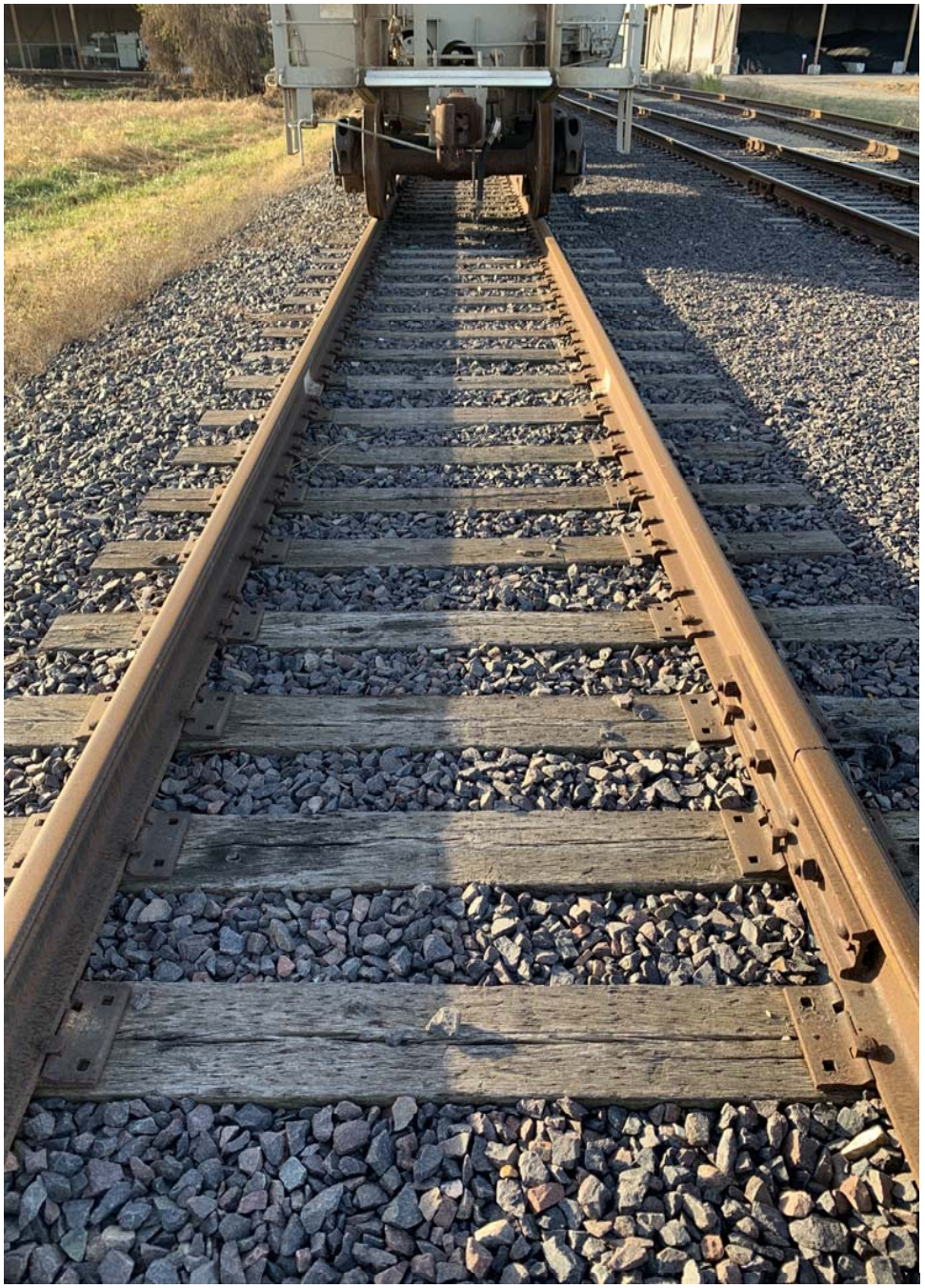


AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. SL#3(A)

AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. SL#3(B)

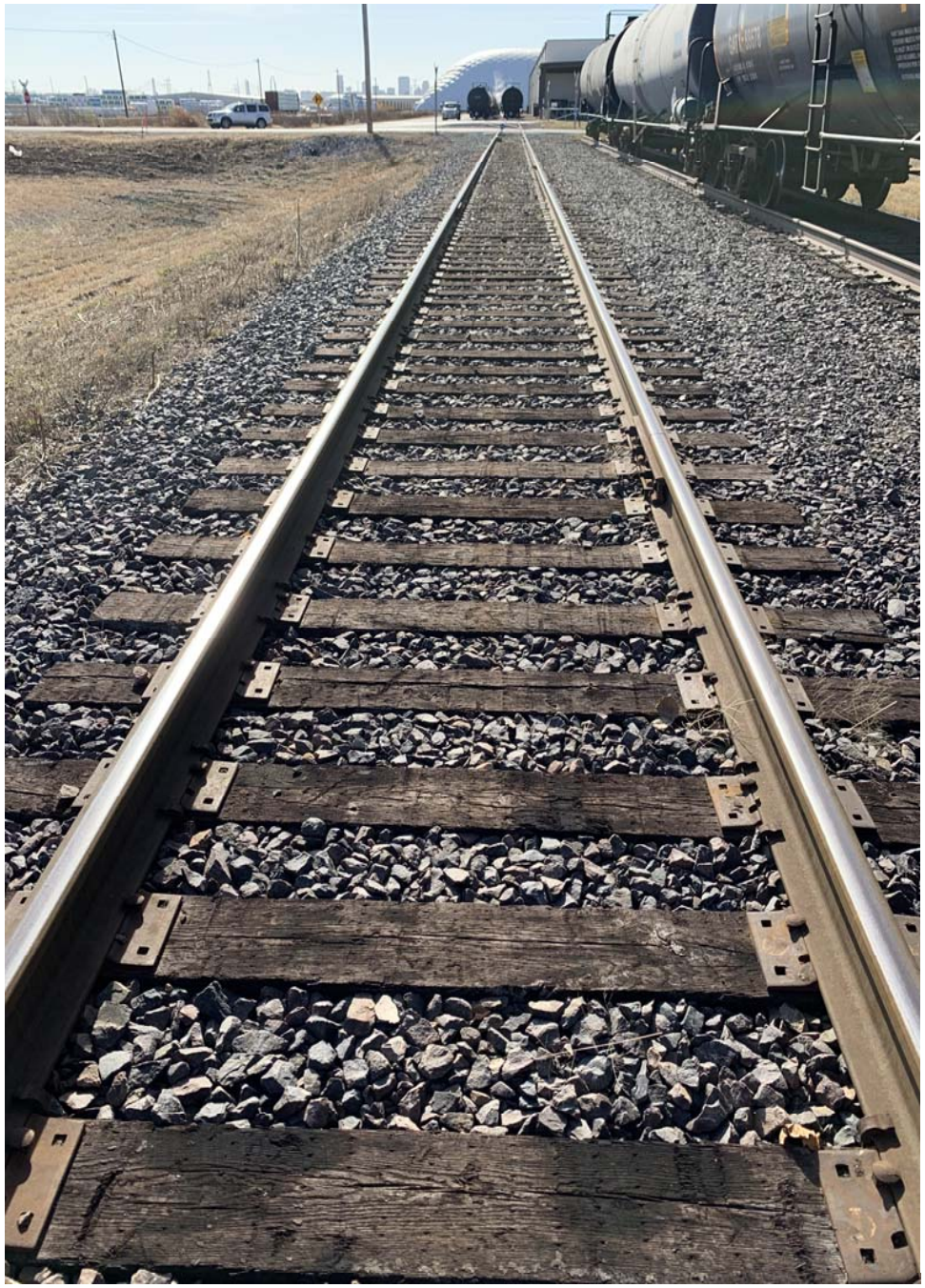
AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. SL#3(C)





AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. WH#1(A)

AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. WH#1(B)



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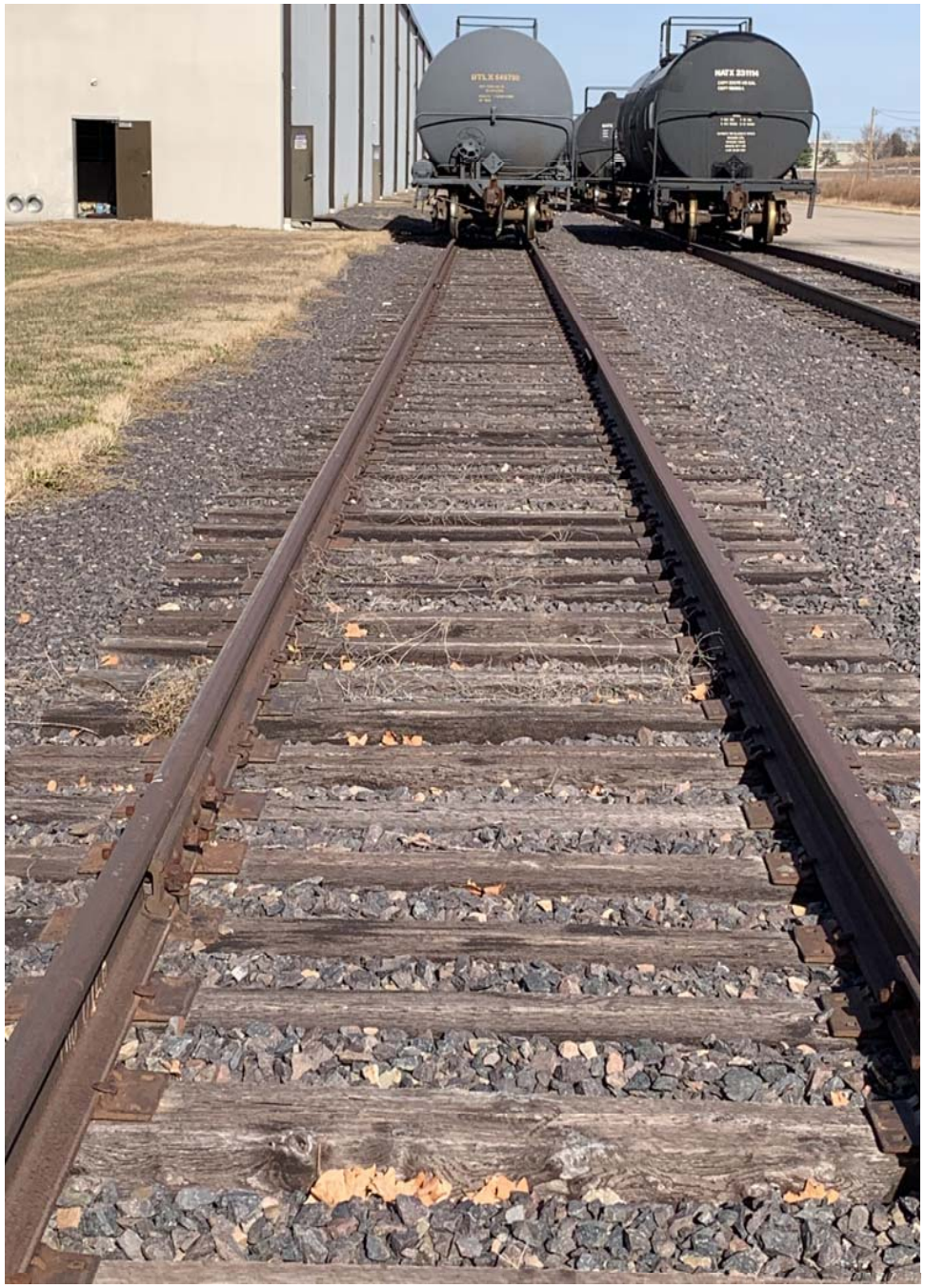
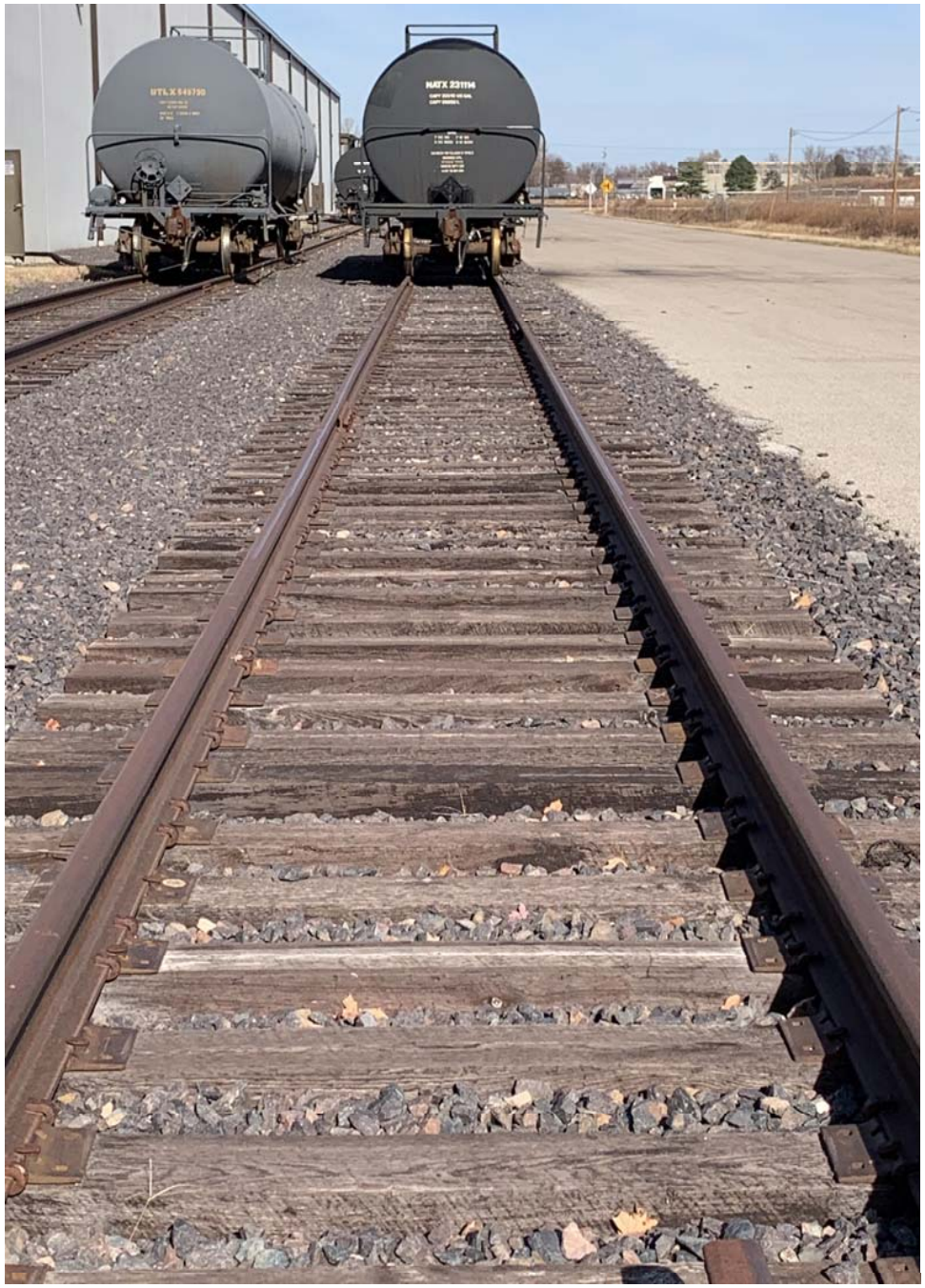
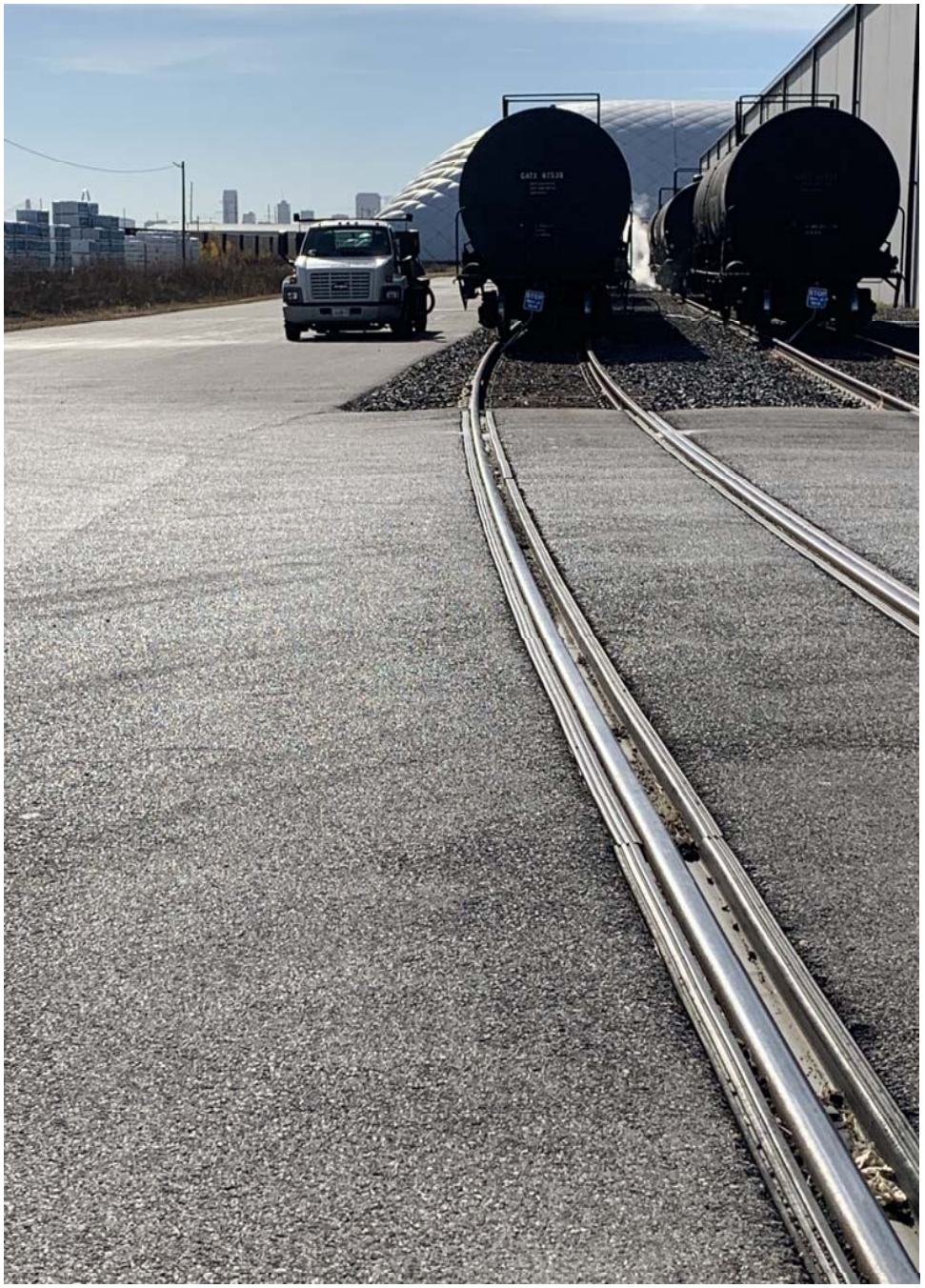


AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. WH#2(A)

AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. WH#3(A)

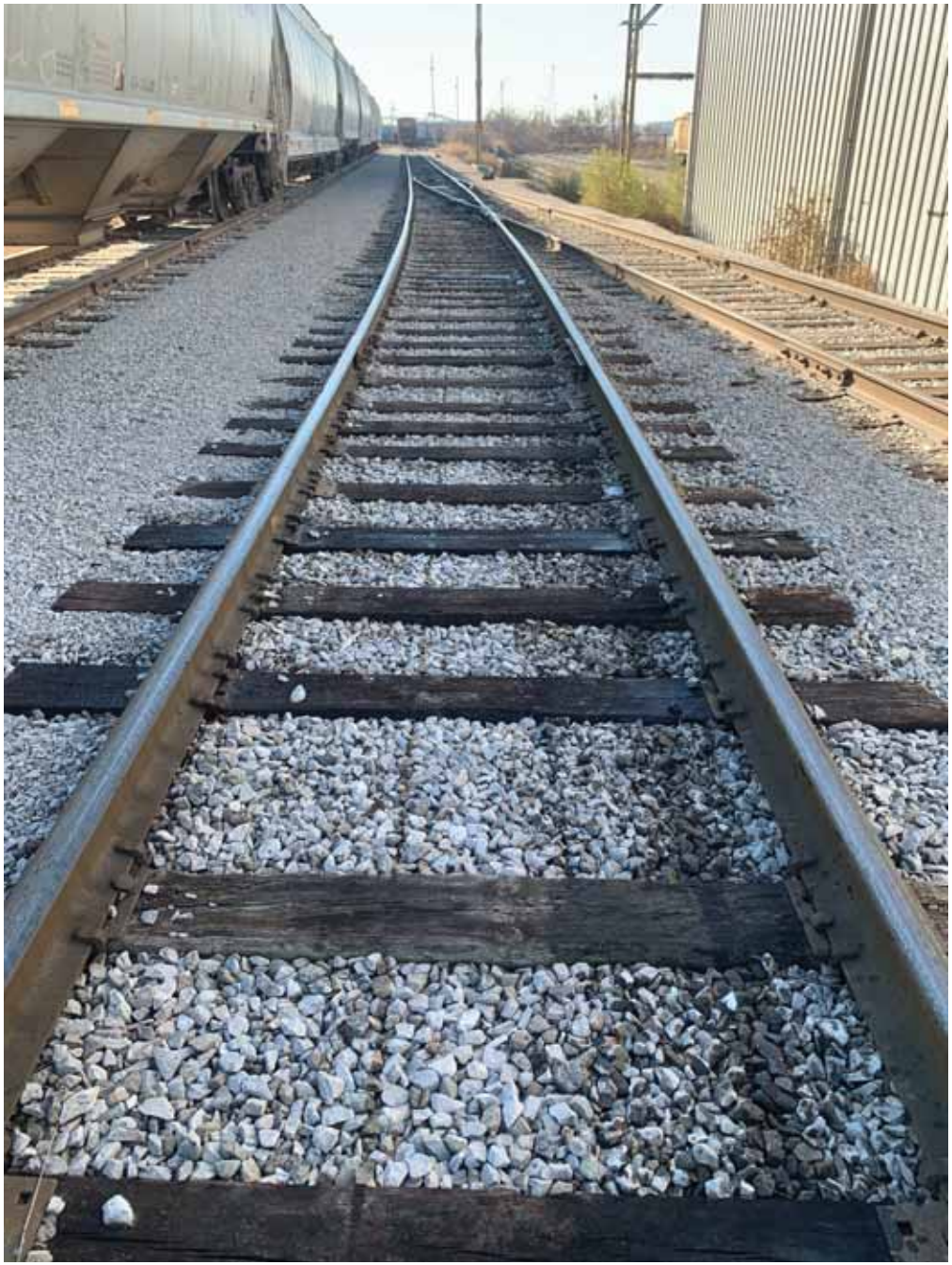




AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. WH#4(A)

AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. WH#4(B)

AMERICA'S CENTRAL PORT PHOTOS OF TRACK SECTION - I.D. XVR#4(A)



AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
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Appendix G

America's Central Port Inventory of Rail Crossings

AMERICA'S CENTRAL PORT INVENTORY OF RAIL CROSSINGS

Designation	RX-01	RX-02
Line of Heavy Traffic	NL	SL
Degree of Curve-Heavy Traffic	15°00'00"	Tangent
Line of Light Traffic	SL	ML
Degree of Curve-Light Traffic	Tangent	15°00'00"
Alignment North	/ Curved	Tangent /
Alignment South	/ Curved	/ Curved
Alignment West	/ Curved	/ Curved
Alignment East	/ Curved	/ Curved
Angle	55-23-58	33-53-31
Manufacturer	Nortrak	Nortrak
Serial No.	Unknown	11D1451
Frog Type	Solid Magnesium	Solid Magnesium
Arm Length	7'-0"	8'-0" Solid Mag.
Track Gauge North-South	to 56 5/8"	to 56 5/8"
Track Gauge West-East	to 56 1/2"	to 57"
Rail Weight and Section	136 lb - RE	136 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed
Year	to 2011	to 2010
Joint Bar Assembly Type	Toeless	Toeless
Rail Weight and Section	N/A	N/A
Type of Rail Construction	N/A	N/A
Year	N/A	N/A
Joint Bar Assembly Type	N/A	N/A
Tie Plate Type / Shoulder	Steel / Double	Steel / Double
Length	18 in to 25 in	15 in to 24 in
Hole Pattern	6 to 8	8 to 10
Spike Type	Cut	Cut / Screw
No. Spikes	6 to 8	4 to 8
Anchor Type	Unit	Unit
Pattern Every Tie	to Full	to Full
Cross Tie Type	Timber	Timber
Width	9 in to 9 in	9 in to 9 in
Length	8'-6" to 20'-0"	10'-0" to 20'-0"
Spacing	20 in to 21 in	18 in to 20 in
Ballast Type	Local	Local
Gauge Rods		

AMERICA'S CENTRAL PORT INVENTORY OF RAIL CROSSINGS

Designation	RX-03	RX-04
Line of Heavy Traffic	NL	BD#5
Degree of Curve-Heavy Traffic	Tangent	Tangent
Line of Light Traffic	BD#5	ML
Degree of Curve-Light Traffic	Tangent	15°00'00"
Alignment North	/ Curved	Tangent /
Alignment South	Tangent /	/ Curved
Alignment West	Tangent /	/ Curved
Alignment East	/ Curved	/ Curved
Angle	75-57-15	84-59-47
Manufacturer	Nortrak	Nortrak
Serial No.	11D1168	Unknown
Frog Type	Solid Magnesium	Solid Magnesium
Arm Length	6'-0"	6'-0"
Track Gauge North-South	to 56 5/8"	to 56 3/4"
Track Gauge West-East	to 56 5/8"	to 57"
Rail Weight and Section	136 lb - RE	136 lb - RE
Type of Rail Construction	6-Jointed	6-Jointed
Year	to 2010	to 2010
Joint Bar Assembly Type	Toeless	Toeless
Rail Weight and Section	N/A	N/A
Type of Rail Construction	N/A	N/A
Year	N/A	N/A
Joint Bar Assembly Type	N/A	N/A
Tie Plate Type / Shoulder	Steel / Double	Steel / Double
Length	18 in to 23 in	18 in to 22 in
Hole Pattern	8 to 10	6 to 8
Spike Type	Cut / Screw	Cut
No. Spikes	4 to 8	4 to 6
Anchor Type	Unit	Unit
Pattern Every Tie	to Full	to Full
Cross Tie Type	Timber	Timber
Width	9 in to 9 in	9 in to 9 in
Length	10'-0" to 13'-0"	10'-0" to 11'-0"
Spacing	19 in to 23 in	18 in to 20 in
Ballast Type	Local	Local
Gauge Rods		

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Appendix H

America's Central Port Photos of Rail Crossings

AMERICA'S CENTRAL PORT PHOTOS OF RAIL CROSSINGS - I.D. 01

AMERICA'S CENTRAL PORT PHOTOS OF RAIL CROSSINGS - I.D. 02

AMERICA'S CENTRAL PORT PHOTOS OF RAIL CROSSINGS - I.D. 03

AMERICA'S CENTRAL PORT PHOTOS OF RAIL CROSSINGS - I.D. 04

AMERICA'S CENTRAL PORT
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Appendix I

America's Central Port Inventory of Direct Fixation

AMERICA'S CENTRAL PORT INVENTORY OF DIRECT FIXATION

Designation	**DF-01**	**DF-02**	**DF-03**	**DF-04**
Track Section	**NL(A)**	**BD#3(A)**	**BD#2(A)**	**BD#3(A)**
Alignment	Tangent /	Tangent /	Tangent /	Tangent /
Track Gauge	56 1/2" to	56 1/4" to	56 1/4" to	to 56 1/2"
Rail Weight and Section	140 lb - RE	136 lb - RE	115 lb - RE	115 lb - RE
Type of Rail Construction	CWR	CWR	6-Jointed	CWR
Year	to 1971	to 2013	to 1999	to 1999
Joint Bar Assembly Type	N/A	N/A	Toeless	N/A
Rail Weight and Section	N/A	N/A	N/A	N/A
Type of Rail Construction	N/A	N/A	N/A	N/A
Year	N/A	N/A	N/A	N/A
Joint Bar Assembly Type	N/A	N/A	N/A	N/A
Tie Plate Type / Shoulder	Flat / #64	E-Clip / E-Clip	E-Clip / E-Clip	E-Clip / E-Clip
Length	to 13 in	to 16 in	to 15 in	to 15 in
Hole Pattern	to 6	to 6	to 6	to 6
Spacing	26 to 34	14 to 44	25 to 30	18 to 31
Spike Type	All-thread rod	All-thread rod	All-thread rod	All-thread rod
No. Spikes	to 4	to 2	to 2	to 2
Anchor Type	None	None	None	None
Pattern Every Tie	to	to	to	to
Foundation	Concrete	Concrete	Concrete	Concrete
Gauge Rods				

12/30/2021

AMERICA'S CENTRAL PORT INVENTORY OF DIRECT FIXATION

Designation	**DF-05**
Track Section	**BD#5(A)**
Alignment	/ Curved
Track Gauge	to 56 1/2"
Rail Weight and Section	110 lb - RE
Type of Rail Construction	4-Jointed
Year	to 1936
Joint Bar Assembly Type	Toeless
Rail Weight and Section	N/A
Type of Rail Construction	N/A
Year	N/A
Joint Bar Assembly Type	N/A
Tie Plate Type / Shoulder	Flat / #64
Length	10 in to
Hole Pattern	2 to
Spacing	19 to 21
Spike Type	All-thread rod
No. Spikes	2 to
Anchor Type	None
Pattern Every Tie	to
Foundation	Concrete
Gauge Rods	

AMERICA'S CENTRAL PORT
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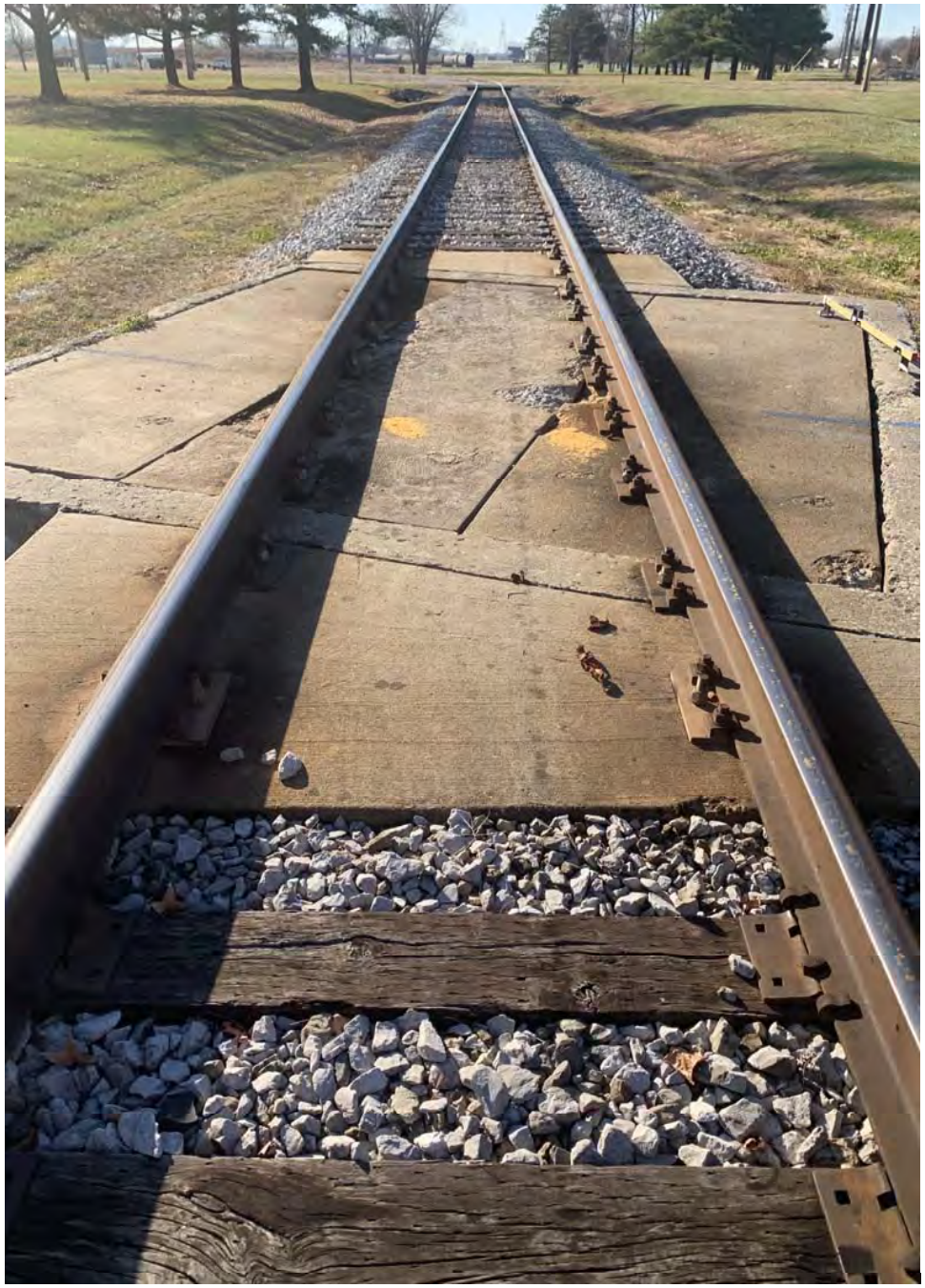
Appendix J

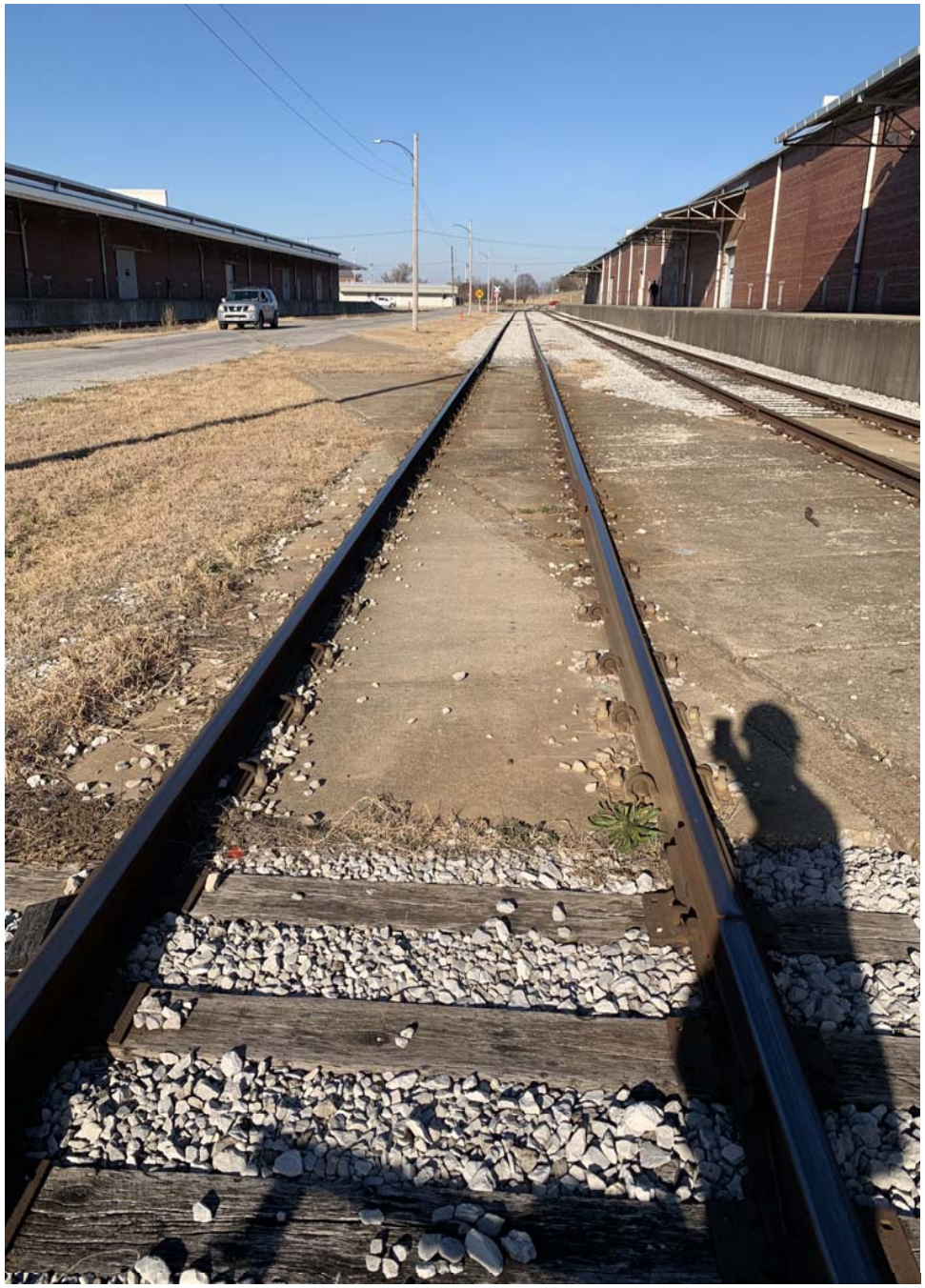
America's Central Port Photos of Direct Fixation

AMERICA'S CENTRAL PORT PHOTOS OF DIRECT FIXATION - I.D. DF-01

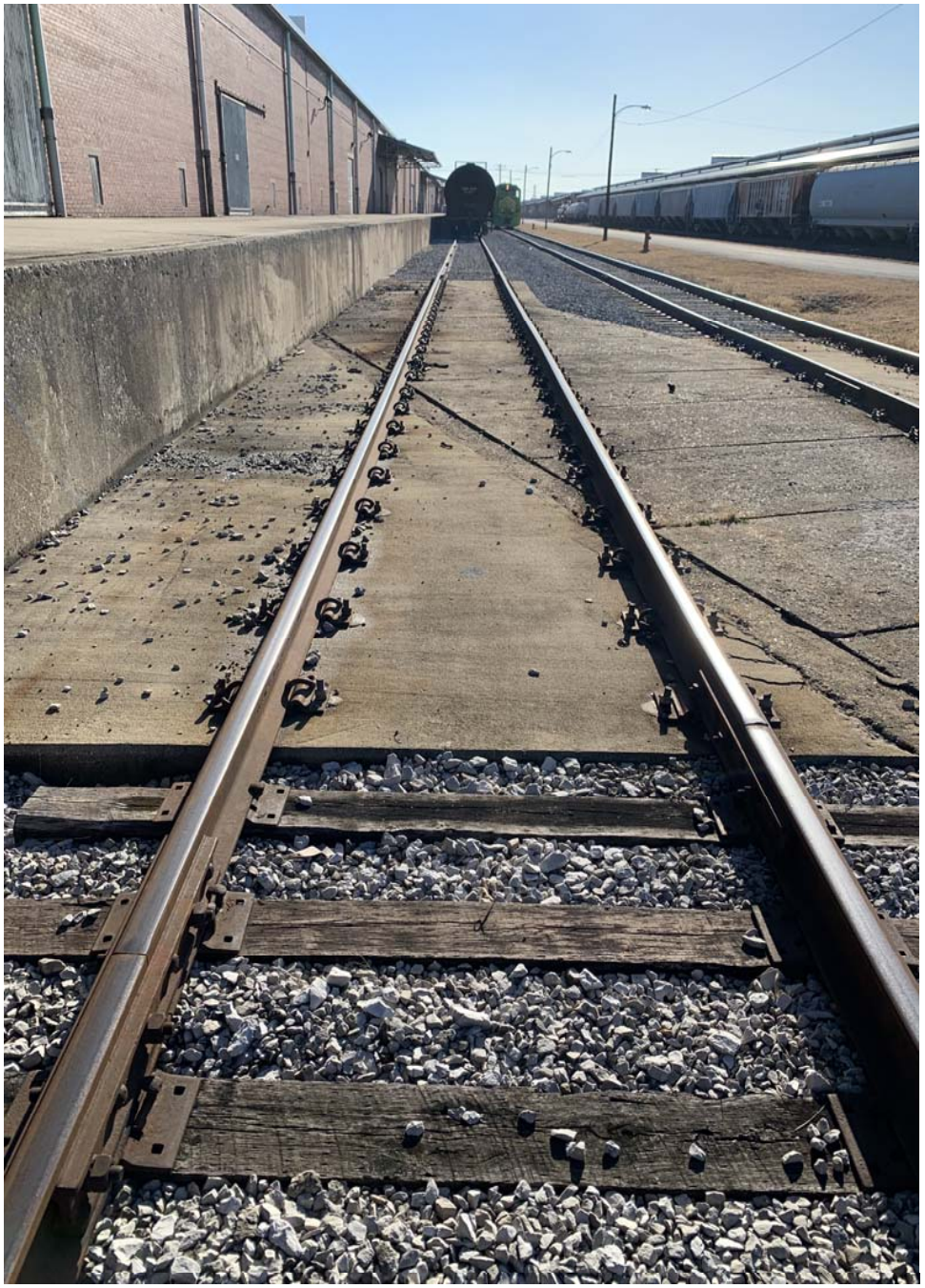


AMERICA'S CENTRAL PORT PHOTOS OF DIRECT FIXATION - I.D. DF-02

AMERICA'S CENTRAL PORT PHOTOS OF DIRECT FIXATION - I.D. DF-03



AMERICA'S CENTRAL PORT PHOTOS OF DIRECT FIXATION - I.D. DF-04



AMERICA'S CENTRAL PORT PHOTOS OF DIRECT FIXATION - I.D. DF-05

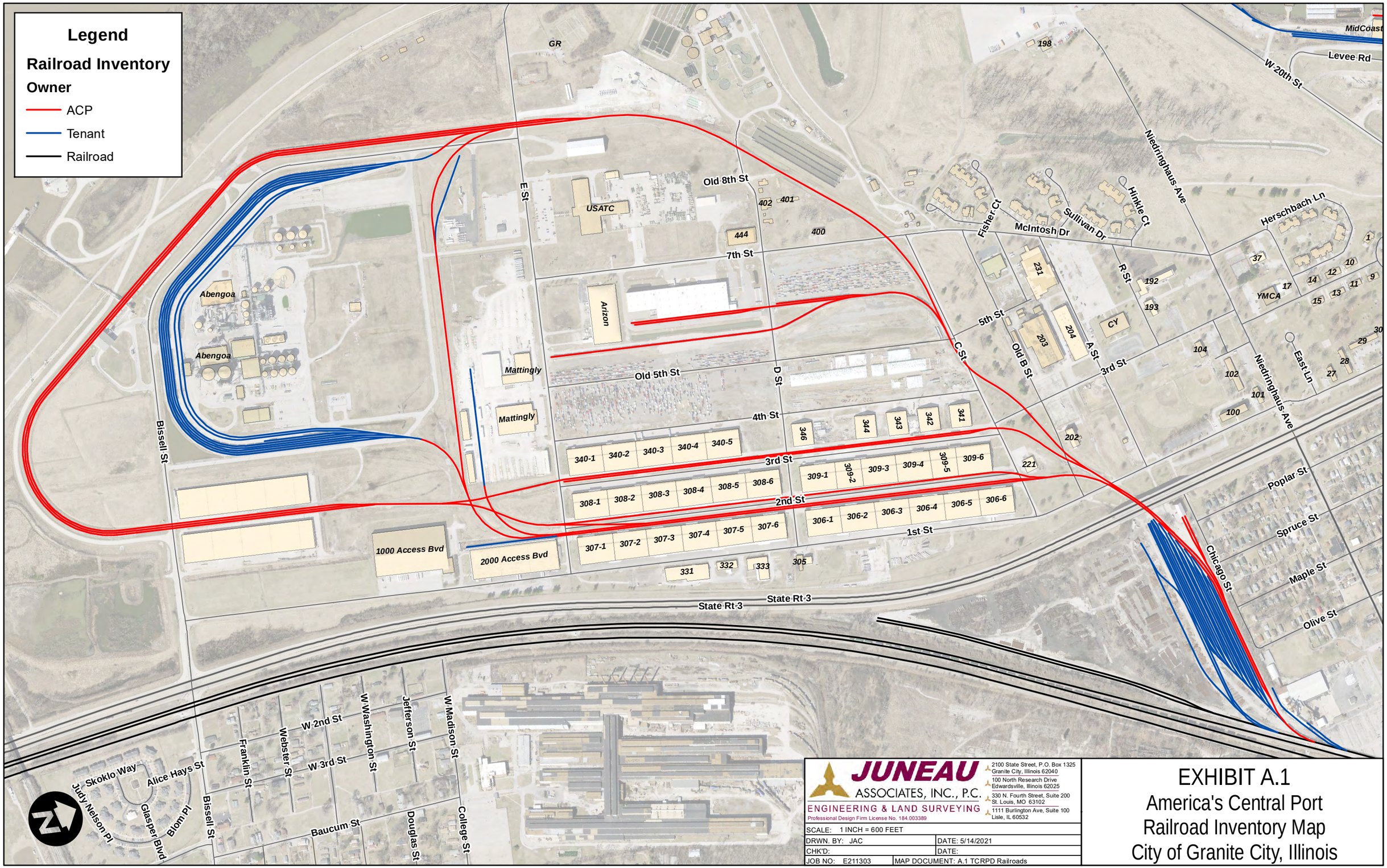
AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Attachment A

Exhibit A.1 and Exhibit A.2 America's Central Port

Railroad Inventory Map

Provided by Juneau Associates, Inc.



JUNEAU ASSOCIATES, INC., P.C.	2100 State Street, P.O. Box 1325 Granite City, Illinois 62040
ENGINEERING & LAND SURVEYING	100 North Research Drive Edwardsville, Illinois 62025
Professional Design Firm License No. 184.003389	330 N. Fourth Street, Suite 200 St. Louis, MO 63102
	1111 Burlington Ave, Suite 100 Lisle, IL 60532

SCALE: 1 INCH = 600 FEET	
DRWN. BY: JAC	DATE: 5/14/2021
CHK'D:	DATE:
JOB NO: E211303	MAP DOCUMENT: A.1 TCRPD Railroads

EXHIBIT A.1
America's Central Port
Railroad Inventory Map
City of Granite City, Illinois

Legend

Railroad Inventory

Owner

- ACP
- Tenant
- Railroad

Chain of Rocks Canal

Levee Rd

Access Road

Gabaret Slough Access Rd

Levee Rd

MidCoast

MidCoast

Bulk Services

Levee Rd

Rock Rd

Bulk Services

Apex

OC

Rock Rd

Bulk Services

Robinson Steel

Arch

Robinson Steel

GC Terminal

US Filter

W 20th St

Union St

Denver St

Independence Dr

State Rt 3

State Rt 3

Old Rock Rd

Hinkle Ct

Niedringhaus Ave

Herschbach Dr

Herschbach Ln

7th St

YMCA

Kennedy Dr

R St

3rd St

East Ln

Niedringhaus Ave

1st St

A St

Poplar St

Spruce St

St Louis Ave

Maple St

Niedringhaus Ave

Park Towne Dr

Park Towne Dr

Leyden Ave

Leyden Ave

Cayuga St

Denver St

McKinley Ave

W 22nd St

Harding Ave

McKinley Ave

Roosevelt Ave

Morgan Ave

Emzee Ave

Division St

Rock Rd

Jefferson Ave

Nevada Ave

W 23rd St

North

1 2 3 5 7 9 10 11 12 13 14 15 17 27 28 29 30 31 37 100 101 102 104 192 193

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330 N. Fourth Street, Suite 200, St. Louis, MO 63102

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SCALE: 1 INCH = 600 FEET	
DRWN. BY: JAC	DATE: 5/14/2021
CHK'D:	DATE:
JOB NO: E211303	MAP DOCUMENT: A.2 TCRPD Railroads

EXHIBIT A.2

America's Central Port

Railroad Inventory Map

City of Granite City, Illinois

AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Attachment B

Track Schematic For America's Central Port

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LEGEND

▬	RAIL CONDITION ASSESSMENT	SL-##	SOUTH LOOP (SL) TURNOUT I.D.
— · — · —	EXISTING PRIVATE TRACK	AK-##	A&K (AK) TURNOUT I.D.
- - - -	PROPOSED ACP TRACK	GP-##	GREEN PLAINS (GP) TURNOUT I.D.
- - - -	FUTURE TRACK	WH-##	WAREHOUSE (WH) TURNOUT I.D.
—	EXISTING ROAD	SB-##	ST. LOUIS SCREW & BOLT (SB) TURNOUT I.D.
﹏﹏	EXISTING EDGE OF CANAL/RIVER	DF-##	DIRECT FIXATION I.D.
#	HIGHWAY–RAIL GRADE CROSSING I.D.		
◇#	TRACK RAIL CROSSING I.D.		
SH-##	SOUTH HARBOR (SH) TURNOUT I.D.		

DESIGN NINE
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY

Drawn By:	JMD	Scale:	AS SHOWN
Checked By:	MPA	Sheet	1 of 2
Drawing:	21046–ACP Owned	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

NO.	DATE	REVISION (THIS DRAWING IS INTENDED TO BE PLOTTED ON 22 x 34 INCH PAPER)	BY

TRACK SCHEMATIC
FOR AMERICA'S CENTRAL PORT
MADISON COUNTY, ILLINOIS

MADISON HARBOR

LEGEND

- RAIL CONDITION ASSESSMENT
- EXISTING PRIVATE TRACK
- PROPOSED ACP TRACK
- FUTURE TRACK
- EXISTING ROAD
- EXISTING EDGE OF CANAL/RIVER
- # HIGHWAY–RAIL GRADE CROSSING I.D.
- # TRACK RAIL CROSSING I.D.

- NH–## NORTH HARBOR (NH) TURNOUT I.D.
- PP–## PLATE PLUS (PP) TURNOUT I.D.

~CHAIN OF ROCKS CANAL~

& DAM~

DOCK | DOCK | DOCK | DOCK

CROSSOVER #2 | CROSSOVER #1

PREVIOUSLY REMOVED NH–04 | LEVEE ROAD

WHITE DOCK ROAD

~APEX~

~MIDCOAST~ | ~U.S. STEEL~

CROSSOVER #6

TRACK 3 | TRACK 9 | TRACK 8 | TRACK 7 | TRACK 6 | TRACK 5 | TRACK 4 | TRACK 4A | TRACK 2 | TRACK 1 | TRACK 10

NH–24 | NH–23 | NH–22 | NH–21 | NH–20 | NH–28 | NH–27 | NH–26 | NH–25 | NH–29 | NH–42 | NH–14 | NH–15 | NH–10 | NH–09 | NH–13 | NH–12 | NH–08 | NH–18 | NH–40 | NH–19 | NH–41 | NH–39 | NH–16 | NH–11 | NH–07 | NH–38 | NH–37 | NH–36 | NH–06 | NH–17 | NH–05 | NH–04

US STEEL LEAD | NO. 3 LEAD

TRACK F | TRACK E | TRACK D | TRACK D1 | F LEAD | E LEAD | TRACK C | TRACK B | CROSSOVER #3 | TRACK A1 | A LEAD

NORFOLK SOUTHERN | LEVEE ROAD

CROSSOVER #4 | CROSSOVER #5 | CROSSOVER #7

NH–33 | NH–34 | NH–35

~GRANITE CITY TERMINAL~ | ~SIEMENS~ | ~PETROLEUM FUEL & TERMINAL CO.~

#1 NORTHWEST–NW | #1 NORTHEAST–NE | #2 NORTH–2N | INDEPENDENCE DRIVE

#1 SOUTHWEST–SW | #1 SOUTHEAST–SE

NH–32 | NH–31 | NH–30

ROCK ROAD | OLD ROCK ROAD | ~LEWIS & CLARK MARINE INC.~

NORTH STREET | A SIDING (ABANDONED) A LEAD | ~ARCH AIR MEDICAL SERVICE~

~PLATE PLUS~ | TRACK PP #3 | TRACK PP #1 | TRACK PP #2 | ~PLATE PLUS~

PP–02 | NH–03 | PP–01 | NH–02 | NH–01

PREVIOUSLY REMOVED

MADISON COUNTY TRANSIT CONFLUENCE TRAIL

NORFOLK SOUTHERN | X–ING | TO ROUTE 3 OVERPASS

29 | 28

2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1

W TWENTIETH STREET | UNION STREET | DENVER STREET | CAYUGA STREET | W SIXTEENTH ST | HERSCHBACH DRIVE | KENNEDY DRIVE | ~TRI–CITY YMCA~ | W FIRST STREET | ILLINOIS ROUTE 3 | NEDERHAUS AVENUE | EAST LANE | STREET | POPLAR STREET

TRACK 6–19 LEAD | PORT HARBOR (PH) LOCOMOTIVE TRACK #1 | PORT HARBOR (PH) LOCOMOTIVE TRACK #2

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DESIGN NINE	Drawn By: JMD	Scale: AS SHOWN	AMERICA'S CENTRAL PORT 1635 WEST FIRST STREET GRANITE CITY, IL 62040
11166 TESSON FERRY ROAD SUITE 100 ST. LOUIS MO, 63123-6966 (314) 729-7600	Checked By: MPA	Sheet 2 of 2	
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY	Drawing: 21046–ACP Owned	Date: 12/27/21	

NO.	DATE	REVISION (THIS DRAWING IS INTENDED TO BE PLOTTED ON 22 x 34 INCH PAPER)	BY

TRACK SCHEMATIC
FOR AMERICA'S CENTRAL PORT
MADISON COUNTY, ILLINOIS

GRANITE CITY HARBOR

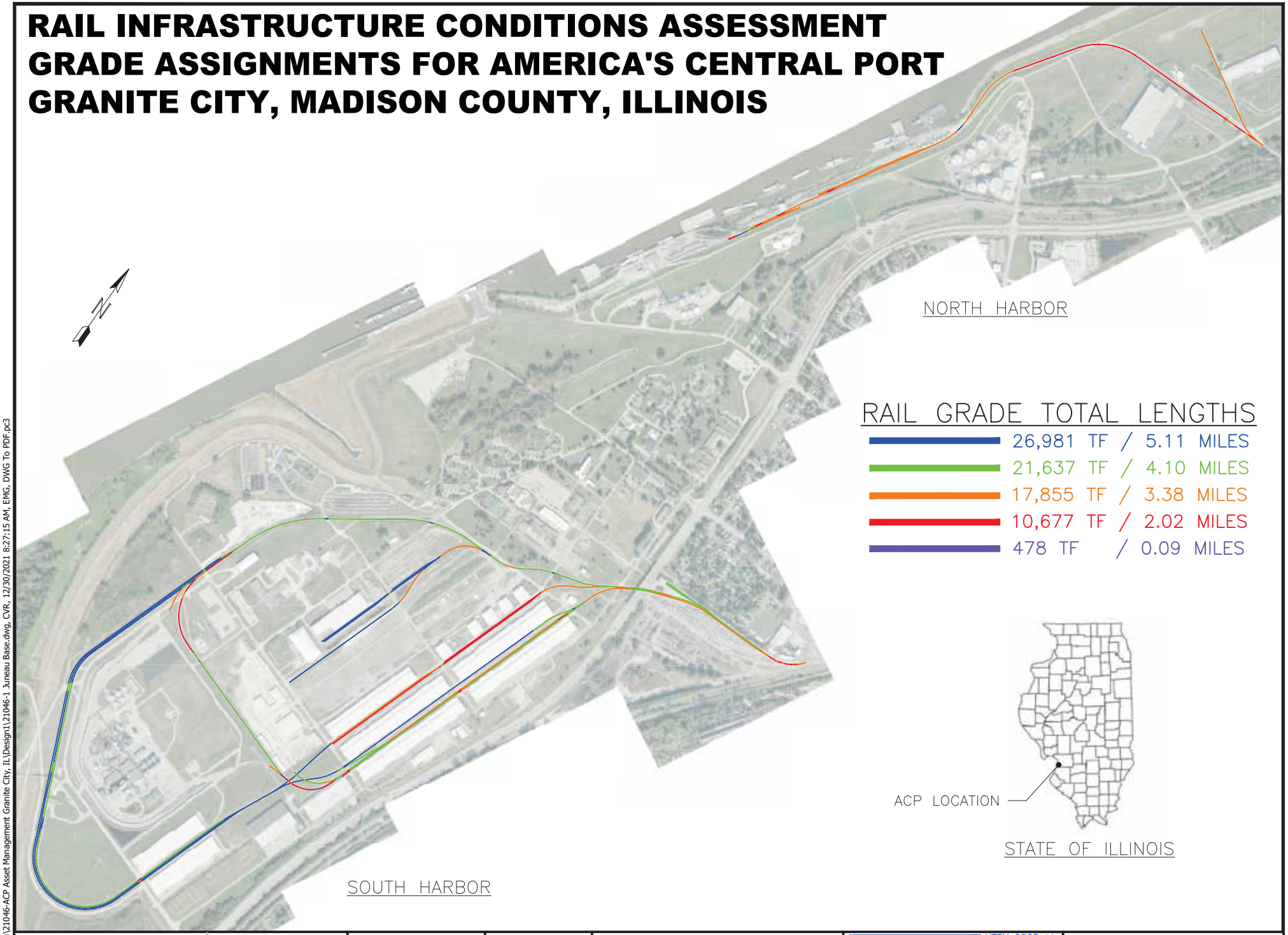
AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Attachment C

Rail Infrastructure Conditions Assessment Grade

Assignments for America's Central Port

RAIL INFRASTRUCTURE CONDITIONS ASSESSMENT
GRADE ASSIGNMENTS FOR AMERICA'S CENTRAL PORT
GRANITE CITY, MADISON COUNTY, ILLINOIS



RAIL GRADE TOTAL LENGTHS

26,981 TF	5.11 MILES
21,637 TF	4.10 MILES
17,855 TF	3.38 MILES
10,677 TF	2.02 MILES
478 TF	0.09 MILES

STATE OF ILLINOIS

DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

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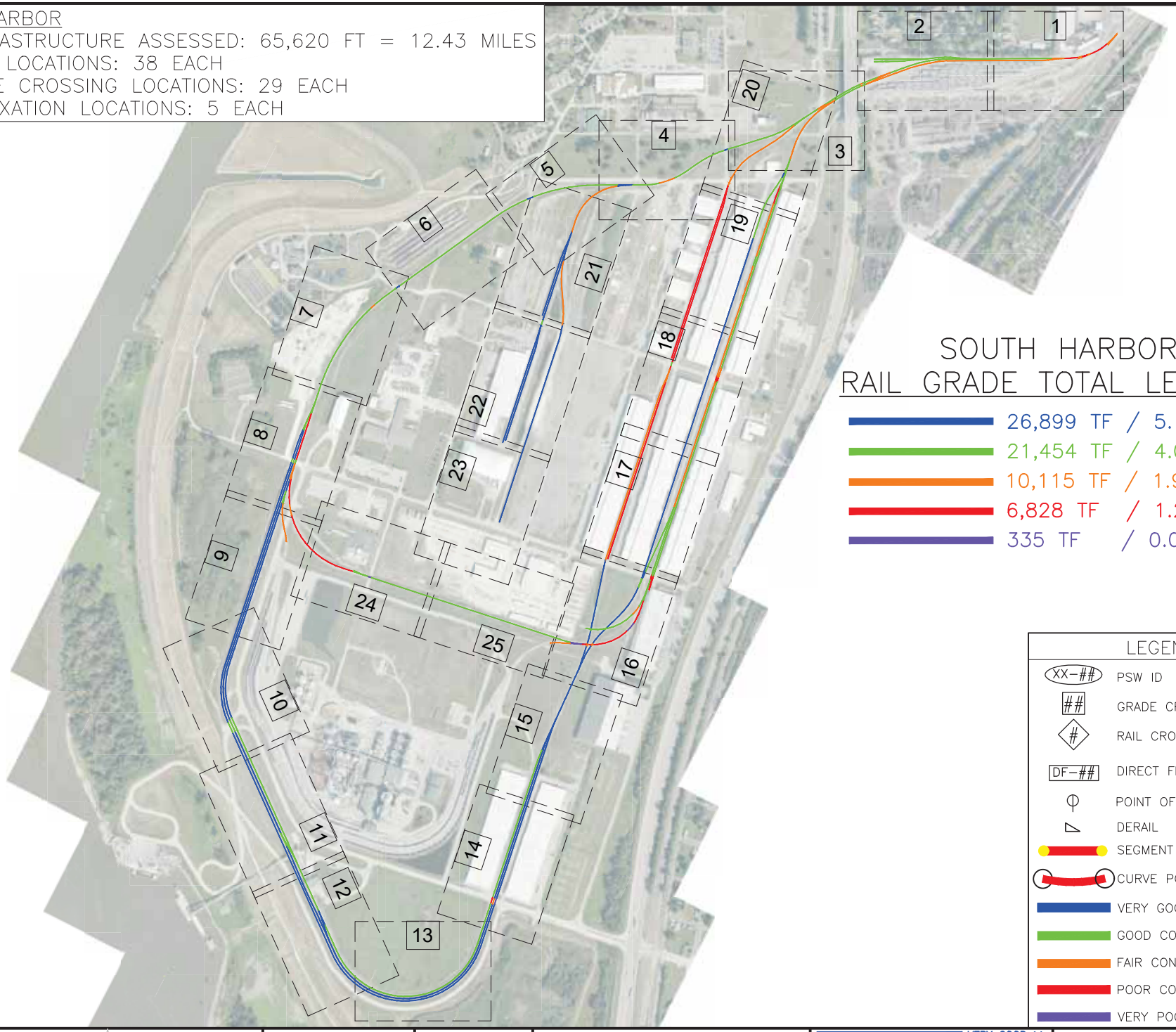
Checked By:	MPA	Sheet	1 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

COVER SHEET

SOUTH HARBOR
RAIL INFRASTRUCTURE ASSESSED: 65,620 FT = 12.43 MILES
TURNOUT LOCATIONS: 38 EACH
AT-GRADE CROSSING LOCATIONS: 29 EACH
DIRECT FIXATION LOCATIONS: 5 EACH



SOUTH HARBOR
RAIL GRADE TOTAL LENGTHS

26,899 TF	5.10 MILES
21,454 TF	4.06 MILES
10,115 TF	1.92 MILES
6,828 TF	1.29 MILES
335 TF	0.06 MILES

LEGEND

- XX-## PSW ID
- ## GRADE CROSSING ID
- # RAIL CROSSING ID
- DF-## DIRECT FIXATION ID
- POINT OF SWITCH
- DERAIL
- SEGMENT INDICATOR
- CURVE POINTS
- VERY GOOD CONDITION (1)
- GOOD CONDITION (2)
- FAIR CONDITION (3)
- POOR CONDITION (4)
- VERY POOR CONDITION (5)

DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
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Checked By:	MPA	Sheet	2 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

SOUTH HARBOR OVERALL PLAN

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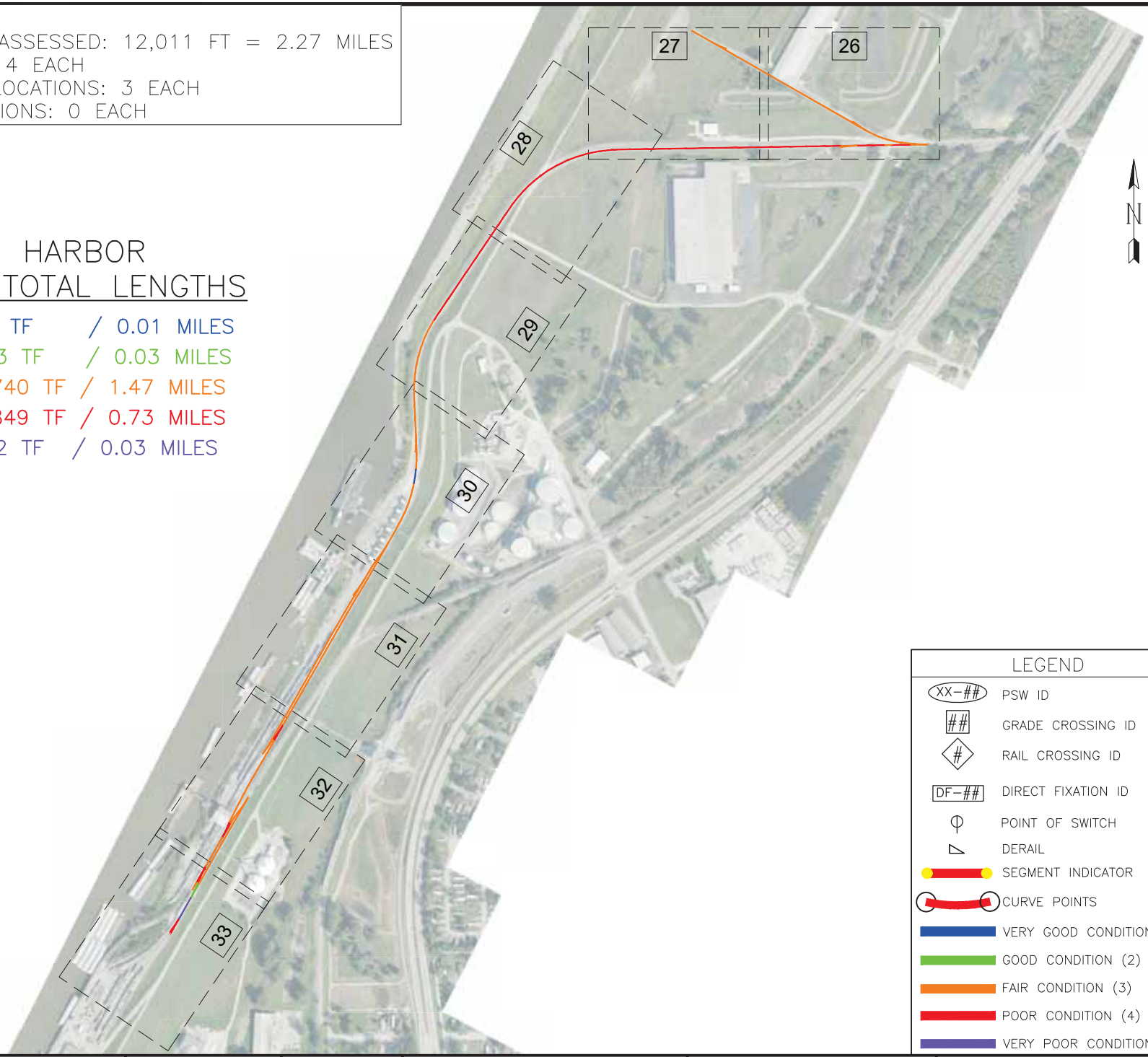
NORTH HARBOR
RAIL INFRASTRUCTURE ASSESSED: 12,011 FT = 2.27 MILES
TURNOUT LOCATIONS: 14 EACH
AT-GRADE CROSSING LOCATIONS: 3 EACH
DIRECT FIXATION LOCATIONS: 0 EACH

NORTH HARBOR
RAIL GRADE TOTAL LENGTHS

- 82 TF / 0.01 MILES
- 183 TF / 0.03 MILES
- 7,740 TF / 1.47 MILES
- 3,849 TF / 0.73 MILES
- 142 TF / 0.03 MILES



LEGEND

- XX-## PSW ID
- ## GRADE CROSSING ID
- # RAIL CROSSING ID
- DF-## DIRECT FIXATION ID
- POINT OF SWITCH
- DERAIL
- SEGMENT INDICATOR
- CURVE POINTS
- VERY GOOD CONDITION (1)
- GOOD CONDITION (2)
- FAIR CONDITION (3)
- POOR CONDITION (4)
- VERY POOR CONDITION (5)

DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	NONE
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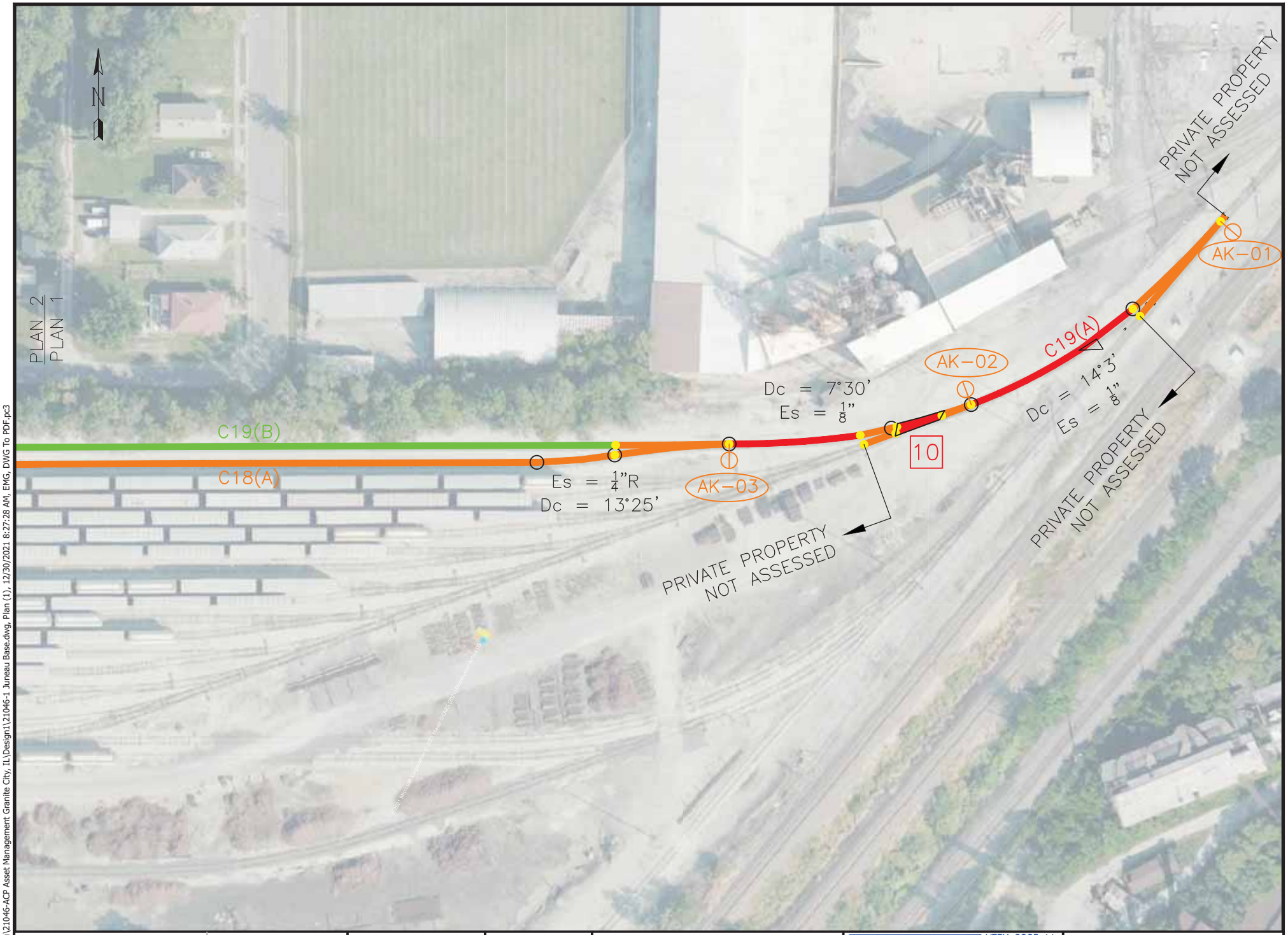
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

- VERY GOOD (A)
- GOOD (B)
- FAIR (C)
- POOR (D)
- VERY POOR (E)

NORTH HARBOR
OVERALL PLAN



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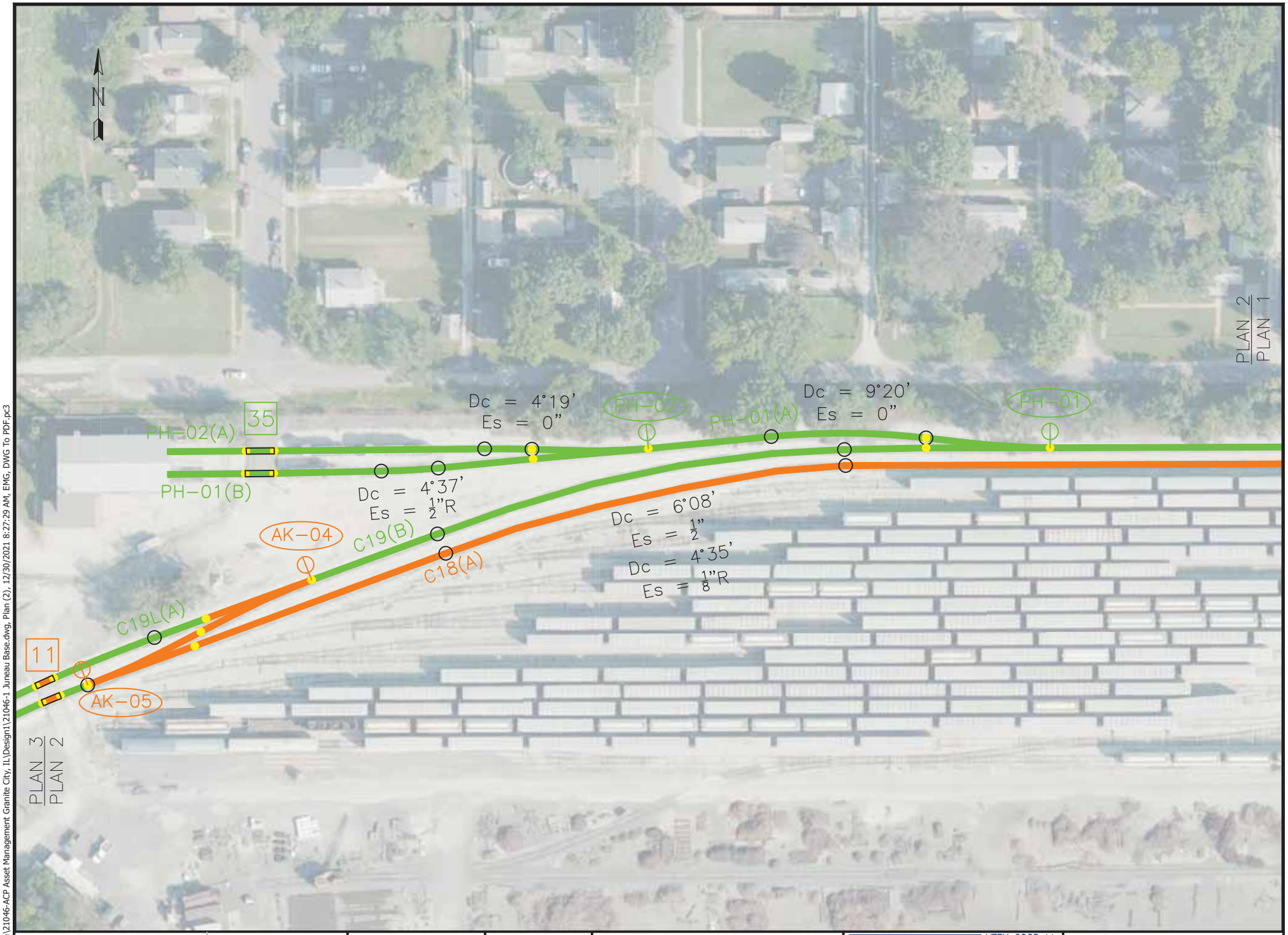
AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 1



DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

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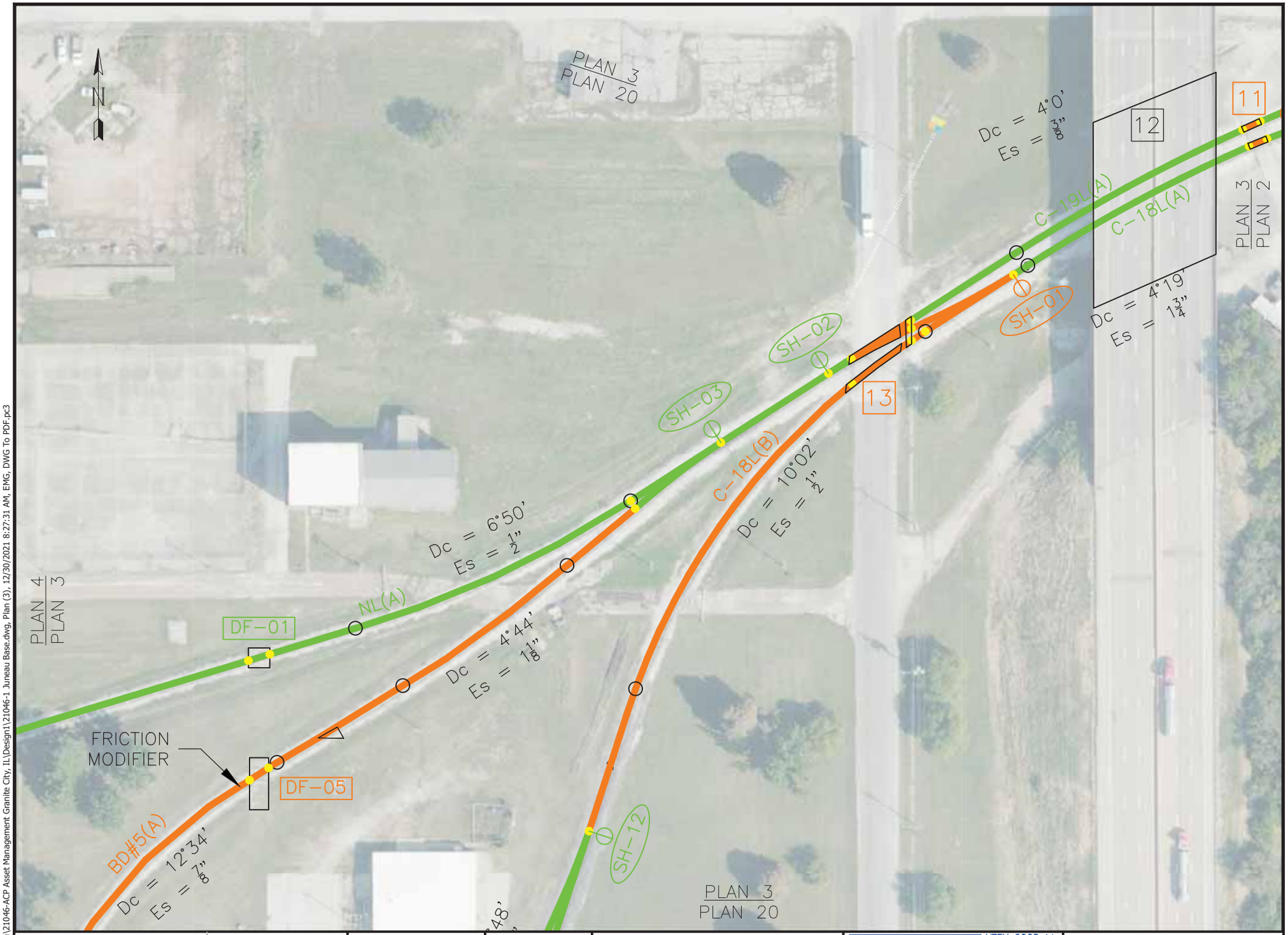
AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 2



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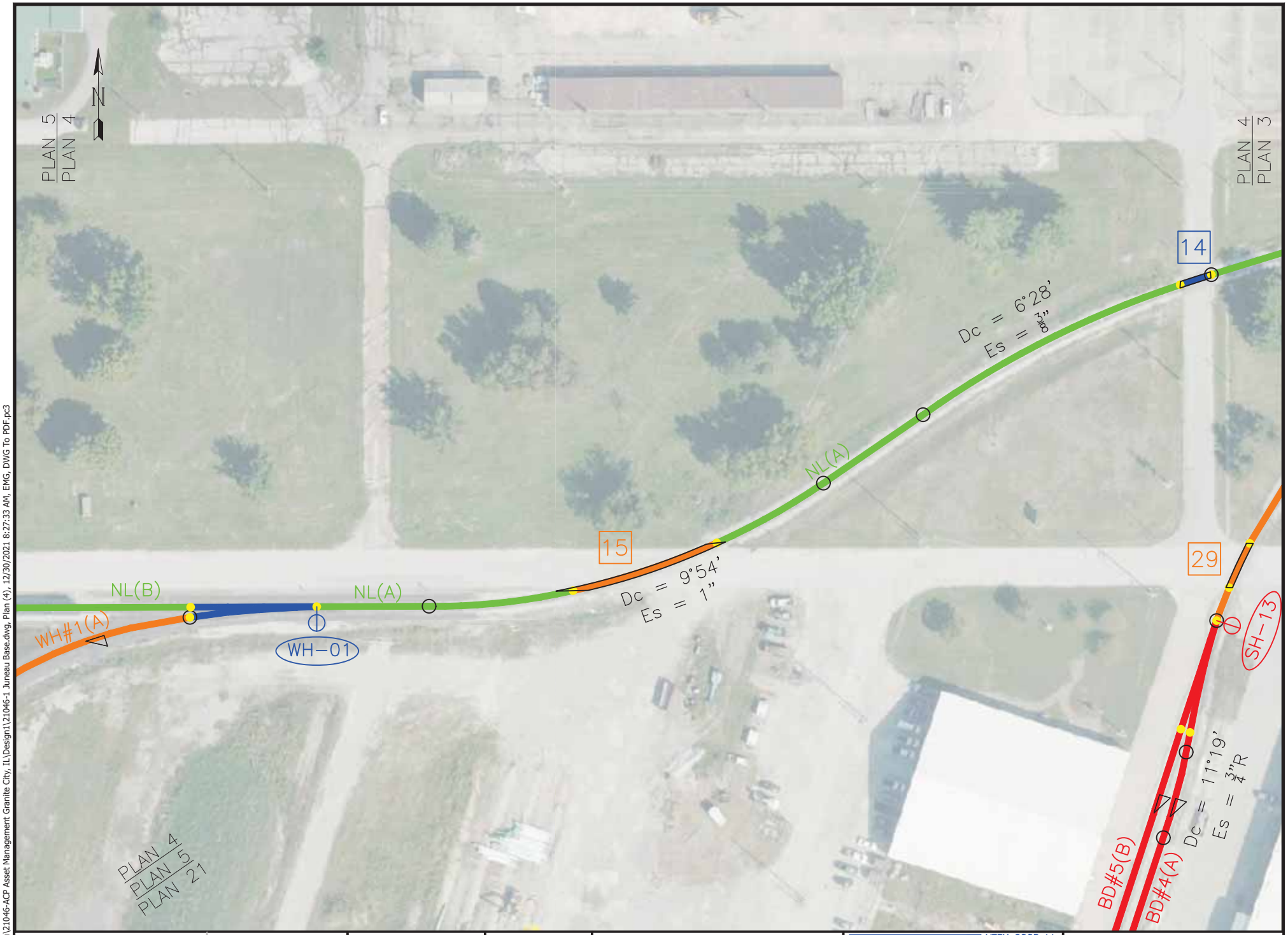
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	6 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 3



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DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY

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SUITE 100
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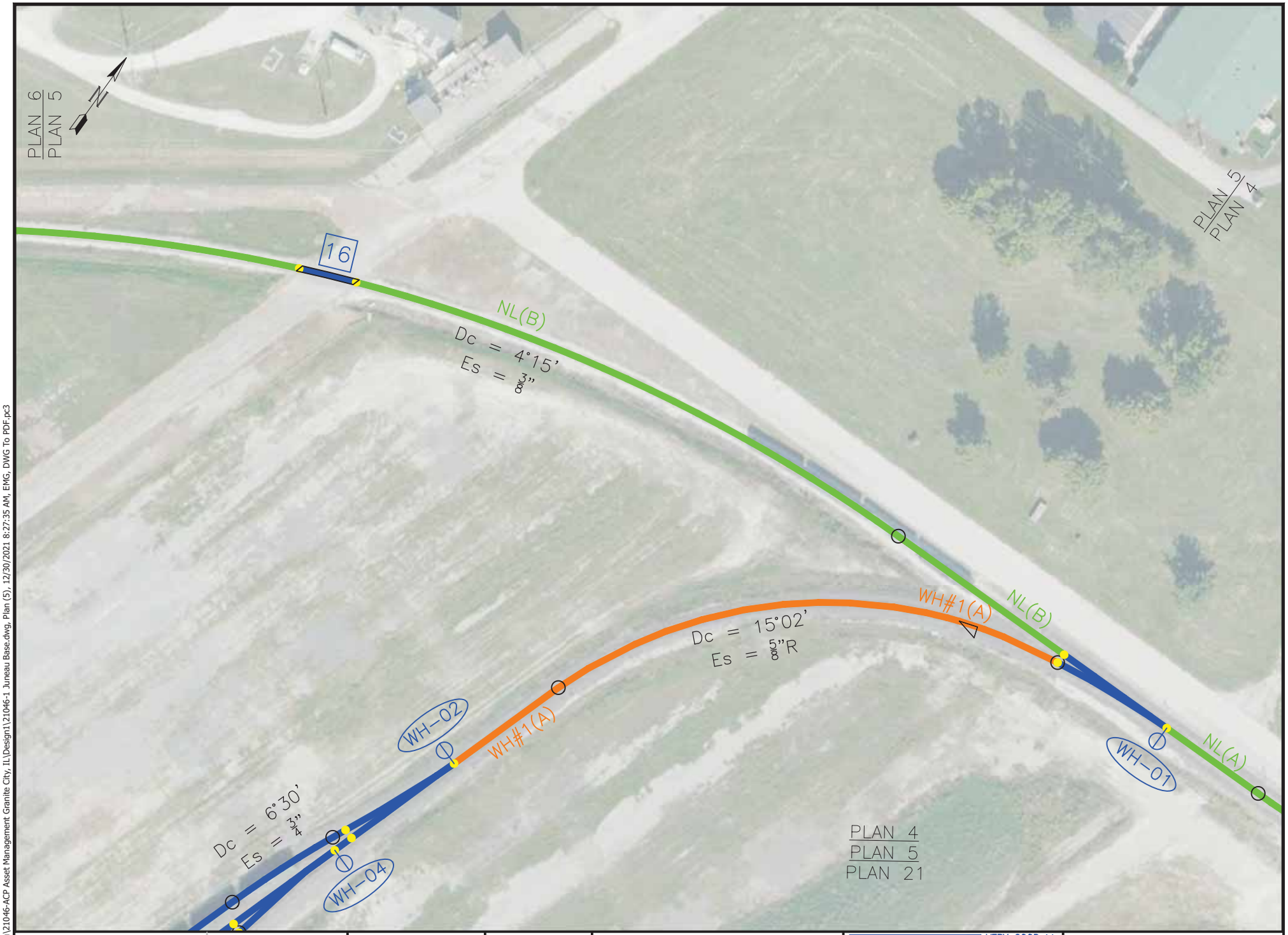
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	7 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

- VERY GOOD (A)
- GOOD (B)
- FAIR (C)
- POOR (D)
- VERY POOR (E)

PLAN 4



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SUITE 100
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Checked By:	MPA	Sheet	8 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

- VERY GOOD (A)
- GOOD (B)
- FAIR (C)
- POOR (D)
- VERY POOR (E)

PLAN 5

DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
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AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 6

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DESIGN NINE
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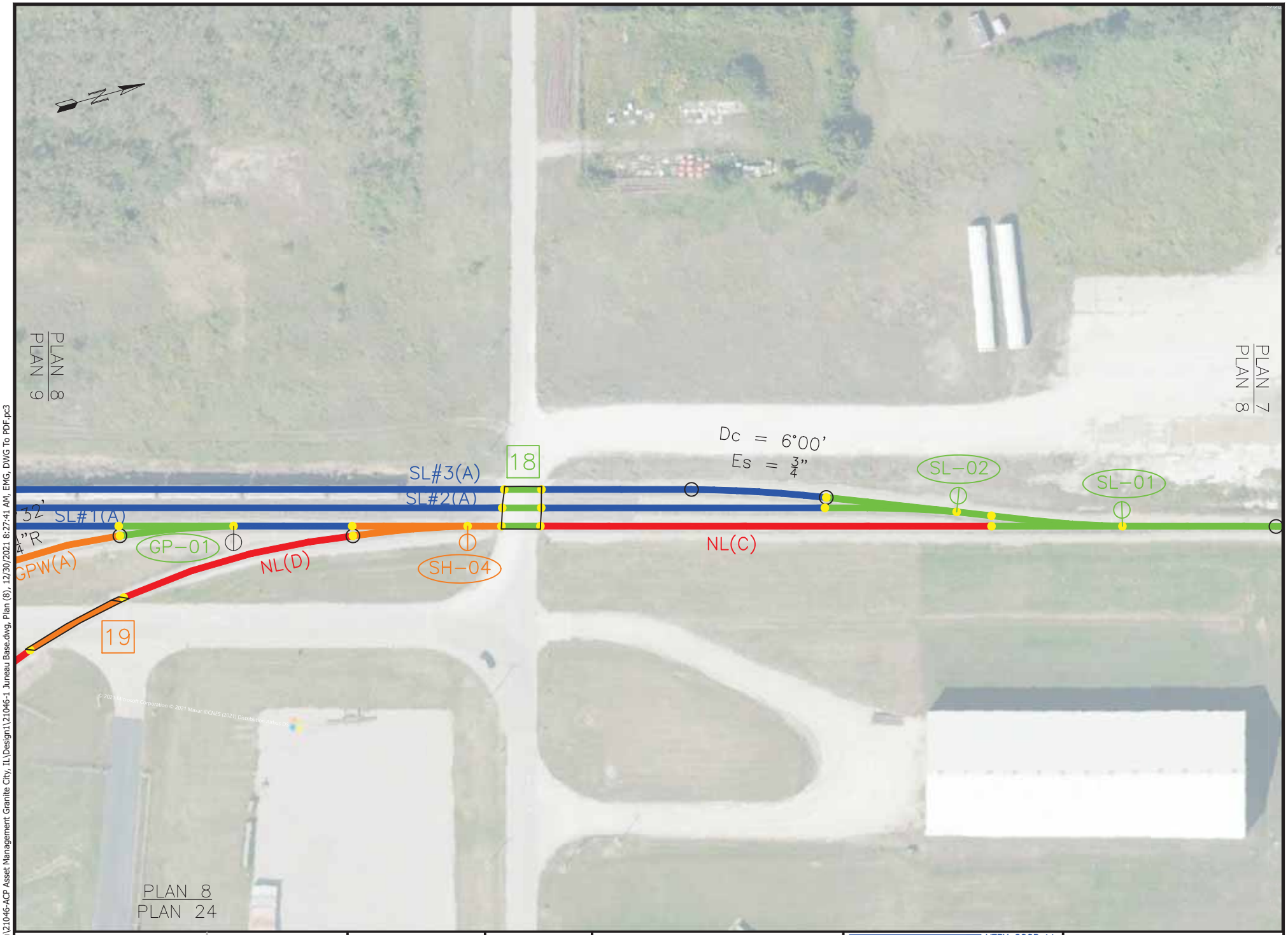
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	10 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 7



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AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 8

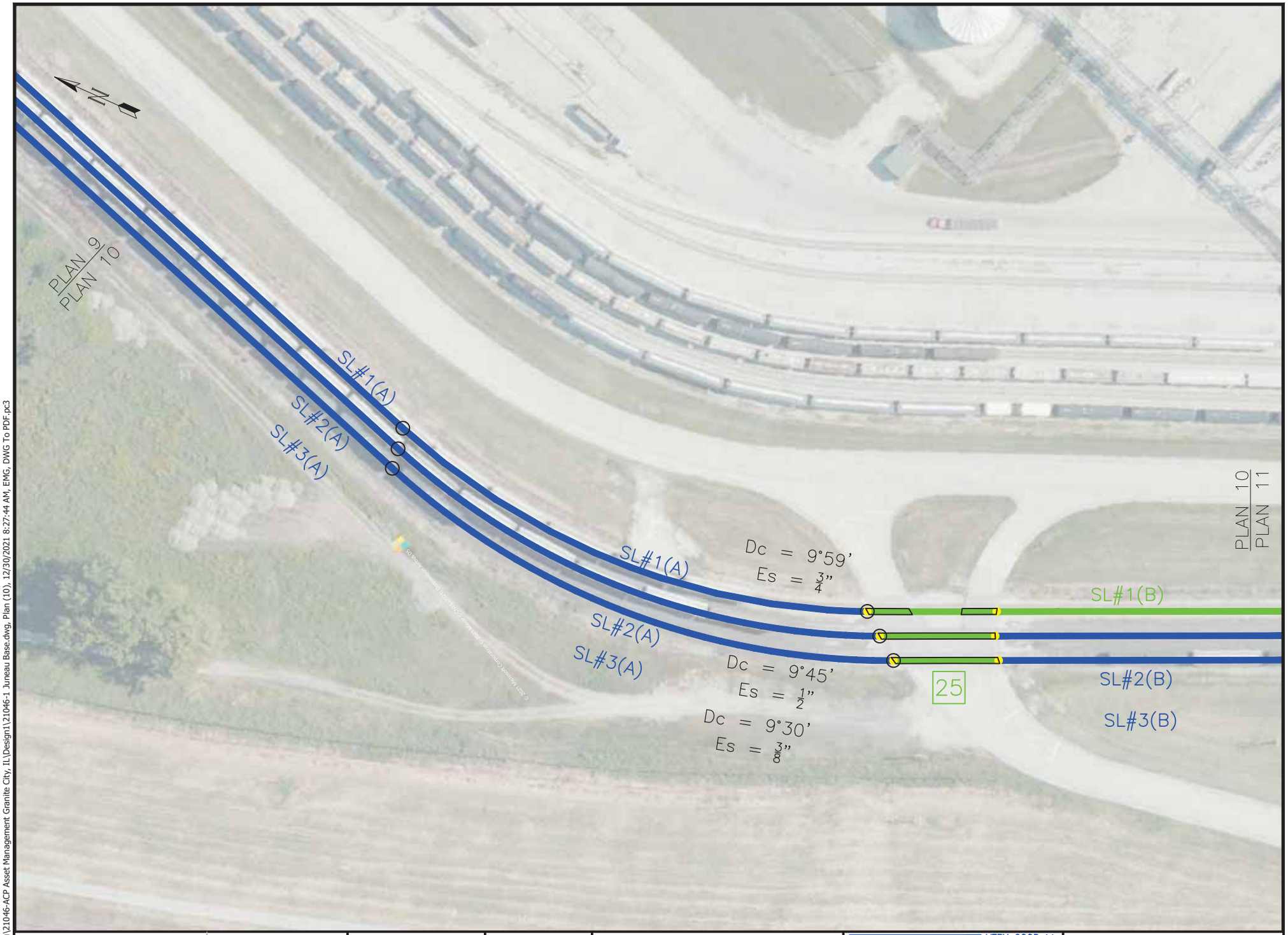
DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	12 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 9



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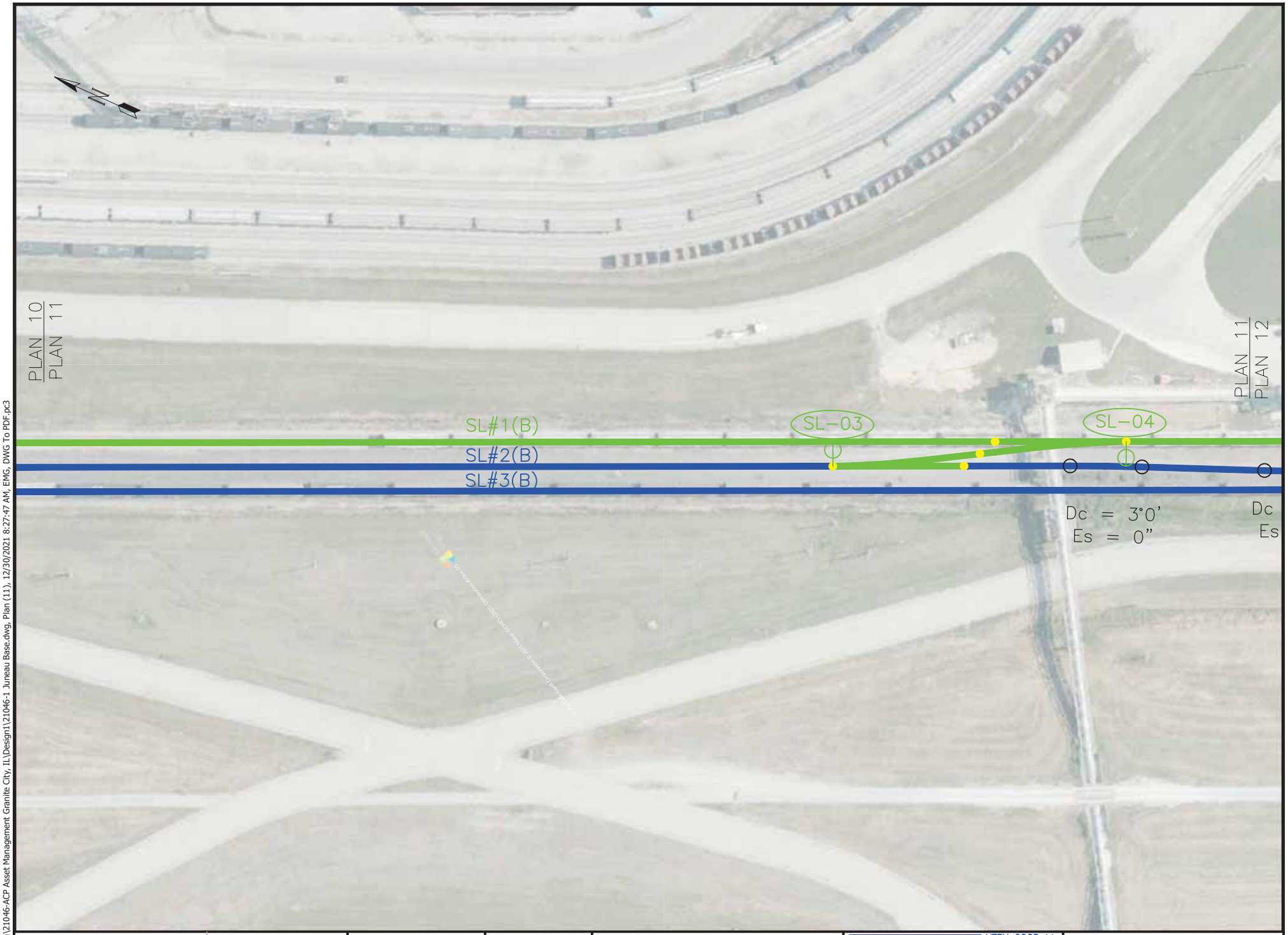
Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	13 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 10



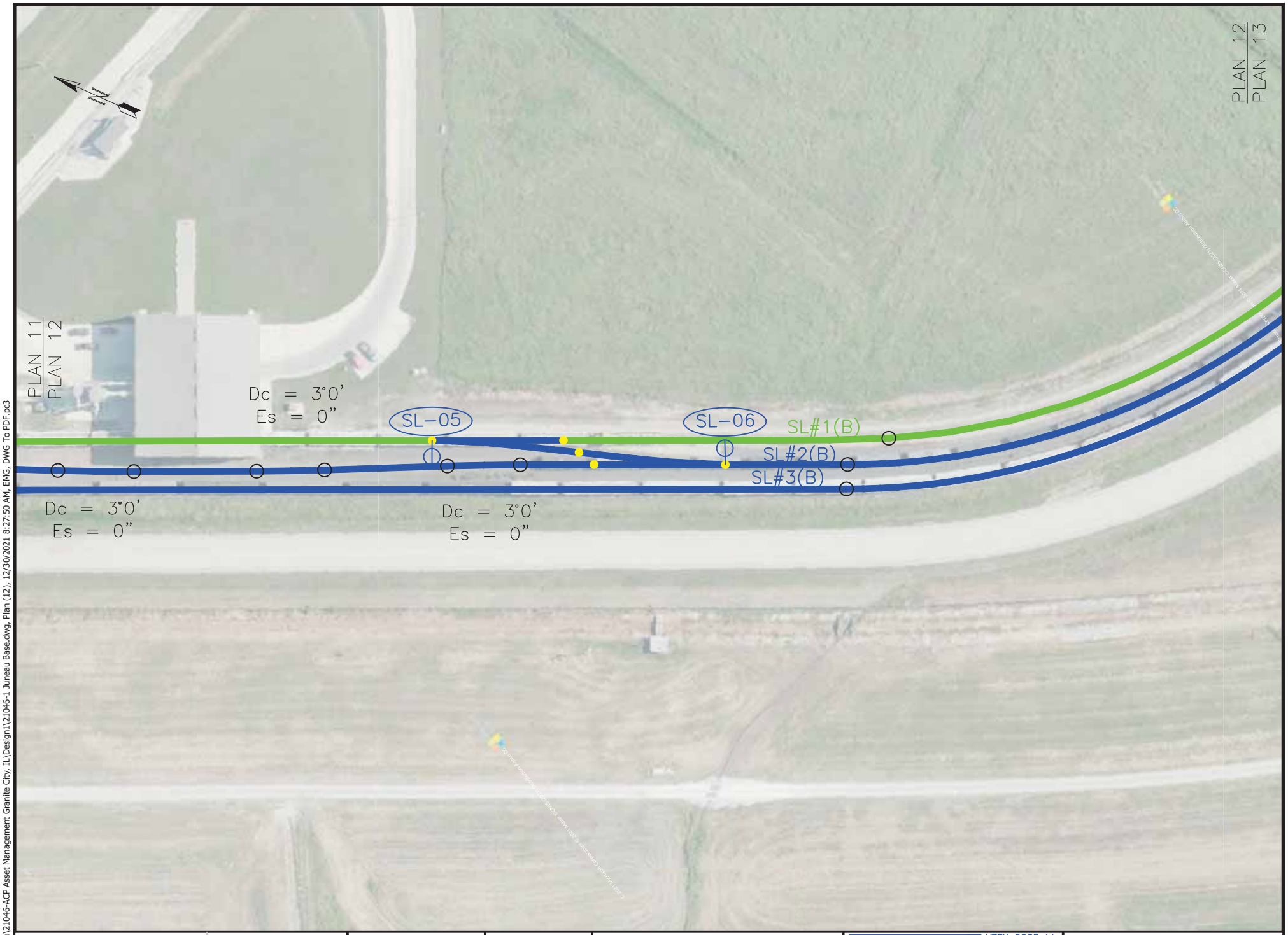
DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	14 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 11



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DESIGN NINE
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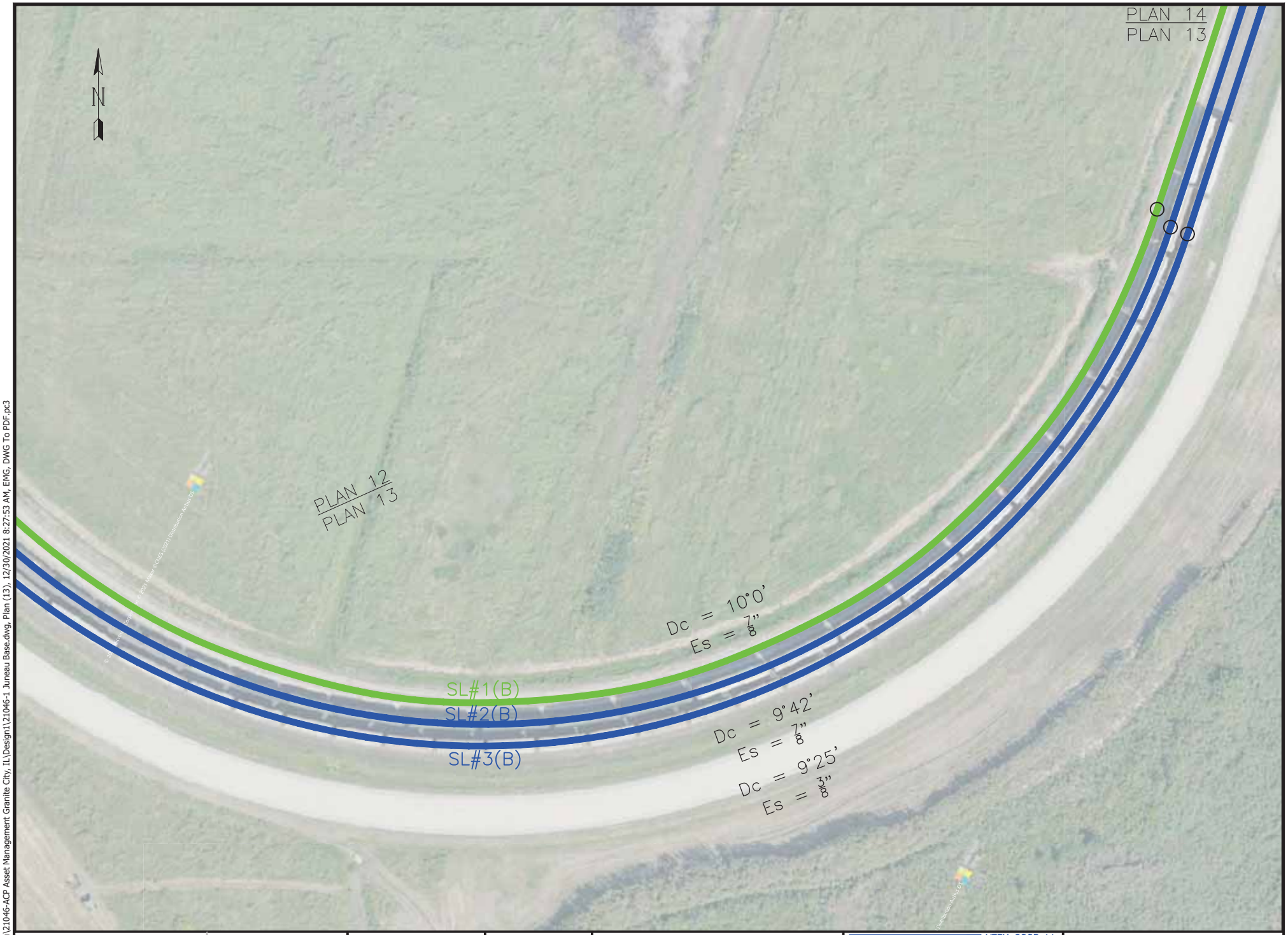
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	15 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 12



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11166 TESSON FERRY ROAD SUITE 100 ST. LOUIS MO, 63123-6966 (314) 729-7600	Checked By: MPA	Sheet 16 of 36	1635 WEST FIRST STREET GRANITE CITY, IL 62040
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY	Drawing: 21046-1	Date: 12/27/21	

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 13

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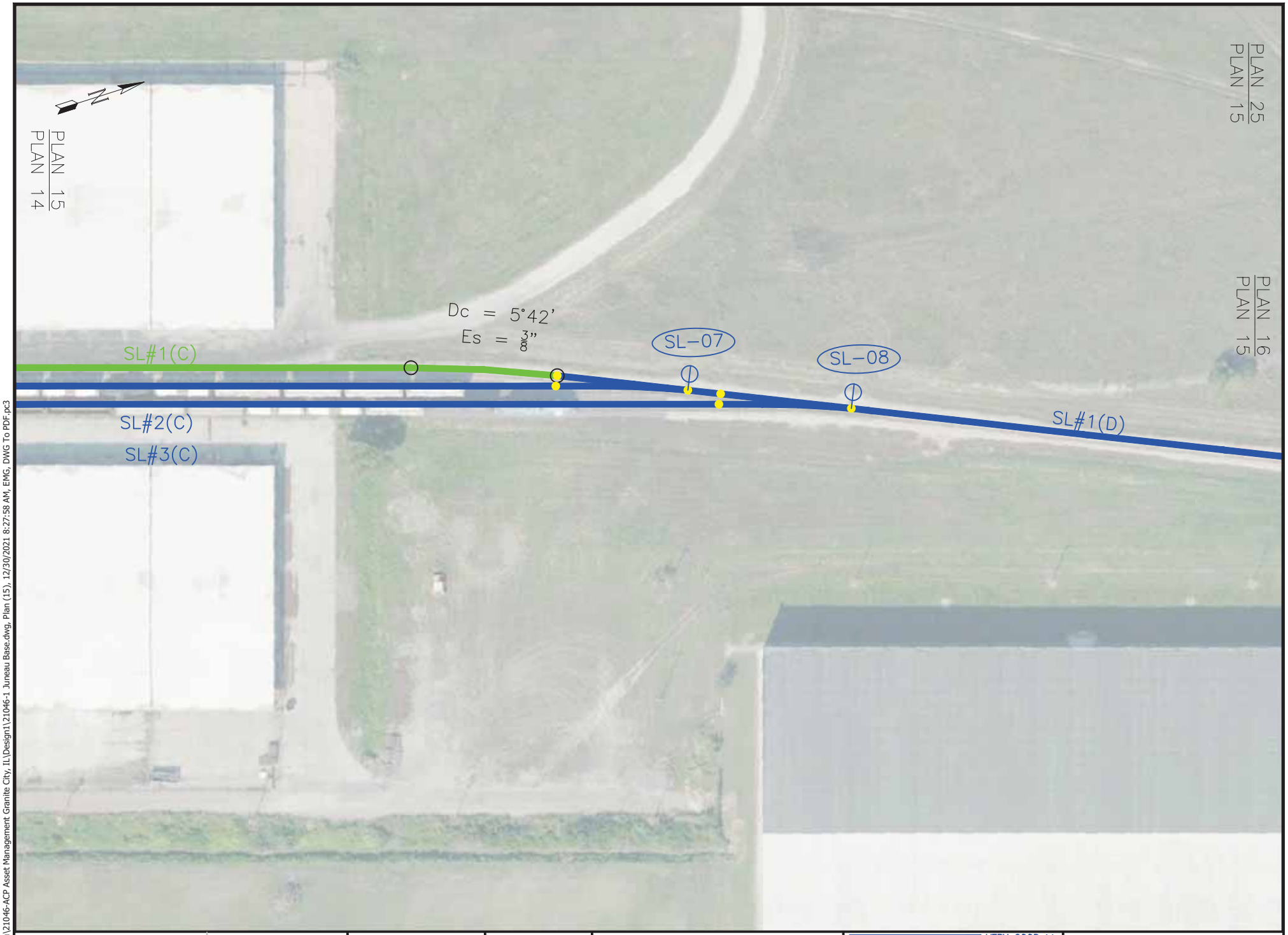
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	17 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 14



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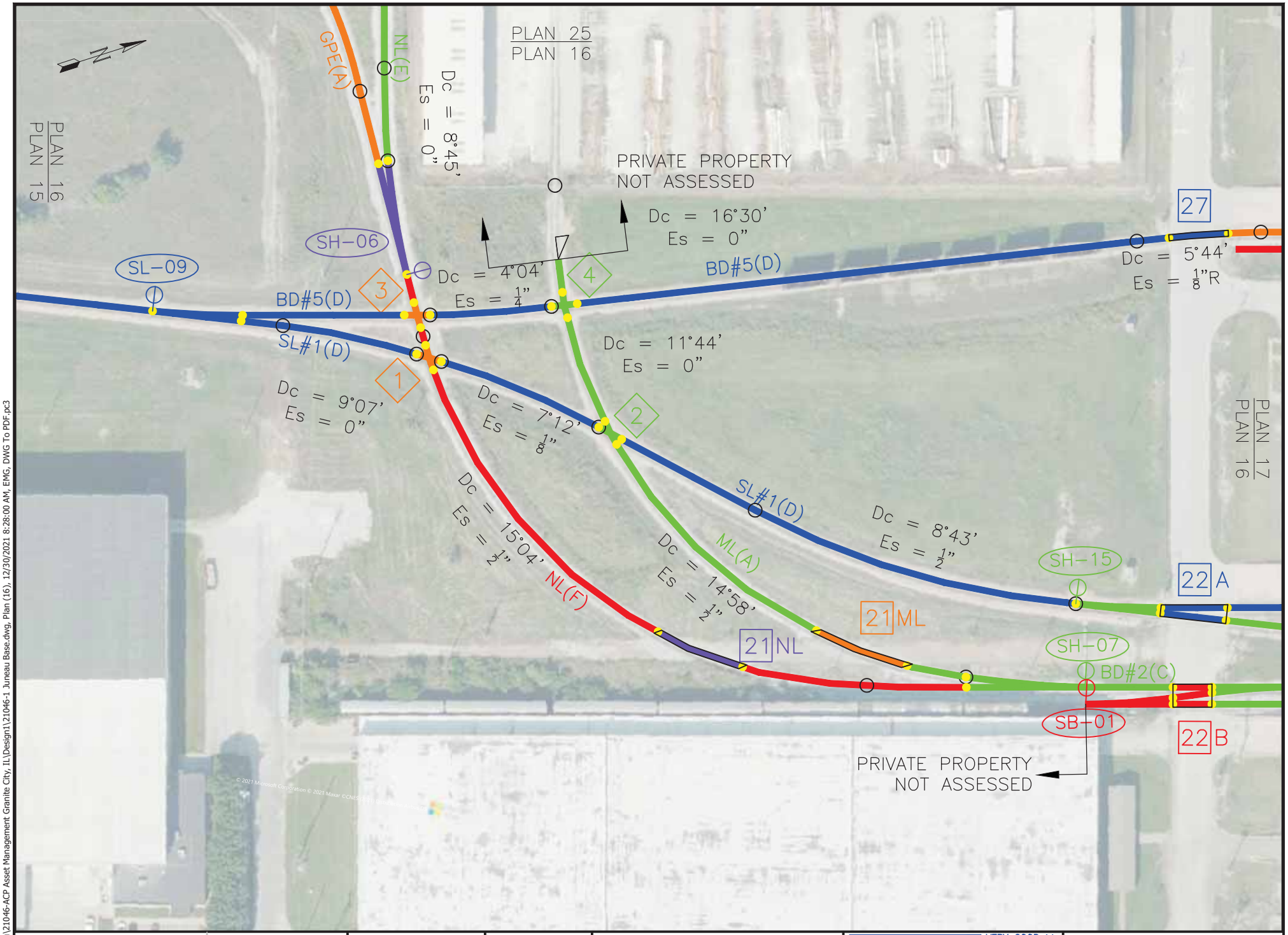
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	18 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 15



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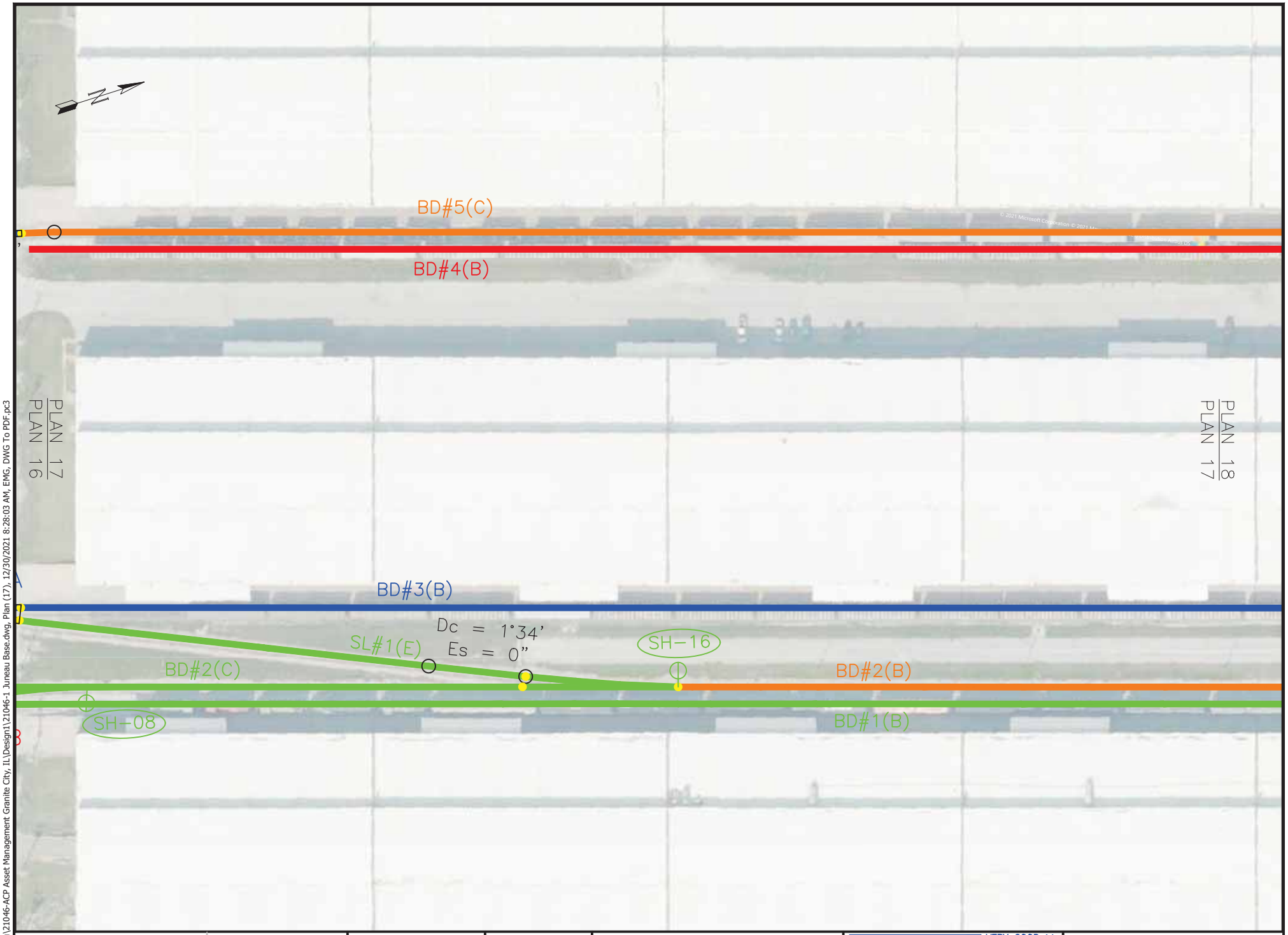
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	19 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 16



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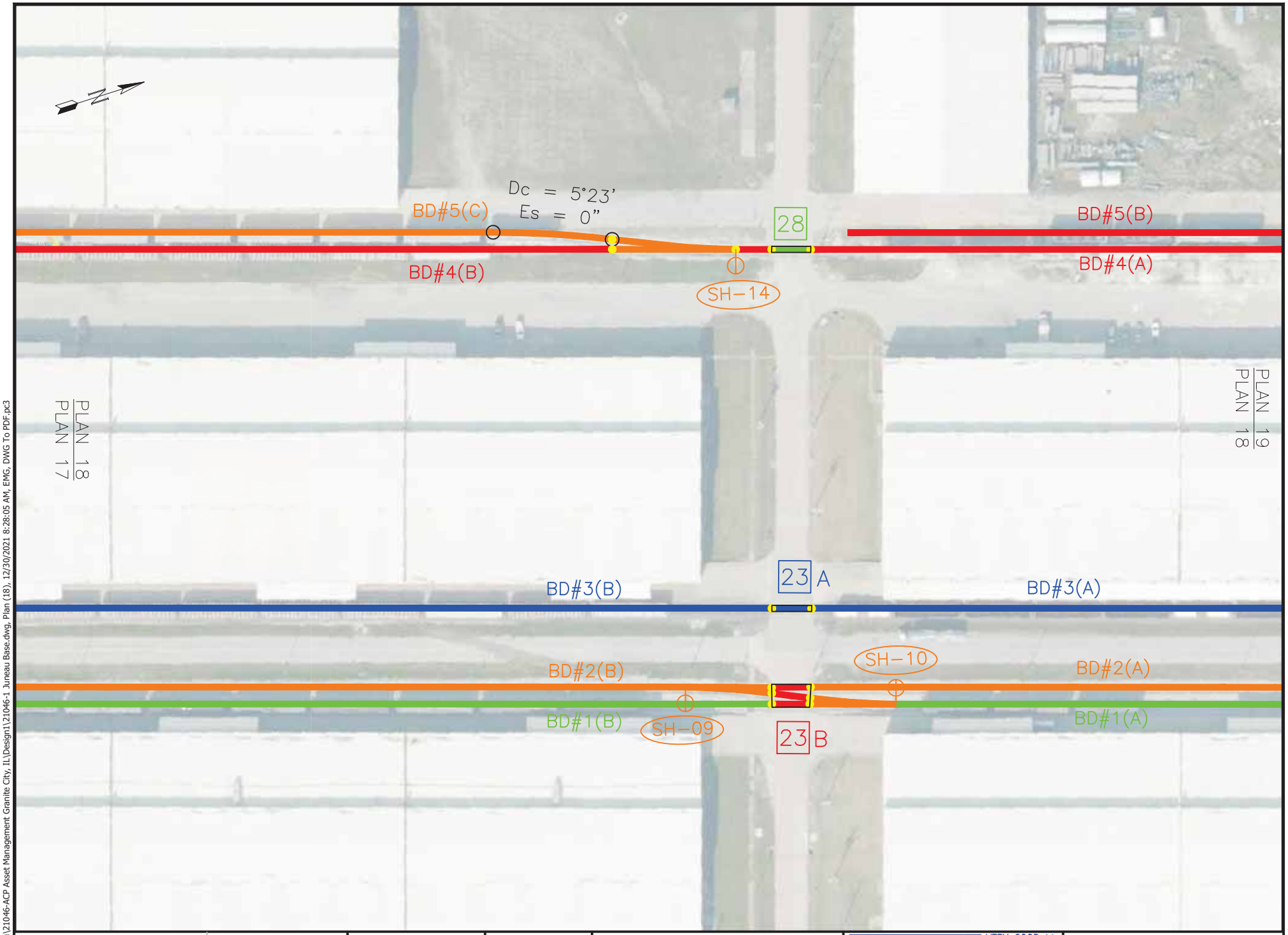
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	20 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 17



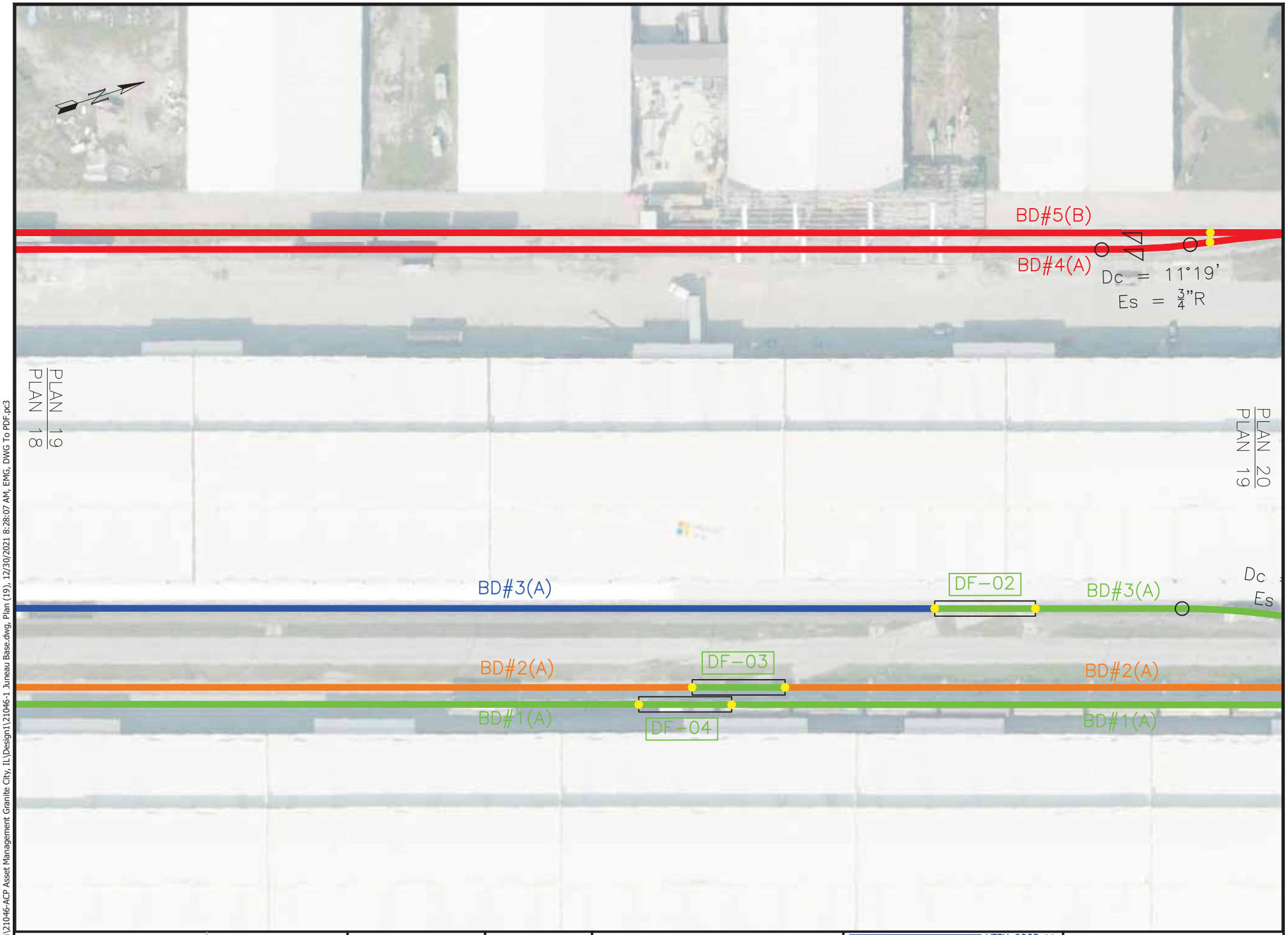
DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	21 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 18



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11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	22 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 19

DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	23 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 20

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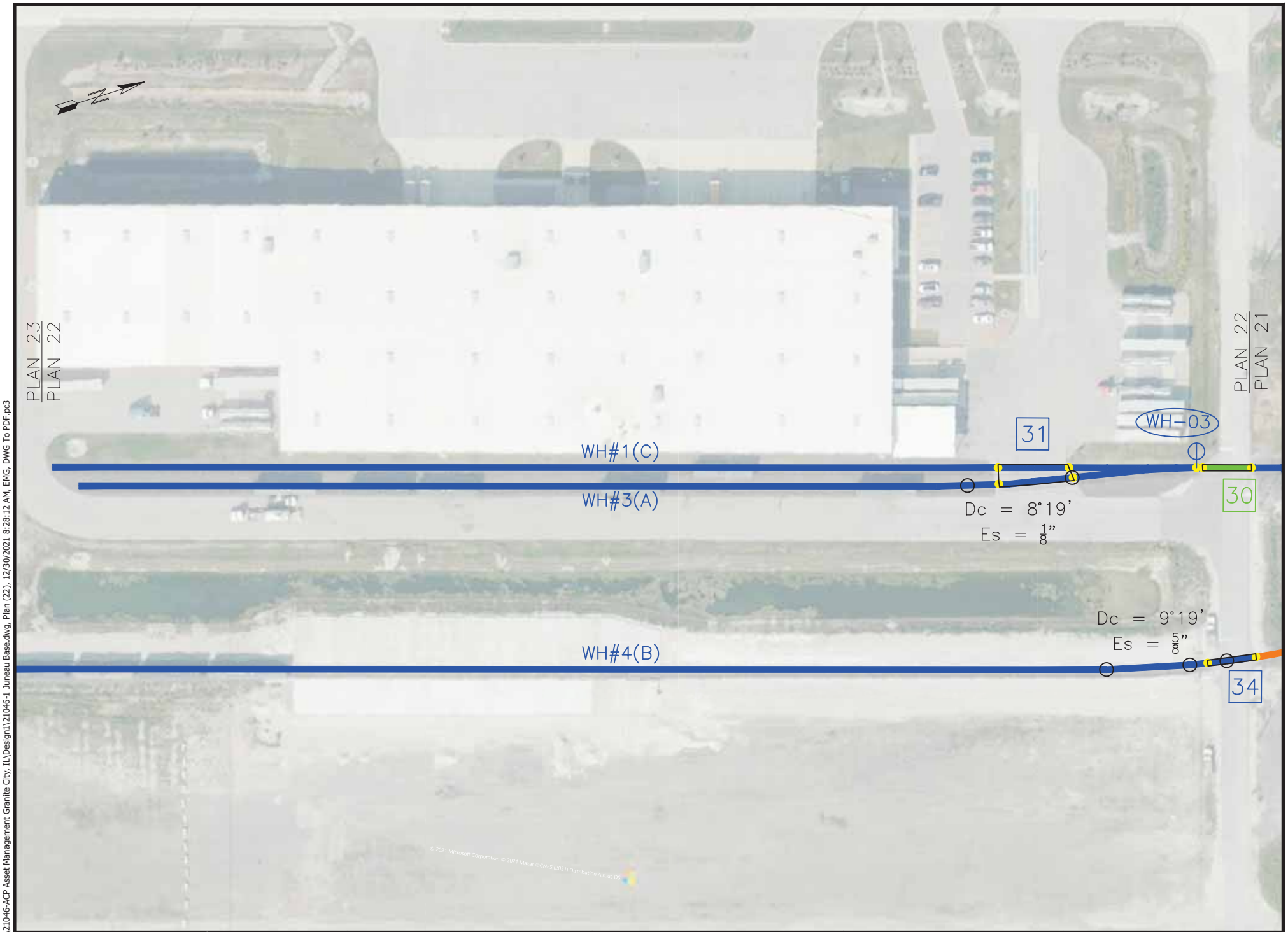
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	24 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 21



DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	25 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 22

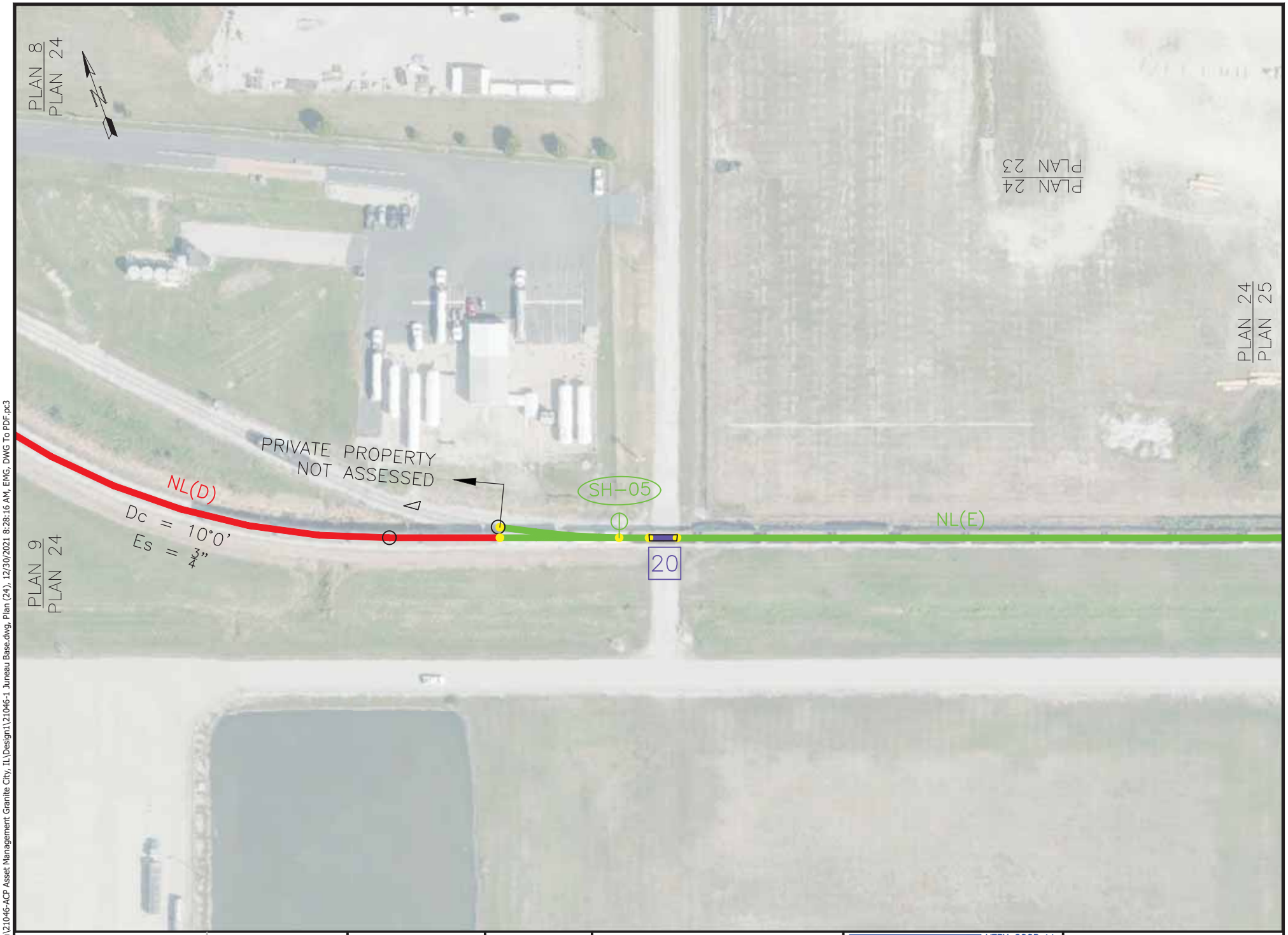
DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	26 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 23



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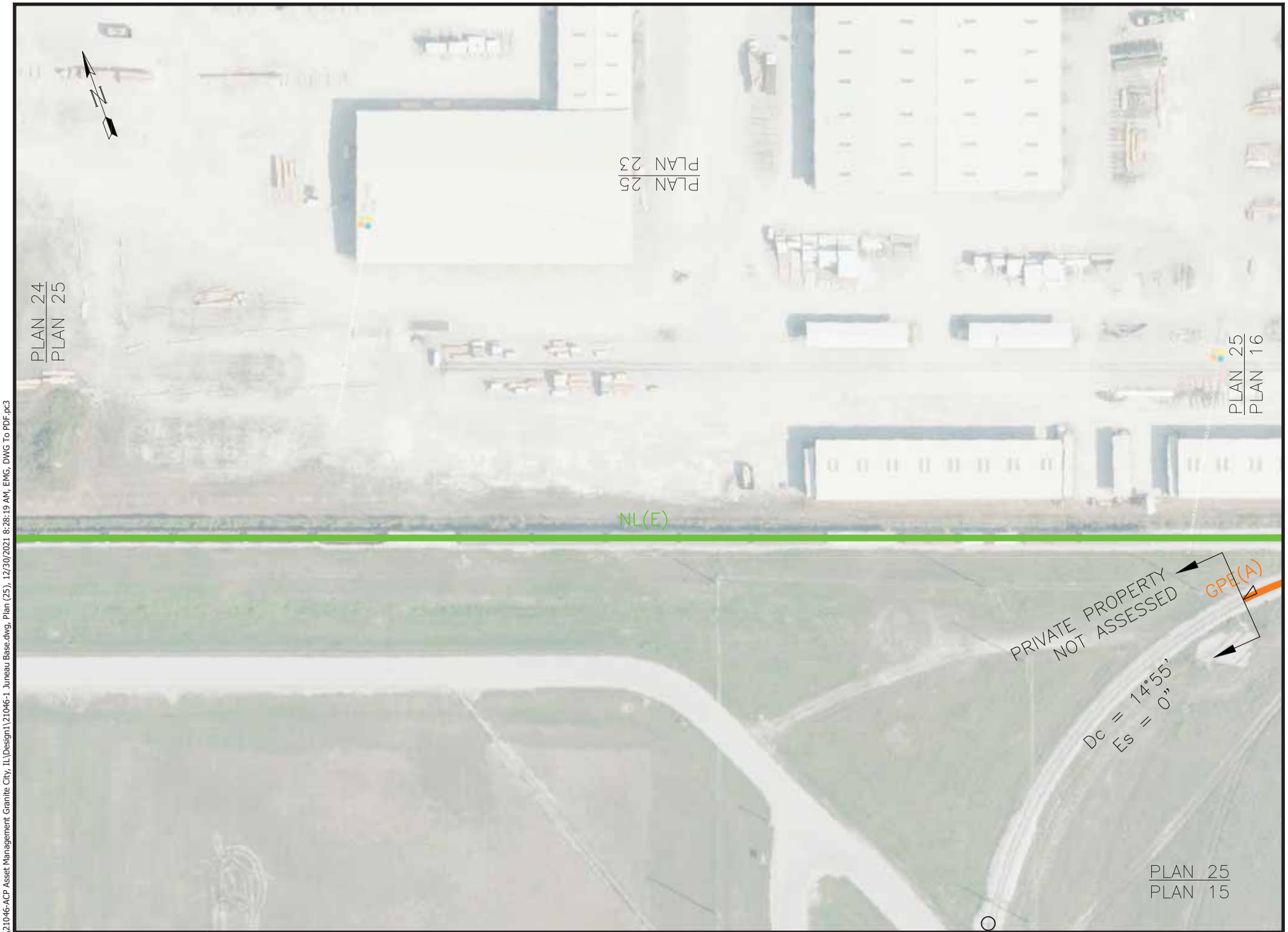
11166 TESSON FERRY ROAD SUITE 100 ST. LOUIS MO, 63123-6966 (314) 729-7600	Checked By: MPA	Sheet 27 of 36	VERY GOOD (A) GOOD (B) FAIR (C) POOR (D) VERY POOR (E)
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY	Drawing: 21046-1	Date: 12/27/21	PLAN 24



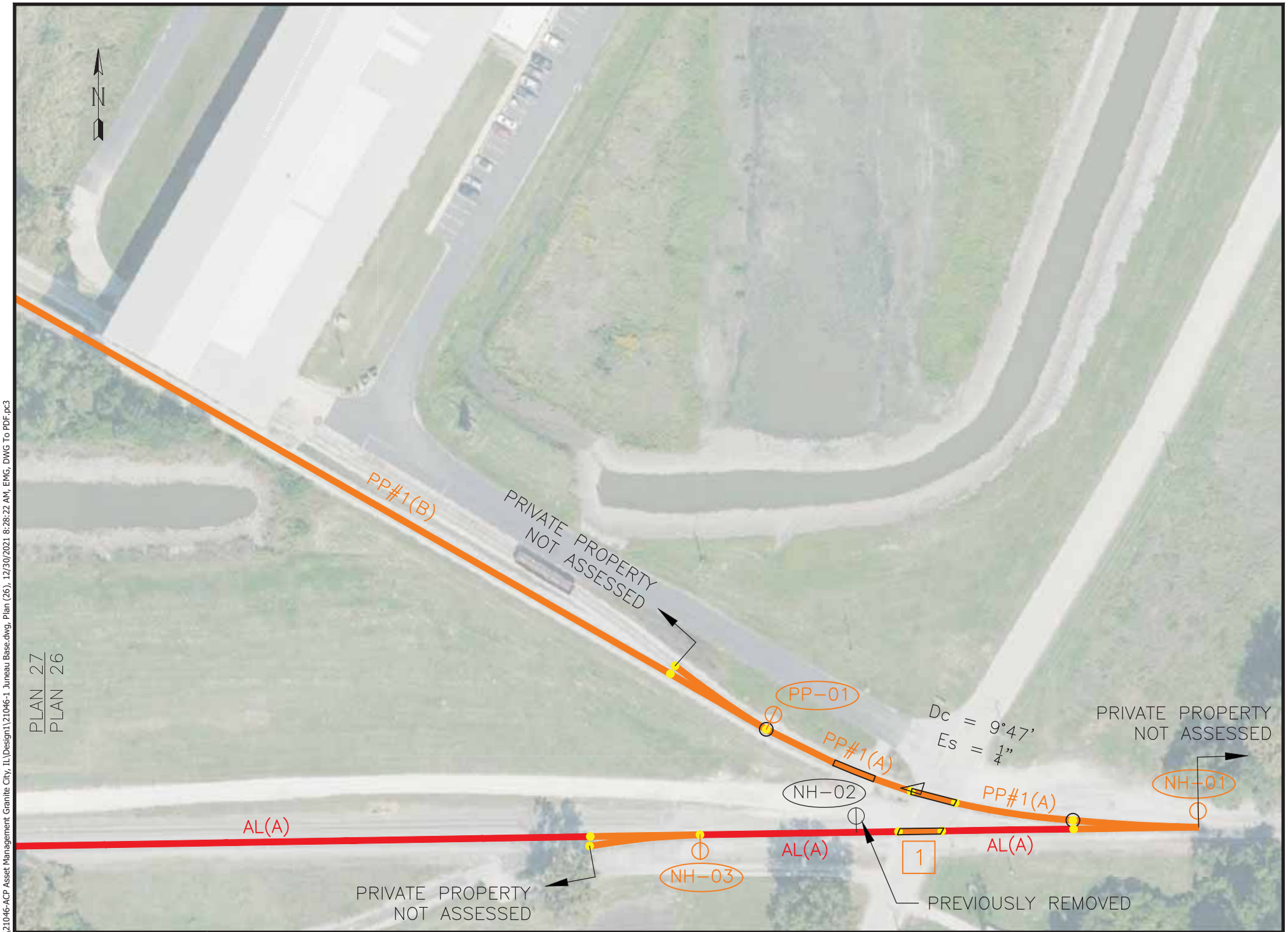
DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	28 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 25



DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	29 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 26

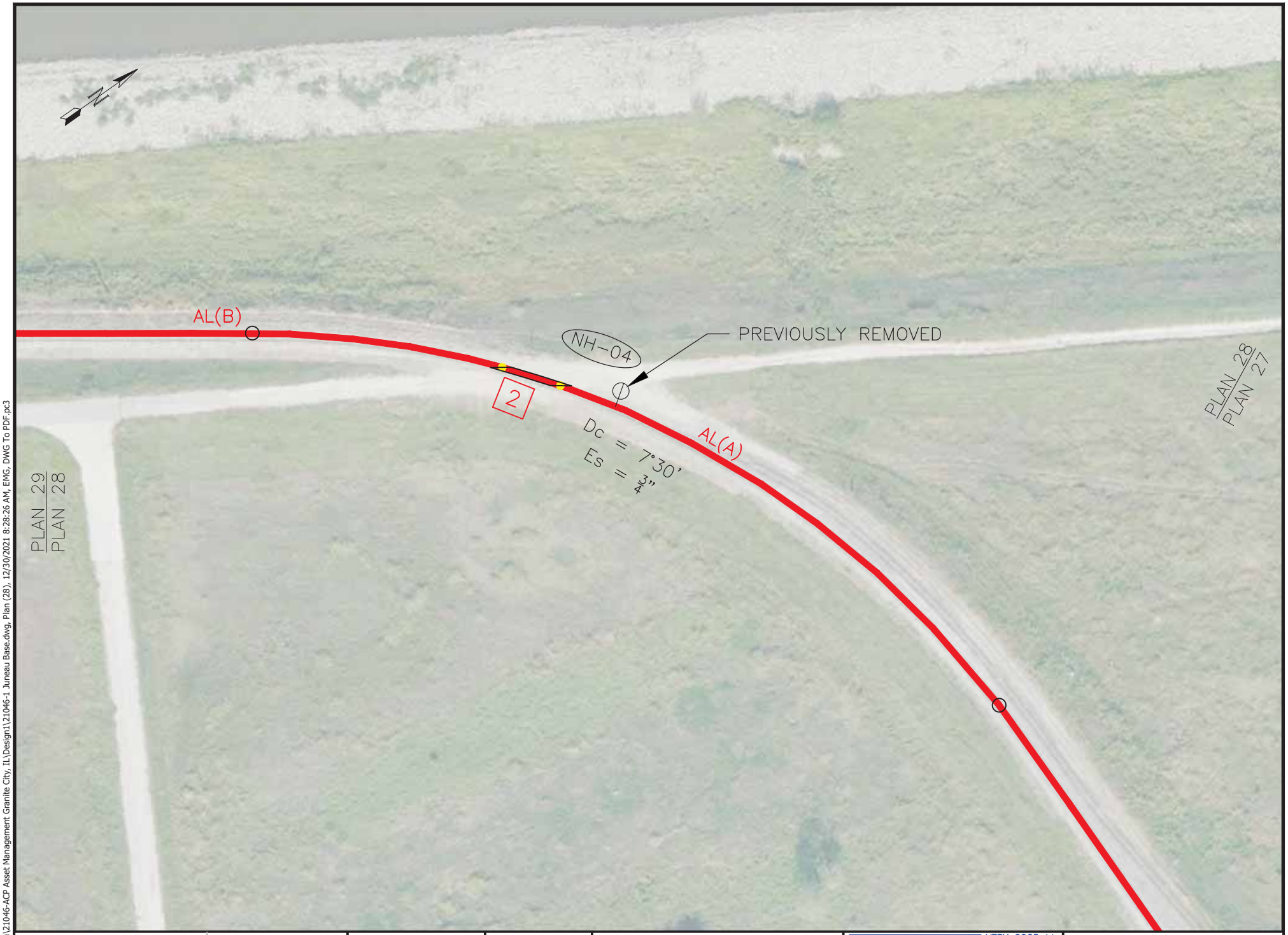
DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	30 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 27



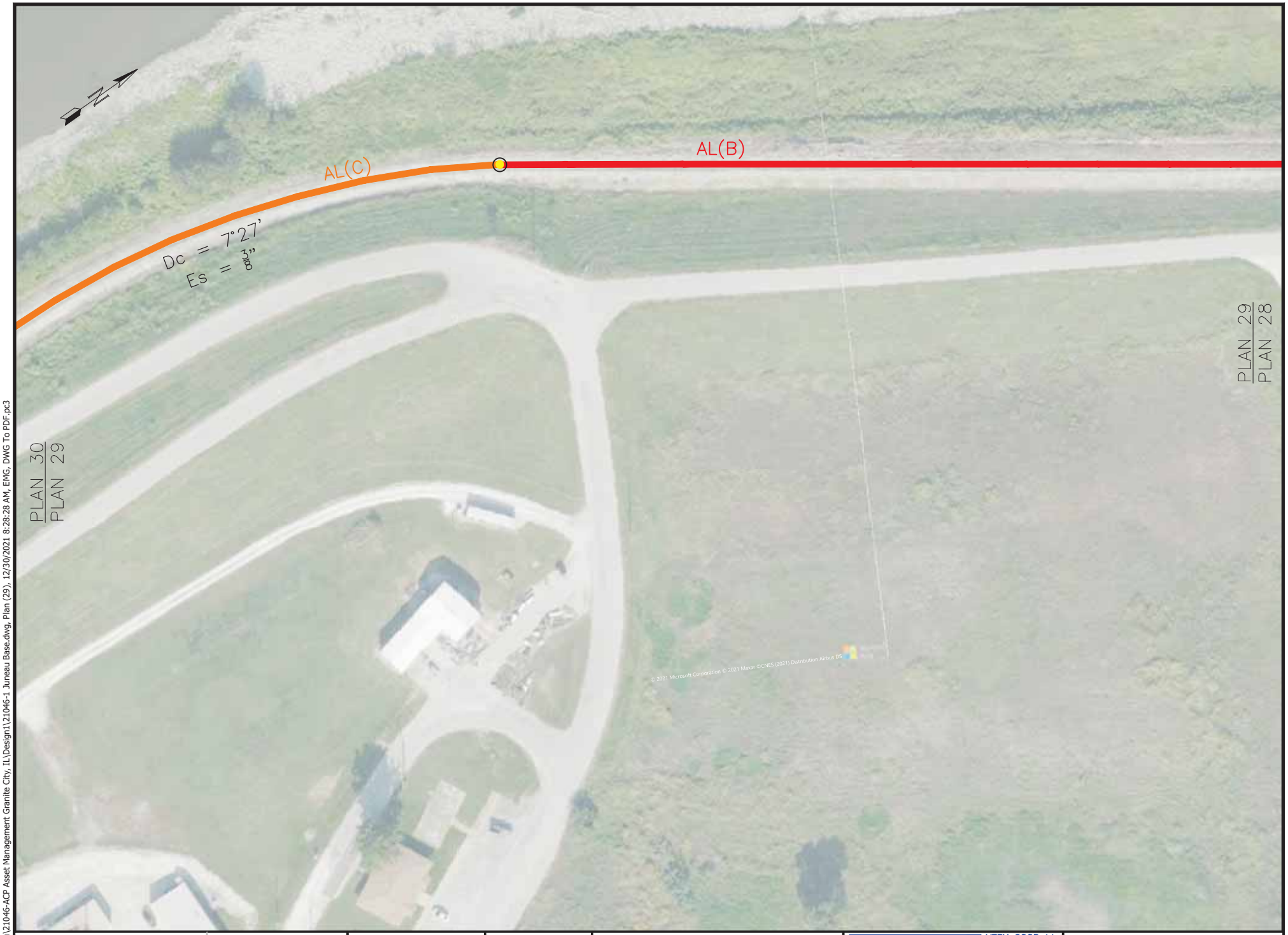
DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	31 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 28



DESIGN NINE
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
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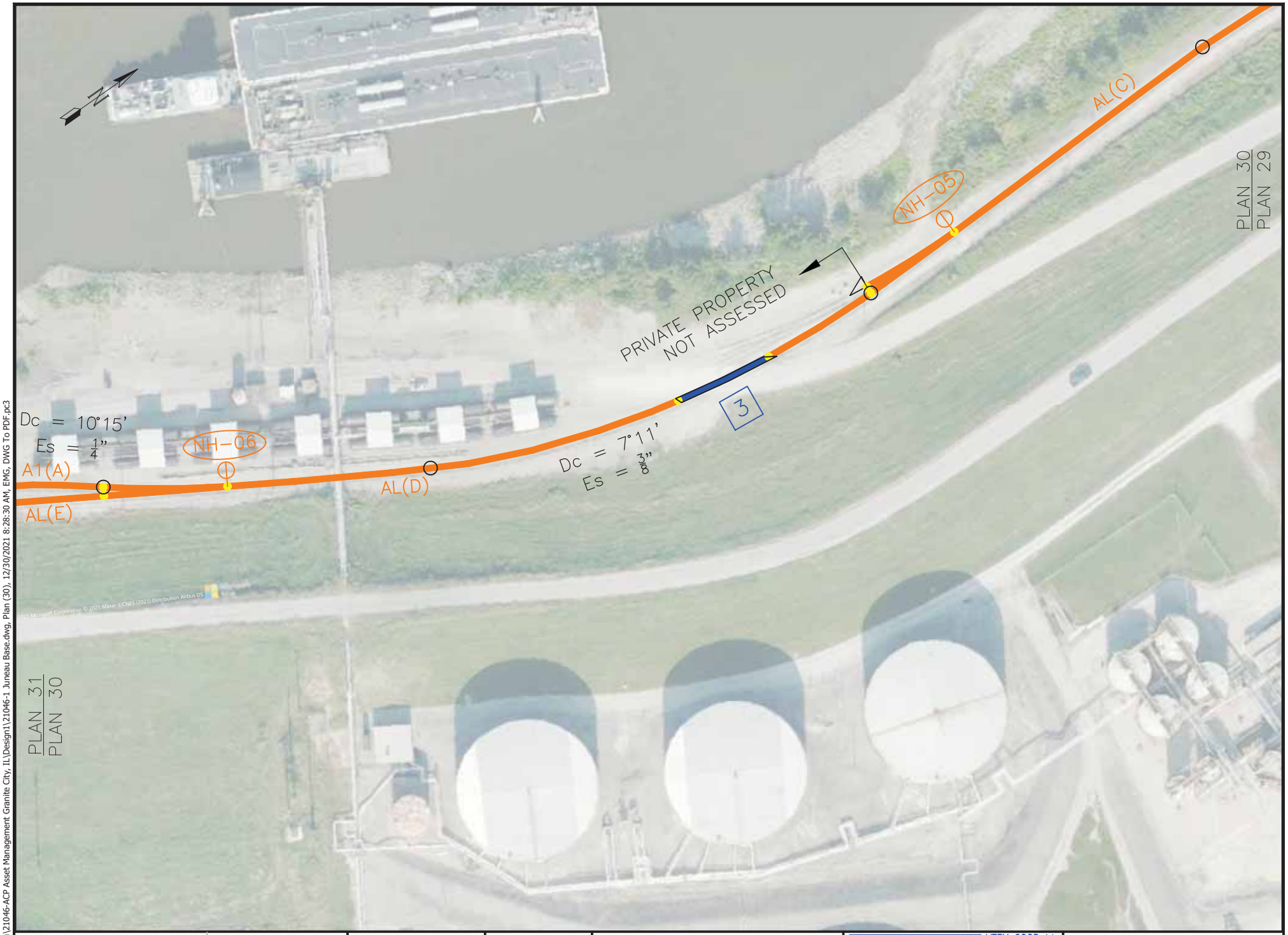
AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 29



DESIGN NINE
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11166 TESSON FERRY ROAD
SUITE 100
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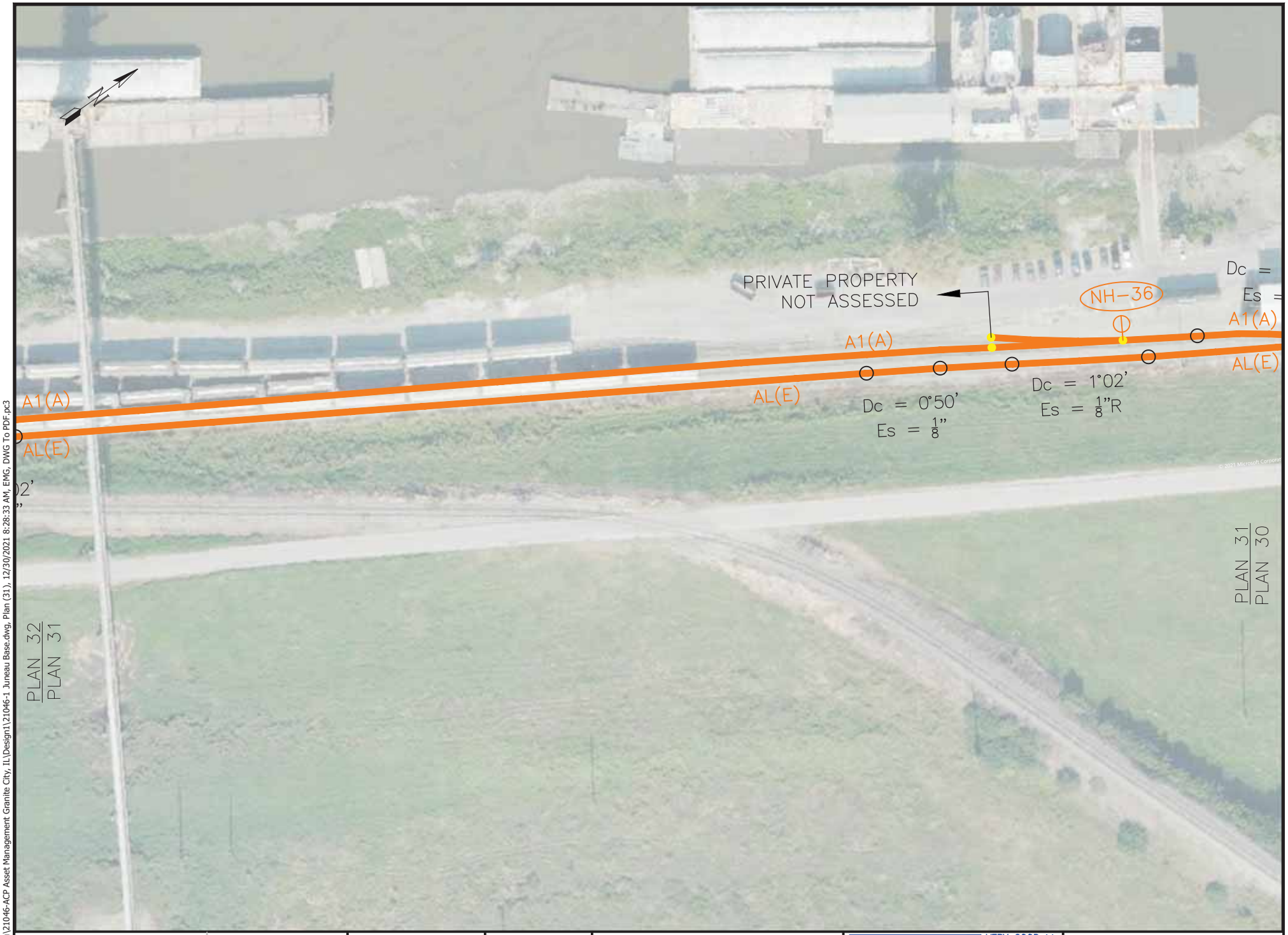
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	33 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 30



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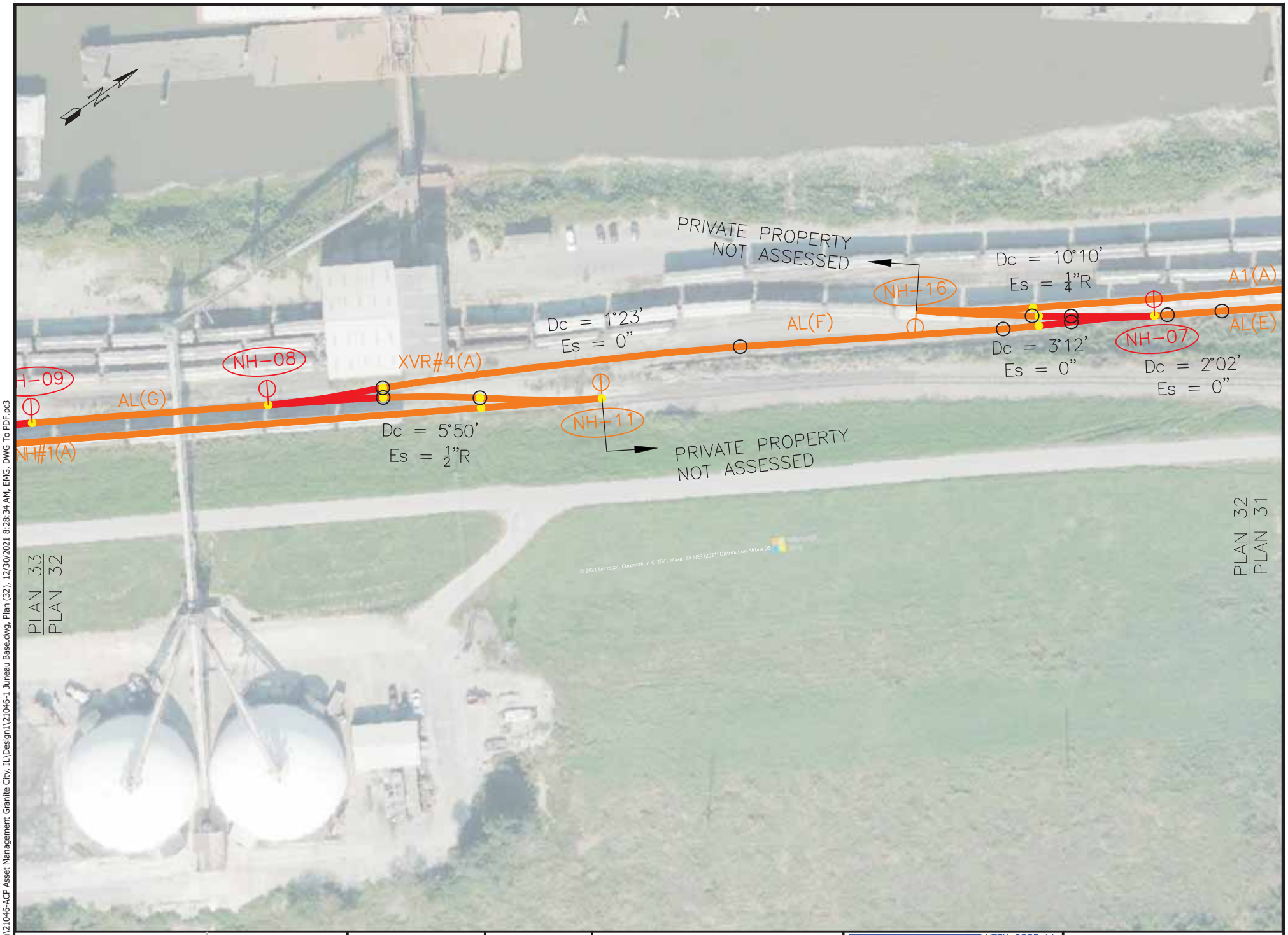
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	34 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 31



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11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
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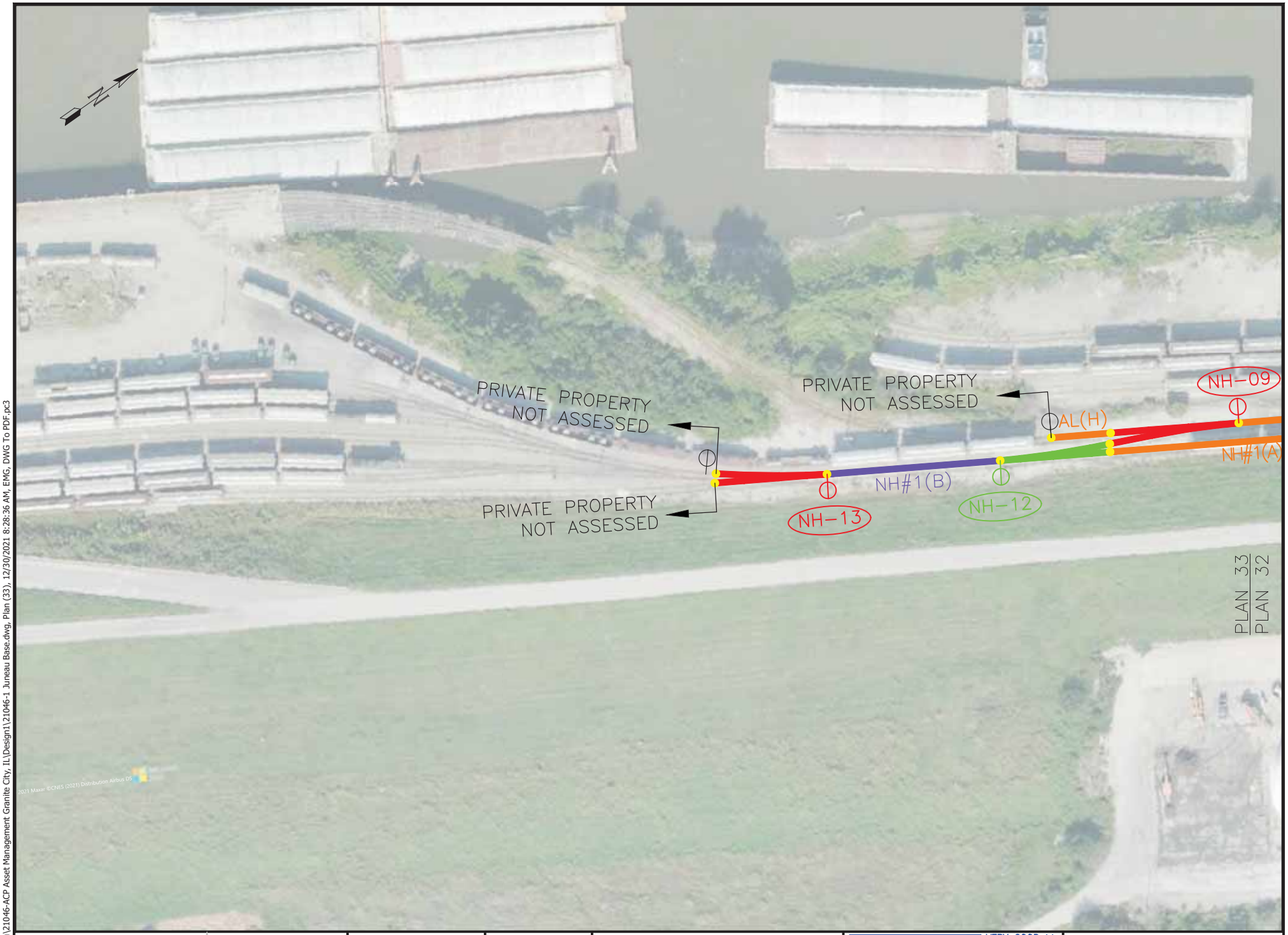
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 32



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SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	EMG	Scale:	1" = 100'
Checked By:	MPA	Sheet	36 of 36
Drawing:	21046-1	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

VERY GOOD (A)
GOOD (B)
FAIR (C)
POOR (D)
VERY POOR (E)

PLAN 33

AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Attachment D

Railroad Crossings For America's Central Port

AMERICA'S CENTRAL PORT
RAILROAD AT-GRADE CROSSINGS
GRANITE CITY, MADISON COUNTY, ILLINOIS

NOTES:

1. AERIAL IMAGERY DERIVED FROM BING MAPS (UNKNOWN DATE).
2. THIRTY–FIVE (35) TOTAL RAILROAD CROSSINGS.
   - 2.1. NINE (9) AT–GRADE CROSSINGS IN GRANITE CITY HARBOR.
   - 2.2. TWENTY–FIVE (25) AT–GRADE CROSSINGS IN MADISON HARBOR.
   - 2.3. ONE (1) RAILROAD UNDER CROSSING IN MADISON HARBOR.
   - 2.4. GRADE CROSSINGS 4, 5 & 6 MAINTAINED BY TENANTS.
   - 2.5. GRADE CROSSINGS 7 & 8 MAINTAINED BY NORFOLK SOUTHERN RAILWAY (NS).
   - 2.6. GRADE CROSSINGS 32 & 33 BY ETHANOL PLANT OWNER.

0' 300' 600' 1200'
GRAPHIC SCALE

FOR INFORMATION ONLY

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11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600

Drawn By:	JMD	Scale:	GRAPHIC
Checked By:	MPA	Sheet	1 of 6
Drawing:	ACP XINGS	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

NO.	DATE	REVISION (THIS DRAWING IS INTENDED TO BE PLOTTED ON 11 x 17 INCH PAPER)	BY

RAILROAD CROSSINGS
FOR AMERICA'S CENTRAL PORT
MADISON COUNTY, ILLINOIS

OVERALL VIEW

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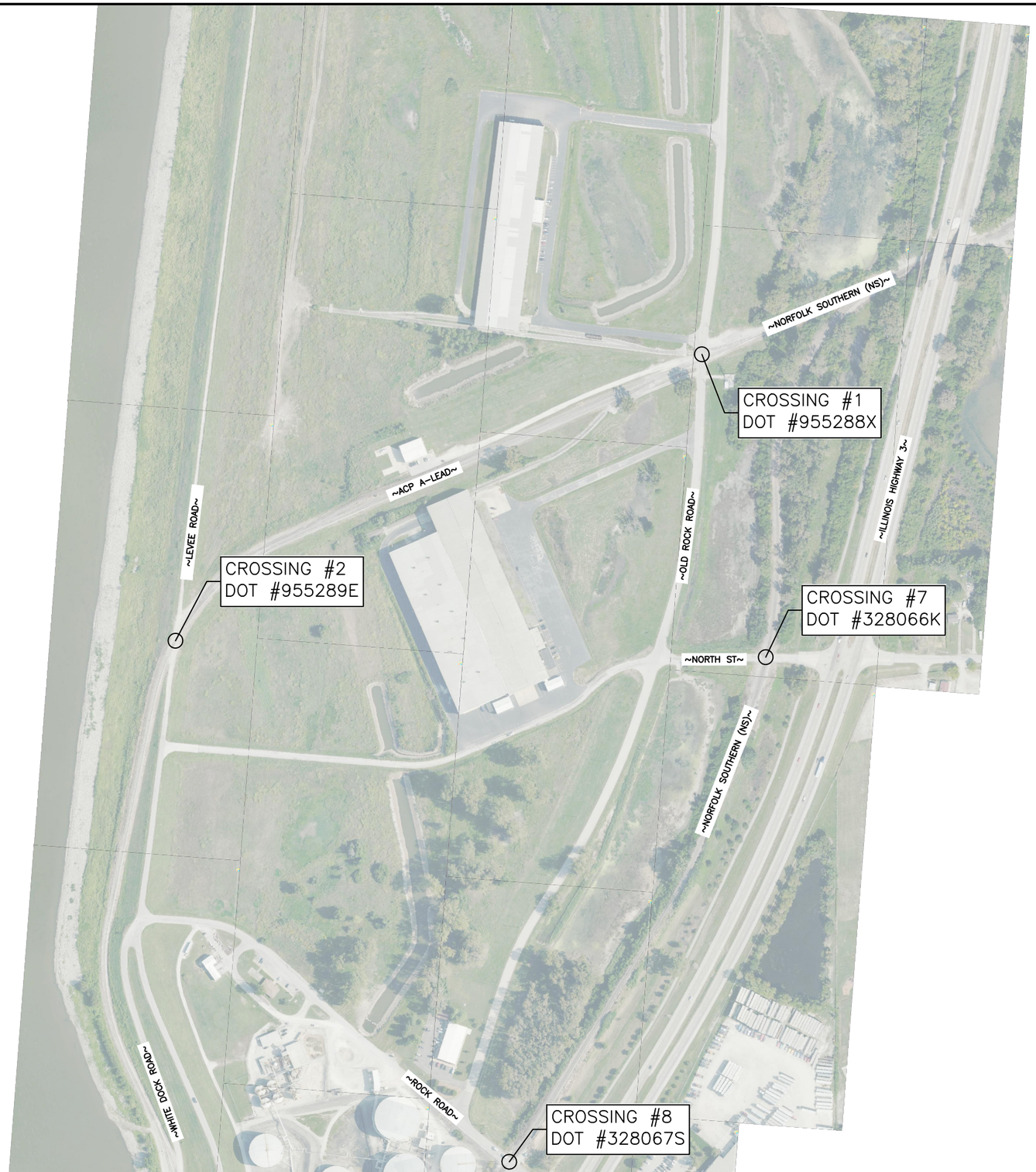
0' 100' 200' 400'
GRAPHIC SCALE

GRANITE CITY HARBOR
NORTHERN PORTION



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(314) 729-7600

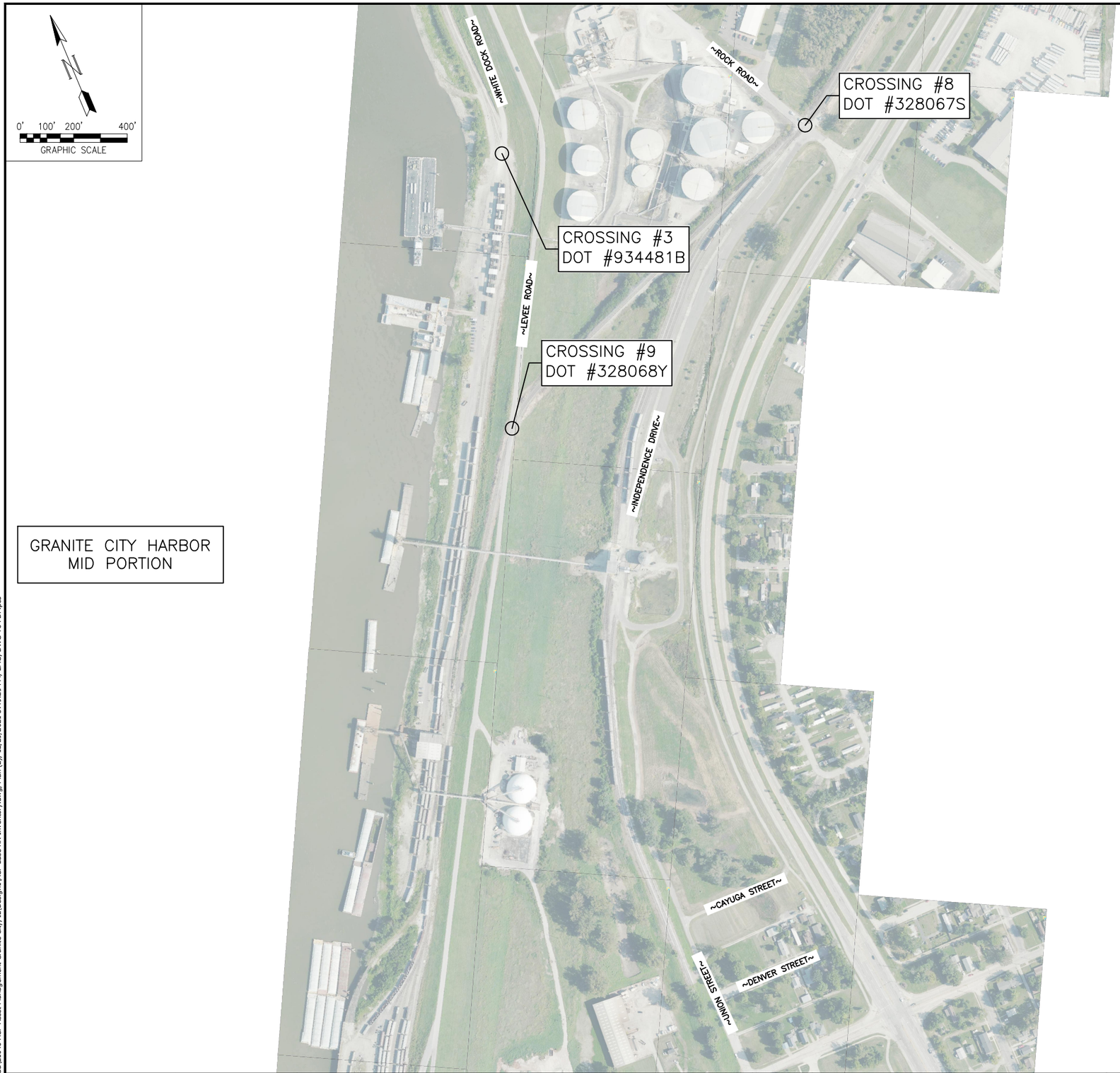
Drawn By:	JMD	Scale:	GRAPHIC
Checked By:	MPA	Sheet	2 of 6
Drawing:	ACP XINGS	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

NO.	DATE	REVISION (THIS DRAWING IS INTENDED TO BE PLOTTED ON 11 x 17 INCH PAPER)	BY

RAILROAD CROSSINGS
FOR AMERICA'S CENTRAL PORT
MADISON COUNTY, ILLINOIS

PLAN VIEW



GRANITE CITY HARBOR
MID PORTION

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DESIGN NINE
11166 TESSON FERRY ROAD
SUITE 100
ST. LOUIS MO, 63123-6966
(314) 729-7600
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY

Drawn By:	JMD	Scale:	GRAPHIC
Checked By:	MPA	Sheet	3 of 6
Drawing:	ACP XINGS	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

NO.	DATE	REVISION (THIS DRAWING IS INTENDED TO BE PLOTTED ON 11 x 17 INCH PAPER)	BY

RAILROAD CROSSINGS
FOR AMERICA'S CENTRAL PORT
MADISON COUNTY, ILLINOIS

PLAN VIEW

0' 100' 200' 400'
GRAPHIC SCALE

CROSSING #4
DOT #934480U

CROSSING #5
DOT #934479A

CROSSING #6
DOT #928973T

CROSSING #10
DOT #928968W

GRANITE CITY HARBOR
SOUTHERN PORTION

GRANITE CITY
HARBOR

MADISON HARBOR

~UNION STREET~
~DENVER STREET~
~W TWENTIETH ST~
~LEVEE ROAD~
~HERSCHBACH DRIVE~
~KENNEDY DRIVE~
~W FIRST STREET~
~EAST LANE~
~W SEVENTH STREET~
~NIEDRINGHAUS AVENUE~

CROSSING #11
DOT #972663P

CROSSING #35
DOT #972672N

CROSSING #12
DOT #928969D (HIGHWAY OVERPASS)

CROSSING #13
DOT #928850G

~HINKLE DRIVE~
~R STREET~
~A STREET~
~SULLIVAN DRIVE~
~JUSTICE COURT~
~MCINTOSH DRIVE~
~FOURTH STREET~
~THIRD STREET~

CROSSING #14
DOT #928851N

CROSSING #29
DOT #928974A

CROSSING #24
DOT #972664W

~C STREET~

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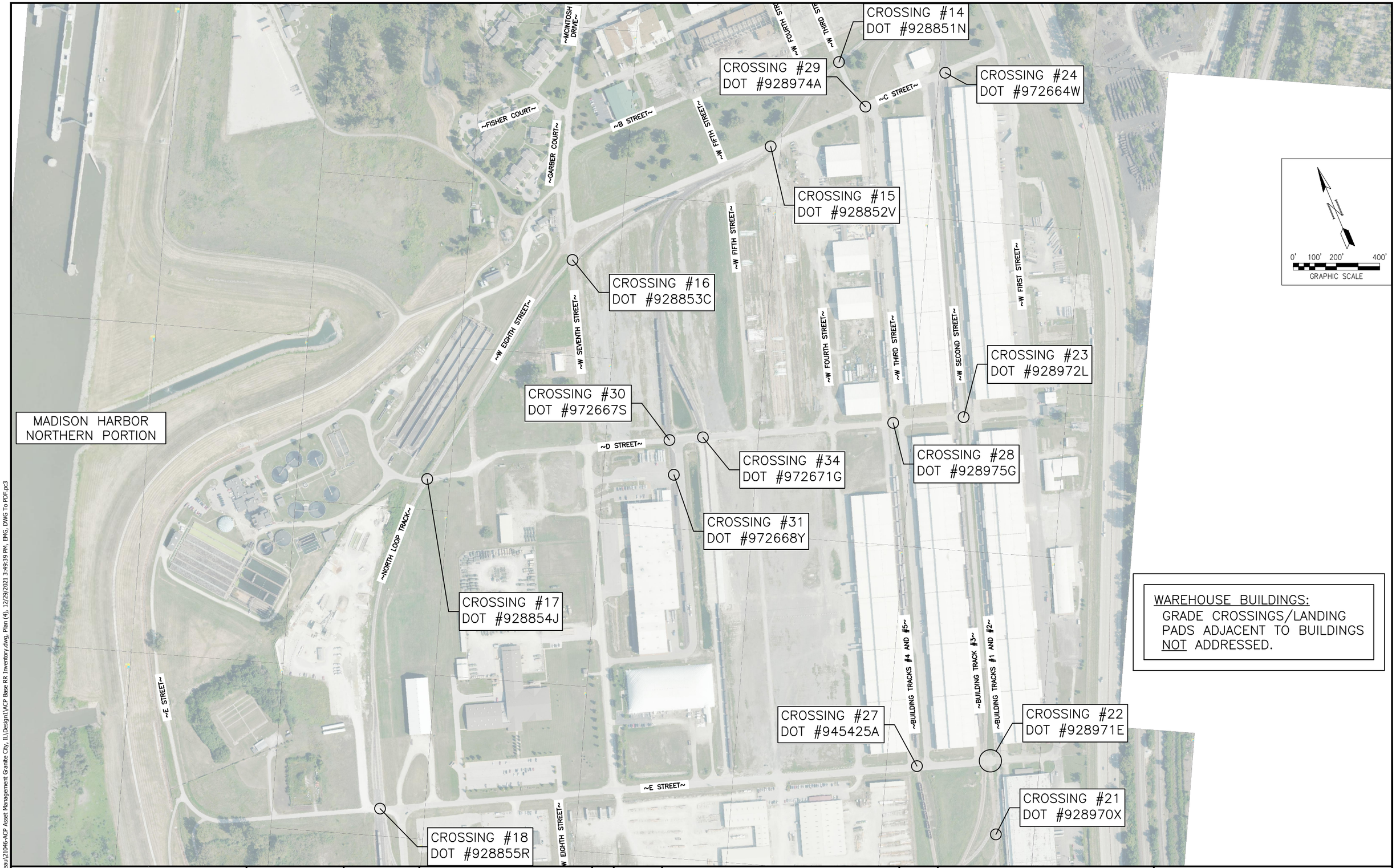
Drawn By:	JMD	Scale:	GRAPHIC
Checked By:	MPA	Sheet	4 of 6
Drawing:	ACP XINGS	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

NO.	DATE	REVISION (THIS DRAWING IS INTENDED TO BE PLOTTED ON 11 x 17 INCH PAPER)	BY

RAILROAD CROSSINGS
FOR AMERICA'S CENTRAL PORT
MADISON COUNTY, ILLINOIS

PLAN VIEW



WAREHOUSE BUILDINGS:
GRADE CROSSINGS/LANDING PADS ADJACENT TO BUILDINGS NOT ADDRESSED.

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(314) 729-7600

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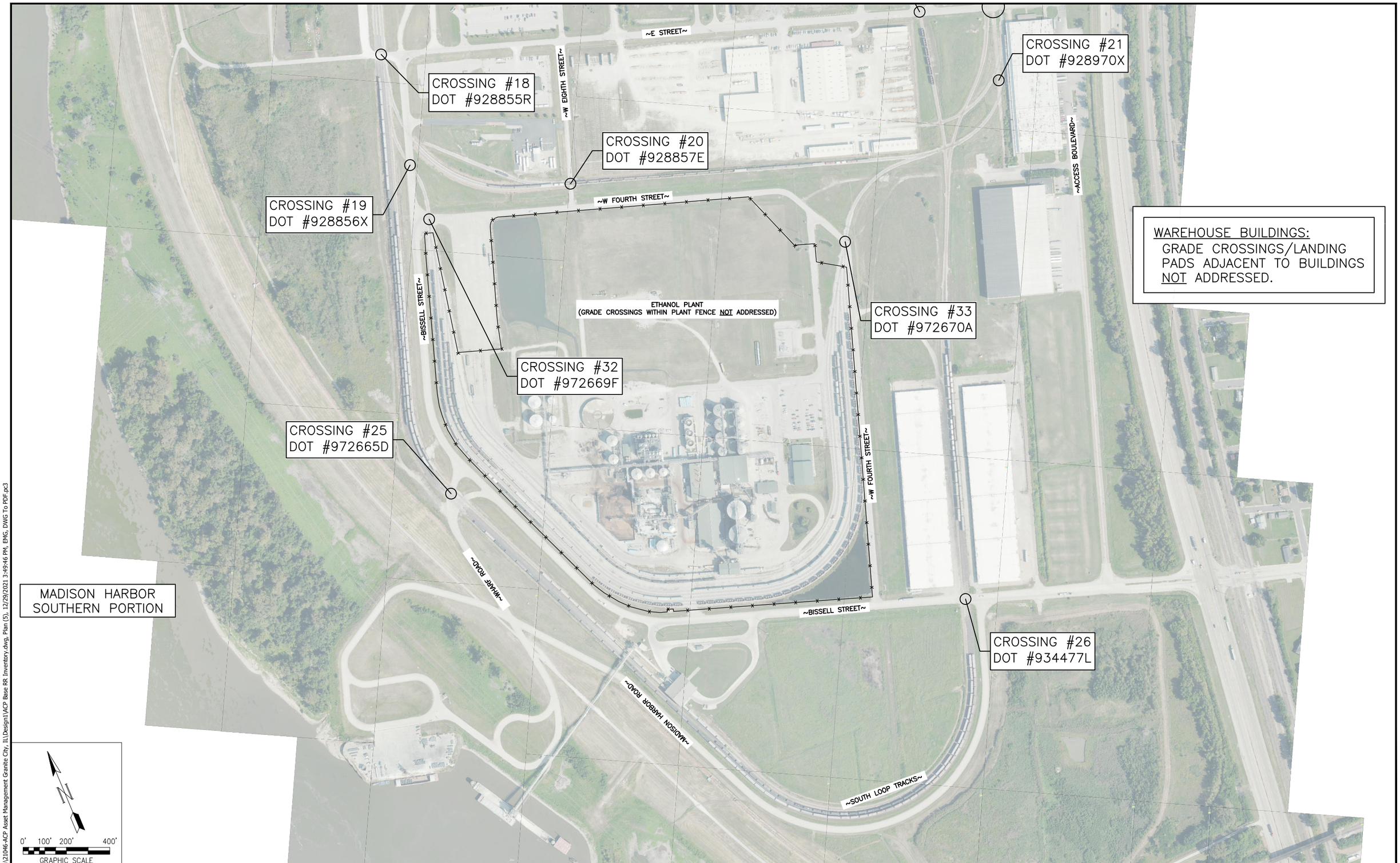
Checked By:	MPA	Sheet	5 of 6
Drawing:	ACP XINGS	Date:	12/27/21

AMERICA'S CENTRAL PORT
1635 WEST FIRST STREET
GRANITE CITY, IL 62040

NO.	DATE	REVISION (THIS DRAWING IS INTENDED TO BE PLOTTED ON 11 x 17 INCH PAPER)	BY

RAILROAD CROSSINGS
FOR AMERICA'S CENTRAL PORT
MADISON COUNTY, ILLINOIS

PLAN VIEW



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DESIGN NINE ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY	11166 TESSON FERRY ROAD SUITE 100 ST. LOUIS MO, 63123-6966 (314) 729-7600	Drawn By: JMD Checked By: MPA Drawing: ACP XINGS	Scale: GRAPHIC Sheet 6 of 6 Date: 12/27/21
AMERICA'S CENTRAL PORT 1635 WEST FIRST STREET GRANITE CITY, IL 62040	NO. / DATE / REVISION (THIS DRAWING IS INTENDED TO BE PLOTTED ON 11 x 17 INCH PAPER) / BY		

RAILROAD CROSSINGS
FOR AMERICA'S CENTRAL PORT
MADISON COUNTY, ILLINOIS

PLAN VIEW

AMERICA'S CENTRAL PORT
GRANITE CITY & MADISON HARBOR
RAIL INFRASTRUCTURE
CONDITIONS ASSESSMENT REPORT
GRANITE CITY, MADISON COUNTY, ILLINOIS

Attachment E

America's Central Port

Photos of Rail Infrastructure Assessed Conditions

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

RAIL END BATTER (SMASHED)

SHELLING AND
PLATE CUTTING

RAIL END BATTER (CHIPPED)

RAIL END BATTER (CHIPPED)

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

ENGINE BURN

PLASTIC DEFORMATION OF FROG WING RAIL WITH RAIL END BATTER

DEFECTIVE TIMBER GRADE CROSSNG SURFACE

INCOMPLETE PEDESTRIAN GRADE CROSSING APPROACHES

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

PAVEMENT SETTLEMENT ALONG GRADE CROSSING SURFACE

LIGHT VEGETATION

FOULED TRACK BALLAST AND LACK OF POSITIVE DRAINAGE

EXCESSIVE WEAR ON GAUGE SIDE OF RAIL

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

SEVERE RAIL CENTER SPALLING WITH EXCESSIVE FLAKING

RAIL GAUGE FLOW

SEVERE RAIL CENTER SPALLING AND FLATTENED RAIL

DEFORMED FROG POINT AND WING RAIL

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

FROG POINT CHIPPED

RAIL END BATTER (CHIPPED)

RAIL FIELD SIDE LIP AND FLATTENED RAIL

RAIL HEAD WORN 1/4" GAUGE SIDE AND ENGINE BURN

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

SHALLOW BALLAST TIE CRIBS

NON-FUNCTIONING LUBRICATION MODIFIER

WEB AND BASE CORROSION OF SINGLE SHOULDER TIE PLATES

EXCESSIVE RAIL JOINT GAP WITH VISIBLE SIGNS OF MOVEMENT

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

LIGHT VEGETATION

LATERAL TRACK MOVEMENT IN BALLAST SHOULDERS

SEVERE RAIL SPALLING WITH FLAKING

PROFILE DIP FROM SUBGRADE INSTABILITY HEAVING TRACK BALLAST SHOULDERS

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

LATERAL TRACK MOVEMENT IN BALLAST SHOULDERS

FOULED TRACK BALLAST FROM LACK OF ADEQUATE DRAIANGE

LATERAL TRACK MOVEMENT IN BALLAST SHOULDERS

LATERAL TRACK MOVEMENT HEAVING BALLAST SHOULDERS

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

PROPER WHEEL RAIL INTERFACE

TRACK MISALIGNMENT (KINK)

LATERAL MOVEMENT WITH BALLAST GAP AT TIE ENDS

TRACK MISALIGNMENT WITH SHALLOW TIE CRIBS

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

FOULED BALLAST AND MUD PUMPING

EXCESSIVE SWITCH POINT WEAR

ABRASIVE SWITCH POINT WEAR WITH LIPPING ONTO STOCK RAIL

DEFORMED FROG WITH CRUSHED HEAD ALONG WING RAIL

AMERICA'S CENTRAL PORT PHOTOS OF ASSESSED CONDITIONS

GEOMETRY RECONFIGURATION