Appendix K:
Utica Harbor Point Redevelopment CM#2 Project, Existing Bulkhead Remedial Concepts, CME, February 2015

CME Associates, Inc.

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February 11, 2015

Via E-Mail Only

Elan Planning, Design & Landscape Architecture, PLLC
c/o O'Brien & Gere
101 First Street, 4th Floor
Utica, New York 13501

Attn: Mr. Paul D. Romano, P.E. Paul.Romano@obg.com

Re: Utica - Harbor Point Redevelopment CM#2 Project
Existing Bulkhead Remedial Concepts
CME Report No. 26959E-02-0215
Page 1 of 2

Dear Mr. Romano:

Pursuant to our discussion on January 13, 2015, the undersigned engineer has developed a concept for remediation of the Existing Bulkhead, which we feel will be considerable less costly than complete demolition and reconstruction, while maintaining a watermark within about one foot of existing.

1.0 INTRODUCTION

I reviewed the June 12, 2014 Canal Corp Terminal Wall Replacement Estimate of $13M and the "replacement concept" represented therein, which was taken from a recent Canal Project for Lock E-9, Upper Approach Wall. As we discussed, this solution is way outside of the $2.5M to $4M range of possible grant and funding money that may be available for the current Harbor Point Redevelopment CM#2 project.

It is important to point out that the existing distressed concrete and wooden structure is 100 years old and any dependence on any elements of the existing structure for the remediation/redevelopment will involve recognition and acceptance of some risks and uncertainties. These risks and uncertainties include but are not limited to, sudden catastrophic collapse, local or general settlements, and/or sudden sinkhole development. These risks are inherent in the existing structure and current condition. The existing Bulkhead Wall is an 8 foot tall wall of deteriorated concrete, built on a submerged horizontal wooden platform supported by timber piles about 10 feet above the bottom of the harbor. The wall varies in width from about 2.5 feet at top to 6 feet at base and has 3 rows of piles spaced at 4.25 feet apart along its 1300 feet length. The wooden platform is constructed of 12x12 or 12x8 timber framing and 4 inch thick wood planking. The platform is about 16 feet wide. It is just water and piles under the

platform structure. Please refer to the attached January 1914, Final Estimate – Dock Alteration No. 1 Drawing for more information on what was planned to be built. It should be noted that the existing Dock and Wall does not conform exactly to this drawing. For example, the existing structure has about 100 piles less than what is shown in the 1914 Drawing.

CME's focus in this effort has been to present a solution that preserves the real estate (i.e. does not give up land to water); reduces the risk of sudden catastrophic collapse; reduces the risk of significant or very costly change orders during the construction by reducing the design concept's dependence on existing load bearing elements; and minimizing Total Project Cost.

2.0 CONCEPTS

CME's first concept studied was to install a temporary sheetpile cofferdam, lower the water, demolish the existing concrete wall, remove the soil above the submerged wooden platform deck, and remove the deck and timber framing. Then inspect the piles and drive intermediate piles, as-needed. Reconstruct the wood deck and a new concrete bulkhead, backfill and pave/surface, and then remove the cofferdam.

CME's second concept studied was to install a permanent light gauge sheetpile cofferdam wall, demolish a portion of existing concrete wall, partially dewater, and use Cellular Controlled Density Fill (CCDF) to fill the entire void space between the light gauge sheetpile wall and land under the deck. Install waler and deadman tiebacks for wall, backfill and pave/surface.

CME's second concept is presented on the attached sketch and is intended for discussion purposes. This concept is about 50% less costly than the first concept and, since the new Bulkhead Wall will be completely backfilled to the mudline, represents a much lower risk alternative by eliminating the sudden collapse and sinkhole risks.

3.0 RECOMMENDATIONS

It is recommended that the Concept Sketch be considered and discussed. If no other significantly different concepts are envisioned that capture the attributes desired, then Design Development of the concept should commence.

Please direct all inquiries and discussion to the undersigned engineer.

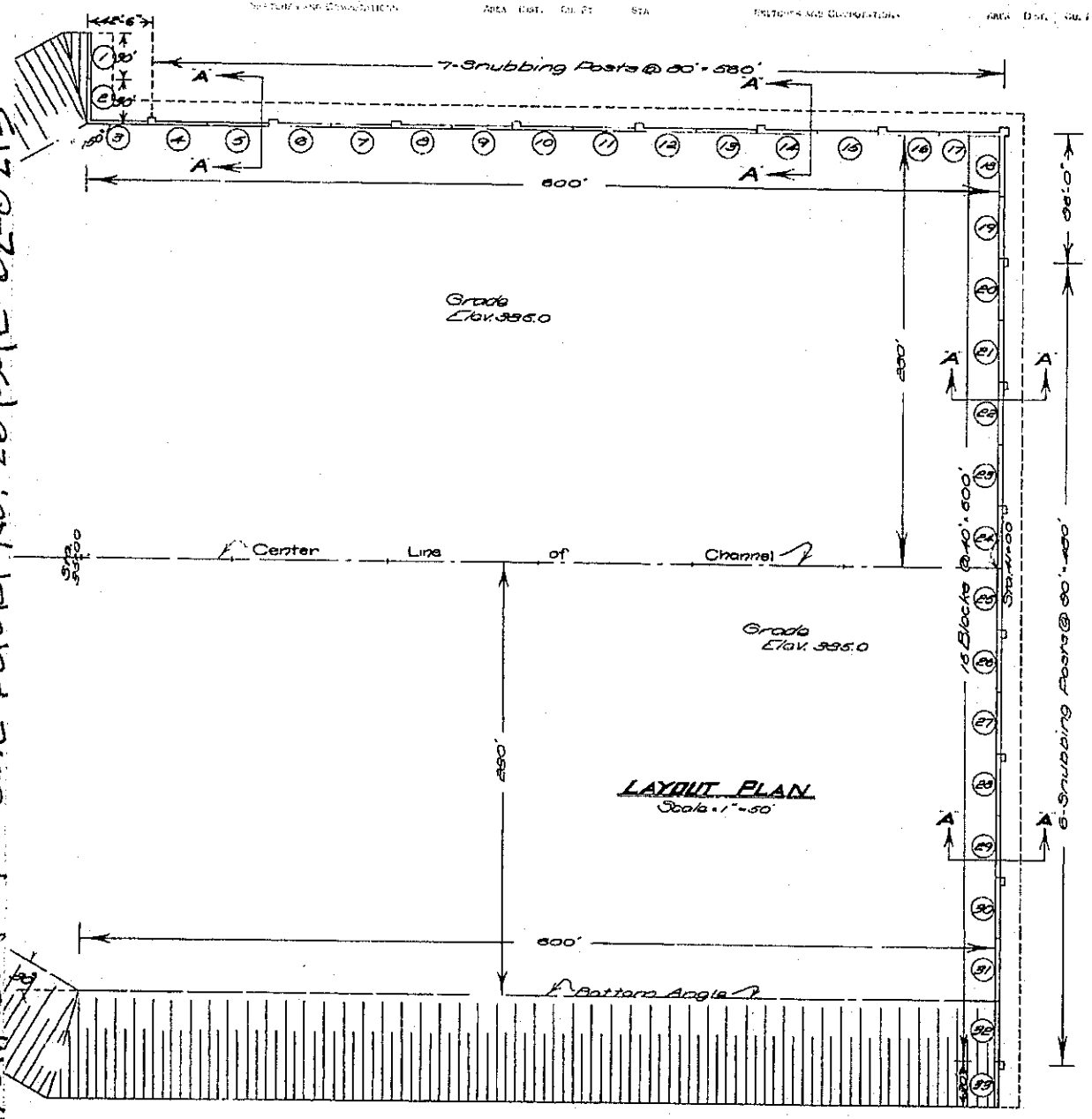
Respectfully submitted,
CME Associates, Inc.

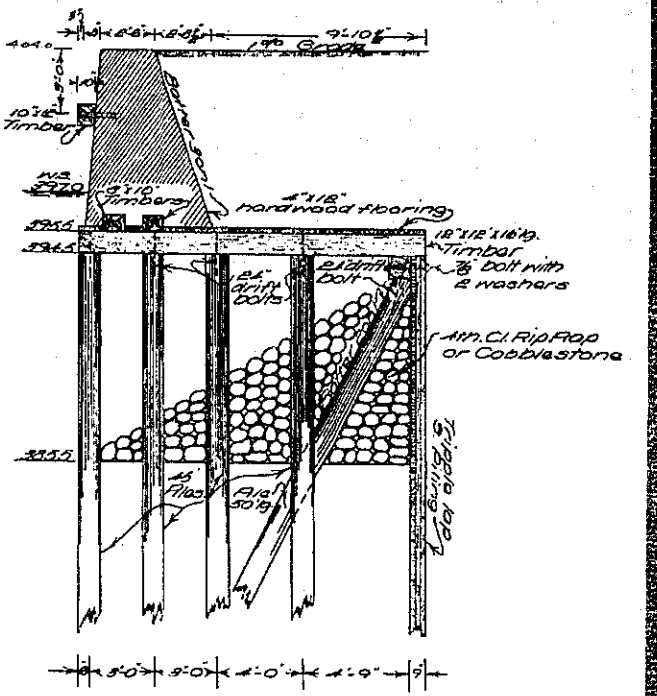
Marcus A. Rotundo, P.E.
Sr. Geotechnical Engineer

MAR/jll

Attachment Listing: 1914 Final Estimate Dock Alteration No. 1, Utica Terminal (1 of 1)
Concept Sketch (1 of 1)

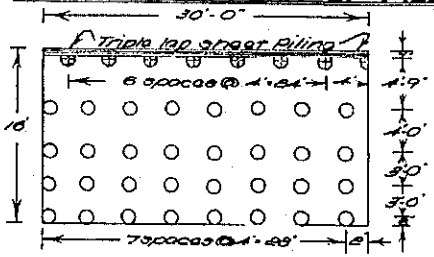
ATTACHMENT TO CME REPORT NO. 2695E-02-0215



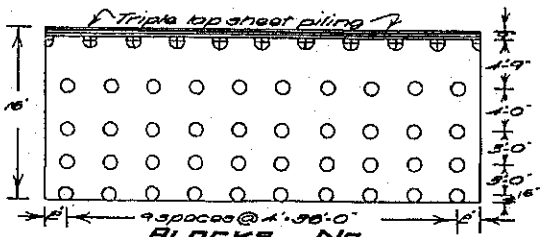


SECTION A-A
Scale 1"=4'

FOUNDATION PLAN OF PILES



BLOCKS No. 1 & 33



BLOCKS No. 2 TO 16 - 16 TO 32 INC.

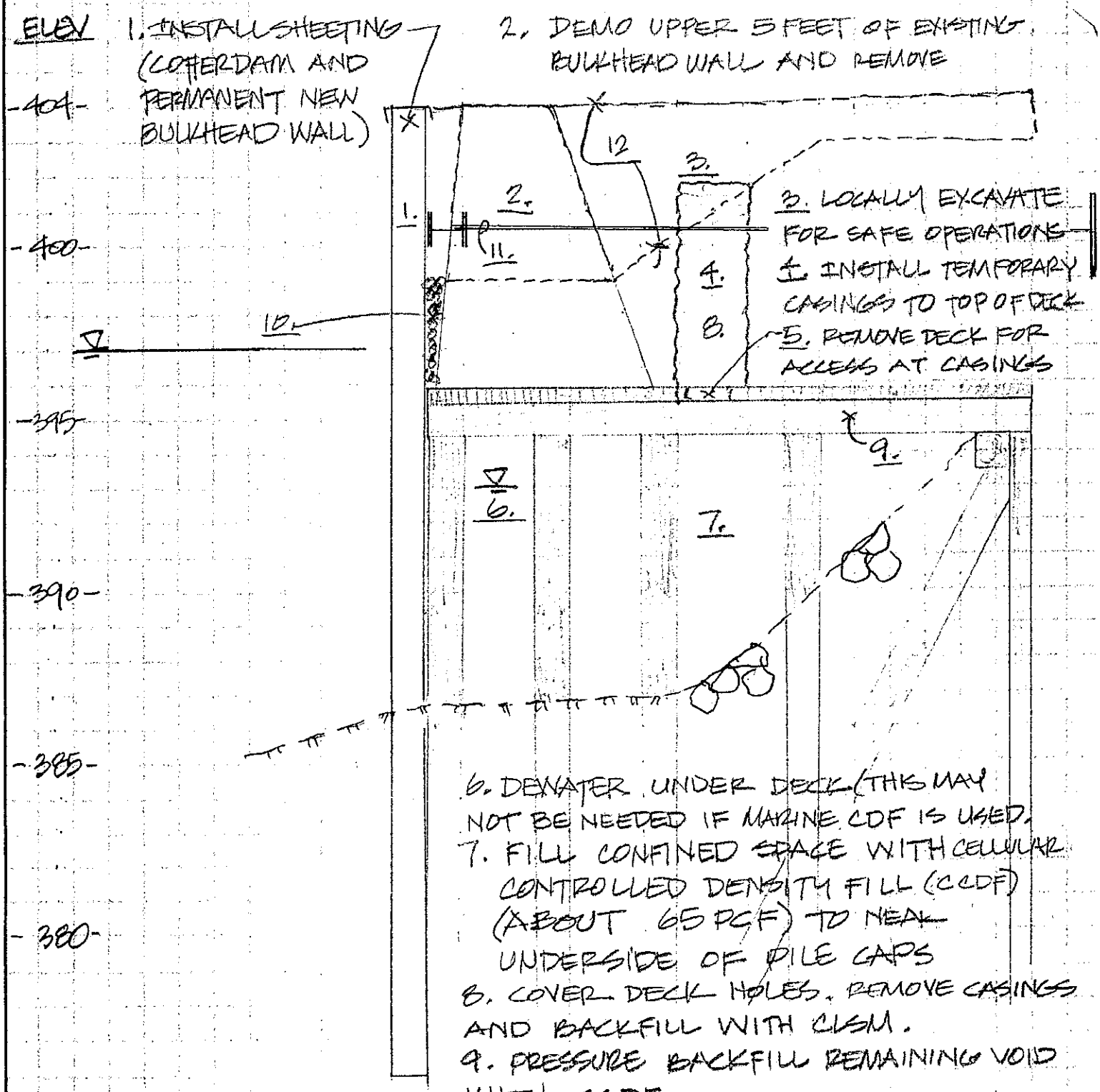
MADE BY [illegible] DATE 4-1914
CHKD BY [illegible]
DIVISION ENGR E. Hulsapple

CME Associates, Inc.
Construction Materials Evaluation

JOB UTICA HARBOR BULKHEAD REDEV.
SHEET NO. 1 OF 1
CALCULATED BY MAROTUNDO DATE 2/11/2015
CHECKED BY DATE
SCALE 1/4" = 1'-0"

CONCEPT SKETCH

CME REPORT NO. 269529E-02-0215



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101 First Street, 4th Floor
Utica, New York 13501

Attn: Mr. Paul D. Romano, P.E. Paul.Romano@obg.com

Re: Utica - Harbor Point Redevelopment CM#2 Project
Canal Corp Inspection of Structure of September 19, 2008
CME Report No. 26959E-01-0215
Page 1 of 2

Dear Mr. Romano:

At your request, the undersigned engineer evaluated the NYSCC Structure Inspection Report STRIN: 400T54A of September 19, 2008 in respect to reliance on and re-use of any of the structure components.

I noted some apparent discrepancies between the January 1914 Final Estimate Dock Alteration No. 1 Documents and the Inspection Report of 2008. They are:

- The wood triple-lap sheeting may not exist or was not installed in 1914.
- The rip-rap may only be a few feet thick and laid on an earth slope.
- The rip-rap slope angle is likely steeper than shown on the 1914 Drawing.
- The piles are 4.25 feet on-center along the lines parallel with the existing concrete wall, not 4 feet on-center as shown on 1914 Drawing.
- One of the two 8x10 timbers to serve as keyways for the concrete wall, may be located at the outside face toe of Wall.

I catalogued the underwater inspection notes for the 4 rows of piles into five categories which are indicators of structural integrity impairment. They are:

L – Cross Section Loss of 10% or more
D – Displaced Horizontally
X – No contact pile to Pile Cap or at least 75% bearing impaired
x – Bearing impaired 50% to 75%
S – Pile Split or Pile Cap Crushed/Split

The inspection Starts at about station 0+60 and Ends at station 12+96 for 304 Rows of four vertical piles each for 1216 piles total. The Batter Piles are not mentioned in the Inspection Report.

My Findings are presented in Table 1. Row 1 is at the outboard toe of existing Bulkhead Wall.

Table 1: Summary of Five Structural Defects of Piles

ROW / Defect	1	2	3	4	Line Totals
L	35	12	9	4	60
D	42	74	59	24	199
X	8	22	29	32	91
x	30	20	19	5	74
S	46	24	20	8	98
TOTALS	**161**	**152**	**136**	**73**	**522**
Cum. Total	**161**	**313**	**449**	**522**	**522**
Cum. %	**31%**	**60%**	**96%**	**100%**	**100%**

We have attached the Annotated Inspection Report showing the location of each Defect, among other notations.

Because Pile Rows 1, 2 and 3 support the existing wall with 912 piles and since 49% (449 piles) exhibited significant defects in 2008, CME has concluded that it is not prudent to proceed with any design which relies on utilizing the existing timber piles for structural support. In our professional opinion, this Bulkhead and submerged wooded platform have reached the end of their useful life.

At this date, one must understand that failure of the wall and/or platform could occur at any time. Failure may be manifested by sudden collapse, sinkhole, slide into Harbor, and progressive settlement of surfaces on, near and/or around the structure.

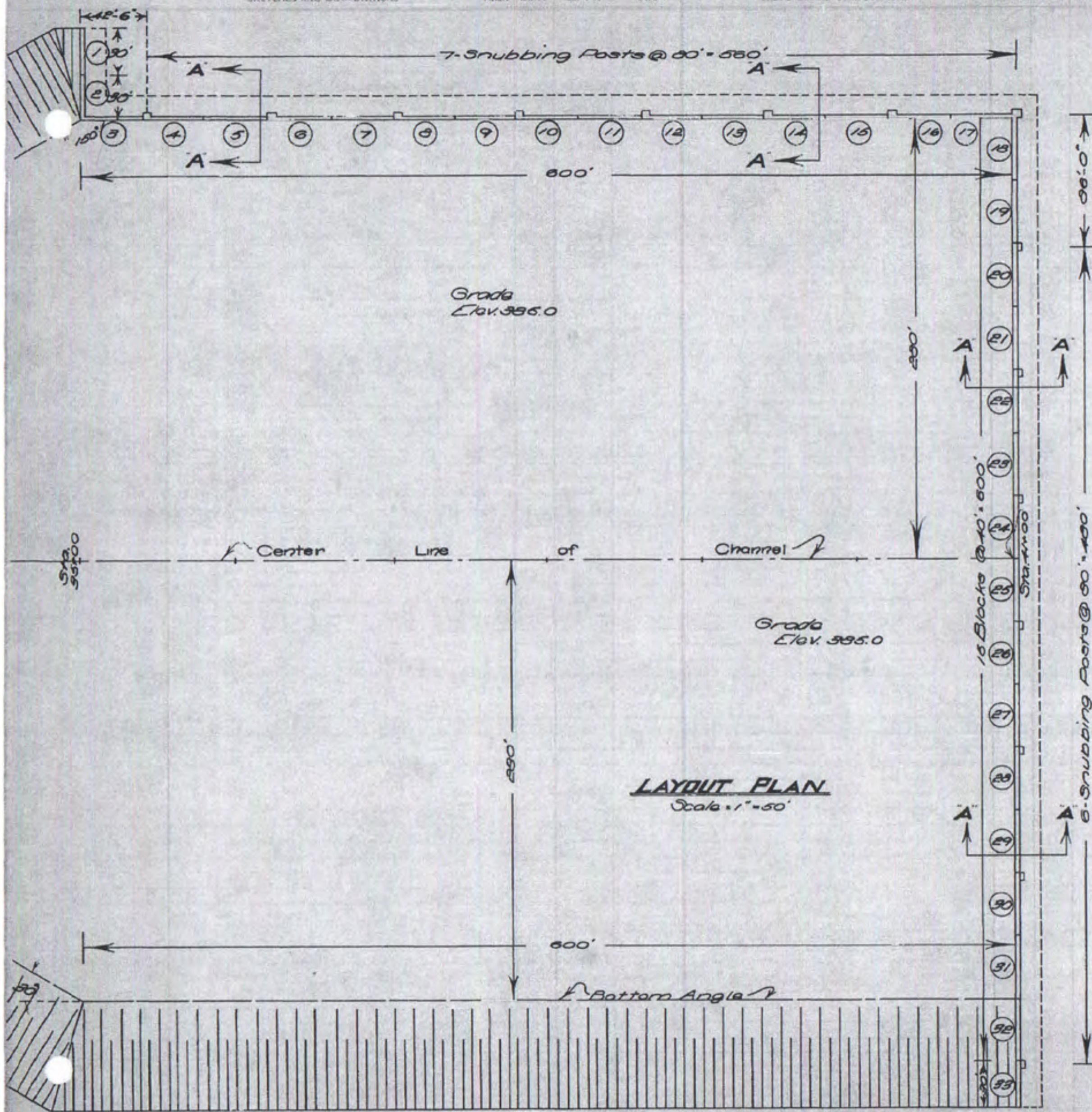
Please contact the undersigned with any questions that you may have.

Respectfully submitted,
CME Associates, Inc.

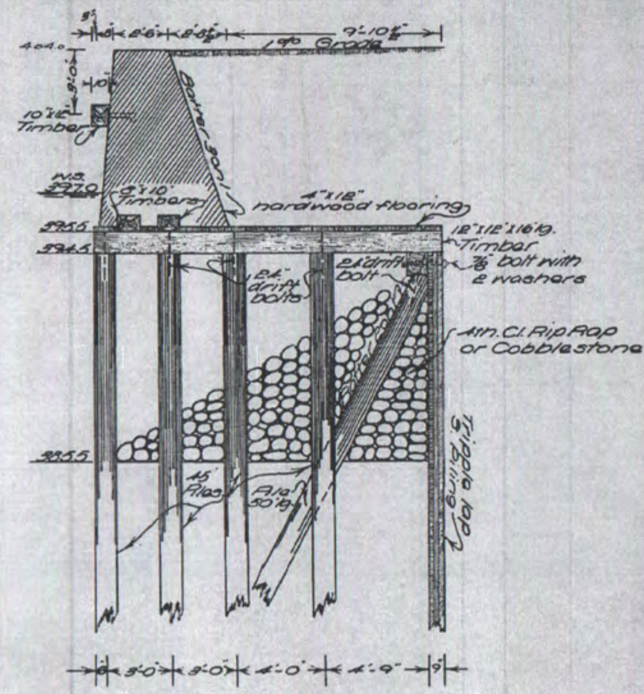
Marcus A. Rotundo, P.E.
Sr. Geotechnical Engineer

MAR/jll

Attachment Listing: Annotated Structure Inspection Report (34 pages)
Final Estimate January 1914, p. 19 (1 page)

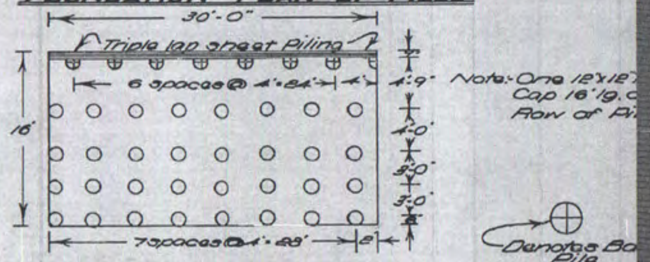


LAYOUT PLAN
Scale: 1" = 50'

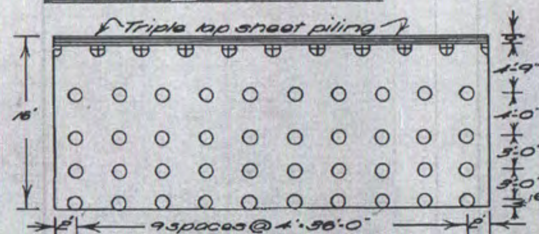


SECTION A-A
Scale 1" = 4'

FOUNDATION PLAN OF PILES



BLOCKS NO. 1 & 33



BLOCKS NO.
4 TO 16 - 18 TO 32 INC.

MADE BY [illegible] DATE [illegible]
CHK'D BY [illegible]
DIVISION CHECK E. Hulsapple

Structure Inspection Report

STRIN: 400T54A

Structure Name: Terminal - Utica

Division: Syracuse

Section: Utica

Inspection Completion Date: 09/19/2008

General Condition Rating: 4

There are no addendums to this report.

Anotations By:
Marcus Rotundo
CME ~~Associates~~ Inc
2/10/2015

STRIN: 400T54A
Structure Name: Terminal - Utica
Inspection Type: Special, Below Water
Approval Status: Approved
Completed Date: 9/19/2008
General Condition Rating: 4
Work Urgency Index: 6
Inspection Performed By: Collins Engineering, P.C.
Team Leader: Heath Pope, P.E.
PE Number: 085945-1
Assistant Team Leader:
Other/Speciality: Frank Lasch, Jaime Stewart
Sub Consultant:

Summary Remarks:

The wall is in fair condition. The eastern concrete wall face has moderate scaling over 100% of the face, many large spalls, and a number of cracks in the face. The southern wall face has light scaling over 50% of the face with minor spalls and is in better shape overall. The timber piles, decking, and cap beams have moderate rot and deterioration. Many piles have 10% section loss on the upper 2 – 4'. The timber fender system is missing over 80% of the structure. Notes for the piles are located at the end of the drawings sheets.

Notes For Next Inspector:

None

Activity Log

Date	Arrival Time	Depart Time	Low Temp (F°)	High Temp (F°)	Weather	Access	Remarks
9/17/2008	8:00 AM	4:00 PM	62	65	Cloudy	Diving;	Swim-by Inspection
9/18/2008	9:00 AM	5:00 PM	70	72	Fair	Diving;	Swim-by Inspection
9/19/2009	9:00 AM	5:00 PM	75	80	Clear	Diving;	Swim-by Inspection

Inspection Approvals

Approver	PE Number	Approval Type	Approval_Date
mackp	47963	Consultant Quality Control	6/26/2009
frasier		Division Approval	7/7/2009
schollen		Headquarters Approval	7/7/2009

Necessary Repairs

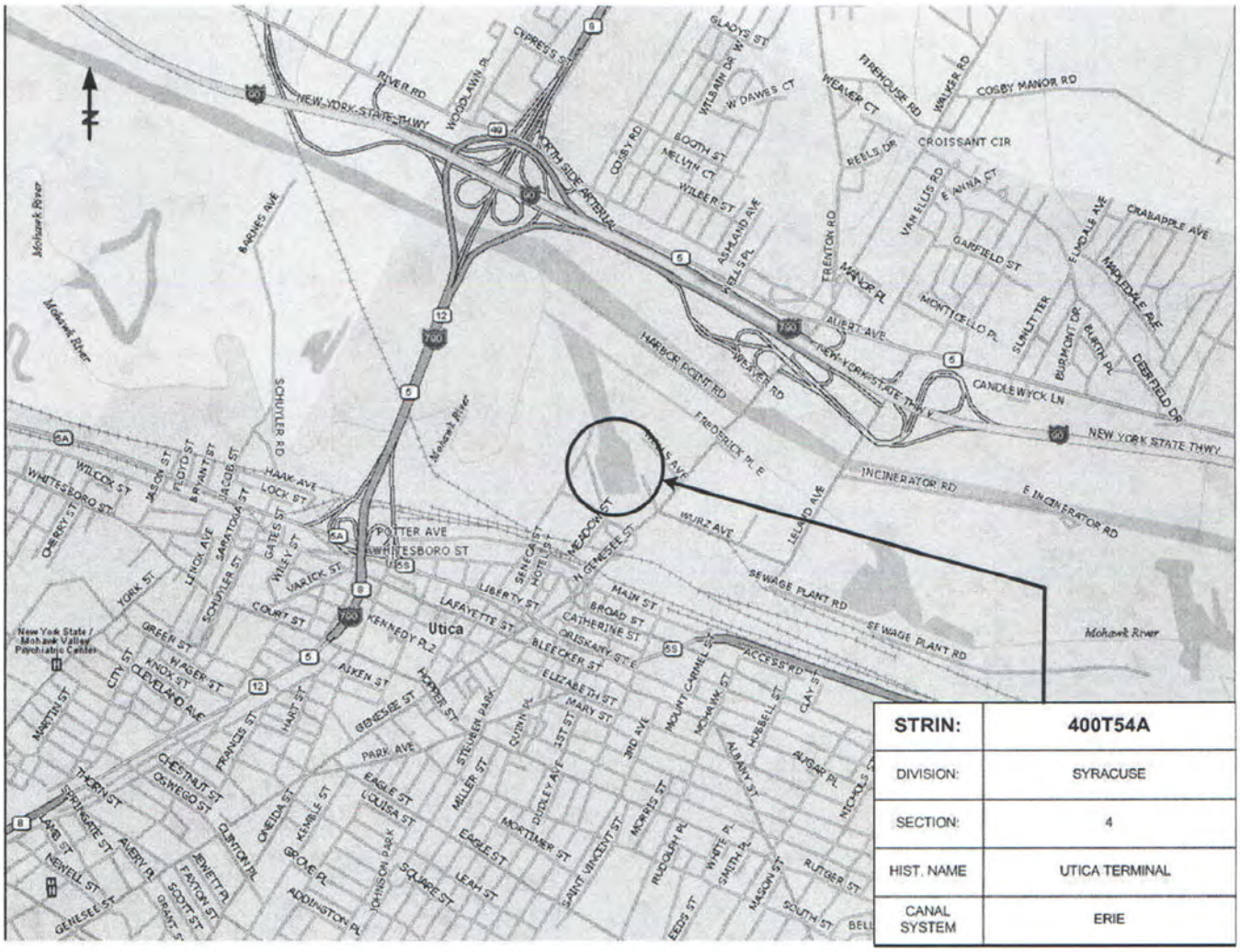
Rating	Category	Code	Quan-tity	WUI	Remarks
.101 Exposed Face (1)	Structural Materials	concrete, formed (CY)	41	6	Repair wall face.
.102 Top Face (1)	Structural Materials	concrete, formed (CY)	15	6	Repair/Recap the top of wall.

Inspection Ratings Section

	Inspection Item	Rating	Notes
.100	**Walls (1)**	4	(none)
.101	Exposed Face (1)	4	(none)
.102	Top Face (1)	4	(none)
.103	Footing (1)	4	(none)
.104	Horizontal Alignment (1)	3	(none)
.105	Vertical Alignment (1)	5	(none)
.106	Fendering System (1)	1	(none)
.200	**Bollards (1)**	0	(none)
.300	**Ladders (1)**	0	(none)
.400	**Adjacent Earth (1)**	0	(none)
.500	**Pile Clusters (1)**	0	(none)
.600	**Lighting or Reflectors (1)**	0	(none)
.700	**Guide Piers (1)**	0	(none)
.701	Concrete (1)	0	(none)
.702	Timber (1)	0	(none)
.703	Steel Sheet Pile (1)	0	(none)
.800	**Pavement (1)**	0	(none)
.900	**Grounds (1)**	0	(none)

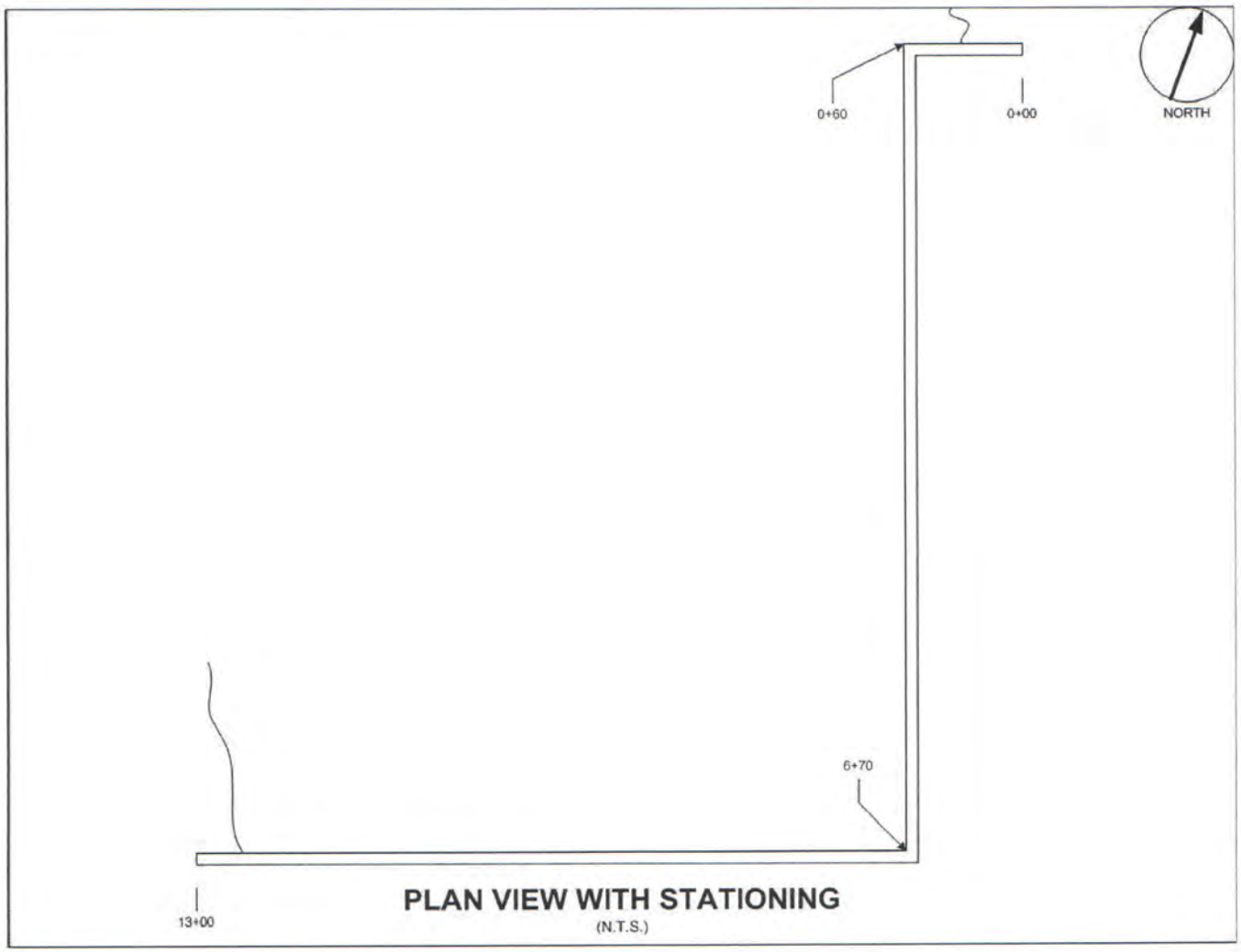
Inspection Images Section

Sketches, drawings, and photographs relevant to the structure in general.

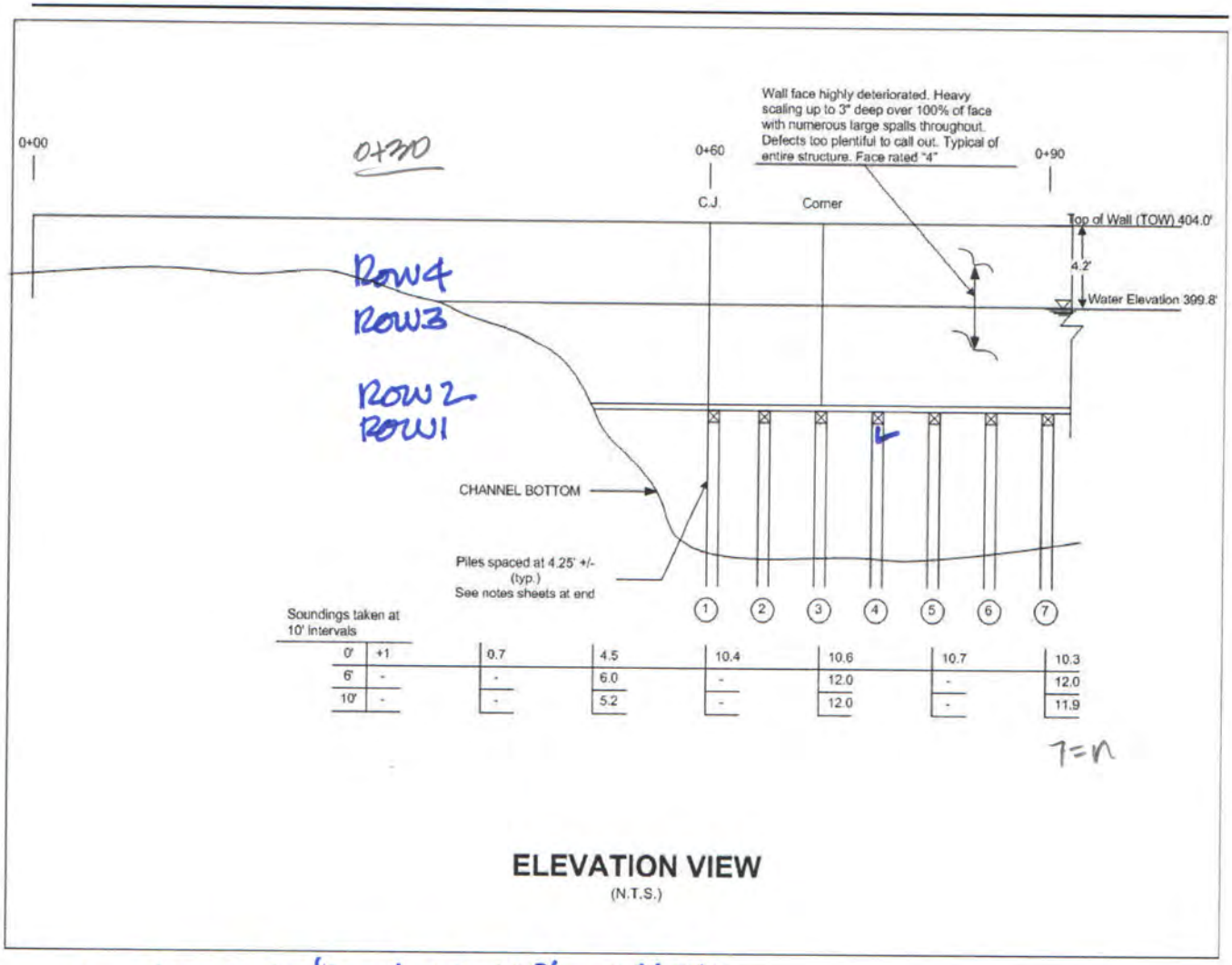


STRIN:	400T54A
DIVISION:	SYRACUSE
SECTION:	4
HIST. NAME	UTICA TERMINAL
CANAL SYSTEM	ERIE

LOCATION



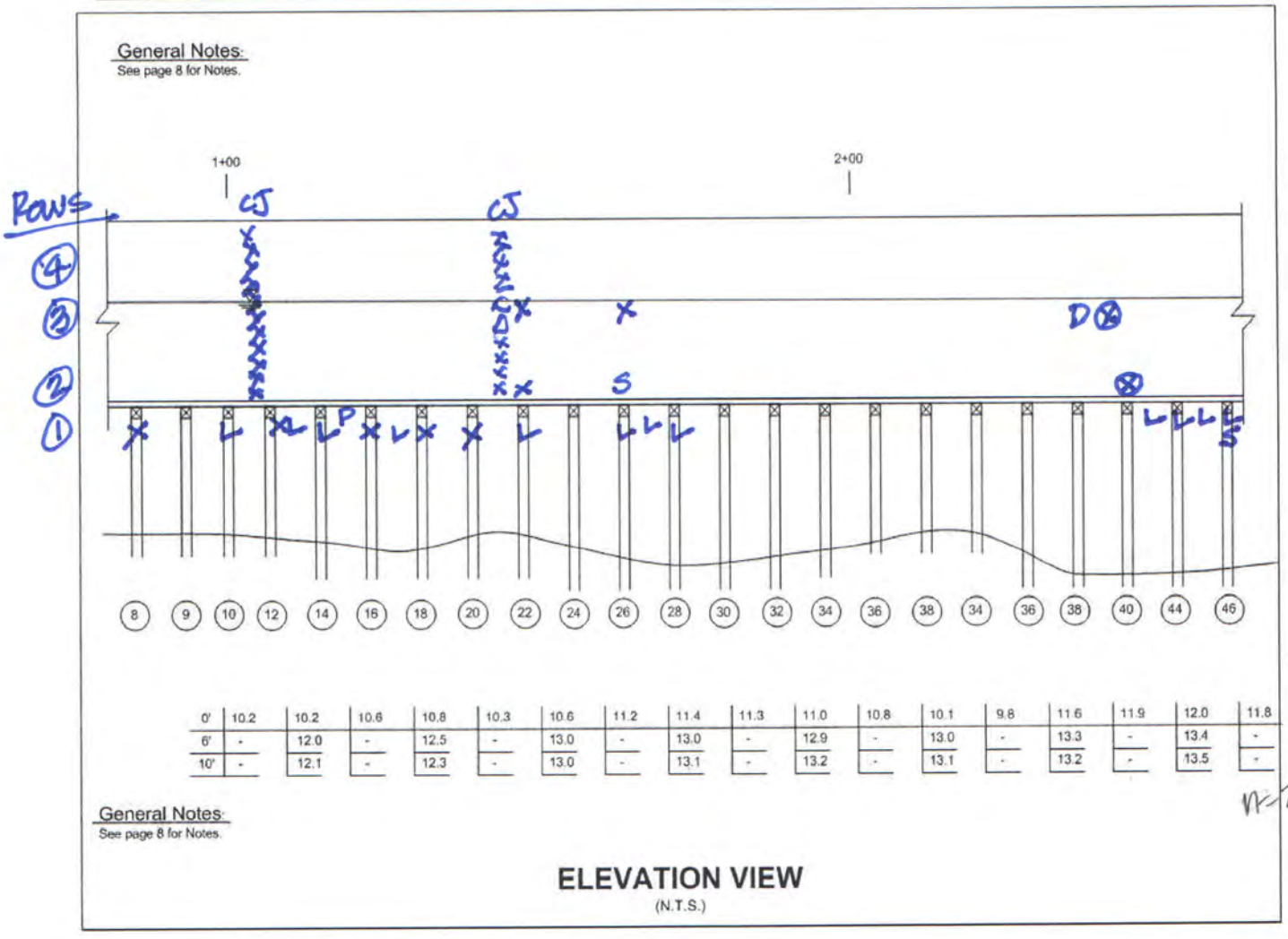
PLAN VIEW



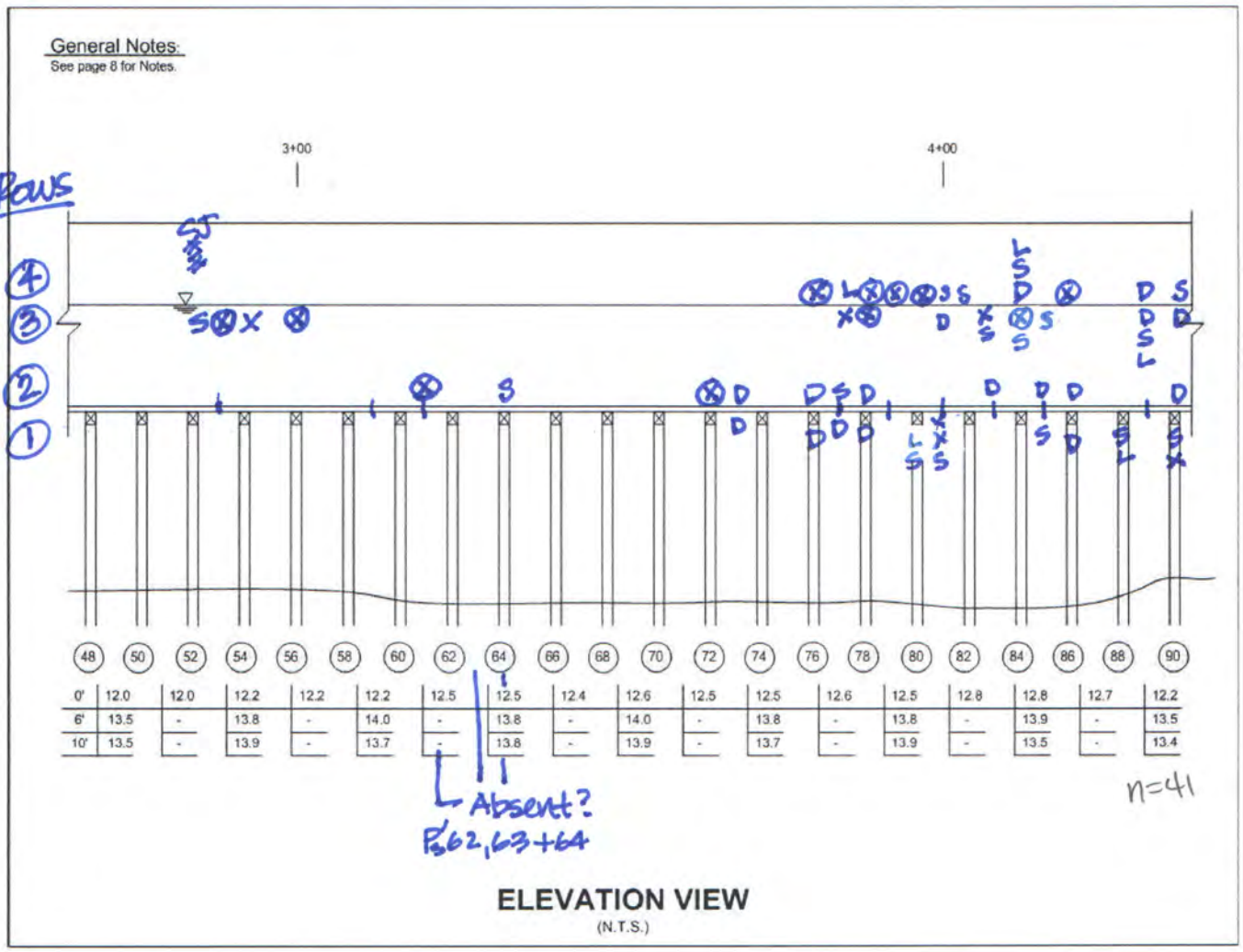
ELEVATION VIEW
(N.T.S.)

L- Cross Section Loss 10% or More
D- Displaced Horizontally
⊗- No Contact with Pile Cap or ≥ 75% Bearing Impaired
X- Bearing impaired 50% or more
S- Pile Cap - crushed/split or split Pile

ELEVATION VIEW

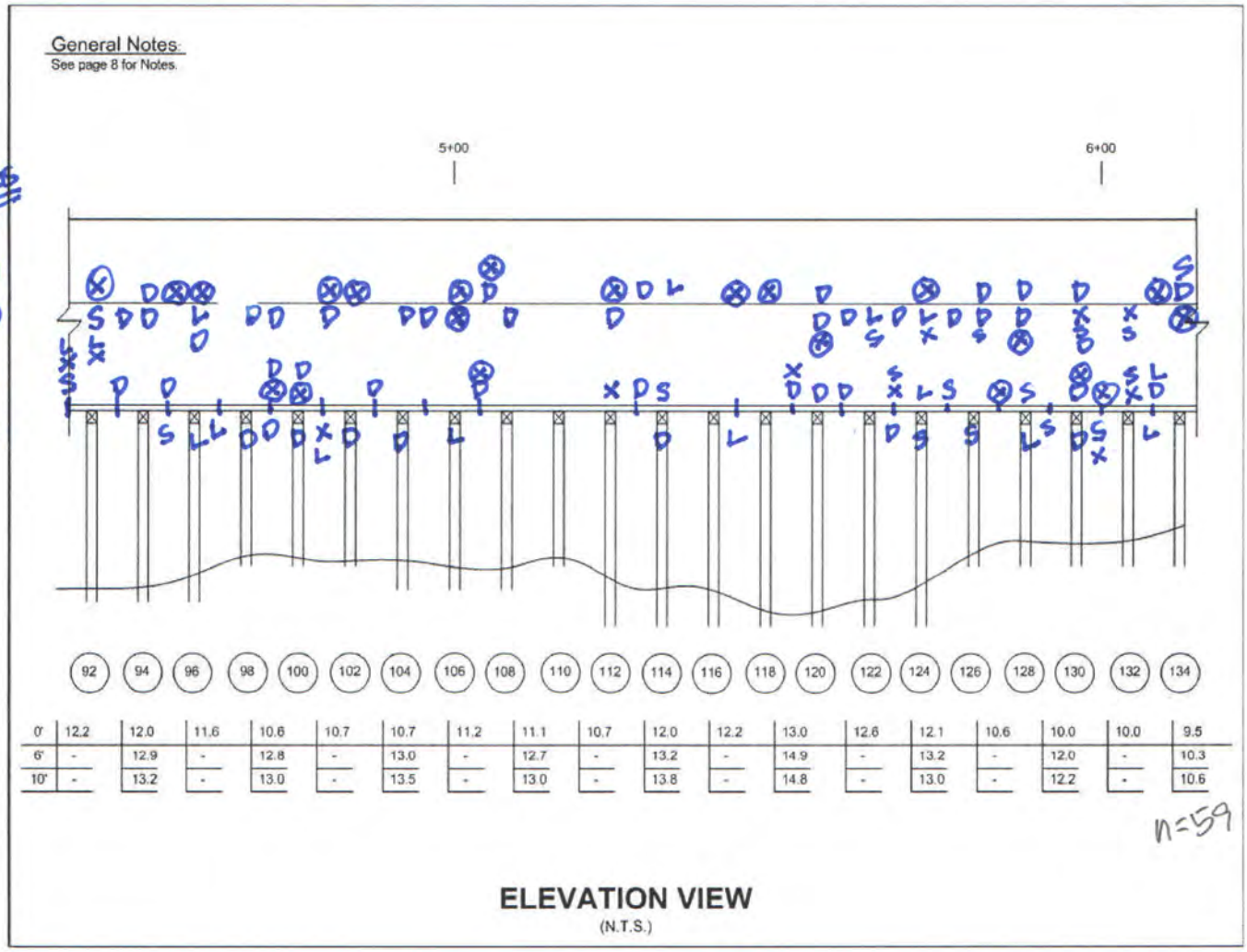


ELEVATION VIEW



ELEVATION VIEW
(N.T.S.)

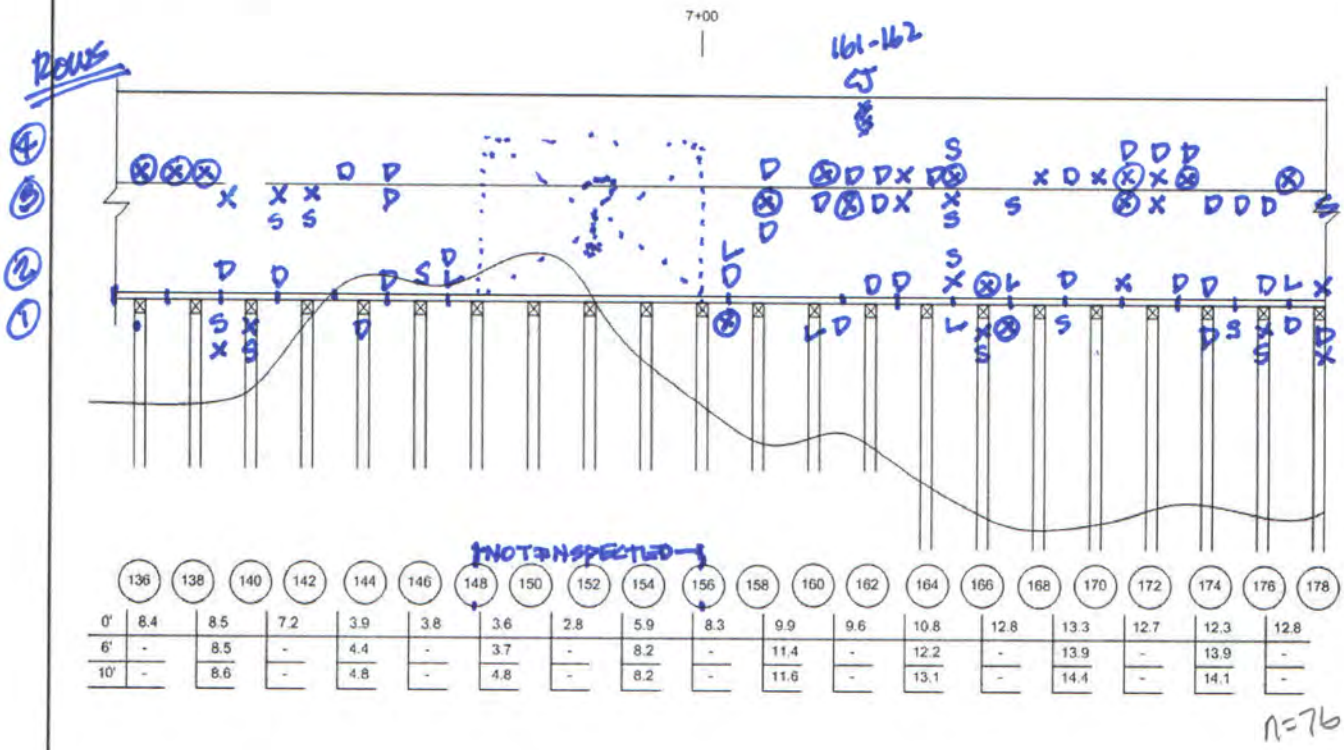
ELEVATION VIEW



ELEVATION VIEW
(N.T.S.)

ELEVATION VIEW

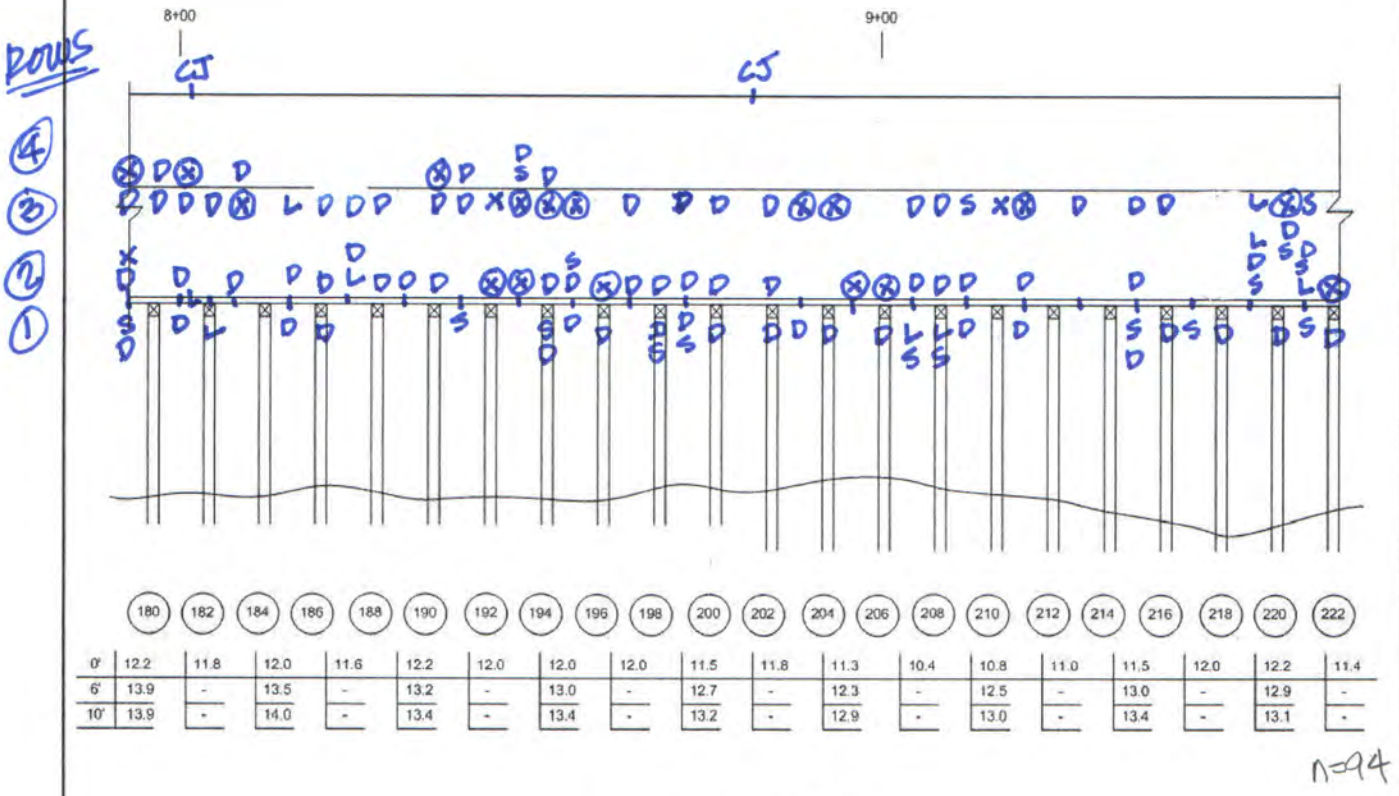
General Notes:
See page 8 for Notes.



ELEVATION VIEW
(N.T.S.)

139 ① Crushed
140 ① Crushed
148-156 All Rows - Not Inspected
157 - Drain Pipe
161-162 - CJ poor condition
ELEVATION VIEW
174 - Sheet Pile?

General Notes:
See page 8 for Notes.

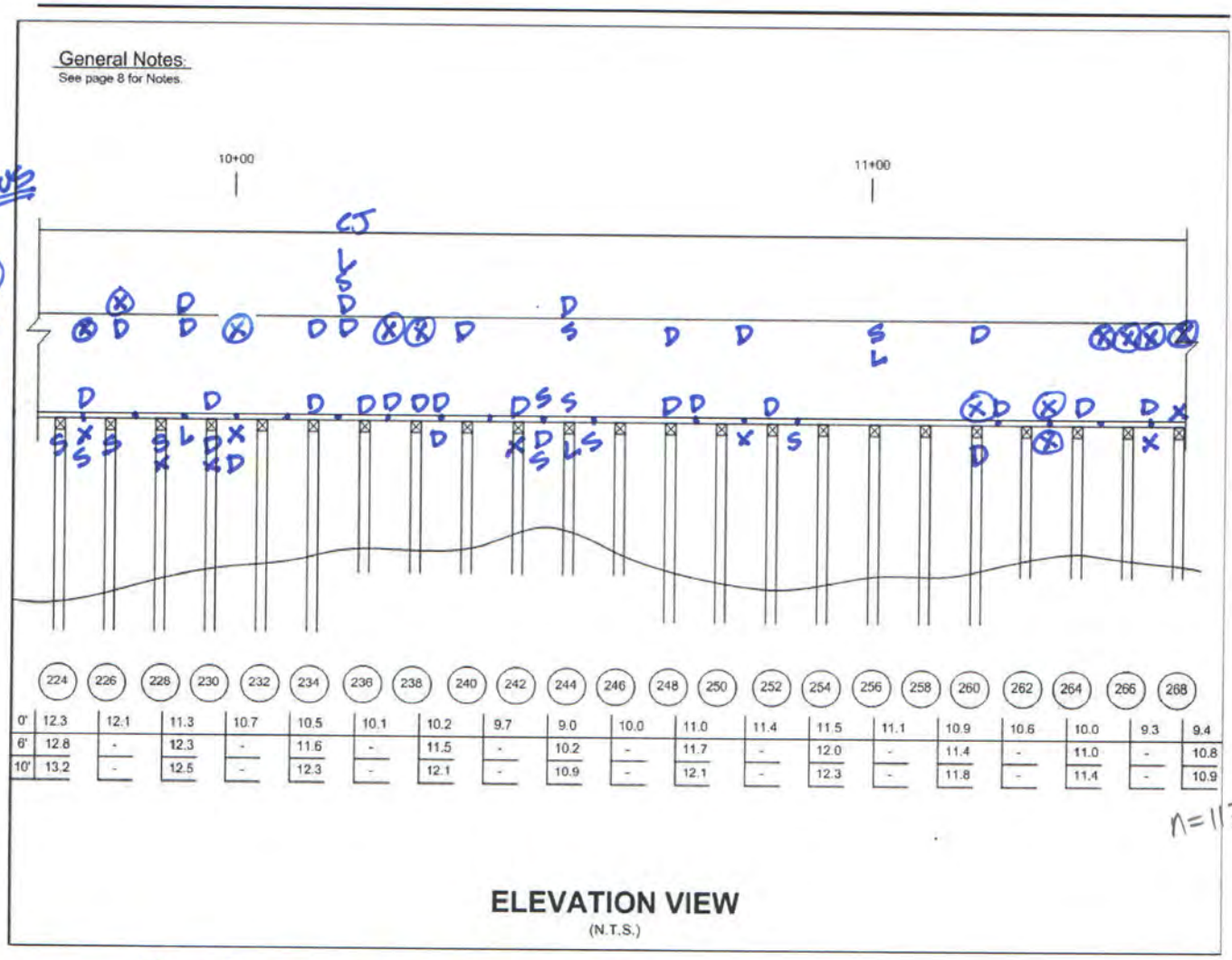


	180	182	184	186	188	190	192	194	196	198	200	202	204	206	208	210	212	214	216	218	220	222
0'	12.2	11.8	12.0	11.6	12.2	12.0	12.0	12.0	11.5	11.8	11.3	10.4	10.8	11.0	11.5	12.0	12.2	11.4
6'	13.9	-	13.5	-	13.2	-	13.0	-	12.7	-	12.3	-	12.5	-	13.0	-	12.9	-
10'	13.9	-	14.0	-	13.4	-	13.4	-	13.2	-	12.9	-	13.0	-	13.4	-	13.1	-

n=94

ELEVATION VIEW
(N.T.S.)

181-182 CJ - spalled
181-182 - Beam between pile caps 50% loss - x
179-180 - do
201-202 CJ - spalled
216-217 Beam broken
ELEVATION VIEW
221 - End Cap Split



ELEVATION VIEW
(N.T.S.)

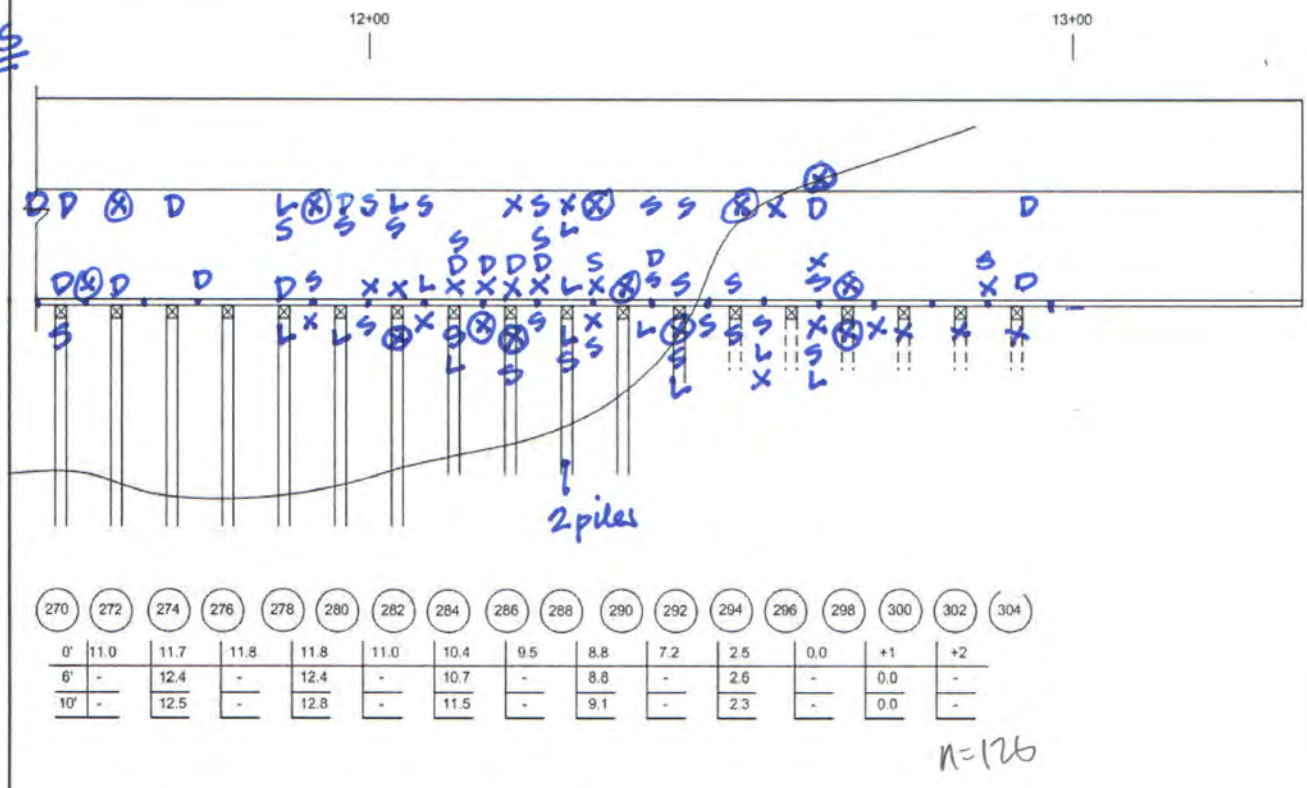
233 - (2) Rip-Rap to Row 2 on angle
234-235 - CJ - 50% Section Loss, Spalling to bottom
237 - same as old report
240 (3) Rip-Rap
241 - ?

ELEVATION VIEW

242 (4) Rip Rap
244-245 Penetrating hole goes up @ 45° angle
246 (3) Rip Rap
249 (4) Rip Rap @ 393±
255 (3) Rip. Rap
260 (3) Rip. Rap

General Notes:
See page 8 for Notes.

ROWS



	270	272	274	276	278	280	282	284	286	288	290	292	294	296	298	300	302	304
0'		11.0	11.7	11.8	11.8	11.0	10.4	9.5	8.8	7.2	2.5	0.0	+1	+2				
6'		-	12.4	-	12.4	-	10.7	-	8.8	-	2.6	-	0.0	-				
10'		-	12.5	-	12.8	-	11.5	-	9.1	-	2.3	-	0.0	-				

N=126

ELEVATION VIEW
(N.T.S.)

294 - (3) Rip-Rap
301 (3) Rip-Rap
303 (1) Rip-Rap

ELEVATION VIEW

PILE NOTES:

Pile 4 / Row 1: Top 3' missing 10% of cross section

Pile 8 / Row 1: About 10% left but pushed out from pier

Pile 10 / Row 1: Top 4' missing 10% of cross section

CJ Pile 11 & 12 / Row 1: Construction Joint, 2' to top of wall
Heavy Scaling, extends 1' to either side of joint
Maximum Penetration

Pile 12 / Row 1: Spalling 2-4" Deep, 1' Wide
Extends to surface to timber
½" wide crack

Pile 13 / Row 1: Pile split into 2, approx. 2' in length
25% section loss in pile

Pile 14 / Row 1: 10% section loss
6" penetration / 2" wide

Pile 15 / Row 1: Pile cap split

Pile 16 / Row 1: Offset 6"
Split in half with 50% section loss
Impact damage
Approx. 50% is bearing weight

Pile 17 / Row 1: 30% section loss

Pile 18 / Row 1: Split pile going all the way through
Approx. 50% is bearing weight

Pile 20: 20% of pile underneath pile cap
Pile has shifted but no horizontal bearing

CJ Pile 21: Spalling at joint
Heavy Scaling

Pile 21 / Row 3: Approx. 50% is bearing weight

Pile 22 / Row 2: Approx. 50% is bearing weight

Pile 24 / Row 1: 20% section loss

Pile 26 / Row 1: 20% section loss

Pile 26 / Row 2: Split 1" wide, down 2' from wall, 3-4" penetration

Pile 26 / Row 3: Approx. 75% is bearing weight

Pile 27 / Row 1: 10% section loss

Pile 28 / Row 1: 20% section loss

Pile 38 / Row 3: 75% of pile under cap

Pile 39 / Row 1: Multiple splits down 2'
Approx. 75% is bearing weight

Pile 39 / Row 3: Pile does not touch pile cap, 2" gap

Pile 40 / Row 2: Approx. 75% is bearing weight

Pile 43 / Row 1: Top 1' missing 10% of material

Pile 44 / Row 1: Top 3' missing 10% of material
20% section loss in pile

Pile 45 / Row 1: 10% section loss

Pile 46 / Row 1: Split through pile
20% section loss

Pile 52 / Row 3: 2 splits, 1" wide, 2' long, 3-4" penetration
Heavy scaling @ concrete joint
Extend 1' below water to top of wall
Extends horizontal 1-2', 6" Max. Pen., 2" Typical

Pile 53 / Row 3: Pile does not touch pile cap, 1" gap

Pile 54 / Row 3: 50% of pile underneath pile cap

Pile 56 / Row 3: Appox. 75% is bearing weight

Pile 58 & 59: Piles are closer than typical spacing

Pile 61 / Row 2: Pile does not touch pile cap, 1" gap

Pile 62: ??????

Pile 64 / Row 2: Split from top of pile, down 3'

Pile 63 & 64: ???????

Pile 72 / Row 2: Pile does not touch pile cap, 1" gap
2 ½" split from top of pile, down 1'
Heavy scaling ?????

Pile 73 / Row 1 & 2: Offset 4" to left

Pile 73 / Row 4: Riprap around pile at channel bottom

Pile 75 / Row 1: 5% section loss

Pile 76 / Row 1 & 2: Offset 3"

Pile 76 / Row 4: Pile does not touch pile cap, ½" gap

Pile 77 / Row 1: Offset 3"

Pile 77 / Row 2: Split through pile, ½" wide x 1' long

Pile 77 / Row 3: 50% of pile touches pile cap, ½" gap

Pile 77 / Row 4: 10% section loss

Pile 78 / Row 1 & 2: Offset 3"

Pile 78 / Row 3 & 4: Piles do not touch pile cap, ½" gap

Pile 79 / Row 4: Pile does not touch pile cap, ½" gap
Offset 4"

Pile 80 / Row 1: 2" split, down 3'
50% section loss

Pile 80 / Row 4: Offset 2"
Pile does not touch pile cap, ½" gap

Pile 81 / Row 1: 1" wide split through pile, down 2'
25% section loss

Pile 81 / Row 3: Offset 4"

Pile 81 / Row 4: 1" wide split through pile, down 2' into rip rap

Pile 82 / Row 4: 2" wide split through pile, down 3'

Pile 83 / Row 2: Offset 2"

Pile 83 / Row 3: 3" wide split through pile, down 3'
25% section loss

Pile 84 / Row 3: Pile does not touch pile cap, ½" gap
1" wide split, 3' long, 3" penetration

Pile 84 / Row 4: Offset 6"
4" wide split, from top to 6" above rip rap, 4" penetration
50% section loss

Pile 85 / Row 1: Pile cap severed, 1½' hanging off, 6" of pile cap

Pile 85 / Row 2: Offset 4"

Pile 85 / Row 3: ½" split, down 4', 1" penetration

Pile 86 / Row 1 & 2: Offset 4"

Pile 86 / Row 4: Pile does not touch pile cap, ½" gap

Pile 88 / Row 1: 1" split through pile, down 2'
20% section loss

Pile Q's
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PILE NOTES

PILE NOTES:

Pile 89 / Row 3: Offset 4"
2" Split through pile, down 4'
25% section loss

Pile 89 / Row 4: Offset 6"

Pile 90 / Row 1: 1" wide split through pile, down 3'
50% section loss

Pile 90 / Row 2 & 3: Offset 3"

Pile 90 / Row 4: 1" split, down 2'

Pile 91 / Row 2: 1" wide split through pile, down 3'
50% section loss

????? Look at notes ????

Pile 92 / Row 3: ½" wide split, down 2'
25% section loss

Pile 92 / Row 4: Pile does not touch pile cap, 1" gap

Pile 93 / Row 2 & 3: Offset 6"

Pile 94 / Row 3 & 4: Offset 4"

Pile 95 / Row 1: Pile cap end, 3" wide crack from top to bottom, 6" penetration, extends 1' past pile

Pile 95 / Row 2: Offset 4"

Pile 95 / Row 4: Pile does not touch pile cap, 2" gap

Pile 96 / Row 1: 10% section loss

Pile 96 / Row 3: Offset 6"
10% section loss

Pile 96 / Row 4: Pile does not touch pile cap, ½" gap

Pile 97 / Row 1: 15% section loss

Pile 98 / Row 1 & 3: Offset 4"

Pile 99 / Row 1: Offset 2"

Pile 99 / Row 2: Pile does not touch pile cap, 1" gap
Offset 4"

Pile 99 / Row 3: Offset 3"

Pile 100 / Row 1: Offset 3"

Pile 100 / Row 2: Offset 12"
Pile does not touch pile cap

Pile 101 / Row 1: 25% section loss

Pile 101 / Row 3: Offset 3"

Pile 101 / Row 4: Pile does not touch pile cap, ½" gap

Pile 102 / Row 1: Offset 2"

Pile 102 / Row 4: Pile does not touch pile cap, 1" gap

Pile 103 / Row 2: Offset 2"

Pile 104 / Row 1 & 3: Offset 3"

Pile 105 / Row 3: Offset 3"

Pile 106 / Row 1: 10% section loss

Pile 106 / Row 3 & 4: Pile does not touch the pile cap, 1" gap

Pile 107 / Row 2: Offset 4"
Pile does not touch pile cap, ½" gap

Pile 107 / Row 4: Offset 12"
Pile is not under the pile cap

Pile 108 / Row 3: Offset 6"

Pile 110 / Row 3: 5% section loss

Pile 112 / Row 2: 50% of pile does not touch pile cap, ½" gap

Pile 112 / Row 3: Offset 3"

Pile 112 / Row 4: Pile does not touch pile, ½" gap

Pile 113 / Row 2 & 4: Offset 5"

Pile 114 / Row 1: Offset 4"

Pile 114 / Row 2: ½" split, down 1'

Pile 114 / Row 4: 10% section loss

Pile 117 / Row 1: 10% section loss

Pile 117 / Row 4: Pile does not touch pile cap, 1" gap

Pile 118 / Row 4: 75% of pile does not touch pile cap, ½" gap

Pile 119 / Row 2: Offset 4"
50% of pile does not touch pile cap, ½" gap

Pile 120 / Row 2 & 4: Offset 4"

Pile 120 / Row 3: Offset 6"
Pile does not touch pile cap, ½" gap

Pile 121 / Row 2 & 3: Offset 4"

Pile 122 / Row 2: 5% section loss

Pile 122 / Row 3: 10% section loss
½" wide split, 1' long, 1" penetration

Pile 123 / Row 1 & 3: Offset 4"

Pile 123 / Row 2: 50% section loss
2 splits 2" wide, down 2'

Pile 124 / Row 1: ½" split, 1' long

Pile 124 / Row 2: 10% section loss

Pile 124 / Row 3: 25% section loss

Pile 124 / Row 4: Pile does not touch pile cap, 2" gap

Pile 125 / Row 2: ½" split through pile, down 1'

Pile 125 / Row 3: Offset 3"

Pile 126 / Row 1: Split through pile, down 1'

Pile 126 / Row 3: Offset 3"
½" split, 2" penetration, down 1'

Pile 126 / Row 4: Offset 3"

Pile 127 / Row 2: Pile does not touch pile cap, ½" gap

Pile 128 / Row 1: 10% section loss

Pile 128 / Row 2: ½" split, 1" penetration

Pile 128 / Row 3: Offset 4"
90% of pile does not touch pile cap

Pile 128 / Row 4: Offset 3"

PILE NOTES

PILE NOTES:

Pile 129: End of pile cap: 3" wide split, 6" penetration

Pile 130 / Row 1: Offset 3"

Pile 130 / Row 2: Offset 8"
90% of pile does not touch pile cap

Pile 130 / Row 3: Offset 6"
Split down middle, 2' long
50% section loss

Pile 130 / Row 4: Offset 5"

Pile 131 / Row 1: 2" wide split, 4' long
50% section loss

Pile 131/ Row 2: 75% of pile does not touch pile cap, 1" gap

Pile 132 / Row 2: 2" wide split through pile, 1' long
25% section loss

Pile 132 / Row 3: 75% section loss
4" wide split down center, 5' long

Pile 133 / Row 1: 10% section loss

Pile 133 / Row 2: Offset 6"
15% section loss

Pile 133 / Row 4: 4" split down center
100% section loss

Pile 134 / Row 3: 75% of pile does not touch pile cap, 1" gap

Pile 134 / Row 4: Offset 4"
End of pile cap: 3" wide split, 4" penetration

Pile 135 / Row 1: 5% section loss

Pile 136 / Row 2: 5% section loss

Pile 136 / Row 4: Pile does not touch pile cap, 1" gap

Pile 137 / Row 4: 75% of pile does not touch pile cap, ½" gap

Pile 138 / Row 4: Pile does not touch pile cap, 1" gap

Pile 139 / Row 1: Pile cap: 2-3" wide split, top to bottom
2" cap crushed down

Pile 139 / Row 2: Offset 4"

Pile 139 / Row 3: ½" GAP, 50% Touching

Pile 140 / Row 1: 15% section loss
Split on end of cap all the way through
4" penetration, 2" wide

Pile 141 / Row 2: Offset 2" to left

Pile 141 / Row 3: Full depth split, 1" wide, 3' down
25% section loss

Pile 142 / Row 3: Full depth split, 2' long
25% section loss

Pile 143 / Row 1: 5% section loss

Pile 143 / Row 4: Offset 2" to left

Pile 144 / Row 1: Offset 3" to left

Pile 145 / Row 1: 5% section loss

Pile 145 / Row 2: Offset 4" to left
5% section loss

Pile 145 / Row 3: Offset 6" to right

Pile 145 / Row 4: Offset 4" to left

Pile 146 / Row 1: 5% section loss

Pile 146 / Row 2: Split, 2" wide, 4' down

Pile 147 / Row 2: Offset 3" to left
Pile cap from end to Pile 2
15% section loss

Piles148-156 NEEDED

Pile 157 / Row 1: 6" gap from bottom to concrete

Pile 157 / Row 2: 2" horizontal, 4" penetration
Spalling at drain pipe

Pile 158 / Row 3: 10-12" shift right of pile cape, no contact

Pile 158 / Row 4: Offset 3" to left

Pile 160 / Row 1: 10% section loss

Pile 160 / Row 3: 6" offset to right

Pile 160 / Row 4: ½" gap, not engaged

Pile 161 / Row 1: Offset 3" to left

Pile 161 / Row 3: ½" gap, no engagement

Pile 161 / Row 4: Offset 2" to right

Piles 161-162: Construction Joint
6'-1' penetration, top to 6" below WL
2' horizontally
Similar to previous notes

Pile 162 / Row 2: Offset 4" to right

Pile 162 / Row 3: Offset 4" to left

Pile 162 / Row 4: Offset 4" to right

Pile 163 / Row 2: Offset 6" to left

Pile 163 / Row 3: ½" gap, 50% engaged

Pile 163 / Row 4: ½" gap, 50% engaged

Pile 164 / Row 4: Offset 3" to left

Pile 165 / Row 1: 10% section loss

Pile 165 / Row 2: 3" wide split goes down 3'
50% section loss

Pile 165 / Row 3: Offset 4" to right
60% of pile engaged

Pile 165 / Row 4: 1" gap, split down middle 1' long
100% NOT engaged

Pile 166 / Row 1: Offset 5" to right
50% engaged

Pile 166 / Row 2: Offset 4" to left, ½" gap
100" of pile not engaged

Pile 167: 4" of end of pile cap deteriorated
Drift pin exposed
5% section loss

Pile 167 / Row 2: 10% section loss

Pile 167 / Row 3: Split from top 3' down, 1" wide

Piles 148-156 NEEDED?

PILE NOTES

PILE NOTES:

Pile 168 / Row 4: ½" gap, 50% engaged

Pile 169 / Row 1: Split on front face, 2' long, 2" wide

Pile 169 / Row 2: Offset 4" to left

Pile 169 / Row 4: Offset 4" to right

Pile 170 / Row 4: 1" gap, 50% engaged

Pile 171 / Row 1: 5% section loss

Pile 171 / Row 2: ½" gap, 50% engaged

Pile 171 / Row 3: 1" gap, 100% pile not attached

Pile 171 / Row 4: Offset 1' to left, 100% not engaged

Pile 172 / Row 3: 1'2" gap, 50% pile engaged

Pile 172 / Row 4: 2-3" split from top down 3'
50% pile engaged

Pile 173 / Row 2: Offset 4" to right

Pile 173 / Row 4: Offset 4" to right
½" gap to top
Rip rap

Pile 174 / Notes: sheet pile

Pile 174 / Row 1: Offset 2" to right

Pile 174 / Row 2: Offset 4" to left

Pile 174 / Row 3: Offset 2" to right

Pile 175 / Notes: 8" length, 4" down split

Pile 175 / Row 3: Offset 4" to right

Pile 176 / Row 1: 12" from top of pile going down
30% section loss

Pile 176 / Row 2: Offset 2"

Pile 176 / Row 3: Offset 3" to left

Pile 177 / Row 1: Offset 3" to left

Pile 177 / Row 2: 15% section loss

Pile 177 / Row 3: Rip rap
1" gap between pile and cap

Pile 178 / Row 1: Offset 3" to left
General not on end of pile cap

Pile 178 / Row 2: Section loss of 6" length, 6-8" height, 4" deep
80% deteriorating (above Pile 2)

Pile 178 / Row 3: 4" split on backside, goes all the way through
1" gap

Pile 179 / Notes: General split at end cap

Pile 179 / Row 1: Offset 3" to right

Pile 179 / Row 2: Offset 7-8"
3" touching

Pile 179 / Row 3: Offset 3" to left

Pile 179 / Row 4: Not touching by ½-1"

Spall at Construction Joint at Piles 181 and 182, 1' x 3" x 3"

Pile 180 / Notes: Horizontal beam from pile cap to pile cap
50% section loss from 179-180

Pile 180 / Row 3: Offset 4" to left

Pile 180 / Row 4: Offset 3" to right

Pile 181 / Row 1: Offset 3" to left

Pile 181 / Row 2: Offset 4" to left

Pile 181 / Row 3: Offset 4" to right

Pile 181 / Row 4: Not engaged, 1" gap at top

Pile 182 / Row 1: 20% section loss from top down 6"

Pile 182 / row 3: Offset 3" to left

Pile 182 / Row 4: Riprap starts, waist high and goes inward to
concrete wall in the back
Distance from row to wall is approx. 4 feet

Pile 183 / Row 2: Offset 3" to left

Pile 183 / Row 3: Not engaged, 1" gap to top

Pile 183 / Row 4: Offset 1" to left

Pile 184 / Notes: Second pile! Double piles – extra pile not
engaged

Pile 184 / Row 1: 5% section loss

Pile 185 / Notes: General note for pile cap

Pile 185 / Row 1: Offset 3" to right

Pile 185 / Row 2: Offset 4" to left

Pile 185 / Row 3: 20% section loss to whole pile

Pile 186 / Row 1: Offset 3" to right and 3" out

Pile 186 / Row 2: Offset 2" to right

Pile 186 / Row 3: Offset 3" to right

Pile 187 / Row 2: Offset 3" to left
15% section loss

Pile 187 / Row 3: Offset 2" to left

Pile 188 / Row 1: End of pile cap – general note

Pile 188 / Row 2: Offset 2" to left

Pile 188 / Row 3: Offset 2" to right

Pile 189 / Row 1: End of pile cap – general note

Pile 189 / Row 2: Offset 3" to left

Pile 189 / Row 3: Riprap

Piles 189-190 / Notes: End of pile cap – general note

Pile 190 / Row 2: Offset 5" to right

Pile 190 / Row 3: Offset 5" to left

Pile 190 / Row 4: Pile not touching cap, 1" gap

Pile 191 / Notes: Crack at end of pile cap, 3" deep, 1" wide

Pile 191 / Row 3: Offset 4" to left

Pile 191 / Row 4: Offset 5" to left

182 - Rip-Rap
185 - pile cap General Note
183 - (5) R-R

PILE NOTES

PILE NOTES:

Pile 192 / Row 2: Offset 4" to left
Not touching with 4" gap

Pile 192 / Row 3: Offset 4" to right
20% section loss
1' down section loss = 50%

Pile 193 / Row 1: Offset 5" to right
5% section loss

Pile 193 / Row 2: 1" touching pile cap
Some missing plank horizontally

Pile 193 / Row 3: Touching 1% from pile to cap

Pile 193 / Row 4: Splits 1'-2' in length, 2" wide, 4" penetration
Offset 4" to right

Pile 194 / Row 1: Pile split down 2'
3" gap at face
4" gap at back
Offset 4" to left
End of pile cap has various splits

Pile 194 / Row 2: Offset 4" to right

Pile 194 / Row 3: Not touching, 2" separation

Pile 194 / Row 4: Offset to right

Pile 195 / Row 1: Offset 3" to front

Pile 195 / Row 2: Offset 6" to right
Split down middle about 2', 1" split all the way through

Pile 195 / Row 3: Not touching, 1" separation

Pile 196 / Row 1: Offset 2" to right

Pile 196 / Row 2: 1.5" penetration
Offset 5" to left
No load bearing at all

Pile 197 / Row 2: Offset 3" to left

Pile 197 / Row 3: Offset 4" to left
Rip rap

Pile 198 / Row 1: Offset 3" to right
End cap has vertical split
4" penetration

Pile 198 / Row 2: Offset 6" to right

Pile 199 / Row 1: Offset 4" to right
General note on splitting

Pile 199 / Row 2: Offset 6" to left

Pile 199 / Row 3: Offset 5" to right

Pile 200 / Row 1: 5% section loss
Offset 4"

Pile 200 / Row 2: Offset 3" to right

Pile 201 / Row 3: Rip rap
Offset 3" to left

In Joint Between 201-202: Spalling from joint to timber
4" penetration

Pile 202 / Row 1: Offset 4" to left

Pile 202 / Row 2: Offset 4" to right

Pile 202 / Row 3: 5" to right of cap

Pile 203 / Row 1: Offset 2" to left

Pile 203 / Row 3: 1" gap between pile and pile cap

Pile 204 / Row 1: Offset 2" to right

Pile 204 / Row 3: 2" gap between pile and pile cap

Pile 205 / Row 2: 1" clearance between pile and pile cap

Pile 206 / Row 1: Offset 1" to right

Pile 206 / Row 2: 1" clearance between pile and pile cap
Angled 20° towards Row 1

Pile 207 / Row 1: Split 1' long
20% section loss

Pile 207 / Row 2: Offset 3" to right
Angled about 25% forward towards Row 1

Pile 207 / Row 3: Offset 3" to right

Pile 208 / Row 1: Split 2' long, all way through
20% section loss

Pile 208 / Row 2: Offset 2" to right

Pile 208 / Row 3: Offset 3" to left

Pile 209 / Row 1: Offset 3" to left

Pile 209 / Row 2: Offset 1" to right

Pile 209 / Row 3: General splitting note
Rip rap

Pile 210 / Row 3: 50% is touching pile cap

Pile 211 / Row 1: Offset 2" to right

Pile 211 / Row 2: Offset 4" to right

Pile 211 / Row 3: Offset 5" to right
10% touching pile cap

Pile 213 / Row 3: Offset 4" to right

Pile 215 / Pile Cap: Split end cap top to bottom, 3" wide, 8' deep

Pile 215 / Row 1: Offset 2" to right

Pile 215 / Row 2: Offset 3" to right

Pile 215 / Row 3: Offset 3" to right

Pile 216 / Row 1: Offset 2" to left

Pile 216 / Row 3: Offset 6" to right

Piles 216-217 / Notes: Horizontal piece broken between 216 and 217

Pile 217 / Row 1: Horizontal split
Split 2.5" down from top to bottom

Pile 218 / Row 1: Offset 3" to left

Pile 219 / Row 2: Split in pile, goes down 2'
Offset 3" to right
10% section loss

Pile 219 / Row 3: 10% section loss

Pile 220 / Row 1: Offset 2" to left

Pile 220 / Row 3: Split from top, 4.5" wide, 2' down
Offset 8" to right
No contact between cap and pile

Pile 221 / Notes: End cap split top to bottom, 3" penetration

201(3) Rip-Rap

PILE NOTES

PILE NOTES:

Pile 221 / Row 2: 25% section loss
Split 2' down
Offset 2" to right of pile cap

Pile 221 / Row 3: General note on splitting

Pile 222 / Row 1: Offset 2" to right

Pile 222 / Row 2: Major split, 4' split
25% touching pile cap
40% section loss

Piles 223-224: Horizontal wood is breaking at edge of concrete, dropped down about 5"

Pile 224 / Notes: End cap split

Pile 225 / Row 1: 20% section loss
End of pile cap split from top to bottom, 1" wide, 4" penetration

Pile 225 / Row 2: Offset 3" to left

Pile 225 / Row 3: 50% is touching, 1" gap

Pile 226 / Notes: End of pile cap split from top to bottom, 1" wide, 4" penetration

Pile 227 / Row 3: Offset 3" to right

Pile 227 / Row 4: Large amount of splitting
Pile cap is broken

Pile 228 / Notes: End of pile cap has split, 4" penetration

Pile 228 / Row 1: Split in half, down 5'
50% section loss

Pile 228 / Row 3: 5% section loss

Pile 229 / Row 1: 10% section loss

Pile 229 / Row 3: Offset 3" to right

Pile 229 / Row 4: Offset 3" to left

Pile 230 / Row 1: Offset 5" to right
40% section loss

Pile 230 / Row 2: Offset 2" to left

Pile 231 / Row 1: 50% section loss
Offset 2"

Pile 231 / Row 3: 1" space between pile and cap

Pile 233 / Row 2: Rip rap comes from Row 3 at an angle

Pile 234 / Row 2: Offset 2" to right

Pile 234 / Row 3: Offset 2" to right

Construction Joint: Spalling goes to bottom of concrete
50% section loss

Pile 235 / Row 3: Offset 3" to left

Pile 235 / Row 4: Offset 6" to left
Multiple splits
15% section loss

Pile 236 / Row 2: Offset 3" to left

Pile 237 / Row 1: Same as old report

Pile 237 / Row 2: Offset 4" to right

Pile 237 / Row 3: 1.5" between pile and pile cap

Pile 238 / Row 2: Offset 3" to right

Pile 238 / Row 3: Not touching pile cap by 2"

Pile 239 / Row 1: Offset 1" to right

Pile 239 / Row 2: Offset 4" to left

Pile 240 / Row 1: 5% section loss

Pile 240 / Row 3: Offset 2" to right
Rip rap

Pile 241 / Row 1: Comes up 1.5' out of water, missing the rest

Pile 242 / Row 1: 30-40% section loss from first 2'

Pile 242 / Row 2: Offset 4" to left

Pile 242 / Row 4: Rip rap

Pile 243 / Row 1: Offset 2" left of pile cap
Split, 2' long, 2" wide, 2" penetration

Pile 243 / Row 2: General note for splitting

Pile 244 / Row 1: 15% section loss

Pile 244 / Row 2: Split, 2' x 2'

Pile 244 / Row 3: 3' split

Pile 244 / Row 4: Offset 3"

Between 244-245: Spalling
Penetrating hole, hole goes up at 45° angle

Pile 245 / Row 1: General note on splitting

Pile 246 / Row 3: Some rip rap
Rows 2 and 3 are close

Pile 248 / Row 3: Offset 2" to left

Pile 249 / Row 2: Offset 5" to right

Pile 249 / Row 4: 1' of exposure, rest is rip rap

Pile 251 / Notes: 20% of load bearing, bearing on pile cap

Pile 251 / Row 3: Offset 2" to right

Pile 252 / Row 1: 2" penetration left side of pile cap

Pile 252 / Row 2: Offset 4" to right

Pile 253 / Row 1: End of pile cap has split, 1" wide, 4" penetration

Pile 255 / Row 3: Large amount of rip rap

Pile 256 / Row 3: Split from top to bottom
10% section loss

Pile 260 / Row 1: Offset 2" to left

Pile 260 / Row 2: Rod going through not pile

Pile 260 / Row 3: Pile offset 3"
Rip rap

Pile 261 / Row 2: Offset 4" to right

Pile 262 / Row 1: 5% section loss

Pile 263 / Row 1: Offset 2" to right
40% section loss

Pile 263 / Row 2: 10% touching

Pile 264 / Row 2: Offset 3" to right

Pile 265 / Row 3: Pile not touching pile cap by 1.5"

241-7

PILE NOTES

PILE NOTES:

Pile 266 / Row 3: Pile split in half, vertically
25% can carry load
75% section loss

Pile 267 / Row 1: 50% touching pile cap
1" penetration

Pile 267 / Row 2: Offset 3" to left

Pile 267 / Row 3: General note on splitting
20% touching pile cap

Pile 268 / Row 2: 30% section loss from 1"-2" down from pile cap, on pile

Pile 268 / Row 3: Not touching cap by 1"

Pile 269 / Row 3: Offset 4" to right

Pile 270 / Row 1: Large split, face of pile cap

Pile 270 / Row 2: Offset 2"

Pile 270 / Row 3: Offset 3"

Pile 271 / Row 2: 2' behind pile 1
Not touching pile cap

Pile 272 / Row 2: Offset 3" to right

Pile 272 / Row 3: Not touching by 2"
Drift pin holding together
Offset 2"

Pile 273 / Row 3: Rip rap

Pile 274 / Row 3: Offset 3" to right

Pile 275 / Row 2: Offset 5"

Pile 278 / Row 1: 10% section loss

Pile 278 / Row 2: Offset 3"

Pile 278 / Row 3: 10% section loss
General splitting

Pile 279 / Row 1: 40% section loss

Pile 279 / Row 2: Multiple splits

Pile 279 / Row 3: Split 3" down, 100% penetration, 2" wide from top to bottom

Pile 280 / Row 2: 20% section loss

Pile 280 / Row 3: Offset 3"
Splits

Pile 281 / Row 1: Splits

Pile 281 / Row 2: 30% section loss, 6" down to pile

Pile 281 / Row 3: Split going forward, 5" down through rip rap (approx. 3.5')

Pile 282 / Row 1: 70% section loss
Pile not touching

Pile 282 / Row 2: 50% section loss

Pile 282 / Row 3: 10% section loss
Multiple splits

Pile 283 / Row 1: 5"-6" penetration

Pile 283 / Row 2: Pile goes down instead of up

Pile 283 / Row 3: 100% load bearing but multiple splits
20% section loss

Pile 284 / Row 1: Beam slops
Multiple splits
15% deterioration

Pile 284 / Row 2: Multiple splits go through pile
20% touching pile cap
Offset 5" to left

Pile 285 / Row 1: 80% section loss
Not touching pile

Pile 285 / Row 2: Offset 3"
25% section loss

Pile 286 / Row 1: 8 x 12 beam going to next level – no load bearing but bolted
100%
Split

Pile 286 / Row 2: Offset 5" to left
30% deterioration

Pile 286 / Row 3: 25% deterioration, 6" down to top of pile

Pile 287 / Row 1: Split, 1" back, 1.5" wide, 3" penetration

Pile 287 / Row 2: Offset 4"
Multiple splits
40% section loss

Pile 287 / Row 3: Multiple splits
5% section loss

Pile 288 / Row 1: 2 piles
15% section loss
Multiple splits, 1'-3'
2nd pile offset 1" to left

Pile 288 / Row 2: 15% section loss at top of pile cap

Pile 288 / Row 3: 15-20% section loss at top of pile cap
Multiple splits

Pile 289 / Row 1: 25% section loss
Multiple splits

Pile 289 / Row 2: Offset 5" to left
20% section loss

Pile 289 / Row 3: 6-7" missing
3" section loss all around pile cap
30% section loss

Pile 290 / Row 2: Split 4' down, 4" wide
15-20% section loss
Offset 5" to left
30% deterioration
Rip rap about 1'

Pile 291 / Row 1: 20% section loss

Pile 291 / Row 2: Split but okay
Offset 3" to left

Pile 291 / Row 3: Split middle but 100% touching

Pile 292 / Row 1: Split in 4 sections, multiple splits
60% section loss
Only 40% touching pile cap

Pile 292 / Row 2: Split 1' down, 1" wide, 4" penetration

Pile 292 / Row 3: Split in middle
15% section loss

Pile 293 / Row 1: Split down 2.5', 2" wide, 2" penetration
100% touching

Pile 294 / Row 3: 60% section loss

PILE NOTES

PILE NOTES:

Pile 294 / Row 1: Split 1' long, 2" penetration

Pile 294 / Row 2: Splits 6" long, 1" wide, ½" penetration

Pile 294 / Row 3: Rip rap

Pile 295 / Row 1: Small split, 1' long, 1" wide, 4" penetration

Pile 296 / Row 1: 15-20% section loss
Split 1' long, 4" penetration
Pile is split, left side is bearing, goes back to row 2 cap

Pile 296 / Row 3: 80% touching

Pile 297 / Row 1: Split whole length
80% deterioration
End of pile cap split to row 2, 3' long

Pile 297 / Row 2: Split whole length
80% deterioration

Pile 297 / Row 3: Offset 4" to left

Pile 297 / Row 4: Offset 7" to left
2"-3" touching
Pile cap has 45% loss

Pile 298 / Row 1: Splits, 3' down, 1.5" wide, 4" penetration
Few splits
50% section loss

Pile 298 / Row 2: Offset 2" to left
No load bearing except 2" x 6" wedge
Split both sides of pile

Pile 298 / Row 3: 5% section loss

Pile 299 / Row 1: Pile cap end, 20-25% deterioration

Pile 300 / Row 1: 25% section loss at face on pile cap, end of pile cap

Pile 300 / Row 2: 2 piles standing next to each other
One towards Row 3 is not touching
Split 12" down from top of pile

Pile 301 / Row 2: Face has split 1' long, 1" wide, 4" penetration, goes all way through

Pile 301 / Row 3: Rip rap

Pile 302 / Row 1: Pile cap has section loss in center, 12" penetration

Pile 302 / Row 2: Offset 5" to left

Pile 302 / Row 3: Offset 5" to right of pile cap

Pile 303 / Row 1: Rip rap
0% section loss

Pile 303 / Row 3: Pile offset 4" to left
Rip rap

Pile 304 / Row 1: Offset 4"
Pile cap offset to right
Pile split 8" long, 2.5" wide, 8"-10" penetration

PILE NOTES

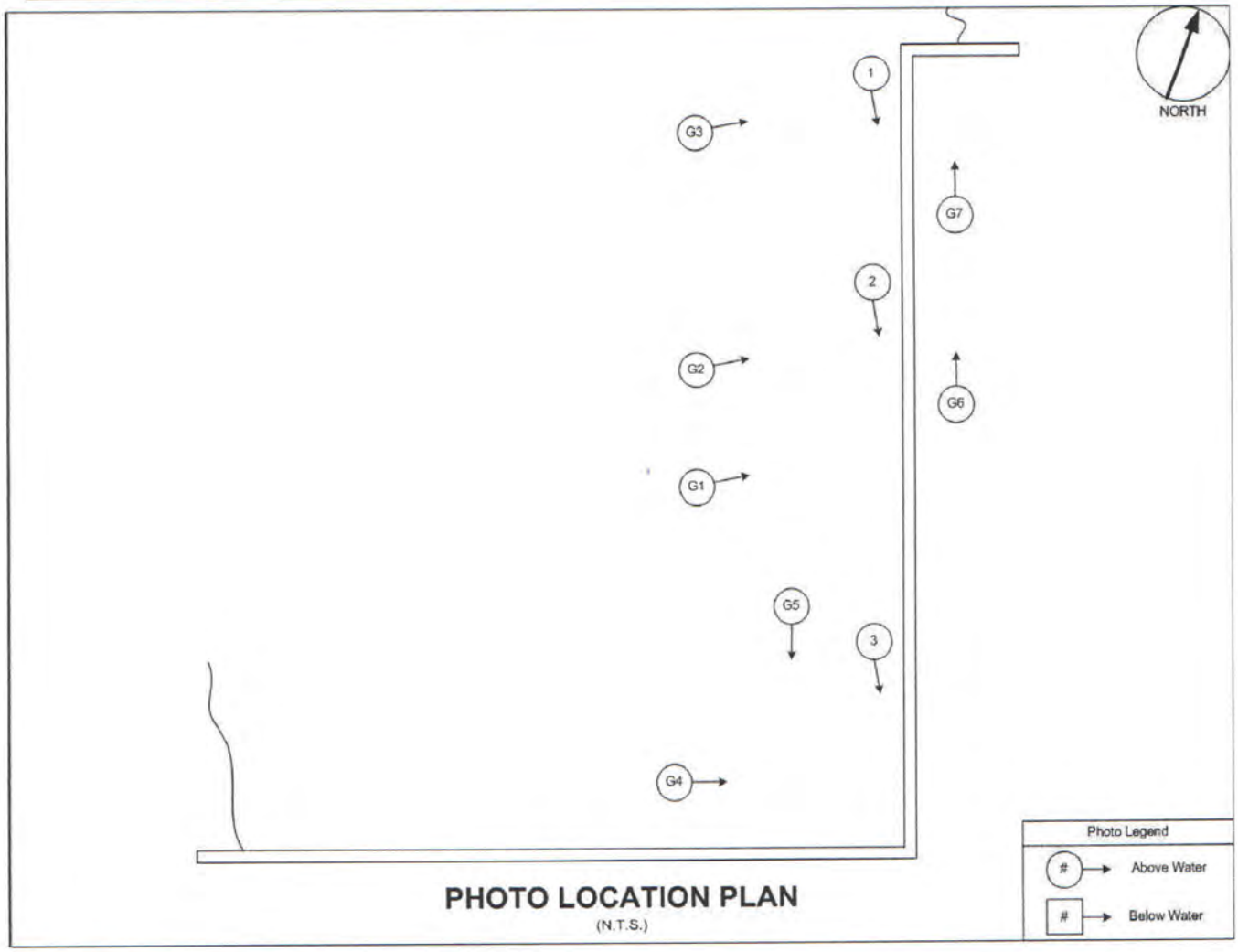
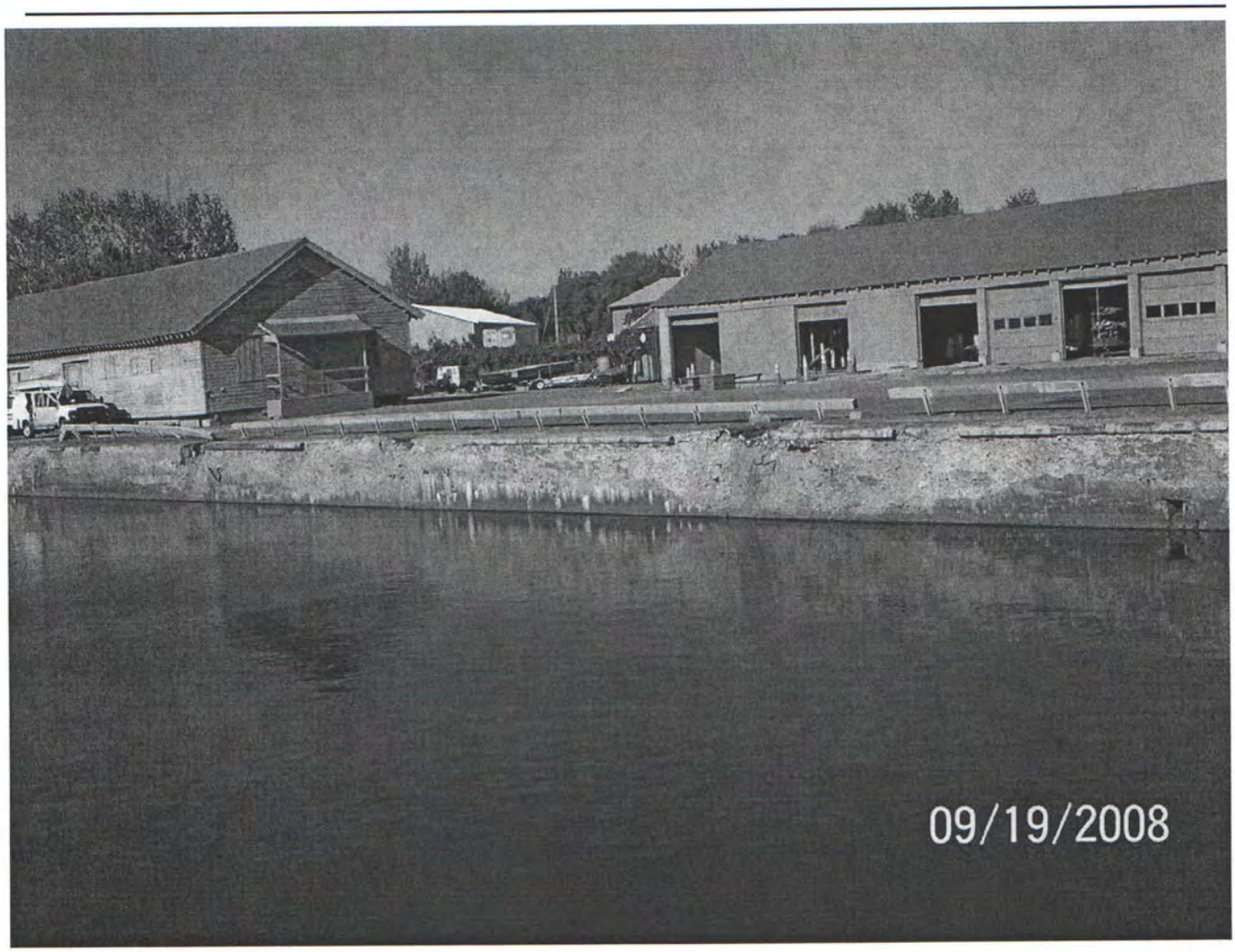


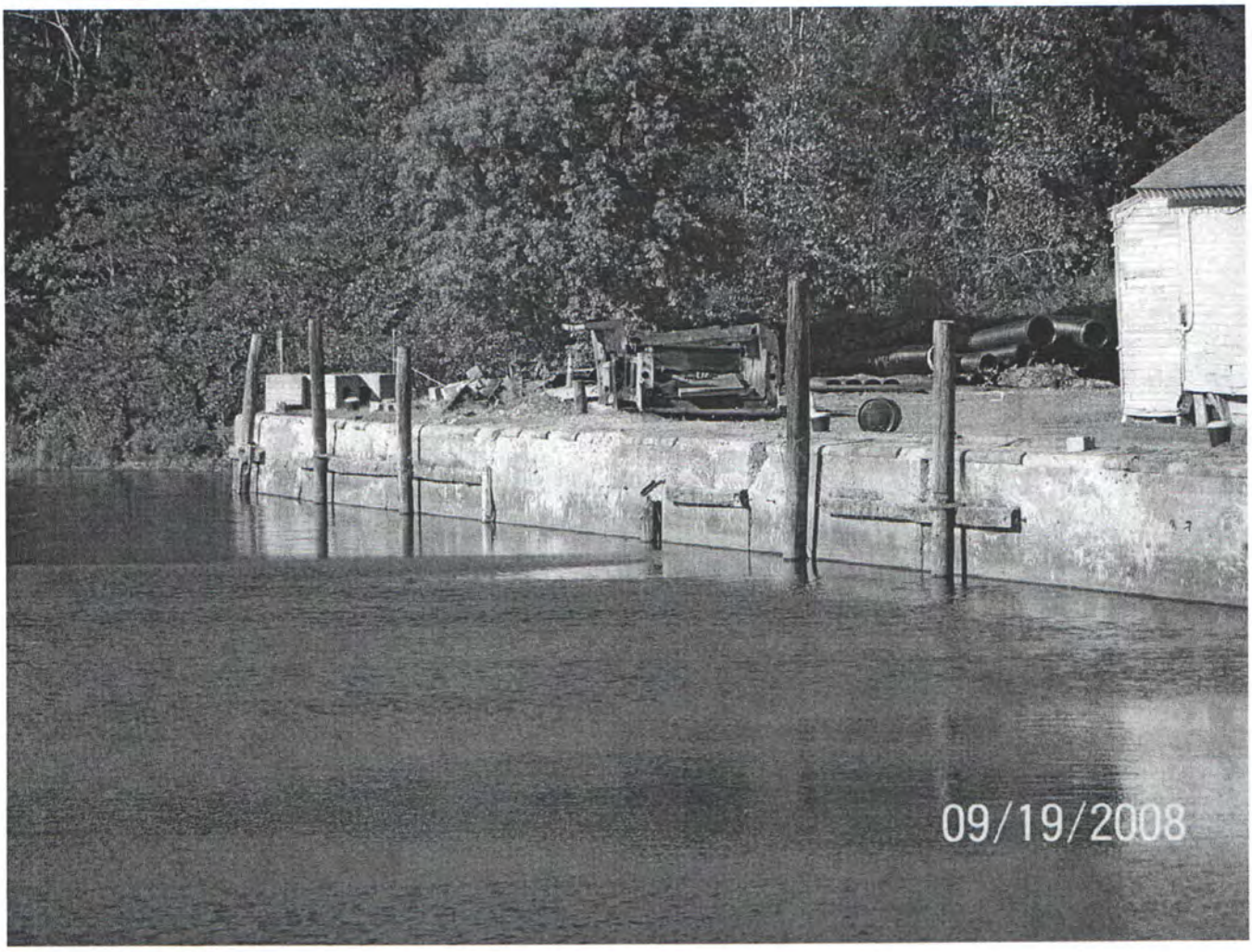
PHOTO LOCATION PLAN
(N.T.S.)

PHOTO PLAN

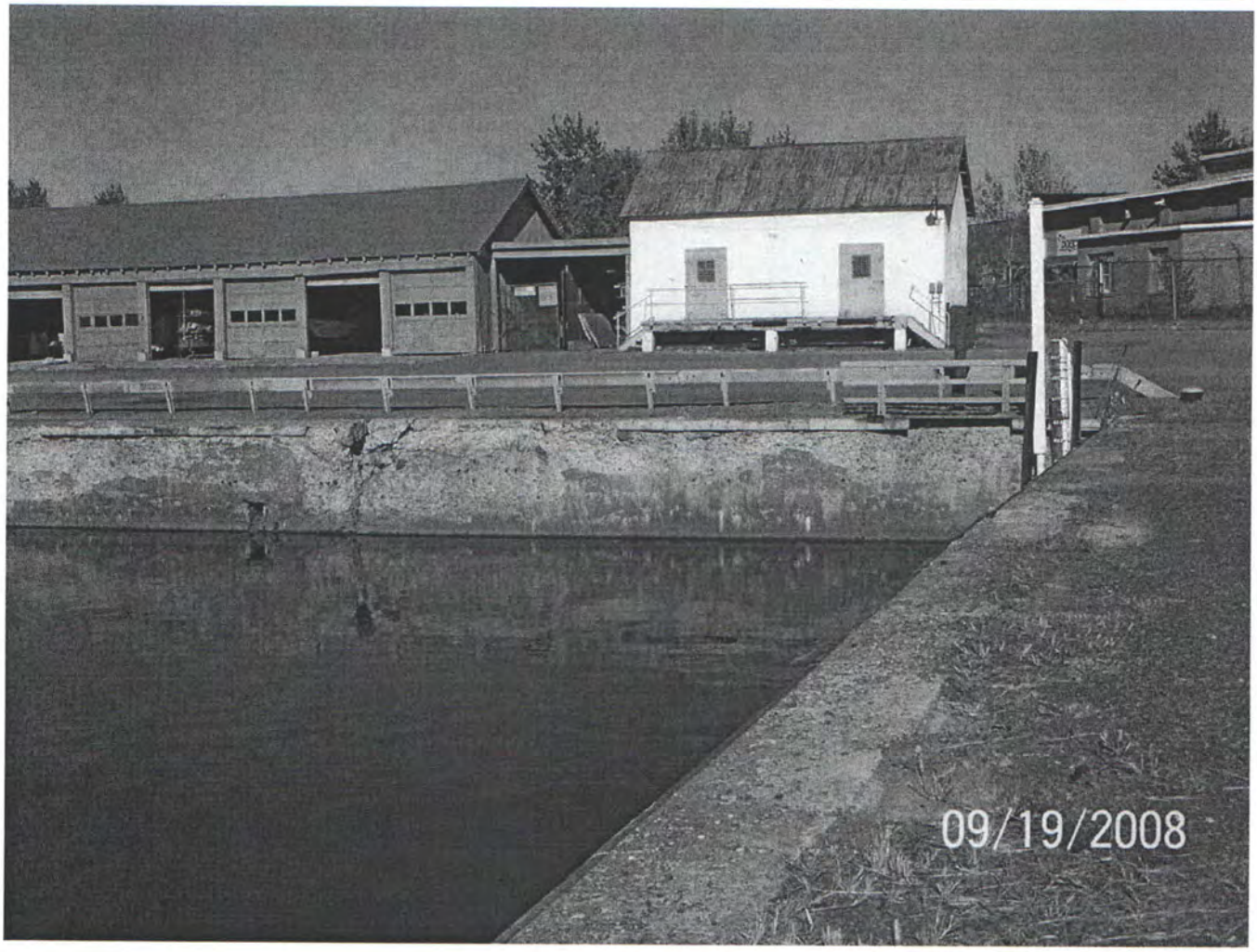


G1 STA 3+50

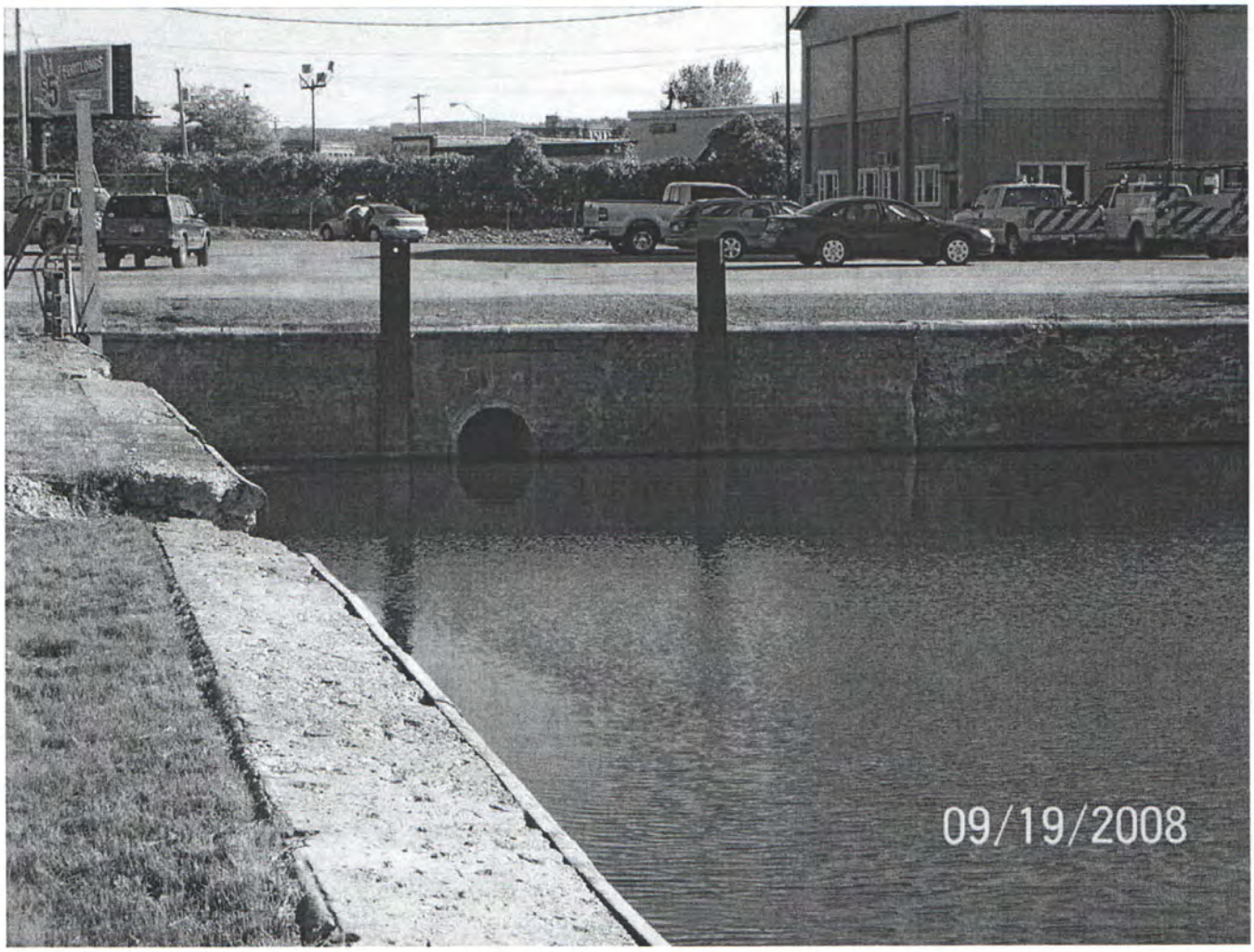
G2 STA 2+00



G3 STA 0+60 FROM SOUTH WEST



G4 STA 6+70 FROM WEST



G5 STA 6+70 FROM NORTH

G6 TOP OF WALL FROM STA 2+00 TO END

G7 TOP OF WALL FROM EAST AT STA 3+00

Ratings Photograph Section

Photographs specific to inspection ratings.

Photo Number: 1

Description:
AT JOINT STA 0+70-STA 1+10
HEAVY SCALING
APPROXIMATELY 3 FT DOWN
FROM TOP OF WALL

Location:

Rating References:
None

Photo Number: 2

Description:
HEAVY SCALING UP TO JOINT
LOSS OF CONCRETE UP TO 1
FOOT PENE.
2 FT FROM TOP
STA 1+80 - STA 2+00

Location:

Rating References:
None

Photo Number: 3

Description:
HEAVY SCALING FROM TOP TO WATER LEVEL
MAX PENE. 1'
TYPICAL 6"
STA 5+90 - STA 5+95

Location:

Rating References:
None