

# 2016 UNDERWATER BRIDGE INSPECTION REPORT



## BRIDGE # 55520 CSAH 12 over ZUMBRO RIVER

DISTRICT: District 6

COUNTY: Olmsted

CITY/TOWNSHIP: ORONOCO

STATE: Minnesota

Date of Inspection: 11/16/2016

Equipment Used:

Owner: County Highway Agency

Inspected By: Forsyth, Roy

Report Written By: Roy Forsyth

Report Reviewed By:

Final Report Date:



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## UNDERWATER INSPECTION

### REPORT SUMMARY

The substructure units inspected at Bridge No. 55520, Piers 1, 2, and 3, were found to be in good condition with no defects of structural significance observed. The channel bottom, consisting of silt and firm clay around Pier 1 and fine silty organic material around Piers 2 and 3, appeared stable with no significant changes since the previous inspection. The footing was exposed around the full perimeter of Pier 1 with 2.5 foot of maximum vertical exposure.

### INSPECTION FINDINGS

- (A) The channel bottom material around Piers 2 and 3 consisted of fine silty organics with greater than 2 feet of probe rod penetration.
- (B) The channel bottom material around Pier 1 consisted of 6 to 12 inch layer of soft silt over firm clay.
- (C) Minor voids due to poor consolidation of the concrete were observed at various locations along the piers, typically up to 1 inch in diameter with up to 1/2 inch of penetration.
- (D) The footing was exposed on all faces of Pier 1 with a maximum vertical face exposure of 2.5 foot. The surface of the footing was rough with 6 to 12 inch diameter irregularities.
- (E) The upstream nose of Pier 2 stops at 6.5 feet below water and cuts back 1.5 feet.

### RECOMMENDATIONS

- (A) Monitor the extent of footing exposure at Pier 1 during future underwater inspections.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Contractor: Collins Engineers

Contractor Job Number: 9687

## UNDERWATER INSPECTION

### 1. BRIDGE DATA

Bridge #: 55520  
Feature Intersected: ZUMBRO RIVER  
Facility Carried: CSAH 12  
District: District 6  
County: 055 - Olmsted

#### Bridge Description:

The superstructure consists of a four span, multiple steel girder bridge. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The pier footings are supported on steel piles. The piers are numbered 1 through 3 starting at the west end of the bridge.

### 2. INSPECTION DATA

Professional Engineer/Team Leader: Roy Forsyth  
Inspection Diver: Marc Stern  
Date of Underwater Inspection: 11/16/2016  
Weather Conditions: Sunny, 50 °F  
Underwater Visibility (feet): 5.0  
Waterway Velocity (ft/sec): None/Negligible

### 3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Piers 1, 2, and 3

#### General Shape:

The piers consist of a rectangular concrete shaft with rounded ends, supported by a rectangular footing founded on steel piles.

Maximum Water Depth at Substructure(s) Inspected (feet): 16.5

### 4. WATERLINE DATUM

Water Level Reference: The top of the webwall at Pier 2.  
Waterline Elevation (feet): 914.7  
Description: The waterline was approximately 15.3 feet below the reference.

### 5. NBIS CODING INFORMATION

(Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code: 6  
Item 61: Channel and Channel Protection: Code: 6  
Item 62: Culvert: Code:  
Item 92B: Underwater Inspection: Code: Y 48 11/2016

Item 113: Scour Critical Bridge:

Code: I

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

Yes

No

(Mark your selection with an X)

6. STRUCTURAL ELEMENT CONDITION RATING

ELEM #	Element Description	Quantity	Unit	Conditions			
				CS1	CS2	CS3	CS4
210	Reinforced Concrete Pier Wall	89	LF	89			
220	Reinforced Concrete Footing	1	EA		1		
885	Scour	1	EA		1		

## UNDERWATER INSPECTION

### INSPECTION PROCEDURES

The routine underwater inspection of Bridge 55520 (CSAH No. 12 over the Zumbro River) was completed on November, 16, 2016. The underwater inspection was conducted from 20 foot boat. The inspection was conducted by a team consisting of a PE-Diver with a valid MnDOT Team leader certification, a backup diver and a dive tender. The inspection utilized commercial dive equipment and techniques (SSA and/or SCUBA) in accordance with OSHA regulations. Profiles were taken along the upstream and downstream faces of the bridge and around the periphery of substructure units to determine the presence, location and area of scour.

The bridge elements inspected consisted of 3 Piers and 1 concrete footing. According to the bridge inventory or design drawings, Piers 1 through 3 were founded on pile footings. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for bottom of foundations. The routine underwater inspection frequency is recommended to remain at 60 months based on those findings and risk factors. Also, inspection procedures should continue to follow the above approach and standard guidance with 100% Level I and 10% Level II intensity efforts.

# Minnesota Structure Inventory Report

Bridge ID: 55520

CSAH 12 over ZUMBRO RIVER

Date: 12/27/2016

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
<b>Agency Br. No.</b> Crew <b>District</b> 06 <b>Maint. Area</b> <b>County</b> 055 - Olmsted <b>City</b> <b>Township</b> 55012 - ORONOCO <b>Desc. Loc.</b> 2.6 MI W OF JCT TH 63 <b>Sect., Twp., Range</b> 11 - 108N - 14W <b>Latitude</b> 44 ° 10' 12.30 " <b>Longitude</b> 92 ° 28' 7.75 " <b>Custodian</b> 02 - County Highway Agency <b>Owner</b> 02 - County Highway Agency <b>BMU Agreement</b> <b>Year Built</b> 1975 <b>MN Year Reconstructed</b> 2001 <b>FHWA Year Reconstructed</b> <b>MN Temporary Status</b> <b>Bridge Plan Location</b> 3 - COUNTY <b>Date Opened to Traffic</b> 1/1/1976 <b>On - Off System</b> 1 - ON <b>Legislative District</b> 29A <b>Potential ABC</b> 2 - N/A	<b>Bridge Match ID (TIS)</b> 0 <b>Roadway O/U Key</b> Route On Structure <b>Route Sys</b> 04 - CSAH <b>Number</b> 12 <b>Roadway Name or Description</b> CSAH 12 <b>Level of Service</b> 1 - MAINLINE <b>Roadway Type</b> 2 - 2-way traffic <b>Control Section (TH Only)</b> <b>Reference Point</b> 009+00.624 <b>Detour Length</b> 10.0 mi. <b>Lanes</b> <b>ON</b> 2 <b>UNDER</b> 0 <b>ADT</b> 1982 <b>YEAR</b> 2008 <b>HCA DT</b> <b>ADTT</b> % <b>Functional Class</b> 06 - Rural - Minor Arterial	<b>Userkey</b> 95 <b>Structurally Deficient</b> N <b>Functionally Obsolete</b> N <b>Sufficiency Rating</b> 98.5 <b>Routine Inspection Date</b> 11/13/2015 <b>Routine Inspection Frequency</b> 24 <b>Inspector Name</b> Forsyth, Roy <b>Status</b> A - Open																				
		+ NBI CONDITION RATINGS +																				
		<b>Deck</b> 7 <b>Unsound Deck %</b> <b>Superstructure</b> 7 <b>Substructure</b> 6 <b>Channel</b> 6 <b>Culvert</b> N																				
		+ NBI APPRAISAL RATINGS +																				
		<b>Structure Evaluation</b> 6 <b>Deck Geometry</b> 8 <b>Underclearances</b> N <b>Waterway Adequacy</b> 9 <b>Approach Alignment</b> 8																				
		+ SAFETY FEATURES +																				
		<b>Bridge Railing</b> 0 - SUBSTANDARD <b>GR Transition</b> 1 - MEETS STANDARDS <b>Appr. Guardrail</b> 1 - MEETS STANDARDS <b>GR Termini</b> 1 - MEETS STANDARDS																				
		+ IN DEPTH INSP. +																				
		<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%; text-align: center;">Y/N</th> <th style="width: 15%; text-align: center;">Freq</th> <th style="width: 15%; text-align: center;">Date</th> </tr> </thead> <tbody> <tr> <td><b>Frac. Critical</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Underwater</b></td> <td></td> <td style="text-align: center;">60</td> <td style="text-align: center;">11/16/2016</td> </tr> <tr> <td><b>Pinned Asbly.</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Spec. Feat.</b></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Y/N	Freq	Date	<b>Frac. Critical</b>				<b>Underwater</b>		60	11/16/2016	<b>Pinned Asbly.</b>				<b>Spec. Feat.</b>			
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<b>Underwater</b>		60	11/16/2016																			
<b>Pinned Asbly.</b>																						
<b>Spec. Feat.</b>																						
		+ WATERWAY +																				
		<b>Drainage Area (sq. mi.)</b> 816.0 <b>Waterway Opening (sf.)</b> 18000 <b>Navigation Control</b> 0 - No nav. control on <b>Pier Protection</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><b>Nav. Clr. (ft.)</b></td> <td style="width: 30%; text-align: center;"><b>Vert.</b> 0.0</td> <td style="width: 40%; text-align: center;"><b>Horiz.</b> 0.0</td> </tr> </table> <b>Nav. Vert. Lift Bridge Clear. (ft.)</b> <b>MN Scour Code</b> I - LOW RISK <b>Year</b> 1991	<b>Nav. Clr. (ft.)</b>	<b>Vert.</b> 0.0	<b>Horiz.</b> 0.0																	
<b>Nav. Clr. (ft.)</b>	<b>Vert.</b> 0.0	<b>Horiz.</b> 0.0																				
		+ CAPACITY RATINGS +																				
		<b>Design Load</b> 5 - HS 20 <b>Operating Rating</b> 2 - HS TRUCK 36.2 <b>Inventory Rating</b> 2 - HS TRUCK 21.7 <b>Posting VEH:</b> <b>SEMI:</b> <b>DBL:</b> <b>Rating Date</b> 12/04/2014 <b>Overweight Permit Codes</b> <b>A</b> N - N/A <b>B</b> N - N/A <b>C</b> N - N/A																				
+ STRUCTURE +	+ RDWY DIMENSIONS +																					
<b>Service On</b> 5 - Highway-pedestrian <b>Service Under</b> 5 - Waterway <b>Main Span Type</b> 4 - Steel Continuous <b>Main Span Design</b> 01 - Beam Span <b>Main Span Detail</b> <b>Appr. Span Type</b> <b>Appr. Span Design</b> <b>Appr. Span Detail</b> <b>Skew</b> 0 <b>Culvert Type</b> <b>Barrel Length</b> <b>Cantilever ID</b>  <b>Number of Spans</b> <b>MAIN:</b> 4 <b>APPR:</b> 0 <b>TOTAL:</b> <b>Main Span Length</b> 135.0 ft. <b>Structure Length</b> 496.0 ft. <b>Deck Width (Out-to-Out)</b> 51.7 ft. <b>Deck Material</b> 1 - Concrete Cast-in-Place <b>Wear Surf Type</b> 4 - Low Slump Concrete <b>Wear Surf Install Year</b> 2001 <b>Wear Course/Fill Depth</b> 0.17 ft. <b>Deck Membrane</b> 0 - None <b>Deck Rebars</b> 0 - None <b>Deck Rebars Install Year</b> <b>Structure Area (Out-to-Out)</b> 25643 sq. ft. <b>Roadway Area (Curb-to-Curb)</b> 21829 sq. ft. <b>Sidewalk Width</b> <b>50A. Lt</b> 0.00 ft. <b>50B. Rt</b> 5.00 ft. <b>Curb Height</b> <b>Lt</b> 0.33 ft. <b>Rt</b> 0.67 ft. <b>Rail Type</b> <b>Lt</b> 17 <b>Rt</b> 17	<b>If Divided</b> <b>NB-EB</b> <b>SB-WB</b> <b>Roadway Width</b> 44.00 ft. ft. <b>Vertical Clearance</b> ft. ft. <b>Max. Vert. Clear.</b> ft. ft. <b>Horizontal Clear.</b> 43.9 ft. ft. <b>Lateral Clearance</b> ft. ft. <b>Appr. Surface Width</b> 44.0 ft. <b>Bridge Roadway Width</b> 44.0 ft. <b>Median Width On Bridge</b> ft.																					
	+ MISC. BRIDGE DATA +																					
	<b>Structure Flared</b> 0 - No flare <b>Parallel Structure</b> N - No parallel structure <b>Field Conn. ID</b> 4 - Bolted <b>Abutment Foundation (Material/Type)</b> 1 - CONC <b>Pier Foundation (Material/Type)</b> 1 - CONC 3 - FTG PILE <b>Historic Status</b> 5 - Not eligible																					
	+ PAINT +																					
	<b>Year Painted</b> 1975 <b>Unsound Paint %</b> <b>Painted Area</b> 53500 sq. ft. <b>Primer Type</b> 6 <b>Finish Type</b> K - Unpainted 3309 Steel																					
	+ BRIDGE SIGNS +																					
	<b>Posted Load</b> 0 - Not Required <b>Traffic</b> 0 - Not Required <b>Horizontal</b> 1 - Object Markers <b>Vertical</b> N - Not Applicable																					

**MINNESOTA BRIDGE INSPECTION REPORT**

01/30/2017

**BRIDGE 55520 CSAH 12 OVER ZUMBRO RIVER**

County: Olmsted	Location: 2.6 MI W OF JCT TH 63	Length: 496.0 ft.
City:	Route: 04 - CSAH 12 Ref. Pt.: 009+00.624	Deck Width: 51.7 ft.
Township: 55012 - ORONOCO	Control Section:	Rdwy. Area/ Pct. Unsnd: 21829 sq. ft. / %
Section: 11 Township: 108N Range: 14W Maint. Area:		Paint Area/ Pct. Unsnd: 53500 sq. ft. / %
Span Type: 4 - Steel Continuous 2 -	Local Agency Bridge Nbr.:	Culvert: N/A
List: Stringer/Multi-beam or Girder		Postings:
NBI Deck: 7 Super: 7 Sub: 6 Chan: 6 Culv: N		
	Open, Posted, Closed: A - Open	
	MN Scour Code: I - LOW RISK	

Appraisal Ratings - Approach: 8	Waterway: 9	Unofficial Structurally Deficient	N
Required Bridge Signs - Load Posting: 0 - Not Required	Traffic: 0 - Not Required	Unofficial Functionally Obsolete	N
Horizontal: 1 - Object Markers	Vertical: N - Not Applicable	Unofficial Sufficiency Rating	98.5

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
12	Reinforced Concrete Deck	Underwater	12/27/2016	25643 SF	25130	0	513	0
		Update	07/14/2016	25643 SF	25130	0	513	0
Notes: [2011-2015] Scattered cracks with efflorescence between the beams. There are two spalls between beams 1 and 2 on the east of pier 2 and one spall west of pier 2. There is a spall in the concrete above the top flange of beam 4 north side of the beam above pier 2. There are scattered delaminations in span 2 and 3 over the water.								
510	Wearing Surfaces	Underwater	12/27/2016	21829 SF	21829	0	0	0
		Update	07/14/2016	21829 SF	21829	0	0	0
Notes: Low Slump Overlay with Uncoated Rebar Notes:								
107	Steel Open Girder/Beam	Underwater	12/27/2016	2451 LF	2352	50	49	0
		Update	07/14/2016	2451 LF	2352	50	49	0
Notes: [2011-2015] Scalling and pitting of beams at abutments, piers and N. fascia. [2013-14] The top left bolt is missing its nut on the inside of the north fascia girder splice connection. Cover plates are welded at negative moment areas.								
515	Steel Protective Coating	Underwater	12/27/2016	53500 SF	53460	0	20	20
		Update	07/14/2016	53500 SF	53460	0	20	20
Notes: [2016] Includes area for diagrams.								
205	Reinforced Concrete Column	Underwater	12/27/2016	6 EA	6	0	0	0
		Update	07/14/2016	6 EA	6	0	0	0
210	Reinforced Concrete Pier Wall	Underwater	12/27/2016	89 LF	83	6	0	0
		Update	07/14/2016	89 LF	83	6	0	0
Notes: [2011-2015] The footing was partially exposed along the east face of Peir 1 with a maximum vertical face exposure of 1 foot. The surface of the footing was rough with 6 to 12 inch diameter irregularities. 0.013" vertical cracks face of pier walls.								
215	Reinforced Concrete Abutment	Underwater	12/27/2016	148 LF	134	14	0	0
		Update	07/14/2016	148 LF	134	14	0	0
Notes: [2011-2015] East abutment-there are seven vertical 0.013" cracks in the front face of the abutment that extend across the bridge seat and up the parapet wall. There is delaminated concrete under beams 1,2,3 and 5. The parapet wall has delaminated concrete between beams 1 and 2 and beams 3 and 4. West abutment-there are five vertical .013 cracks in the front face of the abutment that extend across the bridge seat and up the parapet wall. The parapet wall has delaminated concrete between beams 2 and 3.								
220	Reinforced Concrete Pile Cap/Footing	Underwater	12/27/2016	1 LF	0	1	0	0
Notes: [2016 Underwater] - The footing was exposed on all faces of Pier 1 with a maximum vertical face exposure of 2.5 foot. The surface of the footing was rough with 6 to 12 inch diameter irregularities.								

**BRIDGE 55520 CSAH 12 OVER ZUMBRO RIVER**

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
234	Reinforced Concrete Pier Cap	Underwater	12/27/2016	144 LF	137	7	0	0
		Update	07/14/2016	144 LF	137	7	0	0
Notes: [2011-2015] Several 0.010 vertical cracks in both pier caps that range from 1' to 2.5' in length. Pier 3 there is a 4' long vertical .013 crack in the east face. There are three vertical .013 cracks in size from 1' to 3' in length on the west face of the cap.								
300	Strip Seal Expansion Joint	Underwater	12/27/2016	105 LF	105	0	0	0
		Update	07/14/2016	105 LF	105	0	0	0
Notes: [2011-2015] Strip seals are full of dirt and debris.								
311	Movable Bearing	Underwater	12/27/2016	20 EA	15	5	0	0
		Update	07/14/2016	20 EA	15	5	0	0
Notes: [2011-2015] Active corrosion on all expansion bearings. E. abutment bearings are out of alignment, pushed back towards abutment by 2.5". Bearings at W. pier beams 1 and 2 (S. fascia is beam 1) do not have anchor bolts anchoring the sole plate to the pier cap. East abutment bearings are out of alignment. The bearings are pushed back towards the abutment as much as 1 5/8" at 46 degrees F. The following measurements were taken on the east side of the rockers center of the rocker to the top of the masonry plate; Beam 1, 1 1/2", Beam 2, 1 3/4", Beam 3, 1 3/4", Beam 4, 1 1/2", Beam 5, 1 5/8".								
313	Fixed Bearing	Underwater	12/27/2016	5 EA	5	0	0	0
		Update	07/14/2016	5 EA	5	0	0	0
Notes: [2011-2015] Active corrosion all bearings.								
330	Metal Bridge Railing	Underwater	12/27/2016	991 LF	991	0	0	0
		Update	07/14/2016	991 LF	991	0	0	0
Notes: [2011-2015] Vertical 0.013 cracks with staining in rails. All bolts and nuts are in place on double line of galvanized pipe rail and posts. Railing style is substandard at all speeds.								
515 - Steel Protective Coating		Underwater	12/27/2016	3000 SF	3000	0	0	0
		Update	07/14/2016	3000 SF	3000	0	0	0
Notes: .								
331	Reinforced Concrete Bridge Railing	Underwater	12/27/2016	991 LF	991	0	0	0
		Update	07/14/2016	991 LF	991	0	0	0
Notes: [2011-2015] Vertical 0.013 cracks with staining in rails. All bolts and nuts are in place on double line of galvanized pipe rail and posts. Railing style is substandard at all speeds.								
800	Critical Deficiencies or Safety Hazards	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
Notes: [2011-2015] No critical findings observed.								
810	Concrete Decks - Cracking & Sealing	Underwater	12/27/2016	4000 LF	4000	0	0	0
		Update	07/14/2016	4000 LF	4000	0	0	0
Notes: [2013-15] Approximately 4000 linear feet of cracks were sealed in the surface of the deck with epoxy.								
822	Bituminous Approach Roadway	Underwater	12/27/2016	2 EA	0	2	0	0
		Update	07/14/2016	2 EA	0	2	0	0
Notes: [2011-2015] Unsealed 0.40" cracks with no settlement.								
855	Secondary Members (Superstructure)	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
Notes: [2011-2013] Active corrosion on the endsteel diaphragms.								
881	Steel Section Loss	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
Notes: [2014-15] More than average weathering on North fascia beam with minor section loss, 1% used for load rating.								

**BRIDGE 55520 CSAH 12 OVER ZUMBRO RIVER**

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
883	Concrete Shear Cracking	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
Notes: Use this element to monitor the presence of shear cracking on concrete elements. Pay particular attention to the concrete pier caps.								
885	Scour	Underwater	12/27/2016	1 EA	0	1	0	0
891	Other Bridge Signing	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
Notes: [2011-2015] Clearance markers.								
892	Slopes & Slope Protection	Underwater	12/27/2016	1 EA	0	1	0	0
		Update	07/14/2016	1 EA	0	1	0	0
Notes: [2011-2015] There is an area of slope erosion in front of both abutments. Both slopes are very steep.								
893	Guardrail	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
894	Deck & Approach Drainage	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
895	Sidewalk, Curb, & Median	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
Notes: [2011-2015] Small spalled area in the curb at the SW corner.								
899	Miscellaneous Items	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
Notes: [2011-2015] Overhead power lines on N. side of bridge restrict use of snoopers to S. side only. Telephone conduit on N. edge of slab.								
900	Protected Species	Underwater	12/27/2016	1 EA	1	0	0	0
		Update	07/14/2016	1 EA	1	0	0	0
Notes: Use this element to track the presence of protected species living on this structure.								

General Notes: New 2" low slump overlay 2001.  
 New strip seals installed in 2001.  
 New SRT-350 installed in 2001.

Channel: The footing was partially exposed along the east face of Peir 1 with a maximum vertical face exposure of 1 foot. The surface of the footing was rough with 6 to 12 inch diameter irregularities.

B.M. 957.18 brass plug.

Bridge was inspected by Mn/Dot as requested by Olmsted County and this report reflects their findings as is in bridge file.

Rail joints were sandblasted, filler placed and sealed 2006.  
 Deck cracks were sealed 2006, 2013.  
 Curb and walk cracks were cleaned and sealed 2006, 2013.

Stantec inspected on 7/18/14 for SHV load rating.

58. Deck NBI:

36A. Brdg Railings NBI:

36B. Transitions NBI:

36C. Appr Guardrail NBI:

**BRIDGE 55520 CSAH 12 OVER ZUMBRO RIVER**

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
36D.	Appr Guardrail Terminal NBI:							
59.	Superstructure NBI:							
60.	Substructure NBI:							
61.	Channel NBI:	[2012-2013] The footing was partially exposed along the east face of Peir 1 with a maximum vertical face exposure of 1 foot. The surface of the footing was rough with 6 to 12 inch diameter irregularities.						
62.	Culvert NBI:							
71.	Waterway Adeq NBI:							
72.	Appr Roadway Alignment NBI:							

\_\_\_\_\_  
Inspector's Signature

\_\_\_\_\_  
Reviewer's Signature

# Pictures

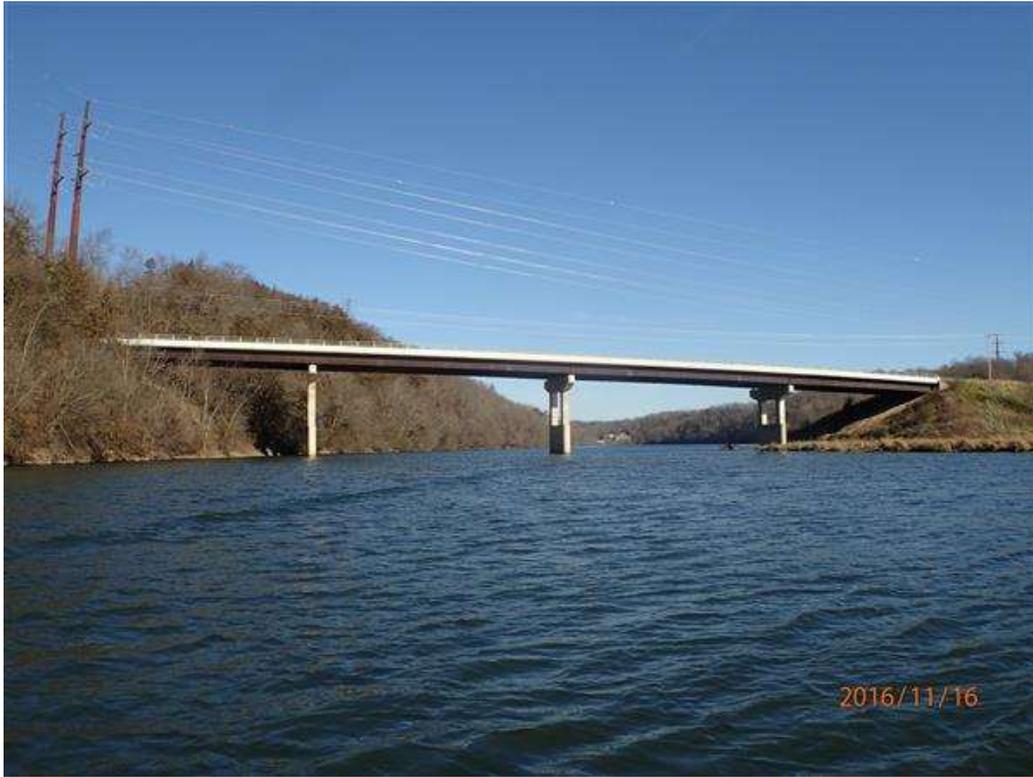


Photo 1 - View of Bridge 55520, looking north.



Photo 2 - View of Bridge 55520, looking south.

# Pictures



Photo 3 - View of West Abutment, looking west.



Photo 4 - View of East Abutment, looking east.

# Pictures



Photo 5 - View of Pier 1, looking west.

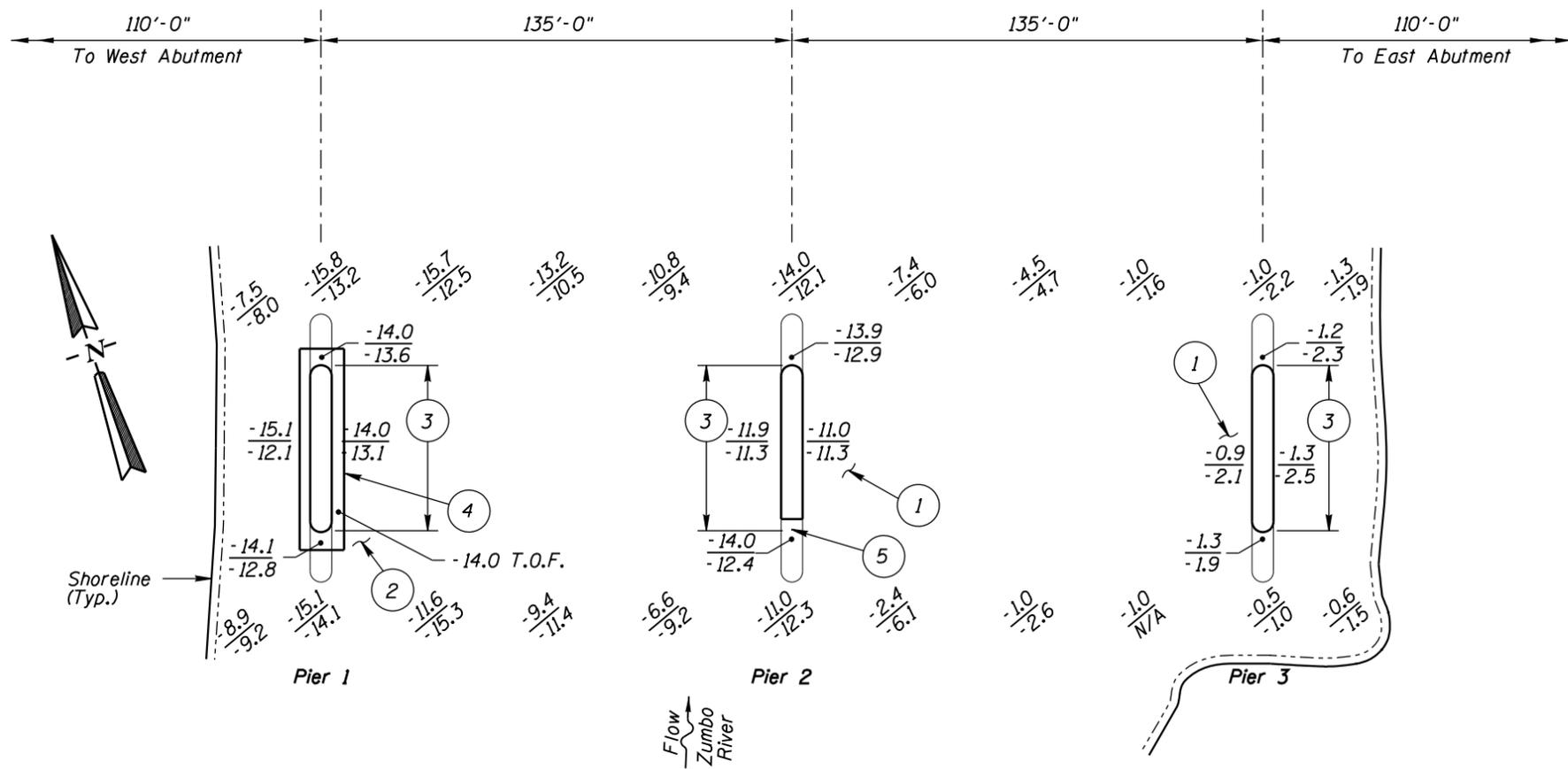


Photo 6 - View of Pier 2, looking west.

## Pictures



Photo 7 - View of Pier 3, looking east.



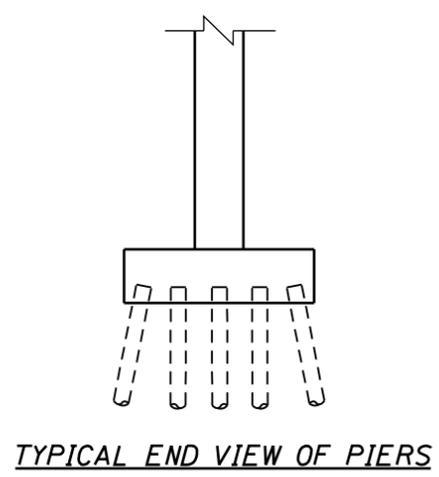
**SOUNDING PLAN**

**GENERAL NOTES:**

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on November 16, 2016, the waterline was located approximately 15.3 feet below the top of the webwall of Pier 2. This corresponds with a waterline elevation of 914.7 based on the previous report dated October 29, 2007.
3. Soundings indicate the water depth at the time of inspection and are measured in feet. All soundings based on 2016 waterline location.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

**INSPECTION NOTES:**

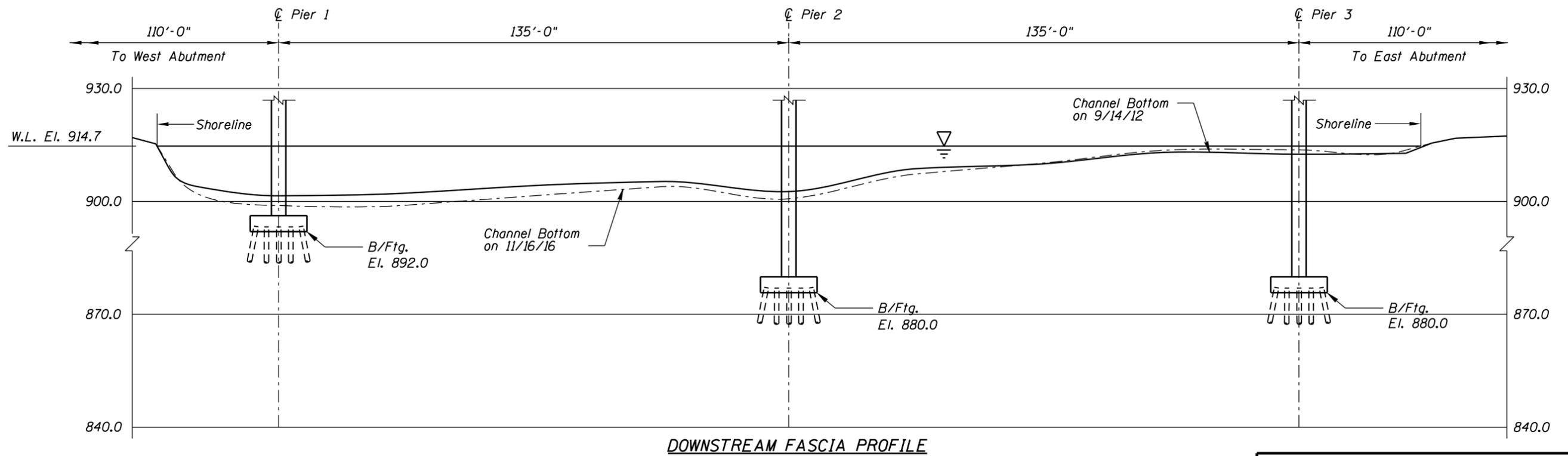
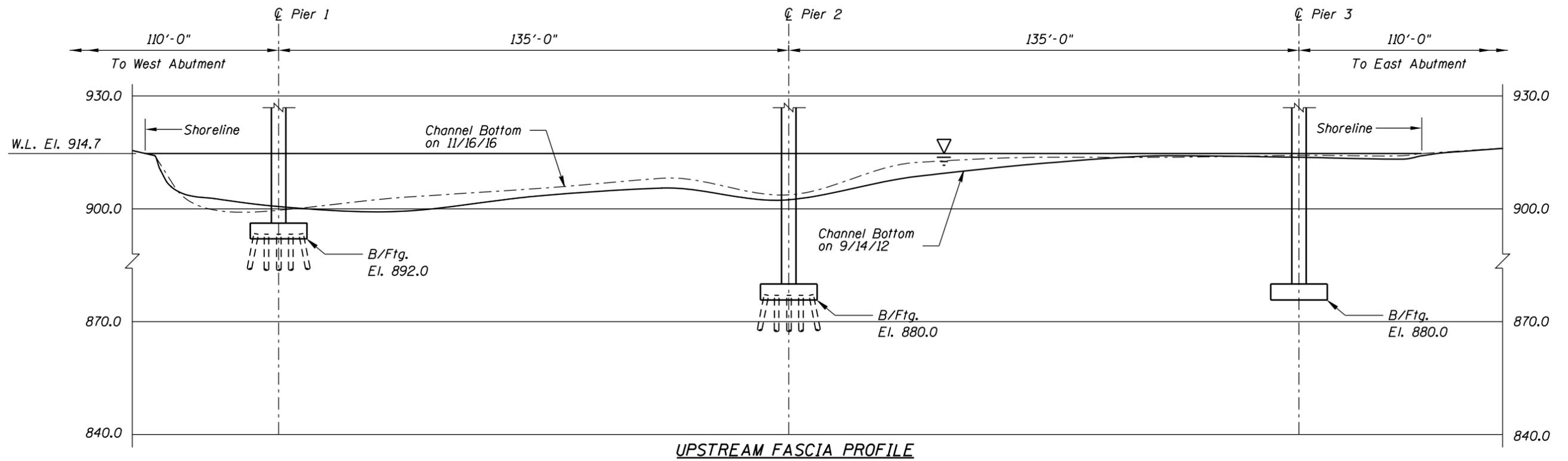
- 1 The channel bottom around Piers 2 and 3 consisted of fine silty organics with greater than 2 feet of probe rod penetration.
- 2 The channel bottom material around Pier 1 consisted of 6 to 12 inches of soft silt over firm clay.
- 3 Minor voids due to poor consolidation of the concrete were observed at various locations along the piers, typically up to 1 inch in diameter with up to 1/2 inch of penetration.
- 4 The footing was exposed on all faces of Pier 1 with a maximum vertical face exposure of 2.5 foot. The surface of the footing was rough and irregular.
- 5 The upstream nose of Pier 2 stops at 6.5 feet below water and cuts back 1.5 feet.



**Legend**

- 2.0 Sounding Depth from Waterline (11/16/16)
- 5.2 Sounding Depth from Waterline (9/14/12)
- Timber Debris
- Scour Depression

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 55520 OVER THE ZUMBRO RIVER DISTRICT 6, OLMSTED COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: MJS	<b>COLLINS ENGINEERS</b> <small>1599 Selby Ave. Suite 206 St. Paul, MN, 55104 (651) 646-8502 www.collinsengr.com</small>	Date: 11/16/2016
Checked By: RAF		Scale: 1"=30'
Project: 9687		Figure No.: 1



**Note:**  
Refer to Figure 1 for General Notes.

**Legend**  
 ——— Channel Bottom per 2012 Inspection  
 - - - - - Channel Bottom per 2016 Inspection

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 55520 OVER THE ZUMBRO RIVER DISTRICT 6, OLMSTED COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: MJS	<b>COLLINS ENGINEERS</b>	Date: 11/16/2016
Checked By: RAF	<small>1599 Selby Ave. Suite 206 St. Paul, MN, 55104 (651) 646-8502 www.collinsengr.com</small>	Scale: 1"=30'
Project: 9687		Figure No.: 2