

CITY OF TAWAS CITY
MICHIGAN
2020 BRIDGE REHABILITATION PROJECT

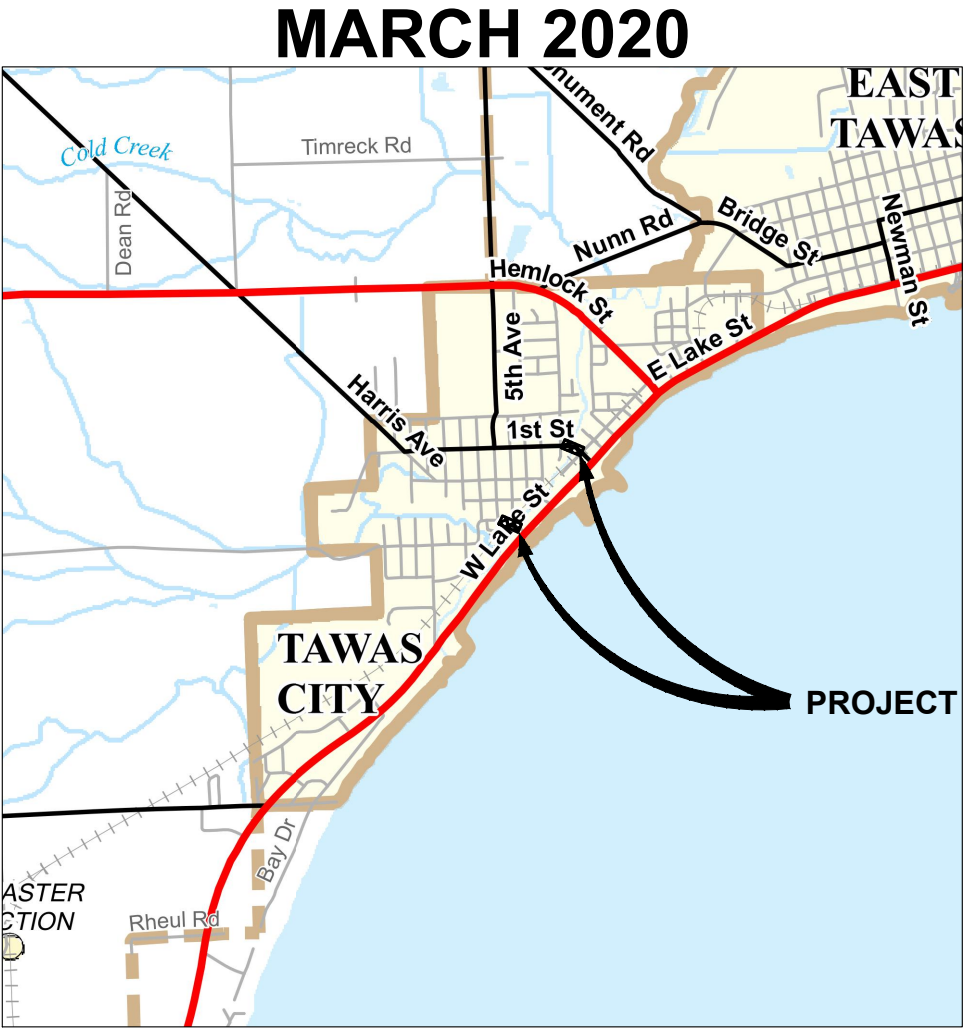
GENERAL NOTES:

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS, OR IN THE PROPOSAL AND SUPPLEMENTAL SPECIFICATIONS, ALL MATERIALS AND WORKMANSHIP SHALL BE ACCORDING TO THE MICHIGAN DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR CONSTRUCTION 2012 EDITION.
WORK SHALL COMPLY WITH SECTION 504 OF THE REHABILITATION ACT OF 1973 AND THE AMERICANS WITH DISABILITIES ACT OF 1990.

DESIGN OF STRUCTURAL MEMBERS BASED ON

STRUCTURAL STEEL: AASHTO M270, GRADE 50	$f_y = 50,000$ psi
CONCRETE: GRADE S2	$f_c = 3,000$ psi
TIMBER: SYP No.1	$f_b = 1,250$ psi

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53 1974 AS AMENDED, THE CONTRACTOR SHALL CONTACT MISS DIG AT 800-482-7171 or on-line at <https://www.missdig.org/> A MINIMUM OF THREE (3) WORKING DAYS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO EXCAVATION ON-SITE. ALL "MISS DIG" PARTICIPATING MEMBERS WILL THUS BE NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING OWNERS WHO MAY NOT PARTICIPATE IN THE "MISS DIG" SYSTEM. ALSO, NOTIFY THE CITY OF TAWAS CITY AT 1 - (989) 362-2521 THREE WORKING DAYS PRIOR AS ABOVE.






#	SHEET TITLE
1	COVER SHEET
2	MATHEWS ST REMOVAL PLAN
3	FIRST ST REMOVAL PLAN
4	MATHEWS ST GENERAL PLAN OF STRUCTURE
5	FIRST ST GENERAL PLAN OF STRUCTURE
6	MATHEWS ST CROSS SECTIONS
7	FIRST ST CROSS SECTIONS
8	MATHEWS ST & FIRST ST SECTION DETAILS
9	MATHEWS ST DECK PLAN
10	FIRST ST DECK PLAN
11	MATHEWS ST & FIRST ST POST TENSIONING SYSTEM
12	FIRST ST DEADMEN PLAN



Know what's below.
Call before you dig.

MATHEWS ST OVER TAWAS RIVER
FIRST ST OVER TAWAS RIVER
SEC 30, T22N, R8E
TAWAS CITY
IOSCO COUNTY, MICHIGAN

CONTRACT FOR: BRIDGE REHABILITATION AND RELATED APPROACH WORK	
CITY OF TAWAS CITY	
GUS OLIVER - DIRECTOR OF PUBLIC WORKS	DATE
	 Link ENGINEERING SERVICES 310 W. FRONT STREET SUITE 224 TRAVERSE CITY, MI 49684 PHONE: (231) 499-9479
PREPARED UNDER THE SUPERVISION OF:	
 BRADLEY A. LINK, P.E. REGISTERED PROFESSIONAL ENGINEER NO. 40060	3-19-2020 DATE

2020 BRIDGE REHABILITATION PROJECT

CAUTION: LAKE STATE RAILROAD
MUST BE KEPT CLEAR WITHIN 25
FEET EACH SIDE OF TRACKS
EXCEPT FOR INGRESS AND EGRESS

WARNING:
OVERHEAD ELECTRIC

REMOVE HMA SURFACE, CONCRETE
SIDEWALK, AND CONCRETE CURB AND
GUTTER AS DIRECTED BY ENGINEER

STRUCTURES, REM ITEMS INCLUDE:
BRIDGE RAILING, TIMBER SIDEWALK
DECK, FASCIA STRINGER, BRACING

PED GUARDRAIL, REM ITEMS
INCLUDE: TIMBER RAILING OFF
BRIDGE AND WINGWALLS

DRIVEWAY APPROACH AND TRAVELWAY TO
RESIDENCES NOT SHOWN MUST REMAIN
ACCESSIBLE TO LOCAL TRAFFIC AT ALL TIMES

WARNING:
OVERHEAD ELECTRIC

CONTRACTOR SHALL FURNISH AND OPERATE THE
FOLLOWING:

BARRICADE TYP III, HIGH INTENSITY, DOUBLE SIDED, LIGHTED

- 1 EA ON FIRST STREET NEAR US-23 INTERSECTION
- 2 EA ON FIRST STREET NEAR EASTERN PROJECT LIMITS
- 1 EA ON FIRST STREET NEAR FIRST AVENUE
- 2 EA ON FIRST STREET NEAR WESTERN PROJECT LIMITS

ITEM DESCRIPTION

QUANTITIES

Curb and gutter, Rem	80 Ft
Sidewalk, Rem	330 Sft
HMA Surface, Rem	250 Syd
Barricade, Type III, High Intensity, Double Sided, Lighted, Furn	6 Ea
Barricade, Type III, High Intensity, Double Sided, Lighted, Oper	6 Ea

HMA REMOVAL
REMOVE HMA FROM DECK BY LIFTING
MAT FROM DECK WITH A SMOOTH EDGE
LOADER/SKIDSTEER BUCKET OR SIMILAR
MINIMIZING REMOVAL OF TIMBER FLOORING

EXISTING UNDERGROUND WATERMAIN,
SEE DOCUMENTS AT TAWAS CITY HALL

EXCAVATE STRUCTURE BACKFILL
AND STOCKPILE FOR REUSE

STA 3+65.19, 48.95 RT
BEGIN EX. PED GUARDRAIL

STA 4+73.70, RT 19.04
END EX. PED GUARDRAIL

STA 5+25.82, RT 18.78
BEGIN EX. PED GUARDRAIL

STA 5+69.68, RT 19.90
POWER POLE

STA 5+71.84, LT 32.22
POWER POLE

STA 4+19.00, LT 20.54
SIGN
STA 4+14.51, LT 14.81
POWER POLE

RAILROAD CENTERLINE
STA 3+92.30

MATHEWS ST

TAWAS RIVER

0 20 40
1" = 20' FEET

CITY OF TAWAS CITY

**MATHEWS ST
REMOVAL PLAN**

2020 BRIDGE REHABILITATION PROJECT

Link
ENGINEERING
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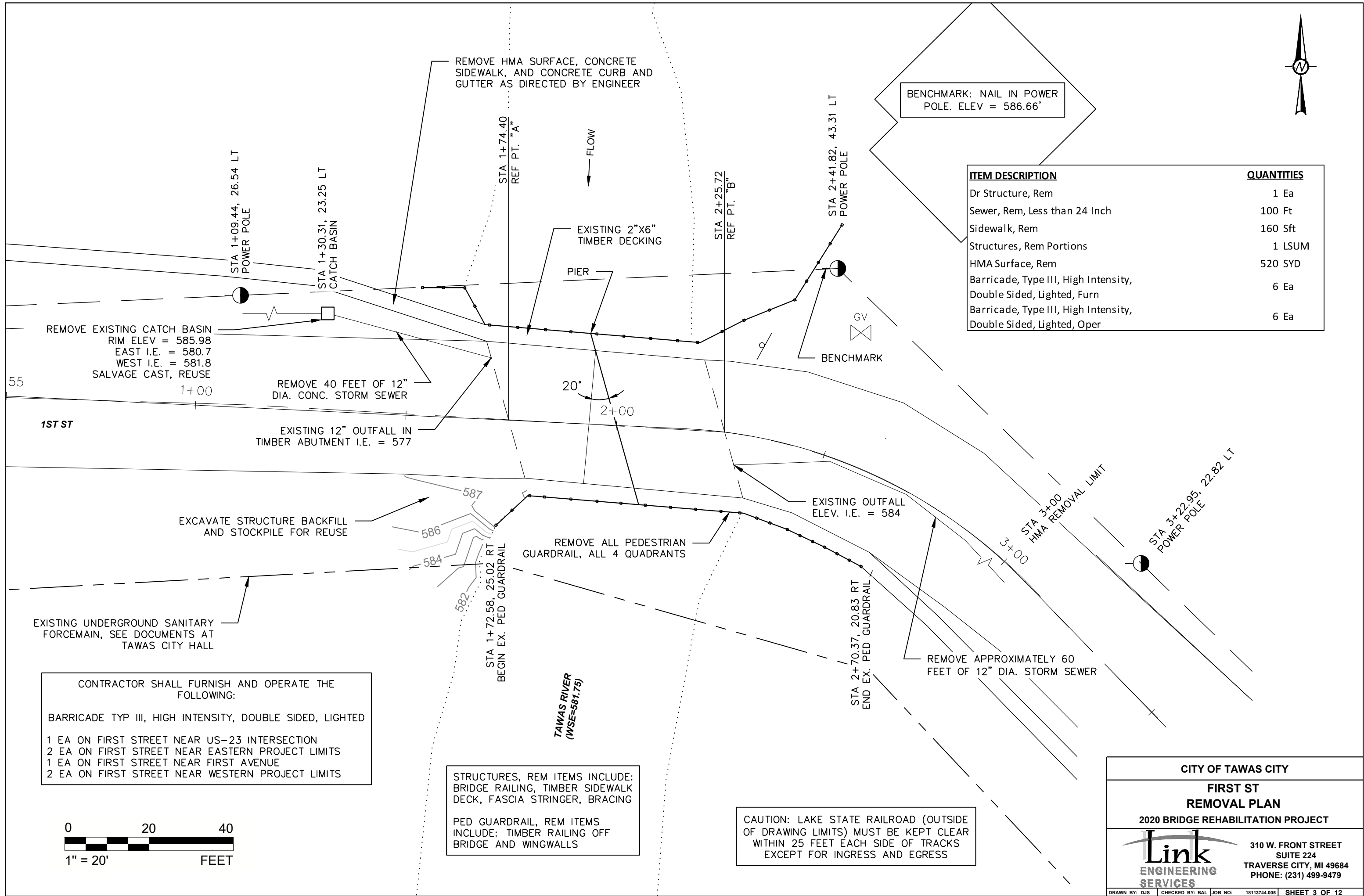
310 W. FRONT STREET
SUITE 224
TRAVERSE CITY, MI 49684
PHONE: (231) 499-9479

DRAWN BY: DJS | CHECKED BY: BAL | JOB NO: 18113744.005 | SHEET 2 OF 12



BENCHMARK: NAIL IN POWER
POLE. ELEV = 586.66'

ITEM DESCRIPTION	QUANTITIES
Dr Structure, Rem	1 Ea
Sewer, Rem, Less than 24 Inch	100 Ft
Sidewalk, Rem	160 Sft
Structures, Rem Portions	1 LSUM
HMA Surface, Rem	520 SYD
Barricade, Type III, High Intensity, Double Sided, Lighted, Furn	6 Ea
Barricade, Type III, High Intensity, Double Sided, Lighted, Oper	6 Ea



CONTRACTOR SHALL FURNISH AND OPERATE THE
FOLLOWING:

BARRICADE TYP III, HIGH INTENSITY, DOUBLE SIDED, LIGHTED

1 EA ON FIRST STREET NEAR US-23 INTERSECTION
2 EA ON FIRST STREET NEAR EASTERN PROJECT LIMITS
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STRUCTURES, REM ITEMS INCLUDE:
BRIDGE RAILING, TIMBER SIDEWALK
DECK, FASCIA STRINGER, BRACING

PED GUARDRAIL, REM ITEMS
INCLUDE: TIMBER RAILING OFF
BRIDGE AND WINGWALLS

CAUTION: LAKE STATE RAILROAD (OUTSIDE
OF DRAWING LIMITS) MUST BE KEPT CLEAR
WITHIN 25 FEET EACH SIDE OF TRACKS
EXCEPT FOR INGRESS AND EGRESS

CITY OF TAWAS CITY

FIRST ST
REMOVAL PLAN

2020 BRIDGE REHABILITATION PROJECT

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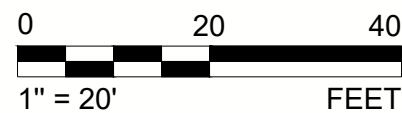
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SHEET 3 OF 12



CAUTION: LAKE STATE RAILROAD
MUST BE KEPT CLEAR WITHIN 25
FEET EACH SIDE OF TRACKS
EXCEPT FOR INGRESS AND EGRESS

RIGHT-OF-WAY AVAILABLE FOR
STAGING, CONTRACTOR
RESPONSIBLE FOR ANY
DAMAGES AND TURF
ESTABLISHMENT TO MATCH
EXISTING CONDITION

DRIVEWAY APPROACH AND TRAVELWAY TO
RESIDENCES NOT SHOWN MUST REMAIN
ACCESSIBLE TO LOCAL TRAFFIC AT ALL TIMES

REPLACE ALL PEDESTRIAN GUARD
RAILING - SEE POST AND RAIL
DETAILS SHEET 11

PROPOSED CURB AND GUTTER
(TYP. ALL 4 QUADS)

MATCH PROPOSED CURB
TO EXISTING CURB

MATHEWS ST

TAWAS RIVER

PLAN

AGGREGATE BASE 22A, 6" MIN

BACKFILL WITH EXCAVATION SPOIL. NO
SPOIL SHALL BE REMOVED FROM THE SITE
UNLESS DIRECTED BY THE ENGINEER

PLACE GEOTEXTILE, KEEP IN
PLACE WHILE BACKFILLING

HEAVY LINE INDICATES LIMITS
OF "EXCAVATION, FDN" AND
HATCHED AREA INDICATES LIMITS
OF "BACKFILL, STRUCTURE, CIP"

PLACE 6A AGGREGATE WRAPPED IN
GEOTEXTILE TO 6 INCHES ABOVE STREAM ELEV.

26' SPAN 26' SPAN

TIMBER
RAIL

SIDEWALK

RAILING OFF DECK NOT
SHOWN FOR CLARITY

WSE TAWAS RIVER
EL = 581.75 (9/8/2017)

EXISTING
STREAM BOTTOM
ELEV. 577.63±

ELEVATION

0 20 40
1" = 20' FEET

ITEM DESCRIPTION	QUANTITIES
Aggregate, 6A	250 CYD
Backfill, Structure, CIP	180 CYD
Excavation, Fdn	300 CYD
Aggregate Base, 6 Inches	180 SYD
HMA, 13A	60 TON
Substructure Conc	20 Cft
Structure, Timber	1 LSUM
Sidewalk, Conc, 4 Inches	330 Sft
Guardrail, Type B	213 Ft
Guardrail Post, Culv	16 Ea
Ped Guard Railing	170 Lft
Ped Guard Rail Posts - Gound Anchor	12 Ea
Ped Guard Rail Posts - Lag Bolt Anchor	9 Ea
Ped Guard Rail Posts - Adhesive Conc Anchor	9 Ea

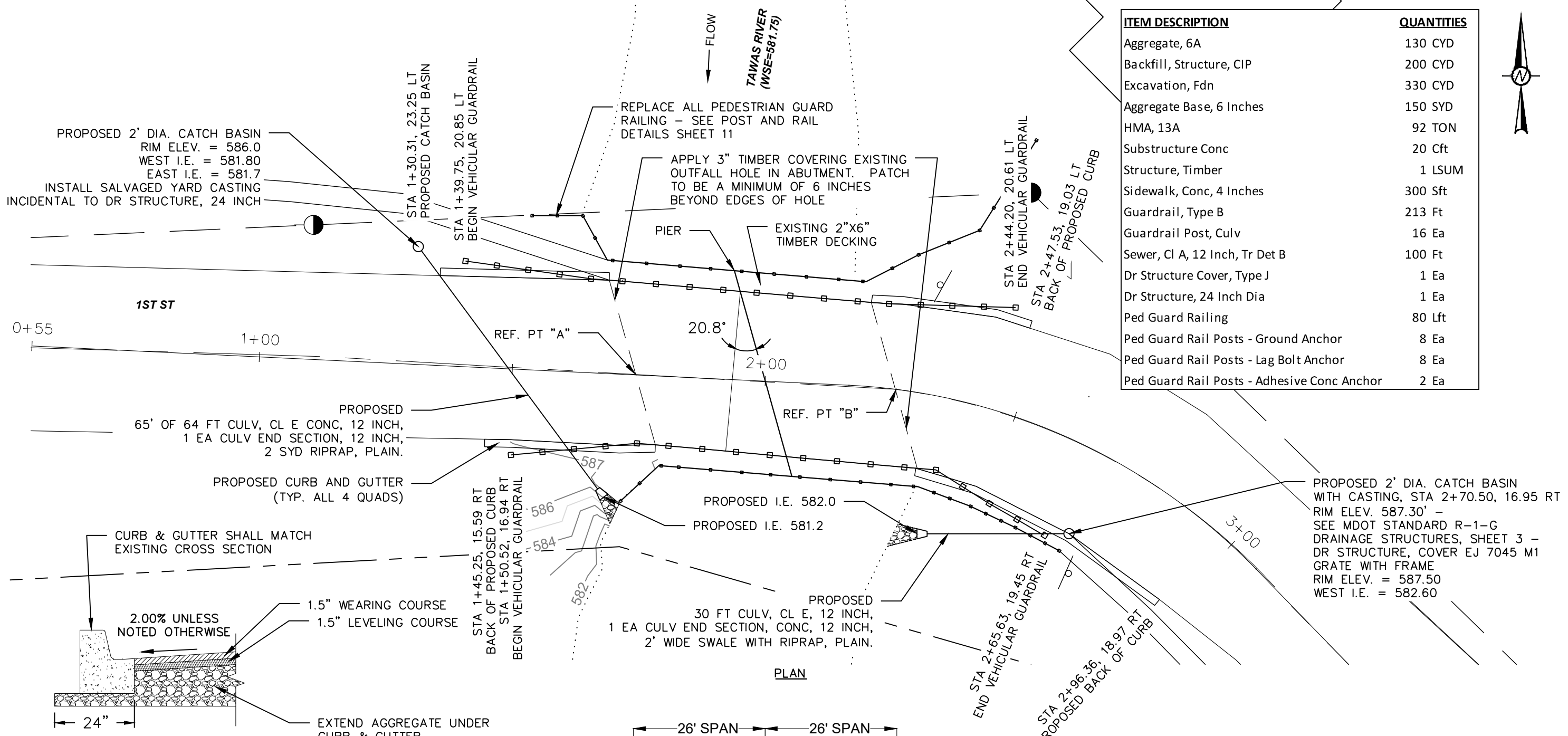
CITY OF TAWAS CITY

MATHEWS ST
GENERAL PLAN OF STRUCTURE
2020 BRIDGE REHABILITATION PROJECT

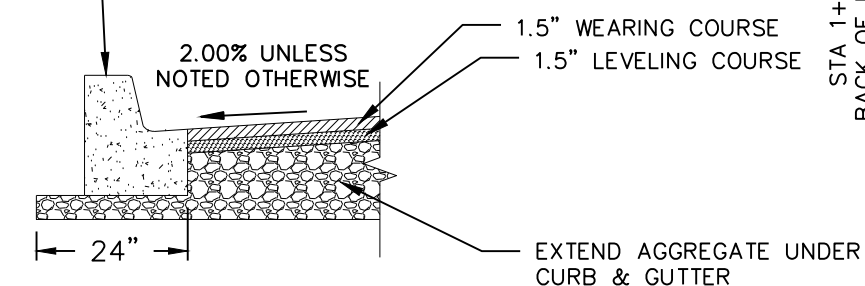
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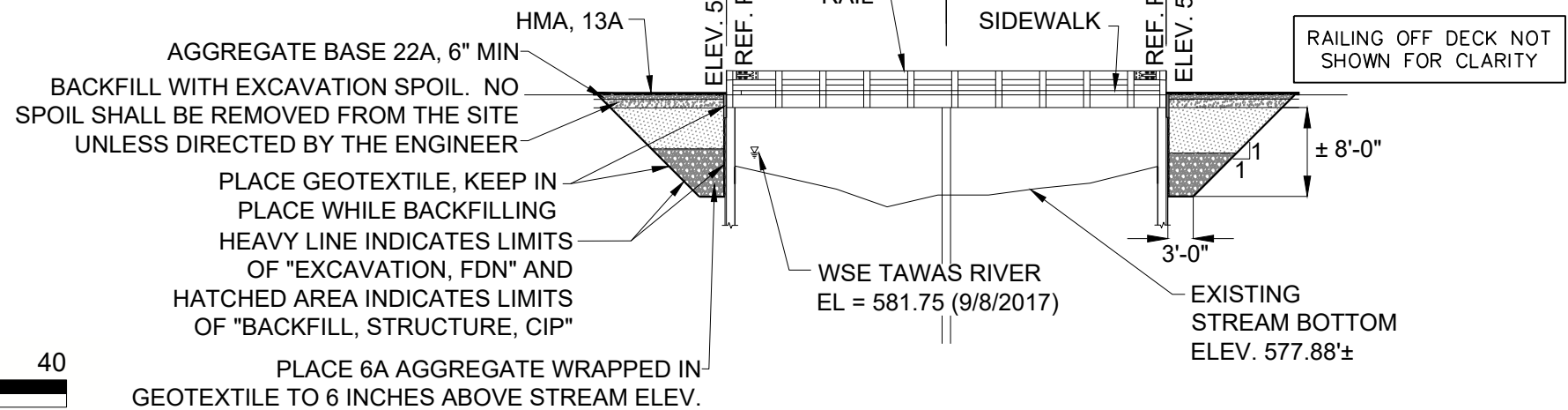
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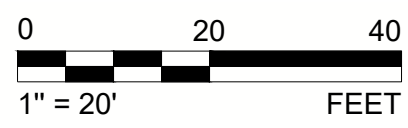
ITEM DESCRIPTION	QUANTITIES
Aggregate, 6A	130 CYD
Backfill, Structure, CIP	200 CYD
Excavation, Fdn	330 CYD
Aggregate Base, 6 Inches	150 SYD
HMA, 13A	92 TON
Substructure Conc	20 Cft
Structure, Timber	1 LSUM
Sidewalk, Conc, 4 Inches	300 Sft
Guardrail, Type B	213 Ft
Guardrail Post, Culv	16 Ea
Sewer, Cl A, 12 Inch, Tr Det B	100 Ft
Dr Structure Cover, Type J	1 Ea
Dr Structure, 24 Inch Dia	1 Ea
Ped Guard Railing	80 Lft
Ped Guard Rail Posts - Ground Anchor	8 Ea
Ped Guard Rail Posts - Lag Bolt Anchor	8 Ea
Ped Guard Rail Posts - Adhesive Conc Anchor	2 Ea



TYPICAL CURB & GUTTER CROSS SECTION



ELEVATION



CITY OF TAWAS CITY

FIRST ST

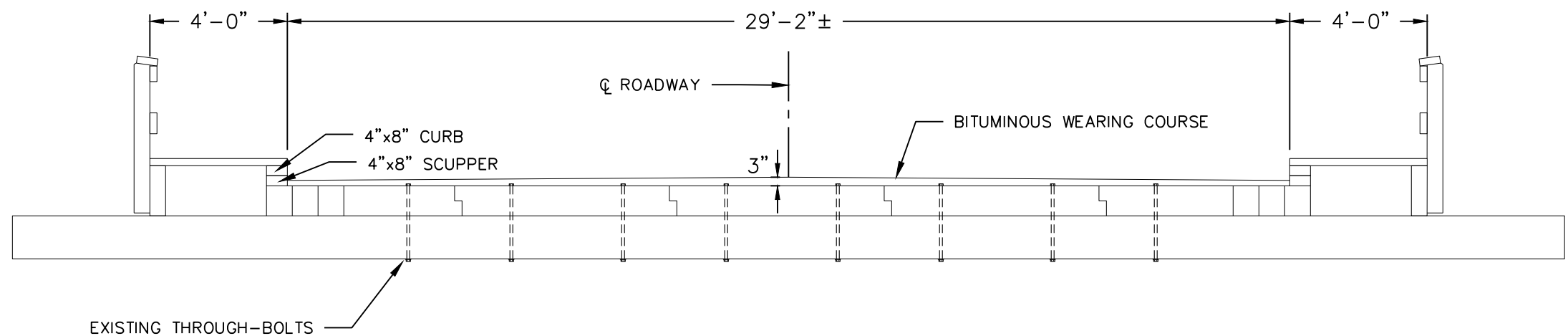
GENERAL PLAN OF STRUCTURE

2020 BRIDGE REHABILITATION PROJECT

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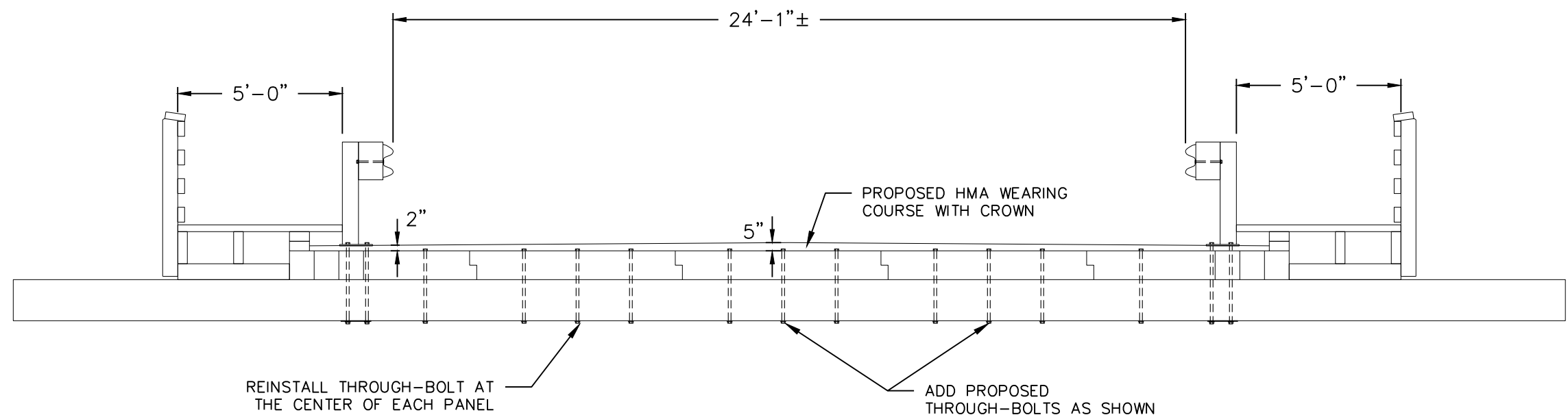
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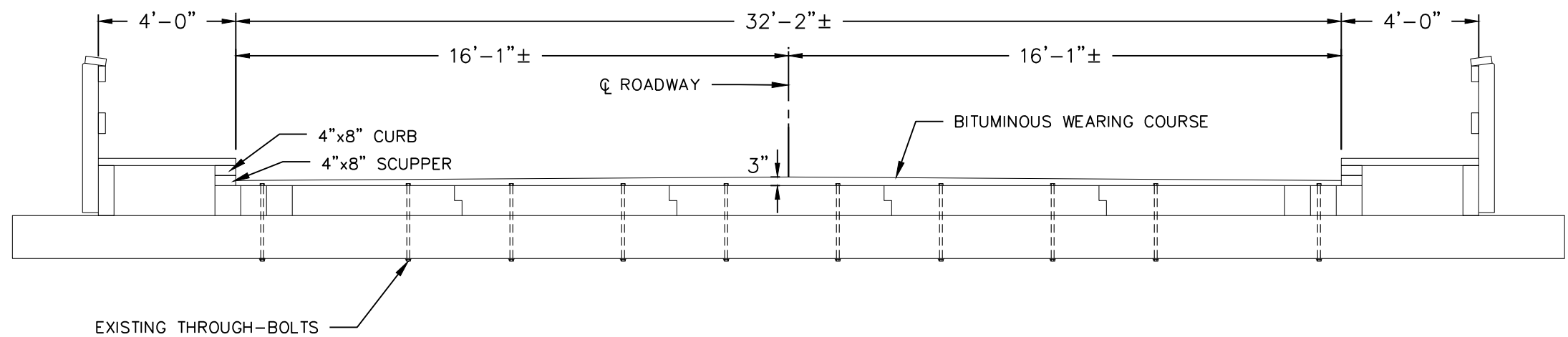
EXISTING MATHEWS ST. SECTION THRU DECK AT SPREADER BEAM

TIMBER, POST TENSIONING ITEMS INCLUDE:
THROUGH-BOLT REMOVAL, REINSTALLATION



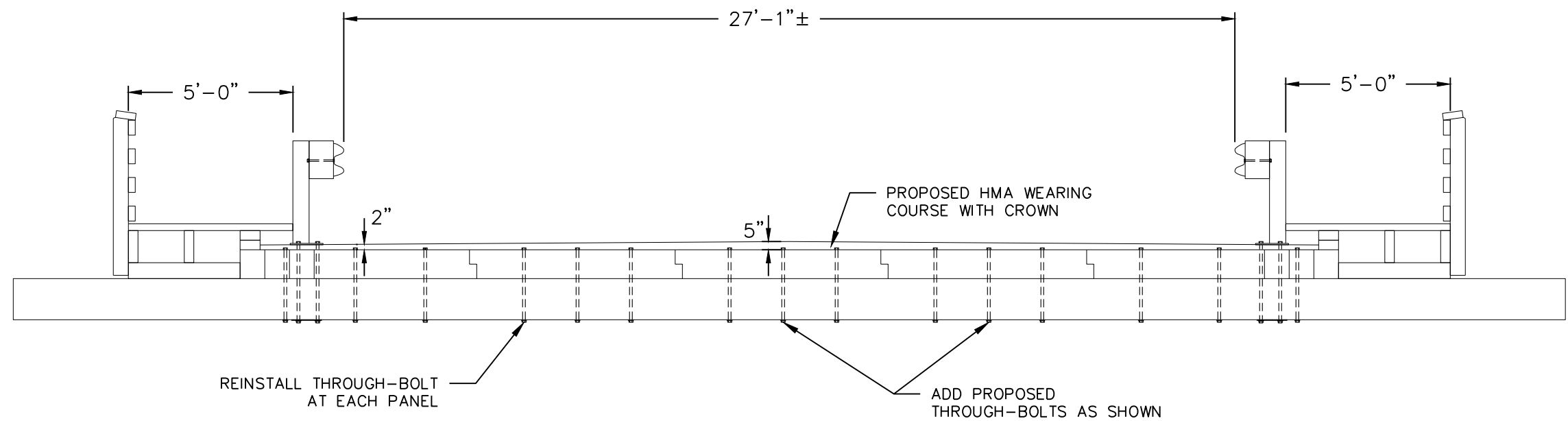
PROPOSED MATHEWS ST. SECTION THRU DECK AT SPREADER BEAM

CITY OF TAWAS CITY	
MATHEWS ST CROSS SECTIONS	
2020 BRIDGE REHABILITATION PROJECT	
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JOB NO: 18113744.005	SHEET 6 OF 12



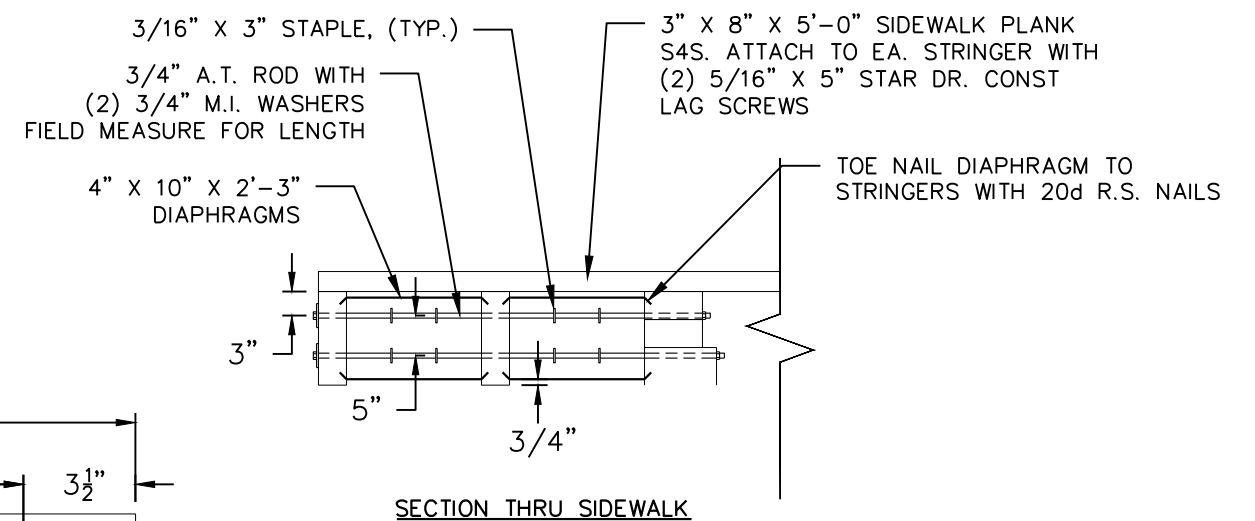
EXISTING FIRST ST. SECTION THRU DECK AT SPREADER BEAM

TIMBER, POST TENSIONING ITEMS INCLUDE:
THROUGH-BOLT REMOVAL, REINSTALLATION



PROPOSED FIRST ST. SECTION THRU DECK AT SPREADER BEAM

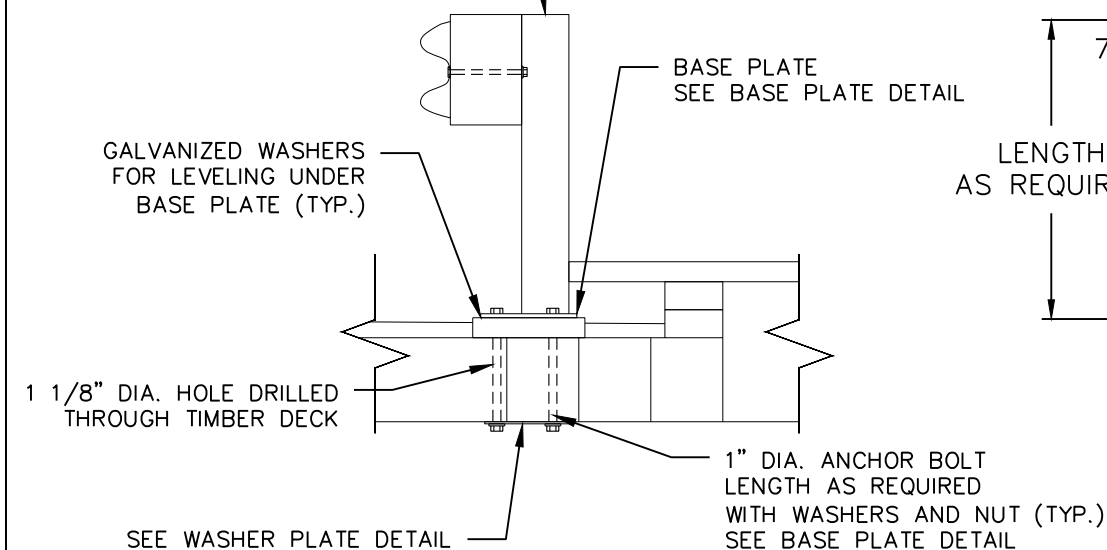
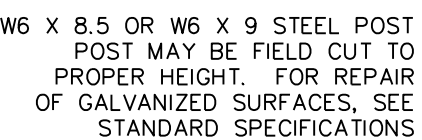
CITY OF TAWAS CITY	
FIRST ST CROSS SECTIONS	
2020 BRIDGE REHABILITATION PROJECT	
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JOB NO: 18113744.005	SHEET 7 OF 12



SECTION THRU SIDEWALK

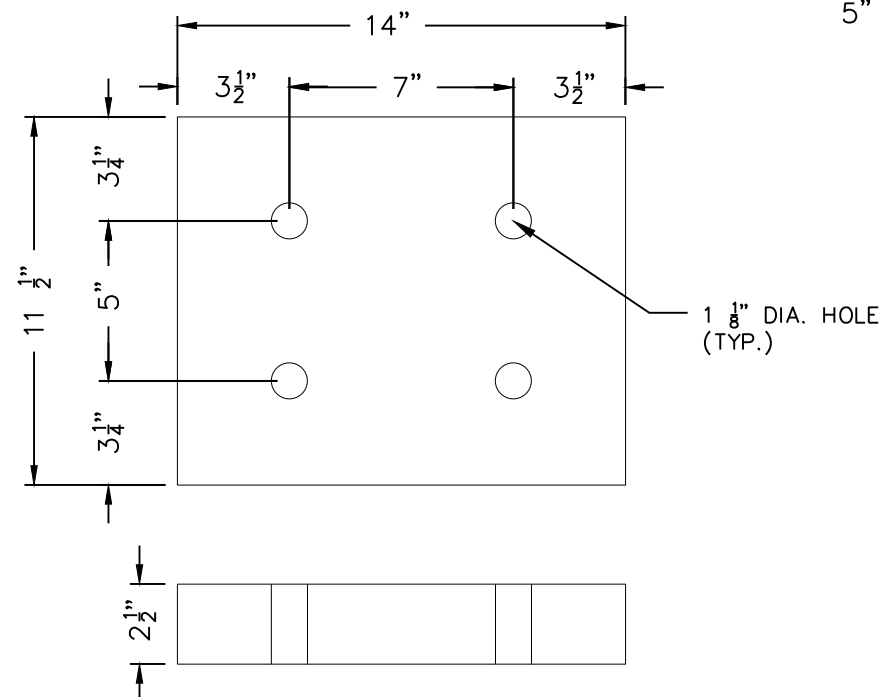
STRUCTURE, TIMBER ITEM INCLUDES: ITEMS SHOWN
IN SECTION THRU SIDEWALK AND TIMBER BLOCK
UNDER GUARDRAIL POSTS

ALL TIMBER SHALL BE SOUTHERN YELLOW PINE, No.1
S4S NOMINAL, GROUND CONTACT GRADE TREATMENT
S.15 MICRONIZED COPPER AZOLE (MCA) PER AWPA
2017 BOOK OF STANDARDS AND SOUTHERN PINE
INSPECTION BUREAU (SYIP)

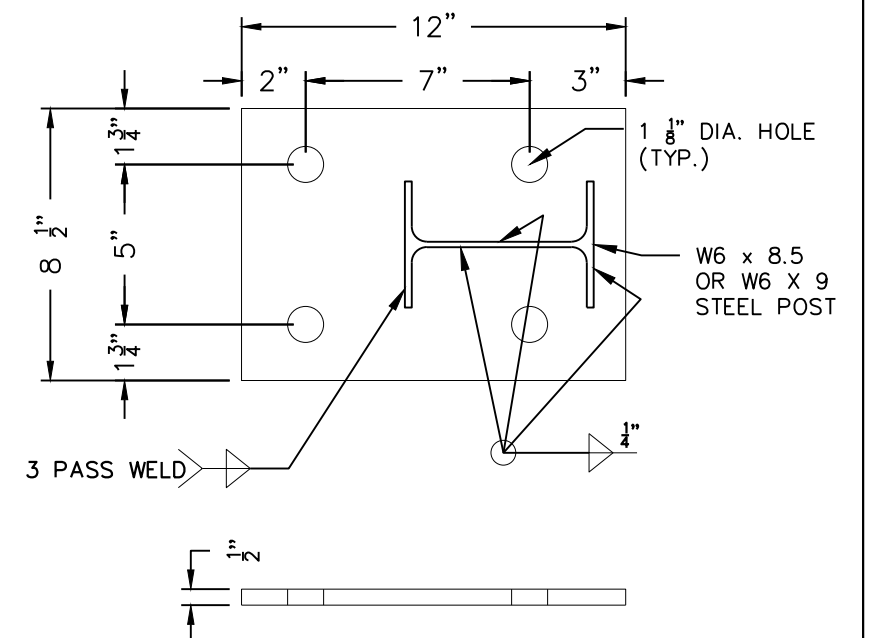


VEHICULAR RAILING DETAIL

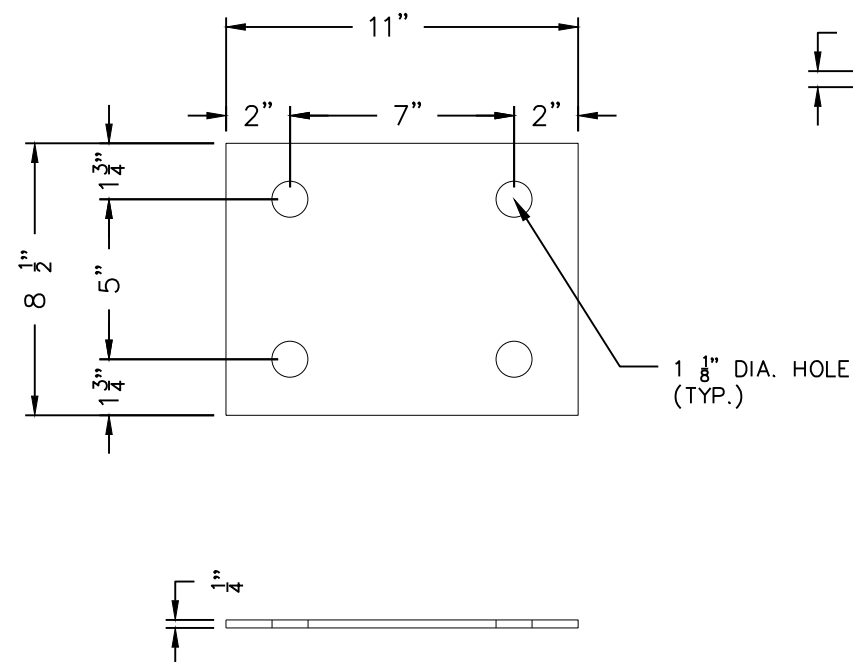
SEE GUARDRAIL OVER BOX OR SLAB CULVERTS SPECIAL DETAIL R-73-F



TIMBER BLOCK DETAIL



BASE PLATE DETAIL

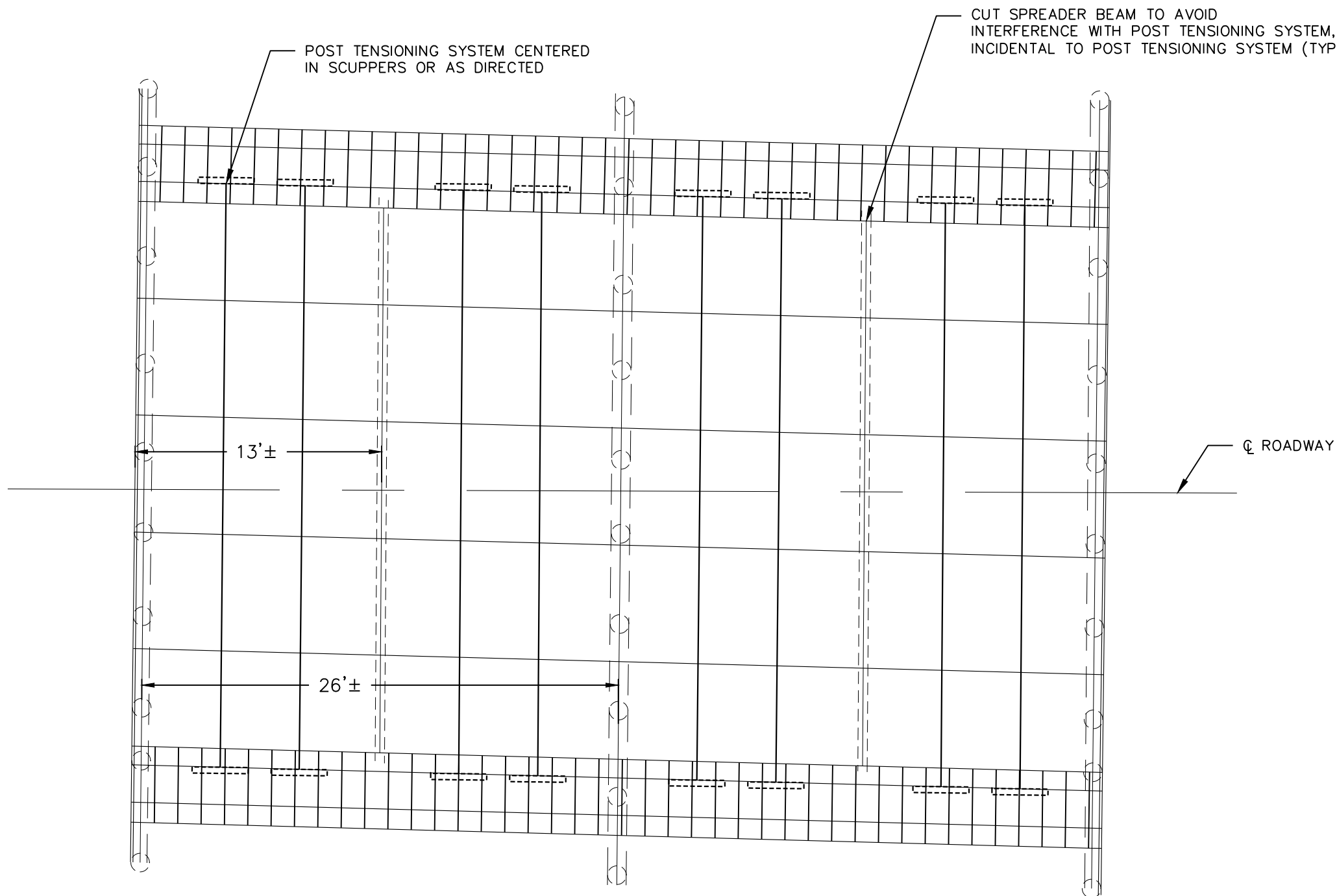


WASHER PLATE DETAIL

SPREADER BEAM THROUGH-BOLTS

1. ALL SPREADER BEAM THROUGH-BOLTS SHALL BE REMOVED EXCEPT THE CENTER BOLT.
2. ALL THROUGH BOLTS SHALL BE RE-INSTALLED OR REPLACED IN ALL PROPOSED LOCATIONS ON DRAWINGS.
3. HOLES SHALL BE DRILLED USING THE ORIGINAL BOLT PATTERN ON THE SPREADER BEAM. DRILL HOLES FOR PROPOSED ADDITIONAL BOLTS.
4. REPLACE SPREAD BEAM NUTS ON THROUGH-BOLTS, RE-USE OR REPLACE REMAINING ASSEMBLY.
5. THE CONTRACTOR SHALL TIGHTEN ALL NUTS ON THE LAST DAY OF CONSTRUCTION IN THE PRESENCE OF THE OWNER TO ENSURE ALL NUTS ARE PROPERLY TIGHTENED.
6. SET THREADS ON ALL SPREADER BEAM BOLTS AT NUT WITH CENTER PUNCH AFTER TIGHTENING.

ITEM DESCRIPTION	QUANTITIES
Post Tensioning	1 LSUM



PLAN VIEW

CITY OF TAWAS CITY

**MATHEWS ST
DECK PLAN**

2020 BRIDGE REHABILITATION PROJECT

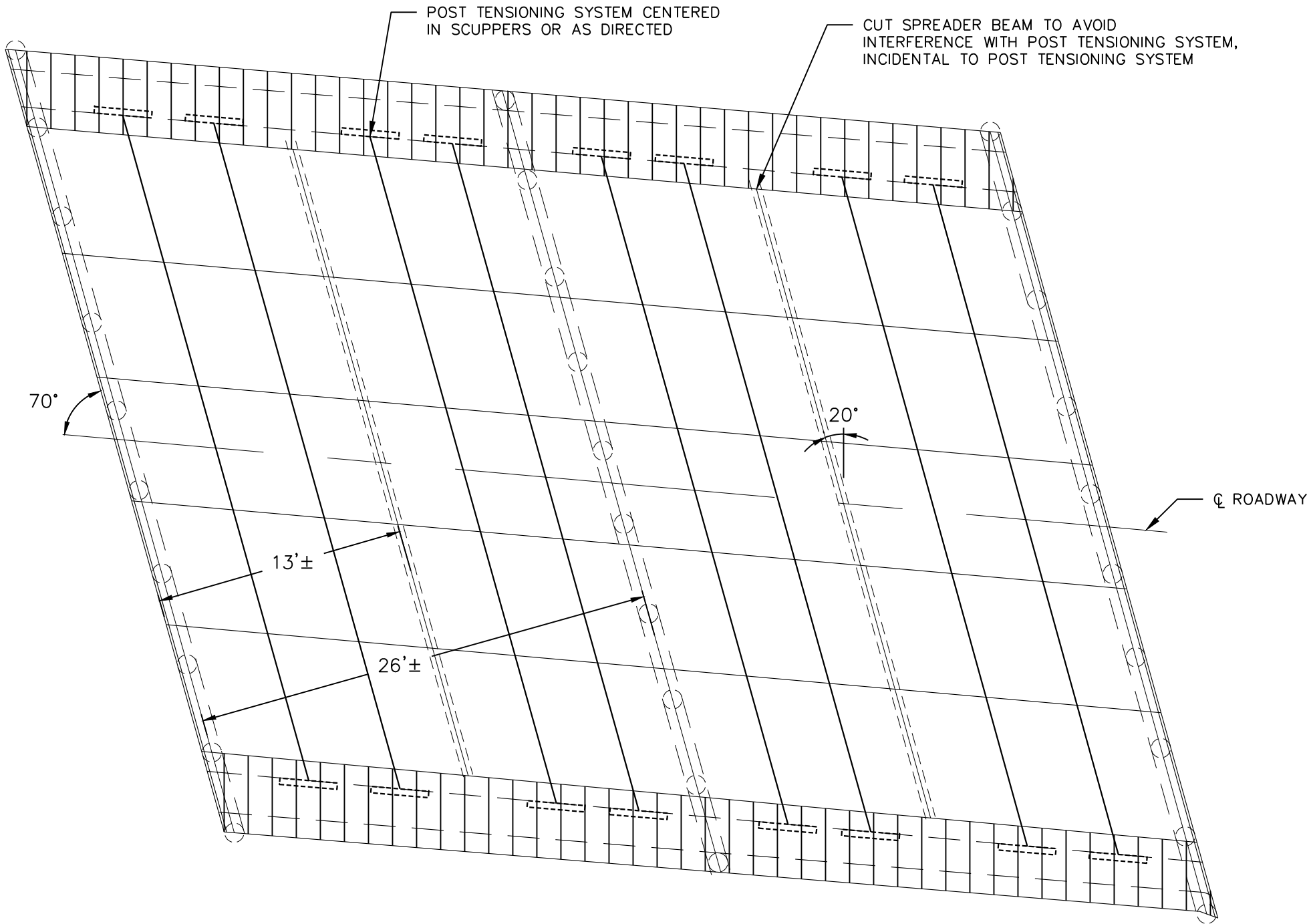
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SPREADER BEAM THROUGH-BOLTS

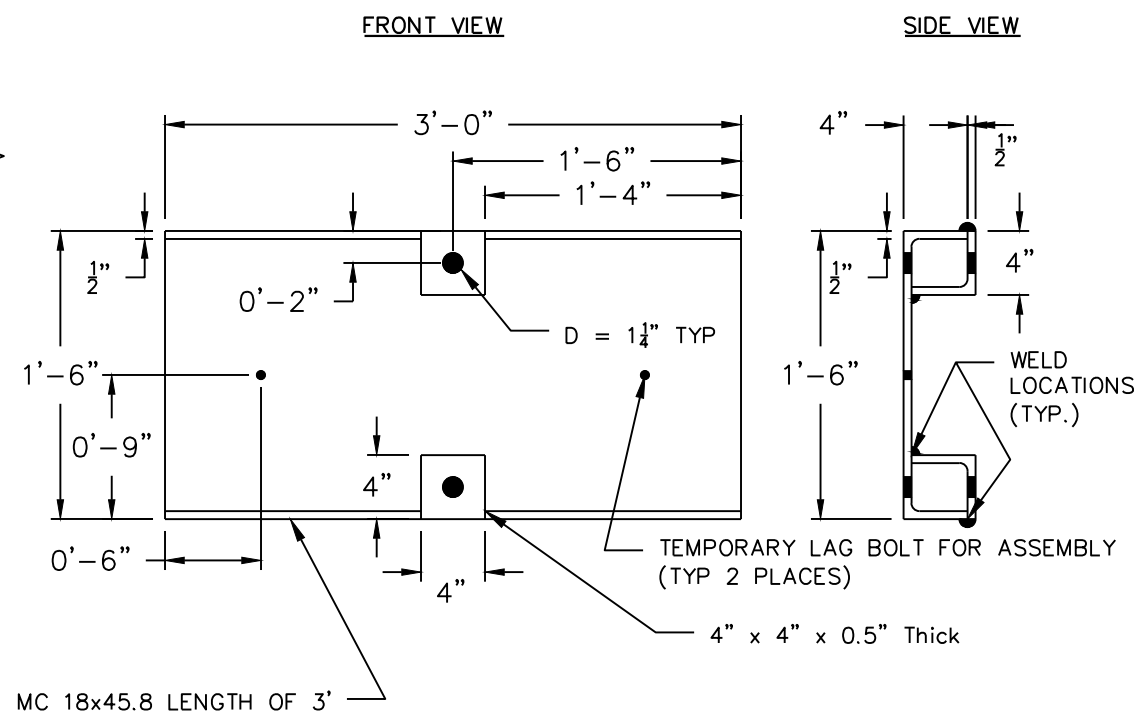
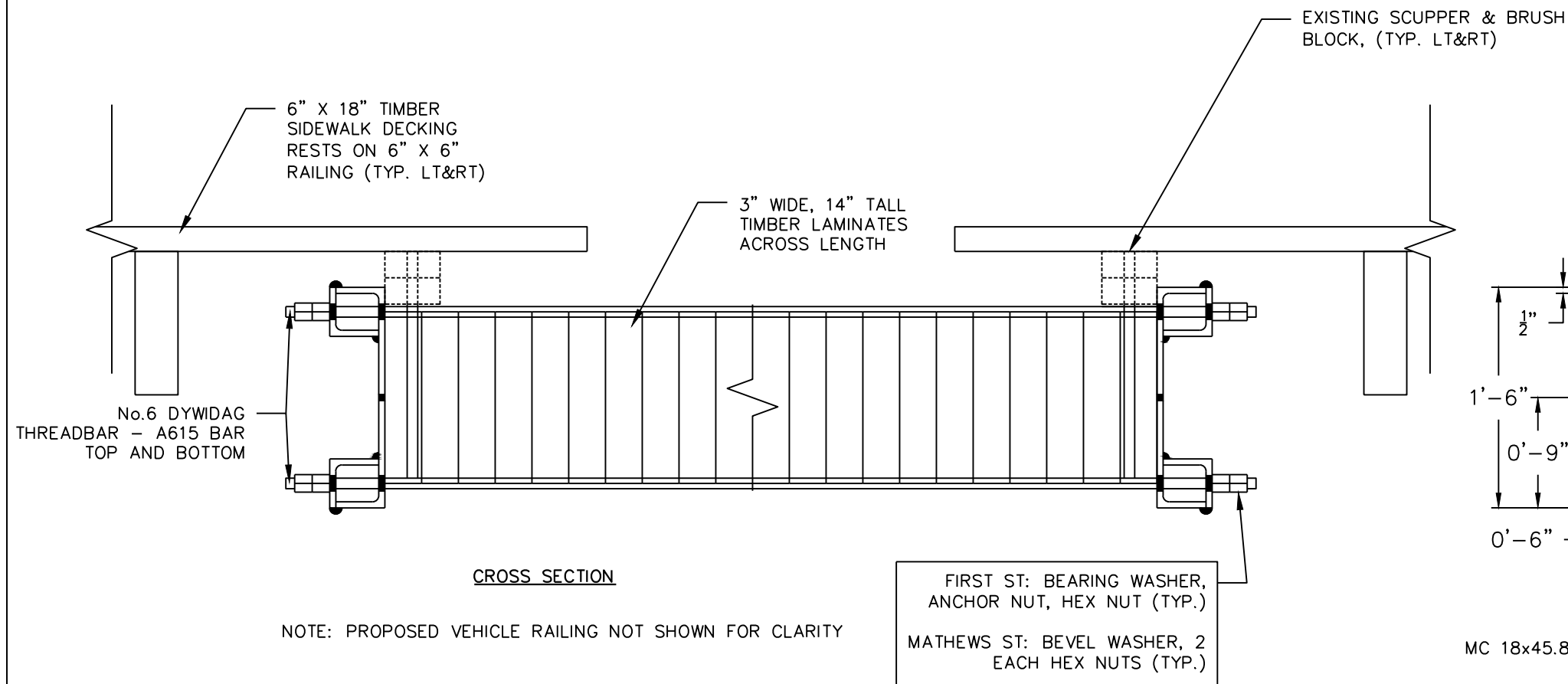
1. ALL SPREADER BEAM THROUGH-BOLTS SHALL BE REMOVED EXCEPT THE CENTER BOLT.
2. ALL THROUGH BOLTS SHALL BE RE-INSTALLED OR REPLACED IN ALL PROPOSED LOCATIONS ON DRAWINGS.
3. HOLES SHALL BE DRILLED USING THE ORIGINAL BOLT PATTERN ON THE SPREADER BEAM. DRILL HOLES FOR PROPOSED ADDITIONAL BOLTS.
4. REPLACE SPREAD BEAM NUTS ON THROUGH-BOLTS, RE-USE OR REPLACE REMAINING ASSEMBLY.
5. THE CONTRACTOR SHALL TIGHTEN ALL NUTS ON THE LAST DAY OF CONSTRUCTION IN THE PRESENCE OF THE OWNER TO ENSURE ALL NUTS ARE PROPERLY TIGHTENED.
6. SET THREADS ON ALL SPREADER BEAM BOLTS AT NUT WITH CENTER PUNCH AFTER TIGHTENING.

ITEM DESCRIPTION	QUANTITIES
Post Tensioning	1 LSUM



PLAN VIEW

CITY OF TAWAS CITY	
FIRST ST DECK PLAN	
2020 BRIDGE REHABILITATION PROJECT	
	310 W. FRONT STREET SUITE 224 TRAVERSE CITY, MI 49684 PHONE: (231) 499-9479
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POST TENSIONING CHANNEL DETAIL

POST TENSIONING SYSTEM

INSTALLATION OF THE POST TENSIONING SYSTEM SHALL BE AS DESCRIBED ON THE DRAWINGS

MATERIALS

1. #6 DYWIDAG THREADBAR, ASTM 615
2. HEX NUT AND WEDGE WASHER (NO BRIDGE SKEW, MATHEWS ST)
3. ANCHOR NUT AND BEARING WASHER (20° SKEW, FIRST ST)
4. CHANNEL SHALL BE GRADE 50
5. ANGLE SHALL BE GRADE 36
6. ALL WELDING BY MDOT CERTIFIED WELDER
7. SUBMIT SHOP DRAWING IF ANY VARIATION FROM THIS DRAWING

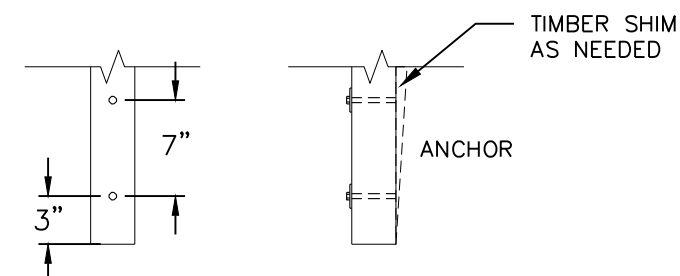
CONSTRUCTION

1. ALTERNATELY TIGHTEN THREADBAR@IN EQUAL INCREMENTS OF TORQUE TO AVOID OUT-OF-PLANE TIMBER GRAIN CRUSHING
2. THE FINAL INCREMENT OF TORQUE SHALL BE 1,125 FT-LB OF TORQUE APPLIED TO EACH ROD FOR A TOTAL OF 2,250 FT-LB
3. FOLLOWING A PERIOD OF 24 HOURS, AGAIN APPLY 1,125 FT-LB OF TORQUE TO EACH ROD FOR A TOTAL OF 2,250 FT-LB. AFTER ANOTHER PERIOD OF 24 HOURS, AGAIN APPLY 1,125 FT-LB OF TORQUE TO EACH ROD FOR A TOTAL OF 2,250 FT-LB
4. WHEN THE WORK IS COMPLETE, APPLY 1,125 FT-LB OF TORQUE TO EACH ROD FOR A TOTAL OF 2,250 FT-LB. THESE PROCEDURES SHALL BE PERFORMED IN THE PRESENCE OF THE OWNER WITH A MINIMUM OF 24 HOURS NOTICE.
5. ALL THREADBAR@ SHALL HAVE DOUBLE NUTS, A NUT THAT IS TORQUED PLUS A HEX NUT AS KEEPER.

3" X 8" CAP RAIL. S4S, ATTACH TO POST WITH (4) 5/16" X 6" STAR DRIVE CONSTRUCTION LAG SCREWS. ATTACH TO TOP RAIL WITH 5/16" X 5" STAR DRIVE CONSTRUCTION LAG SCREWS @ 18" CENTERS

6" X 6" X 4'-5 1/2" SIDEWALK RAILPOST. S4S.

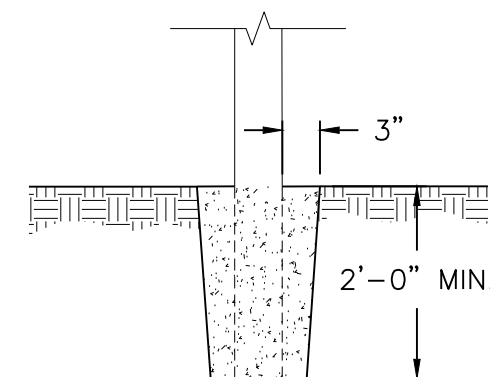
TYPICAL PEDESTRIAN GUARDRAIL SECTION



TYPICAL PEDESTRIAN GUARDRAIL POST ANCHORS

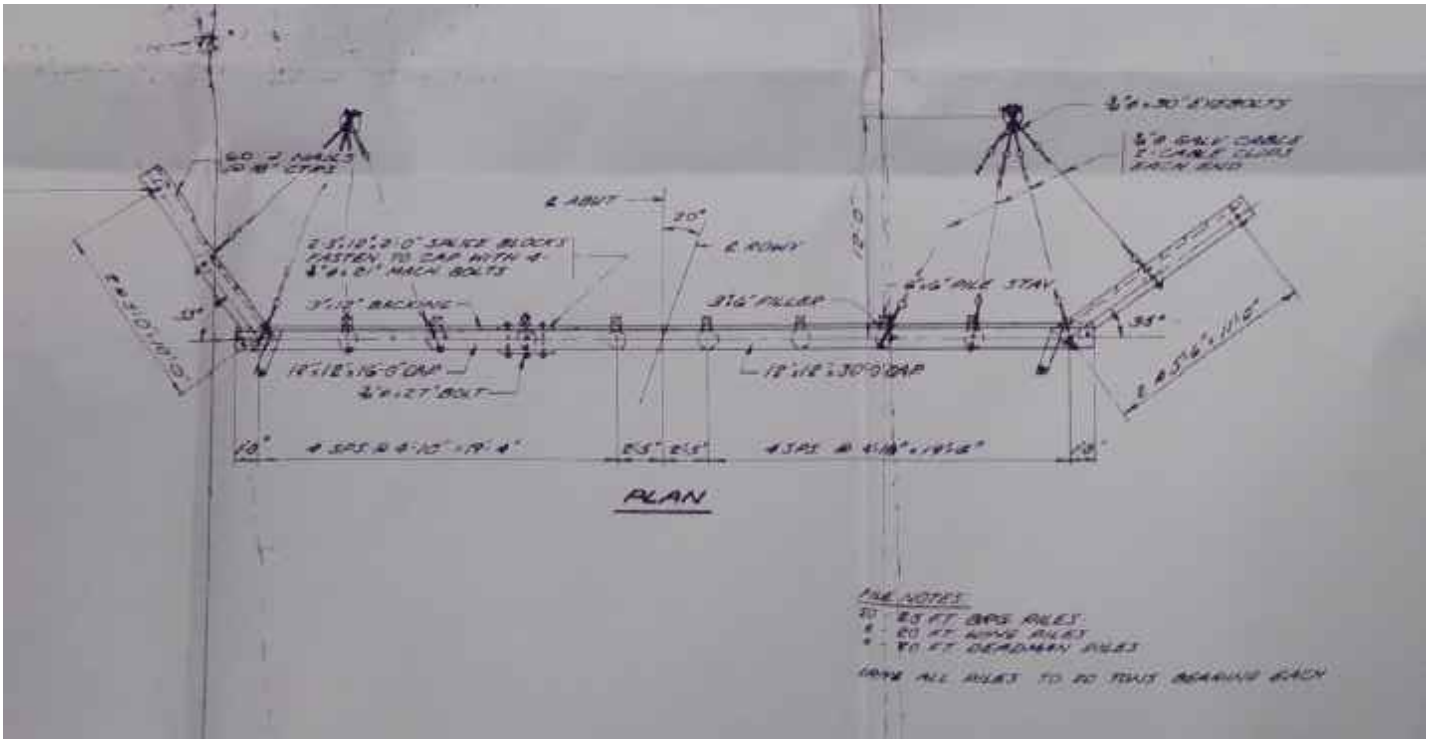
BOLTED POST: 3/8" DIA. GALVANIZED LAG BOLT WITH A MINIMUM OF 6 INCHES PENETRATION INTO TIMBER ANCHORING SUBSTRATE.

CONCRETE ANCHOR: INSTALL ADHESIVE ANCHORS IN ACCORDANCE WITH MDOT FIELD MANUAL FOR CONCRETE ANCHORING 1ST ED, 2/2015



GROUND POST DETAIL

CITY OF TAWAS CITY	
MATHEWS ST & FIRST ST POST TENSIONING SYSTEM	
2020 BRIDGE REHABILITATION PROJECT	
	310 W. FRONT STREET SUITE 224 TRAVERSE CITY, MI 49684 PHONE: (231) 499-9479
DRAWN BY: DJS	CHECKED BY: BAL JOB NO: 18113744.005 SHEET 11 OF 12



FIRST ST. PLAN

CAUTION: BURIED DEADMAN TIMBER PILE WITH CABLING

MATHEWS ST PLANS CURRENTLY NOT AVAILABLE.
EXPECTED TO BE SIMILAR TO ABOVE.