

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.S. 272	16-00159-00-BR	GRUNDY	28	1
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

Contract #87643

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PLANS FOR PROPOSED SURFACE TRANSPORTATION PROGRAM

SECTION 16-00159-00-BR
COUNTY HIGHWAY C41 (FAS 272)
GRUNDY COUNTY
PROJECT YQ35(110)

C-93-044-16

INDEX OF SHEETS

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3	ENTRANCE & AGGREGATE DITCH DETAILS
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5-6	SHOULDER AND GUARDRAIL DETAILS
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26-28	ROADWAY CROSS SECTIONS

STANDARDS	
280001-07	
420406	
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631011-10	
631026-06	
631032-09	
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BLR 21-9	
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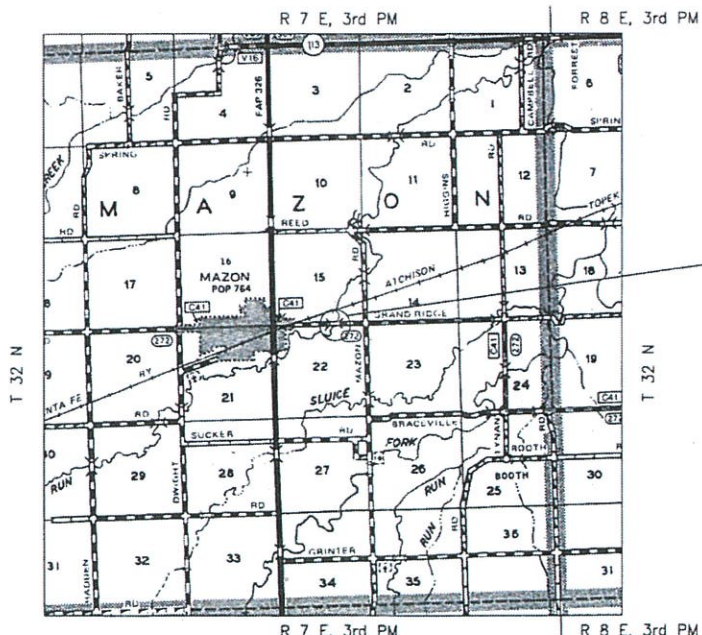
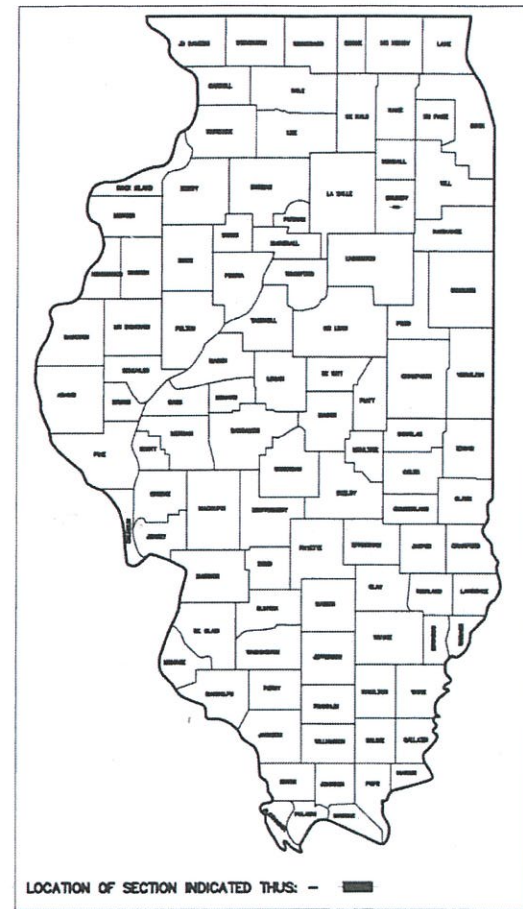
FULL SIZE PLAN SCALES

Plan & Profile
 Hor. 1" = 50'
 Vert. 1" = 5'
 Cross Sections
 Hor. 1" = 10'
 Vert. 1" = 5'

UTILITIES

J.U.L.I.E. SYSTEM - TOLL FREE TELEPHONE NUMBER FOR JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS IS: 1-800-892-0123.

DESIGN FUNCTIONAL CLASSIFICATION
 MAJOR COLLECTOR 750 TO 2000 ADT
 DESIGN TRAFFIC: 950 (2015)
 DESIGN SPEED: 50 MPH



EXISTING STRUCTURE - TWO SPAN REINFORCED CONCRETE SLAB ON CLOSED ABUTMENTS AND SOLID CONCRETE PIER, 81'-1" BK-BK ABUTMENTS, 28'-4" O-O DECK, 0' SKEW AT C. STA. 10+00.00

PROPOSED STRUCTURE - ONE SPAN AT 85'-0" (LOB) PRECAST PRESTRESSED CONCRETE I-BEAMS ON INTEGRAL ABUTMENTS WITH BRIDGE APPROACH PAVEMENTS, 87'-8 1/2" BK-BK ABUTMENTS, 30'-0" O-O DECK, 5' SKEW LT. FORWARD AT C. STA. 10+06.00
 PROPOSED STRUCTURE NUMBER 032-3211

IMPROVEMENT BEGINS STA. 6+50
 IMPROVEMENT ENDS STA. 13+10

LOCATION MAP
 GROSS LENGTH OF SECTION = 660 FEET = 0.125 MILES
 NET LENGTH OF SECTION = 660 FEET = 0.125 MILES



Mark R. Leighton
 Illinois Professional No. 48930
 (expires 11-30-2019)
 Date: 5-21-18

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

APPROVED: 5/22/18 *[Signature]*
 LOCAL AGENCY OFFICIAL

PASSED: 5/25/18 *[Signature]*
 DISTRICT THREE ENGINEER OF LOCAL ROADS & STREETS

Releasing for Bid Based on Limited Review: 5/25/18 *[Signature]*
 REGION TWO ENGINEER



**SUMMARY OF QUANTITIES
CONSTRUCTION CODE 0010**

CODE NO.	ITEM	UNIT	TOTAL QUANTITY
20100210	TREE REMOVAL (OVER 15 UNITS DIAMETER)	UNIT	70
20100500	TREE REMOVAL, ACRES	ACRE	0.1
20200100	EARTH EXCAVATION	CU YD	421
20300100	CHANNEL EXCAVATION	CU YD	248
20400800	FURNISHED EXCAVATION	CU YD	837
28000305	TEMPORARY DITCH CHECKS	FOOT	40
28100107	STONE RIPRAP, CLASS A4	SO YD	258
28200200	FILTER FABRIC	SO YD	258
40600290	BITUMINOUS MATERIALS (TACK COAT)	POUND	377
40603080	HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50	TON	440
40603310	HOT-MIX ASPHALT SURFACE COURSE, MIX "C", N50	TON	135
42000070	PAVEMENT CONNECTOR (HMA) FOR BRIDGE APPROACH SLAB	SO YD	73
44000100	PAVEMENT REMOVAL	SO YD	1415
48101200	AGGREGATE SHOULDERS, TYPE B	TON	70
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1
50105220	PIPE CULVERT REMOVAL	FOOT	242
50200100	STRUCTURE EXCAVATION	CU YD	100
50300225	CONCRETE STRUCTURES	CU YD	58.3
50300255	CONCRETE SUPERSTRUCTURE	CU YD	97.5
50300300	PROTECTIVE COAT	SO YD	574
50301350	CONCRETE SUPERSTRUCTURE (APPROACH SLAB)	CU YD	84.5
50401315	FURNISHING AND ERECTING PRECAST PRESTRESSED CONCRETE BEAMS, IL36N	FOOT	425
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	58430
51200958	FURNISHING METAL SHELL PILES 14" X 0.250"	FOOT	240
51202305	DRIVING PILES	FOOT	240
51203200	TEST PILES METAL SHELLS	EACH	2
51500100	NAME PLATES	EACH	1
54200220	PIPE CULVERTS, CLASS D, TYPE 1 15"	FOOT	363
59100100	GEOCOMPOSITE WALL DRAIN	SO YD	56
60240301	INLETS, TYPE B, TYPE B GRATE	EACH	1
△ 63100045	TRAFFIC BARRIER TERMINAL, TYPE 2	EACH	1
△ 63100075	TRAFFIC BARRIER TERMINAL, TYPE 5A	EACH	1
△ 63100087	TRAFFIC BARRIER TERMINAL, TYPE 6A	EACH	3
△ 63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT	EACH	3
△ 63200310	GUARDRAIL REMOVAL	FOOT	432
67100100	MOBILIZATION	L SUM	1
70101830	TRAFFIC CONTROL AND PROTECTION, STANDARD BLR 21	L SUM	1
△ 72501000	TERMINAL MARKER - DIRECT APPLIED	EACH	4
• X2501000	SEEDING, CLASS 2 (SPECIAL)	ACRE	0.7
• X2830495	AGGREGATE DITCH (SPECIAL)	TON	99
• X5030250	BRIDGE DECK GROOVING (LONGITUDINAL)	SO YD	388
• X5860110	GRANULAR BACKFILL FOR STRUCTURES	CU YD	93
• Z0013798	CONSTRUCTION LAYOUT	L SUM	1
• Z0046304	PIPE UNDERDRAINS FOR STRUCTURES 4"	FOOT	116
△ XX006199	STEEL BRIDGE RAIL, TYPE SM (SPECIAL)	FOOT	232

*SEE SPECIAL PROVISIONS

△ SPECIALTY ITEMS

GENERAL NOTES

WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE ENGINEER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKS AND MONUMENTS UNTIL THE OWNER AND AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.

THE AREA TO BE SEEDDED SHALL CONSIST OF ALL DISTURBED EARTH SURFACES WITHIN THE RIGHT OF WAY, AS DIRECTED BY THE ENGINEER.

AREA OF FINAL SEEDING = 0.7 ACRE

APPLICATION RATES USED IN QUANTITY CALCULATIONS

BITUMINOUS MATERIALS (TACK COAT) 0.025*/SQ. FT.
HOT-MIX ASPHALT (BINDER & SURFACE COURSE) 112*/SQ YD/IN
AGGREGATE SHOULDERS 2.05 TON/CU YD
AGGREGATE DITCH (SPECIAL) 1.75 TON/CU YD

THE ABOVE NOTED APPLICATION RATES FOR BITUMINOUS MATERIALS (PRIME COAT) ARE FOR QUANTITY CALCULATIONS ONLY. THE APPLICATION RATE TO BE APPLIED WILL BE DETERMINED BY THE ENGINEER AT THE TIME OF PLACEMENT.

TREE REMOVAL, ACRES

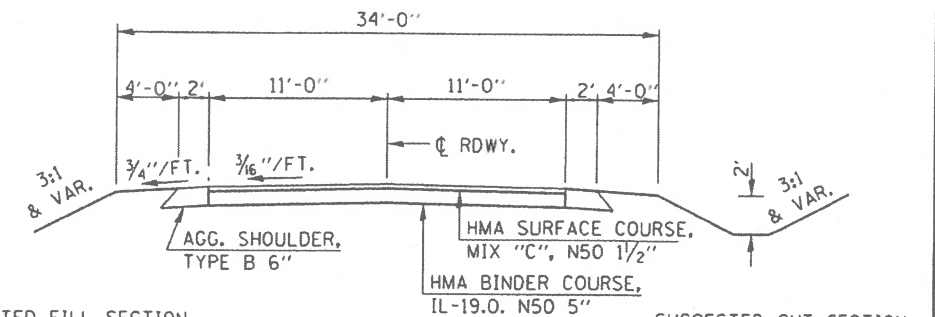
ALL TREES BETWEEN THE LIMITS SHOWN WHICH INTERFERE WITH THE CONSTRUCTION SHALL BE REMOVED ONLY AS DIRECTED BY THE ENGINEER.

RT. STA. 7+48 TO RT. STA. 9+17
RT. STA. 10+33 TO RT. STA. 10+50

TREE REMOVAL, ACRES 0.1 ACRE

TREE REMOVAL (OVER 15 UNITS DIAMETER)

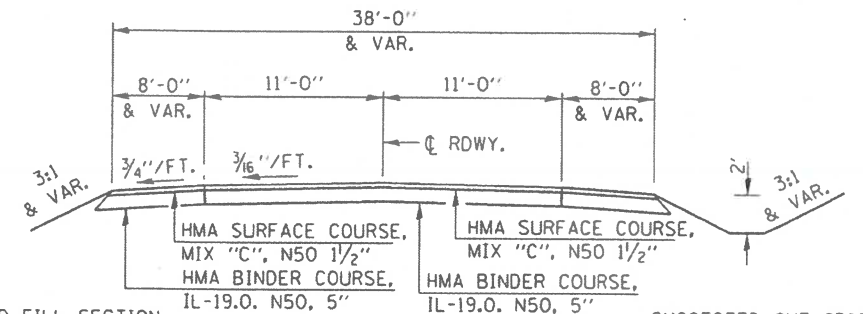
30' LT. STA. 9+39 = 40 UNIT
30' LT. STA. 10+51 = 30 UNIT
TOTAL = 70 UNIT



SUGGESTED FILL SECTION
CONSTRUCT AS SHOWN BY
STATION CROSS SECTIONS

TYPICAL PROPOSED CROSS SECTION
(WITHOUT GUARDRAIL SEE SHEETS 5 & 6)

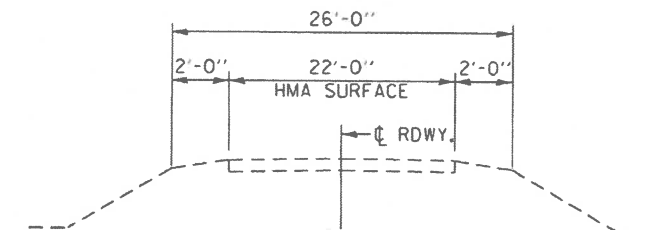
SUGGESTED CUT SECTION
CONSTRUCT AS SHOWN BY
STATION CROSS SECTIONS



SUGGESTED FILL SECTION
CONSTRUCT AS SHOWN BY
STATION CROSS SECTIONS

TYPICAL PROPOSED CROSS SECTION
(WITH GUARDRAIL SEE SHEETS 5 & 6)

SUGGESTED CUT SECTION
CONSTRUCT AS SHOWN BY
STATION CROSS SECTIONS



TYPICAL EXISTING CROSS SECTION

HOT-MIX ASPHALT MIXTURE REQUIREMENTS

MIXTURE USE(S)	H. M. A. SURFACE COURSE	H. M. A. BINDER COURSE
PG:	PG 64-22	PG 64-22
DESIGN AIR VOIDS:	4% @ N50	4% @ N50
MIXTURE COMPOSITION: (GRADATION MIXTURE)	IL-9.5	IL-19.0
FRICTION AGGREGATE	MIX "C"	
QUALITY MANAGEMENT	OC/OA	OC/OA

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

OWNER/DEVELOPER:
GRUNDY COUNTY HWY. DEPT.
245 NORTH ILLINOIS ROUTE 47
MORRIS, IL 60450

PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

DESIGNED: GJC
CHECKED: RDF
DRAWN: GJC
CHECKED: RDF

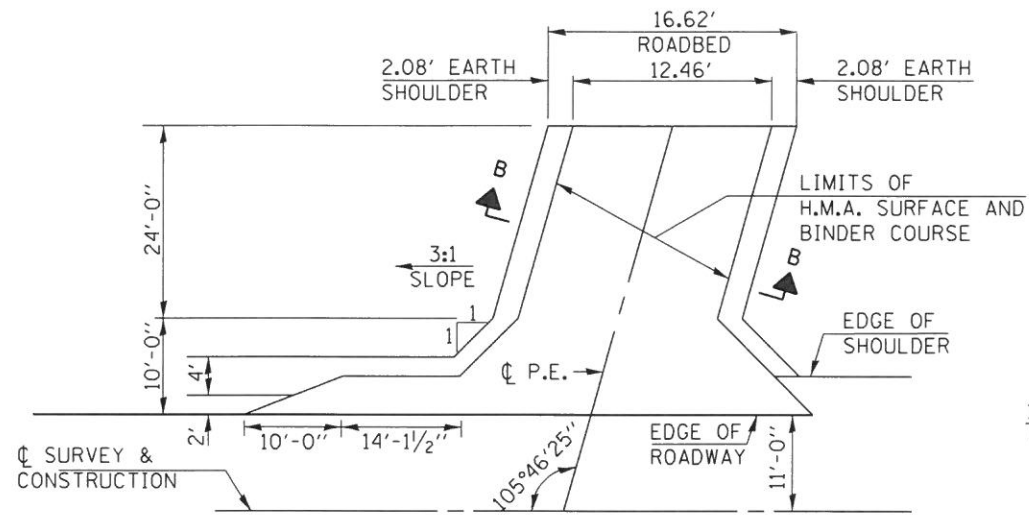
REVISIONS	
REV. NO.	DESCRIPTION

DRAWING:
SUMMARY OF QUANTITIES, GENERAL NOTES
AND TYPICAL CROSS SECTIONS

working file 16-096_SUMTYP.dgn
CONTRACT #: 87643

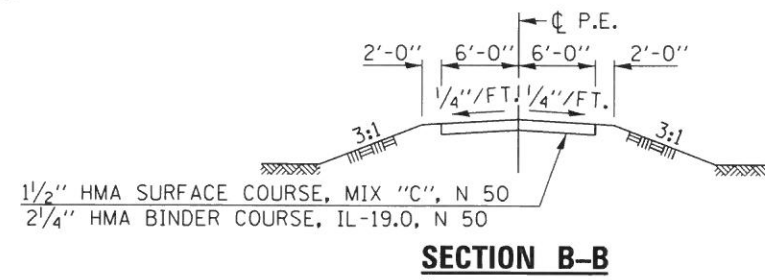
JOB NUMBER:
16-096

SHEET NUMBER
2 of 28

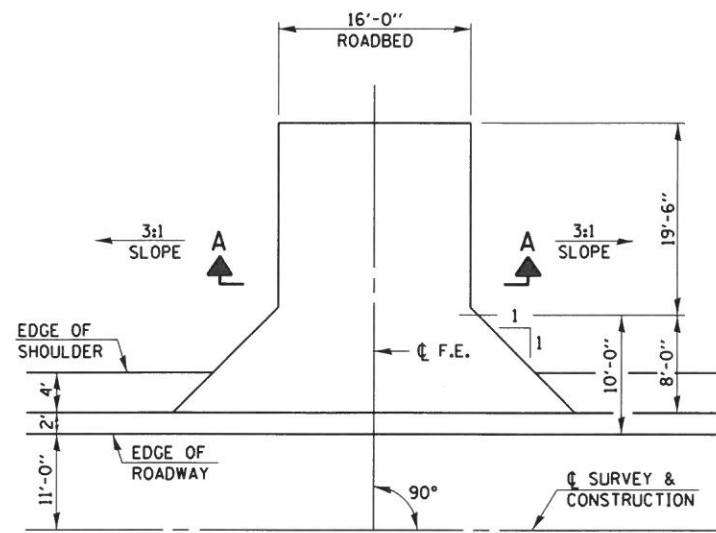


PRIVATE ENTRANCE AND MAILBOX TURNOUT

LT. STA. 9+05

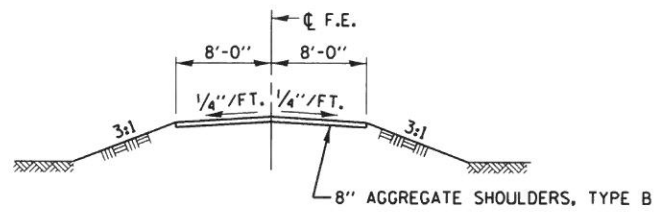


SECTION B-B

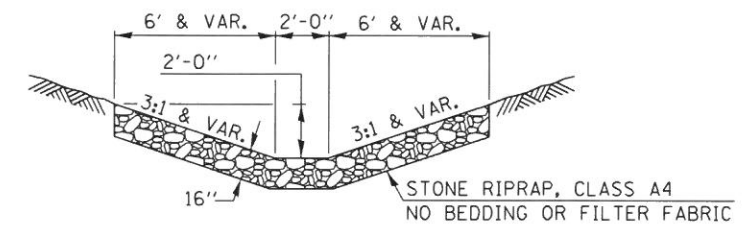


FIELD ENTRANCE DETAIL

LT. STA. 12+64



SECTION A-A



AGGREGATE DITCH (SPECIAL)

RT. STA. 9+00 TO RT. STA. 9+78 = 99 TON
 TOTAL = 99 TON

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 MORRIS, IL 60450

PROJECT AND LOCATION:
 SECTION 16-00159-00-BR
 C.H. C41/GRAND RIDGE ROAD
 PROJECT Y035(110)

DESIGNED: GJC
 CHECKED: RDF
 DRAWN: GJC
 CHECKED: RDF

REVISIONS		
REV. NO.	DESCRIPTION	DATE

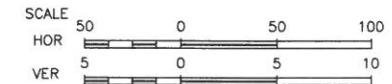
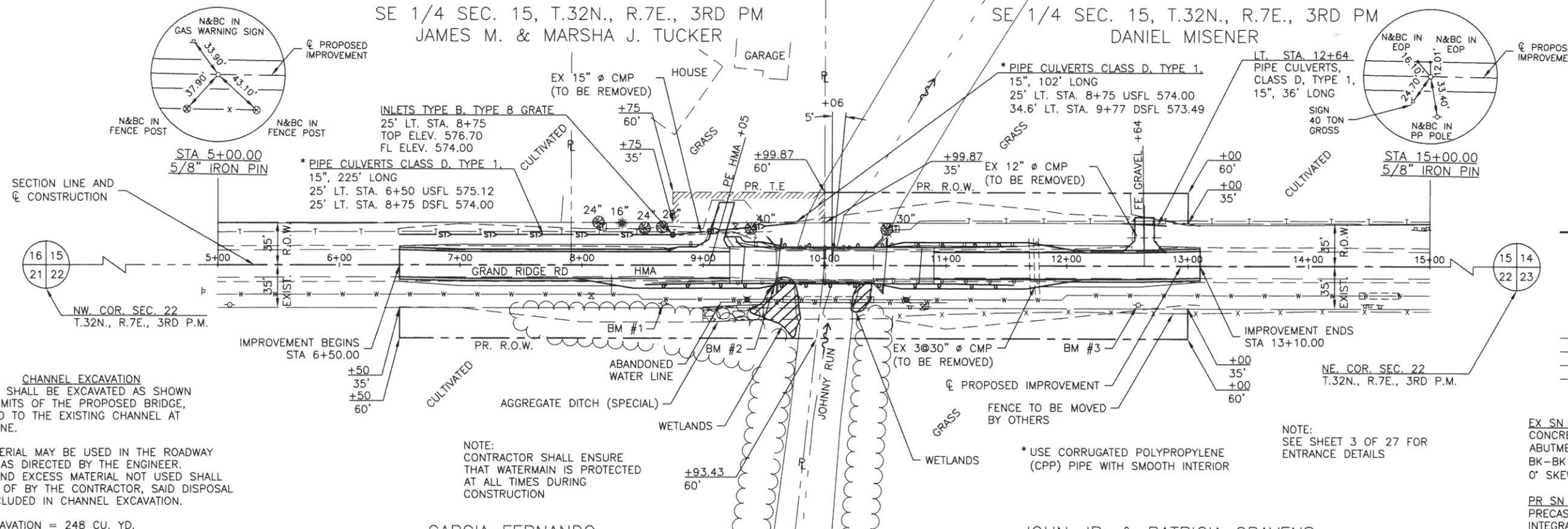
DRAWING:
 ENTRANCE AND AGGREGATE DITCH DETAILS

JOB NUMBER:
 16-096

SHEET NUMBER
 3 of 28

SE 1/4 SEC. 15, T.32N., R.7E., 3RD PM
JAMES M. & MARSHA J. TUCKER

SE 1/4 SEC. 15, T.32N., R.7E., 3RD PM
DANIEL MISENER



- LEGEND**
- POWER POLE
 - TELEPHONE SPLICE BOX
 - ⊕ WATER VALVE
 - ⊞ MAILBOX
 - ⊞ SIGN
 - ⊞ 12" TREE
 - WATER LINE
 - TELEPHONE LINE
 - FENCE
 - STREAM
 - TREE REMOVAL

CHANNEL EXCAVATION
THE CHANNEL SHALL BE EXCAVATED AS SHOWN WITHIN THE LIMITS OF THE PROPOSED BRIDGE, THEN TAPERED TO THE EXISTING CHANNEL AT THE R.O.W. LINE.

SUITABLE MATERIAL MAY BE USED IN THE ROADWAY EMBANKMENT AS DIRECTED BY THE ENGINEER. UNSUITABLE AND EXCESS MATERIAL NOT USED SHALL BE DISPOSED OF BY THE CONTRACTOR, SAID DISPOSAL SHALL BE INCLUDED IN CHANNEL EXCAVATION.

CHANNEL EXCAVATION = 248 CU. YD.

NOTE:
CONTRACTOR SHALL ENSURE THAT WATERMAIN IS PROTECTED AT ALL TIMES DURING CONSTRUCTION

* USE CORRUGATED POLYPROPYLENE (CPP) PIPE WITH SMOOTH INTERIOR

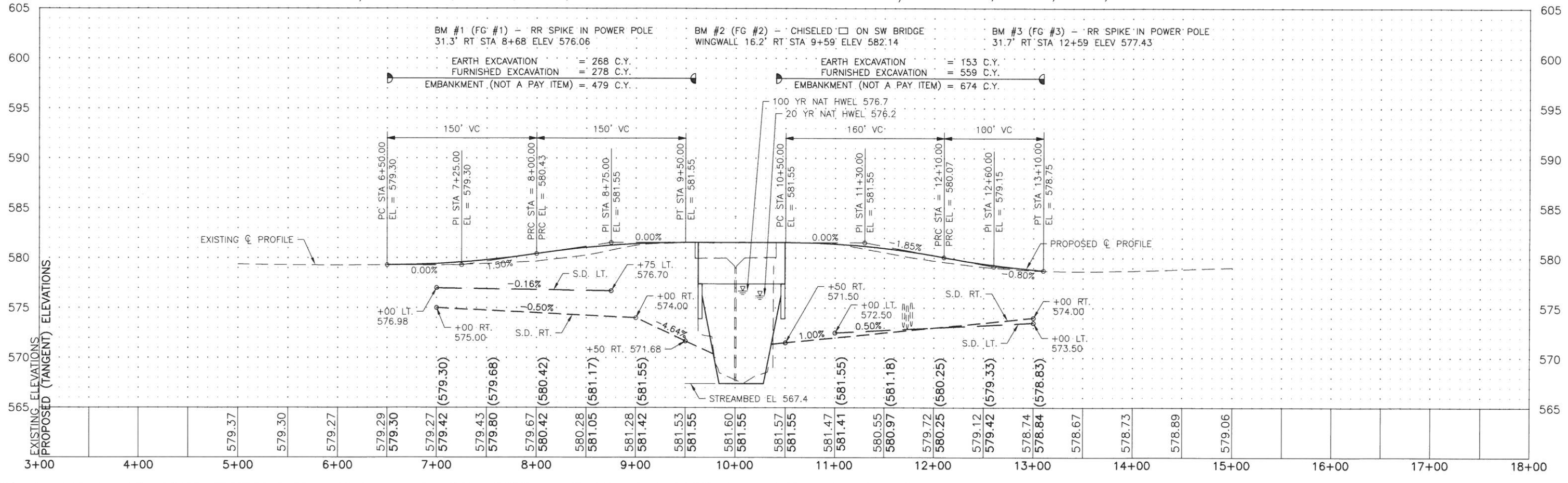
NOTE:
SEE SHEET 3 OF 27 FOR ENTRANCE DETAILS

EX SN 032-3210 - TWO SPAN REINFORCED CONCRETE SLAB ON CLOSED CONCRETE ABUTMENTS AND SOLID CONCRETE PIER, 81'-1" BK-BK ABUTMENTS, 28'-4" OUT-OUT DECK, 0° SKEW AT ϕ STA 10+00.00

PR SN 032-3211 - ONE SPAN AT 85'-0" (LOB) PRECAST PRESTRESSED CONCRETE I-BEAMS ON INTEGRAL ABUTMENTS WITH BRIDGE APPROACH PVMTS., 87'-8 1/2" BK-BK OF ABUTMENTS, 30'-0" OUT-OUT DECK, 5° SKEW LT. FORWARD AT ϕ STA. 10+06.00

GARCIA FERNANDO
NE 1/4 SEC. 22, T.32N., R.7E., 3RD PM

JOHN JR. & PATRICIA CRAVENS
NE 1/4 SEC. 22, T.32N., R.7E., 3RD PM



FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

OWNER/DEVELOPER:
GRUNDY COUNTY HWY. DEPT.
245 NORTH ILLINOIS ROUTE 47
MORRIS, IL 60450

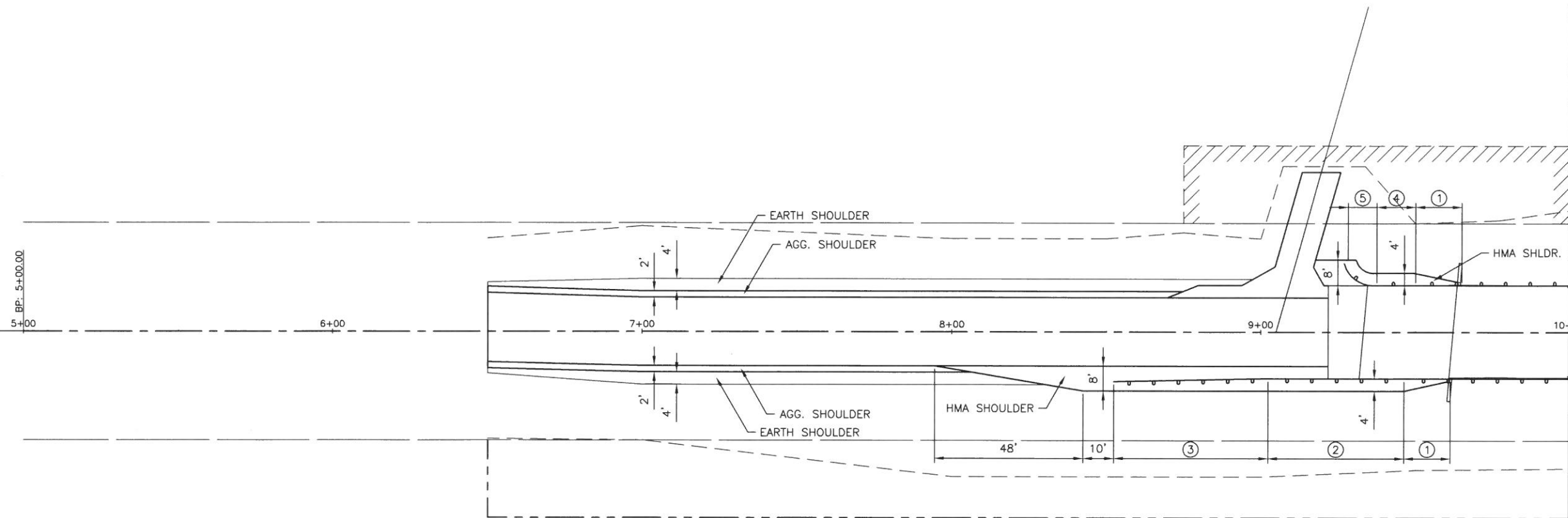
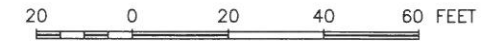
PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT YQ35(110)

DRAWN BY: CFC
APPROVED BY: MRL
DATE: 2-17-2017
SCALE: AS NOTED

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
PLAN & PROFILE

JOB NUMBER:
16-096
SHEET NUMBER:
4 of 28



TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT
 16' RT. STA. 8+52.95 TO 15' RT. STA. 9+02.95 = 1 EACH
 15' RT. STA. 11+06.43 TO 16' RT. STA. 11+56.43 = 1 EACH
 15' LT. STA. 11+09.05 TO 16' LT. STA. 11+59.05 = 1 EACH
 TOTAL = 3 EACH

TRAFFIC BARRIER TERMINAL, TYPE 5A
 15' LT. STA. 9+36.22 TO 15' LT. STA. 9+49.47 = 1 EACH
 TOTAL = 1 EACH

TRAFFIC BARRIER TERMINAL, TYPE 2
 22.15' LT. STA. 9+26.96 TO 15' LT. STA. 9+36.22 = 1 EACH
 TOTAL = 1 EACH

TRAFFIC BARRIER TERMINAL, TYPE 6A
 15' RT. STA. 9+02.95 TO 15' RT. STA. 9+46.85 = 1 EACH
 15' RT. STA. 10+62.53 TO 15' RT. STA. 11+06.43 = 1 EACH
 15' LT. STA. 10+65.15 TO 15' LT. STA. 11+09.05 = 1 EACH
 TOTAL = 3 EACH

LEGEND

- ① STEEL BRIDGE RAIL, TYPE SM (SPECIAL)
- ② TRAFFIC BARRIER TERMINAL, TYPE 6A
- ③ TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT
- ④ TRAFFIC BARRIER TERMINAL, TYPE 5A
- ⑤ TRAFFIC BARRIER TERMINAL, TYPE 2 (SHOP BEND TO 10' RADIUS)

FEHR GRAHAM
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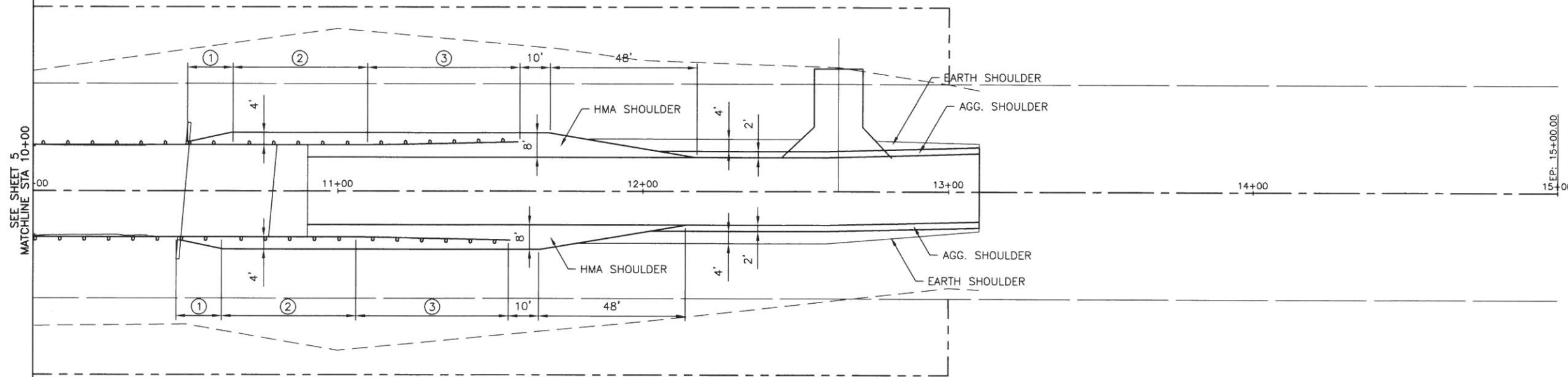
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 APPROVED BY: MRL
 DATE: 2-17-2017
 SCALE: AS NOTED

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
 SHOULDER & GUARDRAIL DETAILS

JOB NUMBER:
 16-096

SHEET NUMBER:
 5 of 28



SEE SHEET 5
MATCHLINE STA 10+00

15+00
15+00.00

LEGEND

- ① STEEL BRIDGE RAIL, TYPE SM (SPECIAL)
- ② TRAFFIC BARRIER TERMINAL, TYPE 6A
- ③ TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT
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FEHR GRAHAM
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PROJECT AND LOCATION:
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SCALE: AS NOTED

REVISIONS		
REV. NO.	DESCRIPTION	DATE

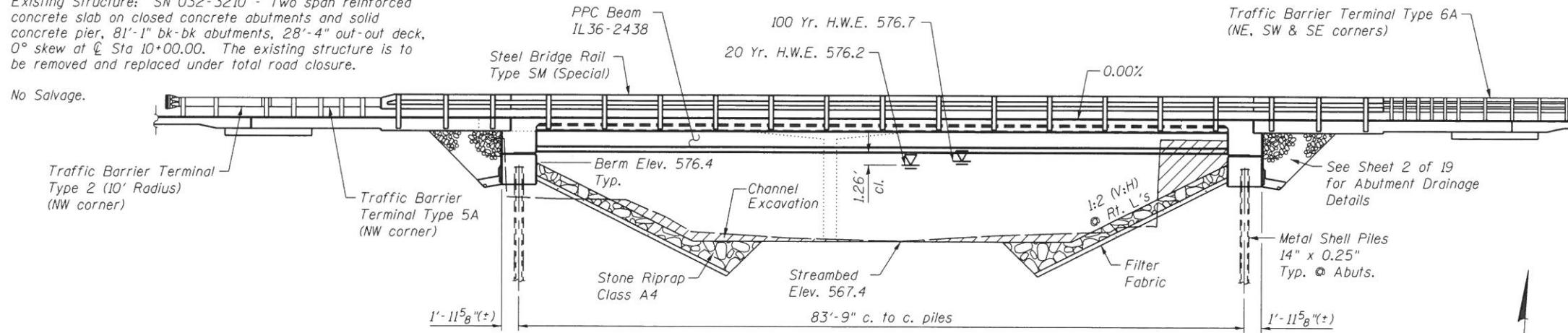
DRAWING:
SHOULDER & GUARDRAIL DETAILS

JOB NUMBER:
16-096
SHEET NUMBER:
6 of 28

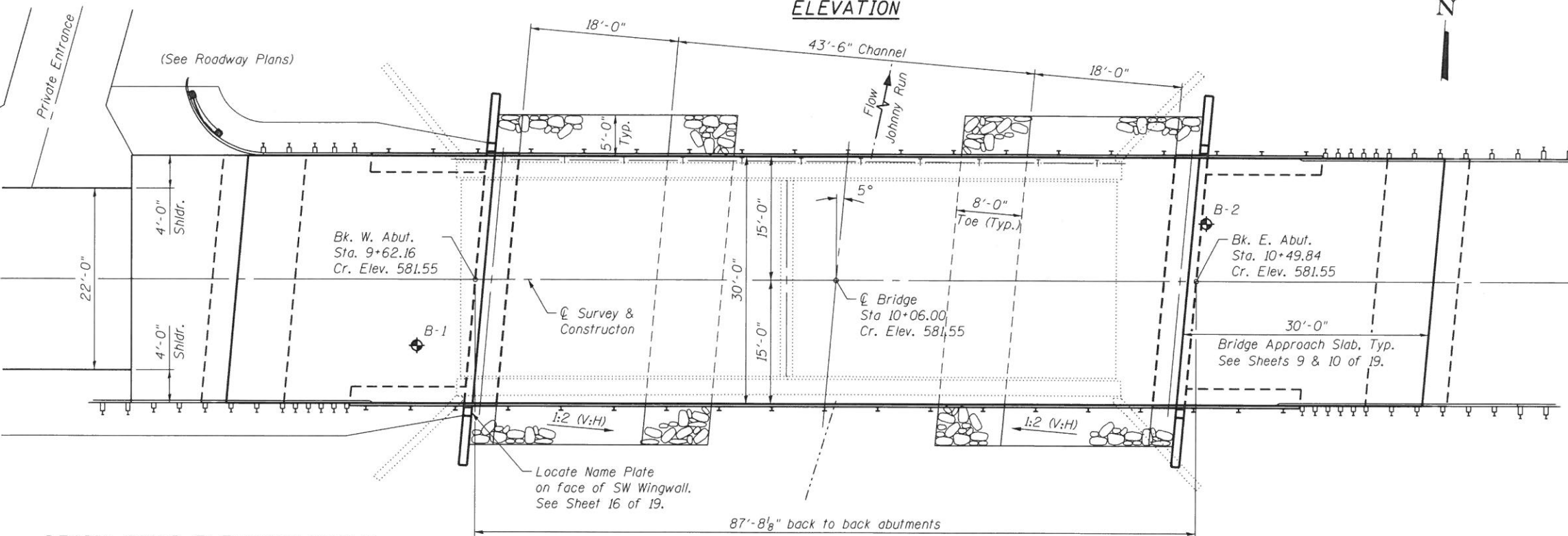
Bench Marks: FG #2 - Chiseled \square on SW Bridge wingwall 16.2' Rt. Sta. 9+59 Elev. 582.14
 FG #1 - RR spike in power pole 31.3' Rt. Sta. 8+68 Elev. 576.06
 FG #3 - RR spike in power pole 31.7' Rt. Sta. 12+59 Elev. 577.43

Existing Structure: SN 032-3210 - Two span reinforced concrete slab on closed concrete abutments and solid concrete pier, 8'-1" bk-bk abutments, 28'-4" out-out deck, 0° skew at \bar{C} Sta 10+00.00. The existing structure is to be removed and replaced under total road closure.

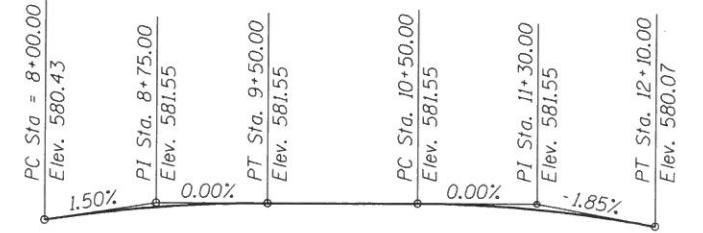
No Salvage.



ELEVATION



PLAN



PROFILE GRADE
(Along proposed \bar{C})

LOADING HL-93
 Allow 50#/sq. ft. for future wearing surface.
DESIGN SPECIFICATIONS
 2014 AASHTO LRFD Bridge Design Specifications, 7th Edition with 2016 Interims

DESIGN STRESSES

FIELD UNITS

f'_c = 4,000 psi
 f_y = 60,000 psi (Reinforcement)

PRECAST PRESTRESSED UNITS

f'_c = 8,500 psi
 f_{ci} = 7,000 psi
 f'_s = 270,000 psi (0.60" ϕ low lax. strands)
 f_{si} = 201,960 psi (0.60" ϕ low lax. strands)

SEISMIC DATA

Seismic Performance Zone (SPZ) = 1
 Design Spectral Acceleration at 1.0 sec. (S_D) = 0.0729
 Design Spectral Acceleration at 0.2 sec. (S_0) = 0.1299
 Soil Site Class = C

JOHNNY RUN
 BUILT 20__ BY
 GRUNDY COUNTY
 SEC. 16-00159-00-BR
 F.A.S. RTE. 272 STA. 10+06
 STR. NO. 032-3211
 LOADING HL-93

NAME PLATE

See Std. 515001

DESIGN SCOUR ELEVATION TABLE

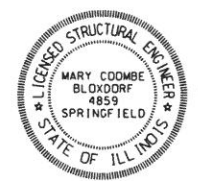
Event/Limit State	Design Scour Elevations (ft.)		Item 113
	W. Abut.	E. Abut.	
Q100	--	--	8
Q200	--	--	
Design	573.88	573.88	
Check	573.88	573.88	

WATERWAY INFORMATION

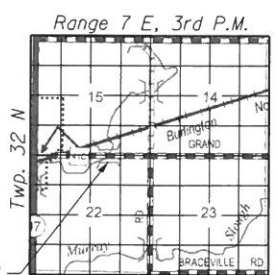
Drainage Area = 45.0 sq. mi.

Flood Event	Freq. Yr.	Discharge Ft ³ /s	Waterway Opening - ft ²		Natural H.W.E. ft.	Head - ft.		Headwater Elevation ft.	
			Existing	Proposed		Existing	Proposed	Existing	Proposed
Design	20	1850	533	542	576.2	0.4	0.4	576.6	576.6
Base	100	2250	570	582	576.7	0.6	0.6	577.3	577.3

"I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the specified 'AASHTO LRFD Bridge Design Specifications'."



Mary Coombe Bloxdorf
 ILLINOIS STRUCTURAL NO. 4859
 EXPIRES 11/30/18
 DATE: 05/21/18



LOCATION SKETCH

GENERAL PLAN & ELEVATION
C.H. C41/GRAND RIDGE ROAD
SECTION 16-00159-00-BR
GRUNDY COUNTY
STATION 10+06.00
S.N. 032-3211

FEHR GRAHAM
 ENGINEERING & ENVIRONMENTAL
 ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
 IOWA
 WISCONSIN

OWNER/DEVELOPER:
 GRUNDY COUNTY HWY. DEPT.
 245 NORTH ILLINOIS ROUTE 47
 MORRIS, IL 60450

PROJECT AND LOCATION:
 SECTION 16-00159-00-BR
 C.H. C41/GRAND RIDGE ROAD
 PROJECT Y035(110)

DESIGNED: ARK
 CHECKED: GJB
 DRAWN: MMY
 CHECKED: ARK-MCB

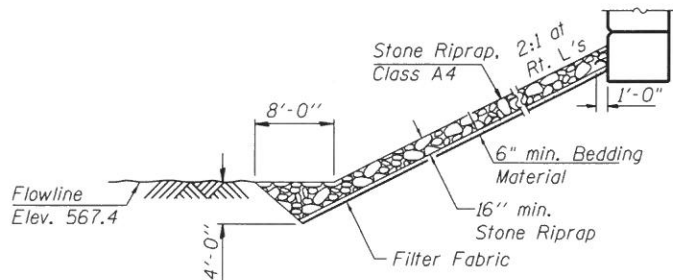
REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
 GENERAL PLAN AND ELEVATION
 STRUCTURE NUMBER 032-3211
 16-096-01-gpe.dgn
 CONRACT #: 87643

JOB NUMBER:
 16-096
 SHEET NUMBER
 7 of 28

GENERAL NOTES

Reinforcement bars designated (E) shall be epoxy coated.
 Layout of slope protection system may be varied in the field to suit ground conditions as directed by the Engineer.
 All (embedded and separate) bearing plates, side retainers, anchor bolts, nuts, washers and pintles shall be galvanized according to AASHTO M111 or M232 as applicable.
 H.S. bolts in bearing assembly shall be galvanized according to AASHTO M298 Class 50.



SECTION A-A

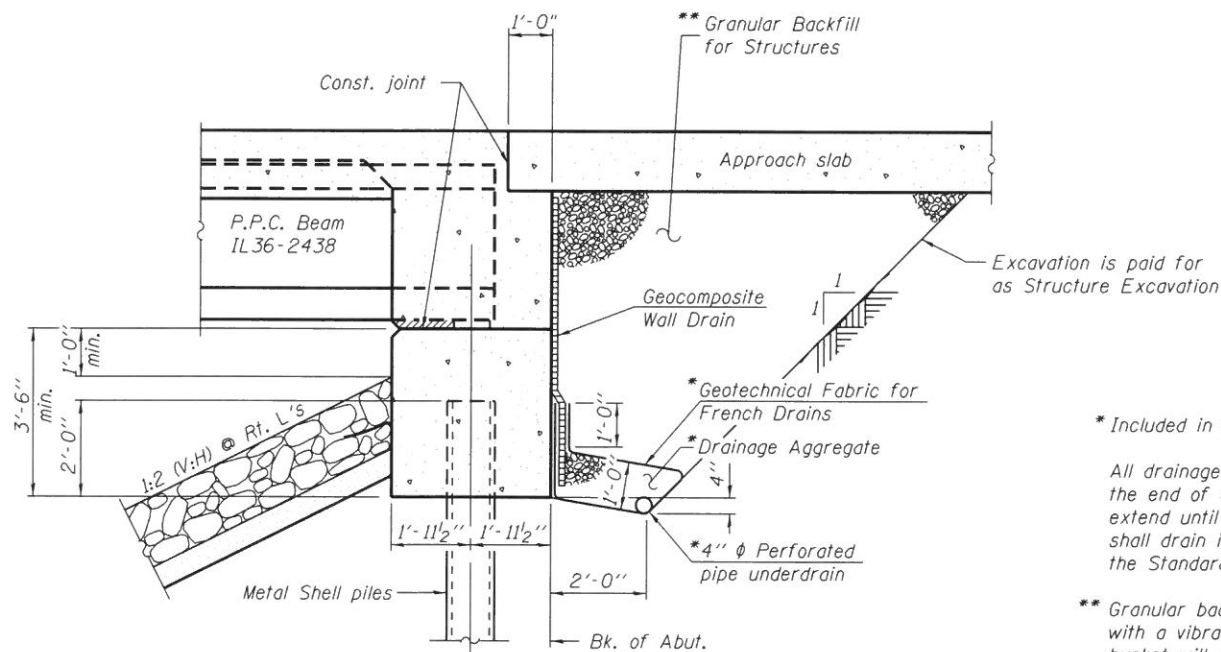
Note: Excavation and aggregate bedding will not be paid for as separate items and shall be considered as included in Stone Riprap, Class A4.

INDEX OF SHEETS - STRUCTURE PLANS

- 1 General Plan & Elevation
- 2 General Notes & Total Bill of Material
- 3-4 Top of Slab Elevations
- 5 Top of Slab Elevations - W. Approach Slab
- 6 Top of Slab Elevations - E. Approach Slab
- 7 Superstructure
- 8 Diaphragm Details
- 9-10 Bridge Approach Slab Details
- 11 Framing Plan
- 12 IL36N Beam
- 13 IL36N Beam Details
- 14-15 Steel Bridge Rail, Type SM (Special)
- 16 Abutments
- 17 Pile Details
- 18-19 Soil Boring Logs

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Removal of Existing Structures	Each			1
Structure Excavation	Cu. Yd.		100	100
Concrete Superstructure	Cu. Yd.	97.5		97.5
Protective Coat	Sq. Yd.	557	17	574
Concrete Structures	Cu. Yd.		58.3	58.3
Reinforcement Bars, Epoxy Coated	Lb.	48,940	9490	58,430
Furnishing Metal Shell Piles, 14" x 0.250"	Ft.		240	240
Driving Piles	Ft.		240	240
Test Piles Metal Shells	Each		2	2
Name Plates	Each		1	1
Granular Backfill for Structures	Cu. Yd.		93	93
Furnishing and Erecting Precast Prestressed Concrete Beams, IL36N	Ft.	425		425
Bridge Deck Grooving (Longitudinal)	Sq. Yd.	388		388
Stone Riprap Class A4	Sq. Yd.		258	258
Filter Fabric	Sq. Yd.		258	258
Steel Bridge Rail, Type SM (Special)	Ft.	232		232
Pipe Underdrains for Structures 4"	Ft.		116	116
Geocomposite Wall Drain	Sq. Yd.		56	56
Concrete Superstructure (Approach Slab)	Cu. Yd.	84.5		84.5



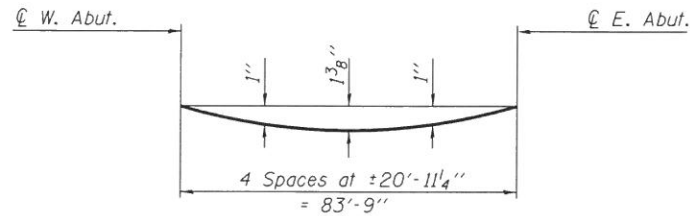
SECTION THRU INTEGRAL ABUTMENT

(Horiz. dim. @ Rt. L's)

* Included in the cost of Pipe Underdrains for Structures.

All drainage system components shall extend 2'-0" from the end of each wingwall except the outlet pipe shall extend until intersecting with the side slopes. The pipes shall drain into concrete headwalls. (See Article 601.05 of the Standard Specifications and Highway Standard 601101.

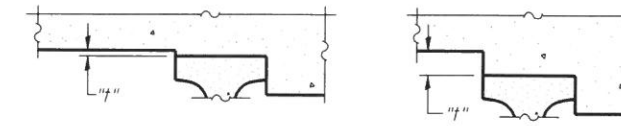
** Granular backfill shall be placed in 6" lifts and compacted with a vibrating plate compactor. Compacting with a backhoe bucket will not be acceptable.



DEAD LOAD DEFLECTION DIAGRAM

(Includes weight of concrete only.)

Note:
The above deflections are not to be used in the field if the engineer is working from the grade elevations adjusted for dead load deflections as shown on Sheet 4 of 19.

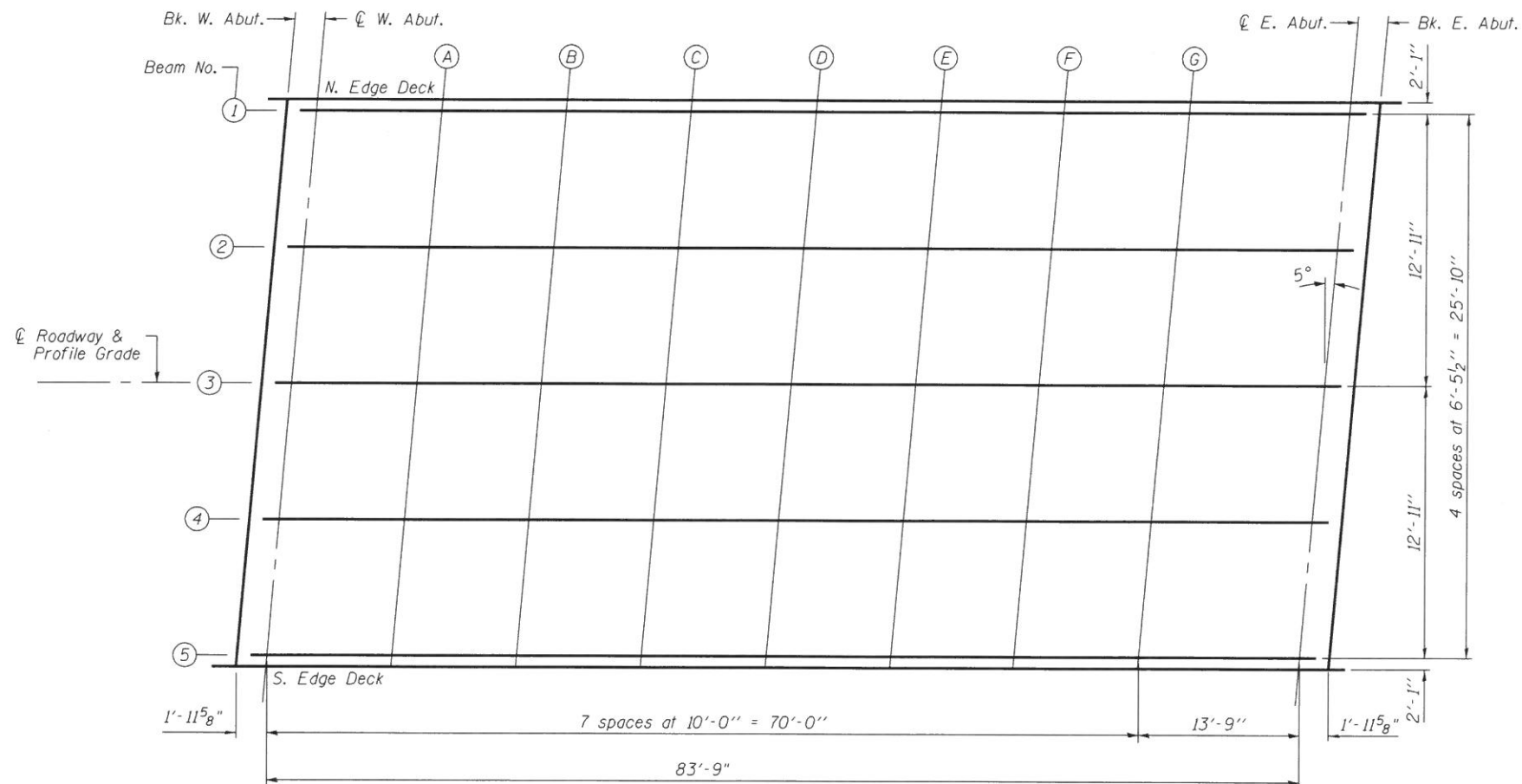


At Minimum Fillet

At Maximum Fillet

To determine "t": After all precast prestressed beams have been erected, elevations of the top flanges of the beams shall be taken at intervals shown below. These elevations subtracted from the "Theoretical Grade Elevations Adjusted for Dead Load Deflection" shown on Sheet 4 of 19, minus slab thickness, equals the fillet heights "t" above top flange of beams.

FILLET HEIGHTS



E-S

7-1-10

Sheet 3 of 19

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
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PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

DESIGNED: ARK
CHECKED: GJB
DRAWN: MMY
CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
TOP OF SLAB ELEVATIONS
STRUCTURE NUMBER 032-3211

JOB NUMBER:
16-096

SHEET NUMBER
9 of 28

16-096-03-top-slab-plan.dgn
CONTRACT #: 87643

N. EDGE OF DECK

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
☉ W. Abut.	965.44	-15.00	581.32	581.32
A	975.44	-15.00	581.32	581.36
B	985.44	-15.00	581.32	581.40
C	995.44	-15.00	581.32	581.42
D	1005.44	-15.00	581.32	581.43
E	1015.44	-15.00	581.32	581.43
F	1025.44	-15.00	581.32	581.41
G	1035.44	-15.00	581.32	581.37
☉ E. Abut.	1049.18	-15.00	581.32	581.32

BEAM 1

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
☉ W. Abut.	965.26	-12.92	581.35	581.35
A	975.26	-12.92	581.35	581.39
B	985.26	-12.92	581.35	581.43
C	995.26	-12.92	581.35	581.45
D	1005.26	-12.92	581.35	581.46
E	1015.26	-12.92	581.35	581.46
F	1025.26	-12.92	581.35	581.44
G	1035.26	-12.92	581.35	581.41
☉ E. Abut.	1049.00	-12.92	581.35	581.35

BEAM 2

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
☉ W. Abut.	964.69	-6.46	581.45	581.45
A	974.69	-6.46	581.45	581.49
B	984.69	-6.46	581.45	581.53
C	994.69	-6.46	581.45	581.55
D	1004.69	-6.46	581.45	581.56
E	1014.69	-6.46	581.45	581.56
F	1024.69	-6.46	581.45	581.54
G	1034.69	-6.46	581.45	581.51
☉ E. Abut.	1048.43	-6.46	581.45	581.45

☉ ROADWAY, P.G. & BEAM 3

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
☉ W. Abut.	964.12	0.00	581.55	581.55
A	974.12	0.00	581.55	581.59
B	984.12	0.00	581.55	581.63
C	994.12	0.00	581.55	581.65
D	1004.12	0.00	581.55	581.66
E	1014.12	0.00	581.55	581.66
F	1024.12	0.00	581.55	581.64
G	1034.12	0.00	581.55	581.61
☉ E. Abut.	1047.87	0.00	581.55	581.55

BEAM 4

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
☉ W. Abut.	963.56	6.46	581.45	581.45
A	973.56	6.46	581.45	581.49
B	983.56	6.46	581.45	581.53
C	993.56	6.46	581.45	581.55
D	1003.56	6.46	581.45	581.56
E	1013.56	6.46	581.45	581.56
F	1023.56	6.46	581.45	581.54
G	1033.56	6.46	581.45	581.51
☉ E. Abut.	1047.31	6.46	581.45	581.45

BEAM 5

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
☉ W. Abut.	962.99	12.92	581.35	581.35
A	972.99	12.92	581.35	581.39
B	982.99	12.92	581.35	581.43
C	992.99	12.92	581.35	581.45
D	1002.99	12.92	581.35	581.46
E	1012.99	12.92	581.35	581.46
F	1022.99	12.92	581.35	581.44
G	1032.99	12.92	581.35	581.41
☉ E. Abut.	1046.74	12.92	581.35	581.35

S. EDGE DECK

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
☉ W. Abut.	962.81	15.00	581.32	581.32
A	972.81	15.00	581.32	581.36
B	982.81	15.00	581.32	581.40
C	992.81	15.00	581.32	581.42
D	1002.81	15.00	581.32	581.43
E	1012.81	15.00	581.32	581.43
F	1022.81	15.00	581.32	581.41
G	1032.81	15.00	581.32	581.37
☉ E. Abut.	1046.56	15.00	581.32	581.32

E-S

7-1-10

Sheet 4 of 19



ILLINOIS
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245 NORTH ILLINOIS ROUTE 47
MORRIS, IL 60450

PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

DESIGNED: ARK
CHECKED: GJB
DRAWN: MMY
CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
TOP OF SLAB ELEVATIONS
STRUCTURE NUMBER 032-3211

JOB NUMBER:
16-096

SHEET NUMBER
10 of 28

16-096-04-tos-e11.dgn
CONTRACT #: 87643

NORTH EDGE OF APPROACH SLAB

Location	Station	Offset	Theoretical Grade Elevations
W. End of W. Approach Slab	934.47	-15.00	581.31
A1	944.47	-15.00	581.32
A2	954.47	-15.00	581.32
E. End of W. Approach Slab	964.47	-15.00	581.32

NORTH EDGE OF ROADWAY

Location	Station	Offset	Theoretical Grade Elevations
W. End of W. Approach Slab	934.12	-11.00	581.37
A1	944.12	-11.00	581.38
A2	954.12	-11.00	581.38
E. End of W. Approach Slab	964.12	-11.00	581.38

☉ ROADWAY

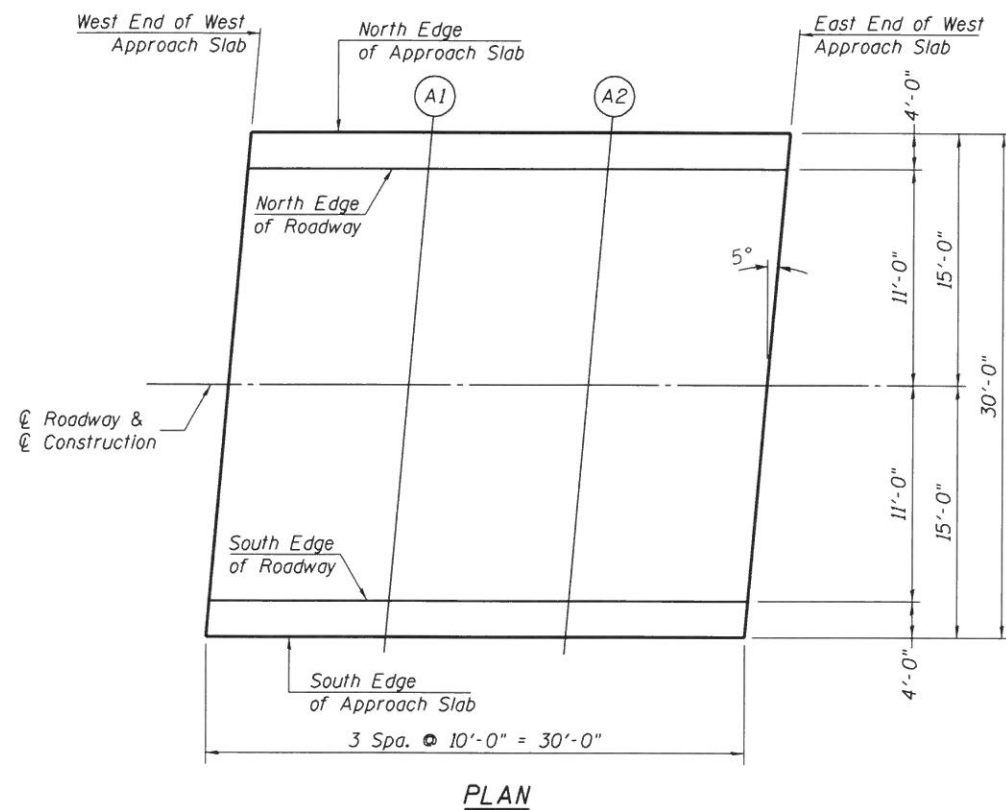
Location	Station	Offset	Theoretical Grade Elevations
W. End of W. Approach Slab	933.16	0.00	581.54
A1	943.16	0.00	581.55
A2	953.16	0.00	581.55
E. End of W. Approach Slab	963.16	0.00	581.55

SOUTH EDGE OF ROADWAY

Location	Station	Offset	Theoretical Grade Elevations
W. End of W. Approach Slab	932.19	11.00	581.36
A1	942.19	11.00	581.38
A2	952.19	11.00	581.38
E. End of W. Approach Slab	962.19	11.00	581.38

SOUTH EDGE OF APPROACH SLAB

Location	Station	Offset	Theoretical Grade Elevations
W. End of W. Approach Slab	931.84	15.00	581.30
A1	941.84	15.00	581.31
A2	951.84	15.00	581.32
E. End of W. Approach Slab	961.84	15.00	581.32



E-AS

7-1-10

Sheet 5 of 19

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
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MORRIS, IL 60450

PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

DESIGNED: ARK
CHECKED: GJB
DRAWN: MMY
CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
TOP OF SLAB ELEVATIONS
WEST APPROACH SLAB
STRUCTURE NUMBER 032-3211
16-096-05-appro-w.dgn

JOB NUMBER:
16-096

SHEET NUMBER
11 of 28

CONTRACT #: 87643

NORTH EDGE OF APPROACH SLAB

Location	Station	Offset	Theoretical Grade Elevations
W. End of E. Approach Slab	1050.14	-15.00	581.32
A3	1060.14	-15.00	581.31
A4	1070.14	-15.00	581.29
E. End of E. Approach Slab	1080.14	-15.00	581.27

NORTH EDGE OF ROADWAY

Location	Station	Offset	Theoretical Grade Elevations
W. End of E. Approach Slab	1049.79	-11.00	581.38
A3	1059.79	-11.00	581.37
A4	1069.79	-11.00	581.36
E. End of E. Approach Slab	1079.79	-11.00	581.33

☉ ROADWAY

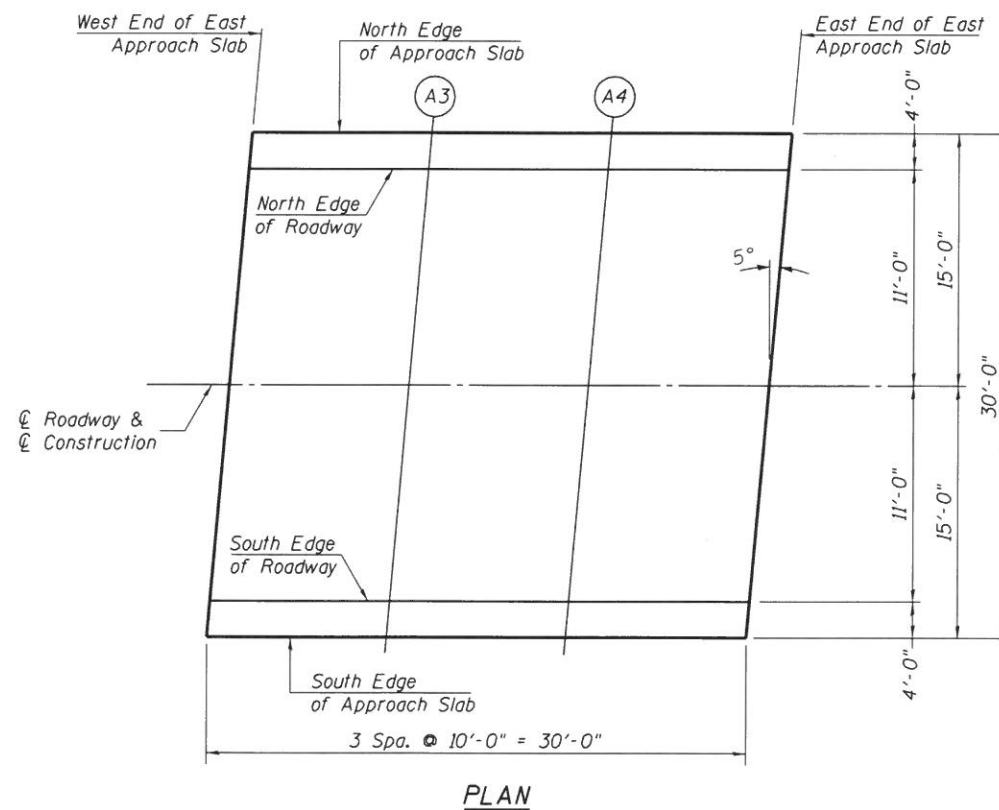
Location	Station	Offset	Theoretical Grade Elevations
W. End of E. Approach Slab	1048.83	0.00	581.55
A3	1058.83	0.00	581.55
A4	1068.83	0.00	581.53
E. End of E. Approach Slab	1078.83	0.00	581.50

SOUTH EDGE OF ROADWAY

Location	Station	Offset	Theoretical Grade Elevations
W. End of E. Approach Slab	1047.87	11.00	581.38
A3	1057.87	11.00	581.38
A4	1067.87	11.00	581.36
E. End of E. Approach Slab	1077.87	11.00	581.33

SOUTH EDGE OF APPROACH SLAB

Location	Station	Offset	Theoretical Grade Elevations
W. End of E. Approach Slab	1047.52	15.00	581.32
A3	1057.52	15.00	581.31
A4	1067.52	15.00	581.30
E. End of E. Approach Slab	1077.52	15.00	581.27



E-AS

7-1-10

Sheet 6 of 19

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
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PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

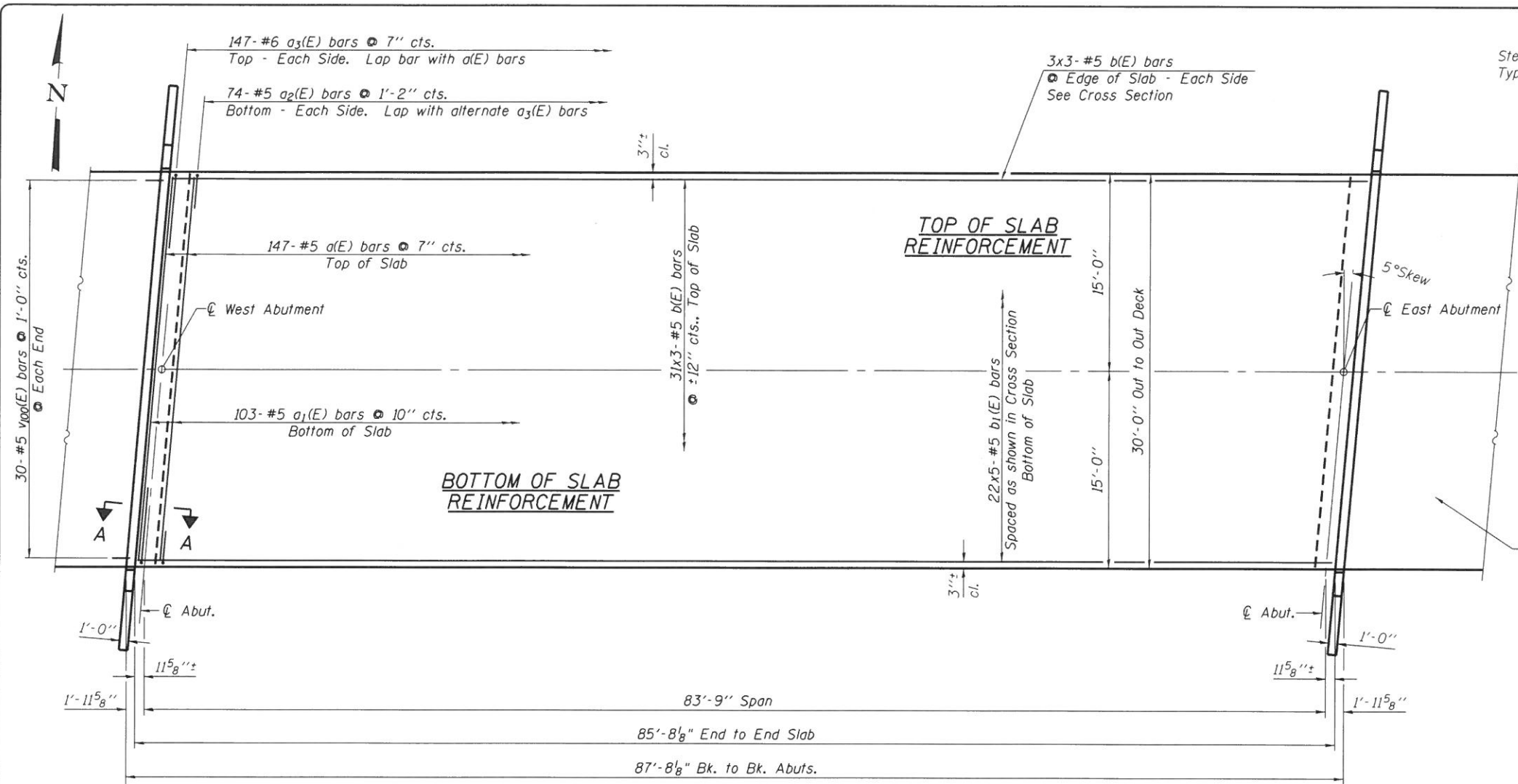
DESIGNED: ARK
CHECKED: GJB
DRAWN: MMY
CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
TOP OF SLAB ELEVATIONS
EAST APPROACH SLAB
STRUCTURE NUMBER 032-3211
16-096-06-appro-e.dgn
CONTRACT #: 87643

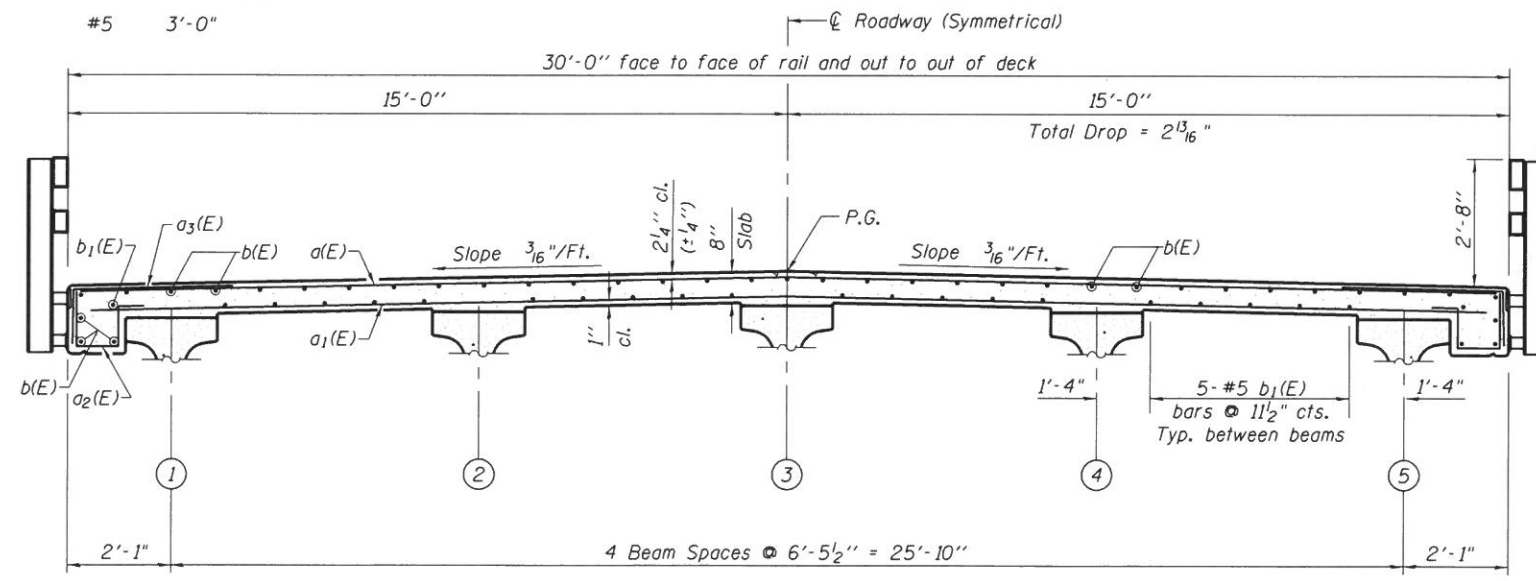
JOB NUMBER:
16-096

SHEET NUMBER
12 of 28



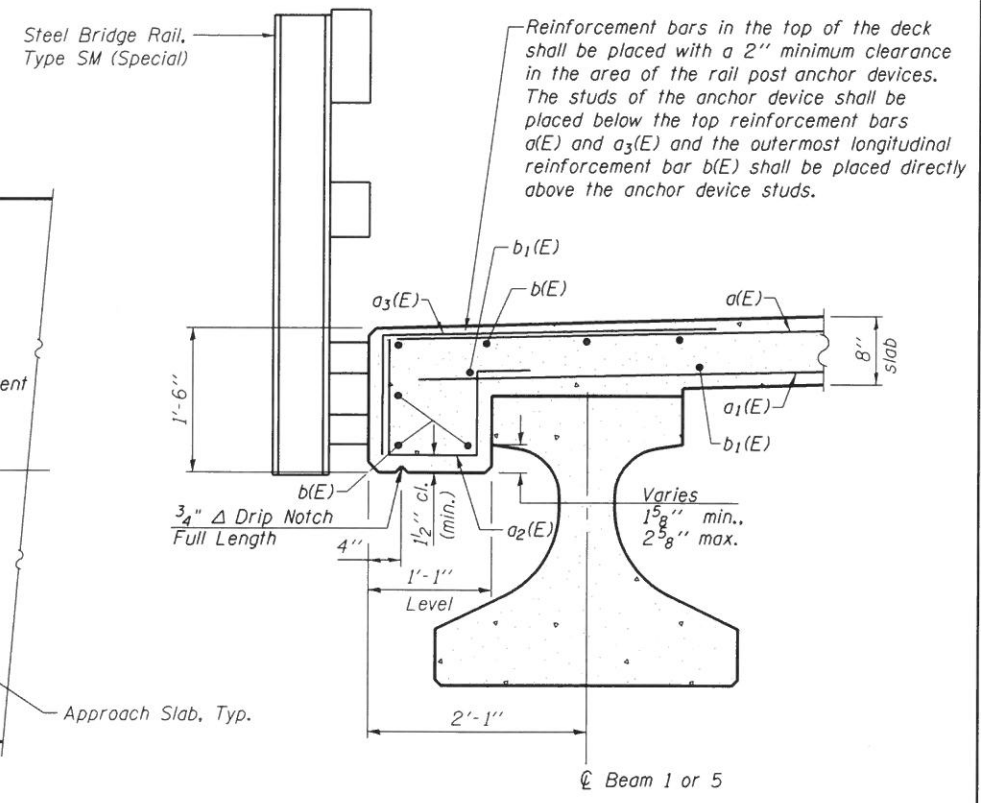
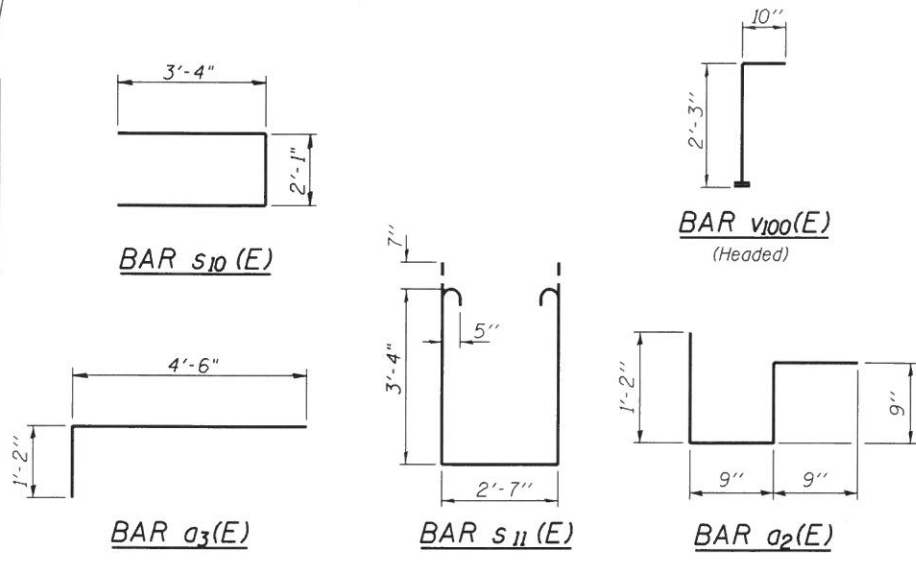
PLAN

MIN. BAR LAPS



CROSS SECTION (Looking East)

Steel Bridge Rail, Type SM (Special)
See Sheet 14 of 19 for Details
& Sheet 15 of 19 for post Spacing.



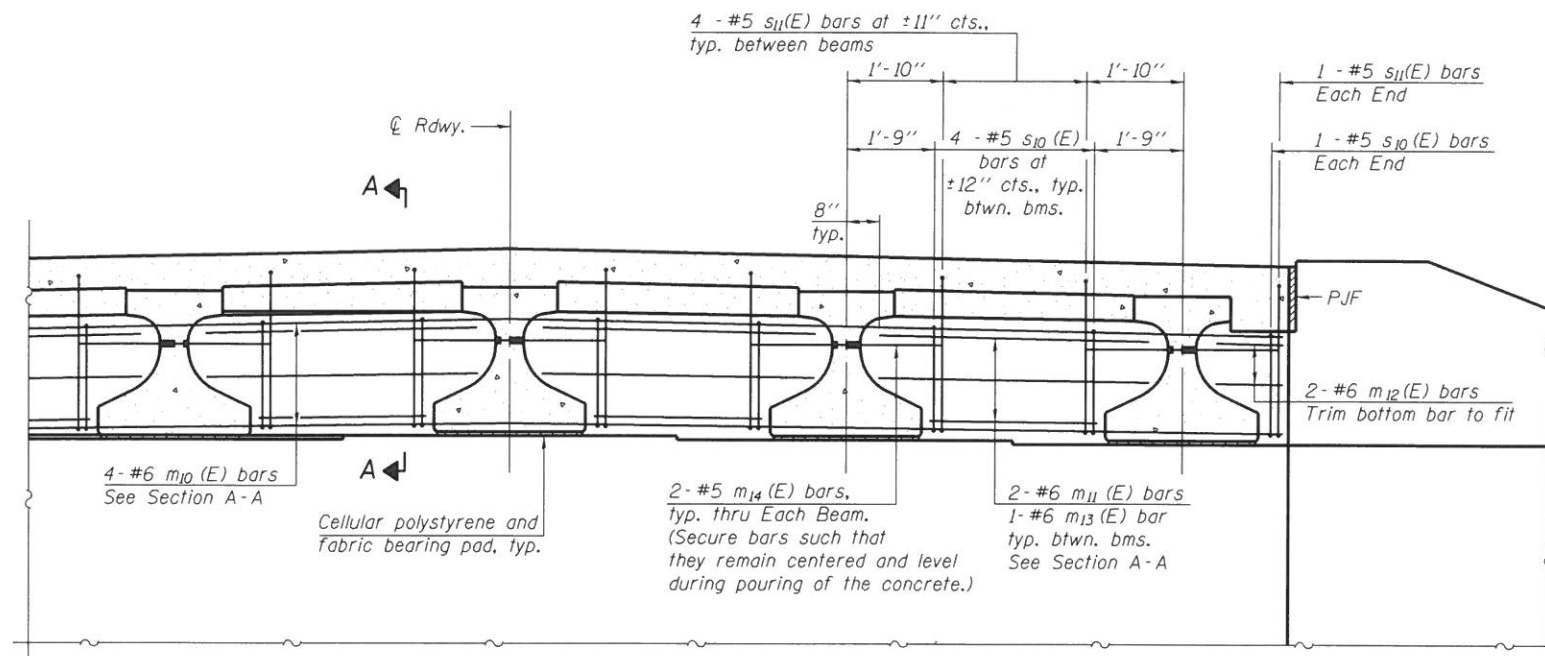
SECTION THRU OVERHANG

SUPERSTRUCTURE BILL OF MATERIAL

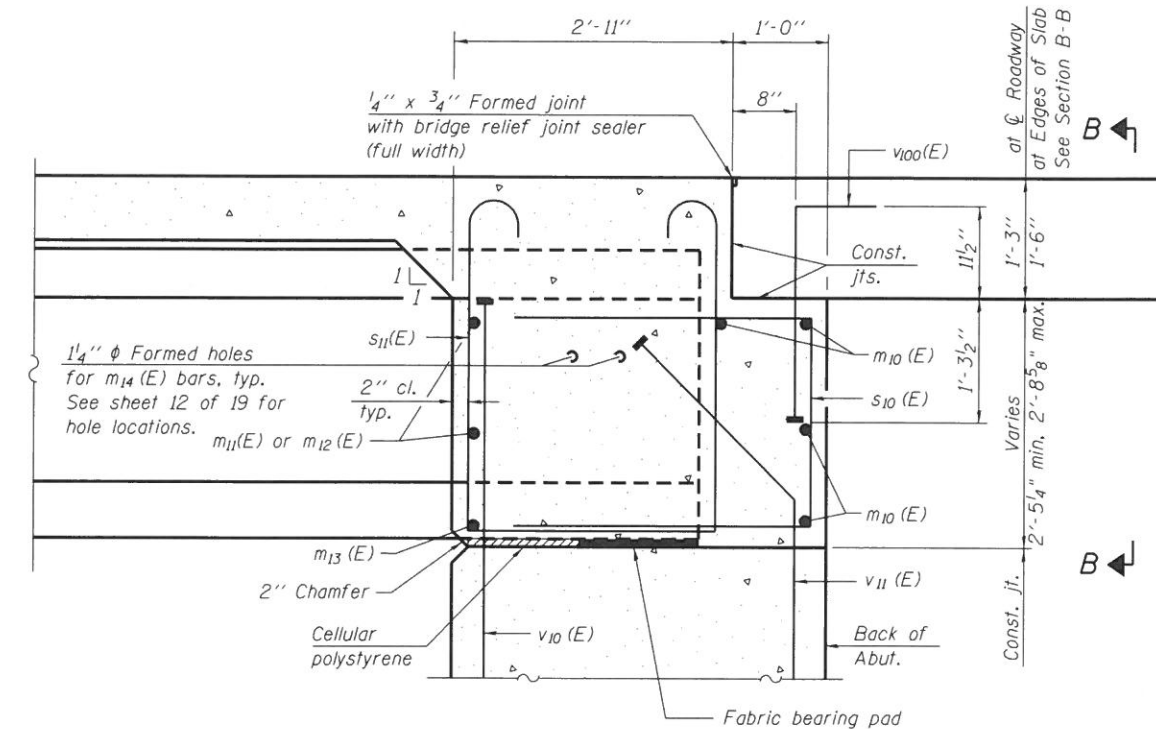
Bar	No.	Size	Length	Shape
a(E)	147	#5	29'-9"	—
a1(E)	103	#5	28'-9"	—
a2(E)	148	#5	3'-5"	└
a3(E)	294	#6	5'-8"	└
b(E)	111	#5	30'-6"	—
b1(E)	110	#5	19'-6"	—
m10(E)	8	#6	29'-10"	—
m11(E)	16	#6	5'-1"	—
m12(E)	8	#6	1'-6"	—
m13(E)	8	#6	3'-1"	—
m14(E)	20	#5	4'-0"	—
s10(E)	36	#5	8'-9"	└
s11(E)	36	#5	10'-5"	└
v100(E)	60	#5	3'-1"	└
Bridge Deck Grooving (Longitudinal)		Sq. Yds.	228	
Reinforcement Bars, Epoxy Coated		Lbs.	17,980	
Concrete Superstructure		Cu. Yds.	97.5	
Protective Coat		Sq. Yd.	337	

Bars indicated thus 1 x 2-#8 etc. indicates 1 line of bars with 2 lengths per line. See Sheet 8 of 19 for Section A-A. See Sheets 9 & 10 of 19 for Approach Slab Details.

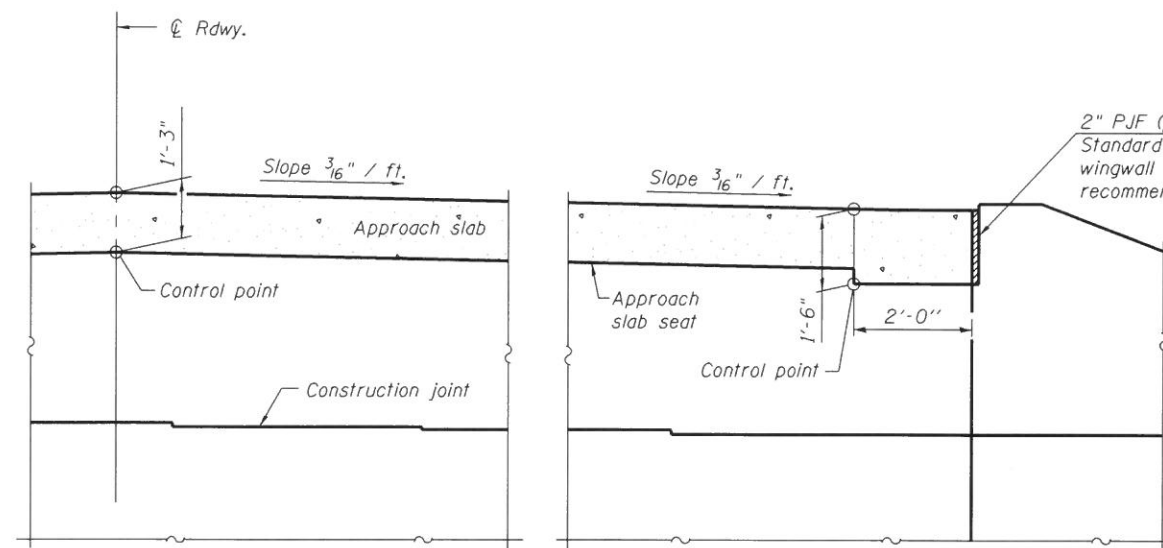
REVISIONS		
REV. NO.	DESCRIPTION	DATE



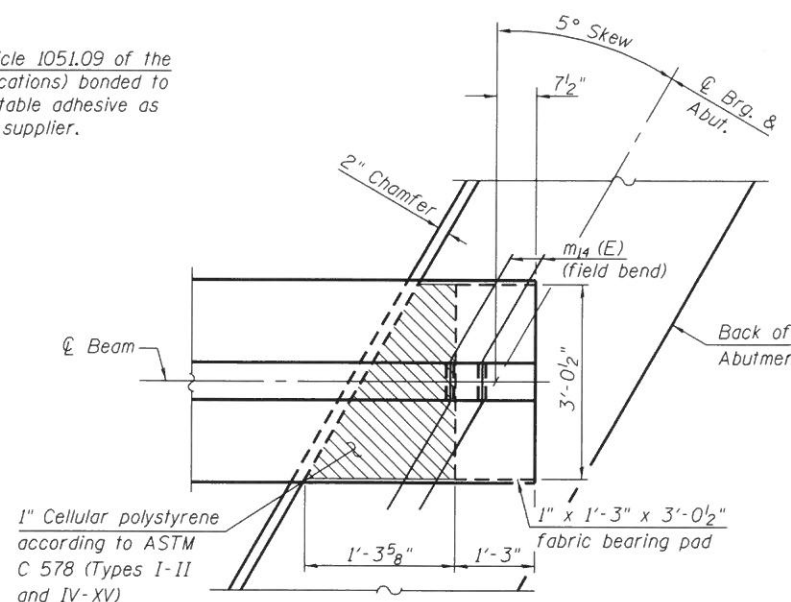
DIAPHRAGM AT ABUTMENT



SECTION A-A
(at Rt. L's)

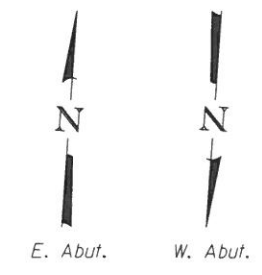
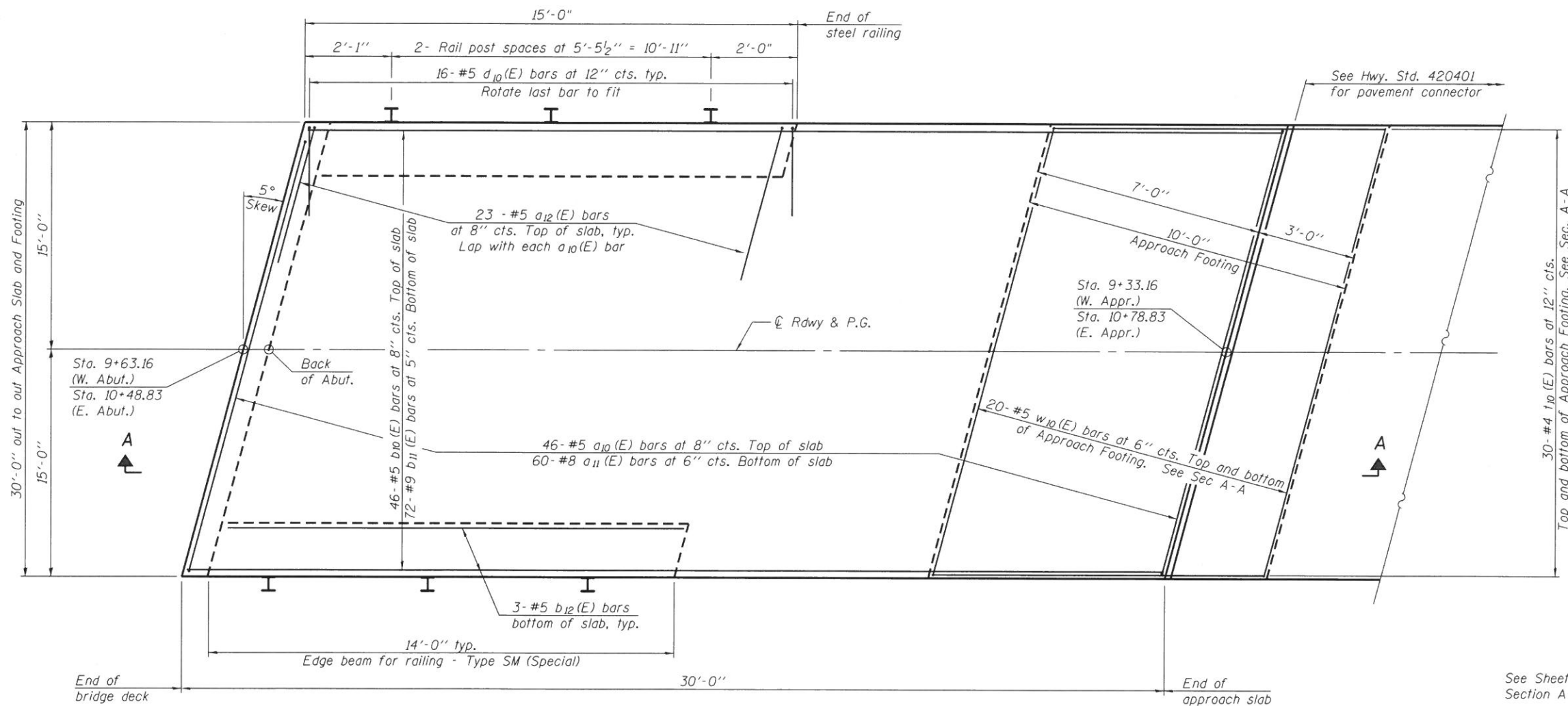


SECTION B-B

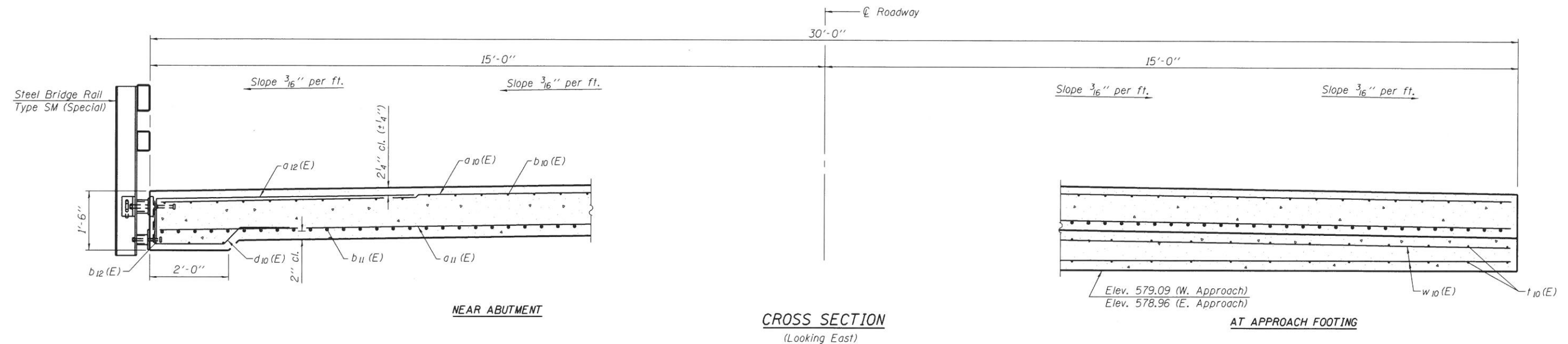


PLAN AT ABUTMENT
(Showing bottom flange of beam)

Notes:
 Reinforcement bars in diaphragm are billed with superstructure on sheet 7 of 19.
 Concrete in diaphragm is included with Concrete Superstructure on sheet 7 of 19.
 For details of bars s10(E), s11(E) and v100(E) see sheet 7 of 19.
 For details of bars v10(E) and v11(E) see sheet 16 of 19.
 The s10(E) and s11(E) bars shall be placed parallel to the beams. Spacing for these bars shall be at right angles to the beams.
 The approach slab seat shall have a constant slope determined from the control points shown.
 Cost of cellular polystyrene is included with Concrete Superstructure.
 Beams shall be braced for stability during erection and remain braced until deck is poured and cured.



PLAN



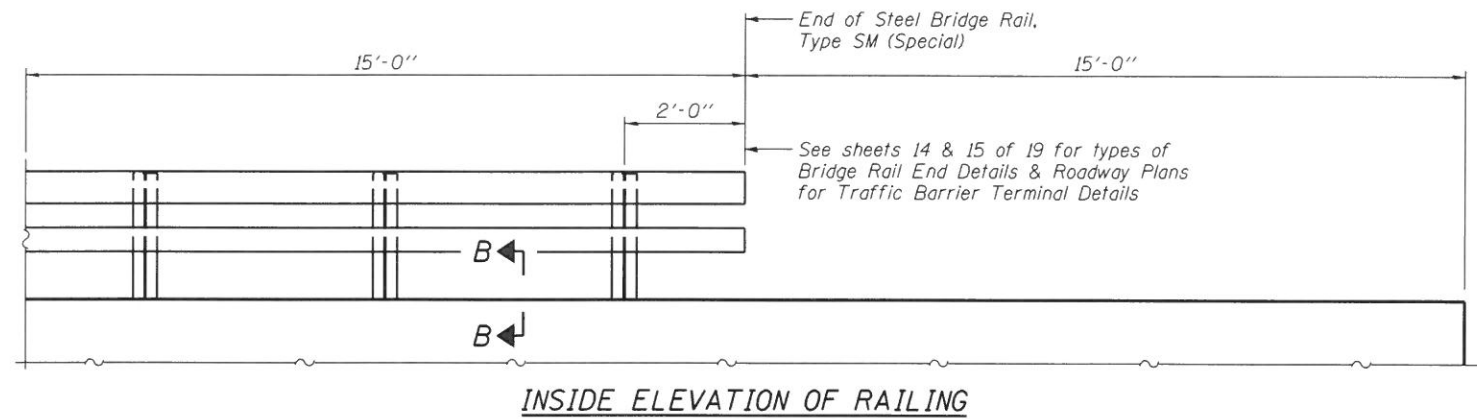
NEAR ABUTMENT

CROSS SECTION
(Looking East)

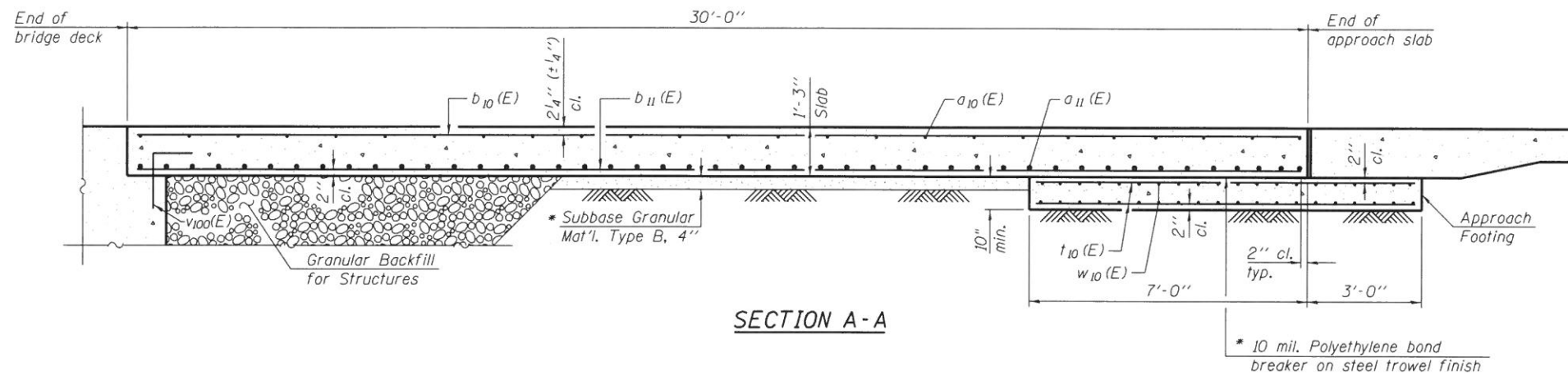
AT APPROACH FOOTING

See Sheet 10 of 19 for Section A-A.

REVISIONS		
REV. NO.	DESCRIPTION	DATE



Notes:
 Approach slab shall be paid for as Concrete Superstructure (Approach Slab).
 Approach footing concrete shall be paid for as Concrete Structures.
 The approach footing maximum applied service bearing pressure (Qmax) = 2.0 ksf.
 Cost of excavation for approach footing included with Concrete Structures.
 For Granular Backfill for Structures and drainage treatment details, see sheet 2 of 19.
 For railing details, see sheets 14 and 15 of 19.



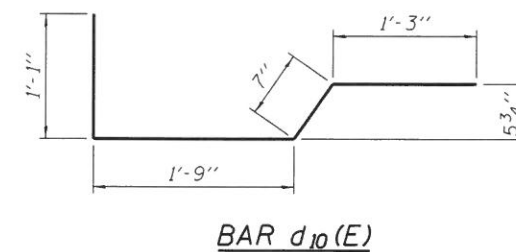
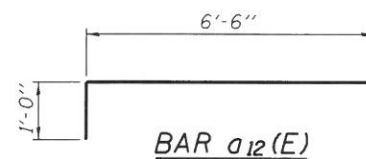
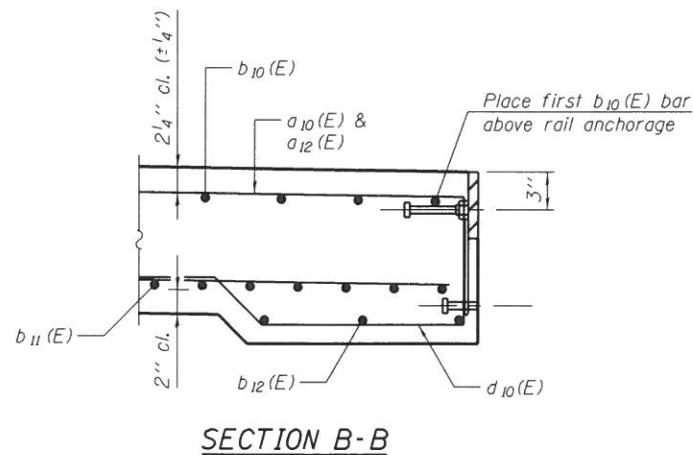
* Cost included with Concrete Superstructure (Approach Slab)

**TWO APPROACHES
 BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
a ₁₀ (E)	92	#5	29'-9"	—
a ₁₁ (E)	120	#8	29'-9"	—
a ₁₂ (E)	92	#5	7'-6"	—
b ₁₀ (E)	92	#5	29'-8"	—
b ₁₁ (E)	144	#9	29'-8"	—
b ₁₂ (E)	12	#5	13'-8"	—
d ₁₀ (E)	64	#5	4'-8"	⌋
t ₁₀ (E)	120	#4	9'-9"	—
w ₁₀ (E)	80	#5	29'-9"	—
Protective Coat			Sq. Yd.	220
Concrete Superstructure (Approach Slab)			Cu. Yd.	84.5
Concrete Structures			Cu. Yd.	21.2
Reinforcement Bars, Epoxy Coated			Pound	34,220
Bridge Deck Grooving (Longitudinal)			Sq. Yd.	160

Note A:

Note A: 30,950 Pound (Superstructure)
 3,270 Pound (Substructure)



BA-CIP-R34C-0 07-22-16

Sheet 10 of 19

FEHR GRAHAM
 ENGINEERING & ENVIRONMENTAL
 ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
 IOWA
 WISCONSIN

OWNER/DEVELOPER:
 GRUNDY COUNTY HWY. DEPT.
 245 NORTH ILLINOIS ROUTE 47
 MORRIS, IL 60450

PROJECT AND LOCATION:
 SECTION 16-00159-00-BR
 C.H. C41/GRAND RIDGE ROAD
 PROJECT Y035(110)

DESIGNED: ARK
 CHECKED: GJB
 DRAWN: MMY
 CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
 BRIDGE APPROACH SLAB DETAILS
 STRUCTURE NUMBER 032-3211

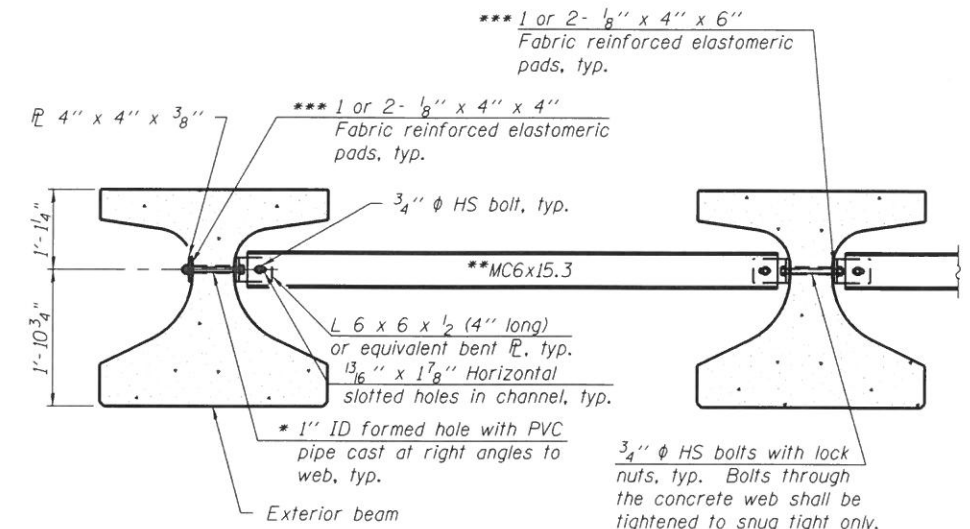
JOB NUMBER:
 16-096

SHEET NUMBER
 16 of 28

INTERIOR BEAM MOMENT TABLE		
0.5 Span		
I	(in ⁴)	100,433
I'	(in ⁴)	294,487
S_b	(in ³)	6832.1
S_b'	(in ³)	11,658
S_t	(in ³)	4715.1
S_t'	(in ³)	26,200
$DC1$	(k/')	1.50
M_{DC1}	(k)	1315
$DC2$	(k/')	0.03
M_{DC2}	(k)	26
DW	(k/')	0.33
M_{DW}	(k)	285
$M_L + IM$	(k)	1270

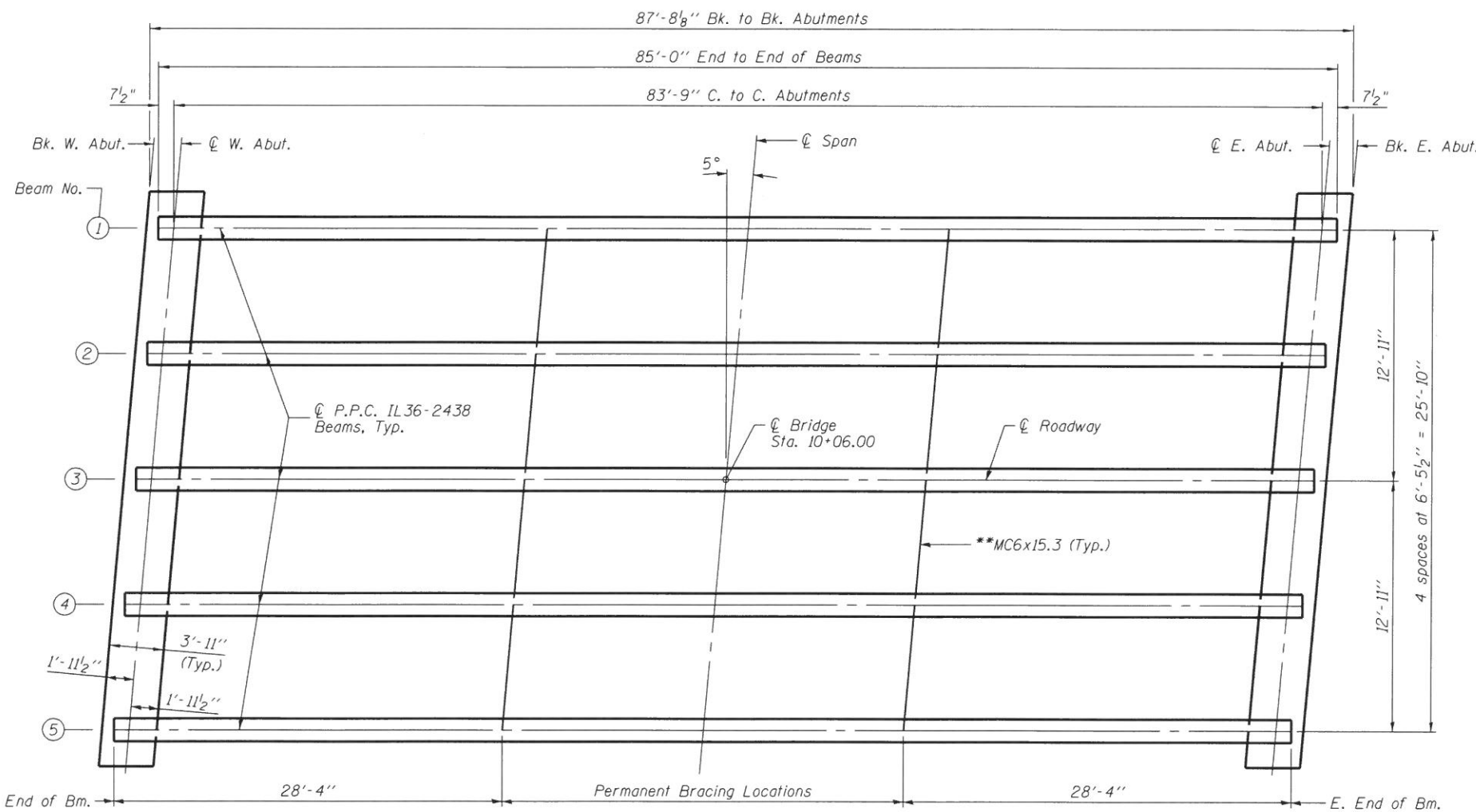
INTERIOR BEAM REACTION TABLE		
Abut.		
R_{DC1}	(k)	59.8
R_{DC2}	(k)	1.3
R_{DW}	(k)	13.7
$R_L + IM$	(k)	79.9
R_{Total}	(k)	154.7

I : Non-composite moment of inertia of beam section (in⁴).
 I' : Composite moment of inertia of beam section (in⁴).
 S_b : Non-composite section modulus for the bottom fiber of the prestressed beam (in³).
 S_b' : Composite section modulus for the bottom fiber of the prestressed beam (in³).
 S_t : Non-composite section modulus for the top fiber of the prestressed beam (in³).
 S_t' : Composite section modulus for the top fiber of the prestressed beam (in³).
 $DC1$: Un-factored non-composite dead load (kips/ft.).
 M_{DC1} : Un-factored moment due to non-composite dead load (kip-ft.).
 $DC2$: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
 M_{DC2} : Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
 DW : Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
 M_{DW} : Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).
 $M_L + IM$: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).



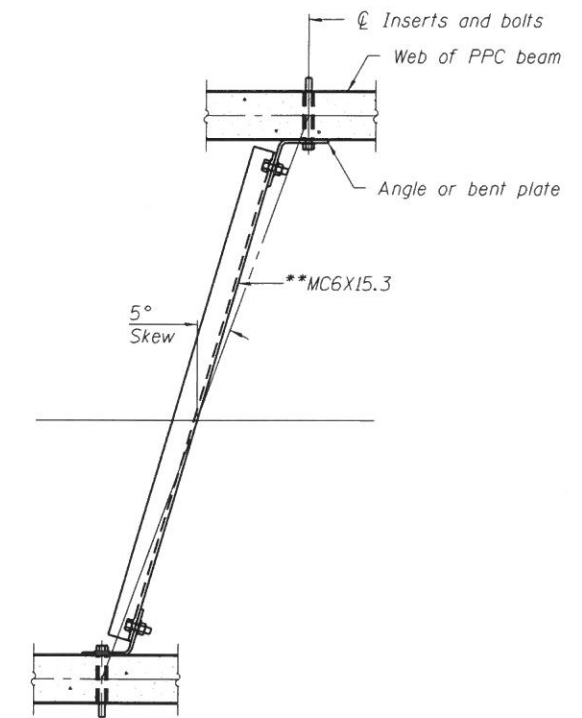
Notes:
 All material for bracing shall be hot dip galvanized according to AASHTO M111 unless otherwise noted.
 Two hardened washers are required for each set of oversized holes.
 All holes shall be 1 5/16" ϕ unless otherwise noted.
 5/16" x 3" x 3" plate washers are required over all slotted holes.
 All bolts shall be galvanized according to AASHTO M232.
 Bracing shall be installed as beams are erected and tightened as soon as possible during erection.
 Permanent bracing shall not be paid for separately, but shall be included in the cost of Furnishing and Erecting Precast Prestressed Concrete Beams.

- * Fabricator shall locate to miss strands within permissible tolerances.
- ** Alternate MC6x18 channels are permitted to facilitate material acquisition.
- *** Place pads as necessary to provide a flat mounting surface between the steel and concrete.



FRAMING PLAN

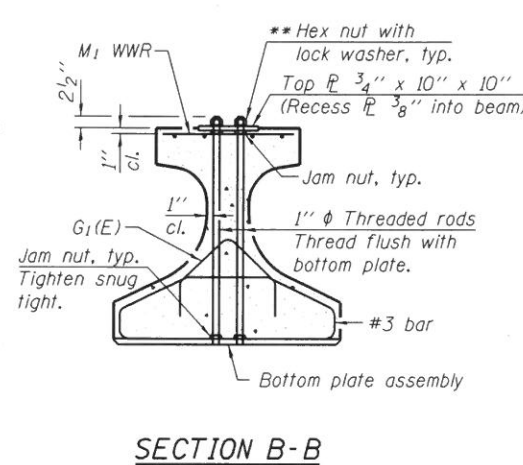
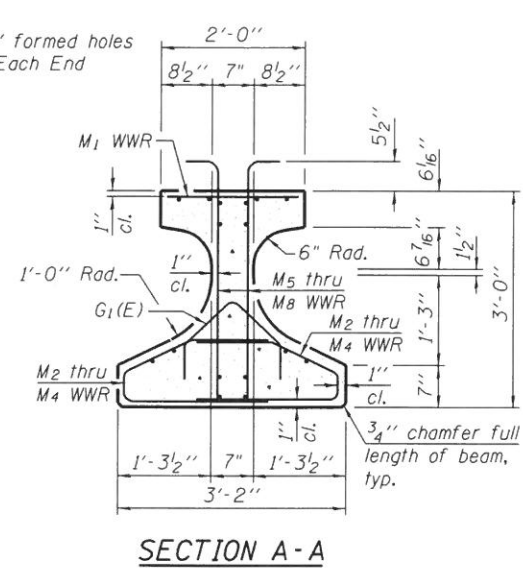
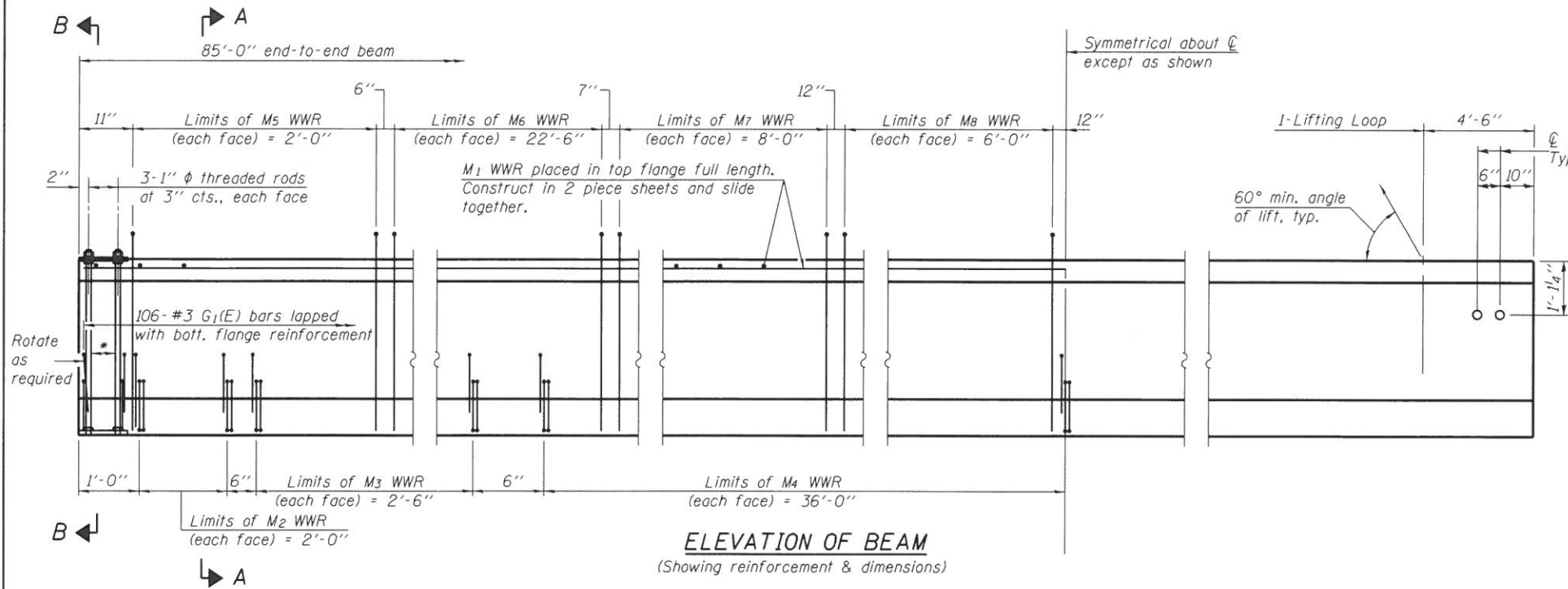
PERMANENT BRACING DETAIL



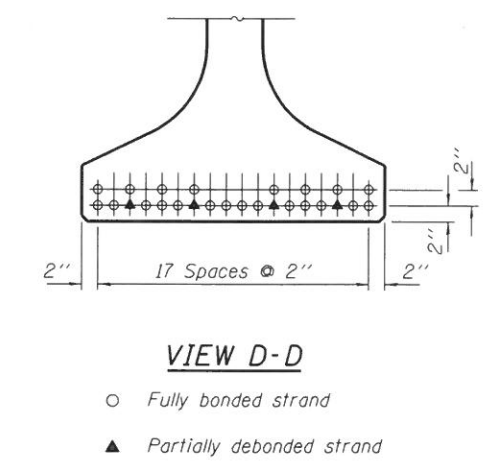
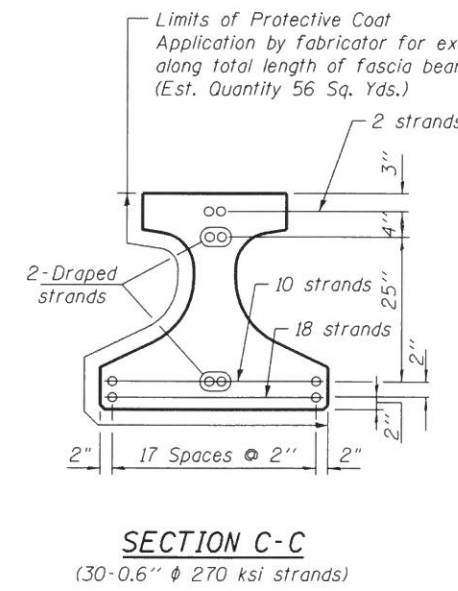
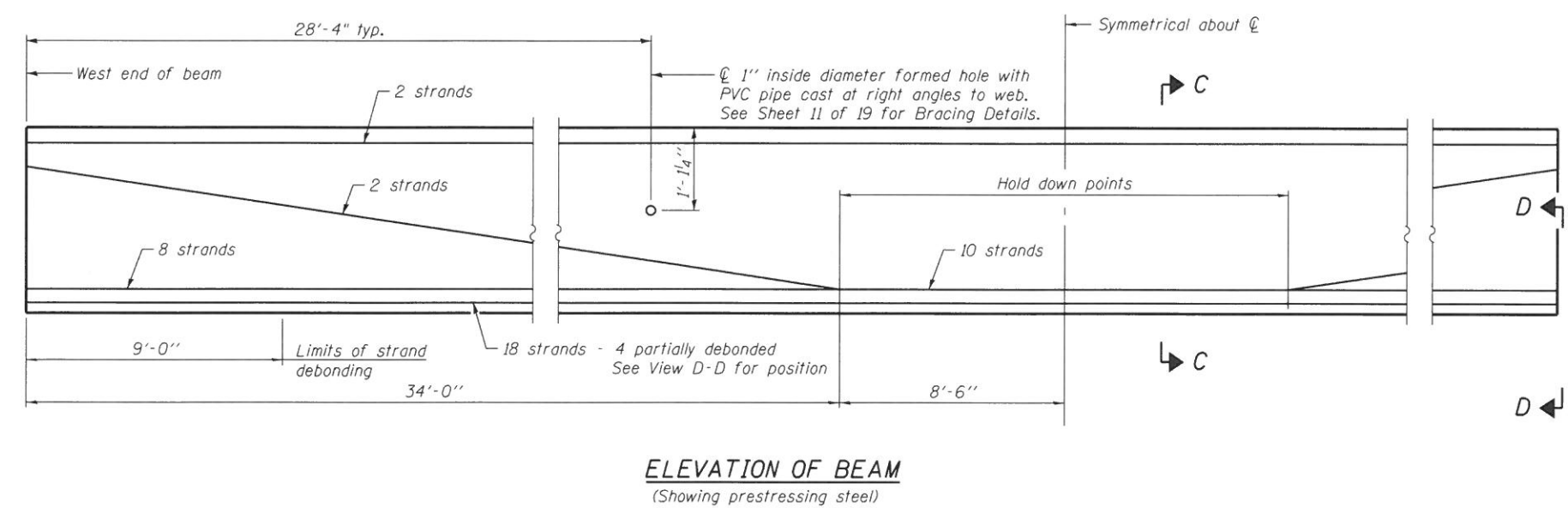
PLAN

(Showing permanent bracing)

REVISIONS		
REV. NO.	DESCRIPTION	DATE



- * 4-3/4" ϕ threaded dowel rods at 3" cts., Each Face
- ** Only tighten sufficiently to compress lock washers



Limits of Protective Coat
Application by fabricator for exterior surfaces along total length of fascia beams (Beams 1 & 5)
(Est. Quantity 56 Sq. Yds.)

Note:
See sheet 13 of 19 for additional details and Bill of Material.

IL36-2438

1-28-16

Sheet 12 of 19

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

OWNER/DEVELOPER:
GRUNDY COUNTY HWY. DEPT.
245 NORTH ILLINOIS ROUTE 47
MORRIS, IL 60450

PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

DESIGNED: ARK
CHECKED: GJB
DRAWN: MMY
CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
IL36N BEAM
STRUCTURE NUMBER 032-3211

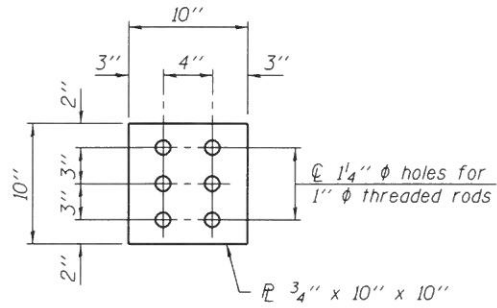
16-096-12-beam.dgn
CONTRACT #: 87643

JOB NUMBER:
16-096

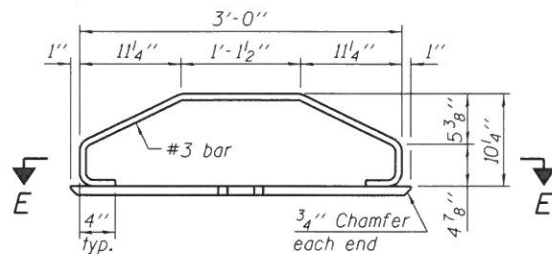
SHEET NUMBER
18 of 28

PLOT DATE: 5/18/2018

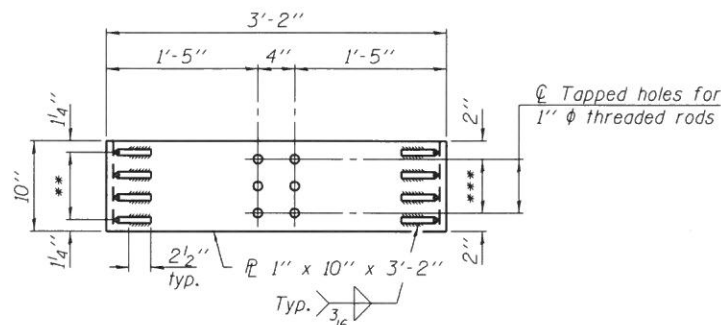
© 2013 FEHR-GRAHAM



PLAN - TOP PLATE



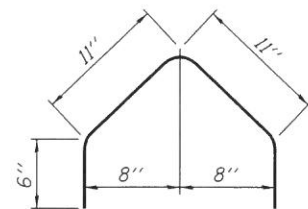
ELEVATION - BOTTOM PLATE ASSEMBLY



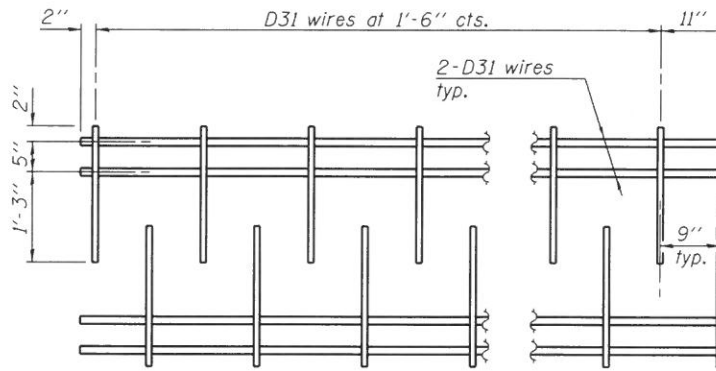
SECTION E-E

** 3 Spaces at 2 1/2" = 7 1/2"

*** 2 Spaces at 3" = 6"

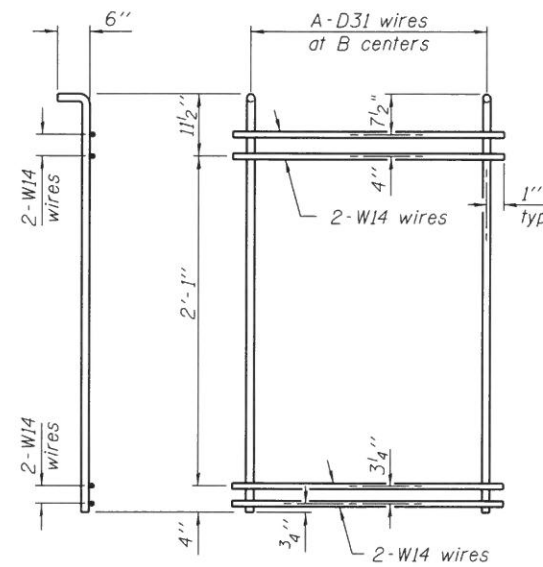


BAR G1(E)



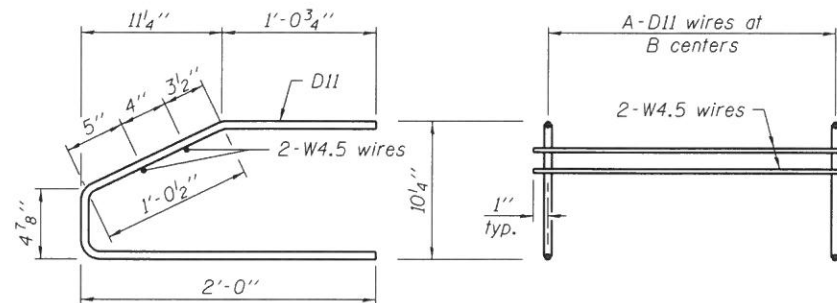
M1 WWR DETAIL

When multiple sheets of M1 WWR are required along the beam length, #5(E) bars (4'-6" long) shall be used to splice the longitudinal D31 wires together.



M5 THRU M8 WWR DETAIL

(See Table of Dimensions)



M2 THRU M4 WWR DETAIL

(See Table of Dimensions)

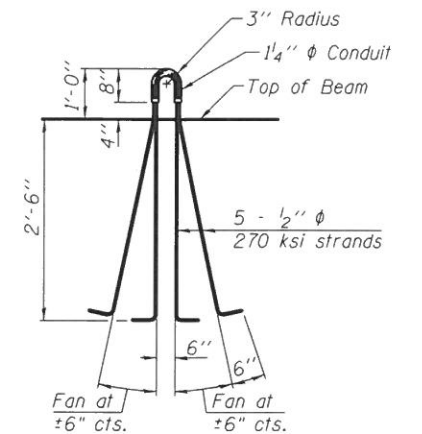
NOTES

Inserts for 3/4" ϕ threaded dowel rods, when specified, are to be two strut, ferrule type for interior beams and single ferrule, flared loop type for exterior beams. Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter for beam strands shall be 0.6" and the nominal cross-sectional area shall be 0.217 sq. in. The nominal diameter for lifting loops shall be 1/2" and the nominal cross sectional area shall be 0.153 sq. in. The beams shall have a final concrete compressive strength, f'_c , of 8500 psi and a release concrete compressive strength, f'_{ci} , of 7000 psi. A minimum 2 1/2" ϕ lifting pin shall be used to engage the lifting loops during handling. The top and bottom plates shall be AASHTO M270 Grade 50. The top plates and bottom plate assemblies shall be galvanized according to AASHTO M111. The threaded rods, nuts and washers shall be galvanized according to AASHTO M232. Threaded rods shall be ASTM F 1554 Grade 55. Beams shall not be released from the fabricator until they have attained 45 days of age or older. Welded Wire Reinforcement (WWR) shall conform to ASTM A884 with a Class A, Type 1 epoxy coating.

TABLE OF DIMENSIONS

SPAN 1

WWR	A	B
M2	9	3"
M3	6	6"
M4	25	1'-6"
M5	9	3"
M6	46	6"
M7	9	1'-0"
M8	4	2'-0"



LIFTING LOOP DETAIL

(1 Required - Each End)

BILL OF MATERIAL

Item	Unit	Total
Furnishing and Erecting Precast Prestressed Concrete Beams, IL36N	Ft.	425

Estimated Total Weight (One Beam) = 64,520 Pounds

IL36-2438D

1-28-16

Sheet 13 of 19

FEHR GRAHAM

ENGINEERING & ENVIRONMENTAL

ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

OWNER/DEVELOPER:

GRUNDY COUNTY HWY. DEPT.
245 NORTH ILLINOIS ROUTE 47
MORRIS, IL 60450

PROJECT AND LOCATION:

SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

DESIGNED: ARK
CHECKED: GJB
DRAWN: MMY
CHECKED: ARK-MCB

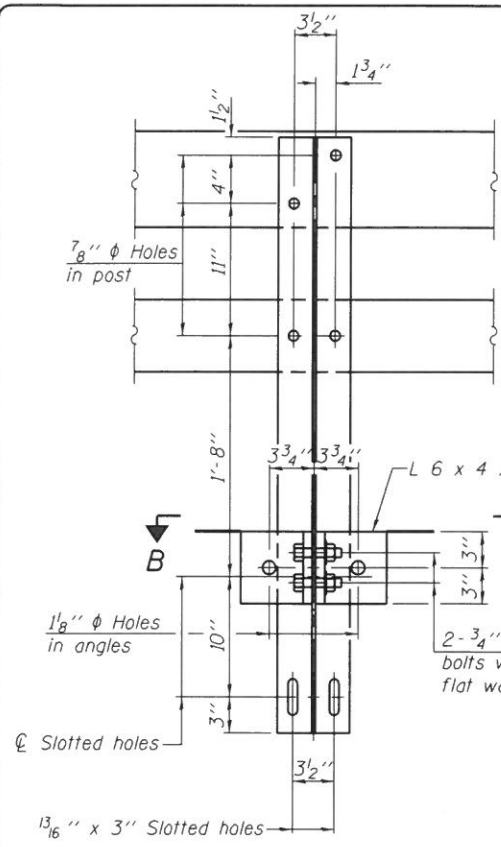
REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
IL36N BEAM DETAILS
STRUCTURE NUMBER 032-3211

16-096-13-beam-det.dgn
CONTRACT #: 87643

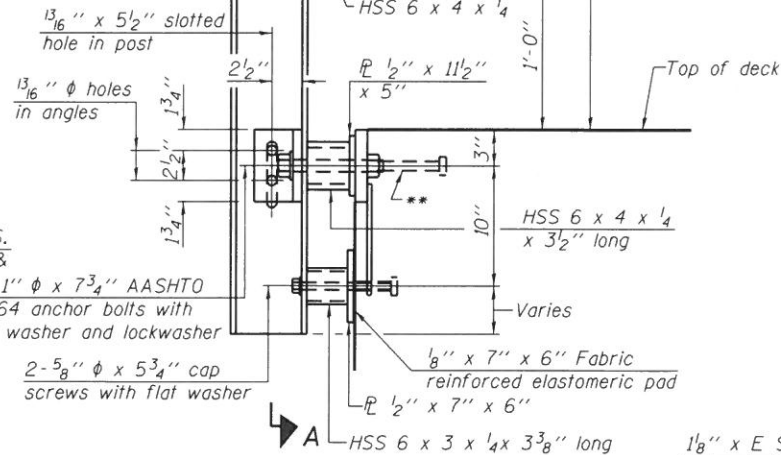
JOB NUMBER:
16-096

SHEET NUMBER
19 of 28

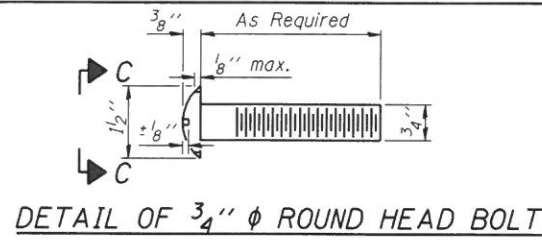


SECTION A-A

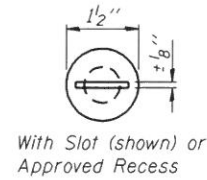
4-3/4" φ x 6" Round Head Bolts with locknut & flat washer.
7/8" φ holes in hollow structural section may be drilled in the field.



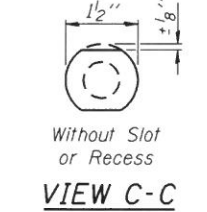
SECTION AT RAIL POST



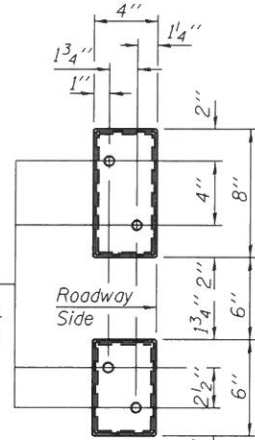
DETAIL OF 3/4" φ ROUND HEAD BOLT



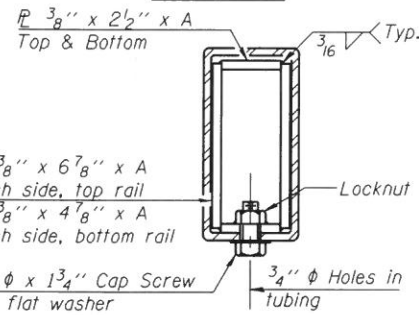
VIEW C-C



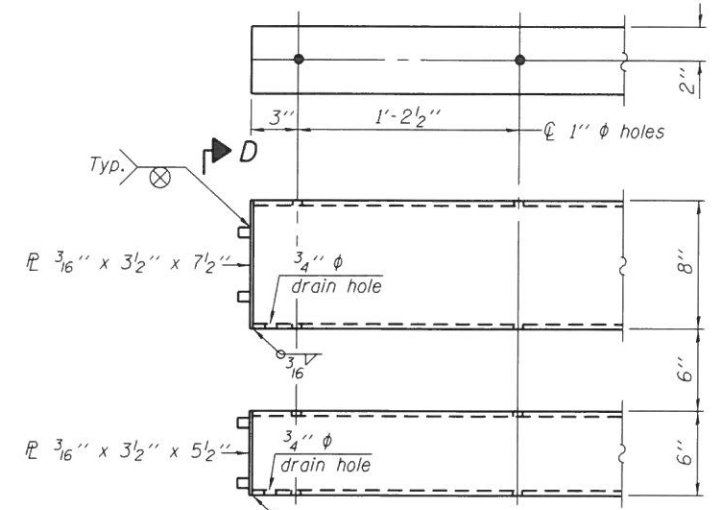
VIEW D-D



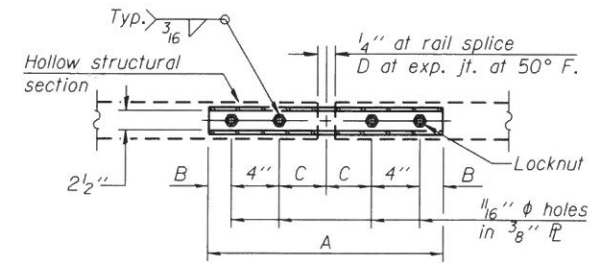
VIEW D-D



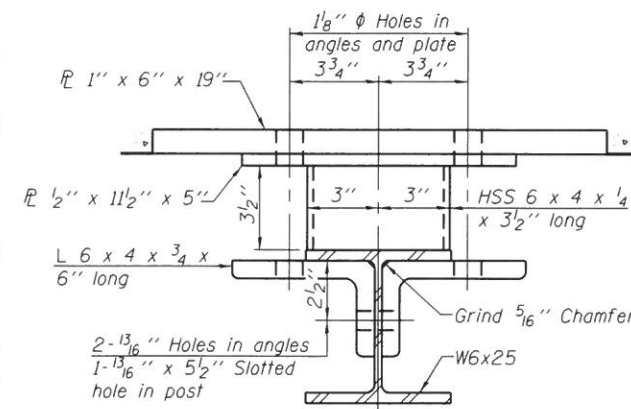
SECTION AT RAIL SPLICE



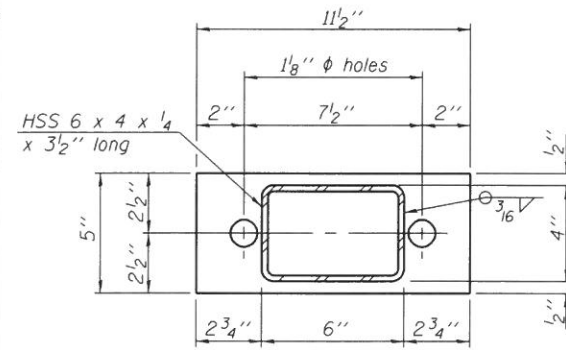
END OF RAIL DETAILS
(At NE, SW & SE corners)



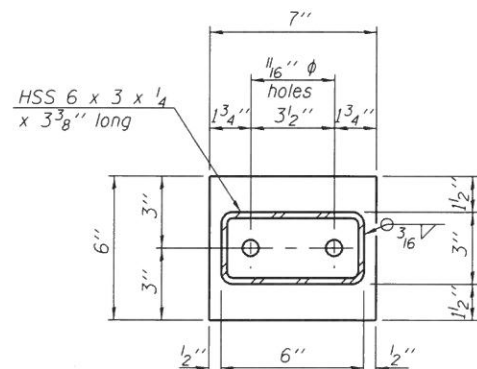
PLAN-BOTT. SPLICE
TYPICAL



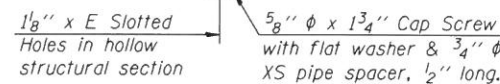
SECTION B-B



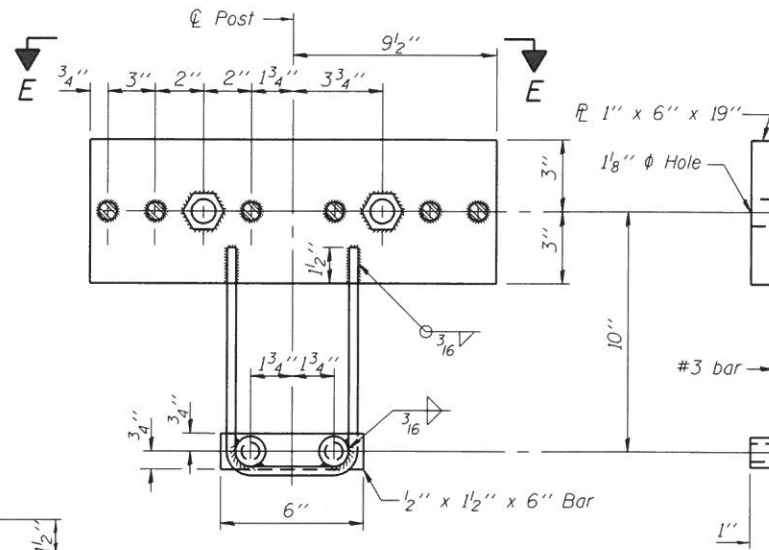
SECTION AT RAIL SPLICE



SECTION AT RAIL SPLICE

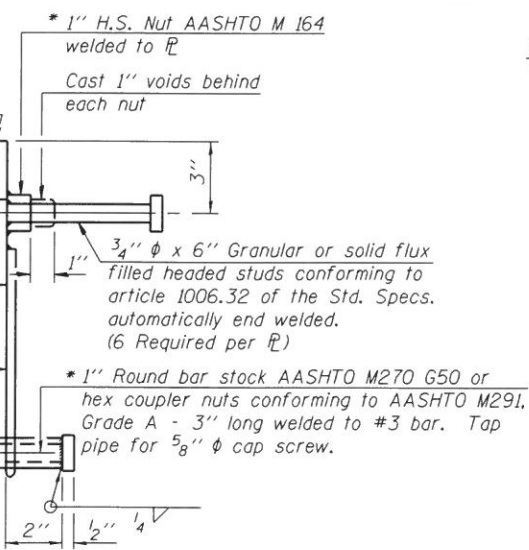


RAIL SPLICE CONNECTION
AT EXPANSION JT.



ANCHOR DEVICE

*Threaded areas shall be plugged or blocked off during casting of beam. Galvanized after fabrication.



SPLICE DIMENSIONS

T	D	A	B	C	E
≤ 4"	2 1/2"	1'-8"	2"	4"	2 1/2"
> 4" ≤ 6 1/2"	3 3/4"	2'-0"	2 1/2"	5 1/2"	3 1/2"
> 6 1/2" ≤ 9"	5"	2'-4"	3 1/2"	6 1/2"	9"
> 9" ≤ 13"	7"	2'-10"	4 1/2"	8 1/2"	11"
Rail Splice	1 1/4"	1'-8"	2"	4"	—

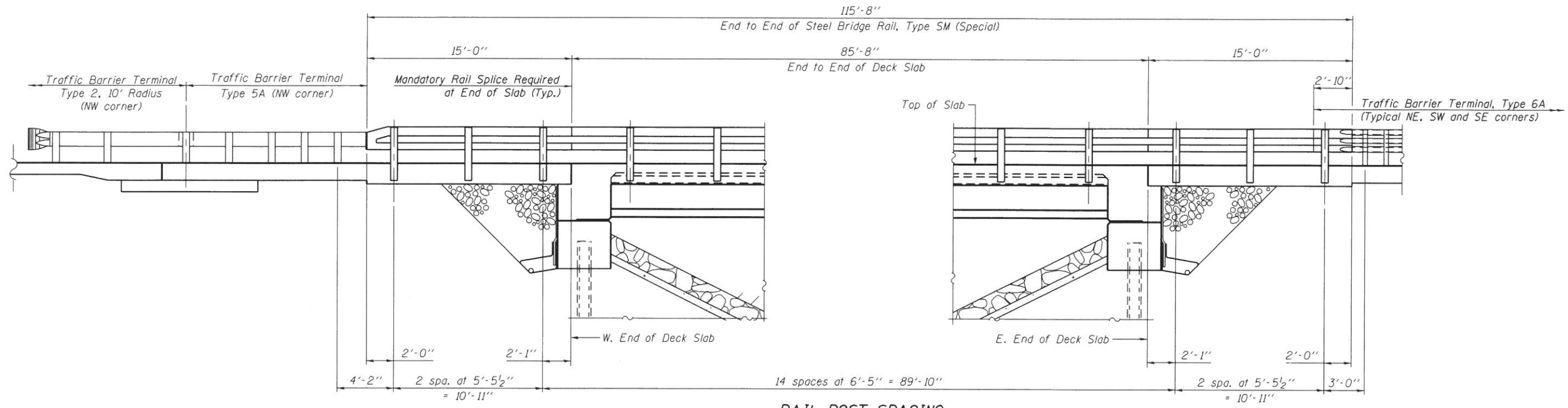
T = Total movement at expansion joint as shown on the design plans.

Notes:
For multi-span bridges, sufficient 1/4" x 6" x 1'-2" galvanized steel shims shall be provided to align rail between adjacent spans. Cost included with Steel Railing, Type SM.
All steel rail members shall be galvanized according to Article 509.05 of the Standard Specifications.
** The studs of the anchor devices shall be placed below the top reinforcement bars and the outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchor device.
See Sheet 15 of 19 for rail post spacing.

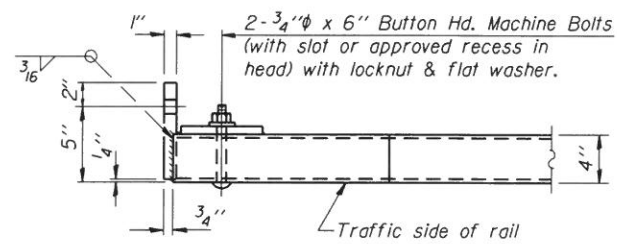
BILL OF MATERIAL

Item	Unit	Quantity
Steel Bridge Rail, Type SM (Special)	Foot	232

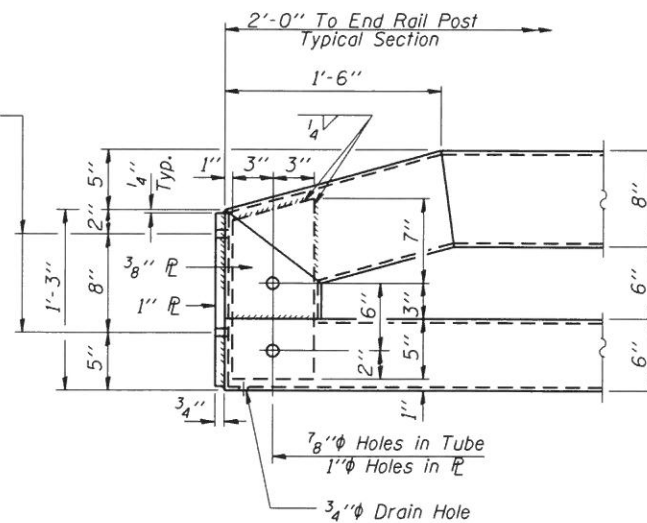
Sheet 14 of 19



RAIL POST SPACING



1/8" phi Holes for 1" phi x 4" Round Head Bolts. Provide 2 flat washers & locknuts for guardrail connection shown on Std. BLR 27.



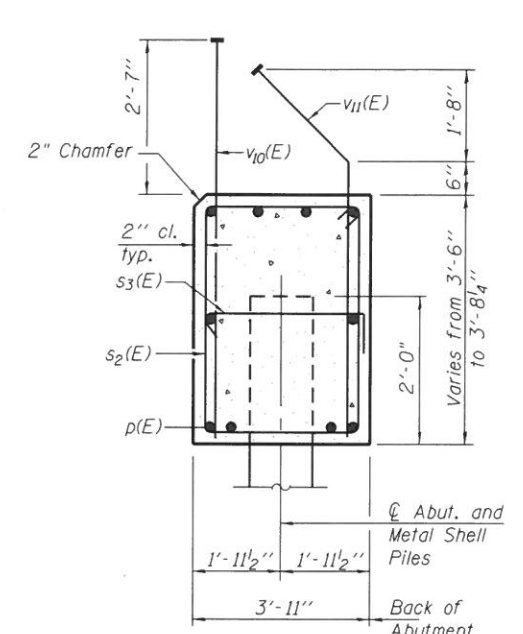
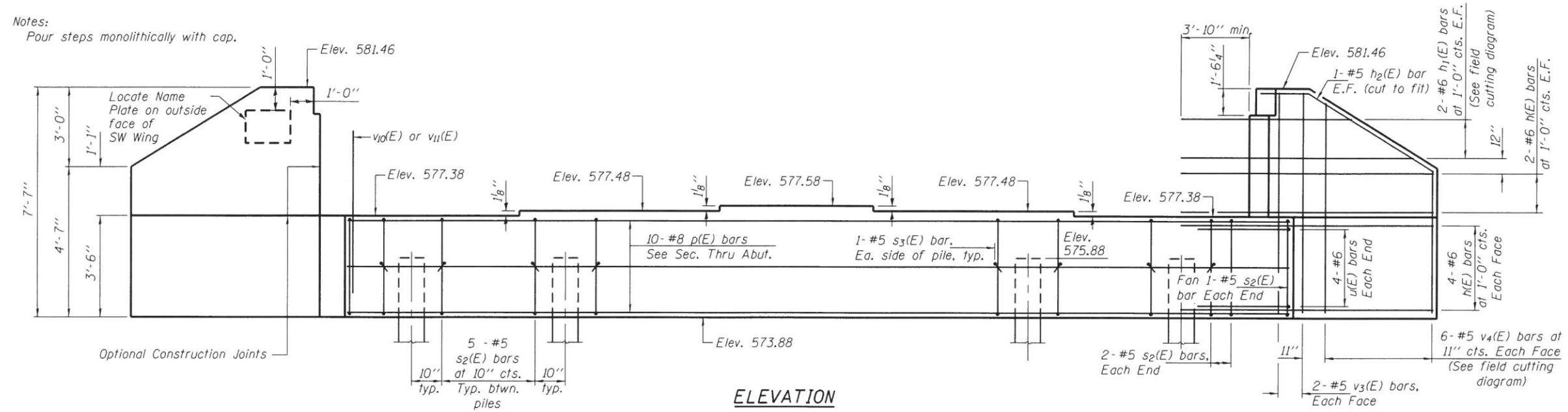
END OF RAIL DETAILS

DEPARTURE END

(NW Corner)

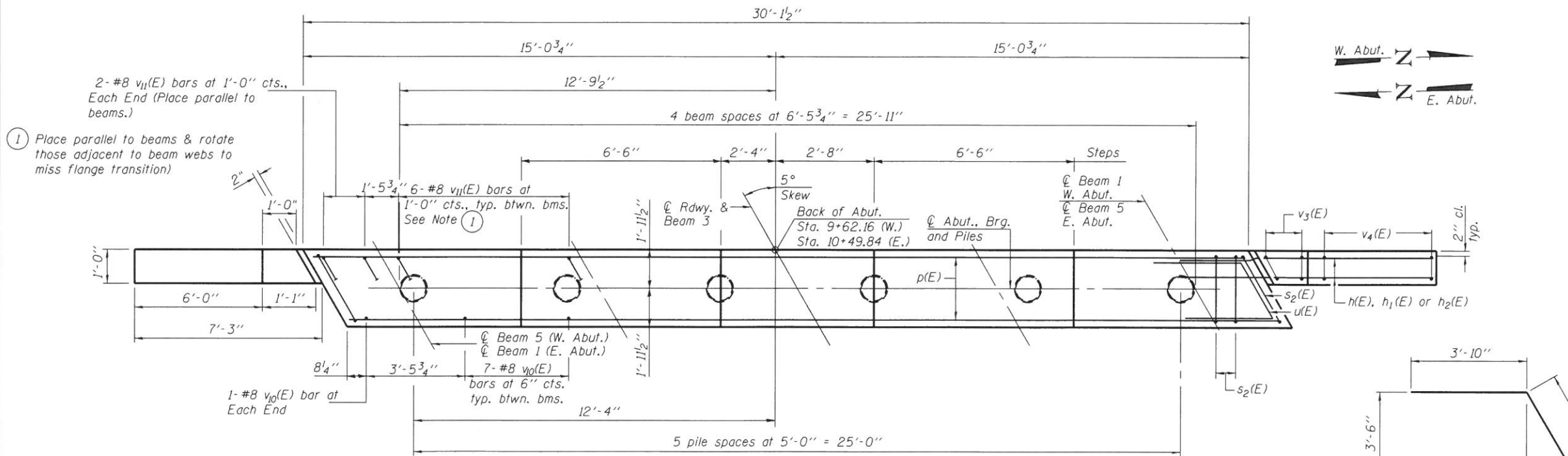
REVISIONS		
REV. NO.	DESCRIPTION	DATE

Notes:
Pour steps monolithically with cap.



SEC. THRU ABUT.

Dimensions at right angles to abutment.



① Place parallel to beams & rotate those adjacent to beam webs to miss flange transition

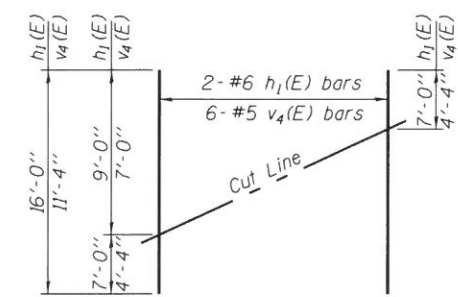
**BILL OF MATERIAL
TWO ABUTMENTS**

Bar	No.	Size	Length	Shape
h(E)	48	#6	10'-11"	—
h1(E)	8	#6	16'-0"	—
h2(E)	8	#5	7'-5"	—
p(E)	20	#8	29'-10"	—
s2(E)	62	#5	14'-5"	□
s3(E)	24	#5	4'-7"	┌
u(E)	16	#6	11'-2"	┌
v3(E)	16	#5	7'-4"	—
v4(E)	24	#5	11'-4"	—
v10(E)	60	#8	5'-11"	—
v11(E)	56	#8	6'-2"	┌
Structure Excavation	Cu. Yd.	100		
Concrete Structures	Cu. Yd.	37.1		
Reinforcement Bars, Epoxy Coated	Pound	6230		
Furnishing Metal Shell Piles, 14" x 0.25"	Foot	240		
Driving Piles	Foot	240		
Test Pile, Metal Shells	Each	2		
Protective Coat	Sq. Yd.	17		

For details of piles see sheet 17 of 19.

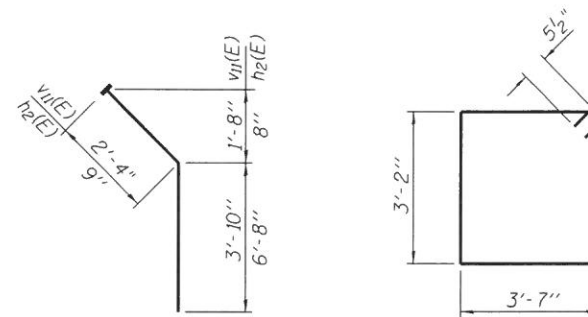
PILE DATA

Type: Metal Shell 14" x 0.25"
Nominal Required Bearing: 365k
Factored Resistance Available: 200k
Est. Length: 24'
No. Production Piles: 10
No. Test Piles: 1 (E. Abut.), 1 (W. Abut.)

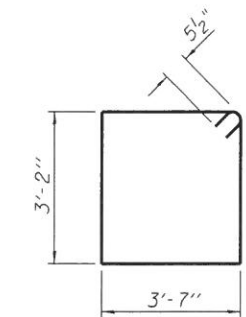


FIELD CUTTING DIAGRAM

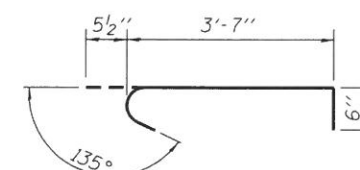
Order h1(E) and v4(E) full length. Cut as shown and use remainder of bars in opposite face.



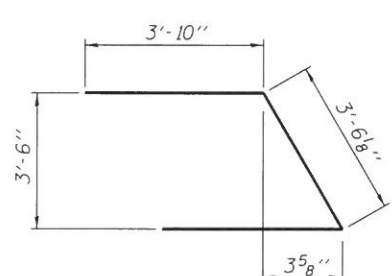
BAR v11(E) & h2(E)
(v11(E) headed)



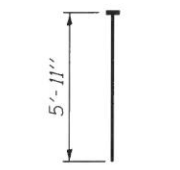
BAR s2(E)



BAR s3(E)



BAR u(E)



BAR v10(E)
(headed)

AI-2440-L

8-31-12

Sheet 16 of 19

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

OWNER/DEVELOPER:
GRUNDY COUNTY HWY. DEPT.
245 NORTH ILLINOIS ROUTE 47
MORRIS, IL 60450

PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

DESIGNED: ARK
CHECKED: GJB
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CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

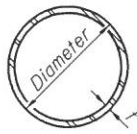
DRAWING:
ABUTMENTS
STRUCTURE NUMBER 032-3211

JOB NUMBER:
16-096
SHEET NUMBER
22 of 28

PLOT DATE: 5/8/2018

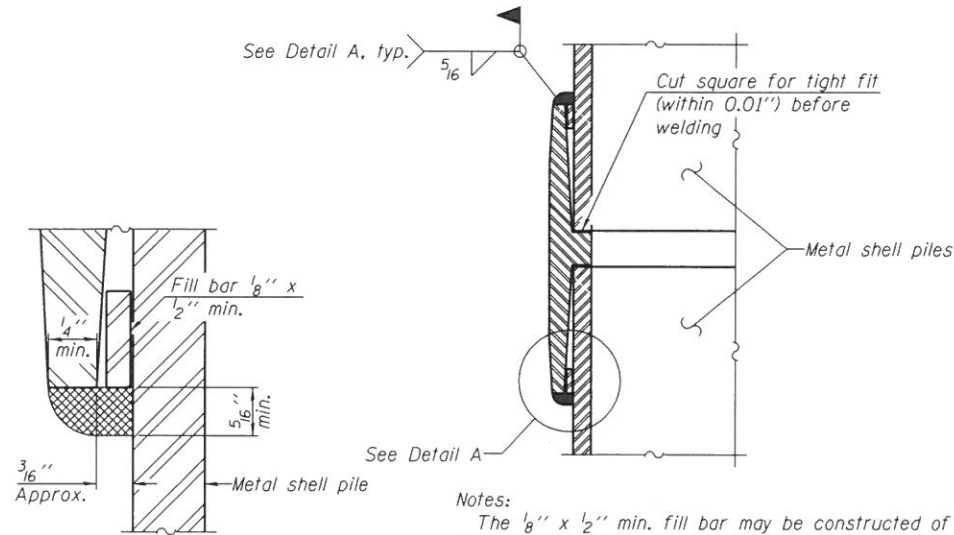
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CONTRACT #: 87643



METAL SHELL PILE TABLE

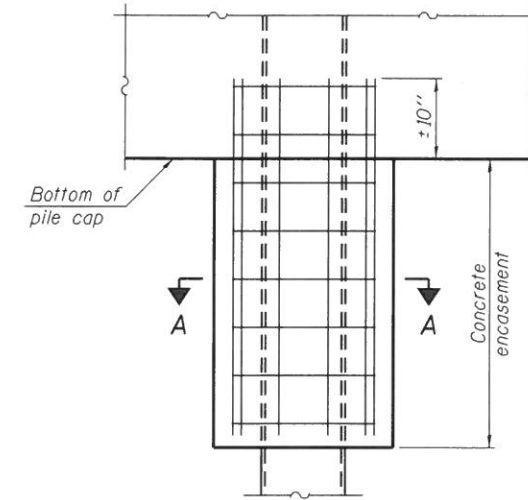
Designation and outside diameter	Wall thickness t	Weight per foot (Lbs./ft.)	Inside volume (yd. ³ /ft.)
PP12	0.179"	22.60	0.0274
PP12	0.250"	31.37	0.0267
PP14	0.250"	36.71	0.0368
PP14	0.312"	45.61	0.0361



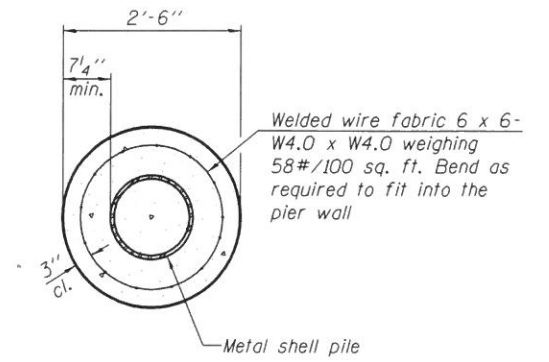
DETAIL A

Notes:
 The 1/8" x 1/2" min. fill bar may be constructed of 2 bars with a 1/8" max. gap between them.
 Pile segments shall be driven to solid contact with splicer before welding.

WELDED COMMERCIAL SPLICE



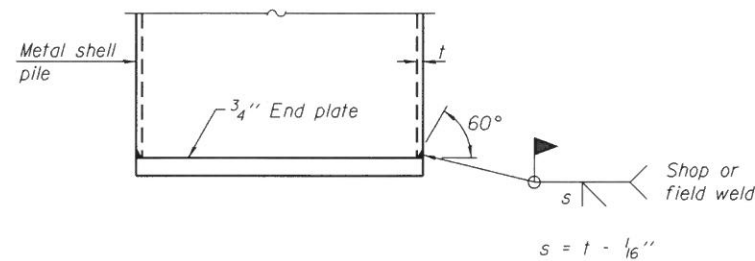
ELEVATION



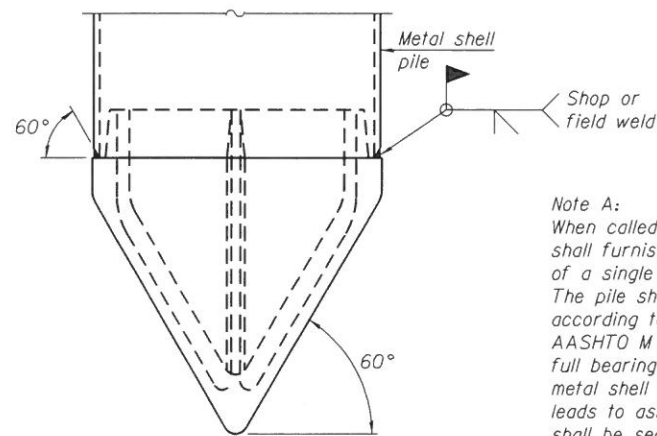
SECTION A-A

Note:
 Forms for encasement may be omitted when soil conditions permit.

CONCRETE ENCASEMENT AT PIERS



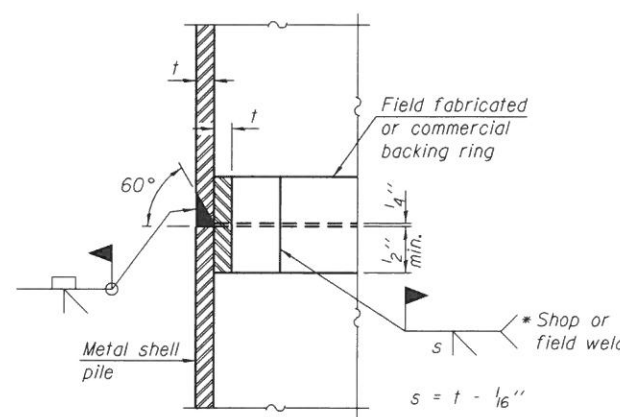
END PLATE ATTACHMENT



Note A:
 When called for on the plans, the Contractor shall furnish metal shell pile shoes consisting of a single piece conical pile point as shown. The pile shoes shall be cast in one piece steel according to either ASTM A 148 Grade 90-60 or AASHTO M 103 Grade 65-35 and shall provide full bearing over the full circumference of the metal shell pile. The pile shoe shall have tapered leads to assure proper alignment and fitting and shall be secured to the pile with a circumferential weld.

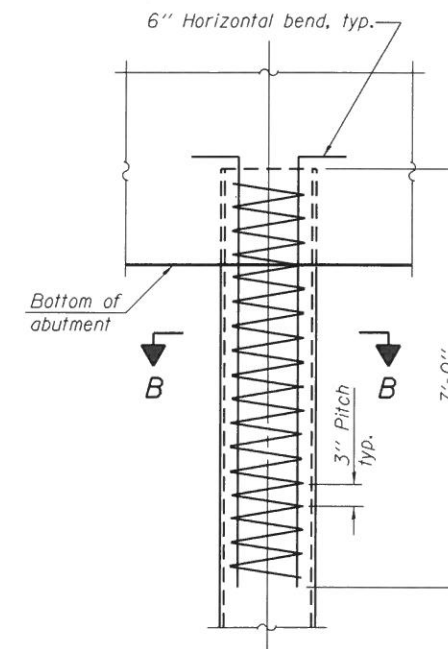
METAL SHELL PILE SHOE ATTACHMENT

(See Note A)

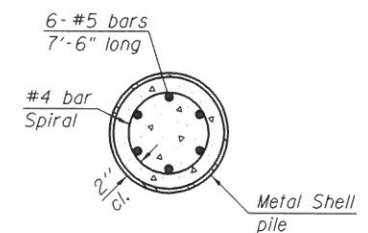


COMPLETE PENETRATION WELD SPLICE

* Field fabricated backing ring may be made from pile shell by removing segment to allow reducing circumference and vertically rejoin with partial joint penetration weld.



ELEVATION



SECTION B-B

METAL SHELL REINFORCEMENT AT ABUTMENTS

Note:
 The metal shell piles shall be according to ASTM A 252 Grade 3.

F-MS

1-27-12

Sheet 17 of 19

FEHR GRAHAM
 ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
 IOWA
 WISCONSIN

OWNER/DEVELOPER:
 GRUNDY COUNTY HWY. DEPT.
 245 NORTH ILLINOIS ROUTE 47
 MORRIS, IL 60450

PROJECT AND LOCATION:
 SECTION 16-00159-00-BR
 C.H. C41/GRAND RIDGE ROAD
 PROJECT Y035(110)

DESIGNED: ARK
 CHECKED: GJB
 DRAWN: MMY
 CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
 METAL SHELL PILE DETAILS
 STRUCTURE NUMBER 032-3211

JOB NUMBER:
 16-096

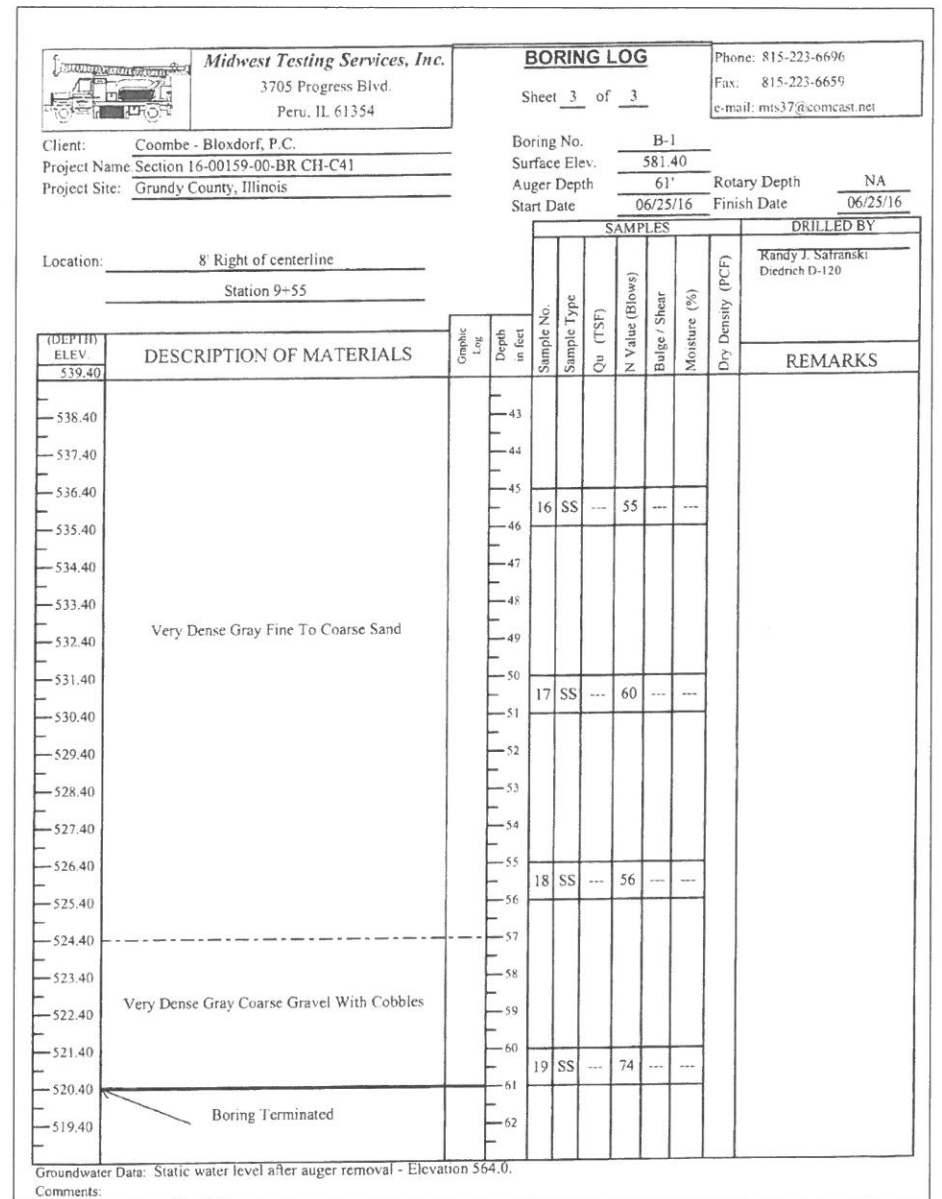
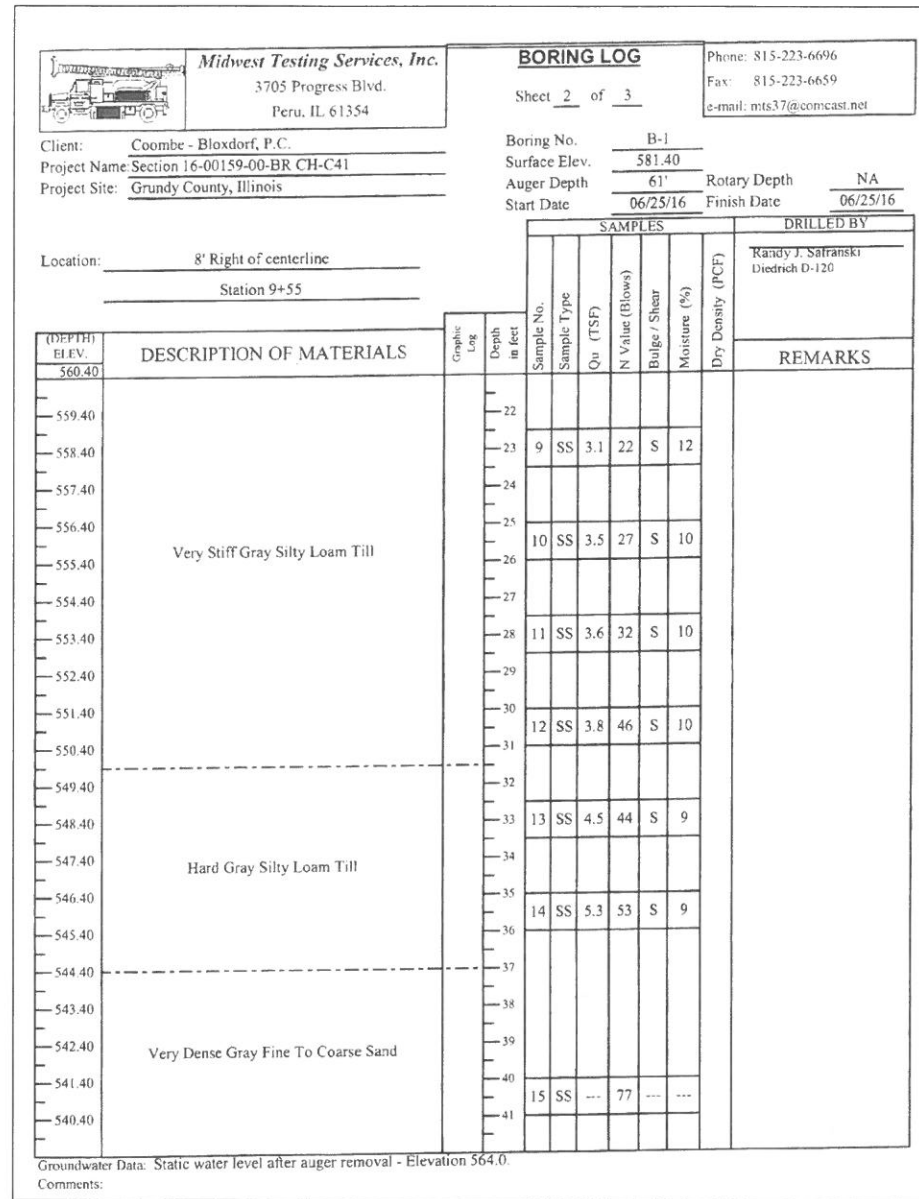
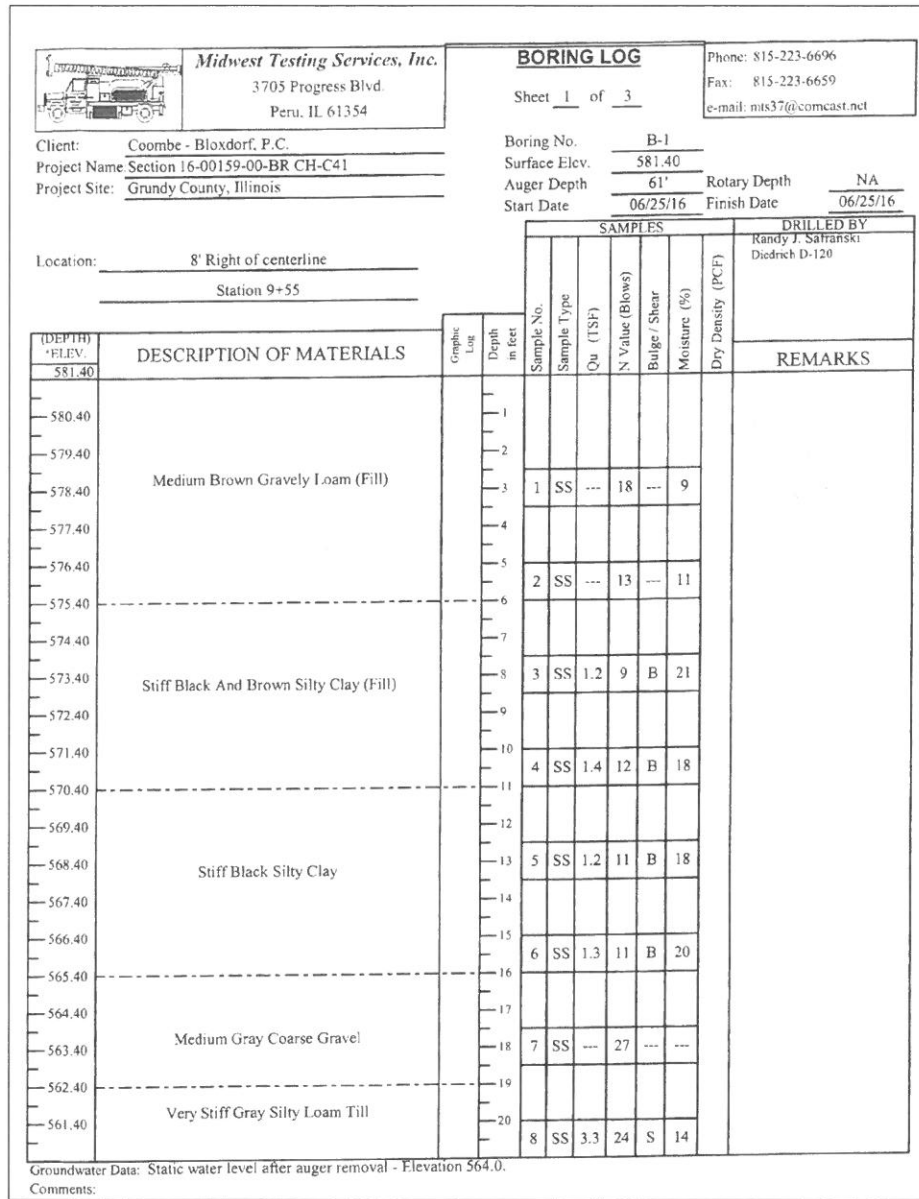
SHEET NUMBER
 23 of 28

PLOT DATE: 5/18/2018

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16-096-17-p1.e.dgn

CONTRACT #: 87643



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ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525
ILLINOIS IOWA WISCONSIN

OWNER/DEVELOPER:
GRUNDY COUNTY HWY. DEPT.
245 NORTH ILLINOIS ROUTE 47
MORRIS, IL 60450

PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD
PROJECT Y035(110)

DESIGNED: ARK
CHECKED: GJB
DRAWN: MMY
CHECKED: ARK-MCB

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:
SOIL BORING LOGS
STRUCTURE NUMBER 032-3211
16-096-18-borings.dgn
CONTRACT #: 87643

JOB NUMBER:
16-096
SHEET NUMBER
24 of 28

Midwest Testing Services, Inc.
3705 Progress Blvd.
Peru, IL 61354
Phone: 815-223-6696
Fax: 815-223-6659
e-mail: mts37@comcast.net

BORING LOG
Sheet 1 of 3

Client: Coombe - Bloxdorf, P.C.
Project Name: Section 16-00159-00-BR CH-C41
Project Site: Grundy County, Illinois

Boring No. B-2
Surface Elev. 581.50
Auger Depth 61' Rotary Depth NA
Start Date 06/25/16 Finish Date 06/25/16

Location: 7' Left of centerline
Station 10+51

(DEPTH) ELEV.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES					DRILLED BY Kandy J. Salfanski Diedrich D-120	REMARKS
				Sample No.	Sample Type	Qu (TSF)	N Value (Blows)	Bulge / Shear		
581.50										
580.50			1							
579.50			2							
578.50	Medium Brown Gravelly Loam (Fill)		3	1	SS	---	27	---	10	
577.50			4							
576.50			5							
575.50			6	2	SS	---	20	---	10	
574.50			7							
573.50	Stiff Black And Brown Silty Clay (Fill)		8	3	SS	1.0	8	B	22	
572.50			9							
571.50			10	4	SS	1.5	10	B	18	
570.50			11							
569.50	Stiff Black Silty Clay		12	5	SS	1.3	10	S	19	
568.50			13							
567.50			14							
566.50	Very Stiff Gray Silty Loam Till		15	6	SS	3.2	25	S	14	
565.50			16							
564.50	Dense Gray Coarse Gravel		17	7	SS	---	32	---	---	
563.50			18							
562.50			19							
561.50	Hard Gray Silty Loam Till		20	8	SS	4.5	44	S	12	

Groundwater Data: Static water level after auger removal - Elevation 564.0.
Comments:

Midwest Testing Services, Inc.
3705 Progress Blvd.
Peru, IL 61354
Phone: 815-223-6696
Fax: 815-223-6659
e-mail: mts37@comcast.net

BORING LOG
Sheet 2 of 3

Client: Coombe - Bloxdorf, P.C.
Project Name: Section 16-00159-00-BR CH-C41
Project Site: Grundy County, Illinois

Boring No. B-2
Surface Elev. 581.50
Auger Depth 61' Rotary Depth NA
Start Date 06/25/16 Finish Date 06/25/16

Location: 7' Left of centerline
Station 10+51

(DEPTH) ELEV.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES					DRILLED BY Kandy J. Salfanski Diedrich D-120	REMARKS
				Sample No.	Sample Type	Qu (TSF)	N Value (Blows)	Bulge / Shear		
580.50			22							
579.50			23	9	SS	3.8	33	S	9	
578.50			24							
577.50	Very Stiff To Hard Silty Loam Till		25	10	SS	3.5	35	S	9	
576.50			26							
575.50			27							
574.50			28	11	SS	4.0	35	S	10	
573.50			29							
572.50			30	12	SS	4.7	49	S	10	
571.50			31							
570.50	Hard Gray Silty Loam Till		32	13	SS	5.3	51	S	9	
569.50			33							
568.50			34							
567.50			35	14	SS	5.3	44	S	9	
566.50			36							
565.50			37							
564.50	Very Dense Gray Fine To Coarse Sand		38							
563.50			39							
562.50			40	15	SS	---	57	---	---	
561.50			41							

Groundwater Data: Static water level after auger removal - Elevation 564.0.
Comments:

Midwest Testing Services, Inc.
3705 Progress Blvd.
Peru, IL 61354
Phone: 815-223-6696
Fax: 815-223-6659
e-mail: mts37@comcast.net

BORING LOG
Sheet 3 of 3

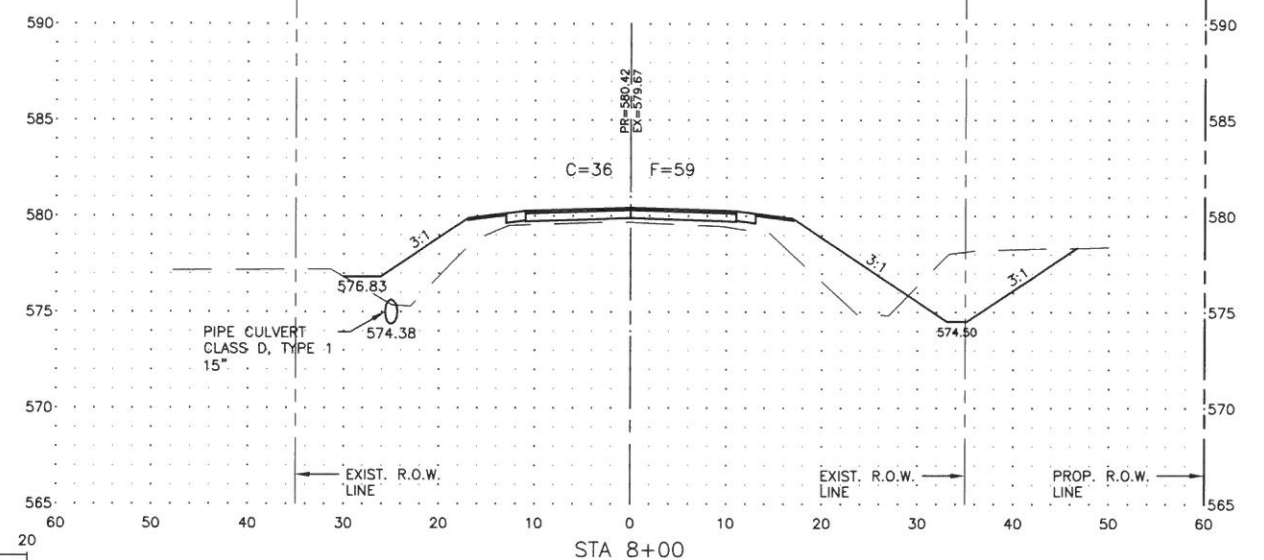
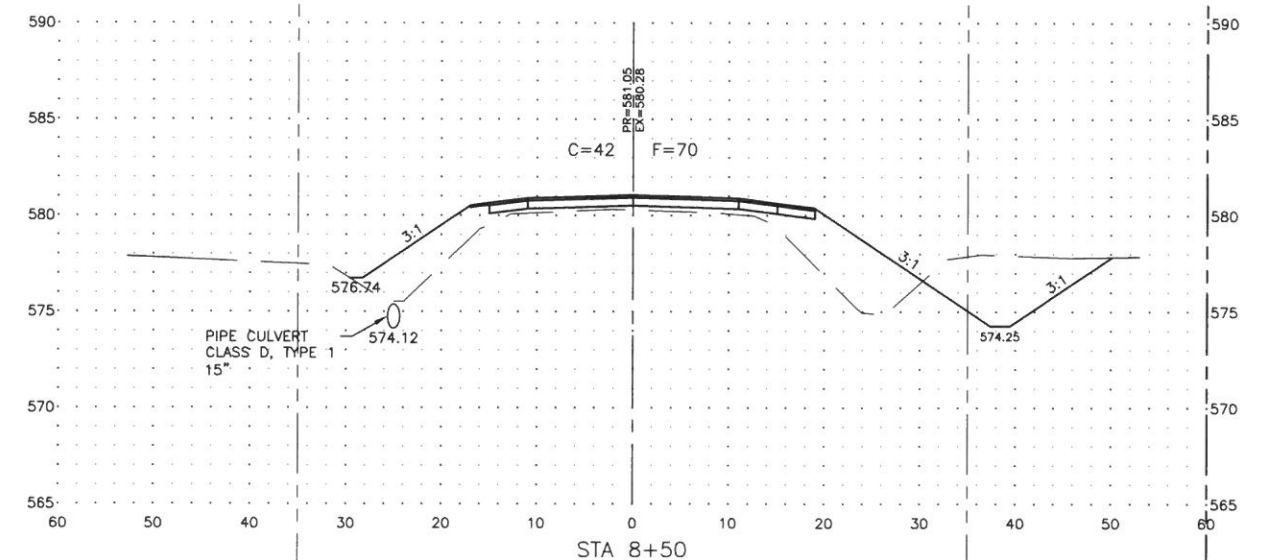
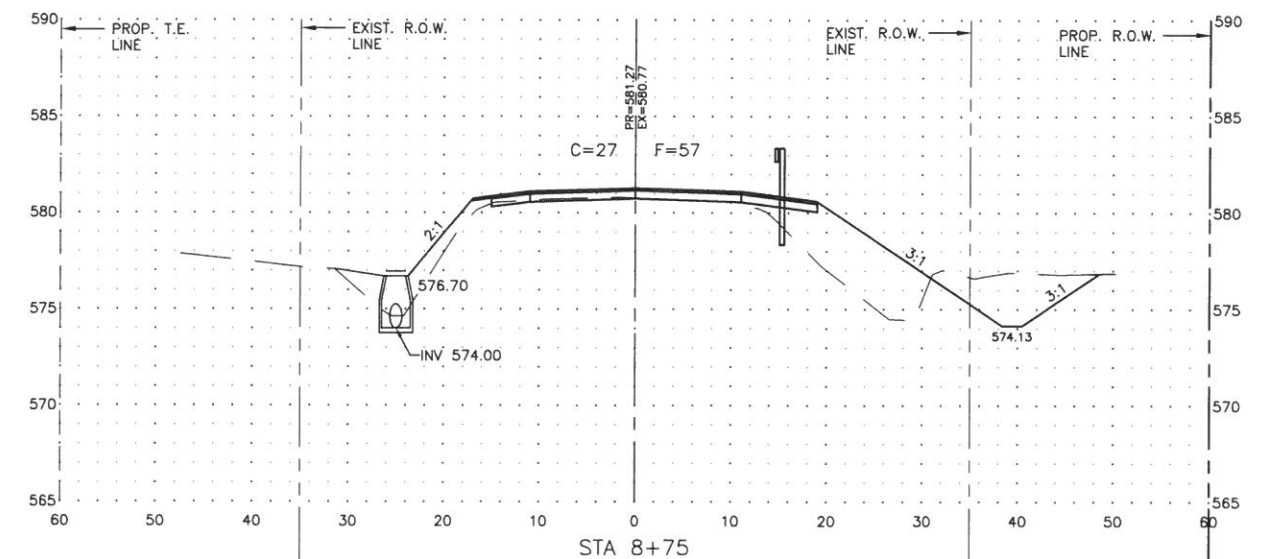
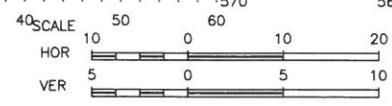
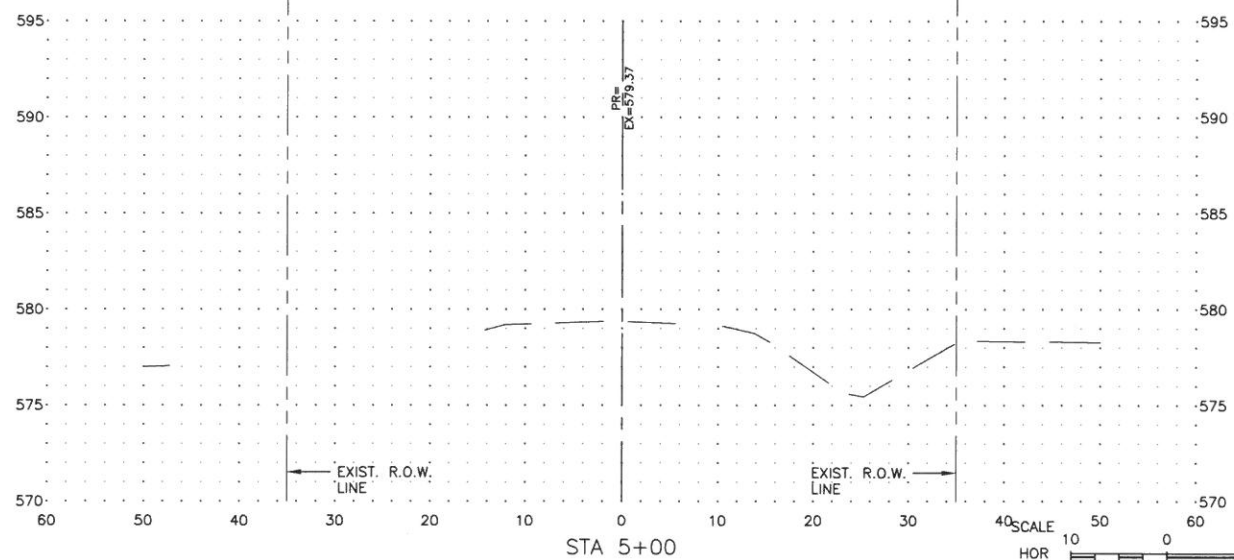
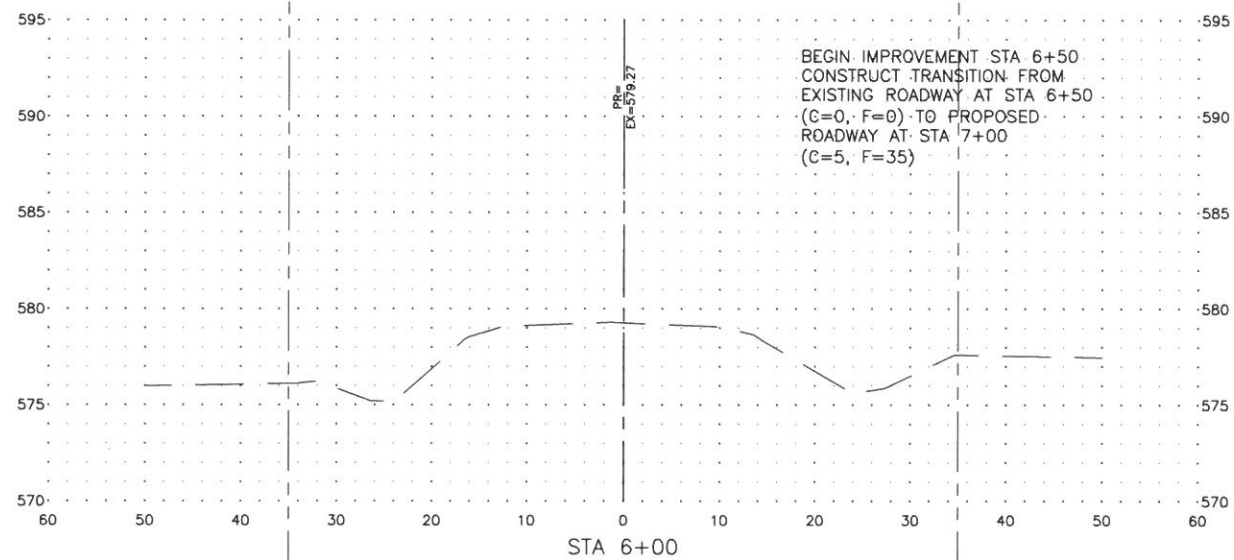
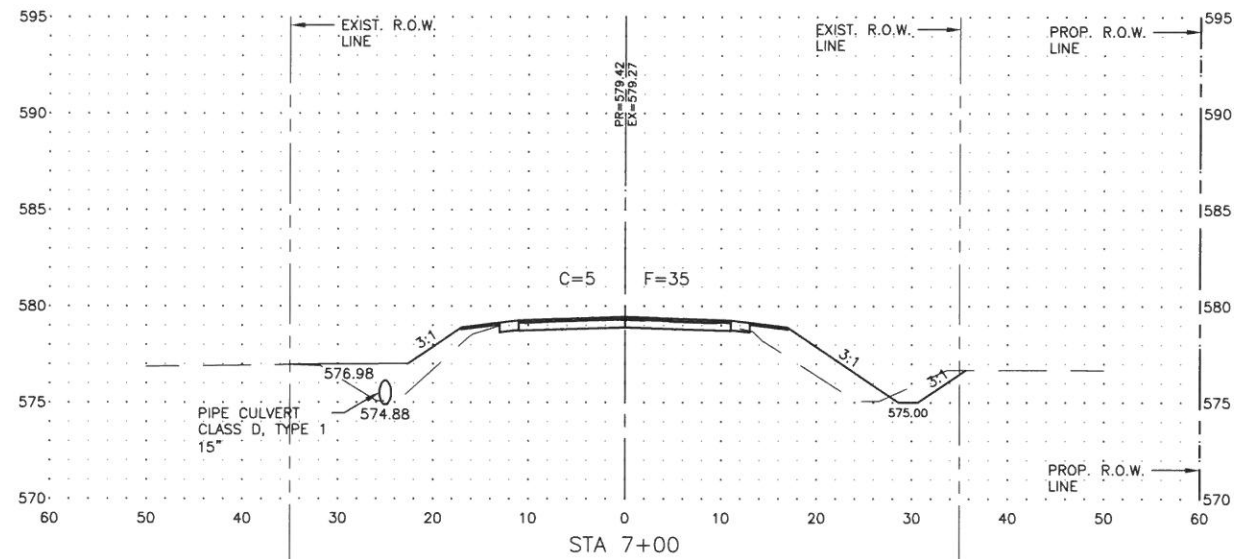
Client: Coombe - Bloxdorf, P.C.
Project Name: Section 16-00159-00-BR CH-C41
Project Site: Grundy County, Illinois

Boring No. B-2
Surface Elev. 581.50
Auger Depth 61' Rotary Depth NA
Start Date 06/25/16 Finish Date 06/25/16

Location: 7' Left of centerline
Station 10+51

(DEPTH) ELEV.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES					DRILLED BY Kandy J. Salfanski Diedrich D-120	REMARKS
				Sample No.	Sample Type	Qu (TSF)	N Value (Blows)	Bulge / Shear		
580.50			43							
579.50			44							
578.50			45	16	SS	---	58	---	---	
577.50			46							
576.50			47							
575.50	Very Dense Gray Fine To Coarse Sand		48							
574.50			49							
573.50			50	17	SS	---	52	---	---	
572.50			51							
571.50			52							
570.50			53							
569.50			54							
568.50			55	18	SS	---	55	---	---	
567.50			56							
566.50			57							
565.50			58							
564.50	Hard Gray Loam Till		59							
563.50			60	19	SS	5.6	62	S	9	
562.50			61							
561.50			62							

Groundwater Data: Static water level after auger removal - Elevation 564.0.
Comments:



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MORRIS, IL 60450

PROJECT AND LOCATION:
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C.H. C41/GRAND RIDGE ROAD,
PROJECT YQ35(110)

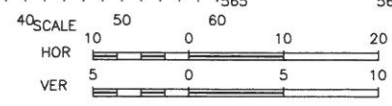
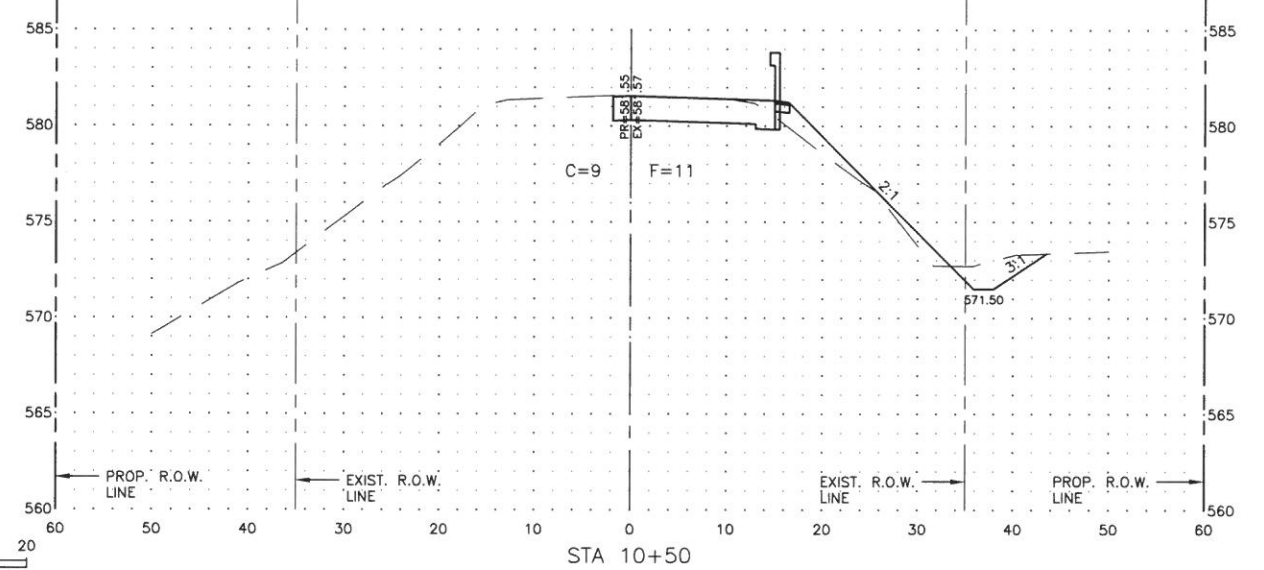
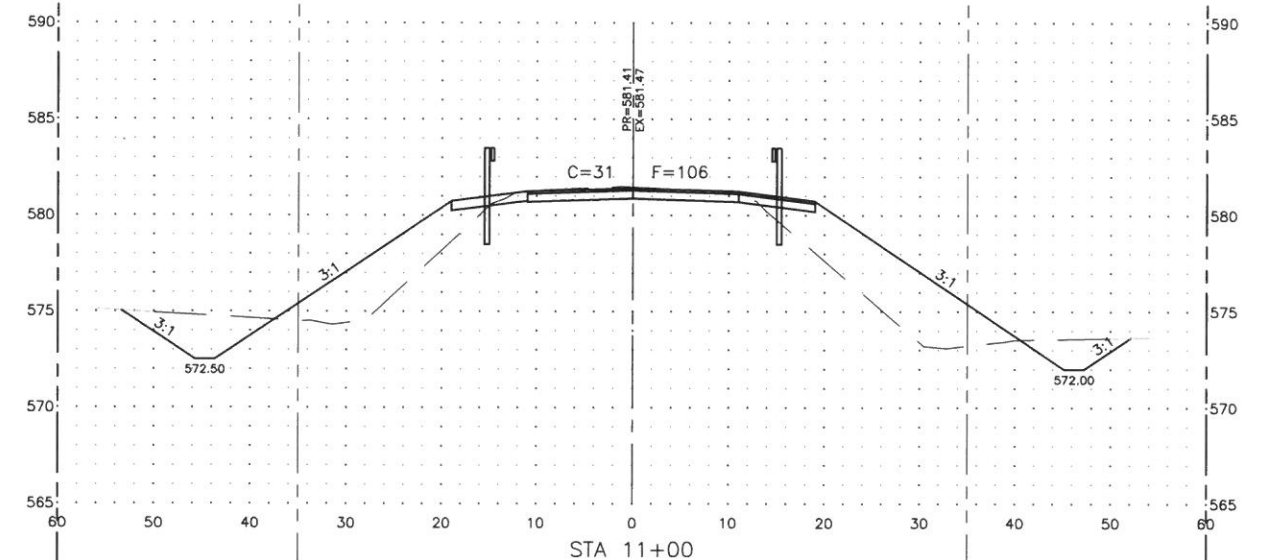
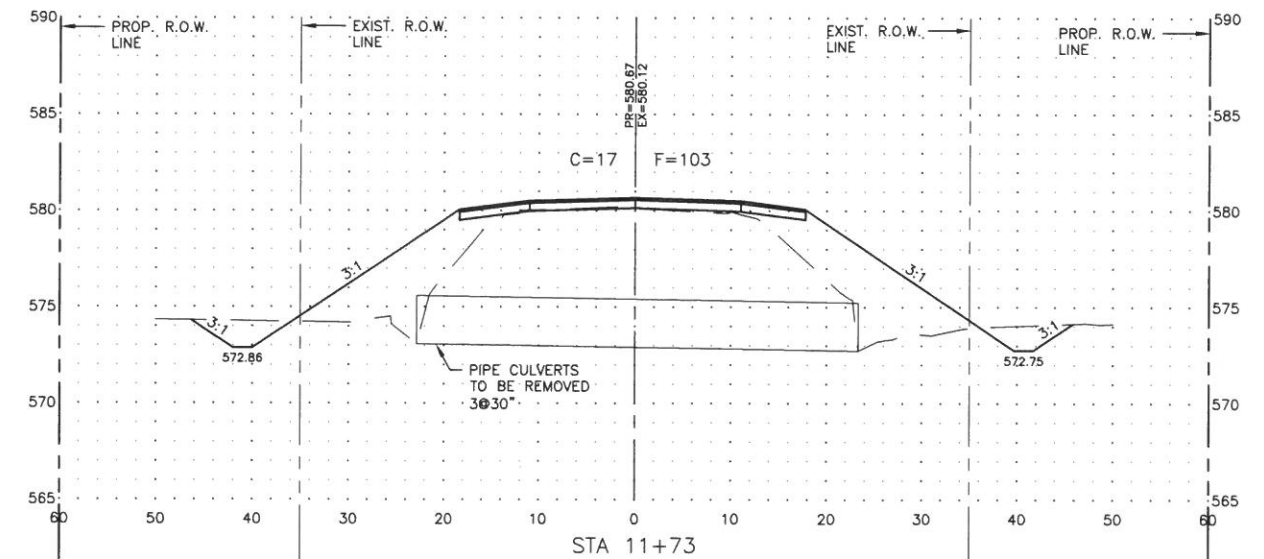
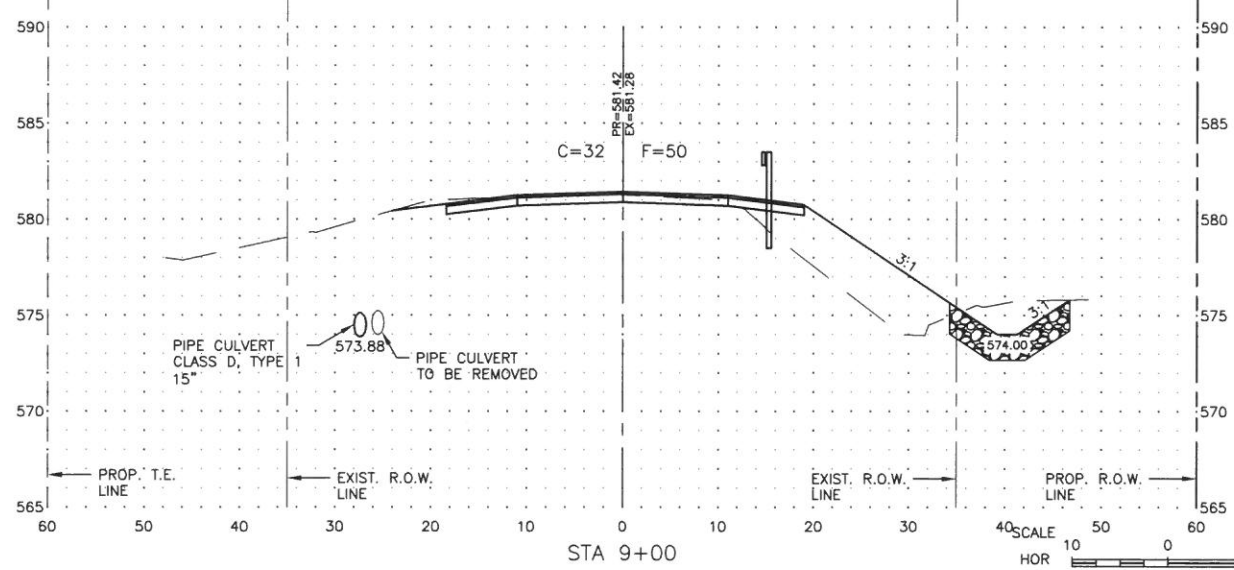
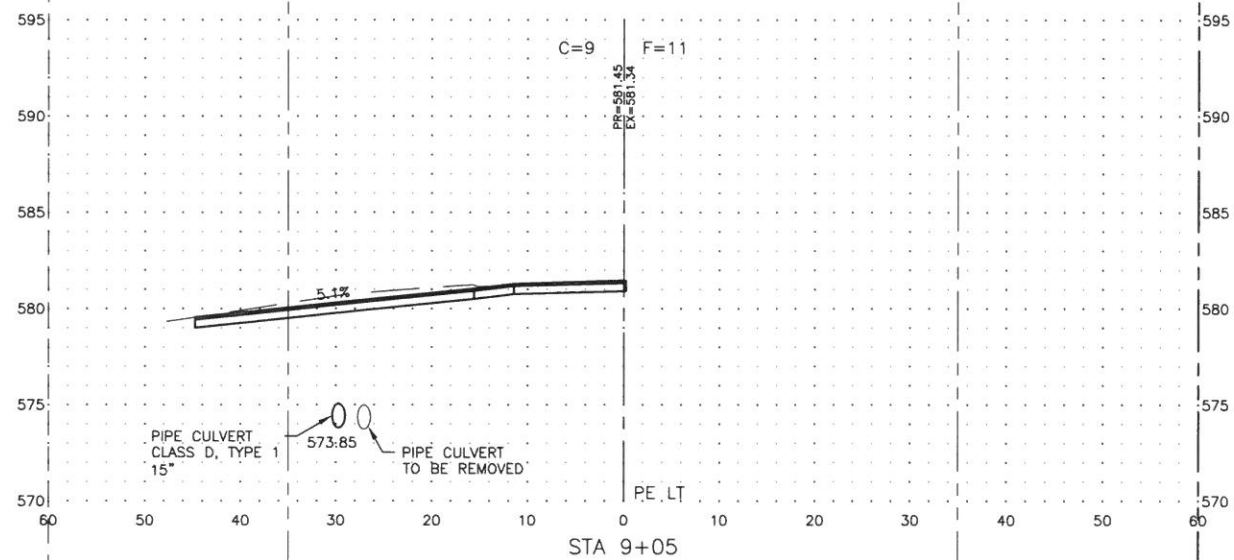
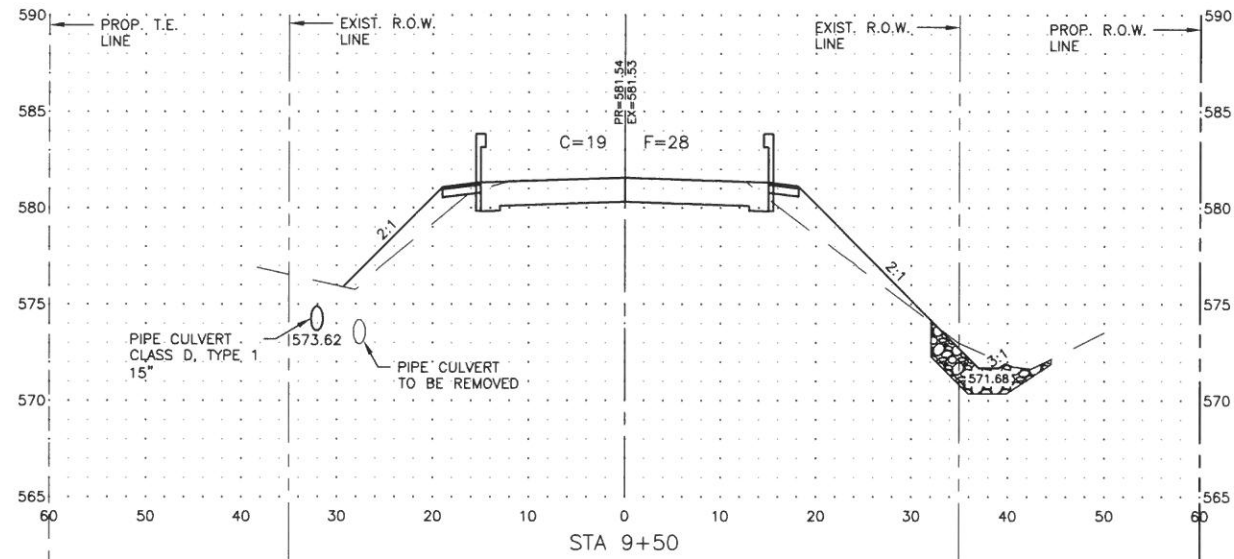
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APPROVED BY: MRL
DATE: 2-17-2017
SCALE: AS NOTED

REVISIONS		
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CROSS SECTIONS

JOB NUMBER:
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ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
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OWNER/DEVELOPER:
GRUNDY COUNTY HWY. DEPT.
245 NORTH ILLINOIS ROUTE 47
MORRIS, IL 60450

PROJECT AND LOCATION:
SECTION 16-00159-00-BR
C.H. C41/GRAND RIDGE ROAD,
PROJECT YQ35(110)

DRAWN BY: CFC
APPROVED BY: MRL
DATE: 2-17-2017
SCALE: AS NOTED

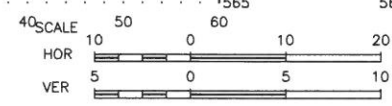
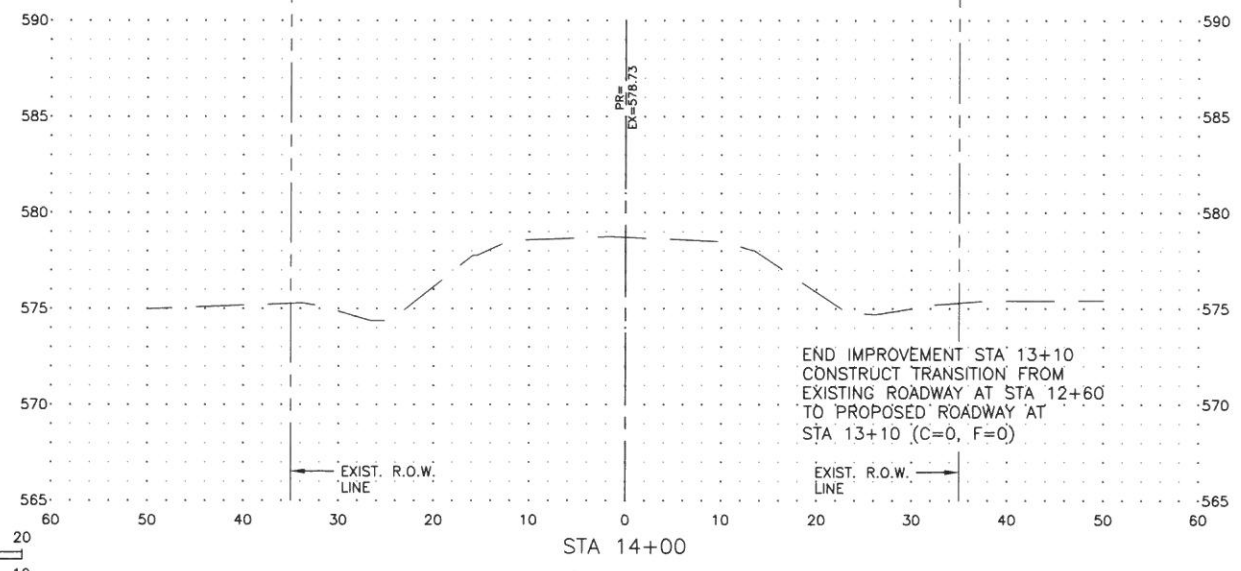
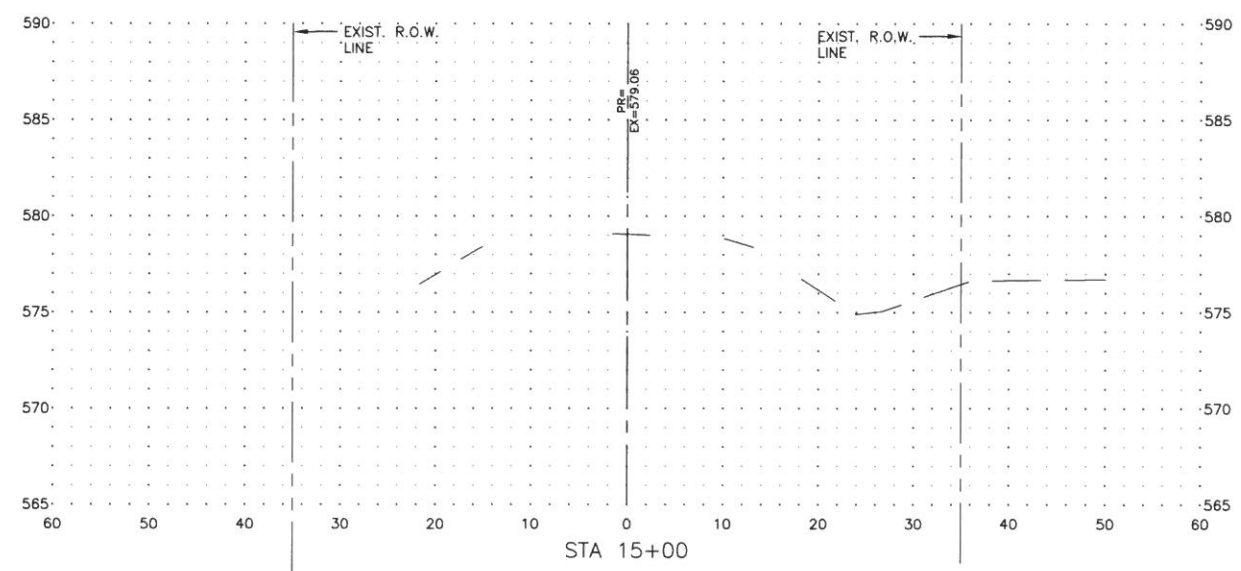
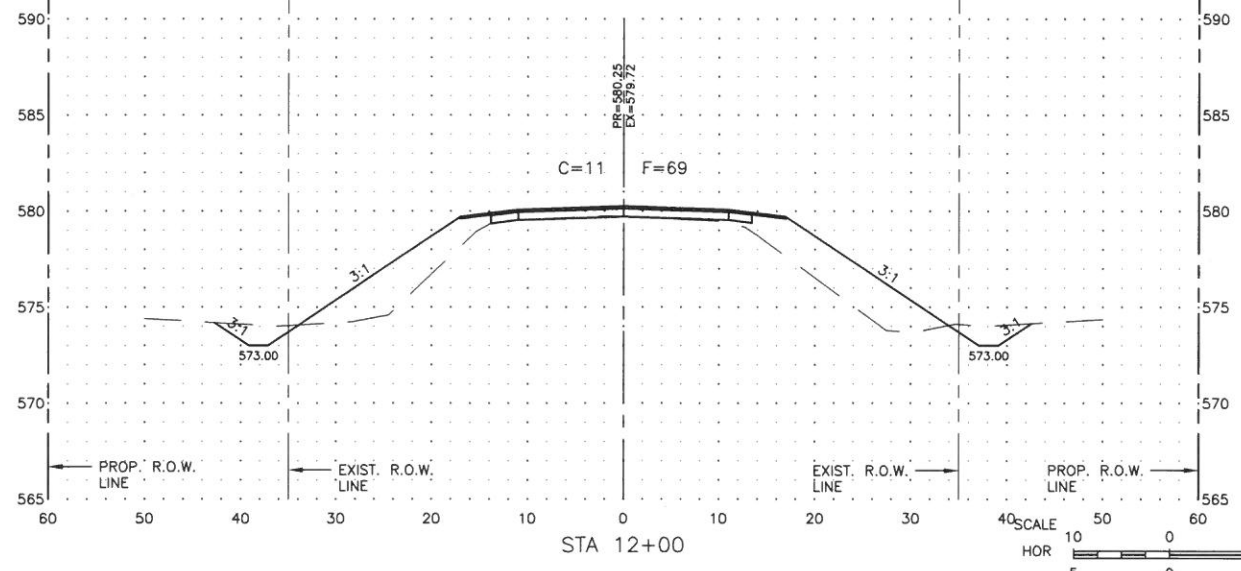
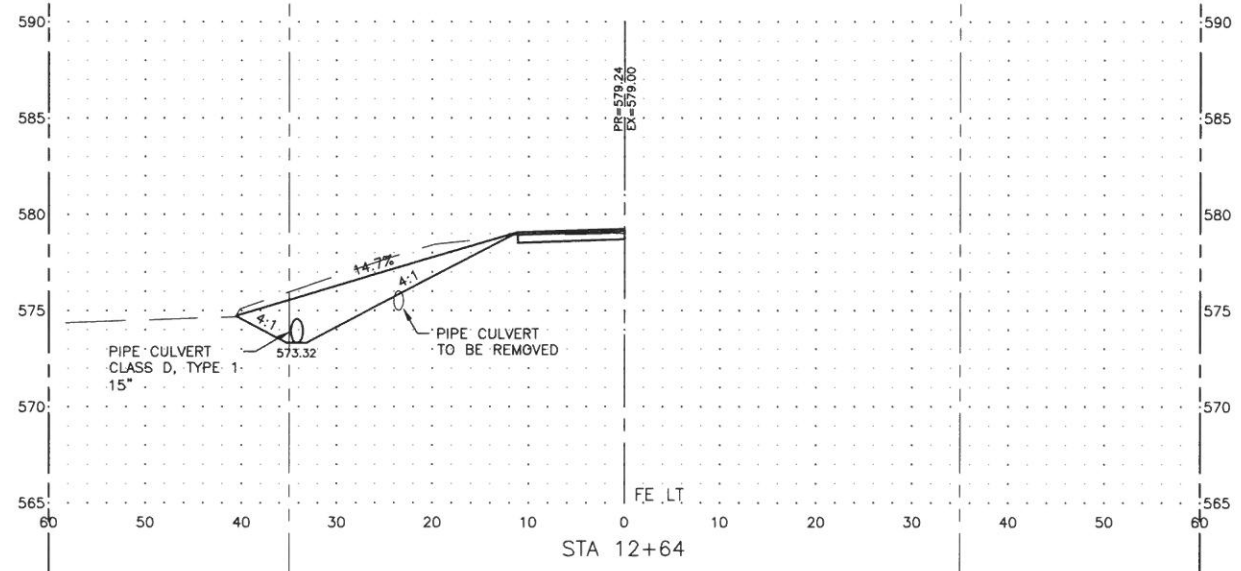
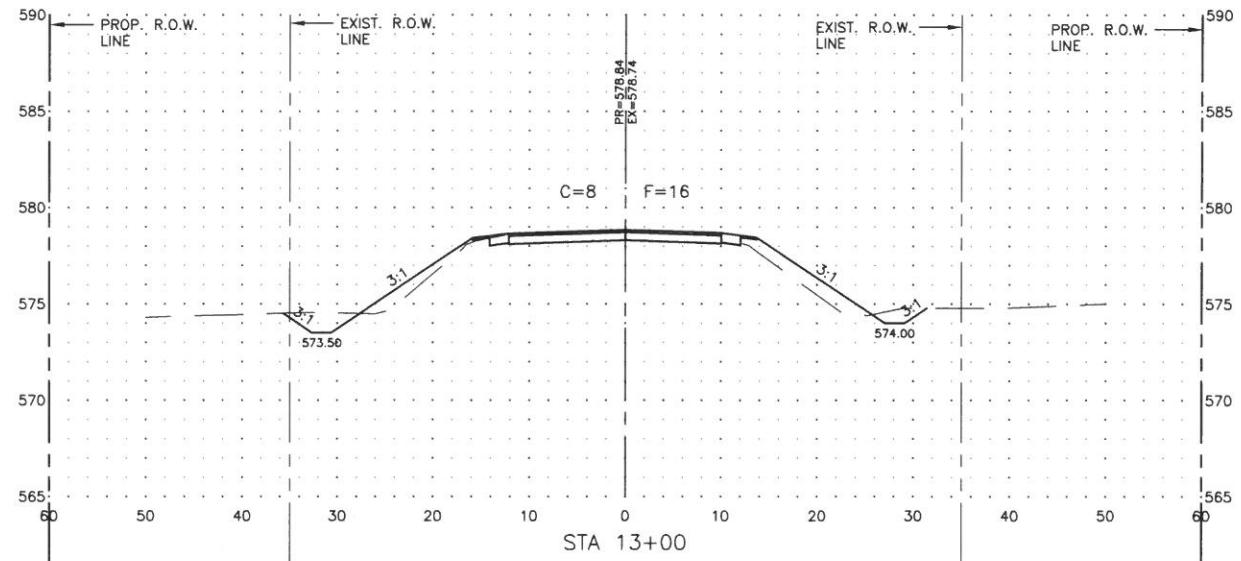
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REV. NO.	DESCRIPTION	DATE

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CROSS SECTIONS

JOB NUMBER:
16-096

SHEET NUMBER:
27 of 28

CONTRACT #: 87643



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