AS BUILT - 4/22/2016

STATE OF OHIO

DEPARTMENT OF TRANSPORTATION

FRA-270-49.00

VILLAGE OF OBETZ

FRANKLIN COUNTY

LOCATION MAP

LATITUDE: 39°52'18.39" LONGITUDE: 82°56'0.48"

SCALE IN MILES
0 1 2 3 4

N

PORTION TO BE IMPROVED
INTERSTATE HIGHWAY
FEDERAL ROUTES
STATE ROUTES
COUNTY & TOWNSHIP ROADS
OTHER ROADS

DESIGN DESIGNATION

	IR-270	ALUM CREEK DRIVE
CURRENT ADT (2016)	74,860	27,490
DESIGN YEAR ADT (2036)	108,150	43,970
DESIGN HOURLY VOLUME (2036)	10,750	3640
DIRECTIONAL DISTRIBUTION	52%	55%
TRUCKS (24 HOUR B&C)	11%	17%
DESIGN SPEED	70 M.P.H.	50 M.P.H.
LEGAL SPEED	65 M.P.H.	45 M.P.H.
DESIGN FUNCTIONAL CLASSIFICATION:	PRINCIPAL ARTERIAL INTERSTATE (URBAN)	MINOR ARTERIAL (URBAN)
NHS PROJECT	YES	NO

DESIGN EXCEPTIONS — NONE REQUIRED

UNDERGROUND UTILITIES

CONTACT BOTH SERVICES
CALL TWO WORKING DAYS
BEFORE YOU DIG

CALL
1-800-362-2764
(TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

OIL & GAS PRODUCERS UNDERGROUND
PROTECTION SERVICE CALL: **1-800-925-0988**

PLAN PREPARED BY:
RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

ENGINEERS SEAL:

STATE OF OHIO
S. SAM KHORSHIDI
E-61030
REGISTERED PROFESSIONAL ENGINEER

SIGNED:
DATE: 04/13/2015

INDEX OF SHEETS:

AS BUILT APRIL 22, 2016

STANDARD CONSTRUCTION DRAWINGS

BP-2.1	07/19/13	F-2.1	07/19/13	RM-3.1	07/19/13			800	07/18/14
BP-2.2	07/18/08	F-3.4	07/19/13	RM-4.2	06/4/14			832	01/17/14
BP-3.1	07/18/14			RM-4.3	07/18/14				
BP-5.1	07/19/13	I-2.3	01/17/14	RM-4.6	07/19/13				
CB-2.1	01/18/13	MGS-1.1	07/19/13	TC-61.10	01/17/14				
		MGS-2.1	07/19/13	TC-65.10	01/17/14				
DM-1.2	01/18/13	MGS-3.1	07/18/14	TC-65.11	07/18/14				
DM-1.4	01/18/13	MGS-3.2	01/18/13	TC-71.10	01/17/14				
DM-2.1	01/18/13	MGS-4.2	07/19/13	TC-72.20	07/18/14				
DM-4.1	07/19/13	MGS-5.3	07/19/13						
DM-4.2	07/20/12	MGS-6.2	01/18/13						
DM-4.3	07/19/13								
DM-4.4	07/20/12	MH-1.2	01/18/13						

AS BUILT SHEETS
27, 32, 33, 34, 37, 41, 48, 49,
63, 64, 68, 69, 94, 108, 113

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE CONSTRUCTION OF A NEW I-270 WESTBOUND ON-RAMP AT ALUM CREEK DRIVE, AS WELL AS THE WIDENING OF THE I-270 EASTBOUND OFF-RAMP AND MODIFICATION OF THE I-270 WESTBOUND OFF-RAMP. WIDENING OF SOUTHBOUND ALUMCREEK DRIVE FROM EAST HOWARD DRIVE TO THE I-270 EASTBOUND RAMP INTERSECTION AND WIDENING OF THE BRIDGE OVER I-270 TO PROVIDE FOR A THIRD SOUTHBOUND THROUGH LANE. ADDITION OF A NOISE WALL ALONG THE NORTHWEST CORNER OF THE INTERCHANGE AND UPGRADING THE LIGHTING AND TRAFFIC SIGNALS.

EARTH DISTURBED AREA

PROJECT EARTH DISTURBED AREA:	6.34 ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA:	0.25 ACRES
NOTICE OF INTENT EARTH DISTURBED AREA:	6.69 ACRES

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

2013 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATE.

APPROVED _____
DATE _____ DISTRICT DEPUTY DIRECTOR

APPROVED _____
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

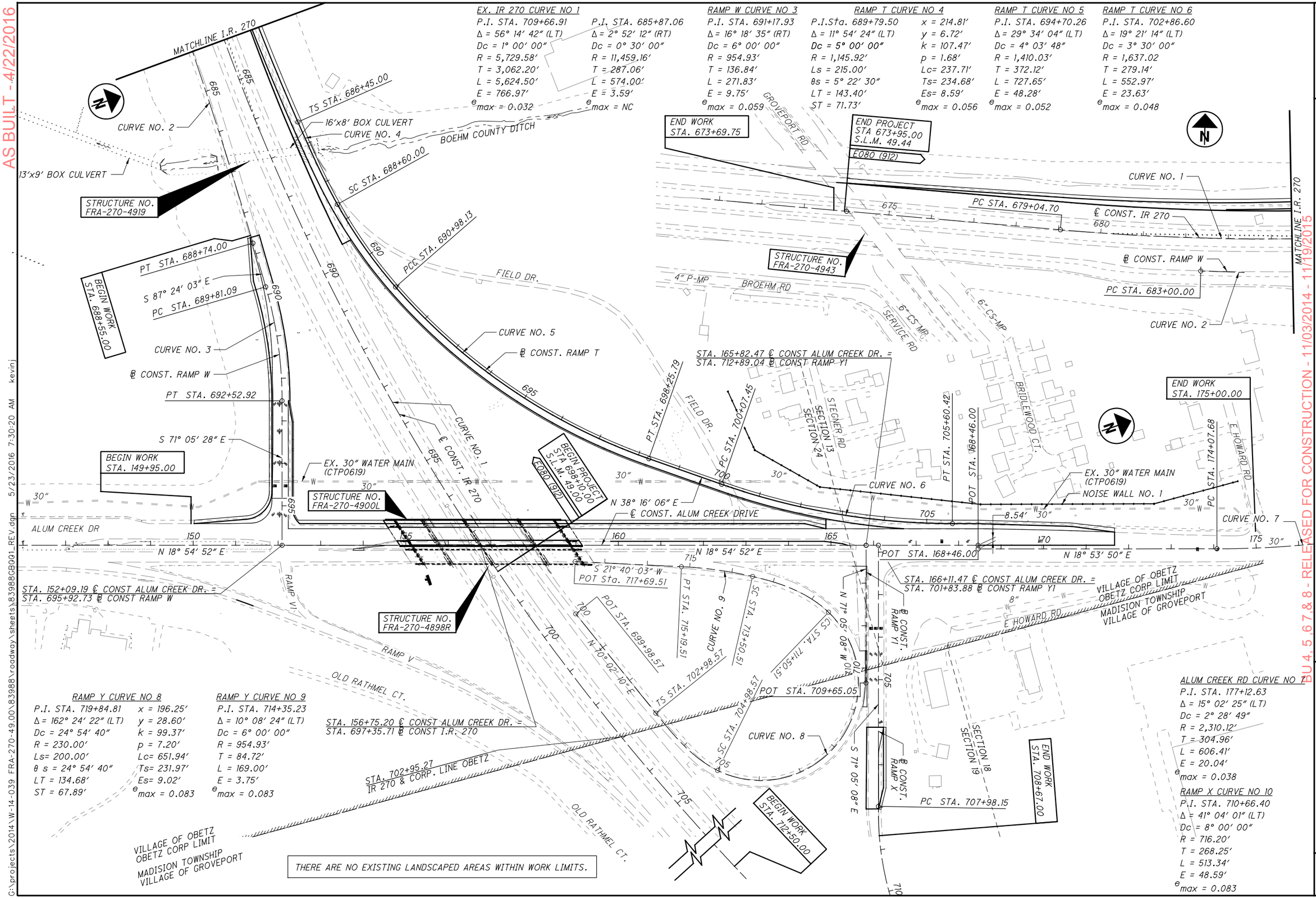
FEDERAL PROJECT NO.	PID NO.	CONSTRUCTION PROJECT NO.
E080 (912)	83988	FRA-270-49.00

RAILROAD INVOLVEMENT: NONE

G:\projects\2014\W-14-039 FRA-270-49.00\83988\roadway\sheets\83988GT002.dgn 6/9/2016 3:32:36 PM colinr

AS BUILT - 4/22/2016

G:\projects\2014\W-14-039 FRA-270-49.00\83988\roadway\sheets\83988GB001_REV.dgn 5/23/2016 7:30:20 AM kevinj



AS BUILT - 11/03/2014 - 11/19/2015

BU 4,5,6,7,8 - RELEASED FOR CONSTRUCTION

SCHEMATIC PLAN

FRA-270-49.00

AS BUILT - 4/22/2016

IR 270 & ALUMCREEK DR. BENCHMARKS & HORIZONTAL CONTROL POINTS

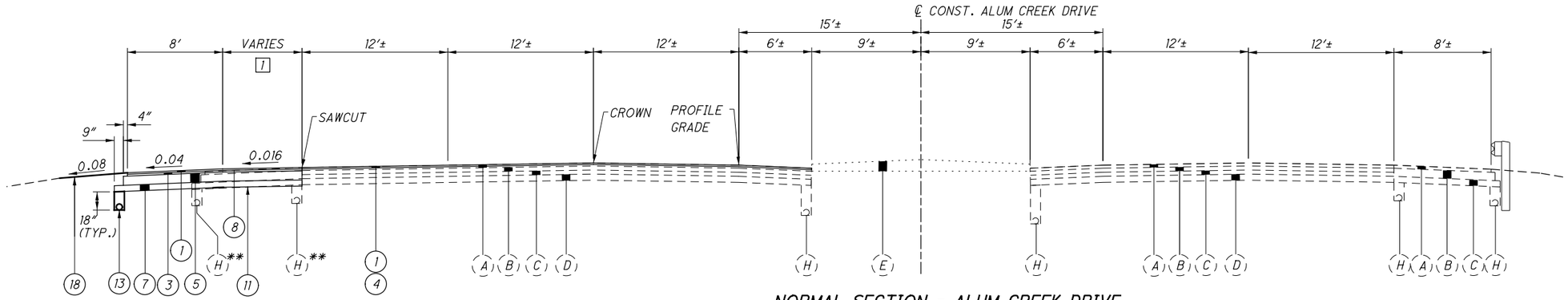
BENCHMARK NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM 1	683725	1847453	746.074	SQUARE CUT ON SE CORNER OF CONCRETE BASE FOR LIGHT POLE, ±100' SOUTH OF EAST HOWARD ROAD, WEST SIDE OF ALUM CREEK DRIVE.
BM 2	681737	1846737	749.346	SQUARE CUT ON NE CORNER OF CONCRETE BASE FOR SIGNAL SUPPORT POLE AT THE NW CORNER OF ALUM CREEK DRIVE SOUTHBOUND AND RAMP W FROM IR 270 EASTBOUND.
BM 3	681810	1846742	742.920	"X" CUT ON NORTH SIDE OF CONCRETE BASE FOR HIGH MAST LIGHT POLE ±75' NORTH OF NW CORNER OF THE INTERSECTION OF ALUM CREEK DRIVE SOUTHBOUND AND RAMP W FROM IR 270 EASTBOUND.
BM 4	681872	1846329	732.192	"X" CUT ON THE NORTH SIDE OF THE STORM MANHOLE RIM IN GRASSY INFIELD BETWEEN IR 270 EASTBOUND AND EXIT RAMP W TO ALUM CREEK DRIVE, ±50' EAST NORTHEAST OF FOOD/LODGING SIGN.
BM 5	682052	1845946	727.773	SQUARE CUT ON SOUTHEAST CORNER OF HEADWALL FOR LARGE BOX CULVERT ACROSS IR 270, NORTH SIDE IR 270 WB.
BM IPINS 12	683676	1847436	746.061	IPINS
BM 14	682434	1847478	746.061	"X" CUT FOUND ON SOUTHWEST BOLT OF HIGH MAST LIGHT POLE AT NORTH SIDE OF IR 270 WESTBOUND AND RAMP Y FROM ALUM CREEK DRIVE NORTHBOUND.

REF. NO.	NORTHING GRID	EASTING GRID	ELEVATION LEVELED	PAF	NORTHING GROUND	EASTING GROUND	ELEVATION LEVELED ADJUSTED	DESCRIPTION
SV10	682800.795	1847501.91	739.784	1.000057522	682840.071	1847608.181	739.974	IPINS
SV11	682731.237	1847061.756	749.528	1.000057522	682770.509	1847168.002	749.718	MAGS
SV12	683636.315	1847329.453	745.871	1.000057522	683675.639	1847435.715	746.061	IPINS
SV13	682307.535	1846916.281	750.971	1.000057522	682346.782	1847022.519	751.161	MAGS
SV14	681683.491	1846647.222	750.204	1.000057522	681722.703	1846753.444	750.394	IPINS
SV15	681939.745	1846636.907	728.81	1.000057522	681978.971	1846743.129	729.000	IPINS
SV16	682285.141	1847148.93	725.021	1.000057522	682324.387	1847255.181	725.211	IPINS
SV17	681991.408	1845803.358	728.342	1.000057522	682030.637	1845909.532	728.532	IPINS

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

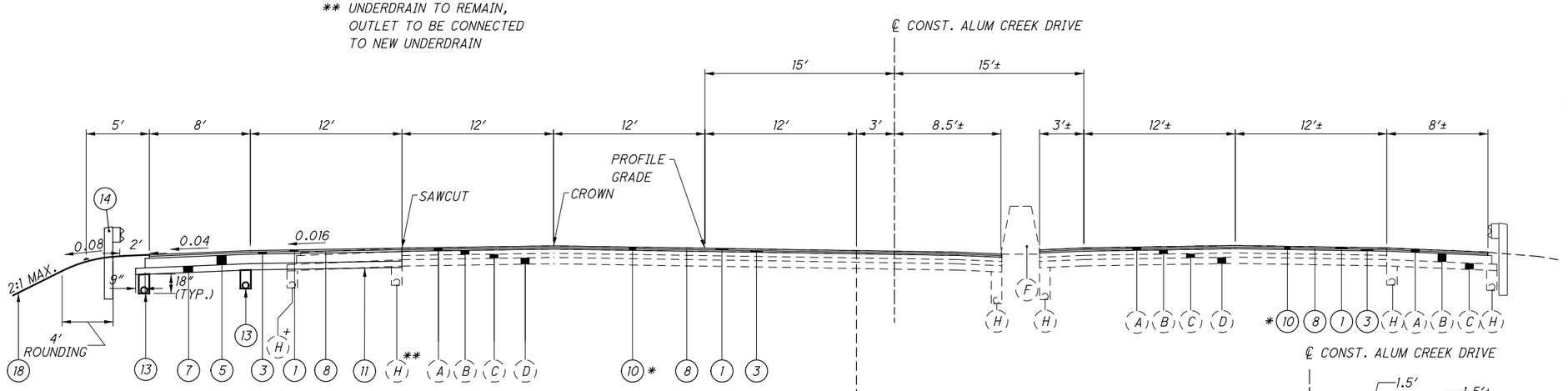
BENCHMARKS & HORIZONTAL CONTROL POINTS

FRA-270-49.00



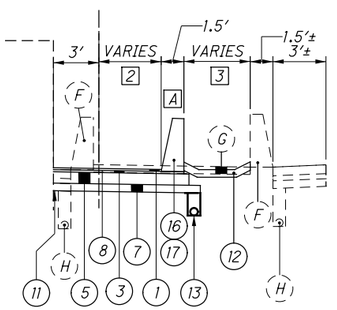
NORMAL SECTION - ALUM CREEK DRIVE

STA. 150+02.30 TO STA. 151+36.32
STA. 151+36.32 TO STA. 152+50.62 RAMP W INTERSECTION (TYPICAL NOT SHOWN)



NORMAL SECTION - ALUM CREEK DRIVE

STA. 152+50.62 TO STA. 154+85.94



STA. 153+76.50 TO STA. 154+84.28

2 VARIES 0′ TO 10.90′
STA. 150+02.30 TO STA. 151+36.32

2 VARIES 7.55′ TO 2.50′
STA. 154+01.50 TO STA. 154+50.00
2.50′
STA. 154+50.00 TO STA. 154+86.52

3 VARIES 0.98′ TO 6.0′±
STA. 154+01.50 TO STA. 154+50.00
6.00′±
STA. 154+50.00 TO STA. 154+86.42

A CONCRETE BARRIER TYPE B
STA. 153+76.50 TO STA. 154+01.50
CONCRETE BARRIER TYPE D
STA. 154+01.50 TO STA. 154+86.52

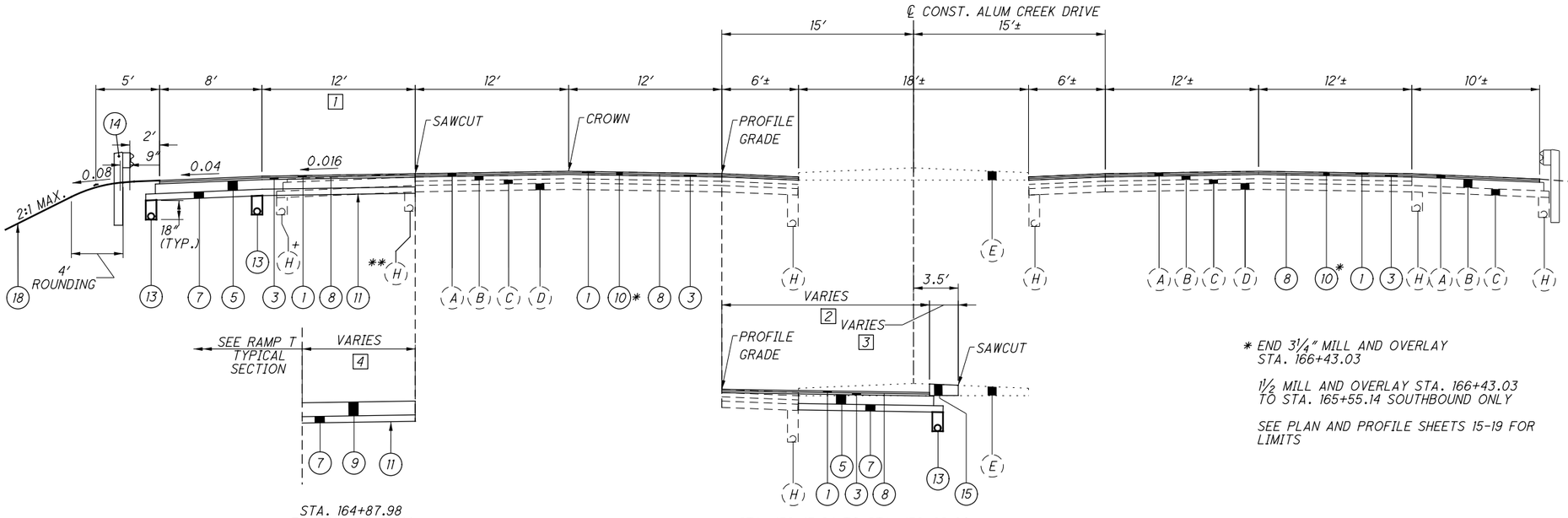
LEGEND

1. ITEM 442 - 1 ½″ ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A, (446)
2. ITEM 302 - VARIABLE DEPTH ASPHALT CONCRETE BASE, PG 64-22
3. ITEM 442 - 1 ¾″ ASPHALT CONCRETE INTERMEDIATE COURSE, 19MM, TYPE A, (446)
4. ITEM 254 - 1½″ PAVEMENT PLANING, ASPHALT CONCRETE
5. ITEM 302 - 9″ ASPHALT CONCRETE BASE, PG 64-22
6. ITEM 302 - 11″ ASPHALT CONCRETE BASE, PG 64-22
7. ITEM 304 - 6″ AGGREGATE BASE
8. ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE
9. ITEM 452 - 13″ NON-REINFORCED CONCRETE PAVEMENT, CLAS QC 1 WITH QC/QA
10. ITEM 254 - 3¼″ PAVEMENT PLANING, ASPHALT CONCRETE
11. ITEM 204 - SUBGRADE COMPACTION
12. ITEM 601 - PAVED GUTTER TYPE 1-2, AS PER PLAN
13. ITEM 605 - 6″ BASE PIPE UNDERDRAIN W/ FABRIC WRAP
14. ITEM 606 - GUARDRAIL, TYPE MGS
15. ITEM 609 - CONCRETE MEDIAN
16. ITEM 622 - CONCRETE BARRIER TYPE B
17. ITEM 622 - CONCRETE BARRIER TYPE D
18. ITEM 659 - SEEDING AND MULCHING
19. ITEM 526 - REINFORCED CONCRETE APPROACH SLAB (T=15″)
20. ITEM 202 - PAVEMENT REMOVED

(A) EXISTING 3″± ASPHALT CONCRETE
(B) EXISTING 4″± - 9″± BITUMINOUS AGGREGATE BASE
(C) EXISTING 4″± - 6″± AGGREGATE BASE
(D) EXISTING 6″± SUBBASE
(E) EXISTING CONCRETE MEDIAN
(F) EXISTING CONCRETE BARRIER
(G) EXISTING CONCRETE FLUME
(H) EXISTING UNDERDRAIN
(I) EXISTING CURB
(J) EXISTING 9″± REINFORCED PORTLAND CEMENT CONCRETE
(K) EXISTING REINFORCED CONCRETE APPROACH SLAB
(L) EXISTING 14″± CONCRETE SLAB

TYPICAL SECTIONS

FRA-270-49.00



* END 3¼" MILL AND OVERLAY STA. 166+43.03

1½ MILL AND OVERLAY STA. 166+43.03 TO STA. 165+55.14 SOUTHBOUND ONLY

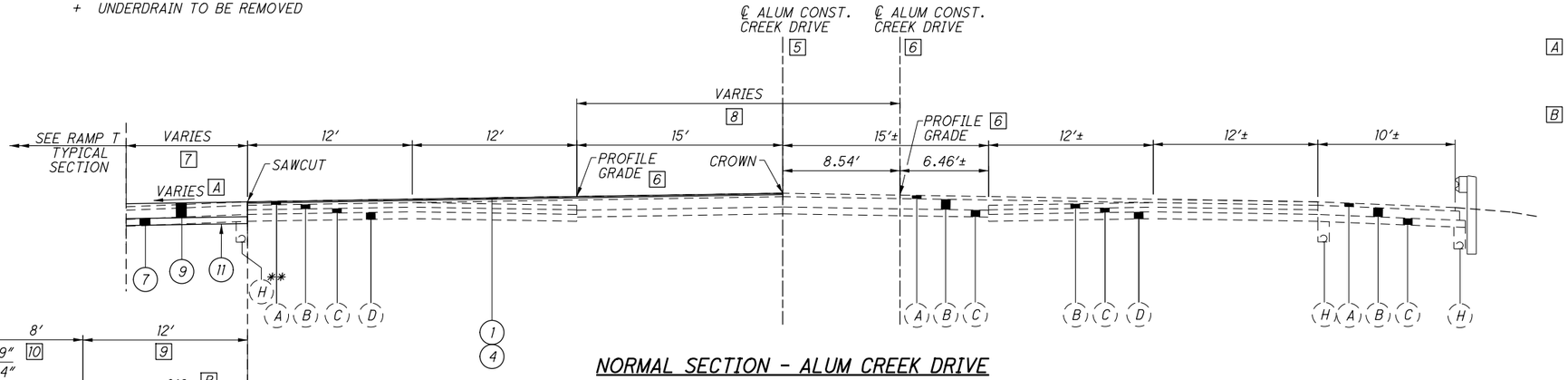
SEE PLAN AND PROFILE SHEETS 15-19 FOR LIMITS

** UNDERDRAIN TO REMAIN, OUTLET TO BE CONNECTED TO NEW UNDERDRAIN

\+ UNDERDRAIN TO BE REMOVED

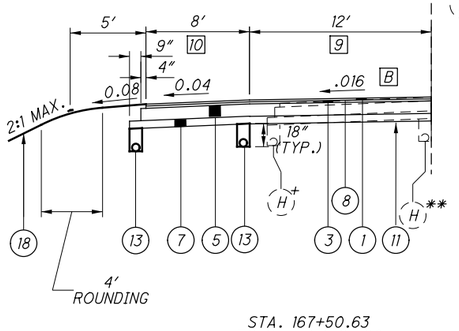
NORMAL SECTION - ALUM CREEK DRIVE

STA. 159+14.82 TO STA. 165+55.14



NORMAL SECTION - ALUM CREEK DRIVE

STA. 165+55.14 TO STA. 171+67.00



STA. 167+50.63 TO STA. 171+67.00

1 VARIES 12′ TO 0′
STA. 164+37.98 TO STA. 164+87.98
0′
STA. 164+87.98 TO STA. 165+55.14

2 16′
STA. 159+15.24 TO STA. 159+40.00
VARIES 16′ TO 5.91′±
STA. 159+40.00 TO STA. 159+82.00

3 2.5′
STA. 159+15.24 TO STA. 159+40.00
VARIES 2.5′ TO 12.59′
STA. 159+22.00 TO STA. 159+82.00

4 VARIES 23.00′ TO 12.13′
STA. 164+87.98 TO STA. 165+55.14

5 STA. 165+55.14 TO STA. 168+46.00

6 STA. 168+54.54 TO STA. 171+67.00

7 VARIES 12.13′ TO 0′
STA. 165+55.14 TO STA. 166+70.62

8 VARIES 23.54′ TO 13.66′
STA. 168+46.00 TO STA. 171+67.00

9 VARIES 12.0′ TO 1.53′
STA. 170+67.00 TO STA. 171+67.00

10 VARIES 8.0′ TO 10.2′
STA. 170+67.00 TO STA. 171+67.00

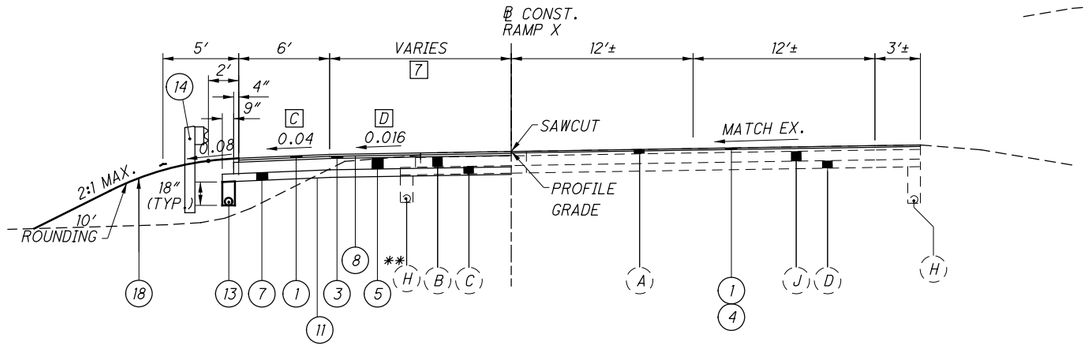
A PVMT CROSS SLOPE TRANSITIONS
0.028 TO 0.019
STA. 165+55.14 TO STA. 167+50.63

B PVMT CROSS SLOPE TRANSITIONS
0.019 TO 0.016
STA. 167+50.63 TO STA. 167+75.00

FOR LEGEND, SEE SHEET 4

TYPICAL SECTIONS

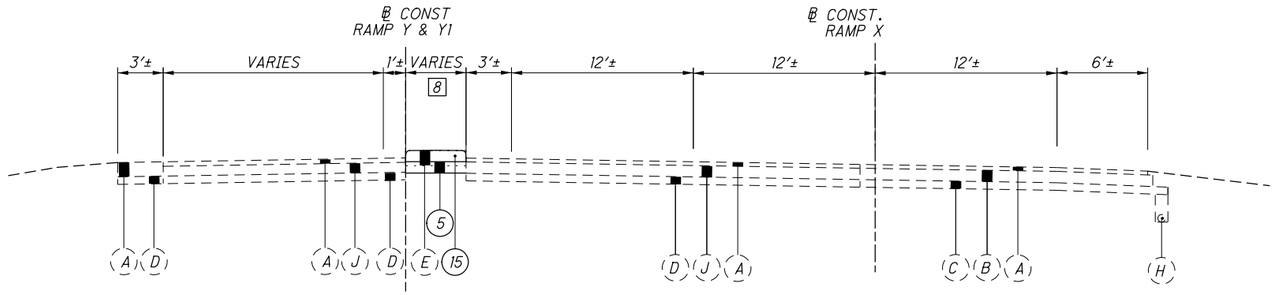
FRA-270-49.00



RAMP X WIDENING

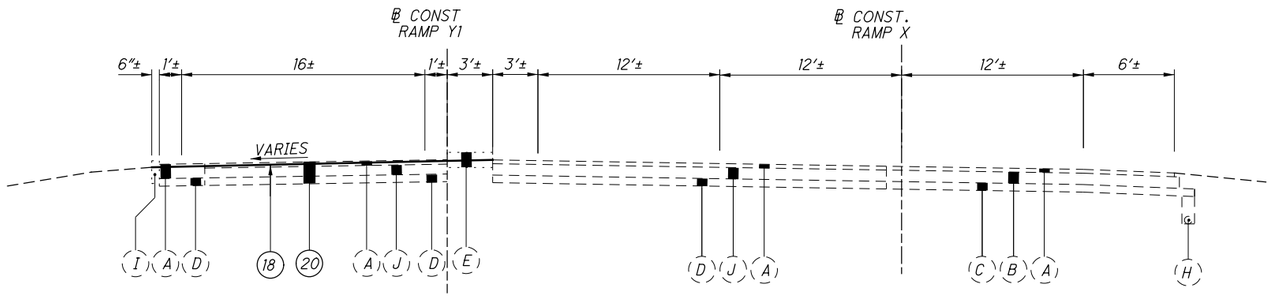
STA. 706+12.00 TO STA. 708+04.00

** UNDERDRAIN TO REMAIN OUTLET TO BE CONNECTED TO NEW UNDERDRAIN



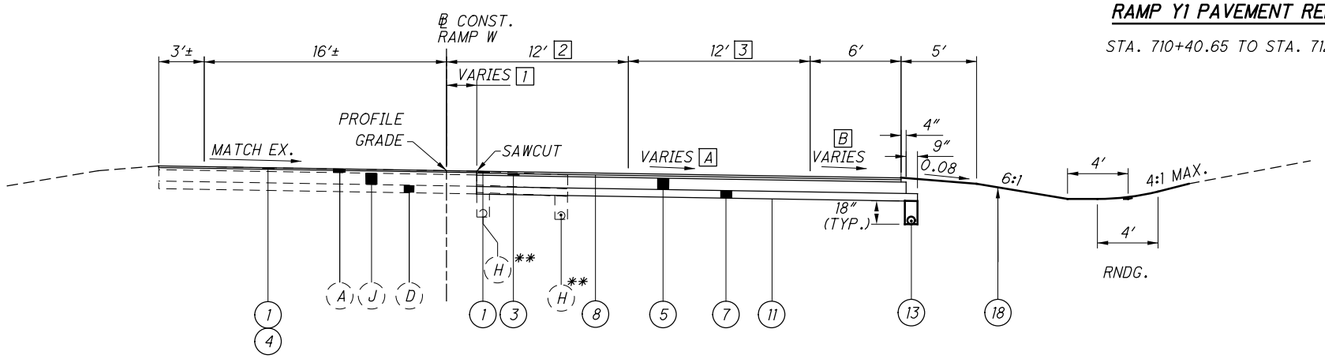
RAMP Y & Y1

STA. 709+11.69 (RAMP Y) TO STA. 710+40.65 (RAMP Y1)



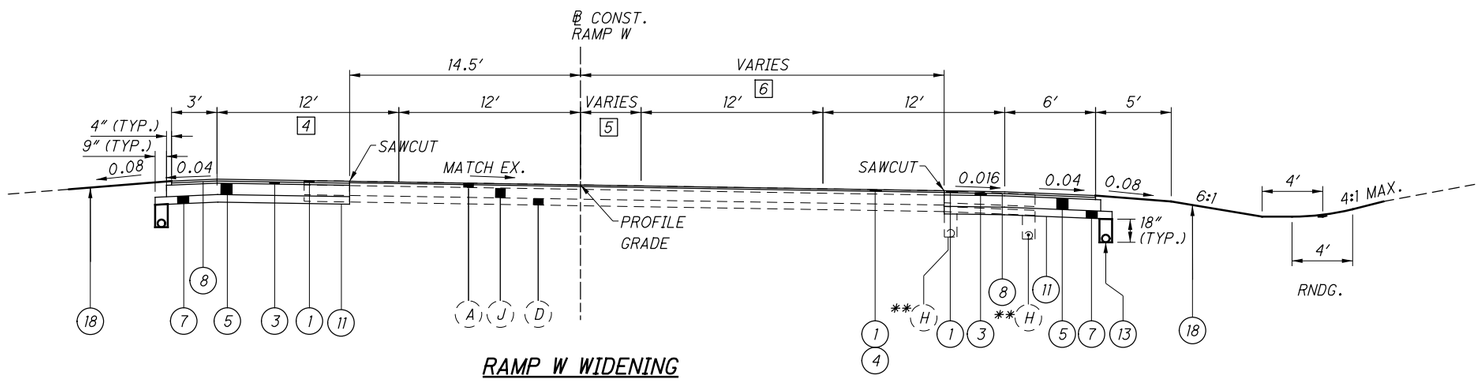
RAMP Y1 PAVEMENT REMOVAL

STA. 710+40.65 TO STA. 712+39.77



RAMP W WIDENING

STA. 688+60.00 TO STA. 692+53.00



RAMP W WIDENING

STA. 692+53.00 TO STA. 695+17.78

[1] VARIES 2.37' TO 21.49'
STA. 688+60.00 TO STA. 692+53.00

[2] VARIES 2.37' TO 12'
STA. 688+60.00 TO STA. 689+10.00

[3] VARIES 0' TO 12'
STA. 689+10.00 TO STA. 689+60.00

[4] VARIES 0' TO 12'
STA. 692+53.00 TO STA. 693+03.00

[5] VARIES 0' TO 13.82'
STA. 694+66.67 TO STA. 695+14.31

[6] 21.5'
STA. 692+53.00 TO STA. 693+50.00
VARIES 21.5' TO 23.0'
STA. 693+50.00 TO STA. 694+82.40
VARIES 23.0' TO 35.03'
STA. 694+82.40 TO STA. 695+17.78

[7] VARIES 12' TO 0'
STA. 707+54.00 TO STA. 708+04.00

[8] VARIES 10.4'± TO 3'±
STA. 709+11.93 TO STA. 709+65.05
3'±
STA. 709+65.05 TO STA. 710+40.65

[A] PVMT CROSS SLOPE TRANSITIONS
0.016 TO 0.047
STA. 688+60.00 TO STA. 692+53.00

[B] PVMT CROSS SLOPE TRANSITIONS
0.040 TO 0.047
STA. 688+60.00 TO STA. 692+53.00

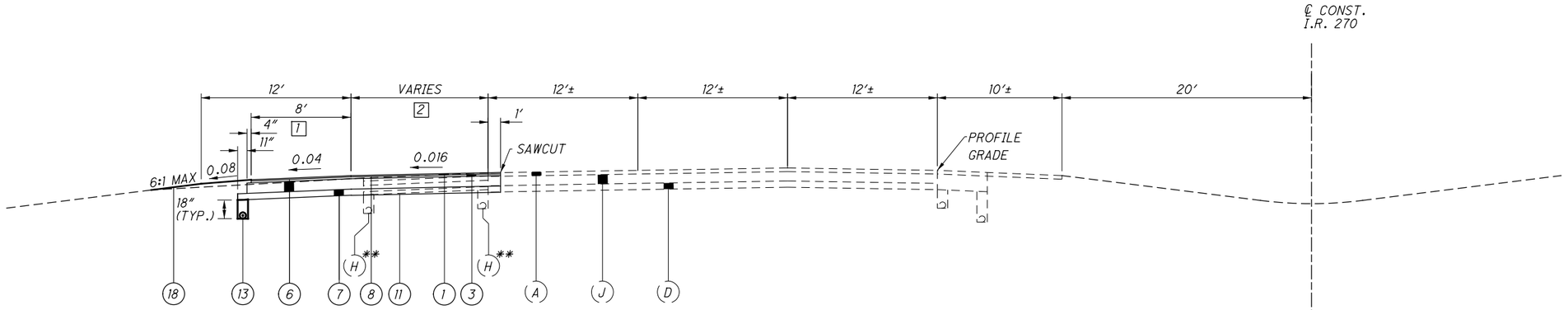
[C] PVMT CROSS SLOPE TRANSITIONS
0.040 TO 0.042
STA. 706+12.00 TO STA. 708+04.00

[D] PVMT CROSS SLOPE TRANSITIONS
0.025 TO 0.042
STA. 706+12.00 TO 708+04.00

FOR LEGEND, SEE SHEET 4

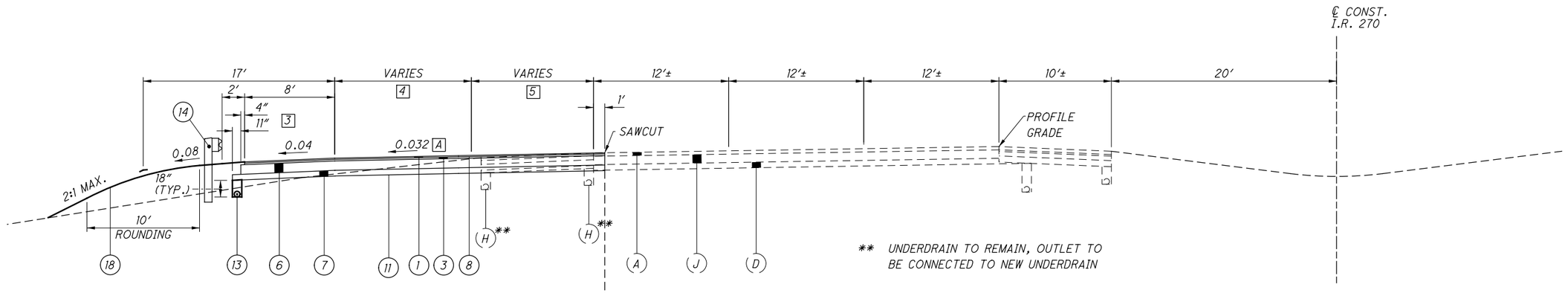
TYPICAL SECTIONS

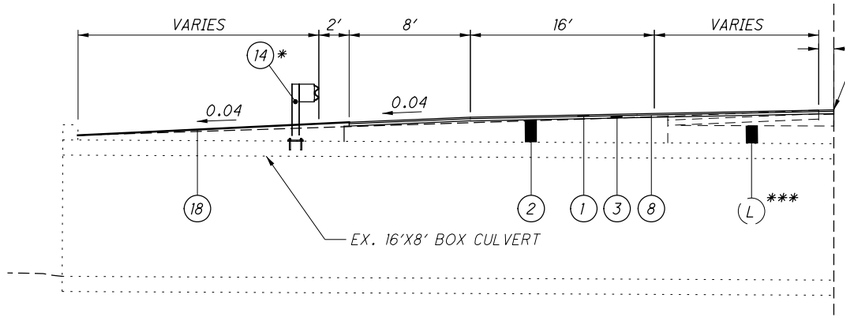
FRA-270-49.00



NORMAL SECTION - I.R. 270 WESTBOUND

STA. 673+95.00 TO STA. 678+48.70





SUPERELEVATED SECTION - I.R. 270 WESTBOUND

STA. 678+48.70 TO STA. 689+54.08

STA. 678+00.00 TO STA. 687+27.50

* 3 GUARDRAIL POSTS SHALL BE ATTACHED TO TOP OF EXISTING CONCRETE BOX CULVERT AS PER STD. DWG. MGS-1.1

*** EXISTING CONCRETE SLAB TO REMAIN

FOR LEGEND, SEE SHEET 4

[A] PVMT CROSS SLOPE TRANSITIONS
0.016 to 0.032
STA. 648+48.70 TO STA. 679+84.70

[1] VARIES 12′ TO 8′
STA. 673+95.00 TO STA. 675+71.00

[2] VARIES 0 TO 8.97′
STA. 673+95.00 TO STA. 678+48.70

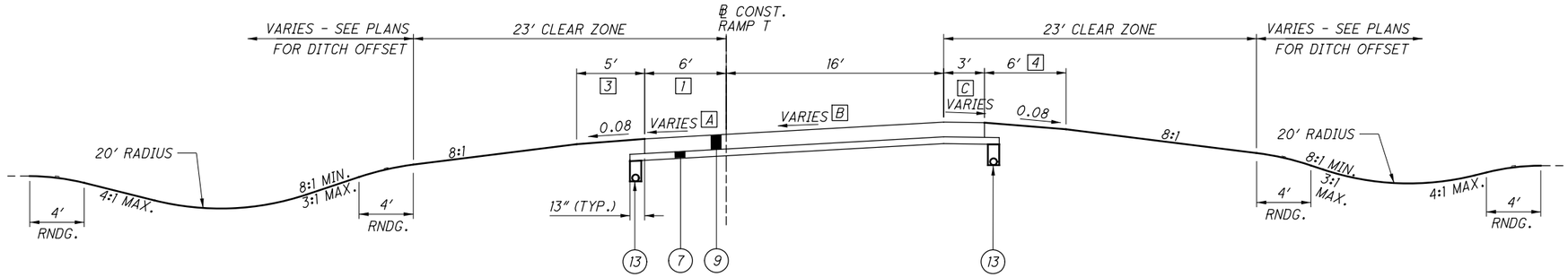
[3] VARIES 8′ TO 6′
STA. 686+45.00 TO STA 686+95.70

[4] VARIES 8.97′ TO 18′
STA. 678+48.70 TO STA. 682+94.93
16′
STA. 682+94.93 TO STA. 689+54.08

[5] VARIES 2′ TO 23.00′
STA. 682+94.93 TO STA. 689+54.08

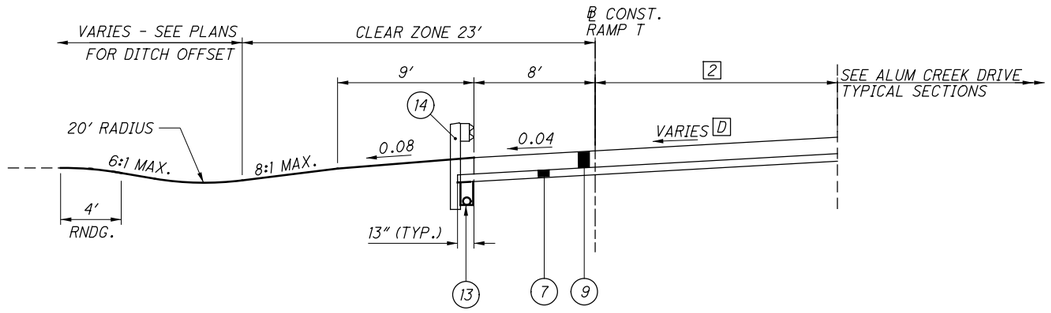
TYPICAL SECTIONS

FRA-270-49.00



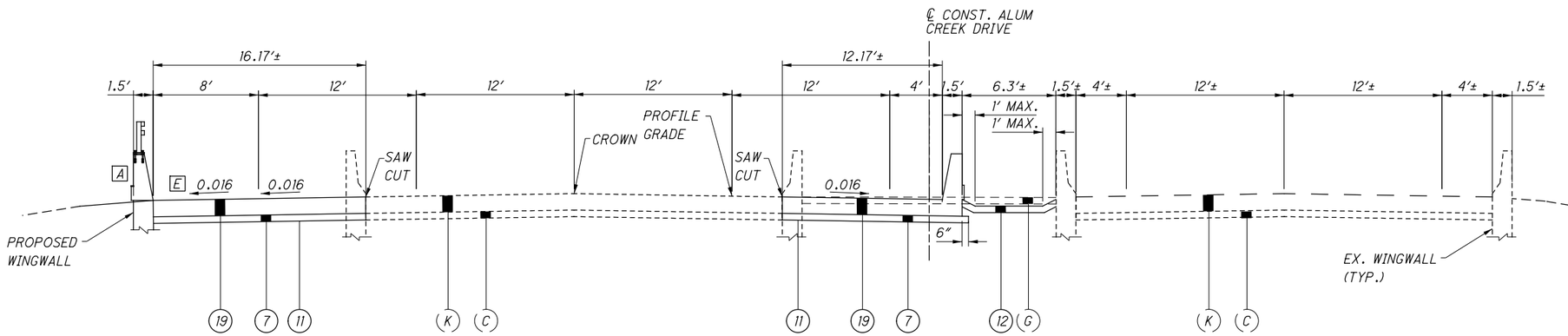
SUPERELEVATED SECTION - RAMP T

STA. 689+47.37 TO STA. 702+64.15



SUPERELEVATED SECTION - RAMP T

STA. 702+64.15 TO STA. 705+60.42



APPROACH SLAB SECTION - ALUM CREEK DRIVE

STA. 154+85.94 TO STA. 155+10.94
STA. 158+89.82 TO STA. 159+14.82

1 VARIES 6' TO 8'
STA. 702+14.15 TO STA. 702+64.15

2 16'
STA. 702+64.15 TO STA. 704+46.54
VARIES 16' TO 12'
STA. 704+46.54 TO STA. 705+60.42

3 VARIES 6' TO 5'
STA. 689+47.37 TO STA. 689+50.00
5'
STA. 689+50.00 TO STA. 698+00.00
VARIES 5' TO 9'
STA. 698+00.00 TO STA. 698+50.00
9'
STA. 689+50.00 TO STA. 702+64.15

4 6'
STA. 691+00.00 TO STA. 698+00.00
VARIES 6' TO 3'
STA. 698+00.00 TO STA. 698+50.00
3'
STA. 698+50.00 TO STA. 702+64.15

A PVMT CROSS SLOPE TRANSITIONS
0.056
STA. 689+47.37 TO STA. 690+98.13
0.056 TO 0.052
STA. 690+98.13 TO STA. 691+10.93
0.052
STA. 691+10.93 TO STA. 697+70.32
0.052 TO 0.048
STA. 697+70.32 TO STA. 697+83.12

B PVMT CROSS SLOPE TRANSITIONS
0.056
STA. 689+47.37 TO STA. 690+98.13
0.056 TO 0.052
STA. 690+98.13 TO STA. 691+10.93
0.052
STA. 691+10.93 TO STA. 697+70.32
0.052 TO 0.048
STA. 697+70.32 TO STA. 697+83.12
0.048
STA. 697+83.12 TO STA. 702+64.15

C PVMT CROSS SLOPE TRANSITIONS
0.014
STA. 689+47.37 TO STA. 690+98.13
0.014 TO 0.018
STA. 690+98.13 TO STA. 691+10.93
0.018
STA. 691+10.93 TO STA. 697+70.32
0.018 TO 0.022
STA. 697+70.32 TO STA. 697+83.12
0.022
STA. 697+83.12 TO STA. 702+64.15

D PVMT CROSS SLOPE TRANSITIONS
0.048
STA. 702+64.15 TO STA. 705+09.22
0.048 TO 0.032
STA. 705+09.22 TO STA. 705+60.42

E PVMT CROSS SLOPE TRANSITIONS
0.040 TO 0.016
STA. 154+86.42 TO STA. 155+11.42
0.016 TO 0.040
STA. 158+89.64 TO STA. 159+14.64

FOR LEGEND, SEE SHEET 4

AS BUILT - 4/22/2016

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

RAMP T TYPICAL SECTIONS

FRA-270-49.00

ROUNDING

THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLIES TO ALL CROSS-SECTIONS EVEN THOUGH OTHERWISE SHOWN.

UTILITIES

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS.

AT&T
111 N. FOURTH STREET
COLUMBUS, OH 43215
614-223-7162

COLUMBIA GAS OF OHIO
3550 JOHNNY APPLESEED COURT
COLUMBUS, OH 43231
ATTN: BYYAN KOPACHY
614-818-2133

AMERICAN ELECTRIC POWER
850 TECH CENTER DRIVE
GAHANNA, OH 43230
614-883-6831

COLUMBIA GAS TRANSMISSION
1440 MCNAUGHTEN ROAD
COLUMBUS, OH 43232
ATTN: CHRIS PERRY
614-863-4658

TIME WARNER TELECOM
1015 OLENTANGY RIVER ROAD
COLUMBUS, OH 43212
614-481-5263

TIME WARNER CABLE
3760 INTERCHANGE DRIVE
COLUMBUS, OH 43204
614-255-6349

CITY OF COLUMBUS DIVISION OF WATER
910 DUBLIN RD.
COLUMBUS, OH 43215
(614) 645-7788

WIDE OPEN WEST
3675 CORPORATE DRIVE
COLUMBUS, OH 43231
614-948-4653

ODOT DISTRICT 6 TRAFFIC DEPARTMENT
400 E. WILLIAM STREET
DELAWARE, OH 43015
740-833-8000

VILLAGE OF OBETZ
MUNICIPAL BUILDING
4175 ALUM CREEK DRIVE
OBETZ, OH 43207
614-491-7507

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

SURVEYING PARAMETERS

USE THE FOLLOWING VERTICAL POSITIONING AND HORIZONTAL POSITIONING PARAMETERS FOR ALL SURVEYING:

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM:	NAVD 88
GEOID:	GEOID US 2009

HORIZONTAL POSITIONING

REFERENCE FRAME:	GRS 80
ELLIPSOID:	NAD83 (2011)
MAP PROJECTION:	LAMBERT CONFORMAL CONIC 2 PARALLEL
COORDINATE SYSTEM:	OHIO SOUTH 3402 (OHIO STATE PLANE COORDINATE SYSTEM, SOUTH ZONE)
COMBINED SCALE FACTOR:	1.000057522

UNITS ARE IN U.S. SURVEY FEET. USE THE FOLLOWING CONVERSION FACTOR: 1 METER = 3.280833333 U.S. SURVEY FEET.

CLEARING AND GRUBBING

THE DEPARTMENT HAS NOT MARKED INDIVIDUAL TREES AND STUMPS FOR REMOVAL. UNLESS SPECIFICALLY DESIGNATED AS "DO NOT DISTURB" IN THE PLANS, REMOVE ALL TREES AND STUMPS WITHIN THE CONSTRUCTION ACTIVITIES.

WORK LIMITS

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. PROVIDE THE INSTALLATION AND OPERATION OF ALL WORK ZONE TRAFFIC CONTROL AND WORK ZONE TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

BENCHING OF FOUNDATION SLOPES

ALTHOUGH CROSS-SECTIONS INDICATE SPECIFIC DIMENSIONS FOR PROPOSED BENCHING OF THE EMBANKMENT FOUNDATIONS IN CERTAIN AREAS, NO WAIVER OF THE SPECIFICATIONS IS INTENDED. BENCH ALL OTHER SLOPED EMBANKMENT AREAS AS SET FORTH IN 203.05. NO ADDITIONAL PAYMENT WILL BE MADE FOR BENCHING REQUIRED UNDER THE PROVISIONS OF 203.05.

ITEM 606 - ANCHOR ASSEMBLY, TYPE E

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING ANY OF THE GUARDRAIL END TERMINALS FOR TYPE MGS GUARDRAIL AS LISTED ON ROADWAY ENGINEERING'S WEB PAGE UNDER ROADSIDE SAFETY DEVICES FOR APPROVED GUARDRAIL END TREATMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

THE FACE OF THE TYPE E IMPACT HEAD SHALL BE COVERED WITH A SHEET OF TYPE G REFLECTIVE SHEETING, PER CMS 730.19.

REFER TO THE MANUFACTURER'S INSTRUCTIONS REGARDING THE INSTALLATION OF, AND THE GRADING AROUND THE FOUNDATION TUBES AND GROUND STRUT. THE TOP OF ANY FOUNDATION TUBE SHOULD BE LESS THAN 4 INCHES ABOVE THE GROUND. THE PLACEMENT OF THE FOUNDATION TUBES SHOULD BE AN APPROPRIATE DEPTH BELOW THE LEVEL LINE IN ORDER TO MAINTAIN THE FINISHED GUARDRAIL HEIGHT OF 31 INCHES FROM THE EDGE OF THE SHOULDER.

ON-SITE GRADING IS REQUIRED IF THE TOP OF THE FOUNDATION TUBES OR TOP OF THE GROUND STRUT DOES PROJECT MORE THAN 4 INCHES ABOVE THE GROUND LINE.

SUBGRADE COMPACTION AND PROOF ROLLING

CONSTRUCT THE SUBGRADE AS FOLLOWS AND IN THE FOLLOWING SEQUENCE:

1. REMOVE AND STRIP THE TOPSOIL. SHAPE THE SUBGRADE TO WITHIN 0.2 FEET OF THE PLAN SUBGRADE ELEVATION.
2. PROOF ROLL THE SUBGRADE. IF UNSUITABLE MATERIAL AND /OR UNSTABLE IS ENCOUNTERED, FOLLOW THE FOLLOWING PROCEDURE:

A. REWORK / RECOMPACT - STRIP TOPSOIL FROM THE SITE AND SCARIFY AND SPREAD THE UNDERLYING SOIL TO A DEPTH UP TO 1.5 FEET AND ALLOW THE SOIL TO DRY OUT DURING A WARM, DRY PERIOD. ALLOW SUFFICIENT TIME TO PASS SUCH THAT THE SOIL REACHES A MOISTURE CONTENT THAT IS CLOSE TO OPTIMUM CONDITIONS. ONCE THE SOIL HAS BEEN DRIED BACK, THEN IT SHOULD BE REPLACED AND COMPACTED AS SPECIFIED IN THE CONTRACT DOCUMENTS. IF THE DRYING TIME IS A FACTOR, THEN THE OPTION B SHOULD BE CONSIDERED. UNSUITABLE MATERIALS SHALL BE REMOVED AS PER CMS 204.01.

B. GEOGRID / AGGREGATE - STRIP TOPSOIL FROM THE SITE AND USE GEOGRID PER ODOT SUPPLEMENTAL SPECIFICATION 861 OVER ODOT ITEM 204 GEOTEXTILE FABRIC, TYPE D, AS A SEPARATOR BETWEEN THE NATURAL SOIL AND THE GEOGRID AND THEN PLACE A MINIMUM UP TO 6.0 INCHES OF ODOT ITEM 204 GRANULAR MATERIAL, TYPE B, TO CREATE A STABLE WORKING PLATFORM ON WHICH TO BUILD THE EMBANKMENT.

3. COMPACT THE STABILIZED SUBGRADE ACCORDING TO 204.03.
4. PROOF ROLL THE COMPACTED SUBGRADE ACCORDING TO 204.06.
5. FINE GRADE THE SUBGRADE TO THE SPECIFIED GRADE.

REVIEW OF DRAINAGE FACILITIES

BEFORE ANY WORK IS STARTED ON THE PROJECT AND AGAIN BEFORE FINAL ACCEPTANCE BY THE STATE, REPRESENTATIVES OF THE STATE AND THE CONTRACTOR, ALONG WITH THE LOCAL REPRESENTATIVES, SHALL MAKE AN INSPECTION OF ALL EXISTING SEWERS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCE SHALL BE DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTION SHALL BE KEPT IN WRITING BY THE STATE.

ALL NEW CONDUITS, INLETS, CATCH BASINS, AND MANHOLES CONSTRUCTED AS A PART OF THE PROJECT SHALL BE FREE OF ALL FOREIGN MATTER AND IN A CLEAN CONDITION BEFORE THE PROJECT WILL BE ACCEPTED BY THE STATE.

ALL EXISTING SEWERS INSPECTED INITIALLY BY THE ABOVE MENTIONED PARTIES SHALL BE MAINTAINED AND LEFT IN A CONDITION REASONABLY COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. ANY CHANGE IN THE CONDITION RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE CORRECTED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.

PART-WIDTH CONSTRUCTION

BECAUSE OF THE NECESSITY TO BUILD THIS PROJECT UNDER TRAFFIC AND TO CONSTRUCT THE FULL PAVEMENT WIDTH IN STAGES, EXERCISE CARE TO PREVENT THE CONSTRUCTION OF A BUTT JOINT IN THE BASE COURSES. LAP LONGITUDINAL JOINTS AS SHOWN ON STANDARD CONSTRUCTION DRAWING BP-3.1

SEEDING AND MULCHING

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT.

CONNECTION BETWEEN EXISTING AND PROPOSED GUARDRAIL

WHEN IT IS NECESSARY TO SPLICE PROPOSED GUARDRAIL TO EXISTING GUARDRAIL, ONLY THE EXISTING GUARDRAIL SHALL BE CUT, DRILLED, OR PUNCHED. THE CONNECTION SHALL BE MADE USING A W-BEAM, BEAM SPLICE AS SHOWN IN AASHTO M 180-12, EXCEPT THE BEAM WASHERS ARE NOT BE USED.

CROSSINGS AND CONNECTIONS TO EXISTING PIPES AND UTILITIES

WHERE PLANS PROVIDE FOR A PROPOSED CONDUIT TO BE CONNECTED TO, OR CROSS OVER OR UNDER AN EXISTING SEWER OR UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UTILITIES BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED CONDUIT.

IF IT IS DETERMINED THAT THE ELEVATION OF THE EXISTING CONDUIT, OR EXISTING APPURTENANCE TO BE CONNECTED, DIFFERS FROM THE PLAN ELEVATION OR RESULTS IN A CHANGE IN THE PLAN CONDUIT SLOPE, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WILL BE AFFECTED BY THE VARIANCE IN THE EXISTING ELEVATIONS.

IF IT IS DETERMINED THAT THE PROPOSED CONDUIT WILL INTERSECT AN EXISTING SEWER OR UNDERGROUND UTILITY IF CONSTRUCTED AS SHOWN ON THE PLAN, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WOULD BE AFFECTED BY THE INTERFERENCE WITH AN EXISTING FACILITY.

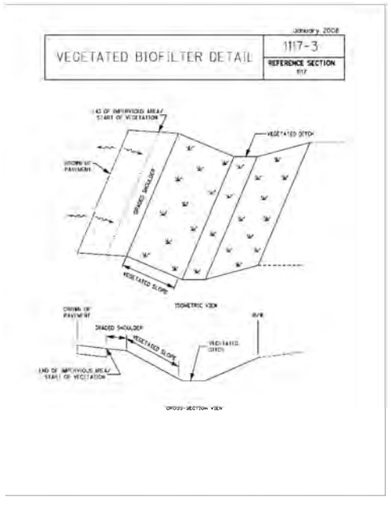
ITEM 606 - IMPACT ATTENUATOR, TYPE 1 (BIDIRECTIONAL)

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING ANY ONE OF THE TYPE 1 IMPACT ATTENUATORS AS LISTED ON THE OFFICE OF ROADWAY ENGINEERING'S WEB PAGE. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

THE FACE OF THE TYPE 1 IMPACT HEAD SHALL BE COVERED WITH A SHEET OF TYPE G REFLECTIVE SHEETING, PER CMS 730.19.

POST CONSTRUCTION STORM WATER TREATMENT

THIS PLAN UTILIZES VEGETATED BIOFILTER BEST MANAGEMENT PRACTICES (BMP'S) FOR POST CONSTRUCTION STORM WATER TREATMENT.



SEE ODOT'S DESIGN BUILD SCOPE OF SERVICES FOR ADDITIONAL REQUIREMENTS NOT REPEATED IN THESE GENERAL NOTES.

UNDERCUTTING

THE UNDERCUT OF THE SUBGRADE FOR THIS PROJECT, WHICH INCLUDES ALL AREA UNDER PAVEMENT OR FULL DEPTH REPLACEMENT, IS ESTIMATED AT APPROXIMATELY 1,014 CY.

IF THE ACTUAL QUANTITY IS MORE OR LESS, THE DEPARTMENT WILL PROCESS A PAYMENT OR CREDIT BASED ON THE 2013 STATE AVERAGE AWARD UNIT BID PRICE FOR ITEM 204-GRANULAR MATERIAL, TYPE B.

PAYMENT FOR THIS SHALL BE INCLUDED IN THE CONTRACT BID PRICE FOR ITEM 204-GRANULAR MATERIAL, TYPE B AND SHALL INCLUDE ADJUSTING UNDERDRAIN DEPTHS, PLACING ADDITIONAL GEOTEXTILE, OR OTHER INCIDENTALS.

CALCULATED JLM
CHECKED SSK

GENERAL NOTES

DISCUSSION OF SEQUENCE OF OPERATIONS AND MOT PROCEDURES

CONSTRUCTION OF THE PROJECT HAS BEEN DIVIDED INTO TWO (2) MAJOR CONSTRUCTION SEASONS. FOR THIS PROJECT, A "CONSTRUCTION SEASON" DENOTES EACH ANTICIPATED CONSTRUCTION SEASON (YEAR). FOR EXAMPLE, CONSTRUCTION SEASON 1 EQUATES TO THE FIRST CONSTRUCTION SEASON.

A "TRAFFIC PHASE" DENOTES A TRAFFIC SHIFT TO A NEW LOCATION, WITHIN EACH CONSTRUCTION SEASON (TIME PERIOD), WHERE CHANGES IN TRAFFIC PATTERNS AND CONSTRUCTION ACTIVITIES ARE REQUIRED. A CONSECUTIVE NUMBERING SYSTEM IS USED FOR THE TRAFFIC PHASES.

AN ASSUMED DURATION OF SPECIFIC TRAFFIC CONTROL SET UP AND RELATED CONSTRUCTION ACTIVITIES HAVE BEEN INCLUDED FOR INFORMATION ONLY. THE CONTRACTOR CAN ELECT TO COMPLETE INDIVIDUAL CONSTRUCTION STAGES AND TRAFFIC PHASES ANY TIME DURING THE PROJECT CONTRACT, PROVIDED THE PREREQUISITES HAVE BEEN MET, AND INTERIM AND FINAL COMPLETION DATES ARE MET.

SEASON 1 PHASE 1 CONSTRUCTION

OBJECTIVE: WIDEN THE WESTERN SIDE OF SOUTHBOUND ALUM CREEK DRIVE AND THE WESTERN SIDE OF THE SOUTHBOUND BRIDGE OVER I-270. CONSTRUCT RAMP T. CONSTRUCT NOISE WALL ALONG RIGHT-OF-WAY NEAR RAMP T. WIDEN THE NORTHERN SIDES OF RAMP W AND RAMP X.

- FILL RUMBLE STRIPS ON IR 270. REMOVE CONFLICTING PAVEMENT MARKINGS AND RAISED PAVEMENT MARKERS AS DETAILED IN THESE PLANS FOR ALUM CREEK DRIVE, IR 270, RAMP W, AND RAMP X.
- INSTALL WORK ZONE STRIPING AS DETAILED IN THESE PLANS FOR ALUM CREEK DRIVE, IR 270, RAMP W, AND RAMP X. PLACE WORK ZONE PORTABLE BARRIERS AND WORK ZONE IMPACT ATTENUATORS ALONG NEW WORK ZONE EDGE LINES. SHIFT TRAFFIC.
- PLACE STORM WATER POLLUTION PREVENTION MEASURES AS DETAILED IN THE SWPPP PLANS.
- CONSTRUCT THE WIDENING OF THE WESTERN SIDE OF ALUM CREEK DRIVE AND THE WIDENING OF THE WESTERN SIDE OF THE BRIDGE. CONSTRUCT RAMP T AND ACCELERATION LANE ALONG WESTBOUND IR 270. CONSTRUCT THE WIDENING OF THE NORTHERN SIDES OF RAMP W AND RAMP X.
- TRAFFIC ON IR 270 WILL BE RESTRICED TO TWO LANES PER THE UNAUTHORIZED LANE USE TABLE FOR BRIDGE PAINTING FOR BOTH EASTBOUND AND WESTBOUND TRAFFIC. IT WILL ALSO BE SHIFTED PER ODOT SCD MT-102.20. TRAFFIC ON IR 270 WILL BE RESTRICTED TO ONE LANE PER THE UNAUTHORIZED LANE USE TABLE FOR DECK REMOVAL AND BEAM ERECTION FOR BOTH EASTBOUND AND WESTBOUND TRAFFIC. ROLLING LANE CLOSURES PER ODOT PIS 209960 AS SHOWN ON SHEET 14 OF THE PLANS WILL ALSO BE REQUIRED FOR BEAM ERECTION AND DECK REMOVAL.
- CONSTRUCT NOISE WALL.

SEASON 2 PHASE 2 CONSTRUCTION

OBJECTIVE: WIDEN THE EASTERN SIDE OF THE SOUTHBOUND ALUM CREEK DRIVE BRIDGE. WIDEN THE SOUTHERN SIDE OF RAMP W. REMOVE THE PORTION OF RAMP Y THAT PROVIDES ACCESS FROM SOUTHBOUND ALUM CREEK DRIVE TO WESTBOUND IR 270 AS DETAILED IN BUILDABLE UNIT 6. INSTALL NEW TOWER LIGHTING, STREET LIGHTING, AND SIGNAL.

- INSTALL WORK ZONE STRIPING AS DETAILED IN BUILDABLE UNIT 6 FOR ALUM CREEK DRIVE, RAMP W, AND RAMP X. PLACE WORK ZONE PORTABLE BARRIERS AND WORK ZONE IMPACT ATTENUATORS ALONG NEW WORK ZONE EDGE LINES. SHIFT TRAFFIC.
- PLACE STORM WATER POLLUTION PREVENTION MEASURES AS DETAILED IN THE SWPPP PLANS.
- OPEN RAMP T TO TO TRAFFIC
- CONSTRUCT THE WIDENING OF THE EASTERN SIDE OF ALUM CREEK DRIVE BRIDGE OVER IR 270. CONSTRUCT THE WIDENING OF THE SOUTHERN SIDE OF RAMP W. REMOVE RAMP Y AS DETAILED IN BUILDABLE UNIT 6.
- INSTALL DECORATIVE RAILING ON THE OUTSIDE PARAPET OF NORTHBOUND AND SOUTHBOUND BRIDGES. LANE CLOSURE ON ALUM CREEK TO PROCEED WITH THIS WORK SHALL BE AS PER STANDARD DRAWING MT-95.30.
- TRAFFIC ON IR 270 WILL BE RESTRICTED TO ONE LANE PER THE UNAUTHORIZED LANE USE TABLE FOR DECK REMOVAL AND BEAM ERECTION FOR BOTH EASTBOUND AND WESTBOUND TRAFFIC. ROLLING LANE CLOSURES PER ODOT PIS 209960 AS SHOWN ON SHEET 14 OF THE PLANS WILL ALSO BE REQUIRED FOR BEAM ERECTION AND DECK REMOVAL.
- INSTALL NEW TOWER LIGHTING, STREET LIGHTING, AND TRAFFIC SIGNALS.

HAUL ROADS

- IR 270
- ALUM CREEK DRIVE

ITEM 614, MAINTAINING TRAFFIC

A MINIMUM OF 2 LANE(S) OF TRAFFIC IN EACH DIRECTION ON IR 270 AND A MINIMUM OF 1 LANE IN EACH DIRECTION ON ALUM CREEK DRIVE SHALL BE MAINTAINED AT ALL TIMES BY USE OF THE EXISTING PAVEMENT, THE COMPLETED PAVEMENT, AND TEMPORARY SURFACES USING ITEMS 410, AND 614. PERMITTED LANE CLOSURES ARE ACCEPTABLE AS FOLLOWS:

EXISTING NUMBER OF LANES PER DIRECTION	UNAUTHORIZED LANE USE TABLE - IR 270				
	LANE REDUCTION	MON TO FRI	SAT	SUN	DISINCENTIVE AMOUNTS PER MINUTE PER LANE
3	3 TO 2	5AM - 9AM & 3PM - 7PM	NO RESTRICTION	NO RESTRICTION	$75
	3 TO 1	5AM - 8PM	6AM - 7PM	6AM - 7PM	$75
SHORT TERM SHOULDER CLOSURES ARE NOT PERMITTED 5AM - 9AM AND 3PM - 7PM MONDAY - FRIDAY.					

RAMP CLOSURE RESTRICTIONS					
INTERSTATE ROUTE 270 IN FRANKLIN COUNTY					
SECONDARY ROUTE: ALUM CREEK DR SLM ALONG 270: 49.00 (SOUTH SIDE)					
RAMP	MOVEMENT	NO CLOSURES ALLOWED		DETOUR ROUTES	
		MON TO FRI	SAT TO SUN	PRIMARY ROUTE	SECONDARY ROUTE
V	ALUM CREEK DR. NB TO I-270 EB	5AM - 8PM	8AM - 7PM	ALUM CREEK DR. N TO 270 W TO US-23 TO 270 E	NONE
W	I-270 EB TO ALUM CREEK DR.	5AM - 8PM	8AM - 7PM	270 E/N TO US-33 W TO 270 S TO ALUM CREEK DR. (RAMP X)	NONE
X	I-270 WB TO ALUM CREEK DR.	5AM - 7PM	8AM - 7PM	270 W TO US-23 TO 270 E TO ALUM CREEK DR. (RAMP W)	NONE
Y	ALUM CREEK DR. NB TO I-270 WB	5AM - 8PM	8AM - 7PM	NONE	ALUM CREEK DR. TO 270 N (RAMP V) TO US-33 W TO 270 S
DISINCENTIVE AMOUNT PER MINUTE PER LANE: $75					

ITEM 614, MAINTAINING TRAFFIC (LANES OPEN DURING HOLIDAYS OR SPECIAL EVENTS)

NO WORK SHALL BE PERFORMED AND THREE (3) LANES PER DIRECTION ON I-270, AT LEAST ONE (1) LANE ON ALUM CREEK DRIVE, AND ALL RAMPS SHALL BE OPEN TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS:

CHRISTMAS — FOURTH OF JULY
NEW YEAR'S — LABOR DAY
MEMORIAL DAY — THANKSGIVING

NO WORK SHALL BE PERFORMED AND THREE (3) LANES PER DIRECTION ON I-270, ONE (1) LANE PER DIRECTION ON ALUM CREEK DRIVE, AND ALL RAMPS SHALL BE OPEN TO TRAFFIC DURING THE WEEK OF THE ZUCCHINI FESTIVAL.

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THIS PERIOD:

DAY OF HOLIDAY EVENT	TIME ALL LANES MUST BE OPEN TO TRAFFIC
SUNDAY	12:00 NOON FRIDAY THROUGH 6:00 AM MONDAY
MONDAY	12:00 NOON FRIDAY THROUGH 6:00 AM TUESDAY
TUESDAY	12:00 NOON MONDAY THROUGH 6:00 AM WEDNESDAY
WEDNESDAY	12:00 NOON TUESDAY THROUGH 6:00 AM THURSDAY
THURSDAY	12:00 NOON WEDNESDAY THROUGH 6:00 AM FRIDAY
THURSDAY (THANKSGIVING ONLY)	5:00 AM WEDNESDAY THROUGH 6:00 AM MONDAY
FRIDAY	12:00 NOON THURSDAY THROUGH 6:00 AM MONDAY
SATURDAY	12:00 NOON FRIDAY THROUGH 6:00 AM MONDAY

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED A DISINCENTIVE IN THE AMOUNT OF $75 FOR EACH MINUTE THE ABOVE DESCRIBED LANE CLOSURE RESTRICTIONS ARE VIOLATED.

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

ITEM 614, MAINTAINING TRAFFIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

CALCULATED JLM CHECKED SSK

MAINTENANCE OF TRAFFIC - GENERAL NOTES

FRA-270-49.00

TRENCH FOR WIDENING

TRENCH EXCAVATION FOR BASE WIDENING SHALL BE ONLY ON ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE AND BASE MATERIAL SHALL FOLLOW AS CLOSELY AS POSSIBLE BEHIND EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL OF THE ENGINEER.

OVERNIGHT TRENCH CLOSING

THE BASE WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 1.5 INCHES BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY. NO TRENCH SHALL BE LEFT OPEN OVERNIGHT EXCEPT FOR A SHORT LENGTH (25 FEET OR LESS) OF A WORK SECTION AT THE END OF THE TRENCH. IN CASE WORK MUST BE SUSPENDED BECAUSE OF INCLEMENT WEATHER OR OTHER REASONS, THE TRENCH FOR THE UNCOMPLETED BASE WIDENING SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEER.

DUST CONTROL

THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER.

ITEM 614, WORK ZONE IMPACT ATTENUATOR FOR 24" WIDE HAZARDS (UNIDIRECTIONAL OR BIDIRECTIONAL)

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING A NON-GATING IMPACT ATTENUATOR FROM THE OFFICE OF ROADWAY ENGINEERING'S APPROVED LIST FOR WORK ZONE IMPACT ATTENUATORS, FROM THE ROADWAY STANDARD'S WEB PAGE FOR ROADWAY STANDARDS APPROVED PRODUCTS.

INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

THE CONTRACTOR SHALL REPAIR OR REPLACE A DAMAGED UNIT WITHIN 24 HOURS OF A DAMAGING IMPACT.

WHEN BIDIRECTIONAL DESIGNS ARE SPECIFIED, THE CONTRACTOR SHALL SUPPLY APPROPRIATE TRANSITIONS.

WHEN GATING IMPACT ATTENUATORS ARE DESIRED, THE CONTRACTOR SHALL SUBMIT DOCUMENTATION TO THE ENGINEER FOR ACCEPTANCE.

ITEM 614, WORK ZONE IMPACT ATTENUATOR, FOR HAZARDS OVER 24" AND LESS THAN 36" WIDE, (UNIDIRECTIONAL OR BIDIRECTIONAL)

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING A NON-GATING IMPACT ATTENUATOR FROM THE OFFICE OF ROADWAY ENGINEERING'S APPROVED LIST FOR WORK ZONE IMPACT ATTENUATORS, FROM THE ROADWAY STANDARD'S WEB PAGE FOR ROADWAY STANDARDS APPROVED PRODUCTS.

INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

THE CONTRACTOR SHALL REPAIR OR REPLACE A DAMAGED UNIT WITHIN 24 HOURS OF A DAMAGING IMPACT.

WHEN BIDIRECTIONAL DESIGNS ARE SPECIFIED, THE CONTRACTOR SHALL SUPPLY APPROPRIATE TRANSITIONS.

ITEM 614 - PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, WHEN NO LONGER NEEDED, AT LEAST TWO (2) PORTABLE CHANGEABLE MESSAGE SIGNS. THE SIGNS SHALL BE OF A TYPE SHOWN ON A LIST OF APPROVED PCMS UNITS AVAILABLE ON THE OFFICE OF MATERIALS MANAGEMENT WEB PAGE. THE LIST CONTAINS CLASS A AND B UNITS WITH MINIMUM LEGIBILITY DISTANCES OF 650 FT. AND 475 FT., RESPECTIVELY.

EACH SIGN SHALL BE TRAILER-MOUNTED AND EQUIPPED WITH A FUNCTIONAL DIMMING MECHANISM, TO DIM THE SIGN DURING DARKNESS, AND A TAMPER AND VANDAL PROOF ENCLOSURE. EACH SIGN SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ON-SITE PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT. THE SIGN SHALL ALSO BE CAPABLE OF BEING POWERED BY AN ELECTRICAL SERVICE DROP FROM A LOCAL UTILITY COMPANY. THE PCMS SHALL BE DELINEATED IN ACCORDANCE WITH C&MS 614.03

THE PROBABLE PCMS LOCATIONS AND WORK LIMITS FOR THOSE LOCATIONS ARE SHOWN ON SHEET(S) 18 AND 20 OF THE PLANS. IN ADDITION TO THESE LOCATIONS PCMS SHALL ALSO BE PROVIDED ON US 33 WB AND IR 270 WB DURING BEAM ERECTION AND DECK REMOVAL ON IR 270 WB. PCMS SHALL BE PROVIDED ON IR 71 N, IR 270 EB, AND US 23 NB DURING BEAM ERECTION AND DECK REMOVAL ON IR 270 EB. THE MESSAGES SHALL NOTIFY MOTORISTS OF THE CLOSURES AND ADVISE THEM TO USE ALTERNATE ROUTES. PLACEMENT, OPERATION, MAINTENANCE AND ALL ACTIVATION OF THE SIGNS BY THE CONTRACTOR SHALL BE AS DIRECTED BY THE ENGINEER. THE PCMS SHALL BE LOCATED IN A HIGHLY VISIBLE POSITION YET PROTECTED FROM TRAFFIC. THE CONTRACTOR SHALL, AT THE DIRECTION OF THE ENGINEER, RELOCATE THE PCMS TO IMPROVE VISIBILITY OR ACCOMMODATE CHANGED CONDITIONS. WHEN NOT IN USE, THE PCMS SHALL BE TURNED OFF. ADDITIONALLY, WHEN NOT IN USE FOR EXTENDED PERIODS OF TIME, THE PCMS SHALL BE TURNED, FACING AWAY FROM ALL TRAFFIC.

THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ODOT PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT, AND TO REVISE SIGN MESSAGES, IF NECESSARY.

(THE CONTRACTOR SHALL IMPLEMENT A SYSTEM WHEREBY CHANGEABLE MESSAGES WILL BE IMPLEMENTED WITHIN 4 HOURS FOLLOWING TELEPHONE NOTIFICATION FROM THE PROJECT ENGINEER TO A DESIGNATED PHONE.)

ALL MESSAGES TO BE DISPLAYED ON THE SIGN WILL BE PROVIDED BY THE ENGINEER. A LIST OF ALL REQUIRED PREPROGRAMMED MESSAGES WILL BE GIVEN TO THE CONTRACTOR AT THE PROJECT PRECONSTRUCTION CONFERENCE. THE SIGN SHALL HAVE THE CAPABILITY TO STORE UP TO 99 MESSAGES. MESSAGE MEMORY OR PRE-PROGRAMMED DISPLAYS SHALL NOT BE LOST AS A RESULT OF POWER FAILURES TO THE ON-BOARD COMPUTER. THE SIGN LEGEND SHALL BE CAPABLE OF BEING CHANGED IN THE FIELD. THREE-LINE PRESENTATION FORMATS WITH UP TO SIX MESSAGE PHASES SHALL BE SUPPORTED. PCMS FORMAT SHALL PERMIT THE COMPLETE MESSAGE FOR EACH PHASE TO BE READ AT LEAST TWICE.

THE PCMS SHALL CONTAIN AN ACCURATE CLOCK AND PROGRAMMING LOGIC WHICH WILL ALLOW THE SIGN TO BE ACTIVATED, DEACTIVATED OR MESSAGES CHANGED AUTOMATICALLY AT DIFFERENT TIMES OF THE DAY FOR DIFFERENT DAYS OF THE WEEK.

(THE PCMS SHALL CONTAIN A CELLULAR TELEPHONE DATA LINK WHICH WILL (IN ACTIVE CELLULAR PHONE AREAS) ALLOW REMOTE SIGN ACTIVATION, MESSAGE CHANGES, MESSAGE ADDITIONS AND REVISIONS TO TIME OF DAY PROGRAMS. THE SYSTEM SHALL ALSO PERMIT VERIFICATION OF CURRENT AND PROGRAMMED MESSAGES. ONE REMOTE DATA INPUT DEVICE (LAPTOP COMPUTER PLUS MODEM OR EQUIVALENT) SHALL BE FURNISHED FOR USE BY THE DISTRICT TRAFFIC ENGINEER, OR EQUIVALENT, AND SHALL BE INSURED AGAINST THEFT.)

THE PCMS UNIT SHALL BE MAINTAINED IN GOOD WORKING ORDER BY THE CONTRACTOR IN ACCORDANCE WITH THE PROVISIONS OF CMS 614.07. THE CONTRACTOR SHALL, PRIOR TO ACTIVATING THE UNIT, MAKE ARRANGEMENTS, WITH AN AUTHORIZED SERVICE AGENT FOR THE PCMS, TO ASSURE PROMPT SERVICE IN THE EVENT OF FAILURE. ANY FAILURE SHALL NOT RESULT IN THE SIGN BEING OUT OF SERVICE FOR MORE THAN 12 HOURS, INCLUDING WEEKENDS. FAILURE TO COMPLY MAY RESULT IN AN ORDER TO STOP WORK AND OPEN ALL TRAFFIC LANES AND/OR IN THE DEPARTMENT TAKING APPROPRIATE ACTION TO SAFELY CONTROL TRAFFIC. THE ENTIRE COST TO CONTROL TRAFFIC, ACCRUED BY THE DEPARTMENT DUE TO THE CONTRACTOR'S NONCOMPLIANCE, WILL BE DEDUCTED FROM MONEYS DUE, OR TO BECOME DUE THE CONTRACTOR ON HIS CONTRACT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR 24-HOUR-PER-DAY OPERATION AND MAINTENANCE OF THESE SIGNS ON THE PROJECT FOR THE DURATION OF THE PHASES WHEN THE PLAN REQUIRES THEIR USE.

ITEM 614 - WORK ZONE PAVEMENT MARKINGS

WORK ZONE PAVEMENT MARKINGS ARE TO BE REAPPLIED PRIOR TO 10/15. WORK ZONE PAVEMENT MARKINGS SHALL BE PER 740.02 TYPE 1A.

CALCULATED JLM
CHECKED SSK

MAINTENANCE OF TRAFFIC - GENERAL NOTES

FRA-270-49.00

ITEM 614, WORK ZONE RAISED PAVEMENT MARKER, AS PER PLAN

WORK ZONE RAISED PAVEMENT MARKERS, AS PER PLAN, AND THEIR INSTALLATION SHALL CONFORM TO CMS 614 OR CMS 621 AS SPECIFIED HEREIN.

RAISED PAVEMENT MARKERS IN USE DURING THE SNOW-PLOWING SEASON SHALL CONFORM TO 621.

RAISED PAVEMENT MARKERS IN USE DURING THE NON-SNOW-PLOW SEASON SHALL CONFORM TO EITHER 614 OR TO 621.

THE SNOW-PLOWING SEASON SHALL RUN FROM OCTOBER 15 THROUGH APRIL 1.

IF PROJECT DELAYS, NOT THE FAULT OF ODOT, CAUSE THE WORK TO EXTEND INTO THE SNOW-PLOWING SEASON, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING WORK ZONE RAISED PAVEMENT MARKERS (WZRPMS) CONFORMING TO CMS 614, WITH RAISED PAVEMENT MARKERS CONFORMING TO 621, AS DETERMINED BY THE ENGINEER, AT THE CONTRACTOR'S EXPENSE.

THIS ITEM SHALL INCLUDE PURCHASE, INSTALLATION AND REMOVAL OF ITEM 614 WORK ZONE RAISED PAVEMENT MARKER, AS PER PLAN, INCLUDING FILLING OF ANY DEPRESSIONS CREATED IN THE PAVEMENT AS PER CMS 621.08.

RESURFACING OF THE TRANSITION AREAS SHALL BE PERFORMED AT THE TIME THAT THE SURFACE COURSE IS BEING APPLIED TO THE ENTIRE PROJECT. PRIOR TO APPLICATION OF THE SURFACE COURSE ON THE PROJECT, THE EXISTING PAVEMENT WITHIN THE TRANSITION AREA SHALL BE REMOVED TO A DEPTH NECESSARY TO REACH THE LEVEL OF THE INTERMEDIATE COURSE OF THE PAVEMENT, AS DETERMINED BY THE ENGINEER.

ITEM 614, WORK ZONE RAISED PAVEMENT MARKERS ON CONCRETE SURFACES

RAISED PAVEMENT MARKERS IN WORK ZONES, INSTALLED ON TO CONCRETE SURFACES, SHALL BE ITEM 614 WORK ZONE RAISED PAVEMENT MARKERS. WZRPMS ARE INTENDED FOR USE ONLY DURING THE NONSNOW-PLOWING SEASON. WZRPMS SHALL NOT BE PROVIDED DURING THE SNOW-PLOWING SEASON.

THE SNOW-PLOWING SEASON SHALL RUN FROM OCTOBER 15 THROUGH APRIL 1.

WHERE A TEMPORARY ALIGNMENT WILL REMAIN IN USE THROUGH THE WINTER, THE WZRPMS SHALL BE REMOVED PRIOR TO THE BEGINNING OF THE SNOW-PLOWING SEASON AND REPLACED APPROXIMATELY APRIL 1, OR AS OTHERWISE DETERMINED BY THE ENGINEER.

THIS ITEM SHALL INCLUDE PURCHASE, INSTALLATION AND REMOVAL OF ITEM 614 WORK ZONE RAISED PAVEMENT MARKERS.

DELINEATION OF PORTABLE AND PERMANENT BARRIER

BARRIER REFLECTORS AND OBJECT MARKERS SHALL BE INSTALLED ON ALL PORTABLE BARRIER (PB) USED FOR TRAFFIC CONTROL AND ON PERMANENT CONCRETE BARRIER (INCLUDING BRIDGE PARAPETS) LOCATED WITHIN 5 FEET OF THE EDGE OF THE ADJACENT TRAVEL LANE.

BARRIER REFLECTORS SHALL CONFORM TO C&MS 626, EXCEPT THAT THE SPACING SHALL BE AS PER TRAFFIC SCD MT-101.70. OBJECT MARKER AND THEIR INSTALLATION SHALL CONFORM TO C&MS 614.03 AND SCD MT-101.70. WHEN THE PB CONTAINS GLARE SCREEN, ONE SET OF THREE VERTICAL STRIPES SHEETING SHALL BE CONSIDERED EQUIVALENT TO AN OBJECT MARKER, ONE-WAY.

[INCREASED BARRIER DELINEATION, AS SPECIFIED HEREIN, SHALL BE INSTALLED ON ALL PB AND CONCRETE PERMANENT BARRIER LOCATED WITHIN 5 FEET OF THE EDGE OF THE TRAVELED LANE ALONG TAPERS AND TRANSITION AREAS AND ALONG CURVES (OUTSIDE ONLY) WITH DEGREE OF CURVATURE GREATER THAN OR EQUAL TO 3 DEGREES.]

[THE INCREASED BARRIER DELINEATION SHALL CONSIST OF EITHER DELINEATION PANELS OR THE TRIPLE STACKING OF WORK ZONE BARRIER REFLECTORS.]

[DELINEATION PANELS SHALL CONSIST OF PANELS OF DELINEATION , APPROXIMATELY 34 INCHES LONG AND 6 INCHES WIDE AND SHALL BE "CRIMPED'. PANELS SHALL BE INSTALLED AND SPACED PER TRAFFIC SCD MT-101.70.]

[TRIPLE STACKED BARRIER REFLECTORS SHALL CONSIST OF ALIGNING THREE BARRIER REFLECTORS VERTICALLY, AT LOCATIONS WHERE A SINGLE BARRIER REFLECTOR WOULD BE OTHERWISE ATTACHED. THERE SHALL BE NO OPEN SPACE BETWEEN THE ADJACENT BARRIER REFLECTORS. THE TRIPLE-STACKED BARRIER REFLECTORS SHALL C&MS 626, EXCEPT THAT THEY SHALL BE SPACED ALIGNED PER TRAFFIC SCD MT-101.70]

DELINEATION OF TEMPORARY AND PERMANENT GUARDRAIL

BARRIER REFLECTORS SHALL BE INSTALLED ON ALL TEMPORARY GUARDRAIL USED FOR TRAFFIC CONTROL AND ON ALL PERMANENT GUARDRAIL LOCATED WITHIN 5 FEET OF THE EDGE OF THE ADJACENT TRAVEL LANE. BARRIER REFLECTORS SHALL CONFORM TO C&MS 626.

[OBJECT MARKERS SHALL BE INSTALLED ON ALL TEMPORARY AND PERMANENT GUARDRAIL LOCATED WI THIN 5 FEET OF THE EDGE OF THE ADJACENT TRAVEL LANE. GUARDRAIL-MOUNTING OF OBJECT MARKERS SHALL BE MADE BY INSTALLING THE OBJECT MARKERS ON THE EXTENSION BLOCKS RATHER THAN DIRECTLY ONTO THE GUARDRAIL ITSELF. OBJECT MARKER SHALL CONFORM TO C7MS 614.03 AND THE SPACING SHALL BE APPROXIMATELY 50 FEET.]

ITEM 614 - LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS

USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED.

IN ADDITION TO THE REQUIREMENTS OF CMS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

- DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.
- DURING A TRAFFIC SIGNAL WHEN IMPACTING THE NORMAL FUNCTION OF THE SIGNAL OR THE FLOW OF TRAFFIC OR WHEN TRAFFIC NEEDS TO BE DIRECTED THROUGH AN ENERGIZED TRAFFIC SIGNAL CONTRARY TO THE SIGNAL DISPLAY (E.G., DIRECTING MOTORISTS THROUGH A RED LIGHT).

IN ADDITION TO THE REQUIREMENTS OF CMS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHOULD BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

- FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/ SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP). IN GENERAL, LEOS SHOULD BE POSITIONED AT THE POINT OF LANE RESTRICTION OR ROAD CLOSURE AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH INTERSECTIONS IN WORK ZONES.
- WHEN CONSTRUCTION VEHICLES ARE ENTERING/EXITING THE ZONE DIRECTLY FROM/INTO AN OPEN LANE OF TRAFFIC. IF A LANE HAS BEEN CLOSED TO PROVIDE AN ACCELERATION/DECELERATION LANE FOR THE VEHICLE, THE LEO WILL NOT BE REQUIRED.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE.

THE LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES.

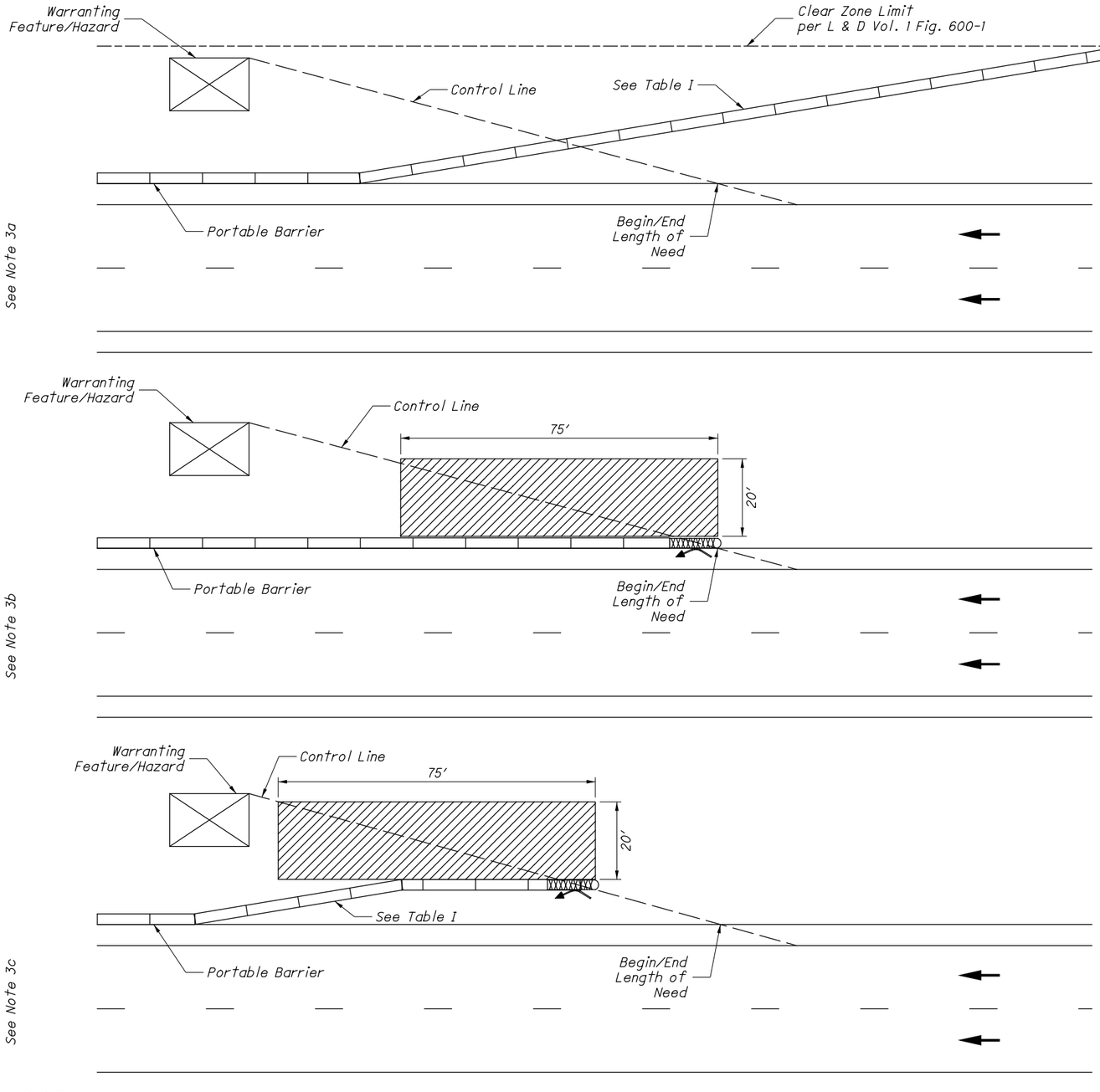
THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. ONCE THE LEO HAS COMPLETED THE DUTIES DESCRIBED ABOVE AND STILL HAS TIME REMAINING ON HIS/HER SHIFT, THE LEO MAY BE ASKED TO PATROL THROUGH THE WORK ZONE (WITH FLASHING LIGHTS OFF) OR BE PLACED AT A LOCATION TO DETER MOTORISTS FROM SPEEDING. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE WHICH SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT.

SEE ODOT'S DESIGN BUILD SCOPE OF SERVICES FOR ADDITIONAL MAINTENANCE OF TRAFFIC REQUIREMENTS NOT REPEATED IN THESE MOT GENERAL NOTES.

CALCULATED JLM
CHECKED SSK

MAINTENANCE OF TRAFFIC - GENERAL NOTES

FRA-270-49.00



LEGEND

- RECOVERY AREA
- PORTABLE BARRIER
- NON-GATING IMPACT ATTENUATOR
- DIRECTION OF TRAVEL

NOTES:

1. Attenuators shall be installed per the manufacturer's specifications.
2. Recovery area shall have slopes 3:1 or flatter and be free of workers, hazards, equipment, drop-offs, and material storage.
3. The Contractor shall select one of the three acceptable options for terminating portable barrier:
   a) Terminate flared section of portable barrier outside clear zone with tapered end only where cross slopes are 10:1 or flatter.
   b) Terminate portable barrier with an impact attenuator. A non-gating attenuator may be included in the length of need measurement.
   c) Flare a section of portable barrier to the length of need control line and terminate with an impact attenuator. A non-gating impact attenuator may be included in the flared section of portable barrier.
4. The Contractor shall submit documentation to the Engineer, 2 weeks prior to implementation, for acceptance when:
   a) Deviating from the three acceptable options for terminating portable barrier.

      Documentation shall explain any deviations and verify that the recovery area fulfills the manufacturer's specifications and Note 2.

   b) Using a gating impact attenuator in lieu of a non-gating impact attenuator.

      The gating impact attenuator length shall not be included as part of the length of need or recovery area requirements. Additional portable barrier will need to be added. The additional cost for the additional barrier required for a gating impact attenuator shall be included in the cost of the gating impact attenuator.

      Documentation shall verify that the extended recovery area fulfills the manufacturer's specifications and and Note 2.
5. Gating impact attenuators shall not be used in gore locations or within the clear zone between bi-directional traffic.

TABLE I

SPEED LIMIT (MPH)	PB FLARE RATE MINIMUM
25	8:1
30	8:1
35	9:1
40	10:1
45	12:1
50	14:1
55	16:1
60	18:1
65	19:1
70	20:1

OFFICE OF ROADWAY ENGINEERING

DESIGNED | REVIEWED

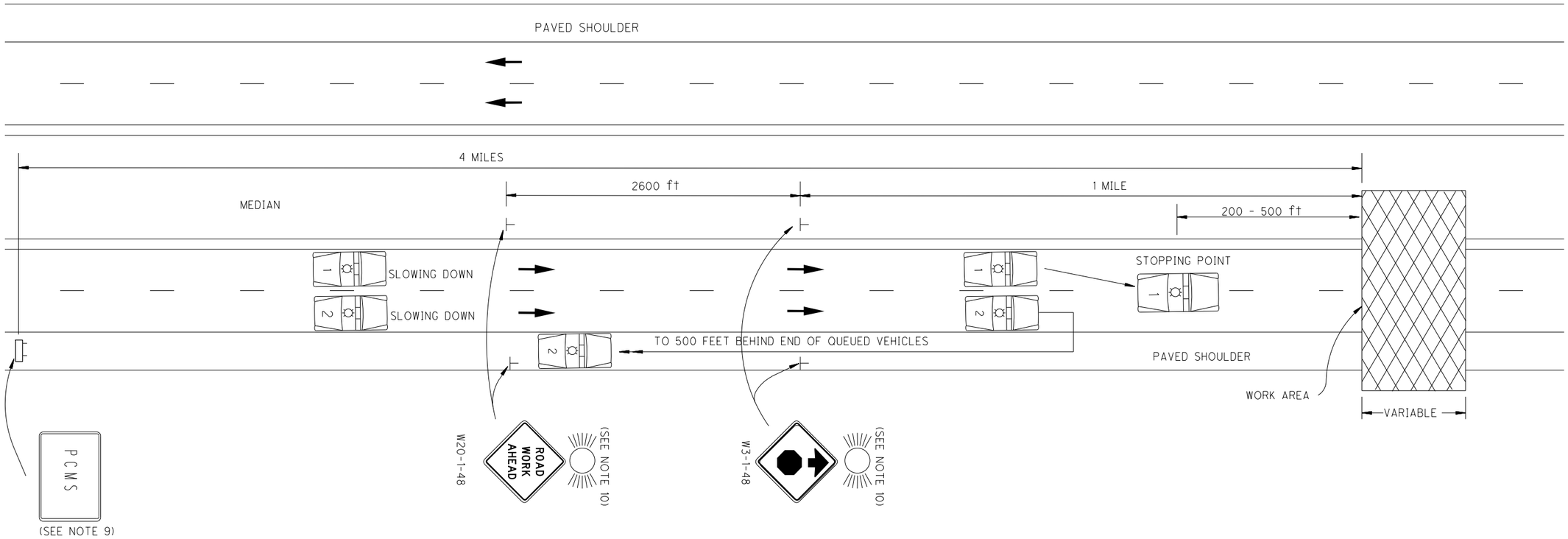
REVISION DATE 7-19-2013 | CHECKED

PIS NUMBER 2010175

IMPACT ATTENUATOR PLACEMENT

PLAN INSERT SHEET

FRA-270-49.00



NOTES

1. This type of highway closure shall be used for all construction, maintenance and utility operations when the duration of closure will not exceed 15 minutes.

2. A minimum of two law enforcement officers (LEO) with patrol cars per direction shall be provided to block traffic and pace motorists to a stop. The number of patrol cars shall equal the number of lanes closed on the highway.

3. Patrol cars, with lights flashing, should enter the stream of traffic at approximately 3 miles before the point of closure. At approximately 2 miles before the point of closure, they should begin the gradual slow down. Traffic shall be brought to a complete stop a safe distance, between 200 and 500 feet, from the work area. This slowing operation shall take no more than 10 minutes. After traffic has been stopped, one patrol car shall travel along the roadway shoulder 500 feet behind the end of the queued vehicles.

4. The Contractor shall not begin work until traffic has been brought to a complete stop.

5. All entrance ramps located between the stopped traffic and the work area shall be closed.

6. After the highway has been closed and reopened via this procedure, both of the following requirements shall have been met before implementation of another short duration closure, except with the approval of the Engineer:
   a) A minimum period of 15 minutes shall have elapsed; and
   b) The queued traffic shall have dissipated.

7. The time frame for stopping traffic shall be specified.

8. The public shall be given advance notice of 5 calendar days of the upcoming closure by providing portable changeable message signs at the site in advance of the scheduled closing. Closure information should also be provided to the Engineer.

9. An ODOT-approved portable changeable message sign, Class 1, shall be provided during operation. The message sign shall be placed approximately 4 miles in advance of the closure or as directed by the Engineer. The message shall be ROAD CLOSED AHEAD (2 sec.), PREPARE TO STOP (2 sec.)

10. The Contractor shall erect and maintain 48-inch ROAD WORK AHEAD and Stop Ahead signs on each side of the highway. Each sign shall be equipped with one Type A flashing warning light and one flare. There shall be one flare at each sign on both sides of the roadway. The flare shall be replaced if it burns out.

OFFICE OF TRAFFIC ENGINEERING

DESIGNED SHB | REVIEWED LAM

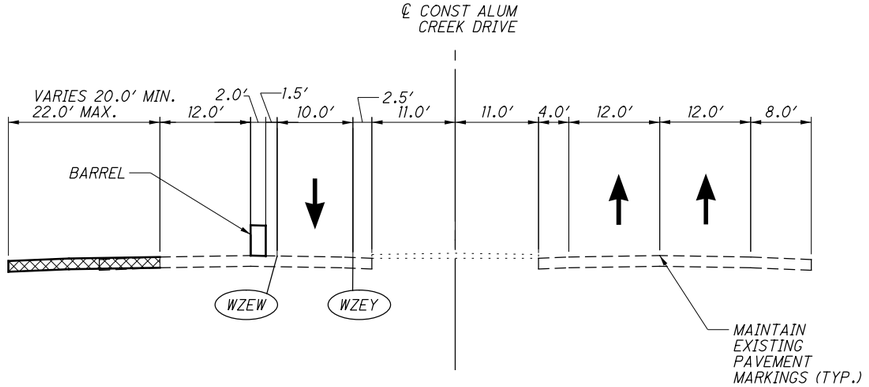
REVISION DATE 07/20/12 | CHECKED

PID NUMBER 209960

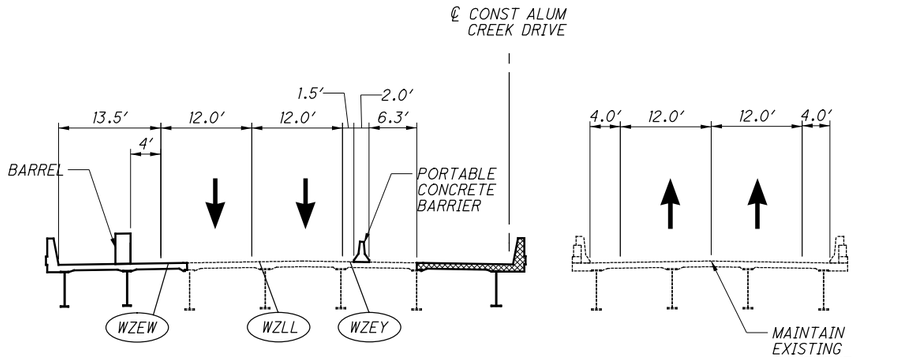
SHORT-DURATION CLOSURE OF MULTI-LANE DIVIDED HIGHWAY

PLAN INSERT SHEET

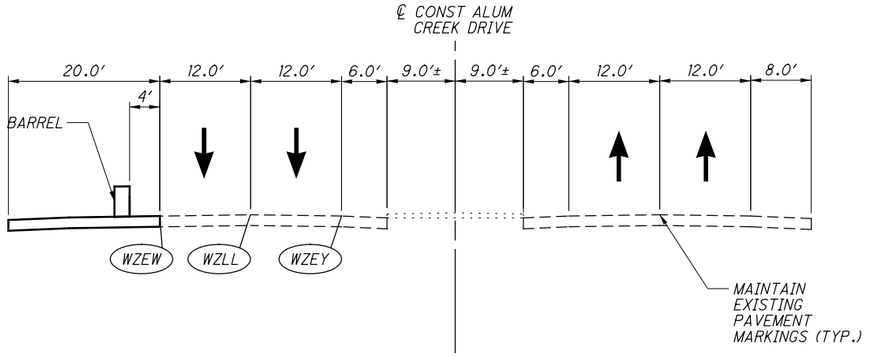
FRA-270-49.00



PHASE 1 ALUM CREEK DRIVE
(SECTION A-A)



PHASE 2 ALUM CREEK DRIVE
(SECTION B-B)



PHASE 2 ALUM CREEK DRIVE
(SECTION C-C)

EXISTING PAVEMENT

PHASE CONSTRUCTION

WORK COMPLETED IN PRIOR PHASE CONSTRUCTION

WZEW — WORK ZONE EDGE LINE, WHITE

WZEY — WORK ZONE EDGE LINE, YELLOW

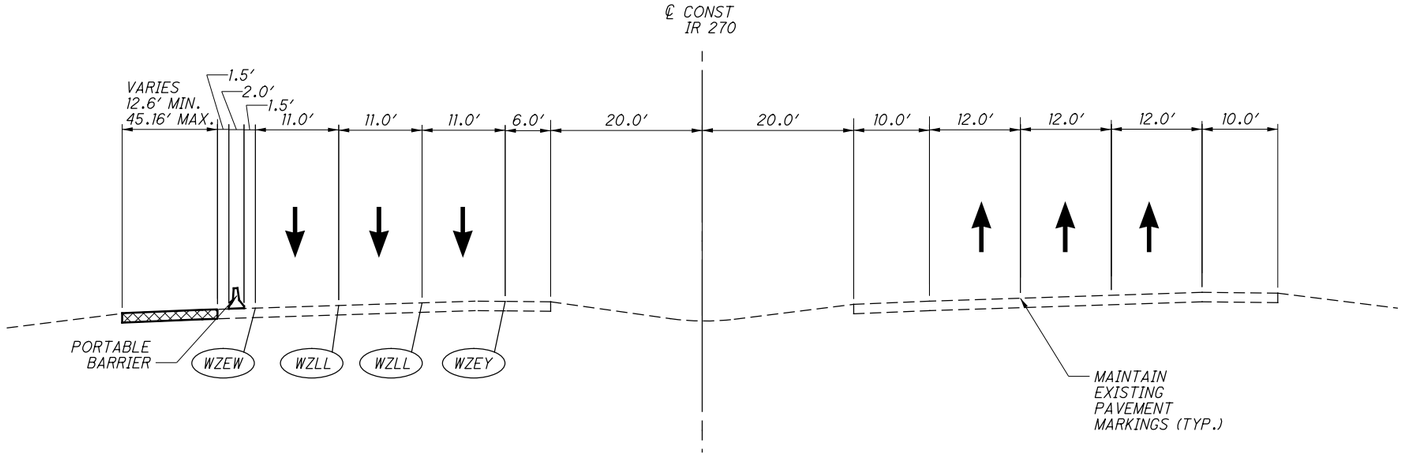
WZLL — WORK ZONE LANE LINE

WZCH — WORK ZONE CHANNELIZING LINE

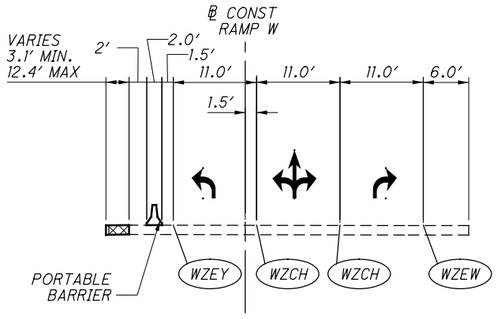
CALCULATED JLM
CHECKED SSK

MAINTENANCE OF TRAFFIC - TYPICAL SECTIONS

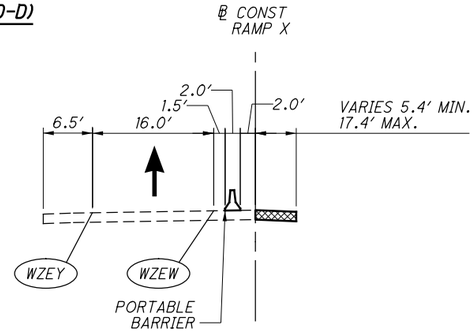
FRA-270-49.00



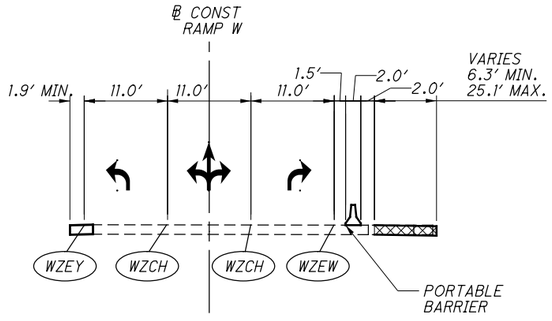
PHASE 1 IR 270
(SECTION D-D)



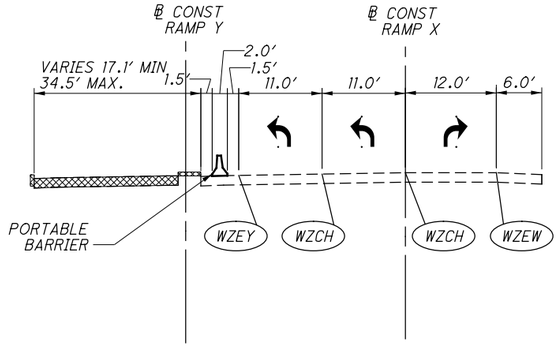
PHASE 1 RAMP W
(SECTION E-E)



PHASE 1 RAMP X
(SECTION G-G)



PHASE 2 RAMP W
(SECTION F-F)



PHASE 2 RAMP X
(SECTION H-H)

EXISTING PAVEMENT

PHASE CONSTRUCTION

WORK COMPLETED IN PRIOR PHASE CONSTRUCTION

WZEW — WORK ZONE EDGE LINE, WHITE

WZEY — WORK ZONE EDGE LINE, YELLOW

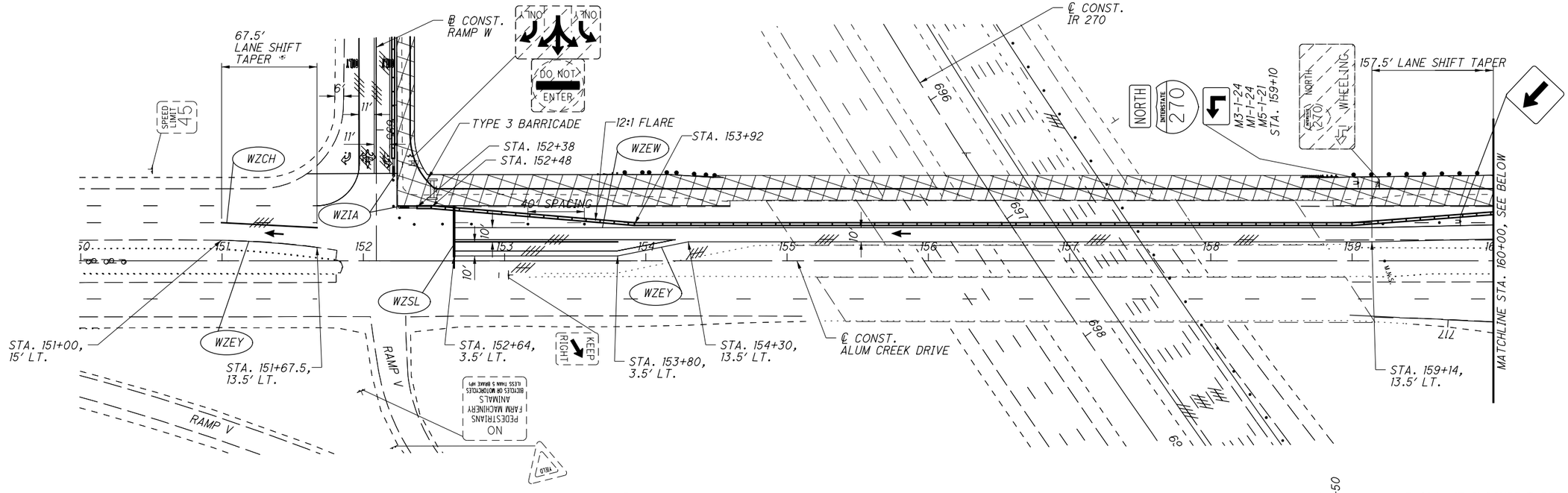
WZLL — WORK ZONE LANE LINE

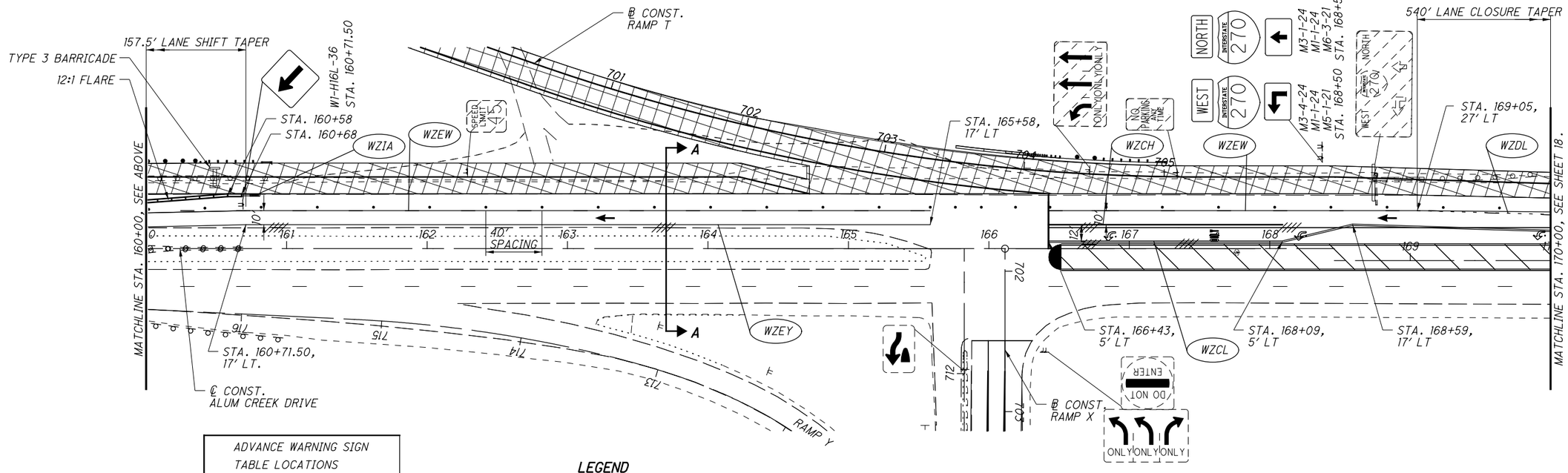
WZCH — WORK ZONE CHANNELIZING LINE

CALCULATED JLM
CHECKED SSK

MAINTENANCE OF TRAFFIC - TYPICAL SECTIONS

FRA-270-49.00





ADVANCE WARNING SIGN TABLE LOCATIONS	
SIGN NUMBER	END ROAD WORK E5-H2b-48
STATIONS	141+00
SIDE	RT

LEGEND

- DRUMS
- 32" PORTABLE BARRIER
- WZIA — WORK ZONE IMPACT ATTENUATOR
- WZEW — WORK ZONE EDGE LINE WHITE
- WZEY — WORK ZONE EDGE LINE YELLOW
- WZLL — WORK ZONE LANE LINE
- WZCH — WORK ZONE CHANNELIZING LINE
- WZDL — WORK ZONE DOTTED LINE
- WZSL — WORK ZONE STOP LINE
- WZCL — WORK ZONE CENTER LINE
- TYPE A, WARNING LIGHTS
- EXISTING PAVEMENT MARKING AND RAISED PAVEMENT MARKER REMOVED
- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE

NOTES:

1.) SEE BUILDABLE UNIT 4 FOR BRIDGE PHASING DETAILS.

2.) SEE BUILDABLE UNIT 6 FOR SIGNING PLANS.

3.) SEE SHEET 22 FOR ADDITONAL DETAILS FOR RAMPS X AND W.

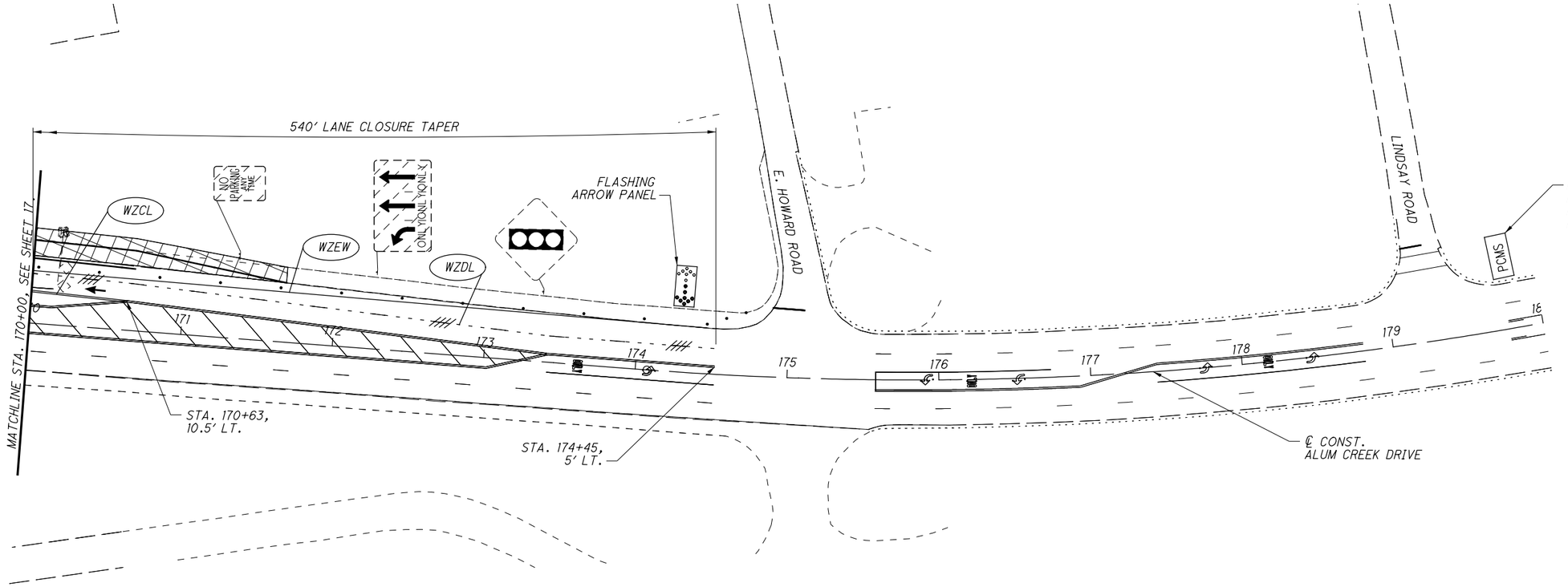
4.) SEE SHEETS 19 TO 21 FOR ADDITONAL DETAILS FOR IR 270.

HORIZONTAL SCALE IN FEET
0 20 40 80

CALCULATED JLM
CHECKED SSK

MAINTENANCE OF TRAFFIC PHASE 1
ALUM CREEK DRIVE STATION 150+00 TO STATION 170+00

FRA-270-49.00



ADVANCE WARNING SIGN TABLE LOCATIONS			
SIGN NUMBER	W4-2R-48	W20-5R-48 (RIGHT LANE CLOSED AHEAD)	W20-1-48 (ROAD WORK AHEAD) 1/4 MILES W16-3aP-30
STATIONS	179+45	184+45	189+45
SIDE	RT	RT	RT

LEGEND

- DRUMS
- 32" PORTABLE BARRIER
- WZIA — WORK ZONE IMPACT ATTENUATOR
- WZEW — WORK ZONE EDGE LINE WHITE
- WZEY — WORK ZONE EDGE LINE YELLOW
- WZLL — WORK ZONE LANE LINE
- WZCH — WORK ZONE CHANNELIZING LINE
- WZDL — WORK ZONE DOTTED LINE
- WZSL — WORK ZONE STOP LINE
- WZCL — WORK ZONE CENTER LINE
- TYPE A, WARNING LIGHTS
- EXISTING PAVEMENT MARKING AND RAISED PAVEMENT MARKER REMOVED
- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE

HORIZONTAL SCALE IN FEET: 0, 20, 40, 80

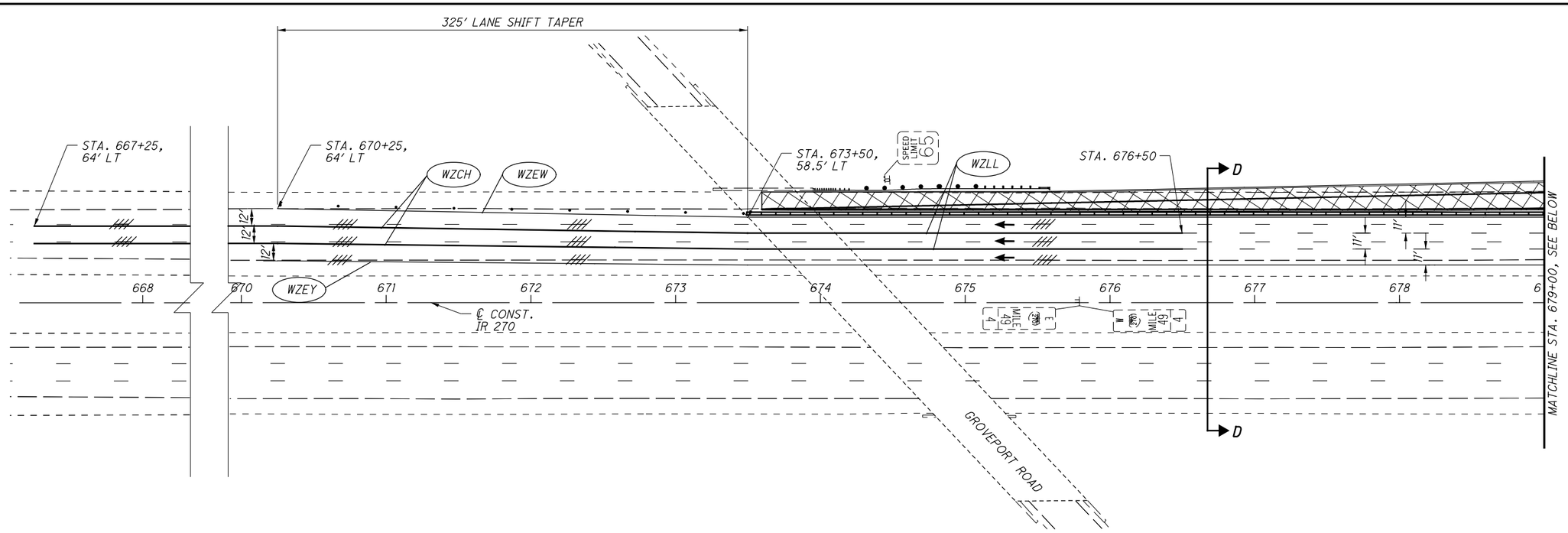
CALCULATED JLM CHECKED SSK

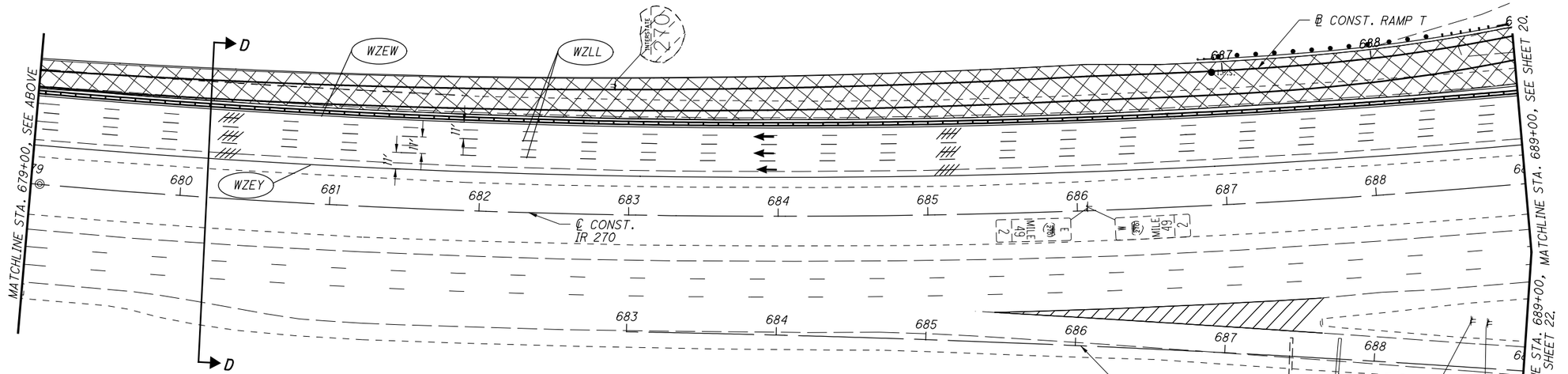
MAINTENANCE OF TRAFFIC PHASE 1

ALUM CREEK DRIVE STATION 170+00 TO STATION 180+00

FRA-270-49.00

AS BUILT - 4/22/2016





ADVANCE WARNING SIGN TABLE LOCATIONS	
SIGN NUMBER	END ROAD WORK E5-H2b-48
STATIONS	660+25 WB
SIDE	LT/ RT

LEGEND

- DRUMS
- 32" PORTABLE BARRIER
- WZIA — WORK ZONE IMPACT ATTENUATOR
- WZEW — WORK ZONE EDGE LINE WHITE
- WZEY — WORK ZONE EDGE LINE YELLOW
- WZLL — WORK ZONE LANE LINE
- WZCH — WORK ZONE CHANNELIZING LINE
- WZDL — WORK ZONE DOTTED LINE
- WZSL — WORK ZONE STOP LINE
- WZCL — WORK ZONE CENTER LINE
- TYPE A, WARNING LIGHTS
- EXISTING PAVEMENT MARKING AND RAISED PAVEMENT MARKER REMOVED
- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

MAINTENANCE OF TRAFFIC PHASE 1
I.R. 270 STATION 667+25 TO STATION 689+00

FRA-270-49.00

CALCULATED JLM CHECKED SSK

HORIZONTAL SCALE IN FEET 0 20 40 80

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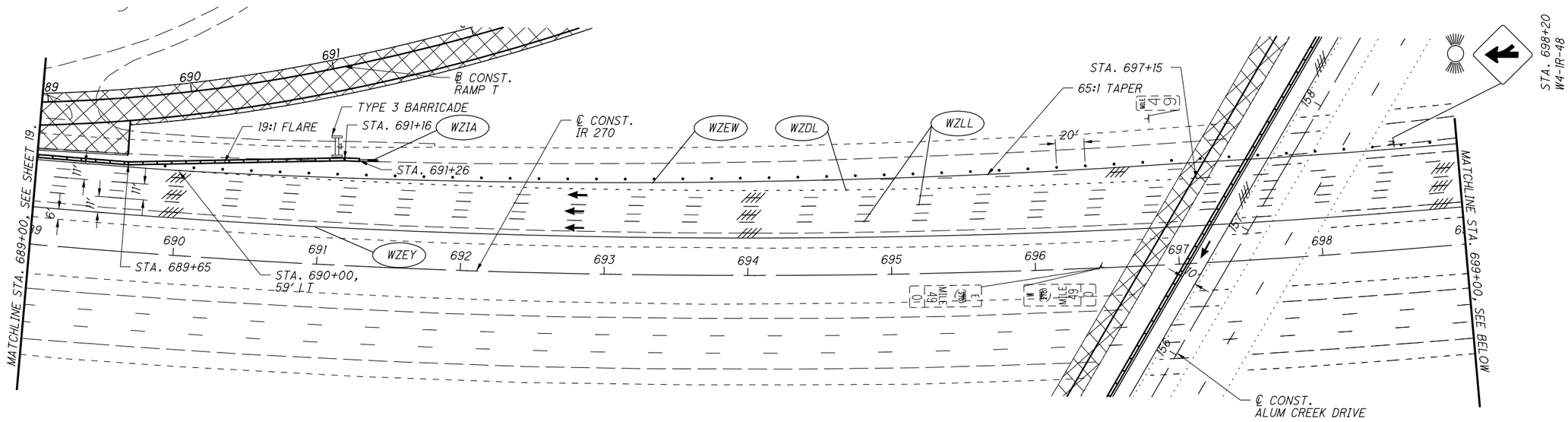
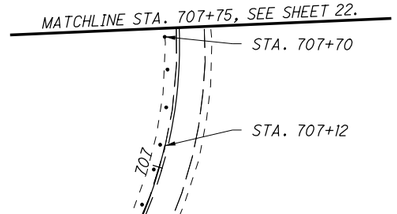


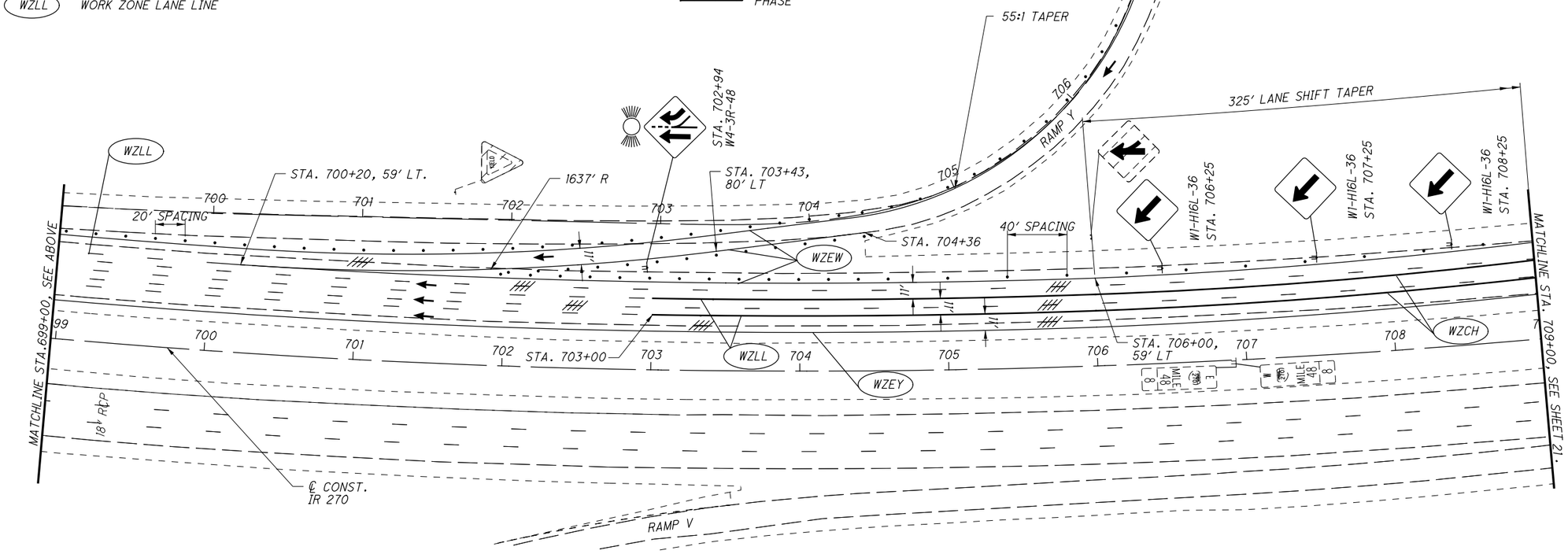
LEGEND

- DRUMS
- 32" PORTABLE BARRIER
- WZIA — WORK ZONE IMPACT ATTENUATOR
- WZEW — WORK ZONE EDGE LINE WHITE
- WZEY — WORK ZONE EDGE LINE YELLOW
- WZLL — WORK ZONE LANE LINE
- WZCH — WORK ZONE CHANNELIZING LINE
- WZDL — WORK ZONE DOTTED LINE
- WZSL — WORK ZONE STOP LINE
- WZCL — WORK ZONE CENTER LINE
- TYPE A, WARNING LIGHTS
- EXISTING PAVEMENT MARKING AND RAISED PAVEMENT MARKER REMOVED
- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE



NOTES:

1.) SEE SHEET 17 FOR ADDITONAL DETAILS FOR ALUM CREEK DRIVE.

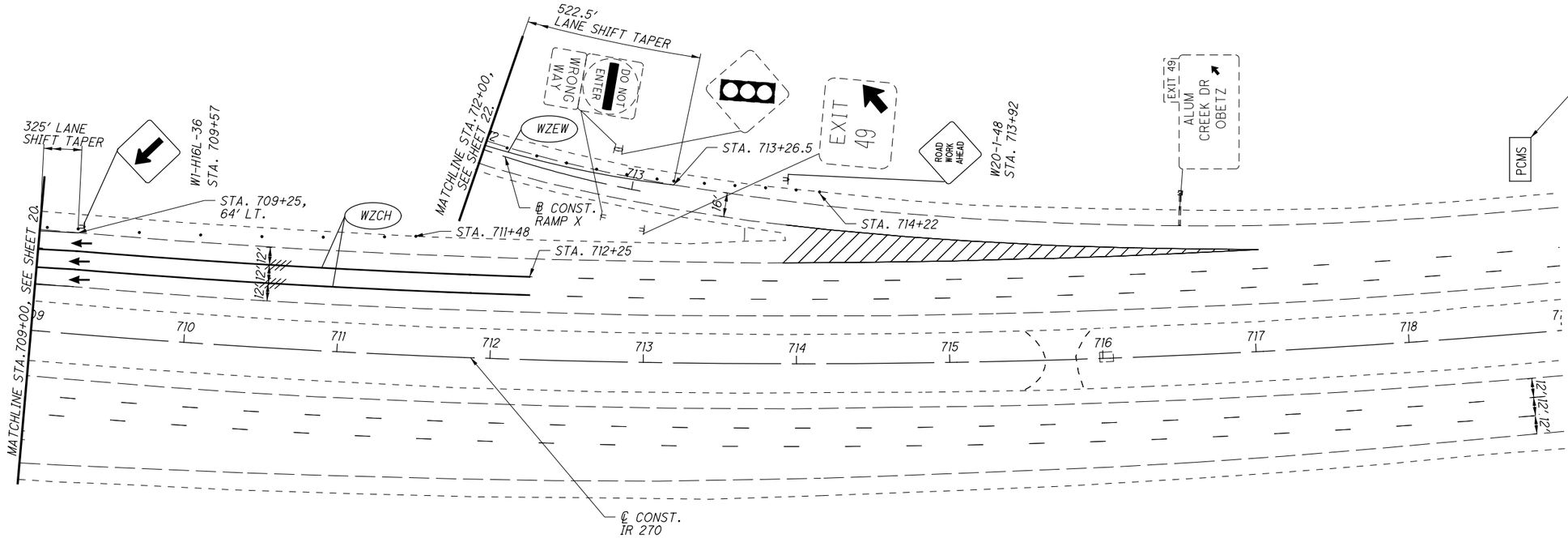


MAINTENANCE OF TRAFFIC PHASE 1
I.R. 270 STATION 689+00 TO STATION 709+00

FRA-270-49.00

HORIZONTAL SCALE IN FEET
0 20 40 80

CALCULATED JLM CHECKED SSK



ADVANCE WARNING SIGN TABLE LOCATIONS				
SIGN NUMBER	W1-4bR-48	R4-9-36 (STAY IN LANE)	R4-H5aR (TRUCKS USE RIGHT 2 LANES)	W20-1-48 (ROAD WORK AHEAD)
STATIONS	719+25 WB	729+25 WB	742+45 WB	755+65 WB
SIDE	LT/ RT	LT/ RT	LT/ RT	LT/ RT

- DRUMS
- 32" PORTABLE BARRIER
- WZIA — WORK ZONE IMPACT ATTENUATOR
- WZEW — WORK ZONE EDGE LINE WHITE
- WZEY — WORK ZONE EDGE LINE YELLOW
- WZLL — WORK ZONE LANE LINE
- WZCH — WORK ZONE CHANNELIZING LINE
- WZDL — WORK ZONE DOTTED LINE
- WZSL — WORK ZONE STOP LINE
- WZCL — WORK ZONE CENTER LINE

- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE

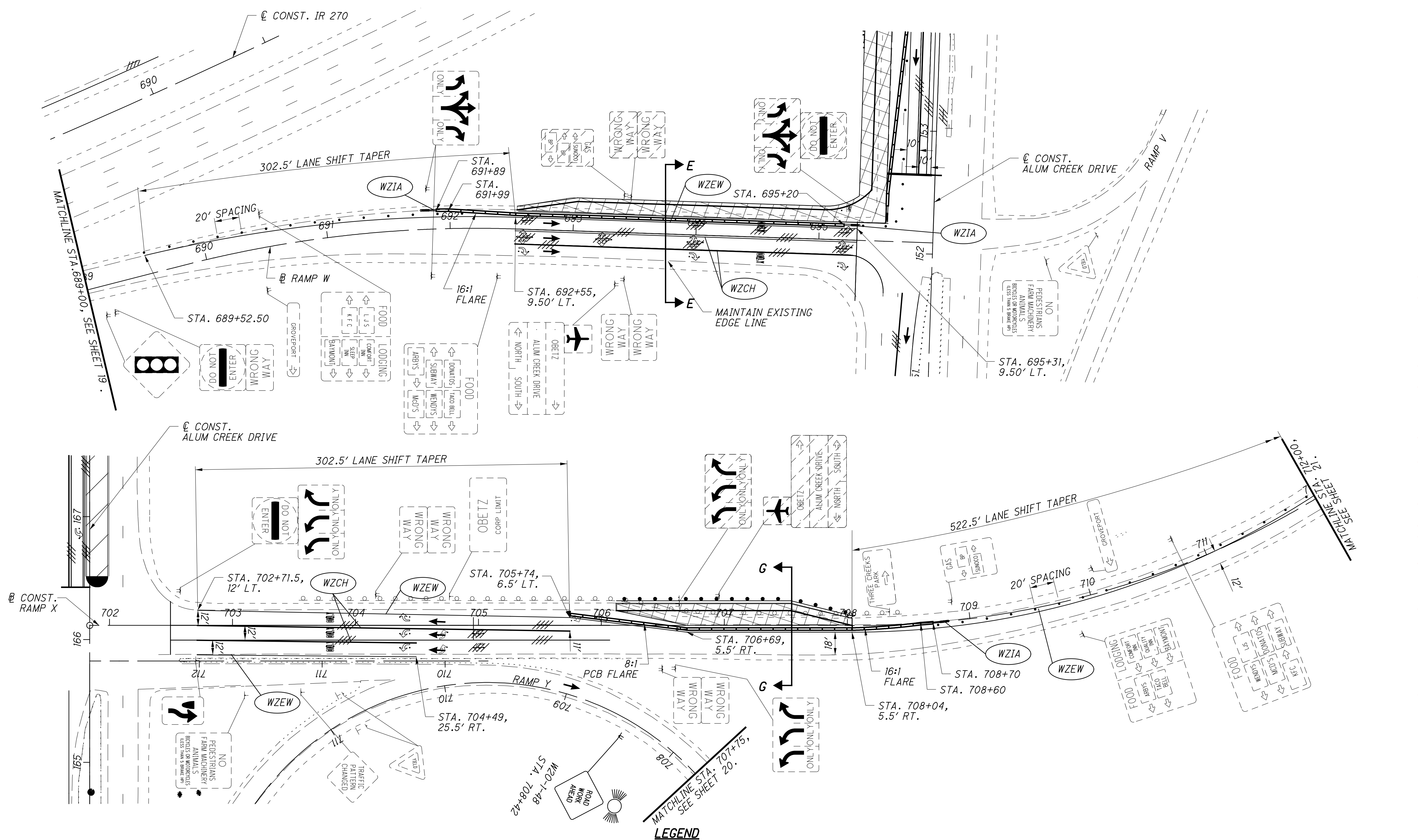
HORIZONTAL SCALE IN FEET: 0, 20, 40, 80

CALCULATED JLM
CHECKED SSK

MAINTENANCE OF TRAFFIC PHASE 1
I.R. 270 STATION 709+00 TO STATION 719+00

FRA-270-49.00

21
182



℄ CONST. IR 270
302.5' LANE SHIFT TAPER
20' SPACING
MATCHLINE STA. 689+00, SEE SHEET 19.
STA. 689+52.50
℄ RAMP W
STA. 691+89
STA. 691+99
16:1 FLARE
STA. 692+55, 9.50' LT.
STA. 695+20
MAINTAIN EXISTING EDGE LINE
STA. 695+31, 9.50' LT.
℄ CONST. ALUM CREEK DRIVE
RAMP V
WZIA
WZEW
WZCH
WRONG WAY
DO NOT ENTER
ONLY
FOOD
LODGING
GROVEPORT
NORTH
SOUTH
ALUM CREEK DRIVE
OBETZ
NO PEDESTRIANS FARM MACHINERY ANIMALS BICYCLES
℄ CONST. ALUM CREEK DRIVE
302.5' LANE SHIFT TAPER
℄ CONST. RAMP X
STA. 702+71.5, 12' LT.
STA. 705+74, 6.5' LT.
OBETZ CORP LIMIT
STA. 706+69, 5.5' RT.
8:1 PCB FLARE
STA. 704+49, 25.5' RT.
RAMP Y
522.5' LANE SHIFT TAPER
20' SPACING
16:1 FLARE
STA. 708+70
STA. 708+60
STA. 708+04, 5.5' RT.
MATCHLINE STA. 712+00, SEE SHEET 21.
MATCHLINE STA. 707+75, SEE SHEET 20.
W20-1-48 STA. 708+42
ROAD WORK AHEAD
THREE CREEKS PARK
GAS
TRAFFIC PATTERN CHANGED

LEGEND

• • • •	DRUMS
═══	32" PORTABLE BARRIER
WZIA	WORK ZONE IMPACT ATTENUATOR
WZEW	WORK ZONE EDGE LINE WHITE
WZEY	WORK ZONE EDGE LINE YELLOW
WZLL	WORK ZONE LANE LINE
WZCH	WORK ZONE CHANNELIZING LINE
WZDL	WORK ZONE DOTTED LINE
WZSL	WORK ZONE STOP LINE
WZCL	WORK ZONE CENTER LINE
	TYPE A, WARNING LIGHTS
	EXISTING PAVEMENT MARKING AND RAISED PAVEMENT MARKER REMOVED
	PHASE CONSTRUCTION
	REMOVE OR COVER SIGN DURING THIS PHASE

NOTES:

1.) SEE BUILDABLE UNIT 6 FOR SIGNING PLANS.

0 20 40 80
HORIZONTAL SCALE IN FEET

CALCULATED JLM
CHECKED SSK

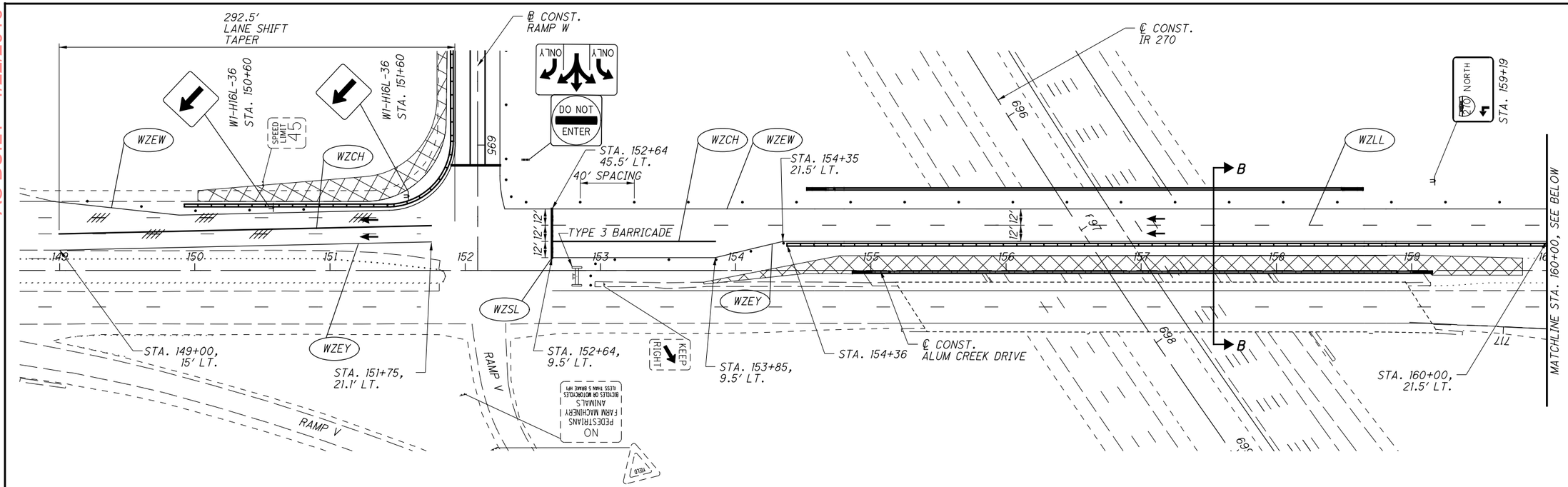
BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

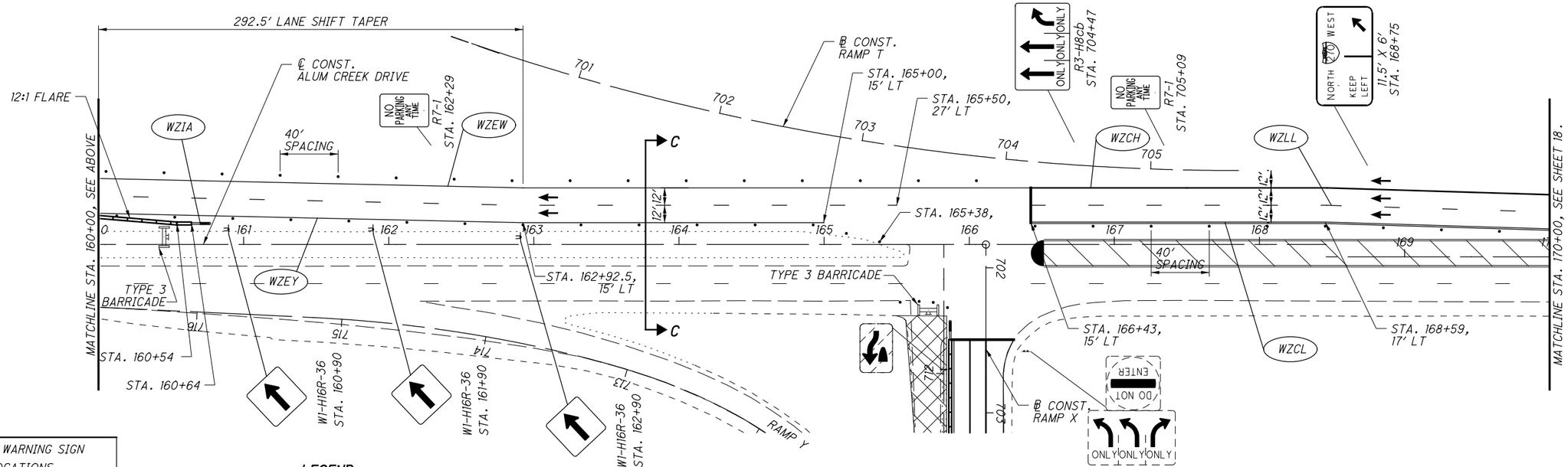
MAINTENANCE OF TRAFFIC PHASE 1

RAMPS W AND X STATION 689+00 TO STATION 712+00

FRA-270-49.00

AS BUILT - 4/22/2016





ADVANCE WARNING SIGN TABLE LOCATIONS	
SIGN NUMBER	END ROAD WORK E5-H2b-48
STATIONS	141+00
SIDE	RT

LEGEND

- DRUMS
- 32" PORTABLE BARRIER
- WZIA — WORK ZONE IMPACT ATTENUATOR
- WZEW — WORK ZONE EDGE LINE WHITE
- WZEY — WORK ZONE EDGE LINE YELLOW
- WZLL — WORK ZONE LANE LINE
- WZCH — WORK ZONE CHANNELIZING LINE
- WZDL — WORK ZONE DOTTED LINE
- WZSL — WORK ZONE STOP LINE
- WZCL — WORK ZONE CENTER LINE
- TYPE A, WARNING LIGHTS
- EXISTING PAVEMENT MARKING AND RAISED PAVEMENT MARKER REMOVED
- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE

NOTES:

1.) SEE BUILDABLE UNIT 4 FOR BRIDGE PHASING DETAILS.

2.) SEE BUILDABLE UNIT 6 FOR SIGNING PLANS.

3.) SEE SHEET 26 FOR ADDITONAL DETAILS FOR RAMPS X AND W.

HORIZONTAL SCALE IN FEET
0 20 40 80

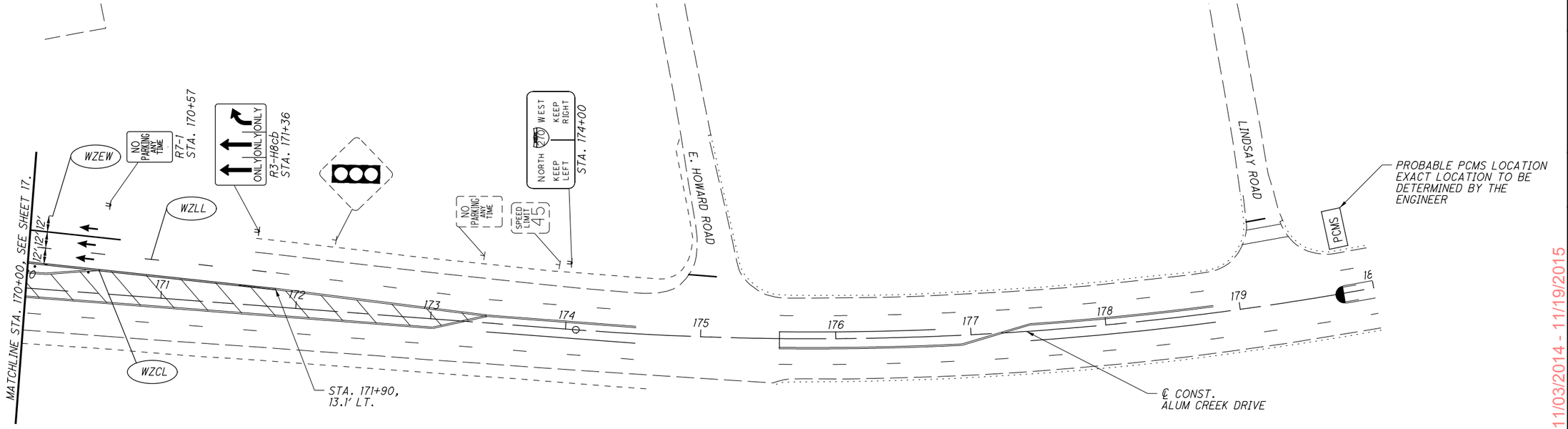
CALCULATED JLM
CHECKED SSK

MAINTENANCE OF TRAFFIC PHASE 2
ALUM CREEK DRIVE STATION 149+00 TO STATION 170+00

FRA-270-49.00

23
182

BU 4, 5, 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015



ADVANCE WARNING SIGN TABLE LOCATIONS	
SIGN NUMBER	ROAD WORK AHEAD ¼ MILES W20-1-48 W16-3aP-30
STATIONS	189+45
SIDE	RT

LEGEND

- DRUMS
- 32" PORTABLE BARRIER
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- WZLL — WORK ZONE LANE LINE
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- WZCL — WORK ZONE CENTER LINE
- TYPE A, WARNING LIGHTS
- EXISTING PAVEMENT MARKING AND RAISED PAVEMENT MARKER REMOVED
- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE

MAINTENANCE OF TRAFFIC PHASE 2

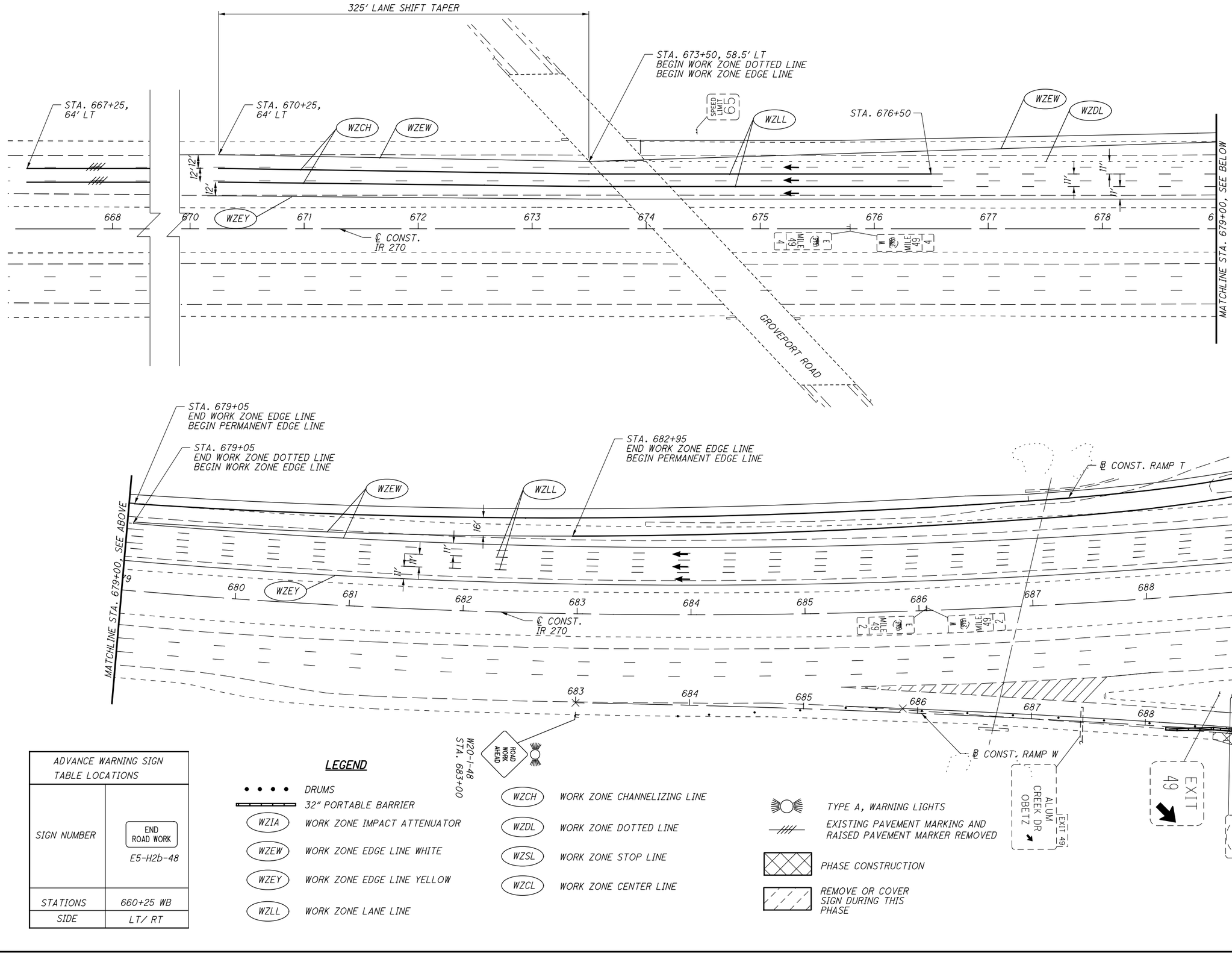
ALUM CREEK DRIVE STATION 170+00 TO STATION 180+00

HORIZONTAL SCALE IN FEET: 0, 20, 40, 80

CALCULATED JLM | CHECKED SSK

FRA-270-49.00

AS BUILT - 4/22/2016



ADVANCE WARNING SIGN TABLE LOCATIONS	
SIGN NUMBER	END ROAD WORK E5-H2b-48
STATIONS	660+25 WB
SIDE	LT/ RT

LEGEND

- DRUMS
- 32" PORTABLE BARRIER
- WZIA — WORK ZONE IMPACT ATTENUATOR
- WZEW — WORK ZONE EDGE LINE WHITE
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- WZLL — WORK ZONE LANE LINE
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- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE

BU 4, 5, 6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

HORIZONTAL SCALE IN FEET 0 20 40 80

CALCULATED JLM CHECKED SSK

MAINTENANCE OF TRAFFIC PHASE 2
I.R. 270 STATION 667+25 TO STATION 689+00

FRA-270-49.00

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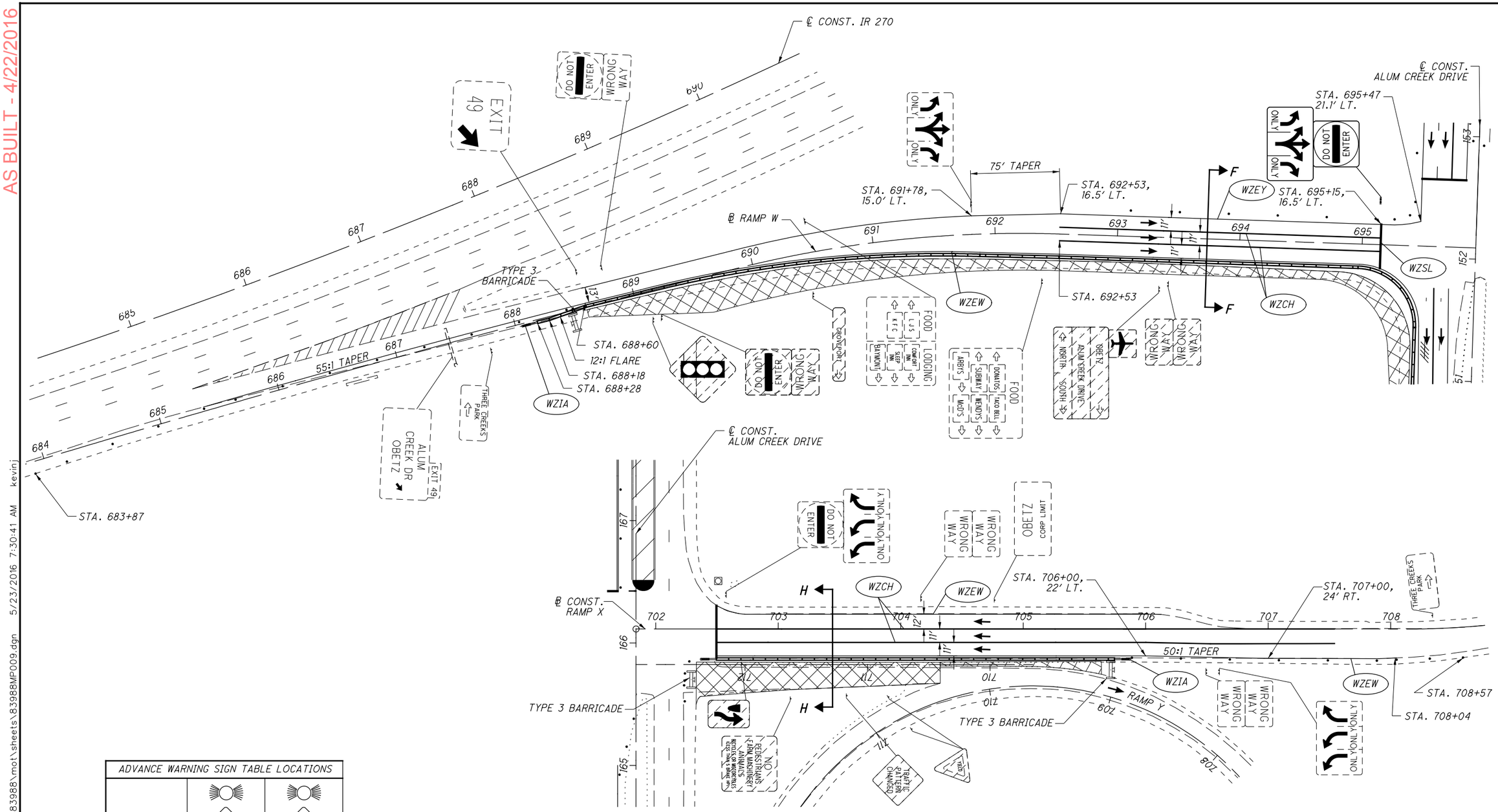
AS BUILT - 4/22/2016



ADVANCE WARNING SIGN TABLE LOCATIONS		
SIGN NUMBER	ROAD WORK AHEAD W20-1-48	ROAD WORK AHEAD W20-1-48
STATIONS	RAMP W STA. 683+00	RAMP X STA. 713+00
SIDE	RT	RT

LEGEND

- DRUMS
- 32" PORTABLE BARRIER
- WZIA — WORK ZONE IMPACT ATTENUATOR
- WZEW — WORK ZONE EDGE LINE WHITE
- WZEY — WORK ZONE EDGE LINE YELLOW
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- WZCL — WORK ZONE CENTER LINE
- TYPE A, WARNING LIGHTS
- EXISTING PAVEMENT MARKING AND RAISED PAVEMENT MARKER REMOVED
- PHASE CONSTRUCTION
- REMOVE OR COVER SIGN DURING THIS PHASE

NOTES:
1.) SEE BUILDABLE UNIT 6 FOR SIGNING PLANS.

BU 4, 5, 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

MAINTENANCE OF TRAFFIC PHASE 2
RAMPS W AND X STATION 689+00 TO STATION 712+00

FRA-270-49.00

AS BUILT - 4/22/2016

GENERAL SUMMARY

SHEET NUMBER 30	31	32	105	107	108	121	131	135	143	OFFICE CALCS	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
															ROADWAY	
											201	11000	LUMP		CLEARING AND GRUBBING	
	197										202	30500	197	SQ YD	CONCRETE MEDIAN REMOVED	
	209										202	30700	209	FT	CONCRETE BARRIER REMOVED	
	1177										202	38000	1177	FT	GUARDRAIL REMOVED	
		20									202	35200	20	FT	PIPE REMOVED, OVER 24"	
		1									202	58100	1	EACH	CATCH BASIN REMOVED	
	5102										202	75000	5102	FT	FENCE REMOVED	
		115									202	98300	115	SQ YD	REMOVAL MISC.: PAVED GUTTER REMOVED	
										10224	203	10000	10224	CU. YD.	EXCAVATION	
										9653	203	20000	9653	CU. YD.	EMBANKMENT	
										14255	204	10000	14255	SQ. YD.	SUBGRADE COMPACTION	
	5										204	45000	5	HOURS	PROOF ROLLING	
	212.5										606	13000	212.5	FT	GUARDRAIL, TYPE 5	
	1001										606	15050	1001	FT	GUARDRAIL, TYPE MGS	
	25										606	15500	25	FT	GUARDRAIL BARRIER DESIGN, TYPE 5	
	6										606	26150	6	EACH	ANCHOR ASSEMBLY, MGS TYPE E	
	1										606	26500	1	EACH	ANCHOR ASSEMBLY, TYPE T	
	3										606	26550	3	EACH	ANCHOR ASSEMBLY, MGS TYPE T	
	1										606	35000	1	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 1	
	5										606	35002	5	EACH	MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1	
	3										606	35102	3	EACH	MGS BRIDGE TERMINAL ASSEMBLY, TYPE 2	
	4080										607	15000	4080	FT	FENCE, TYPE 47	
	33										609	24150	33	FT	CURB TYPE 4C	
	104										609	72000	104	SQ YD	CONCRETE MEDIAN	
	285										622	10160	285	FT	CONCRETE BARRIER SINGLE SLOPE TYPE D	
	25										622	23400	25	FT	CONCRETE BARRIER TYPE B	
	4										622	25000	4	EACH	CONCRETE BARRIER END SECTION, TYPE D	
	57										626	13100	57	EACH	BARRIER REFLECTOR	
															EROSION CONTROL	
										2	659	00100	2	EACH	SOIL ANALYSIS TEST	
										2177	659	00300	2177	CU YD	TOPSOIL	
										19606	659	10000	19606	SQ YD	SEEDING AND MULCHING	
										4	659	10300	4	ACRE	LIME	
										3	659	11000	3	TON	COMMERCIAL FERTILIZER	
										980	659	14000	980	SQ YD	REPAIR SEEDING AND MULCHING	
										980	659	15000	980	SQ YD	INTER SEEDING	
										106	659	35000	106	M. GAL.	WATER	
										44	659	40000	44	MSF	MOWING	
															DRAINAGE	
		156									601	21060	156	SQ YD	TIED CONCRETE BLOCK MAT, TYPE 2	
		54									601	38101	54	SQ YD	PAVED GUTTER TYPE 1-6, AS PER PLAN	94
		0									602	20000	0	CU YD	CONCRETE MASONRY	
		6713									605	14020	6713	FT	6" BASE PIPE UNDERDRAIN WITH FABRIC WRAP	
		230									611	01500	230	FT	6" CONDUIT TYPE F	
		120									611	01100	120	FT	6" CONDUIT TPYE C	
		38									611	07400	38	FT	18" CONDUIT, TYPE B	
		50									611	10200	50	FT	24" CONDUIT TYPE A	
		121									611	10600	121	FT	24" CONDUIT TYPE C	
		1									611	98180	1	EACH	CATCH BASIN NO. 3A	
		1									611	98300	1	EACH	CATCH BASIN NO. 5	
		2									611	98390	2	EACH	CATCH BASIN NO. 7	
		1									611	98820	1	EACH	INLET I-3D	
		1									611	99574	1	EACH	MANHOLE NO. 3	
		5									611	99710	5	EACH	PRECAST REINFORCED CONCRETE OUTLET	
		810									670	00700	810	SQ YD	DITCH EROSION PROTECTION MAT, TYPE A	
		429									670	00760	429	SQ YD	DITCH EROSION PROTECTION MAT, TYPE F	
		42									836	10000	42	SQ YD	SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1	
															PAVEMENT	
										11113	254	01000	11113	SQ. YD.	PAVEMENT PLANING	
										2480	302	46000	2480	CU. YD.	ASPHALT CONCRETE BASE, PG 64-22	
										2376	304	20000	2376	CU. YD.	AGGREGATE BASE	
										993	407	14000	993	GAL.	TACK COAT FOR INTERMEDIATE COURSE	
										828	442	10000	828	CU. YD.	ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A (446)	

Revision	DATE	DESCRIPTION
1	4/22/16	AS BUILT

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BU 4, 5, 6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED JLM CHECKED SSK

FRA-270-49.00

AS BUILT - 4/22/2016

SHEET NUMBER																ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
30	31	32	105	107	108	109	121	131	135	143	OFFICE CALCS										
											721					442	10100	721	CU. YD.	ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	
											4635					452	16020	4635	SQ. YD.	13" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1 WITH QC/QA	
											0					618	40100	0.30	MILES	RUMBLE STRIPS, (ASPHALT CONCRETE)	
																				TRAFFIC CONTROL	
				12												620	00501	12	EACH	DELINEATOR POST MOUNTED, AS PER PLAN	110
				77												621	12800	77	EACH	RAISED PAVEMENT MARKERS	
						152		15								630	02100	167	FT	GROUND MOUNTED SUPPORT POST NO. 2	
						268										630	03100	268	FT	GROUND MOUNTED SUPPORT POST NO. 3	
						34										630	04100	34	FT	GROUND MOUNTED SUPPORT POST NO. 4	
						38										630	06500	38	FT	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W6X9	
						50										630	07000	50	FT	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W8X18	
						86										630	07600	86	FT	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W10X12	
									30							630	08510	30	FT	STREET NAME SIGN SUPPORT, NO. 2 POST	
						8										630	09000	8	EACH	BREAKAWAY STRUCTURAL BEAM CONNECTION	
						1										630	20300	1	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-12.30 DESIGN 3	
						8										630	75000	8	EACH	SIGN ATTACHMENT ASSEMBLY	
								2								630	79100	2	EACH	SIGN HANGER ASSEMBLY, MAST ARM	
								4	2							630	79500	6	EACH	SIGN SUPPORT ASSEMBLY, POLE MOUNTED	
					221			24	13							630	80100	258	SF	SIGN, FLAT SHEET	
					252											630	80200	252	SQ FT	SIGN, GROUND MOUNTED EXTRUSHEET	
					69											630	80224	69	SQ FT	SIGN, OVERHEAD EXTRUSHEET	
						8										630	84500	8	EACH	GROUND MOUNTED STRUCTURAL BEAM SUPPORT FOUNDATION	
						1										630	84510	1	EACH	RIGID OVERHEAD SIGN SUPPORT FOUNDATION	
					29											630	84900	29	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	
					5											630	85400	5	EACH	REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL	
					33											630	86002	33	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	
					7											630	86102	7	EACH	REMOVAL OF GROUND MOUNTED STRUCTURAL BEAM SUPPORT AND DISPOSAL	
					1											630	87000	1	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND DISPOSAL	
					1											630	89702	1	EACH	REMOVAL OF OVERHEAD SIGN SUPPORT AND DISPOSAL	
				0.36												644	00100	0.36	MILE	EDGE LINE, 4"	
				3												644	00104	3	MILE	EDGE LINE, 6"	
				1												644	00200	1	MILE	LANE LINE, 4"	
				2												644	00204	2	MILE	LANE LINE, 6"	
				0.12												644	00290	0.12	MILE	CENTERLINE	
				743												644	00400	743	FT	CHANNELIZING LINE, 8"	
				4118												644	00404	4118	FT	CHANNELIZING LINE, 12"	
				118												644	00500	118	FT	STOP LINE	
				364												644	00700	364	FT	TRANSVERSE/ DIAGONAL LINE	
				22												644	01300	22	EACH	LANE ARROW	
				1736												644	01508	1736	FT	DOTTED LINE, 6"	
				0.16												646	10000	0.16	MILE	EDGE LINE, 4"	
				0.16												646	10100	0.16	MILE	LANE LINE, 4"	
				430												646	10300	430	FT	CHANNELIZING LINE, 8"	
				3												646	20300	3	EACH	LANE ARROW	
																				MAINTENENANCE OF TRAFFIC	
6																614	12350	6	EACH	WORK ZONE IMPACT ATTENUATOR	
1.06																614	12800	1.06	EACH	WORK ZONE RAISED PAVEMENT MARKERS	
0.08																614	13100	0.08	EACH	BARRIER REFLECTOR	
2.68																614	13350	2.68	EACH	OBJECT MARKER, ONE-WAY	
1255																614	13360	1255	EACH	OBJECT MARKER, TWO-WAY	
5082																614	20000	5082	MILE	WORK ZONE LANE LINE, CLASS I	
35																614	21000	35	MILE	WORK ZONE CENTER LINE, CLASS I	
6																614	22000	6	MILE	WORK ZONE EDGE LINE, CLASS I	
54																614	23000	54	FT	WORK ZONE CHANNELIZING LINE, CLASS I	
15																614	24000	15	FT	WORK ZONE DOTTED LINE	
206																614	26000	206	FT	WORK ZONE STOP LINE, CLASS I	
371																614	30000	371	EACH	WORK ZONE ARROW, CLASS I	
2803																622	41000	2803	FT	PORTABLE BARRIER, 32"	
430																622	41020	430	FT	PORTABLE BARRIER, 32", BRIDGE MOUNTED (UNANCHORED)	
																				TRAFFIC SIGNALS, LIGHTING, AND ITS	
							1									625	00100	1	EACH	LIGHT POLE REMOVED FOR REERECTION, AS PER PLAN	120
							2									625	13204	2	EACH	LIGHT TOWER, BBBB100	
							2									625	15100	2	EACH	LIGHT TOWER FOUNDATION, 36" X 20' DEEP	
							1									625	15101	1	EACH	LIGHT TOWER FOUNDATION, 36" X 20' DEEP, AS PER PLAN	120
							320									625	23308	320	FT	DISTRIBUTION CABLE, MISC.: NO. 4 AWG 2400 VOLT DISTRIBUTION CABLE	

CALCULATED JLM CHECKED SSK

EU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

GENERAL SUMMARY

FRA-270-49.00

SHEET NUMBER															ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
30	31	32	105	107	108	121	131	135	143	OFFICE CALCS										
						2695									625	24100	2695	FT	1 1/2" DUCT CABLE WITH THREE NO. 4 AWG 5000 VOLT CABLES	
							270								625	25500	270	FT	CONDUIT, 3", 725.04	
									200						625	25502	200	FT	CONDUIT, 3", 725.05	
								330							625	25504	330	FT	CONDUIT, 3", 725.051	
						150	250	130							625	25900	530	FT	CONDUIT, JACKED OR DRILLED	
						8									625	26260	8	EACH	LUMINAIRE, HIGH MAST, ASYMETRIC, 400W HPS, 480 VOLT, AS PER PLAN	120
							270	330							625	29000	600	FT	TRENCH	
						2625									625	29002	2625	FT	TRENCH, 24" DEEP	
						4	2	1	1						625	30700	8	EACH	PULL BOX, 725.08, 18"	
							2	2							625	30706	4	EACH	PULL BOX, 725.08, 24"	
					1	8	5	3							625	32000	17	EACH	GROUND ROD	
						1									625	35020	1	EACH	RE-ERECT EXISTING LIGHT TOWER	
						2775	270	330							625	36000	3375	FT	PLASTIC CAUTION TAPE	
						2									625	75400	2	EACH	LIGHT POLE REMOVED	
						2									625	75502	2	EACH	PORTION OF LIGHT POLE FOUNDATION REMOVED	
						1									625	75503	1	EACH	PORTION OF LIGHT POLE FOUNDATION REMOVED, AS PER PLAN	120
						2									625	75506	2	EACH	LUMINAIRE REMOVED	
						80									625	98100	80	FT	LIGHTING MISC., 3" RMC (725.04) IN TRENCH	
						1									625	98200	LUMP		LIGHTING MISC.: REVISE LIGHTING CONTROL CENTER	
						8									625	00460	8	EACH	CONNECTION, UNFUSED PERMANENT	
							10	8							632	05007	18	EACH	VEHICULAR SIGNAL HEAD, (LED), BLACK, 3 SECTION, 12" LENS 1-WAY WITH BACKPLATE, AS PER PLAN	126
							2								632	05087	2	EACH	VEHICULAR SIGNAL HEAD, (LED), BLACK, 5 SECTION, 12" LENS 1-WAY WITH BACKPLATE, AS PER PLAN	126
							12	9							632	25000	21	EACH	COVERING OF VEHICULAR SIGNAL HEAD	
							1	1							632	34001	2	EACH	POWER SERVICE, AS PER PLAN	127
							1825	1405							632	40700	3230	FT	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	
							3	2							632	54010	5	EACH	SIGNAL SUPPORT FOUNDATION	
							1								632	64020	1	EACH	PEDESTAL FOUNDATION	
							210	300							632	69300	510	FT	POWER CABLE, 3 CONDUCTOR, NO. 4 AWG	
							1								632	75043	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 4, WITH MAST ARMS DESIGN 2 AND 3, AS PER PLAN	126
								1							632	75410	1	EACH	SIGNAL SUPPORT, TYPE TC-12.30, DESIGN 8 WITH MAST ARMS DESIGN 13 AND 11, AS PER PLAN	126
							1								632	77231	1	EACH	SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-8121 MAST ARM (GREATER THAN 59' IN LENGTH), AS PER PLAN	128
							1								632	80103	1	EACH	SINGAL SUPPORT, TYPE TC-81.21, DESIGN 1, AS PER PAN	126
							1	1							632	80629	2	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 14, AS PER PLAN	126
							1								632	89901	1	EACH	PEDESTAL, 8', TRANSFORMER BASE, AS PER PLAN	126
							1	1							632	90101	2	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN	126
							1	1							632	90400	2	EACH	SIGNALIZATION MISC.:CDMA MODEM, FURNISH ONLY	
									1						632	90400	1	EACH	SIGNALIZATION, MISC.: 32" ROUND CONCRETE PULL BOX	
									1						632	90400	1	EACH	SIGNALIZATION, MISC.: CCTV IP-CAMERA SYSTEM, DOME TYPE	
									1						632	90400	1	EACH	SIGNALIZATION, MISC.:CCTV POLE, CONCRETE, 70', WITH LOWERING UNIT	
								1							632		1	EACH	VEHICULAR SIGNAL HEAD, (LED), BLACK, 1 SECTION, 12" LENS 1-WAY WITH BACKPLATE, AS PER PLAN	126
							1	1							633	01581	2	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET TYPE TS1, AS PER PLAN	127
									135						633	62810	135	FT	INTERCONNECT CABLE MISC. CATEGORY 5E CABLE, OUTDOOR RATED	
							1	1							633	67000	2	EACH	CABINET RISER	
							1	1							633	67100	2	EACH	CABINET FOUNDATION	
							1	1							633	67200	2	EACH	CONTROLLER WORK PAD	
							3	2							633	69000	5	EACH	ADVANCE/ DILEMMA ZONE DETECTION RADAR	
							2	1							633	69100	3	EACH	STOP BAR DETECTION RADAR	
							1	1							633	75000	2	EACH	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN	127
									1						633	99000	1	EACH	CONTROLLER ITEM, MISC.: ITS CABINET, GROUND MOUNTED	
									1						633	99000	1	EACH	CONTROLLER MISC.: ITS WORK PAD	
																			NOISE BARRIER	
			169												606	10200	169	SF	SPECIAL-NOISE BARRIER (REFLECTIVE), 10' HEIGHT AND UNDER	
			16940												606	10210	16940	SF	SPECIAL-NOISE BARRIER (REFLECTIVE), OVER 10' TO 14'HEIGHT	

AS BUILT - 4/22/2016

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED JLM CHECKED SSK

GENERAL SUMMARY

FRA-270-49.00

29
182

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AS BUILT - 4/22/2016

LOCATION	PHASE	STATION TO STATION		614											614 OR 621	622	
				WORK ZONE IMPACT ATTENUATOR	WORK ZONE LANE LINE, CLASS I	WORK ZONE CENTER LINE, CLASS I	WORK ZONE EDGE LINE, CLASS I	WORK ZONE DOTTED LINE	WORK ZONE CHANNELIZING LINE, CLASS I	WORK ZONE STOP LINE, CLASS I	WORK ZONE ARROW, CLASS I	OBJECT MARKER, ONE-WAY	OBJECT MARKER, TWO-WAY	BARRIER REFLECTOR	WORK ZONE RAISED PAVEMENT MARKERS	PORTABLE BARRIER, 32"	PORTABLE BARRIER, 32", BRIDGE MOUNTED (UNANCHORED)
				EACH	MILE	MILE	MILE	FT	FT	FT	EACH	EACH	EACH	EACH	EACH	FT	FT
ALUM CREEK DRIVE	1	151+00.0	151+67.5				0.01										
ALUM CREEK DRIVE	1	151+00.0	151+67.5						67.5								
ALUM CREEK DRIVE	1	152+64.0								35							
ALUM CREEK DRIVE	1	152+38.0	160+68.0	2								18		53		400	430
ALUM CREEK DRIVE	1	152+64.0	165+58.0				0.25										
ALUM CREEK DRIVE	1	152+64.0	166+43.0				0.26										
ALUM CREEK DRIVE	1	152+64.0	153+80.0						116								
ALUM CREEK DRIVE	1	166+43.0	174+45.0				0.15										
ALUM CREEK DRIVE	1	166+43.0	168+09.0						166								
ALUM CREEK DRIVE	1	166+43.0	170+63.0			0.08											
ALUM CREEK DRIVE	1	169+05.0	174+45.0					540									
IR 270 WB	1	670+25.0	700+20.0				0.57								46		
IR 270 WB	1	670+25.0	709+25.0				0.74								92		
IR 270 WB	1	667+25.0	676+50.0						925						46		
IR 270 WB	1	667+25.0	676+50.0						925						46		
IR 270 WB	1	673+50.0	691+26.0	1								37		110		1776	
IR 270 WB	1	676+50.0	703+00.0		0.50										23		
IR 270 WB	1	676+50.0	703+00.0		0.50										23		
IR 270 WB	1	700+20.0	709+25.0				0.17										
IR 270 WB	1	703+00.0	712+25.0						925						47		
IR 270 WB	1	703+00.0	712+25.0						925						47		
IR 270 WB	1	690+00.0	697+15.0					715									
IR 270 WB	1	697+15.0	700+20.0		0.06												
Ramp Y	1	700+00.0	704+36.0				0.08										
Ramp Y	1	700+20.0	707+12.0				0.13										
RAMP W	1	689+52.5	695+31.0				0.11										
RAMP W	1	691+89.0	695+20.0	2									8	23		331	
RAMP W	1	692+55.0	695+31.0						276								
RAMP W	1	692+55.0	695+31.0						276		3						
RAMP X	1	702+71.5	705+74.0				0.06										
RAMP X	1	702+71.5	704+49.0				0.03										
RAMP X	1	702+71.5	705+74.0						302.5								
RAMP X	1	702+71.5	704+49.0						177.5		3						
RAMP X	1	705+74.0	708+70.0	1									7	21		296	
TOTALS CARRIED TO GENERAL SUMMARY				6	1.06	0.08	2.56	1255	5082	35	6	54	15	206	371	2803	430

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED JLM
CHECKED SSK

MAINTENANCE OF TRAFFIC SUBSUMMARY

FRA-270-49.00

AS BUILT - 4/22/2016

LOCATION	STATION TO STATION		SIDE	202				606								607	609		622			626				
				GUARDRAIL REMOVED	CONCRETE BARRIER REMOVED	CONCRETE MEDIAN REMOVED	FENCE REMOVED	GUARDRAIL, TYPE MGS	GUARDRAIL BARRIER DESIGN, TYPE 5	GUARDRAIL, TYPE 5	ANCHOR ASSEMBLY, TYPE T	ANCHOR ASSEMBLY, MGS TYPE T	ANCHOR ASSEMBLY, MGS TYPE E	BRIDGE TERMINAL ASSEMBLY, TYPE 1	MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1	MGS BRIDGE TERMINAL ASSEMBLY, TYPE 2	FENCE, TYPE 47	CURB TYPE 4C	CONCRETE MEDIAN	CONCRETE BARRIER SINGLE SLOPE TYPE D	CONCRETE BARRIER END SECTION, TYPE D	CONCRETE BARRIER TYPE B	BARRIER REFLECTOR				
				FT	FT	SQ YD	FT	FT	FT	FT	EACH	EACH	EACH	EACH	EACH	EACH	FT	FT	SQ YD	FT	EACH	FT	EACH				
ALUM CREEK DRIVE	153+63.97	154+54.65	LT.					78.13				1				1		19					2				
ALUM CREEK DRIVE	153+64.00	154+63.00	LT.	99																							
ALUM CREEK DRIVE	153+76.50	154+79.00	MED		103																						
ALUM CREEK DRIVE	153+76.50	154+01.50	MED																			25	1				
ALUM CREEK DRIVE	154+01.50	154+85.94	MED																	84			2				
ALUM CREEK DRIVE	154+52.65	158+63.90	LT																				5				
ALUM CREEK DRIVE	154+86.60	159+15.24	MED																				5				
ALUM CREEK DRIVE	158+61.40	160+88.30	LT					150.00					1		1			14					3				
ALUM CREEK DRIVE	158+81.00	160+87.00	LT	206																							
ALUM CREEK DRIVE	159+01.00	159+82.00	MED			78																					
ALUM CREEK DRIVE	159+14.88	160+14.54	MED							100.00				1									2				
ALUM CREEK DRIVE	159+12.70	160+14.54	MED	102																							
ALUM CREEK DRIVE	159+15.24	159+74.50	MED																35								
ALUM CREEK DRIVE	167+34.02	171+67.00	RT				439										439										
ALUM CREEK DRIVE	167+85.52	174+58.00	LT				670																				
ALUM CREEK DRIVE	167+85.52	168+44.10	LT					58.60							1												
ALUM CREEK DRIVE	168+42.00	169+10.09	LT																	54	1		2				
ALUM CREEK DRIVE	168+74.00	169+10.00	LT		36																						
ALUM CREEK DRIVE	169+07.59	169+96.98	LT					12.50					1		1								2				
	169+14.00	169+89.00	LT	75																							
IR 270																											
IR 270	673+78.37	686+00.13	LT				1202																				
IR 270	673+78.37	686+29.35	LT														1230										
IR 270	673+92.53	675+70.03	LT					100.00					1		1								3				
IR 270	673+95.00	675+70.03	LT	175																							
IR 270	694+17.50	695+89.89	RT					100.00					1		1								3				
IR 270	694+43.00	696+16.10	RT	173																							
IR 270	695+89.89	696+33.09	RT																	29	1		1				
IR 270	696+16.92	696+33.09	RT		16																						
IR 270	696+42.19	696+93.24	MED						25	25.00													2				
IR 270	696+42.19	696+93.24	MED	51																							
IR 270	696+66.70	696+91.70	MED							12.50	1												1				
IR 270	696+66.70	696+91.70	MED	25																							
IR 270	696+72.50	696+92.50	RT		20															20			1				
IR 270	696+73.81	697+14.43	LT					28.13				1			1								1				
IR 270	697+12.43	697+67.72	LT																	41	1		2				
IR 270	697+12.50	697+50.00	MED							37.50													1				
IR 270	697+12.50	697+50.00	MED							37.50													1				
IR 270	697+17.00	697+53.64	LT	37																							
IR 270	697+53.64	697+67.72	LT		14																						
	697+97.74	698+18.10	LT		20															20			1				
RAMP T																											
RAMP T	689+09.85	705+60.42	LT				1633										1253										
RAMP T	686+45.00	699+48.77	LT																								
	686+70.00	688+70.00	LT					137.50				1	1										5				
RAMP W	703+49.86	703+99.74	LT																	36	1		2				
	703+99.46	705+60.42	LT					136.00							1								4				
RAMP X																											
RAMP X	688+60.00	695+89.26	RT				675										675										
RAMP X																											
RAMP X	703+41.56	708+04.15	LT				483										483										
	704+32.28	703+63.90	RT																69								
RAMP Y1	706+12.00	708+45.92	LT	234																							
	706+12.00	708+61.29	LT					200.00					1										3				
	711+40.65	712+39.77	RT			119																					
TOTALS CARRIED TO GENERAL SUMMARY				1177	209	197	5102	1000.85	25.00	212.50	1	3	6	1	5	3	4080	33	104	285	4	25	57				

CALCULATED JLM
CHECKED SSK

BU4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

ROADWAY SUBSUMMARY

FRA-270-49.00

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AS BUILT - 4/22/2016

LOCATION	STATION TO STATION		SIDE	202 REMOVAL MISC.: PAVED GUTTER REMOVED	202 PIPE REMOVED, OVER 24"	202 CATCH BASIN REMOVED	601 PAVED GUTTER TYPE I-6, AS PER PLAN	601 TIED CONCRETE BLOCK MAT, TYPE 2	602 CONCRETE MASONRY	605 6" BASE PIPE UNDERDRAIN WITH FABRIC WRAP	611 6" CONDUIT TYPE F	611 6" CONDUIT TPYE C	611 18" CONDUIT, TYPE B	611 24" CONDUIT TYPE A	611 24" CONDUIT TYPE C	611 CATCH BASIN NO. 3A	611 CATCH BASIN NO. 5	611 CATCH BASIN NO. 7	611 INLET I-3D	611 MANHOLE NO. 3	611 PRECAST REINFORCED CONCRETE OUTLET	670 DITCH EROSION PROTECTION MAT, TYPE A	670 DITCH EROSION PROTECTION MAT, TYPE F	836 SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1			
				SQ YD	FT	EACH	SQ YD	SQ YD	CU YD	FT	FT	FT	FT	FT	FT	EACH	EACH	EACH	EACH	EACH	EACH	SQ YD	SQ YD	SQ YD			
ALUM CREEK DRIVE	150+02.00	151+36.32								134																	
ALUM CREEK DRIVE	152+50.62	154+85.94								470	17																
ALUM CREEK DRIVE	153+76.50	154+84.28								108																	
ALUM CREEK DRIVE	153+89.74	154+99.64	MED	115																							
ALUM CREEK DRIVE	154+01.50	154+99.64	MED				54																				
ALUM CREEK DRIVE	154+74.13		MED			1													1								
ALUM CREEK DRIVE	158+93.40		LT					156																			
ALUM CREEK DRIVE	159+38.69	159+75.37	MED										38			1											
ALUM CREEK DRIVE	167+85.52	171+67.00								762																	
ALUM CREEK DRIVE	170+24.15	171+50.50	LT								1	120						2	1								
IR 270	673+95.00	689+54.08								1559	106										3						
RAMP T	689+47.37	702+64.15								2534	97										2						
RAMP T	690+50.00	692+00.00	LT																			180					
RAMP T	690+50.00	692+42.00	RT																				166				
RAMP T	690+79.99	692+48.15	RT		20				0.43					1	50	121	1			1							
RAMP T	693+00.00	694+50.00	LT																			179					
RAMP T	695+00.00	697+50.00	LT																			203					
RAMP T	697+50.00	698+50.00	RT																			87					
RAMP T	698+00.00	698+50.00	LT																			41					
RAMP T	699+50.00	700+00.00	LT																				42				
RAMP T	701+00.00	701+50.00	RT																				43				
RAMP T	702+00.00	703+72.39	LT																				136				
RAMP T	702+64.15	705+60.42								296																	
RAMP W	688+60.00	695+17.78								658	10																
RAMP W	690+00.00	690+50.00	RT																			40					
RAMP W	691+00.00	691+50.00	RT																			40					
RAMP W	692+00.00	692+50.00	RT																			40					
RAMP W	692+50.00	693+00.00	RT																					42			
RAMP W	693+00.00	693+50.00	RT																				42				
RAMP X	706+12.00	708+04.00								192																	
TOTALS CARRIED TO GENERAL SUMMARY				115	20	1	54	156	0.43	6713	230	120	38	50	121	1	1	2	1	1	5	810	429	42			

1	DATE	DESCRIPTION
	4/22/16	AS BUILT

CALCULATED JLM
CHECKED SSK

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

DRAINAGE SUBSUMMARY

FRA-270-49.00

AS BUILT - 4/22/2016

BEGIN WORK STA. 149+95.00

BEGIN SHLD TAPER STA 150+02.30, 59.03' LT.

CONNECT U.D. TO EXISTING STA. 150+02.30, 59.53 LT ELEV. = 743.29±

EX. 30" WM (CTP0619_005)

EX PULL BOX (TBR)

END SHLD TAPER STA 151+24.91, 69.25' LT.

R=58'

R=65'

CONST. LIMITS

PROP. SIGNAL POLE

SAWCUT

+02.30 51.00' LT

+02.30 50.95' LT

+84.19 50.98' LT

+36.32 51.88' LT

50.95'

ALUM CREEK DR (SB)

CONC.

150

151

152

N 18° 54' 52" E

ALUM CREEK DR. (NB)

STA. 152+09.18 ℄ CONST ALUM CREEK DR. = STA. 695+92.73 ℄ CONST RAMP W

STA. 694+82.44 (RAMP W)

695

14.55±

9.45'± 3'

℄ CONST. RAMP W

39.00' LT

+23.69

+32.00 39.00' LT.

39'

50.37'

EX. SIGNAL POLE, PULL BOXES, AND CONTROLLER, MH (TBR)

B.M.#2

B.M.#3

+46.96 59.00' LT.

EX PULL BOX (TBR)

U.D. STA. 152+50.60, 59.5 LT ELEV. = 747.61 (TEE)

U.D. STA. 152+50.60, 51.58 LT ELEV. = 747.93 (90 ELL)

+50.62 51.00' LT

SAWCUT

EX. ST LT

ALUM CREEK DR. (SB)

℄ CONST. ALUM CREEK DR. 153

N 18° 54' 52" E

BEGIN OVERLAY ALUM CREEK DR. STA. 152+32.00

12" CCP

12" CCP

12" CCP

12" CCP

8.50'

+77.24 8.50' RT

CONC. BARRIER TYPE D

154

EX. CONC. BARRIER (TO BE REMOVED)

+50.00 1.00' RT

CONC. (TBR)

+80.17 8.71' LT.

+1.50

EX. CONC. BARRIER (TO REMAIN)

℄ BEGIN APPR. SLAB STA 154+85.94, 0.00' RT.

+86.52 1.00' RT

+76.50

ALUM CREEK DR. (NB)

CONC. BARRIER TYPE B

EX. E/S

CONST. LIMITS

PROP. PAVED GUTTER SEE DETAILS ON SHEET 94

STRUCTURE NO. FRA-270-4900L

+54.65, 59.00' LT. BEGIN MGS TYPE 2 BR TERM.ASSM.

MGS TYPE T ANCHOR ASSEMBLY STA. 153+63.97, 61.00' LT.

+42.12 59.00' LT.

EX. TRAFFIC CAMERA ON MAST POLE, W MISC. (TBR)

+92.15 61.00' LT.

+48.21 56.92' LT.

+57.82 42.42' LT.

B-1

+59.88 38.00' LT

D-1

+76.78 11.17' LT

MATCHLINE ALUM CREEK DR. STA. 155+00, SEE SHEET 34.

EX. ST LT

EX. SIGNAL POLE W BOX (TBR)

PROP. SIGNAL POLE

EX. SIGNAL POLE

RAMP V

RAMP VI

EX. ST LT

(A) U.D. STA. 154+48.22, 59.5 LT. ELEV. 748.70 (PLUG)

(B) U.D. STA. 154+51.75, 51.58 LT. ELEV. 748.98 (PLUG)

NOTES:

(1) FULL DEPTH ASPHALT PAVEMENT, SEE ALUM CREEK DR. TYPICAL SECTIONS FOR MEDIAN RECONSTRUCTION DETAILS, STA. 153+76 TO STA. 154+90, SEE SHEET 94

LEGEND

1½" PAVEMENT PLANING, W/ 1½" ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A, (446)

3¼" PAVEMENT PLANING, 1½" ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A, (446) 1¾" ASPHALT CONCRETE INTERMEDIATE COURSE, 19MM, TYPE A, (446)

- STRUCTURE BORING

DATE	DESCRIPTION
4/22/16	AS BUILT

P.V.I. STA 152+95.00 ELEV 752.78

380.00' VC, K = 155

PVC STA 151+05.00 ELEV 748.79

PVT STA 154+85.00 ELEV 752.12

℄ CONST. RAMP W

+2.10 %

-0.35 %

STA 152+32.00 MATCH EX ELEV 750.94

STA 152+84.14, 7.36' RT EX. CB, GRATE ELEV 750.85 EX. 12" CPP N 746.40 EX. 8" CPP E 746.85 EX. 8" CPP W 746.95

STA 153+26.12, 5.54' RT EX. MH, TC ELEV 751.36 EX. 12" CPP N 744.86 EX. 12" CPP E 740.00 EX. 12" CPP S 744.56

STA 153+49.50, 7.42' RT EX. CB, GRATE ELEV 751.46 EX. 12" CPP N 746.51 EX. 12" CPP E 746.46 EX. 12" CPP S 746.31

STA 153+49.65, 13.04' RT EX. CB, GRATE ELEV 751.46 EX. 8" CPP N 747.21 EX. 12" CPP W 746.61

STA 154+74.13, 0.54' RT I-3-D, GRATE ELEV 751.62 EX. 12" CPP S 748.44

STA 154+74.74, 0.29' RT EX. CB, GRATE ELEV 751.37 EX. 12" CPP S 748.44

SB PROFILE GRADE

EX. GROUND

EX. ST LT

EX. 12" CPP

EX. 12" CPP

EX. 12" CPP

ELEV. @ PROFILE GRADE

746.59 747.11 747.64 748.16 748.69 749.20 749.67 750.10 750.50 750.85 751.16 751.43 751.66 751.85 752.00 752.11 752.18 752.21 752.20 752.15 752.06

747.11 748.12 748.86 749.86 750.54 751.18 751.63 752.01 752.20 752.25 752.04

770 765 760 755 750 745 740 735

150+00 151+00 152+00 153+00 154+00 155+00

BU 4, 5, 6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

HORIZONTAL SCALE IN FEET 0 10 20 40

CALCULATED SSK CHECKED CFR

PLAN AND PROFILE ALUM CREEK DR. STA. 150+00 TO STA. 155+00

FRA-270-49.00

33 182

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AS BUILT - 4/22/2016

STRUCTURE NO. FRA-270-4900L

BEGIN PROJECT STA 698+10.00 S.I.M. 49.00 EOBO (912)

CRUSHED AGGREGATE SLOPE PROTECTION (TYP.)

CONST. LIMITS

CONC. BARRIER, TYPE D

EX. ST LT

MATCHLINE ALUM CREEK DR. STA. 155+00, SEE SHEET 33.

MATCHLINE ALUM CREEK DR. STA. 160+00, SEE SHEET 35.

63.00' O/O BRIDGE

ALUM CREEK DR. (SB)

℄ CONST. ALUM CREEK DR.

N 18° 54' 52" E

ALUM CREEK DR. (NB)

STA. 156+75.20 ℄ CONST ALUM CREEK DR.
STA. 697+35.71 ℄ CONST I.R. 270

IR 270 EB

IR 270 WB

CONC. BARRIER

36.28'± O/O BRIDGE

PNT. VERT. CLR.

STRUCTURE NO. FRA-270-4898R

24" RCP

10.5'±

35'±

11'±

8'±

15'±

℄ CONST. I.R. 270

RAMP Y

+63.63, 59.00' RT
BEGIN MGS TYPE 1 BR TERM. ASSM.
+75.59
58.92' LT

+63.90
BEGIN CURB

+89.90
END CURB

U.D. STA. 158+75.39, 59.42' LT
ELEV. = 747.20 (PLUG)

U.D. STA. 158+81.02, 51.58' LT
ELEV. = 747.50 (PLUG)

TIED CONC. BLOCK MAT. (SEE STD. DM 4.1)

EX. GUIDE SIGN (TO BE RELOCATED)

+81.02
51.00' LT

+93.40

+86.47
42.65' LT

B102

SAWCUT

END PAVMT TAPER
STA 159+82.00,
9.09' LT.

+88.91
39.00' LT

+07.29
11.36' LT

℄ END APPR. SLAB
STA 159+14.82, 0.00' RT.

PROP. CONC. MEDIAN

CONC.

SAWCUT

BEGIN PAVMT TAPER
STA 159+40.00,
1.00' RT.

+82.00
3.50' RT

℄ CONST. RAMP Y

+14.88, 1.00' RT.
BEGIN TYPE 1 BR TERM. ASSM.
+15.24
1.00' RT
+15.24
3.50' RT

EX. E/S

CONST. LIMITS

STA. 717+69.51 RAMP Y =
STA. 158+98.54, 38.40' RT.
ALUM CREEK DR.

8"

12"

24"

5.92'

12" CPP

NOTES:

1. FULL DEPTH ASPHALT PAVEMENT, SEE ALUM CREEK DR. TYPICAL SECTIONS
   FOR MEDIAN RECONSTRUCTION DETAILS, STA. 159+15 TO STA. 159+75, SEE SHEET 94

LEGEND

3¼" PAVEMENT PLANING,
1½" ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A, (446)
1¾" ASPHALT CONCRETE INTERMEDIATE COURSE, 19MM, TYPE A, (446)

- STRUCTURE BORING

ELEV. @ PROFILE GRADE

752.06 751.98 751.89 751.80 751.71 751.63 751.54 751.45 751.36 751.28 751.19 751.10 751.01 750.93 750.84 750.75 750.66 750.62 750.57 750.53 750.48

-0.35 % SB PROFILE GRADE

PVI STA 159+00.00
ELEV 750.66

-0.35 % -0.18 %

D-2 STA 159+38.69, 0.77' RT
CB-3A, GRATE ELEV 750.35
18" (N) 747.34

1

STA 159+75.37, 9.99' LT
EX. CB, GRATE ELEV 750.50
EX. 12" CPP N 747.35
EX. 12" CPP E 747.14
18" (S) 747.36

D-3

38'-18" TYPE B @ 0.68%

EX. 12" CPP

STA 159+74.93, 10.56' RT
EX. CB, GRATE ELEV 750.42
EX. 12" CPP W 747.62

EX. GROUND

CRUSHED AGGREGATE SLOPE PROTECTION (TYP.)

16'-7" EX. BEAM MIN. V.C.
16'-10" PROP. BEAM MIN. V.C.

17'-2" EX. BEAM MIN. V.C.
17'-5" PROP. BEAM MIN. V.C.

IR 270 EB

℄ CONST. IR 270

IR 270 WB

EX. 24" RCP

EX. ST LT

750.98 750.82 750.71 750.87 750.64

755 750 745 740 735 730 725

155+00 156+00 157+00 158+00 159+00 160+00

DATE	DESCRIPTION
4/22/16	AS BUILT

1

HORIZONTAL SCALE IN FEET 0 10 20 40

CALCULATED SSK CHECKED CFR

PLAN AND PROFILE ALUM CREEK DR.
STA. 155+00 TO STA. 160+00

FRA-270-49.00

34
182

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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AS BUILT - 4/22/2016

WOODED AREA

MGS TYPE E ANCHOR ASSEMBLY STA. 160+88.30, 61.00' LT.

GRAVEL

FIELD DRIVE (ASPHALT)

BMP NO. 4 VEGETATED BIOFILTER

RAMP T

℄ CONST. RAMP T

BMP NO. 2 VEGETATED BIOFILTER

U.D. STA. 164+37.98, 59.50' LT ELEV. 745.50 (TEE)

U.D. STA. 164+37.98, 51.58' LT ELEV. 745.82 (90 ELL)

BEGIN PAVMT TAPER STA 164+37.98, 51.00' LT.

+87.98 58.95' LT

END PAVMT TAPER STA 164+87.98, 39.00' LT.

SAWCUT

ALUM CREEK DR. (SB)

℄ CONST. ALUM CREEK DR.

12" CCP

12" RCP

CONC.

N 18° 54' 52" E

BEGIN PAVMT TAPER STA 164+84.42, 9.20' LT.

ALUM CREEK DR. (NB)

STA. 160+14.54, 1.54' LT.

S 21° 40' 03" W

℄ CONST. RAMP Y

RAMP Y1

RAMP Y

EX. SIGNAL CONDUIT

EX. E/S

CONST. LIMITS

END OVERLAY RAMP Y STA. 713+50.51

15" RCP

MATCHLINE ALUM CREEK DR. STA. 160+00, SEE SHEET 34.

MATCHLINE ALUM CREEK DR. STA. 165+00, SEE SHEET 36.

PT STA. 715+19.51

SC STA. 713+50.51

B.M.#6

LEGEND

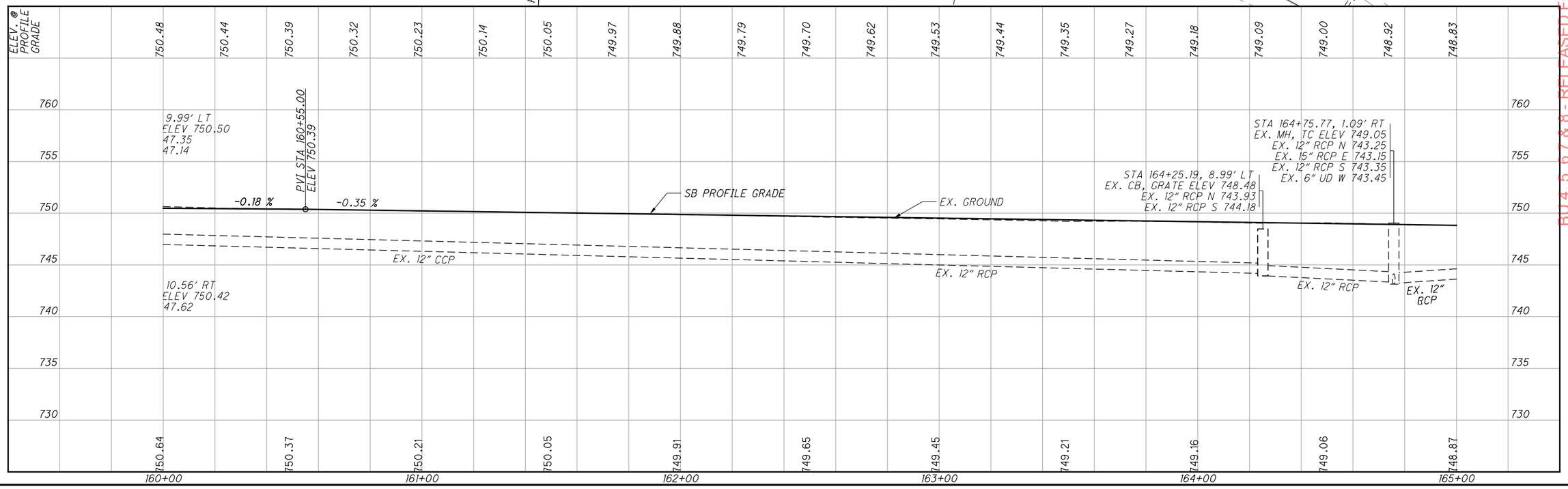
3¼" PAVEMENT PLANING,
1½" ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A, (446)
1¾" ASPHALT CONCRETE INTERMEDIATE COURSE, 19MM, TYPE A, (446)

ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE F

- STRUCTURE BORING

NOTES:

1. FULL DEPTH ASPHALT PAVEMENT, SEE ALUM CREEK DR. TYPICAL SECTIONS
2. FULL DEPTH CONCRETE PAVEMENT, SEE ALUM CREEK DR. TYPICAL SECTIONS



HORIZONTAL SCALE IN FEET

CALCULATED CFR
CHECKED SSK

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

PLAN AND PROFILE ALUM CREEK DR. STA. 160+00 TO STA. 165+00

FRA-270-49.00

35
182

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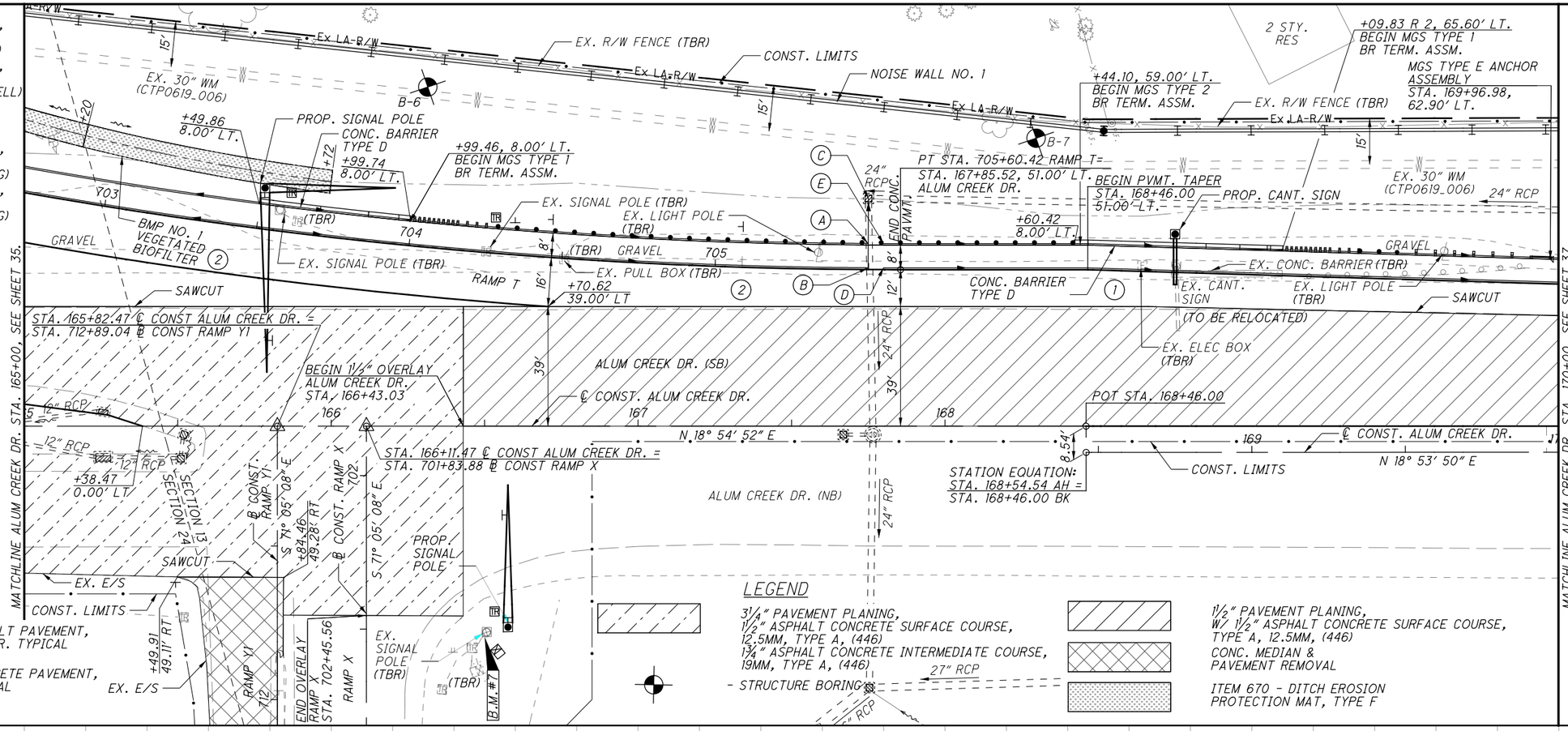
AS BUILT - 4/22/2016

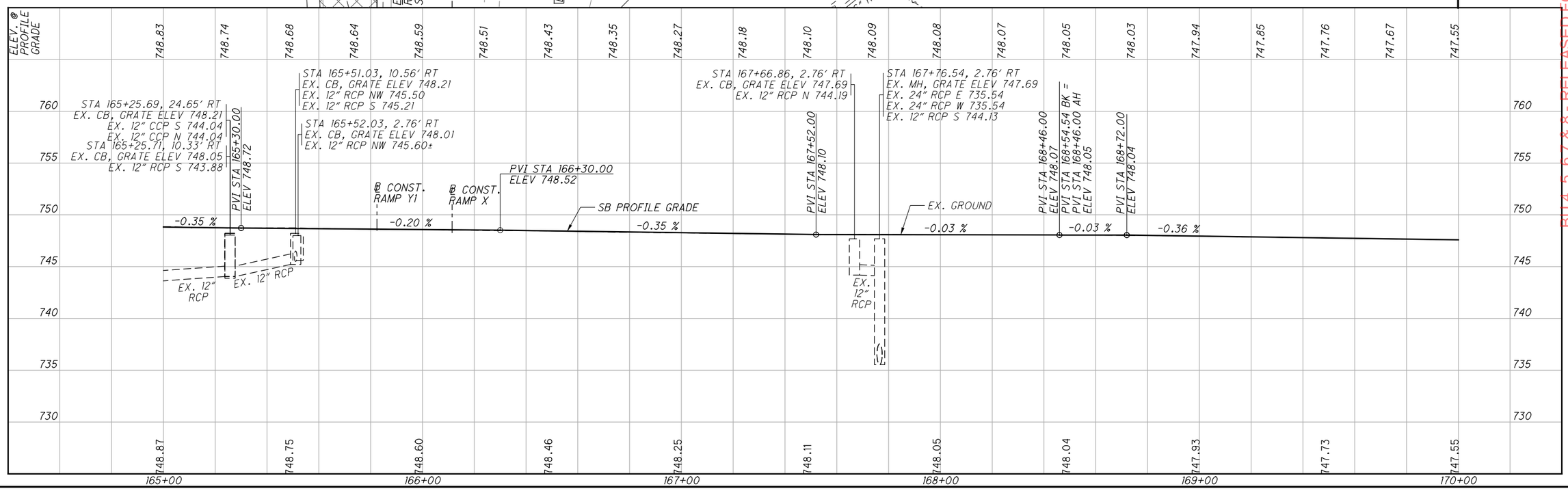
(A) U.D. STA. 167+75.00, 59.50 LT, ELEV. = 744.20 (TEE)
(B) U.D. STA. 167+75.00, 51.58 LT, ELEV. = 744.56 (90 ELL)
(C) STA. 167+75.00, 74.19 LT, ELEV. = 744.00
(D) U.D. STA. 167+80.00, 51.58 LT, ELEV. = 744.64 (PLUG)
(E) U.D. STA. 167+80.00, 59.50 LT, ELEV. = 744.32 (PLUG)



NOTES:
1. FULL DEPTH ASPHALT PAVEMENT, SEE ALUM CREEK DR. TYPICAL SECTIONS
2. FULL DEPTH CONCRETE PAVEMENT, SEE RAMP T TYPICAL SECTIONS

LEGEND

- 3¼" PAVEMENT PLANING, 1½" ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A, (446) 1¾" ASPHALT CONCRETE INTERMEDIATE COURSE, 19MM, TYPE A, (446)
- 1½" PAVEMENT PLANING, W/ 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE A, 12.5MM, (446) CONC. MEDIAN & PAVEMENT REMOVAL
- STRUCTURE BORING
- ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE F



HORIZONTAL SCALE IN FEET: 0, 10, 20, 40
CALCULATED CFR
CHECKED SSK

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

PLAN AND PROFILE ALUM CREEK DR. STA. 165+00 TO STA. 170+00

FRA-270-49.00

36
182

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AS BUILT - 4/22/2016

PROP. CB 7 STA. 170+24.15, 105.52' LT.
TOP. ELEV. 745.35
APPROX. INV. ELEV. 743.73

PROP. CB 7 STA. 171+50.50, 106.73 LT.
TOP. ELEV. 746.20
APPROX. INV. ELEV. 744.63

GARAGE

D-10

D-12

D-11

EX. R/W FENCE (TBR)

EX. R/W FENCE (TBR)

Ex LA-R/W

CONST. LIMITS

EX. FENCE (TBR)

B-110

B-108

NOISE WALL NO. 1

15'

55' - 6" CONDUIT @4.33%

65' - 6" CONDUIT @5.05%

24" RCP

EX. 6" CONDUIT
INV. ELEV. 741.35

EX. 30" WM
(CTP0619 006)

END PVMT. TAPER
STA. 170+67.00
52.73' LT.

END PVMT. TAPER
STA. 171+67.00
39.20' LT.

EX. PULL BOX
(TBR)

8'

9.76'

34.41'

8.54'

10.21'±

30.66'

8.54'

CONNECT U.D. TO EXISTING
STA. 171+67.00, 49.9 LT
ELEV. 743.70±

CONNECT U.D. TO EXISTING
STA. 171+67.00, 39.78 LT
ELEV. 744.10±

B.M.#1

PC STA. 174+07.68

ALUM CREEK DR. (SB)

℄ CONST. ALUM CREEK DR.

ALUM CREEK DR. (NB)

N 18° 53' 50" E

CONST. LIMITS

END OVERLAY
ALUM CREEK DR.
STA. 171+67.00

18" RCP

E HOWARD RD.

END WORK
STA. 175+00.00

CORP. OF OBETZ
MADISION TOWNSHIP

MATCHLINE ALUM CREEK DR. STA. 170+00, SEE SHEET 36.

DATE	DESCRIPTION
4/22/16	AS BUILT

LEGEND

1½" PAVEMENT PLANING,
W/ 1½" ASPHALT CONCRETE SURFACE COURSE,
TYPE A, 12.5MM, (446)

- STRUCTURE BORING

27" RCP

27" RCP

ELEV. @ PROFILE GRADE

747.55 747.39 747.22 747.18 747.13 747.11 747.08

PROFILE GRADE

STA 171+67.00
MATCH
EX ELEV 747.14

EX. GROUND

-0.36 %

+0.12 %

PVC STA 170+57.50
ELEV 747.38

PVI STA 171+65.00 ELEV 746.99
215.00' VC, K = 447.9

PVT STA 172+72.50
ELEV 747.12

747.55 747.22 747.13 747.08 747.02 746.99 747.17 747.13 747.25 747.35

760 755 750 745 740 735 730

170+00 171+00 172+00 173+00 174+00 175+00

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED CFR
CHECKED SSK

BU 4, 5, 6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

PLAN AND PROFILE ALUM CREEK DR.
STA. 170+00 TO STA. 175+00

FRA-270-49.00

37
182

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AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

770
760
750
740
730

℄=747.2

CONC. MEDIAN

EX 30" WM
(CTP0619)

748.86
151+00.00
748.86

EX LA-R/W

6:1

℄=746.1

748.12
150+50.00
748.12

EX A

EX LA-R/W

℄=745.0

RAMP V

EX ST LT

747.16
150+02.30
747.16

747.00
BEGIN WORK
149+95.00
747.00

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED CFR
CHECKED SSK

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 150+02.30 TO STA. 151+00.00

FRA-270-49.00

38
182

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AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

STA 152+84.14, 7.36' RT
EX. CB, GRATE ELEV 750.85
12" CPP N 746.40
8" CPP E 746.85
8" CPP W 746.95

3:1
4:1
8:1
14.4:1

751.66
153+00.00
751.63

751.16
152+50.00
751.18

INTERSECTION OF
ALUM CREEK DR. & RAMP W
152+09.18

CONC. MEDIAN

749.86
151+50.00
749.86

770
760
750
740
730

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED	CHECKED
CFR	SSK

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 151+50.00 TO STA. 153+00.00

FRA-270-49.00

39
182

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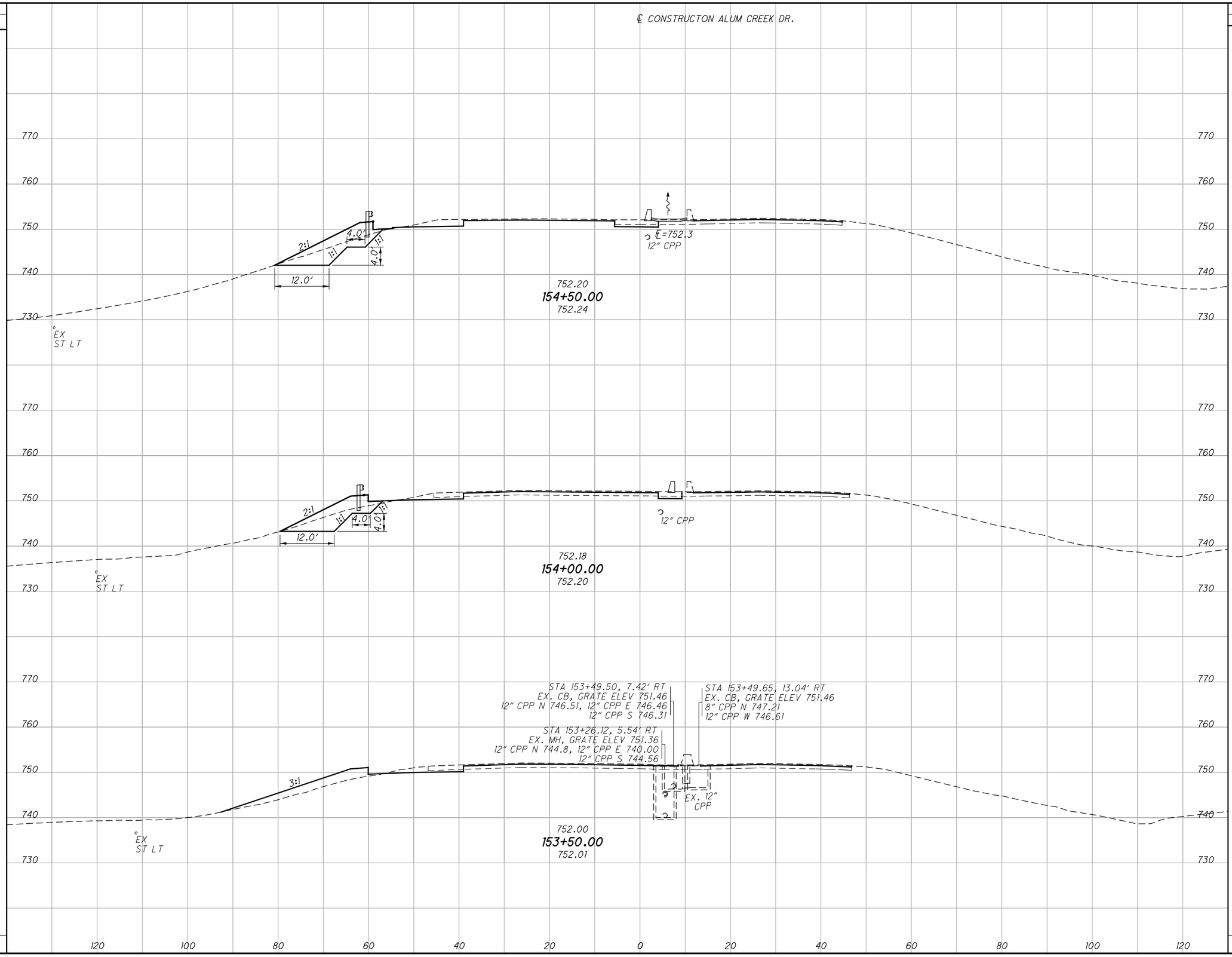
AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.



END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED	CHECKED
CFR	SSK

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR. STA. 153+50.00 TO STA. 154+50.00

FRA-270-49.00

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AS BUILT - 4/22/2016

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SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

STA 159+75.37, 9.99' LT
EX. CB, GRATE ELEV 750.50
12" CPP N 747.35
12" CPP E 747.14
18" (S) 747.36

D-3

℄ RAMP Y

STA 159+74.93, 10.56' RT
EX. CB, GRATE ELEV 750.42
12" CPP W 747.62

7.8:1

18" TYPE B

EX. 12" CPP

1

750.57
159+50.00
750.87

1

D-2

STA 159+38.69, 0.77' RT
CB-3A, GRATE ELEV 750.35
18" (N) 747.34

3:1

18" TYPE B

750.66
159+00.00
750.71

END APPROACH SLAB
159+14.82

AHEAD 158+89.92
STRUCTURE NO. FRA-270-4900L
BACK 155+10.94

EX. STRUCTURE NO. FRA-270-4898R

BEGIN APPROACH SLAB
154+85.94

BRIDGE
FRA-270-49.00 L

D-1

STA 154+74.13, 0.54' RT
I-3-D, GRATE ELEV 751.62
STA 154+74.74, 0.29' RT
EX. CB, GRATE ELEV 751.37
12" CPP S 748.44
(TO BE REMOVED)

1

℄=752.1

STA 154+79.80, 110.91' LT
EX. CB, GRATE ELEV 726.02'
15" RCP NW 718.88
24" RCP SE 719.03
24" RCP SW 719.52

752.14
154+76.78
752.01

EX
ST LT

EX
ST LT

770 760 750 740 730

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED CFR
CHECKED SSK

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 154+76.78 TO STA. 159+50.00

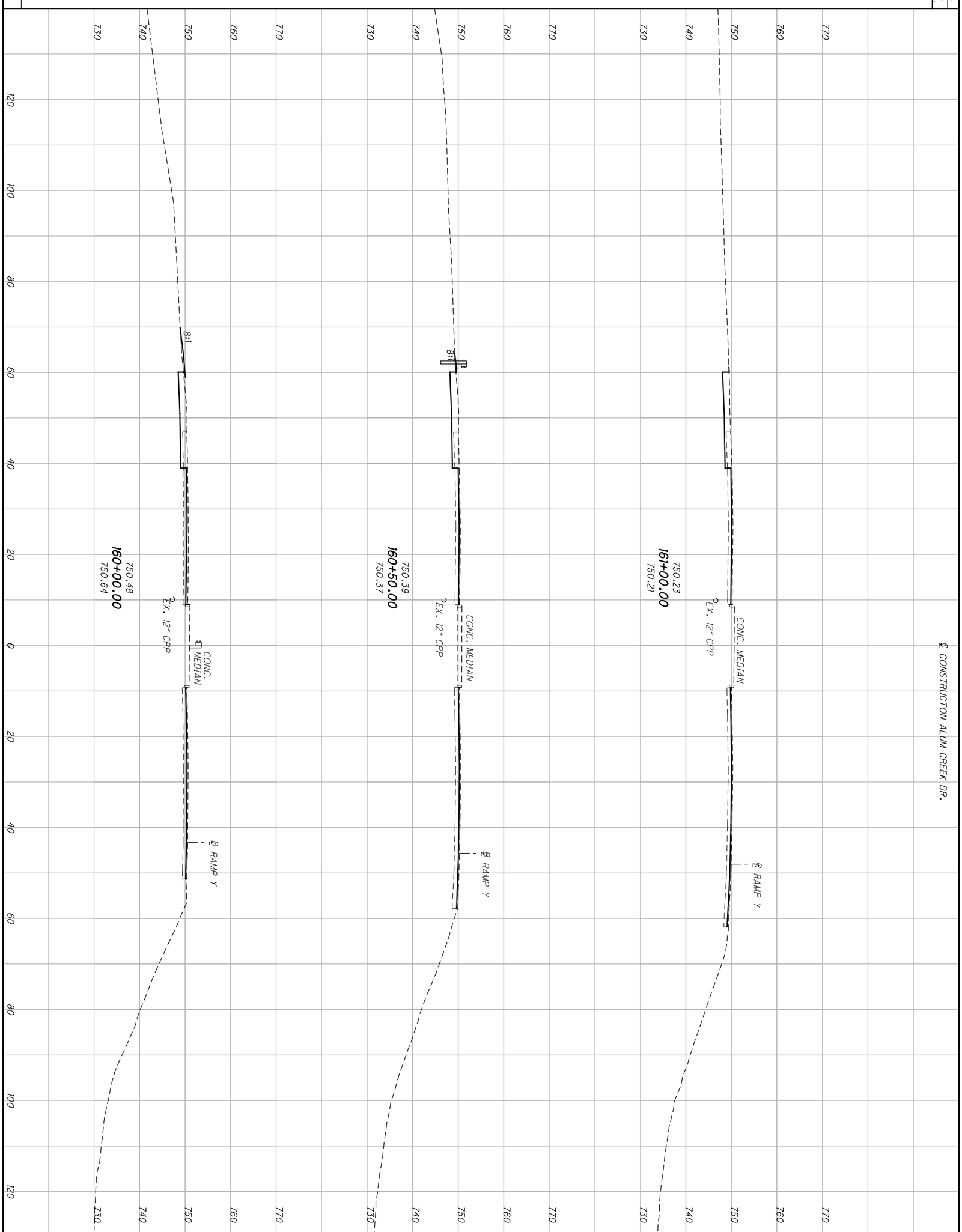
FRA-270-49.00

41
182

1	DATE	DESCRIPTION
	4/22/16	AS BUILT

AS BUILT - 4/22/2016

SEEDING
WIDTH | END | SQ. YDS.



END AREA
CUT | FILL

VOLUME
CUT | FILL

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

42
182

FRA-270-49.00

CROSS SECTIONS ALUM CREEK DR.
STA. 160+00.00 TO STA. 161+00.00

CALCULATED CFR
CHECKED SSK

AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR
CHECKED SSK

℄ CONSTRUCTON ALUM CREEK DR.

SEE RAMP T CROSS SECTIONS

8:1

CONC. MEDIAN

℄ RAMP Y

EX. 12" CPP

749.70
162+50.00
749.65

8:1

CONC. MEDIAN

℄ RAMP Y

EX. 12" CPP

749.88
162+00.00
749.91

8:1

CONC. MEDIAN

℄ RAMP Y

EX. 12" CPP

750.05
161+50.00
750.05

770
760
750
740
730

120 100 80 60 40 20 0 20 40 60 80 100 120

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 161+50.00 TO STA. 162+50.00

FRA-270-49.00

43
182

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AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

℄ CONST RAMP T

6.2:1 8.2:1

℄=745.2

12.5:1 8:1

℄=747.6

CONC. MEDIAN

EX. 12" CPP

749.18

164+00.00

749.16

℄ RAMP Y

770 760 750 740 730

SEE RAMP T CROSS SECTIONS

8.3:1 8:1

℄=746.7

CONC. MEDIAN

EX. 12" CPP

749.35

163+50.00

749.21

℄ RAMP Y

SEE RAMP T CROSS SECTIONS

8:1

CONC. MEDIAN

EX. 12" CPP

749.53

163+00.00

749.45

℄ RAMP Y

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED	CHECKED
CFR	SSK

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR. STA. 163+00.00 TO STA. 164+00.00

FRA-270-49.00

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AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

℄ CONST. NOISE WALL

EX LA-R/W

℄ CONST RAMP T

6.1:1 — 8.1:1

E=745.7

EX 30" WM (CTP0619)

STA 165+51.99, 2.73' RT
EX. CB, GRATE ELEV 748.01
12" RCP NW 745.60

STA 165+25.71, 4.67' LT
EX. CB, GRATE ELEV 748.05
12" RCP S 743.88

STA 165+25.69, 9.65' RT
EX. CB, GRATE ELEV 748.21
12" CCP S 744.04
12" CCP N 744.04

STA 165+51.03, 10.56' RT
EX. CB, GRATE ELEV 748.21
12" RCP NW 745.50
12" RCP S 745.21

CONC. MEDIAN

EX. 12" CCP

EX. 12" RCP

748.68
165+50.00
748.75

℄ CONST. NOISE WALL

EX LA-R/W

℄ CONST RAMP T

6.1:1 — 8.1:1

E=745.8

EX 30" WM (CTP0619)

STA 164+75.77, 1.09' RT
EX. MH, GRATE ELEV 749.05
12" RCP N 743.25, 15" RCP E 743.15
12" RCP S 743.35, 6" UD W 743.45

STA 164+75.22, 88.69' RT
EX. CB, GRATE ELEV 744.60
12" RCP W 742.65
15" RCP SE 742.55

CONC. MEDIAN

EX. 15" RCP

748.83
165+00.00
748.87

℄ CONST RAMP T

6.1:1 — 8.1:1 — 12.5:1 — 12.5:1

E=745.5

E=748.1

EX 30" WM (CTP0619)

STA 164+25.19, 8.99' LT
EX. CB, GRATE ELEV 748.48
12" RCP N 743.93
12" RCP S 744.18
CONC. MEDIAN

EX. 12" RCP

℄ RAMP Y

15" RCP

749.00
164+50.00
749.06

770 760 750 740 730

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED	CHECKED
CFR	SSK

AS BUILT - 11/03/2014 - 11/19/2015

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 164+50.00 TO STA. 165+50.00

FRA-270-49.00

AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED CFR
CHECKED SSK

770 / 760 / 750 / 740 / 730

℄ CONST. NOISE WALL
EX LA-R/W
℄ CONST RAMP T
6:1
8:1
℄=745.3
EX 30" WM (CTP0619)
748.27
167+00.00
748.25

℄ CONST. NOISE WALL
EX LA-R/W
℄ CONST RAMP T
6:1
8:1
℄=745.4
EX 30" WM (CTP0619)
748.43
166+50.00
748.46

INTERSECTION OF
ALUM CREEK DR. & RAMP X
166+11.47

℄ CONST. NOISE WALL
EX LA-R/W
℄ CONST RAMP T
6:1
8.1:1
℄=745.6
EX 30" WM (CTP0619)
748.59
166+00.00
748.60

INTERSECTION OF
ALUM CREEK DR. & RAMP Y1
165+82.47

120 100 80 60 40 20 0 20 40 60 80 100 120

AS BUILT - 11/03/2014 - 11/19/2015

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 166+00.00 TO STA. 167+00.00

FRA-270-49.00

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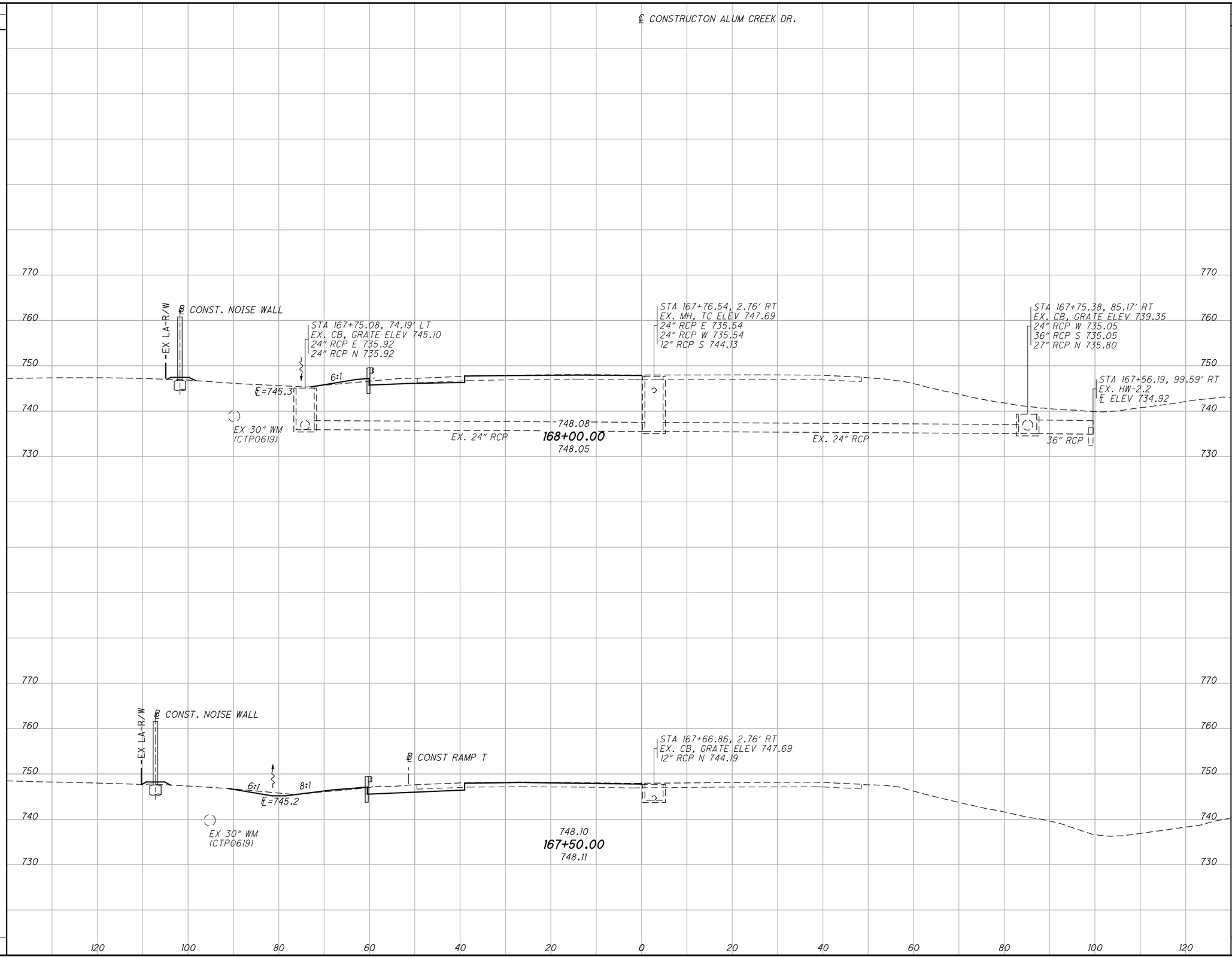
SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR
CHECKED SSK



CROSS SECTIONS ALUM CREEK DR.
STA. 167+50.00 TO STA. 168+00.00

FRA-270-49.00

AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

℄ CONST. NOISE WALL

EX LA-R/W

1

6:1

℄=744.2

EX 30" WM (CTP0619)

EX. 24" RCP

747.58
170+00.00
747.60

STA 170+24.40, 69.28' RT
EX. MH, GRATE ELEV 744.58
27" RCP S 738.30
27" RCP N 740.23

EX LA-R/W

EX 8" WAT

℄ CONST. NOISE WALL

EX LA-R/W

6:1

℄=744.4

EX 30" WM (CTP0619)

EX. 24" RCP

747.76
169+50.00
747.77

EX. 27" RCP

EX LA-R/W

EX 8" WAT

℄ CONST. NOISE WALL

EX LA-R/W

8:1

℄=744.8

EX 30" WM (CTP0619)

EX. 24" RCP

747.94
169+00.00
747.95

EX. 27" RCP

1	DATE	DESCRIPTION
	6/8/16	AS BUILT

℄ CONST. NOISE WALL

1

EX LA-R/W

6:1

℄=745.2

EX 30" WM (CTP0619)

EX. 24" RCP

748.05
168+50.00
748.08

EX. 27" RCP

770 760 750 740 730

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED	CHECKED
CFR	SSK

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 168+50.00 TO STA. 170+00.00

FRA-270-49.00

48
182

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AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

770 / 760 / 750 / 740 / 730

-EX LA-R/W
℄ CONST. NOISE WALL
12.6:1
℄=744.7
EX 30" WM (CTP0619)
EX. 24" RCP
747.16
171+50.00
747.11
EX. 27" RCP
EX 8" WAT
-EX LA-R/W

1
STA 170+75.00, 77.64' LT
EX. CB, GRATE ELEV 743.70 (RECONSTRUCTED)
24" RCP S 737.60
24" RCP N 737.29
6" PVC (SW & N) 741.50

-EX LA-R/W
℄ CONST. NOISE WALL
6:1
℄=743.8
6" TYPE C
EX 30" WM (CTP0619)
747.26
171+00.00
747.22
EX. 27" RCP
EX 8" WAT
-EX LA-R/W

-EX LA-R/W
℄ CONST. NOISE WALL
1
6:1
℄=744.0
EX 30" WM (CTP0619)
EX. 24" RCP
747.40
170+50.00
747.40
EX. 27" RCP
EX 8" WAT
-EX LA-R/W

120 100 80 60 40 20 0 20 40 60 80 100 120

DATE	DESCRIPTION
6/8/16	AS BUILT

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED CFR
CHECKED SSK

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 170+50.00 TO STA. 171+50.00

FRA-270-49.00

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AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON ALUM CREEK DR.

742.71
END WORK
175+00.00
742.71

EX LA-R/W

EX 30" WM (CTP0619)

EX. 24" RCP

747.14
172+00.00
747.15

EX. 27" RCP

EX 8" WAT

EX LA-R/W

℄ CONST. NOISE WALL

12.6:1

℄=744.7

EX 30" WM (CTP0619)

EX. 24" RCP

747.14
171+67.00
747.15

EX. 27" RCP

EX 8" WAT

EX LA-R/W

770
760
750
740
730

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED	CHECKED
CFR	SSK

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS ALUM CREEK DR.
STA. 171+67.00 TO STA. 172+00.00

FRA-270-49.00

50
182

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END WORK
STA. 673+69.75

END PROJECT
STA 673+95.00
S.L.M. 49.44

E080 (912)

EX. CONC
BARRIER
(TO REMAIN)

+92.53, 77.40' LT.
BEGIN MGS TYPE 1
BR TERM. ASSM.

CONNECT U.D. TO EXISTING
STA. 673+95.00, 78.50 LT.
ELEV. 730.11±

MGS TYPE E
ANCHOR ASSEMBLY
STA. 675+70.03,
79.58' LT.

EX. GUARD RAIL (TBR)

+44.76
77.40' LT.

+94.76
79.52' LT.

+19.76
79.52' LT.

END SHLD TAPER
STA 675+71.00, 77.52' LT.

CONST. LIMITS

BEGIN SHLD. TAPER
STA 673+71.00, 77.39' LT.

EX. CONC BARRIER

12'

11.52'

8'

50:1 TAPER

BEGIN PAVMT TAPER
STA 673+95.00, 66.00' LT.

3.52'

SAWCUT

CONST. LIMITS

IR-270 WB

6" CS MP

65.52'

66'

65'

66'

674

675

676

℄ CONST. I.R. 270

677

678

S 86° 19' 04" E

MATCHLINE I.R. 270 STA. 678+50, SEE BELOW

GROVEPORT ROAD

STRUCTURE NO.
FRA-270-4943

IR-270 EB

PRECAST REINFORCED CONCRETE OUTLET
AND TIED CONCRETE BLOCK MAT, TYPE 1
U.D. STA. 680+00.00, 106.0 LT.
ELEV. 727.13

U.D. STA. 680+00.00, 86.6 LT.
ELEV. 727.32 (TEE)

U.D. STA. 680+05.00, 86.7 LT.
ELEV. 727.30 (PLUG)

CONST. LIMITS

EX. SIGN
(TO BE RELOCATED)

24"

SAN

50:1 TAPER

8'

12'

CONNECT U.D. TO EXISTING
STA. 680+00.00, 78.0 LT.
ELEV. 727.64±

1'

2'

16'

+04.70
66.00' RT.

+95.00
66.00' LT.

SAWCUT

+94.93
66.00' LT.

CONST. LIMITS

IR-270 WB

65'

66'

66'

MATCHLINE IR 270 STA. 678+50, SEE ABOVE

MATCHLINE I.R. 270 STA. 684+00, SEE SHEET 52.

PC STA. 679+04.70

679

680

℄ CONST. IR 270

681

18" RCP

CURVE NO. 1

682

683

S 86° 19' 04" E

IR-270 EB

EX. IR 270 CURVE NO 1

P.I. STA. 709+66.90 T = 3,062.20'
Δ = 56° 14' 42" (LT) L = 5,624.50'
Dc = 1° 00' 00" E = 766.97'
R = 5,729.58' e_{max} = 0.032

HORIZONTAL
SCALE IN FEET
0 10 20 40

CALCULATED CFR
CHECKED SSK

IR 270 PLAN
STA. 673+50.00 TO STA. 684+00.00

FRA-270-49.00

AS BUILT - 4/22/2016

PRECAST REINFORCED CONCRETE OUTLET AND TIED CONCRETE BLOCK MAT, TYPE 1
U.D. STA. 685+00.00, 115.6 LT.
725.41 ELEV.

CONST. LIMITS

TS STA. 686+45.00 RAMP T=
STA. 686+45.00 , 91.00' LT.
IR 270

BEGIN SHLD TAPER
STA 686+45.00,
99.00' LT. IR 270

END SHLD TAPER
STA 686+95.00,
97.88' LT. IR 270

BOEHM COUNTY DITCH

B.M.#5

WOODED AREA

EX. PCB (TBR)

℄ CONST RAMP T

SC STA. 688+60.00

RAMP T SEE PLAN & PROFILE SHEETS .

GRASS

GRAVEL

50:1 TAPER

U.D. STA. 685+00.00, 96.6 LT.
ELEV. 725.60 (TEE)

25:1 TAPER

GRAVEL

SAWCUT

CONST. LIMITS

MATCHLINE IR 270 STA. 684+00, SEE SHEET 51.

CONNECT U.D. TO EXISTING
STA. 685+00.00, 77.0 LT.
ELEV. 726.30±

SAWCUT

I.R. 270 WB

U.D. STA. 685+05.00, 96.7 LT.
ELEV. 725.56 (PLUG)

END PAVMT TAPER
STA 686+45.00,
66.00' LT. IR 270

16'x8' BOX CULVERT

STRUCTURE NO.
FRA-270-4919

18" RCP

℄ CONST. I.R. 270

12" RCP

18" RCP

LEGEND

EX. CONCRETE SLAB TO REMAIN

BEGIN PROJECT
STA 698+10.00
S.L.M. 49.00

E080 (912)

STA. 697+14.43, 98.88' LT.
℄ CONST. I.R. 270
BEGIN MGS TYPE 2
BR TERM. ASSM.

CONC. BARRIER TYPE D

EX. ST LT

RAMP Y

IR 270 WB

MGS TYPE T
ANCHOR ASSEMBLY
STA. 696+73.81,
98.88' LT.

EX. 30" WM
(CTP0619.006)
EX. 48" CASING PIPE

STRUCTURE NO.
FRA-270-4900L

EX. MEDIAN GUARD RAIL

TYPE T
ANCHOR ASSEMBLY
STA. 696+66.70,
6.37' LT.

EX. IMPACT ATTENUATOR

REMOVE EX. MEDIAN GUARD RAIL DURING PIER CONSTRUCTION

ALUM CREEK DR. (SB)

℄ CONST ALUM CREEK DR.

ALUM CREEK DR. (NB)

STA. 697+35.71 ℄ CONST I.R. 270 =
STA. 156+75.20 ℄ CONST ALUM CREEK DR.

EX. CABLE BARRIER

CONST. LIMITS

63.00'
O/O
BRIDGE

N 18° 54' 52" E

MGS TYPE E ANCHOR ASSEMBLY
STA. 694+17.50,
78.00' RT.

STA. 695+90.21, 76.92' RT.
℄ CONST. I.R. 270
BEGIN MGS TYPE 1
BR TERM. ASSM.

15" RCP

15" RCP

STRUCTURE NO.
FRA-270-4898R

+91.67 6.82' LT.
+12.50 6.85' LT.
+50.00 6.72' LT.
+42.19 2.34' RT.
+50.00 5.56' RT.
+93.24 5.80' RT.
+12.50 5.65' RT.
+91.49 78.00' RT.
+40.81 76.92' RT.
+03.70 76.92' RT.
+89.89 76.92' RT.
+33.09 76.92' RT.
+92.50 76.64' RT.
+72.51 76.60' RT.
+97.74 99.21' LT.
+67.72 98.88' LT.
+26.67 98.86' LT.
+18.10 99.69' LT.

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED CFR
CHECKED SSK

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

IR 270 PLAN
STA. 684+00.00 TO STA. 699+00.00

FRA-270-49.00

52
182

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SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON IR 270

℄=731.2

EX 6" GAS

732.94
675+00.00
732.94

EX 6" GAS

733.27
674+50.00
733.27

EX 6" GAS

733.58
674+00.00
733.58

EX 6" GAS

℄=731.6

733.60
END PROJECT
673+95.00
733.60

END WORK
673+69.75

750
740
730
720

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED	CHECKED
CFR	SSK

CROSS SECTIONS IR 270
STA. 673+50.00 TO STA. 675+00.00

FRA-270-49.00

AS BUILT - 4/22/2016

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR

CHECKED SSK

℄ CONSTRUCTON IR 270

℄=729.8

8:1

731.65
677+00.00
731.65

℄ EX 6" GAS

731.44
676+50.00
731.44

12.5:1

732.35
676+00.00
732.35

EX 6" GAS℄

℄=730.6

732.81
675+50.00
732.81

EX 6" GAS℄

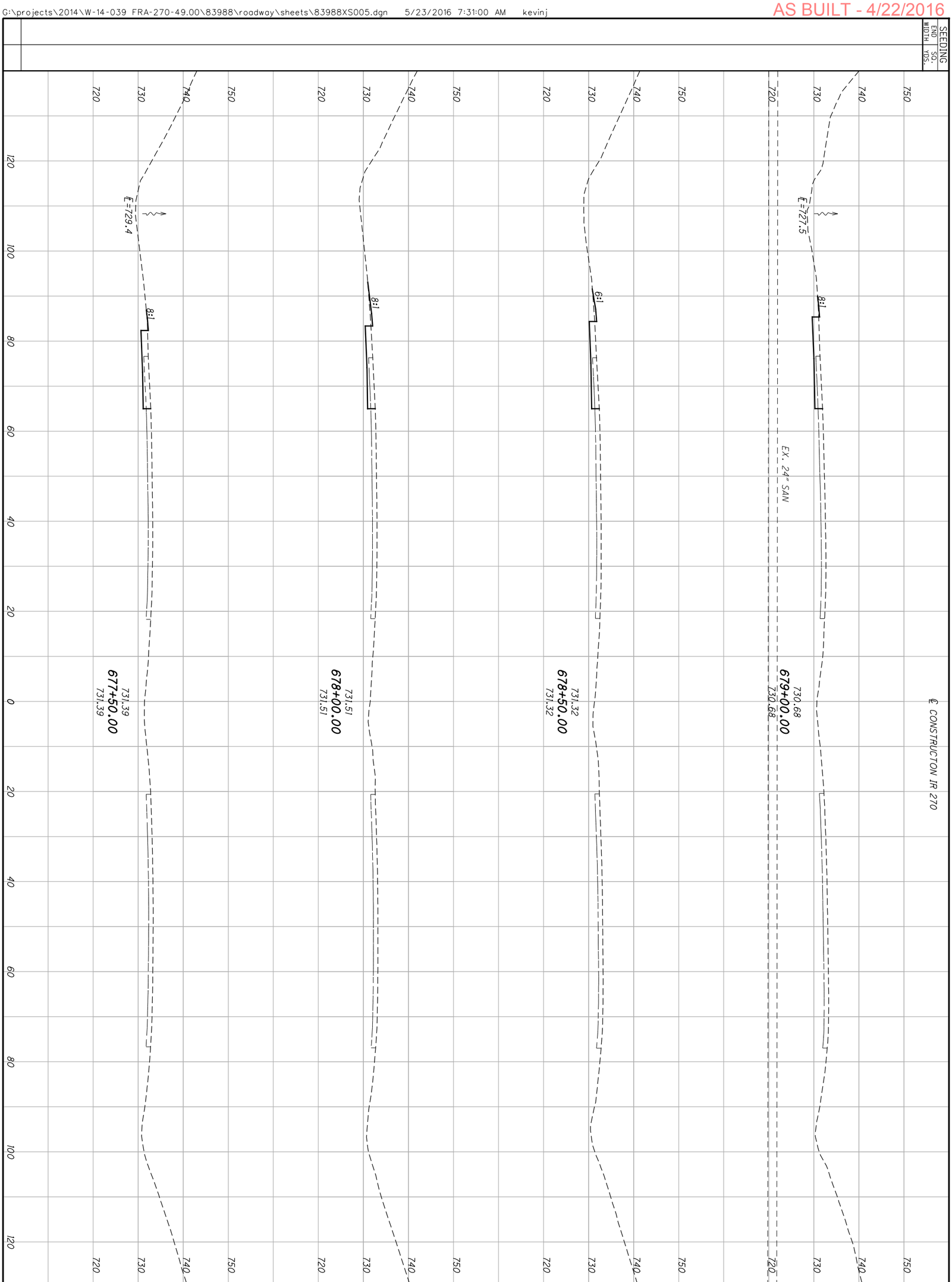
750
740
730
720

120 100 80 60 40 20 0 20 40 60 80 100 120

CROSS SECTIONS IR 270
STA. 675+50.00 TO STA. 677+00.00

FRA-270-49.00

AS BUILT - 4/22/2016



END AREA CUT FILL VOLUME CUT FILL

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

55
182

FRA-270-49.00

CROSS SECTIONS IR 270
STA. 677+50.00 TO STA. 679+00.00

CALCULATED CFR
CHECKED SSK

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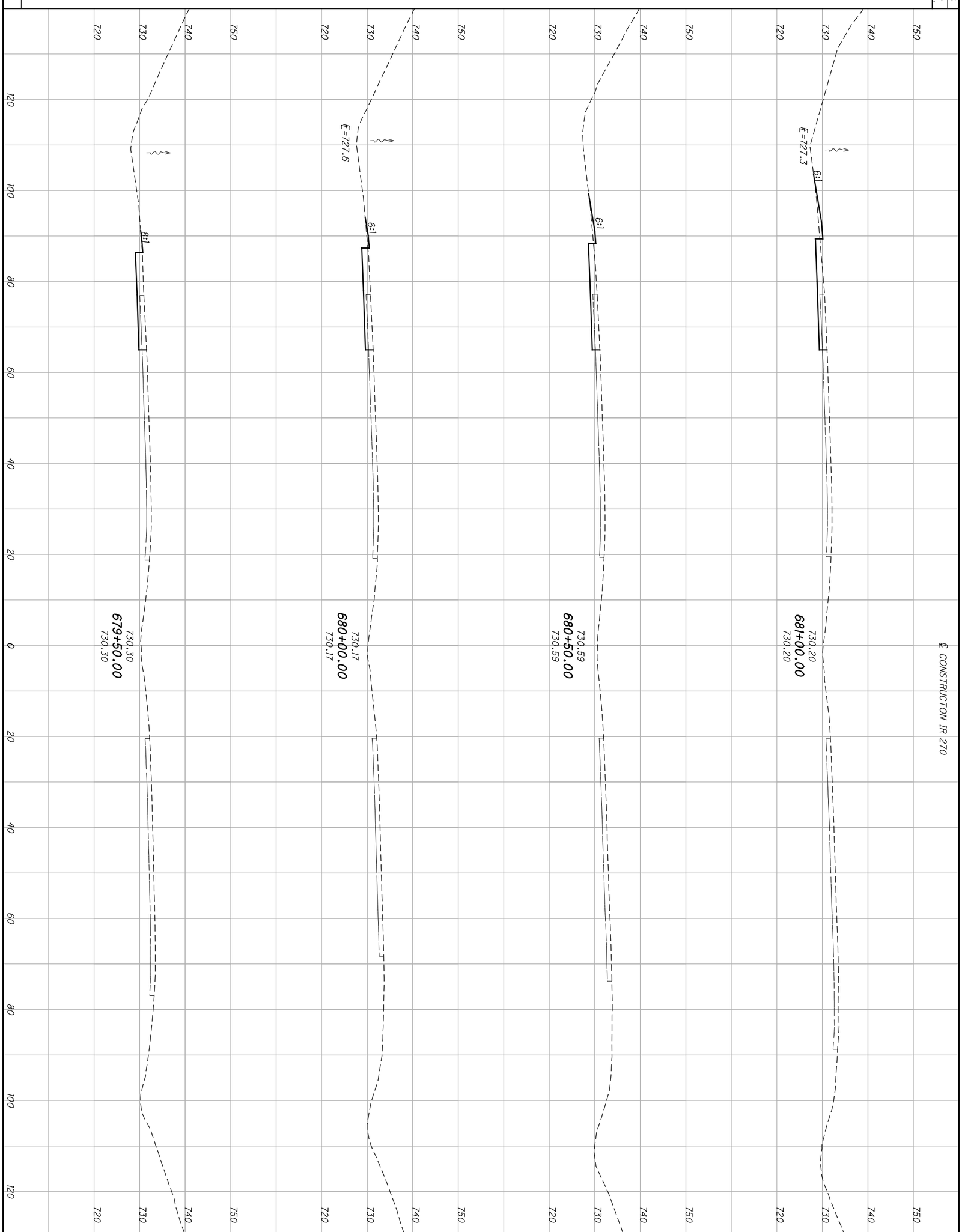
AS BUILT - 4/22/2016

SEEDING
END AREA
VOLUME



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

56
182

FRA-270-49.00

CROSS SECTIONS IR 270
STA. 679+50.00 TO STA. 681+00.00

CALCULATED CFR
CHECKED SSK

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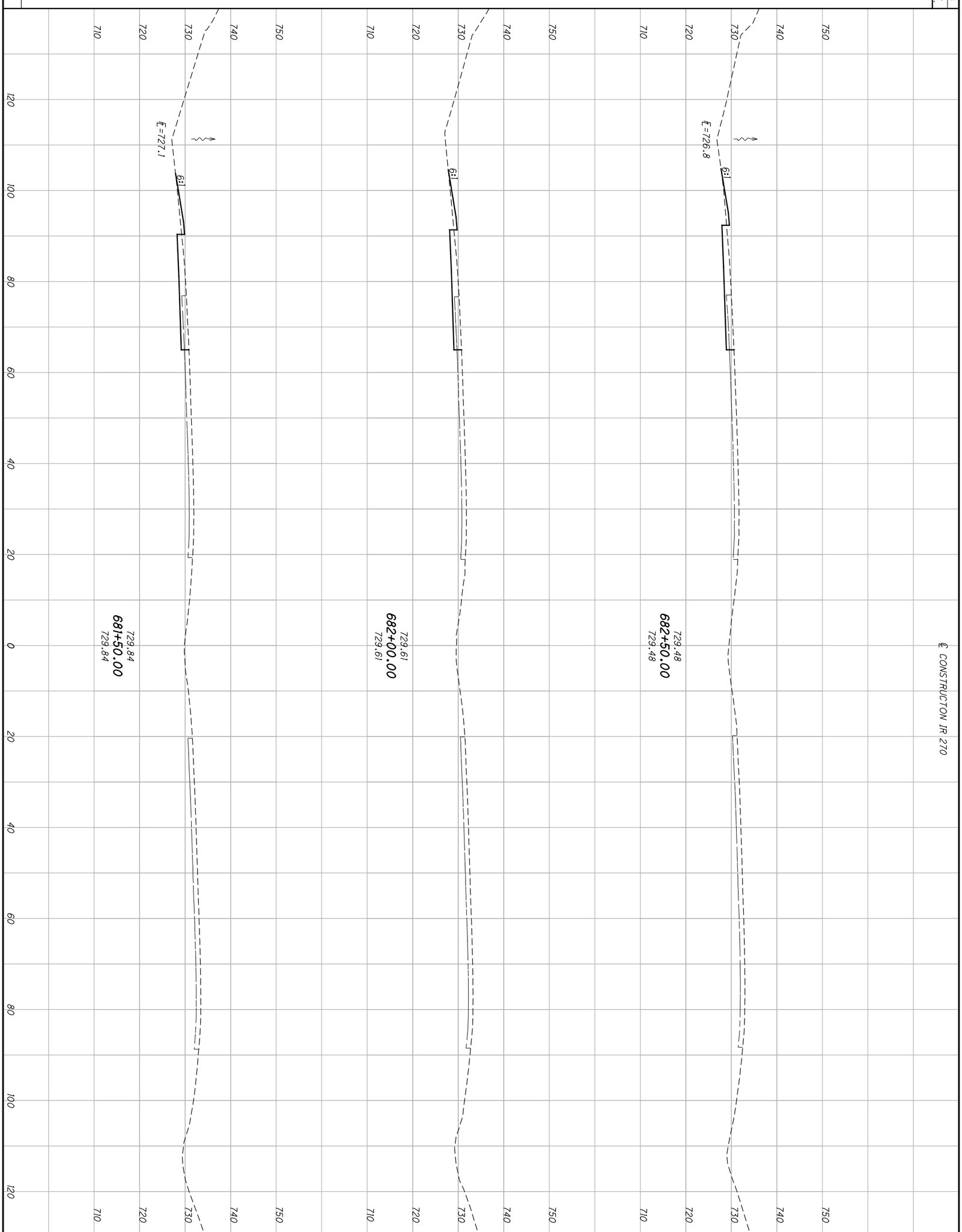
AS BUILT - 4/22/2016

SEEDING
END WIDTH
SQ. YDS.



END AREA
CUT
FILL

VOLUME
CUT
FILL

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

57
182

FRA-270-49.00

CROSS SECTIONS IR 270
STA. 681+50.00 TO STA. 682+50.00

CALCULATED CFR
CHECKED SSK

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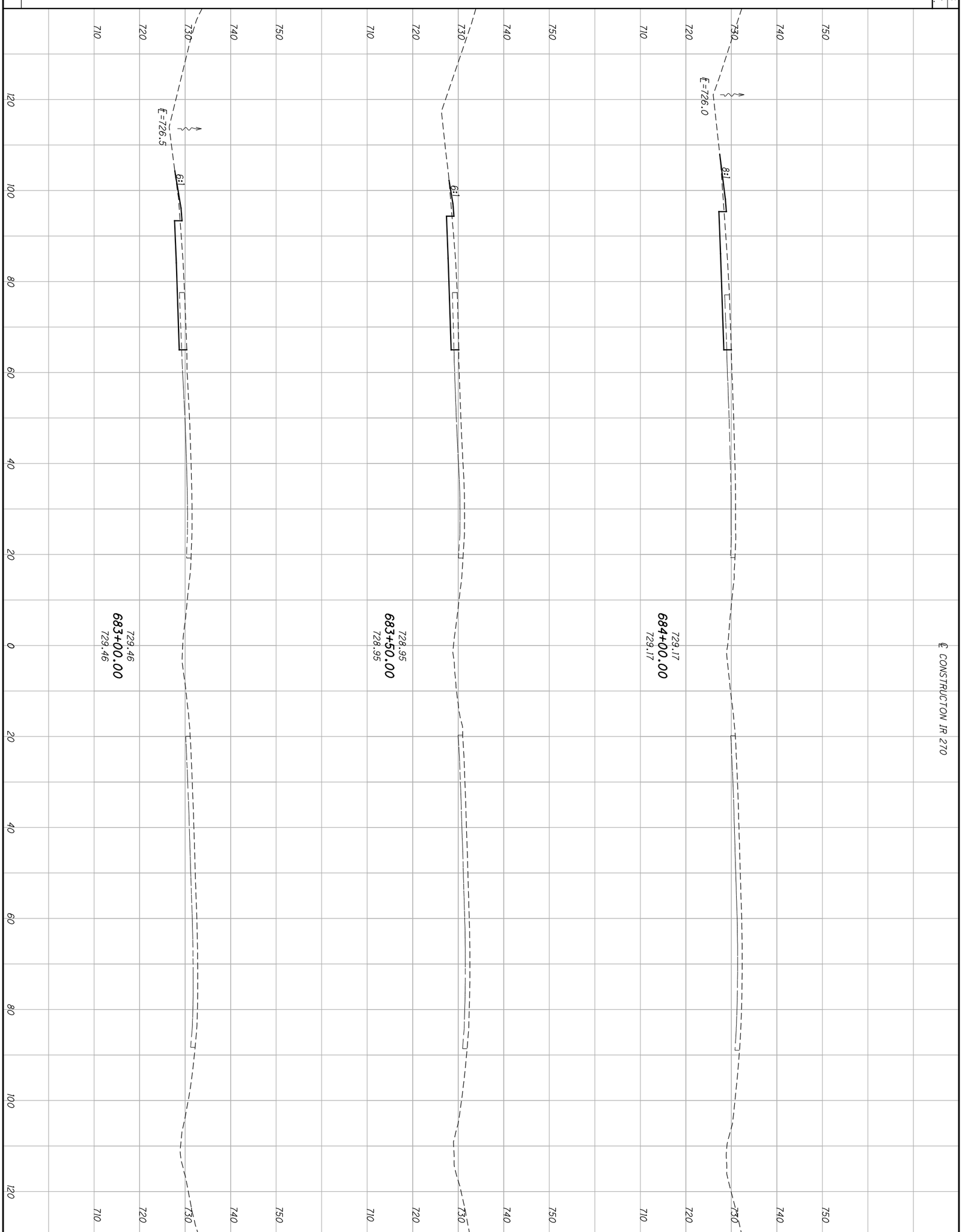
AS BUILT - 4/22/2016

SEEDING
END WIDTH
SQ. YDS.



END AREA
CUT
FILL

VOLUME
CUT
FILL

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

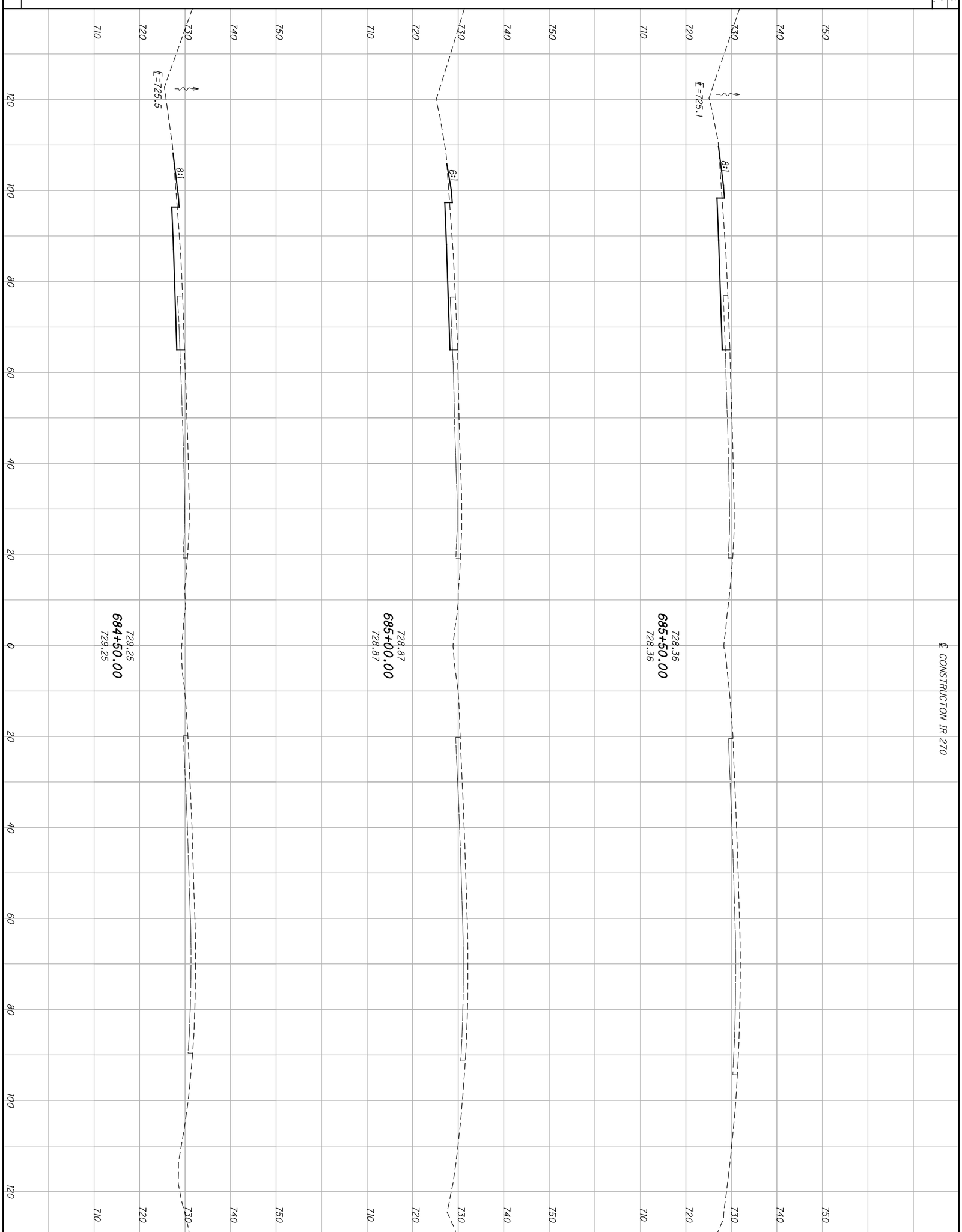
58
182

FRA-270-49.00

CROSS SECTIONS IR 270
STA. 683+00.00 TO STA. 684+00.00

CALCULATED
CFR
CHECKED
SSK

SEEDING
END WIDTH | SQ. YDS.



END AREA
CUT | FILL

VOLUME
CUT | FILL

59
182

FRA-270-49.00

CROSS SECTIONS IR 270
STA. 684+50.00 TO STA. 685+50.00

CALCULATED CFR
CHECKED SSK

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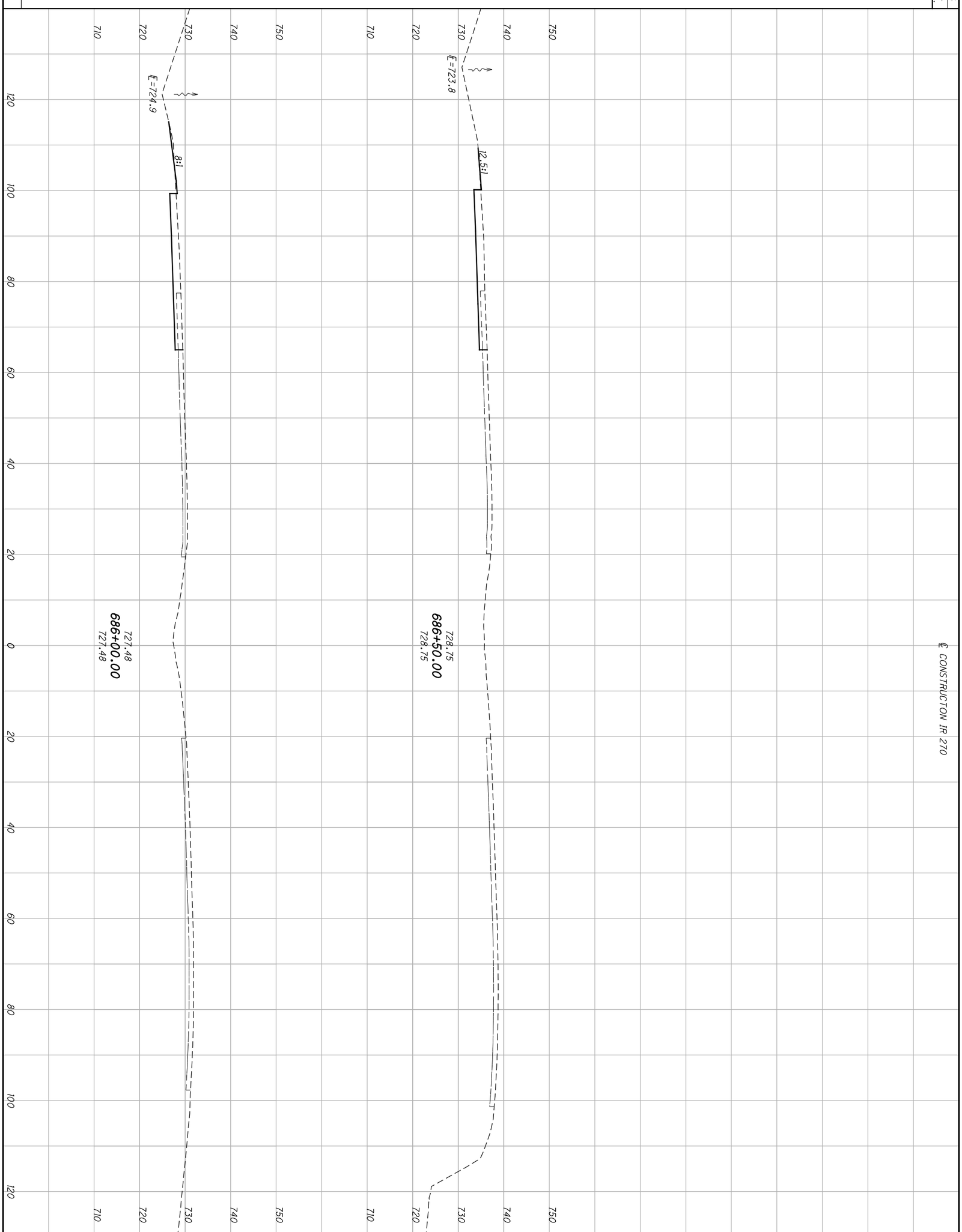
AS BUILT - 4/22/2016

SEEDING
END WIDTH
SQ. YDS.



END AREA
CUT
FILL

VOLUME
CUT
FILL

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

60
182

FRA-270-49.00

CROSS SECTIONS IR 270
STA. 686+00.00 TO STA. 686+50.00

CALCULATED CFR
CHECKED SSK

AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON IR 270

740
730
720
710

12.5:1
12.5:1
℄=722.9

729.20
688+50.00
729.20

℄=721.0

728.11
688+00.00
728.12

727.07
687+50.00
727.07

STA 687+23.66, 110.56' LT
EX. 16'x8' BOX CULVERT
ELEV (SW) 717.46

STA 686+55.25, 120.71' RT
EX. 16'x8' BOX CULVERT
96X192" RCP NE 716.53

℄=720.9

EX. 16'x8' BOX CULVERT

727.92
687+00.00
727.92

EX. CONCRETE SLAB TO REMAIN

120 100 80 60 40 20 0 20 40 60 80 100 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED	CHECKED
CFR	SSK

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS IR 270
STA. 687+00.00 TO STA. 688+50.00

FRA-270-49.00

61
182

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SEEDING	
END WIDTH	SQ. YDS.

℄ CONSTRUCTON IR 270

SEE RAMP T CROSS SECTIONS SHEETS FOR ADDITIONAL INFORMATION

750
740
730
720
710

4:1 4:1 8:1
℄=723.3

728.15
689+50.00
728.15

4:1 4:1 8:1
℄=723.1

729.22
689+00.00
729.22

140 120 100 80 60 40 20 0 20 40 60 80 100

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED	CHECKED
CFR	SSK

CROSS SECTIONS IR 270

STA. 689+00.00 TO STA. 689+50.00

FRA-270-49.00

AS BUILT - 4/22/2016

COMM. BLDG. 1 STY.

PRECAST REINFORCED CONCRETE OUTLET AND TIED CONCRETE BLOCK MAT, TYPE 1 U.D. STA. 686+94.31, 21.6 LT. ELEV. 724.50

END SHLD TAPER STA 686+95.00, 6.00' LT.

U.D. STA. 686+94.31, 6.5 LT. ELEV. 724.74 (TEE)

U.D. STA. 686+99.31, 6.5 LT. ELEV. 724.71 (PLUG)

BEGIN SHLD TAPER STA 686+45.00, 8.00' LT.

TS STA. 686+45.00 RAMP T= STA. 686+45.00 , 91.00' LT. IR 270

MGS TYPE T ANCHOR ASSEMBLY STA. 686+70.00, 8.53' LT.

+07.50, 8.00' LT.
+13.75, 8.00' LT.
+20.00, 8.00' LT.
+26.25, 8.00' LT.

BOEHM COUNTY DITCH

EX. HEADWALL

EX. PCB (TBR)

B.M.#5

SC STA. 688+60.00

℄ CONST RAMP T

+45.00 8.00' LT.

+20.00 8.00' LT.

MGS TYPE E ANCHOR ASSEMBLY STA. 688+70.00, 8.00' LT.

BEGIN CONC. PAVMT. STA. 689+47.37 (RAMP T)

CONST. LIMITS

GRAVEL FIELD DR

PCC STA. 690+98.13

U.D. STA. 690+59.81, 6.50 LT. ELEV. 723.06 (TEE)

CURVE NO. 4

CURVE NO. 5

SEE SHEET 64.

8' 25:1 TAPER 16'

+45.00 75.00' LT

+75.00± 14.50' RT.

+40.00± 16.00' RT.

EX. CONC. SLAB

GRAVEL

GRASS

RAMP T

END PAVMT TAPER STA 686+45.00 66.00' LT. IR 270

U.D. STA. 689+05.00, 19.50 RT. ELEV. 724.98 (PLUG)

+47.37 19.00' RT

+31.65 65.23' LT

+54.58 67.41' LT

SAWCUT

IR 270 WB

U.D. STA. 690+59.81, 19.50 RT. ELEV. 722.50 (CROSS)

CONST. LIMITS

REMOVE EX. 36" RCP TO THE PROP. MH

U.D. STA. 690+79.99, 41.01 RT. ELEV. 722.00

END PAVEMENT TAPER STA. 689+54.55 68.41' LT. IR 270

MATCHLINE RAMP T STA. 691+00

D-4

24"

36" RCP

65.00'

66'

16'x8' BOX CULVERT

CONNECT TO EXISTING U.D. STA. 686+94.31, 14.0 RT. ELEV. 725.61±

STRUCTURE NO. FRA-270-4919

12" RCP

18" RCP

686 687 688 689 690

RAMP T CURVE NO 4
P.I.Sta. 689+79.50
Δ = 11° 54′ 24″ (LT)
Dc = 5° 00′ 00″
R = 1,145.92′
Ls = 215.00′
s = 5° 22′ 30″
LT = 143.40′
ST = 71.73′
x = 214.81′
y = 6.72′
k = 107.47′
p = 1.68′
Lc= 237.71′
Ts= 234.68′
Es= 8.59′
e max = 0.056

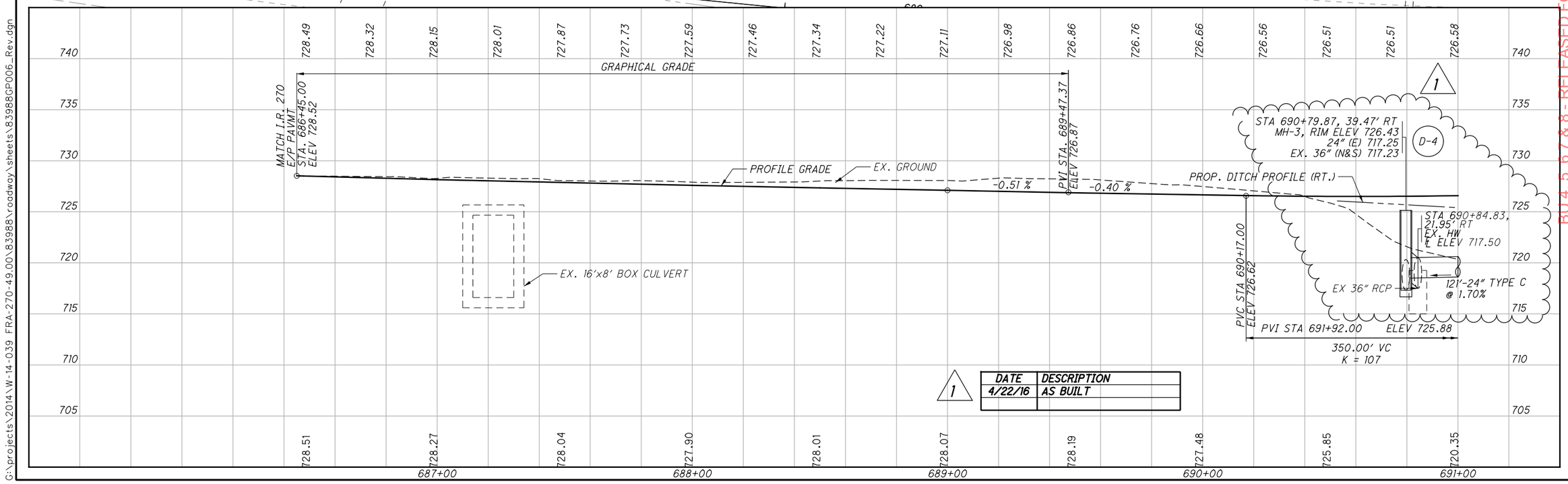
RAMP T CURVE NO 5
P.I. STA. 694+70.26
Δ = 29° 34′ 04″ (LT)
Dc = 4° 03′ 48″
R = 1,410.03′
T = 372.12′
L = 727.65′
E = 48.28′
e max = 0.052

NOTES:
1. FULL DEPTH ASPHALT PAVEMENT, SEE RAMP T TYPICAL SECTIONS
2. FULL DEPTH CONCRETE PAVEMENT, SEE RAMP T TYPICAL SECTIONS
3. MGS STEEL BEAM POST ANCHORED TO EX. BOX CULVERT PER MGS 1.1

LEGEND
ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE A
ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE F
EX. CONCRETE SLAB TO REMAIN

HORIZONTAL SCALE IN FEET 0 10 20 40

CALCULATED CFR CHECKED SSK



DATE	DESCRIPTION
4/22/16	AS BUILT

1

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

PLAN AND PROFILE - RAMP T STA. 686+09.59 TO STA. 691+00

FRA-270-49.00

63
182

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AS BUILT - 4/22/2016

LEGEND

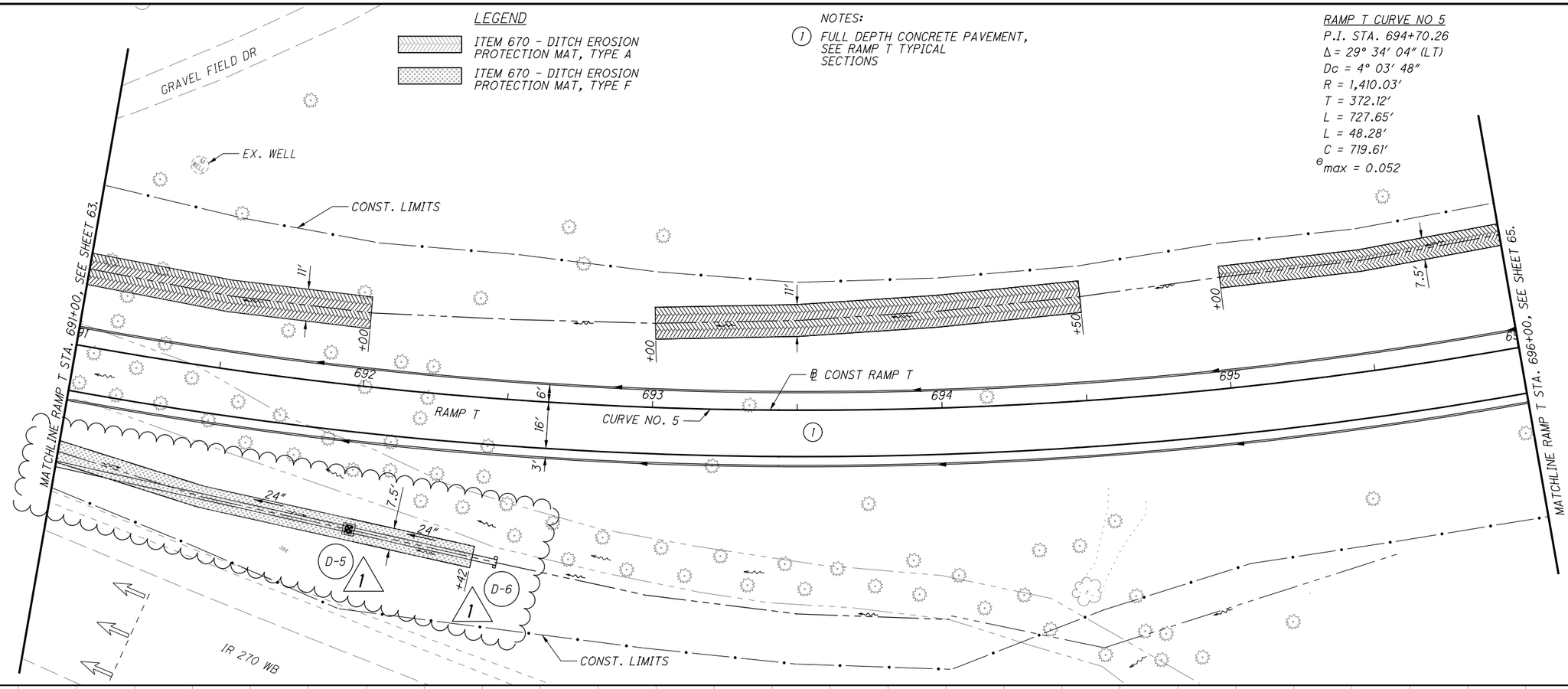
ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE A

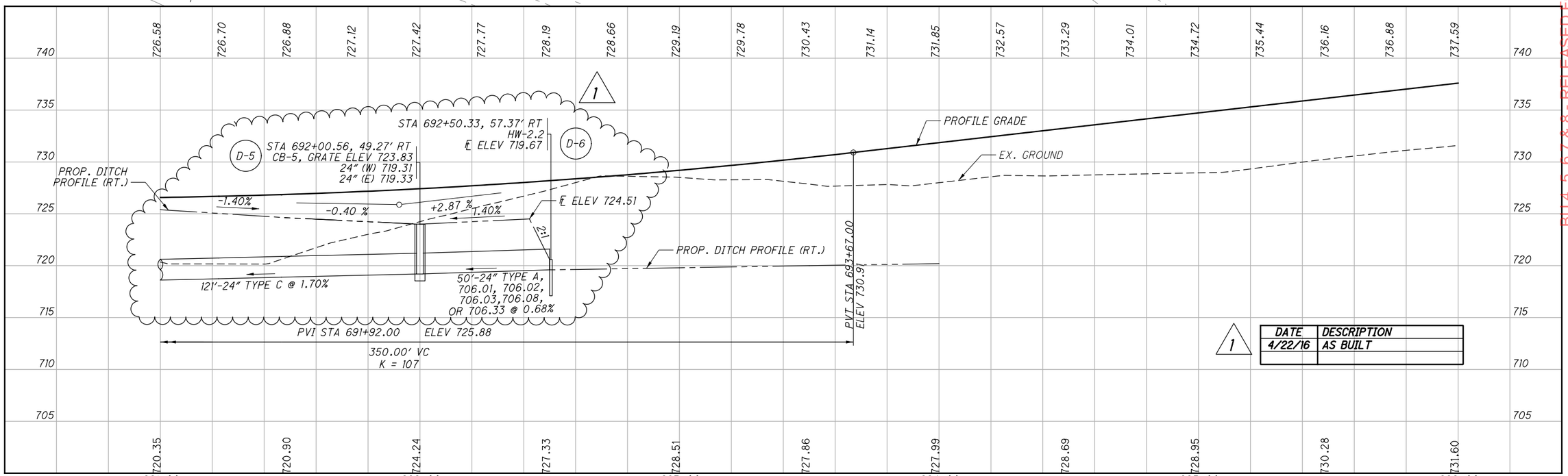
ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE F

NOTES:

(1) FULL DEPTH CONCRETE PAVEMENT, SEE RAMP T TYPICAL SECTIONS

RAMP T CURVE NO 5
P.I. STA. 694+70.26
Δ = 29° 34′ 04″ (LT)
Dc = 4° 03′ 48″
R = 1,410.03′
T = 372.12′
L = 727.65′
L = 48.28′
C = 719.61′
e_{max} = 0.052





DATE	DESCRIPTION
4/22/16	AS BUILT

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED CFR
CHECKED SSK

BU 4, 5, 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

PLAN AND PROFILE - RAMP T STA. 691+00 TO STA. 696+00

FRA-270-49.00

64
182

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AS BUILT - 4/22/2016

LEGEND

ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE A

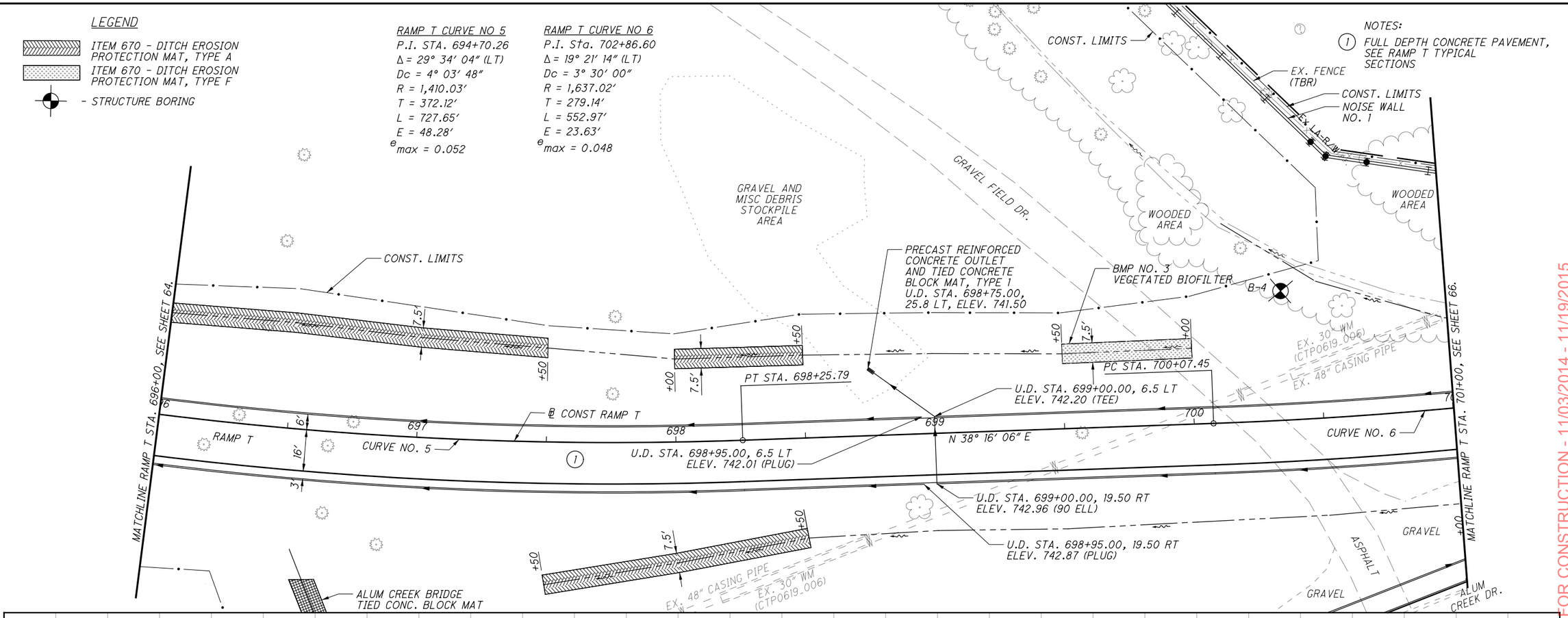
ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE F

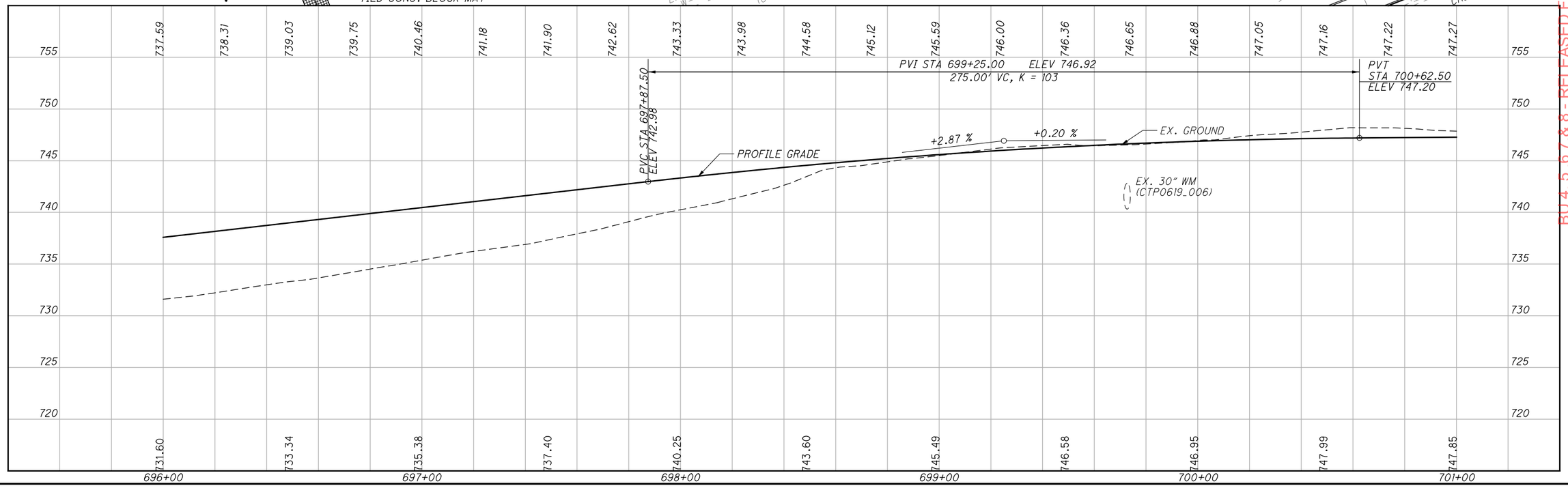
- STRUCTURE BORING

RAMP T CURVE NO 5
P.I. STA. 694+70.26
Δ = 29° 34′ 04″ (LT)
Dc = 4° 03′ 48″
R = 1,410.03′
T = 372.12′
L = 727.65′
E = 48.28′
e_{max} = 0.052

RAMP T CURVE NO 6
P.I. Sta. 702+86.60
Δ = 19° 21′ 14″ (LT)
Dc = 3° 30′ 00″
R = 1,637.02′
T = 279.14′
L = 552.97′
E = 23.63′
e_{max} = 0.048

NOTES:
1. FULL DEPTH CONCRETE PAVEMENT, SEE RAMP T TYPICAL SECTIONS





HORIZONTAL SCALE IN FEET 0 10 20 40

CALCULATED CFR CHECKED SSK

PLAN AND PROFILE - RAMP T
STA. 696+00 TO STA. 701+00

FRA-270-49.00

65
182

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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AS BUILT - 4/22/2016

RAMP T CURVE NO 6
P.I. STA. 702+86.60
Δ = 19° 21' 14" (LT)
Dc = 3° 30' 00"
R = 1,637.02
T = 279.14'
L = 552.97'
E = 23.63'
e_{max} = 0.048

(A) U.D. STA. 702+15.00, 19.5 RT., ELEV. 745.01 (TEE)
(B) U.D. STA. 702+64.15, 8.5 LT. ELEV. 744.11 (TEE)
(C) U.D. STA. 702+64.15, 0.58 LT. ELEV. 744.49 (90 ELL)
(D) U.D. STA. 702+64.15, 19.5 RT. ELEV. 745.20 (PLUG)
(E) U.D. STA. 703+50.00, 8.50 LT, ELEV. = 744.22
(F) U.D. STA. 703+50.00, 0.58 LT ELEV. = 744.60

NOTES:
1. FULL DEPTH PAVEMENT (ASPHALT), SEE ALUM CREEK TYPICAL SECTIONS
2. FULL DEPTH PAVEMENT (CONC.), SEE RAMP T TYPICAL SECTIONS
3. FOR PROP. CULVERT PIPE INVERTS SEE NOISE WALL CROSS SECTION

LEGEND
- 1¼" PAVEMENT PLANING, W/ 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE A, 12.5MM, (446)
- ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE F
- STRUCTURE BORING

HORIZONTAL SCALE IN FEET 0 10 20 40

CALCULATED CFR CHECKED SSK

PLAN AND PROFILE - RAMP T
STA. 701+00 TO STA. 705+25.82

FRA-270-49.00

66 / 182

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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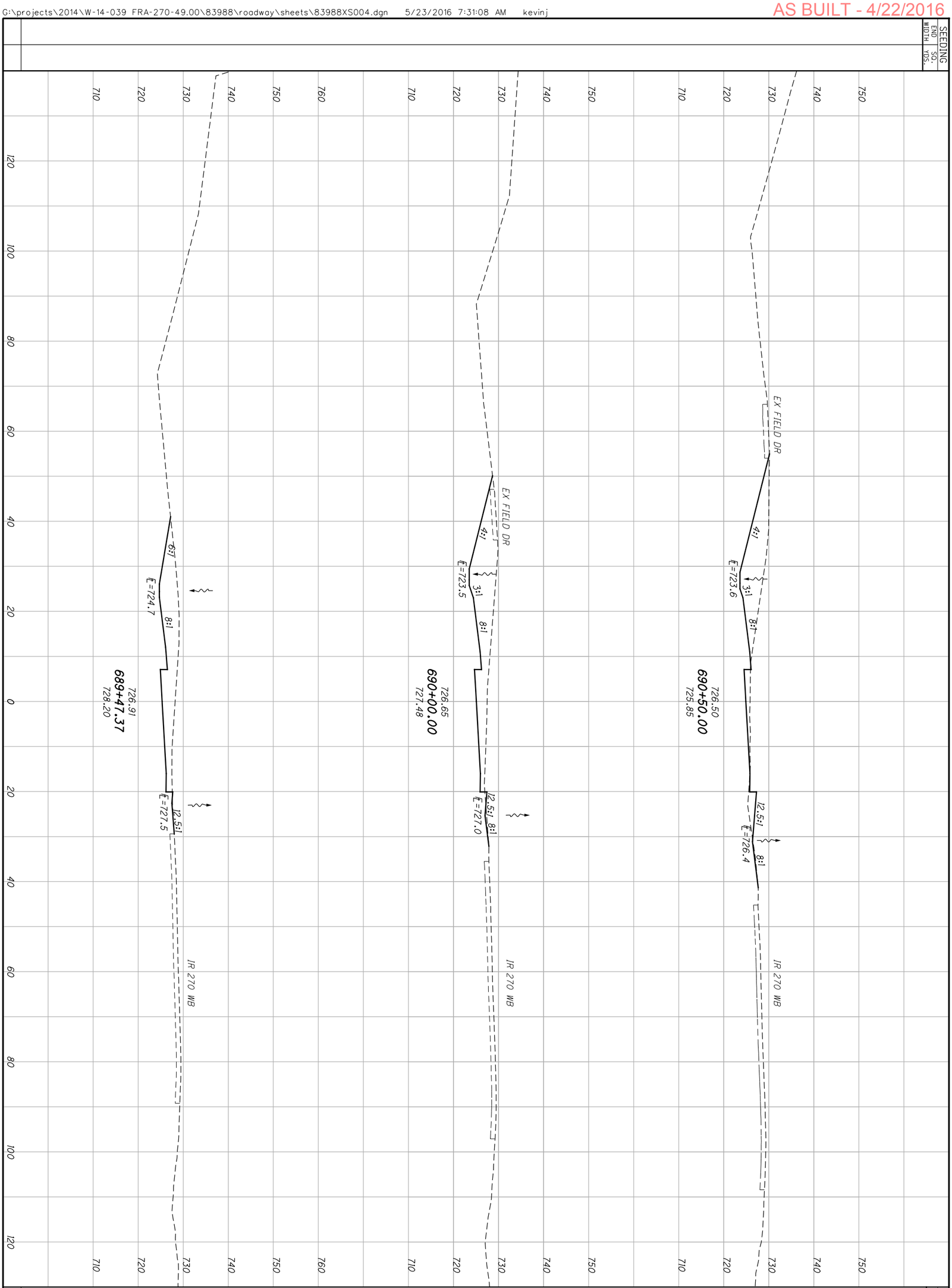
AS BUILT - 4/22/2016



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

67
182

FRA-270-49.00

CROSS SECTIONS RAMP T
STA. 689+47.37 TO STA. 690+50.00

CALCULATED CFR
CHECKED SSK

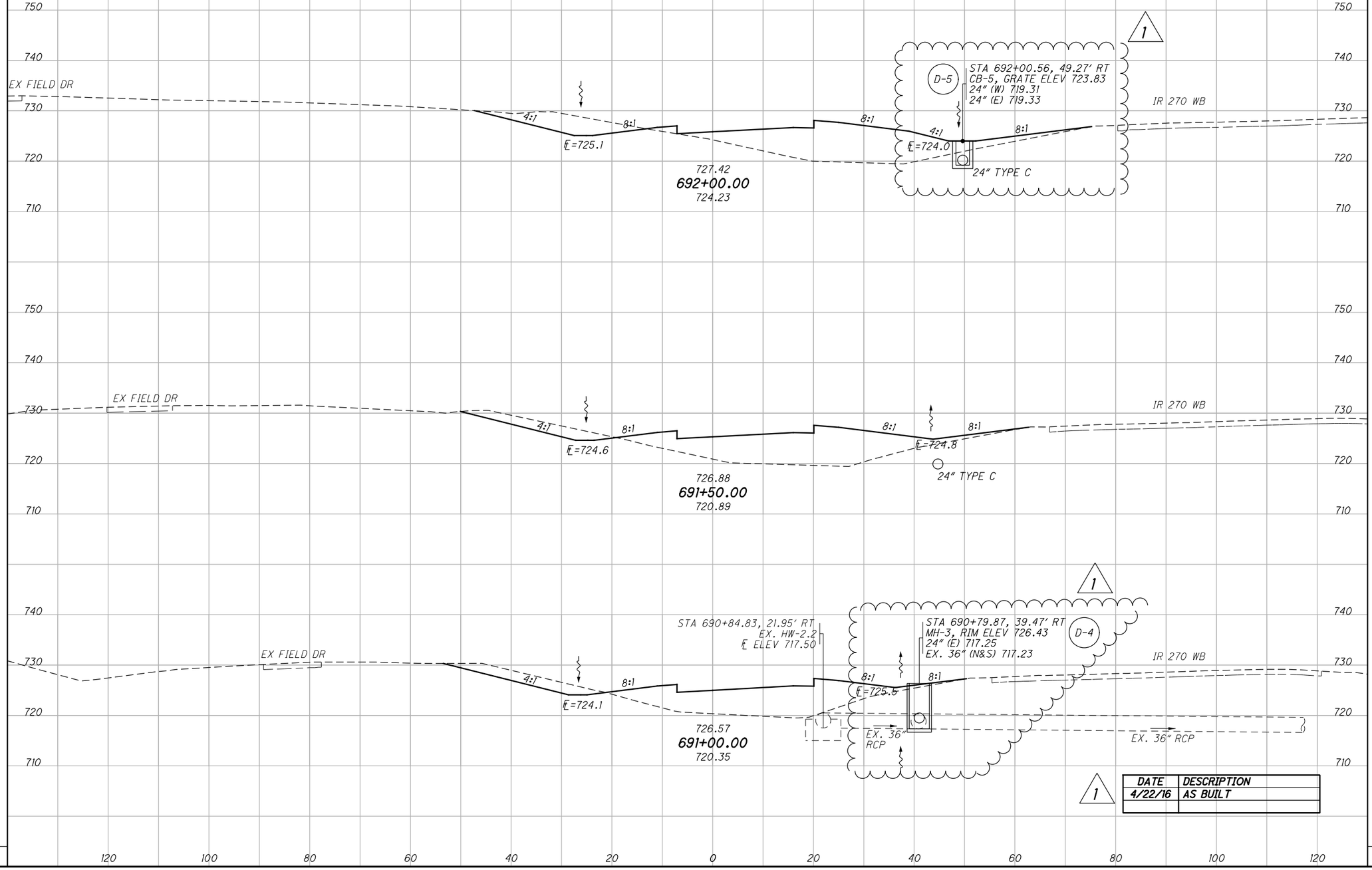
AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED	CHECKED
CFR	SSK



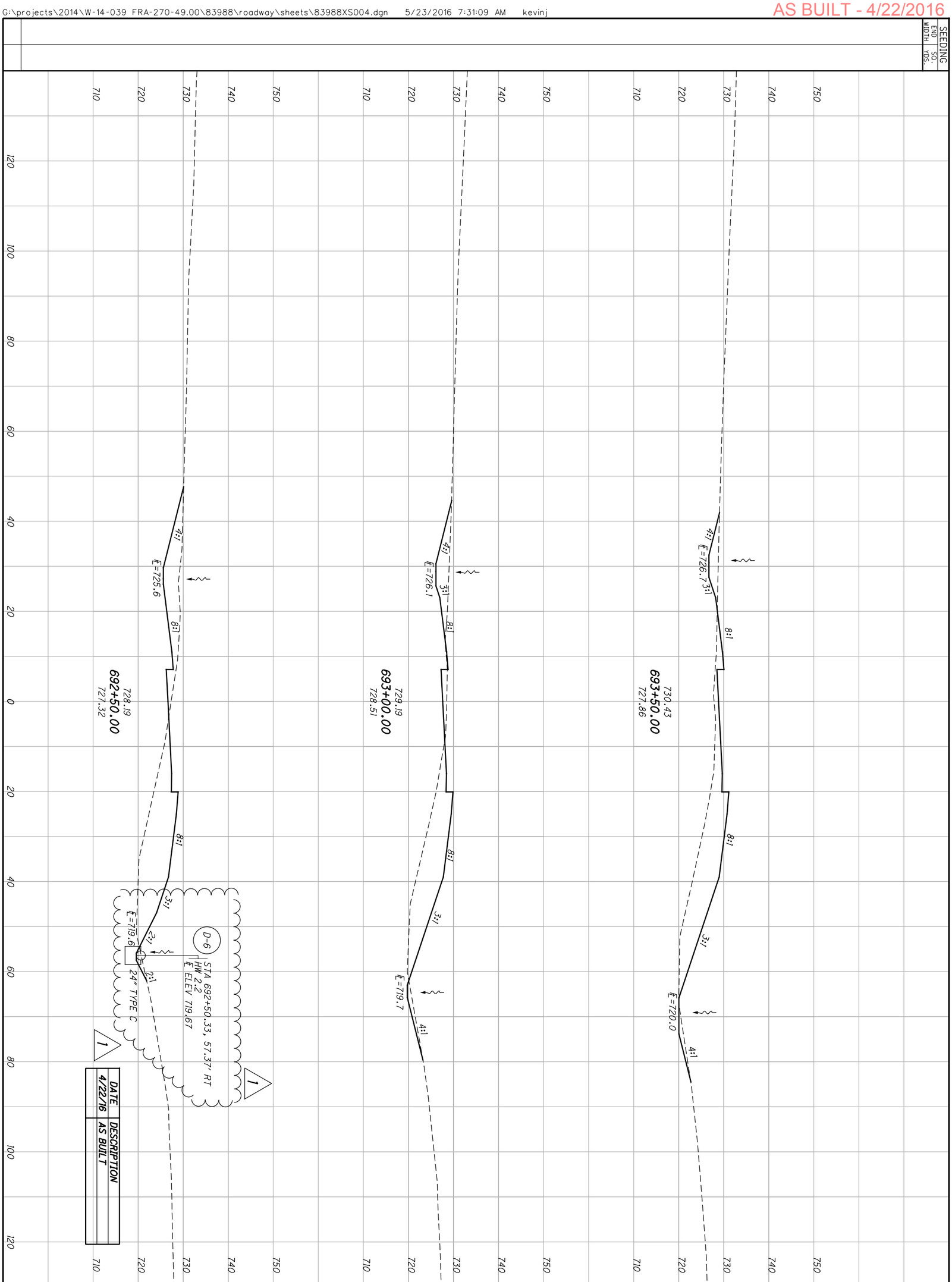
1	DATE	DESCRIPTION
	4/22/16	AS BUILT

BU 4, 5, 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS RAMP T
STA. 691+00.00 TO STA. 692+00.00

FRA-270-49.00

AS BUILT - 4/22/2016



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

69
182

FRA-270-49.00

CROSS SECTIONS RAMP T

STA. 692+50.00 TO STA. 693+50.00

CALCULATED CFR

CHECKED SSK

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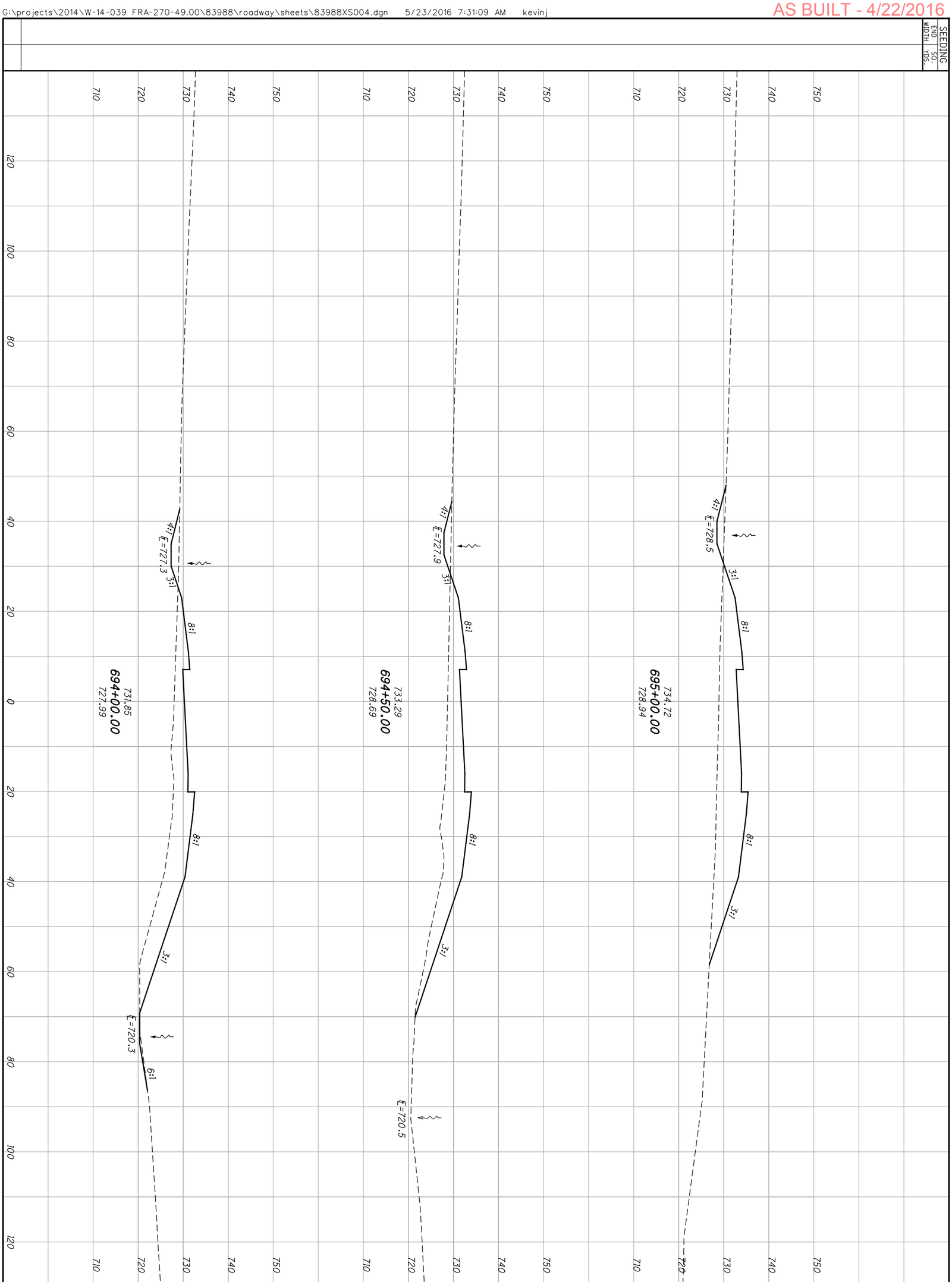
AS BUILT - 4/22/2016



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

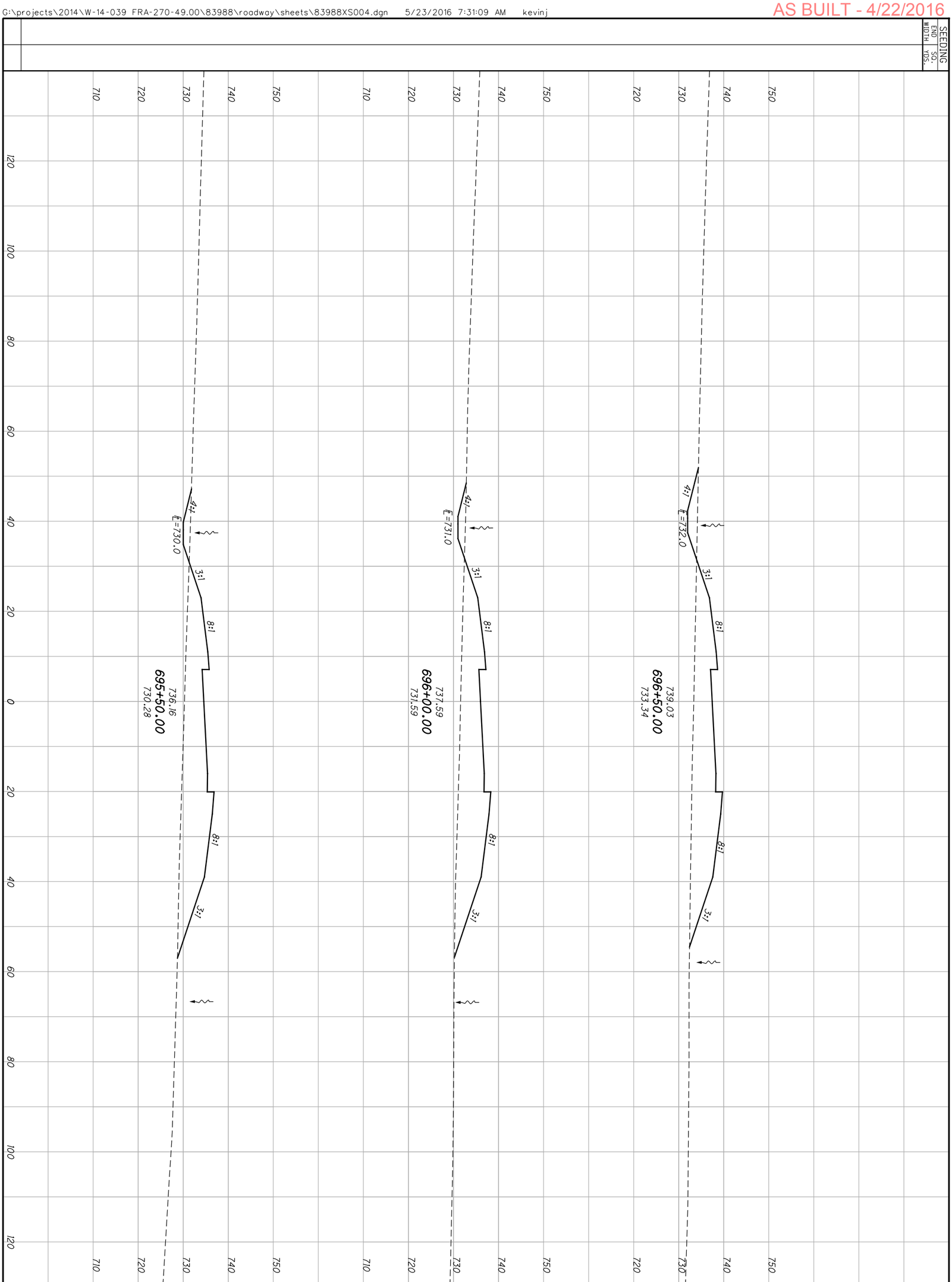
70
182

FRA-270-49.00

CROSS SECTIONS RAMP T
STA. 694+00.00 TO STA. 695+00.00

CALCULATED CFR
CHECKED SSK

AS BUILT - 4/22/2016



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

71 / 182	FRA-270-49.00	CROSS SECTIONS RAMP T STA. 695+50.00 TO STA. 696+50.00

CALCULATED CFR
CHECKED SSK

AS BUILT - 4/22/2016

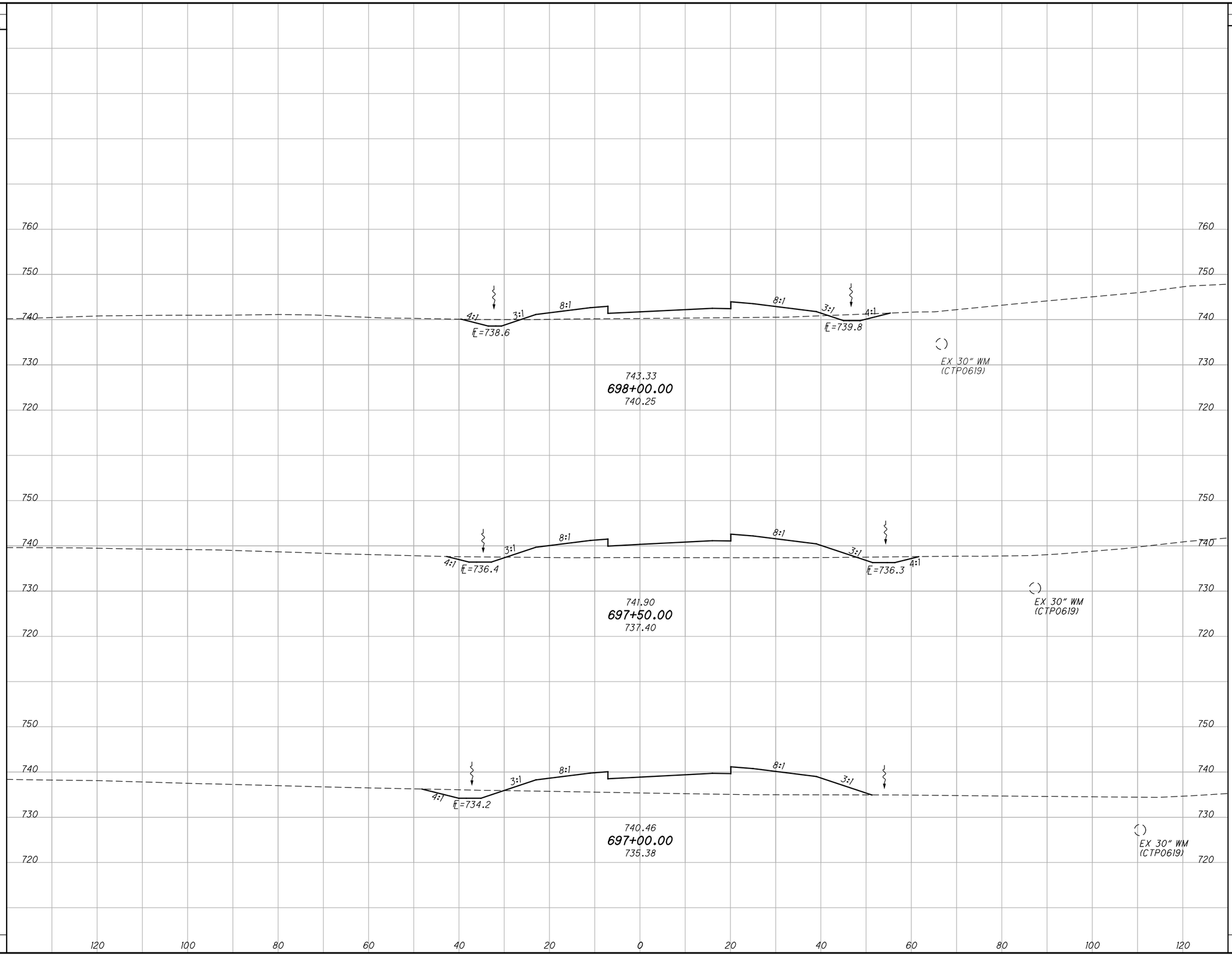
SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR

CHECKED SSK



BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS RAMP T
STA. 697+00.00 TO STA. 698+00.00

FRA-270-49.00

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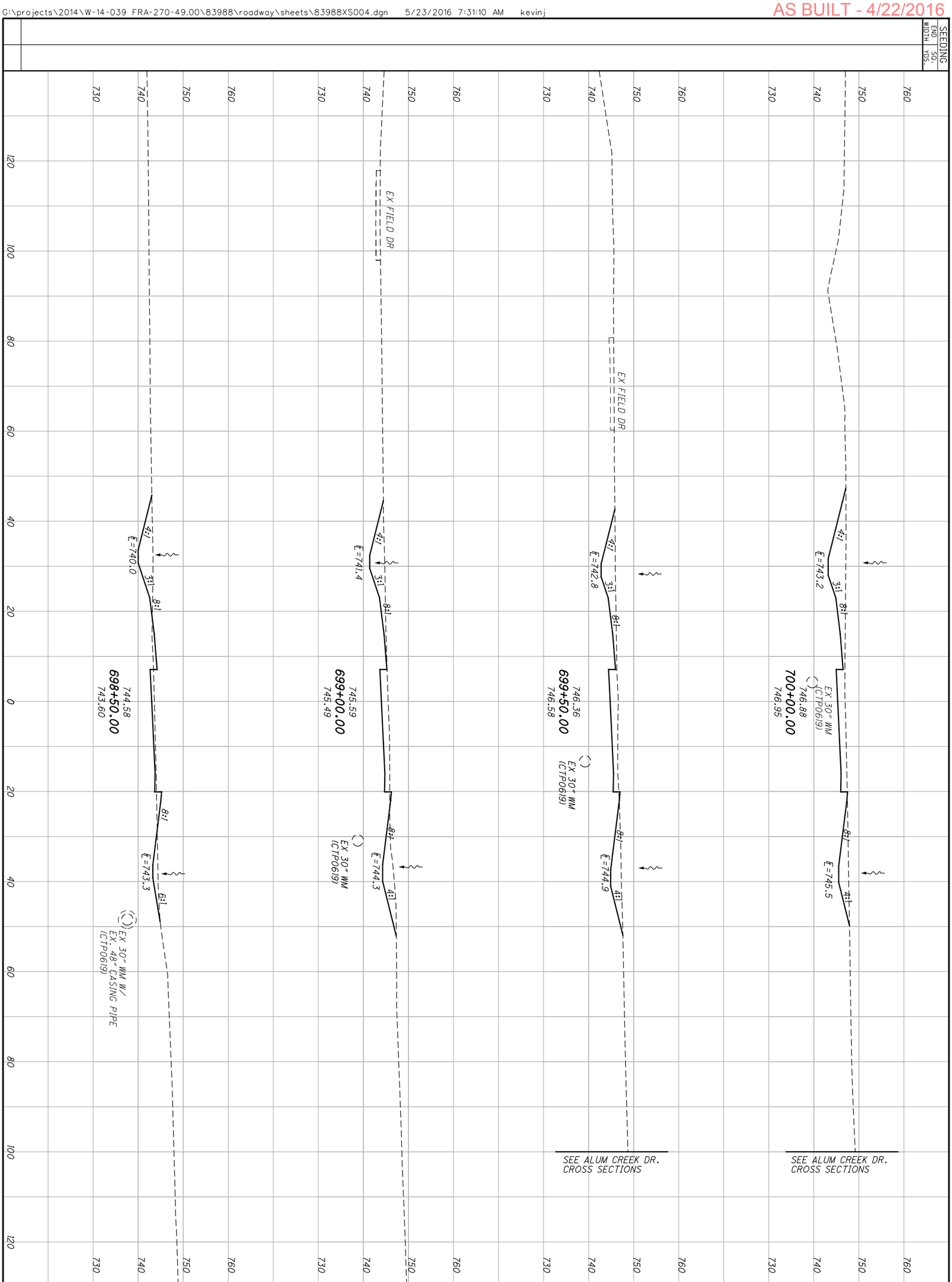
AS BUILT - 4/22/2016



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

73
182

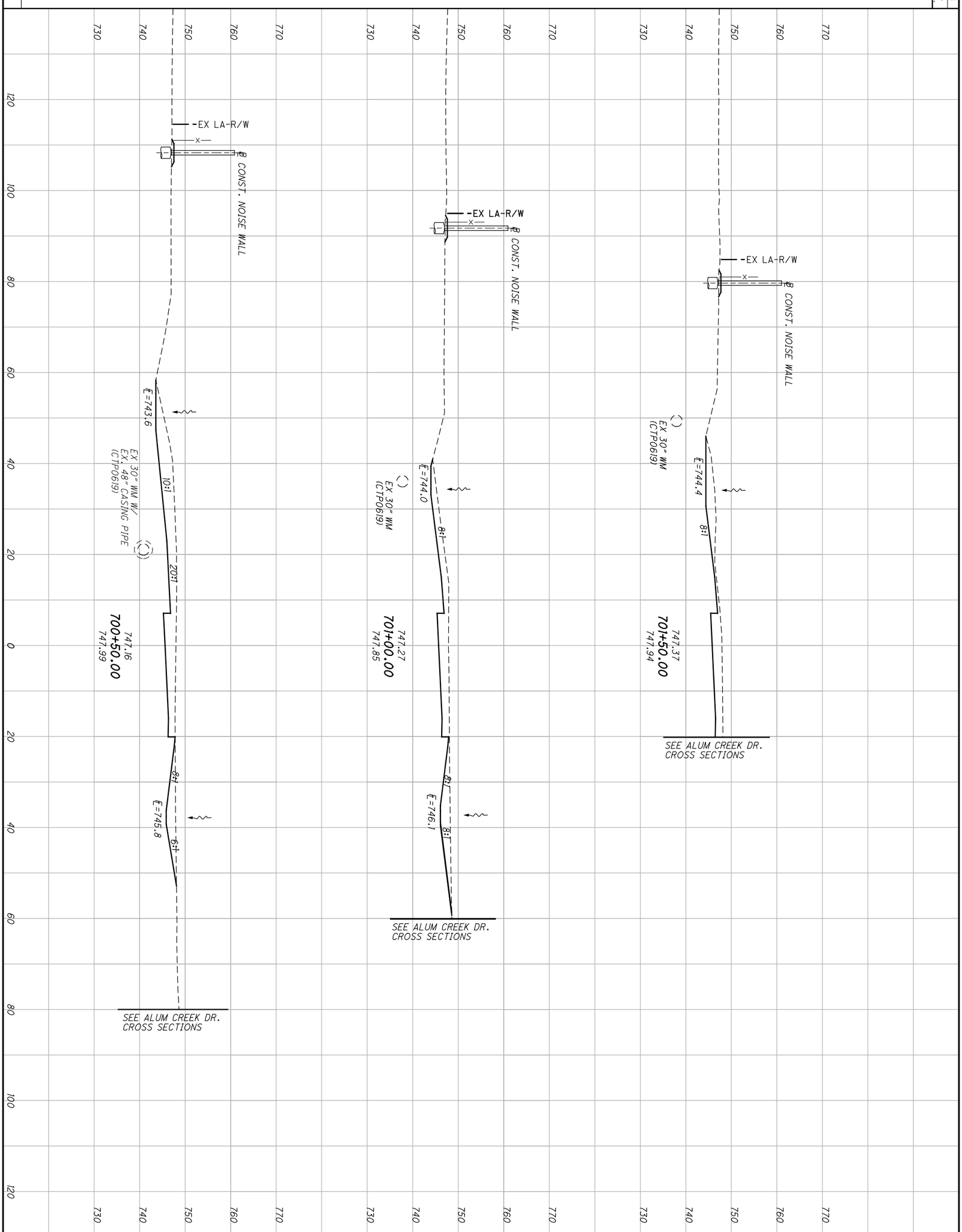
FRA-270-49.00

CROSS SECTIONS RAMP T
STA. 698+50.00 TO STA. 700+00.00

CALCULATED CFR
CHECKED SSK

AS BUILT - 4/22/2016

SEEDING
END AREA
VOLUME



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

74 / 182	FRA-270-49.00	CROSS SECTIONS RAMP T STA. 700+50.00 TO STA. 701+50.00	CALCULATED CFR CHECKED SSK

AS BUILT - 4/22/2016

RAMP W CURVE NO 2
P.I. STA. 685+87.06
Δ = 2° 52' 12" (RT)
Dc = 0° 30' 00"
R = 11,459.16'
T = 287.06'
L = 574.00'
E = 3.59'
e_{max} = NC

RAMP W CURVE NO 3
P.I. STA. 691+17.93
Δ = 16° 18' 35" (RT)
Dc = 6° 00' 00"
R = 954.93'
T = 136.84'
L = 271.83'
E = 9.75'
e_{max} = 0.059

687 18" RCP
℄ CONST. IR 270
16'x8' BOX CULVERT
STRUCTURE NO. FRA-270-4919
BEGIN WORK STA. 688+55.00
IR 270 EB
10.5'±
35'±
11'±
CONNECT U.D. TO EXISTING STA. 688+60.00, 8.87 RT. ELEV. 728.21±
36" RCP
36" RCP
B.M.#4
30" RCP
42" RCP
+60.00 19.70' LT
CONST. LIMITS
19.70'±
2.37'±
OVERHEAD CANT. SIGN
RAMP W
687
688
CURVE NO. 2
689
690
℄ CONST. RAMP W
691
CURVE NO. 3
S 87° 24' 03" E
PC STA 689+81.09
.9'
.9
BEGIN PAVMT TAPER STA 688+60.00, 2.37' RT.
PT STA 688+74.00
END PAVMT TAPER STA 689+60.00, 24.00' RT.
7.5'
+00
+50
48" RCP
MATCHLINE RAMP W STA. 691+50, SEE SHEET 76.
BOEHM COUNTY DITCH
48" RCP
CONST. LIMITS
WOODED AREA
WOODED AREA
WOODED AREA
Ex LA-R/W
Ex LA-R/W
Ex R/W
Ex R/W

LEGEND

1½" PAVEMENT PLANING, W/ 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE A, 9.5MM, (446)

ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE A

731.73 732.09 732.53 733.07 733.74 734.45 735.23 736.06 736.86 737.72 738.63 739.56

GRAPHICAL GRADE

STA 688+60.00 MATCH EX ELEV 731.53

PROFILE GRADE

EX. GROUND

EX ST LT

EX. 16'x8' BOX CULVERT

EX. 42" RCP

750 745 740 735 730 725 720 715

731.38 731.19 730.67 730.90 731.34 732.09 733.07 734.45 736.06 737.72 739.56

687+00 688+00 689+00 690+00 691+00

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED CFR
CHECKED SSK

PLAN AND PROFILE - RAMP W
STA. 686+50 TO STA. 691+50

FRA-270-49.00

75
182

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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AS BUILT - 4/22/2016

LEGEND

- 1½" PAVEMENT PLANING, W/ 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE A, 12.5MM, (446)
- ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE A
- ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE F
- ITEM 836 - SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1

NOTES:
1. FULL DEPTH ASPHALT PAVEMENT, SEE RAMP W TYPICAL SECTIONS

RAMP W CURVE NO 3
P.I. STA. 691+17.93
Δ = 16° 18' 35" (RT)
Dc = 6° 00' 00"
R = 954.93'
T = 136.84'
L = 271.83'
E = 9.75'
e_{max} = 0.059

HORIZONTAL SCALE IN FEET: 0, 10, 20, 40

CALCULATED CFR
CHECKED SSK

5/23/2016 7:31:12 AM kevinj
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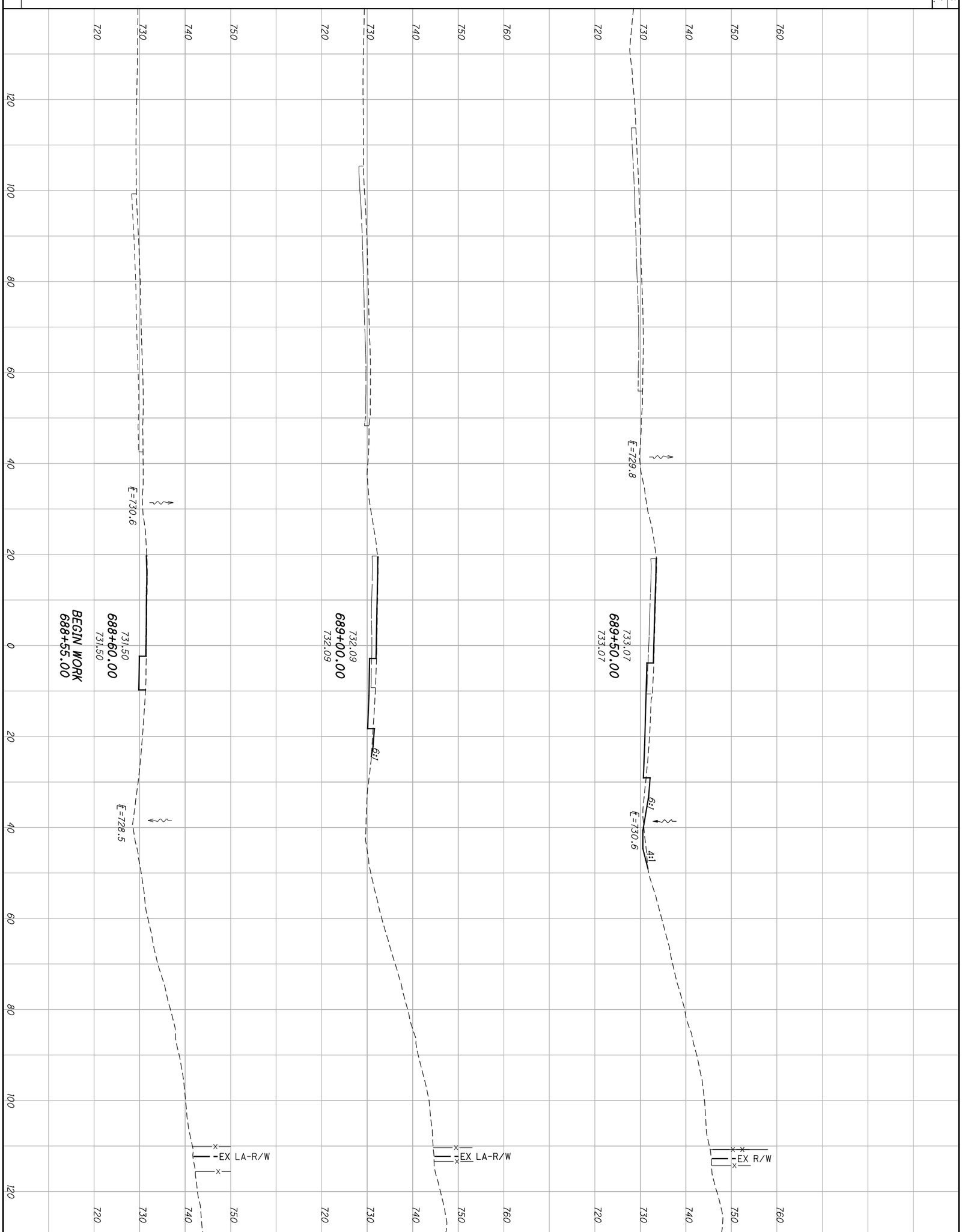
BU 4, 5, & 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

PLAN AND PROFILE - RAMP W
STA. 691+50 TO STA. 695+92.73

FRA-270-49.00

76
182

SEEDING
END WIDTH
SQ. YDS.



END AREA
CUT
FILL

VOLUME
CUT
FILL

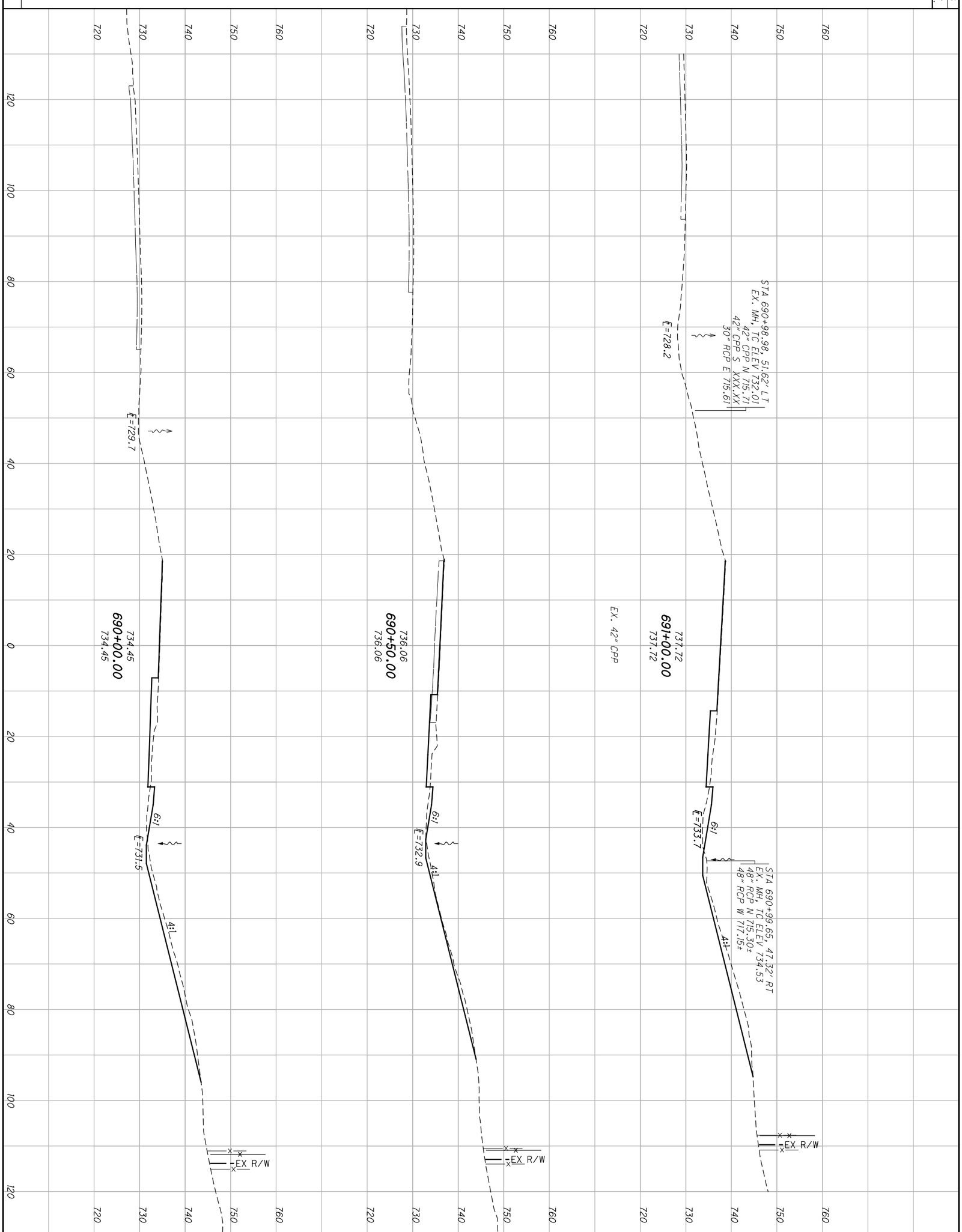
77
182

FRA-270-49.00

CROSS SECTIONS RAMP W
STA. 688+60.00 TO STA. 689+50.00

CALCULATED CFR
CHECKED SSK

SEEDING
END WIDTH | SQ. YDS.



END AREA CUT | FILL
VOLUME CUT | FILL

78
182

FRA-270-49.00

CROSS SECTIONS RAMP W
STA. 690+00.00 TO STA. 691+00.00

CALCULATED CFR
CHECKED SSK

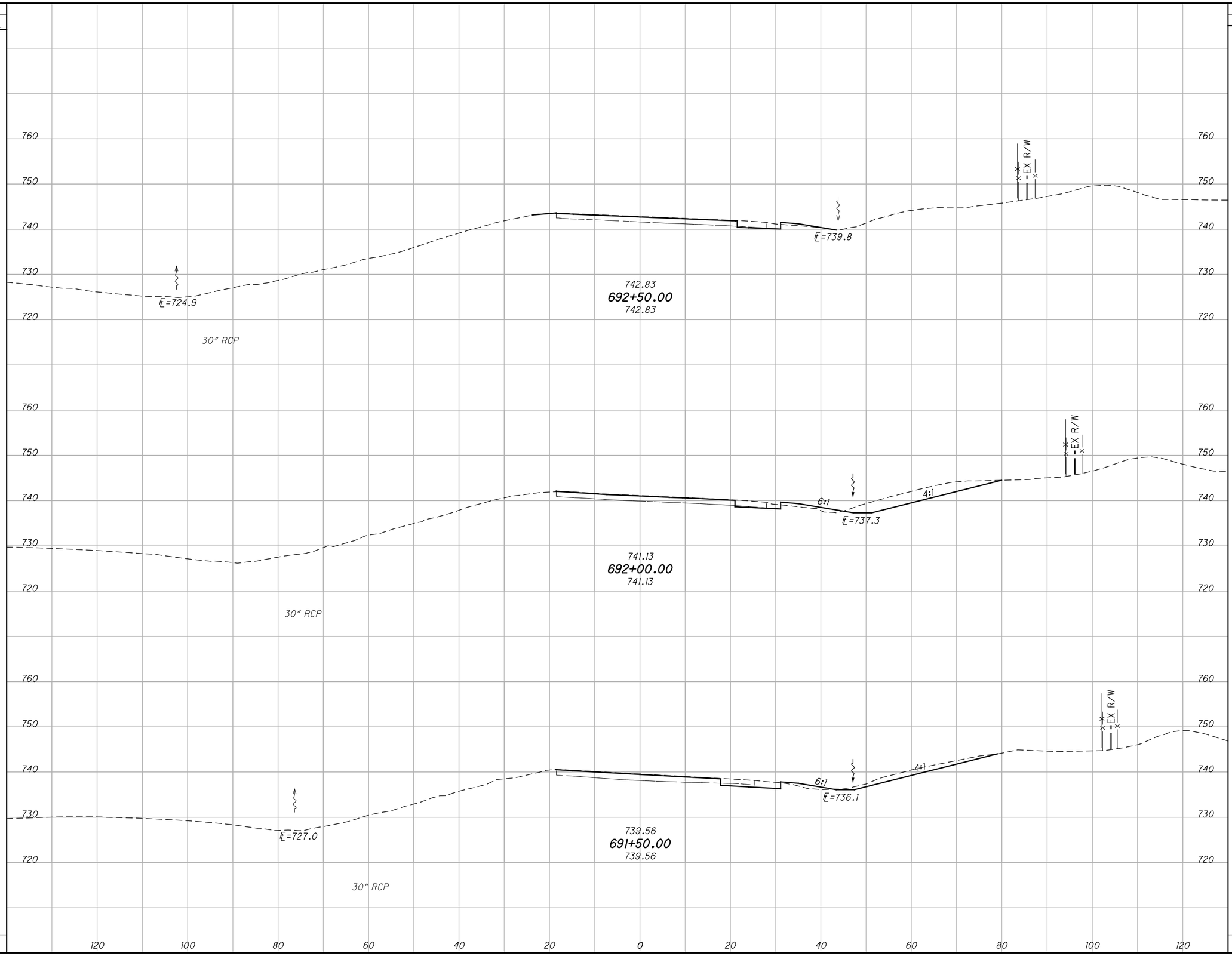
AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR
CHECKED SSK



CROSS SECTIONS RAMP W
STA. 691+50.00 TO STA. 692+50.00

FRA-270-49.00

79
182

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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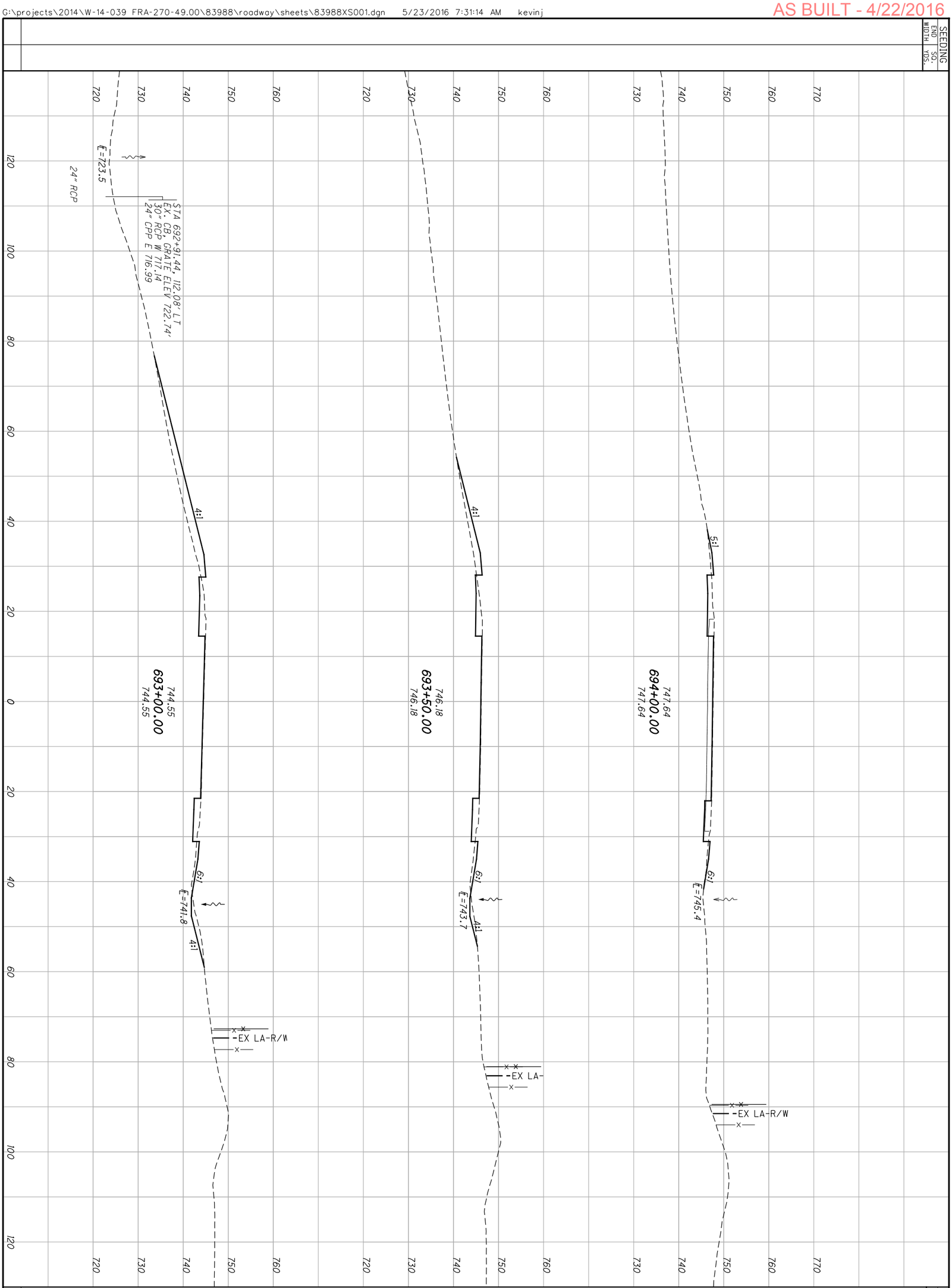

END AREA CUT FILL VOLUME CUT FILL

80
182

FRA-270-49.00

CROSS SECTIONS RAMP W
STA. 693+00.00 TO STA. 694+00.00

CALCULATED CFR
CHECKED SSK

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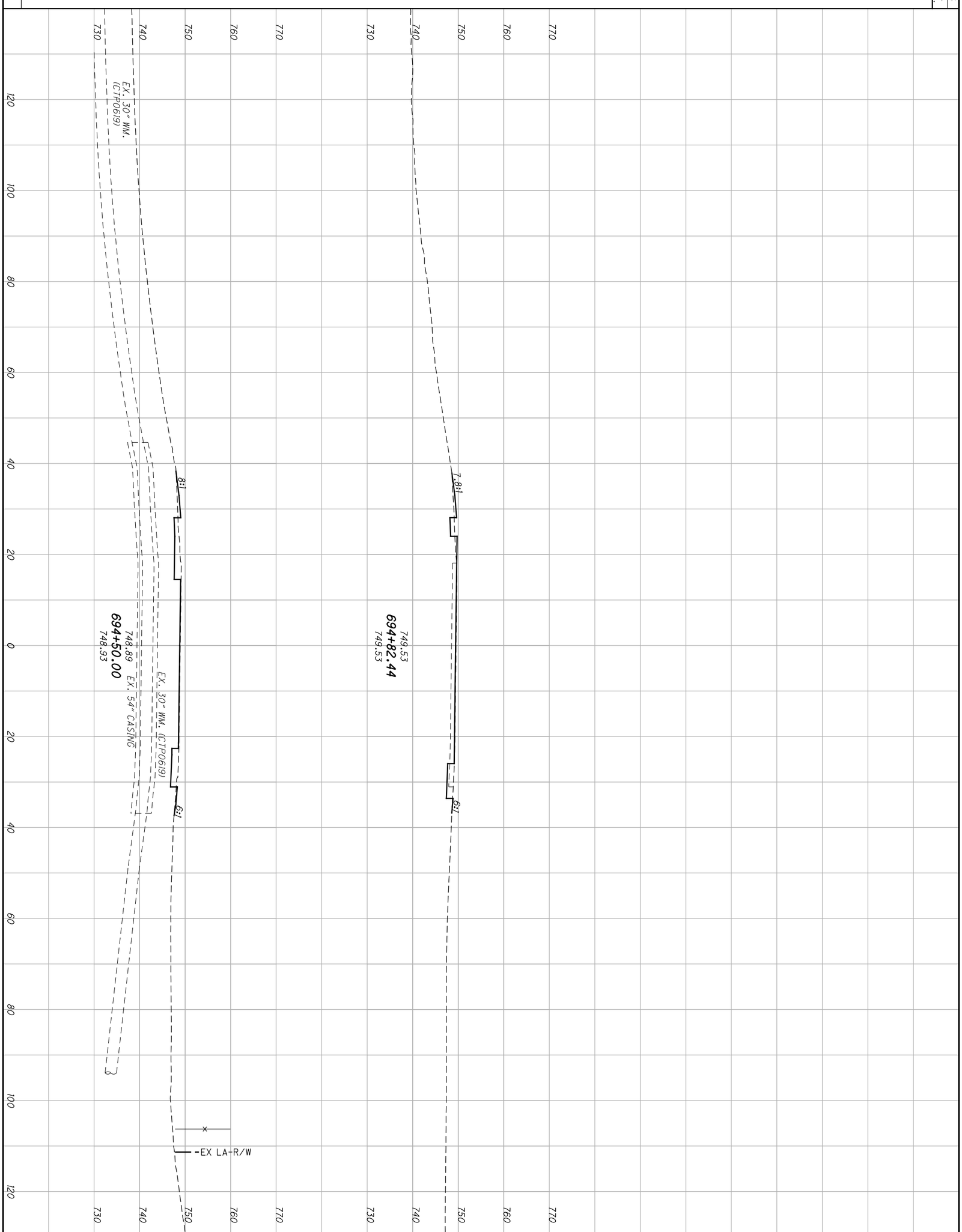
AS BUILT - 4/22/2016

SEEDING
END AREA
CUT
FILL
VOLUME
CUT
FILL



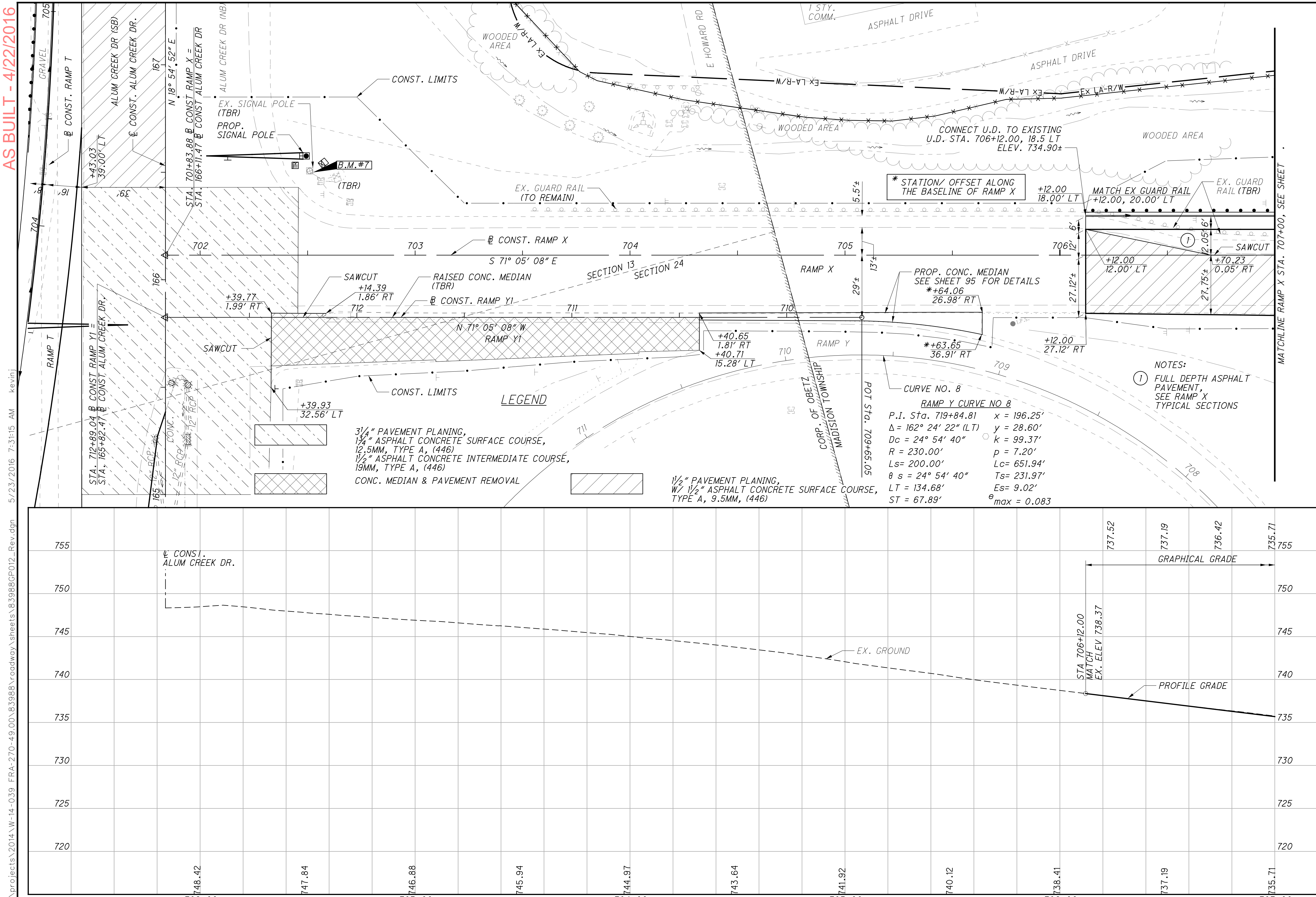
BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

81
182

FRA-270-49.00

CROSS SECTIONS RAMP W
STA. 694+50.00 TO STA. 694+82.44

CALCULATED CFR
CHECKED SSK


CONST. LIMITS
EX. SIGNAL POLE (TBR)
PROP. SIGNAL POLE
B.M.#7
(TBR)
WOODED AREA
EX LA-R/W
E HOWARD RD
1 STY. COMM.
ASPHALT DRIVE
WOODED AREA
CONNECT U.D. TO EXISTING U.D. STA. 706+12.00, 18.5 LT ELEV. 734.90±
* STATION/ OFFSET ALONG THE BASELINE OF RAMP X
EX. GUARD RAIL (TO REMAIN)
+12.00 18.00' LT
MATCH EX GUARD RAIL +12.00, 20.00' LT
EX. GUARD RAIL (TBR)
SAWCUT
+70.23 0.05' RT
+12.00 12.00' LT
MATCHLINE RAMP X STA. 707+00, SEE SHEET
℄ CONST. RAMP X
S 71° 05' 08" E
SECTION 13
SECTION 24
RAMP X
PROP. CONC. MEDIAN SEE SHEET 95 FOR DETAILS
*+64.06 26.98' RT
*+63.65 36.91' RT
+12.00 27.12' RT
RAISED CONC. MEDIAN (TBR)
℄ CONST. RAMP Y1
+14.39 1.86' RT
+39.77 1.99' RT
N 71° 05' 08" W
RAMP Y1
RAMP Y
+40.65 1.81' RT
+40.71 15.28' LT
+39.93 32.56' LT
SAWCUT
CONST. LIMITS
CORP. OF OBETZ
MADISON TOWNSHIP
POT Sta. 709+65.05
CURVE NO. 8
RAMP Y CURVE NO 8
P.I. Sta. 719+84.81
Δ = 162° 24' 22" (LT)
Dc = 24° 54' 40"
R = 230.00'
Ls= 200.00'
θ s = 24° 54' 40"
LT = 134.68'
ST = 67.89'
x = 196.25'
y = 28.60'
k = 99.37'
p = 7.20'
Lc= 651.94'
Ts= 231.97'
Es= 9.02'
e max = 0.083
NOTES:
1 FULL DEPTH ASPHALT PAVEMENT, SEE RAMP X TYPICAL SECTIONS
LEGEND
3¼" PAVEMENT PLANING, 1¼" ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A, (446) 1½" ASPHALT CONCRETE INTERMEDIATE COURSE, 19MM, TYPE A, (446)
CONC. MEDIAN & PAVEMENT REMOVAL
1½" PAVEMENT PLANING, W/ 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE A, 9.5MM, (446)
STA. 701+83.88 ℄ CONST RAMP X = STA. 166+11.47 ℄ CONST ALUM CREEK DR
STA. 712+89.04 ℄ CONST RAMP Y1 = STA. 165+82.47 ℄ CONST. ALUM CREEK DR.
ALUM CREEK DR (SB)
℄ CONST. ALUM CREEK DR.
℄ CONST. RAMP T
N 18° 54' 52" E
+43.03 39.00' LT
GRAVEL
RAMP T
℄ CONST. ALUM CREEK DR.
EX. GROUND
GRAPHICAL GRADE
PROFILE GRADE
STA 706+12.00 MATCH EX. ELEV 738.37
737.52
737.19
736.42
735.71
748.42
747.84
746.88
745.94
744.97
743.64
741.92
740.12
738.41
737.19
735.71
702+00
703+00
704+00
705+00
706+00
707+00

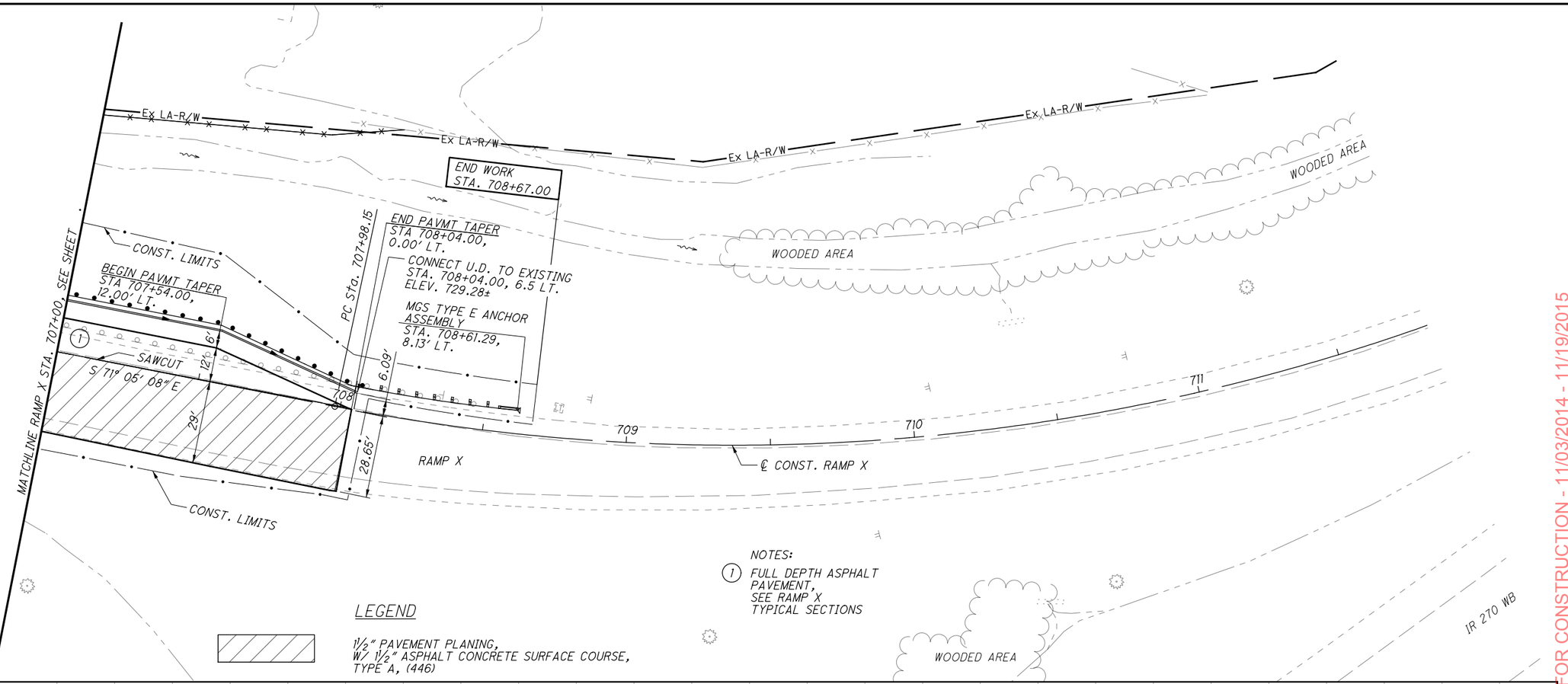
HORIZONTAL SCALE IN FEET

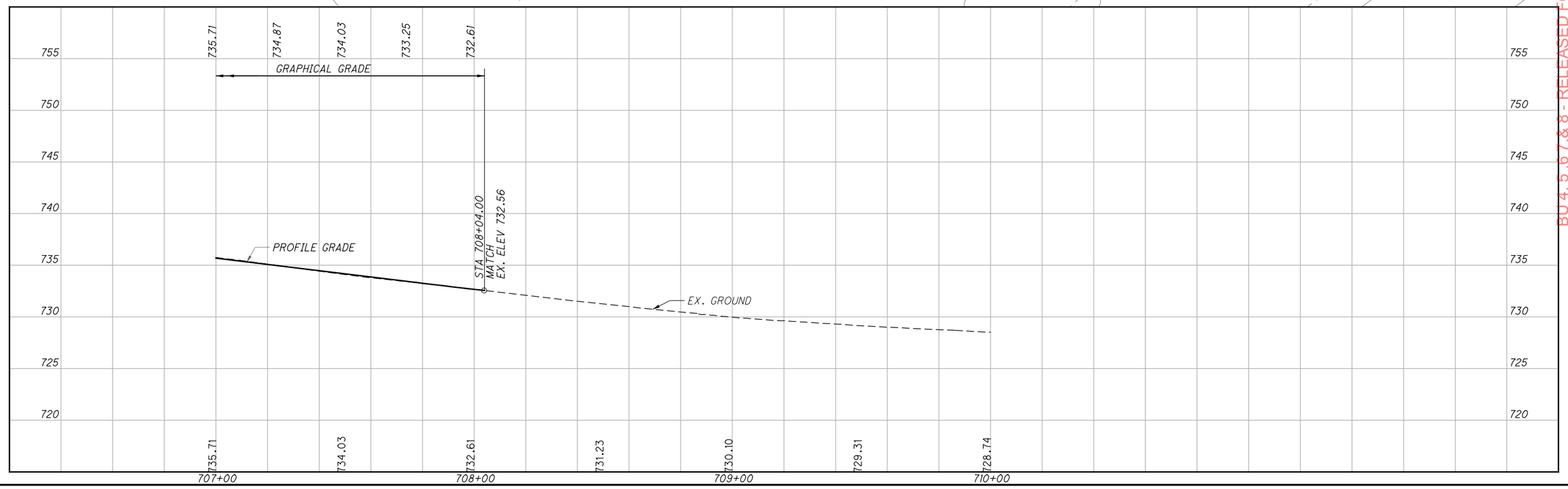
CALCULATED CFR
CHECKED SSK

PLAN AND PROFILE - RAMP X & Y1
STA. 701+83.88 TO STA. 707+00

FRA-270-49.00

AS BUILT - 4/22/2016





CALCULATED CFR
CHECKED SSK

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP X
STA. 707+00 TO STA. 710+00

FRA-270-49.00

83
182

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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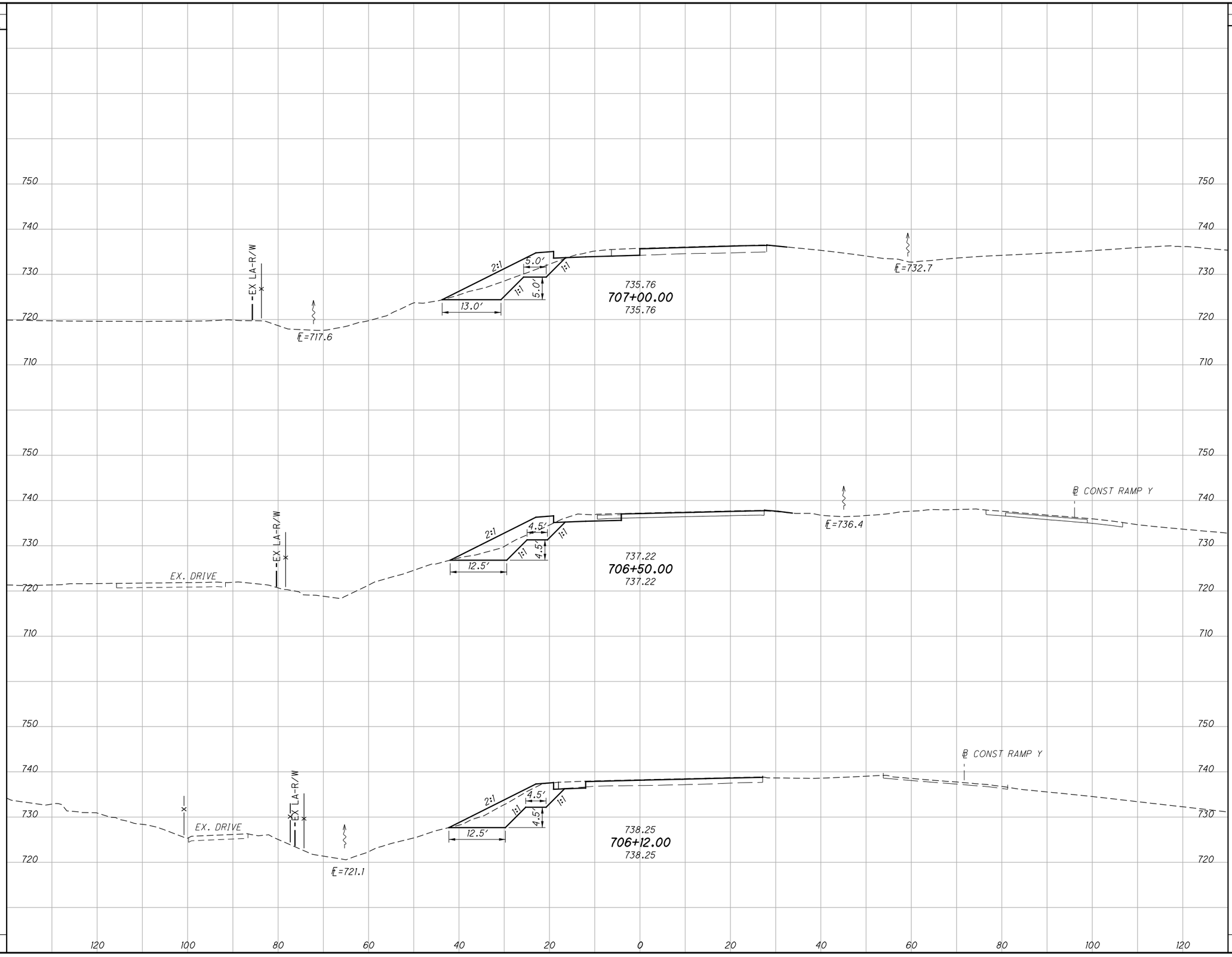
AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR
CHECKED SSK



BU 4, 5, 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS RAMP X
STA. 706+12.00 TO STA. 707+00.00

FRA-270-49.00

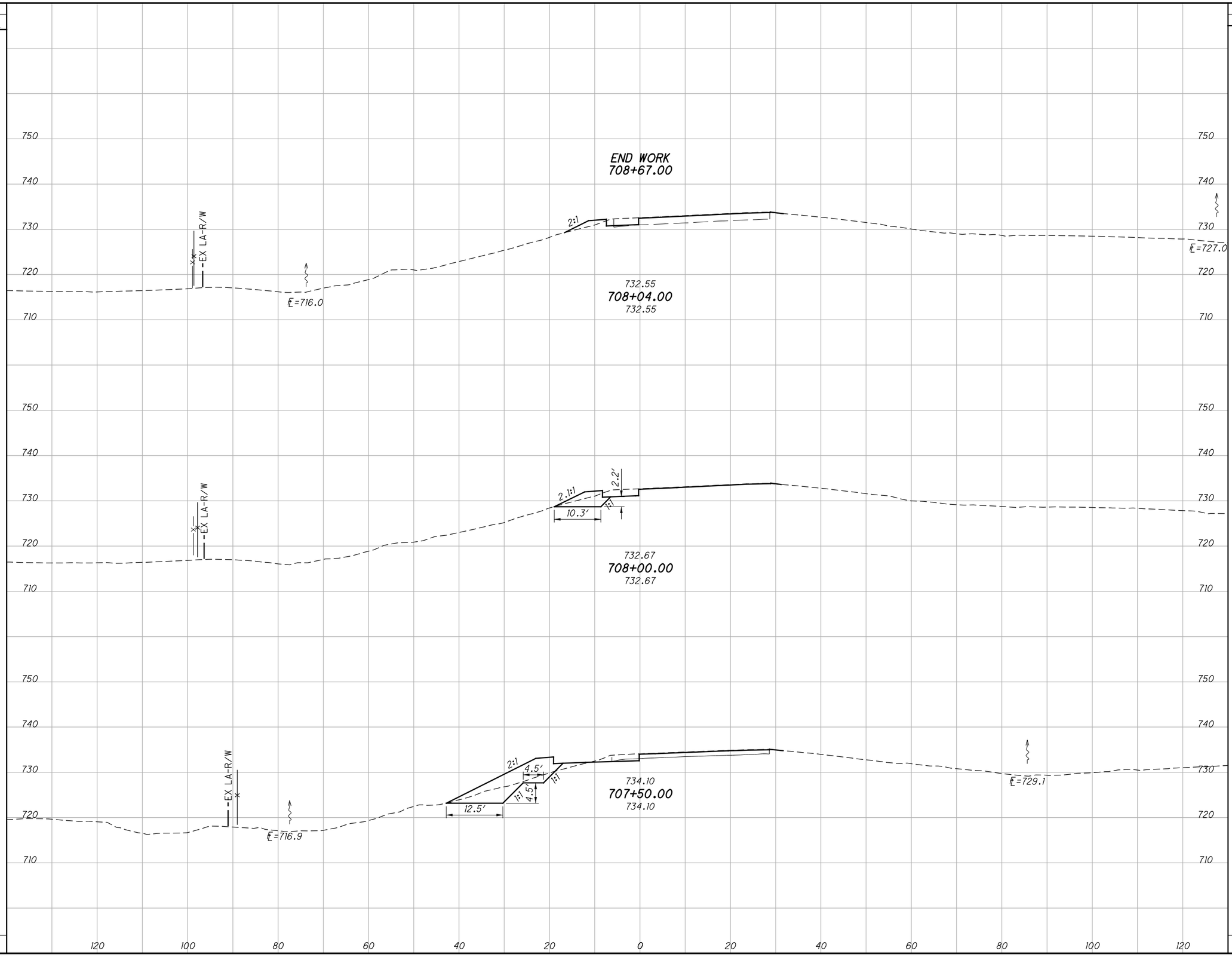
AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR
CHECKED SSK



BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS RAMP X
STA. 707+50.00 TO STA. 708+04.00

FRA-270-49.00

85
182

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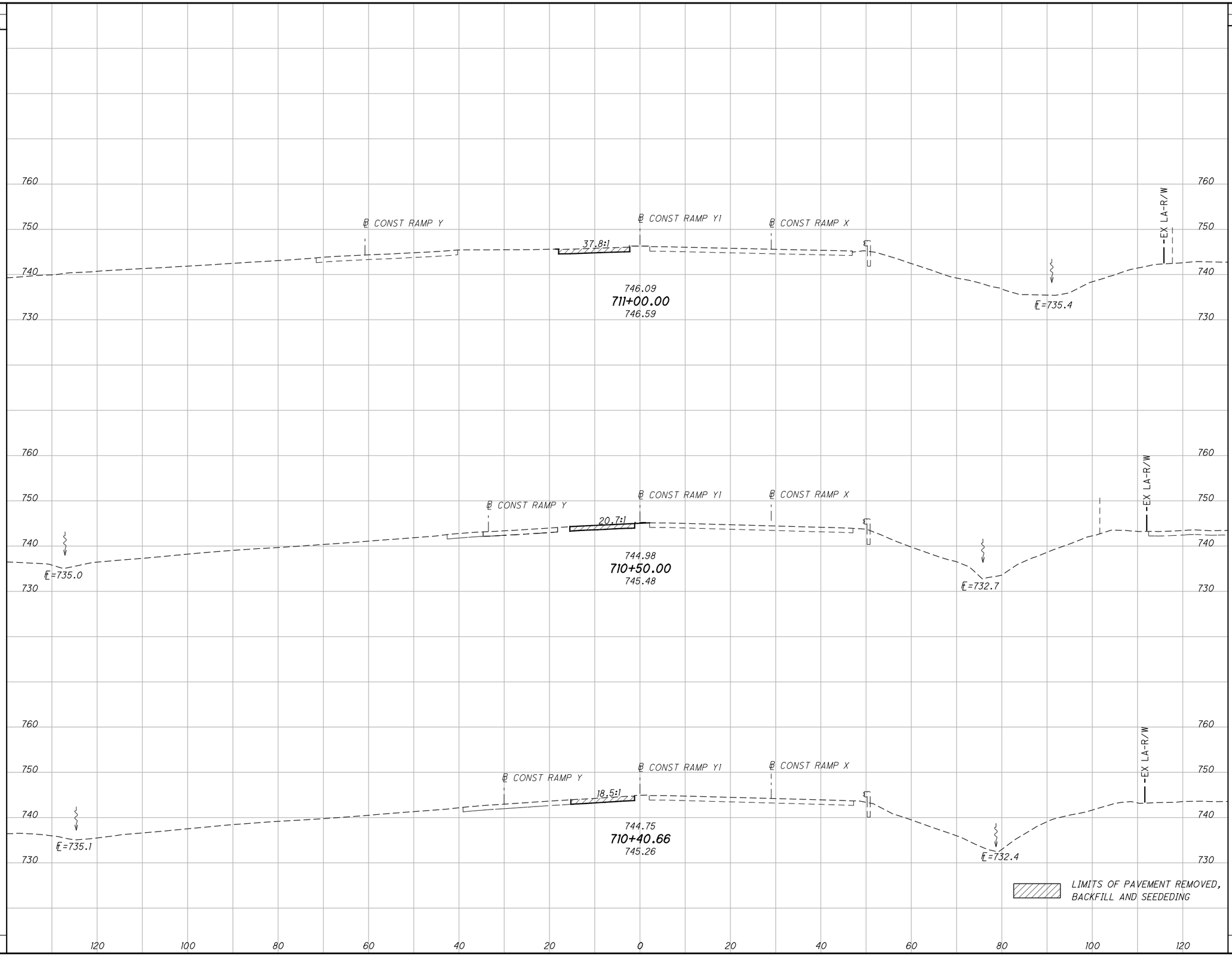
AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR
CHECKED SSK



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BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS RAMP Y1
STA. 710+40.66 TO STA. 711+00.00

FRA-270-49.00

AS BUILT - 4/22/2016

BU 4, 5, 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED CFR

CHECKED SSK

CROSS SECTIONS RAMP Y1

STA. 711+50.00 TO STA. 712+39.77

FRA-270-49.00

87
182

760
750
740
730

℄ CONST RAMP Y1 ℄ CONST RAMP X

15" RCP

748.44
712+39.77
748.37

STA 712+00.42, 107.49' LT
EX. CB, GRATE ELEV 744.41'
27" CPP W 742.46
24" CPP E 742.35

43.1:1

747.98
712+00.00
748.26

℄ CONST RAMP Y

37.8:1

747.01
711+50.00
747.51

℄=735.8

LIMITS OF PAVEMENT REMOVED, BACKFILL AND SEEDEDING

120 100 80 60 40 20 0 20 40 60 80 100 120

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SUPERELEVATION TABLE - I.R. 270 RAMP T

CURVE 4	P.I. STA. 689+79.50	Dc = 5° 00' 00"
CURVE 5	P.I. STA. 694+70.26	Dc = 4° 03' 48.36"
CURVE 6	P.I. STA. 702+86.60	Dc = 3° 30' 00"

SHOULDER					STATION	INSIDE EDGE (PROFILE GRADE)		RIGHT SIDE					SHOULDER					REMARKS
ELEVATION	ELEVATION CORRECTION	CROSS SLOPE	TRANSITION RATE	WIDTH		OFFSET	ELEVATION	WIDTH	TRANSITION RATE	CROSS SLOPE	ELEVATION CORRECTION	ELEVATION	WIDTH	TRANSITION RATE	CROSS SLOPE	ELEVATION CORRECTION	ELEVATION	
726.53	-0.34	-0.0560		6	689+47.37		726.87	16		0.0560	0.90	727.77	3	200:1	0.0267	0.08	727.85	
726.52	-0.34	-0.0560		6	689+50.00		726.86	16		0.0560	0.90	727.76	3	200:1	0.0223	0.07	727.82	
726.43	-0.34	-0.0560		6	689+71.97		726.77	16		0.0560	0.90	727.67	3	200:1	-0.0144	-0.04	727.62	
726.42	-0.34	-0.0560		6	689+75.00		726.76	16		0.0560	0.90	727.65	3		-0.0140	-0.04	727.61	
726.32	-0.34	-0.0560		6	690+00.00		726.66	16		0.0560	0.90	727.55	3		-0.0140	-0.04	727.51	
726.22	-0.34	-0.0560		6	690+25.00		726.56	16		0.0560	0.90	727.46	3		-0.0140	-0.04	727.41	
726.17	-0.34	-0.0560		6	690+50.00		726.51	16		0.0560	0.90	727.40	3		-0.0140	-0.04	727.36	
726.18	-0.34	-0.0560		6	690+75.00		726.51	16		0.0560	0.90	727.41	3		-0.0140	-0.04	727.37	
726.23	-0.34	-0.0560		6	690+98.13		726.57	16	200:1	0.0560	0.90	727.47	3		-0.0140	-0.04	727.42	PCC, FS
726.24	-0.33	-0.0554		6	691+00.00		726.58	16	200:1	0.0554	0.89	727.46	3		-0.0146	-0.04	727.42	
726.31	-0.31	-0.0520		6	691+10.93		726.62	16	200:1	0.0520	0.83	727.46	3		-0.0180	-0.05	727.40	FS
726.39	-0.31	-0.0520		6	691+25.00		726.70	16		0.0520	0.83	727.53	3		-0.0180	-0.05	727.48	
726.57	-0.31	-0.0520		6	691+50.00		726.88	16		0.0520	0.83	727.71	3		-0.0180	-0.05	727.66	
726.81	-0.31	-0.0520		6	691+75.00		727.12	16		0.0520	0.83	727.95	3		-0.0180	-0.05	727.90	
727.11	-0.31	-0.0520		6	692+00.00		727.42	16		0.0520	0.83	728.25	3		-0.0180	-0.05	728.20	
727.46	-0.31	-0.0520		6	692+25.00		727.77	16		0.0520	0.83	728.61	3		-0.0180	-0.05	728.55	
727.88	-0.31	-0.0520		6	692+50.00		728.19	16		0.0520	0.83	729.02	3		-0.0180	-0.05	728.97	
728.35	-0.31	-0.0520		6	692+75.00		728.66	16		0.0520	0.83	729.49	3		-0.0180	-0.05	729.44	
728.88	-0.31	-0.0520		6	693+00.00		729.19	16		0.0520	0.83	730.03	3		-0.0180	-0.05	729.97	
729.47	-0.31	-0.0520		6	693+25.00		729.78	16		0.0520	0.83	730.62	3		-0.0180	-0.05	730.56	
730.12	-0.31	-0.0520		6	693+50.00		730.43	16		0.0520	0.83	731.27	3		-0.0180	-0.05	731.21	
730.82	-0.31	-0.0520		6	693+75.00		731.14	16		0.0520	0.83	731.97	3		-0.0180	-0.05	731.91	
731.54	-0.31	-0.0520		6	694+00.00		731.85	16		0.0520	0.83	732.69	3		-0.0180	-0.05	732.63	
732.26	-0.31	-0.0520		6	694+25.00		732.57	16		0.0520	0.83	733.40	3		-0.0180	-0.05	733.35	
732.98	-0.31	-0.0520		6	694+50.00		733.29	16		0.0520	0.83	734.12	3		-0.0180	-0.05	734.07	
733.69	-0.31	-0.0520		6	694+75.00		734.01	16		0.0520	0.83	734.84	3		-0.0180	-0.05	734.78	
734.41	-0.31	-0.0520		6	695+00.00		734.72	16		0.0520	0.83	735.56	3		-0.0180	-0.05	735.50	
735.13	-0.31	-0.0520		6	695+25.00		735.44	16		0.0520	0.83	736.27	3		-0.0180	-0.05	736.22	
735.85	-0.31	-0.0520		6	695+50.00		736.16	16		0.0520	0.83	736.99	3		-0.0180	-0.05	736.94	
736.56	-0.31	-0.0520		6	695+75.00		736.88	16		0.0520	0.83	737.71	3		-0.0180	-0.05	737.65	
737.28	-0.31	-0.0520		6	696+00.00		737.59	16		0.0520	0.83	738.43	3		-0.0180	-0.05	738.37	
738.00	-0.31	-0.0520		6	696+25.00		738.31	16		0.0520	0.83	739.14	3		-0.0180	-0.05	739.09	
738.72	-0.31	-0.0520		6	696+50.00		739.03	16		0.0520	0.83	739.86	3		-0.0180	-0.05	739.81	
739.43	-0.31	-0.0520		6	696+75.00		739.75	16		0.0520	0.83	740.58	3		-0.0180	-0.05	740.52	
740.15	-0.31	-0.0520		6	697+00.00		740.46	16		0.0520	0.83	741.30	3		-0.0180	-0.05	741.24	
740.87	-0.31	-0.0520		6	697+25.00		741.18	16		0.0520	0.83	742.01	3		-0.0180	-0.05	741.96	
741.59	-0.31	-0.0520		6	697+50.00		741.90	16		0.0520	0.83	742.73	3		-0.0180	-0.05	742.68	
742.17	-0.31	-0.0520		6	697+70.32		742.48	16	200:1	0.0520	0.83	743.31	3		-0.0180	-0.05	743.26	FS
742.31	-0.30	-0.0505		6	697+75.00		742.62	16	200:1	0.0505	0.81	743.43	3		-0.0195	-0.06	743.37	
742.56	-0.29	-0.0480		6	697+83.12		742.85	16	200:1	0.0480	0.77	743.62	3		-0.0220	-0.07	743.55	FS
743.04	-0.29	-0.0480		6	698+00.00		743.33	16		0.0480	0.77	744.09	3		-0.0220	-0.07	744.03	
743.70	-0.29	-0.0480		6	698+25.00		743.98	16		0.0480	0.77	744.75	3		-0.0220	-0.07	744.69	
743.72	-0.29	-0.0480		6	698+25.79		744.00	16		0.0480	0.77	744.77	3		-0.0220	-0.07	744.71	PT
744.29	-0.29	-0.0480		6	698+50.00		744.58	16		0.0480	0.77	745.35	3		-0.0220	-0.07	745.28	
744.83	-0.29	-0.0480		6	698+75.00		745.12	16		0.0480	0.77	745.88	3		-0.0220	-0.07	745.82	
745.30	-0.29	-0.0480		6	699+00.00		745.59	16		0.0480	0.77	746.36	3		-0.0220	-0.07	746.29	
745.72	-0.29	-0.0480		6	699+25.00		746.00	16		0.0480	0.77	746.77	3		-0.0220	-0.07	746.71	
746.07	-0.29	-0.0480		6	699+50.00		746.36	16		0.0480	0.77	747.13	3		-0.0220	-0.07	747.06	
746.36	-0.29	-0.0480		6	699+75.00		746.65	16		0.0480	0.77	747.42	3		-0.0220	-0.07	747.35	
746.59	-0.29	-0.0480		6	700+00.00		746.88	16		0.0480	0.77	747.65	3		-0.0220	-0.07	747.58	
746.65	-0.29	-0.0480		6	700+07.45		746.94	16		0.0480	0.77	747.71	3		-0.0220	-0.07	747.64	PC
746.77	-0.29	-0.0480		6	700+25.00		747.05	16		0.0480	0.77	747.82	3		-0.0220	-0.07	747.76	
746.88	-0.29	-0.0480		6	700+50.00		747.16	16		0.0480	0.77	747.93	3		-0.0220	-0.07	747.87	
746.93	-0.29	-0.0480		6	700+75.00		747.22	16		0.0480	0.77	747.99	3		-0.0220	-0.07	747.92	
746.98	-0.29	-0.0480		6	701+00.00		747.27	16		0.0480	0.77	748.04	3		-0.0220	-0.07	747.97	
747.03	-0.29	-0.0480		6	701+25.00		747.32	16		0.0480	0.77	748.09	3		-0.0220	-0.07	748.02	

AS BUILT - 4/22/2016

BU 4,5,6,7 & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED CT CHECKED SSK

SUPERELEVATION TABLE - I.R. 270 RAMP T - CURVE 4,5,6

FRA-270-49.00

88
182

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SUPERELEVATION TABLE - I.R. 270 RAMP T

CURVE 4	P.I. STA. 689+79.50	Dc = 5° 00' 00"
CURVE 5	P.I. STA. 694+70.26	Dc = 4° 03' 48.36"
CURVE 6	P.I. STA. 702+86.60	Dc = 3° 30' 00"

SHOULDER					STATION	INSIDE EDGE (PROFILE GRADE)		RIGHT SIDE					SHOULDER					REMARKS
ELEVATION	ELEVATION CORRECTION	CROSS SLOPE	TRANSITION RATE	WIDTH		OFFSET	ELEVATION	WIDTH	TRANSITION RATE	CROSS SLOPE	ELEVATION CORRECTION	ELEVATION	WIDTH	TRANSITION RATE	CROSS SLOPE	ELEVATION CORRECTION	ELEVATION	
747.08	-0.29	-0.0480		6.0	701+50.00		747.37	16		0.0480	0.77	748.14	3		-0.0220	-0.07	748.07	
747.13	-0.29	-0.0480		6.0	701+75.00		747.42	16		0.0480	0.77	748.19	3		-0.0220	-0.07	748.12	
747.18	-0.29	-0.0480		6.0	702+00.00		747.47	16		0.0480	0.77	748.24	3		-0.0220	-0.07	748.17	
747.21	-0.32	-0.0480		6.6	702+25.00		747.52	16		0.0480	0.77	748.29	3		-0.0220	-0.07	748.22	
747.20	-0.34	-0.0480		7.1	702+36.95		747.55	16		0.0480	0.77	748.31	3	200:1	-0.0220	-0.07	748.25	
747.21	-0.36	-0.0480		7.6	702+50.00		747.57	16		0.0480	0.77	748.34	3	200:1	-0.0003	0.00	748.34	
747.22	-0.38	-0.0480		8.0	702+64.15		747.60	16		0.0480	0.77	748.37	3	200:1	0.0233	0.07	748.44	

AS BUILT - 4/22/2016

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED CT CHECKED SSK

SUPERELEVATION TABLE - I.R. 270 RAMP T - CURVE 4,5,6

FRA-270-49.00

89
182

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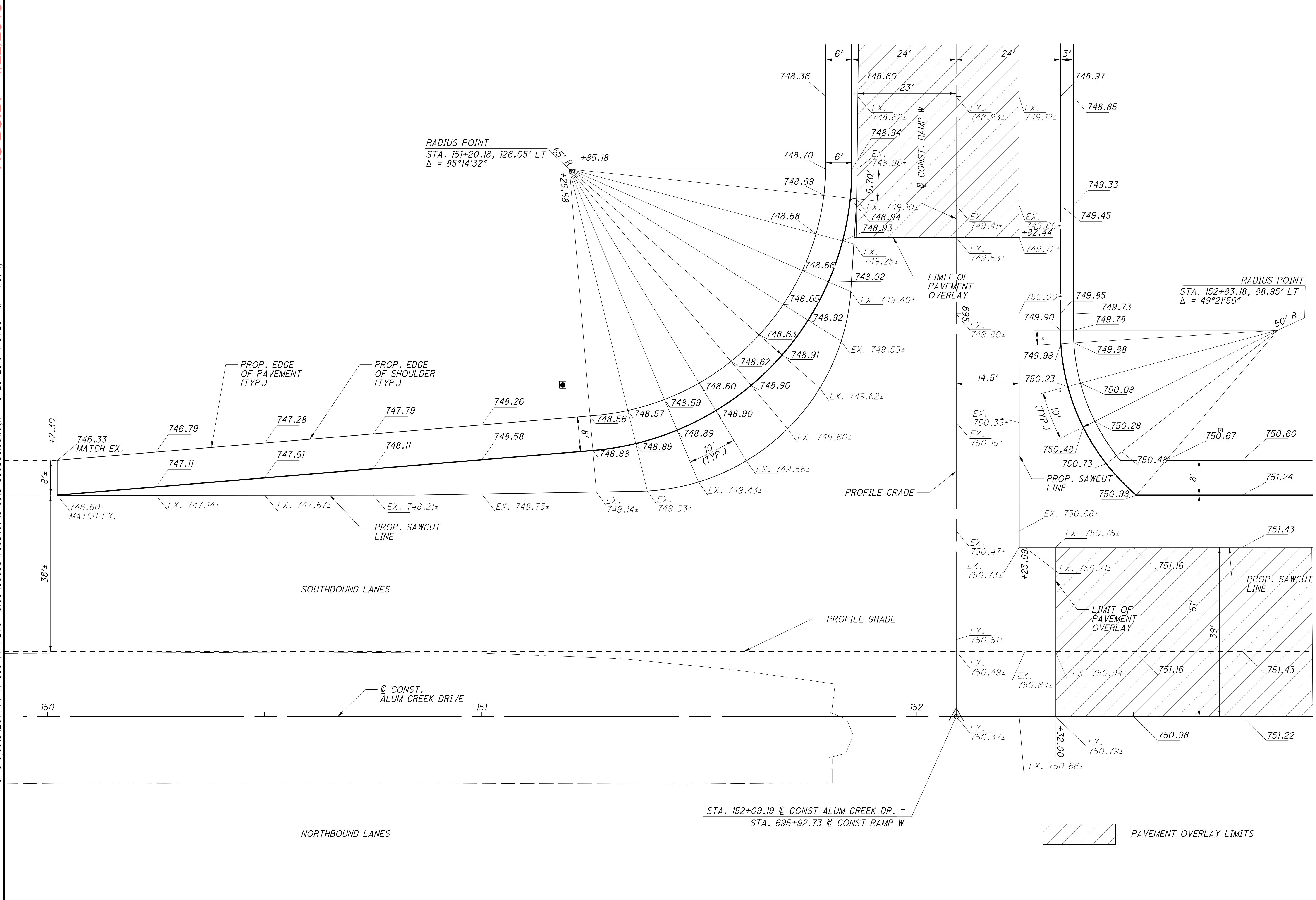
AS BUILT - 4/22/2016



HORIZONTAL SCALE IN FEET

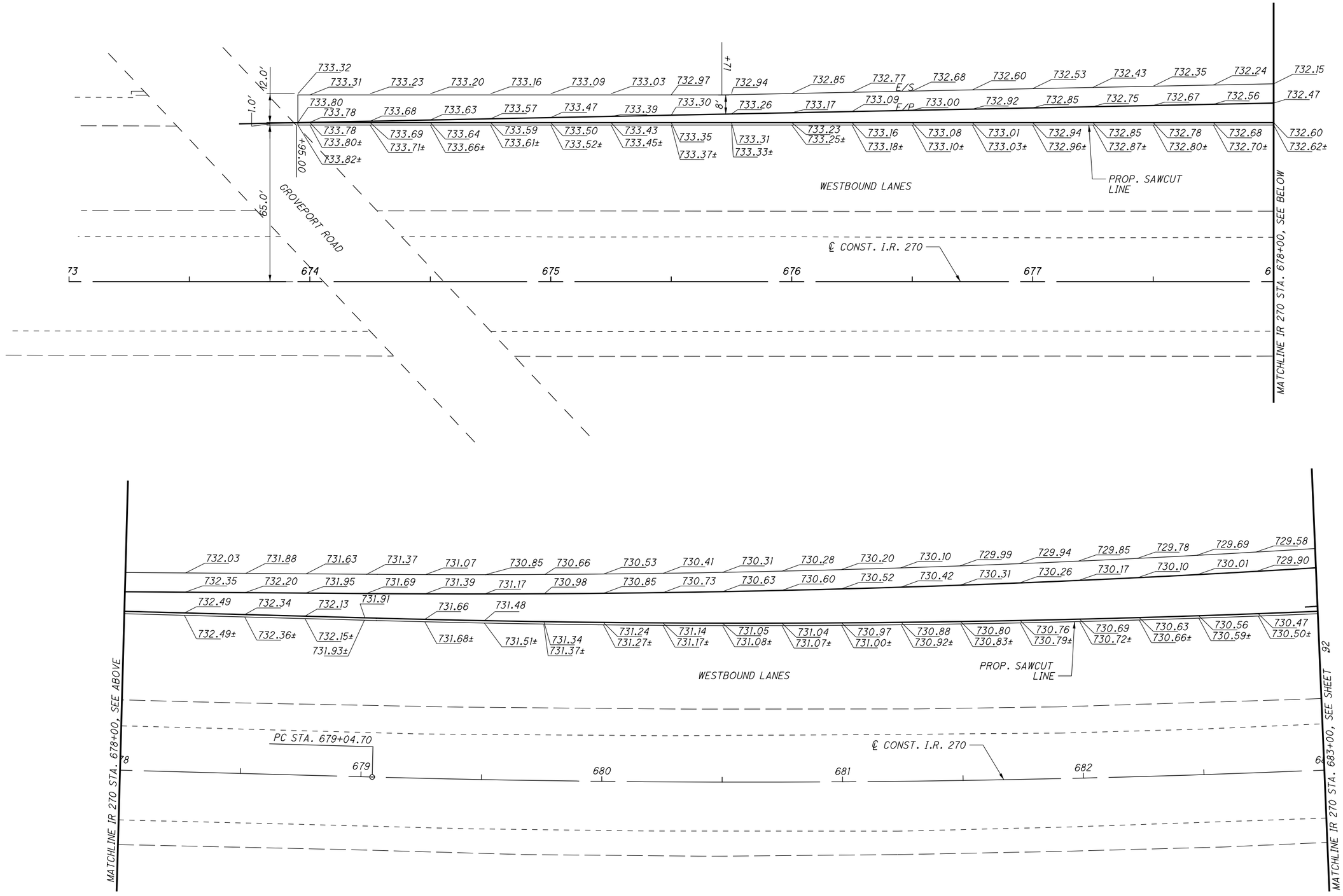
CALCULATED JLM
CHECKED SSK

BU 4, 5, 6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

INTERSECTION DETAIL
RAMP W AT ALUM CREEK DRIVE

FRA-270-49.00

AS BUILT - 4/22/2016



BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

RAMP TERMINAL DETAILS

STA. 673+00.00 TO STA. 683+00.00

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JLM
CHECKED SSK

FRA-270-49.00

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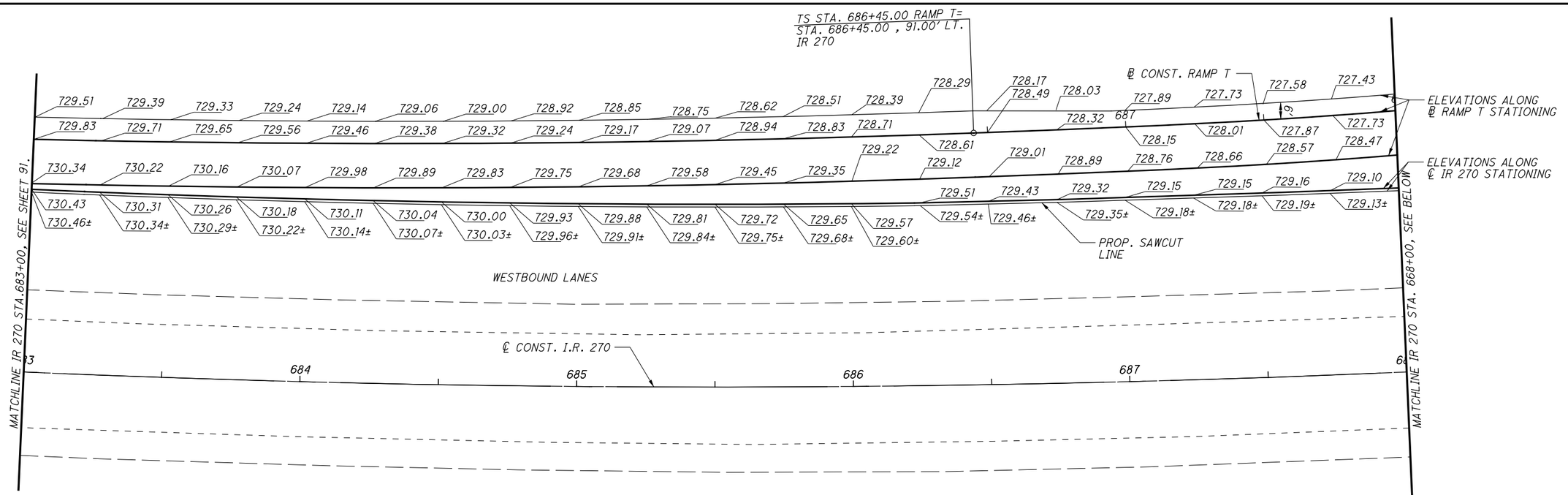
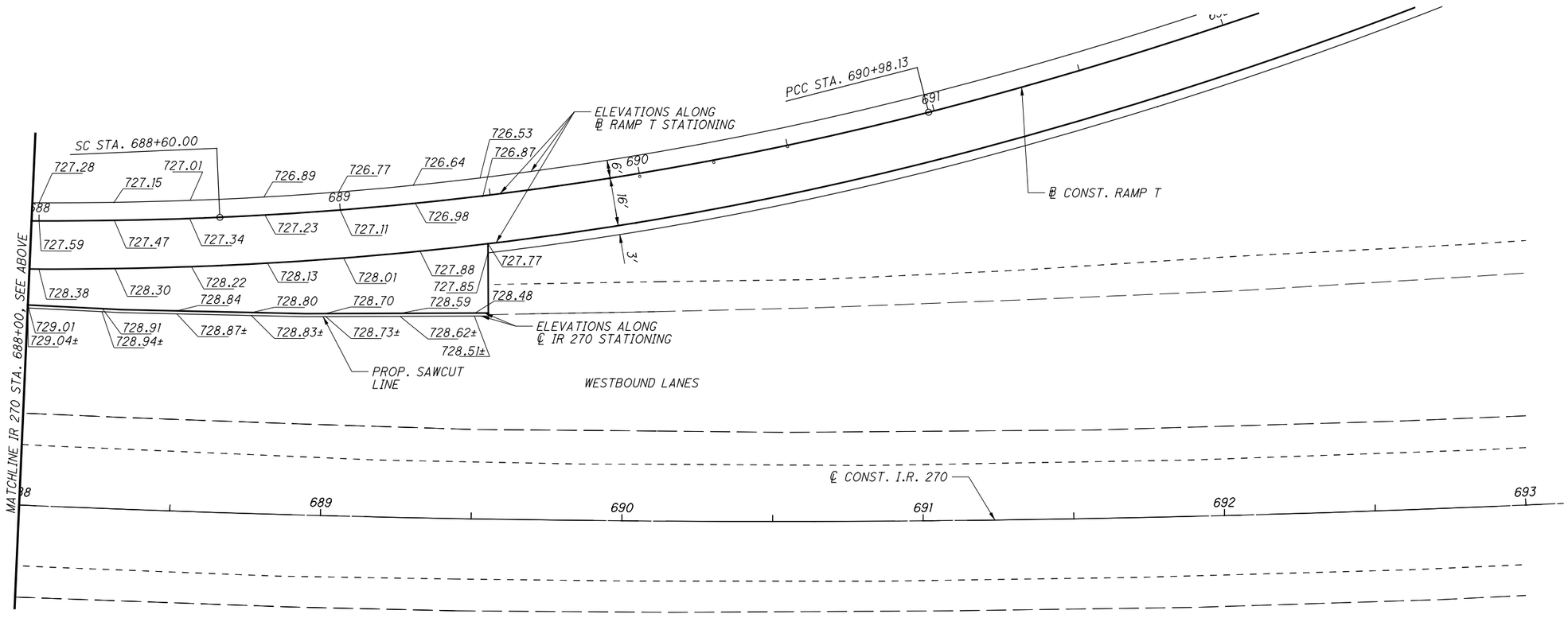
AS BUILT - 4/22/2016





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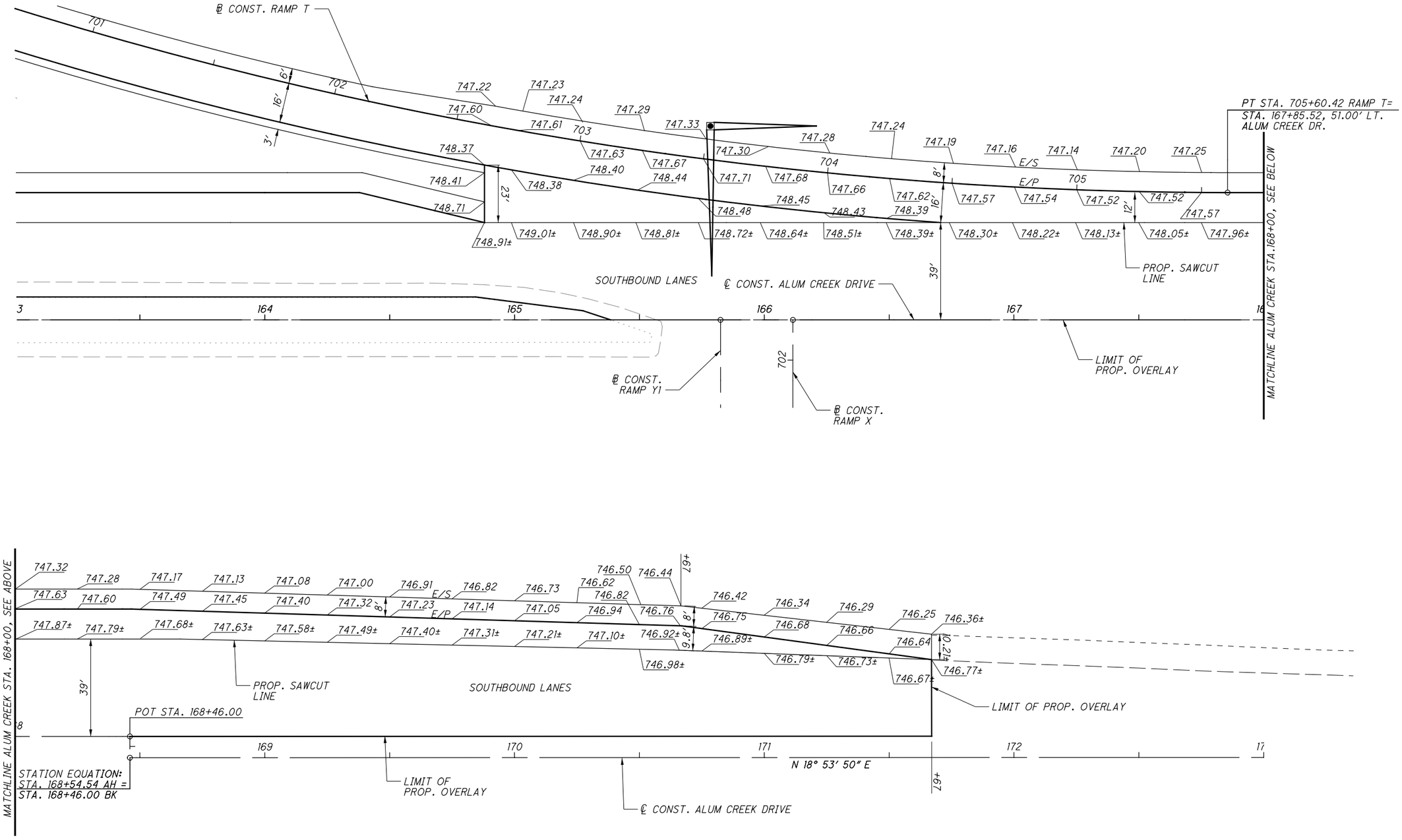
BU 4, 5 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JLM
CHECKED SSK

RAMP TERMINAL DETAILS
STA. 683+00.00 TO STA. 693+00.00

FRA-270-49.00



CALCULATED JLM
CHECKED SSK

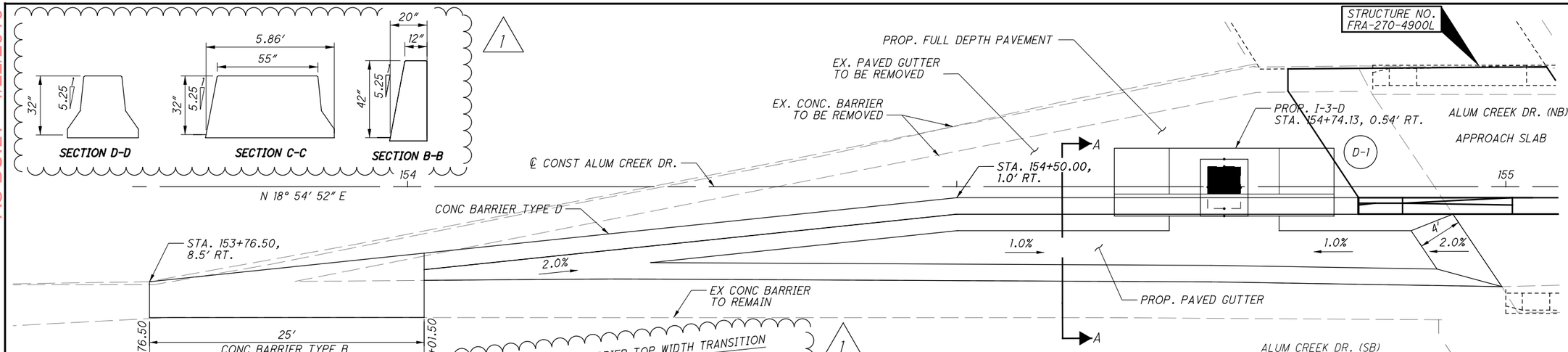
HORIZONTAL SCALE IN FEET
0 10 20 100

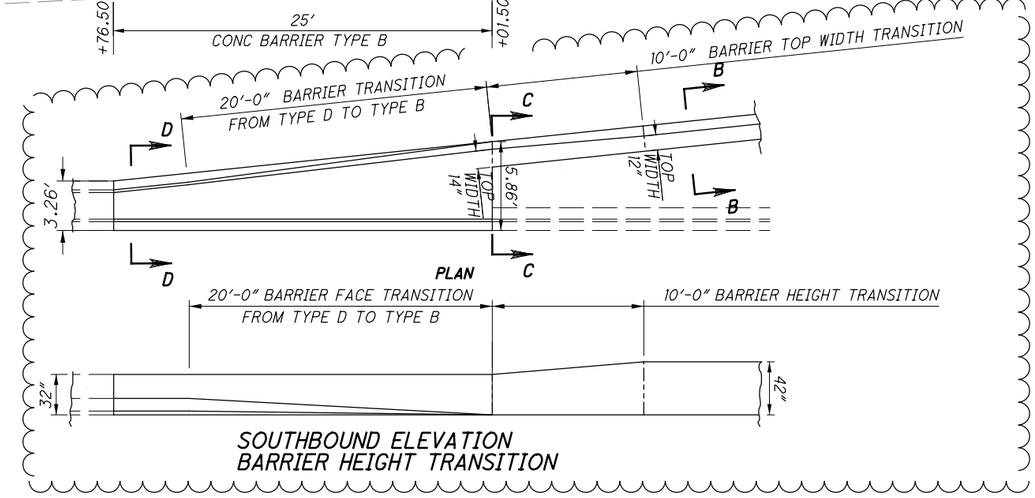
RAMP TERMINAL DETAILS
STA. 163+00.00 TO STA. 173+00.00

FRA-270-49.00

AS BUILT - 4/22/2016

1

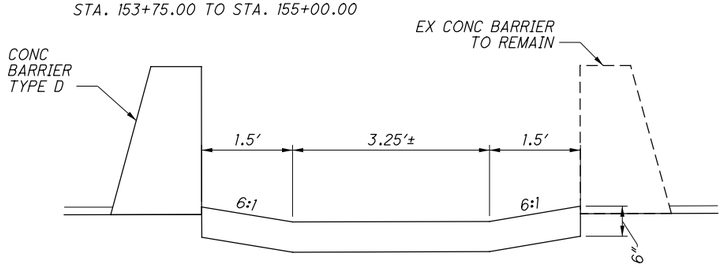




1

MEDIAN DETAIL

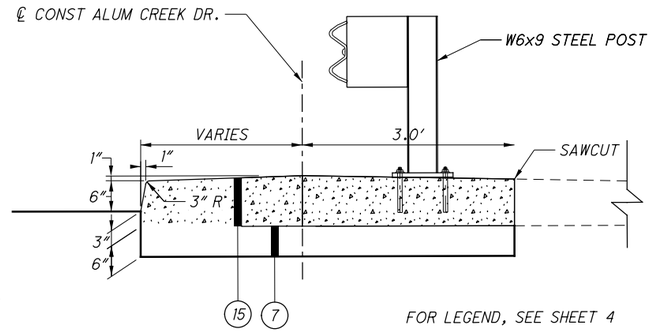
STA. 153+75.00 TO STA. 155+00.00



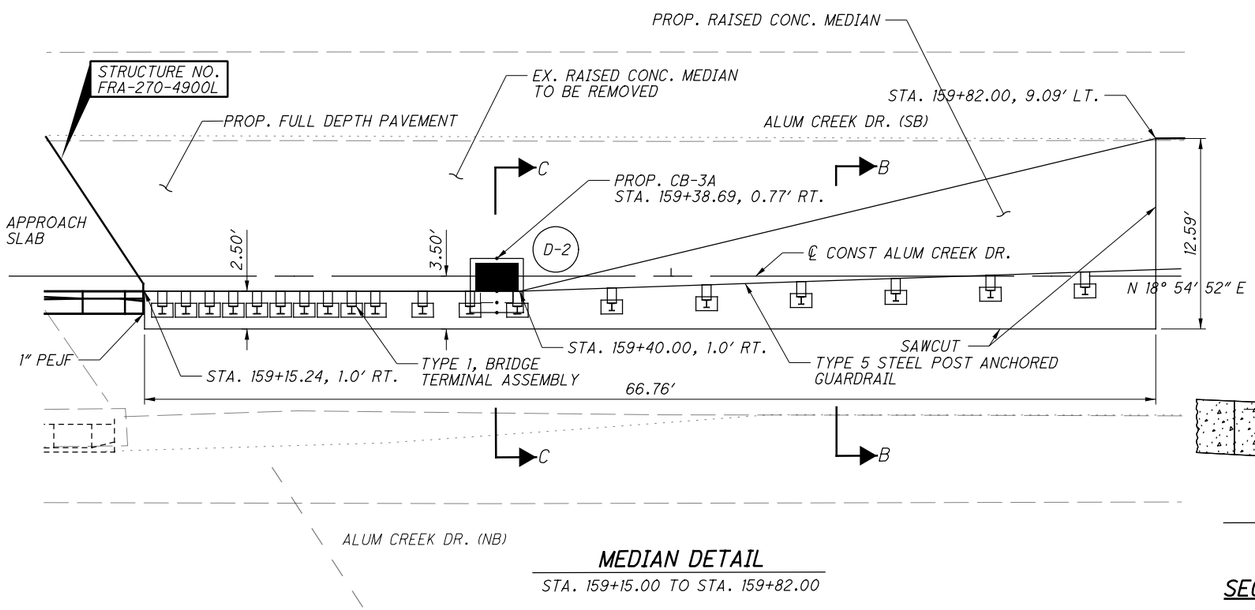
SECTION A-A PAVED GUTTER

1

DATE	DESCRIPTION
4/22/16	AS BUILT

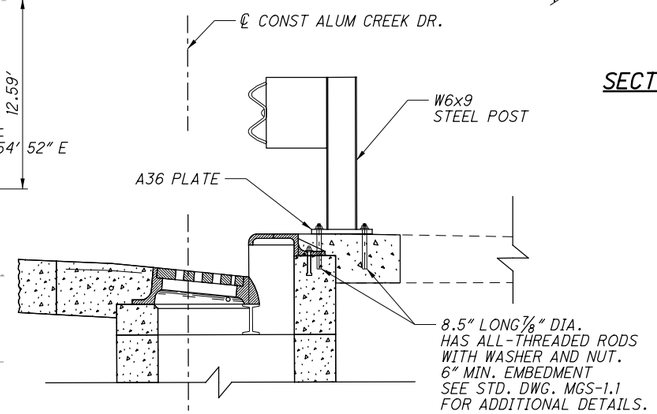


SECTION B-B RAISED CONC. MEDIAN

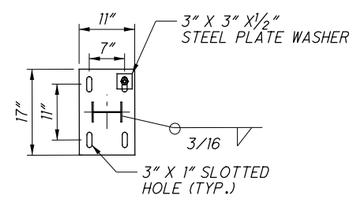


MEDIAN DETAIL

STA. 159+15.00 TO STA. 159+82.00



SECTION C-C RAISED CONC. MEDIAN



ASTM A 36 PLATE
¾″ THICK WITH SLTTED
BOLT HOLES AND WASHERS

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED JLM
CHECKED SSK

HORIZONTAL SCALE IN FEET
0 2.5 5 10

MEDIAN DETAILS
ALUM CREEK DRIVE

FRA-270-49.00

94
182

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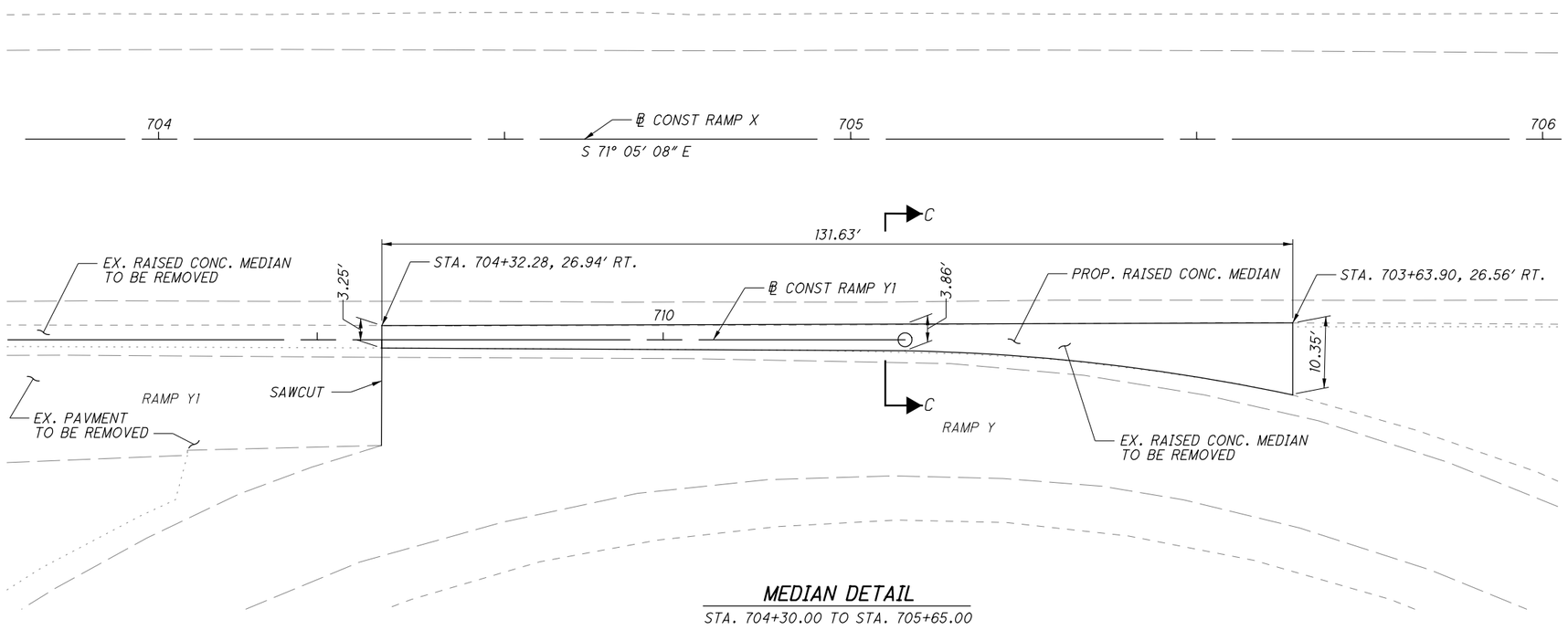
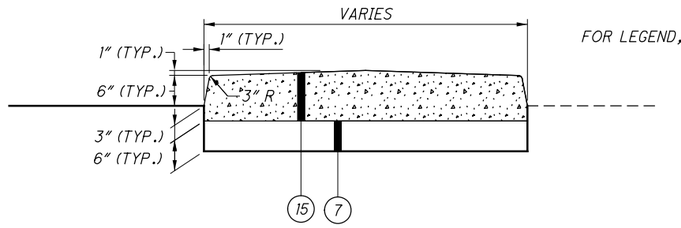


MEDIAN DETAIL

STA. 704+30.00 TO STA. 705+65.00



FOR LEGEND, SEE SHEET 4

SECTION C-C RAISED CONC. MEDIAN

N

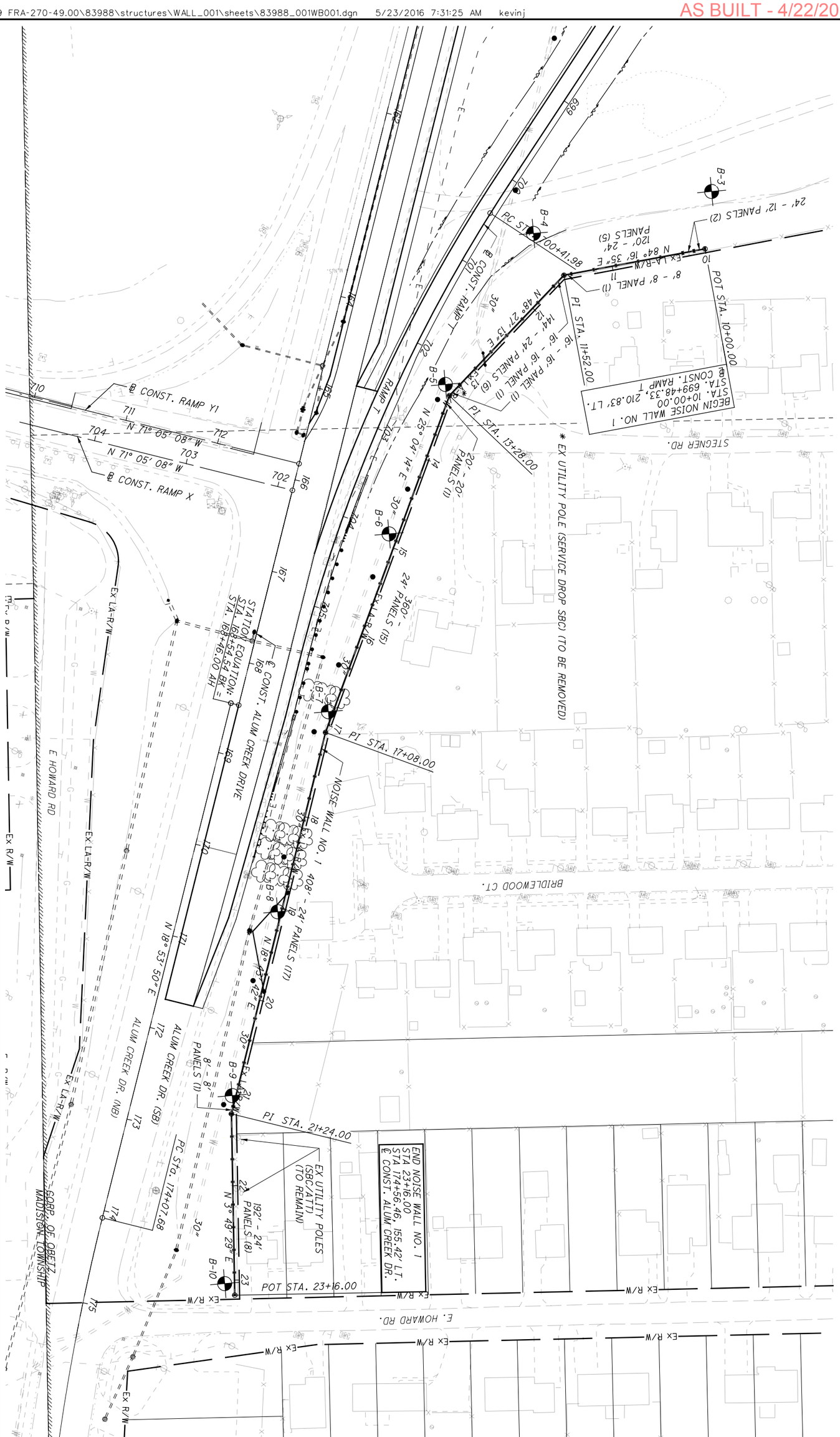
HORIZONTAL SCALE IN FEET
0 2.5 5 10

CALCULATED JLM
CHECKED SSK

MEDIAN DETAILS
RAMP X

FRA-270-49.00

AS BUILT - 4/22/2016

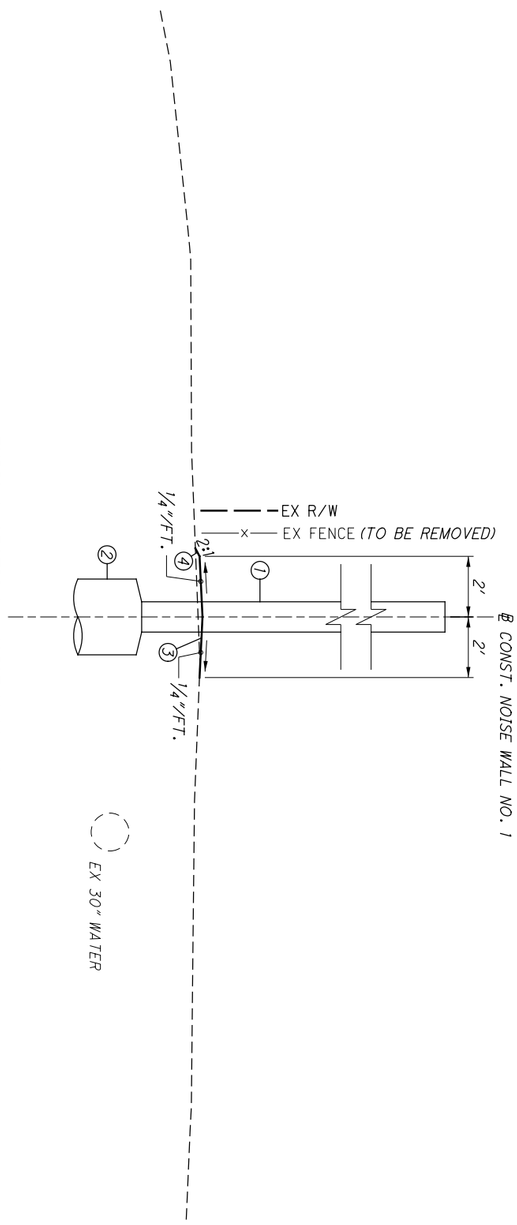


NOISE WALL NO. 1 - BASELINE GEOMETRY

P.I. NO.	NOISE BARRIER STATION	CL/BL	STATION	OFFSET	NORTHING	EASTING	BEARING
1	10+00.00	RAMP T	699+48.70	-210.83	682,780.49	1,846,788.45	N 84D 16' 35" E
2	11+52.00	RAMP T	700+57.35	-100.76	682,795.65	1,846,939.69	N 48D 27' 13" E
3	13+28.00	RAMP T	720+35.89	-54.98	682,912.37	1,847,071.41	N 25D 04' 14" E
4	17+08.00	ALUM CREEK DR.	168+46.00	-96.38	683,256.57	1,847,232.43	N 18D 43' 42" E
5	21+24.00	ALUM CREEK DR.	172+67.78	-105.98	683,650.55	1,847,366.00	N 3D 49' 29" E
6	23+16.00	ALUM CREEK DR.	174+56.46	-155.42	683,842.12	1,847,378.81	-

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

96 / 182	1 / 10	FRA-270-49.00	SCHEMATIC PLAN - NOISE WALL NO. 1	CALCULATED SMJ / CHECKED NCK	0 50 / 25 100 HORIZONTAL SCALE IN FEET	N



TYPICAL SECTION - NOISE WALL NO. 1

STA. 10+00.00 TO STA. 23+16.00 = 1316.00'

LEGEND

1. ITEM SPECIAL - NOISE BARRIER
2. ITEM 524 - DRILLED SHAFTS
3. ITEM 203 - EMBANKMENT
4. ITEM 659 - SEEDING AND MULCHING

AS BUILT - 4/22/2016

BEGIN NOISE WALL NO. 1
@ STA. 10+00.00
TA. 699+48.70, 210.83' RT.
CONST. RAMP T

POT Sta. 10+00.00

Ex LA-R/W

N 84° 16' 35" E

B-3

℄ NOISE WALL NO. 1

CONST. LIMITS

PI Sta. 11+52.00

EX. FENCE
(TO BE REMOVED)

ROCK CHANNEL PROTECTION,
TYPE C WITH FILTER (5'X4'X18" THICK)

EX. 30" WM
(CTP0619-006)

B-4

EX. 48"
CASING PIPE

N 48° 27' 13" E

EX UTILITY POLE
(SERVICE DROP SBC)
(TO BE REMOVED)

HW-2.2
15" TYPE C

HW-2.2

B-5

EX. 30" WATERLINE
POTHOLE #1
N = 682915.3690
E = 1847084.2580

PI Sta. 13+28.00

N 25° 04' 14" E

EX. 30" WATERLINE
POTHOLE #2
N = 683007.2158
E = 1847123.8075

MATCHLINE STA. 14+40

℄ CONST. RAMP T

RAMP T

ALUM CREEK DR. (SB)

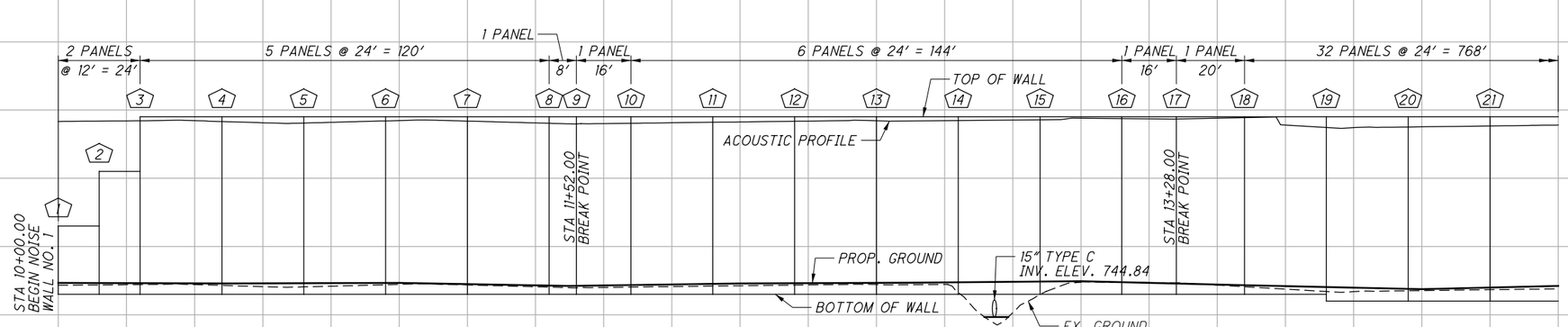
℄ CONST.
ALUM CREEK DR.

165' 12" RCP

12" RCP

TOP OF WALL ELEV.	751.50	755.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50
ACOUSTIC PROFILE ELEV.		759.22		759.15	759.07	759.23	759.16	758.99	759.05	759.13	759.21	759.20	759.26	759.41	759.34	759.45	758.68	758.77	758.85		
BOTTOM OF WALL ELEV.	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.50	746.00	746.00	746.00	
PANEL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

(XX) = DRILLED SHAFT NUMBERS



PROPOSED GRADE ELEV.	747.33	747.31	747.29	747.31	747.33	747.22	747.12	747.20	747.29	747.32	747.35	747.41	747.46	747.31	747.16	747.02	746.88	747.02			
EX. GROUND ELEV.	747.16	747.22	747.14	747.06	747.23	747.15	746.99	747.05	747.13	747.20	747.20	744.32	747.39	747.34	747.03	746.66	746.77	746.85			

705
700

10+00 11+00 12+00 13+00 14+00 15+00

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CONSTRUCTION - 11/03/2014 - 11/19/2015

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED SMJ
CHECKED NCK

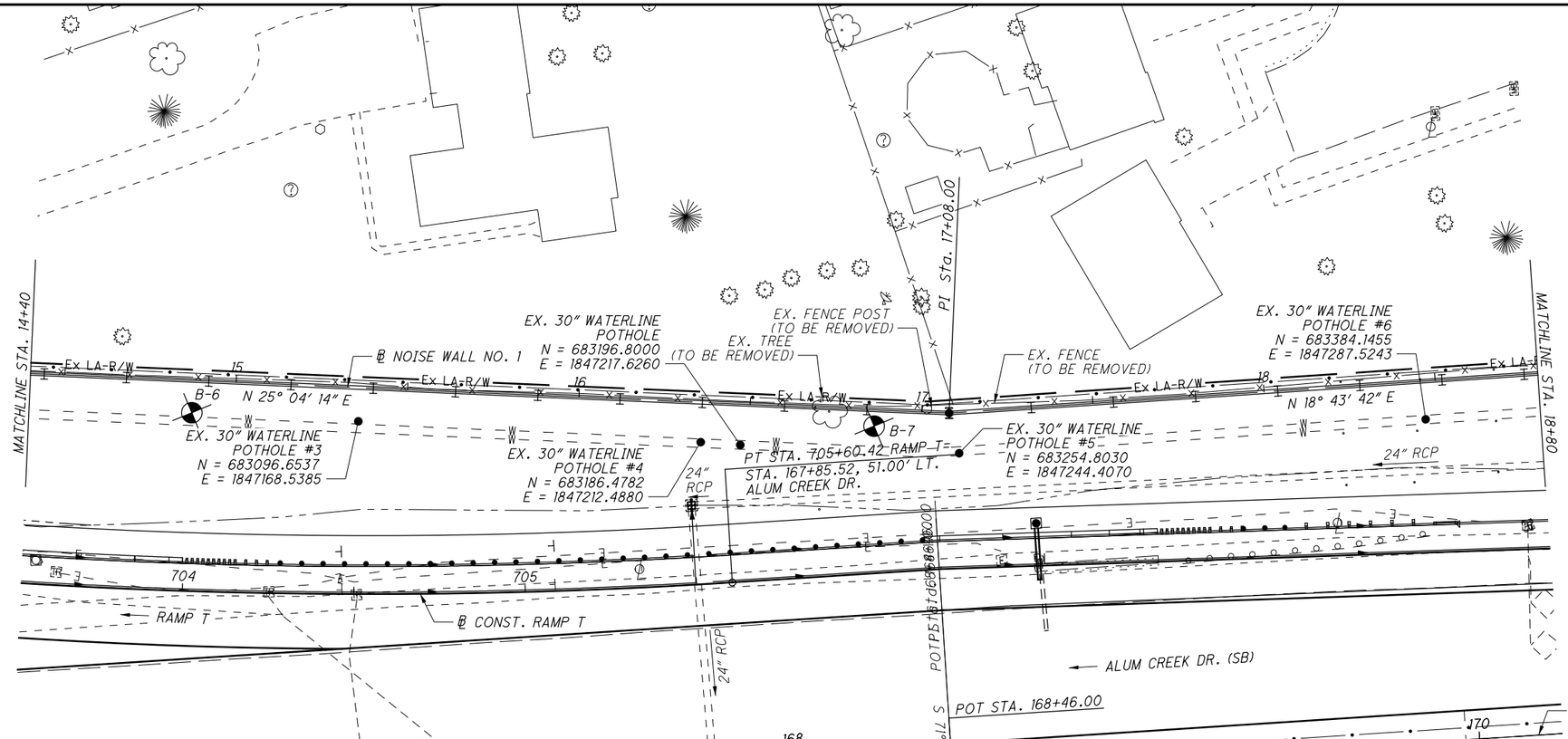
PLAN AND PROFILE - NOISE WALL NO. 1
STA. 10+00 TO STA. 14+40

FRA-270-49.00

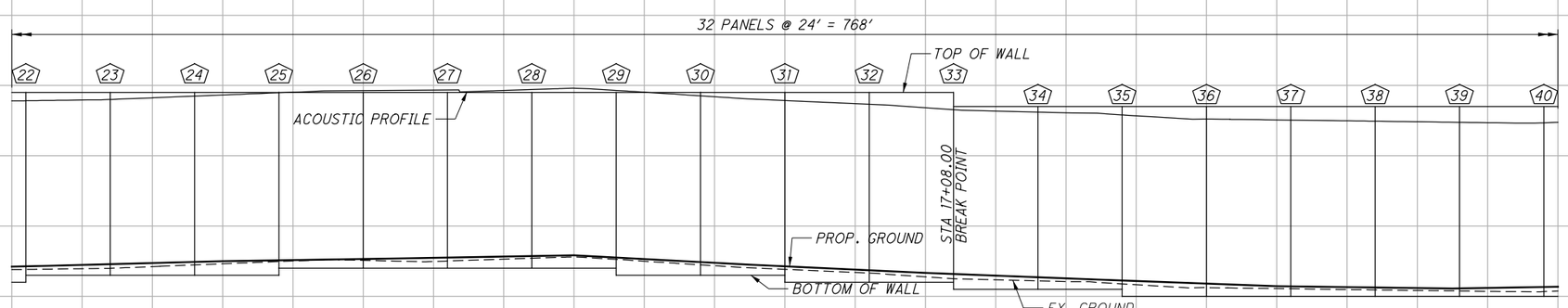
3 / 10

98 / 182

AS BUILT - 4/22/2016



TOP OF WALL ELEV.	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	759.50	758.50	758.50	758.50	758.50	758.50	758.50	758.50		
ACOUSTIC PROFILE ELEV.	758.93	759.07	759.32	759.58	759.66	759.61	759.81	759.45	759.04	758.77	758.42	758.15	758.01	757.62	757.55	757.47	757.39	757.34		
BOTTOM OF WALL ELEV.	746.50	746.50	746.50	747.00	747.00	747.00	747.00	746.50	746.50	746.00	746.00	745.50	745.50	745.00	745.00	745.00	745.00	745.00		
PANEL NO.	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
PROPOSED GRADE ELEV.	747.17	747.33	747.50	747.60	747.70	747.81	747.92	747.58	747.25	746.96	746.67	746.43	746.19	745.96	745.72	745.64	745.55	745.66		
EX. GROUND ELEV.	746.93	747.06	747.32	747.57	747.50	747.60	747.80	747.42	747.03	746.76	746.39	746.15	745.97	745.60	745.55	745.47	745.39	745.33		



XX = DRILLED SHAFT NUMBERS

HORIZONTAL SCALE IN FEET: 0, 10, 20, 40

CALCULATED SMJ
CHECKED NCK

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

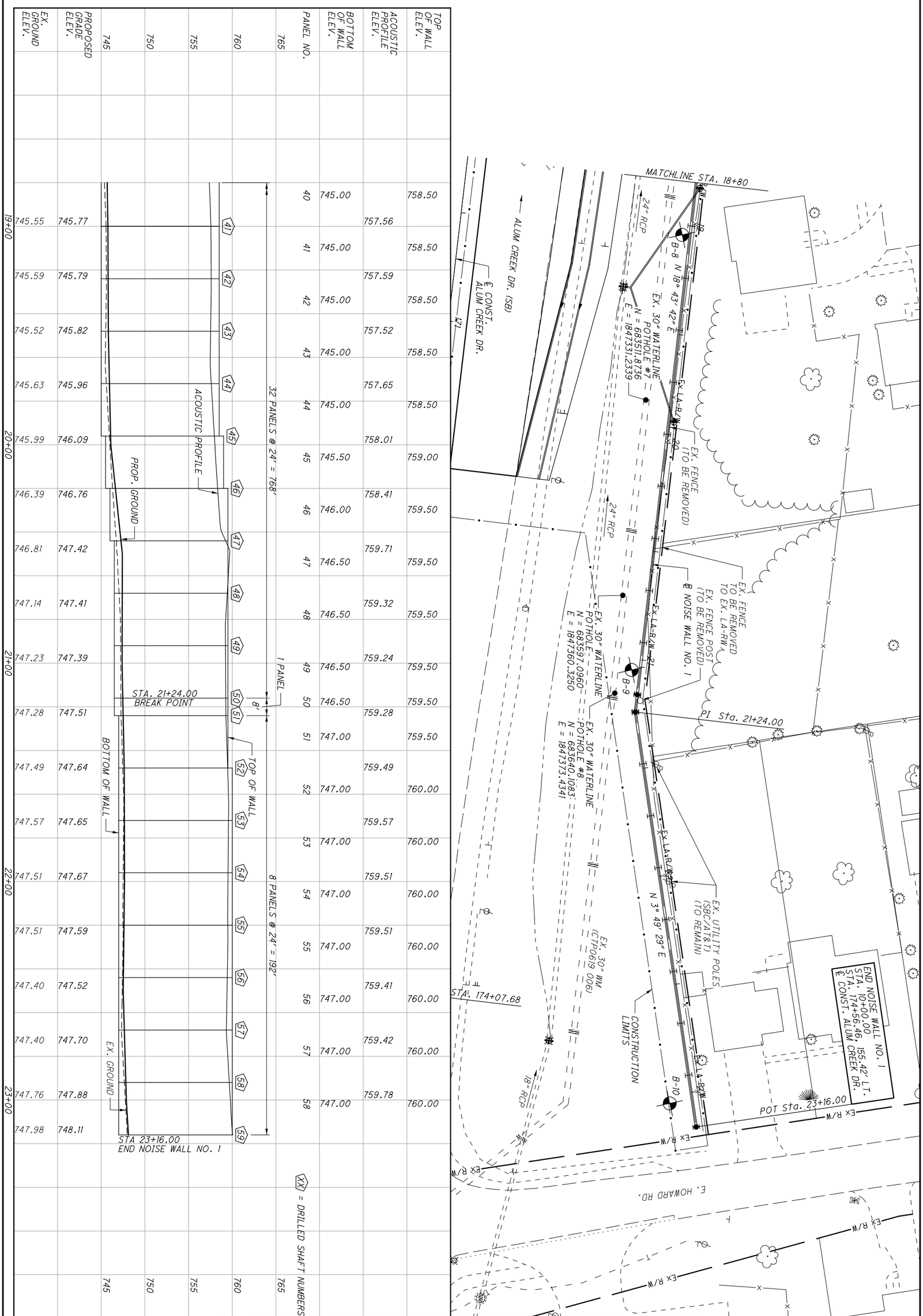
PLAN AND PROFILE - NOISE WALL NO. 1
STA. 14+40 TO STA. 18+80

FRA-270-49.00

4 / 10

99 / 182

AS BUILT - 4/22/2016



100 / 182	5 / 10	FRA-270-49.00	PLAN AND PROFILE - NOISE WALL NO. 1 STA. 18+80 TO STA. 23+16	CALCULATED SMJ CHECKED NCK	0 20 10 40 HORIZONTAL SCALE IN FEET

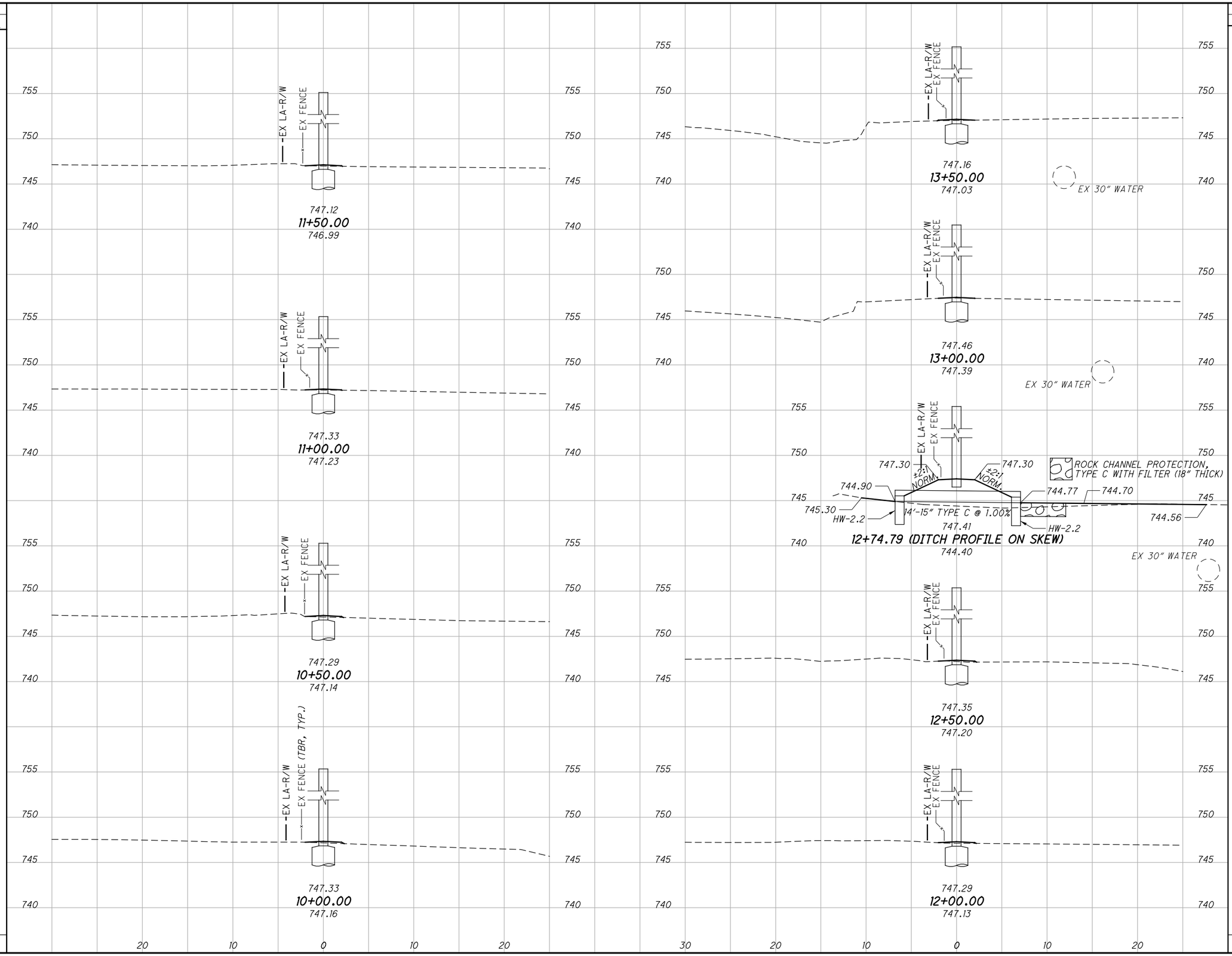
AS BUILT - 4/22/2016

SEEDING	
END WIDTH	SQ. YDS.

END AREA	
CUT	FILL

VOLUME	
CUT	FILL

CALCULATED SMJ
CHECKED NCK



BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CROSS SECTIONS NOISE WALL NO. 1
STA. 10+00.00 TO STA. 13+50.00

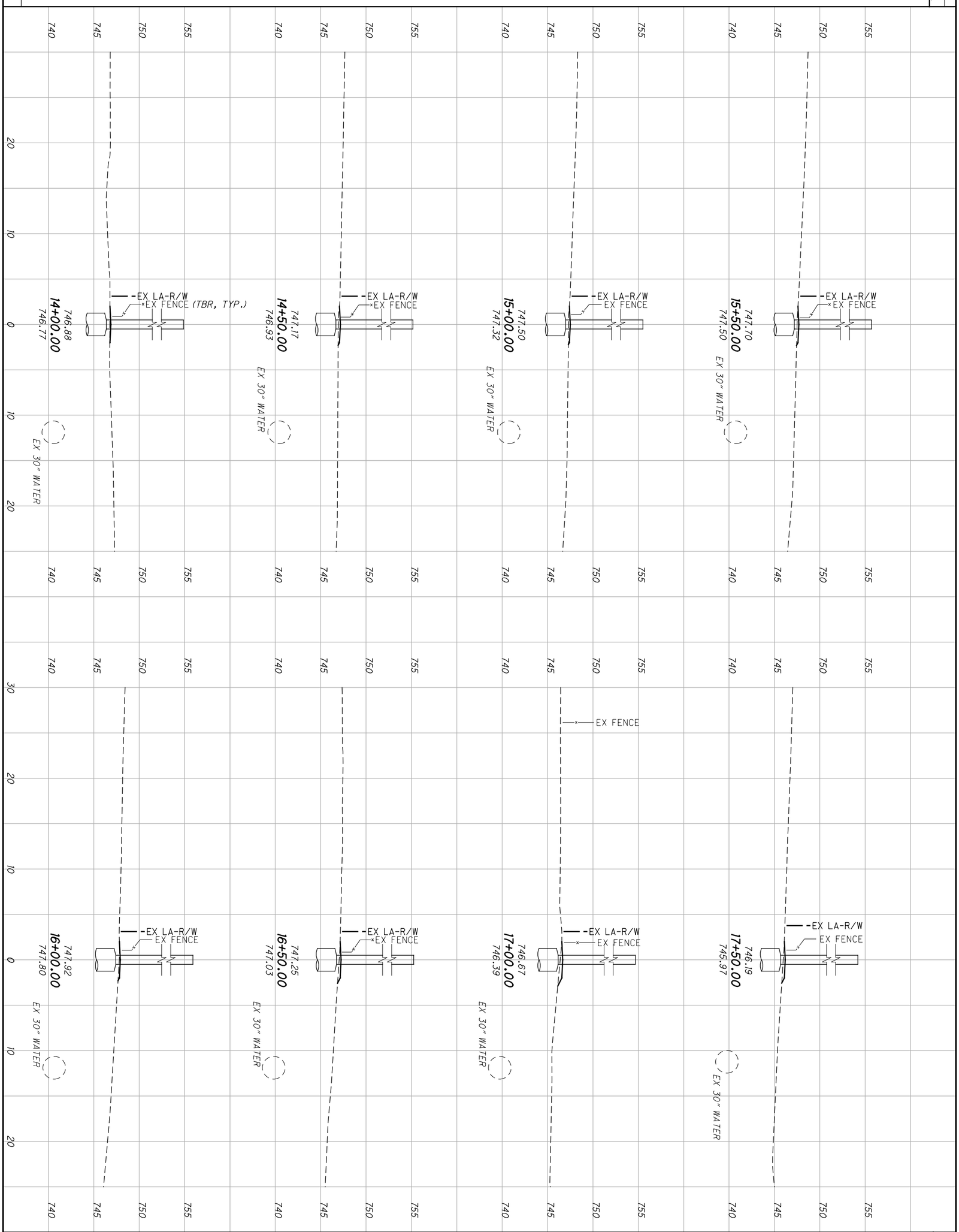
FRA-270-49.00

6 / 10

101 / 182

AS BUILT - 4/22/2016

SEEDING
END WIDTH | SQ. YDS.



END AREA CUT | FILL
VOLUME CUT | FILL

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

102 / 182 | 7 / 10 | FRA-270-49.00

CROSS SECTIONS NOISE WALL NO. 1
STA. 14+00.00 TO STA. 17+50.00

CALCULATED SMJ
CHECKED NCK

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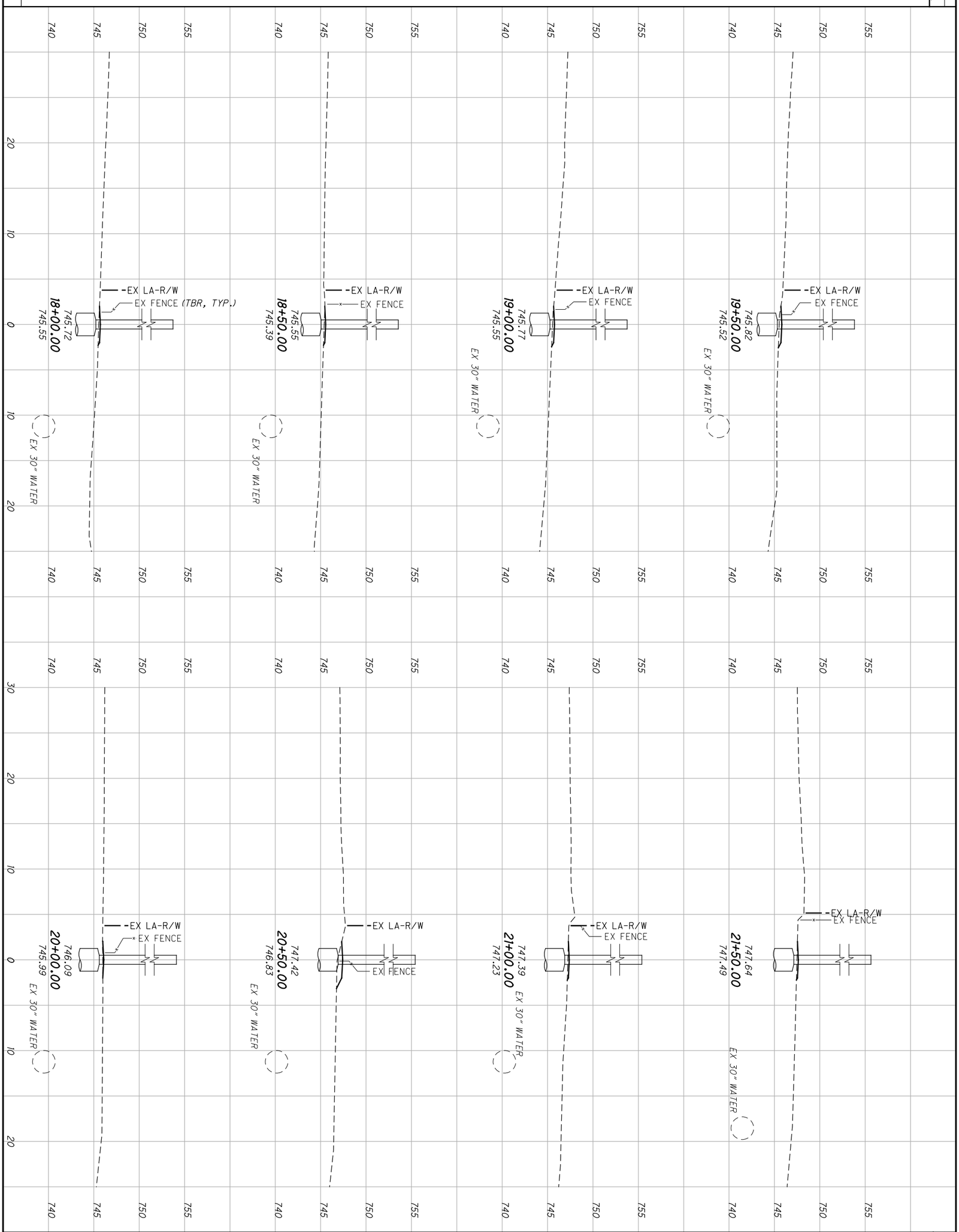
AS BUILT - 4/22/2016

SEEDING
END WIDTH | SQ. YDS.



END AREA CUT | FILL
VOLUME CUT | FILL

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

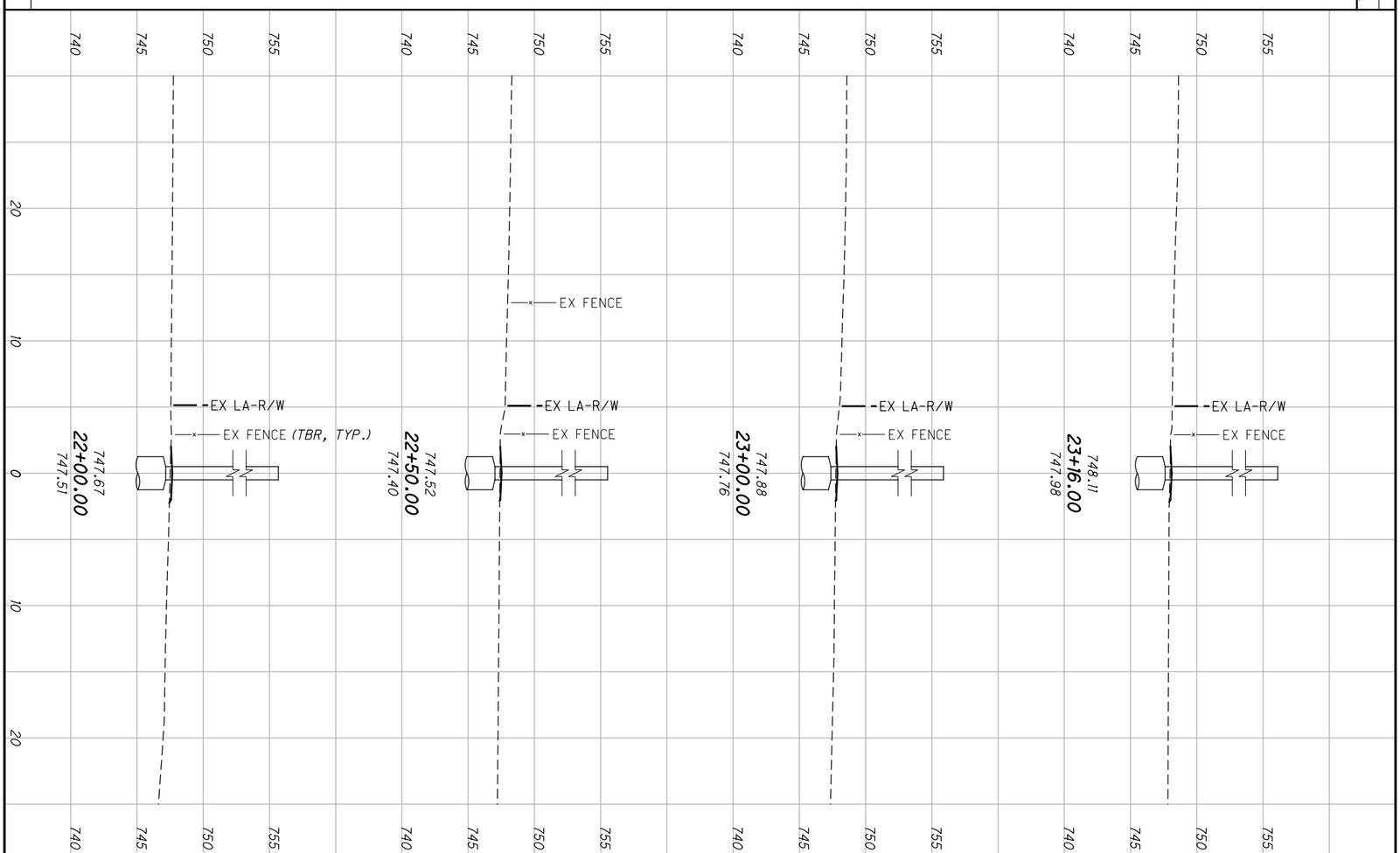
103 / 182 | 8 / 10 | FRA-270-49.00

CROSS SECTIONS NOISE WALL NO. 1
STA. 18+00.00 TO STA. 21+50.00

CALCULATED SMJ
CHECKED NCK

AS BUILT - 4/22/2016

SEEDING
END WIDTH | SQ. YDS.



END AREA
CUT | FILL

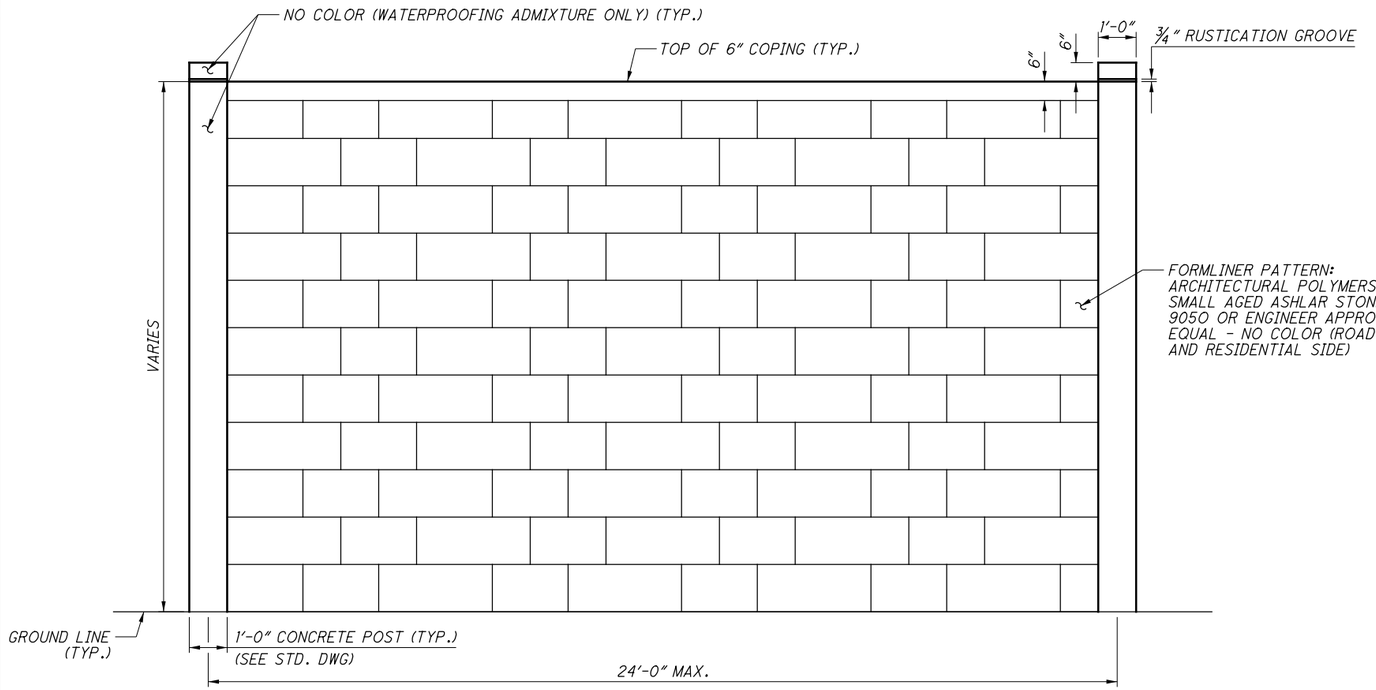
VOLUME
CUT | FILL

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

104 / 182	9 / 10	FRA-270-49.00	CROSS SECTIONS NOISE WALL NO. 1 STA. 22+00.00 TO STA. 23+16.00

CALCULATED SMJ
CHECKED NCK

NOISE WALL NO. 1			
DRILLED SHAFT NO.	WORKPOINT STATION	TOP OF DRILLED SHAFT ELEVATION	SHAFT LENGTH (FEET)
1	10+00.00	746.26	7.00
2	10+12.00	746.19	7.00
3	10+24.00	746.19	7.00
4	10+48.00	746.19	7.00
5	10+72.00	746.19	7.00
6	10+96.00	746.19	7.00
7	11+20.00	746.19	7.00
8	11+44.00	746.19	7.00
9	11+52.00	746.19	7.00
10	11+68.00	746.19	7.00
11	11+92.00	746.19	7.00
12	12+16.00	746.19	7.00
13	12+40.00	746.19	7.00
14	12+64.00	746.19	10.00
15	12+88.00	746.19	10.00
16	13+12.00	746.19	10.00
17	13+28.00	746.19	10.00
18	13+48.00	746.19	10.00
19	13+72.00	745.69	10.00
20	13+96.00	745.69	10.00
21	14+20.00	745.69	10.00
22	14+44.00	745.69	9.50
23	14+68.00	746.19	9.50
24	14+92.00	746.19	9.50
25	15+16.00	746.19	9.50
26	15+40.00	746.69	9.50
27	15+64.00	746.69	9.50
28	15+88.00	746.69	9.50
29	16+12.00	746.19	9.50
30	16+36.00	746.19	9.50
31	16+60.00	745.69	9.50
32	16+84.00	745.69	9.50
33	17+08.00	745.19	9.50
34	17+32.00	745.19	9.50
35	17+56.00	744.69	9.50
36	17+80.00	744.69	9.50
37	18+04.00	744.69	9.50
38	18+28.00	744.69	9.50
39	18+52.00	744.69	9.50
40	18+76.00	744.69	9.50
41	19+00.00	744.69	9.50
42	19+24.00	744.69	9.50
43	19+48.00	744.69	9.50
44	19+72.00	744.69	9.50
45	19+96.00	744.69	9.50
46	20+20.00	745.19	9.50
47	20+44.00	745.69	9.50
48	20+68.00	745.69	9.50
49	20+92.00	745.69	9.50
50	21+16.00	745.69	9.50
51	21+24.00	746.19	9.50
52	21+48.00	746.69	9.50
53	21+72.00	746.69	9.50
54	21+96.00	746.69	9.50
55	22+20.00	746.69	9.50
56	22+44.00	746.69	9.50
57	22+68.00	746.69	9.50
58	22+92.00	746.69	9.50
59	23+16.00	746.76	9.50



NOISE BARRIER ELEVATION
(ROADWAY AND RESIDENTIAL SIDE)

NOTES:
1. SEE STANDARDS DRAWING NBS-1-09 FOR ADDITIONAL DETAILS.
2. THE NOISE WALL SHALL BE REFLECTIVE CONCRETE.
3. THE POST RUSTICATION GROOVE SHALL MEET THE TOP OF THE HIGHEST ADJACENT PANEL (TOP OF THE PANEL COPING).
4. THE PANEL CAP SHALL HAVE A 2" OVERHANG AND THE POST CAP SHALL HAVE NO OVERHANG.

ITEM	ITEM EXT.	QUANTITY	UNIT	DESCRIPTION
606	10200	169	S.F.	SPECIAL - NOISE BARRIER (REFLECTIVE), 10' HEIGHT AND UNDER
606	10210	16940	S.F.	SPECIAL - NOISE BARRIER (REFLECTIVE), OVER 10' TO 14' HEIGHT

CALCULATED SMJ
CHECKED NCK

NOISE BARRIER DATA TABLE AND DETAILS

FRA-270-49.00

AS BUILT - 4/22/2016

CONST. LIMITS

GRAVEL AND MISC. DEBRIS STOCKPILE AREA

GRAVEL FIELD DR.

WOODED AREA

CONST. LIMITS

EX. FENCE (TBR)

CONST. LIMITS NOISE WALL NO. 1

EX. LA-R/W

WOODED AREA

EX. LA-R/W

D-7

D-8

15"

RAMP T

16'

16'

CURVE NO. 5

698

PT STA. 698+25.79

℄ CONST RAMP T

Sta. 699+87.86 ℄ CONST. RAMP T = Sta. 39+46.97 ℄ EX. WATERLINE

699

N 38° 16' 06" E

PC STA. 700+07.45

37

EX. 48" CASING PIPE

38

EX. 30" WM (CTP0619_006)

39

700

EX. 30" WM (CTP0619_006)

40

EX. 48" CASING PIPE

41

42

CURVE NO. 6

701

702

FIELD SURVEYED (POT HOLE)
GROUND EL. 744.57
DEPTH TO TOP OF EX. 30" WM 7.35'±

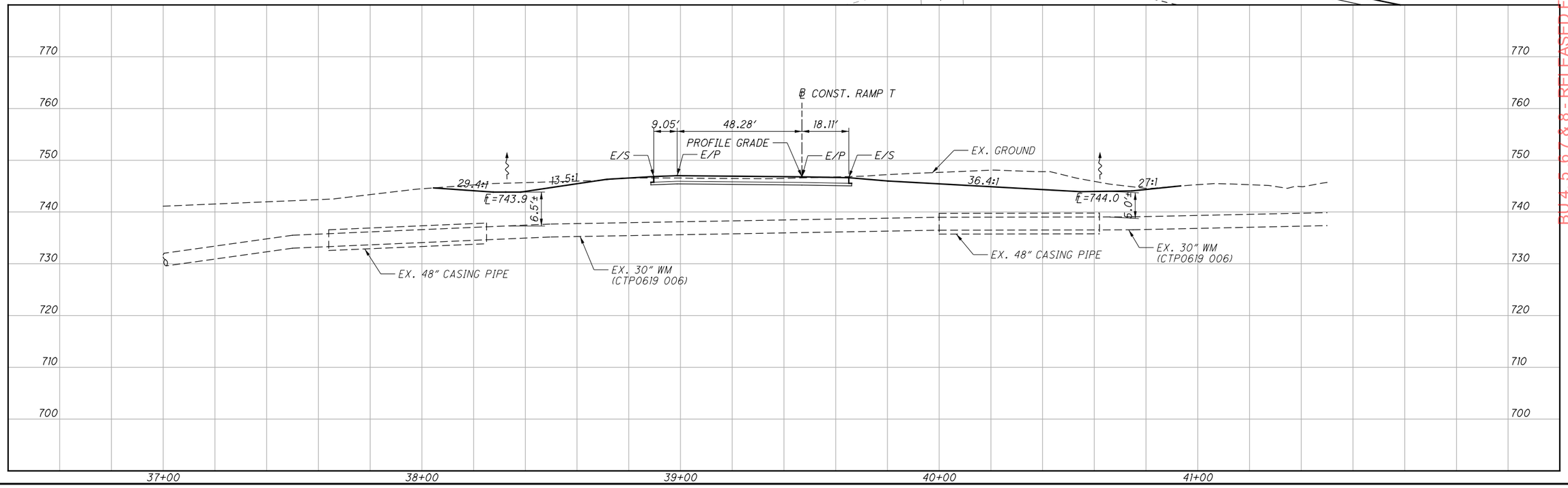
FIELD SURVEYED (POT HOLE)
GROUND EL. 745.93
DEPTH TO TOP OF EX 30" WM 7.22'±

ASPHALT

GRAVEL

RAMP T CURVE NO 5
P.I. STA. 694+70.26
Δ = 29° 34' 04" (LT)
Dc = 4° 03' 48"
R = 1,410.03'
T = 372.12'
L = 727.65'
E = 48.28'
e_{max} = 0.052

RAMP T CURVE NO 6
P.I. Sta. 702+86.60
Δ = 19° 21' 14" (LT)
Dc = 3° 30' 00"
R = 1,637.02'
T = 279.14'
L = 552.97'
E = 23.63'
e_{max} = 0.048



BU 4, 5, 6, 7 & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED CFR
CHECKED SSK

EX. WATER MAIN PLAN AND PROFILE - RAMP T
STA. 37+00 TO STA. 41+31.78

FRA-270-49.00

106
182

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AS BUILT - 4/22/2016

LOCATION	STATION TO STATION		620	621	644														646			
			DELINEATOR POST MOUNTED, AS PER PLAN	RAISED PAVEMENT MARKERS	LANE LINE, 6"	LANE LINE, 4"	EDGE LINE, 6"	EDGE LINE, 4"	CENTERLINE, 4" DOUBLE SOLID	DOTTED LINE, 6"	STOP LINE, 24"	STOP LINE, 12"	CHANNELIZING LINE, 12"	CHANNELIZING LINE, 8"	TRANSVERSE LINE, 24"	TRANSVERSE LINE, 12"	LANE ARROW	LANE LINE, 4"	EDGE LINE, 4"	CHANNELIZING LINE, 8"	LANE ARROW
			EACH	EACH	MILE	MILE	MILE	MILE	MILE	FT	FT	FT	FT	FT	FT	FT	EACH	MILE	MILE	FT	EACH
ALUM CREEK DRIVE	149+02	151+81						0.05													
ALUM CREEK DRIVE	149+02	151+12				0.04															
ALUM CREEK DRIVE	149+02	151+12				0.04															
ALUM CREEK DRIVE	151+12	151+81								75											
ALUM CREEK DRIVE	152+21	152+87								102											
ALUM CREEK DRIVE	152+89											48									
ALUM CREEK DRIVE	152+89	154+52						0.03													
ALUM CREEK DRIVE	152+89	154+60				0.03															
ALUM CREEK DRIVE	152+89	154+67				0.03															
ALUM CREEK DRIVE	152+89	154+84						0.04													
ALUM CREEK DRIVE	152+89	154+75												186			2				
ALUM CREEK DRIVE	154+52	158+81																	0.08		
ALUM CREEK DRIVE	154+60	158+89																0.08			
ALUM CREEK DRIVE	154+67	158+97																0.08			
ALUM CREEK DRIVE	154+75	159+05																		430	3
ALUM CREEK DRIVE	154+84	159+13																	0.08		
ALUM CREEK DRIVE	158+81	164+88						0.11													
ALUM CREEK DRIVE	158+89	164+88				0.11															
ALUM CREEK DRIVE	158+97	165+34				0.12															
ALUM CREEK DRIVE	159+05	159+22												17							
ALUM CREEK DRIVE	159+13	165+59						0.12													
ALUM CREEK DRIVE	164+88	166+70												182		87					
ALUM CREEK DRIVE	164+88	168+46	12											358							
ALUM CREEK DRIVE	165+34	166+00								102											
ALUM CREEK DRIVE	166+36	172+90							0.12							277					
ALUM CREEK DRIVE	166+36	172+90				0.12															
ALUM CREEK DRIVE	166+43											26									
ALUM CREEK DRIVE	168+46	171+67								102											
IR 270	667+26	709+25					0.80														
IR 270	667+26	712+25		38	0.85																
IR 270	667+26	712+25		38	0.85																
IR 270	667+26	686+45					0.36														
IR 270	673+95	682+95								102											
IR 270	682+95	686+45											350								
IR 270	682+95	687+48											453								
IR 270	687+48	700+01					0.24														
IR 270	687+48	700+01								1253											
IR 270	700+01	704+43											442								
IR 270	704+43	709+25					0.09														
RAMP T	686+45	687+48											103								
RAMP T	686+45	705+60					0.36														
RAMP T	686+45	702+65					0.31														
RAMP W	688+60	695+18					0.12														
RAMP W	688+60	695+18					0.12														
RAMP W	689+60	695+18											558								
RAMP W	689+60	695+18											558								
RAMP W	693+03	695+18											215		28		8				
RAMP W	695+18										75										
RAMP X	702+50	708+02					0.10														
RAMP X	702+50										43										
RAMP X	702+50	707+53											503				12				
RAMP X	702+50	707+53											503								
RAMP X	702+50	706+12					0.07														
RAMP Y	700+01	704+34											433								
RAMP Y	700+01	707+12					0.13														
RAMP Y	709+38	710+53					0.02														
TOTALS CARRIED TO GENERAL SUMMARY			12	77	2	1	3	0.36	0.12	1736	118	74	4118	743	28	364	22	0.16	0.16	430	3

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BU 4, 5, 6, 7, 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED JLM
CHECKED SSK

PAVEMENT MARKING SUBSUMMARY

FRA-270-49.00

AS BUILT - 4/22/2016

				SIGN FLATSHEET																	EXTRUSHEET					625	630							
REF. NO.	STATION	SIDE	SHEET NO.	D1-H1-48	I5-30	I-H25a	M1-3-24	M1-3-36	M3-1-24	M3-4-36	M6-1-21	R2-1-30	R2-1-48	R3-H8cb	R3-H8cc	R3-H8dp AS PER PLAN	R5-1-48	R5-1a-42	R7-1	W3-3-48	D3-H3a	D3-H5	E "8' X 5'"	E "12' X 6'"	E "11.5' X 6'"	GROUND ROD	SIGN. FLAT SHEET	SIGN GROUND MOUNTED EXTRUSHEET	SIGN. OVERHEAD EXTRUSHEET	REMOVAL OF GROUND MOUNTED SIGNS AND DISPOSAL	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	REMOVAL OF GROUND MOUNTED STRUCTURAL BEAM SUPPORT AND DISPOSAL	REMOVAL OF OVERHEAD MOUNTED SIGN AND DISPOSAL	REMOVAL OF OVERHEAD SIGN SUPPORT AND DISPOSAL	REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL
				SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ. FT.	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	EACH	SQ FT	SQ FT	SQ FT	EACH	EACH	EACH	EACH	EACH	EACH
S-1	150+51	LT	110									1															7.5			1	1				
S-2	158+65	LT	110			1																					1.0								
S-3	159+19	LT	110																				1					40.0							1
S-4	160+11	LT	110									1															7.5			1	1				
S-5	162+29	LT	110																1								1.5			1	1				
S-6	704+47	LT	110											1													10.0			1	2				
S-7	705+09	LT	110																1								1.5			1	1				
S-8	168+75	LT	110																						1	1			69.0				1	1	
S-9	170+57	LT	111																1								1.5			1	1				
S-10	171+36	LT	111											1													10.0			1	2				
S-11	674+48	LT	112										1														12.0			1	2				
S-12	682+90	LT	112					1		1																	12.3								
S-13	693+46	LT.	115															2									17.5			2	2				
S-14	695+22	LT.	115													1	1										27.3			2	2				
S-14A	151+85	RT	115				1		1		1																9.2								
S-15	689+12	RT.	115																	1							16.0			1	2				
S-16	689+19	RT.	115														1	1									24.8			2	2				
S-17	690+42	RT.	115	1												1											2.7			1	2				
S-18	691+80	RT.	115													1											11.3			1	2				
S-19	691+80	LT.	115													1											11.3			1	2				
S-20	693+35	RT.	115		1						1										2	1					8.4	70.0		2		2			2
S-21	693+43	RT.	115															2									17.5			2	2				
S-22	706+63	LT.	115												1												10.0			1	2				
S-23	706+96	LT.	115		1																2	1					8.4	70.0		2		2			2
S-24	702+30	RT.	115																											1	1				
S-25	702+40	LT.	115																											1	1				
S-26	703+00	RT.	115																											1	1				
S-27	710+80	LT	115																											1	1				
S-28	710+83	RT	115																											1	1				
S-29	174+00	LT	111																					1				72.0							
S-30	702+67	RT	113	1																										1	1	1			
																																1			
TOTAL				1	2	1	1	1	1	1	2	2	1	2	1	3	2	5	3	1	4	2	1	1	1	1	221	252	69	30	34	7	1	1	5

1	DATE	DESCRIPTION
	6/8/16	AS BUILT

CALCULATED JLM
CHECKED SSK

SIGNING SUBSUMMARY

BU 4, 5, 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

FRA-270-49.00

AS BUILT - 4/22/2016

CALCULATED JLM
CHECKED SSK

SIGNING SUBSUMMARY

REF. NO.	STATION	SIDE	SHEET NO.	SIGN FLATSHEET																EXTRUSHEET					630										
				D1-H1-48	15-30	1-H25a	M1-3-24	M1-3-36	M3-1-24	M3-4-36	M6-1-21	R2-1-30	R2-1-48	R3-H8cb	R3-H8cc	R3-H8dp AS PER PLAN	R5-1-48	R5-1a-42	R7-1	W3-3-48	D3-H3a	D3-H5	E "8" X 5'"	E "12" X 6'"	E "11.5' X 6'"	GROUND MOUNTED SUPPORT POST No. 2	GROUND MOUNTED SUPPORT POST No. 3	GROUND MOUNTED SUPPORT POST No. 4	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W6X9	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W10 X 12	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W8 X 18	GROUND MOUNTED STRUCTURAL BEAM SUPPORT FOUNDATION	BREAKAWAY STRUCTURAL BEAM CONNECTION	OVERHEAD SIGN SUPPORT, TYPE TC-12.30 DESIGN 3	RIGID OVERHEAD SIGN SUPPORT FOUNDATION	SIGN ATTACHMENT ASSEMBLY	
				SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	SQ. FT.	SQ FT	SQ FT	SQ FT	SQ FT	SQ FT	FT	FT	FT	FT	FT	FT	FT	EACH	EACH	EACH	EACH	EACH	
S-1	150+51	LT	110									1															13.0										
S-2	158+65	LT	110			1																				10.5										
S-3	159+19	LT	110																				1						38.4				2	2				
S-4	160+11	LT	110									1															13.0										
S-5	162+29	LT	110																1							11.5										
S-6	704+47	LT	110											1												25.0										
S-7	705+09	LT	110																1							11.5										
S-8	168+75	LT	110																						1									1	1	8	
S-9	170+57	LT	111																1							11.5										
S-10	171+36	LT	111											1												25.0										
S-11	674+48	LT	112										1															34.0									
S-12	682+90	LT	112					1																			30.0										
S-13	693+46	LT.	115															2									29.0										
S-14	695+22	LT.	115													1	1										32.0										
S-14A	151+85	RT	115				1		1		1																14.5										
S-15	689+12	RT.	115																	1							30.0										
S-16	689+19	RT.	115														1	1									32.0										
S-17	690+42	RT.	115	1																						21.0										
S-18	691+80	RT.	115													1											29.0										
S-19	691+80	LT.	115													1											29.0										
S-20	693+35	RT.	115		1						1										2	1								45.0		2	2				
S-21	693+43	RT.	115															2									29.0										
S-22	706+63	LT.	115												1											36.0										
S-23	706+96	LT.	115		1																2	1									50.0	2	2				
S-24	702+30	RT.	115																																		
S-25	702+40	LT.	115																																		
S-26	703+00	RT.	115																																		
S-27	710+80	LT	115																																		
S-28	710+83	RT	115																																		
S-29	174+00	LT	111																					1						40.7		2	2				
TOTAL				1	2	1	1	1	1	1	2	2	1	2	1	3	2	5	3	1	4	2	1	1	1	152	268	34	38	86	50	8	8	1	1	8	

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

FRA-270-49.00

AS BUILT - 4/22/2016

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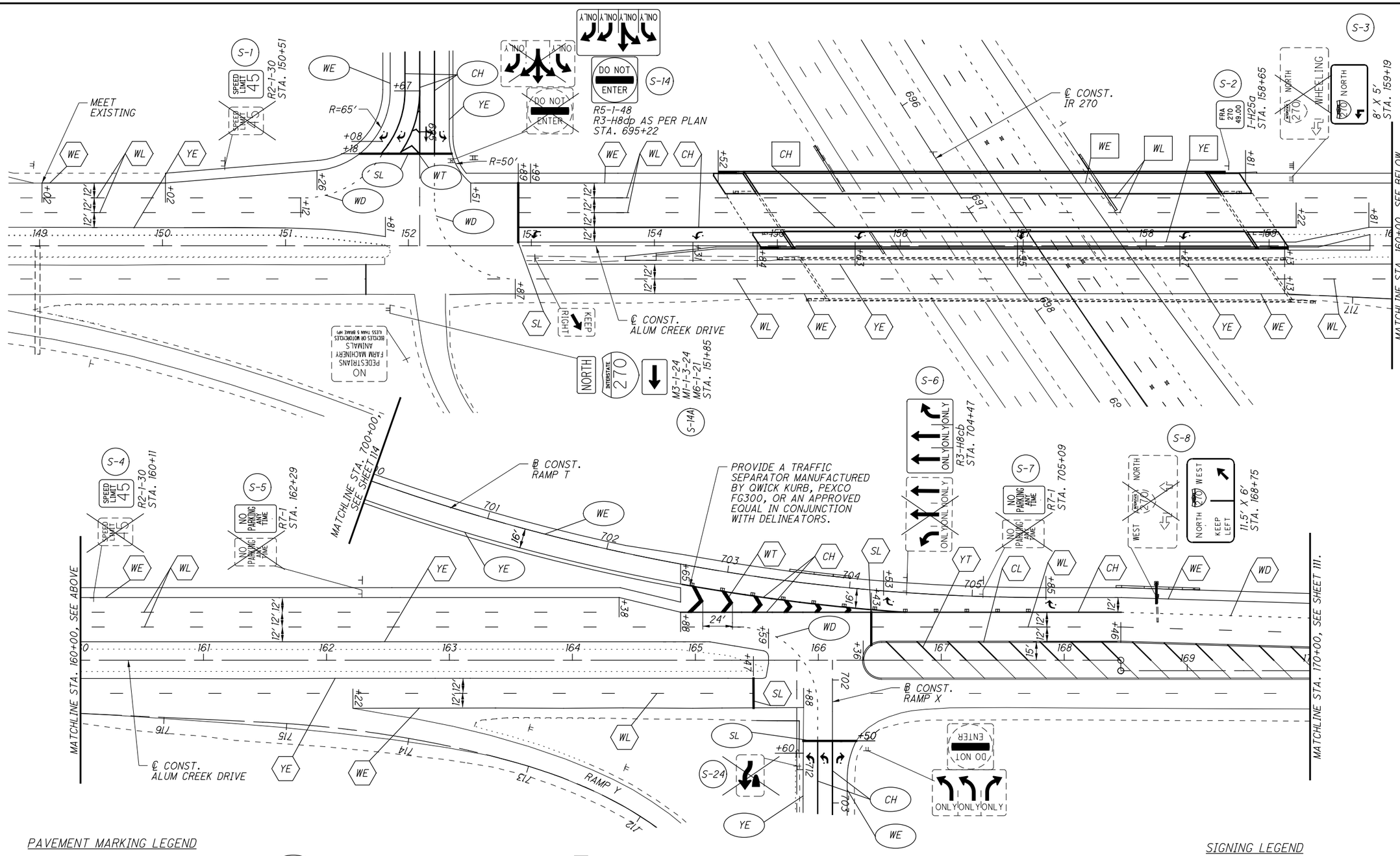


PAVEMENT MARKING LEGEND

- CH — ITEM 644 - CHANNELIZING LINE, 12" WHITE
- WL — ITEM 644 - LANE LINE, 6" WHITE
- WE — ITEM 644 - EDGE LINE, 6" WHITE
- YE — ITEM 644 - EDGE LINE, 6" YELLOW
- WT — ITEM 644 - TRANSVERSE LINE, 24" WHITE
- WD — ITEM 644 - DOTTED LINE, 6" WHITE
- SL — ITEM 644 - STOP LINE, 24" WHITE
- WL — ITEM 644 - LANE LINE, 4" WHITE
- YE — ITEM 644 - EDGE LINE, 4" YELLOW
- WE — ITEM 644 - EDGE LINE, 4" WHITE
- CH — ITEM 644 - CHANNELIZING LINE, 8" WHITE
- WD — ITEM 644 - DOTTED LINE, 4" WHITE
- CL — ITEM 644 - CENTERLINE, 4" DOUBLE SOLID
- WT — ITEM 644 - TRANSVERSE LINE, 12" WHITE
- YT — ITEM 644 - TRANSVERSE LINE, 12" YELLOW
- SL — ITEM 644 - STOP LINE, 12" WHITE
- WL — ITEM 646 - LANE LINE, 4" WHITE
- WE — ITEM 646 - EDGE LINE, 4" WHITE
- YE — ITEM 646 - EDGE LINE, 4" YELLOW
- CH — ITEM 646 - CHANNELIZING LINE, 8" WHITE
- RAISED PAVEMENT MARKER
- TYPE C DELINEATOR, WHITE

SIGNING LEGEND

- PROPOSED SIGN
- EXISTING SIGN TO REMAIN
- EXISTING SIGN TO BE REMOVED

HORIZONTAL SCALE IN FEET
0 20 40 80

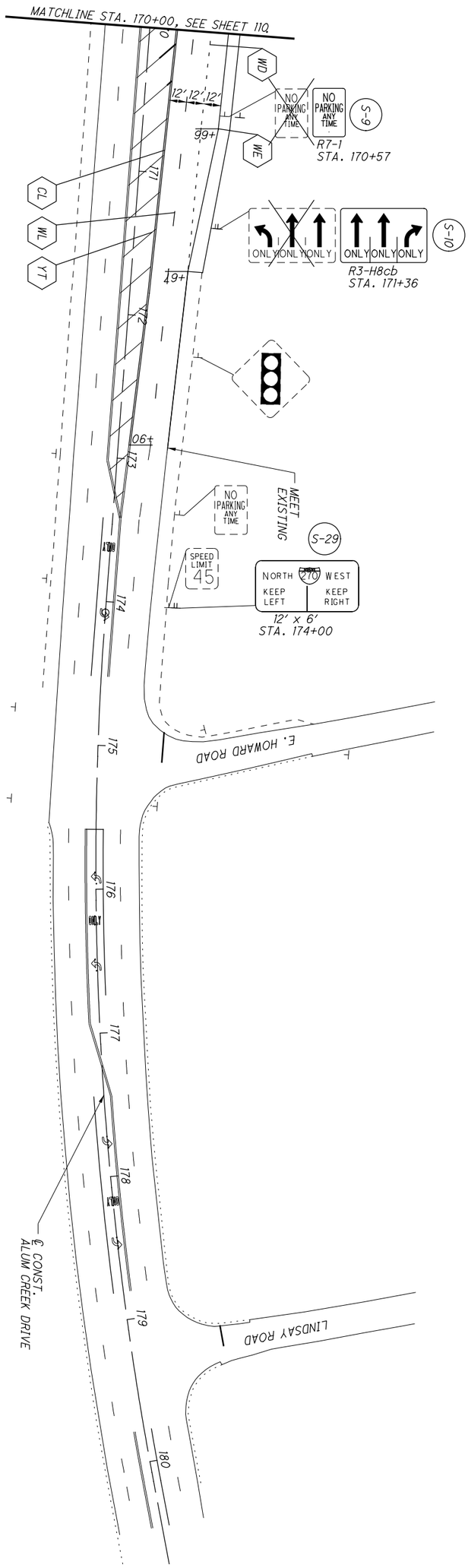
CALCULATED JLM
CHECKED SSK

BU 4, 5 67,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

TRAFFIC CONTROL PLAN

ALUM CREEK DRIVE STATION 148+75 TO STATION 170+00

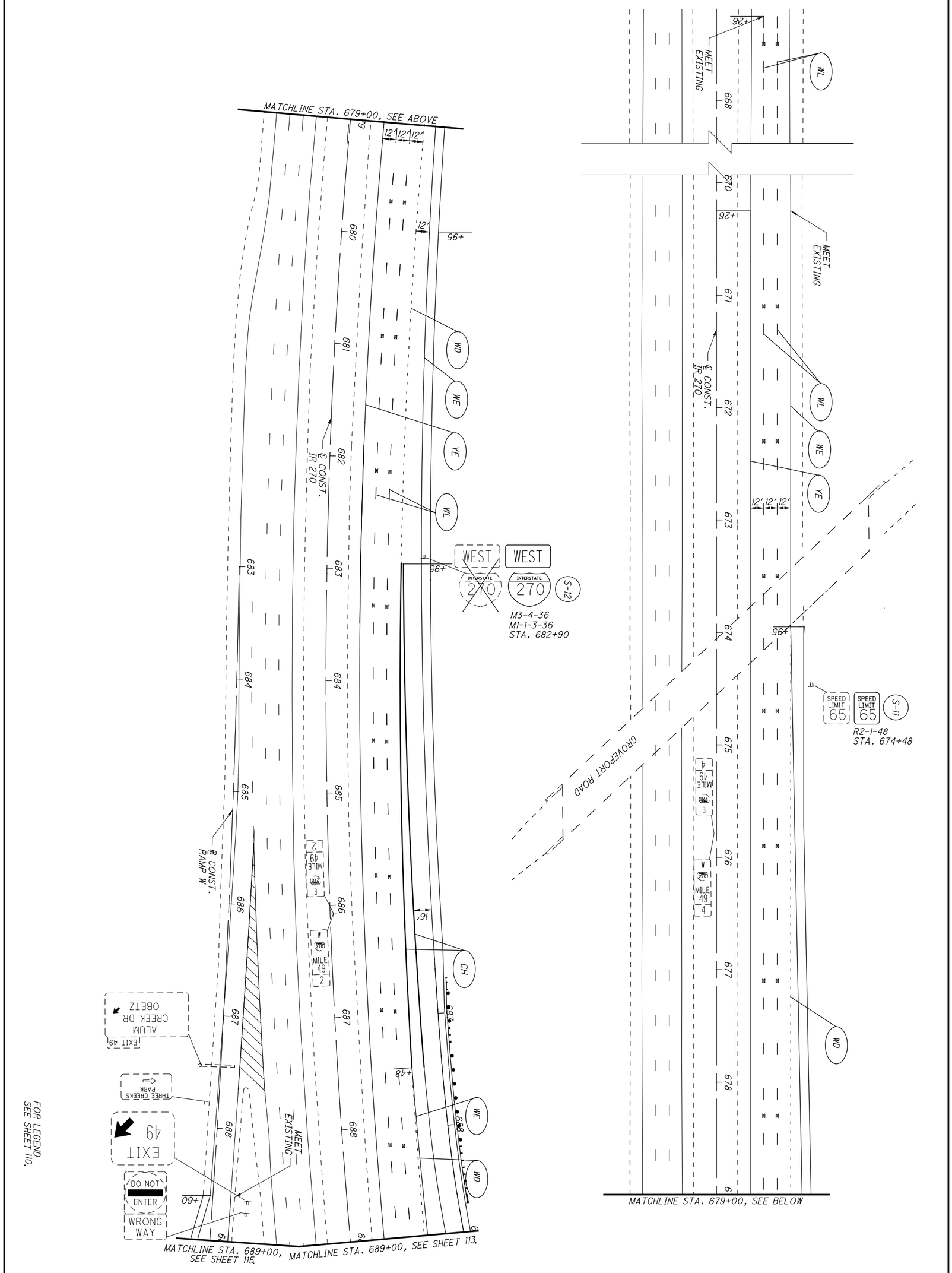
FRA-270-49.00



FOR LEGEND, SEE SHEET 11O.

111 / 182	FRA-270-49.00	TRAFFIC CONTROL PLAN ALUM CREEK DRIVE STATION 170+00 TO STATION 180+00	CALCULATED JLM CHECKED SSK	0 40 20 80 HORIZONTAL SCALE IN FEET

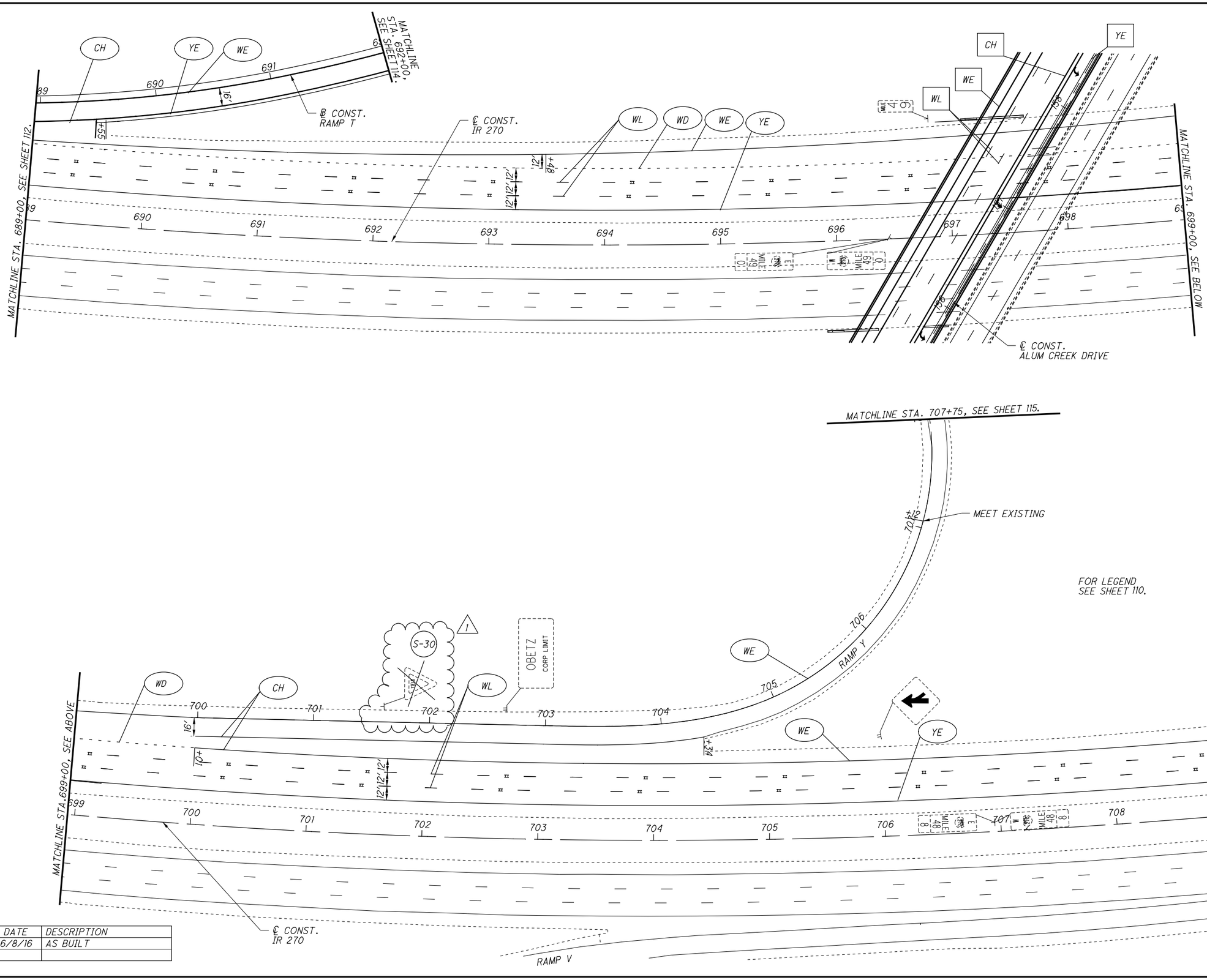
AS BUILT - 4/22/2016



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

112 / 182	FRA-270-49.00	TRAFFIC CONTROL PLAN I.R. 270 STATION 667+75 TO STATION 689+00	CALCULATED JLM CHECKED SSK	0 40 20 80 HORIZONTAL SCALE IN FEET

AS BUILT - 4/22/2016



1	DATE	DESCRIPTION
	6/8/16	AS BUILT

BU 4, 5 6 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

TRAFFIC CONTROL PLAN

I.R. 270 STATION 689+00 TO STATION 709+00

HORIZONTAL SCALE IN FEET
0 20 40 80

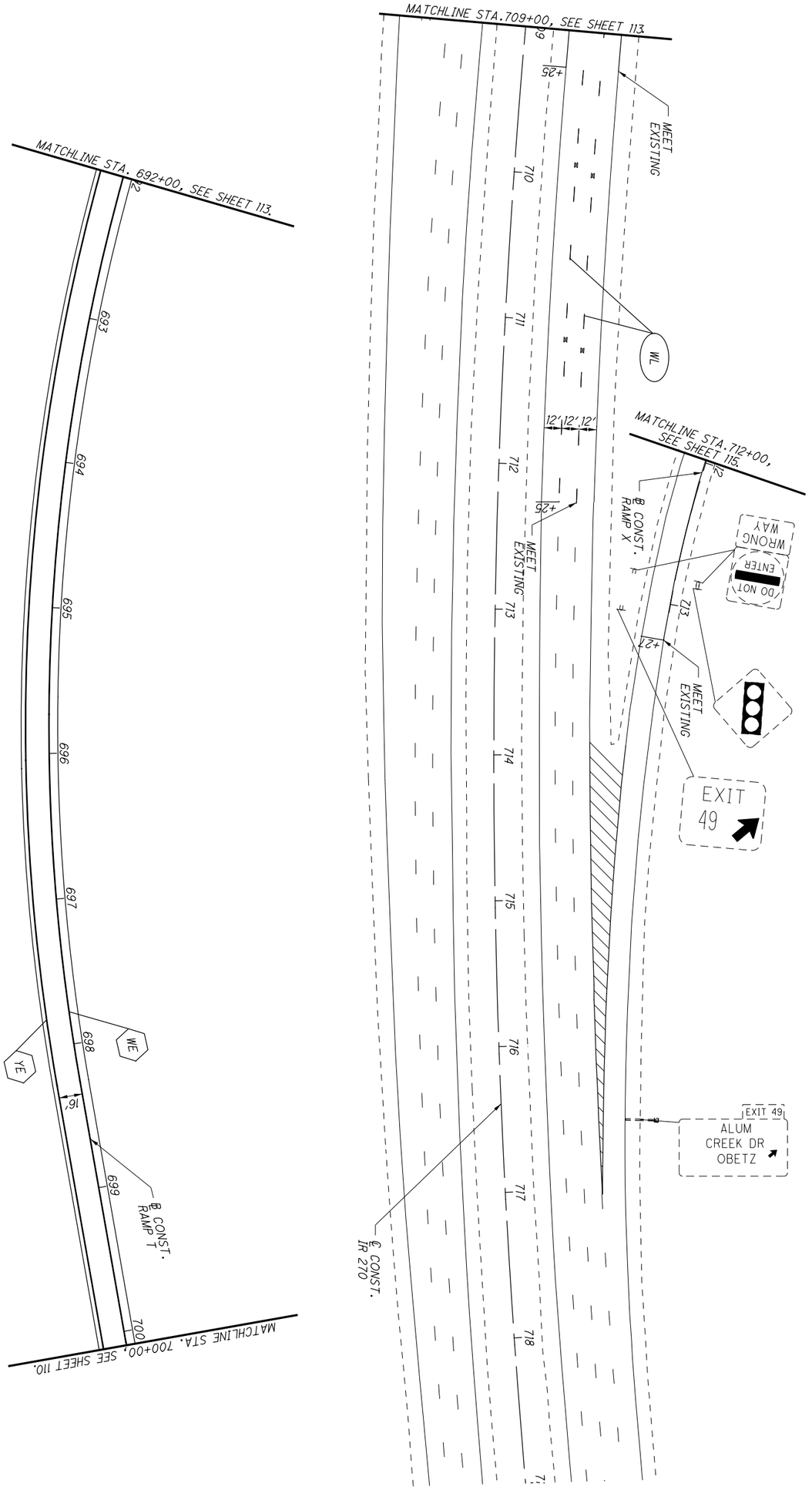
CALCULATED JLM
CHECKED SSK

FRA-270-49.00

113
182

G:\projects\2014\W-14-039 FRA-270-49.00\83988\traffic control\sheets\83988TP004_RV.dgn 6/9/2016 12:27:25 PM colinr

AS BUILT - 4/22/2016

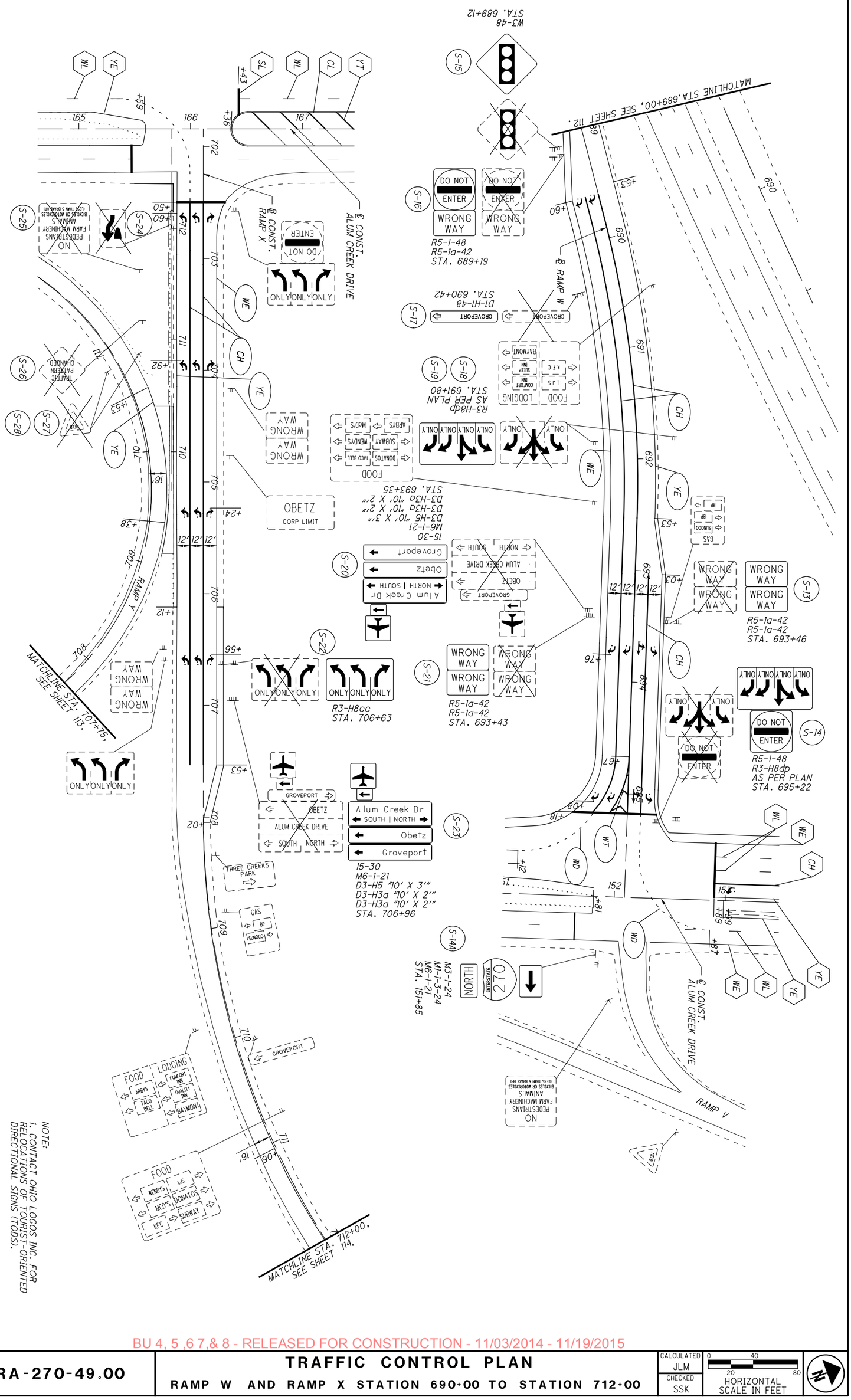


FOR LEGEND, SEE SHEET 110.

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

114 / 182	FRA-270-49.00	TRAFFIC CONTROL PLAN I.R. 270 AND RAMP T STATION 709+00 TO STATION 700+00	CALCULATED JLM CHECKED SSK	0 40 20 80 HORIZONTAL SCALE IN FEET

AS BUILT - 4/22/2016

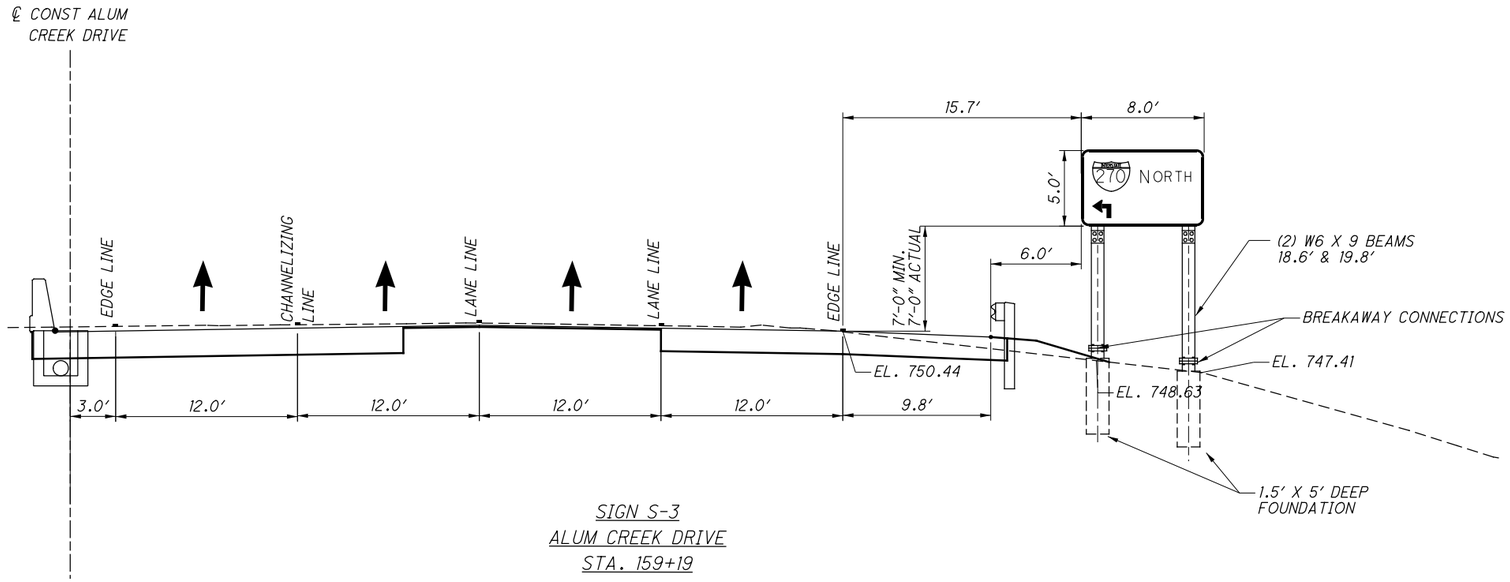


NOTE:
1. CONTACT OHIO LOGOS INC. FOR RELOCATIONS OF TOURIST-ORIENTED DIRECTIONAL SIGNS (TODS).

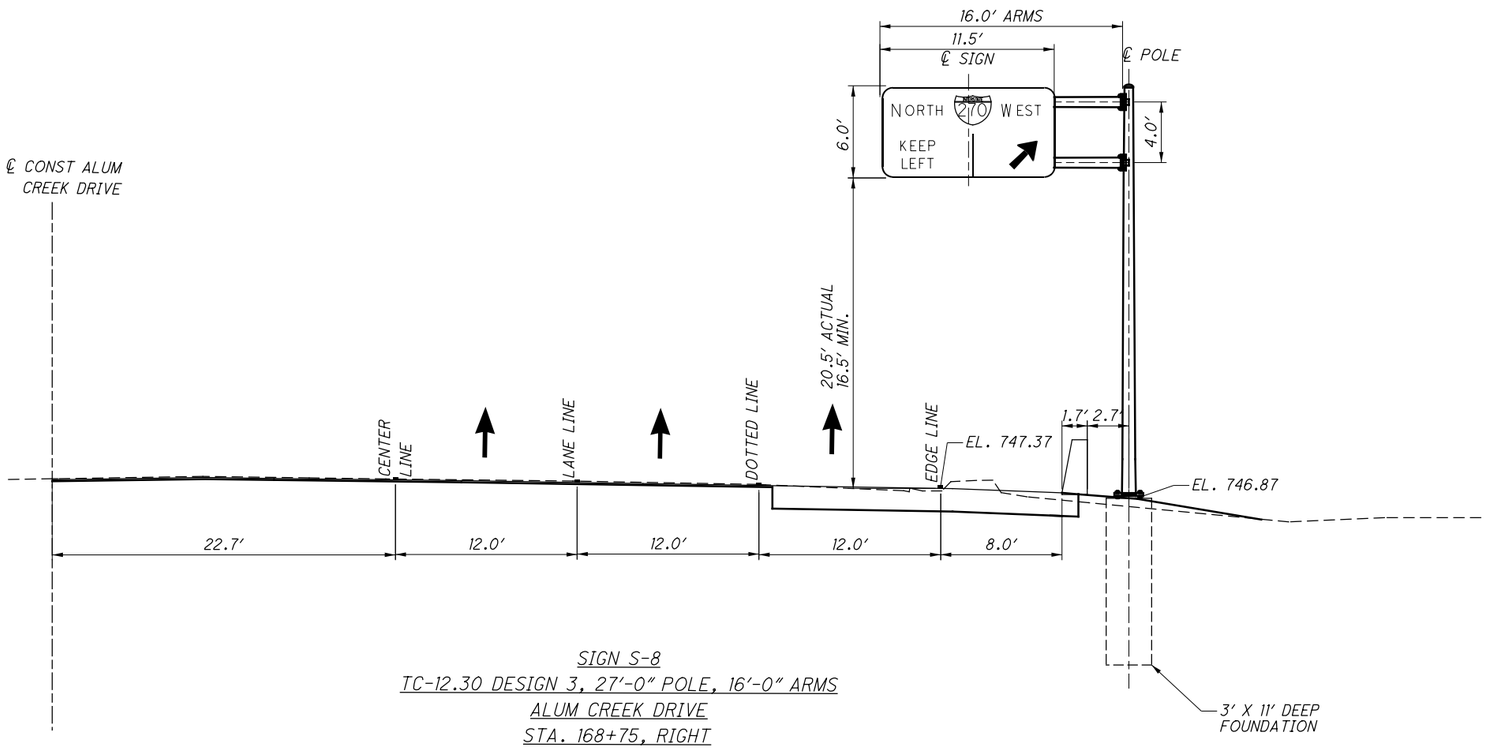
FOR LEGEND SEE SHEET 110.

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

115 / 182	FRA-270-49.00	TRAFFIC CONTROL PLAN RAMP W AND RAMP X STATION 690+00 TO STATION 712+00	CALCULATED JLM CHECKED SSK	0 40 20 80 HORIZONTAL SCALE IN FEET



SIGN S-3
ALUM CREEK DRIVE
STA. 159+19

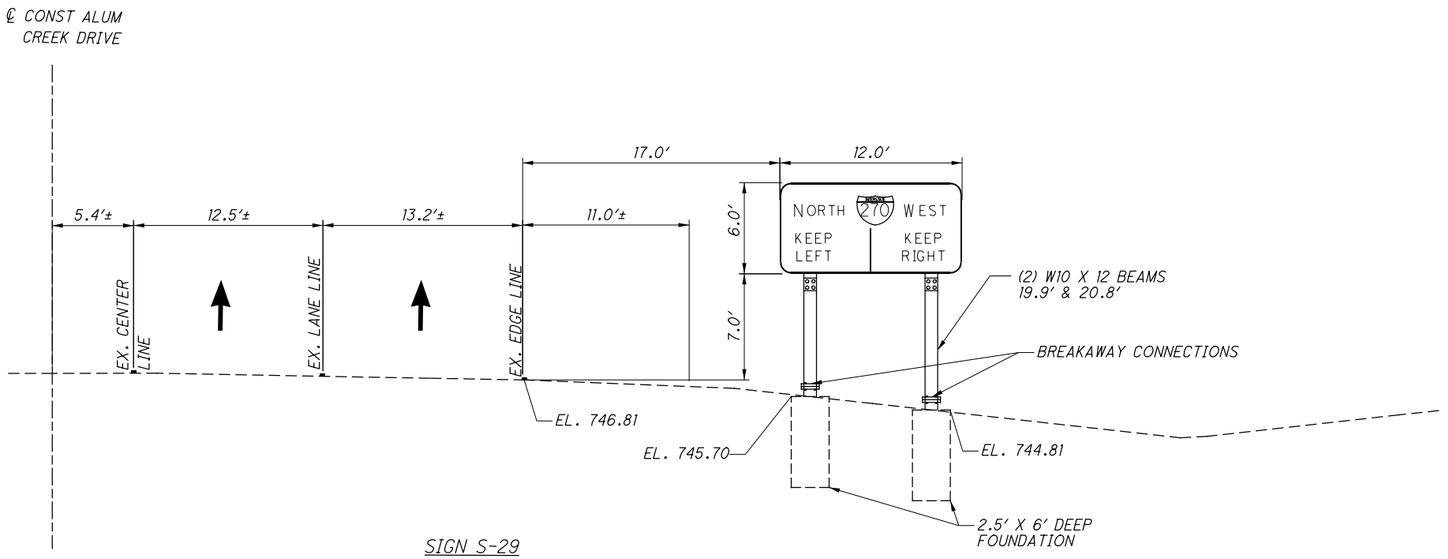


SIGN S-8
TC-12.30 DESIGN 3, 27′-0″ POLE, 16′-0″ ARMS
ALUM CREEK DRIVE
STA. 168+75, RIGHT

CALCULATED JLM
CHECKED SSK

SIGN ELEVATIONS

FRA-270-49.00

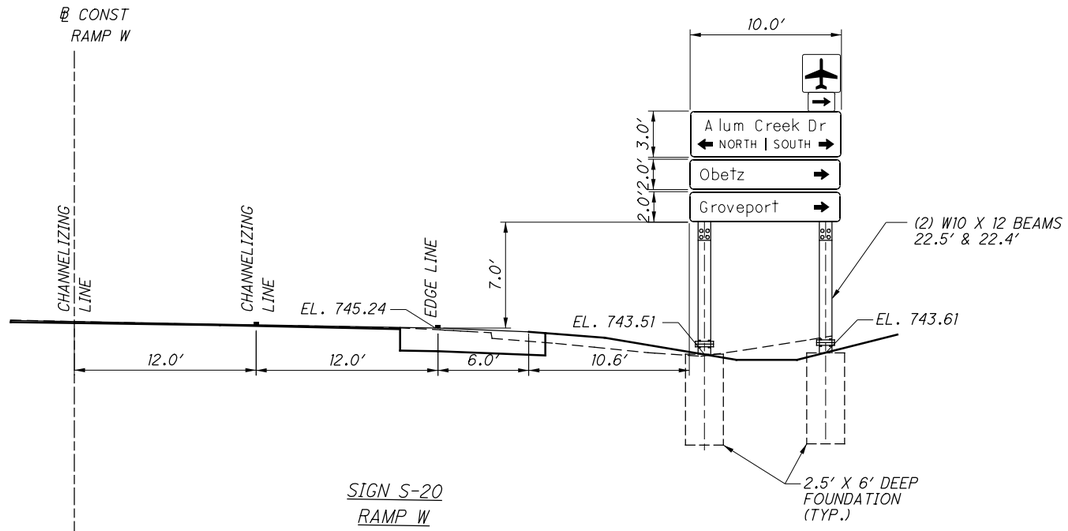


SIGN S-29
ALUM CREEK DRIVE
STA. 174+00

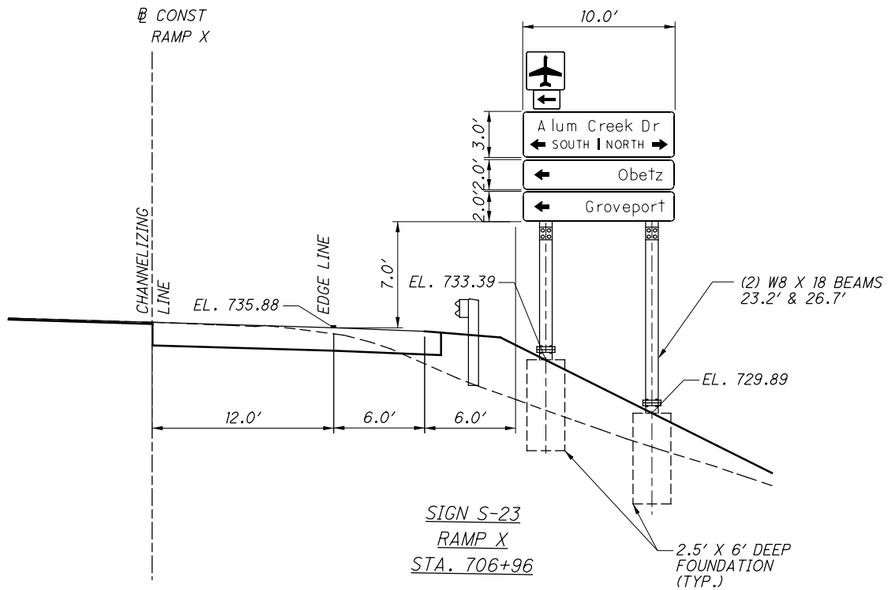
CALCULATED JLM
CHECKED SSK

SIGN ELEVATIONS

FRA-270-49.00



SIGN S-20
RAMP W
STA. 693+35



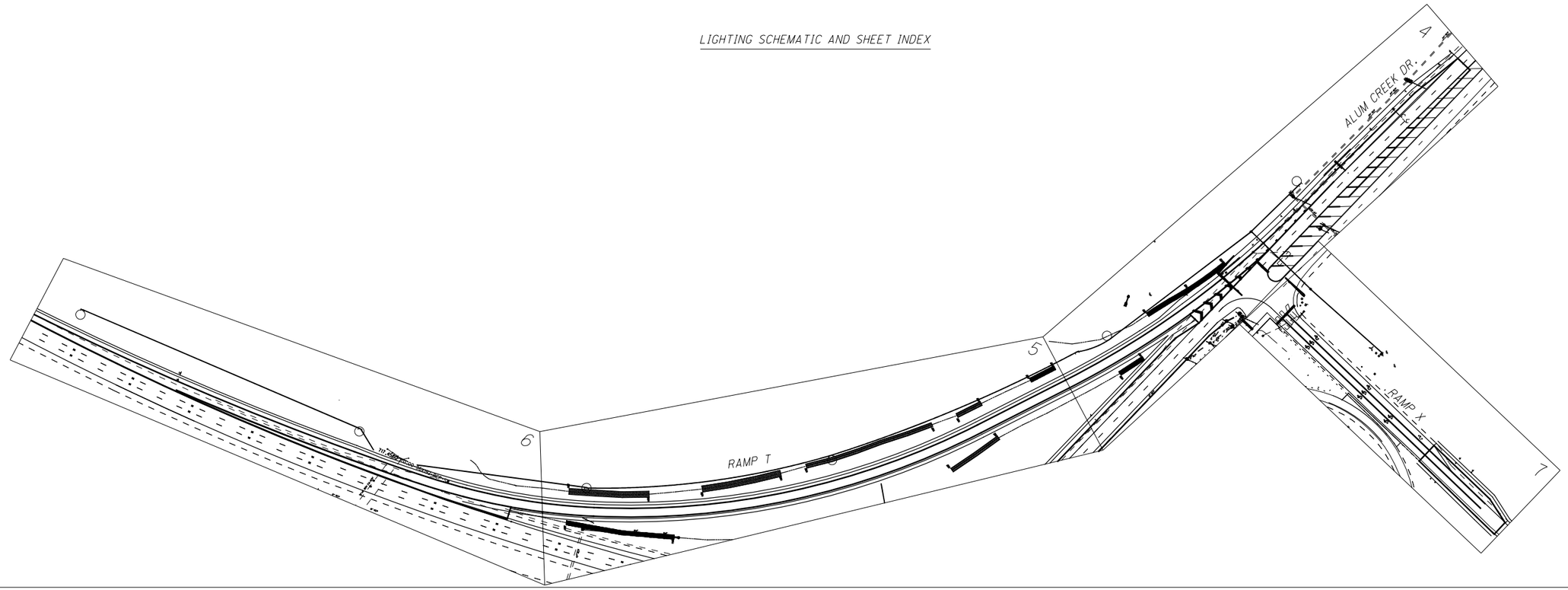
SIGN S-23
RAMP X
STA. 706+96

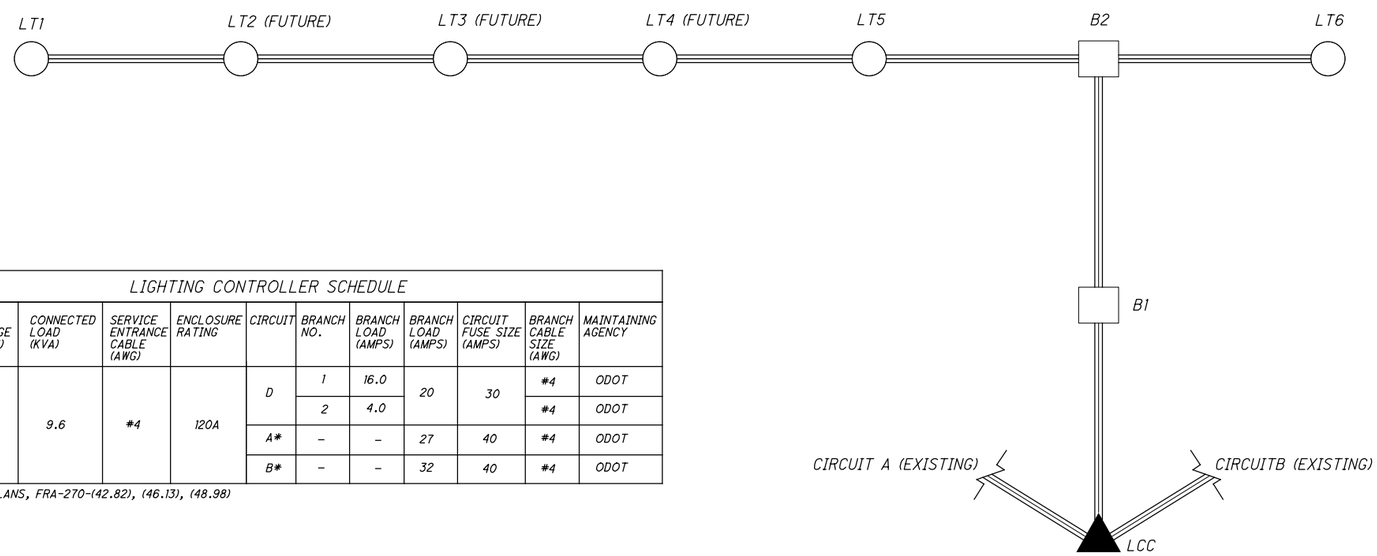
CALCULATED JLM
CHECKED SSK

SIGN ELEVATIONS

FRA-270-49.00

LIGHTING SCHEMATIC AND SHEET INDEX





POWER SERVICE ADDRESS:
4590 ALUM CREEK DR.
COLUMBUS, OH 43207

LIGHTING CIRCUIT DIAGRAM

LIGHTING CONTROLLER SCHEDULE

POWER SERVICE	LINE VOLTAGE (VOLTS)	CONNECTED LOAD (KVA)	SERVICE ENTRANCE CABLE (AWG)	ENCLOSURE RATING	CIRCUIT	BRANCH NO.	BRANCH LOAD (AMPS)	BRANCH LOAD (AMPS)	CIRCUIT FUSE SIZE (AMPS)	BRANCH CABLE SIZE (AWG)	MAINTAINING AGENCY
LCC	480	9.6	#4	120A	D	1	16.0	20	30	#4	ODOT
						2	4.0			#4	ODOT
					A*	–	–	27	40	#4	ODOT
					B*	–	–	32	40	#4	ODOT

* PER LIGHTING PLANS, FRA-270-(42.82), (46.13), (48.98)

CALCULATED SGB
CHECKED ERW

LIGHTING SCHEMATIC AND CIRCUIT DIAGRAM

FRA-270-49.00

LIGHTING OVERVIEW

THE LIGHTING PORTION OF THIS PROJECT CONSISTS OF PROVISION AND INSTALLATION OF NEW HIGH-MAST LIGHTING, COMPLETE WITH ALL ASSOCIATED WIRING, CONDUIT, FOUNDATIONS, HARDWARE, ETC., AND CONNECTION TO EXISTING LIGHTING CONTROLLER, WITH REVISIONS TO THAT CONTROLLER. IN ADDITION, ONE HIGH-MAST TOWER IS TO BE RELOCATED, AND SOME EXISTING LIGHTING IS TO BE REMOVED.

NOTE THAT THERE IS SOME PROVISION FOR MORE LIGHTING TO BE ADDED IN THE FUTURE, BUT NO FOUNDATIONS ARE INCLUDED FOR THE FUTURE LIGHTING.

625, LUMINAIRE, HIGH MAST, AS PER PLAN

THE LUMINAIRE ARRAYS AND ASSOCIATED ILLUMINATION TEST AREAS SPECIFIED IN CMS 725.11 ARE HEREBY WAIVED. INSTEAD, THE LUMINAIRES FOR HIGH MAST LIGHTING SHALL MEET THE FOLLOWING REQUIREMENTS:

LUMINAIRES FOR HIGH-MAST LIGHTING UNITS WITH SYMMETRIC DISTRIBUTION SHALL BE HOLOPHANE "HMST" WITH PHOTOMETRIC DISTRICUTION 36383, GENERAL ELECTRIC "HM" WITH PHOTOMETRIC DISTRIBUTION 6312, OR COOPER "HMX" WITH PHOTOMETRIC DISTRIBUTION HMX4SDW. OR EQUAL AS APPROVED BY THE ENGINEER.

LUMINAIRES FOR HIGH-MAST LIGHTING UNITS WITH ASYMMETRIC DISTRIBUTION SHALL BE HOLOPHANE "HMST" WITH PHOTOMETRIC DISTRIBUTION 46973, GENERAL ELECTRIC "HM" WITH PHOTOMETRIC DISTRIBUTION 7349, OR COOPER "HMC" WITH PHOTOMETRIC DISTRIBUTION HMC4S3D. OR EQUAL AS APPROVED BY THE ENGINEER.

LUMINAIRES FOR HIGH-MAST LIGHTING UNITS WITH LONG NARROW DISTRIBUTION SHALL BE HOLOPHANE "HMST" WITH PHOTOMETRIC DISTRICUTION 36801, GENERAL ELECTRIC "HM" WITH PHOTOMETRIC DISTRIBUTION 8946, OR COOPER "HMC" WITH PHOTOMETRIC DISTRIBUTION HMC4S1DL. OR EQUAL AS APPROVED BY THE ENGINEER.

IN ADDITION, OTHER LUMINAIRES WILL BE CONSIDERED IF THE DESIGNED INTENSITY AND UNIFORMITY ARE PROVIDED USING THE POLE LOCATIONS AND THE DESIGNED NUMBER AND TYPE OF FIXTURES PER POLE.

PADLOCKS AND KEYS

PADLOCKS FURNISHED SHALL BE EITHER BRASS OR BRONZE, EQUAL TO MASTER NO. 4BKA OR WILSON BOHANNAN 660A, AND SHALL BE KEYED IN ACCORDANCE WITH CMS 631.06. PAYMENT SHALL BE INCLUDED IN THE BID FOR ITEM(S) BEING LOCKED.

625, RELOCATION OF EXISTING LIGHT TOWER

THE EXISTING LIGHT TOWER AND LUMINAIRES LOCATED AT STA: 702+80.0 ℄ RAMP T ARE TO BE REMOVED, AND REINSTALLED ON A NEW FOUNDATION AT STA: 701+13.5 ℄ RAMP T

625, LIGHT TOWER FOUNDATION, AS PER PLAN

THE PROPOSED LIGHT TOWER FOUNDATION LOCATED AT STA: 701+13.5 ℄ RAMP T SHALL MEET ALL REQUIREMENTS OF THE CMS AS WELL AS HAVE IDENTICAL ANCHOR BOLT ARRANGEMENT IN RELATION TO BOLT SIZE AND LOCATION AS THE EXISTING FOUNDATION LOCATED AT STA:STA: 704+79.6 ℄ RAMP T

625, PORTION OF LIGHT POLE FOUNDATION REMOVED, AS PER PLAN

THIS ITEM INCLUDES ALL REQUIREMENTS OF CMS 625 "PORTION OF LIGHT POLE REMOVED" WITH THE EXCEPTION OF IT PERTAINING TO THE EXISTING LIGHT TOWER FOUNDATION LOCATED AT STA. 702+80.0 ℄ RAMP T.

625, LIGHT POLE REMOVED FOR REERECTION, AS PER PLAN

THIS ITEM INCLUDES ALL REQUIREMENTS OF CMS 625 "LIGHT POLE REMOVED FOR REERECTION" WITH THE EXCEPTION OF IT PERTAINING TO THE EXISTING LIGHT TOWER LOCATED AT STA. 702+80.0 ℄ RAMP T.

625, LIGHTING MISCELLANEOUS: 3" RMC (725.04) IN TRENCH

THE PROPOSED RMC SHALL MEET ALL OF THE REQUIREMENTS OF CMS 725.04 AND SHALL BE PLACED IN A TRENCH. THE TRENCH SHALL CONFORM TO ODOT STANDARD CONSTRUCTION DRAWING HL-20.11, WITH THE EXCEPTION THAT, WHERE A TRENCH DEPTH OF 24 INCHES IS NOT POSSIBLE DUE TO THE CULVERT, THE TRENCH SHALL EXTEND TO THE TOP OF THE CULVERT.

625, LIGHTING MISCELLANEOUS, REVISE LIGHTING CONTROL CENTER

THE EXISTING LIGHTING CENTER ALONG RAMP X AT STA: 704+26.0 OFFSET: 69.3 IS 2-WIRE, 480 VOLT, 60 AMPERES WITH 2-40 AMP FUSES. EACH FUSE CURRENTLY SERVES ONE CIRCUIT WITH LOADS OF 27.0 AMPS AND 32.0 AMPS RESPECTIVELY. UPGRADE EXISTING CONTROL CENTER TO AN ENCLOSURE RATING OF 120 AMPS INCLUDING THE 2 EXISTING 40-AMP FUSES AND ONE NEW 30 AMP FUSE. THIS ITEM SHALL BE PAID AT A LUMP SUM BID PRICE AND INCLUDES ALL LABOR, PARTS, AND INCIDENTALS NECESSARY TO ACCOMODATE A 2-WIRE, 480 VOLT, 120 AMP SERVICE. THIS ITEM ALSO INCLUDES NEW SERVICE CABLE AND CONNECTIONS.

THIS WORK SHALL CONSIST OF CONVERTING THE EXISTING FLAT RATE POWER SERVICE AT SPECIFIED LOCATION(S) OVER TO METERED POWER SERVICE. REMOVAL OF EXISTING POWER SERVICE MAY INCLUDE BUT NOT LIMITED TO THE MATERIALS AND HARDWARE NORMALLY COMPRISING OF A POWER SERVICE. ALSO, THE AREA SHALL BE CLEARED OF GROWTH AND DEBRIS AT THE LOCATION(S). ANY RESULTANT OPENINGS SHALL BE BACKFILLED TO GRADE WITH SUITABLE COMPACTED SOIL AND RESTORED TO MATCH THE SURROUNDING AREA. ALL MATERIAL REMOVED SHALL BE DISPOSED OF BEYOND THE PROJECT SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION WITH THE POWER COMPANY FOR THE REMOVAL AND CONVERSION OF T HE POWER SERVICE. A UNIQUE POWER SERVICE ADDRESS WILL NEED TO BE ASSIGNED TO EACH LOCATION. THE ADDRESS FOR THIS POWER SERVICE SHALL BE:

4590 ALUM CREEK DRIVE
OBETZ, OH 43207

THE CONTACT PERSON FOR THE OHIO DEPARTMENT OF TRANSPORTATION IS LISTED BELOW:

CHARLIE FISHER
ODOT DISTRICT 6 TRAFFIC ENGINEER
740-833-8267

THE NEW METERS WILL BE PROVIDED BY THE POWER COMPANY AND SHALL BE INSTALLED BY THE CONTRACTOR AT THE LOCATIONS WHERE EXISTING SERVICE IS BEING REMOVED. CHANGEOVER SHALL BE PERFORMED IN A TIMELY FASHION SO THAT LIGHTING WILL BE PRESENT NIGHTLY. THE CONTRACTOR SHALL ASSURE THAT ALL CIRCUITS ARE IN OPERATION.

CALCULATED SGB
CHECKED ERW

LIGHTING NOTES

FRA-270-49.00

AS BUILT - 4/22/2016

LOCATION	STATION	SIDE	ITEM 625																									
			LUMINAIRE, HIGH MAST, ASYMETRIC, 400W HPS, 480 VOLT		LIGHT TOWER, BBBB100		LIGHT TOWER FOUNDATION, 36"X20" DEEP	LIGHT TOWER FOUNDATION, 36"X20" DEEP, AS PER PLAN		NO. 4 AWG 2400 VOLT DISTRIBUTION CABLE		CONNECTION, UNFUSED PERMANENT	3" CONDUIT JACKED OR DRILLED UNDER PAVEMENT	TRENCH, 24" DEEP	PLASTIC CAUTION TAPE		PULLBOX, 725.08, 18"	GROUND ROD	LIGHTING MISC., 3" RMC (725.04) IN TRENCH	1 1/2" DUCT CABLE WITH TWO NO. 4 AWG 5000 VOLT CABLES		LIGHTING MISC.: REVISE LIGHTING CONTROL CENTER		PORTION OLF LIGHT POLE FOUNDATION REMOVED, AS PER PLAN	LIGHT POLE REMOVED FOR REERECTION, AS PER PLAN	RE-ERECT EXISTING LIGHT TOWER	PORTION OF LIGHT POLE FOUNDATION REMOVED	LUMINAIRE REMOVED	LIGHT POLE REMOVED
			EACH		EACH		EACH	EACH		FT		EACH	FT	FT	FT		EACH	EACH	FT	FT		LUMP		EACH	EACH	EACH	EACH	EACH	EACH
IR 270	680+72.6	LT	4		1		1											2										
IR 270	680+72.6 686+78.0 (RAMP T)	RT												600	600					620								
RAMP T	686+78.0	LT										2					1											
RAMP T	686+78.0 687+60.0	LT												80	80				80	90								
RAMP T	687+60.0	LT										2					1											
RAMP T	687+60.0 700+50.0	LT												1255	1255					1265								
RAMP T	700+50.0	LT	4		1		1											2										
RAMP T	700+50.0 166+75.4 (ALUM CREEK)	LT												390	390					400								
RAMP T	702+80.0	LT																						1	1			
ALUM CREEK DRIVE	166+75.4	RT										2					1	1										
ALUM CREEK DRIVE	166+75.4 168+00.0	LT												125	125					135								
ALUM CREEK DRIVE	168+00.0	LT						1										2							1			
ALUM CREEK DRIVE	166+75.4 166+75.4	RT/LT								320			150		150													
ALUM CREEK DRIVE	166+75.4	RT										2					1	1										
ALUM CREEK DRIVE	166+75.4 704+25.8 (RAMP X)	RT												175	175					185								
RAMP X	704+26.0	LT																				1						
ALUM CREEK DRIVE	167+58.8	LT																								1	1	1
ALUM CREEK DRIVE	169+62.7	LT																								1	1	1
TOTALS CARRIED TO GENERAL SUMMARY			8		2		2	1		320		8	150	2625	2775		4	8	80	2695		1		1	1	1	2	2	2

AS PER PLAN

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CALCULATED SGB CHECKED ERW

LIGHTING SUBSUMMARY

FRA-270-49.00

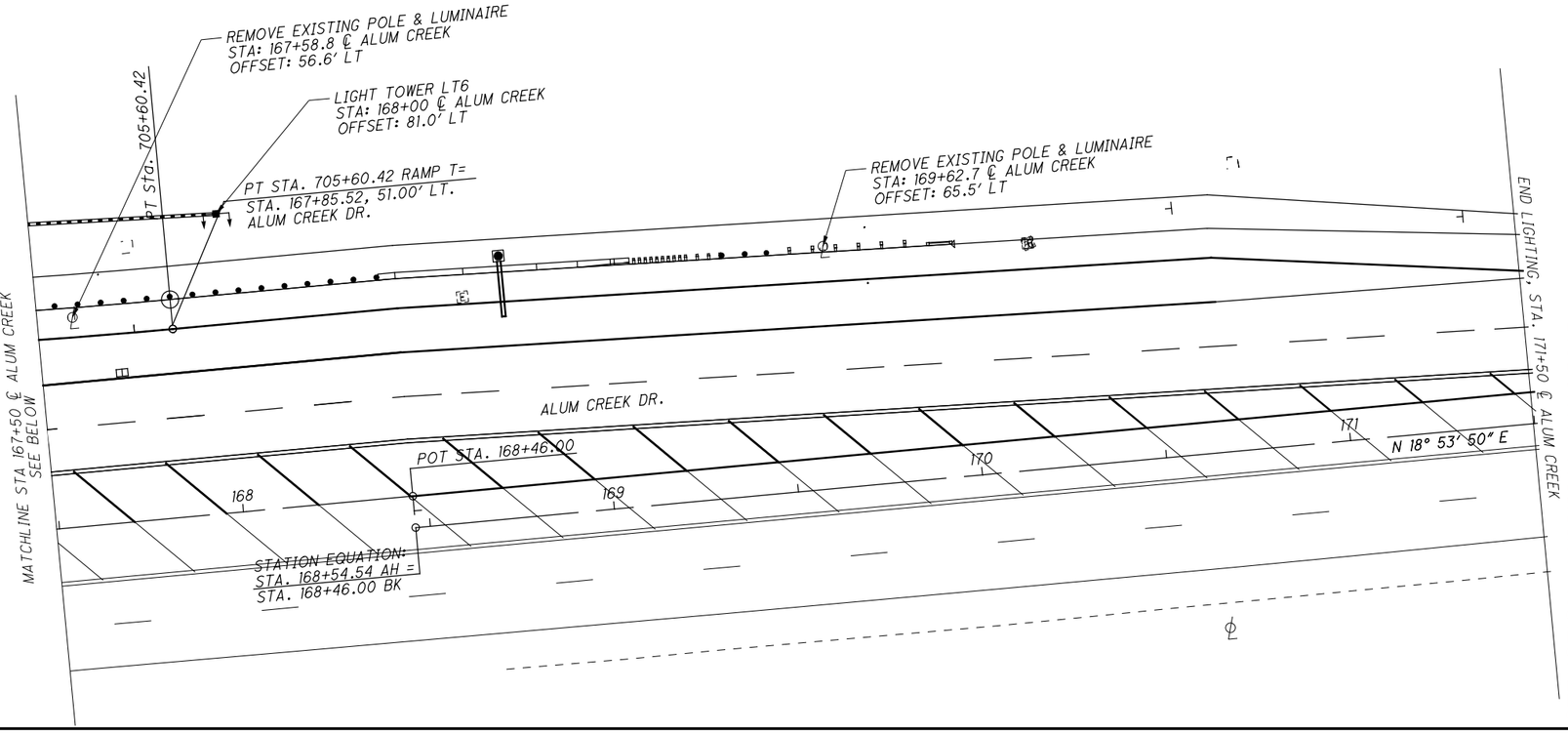
121
182

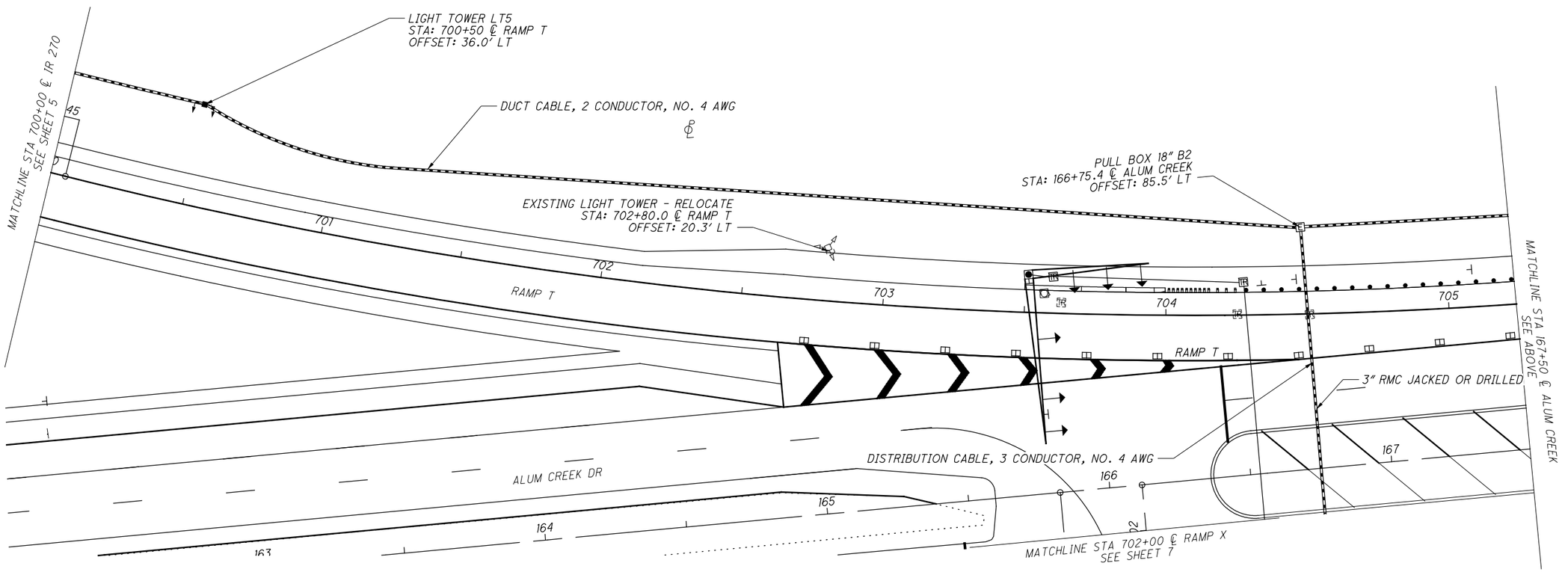
BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

AS BUILT - 4/22/2016

LEGEND

- LUMINAIRE, HIGH MAST, ASYMMETRIC LUMINAIRE, BBBB100
- LIGHT TOWER LOCATION TO BE INSTALLED AT A FUTURE DATE IF INTERCHANGE IS UPGRADED TO CONTINUOUS LIGHTING
- LIGHT TOWER LTX (FUTURE)
- LIGHT TOWER NUMBER
- E ELECTRICAL PULL BOX
- PROPOSED DUCT CABLE, UNLESS OTHERWISE NOTED





HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED SGB
CHECKED ERW

BU 4,5,6,7&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

LIGHTING PLAN
ALUM CREEK DR.

FRA-270-49.00

122
182

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AS BUILT - 4/22/2016

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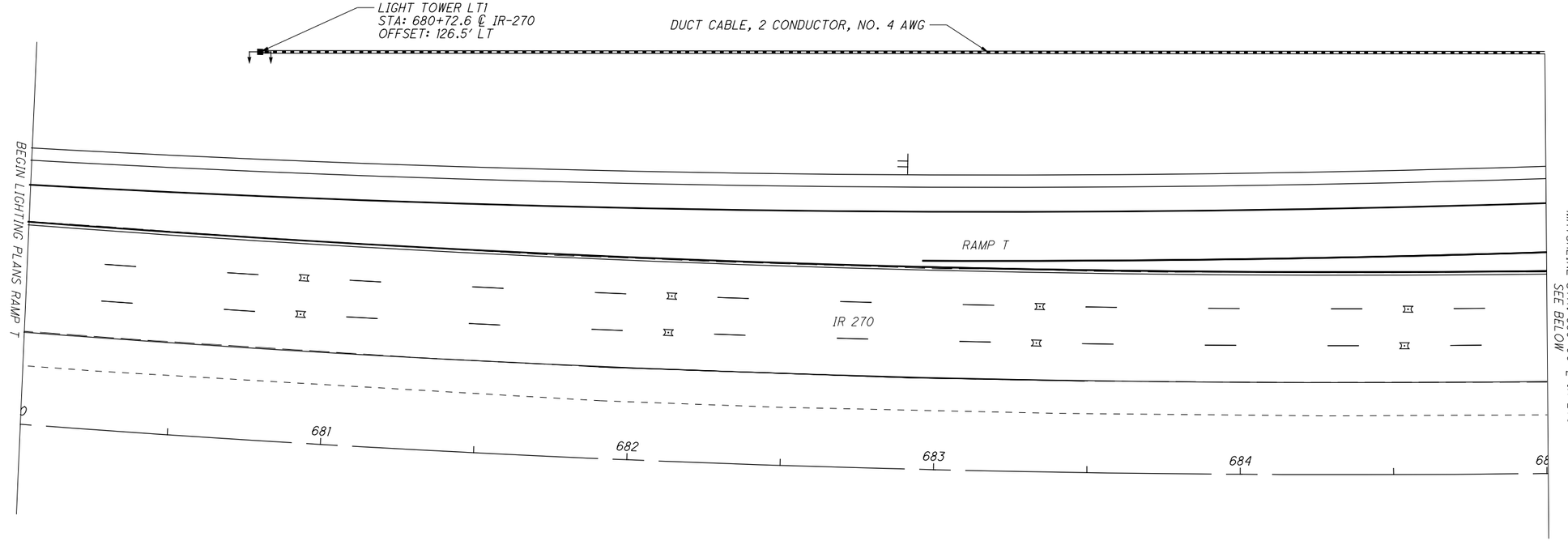
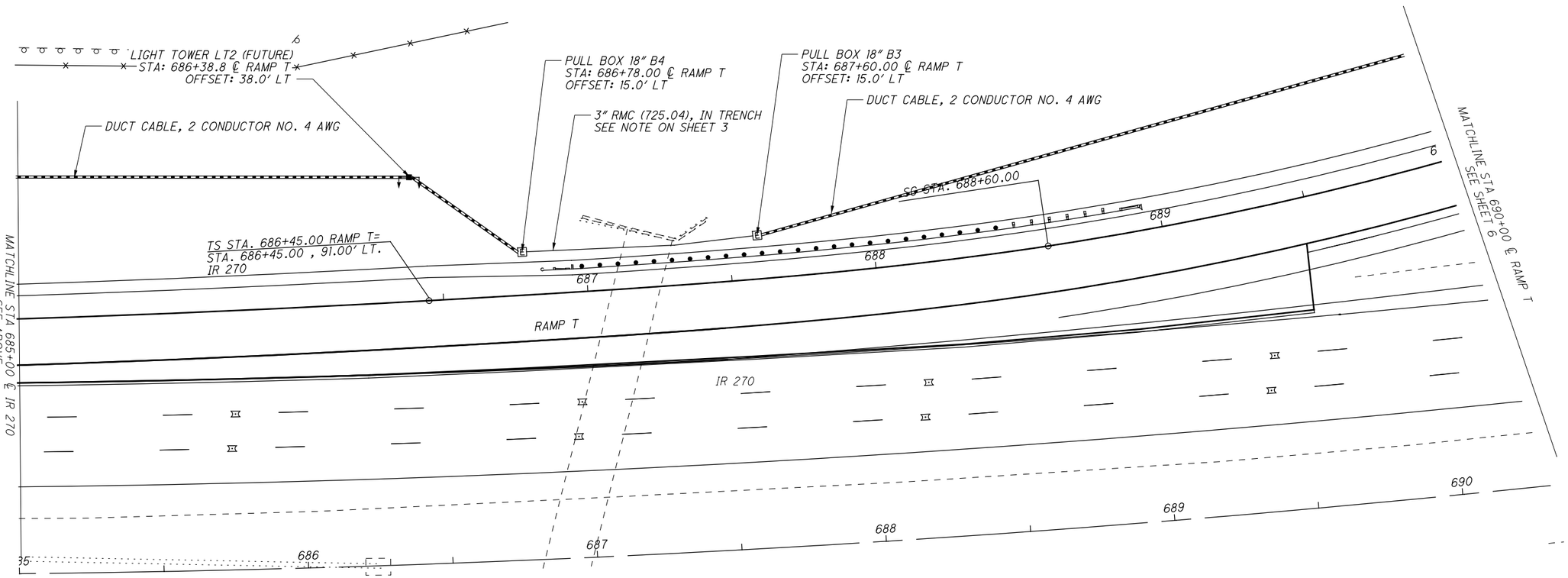




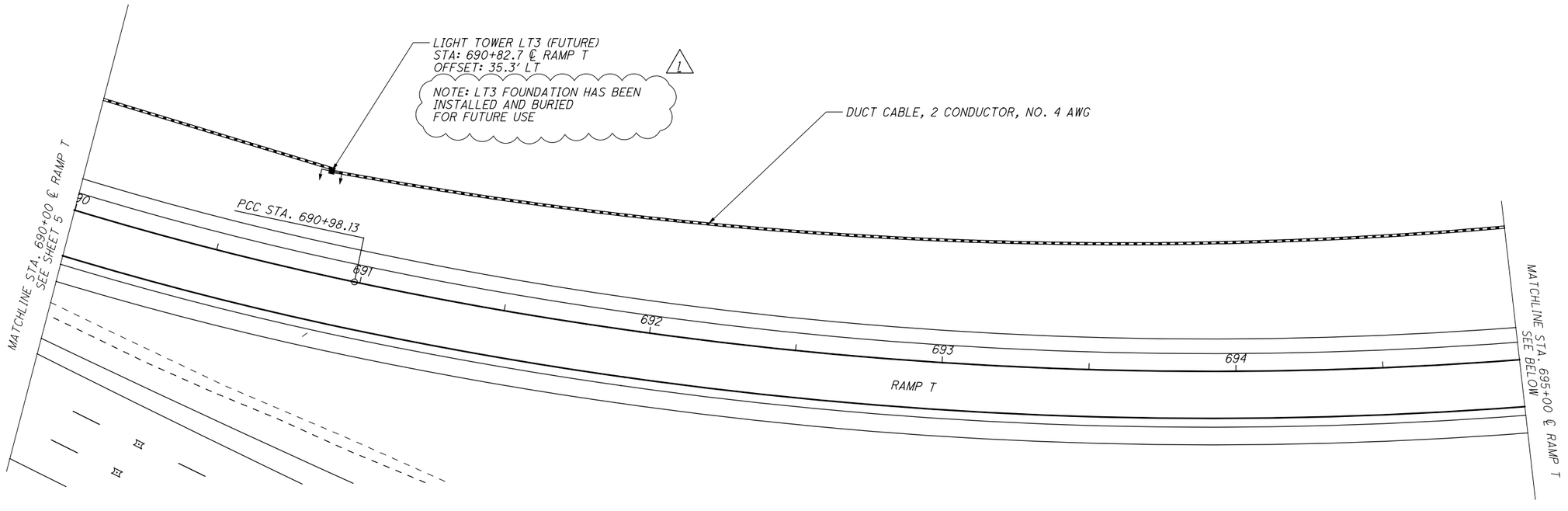
BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

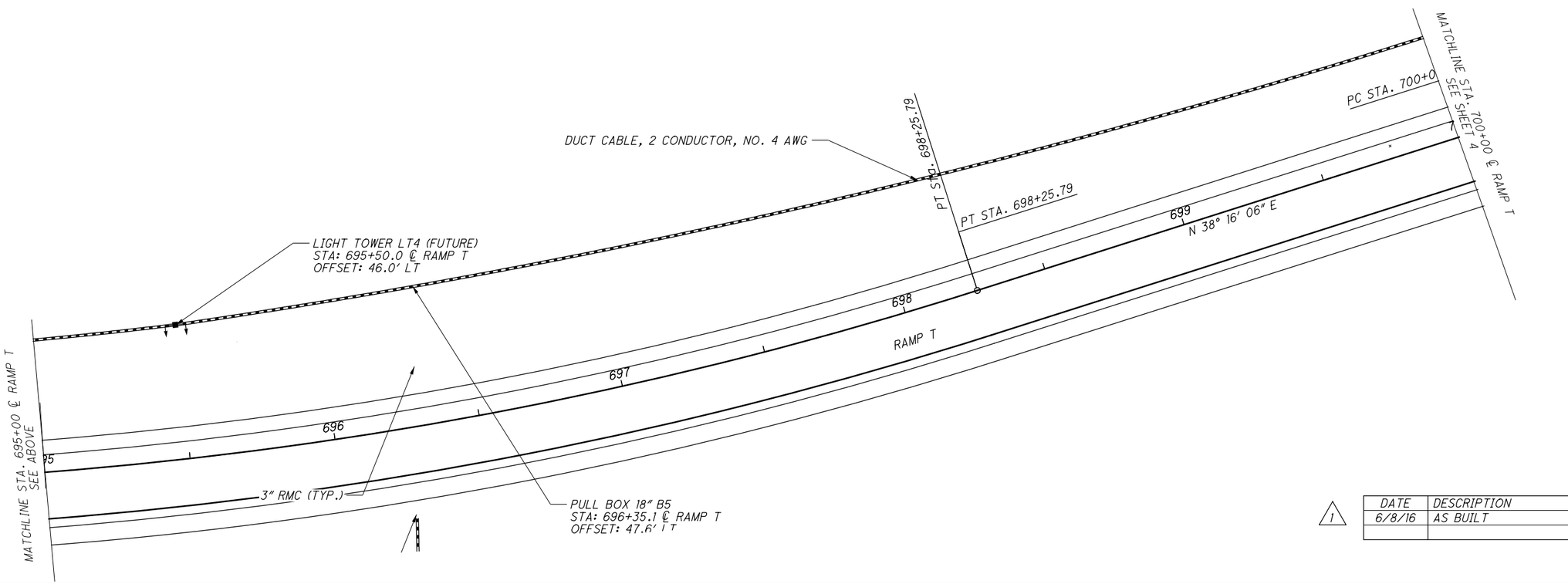
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED SGB
CHECKED ERW

LIGHTING PLAN: RAMP T
BEGIN LIGHTING TO 690+00

FRA-270-49.00





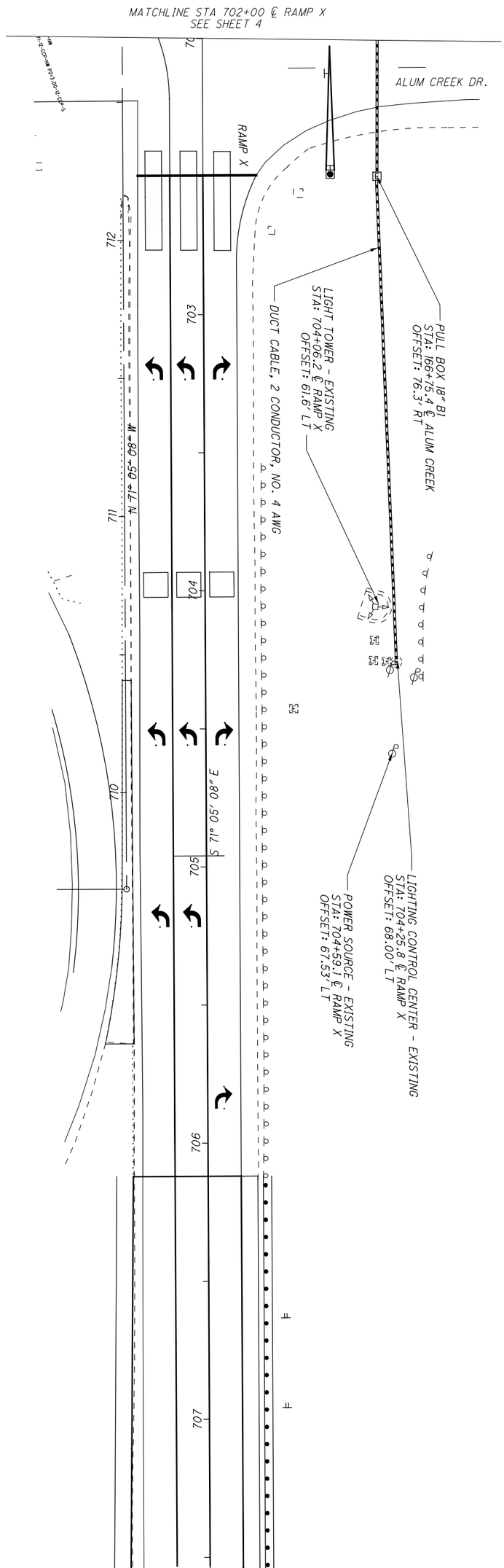
	DATE	DESCRIPTION
1	6/8/16	AS BUILT

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED SGB
CHECKED ERW

LIGHTING PLAN: RAMP T
STA. 690+00 TO STA. 700+00

FRA-270-49.00



125
182

FRA-270-49.00

LIGHTING PLAN: RAMP X
BEGIN CONSTRUCTION TO END OF RAMP X

CALCULATED SGB
CHECKED ERW

0 10 20 40
HORIZONTAL SCALE IN FEET

TRAFFIC SIGNAL NOTES

NEW TRAFFIC SIGNAL INSTALLATION

THIS WORK CONSISTS OF FURNISHING AND INSTALLING TRAFFIC SIGNAL EQUIPMENT, COMPLETE AND READY FOR SERVICE. THIS WORK ALSO INCLUDES NECESSARY EXCAVATION AND BACKFILL, DISPOSAL OF DISCARDED MATERIALS, RESTORATION OF DISTURBED FACILITIES AND SURFACES TO A CONDITION EQUAL TO THAT EXISTING BEFORE THE WORK STARTED, AND ELECTRICAL TESTING AS SPECIFIED.

PULL BOXES, CONDUITS, GROUND RODS, AND CABLE SPLICING KITS REQUIRED FOR TRAFFIC SIGNAL EQUIPMENT INSTALLATIONS ARE SPECIFIED IN ITEM 625. BEFORE ANY WORK IS STARTED ON THE TRAFFIC SIGNAL, THE DISTRICT SIX TRAFFIC ENGINEER (740-833-8198) AND THE CONTRACTORS REPRESENTATIVE SHALL REVIEW AND RESOLVE ANY POTENTIAL PROBLEMS AT THE LOCATION WHERE THE NEW SIGNAL WILL BE CONSTRUCTED.

ALL OF THE REQUIRED PERMANENT SIGNS SHALL BE ERECTED AND THE REQUIRED PAVEMENT MARKINGS SHALL BE IN PLACE PRIOR TO THE FINAL ACCEPTANCE OF THE TRAFFIC SIGNAL.

PRIOR TO THE FINAL ACCEPTANCE OF THE COMPLETED SIGNAL, THE DISTRICT SIX ROADWAY SERVICES REPRESENTATIVE AND THE CONTRACTORS REPRESENTATIVE, SHALL INSPECT AND RESOLVE ANY EXISTING PROBLEMS PRIOR TO THE ACCEPTANCE OF EACH NEW SIGNAL BY THE OHIO DEPARTMENT OF TRANSPORTATION.

MAINTENANCE OF TRAFFIC SIGNAL INSTALLATIONS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC SIGNAL INSTALLATIONS WITHIN THE PROJECT UNDER THE FOLLOWING CIRCUMSTANCES:

1. EXISTING SIGNAL INSTALLATION WHICH THE PLANS REQUIRE THE CONTRACTOR TO ADJUST, MODIFY, ADD ONTO OR REMOVE OR WHICH THE CONTRACTOR ACTUALLY ADJUSTS, MODIFIES, OR OTHERWISE DISTURBS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENTIRE INSTALLATION (AT AN INTERSECTION) FROM THE TIME THE CONTRACTOR'S OPERATIONS FIRST DISTURB THE INSTALLATION UNTIL THE INSTALLATION HAS BEEN SUBSEQUENTLY REMOVED OR MODIFIED AND THE WORK IS ACCEPTED.

2. NEW SIGNAL INSTALLATION OR DEVICE, INSTALLED BY THE CONTRACTOR: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THIS FROM THE TIME OF INSTALLATION UNTIL THE WORK IS ACCEPTED.

THE CONTRACTOR SHALL CORRECT AS QUICKLY AS POSSIBLE ALL OUTAGES OR MALFUNCTIONS AND PROVIDE THE MAINTAINING AGENCY AND THE ENGINEER SUCH WITH THE NAME(S) AND THE PHONE NUMBER(S) OF THE CONTRACTORS REPRESENTATIVE(S) TO RECEIVE ALL CALLS AND DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MUST GIVE PROMPT ATTENTION TO THESE CALLS AND BE READILY AVAILABLE CONTINUOUSLY 24 HOURS A DAY, 7 DAYS A WEEK. ALL LAMP OUTAGES, CABLE OUTAGES, ELECTRICAL FAILURES, EQUIPMENT MALFUNCTIONS AND MISALIGNED SIGNAL HEADS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN FOUR HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF AN OUTAGE.

IN THE EVENT NEW SIGNALS ARE DAMAGED PRIOR TO ACCEPTANCE, ALL DAMAGED EQUIPMENT EXCEPT POLES AND CONTROL EQUIPMENT SHALL BE REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER WITH THE NEW SIGNAL BACK IN SERVICE WITHIN 8 HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF THE OUTAGE. THE CONTRACTOR SHALL ARRANGE FOR FULL TRAFFIC CONTROL UNTIL THE SIGNAL IS BACK IN OPERATION.

IF POLES AND/OR CONTROLLERS ARE DAMAGED AND MUST BE REPLACED, THE CONTRACTOR SHALL MAKE TEMPORARY REPAIRS AS NECESSARY TO BRING THE SIGNAL BACK INTO OPERATION WITHIN THE ALLOWED 8 HOUR TIME PERIOD, AND SHALL MAKE PERMANENT REPAIRS OR REPLACEMENT AS SOON THEREAFTER AS POSSIBLE.

NONE OF THE ABOVE SHALL BE CONSTRUED AS COLLECTIVE OR CONSECUTIVE OUTAGE TIME PERIODS AT ANY ONE LOCATION. THAT IS, WHERE MORE THAN ONE OUTAGE OCCURS AT ANY ONE LOCATION THEN THE ALLOTTED TIME LIMIT SHALL BE FOR THE WORST SINGLE OUTAGE.

WHERE OUTAGES ARE THE DIRECT RESULT OF A VEHICLE ACCIDENT THE RESPONSE OF THE CONTRACTOR SHALL BE AS OUTLINE ABOVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COLLECTION OF ANY COMPENSATION FOR THIS WORK FROM THOSE PARTIES RESPONSIBLE FOR THE DAMAGE.

WHERE THE CONTRACTOR HAS FAILED OR CANNOT RESPOND TO AN OUTAGE OR SIGNAL EQUIPMENT MALFUNCTION, AT THESE LOCATIONS WITHIN HIS RESPONSIBILITY, WITHIN PERIODS AS SPECIFIED ABOVE, THE ENGINEER MAY INVOKE THE PROVISIONS OF SECTION 105.15 AND ANY SUBSEQUENT BILLINGS TO THE STATE FOR POLICE SERVICES AND MAINTENANCE SERVICES BY THE PROVIDING AGENCY FORCES SHALL BE DEDUCTED FROM MONIES DUE OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF SECTION 105.15. ANY VEHICULAR TRAFFIC SIGNAL HEAD EITHER NEW OR EXISTING THAT WILL BE OUT OF OPERATION SHALL BE COVERED IN THE MANNER DESCRIBED IN 632.25. THE CONTRACTOR SHALL MAINTAIN COMPLETE RECORDS OF MALFUNCTIONS INCLUDING:

1. TIME OF NOTIFICATION OF MALFUNCTION;
2. TIME OF WORK CREWS ARRIVAL TO CORRECT MALFUNCTION;
3. ACTIONS TAKEN TO CORRECT THE MALFUNCTION, INCLUDING A LIST OF PARTS REPAIRED AND REPLACED;
4. A DIAGNOSIS OR REASON FOR THE MALFUNCTION AND PROBABILITY OF REOCCURRENCE;
5. TIME OF COMPLETION OF THE REPAIR AND SYSTEM RESTORED TO FULL SERVICE;

A COPY OF THESE RECORDS SHALL BE PROVIDED TO THE ENGINEER WITHIN THREE (3) WORKING DAYS FOLLOWING COMPLETION OF EACH REPAIR.

ALL COSTS RESULTING FROM THE ABOVE REQUIREMENTS SHALL BE CONSIDERED TO BE INCLUDING IN THE LUMP SUM PRICE BID FOR ITEM 614, MAINTAINING TRAFFIC.

GROUNDING AND BONDING

THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (CMS) AND THE TC SERIES OF STANDARD CONSTRUCTION DRAWINGS ARE MODIFIED AS FOLLOWS:

1. ALL METALLIC PARTS CONTAINING ELECTRICAL CONDUCTORS SHALL BE PERMANENTLY JOINED TO FORM AN EFFECTIVE GROUND FAULT CURRENT PATH BACK TO THE GROUNDED CONDUCTOR IN THE POWER SERVICE DISCONNECT SWITCH.

   A. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN METALLIC CONDUITS (725.04) IN ADDITION TO THE CONDUCTORS SPECIFIED AND BOND THE CONDUIT TO THIS GROUNDING CONDUCTOR.
   B. WHEN AN EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED IN PLASTIC CONDUIT (725.05), THE INSTALLATION SHALL INCLUDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN ADDITION TO THE CONDUCTORS SPECIFIED.
   C. METALLIC CONDUIT CARRYING THE LOOP WIRES FROM IN THE PAVEMENT TO THE PULL BOX SPLICE LOCATION WILL ONLY BE BONDED AT THE PULL BOX END, AND WILL NOT CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR.
   D. IF MULTIPLE CONDUIT RUNS BEGIN AND END AT THE SAME POINTS, ONLY ONE EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED.
   E. IF AN EQUIPMENT GROUNDING CONDUCTOR IS NEEDED IN CONDUIT BETWEEN SIGNALIZED INTERSECTIONS FOR UNDERGROUND INTERCONNECT CABLE, THE GROUNDING SYSTEM FOR EACH SIGNALIZED INTERSECTION WILL BE SEPARATED ABOUT MIDWAY BETWEEN THE INTERSECTIONS.
   F. THE MESSENGER WIRE AT SIGNALIZED INTERSECTIONS WILL BE USED AS THE CONDUCTIVE PATH FROM CORNER TO CORNER IF CONDUIT IS NOT PROVIDED UNDER THE ROADWAY. WHEN CONDUIT CONNECTS THE CORNERS OF AN INTERSECTION, AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE USED IN THE CONDUIT.

2. CONDUITS.
   A. THE 725.04 CONDUIT SHALL HAVE GROUNDING BUSHINGS INSTALLED AT ALL TERMINATION POINTS. THE BUSHING MATERIAL SHALL BE COMPATIBLE WITH GALVANIZED STEEL CONDUIT AND THE GROUNDING LUG MATERIAL SHALL BE COMPATIBLE FOR USE WITH COPPER WIRE. THREADED OR COMPRESSION TYPE BUSHINGS MAY BE USED.
   B. THE 725.05 CONDUIT SHALL HAVE THE INSIDE AND OUTSIDE DIAMETERS OF THE CONDUIT DEBURRED AT ALL TERMINATION POINTS.
   C. BOTH ENDS OF METALLIC CONDUIT SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.
   D. METALLIC CONDUIT MAY BE BONDED TO METALLIC BOXES THROUGH THE USE OF CONDUIT FITTINGS UL APPROVED FOR THIS TYPE OF CONNECTION, WITH THE BOX BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.

3. WIRE FOR GROUNDING AND BONDING.
   A. USE INSULATED, COPPER WIRE FOR THE EQUIPMENT GROUNDING CONDUCTOR. BONDING JUMPERS IN BOXES AND ENCLOSURES MAY BE BARE OR INSULATED COPPER WIRE. WIRE SIZE SHALL BE AS FOLLOWS:
      I. USE 4 AWG BETWEEN THE POWER SERVICE AND SUPPORTS, POLES, PEDESTALS, CONTROLLER OR FLASHER CABINETS.
      II. USE A MINIM UM 8 AWG BETWEEN LOOP DETECTOR PULL BOXES AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.
      III. USE A MINIMUM 8 AWG BETWEEN THE "PREPARE TO STOP WHEN FLASHING" INSTALLATION (INCLUDING SUPPORT) AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.
      IV. THE INSULATION SHALL BE GREEN OR GREEN WITH YELLOW STRIPE(S). FOR 4 AWG OR LARGER, INSULATION MAY ALSO BE BLACK WITH GREEN TAPE/LABELS INSTALLED AT ALL ACCESS POINTS.
   B. IN A HIGHWAY LIGHTING SYSTEM, THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE THE SAME WIRE SIZE AS THE DUCT CABLE OR DISTRIBUTION CABLE CIRCUIT CONDUCTORS, WITH THE MINIMUM CONDUCTOR SIZE OF 4 AWG. BONDING JUMPERS WILL BE MINIMUM SIZE 4 AWG.

4. GROUND ROD.
   A. A ¾ INCH SCHEDULE 40 PVC CONDUIT WILL BE USED IN FOUNDATIONS AND CONCRETE WALLS FOR THE GROUNDING CONDUCTOR (GROUND WIRE) RACEWAY TO THE GROUND ROD. SHOULD METALLIC CONDUIT BE USED, BOTH ENDS OF THE CONDUIT SHALL BE BONDED TO THE GROUNDING CONDUCTOR.
   B. THE TYPICAL GROUNDING CONDUCTOR (GROUND WIRE) SHALL BE 4 AWG INSULATED, COPPER.

5. THE GREEN CONDUCTOR IN SIGNAL CABLES (CONDUCTOR #4) SHALL NOT BE USED TO SUPPLY POWER TO A SIGNAL INDICATION. IT WILL BE CONNECTED TO THE SIGNAL BODY AS AN EQUIPMENT GROUND IN ALUMINUM HEADS AND IT WILL BE UNUSED IN PLASTIC HEADS. UNUSED CONDUCTORS SHALL BE GROUNDED IN THE CABINET. TYPICAL USE OF CONDUCTORS IS AS FOLLOWS:

COND. NO.	COLOR	VEHICLE SIGNAL	PEDESTRIAN SIGNAL
1	BLACK	GREEN BALL	#1 WALK
2	WHITE	AC NEUTRAL	AC NEUTRAL
3	RED	RED BALL	#1 DW/FDW
4	GREEN	EQUIPMENT GROUND	QUIPMENT GROUND
5	ORANGE	YELLOW BALL	#2 DW/FDW
6	BLUE	GREEN ARROW	#2 WALK
7	WHITE/BLACK STRIPE	YELLOW ARROW	NOT USED

6. POWER SERVICE AND DISCONNECT SWITCH.
   A. AT THE POWER SERVICE LOCATION, THE GROUNDING CONDUCTOR (GROUND WIRE) FROM THE DISCONNECT SWITCH NEUTRAL (AC-) BAR TO THE GROUND ROD SHALL BE A CONTINUOUS, UNSPLICED CONDUCTOR. IF SPLICED, IT SHALL BE AN EXOTHERMIC WELD BUTT SPICE.
   B. THE SERVICE NEUTRAL (AC-) SHALL ONLY BE CONNECTED TO GROUND AT THE PRIMARY POWER SERVICE DISCONNECT SWITCH.
      I. NEMA CONTROLLER CABINETS: IF A POWER SERVICE DISCONNECT SWITCH IS LOCATED BEFORE THE CONTROLLER CABINET, THE NEUTRAL (AC-) AND THE GROUNDING BARS IN THE CONTROLLER CABINET SHALL NOT BE CONNECTED TOGETHER AS SHOWN IN NEMA TS-2, FIGURE 5-4.
      II. IF SECONDARY DISCONNECT SWITCHES ARE CONNECTED AFTER THE PRIMARY DISCONNECT SWITCH, THE NEUTRAL (AC-) SHALL ONLY BE GROUNDED AT THE PRIMARY SWITCH. EQUIPMENT GROUNDING CONDUCTORS SHALL BE BROUGHT TO THE PRIMARY SWITCH, BUT SHALL BE GROUNDED AT BOTH SECONDARY AND PRIMARY SWITCHES.

614 MAINTAINING TRAFFIC, MISC.: TEMPORARY SIGNAL DETECTION

THE CONTRACTOR SHALL PROVIDE TEMPORARY DETECTION FOR THE EXISTING TRAFFIC SIGNALS WITHIN THE PROJECT AREA AS NEEDED TO MAINTAIN PROPER SIGNAL OPERATION THROUFHOUT ALL PHASES OF CONSTRUCTION.

DETECTION CAN BE ACCOMPLISHED THROUGH THE USE OF LOOP, VIDEO, OR RADAR DETECTION OR ANY COMBINATION OF THESE. THIS ITEM INCLUDES ALL MATERIALS AND LABOR FOR THE INSTALLATION OF THE TEMPORARY DETECTION AND ANY MODIFICATION REQUIRED TO PROVIDE PROPER SIGNAL OPERATION FOR EACH PHASE OF CONSTRUCTION.

632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN

TRAFFIC SIGNAL INSTALLATIONS, INCLUDING SIGNAL HEADS, CABLE, MESSENGER WIRE, STRAIN POLES, CABINET, CONTROLLER, ETC., SHALL BE REMOVED IN ACCORDANCE WITH CMS 632.26 AND AS INDICATED ON THE PLANS.

THE CONTRACTOR SHALL CONTACT CHARLES FISHER 740.833.8267 WHEN THE FOLLOWING ITEMS LISTED BELOW ARE READY FOR PICK UP. THESE ITEMS SHALL BE STORED SAFELY UNTIL THEY ARE PICKED UP BY ODOT DISTRICT 6.

- CONTROLLER CABINETS ANd ALL CONTENTS
- VIDEO DETECTION UNITS AND ALL ASSOCIATED EQUIPMENT
- UPS CAPINETS ADN ALL CONTENTS
- VEHICULAR SIGNAL HEADS (EB RAMP ONLY)

IN THE EVENT THE ITEMS ARE NOT SALVAGED BY THE ENGINEERS OFFICE THE CONTRACTOR SHALL, WHEN DIRECTED BY THE ENGINEER IN WRITING, REMOVE AND DISPOSE OF THE ITEMS AT NO ADDITIONAL COST TO THE PROJECT.

632 SIGNAL SUPPORT, (BY TYPE), BY DESIGN, AS PER PLAN

POLE LOCATIONS HAVE BEEN INDICATED AS ACCURATELY AS POSSIBLE. IN NO CASE SHALL THE CLEARANCE FROM THE FACE OF CURB TO THE POLE, PEDESTRIAN SIGNAL, SIGN OR OTHER PROPOSED ITEMS BE LESS THAN 2 FT.

SIGNAL MAST ARM POLES SHALL MEET THE REQUIREMENT OF 732.11. POLES AND MAST ARMS SHALL BE PAINTED BLACK AND SHALL BE GALVANIZED PER ITEM 711.02.

632 VEHICULAR SIGNAL HEAD, LED, BLACK, (BY TYPE), WITH BACK PLATE, AS PER PLAN:

IN ADDITION TO THE REQUIREMENTS OF CMS 632 AND 732, THE FOLLOWING SHALL APPLY:

1. SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED OF BLACK POLYCARBONATE PLASTIC WITH VISORS AS SPECIFIED AND MEET ITE SPECIFICATIONS.
2. PROPER EXTERIOR COLORS SHALL BE OBTAINED BY USE OF COLORED PLASTIC MATERIAL RATHER THAN PAINTING.
3. ALL UPPER SIGNAL SUPPORT HARDWARE AND PIPING UP TO AND INCLUDING THE WIRE INLET FITTING SHALL BE FERROUS METAL.
4. THE ENTRANCE FITTING SHALL BE OF THE TRI-STUD DESIGN WITH SERRATED RINGS IN ORDER TO ACHIEVE POSITIVE LOCKING.
5. ALUMINUM BACKPLATES SHALL BE IN ACCORDANCE WITH CMS 732.22 AND INCLUDE A FLOURESCENT YELLOW REFLECTIVE BORDER.
6. THE LIGHT EMITTING DIODE (LED) SIGNAL LAMP UNITS SHALL MEET THE REQUIREMENTS OF CMS 732.04-C. THE CONTRACTOR SHALL PROVIDE ODOT, IN WRITING, WITH THE LED MANUFACTURER NAME, SERIAL NUMBER, PART NUMBER, DESCRIPTION OF LAMP, AND DATE OF MANUFACTURE FOR ALL LED UNITS THAT ARE TO BE USED IN THE SIGNAL HEAD PRIOR TO INSTALLATION, FOR ACCEPTANCE AND WARRANTY PURPOSES.
7. SIGNAL HEADS SHALL HAVE A MINIMUM WALL THICKNESS OF 0.117 INCHES.
8. SIGNAL HEADS SHALL INCLUDE CUTAWAY TYPE VISORS
9. APPLY A BEAD OF SILICONE TO THE SIGNAL HEAD, WASHER, AND ENTRANCE ADAPTER SERRATIONS TO PREVENT WATER INTRUSION. ALSO, FILL THE SPACE BETWEEN CONCENTRIC SERRATION RINGS ON THE TOP OF THE SIGNAL HEAD TO COMPLETELY EXCLUDE WATER FROM THE SPACE BETWEEN THE CONCENTRIC RINGS.

CALCULATED SGB CHECKED ERW

TRAFFIC SIGNAL NOTES

FRA 270-49.00

TRAFFIC SIGNAL NOTES

632 SIGNALIZATION, MISC.: CDMA MODEM, FURNISH ONLY

FURNISH A CDMA MODEM, TWO ANTENNAS WITH A 10-FOOT CABLE, AND A 10-FOOT ETHERNET CABLE FOR REMOTE WIRELESS CELLULAR COMMUNICATION. FOR NETWORK CONSISTENCY CDMA MODEMS SHALL BE THE SIERRA WIRELESS AIRLINK GX440 ETHERNET MODEL.

THIS ITEM SHALL INCLUDE THE FURNISHING OF A COMTROL ROCKETLINX ES8105 ETHERNET SWITCH WITH ALL POWER SUPPLIES NECESSARY TO FUNCTION.

THIS ITEM SHALL INCLUDE THE FURNISHING AND INSTALLATION OF A MOUNTING BRACKET FOR THE ANTENNA WITH ALL NECESSARY HARDWARE INCLUDING BUT NOT LIMITED TO SPRING NUTS, WASHERS, AND BOLTS THAT INSTALLS TO THE MOUNTING CHANNEL ON THE SIDE OF THE SIGNAL CABINET.

THE CDMA MODEM EQUIPMENT AND ETHERNET SWITCH SHALL BE DELIVERED TO ODOT DISTRICT 6 TRAFFIC FOR PROGRAMMING AND INSTALLATION.

ODOT DISTRICT 6 TRAFFIC
ATTN: KRAIG SHREWSBERRY
400 E. WILLIAM ST.
DELAWARE, OH 43015

THE CONTRACTOR SHALL PROVIDE THE MODEM SERIAL NUMBERS AND NECESSARY ESN NUMBERS FOR ODOT TO ESTABLISH WIRELESS SERVICE.

ITEM - 632 POWER SERVICE

THE CONTRACTOR SHALL CONTACT THE METER SECTION OF AMERICAN ELECTRIC POWER FOR INFORMATION REGARDING THE METER BASE INSTALLATION PRIOR TO ORDERING POLES. THE CONTRACTOR WILL BE RESPONSIBLE FOR REQUESTING AND SCHEDULING ANY INSPECTIONS THE POWER COMPANY MAY REQUIRE FOR THE POWER SERVICE HOOP UP. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE POWER COMPANY FOR THE ELECTRICAL SERVICE CONNECTION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR SPLICE POWER CABLE TO THE POWER COMPANY'S CIRCUITS. THE VOLTAGE SUPPLIED SHALL BE NOMINALLY 120 VOLTS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS AND THE PAYING OF ALL FEES WITH THE EXCEPTION OF NORMAL MONTHLY ENERGY CHARGES. THE CONTRACTOR SHALL COORDINATE WITH THE POWER COMPANY TO CONTINUE BILLING ON THE EXISTING DISTRICT 6 ACCOUNT.

THE EXISTING SIGNAL ADDRESS ARE TO BE MAINTAINED:
FRA-270 WB RAMPS & ALUM CREEK DR.
4600 ALUM CREEK DR.
COLUMBUS, OH 43207
FRA-270 EB RAMPS ALUM CREEK DR.
4701 ALUM CREEK DR.
COLUMBUS, OH 43207

ITEM 633 - UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN:

IN ADDITION TO THE REQUIREMENTS OF CMS 633 AND 733, A 12-INCH CABINET RISER AND ANCHOR BOLTS SHALL BE PROVIDED WITH THE BASE MOUNTED CABINET
THE UPS CABINET SHALL INCLUDE AN AUXILIARY POWER PANEL WITH A HEAVY DUTY POWER RELAY VERSUS THE LINE VOLTAGE GENERATOR SWITCH. THE GENERATOR INLET SHALL BE A RECESSED PANEL WITH A DOOR THAT IS FLUSH WITH THE EXTERNAL SIDE OF THE UPS CABINET. IT SHALL INCLUDE A RECESSED PLUG, MANUAL TRANSFER SWITCH, A DOOR THAT SECURELY CLOSES OVER THE POWER CORD, AND AN LED LIGHT THAT INDICATES LINE POWER IS AVAILABLE. EACH BATTERY SHALL BE 12VDC AND BE RATED AT 105 AHRS TO ACHIEVE THE 2.5 HOUR RUN TIME REQUIREMENT. FURNISH BATTERIES EASILY REPLACED AND COMMERCIALLY AVAILABLE OFF THE SHELF. FURNISH DEEP CYCLE, SEALED PRISMATIC LEAD-CALCIUM BASED AGM/VRLA (ABSORBED GLASS MAT/VALVE REGULATED LEAD ACID) BATTERIES. FURNISH BATTERIES CERTIFIED BY THE MANUFACTURER TO OPERATE OVER A TEMPERATURE RANGE OF -13°F TO +165°F.PLACE ALL BATTERIES ON BATTERY HEATER MATS IN THE ENCLOSURE. BATTERIES SHALL BE WARRANTED FOR FULL REPLACEMENT FOR TWO (2) YEARS FROM DATE OF ACCEPTANCE.
THE UPS OUTPUT NOTIFICATIONS FOR ON BATTERY, BATTERY 2 HOUR TIMER, AND LOW BATTERY SHALL BE WIRED INTO THE TRAFFIC SIGNAL CABINET BACK PANEL TO PROVIDE SPECIAL STATUS ALARMS FOR EACH OUTPUT INTO THE SIGNAL CONTROLLER. SPECIAL STATUS ALARMS SHALL BE PROGRAMMED INTO THE CONTROLLER.
THIS ITEM SHALL INCLUDE A RED LED STATUS INDICATOR LAMP TO ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. THE LED HOUSING SHALL BE NEMA 4X, IP65 OR IR66, RATED FOR OUTDOOR USE AND BE TAMPER/ SHATTER RESISTANT. IT SHALL BE A DOMED ENCLOSURE CONTAINING A RED LENS WITH LED THAT IS VISIBLE FROM 100 FEET MINIMUM. THE ENCLOSURE AND LED LAMP UNIT SHALL BE PLACED ON THE STREET-SIDE OF THE CABINET OR CENTERED ON THE TOP SURFACE OF THE UPS CABINET AND SEALED FROM WATER INTRUSION. IT SHOULD BE WIRED USING MINIMUM 20GA STRANDED, INSULATED HOOKUP WIRE TO THE STATUS RELAY OUTPUTS OF THE UPS. THE WIRES SHALL BE TERMINATED BY LUGS AT THE DISPLAY END AND PERMANENTLY LABELED "BACKUP POWER STATUS DISPLAY," WITH WIRE POLARITY INDICATED. THE RED LED SHALL ONLY ILLUMINATE TO INDICATE THE CABINET IS OPERATING UNDER UPS BACKUP POWER (THE "BACKU" OPERATING CONDITION). THIS ITEM ALSO INCLUDES PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THESE STATUS DISPLAYS WILL BE SOLID 100% DUTY CYCLE(NOT FLASHING) DISPLAYS.

ITEM 632 - CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS2, AS PER PLAN

THE ELECTRICAL TRAFFIC CONTROL EQUIPMENT PROVIDED SHALL MEET THE FOLLOWING SPECIFICATIONS AND BE MANUFACTURED BY EAGLE TRAFFIC CONTROL SYSTEMS. THE EQUIPMENT PROVIDED AS PART OF THIS CONTRACT SHALL BE THE LATEST MODEL, CURRENTLY UNDER PRODUCTION AND NEW. THE CONTROLLER CABINET AND ACCESSORIES SHALL MEET THE NEMA TS-2, 1992 STANDARD FOR ACTUATED CONTROLLER UNITS. THE CATALOG NUMBER FOR THE GROUND MOUNTED P CABINET SHALL BE EL 712 OR NEWER. THE CABINET SHALL BE ALUMINUM WITH THE NATURAL ALUMINUM FINISH INSIDE AND OUTSIDE. THE LOAD BAY SHALL BE THE TF5016 OR NEWER, WITH 16 LOAD SWITCH POSITIONS. PROVIDE ONLY THE EXACT NUMBER OF LOAD SWITCHES REQUIRED. EACH LOAD SWITCH SHALL HAVE LIGHT EMITTING DIODES (LEDS) FOR THE CONTROLLER OUTPUT AND LOAD SWITCH OUTPUT. ALSO PROVIDE 8 FLASH RELAY POSITIONS (BUT ONLY SUPPLY THE EXACT NUMBER OF RELAYS NEEDED FOR EACH SPECIFIC INTERSECTION), 1 NEMA 2-CIRCUIT FLASHER, AND AN MMU MONITOR. EACH CABINET SHALL COME EQUIPPED WITH TWO 16-CHANNEL CABINET DETECTOR RACKS (CDR) INCLUDING BUS INTERFACE UNITS (BIU). THE LOOP DETECTOR TERMINATION PANEL FOR THE SECOND DETECTOR RACK SHALL BE OMITTED. WHERE LOOP DETECTORS ARE SPECIFIED, THE CABINET SHALL INCLUDE THE EXACT NUMBER OF FOUR CHANNEL DETECTOR CARDS WITH SOFTWARE REQUIRED FOR EACH INTERSECTION. THE CABINET SHALL BE EQUIPPED WITH A CABINET POWER SUPPLY (CPS). THE POLICE PANEL ON THE OUTSIDE OF THE CABINET DOOR SHALL HAVE A FLASH SWITCH, A SWITCH FOR AUTOMATIC/MANUAL OPERATION, SIGNAL ON/OFF SWITCH AND A MANUAL PUSHBUTTON WITH A MINIMUM CORD LENGTH OF 10 FEET. THE TECHNICIAN PANEL ON THE INSIDE OF THE CABINET DOOR SHALL INCLUDE A FLASH SWITCH, A STOP TIME SWITCH, AND AN EQUIPMENT ON/OFF SWITCH. A CABINET DOOR OPEN SWITCH AND A CABINET LIGHT ON / OFF SWITCH SHALL ALSO BE SUPPLIED.

THE CONTROLLER CABINET SHALL ALSO INCLUDE:
A SLIDE-OUT LAPTOP SHELF INTERIOR, UNDERSHELF LED CABINET LIGHTING, INCLUDING A MINIMUM OF 2
PANELS OF 6 HIGH-INTENSITY LED'S EACH AND A DOOR-ACTIVATED SWITCH. THE LED PANELS SHALL BE MOUNTED IN LOCATIONS TO MAXIMIZE LIGHT ON THE CABINET EQUIPMENT.
A GOOSENECK/ADJUSTABLE LIGHT FIXTURE WITH AN LED LAMP. THE ADJUSTABLE LIGHT FIXTURE SHALL BE MOUNTED ON THE LOWER RIGHT SIDE OF THE CONTROLLER CABINET.
A MINIMUM OF TWO (2) GFCI PROTECTED RECEPTACLES
A MINIMUM OF SIX (6) SURGE PROTECTED (NON-GFCI)RECEPTACLES

CONTROLLER CABINET LABELING TO IDENTIFY THE WIRING AND FUNCTION

DETECTOR LEAD-IN CABLE
PHASE NUMBER SERVICE, DIRECTION, MOVEMENT TYPE, AND LOOP PLAN NUMBER.
SIGNAL HEAD FIELD WIRING
PHASE NUMBER, DIRECTION, MOVEMENT TYPE, AND COLOR (RED, YELLOW, GREEN, YELLOW ARROW, GREEN ARROW) OR PEDESTRIAN MOVEMENT.

THE CONTROLLER TIMER SHALL BE THE GENESIS, EPAC3###M52 (OR MOST CURRENT MODEL) NEMA TS-2 TYPE 2 AND COME EQUIPPED WITH ALL INTERNAL COMPONENTS TO MAKE IT FULLY SYSTEM READY FOR THE ACTRA (OR LATEST) SYSTEM, INCLUDING THE INTERNAL MODEM. EACH CONTROLLER TIMER SHALL HAVE 6 MODES OF COORDINATION, ADAPTIVE TRAFFIC CONTROL, REPORTS, PREEMPTION / PRIORITY, DIAGNOSTICS AND INTERNAL TIME BASE CONTROL. THE CONTROLLER SHALL INCLUDE A "PORT 3 MODULE" AND AN ETHERNET PORT.

EACH CONDUIT ENTRANCE TO THE CABINET SHALL BE SEALED WITH A RUBBER PIPE/CONDUIT SEAL GASKET. THE SEAL SHALL BE OF A MATERIAL AND TYPE TIGHTLY FITTING AND ABLE TO SEAL OUT WATER, INSECTS, RODENTS, AND DIRT. THE SEAL SHALL BE EASILY REMOVED FOR SERVICE INSTALLATIONS OR CABLE REPLACEMENTS.

THE CONTRACTOR SHALL PROVIDE THE CABINET WIRING DIAGRAM/PLANS IN .PDF FORMAT TO ODOT DISTRICT 6 TRAFFIC.

ITEM 633 - DILEMMA ZONE DETECTION SYSTEM

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR ADVANCE DETECTION UNIT (MODEL SS-200E). THE
DETECTION UNIT SHALL INCLUDE THE FOLLOWING:
- POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
- ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
- THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
- SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
- THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
- A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MIN. 7 FEET)
- THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR A UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
- PRIOR TO PROGRAMMING, THE CONTRACTOR SHALL CONTACT THE ODOT DISTRICT 6 DISTRICT TRAFFIC ENGINEER AT 740-833-8198. A DISTRICT 6 TRAFFIC DEPARTMENT REPRESENTATIVE SHALL BE PRESENT DURING THE PROGRAMMING OF THE SYSTEM.

ITEM 633 - STOP BAR DETECTION RADAR UNIT

ITEM 633 STOP BAR DETECTION RADAR UNIT:
THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR MATRIX DETECTION UNIT. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:
- POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
- ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
- THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
- SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
- THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
- A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MIN. 7 FEET)
- THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET.
THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR A UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
- PRIOR TO PROGRAMMING, THE CONTRACTOR SHALL CONTACT THE ODOT DISTRICT 6 DISTRICT TRAFFIC ENGINEER AT 740-833-8198. A DISTRICT 6 TRAFFIC DEPARTMENT REPRESENTATIVE SHALL BE PRESENT DURING THE PROGRAMMING OF THE SYSTEM.

TRAFFIC SIGNAL NOTES

ITEM 633 SPREAD SPECTRUM RADIO

THE CONTRACTOR SHALL FURNISH AND INSTALL THE SPREAD SPECTRUM RADIO INTERCONNECT SYSTEM AND ALL NECESSARY ACCESSORIES THAT ARE REQUIRED TO MAKE THE CLOSED LOOP SYSTEM FUNCTIONAL AND OPERATIONAL. ITEMS TO BE INCLUDED ARE YAGI ANTENNA AT ALL LOCAL CONTROLLERS.

ALL LOCATIONS SHALL INCLUDE, BUT NOT LIMITED TO, GROUND STRAP FOR COAX SHIELD, POLY PHASER, SPREAD SPECTRUM RADIO (MDS TRANSNET 900 PRE-APPROVED EQUAL), COAX CABLE WITH MANUFACTERER RECOMMENDED CONNECTORS. SOFTWARE AND CONNECTORS TO PROGRAM THE RADIOS.

THE CONTRACTOR SHALL PERFORM A SITE SURVEY AT EACH RADIO LOCATION AND EVALUATE THE ANTENNA LOCATIONS FOR THE PURPOSE OF RELIABLE COMMUNICATIONS. IF THE CONTRACTOR DETERMINES A PROBLEM TO EXIST IT SHOULD BE BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER/COORDINATOR.

632 SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-81.21 MAST ARM (GREATER THAN 59' IN LENGTH), AS PER PLAN

THIS ITEM SHALL CONSIST OF THE CONTRACTOR INSTALLING A TUNED MECHANICAL STOCKBRIDGE OR MASS-SPRING TYPE DAMPER ON A TC-81.21 MAST ARM SIGNAL SUPPORT TO REDUCE THE POSSIBILITY OF HARMONIC VIBRATIONS CAUSED BY WIND LOADS. A MECHANICAL DAMPER SHALL BE APPLIED TO ALL MAST ARMS OVER 59 FEET IN LENGTH. THE INSTALLED DAMPER SHALL BE CAPABLE OF REDUCING THE LOADED MAXIMUM VERTICAL MOVEMENT AT THE TIP OF THE ARM TO 8 INCHES MEASURED FROM THE HIGHEST TO THE LOWEST POINT OF DEFLECTION AT WIND SPEEDS OF 5-20 MPH.
ALL ATTACHMENT HARDWARE CONNECTIONS SHALL BE STAINLESS STEEL.
STOCKBRIDGE-TYPE DAMPERS SHALL HAVE A STAINLESS STEEL SAFETY CHAIN ANCHORED TO THE MAST ARM TO PREVENT WEIGHTS FROM FALLING SHOULD THEY BECOME SEPARATED FROM THE REST OF THE ASSEMBLY. THE DAMPER SHALL BE ATTACHED TO THE ARM WITHIN 8 FEET OF MAST ARM TIP. INSTALLATION SHALL BE PER THE MANUFACTURER'S GUIDELINES. STATIC DAMPERS SUCH AS HORIZONTAL FLAT SIGN MOUNTINGS SHALL NOT BE USED. ACCEPTABLE DEVICES INCLUDE THE FOLLOWING OR
APPROVED EQUAL:
1. UNION METAL ALCOA DAMPER DEVICE DWG. NO. 2G-1817-C1
2. VALMONT STRUCTURES ALCOA DEVICE DWG. NO. OH104242 P1
3. FLORIDA DOT SPRING-MASS DAMPER DRAWING INDEX NO. 17749

AS BUILT - 4/22/2016

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED SGB
CHECKED ERW

TRAFFIC SIGNAL NOTES

FRA-270-49.00

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182

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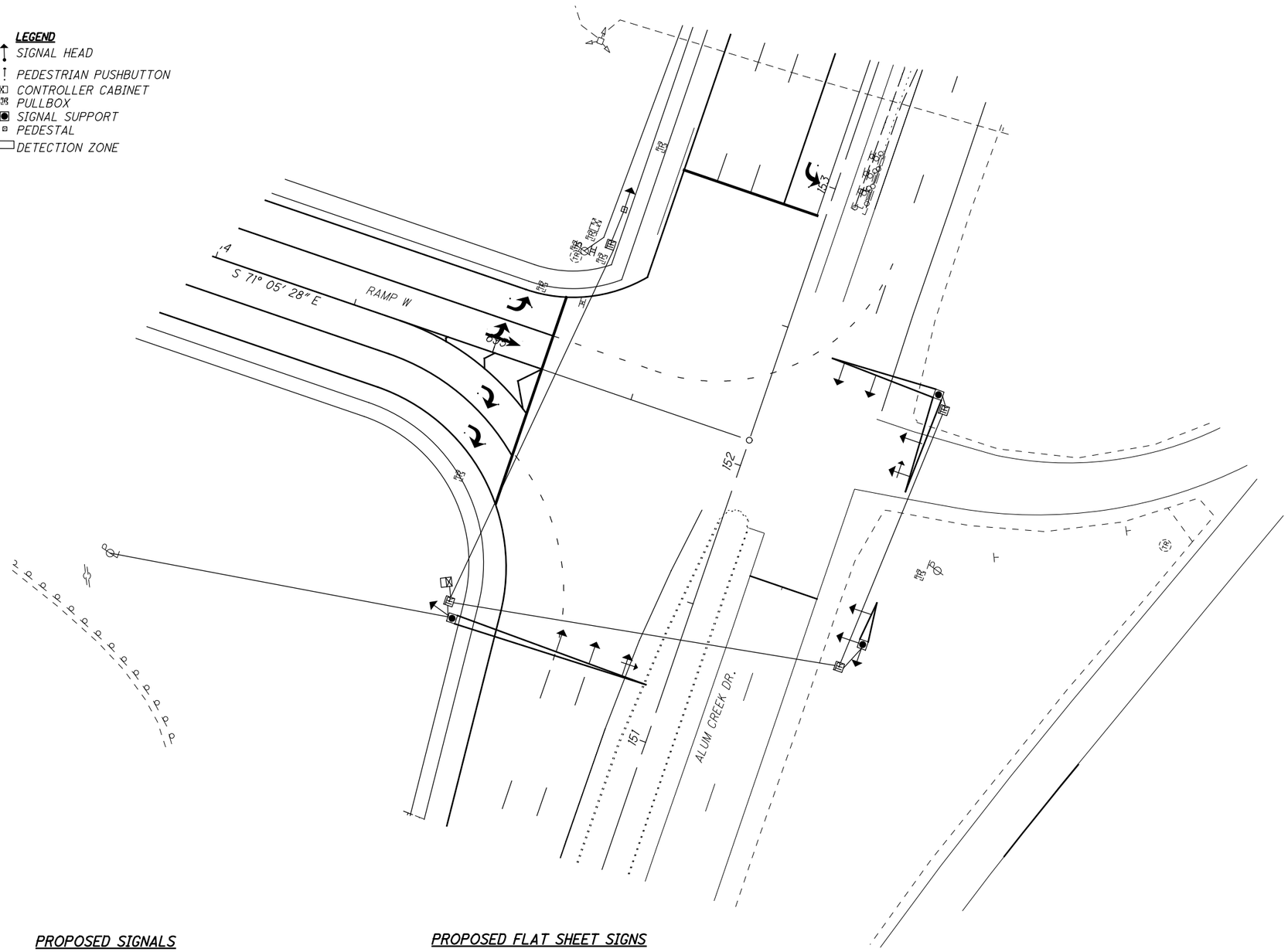
AS BUILT - 4/22/2016

LEGEND

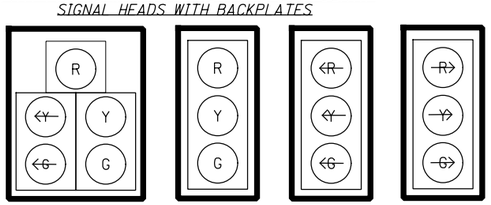
- SIGNAL HEAD
- PEDESTRIAN PUSHBUTTON
- CONTROLLER CABINET
- PULLBOX
- SIGNAL SUPPORT
- PEDESTAL
- DETECTION ZONE



FIELD WIRING HOOK-UP CHART			
SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
S1 (SBL)	R	ϕ6 R	R
	Y	ϕ6 Y	
	G	ϕ6 G	
	~~Y~~	ϕ1 Y	
	~~G~~	ϕ1 G	
S2,S3 (SB)	R	ϕ6 R	R
	Y	ϕ6 Y	
	G	ϕ6 G	
S4,S5,S10 (NB)	R	ϕ2 R	R
	Y	ϕ2 Y	
	G	ϕ2 G	
S6 (EBL)	~~R~~	ϕ4 R	R
	~~Y~~	ϕ4 Y	
	~~G~~	ϕ4 G	
S7 (EBL)	R	ϕ4 R	R
	Y	ϕ4 Y	
	G	ϕ4 G	
	~~Y~~	ϕ4 Y	
	~~G~~	ϕ4 R	
S8,S9, S11 (EBR)	~~R~~	OLA	R
	~~Y~~	OLA	
	~~G~~	OLA	

PROPOSED SIGNALS

PROPOSED 12 in. POLYCARBONATE (LED) BLACK SIGNAL HEADS WITH BACKPLATES



S1, S7 — S2, S3, S4 S5, S10, S12 — S6 — S8, S9, S11

PROPOSED FLAT SHEET SIGNS

R9-3

SN1, SN2, SN3, SN5, SN7 18X18

R10-11C

NO TURN ON RED EXCEPT FROM RIGHT LANE

SN6 30x42

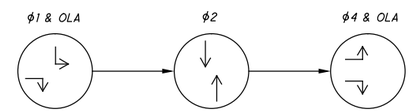
R3-3

NO TURNS

SN4 24X24

NOTES

1. ALL SIGNAL HEADS AND SIGNS SHALL BE FIELD ADJUSTED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER TO ENSURE CORRECT PLACEMENT
2. ALL PULLBOXES ARE 24" EXCEPT PULLBOX B2 & B3
3. POLE LOCATIONS HAVE BEEN INDICATED AS ACCURATELY AS POSSIBLE. IN NO CASE SHALL THE CLEARANCE FROM FACE OF CURB TO FACE OF POLE, PEDESTRIAN SIGNAL, SIGN OR OTHER PROPOSED ITEMS BE LESS THAN 2 FT. TOP OF POLE FOUNDATIONS SHALL BE FLUSH WITH ADJACENT WALK WAYS.



PROPOSED PHASE DIAGRAM

N

0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED SGB | CHECKED ERW

TRAFFIC SIGNAL PLAN
ALUM CREEK DRIVE AND RAMP W

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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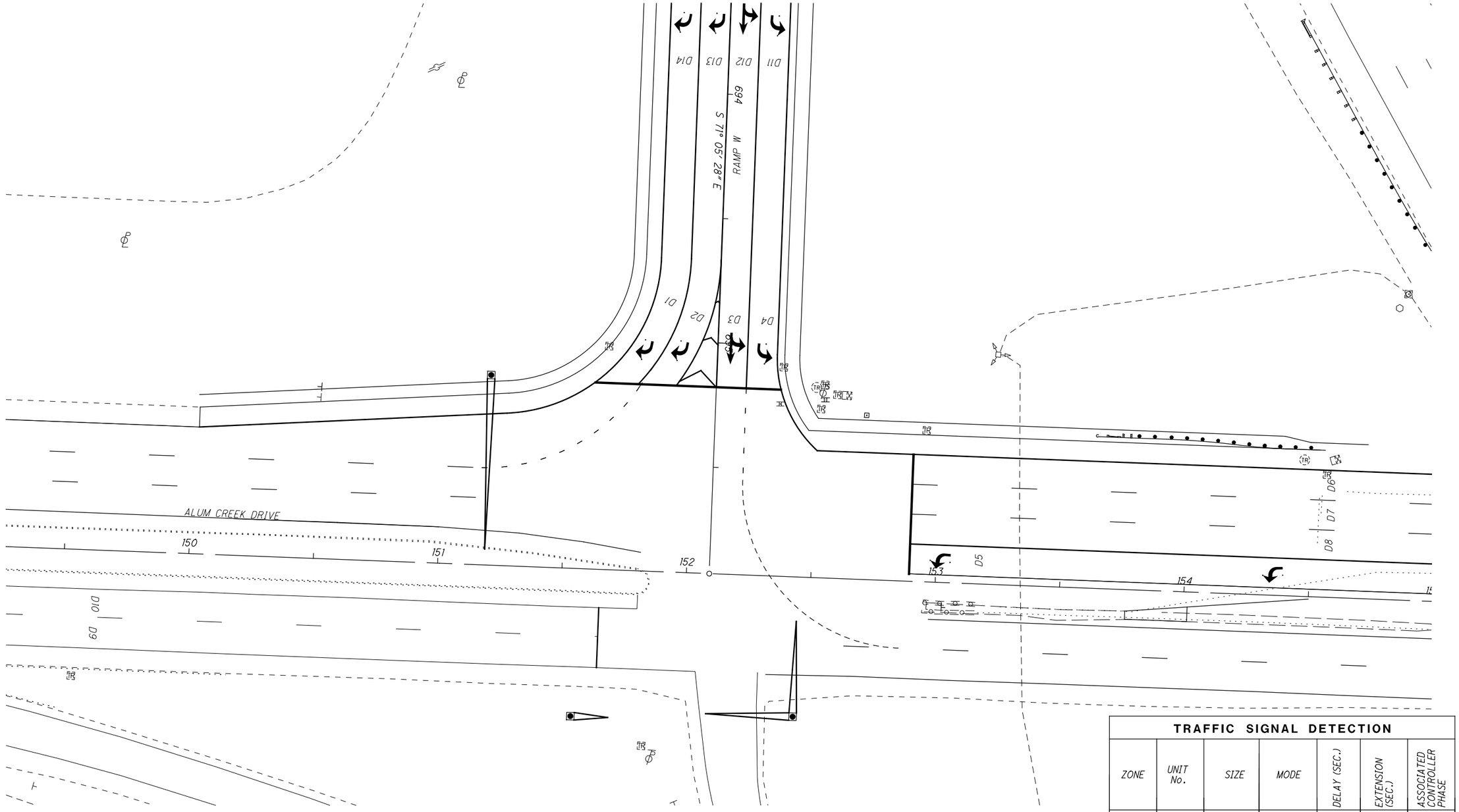

PROPOSED VEHICLE DETECTION PLAN

TRAFFIC SIGNAL DETECTION

ZONE	UNIT No.	SIZE	MODE	DELAY (SEC.)	EXTENSION (SEC.)	ASSOCIATED CONTROLLER PHASE
D1	SB1	RADAR	PRESENCE	10	-	4
D2	SB1	RADAR	PRESENCE	5	-	4
D3	SB1	RADAR	PRESENCE	5	-	4
D4	SB1	RADAR	PRESENCE	5	-	4
D5	SB2	RADAR	PRESENCE	5	-	1
D6	AR2	RADAR	PULSE	-	-	6
D7	AR2	RADAR	PULSE	-	-	6
D8	AR2	RADAR	PULSE	-	-	6
D9	AR1	RADAR	PULSE	-	-	2
D10	AR1	RADAR	PULSE	-	-	2
D11	AR3	RADAR	PULSE	-	-	4
D12	AR3	RADAR	PULSE	-	-	4
D13	AR3	RADAR	PULSE	-	-	4
D14	AR3	RADAR	PULSE	-	-	4

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED SGB
CHECKED ERW

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

TRAFFIC SIGNAL PLAN
ALUM CREEK DRIVE AND RAMP W

FRA-270 49.00

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ITEM	QTY	UNIT	ITEM DESCRIPTION
625	250	FT.	CONDUIT, JACKED OR DRILLED, 3"
625	270	FT.	CONDUIT, 3", 725.04
625	2	EACH	PULL BOX, 725.08, 18"
625	2	EACH	PULL BOX, 725.08, 24"
625	5	EACH	GROUND ROD
625	270	FT.	TRENCH
625	270	FT.	PLASTIC CAUTION TAPE
630	2	EACH	SIGN HANGER ASSEMBLY, MAST ARM
630	4	EACH	SIGN SUPPORT ASSEMBLY, POLE MOUNTED
630	24	S.F.	SIGN, FLAT SHEET
630	15	FT.	GROUND MOUNTED SUPPORT, NO. 2 POST
632	10	EACH	VEHICULAR SIGNAL HEAD, (LED), BLACK, 3 SECTION, 12" LENS 1-WAY WITH BACKPLATE, AS PER PLAN
632	2	EACH	VEHICULAR SIGNAL HEAD, (LED), BLACK, 5 SECTION, 12" LENS 1-WAY WITH BACKPLATE, AS PER PLAN
632	12	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	1825	FT.	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	3	EACH	SIGNAL SUPPORT FOUNDATION
632	1	EACH	PEDESTAL FOUNDATION
632	210	FT.	POWER CABLE, 3 CONDUCTOR, NO. 4 AWG
632	1	EACH	POWER SERVICE, AS PER PLAN
632	1	EACH	SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-8121 MAST ARM (GREATER THAN 59' IN LENGTH), AS PER PLAN
632	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 14, AS PER PLAN
632	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 4, WITH MAST ARMS DESIGN 2 AND 3, AS PER PLAN
632	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 1, AS PER PLAN
632	1	EACH	PEDESTAL, 8', TRANSFORMER BASE, AS PER PLAN
632	1	EACH	SIGNALIZATION MISC.: CDMA MODEM, FURNISH ONLY
632	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
633	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET TYPE TS1, AS PER PLAN
633	1	EACH	CABINET RISER
633	1	EACH	CABINET FOUNDATION
633	1	EACH	CONTROLLER WORK PAD
633	3	EACH	ADVANCE/DILEMMA ZONE DETECTION RADAR
633	2	EACH	STOP BAR DETECTION RADAR
633	1	EACH	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT

TRAFFIC SIGNAL CONTROLLER TIMING CHART

ALUM CREEK DRIVE & EB IR-270 RAMP
MAINTAINING AGENCY: ODOT

START UP
START IN: Y/R FLASH ○; ALL RED ⊗
TIME FOR FLASH OR ALL RED: 10 SEC
FIRST PHASE: 2+6
COLOR DISPLAYED: GREEN ⊗ :YELLOW○

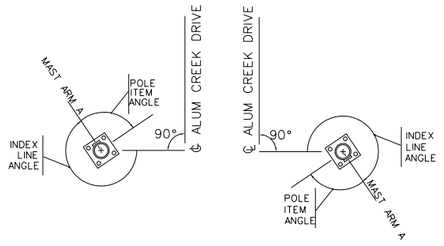
DUAL ENTRY ⊗ 2:6
REST IN RED: R1⊗ R2○
OVERLAP
PHASES

INTERVAL OR FEATURE	CONTROLLER MOVEMENT No. 1	2	3	4	5	6	7	8
INTERSECTION MOVEMENT	↳	↑		⇅		↓		
MINIMUM GREEN (INITIAL) (SEC.)	10	20	-	12	-	20	-	-
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)	3.0	5.0	-	4.0	-	5.0	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	20	50	-	40	-	50	-	-
MAXIMUM GREEN II (SEC.)	-	-	-	-	-	-	-	-
YELLOW CHANGE (SEC.)	4.5	4.5	-	4	-	4.5	-	-
ALL RED CLEARANCE (SEC.)	2.0	2.0	-	2.5	-	2.0	-	-
WALK (SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE (SEC.)	-	-	-	-	-	-	-	-
RECALL MAXIMUM (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
RECALL MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
RECALL PEDESTRIAN (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY (ON/OFF)		-		OFF		-		OFF
CALL TO NON-ACTUATED No. 1		ON				ON		
CALL TO NON-ACTUATED No. 2								

NOTE: OMIT CALLS TO ϕ1 DURING ϕ6 GREEN.

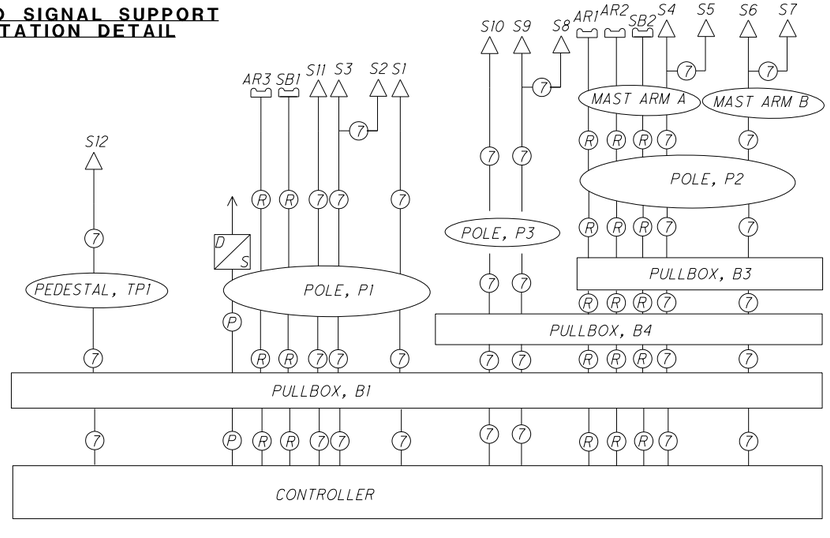
SIGNAL WIRING DIAGRAM LEGEND

- VEHICULAR SIGNAL HEAD
- (7) 7 CONDUCTOR, #14 AWG SIGNAL CABLE
- (P) POWER CABLE
- (R) RADAR CABLE
- SB1 STOP BAR RADAR
- AR1 ADVANCED DETECTION RADAR
- D/S DISCONNECT SWITCH



PROPOSED SIGNAL SUPPORT ORIENTATION DETAIL

SIGNAL WIRING DIAGRAM



TRAFFIC SIGNAL SUPPORTS

SUPPORT NO.	LOCATION	STATION AND OFFSET	POLE TYPE	FOUNDATION ELEVATION	POLE HEIGHT	POLE DESIGN	MAST ARM "A" (FT)	MAST ARM "B" (FT)	L1 (FT)	L2 (FT)	L3 (FT)	L4 (FT)	L5 (FT)	L6 (FT)	ELEV. A	ELEV. B	INDEX ANGLE (DEG.)	ANGLES (DEG.) FROM INDEX LINE: MAST ARM B	PED SIGNAL	PUSHBUTTON	SIGN	LUMINAIRE	DISCONNECT	HANDHOLE	VEH SIGNAL
P1**	SW	151+18.6, 76.4' LT	TC-81.21	-	23'	14	70	-	44	54	68	-	-	-	-	-	0	-	-	-	0	-	180	180	196
P2	NE	152+44.8, 56.2' RT	TC-81.21	-	23'	4	36	-	22	28	34	-	-	-	-	-	0	-	-	-	0	-	-	180	-
					-	-	-	32	18	30	-	-	-	-	-	-	-	270	-	-	-	-	-	-	-	-
P3	SE	151+55.6, 59.3' RT	TC-81.21	-	23'	1	15	-	5	11	-	-	-	-	-	-	90	-	-	-	0	-	-	180	0 / 270
TP1*	SW	151+38.2 79.7' LT	PED	-	17'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	180	270

*POLE ITEMS ON PEDESTALS ARE MEASURED FROM PERPENDICULAR LINE TO ℄ OF ALUM CREEK DR.
**MECHANICAL DAMPER TO BE INSTALLED PER MANUFACTURER RECOMENDED POSITION AND ORIENTATION
***RADAR DETECTION UNITS ARE NOT SHOWN IN CHART, TO BE ADDED TO THE SUPPORT/MASTARM PER MANUFACTURER RECOMENDED POSITION AND ORIENTATION

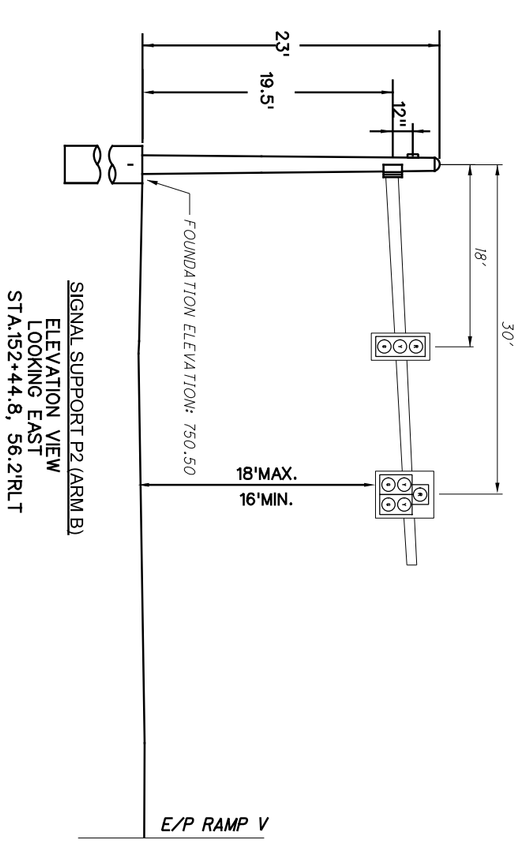
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED SGB
CHECKED ERW

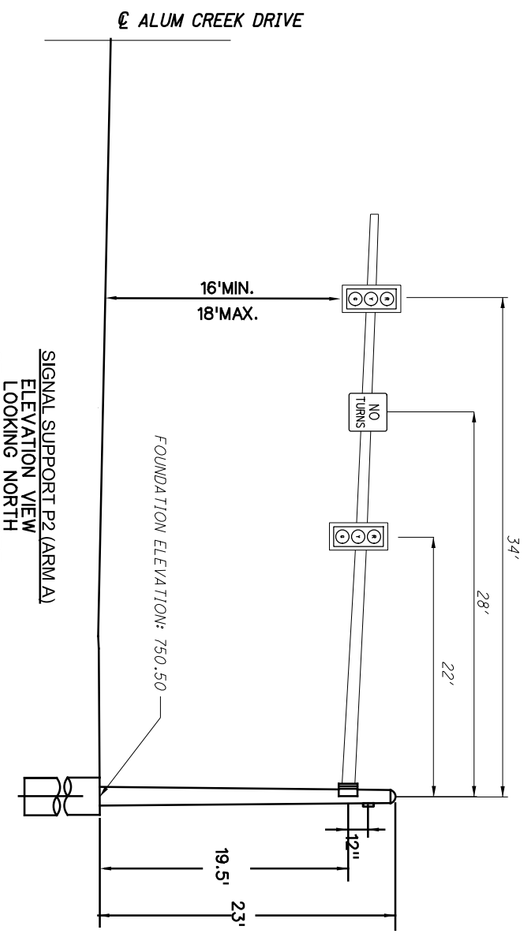
TRAFFIC SIGNAL PLAN
ALUM CREEK DRIVE AND RAMP W

FRA-270 49.00

AS BUILT - 4/22/2016



SIGNAL SUPPORT P2 (ARM B)
ELEVATION VIEW
LOOKING EAST
STA.152+44.8, 56.2'RLT



SIGNAL SUPPORT P2 (ARM A)
ELEVATION VIEW
LOOKING NORTH
STA.152+44.8, 56.2'RT

*RADAR UNITS NOT SHOWN

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

132/182	FRA-270 49.00	TRAFFIC SIGNAL DETAILS ALUM CREEK DRIVE AND RAMP W	CALCULATED SGB CHECKED ERW

AS BUILT - 4/22/2016

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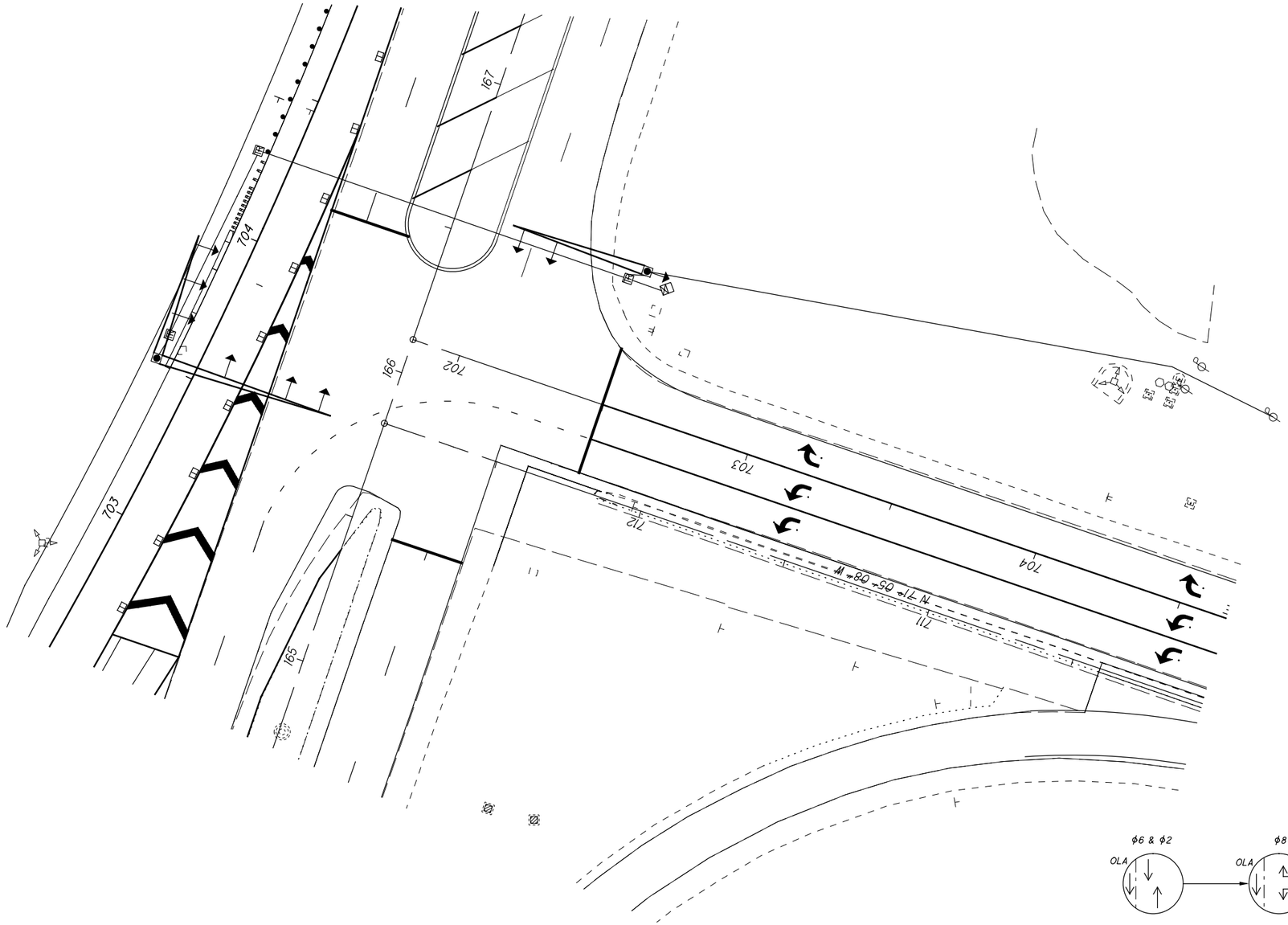
LEGEND

- SIGNAL HEAD
- PEDESTRIAN PUSHBUTTON
- CONTROLLER CABINET
- PULLBOX
- SIGNAL SUPPORT
- PEDESTAL
- DETECTION ZONE



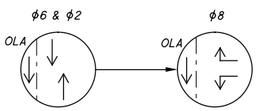
FIELD	WIRING	HOOK-UP	CHART
SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
S1, S2 (NB)	R	ϕ2 R	R
	Y	ϕ2 Y	
	G	ϕ2 G	
S3, S9 (WB)	~~R~~	ϕ8 R	R
	~~Y~~	ϕ8 Y	
	~~G~~	ϕ8 G	
S4, S5 (WB)	~~R~~	ϕ8 R	R
	~~Y~~	ϕ8 Y	
	~~G~~	ϕ8 G	
S6 (SB)		OLA G	-
S7, S8 (SB)	R	ϕ6 R	R
	Y	ϕ6 Y	
	G	ϕ6 G	

PROPOSED FLAT SHEET SIGNS

R3-2 — SN3 24X24

R3-3 — NO TURNS — SN6 24X24

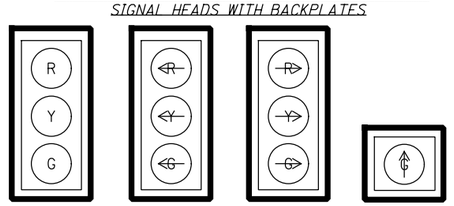
R9-3 — SN1,SN2, SN4,SN5 18X18



PROPOSED PHASE DIAGRAM

PROPOSED SIGNALS

PROPOSED 12 in. POLYCARBONATE (LED) BLACK SIGNAL HEADS WITH BACKPLATES



S1, S2, S7, S8 — S4, S5 — S3, S9 — S6

NOTES

1. ALL SIGNAL HEADS AND SIGNS SHALL BE FIELD ADJUSTED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER TO ENSURE CORRECT PLACEMENT
2. ALL PULLBOXES ARE 24" EXCEPT PULLBOX B3
3. POLE LOCATIONS HAVE BEEN INDICATED AS ACCURATELY AS POSSIBLE. IN NO CASE SHALL THE CLEARANCE FROM FACE OF CURB TO FACE OF POLE, PEDESTRIAN SIGNAL, SIGN OR OTHER PROPOSED ITEMS BE LESS THAN 2 FT. TOP OF POLE FOUNDATIONS SHALL BE FLUSH WITH ADJACENT WALK WAYS.

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

HORIZONTAL SCALE IN FEET 0 10 20 40

CALCULATED SGB CHECKED ERW

TRAFFIC SIGNAL PLAN

ALUM CREEK DRIVE AND RAMP X

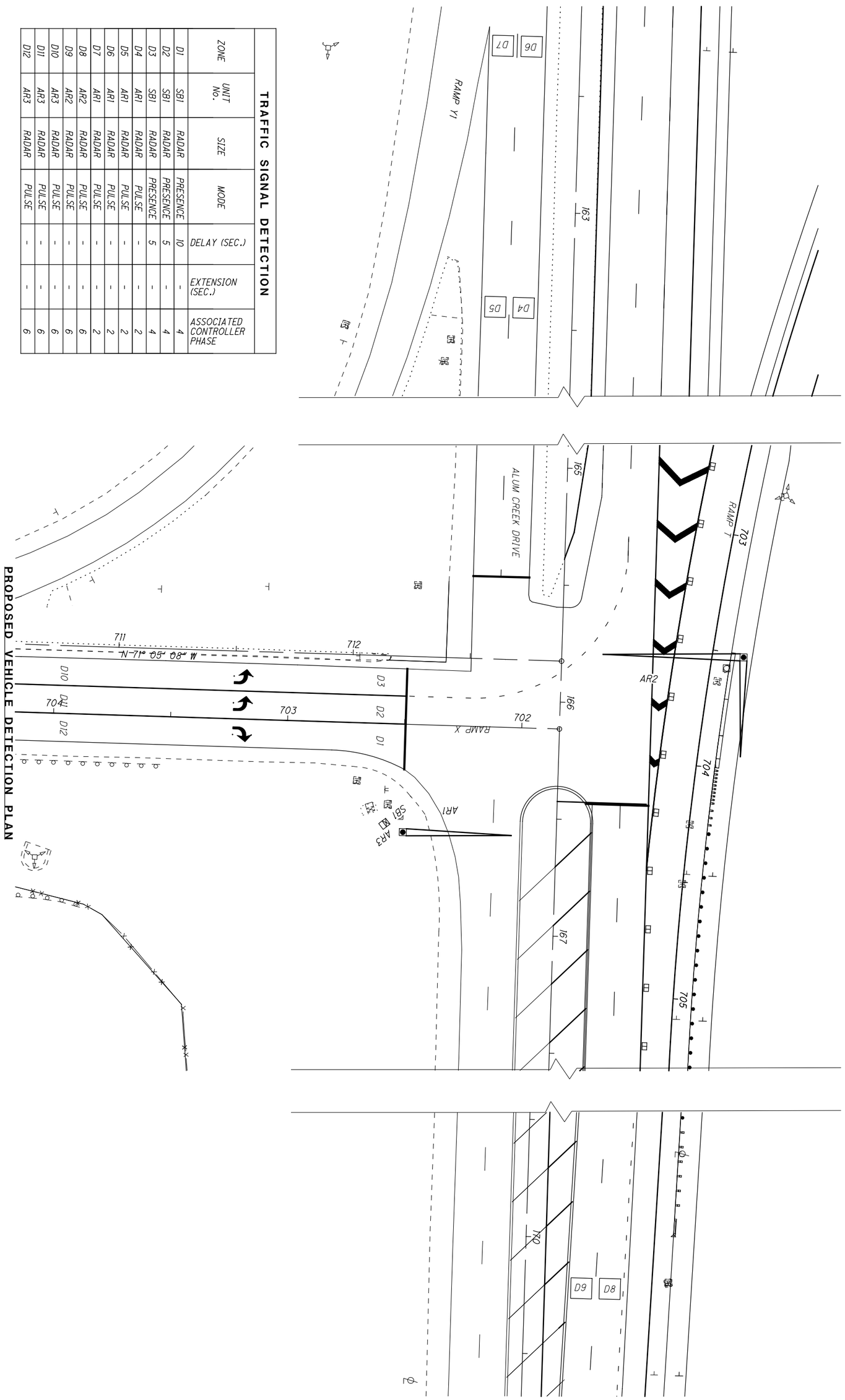
FRA-270-49.00

133 / 182

AS BUILT - 4/22/2016

TRAFFIC SIGNAL DETECTION

ZONE	UNIT No.	SIZE	MODE	DELAY (SEC.)	EXTENSION (SEC.)	ASSOCIATED CONTROLLER PHASE
D1	SBI	RADAR	PRESENCE	10	-	4
D2	SBI	RADAR	PRESENCE	5	-	4
D3	SBI	RADAR	PRESENCE	5	-	4
D4	ARI	RADAR	PULSE	-	-	2
D5	ARI	RADAR	PULSE	-	-	2
D6	ARI	RADAR	PULSE	-	-	2
D7	ARI	RADAR	PULSE	-	-	2
D8	AR2	RADAR	PULSE	-	-	6
D9	AR2	RADAR	PULSE	-	-	6
D10	AR3	RADAR	PULSE	-	-	6
D11	AR3	RADAR	PULSE	-	-	6
D12	AR3	RADAR	PULSE	-	-	6



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

134 / 182	FRA-270 49.00	TRAFFIC SIGNAL PLAN ALUM CREEK DRIVE AND RAMP X	CALCULATED SGB CHECKED ERW	0 10 20 40 HORIZONTAL SCALE IN FEET

AS BUILT - 4/22/2016

ITEM	QTY	UNIT	TRAFFIC SIGNAL
625	330	FT.	CONDUIT, 3", 725.051
625	130	FT.	CONDUIT, JACKED OR DRILLED 3"
625	330	FT.	TRENCH
625	330	FT.	PLASTIC CAUTION TAPE
625	1	EACH	PULL BOX, 725.08, 18"
625	2	EACH	PULL BOX, 725.08, 24"
625	3	EACH	GROUND ROD
630	2	EACH	SIGN SUPPORT ASSEMBLY, POLE MOUNTED
630	13	S.F.	SIGN, FLAT SHEET
630	30	FT.	STREET NAME SIGN SUPPORT, NO. 2 POST
632	1	EACH	VEHICULAR SIGNAL HEAD, (LED), 1 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	8	EACH	VEHICULAR SIGNAL HEAD, (LED) BLACK, 3-SECTION, 12" LENS, 1-WAY, WITH BACKPLATE, AS PER PLAN
632	9	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	1405	FT.	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	300	FT.	POWER CABLE, 3 CONDUCTOR, NO. 4 AWG
632	1	EACH	POWER SERVICE, AS PER PLAN
632	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 14, AS PER PLAN
632	1	EACH	SIGNAL SUPPORT, TYPE TC-12.30, DESIGN 8 WITH MAST ARMS DESIGN 11 AND 13, AS PER PLAN
632	2	EACH	SIGNAL SUPPORT FOUNDATION
632	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	1	EACH	SIGNALIZATION MISC.: CDMA MODEM, FURNISH ONLY
633	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET TYPE TS1, AS PER PLAN
633	1	EACH	CABINET RISER
633	1	EACH	CABINET FOUNDATION
633	1	EACH	CONTROLLER WORK PAD
633	2	EACH	ADVANCE/DILEMMA ZONE DETECTION RADAR
633	1	EACH	STOP BAR DETECTION RADAR
633	1	EACH	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT

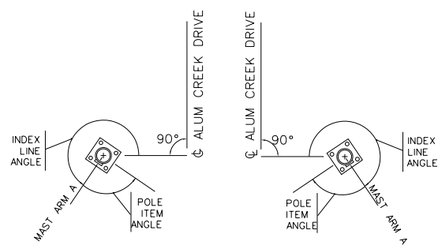
TRAFFIC SIGNAL CONTROLLER TIMING CHART

ALUM CREEK DRIVE & WB IR-270 RAMP
MAINTAINING AGENCY: ODOT

START UP
START IN: Y/R FLASH ○; ALL RED ⊗
TIME FOR FLASH OR ALL RED: 10 SEC
FIRST PHASE: 2+6
COLOR DISPLAYED: GREEN ⊗ :YELLOW ○

DUAL ENTRY ⊗ 2:6
REST IN RED: R1 ⊗ R2 ○
OVERLAP: OL A
PHASES: 4 8 6

INTERVAL OR FEATURE	CONTROLLER MOVEMENT No. 1	2	3	4	5	6	7	8
INTERSECTION MOVEMENT		↑		⇕		↓		
MINIMUM GREEN (INITIAL) (SEC.)	-	20	-	20	-	20	-	-
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)	-	5.0	-	5.0	-	5.0	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	-	60	-	45	-	60	-	-
MAXIMUM GREEN II (SEC.)	-	60	-	45	-	60	-	-
YELLOW CHANGE (SEC.)	-	4.5	-	4.0	-	4.5	-	-
ALL RED CLEARANCE (SEC.)	-	2.0	-	2.5	-	2.0	-	-
WALK (SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE (SEC.)	-	-	-	-	-	-	-	-
RECALL MAXIMUM (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
RECALL MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
RECALL PEDESTRIAN (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY (ON/OFF)		-		OFF		-		OFF
CALL TO NON-ACTUATED No. 1		ON				ON		
CALL TO NON-ACTUATED No. 2								

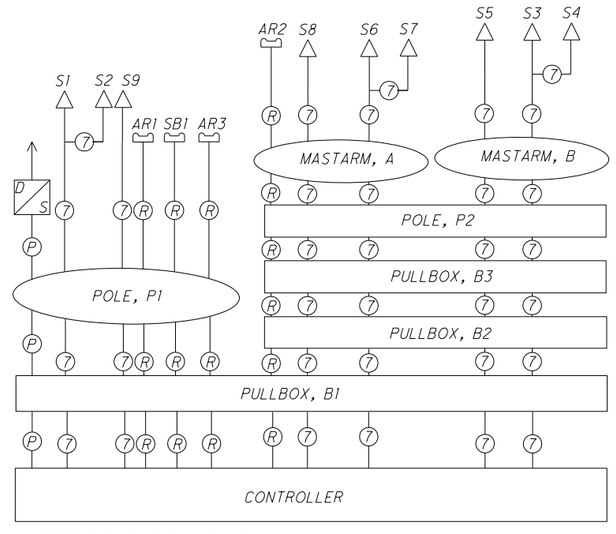


PROPOSED SIGNAL SUPPORT ORIENTATION DETAIL

SIGNAL WIRING DIAGRAM LEGEND

- VEHICULAR SIGNAL HEAD
- (7) 7 CONDUCTOR, #14 AWG SIGNAL CABLE
- (P) POWER CABLE, 3 CONDUCTOR, #6 AWG
- (R) RADAR CABLE
- SB1 STOP BAR RADAR
- AR1 ADVANCED DETECTION RADAR
- D/S DISCONNECT SWITCH

SIGNAL WIRING DIAGRAM



*DETECTION CABLE NOT SHOWN

TRAFFIC SIGNAL SUPPORTS

SUPPORT NO.	LOCATION	STATION AND OFFSET	POLE TYPE	FOUNDATION ELEVATION	POLE HEIGHT	POLE DESIGN	MAST ARM "A" (FT)	MAST ARM "B" (FT)	L1 (FT)	L2 (FT)	L3 (FT)	L4 (FT)	L5 (FT)	L6 (FT)	ELEV. A	ELEV. B	INDEX ANGLE (DEG.)	ANGLES (DEG.) FROM INDEX LINE: MAST ARM B	PED SIGNAL	PUSHBUTTON	SIGN	LUMINAIRE	DISCONNECT	HANDHOLE	VEH SIGNAL
P1	NE	166+57.6, 65.5' RT	TC-81.21	-	23'	14	46	-	31	37	43	-	-	-	-	-	0	-	-	-	0	-	180	180	180
P2	SW	165+78.5, 77.6' LT	TC-12.30	-	23'	8	58	-	23	44	50	56	-	-	-	-	0	-	-	-	0	-	-	180	-
							-	41	16	27	39	-	-	-	-	-	-	90	-	-	-	-	-	-	-

***RADAR DETECTION UNITS ARE NOT SHOWN IN CHART, TO BE ADDED TO THE SUPPORT/MASTARM PER MANUFACTURER RECOMENDED POSITION AND ORIENTATION

K:\2014 Projects\14115 Resource International\003 FRA IR 270 49.00\As Builts\Obsolete Sources\83988CD004.dgn 6/15/2016 8:11:13 AM synchro

BU 4,5,6,7,8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

HORIZONTAL SCALE IN FEET: 0, 10, 20, 40

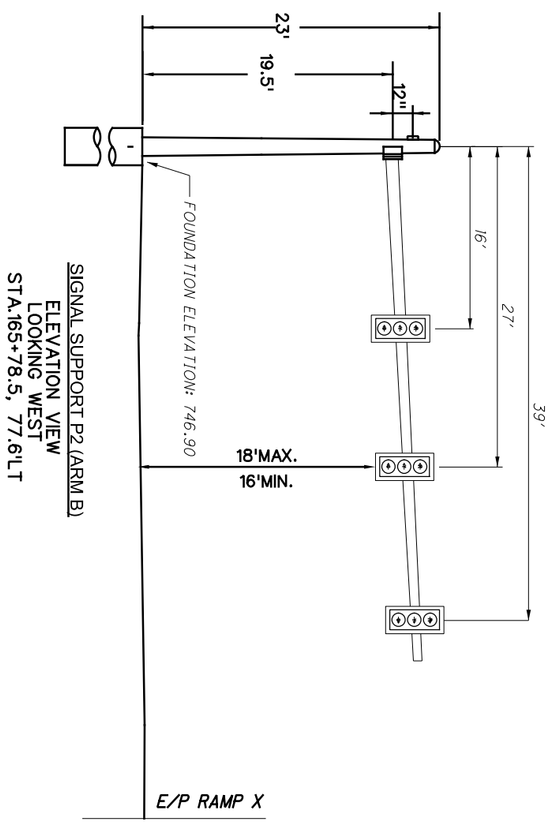
CALCULATED SGB
CHECKED ERW

TRAFFIC SIGNAL PLAN
ALUM CREEK DRIVE AND RAMP X

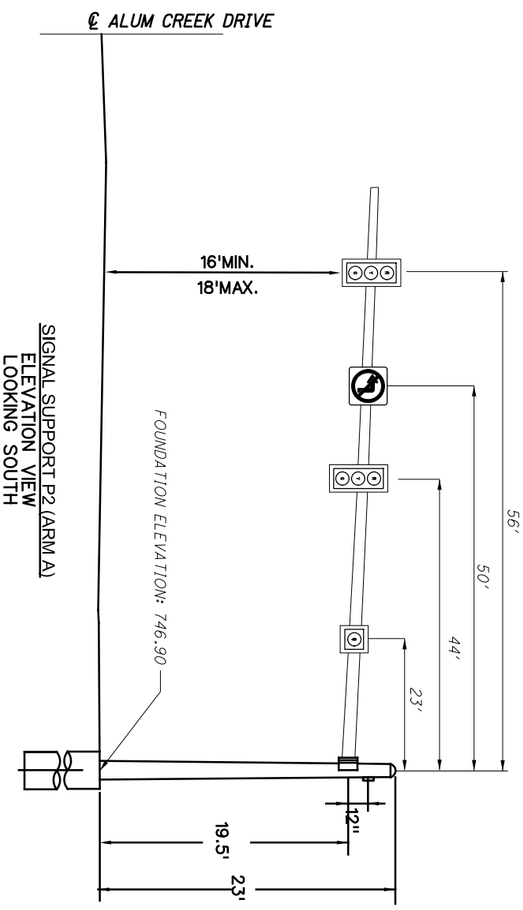
FRA-270 49.00

135
182

AS BUILT - 4/22/2016



SIGNAL SUPPORT P2 (ARM B)
ELEVATION VIEW
LOOKING WEST
STA.165+78.5, 77.6'LT



SIGNAL SUPPORT P2 (ARM A)
ELEVATION VIEW
LOOKING SOUTH
STA.165+78.5, 77.6'LT

*RADAR UNITS NOT SHOWN

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

FRA-270 49.00

TRAFFIC SIGNAL DETAILS
ALUM CREEK DRIVE AND RAMP X

CALCULATED SGB
CHECKED ERW

ITS NOTES

ITEM 632 - SIGNALIZATION MISC.: CCTV IP-CAMERA SYSTEM, DOME -TYPE

1300.1 GENERAL DESCRIPTION

CLOSED CIRCUIT TELEVISION (CCTV) POLE CAMERA ASSEMBLY THE CCTV POLE CAMERA ASSEMBLY SHALL INCLUDE THE CAMERA, UNPRESSURIZED DOME/HOUSING, PTZ UNIT, CAMERA CONTROLLER, LOCAL CAMERA CONTROL UNIT, ITS CABINET, WORK PAD, AND ALL MATERIALS, LABOR, WORKMANSHIP, EQUIPMENT, TESTING, DOCUMENTATION, AND INCIDENTAL ITEMS REQUIRED TO DELIVER A FULLY OPERATIONAL CCTV POLE CAMERA. ASSEMBLY IN ACCORDANCE WITH THESE SPECIAL PROVISIONS AND THE PLANS

THE CCTV IP-CAMERA SYSTEM WILL BE PLACED AT ROADSIDE LOCATIONS AND WILL MEET NEMA TYPE 4X AND IP66 ENVIRONMENTAL STANDARDS AND WILL BE SUITABLE FOR OUTDOOR INSTALLATION ATOP POLES UP TO 80 FEET.THE CCTV IP-CAMERA SYSTEM INCLUDES IP-CAMERA, UNPRESSURIZED DOME/HOUSING, PTZ UNIT, CAMERA CONTROLLER, AND ALL NECESSARY CONNECTORS AND CABLES.

THE CCTV IP-CAMERA SYSTEM SHALL BE ONE OF THE FOLLOWING TYPES:
PELCO SPECTRA IV IP H.264
COHU 3920 (VIA ONVIF DRIVER)
OPTELECOM HSD626

THE OHIO DEPARTMENT OF TRANSPORTATION WILL BE RESPONSIBLE FOR ALL COMMUNICATIONS WITH THE TMC; ALL CONTRARY REQUIREMENTS IN THIS PROVISION WILL BE EXCLUDED

THE IP-CAMERA ASSEMBLY WILL BE CAPABLE OF INDIVIDUAL, OR LOCAL, CAMERA SITE CONTROL BY WAY OF A LAPTOP COMPUTER. COMMUNICATIONS TO THE IP-CAMERA WILL BE ETHERNET I/O PROTOCOL. THE LOCAL CAMERA CONTROL UNIT SHALL BE A UNIT CAPABLE OF PROVIDING PTZ CONTROL AND VIDEO LOCALLY AT THE CAMERA POLE ONLY. THIS UNIT SHALL NOT BE USED IN ANY MANNER TO PORT VIDEO AND/OR PTZ CONTROL FOR REMOTE VIEWING AND/OR CONTROL. A SEPARATE MONITOR SHALL NOT BE NEEDED TO VIEW VIDEO FROM THIS UNIT. THE UNIT SHALL INCLUDE LOCAL ACCESS CONTROL SUCH AS PASSWORD PROTECTION OR REQUIRE USB KEY TO LOG IN.

THE CCTV WILL BE CAPABLE OF DISPLAYING THE COMPASS HEADING OF THE CAMERA DIRECTION (IE; N, E, S, ETC.) AND ALLOW FOR TITLE OVERLAYS OF THE LOCATION OF THE CAMERA.

ALL CAMERA CONTROL, VIDEO COMPRESSION, AND RELATED CCTV FUNCTIONALITY SHALL BE CONTAINED IN THE IP CCTV HOUSING UNIT. NO SEPARATE UNIT WILL BE REQUIRE OR ACCEPTED BY ODOT IN THE ITS CABINET.

THE CCTV IP-CAMERA SYSTEM WILL BE CAPABLE OF USER SELECTABLE VIDEO COMPRESSION RATES OF H.264, MPEG-4 OR MJPEG.

THE CONTRACTOR SHALL SUPPLY THE FOLLOWING SOFTWARE OPTIONS FOR THE MILESTONE CAMERA MANAGEMENT SOFTWARE WITH EACH CAMERA PROVIDED AND SHALL PROVIDE ALL LICENSING DOCUMENTATION TO THE ODOT TRAFFIC OPERATIONS ITS/SIGNALS SECTION (2 HARD-COPIES AND 1 ELECTRONIC COPY):
- ONE MILESTONE XPROTECT CORPORATE DEVICE CHANNEL PER CAMERA
- ONE MILESTONE FIVE YEAR PMA FOR XPROTECT CORPORATE DEVICE CHANNEL LICENSE PER CAMERA

THE CONTRACTOR SHALL SUBMIT A DEMO CAMERA AND DRIVER FOR MATERIALS ACCEPTANCE TESTING PRIOR TO ODOT PROVIDING AUTHORIZATION TO THE CONTRACTOR TO MOVE FORWARD WITH CAMERA PURCHASING FOR THE ENTIRE PROJECT.

THE IP-CAMERA ASSEMBLY SHALL BE CAPABLE OF TRANSMITTING SIMULTANEOUS VIDEO VIA THE ENCODER LOCATED IN THE CAMERA HOUSING AND VIA A COAXIAL CABLE CONNECTED TO THE CAMERA AND RUN INTO THE ITS CABINET.

THIS COAXIAL CABLE SHALL BE FITTED WITH COMPRESSION BNC-TYPE CONNECTORS AND SHALL NOT BE USED FOR THE SOLE TEST OF THE CAMERA. THE SOLE PURPOSE OF THIS COAXIAL CONNECTION SHALL BE FOR VERIFYING CAMERA VIDEO FOR MAINTENANCE OPERATIONS. ALL MAIN TESTING OF THE CAMERA OPERATION SHALL BE PERFORMED THROUGH COMMUNICATIONS WITH THE CAMERA ENCODER.

1300.2 CLOSED CIRCUIT-TELEVISION (CCTV) IP CAMERA EQUIPMENT

THE CCTV COMMUNICATIONS SUBSYSTEM WILL PROVIDE FOR TWO BASIC FUNCTIONS: (1) THE EXCHANGE OF CONTROL AND STATUS DATA FROM THE LOCAL CONTROL TO THE IP-CAMERA AND THE PAN TILT ZOOM (PTZ) UNIT ON WHICH THE IP-CAMERA IS MOUNTED, AND (2) THE TRANSMISSION OF IMAGES FROM THE VIDEO IP-CAMERA TO THE LOCAL CONTROL.

VIDEO IMAGES WILL BE GENERATED AT THE CCTV SITE AT THE RATE OF NO LESS THAN THIRTY FRAMES PER SECOND ACCORDING TO THE APPLICABLE MULTI-STREAM H.264, MPEG-4 AND MOTION JPEG. IMAGES CAPTURED BY THE IP CAMERA WILL BE CONTINUALLY TRANSMITTED VIA HARDWIRED COMMUNICATION TO THE IP-CAMERA CONTROL UNIT.

1300.3 FUNCTIONAL PROVISIONS

THE CCTV ASSEMBLY COMPONENTS WILL BE COMPATIBLE WITH EACH OTHER. ALL CCTV ASSEMBLY COMPONENTS WILL BE PROVIDED AND WARRANTED BY A SINGLE VENDOR, TO PROVIDE AN END-TO-END MANUFACTURER RESPONSIBILITY.

A MINIMUM OF SIXTY-FOUR PRESETS WILL BE PROVIDED ON BOTH THE ZOOM LENS AND THE PAN/TILT MECHANISM TO ALLOW SETTING THE LENS AND THE PAN/TILT TO PREDEFINED LOCATIONS IN ACCORDANCE WITH THE PROJECT REQUIREMENTS. THE PAN, TILT, ZOOM, PRESET SELECTION, POWER ON/OFF AND OTHER FUNCTIONS OF EACH CCTV FIELD IP-CAMERA WILL BE CONTROLLED FROM THE CENTRAL SITE, BOTH MANUALLY WITH A CONTROL PANEL AND BY USING A HTTP BROWSER BASED APPLICATION WITH A GRAPHICAL USER INTERFACE. THE CCTV WILL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING COMPONENTS AND FEATURES:
- PASSWORD PROTECTION: PROGRAMMABLE SETTINGS WITH OPTIONAL PASSWORD PROTECTION
- OPEN API FOR SOFTWARE INTEGRATION
- A CCTV IP CAMERA WITH AUTO FOCUS ZOOM LENS IN AN OUTDOOR DOME ATTACHED TO THE IP-CAMERA-LOWERING DEVICE.
- A DOMED, WATERTIGHT, ENVIRONMENTAL HOUSING WITH AN INTEGRATED POSITIONED FOR PAN AND TILT UNIT AND CCTV IP-CAMERA, AS DETERMINED, PER IP-CAMERA SITE BY THE DEPARTMENT AND AS DETAILED HEREIN, WITHIN THE PLAN SET, AND/OR IN THE CONTRACT; (ALL CAMERA CIRCUITRY SHALL BE LOCATED WITHIN THE DOME HOUSING)
- DOMED MOUNTING HARDWARE OF THE VERTICAL OR ADAPTED WALL MOUNTING TYPE WITH NO EXPOSED CAMERA CONTROL WIRING:
- IP-CAMERA SITE EXTERIOR ETHERNET CAT-6 STP OR EQUAL COMPOSITE CABLING.
- JUNCTION BOXES AS REQUIRED HEREIN, WITHIN THE PLAN SET, AND/OR IN THE CONTRACT;
- IP-CAMERA CONTROL ELECTRONICS AND EQUIPMENT (I.E HARDWARE AND SOFTWARE):
- A IP-CCTV ASSEMBLY WITH AZIMUTH POSITIONING CAPABILITIES;
- EXTERIOR ETHERNET STP CAT-6 OR EQUAL COMPOSITE; POWER, AND DATA/VIDEO CABLES FOR POWER SUPPLY, IMAGES, AND CAMERA CONTROLS;
- TRANSFER VOLTAGE SUPPRESSION AND PROTECTION;
- IP-CAMERA CONTROLLER

1300.4 IP-CAMERA ASSEMBLY ELECTRICAL PROVISIONS

THE IP-CAMERA ASSEMBLY WILL BE FURNISHED WITH ANY AND ALL EQUIPMENT REQUIRED FOR A FULLY FUNCTIONAL SYSTEM, INCLUDING ALL APPROPRIATE POWER AND COMMUNICATION CABLES AS DEFINED BY THE MANUFACTURER. THE POWER CABLES WILL BE SIZED TO MEET THE APPLICABLE NATIONAL ELECTRICAL CODE (NEC) REQUIREMENTS THE COMMUNICATION CABLES FROM THE IP-CAMERA ASSEMBLY TO THE NETWORK COMMUNICATION DEVICES WILL BE APPROPRIATE FOR THE TECHNOLOGY EMPLOYED (E.G., FIBER OPTIC, TWISTED PAIR,) AND WILL MEET THE MINIMUM SIZE AND/OR BANDWIDTH REQUIREMENTS DEFINED BY THE MANUFACTURER. THE EXTERIOR CAMERA CAT-6 STP OR EQUAL COMPOSITE CABLE WILL BE OUTDOOR NEC RATED.

ALL DEVICES SUPPLIED AS SYSTEM COMPONENTS WILL ACCEPT, AS A PRIMARY POWER SOURCE, OF 120 VOLTS ALTERNATING CURRENT (VAC)/60 HERTZ (HZ) INPUT, EXCLUDING CAMERAS. ANY DEVICE THAT REQUIRES SOURCE INPUT OTHER THAN 120 VAC/60 HZ, SUCH AS CAMERAS, PTUS, AND DOME HEATERS/BLOWERS THAT OPERATE AT 24 VOLTS, WILL BE FURNISHED WITH THE APPROPRIATE MEANS OF CONVERSION.

THE LENGTH OF THE CABLES WILL BE BASED UPON THE CCTV POLE LENGTH (70 AND 80 FEET) AND NECESSARY CABLE TO BE ROUTED INTO THE ITS CABINET

1300.5 NETWORK COMMUNICATION PROVISION
ODOT WILL FURNISH THE NETWORK SWITCHES, INSTALL, CONFIGURE AND TEST THE VIDEO AND NETWORK EQUIPMENT.

1300.6 PROTOCOL

AT A MINIMUM, THE FOLLOWING SUPPORTED PROTOCOLS WILL BE PROVIDED FOR THE IP CAMERA:
- IP, HTTP, UPNP, SNMP, RTSP, RTP, TCP, UDP, IGMP, DHC, H 264, MPEG-4, MJPEG

1300.7 IP-CAMERA ASSEMBLY PERFORMANCE PROVISIONS

1300.7.1 IP-CAMERA IMAGE SENSOR PROVISIONS

THE CCTV IP-CAMERA IMAGE SENSOR WILL BE A DAY/NIGHT CAMERA THAT PROVIDES COLOR IMAGES DURING DAYTIME AND BLACK AND WHITE (MONOCHROME) IMAGES DURING NIGHTTIME BOTH WITH MANUAL OR AUTOMATIC CONTROL CAPABILITIES. THE IP-CAMERA VIDEO OUTPUT WILL BE COMPLIANT WITH ITU-T VIDEO CODING EXPERTS GROUP (VCEG) AND ISO/IEC MOVING PICTURE EXPERTS GROUP (MPEG) STANDARDS. THE IP-CAMERA SENSOR WILL BE A CHARGE-COUPLED DEVICE (CCD) WITH 1/4 INCH PROGRESSIVE SCAN.

THE MINIMUM RESOLUTION SUPPORTED WILL BE NTSC: 700X480 TO 176X120. THE CCTV ASSEMBLY WILL PROVIDE VIDEO IMAGES WITH MINIMAL QUALITY/BANDWIDTH DEGRADATION IN VARIOUS ENVIRONMENTAL CONDITIONS. THE CCTV ASSEMBLY WILL PROVIDE LOW LIGHT-LEVEL SENSITIVITY TO ACHIEVE DESIRED LEVELS OF OPERATION AT NIGHT.

THE IP-CAMERA WILL SUPPORT THE FOLLOWING IMAGE SETTINGS

- WIDE DYNAMIC RANGE (WDR),
- ELECTRONIC IMAGE STABILIZATION (EIS),
- MANUAL SHUTTER TIME COLOR, BRIGHTNESS, CONTRAST, SHARPNESS
- TEXT AND IMAGE OVERLAY AND PRIVACY MASK

THE IP-CAMERA WILL SUPPORT AUTOMATIC SHUTTER TIME/SPEED THAT IS SELECTABLE ALLOW SETTING TO YIELD OPTIMAL RESULTS UNDER LOW LIGHTING CONDITIONS WITHOUT BLOOMING OR SMEARING.

THE IP-CAMERA SENSOR WILL SUPPORT AUTOMATIC AND MANUAL IRIS ADJUSTMENT. THE IP-CAMERA WILL SUPPORT AUTOMATIC GAIN CONTROL (AGC). THE IP-CAMERA ASSEMBLY WILL BE CAPABLE OF GENERATING AND OVERLAYING LINES OF ENGLISH LANGUAGE TEXT ON THE VIDEO IMAGE. A MINIMUM OF TWENTY ALPHANUMERIC CHARACTERS PER LINE WILL BE SUPPORTED. CONTROL (ENABLE, DISABLE, AND EDIT) OF THIS FEATURE WILL BE AVAILABLE REMOTELY

AND AT THE SITE USING A LAPTOP COMPUTER. THE TEXT MESSAGES WILL BE STORED IN NON-VOLATILE MEMORY. THE IP-CAMERA ID TEXT WILL CONSIST OF ONE LINE OF TEXT. SECTOR TEXT WILL CONSIST OF TEXT MESSAGES THAT CHANGE BASED ON THE POSITION OF THE IP-CAMERA WITHIN A SECTOR. A MINIMUM OF EIGHT UNIFORM SECTORS WILL BE PROVIDED.

THE IP-CAMERA WILL INCLUDE PRIVACY ZONES SO THAT THE OPERATOR CANNOT VIEW SCENES AT PREPROGRAMMED CAMERA POSITIONS. THIS PREVENTS VIEWING THE WINDOWS OF PRIVATE HOMES, HOTELS, OR OTHER BUILDINGS IN THE VICINITY OF THE CAMERA. THE PRIVACY ZONES WILL BE USER DEFINABLE. THERE WILL BE A MINIMUM OF EIGHT PRIVACY ZONES. PROVIDE A IP-CAMERA INTERFACE COMPATIBLE WITH THE COMMUNICATION EQUIPMENT.

1300.7.2 IP-CAMERA LENS PROVISIONS

THE IP-CAMERA LENS WILL BE MOTORIZED, AND BE MECHANICALLY OR ELECTRICALLY PROTECTED FROM OVERRUNNING IN EXTREME POSITIONS. INTEGRATED CAMERA/LENS COMBINATION MAY BE SUBSTITUTED

OPTICAL ZOOM RANGE WILL BE 35X. DIGITAL ZOOM RANGE WILL BE 1X THROUGH 12X WITH A SMOOTH TRANSITION FROM OPTICAL TO DIGITAL ZOOM.

THE LENS WILL HAVE AN AUTOMATIC IRIS CAPABILITY WITH MANUAL OVERRIDE.

THE ZOOM LENS WILL BE SELECTED AUTOMATICALLY OR MANUALLY TO PROVIDE A MINIMUM FOCAL LENGTH OF 0.14 TO 3.2 INCHES (3.5 TO 81 MM) THAT PROVIDES THE FULL COVERAGE OF THE CORRIDOR MAINLINES AND SHOULDERS

THE MINIMUM FOCUSING DISTANCE WILL BE A DISTANCE OF 4 FEET (1.2 M). THE LENS WILL ALSO HAVE A MINIMUM APERTURE OF F/1.2 AND A 1/4 INCH [0.6 CM] WITH 10 PRESET POSITION POINTS. THE IRIS, ZOOM AND FOCUS WILL BE CONTROLLED FROM THE CENTRAL LOCATION VIA HTTP PROTOCOL. THE MOTORS CONTROLLING THE IRIS, ZOOM AND FOCUS WILL NOT BE DAMAGED DUE TO OVERLOAD AT TRAVEL LIMITS. THE IP-CAMERA LENS WILL SUPPORT

OPTICAL ZOOMING RANGING FROM 2.5°TELEPHOTO (MAX) TO 25°WIDE ANGLE (MIN). THE IP-CAMERA WILL SUPPORT AUTOMATIC FOCUS ADJUSTMENTS, WITH MANUAL OVERRIDE. VIBRATION OR AMBIENT TEMPERATURE CHANGES WILL NOT AFFECT THE AUTOMATIC IRIS FUNCTION, FOCUS MECHANISM, AND ZOOM MECHANISM.

THE IP-CAMERA/LENS COMBINATION WILL SUPPORT AUTOMATIC RECOVERY FROM OVER AND UNDER VOLTAGE CONDITIONS, WHEN POWER IS RETURNED TO NORMAL VALUES. THE LENS WILL RETURN TO THE LAST POSITION PRIOR TO THE OVER/UNDER VOLTAGE CONDITION

THE IP-CAMERA/LENS COMBINATION WILL SUPPORT AUTOMATIC RECOVERY FROM OVER AND UNDER VOLTAGE CONDITIONS, WHEN POWER IS RETURNED TO NORMAL VALUES. THE LENS WILL RETURN TO THE LAST POSITION PRIOR TO THE OVER/UNDER VOLTAGE CONDITION

1300.7.3 IP-CAMERA PAN/TILT UNIT (PTU)/POSITIONER PROVISIONS
THE PTU WILL BE A DOOM INTEGRATED MOTORIZED, REMOTELY CONTROLLED DEVICE THAT ALLOWS THE OPERATOR TO POINT THE IP-CAMERA INTO A PAN (HORIZONTAL VECTORING) RANGE WITH THE FOLLOWING REQUIREMENTS
- 360° CONTINUOUS ROTATION CAPABILITY IN EITHER DIRECTION. SOFTWARE LIMITS PROVIDED FOR PAN MODE.
- 90° OF TILT MOVEMENT, VIDEO ROTATION AT 90° DOWN WITH AUTO-FLIP.
- PAN SPEED (OPERATOR CONTROL): VARIABLE FROM 0.1°/S TO 80 °/S
- PAN SPEED (PRESET CONTROL): MINIMUM 200°/S
- TILT SPEED (OPERATOR CONTROL): VARIABLE FROM 0.1°/S TO 40 °/S
- TILT SPEED (PRESET CONTROL): 60°/S
- MINIMUM SIXTY-FOUR PRESET POSITIONS WITH REPUTABILITY WITHIN *0.1°

1300.7.4 IP-CAMERA CONTROLLER
THE IP-CAMERA CONTROLLER WILL PROVIDE A SINGLE POINT INTERFACE FOR CONTROL AND VIDEO COMMUNICATIONS. IT WILL ALSO PROVIDE A SINGLE POINT INTERFACE FOR PRIME POWER THAT PROVIDES POWER PROTECTION, CONVERSION, AND DISTRIBUTION TO THE IP-CAMERA ASSEMBLY. THE IP-CAMERA CONTROLLER WILL HAVE 10/100 BASE-T RJ-45 ETHERNET OUTPUT FOR LOCAL VIDEO MONITORING AND COMMUNICATIONS TO A LAPTOP.THE IP-CAMERA CONTROLLER WILL RECEIVE PROCESS AND CONTROL CAMERA, ZOOM LENS, AND PTU CENTRAL COMMANDS. THESE COMMANDS WILL BE PROCESSED AND DISTRIBUTED TO THE APPROPRIATE DEVICES. THE CAMERA CONTROLLER WILL USE NON-VOLATILE MEMORY TO STORE THE REQUIRED INFORMATION FOR PRESETS, CAMERA ID, AND SECTOR TEXT. A MINIMUM OF SIXTY-FOUR PRESETS WILL BE SUPPORTED. EACH PRESET WILL CONSIST OF PAN, TILT, ZOOM, AND FOCUS POSITIONS.

THE USE OF A SEPARATE CONTROL BOX FOR POWER SURGES, TESTING, VIDEO PROCESSING AND CAMERA CONTROL WILL NOT BE REQUIRED OR ACCEPTED BY ODOT.

CALCULATED SGB CHECKED ERW

ITS NOTES

FRA-270-49.00

ITS NOTES

1300.8 IP-CAMERA ENVIRONMENTAL ENCLOSURE PROVISIONS

THE CCTV IP-CAMERA ASSEMBLY WILL MEET NEMA TYPE 4X AND IP66 ENVIRONMENTAL STANDARDS AND INCLUDE AN UNPRESSURIZED DOME-TYPE HOUSING ENCLOSURE WITH AN MINIMUM AMBIENT OPERATING TEMPERATURE OF -40 TO 140 *F (-40 TO 60 *C) WITH 100 PERCENT RELATIVE HUMIDITY THAT PROVIDES COMPLETE PROTECTION FOR THE CAMERA AND ZOOM LENS ASSEMBLY FROM MOISTURE AND AIRBORNE CONTAMINANTS. THE ENCLOSURE WILL PROTECT THE CAMERA ELECTRONICS AND ZOOM LENSES FROM BLOWING RAIN AT STORM RATES, BLOWING SAND, BLOWING DUST, TEMPERATURE, AND SOLAR LOADING, WITH AN INTERNAL HEATER AND BLOWER. THE ENCLOSURE WILL BE CORROSION RESISTANT, AND MOUNTABLE IN A MANNER, WHICH LEAVES NO EXPOSED CABLING. THE MAXIMUM OUTSIDE DIAMETER OF THE DOME WILL BE A MINIMUM OF 11.1 INCHES (280 MM), WITH A MAXIMUM OVERALL DIMENSION OF 15 X 15 IN (380 X 380 MM).

THE DOME-TYPE HOUSING'S LOWER SECTION WILL BE SITE-COATED WITH RAIN-X OR AN EQUIVALENT PRODUCT PRIOR TO FINAL ACCEPTANCE;

1300.9 IP-CAMERA CABLES

FURNISH ALL CABLES FOR THE IP-CAMERA, PTZ DOME, AND CONTROLLER. THE MOUNTING HEIGHT WILL BE 80 FEET MAXIMUM. THE CABLE SHOULD BE COMPOSITE SINGLE JACKET AND FULLY COMPATIBLE WITH THE CAMERA LOWERING UNIT.

1300.10 IP-CAMERA CONSTRUCTION PROVISIONS
FURNISH ALL TOOLS, EQUIPMENT, MATERIALS, SUPPLIES, AND MANUFACTURED ARTICLES, AND PERFORM ALL OPERATIONS AND EQUIPMENT INTEGRATION NECESSARY TO PROVIDE A COMPLETE, FULLY OPERATIONAL IP-CAMERA SITE AS DEPICTED HEREIN, WITHIN THE PLAN SET, AND/OR IN THE CONTRACT.

PROVIDE THE DEPARTMENT WITH A WRITTEN INVENTORY BY LOCATION INCLUDING SERIAL NUMBERS OF ITEMS RECEIVED AND THE CONDITION IN WHICH THEY WERE RECEIVED. ONCE RECEIVED, THE EQUIPMENT BECOMES THE CONTRACTOR'S RESPONSIBILITY. PROVIDE ALL LABOR AND EQUIPMENT NECESSARY TO MOVE INVENTORY OUT OF THE DESIGNATED STORAGE FACILITY AND TO TRANSPORT IT TO THE INSTALLATION LOCATION. ALL ITEMS WILL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS OR AS DIRECTED BY THE DEPARTMENT.

MESSENGER WIRE (IF REQUIRED) WILL BE USED FOR ALL OVERHEAD WIRING OF IP-CAMERA CABLE. CABLES WILL BE ATTACHED TO MESSENGER WIRE AS PER PLAN SHEET TC-24.81.

IF IT IS DETERMINED THAT RADIO FREQUENCY INTERFERENCE (RFI) IS INDUCING NOISE AND DEGRADING THE QUALITY OF THE VIDEO IMAGES BEING TRANSMITTED BY THE IP-CAMERA ASSEMBLY OR ITS COMPONENTS, IF REQUIRED BY THE DEPARTMENT, FURNISH AND INSTALL FERRITE COILS OR OTHER RADIO FREQUENCY (RF) SUPPRESSION DEVICES FOR RFI DAMPENING. THIS INSTALLATION AND THE PLACEMENT OF THESE RF SUPPRESSION DEVICES WILL BE AS RECOMMENDED BY THE MANUFACTURER. THE FURNISHING AND INSTALLATION OF THESE DEVICES WILL BE AN ANCILLARY COST TO THE IP-CAMERA ASSEMBLY PAY ITEM.

1300.11 IP-CAMERA TESTING PROVISIONS

THE CONTRACTOR WILL PROVIDE ONE (1) COMPLETE IP-CCTV UNIT INCLUDING SOFTWARE TO ODOT FOR TESTING IN ADVANCE OF INSTALLATION. THE CONTRACTOR WILL NOT ORDER ADDITIONAL IP-CAMERA UNITS UNTIL ODOT HAS TESTED THE FIRST UNIT AND DETERMINED IT ACCEPTABILITY. IF APPROVED, THIS UNIT SHALL BECOME THE PROPERTY OF ODOT AND SHALL NOT BE INCLUDED IN THE QUANTITY FOR THE TOTAL NUMBER OF CAMERAS TO BE PROVIDED ON THE PROJECT.

TESTING PROCESS WILL INCLUDE IP-CAMERA CABLE TESTING AND IP-CAMERA LOCAL CONTROL TESTING

THE DEPARTMENT WILL BE NOTIFIED AT LEAST FOURTEEN WORKING DAYS PRIOR TO INSTALLATION OF THE IP-CAMERA ASSEMBLY SO THAT THE DEPARTMENT, OR HIS REPRESENTATIVE(S), CAN BE PRESENT TO ESTABLISH THE APPROPRIATE SETTINGS FOR THE PAN-AND-TILT STOPS.

THE DEPARTMENT WILL BE NOTIFIED AT LEAST FOURTEEN WORKING DAYS IN ADVANCE OF THE PROPOSED DATE FOR THE IP-CAMERA CABLE TEST AND THE LOCAL FIELD OPERATIONAL TEST. THE DEPARTMENT HAS THE RIGHT TO WITNESSSUCH TESTS OR TO DESIGNATE A REPRESENTATIVE OR ENTITY TO WITNESS SUCH TESTS ON THE ODOT'S BEHALF.

1300.11.1 IP-CAMERA CABLE TESTING PROVISIONS

FURNISH ALL EQUIPMENT, APPLIANCES, AND LABOR NECESSARY TO TEST THE INSTALLED IP-CAMERA CABLE BETWEEN THE IP-CAMERA ASSEMBLY AND THE NETWORK COMMUNICATION DEVICE. BEFORE ANY CONNECTIONS ARE MADE.

- VERIFY EXTERIOR IP-CAMERA CAT-6 STP CABLE IS OUTDOOR NEC RATED AND IS COMPLIANT TO TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA). INTERNATIONAL ORGANIZATION FOR STANDARDS (ISO/ IEC) CREATES AND MAINTAINS STANDARDS FOR TELECOMMUNICATION CABLING.
- PERFORM A CABLE ANALYSIS TO ANSI/TIA-568-C.2 STANDARDS OF CATEGORY 6 CABLING AND CONTINUITY TEST ON THE IP-CAMERA CABLE, WHICH MUST NOT EXHIBIT ANY DISCONTUNITIES, SUCH AS OPENING, SHORTS, CRIMPS, OR DEFECTS;
- REPLACE ANY CABLE THAT FAILS TO MEET THE PARAMETERS, OR IF ANY TESTING REVEALS DEFECTS IN THE CABLE, AND RETEST NEW CABLE AS SPECIFIED ABOVE; AND
- FURNISH ALL TEST EQUIPMENT.

1300.11.2 IP-CAMERA LOCAL CONTROL TESTING
THE FOLLOWING LOCAL FIELD OPERATIONAL TESTS WILL BE PERFORMED AT THE IP-CAMERA ASSEMBLY FIELD SITE IN ACCORDANCE WITH THE TEST PLANS. A PDA OR LAPTOP COMPUTER WILL PROVIDE IP-CAMERA CONTROL AND POSITIONING. AFTER THE IP-CAMERA ASSEMBLY, INCLUDING THE CAMERA HARDWARE, POWER SUPPLY, AND CONNECTING CABLES, HAS BEEN INSTALLED.

- VERIFY THAT PHYSICAL CONSTRUCTION HAS BEEN COMPLETED AS DETAILED HEREIN, WITHIN THE PLAN SET, AND/OR IN THE CONTRACT;
- INSPECT THE QUALITY AND TIGHTNESS OF GROUND AND SURGE PROTECTOR CONNECTIONS;
- CHECK THE POWER SUPPLY VOLTAGES AND OUTPUT;
- CONNECT DEVICES TO THE POWER SOURCE;
- VERIFY TINSTALLATION OF SPECIFIED CABLES AND CONNECTIONS BETWEEN THE IP-CAMERA, PTU, AND IP-CAMERA CONTROL RECEIVER;
- CONNECT TO IP-CAMERA THROUGH A LAPTOP ETHERNET CONNECTION AND ESTABLISH COMMUNICATION WITH IP-CAMERA VIA TCP/IP-HTTP PROTOCOLS.
- SET THE IP-CAMERA ADDRESS;
- VERIFY THE PRESENCE OF INDUSTRY COMPLIANT VIDEO IMAGE I.E. H.264 WITH LOCAL OR REMOTE LAPTOP/COMPUTER. EXERCISE THE PAN, TILT, ZOOM, FOCUS, IRIS OPENING, AND MANUAL IRIS CONTROL SELECTION, AND THE OPERATION, LOW PRESSURE ALARM (IF PRESENT), PRESENT POSITIONING, AND POWER ON/OFF FUNCTIONS;
- OBSERVE THE VIDEO PICTURE ON A LAPTOP/COMPUER; DEMONSTRATE IP-CAMERA SENSITIVITY AT LOWLIGHT LEVELS TO MEET THE PROVISIONS;
- DEMONSTRATE THE PAN/TILT SPEED AND EXTENT OF MOVEMENT TO MEET THE PROVISIONS;
- VERIFY PROPER VOLTAGE OF ALL THE POWER SUPPLIES.

1300.12 VENDOR AND MANUAL PROVISIONS

PROVIDE A TRAINING AND MAINTENANCE MANUAL FOR THE IP-CAMERA ASSEMBLY AND THE CCTV NETWORKS, INCLUDING DETAILED PROVISIONS AND INFORMATION REGARDING THE FOLLOWING CCTV SYSTEM COMPONENTS.
WEIGHT AND DIMENSIONS;RESOLUTION;
SENSITIVITY;
POWER CONSUMPTION;
OPTICAL ZOOM RANGE;
DIGITAL ZOOM RANGE;
ZOOM AND FOCUS PRESETS;
PAN/TILT PRESETS;
ETHERNET CONNECTION;
SECURITY;
SUPPORTED NETWORK PROTOCOLS;
VIDEO COMPRESSION;
FRAME RATE;
NUMBER OF VIDEO STREAMS AND STREAM OUTPUTS;
IP-CAMERA CONTROL INTERFACE AS REQUIRED BY RECOMMENDED STANDARD 10/100 BASE-T RJ-45 ETHERNET, ETC.;
OPERATING TEMPERATURE AND RELATIVE HUMIDITY; AND GENERAL MAINTENANCE PROCEDURES

PROVIDE DOCUMENTATION DETAILING THE TECHNICAL AND OPERATIONAL ASPECTS OF THE COMPLETED SYSTEM. THIS WILL INCLUDE DEVICE MANUALS, SYSTEM DIAGRAMS, CABLING DIAGRAMS, ANY AND ALL FIELD ENGINEERING NOTES SPECIFIC TO EACH INSTALLED IP-CAMERA ASSEMBLY, AND ANY OTHER DOCUMENTATION AS REQUIRED BY THE DEPARTMENT.SUPPLY A MINIMUM OF TWO DAYS OF TRAINING FOR OPERATIONS AND MAINTENANCE PERSONNEL REGARDING ALL FUNCTIONAL, OPERATIONAL, AND MECHANICAL ASPECTS OF THE IP-CAMERA ASSEMBLY AND THE SUPPORTING NETWORK COMMUNICATION DEVICES.

THE VENDOR SHALL SUPPLY TO ODOT COPIES OF THE COMPUTER SOFTWARE FOR SETUP, TESTING, AND CONTROL OF THE CCTV LOCALLY

1300.13 WARRANTY

EQUIPMENT FURNISHED UNDER THIS SPECIFICATION WILL BE GUARANTEED TO PERFORM ACCORDING TO THESE SPECIFICATIONS AND TO THE MANUFACTURER'S PUBLISHED SPECIFICATIONS. EQUIPMENT WILL BE WARRANTED FOR A MINIMUM OF FIVE (5) YEARS FROM TIME OF ACCEPTANCE AGAINST MANUFACTURER'S DEFECTS AND/OR FAILURE IN DESIGN, MATERIALS OR WORKMANSHIP. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LABOR TO TROUBLESHOOT/RESOLVE ISSUES DURING THIS 5 YEAR WARRANTY. UNLESS OTHERWISE SPECIFIED IN THE INVITATION FOR BIDS, WARRANTY COVERAGE WILL BECOME EFFECTIVE ON THE DATE OF FINAL ACCEPTANCE OF THE SYSTEM BY THE DEPARTMENT. THE CCTV IP-CAMERA SYSTEM MANUFACTURER(S) WILL ASSIGN TO THE DEPARTMENT ALL MANUFACTURER'S NORMAL WARRANTIES OR GUARANTEES, ON ALL SUCH ELECTRONIC, ELECTRICAL AND MECHANICAL EQUIPMENT, MATERIALS, TECHNICAL DATA, AND PRODUCTS FURNISHED FOR AND INSTALLED ON THE PROJECT. DEFECTIVE EQUIPMENT WILL BE REPAIRED OR REPLACED, AT THE MANUFACTURER'S OPTION, DURING THE WARRANTY PERIOD AT NO COST TO THE DEPARTMENT. THE CONTRACTOR SHALL HAVE PERSONNEL ON SITE TO TROUBLESHOOT WITHIN TEN (10) BUSINESS DAYS UPON NOTIFICATION FROM ODOT. IF PARTS ARE REQUIRED, THE CONTRACTOR MAY BE GIVEN AN ADDITIONAL TEN (10) BUSINESS DAYS TO RECEIVE THE PARTS AND COMPLETELY RESOLVE THE ISSUE. IF THE PROBLEM IS NOT RESOLVED DUE TO NEGLIGENCE IN RESPONSE FROM THE CONTRACTOR AFTER THIRTY (30) DAYS, ODOT RESERVES THE RIGHT TO BACK-CHARGE THE CONTRACTOR IN ORDER TO INTERNALLY FIX OR HIRE A 3RD PARTY CONTRACTOR TO MAKE NECESSARY REPAIRS. THIS WARRANTY RESPONSIBILITY TO ODOT MAY BE TRANSFERRED FROM THE CONTRACTOR'S RESPONSIBILITY TO THE MANUFACTURER IF WRITTEN DOCUMENTATION IS PROVIDED AND ACCEPTED BY ODOT.

AS BUILT - 4/22/2016

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BU 4, 5, 6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

ITS NOTES

FRA-270-49.00

ITS SIGNAL NOTES

ITEM 633 - CONTROLLER ITEM, MISC.: ITS CABINET, GROUND MOUNTED

1800.0 GENERAL DESCRIPTION
THE CABINET SHALL BE A STANDARD 334 TRAFFIC CONTROLLER CABINET PER ODOT 2013 CONSTRUCTION AND MATERIALS SPECIFICATION 733.03 AND SHALL CONFORM TO THE ADDITIONAL BELOW SPECIFICATIONS. IN CASES WHERE THE BELOW SPECIFICATION CONFLICTS WITH THE ODOT 2013 CONSTRUCTION AND MATERIALS SPECIFICATION 733.03, THE BELOW SPECIFICATION SHALL TAKE PRECEDENCE. THE POWER DISTRIBUTION ASSEMBLY PDA-3 MODULE REQUIREMENT SHALL BE REMOVED FROM THIS SPECIFICATION. FIELD CABINETS SHALL BE DESIGNED AND FURNISHED TO HOUSE ANY COMBINATION OF THE FOLLOWING COMMUNICATIONS EQUIPMENT OR INTERFACE EQUIPMENT TO THE FOLLOWING FIELD DEVICES:
- CLOSED CIRCUIT TELEVISION (CCTV) CAMERA
- CHANGEABLE MESSAGE SIGN (DMS)
- HIGHWAY ADVISORY RADIO (HAR)
- MANAGED EDGE ETHERNET SWITCH
- ETHERNET HUB SWITCH
- NON-INTRUSIVE MICROWAVE DETECTION SYSTEM
- DEVICE SERVER
- UNINTERRUPTIBLE POWER SUPPLY (UPS)
- VIDEO ENCODER
FURNISH AND INSTALL A GROUND MOUNTED CABINET WITH 12 INCH CABINET RISER ON STANDARD CABINET FOUNDATION WITH A 19-INCH (480-MM) RACK FRAME ASSEMBLY AT SPECIFIED SITES AS SHOWN ON THE PLANS. THE GROUND MOUNTED CABINETS SHALL BE INSTALLED AS SHOWN ON THE PLANS. CABINETS SHALL BE GROUND MOUNTED. ALL CABINETS SHALL BE PROVIDED WITH: DEDICATED SPACE FOR FUTURE ADDITION OF FIBER OPTIC PATCH PANEL 36 INCHES FROM THE TOP OF CABINET RISER WITH MINIMUM DIMENSION OF 17 (W) X 14 (H) X 8 (D) IN; GROUNDING BUSS BAR; 19-INCH (480-MM) RACK SYSTEM FOR MOUNTING OF ALL DEVICES IN THE CABINET; DOOR-ACTIVATED LED LIGHT BARS MOUNTED AT THE TOP (REAR AND FRONT) OF CABINET IN A WAY THAT NO CABINET RACK SPACE IS USED FOR LIGHTING (MINIMUM 12 INCHES IN LENGTH, MINIMUM 110 DEGREE BEAM ANGLE, COOL WHITE, MINIMUM 300 LUMENS PER UNIT, ON/OFF SWITCH, MAXIMUM 0.75 INCHES IN WIDTH, 24 VOLT); PULL-OUT SHELF/DRAWER FOR LAPTOP AND MAINTENANCE USE; VENTILATION FANS; 120 VOLTS ALTERNATING CURRENT (VAC) POWER SUPPLY; 120 VAC GROUND FAULT INTERRUPTED (GFI) PROTECTED DUPLEX OUTLETS FOR TOOLS. ALL CABINETS SHALL HAVE DOOR-ACTIVATED SWITCHES THAT PROVIDE A CONTACT CLOSURE FOR ALARM WHEN THE DOOR(S) ARE OPENED TO ODOT'S NETWORK SWITCH. THE GAUGE OF THE WIRE CONNECTED TO THE SWITCHES SHALL BE 16 AWG AND A LENGTH OF 5 FEET TO CONNECT TO ODOT'S NETWORK SWITCH. THE CABINETS SHALL BE SIZED TO ENSURE EASE OF ACCESS TO EQUIPMENT AND PROVIDED WITH PROPER VENTILATION TO MAINTAIN AN INTERNAL OPERATING ENVIRONMENT THAT DOES NOT EXCEED THE ENVIRONMENTAL OPERATING RANGES FOR DEVICES PLACED WITHIN THE CABINET. FURNISH ALL MATERIALS WITH THE MOST RECENTLY DEVELOPED AND APPROVED PRODUCT VERSIONS THAT MEET OR EXCEED ALL APPLICABLE STANDARDS, PROVISIONS, AND REQUIREMENTS BEFORE THE SYSTEM IS CONSIDERED FOR ACCEPTANCE. EACH CABINET ASSEMBLY SHALL ALSO INCLUDE ANY ANCILLARY EQUIPMENT OR INCIDENTAL ITEMS, SUCH AS REQUIRED MOUNTING HARDWARE AND CABLING. THE CABINET INTERIOR SHALL BE COMPLETELY INSULATED PER THIS SPECIFICATION.

1800.1 MATERIALS
MATERIALS AND EQUIPMENT FURNISHED BY THE QUALIFIED PROVIDER SHALL MEET ALL REQUIREMENTS IN THIS PROVISION. EQUIPMENT SUPPLIED SHALL BE A STANDARD PRODUCTION MODEL; PROTOTYPE EQUIPMENT WILL NOT BE ACCEPTABLE. ALL EQUIPMENT SHALL BE WARRANTED AGAINST DEFECTS AND ANY FAILURES WHICH MAY OCCUR THROUGH NORMAL USE FOR A MINIMUM OF FIVE YEARS FROM THE DATE OF SUCCESSFUL COMPLETION OF THE EQUIPMENT'S SYSTEM TEST.

1800.2 GENERAL
THE CABINETS SHALL BE COMPLETE WITH A PREFABRICATED CABINET SHELL, AND ALL INTERNAL COMPONENTS AND EQUIPMENT, BACK AND SIDE PANELS, FRONT AND BACK DOORS, TERMINAL STRIPS, CABLING AND HARNESSES, SURGE PROTECTION FOR POWER AND COMMUNICATION CIRCUITS, POWER DISTRIBUTION BLOCKS OR ASSEMBLIES, SHELVES, CONNECTORS AND ALL MOUNTING HARDWARE NECESSARY FOR INSTALLATION OF EQUIPMENT. THE CABINETS SHALL BE COMPLETELY WEATHERPROOF TO PREVENT THE ENTRY OF WATER. THE CABINET TOP SHALL BE CROWNED 1/2 INCH (13 MM) OR SLANTED TO THE REAR TO PREVENT STANDING WATER.

1800.3 REQUIREMENTS
1800.3.1 CONSTRUCTION
THE CABINET SHALL HAVE MINIMUM DIMENSIONS: 67 IN H X 24 IN W X 30 IN D. THE CABINET AND DOORS SHALL BE FABRICATED OF 0.125-INCH (3.2-MM) MINIMUM THICKNESS ALUMINUM. ALL EXTERIOR SEAMS FOR THE CABINETS AND DOORS SHALL BE CONTINUOUSLY WELDED. EXTERIOR WELDS SHALL BE GROUND SMOOTH. EDGES SHALL BE FILED TO A RADIUS OF 0.03-INCH (0.76-MM), MINIMUM.

1800.3.2 LOCKS
WHEN THE DOOR IS CLOSED AND LATCHED, THE DOOR SHALL BE LOCKED. THE HANDLE SHALL HAVE A MINIMUM LENGTH OF 7 INCHES (180 MM) AND SHALL BE PROVIDED WITH A 5/8INCH (16-MM), MINIMUM, STEEL SHANK. THE HANDLE SHALL BE FABRICATED OF CAST ALUMINUM, STAINLESS STEEL, OR OF ZINC-PLATED OR CADMIUM-PLATED STEEL. CABINET LOCKS SHALL BE THE SOLID BRASS AND KEYED TO THE ODOT MASTER KEY CORBIN NUMBER 2, 6 -PIN TUMBLER RIM TYPE. THE LOCK SHALL HAVE RECTANGULAR, SPRING-LOADED BOLTS. THE LOCKS SHALL BE LEFT HAND, AND RIGIDLY MOUNTED WITH STAINLESS STEEL MACHINE SCREWS APPROXIMATELY 2 INCHES DIAGONALLY APART. THE CABINET DOORS SHALL ALSO BE PAD LOCKABLE. KEYS SHALL BE REMOVABLE IN THE LOCKED AND UNLOCKED POSITIONS, AND TWO KEYS FURNISHED WITH EACH CABINET. THE FRONT POSITION OF THE LOCK SHALL EXTEND 1/8 INCH (3.2 MM) TO 3/8 INCH (9.5 MM) BEYOND THE OUTSIDE SURFACE OF THE DOOR.

1800.3.3 DOORS
ALL CABINETS SHALL HAVE TWO FULL-SIZE DOORS. GROUND MOUNTED CABINETS SHALL BE DESIGNED SO MOUNTING BRACKETS CAN BE INSTALLED ON THE SIDE SO BOTH DOORS ARE FULLY FUNCTIONAL. THE DOORS SHALL BE PROVIDED A FULL-LENGTH STAINLESS STEEL PIANO HINGE, WITH STAINLESS STEEL PINS SPOT-WELDED AT THE TOP. THE HINGES SHALL BE MOUNTED SO THAT THEY CANNOT BE REMOVED FROM THE DOOR OR CABINET WITHOUT FIRST OPENING THE DOOR. THE DOOR AND HINGES SHALL BE BRACED TO WITHSTAND A 100-POUND PER VERTICAL FOOT (149 KG/M) OF DOOR HEIGHT LOAD APPLIED VERTICALLY TO THE OUTER EDGE OF THE DOOR WHEN STANDING OPEN. THERE SHALL BE NO PERMANENT DEFORMATION OR IMPAIRMENT OF ANY PART OF THE DOOR OR CABINET BODY WHEN THE LOAD IS REMOVED. THE DOOR OPENING SHALL BE DOUBLE FLANGED ON ALL FOUR SIDES. DOORSTOPS SHALL BE INCLUDED AT 90 AND 120-DEGREE POSITIONS. THE CATCHES SHALL BE 3/8 INCH (9.5 MM) DIAMETER, MINIMUM, PLATED STEEL RODS. THE CATCHES SHALL BE CAPABLE OF HOLDING THE DOOR OPEN AT 90 DEGREES IN A 60 MPH (96.5 KM/H) WIND AT AN ANGLE PERPENDICULAR TO THE PLANE OF THE DOOR. BOTH THE DOOR AND THE DOORSTOP MECHANISM SHALL BE OF SUFFICIENT STRENGTH TO WITHSTAND A SIMULATED WIND LOAD OF 5 POUNDS PER SQUARE FOOT (24.4 KG/SQ M) OF DOOR AREA APPLIED TO BOTH THE INSIDE AND OUTSIDE SURFACES WITHOUT FAILURE, PERMANENT DEFORMATION, OR COMPROMISING OF DOOR POSITION AND NORMAL OPERATION. THE CABINET DOOR FRAME SHALL BE DESIGNED SO THAT THE LATCHING MECHANISM WILL HOLD TENSION ON AND FORM A FIRM SEAL BETWEEN DOOR GASKET AND DOOR FRAME. THE LATCHING MECHANISM SHALL BE A 3-POINT CABINET LATCH WITH NYLON ROLLERS. THE CENTER CATCH AND PUSHRODS SHALL BE 6061 ALUMINUM, OR ZINC-PLATED OR CADMIUM-PLATED STEEL. PUSHRODS SHALL BE TURNED EDGEWISE AT THE OUTER SUPPORTS AND SHALL BE 1/4 X 3/4 IN, (6.4 X 19 MM) MINIMUM. THE NYLON ROLLERS SHALL HAVE A MINIMUM DIAMETER OF 3/4 INCH (19 MM) AND SHALL BE EQUIPPED WITH BALL BEARINGS. THE DOORS SHALL BE MANUFACTURED SO THAT ALL INTERNAL COMPONENTS (LOCKING MECHANISM, FILTER BRACKETS, ETC.) ARE WELDED TO THE DOOR. (NOTHING SHALL BE FASTENED TO THE INSIDE OF EITHER DOOR BY THE METHOD OF INSERTING A BOLT THROUGH THE DOOR.)

1800.3.4 GASKETS
ENSURE THAT CABINET DOORS INCLUDE A GASKET TO PROVIDE A DUST AND WEATHER-RESISTANT SEAL WHEN CLOSED. THE GASKET MATERIAL SHALL BE CLOSED-CELL NEOPRENE AND SHALL MAINTAIN ITS RESILIENCY AFTER EXPOSURE TO THE OUTDOOR ENVIRONMENT. THE GASKET SHALL SHOW NO SIGN OF ROLLING OR SAGGING, AND SHALL ENSURE A UNIFORM DUST AND WEATHER RESISTANT SEAL AROUND THE ENTIRE DOOR FACING. GASKET SHALL BE PROVIDED ON ALL DOOR OPENINGS AND SHALL BE DUST-TIGHT. GASKETS SHALL BE PERMANENTLY BONDED TO THE METAL. THE MATING SURFACE OF THE GASKET SHALL BE COVERED WITH A SILICONE LUBRICANT TO PREVENT STICKING TO THE MATING SURFACE. ALL OVERLAPPING EXTERIOR SEAMS AND DOORS SHALL MEET THE REQUIREMENTS FOR TYPE 4 ENCLOSURES IN THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA) ENCLOSURE STANDARDS.

1800.3.5 MOUNTING
ALL GROUND MOUNTED CABINETS SHALL INCLUDE ALL NECESSARY COMPONENTS REQUIRED FOR SECURE CONNECTION TO THE FOUNDATION AND RISER INCLUDING BUT NOT LIMITED TO THE ANY MOUNTING BRACKETS AND MOUNTING HARDWARE. 12 INCH RISERS SHALL BE INCLUDED. THE RISERS SHALL HAVE A RODENT PROOF VENT THAT WILL ALLOW ANY WATER TO ESCAPE THAT MAY ENTER THE CABINET.

1800.3.6 SHELVES
TWO SUBSTANTIAL METAL SHELVES SHALL BE PROVIDED TO SUPPORT EQUIPMENT AT THE MIDDLE OF THE 19 INCH RACK JUST ABOVE THE POWER RECEPTACLES AND CIRCUIT BREAKERS. MACHINE SCREWS AND BOLTS SHALL NOT PROTRUDE BEYOND THE OUTSIDE WALL OF THE CABINET. THE SHELVES SHALL NOT REQUIRE MORE THAN 2U OF RACK SPACE. MAXIMUM SHELF DIMENSIONS SHALL BE 17 INCHES (W) X 4 INCHES (H) X 15 INCHES (D).

1800.3.7 COATING
ALL COATINGS SHALL BE COMMERCIALLY SMOOTH, SUBSTANTIALLY FREE OF FLOW LINES, PAINT WASHOUT, STREAKS, BLISTERS AND OTHER DEFECTS THAT WOULD IMPAIR SERVICEABILITY OR DETRACT FROM GENERAL APPEARANCE. ALL CADMIUM PLATING SHALL CONFORM TO THE REQUIREMENTS IN MILITARY SPECIFICATION MIL-QQ-416B. ALL ZINC PLATING SHALL CONFORM TO THE REQUIREMENTS IN MILITARY SPECIFICATION MIL-QQ-325B.

1800.3.8 VENTILATION
CABINETS SHALL BE PROVIDED WITH VENT OPENINGS IN THE FRONT DOOR TO ALLOW CONVECTION COOLING OF ELECTRONIC COMPONENTS. EACH CABINET SHALL BE EQUIPPED WITH AN ELECTRIC FAN WITH BALL OR ROLLER BEARINGS AND A CAPACITY OF AT LEAST 100 CUBIC FEET PER MIN (2.8 CU M/MIN). THE FAN SHALL BE THERMOSTATICALLY CONTROLLED AND SHALL BE MANUALLY ADJUSTABLE TO TURN ON BETWEEN 89.6 °F (32 °C) AND 149 °F (65 °C) WITH A DIFFERENTIAL OF NOT MORE THAN 10.8 °F (6 °C) BETWEEN AUTOMATIC TURN ON AND TURN OFF. THE CABINET FAN CIRCUIT SHALL BE FUSED AT 125 PERCENT OF THE AMPACITY OF THE FAN MOTOR INSTALLED. THE MANUAL ADJUSTMENT SHALL BE GRADED IN 18 °F (10 °C) INCREMENTS. THE VENT OPENING SHALL BE LOCATED ON THE LOWER PORTION OF THE CABINET DOOR AND SHALL BE COVERED FULLY ON THE INSIDE WITH A COMMERCIALLY AVAILABLE FILTER. REMOVABLE AIR FILTER SHALL BE HOUSED BEHIND THE DOOR VENTS. THE FILTER SHALL BE REMOVEABLE, WASHABLE, AND RE-USEABLE AND A SPARE FILTER OF THE SAME TYPE SHALL BE PROVIDED PER EACH FILTER IN USE ON THE CABINET.

THE FILTER FILTRATION AREA SHALL COVER THE VENT OPENING AREA. A FILTER SHELL SHALL BE PROVIDED THAT FITS OVER THE FILTER, PROVIDING MECHANICAL SUPPORT FOR THE FILTER. THE SHELL SHALL BE LOUVERED TO DIRECT THE INCOMING AIR DOWNWARD. THE SHELL SIDES AND TOP SHALL BE BENT OVER A MINIMUM OF 0.26 INCHES (6 MM) TO HOUSE THE FILTER. THE FILTER AND SHELL SHALL BE HELD FIRMLY IN PLACE WITH A BOTTOM BRACKET AND A SPRING-LOADED UPPER CLAMP. NO INCOMING AIR SHALL BYPASS THE FILTER. THE BOTTOM FILTER BRACKET SHALL BE FORMED TO CREATE A WATERPROOF SUMP WITH DRAIN HOLES TO THE OUTSIDE HOUSING. THE FILTER SHALL TRAP PARTICLES 2 MICRONS AND LARGER.

1800.3.9 WIRING
CONDUCTORS USED IN CABINET WIRING SHALL BE NO. 22, OR LARGER, WITH A MINIMUM OF 19 STRANDS. CONDUCTORS SHALL CONFORM TO MILITARY SPECIFICATION MIL-W-16878D, TYPE B OR BETTER. THE INSULATION SHALL HAVE A MINIMUM THICKNESS OF 10 MIL (254X10^M) AND SHALL BE NYLON JACKETED POLYVINYL CHLORIDE OR SHALL BE IRRADIATED CROSS-LINK POLYVINYL CHLORIDE, POLYHALOCARBON OR POLYCHLORO-ALKENE, EXCEPT THAT, AT THE CONTRACTOR'S OPTION, CONDUCTORS NO. 14 AND LARGER MAY BE UNDERWRITERS LABORATORIES INCORPORATED (UL) TYPE THERMOPLASTIC HIGH HEAT RESISTANT NYLON COATED (THHN). CONDUCTOR INSULATION SHALL BE RATED AT 300 VOLTS (V) AND SHALL BE RATED FOR USE AT 221 °F (105 °C). CABLES SHALL BE PROVIDED WITH STRAIN RELIEF. WIRING WITHIN CABINETS SHALL BE NEATLY ARRANGED AND LACED, OR ENCLOSED IN PLASTIC TUBING OR RACEWAY. CONDUCTORS USED IN CABINET WIRING SHALL CONFORM TO THE FOLLOWING COLOR-CODE REQUIREMENTS:

A: THE GROUNDED CONDUCTOR OF A CIRCUIT SHALL BE IDENTIFIED BY A CONTINUOUS WHITE OR NATURAL GRAYCOLOR.

B: THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE IDENTIFIED BY A CONTINUOUS GREEN COLOR OR BY A CONTINUOUS GREEN COLOR WITH ONE OR MORE YELLOW STRIPES.

C: THE UNGROUNDED CONDUCTORS SHALL BE IDENTIFIED BY ANY COLOR NOT SPECIFIED IN A OR B ABOVE.

CONDUCTORS USED IN CABINET WIRING SHALL TERMINATE WITH PROPERLY SIZED CAPTIVE OR SPRING SPADE TYPE TERMINALS OR SHALL BE SOLDERED TO A THROUGH-PANEL SOLDER LUG ON THE REAR SIDE OF THE TERMINAL BLOCK. CRIMP-STYLE CONNECTORS SHALL BE APPLIED WITH A PROPER TOOL WHICH PREVENTS OPENING OF THE HANDLES UNTIL THE CRIMP IS COMPLETED. EQUIPMENT GROUNDING CONDUCTOR BUS SHALL BE PROVIDED IN EACH CABINET. THE BUS SHALL BE GROUNDED TO THE CABINET AND SHALL BE CONNECTED TO THE METAL CONDUIT SYSTEM OR OTHER APPROVED GROUND WITH A NUMBER 8, OR LARGER, GROUNDING CONDUCTOR. WITH ALL THE CABINET EQUIPMENT IN PLACE AND CONNECTED, THE RESISTANCE BETWEEN THE GROUNDED CONDUCTOR TERMINAL BUS AND THE EQUIPMENT GROUNDING CONDUCTOR BUS SHALL BE 50 MEGAOHMS, MINIMUM, WHEN MEASURED WITH AN APPLIED VOLTAGE OF 150 VOLTS-DIRECT CURRENT (VDC). IF DIRECT CURRENT (DC-) IS TO BE GROUNDED, IT SHALL BE CONNECTED TO EQUIPMENT GROUND ONLY. TWO OR MORE TERMINAL BLOCKS SHALL BE PROVIDED FOR FIELD CONNECTIONS. FIELD TERMINALS SHALL BE INSTALLED WITHIN 22 INCHES (560 MM) OF THE FACE OF THE CABINET AND SHALL BE ORIENTED FOR SCREWDRIVER OPERATION FROM THE DOOR OPENING. ALL TERMINALS SHALL BE A MINIMUM OF 5 INCHES (127 MM) ABOVE THE FOUNDATION. NO MORE THAN THREE CONDUCTORS SHALL BE BROUGHT TO ANY ONE TERMINAL. TWO FLAT METAL JUMPERS, STRAIGHT OR U SHAPED, MAY ALSO BE PLACED UNDER A TERMINAL SCREW. AT LEAST TWO FULL THREADS OF ALL TERMINAL SCREWS SHALL BE FULLY ENGAGED WHEN THE SCREW IS TIGHTENED. NO LIVE PARTS SHALL EXTEND BEYOND THE BARRIER.

FIELD CONNECTION SHALL BE MADE FOR THE CONDUCTORS OF SIGNAL CABLE, POWER CABLE, INTERCONNECT CABLE AND WIRELESS CABLE. CONDUCTORS SHALL BE CONNECTED SO THE OUTGOING CIRCUITS SHALL BE OF THE SAME POLARITY AS THE LINE SIDE OF THE POWER SUPPLY. THE CIRCUIT COMMON RETURN SHALL BE OF THE SAME POLARITY AS THE GROUND SIDE OF THE POWER SUPPLY. THE GROUNDED SIDE OF THE POWER SUPPLY SHALL BE GROUNDED TO THE CABINET IN AN APPROVED MANNER. ALL FIELD WIRING SHALL BE NEATLY ARRANGED AND ROUTED TO THE APPROPRIATE TERMINAL BLOCKS. FIELD WIRING SHALL BE IDENTIFIED IN ACCORDANCE WITH SECTION 713.18 EXCEPT THAT MARKING MAY BE BY INDELIBLE PEN INSTEAD OF EMBOSSED LETTERS.

FIELD WIRING ENTERING THE CABINET EXCEPT POWER WIRING SHALL BE FITTED WITH SPADE TERMINALS TO ASSURE A GOOD CONNECTION. INCOMING POWER WIRING MAY USE SPACE TERMINALS; OR THE BARE CONDUCTOR WIRE MAY BE CONNECTED TO TERMINAL POINTS UTILIZING SCREW OR SPRING APPLIED CLAMPING SURFACES COMPATIBLE WITH EITHER COPPER OR ALUMINUM WIRE AND PROVIDING A POSITIVE GRIP. AFTER COMPLETION OF FIELD WIRING, THE CONDUIT ENTERING THE CABINET SHALL BE COMPLETELY SEALED IN AN APPROVED MANNER WITH A REMOVABLE SEALING COMPOUND OR A MOLDED PLASTIC OR RUBBER DEVICE, WHICH IS COMPATIBLE WITH THE CABLE JACKET, THE INSULATION AND THE CONDUIT MATERIAL.

1800.3.10 LABELS
A PERMANENT PRINTED, ENGRAVED OR SILK SCREENED LABEL SHALL BE PROVIDED FOR ALL REMOVABLE ITEMS OF EQUIPMENT; SUCH AS, RECEPTACLES FOR RELAYS, SWITCHING DEVICES, SWITCHES, FUSES, AND CIRCUIT BREAKERS. LABELS SHALL CONFORM TO THE DESIGNATIONS ON THE CABINET WIRING DIAGRAM. LABELS FOR ALL SHELF-MOUNTED EQUIPMENT SHALL BE ON THE FACE OF THE SHELF BELOW THE ITEM. LABELS FOR WALL-MOUNTED EQUIPMENT SHALL BE BELOW THE ITEM. ALL EQUIPMENT IN THE CABINET, WHEN REQUIRED, SHALL BE PERMANENTLY AND CLEARLY LABELED. THE MARKER STRIPS SHALL BE MADE OF MATERIAL THAT CAN BE EASILY AND LEGIBLY WRITTEN UPON USING A PENCIL OR BALLPOINT PEN. MARKER STRIPS SHALL BE LOCATED IMMEDIATELY BELOW THE ITEM THEY ARE TO IDENTIFY AND MUST BE CLEARLY VISIBLE WITH ALL ITEMS INSTALLED.

CALCULATED SGB CHECKED ERW

ITS NOTES

FRA-270-49.00

ITS NOTES

ITEM 633 - CONTROLLER ITEM, MISC.: ITS CABINET, GROUND MOUNTED (CONTINUED)

1800.3.11 POWER UNIT
A RACK MOUNTED POWER UNIT SHALL BE MOUNTED IN THE BOTTOM FRONT OF THE CABINET. THE POWER UNIT SHALL CONTAIN THE FOLLOWING REQUIREMENTS:

- MAXIMUM DIMENSIONS: 17 INCHES (W) X 7 INCHES (H) X 8 INCHES (D)

- EQUIPMENT RECEPTACLE:

1. SHALL BE MOUNTED ON THE REAR OF THE POWER UNIT
2. EQUIPMENT RECEPTACLES SHALL BE DUPLEX, 3-PRONG, NEMA TYPE 5-20R GROUNDING TYPE OUTLET AND SHALL CONFORM TO THE REQUIREMENTS IN UL STANDARD 943.

- FIELD PERSONNEL TESTING OUTLET
1. ONE GFCI RECEPTACLE OUTLET ON RIGHT FRONT

- SURGE SUPPRESSION:
1. SHALL BE INSTALLED SO THAT ANY LED INDICATORS CAN BE EASILY SEEN AND THE UNIT CAN BEEASILY REPLACED.
2. MOUNTED ON RIGHT FRONT OF UNIT WITH THE FOLLOWING SPECIFICATIONS
3. 100 KA PER PHASE RATING 120 SINGLE PHASE
4. UL 1449 LISTED
5. < 1 NANOSECOND RESPONSE TIME
6. NORMAL OPERATING TEMPERATURE: -40 TO +55 CELSIUS
7. PEAK OPERATING TEMPERATURE: 80 CELSIUS
8.MAXIMUM DIMENSIONS: 8 INCHES (W) X 4 INCHES (H) X 4 INCHES (D)

- 3 CIRCUIT BREAKERS MOUNTED ON LEFT FRONT OF UNIT (1-60 AMP & 2-20 AMP)
1. CIRCUIT BREAKERS SHALL HAVE A MINIMUM INTERRUPTING CAPACITY OF 5000 A, ROOT MEAN SQUARE (RMS).
2. THE 60 AMP BREAKER (CB1) SHALL BE THE MAIN BREAKER OF THE CABINET. INCOMING POWER SHALL BE WIRED THROUGH THE FOLLOWING PATH:
3. ONE 20 AMP BREAKER (CB2) SHALL BE UTILIZED FOR ALL CABINET EQUIPMENT.
4. ONE 20 AMP BREAKER (CB3) SHALL BE UTILIZED FOR THE GFCI, LED LIGHTING, AND CABINET FANS.
5. THE SURGE SUPPRESSION SHALL BE WIRED TO ENCOMPASS BOTH 20 AMP BREAKERS.
6. THE NOISE FILTER SHALL BE WIRED TO ONLY ENCOMPASS THE EQUIPMENT OUTLET.

- POWER DISTRIBUTION BLOCKS
A POWER DISTRIBUTION BLOCK SHALL BE PROVIDED FOR THE MAIN POWER ENTERING THE CABINET. THE POWER DISTRIBUTION BLOCK SHALL HAVE THE FOLLOWING MINIMUM REQUIREMENTS:
1. CURRENT RATING 175 AMPS
2. VOLTAGE RATING 600 VOLTS
3. 3 POLE
4. PRIMARY WIRE RANGE 14 2/0 AWG COPPER
5. SECONDARY WIRE RANGE 14 4 AWG COPPER
6. SHALL BE EQUIPPED WITH A TOUCH SAFE COVER

A SEPARATE UNIT SHALL ALSO BE INCIDENTAL TO THE PRICE OF THE CABINET FOR THE PURPOSE OF REMOTE MANAGEMENT OF 12VDC AND 24VDC POWER OUTPUTS. THIS UNIT SHALL BE 19 INCH RACK-MOUNTABLE AND SHALL ALLOW FOR REMOTE MANAGEMENT OF A MINIMUM OF 5 SEPARATE DC POWER SOURCES. THERE SHALL BE A MINIMUM OF 3 ALARM CONTACT CLOSURE INPUTS, THAT WHEN TRIGGERED WILL SEND AN EMAIL TO A USER DEFINED ADDRESS. THE UNIT SHALL ALSO MONITOR THE OUTPUT STATES OF ALL THE POWER OUTPUTS.

1800.3.12 TERMINAL BLOCKS
TERMINAL BLOCKS SHALL BE RATED 600 VAC, MINIMUM, AND SHALL BE PROVIDED WITH NICKEL, SILVER OR CADMIUM PLATED BRASS BINDER HEAD SCREW TERMINALS. HEAVY DUTY TERMINAL BLOCKS SHALL BE RATED AT 20 A AND SHALL BE PROVIDED WITH TWELVE POLES WITH NUMBER 10 X 5/16 IN (250 X 7.9 MM) NICKEL PLATED BRASS BINDER HEAD SCREWS AND NICKEL PLATED BRASS INSERTS. EACH POLE POSITION SHALL BE PROVIDED WITH TWO TERMINAL POSITIONS. THE TERMINAL BLOCKS SHALL BE THE BARRIER TYPE, WITH SHORTING BARS IN EACH OF THE TWELVE POSITIONS, AND SHALL BE PROVIDED WITH INTEGRAL TYPE MARKING STRIPS. LIGHT DUTY TERMINAL BLOCKS SHALL BE RATED AT 5 A AND SHALL BE PROVIDED WITH TWELVE POLES WITH NUMBER 6 X 1/8 IN (150 X 3.2 MM) BINDER HEAD SCREWS. EACH POLE POSITION SHALL BE PROVIDED WITH ONE TERMINAL POSITION. ALL TERMINAL BLOCKS SHALL BE FITTED WITH ASSOCIATED CLEAR SAFETY COVERS TO PROTECT AGAINST ACCIDENT CONTACT.

1800.3.13 PULLOUT DRAWER ASSEMBLY
A PULLOUT DRAWER SHALL BE INSTALLED IN THE CABINET CAGE. THE DRAWER SHALL BE 16.92 INCHES (430 MM) LONG BY 16.92 INCHES (430 MM) WIDE BY 1.73 INCHES (44 MM) DEEP. IT SHALL HAVE A HINGED TOP THAT COVERS THE STORAGE BOX AREA AND ALSO PROVIDES A SMOOTH SURFACE TO WRITE ON. THE TOP OF THE STORAGE COMPARTMENT SHALL BE ALUMINUM. THE DRAWER SHALL BE GENERAL DEVICES D4080-19W (OR EQUAL). THE COMPARTMENT SHALL HAVE BALL BEARING TELESCOPING DRAWER GUIDES TO ALLOW FULL EXTENSION FROM THE RACK ASSEMBLY. WHEN EXTENDED, THE STORAGE COMPARTMENT SHALL OPEN TO PROVIDE STORAGE SPACE FOR CABINET DOCUMENTATION AND OTHER MISCELLANEOUS ITEMS. THE STORAGE COMPARTMENT SHALL BE OF ADEQUATE CONSTRUCTION TO SUPPORT A WEIGHT OF 20 POUNDS (9 KG) WHEN EXTENDED WITHOUT SAGGING. A PLASTIC ENVELOPE WITH RE-SEALABLE OPENING SHALL BE IN EACH DRAWER TO PROVIDE PROTECTION FOR CABINET AND SITE DETAILED DRAWINGS. THE SIZE OF THE ENVELOPES SHALL BE BIG ENOUGH TO ACCOMMODATE THE ABOVE DRAWINGS.

1800.3.14 CABINET MONITOR
ALL CABINETS SHALL HAVE DOOR-ACTIVATED SWITCHES THAT PROVIDE A CONTACT CLOSURE FOR ALARMS WHEN THE DOOR(S) ARE OPENED TO A CABINET MONITORING UNIT. THE GAUGE OF THE WIRE CONNECTED TO THE SWITCHES SHALL BE 16 AWG. THE MONITORING UNIT SHALL HAVE THE FOLLOWING REQUIREMENTS:
- MINIMUM 4 DRY CONTACTS FOR VARIOUS CABINET ALARMS
- NOTIFICATION OF ALARMS VIA MULTIPLE EMAIL / SMS USERS
- WEB-INTERFACE TCP/IP ADDRESSABLE

1800.3.15 CARTRIDGE FUSES
CARTRIDGE FUSES SHALL BE INSTALLED IN PANEL MOUNTED FUSE HOLDERS. FUSE TYPE AND RATING SHALL BE AS RECOMMENDED BY THE FUSE MANUFACTURER FOR THE TYPE OF LOAD BEING PROTECTED.

1800.3.16 AC POWER DISTRIBUTION UNIT
THE CABINET SHALL INCLUDE A MANAGED POWER DISTRIBUTION UNIT WITH THE FOLLOWING REQUIREMENTS:

- SHALL BE CAPABLE OF REMOTELY CONTROL INDIVIDUAL OUTLETS TO REBOOT EQUIPMENT REMOTELY.
- SHALL HAVE A MINIMUM OF 8 120 VAC, 15 AMP OUTLETS
- SHALL HAVE A CURRENT (A) MONITORING DIGITAL DISPLAY.
- THE OUTLETS SHALL BE LOCATED IN THE REAR OF THE UNIT.

1800.3.17 DC POWER DISTRIBUTION UNIT
THE CABINET SHALL INCLUDE A MANAGED POWER DISTRIBUTION UNIT WITH THE FOLLOWING REQUIREMENTS:

- SHALL INCLUDE ONE 12 VDC (3- 1.0 AMP OUTPUTS)
- SHALL INCLUDE ONE 24 VDC MINIMUM (2 1.0 AMP OUTPUTS AND 1- 2.0 AMP OUTPUT)
- SHALL INCLUDE ONE 48 VDC (2 2.0 AMP OUTPUTS)
- SHALL BE CAPABLE OF REMOTELY CONTROLLING INDIVIDUAL 12VDC, 24 VDC, AND 48 VDC POWER SUPPLIES.
- THE 2 2.0 AMP OUTPUTS SHALL BE LABELED AND WIRED TO SEPARATE TERMINAL STRIPS ON THE NETWORK DEVICE DIN RAIL.
- THE MAXIMUM DIMENSIONS OF THIS UNIT ARE 17 INCHES (W) X 7 INCHES (H) X 8 INCHES (D)

1800.3.18 NETWORK DEVICE DIN RAIL
THE CABINET SHALL INCLUDE A RACK MOUNT DIN RAIL UNIT FOR MOUNTING A CISCO IE3000-8TC NETWORK SWITCH WITH CISCO IEM-3000-4SM EXPANSION MODULE. THE DIN RAIL SHALL BE RECESSED AND SHALL HAVE ACCESS HOLES FOR NETWORK CABLING ON EACH SIDE OF THE PANEL AS WELL AS CABLE MANAGEMENT PANELS AT THE TOP OF THE CABINET FRONT AND BACK. THE ACCESS HOLES SHALL HAVE GROMMETS INSTALLED TO PROTECT THE CABLES FROM WEARING ON BARE METAL. THE DIMENSIONS SHALL BE APPROXIMATELY 17 INCHES (W) X 8 INCHES (H) X 10 INCHES (D) AND SHALL HAVE A LOUVERED BOTTOM TO ACT AS A SHELF WHEN IE3000 SWITCHES ARE NOT UTILIZED.

1800.3.19 GENERATOR POWER PANEL
THE CABINET SHALL INCLUDE A GENERATOR POWER PANEL PER ODOT PLAN INSERT SHEET (PIS #203011).

1800.3.20 CONNECTORS
CONNECTORS USED FOR INTERCONNECTING VARIOUS PORTIONS OF CIRCUITS TOGETHER SHALL BE DESIGNED AND CONSTRUCTED FOR THE APPLICATION INVOLVED. CONNECTORS SHALL BE DESIGNED TO PROVIDE POSITIVE CONNECTION OF ALL CIRCUITS, AND EASY INSERTION AND REMOVAL OF MATING CONTACTS. CONNECTORS SHALL BE PERMANENTLY KEYED TO PREVENT IMPROPER CONNECTION OF CIRCUITS. CONNECTORS, OR DEVICES PLUGGING INTO CONNECTORS, SHALL BE PROVIDED WITH POSITIVE MEANS TO PREVENT ANY INDIVIDUAL CIRCUIT FROM BEING BROKEN DUE TO VIBRATION, PULL ON CONNECTING CABLE OR SIMILAR DISRUPTIVE FORCE.

1800.3.21 CONDUITS ENTERING FOUNDATION
THERE SHALL BE A TOTAL OF 4 CONDUITS ENTERING THE FOUNDATION. THIS INCLUDES TWO 4-INCH SCHEDULE 40 MULTI-CELL CONDUITS TO BE CONNECTED TO 36-INCH COMMUNICATIONS "TRAFFIC9" PULLBOX, ONE 2-INCH SCHEDULE 40 CONDUIT TO BE CONNECTED TO THE 18-INCH POWER "ELECTRIC" PULLBOX, AND ONE 3/4-INCH GALVANIZED STEEL CONDUIT TO BE CONNECTED TO THE GROUND ROD. THE COST OF THESE CONDUITS SHALL BE INCIDENTAL TO THE COST OF THE ITS CABINET. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE BOTH THE "ELECTRIC" AND "TRAFFIC" PULL BOXES IN LOCATIONS AS IDENTIFIED IN THE PLANS SO AS TO GET AN ACCURATE QUANTITY OF CONDUIT TO PROVIDE ON A PER SITE BASIS.

1800.3.22 WORKPADS
WORK PADS SHALL BE INSTALLED PER ODOT CMS 633.11 AND SHALL BE INCIDENTAL TO THE PRICE OF THE CABINET.

1800.4 ENVIRONMENTAL
THE COMPONENTS SUCH AS SURGE SUPPRESSORS AND POWER DISTRIBUTION SHALL OPERATE PROPERLY WITHIN THE AMBIENT TEMPERATURE LIMITS OF 0 °F (-17.8 °C) TO 120 °F (48.9 °C) AND MEET THE AMBIENT TEMPERATURE RANGE, RELATIVE HUMIDITY, APPLIED POWER, SHOCK AND VIBRATION RANGE OF NEMA TS-2.

1800.5 TESTING
GENERAL: SUBJECT THE EQUIPMENT COVERED BY THESE PROVISIONS TO DESIGN APPROVAL TEST (DAT) AND FACTORY APPROVAL TESTS (FAT'S). THE DEPARTMENT RESERVES THE RIGHT TO WITNESS ALL FAT'S. COMPLETE THE TESTS WITHIN FIVE CALENDAR DAYS. ENSURE THAT THE TEST PLANS DEMONSTRATE EACH AND EVERY FEATURE AVAILABLE IN THE DEVICE OR SYSTEM UNDER TEST AND INCLUDES THE TESTS DISCUSSED BELOW. THE DEPARTMENT WILL EVALUATE MATERIAL AND DEVICES PURCHASED UNDER THIS CONTRACT TO VERIFY COMPLIANCE WITH PROVISIONS AND DETERMINE SUITABILITY FOR USE. SAMPLE MATERIAL AND DEVICES MUST BE SUBMITTED AT NO ADDITIONAL COST TO THE DEPARTMENT FOR EVALUATION AND WILL BE RETAINED FOR OPERATIONAL TESTING AS LONG AS THE MATERIAL OR DEVICE IS APPROVED FOR USE.

DAT AND FAT: DEVELOP AND SUBMIT A TEST PLAN FOR DAT'S AND FAT'S TO THE DEPARTMENT FOR CONSIDERATION AND APPROVAL. THE DEPARTMENT MAY ACCEPT CERTIFICATION BY AN INDEPENDENT TESTING LABORATORY IN LIEU OF THE DAT'S TO SATISFY THE REQUIREMENT THAT CERTAIN FEATURES AND FUNCTIONS HAVE BEEN WITNESSED AND DOCUMENTED AS PERFORMING SATISFACTORILY. ARRANGE FOR AND CONDUCT THE TESTS AND IS RESPONSIBLE FOR SATISFYING ALL INSPECTION REQUIREMENTS PRIOR TO SUBMISSION FOR THE DEPARTMENT'S INSPECTION AND ACCEPTANCE. THE DEPARTMENT RESERVES THE RIGHT TO WITNESS ALL DAT'S AND FAT'S. COMPLETE THE TESTS WITHIN FIVE CALENDAR DAYS.

TRANSIENT, TEMPERATURE, VOLTAGE, AND HUMIDITY TESTING: THE SELECTED MANUFACTURER WILL PROVIDE ONE CABINET OF EACH TYPE FOR TESTING AND EVALUATION PURPOSES AT NO COST TO THE DEPARTMENT. THE UNITS SHALL BE TESTED AND EVALUATED AS INDICATED BELOW. THE TRAFFIC OPERATIONS RESEARCH LABORATORY (TERL) WILL REVIEW THE PROPOSED PRODUCTS FOR COMPLIANCE OF THE TEST PROCEDURES AS NOTED WITHIN SECTION 2.2.7 OF THE NEMA TS 2-1998 STANDARD AND SHALL INCLUDE THE FOLLOWING TESTS:
- TEST A: (DAT) PLACEMENT IN ENVIRONMENTAL CHAMBER AND CHECK-OUT OF HOOK-UP.
- TEST B: (DAT) TEMPERATURE CYCLING AND APPLIED TRANSIENT TESTS (POWER SERVICE).
- TEST C: (DAT AND PRODUCTION TESTING) LOW-TEMPERATURE LOW-VOLTAGE TESTS.
- TEST D: (DAT AND PRODUCTION TESTING) LOW-TEMPERATURE HIGH-VOLTAGE TESTS.
- TEST E: (DAT AND PRODUCTION TESTING) HIGH-TEMPERATURE HIGH-VOLTAGE TESTS.
- TEST F: (DAT AND PRODUCTION TESTING) HIGH-TEMPERATURE LOW-VOLTAGE TESTS.
- TEST G: TEST TERMINATION (ALL TESTS).
- TEST H: APPRAISAL OF EQUIPMENT UNDER TEST.

ITEM 633 - CONTROLLER ITEM, MISC.: RELOCATE POWER SUPPLY

THIS ITEM INCLUDES ALL LABOR, MATERIAL, AND INCIDENTALS, INCLUDING BUT NOT LIMITED TO NEW CABLE OR CABLE EXTENSION, TO RELOCATE THE EXISTING ITS POWER SUPPLY FROM THE EXISTING ITS CABINET TO THE PROPOSED ITS CABINET.

ITEM 633 - CONTROLLER ITEM, MISC.: RELOCATE ITS COMMUNICATION

THIS ITEM INCLUDES ALL LABOR, MATERIAL, AND INCIDENTALS, INCLUDING BUT NOT LIMITED TO NEW CABLE OR CABLE EXTENSION, TO RELOCATE THE EXISTING ITS COMMUNICATIONS FROM THE EXISTING ITS CABINET TO THE PROPOSED ITS CABINET. THIS ITEM INCLUDES COMPLETE CONNECTION OF COMMUNICATIONS TO THE PROPOSED ITS CAMERA USING THE SAME PARAMETERS AND PROTOCALS OF THE EXISTING CAMERA INSTALLATION. THIS ITEM SHALL BE PAID AT THE LUMP SUM PRICE UPON ACCEPTANCE OF COMPLETED COMMUNICATIONS RELOCATION.

ITS NOTES

ITEM 632 - SIGNALIZATION, MISC.: CCTV POLE, CONCRETE, 70', WITH LOWERING UNIT

1400.1 DESCRIPTION
THIS WORK CONSISTS OF FURNISHING AND INSTALLING CLOSED CIRCUIT TELEVISION POLES COMPLETE AND READY FOR SERVICE.

1400.2 MATERIALS
FURNISH MATERIALS AND EQUIPMENT THAT ARE NEW, TOP QUALITY, OF CURRENT DESIGN, AND FREE FROM DEFECTS.

1400.3 DESIGN REQUIREMENTS
THE CCTV POLE WILL BE DESIGNED IN ACCORDANCE WITH THE LATEST AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS." MINIMUM LOADING REQUIREMENTS WILL BE BASED ON AN ISOTACH WIND VELOCITY OF 100 MPH (145 KM/HR) WITH A 1.3 GUST FACTOR. CALCULATIONS AND DETAILED DRAWINGS WILL BE SUBMITTED TO THE ENGINEER DEMONSTRATING COMPLIANCE WITH THE AASHTO SPECIFICATION. THE CONCRETE POLE WILL BE DESIGNED TO SUPPORT AN ITS CABINET LOCATED 30 INCHES ABOVE FINAL GRADE. THE CONTRACTOR/POLE MANUFACTURER WILL BE RESPONSIBLE FOR SPECIFYING THE REQUIRED EMBEDDED DEPTH BASED ON SOIL AND SLOPE CONDITIONS AT EACH PROJECT PLAN SITE.

1400.4 CONCRETE CCTV POLE
POLES WILL BE PRESTRESSED AND THE CONCRETE PLACED BY THE CENTRIFUGAL SPINNING PROCESS. THE CENTRIFUGAL SPINNING IS TO INSURE BOTH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 8,000 PSI AND A MINIMUM OF 0.75 INCH (19 MM) COVER OVER THE PRESTRESSING STRAND. POLES WILL HAVE A SMOOTH NATURAL FORM FINISH, SOFT GRAY IN COLOR. POLES WILL BE DESIGNED AND CONSTRUCTED SO THAT ALL WIRING AND GROUNDING FACILITIES ARE CONCEALED WITHIN THE POLE. ALL HANDHOLES, COUPLINGS, THRU-BOLT HOLES AND GROUND WIRE WILL BE CAST INTO THE POLE DURING THE MANUFACTURING PROCESS. POLES WILL BE ROUND IN CROSS SECTION AND PROVIDE A CONTINUOUS TAPER OF 0.18 INCHES PER FOOT OF LENGTH AND PROVIDE A MINIMUM 0.75 INCHES (19 MM) OF CONCRETE COVERAGE OVER THE PRESTRESSING STRANDS. ALL CABLE ENTRY HOLES, AND SIZES REQUIRED WILL BE IN ACCORDANCE WITH THE LOCATION ON SUBMITTAL DRAWINGS. THE CABLE ENTRY HOLES WILL ALSO BE FREE FROM SHARP EDGES FOR PASSAGES OF ELECTRICAL WIRING. OTHER GENERAL CONCRETE POLE SPECIFICATIONS INCLUDE:

1. TWO 4 INCHES X 12 INCHES (75 X 300 MM) CONDUIT ENTRANCE OPENINGS CENTERED 20 INCHES (450 MM) BELOW GRADE. THE INSTALLATION OF TWO 3 INCH CONDUITS FROM THE "TRAFFIC" PULL BOX TO THE INSIDE OF THE CONCRETE POLE SHALL BE INCIDENTAL TO THE CCTV POLE. THESE CONDUITS SHALL BE FITTED WITH 90 DEGREE ELBOWS SO AS TO DIRECT ANY FISH TAPES UPWARD WHEN PUSHED THROUGH THE CONDUIT FROM PULL BOX, OR AS DIRECTED BY THE ENGINEER.
2. ONE 4.5 INCHES X 30 INCHES (114.3 X 762 MM) STEEL GALVANIZED REINFORCED HANDHOLE FRAME WITH FLUSH COVER AND 9/16 INCH HEX SCREWS. THE BOTTOM SHALL BE LOCATED APPROXIMATELY 38 INCHES ABOVE GRADE.
3. CAMERA LOWERING DEVICE MUST MOUNT TO A SPECIAL DESIGNED TENON BOLTED TO THE TOP OF POLE AND SHALL BE 180 DEGREES FROM THE HANDHOLE, OR AS DIRECTED BY THE ENGINEER.
4. ALL POLES WILL BE PROVIDED WITH A FISH WIRE TO FACILITATE CABLE INSTALLATION.
5. ALL POLES MUST HAVE A MINIMUM INSIDE RACEWAY DIMENSION OF 5 INCHES (125 M) AT TIP OF POLE.
6. ALL POLES UP TO 75 FEET (22.9 M) LONG ABOVE GROUND WILL BE DESIGNED TO HAVE A MINIMAL DEFLECTION NOT GREATER THAN 1.00 INCHES (25 MM). ALL POLES OVER 75 FEET (22.9 M) LONG ABOVE GROUND WILL BE DESIGNED TO HAVE A MINIMAL DEFLECTION LESS THAN 1.62" (40 MM) AT 30 MPH (50 KM/HR) NON GUST WIND SPEED.
7. ALL MANUFACTURING TOLERANCES, DETAILS OF REINFORCEMENT, AND FINISHES WILL BE IN ACCORDANCE WITH THE GUIDE SPECIFICATION FOR PRESTRESSED CONCRETE POLES AS PUBLISHED IN THE MAY-JUNE, 1982 ISSUE OF THE JOURNAL OF THE PRESTRESSED CONCRETE INSTITUTE.
8. PRESTRESSED CONCRETE POLES WILL BE LIFTED AND SUPPORTED DURING MANUFACTURING, STOCKPILING, TRANSPORTING AND ERECTION OPERATIONS ONLY AT THE POINTS SHOWN ON THE SHOP DRAWINGS.
9. TRANSPORTATION, SITE HANDLING, AND ERECTION WILL BE PERFORMED WITH ACCEPTABLE EQUIPMENT AND METHODS BY QUALIFIED PERSONNEL.
10. POLES SHALL BE CAPABLE OF HOUSING A MINIMUM 1.25 INCH PVC CONDUIT INSTALLED INSIDE OF THE POLE FROM THE TOP OF THE POLE TO THE TOP OF THE HANDHOLE. THE PURPOSE OF THIS CONDUIT IS TO HOUSE THE LOWERING CABLE SO THAT IT IS SEPARATE FROM THE COMMUNICATION CABLE(S).
11. POLES SHALL BE COATED IN A WEATHERPROOF SILANE TREATMENT FOR THE BOTTOM 30 FOOT (9.144 M) SECTION OF THE CONCRETE POLE AND IN ACCORDANCE WITH THE PRODUCT SPECIFICATIONS.

A. CONCRETE THE POLE WILL ACHIEVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 8,000 PSI. CEMENT WILL CONFORM TO THE LATEST REQUIREMENTS OF TYPE I PORTLAND CEMENT IN ACCORDANCE WITH ASTM-C150. MAXIMUM SIZE AGGREGATE MUST BE EITHER 0.75 INCH (19MM) OR 75% OF THE CLEAR SPACING BETWEEN REINFORCING STEEL AND SURFACE OF POLE. ANY WATER REDUCERS, RETARDERS, OR ACCELERATING ADMIXTURES WILL CONFORM TO ASTMC494. WATER WILL BE FREE FROM FOREIGN MATERIALS IN AMOUNTS HARMFUL TO CONCRETE AND EMBEDDED STEEL.

B. REINFORCING STEEL
DEFORMED STEEL REINFORCEMENT WILL CONFORM TO REQUIREMENTS OF ASTM-A615 FOR GRADE 60 REBAR.

C. PRESTRESSING STEEL
PRESTRESSING STEEL REINFORCEMENT WILL CONFORM TO UNCOATED 7-WIRE, STRESS RELIEVED STRAND; ASTMA416.

D. SPIRAL REINFORCEMENT STEEL
SPIRAL REINFORCEMENT WILL CONFORM TO THE REQUIREMENTS OF ASTM-A82 AND WILL NOT BE LESS THAN 0.150-INCH (3.75 MM) DIAMETER.

E. HARDWARE
ALL STRUCTURAL STEEL WILL CONFORM TO ASTM-A36 AND ZINC ALLOY AC41A WILL CONFORM TO ASTM-B240. THE FINISH WILL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM-A153.
F. ELECTRICAL GROUND
ALL POLES WILL BE SUPPLIED WITH A NUMBER 6 STRANDED COPPER GROUND WIRE CAST INTO THE WALL OF THE POLE AT THE HANDHOLE BOX LOCATION. THIS GROUND LUG SHALL NOT INTERFERE WITH THE MOUNTING OF THE LOWERING DEVICE.

1400.5 CAMERA LOWERING DEVICE
THE CAMERA LOWERING SYSTEM SHALL BE MANUFACTURED BY MG SQUARED INC. AND WILL BE DESIGNED TO SUPPORT AND LOWER A STANDARD CLOSED CIRCUIT TELEVISION CAMERA, LENS, HOUSING, PTZ MECHANISM, CABLING, CONNECTORS AND OTHER SUPPORTING FIELD COMPONENTS WITHOUT DAMAGE OR CAUSING DEGRADATION OF CAMERA OPERATIONS. THE CAMERA LOWERING DEVICE AND THE POLE ARE INTERDEPENDENT UPON EACH OTHER AND THUS, MUST BE CONSIDERED A SINGLE UNIT OR SYSTEM. THE LOWERING SYSTEM WILL CONSIST OF A POLE, COMMUNICATIONS CONTACT UNIT, SELF-ALIGNING DIVIDED SUPPORT ARM, A POLE ADAPTER FOR ATTACHMENT TO A POLE TOP TENON, AND A CAMERA JUNCTION BOX. THE DIVIDED SUPPORT ARM AND RECEIVER BRACKETS WILL BE DESIGNED TO SELF-ALIGN THE CONTACT UNIT WITH THE POLE CENTER LINE DURING INSTALLATION AND INSURE THE CONTACT UNIT CANNOT TWIST UNDER HIGH WIND CONDITIONS. ROUND SUPPORT ARMS ARE NOT ACCEPTABLE. THE CAMERA-LOWERING DEVICE WILL WITHSTAND WIND FORCES OF 100 MPH (160 KM/HR) WITH A 30 PERCENT GUST FACTOR USING A 1.65 SAFETY FACTOR. THE LOWERING DEVICE MANUFACTURER WILL FURNISH INDEPENDENT LABORATORY TESTING DOCUMENTS CERTIFYING ADHERENCE TO THE STATED WIND FORCE CRITERIA UTILIZING, AS A MINIMUM EFFECTIVE PROJECTED AREA, THE ACTUAL EPA OR AN EPA GREATER THAN THAT OF THE CAMERA SYSTEM TO BE ATTACHED.

THE LOWERING DEVICE MANUFACTURER, MG SQUARED INC., SHALL FURNISH A FACTORY REPRESENTATIVE TO ASSIST THE INSTALLATION CONTRACTOR WITH THE ASSEMBLY AND TESTING OF THE FIRST LOWERING SYSTEMS ONTO THE POLE ASSEMBLIES. THE MANUFACTURER WILL SUPPLY TRAINING FOR THE CONTRACTOR ON THE INSTALLATION, OPERATION, AND SAFETY OF THE POLES AND LOWERING DEVICES. THE MANUFACTURER WILL FURNISH THE ENGINEER DOCUMENTATION CERTIFYING THAT THE SPECIFIED ELECTRICAL CONTRACTOR PERSONNEL HAVE BEEN TRAINED ON THE INSTALLATION, OPERATION, AND SAFETY FEATURES OF THE LOWERING DEVICE. THESE PERSONNEL SHALL BE THE ONLY ONES AUTHORIZED BY ODOT TO WORK ON THE CAMERA POLE AND LOWERING
SYSTEM FOR THE DURATION OF THE PROJECT AND ANY WARRANTY PERIOD. APPLICABLE MAINTENANCE PERSONNEL "ON SITE" OPERATIONAL INSTRUCTIONS MUST BE PROVIDED.

A.SUSPENSION CONTACT UNIT
THE SUSPENSION CONTACT UNIT WILL HAVE A MINIMUM LOAD CAPACITY OF 600 LBS. WITH A 4 TO 1 SAFETY FACTOR. THERE WILL BE A LOCKING MECHANISM BETWEEN THE FIXED AND MOVEABLE COMPONENTS OF THE LOWERING DEVICE. THE MOVABLE ASSEMBLY WILL HAVE A MINIMUM OF 2 LATCHES. THIS LATCHING MECHANISM WILL SECURELY HOLD THE DEVICE AND ITS MOUNTED EQUIPMENT. THE LATCHING MECHANISM WILL OPERATE BY ALTERNATELY RAISING AND LOWERING THE ASSEMBLY USING THE WINCH AND LOWERING CABLE. WHEN LATCHED, ALL WEIGHT WILL BE REMOVED FROM THE LOWERING CABLE. THE FIXED UNIT WILL HAVE A HEAVY DUTY CAST TRACKING GUIDE AND THE MEANS TO ALLOW LATCHING IN THE SAME POSITION EACH TIME. THE CONTACT UNIT HOUSING WILL BE WEATHERPROOF WITH A GASKET PROVIDED TO SEAL THE INTERIOR FROM BOTH DUST AND MOISTURE.

THE PREFABRICATED COMPONENTS OF THE LIFT UNIT SUPPORT SYSTEM WILL BE DESIGNED TO PRECLUDE THE LIFTING CABLE FROM CONTACTING THE POWER OR VIDEO CABLING. THE CONTRACTOR SHALL SUPPLY AN INTERNAL POLE CONDUIT FOR THE CCTV CAMERA STAINLESS STEEL LOWERING CABLE. THE ONLY CABLE PERMITTED TO MOVE WITHIN THE POLE OR LOWERING DEVICE DURING LOWERING OR RISING WILL BE THE STAINLESS STEEL LOWERING CABLE. ALL OTHER CABLES MUST REMAIN STABLE AND SECURE DURING LOWERING AND RAISING OPERATIONS.

THE CONNECTOR BLOCK CONSISTS OF SYNTHETIC MOLDED RUBBER BODIES THAT HOLD THE INDIVIDUAL CONTACTS. GUIDE PINS AND/OR GUIDE BUSHINGS WILL PREVENT MIS-CONNECTIONS AND PROVIDE ACCURATE MATING WITHOUT RELYING ON THE CONTACT PINS TO PROVIDE ALIGNMENT. THERE WILL BE A MINIMUM OF 7 CONTACTS, EACH HAVING A MINIMUM OUTER DIAMETER OF 1/16 INCHES, AND 8 CONTACTS, EACH HAVING A MINIMUM OUTER DIAMETER OF 1/16 INCHES, FOR CATEGORY 5 ETHERNET CONNECTION. THE MAXIMUM CURRENT RATING FOR EACH PIN WILL BE AT LEAST 13 AMPS. THE SIGNAL AND POWER WIRES WILL BE CRIMPED WITH AN INDUSTRY STANDARD 8 POINT CRIMP TOOL. THE ANALOG VIDEO SIGNAL SHALL BE PASSED TO THE ITS CABINET UTILIZING TWO OF THE PINS IN THE CONNECTOR BLOCK NOT USED FOR THE CATEGORY 5 ETHERNET CONNECTION. THE CAMERA CABLE WILL BE ASSEMBLED WITH THE CONNECTOR BLOCK IN THE FACTORY AND SEALED WITH ELECTRICAL INSULATING RESIN EPOXY OR OTHER ACCEPTABLE MATERIAL OF THE SAME TYPE. THE ENTIRE CONNECTOR BLOCK SHALL BE SEALED FROM EXTERNAL DUST AND EXTERNAL MOISTURE WHEN IN THE MATED OR UN-MATED CONDITION.

B. CONNECTORS
THE CONNECTORS / CONNECTOR BLOCKS SHALL CONSIST OF OUTDOOR-RATED HEAVY DUTY SYNTHETIC MOLDED RUBBER MALE AND FEMALE MATCHED BODY PARTS THAT MATE TOGETHER TO MAKE AN ELECTRICAL CONNECTION BETWEEN THE COMPOSITE CABLE AND THE CAMERA HOUSING WHEN THE CAMERA IS FULLY RAISED AND LOCKED. THIS CONNECTOR SHALL BE SHIELDED ENVIRONMENTALLY AS WELL AS FOR IP COMMUNICATIONS. THESE CONNECTORS / CONTACTS SHALL BE SUCCESSFULLY TESTED AND CERTIFIED FOR CATEGORY 5 100 BASE T SPECIFICATIONS. ALL CONNECTORS SHALL BE FACTORY TERMINATED ONTO THE CABLE.

C. CONTACTS
THE CONTACTS SHALL SUPPLY METAL, ELECTRICALLY CONDUCTIVE CONNECTIONS IN THE MALE AND FEMALE CONNECTORS. CONTACTS SHALL BE PRESENT FOR EACH FUNCTION / COMMUNICATION METHOD THAT THE SPECIFIED CAMERA PROVIDES. THESE CONTACTS SHALL BE HEAVY DUTY, GOLD PLATED, COPPER MATERIAL. EACH MALE CONTACT SHALL HAVE A MINIMUM OUTER DIAMETER OF 1/16 INCHES. THE FEMALE SOCKETS SHALL BE SIZED ACCORDINGLY TO MATCH THE MALE CONTACTS. THE CONNECTOR SHALL PROVIDE A RAINTIGHT SEAL WHEN MALE AND FEMALE COMPONENTS ARE FULLY CONNECTED BY WAY OF RUBBER SHOULDER AT THE BASE OF EACH MALE CONTACT.

D. CONTROL CABLE
THIS ITEM SHALL INCLUDE THE REPLACEMENT OF UP TO 130 FEET OF CCTV CONTROL CABLE. THE CONTROL CABLE SHALL BE RAN FROM THE ITS CABINET TO THE TOP OF THE CCTV POLE. THE CONTROL CABLE SHALL BE EASILY REPLACEABLE WITHOUT HAVING TO REPLACE THE LOWERING UNIT TENON ARM. THIS SHALL BE DONE BY WAY OF SEPARATE CONTROL CABLE CONNECTOR AT THE TOP OF THE POLE JUST INSIDE THE POLE TOP ADAPTER. THE TENON ARM SHALL ALSO BE CAPABLE OF SLIGHT DEGREES OF ADJUSTMENT WITHOUT COMPLETELY REMOVING THE BOLTS SECURING THE POLE TOP ADAPTER TO THE CAMERA POLE. THE CONTROL CABLE SHALL BE COMPRISED OF A COMPOSITE CABLE THAT CARRIES POWER (SEPARATE 24 VAC FOR HEATER AND CAMERA), SERIAL DATA (RS-232, RS-422, OR RS-485), ANALOG VIDEO COMMUNICATIONS, AND ETHERNET COMMUNICATIONS (CAT 5 100 BASE T TESTED AND CERTIFIED). THE CONTROL CABLE SHALL HAVE ALL ETHERNET AND COAXIAL CONNECTIONS PRE-TERMINATED AT THE FACTORY. THE CABLE SHALL BE PROVIDED BY THE FACTORY TO THE CONTRACTOR WITH TESTING CERTIFICATION SHOWING THAT THE CONNECTOR PASSES SPECIFIED TESTS. ALL CABLE CONNECTIONS AT THE TOP OF THE POLE SHALL BE CONNECTED USING OUTDOOR-RATED CONNECTORS.

E. LOWERING TOOL
THE CAMERA-LOWERING DEVICE WILL BE OPERATED BY USE OF AN EXTERNALLY-POWERED PORTABLE LOWERING TOOL. THE TOOL WILL CONSIST OF A LIGHTWEIGHT METAL FRAME AND WINCH ASSEMBLY WITH CABLE AS DESCRIBED HEREIN, TWO QUICK RELEASE CABLE CONNECTORS, AN ADJUSTABLE SAFETY CLUTCH AND A VARIABLE SPEED INDUSTRIAL DUTY ELECTRIC DRILL MOTOR WITH A MAXIMUM OF 550 RPM. THIS TOOL WILL BE COMPATIBLE WITH ACCESSING THE SUPPORT CABLE THROUGH THE HAND HOLE OF THE POLE. WHEN ATTACHED TO THE HAND HOLE BY MEANS OF ONE SINGLE BOLT AND/OR A SPEED ADAPTER, THE TOOL WILL SUPPORT ITSELF AND THE LOAD ASSURING LOWERING OPERATIONS AND PROVIDE A MEANS TO PREVENT FREEWHEELING WHEN LOADED. THE LOWERING TOOL WILL BE DELIVERED TO THE ENGINEER UPON PROJECT COMPLETION. THE LOWERING TOOL WILL HAVE A REDUCTION GEAR TO REDUCE THE MANUAL EFFORT REQUIRED TO OPERATE THE LIFTING HANDLE TO RAISE AND LOWER A CAPACITY LOAD. THE LOWERING TOOL WILL BE PROVIDED WITH AN ADAPTER FOR OPERATING THE LOWERING DEVICE BY A PORTABLE DRILL USING A CLUTCH MECHANISM. THE LOWERING TOOL WILL BE EQUIPPED WITH A POSITIVE LOCKING MECHANISM TO SECURE THE CABLE REEL DURING RAISING AND LOWERING OPERATIONS. MANUFACTURER WILL PROVIDE A VARIABLE SPEED, HEAVY-DUTY REVERSIBLE DRILL MOTOR AND A MINIMUM OF ONE LOWERING TOOL PLUS ANY ADDITIONAL TOOLS REQUIRED BY PLAN NOTES. THE LOWERING TOOL WILL BE MADE OF DURABLE AND CORROSION RESISTANT MATERIALS, POWDER COATED, GALVANIZED, OR OTHERWISE PROTECTED FROM THE ENVIRONMENT BY INDUSTRY-ACCEPTED COATINGS TO WITHSTAND EXPOSURE TO A CORROSIVE ENVIRONMENT. EACH LOWERING TOOL WITH ASSOCIATED DRILL SHALL BE HOUSED IN A WATERTIGHT CASE.

F. LOWER JUNCTION BOX
THE LOWER JUNCTION BOX SHALL CONSIST OF A HEAVY DUTY CLAMSHELL BOX THAT IS WEATHER-SEALED WHEN CLOSED, WITH THE EXCEPTION OF A DRAIN HOLE IN THE BOTTOM. THIS BOX SHALL BE CLOSED BY WAY OF STAINLESS STEEL HEX BOLTS OR NUTS. THE HEX BOLTS/NUTS SHALL BE SECURED IN A WAY THAT WHEN THE JUNCTION BOX IS OPEN THE BOLTS/NUTS ARE NOT PERMITTED, WITHOUT EXTRA EFFORT, TO COME OUT OF THE LOWER PORTION OF THE CLAMSHELL. THE JUNCTION BOX SHALL BE SIZED ACCORDINGLY TO PERMIT THE INSTALLATION OF SURGE PROTECTION FOR ALL WIRING. THE LOWER PORTION OF THE JUNCTION BOX SHALL NOT WEIGH MORE THAN 10 POUNDS SO THAT MINIMAL EFFORT IS REQUIRED TO HOLD THE CAMERA AND LOWER PORTION INTO POSITION WHEN FASTENING THE LOWER JUNCTION BOX IN THE CLOSED, SEALED POSITION. A RAISED NECK SHALL BE INCORPORATED INTO THE JUNCTION BOX SO THAT ANY MOISTURE THAT ACCUMULATES IN THE JUNCTION BOX DOES NOT FLOW INTO THE CAMERA.

G. MATERIALS
ALL PULLEYS FOR THE CAMERA LOWERING DEVICE AND PORTABLE LOWERING TOOL WILL HAVE SEALED, SELF LUBRICATED BEARINGS, OIL TIGHT BRONZE BEARINGS, OR SINTERED BRONZE BUSHINGS. THE LOWERING CABLE WILL BE A MINIMUM 1/8-INCH (3 MM) DIAMETER STAINLESS STEEL AIRCRAFT CABLE WITH A MINIMUM BREAKING STRENGTH OF 1,740 POUNDS WITH 7 STRANDS OF 19 WIRES EACH.

H. WARRANTY
THE COMPLETE LOWERING UNIT ASSEMBLY SHALL BE WARRANTIED FOR 5 YEARS OF LABOR AND PARTS. IF IT'S DETERMINED THAT THE LOWERING UNIT IS AT FAULT FOR UNSUCCESSFUL VIDEO/DATA TRANSMISSION, THE MANUFACTURER SHALL BE RESPONSIBLE FOR THE REMOVAL, REPLACEMENT, OR REPAIR OF THE UNIT. DOCUMENTATION SHALL BE SUBMITTED INDICATING THIS MANUFACTURER WARRANTY PRIOR TO DEVICE ACCEPTANCE.

CALCULATED SGB CHECKED ERW

ITS NOTES

FRA-270-49.00

ITS NOTES

ITEM 632 - SIGNALIZATION, MISC.: CCTV POLE, CONCRETE, 70', WITH LOWERING UNIT (CONTINUED)

ALL ELECTRICAL AND VIDEO CONNECTIONS BETWEEN THE FIXED AND LOWER-ABLE PORTION OF THE OUTDOOR-RATED CONTACT BLOCK WILL BE PROTECTED FROM EXPOSURE TO THE WEATHER BY A WATERPROOF SEAL TO PREVENT DEGRADATION OF THE ELECTRICAL CONTACTS. THE ELECTRICAL CONNECTIONS BETWEEN THE FIXED AND MOVABLE LOWERING DEVICE COMPONENTS WILL BE DESIGNED TO CONDUCT HIGH FREQUENCY DATA BITS AND ONE (1) VOLT PEAK-TO-PEAK VIDEO SIGNALS AS WELL AS THE POWER REQUIREMENTS FOR OPERATION OF DOME ENVIRONMENTAL CONTROLS.
THE INTERFACE AND LOCKING COMPONENTS WILL BE MADE OF STAINLESS STEEL OR ALUMINUM. ALL EXTERNAL COMPONENTS OF THE LOWERING DEVICE WILL BE MADE OF CORROSION RESISTANT MATERIALS, POWDER COATED, GALVANIZED, OR OTHERWISE PROTECTED FROM THE ENVIRONMENT BY INDUSTRY-ACCEPTED COATINGS TO WITHSTAND EXPOSURE TO A CORROSIVE ENVIRONMENT.

THE CAMERA MANUFACTURER, IF NEEDED, WILL PROVIDE EITHER WEIGHTS OR COUNTERWEIGHTS AS NECESSARY TO ASSURE THAT THE ALIGNMENT OF PINS AND CONNECTORS ARE PROPER FOR THE CAMERA SUPPORT TO BE RAISED INTO POSITION WITHOUT BINDING. THE LOWERING UNIT WILL HAVE SUFFICIENT WEIGHT TO DISENGAGE THE CAMERA AND ITS CONTROL COMPONENTS IN ORDER THAT IT CAN BE LOWERED PROPERLY.

THE CAMERA MANUFACTURER, IF NEEDED, WILL PROVIDE THE APPROPRIATE LENGTH, TYPE OF POWER AND SIGNAL CABLE TO THE LOWERING SYSTEM MANUFACTURER SO THAT SAME CAN BE PRE-WIRED TO THE FEMALE CONNECTOR AND STRAIN-RELIEVED AT THE LOWERING DEVICE FACTORY PRIOR TO SHIPMENT.

THE CAMERA MANUFACTURER WILL PROVIDE A MOUNTING FLANGE SUFFICIENT FOR MOUNTING THEIR RESPECTIVE CAMERA ASSEMBLY TO THE BOTTOM OF THE CAMERA CONNECTION BOX.

ITEM 632 - INTERCONNECT CABLE MISC.: CATEGORY 5E CABLE, OUTDOOR RATED

2400.1 GENERAL DESCRIPTION
THE CONTRACTOR SHALL FURNISH AND INSTALL A CATEGORY 5E OUTSIDE PLANT ETHERNET CABLE THAT MEETS THE
FOLLOWING MINIMUM SPECIFICATIONS:
- FOOTAGE MARKINGS: EVERY 3 FEET
- ARMOR: HELICALLY APPLIED 12MM ALUMINUM WITH INNER JACKET
- CONDUCTOR INSULATION: POLYOLEFIN
- JACKET: UV AND ABRASION RESISTANT POLYETHYLENE
- CONDUCTORS: 24 AWG SOLID BARE ANNEALED COPPER
- CABLE DIAMETER: MAXIMUM 0.35 INCHES
- FLOODING COMPOUND: WATERPROOF GEL
- MINIMUM BEND RADIUS: 1.0 INCH
- MAXIMUM PULLING FORCE: 25 POUNDS
- TEMPERATURE RATING
- INSTALLATION: -30 TO +60 C
- OPERATION: -45 TO +80 C
- COLOR CODE
- PAIR 1: BLUE-WHITE/BLUE
- PAIR 2: ORANGE-WHITE/ORANGE
- PAIR 3: GREEN-WHITE/GREEN
- PAIR 4: BROWN-WHITE/BROWN

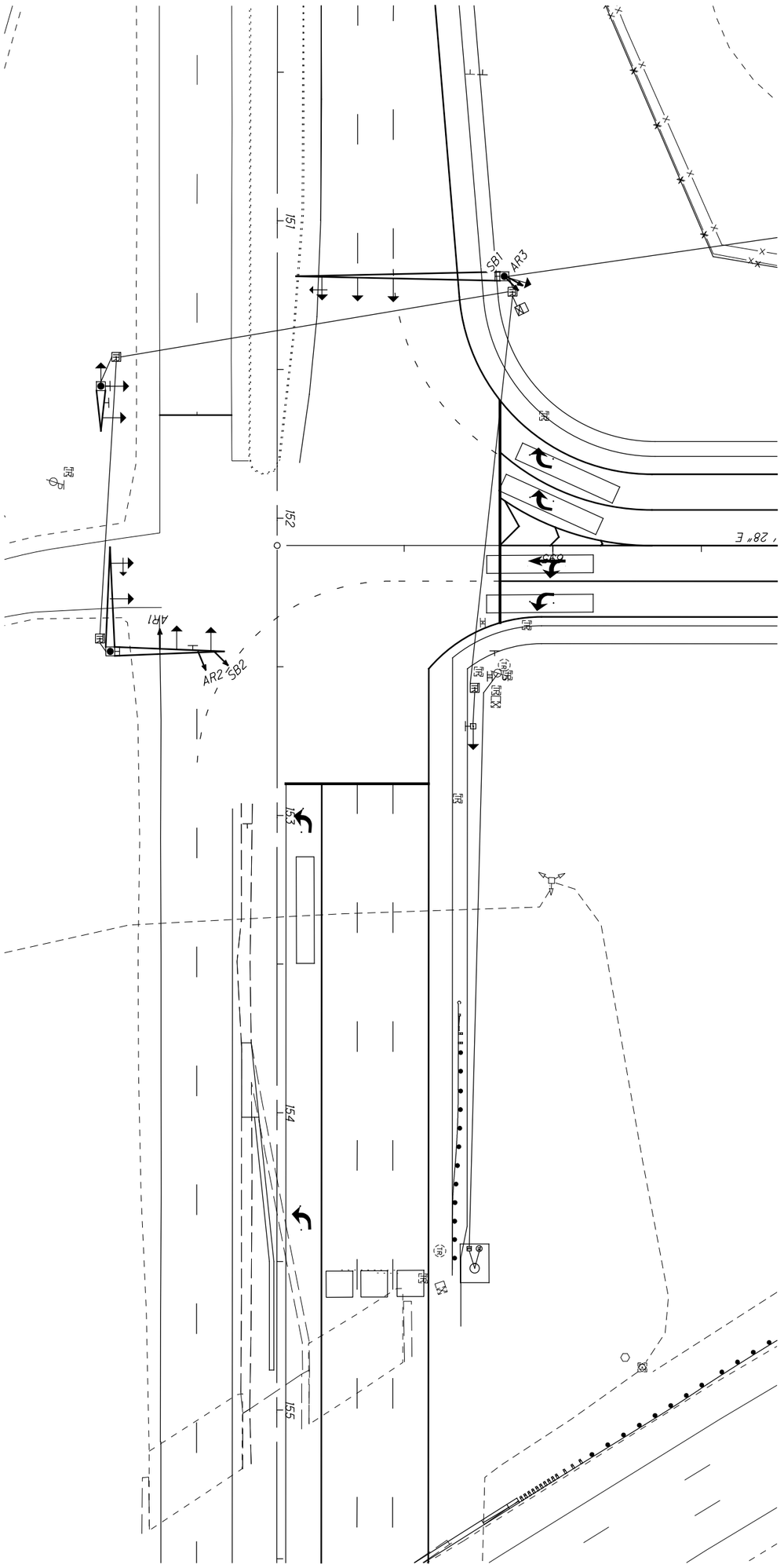
THE CONTRACTOR SHALL INSTALL CABLE AS SHOWN IN PLANS, OR AS DIRECTED BY ENGINEER, LEAVING 10 FEET OF SLACK IN EACH PULL BOX. THE CABLE SHALL BE TERMINATE WITH RJ-45 CONNECTORS AND WIRED PER TIA/EIA 568-B.

CALCULATED SGB
CHECKED ERW

ITS NOTES

FRA-270-49.00

AS BUILT - 4/22/2016



ITEM	UNIT	DESCRIPTION	Total
		ITS	
625	FT	CONDUIT, 3", 725.05	200
625	FT	PULLBOX, 725.08, 18"	1
632	EACH	SIGNALIZATION, MISC.: CCTV IP-CAMERA SYSTEM, DOME TYPE	1
632	EACH	SIGNALIZATION, MISC.: CCTV POLE, CONCRETE, 70', WITH LOWERING UNIT	1
632	EACH	SIGNALIZATION, MISC.: 32" ROUND CONCRETE PULLBOX	1
633	EACH	CONTROLLER ITEM, MISC.: ITS CABINET, GROUND MOUNTED	1
633	FT	INTERCONNECT CABLE MISC.: CATEGORY 5E CABLE, OUTDOOR RATED	135
633	EACH	CONTROLLER MISC.: ITS WORK PAD	1

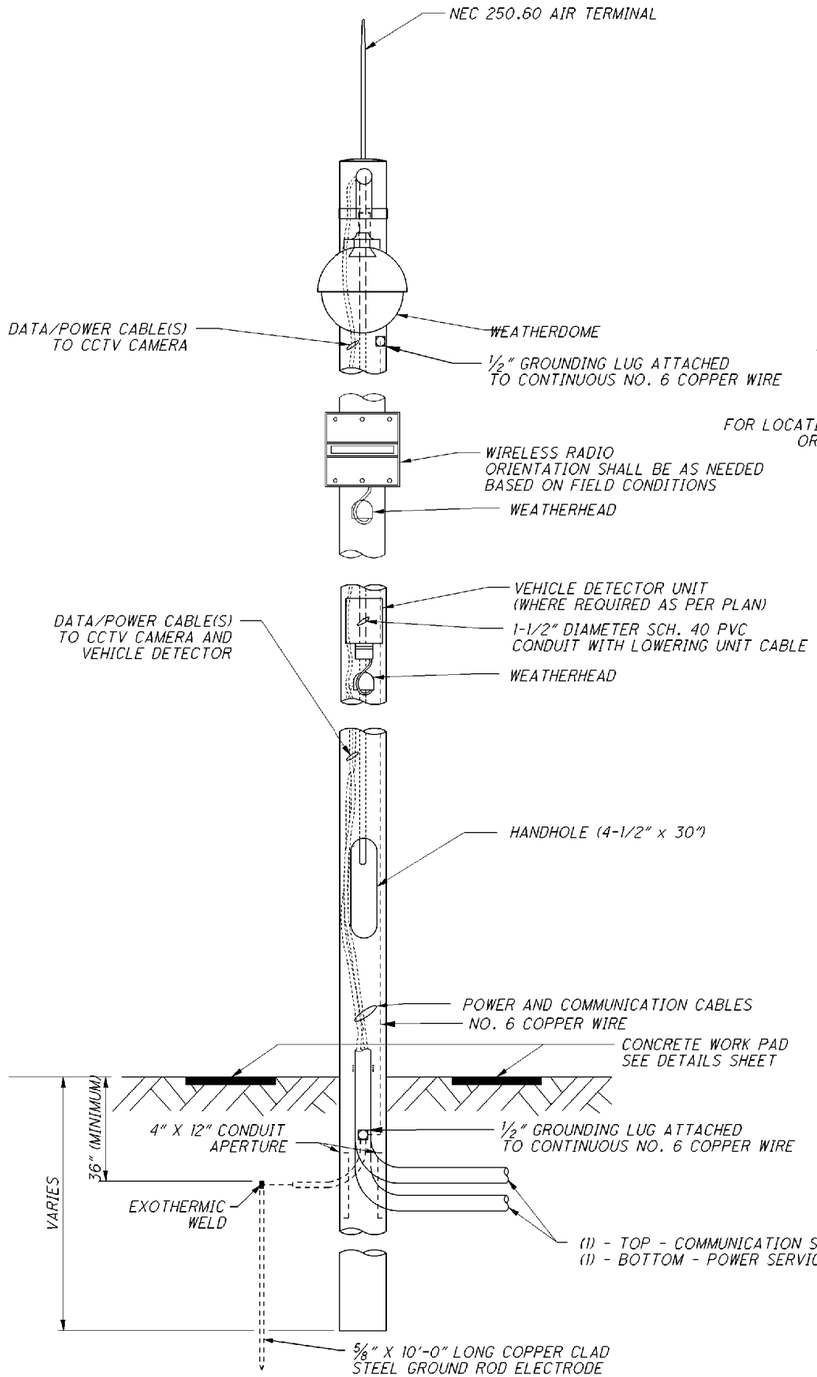
BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

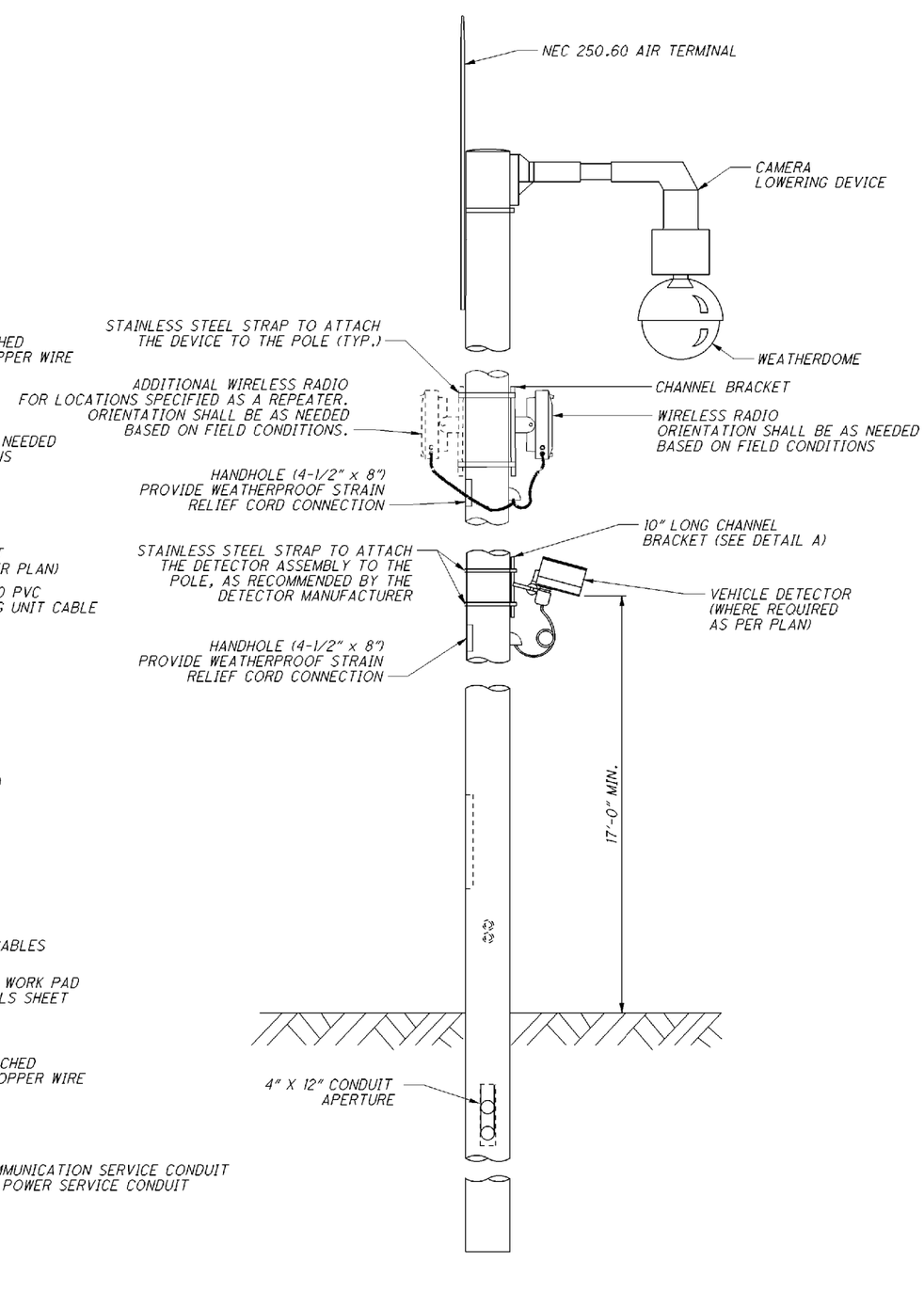
FRA-270-49.00

ITS PLAN
ALUM CREEK DRIVE

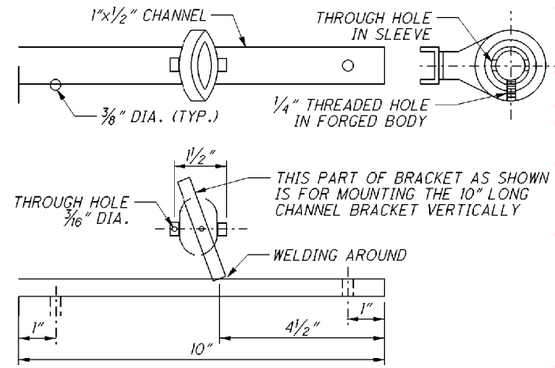
CALCULATED SGB
CHECKED ERW

0 20
10 40
HORIZONTAL SCALE IN FEET





CCTV CAMERA ASSEMBLY (TYPICAL)
NOT TO SCALE



DETAIL 'A', CHANNEL BRACKET (SUPPLIED BY DETECTOR MANUFACTURER)
NOT TO SCALE

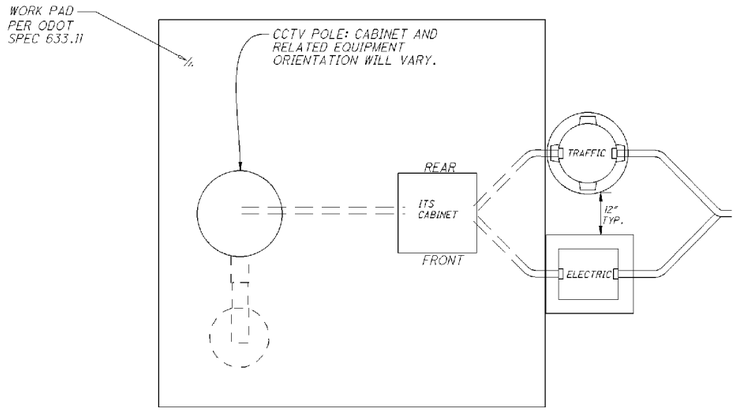
NOTES:

1. MOUNT VEHICLE DETECTOR UNIT SO THAT THE DETECTOR IS MOUNTED ON THE ROADWAY SIDE OF POLE AT A HEIGHT RECOMMENDED BY THE MANUFACTURER.
2. SUPPORT HOOKS SHOULD BE APPROPRIATELY SIZED FOR THE NUMBER AND SIZE OF CONDUCTORS TO BE SUPPORTED. SUPPORT ELECTRICAL AND COMMUNICATION CABLES WITH SEPARATE HOOKS.
3. RUN ALL WIRING INSIDE THE POLE AND PROVIDE STRAIN RELIEF AND SUPPORT FOR ALL CONTROL CABLES.
4. SEE PLAN SHEETS FOR VEHICLE DETECTOR LOCATIONS.
5. WHEN INSTALLING THE MOUNTING BRACKETS FOR VEHICLE DETECTORS, ALIGN AND ANGLE THE DETECTORS TO COVER THE DETECTION ZONE(S) PER MANUFACTURER'S SPECIFICATIONS.

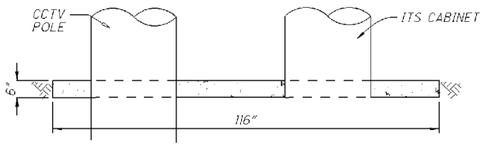
CALCULATED SGB
CHECKED ERW

ITS DETAILS

FRA-270 49.00



TYPICAL CCTV CAMERA POLE
DEVICE WORK PAD DETAIL(116"x116"x6")
PLAN VIEW
NOT TO SCALE

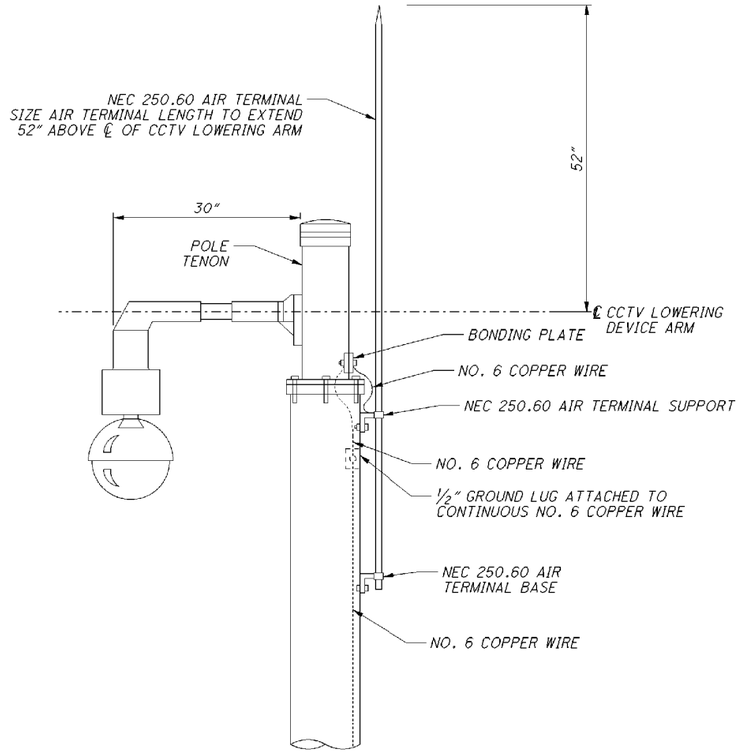


CROSS-SECTION
DEVICE WORK PAD
(116"x116"x6")
ELEVATION VIEW
NOT TO SCALE

NOTES:

1. ½" PREFORMED JOINT FILLER AS PER 705.03 SHALL BE USED BETWEEN CONCRETE POLE AND ADJACENT PAVED AREAS.

2. A 6" THICK WORK PAD WITH DIMENSIONS SHOWN ON DETAILS SHALL BE PROVIDED UNLESS IN AN OTHERWISE PAVED AREA. IN LEVEL AREAS, THE TOP OF THE PAD SHALL BE 1" ABOVE THE GROUND LINE. IN STEEPLY SLOPED AREAS, THE PAD'S DESIGN SHALL BE ADJUSTED TO PROVIDE ACCESS, DRAINAGE, AND SAFETY, AS APPROVED BY THE PROJECT ENGINEER. SEE TYPICAL DRAWING FOR SLOPED AREA DEVICE WORK PAD DESIGN DETAILS IF PROVIDED.

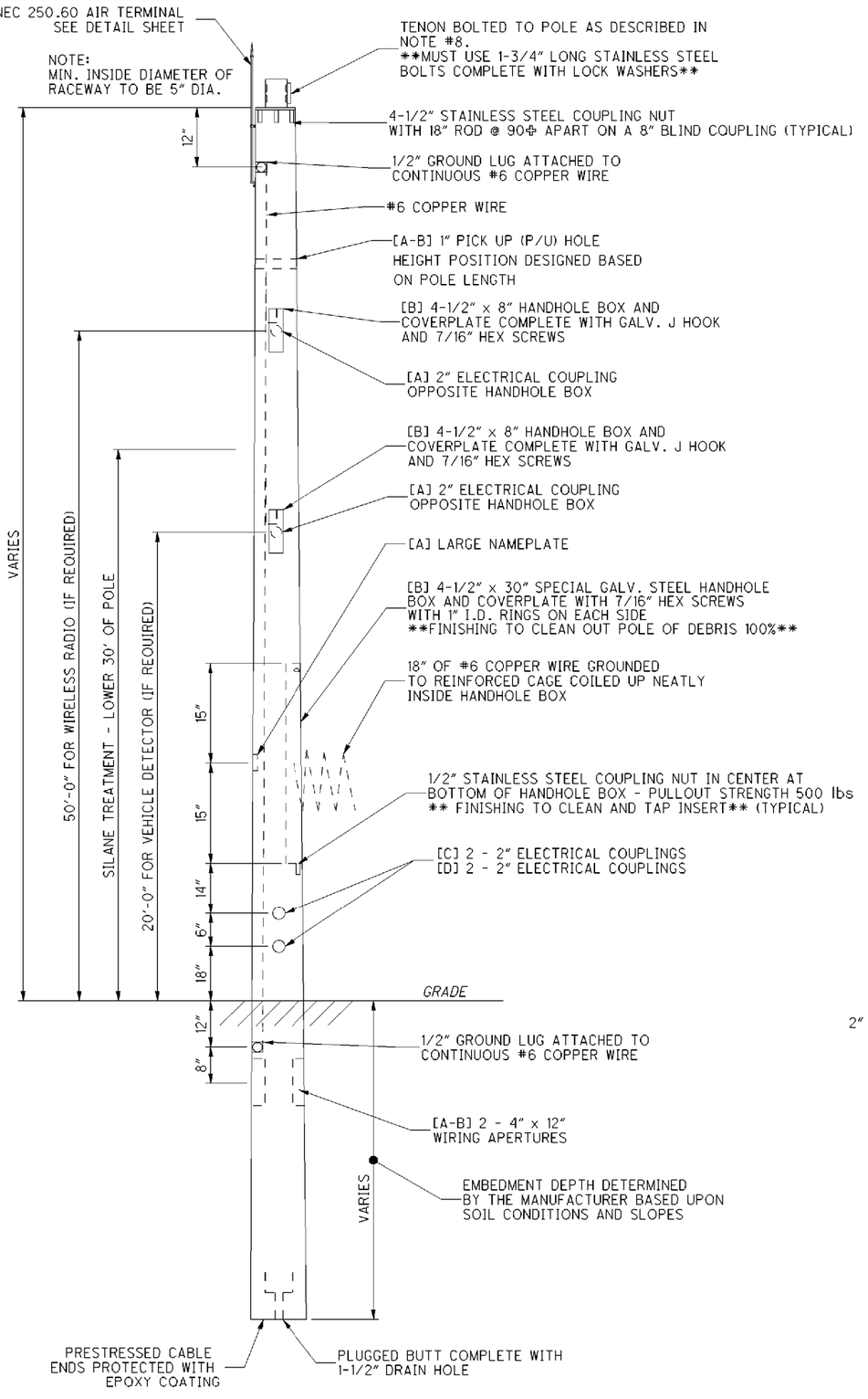


DETAIL
AIR TERMINAL
NOT TO SCALE

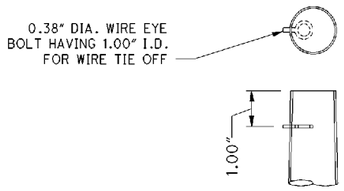
CALCULATED SGB
CHECKED ERW

ITS DETAILS

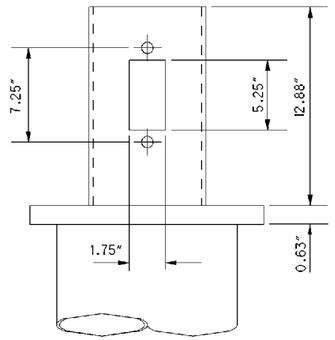
FRA-270 49.00



NOT TO SCALE



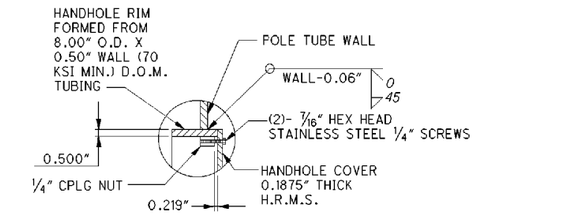
DETAIL 1 — TENON TOP



SEE POLE SCHEDULE & ORIENTATION VIEW
FOR QTY. REQ'D AND PROPER ORIENTATIONS

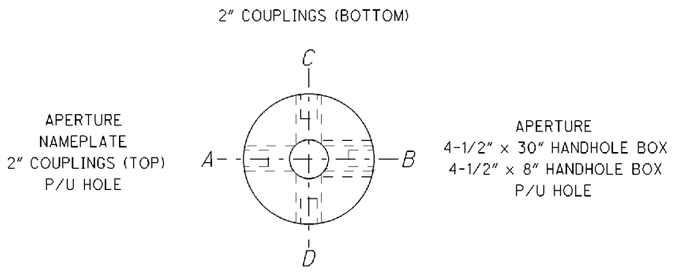
TENON TIP SHALL BE SIZED
TO HOUSE CAMERA SELECTED

DETAIL 2 — POLE TENON



4-1/2" x 8" HANDHOLES SHALL HAVE SAME REQUIREMENTS
WITH DIMENSIONS ADJUSTED ACCORDINGLY (IF REQUIRED)

DETAIL 3 — 4-1/2" x 30" HANDHOLE



ORIENTATION

NOTES:

1. IF ITS CABINET IS POLE-MOUNTED, IT SHALL BE ORIENTED ON SIDE [C] OF POLE, ABOVE 2" COUPLINGS.
2. IF COMM CABINET IS POLE-MOUNTED, IT SHALL BE ORIENTED ON SIDE [D] OF POLE, ABOVE 2" COUPLINGS (IF REQUIRED).
3. LOWERING DEVICE WITH CAMERA ARM SHALL BE ORIENTED ON SIDE [A] OF POLE OR OFFSET ANGLE ALLOWABLE UP TO 45 DEGREES TOWARD SIDE [C] OR [D], TO AVOID LOWERING CAMERA INTO THE POLE-MOUNTED CABINETS, APPROVED BY ENGINEER.
4. THE GROUNDING SYSTEM/LUGS SHALL BE INTEGRATED NEARBY THE 4-1/2" X 30" HANDHOLE OPENING TO ALLOW FOR EASY INSPECTION AND ATTACHMENT OF GROUNDING WIRE TO LUG. THE GROUNDING LUG SHALL IN NO WAY INTERFERE WITH THE PLACEMENT/OPERATION OF THE CAMERA LOWERING DEVICE OR WINCH.
5. MAXIMUM HORIZONTAL DEFLECTION IS 1 (ONE) INCH FOR A SUSTAINED 30 MPH WIND VELICITY WITH NO GUST.
6. LOADING AND ALLOWING STRESS CRITERIA:
   1994 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS."
7. ALL UNUSED COUPLING HOLES SHALL BE PLUGGED TO PREVENT ANY KIND OF WEATHER/RODENT INTRUSION.
8. TENON BOLTED TO POLE SO THE RECTANGULAR OPENING FOR THE CAMERA ARM IS ORIENTED IN THE RANGE OF 130 TO 230 DEGREES FROM THE LARGE HANDHOLE BOX. THE CAMERA ARM SHALL BE ORIENTED TO BE CAPABLE OF VIEWING IN ALL ROADWAY DIRECTIONS. THEREFORE, THE POLE SHALL BLOCK AS LITTLE AMOUNT OF ROADWAY AS POSSIBLE. THE CAMERA SHALL ALSO BE ORIENTED SO THAT UPON LOWERING THE CAMERA WILL NOT HIT ANY POLE MOUNTED CABINETS OR OTHER EQUIPMENT.

AS BUILT - 4/22/2016

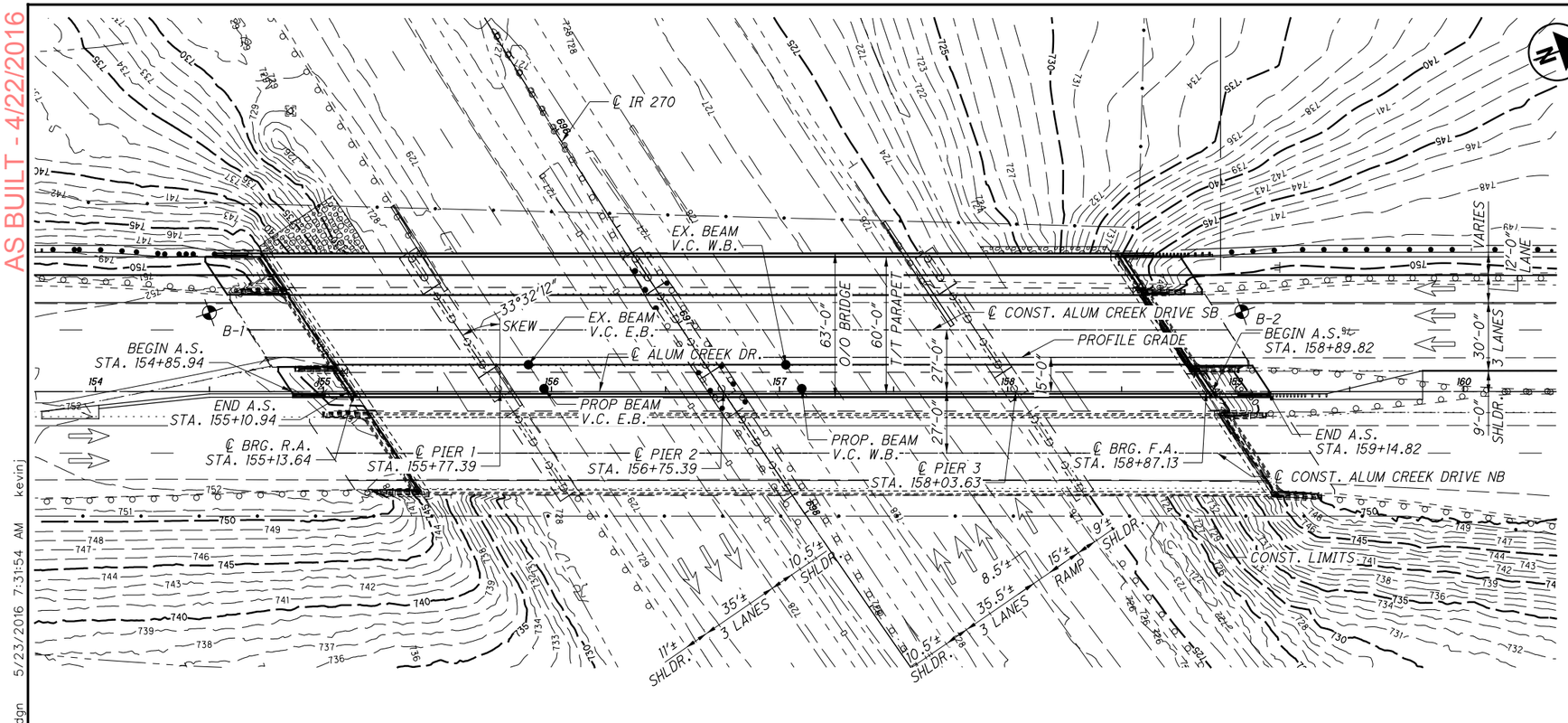
BU 4, 5, 6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

CALCULATED SGB CHECKED ERW

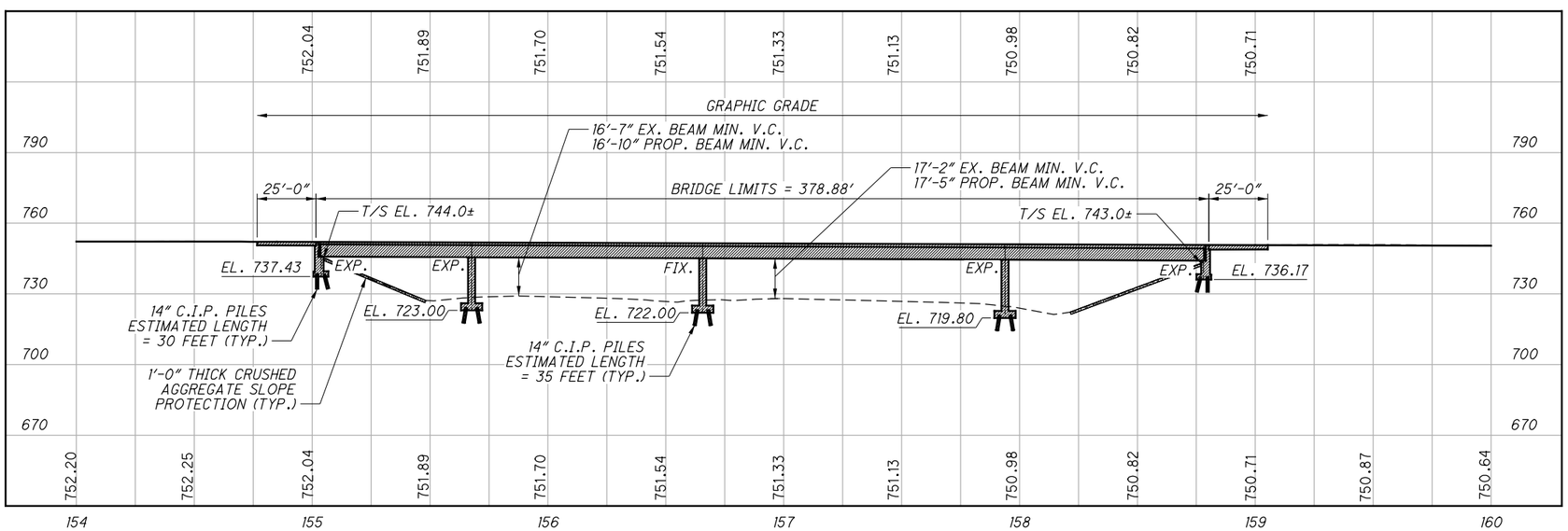
ITS DETAILS

FRA-270 49.00

AS BUILT - 4/22/2016



PLAN



PROFILE - ALONG PROFILE GRADE

BENCHMARK DATA

BM #1 STA. 173+65.92, ELEV. 746.07, OFFSET 47.83', LT.
BM #2 STA. 152+53.72, ELEV. 749.35, OFFSET 72.54', LT.
BM #3 STA. 153+24.40, ELEV. 742.92, OFFSET 91.38', LT.

FOR ADDITIONAL BENCHMARK INFORMATION, SEE BU 6 - ROADWAY PLAN, SHEET 3/88

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
2016 ADT = 27,490 2016 ADTT = 4,674
2036 ADT = 43,970 2036 ADTT = 7,475
DIRECTIONAL DISTRIBUTION = 55%

LEGEND

- BORING LOCATION
- 16'-0" REQUIRED MINIMUM VERTICAL CLEARANCE
  16'-7" ACTUAL MINIMUM VERTICAL CLEARANCE

EXISTING STRUCTURE

TYPE: 4 SPAN CONTINUOUS NON-COMPOSITE STEEL GIRDERS WITH REINFORCED CONCRETE DECK & SUBSTRUCTURE.
SPANS: 63.75', 98.0', 128.25', 83.5' C/C BRGS.
ROADWAY: 30'-8"± T/T CURB
LOADING: CF - 2000 (57)
SKEW: 33° 32' 12" R.F.
APPROACH SLABS: SPECIAL (25' LONG)
WEARING SURFACE: 1¼" MICROSILICA MODIFIED CONCRETE OVERLAY
ALIGNMENT: TANGENT
CROWN: 3/16" / FT.
STRUCTURAL FILE NUMBER: 2513862
DATE BUILT: 1966
DISPOSITION: TO BE REHABILITATED

PROPOSED STRUCTURE

TYPE: 4 SPAN CONTINUOUS NON-COMPOSITE STEEL GIRDERS WITH REINFORCED CONCRETE DECK & SUBSTRUCTURE.
SPANS: 63.75', 98.0', 128.25', 83.5' C/C BRGS.
ROADWAY: 60'-0" T/T PARAPET
LOADING: HS20 CASE II AND ALTERNATE MILITARY
FUTURE WEARING SURFACE LOADING: 60 PSF
WEARING SURFACE: 1" MONOLITHIC CONCRETE
SKEW: 33° 32' 12" R.F.
APPROACH SLABS: 25'-0" LONG (AS-1-81)
ALIGNMENT: TANGENT
CROWN: 0.016
COORDINATES: LATITUDE 39° 52' 19"
LONGITUDE 82° 56' 01"

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

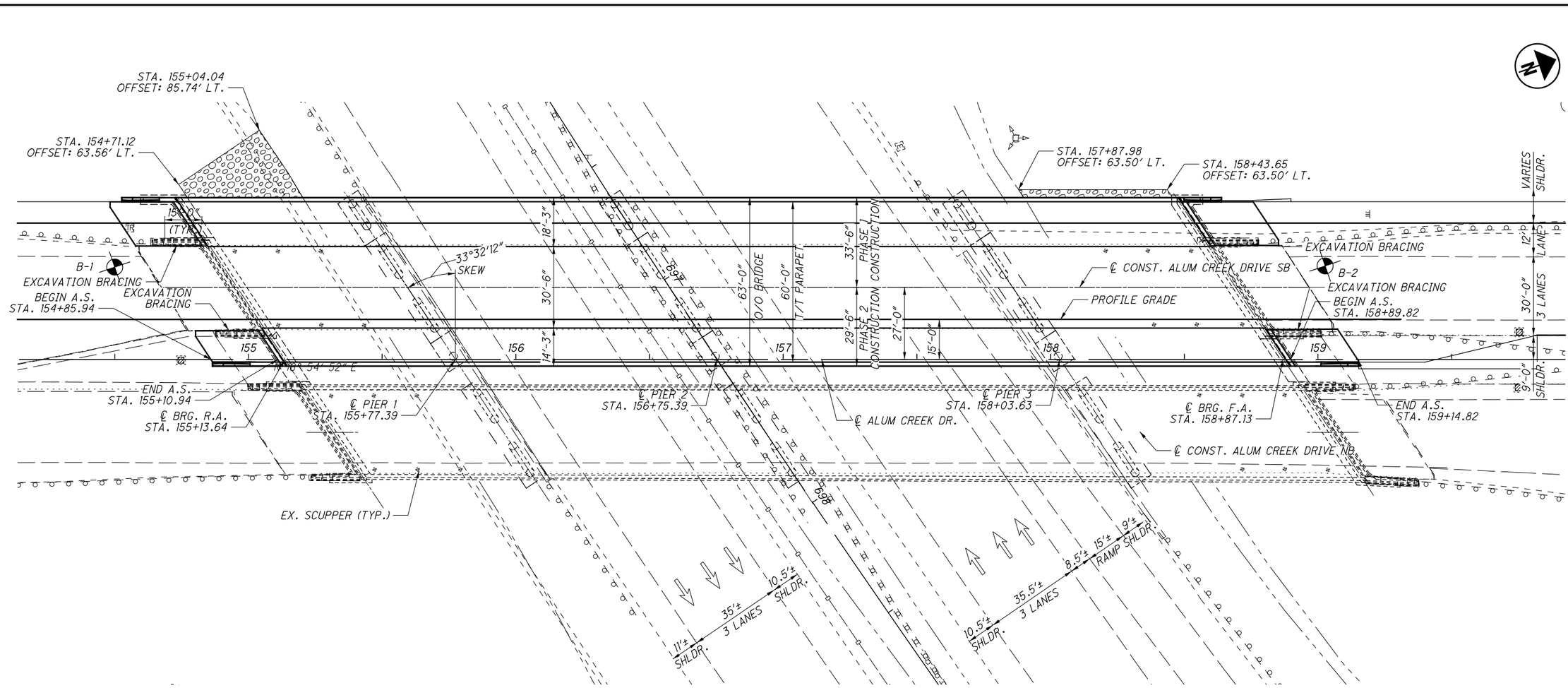
RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

FRANKLIN COUNTY
STA. 155+10.94
STA. 158+89.82

SITE PLAN
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988



GENERAL PLAN

PROPOSED WORK:

1. CONSTRUCT PIERS AS SHOWN ON SHEET 13/32
2. PLUG SCUPPERS
3. REMOVE PORTION OF SLAB AND PARAPET AS SHOWN ON SHEET 5/32
4. REMOVE PORTION OF ABUTMENTS AS SHOWN ON SHEET 6/32 & 7/32
5. CONSTRUCT ABUTMENTS AS SHOWN ON SHEETS 9/32 10/32 12/32
6. CONSTRUCT PROPOSED GIRDERS, PG1, PG2 & PG3. INSTALL CROSSFRAMES.
7. CONSTRUCT DECK AND PARAPETS.
8. SEAL PHASE C.J. WITH 2'-0" HMWM RESIN.
9. SEAL PARAPETS, PIERS AND ABUTMENTS WITH A NON-EPOXY SEALER.
10. PAINT FASCIA BEAMS, LEFT FASCIA BEAM (PROPOSED) ON THE LEFT BRIDGE AND RIGHT FASCIA BEAM (EXISTING) ON THE RIGHT BRIDGE.
11. INSTALL ORNAMENTAL RAILING.

RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	12/01/2015
CHECKED	REVISED		STRUCTURE FILE NUMBER
JLM			2513862

GENERAL PLAN

BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

2 / 32

148
182

AS BUILT - 4/22/2016

REFER TO THE FOLLOWING STANDARD BRIDGE DRAWING(S):

A-1-69	REVISED	07-19-02
AS-1-81	REVISED	01-18-13
EXJ-4-87	REVISED	07-19-02
GSD-1-96	REVISED	07-19-02
PCB-91	REVISED	01-18-13
SBR-1-99	REVISED	07-19-02

DESIGN SPECIFICATIONS:

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002, AND THE ODOT BRIDGE DESIGN MANUAL.

DESIGN LOADING:

HS-20-44 CASE II AND ALTERNATE MILITARY LOADING
FUTURE WEARING SURFACE (FWS) OF 60 PSF

DESIGN DATA:

CONCRETE CLASS QC2 - COMPRESSIVE STRENGTH 4500 PSI (SUPERSTRUCTURE)

CONCRETE CLASS QC1 - COMPRESSIVE STRENGTH 4000 PSI (SUBSTRUCTURE)

REINFORCING STEEL - ASTM A615 OR A996 GRADE 60 MINIMUM YIELD STRENGTH 60,000 PSI

STRUCTURAL STEEL - ASTM A709 GRADE 50W - YIELD STRENGTH 50 KSI

DECK PROTECTION METHOD:

EPOXY COATED REINFORCING STEEL
2½" CONCRETE COVER

MONOLITHIC WEARING SURFACE:

MONOLITHIC WEARING SURFACE IS ASSUMED, FOR DESIGN PURPOSES, TO BE 1 INCH THICK.

EXISTING STRUCTURE REMOVAL NOTES:

SUBSTRUCTURE CONCRETE REMOVAL:

REMOVE CONCRETE BY MEANS OF APPROVED PNEUMATIC HAMMERS EMPLOYING POINTED AND BLUNT CHISEL TOOLS. HYDRAULIC HOE-RAM TYPE HAMMERS WILL NOT BE PERMITTED. THE WEIGHT OF THE HAMMER SHALL NOT BE MORE THAN 35 POUNDS FOR REMOVAL WITHIN 18 INCHES OF PORTIONS TO BE PRESERVED. OUTSIDE THE 18 INCH LIMIT, THE CONTRACTOR MAY USE HAMMERS NOT EXCEEDING 90 POUNDS UPON THE APPROVAL OF THE ENGINEER. DO NOT PLACE PNEUMATIC HAMMERS IN DIRECT CONTACT WITH REINFORCING STEEL THAT IS TO BE RETAINED IN REBUILT STRUCTURE.

CONCRETE DECK REMOVAL PROJECTS:

THIS WORK CONSISTS OF THE REMOVAL OF CONCRETE DECKS INCLUDING, PARAPETS, DECK JOINTS AND OTHER APPURTENANCES FROM STEEL SUPPORTING SYSTEMS (GIRDERS, CROSS FRAMES, ETC.). THE PROVISIONS OF ITEM 202 APPLY EXCEPT AS SPECIFIED BY THE FOLLOWING NOTES. PERFORM WORK CAREFULLY DURING DECK REMOVALS TO PROTECT PORTIONS OF SUCH SYSTEMS THAT ARE TO BE SALVAGED AND INCORPORATED INTO THE PROPOSED STRUCTURE. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE RAM TYPE OF EQUIPMENT IS PROHIBITED. SUBMIT CONSTRUCTION PLANS ACCORDING TO CMS 501.05.

PROTECTION OF STEEL SUPPORT SYSTEMS:

BEFORE DECK SLAB CUTTING IS PERMITTED, DRAW THE OUTLINE OF PRIMARY STEEL MEMBERS IN CONTACT WITH THE BOTTOM OF THE DECK ON THE SURFACE OF DECK. DRILL SMALL DIAMETER PILOT HOLES 2 INCHES OUTSIDE THESE LINES TO CONFIRM THE LOCATION OF FLANGE EDGES. DECK CUTS OVER OR WITHIN 2 INCHES OF FLANGE EDGES SHALL NOT EXTEND LOWER THAN BOTTOM LAYER DECK SLAB REINFORCING STEEL. CUTS MADE OUTSIDE 2 INCHES OF FLANGE EDGES MAY EXTEND THE FULL DEPTH OF THE DECK. PERFORM WORK CAREFULLY DURING CUTTING OF THE DECK SLAB TO AVOID DAMAGING STEEL MEMBERS THAT ARE TO BE INCORPORATED INTO THE PROPOSED STRUCTURE. REPLACE OR REPAIR STEEL MEMBERS DAMAGED BY THE DECK SLAB CUTTING OPERATIONS AT NO COST TO THE PROJECT. AT LEAST 7 DAYS BEFORE PERFORMING REPAIR WORK, SUBMIT A PROPOSED REPAIR PLAN, DEVELOPED BY AN OHIO REGISTERED PROFESSIONAL ENGINEER TO THE DIRECTOR. OBTAIN THE DIRECTOR'S APPROVAL BEFORE PERFORMING REPAIR.

REMOVAL METHODS:

THE CONTRACTOR MAY REMOVE CONCRETE BY CUTTING AND BY MEANS OF HAND OPERATED PNEUMATIC HAMMERS POINTED OR BLUNTED CHISEL TOOLS. FOR REMOVALS OVER STRUCTURAL MEMBERS (STEEL GIRDER), THE CONTRACTOR MAY USE A HAMMER HEAVIER THAN 35 POUNDS BUT NOT TO EXCEED 90 POUNDS UNLESS APPROVED BY THE ENGINEER. REMOVAL METHODS OVER STRUCTURAL MEMBERS SHALL ENSURE ADEQUATE DEPTH CONTROL AND PREVENT NICKING OR GOUGING THE PRIMARY STRUCTURAL MEMBERS.
DUE TO THE POSSIBLE PRESENCE OF ATTACHMENTS (EG., FINISHING MACHINE, SCUPPER AND FORM SUPPORTS, ETC.) TO EXISTING STRUCTURAL MEMBERS, PERFORM WORK CAREFULLY DURING DECK REMOVAL TO AVOID DAMAGING STRUCTURAL MEMBERS THAT ARE REMAIN. REPLACE OR REPAIR STRUCTURAL MEMBERS DEMAGED BY THE REMOVAL OPERATIONS AT NO COST TO THE PROJECT. AT LEAST 7 DAYS BEFORE PERFORMING REPAIR WORK, SUBMIT A PROPOSED REPAIR PLAN, DEVELOPED BY AN OHIO REGISTERED PROFESSIONAL ENGINEER TO THE DIRECTOR. OBTAIN THE DIRECTOR'S APPROVAL BEFORE PERFORMING REPAIR.

EXISTING WELDED ATTACHMENTS:

REMOVE EXISTING WELDED ATTACHMENTS (E.G., FINISHING MACHINE AND FORM SUPPORTS; AND SUPPORTS FOR SCUPPERS AND BULB ANGLES WHICH ARE TO BE REMOVED) LOCATED IN THE DESIGNATED TENSION PORTIONS OF THE TOP FLANGES OF EXISTING STEEL MEMBERS AND GRIND THE FLANGE SURFACES SMOOTH. CAREFULLY GRIND PARALLEL TO THE FLANGES.

CUT LINE CONSTRUCTION JOINT PREPARATION:

SAW CUT BOUNDARIES OF PROPOSED CONCRETE REMOVALS 1 INCH DEEP. REMOVE CONCRETE TO A ROUGH SURFACE. LEAVE THE EXISTING REINFORCING STEEL, IF REQUIRED IN THE PLANS, IN PLACE. INSTALL DOWEL BARS IF SPECIFIED. PRIOR TO CONCRETE PLACEMENT ABRASIVELY CLEAN JOINT SURFACES AND EXISTING EXPOSED REINFORCEMENT TO REMOVE LOOSE AND DISINTEGRATED CONCRETE AND LOOSE RUST. THOROUGHLY CLEAN THE JOINT SURFACE AND EXPOSED REINFORCEMENT OF ALL DIRT, DUST, RUST OR OTHER FOREIGN MATERIAL BY THE USE OF WATER, AIR UNDER PRESSURE, OR OTHER METHODS THAT PRODUCE SATISFACTORY RESULTS. EXISTING REINFORCING STEEL DOES NOT HAVE TO HAVE A BRIGHT STEEL FINISH, BUT REMOVE ALL PACK AND LOOSE RUST. THOROUGHLY DRENCH EXISTING CONCRETE SURFACES WITH CLEAN WATER AND ALLOW TO DRY TO A DAMP CONDITION BEFORE PLACING CONCRETE.

REHABILITATION OF EXISTING STRUCTURES:

EXISTING STRUCTURE VERIFICATION:

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05,105.02 AND 513.04.

REINFORCING STEEL REPLACEMENT:

ITEM 509 REINFORCING STEEL, REPLACEMENT OF EXISTING REINFORCING STEEL, AS PER PLAN:

REPLACE ALL EXISTING REINFORCING BARS DEEMED BY THE ENGINEER TO BE UNUSABLE BECAUSE OF CORROSION. THE DEPARTMENT WILL MEASURE THE REPLACEMENT REINFORCING STEEL BY THE NUMBER OF POUNDS ACCEPTED IN PLACE.

REPLACE ALL EXISTING REINFORCING STEEL BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND ARE DEEMED BY THE ENGINEER TO BE MADE UNUSABLE BY CONCRETE REMOVAL OPERATIONS WITH NEW EPOXY COATED REINFORCING STEEL OF THE SAME SIZE AT NO COST TO THE DEPARTMENT.

ITEM 514 - FIELD PAINTING STRUCTURAL STEEL, FINISH COAT:

THE FINISH COAT OF PAINT ON THE STRUCTURAL STEEL IS TO BE FEDERAL COLOR - BLUE (#15526). PAINT FASCIA BEAMS ONLY SEE SHEET 5/32 FOR PAINTING LIMITS.

DECK PLACEMENT DESIGN ASSUMPTIONS:

THE FOLLOWING ASSUMPTIONS OF CONSTRUCTION MEANS AND METHODS WERE MADE FOR THE ANALYSIS AND DESIGN OF THE SUPERSTRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE FALSEWORK SUPPORT SYSTEM WITHIN THESE PARAMETERS AND WILL ASSUME RESPONSIBILITY FOR SUPERSTRUCTURE ANALYSIS FOR DEVIATION FROM THESE DESIGN ASSUMPTIONS.

AN EIGHT WHEEL FINISHING MACHINE WITH A MAXIMUM LOAD OF 1.75 KIPS FOR A TOTAL MACHINE LOAD OF 14 KIPS.

A MINIMUM OUT-TO-OUT WHEEL SPACING AT EACH END OF THE MACHINE OF 103".

A MAXIMUM SPACING OF OVERHANG FALSEWORK BRACKETS OF 48 IN.

A MAXIMUM DISTANCE FROM THE CENTERLINE OF THE FASCIA GIRDER TO THE FACE OF THE SAFETY HANDRAIL OF 65".

PILE DESIGN LOADS (ULTIMATE BEARING VALUE):

THE ULTIMATE BEARING VALUE IS 65 TONS PER PILE FOR THE ABUTMENT PILES. THE ULTIMATE BEARING VALUE IS 112.50 TONS PER PILE FOR THE PIER PILES.

ABUTMENT PILES:
14" DIAMETER C.I.P. PILES 35 FEET LONG, ORDER LENGTH
1 DYNAMIC LOAD TESTING ITEM

PIER PILES:
14" DIAMETER C.I.P. PILES 40 FEET LONG, ORDER LENGTH
1 DYNAMIC LOAD TESTING ITEM

ABBREVIATIONS:

ABUT. - ABUTMENT
ADT - AVERAGE DAILY TRAFFIC
ADTT - AVERAGE DAILY TRUCK TRAFFIC
A.S. - APPROACH SLAB
℄ - BASELINE
BRG. - BEARING
C/C - CENTER TO CENTER
C.J. - CONSTRUCTION JOINT
C.I.P. - CAST-IN-PLACE
℄ - CENTERLINE
CLR. - CLEAR
CONC. - CONCRETE
CONST. - CONSTRUCTION
DIA. - DIAMETER
EL. - ELEVATION
EQ. - EQUAL
EX. - EXISTING
EXP. - EXPANSION
F.A. - FORWARD ABUTMENT
F/F - FACE TO FACE
FWD. - FORWARD
IN. - INCH
IN-BET. - IN-BETWEEN
INCR. - INCREMENT
JNT. - JOINT
L.F. - LEFT FORWARD
LT. - LEFT
MID. - MIDDLE
MIN. - MINIMUM
NB - NORTHBOUND
NO. - NUMBER
NPCPP - NON-PERFORATED CORRUGATED PLASTIC PIPE
O/O - OUT TO OUT
PCB - PORTABLE CONCRETE BARRIER
PCPP - PERFORATED CORRUGATED PLASTIC PIPE
PEJF - PREFORMED EXPANSION JOINT FILLER
℄ - PLATE
PRESS. - PRESSURE
PROP. - PROPOSED
PVI - POINT OF VERTICAL INTERSECTION
R.A. - REAR ABUTMENT
RAD. - RADIUS
RD. - ROAD
REQ'D - REQUIRED
RT. - RIGHT
SB - SOUTHBOUND
SER.- SERIES
SHLDR. - SHOULDER
SPA. - SPACES
STA. - STATION
STR. - STRAIGHT
SUPER. - SUPERSTRUCTURE
TEMP. - TEMPORARY
T/T - TOE TO TOE
TYP. - TYPICAL
VAR. - VARYING
VERT. - VERTICAL
W/ - WITH

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

RESOURCE INTERNATIONAL INC.
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COLUMBUS, OHIO 43231
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DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

GENERAL NOTES
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

ESTIMATED QUANTITIES

ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.	SHEET NO.
202	11203	LUMP		PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN				LUMP	3
503	11100	LUMP		COFFERDAMS AND EXCAVATION BRACING			LUMP		
503	21300	LUMP		UNCLASSIFIED EXCAVATION				LUMP	
505	11100	LUMP		PILE DRIVING EQUIPMENT MOBILIZATION				LUMP	
507	600	1650	FT	14" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	600	1050			
507	650	1900	FT	14" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	700	1200			
509	10000	168599	POUND	EPOXY COATED REINFORCING STEEL	11882	29321	127396		
509	20000	119	POUND	REINFORCING STEEL, REPLACEMENT OF EXISTING REINFORCING STEEL	119				
510	10000	180	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	180				
511	34446	435	CU YD	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK			435		
511	34450	133	CU YD	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)			133		
511	50212	304	CU YD	CLASS QC1 CONCRETE WITH QC/QA, SUBSTRUCTURE	153	151			
512	10100	1364	SQ YD	SEALING OF CONCRETE SURFACES (NON-EPOXY)	109	201	1054		
512	33000	17	SQ YD	TYPE 2 WATERPROOFING	17				
513	10280	218810	LB	STRUCTURAL STEEL MEMBERS, LEVEL 4			218810		
514	00050	3284	SQ FT	SURFACE PREPARATION OF EXISTING STRUCTURAL STEEL			3284		
514	00056	3284	SQ FT	FIELD PAINTING OF EXISTING STRUCTURAL STEEL, PRIME COAT			3284		
514	00060	6172	SQ FT	FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT			6172		
514	00066	6172	SQ FT	FIELD PAINTING STRUCTURAL STEEL, FINISH COAT			6172		
514	00504	6	MAN HOUR	GRINDING FINS, TEARS, SLIVERS ON EXISTING STRUCTURAL STEEL			6		
514	10000	5	EACH	FINAL INSPECTION REPAIR			5		
516	11210	73	FT	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL				73	
516	13900	85	SF	2" PREFORMED EXPANSION JOINT FILLER	85				
516	44200	6	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	6				
				12" X 18" X 3.32" WITH 19" X 13" X 1 1/2" LOAD PLATE					
516	44200	3	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	3				
				15" X 24" X 3.61" WITH 25" X 16" X 2" LOAD PLATE					
516	44200	2	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	2				
				18" X 23" X 3.61" WITH 29" X 19" X 2 1/2" LOAD PLATE					
516	44200	2	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	2				
				18" X 23" X 3.61" WITH 24" X 19" X 2 1/2" LOAD PLATE					
516	44200	1	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	1				
				18" X 25" X 3.61" WITH 31" X 19" X 2 1/2" LOAD PLATE					
516	44200	1	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	1				
				18" X 25" X 3.61" WITH 26" X 19" X 2 1/2" LOAD PLATE					
518	12500	24	EACH	SCUPPER, MISC.: PLUG SCUPPER				24	
518	21200	62	CU YD	POROUS BACKFILL WITH FILTER FABRIC	62				
518	40000	72	FT	6" PERFORATED CORRUGATED PLASTIC PIPE				72	
518	40010	46	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS				46	
526	25000	167	SQ YD	REINFORCED CONCRETE APPROACH SLABS (T=15")			167		
601	20010	88	CU YD	CRUSHED AGGREGATE SLOPE PROTECTION				88	
848	50000	42	SQ YD	HAND CHIPPING			42		

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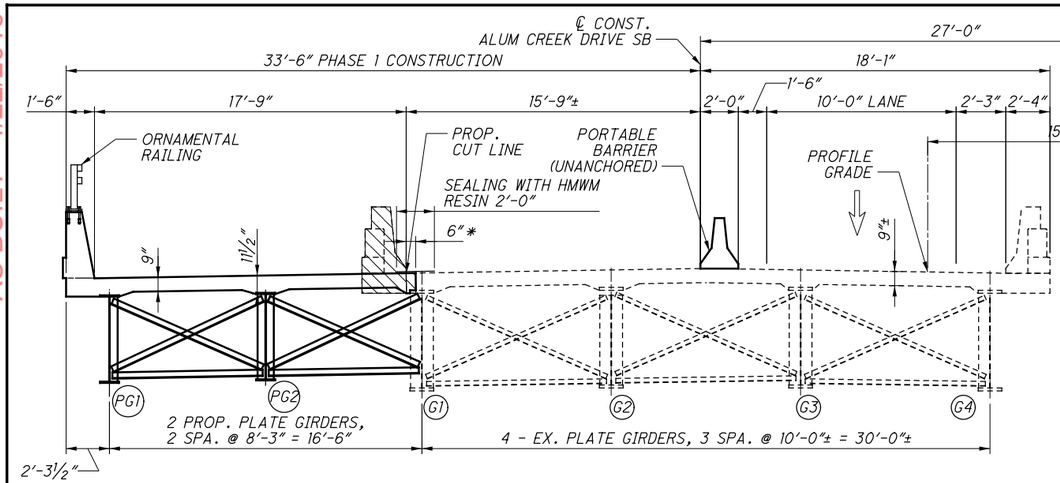
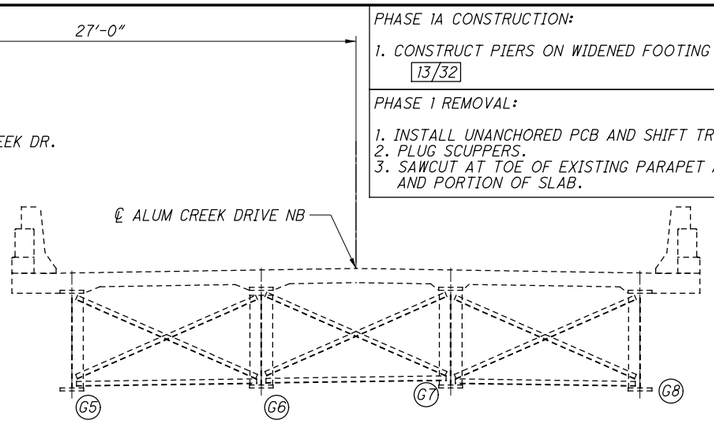
CHECKED JLM | REVISED | STRUCTURE FILE NUMBER 2513862

ESTIMATED QUANTITIES
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988



PHASE 1



PHASE 1A CONSTRUCTION:

1. CONSTRUCT PIERS ON WIDENED FOOTING AS SHOWN ON SHEET 13/32

PHASE 1 REMOVAL:

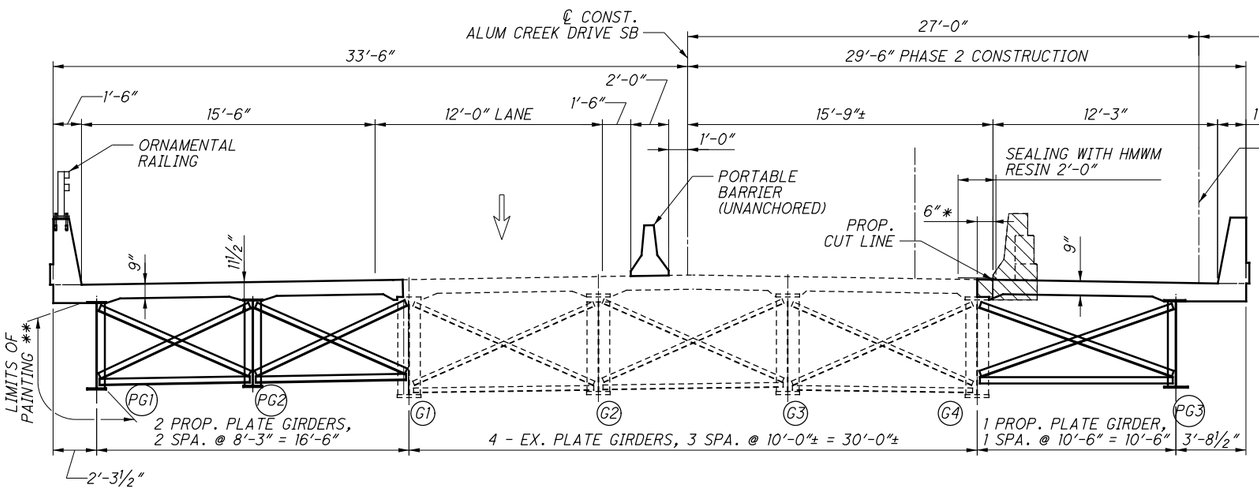
1. INSTALL UNANCHORED PCB AND SHIFT TRAFFIC PER MOT PLANS.
2. PLUG SCUPPERS.
3. SAWCUT AT TOE OF EXISTING PARAPET AND REMOVE PARAPET AND PORTION OF SLAB.

PHASE 1B CONSTRUCTION:

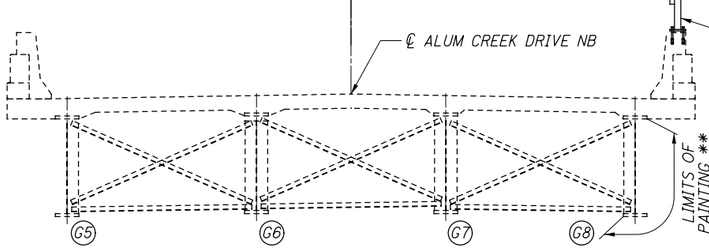
1. WIDEN SUBSTRUCTURE AS SHOWN IN ABUTMENT SHEETS 9/32 & 10/32
2. INSTALL PG1 AND PG2, CROSSFRAMES, DECK AND PARAPET AND PROPOSED ORNAMENTAL RAILING.
3. SEAL PHASE C.J. WITH 2′-0″ HMWM RESIN.
4. SEAL CONCRETE SURFACES WITH NON-EPOXY SEALER.

PHASE 2 REMOVAL:

1. INSTALL UNANCHORED PCB AND SHIFT TRAFFIC PER MOT PLANS.
2. PLUG SCUPPERS.
3. SAWCUT AT TOE OF EXISTING PARAPET AND REMOVE PARAPET AND PORTION OF SLAB.

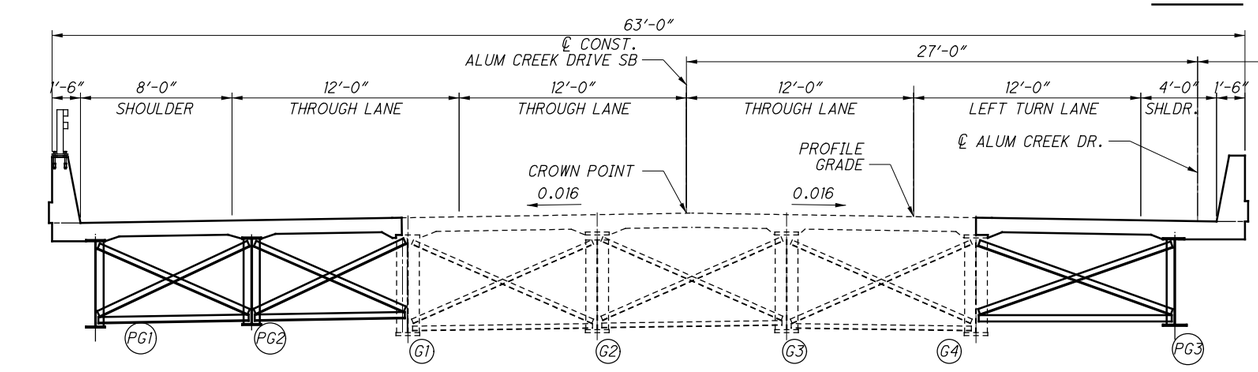


PHASE 2

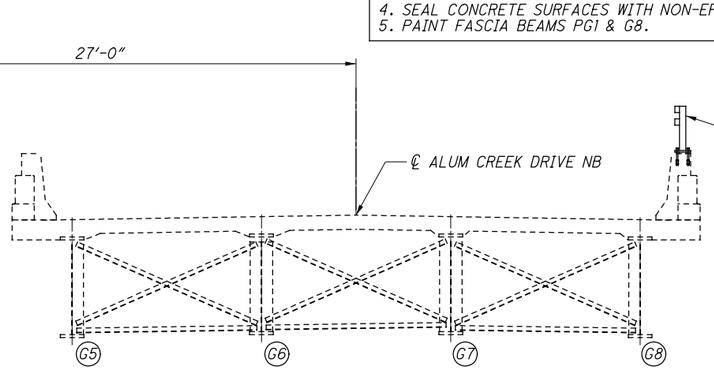


PHASE 2 CONSTRUCTION:

1. WIDEN SUBSTRUCTURE AS SHOWN IN ABUTMENT SHEET 9/32 & 10/32
2. INSTALL PG3, CROSSFRAMES, DECK AND PROPOSED RAILING.
3. SEAL PHASE C.J. WITH 2′-0″ HMWM RESIN
4. SEAL CONCRETE SURFACES WITH NON-EPOXY SEALER.
5. PAINT FASCIA BEAMS PG1 & G8.



FINAL CONFIGURATION



LEGEND:

- ITEM 202 PORTIONS OF STRUCTURE REMOVED

** PAINT ALL EXPOSED SURFACES OF THE BEAM FOR THE LAST 10 FEET, INCLUDING CROSS FRAMES.

* HAND CHIP AND REMOVE 6″± OF EXISTING DECK. CARE SHOULD BE TAKEN TO NOT REMOVE PORTION OF THE DECK BEYOND THE CENTER OF FLANGE IN ORDER TO PROVIDE SUFFICIENT BEARING FOR EXISTING DECK SLAB. PRESERVE EXISTING TRANSVERSE REINFORCEMENT. PROVIDE MECHANICAL CONNECTORS TO CONNECT EXISTING TRANSVERSE REBARS TO PROPOSED TRANSVERSE REBARS.

RESOURCE INTERNATIONAL INC.
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JLM	JLM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM		2513862	

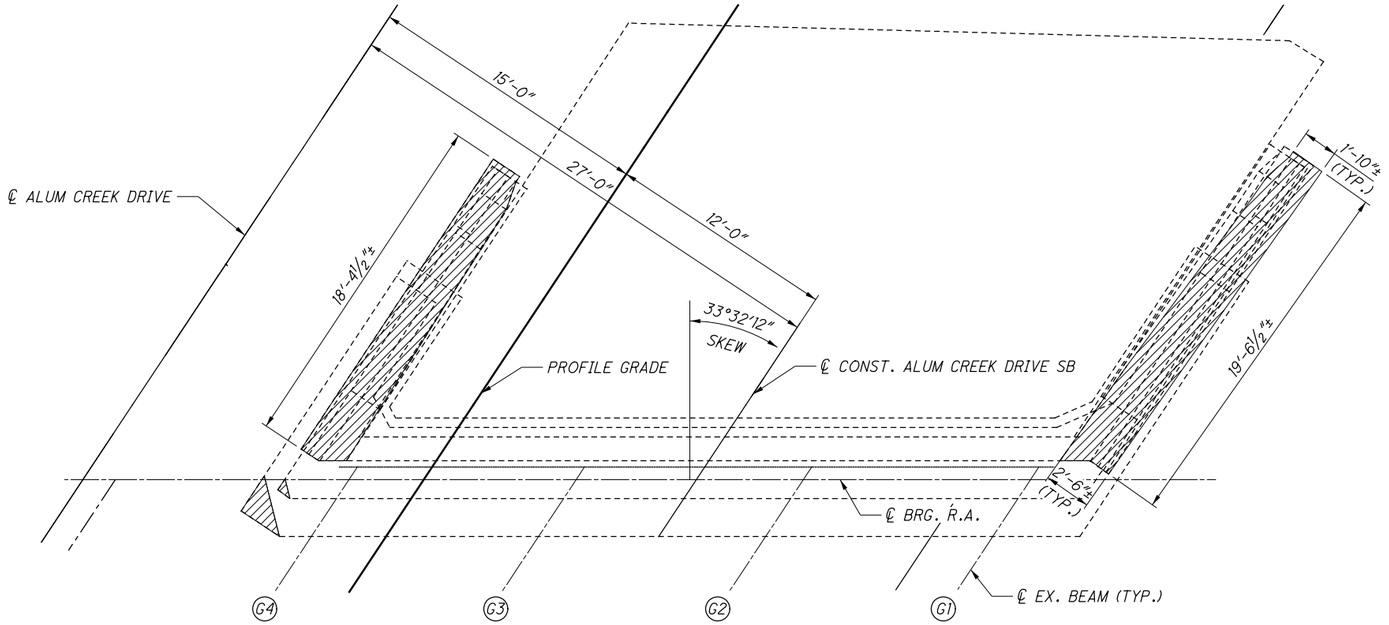
PHASE CONSTRUCTION DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

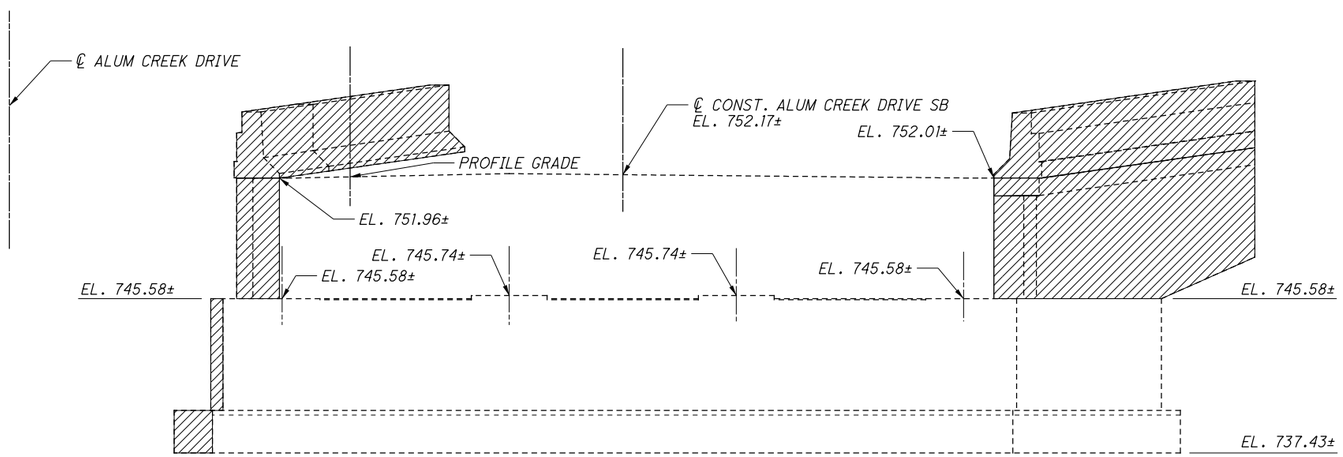
FRA-270-49.00
PID No. 83988

5 / 32

151
182



PLAN



ELEVATION

LEGEND:

▨ - ITEM 202
PORTIONS OF STRUCTURE
REMOVED

NOTE:

CONTRACTOR TO DETERMINE ACTUAL REMOVAL LIMITS IN THE FIELD AS APPROVED BY THE ENGINEER.

REAR ABUTMENT REMOVAL DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

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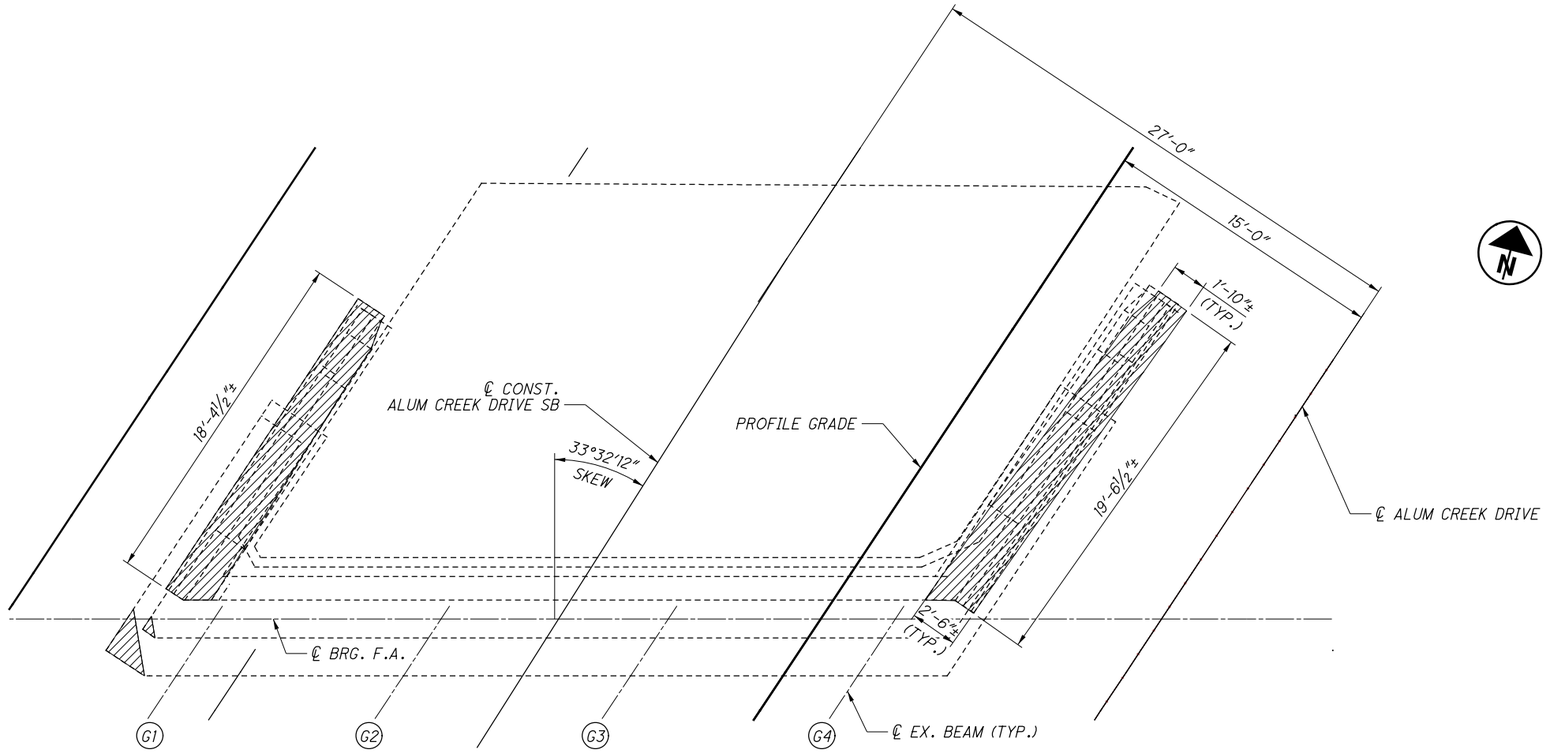
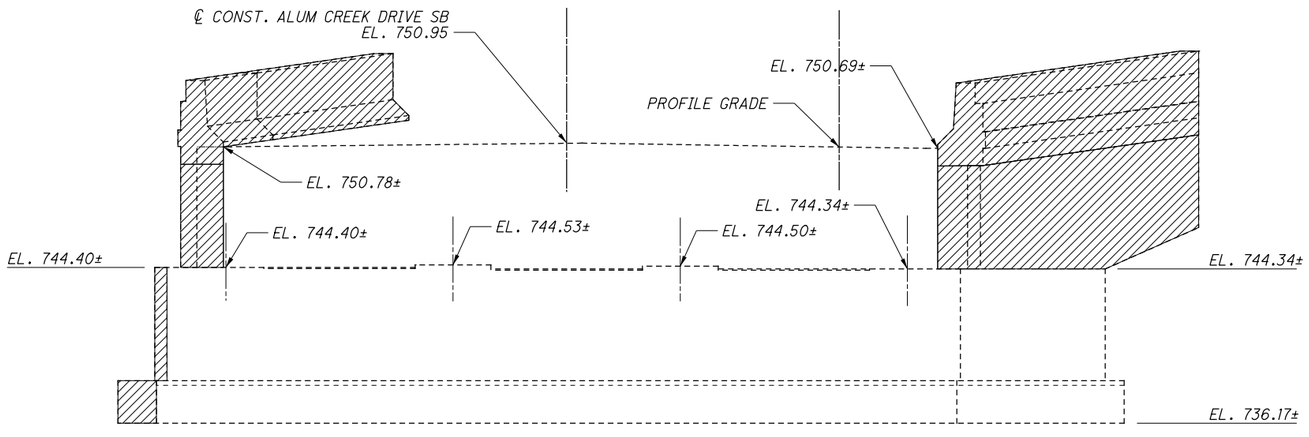


PLAN



ELEVATION

LEGEND:

▨ - ITEM 202 PORTIONS OF STRUCTURE REMOVED

NOTE:

CONTRACTOR TO DETERMINE ACUTAL REMOVAL LIMITS IN THE FIELD AS APPROVED BY THE ENGINEER.

FORWARD ABUTMENT REMOVAL DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

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CHECKED	REVISED	STRUCTURE FILE NUMBER	
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FRA-270-49.00
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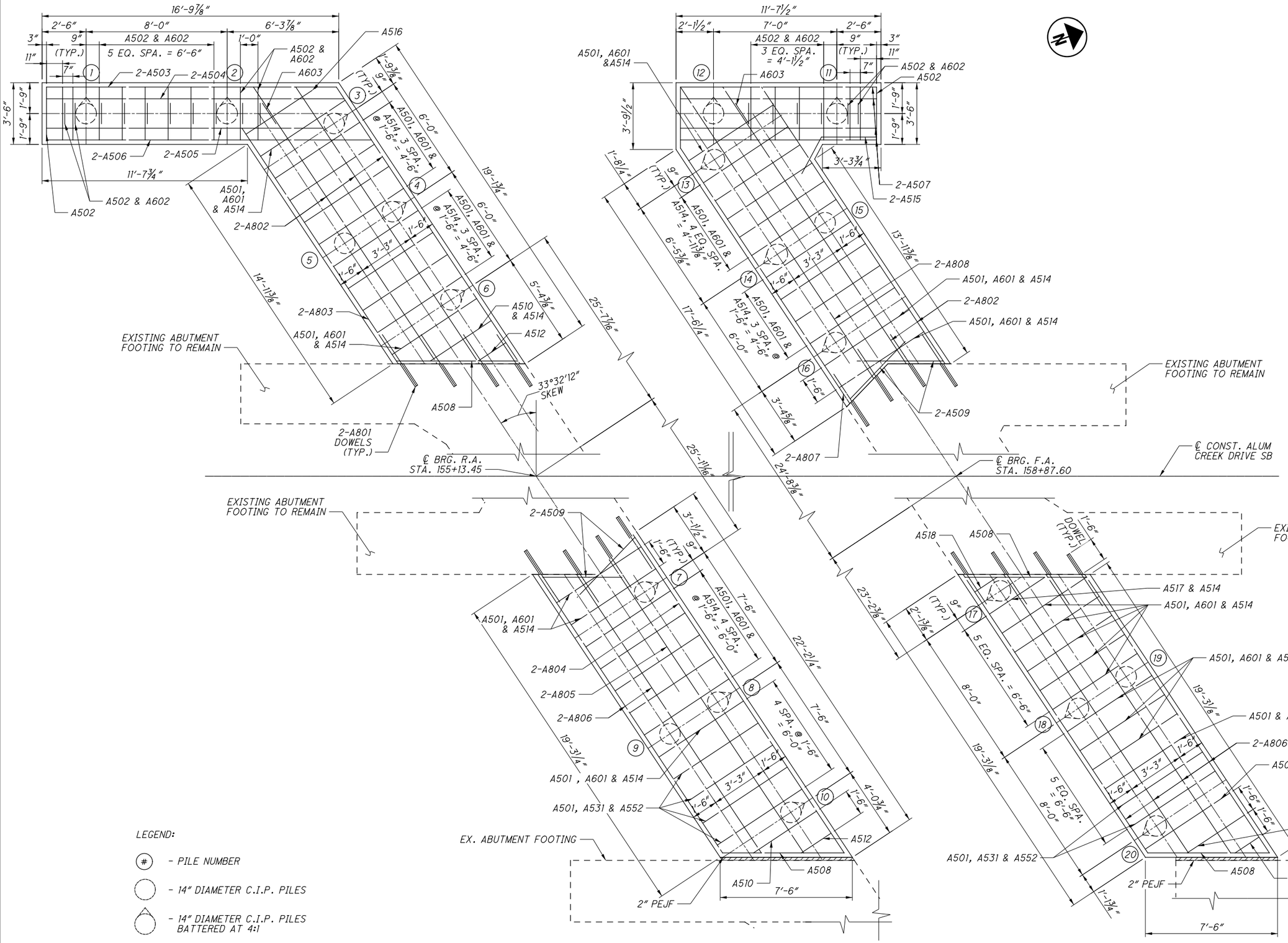
AS BUILT - 4/22/2016



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BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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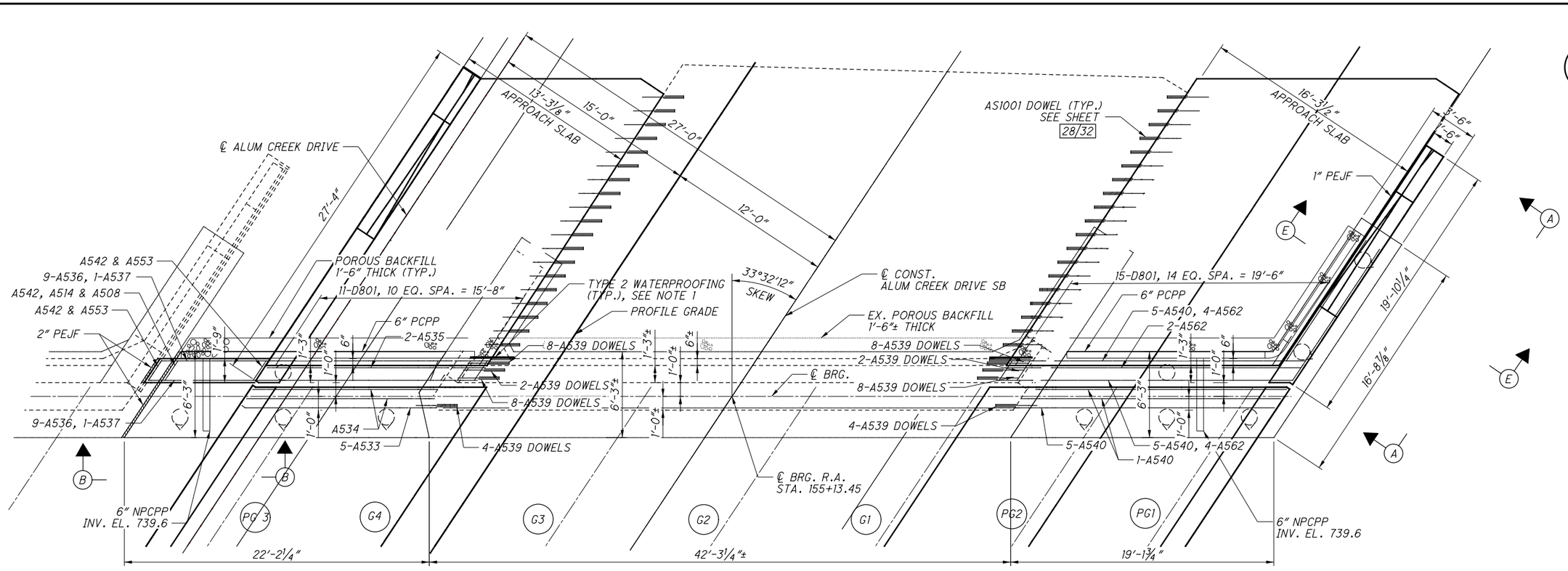
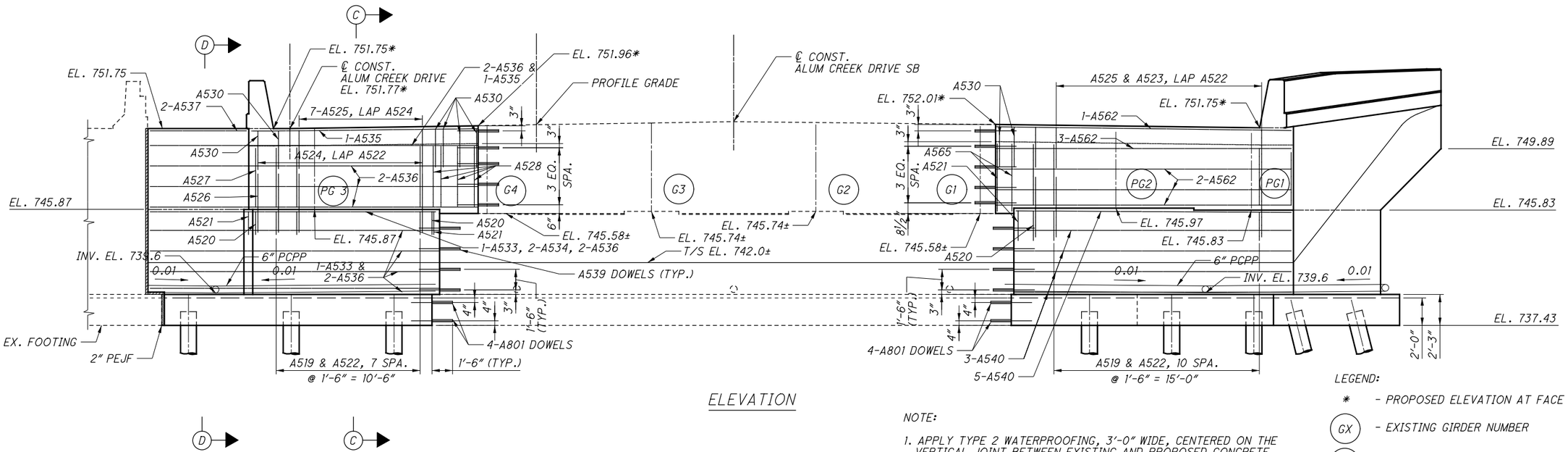
ABUTMENT FOOTING DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-36.94
PID No. 83988



PLAN



ELEVATION

NOTE:

1. APPLY TYPE 2 WATERPROOFING, 3'-0" WIDE, CENTERED ON THE VERTICAL JOINT BETWEEN EXISTING AND PROPOSED CONCRETE.

LEGEND:

* - PROPOSED ELEVATION AT FACE OF BACKWALL

(GX) - EXISTING GIRDER NUMBER

(PG X) - PROPOSED GIRDER NUMBER

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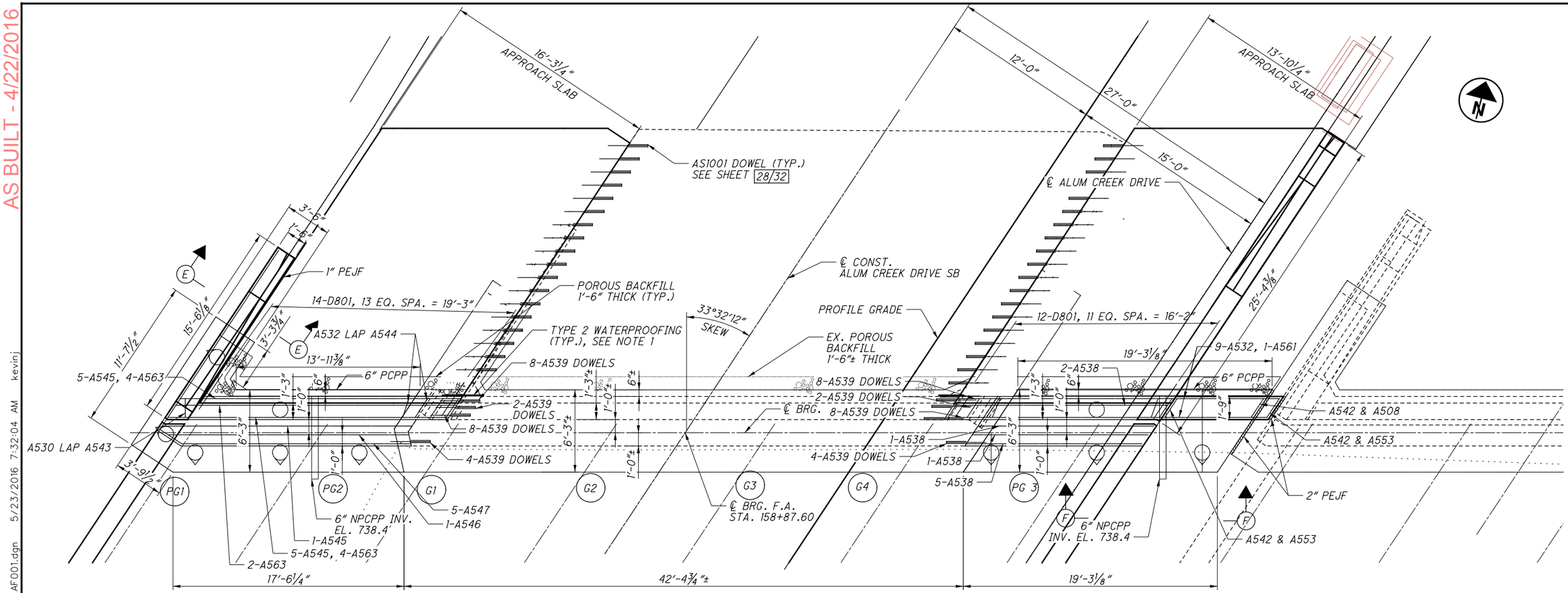
FRA-270-49.00
PID No. 83988



NOTE:

1. APPLY TYPE 2 WATERPROOFING, 3'-0" WIDE, CENTERED ON THE VERTICAL JOINT BETWEEN EXISTING AND PROPOSED CONCRETE.

LEGEND:

* - PROPOSED ELEVATION AT FACE OF BACKWALL

(GX) - EXISTING GIRDER NUMBER

(PG X) - PROPOSED GIRDER NUMBER

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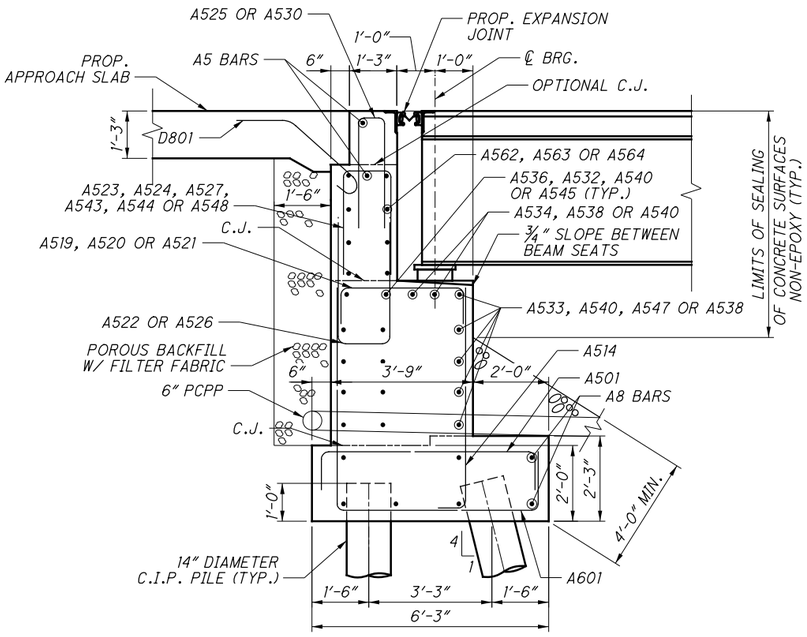
JLM		2513862	

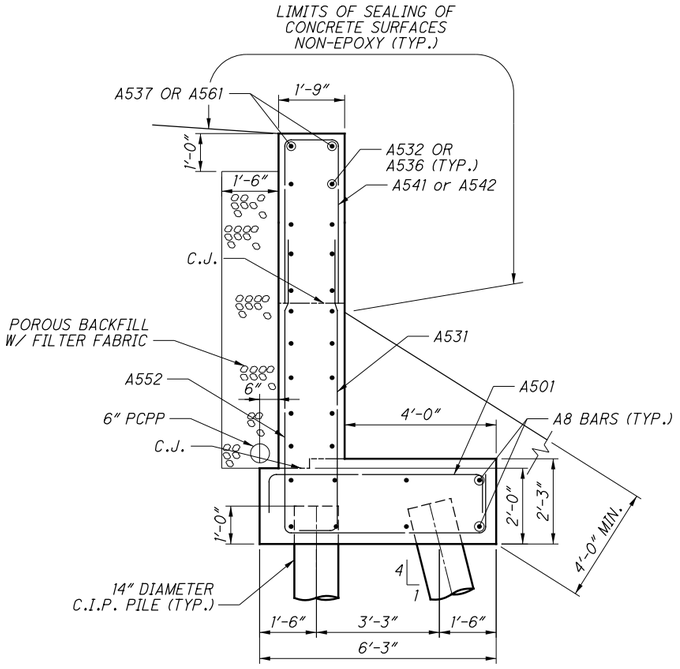
FORWARD ABUTMENT DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

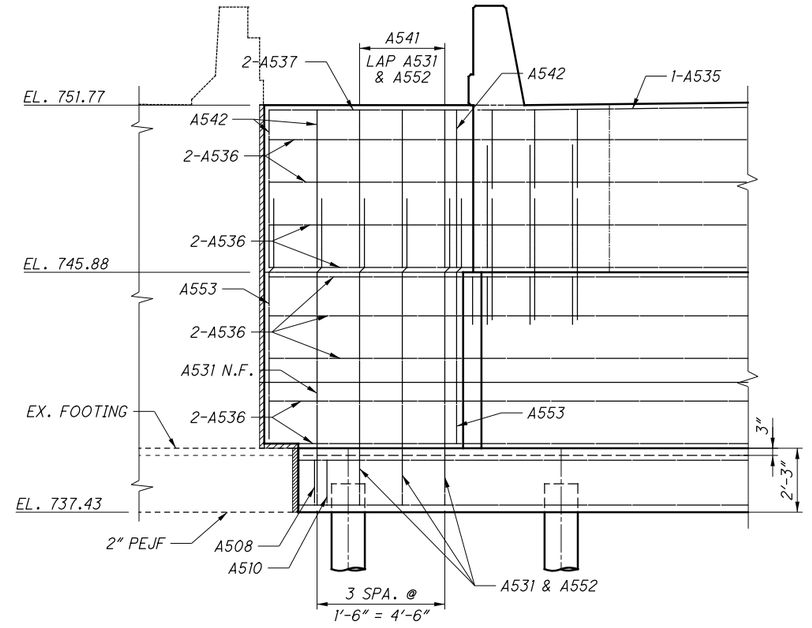
FRA-270-49.00
PID No. 83988



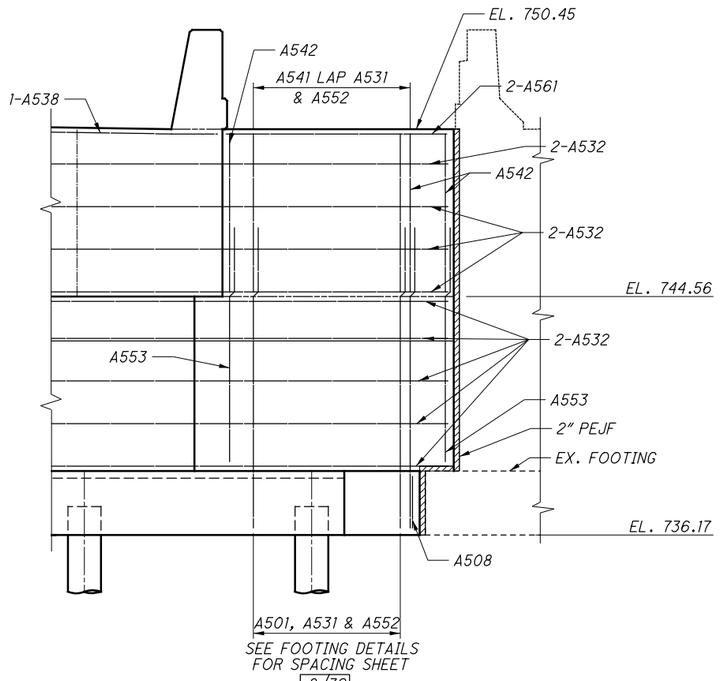
SECTION C-C



SECTION D-D



VIEW B-B
(REAR ABUTMENT)



VIEW F-F
(FORWARD ABUTMENT)

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(614) 823-4949

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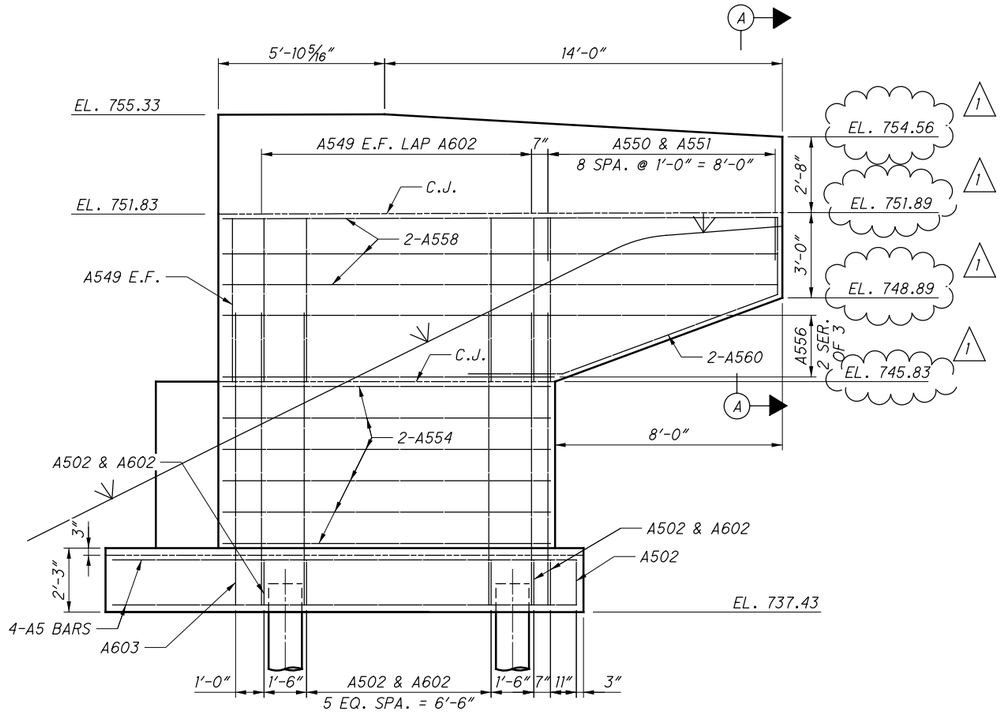
JLM		2513862	

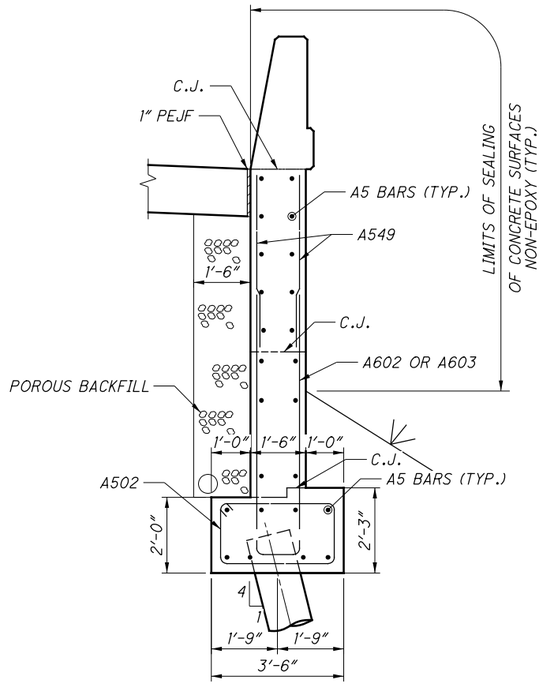
ABUTMENT DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

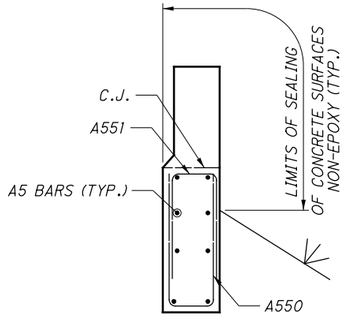
FRA-270-49.00
PID No. 83988



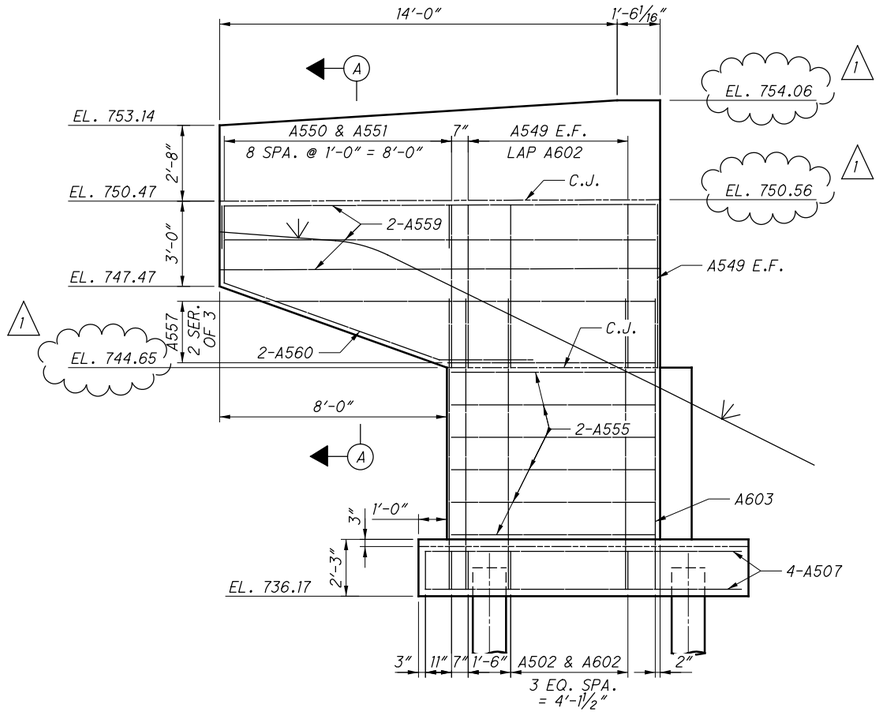
VIEW A-A



SECTION E-E



SECTION A-A



VIEW B-B

1 REVISED 4/24/2015

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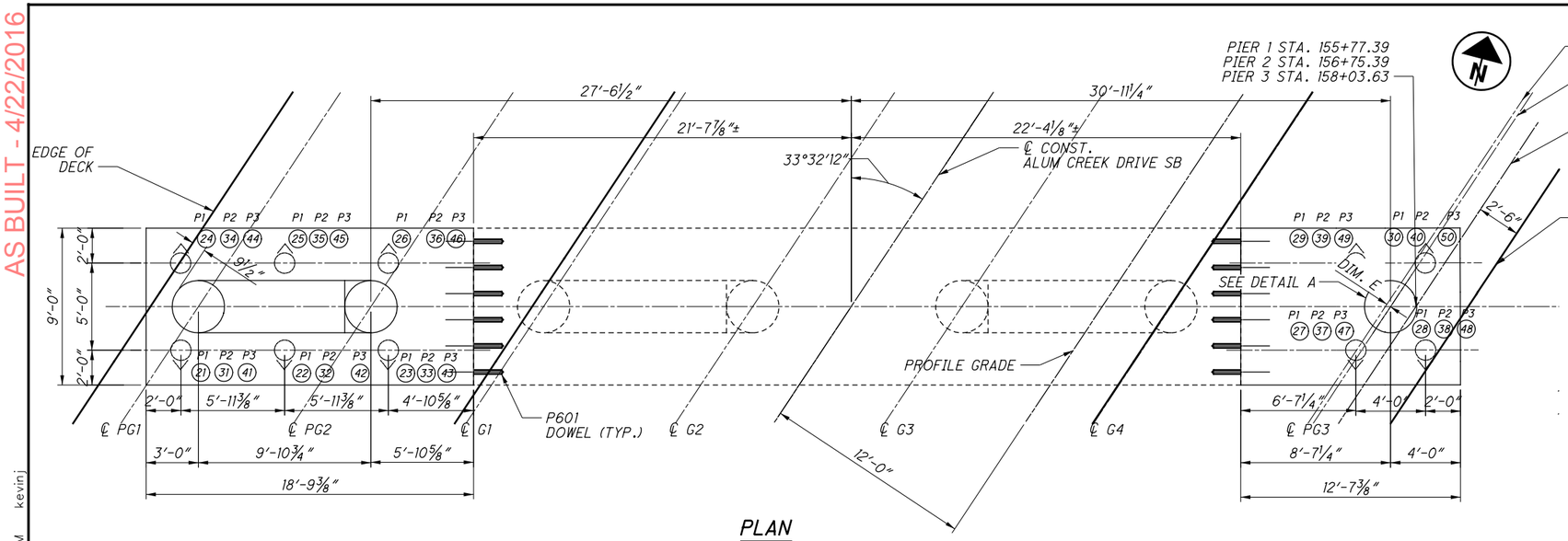
JLM	JGM	2513862	

ABUTMENT DETAILS

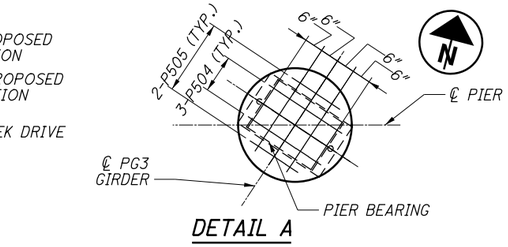
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

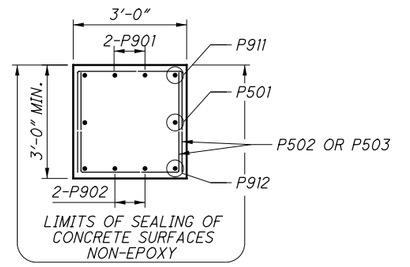


PLAN

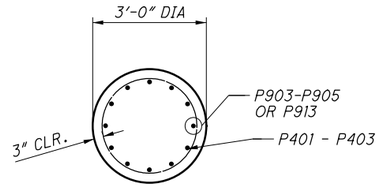
LOCATION	DIMENSION E
PIER 1	2 13/16"
PIER 2	3 3/16"
PIER 3	3 5/8"



DETAIL A

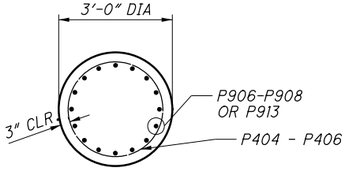


SECTION A-A



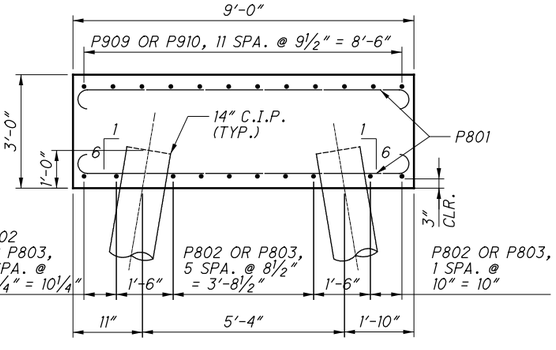
SECTION B-B

(PIER 1)

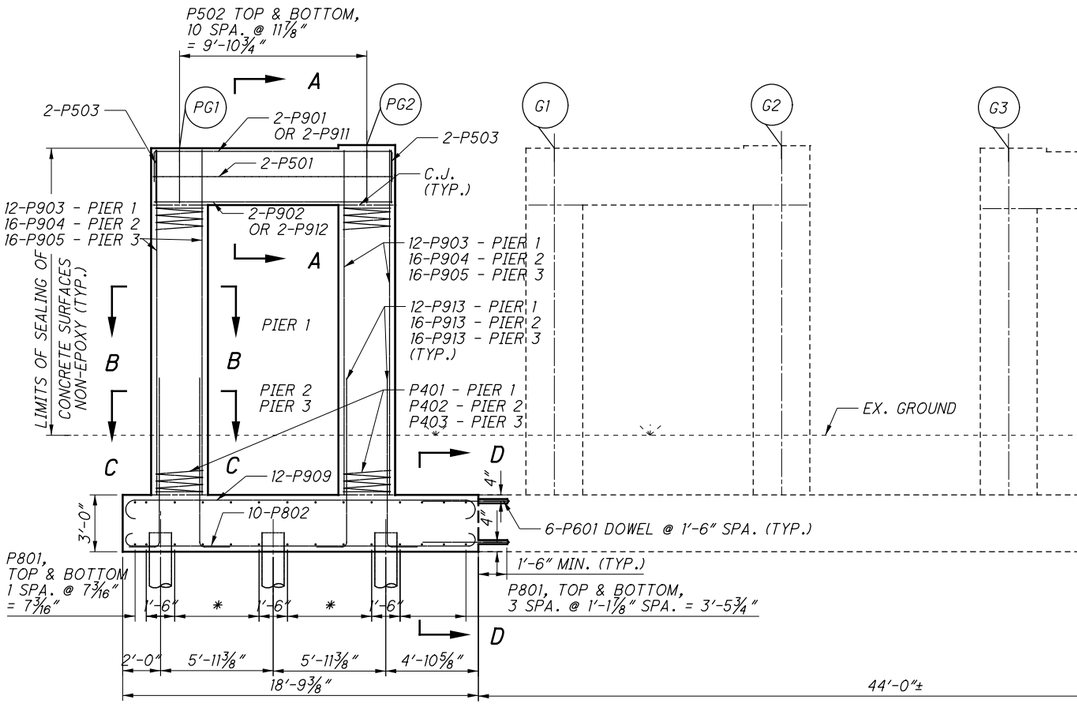


SECTION C-C

(PIER 2 PIER 3)



SECTION D-D



ELEVATION

* P801 TOP & BOTTOM, 3 SPA. @ 1'-5¾" = 4'-5⅜"

** P801 TOP & BOTTOM, 2 SPA. @ 1'-3" = 2'-6"

LAP NO. 9 BAR - 6'-2" MIN.

	PG1	PG2	G1	G2	G3	G4	PG3
PIER 1	745.67	745.77	744.29	744.45	744.38	744.25	745.60
PIER 2	745.19	745.31	744.60	744.73	744.70	744.55	745.12
PIER 3	744.68	744.80	743.31	743.46	743.43	743.24	744.66

LEGEND

14" DIA. CAST IN PLACE PILE BATTERED AT 6:1

PILE NUMBER

NOTE

1. ACCURATELY PLACE REINFORCING STEEL IN THE VICINITY OF THE BRIDGE SEAT TO AVOID INTERFERENCE WITH THE DRILING OF BEARING ANCHOR HOLES OR THE PRE-SETTING OF BEARING ANCHORS.

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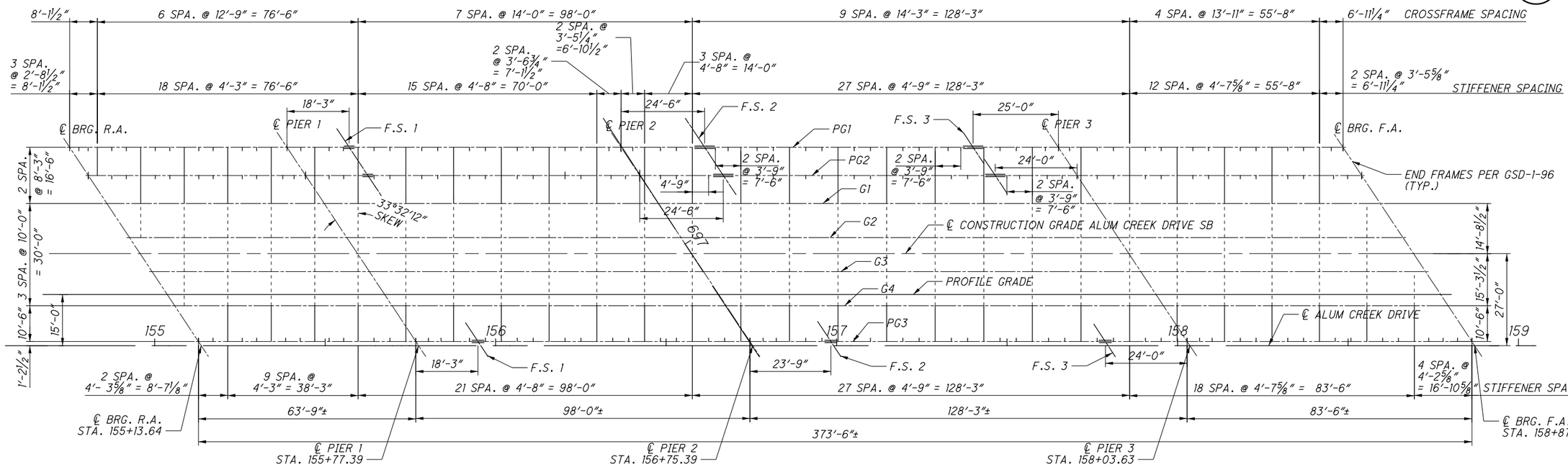
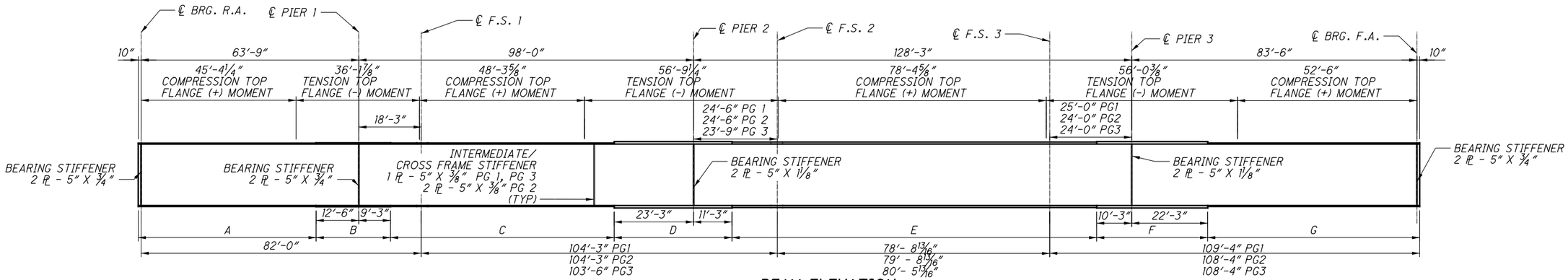
PIER DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988



FRAMING PLAN



BEAM ELEVATION

DIMENSION	LENGTH	WEB PLATE	PG1 & PG2 TOP & BOTTOM FLANGE PLATES	PG3 TOP & BOTTOM FLANGE PLATES
A	52'-1"	54" X ⅜"	12" X ¾"	15" X ¾"
B	21'-9"	54" X ⅜"	12" X 1⅛"	15" X 1⅛"
C	65'-6"	54" X ⅜"	12" X 0⅞"	15" X 0⅞"
D	34'-6"	54" X ⅜"	12" X 2⅛"	15" X 2"
E	106'-9"	54" X ⅜"	12" X 1¾"	15" X 1¾"
F	32'-6"	54" X ⅜"	12" X 2⅛"	15" X 2"
G	62'-1"	54" X ⅜"	12" X 0⅞"	15" X 0⅞"

NOTES:

1. INTERMEDIATE STIFFENERS SHALL BE PLACED AT APPROXIMATELY EQUAL SPACING BETWEEN INTERMEDIATE CROSSFRAMES AND BEARING STIFFENERS AS SHOWN IN THE FRAMING PLAN. IN NO CASE SHALL THE CLEAR SPACING BETWEEN STIFFENERS EXCEED 60 INCHES EXCEPT AS SHOWN ON THE FRAMING PLAN NEAR FIELD SPLICES.
2. STIFFENERS FOR INTERMEDIATE CROSS FRAMES SHALL BE PLACED IN LINE WITH EXISTING CROSSFRAMES ON EXISTING BEAMS. LOCATIONS OF EXISTING CROSSFRAME STIFFENERS SHALL BE FIELD VERIFIED PRIOR TO FABRICATION.
3. THE DIMENSIONS LOCATING THE BOLTED FIELD SPLICES MAY BE VARIED ± 18" MAX. TO AVOID INTERFERENCE OF INTERMEDIATE STIFFENERS OR CROSSFRAME ANGLES WITH THE WEB SPLICE PLATES.
4. WELD ATTACHMENT OF SUPPORTS FOR CONCRETE DECK FINISHING MACHINE TO AREAS OF THE FASCIA GIRDER FLANGES DESIGNATED "COMPRESSION". DO NOT WELD ATTACHMENTS TO AREAS DESIGNATED "TENSION". FILLET WELDS TO COMPRESSION FLANGES SHALL BE AT LEAST 1" FROM EDGE OF FLANGE, BE NO MORE THAN 2" LONG, AND BE AT LEAST ¼" FOR THICKNESSES UP TO ¾" OR 5/16" FOR GREATER THAN ¾" THICK.
5. PAINT FASCIA BEAMS SEE SHEET 3/32 AND 5/32 FOR NOTES AND LIMITS.
6. WELD ATTACHMENT OF SUPPORTS FOR CONCRETE DECK FINISHING MACHINE TO AREAS OF THE FASCIA STRINGER FLANGES DESIGNATED "COMPRESSION". DO NOT WELD ATTACHMENTS TO AREAS DESIGNATED "TENSION". FILLET WELDS TO COMPRESSION FLANGES SHALL BE AT LEAST 1" FROM EDGE OF FLANGE, BE NO MORE THAN 2" LONG, AND BE AT LEAST ¼" FOR THICKNESS UP TO ¾" OR 5/16" FOR GREATER THAN ¾" THICK.

AS BUILT - 4/22/2016

BU 4, 5, 6, 7 & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

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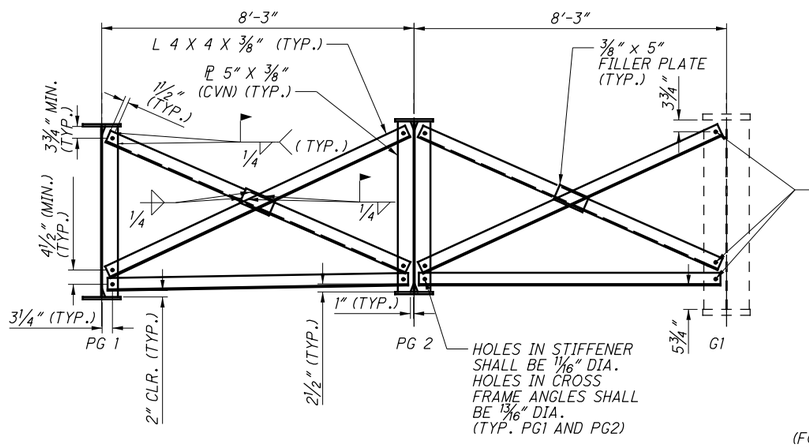
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

SUPERSTRUCTURE DETAILS

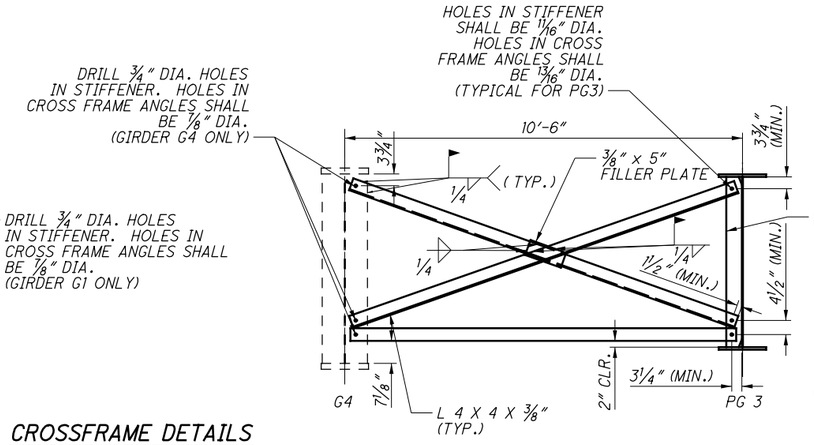
BRIDGE NO. FRA-270-4900
OVER IR 270

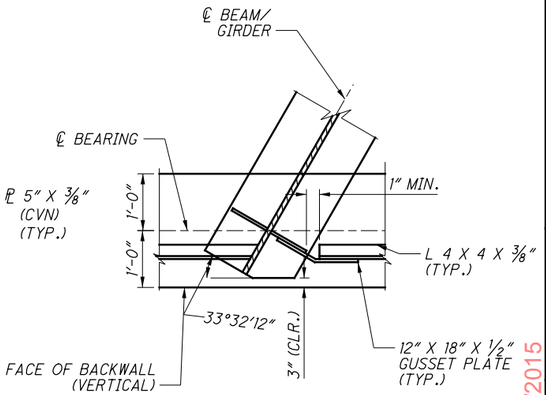
FRA-270-49.00
PID No. 83988



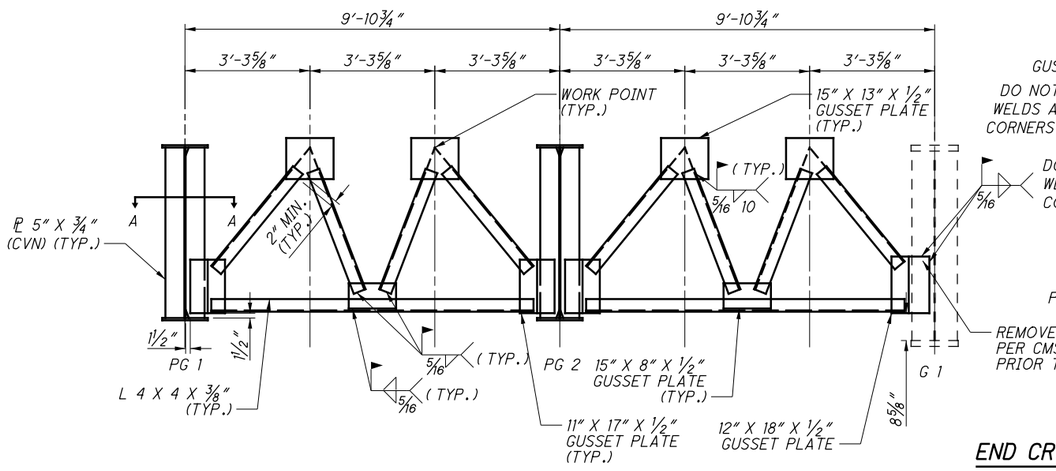
CROSSFRAME DETAILS

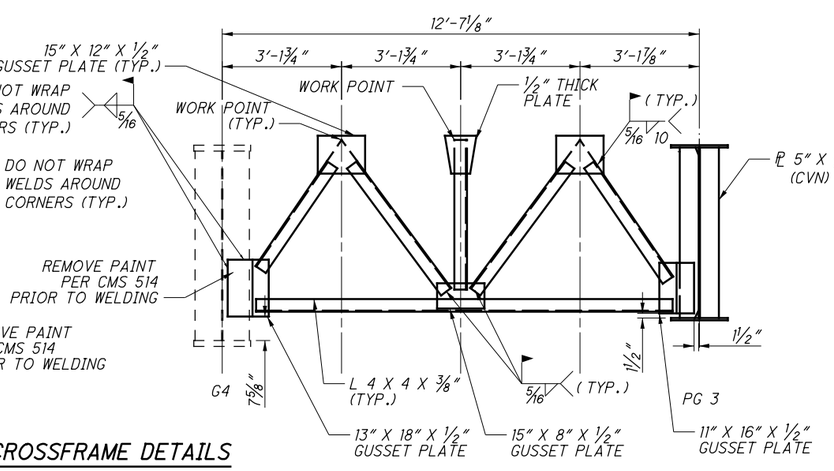
(FOR ADDITIONAL DETAILS, SEE STD. DWG. GSD-1-96, TYPE 3 CROSS FRAME)





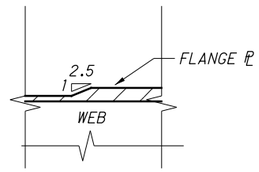
SECTION A-A



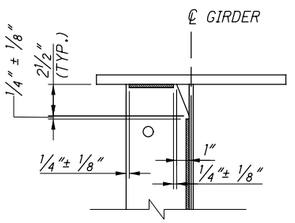


END CROSSFRAME DETAILS

(FOR ADDITIONAL DETAILS, SEE STD. DWG. GSD-1-96)

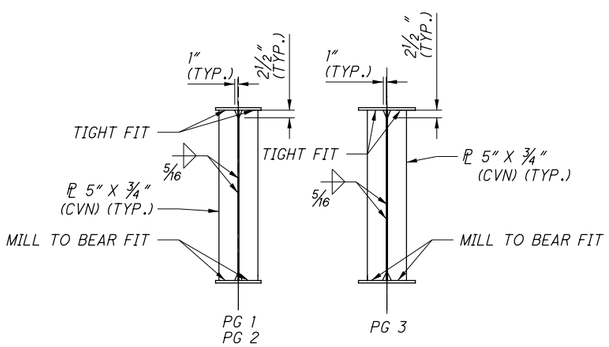


GIRDER FLANGE PLATE THICKNESS TRANSITION DIAGRAM

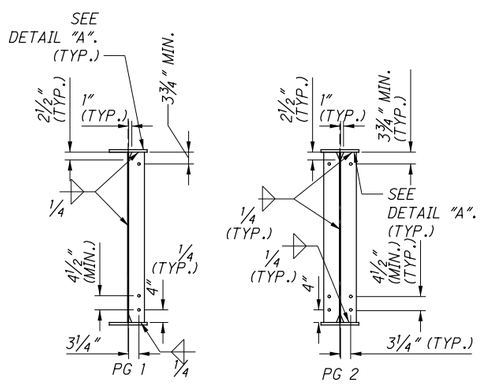


DETAIL A

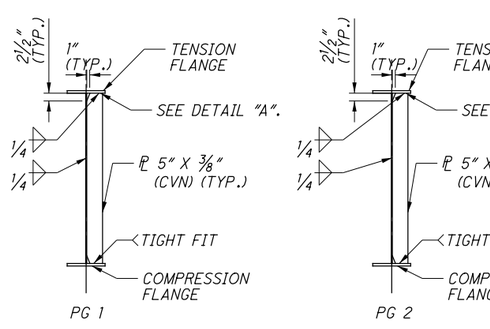
(ONE STIFFENER SHOWN TWO STIFFENERS SIMILAR)



BEARING STIFFENER DETAILS



INTERMEDIATE STIFFENER DETAIL AT CROSSFRAMES



INTERMEDIATE STIFFENER DETAIL

(INBETWEEN CROSSFRAMES)

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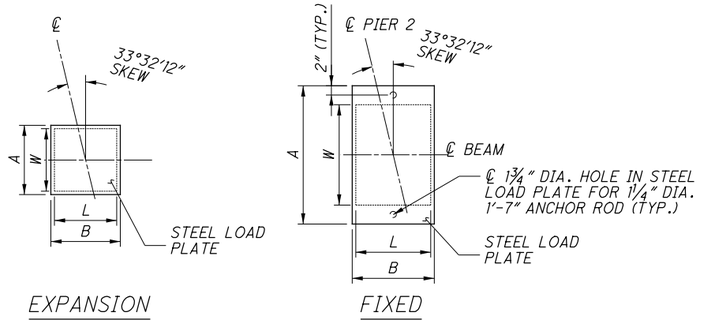
SUPERSTRUCTURE DETAILS
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

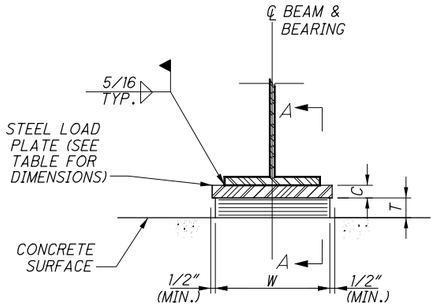
15 / 32

161
182

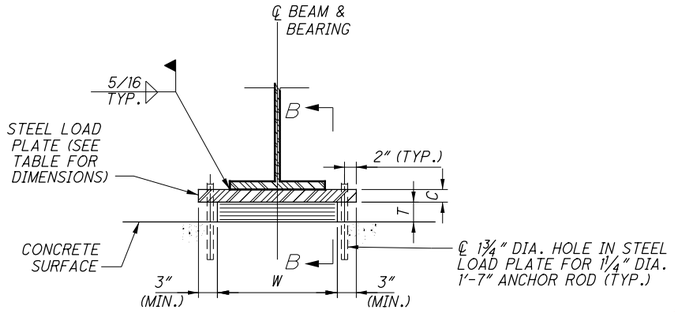
G:\projects\2014\W-14-039 FRA-270-49.00\83988\structures\FRA270_4900L\sheets\270_4900LSD002.dgn 5/23/2016 7:32:10 AM kevinj



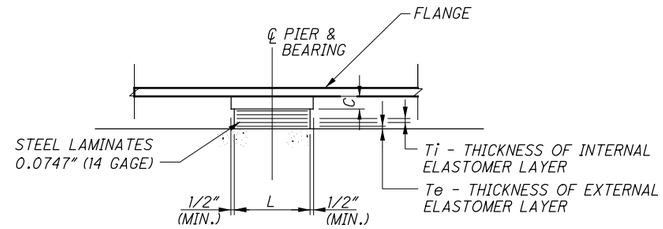
BEARING ORIENTATION PLAN



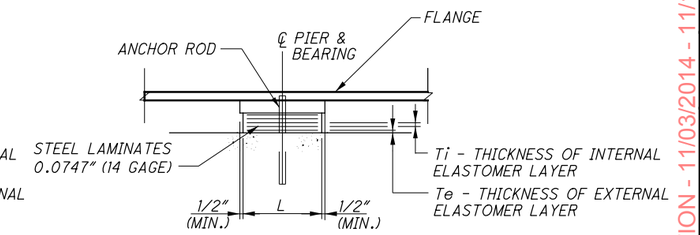
LAMINATED ELASTOMERIC BEARING
EXPANSION AT ABUTMENTS, PIER 1, AND PIER 3



LAMINATED ELASTOMERIC BEARING
FIXED AT PIER 2



SECTION A-A



SECTION B-B

NOTES

1. STEEL LOAD PLATE AND PEDESTAL SHALL MEET THE REQUIREMENTS OF ASTM-A709, GRADE 50W STEEL.
2. THE ELASTOMER SHALL HAVE A HARDNESS OF 50 DUROMETER. THE BEARINGS WERE DESIGNED UNDER DIVISION I, SECTION 14.6.6 (METHOD A) OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

TABLE OF ELASTOMERIC BEARING DATA

BEARING TYPE	GIRDER NUMBER	LOCATION	BEARING TYPE	NO. REQ.	L (INCHES)	W (INCHES)	T (INCHES)	Te (INCHES)	TI (INCHES)	NUMBER OF INTERNAL LAYERS	NUMBER OF STEEL LAMINATES	LOAD PLATE SIZE (INCHES)			MAX. DEAD LOAD (KIPS)	MAX. LIVE LOAD (KIPS)	DESIGN LOAD (KIPS)
												A	B	C			
1	PG1	REAR ABUTMENT	EXPANSION	1	12	18	3.32	0.48	0.6875	3	4	19	13	1.5	38.5	40.2	78.7
1	PG1	FORWARD ABUTMENT	EXPANSION	1	12	18	3.32	0.48	0.6875	3	4	19	13	1.5	44.9	41.8	86.7
1	PG2	REAR ABUTMENT	EXPANSION	1	12	18	3.32	0.48	0.6875	3	4	19	13	1.5	43.9	48.9	92.8
1	PG2	FORWARD ABUTMENT	EXPANSION	1	12	18	3.32	0.48	0.6875	3	4	19	13	1.5	51.2	50.7	101.9
1	PG3	REAR ABUTMENT	EXPANSION	1	12	18	3.32	0.48	0.6875	3	4	19	13	1.5	51.6	46.8	98.4
1	PG3	FORWARD ABUTMENT	EXPANSION	1	12	18	3.32	0.48	0.6875	3	4	19	13	1.5	60.8	48.7	109.5
2	PG1	PIER 1	EXPANSION	1	15	24	3.61	0.53	0.75	3	4	25	16	2	141.4	60.9	202.3
2	PG2	PIER 1	EXPANSION	1	15	24	3.61	0.53	0.75	3	4	25	16	2	161.2	67.1	228.3
2	PG3	PIER 1	EXPANSION	1	15	24	3.61	0.53	0.75	3	4	25	16	2	190.0	70.9	260.9
3	PG1	PIER 2	FIXED	1	18	23	3.61	0.53	0.75	3	4	29	19	2.5	213.2	75.1	288.3
3	PG1	PIER 3	EXPANSION	1	18	23	3.61	0.53	0.75	3	4	24	19	2.5	215.4	74.2	289.5
3	PG2	PIER 2	FIXED	1	18	23	3.61	0.53	0.75	3	4	29	19	2.5	241.9	82.8	324.7
3	PG2	PIER 3	EXPANSION	1	18	23	3.61	0.53	0.75	3	4	24	19	2.5	244.4	81.7	326.1
4	PG3	PIER 2	FIXED	1	18	25	3.61	0.53	0.75	3	4	31	19	2.5	285.2	87.5	372.7
4	PG3	PIER 3	EXPANSION	1	18	25	3.61	0.53	0.75	3	4	26	19	2.5	286.4	86.0	372.4

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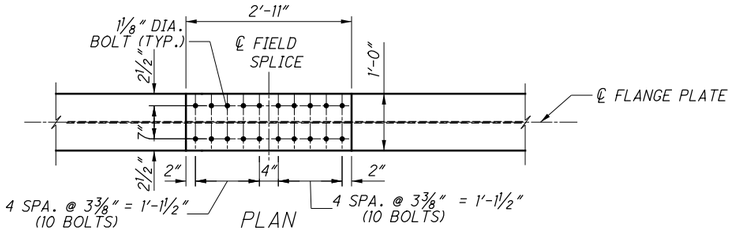
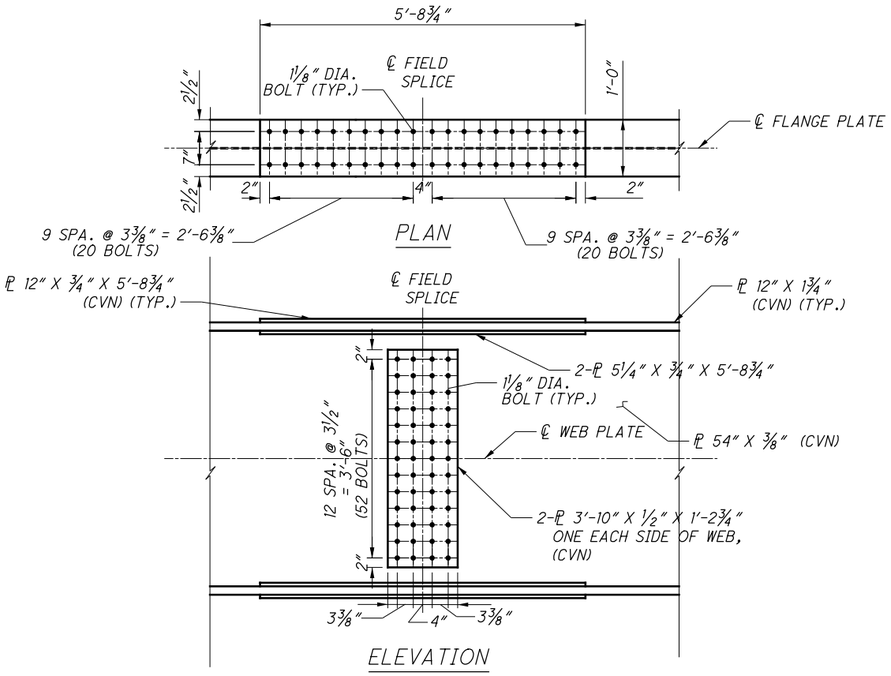
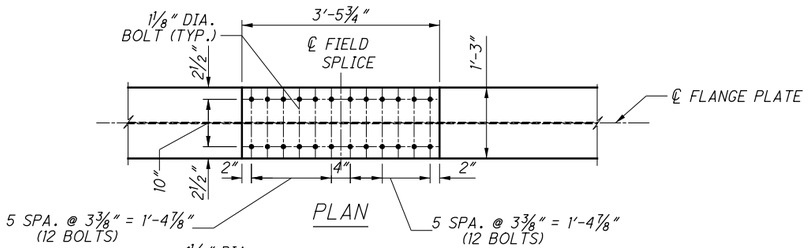
FRA-270-49.00
PID No. 83988



FIELD SPLICE 1
(PG1 AND PG2)



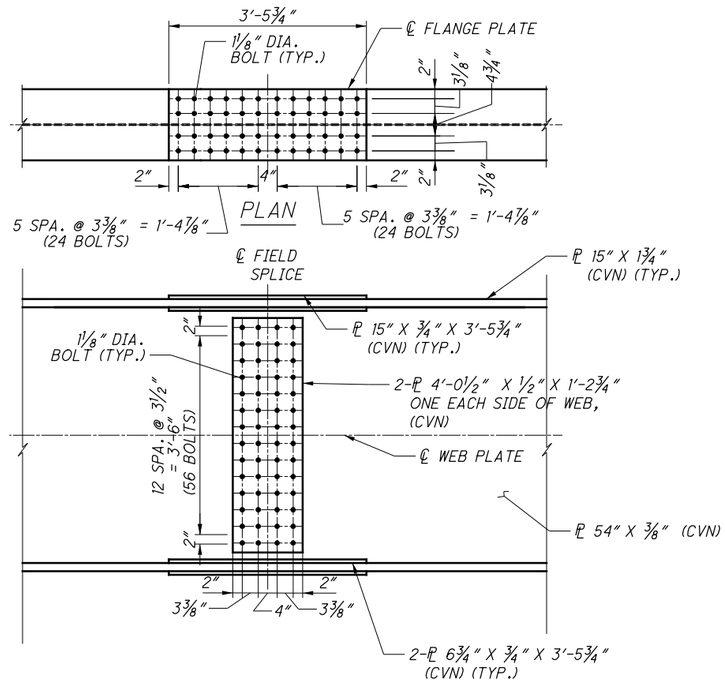
FIELD SPLICE 2 AND 3
(PG1 AND PG2)



FIELD SPLICE 1
(PG3)

NOTES:

1. ALL BOLTED SPLICE FASTENERS ARE 1⅛" DIAMETER, TYPE 3 HIGH STRENGTH BOLTS, ASTM - A325.
2. CHARPY-V-NOTCH TOUGHNESS: WHERE A SHAPE OR PLATE IS DESIGNATED (CVN) THE MATERIAL SHALL MEET SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.01.
3. PLACE BOLT HEAD ON EXPOSED SIDE OF FASCIA GIRDER.
4. FOR FIELD SPLICE LOCATIONS, SEE FRAMING PLAN SHEET 14/32



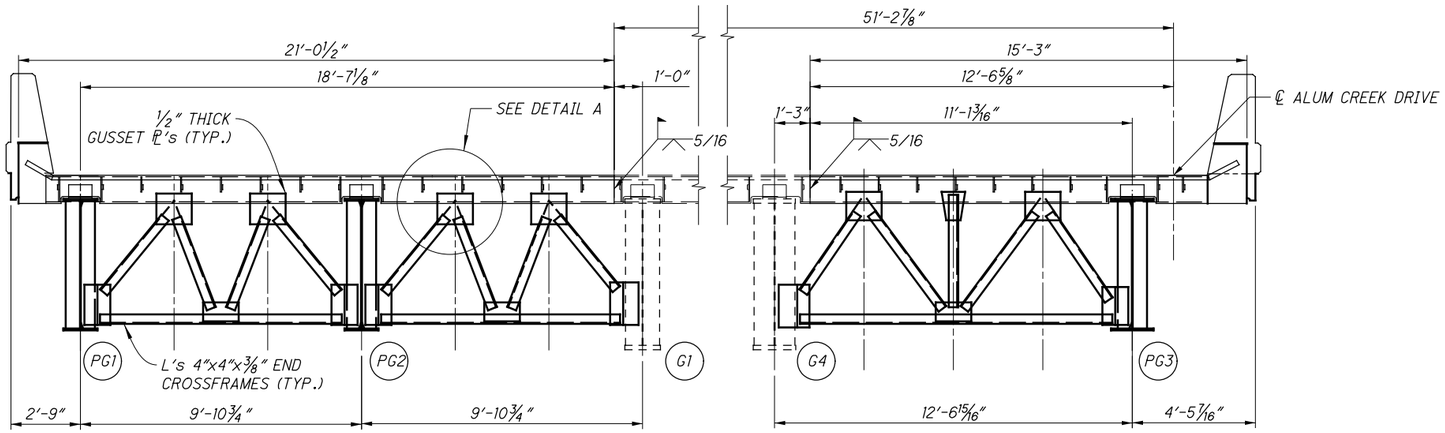
FIELD SPLICE 2 AND 3
(PG3)

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

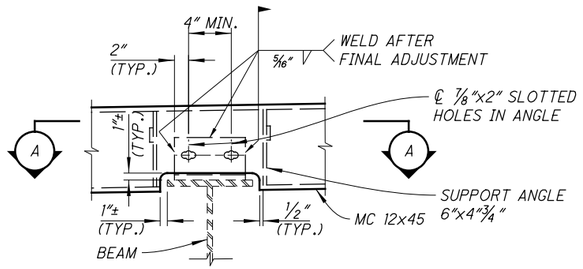
DESIGNED	DRAWN	REVIEWED	DATE
JLM	JGM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM		2513862	

SUPERSTRUCTURE DETAILS
BRIDGE NO. FRA-270-4900
OVER IR 270

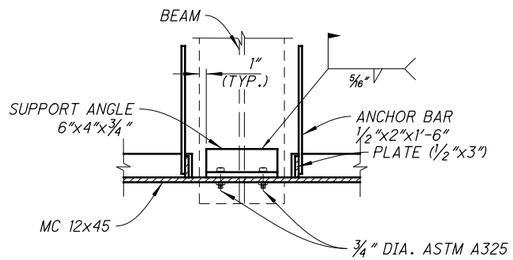
FRA-270-49.00
PID No. 83988



TRANSVERSE SECTION AT ABUTMENT (ALONG SKEW)

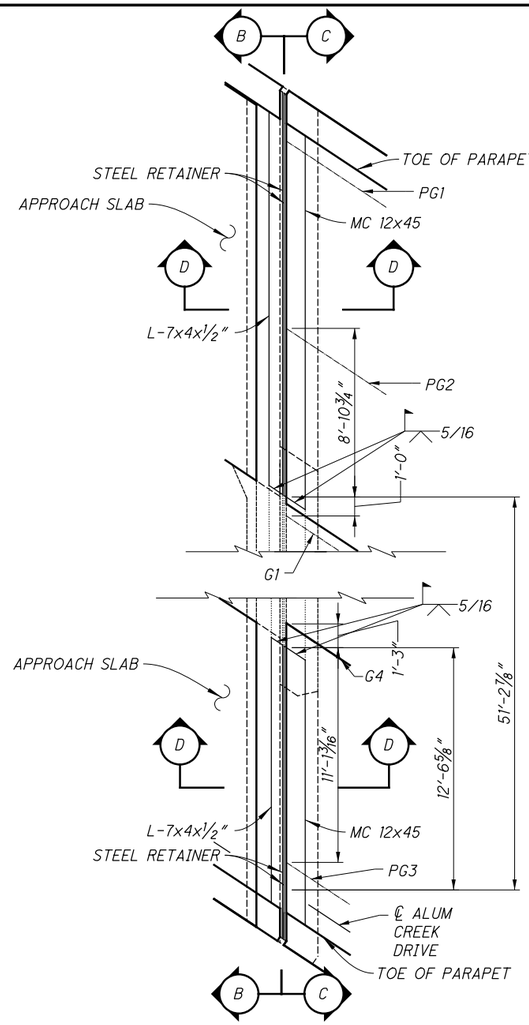


DETAIL A

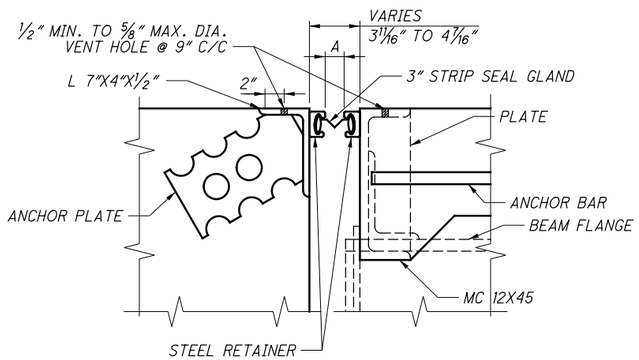


SECTION A-A

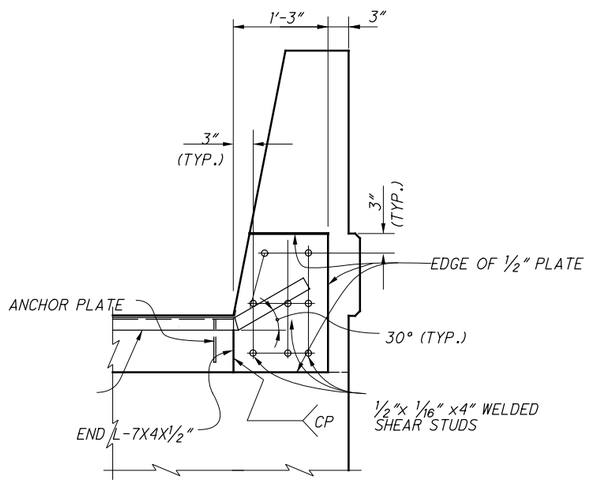
TEMPERATURE (°F)	REAR ABUTMENT DIMENSION "A" INCHES	FORWARD ABUTMENT DIMENSION "A" INCHES
30	2 1/2"	2 1/2"
40	2 5/16"	2 5/16"
50	2 3/16"	2 3/16"
60	2"	2"
70	1 13/16"	1 13/16"
80	1 5/8"	1 5/8"
90	1 7/16"	1 7/16"



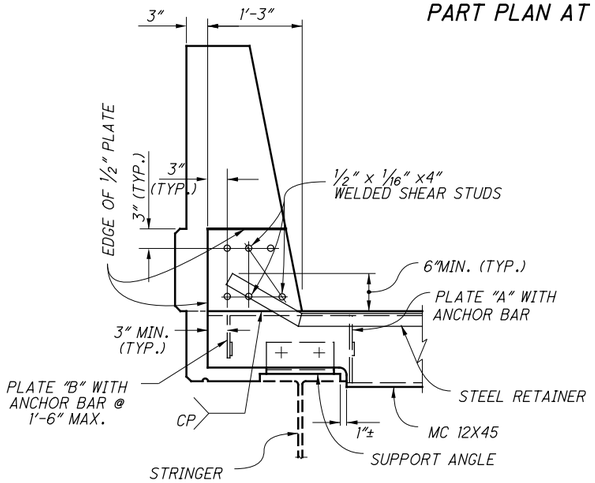
PART PLAN AT ABUTMENT



SECTION D-D



SECTION B-B



SECTION C-C

NOTES:

1. SEE EXJ-4-87 FOR ADDITONAL STRIP SEAL EXPANSION JOINT DETAILS.

RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED	DRAWN	REVIEWED	DATE
JLM	JLM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM		2513862	

EXPANSION JOINT DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

AS BUILT - 4/22/2016

FINAL DECK ELEVATIONS

LOCATION	SPAN 1								SPAN 2									
	BRG. R.A.		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. PIER 1		F.S. 1		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. PIER 2	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
TOE OF PARAPET	154+74.53	751.75	154+90.47	751.75	155+06.41	751.76	155+22.34	751.70	155+38.28	751.68	155+56.53	751.59	155+62.78	751.55	155+87.28	751.46	156+11.78	751.38	156+36.28	751.32
PG1	154+75.06	751.76	154+90.99	751.76	155+06.93	751.77	155+22.87	751.71	155+38.81	751.69	155+57.06	751.60	155+63.31	751.56	155+87.81	751.47	156+12.31	751.40	156+36.81	751.34
PG2	154+80.52	751.89	154+96.46	751.90	155+12.40	751.88	155+28.34	751.84	155+44.27	751.79	155+62.52	751.70	155+68.77	751.66	155+93.27	751.57	156+17.77	751.51	156+42.27	751.45
C.J.	154+85.63	752.01	155+01.57	752.02	155+17.51	751.99	155+33.45	751.98	155+49.38	751.88	155+67.63	751.79	155+73.88	751.75	155+98.38	751.67	156+22.88	751.61	156+47.38	751.56
C.J. & G4	155+05.88	751.97	155+21.81	751.94	155+37.75	751.91	155+53.69	751.87	155+69.63	751.82	155+87.88	751.75	155+94.13	751.73	156+18.63	751.63	156+43.13	751.53	156+67.63	751.48
PG3	155+12.84	751.79	155+28.77	751.76	155+44.71	751.71	155+60.65	751.70	155+76.59	751.62	155+94.84	751.56	156+01.09	751.54	156+25.59	751.44	156+50.09	751.34	156+74.59	751.26
C/L ALUM CREEK DR.	155+13.64	751.77	155+29.57	751.74	155+45.51	751.69	155+61.45	751.67	155+77.39	751.60	155+95.64	751.54	156+01.89	751.51	156+26.39	751.42	156+50.89	751.32	156+75.39	751.23
TOE OF PARAPET	155+14.30	751.75	155+30.24	751.73	155+46.18	751.67	155+62.11	751.65	155+78.05	751.58	155+96.30	751.52	156+02.55	751.49	156+27.05	751.40	156+51.55	751.31	156+76.05	751.21

LOCATION	SPAN 3								SPAN 4									
	F.S. 2		1/4 SPAN		1/2 SPAN		3/4 SPAN		F.S. 3		BRG. PIER 3		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. F.A.	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
TOE OF PARAPET	156+61.28	751.25	156+68.34	751.23	157+00.40	751.09	157+32.46	750.92	157+39.02	750.89	157+64.52	750.82	157+85.40	750.74	158+06.27	750.68	158+27.15	750.63	158+48.02	750.57
PG1	156+61.81	751.26	156+68.87	751.25	157+00.93	751.10	157+32.99	750.93	157+39.55	750.90	157+65.05	750.83	157+85.92	750.75	158+06.80	750.69	158+27.67	750.64	158+48.55	750.58
PG2	156+66.77	751.38	156+74.33	751.37	157+06.39	751.21	157+38.45	751.04	157+47.51	751.01	157+70.51	750.95	157+91.39	750.87	158+12.26	750.81	158+33.14	750.76	158+54.01	750.69
C.J.	156+71.88	751.50	156+79.44	751.47	157+11.50	751.30	157+43.56	751.14	157+52.62	751.11	157+75.62	751.06	157+96.50	750.97	158+17.37	750.92	158+38.25	750.87	158+59.12	750.80
C.J. & G4	156+92.13	751.37	156+99.69	751.31	157+31.75	751.20	157+63.81	751.10	157+72.87	751.02	157+95.87	750.99	158+16.74	750.91	158+37.62	750.85	158+58.49	750.78	158+79.37	750.69
PG3	156+97.59	751.16	157+06.65	751.14	157+38.71	751.00	157+70.77	750.87	157+78.83	750.83	158+02.83	750.79	158+23.70	750.72	158+44.58	750.66	158+65.45	750.59	158+86.33	750.51
C/L ALUM CREEK DR.	156+98.39	751.13	157+07.45	751.12	157+39.51	750.98	157+71.57	750.84	157+79.63	750.82	158+03.63	750.77	158+24.50	750.69	158+45.38	750.63	158+66.25	750.57	158+87.13	750.49
TOE OF PARAPET	156+99.05	751.11	157+08.11	751.10	157+40.17	750.96	157+72.23	750.82	157+80.29	750.80	158+04.29	750.75	158+25.17	750.68	158+46.04	750.61	158+66.92	750.55	158+87.79	750.47

FINAL DECK SURFACE ELEVATIONS

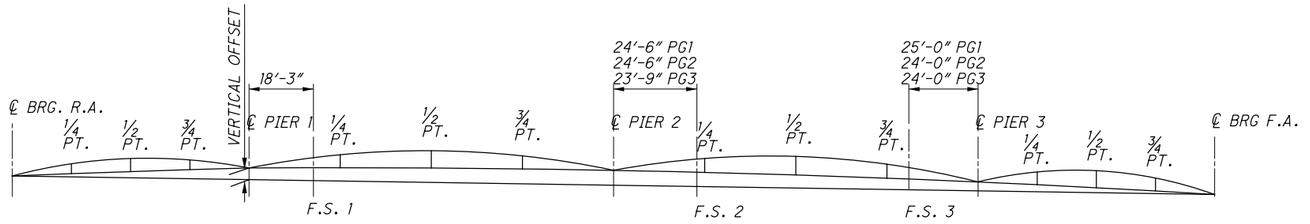
FINAL DECK SURFACE ELEVATIONS SHOWN REPRESENT THE DECK SURFACE LOCATION AFTER ALL ANTICIPATED DEAD LOAD DEFLECTIONS HAVE OCCURRED.

CAMBER TABLE

	SPAN 1				BRG. PIER 1	SPAN 2				BRG. PIER 2	SPAN 3					BRG. PIER 3	SPAN 4			
	BRG. R.A.	1/4 SPAN	1/2 SPAN	3/4 SPAN		F.S. 1	1/4 SPAN	1/2 SPAN	3/4 SPAN		F.S. 2	1/4 SPAN	1/2 SPAN	3/4 SPAN	F.S. 3		1/4 SPAN	1/2 SPAN	3/4 SPAN	BRG. F.A.
PG1																				
DEFLECTION DUE TO WEIGHT OF STEEL	0	1/16	1/16	0	0	0	1/16	0	- 1/16	0	3/16	5/16	7/16	5/16	3/16	0	- 1/16	0	1/16	0
DEFLECTION DUE TO REMAINING DEAD LOAD	0	1/8	3/16	1/16	0	1/8	3/16	1/4	1/16	0	7/16	5/8	1	5/8	7/16	0	0	1/4	1/4	0
ADJUSTMENT REQUIRED FOR VERTICAL CURVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REQUIRED SHOP CAMBER (IN)=	0	3/16	3/16	1/16	0	1/8	3/16	1/4	0	0	5/8	7/8	1 1/2	7/8	5/8	0	0	1/4	1/4	0
PG2																				
DEFLECTION DUE TO WEIGHT OF STEEL	0	1/16	1/16	0	0	0	1/16	0	- 1/16	0	3/16	5/16	7/16	5/16	3/16	0	- 1/16	0	1/16	0
DEFLECTION DUE TO REMAINING DEAD LOAD	0	3/16	3/16	1/16	0	1/8	1/4	5/16	1/16	0	9/16	3/4	1 1/4	3/4	1/2	0	1/16	1/4	5/16	0
ADJUSTMENT REQUIRED FOR VERTICAL CURVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REQUIRED SHOP CAMBER (IN)=	0	3/16	1/4	1/8	0	3/16	1/4	5/16	0	0	3/4	1 1/16	1 11/16	1	3/4	0	0	1/4	5/16	0
PG3																				
DEFLECTION DUE TO WEIGHT OF STEEL	0	1/16	1/16	0	0	0	0	0	- 1/16	0	3/16	5/16	7/16	5/16	3/16	0	- 1/16	0	0	0
DEFLECTION DUE TO REMAINING DEAD LOAD	0	3/16	3/16	1/16	0	1/8	3/16	5/16	1/16	0	1/2	3/4	1 3/16	3/4	1/2	0	1/16	1/4	5/16	0
ADJUSTMENT REQUIRED FOR VERTICAL CURVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REQUIRED SHOP CAMBER (IN)=	0	3/16	1/4	1/16	0	3/16	1/4	5/16	0	0	3/4	1	1 5/8	1	3/4	0	0	1/4	5/16	0

VERTICAL OFFSETS

	BRG. R.A.	BRG. PIER 1	BRG. PIER 2	BRG. PIER 3	BRG. F.A.
PG1	0	0	0	0	0
PG1	0	0	0	0	0
PG1	0	0	0	0	0



BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED JGM | DRAWN JGM | REVIEWED NCK | DATE 12/01/2015
CHECKED JLM | REVISED | STRUCTURE FILE NUMBER 2513862

SUPERSTRUCTURE DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

19 / 32

165
182

G:\projects\2014\W-14-039 FRA-270-49.00\83988\structures\FRA270_4900L\sheets\270_4900LSD014.dgn 5/23/2016 7:32:13 AM kevinj

AS BUILT - 4/22/2016

SCREED ELEVATIONS

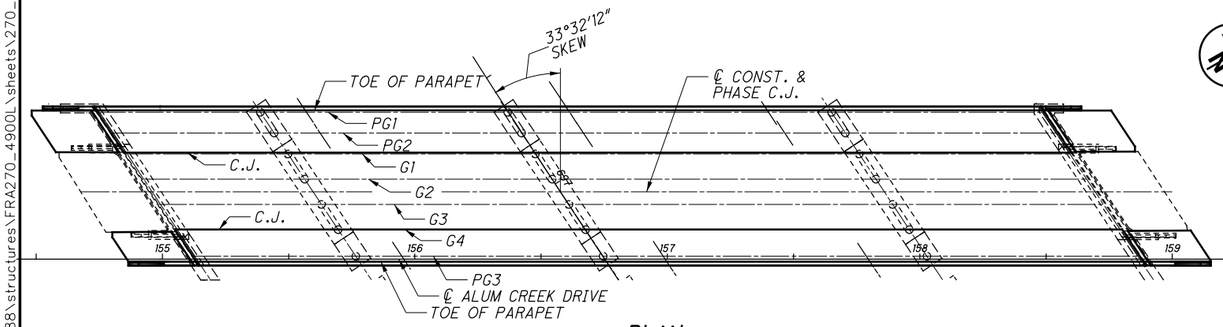
LOCATION	SPAN 1										SPAN 2									
	BRG. R.A.		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. PIER 1		F.S. 1		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. PIER 2	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
TOE OF PARAPET	154+74.53	751.75	154+90.47	751.76	155+06.41	751.77	155+22.34	751.71	155+38.28	751.68	155+56.53	751.60	155+62.78	751.57	155+87.28	751.48	156+11.78	751.39	156+36.28	751.32
C.J.	154+85.63	752.01	155+01.57	752.04	155+17.51	752.00	155+33.45	751.71	155+49.38	751.88	155+67.63	751.80	155+73.88	751.77	155+98.38	751.69	156+22.88	751.61	156+47.38	751.56
C.J.	155+05.88	751.97	155+21.81	751.95	155+37.75	751.93	155+53.69	751.88	155+69.63	751.82	155+87.88	751.76	155+94.13	751.75	156+18.63	751.65	156+43.13	751.54	156+67.63	751.48
TOE OF PARAPET	155+14.30	751.75	155+30.24	751.74	155+46.18	751.69	155+62.11	751.66	155+78.05	751.58	155+96.30	751.53	156+02.55	751.51	156+27.05	751.42	156+51.55	751.31	156+76.05	751.21

LOCATION	SPAN 3										SPAN 4									
	F.S. 2		1/4 SPAN		1/2 SPAN		3/4 SPAN		F.S. 3		BRG. PIER 3		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. F.A.	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
TOE OF PARAPET	156+61.28	751.29	156+68.34	751.29	157+00.40	751.18	157+32.46	750.97	157+39.02	750.92	157+64.52	750.82	157+85.40	750.74	158+06.27	750.70	158+27.15	750.65	158+48.02	750.57
C.J.	156+71.88	751.54	156+79.44	751.54	157+11.50	751.41	157+43.56	751.20	157+52.62	751.16	157+75.62	751.06	157+96.50	750.98	158+17.37	750.94	158+38.25	750.89	158+59.12	750.80
C.J.	156+92.13	751.41	156+99.69	751.37	157+31.75	751.30	157+63.81	751.16	157+72.87	751.06	157+95.87	750.99	158+16.74	750.92	158+37.62	750.88	158+58.49	750.80	158+79.37	750.69
TOE OF PARAPET	156+99.05	751.16	157+08.11	751.16	157+40.17	751.06	157+72.23	750.88	157+80.29	750.84	158+04.29	750.75	158+25.17	750.68	158+46.04	750.64	158+66.92	750.58	158+87.79	750.47

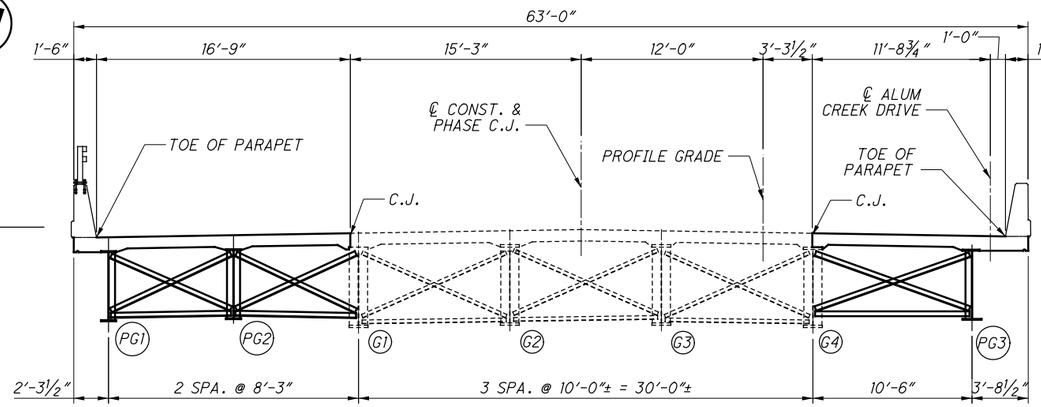
TOP OF HAUNCH ELEVATIONS

LOCATION	SPAN 1										SPAN 2									
	BRG. R.A.		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. PIER 1		F.S. 1		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. PIER 2	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
PG1	154+75.06	751.01	154+90.99	751.02	155+06.93	751.04	155+22.87	750.97	155+38.81	750.94	155+57.06	750.86	155+63.31	750.82	155+87.81	750.74	156+12.31	750.65	156+36.81	750.59
PG2	154+80.52	751.14	154+96.46	751.16	155+12.40	751.15	155+28.34	751.10	155+44.27	751.04	155+62.52	750.96	155+68.77	750.92	155+93.27	750.85	156+17.77	750.76	156+42.27	750.70
PG3	155+12.84	751.04	155+28.77	751.03	155+44.71	750.98	155+60.65	750.95	155+76.59	750.87	155+94.84	750.82	156+01.09	750.80	156+25.59	750.71	156+50.09	750.60	156+74.59	750.51

LOCATION	SPAN 3										SPAN 4									
	F.S. 2		1/4 SPAN		1/2 SPAN		3/4 SPAN		F.S. 3		BRG. PIER 3		1/4 SPAN		1/2 SPAN		3/4 SPAN		BRG. F.A.	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
PG1	156+61.81	750.55	156+68.87	750.55	157+00.93	750.44	157+32.99	750.23	157+39.55	750.19	157+65.05	750.08	157+85.92	750.00	158+06.80	749.96	158+27.67	749.91	158+48.55	749.83
PG2	156+66.77	750.68	156+74.33	750.68	157+06.39	750.56	157+38.45	750.35	157+47.51	750.30	157+70.51	750.20	157+91.39	750.12	158+12.26	750.08	158+33.14	750.03	158+54.01	749.94
PG3	156+97.59	750.45	157+06.65	750.45	157+38.71	750.35	157+70.77	750.18	157+78.83	750.13	158+02.83	750.04	158+23.70	749.97	158+44.58	749.93	158+65.45	749.87	158+86.33	749.76



PLAN



TRANSVERSE SECTION

SCREED ELEVATION

SCREED ELEVATIONS SHOWN REPRESENT THE THEORETICAL DECK SURFACE LOCATION PRIOR TO DEFLECTIONS CAUSED BY DECK PLACEMENT AND OTHER ANTICIPATED DEAD LOADS.

TOP OF HAUNCH ELEVATIONS

TOP OF HAUNCH ELEVATIONS SHOWN REPRESENT THE THEORETICAL LOCATION OF THE BOTTOM OF THE DECK ABOVE THE BEAM/GIRDER HAUNCH PRIOR TO DEFLECTIONS CAUSED BY DECK PLACEMENT AND OTHER ANTICIPATED DEAD LOADS.

RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

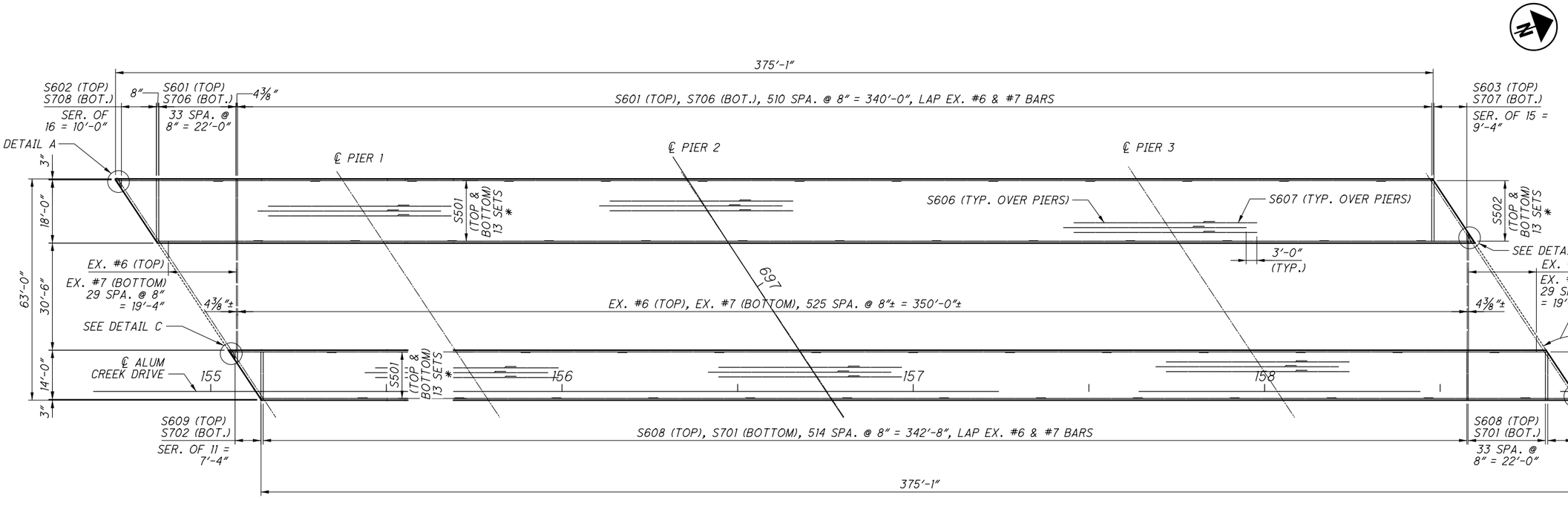
DESIGNED JLM | DRAWN JGM | CHECKED JGM | REVIEWED NCK | DATE 12/01/2015 | REVISED | STRUCTURE FILE NUMBER 2513862

BU 4, 5, 6, 7, & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

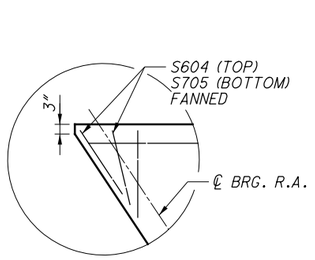
SUPERSTRUCTURE DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

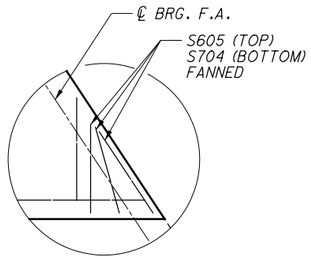
FRA-270-49.00
PID No. 83988



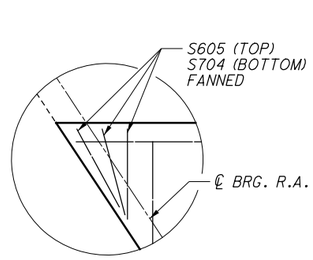
DECK PLAN



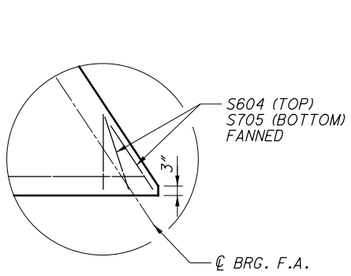
DETAIL A



DETAIL B



DETAIL C



DETAIL D

LEGEND:

* - SEE SHEET 22/32 FOR SPACING

NOTES:

LAP NO. 5 BAR - 2'-5" MIN.

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
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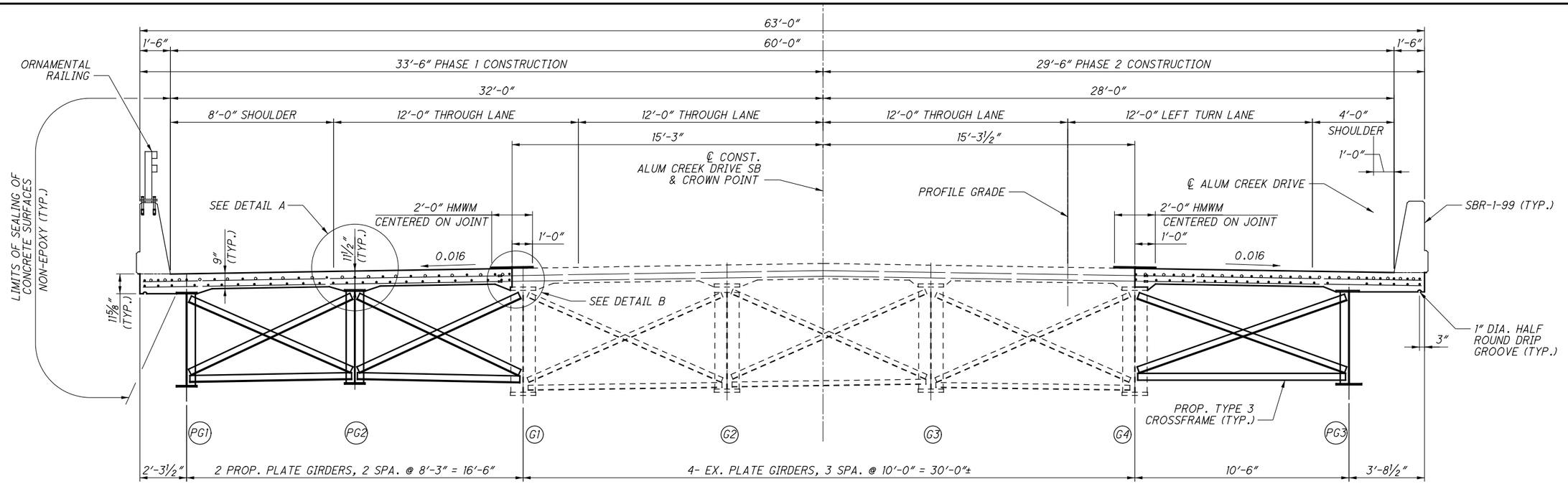
(614) 823-4949

DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

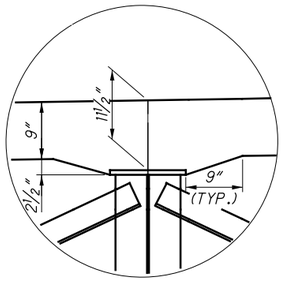
DECK SLAB DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

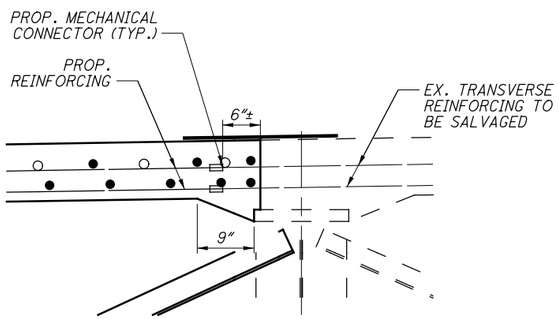
FRA-270-49.00
PID No. 83988



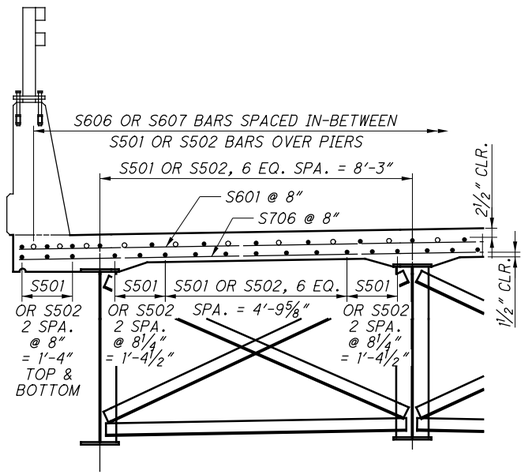
TRANSVERSE SECTION



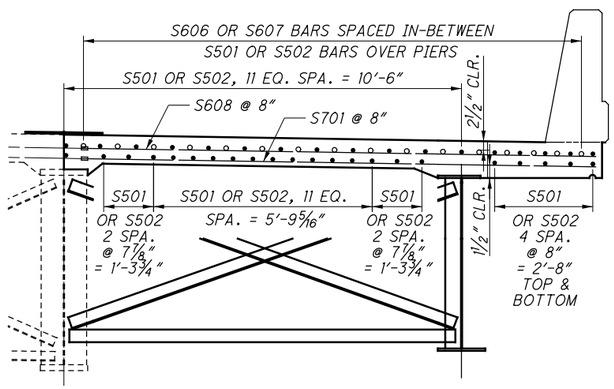
DETAIL A



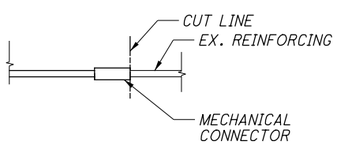
DETAIL B



TYPICAL 8'-3" BAY REINFORCING



10'-6" BAY REINFORCING



MECHANICAL CONNECTOR DETAIL

NOTES:

LAP NO. 5 BAR 2'-5" MIN.
LAP NO. 6 BAR 2'-11" MIN.
LAP NO. 7 BAR 3'-8" MIN.

AS BUILT - 4/22/2016

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
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DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

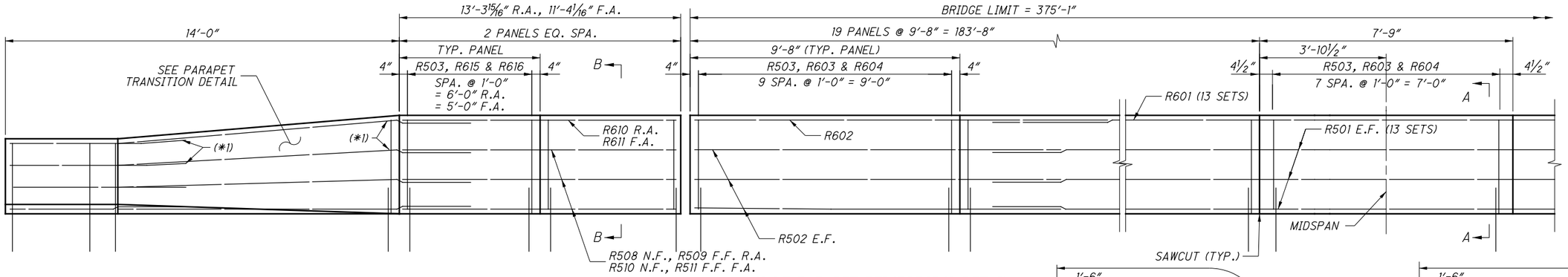
TRANSVERSE SECTION
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

22 / 32

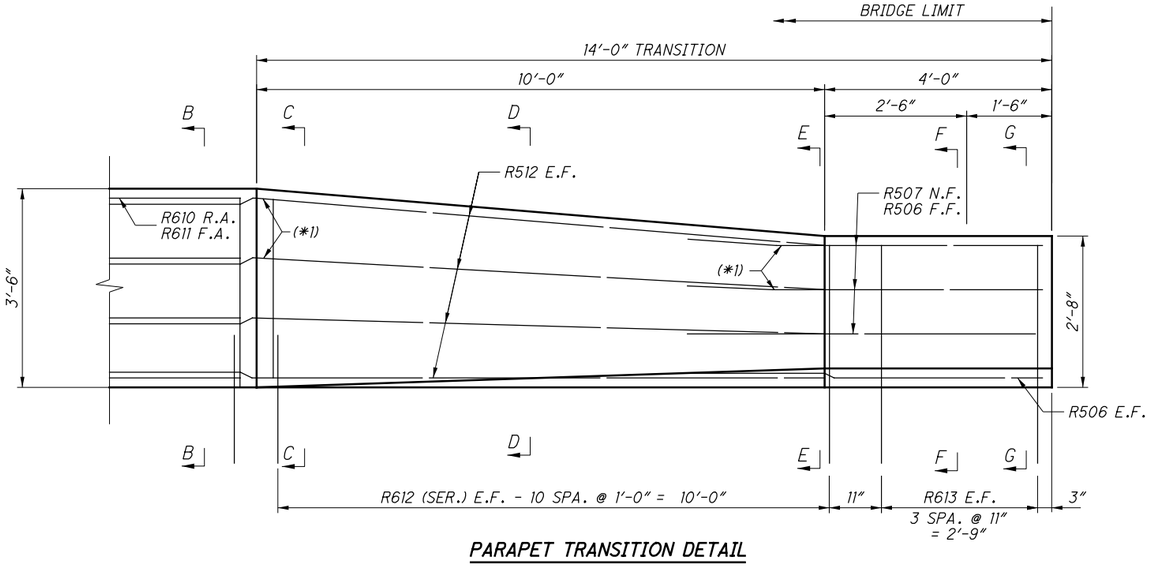
168
182

G:\projects\2014\W-14-039 FRA-270-49.00\83988\structures\FRA270_4900L\sheets\270_4900LTS001.dgn 5/23/2016 7:32:16 AM kevinj

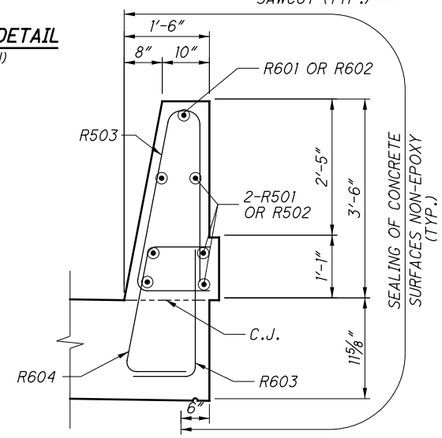


HALF PARAPET REINFORCING DETAIL

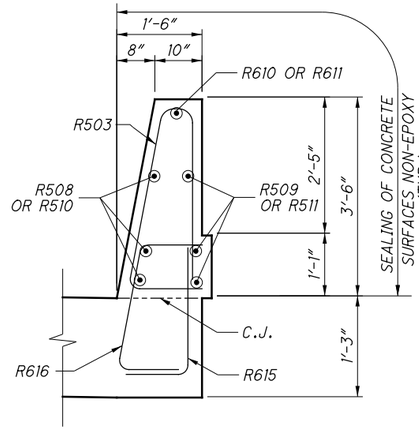
(SYMMETRICAL ABOUT MIDSPAN)



PARAPET TRANSITION DETAIL



SECTION A-A



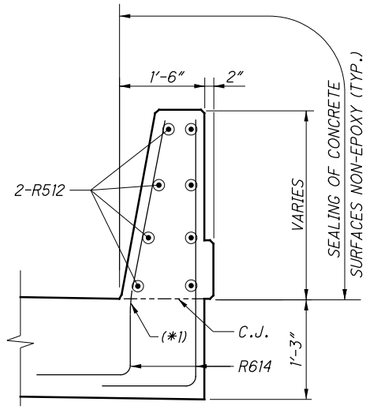
SECTION B-B

LEGEND:

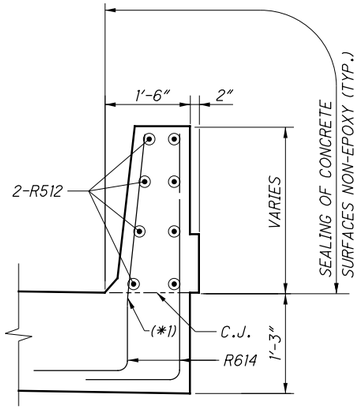
(*1) FIELD BEND AS NECESSARY

NOTES:

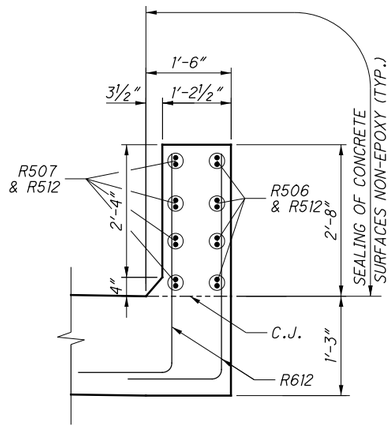
1. FOR NOTES AND ADDITIONAL DETAILS OF THE CONCRETE PARAPET, REFERENCE STANDARD DRAWING SBR-1-99.
2. MINIMUM LAP LENGTHS:
   #5 BARS 2′-5″
   #6 BARS 2′-11″
   TOP #6 BARS 4′-1″



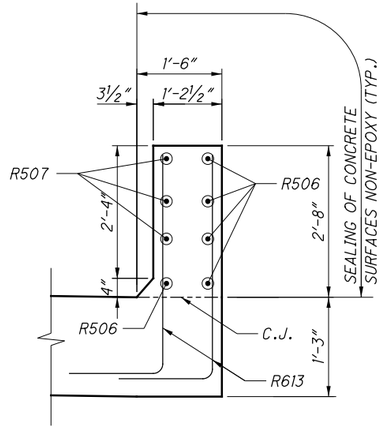
SECTION C-C



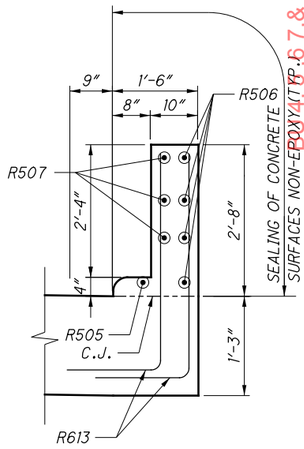
SECTION D-D



SECTION E-E



SECTION F-F



SECTION G-G

RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

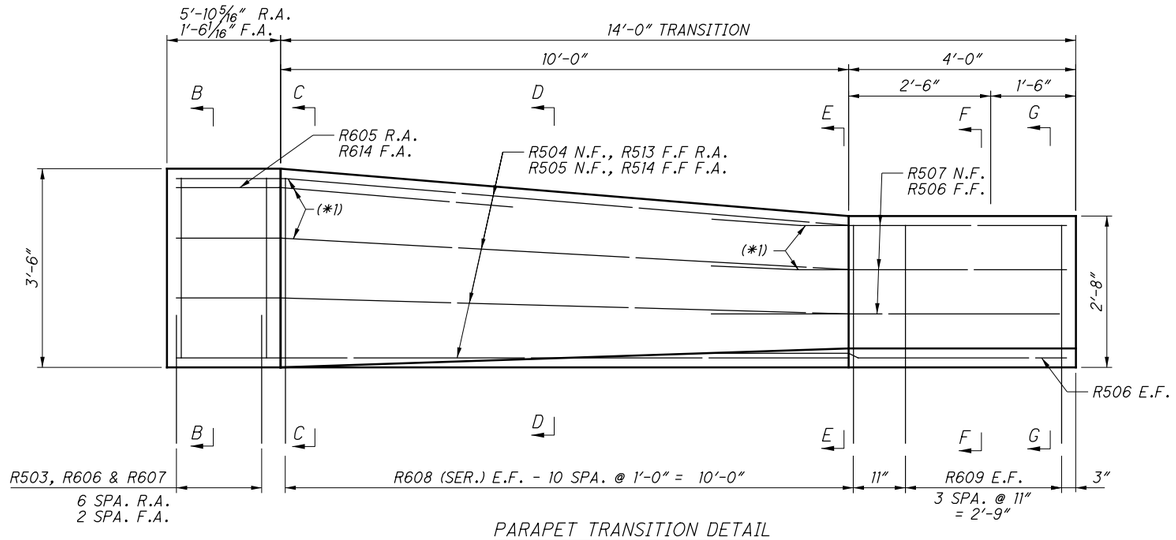
RIGHT PARAPET & TRANSITION DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

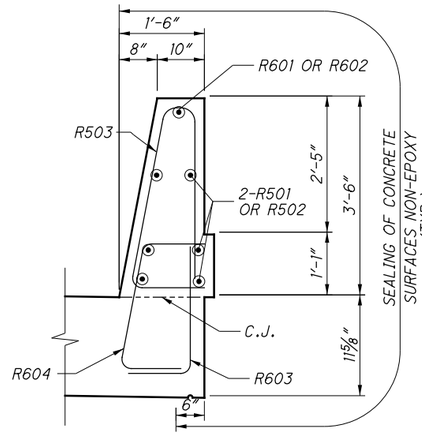
FRA-270-49.00
PID No. 83988

23 / 32

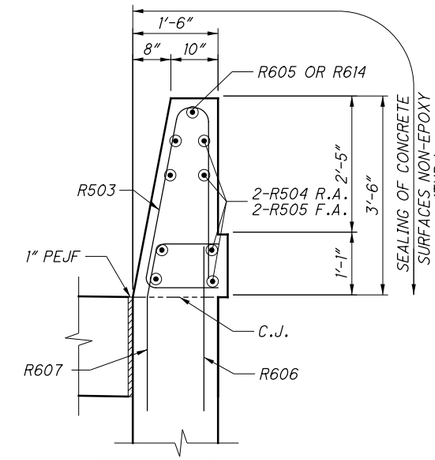
169
182



PARAPET TRANSITION DETAIL



SECTION A-A



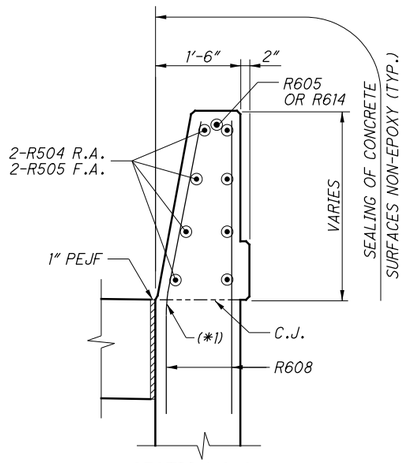
SECTION B-B

LEGEND:

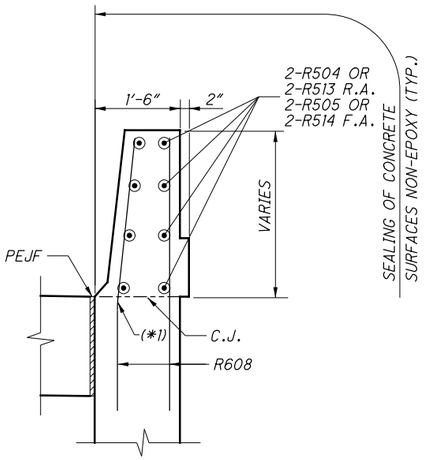
(*1) FIELD BEND AS NECESSARY

NOTES:

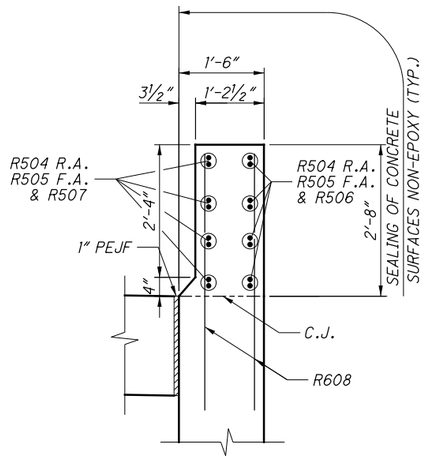
1. FOR NOTES AND ADDITIONAL DETAILS OF THE CONCRETE PARAPET, REFERENCE STANDARD DRAWING SBR-1-99.
2. MINIMUM LAP LENGTHS:
   #5 BARS 2′-5″
   #6 BARS 2′-11″
3. PARAPET DIMENSIONS ARE MEASURED ALONG THE INSIDE FACE OF PARAPET.



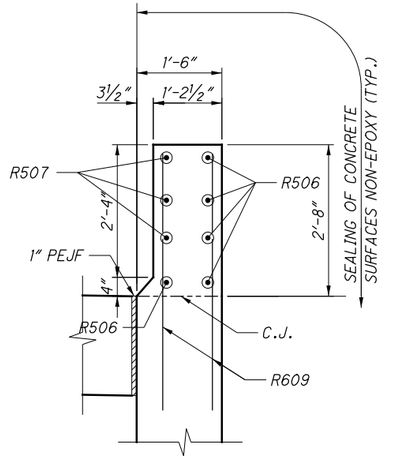
SECTION C-C



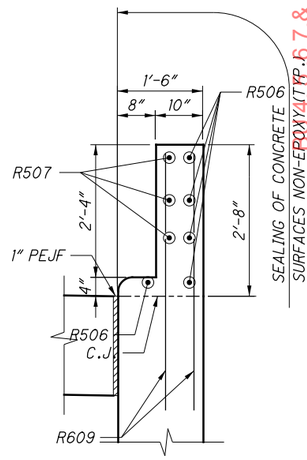
SECTION D-D



SECTION E-E



SECTION F-F



SECTION G-G

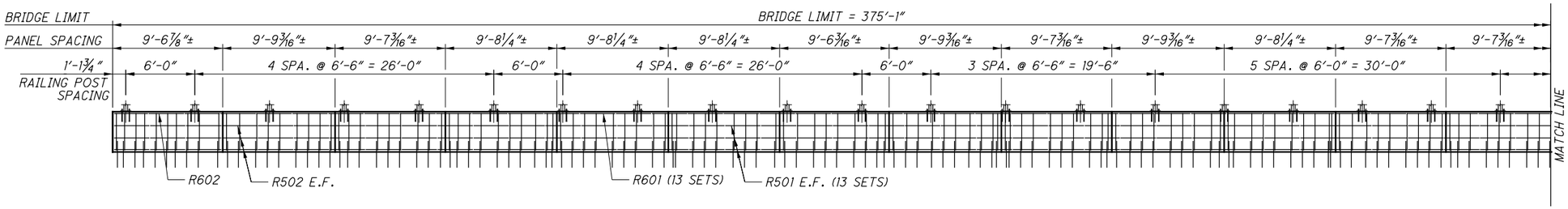
RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

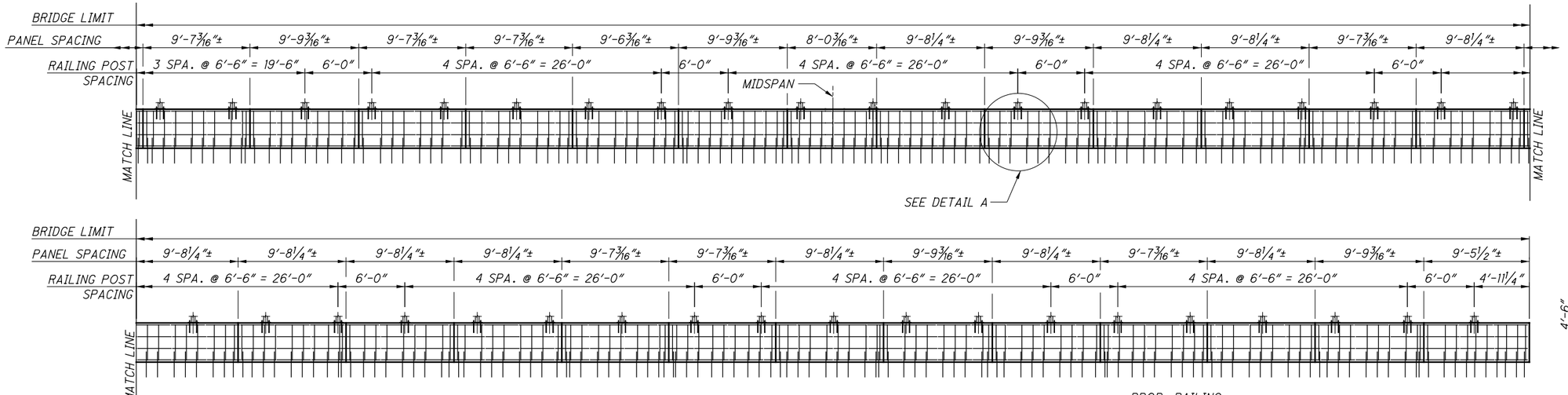
DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

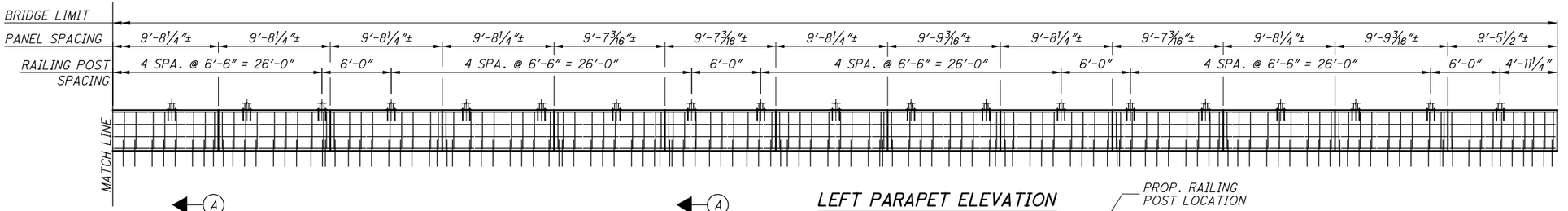
LEFT PARAPET & TRANSITION DETAILS

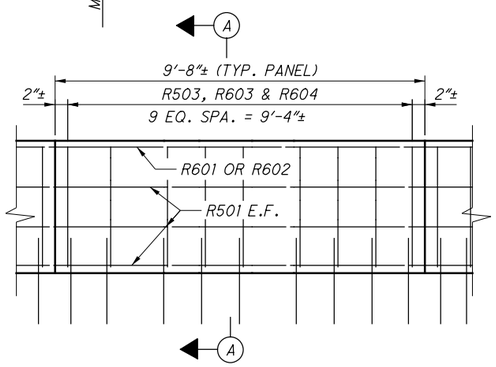
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

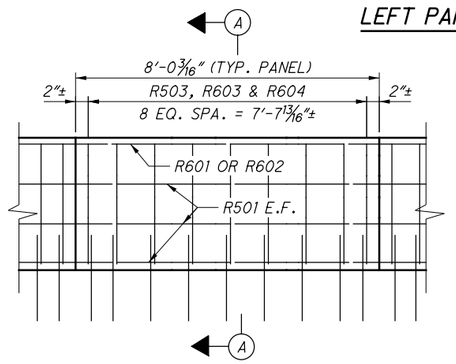






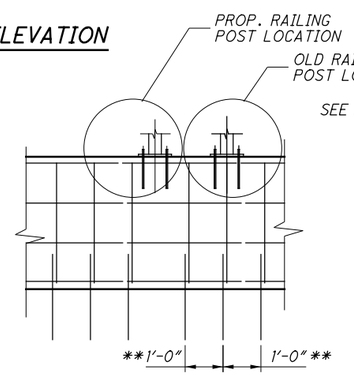


9'-8"± TYPICAL PANEL

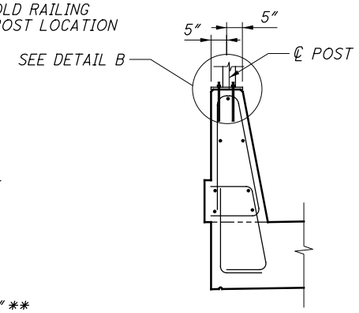


8'-0 3/16"± PANEL

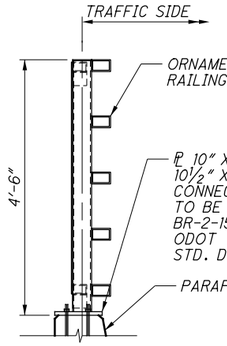
LEFT PARAPET ELEVATION



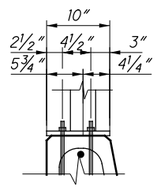
DETAIL A



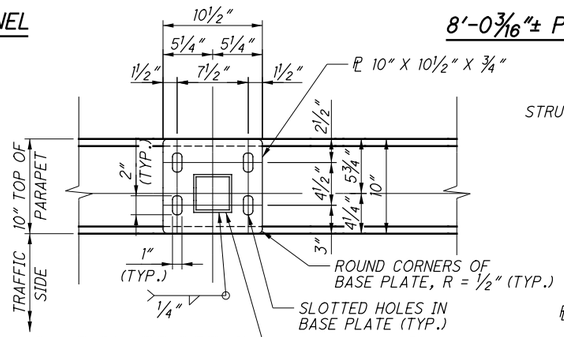
SECTION A-A



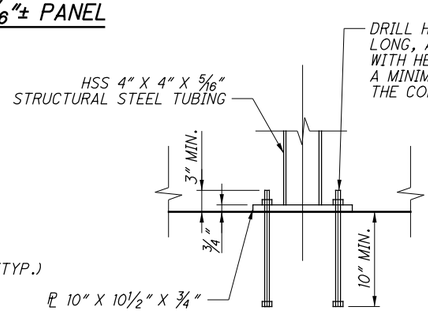
ORNAMENTAL RAILING



DETAIL B



BASE PLATE DETAIL



SECTION B-B

LEGEND:

** - ADDITIONAL R503, R603 & R604 BARS CENTERED AT EACH OLD RAILING POST LOCATION. STAGGERED WITH STANDARD PARAPET REINFORCEMENT. (RAILING POST LOCATIONS HAVE BEEN MODIFIED SINCE CONSTRUCTION. LOCATIONS OF REBARS AT OLD POST LOCATIONS ARE SHOWN IN ELEVATION VIEW.)

NOTES:

1. SEE SHEET 26/32 FOR ADDITIONAL RAILING NOTES.
2. DIMENSIONS ARE MEASURED ALONG BACK FACE OF PARAPET.
3. FASTENERS: THE ⅞ INCH DIA. HIGH STRENGTH BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH C&MS 711.09 (ASTM A 325) GALVANIZED.

   USE POWERS PE1000+ EPOXY ADHESIVE ANCHOR SYSTEM (ICCES REPORT ESR-2583) ANCHOR ADHESIVE EVALUATED ACCORDING TO ICCES REPORT AC308, "ACCEPTANCE CRITERIA FOR POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE ELEMENTS", FOR CRACKED AND UNCRACKED CONCRETE APPLICATIONS.

   INSTALL ADHESIVE ANCHORS ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS PUBLISHED IN SECTION 4.3 OF THE ICCES REPORTS LISTED ABOVE. THE MINIMUM EMBEDMENT DEPTH (H_{EV}) FOR ANCHORS SHALL BE 10".
4. BASE PLATES SHALL CLEAR PARAPET DEFLECTION CONTROL JOINTS BY 2" MINIMUM. IF REQUIRED, CONTRACTOR MAY SAW CUT ADDITIONAL DEFLECTION CONTROL JOINTS IF THERE IS A POST/JOINT CONFLICT.
5. AVOID INTERFERENCE WITH EXISTING AND PROPOSED REBAR WHEN INSTALLING PROPOSED THREADED ANCHORS.

RESOURCE INTERNATIONAL INC.
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CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

LEFT PARAPET & RAILING

BRIDGE NO. FRA-270-4900
OVER IR 270

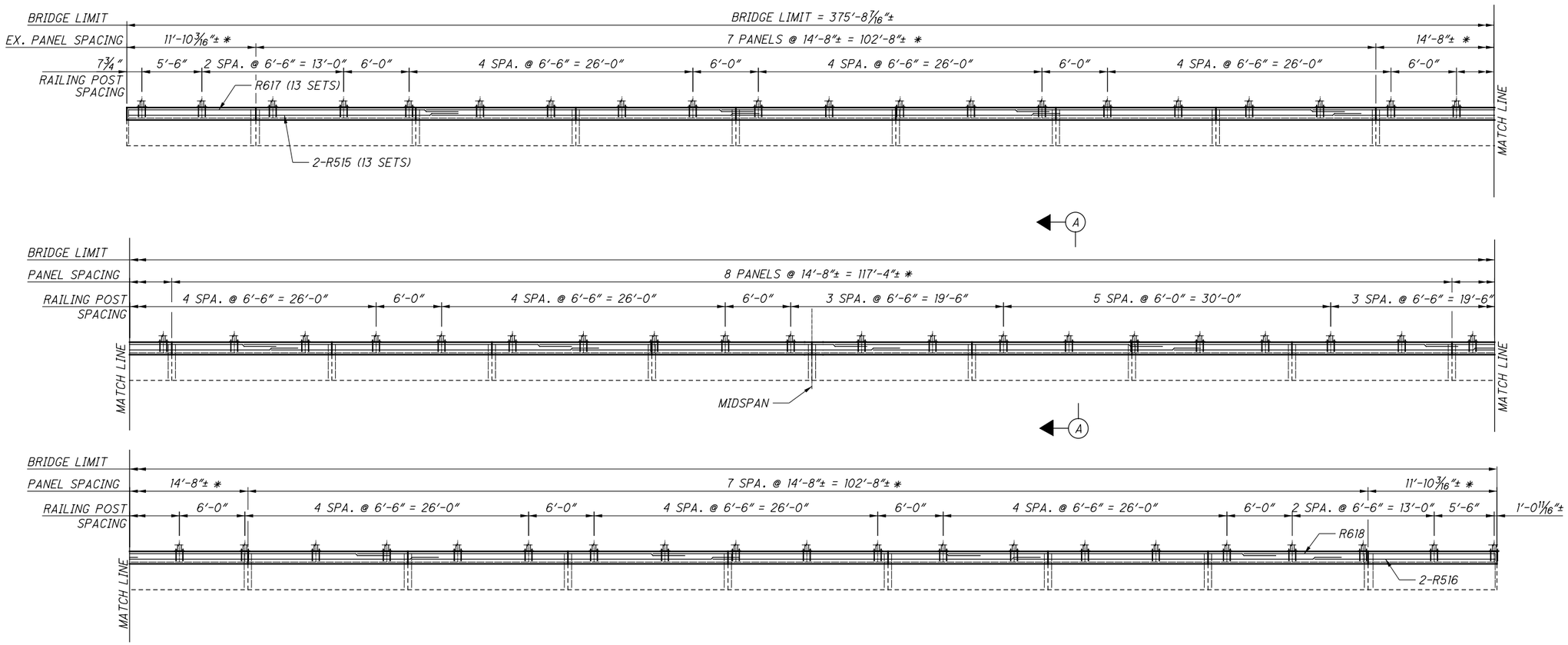
FRA-270-49.00
PID No. 83988

25/32

171/182

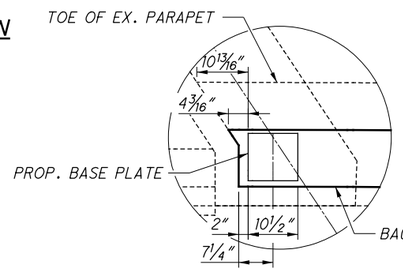
AS BUILT - 4/22/2016

BU 4,5,6,7,8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

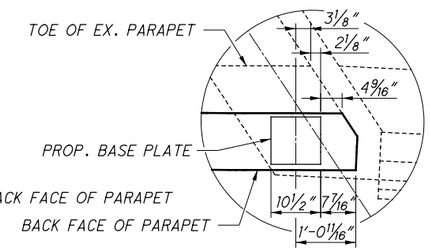


RIGHT PARAPET ELEVATION

MARK	TOTAL	LENGTH	WEIGHT (LBS.)	TYPE	DIMENSIONS						
					A	B	C	D	E	R	INC
PARAPET											
R515	26	30'-0"	814	ST							
R516	2	17'-6"	37	ST							
R617	13	30'-0"	586	ST							
R618	1	24'-0"	36	ST							
TOTAL			1472								



PLAN
(BASE PLATE AT REAR ABUTMENT)



PLAN
(BASE PLATE AT FORWARD ABUTMENT)

NOTES:

1. BASE PLATES SHALL BE ASTM A709 GRADE 50 STEEL GALVANIZED ACCORDING TO 711.02.
2. FURNISH FASTENERS AS FOLLOWS:
   THE ANCHOR BOLTS SHALL BE HEAVY HEX ASTM A449 WITH HARDENED STEEL WASHERS ABD HEAVY HEX NUTS.
   THE HEX CAP SCREWS (BOLTS), HEX NUTS, AND WASHERS AT RAILING INTERNAL SPLICE, SHALL CONFORM TO ASTM A449.
3. GALVANIZE ALL STRUCTURAL STEEL PLATES, HARDWARE AND ACCESSORIES ACCORDING TO CMS 711.02.
4. REFER TO ODOT STANDARD DRAWING BR-2-15 FOR ADDITIONAL DETAILS.
5. THE ANCHORS SHALL BE CAST-IN-PLACE WITH A MINIMUM 10" EMBEDMENT LENGTH.
6. PROPOSED RAILING IS PER MANUFACTURE'S SPECIFICATIONS.
7. BASE PLATES SHALL CLEAR PARAPET DEFLECTION CONTROL JOINTS BY 2" MINIMUM. IF REQUIRED, CONTRACTOR MAY SAW CUT ADDITIONAL DEFLECTION CONTROL JOINTS IF THERE IS A POST/JOINT CONFLICT.
8. AVOID INTERFERENCE WITH EXISTING AND PROPOSED REBAR WHEN INSTALLING PROPOSED THREADED ANCHORS.
9. DIMENSIONS MEASURED ALONG THE BACK FACE OF PARAPET.
10. MIN. LAP LENGTHS
    NO. 5 BAR: 2'-5"
    NO. 6 BAR: 2'-11"
11. PROPOSED CONTROL JOINTS FOR CONCRETE PARAPETS: SAWCUT 1/4" DEEP CONTROL JOINTS ALONG THE PERIMETER OF THE PARAPET AS SOON AS THE SAW CAN BE OPERATED WITHOUT DAMAGING THE CONCRETE.

USE AN EDGE GUIDE, FENCE OR JIG TO ENSURE THAT THE CUT JOINT IS STRAIGHT, TRUE AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 1/4 INCH.

PLACE CONTROL JOINTS TO LINE UP WITH EXISTING JOINTS.

SEAL THE PERIMETER OF THE CONTROL JOINT TO A MINIMUM DEPTH OF ONE INCH WITH POLYURETHANE OR POLYMETRIC MATERIAL CONFORMING TO ASTM C920, TYPE S.

LEGEND:

* - PROPOSED PANEL JOINTS SHALL LINE UP WITH EXISTING JOINTS.

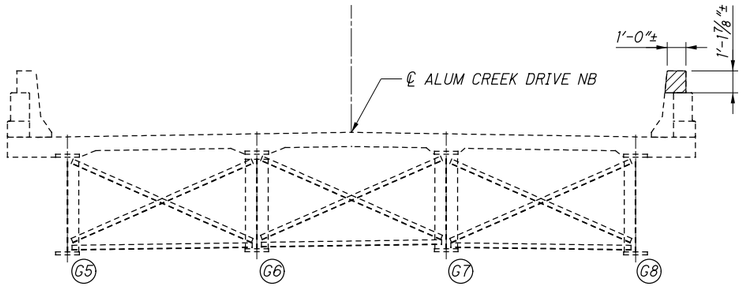
RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

RIGHT RAILING DETAILS ON EXISTING PARAPET

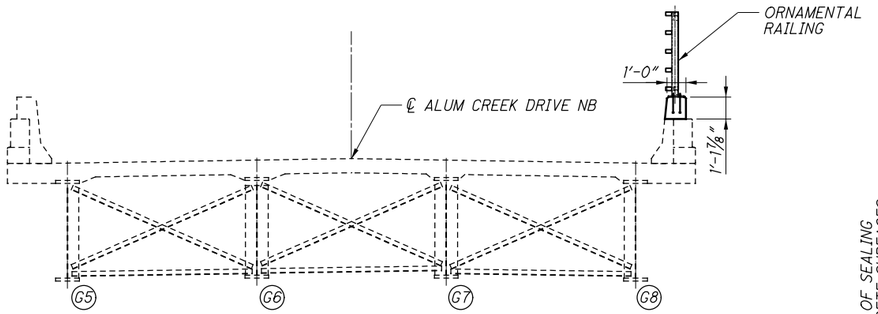
BRIDGE NO. FRA-270-4900
OVER IR 270

DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	12/01/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

FRA-270-49.00
PID No. 83988



PARAPET REMOVAL



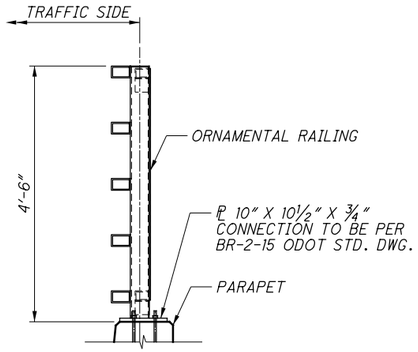
PARAPET CONSTRUCTION

RAILING REMOVAL:

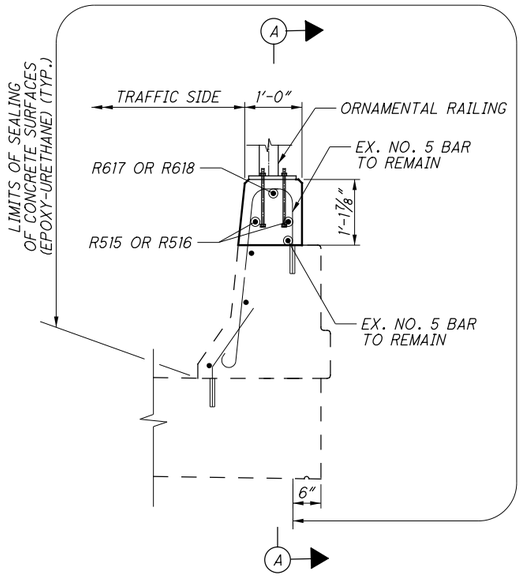
1. REMOVE PORTION OF EXISTING PARAPET AS SHOWN.
2. SALVAGE EXISTING REBARS AS SHOWN IN DETAIL A.

RAILING CONSTRUCTION:

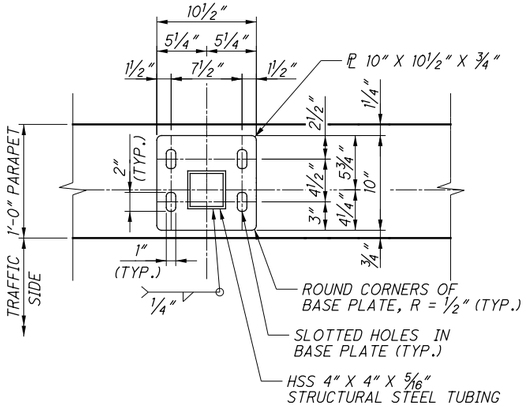
1. CONSTRUCT PORTION OF PARAPET AS SHOWN IN DETAIL A.
2. INSTALL ORNAMENTAL RAILING.



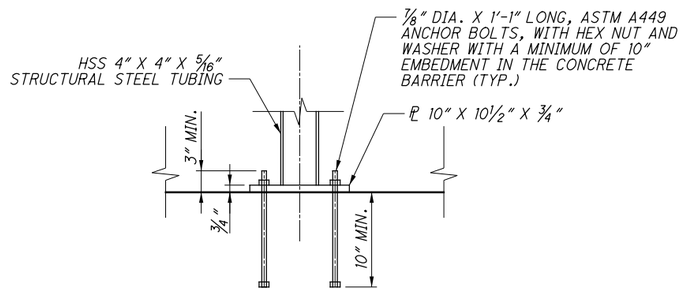
ORNAMENTAL RAILING



DETAIL A



BASE PLATE DETAIL



SECTION A-A

NOTES:

1. REFER TO ODOT STANDARD DRAWING BR-2-15 FOR ADDITIONAL DETAILS.
2. SEE SHEET 26/32 FOR RAILING NOTES.

LEGEND:

▨ - ITEM 202 PORTIONS OF STRUCTURE REMOVED

RESOURCE INTERNATIONAL INC.
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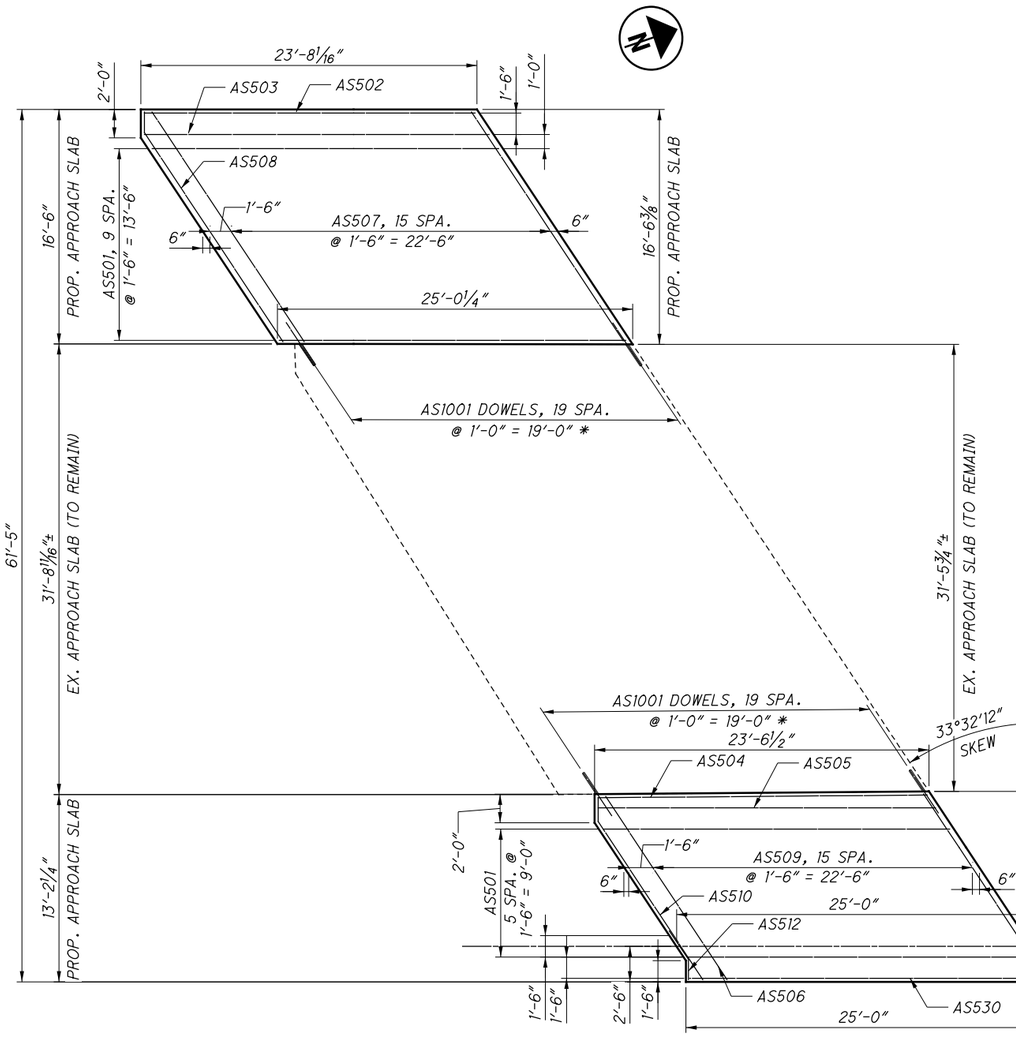
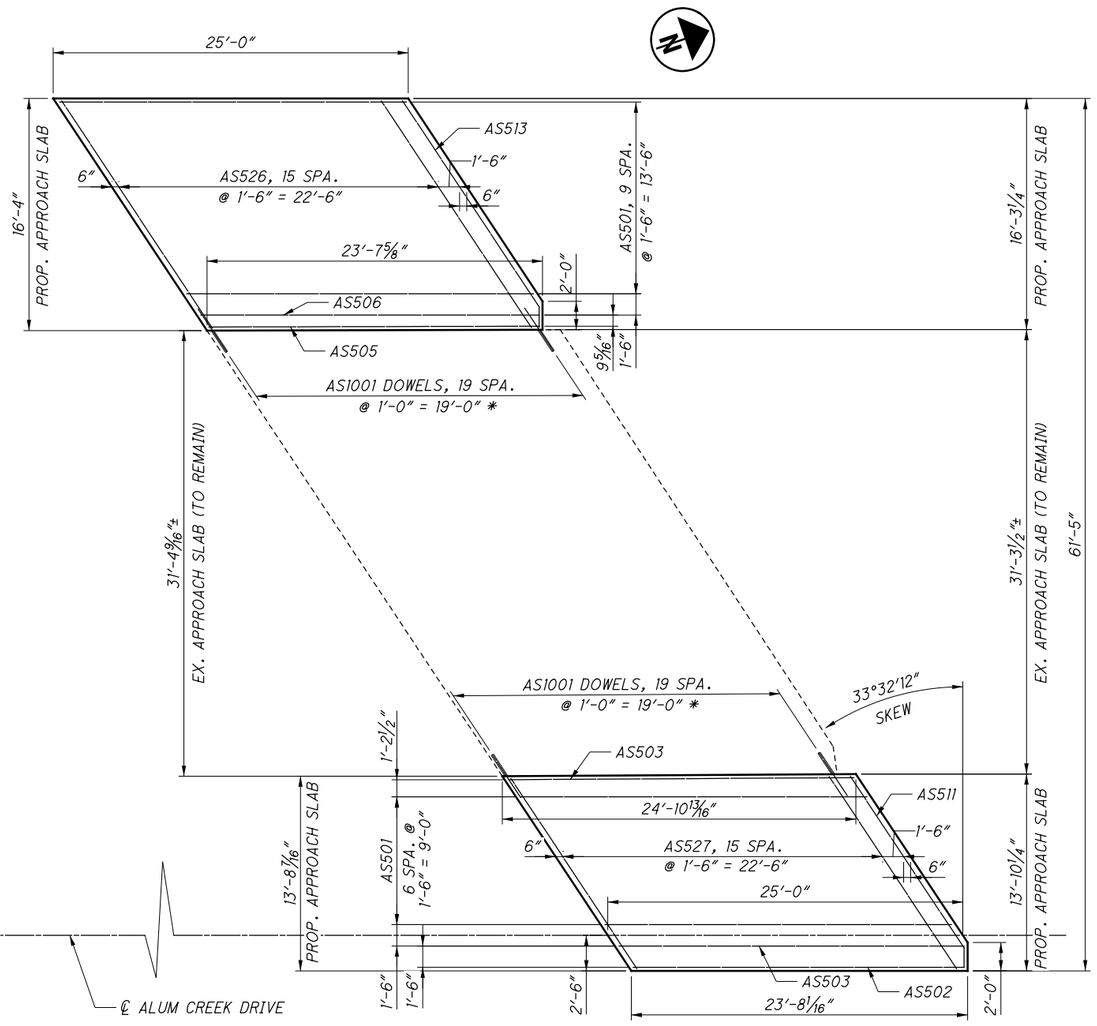
CHECKED	REVISED	STRUCTURE FILE NUMBER	
NCK		2513862	

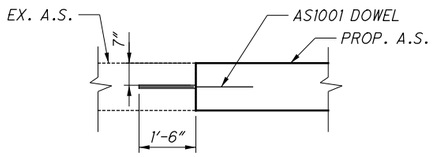
RIGHT RAILING DETAILS ON EXISTING PARAPET

BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988







DETAIL A

REAR APPROACH SLAB

TOP REINFORCING

FORWARD APPROACH SLAB

TOP REINFORCING

NOTES:

1. SEE ODOT STANDARD DRAWING AS-1-81 FOR REINFORCING DETAILS.

LEGEND:

* - MEASURED PERPENDICULAR TO APPROACH SLAB. DOWELS ARE LOCATED IN THE CENTER OF THE CONCRETE. SEE DETAIL A.

RESOURCE INTERNATIONAL INC.
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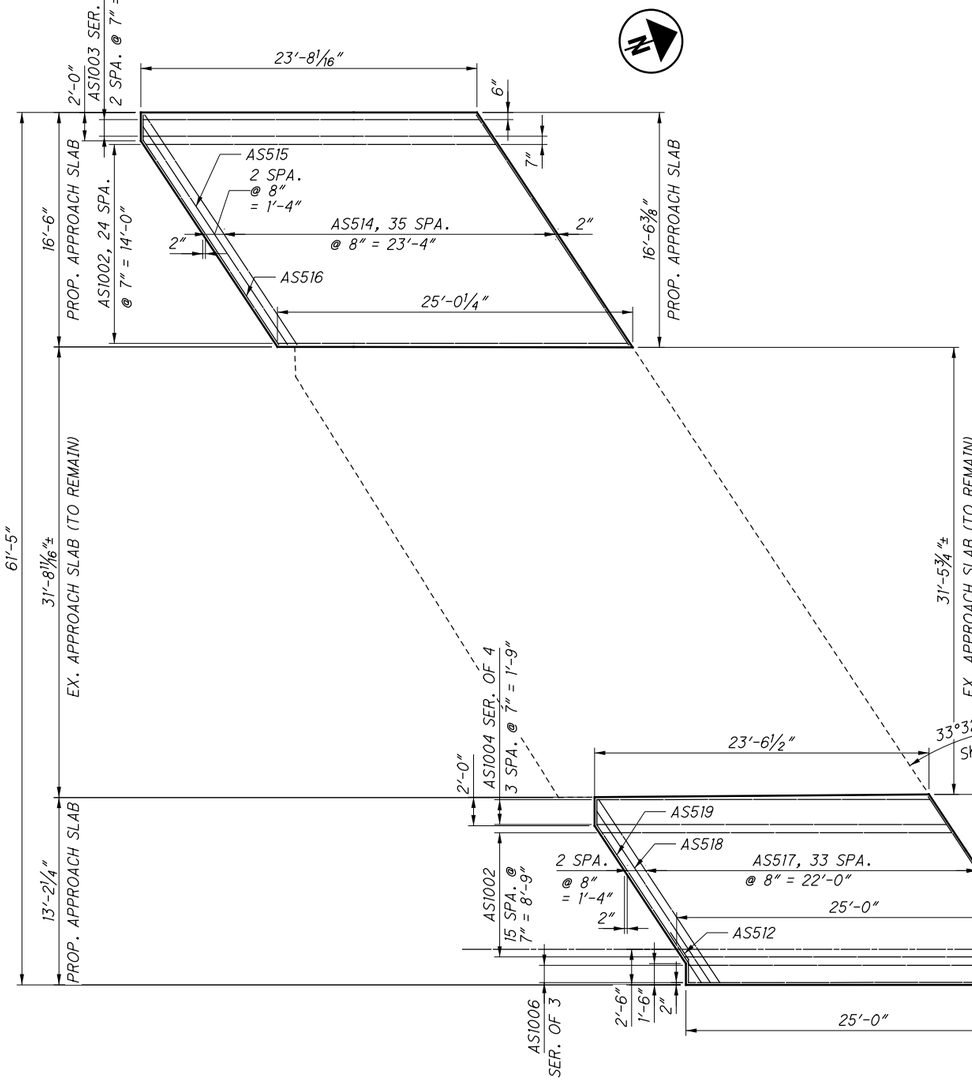
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

APPROACH SLAB DETAILS

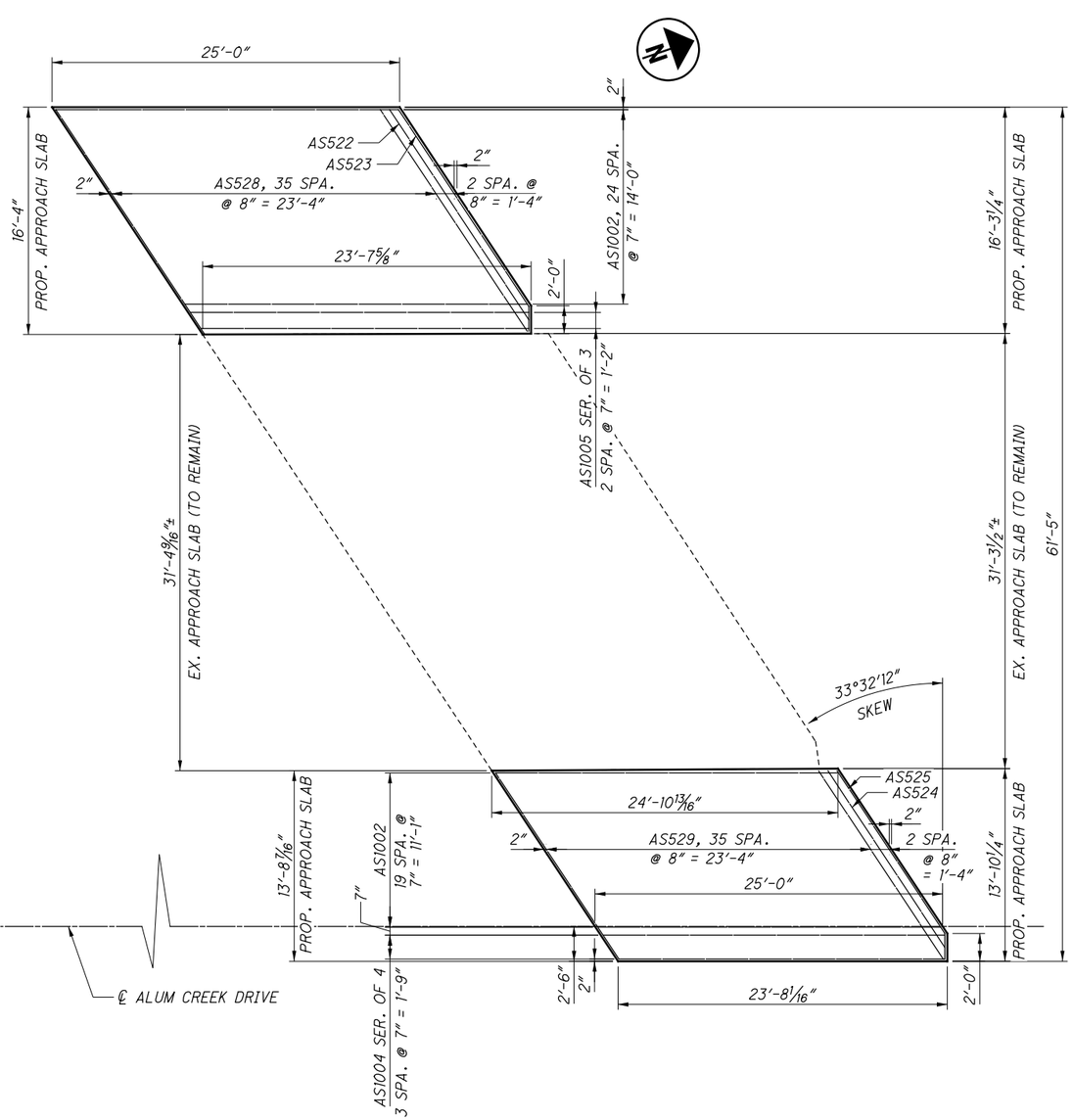
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988



REAR APPROACH SLAB

BOTTOM REINFORCING



FORWARD APPROACH SLAB

BOTTOM REINFORCING

NOTES:

1. SEE ODOT STANDARD DRAWING AS-1-81 FOR REINFORCING DETAILS.

LEGEND:

* - MEASURED PERPENDICULAR TO APPROACH SLAB

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED	DRAWN	REVIEWED	DATE
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CHECKED	REVISED	STRUCTURE FILE NUMBER	
JLM		2513862	

APPROACH SLAB DETAILS

BRIDGE NO. FRA-270-4900
OVER IR 270

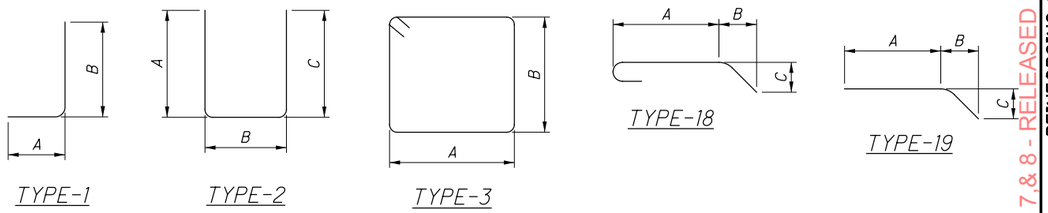
FRA-270-49.00
PID No. 83988

AS BUILT - 4/22/2016

ABUTMENTS

MARK	NUMBER R.A	NUMBER F.A	NUMBER TOTAL	LENGTH	WEIGHT (LBS.)	TYPE	DIMENSIONS A	B	C	D	E	R	INC
A501	22	23	45	8'-10"	415	2	1'-7"	5'-11"	1'-7"				
A502	11	7	18	9'-7"	180	3	3'-0"	1'-7"					
A503	2		2	16'-5"	34	ST							
A504	2		2	16'-10"	35	ST							
A505	2		2	15'-8"	33	ST							
A506	2		2	18'-5"	38	ST							
A507		8	8	11'-1"	92	ST							
A508	2	2	4	17'-3"	72	3	6'-10"	1'-7"					
A509	4	4	8	4'-9"	40	ST							
A510	2		2	11'-11"	25	3	4'-2"	1'-7"					
A511		1	1	11'-3"	12	3	3'-10"	1'-7"					
A512	2		2	7'-1"	15	3	1'-9"	1'-7"					
A513		1	1	6'-9"	7	3	1'-7"	1'-7"					
A514	18	21	39	9'-1"	369	1	1'-0"	8'-2"					
A515		2	2	5'-4"	11	19	3'-0"	1'-2"	2'-1"				
A516			1	13'-3"	14	3	4'-10"	1'-7"					
A517		1	1	11'-1"	12	3	3'-9"	1'-7"					
A518		1	1	6'-7"	7	3	1'-6"	1'-7"					
A519	19	21	40	7'-2"	299	2	2'-0"	3'-5"	2'-0"				
A520	3	3	6	7'-4"	46	2	2'-0"	3'-8"	2'-0"				
A521	3	3	6	7'-6"	47	2	2'-0"	3'-10"	2'-0"				
A522	16	21	37	10'-4"	399	2	4'-7"	1'-5"	4'-7"				
A523	1 SER. OF 11		1 SER. OF 11	9'-3" TO 10'-0"	110	2	4'-0 5/8" TO 4'-5"	1'-5"					7/16"
A524	1 SER. OF 8		1 SER. OF 8	9'-9" TO 10'-0"	82	2	4'-3 1/2" TO 4'-5"	1'-5"					3/16"
A525	18	20	38	6'-2"	244	2	2'-9"	11"	2'-9"				
A526	2	5	7	10'-7"	77	2	4'-7"	1'-8"	4'-7"				
A527	3	2	5	9'-11"	52	2	4'-3"	1'-8"	4'-3"				
A528	4	4	8	10'-3"	86	2	4'-5"	1'-8"	4'-5"				
A529	1		1	10'-7"	11	2	4'-7"	1'-8"	4'-7"				
A530	8		18	6'-4"	119	2	2'-9"	1'-1"	2'-9"				
A531	4	4	8	12'-8"	106	1	1'-6"	11'-3"					
A532		18	18	24'-4"	457	ST							
A533	5		5	14'-1"	73	19	13'-10"	2 1/2"	1 3/4"				
A534	2		2	13'-5"	28	ST							
A535	2		2	15'-10"	33	ST							
A536	18		18	23'-10"	447	ST							
A537	2		2	7'-8"	16	ST							
A538		7	7	13'-4"	97	ST							
* A539	44	44	88	3'-11"	359	ST							
A540	17		17	18'-10"	334	ST							
A541	3	6	9	12'-6"	117	2	5'-8"	1'-5"	5'-8"				
A542	3	3	6	12'-9"	80	2	5'-8"	1'-8"	5'-8"				
A543		1 SER. OF 12	1 SER. OF 12	9'-8" TO 10'-0"	123	2	4'-3" TO 4'-5"	1'-5"					3/16"
A544		2	2	10'-3"	21	2	4'-5"	1'-8"	4'-5"				
A545		11	11	18'-11"	217	ST							
A546		1	1	18'-3"	19	ST							
A547		5	5	19'-4"	101	19	17'-4"	1'-8"	1'-1"				
A548		1 SER. OF 8	1 SER. OF 8	9'-10" TO 10'-1 1/2"	0 83	0 2	4'-4" TO 4'-5 3/4"	1'-5"					1/4"
A549	18	12	30	5'-9"	180	ST							
A550	1 SER. OF 9	1 SER. OF 9	2 SER. OF 9	6'-5" TO 12'-8"	179	2	2'-9" TO 5'-9"	1'-2"	2'-9" TO 5'-9"				4 1/2"
A551	9	9	18	4'-3"	80	2	1'-8"	1'-2"	1'-8"				
A552	3	4	7	17'-11"	82	2	11'-3"	5'-4"	1'-7"				
A553	2	2	4	19'-11"	83	2	9'-3"	1'-8"	9'-3"				
A554	12		12	11'-6"	144	ST							
A555		12	12	7'-2"	90	ST							
A556	2 SER. OF 3		2 SER. OF 3	11'-8" TO 17'-6"	91	ST							2'-11"
A557		2 SER. OF 3	2 SER. OF 3	7'-4" TO 13'-4"	65	ST							3'-0"
A558	6		6	19'-6"	122	ST							
A559		6	6	15'-2"	95	ST							
A560	2	2	4	11'-4"	47	19	8'-4"	2'-10"	1'-0"				
A561		2	2	7'-8"	16	ST							
A562	10		10	21'-6"	224	ST							
A563		10	10	21'-3"	222	ST							
A564		4	4	23'-2"	97	ST							
A565	2	2	4	13'-7"	57	3	1'-8"	4'-11"					
A601	18	21	39	17'-10"	1045	2	1'-7"	5'-4"	11'-3"				
A602	11	6	17	23'-2"	592	2	11'-2"	1'-2"	11'-2"				
A603	1	1	2	23'-4"	70	3	11'-2"	1'-4"	11'-2"				
D801	26	26	52	5'-2"	717	18	2'-9"	1'-0"	1'-0"				
* A801	16	16	32	3'-0"	256	ST							
A802	6	4	10	18'-10"	503	ST							
A803	2		2	16'-0"	85	ST							
A804	2		2	21'-8"	116	ST							
A805	2		2	19'-11"	106	ST							
A806	4	8	12	18'-11"	606	ST							
A807		2	2	20'-9"	111	19	17'-4"	2'-10"	1'-11"				
A808		2	2	19'-10"	106	ST							
			SUB TOTAL		11882								

BENDING DIAGRAMS



LEGEND:

* - DOWEL BAR

NOTES:

1. THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE 3 DIGITS ARE USED, AND THE FIRST 2 DIGITS WHERE FOUR DIGITS ARE USED, INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, P601 IS A NO. 6 BAR. BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. "R" INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.

2. ALL REINFORCING STEEL TO BE EPOXY COATED, UNLESS NOTED OTHERWISE.

BU 4,5,6,7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED JGM | DRAWN JGM | CHECKED JLM | REVIEWED NCK | DATE 12/01/2015 | REVISED | STRUCTURE FILE NUMBER 2513862

REINFORCING STEEL LIST

BRIDGE NO. FRA-270-4900
OVER IR 270

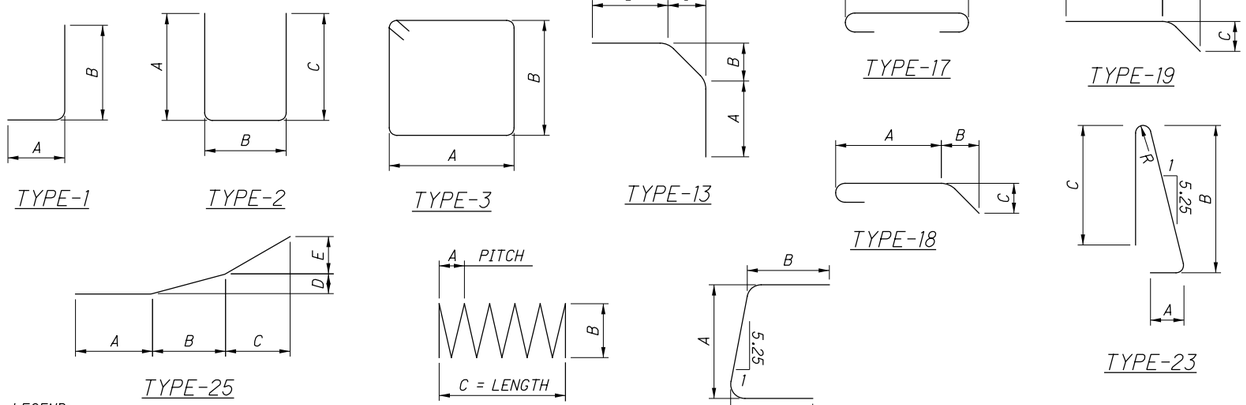
FRA-270-49.00
PID No. 83988

AS BUILT - 4/22/2016

MARK	PIER 1	PIER 2	PIER 3	TOTAL	LENGTH	WEIGHT (LBS.)	TYPE	DIMENSIONS						
								A	B	C	D	E	R	INC
PIERS														
P401	2			2	16'-5"	482	27	4 1/2"	2'-6"	16'-5"				
P402		2		2	17'-0"	498	27	4 1/2"	2'-6"	17'-0"				
P403			2	2	18'-9"	546	27	4 1/2"	2'-6"	18'-9"				
P404	1			1	19'-4"	282	27	4 1/2"	2'-6"	19'-4"				
P405		1		1	19'-11"	290	27	4 1/2"	2'-6"	19'-11"				
P406			1	1	21'-8"	314	27	4 1/2"	2'-6"	21'-8"				
P501	2	2	2	6	9'-10"	62	ST.							
P502	22	22	22	66	7'-3"	499	2	2'-6"	2'-6"	2'-6"				
P503	4	4	4	12	6'-1"	76	2	2'-6"	1'-4"	2'-6"				
P504	6	6	6	18	2'-3"	42	ST.							
P505	4	4	4	12	1'-6"	19	ST.							
P601	24	24	24	72	4'-5"	478	ST.							
P801	48	48	48	144	10'-2"	3909	17	8'-6"						
P802	10	10	10	30	20'-1"	1609	17	18''-5"						
P803	10	10	10	30	13'-11"	1115	17	12'-3"						
P901	2	2	2	6	15'-1"	308	2	12'-5'	1'-7"					
P902	2	2	2	6	12'-5"	253	ST.							
P903	24			24	19'-2"	1564	ST.							
P904		32		32	19'-10"	2158	ST.							
P905			32	32	21'-7"	2348	ST.							
P906	12			12	19'-4"	789	ST.							
P907		16		16	19'-11"	1083	ST.							
P908			16	16	21'-8"	1179	ST.							
P909	12	12	12	36	20'-11"	2560	17	18'-5"						
P910	12	12	12	36	14'-9"	1805	17	12'-3"						
P911	2	2	2	6	12'-5"	253	2	9'-10"	1'-7"					
P912	2	2	2	6	9'-10"	201	ST.							
P913	36	48	48	132	10'-3"	4600	1	8'-11"	1'-7"					
SUB-TOTAL 29321														

MARK	TOTAL	LENGTH	WEIGHT (LBS.)	TYPE	DIMENSIONS						
					A	B	C	D	E	R	INC
SUPERSTRUCTURE											
S501	1053	30'-0"	32948	ST							
S502	81	16'-6"	1394	ST							
S601	545	17'-7"	14394	ST							
S602	1 SER. OF 16	2'-3" TO 17'-3"	234	ST							1'-0"
S603	1 SER. OF 15	2'-8" TO 16'-9"	219	ST							11 1/4"
S604	4	2'-0"	12	ST							
S605	6	2'-4"	21	ST							
S606	93	40'-0"	5587	ST							
S607	93	14'-11"	2084	ST							
S608	549	13'-7"	11201	ST							
	1	3'-0"									
S609	SER. OF 11	TO 13'-0"	132	ST							1'-0"
	1	2'-0"									
S610	SER. OF 11	TO 12'-10"	123	ST							1'-1"
S701	549	13'-7"	15243	ST							
	1	3'-0"									
S702	SER. OF 11	TO 13'-0"	180	ST							1'-0"
	1	2'-0"									
S703	SER. OF 11	TO 12'-10"	167	ST							1'-1"
S704	6	2'-4"	29	ST							
S705	4	2'-0"	16	ST							
S706	545	17'-7"	19587	ST							
	1	2'-8"									
S707	SER. OF 15	TO 16'-9"	298	ST							11 1/4"
	1	2'-3"									
S708	SER. OF 16	TO 17'-3"	319	ST							1'-0"
SUB-TOTAL 104187											

BENDING DIAGRAMS



LEGEND:

* - DOWEL BAR

NOTES:

1. THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE 3 DIGITS ARE USED, AND THE FIRST 2 DIGITS WHERE FOUR DIGITS ARE USED, INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, P601 IS A NO. 6 BAR. BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. "R" INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.

2. ALL REINFORCING STEEL TO BE EPOXY COATED, UNLESS NOTED OTHERWISE.

BU 4, 5, 6, 7 & 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED JGM | DRAWN JGM | REVIEWED NCK | DATE 12/01/2015 | CHECKED JLM | REVISED | STRUCTURE FILE NUMBER 2513862

REINFORCING STEEL LIST

BRIDGE NO. FRA-270-4900
OVER IR 270

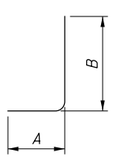
FRA-270-49.00
PID No. 83988

AS BUILT - 4/22/2016

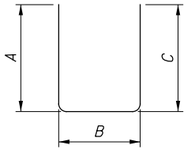
MARK	TOTAL	LENGTH	WEIGHT (LBS.)	TYPE	DIMENSIONS A	B	C	D	E	R	INC
PARAPET											
R501	156	30'-0"	4881	ST							
R502	24	9'-4"	234	ST							
R503	831	7'-5"	6428	23	1'-1"	3'-2"	3'-0"				2 3/4"
R504	4	16'-4"	68	ST							
R505	4	10'-7"	44	ST							
R506	20	5'-6"	115	ST							
R507	12	5'-6"	69	25	1'-8"	2'-5"	1'-4 1/4"	1 1/2"	5"		
R508	3	13'-2"	41	ST							
R509	3	12'-5"	39	ST							
R510	3	11'-1"	35	ST							
R511	3	11'-10"	37	ST							
R512	16	12'-5"	207	ST							
R513	4	15'-6"	65	ST							
R514	4	11'-4"	47	ST							
R601	26	30'-0"	1172	ST							
R602	4	12'-10"	77	ST							
R603	791	2'-8"	3167	1	1'-1"	1'-8 1/2"					
R604	791	3'-7"	4257	28	1'-8 1/2"	1'-1"					
R605	1	8'-11"	13	ST							
R606	10	2'-11"	44	ST							
R607	10	3'-11"	59	13	2'-0"	11"	2 1/8"	1'-1"			
R608	8 SER. OF 11	5'-6" TO 6'-4"	782	ST ST							1"
R609	8	5'-4"	64	ST							
R610	1	12'-9"	19	ST							
R611	1	11'-5"	17	ST							
* R612	8 SER. OF 11	6'-5" TO 7'-3"	903	1	1'-1"	5'-6" TO 6'-4"					1"
R613	8	4'-6"	54	1	1'-1"	3'-7"					
R614	1	4'-3"	6	ST							
R615	26	2'-11"	114	1	1'-1"	2'-0"					
R616	26	3'-10"	150	28	1'-1"	2'-0"					
SUB-TOTAL			23209								
TOTAL			168599								

MARK	TOTAL	LENGTH	WEIGHT (LBS.)	TYPE	DIMENSIONS A	B	C	D	E	R	INC
APPROACH SLABS - INFO ONLY											
AS501	33	24'-6"	847	ST							
AS502	2	23'-3"	49	ST							
AS503	3	24'-3"	76	ST							
AS504	1	23'-2"	25	ST							
AS505	2	23'-9"	50	ST							
AS506	2	24'-4"	51	ST							
AS507	16	19'-2"	320	ST							
AS508	1	19'-0"	20	19	17'-7"	1'-2 1/2"	9 11/16"				
AS509	16	15'-6"	259	ST							
AS510	1	15'-0"	16	19	13'-4"	1'-4 3/4"	11 1/8"				
AS511	1	15'-5"	17	19	14'-6"	9 1/2"	6 1/4"				
AS512	2	3'-10"	8	19	2'-5"	1'-2"	9 3/8"				
AS513	1	18'-9"	20	19	17'-4"	1'-2 1/2"	9 5/8"				
AS514	72	19'-4"	1452	ST							
AS515	1	18'-4"	20	ST							
AS516	1	19'-0"	20	19	17'-3"	1'-5 3/4"	11 7/8"				
AS517	36	15'-8"	589	ST							
AS518	1	14'-5"	16	ST							
AS519	1	15'-0"	16	19	13'-3"	1'-5 3/4"	11 7/8"				
AS520	NOT	USED									
AS521	NOT	USED									
AS522	1	18'-1"	19	ST							
AS523	1	18'-10"	20	19	17'-0"	1'-5 3/4"	11 7/8"				
AS524	1	15'-2"	16	ST							
AS525	1	15'-10"	17	19	14'-0"	1'-5 3/4"	11 7/8"				
AS526	16	19'-2"	320	ST							
AS527	15	16'-1"	252	ST							
AS528	36	19'-2"	720	ST							
AS529	36	16'-1"	604	ST							
AS530	1	25'-0"	27	ST							
AS1001	60	3'-0"	775	ST							
AS1002	86	25'-11"	9592	16	24'-6"						
	1	25'-1"			23'-8"						
AS1003	SER. OF	TO	329	16	TO						4 1/2"
	3	25'-10"			24'-5"						
	2	24'-10"			23'-5"						
AS1004	SER. OF	TO	874	16	TO						4 1/2"
	4	25'-11"			24'-6 1/2"						
	1	24'-11"			23'-6"						
AS1005	SER. OF	TO	327	16	TO						4 1/2"
	3	25'-8"			24'-3"						
	1	26'-1"			24'-8"						
AS1006	SER. OF	TO	342	16	TO						5"
	3	26'-11"			25'-6"						
SUB-TOTAL			18104								

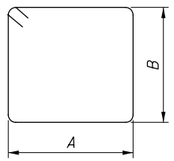
BENDING DIAGRAMS



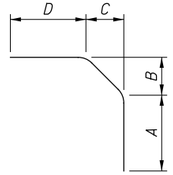
TYPE-1



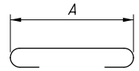
TYPE-2



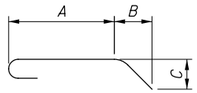
TYPE-3



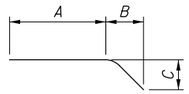
TYPE-13



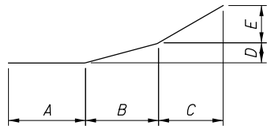
TYPE-17



TYPE-18



TYPE-19



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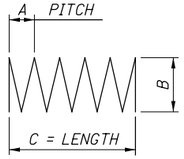
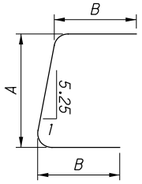
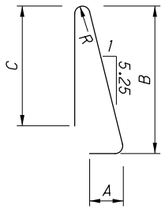


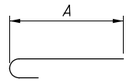
TYPE - 27



TYPE 28



TYPE-23



TYPE-16

LEGEND:

** - DOWEL BAR*

NOTES:

1. THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE 3 DIGITS ARE USED, AND THE FIRST 2 DIGITS WHERE FOUR DIGITS ARE USED, INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, P6011S A NO. 6 BAR. BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. "R" INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.

2. ALL REINFORCING STEEL TO BE EPOXY CODED, UNLESS NOTED OTHERWISE.

BU 4,5,6,7,&8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

RESOURCE INTERNATIONAL INC.
8350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED JGM | DRAWN JGM | CHECKED JLM | REVIEWED NCK | DATE 12/01/2015 | REVISED | STRUCTURE FILE NUMBER 2513862

REINFORCING STEEL LIST

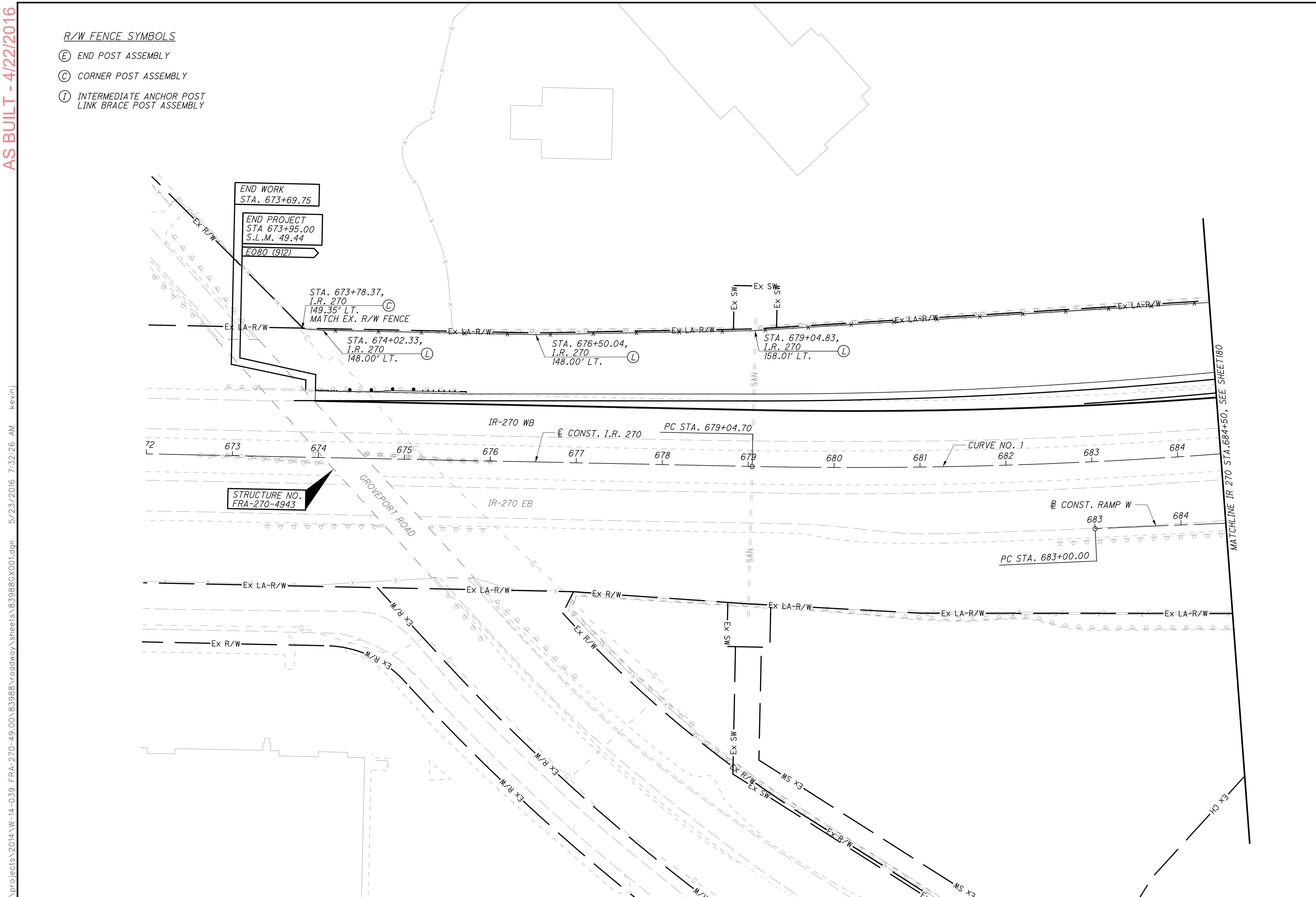
BRIDGE NO. FRA-270-4900
OVER IR 270

FRA-270-49.00
PID No. 83988

32/32

178
182

G:\projects\2014\W-14-039 FRA-270-49.00\83988\structures\FRA270_4900L\sheets\270_4900LRL003.dgn 5/23/2016 7:32:25 AM kevinj


R/W FENCE SYMBOLS
E END POST ASSEMBLY
C CORNER POST ASSEMBLY
I INTERMEDIATE ANCHOR POST LINK BRACE POST ASSEMBLY
END WORK STA. 673+69.75
END PROJECT STA 673+95.00 S.L.M. 49.44
E080 (912)
STA. 673+78.37, I.R. 270 149.35' LT. MATCH EX. R/W FENCE
STA. 674+02.33, I.R. 270 148.00' LT.
STA. 676+50.04, I.R. 270 148.00' LT.
STA. 679+04.83, I.R. 270 158.01' LT.
Ex LA-R/W
Ex R/W
Ex SW
SAN
IR-270 WB
℄ CONST. I.R. 270
PC STA. 679+04.70
CURVE NO. 1
IR-270 EB
STRUCTURE NO. FRA-270-4943
GROVEPORT ROAD
℄ CONST. RAMP W
PC STA. 683+00.00
MATCHLINE IR 270 STA.684+50, SEE SHEET180
Ex CH
72
673
674
675
676
677
678
679
680
681
682
683
684
HORIZONTAL SCALE IN FEET
0
25
50
100

CALCULATED CFR
CHECKED SSK

FENCE PLAN
STA. 672+00.00 TO STA. 684+50.00

FRA-270-49.00

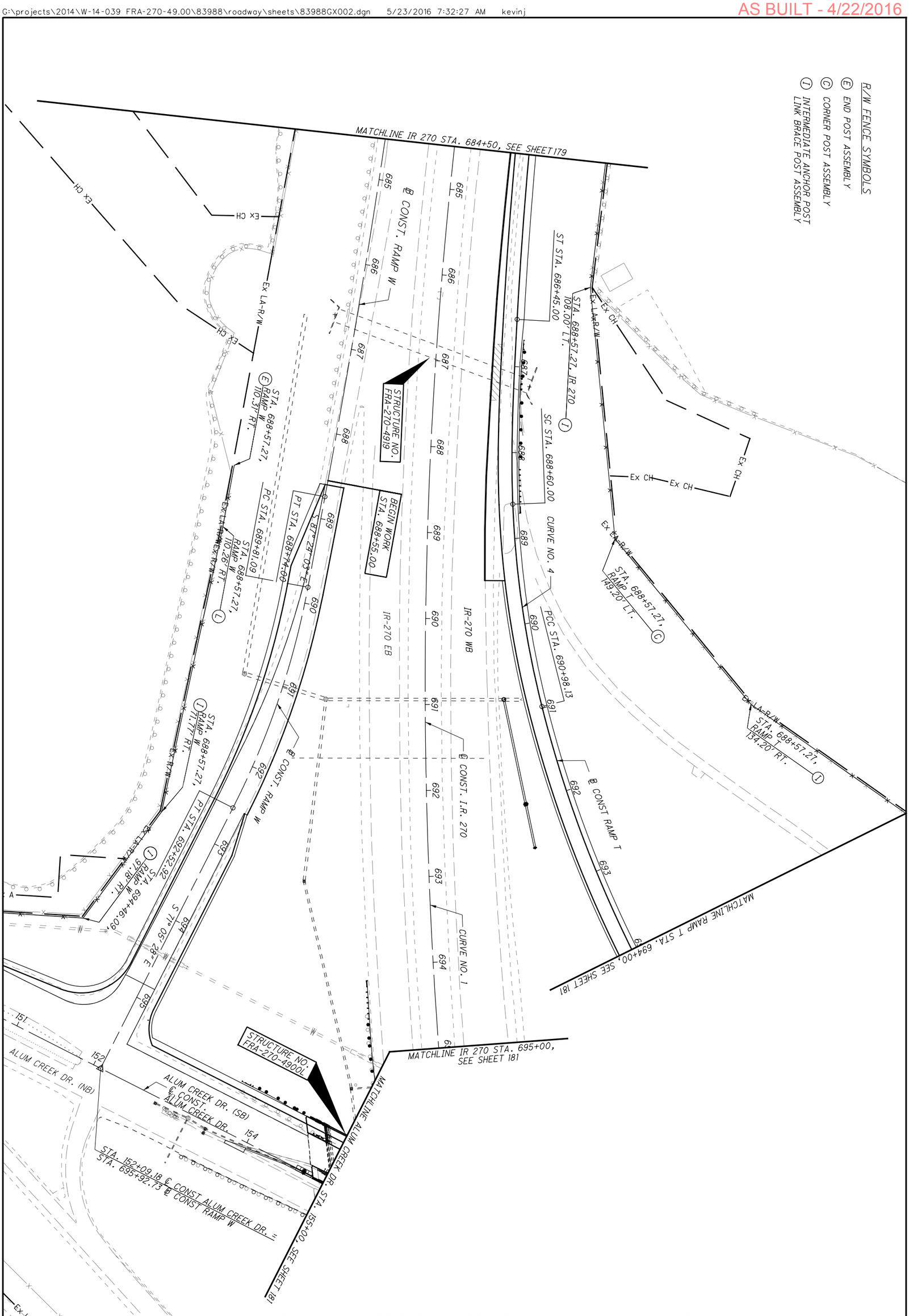
AS BUILT - 4/22/2016

R/W FENCE SYMBOLS

(E) END POST ASSEMBLY

(C) CORNER POST ASSEMBLY

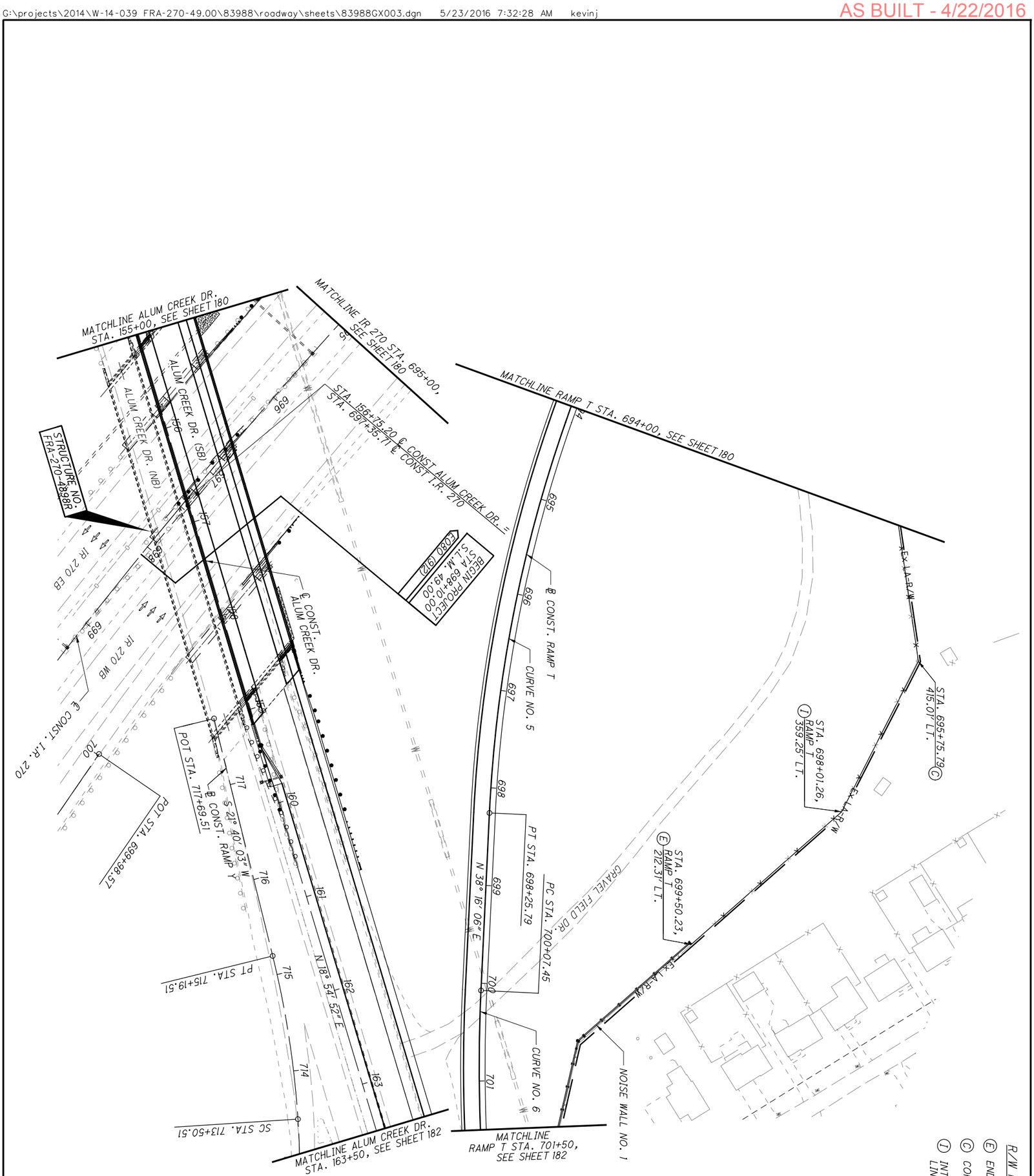
(I) INTERMEDIATE ANCHOR POST
LINK BRACE POST ASSEMBLY



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

180 / 182	FRA-270-49.00	FENCE PLAN STA 684+50.00 TO STA. 695+00.00	CALCULATED CFR CHECKED SSK	0 50 25 100 HORIZONTAL SCALE IN FEET

AS BUILT - 4/22/2016



R/W FENCE SYMBOLS

Ⓔ END POST ASSEMBLY

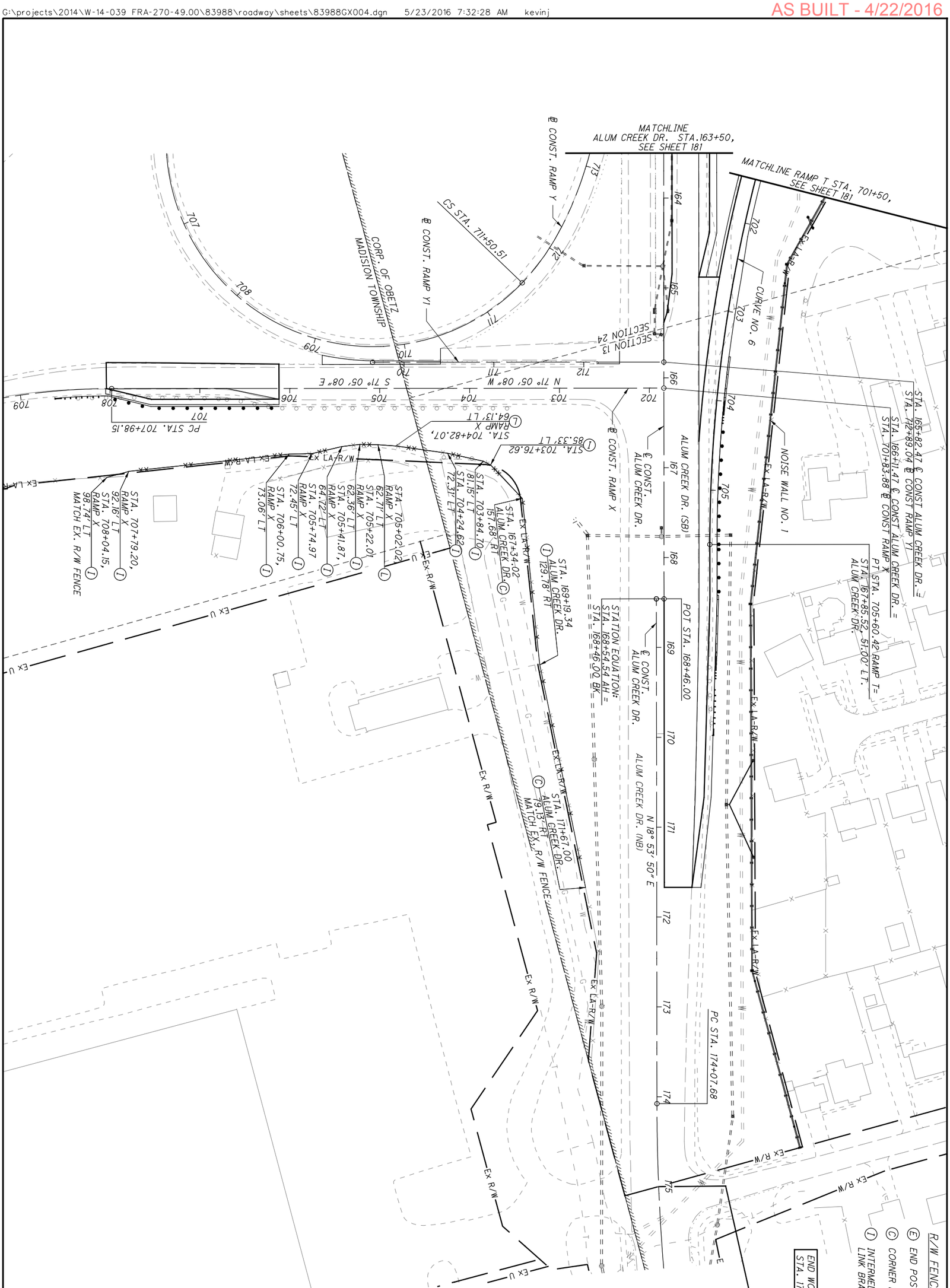
Ⓒ CORNER POST ASSEMBLY

① INTERMEDIATE ANCHOR POST LINK BRACE POST ASSEMBLY

BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

181 / 182	FRA-270-49.00	FENCE PLAN STA. 155+00.00 TO STA. 163+50.00	CALCULATED CFR CHECKED SSK	0 50 25 100 HORIZONTAL SCALE IN FEET

AS BUILT - 4/22/2016



BU 4, 5 ,6 7,& 8 - RELEASED FOR CONSTRUCTION - 11/03/2014 - 11/19/2015

182 / 182	FRA-270-49.00	FENCE PLAN STA. 163+50.00 TO 176+00.00	CALCULATED CFR CHECKED SSK	0 50 25 100 HORIZONTAL SCALE IN FEET