POLK COUNTY - DESIGN NO. 718

RCB CULVERT REPLACEMENT - TRIPLE BOX

IM-NHS-035-4(218)93--03-77

LETTING DATE 07-18-2017

POLK COUNTY

LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY (80)
- UNITED STATES HIGHWAY (65)
- STATE HIGHWAY (175)
- COUNTY HIGHWAY (S27)
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES — ABBEY ROAD
- UNINCORPORATED PLACE — ELWOOD

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

INTERSTATE ROAD SYSTEM

POLK COUNTY

RCB CULVERT REPLACEMENT - TRIPLE BOX
STAGE 1 - ON INTERSTATE 35
IN ANKENY APPROX 0.8 MILES N OF E 1ST ST (NB)

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

ENGLISH STANDARD CULVERT PLANS

STANDARD	ISSUED	REVISED
TRRCB G1-12	APRIL 2012	07-16
TRRCB G2-12	APRIL 2012	12-16
TRRCB 12-8-12	APRIL 2012	-----
TRH 0-1-12	APRIL 2012	12-16
TRH 0-2-12	APRIL 2012	-----
TRH 0-3-12	APRIL 2012	12-16
TRH 0-4-12	APRIL 2012	07-16
TRH 0-5-12	APRIL 2012	-----
PRCB G1-13	JANUARY 2013	07-16
PRCB G2-13	JANUARY 2013	07-16
PRCB 12-13	JANUARY 2013	-----
PES 1-13-T3	JANUARY 2013	07-16
PES 3-13-T3	JANUARY 2013	07-16
PES 4-13	JANUARY 2013	-----
PEP 1-13	JANUARY 2013	12-15

TOTAL SHEETS
30
PROJECT NUMBER
IM-NHS-035-4(218)93--03-77
R.O.W. PROJECT NUMBER
PROJECT IDENTIFICATION NUMBER
04-77-035-030-01

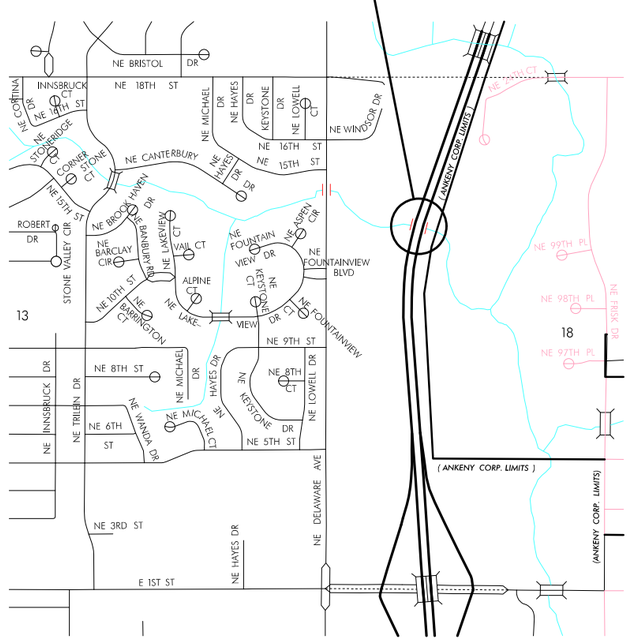
INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
RA	REVISION SHEET
2	ESTIMATE SHEET - DESIGN 718 CAST IN PLACE CULVERT
2-4	DES 718 CAST IN PLACE CULVERT
5	ESTIMATE SHEET - DESIGN 718 PRECAST CULVERT ALTERNATE
5-8	DES 718 PRECAST CULVERT ALTERNATE
SPS.1	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
A.1-L.1	ROADWAY SHEETS

REVISIONS

SEE REVISION SHEET RA 10-24-2018

DESIGN NO. 718



LOCATION MAP

CITY MAP NOT TO SCALE

T-80N R-23W
SECTION 18
DOUGLAS TWP.
PART OF CITY OF ANKENY

STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER C.1

DESIGN DATA URBAN

2012	AADT	39,900	V.P.D.
2035	AADT	77,600	V.P.D.
2035	DHV	7,530	V.P.H.
TRUCKS		15	%
Total Design ESALs			

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	Steven M. Kunz	STRUCTURAL DESIGN
1	Mark A. Land	HYDRAULIC DESIGN
*SPS.1	Matthew D. Cushman	GEOTECHNICAL DESIGN
**A.1	Scott E. Port	ROADWAY DESIGN
CULVERT STANDARDS	NORMAN L. McDONALD	STRUCTURAL DESIGN

* Provided by Terracon Consultants Inc.
** Provided by Snyder & Associates Inc.

HYDRAULIC DESIGN

LICENSED PROFESSIONAL ENGINEER Mark A. Land 14045 IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: Mark A. Land Date: 04-19-2017

Printed or Typed Name: Mark A. Land

My license renewal date is December 31, 2018

Pages or sheets covered by this seal: SHEETS 4, 7 (HYDRAULIC DATA)

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER Steven M. Kunz 14321 IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: Steven M. Kunz Date: 04-19-2017

Printed or Typed Name: Steven M. Kunz

My license renewal date is December 31, 2017

Pages or sheets covered by this seal: SHEETS 1 THRU 8 (EXCLUDING HYDRAULIC DATA)

PROJECT DIRECTORY NAME: 7703503004

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS
10-24-2018	RA		REVISION SHEET ADDED.
10-24-2018	4A01	1	REVISED: ADDED NEW SHEET, TEMPORARY SHORING SEAL DETAILS. REASON: THE EXPOSED CELLS AT THE WEST END OF STAGE 1 R.C.B.C. CONSTRUCTION ARE REQUIRED TO BE SEALED IN ORDER TO ALLOW THE PLACEMENT OF BACKFILL AND ROADWAY PAVEMENT BETWEEN STAGE 1 AND STAGE 2 R.C.B.C. CONSTRUCTION.
10-24-2018	4A02	1	REVISED: ADDED NEW SHEET, TEMPORARY SHORING SEAL DETAILS. REASON: THE EXPOSED CELLS AT THE WEST END OF STAGE 1 R.C.B.C. CONSTRUCTION ARE REQUIRED TO BE SEALED IN ORDER TO ALLOW THE PLACEMENT OF BACKFILL AND ROADWAY PAVEMENT BETWEEN STAGE 1 AND STAGE 2 R.C.B.C. CONSTRUCTION.

DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
Steven M. Kunz
14321
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: Steven M. Kunz — Date: 10-24-2018

Printed or Typed Name: Steven M. Kunz

My license renewal date is December 31, 2019

Pages or sheets covered by this seal: SHEETS 1, RA, 4A01, 4A02

POLK COUNTY
DESIGN NO. 718
REVISION SHEET

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

REVISED: OCTOBER 24, 2018

ESTIMATED CAST IN PLACE CULVERT QUANTITIES - ALTERNATE - STAGE 1

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2102-0425071	SPECIAL BACKFILL	CY	147.2	
2	2401-6750001	REMOVALS, AS PER PLAN	LS	1.00	
3	2402-2720000	EXCAVATION, CLASS 20	CY	2492	
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	380.0	
5	2404-7775000	REINFORCING STEEL	LB	55,941	
6	2501-8400172	TEMPORARY SHORING	LS	1.00	
7	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
8	2533-4980005	MOBILIZATION	LS	1.00	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2102-0425071	**SPECIAL BACKFILL** INCLUDES COST OF 1'-0 THICK WORKING BLANKET (SPECIAL BACKFILL). SEE SHEET SPS.1 FOR ADDITIONAL INFORMATION. THE WORKING BLANKET MAY BE DELETED IF DETERMINED TO BE UNNECESSARY AT THE TIME OF CONSTRUCTION. RECLAIMED ASPHALT PAVEMENT (RAP) AND RECLAIMED HMA SHALL NOT BE USED FOR THE SPECIAL BACKFILL.
2	2401-6750001	**REMOVALS, AS PER PLAN** INCLUDES ALL WORK FOR REMOVAL AND OFF-SITE DISPOSAL OF THE EXISTING HEADWALL WINGS, SLAB, AND BARREL SECTION AT ONE END OF THE EXISTING CULVERT, AS NEEDED TO CONSTRUCT THE NEW BARREL EXTENSIONS AND HEADWALL. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS. ANY DAMAGE TO MATERIAL NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.
3	2402-2720000	**EXCAVATION, CLASS 20** INCLUDES EXCAVATION NECESSARY TO PLACE THE 1'-0 THICK WORKING BLANKET. QUANTITY SHOULD BE REDUCED BY 147 CY IN THE EVENT THAT THE WORKING BLANKET IS DELETED. INCLUDES FILLING AND COMPACTING LOW AREAS AROUND PROPOSED CULVERT.
4	2403-0100020	**STRUCTURAL CONCRETE (RCB CULVERT)** - -
5	2404-7775000	**REINFORCING STEEL** - -
6	2501-8400172	**TEMPORARY SHORING** - -
7	2526-8285000	**CONSTRUCTION SURVEY** - -
8	2533-4980005	**MOBILIZATION** - -

SPECIFICATIONS:

DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5TH ED., SERIES OF 2010.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, CURRENT SERIES, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5th Ed, SERIES OF 2010.
REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 4.0 KSI.

STANDARDS:
FOR DETAILS AND NOTES NOT SHOWN REFER TO THE FOLLOWING IOWA D.O.T. - HIGHWAY STANDARDS:

STANDARD	ISSUED	REVISED
TRRCB G1-12	APRIL 2012	07-16
TRRCB G2-12	APRIL 2012	12-16
TRRCB 12-8-12	APRIL 2012	-----
TRH 0-1-12	APRIL 2012	12-16
TRH 0-2-12	APRIL 2012	-----
TRH 0-3-12	APRIL 2012	12-16
TRH 0-4-12	APRIL 2012	07-16
TRH 0-5-12	APRIL 2012	-----

SUMMARY OF REINFORCING STEEL

LOCATION	QUANTITY	TOTAL
HEADWALL 0° SKEW	1 AT 8,168	8,168
32'-0 BARREL SECTION	2 AT 18,758	37,516
17'-0 BARREL END SECTION	1 AT 9,965	9,965
5r1 x 3'-6 DOWEL BARS	2 AT 146	292
	TOTAL (LBS.)	55,941

CONCRETE PLACEMENT QUANTITIES

LOCATION	FOOTING	WALLS	SLAB	TOTAL
HEADWALL 0° SKEW	1 AT 45.8	1 AT 13.7	* 1 AT 3.6	63.1
32'-0 BARREL SECTION	2 AT 53.3	2 AT 26.9	2 AT 45.0	250.4
17'-0 BARREL END SECTION	1 AT 14.3	1 AT 28.3	1 AT 23.9	66.5
TOTAL (C.Y.)	166.7	95.8	117.5	380.0

* INCLUDES PARAPET AND TOP OF WINGWALL.

NOTE:
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGN HISTORY AT THIS SITE
(INCLUDES THIS DESIGN)

DES. NO.	TYPE OF WORK
718	NEW CONSTRUCTION - STAGE 1
3762	ORIGINAL DESIGN

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 81'-0 R.C.B. CULVERT - STAGE 1

ESTIMATED QUANTITIES

STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 3 FILE NO. 30451 DESIGN NO. 718

GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO REPLACE A SEGMENT OF THE EXISTING TWIN 8'-0 x 10'-0 x 155'-0 REINFORCED CONCRETE BOX CULVERT SKEWED 0° AT STATION 309+80 WITH A TRIPLE 12'-0 x 8'-0 x 81'-0 REINFORCED CONCRETE BOX CULVERT SKEWED 0° AT STATION 309+87.00. NEW CULVERT CONSTRUCTION WILL BE DONE IN 3 STAGES. THESE PLANS INCLUDE STAGE 1 ONLY. STAGES 2 AND 3 WILL BE COMPLETED AT A FUTURE DATE UNDER SEPARATE CONTRACTS. STAGE 1 OF THIS CULVERT CONSTRUCTION PROJECT CORRESPONDS TO STAGE 3 OF THE GRADING PROJECT IM-NHS-035-4(140)92--03-77.

THE RCB CULVERT SECTIONS ARE DESIGNED FOR HL-93 LIVE LOAD AND EARTH FILLS OF 10 FEET.

ELECTRONIC COPIES OF ORIGINAL DESIGN PLANS ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN 3762).

FAINT LINES ON PLANS INDICATE EXISTING STRUCTURE.

UTILITY COMPANIES AND MUNICIPALITIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

EXCESS CLASS 20 EXCAVATION MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED AT THE CONSTRUCTION SITE, AS DIRECTED BY THE ENGINEER.

CLASS 20 EXCAVATION MATERIAL UNSUITABLE FOR BACKFILLING SHALL BE DISPOSED OF IN A MANNER THAT WILL LEAVE THE SITE IN A NEAT CONDITION.

THE CLASS 20 EXCAVATION QUANTITY IS BASED ON THE ASSUMPTION THAT AT THE START OF CULVERT CONSTRUCTION, THE EXISTING GROUNDLINE SHOWN ON THE "SITUATION PLAN" ON DESIGN SHEET 3 HAS REMAINED UNDISTURBED AND NO ROADWAY FILL HAS BEEN PLACED.

THE PRICE BID FOR "REMOVALS, AS PER PLAN" SHALL INCLUDE THE COST FOR REMOVALS OF PORTIONS OF THE EXISTING CULVERT.

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION IN RELATION TO EXISTING PORTIONS OF THE STRUCTURE SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

REMOVAL OF THE EXISTING CULVERT SHALL BE ON A VERTICAL PLANE PARALLEL WITH AND AT THE LOCATION INDICATED ON THE "SITUATION PLAN", AND TO THE WIDTH OF THE FLOOR. THE WALLS SHALL BE CUT NORMAL TO THE BARREL WALLS. THE REMOVAL LINE SHALL BE INITIATED WITH A $2\frac{1}{2}\pm$ DEEP SAW CUT ON THE TOP AND BOTH SIDES OF EACH WALL, AND ACROSS THE TOP OF THE FLOOR. THIS SAW CUT SHOULD CUT THRU ANY EXISTING LONGITUDINAL REINFORCING THEREBY FACILITATING A NEAT NON-SPALLED BREAK LINE.

ALL REMOVALS SHALL BE CAREFULLY ACCOMPLISHED AND ANY CONCRETE DAMAGED BY THE CONTRACTOR THAT IS NOT TO BE REMOVED SHALL BE REPAIRED BY THE CONTRACTOR AT NO EXTRA COST TO THE STATE. REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

FLOOR OF BARREL IS TO BE FINISIHED SMOOTH. SIDES OF FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

TEMPORARY SHORING (SHEET PILE OR OTHER) SHALL BE REQUIRED AS NECESSARY TO PREVENT THE EARTH UNDER THE TRAFFIC LANE FROM SLOUGHING IN DURING CONSTRUCTION.

THE CONTRACTOR SHALL SUBMIT A TEMPORARY SHORING PLAN FOR REVIEW. THE TEMPORARY SHORING PLAN SHALL BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA. THE CONTRACTOR SHALL NOT PROCEED WITH INSTALLATION OF THE TEMPORARY SHORING WITHOUT NOTICE TO PROCEED FROM THE ENGINEER.

THE TEMPORARY SHORING SUBMITTAL SHALL INCLUDE:

- DESIGN CALCULATIONS (INCLUDING A GLOBAL STABILITY ANALYSIS)
- SOIL PROPERTIES
- SHORING MATERIALS
- SHORING PLAN LAYOUT (SHOWING LOCATION OF TRAFFIC)
- SHORING DETAILS

TEMPORARY SHORING SHALL BE PAID FOR AS A LUMP SUM INCLUDING ALL OF THE COST FOR DESIGNING, FURNISHING, INSTALLING AND REMOVAL. ALL MATERIAL USED FOR SHORING SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. SHORING IS TO BE REMOVED ONLY AFTER BACKFILLING HAS BEEN COMPLETED. IN ADDITION TO THE REQUIREMENTS NOTED ABOVE, ARTICLE 1107.07 OF THE STANDARD SPECIFICATIONS STILL APPLIES.

THE ROADWAY WILL BE OPEN TO TRAFFIC DURING CONSTRUCTION. TRAFFIC WILL BE MAINTAINED AT ALL TIMES IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS. REFER TO PROJECT NO. IM-NHS-035-4(140)92--03-77 FOR TRAFFIC CONTROL PLANS.

TRAFFIC CONTROL ADJACENT TO THE CULVERT SHALL BE THE RESPONSIBILITY OF THE GRADING CONTRACTOR. THE CONTRACTOR CONSTRUCTING THE CULVERT SHALL COORDINATE CONSTRUCTION OF THE CULVERT WITH THE GRADING CONTRACTOR.

WHEN DE-WATERING PRESENTS A PROBLEM FOR PLACING THE CURTAIN WALLS AS DETAILED, ALTERNATE METHODS SUCH AS STEEL SHEET PILE AND PRECAST CONCRETE WALLS MAY BE APPROVED BUT AT NO ADDITIONAL COST. THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER FOR APPROVAL COMPLETE DRAWINGS OF THE PROPOSED CURTAIN WALL ALTERNATE BEFORE BEGINNING CONSTRUCTION.

DRAINAGE THROUGH EXISTING CULVERT/CHANNEL SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

DURING CONSTRUCTION OF THIS PROJECT THE CULVERT CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME PERIOD OF TIME WILL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

IM-NHS-035-4(140)92--03-77	GRADING
IM-NHS-035-4(194)94--03-77	BRIDGE REPLACEMENT-PPCB
IM-NHS-035-4(193)93--03-77	BRIDGE REPLACEMENT-PPCB
NHS-035-4(221)93--11-77	RECONSTRUCTION-BRIDGE WIDENING
ITS-035-4(239)--25-77	FIBER OPTICS INSTALLATION
NHSX-160-1(13)--3H-77	PCC PAVEMENT WIDENING

TRAFFIC CONTROL PLAN

THE TRAFFIC CONTROL PLAN IS NOT INCLUDED IN THESE PLANS, BUT IS INCLUDED IN THE GRADING PLANS PROJECT IM-NHS-035-4(140)92--03-77 WHICH IS TIED TO THESE CULVERT PLANS THROUGH THE CONTRACT LETTING PROCESS.

THE POLLUTION PREVENTION PLAN IS NOT INCLUDED IN THESE PLANS, BUT IS INCLUDED IN THE GRADING PLANS PROJECT IM-NHS-035-4(140)92--03-77 WHICH IS TIED TO THESE CULVERT PLANS THROUGH THE CONTRACT LETTING PROCESS.

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 81'-0
R.C.B. CULVERT - STAGE 1

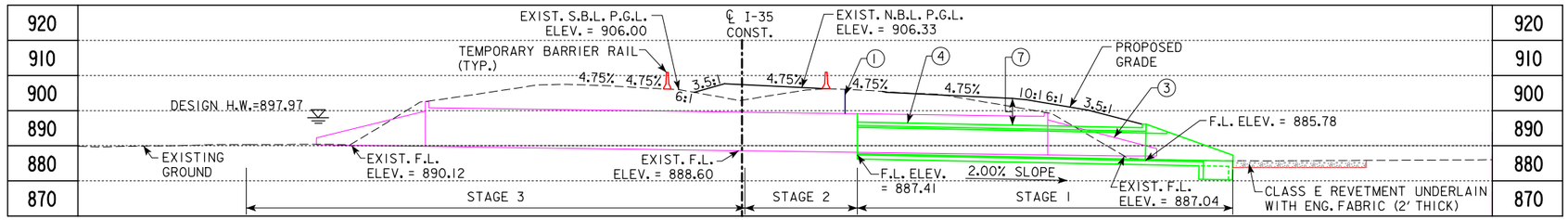
GENERAL NOTES

STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 3 FILE NO. 30451 DESIGN NO. 718



LONGITUDINAL SECTION ALONG ℄ CULVERT

ANTICIPATED CULVERT SETTLEMENT = 1 INCH

BM NO.11 STA. 309+88.71, 91.00'LT.
CUT 'X' IN TOP OF NORTH CORNER OF INLET
HEADWALL OF RCB UNDER I-35
MILE MARKER 93.35. ELEV. = 902.48

PROPOSED GRADE I-35 S.B.L. AND N.B.L.

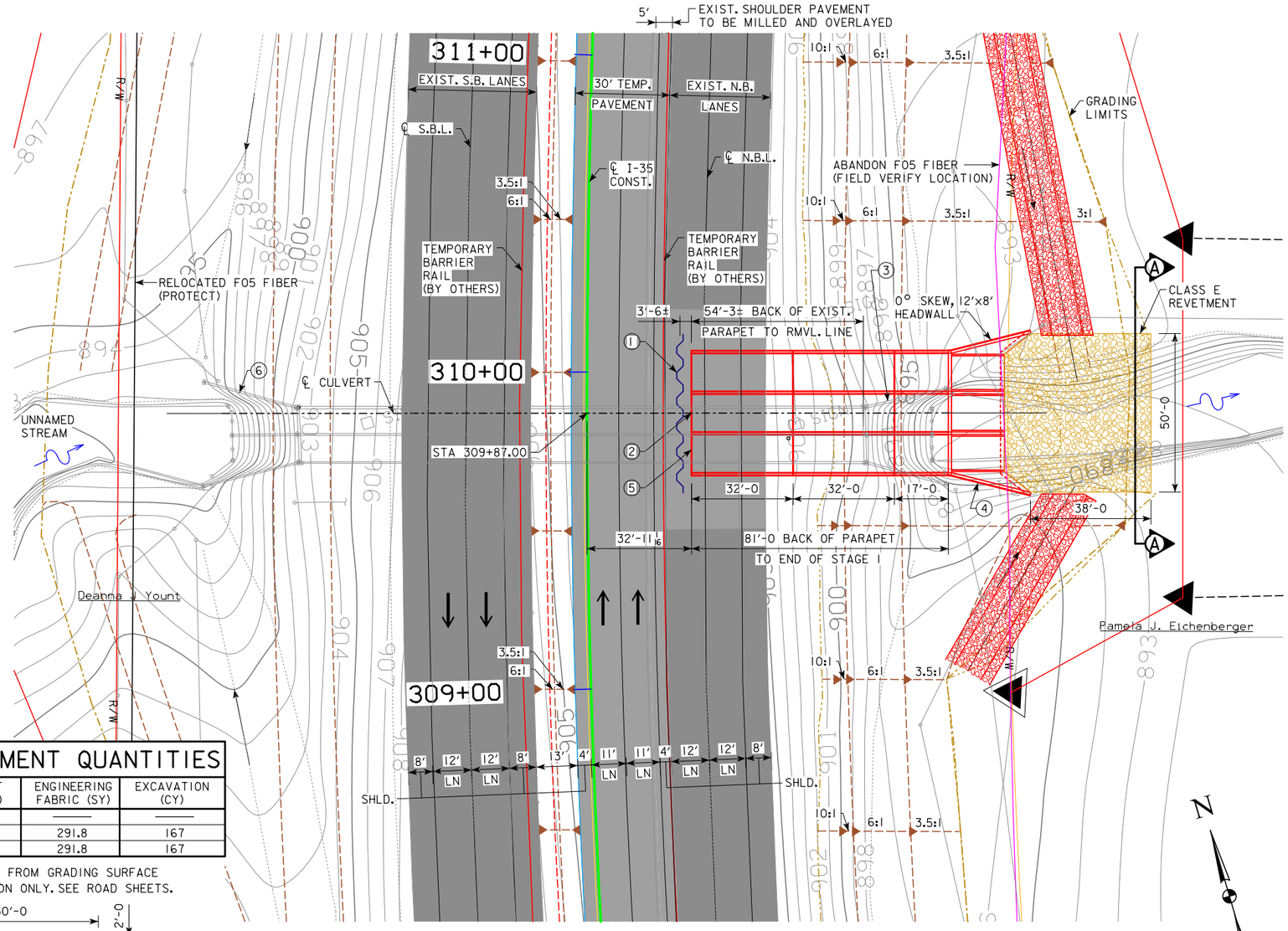
-0.52% -0.75% 0.50%

VPI STA. 287+75.00
ELEV.=922.93
LVC=210.00ft

VPI STA. 315+00.00
ELEV.=902.48
LVC=230.00ft

NOTES:

1. TEMPORARY SHORING AS REQUIRED FOR STAGED CONSTRUCTION
2. STA. 309+87.00, 32.91' RT. EXIST. F.L. ELEV. = 887.93
3. REMOVE EXISTING HEADWALL & BARREL TO LIMITS INDICATED.
4. CONSTRUCT 0° SKEW, 12'x8' HEADWALL AND BARREL SECTIONS.
5. DRAINAGE THROUGH EXISTING CULVERT/CHANNEL SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
6. MAINTAIN EXISTING HEADWALL AND BARREL SECTIONS.
7. DESIGN EARTH FILL = 10' FOR ALL STAGES.



HORIZONTAL CURVE DATA

SCS PI Sta 305+14.32
Δ = 24° 53' 19.19" (RT)
Theta = 4° 08' 56.42"
Ls = 420.00
Ts = 850.48
Es = 72.37
P = 2.53
K = 209.96
Xc = 419.78
Yc = 10.13
LT = 280.08
ST = 140.07
LC = 419.90

Curve Data
Δ = 16° 35' 27.42" (RT)
T = 422.83
L = 839.74
R = 2,900.00
E = 30.66
e = 5.6%
L = 420.0'
X = 188.0'

TRAFFIC ESTIMATE

A.D.T.=53,600 V.P.D. (2008)
A.D.T.=100,300 V.P.D. (2035)
16% Trucks

HYDRAULIC DATA

DRAINAGE AREA = 2.2 SQ MI.
DESIGN Q50 = 1820 CFS
DESIGN Q100 = 2100 CFS
DESIGN Q500 = 2750 CFS
DESIGN HIGH WATER ELEV. = 897.97
OUTLET STREAM SLOPE= 0.0040 FT/FT
CULVERT WATERWAY AREA= 288.0 SF

EXISTING STRUCTURE

TWIN 8'-0 x 10'-0 x 155'-0 R.C.B.

PROPOSED STRUCTURE

TRIPLE 12'-0 x 8'-0 x 81'-0 R.C.B. (STAGE 1)

UTILITIES LEGEND:

F05 - FIBER OPTICS - IOWA DOT

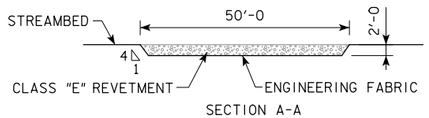
LOCATION

I-35 OVER TRIBUTARY A
TO FOURMILE CREEK
T-80 N R-23 W
SECTION 18
DOUGLAS TOWNSHIP
CITY OF ANKENY
POLK COUNTY
LAT 41.742119°
LONG -93.577544°
FHWA No. 700770

ESTIMATED REVETMENT QUANTITIES

LOCATION	REVETMENT CL. E (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET (STAGE 3)	———	———	———
OUTLET (STAGE 1)	267.2	291.8	167
TOTALS	267.2	291.8	167

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE
QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.



SECTION A-A

SITUATION PLAN

ALL UNITS IN FEET UNLESS NOTED OTHERWISE

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 81'-0 R.C.B. CULVERT - STAGE 1

SITUATION PLAN

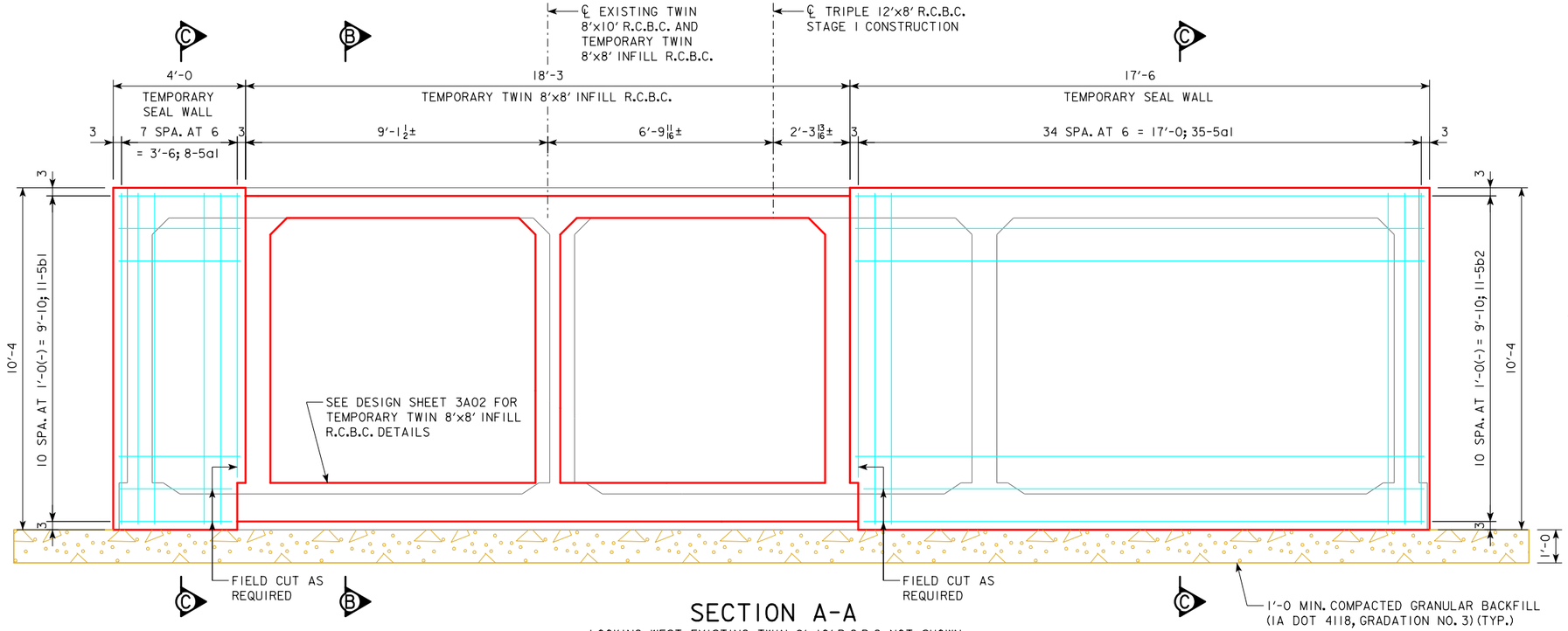
STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

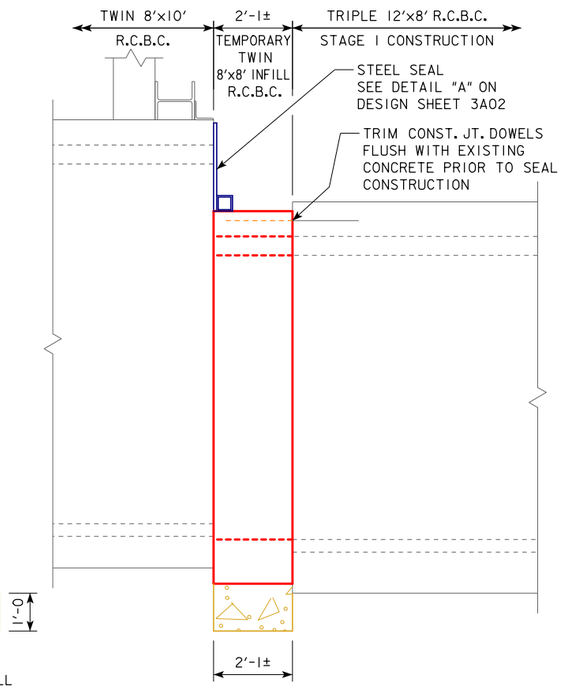
DESIGN SHEET NO. 3 OF 3 FILE NO. 30451 DESIGN NO. 718

DESIGN TEAM SHUCK-BRITSON INC. 400 EAST COURT AVE. SUITE 140 DES MOINES, IOWA 50309 515-243-4477 S.B.I. NO. 109.0051.01 | POLK COUNTY | PROJECT NUMBER IM-NHS-035-4(218)93--03-77 | SHEET NUMBER 4

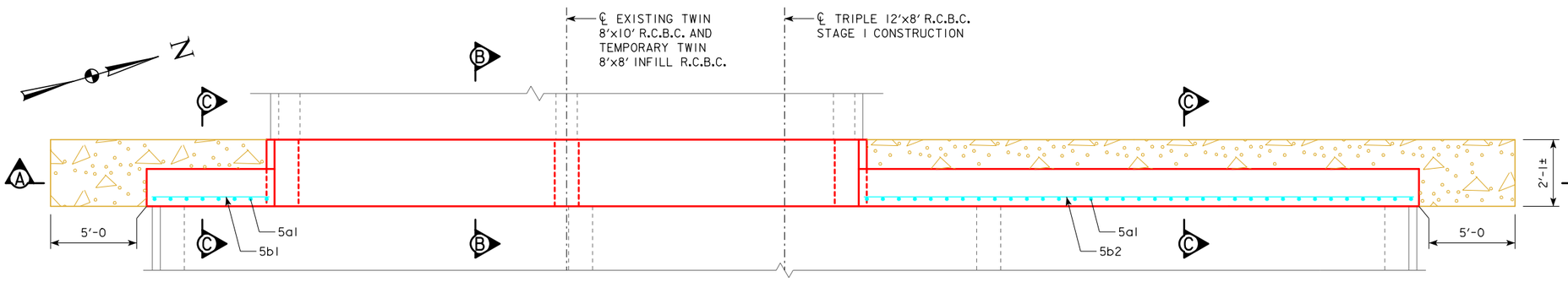


SECTION A-A

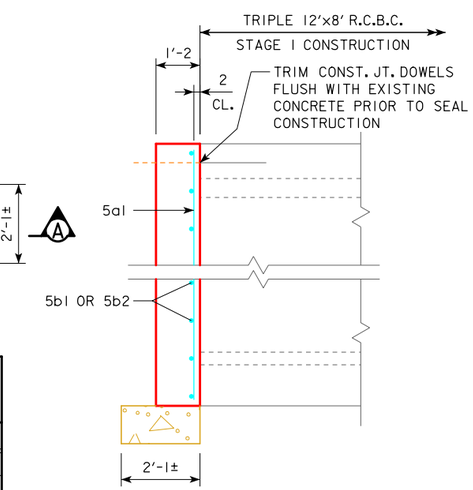
LOOKING WEST, EXISTING TWIN 8'x10' R.C.B.C. NOT SHOWN



SECTION B-B



PLAN AT LIMITS OF STAGE I CULVERT CONSTRUCTION



SECTION C-C

NOTES:
PROVIDE BOND BREAK OF 1/8" TAR PAPER BETWEEN TRIPLE 12'x8' R.C.B.C. STAGE I CONSTRUCTION AND THE TEMPORARY CONCRETE SEAL WALLS AND TEMPORARY TWIN INFILL R.C.B.C. TO FACILTATE FUTURE REMOVAL OF TEMPORARY SHORING SEAL.

CONCRETE FORMS FOR THE TEMPORARY SEAL WALLS MAY BE SUPPORTED USING CONCRETE ANCHORS DRILLED INSIDE THE BARREL OF THE TRIPLE 12'x8' R.C.B.C STAGE I CONSTRUCTION. CONCRETE ANCHORS SHALL BE ONE OF THE FOLLOWING TYPES:

1. DRILLED/GROUTED THREADED STAINLESS STEEL ANCHOR RODS. UPON REMOVAL OF FORMWORK, ANCHOR RODS SHALL BE GROUND FLUSH WITH SURFACE OF CONCRETE. STAINLESS STEEL ANCHOR RODS SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS 4187.01, C.
2. REMOVABLE THREADED ANCHORS. ANCHORS SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. UPON REMOVAL OF FORMWORK, THE ANCHOR HOLES SHALL BE FILLED WITH GROUT.

POLYMER GROUT SHALL BE USED FOR BOTH OPTIONS, AND SHALL BE IN ACCORDANCE WITH IM 491.11.

SEE GENERAL NOTES ON DESIGN SHEET 2 AND IOWA DOT STANDARD SHEET TRRCB G1-12 FOR ADDITIONAL NOTES.

CONCRETE PLACEMENT SUMMARY - TEMPORARY SEAL WALLS

CONCRETE	TOTAL
SOUTH SEAL WALL	1.8
NORTH SEAL WALL	7.8
TOTAL (CU. YDS.)	9.6

1 REVISED: 10-24-2018 THIS SHEET ADDED.

REASON: THE EXPOSED CELLS AT THE WEST END OF STAGE I R.C.B.C. CONSTRUCTION ARE REQUIRED TO BE SEALED IN ORDER TO ALLOW THE PLACEMENT OF BACKFILL AND ROADWAY PAVEMENT BETWEEN STAGE I AND STAGE 2 R.C.B.C. CONSTRUCTION.

REINF. BAR LIST - TEMPORARY SEAL WALLS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	SEAL WALLS (NORTH & SOUTH), VERTICAL	—	43	10'-0	449
5b1	SEAL WALL (SOUTH), HORIZONTAL	—	11	3'-8	42
5b2	SEAL WALL (NORTH), HORIZONTAL	—	11	17'-2	197
	REINFORCING STEEL - TOTAL (LBS.)				688

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 81'-0 R.C.B. CULVERT - STAGE I

TEMPORARY SHORING SEAL DETAILS

STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

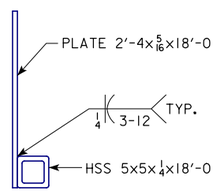
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3A01 OF 3 FILE NO. 30451 DESIGN NO. 718

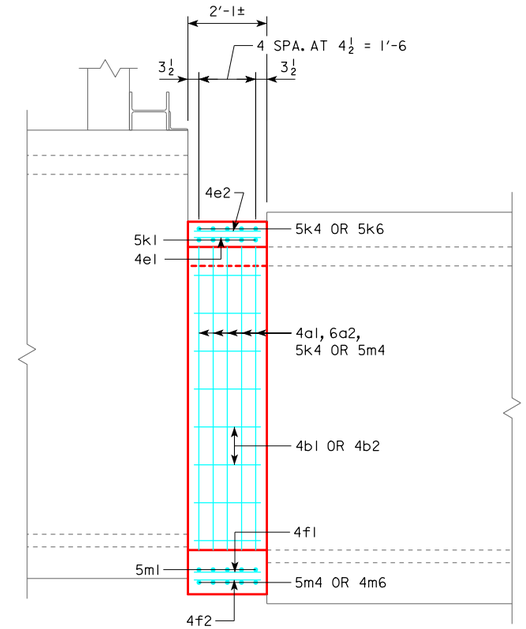
REVISED: OCTOBER 24, 2018

ESTIMATED TEMPORARY SHORING SEAL QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2107-3825025	GRANULAR MATERIAL FOR BLANKET AND SUBDRAIN	CY	3.8	
2	2402-2720000	EXCAVATION, CLASS 20	CY	4	
3	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	13.7	
4	2404-7775000	REINFORCING STEEL	LB	1543	
5	2408-7800000	STRUCTURAL STEEL	LB	819	



DETAIL "A"
SHOWING STEEL SEAL DETAILS

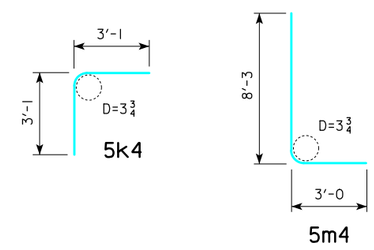


PART LONGITUDINAL SECTION
STEEL SEAL NOT SHOWN

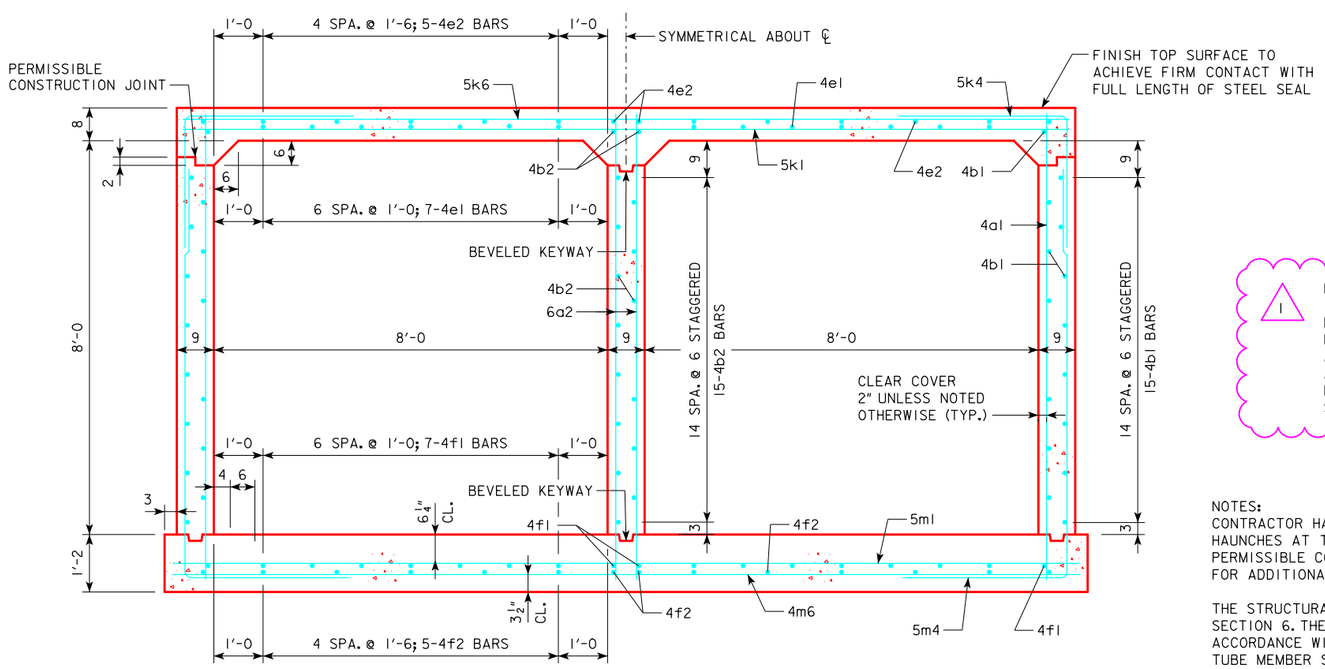
REINF. BAR LIST - TEMPORARY TWIN 8'x8' INFILL R.C.B.C.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	EXTERIOR WALLS, F.F.V.	—	10	9'-5	63
6a2	INTERIOR WALL, VERTICAL	—	10	9'-5	141
4b1	EXTERIOR WALLS, F.F.H. & B.F.H.	—	32	1'-9	37
4b2	INTERIOR WALL, F.F.H. & B.F.H.	—	17	1'-9	20
4e1	SLAB, BOTT. LONGIT.	—	14	1'-9	16
4e2	SLAB, TOP LONGIT.	—	14	1'-9	16
4f1	FLOOR, TOP LONGIT.	—	18	1'-9	21
4f2	FLOOR, BOTT. LONGIT.	—	14	1'-9	16
5k1	SLAB, BOTT. TRANSV.	—	5	17'-11	93
5k4	SLAB, TOP CORNER	┌	10	6'-2	64
5k6	SLAB, TOP TRANSV.	—	5	17'-11	93
5m1	FLOOR, TOP TRANSV.	—	5	18'-5	96
5m4	FLOOR, BOTT. CORNER	└	10	11'-3	117
4m6	FLOOR, BOTT. TRANSV.	—	5	18'-5	62
			REINFORCING STEEL - TOTAL (LBS.)		855

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.



TEMPORARY TWIN 8' x 8' INFILL R.C.B.C. BARREL SECTION

1

REVISED: 10-24-2018 THIS SHEET ADDED.

REASON: THE EXPOSED CELLS AT THE WEST END OF STAGE 1 R.C.B.C. CONSTRUCTION ARE REQUIRED TO BE SEALED IN ORDER TO ALLOW THE PLACEMENT OF BACKFILL AND ROADWAY PAVEMENT BETWEEN STAGE 1 AND STAGE 2 R.C.B.C. CONSTRUCTION.

NOTE:
ALL TRANSVERSE REINFORCING BARS AND HORIZONTAL LEGS OF CORNER BARS SHALL BE PLACED PARALLEL TO THE CONCRETE BREAK LINE AS SHOWN.
DIMENSIONS SHOWN FOR ℄-℄ OF TRANSVERSE BARS, VERTICAL WALL BARS, AND CORNER BARS ARE MEASURED ALONG ℄ CULVERT.
TOTAL BARREL CONCRETE:
SLAB = 1.1 CU. YDS.
WALLS = 1.3 CU. YDS.
FLOOR = 1.7 CU. YDS.
TOTAL = 4.1 CU. YDS.

NOTES:
CONTRACTOR HAS THE OPTION TO ELIMINATE THE 6"x6" CHAMFERED HAUNCHES AT THE TOP SLAB IF THE TOP SLAB IS THICKENED TO THE PERMISSIBLE CONSTRUCTION JOINT. NO EXTRA PAYMENT WILL BE MADE FOR ADDITIONAL CONCRETE.

THE STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH AASHTO LRFD SECTION 6. THE MATERIAL FOR THE SEAL PLATE SHALL BE IN ACCORDANCE WITH ASTM A709, GRADE 36. THE MATERIAL FOR THE HSS TUBE MEMBER SHALL BE IN ACCORDANCE WITH ASTM A500, GRADE B.

SEE GENERAL NOTES ON DESIGN SHEET 2 AND IOWA DOT STANDARD SHEET TRRCB GI-12 FOR ADDITIONAL NOTES.

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 81'-0 R.C.B. CULVERT - STAGE 1

TEMPORARY SHORING SEAL DETAILS

STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3A02 OF 3 FILE NO. 30451 DESIGN NO. 718

REVISED: OCTOBER 24, 2018

ESTIMATED PRECAST CULVERT QUANTITIES - ALTERNATE - STAGE 1

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2102-0425071	SPECIAL BACKFILL	CY	257.9	
2	2401-6750001	REMOVALS, AS PER PLAN	LS	1.00	
3	2402-2720000	EXCAVATION, CLASS 20	CY	2572	
4	2415-2111208	PRECAST CONCRETE BOX CULVERT, 12 FT. X 8 FT.	LF	255.0	
5	2415-2201208	PRECAST CONCRETE BOX CULVERT STRAIGHT END SECTION, 12 FT. X 8 FT.	EA	3	
6	2501-8400172	TEMPORARY SHORING	LS	1.00	
7	2502-8213204	SUBDRAIN, PVC, STANDARD PERFORATED, 4 IN.	LF	212.0	
8	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
9	2533-4980005	MOBILIZATION	LS	1.00	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2102-0425071	**SPECIAL BACKFILL** INCLUDES COST OF 1'-0 THICK WORKING BLANKET (SPECIAL BACKFILL) AND THE 6" THICK GRANULAR BEDDING INSTALLED ABOVE THE WORKING BLANKET. SEE DESIGN SHEET 4 AND SHEET SPS.1 FOR ADDITIONAL INFORMATION. THE WORKING BLANKET MAY BE DELETED IF DETERMINED TO BE UNNECESSARY AT THE TIME OF CONSTRUCTION. HOWEVER, THE 6" GRANULAR BEDDING THAT OVERLAYS THE WORKING BLANKET CANNOT BE DELETED. QUANTITY SHOULD BE REDUCED BY 160.6 CY IN THE EVENT THE WORKING BLANKET IS DELETED. RECLAIMED ASPHALT PAVEMENT (RAP) AND RECLAIMED HMA SHALL NOT BE USED FOR THE SPECIAL BACKFILL.
2	2401-6750001	**REMOVALS, AS PER PLAN** INCLUDES ALL WORK FOR REMOVAL AND OFF-SITE DISPOSAL OF THE EXISTING HEADWALL WINGS, SLAB, AND BARREL SECTION AT ONE END OF THE EXISTING CULVERT, AS NEEDED TO CONSTRUCT THE NEW BARREL EXTENSIONS AND HEADWALL. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS. ANY DAMAGE TO MATERIAL NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.
3	2402-2720000	**EXCAVATION, CLASS 20** INCLUDES EXCAVATION NECESSARY TO PLACE THE 1'-0 THICK WORKING BLANKET AS WELL AS THE 6" THICK GRANULAR BEDDING. QUANTITY SHOULD BE REDUCED BY 161 CY IN THE EVENT THAT THE WORKING BLANKET IS DELETED. INCLUDES FILLING AND COMPACTING LOW AREAS AROUND PROPOSED CULVERT.
4	2415-2111208	**PRECAST CONCRETE BOX CULVERT, 12 FT. X 8 FT.** INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE CULVERT TIES, LIFTING HOLE PLUGS, ENGINEERING FABRIC, JOINT MATERIAL, AND GROUT AS REQUIRED.
5	2415-2201208	**PRECAST CONCRETE BOX CULVERT STRAIGHT END SECTION, 12 FT. X 8 FT.** INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE CULVERT TIES, LIFTING HOLE PLUGS, ENGINEERING FABRIC, JOINT MATERIAL, AND GROUT AS REQUIRED. INCLUDES 0° SKEW, 3 PRECAST END SECTIONS, 3 PRECAST LINTEL BEAMS, AND 3 PRECAST CURTAIN WALLS.
6	2501-8400172	**TEMPORARY SHORING** - -
7	2502-8213204	**SUBDRAIN, PVC, STANDARD PERFORATED, 4 IN.** INCLUDES COST OF FURNISHING AND PLACING OUTLET.
8	2526-8285000	**CONSTRUCTION SURVEY** - -
9	2533-4980005	**MOBILIZATION** - -

SPECIFICATIONS:

DESIGN:
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5TH ED., SERIES OF 2010.

CONSTRUCTION:
IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, CURRENT SERIES, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5TH ED., SERIES OF 2010:
BAR REINFORCEMENT IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60.
WELDED WIRE REINFORCEMENT IN ACCORDANCE WITH AASHTO LRFD SECTION 5.
CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c FOR BARREL SECTIONS AS NOTED ON CULVERT BARREL DETAIL STANDARDS, FOR END SECTION DESIGN f'c = 5 KSI.

STANDARDS:
FOR DETAILS AND NOTES NOT SHOWN REFER TO THE FOLLOWING IOWA D.O.T. - HIGHWAY STANDARDS:

STANDARD	ISSUED	REVISED
PRCB G1-13	JANUARY 2013	07-16
PRCB G2-13	JANUARY 2013	07-16
PRCB 12-13	JANUARY 2013	-----
PES 1-13-T3	JANUARY 2013	07-16
PES 3-13-T3	JANUARY 2013	07-16
PES 4-13	JANUARY 2013	-----
PEP 1-13	JANUARY 2013	12-15

NOTE:
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGN HISTORY AT THIS SITE
(INCLUDES THIS DESIGN)

DES. NO.	TYPE OF WORK
718	NEW CONSTRUCTION - STAGE 1
3762	ORIGINAL DESIGN

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 85'-0 PRECAST R.C.B. CULVERT - STAGE 1

ESTIMATED QUANTITIES

STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 4 FILE NO. 30451 DESIGN NO. 718

GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO REPLACE A SEGMENT OF THE EXISTING TWIN 8'-0 x 10'-0 x 155'-0 REINFORCED CONCRETE BOX CULVERT SKEWED 0° AT STATION 309+80 WITH A TRIPLE 12'-0 x 8'-0 x 85'-0 PRECAST REINFORCED CONCRETE BOX CULVERT SKEWED 0° AT STATION 309+87.00. NEW CULVERT CONSTRUCTION WILL BE DONE IN 3 STAGES. THESE PLANS INCLUDE STAGE 1 ONLY. STAGES 2 AND 3 WILL BE COMPLETED AT A FUTURE DATE UNDER SEPARATE CONTRACTS. STAGE 1 OF THIS CULVERT CONSTRUCTION PROJECT CORRESPONDS TO STAGE 3 OF THE GRADING PROJECT IM-NHS-035-4(140)92--03-77.

ELECTRONIC COPIES OF ORIGINAL DESIGN PLANS ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN 3762).

FAINT LINES ON PLANS INDICATE EXISTING STRUCTURE.

UTILITY COMPANIES AND MUNICIPALITIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

EXCESS CLASS 20 EXCAVATION MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED AT THE CONSTRUCTION SITE, AS DIRECTED BY THE ENGINEER.

CLASS 20 EXCAVATION MATERIAL UNSUITABLE FOR BACKFILLING SHALL BE DISPOSED OF IN A MANNER THAT WILL LEAVE THE SITE IN A NEAT CONDITION.

THE CLASS 20 EXCAVATION QUANTITY IS MEASURED TO THE LIMITS SHOWN IN THE GRANULAR BEDDING DETAIL ON DESIGN SHEET 4 AND IS BASED ON THE ASSUMPTION THAT AT THE START OF CULVERT CONSTRUCTION, THE EXISTING GROUNDLINE SHOWN ON THE "SITUATION PLAN" ON DESIGN SHEET 3 HAS REMAINED UNDISTURBED AND NO ROADWAY FILL HAS BEEN PLACED.

THE PRICE BID FOR "REMOVALS AS PER PLAN" SHALL INCLUDE THE COST FOR REMOVALS OF PORTIONS OF THE EXISTING CULVERT.

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION IN RELATION TO EXISTING PORTIONS OF THE STRUCTURE SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

REMOVAL OF THE EXISTING CULVERT SHALL BE ON A VERTICAL PLANE PARALLEL WITH AND AT THE LOCATION INDICATED ON THE "SITUATION PLAN", AND TO THE WIDTH OF THE FLOOR. THE WALLS SHALL BE CUT NORMAL TO THE BARREL WALLS. THE REMOVAL LINE SHALL BE INITIATED WITH A 2½± DEEP SAW CUT ON THE TOP AND BOTH SIDES OF EACH WALL, AND ACROSS THE TOP OF THE FLOOR. THIS SAW CUT SHOULD CUT THRU ANY EXISTING LONGITUDINAL REINFORCING THEREBY FACILITATING A NEAT NON-SPALLED BREAK LINE.

ALL REMOVALS SHALL BE CAREFULLY ACCOMPLISHED AND ANY CONCRETE DAMAGED BY THE CONTRACTOR THAT IS NOT TO BE REMOVED SHALL BE REPAIRED BY THE CONTRACTOR AT NO EXTRA COST TO THE STATE. REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

TEMPORARY SHORING (SHEET PILE OR OTHER) SHALL BE REQUIRED AS NECESSARY TO PREVENT THE EARTH UNDER THE TRAFFIC LANE FROM SLOUGHING IN DURING CONSTRUCTION.

THE CONTRACTOR SHALL SUBMIT A TEMPORARY SHORING PLAN FOR REVIEW. THE TEMPORARY SHORING PLAN SHALL BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA. THE CONTRACTOR SHALL NOT PROCEED WITH INSTALLATION OF THE TEMPORARY SHORING WITHOUT NOTICE TO PROCEED FROM THE ENGINEER.

THE TEMPORARY SHORING SUBMITTAL SHALL INCLUDE:
- DESIGN CALCULATIONS (INCLUDING A GLOBAL STABILITY ANALYSIS)
- SOIL PROPERTIES
- SHORING MATERIALS
- SHORING PLAN LAYOUT (SHOWING LOCATION OF TRAFFIC)
- SHORING DETAILS

TEMPORARY SHORING SHALL BE PAID FOR AS A LUMP SUM INCLUDING ALL OF THE COST FOR DESIGNING, FURNISHING, INSTALLING AND REMOVAL. ALL MATERIAL USED FOR SHORING SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. SHORING IS TO BE REMOVED ONLY AFTER BACKFILLING HAS BEEN COMPLETED. IN ADDITION TO THE REQUIREMENTS NOTED ABOVE, ARTICLE 1107.07 OF THE STANDARD SPECIFICATIONS STILL APPLIES.

THE ROADWAY WILL BE OPEN TO TRAFFIC DURING CONSTRUCTION. TRAFFIC WILL BE MAINTAINED AT ALL TIMES IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS. REFER TO PROJECT NO. IM-NHS-035-4(140)92--03-77 FOR TRAFFIC CONTROL PLANS.

TRAFFIC CONTROL ADJACENT TO THE CULVERT SHALL BE THE RESPONSIBILITY OF THE GRADING CONTRACTOR. THE CONTRACTOR CONSTRUCTING THE CULVERT SHALL COORDINATE CONSTRUCTION OF THE CULVERT WITH THE GRADING CONTRACTOR.

DRAINAGE THROUGH EXISTING CULVERT/CHANNEL SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

PRECAST GENERAL NOTES:

THE PRECAST R.C.B. CULVERT SECTIONS ARE DESIGNED FOR HL-93 LIVE LOAD AND EARTH FILLS OF 10 FEET.

THE PRECAST R.C.B. BARREL AND END SECTIONS SHALL CONFROM TO IOWA D.O.T. SINGLE PRECAST R.C.B. CULVERT STANDARDS. AT THE CONTRACTOR'S OPTION, PRECAST BARREL SECTIONS MAY CONFORM TO ASTM C1577.

THE LENGTH IN LINEAR FEET OF PRECAST REINFORCED CONCRETE BOX CULVERT WILL BE BASED ON THE PLAN QUANTITY. FOR THE NUMBER OF LINEAR FEET GIVEN ON THE PLAN, THE CONTRACTOR WILL BE PAID THE CONTRACT UNIT PRICE PER LINEAR FOOT. THE PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, LABOR AND EQUIPMENT NECESSSARY TO COMPLETE THE WORK EXCEPT FOR BID ITEMS "CONCRETE BOX CULVERT STRAIGHT END SECTION", "CLASS 20 EXCAVATION", "CLASS E REVETMENT", "SPECIAL BACKFILL, AND SUBDRAIN, PVC, STANDARD PERFORATED, 4 IN".

FOR EACH PRECAST BOX CULVERT STRAIGHT END SECTION INSTALLED THE CONTRACTOR WILL BE PAID THE CONTRACT PRICE PER EACH. THE PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL (INCLUDING LINTEL BEAMS AND CURTAIN WALLS), LABOR AND EQUIPMENT NECESSARY TO COMPLETE THE WORK EXCEPT FOR BID ITEMS "PRECAST CONCRETE BOX CULVERT", "CLASS 20 EXCAVATION", "CLASS E REVETMENT", "SPECIAL BACKFILL", AND SUBDRAIN, PVC, STANDARD PERFORATED, 4 IN".

THE CURTAIN WALL AND THE TYPE 3 LINTEL BEAM SHALL BE PRECAST.

THE CONTRACTOR SHALL FURNISH AND INSTALL CULVERT TIES FOR ALL JOINTS. THE MAIN SECTION JOINTS WILL HAVE ONE TIE ON EACH SIDE OF THE BARREL AND THE LAST BARREL SECTION WILL BE ATTACHED TO THE END SECTIONS WITH TWO TIES PER SIDE. THE END SECTION JOINTS WILL HAVE TWO TIES PER SIDE.

CULVERT TIES SHALL BE INCLUDED IN THE COST FOR PRECAST CONCRETE BOX CULVERT. TIE RODS WILL BE 1 INCH DIAMETER STEEL AND SHALL MEET REQUIREMENTS OF ASTM A709 GRADE 36 OR EQUAL.

CULVERT TIE ASSEMBLIES SHALL BE GALVANIZED AFTER FABRICATION.

THE LIMITS FOR EXCAVATION FOR THE PRECAST CONCRETE BOX CULVERT SHALL BE AS SHOWN ON THE "GRANULAR BEDDING DETAIL" ON DESIGN SHEET 4.

THE CONTRACTOR SHALL SUBMIT DETAILS OF THE PROPOSED PRECAST BOX SECTIONS TO THE OFFICE OF BRIDGES AND STRUCTURES FOR ALL PROJECTS. THE DETAILS SHALL INCLUDE THE FOLLOWING INFORMATION AS FOUND ON THE "SUBMITTAL SHOP DRAWING" STANDARD SHEET:

A. A SITUATION PLAN DRAWING SHOWING THE BACK TO BACK PARAPET DIMENSION FOR THE LINE OF THE CULVERT SECTIONS.
B. DIMENSION THE NUMBER OF PRECAST SECTIONS AND SECTION LENGTHS.
C. A DETAIL OF THE PRECAST BARREL SECTIONS SHOWING A CROSS SECTION VIEW OF THE SECTION, STEEL LOCATIONS, DIMENSIONS, ETC.
D. A DETAIL OF THE PRECAST CULVERT END SECTION SHOWING A CROSS SECTION VIEW OF THE SECTIONS, STEEL LOCATIONS, DIMENSIONS, ETC. SIMILAR TO THE END SECTION DETAILS SHOWN IN THE IDOT STANDARDS.

THE CONTRACTOR SHALL PROVIDE ALL INFORMATION SHOWN ON THE SUBMITTAL SHOP DRAWING SHEET REGARDLESS OF WHICH PRECAST BOX OPTION IS SELECTED.

APPROVAL OF DETAILS IS NOT REQUIRED FOR PROJECTS CONFORMING TO "ASTM C1577" AND "IDOT STANDARDS" PRECAST BOX OPTIONS WITH END SECTIONS CONFORMING TO "IDOT STANDARDS." HOWEVER, THE DETAILS SHALL BE RECEIVED BY THE OFFICE OF BRIDGES AND STRUCTURES PRIOR TO THE START OF FABRICATION.

APPROVAL OF DETAILS IS REQUIRED FOR "NONSTANDARD" PRECAST BOX OPTIONS AND "NONSTANDARD" END SECTION OPTIONS. BOXES AND END SECTIONS REQUIRING OPENINGS OR ATTACHMENTS SHALL BE CONSIDERED NONSTANDARD. THE CONTRACTOR SHALL ALLOW THIRTY WORKING DAYS FOR THE ENGINEER'S REVIEW PRIOR TO THE START OF FABRICATION.

DETAILS REQUIRING APPROVAL SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF IOWA. BOXCAR SOFTWARE VERSION 3.1 OR LATER OR OTHER EQUIVALENT SOFTWARE CAN BE USED TO DESIGN THE PRECAST BOX CULVERT BARREL SECTIONS, PROVIDING THE ANALYSIS MEETS THE MINIMUM REQUIREMENTS ESTABLISHED FOR THE IDOT STANDARDS AS FOUND IN THE IDOT BRIDGE DESIGN MANUAL. THE MINIMUM REQUIREMENTS INCLUDE REINFORCEMENT CLEARANCE REQUIREMENTS USED IN THE "IDOT STANDARDS."

DURING CONSTRUCTION OF THIS PROJECT THE CULVERT CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME PERIOD OF TIME WILL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

IM-NHS-035-4(140)92--03-77	GRADING
IM-NHS-035-4(194)94--03-77	BRIDGE REPLACEMENT-PPCB
IM-NHS-035-4(193)93--03-77	BRIDGE REPLACEMENT-PPCB
NHS-035-4(221)93--11-77	RECONSTRUCTION-BRIDGE WIDENING
ITS-035-4(239)--25-77	FIBER OPTICS INSTALLATION
NHSX-160-1(13)--3H-77	PCC PAVEMENT WIDENING

INSTALLATION NOTES:

PRECAST CONCRETE BOX CULVERT SECTIONS SHALL BE LAID WITH THE GROOVE END OF EACH SECTION UP-GRADE, AND THE SECTIONS SHALL BE TIGHTLY JOINED. CONCRETE TIES TO BE USED ONLY TO HOLD BOX SECTIONS TOGETHER, NOT FOR PULLING SECTIONS TIGHT. JOINT OPENINGS BETWEEN SECTIONS SHOULD BE AS TIGHT AS PRACTICABLE AND LIMITED TO A MAXIMUM OF ¾ INCH OPENINGS. THE JOINT ON THE BOTTOM OF THE CULVERT SHALL BE SEALED WITH A FLEXIBLE WATER TIGHT 1 INCH BUTYL ROPE GASKET AS PER MATERIALS I.M. 491.09.

BUTYL ROPE GASKET SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER AND SHALL EXTEND VERTICALLY 6 INCHES ABOVE THE BOTTOM FILLET. ALL JOINTS SHALL BE TRIMMED CLEAN ON THE INSIDE AFTER SEALING.

THE CONTRACTOR SHALL PLACE A 2 FOOT WIDE PIECE OF ENGINEERING FABRIC AROUND THE TOP AND SIDES OF EACH PRECAST JOINT. THE FABRIC SHALL BE CENTERED WITH 1 FOOT ON EACH SIDE OF THE JOINT, THE FABRIC SHALL BE ATTACHED TO THE WALLS AND TOP OF EACH SECTION TO PREVENT THE FABRIC FROM SLIPPING OFF THE JOINT DURING BACKFILLING OPERATIONS. ATTACHMENT METHODS SHALL BE APPROVED BY THE ENGINEER. ALL COSTS INCLUDING MATERIAL AND LABOR ASSOCIATED WITH PROVIDING THE ENGINEERING FABRIC AND INSTALLING IT AS REQUIRED SHALL BE INCLUDED IN THE BID ITEMS "PRECAST CONCRETE BOX CULVERT" AND "PRECAST BOX CULVERT STRAIGHT END SECTION". THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

CLASS E REVETMENT WILL BE PLACED AROUND BOTH PRECAST BOX CULVERT END SECTIONS, AS SHOWN IN THESE PLANS.

DURING BACKFILLING THE COMPACTION ADJACENT TO THE BOTTOM CORNER RADII OR CHAMFER SHALL BE ACCOMPLISHED WITH A MECHANICAL HAND COMPACTOR.

THE CONTRACTOR SHALL FURNISH AND INSTALL LIFTING HOLE PLUGS FOR EACH SECTION. LIFTING HOLES SHALL BE PLUGGED WITH A PRECAST CONCRETE PLUG OR PLASTIC PLUG APPROVED BY THE ENGINEER, SEALED AND COVERED WITH A 2'-0 x 2'-0 PIECE OF ENGINEERING FABRIC CENTERED OVER THE HOLE AND ATTACHED TO THE SECTION TO PREVENT THE FABRIC FROM SLIPPING.

SINCE PRECAST CONCRETE CULVERT END SECTIONS HAVE THE FORESLOPE LOCATED AT THE BOTTOM OF THE PARAPET INSTEAD OF THE TOP (AS IN THE CASE OF CAST IN PLACE RCB CULVERTS) THE MAIN BARREL SECTION HAS BEEN LENGTHENED.

TRAFFIC CONTROL PLAN

THE TRAFFIC CONTROL PLAN IS NOT INCLUDED IN THESE PLANS, BUT IS INCLUDED IN THE GRADING PLANS PROJECT IM-NHS-035-4(140)92--03-77 WHICH IS TIED TO THESE CULVERT PLANS THROUGH THE CONTRACT LETTING PROCESS.

THE POLLUTION PREVENTION PLAN IS NOT INCLUDED IN THESE PLANS, BUT IS INCLUDED IN THE GRADING PLANS PROJECT IM-NHS-035-4(140)92--03-77 WHICH IS TIED TO THESE CULVERT PLANS THROUGH THE CONTRACT LETTING PROCESS.

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 85'-0
PRECAST R.C.B. CULVERT - STAGE 1

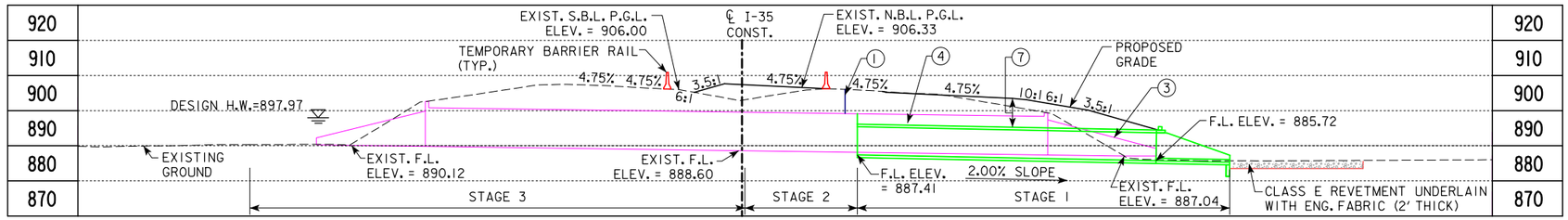
GENERAL NOTES

STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 4 FILE NO. 30451 DESIGN NO. 718



LONGITUDINAL SECTION ALONG ℄ CULVERT

ANTICIPATED CULVERT SETTLEMENT = 1 INCH

BM NO.11 STA. 309+88.71, 91.00'LT.
CUT 'X' IN TOP OF NORTH CORNER OF INLET
HEADWALL OF RCB UNDER I-35
MILE MARKER 93.35. ELEV. = 902.48

PROPOSED GRADE I-35 S.B.L. AND N.B.L.

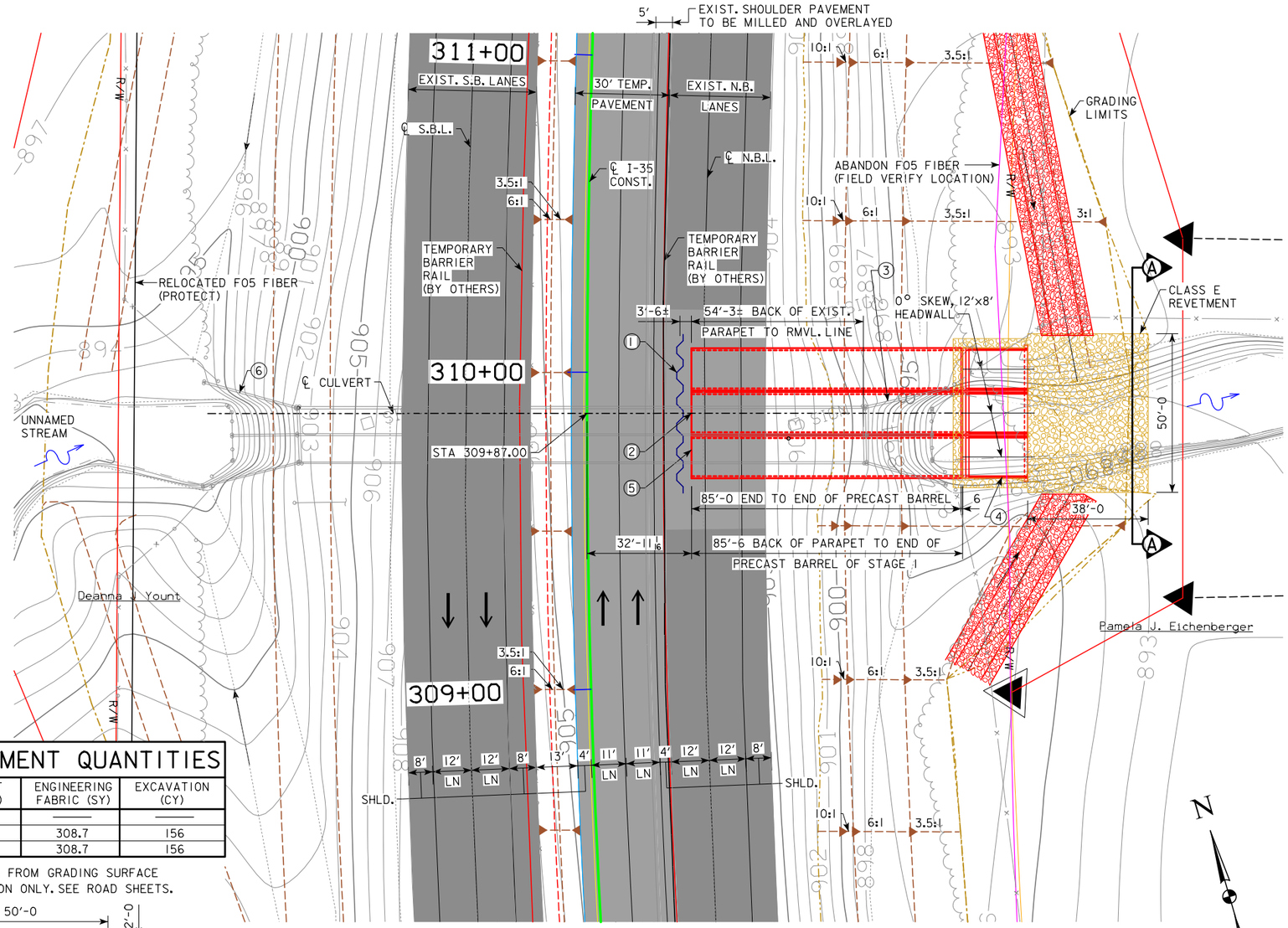
-0.52% -0.75% 0.50%

VPI STA. 287+75.00
ELEV.=922.93
LVC=210.00ft

VPI STA. 315+00.00
ELEV.=902.48
LVC=230.00ft

NOTES:

1. TEMPORARY SHORING AS REQUIRED FOR STAGED CONSTRUCTION
2. STA. 309+87.00, 32.91' RT. EXIST. F.L. ELEV. = 887.93
3. REMOVE EXISTING HEADWALL & BARREL TO LIMITS INDICATED.
4. CONSTRUCT 0° SKEW, 12'x8' PRECAST HEADWALLS AND BARREL SECTIONS.
5. DRAINAGE THROUGH EXISTING CULVERT/CHANNEL SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
6. MAINTAIN EXISTING HEADWALL AND BARREL SECTIONS.
7. DESIGN EARTH FILL = 10' FOR ALL STAGES.



SITUATION PLAN

ALL UNITS IN FEET UNLESS NOTED OTHERWISE

HORIZONTAL CURVE DATA

SCS PI Sta 305+14.32
Δ = 24° 53' 19.19" (RT)
Theta = 4° 08' 56.42"
Ls = 420.00
Ts = 850.48
Es = 72.37
P = 2.53
K = 209.96
Xc = 419.78
Yc = 10.13
LT = 280.08
ST = 140.07
LC = 419.90

Curve Data
Δ = 16° 35' 27.42" (RT)
T = 422.83
L = 839.74
R = 2,900.00
E = 30.66
e = 5.6%
L = 420.0'
X = 188.0'

TRAFFIC ESTIMATE

A.D.T.=53,600 V.P.D. (2008)
A.D.T.=100,300 V.P.D. (2035)
16% Trucks

HYDRAULIC DATA

DRAINAGE AREA = 2.2 SQ MI.
DESIGN Q50 = 1820 CFS
DESIGN Q100 = 2100 CFS
DESIGN Q500 = 2750 CFS
DESIGN HIGH WATER ELEV. = 897.97
OUTLET STREAM SLOPE= 0.0040 FT/FT
CULVERT WATERWAY AREA= 288.0 SF

EXISTING STRUCTURE

TWIN 8'-0 x 10'-0 x 155'-0 R.C.B.

PROPOSED STRUCTURE

TRIPLE 12'-0 x 8'-0 x 85'-0
PRECAST R.C.B. (STAGE 1)

UTILITIES LEGEND:

F05 - FIBER OPTICS - IOWA DOT

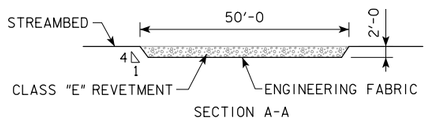
LOCATION

I-35 OVER TRIBUTARY A
TO FOURMILE CREEK
T-80 N R-23 W
SECTION 18
DOUGLAS TOWNSHIP
CITY OF ANKENY
POLK COUNTY
LAT 41.742119°
LONG -93.577544°
FHWA No. 700770

ESTIMATED REVETMENT QUANTITIES

LOCATION	REVETMENT CL. E (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET (STAGE 3)	——	——	——
OUTLET (STAGE 1)	249.6	308.7	156
TOTALS	249.6	308.7	156

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE
QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.



SECTION A-A

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 85'-0 PRECAST R.C.B. CULVERT - STAGE 1

SITUATION PLAN

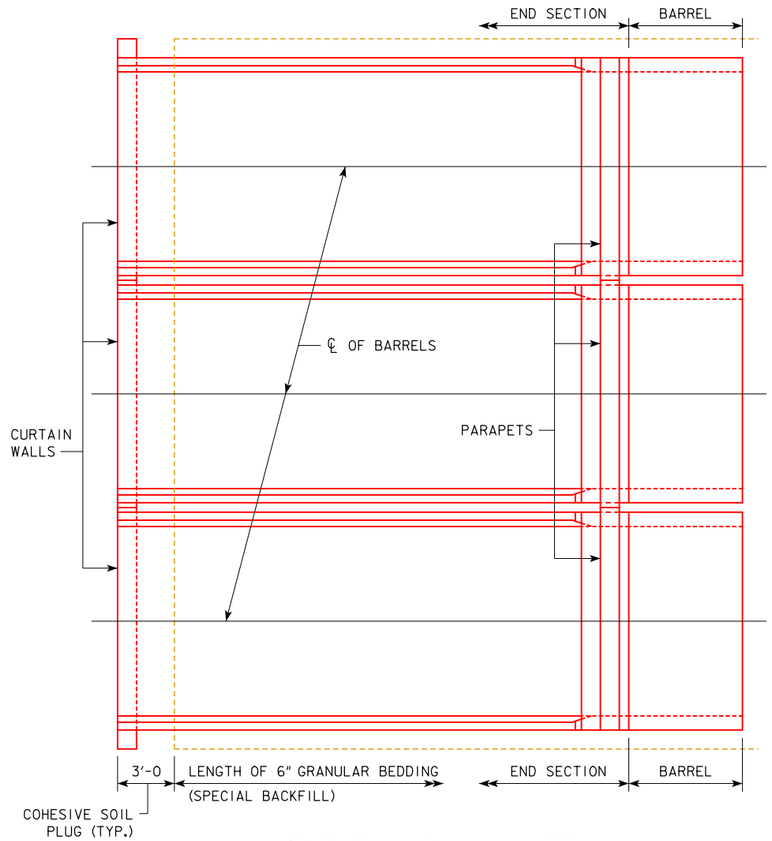
STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

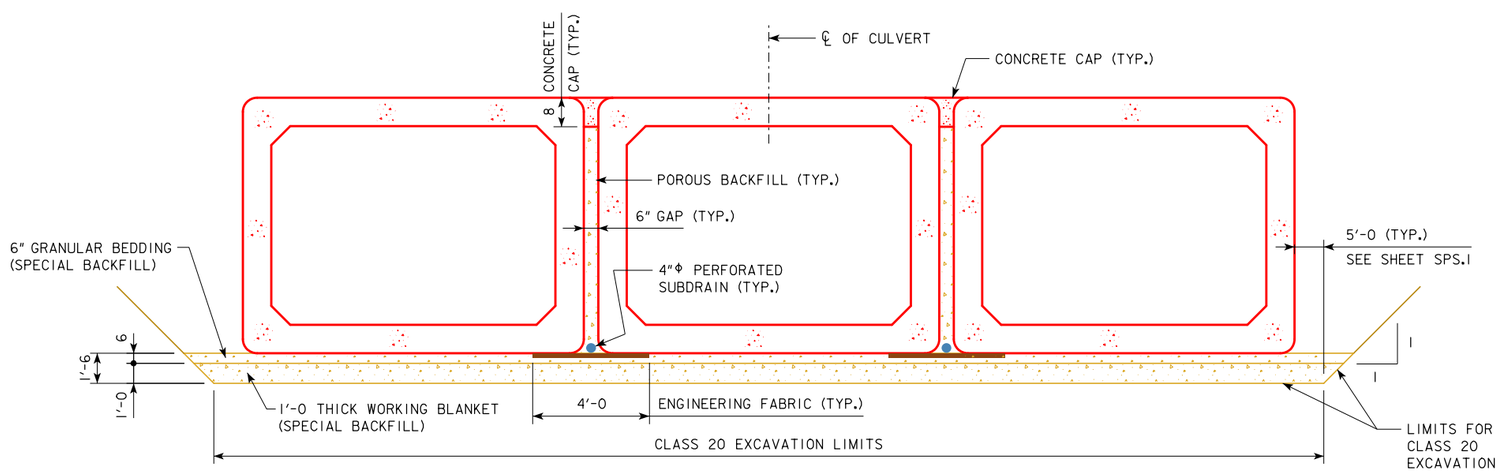
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 4 FILE NO. 30451 DESIGN NO. 718

DESIGN TEAM SHUCK-BRITSON INC. 400 EAST COURT AVE. SUITE 140 DES MOINES, IOWA 50309 515-243-4477 S.B.I. NO. 109.0051.01 | POLK COUNTY | PROJECT NUMBER IM-NHS-035-4(218)93--03-77 | SHEET NUMBER 7



TYPICAL PLAN VIEW



GRANULAR BEDDING DETAIL

6" GRANULAR BEDDING (SPECIAL BACKFILL) SHALL TERMINATE 3'-0 SHORT OF THE PRECAST CURTAIN WALL.

1'-0 THICK WORKING BLANKET (SPECIAL BACKFILL) SHALL TERMINATE AT LIMITS SHOWN ON SHEET SPS.1

GRANULAR BEDDING NOTES:

ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3 OF THE STANDARD SPECIFICATIONS. A 4 FOOT WIDE STRIP OF ENGINEERING FABRIC SHALL BE PLACED ON TOP OF THE GRANULAR BEDDING MATERIAL AND THE COHESIVE SOIL. ENGINEERING FABRIC SHALL BE PLACED THE FULL LENGTH OF THE PRECAST CULVERT. THE ENGINEERING FABRIC SHALL BE CENTERED OVER THE CENTERLINE OF CULVERT BEFORE THE PRECAST CULVERTS ARE PLACED. ALL COSTS INCLUDING MATERIAL AND LABOR ASSOCIATED WITH PROVIDING THE ENGINEERING FABRIC AND INSTALLING IT AS REQUIRED SHALL BE INCLUDED IN THE BID ITEMS "PRECAST CONCRETE BOX CULVERT" AND "PRECAST BOX CULVERT STRAIGHT END SECTION".

THE 4" DIAMETER SUBDRAIN SHALL TERMINATE AND BE CAPPED AT THE UPSTREAM END OF THE END BARREL SECTION. THE SUBDRAIN SHALL OUTLET DOWNSTREAM AT THE END OF THE APRON OF THE END SECTION. THE SUBDRAIN SHALL BE SURROUNDED BY POROUS BACKFILL IN ACCORDANCE WITH SECTION 4131 OF THE STANDARD SPECIFICATIONS. NO COMPACTION OF THE POROUS BACKFILL IS REQUIRED.

POROUS BACKFILL SHALL BE PLACED BETWEEN THE PRECAST BARREL WALLS UP TO 8 INCHES FROM THE TOP OF THE BARREL SLABS. POROUS BACKFILL SHALL ALSO BE PLACED BETWEEN THE END SECTIONS UP TO 8 INCHES FROM THE TOP OF THE WALLS AND 8 INCHES SHORT OF THE END OF THE APRON OF THE END SECTION. THE POROUS BACKFILL SHALL BE IN ACCORDANCE WITH SECTION 4131 OF THE STANDARD SPECIFICATIONS.

A CONCRETE CAP SHALL BE PLACED ON TOP OF THE POROUS BACKFILL BETWEEN THE PRECAST CULVERTS FOR A DEPTH OF 8 INCHES FROM THE TOP OF THE BARREL SLABS, THE TOP OF THE END SECTION WALLS, AND TO A 8 INCH DEPTH AT THE ENDS OF THE APRON OF THE END SECTIONS. THE CONCRETE SHALL BE CLASS C CONCRETE IN ACCORDANCE WITH SECTION 2403 OF THE STANDARD SPECIFICATIONS. THE CONCRETE CAP, APPROXIMATELY 0.03 CU. YDS. PER FOOT, INCLUDING MATERIAL AND LABOR IS INCLUDED IN THE BID ITEMS "PRECAST CONCRETE BOX CULVERT" AND "PRECAST BOX CULVERT STRAIGHT END SECTION".

NOTES:

1. DOUBLE WELDED PIPE OR DOUBLE EYE BOLT TYPE TIES ARE REQUIRED FOR THE BARREL WALL ADJACENT TO THE FIRST PRECAST CULVERT STRUCTURE PLACED AT THE SITE TO ALLOW THE TIES TO BE TIGHTENED FROM THE INSIDE OF THE BARREL WALL.
2. THE TYPE 3 LINTEL BEAMS AND PARAPETS LENGTH SHALL BE INCREASED SO THE ADJOINING ENDS WILL ABUT AGAINST EACH OTHER AT THE SIDES OF CULVERT FOR SIDE-BY-SIDE PRECAST CULVERT STRUCTURES.
3. THE CURTAIN WALLS LENGTH SHALL BE SHORTENED SO THE ADJOINING ENDS WILL ABUT AGAINST EACH OTHER AT THE SIDES OF THE CULVERTS FOR SIDE-BY-SIDE PRECAST CULVERT STRUCTURES.

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 85'-0 PRECAST R.C.B. CULVERT - STAGE 1

GRANULAR BEDDING DETAILS

STA. 309+87.00 ℄ I-35 MAY 2017

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 4 FILE NO. 30451 DESIGN NO. 718

LEGEND

$-H_2O-$	WATER
— DRY	DRY
-◁	PLUGGED
M—	MOISTURE
■	SHELBY
■	BLOW COUNT
▬	DENS. CORE
Ⓢ	SAMPLE

BLOW COUNT
LAYER - NO. BLOWS
B2 ■ 5

	DIAMOND CORE
	SAND
	GRAVELLY SAND
	BOULDERS

SOILS BOOK NO. _ _ _ _ _

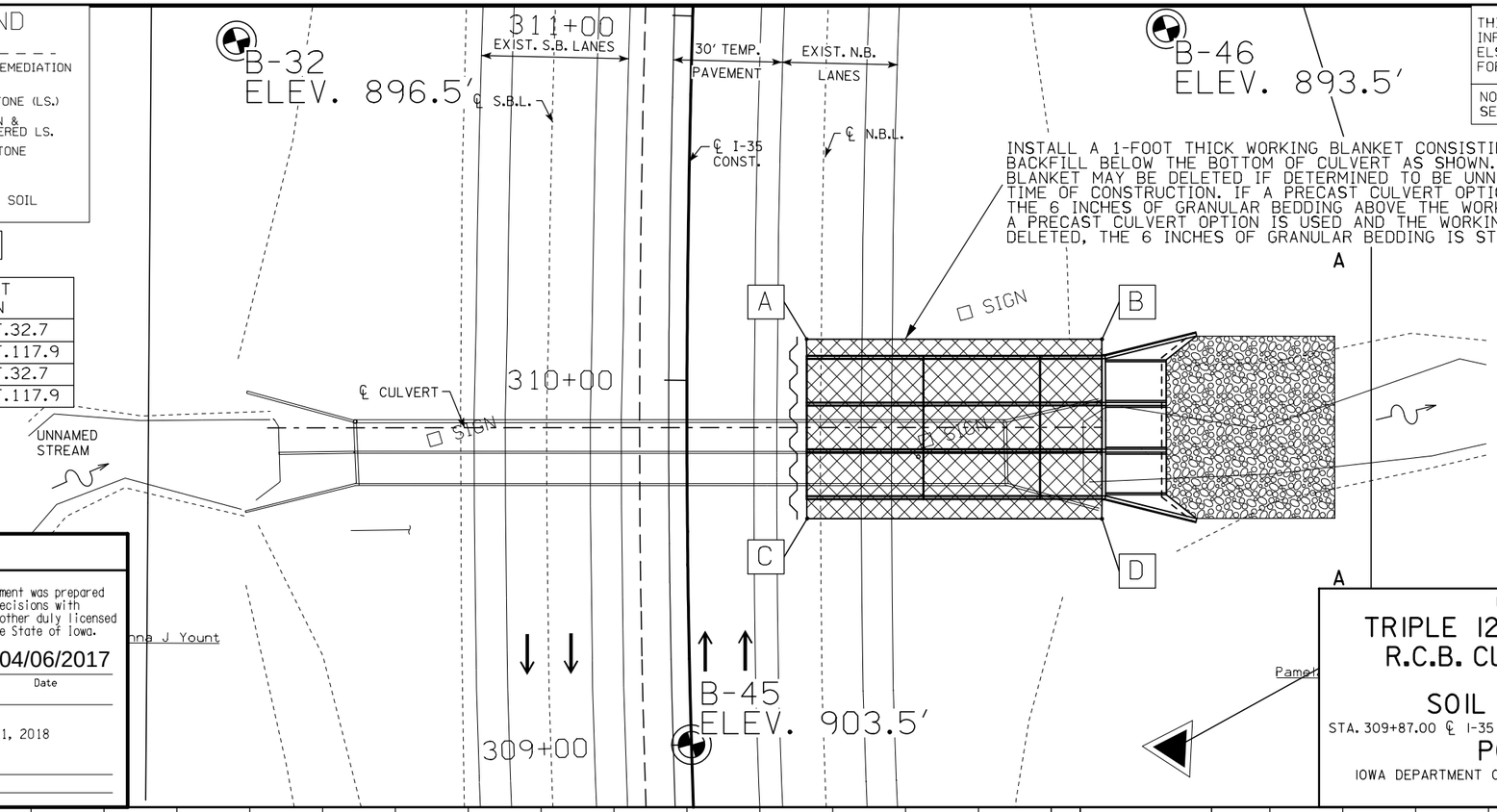
	SOIL REMEDIATION AREA
	LIMESTONE (LS.)
	BROKEN & WEATHERED LS.
	SANDSTONE
	SHALE
	SANDY SOIL

X.X -INDICATES LAYER THICKNESS (ft.)

POINT	CAST-IN-PLACE OPTION	PRECAST OPTION
A	310+11.5 RT.32.7	310+12.5 RT.32.7
B	310+11.5 RT.113.8	310+12.5 RT.117.9
C	309+62.5 RT.32.7	309+61.5 RT.32.7
D	309+62.5 RT.113.8	309+61.5 RT.117.9

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



0 FEET 40

LOCATION

I-35 OVER TRIBUTARY A
TO FOURMILE CREEK
T-80 N R-23 W
SECTION 18
DOUGLAS TOWNSHIP
POLK COUNTY CITY OF ANKENY
LAT 41.742119°
LONG -93.577544°
FHWA No. 700770

GEOTECHNICAL DESIGN

CENSED PROFESSIONAL ENGINEER
MATTHEW D. CUSHMAN
20478
IOWA

I hereby certify that this engineering document was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly licensed Professional Engineers under the laws of the State of Iowa.

Matthew D. Cushman 04/06/2017
Signature Date
MATTHEW D. CUSHMAN
Printed or Typed Name

My license renewal date is December 31, 2018

Pages or sheets covered by this seal: SPS.1

DESIGN FOR 0° SKEW

TRIPLE 12'-0 x 8'-0 x 81'-0 R.C.B. CULVERT - STAGE I

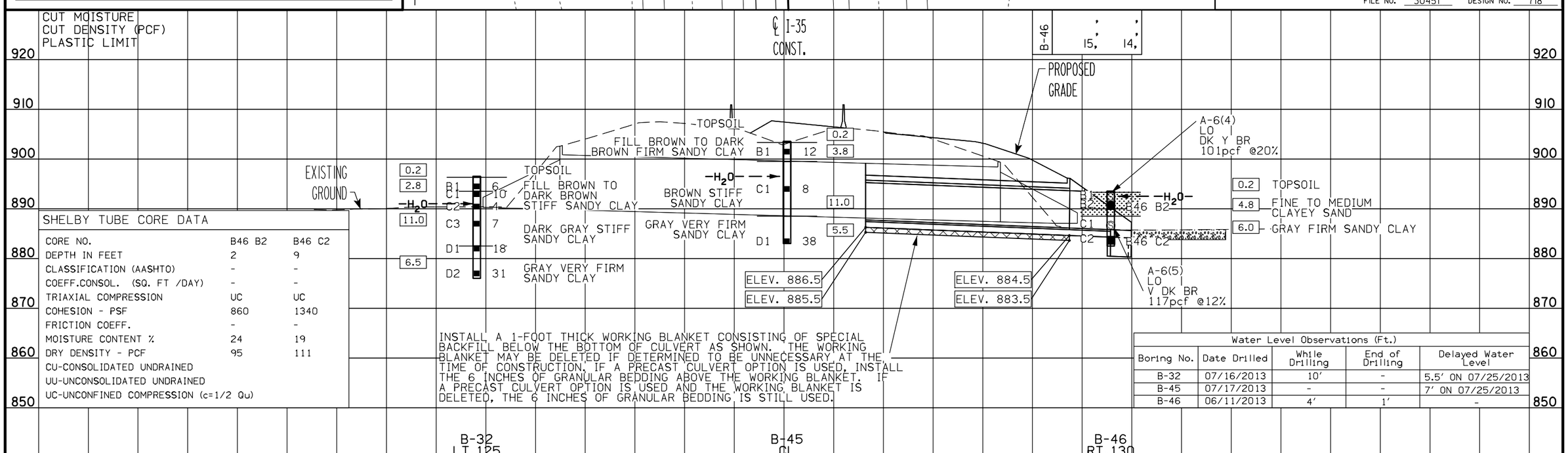
SOIL PROFILE SHEET

STA. 309+87.00 ℄ I-35

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

FILE NO. 30451 DESIGN NO. 718



SHELBY TUBE CORE DATA

CORE NO.	B46 B2	B46 C2
DEPTH IN FEET	2	9
CLASSIFICATION (AASHTO)	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-
TRIAXIAL COMPRESSION	UC	UC
COHESION - PSF	860	1340
FRICTION COEFF.	-	-
MOISTURE CONTENT %	24	19
DRY DENSITY - PCF	95	111

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

INSTALL A 1-FOOT THICK WORKING BLANKET CONSISTING OF SPECIAL BACKFILL BELOW THE BOTTOM OF CULVERT AS SHOWN. THE WORKING BLANKET MAY BE DELETED IF DETERMINED TO BE UNNECESSARY AT THE TIME OF CONSTRUCTION. IF A PRECAST CULVERT OPTION IS USED, INSTALL THE 6 INCHES OF GRANULAR BEDDING ABOVE THE WORKING BLANKET. IF A PRECAST CULVERT OPTION IS USED AND THE WORKING BLANKET IS DELETED, THE 6 INCHES OF GRANULAR BEDDING IS STILL USED.

Water Level Observations (Ft.)

Boring No.	Date Drilled	While Drilling	End of Drilling	Delayed Water Level
B-32	07/16/2013	10'	-	5.5' ON 07/25/2013
B-45	07/17/2013	-	-	7' ON 07/25/2013
B-46	06/11/2013	4'	1'	-

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	**Title Sheets**
A.1	Title Sheet
C Sheets	**Quantities and General Information**
C.1	Project Description
C.1	Estimated Project Quantities
C.1	Estimate Reference Information
C.1	Standard Road Plans
C.1	Index of Tabulations
C.2	Tabulations
D Sheets	**Mainline Plan and Profile Sheets**
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	Interstate-35 Plan View
G Sheets	**Survey Sheets**
G.1 - 2	Reference Ties and Bench Marks
G.3 - 12	Horizontal Control Tab. & Super for all Alignments
J Sheets	**Traffic Control and Staging Sheets**
* J.1	Traffic Control Plan
* J.1	Tabulation of Coordinated Operations
* J.2	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.3	Staging and Traffic Control Sheets
L Sheets	**Geometric, Staking and Jointing Sheets**
L.1	Full Depth Patch Geometrics and Elevations
	* Color Plan Sheets

DESIGN NO. 718

NO MILEAGE SUMMARY

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

ROADWAY DESIGN

LICENSED PROFESSIONAL ENGINEER
SCOTT E. PORT
20264
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Scott E. Port 04/17/2017
Signature Date

Scott E. Port, P.E.
Printed or Typed Name

My license renewal date is December 31, 2018

Pages or sheets covered by this seal: A.1, C.1-C.2, D.1-D.2, G.1-G.12, J.1-J.3, L.1

FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER A.1

100-1A
07-15-97

ESTIMATED PROJECT QUANTITIES
(1 DIVISION PROJECT)

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	167	
2	2402-0425040	FLOODED BACKFILL	CY	142.2	
3	2402-0875150	COMPACTION WITH MOISTURE CONTROL (STRUCTURES)	CY	1930.5	
4	2418-0000010	TEMPORARY STREAM DIVERSION	EACH	1	
5	2507-3250005	ENGINEERING FABRIC	SY	291.8	
6	2507-6800061	REVETMENT, CLASS E	TON	267.2	
7	2529-5070111	PATCHES, FULL-DEPTH FINISH, BY AREA (50 FEET OR GREATER IN LENGTH)	SY	320	
8	2529-5070120	PATCHES, FULL-DEPTH FINISH, BY COUNT	EACH	3	
9	2529-8174010	SUBBASE (PATCHES)	SY	350	
10	2529-8174050	PATCH SUBDRAIN	EACH	1	
11	2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE	STA	0.9	
12	2548-0000110	ASPHALT EMULSION FOR FOG SEAL (SHOULDER RUMBLE STRIPS)	GAL	1	

100-1D
10-18-05

PROJECT DESCRIPTION

This project involves Stage 1 of the triple 12' x 8' box culvert under the northbound I-35 roadway. Stage 2 and Stage 3 of the triple 12' x 8' box culvert shall take place the following years and be construction by others. Refer to the IM-NHS-035-4(140)92--03-77 I-35 Northbound Grading Project for grading, traffic control, staging, TBR, sign removal, erosion control, etc.

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
DR-111	04-21-15	Box Culvert (Backfill)
DR-303	10-18-16	Subdrains (Longitudinal)
EC-301	10-18-16	Rock Erosion Control (REC)
EW-402	04-18-17	Temporary Stream Diversion
PR-140	04-21-15	Subbase Patches
PV-12	04-19-16	Milled Shoulder Rumble Strips
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2402-2710070	EXCAVATION, CLASS 10
		QUANTITY INCLUDES 167 CY OF CLASS 10 CUT FOR THE INSTALLATION OF REVETMENT, CLASS E
		QUANTITY TO BE REDUCED TO 156 CY IN THE EVENT THE PRECAST ALTERNATE OPTION IS SELECTED
		REFER TO TABLES ON SHEETS 4 AND 7
2	2402-0425040	FLOODED BACKFILL
		REFER TO TAB 104-4 FOR QUANTITIES
		REFER TO SUPPLEMENTAL SPECIFICATION SS-15003 "BACKFILLING AND COMPACTION OF PIPE AND REINFORCED BOX
		CULVERTS BY FLOODING", DATE:10/20/2015
3	2107-0875100	COMPACTION WITH MOISTURE CONTROL (STRUCTURES)
		REFER TO TABULATION 104-4 FOR QUANTITIES
4	2418-0000010	TEMPORARY STREAM DIVERSION
		DRAINAGE OF UNNAMED STREAM SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION
5	2507-3250005	ENGINEERING FABRIC
		REFER TO TABULATION 100-23 FOR QUANTITIES
		QUANTITY TO BE INCREASED TO 308.7 SY IN THE EVENT THE PRECAST ALTERNATE OPTION IS SELECTED
		REFER TO TABLES ON SHEETS 4 AND 7
6	2507-6800061	REVETMENT, CLASS E
		REFER TO TABULATION 100-23 FOR QUANTITIES
		QUANTITY TO BE REDUCED TO 249.6 TONS IN THE EVENT THE PRECAST ALTERNATE OPTION IS SELECTED
		REFER TO TABLES ON SHEETS 4 AND 7
7	2529-5070111	PATCHES, FULL-DEPTH FINISH, BY AREA (50 FEET OR GREATER IN LENGTH)
8	2529-5070120	PATCHES, FULL-DEPTH FINISH, BY COUNT
9	2529-8174010	SUBBASE (PATCHES)
10	2529-8174050	PATCH SUBDRAIN
		REFER TO TABULATION 102-6C FOR QUANTITIES.
		REFER TO D SHEETS FOR REMOVAL LIMITS.
		REFER TO L SHEETS FOR GEOMETRICS AND ELEVATIONS.
		PATCHES TO CONSIST OF 6" DEPTH OF HOT MIX ASPHALT HIGH TRAFFIC BASE COURSE, 1/2 INCH MIX, 2.5" DEPTH OF
		HMA HIGH TRAFFIC INTERMEDIATE COURSE, 1/2 INCH MIX, AND 2" DEPTH OF HMA HIGH TRAFFIC SURFACE COURSE, 1/2' MIX
		WITH PG 58-28H HIGH TRAFFIC ASPHALT BINDER.
11	2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE
12	2548-0000110	ASPHALT EMULSION FOR FOG SEAL (SHOULDER RUMBLE STRIPS)
		REFER TO TABULATION 112-10 FOR QUANTITIES

111-25
10-18-11

INDEX OF TABULATIONS

Tabulation	Tabulation Title	Sheet No.
C Sheets		
100-1A	ESTIMATED PROJECT QUANTITIES (1 DIVISION PROJECT)	C.1
100-1D	PROJECT DESCRIPTION	C.1
100-4A	ESTIMATE REFERENCE INFORMATION	C.1
100-23	ROCK EROSION CONTROL	C.2
102-5	EXISTING PAVEMENT	C.1
102-6C	FULL-DEPTH PATCHES	C.2
104-4	DRAINAGE STRUCTURES BY CULVERT CONTRACTOR	C.2
105-4	STANDARD ROAD PLANS	C.1
110-1	REMOVAL OF PAVEMENT	C.2
112-10	MILLED RUMBLE STRIPS	C.2

102-5
04-18-17

EXISTING PAVEMENT

No.	Location					Year	Type	Project Number	Surface		Base		Subbase		Removal		Coarse Aggregate			Reinforcement	Remarks
	County	Route	Dir. of Travel	Begin Ref. Loc. Sign	End Ref. Loc. Sign				Type	Depth IN	Type	Depth IN	Type	Depth IN	Type	Depth IN	Source	Type	Durability Class	Type	
1	POLK	I-035	1	92.65	93.84	2008		IM-35-4-(131)92--13-77	HMA	2	HMA	2			MIL	2	AMES MINE	C.LST.			WIDENING VARIES
2	POLK	I-035	1	92.65	93.84	2008	W	IM-35-4-(131)92--13-77	HMA	2	HMA	2					AMES MINE	C.LST.			
3	POLK	I-035	1	92.65	93.84	1988		IR-35-3(49)87	AAC	4							AMES MINE	C.LST.			
4	POLK	I-035	1	92.65	93.84	1965		I-35-4(11)93	PCC	10			GSB	4			CHRISTENSEN	GRAVEL	1		

102-6C
04-18-17

FULL-DEPTH PATCHES

Possible Standards: PR-101, PR-102, PR-103, PR-104, PR-105 and PR-140.

Location				Dimension			PCC Patches													
Count	Station	Reference Location Sign	Lane	Length	Width	Patch Thickness	With Dowels	Without Dowels	C R C	Ramp with Dowels	HMA Patches	Composite HMA	Subbase Patches	Subbase Patch w/ 'EF' Joint	Patch Subdrain	'CD' Joints	'CT' Joints	'EF' Joints	Anchor Lugs Removal	Remarks
							PR-103	PR-102	PR-104	PR-105			PR-140	PR-101	PR-101 or PR-140			PR-101		
			L, R, or B	FT	FT	IN	SY	SY	SY	SY	SY	TON	SY	SY	No.	No.	No.	No.	No.	
1 & 2	309+50.00		ALL	90.0	24.0	10.5					240.0		240.0							INCLUDES 6" DEPTH OF SPECIAL BACKFILL TO 3'
3	309+50.00		SHOULDER	90.0	8.0	10.5					80.0		110.0		1					OUTSIDE OF EDGE OF SHOULDER.
										TOTALS:	320.0		350.0		1					

104-4
10-20-09

DRAINAGE STRUCTURES BY CULVERT CONTRACTOR

* Not a Bid Item

Location	Design Number	Size	Kind	Lgth. New Const.	No. of Aprons	Flow Line Elevation				Dimensions - Lin. Ft.				Skew Ahead		By Road Contractor								Remarks
										Total		Extensions		Degrees		Dike					Comp. Backfill	Floodable* Backfill	Porous* Backfill	Flooded Backfill	
																Rt. / Lt.	Location Station	Top. Elev.	Type			(A)	(B)	(A+B)	
		Ft.		Lin. Ft.		Left	Right	Other	Other	Left	Right	Left	Right	Left	Right						Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	
309+87.00	718	12X8	TRIPLE BOX	81	1	887.41	885.78				131										1930.5	135.0	7.2	142.2	Culvert contains 2,492 CY of Class 20
																									Excavation. Refer to box culvert quantities.
																									Refer to Sheet 2 and Situation Plan Sheet.

100-23
04-21-15

ROCK EROSION CONTROL

Refer to EC-301

Location				L	W	Rock Erosion Control (REC)					Material Bid Quantities			Remarks
Road Identification	Begin Station	End Station	Side			Type 1	Type 2	Type 3	Type 4	Type 5	Erosion Stone	Class E Revetment	Eng. Fabric	
						Rock Ditch Check	Rock Ditch	Rock Flume	Rock Splash Basin	Rock Slope Protection				
			Lt./Rt.	FT	FT						TON	TON	SY	
I-35	309+87.00		RT	38	50				X			267.2	291.8	Quantity based on
														cast-in-place
														alternate option

112-10
04-19-11

MILLED RUMBLE STRIPS

See PV-12 and PV-13.

* Calculated at 18" width for Shoulder.

Location						Fog Seal* (Milled Rumble Strip)	Effective Shoulder Width			Remarks
Road Identification	Station to Station		Length		Type (Centerline, Rt or Lt Shoulder	Shoulder	PCC Paved	HMA Paved	Granular\ Earth	
			PCC	HMA						
			STA	STA		GAL	FT	FT	FT	
I-35	309+40.00	310+30.00		0.90	Right Shoulder	1.0		8.0		

110-1
04-16-13

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5

* Not a Bid Item

Begin Station	End Station	Side	Pavement Type	Area	Saw Cut*	Remarks
				SY	LF	
309+46.37	310+26.78	MAINLINE	COMPOSITE	240.0	138.0	INCIDENTAL TO FULL DEPTH PATCH
309+46.37	310+26.78	SHOULDER	HMA	80.0	16.0	INCIDENTAL TO FULL DEPTH PATCH
			TOTAL:	320.0	154.0	

SURVEY SYMBOLS

- IN Storm Sewer Intake
- FW Wire Fence
- INB Storm Sewer Beehive Intake
- PR Electic Riser Pole
- GP Guard Post (Less Than 4 Posts)
- SL Speed Limit Sign
- SI Sign
- TIL Tile Line
- GDL Guard Rail Steel
- LUM Luminaire
- UE Utility Elevation
- WV Water Valve
- GPR Guard Post (4 or More Posts)
- FP Filler Pipe
- OUT Tile Outlet
- MIS Miscellaneous
- PPA Power Pole Co. 1
- AST Above Ground Storage Tank
- LP L.P. Tank
- FLG Flag Poles
- WHD Water Hydrant
- WEL Well
- MH Utility Access (Manhole)
- TPD Telephone Pedestal
- MM Mile Marker Post
- FCL Chain Link and Security Fence
- EB Electrical Box
- TV Satelite TV Dish
- UB Utility Box
- UST Underground Tank
- GV Gas Valve
- WHU RV Water Hook Up
- SEP Septic Tank
- FHD Fire Hydrants
- FWD Wood Fence
- RET Retaining Walls
- D Centerline Draw or Stream (Down)
- BNK Stream Bank
- RIP Rip-Rap
- EW Edge of Water
- DU Centerline Draw or Stream (Up)
- ENT Centerline BL of Entrance
- ENU Edge Unpaved Entrance & Parking
- EG Edge of Gravel Road
- SNP Unpaved Shoulder
- DIK Centerline of Dike or Dam

- FO2 FOB Underground Fiber Optic Co. 2
- T1 TLA Underground Telephone Line Co. 1
- E1 ELA Underground Electric Line Co. 1
- FO FOA Underground Fiber Optic Co. 1
- W WLA Underground Water Line Co. 1
- St.S.2 STB Storm Sewer Line Co. 2
- San. SAA Sanitary Sewer Line Co. 1
- E2 ELB Underground Electric Line Co. 2
- TV TVA Underground TV Cable Co. 1
- FO3 FOC Underground Fiber Optic Co. 3

UTILITY LEGEND

This is a POINT 25 Project and is subject to provisions of IAC 761-115.25

Mid American Electric

Mid American Electric

E1 — Mid American Energy - Electric
Michael Younts
10510 Douglas Avenue
Urbandale, IA 50322
515-252-6565
515-979-8294 (Mobile)
myounts@midamerican.com

E2 — Mid Amer. - Electric (Traffic Signals)
Michael Younts
10510 Douglas Avenue
Urbandale, IA 50322
515-252-6565
515-979-8294 (Mobile)
myounts@midamerican.com

FO — City of Ankeny - Fiber
Tom Dozler
220 W. 1st Street
Ankeny, IA 50023
(515) 669-0420
TDozler@AnkenyIowa.gov

FO2 — Iowa Comm. Network (ICN) - Fiber
Mike Broderick
400 E. 14th Street
Des Moines, IA 50319
(515) 725-4610
mike.broderick@iowa.gov

FO3 — Mediacom - Fiber
Al Roberts
2205 Ingersoll Avenue
Des Moines, IA 50312
(515) 202-8669
aroberts@mediacomcc.com

FO4 — CenturyLink - Fiber
Robin DePenning
210 S 3rd Street
Ames, IA 50010
(515) 233-5149
(515) 451-1538 (mobile)
robin.depenning@centurylink.com

FO5 — Iowa DOT - ITS
Tony Taylor
515-239-1902
tony.taylor@dot.iowa.gov

FO6 — Windstream - Fiber
Jim Wiand
3630 109th Street
Urbandale, IA 50322
(515) 382-3180 (Office)
(641) 787-2270 (Mobile)
James.Wiand@windstream.com

FO7 — Nexgen Communications
Ryan Rolwes
3405 SE Crossroads Drive, Ste V
Grimes, IA 50111
(515) 369-7131 (Office)
(515) 401-7979 (Mobile)
ryan@nexgencom.com

FO8 — Aureon Technology (Formerly INS)
Jeff Klocko
7760 Office Plaza Drive South
West Des Moines, IA 50266
(515) 830-0445
jeff.klocko@aureon.com

FO9 — Unite Private Networks (UPN)
Jeff Hensley
13300 Hickman Road, Suite 115
Clive, IA 50325
(515) 243-2241 (Office)
(515) 419-4838 (Mobile)
jeff.hensley@upnfiber.com

G — Mid American Energy - Gas
Michael Younts
10510 Douglas Avenue
Urbandale, IA 50322
(515) 252-6565 (Office)
(515) 979-8294 (Mobile)
myounts@midamerican.com

G2 — Northern Natural Gas
Tom Dickson
1120 Centre Point Drive
Suite 400
Mendota, MN 55120
(651) 456-1777
(763) 234-2970 (mobile)
Tom.Dickson@nngco.com

San. / San. 2 — City of Ankeny - Sanitary Sewer
Roger McFarland
220 W. 1st Street
Ankeny, IA 50023
(515) 460-3747
rmcfarland@AnkenyIowa.gov

T1 — CenturyLink - Telephone
Robin DePenning
210 S 3rd Street
Ames, IA 50010
(515) 233-5149
(515) 451-1538 (mobile)
robin.depenning@centurylink.com

TV — Mediacom - Television
Al Roberts
2205 Ingersoll Avenue
Des Moines, IA 50312
(515) 202-8669
aroberts@mediacomcc.com

W — City of Ankeny - Water
Shawn Buckner
220 W. 1st Street
Ankeny, IA 50023
(515) 979-6987
sbuckner@ankenyiowa.gov

W2 — Des Moines Water Works
Katie Kinsey
2201 George Flagg Parkway
Des Moines, IA 50321
(515) 283-8796
kinsey@dmww.com

St. S — City of Ankeny - Stormwater
Jared Bright
220 W. 1st Street
Ankeny, IA 50023
(515) 229-9539
jbright@ankenyiowa.gov

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING	**Design Color No.**	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

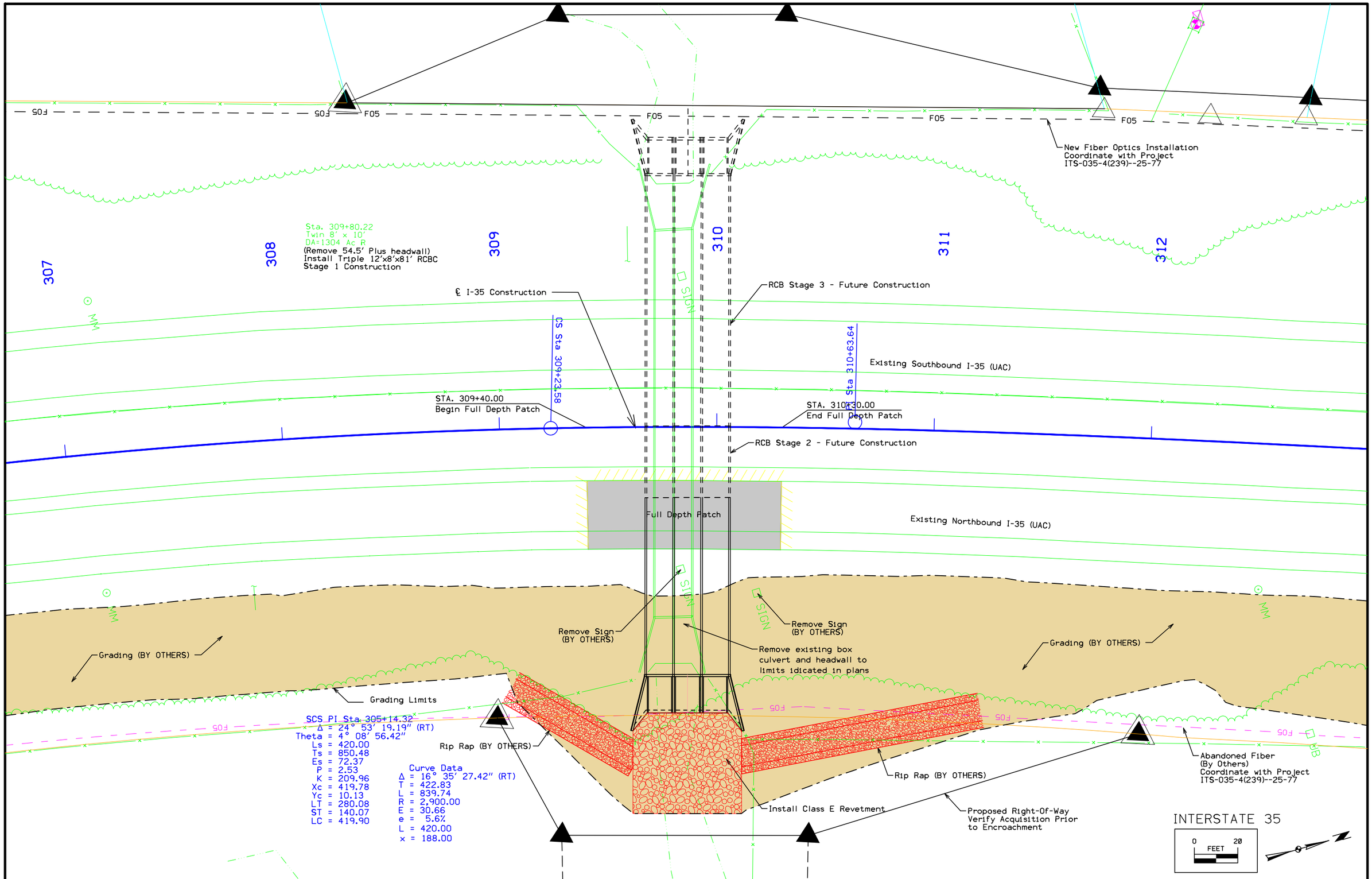
Reference Point
Station
Survey Line
Section Corner
Ground Line Intercept
Saw Cut
Guardrail
Trench Drain
HighTension Cable Guardrail
Sheet Pile
Clearing & Grubbing Area
Pavement Removal

RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D, E, F, & K)



FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER D.2

10:14:21 AM 4/17/2017 V8i_IDOTRoadJ:\2009_projects\109.0051\Design_(218)_RCB_Stage_1\k77035218_D02.SHT

GENERAL INFORMATION

HORIZONTAL DATUM BASED ON IOWA STATE PLANE SOUTH,SCALED FROM POINT #23 (HOWARD R. GREEN) WITH A SCALE FACTOR OF .999955522

VERTICAL DATUM IS NAVD88, WITH ELEVATIONS ESTABLISHED VIA DIGITAL LEVEL LOOP, ORIGINATING ON IDOT BM #827 (ELEV=936.820) FROM IDOT PROJECT #

BENCHMARKS ELEVATION

No. 9 Sta. 335+38.74 152.88' LT SET 1"x36" SMOOTH BAR 10'+/- EAST OF WEST ROW LINE 250'+/- NORTH OF MILE MARKER 93.8 ON I-35----------919.38

No. 10 Sta. 322+64.11 148.31' LT SET 1"x36" SMOOTH BAR, 10'+/- EAST OF WEST ROW LINE, 25'+/- SOUTH OF MILE MARKER 93.6 AND IN LINE WITH 18" RCP----------913.93

No. 11 Sta. 309+88.71 91.00' LT SET CUT "X" IN TOP OF NORTH CORNER OF INLET HEADWALL OF RCB UNDER I-35 MILE MARKER 93.35----------902.48

No. 12 Sta. 302+98.61 115.95' LT SET 1"x36" SMOOTH BAR IN WEST ROW, 15'+/- SOUTH OF BLUE EAST EXIT 92 SIGN 100'+/- NORTH NORTH OF MILE MARKER 93.2----------911.51

No. 13 Sta. 291+97.94 173.56' LT SET 1"x36" SMOOTH BAR IN WEST ROW 5'+/- EAST OF WEST ROW LINE AND 100'+/- NORTH OF MILE MARKER 93.0----------918.35

No. 14 Sta. 273+75.10 599.90' LT SET 1"x36" SMOOTH BAR AT NW QUADRANT ON E. 1ST ST. AND SOUTHBOUND I35 OFF RAMP, 50'+/- NORTH OF LIGHT POLE----------922.09

No. 15 Sta. 270+16.50 1040.74' RT SET 1"x36" SMOOTH BAR SE QUADRANT CREEKVIEW AND E. 1ST ST., 50'+/- EAST OF HYDRANT, DUE NORTH OF OF EAST EDGE OF CREEKVIEW-------896.74

No. 16 Sta. 258+65.45 178.22' LT SET 1"x36" SMOOTH BAR W OF I35, JUST OFF OF SB ON RAMP, 25'+/- EAST OF ROW LINE AT MILE MARKER 92.4----------911.96

No. 17 Sta. 246+77.70 159.26' LT SET 1"x36" SMOOTH BAR IN WEST ROW OF I35, 10'+/- WEST OF ROW FENCE DIRECTLY EAST OF MILLPOND OIL PUMP, 150'+/- SOUTH OF MM 92.2--------915.70

No. 18 Sta. 238+37.02 147.41' LT SET 1"x36" SMOOTH BAR IN WEST ROW I-35, 25'+/- NORTH OF MILE MARKER 92.0 AT TOP OF BACKSLOPE----------914.58

No. 19 Sta. 227+77.41 130.80' LT SET 1"x36" SMOOTH BAR IN WEST ROW I35, 25'+/- NORTH OF MILE MARKER 91.8, DUE WEST OF EXIT 90 SIGN----------912.04

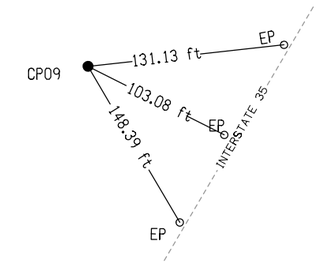
No. 20 Sta. 216+42.77 104.94' LT SET CUT "X" IN NORTH CORNER INLET HEADWALL ON RCB UNDER I35, 30'+/- SOUTH OF MILE MARKER 91.6----------908.47

No. 21 Sta. 206+65.30 95.44' LT SET CUT X----------922.61

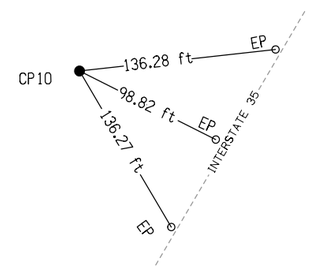
CONTROL POINT INFORMATION

CONTROL POINT	NORTHING	EASTING	DESCRIPTION
CP1	624695.50	1619613.00	SET PK NAIL IN EAST SHOULDER OF NORTHBOUND I35, EVEN WITH NORTH BUILDING LINE OF SLUMBERLAND.
CP2	629077.21	1619522.66	SET PK NAIL AT INTERSECTION OF PAINT STRIPING FOR NORTHBOUND I35 AND E. 1ST ST. OFF RAMP
CP3	630972.41	1621730.68	SET PK NAIL IN SOUTH SHOULDER OF E. 1ST ST., 600'+/- EAST OF INTERSECTION WITH FRISK DRIVE
CP4	632475.57	1619281.93	SET PK NAIL AT INTERSECTION OF PAINT STRIPING FOR NORTHBOUND I35 AND E. 1ST ST. ON RAMP
CP5	637143.11	1620134.70	SET PK NAIL IN EAST SHOULDER OF NORTHBOUND I35 AT SPOT WHERE 18TH ST. REST AREA OFF RAMP BEGINS.
CP6	632399.09	1619187.95	SET PK NAIL AT INTERSECTION OF PAINT STRIPING FOR SOUTHBOUND I35 AND E. 1ST ST. OFF RAMP
CP7	631034.95	1617875.84	SET GIN SPIKE IN TOP OF CURB ON E. 1ST ST., DUE SOUTH OF BURGER KING SIGN.
CP8	629401.77	1619402.36	SET PK NAIL AT INTERSECTION OF PAINT STRIPING FOR SOUTHBOUND I35 AND E. 1ST ST. ON RAMP.
CP9	637196.35	1619939.07	SET 1"X36" SMOOTH BAR, 10'+/- EAST OF WEST ROW LINE, 250'+/- NORTH OF MILE MARKER 93.8.
CP10	635990.47	1619526.09	SET 1"X36" SMOOTH BAR, 10'+/- EAST OF WEST ROW LINE, 25'+/- SOUTH OF MILE MARKER 93.6 AND IN LINE WITH 18" RCP.
CP11	634760.19	1619167.08	SET CUT 'X' IN TOP OF NORTH CORNER OF INLET HEADWALL OF RCB UNDER I35 MILE MARKER 93.35
CP12	634060.99	1619025.89	SET 1"X36" SMOOTH BAR IN WEST ROW, 15'+/- SOUTH OF BLUE GAS EXIT SIGN, 100'+/- NORTH OF MILE MARKER 93.2.
CP13	632941.32	1619046.28	SET 1"X36" SMOOTH BAR IN WEST ROW, 5' EAST OF WEST ROW LINE, AND 100'+/- OF MILE MARKER 93.0.
CP14	631101.29	1618791.81	SET 1"X36" SMOOTH BAR AT NW QUADRANT ON E. 1ST ST. AND SOUTHBOUND I35 OFF RAMP, 50'+/- NORTH OF LIGHT POLE.
CP15	630860.72	1620453.87	SET 1"X36" SMOOTH BAR IN SE QUADRANT OF CREEKVIEW AND E. 1ST ST., 50'+/- EAST OF HYDRANT, DUE NORTH OF EAST EDGE OF CREEKVIEW.
CP16	629633.65	1619296.52	SET 1"X36" SMOOTH BAR, WEST ROW OF I35, JUST OFF OF SOUTHBOUND ON RAMP, 25'+/- EAST OF ROW LINE AT MILE MARKER 92.4.
CP17	628447.01	1619333.77	SET 1"X36" SMOOTH BAR IN WEST ROW OF I35, 10'+/- WEST OF ROW FENCE, DIRECTLY EAST OF MILL POND OIL PUMP, 150'+/- SOUTH OF MILE MARKER 92.2.
CP18	627606.62	1619358.46	SET 1"X36" SMOOTH BAR IN WEST ROW OF I35, 25'+/- NORTH OF MILE MARKER 92.0 AT TOP OF BACKSLOPE.
CP19	626547.38	1619391.28	SET 1"X36" SMOOTH BAR IN WEST ROW OF I35, 25'+/- NORTH OF MILE MARKER 91.8, DUE WEST OF EXIT 90 SIGN.
CP20	625413.27	1619434.49	SET CUT 'X' IN NORTH CORNER INLET OF HEADWALL ON RCB UNDER I35, 50'+/- SOUTH OF MILE MARKER 91.6.
CP21	624436.07	1619459.21	SET CUT 'X' ON TOP OF INLET FLUME OF 48" RCP, WEST ROW OF I35, 100'+/- NORTH OF MILE MARKER 91.4.

STA 335+38.74
SET 1"X36" SMOOTH BAR
XC=1619526.09, YC=635990.47



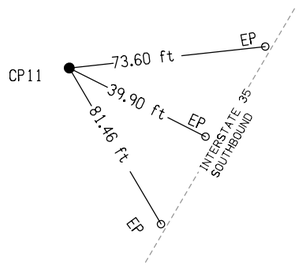
STA 322+64.11
SET 1"X36" SMOOTH BAR
XC=1619526.09, YC=635990.47



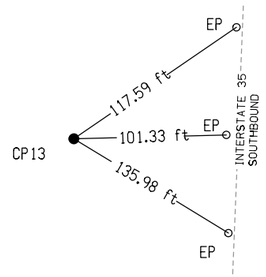
DETAILS OF REFERENCE INFORMATION

All References are Plumb Distances unless otherwise noted.

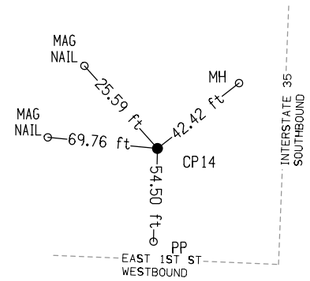
STA 309+88.71
SET CUT 'X'
XC=1619167.08, YC=634760.19



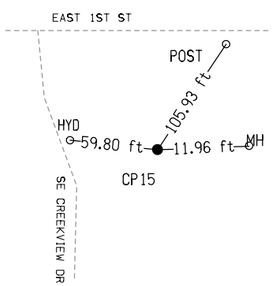
STA 291+97.94
SET 1"X36" SMOOTH BAR
XC=1619046.28, YC=632941.32



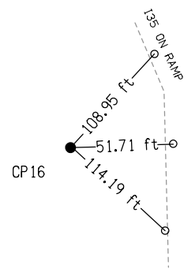
STA 273+75.10
SET 1"X36" SMOOTH BAR
XC=1618791.81, YC=631101.29



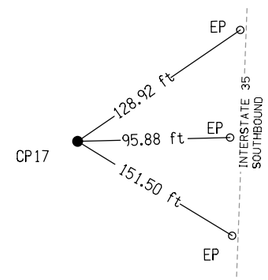
STA 270+16.50
SET 1"X36" SMOOTH BAR
XC=1620453.87, YC=630860.72



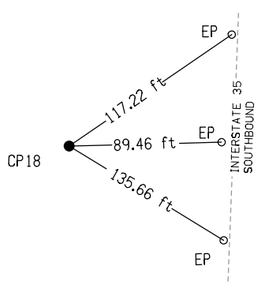
STA 258+65.45
SET 1"X36" SMOOTH BAR
XC=1619296.53, YC=629633.65



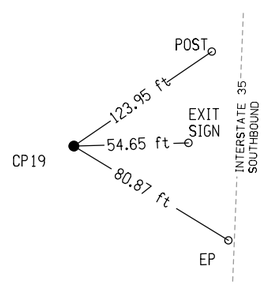
STA 246+77.70
SET 1"X36" SMOOTH BAR
XC=1619333.77, YC=628447.01



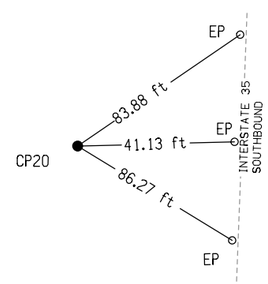
STA 238+37.02
SET 1"X36" SMOOTH BAR
XC=1619358.46, YC=627606.62



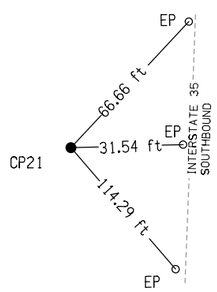
STA 227+77.41
SET 1"X36" SMOOTH BAR
XC=1619391.28, YC=626547.38



STA 216+42.77
SET CUT 'X'
XC=1619434.49, YC=625413.27

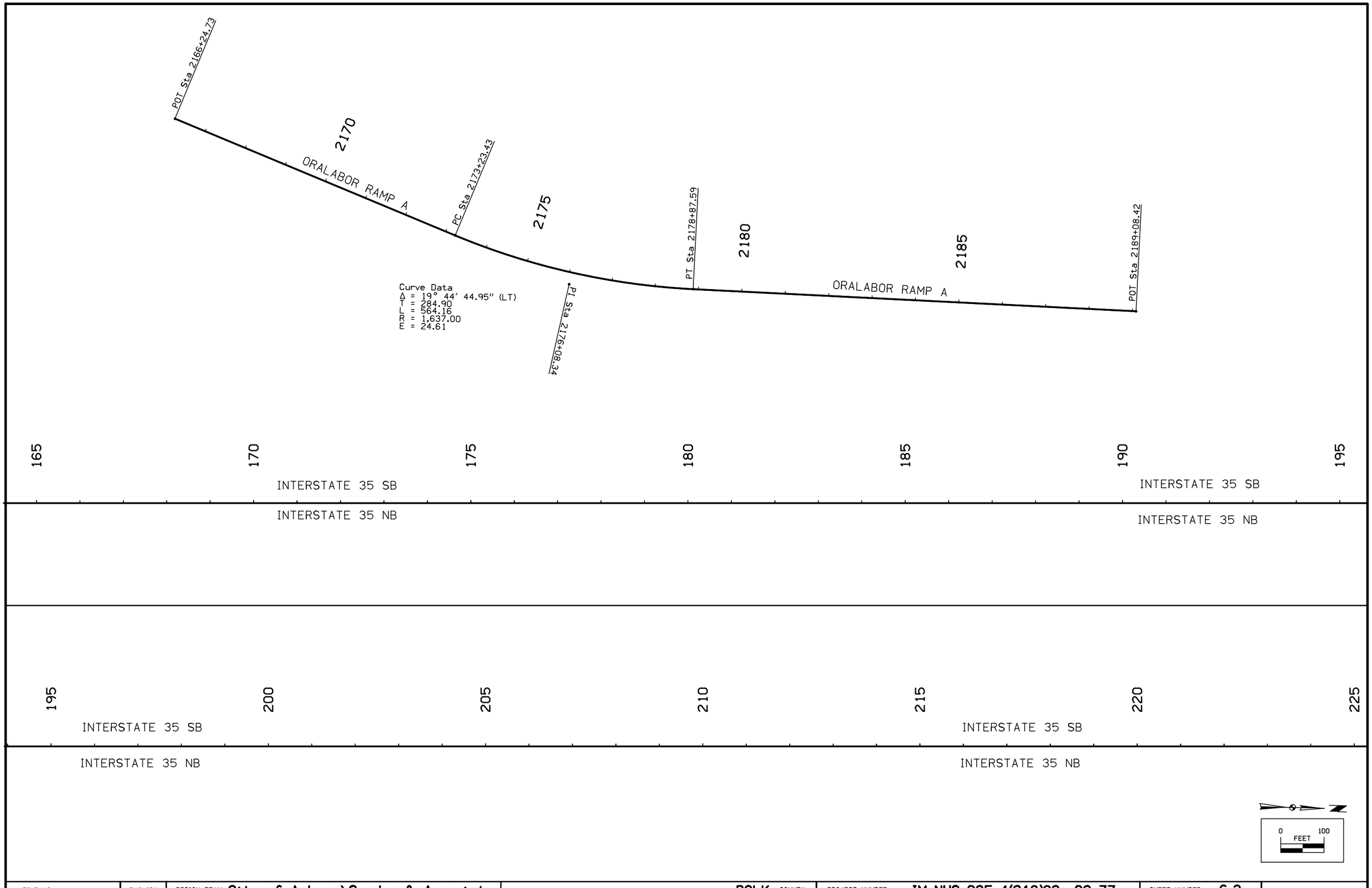


STA 206+65.30
SET CUT 'X'
XC=1619459.21, YC=624436.07



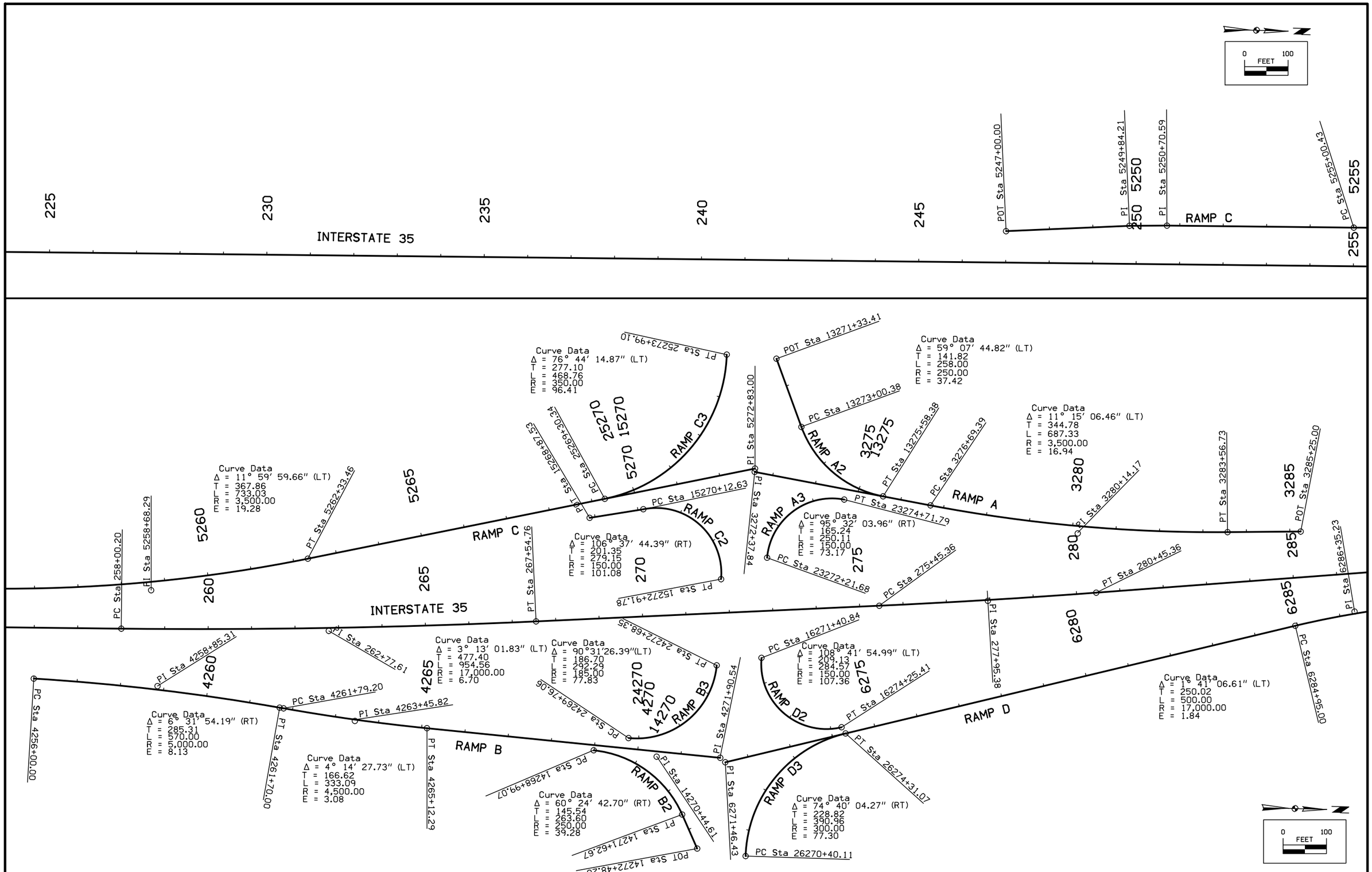
DETAILS OF REFERENCE INFORMATION

All References are Plumb Distances unless otherwise noted.



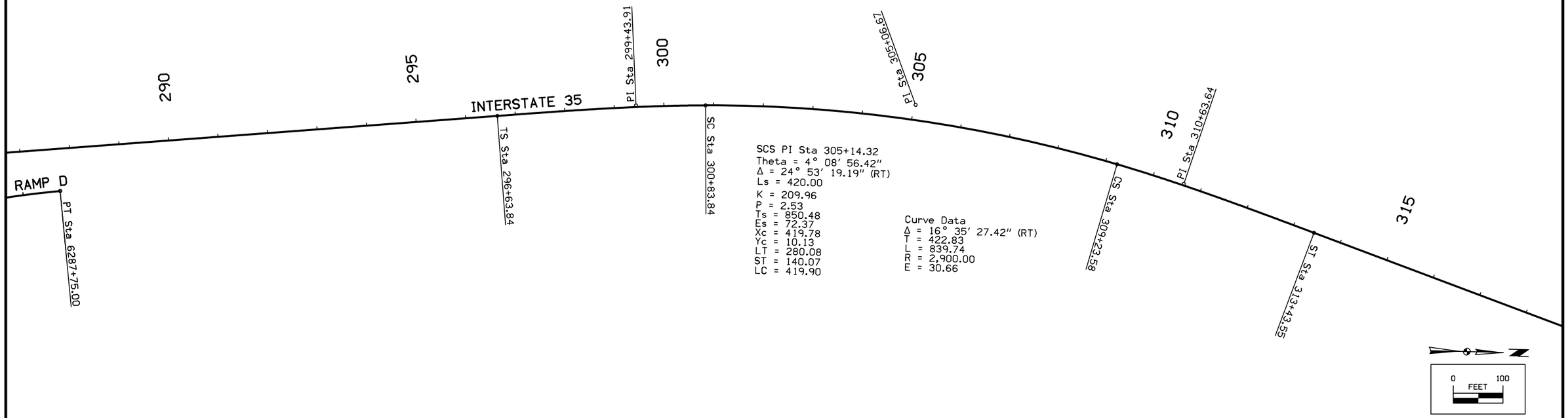
FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER G.3

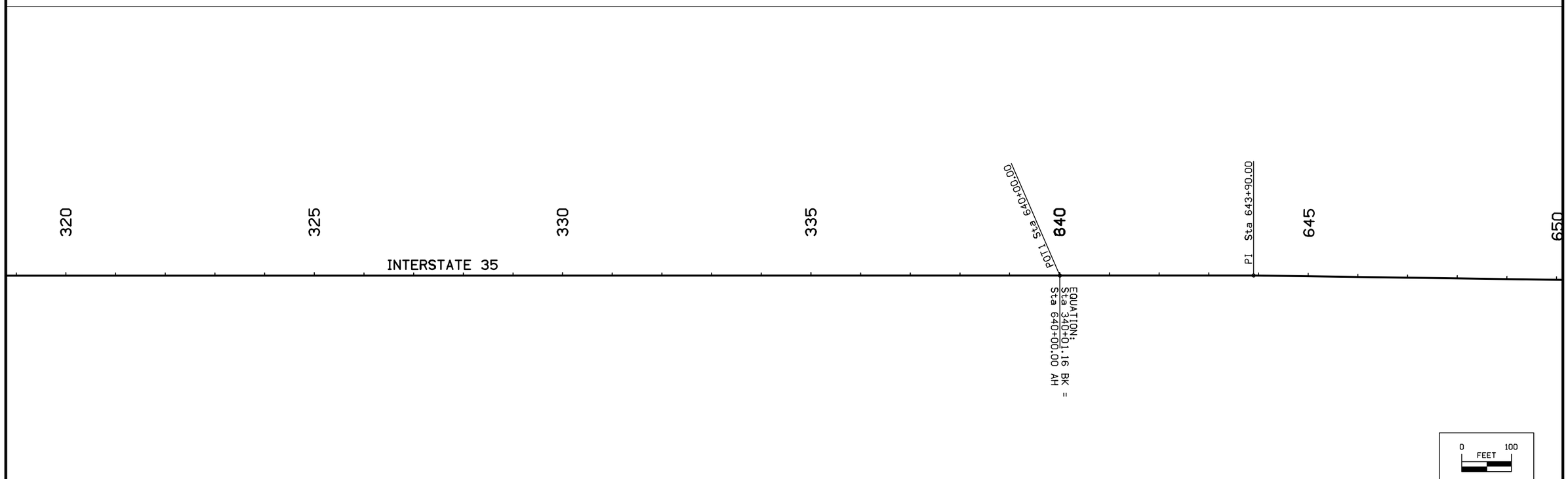
10:48:07 AM 3/17/2017 V81_IDOTRoadJ:\2009_projects\109.0051\Design_(218)_RCB_Stage_1\k77035218_G03.SHT



FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER G.4

10:48:31 AM 3/17/2017 V8i_IDOTRoadJ:\2009_projects\109.0051\Design_(218)_RCB_Stage_1\k77035218_G04.SHT





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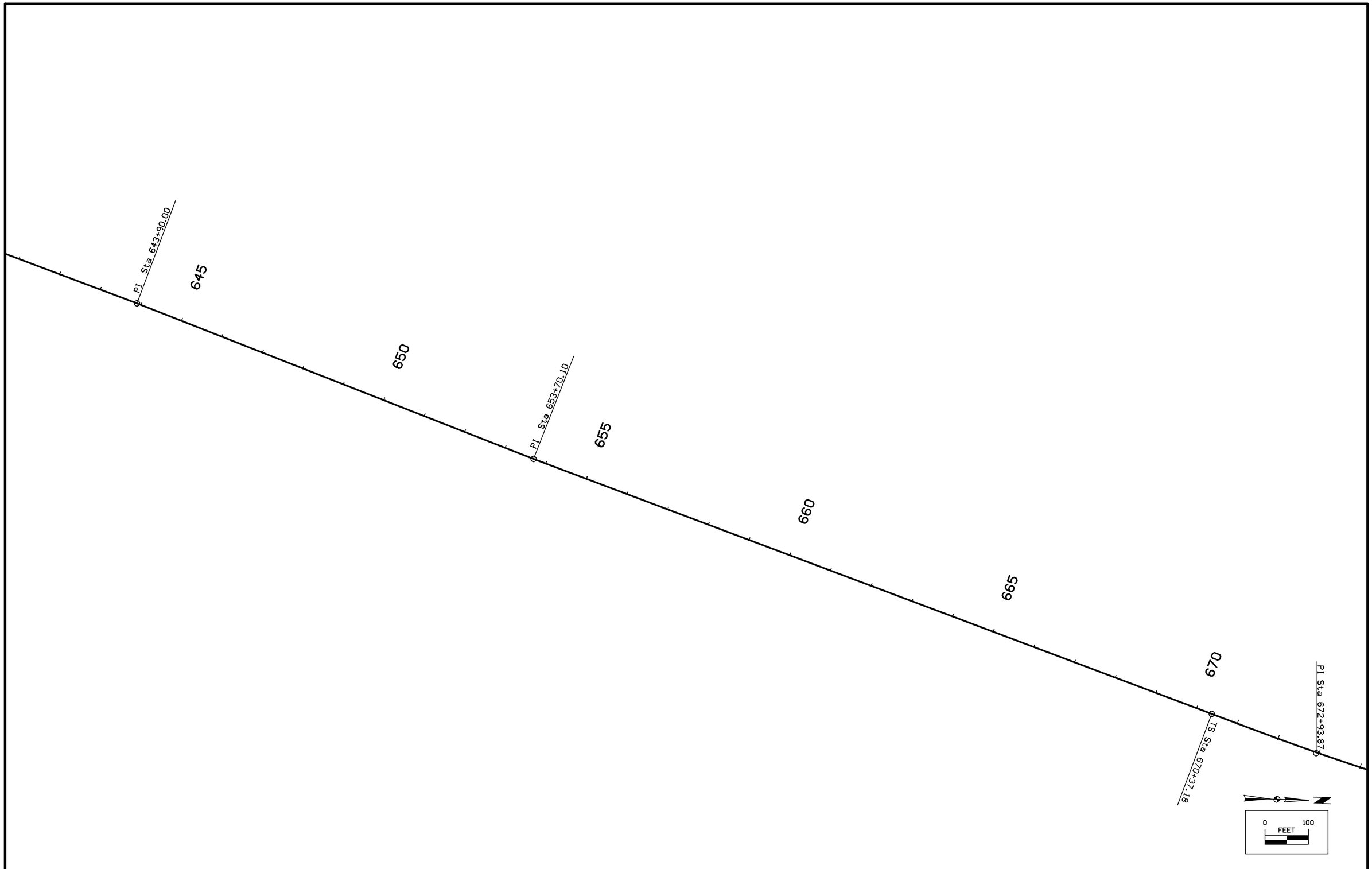
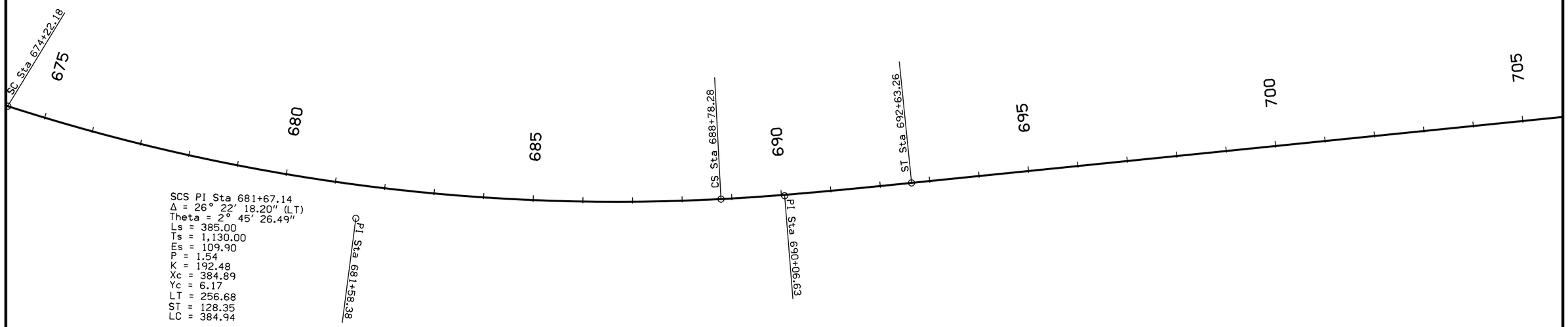
10:48:55 AM 3/17/2017 V81_IDOTRoadJ:\2009_projects\109.0051\Design_(218)_RCB_Stage_1\k77035218_G05.SHT



FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER G.6

10:49:32 AM 3/17/2017 V8i_IDOTRoadJ:\2009_projects\109.0051\Design_(218)_RCB_Stage_1\k77035218_G06.SHT



SCS PI Sta 681+67.14
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Theta = 2° 45′ 26.49″
Ls = 385.00
Ts = 1,130.00
Es = 109.90
P = 1.54
K = 192.48
Xc = 384.89
Yc = 6.17
LT = 256.68
ST = 128.35
LC = 384.94

Curve Data
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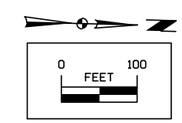
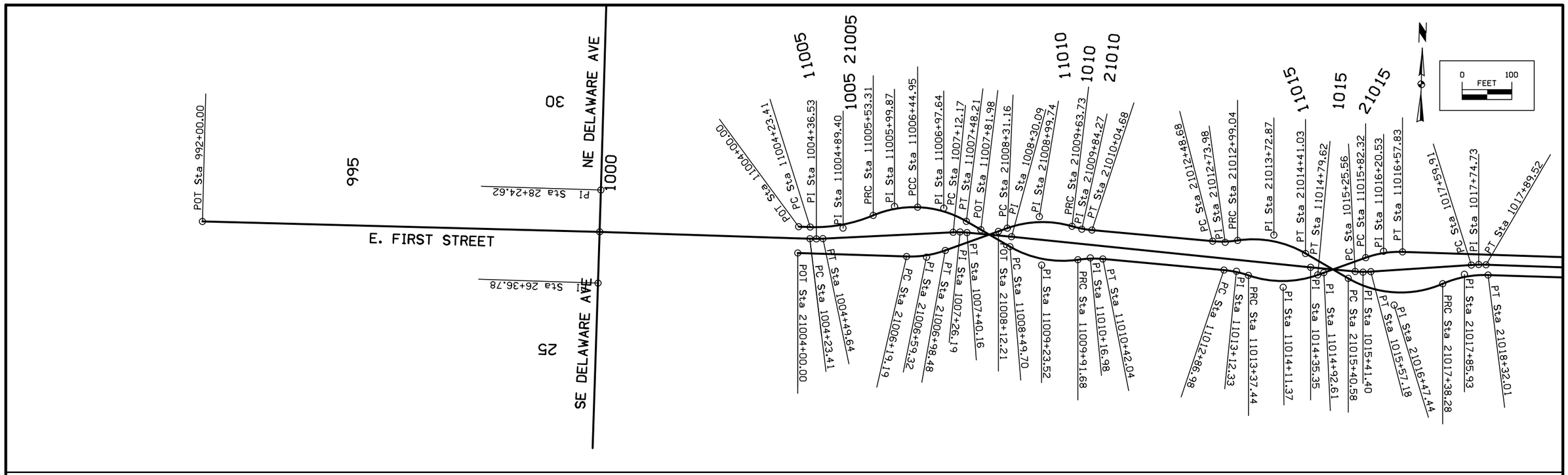
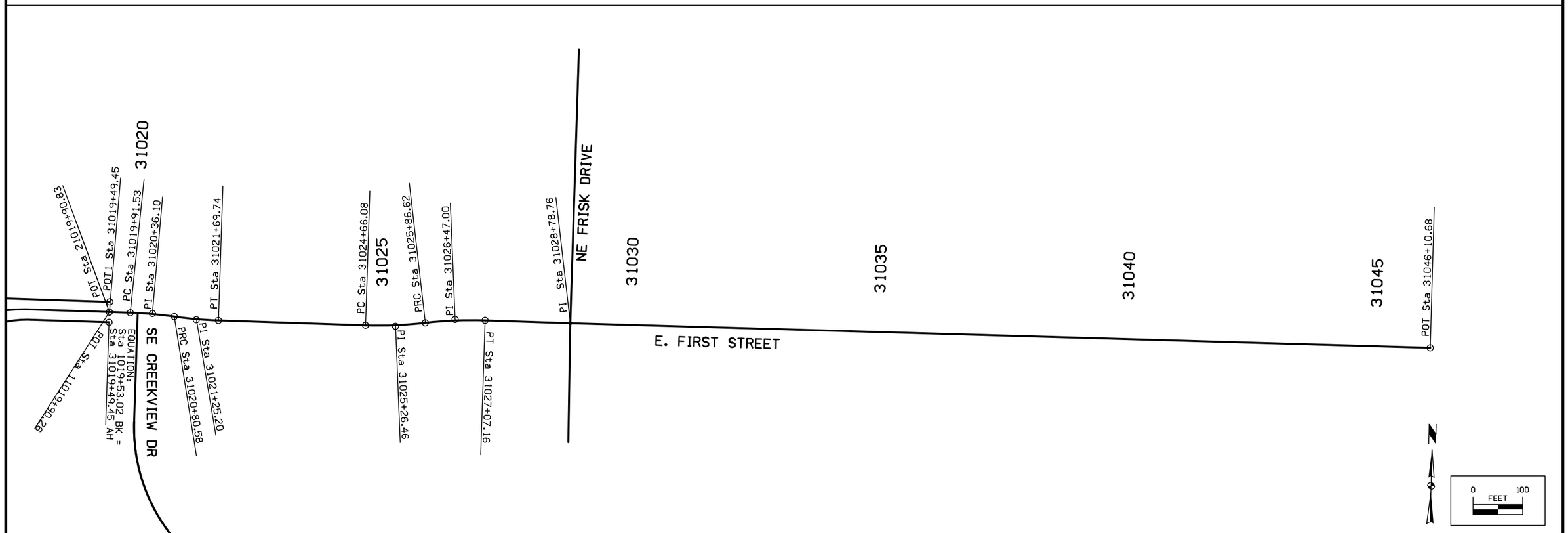
R = 4,000.00
E = 67.18



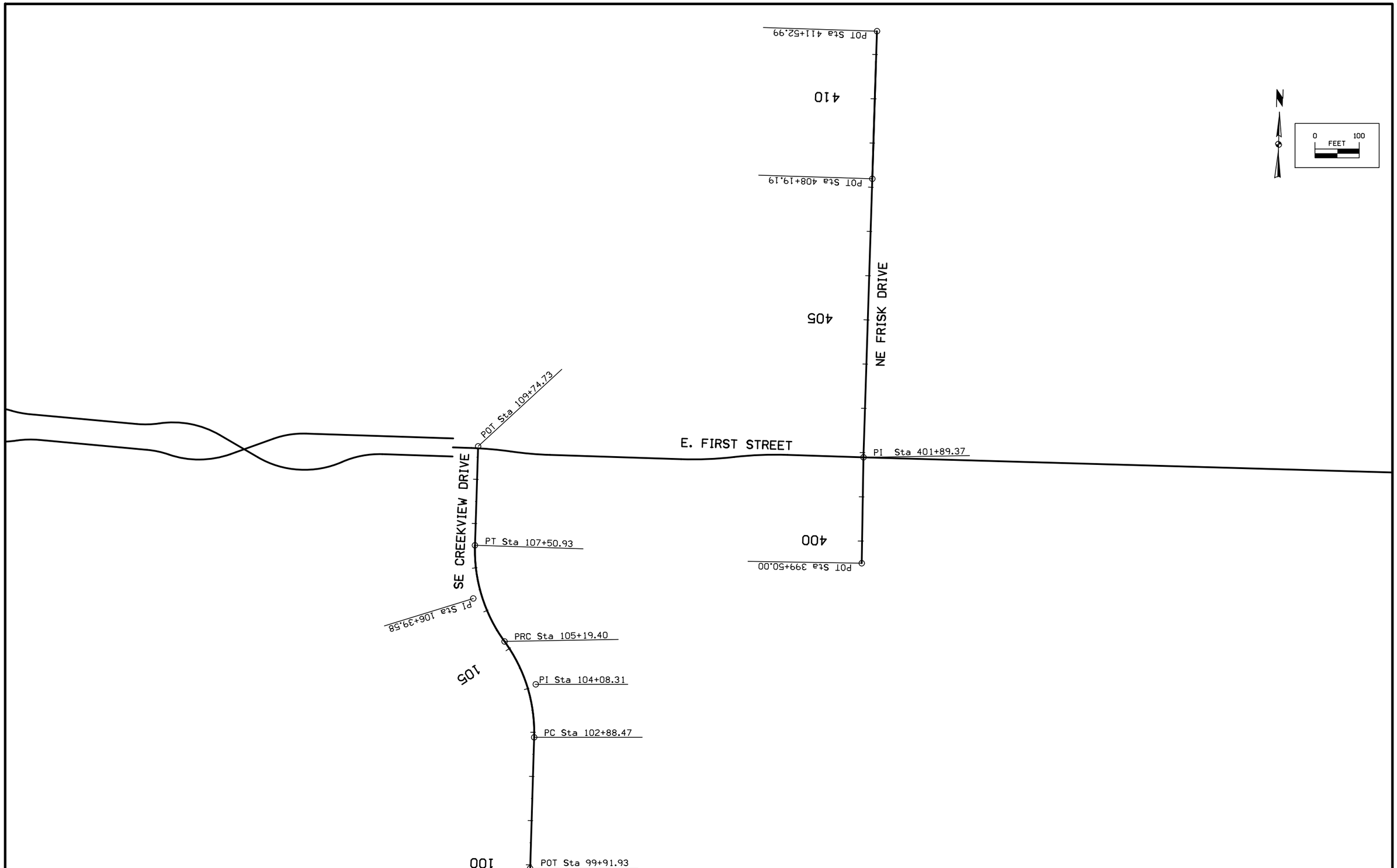
FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER G.7





FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER G.8

10:51:02 AM 3/17/2017 V81_IDOTRoadJ:\2009_projects\109.0051\Design_(218)_RCB_Stage_1\k77035218_G08.SHT



FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER G.9

10:51:50 AM 3/17/2017 V8i_IDOTRoadJ:\2009_projects\109.0051\Design_(218)_RCB_Stage_1\k77035218_G09.SHT

ALIGNMENT COORDINATES

101-16
10-20-09

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
POINT CL1	Interstate 35	108+32.89	614,606.26	1,619,704.72															
CURVE I35-1	Interstate 35							258+00.20	629,571.82	1,619,475.84	262+77.61	630,049.17	1,619,468.54	267+54.76	630,525.36	1,619,434.46			
CURVE I35-2	Interstate 35							275+45.36	631,313.94	1,619,378.03	277+95.38	631,563.32	1,619,360.18	280+45.36	631,812.07	1,619,335.01			
SPIRAL I35-3B	Interstate 35				296+63.84	633,422.32	1,619,172.05										300+83.84	633,840.99	1,619,139.87
CURVE I35-3	Interstate 35							300+83.84	633,840.99	1,619,139.87	305+06.67	634,263.65	1,619,127.85	309+23.58	634,672.14	1,619,237.01			
SPIRAL I35-3A	Interstate 35				309+23.58	634,672.14	1,619,237.01										313+43.55	635,072.08	1,619,364.85
POINT CL2	Interstate 35	640+00.00	637,583.23	1,620,234.91															
POINT CL3	Interstate 35	643+90.00	637,951.73	1,620,362.59															
POINT CL4	Interstate 35	653+70.10	638,873.15	1,620,696.66															
SPIRAL I35-4B	Interstate 35				670+37.18	640,448.35	1,621,242.43										674+22.18	640,814.07	1,621,362.61
CURVE I35-4	Interstate 35							674+22.18	640,814.07	1,621,362.61	681+58.38	641,520.49	1,621,569.89	688+78.28	642,254.42	1,621,512.07			
SPIRAL I35-4A	Interstate 35				688+78.28	642,254.41	1,621,512.07										692+63.26	642,637.00	1,621,469.54
CURVE I35-5	Interstate 35							710+42.10	644,401.58	1,621,244.70	716+07.01	644,961.95	1,621,173.29	721+71.08	645,526.56	1,621,154.85			
POINT CL5	Interstate 35	733+56.20	646,711.04	1,621,116.15															
POINT RAMPA1	RAMP A	3272+37.84	630,999.36	1,619,077.75															
CURVE RAMPA-1	RAMP A							3276+69.39	631,425.70	1,619,144.19	3280+14.17	631,765.96	1,619,199.84	3283+56.73	632,110.53	1,619,188.02			
POINT RAMPA2	RAMP A	3285+25.00	632,278.70	1,619,182.25															
POINT RAMPA21	RAMP A	13271+33.41	631,062.59	1,618,816.26															
CURVE RAMPA2-1	RAMP A							13273+00.38	631,124.01	1,618,971.52	13274+42.20	631,176.18	1,619,103.39	13275+58.38	631,316.14	1,619,126.28			
CURVE RAMPA3-1	RAMP A							23272+21.68	631,052.92	1,619,274.20	23273+86.92	631,063.74	1,619,109.32	23274+71.79	631,226.81	1,619,135.99			
CURVE RAMPB-1	RAMP B							4256+00.00	629,373.43	1,619,595.89	4258+85.31	629,658.57	1,619,605.78	4261+70.00	629,940.73	1,619,648.04			
CURVE RAMPB-2	RAMP B							4261+79.20	629,949.83	1,619,649.40	4263+45.82	630,114.61	1,619,674.08	4265+12.29	630,280.77	1,619,686.50			
POINT RAMPB1	RAMP B	4271+90.54	630,957.14	1,619,737.09															
CURVE RAMPB2-1	RAMP B							14268+99.07	630,665.58	1,619,727.32	14270+44.61	630,810.71	1,619,738.17	14271+62.67	630,872.94	1,619,869.74			
POINT RAMPB22	RAMP B	14272+48.20	630,909.50	1,619,947.06															
CURVE RAMPB3-1	RAMP B							24269+76.06	630,745.04	1,619,697.16	24271+62.76	630,931.22	1,619,711.08	24272+68.35	630,943.44	1,619,524.78			
POINT RAMPC1	RAMP C	5247+00.00	628,470.64	1,619,420.32															
POINT RAMPC2	RAMP C	5249+84.21	628,754.17	1,619,400.57															
POINT RAMPC3	RAMP C	5250+70.59	628,840.50	1,619,398.01															
CURVE RAMPC-1	RAMP C							5255+00.43	629,270.29	1,619,391.44	5258+68.29	629,638.11	1,619,385.82	5262+33.46	629,996.72	1,619,303.84			
POINT RAMPC4	RAMP C	5272+83.00	631,019.87	1,619,069.96															
POINT RAMPC21	RAMP C	15268+87.53	630,642.37	1,619,193.18															
CURVE RAMPC2-1	RAMP C							15270+12.63	630,765.34	1,619,170.20	15272+13.98	630,961.63	1,619,125.33	15272+91.78	630,948.45	1,619,326.24			
CURVE RAMPC3-1	RAMP C							25269+30.34	630,676.08	1,619,148.54	25272+07.44	630,946.21	1,619,086.79	25273+99.10	630,948.08	1,618,809.71			
POINT RAMPD1	RAMP D	6271+46.43	630,968.91	1,619,476.99															
CURVE RAMPD-1	RAMP D							6284+95.00	632,271.87	1,619,399.18	6286+35.23	632,407.35	1,619,363.02	6287+75.00	632,546.56	1,619,346.11			
CURVE RAMPD2-1	RAMP D							16271+40.84	631,045.97	1,619,504.83	16273+49.96	631,032.28	1,619,713.51	16274+25.41	631,234.33	1,619,659.58			
CURVE RAMPD3-1	RAMP D							26270+40.11	631,021.31	1,619,961.40	26272+68.93	631,022.86	1,619,732.59	26274+31.07	631,243.94	1,619,673.57			
POINT FIRST10	East First St.	992+00.00	631,005.33	1,617,486.57															
POINT FIRST11	East First St.	999+99.99	631,005.11	1,618,286.56															
CURVE FIRST_OR-1	East First St.							1004+23.41	631,002.25	1,618,709.97	1004+36.53	631,002.17	1,618,723.09	1004+49.64	631,003.14	1,618,736.18			
CURVE FIRST_OR-2	East First St.							1007+12.17	631,022.64	1,618,997.98	1007+26.19	631,023.68	1,619,011.96	1007+40.16	631,022.76	1,619,025.95			
POINT FIRST12	East First St.	1008+30.09	631,016.87	1,619,115.68															
POINT FIRST13	East First St.	1014+35.35	630,970.76	1,619,719.19															
CURVE FIRST_OR-3	East First St.							1015+25.56	630,964.79	1,619,809.20	1015+41.40	630,963.74	1,619,825.01	1015+57.18	630,965.20	1,619,840.79			
CURVE FIRST_OR-4	East First St.							1017+59.91	630,983.81	1,620,042.66	1017+74.73	630,985.17	1,620,057.41	1017+89.52	630,985.07	1,620,072.23			
POINT EQ1	East First St.	31019+49.45	630,983.96	1,620,235.73															
CURVE FIRST_OR-5	East First St.							31019+91.53	630,983.68	1,620,277.81	31020+36.10	630,983.38	1,620,322.37	31020+80.58	630,978.25	1,620,366.64			
CURVE FIRST_OR-6	East First St.							31020+80.58	630,978.25	1,620,366.64	31021+25.20	630,973.11	1,620,410.97	31021+69.74	630,972.81	1,620,455.59			
CURVE FIRST_OR-7	East First St.							31024+66.08	630,970.82	1,620,751.93	31025+26.46	630,970.41	1,620,812.30	31025+86.62	630,978.84	1,620,872.09			
CURVE FIRST_OR-8	East First St.							31025+86.62	630,978.84	1,620,872.09	31026+47.00	630,987.27	1,620,931.88	31027+07.16	630,986.86	1,620,992.26			
POINT FIRST14	East First St.	31028+78.76	630,985.70	1,621,163.85															
POINT FIRST15	East First St.	31046+10.68	630,981.03	1,622,895.77															
POINT DDIEB1	East First St.	21004+00.00	630,972.91	1,618,686.36															
CURVE DDIEB-1	East First St.							21006+19.19	630,971.43	1,618,905.55	21006+59.32	630,971.16	1,618,945.67	21006+98.48	630,985.70	1,618,983,06			
POINT DDIEB2	East First St.	21008+12.21	631,026.92	1,619,089.06															
CURVE DDIEB-2	East First St.							21008+31.16	631,033.78	1,619,106.72	21008+99.74	631,058.64	1,619,170.64	21009+63.73	631,040.97	1,619,236.91			
CURVE DDIEB-3	East First St.							21009+63.73	631,040.97	1,619,236.91	21009+84.27	631,035.68	1,619,256.75	21010+04.68	631,034.34	1,619,277.25			
CURVE DDIEB-4	East First St.							21012+48.68	631,018.37	1,619,520.73	21012+73.98	631,016.71	1,619,545.97	21012+99.04	631,021.10	1,619,570.89			
CURVE DDIEB-5	East First St.							21012+99.04	631,021.10	1,619,570.89	21013+72.87	631,033.90	1,619,643.60	21014+41.03	630,998.39	1,619,708.32			
CURVE DDIEB-6	East First St.							21015+40.58	630,950.50	1,619,795.60	21016+47.44	630,899.10	1,619,889.28	21017+38.28	630,944.58	1,619,985.99			
CURVE DDIEB-7	East First St.							21017+38.28	630,944.58	1,619,985.99	21017+85.93	630,964.86	1,620,029.11	21018+32.01	630,964.54	1,620,076.77			
POINT DDIEB3	East First St.	21019+90.83	630,963.46	1,620,235.59															

ALIGNMENT COORDINATES

101-16
10-20-09

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
DDIWB1	East First St.	11004+00.00	631,025.91	1,618,686.72															
DDIWB-1	East First St.							11004+23.41	631,025.75	1,618,710.13	11004+89.40	631,025.31	1,618,776.11	11005+53.31	631,052.59	1,618,836.19			
DDIWB-2	East First St.							11005+53.31	631,052.59	1,618,836.19	11005+99.87	631,071.84	1,618,878.58	11006+44.95	631,071.37	1,618,925.14			
DDIWB-3	East First St.							11006+44.95	631,071.37	1,618,925.14	11006+97.64	631,070.83	1,618,977.83	11007+48.21	631,045.49	1,619,024.03			
DDIWB2	East First St.	11007+81.98	631,029.24	1,619,053.64															
DDIWB-4	East First St.							11008+49.70	630,996.67	1,619,113.01	11009+23.52	630,961.15	1,619,177.73	11009+91.68	630,973.96	1,619,250.44			
DDIWB-5	East First St.							11009+91.68	630,973.96	1,619,250.44	11010+16.98	630,978.34	1,619,275.36	11010+42.04	630,976.69	1,619,300.60			
DDIWB-6	East First St.							11012+86.98	630,960.66	1,619,545.02	11013+12.33	630,959.00	1,619,570.32	11013+37.44	630,951.36	1,619,594.49			
DDIWB-7	East First St.							11013+37.44	630,951.36	1,619,594.49	11014+11.37	630,929.11	1,619,664.99	11014+79.62	630,955.90	1,619,733.90			
DDIWB3	East First St.	11014+92.61	630,960.60	1,619,746.01															
DDIWB-8	East First St.							11015+82.32	630,993.11	1,619,829.62	11016+20.53	631,006.96	1,619,865.23	11016+57.83	631,006.71	1,619,903.45			
DDIWB4	East First St.	11019+90.26	631,004.46	1,620,235.86															
CREEK1	Creekview	99+91.93	630,037.26	1,620,434.96				102+88.47	630,333.80	1,620,436.31	104+08.31	630,453.64	1,620,436.85	105+19.40	630,548.66	1,620,363.82			
CREEKVIEW-1	Creekview							105+19.40	630,548.66	1,620,363.82	106+39.58	630,643.95	1,620,290.59	107+50.93	630,764.13	1,620,291.34			
CREEKVIEW-2	Creekview																		
CREEK2	Creekview	109+74.73	630,987.94	1,620,292.74															
FRISK1	Frisk	400+00.00	630,796.34	1,621,165.61															
FRISK2	Frisk	401+89.37	630,985.70	1,621,163.85															
FRISK3	Frisk	408+19.19	631,615.51	1,621,167.43															
Point RAMPA01	RAMP A_Oralabor	2166+24.73	620,461.10	1,619,100.12															
Curve RAMPA_O-1	RAMP A_Oralabor							2173+23.43	621,110.14	1,619,358.82	2176+08.34	621,374.80	1,619,464.31	2178+87.59	621,659.53	1,619,474.19			
Point RAMPA02	RAMP A_Oralabor	2189+08.42	622,679.75	1,619,509.57															

SPIRAL OR CIRCULAR CURVE DATA

Name	Location	Δ_{scs}	Horizontal Alignment Data													Remarks
			Spiral Data								Curve Data					
			θs	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	Δ_c	T	L	R	E	
I35-1	Interstate 35										3° 13′ 01.83″	477.40	954.56	17,000.00	6.70	
I35-2	Interstate 35										1° 41′ 06.61″	250.02	500.00	17,000.00	1.84	
I35-3B	Interstate 35	24° 53′ 19.19″	4° 08′ 56.42″	420.00′	850.48′	72.37′	419.78′	10.13′	280.08′	140.07′						
I35-3	Interstate 35										16° 35′ 27.42″	422.83	839.74	2,900.00	30.66	
I35-3A	Interstate 35	24° 53′ 19.19″	4° 08′ 55.35″	420.00′	850.48′	72.37′	419.75′	10.13′	280.06′	140.06′						
I35-4B	Interstate 35	26° 22′ 18.20″	2° 45′ 26.49″	385.00′	1,130.00′	109.90′	384.91′	6.18′	256.70′	128.36′						
I35-4	Interstate 35										20° 51′ 25.73″	736.20	1,456.10	4,000.00	67.18	
I35-4A	Interstate 35	26° 22′ 18.20″	2° 45′ 26.49″	385.00′	1,130.00′	109.90′	384.91′	6.18′	256.70′	128.36′						
I35-5	Interstate 35										5° 23′ 25.77″	564.91	1,128.57	12,000.00	13.28	
RAMPA-1	RAMP A										11° 15′ 06.46″	344.78	687.33	3,500.00	16.94	
RAMPA2-1	RAMP A										59° 07′ 44.82″	141.82	258.00	250.00	37.42	
RAMPA3-1	RAMP A										95° 32′ 03.96″	165.24	250.11	150.00	73.17	
RAMPB-1	RAMP B										6° 31′ 54.19″	285.31	570.00	5,000.00	8.13	
RAMPB-2	RAMP B										4° 14′ 27.73″	166.62	333.09	4,500.00	3.08	
RAMPB2-1	RAMP B										60° 24′ 42.70″	145.54	263.60	250.00	39.28	
RAMPB3-1	RAMP B										90° 31′ 26.39″	186.70	292.29	185.00	77.73	
RAMPC-1	RAMP C										11° 59′ 59.66″	367+86	733.03	3,500.00	19.28	
RAMPC2-1	RAMP C										106° 37′ 44.39″	201.35	279.15	150.00	101.08	
RAMPC3-1	RAMP C										76° 44′ 14.87″	277.10	468.76	350.00	96.41	
RAMPD-1	RAMP D										8° 01′ 17.07″	140.23	280.00	2,000.00	4.91	
RAMPD2-1	RAMP D										108° 41′ 54.99″	209.13	284.57	150.00	107.36	
RAMPD3-1	RAMP D										74° 40′ 04.27″	228.82	390.96	300.00	77.30	
FIRST_OR-1	East First St.										4° 38′ 46.64″	13.12	26.23	323.50	0.27	
FIRST_OR-2	East First St.										8° 01′ 02.32″	14.02	27.99	200.00	0.49	
FIRST_OR-3	East First St.										9° 03′ 36.03″	15.85	31.63	200.00	0.63	
FIRST_OR-4	East First St.										5° 39′ 12.89″	14.81	29.60	300.00	0.37	
FIRST_OR-5	East First St.										6° 13′ 19.50″	44.57	89.05	820.00	1.21	
FIRST_OR-6	East First St.										6° 13′ 19.50″	44.62	89.16	821.00	1.21	
FIRST_OR-7	East First St.										8° 24′ 44.57″	60.38	120.54	821.00	2.21	
FIRST_OR-8	East First St.										8° 24′ 44.57″	60.38	120.54	821.00	2.21	
DDIEB-1	East First St.										21° 38′ 00.74″	40.12	79.29	210.00	3.73	
DDIEB-2	East First St.										36° 10′ 18.60″	68.58	132.58	210.00	10.92	
DDIEB-3	East First St.										11° 10′ 18.60″	20.54	40.95	210.00	1.00	
DDIEB-4	East First St.										13° 44′ 21.95″	25.30	50.36	210.00	1.52	
DDIEB-5	East First St.										38° 44′ 21.95″	73.83	141.99	210.00	12.60	
DDIEB-6	East First St.										53° 56′ 21.18″	106.86	197.70	210.00	25.62	
DDIEB-7	East First St.										25° 34′ 21.93″	47.66	93.73	210.00	5.34	
DDIWB-1	East First St.										24° 48′ 30.22″	65.98	129.90	300.00	7.17	
DDIWB-2	East First St.										25° 00′ 08.53″	46.56	91.64	210.00	5.10	
DDIWB-3	East First St.										28° 10′ 20.96″	52.69	103.26	210.00	6.51	
DDIWB-4	East First St.										38° 44′ 21.95″	73.83	141.99	210.00	12.60	
DDIWB-5	East First St.										13° 44′ 21.95″	25.3	50.36	210.00	1.52	
DDIWB-6	East First St.										13° 46′ 05.65″	25.35	50.46	210.00	1.53	
DDIWB-7	East First St.										38° 46′ 02.24″	73.93	142.17	210.00	12.63	
DDIWB-8	East First St.										21° 38′ 00.74″	38.21	75.52	200.00	3.62	
CREEKVIEW-1	Creekview										37° 48′ 11.34″	119.84	230.93	350.00	19.95	
CREEKVIEW-2	Creekview										37° 54′ 06.11″	120.18	231.53	350.00	20.06	
RAMPA-O	RAMP A - Oralabor										19° 44′ 44.95″	284.90	564.16	1,637.00	24.61	

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1. All traffic control and traffic control devices shall be FOR INFORMATION ONLY.

   Coordinate with projects listed in Tab 111-01.

   Refer to the IM-NHS-035-4(140)92--03-77 plans for a complete set of traffic control and staging operations.

2. Two lanes of traffic shall be maintained on I-35 at all times except as noted in Note 3.

3. Lane Closures allowed as indicated on Tab 108-23B.

111-01
04-17-12

COORDINATED OPERATIONS

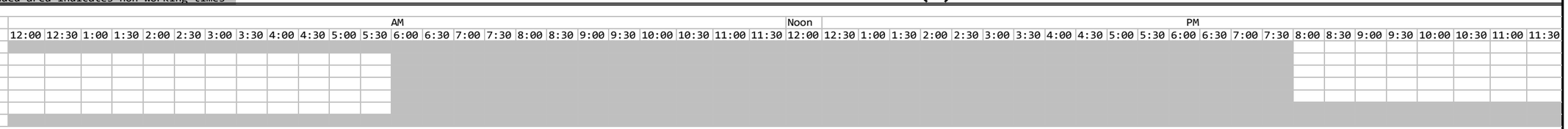
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
IM-NHS-035-4(140)92--03-77	Grading
	In Ankeny from N of Oralabor
	Rd to NE 36th St (NB)
IM-NHS-035-4(194)94--03-77	Bridge Replacement-PPCB
	In Ankeny over Fourmile Creek
	(Median & NB)
IM-NHS-035-4(193)93--03-77	Bridge Replacement-PPCB
	In Ankeny over E 1st St (NB)
NHS-035-4(221)93--11-77	Reconstruction-Bridge Widening
	In Ankeny, E 1st St over
	Fourmile Creek approx 0.25 mi
	E of I-35
ITS-035-4(239)--25-77	Fiber Optics Installation
NHSX-160-1(13)--3H-77	PCC Pavement Widening
	Oralabor RD/IA 160

108-23B
04-21-15

* This is to only be used in conjunction with Tabulation 108-23A
Shaded area indicates non-working times

TRAFFIC CONTROL CLOSURE TABLE(S)



108-25
10-21-14

511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
No travel restrictions expected												

CROSS SECTION VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

Pavement Removal	Proposed Granular Shoulder
Proposed Granular Subbase	Temporary Shoulder
Proposed Special Backfill	Existing Shoulder Strengthening
Temporary Barrier Rail	Permanent Barrier Rail
	Channelizing Device

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

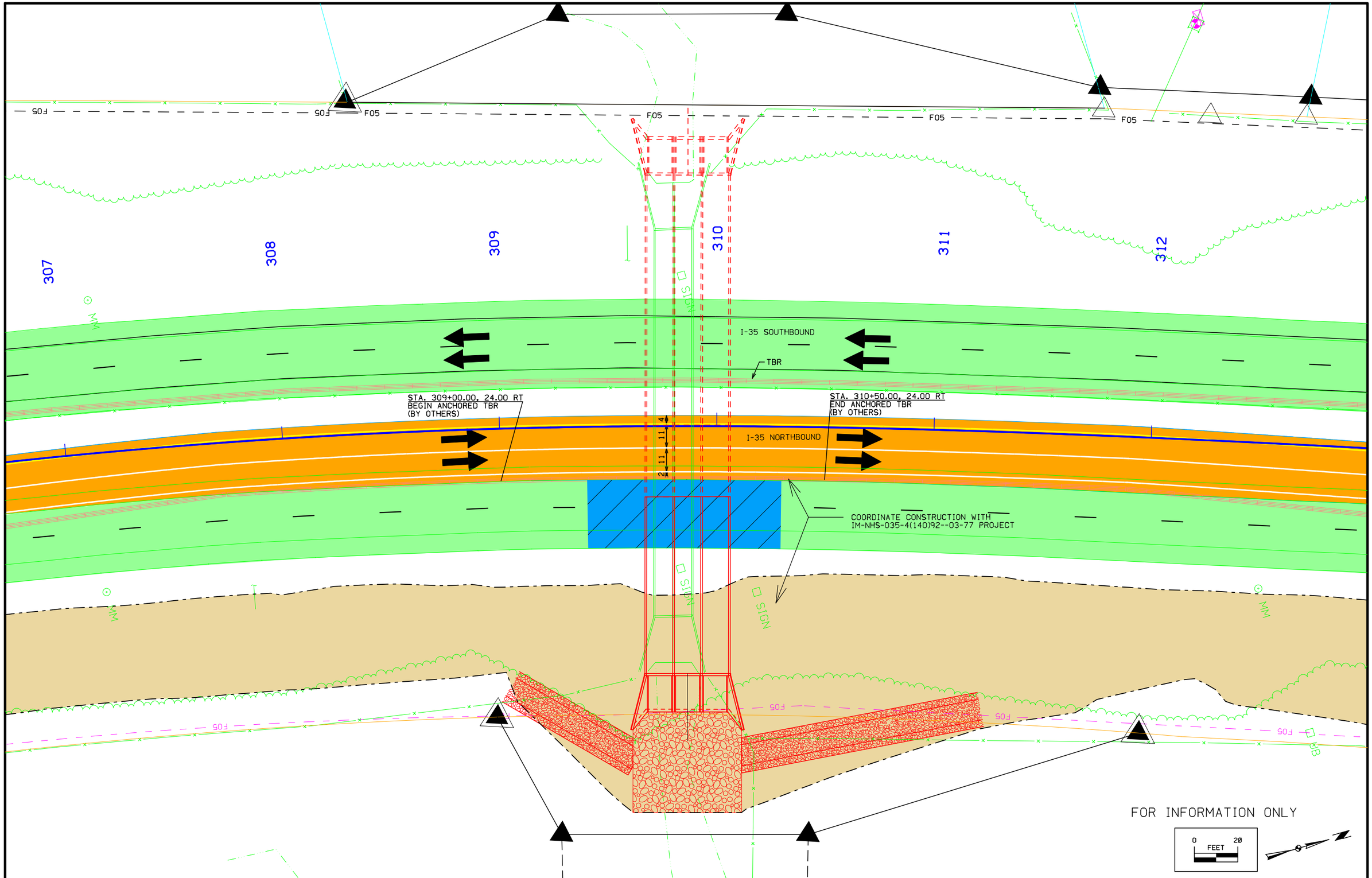
PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

Channelizing Device	Crash Cushion
Drum	Traffic Signal
Temporary Lane Separator	Flagger
Tubular Marker	Temporary Floodlighting
Channelizer Marker	Traffic Sign
Concrete Barrier Marker	Type III Barricade
Delineator	Type A Warning Light
Temporary Barrier Rail	Direction of Traffic
Pavement Removal	Safety Closure

NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

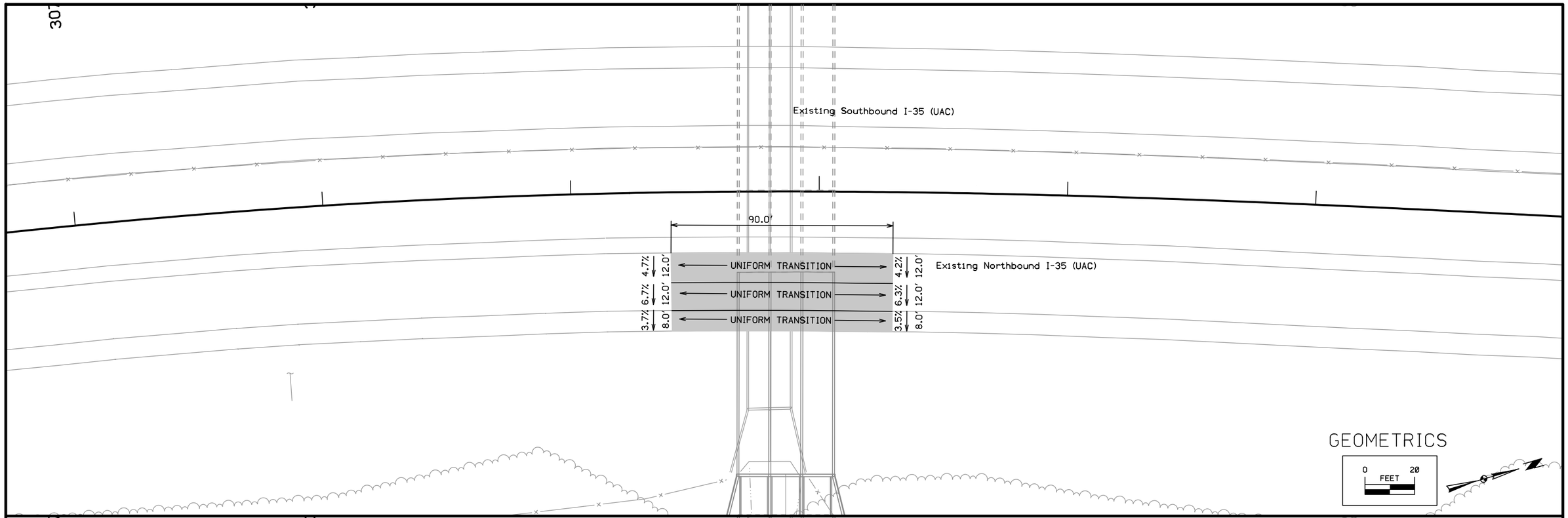
TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

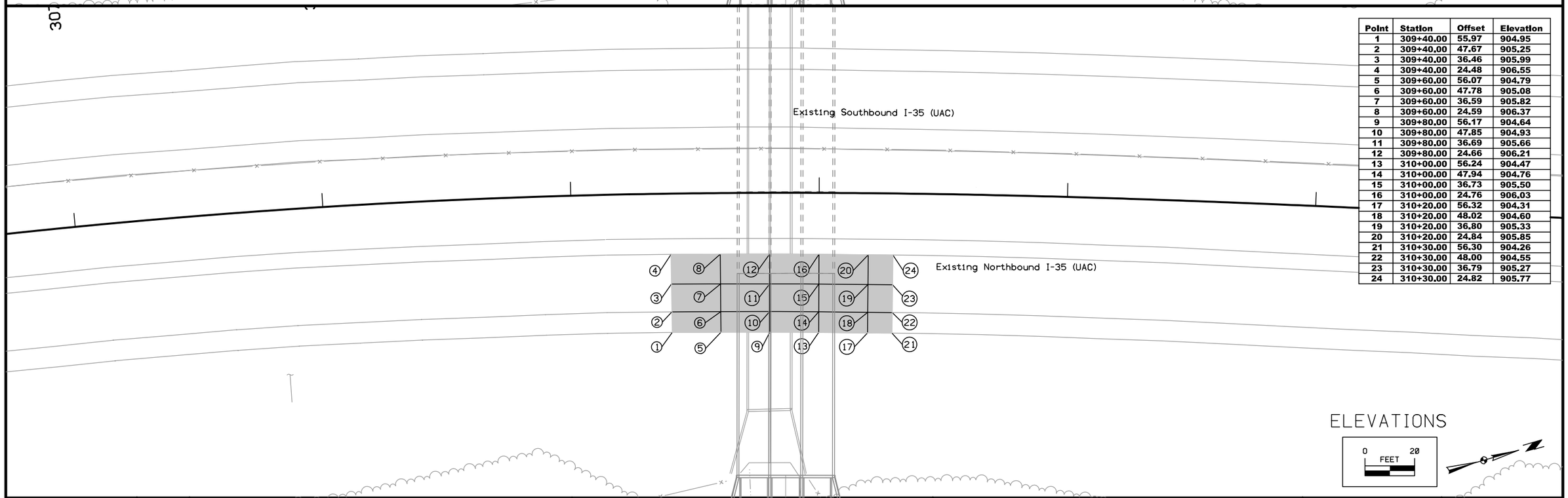
(COVERS SHEET SERIES J)



FILE NO.	ENGLISH	DESIGN TEAM City of Ankeny\Snyder & Associates	POLK COUNTY	PROJECT NUMBER IM-NHS-035-4(218)93--03-77	SHEET NUMBER J.3

10:56:58 AM 3/17/2017 KSB J:\2009_projects\109.0051\Design_(218)_RCB_Stage_1\k77035218_J.03.SHT





Point	Station	Offset	Elevation
1	309+40.00	55.97	904.95
2	309+40.00	47.67	905.25
3	309+40.00	36.46	905.99
4	309+40.00	24.48	906.55
5	309+60.00	56.07	904.79
6	309+60.00	47.78	905.08
7	309+60.00	36.59	905.82
8	309+60.00	24.59	906.37
9	309+80.00	56.17	904.64
10	309+80.00	47.85	904.93
11	309+80.00	36.69	905.66
12	309+80.00	24.66	906.21
13	310+00.00	56.24	904.47
14	310+00.00	47.94	904.76
15	310+00.00	36.73	905.50
16	310+00.00	24.76	906.03
17	310+20.00	56.32	904.31
18	310+20.00	48.02	904.60
19	310+20.00	36.80	905.33
20	310+20.00	24.84	905.85
21	310+30.00	56.30	904.26
22	310+30.00	48.00	904.55
23	310+30.00	36.79	905.27
24	310+30.00	24.82	905.77