FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			1164
STATE	STATE DIST.	COUNTY	
TEXAS	9	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

VOLUME 7

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1164	TITLE SHEET
1165-1169	INDEX OF SHEETS

RAS INSPECTION REQUIRED

TDLR NO. EABPRJA ____

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT:
CSJ: 0015-01-246

McLENNAN COUNTY
IH 35

LIMITS: FROM SOUTH STATE LOOP 340 TO 12TH ST

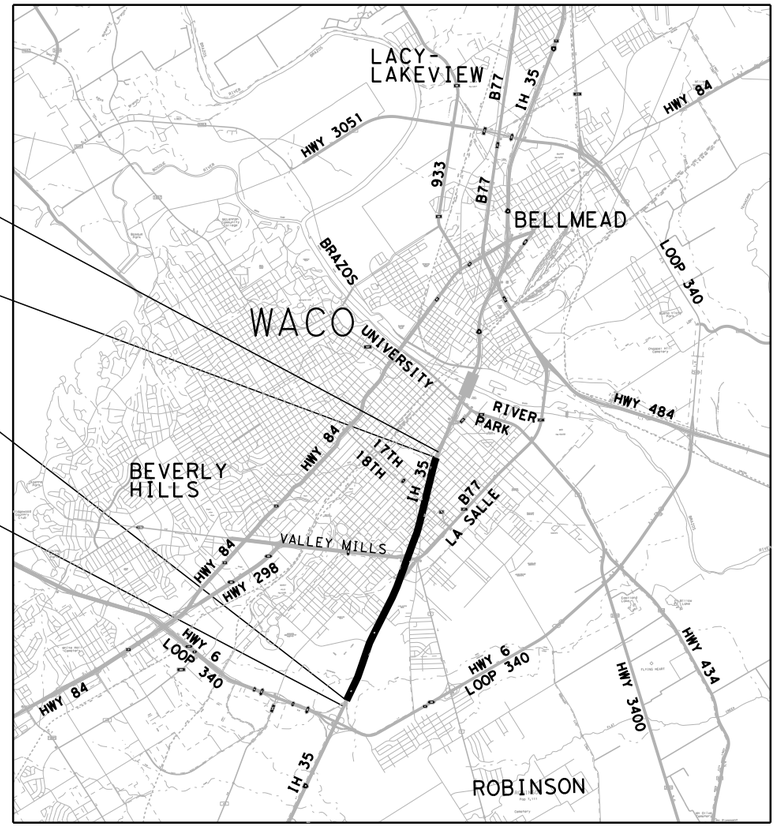
ROADWAY = 14,587.00 FT = 2.763 MI
BRIDGE = 1,063.00 FT = 0.201 MI
NET LENGTH OF PROJECT = 15,650.00 FT = 2.964 MI

FUNCTIONAL CLASS: URBAN INTERSTATE
DESIGN SPEED: 60 MPH - IH 35 MAINLANES
45 MPH - RAMPS
40 MPH - BYPASS RAMPS
40 MPH - FRONTAGE ROADS
45 MPH - INTERSECTING STREETS - NEW RD, 18TH, 17TH
30 MPH - INTERSECTING STREETS - IRVING LEE
20 MPH - VALLEY MILLS DDI
15 MPH - U-TURNS

YEAR	ADT
2013	131,800
2033	187,400

FOR THE CONSTRUCTION OF THE WIDENING OF A FREEWAY FACILITY CONSISTING OF WIDENING, GRADING, STRUCTURES & SURFACES.

NOT TO SCALE



END CONSTRUCTION
CSJ: 0015-01-243
℄ IH 35 STA 167+00.00

END PROJECT
END CSJ: 0015-01-246
BEGIN CSJ: 0015-01-243
℄ IH 35 STA 156+50.00
REF. MRKR. 334+0.485

BEGIN PROJECT
CSJ: 0015-01-246
EQUATION:
℄ IH 35 STA 935+11.96 (BK) =
℄ IH 35 STA 0+00.00 (AH)

BEGIN CONSTRUCTION
CSJ: 0015-01-246
℄ IH 35 STA 922+25.00

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 2023).

EXCEPTIONS: NONE

EQUATIONS: ℄ IH 35 STA 935+11.96 (BK) = ℄ IH 35 STA 0+00.00 (AH)

RAILROAD CROSSINGS: NONE

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

SUBMITTED FOR LETTING

PROJECT MANAGER

Texas Department of Transportation
© 2024

RECOMMENDED FOR LETTING

AREA ENGINEER

RECOMMENDED FOR LETTING

DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

APPROVED FOR LETTING

DISTRICT ENGINEER

PLOTDRIVER: WACO_PSE-pdf.pltcfg PENTABLE: TxDOT_Waco.tbl
DATE:8/23/2024 11:27:49 AM USER:
FILE:c:\caddlib\pw\hntb.jiping\central\d0202097\68651_V01-TITLE_SHEET.DGN

COUNTY McLENNAN PROJ. NO.
HWY. NO. IH 35 LETTING DATE 09/03/2024
DATE ACCEPTED

...\68651_V01-TITLE_SHEET.DGN

THE STANDARD SHEETS (* OR #) SPECIFICALLY IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT

STATE OF TEXAS
JESUS IPINA
135023
PROFESSIONAL ENGINEER
* 024

STATE OF TEXAS
RYAN J. LAGSDING
\# 8/23/2024

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

INDEX OF SHEETS

SHEET 1 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1165
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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THE STANDARD SHEETS (* OR **) SPECIFICALLY IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT

* 024

** 8/23/2024

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

INDEX OF SHEETS

SHEET 2 OF 5

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1166
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

INDEX OF SHEETS

SHEET 3 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1167
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

SHEET NO	DESCRIPTION
1237	BENT 3 IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS DRIVE)
1238	BENT 4 IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS DRIVE)
1239-1241	BENT DETAILS IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS DRIVE)
1242	BEAM LAYOUT SPAN 1 IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS DRIVE)
1243-1244	34.500' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS DRIVE)
1245	BEAM LAYOUT SPANS 2 & 3 IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS)
1246-1247	188.000' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS)
1248	BEAM LAYOUT SPAN 4 IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS)
1249-1250	72.500' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS)
1251	PRESTRESSED CONCRETE U-BEAMS (DESIGN DATA)
	IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1252	BRIDGE LAYOUT IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1253	TYPICAL SECTIONS IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1254	TEST HOLE DATA IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1255	ESTIMATED QUANTITIES IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1256	BEARING SEAT ELEVATIONS IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1257	BEARING PAD TAPER REPORT IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1258	ABUTMENT 1 IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1259	ABUTMENT 5 IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1260	ABUTMENT DETAILS IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1261	BENT 2 IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1262-1263	BENT 2 DETAILS IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1264	BENT 3 IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1265	BENT 4 IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1266-1267	BENTS 3 & 4 DETAILS IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1268	BEAM LAYOUT SPAN 1 IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1269-1270	34.000' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)
1271	BEAM LAYOUT SPANS 2 & 3 IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS)
1272-1273	185.750' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS)
1274	BEAM LAYOUT SPAN 4 IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS)
1275-1276	71.670' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS)
1277	PRESTRESSED CONCRETE U-BEAMS (DESIGN DATA)
	IH 35 SB & NB OVERPASS AT 18TH STREET
1278	BRIDGE LAYOUT IH 35 SB OVERPASS AT 18TH STREET
1279	BRIDGE LAYOUT IH 35 NB OVERPASS AT 18TH STREET
1280	PHASED TYPICAL SECTIONS IH 35 SB & NB OVERPASS AT 18TH STREET
1281	TEST HOLE DATA IH 35 SB & NB OVERPASS AT 18TH STREET
1282	ESTIMATED QUANTITIES IH 35 SB & NB OVERPASS AT 18TH STREET
1283	BEARING SEAT ELEVATIONS IH 35 SB & NB OVERPASS AT 18TH STREET
1284	BEARING PAD TAPER REPORT IH 35 SB & NB OVERPASS AT 18TH STREET
1285	ABUTMENT 1 IH 35 SB OVERPASS AT 18TH STREET
1286	ABUTMENT 3 IH 35 SB OVERPASS AT 18TH STREET
1287	ABUTMENT DETAILS IH 35 SB OVERPASS AT 18TH STREET
1288	BENT 2 IH 35 SB OVERPASS AT 18TH STREET
1289-1290	BENT DETAILS IH 35 SB OVERPASS AT 18TH STREET
1291	BEAM LAYOUT IH 35 SB OVERPASS AT 18TH STREET
1292-1293	250.000' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 SB OVERPASS AT 18TH STREET
1294	ABUTMENT 1 IH 35 NB OVERPASS AT 18TH STREET
1295	ABUTMENT 3 IH 35 NB OVERPASS AT 18TH STREET
1296	ABUTMENT DETAILS IH 35 NB OVERPASS AT 18TH STREET
1297	BENT 2 IH 35 NB OVERPASS AT 18TH STREET
1298-1299	BENT DETAILS IH 35 NB OVERPASS AT 18TH STREET
1300	BEAM LAYOUT IH 35 NB OVERPASS AT 18TH STREET
1301-1302	250.000' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 NB OVERPASS AT 18TH STREET
1303	PRESTRESSED CONCRETE U-BEAMS (DESIGN DATA)
	IH 35 SB & NB OVERPASS AT 17TH STREET
1304	BRIDGE LAYOUT IH 35 SB OVERPASS AT 17TH STREET
1305	BRIDGE LAYOUT IH 35 NB OVERPASS AT 17TH STREET
1306	PHASED TYPICAL SECTIONS IH 35 SB & NB OVERPASS AT 17TH STREET
1307	TEST HOLE DATA IH 35 SB & NB OVERPASS AT 17TH STREET
1308	ESTIMATED QUANTITIES IH 35 SB & NB OVERPASS AT 17TH STREET
1309	BEARING SEAT ELEVATIONS IH 35 SB & NB OVERPASS AT 17TH STREET
1310	BEARING PAD TAPER REPORT IH 35 SB & NB OVERPASS AT 17TH STREET
1311	ABUTMENT 1 IH 35 SB OVERPASS AT 17TH STREET
1312	ABUTMENT 3 IH 35 SB OVERPASS AT 17TH STREET
1313	ABUTMENT DETAILS IH 35 SB OVERPASS AT 17TH STREET
1314	BENT 2 IH 35 SB OVERPASS AT 17TH STREET
1315-1316	BENT DETAILS IH 35 SB OVERPASS AT 17TH STREET
1317	BEAM LAYOUT IH 35 SB OVERPASS AT 17TH STREET
1318-1319	240.000' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 SB OVERPASS AT 17TH STREET
1320	ABUTMENT 1 IH 35 NB OVERPASS AT 17TH STREET
1321	ABUTMENT 3 IH 35 NB OVERPASS AT 17TH STREET

THE STANDARD SHEETS (*** OR ****) SPECIFICALLY IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT

	SHEET NO	DESCRIPTION
	1322	ABUTMENT DETAILS IH 35 NB OVERPASS AT 17TH STREET
	1323	BENT 2 IH 35 NB OVERPASS AT 17TH STREET
	1324-1325	BENT DETAILS IH 35 NB OVERPASS AT 17TH STREET
	1326	BEAM LAYOUT IH 35 NB OVERPASS AT 17TH STREET
	1327-1328	240.000' PRESTRESSED CONCRETE U-BEAM UNIT IH 35 NB OVERPASS AT 17TH STREET
	1329	PRESTRESSED CONCRETE U-BEAMS (DESIGN DATA)
		BRIDGE PROJECT STANDARDS
	1330	INTERIOR BENT AESTHETIC DETAILS
	1331	SPECIAL MODIFICATION TO TYPE SSTR RAIL
***	1332-1333	BAS-C(MOD)
***	1334-1338	TYPE C402(MOD)
***	1339-1341	TYPE SSTR(MOD)
***	1342-1345	TYPE T402(MOD)
***	1346-1348	BMCS
***	1349-1350	BRSM
***	1351	BS-EJCP
***	1352-1353	CSAB
***	1354-1355	FD
***	1356	MEBR(U)
***	1357	NBIS
***	1358-1361	PCP
***	1362	PCP-FAB
***	1363-1364	PMDF
***	1365	SEJ-M
***	1366-1368	UBD
***	1369-1370	UBEB
***	1371	UBMS
***	1372	UBTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
*** 8/23/2024

STATE OF TEXAS
JAIME A. SAENZ GARCIA
130696
LICENSED
PROFESSIONAL ENGINEER
*** 8/23/2024

VOLUME VIII

VIII. TRAFFIC ITEMS

	1373	TITLE SHEET
	1374-1378	INDEX OF SHEETS
	1379-1394	LIGHTING LAYOUT
	1395-1398	UNDERBRIDGE LIGHTING
	1399-1427	PAVEMENT MARKINGS
	1428-1453	SIGNING AND DELINEATION
	1454-1470	GUIDE SIGN ELEVATION LAYOUT
	1471-1476	OVERHEAD SIGN BRIDGE DETAILS
	1477-1484	LARGE SIGN DETAILS
	1485-1486	GROUND MOUNTED SIGN DETAILS
	1487-1488	SMALL SIGN DETAILS
	1489	PROPOSED SIGNAL LAYOUT SBFR AT NEW RD
	1490	PROPOSED SIGNAL LAYOUT NBFR AT NEW RD
	1491	SIGNAL SUMMARY NEW ROAD
	1492-1492A	PROPOSED SIGNAL LAYOUT VALLEY MILLS DR
	1492B	PROPOSED SIGNAL LAYOUT VALLEY MILLS DR - EAST CROSSOVER
	1493	SIGNAL SUMMARY VALLEY MILLS DR
	1493A	PROPOSED SIGNAL LAYOUT SBFR AT IRVING LEE ST
	1493B	PROPOSED SIGNAL LAYOUT NBFR AT PRIMROSE DR
	1493C	SIGNAL SUMMARY IRVING LEE ST/PRIMROSE DR
	1494	PROPOSED SIGNAL LAYOUT NBFR AT 18TH ST
	1495	PROPOSED SIGNAL LAYOUT SBFR AT 18TH ST
	1496	PROPOSED SIGNAL LAYOUT NBFR AT 17TH ST
	1497	PROPOSED SIGNAL LAYOUT SBFR AT 17TH ST
	1498-1499	SIGNAL SUMMARY 18TH & 17TH
	1499A	PEDESTRIAN POLE SPREAD FOOTING
	1500	ITS GENERAL NOTES
	1501-1504	ITS NETWORK SCHEMATIC
	1505-1527	ITS LAYOUT
	1528	ITS DMS ELEVATION DETAILS DMS
	1529	ITS ELECTRICAL SERVICES SUMMARY
****	1530-1538	ED(1)-14 THRU ED(9)-14
****	1539-1545	HMID(1)-24 THRU HMID(7)-24
****	1546-1547, 1547A	DMA-80-1 THRU DMA-80-3
****	1548-1549	HMIF(1)-98 & HMIF(2)-98
****	1550-1551	HMIP(1)-16 & HMIP(2)-16
****	1552	LUM-A-12
****	1553	MA-D-12
****	1554-1556	RID(1)-20 THRU RID(3)-20
****	1557-1560	RIP(1)-19 THRU RIP(4)-19
****	1561	CFA-12

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

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6	SEE TITLE SHEET		1168
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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	SHEET NO	DESCRIPTION
****	1562-1563	COSSD
****	1564	HCOSS-Z1-21
****	1565-1566	HOSB-Z2I
****	1567	OSBC
****	1568-1573	D&OM(1)-20 THRU D&OM(6)-20
****	1574	D&OM(VIA)-20
****	1575-1576	SP-80(1)-12 & SP-80(2)-12
****	1577-1578	SMA-80(1)-12 & SMA-80(2)-12
****	1579-1583	LMA(1)-12 THRU LMA(5)-12
****	1584	MA-C-12
****	1585	MA-DPD-20
****	1586-1589	SMD(2-1)-08 THRU SMD(2-4)-08
****	1590	SMD(2-6)-01
****	1591-1593	SMD(BR-1)-14 THRU SMD(BR-3)-14
****	1594	SMD(FRP)-08
****	1595	SMD(GEN)-08
****	1596-1598	SMD(SLIP-1)-08 THRU SMD(SLIP-3)-08
****	1599	SMD(TWT)-08
****	1600	SMD(TY-G)-08
****	1601-1602	SMD(8W1)-08 & SMD(8W2)-08
****	1603	TS-BP-20
****	1604	TS-CF-21
****	1605	TS-FD-12
****	1606-1610	TSR(1)-13 THRU TSR(5)-13
****	1611-1616	FPM(1)-22 THRU FPM(6)-22
****	1617-1620	PM(1)-22 THRU PM(3)-22, PM(4)-22A
****	1621-1623	BMCS
****	1624	CPM (1)-23
####	1625-1627	DMS(TM-1)-16 THRU DMS(TM-3)-16
####	1628	DMS(HZ-2)-21
####	1629-1630	ITS(1)-15 & ITS(2)-15
####	1631	ITS(3)-16
####	1632,1632A,1633-1635	ITS(4)-15,ITS(4A)-15 THRU ITS(7)-15
####	1636	ITS(15)-15
####	1637-1638	ITS (17)-15 & ITS(18)-15
####	1639	ITS(19)-17
####	1640-1641	ITS(20)-15 & ITS(21)-15
####	1642	ITS(23)-15
####	1643-1644	ITS(27)-16 & ITS(28)-16
####	1645-1646	ITS(35)-16 & ITS(36)-16
####	1647	ITS(37)-22
####	1648	ITS(38)-17
####	1649	ITS(39)-16
####	1650	ITS(40)-17
####	1651-1652	ITS(42)-16 & ITS(43)-16

VOLUME IX

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	1654-1658	INDEX OF SHEETS
	1659	ENVIRONMENTAL PERMITS, ISSUES & COMMITMENTS (EPIC)
	1660-1661	STORM WATER POLLUTION PREVENTION PLAN (SW3P)
	1662-1663	OMIT
	1664-1683, 1683A, 1684-1685	EROSION CONTROL PLAN PHASE 1 STAGE 1
	1686-1711	EROSION CONTROL PLAN PHASE 1 STAGE 2
	1712-1735	EROSION CONTROL PLAN PHASE 1 STAGE 3
	1736-1754	EROSION CONTROL PLAN PHASE 1 STAGE 4
	1755-1775	EROSION CONTROL PLAN PHASE 1 STAGE 5
	1776-1801	EROSION CONTROL PLAN PHASE 2 STAGE 1
	1802-1820	EROSION CONTROL PLAN PHASE 2 STAGE 2
	1821-1841	EROSION CONTROL PLAN PHASE 2 STAGE 3
	1842-1859	EROSION CONTROL PLAN PHASE 2 STAGE 4
	1860-1863	EROSION CONTROL PLAN PHASE 2 STAGE 4 STEP 2
	1864-1868	EROSION CONTROL PLAN PHASE 2 STAGE 5
	1869-1871	EROSION CONTROL PLAN PHASE 2 STAGE 5 STEP 2
	1872	EROSION CONTROL DEVICE INSTALLATION CHART
	1872A	EROSION CONTROL INLET PROTECTION DETAIL
##	1873-1875	EC(1)-16 THRU EC(3)-16
##	1876-1885	TA-BMP (WACO DISTRICT)

THE STANDARD SHEETS (**** OR ## OR ####) SPECIFICALLY IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT

STATE OF TEXAS
JAIME A. SAENZ GARCIA
130696
LICENSED PROFESSIONAL ENGINEER
**** 8/23/2024

STATE OF TEXAS
SELENA S. ASIRE
99244
LICENSED PROFESSIONAL ENGINEER
8/23/2024

STATE OF TEXAS
McKENZIE L. F. OLSON
142002
LICENSED PROFESSIONAL ENGINEER
8/23/2024

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

INDEX OF SHEETS

SHEET 5 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1169
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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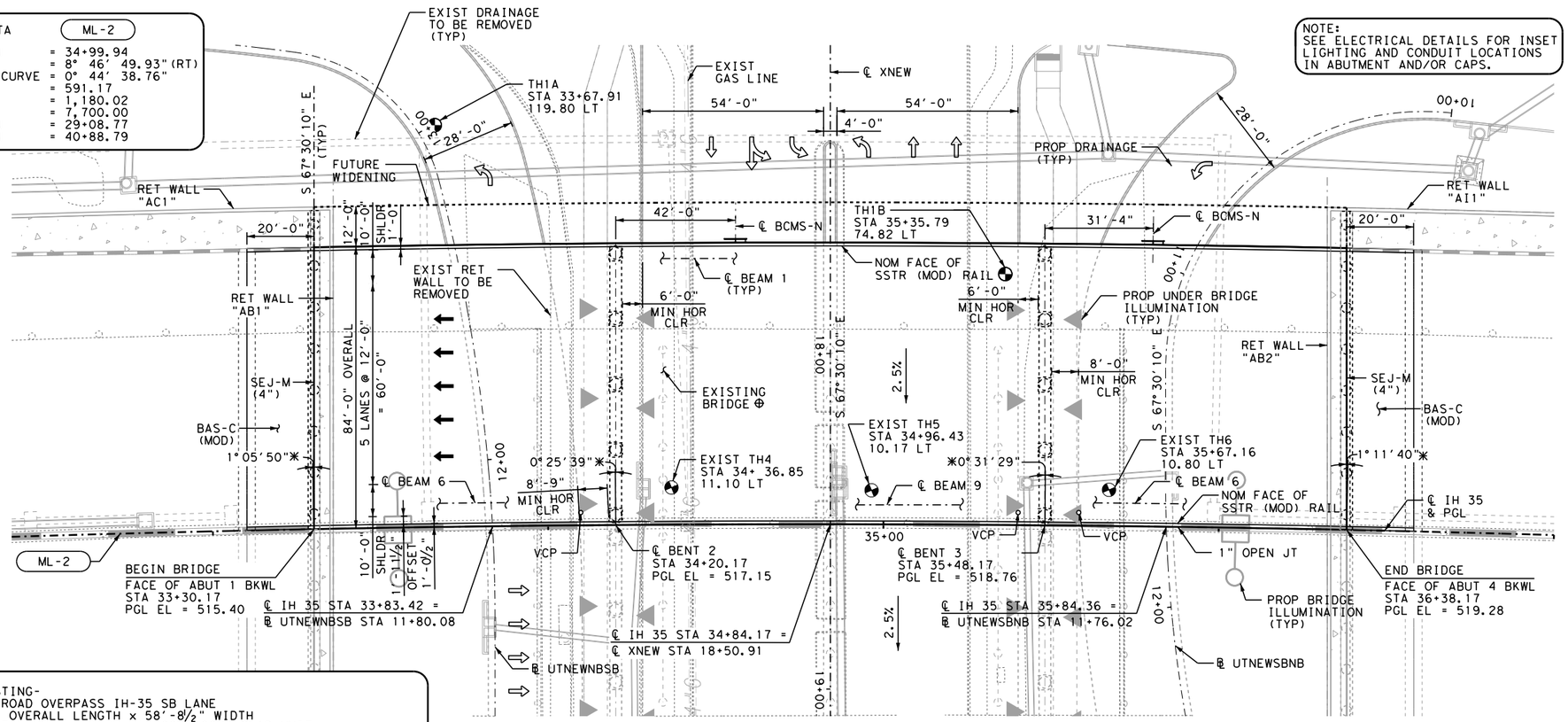
TANGENT	= 591.17
LENGTH	= 1,180.02
RADIUS	= 7,700.00
PC STATION	= 29+08.77
PT STATION	= 40+88.79

NOTE:
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT AND/OR CAPS.



⊕ EXISTING-
NEW ROAD OVERPASS IH-35 SB LANE
175' OVERALL LENGTH x 58'-8½" WIDTH
1-(37.5' 50' 50' 37.5') CONT CONC SLAB UNIT
57° RDWY NORMAL SKEW ON CONCRETE BENTS - TO BE REMOVED.

PLAN

✳ MEASURED RADIAL TO CURVE

0' 10' 20' 40'

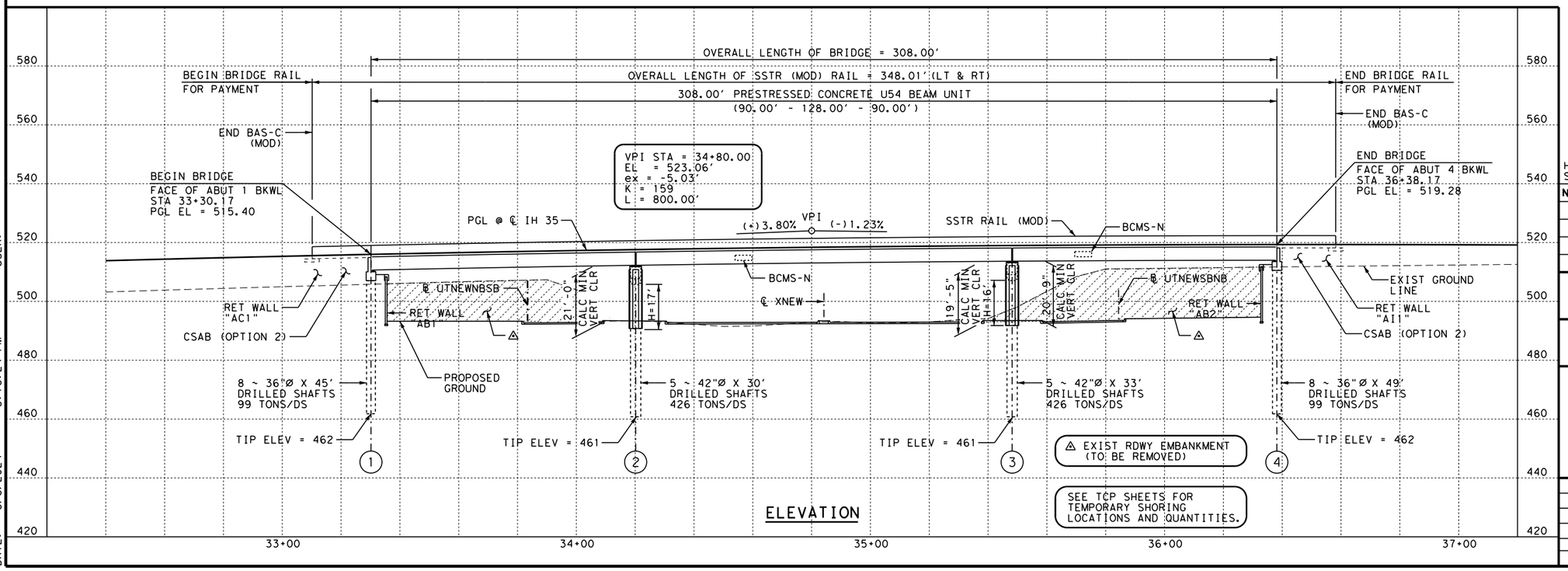
GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUTS FOR EXISTING STRUCTURE CSJ 0015-01-124,1993. BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. FOR BRIDGE TYPICAL SECTIONS, SEE "PHASED TYPICAL SECTIONS" SHEET.
6. VCP: CRITICAL VERTICAL CLEARANCE POINT.
7. DRILLED SHAFT SHALL BE FOUNDED AT ELEVATION SHOWN OR DEEPER TO ATTAIN A MINIMUM OF TWO DIAMETER PENETRATION INTO SHALE.
8. FOR PROP ILLUMINATION POLE MOUNTED TO SSTR RAIL AT ℄ IH 35, SEE "SPECIAL MODIFICAITON TO TYPE SSTR RAIL" SHEET.

FUNCT. CLASS = INTERSTATE
DESIGN SPEED = 60 MPH
PROP ADT (2026) = 74780
(2046) = 102270

EXISTING NBI NO = 09-161-0-0015-01-213
EXISTING PSN NO = 213

NEW NBI NO = 09-161-0-0015-01-812
NEW PSN NO = 812



ELEVATION

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
6/6/2024

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.10/2.16

NO.	DATE	REVISION	APPROVED

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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT
IH 35 SB OVERPASS AT NEW ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		11-70
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRLY5_01NR_SB_001.dgn
DATE: 6/6/2024 3:16:24 PM
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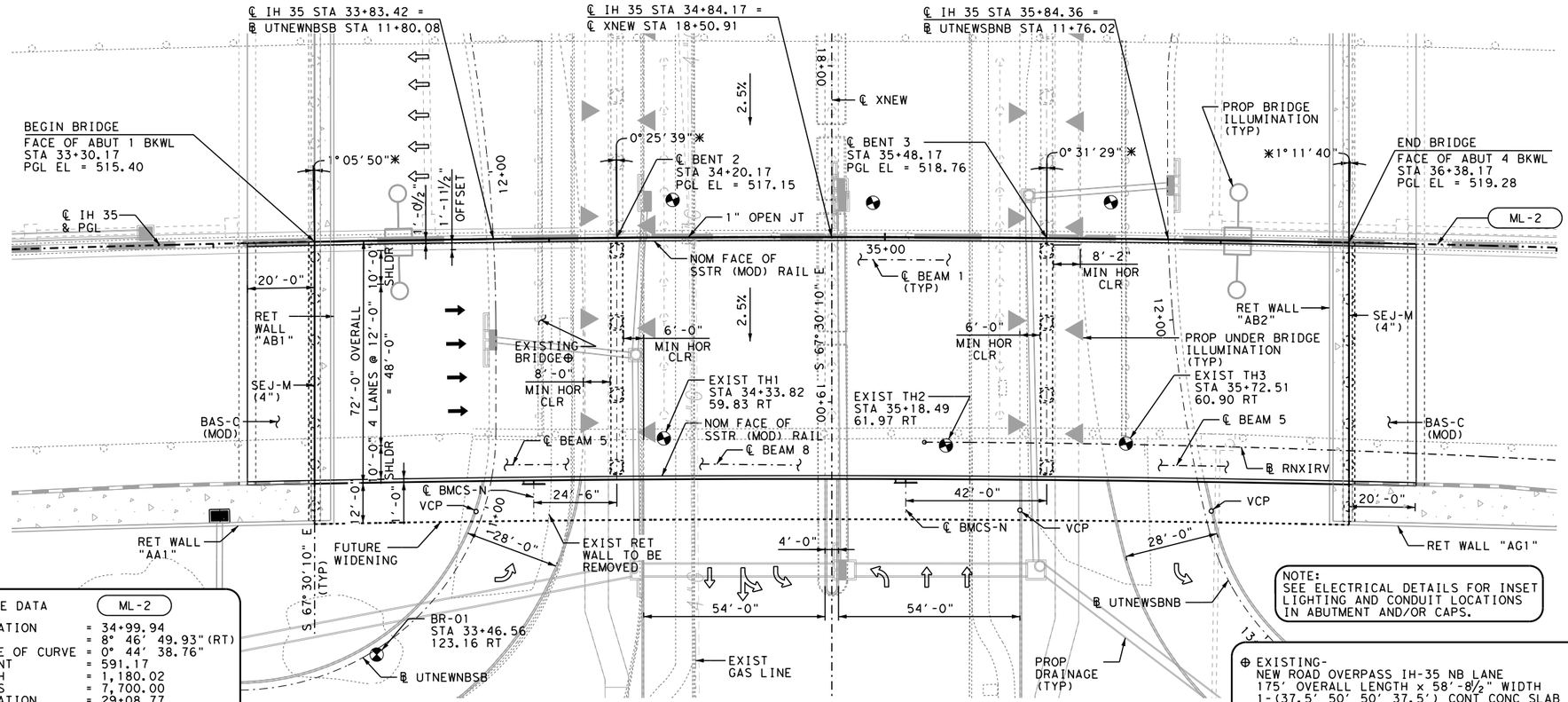


CURVE DATA	ML-2
PI STATION	= 34+99.94
DELTA	= 8° 46' 49.93" (RT)
DEGREE OF CURVE	= 0° 44' 38.76"
TANGENT	= 591.17
LENGTH	= 1,180.02
RADIUS	= 7,700.00
PC STATION	= 29+08.77
PT STATION	= 40+88.79

PLAN

✱ MEASURED RADIAL TO CURVE

NOTE:
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT AND/OR CAPS.

⊕ EXISTING-
NEW ROAD OVERPASS IH-35 NB LANE
175' OVERALL LENGTH x 58'-8½" WIDTH
1-(37.5' 50' 50' 37.5') CONT CONC SLAB UNIT
57° RDWY NORMAL SKEW ON CONCRETE
BENTS - TO BE REMOVED.

0' 10' 20' 40'

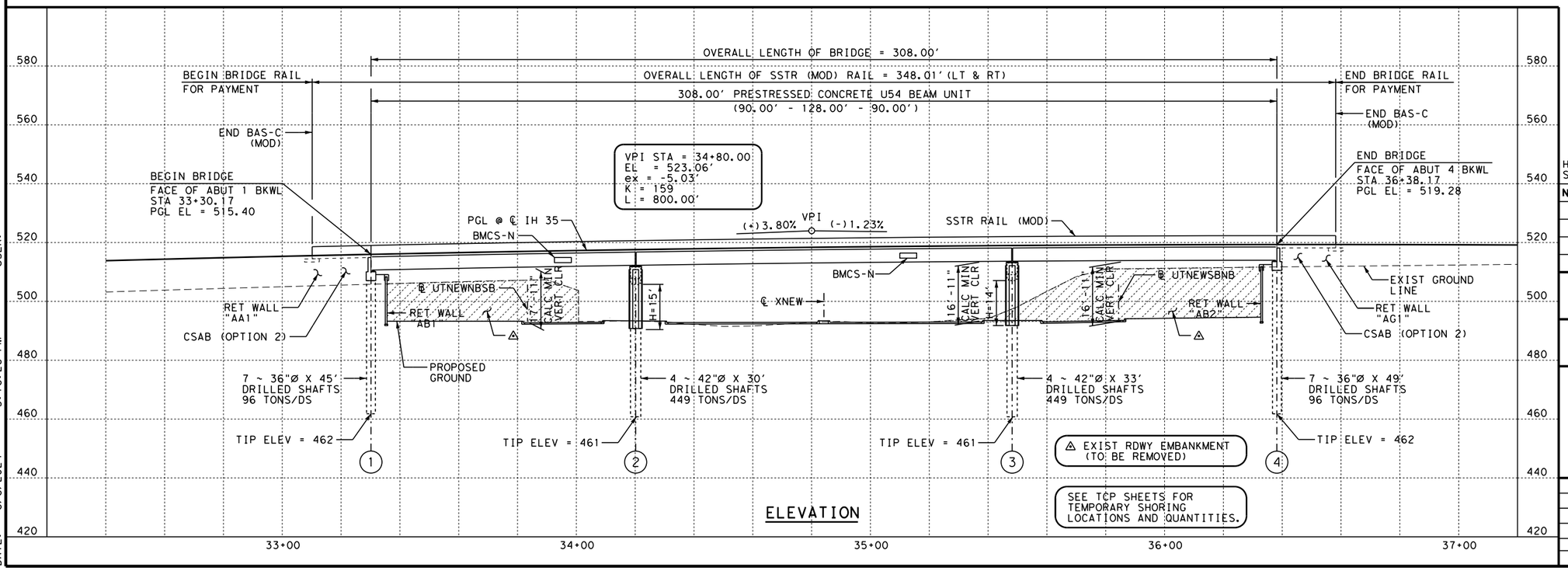
GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUTS FOR EXISTING STRUCTURE CSJ 0015-01-124, 1993. BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. FOR BRIDGE TYPICAL SECTIONS, SEE "PHASED TYPICAL SECTIONS" SHEET.
6. VCP: CRITICAL VERTICAL CLEARANCE POINT.
7. DRILLED SHAFT SHALL BE FOUNDED AT ELEVATION SHOWN OR DEEPER TO ATTAIN A MINIMUM OF TWO DIAMETER PENETRATION INTO SHALE.
8. FOR PROP ILLUMINATION POLE MOUNTED TO SSTR RAIL AT ℄ IH 35, SEE "SPECIAL MODIFICATION TO TYPE SSTR RAIL" SHEET.

FUNCT. CLASS = INTERSTATE
DESIGN SPEED = 60 MPH
PROP ADT (2026) = 55040
(2046) = 75845

EXISTING NBI NO = 09-161-0-0015-01-212
EXISTING PSN NO = 212

NEW NBI NO = 09-161-0-0015-01-813
NEW PSN NO = 813



ELEVATION

⚠ EXIST RDWY EMBANKMENT (TO BE REMOVED)

SEE TCP SHEETS FOR TEMPORARY SHORING LOCATIONS AND QUANTITIES.

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
6/6/2024

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.03/2.03

NO.	DATE	REVISION	APPROVED

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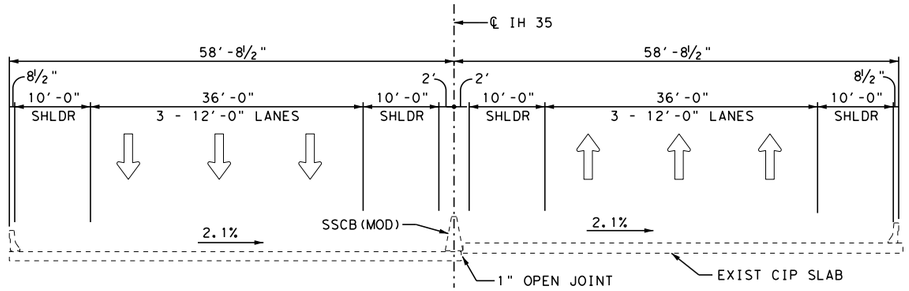
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

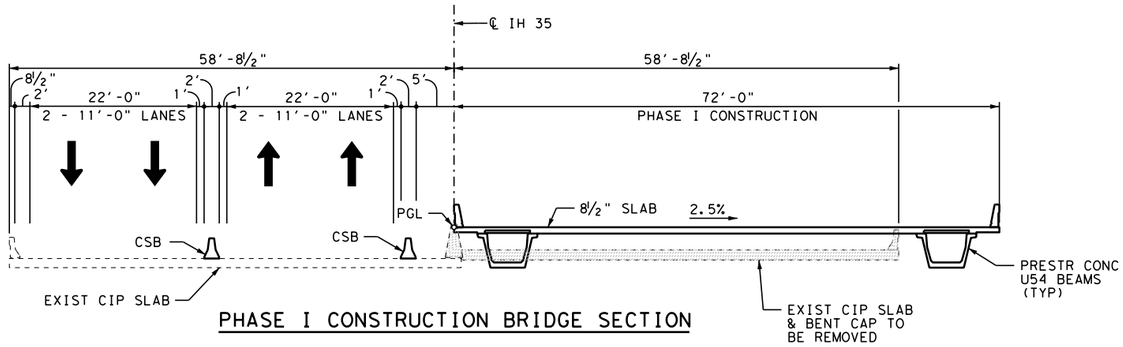
BRIDGE LAYOUT
IH 35 NB OVERPASS AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1171
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

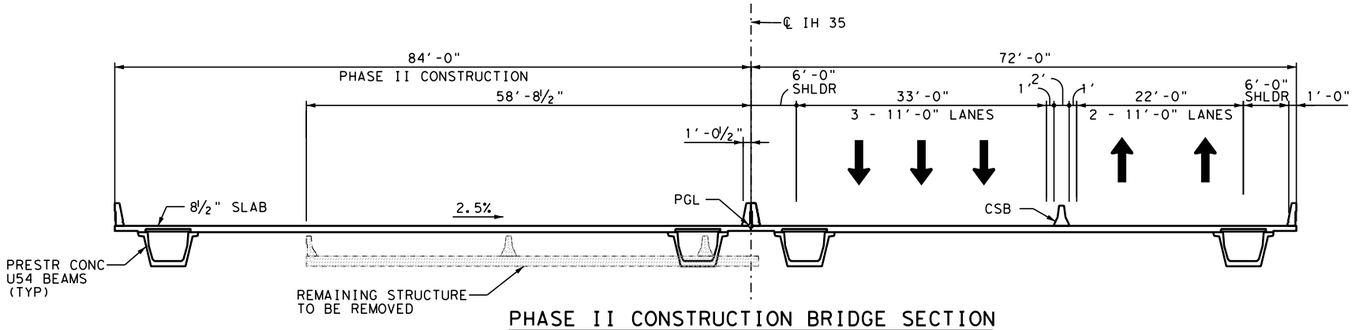
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRLY5_01NR_NB_001.dgn
DATE: 6/6/2024 3:16:28 PM USER:



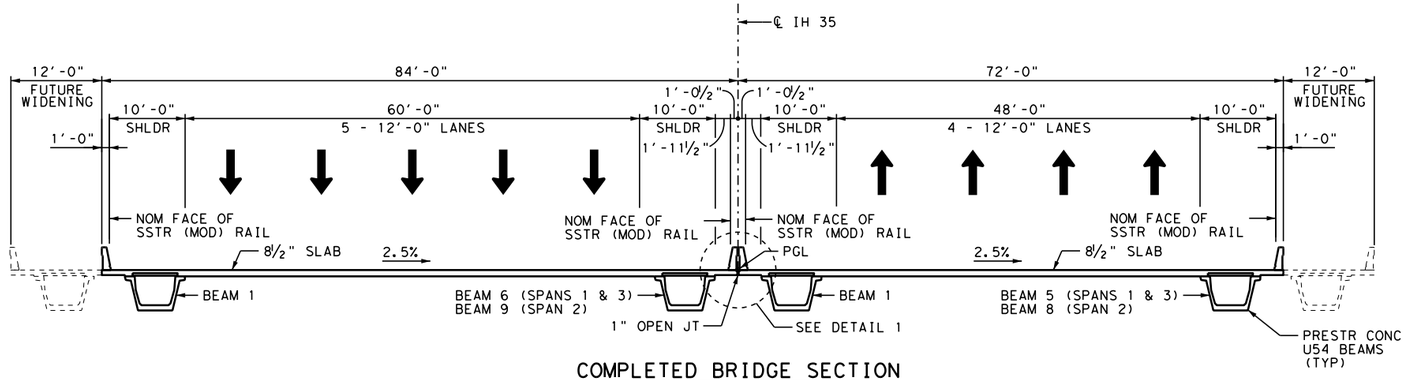
EXISTING BRIDGE SECTION



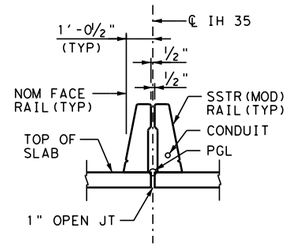
PHASE I CONSTRUCTION BRIDGE SECTION



PHASE II CONSTRUCTION BRIDGE SECTION



COMPLETED BRIDGE SECTION



DETAIL 1

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
7/25/2024

NO.	DATE	REVISION	APPROVED

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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

PHASED TYPICAL SECTIONS

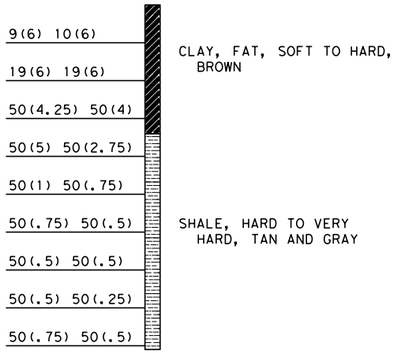
IH 35 SB & NB OVERPASS
AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		11-72
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRTY5_01NR_001.dgn
DATE: 7/25/2024 12:36:18 PM USER:

TEST HOLE NO. 1A
STA 33+67.91, 119.8 LT

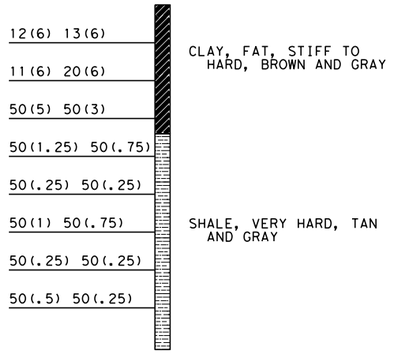
T/H EL = 492.28



TEST HOLE 1A
B/H EL = 446.78

TEST HOLE NO. 1B
STA 35+35.79, 74.82 LT

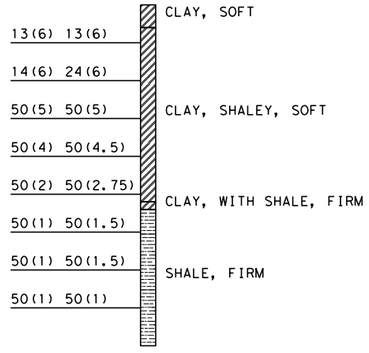
T/H EL = 494.76



TEST HOLE 1B
B/H EL = 449.26

TEST HOLE NO. TH1
STA 34+33.82, 59.83 RT

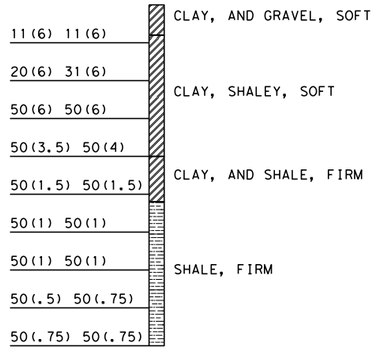
T/H EL = 496.00



EXIST TEST HOLE TH1
B/H EL = 451.00

TEST HOLE NO. TH2
STA 35+18.49, 61.97 RT

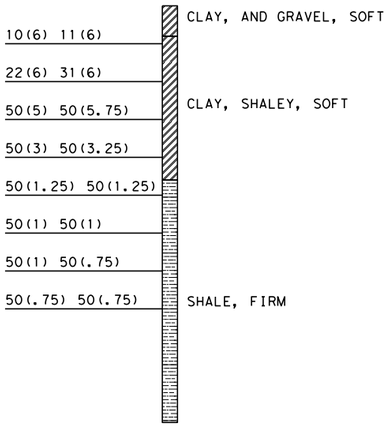
T/H EL = 496.00



EXIST TEST HOLE TH2
B/H EL = 451.00

TEST HOLE NO. TH3
STA 35+72.51, 60.90 RT

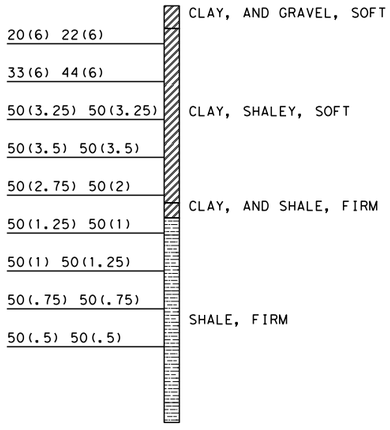
T/H EL = 495.00



EXIST TEST HOLE TH3
B/H EL = 440.00

TEST HOLE NO. TH4
STA 34+36.85, 11.10 LT

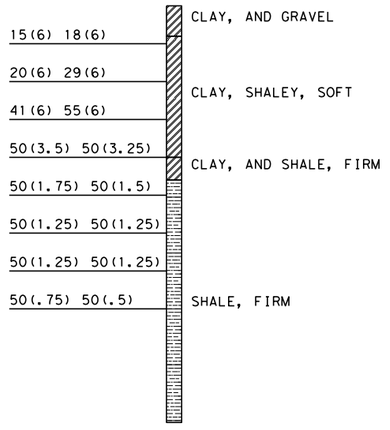
T/H EL = 496.00



EXIST TEST HOLE TH4
B/H EL = 441.00

TEST HOLE NO. TH5
STA 34+96.43, 10.17 LT

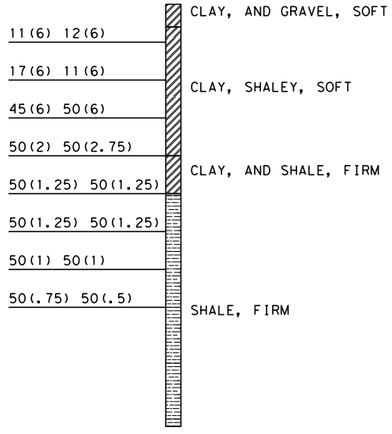
T/H EL = 496.00



EXIST TEST HOLE TH5
B/H EL = 441.00

TEST HOLE NO. TH6
STA 35+67.16, 10.80 LT

T/H EL = 496.00



EXIST TEST HOLE TH6
B/H EL = 441.00

NOTE

1. FOR TEST HOLE BR-01, SEE "TEST HOLE DATA NORTHBOUND" SHEETS.

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TEST HOLE DATA

IH 35 SB & NB OVERPASS
AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1173
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:48:29 AM USER:

SUMMARY OF ESTIMATED QUANTITIES

	ITEM - DESCRIPTION CODE	400 6005	416 6004	416 6005	420 6012	420 6014	420 6026	422 6001	422 6015	425 6028	450 6062	454 6018
	ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)	CL B CONC (MISC)	CL C CONC (ABUT) (HPC)	CL C CONC (BENT) (HPC)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC U-BEAM (U54)	RAIL (TY SSTR) (MOD)	SEALED EXPANSION JOINT (4 IN) (SEJ-M)
		CY	LF	LF	CY	CY	CY	SF	CY	LF	LF	LF
SBML	2-ABUTMENTS	389	752		1.0	108.8			160.8			166
SBML	2-INTERIOR BENTS			315			209.5					
SBML	1-308.00' PRESTR CONC U-BEAM UNIT							25,859		2,221.70	696.0	
SBML												
SBML												
SBML												
	SBML TOTAL	389	752	315	1.0	108.8	209.5	25,859	160.8	2,221.70	696.0	166
NBML	2-ABUTMENTS	349	658		1.0	95.4			137.8			142
NBML	2-INTERIOR BENTS			252			166.6					
NBML	1-308.00' PRESTR CONC U-BEAM UNIT							22,163		1,915.20	696.0	
NBML												
NBML												
NBML												
	NBML TOTAL	349	658	252	1.0	95.4	166.6	22,163	137.8	1,915.20	696.0	142
	TOTAL	738	1,410	567	2.0	204.2	376.1	48,022	298.6	4,136.90	1,392.0	308

NO.	DATE	REVISION	APPROVED

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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ESTIMATED QUANTITIES

IH 35 SB & NB OVERPASS
AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		11-74
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

SB BEARING SEAT ELEVATIONS (ft)

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
ABUT 1 (FWD)	511.874	511.761	511.501	511.387	511.127	511.014

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
	510.754	510.640	510.380	510.266	510.006	509.893

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
BENT 2 (BK)	513.563	513.450	513.194	513.080	512.825	512.711

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
	512.455	512.342	512.086	511.972	511.717	511.603

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
BENT 2 (FWD)	513.596	513.483	513.365	513.252	513.134	513.021

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
	512.903	512.791	512.672	512.560	512.442	512.329

	BEAM 7 LEFT	BEAM 7 RIGHT	BEAM 8 LEFT	BEAM 8 RIGHT	BEAM 9 LEFT	BEAM 9 RIGHT
	512.211	512.098	511.980	511.868	511.749	511.637

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
BENT 3 (BK)	515.168	515.056	514.939	514.827	514.710	514.598

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
	514.481	514.369	514.252	514.140	514.023	513.911

	BEAM 7 LEFT	BEAM 7 RIGHT	BEAM 8 LEFT	BEAM 8 RIGHT	BEAM 9 LEFT	BEAM 9 RIGHT
	513.794	513.682	513.565	513.453	513.336	513.224

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
BENT 3 (FWD)	515.185	515.073	514.819	514.707	514.453	514.340

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
	514.086	513.974	513.720	513.608	513.354	513.241

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
ABUT 4 (BK)	515.693	515.581	515.326	515.214	514.960	514.848

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
	514.593	514.481	514.227	514.115	513.860	513.748

NB BEARING SEAT ELEVATIONS (ft)

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
ABUT 1 (FWD)	509.739	509.626	509.348	509.235	508.958	508.844

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT
	508.566	508.453	508.176	508.062

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
BENT 2 (BK)	511.453	511.339	511.066	510.953	510.680	510.566

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT
	510.294	510.180	509.907	509.794

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
BENT 2 (FWD)	511.486	511.373	511.265	511.152	511.044	510.932

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
	510.823	510.711	510.603	510.490	510.382	510.269

	BEAM 7 LEFT	BEAM 7 RIGHT	BEAM 8 LEFT	BEAM 8 RIGHT
	510.161	510.049	509.940	509.828

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
BENT 3 (BK)	513.075	512.962	512.856	512.743	512.637	512.524

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
	512.418	512.305	512.199	512.086	511.980	511.867

	BEAM 7 LEFT	BEAM 7 RIGHT	BEAM 8 LEFT	BEAM 8 RIGHT
	511.761	511.648	511.542	511.429

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
BENT 3 (FWD)	513.092	512.980	512.709	512.597	512.326	512.213

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT
	511.942	511.830	511.559	511.447

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
ABUT 4 (BK)	513.598	513.486	513.215	513.103	512.831	512.719

	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT
	512.448	512.336	512.065	511.952

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING SEAT ELEVATIONS

IH 35 SB & NB OVERPASS
AT NEW ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		11-75
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

SB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6			
ABUT 1 (FWD)	0.01886	0.01891	0.01896	0.01900	0.01905	0.01910			
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6			
BENT 2 (BK)	0.01886	0.01891	0.01896	0.01900	0.01905	0.01910			
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8	BEAM 9
BENT 2 (FWD)	0.01250	0.01252	0.01253	0.01254	0.01256	0.01257	0.01259	0.01260	0.01262
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8	BEAM 9
BENT 3 (BK)	0.01250	0.01252	0.01253	0.01254	0.01256	0.01257	0.01259	0.01260	0.01262
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6			
BENT 3 (FWD)	0.00614	0.00614	0.00614	0.00613	0.00613	0.00613			
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6			
ABUT 4 (BK)	0.00614	0.00614	0.00614	0.00613	0.00613	0.00613			

NB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5			
ABUT 1 (FWD)	0.01914	0.01919	0.01924	0.01929	0.01934			
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5			
BENT 2 (BK)	0.01914	0.01919	0.01924	0.01929	0.01934			
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
BENT 2 (FWD)	0.01263	0.01265	0.01266	0.01268	0.01269	0.01270	0.01272	0.01273
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
BENT 3 (BK)	0.01263	0.01265	0.01266	0.01268	0.01269	0.01270	0.01272	0.01273
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5			
BENT 3 (FWD)	0.00613	0.00613	0.00612	0.00612	0.00612			
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5			
ABUT 4 (BK)	0.00613	0.00613	0.00612	0.00612	0.00612			

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
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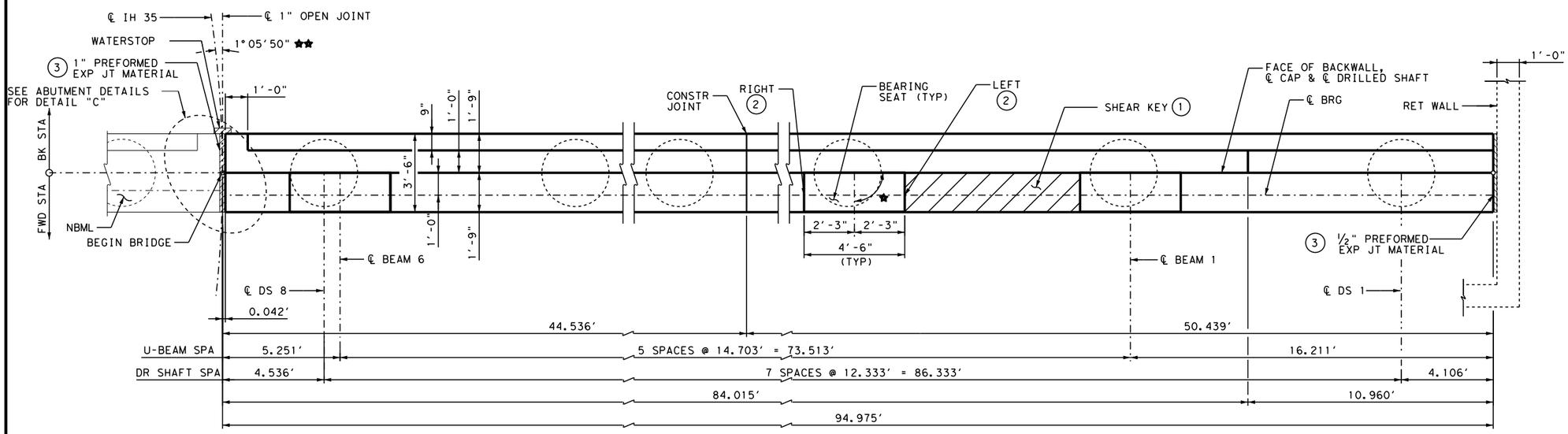
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST
BEARING PAD TAPER REPORT
IH 35 SB & NB OVERPASS AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		11-76
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

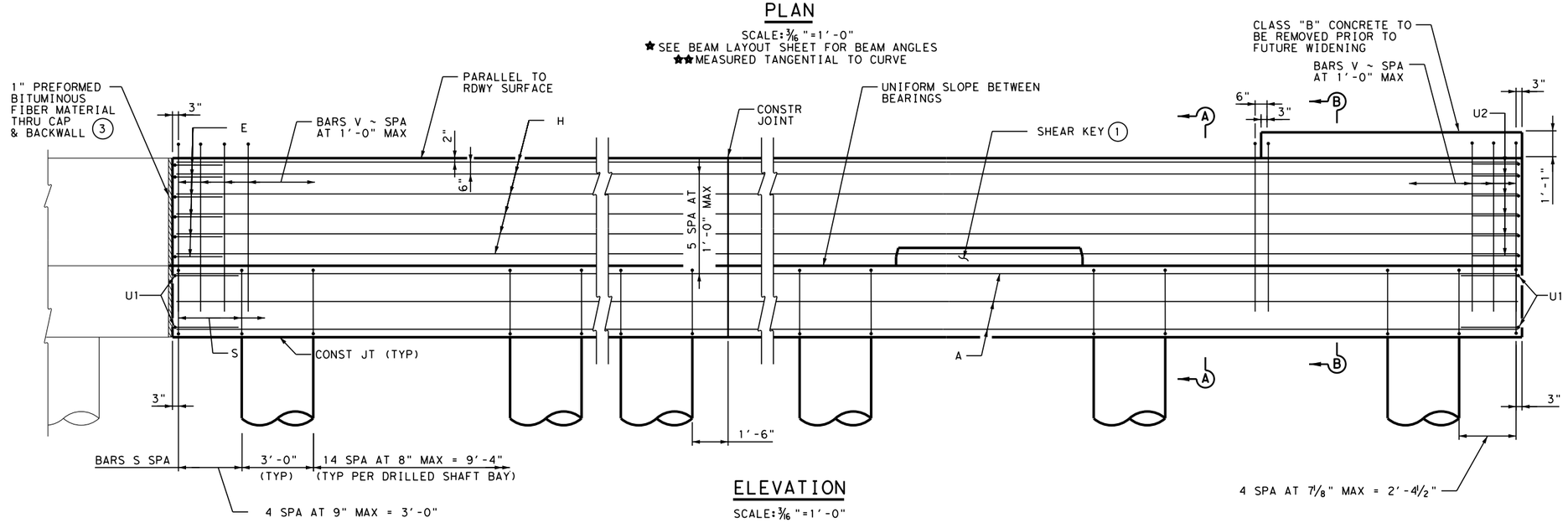


PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES

★★ MEASURED TANGENTIAL TO CURVE



ELEVATION

SCALE: 3/16"=1'-0"

1. SEE ABUTMENT DETAILS FOR SHEAR KEY DETAILS
2. SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS
3. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	10	#11	* 101'- 5"	5,389
E	6	#5	6'- 9"	43
H	12	#6	** 98'- 3"	1,771
P1	11	#5	5'- 1"	59
P2	3	#5	9'- 8"	31
S	115	#6	13'- 6"	2,332
U1	4	#6	8'- 1"	49
U2	6	#5	4'- 7"	29
V	98	#5	15'- 4"	1,568
SUBTOTAL STEEL (LB) ***				11,271
CLASS "C" CONC (ABUT) (HPC) (CY)				54.4
CLASS "B" CONC (MISC) (CY)				0.5

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER

10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

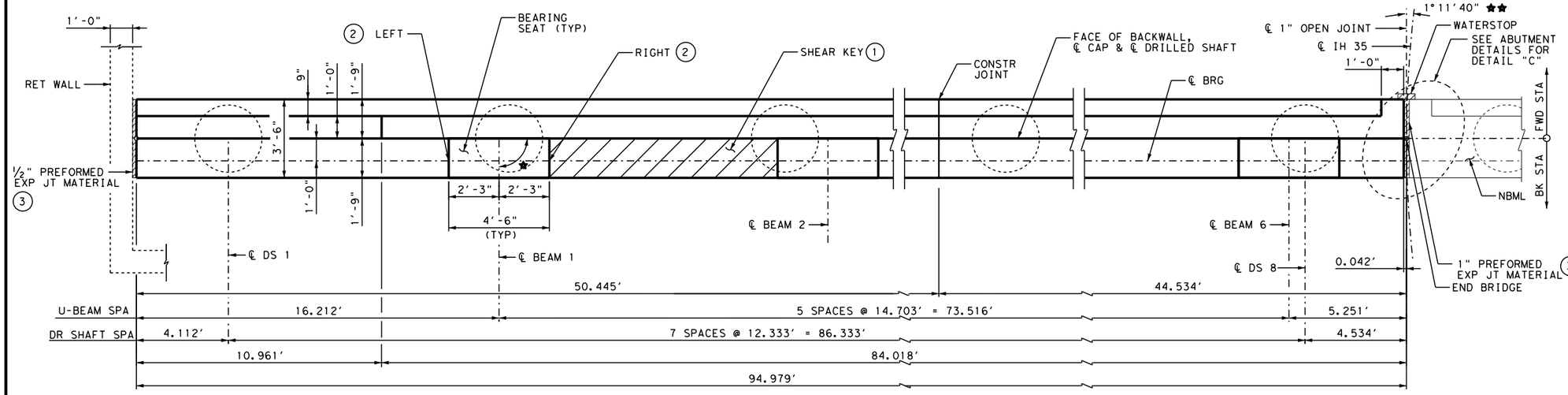
IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 SB OVERPASS AT NEW ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		11-77
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

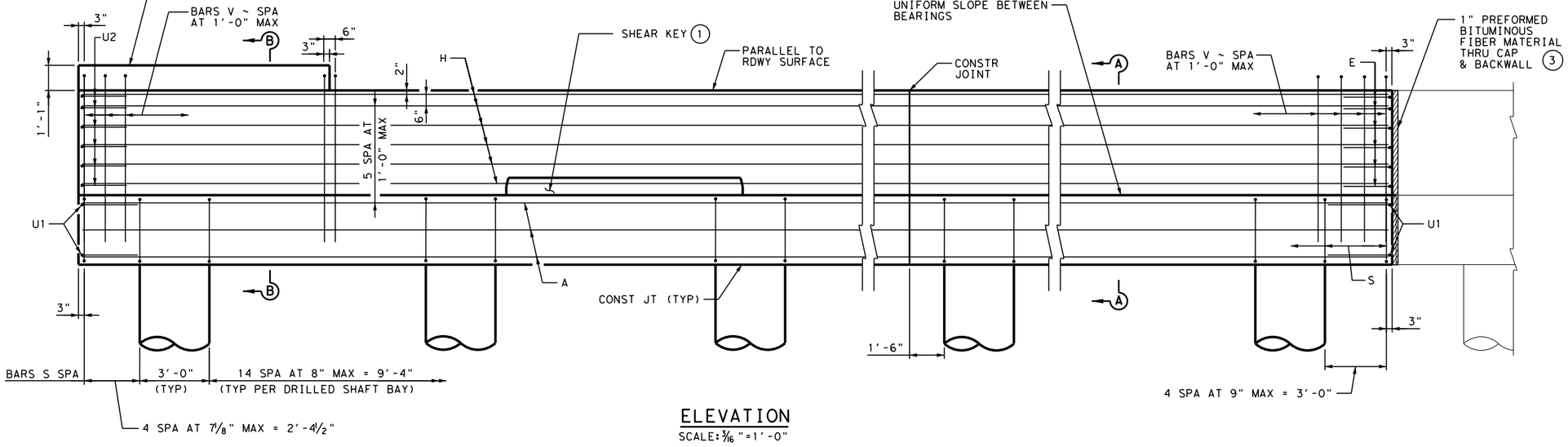
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRAB5_01NR_SB_001.dgn
DATE: 10/17/2023 11:48:40 AM USER:



PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES
★★ MEASURED TANGENTIAL TO CURVE



ELEVATION

SCALE: 3/16"=1'-0"

1. SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS
2. SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS
3. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 4

BAR	NO	SIZE	LENGTH	WEIGHT
A	10	#11	* 101'- 5"	5,389
E	6	#5	6'- 9"	43
H	12	#6	** 98'- 3"	1,771
P1	11	#5	5'- 1"	59
P2	3	#5	9'- 8"	31
S	115	#6	13'- 6"	2,332
U1	4	#6	8'- 1"	49
U2	6	#5	4'- 7"	29
V	98	#5	15'- 4"	1,568
SUBTOTAL STEEL (LB) ***				11,271
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STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 4

IH 35 SB OVERPASS AT NEW ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1178
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRAB5_01NR_SB_002.dgn
DATE: 10/17/2023 11:48:42 AM
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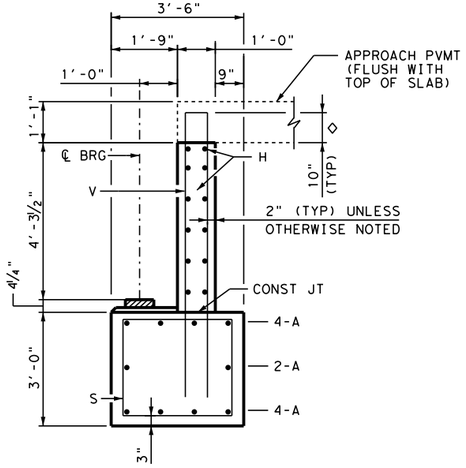
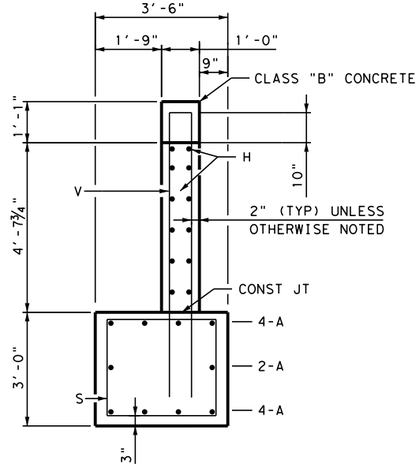


SECTION A-A

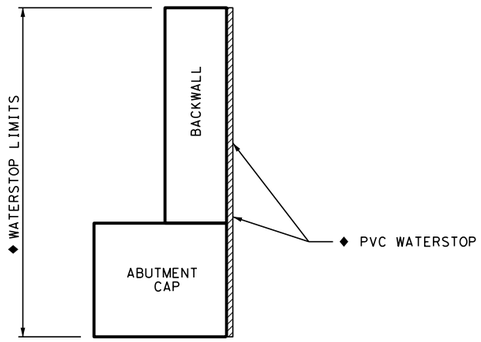
SCALE: ¼"=1'-0"

◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



SECTION B-B

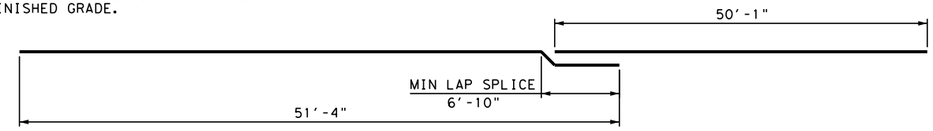
SCALE: ¼"=1'-0"



WATERSTOP DETAIL

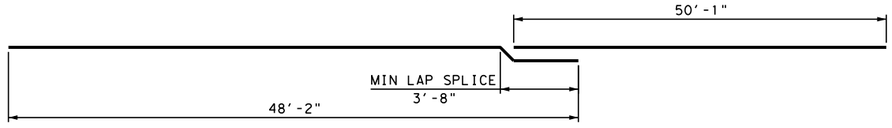
SCALE: ¼"=1'-0"

◆ WATERSTOP SHALL BE CONSIDERED SUBSIDIARY TO CLASS "C" CONCRETE



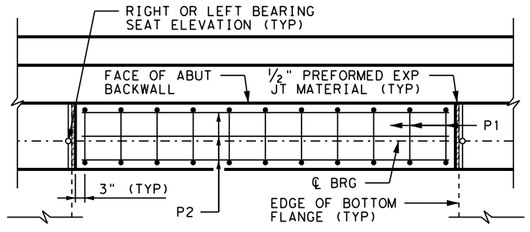
BARS A

(ABUT 1 SHOWN, ABUT 4 SHALL BE OPPOSITE HAND)

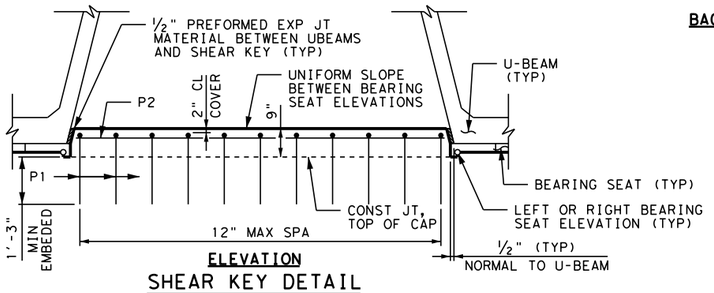


BARS H

(ABUT 1 SHOWN, ABUT 4 SHALL BE OPPOSITE HAND)

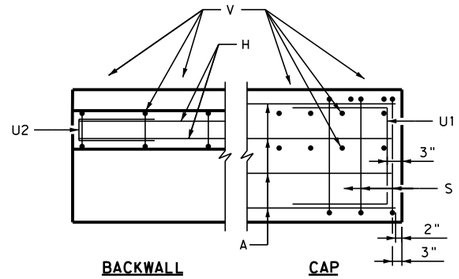


PLAN



ELEVATION

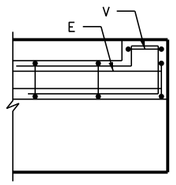
SHEAR KEY DETAIL



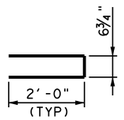
BACKWALL **CAP**

CORNER DETAIL

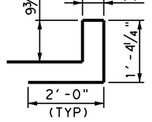
SCALE: ¼"=1'-0"



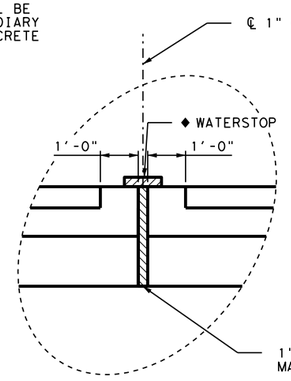
BACKWALL



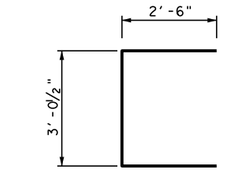
BARS U2



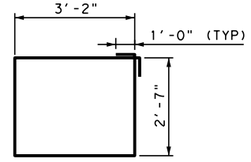
BARS E



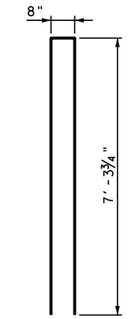
DETAIL "C"



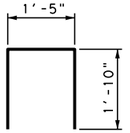
BARS U1



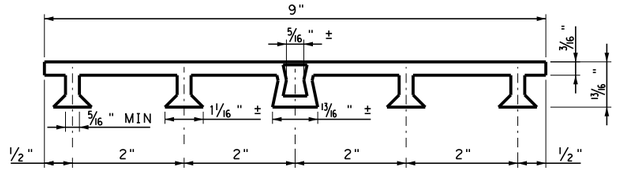
BARS S



BARS V



BARS P1



PVC WATERSTOP TYPE "A"

(DIMENSIONS AND SHAPE MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER)

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

CLASS "B" CONCRETE STRENGTH SHALL BE f'c = 2000 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

CALCULATED FOUNDATION LOADS= 99 TONS/DRILLED SHAFT.

SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENTS.

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

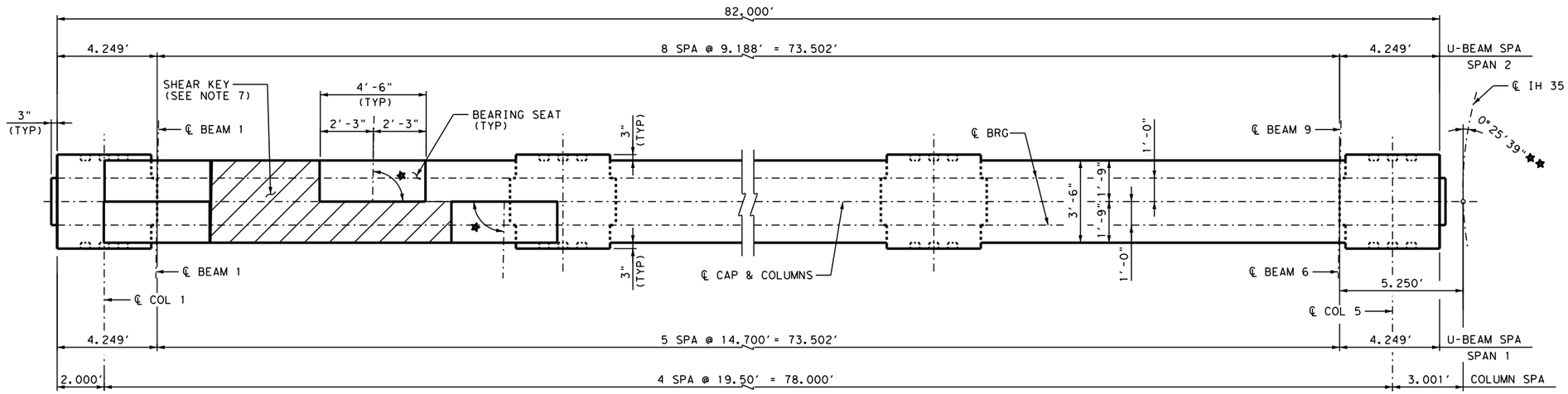
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

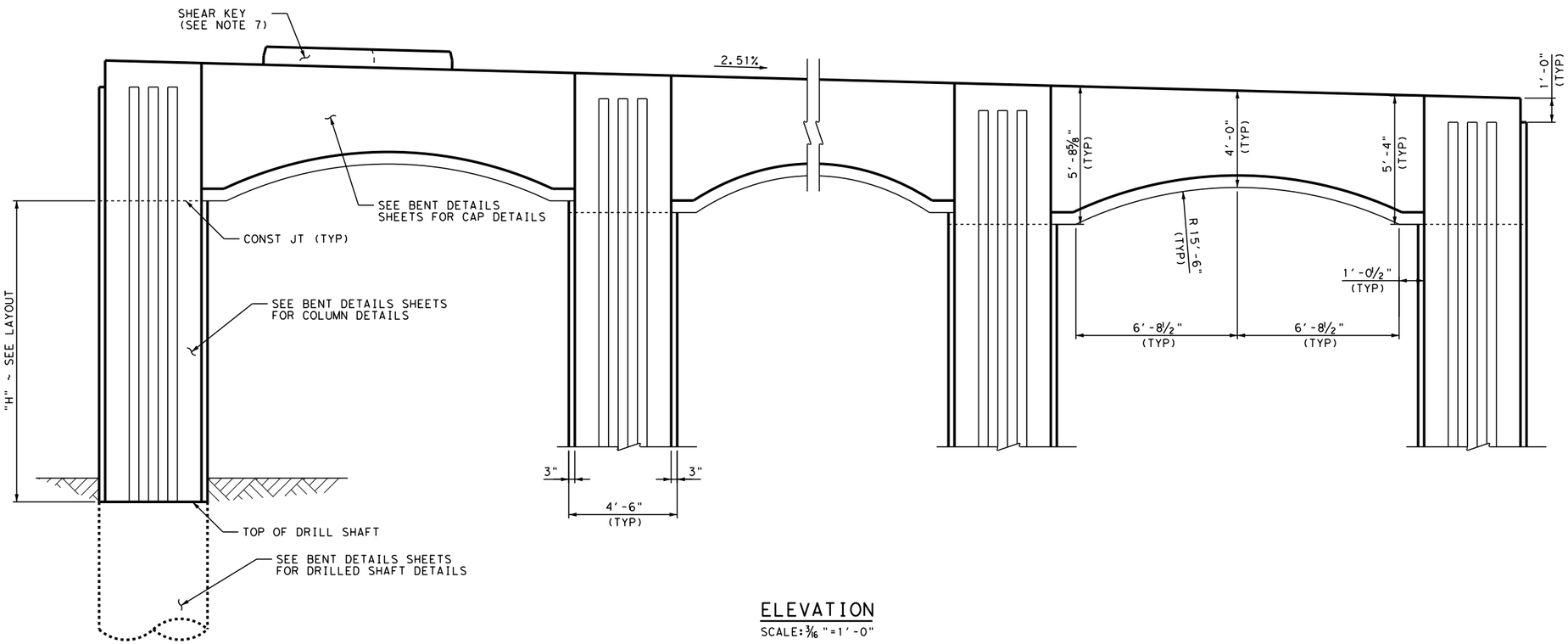
IH 35 SB OVERPASS AT NEW ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1179
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



PLAN

SCALE: 3/16"=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES
★★ MEASURED TANGENTIAL TO CURVE



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP

10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 2

IH 35 SB OVERPASS AT NEW ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1180
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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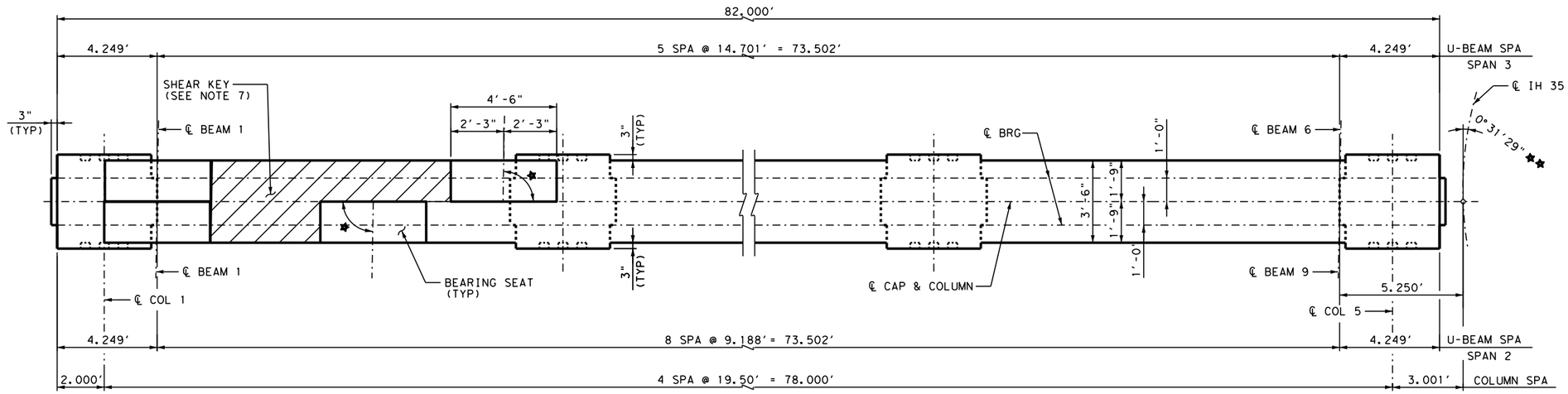
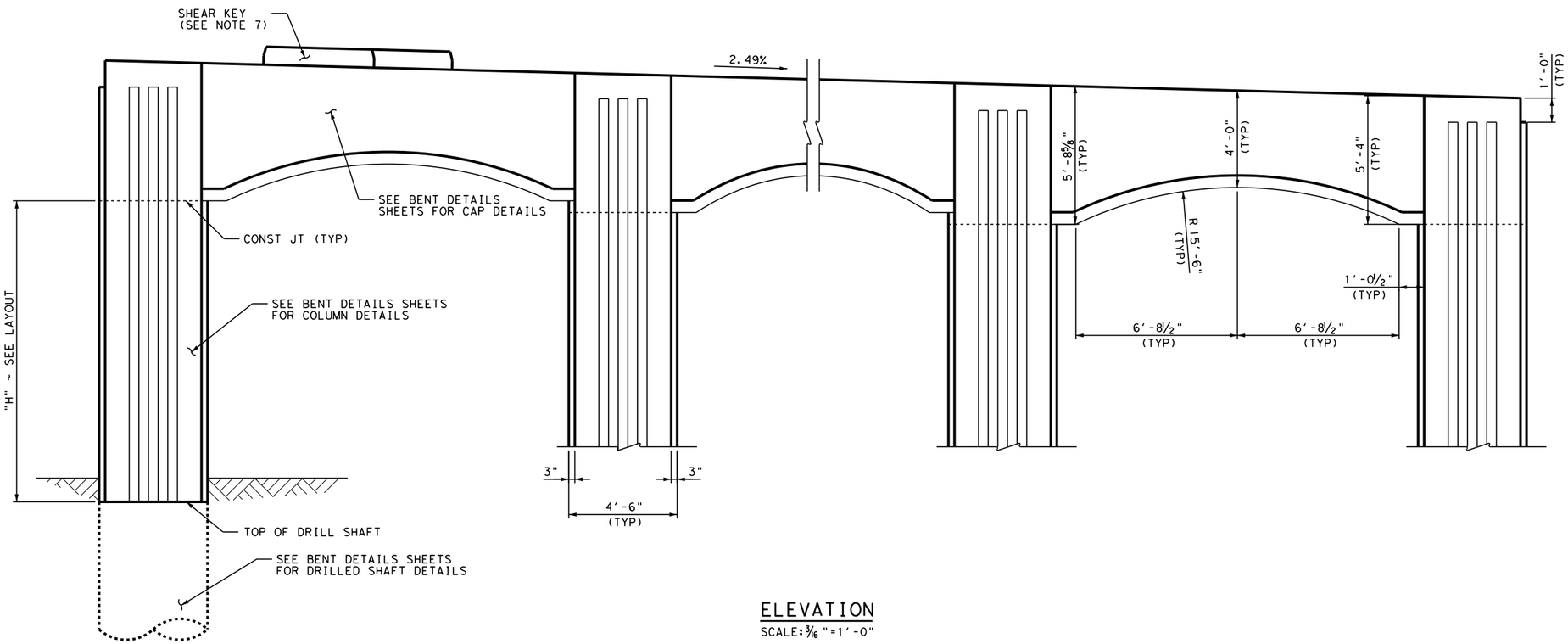


PLAN

SCALE: 3/16"=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES
★★ MEASURED TANGENTIAL TO CURVE



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP

STATE OF TEXAS
QING LIU
91266
LICENSED
PROFESSIONAL ENGINEER

10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

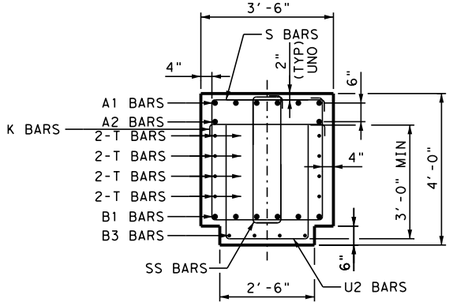
IH 35 FROM S LP 340 TO 12TH ST

BENT 3

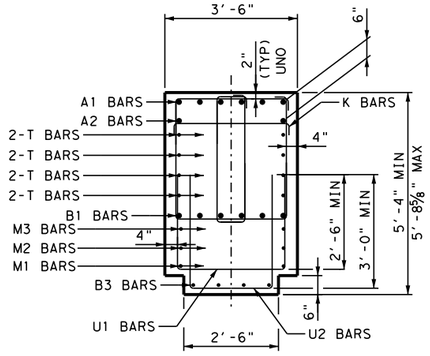
IH 35 SB OVERPASS AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1181
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRBN5_01NR_SB_002.dgn
DATE: 10/17/2023 11:48:49 AM USER:



SECTION A-A



SECTION B-B
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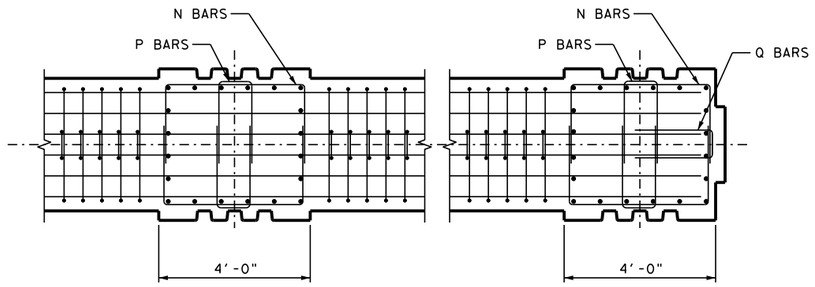
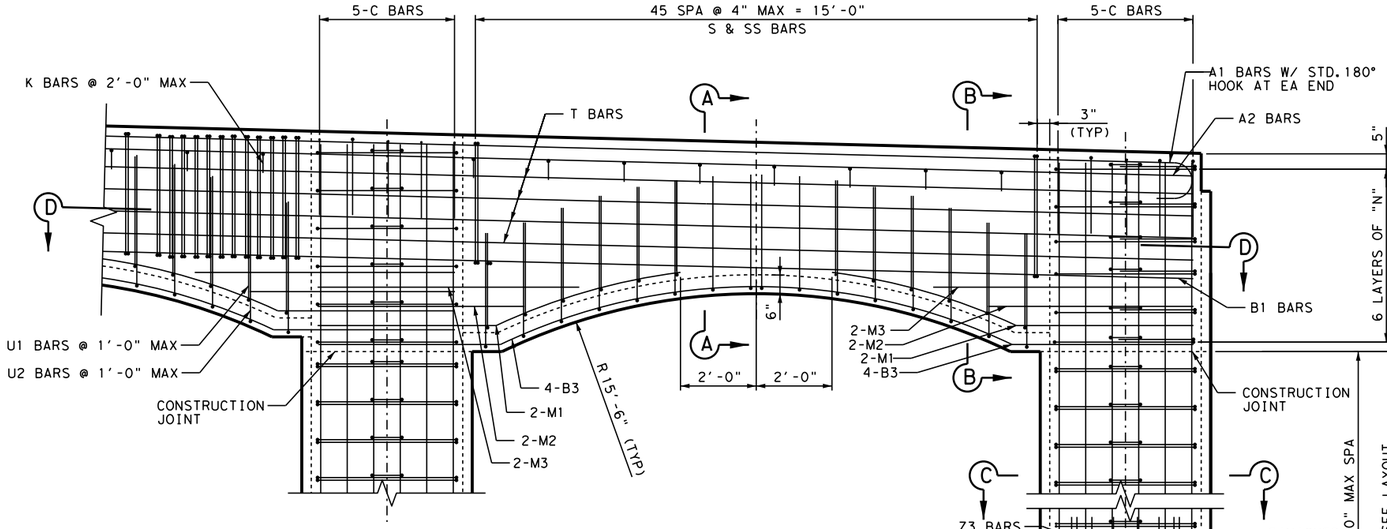
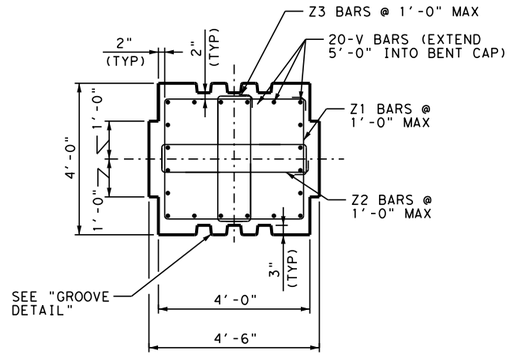


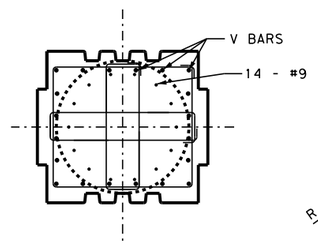
SECTION D-D



ELEVATION



SECTION C-C



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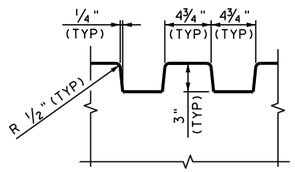
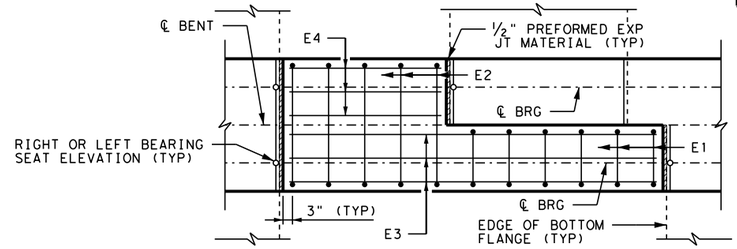
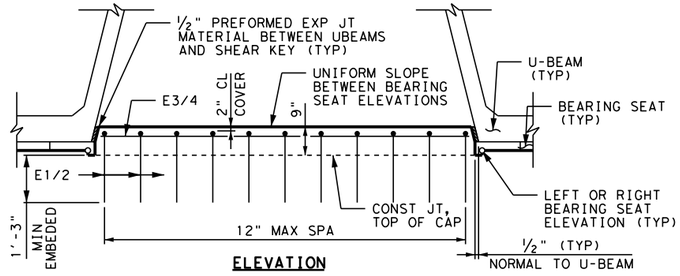


GROOVE DETAIL



PLAN
(BENT 2 SHOWN, BENT 3 SHALL BE OPPOSITE HAND)



ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 SB OVERPASS AT NEW ROAD

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1182
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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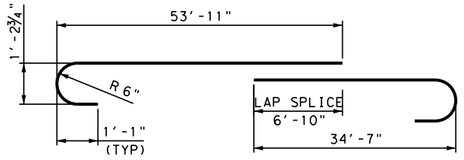
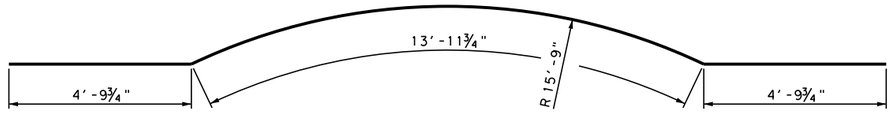
DATE: 10/17/2023 11:48:54 AM USER:

* LENGTH SHOWN INCLUDES ONE 6'-10" SPLICE.
** LENGTH SHOWN INCLUDES ONE 5'-3" SPLICE.
*** LENGTH SHOWN INCLUDES ONE 2'-2" SPLICE.
**** FOR CONTRACTOR'S INFORMATION ONLY.
(1) VARIABLE QUANTITIES ARE BASED ON COLUMN HEIGHTS "H" SHOWN.



BAR A1



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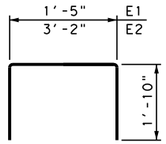
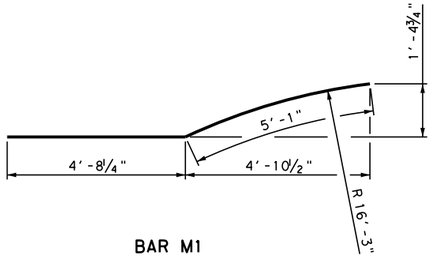
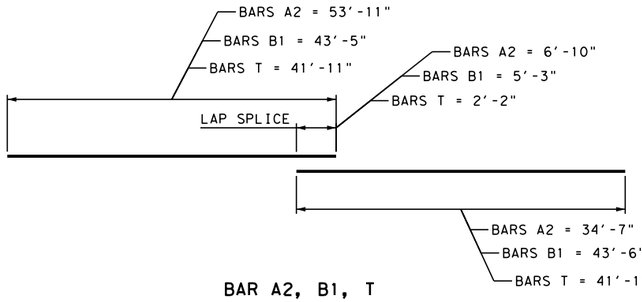


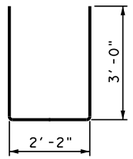
BARS E1 & E2



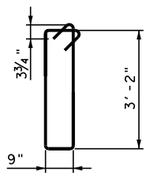
BAR M1



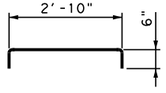
BAR A2, B1, T



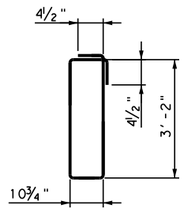
BAR U2



BAR SS



BAR K



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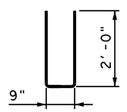

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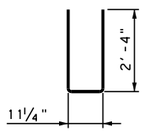

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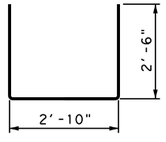
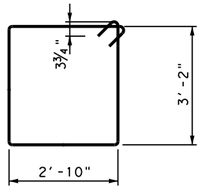
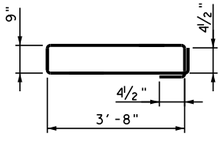


BAR U1



BAR S



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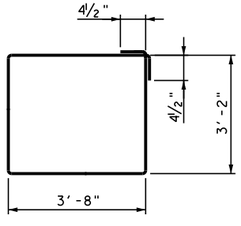

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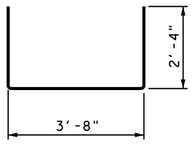
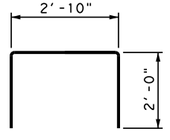


BAR N



BAR C

TABLE OF QUANTITIES BENT 2

CONSTANT QUANTITIES

BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 91'-8"	2923
A2	2	#11	* 88'-6"	941
B1	6	#11	** 86'-11"	2771
B3	16	#8	23'-7"	1009
C	25	#4	6'-10"	115
E1	6	#5	5'-1"	32
E2	5	#5	6'-10"	36
E3	3	#5	9'-8"	30
E4	3	#5	4'-2"	13
K	36	#3	3'-10"	52
M1	16	#8	9'-9"	418
M2	16	#8	5'-4"	227
M3	16	#8	6'-9"	227
N	60	#4	8'-4"	334
P	60	#4	5'-7"	225
Q	12	#4	4'-9"	39
S	184	#5	12'-11"	2479
SS	184	#5	8'-9"	1680
T	8	#6	*** 83'-10"	1008
U1	48	#4	7'-10"	252
U2	64	#4	8'-2"	350
SUBTOTAL STEEL (LBS) ****				15,223

VARIABLE QUANTITIES (1)

"H" = 17'				
V	100	#11	21'-9"	11,556
Z1	90	#4	14'-5"	867
Z2	90	#4	9'-7"	577
Z3	90	#4	8'-11"	534
SUBTOTAL STEEL (LBS) ****				13,534
CL "C" CONC (BENT) (HPC)(CY)				107.7

TABLE OF QUANTITIES BENT 3

CONSTANT QUANTITIES

BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 91'-8"	2923
A2	2	#11	* 88'-6"	941
B1	6	#11	** 86'-11"	2771
B3	16	#8	23'-7"	1009
C	25	#4	6'-10"	115
E1	6	#5	5'-1"	32
E2	5	#5	6'-10"	36
E3	3	#5	9'-8"	30
E4	3	#5	4'-2"	13
K	36	#3	3'-10"	52
M1	16	#8	9'-9"	418
M2	16	#8	5'-4"	227
M3	16	#8	6'-9"	227
N	60	#4	8'-4"	334
P	60	#4	5'-7"	225
Q	12	#4	4'-9"	39
S	184	#5	12'-11"	2479
SS	184	#5	8'-9"	1680
T	8	#6	*** 83'-10"	1008
U1	48	#4	7'-10"	252
U2	64	#4	8'-2"	350
SUBTOTAL STEEL (LBS) ****				15,223

VARIABLE QUANTITIES (1)

"H" = 16'				
V	100	#11	20'-9"	11,025
Z1	85	#4	14'-5"	819
Z2	85	#4	9'-7"	545
Z3	85	#4	8'-11"	504
SUBTOTAL STEEL (LBS) ****				12,893
CL "C" CONC (BENT) (HPC)(CY)				101.8

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 SB OVERPASS AT NEW ROAD

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1183
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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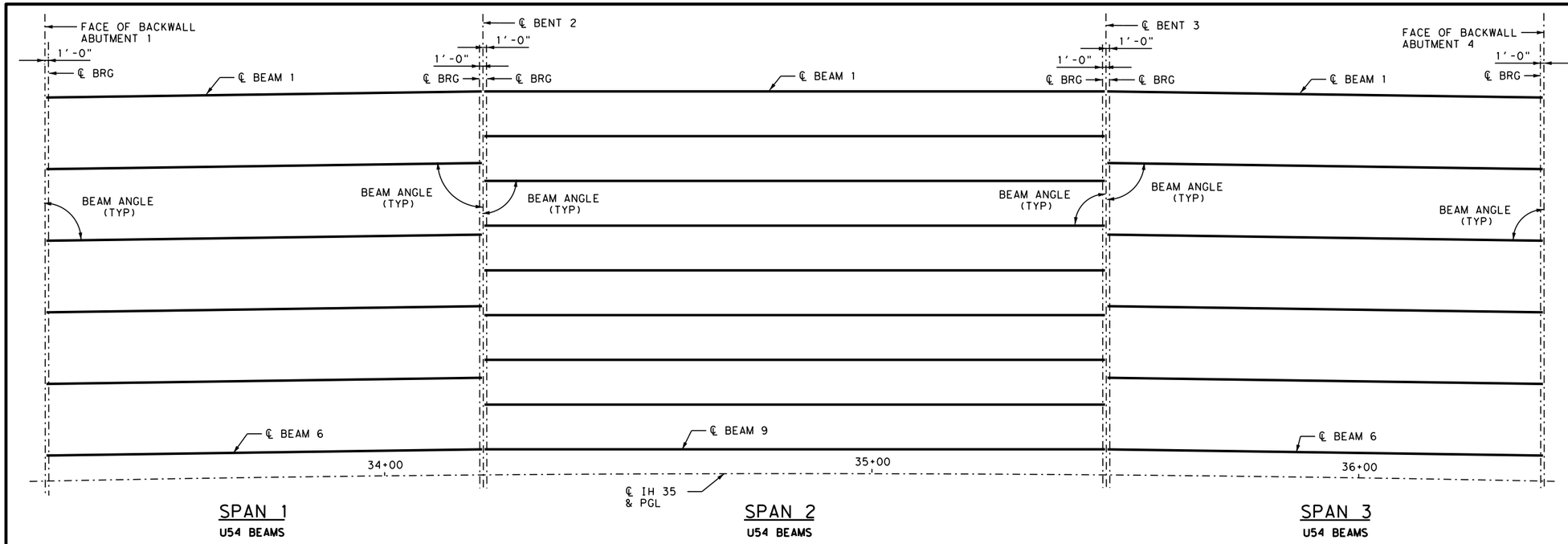


SPAN 1
U54 BEAMS

SPAN 2
U54 BEAMS

SPAN 3
U54 BEAMS

BENT REPORT

ABUT NO. 1 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.764 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	89 14 43
	BEAM	2	14.703	89 14 38
	BEAM	3	14.703	89 14 33
	BEAM	4	14.703	89 14 28
	BEAM	5	14.703	89 14 23
	BEAM	6	14.703	89 14 17
	TOTAL		73.513	

BENT NO. 2 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.752 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	89 14 43
	BEAM	2	14.700	89 14 38
	BEAM	3	14.700	89 14 33
	BEAM	4	14.700	89 14 28
	BEAM	5	14.700	89 14 23
	BEAM	6	14.700	89 14 17
	TOTAL		73.502	

BENT REPORT

BENT NO. 2 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.752 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM	1	0.000	89 57 6
	BEAM	2	9.188	89 57 6
	BEAM	3	9.188	89 57 6
	BEAM	4	9.188	89 57 6
	BEAM	5	9.188	89 57 6
	BEAM	6	9.188	89 57 5
	BEAM	7	9.188	89 57 5
	BEAM	8	9.188	89 57 5
	BEAM	9	9.188	89 57 5
	TOTAL		73.502	

BENT NO. 3 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.753 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM	1	0.000	89 57 7
	BEAM	2	9.188	89 57 7
	BEAM	3	9.188	89 57 7
	BEAM	4	9.188	89 57 7
	BEAM	5	9.188	89 57 6
	BEAM	6	9.188	89 57 6
	BEAM	7	9.188	89 57 6
	BEAM	8	9.188	89 57 6
	BEAM	9	9.188	89 57 6
	TOTAL		73.503	

BENT REPORT

BENT NO. 3 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.753 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 3	BEAM	1	0.000	89 8 57
	BEAM	2	14.701	89 8 51
	BEAM	3	14.701	89 8 45
	BEAM	4	14.701	89 8 39
	BEAM	5	14.701	89 8 34
	BEAM	6	14.701	89 8 28
	TOTAL		73.503	

ABUT NO. 4 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.767 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 3	BEAM	1	0.000	89 8 57
	BEAM	2	14.703	89 8 51
	BEAM	3	14.703	89 8 45
	BEAM	4	14.703	89 8 39
	BEAM	5	14.703	89 8 33
	BEAM	6	14.703	89 8 28
	TOTAL		73.516	

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	89.999	87.999	89.52	0.0192
BEAM 2	89.999	87.999	89.52	0.0192
BEAM 3	89.999	87.999	89.52	0.0193
BEAM 4	89.999	87.999	89.52	0.0193
BEAM 5	89.999	87.999	89.52	0.0194
BEAM 6	89.999	87.999	89.52	0.0194

BEAM REPORT

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	127.999	125.999	127.51	0.0125
BEAM 2	127.999	125.999	127.51	0.0125
BEAM 3	127.999	125.999	127.51	0.0125
BEAM 4	127.999	125.999	127.51	0.0125
BEAM 5	127.999	125.999	127.51	0.0125
BEAM 6	127.999	125.999	127.51	0.0125
BEAM 7	127.999	125.999	127.51	0.0126
BEAM 8	127.999	125.999	127.51	0.0126
BEAM 9	127.999	125.999	127.51	0.0126

BEAM REPORT

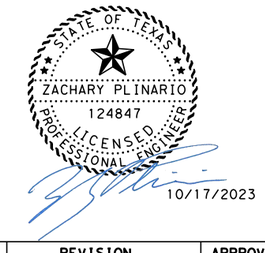
BEAM REPORT, SPAN 3

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	89.999	87.999	89.50	0.0058
BEAM 2	89.999	87.999	89.50	0.0058
BEAM 3	89.999	87.999	89.50	0.0058
BEAM 4	89.999	87.999	89.50	0.0058
BEAM 5	89.999	87.999	89.50	0.0058
BEAM 6	89.999	87.999	89.50	0.0058

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

ACUTE BEAM ANGLE SHOWN



NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
© 2023

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT

IH 35 SB OVERPASS AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1184
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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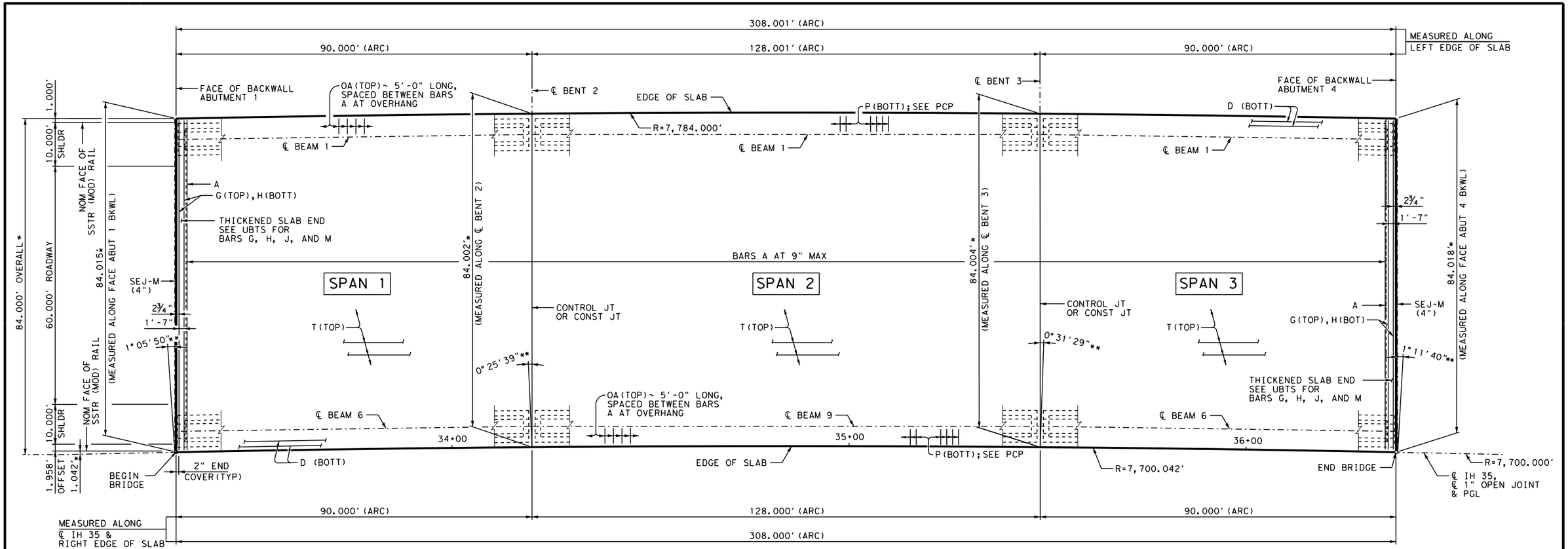
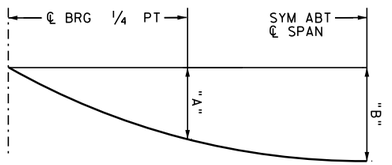


PLAN

* MEASURED TO ℄ IH 35
** MEASURED RADIAL TO CURVE

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1&3	1&6	0.053	0.075
1&3	2-5	0.062	0.087
2	1	0.178	0.253
2	2-8	0.163	0.229
2	9	0.166	0.236



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION(2017).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T.

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c = 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS;

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

308.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 SB OVERPASS AT NEW ROAD

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1185
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:49:03 AM USER:

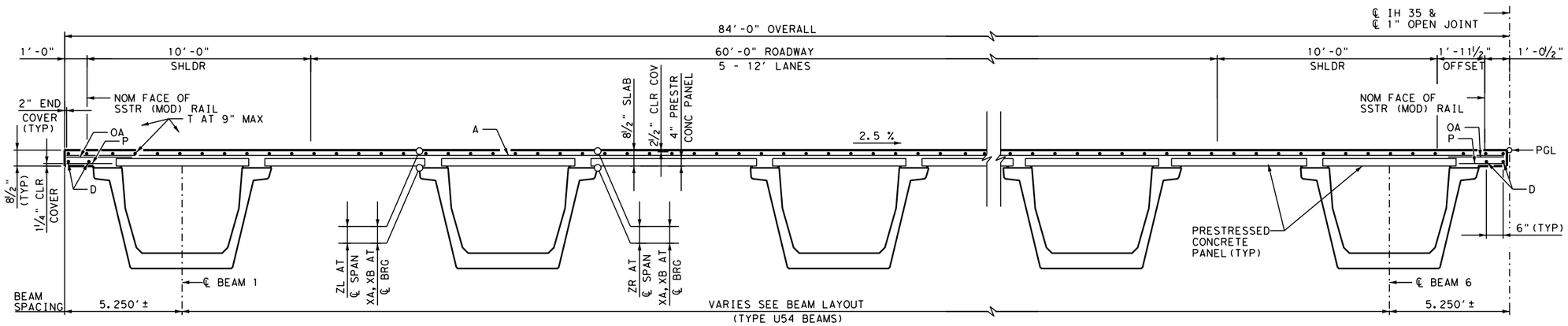
① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

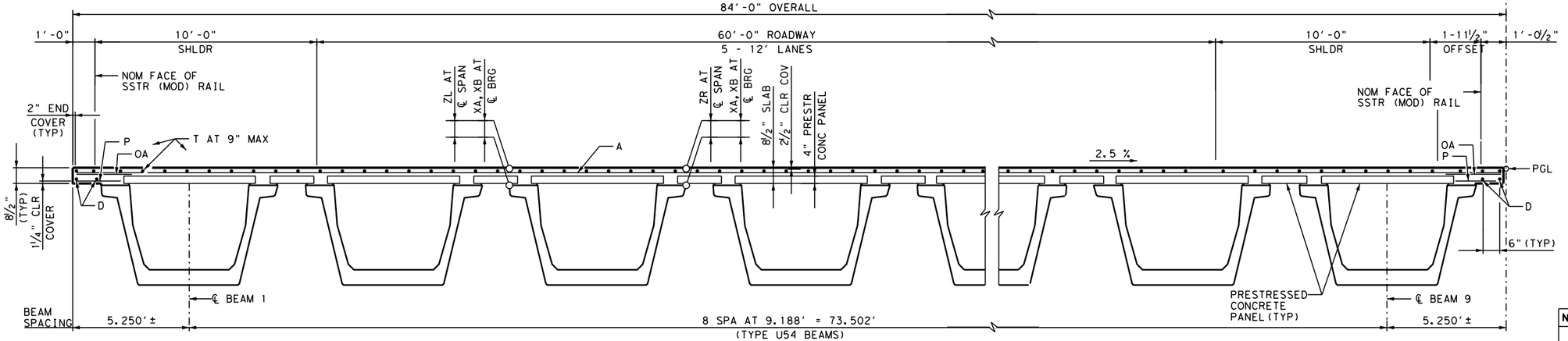
TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	② PRESTR CONC U-BEAM (U54)	① REINFORCING STEEL
	SF	LF	LB
1	7,556	537.1	27,957
2	10,747	1147.6	39,764
3	7,556	537.0	27,957
TOTAL	25,859	2221.7	95,678



TYPICAL TRANSVERSE SECTION

(SHOWING SPANS 1 & 3)



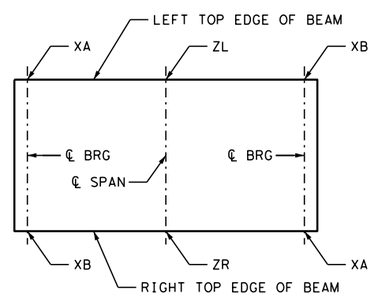
TYPICAL TRANSVERSE SECTION

(SHOWING SPAN 2)

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN *** (IN)	"ZR" AT ℄ SPAN *** (IN)
1&3	1&6	10 1/2	10 1/2	10 1/4	10 1/4
1&3	2-5	10 1/2	10 1/2	10 3/8	10 3/8
2	1	10 1/2	10 1/2	11	11
2	2-8	10 1/2	10 1/2	10 3/4	10 3/4
2	9	10 1/2	10 1/2	10 1/8	10 1/8

*** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.

BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
T	#4

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL LICENSED ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

308.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 SB OVERPASS AT NEW ROAD

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1186

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRLD5_01NR_SB_002.dgn
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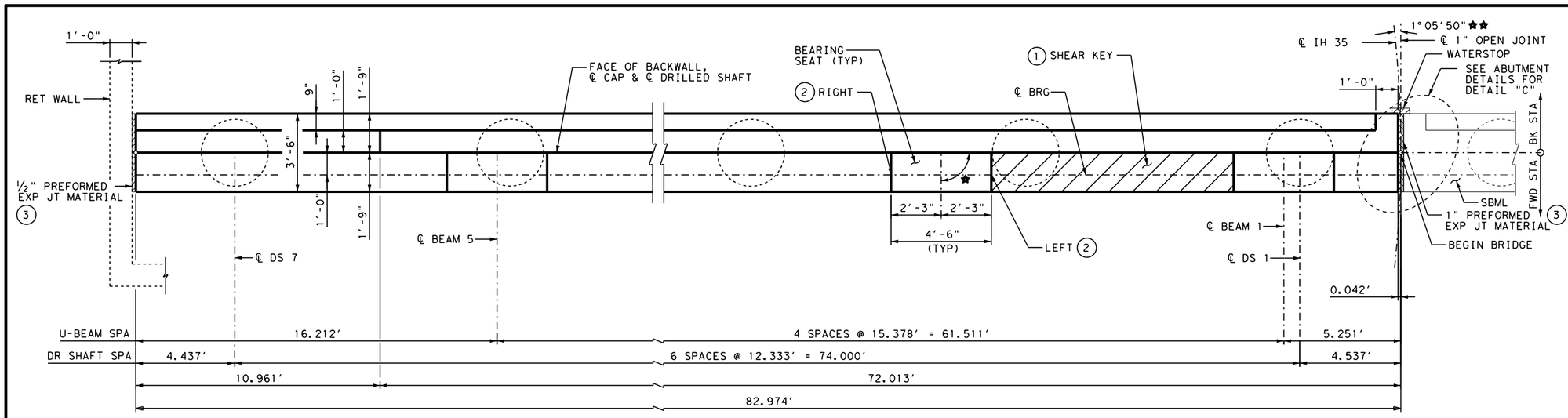
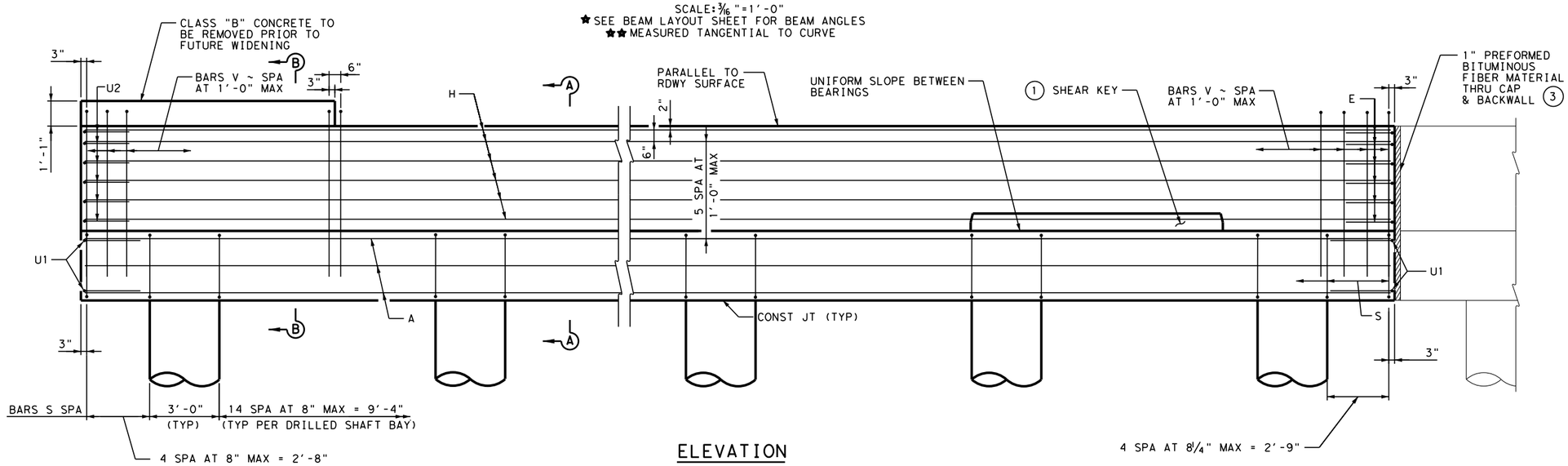


PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES

★★ MEASURED TANGENTIAL TO CURVE



ELEVATION

SCALE: 3/16"=1'-0"

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	10	#11	* 89'- 5"	4,751
E	6	#5	6'- 9"	43
H	12	#6	** 86'- 3"	1,555
P1	12	#5	5'- 1"	64
P2	3	#5	10'- 4"	33
S	100	#6	13'- 6"	2,028
U1	4	#6	8'- 1"	49
U2	6	#5	4'- 7"	29
V	86	#5	15'- 4"	1,376
SUBTOTAL STEEL (LB) ***				9,928
CLASS "C" CONC (ABUT) (HPC) (CY)				47.7
CLASS "B" CONC (MISC) (CY)				0.5

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
JORDAN R. GREENE
124925
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 NB OVERPASS AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1187
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRAB5_01NR_NB_001.dgn
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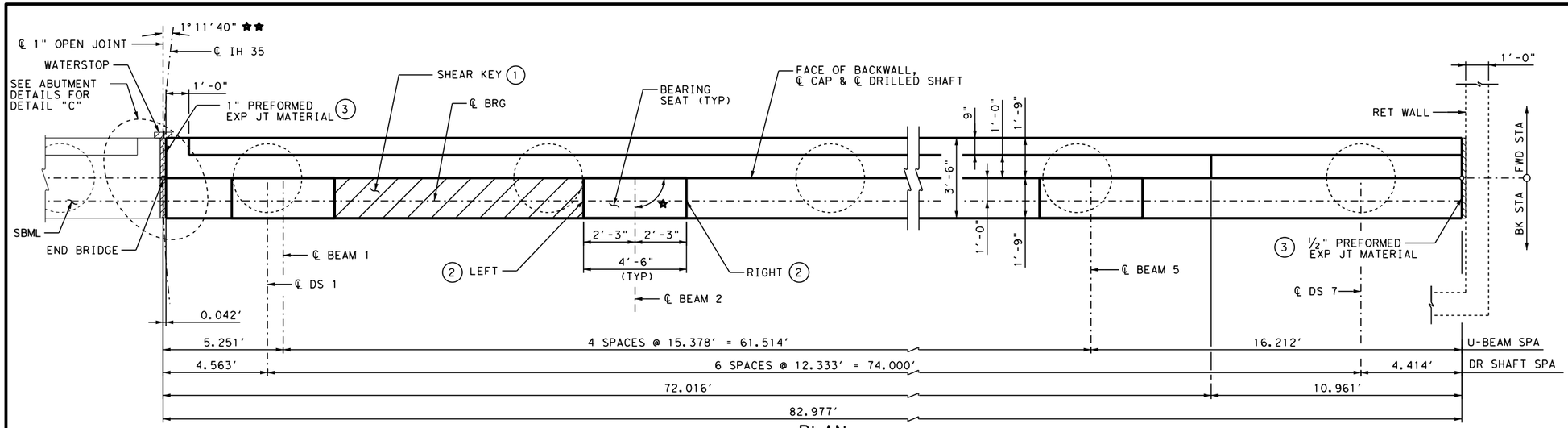
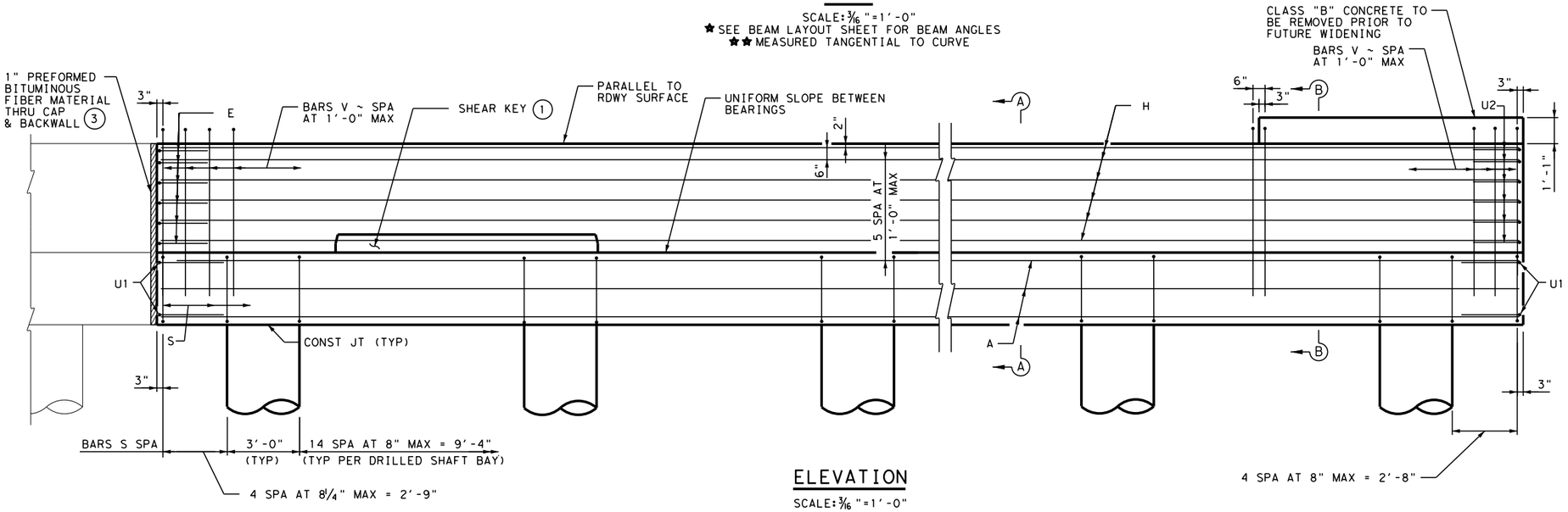


PLAN

SCALE: 3/16"=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES
★★ MEASURED TANGENTIAL TO CURVE



ELEVATION

SCALE: 3/16"=1'-0"

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 4

BAR	NO	SIZE	LENGTH	WEIGHT
A	10	#11	* 89'- 5"	4,751
E	6	#5	6'- 9"	43
H	12	#6	** 86'- 3"	1,555
P1	12	#5	5'- 1"	64
P2	3	#5	10'- 4"	33
S	100	#6	13'- 6"	2,028
U1	4	#6	8'- 1"	49
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** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

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STATE OF TEXAS
JORDAN R. GREENE
124925
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 4

IH 35 NB OVERPASS AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1188
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRAB5_01NR_NB_002.dgn
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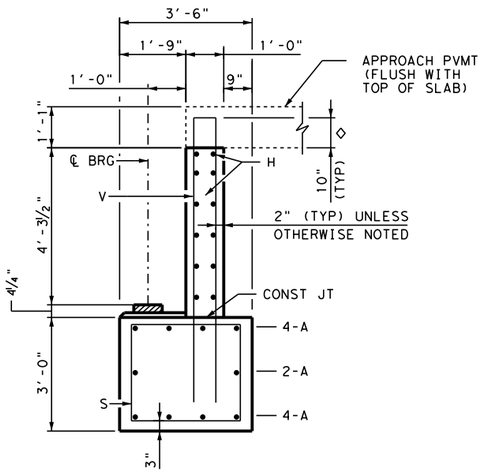
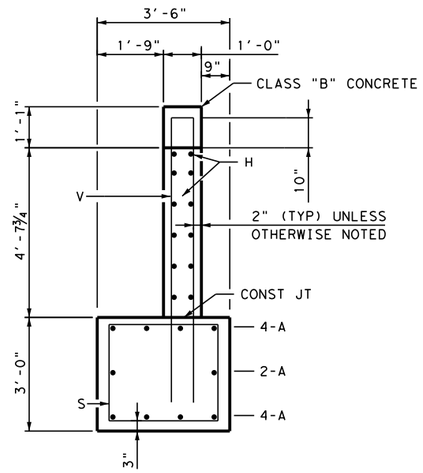


SECTION A-A

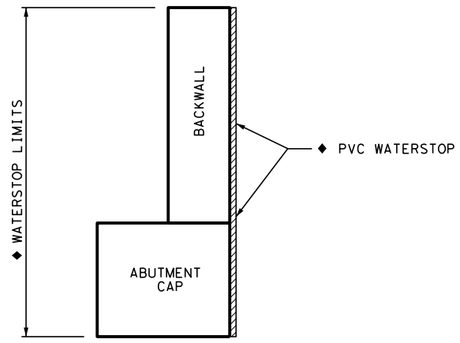
SCALE: 1/4"=1'-0"

◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



SECTION B-B

SCALE: 1/4"=1'-0"



WATERSTOP DETAIL

SCALE: 1/4"=1'-0"

◆ WATERSTOP SHALL BE CONSIDERED SUBSIDIARY TO CLASS "C" CONCRETE

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

CLASS "B" CONCRETE STRENGTH SHALL BE f'c = 2000 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

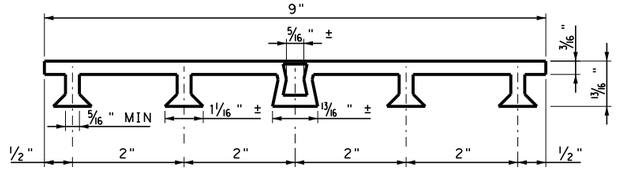
COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

CALCULATED FOUNDATION LOADS= 96 TONS/DRILLED SHAFT.

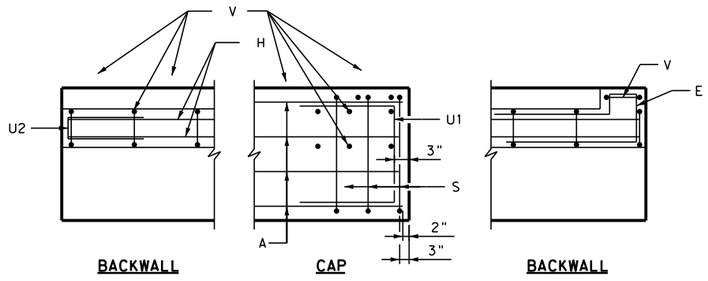
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOACATIONS IN ABUTMENT.

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.



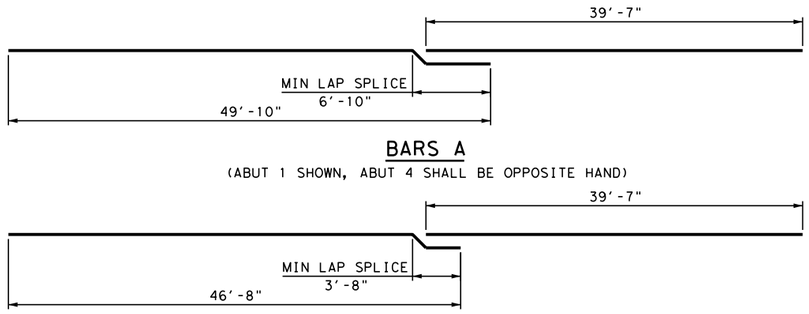
PVC WATERSTOP TYPE "A"

(DIMENSIONS AND SHAPE MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER)



CORNER DETAIL

SCALE: 1/4"=1'-0"

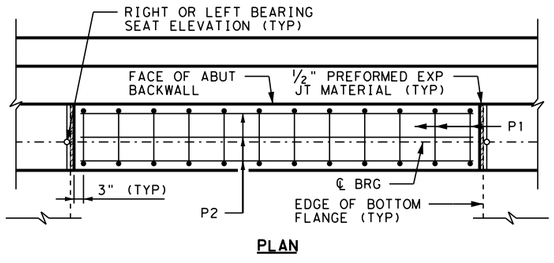


BARS A

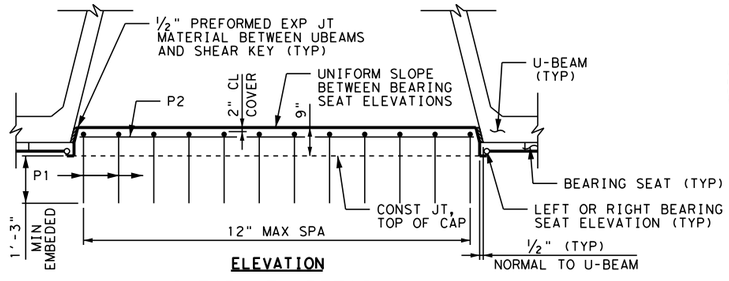
(ABUT 1 SHOWN, ABUT 4 SHALL BE OPPOSITE HAND)

BARS H

(ABUT 1 SHOWN, ABUT 4 SHALL BE OPPOSITE HAND)

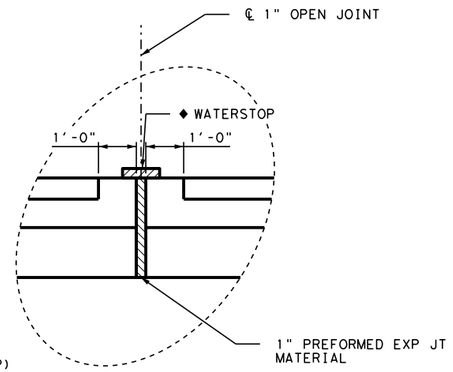


PLAN

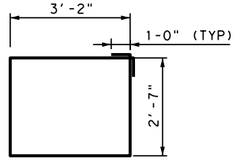


ELEVATION

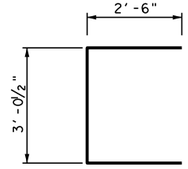
SHEAR KEY DETAIL



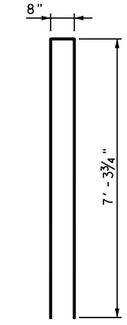
DETAIL "C"



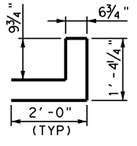
BARS S



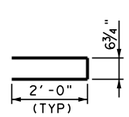
BARS U1



BARS V



BARS E



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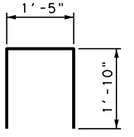

BARS P1

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL ENGINEER
10/17/2023

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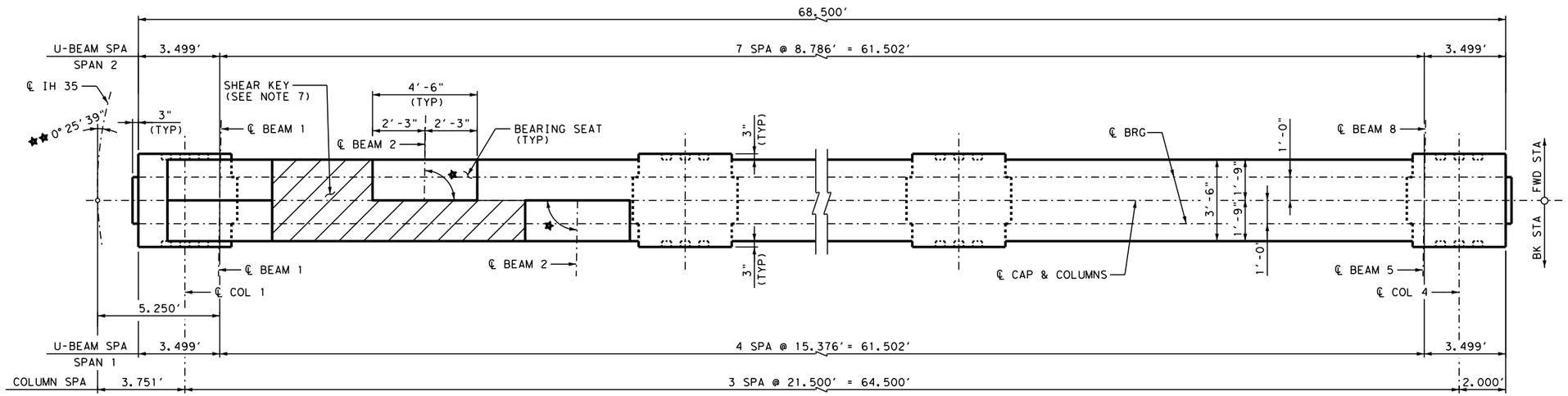
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

IH 35 NB OVERPASS AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1189
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

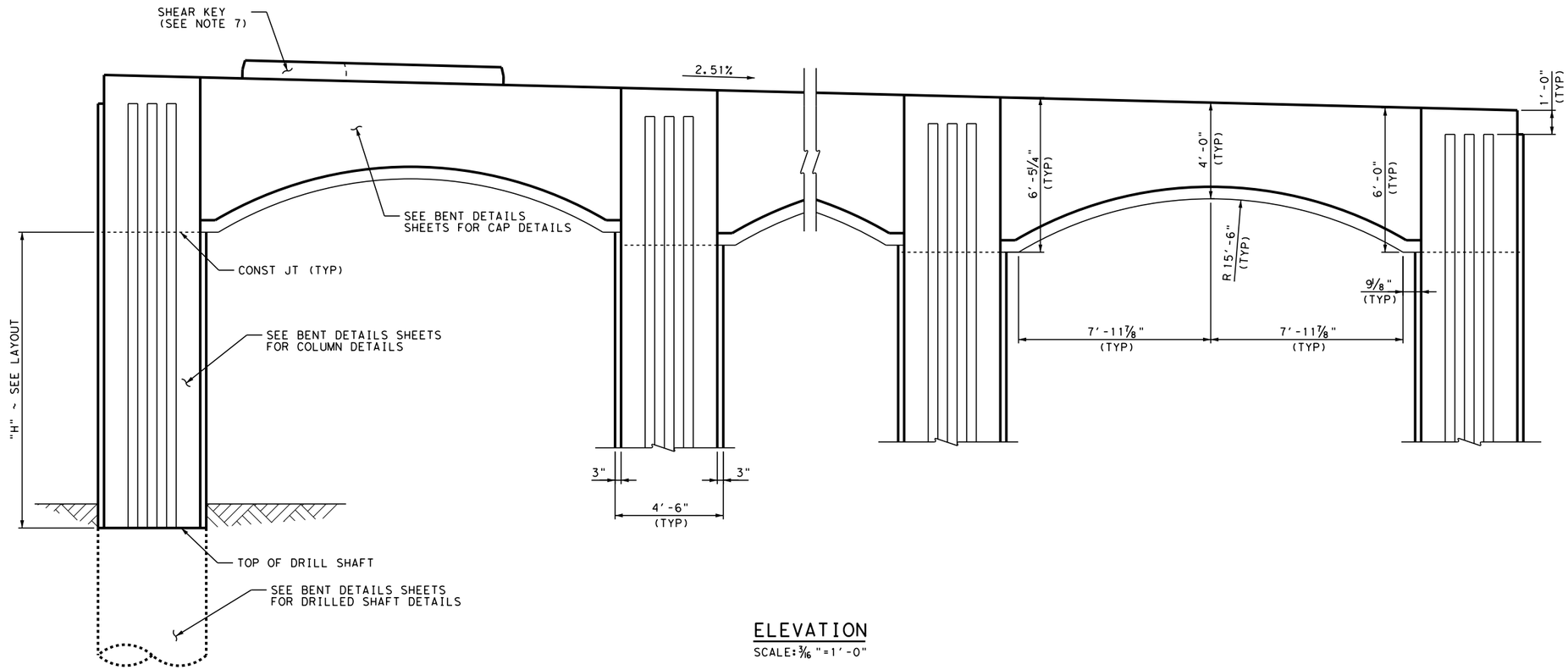


PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES

★★ MEASURED TANGENTIAL TO CURVE



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
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The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 2

IH 35 NB OVERPASS AT NEW ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1190
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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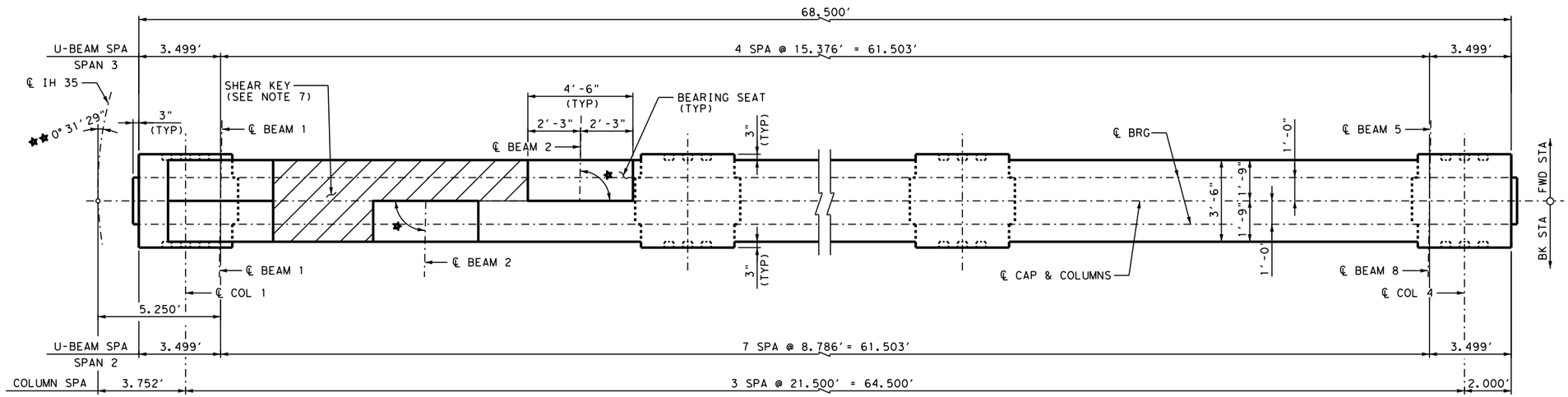
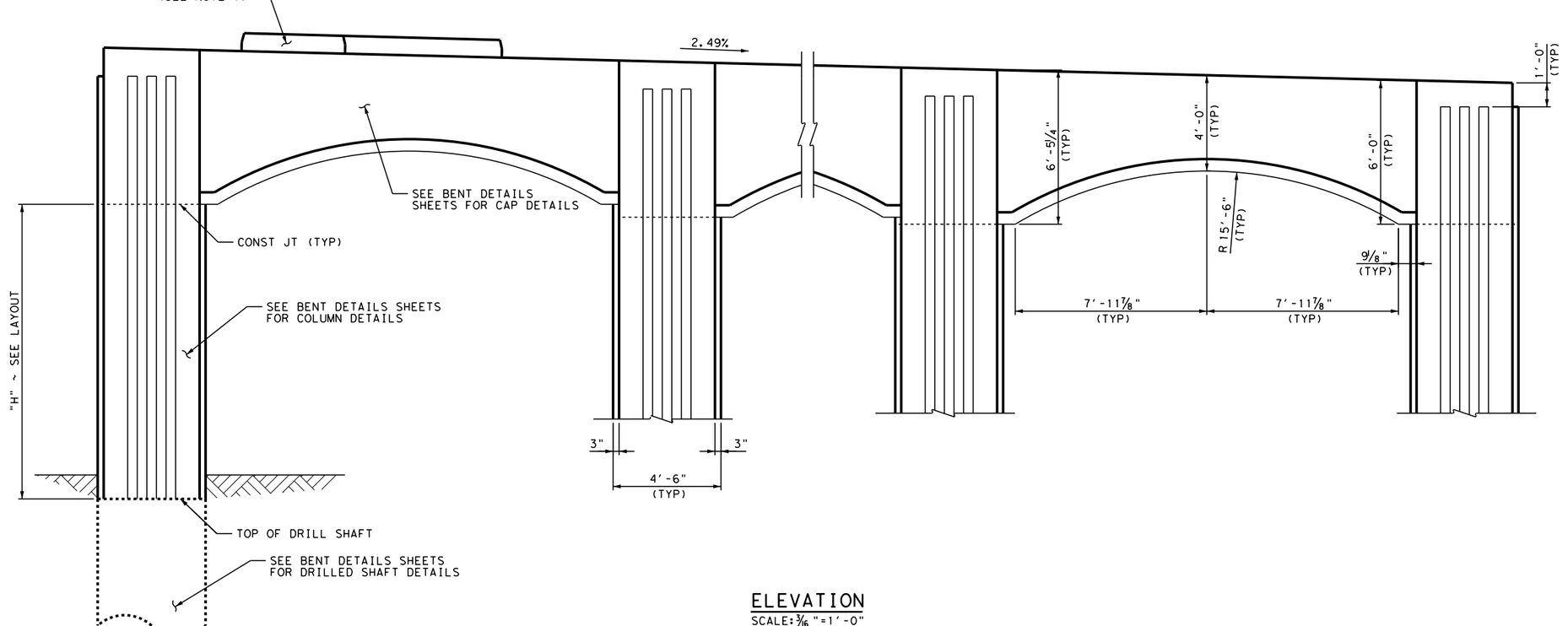


PLAN

SCALE: 3/16"=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES
★★ MEASURED TANGENTIAL TO CURVE



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

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8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 3

IH 35 NB OVERPASS AT NEW ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1191
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRBN5_01NR_NB_002.dgn
DATE: 10/17/2023 11:49:20 AM
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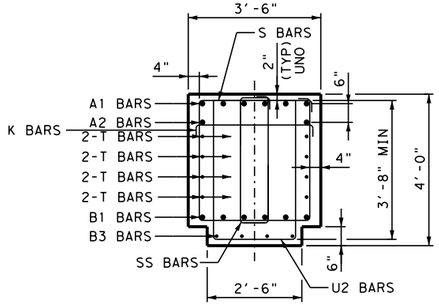
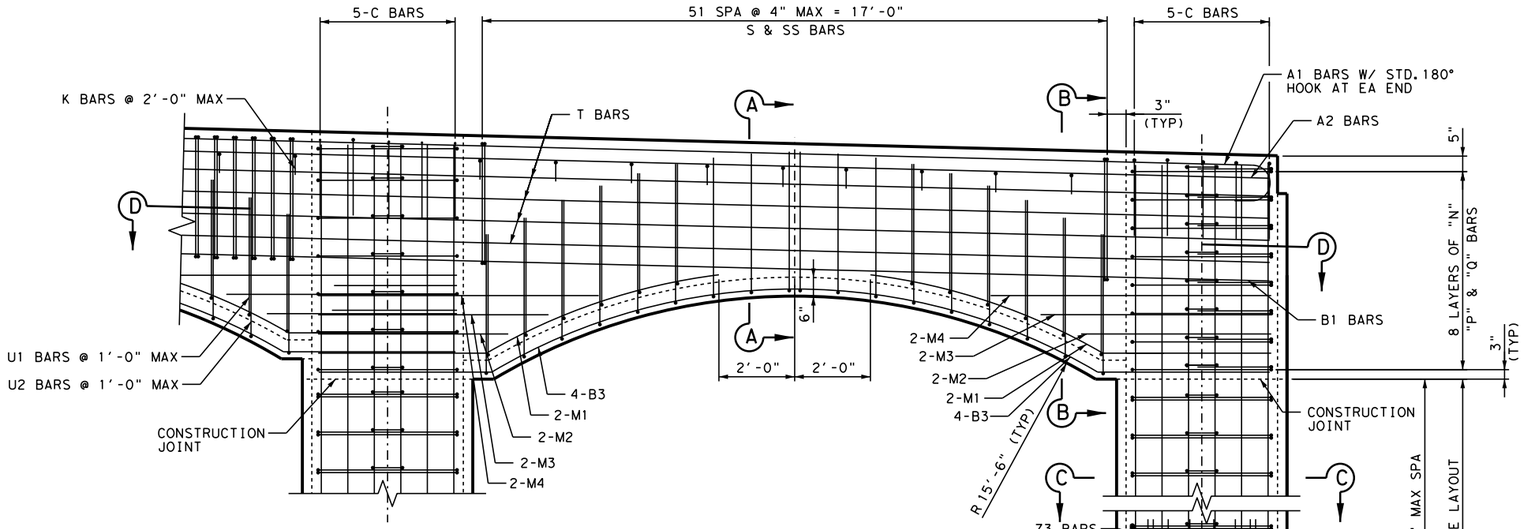
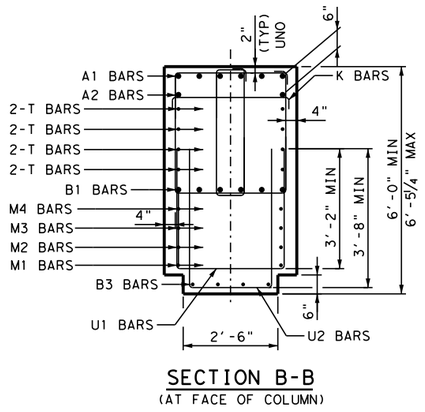


SECTION A-A



ELEVATION



SECTION B-B
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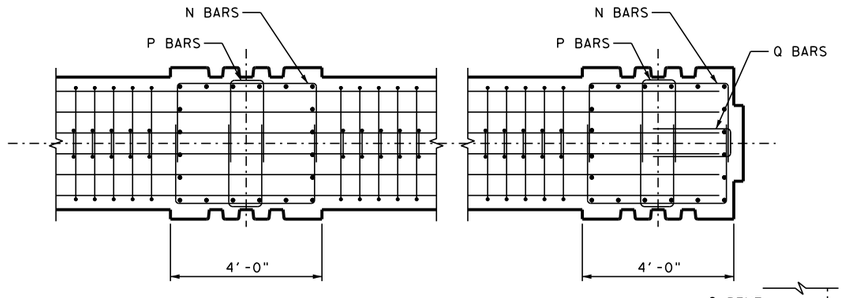
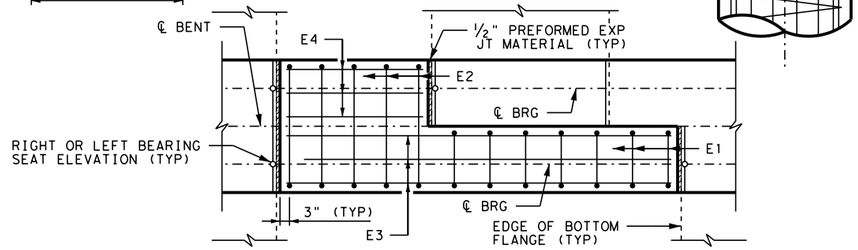
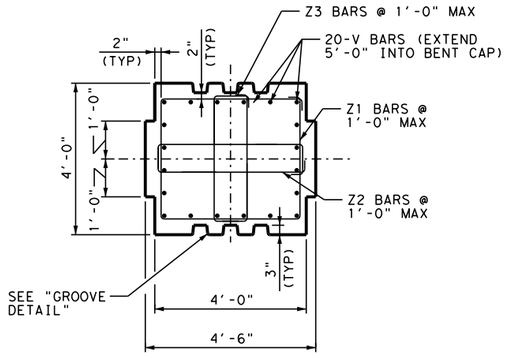


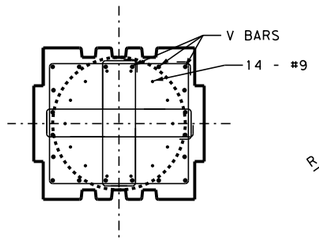
SECTION D-D



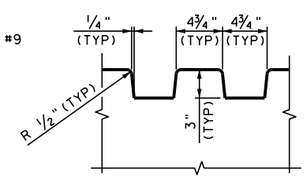
PLAN
(BENT 2 SHOWN, BENT 3 SHALL BE OPPOSITE HAND)



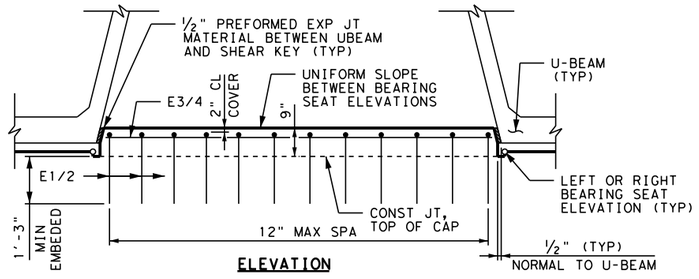
SECTION C-C



SECTION E-E



GROOVE DETAIL



ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
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NO.	DATE	REVISION	APPROVED

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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 NB OVERPASS AT NEW ROAD

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1192
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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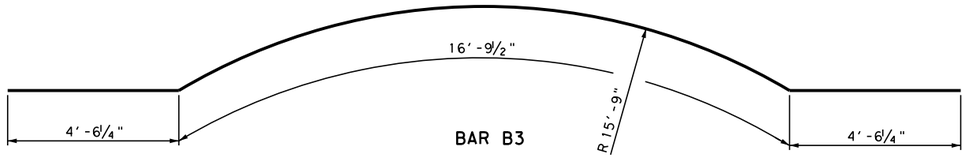
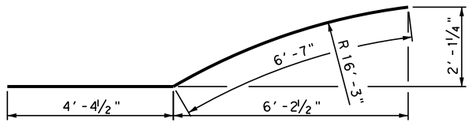
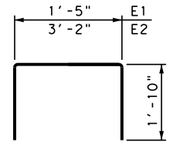


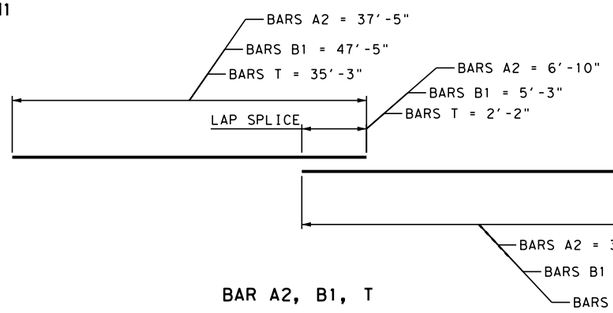
BAR B3



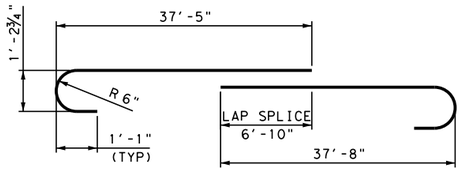
BAR M1



BARS E1 & E2



BAR A2, B1, T



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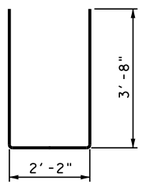
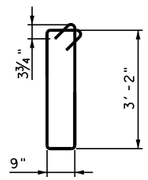
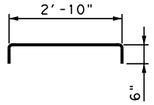


BAR U2



BAR SS



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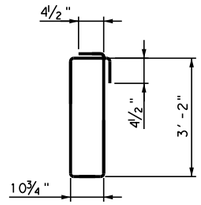

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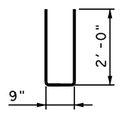

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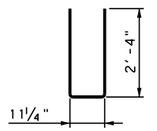

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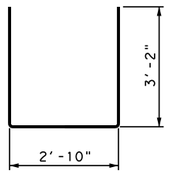

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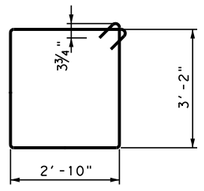

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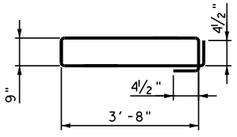

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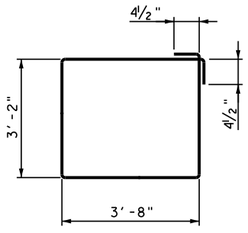

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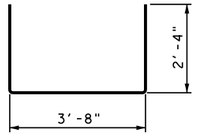

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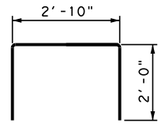

BAR C

TABLE OF QUANTITIES BENT 2					TABLE OF QUANTITIES BENT 3				
CONSTANT QUANTITIES									
BAR	NO	SIZE	LENGTH	WEIGHT	BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 78'-3"	2493	A1	6	#11	* 78'-3"	2493
A2	2	#11	* 75'-1"	798	A2	2	#11	* 75'-1"	798
B1	6	#11	** 73'-6"	2342	B1	6	#11	** 73'-6"	2342
B3	12	#8	25'-10"	828	B3	12	#8	25'-10"	828
C	20	#4	6'-10"	92	C	20	#4	6'-10"	92
E1	7	#5	5'-1"	38	E1	7	#5	5'-1"	38
E2	5	#5	6'-10"	36	E2	5	#5	6'-10"	36
E3	3	#5	10'-4"	32	E3	3	#5	10'-4"	32
E4	3	#5	3'-9"	12	E4	3	#5	3'-9"	12
K	30	#3	3'-10"	44	K	30	#3	3'-10"	44
M1	12	#8	10'-11"	350	M1	12	#8	10'-11"	350
M2	12	#8	4'-10"	155	M2	12	#8	4'-10"	155
M3	12	#8	5'-11"	189	M3	12	#8	5'-11"	189
M4	12	#8	7'-3"	231	M4	12	#8	7'-3"	231
N	64	#4	8'-4"	357	N	64	#4	8'-4"	357
P	64	#4	5'-7"	240	P	64	#4	5'-7"	240
Q	16	#4	4'-9"	51	Q	16	#4	4'-9"	51
S	156	#5	12'-11"	2102	S	156	#5	12'-11"	2102
SS	156	#5	8'-9"	1424	SS	156	#5	8'-9"	1424
T	8	#6	*** 70'-5"	846	T	8	#6	*** 70'-5"	846
U1	36	#4	9'-2"	221	U1	36	#4	9'-2"	221
U2	54	#4	9'-6"	343	U2	54	#4	9'-6"	343
SUBTOTAL STEEL (LBS) ****				13,224	SUBTOTAL STEEL (LBS) ****				13,224
VARIABLE QUANTITIES (1)									
"H" = 15'					"H" = 14'				
V	80	#11	19'-9"	8395	V	80	#11	18'-9"	7970
Z1	64	#4	14'-5"	617	Z1	60	#4	14'-5"	578
Z2	64	#4	9'-7"	410	Z2	60	#4	9'-7"	384
Z3	64	#4	8'-11"	379	Z3	60	#4	8'-11"	356
CL "C" CONC (BENT) (HPC) (CY)				84.5	CL "C" CONC (BENT) (HPC) (CY)				82.1
SUBTOTAL STEEL (LBS) ****				9800	SUBTOTAL STEEL (LBS) ****				9,288

* LENGTH SHOWN INCLUDES ONE 6'-10" SPLICE.
** LENGTH SHOWN INCLUDES ONE 5'-3" SPLICE.
*** LENGTH SHOWN INCLUDES ONE 2'-2" SPLICE.
**** FOR CONTRACTOR'S INFORMATION ONLY.
(1) VARIABLE QUANTITIES ARE BASED ON COLUMN HEIGHTS "H" SHOWN.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL LICENSED ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 NB OVERPASS AT NEW ROAD

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1193
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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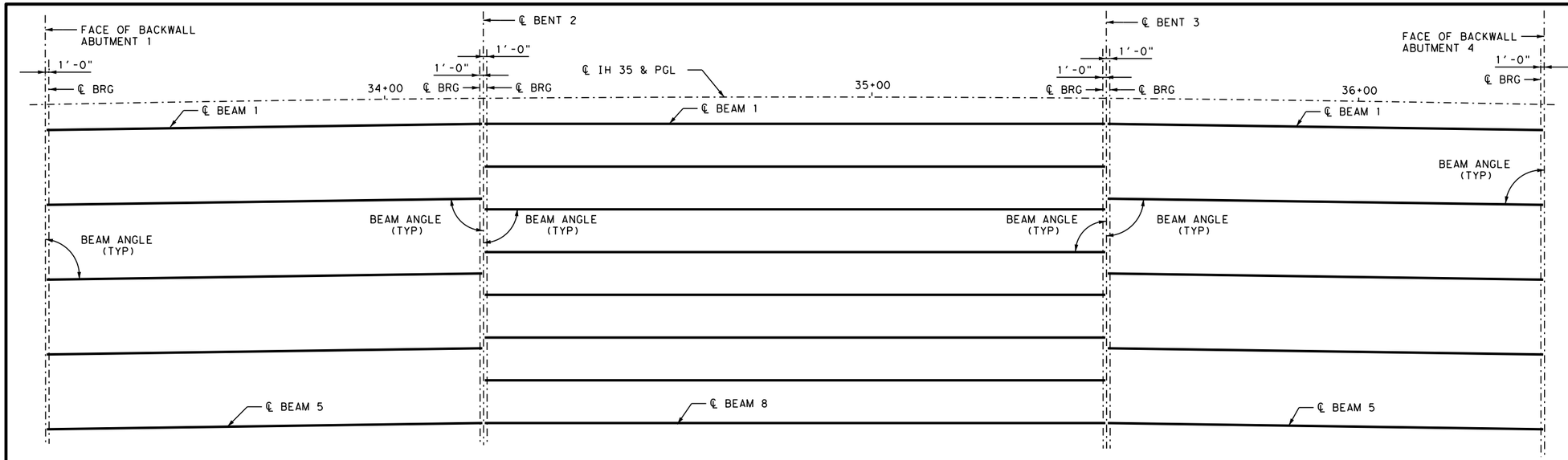


SPAN 1
U54 BEAMS

BENT REPORT

ABUT NO. 1 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.251 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	89 14 14
	BEAM	2	15.378	89 14 8
	BEAM	3	15.378	89 14 3
	BEAM	4	15.378	89 13 57
	BEAM	5	15.378	89 13 51
	TOTAL		61.511	

BENT NO. 2 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	89 14 14
	BEAM	2	15.375	89 14 8
	BEAM	3	15.375	89 14 3
	BEAM	4	15.375	89 13 57
	BEAM	5	15.375	89 13 52
	TOTAL		61.502	

BENT REPORT

BENT NO. 2 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM	1	0.000	89 57 4
	BEAM	2	8.786	89 57 4
	BEAM	3	8.786	89 57 4
	BEAM	4	8.786	89 57 4
	BEAM	5	8.786	89 57 4
	BEAM	6	8.786	89 57 3
	BEAM	7	8.786	89 57 3
	BEAM	8	8.786	89 57 3
	TOTAL		61.502	

BENT NO. 3 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM	1	0.000	89 57 5
	BEAM	2	8.786	89 57 5
	BEAM	3	8.786	89 57 5
	BEAM	4	8.786	89 57 5
	BEAM	5	8.786	89 57 4
	BEAM	6	8.786	89 57 4
	BEAM	7	8.786	89 57 4
	BEAM	8	8.786	89 57 4
	TOTAL		61.503	

SPAN 2
U54 BEAMS

BENT REPORT

BENT NO. 3 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 3	BEAM	1	0.000	89 8 23
	BEAM	2	15.376	89 8 17
	BEAM	3	15.376	89 8 11
	BEAM	4	15.376	89 8 5
	BEAM	5	15.376	89 7 58
	TOTAL		61.503	

ABUT NO. 4 (S 67 30 10 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.251 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 3	BEAM	1	0.000	89 8 23
	BEAM	2	15.378	89 8 17
	BEAM	3	15.378	89 8 11
	BEAM	4	15.378	89 8 5
	BEAM	5	15.378	89 7 58
	TOTAL		61.514	

SPAN 3
U54 BEAMS

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	90.000	88.000	89.52	0.0195
BEAM 2	90.000	88.000	89.52	0.0195
BEAM 3	90.000	88.000	89.52	0.0196
BEAM 4	90.000	88.000	89.52	0.0196
BEAM 5	90.000	88.000	89.52	0.0197

BEAM REPORT

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	127.999	125.999	127.51	0.0126
BEAM 2	127.999	125.999	127.51	0.0126
BEAM 3	127.998	125.998	127.51	0.0126
BEAM 4	127.998	125.998	127.51	0.0127
BEAM 5	127.998	125.998	127.51	0.0127
BEAM 6	127.998	125.998	127.51	0.0127
BEAM 7	127.998	125.998	127.51	0.0127
BEAM 8	127.998	125.998	127.51	0.0127

BEAM REPORT

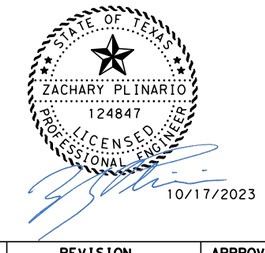
BEAM REPORT, SPAN 3

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	90.000	87.999	89.50	0.0058
BEAM 2	90.000	87.999	89.50	0.0058
BEAM 3	90.000	87.999	89.50	0.0058
BEAM 4	90.000	87.999	89.50	0.0057
BEAM 5	90.000	88.000	89.50	0.0057

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

ACUTE BEAM ANGLE SHOWN



NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT

IH 35 NB OVERPASS AT NEW ROAD

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1194
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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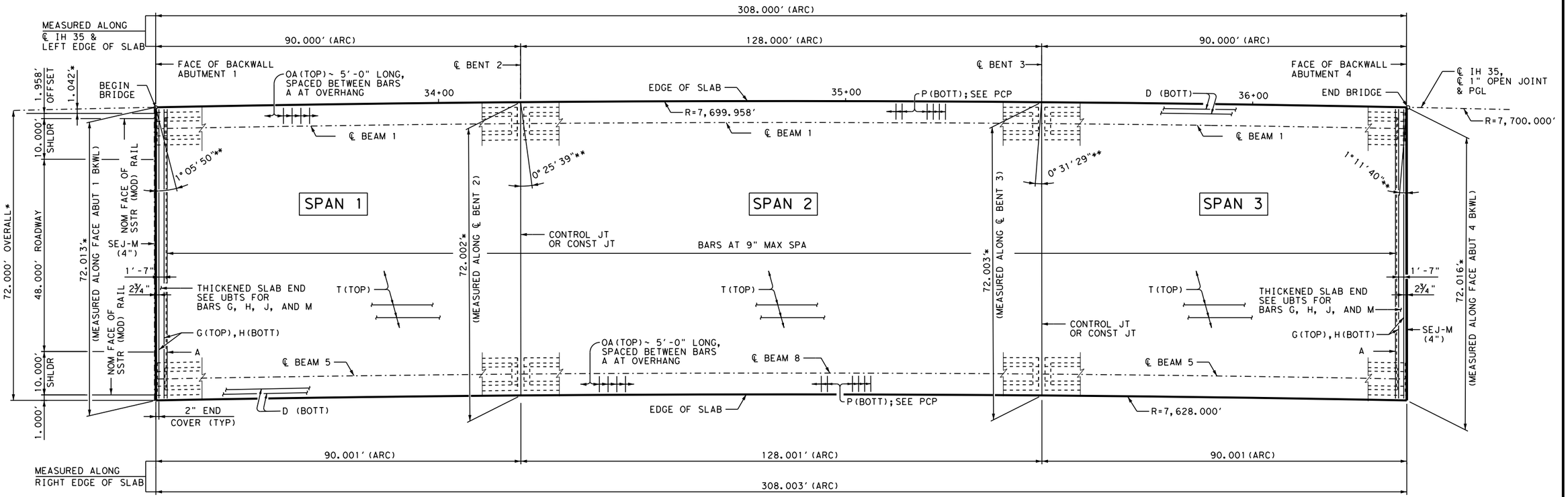
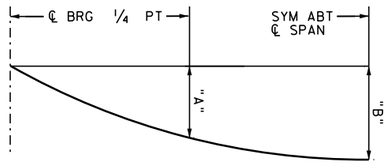


PLAN

* MEASURED TO ℄ IH 35
** MEASURED RADIAL TO CURVE



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DIMENSIONS SHALL BE LESS. DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

TABLE OF DEAD LOAD DEFLECTIONS

SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1&3	1	0.054	0.077
1&3	2-4	0.065	0.091
1&3	5	0.055	0.076
2	1	0.175	0.245
2	2-7	0.156	0.219
2	8	0.167	0.235

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c = 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS;

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

308.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 NB OVERPASS AT NEW ROAD

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1195
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:49:33 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

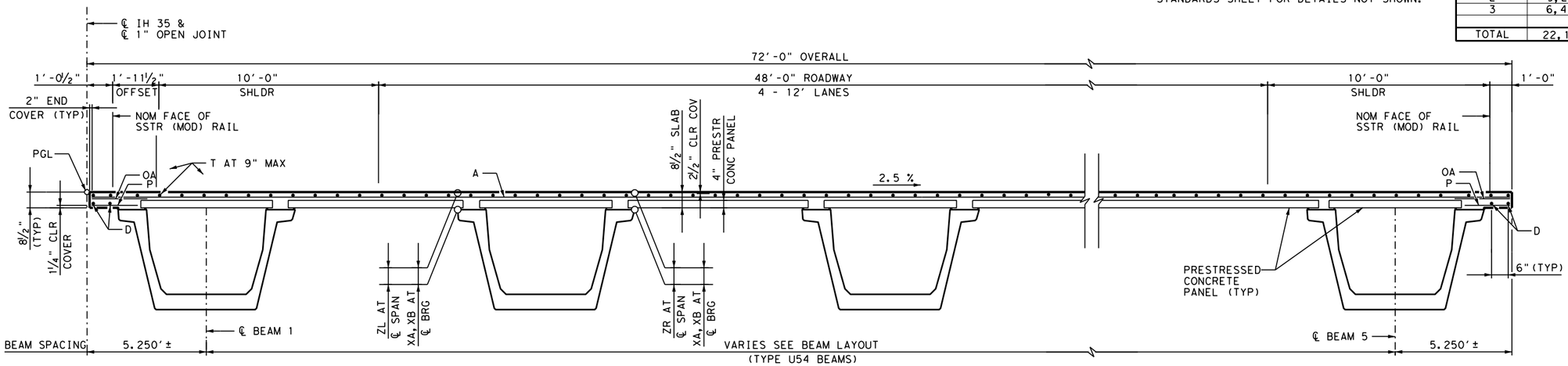
③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U54)	① REINFORCING STEEL
	SF	LF	LB
1	6,476	447.6	23,961
2	9,211	1020.1	34,081
3	6,476	447.5	23,961
TOTAL	22,163	1915.2	82,003

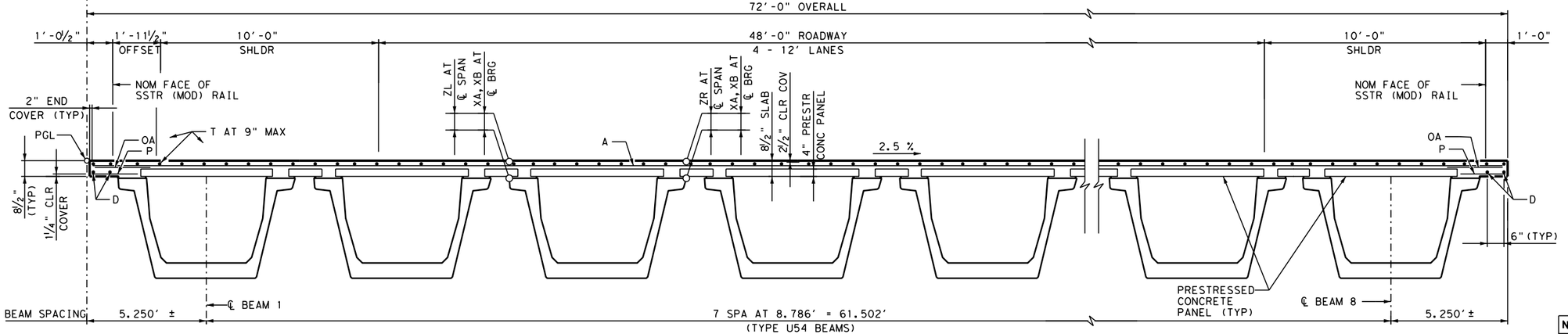
GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.



TYPICAL TRANSVERSE SECTION

(SHOWING SPANS 1 & 3)



TYPICAL TRANSVERSE SECTION

(SHOWING SPAN 2)

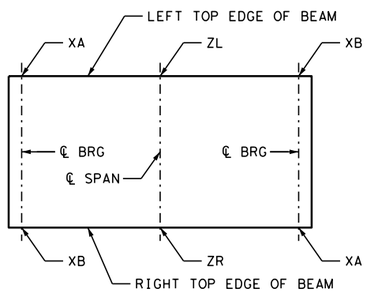
BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN *** (IN)	"ZR" AT ℄ SPAN *** (IN)
1&3	1	10 1/2	10 1/2	10 3/4	10 3/4
1&3	2-4	10 1/2	10 1/2	10 7/8	10 7/8
1&3	5	10 1/2	10 1/2	10 3/4	10 3/4
2	1	10 1/2	10 1/2	11 7/8	11 7/8
2	2-7	10 1/2	10 1/2	11 5/8	11 5/8
2	8	10 1/2	10 1/2	11 3/4	11 3/4

*** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

308.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 NB OVERPASS AT NEW ROAD

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1196

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\01_New Road\BRLD5_01NR_NB_002.dgn
DATE: 10/17/2023 11:49:36 AM
USER:

DATE:
FILE:

DESIGNED BEAMS (STRAIGHT STRANDS)

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH fpu (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)	PRESTRESSING STRANDS: TOT NO. DEB	DEBONDED STRAND PATTERN PER ROW: DIST FROM BOTTOM (in)	DEBONDED STRAND PATTERN PER ROW: NO.OF STRANDS TOTAL	DEBONDED STRAND PATTERN PER ROW: NO.OF STRANDS DE-BONDED	DEBONDED STRAND PATTERN PER ROW: NUMBER OF STRANDS DEBONDED TO (ft from end) 3	6	9	12	15	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
IH 35 SB OVERPASS AT NEW ROAD	1 & 3	ALL	U54		35	0.6	270	19.84	19.60	12	2.17	27	12	2	6	4	0	0	4.000	5.000
	2	ALL	U54		56	0.6	270	19.20	19.08	25	2.17	27	13	0	0	9	2	2	5.600	7.700
											4.14	27	12	4	8	0	0	0		
IH 35 NB OVERPASS AT NEW ROAD	1 & 3	ALL	U54		35	0.6	270	19.84	19.60	12	2.17	27	12	2	6	4	0	0	4.000	5.000
	2	ALL	U54		54	0.6	270	19.30	19.21	23	2.17	27	13	0	3	8	0	2	5.400	7.600
											4.14	27	10	6	4	0	0	0		

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
IH 35 SB OVERPASS AT NEW ROAD	1 & 3	ALL	U54	2.891	-2.652	7428	0.917	1.291
	2	ALL	U54	4.965	-4.249	10752	0.608	0.852
IH 35 NB OVERPASS AT NEW ROAD	1 & 3	ALL	U54	2.963	-2.764	7772	0.947	1.338
	2	ALL	U54	4.924	-4.197	10568	0.588	0.822

LOAD RATING FACTORS

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	STRENGTH I Inv	STRENGTH I Opr	SERVICE III Inv
IH 35 SB OVERPASS AT NEW ROAD	1 & 3	ALL	U54	1.28	2.16	1.27
	2	ALL	U54	1.92	2.59	1.10
IH 35 NB OVERPASS AT NEW ROAD	1 & 3	ALL	U54	1.08	2.03	1.13
	2	ALL	U54	1.98	2.57	1.03

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation.

Optional designs must have a calculated residual camber equal to or greater than that of the designed beam.

Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

The grid pattern for the strands is based on exact conversions from a metric grid spacing of 50mm.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

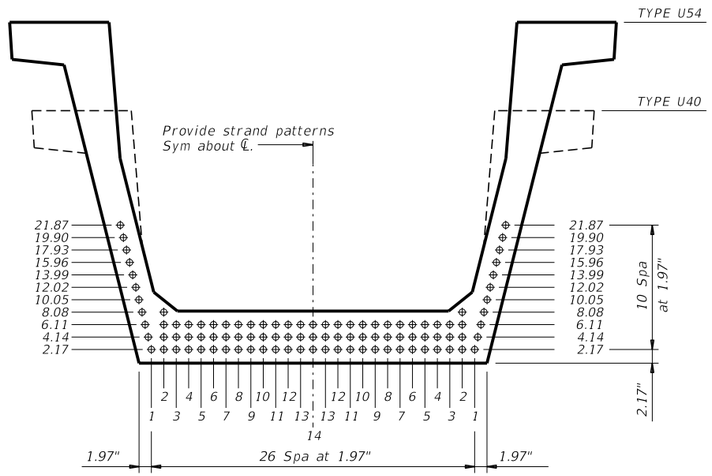
When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

Locate strands for the designed beam as low as possible on the 1.97" grid system unless a non-standard stand pattern is indicated. Fill row "2.17", then row "4.14", then row "6.11", etc., beginning each row in the "1" position and, distributing uniformly as practical, working inward until the required number of strands is reached.

Strand debonding must comply with Item 424.4.2.2.2.4.

Do not debond strands in position "1". Distribute debonded strands equally about the vertical centerline. Decrease debonded lengths working inward, with debonding staggered in each row.

Full-length debonded strands are not permitted in positions "1" and "2".



TxDOT TYPE U54 & TYPE U40 BMS

HL93 LOADING

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

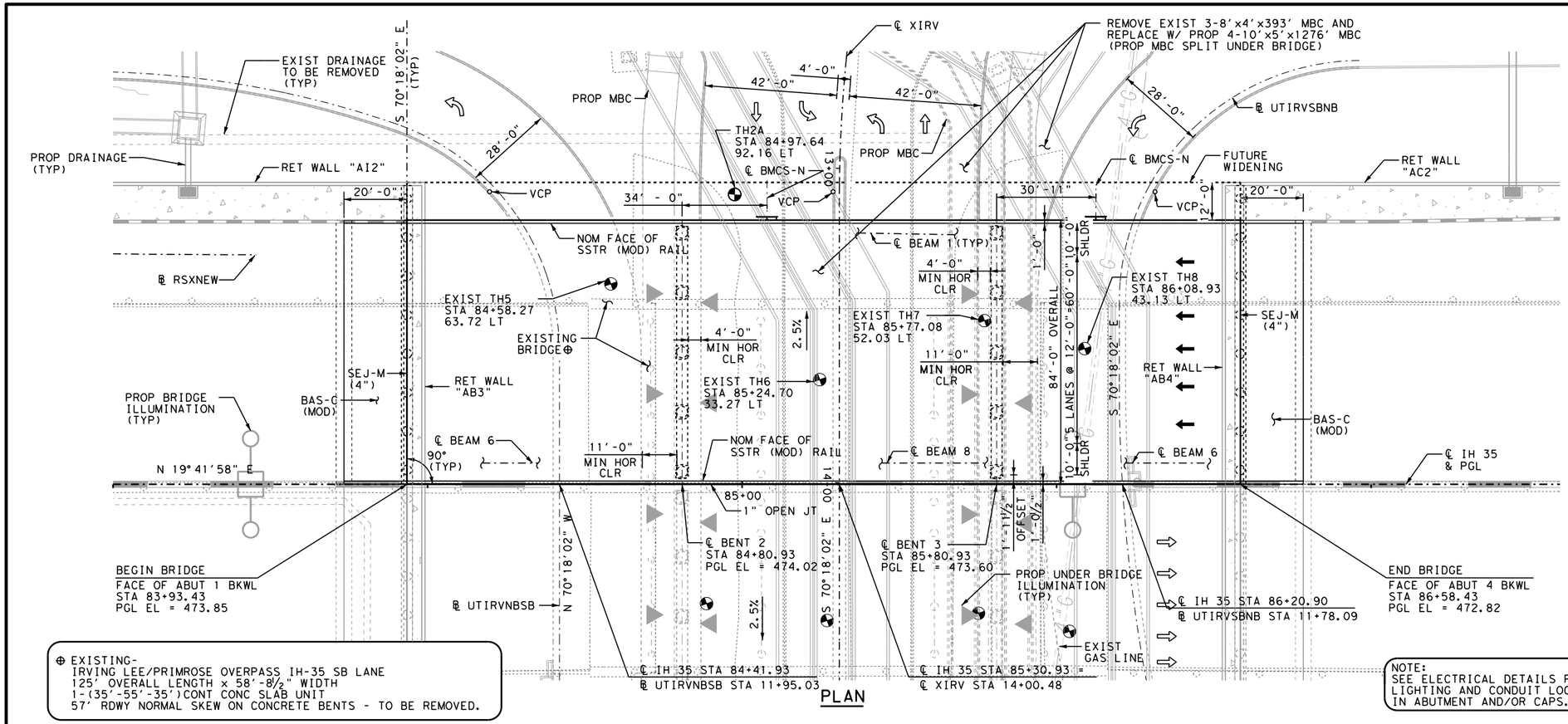
Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE U-BEAM DESIGNS (DESIGN DATA)

UBND

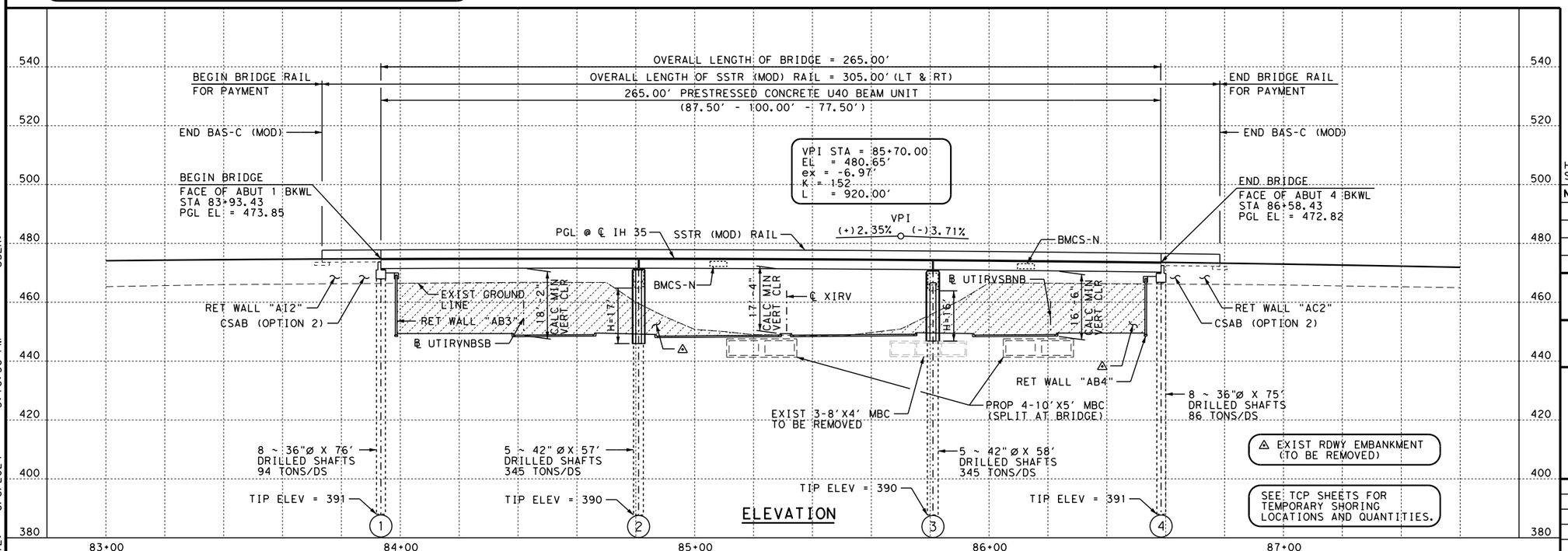
FILE: ubstds04.dgn	DN: TxDOT	CK: TxDOT	DW: SFS	CK: SDB
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
01-16: Notes. 03-22: Added Load Rating.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1197



⊕ EXISTING-
IRVING LEE/PRIMROSE OVERPASS IH-35 SB LANE
125' OVERALL LENGTH x 58'-8½" WIDTH
1-(35'-55'-35')CONT CONC SLAB UNIT
57' RDWY NORMAL SKEW ON CONCRETE BENTS - TO BE REMOVED.

NOTE:
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT AND/OR CAPS.

PLAN



⚠ EXIST RDWY EMBANKMENT (TO BE REMOVED)

SEE TCP SHEETS FOR TEMPORARY SHORING LOCATIONS AND QUANTITIES.

ELEVATION

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLD DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUT FOR EXISTING STRUCTURE CSJ 0015-01-025,1962 AND CSJ 0015-01-124,1993. BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. FOR BRIDGE TYPICAL SECTIONS, SEE "PHASED TYPICAL SECTIONS" SHEET.
6. VCP: CRITICAL VERTICAL CLEARANCE POINT.
7. DRILLED SHAFT SHALL BE FOUNDED AT ELEVATION SHOWN OR DEEPER TO ATTAIN A MINIMUM OF TWO DIAMETER PENETRATION INTO SHALE.
8. FOR PROP ILLUMINATION POLE MOUNTED TO SSTR RAIL AT ℄ IH 35, SEE "SPECIAL MODIFICAITON TO TYPE SSTR RAIL" SHEET.

FUNCT. CLASS = INTERSTATE
DESIGN SPEED = 60 MPH
PROP ADT (2026) = 77780
(2046) = 106030

EXISTING NBI NO = 09-161-0-0015-01-375
EXISTING PSN NO = 375

NEW NBI NO = 09-161-0-0015-01-814
NEW PSN NO = 814

ZACHARY PLINARIO
124847
STATE OF TEXAS
PROFESSIONAL LICENSED ENGINEER
6/6/2024

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.12/1.89

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT
IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1198
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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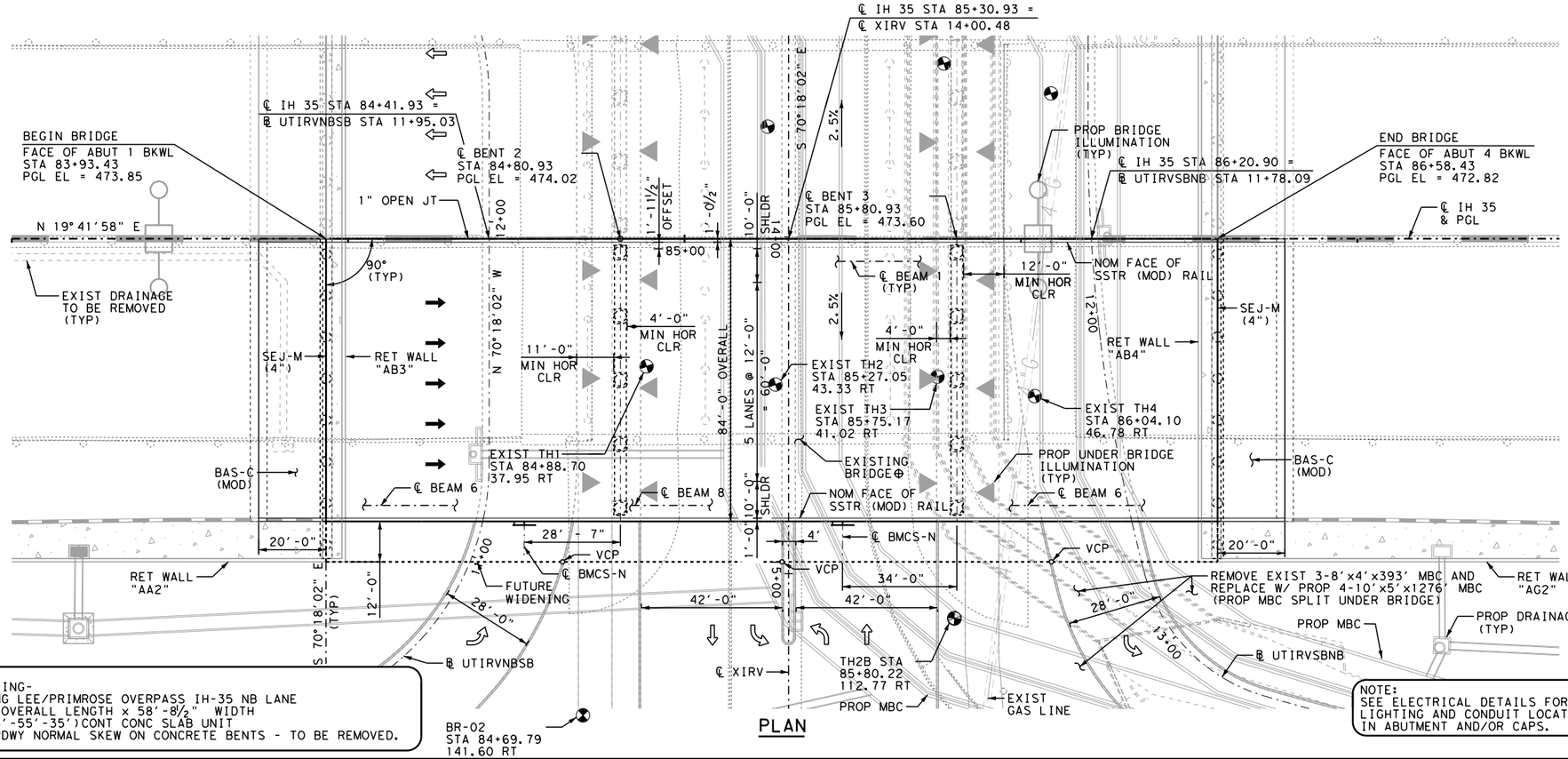


PLAN

⊕ EXISTING-
IRVING LEE/PRIMROSE OVERPASS IH-35 NB LANE
125' OVERALL LENGTH x 58'-8½" WIDTH
1-(35'-55'-35')CONT CONC SLAB UNIT
57° RDWY NORMAL SKEW ON CONCRETE BENTS - TO BE REMOVED.

NOTE:
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT AND/OR CAPS.

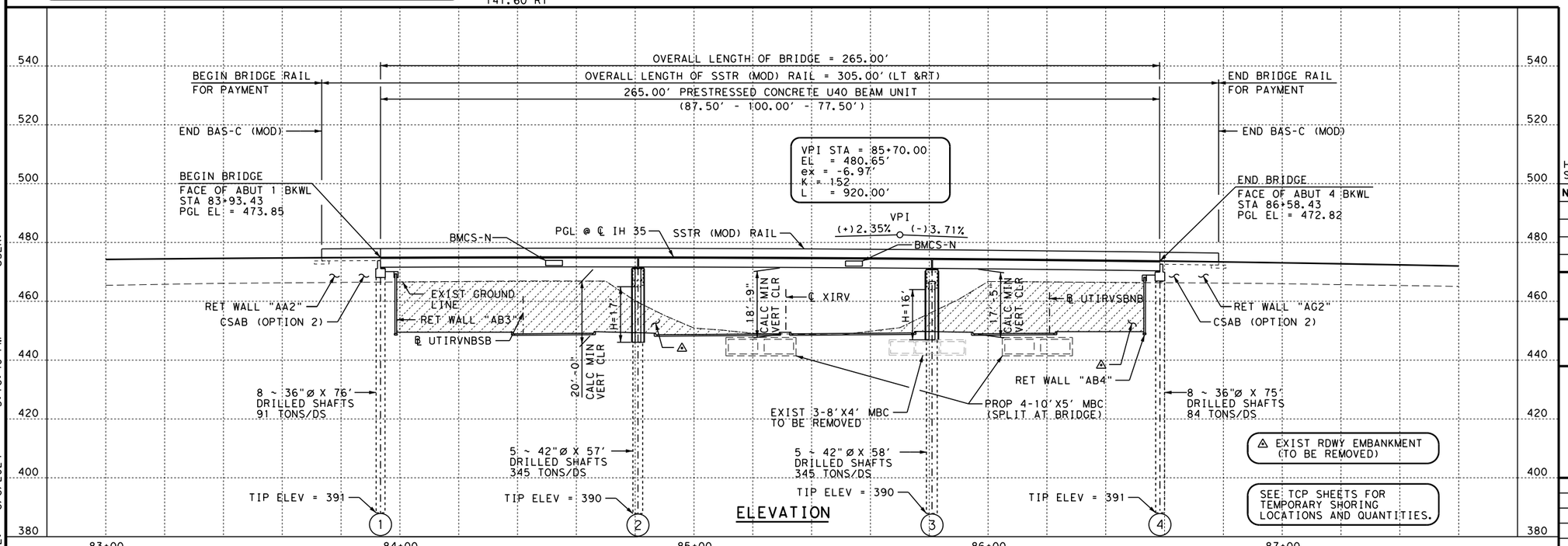
GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUT FOR EXISTING STRUCTURE CSJ 0015-01-025,1962 AND CSJ 0015-01-124,1993. BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. FOR BRIDGE TYPICAL SECTIONS, SEE "PHASED TYPICAL SECTIONS" SHEET.
6. VCP: CRITICAL VERTICAL CLEARANCE POINT.
7. DRILLED SHAFT SHALL BE FOUNDED AT ELEVATION SHOWN OR DEEPER TO ATTAIN A MINIMUM OF TWO DIAMETER PENETRATION INTO SHALE.
8. FOR PROP ILLUMINATION POLE MOUNTED TO SSTR RAIL AT ℄ IH 35, SEE "SPECIAL MODIFICAITON TO TYPE SSTR RAIL" SHEET.

FUNCT. CLASS = INTERSTATE
DESIGN SPEED = 60 MPH
PROP ADT (2026) = 60705
(2046) = 84085

EXISTING NBI NO = 09-161-0-0015-01-374
EXISTING PSN NO = 374

NEW NBI NO = 09-161-0-0015-01-815
NEW PSN NO = 815



ELEVATION

△ EXIST RDWY EMBANKMENT (TO BE REMOVED)

SEE TCP SHEETS FOR TEMPORARY SHORING LOCATIONS AND QUANTITIES.

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.03/1.89

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1199
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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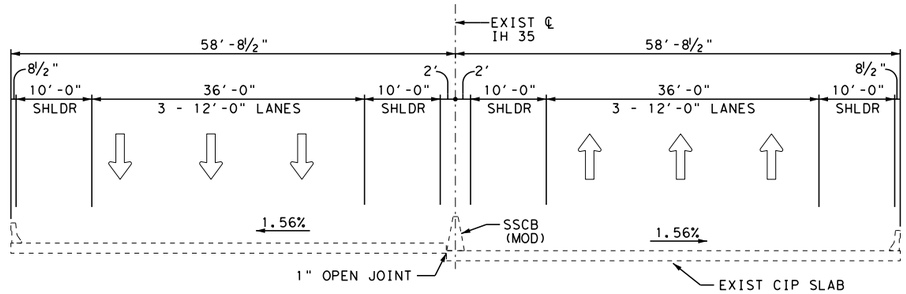
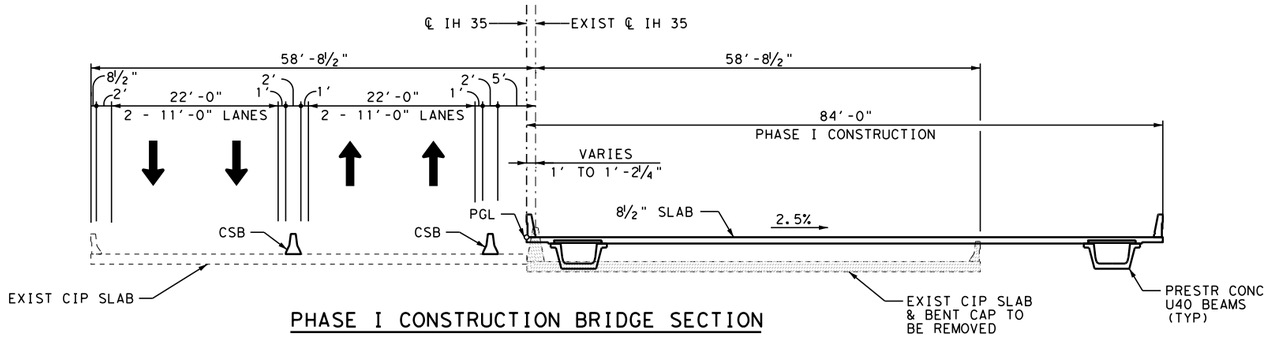
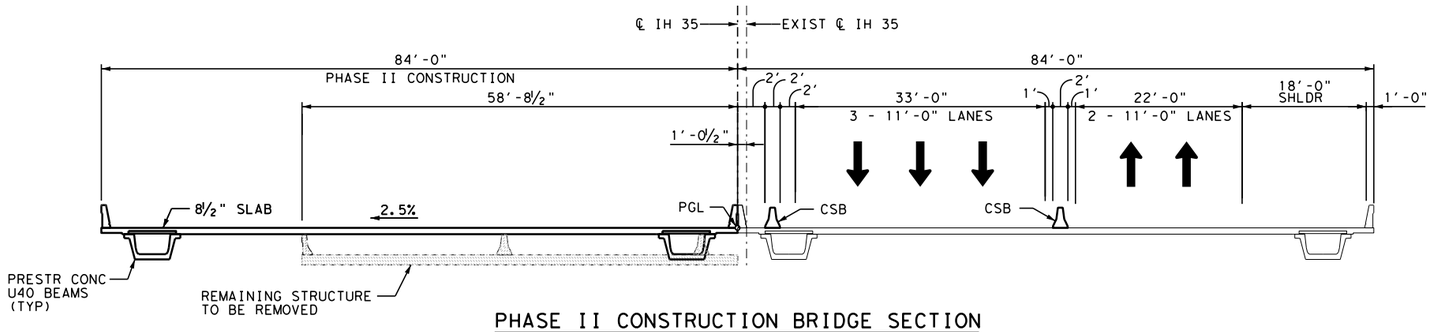


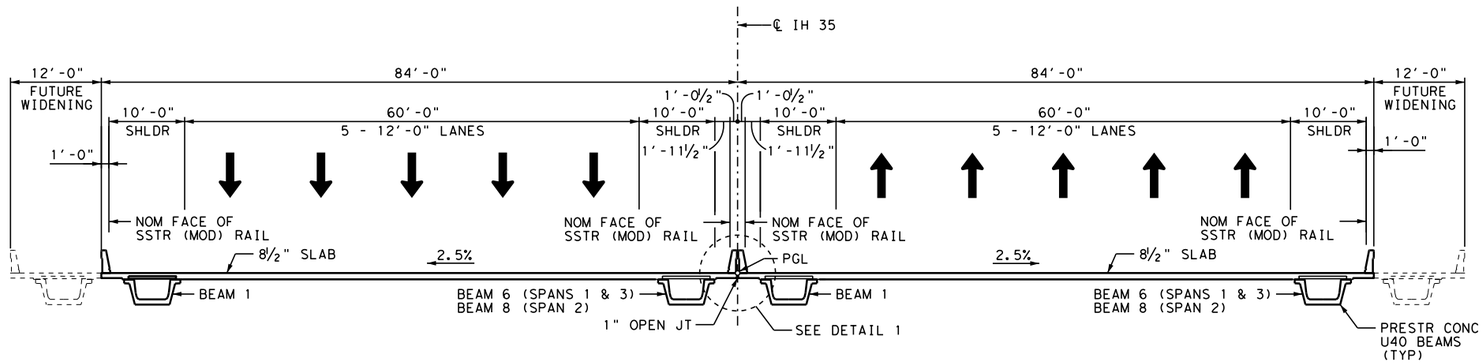
EXISTING BRIDGE SECTION



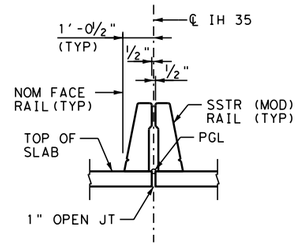
PHASE I CONSTRUCTION BRIDGE SECTION



PHASE II CONSTRUCTION BRIDGE SECTION



COMPLETED BRIDGE SECTION



DETAIL 1

ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
7/25/2024

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

PHASED TYPICAL SECTIONS

IH 35 SB & NB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1200
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRTY5_02IL_001.dgn
DATE: 7/25/2024 12:37:10 PM USER:

TEST HOLE NO. 2A
STA 84+97.64, 92.16 LT

T/H EL = 450.44

7(6) 7(6)	CLAY, SANDY FAT, SOFT, BROWN
7(6) 9(6)	CLAY, LEAN, STIFF, BROWN, WITH SAND
9(6) 15(6)	
12(6) 17(6)	CLAY, SANDY LEAN, STIFF, BROWN
13(6) 13(6)	CLAY, LEAN, STIFF, WITH SAND AND GRAVEL
15(6) 18(6)	
50(5.5) 50(4)	CLAY, FAT, HARD TO VERY HARD, BROWN
40(6) 50(4)	
50(3) 50(1)	
50(4) 50(3)	
50(1) 50(.5)	LIMESTONE, VERY HARD, GRAY
50(1.5) 50(1)	
50(1.25) 50(.5)	
50(.5) 50(.375)	

TEST HOLE 2A
B/H EL = 379.94

TEST HOLE NO. 2B
STA 85+80.22, 112.77 RT

T/H EL = 448.54

8(6) 7(6)	CLAY, FAT, SOFT, BROWN, WITH SAND AND GRAVEL
8(6) 8(6)	CLAY, LEAN, SOFT TO STIFF, REDDISH BROWN, WITH SAND
11(6) 15(6)	
13(6) 12(6)	
14(6) 13(6)	CLAY, LEAN, STIFF, REDDISH BROWN
13(6) 18(6)	SAND, CLAYEY, SLIGHTLY COMPACT, BROWN
50(2) 50(2)	
50(2) 50(1)	SAND, VERY DENSE, BROWN, WITH SILT AND GRAVEL
50(1.5) 50(1)	
50(2) 50(1)	SHALE, VERY HARD, GRAY
50(1.5) 50(1.25)	
50(1.5) 50(.75)	LIMESTONE, VERY HARD, GRAY
50(1.5) 50(1)	
50(.75) 50(.5)	

TEST HOLE 2B
B/H EL = 378.04

TEST HOLE NO. TH1
STA 84+88.70, 37.95 RT

T/H EL = 450.00

14(6) 17(6)	CLAY
15(6) 16(6)	GRAVEL
21(6) 23(6)	CLAY
18(6) 20(6)	
18(6) 20(6)	
22(6) 34(6)	
50(2.25) 50(.75)	SAND, (SP) CLAY, SHALEY
50(1.75) 50(.5)	SHALE
50(1.75) 50(.75)	
50(1.5) 50(.25)	LIMESTONE

EXIST TEST HOLE TH1
B/H EL = 395.00

TEST HOLE NO. TH2
STA 85+27.05, 43.33 RT

T/H EL = 450.00

20(6) 21(6)	CLAY
16(6) 16(6)	CLAY, W/ SAND
24(6) 22(6)	CLAY
26(6) 26(6)	
20(6) 22(6)	
25(6) 46(6)	
50(1.5) 50(.75)	SAND, (SP) CLAY, SHALEY
50(1) 50(.5)	SHALE
50(2.25) 50(1)	
50(1.25) 50(.25)	LIMESTONE

EXIST TEST HOLE TH2
B/H EL = 395.00

NOTE

1. FOR TEST HOLE BR-02, SEE "TEST HOLE DATA NORTHBOUND" SHEETS.

TEST HOLE NO. TH3
STA 85+75.17, 41.02 RT

T/H EL = 450.00

26(6) 22(6)	CLAY
18(6) 19(6)	
15(6) 23(6)	
25(6) 27(6)	
24(6) 25(6)	
30(6) 31(6)	SAND, (SP) CLAY, SHALEY
50(3.5) 50(1.75)	
50(1.75) 50(.5)	
50(1.25) 50(.75)	SHALE
50(.5) 50(.5)	LIMESTONE

EXIST TEST HOLE TH3
B/H EL = 395.00

TEST HOLE NO. TH4
STA 86+04.10, 46.78 RT

T/H EL = 450.00

20(6) 26(6)	CLAY
27(6) 28(6)	CLAY, W/ GRAVEL
28(6) 25(6)	CLAY
24(6) 20(6)	
22(6) 20(6)	
32(6) 27(6)	SAND, (SP)
50(5) 50(5)	GRAVEL, (CP-MP)
50(2) 50(.75)	CLAY, SHALEY
50(2) 50(1)	SHALE
50(1.25) 50(.25)	
	LIMESTONE

EXIST TEST HOLE TH4
B/H EL = 395.00

TEST HOLE NO. TH5
STA 84+58.27, 63.72 LT

T/H EL = 450.00

16(6) 21(6)	CLAY
14(6) 34(6)	
15(6) 24(6)	GRAVEL CLAY
27(6) 37(6)	
29(6) 29(6)	
37(6) 41(6)	
50(3) 50(.75)	SAND, (SP-SM) CLAY, WITH SAND
50(1.5) 50(1)	SHALE
50(2) 50(.5)	
50(1) 50(1.25)	
50(.75) 50(.25)	LIMESTONE
50(.75) 50(.25)	

EXIST TEST HOLE TH5
B/H EL = 390.00

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

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Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TEST HOLE DATA

IH 35 SB & NB OVERPASS
AT IRVING LEE/PRIMROSE

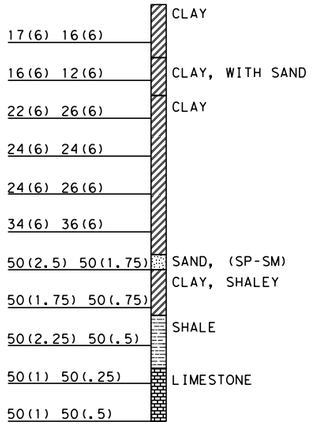
SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1201

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

TEST HOLE NO. TH6
STA 85+24.70, 33.27 LT

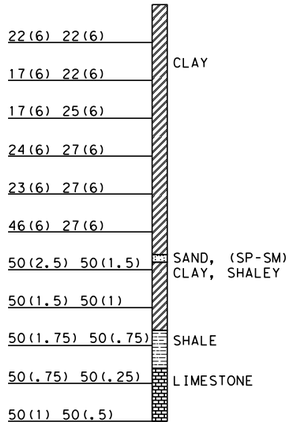
T/H EL = 450.00



EXIST TEST HOLE TH6
B/H EL = 395.00

TEST HOLE NO. TH7
STA 85+77.08, 52.03 LT

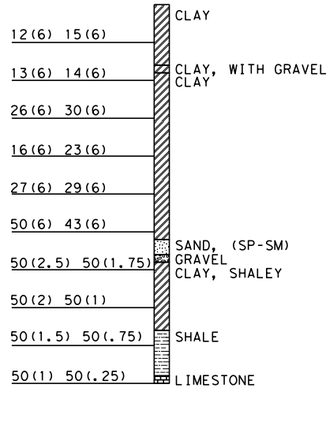
T/H EL = 450.00



EXIST TEST HOLE TH7
B/H EL = 395.00

TEST HOLE NO. TH8
STA 86+08.93, 43.13 LT

T/H EL = 450.00



EXIST TEST HOLE TH8
B/H EL = 400.00

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TEST HOLE DATA

IH 35 SB & NB OVERPASS
AT IRVING LEE/PRIMROSE

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1202
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRLS5_02IL_002.dgn
DATE: 10/17/2023 11:50:04 AM USER:

SUMMARY OF ESTIMATED QUANTITIES

	ITEM - DESCRIPTION CODE	400 6005	416 6004	416 6005	420 6012	420 6014	420 6026	422 6001	422 6015	425 6027	450 6062	454 6018
	ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)	CL B CONC (MISC)	CL C CONC (ABUT) (HPC)	CL C CONC (BENT) (HPC)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC U-BEAM (U40)	RAIL (TY SSTR) (MOD)	SEALED EXPANSION JOINT (4 IN) (SEJ-M)
		CY	LF	LF	CY	CY	CY	SF	CY	LF	LF	LF
SBML	2-ABUTMENTS	360	1,208		0.8	100.4			160.8			166
SBML	2-INTERIOR BENTS			575			205.2					
SBML	1-265.00' PRESTR CONC U-BEAM UNIT							22,249		1,780.00	610.0	
SBML												
SBML												
SBML												
	SBML TOTAL	360	1,208	575	0.8	100.4	205.2	22,249	160.8	1,780.00	610.0	166
NBML	2-ABUTMENTS	352	1,208		0.8	100.4			160.8			166
NBML	2-INTERIOR BENTS			575			205.2					
NBML	1-265.00' PRESTR CONC U-BEAM UNIT							22,249		1,780.00	610.0	
NBML												
NBML												
NBML												
	NBML TOTAL	352	1,208	575	0.8	100.4	205.2	22,249	160.8	1,780.00	610.0	166
	TOTAL	712	2,416	1,150	1.6	200.8	410.4	44,498	321.6	3,560.00	1,220.0	332

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ESTIMATED QUANTITIES

IH 35 SB & NB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1203
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

SB BEARING SEAT ELEVATIONS (ft)

	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
ABUT 1 (FWD)	467.394	467.507	467.762	467.874	468.129	468.242
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	468.497	468.609	468.864	468.977	469.232	469.344
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
BENT 2 (BK)	467.560	467.672	467.927	468.040	468.295	468.407
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	468.662	468.775	469.030	469.142	469.397	469.510
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
BENT 2 (FWD)	467.558	467.670	467.820	467.933	468.083	468.195
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	468.345	468.458	468.608	468.720	468.870	468.983
	LEFT BEAM 7	RIGHT	LEFT BEAM 8	RIGHT		
	469.133	469.245	469.395	469.508		
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
BENT 3 (BK)	467.142	467.255	467.405	467.517	467.667	467.780
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	467.930	468.042	468.192	468.305	468.455	468.567
	LEFT BEAM 7	RIGHT	LEFT BEAM 8	RIGHT		
	468.717	468.830	468.980	469.092		
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
BENT 3 (FWD)	467.127	467.240	467.495	467.607	467.862	467.975
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	468.230	468.342	468.597	468.710	468.965	469.077
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
ABUT 4 (BK)	466.365	466.478	466.733	466.845	467.100	467.213
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	467.468	467.580	467.835	467.948	468.203	468.315

NB BEARING SEAT ELEVATIONS (ft)

	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
ABUT 1 (FWD)	469.344	469.232	468.977	468.864	468.609	468.497
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	468.242	468.129	467.874	467.762	467.507	467.394
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
BENT 2 (BK)	469.510	469.397	469.142	469.030	468.775	468.662
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	468.407	468.295	468.040	467.927	467.672	467.560
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
BENT 2 (FWD)	469.508	469.395	469.245	469.133	468.983	468.870
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	468.720	468.608	468.458	468.345	468.195	468.083
	LEFT BEAM 7	RIGHT	LEFT BEAM 8	RIGHT		
	467.933	467.820	467.670	467.558		
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
BENT 3 (BK)	469.092	468.980	468.830	468.717	468.567	468.455
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	468.305	468.192	468.042	467.930	467.780	467.667
	LEFT BEAM 7	RIGHT	LEFT BEAM 8	RIGHT		
	467.517	467.405	467.255	467.142		
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
BENT 3 (FWD)	469.077	468.965	468.710	468.597	468.342	468.230
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	467.975	467.862	467.607	467.495	467.240	467.127
	LEFT BEAM 1	RIGHT	LEFT BEAM 2	RIGHT	LEFT BEAM 3	RIGHT
ABUT 4 (BK)	468.315	468.203	467.948	467.835	467.580	467.468
	LEFT BEAM 4	RIGHT	LEFT BEAM 5	RIGHT	LEFT BEAM 6	RIGHT
	467.213	467.100	466.845	466.733	466.478	466.365

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING SEAT ELEVATIONS

IH 35 SB & NB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1204
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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DATE: 10/17/2023 11:50:09 AM USER:

SB BEARING PAD TAPER REPORT

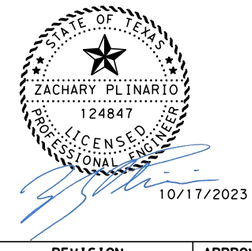
BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
ABUT 1 (FWD)	0.00194	0.00194	0.00194	0.00194	0.00194	0.00194		
BENT 2 (BK)	0.00194	0.00194	0.00194	0.00194	0.00194	0.00194		
BENT 2 (FWD)	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424
BENT 3 (BK)	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424
BENT 3 (FWD)	-0.01009	-0.01009	-0.01009	-0.01009	-0.01009	-0.01009		
ABUT 4 (BK)	-0.01009	-0.01009	-0.01009	-0.01009	-0.01009	-0.01009		

NB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
ABUT 1 (FWD)	0.00194	0.00194	0.00194	0.00194	0.00194	0.00194		
BENT 2 (BK)	0.00194	0.00194	0.00194	0.00194	0.00194	0.00194		
BENT 2 (FWD)	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424
BENT 3 (BK)	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424	-0.00424
BENT 3 (FWD)	-0.01009	-0.01009	-0.01009	-0.01009	-0.01009	-0.01009		
ABUT 4 (BK)	-0.01009	-0.01009	-0.01009	-0.01009	-0.01009	-0.01009		



NO.	DATE	REVISION	APPROVED

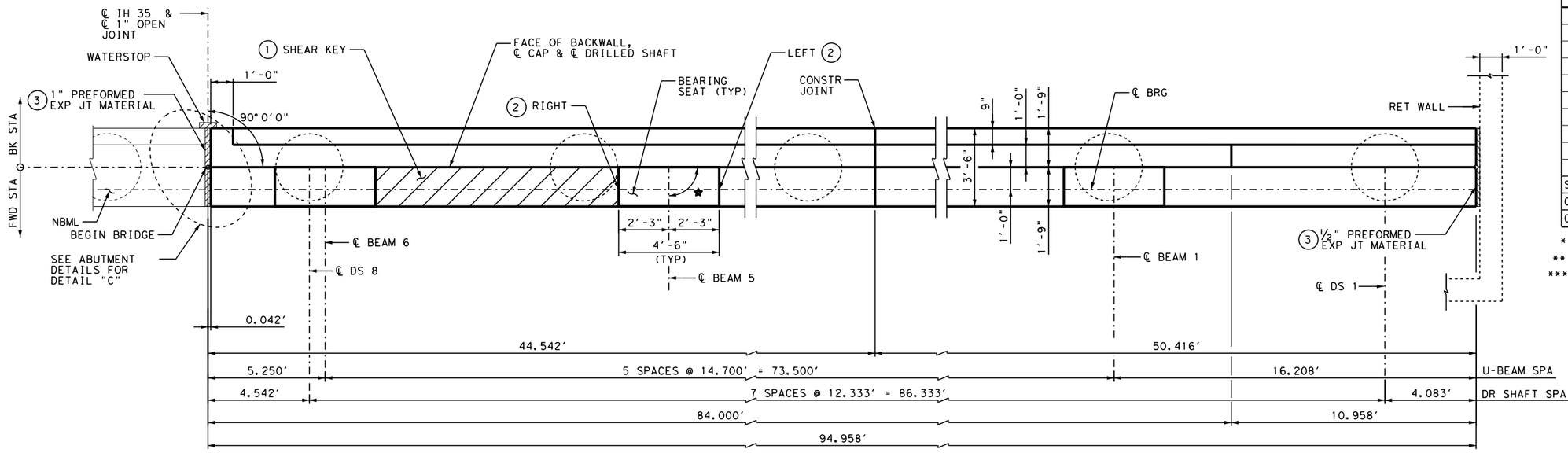
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING PAD TAPER REPORT

IH 35 SB & NB OVERPASS
AT IRVING LEE/PRIMROSE

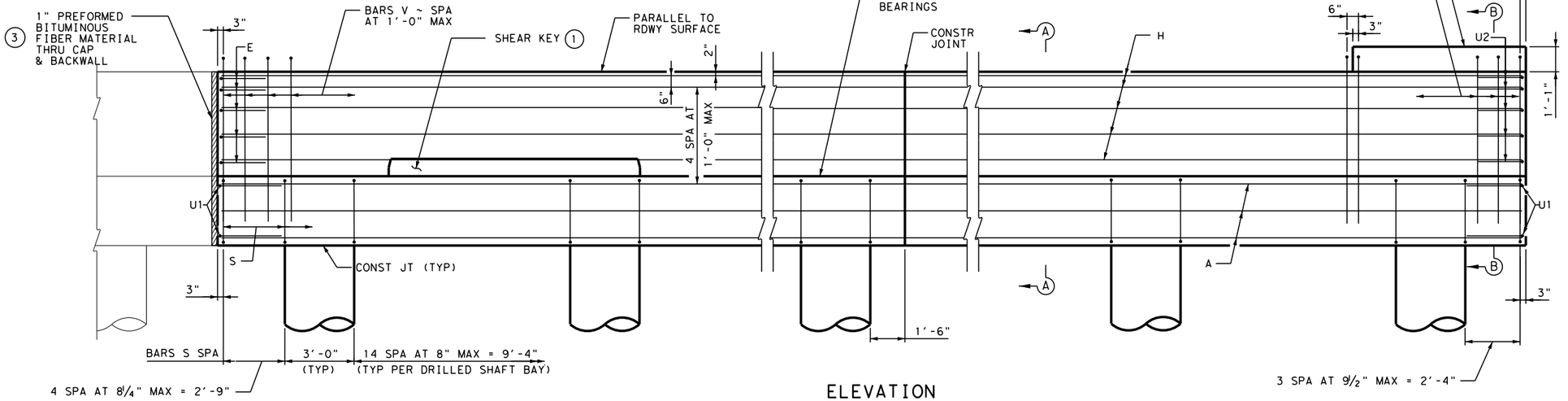
FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1205
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



PLAN

SCALE: 3/16 "=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"

1. SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS
2. SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS
3. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	10	#11	* 101'-6"	5,393
E	5	#5	6'- 9"	36
H	10	#6	** 98'- 4"	1,477
P1	11	#5	5'- 1"	59
P2	3	#5	9'- 8"	31
S	114	#6	13'- 6"	2,312
U1	4	#6	8'- 1"	49
U2	5	#5	4'- 7"	24
V	98	#5	13'- 0"	1,329
SUBTOTAL STEEL (LB) ***				10,710
CLASS "C" CONC (ABUT) (HPC)(CY)				50.2
CLASS "B" CONC (MISC) (CY)				0.4

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER

10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1206
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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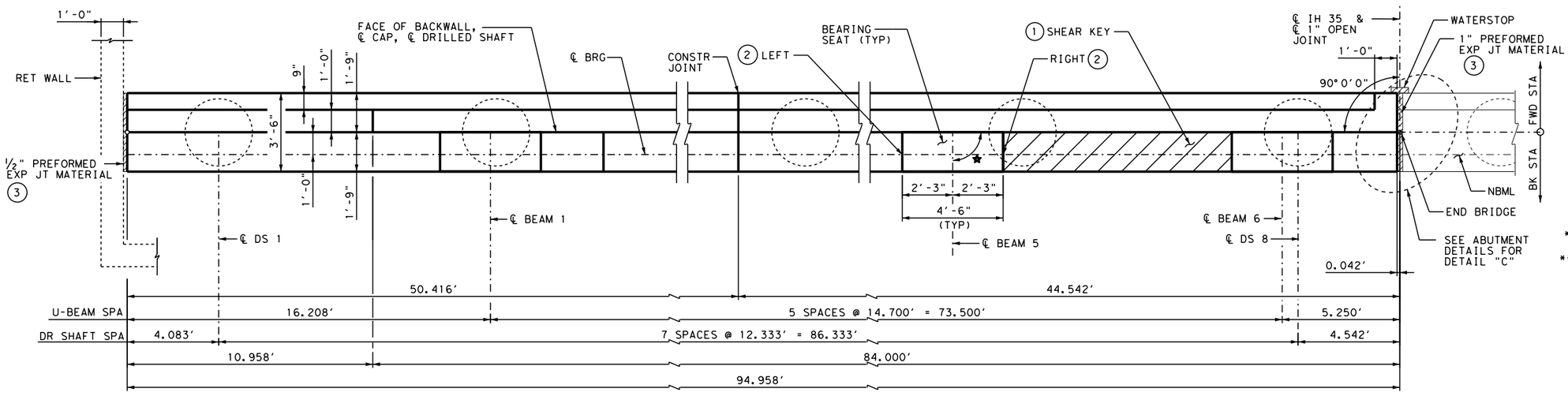
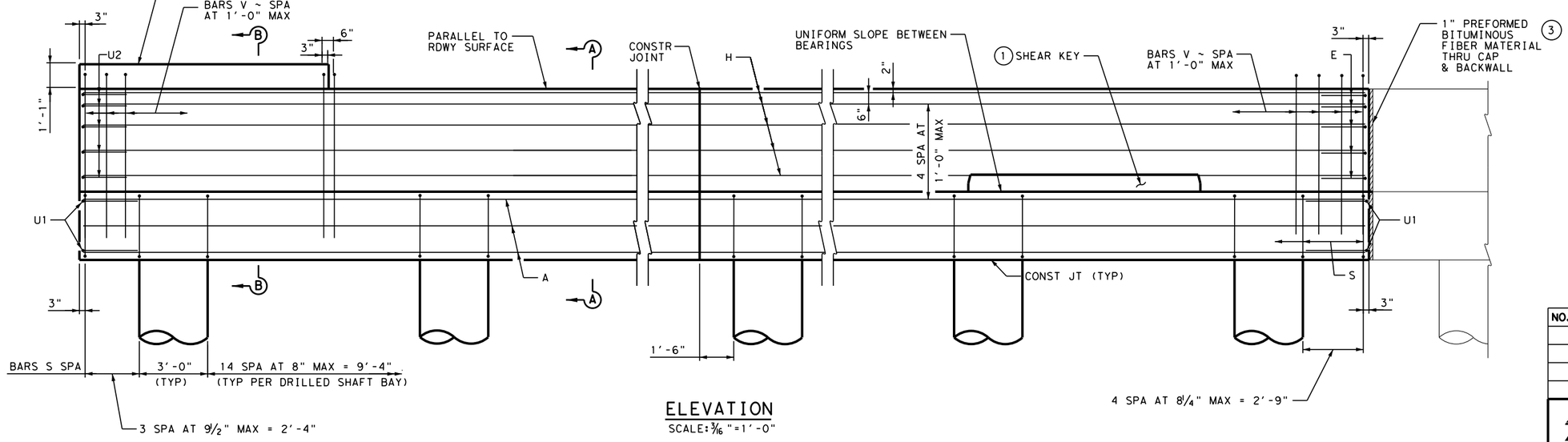


PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

1. SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS
2. SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS
3. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 4

BAR	NO	SIZE	LENGTH	WEIGHT
A	10	#11	*101'- 6"	5,393
E	5	#5	6'- 9"	36
H	10	#6	** 98'- 4"	1,477
P1	11	#5	5'- 1"	59
P2	3	#5	9'- 8"	31
S	114	#6	13'- 6"	2,312
U1	4	#6	8'- 1"	49
U2	5	#5	4'- 7"	24
V	98	#5	13'-0"	1,329
SUBTOTAL STEEL (LB) ***				10,710
CLASS "C" CONC (ABUT) (HPC)(CY)				50.2
CLASS "B" CONC (MISC) (CY)				0.4

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 4

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1207
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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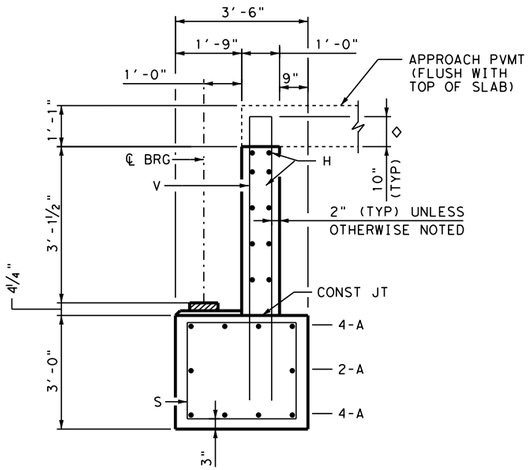
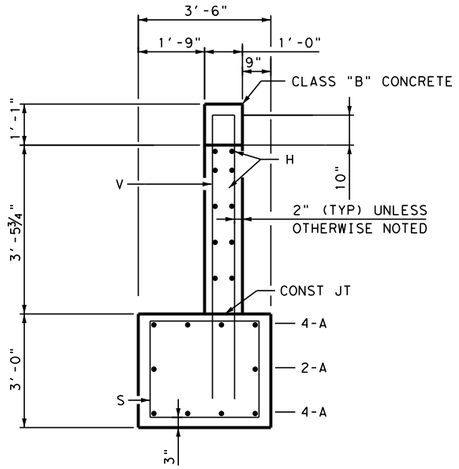


SECTION A-A

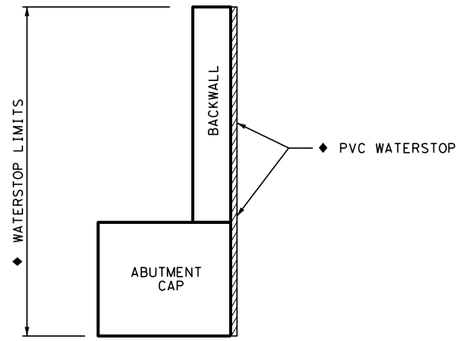
SCALE: ¼"=1'-0"

◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



SECTION B-B

SCALE: ¼"=1'-0"



WATERSTOP DETAIL

SCALE: ¼"=1'-0"

◆ WATERSTOP SHALL BE CONSIDERED SUBSIDIARY TO CLASS "C" CONCRETE

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

CLASS "B" CONCRETE STRENGTH SHALL BE f'c = 2000 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

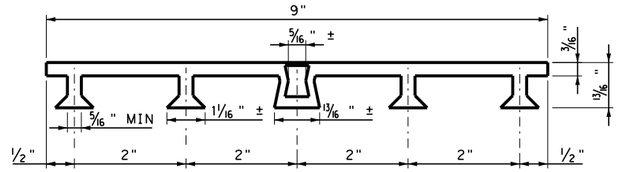
CALCULATED FOUNDATION LOADS,

ABUTMENT 1= 94 TONS/DRILLED SHAFT,

ABUTMENT 4= 86 TONS/DRILLED SHAFT.

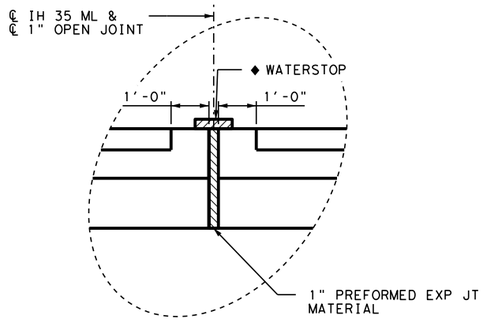
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT.

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

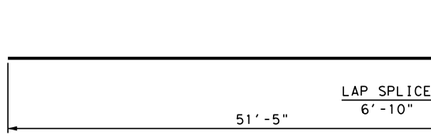


PVC WATERSTOP TYPE "A"

(DIMENSIONS AND SHAPE MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER)

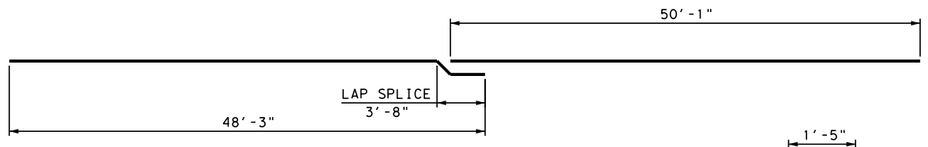


DETAIL "C"



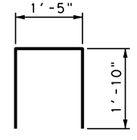
BARS A

(ABUT 1 SHOWN, ABUT 4 SHALL BE OPPOSITE HAND)

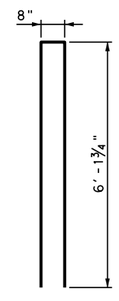


BARS H

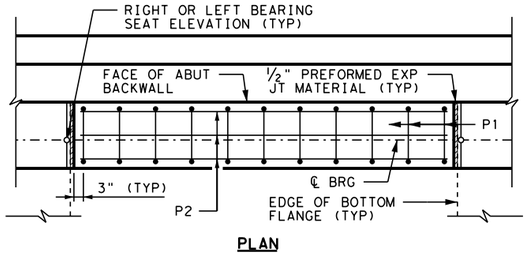
(ABUT 1 SHOWN, ABUT 4 SHALL BE OPPOSITE HAND)



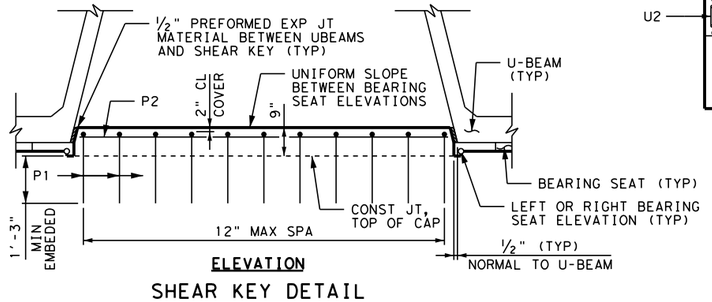
BARS P1



BARS V

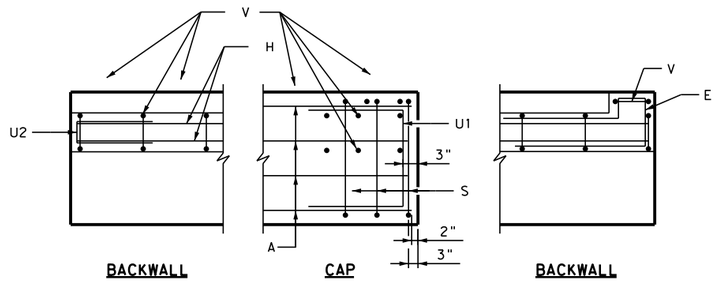


PLAN



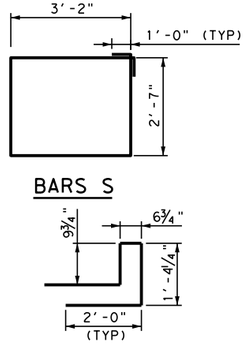
ELEVATION

SHEAR KEY DETAIL



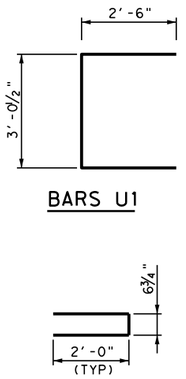
CORNER DETAIL

SCALE: ¼"=1'-0"



BARS S

BARS E



BARS U1

BARS U2

NO.	DATE	REVISION	APPROVED

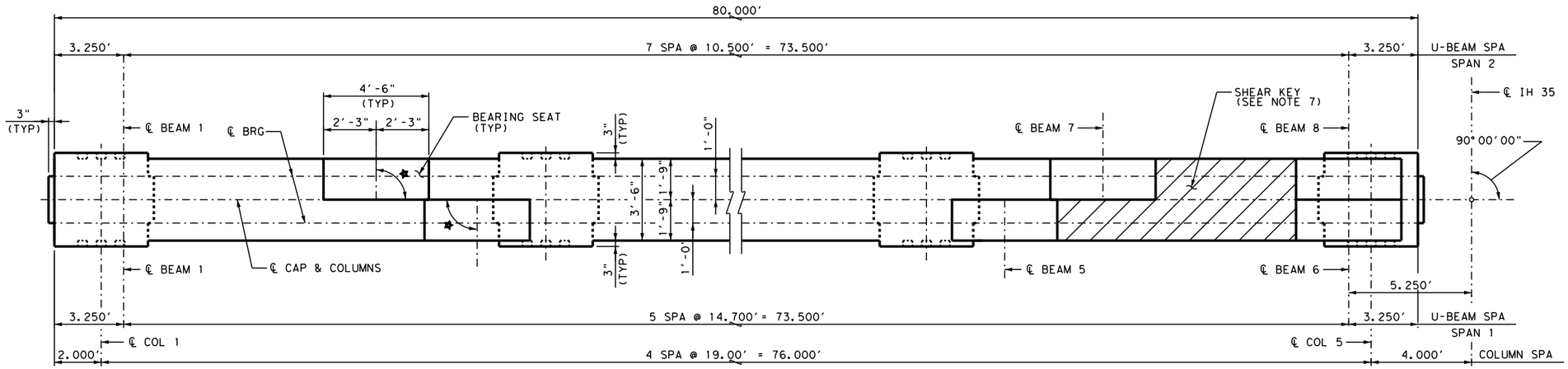
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

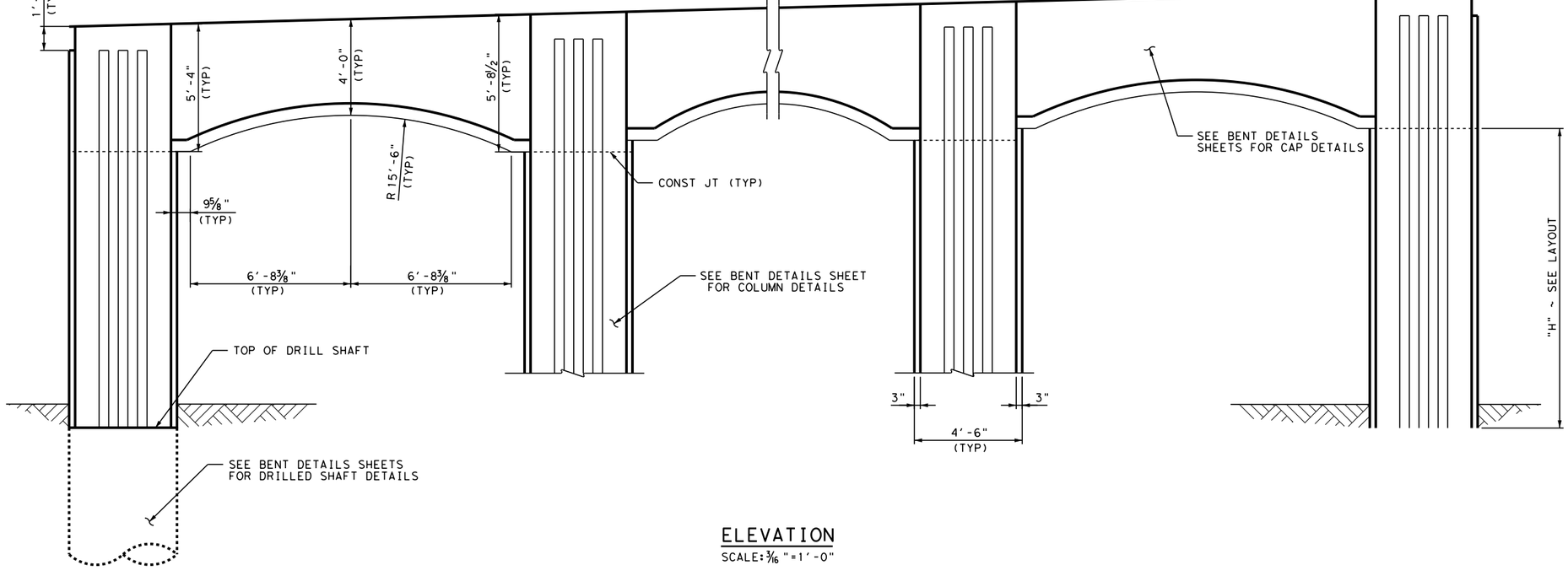
FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1208
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



PLAN

SCALE: 3/16 "=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

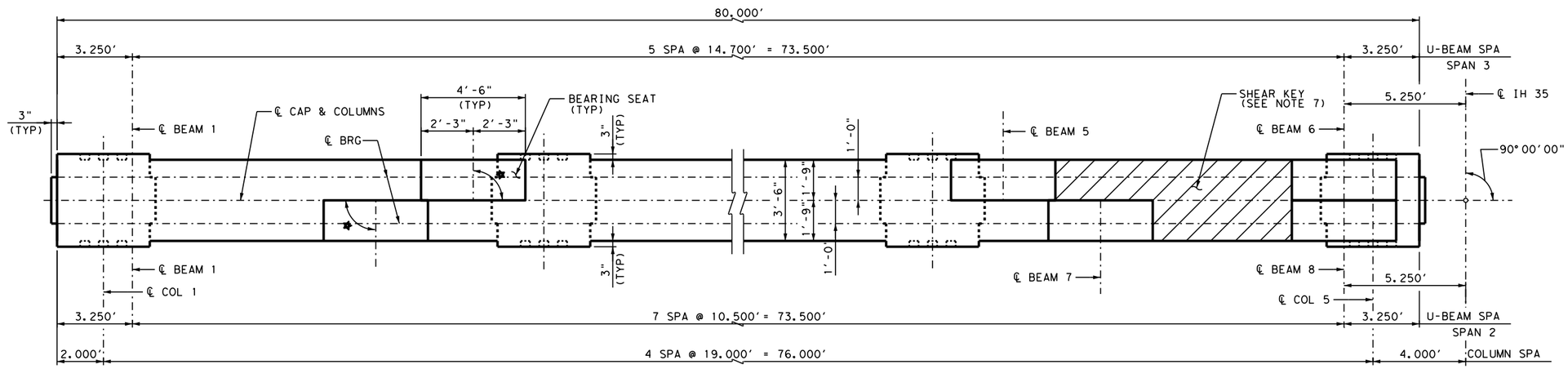
IH 35 FROM S LP 340 TO 12TH ST

BENT 2

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1209
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

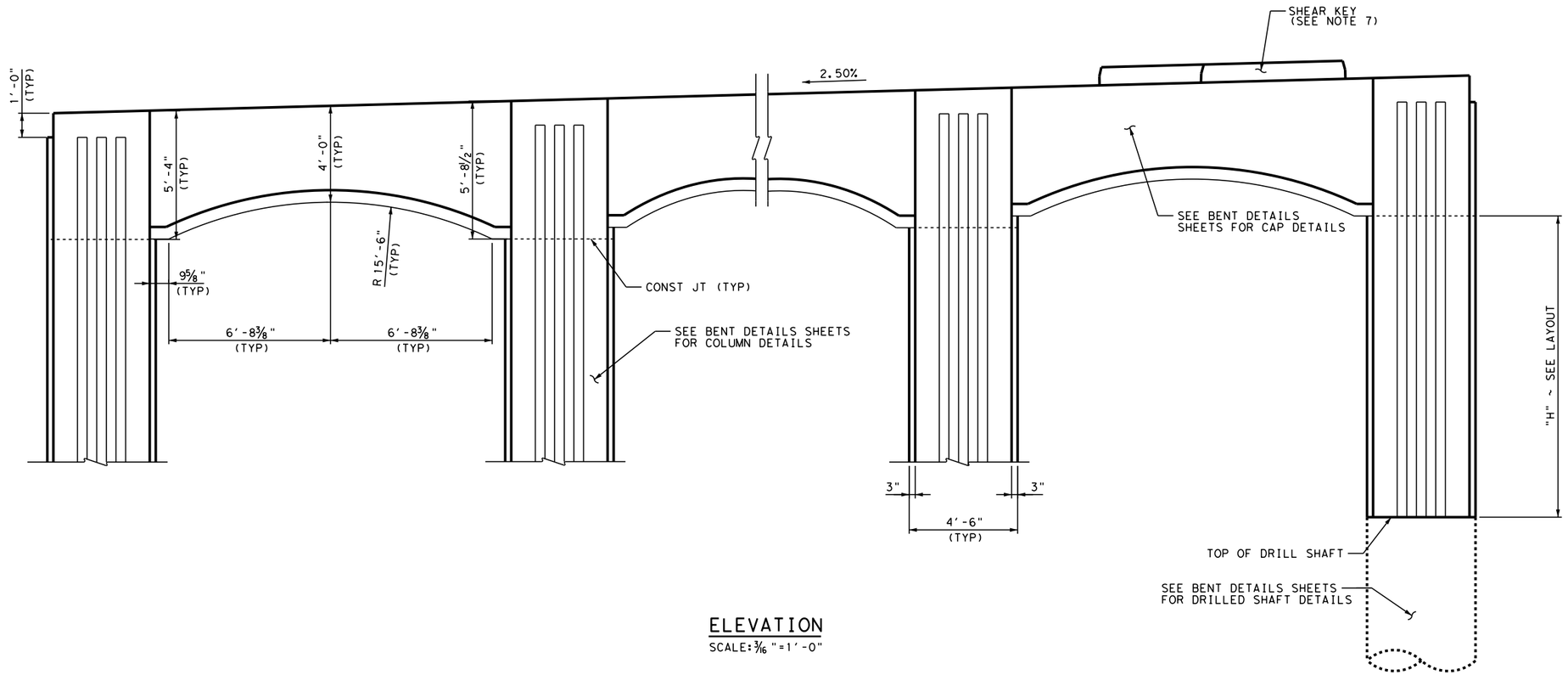
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRBN5_02IL_SB_001.dgn
DATE: 10/17/2023 11:50:32 AM USER:



PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 3

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1210
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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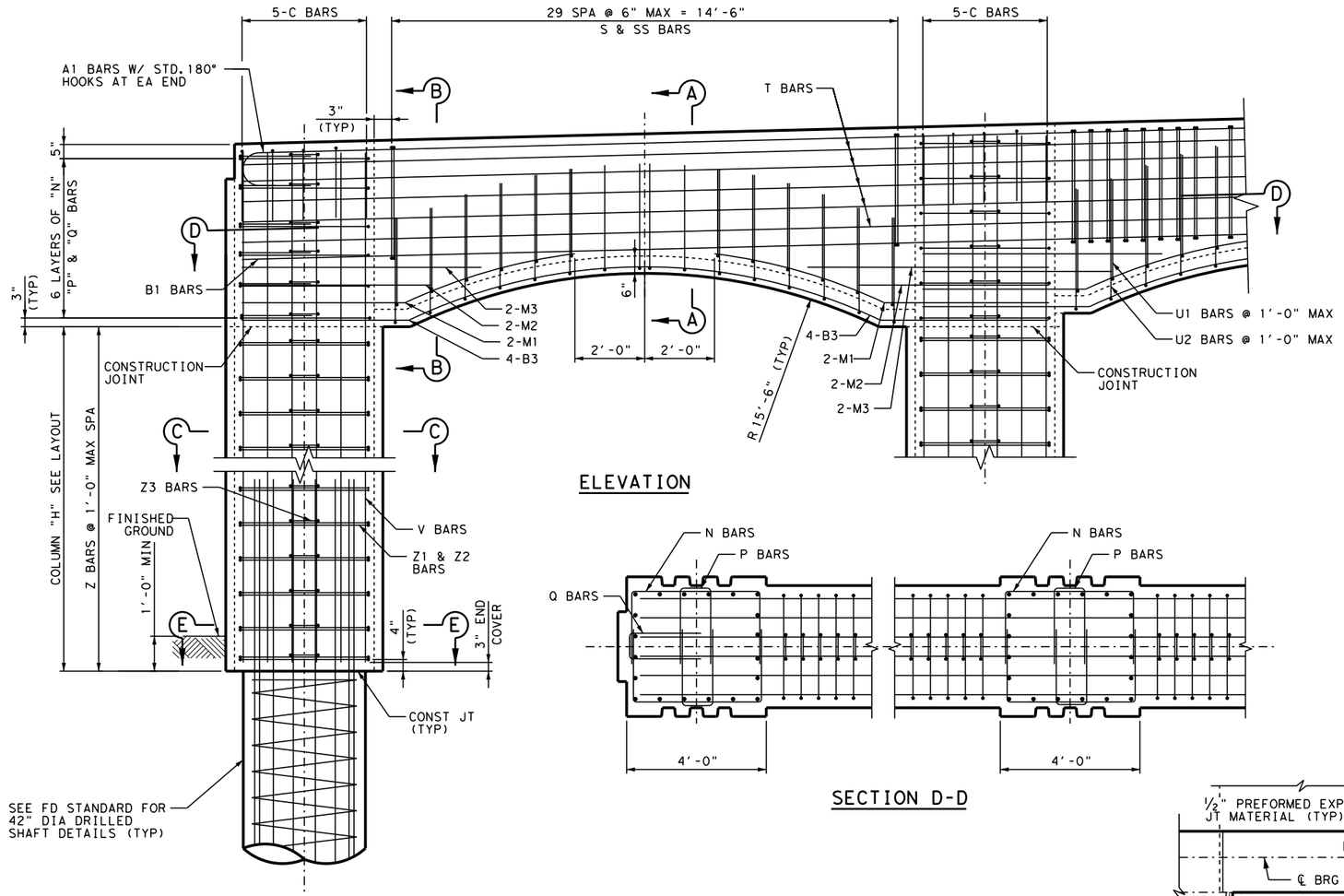
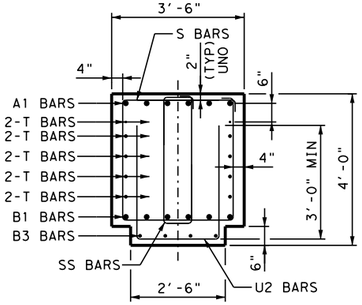
DATE: 10/17/2023 11:50:35 AM USER:

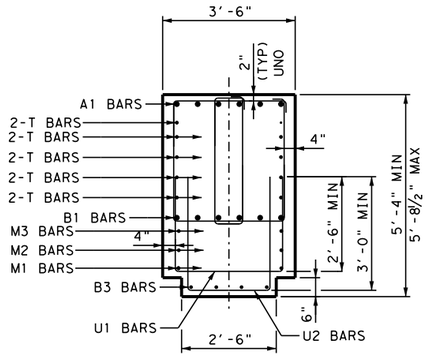


ELEVATION

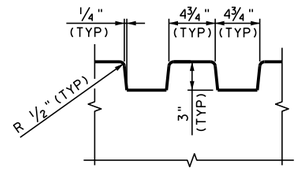
SECTION D-D



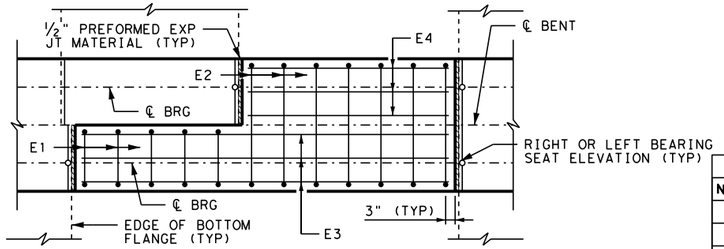
SECTION A-A



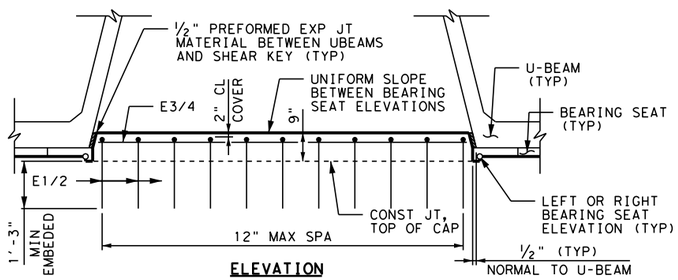
SECTION B-B
(AT FACE OF COLUMN)



GROOVE DETAIL



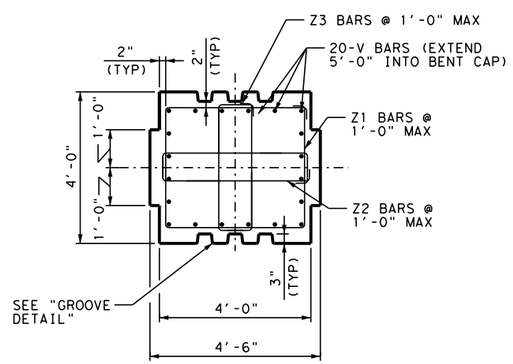
PLAN
(BENT 2 SHOWN, BENT 3 SHALL BE OPPOSITE HAND)



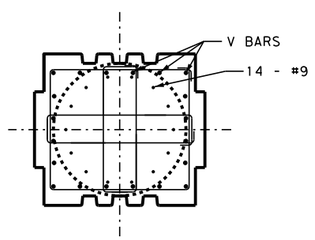
ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.



SECTION C-C



SECTION E-E

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

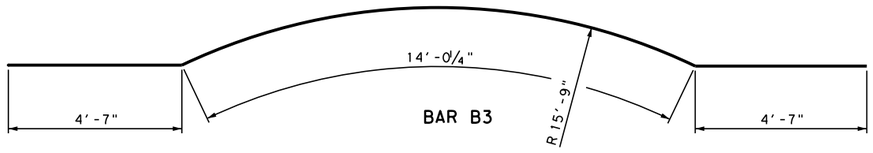
SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1211
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

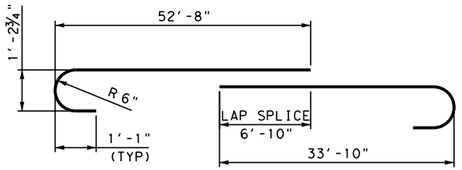
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRBNS_02IL_SB_003.dgn
DATE: 10/17/2023 11:50:39 AM USER:

* LENGTH SHOWN INCLUDES ONE 6'-10" SPLICE.
** LENGTH SHOWN INCLUDES ONE 5'-3" SPLICE.
*** LENGTH SHOWN INCLUDES ONE 2'-2" SPLICE.
**** FOR CONTRACTOR'S INFORMATION ONLY.

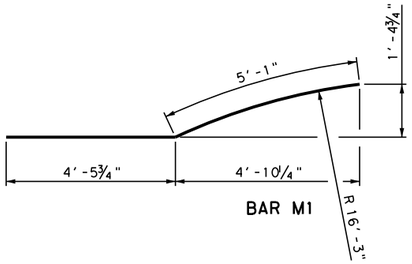
(1) VARIABLE QUANTITIES ARE BASED ON COLUMN HEIGHTS "H" SHOWN.



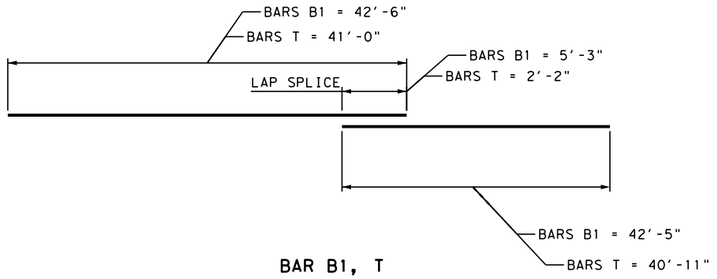
BAR B3



BAR A1

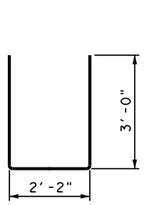


BAR M1

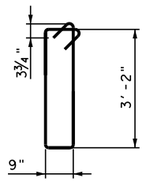


BAR B1, T

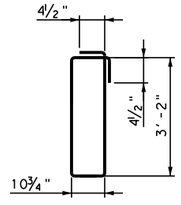
TABLE OF QUANTITIES BENT 2					TABLE OF QUANTITIES BENT 3				
CONSTANT QUANTITIES									
BAR	NO	SIZE	LENGTH	WEIGHT	BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 89'-8"	2859	A1	6	#11	* 89'-8"	2859
B1	6	#11	** 84'-11"	2707	B1	6	#11	** 84'-11"	2707
B3	16	#8	23'-3"	991	B3	16	#8	23'-3"	991
C	25	#4	6'-10"	115	C	25	#4	6'-10"	115
E1	5	#5	5'-1"	27	E1	5	#5	5'-1"	27
E2	7	#5	6'-10"	50	E2	7	#5	6'-10"	50
E3	3	#5	9'-8"	30	E3	3	#5	9'-8"	30
E4	3	#5	5'-5"	17	E4	3	#5	5'-5"	17
M1	16	#8	9'-7"	409	M1	16	#8	9'-7"	409
M2	16	#8	5'-1"	217	M2	16	#8	5'-1"	217
M3	16	#8	6'-7"	278	M3	16	#8	6'-7"	278
N	60	#4	8'-4"	334	N	60	#4	8'-4"	334
P	60	#4	5'-8"	225	P	60	#4	5'-8"	225
Q	12	#4	4'-9"	39	Q	12	#4	4'-9"	39
S	120	#5	12'-11"	1617	S	120	#5	12'-11"	1617
SS	120	#5	8'-9"	1096	SS	120	#5	8'-9"	1096
T	10	#6	*** 81'-11"	1230	T	10	#6	*** 81'-11"	1230
U1	48	#4	7'-10"	252	U1	48	#4	7'-10"	252
U2	64	#4	8'-2"	350	U2	64	#4	8'-2"	350
SUBTOTAL STEEL (LBS) ****				12,843	SUBTOTAL STEEL (LBS) ****				12,843
VARIABLE QUANTITIES (1)									
"H" = 17'					"H" = 16'				
V	100	#11	21'-9"	11,556	V	100	#11	20'-9"	11,024
Z1	90	#4	14'-5"	867	Z1	85	#4	14'-5"	819
Z2	90	#4	9'-7"	576	Z2	85	#4	9'-7"	544
Z3	90	#4	8'-11"	534	Z3	85	#4	8'-11"	504
SUBTOTAL STEEL (LBS) ****				13,533	SUBTOTAL STEEL (LBS) ****				12,891
CL "C" CONC (BENT) (HPC)(CY)				104.1	CL "C" CONC (BENT) (HPC)(CY)				101.1



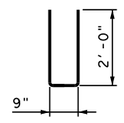
BAR U2



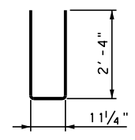
BAR SS



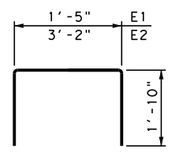
BAR Z3



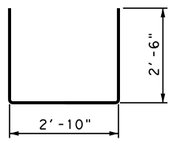
BAR Q



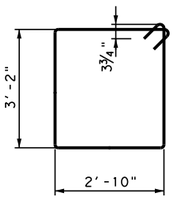
BAR P



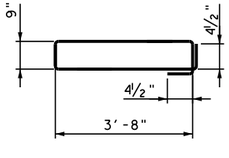
BARS E1 & E2



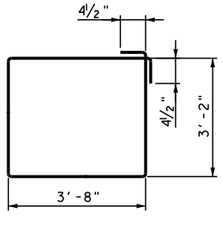
BAR U1



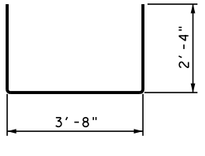
BAR S



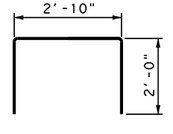
BAR Z2



BAR Z1



BAR N



BAR C

10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

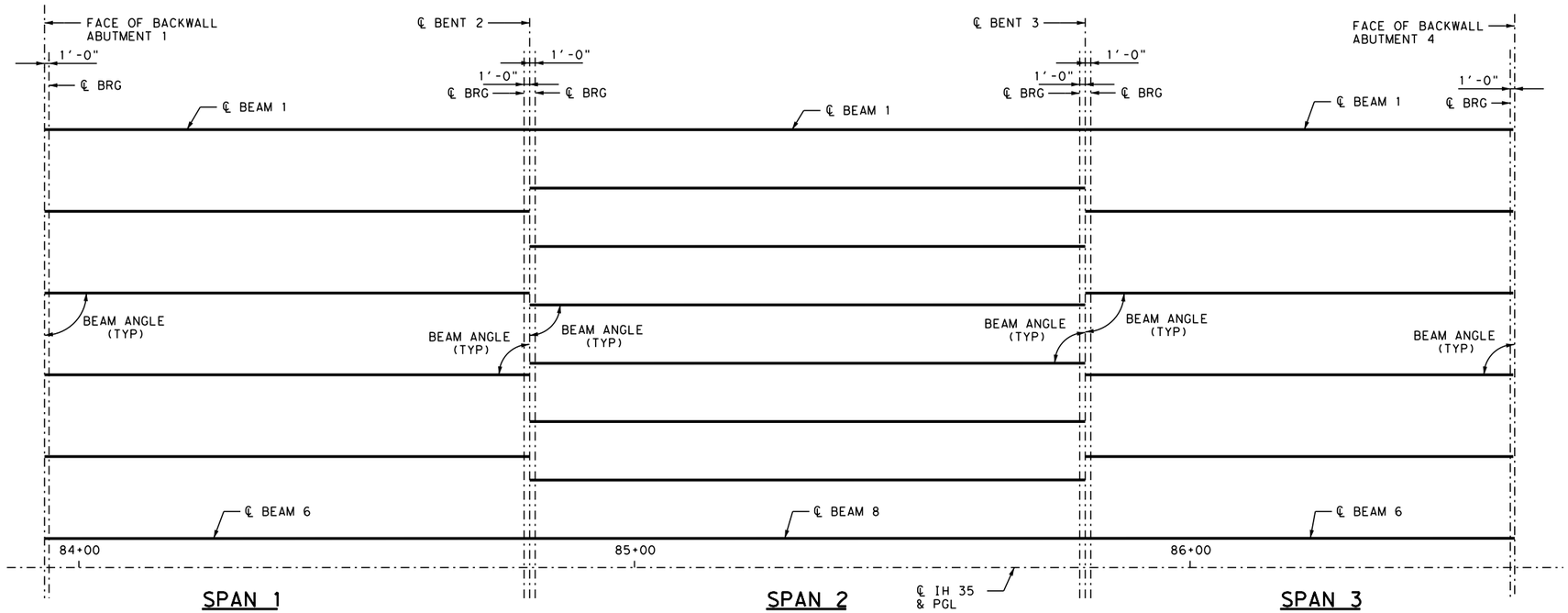
IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1212
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



ACUTE BEAM ANGLE SHOWN

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

BENT REPORT

ABUT NO. 1 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.750 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM	1	0.000	90	0	0
	BEAM	2	14.700	90	0	0
	BEAM	3	14.700	90	0	0
	BEAM	4	14.700	90	0	0
	BEAM	5	14.700	90	0	0
	BEAM	6	14.700	90	0	0
	TOTAL		73.500			

BENT NO. 2 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.750 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM	1	0.000	90	0	0
	BEAM	2	14.700	90	0	0
	BEAM	3	14.700	90	0	0
	BEAM	4	14.700	90	0	0
	BEAM	5	14.700	90	0	0
	BEAM	6	14.700	90	0	0
	TOTAL		73.500			

BENT REPORT

BENT NO. 2 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.750 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM	1	0.000	90	0	0
	BEAM	2	10.500	90	0	0
	BEAM	3	10.500	90	0	0
	BEAM	4	10.500	90	0	0
	BEAM	5	10.500	90	0	0
	BEAM	6	10.500	90	0	0
	BEAM	7	10.500	90	0	0
	BEAM	8	10.500	90	0	0
	TOTAL		73.500			

BENT NO. 3 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.750 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM	1	0.000	90	0	0
	BEAM	2	10.500	90	0	0
	BEAM	3	10.500	90	0	0
	BEAM	4	10.500	90	0	0
	BEAM	5	10.500	90	0	0
	BEAM	6	10.500	90	0	0
	BEAM	7	10.500	90	0	0
	BEAM	8	10.500	90	0	0
	TOTAL		73.500			

BENT REPORT

BENT NO. 3 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.750 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 3	BEAM	1	0.000	90	0	0
	BEAM	2	14.700	90	0	0
	BEAM	3	14.700	90	0	0
	BEAM	4	14.700	90	0	0
	BEAM	5	14.700	90	0	0
	BEAM	6	14.700	90	0	0
	TOTAL		73.500			

ABUT NO. 4 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 78.750 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 3	BEAM	1	0.000	90	0	0
	BEAM	2	14.700	90	0	0
	BEAM	3	14.700	90	0	0
	BEAM	4	14.700	90	0	0
	BEAM	5	14.700	90	0	0
	BEAM	6	14.700	90	0	0
	TOTAL		73.500			

BEAM REPORT

BEAM REPORT, SPAN 1

	C-C BENT	HORIZONTAL DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	87.500	85.500	87.00	0.0019
BEAM 2	87.500	85.500	87.00	0.0019
BEAM 3	87.500	85.500	87.00	0.0019
BEAM 4	87.500	85.500	87.00	0.0019
BEAM 5	87.500	85.500	87.00	0.0019
BEAM 6	87.500	85.500	87.00	0.0019

BEAM REPORT

BEAM REPORT, SPAN 2

	C-C BENT	HORIZONTAL DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	100.000	98.000	99.50	-0.0042
BEAM 2	100.000	98.000	99.50	-0.0042
BEAM 3	100.000	98.000	99.50	-0.0042
BEAM 4	100.000	98.000	99.50	-0.0042
BEAM 5	100.000	98.000	99.50	-0.0042
BEAM 6	100.000	98.000	99.50	-0.0042
BEAM 7	100.000	98.000	99.50	-0.0042
BEAM 8	100.000	98.000	99.50	-0.0042

BEAM REPORT

BEAM REPORT, SPAN 3

	C-C BENT	HORIZONTAL DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	77.500	75.500	77.00	-0.0101
BEAM 2	77.500	75.500	77.00	-0.0101
BEAM 3	77.500	75.500	77.00	-0.0101
BEAM 4	77.500	75.500	77.00	-0.0101
BEAM 5	77.500	75.500	77.00	-0.0101
BEAM 6	77.500	75.500	77.00	-0.0101

NO.	DATE	REVISION	APPROVED

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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

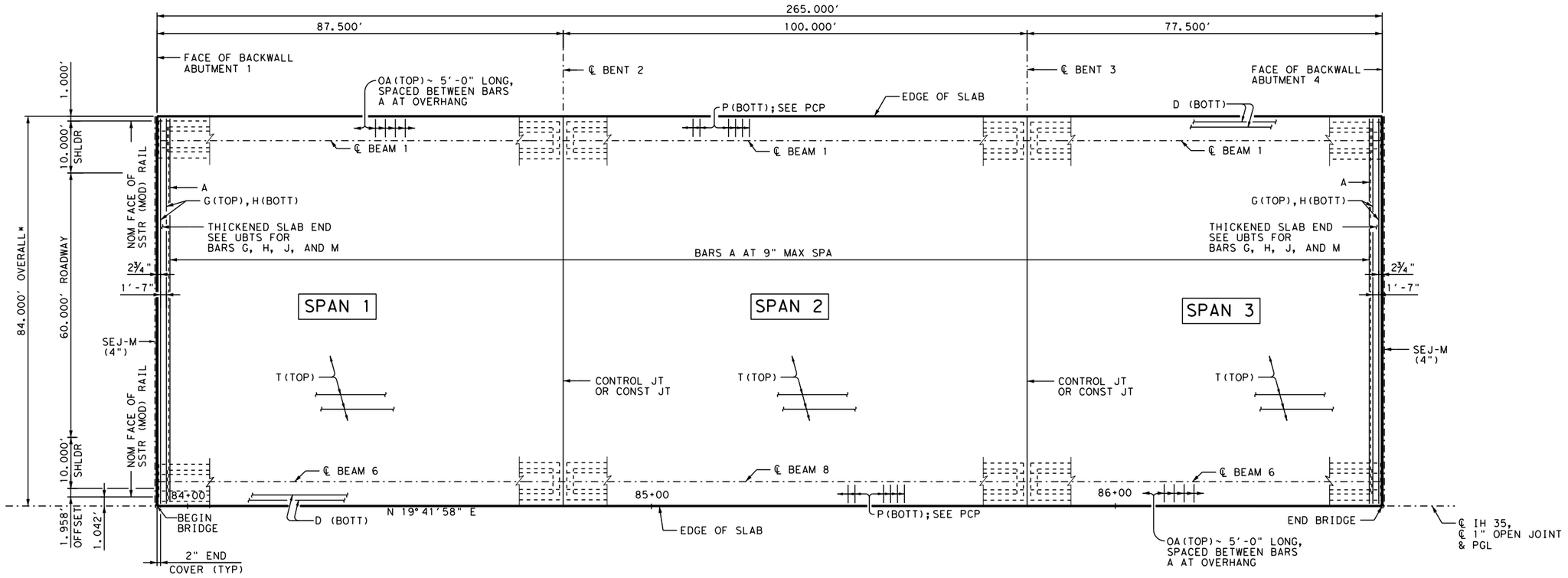
IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1213
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

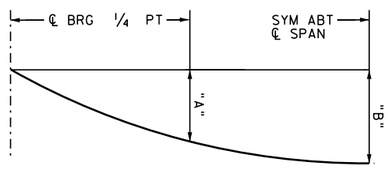
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRFP5_02IL_SB_001.dgn
DATE: 10/17/2023 11:50:45 AM USER:



PLAN

* MEASURED TO ℄ IH 35

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1	1&6	0.105	0.147
1	2-5	0.122	0.171
2	ALL	0.150	0.211
3	1&6	0.063	0.089
3	2-5	0.074	0.104



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION(2017).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c = 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS;

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

265.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 SB OVERPASS
AT IRVING LEE/PRIMROSE

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1214

STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN

CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRLD5_02IL_SB_001.dgn
DATE: 10/17/2023 11:50:49 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

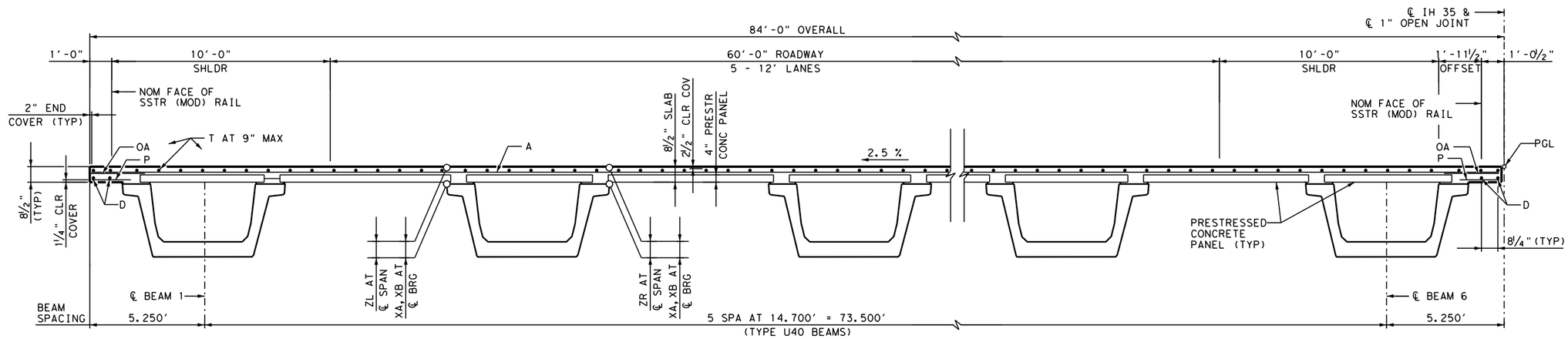
③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U40)	① REINFORCING STEEL
	SF	LF	LB
1	7,346	522.0	27,180
2	8,396	796.0	31,065
3	6,507	462.0	24,076
TOTAL	22,249	1780.0	82,321

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.

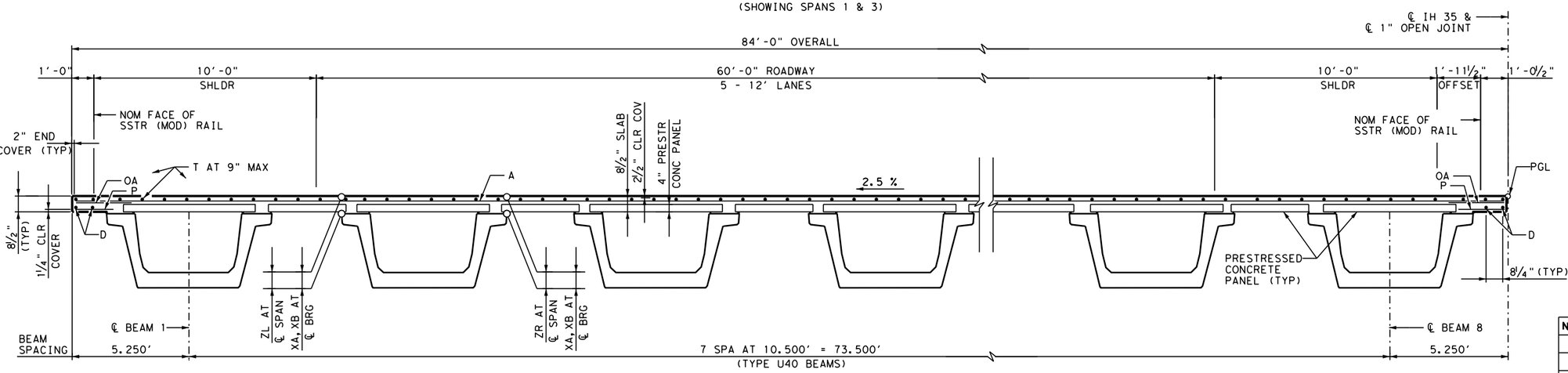


TYPICAL TRANSVERSE SECTION

(SHOWING SPANS 1 & 3)

BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
T	#4



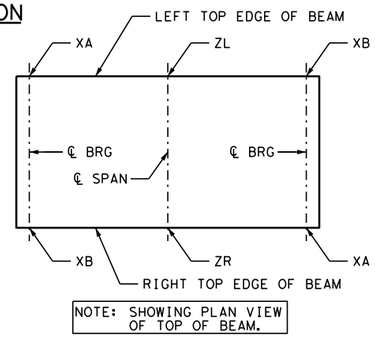
TYPICAL TRANSVERSE SECTION

(SHOWING SPAN 2)

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN ** (IN)	"ZR" AT ℄ SPAN ** (IN)
1	1&6	10 1/2	10 1/2	10	10
1	2-5	10 1/2	10 1/2	10 1/4	10 1/4
2	ALL	10 1/2	10 1/2	10	10
3	1&6	10 1/2	10 1/2	9 5/8	9 5/8
3	2-5	10 1/2	10 1/2	9 3/4	9 3/4

**THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

265.000′ PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 SB OVERPASS AT IRVING LEE/PRIMROSE

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1215
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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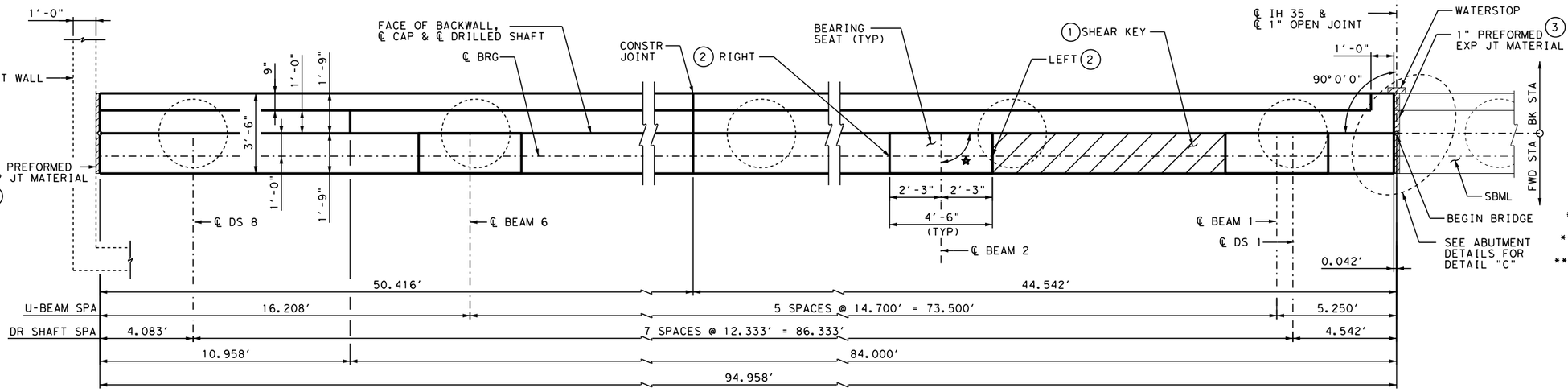
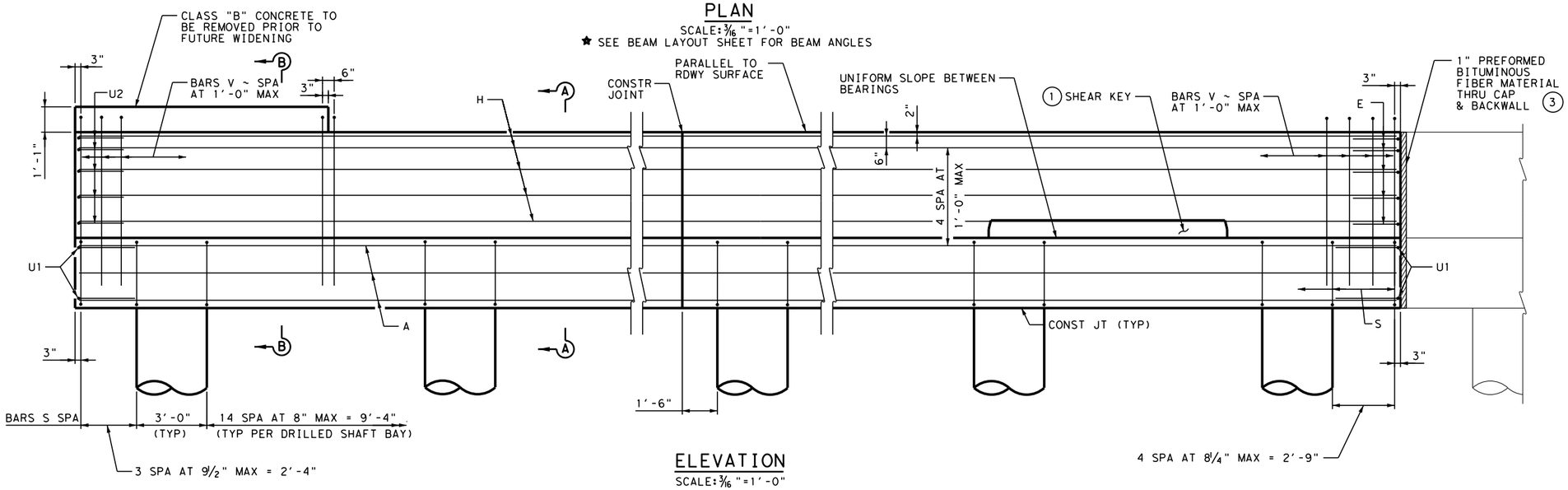


PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	10	#11	*101'- 6"	5,393
E	5	#5	6'-9"	36
H	10	#6	** 98'- 4"	1,477
P1	11	#5	5'- 1"	59
P2	3	#5	9'- 8"	31
S	114	#6	13'- 6"	2,312
U1	4	#6	8'- 1"	49
U2	5	#5	4'-7"	24
V	98	#5	13'-0"	1,329
SUBTOTAL STEEL (LB) ***				10,710
CLASS "C" CONC (ABUT) (HPC)(CY)				50.2
CLASS "B" CONC (MISC) (CY)				0.4

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1216
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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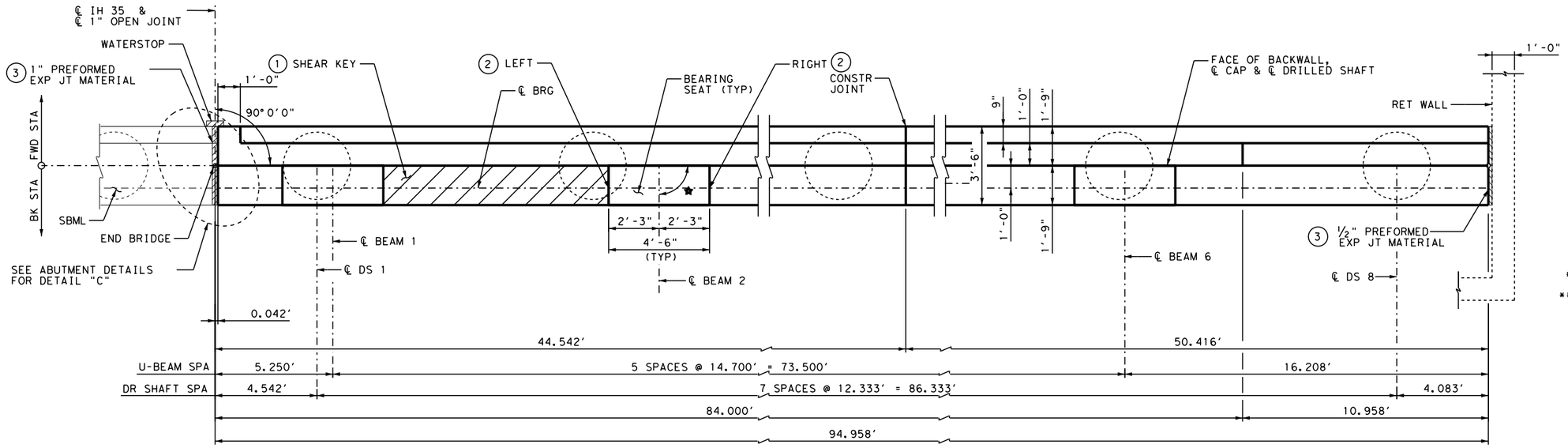
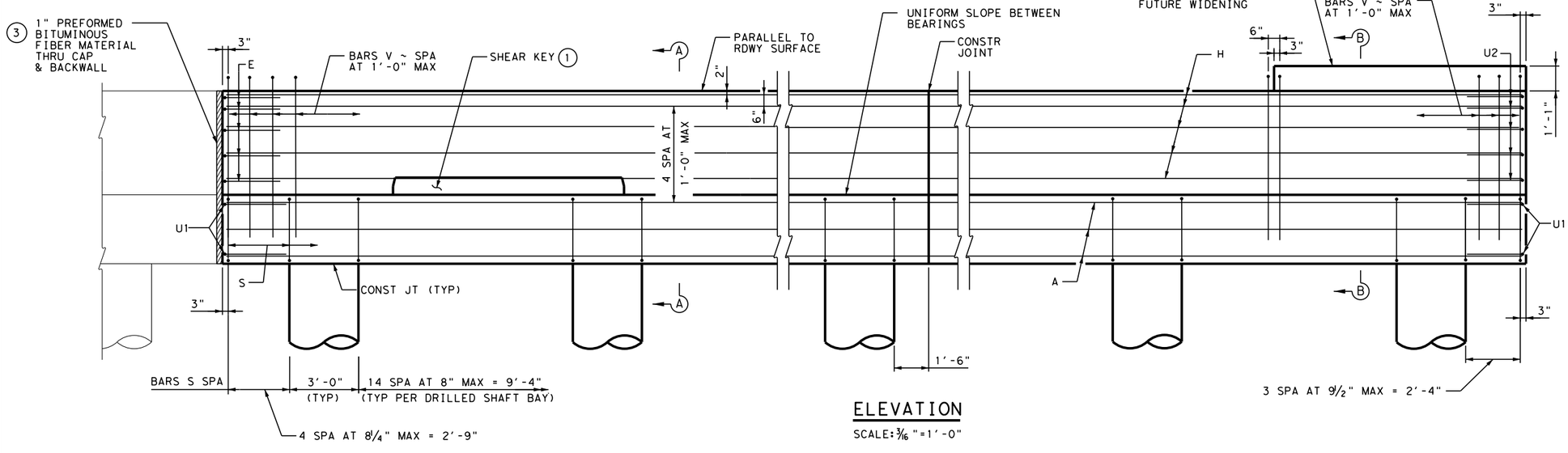


PLAN

SCALE: 3/16"=1'-0"

★SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

1 SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

2 SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

3 INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 4

BAR	NO	SIZE	LENGTH	WEIGHT
A	10	#11	*101'- 6"	5,393
E	5	#5	6'- 9"	36
H	10	#6	** 98'- 4"	1,477
P1	11	#5	5'- 1"	59
P2	3	#5	9'- 8"	31
S	114	#6	13'- 6"	2,312
U1	4	#6	8'- 1"	49
U2	5	#5	4'- 7"	24
V	98	#5	13'-0"	1,329
SUBTOTAL STEEL (LB) ***				10,710
CLASS "C" CONC (ABUT) (HPC)(CY)				50.2
CLASS "B" CONC (MISC) (CY)				0.4

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 4

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1217
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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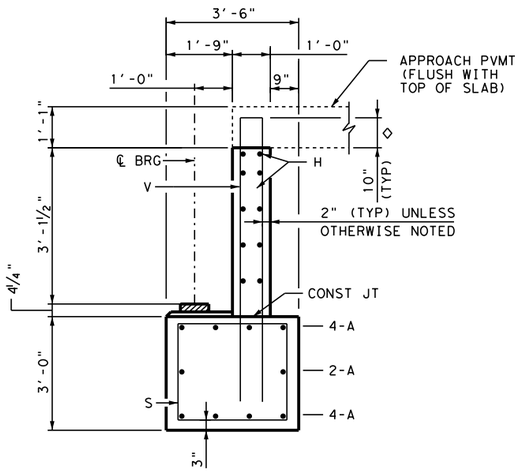
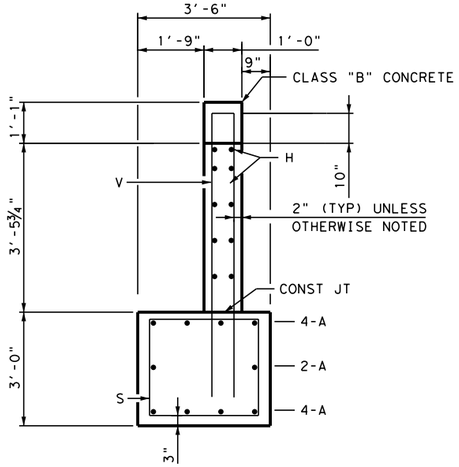


SECTION A-A

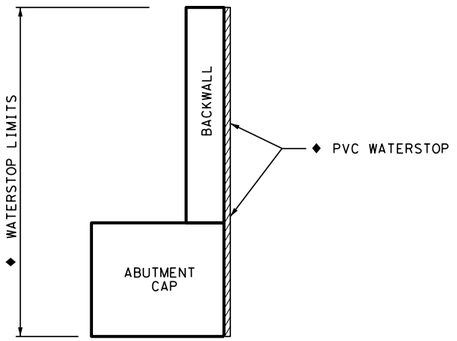
SCALE: ¼"=1'-0"

◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



SECTION B-B

SCALE: ¼"=1'-0"



WATERSTOP DETAIL

SCALE: ¼"=1'-0"

◆ WATERSTOP SHALL BE CONSIDERED SUBSIDIARY TO CLASS "C" CONCRETE

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

CLASS "B" CONCRETE STRENGTH SHALL BE f'c = 2000 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

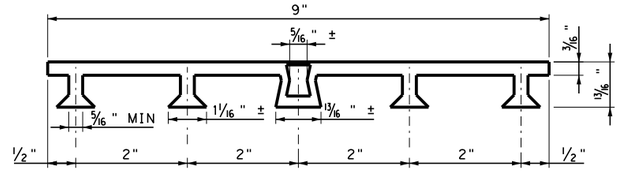
CALCULATED FOUNDATION LOADS,

ABUTMENT 1= 91 TONS/DRILLED SHAFT,

ABUTMENT 4= 84 TONS/DRILLED SHAFT.

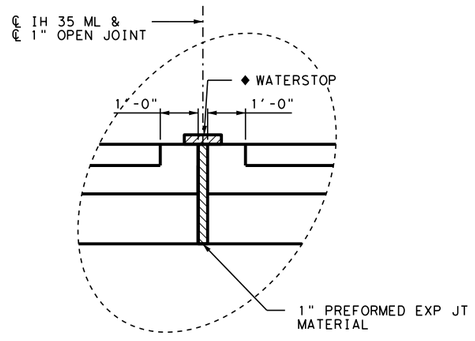
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

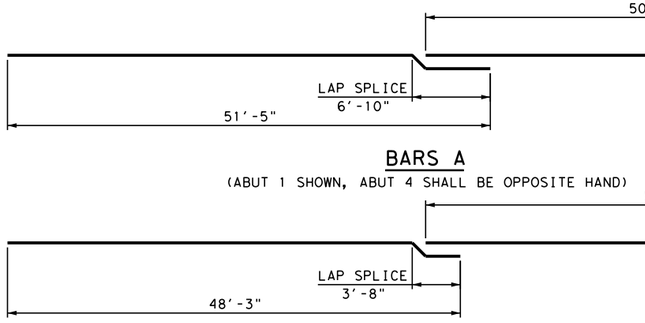


PVC WATERSTOP TYPE "A"

(DIMENSIONS AND SHAPE MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER)

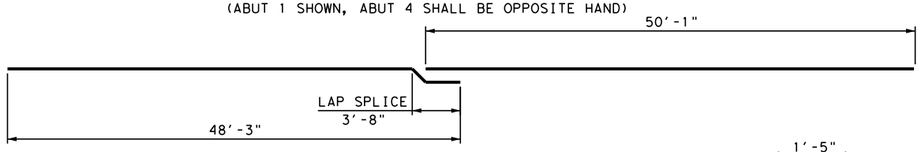


DETAIL "C"



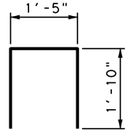
BARS A

(ABUT 1 SHOWN, ABUT 4 SHALL BE OPPOSITE HAND)

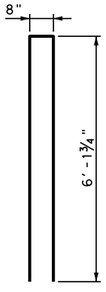


BARS H

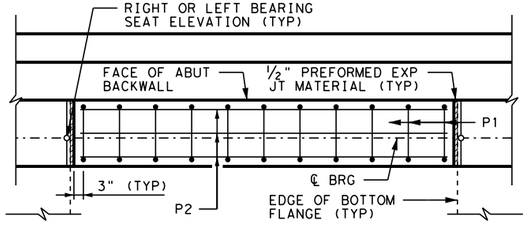
(ABUT 1 SHOWN, ABUT 4 SHALL BE OPPOSITE HAND)



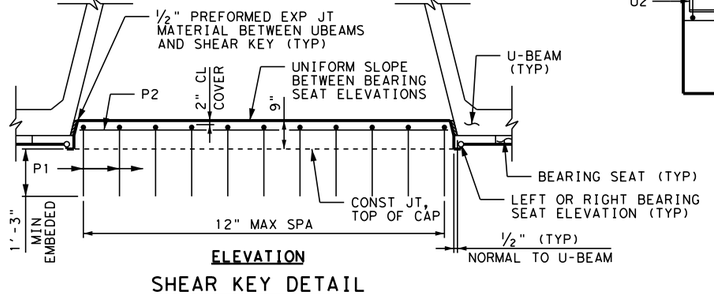
BARS P1



BARS V

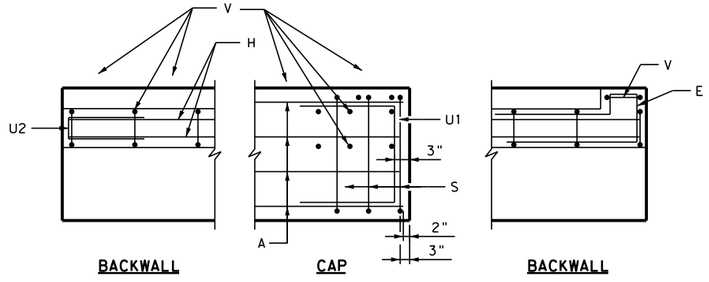


PLAN



ELEVATION

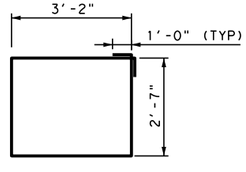
SHEAR KEY DETAIL



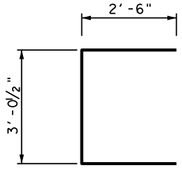
BACKWALL CAP BACKWALL

CORNER DETAIL

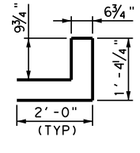
SCALE: ¼"=1'-0"



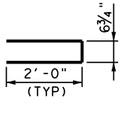
BARS S



BARS U1



BARS E



BARS U2

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1218

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRAB5_02IL_NB_003.dgn
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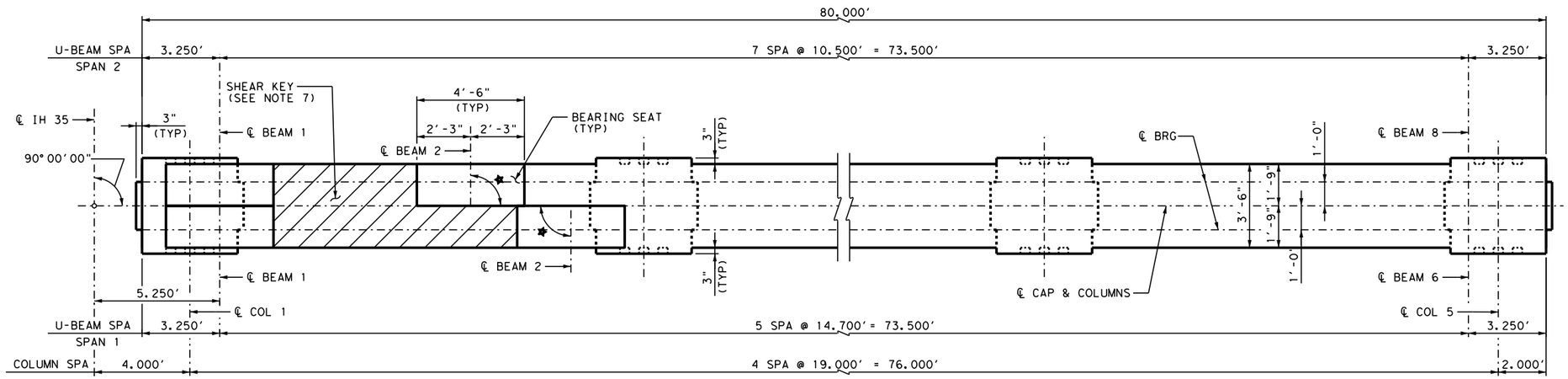
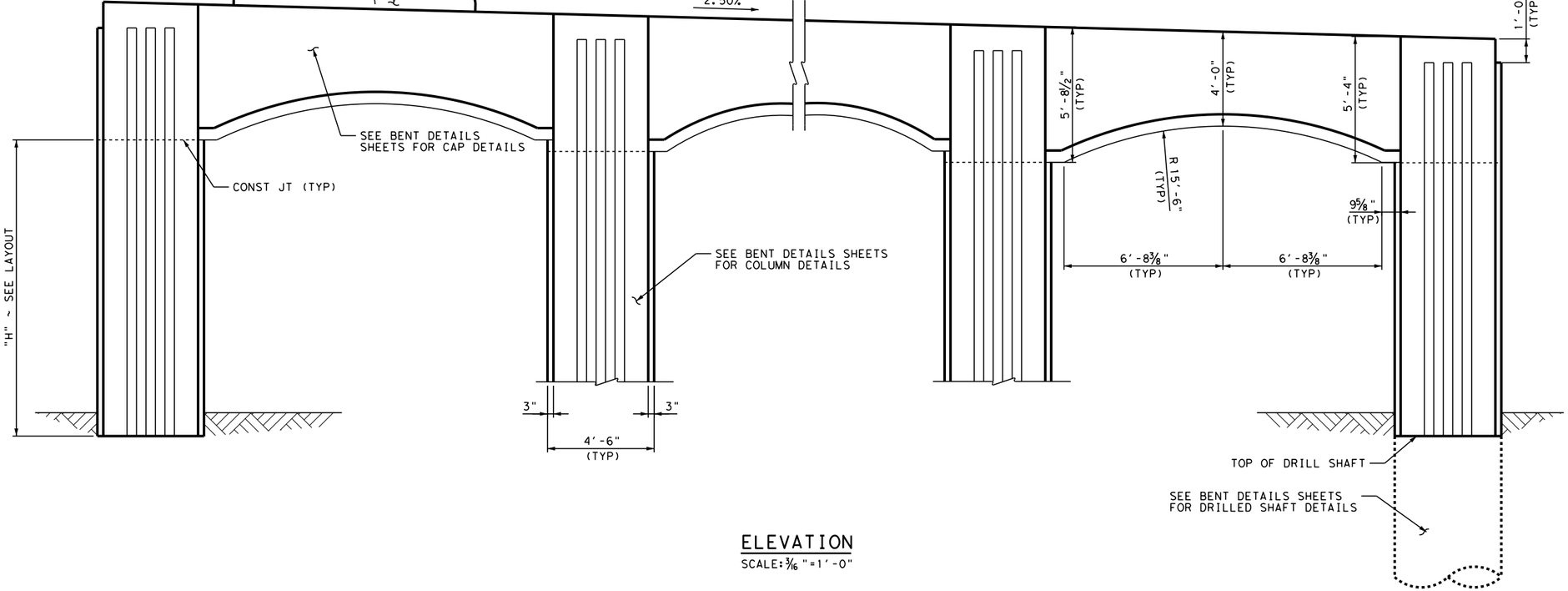


PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.

10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 2

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1219
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRBN5_02IL_NB_001.dgn
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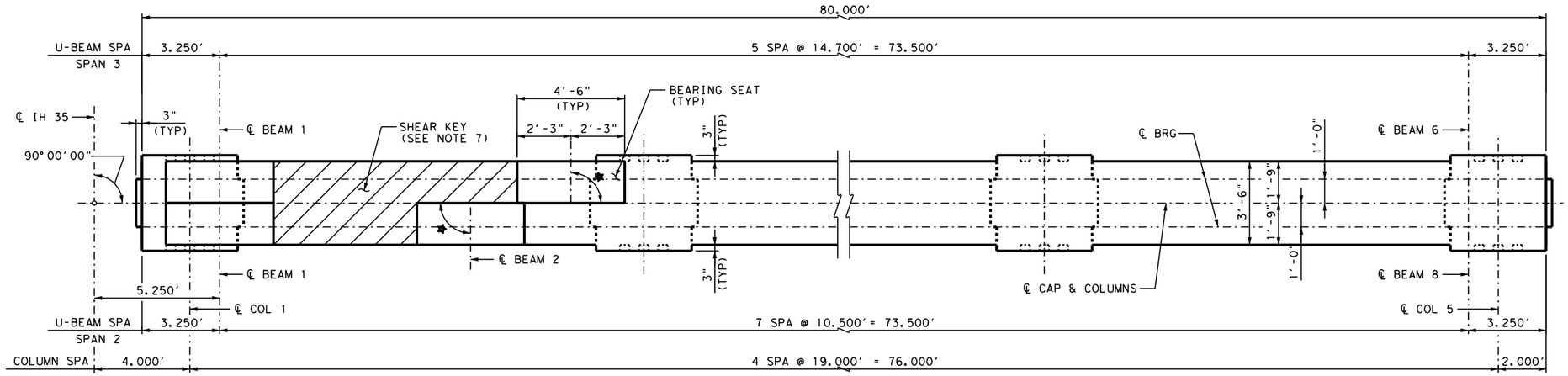
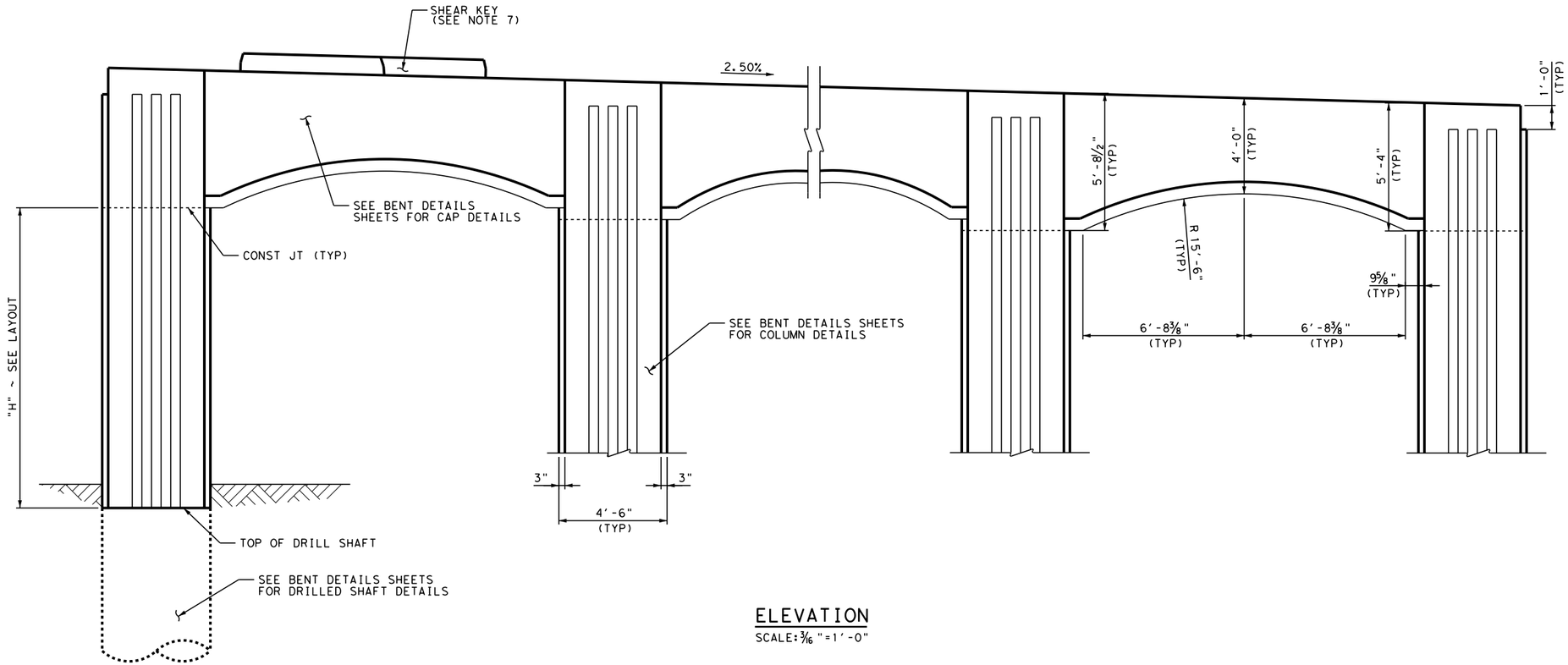


PLAN

SCALE: 3/16"=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 3

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1220
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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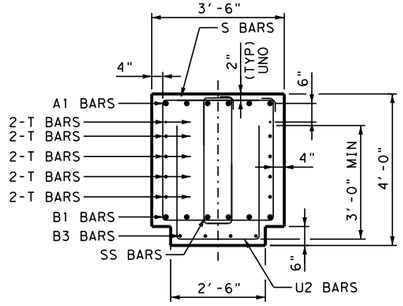

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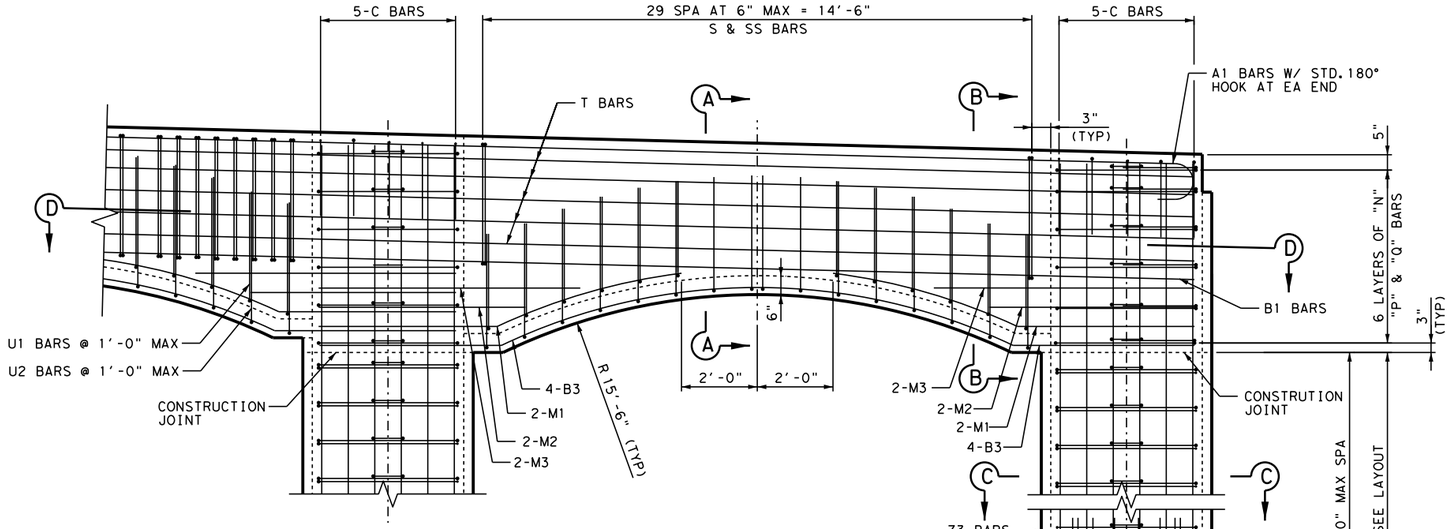
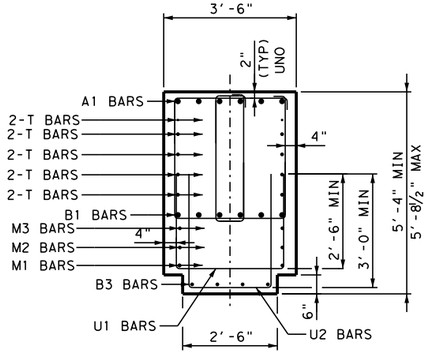
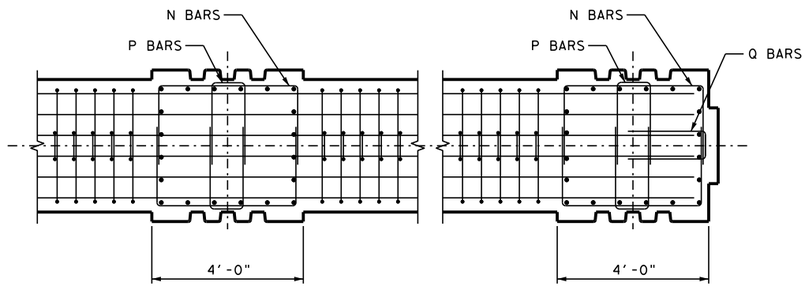


ELEVATION



SECTION B-B
(AT FACE OF COLUMN)



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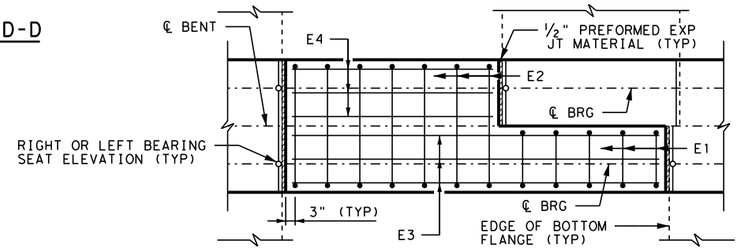
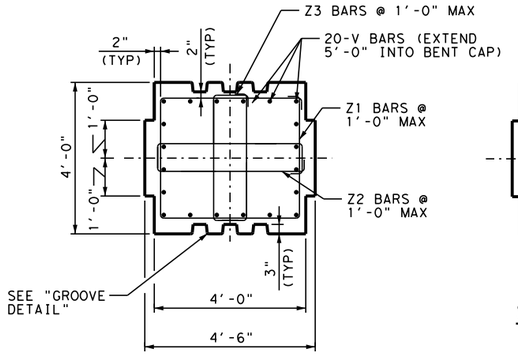


PLAN
(BENT 2 SHOWN, BENT 3 SHALL BE OPPOSITE HAND)



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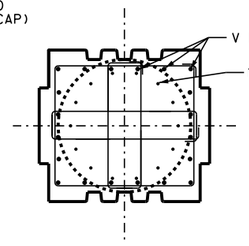

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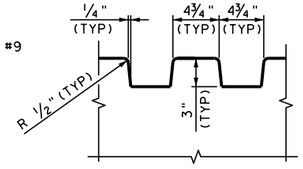
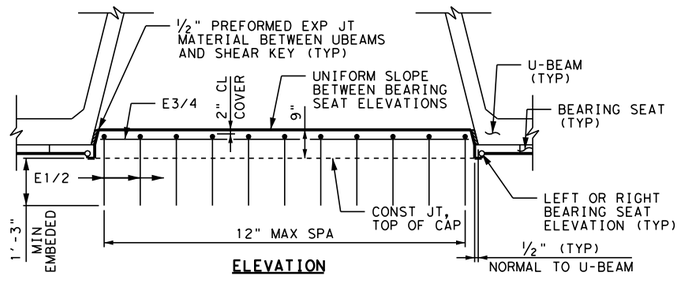


GROOVE DETAIL



ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

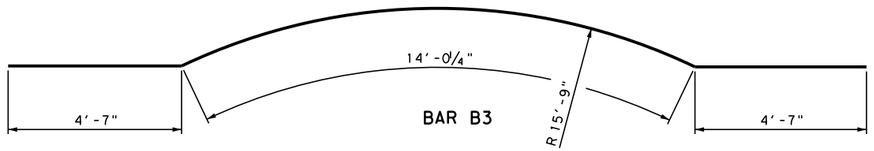
SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1221
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

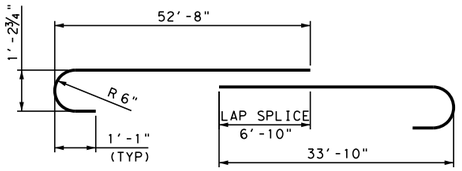
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRBNS_02IL_NB_003.dgn
DATE: 10/17/2023 11:51:22 AM USER:

* LENGTH SHOWN INCLUDES ONE 6'-10" SPLICE.
** LENGTH SHOWN INCLUDES ONE 5'-3" SPLICE.
*** LENGTH SHOWN INCLUDES ONE 2'-2" SPLICE.
**** FOR CONTRACTOR'S INFORMATION ONLY.

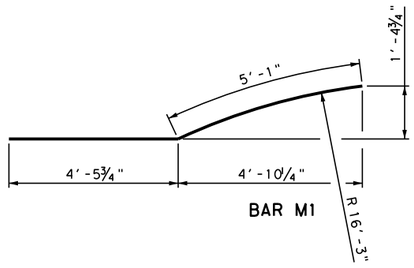
(1) VARIABLE QUANTITIES ARE BASED ON COLUMN HEIGHTS "H" SHOWN.



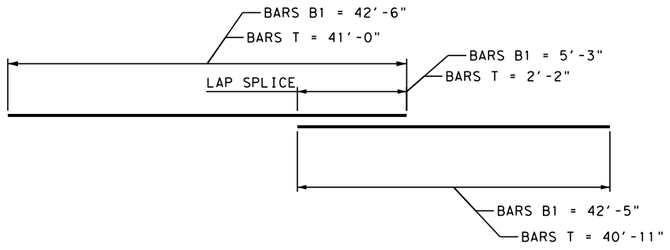
BAR B3



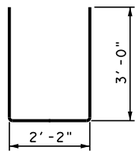
BAR A1



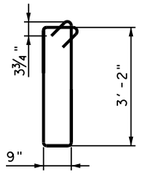
BAR M1



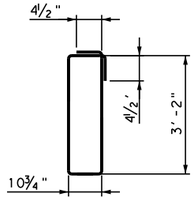
BAR B1, T



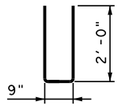
BAR U2



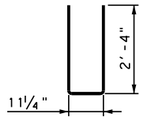
BAR SS



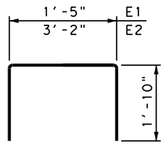
BAR Z3



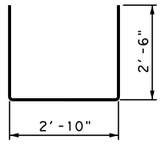
BAR Q



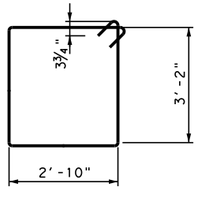
BAR P



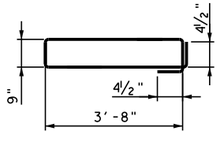
BARS E1 & E2



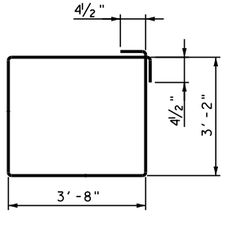
BAR U1



BAR S



BAR Z2



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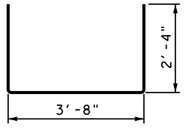
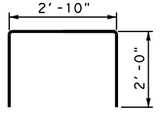


BAR N



BAR C

TABLE OF QUANTITIES BENT 2

CONSTANT QUANTITIES

BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 89'-8"	2859
B1	6	#11	** 84'-11"	2707
B3	16	#8	23'-3"	991
C	25	#4	6'-10"	115
E1	5	#5	5'-1"	27
E2	7	#5	6'-10"	50
E3	3	#5	9'-8"	30
E4	3	#5	5'-5"	17
M1	16	#8	9'-7"	409
M2	16	#8	5'-1"	217
M3	16	#8	6'-7"	278
N	60	#4	8'-4"	334
P	60	#4	5'-8"	225
Q	12	#4	4'-9"	39
S	120	#5	12'-11"	1617
SS	120	#5	8'-9"	1096
T	10	#6	*** 81'-11"	1230
U1	48	#4	7'-10"	252
U2	64	#4	8'-2"	350
SUBTOTAL STEEL (LBS) ****				12,843

VARIABLE QUANTITIES (1)

"H" = 17'				
V	100	#11	21'-9"	11,556
Z1	90	#4	14'-5"	867
Z2	90	#4	9'-7"	576
Z3	90	#4	8'-11"	534
SUBTOTAL STEEL (LBS) ****				13,533
CL "C" CONC (BENT) (HPC)(CY)				104.1

TABLE OF QUANTITIES BENT 3

CONSTANT QUANTITIES

BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 89'-8"	2859
B1	6	#11	** 84'-11"	2707
B3	16	#8	23'-3"	991
C	25	#4	6'-10"	115
E1	5	#5	5'-1"	27
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E3	3	#5	9'-8"	30
E4	3	#5	5'-5"	17
M1	16	#8	9'-7"	409
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M3	16	#8	6'-7"	278
N	60	#4	8'-4"	334
P	60	#4	5'-8"	225
Q	12	#4	4'-9"	39
S	120	#5	12'-11"	1617
SS	120	#5	8'-9"	1096
T	10	#6	*** 81'-11"	1230
U1	48	#4	7'-10"	252
U2	64	#4	8'-2"	350
SUBTOTAL STEEL (LBS) ****				12,843

VARIABLE QUANTITIES (1)

"H" = 16'				
V	100	#11	20'-9"	11,024
Z1	85	#4	14'-5"	819
Z2	85	#4	9'-7"	544
Z3	85	#4	8'-11"	504
SUBTOTAL STEEL (LBS) ****				12,891
CL "C" CONC (BENT) (HPC)(CY)				101.1

STATE OF TEXAS
QING LIU
91266
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

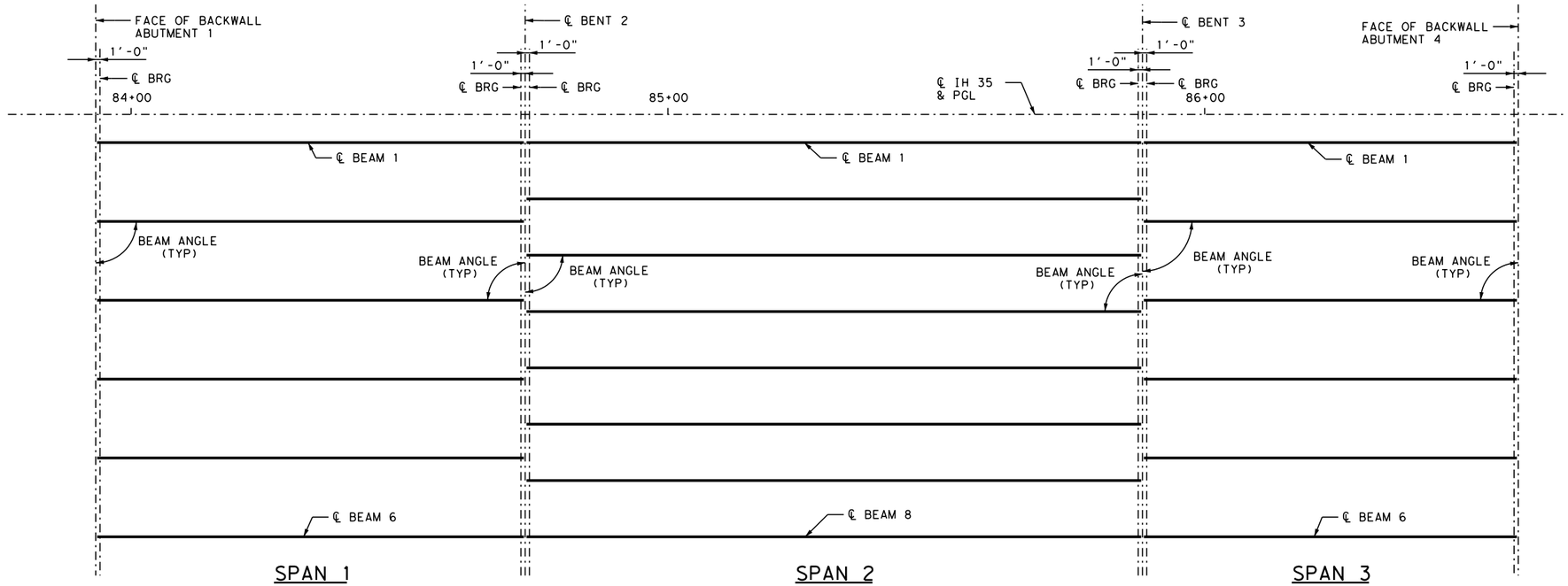
BENT DETAILS

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1222

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



SPAN 1
U40 BEAMS

BENT REPORT

ABUT NO. 1 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM 1		0.000	90	0	0
	BEAM 2		14.700	90	0	0
	BEAM 3		14.700	90	0	0
	BEAM 4		14.700	90	0	0
	BEAM 5		14.700	90	0	0
	BEAM 6		14.700	90	0	0
	TOTAL		73.500			

BENT NO. 2 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM 1		0.000	90	0	0
	BEAM 2		14.700	90	0	0
	BEAM 3		14.700	90	0	0
	BEAM 4		14.700	90	0	0
	BEAM 5		14.700	90	0	0
	BEAM 6		14.700	90	0	0
	TOTAL		73.500			

BENT REPORT

BENT NO. 2 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM 1		0.000	90	0	0
	BEAM 2		10.500	90	0	0
	BEAM 3		10.500	90	0	0
	BEAM 4		10.500	90	0	0
	BEAM 5		10.500	90	0	0
	BEAM 6		10.500	90	0	0
	BEAM 7		10.500	90	0	0
	BEAM 8		10.500	90	0	0
	TOTAL		73.500			

BENT NO. 3 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM 1		0.000	90	0	0
	BEAM 2		10.500	90	0	0
	BEAM 3		10.500	90	0	0
	BEAM 4		10.500	90	0	0
	BEAM 5		10.500	90	0	0
	BEAM 6		10.500	90	0	0
	BEAM 7		10.500	90	0	0
	BEAM 8		10.500	90	0	0
	TOTAL		73.500			

SPAN 2
U40 BEAMS

BENT REPORT

BENT NO. 3 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 3	BEAM 1		0.000	90	0	0
	BEAM 2		14.700	90	0	0
	BEAM 3		14.700	90	0	0
	BEAM 4		14.700	90	0	0
	BEAM 5		14.700	90	0	0
	BEAM 6		14.700	90	0	0
	TOTAL		73.500			

ABUT NO. 4 (S 70 18 2 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 5.250 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 3	BEAM 1		0.000	90	0	0
	BEAM 2		14.700	90	0	0
	BEAM 3		14.700	90	0	0
	BEAM 4		14.700	90	0	0
	BEAM 5		14.700	90	0	0
	BEAM 6		14.700	90	0	0
	TOTAL		73.500			

SPAN 3
U40 BEAMS

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	87.500	85.500	87.00	0.0019
BEAM 2	87.500	85.500	87.00	0.0019
BEAM 3	87.500	85.500	87.00	0.0019
BEAM 4	87.500	85.500	87.00	0.0019
BEAM 5	87.500	85.500	87.00	0.0019
BEAM 6	87.500	85.500	87.00	0.0019

BEAM REPORT

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	100.000	98.000	99.50	-0.0042
BEAM 2	100.000	98.000	99.50	-0.0042
BEAM 3	100.000	98.000	99.50	-0.0042
BEAM 4	100.000	98.000	99.50	-0.0042
BEAM 5	100.000	98.000	99.50	-0.0042
BEAM 6	100.000	98.000	99.50	-0.0042
BEAM 7	100.000	98.000	99.50	-0.0042
BEAM 8	100.000	98.000	99.50	-0.0042

BEAM REPORT

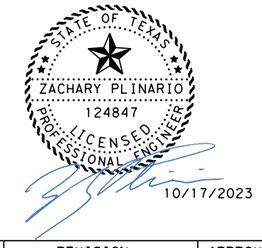
BEAM REPORT, SPAN 3

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	77.500	75.500	77.00	-0.0101
BEAM 2	77.500	75.500	77.00	-0.0101
BEAM 3	77.500	75.500	77.00	-0.0101
BEAM 4	77.500	75.500	77.00	-0.0101
BEAM 5	77.500	75.500	77.00	-0.0101
BEAM 6	77.500	75.500	77.00	-0.0101

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

ACUTE BEAM ANGLE SHOWN



NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

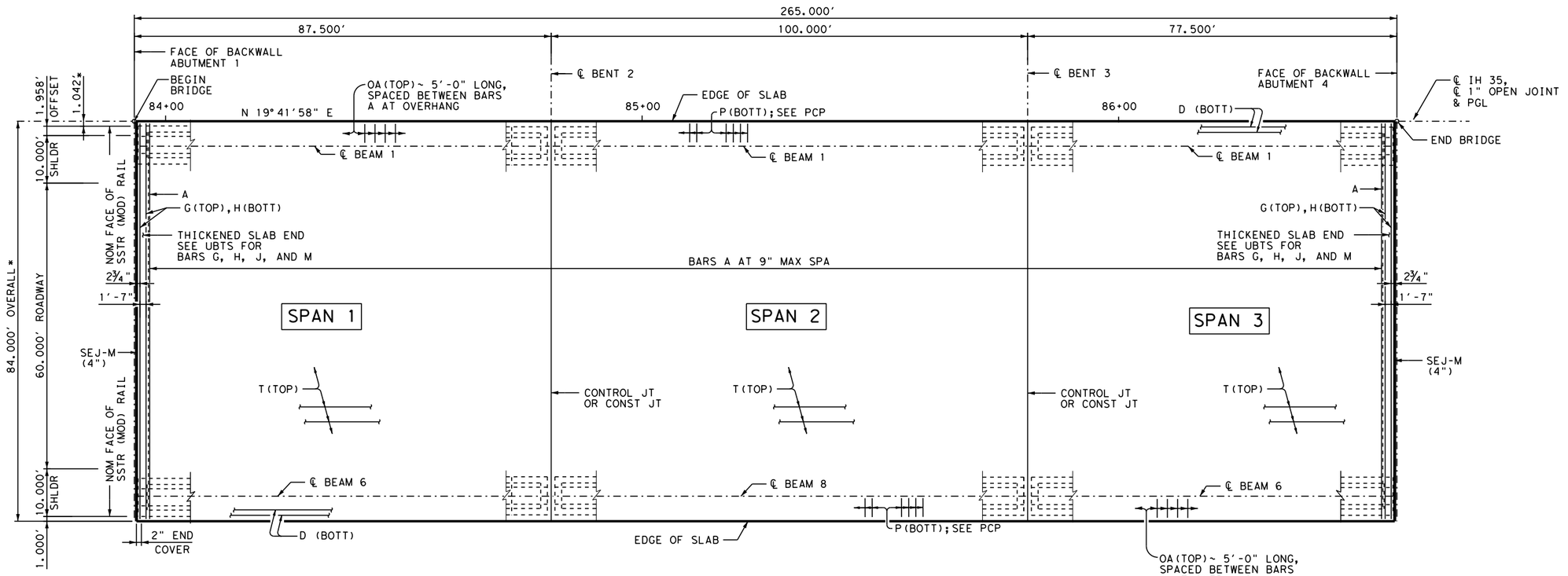
IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1223
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

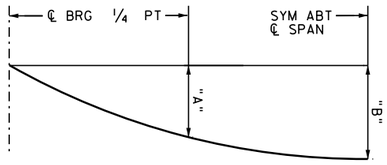
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\02_Irving Lee\BRFP5_02IL_NB_001.dgn
DATE: 10/17/2023 11:51:33 AM USER:



PLAN

* MEASURED TO ℄ IH 35

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1	1&6	0.105	0.147
1	2-5	0.122	0.171
2	ALL	0.150	0.211
3	1&6	0.063	0.089
3	2-5	0.074	0.104



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION(2017).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c = 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS;

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

265.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1224
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:51:35 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

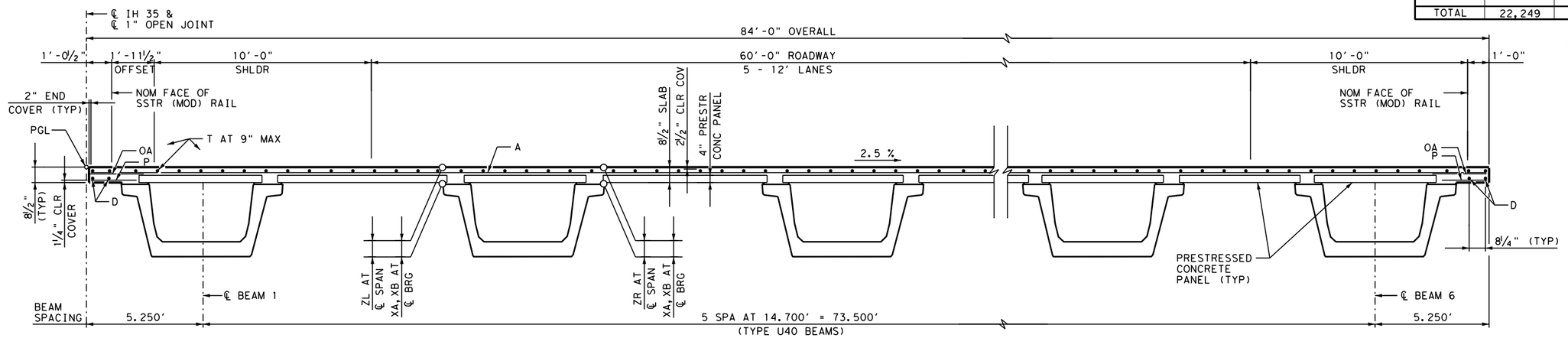
③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U40)	① REINFORCING STEEL
	SF	LF	LB
1	7,346	522.0	27,180
2	8,396	796.0	31,065
3	6,507	462.0	24,076
TOTAL	22,249	1780.0	82,321

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.

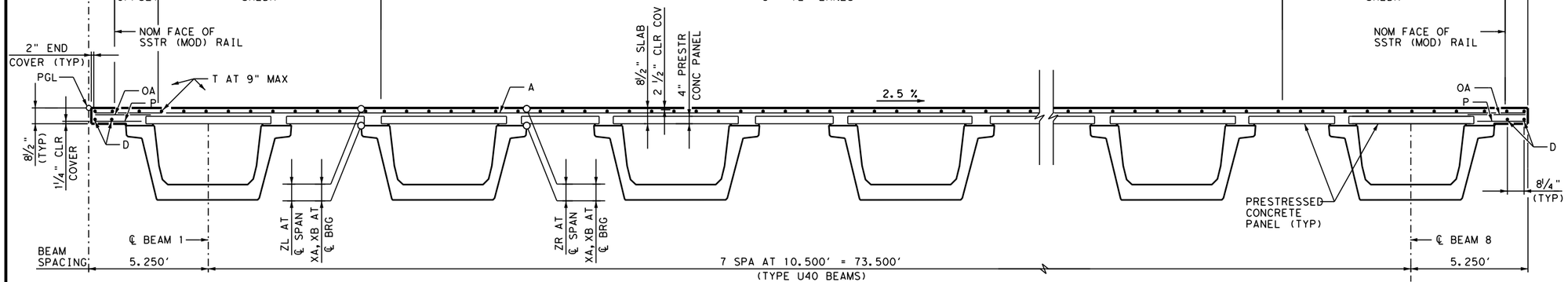


TYPICAL TRANSVERSE SECTION

(SHOWING SPANS 1 & 3)

BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
T	#4



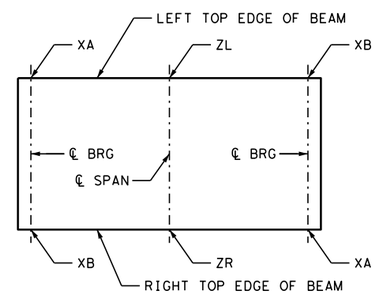
TYPICAL TRANSVERSE SECTION

(SHOWING SPAN 2)

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN ** (IN)	"ZR" AT ℄ SPAN ** (IN)
1	1&6	10 1/2	10 1/2	10 1/4	10 1/4
1	2-5	10 1/2	10 1/2	10 3/8	10 3/8
2	ALL	10 1/2	10 1/2	10 1/2	10 1/2
3	1&6	10 1/2	10 1/2	9 3/4	9 3/4
3	2-5	10 1/2	10 1/2	9 7/8	9 7/8

** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
10/17/2023

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HNTB
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The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

265.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 NB OVERPASS
AT IRVING LEE/PRIMROSE

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1225

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DESIGNED BEAMS (STRAIGHT STRANDS)

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH fpu (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)	PRESTRESSING STRANDS: TOT NO. DEB	DEBONDED STRAND PATTERN PER ROW: DIST FROM BOTTOM (in)	NO.OF STRANDS: TOTAL	NO.OF STRANDS: DE-BONDED	NUMBER OF STRANDS DEBONDED TO (ft from end): 3	6	9	12	15	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
IH 35 SB OVERPASS AT IRVING LEE/ PRIMROSE	1 & 3	ALL	U40		45	0.6	270	13.39	13.27	19	2.17	27	13	0	5	4	4	0	5.500	7.000
											4.14	18	6	2	4	0	0	0		
	2	ALL	U40		53	0.6	270	13.21	13.13	23	2.17	27	13	0	3	6	2	2	5.800	6.900
											4.14	26	10	2	8	0	0	0		
IH 35 NB OVERPASS AT IRVING LEE/ PRIMROSE	1 & 3	ALL	U40		43	0.6	270	13.45	13.36	19	2.17	27	13	0	5	4	4	0	5.500	7.000
											4.14	16	6	2	4	0	0	0		
	2	ALL	U40		47	0.6	270	13.34	13.20	19	2.17	27	13	0	5	4	2	2	5.500	7.100
											4.14	20	6	2	4	0	0	0		

OPTIONAL DESIGN

DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
4.129	-3.794	6914	0.889	1.252
4.628	-4.059	7047	0.685	0.943
4.123	-3.765	6855	0.889	1.252
4.642	-4.072	7070	0.687	0.943

LOAD RATING FACTORS

STRENGTH I Inv	STRENGTH I Opr	SERVICE III Inv
1.26	1.89	1.12
1.75	2.37	1.37
1.14	1.89	1.04
1.68	2.29	1.03

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation.

Optional designs must have a calculated residual camber equal to or greater than that of the designed beam.

Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

The grid pattern for the strands is based on exact conversions from a metric grid spacing of 50mm.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

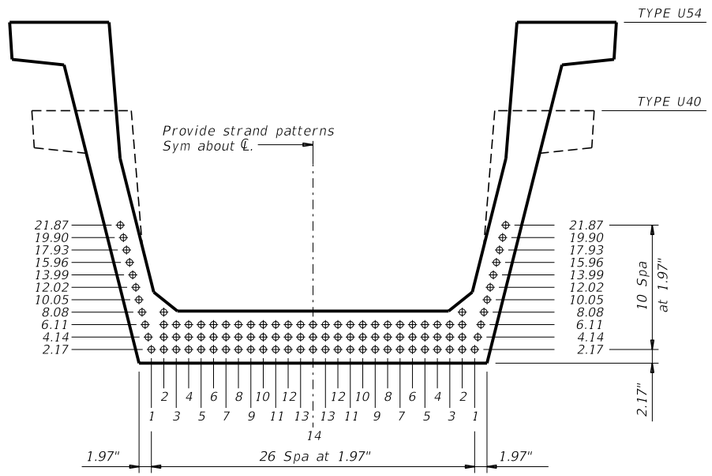
When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

Locate strands for the designed beam as low as possible on the 1.97" grid system unless a non-standard stand pattern is indicated. Fill row "2.17", then row "4.14", then row "6.11", etc., beginning each row in the "1" position and, distributing uniformly as practical, working inward until the required number of strands is reached.

Strand debonding must comply with Item 424.4.2.2.2.4.

Do not debond strands in position "1". Distribute debonded strands equally about the vertical centerline. Decrease debonded lengths working inward, with debonding staggered in each row.

Full-length debonded strands are not permitted in positions "1" and "2".



TxDOT TYPE U54 & TYPE U40 BMS

HL93 LOADING

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

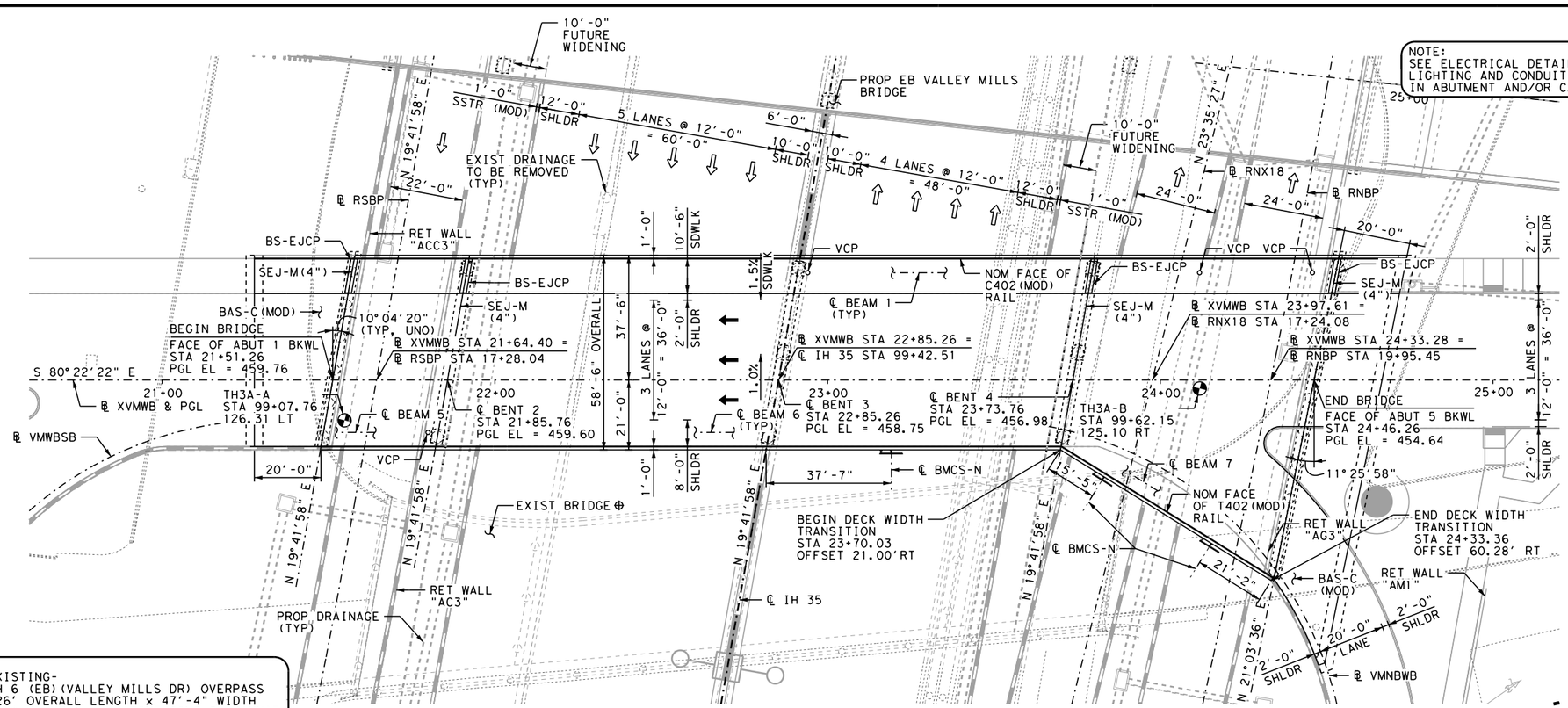
Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE U-BEAM DESIGNS (DESIGN DATA)

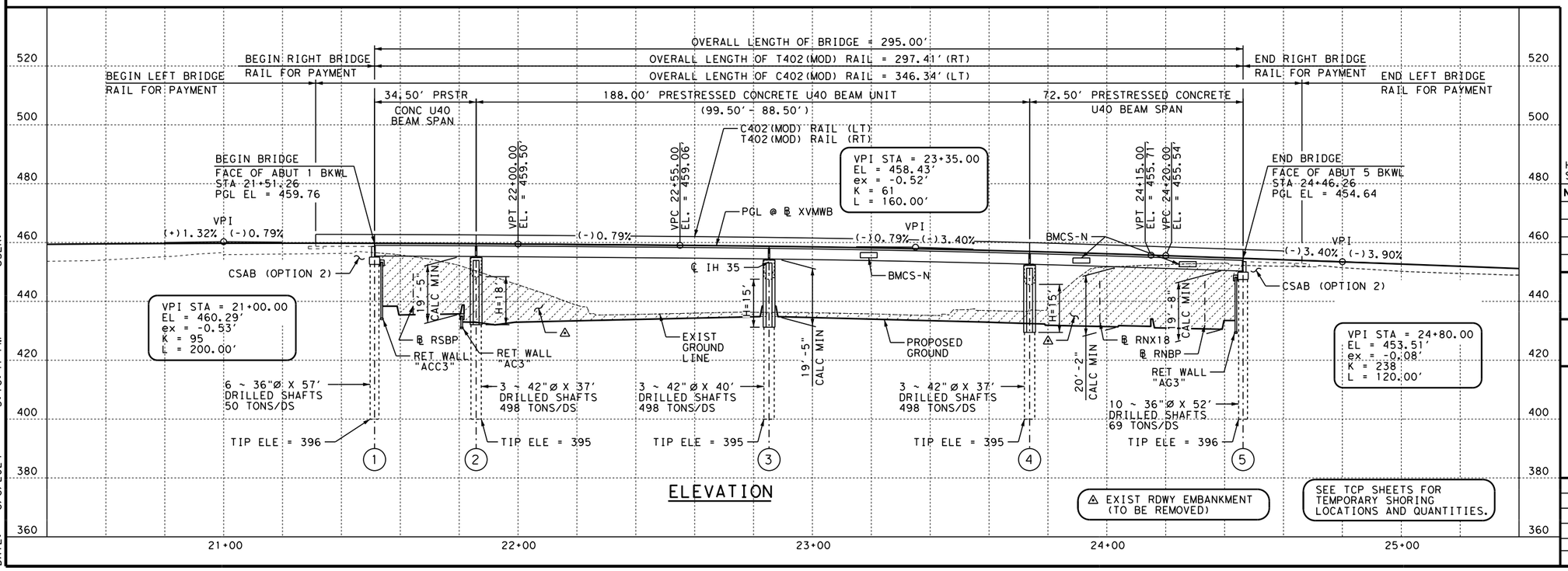
UBND

FILE: ubstds04.dgn	DN: TxDOT	CK: TxDOT	DW: SFS	CK: SDB
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
01-16: Notes. 03-22: Added Load Rating.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1226



PLAN

⊕EXISTING-
SH 6 (EB)(VALLEY MILLS DR) OVERPASS
226' OVERALL LENGTH x 47'-4" WIDTH
(48'-65'-65'-48') CONT CONC SLAB UNIT
15° LFS - 40' RDWY W/ ONE 1'-6" CURB &
4'-0" SIDEWALK ON CONCRETE
COLUMNS-TO BE REMOVED.



ELEVATION

⚠ EXIST RDWY EMBANKMENT (TO BE REMOVED)

SEE TCP SHEETS FOR TEMPORARY SHORING LOCATIONS AND QUANTITIES.

0' 10' 20' 40'

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).
2. ◔ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUT FOR EXISTING STRUCTURE CSJ 0015-01-025, 1962. BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. VCP: VERTICAL CLEARANCE POINT.
6. FOUND DRILLED SHAFTS AT ELEVATION SHOWN OR DEEPER TO OBTAIN A MINIMUM TWO DRILLED SHAFT DIAMETER PENETRATION INTO LIMESTONE.
7. FOR VARIABLE DIMENSIONS, SEE "TYPICAL SECTIONS" SHEET.

FUNCT. CLASS = MINOR ARTERIAL
DESIGN SPEED = 20 MPH
PROP ADT (2026) = 12,220
(2046) = 16,595

EXISTING NBI NO = 09-161-0-0015-01-217
EXISTING PSN NO = 217

NEW NBI NO = 09-161-0-0015-01-817
NEW PSN NO = 817

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.05/1.98

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1227
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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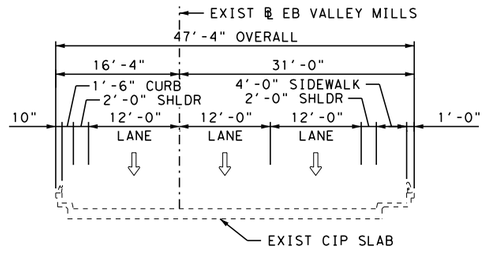
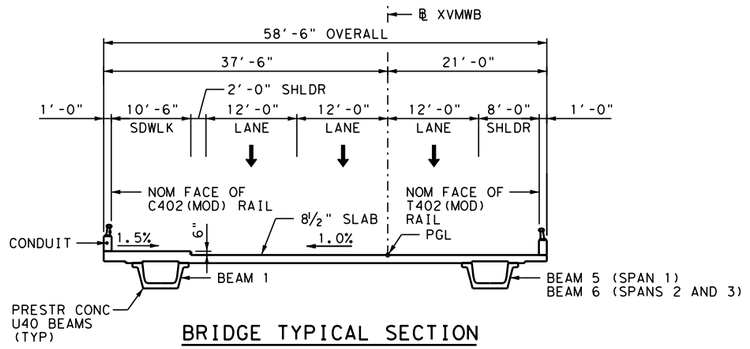
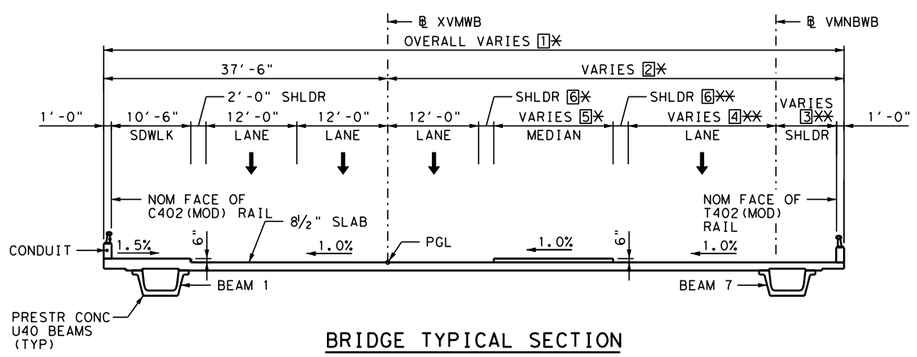


EXISTING BRIDGE TYPICAL SECTION



BRIDGE TYPICAL SECTION

SPANS 1-3
(NTS)



BRIDGE TYPICAL SECTION

SPAN 4
(NTS)

1 58'-6" MIN, 97'-9" MAX
2 21'-0" MIN, 60'-3" MAX
3 2'-0" MIN, 10'-5" MAX
4 0'-0" MIN, 20'-0" MAX/USUAL
5 0'-0" MIN, 15'-9" MAX
6 0'-0" MIN, 2'-0" MAX
X MEASURED RADIAL TO ℄ XVMWB
XX MEASURED RADIAL TO ℄ VMNBWB

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TYPICAL SECTIONS

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1228
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 6/6/2024 3:16:50 PM USER:

TEST HOLE NO. 3A-A
STA 99+07.76, 126.31 LT

T/H EL = 457.11

5(6) 5(6)	SAND, CLAYEY, LOOSE, RED, FILL
19(6) 21(6)	CLAY, SANDY LEAN, STIFF TO VERY STIFF, GRAY-BROWN
23(6) 30(6)	SAND, CLAYEY, SLIGHTLY COMPACT, BROWN
9(6) 13(6)	CLAY, LEAN, STIFF TO VERY STIFF, GRAY-BROWN
10(6) 15(6)	
11(6) 18(6)	
12(6) 35(6)	CLAY, SANDY LEAN, VERY STIFF TO HARD, YELLOWISH BROWN
50(3) 50(2.5)	SAND, DENSE, WITH CLAY
50(2) 50(1)	CLAY, LEAN, HARD, DARK GRAY, WITH LIMESTONE FRAGMENTS
50(.25) 50(.25)	
50(1.5) 50(1)	
50(1) 50(1)	LIMESTONE, HARD TO VERY HARD, GRAY
50(.75) 50(.75)	

TEST HOLE 3A-A
B/H EL = 391.61

TEST HOLE NO. 3A-B
STA 99+62.15, 125.10 RT

T/H EL = 452.11

7(6) 5(6)	CLAY, SANDY LEAN, VERY STIFF TO HARD, REDDISH BROWN
6(6) 8(6)	CLAY, LEAN, STIFF TO VERY STIFF, DARK GRAY-BROWN, WITH SAND
10(6) 16(6)	
9(6) 13(6)	
11(6) 13(6)	CLAY, FAT, VERY STIFF TO HARD, GRAY-BROWN, WITH LIMESTONE FRAGMENTS
12(6) 15(6)	
50(5) 50(3.5)	CLAY, LEAN, VERY STIFF TO HARD, REDDISH GRAY
50(4.5) 50(3)	CLAY, SANDY FAT, HARD, GRAY, WITH GRAVEL
50(4) 50(3.5)	
50(.5) 50(.25)	
50(.5) 50(.25)	LIMESTONE, VERY HARD, MEDIUM GRAY
50(.25) 50(.25)	
50(.25) 50(.25)	
50(.25) 50(.125)	

TEST HOLE 3A-B
B/H EL = 381.61

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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HNTB
HNTB Corporation
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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TEST HOLE DATA

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1229
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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SUMMARY OF ESTIMATED QUANTITIES

	ITEM - DESCRIPTION CODE	400 6005	416 6004	416 6005	420 6014	420 6026	422 6001	422 6011	422 6013	422 6015	425 6027	442 6007	450 6010	450 6034	454 6018
	ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)	CL C CONC (ABUT) (HPC)	CL C CONC (BENT) (HPC)	REINF CONC SLAB	BRIDGE MEDIAN	BRIDGE SIDEWALK	APPROACH SLAB	PRESTR CONC U-BEAM (U-40)	STR STEEL (MISC NON - BRIDGE) ①	RAIL (TY T402) ②	RAIL (TY C402) ③	SEALED EXPANSION JOINT (4 IN) (SEJ-M)
		CY	LF	LF	CY	CY	SF	SF	SF	CY	LF	LB	LF	LF	LF
WB	2-ABUTMENTS	265	862		85.1			518	571	176.8					136
WB	3-INTERIOR BENTS			342		206.9									96
WB	1-34.50' PRESTR CONC U-BEAM SPAN						2,018		397		170.00	146	34.5	64.5	
WB	1-188.00' PRESTR CONC U-BEAM UNIT						10,998		2,162		1,122.12	292	188.0	188.0	
WB	1-72.50' PRESTR CONC U-BEAM SPAN						5,680	122	843		506.07	147	74.9	93.8	
WB															
	TOTAL	265	862	342	85.1	206.9	18,696	640	3,973	176.8	1,798.19	585	297.4	346.3	232

① SIDEWALK EXP PLATE

② THIS BID ITEM ENTAILS ALL QUANTITIES MARKED AS T402(MOD) RAIL

③ THIS BID ITEM ENTAILS ALL QUANTITIES MARKED AS C402(MOD) RAIL

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ESTIMATED QUANTITIES

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1230
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\03_WB Valley Mills\BRES_03VM_WB_001.dgn
DATE: 6/6/2024 3:16:53 PM USER:

WB BEARING SEAT ELEVATION (FT)

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT
ABUT 1 (FWD)	454.950	454.999	455.078	455.126	455.205	455.253	455.331	455.379	455.457	455.504

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT
BENT 2 (BK)	454.782	454.830	454.916	454.965	455.050	455.098	455.184	455.232	455.317	455.365

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
BENT 2 (FWD)	454.765	454.817	454.873	454.925	454.981	455.033	455.088	455.140	455.195	455.247	455.302	455.354

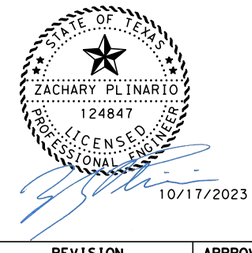
	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
BENT 3 (BK)	453.897	453.949	454.016	454.068	454.135	454.187	454.253	454.305	454.370	454.422	454.488	454.539

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
BENT 3 (FWD)	453.863	453.924	453.983	454.043	454.102	454.162	454.221	454.281	454.339	454.399	454.457	454.516

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT
BENT 4 (BK)	452.051	452.112	452.194	452.255	452.337	452.398	452.480	452.540	452.622	452.682	452.764	452.824

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT	BEAM 7 LEFT	BEAM 7 RIGHT
BENT 4 (FWD)	451.991	452.060	452.112	452.181	452.233	452.302	452.354	452.423	452.474	452.544	452.594	452.664	452.714	452.784

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT	BEAM 4 LEFT	BEAM 4 RIGHT	BEAM 5 LEFT	BEAM 5 RIGHT	BEAM 6 LEFT	BEAM 6 RIGHT	BEAM 7 LEFT	BEAM 7 RIGHT
ABUT 5 (BK)	449.646	449.719	449.895	449.968	450.144	450.216	450.392	450.464	450.640	450.712	450.887	450.959	451.134	451.205



NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING SEAT ELEVATIONS

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1231
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:52:02 AM USER:

WB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7
ABUT 1 (FWD)	-0.00337	-0.00314	-0.00292	-0.00270	-0.00248		
BENT 2 (BK)	-0.00337	-0.00314	-0.00292	-0.00270	-0.00248		
BENT 2 (FWD)	-0.00697	-0.00687	-0.00676	-0.00666	-0.00655	-0.00645	
BENT 3 (BK)	-0.00697	-0.00687	-0.00676	-0.00666	-0.00655	-0.00645	
BENT 3 (FWD)	-0.01889	-0.01862	-0.01834	-0.01807	-0.01780	-0.01752	
ABUT 4 (BK)	-0.01889	-0.01862	-0.01834	-0.01807	-0.01780	-0.01752	
BENT 4 (FWD)	-0.03065	-0.03044	-0.03022	-0.03000	-0.02978	-0.02957	-0.02934
BENT 5 (BK)	-0.03027	-0.03006	-0.02985	-0.02962	-0.02939	-0.02915	-0.02888

NO.	DATE	REVISION	APPROVED

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING PAD TAPER REPORT

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1232
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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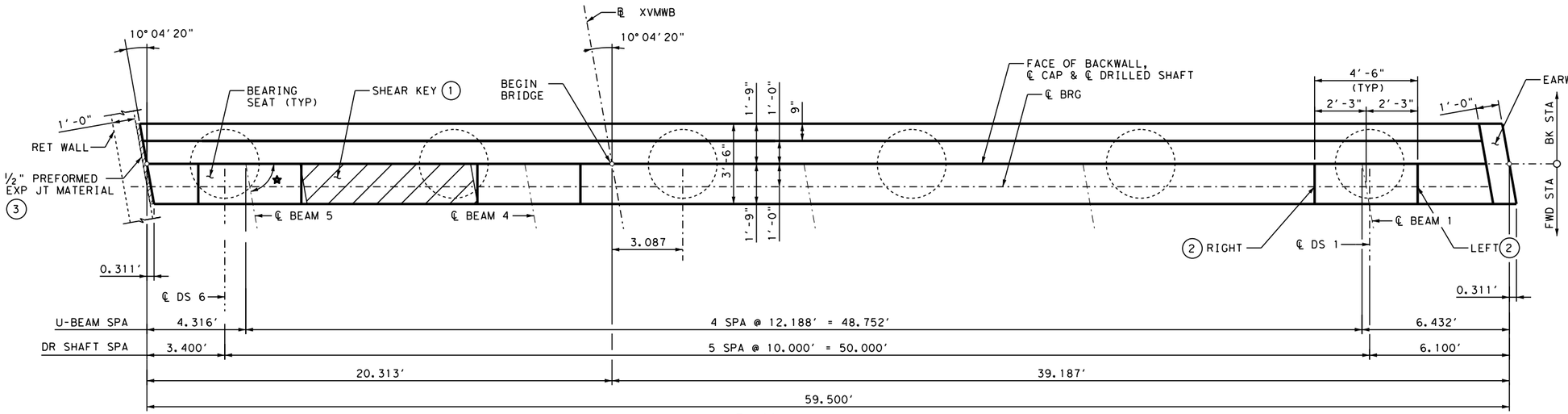
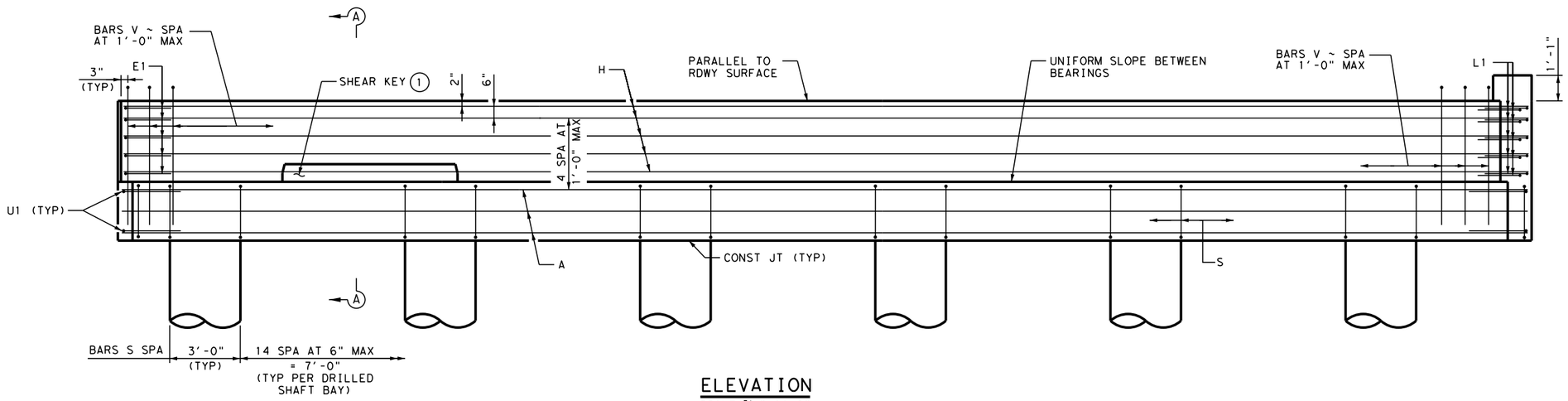


PLAN

SCALE: 3/16" = 1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16" = 1'-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	58'-6"	3,730
E1	5	#5	4'-7"	24
H	10	#6	59'-2"	889
L1	10	#6	3'-9"	56
P1	9	#5	5'-2"	48
P2	3	#5	7'-2"	23
S	83	#6	13'-6"	1,683
U1	4	#6	8'-1"	49
V	59	#5	13'-0"	800
wH	12	#6	3'-2"	57
wV	3	#5	13'-0"	41
SUBTOTAL STEEL (LB) *				7,400
CLASS "C" CONC (ABUT) (HPC) (CY)				31.9

* REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1233
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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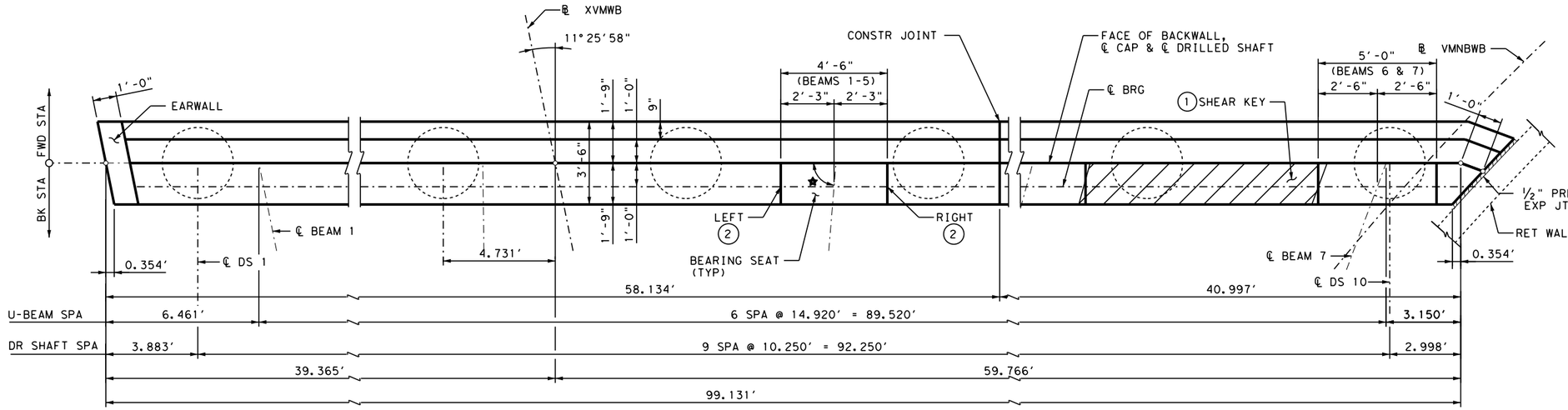
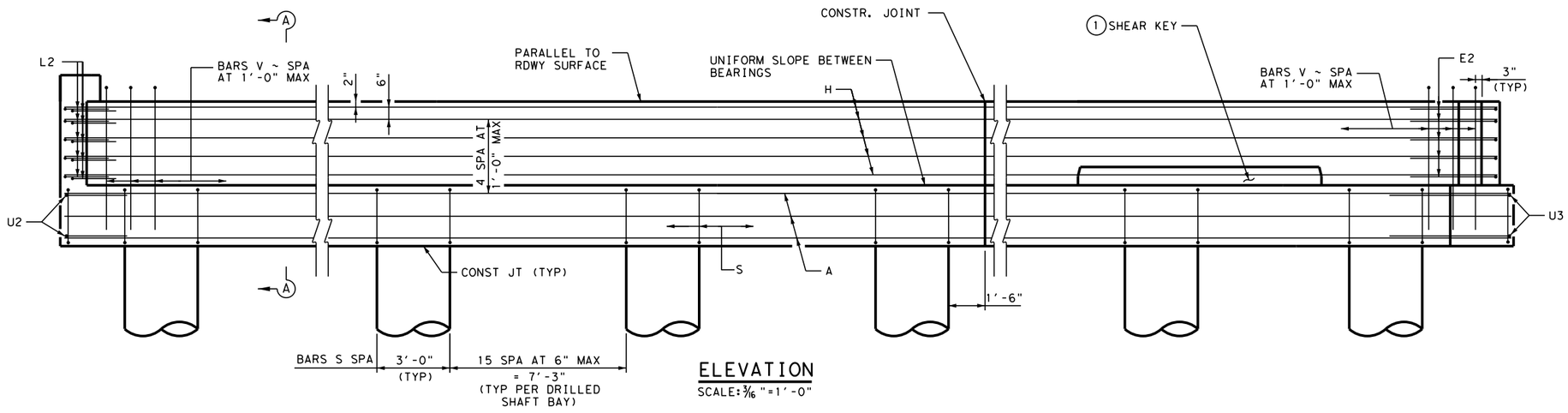


PLAN

SCALE: 3/16 "=1′-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1′-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 5

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	*105′-5"	6,721
CS	1	#6	14′-0"	21
E2	5	#5	6′-10"	36
H	10	#6	**102′-9"	1,543
L2	10	#6	3′-9"	56
P1	11	#5	5′-2"	60
P2	3	#5	9′-8"	31
S	149	#6	13′-6"	3,021
U2	2	#6	8′-1"	24
U3	2	#6	10′-1"	30
V	100	#5	13′-0"	1,356
wH	12	#6	3′-2"	57
wV	3	#5	13′-0"	41
SUBTOTAL STEEL (LB) ***				12,997
CLASS "C" CONC (ABUT) (HPC) (CY)				53.2

* AVERAGE LENGTH PROVIDED, LENGTH SHOWN INCLUDES ONE 6′-10" LAP

** LENGTH SHOWN INCLUDES ONE 3′-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 5

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1234
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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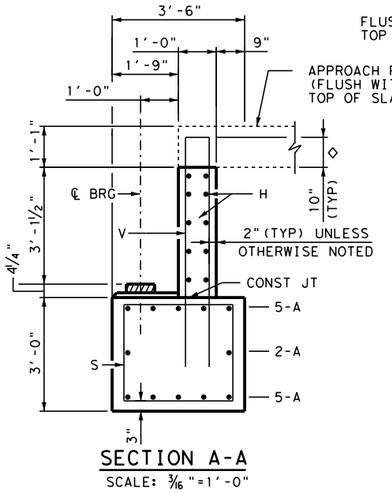
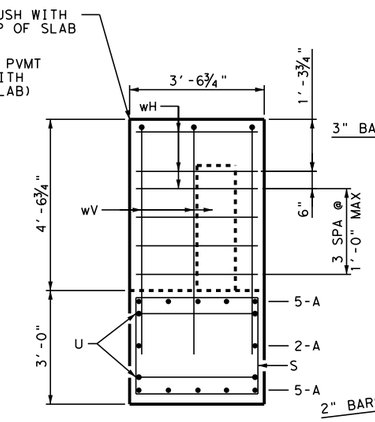


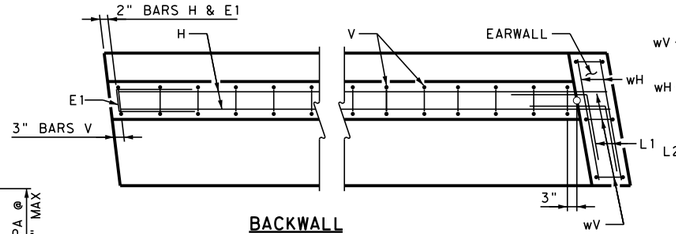
SECTION A-A

SCALE: 3/16"=1'-0"

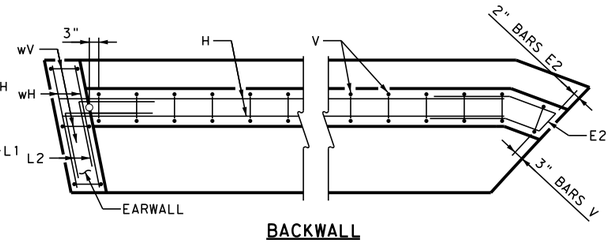
◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



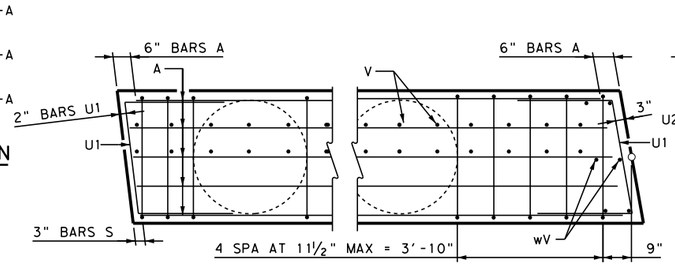
EARWALL ELEVATION



BACKWALL

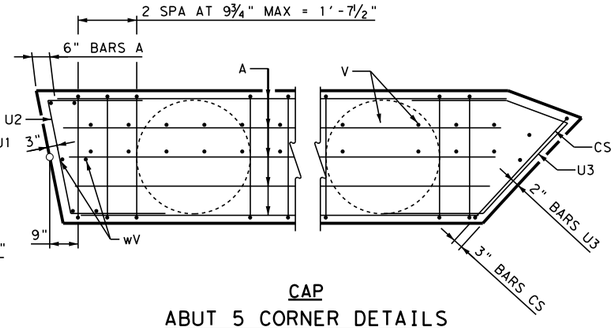


BACKWALL



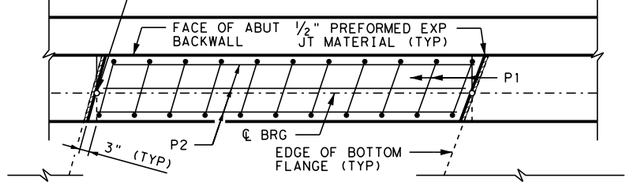
CAP
ABUT 1 CORNER DETAILS

SCALE: 3/16"=1'-0"

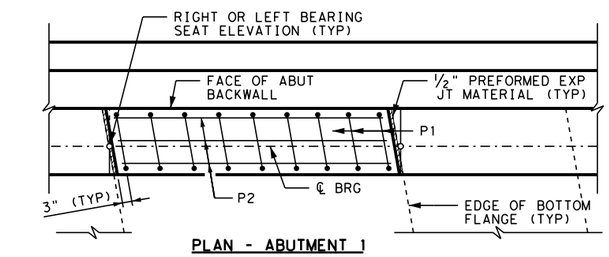


CAP
ABUT 5 CORNER DETAILS

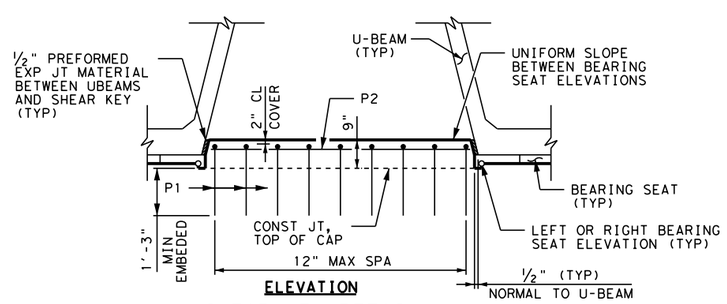
SCALE: 3/16"=1'-0"



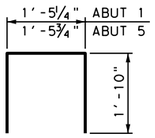
PLAN - ABUTMENT 5



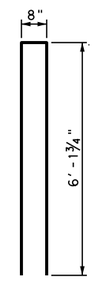
PLAN - ABUTMENT 1



ELEVATION
SHEAR KEY DETAIL



BARS P1



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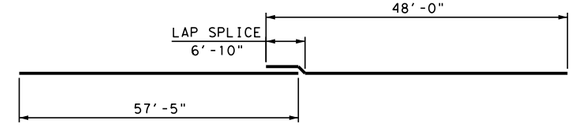
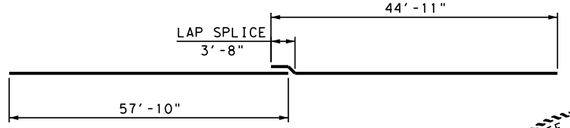


BARS A
(ABUT 5 ONLY)



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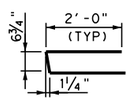
(ABUT 5 ONLY)



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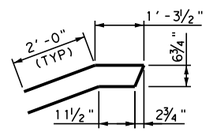

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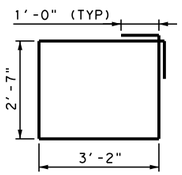

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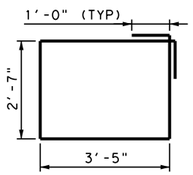

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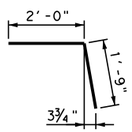

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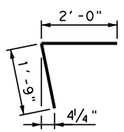

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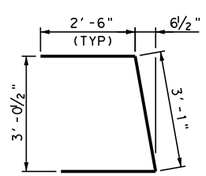

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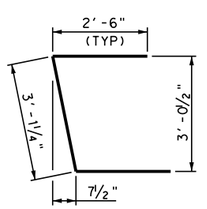

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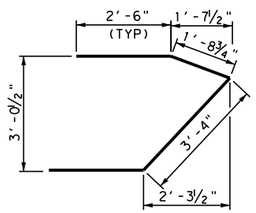

BARS U3

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

CALCULATED FOUNDATION LOADS
ABUTMENT 1= 50 TONS/DRILLED SHAFT,
ABUTMENT 5= 69 TONS/DRILLED SHAFT.

SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENTS.

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

NO.	DATE	REVISION	APPROVED

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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1235
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\03_WB Valley Mills\BRAB5_03VM_WB_003.dgn
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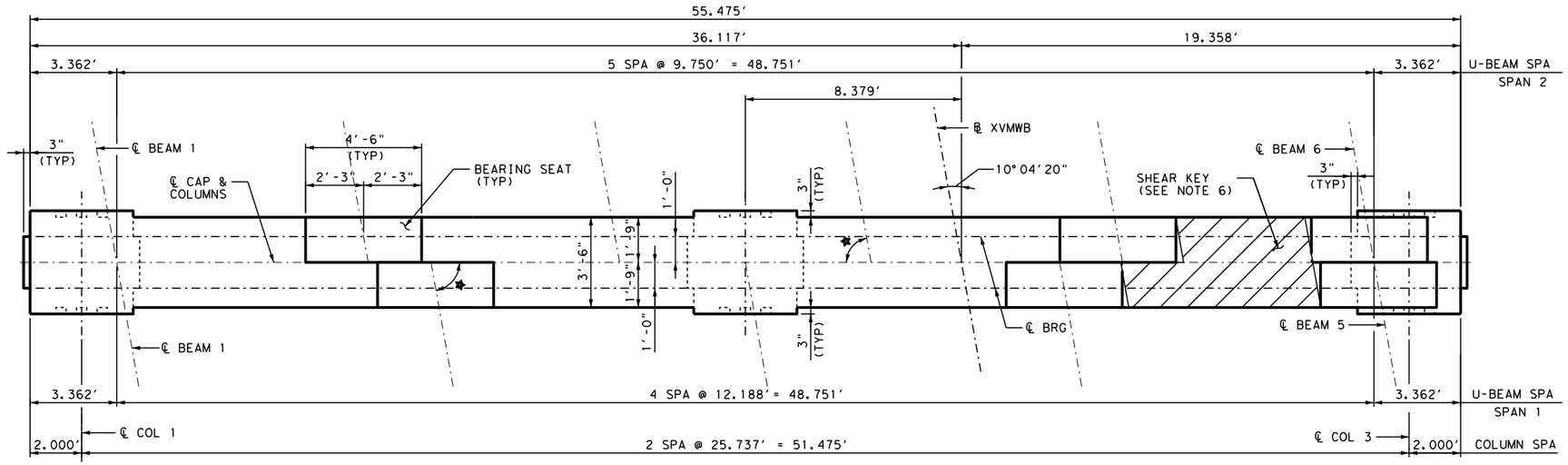
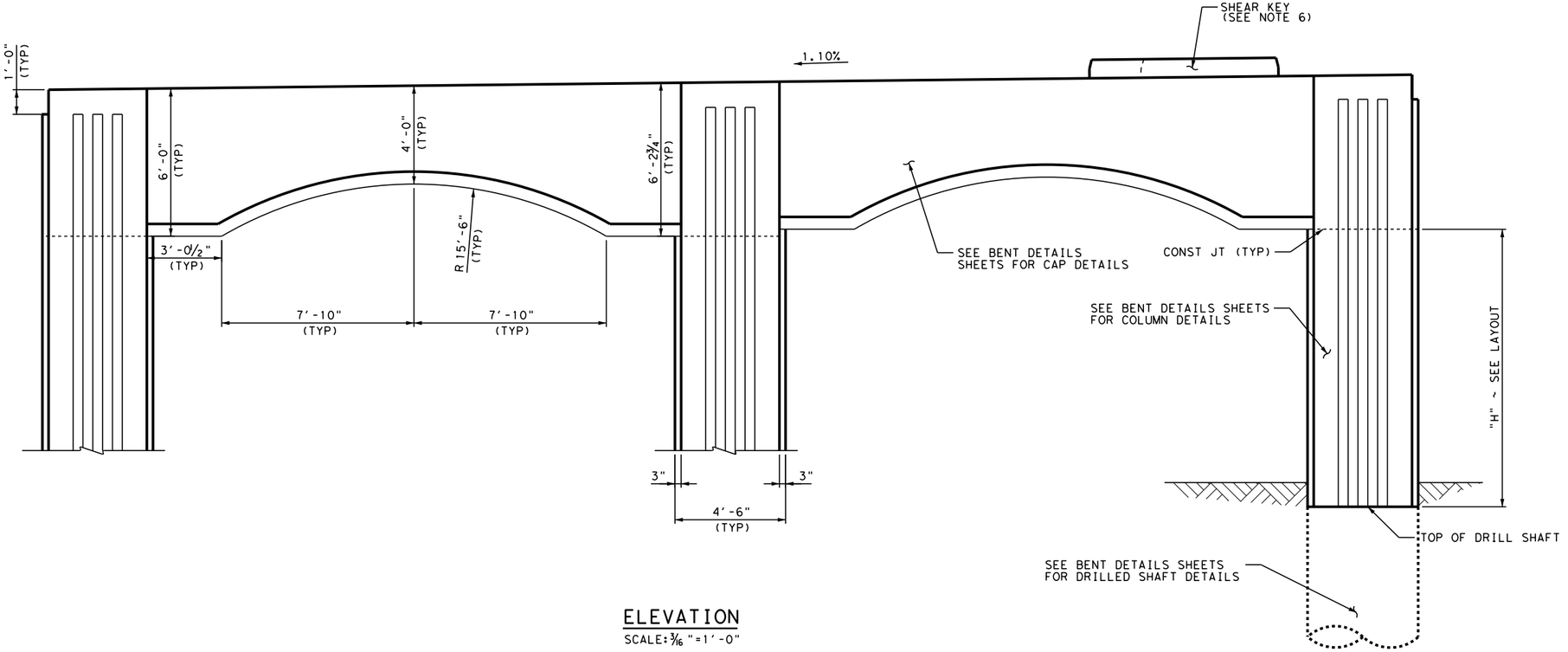


PLAN

SCALE: 3/16 "=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
7. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.
8. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL LICENSED ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 2

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1236
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\03_WB Valley Mills\BRBN5_03VM_WB_001.dgn
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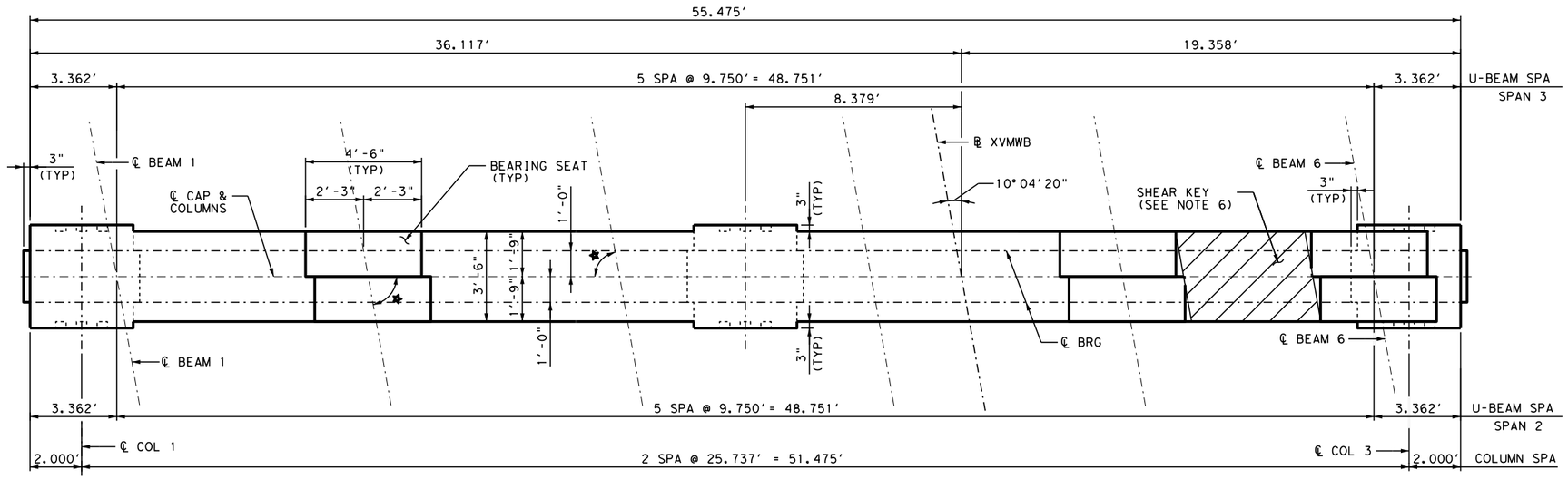
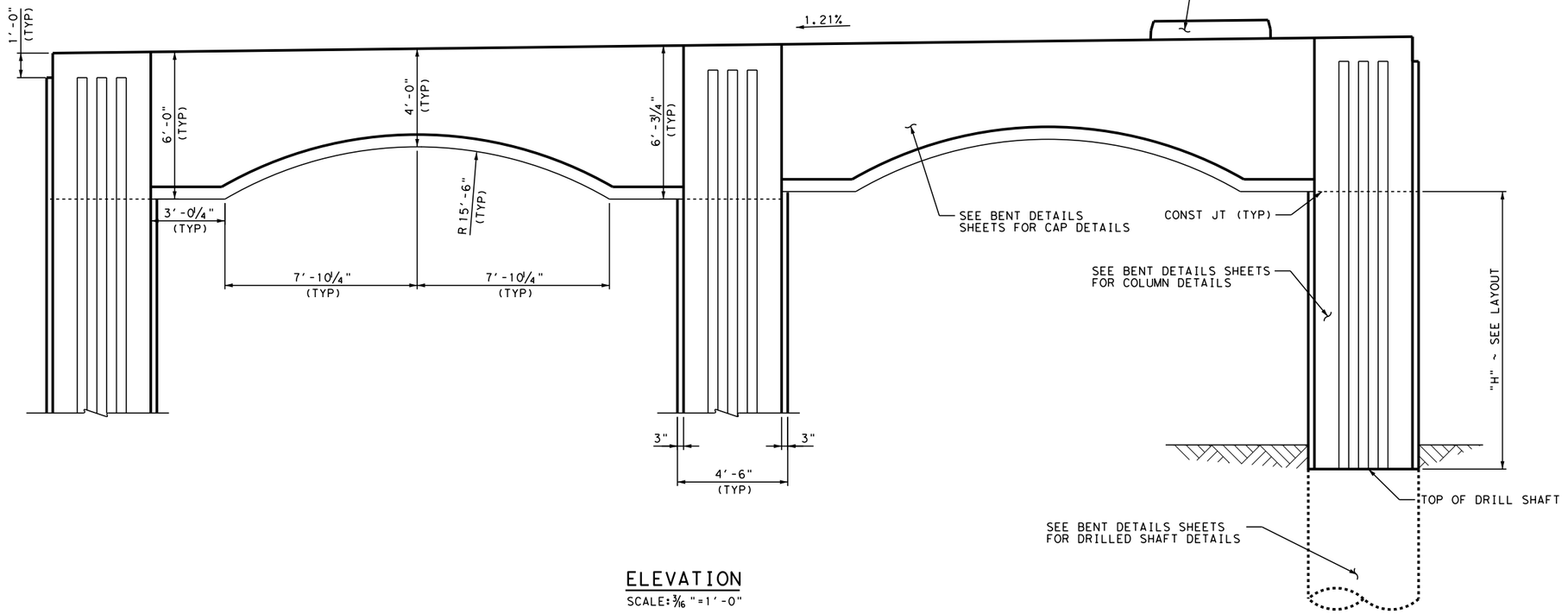


PLAN

SCALE: 3/16"=1'-0"

★SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).
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5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
7. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.
8. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET

STATE OF TEXAS
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10/17/2023

NO.	DATE	REVISION	APPROVED

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The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 3

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1237
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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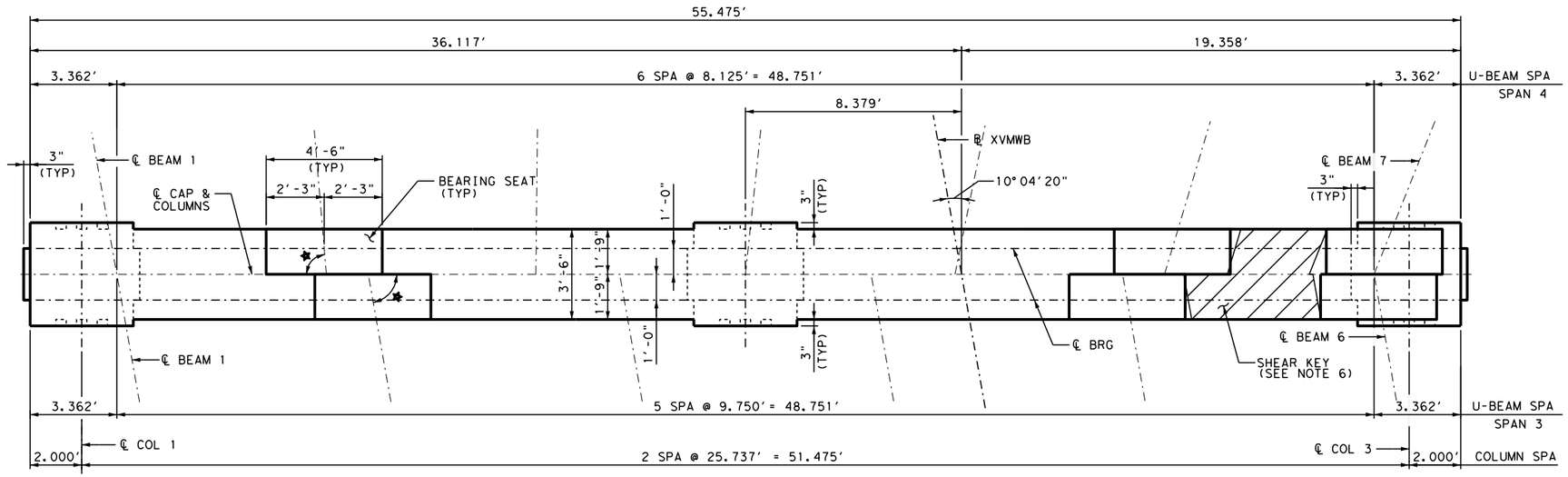
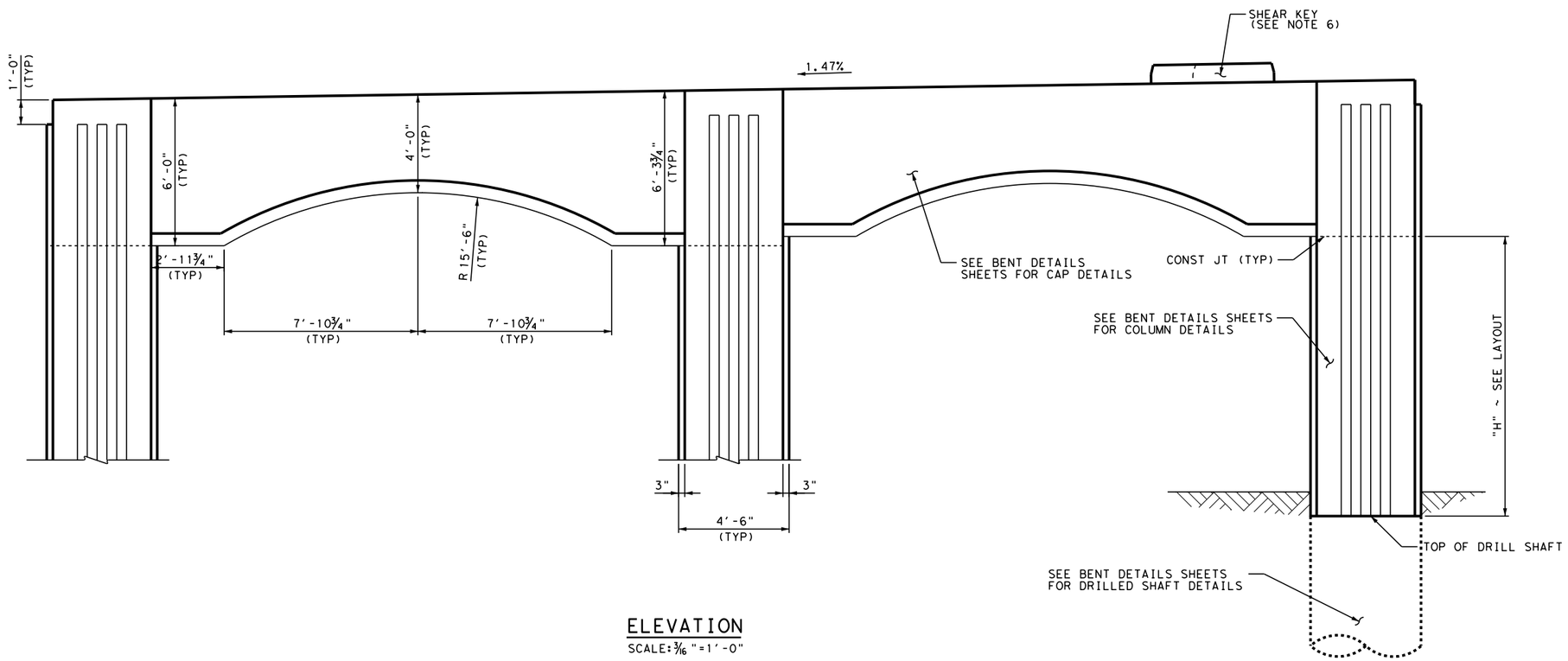


PLAN

SCALE: 3/16"=1'-0"
★SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).
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5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
7. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.
8. FOR BEARING SEAT DETAILS AND INFORMATON NOT SHOWN, SEE "UBEB" STANDARD SHEET.

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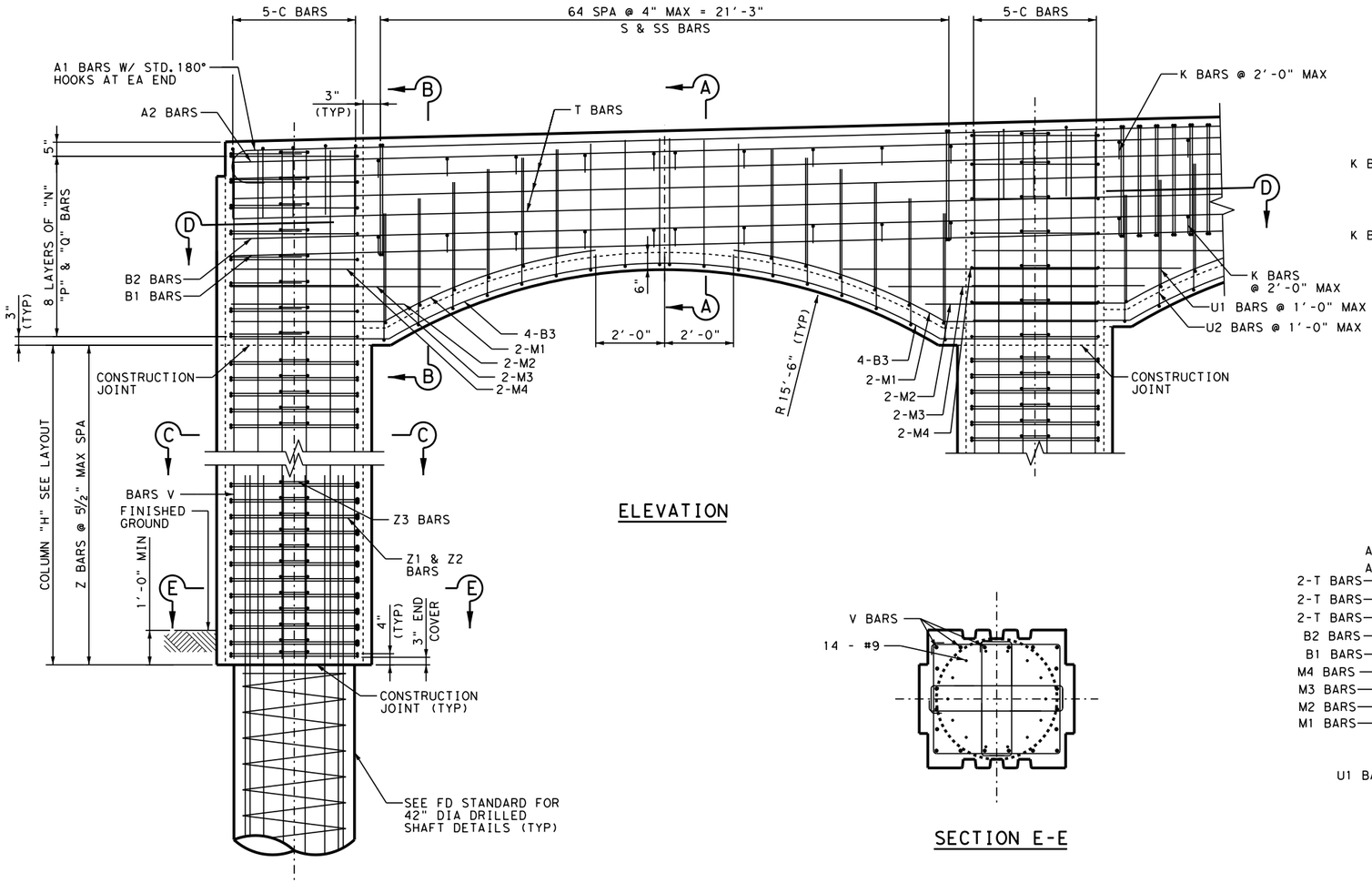
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

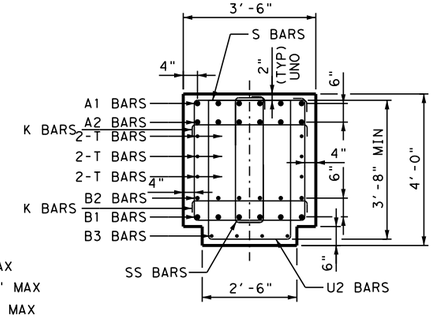
BENT 4

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

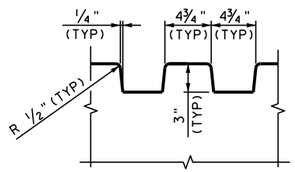
FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1238
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



ELEVATION

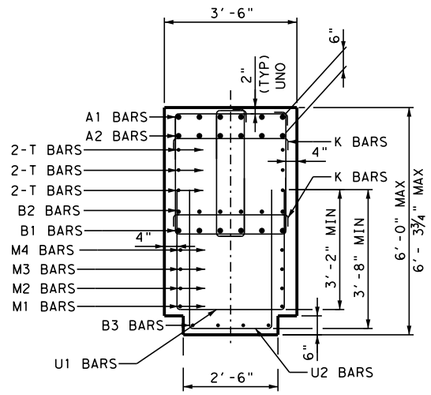


SECTION A-A

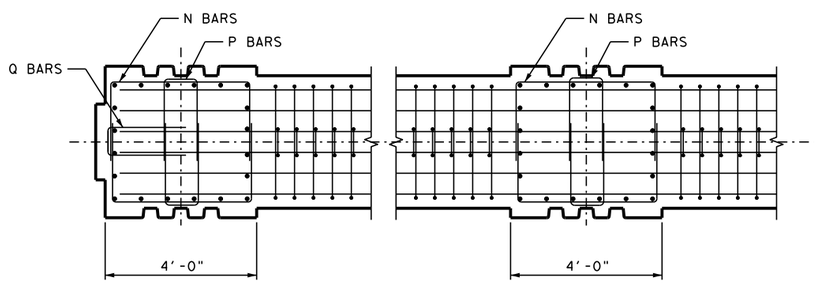


GROOVE DETAIL

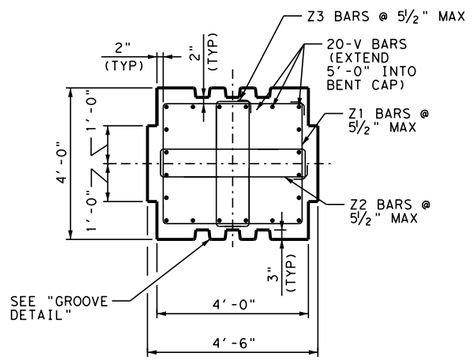
SECTION E-E



SECTION B-B
(AT FACE OF COLUMN)



SECTION D-D



SECTION C-C

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LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

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Engineers Architects Planners
Firm Registration Number F-420

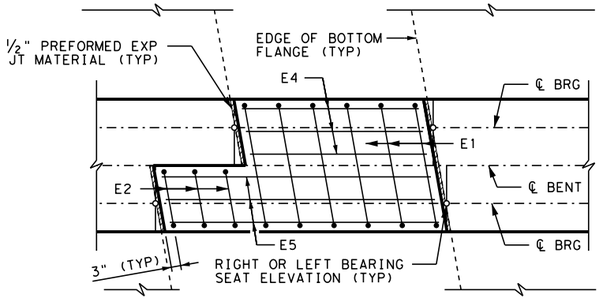
IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

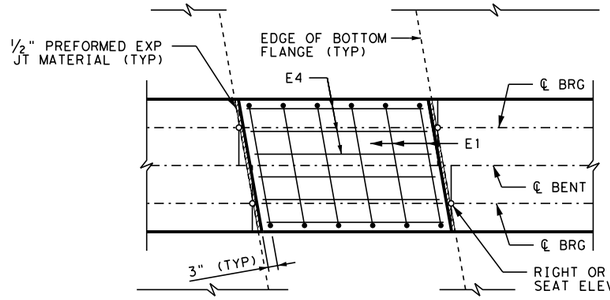
IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

SHEET 1 OF 3

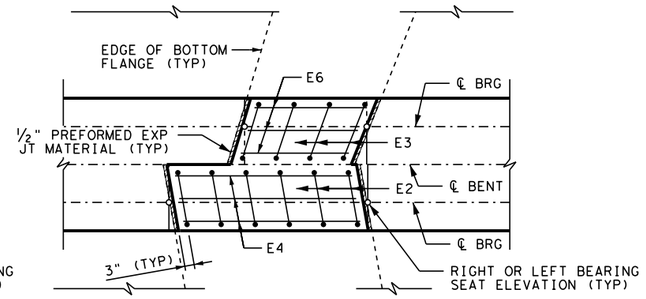
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1239
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



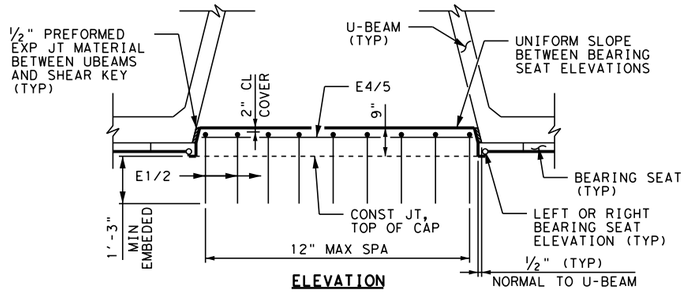
PLAN



PLAN

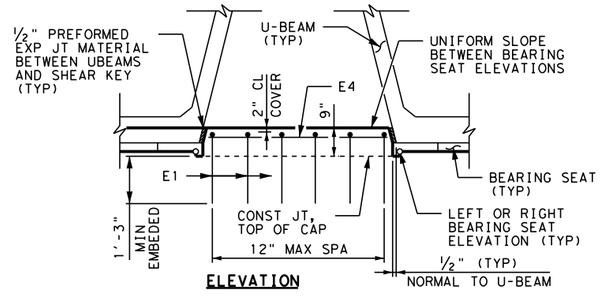


PLAN



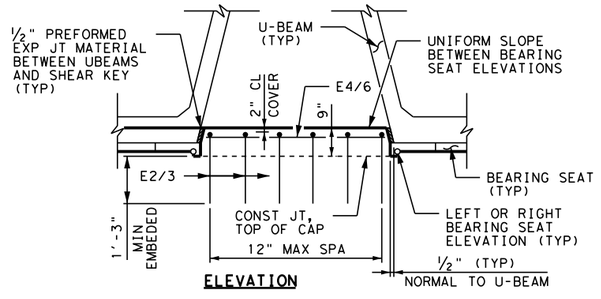
ELEVATION

BENT 2



ELEVATION

BENT 3



ELEVATION

BENT 4

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

SHEET 2 OF 3

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1240
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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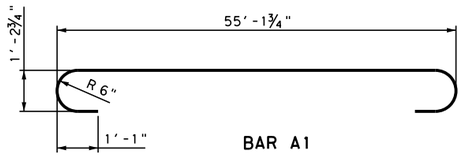
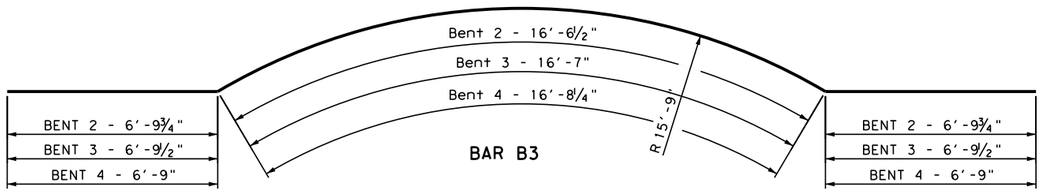
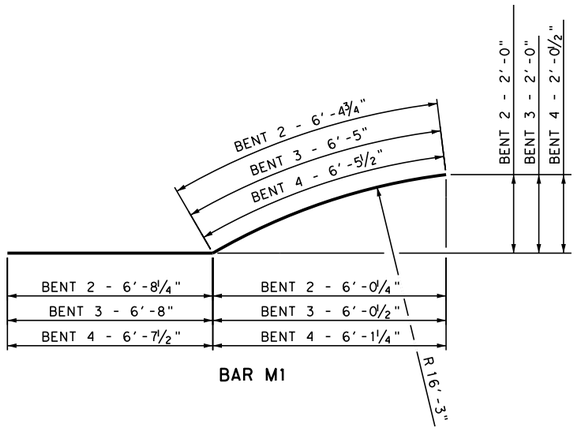


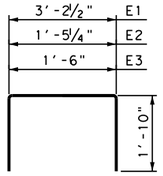
BAR A1



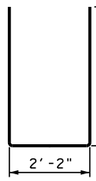
BAR B3



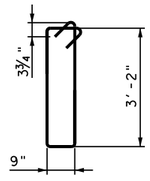
BAR M1



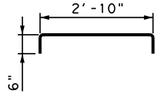
BARS E1, E2, E3



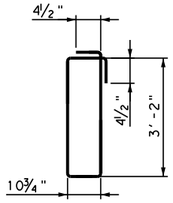
BAR U2



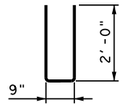
BAR SS



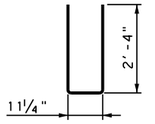
BAR K



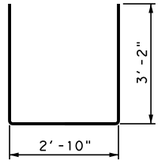
BAR Z3



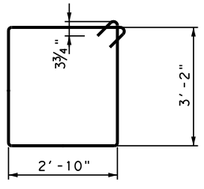
BAR Q



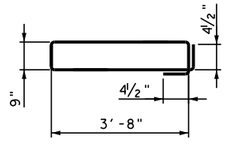
BAR P



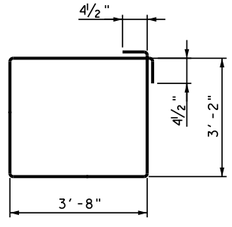
BAR U1



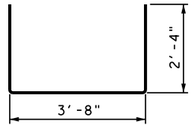
BAR S



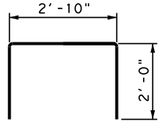
BAR Z2



BAR Z1



BAR N



BAR C

TABLE OF QUANTITIES BENT 2					TABLE OF QUANTITIES BENT 3					TABLE OF QUANTITIES BENT 4				
CONSTANT QUANTITIES														
BAR	**NO.**	**SIZE**	**LENGTH**	**WEIGHT**	**BAR**	**NO.**	**SIZE**	**LENGTH**	**WEIGHT**	**BAR**	**NO.**	**SIZE**	**LENGTH**	**WEIGHT**
A1	6	#11	58′ -4″	1,859	A1	6	#11	58′ -4″	1,859	A1	6	#11	58′ -4″	1,859
A2	6	#11	55′ -2″	1,758	A2	6	#11	55′ -2″	1,758	A2	6	#11	55′ -2″	1,758
B1	6	#11	55′ -2″	1,758	B1	6	#11	55′ -2″	1,758	B1	6	#11	55′ -2″	1,758
B2	6	#11	55′ -2″	1,758	B2	6	#11	55′ -2″	1,758	B2	6	#11	55′ -2″	1,758
B3	8	#8	30′ -2″	644	B3	8	#8	30′ -2″	644	B3	8	#8	30′ -3″	645
C	15	#4	6′ -10″	68	C	15	#4	6′ -10″	68	C	15	#4	6′ -10″	68
E1	6	#5	6′ -11″	44	E1	6	#5	6′ -11″	44	E2	6	#5	5′ -2″	32
E2	3	#5	5′ -2″	16	E4	6	#5	4′ -8″	30	E3	4	#5	5′ -3″	22
E4	3	#5	4′ -8″	15	K	48	#3	3′ -10″	69	E4	3	#5	4′ -8″	15
E5	3	#5	7′ -2″	23	M1	8	#8	13′ -1″	279	E6	3	#5	2′ -11″	9
K	48	#3	3′ -10″	69	M2	8	#8	7′ -1″	151	K	48	#3	3′ -10″	69
M1	8	#8	13′ -1″	279	M3	8	#8	8′ -2″	174	M1	8	#8	13′ -1″	279
M2	8	#8	7′ -2″	151	M4	8	#8	9′ -6″	202	M2	8	#8	7′ -1″	150
M3	8	#8	8′ -2″	174	N	48	#4	8′ -4″	267	M3	8	#8	8′ -2″	173
M4	8	#8	9′ -6″	202	P	48	#4	5′ -8″	180	M4	8	#8	9′ -5″	201
N	48	#4	8′ -4″	267	Q	16	#4	4′ -9″	51	N	48	#4	8′ -4″	267
P	48	#4	5′ -8″	180	S	130	#5	12′ -11″	1,751	P	48	#4	5′ -8″	180
Q	16	#4	4′ -9″	51	SS	130	#5	8′ -9″	1,186	Q	16	#4	4′ -9″	51
S	130	#5	12′ -11″	1,751	T	6	#6	55′ -2″	497	S	130	#5	12′ -11″	1,751
SS	130	#5	8′ -9″	1,186	U1	36	#4	9′ -2″	220	SS	130	#5	8′ -9″	1,186
T	6	#6	55′ -2″	497	U2	48	#4	9′ -6″	305	T	6	#6	55′ -2″	497
U1	36	#4	9′ -2″	220						U1	36	#4	9′ -2″	220
U2	48	#4	9′ -6″	305						U2	48	#4	9′ -6″	305
SUBTOTAL STEEL (LBS)*				13,275	SUBTOTAL STEEL (LBS)*				13,251	SUBTOTAL STEEL (LBS)*				13,253
VARIABLE QUANTITIES ①														
"H" = 18′					"H" = 15′					"H" = 15′				
V	60	#11	23′ -5″	7,465	V	60	#11	20′ -5″	6,508	V2	60	#11	20′ -5″	6,508
Z1	195	#4	14′ -5″	2,932	Z1	165	#4	14′ -5″	2,481	Z1	165	#4	14′ -5″	2,481
Z2	195	#4	9′ -7″	1,949	Z2	165	#4	9′ -7″	1,649	Z2	165	#4	9′ -7″	1,649
Z3	195	#4	8′ -11″	1,805	Z3	165	#4	8′ -11″	1,527	Z3	165	#4	8′ -11″	1,527
CL "C" CONC (BENT) (HPC) (CY)				72.6	CL "C" CONC (BENT) (HPC) (CY)				67.1	CL "C" CONC (BENT) (HPC) (CY)				67.2
SUBTOTAL STEEL (LBS)*				14,151	SUBTOTAL STEEL (LBS)*				12,165	SUBTOTAL STEEL (LBS)*				12,165

* FOR CONTRACTOR'S INFORMATION ONLY.

① VARIABLE QUANTITIES ARE BASED ON COLUMN HEIGHTS "H" SHOWN.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL LICENSED ENGINEER

10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

SHEET 3 OF 3

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1241
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\03_WB Valley Mills\BRBN5_03VM_WB_007.dgn
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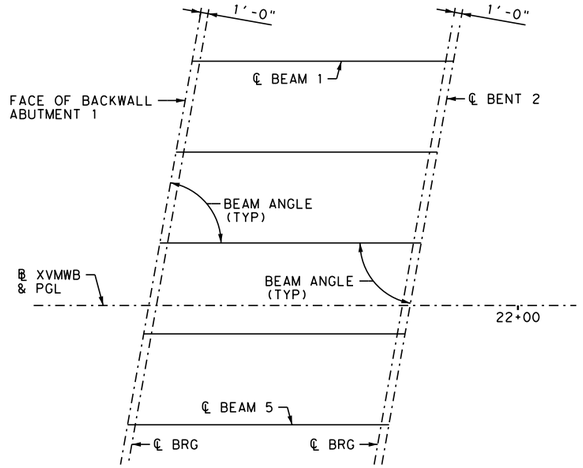

SPAN 1

U40 BEAMS

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

ACUTE BEAM ANGLE SHOWN

BENT REPORT

ABUT NO. 1 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 32.755 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	79 55 40
	BEAM	2	12.188	79 55 40
	BEAM	3	12.188	79 55 40
	BEAM	4	12.188	79 55 40
	BEAM	5	12.188	79 55 40
	TOTAL		48.752	

BENT NO. 2 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 32.755 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	79 55 40
	BEAM	2	12.188	79 55 40
	BEAM	3	12.188	79 55 40
	BEAM	4	12.188	79 55 40
	BEAM	5	12.188	79 55 40
	TOTAL		48.752	

BEAM REPORT

BEAM REPORT, SPAN 1

		HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM	1	34.500	32.469	34.00	-0.0052
BEAM	2	34.500	32.469	34.00	-0.0050
BEAM	3	34.500	32.469	34.00	-0.0048
BEAM	4	34.500	32.469	34.00	-0.0045
BEAM	5	34.500	32.469	34.00	-0.0043

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT SPAN 1

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1242
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\03_WB Valley Mills\BRFP5_03VM_WB_001.dgn
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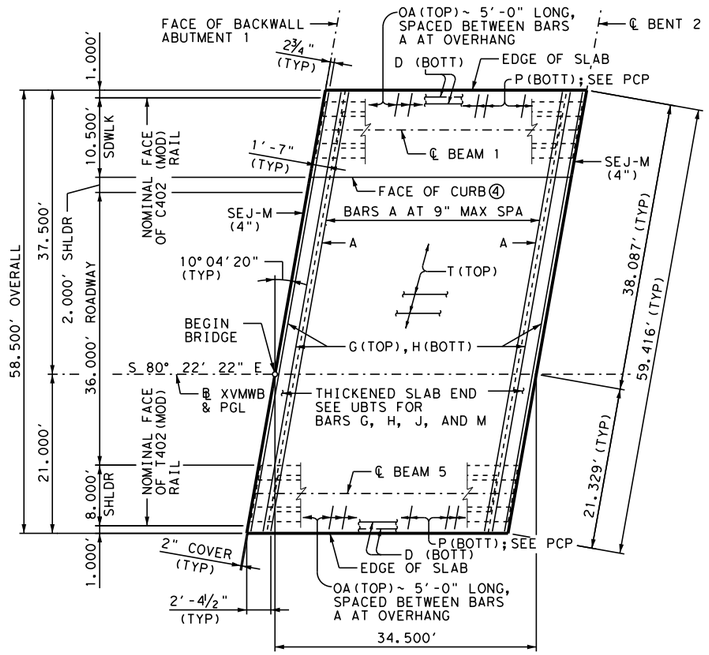
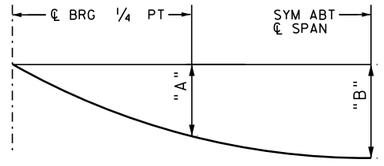


SPAN 1

PLAN



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1	ALL	0.002	0.003

④ SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARD FOR SIDEWALK AND ANCHORAGE DETAILS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 9TH EDITION(2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP AND PCP-FAB STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c= 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS:

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.
COMBINATION RAIL DETAILS TYPE C402(MOD).
TRAFFIC RAIL DETAILS TYPE T402(MOD).

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS:
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

34.500' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS)

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1243
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\03_WB Valley Mills\BRLD5_03VM_WB_001.dgn
DATE: 10/17/2023 11:52:41 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

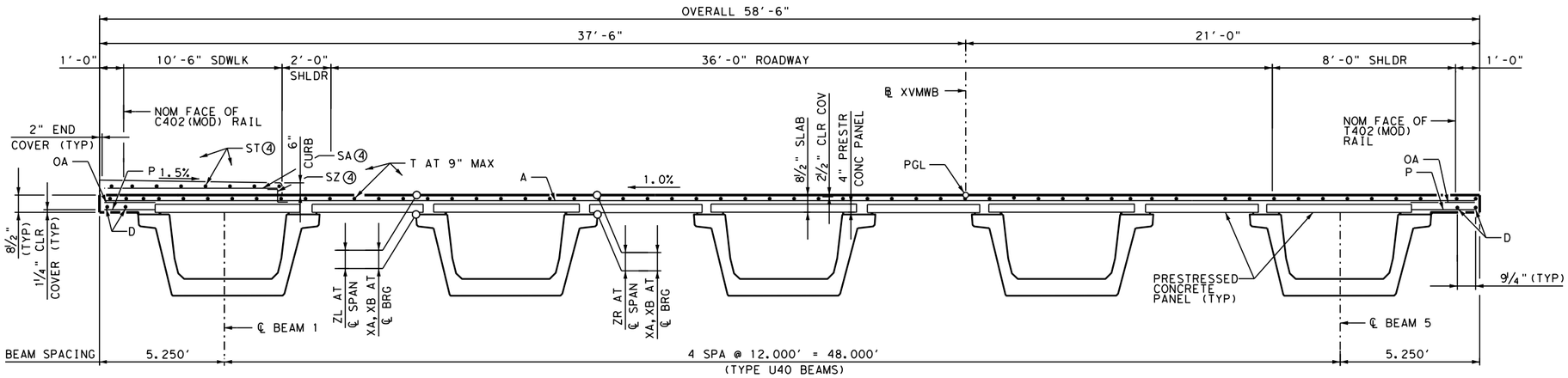
④ SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARD FOR SIDEWALK AND ANCHORAGE DETAILS.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	BRIDGE SIDEWALK	②PRESTR CONC U-BEAM (U40)	① REINFORCING STEEL
	SF	SF	LF	LB
1	2,018	397	170.0	7,467
TOTAL	2,018	397	170.0	7,467

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.



TYPICAL TRANSVERSE SECTION

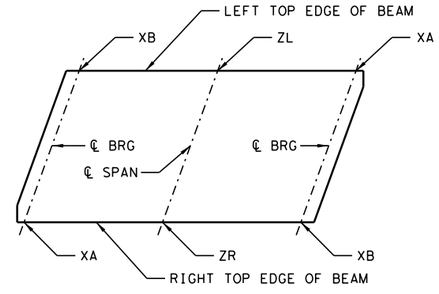
BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
SA	#4
ST	#4
SZ	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN * (IN)	"ZR" AT ℄ SPAN * (IN)
1	1	10 ½	10 ½	10 ⅝	10 ⅝

* THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

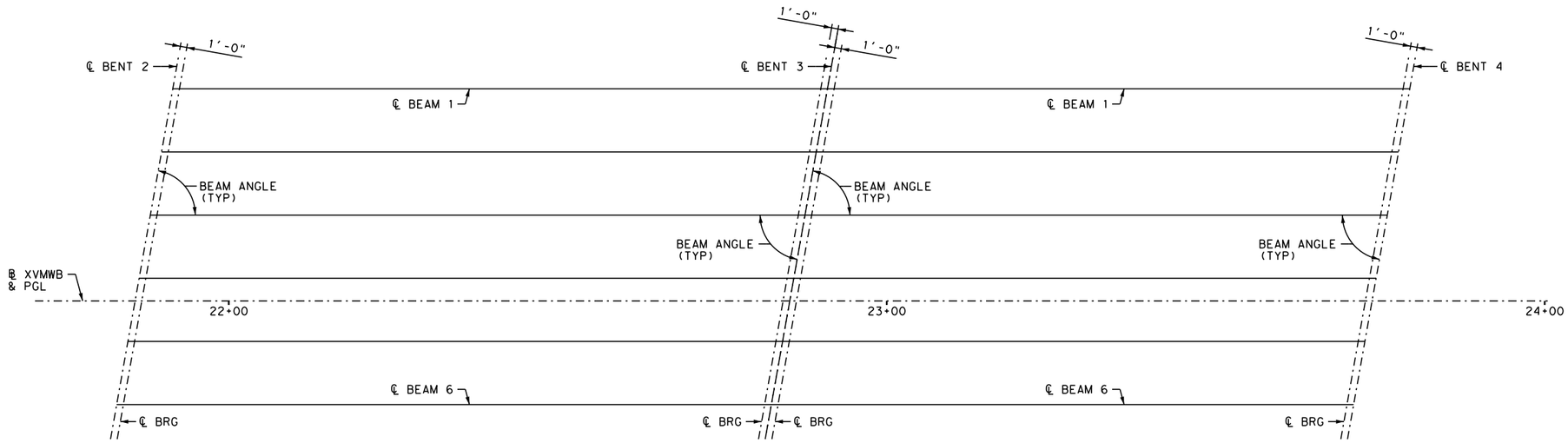
34.500' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS)

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1244

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



SPAN 2
U40 BEAMS

SPAN 3
U40 BEAMS

ACUTE BEAM ANGLE SHOWN

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

BENT REPORT

BENT NO. 2 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 32.755 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	2	BEAM 1	0.000	79 55 40
		BEAM 2	9.750	79 55 40
		BEAM 3	9.750	79 55 40
		BEAM 4	9.750	79 55 40
		BEAM 5	9.750	79 55 40
		BEAM 6	9.750	79 55 40
		TOTAL	48.750	

BENT NO. 3 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 32.755 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	2	BEAM 1	0.000	79 55 40
		BEAM 2	9.750	79 55 40
		BEAM 3	9.750	79 55 40
		BEAM 4	9.750	79 55 40
		BEAM 5	9.750	79 55 40
		BEAM 6	9.750	79 55 40
		TOTAL	48.750	

BENT REPORT

BENT NO. 3 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 32.755 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	3	BEAM 1	0.000	79 55 40
		BEAM 2	9.750	79 55 40
		BEAM 3	9.750	79 55 40
		BEAM 4	9.750	79 55 40
		BEAM 5	9.750	79 55 40
		BEAM 6	9.750	79 55 40
		TOTAL	48.750	

BENT NO. 4 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 32.755 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	3	BEAM 1	0.000	79 55 40
		BEAM 2	9.750	79 55 40
		BEAM 3	9.750	79 55 40
		BEAM 4	9.750	79 55 40
		BEAM 5	9.750	79 55 40
		BEAM 6	9.750	79 55 40
		TOTAL	48.750	

BEAM REPORT

BEAM REPORT, SPAN 2

		HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM	1	99.500	97.469	99.00	-0.0089
BEAM	2	99.500	97.469	99.00	-0.0088
BEAM	3	99.500	97.469	99.00	-0.0087
BEAM	4	99.500	97.469	99.00	-0.0086
BEAM	5	99.500	97.469	99.00	-0.0085
BEAM	6	99.500	97.469	99.00	-0.0084

BEAM REPORT

BEAM REPORT, SPAN 3

		HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM	1	88.500	86.469	88.02	-0.0210
BEAM	2	88.500	86.469	88.02	-0.0207
BEAM	3	88.500	86.469	88.02	-0.0204
BEAM	4	88.500	86.469	88.02	-0.0201
BEAM	5	88.500	86.469	88.02	-0.0199
BEAM	6	88.500	86.469	88.02	-0.0196

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT SPANS 2 & 3

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1245

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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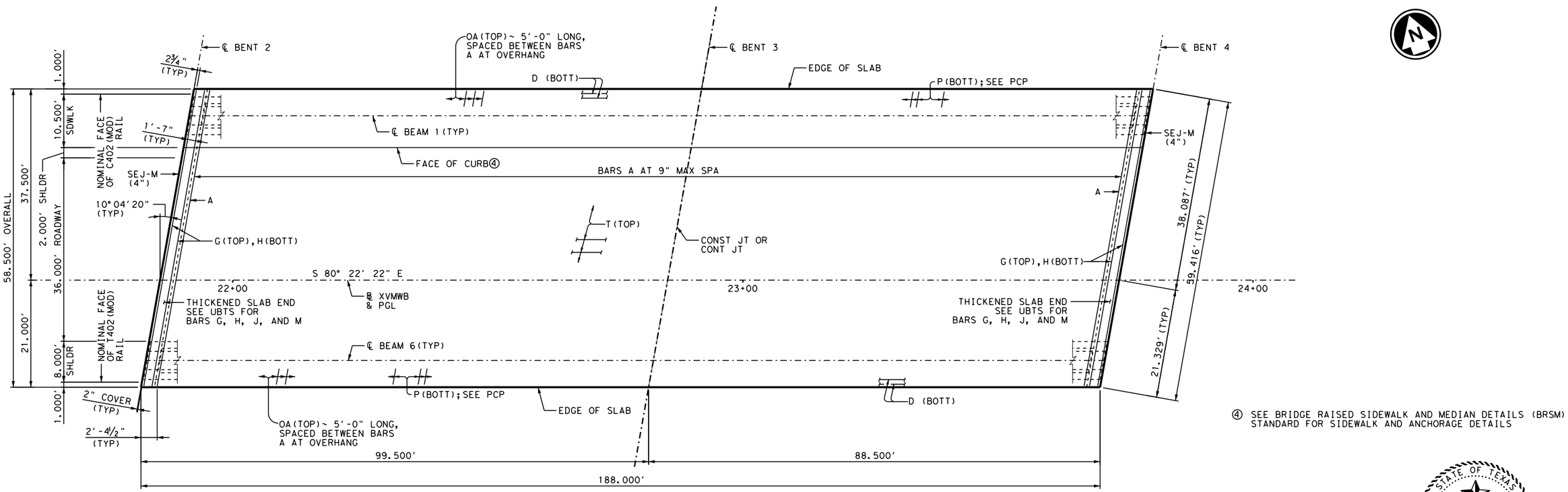
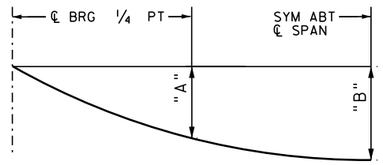


④ SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARD FOR SIDEWALK AND ANCHORAGE DETAILS

PLAN

TABLE OF DEAD LOAD DEFLECTIONS

SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
2	1	0.138	0.197
2	2-5	0.133	0.189
2	6	0.139	0.198
3	1	0.086	0.122
3	2-5	0.082	0.117
3	6	0.086	0.123



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 9TH EDITION(2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP AND PCP-FAB STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T.

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c= 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS:

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.
COMBINATION RAIL DETAILS TYPE C402(MOD).
TRAFFIC RAIL DETAILS TYPE T402(MOD).

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

188.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1246
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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DATE: 10/17/2023 11:52:48 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

③ SEE PRESTRESSED CONCRETE PANELS (PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

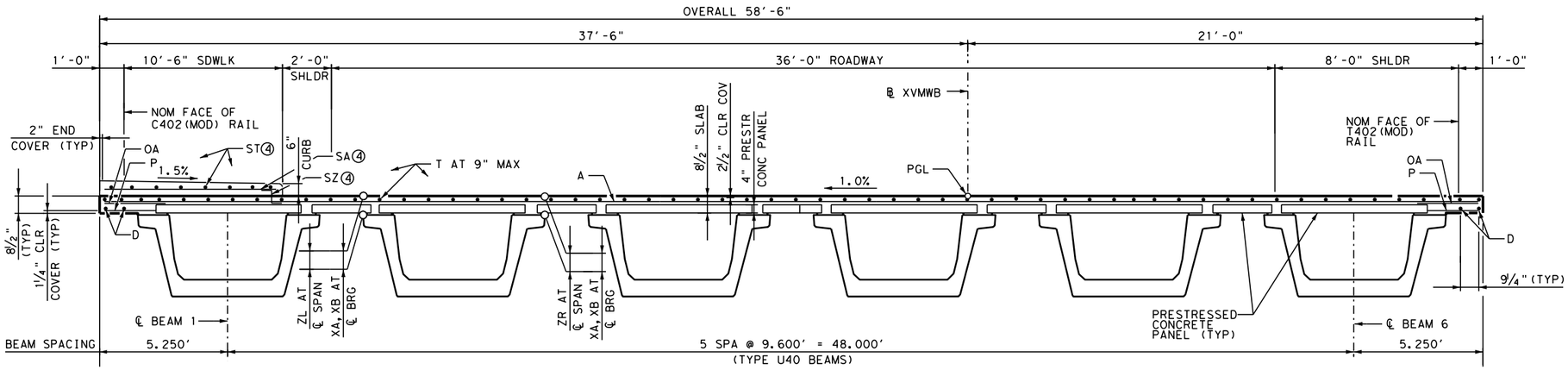
④ SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARD FOR SIDEWALK AND ANCHORAGE DETAILS.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	BRIDGE SIDEWALK	②PRESTR CONC U-BEAM (U40)	① REINFORCING STEEL
	SF	SF	LF	LB
2	5,821	1,144	594.0	21,538
3	5,177	1,018	528.1	19,155
TOTAL	10,998	2,162	1,122.1	40,693

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.



TYPICAL TRANSVERSE SECTION

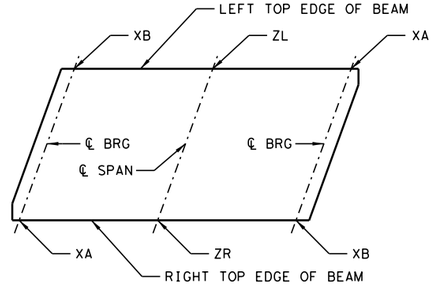
BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
SA	#4
ST	#4
SZ	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN * (IN)	"ZR" AT ℄ SPAN * (IN)
2	1	10 1/2	10 1/2	9 3/4	9 3/4
2	2	10 1/2	10 1/2	9 5/8	9 5/8
2	3	10 1/2	10 1/2	9 5/8	9 1/2
2	4&5	10 1/2	10 1/2	9 1/2	9 1/2
2	6	10 1/2	10 1/2	9 5/8	9 5/8
3	ALL	10 1/2	10 3/4	11 1/4	11 1/4

* THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

188.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS)

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1247
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\03_WB Valley Mills\BRLD5_03VM_WB_004.dgn
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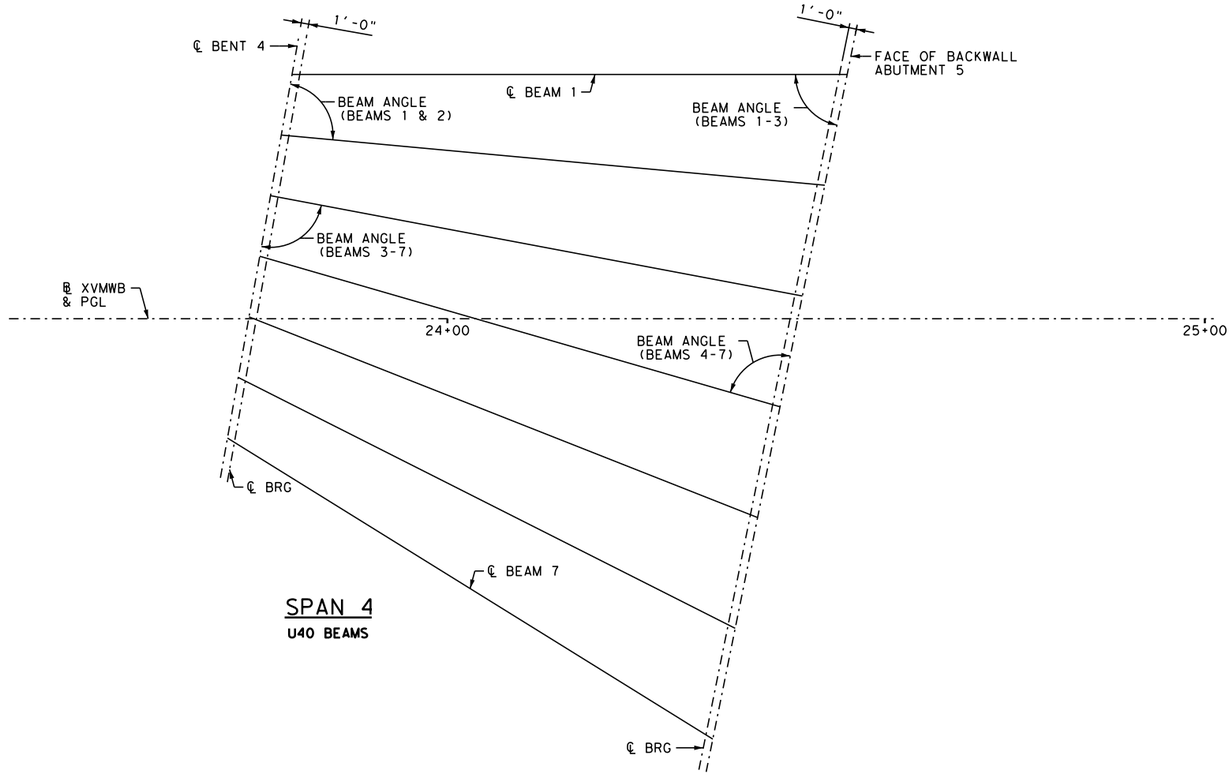

SPAN 4
U40 BEAMS

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

ACUTE BEAM ANGLE SHOWN

BENT REPORT

BENT NO. 4 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 32.755 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 4	BEAM	1	0.000	79 55 40
	BEAM	2	8.125	85 12 06
	BEAM	3	8.125	89 23 19
	BEAM	4	8.125	83 56 11
	BEAM	5	8.125	78 32 21
	BEAM	6	8.125	73 17 20
	BEAM	7	8.125	68 15 47
	TOTAL		48.750	

ABUT NO. 5 (N 21 03 36 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 32.903 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 4	BEAM	1	0.000	78 34 02
	BEAM	2	14.920	83 50 28
	BEAM	3	14.920	89 15 03
	BEAM	4	14.920	85 17 49
	BEAM	5	14.920	79 53 59
	BEAM	6	14.920	74 38 58
	BEAM	7	14.920	69 37 25
	TOTAL		89.520	

BEAM REPORT

BEAM REPORT, SPAN 4

		HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM	1	73.293	71.258	72.83	-0.0329
BEAM	2	72.062	70.053	71.60	-0.0317
BEAM	3	71.459	69.459	70.99	-0.0301
BEAM	4	71.501	69.492	71.03	-0.0283
BEAM	5	72.186	70.150	71.71	-0.0262
BEAM	6	73.497	71.415	73.01	-0.0239
BEAM	7	75.400	73.256	74.90	-0.0216

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10/17/2023

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Texas Department of Transportation

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HNTB Corporation
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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT SPAN 4

IH 35 UNDERPASS AT LP 396 WB
(VALLEY MILLS DRIVE)

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1248
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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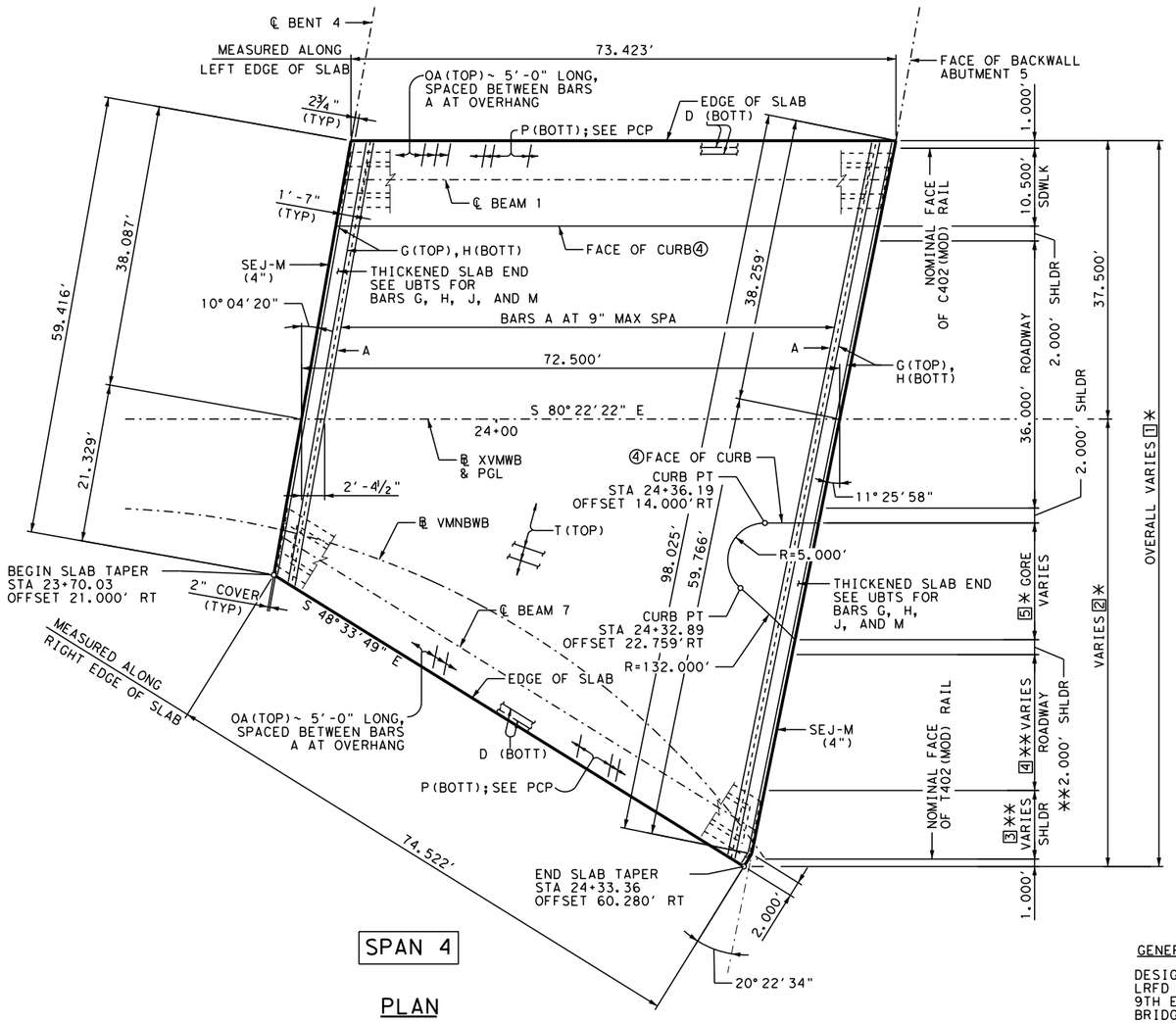
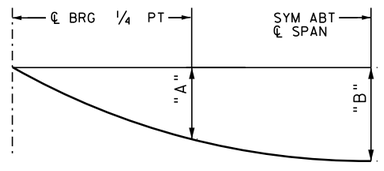


SPAN 4

PLAN



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
4	1	0.043	0.062
4	2	0.042	0.060
4	3&4	0.040	0.058
4	5	0.041	0.060
4	6	0.044	0.063
4	7	0.050	0.072

④ SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARD FOR SIDEWALK AND ANCHORAGE DETAILS

[1] 58.500' MIN, 97.780' MAX
[2] 21.000 MIN, 60.280' MAX
[3] 2.000' MIN, 10.429' MAX
[4] 0.000' MIN, 20.000' MAX/USUAL
[5] 0.000' MIN, 15.727' MAX
* MEASURED RADIAL TO ℄ XVMWB
** MEASURED RADIAL TO ℄ VMNBWB

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 9TH EDITION(2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP AND PCP-FAB STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T.

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c= 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS:

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.
COMBINATION RAIL DETAILS TYPE C402(MOD).
TRAFFIC RAIL DETAILS TYPE T402(MOD).

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

72.500' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1249
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

③ SEE PRESTRESSED CONCRETE PANELS (PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

④ SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARD FOR SIDEWALK, MEDIAN AND ANCHORAGE DETAILS.

TABLE OF ESTIMATED QUANTITIES

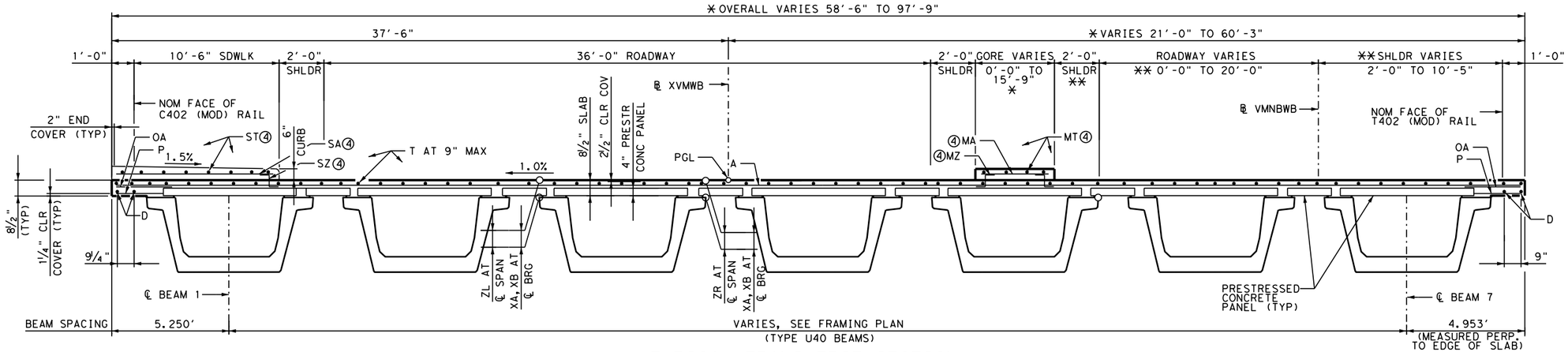
SPAN	REINF CONC SLAB	BRIDGE SIDEWALK	BRIDGE MEDIAN	②PRESTR CONC U-BEAM (U40)	① REINFORCING STEEL
	SF	SF	SF	LF	LB
4	5,680	843	122	506.1	21,016
TOTAL	5,680	843	122	506.1	21,016

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.

✳ MEASURED RADIAL TO ℄ XVMWB

✳✳ MEASURED RADIAL TO ℄ VMNBWB



TYPICAL TRANSVERSE SECTION

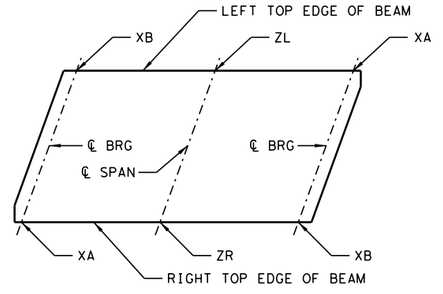
BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
MA	#4
MT	#4
MZ	#4
OA	#5
P	#4
SA	#4
ST	#4
SZ	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN *** (IN)	"ZR" AT ℄ SPAN *** (IN)
4	ALL	10 ½	11	11	11

*** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

NO.	DATE	REVISION	APPROVED

HNTB Corporation
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Engineers Architects Planners
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IH 35 FROM S LP 340 TO 12TH ST

72.500' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS)

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1250
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: DATE TIME
FILE: DOCUMENT NAME

DESIGNED BEAMS (STRAIGHT STRANDS)

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH fpu (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)	PRESTRESSING STRANDS: TOT NO. DEB	DEBONDED STRAND PATTERN PER ROW: DIST FROM BOTTOM (in)	DEBONDED STRAND PATTERN PER ROW: NO.OF STRANDS TOTAL	DEBONDED STRAND PATTERN PER ROW: NO.OF STRANDS DE-BONDED	DEBONDED STRAND PATTERN PER ROW: NUMBER OF STRANDS DEBONDED TO (ft from end) 3	6	9	12	15	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS DRIVE)	1	ALL	U40		10	0.6	270	14.18	14.18										4.000	5.000
	2	ALL	U40		51	0.6	270	13.25	13.13	21	2.17	27	13	0	3	8	0	2	5.800	7.000
											4.14	24	8	2	6	0	0	0		
	3	ALL	U40		39	0.6	270	13.57	13.27	13	2.17	27	13	1	6	4	2	0	4.900	6.400
	4	ALL	U40		29	0.6	270	14.04	13.99	8	2.17	27	8	2	4	2	0	0	4.500	5.000

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS DRIVE)	1	ALL	U40	0.597	-0.680	1984	0.993	1.203
	2	ALL	U40	4.573	-4.297	7514	0.642	0.928
	3	ALL	U40	3.701	-3.505	6225	0.661	0.936
	4	ALL	U40	2.639	-2.611	4908	0.792	1.093

LOAD RATING FACTORS

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	STRENGTH I Inv	STRENGTH I Opr	SERVICE III Inv
IH 35 UNDERPASS AT LP 396 WB (VALLEY MILLS DRIVE)	1	ALL	U40	1.77	2.29	3.24
	2	ALL	U40	1.68	2.21	1.09
	3	ALL	U40	1.47	2.24	1.05
	4	ALL	U40	1.45	1.98	1.24

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation.

Optional designs must have a calculated residual camber equal to or greater than that of the designed beam.

Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

The grid pattern for the strands is based on exact conversions from a metric grid spacing of 50mm.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

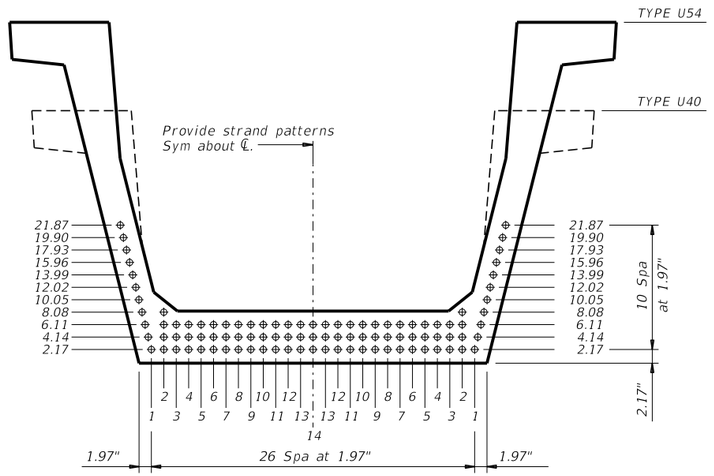
When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

Locate strands for the designed beam as low as possible on the 1.97" grid system unless a non-standard stand pattern is indicated. Fill row "2.17", then row "4.14", then row "6.11", etc., beginning each row in the "1" position and, distributing uniformly as practical, working inward until the required number of strands is reached.

Strand debonding must comply with Item 424.4.2.2.2.4.

Do not debond strands in position "1". Distribute debonded strands equally about the vertical centerline. Decrease debonded lengths working inward, with debonding staggered in each row.

Full-length debonded strands are not permitted in positions "1" and "2".



TxDOT TYPE U54 & TYPE U40 BMS

HL93 LOADING

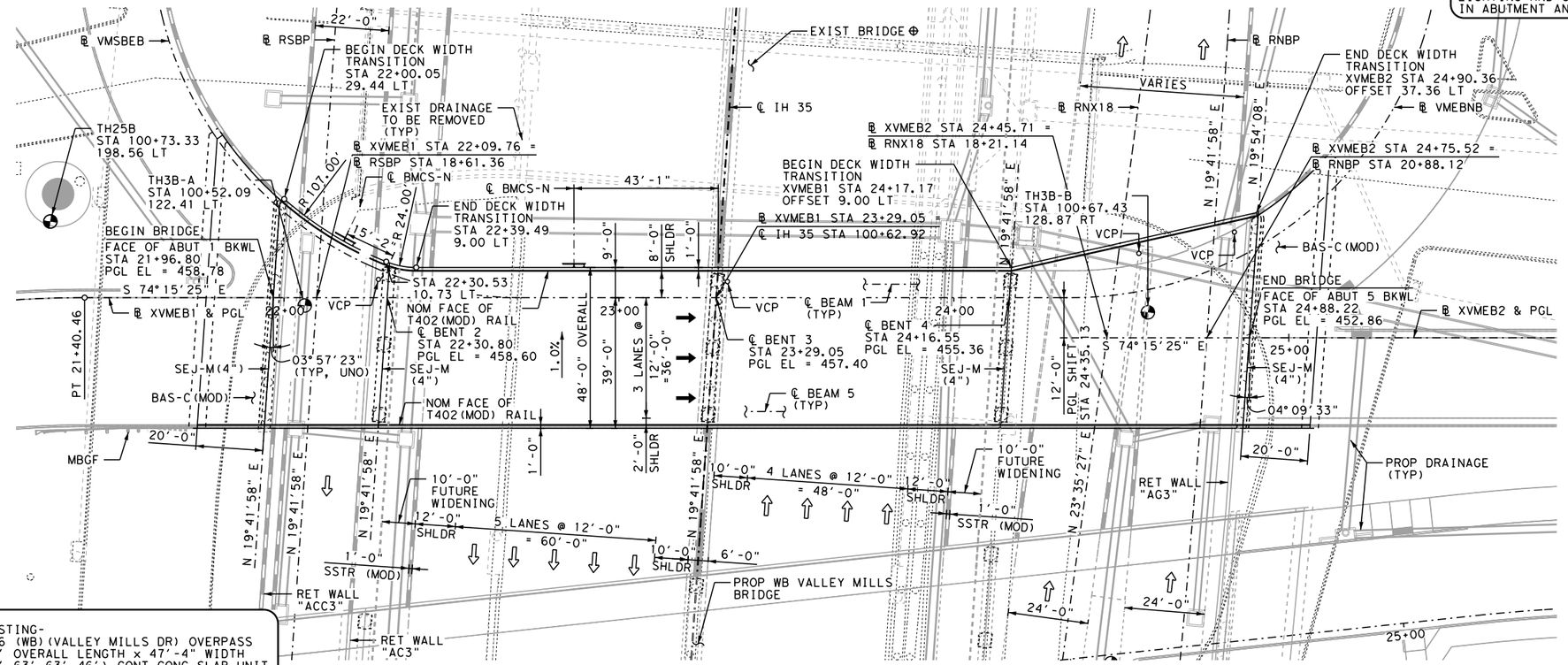
Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE U-BEAM DESIGNS (DESIGN DATA)

UBND

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

FILE: ubstds04-22.dgn	DN: TxDOT	CK: TxDOT	DW: SFS	CK: SDB
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
01-16: Notes. 03-22: Added Load Rating.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1251



PLAN

⊕ EXISTING-
SH 6 (WB)(VALLEY MILLS DR) OVERPASS
218' OVERALL LENGTH x 47'-4" WIDTH
(46'-63'-63'-46') CONT CONC SLAB UNIT
NORMAL - 40' RDWY W/ ONE 1'-6" CURB &
4'-0" SIDEWALK ON CONCRETE
COLUMNS-TO BE REMOVED.

GENERAL NOTES

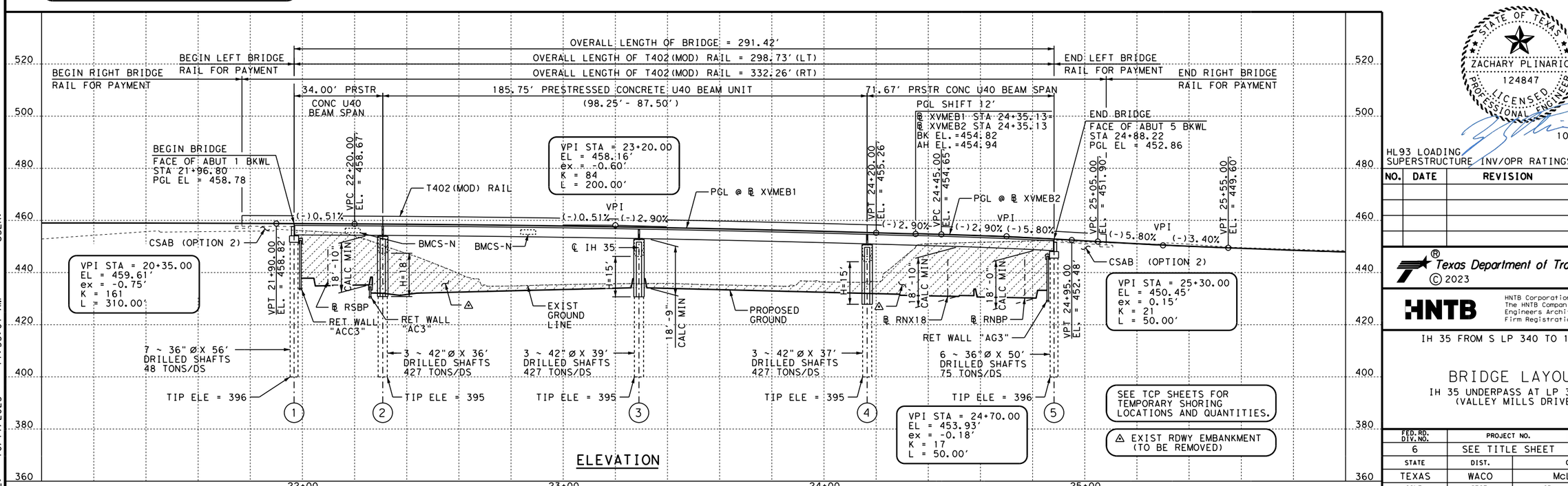
1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUT FOR EXISTING STRUCTURE CSJ 0015-01-025,1962. BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. VCP: VERTICAL CLEARANCE POINT.
6. FOUND DRILLED SHAFTS AT ELEVATION SHOWN OR DEEPER TO OBTAIN A MINIMUM TWO DRILLED SHAFT DIAMETER PENETRATION INTO LIMESTONE.
7. FOR VARIABLE DIMENSIONS, SEE "TYPICAL SECTIONS" SHEET.

FUNCT. CLASS = MINOR ARTERIAL
DESIGN SPEED = 20 MPH
PROP ADT (2026) = 22,705
(2046) = 31,180

EXISTING NBI NO = 09-161-0-0015-01-218
EXISTING PSN NO = 218

NEW NBI NO = 09-161-0-0015-01-818
NEW PSN NO = 818

0' 10' 20' 40'



ELEVATION

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.08/1.83

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1252
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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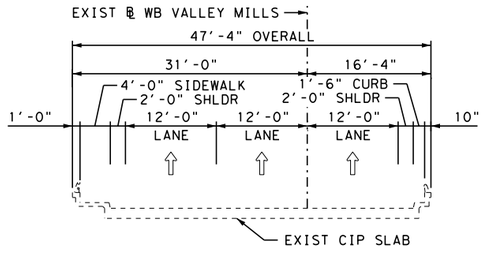
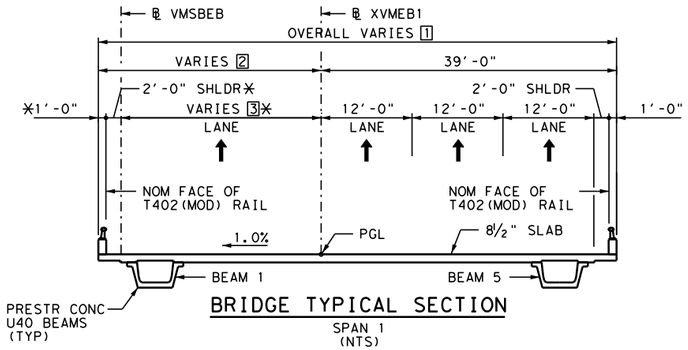


EXISTING BRIDGE TYPICAL SECTION



BRIDGE TYPICAL SECTION

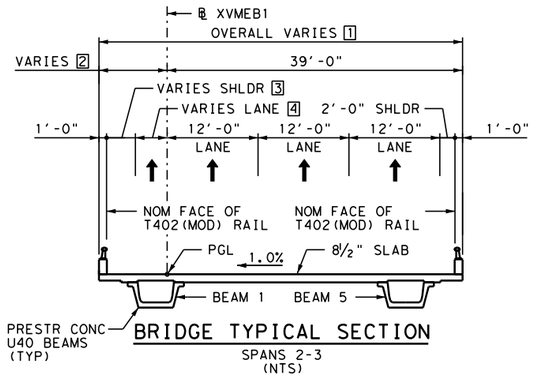
SPAN 1
(NTS)

[1] 49'-4" MIN, 68'-5" MAX

[2] 10'-4" MIN, 29'-5" MAX

[3] 6'-11" MIN, 22'-5" MAX

✳ MEASURED RADIAL TO ℄ VMSBEB



BRIDGE TYPICAL SECTION

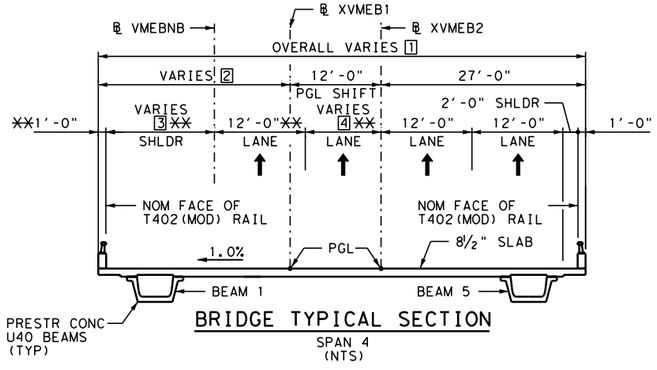
SPANS 2-3
(NTS)

[1] 48'-0" MIN/USUAL, 49'-4" MAX

[2] 9'-0" MIN/USUAL, 10'-4" MAX

[3] 2'-2" MIN, 8'-0" MAX/USUAL

[4] 0'-0" MIN/USUAL, 7'-5" MAX



BRIDGE TYPICAL SECTION

SPAN 4
(NTS)

[1] 48'-0" MIN, 64'-4" MAX

[2] 9'-0" MIN, 25'-4" MAX

[3] 8'-0" MIN, 14'-4" MAX

[4] 0'-0" MIN, 11'-1" MAX

✳✳ MEASURED RADIAL TO ℄ VMEBNB

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER

6/6/2024

NO.	DATE	REVISION	APPROVED

HNTB

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TYPICAL SECTIONS

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1253
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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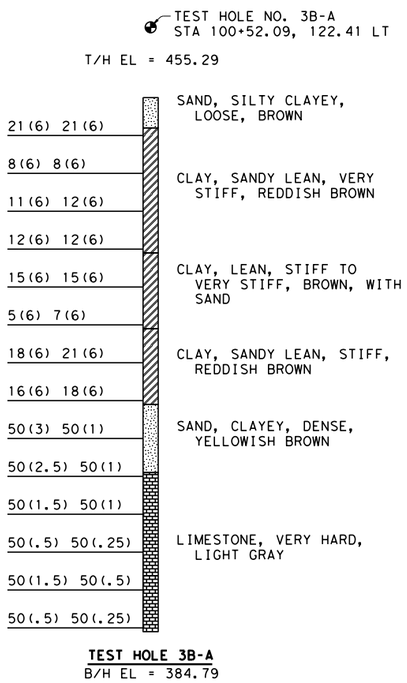

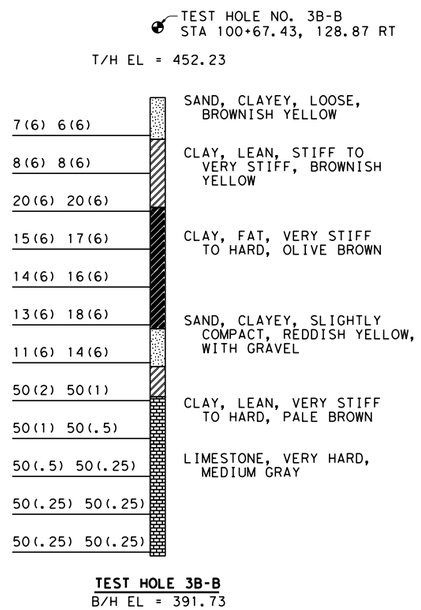

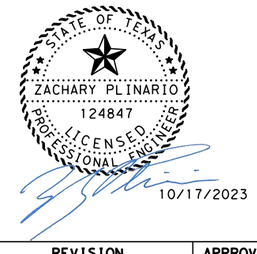

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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TEST HOLE DATA

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1254
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\04_EB Valley Mills\BRLS5_03VM_EB_001.dgn
DATE: 10/17/2023 11:53:13 AM USER:

SUMMARY OF ESTIMATED QUANTITIES

	ITEM - DESCRIPTION CODE	400 6005	416 6004	416 6005	420 6014	420 6026	422 6001	422 6011	422 6015	425 6027	450 6010	454 6018
	ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)	CL C CONC (ABUT) (HPC)	CL C CONC (BENT) (HPC)	REINF CONC SLAB	BRIDGE MEDIAN	APPROACH SLAB	PRESTR CONC U-BEAM (U-40)	RAIL (TY T402) ①	SEALED EXPANSION JOINT (4 IN) (SEJ-M)
		CY	LF	LF	CY	CY	SF	SF	CY	LF	LF	LF
EB	2-ABUTMENTS	197	692		71.8			11	146.7			132
EB	3-INTERIOR BENTS			336		176.5						96
EB	1-34.00' PRESTR CONC U-BEAM SPAN						1,974			174.80	91.7	
EB	1-185.75' PRESTR CONC U-BEAM UNIT						8,920			923.90	371.8	
EB	1-71.67' PRESTR CONC U-BEAM SPAN						4,077			366.59	167.7	
EB												
	TOTAL	197	692	336	71.8	176.5	14,971	11	146.7	1,465.29	631.2	228

① THIS BID ITEM ENTAILS ALL QUANTITIES MARKED AS T402(MOD) RAIL

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ESTIMATED QUANTITIES

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1255
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

EB BEARING SEAT ELEVATION (FT)

	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
ABUT 1 (FWD)	454.116	454.162	454.265	454.312	454.415	454.462	454.565	454.611	454.714	454.761
	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 2 (BK)	454.134	454.181	454.236	454.283	454.338	454.385	454.440	454.487	454.542	454.589
	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 2 (FWD)	454.113	454.162	454.217	454.266	454.321	454.369	454.424	454.473	454.528	454.576
	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 3 (BK)	452.909	452.957	453.020	453.069	453.131	453.180	453.242	453.291	453.354	453.402
	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 3 (FWD)	452.870	452.922	452.982	453.034	453.093	453.145	453.205	453.257	453.316	453.368
	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 4 (FWD)	450.863	450.915	450.981	451.033	451.099	451.152	451.218	451.270	451.336	451.388
	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 4 (FWD)	450.801	450.858	450.919	450.977	451.038	451.096	451.157	451.214	451.276	451.333
	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
ABUT 5 (FWD)	447.984	448.043	448.179	448.237	448.372	448.431	448.566	448.624	448.759	448.817

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING SEAT ELEVATIONS

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1256
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:53:17 AM USER:

EB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
ABUT 1 (FWD)	-0.00485	-0.00480	-0.00476	-0.00472	-0.00468
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
BENT 2 (BK)	-0.00485	-0.00480	-0.00476	-0.00472	-0.00468
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
BENT 2 (FWD)	-0.01180	-0.01172	-0.01164	-0.01156	-0.01148
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
BENT 3 (BK)	-0.01180	-0.01172	-0.01164	-0.01156	-0.01148
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
BENT 3 (FWD)	-0.02273	-0.02265	-0.02257	-0.02249	-0.02241
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
ABUT 4 (BK)	-0.02273	-0.02265	-0.02257	-0.02249	-0.02241
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
BENT 4 (FWD)	-0.03616	-0.03583	-0.03553	-0.03523	-0.03495
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
BENT 5 (BK)	-0.03611	-0.03578	-0.03548	-0.03519	-0.03490

STATE OF TEXAS
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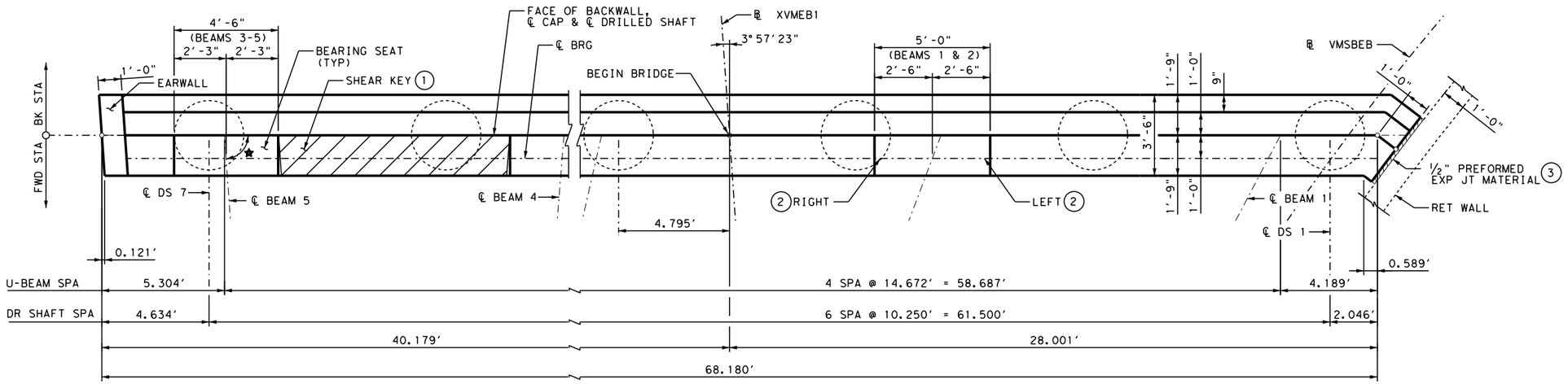
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING PAD TAPER REPORT

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

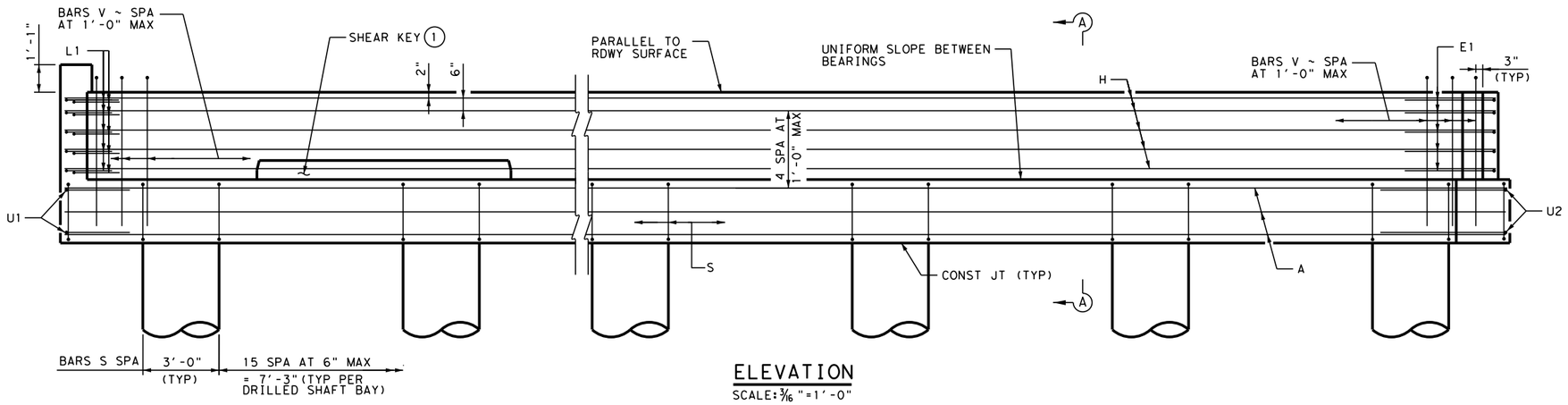
FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1257
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



PLAN

SCALE: 3/16 "=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	*74'-6"	4,750
E1	5	#5	6'-7"	34
H	10	#6	**71'-10"	1,079
L1	10	#6	3'-9"	56
P1	11	#5	5'-1"	59
P2	3	#5	9'-6"	30
S	102	#6	13'-6"	2,068
U1	2	#6	8'-1"	24
U2	2	#6	9'-9"	29
V	69	#5	13'-0"	936
wH	12	#6	3'-2"	57
wV	3	#5	13'-0"	41
SUBTOTAL STEEL (LB) ***				9,163
CLASS "C" CONC (ABUT) (HPC) (CY)				37.1

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

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Texas Department of Transportation

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The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1258
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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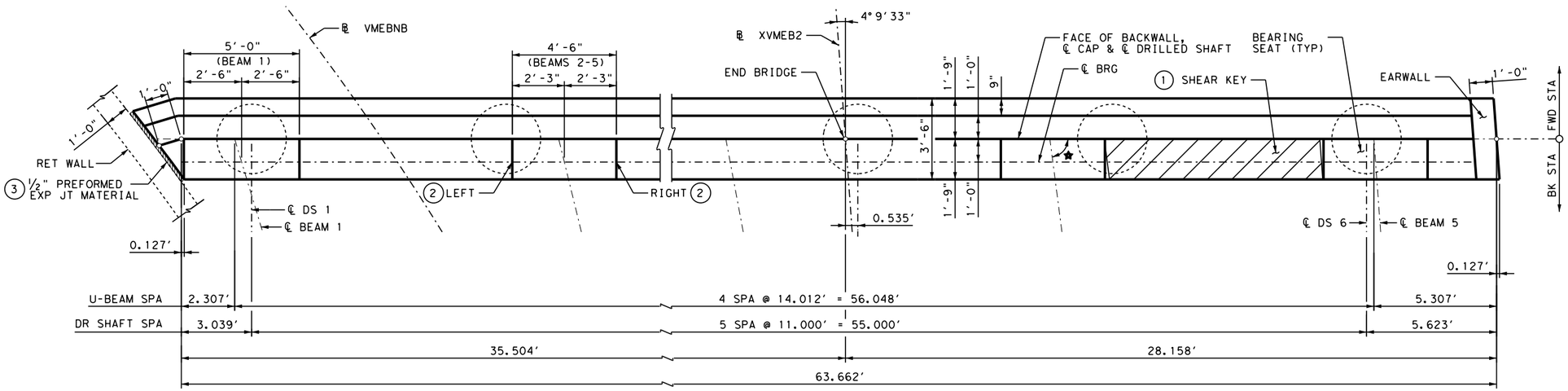
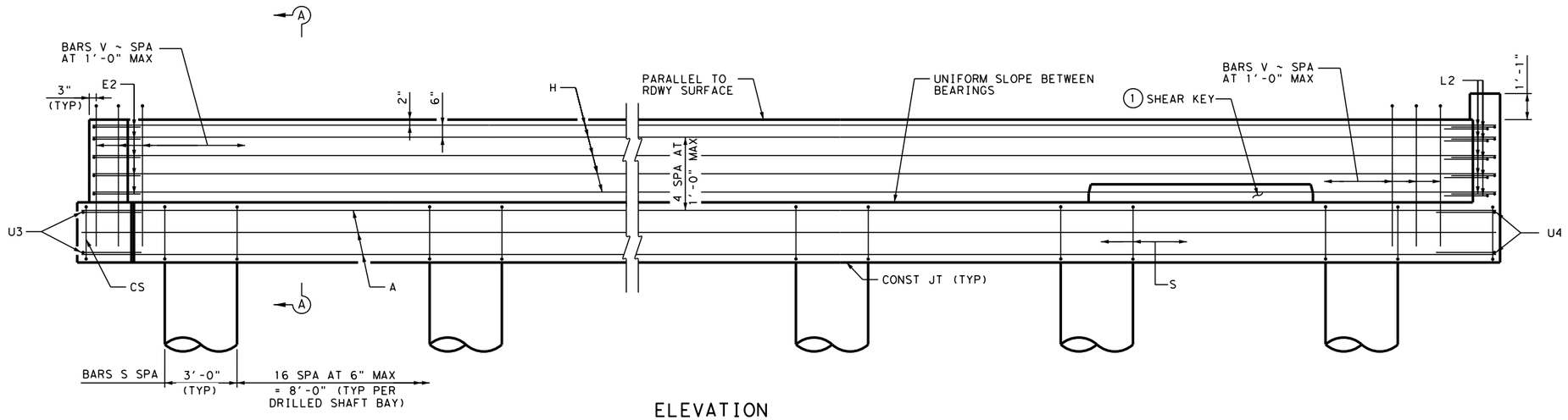


PLAN

SCALE: 3/16 "=1′-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1′-0"

TABLE OF ESTIMATED QUANTITIES ABUTMENT 5				
BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	*70′-1"	4,468
CS	1	#6	13′-11"	21
E2	5	#5	6′-9"	35
H	10	#6	**67′-3"	1,010
L2	10	#6	3′-9"	56
P1	10	#5	5′-1"	54
P2	3	#5	8′-11"	28
S	92	#6	13′-6"	1,865
U3	2	#6	9′-10"	30
U4	2	#6	8′-1"	24
V	65	#5	13′-0"	881
wH	12	#6	3′-2"	57
wV	3	#5	13′-0"	41
SUBTOTAL STEEL (LB) ***				8,570
CLASS "C" CONC (ABUT) (HPC) (CY)				34.7

* LENGTH SHOWN INCLUDES ONE 6′-10" LAP

** LENGTH SHOWN INCLUDES ONE 3′-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

1. SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS
2. SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS
3. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 5

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1259
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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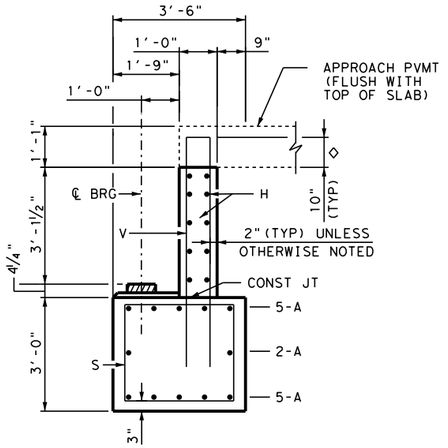
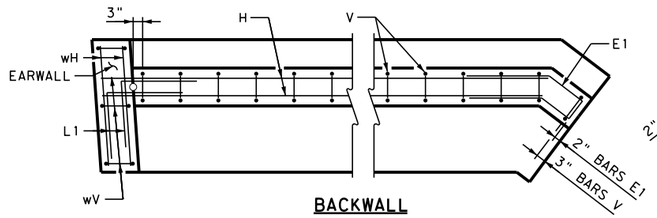


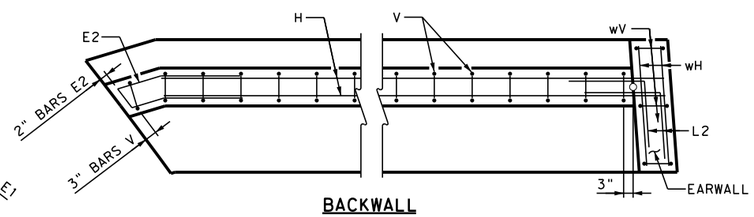
SECTION A-A

SCALE: 3/16 "=1'-0"

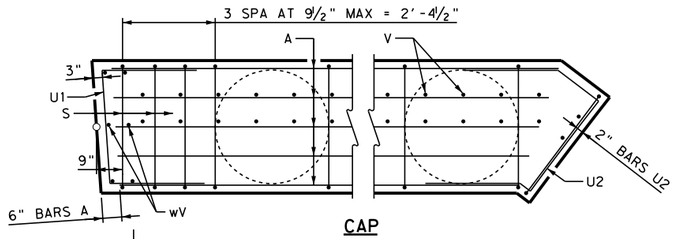
◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



BACKWALL



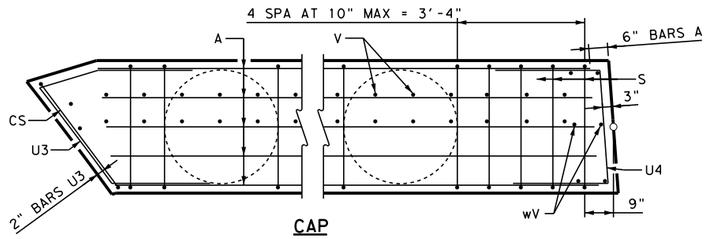
BACKWALL



CAP

ABUT 1 CORNER DETAILS

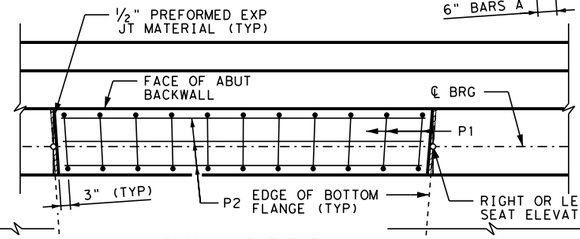
SCALE: 3/16 "=1'-0"



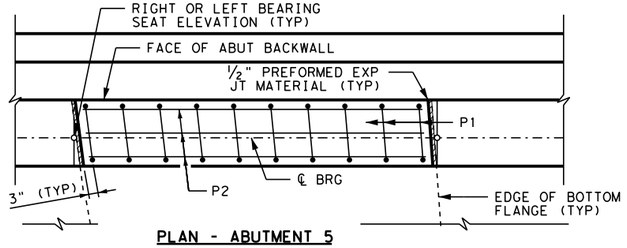
CAP

ABUT 5 CORNER DETAILS

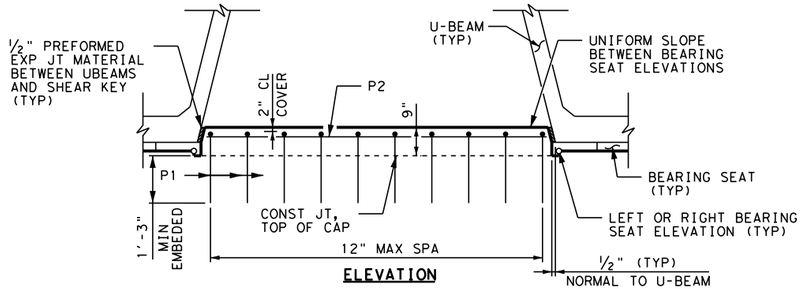
SCALE: 3/16 "=1'-0"



PLAN - ABUTMENT 1

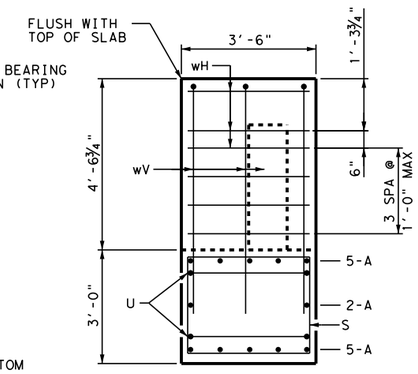


PLAN - ABUTMENT 5

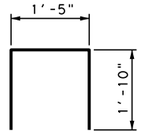


ELEVATION

SHEAR KEY DETAIL



EARWALL ELEVATION



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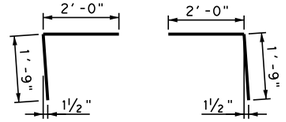
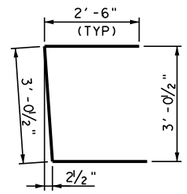
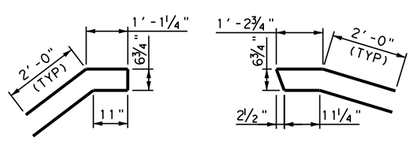


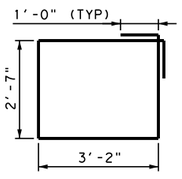
BARS L1 BARS L2



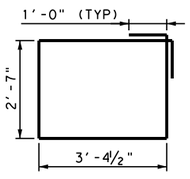
BARS U1



BARS E1 BARS E2



BARS S



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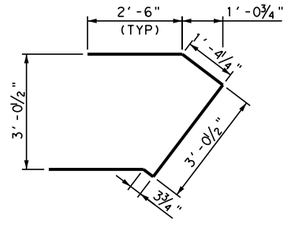

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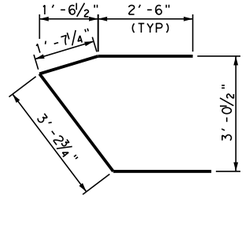

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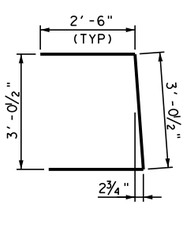

BARS U4

BARS V & wV

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

CALCULATED FOUNDATION LOADS
ABUTMENT 1= 48 TONS/DRILLED SHAFT,
ABUTMENT 5= 75 TONS/DRILLED SHAFT.

SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENTS.

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

NO.	DATE	REVISION	APPROVED

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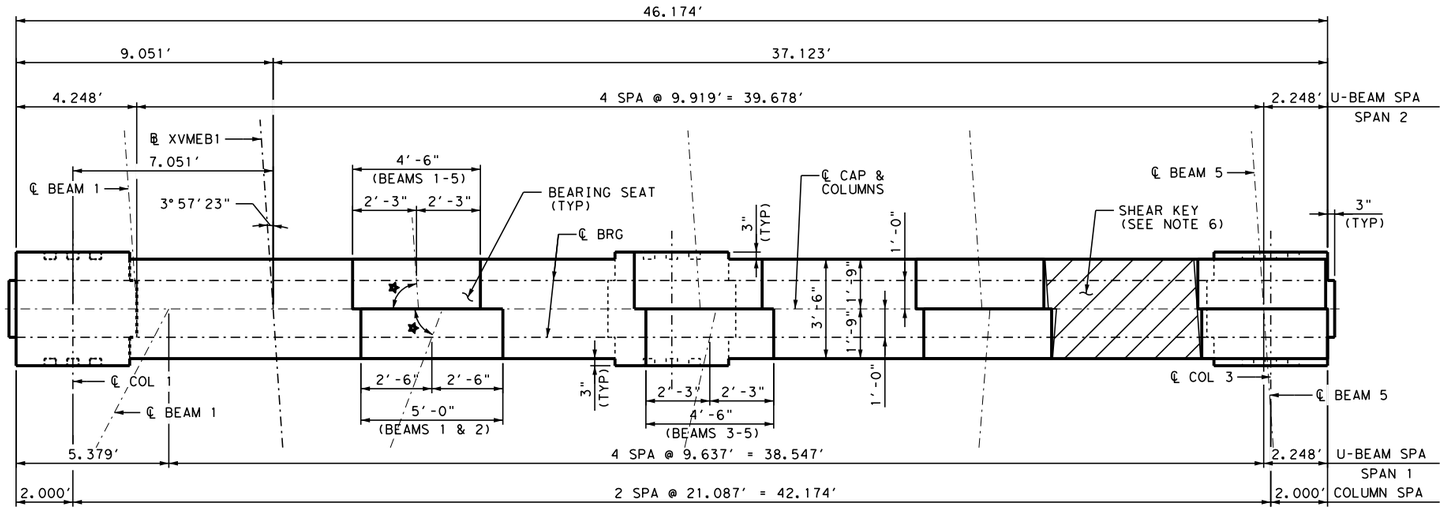
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

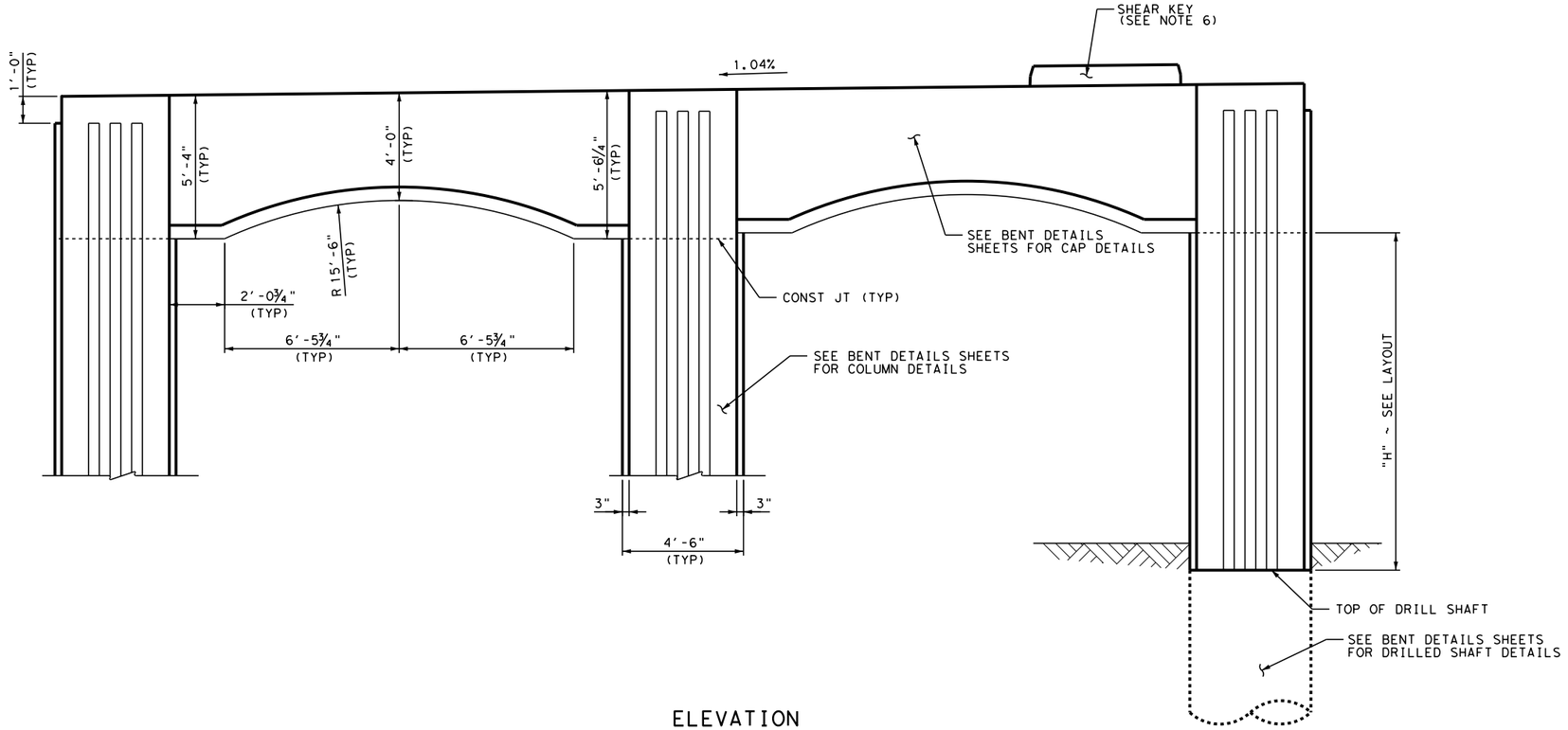
IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1260
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



PLAN

SCALE: 3/16 "=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
7. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.
8. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.

10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 2

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1261
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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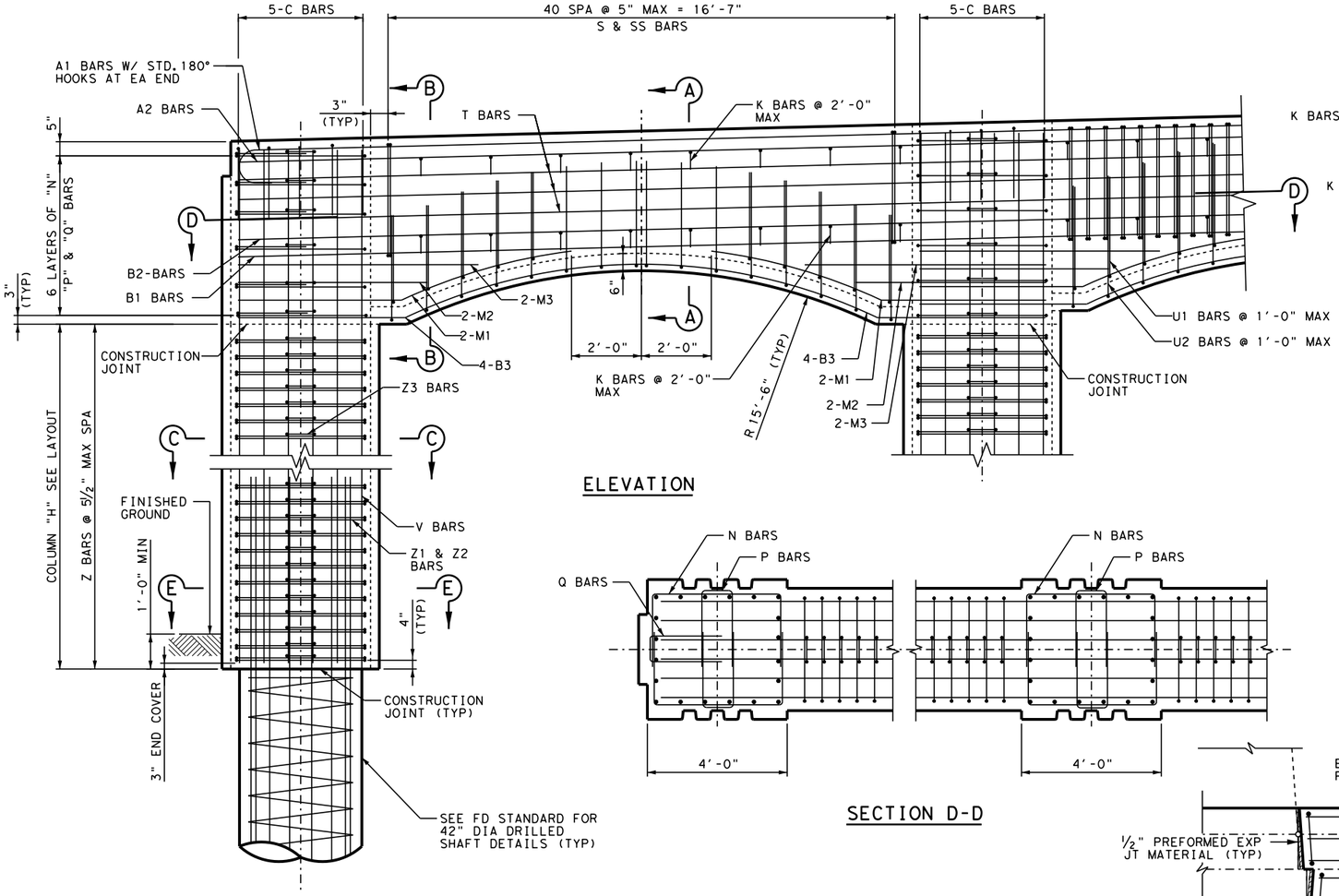
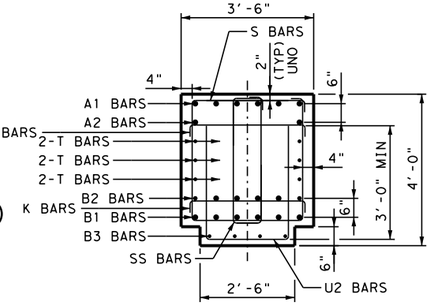


ELEVATION

SECTION D-D



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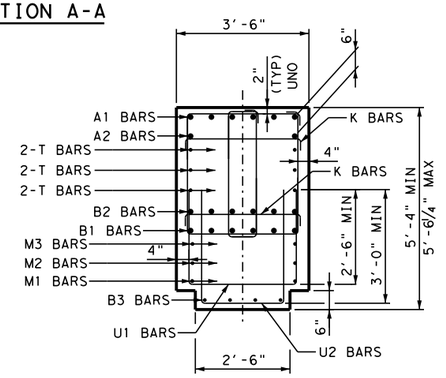

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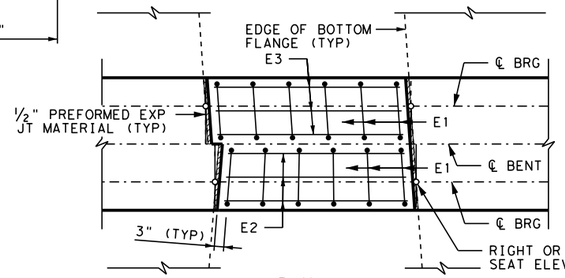
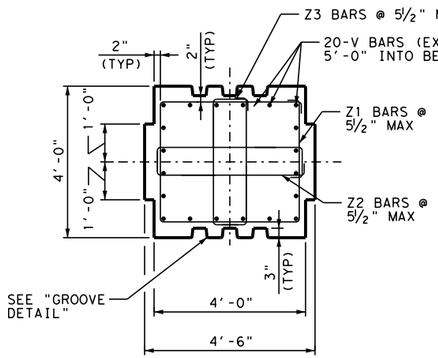
(AT FACE OF COLUMN)



PLAN



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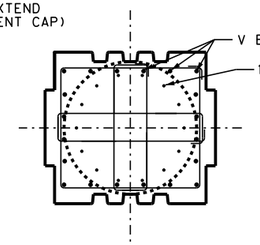

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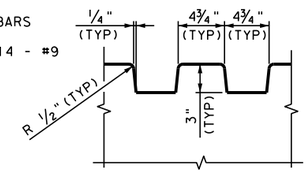
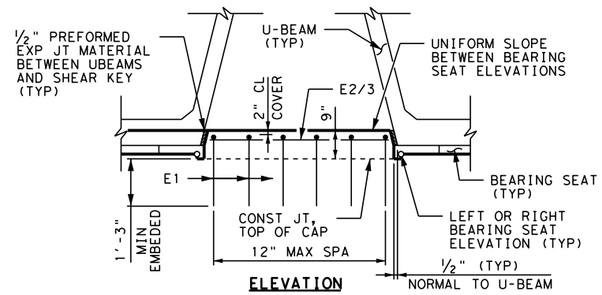


GROOVE DETAIL



ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

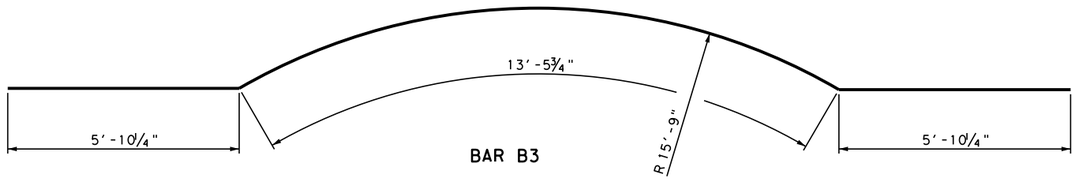
BENT 2 DETAILS

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1262
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\04_EB Valley Mills\BRBN5_03VM_EB_004.dgn
DATE: 10/17/2023 11:53:35 AM USER:



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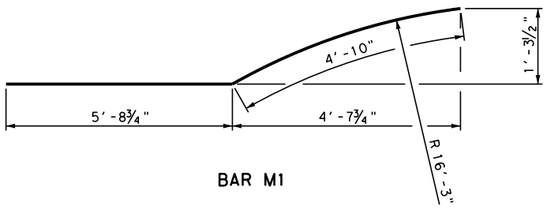
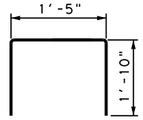


BAR M1



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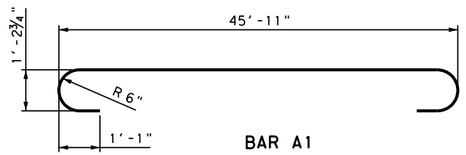

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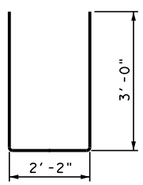

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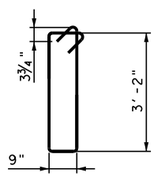
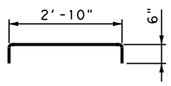
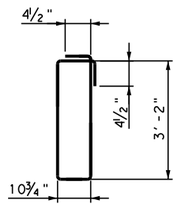


BAR SS



BAR K



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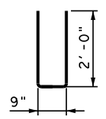

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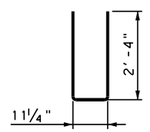

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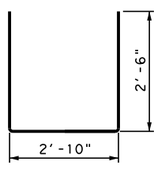

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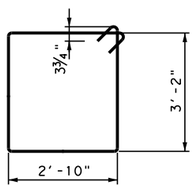

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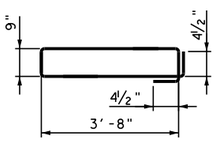
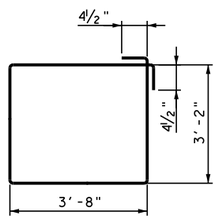
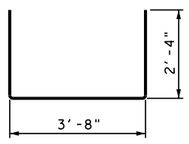


BAR Z2



BAR Z1



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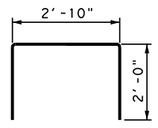

BAR C

TABLE OF QUANTITIES
BENT 2

CONSTANT QUANTITIES

BAR	NO.	SIZE	LENGTH	WEIGHT
A1	6	#11	49′ -1"	1,562
A2	2	#11	45′ -11"	487
B1	6	#11	45′ -11"	1,461
B2	6	#11	45′ -11"	1,461
B3	8	#8	25′ -3"	538
C	15	#4	6′ -10"	68
E1	12	#5	5′ -1"	64
E2	3	#5	4′ -9"	15
E3	3	#5	4′ -11"	16
K	40	#3	3′ -10"	58
M1	8	#8	10′ -7"	226
M2	8	#8	6′ -4"	135
M3	8	#8	7′-10"	166
N	36	#4	8′ -4"	200
P	36	#4	5′ -8"	135
Q	12	#4	4′ -9"	38
S	82	#5	12′ -11"	1,105
SS	82	#5	8′ -9"	748
T	6	#6	45′ -11"	413
U1	28	#4	7′ -10"	147
U2	40	#4	8′ -2"	218
SUBTOTAL STEEL (LBS) *				9,261

VARIABLE QUANTITIES ①

"H" = 18′				
V	60	#11	22′ -9"	7,252
Z1	117	#4	14′ -5"	1,759
Z2	117	#4	9′ -7"	1,169
Z3	117	#4	8′ -11"	1,083
CL "C" CONC (BENT) (HPC) (CY)				63.3
SUBTOTAL STEEL (LBS) *				11,263

* FOR CONTRACTOR'S INFORMATION ONLY.

① VARIABLE QUANTITIES ARE BASED ON COLUMN HEIGHTS "H" SHOWN.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 2 DETAILS

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1263
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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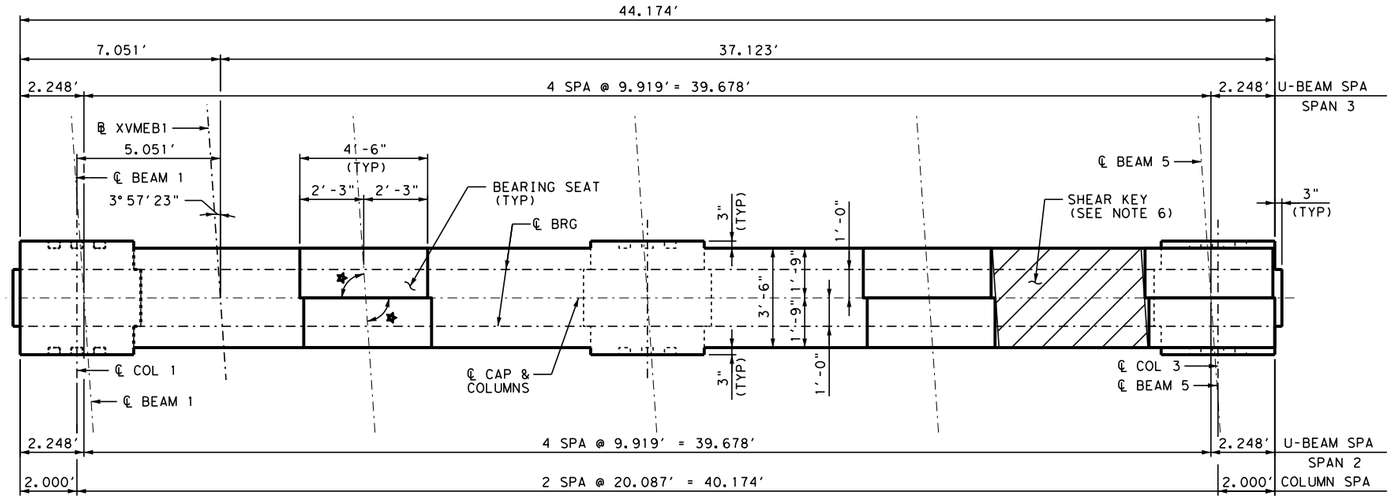
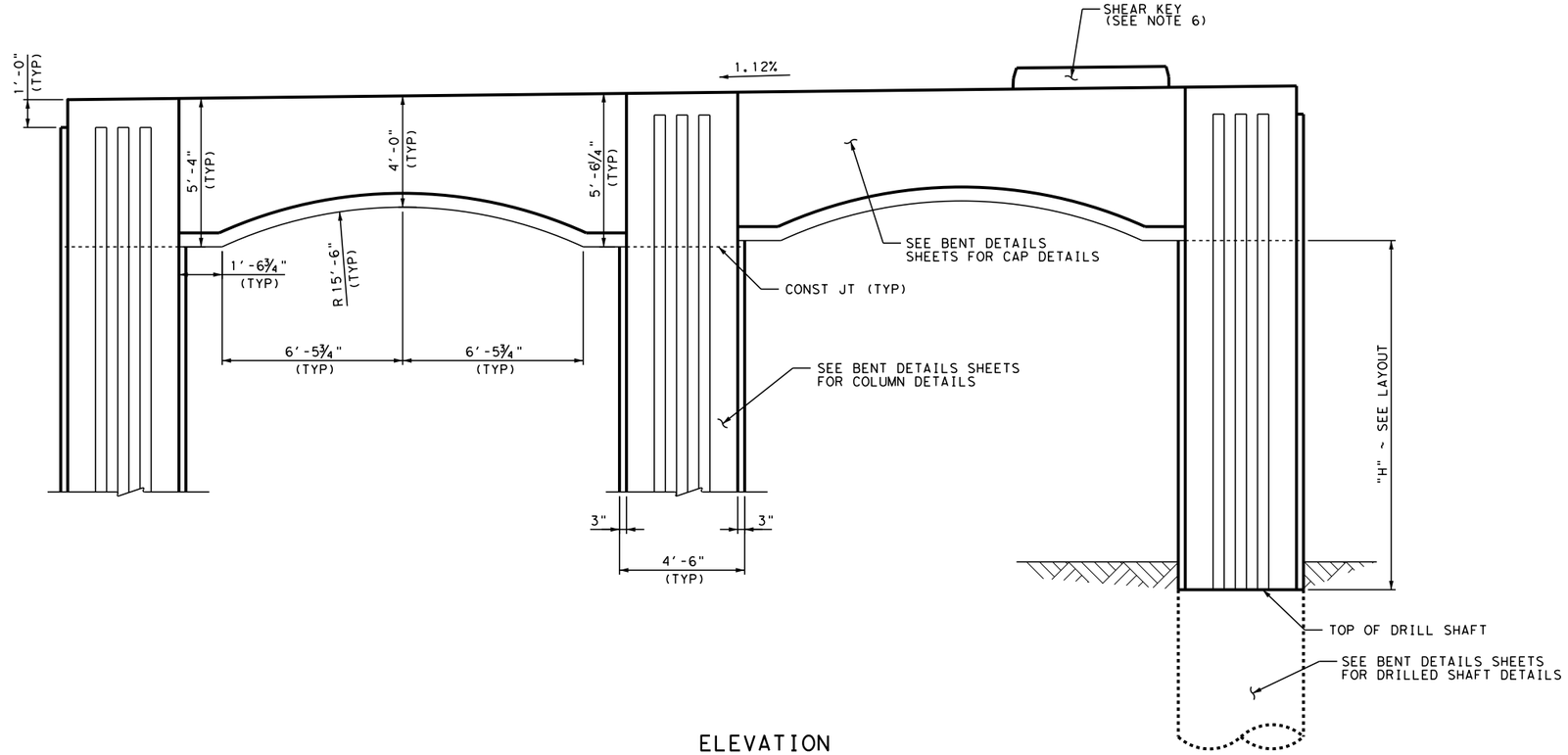


PLAN

SCALE: 3/16"=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
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STATE OF TEXAS
QING LIU
91266
PROFESSIONAL ENGINEER
LICENSED
6/6/2024

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 3

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1264
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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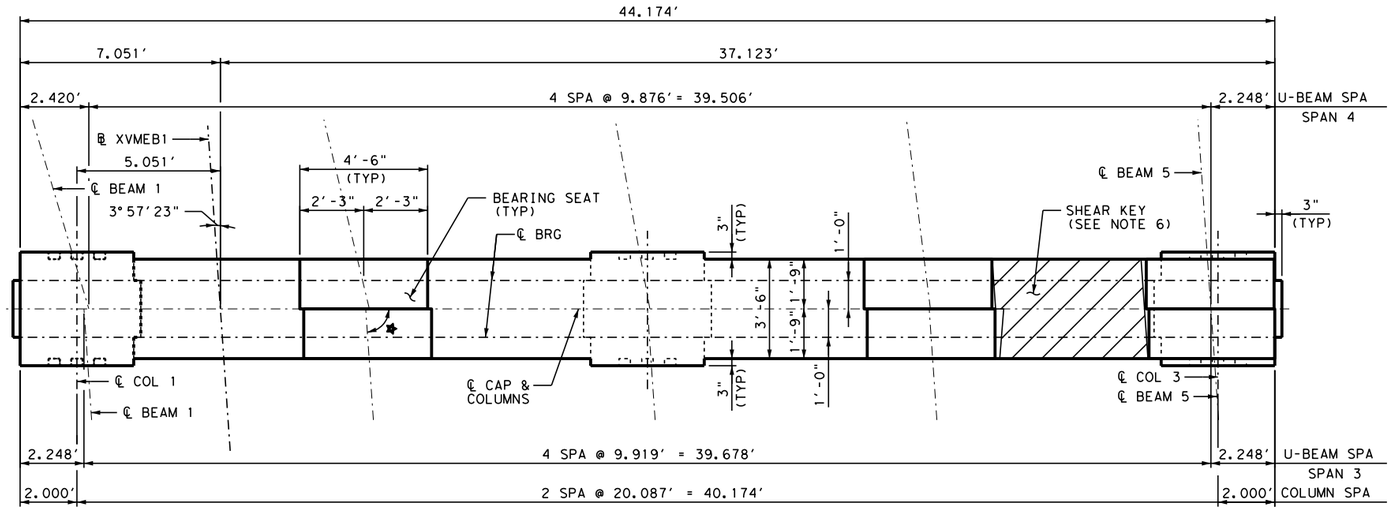
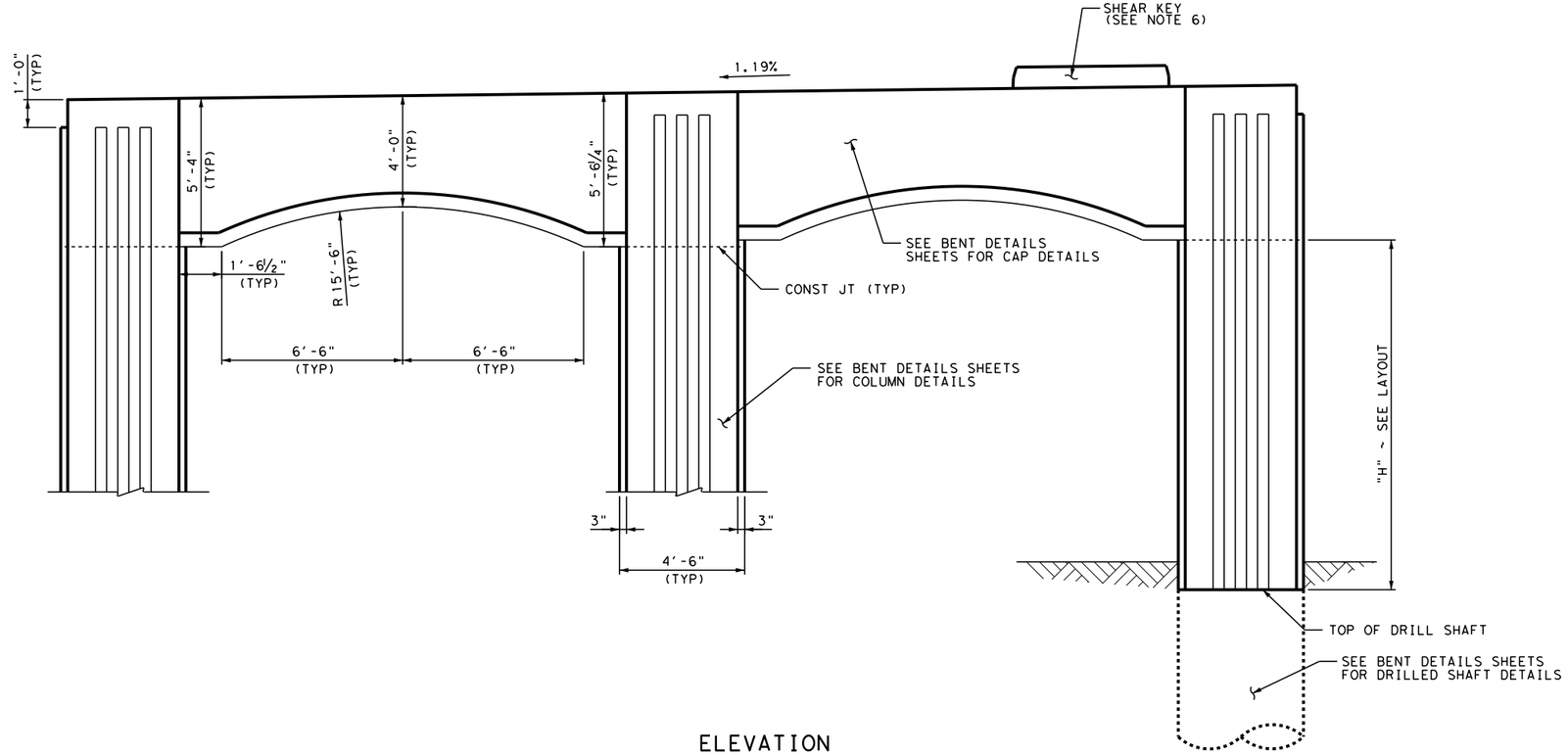


PLAN

SCALE: 3/16"=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).
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STATE OF TEXAS
QING LIU
91266
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6/6/2024

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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 4

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1265
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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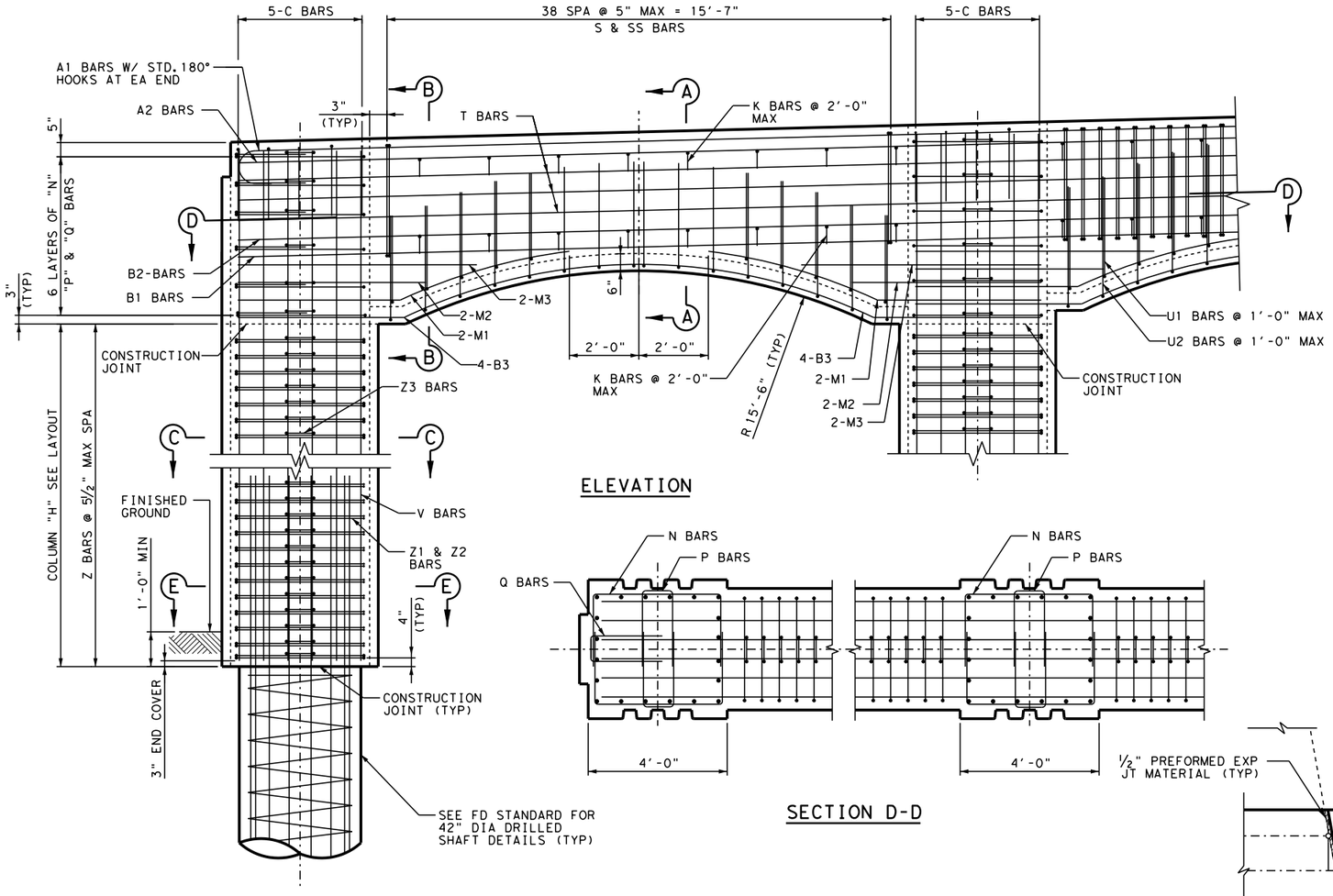
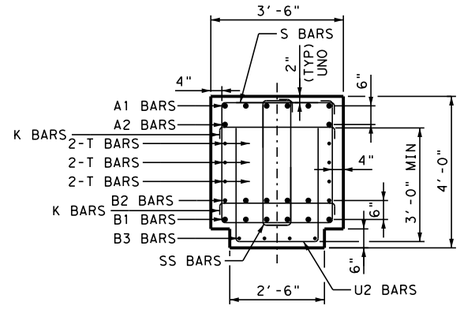
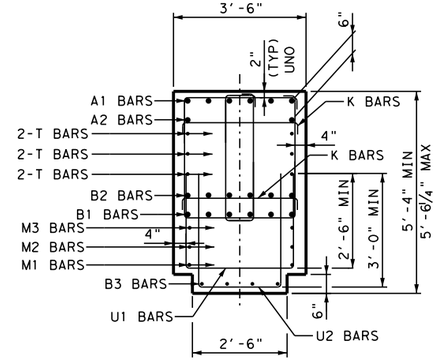


ELEVATION

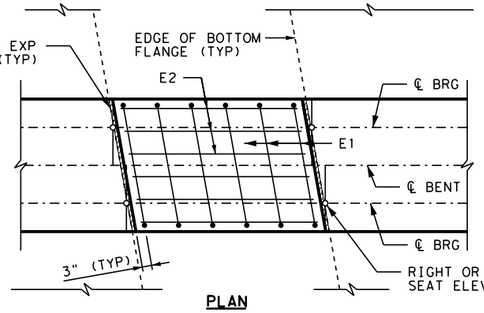
SECTION D-D



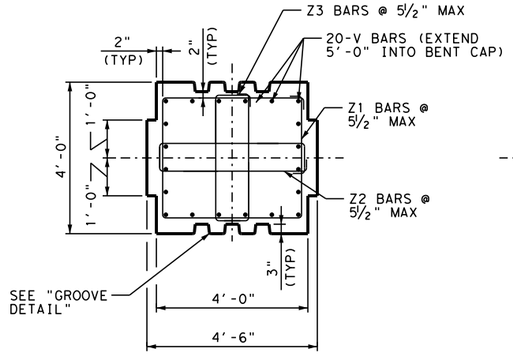
SECTION A-A



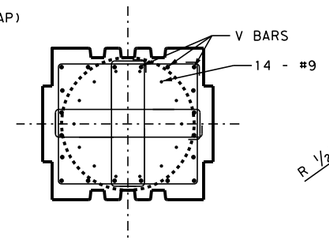
SECTION B-B
(AT FACE OF COLUMN)



PLAN



SECTION C-C



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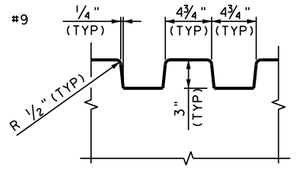
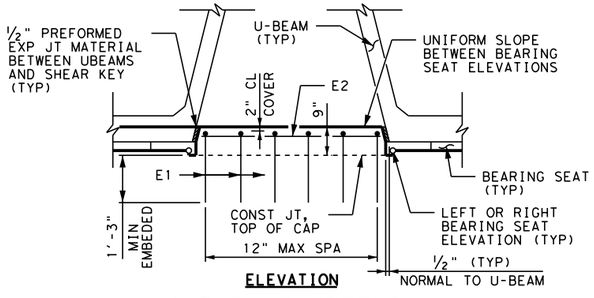


GROOVE DETAIL



ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL LICENSED ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENTS 3 & 4 DETAILS

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1266

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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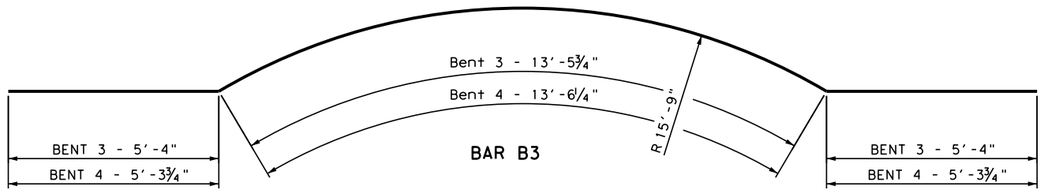

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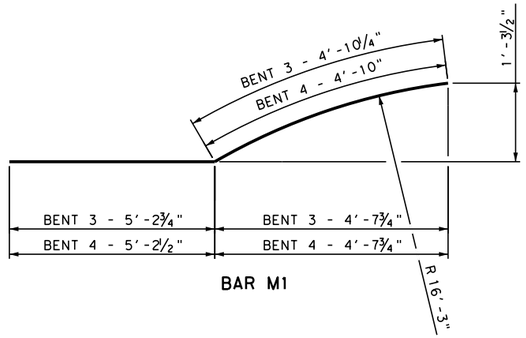

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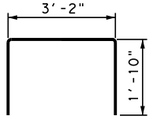

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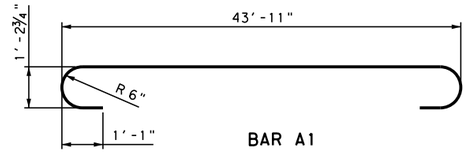

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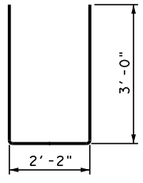

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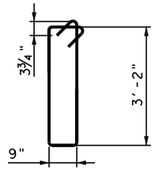
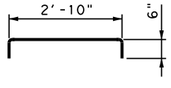
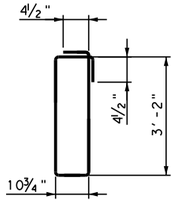


BAR SS



BAR K



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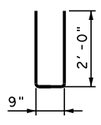
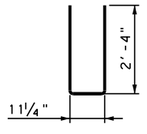
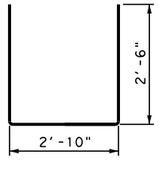


BAR Q



BAR P



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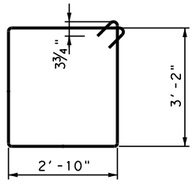

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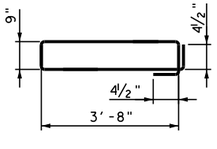
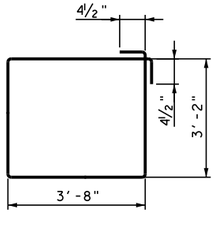


BAR Z2



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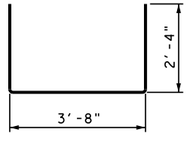

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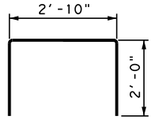

BAR C

TABLE OF QUANTITIES
BENT 3

TABLE OF QUANTITIES
BENT 4

CONSTANT QUANTITIES

BAR	NO.	SIZE	LENGTH	WEIGHT	BAR	NO.	SIZE	LENGTH	WEIGHT
A1	6	#11	47' -1"	1,499	A1	6	#11	47' -1"	1,499
A2	2	#11	43' -11"	466	A2	2	#11	43' -11"	466
B1	6	#11	43' -11"	1,398	B1	6	#11	43' -11"	1,398
B2	6	#11	43' -11"	1,398	B2	6	#11	43' -11"	1,398
B3	8	#8	24' -2"	516	B3	8	#8	24' -2"	516
C	15	#4	6' -10"	68	C	15	#4	6' -10"	68
E1	6	#5	6' -10"	43	E1	6	#5	6' -10"	43
E2	6	#5	4' -8"	31	E2	6	#5	4' -8"	31
K	36	#3	3' -10"	52	K	36	#3	3' -10"	52
M1	8	#8	10' -1"	215	M1	8	#8	10' -1"	214
M2	8	#8	5' -10"	124	M2	8	#8	5' -10"	124
M3	8	#8	7' -4"	155	M3	8	#8	7' -4"	155
N	36	#4	8' -4"	200	N	36	#4	8' -4"	200
P	36	#4	5' -8"	135	P	36	#4	5' -8"	135
Q	12	#4	4' -9"	38	Q	12	#4	4' -9"	38
S	78	#5	12' -11"	1,051	S	78	#5	12' -11"	1,051
SS	78	#5	8' -9"	712	SS	78	#5	8' -9"	712
T	6	#6	43' -11"	395	T	6	#6	43' -11"	395
U1	24	#4	7' -10"	126	U1	24	#4	7' -10"	126
U2	36	#4	8' -2"	196	U2	36	#4	8' -2"	196
SUBTOTAL STEEL (LBS)*				8,818	SUBTOTAL STEEL (LBS)*				8,817

VARIABLE QUANTITIES ①

	"H" = 15'					"H" = 15'			
V	60	#11	19' -9"	6,296	V	60	#11	19' -9"	6,296
Z1	99	#4	14' -5"	1,489	Z1	99	#4	14' -5"	1,489
Z2	99	#4	9' -7"	990	Z2	99	#4	9' -7"	990
Z3	99	#4	8' -11"	916	Z3	99	#4	8' -11"	916
CL "C" CONC (BENT) (HPC) (CY)				56.6	CL "C" CONC (BENT) (HPC) (CY)				56.6
SUBTOTAL STEEL (LBS)*				9,691	SUBTOTAL STEEL (LBS)*				9,691

* FOR CONTRACTOR'S INFORMATION ONLY.

① VARIABLE QUANTITIES ARE BASED ON COLUMN HEIGHTS "H" SHOWN.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER

10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENTS 3 & 4 DETAILS

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1267

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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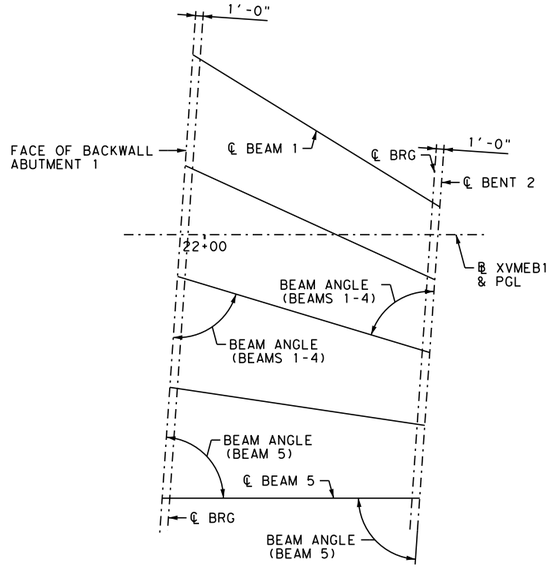

SPAN 1

U40 BEAMS

BENT REPORT

ABUT NO. 1 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 23.812 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	62 19 09
	BEAM	2	14.672	69 23 10
	BEAM	3	14.672	77 10 19
	BEAM	4	14.672	85 28 03
	BEAM	5	14.672	86 02 37
	TOTAL		58.688	

BENT NO. 2 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 3.673 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	62 19 09
	BEAM	2	9.637	69 23 10
	BEAM	3	9.637	77 10 19
	BEAM	4	9.637	85 28 03
	BEAM	5	9.637	86 02 37
	TOTAL		38.548	

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	38.303	36.044	37.77	-0.0007
BEAM 2	36.239	34.102	35.72	-0.0006
BEAM 3	34.787	32.736	34.28	-0.0021
BEAM 4	34.025	32.019	33.53	-0.0037
BEAM 5	34.000	31.995	33.50	-0.0052

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

ACUTE BEAM ANGLE SHOWN

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT SPAN 1

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1268
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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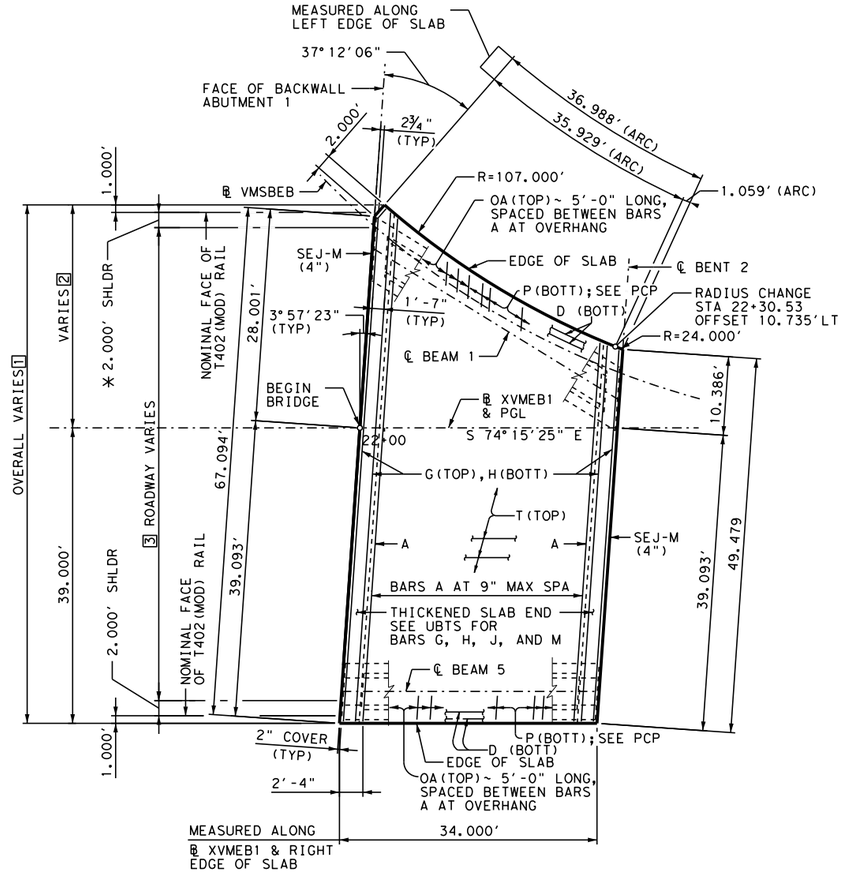
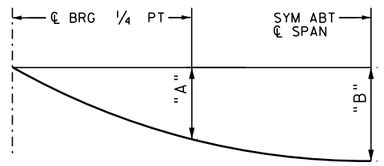


SPAN 1

PLAN



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM
NTS

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1	1	0.003	0.004
1	2-4	0.002	0.003
1	5	0.002	0.002

[1] 49.362' MIN, 68.440' MAX
[2] 10.362' MIN, 29.440' MAX
[3] 43.402' MIN, 62.685' MAX
✳ MEASURED RADIAL TO ℄ VMSBEB

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 9TH EDITION(2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP AND PCP-FAB STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T.

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c= 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS:

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.
TRAFFIC RAIL DETAILS TYPE T402(MOD).

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS:
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

34.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1269
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 6/6/2024 3:17:09 PM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

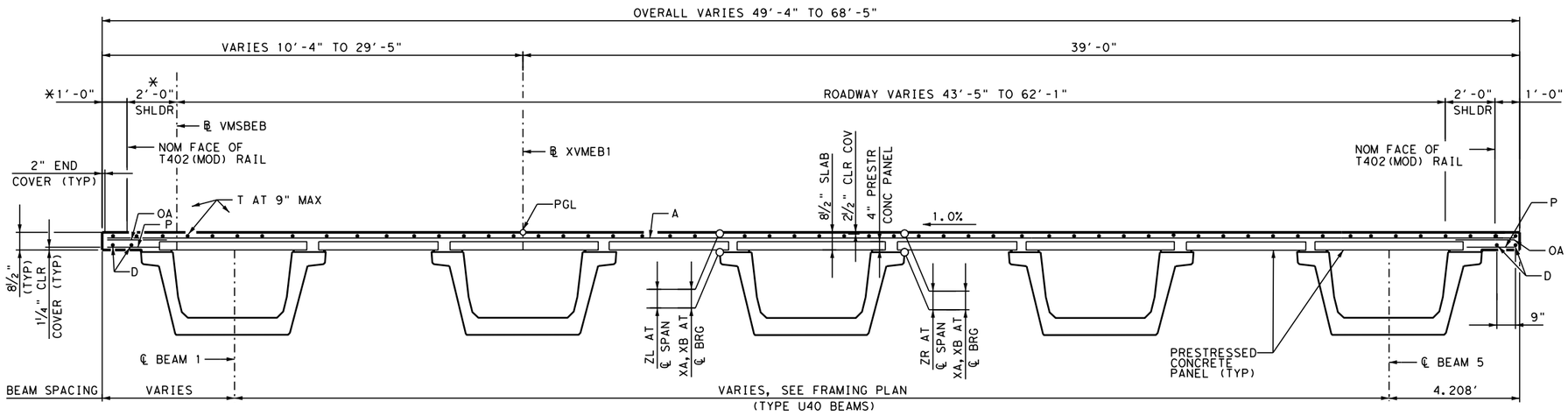
TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U40)	① REINFORCING STEEL
	SF	LF	LB
1	1,974	174.8	7,304
TOTAL	1,974	174.8	7,304

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.

* MEASURED RADIAL TO ℄ VMSBEB



TYPICAL TRANSVERSE SECTION

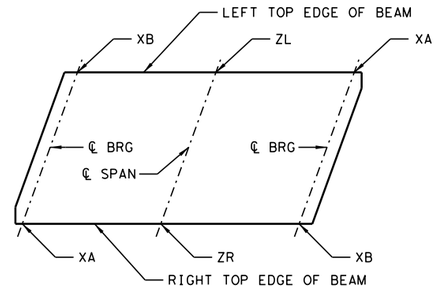
BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN ** (IN)	"ZR" AT ℄ SPAN ** (IN)
1	ALL	10 ½	10 ½	10 ⅜	10 ⅜

** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

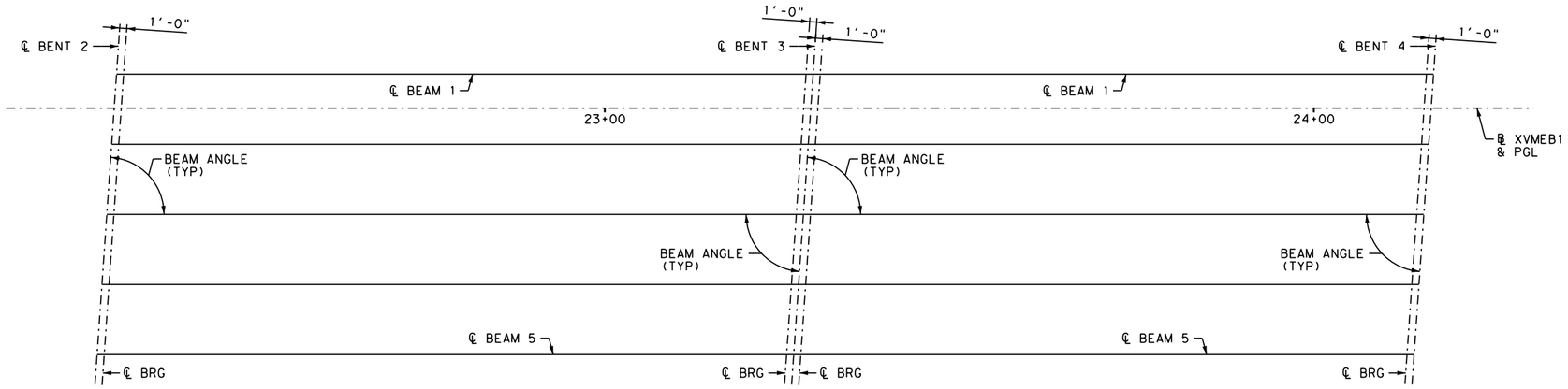
34.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1270

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



SPAN 2
U40 BEAMS

SPAN 3
U40 BEAMS

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

ACUTE BEAM ANGLE SHOWN

BENT REPORT

BENT NO. 2 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 4.803 L

		BEAM	BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	2	BEAM 1	0.000	86 02 37
		BEAM 2	9.919	86 02 37
		BEAM 3	9.919	86 02 37
		BEAM 4	9.919	86 02 37
		BEAM 5	9.919	86 02 37
		TOTAL	39.676	

BENT NO. 3 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 4.803 L

		BEAM	BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	2	BEAM 1	0.000	86 02 37
		BEAM 2	9.919	86 02 37
		BEAM 3	9.919	86 02 37
		BEAM 4	9.919	86 02 37
		BEAM 5	9.919	86 02 37
		TOTAL	39.676	

BENT REPORT

BENT NO. 3 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 4.803 L

		BEAM	BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	3	BEAM 1	0.000	86 02 37
		BEAM 2	9.919	86 02 37
		BEAM 3	9.919	86 02 37
		BEAM 4	9.919	86 02 37
		BEAM 5	9.919	86 02 37
		TOTAL	39.676	

BENT NO. 4 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 4.803 L

		BEAM	BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	3	BEAM 1	0.000	86 02 37
		BEAM 2	9.919	86 02 37
		BEAM 3	9.919	86 02 37
		BEAM 4	9.919	86 02 37
		BEAM 5	9.919	86 02 37
		TOTAL	39.676	

BEAM REPORT

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	98.250	96.245	97.76	-0.0123
BEAM 2	98.250	96.245	97.76	-0.0122
BEAM 3	98.250	96.245	97.76	-0.0121
BEAM 4	98.250	96.245	97.76	-0.0120
BEAM 5	98.250	96.245	97.76	-0.0120

BEAM REPORT

BEAM REPORT, SPAN 3

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	87.500	85.495	87.02	-0.0234
BEAM 2	87.500	85.495	87.02	-0.0233
BEAM 3	87.500	85.495	87.02	-0.0232
BEAM 4	87.500	85.495	87.02	-0.0232
BEAM 5	87.500	85.495	87.02	-0.0231

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

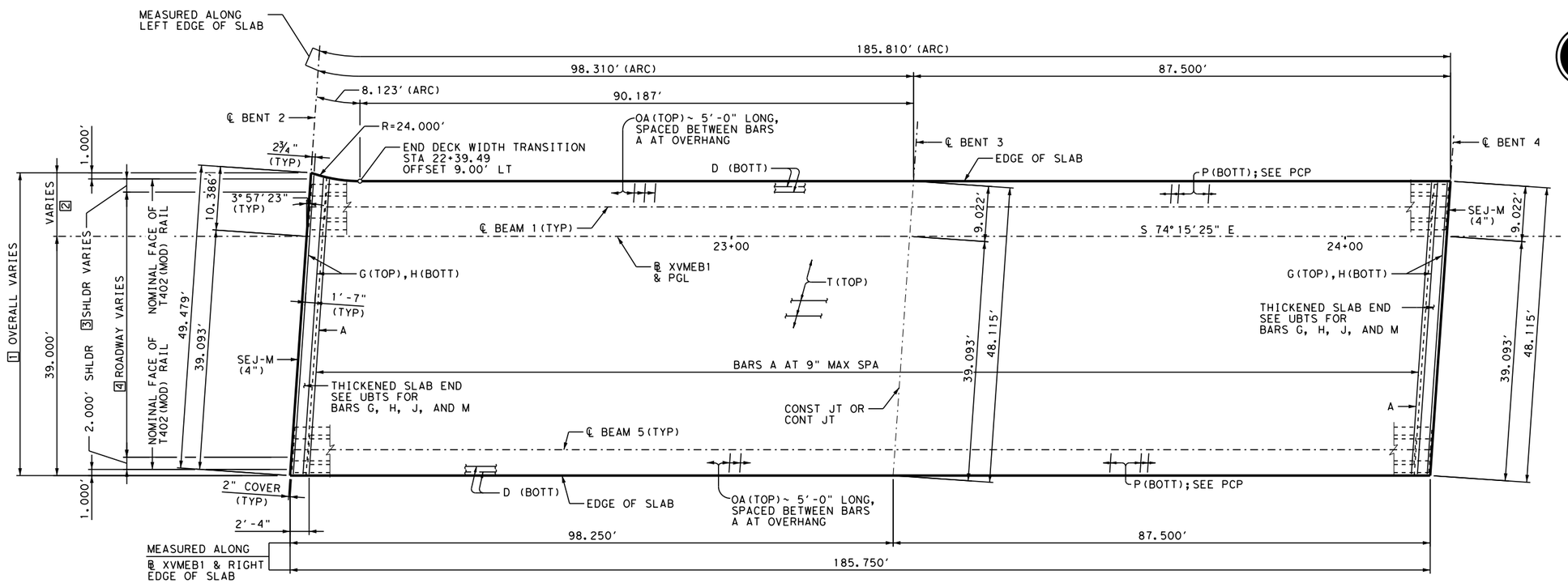
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT SPANS 2 & 3

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1271
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



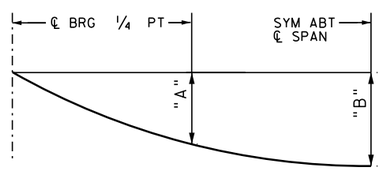
1 48.000' MIN/USUAL, 49.362' MAX
2 9.000' MIN/USUAL, 10.362' MAX
3 2.151' MIN, 8.000' MAX/USUAL
4 36.000' MIN/USUAL, 43.402' MAX

SPAN 2

SPAN 3

PLAN

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
2	1	0.120	0.171
2	2-4	0.130	0.185
2	5	0.121	0.172
3	1	0.075	0.106
3	2-4	0.081	0.115
3	5	0.075	0.107



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 9TH EDITION(2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP AND PCP-FAB STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T.

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c= 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS:

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.
TRAFFIC RAIL DETAILS TYPE T402(MOD).

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
6/6/2024

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

185.750' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1272
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\04_EB Valley Mills\BRLD5_03VM_EB_003.dgn
DATE: 6/6/2024 3:17:13 PM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

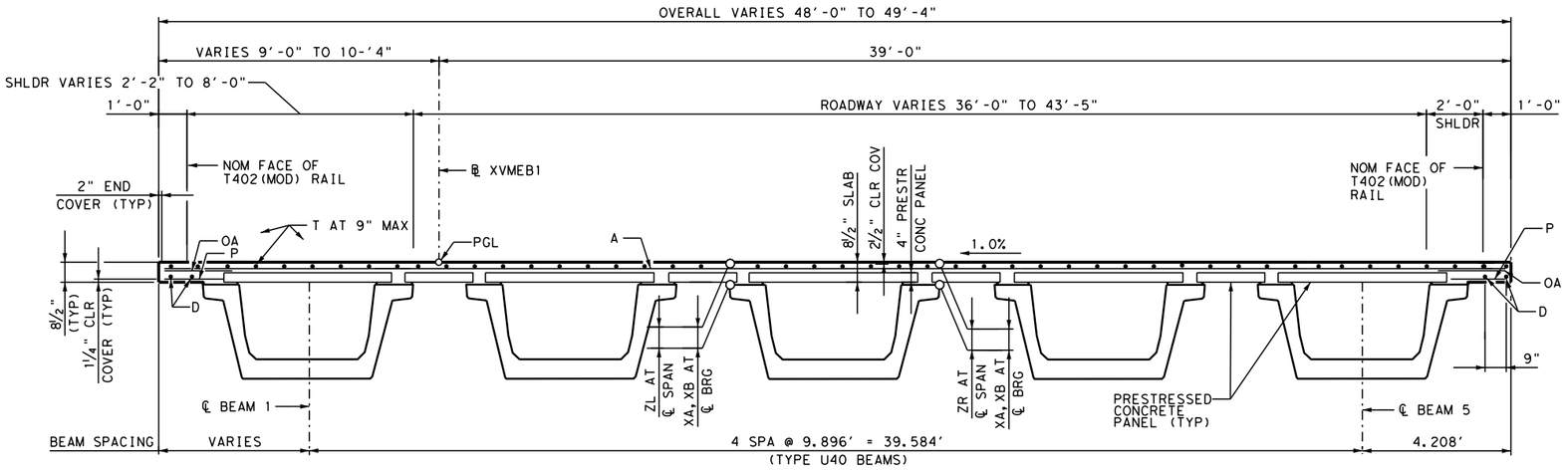
③ SEE PRESTRESSED CONCRETE PANELS (PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U40)	① REINFORCING STEEL
	SF	LF	LB
2	4,720	488.8	17,464
3	4,200	435.1	15,540
TOTAL	8,920	923.9	33,004

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.



TYPICAL TRANSVERSE SECTION

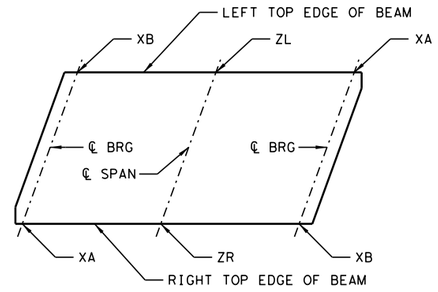
BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN * (IN)	"ZR" AT ℄ SPAN * (IN)
2	1&5	10 ½	10 ½	11 ⅛	11 ⅛
2	2-4	10 ½	10 ½	11 ¼	11 ¼
3	1&5	10 ½	10 ½	11	11
3	2-4	10 ½	10 ½	11 ⅛	11 ⅛

* THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

185.750' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1273

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\04_EB Valley Mills\BRLD5_03VM_EB_004.dgn
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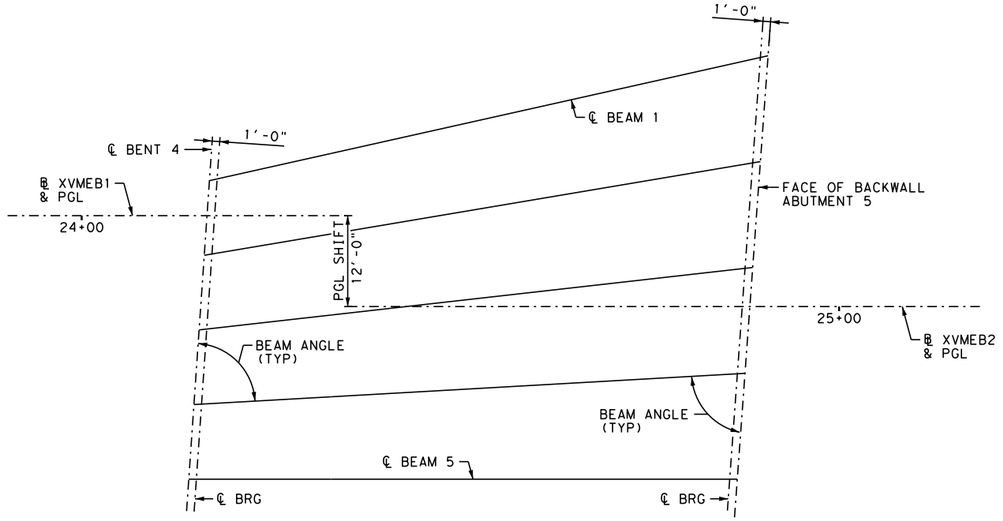

SPAN 4

U40 BEAMS

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

ACUTE BEAM ANGLE SHOWN

BENT REPORT

BENT NO. 4 (N 19 41 58 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 4.631 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 4	BEAM	1	0.000	73 26 28
	BEAM	2	9.876	76 28 56
	BEAM	3	9.876	79 36 26
	BEAM	4	9.876	82 48 01
	BEAM	5	9.876	86 02 37
	TOTAL		39.504	

ABUT NO. 5 (N 19 54 08 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 33.198 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 4	BEAM	1	0.000	73 14 18
	BEAM	2	14.012	76 16 46
	BEAM	3	14.012	79 24 16
	BEAM	4	14.012	82 35 51
	BEAM	5	14.012	85 50 27
	TOTAL		56.048	

BEAM REPORT

BEAM REPORT, SPAN 4

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	75.579	73.492	75.12	-0.0383
BEAM 2	74.458	72.400	74.00	-0.0379
BEAM 3	73.552	71.518	73.10	-0.0373
BEAM 4	72.870	70.854	72.41	-0.0366
BEAM 5	72.419	70.414	71.96	-0.0358

STATE OF TEXAS
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NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT SPAN 4

IH 35 UNDERPASS AT LP 396 EB
(VALLEY MILLS DRIVE)

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1274
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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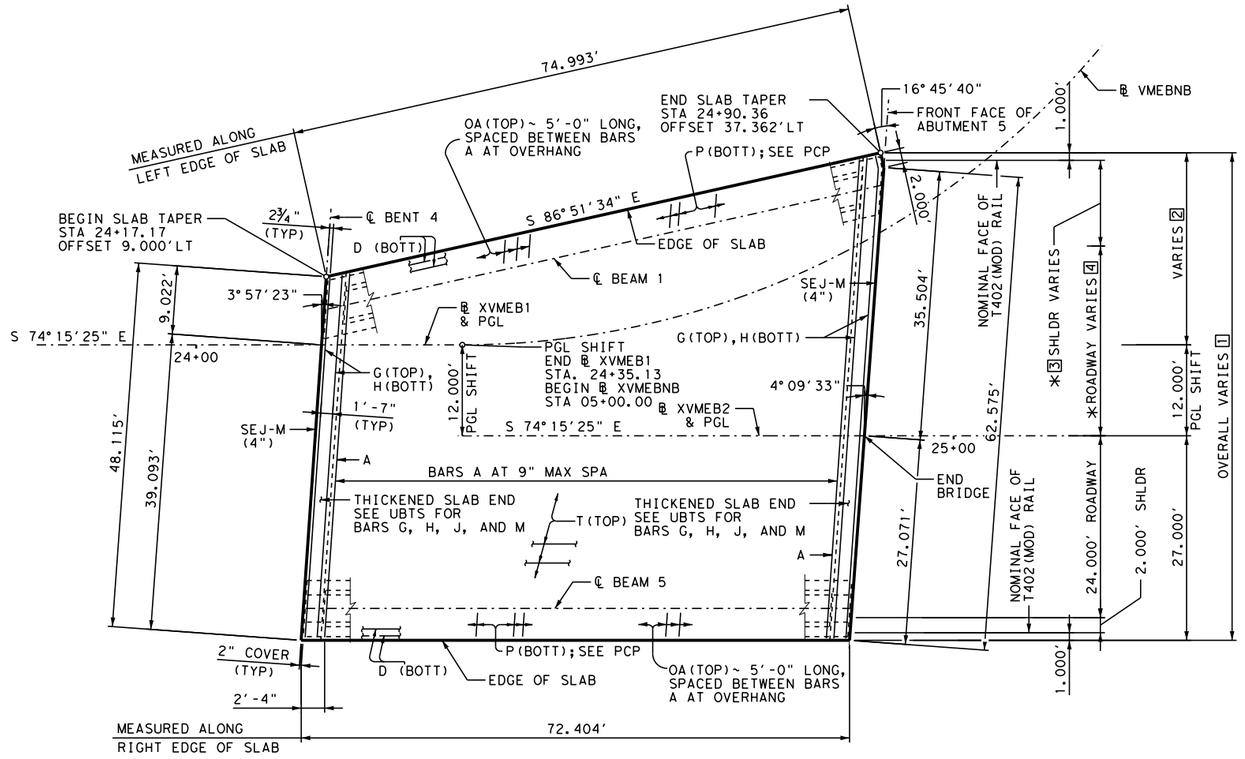
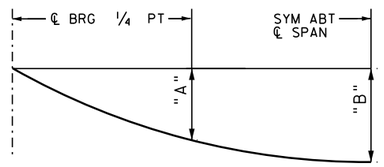


1 48.000 MIN, 64.362' MAX
2 9.000' MIN, 25.362' MAX
3 8.000' MIN, 14.352' MAX
4 12.000' MIN, 23.051' MAX
* MEASURED RADIAL TO ℄ VMEBNB

SPAN 4

PLAN

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
4	1	0.045	0.064
4	2	0.048	0.069
4	3	0.047	0.067
4	4	0.045	0.065
4	5	0.038	0.054



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 9TH EDITION(2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP AND PCP-FAB STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T.

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c= 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS:

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.
TRAFFIC RAIL DETAILS TYPE T402(MOD).

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

71.670' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1275
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

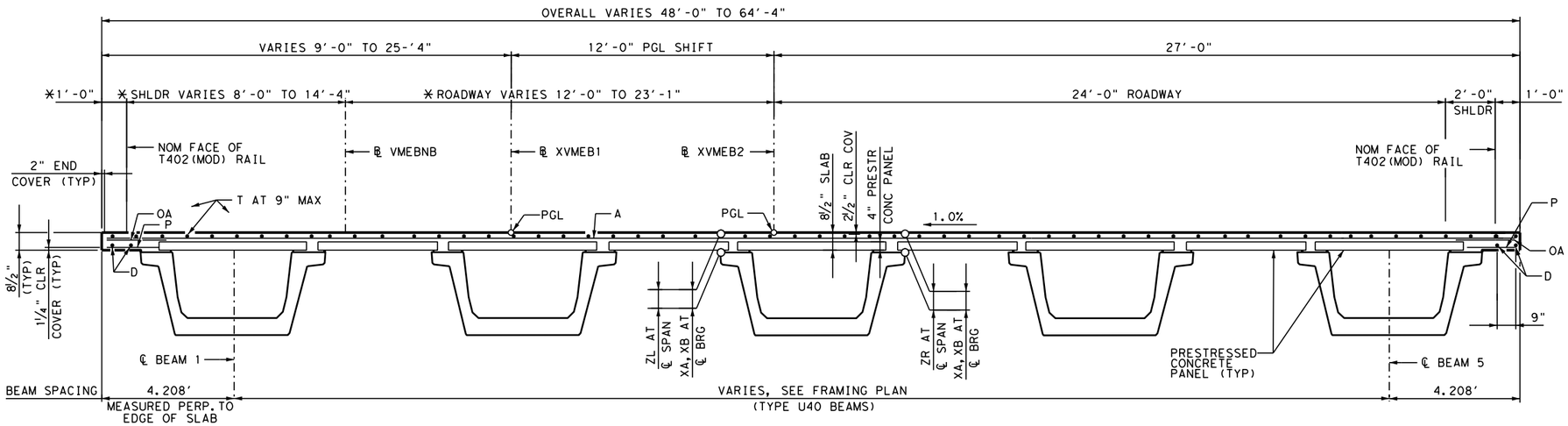
TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U40)	① REINFORCING STEEL
	SF	LF	LB
4	4,077	366.6	15,085
TOTAL	4,077	366.6	15,085

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.

* MEASURED RADIAL TO ℄ VMEBNB



TYPICAL TRANSVERSE SECTION

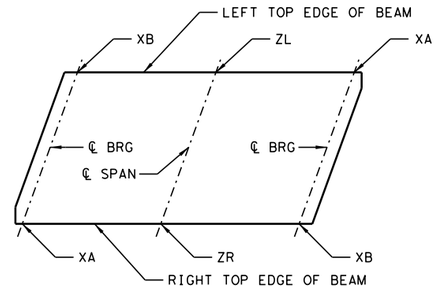
BAR TABLE

BAR	SIZE
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
M	#4
OA	#5
P	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN ** (IN)	"ZR" AT ℄ SPAN ** (IN)
4	1	10 1/2	10 3/4	13 1/8	13 1/8
4	2	10 1/2	10 3/4	13 1/8	13 1/8
4	3	10 1/2	10 3/4	13	13
4	4	10 1/2	10 3/4	13	12 7/8
4	5	10 1/2	10 3/4	12 3/4	12 5/8

** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

71.670' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1276
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

DATE: DATE TIME
FILE: DOCUMENT NAME

DESIGNED BEAMS (STRAIGHT STRANDS)

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH fpu (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)	PRESTRESSING STRANDS: TOT NO. DEB	DEBONDED STRAND PATTERN PER ROW: DIST FROM BOTTOM (in)	DEBONDED STRAND PATTERN PER ROW: NO.OF STRANDS TOTAL	DEBONDED STRAND PATTERN PER ROW: NO.OF STRANDS DE-BONDED	DEBONDED STRAND PATTERN PER ROW: NUMBER OF STRANDS DEBONDED TO (ft from end) 3	6	9	12	15	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)	1	ALL	U40		12	0.6	270	14.18	14.18											4.000	5.000
	2	ALL	U40		43	0.6	270	13.45	13.20	15	2.17	27	13	0	7	2	2	2		5.100	6.900
											4.14	16	2	2	2	0	0	0			
	3	ALL	U40		33	0.6	270	13.82	13.67	10	2.17	27	10	2	6	2	0	0		4.400	5.300
	4	ALL	U40		26	0.6	270	14.18	14.18	6	2.17	26	6	4	2	0	0	0		4.400	5.000

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)	1	0.713	-0.750	2159	0.988	1.218
	2	4.361	-3.726	6465	0.648	0.920
	3	3.464	-3.009	5344	0.668	0.930
	4	2.753	-2.496	4640	0.799	1.092

LOAD RATING FACTORS

STRUCTURE	SPAN NO.	STRENGTH I Inv	STRENGTH I Opr	SERVICE III Inv
IH 35 UNDERPASS AT LP 396 EB (VALLEY MILLS DRIVE)	1	1.95	2.53	3.25
	2	1.73	2.27	1.10
	3	1.42	2.11	1.08
	4	1.34	1.83	1.12

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation.

Optional designs must have a calculated residual camber equal to or greater than that of the designed beam.

Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

The grid pattern for the strands is based on exact conversions from a metric grid spacing of 50mm.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

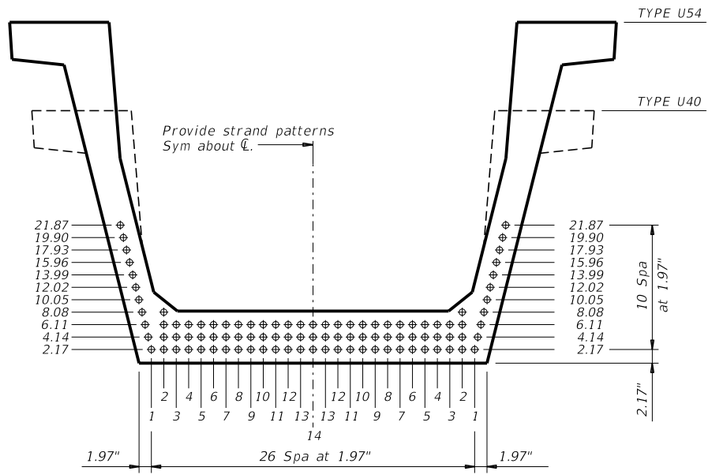
When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

Locate strands for the designed beam as low as possible on the 1.97" grid system unless a non-standard stand pattern is indicated. Fill row "2.17", then row "4.14", then row "6.11", etc., beginning each row in the "1" position and, distributing uniformly as practical, working inward until the required number of strands is reached.

Strand debonding must comply with Item 424.4.2.2.2.4.

Do not debond strands in position "1". Distribute debonded strands equally about the vertical centerline. Decrease debonded lengths working inward, with debonding staggered in each row.

Full-length debonded strands are not permitted in positions "1" and "2".



TxDOT TYPE U54 & TYPE U40 BMS

HL93 LOADING

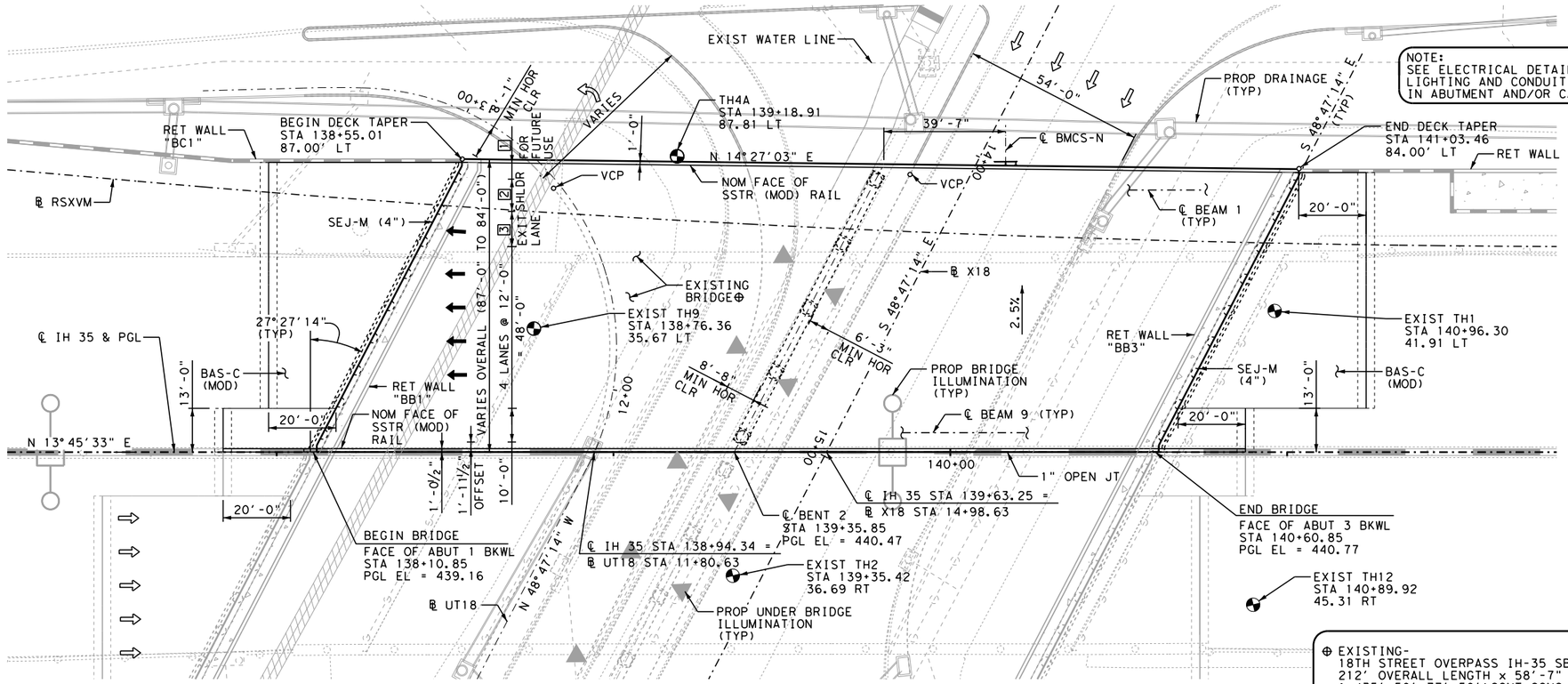
Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE U-BEAM DESIGNS (DESIGN DATA)

UBND

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
10/17/2023

FILE: ubstds04-22.dgn	DN: TxDOT	CK: TxDOT	DW: SFS	CK: SDB
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
01-16: Notes. 03-22: Added Load Rating.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1277



PLAN

⊕ EXISTING-
18TH STREET OVERPASS IH-35 SB LANE
212' OVERALL LENGTH x 58'-7" WIDTH
1-(35'-50'-77'-50')CONT CONC GIR UNIT
57' RDWY 28°30' LFS ON CONCRETE
COLUMNS - TO BE REMOVED.

NOTE:
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT AND/OR CAPS.

0' 10' 20' 40'

GENERAL NOTES

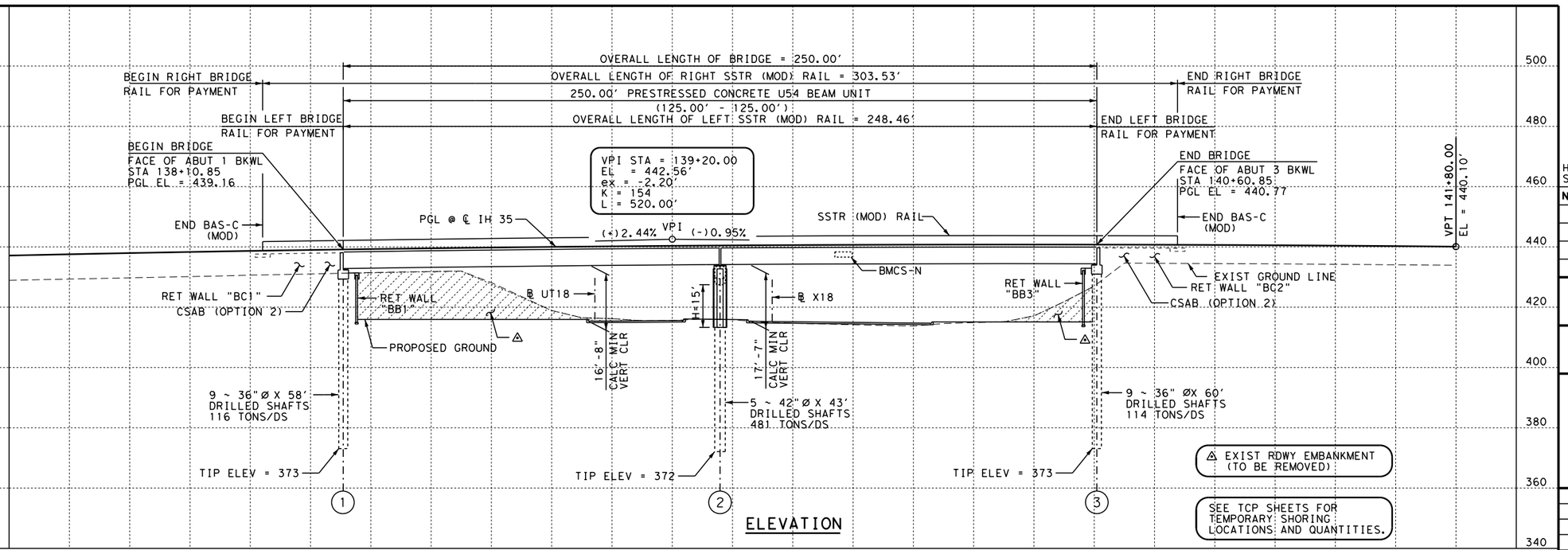
1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUT FOR EXISTING STRUCTURE CSJ 0015-01-123,1989 BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. FOR BRIDGE TYPICAL SECTIONS, SEE "PHASED TYPICAL SECTIONS" SHEET.
6. VCP: CRITICAL VERTICAL CLEARANCE POINT.
7. DRILLED SHAFT SHALL BE FOUNDED AT ELEVATION SHOWN OR DEEPER TO ATTAIN A MINIMUM OF TWO DIAMETER PENETRATION INTO LIMESTONE.
8. FOR PROP ILLUMINATION POLE MOUNTED TO SSTR RAIL AT ℄ IH 35, SEE "SPECIAL MODIFICAITON TO TYPE SSTR RAIL" SHEET.

FUNCT. CLASS = INTERSTATE
DESIGN SPEED = 60 MPH
PROP ADT (2026) = 80115
(2046) = 109240

EXISTING NBI NO = 09-161-0-0015-01-261
EXISTING PSN NO = 261

NEW NBI NO = 09-161-0-0015-01-820
NEW PSN NO = 820

[1] 5'-0" MIN TO 12'-0" MAX
[2] 7'-8¾"± MIN TO 8'-10½"± MAX
[3] 12'-3¼"± MAX TO 1'-1½"± MIN



ELEVATION

⚠ EXIST RDWY EMBANKMENT (TO BE REMOVED)

SEE TCP SHEETS FOR TEMPORARY SHORING LOCATIONS AND QUANTITIES.

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.01/2.35

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
6/6/2024

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT

IH 35 SB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1278
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRLY5_0518_SB_001.dgn
DATE: 6/6/2024 3:17:18 PM
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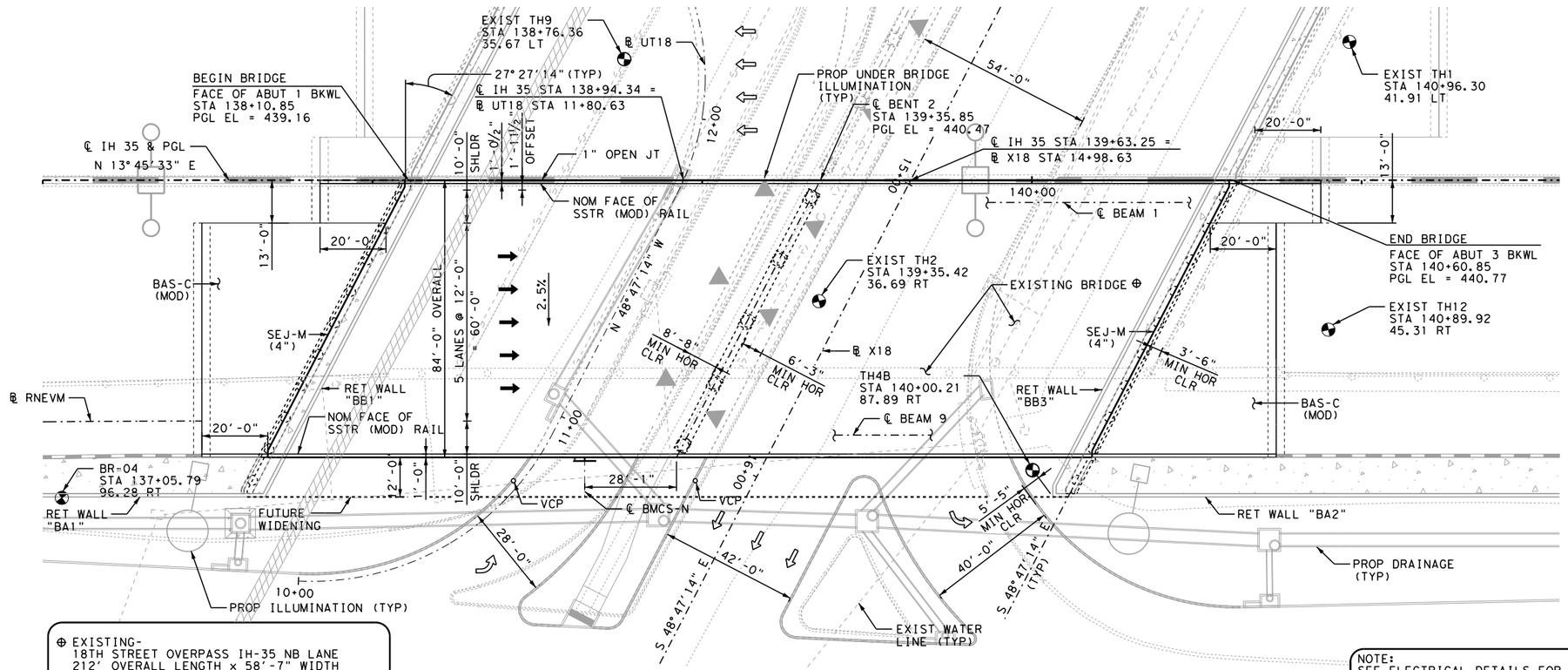
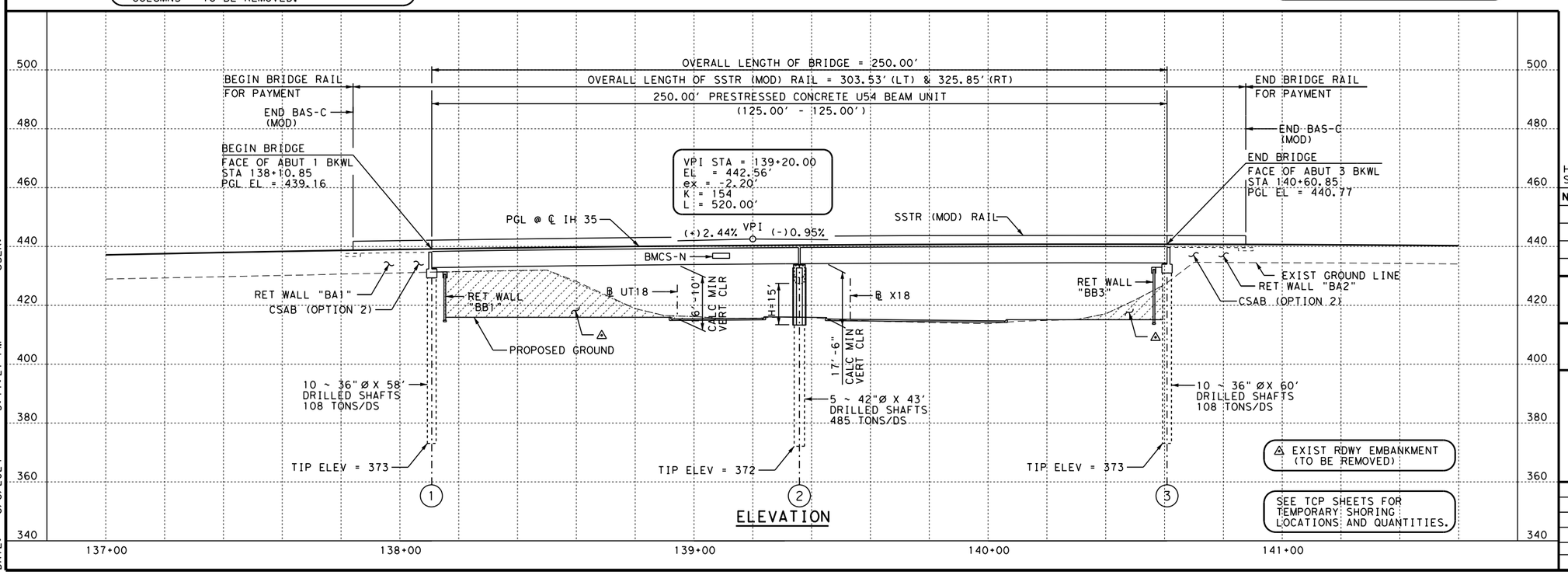


PLAN

⊕ EXISTING-
18TH STREET OVERPASS IH-35 NB LANE
212' OVERALL LENGTH x 58'-7" WIDTH
1-(35'-50'-77'-50')CONT CONC GIR UNIT
57' RDWY 28°30' LFS ON CONCRETE COLUMNS - TO BE REMOVED.

NOTE:
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT AND/OR CAPS.



ELEVATION

⚠ EXIST RDWY EMBANKMENT (TO BE REMOVED)

SEE TCP SHEETS FOR TEMPORARY SHORING LOCATIONS AND QUANTITIES.

0' 10' 20' 40'

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUT FOR EXISTING STRUCTURE CSJ 0015-01-123,1989 BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. FOR BRIDGE TYPICAL SECTIONS, SEE "PHASED TYPICAL SECTIONS" SHEET.
6. VCP: CRITICAL VERTICAL CLEARANCE POINT.
7. DRILLED SHAFT SHALL BE FOUNDED AT ELEVATION SHOWN OR DEEPER TO ATTAIN A MINIMUM OF TWO DIAMETER PENETRATION INTO LIMESTONE.
8. FOR PROP ILLUMINATION POLE MOUNTED TO SSTR RAIL AT ℄ IH 35, SEE "SPECIAL MODIFICAITON TO TYPE SSTR RAIL" SHEET.

FUNCT. CLASS = INTERSTATE
DESIGN SPEED = 60 MPH
PROP ADT (2026) = 69540
(2046) = 94545

EXISTING NBI NO = 09-161-0-0015-01-262
EXISTING PSN NO = 262

NEW NBI NO = 09-161-0-0015-01-821
NEW PSN NO = 821

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
6/6/2024

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.08/2.40

NO.	DATE	REVISION	APPROVED

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The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT

IH 35 NB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1279
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRLY5_0518_NB_001.dgn
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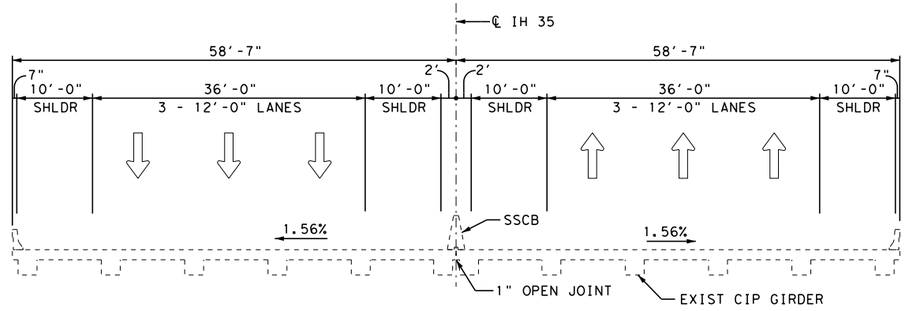
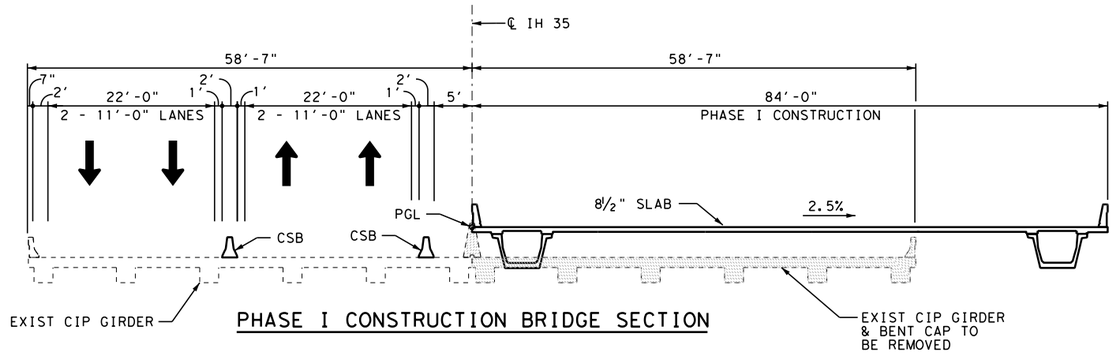
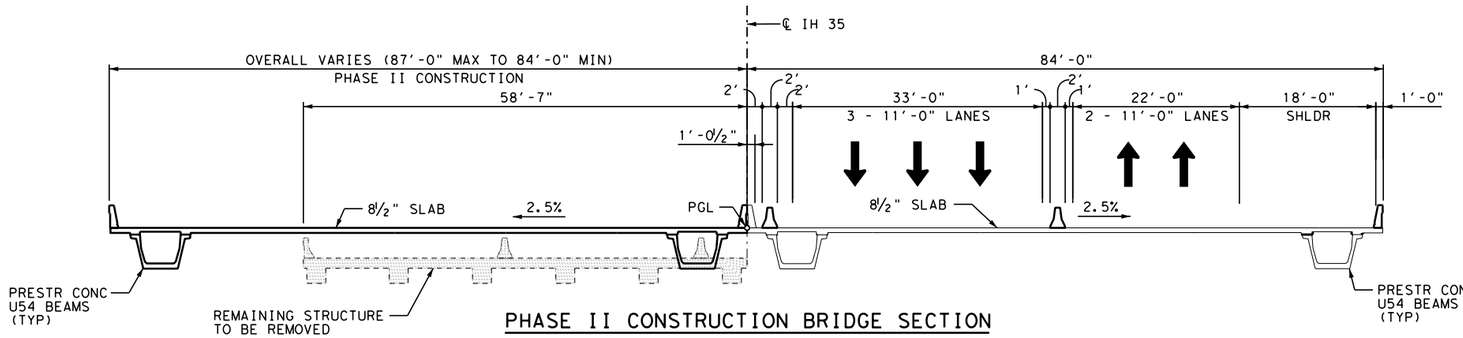


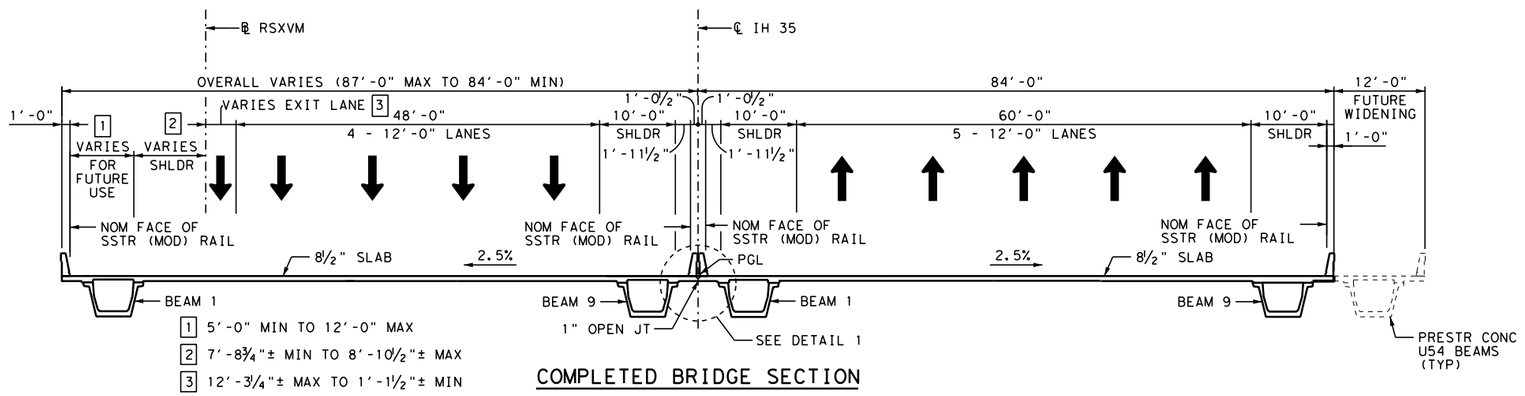
EXISTING BRIDGE SECTION



PHASE I CONSTRUCTION BRIDGE SECTION



PHASE II CONSTRUCTION BRIDGE SECTION

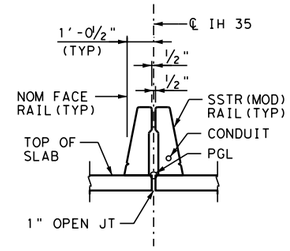


1 5′-0" MIN TO 12′-0" MAX

2 7′-8¾"± MIN TO 8′-10½"± MAX

3 12′-3¼"± MAX TO 1′-1½"± MIN

COMPLETED BRIDGE SECTION



DETAIL 1

NOTES:

1. ALL DIMENSIONS SHOWN ARE PERPENDICULAR TO PROPOSED AND EXISTING ℄ IH 35.

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
7/25/2024

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

PHASED TYPICAL SECTIONS

IH 35 SB & NB OVERPASS
AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1280
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRTY5_0518_001.dgn
DATE: 7/25/2024 12:39:49 PM
USER:

TEST HOLE NO. 4A
STA 139+18.91, 87.81 LT

T/H EL = 417.76

8(6) 7(6)	CLAY, LEAN, SOFT, LIGHT BROWN
11(6) 12(6)	
8(6) 14(6)	CLAY, FAT, STIFF, REDDISH BROWN
50(1) 50(.5)	SAND, REDDISH BROWN, WITH GRAVEL
50(.25) 50(.25)	LIMESTONE, VERY HARD, GRAY
50(.5) 50(.5)	
50(.25) 50(.25)	
50(.5) 50(.5)	

TEST HOLE 4A
B/H EL = 377.26

TEST HOLE NO. 4B
STA 140+00.21, 87.89 RT

T/H EL = 414.31

9(6) 13(6)	CLAY, FAT, STIFF, BROWN, WITH SAND
12(6) 12(6)	CLAY, SANDY FAT, STIFF, LIGHT BROWN
5(6) 5(6)	
4(6) 4(6)	CLAY, FAT, SOFT, REDDISH BROWN
3(6) 3(6)	CLAY, SANDY LEAN, SOFT, REDDISH BROWN
3(6) 5(6)	
50(1) 50(.5)	SAND, LOOSE, BROWN, WITH GRAVEL
50(.125) 50(.125)	LIMESTONE, VERY HARD, GRAY
50(.25) 50(.25)	
50(.25) 50(.25)	
50(.25) 50(.125)	

TEST HOLE 4B
B/H EL = 358.81

TEST HOLE NO. TH1
STA 140+96.30, 41.91 LT

T/H EL = 417.00

	CLAY
	CLAY, W/ GRAVEL
	CLAY, W/ SAND
	CLAY
50(6) 50(6)	CLAY, W/ SHALE
50(3) 50(1.74)	LIMESTONE
50(.25) 50(.5)	
50(1) 50(.5)	
50(.5) 50(.75)	

EXIST TEST HOLE TH1
B/H EL = 371.50

TEST HOLE NO. TH2
STA 139+35.42, 36.69 RT

T/H EL = 417.00

	CLAY, SHALEY, SOFT, LIGHT GREY W/ LIGHT YELLOW STREAKS
18(6) 21(6)	CLAY, W/ TRACE OF SMALL GRAVEL & SMALL WHITE PEBBLES, SOFT, DULL BROWN
20(6) 18(6)	CLAY, SOFT, DULL RED, W/ TRACE OF GRAVEL
	CLAY, SOFT, LIGHT BROWN, W/ TRACE OF SAND
24(6) 22(6)	SAND, UNCEMENTED, LIGHT BROWN, WATER BEARING
50(1) 50(.25)	LIMESTONE, HARD, LIGHT GREY
50(1) 50(.2)	
50(1.75) 50(1.5)	SHALE, FIRM, LIGHT GREY
50(1.5) 50(.25)	LIMESTONE, HARD, LIGHT GREY
50(.625) 50(.125)	
50(1) 50(.25)	

EXIST TEST HOLE TH2
B/H EL = 371.50

TEST HOLE NO. TH9
STA 138+76.36, 35.67 LT

T/H EL = 419.00

	CLAY, W/ A TRACE OF FINE GRAVEL, SOFT, BLACK
	CLAY, W/ SMALL WHITE PEBBLES, SOFT, LIGHT BROWN
	CLAY, W/ TRACE OF SMALL GRAVEL & SMALL WHITE PEBBLES, SOFT, DULL BROWN
50(.625) 50(.25)	CLAY, SHALEY, SOFT, LIGHT GREY W/ LIGHT YELLOW STREAKS
	CLAY, SHALEY, FIRM, DULL GREY, W/ LIGHT GREY STREAKS
50(.5) 50(.25)	
50(.75) 50(.375)	LIMESTONE, HARD, LIGHT GREY

EXIST TEST HOLE TH9
B/H EL = 393.50

TEST HOLE NO. TH12
STA 140+89.92, 45.31 RT

T/H EL = 418.00

	CLAY, WITH A TRACE OF FINE GRAVEL, SOFT, BLACK
	CLAY, WITH SMALL WHITE PEBBLES, SOFT, LIGHT BROWN
	CLAY, WITH A TRACE OF SMALL GRAVEL AND SMALL WHITE PEBBLES, SOFT, DULL BROWN
	GRAVEL, WITH A TRACE OF CLAY, SOFT, BROWN
	CLAY, SHALE, SOFT, LIGHT GRAY
50(3) 22(6)	LIMESTONE, HARD, LIGHT GRAY
	SAND, UNCEMENTED, LIGHT BROWN, WATER BEARING
50(1.75) 50(.5)	CLAY, SOFT, LIGHT BROWN, WITH TRACE SAND
	SHALE, FIRM DARK GRAY, WITH LIGHT GRAY SPOTS
50(1) 50(.125)	LIMESTONE, HARD, LIGHT GRAY
50(1) 50(.25)	

EXIST TEST HOLE TH12
B/H EL = 363.00

NOTE

1. FOR TEST HOLE BR-04, SEE "TEST HOLE DATA NORTHBOUND" SHEETS.

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TEST HOLE DATA

IH 35 SB & NB OVERPASS
AT 18TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1281

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRLS5_0518_001.dgn
DATE: 10/17/2023 11:54:45 AM USER:

SUMMARY OF ESTIMATED QUANTITIES

	ITEM - DESCRIPTION CODE	400 6005	416 6004	416 6005	420 6012	420 6014	420 6026	422 6001	422 6015	425 6028	450 6062	454 6018
	ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)	CL B CONC (MISC)	CL C CONC (ABUT) (HPC)	CL C CONC (BENT) (HPC)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC U-BEAM (U54)	RAIL (TY SSTR) (MOD)	SEALED EXPANSION JOINT (4 IN) (SEJ-M)
		CY	LF	LF	CY	CY	CY	SF	CY	LF	LF	LF
SBML	2-ABUTMENTS	469	1,062			109.1			273.6			189
SBML	1-INTERIOR BENT			215			105.1					
SBML	1-250.00' PRESTR CONC U-BEAM UNIT							21,362		2,233.52	552.0	
SBML												
SBML												
SBML												
	SBML TOTAL	469	1,062	215	0.0	109.1	105.1	21,362	273.6	2,233.52	552.0	189
NBML	2-ABUTMENTS	546	1,180		1.0	122.6			269.9			186
NBML	1-INTERIOR BENT			215			104.4					
NBML	1-250.00' PRESTR CONC U-BEAM UNIT							20,990		2,240.55	629.4	
NBML												
NBML												
NBML												
	NBML TOTAL	546	1,180	215	1.0	122.6	104.4	20,990	269.9	2,240.55	629.4	186
	TOTAL	1,015	2,242	430	1.0	231.7	209.5	42,352	543.5	4,474.07	1,181.4	375

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ESTIMATED QUANTITIES

IH 35 SB & NB OVERPASS
AT 18TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1282
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:54:50 AM USER:

SB BEARING SEAT ELEVATION (FT)

	BEAM 1		BEAM 2		BEAM 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
ABUT 1 (FWD)	432.044	432.137	432.221	432.313	432.396	432.488

	BEAM 4		BEAM 5		BEAM 6	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	432.570	432.661	432.742	432.832	432.913	433.002

	BEAM 7		BEAM 8		BEAM 9	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.082	433.170	433.249	433.337	433.415	433.502

	BEAM 1		BEAM 2		BEAM 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 2 (BK)	433.029	433.122	433.240	433.333	433.450	433.542

	BEAM 4		BEAM 5		BEAM 6	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.658	433.749	433.865	433.955	434.071	434.160

	BEAM 7		BEAM 8		BEAM 9	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	434.274	434.363	434.477	434.565	434.677	434.765

	BEAM 1		BEAM 2		BEAM 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 2 (FWD)	433.029	433.141	433.241	433.352	433.451	433.561

	BEAM 4		BEAM 5		BEAM 6	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.660	433.770	433.867	433.976	434.073	434.181

	BEAM 7		BEAM 8		BEAM 9	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	434.278	434.385	434.481	434.587	434.682	434.788

	BEAM 1		BEAM 2		BEAM 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
ABUT 3 (BK)	433.029	433.140	433.274	433.384	433.517	433.627

	BEAM 4		BEAM 5		BEAM 6	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.759	433.868	433.999	434.108	434.238	434.346

	BEAM 7		BEAM 8		BEAM 9	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	434.476	434.583	434.712	434.818	434.947	435.052

NB BEARING SEAT ELEVATION (FT)

	BEAM 1		BEAM 2		BEAM 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
ABUT 1 (FWD)	433.428	433.293	433.130	432.994	432.830	432.693

	BEAM 4		BEAM 5		BEAM 6	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	432.529	432.392	432.227	432.088	431.923	431.784

	BEAM 7		BEAM 8		BEAM 9	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	431.617	431.478	431.311	431.170	431.002	430.861

	BEAM 1		BEAM 2		BEAM 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 2 (BK)	434.741	434.606	434.481	434.345	434.219	434.082

	BEAM 4		BEAM 5		BEAM 6	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.956	433.818	433.691	433.553	433.425	433.286

	BEAM 7		BEAM 8		BEAM 9	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.158	433.018	432.888	432.748	432.618	432.477

	BEAM 1		BEAM 2		BEAM 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
BENT 2 (FWD)	434.747	434.630	434.487	434.370	434.226	434.108

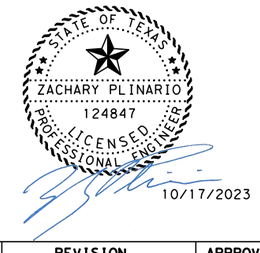
	BEAM 4		BEAM 5		BEAM 6	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.964	433.845	433.700	433.580	433.434	433.314

	BEAM 7		BEAM 8		BEAM 9	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.167	433.046	432.899	432.777	432.629	432.507

	BEAM 1		BEAM 2		BEAM 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
ABUT 3 (BK)	435.062	434.946	434.841	434.723	434.617	434.499

	BEAM 4		BEAM 5		BEAM 6	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	434.393	434.274	434.166	434.047	433.939	433.818

	BEAM 7		BEAM 8		BEAM 9	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
	433.710	433.589	433.479	433.357	433.247	433.125



NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING SEAT ELEVATIONS

IH 35 SB & NB OVERPASS
AT 18TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1283
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

SB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8	BEAM 9
ABUT 1 (FWD)	0.01842	0.01870	0.01898	0.01927	0.01954	0.01982	0.02009	0.02037	0.02065
BENT 2 (BK)	0.01842	0.01870	0.01898	0.01927	0.01954	0.01982	0.02009	0.02037	0.02065
BENT 2 (FWD)	0.01126	0.01153	0.01180	0.01207	0.01235	0.01262	0.01290	0.01317	0.01344
ABUT 3 (BK)	0.01126	0.01153	0.01180	0.01207	0.01235	0.01262	0.01290	0.01317	0.01344

NB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8	BEAM 9
ABUT 1 (FWD)	-0.00203	-0.00176	-0.00148	-0.00122	-0.00094	-0.00067	-0.00039	-0.00012	-0.00015
BENT 2 (BK)	-0.00203	-0.00176	-0.00148	-0.00122	-0.00094	-0.00067	-0.00039	-0.00012	-0.00015
BENT 2 (FWD)	-0.00924	-0.00897	-0.00870	-0.00843	-0.00815	-0.00788	-0.00761	-0.00733	-0.00706
ABUT 3 (BK)	-0.00924	-0.00897	-0.00870	-0.00843	-0.00815	-0.00788	-0.00761	-0.00733	-0.00706

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

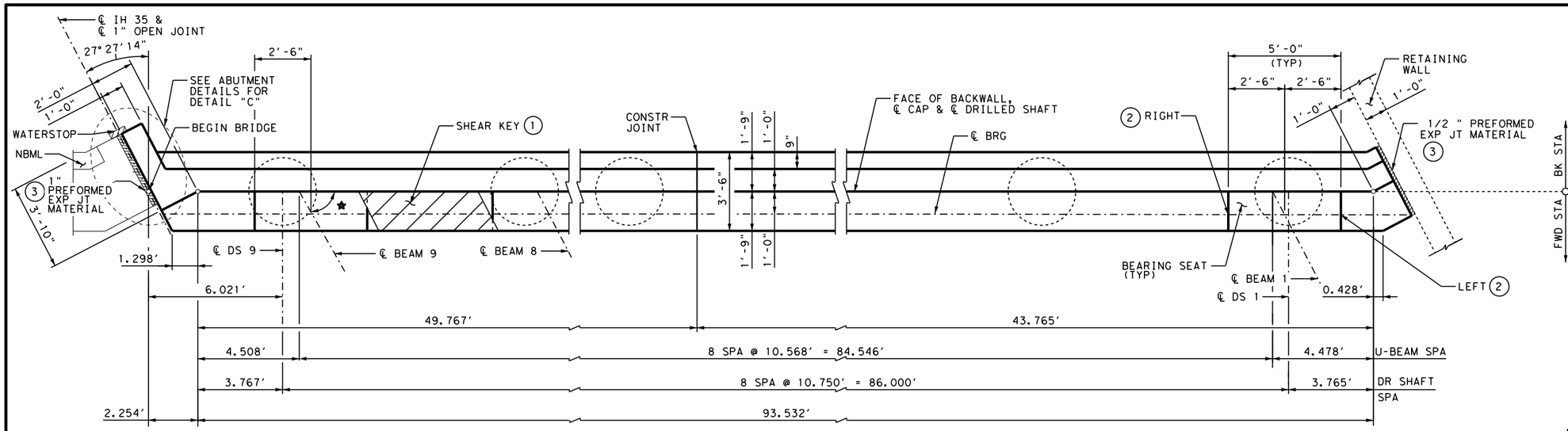
IH 35 FROM S LP 340 TO 12TH ST

BEARING PAD TAPER REPORT

IH 35 SB & NB OVERPASS
AT 18TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1284
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

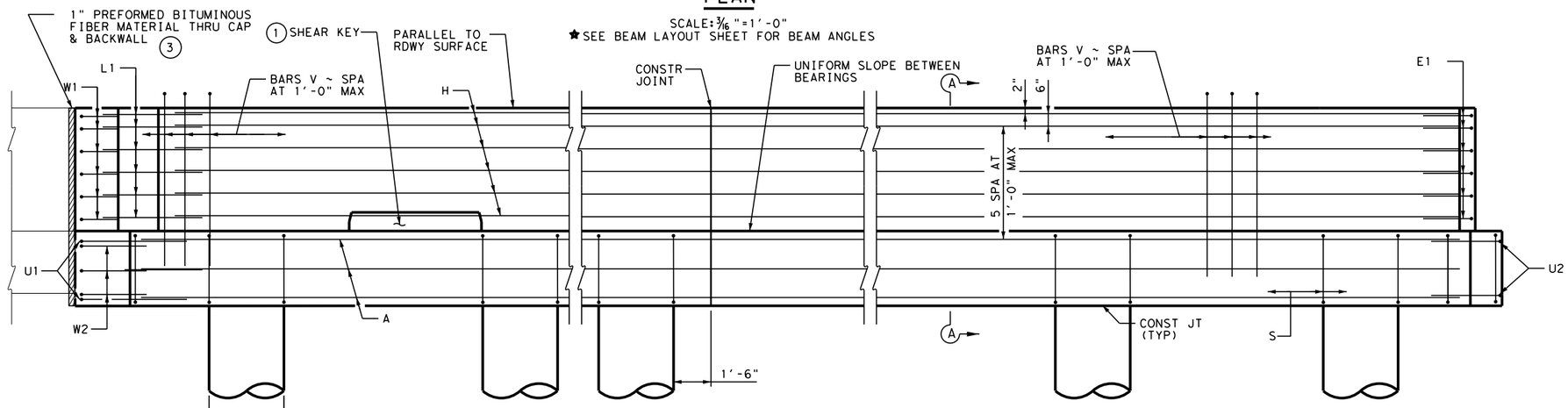
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRES5_0518_003.dgn
DATE: 10/17/2023 11:54:55 AM USER:



PLAN

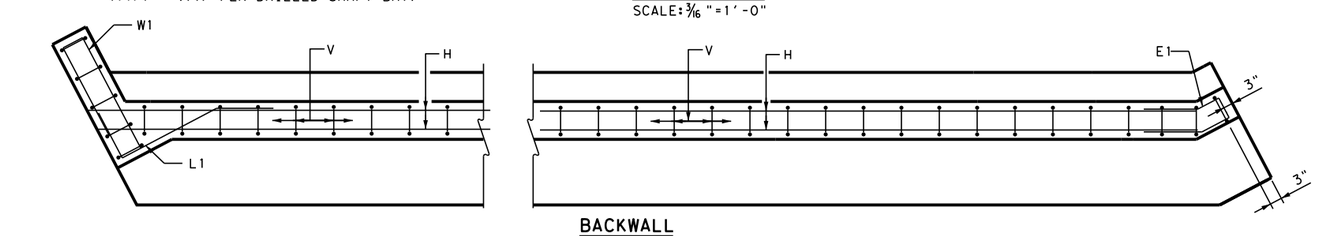
SCALE: 3/16 "=1'-0"

★SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"



CORNER DETAILS

SCALE: 1/4 "=1'-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	* 101'-0"	6,439
E1	6	#5	5'- 9"	36
H	12	#6	** 99'- 2"	1,787
L1	6	#6	6'-11"	62
P1	6	#5	5'-3"	33
P2	3	#5	4'-11"	16
S	149	#6	13'- 6"	3,021
U1	2	#6	8'- 5"	26
U2	2	#6	9'- 6"	29
V	102	#5	15'- 4"	1,631
W1	6	#5	7'- 6"	47
W2	3	#5	9'- 5"	30
SUBTOTAL STEEL (LB) ***				13,157
CLASS "C" CONC (ABUT) (HPC)(CY)				55.8

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

1 SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

2 SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

3 INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
JORDAN R. GREENE
124925
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 SB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1285
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRAB5_0518_SB_001.dgn
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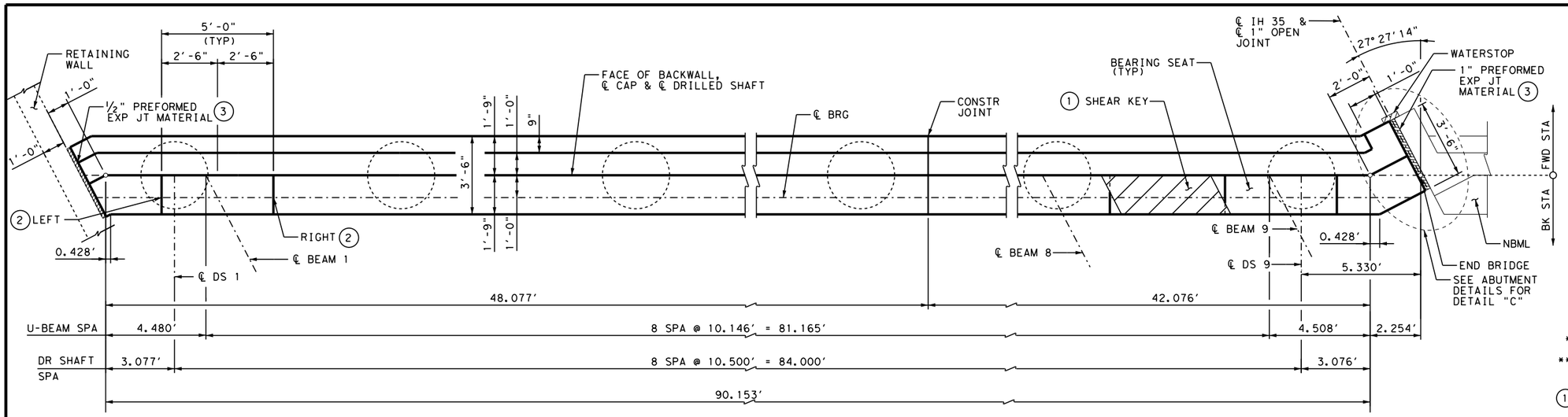
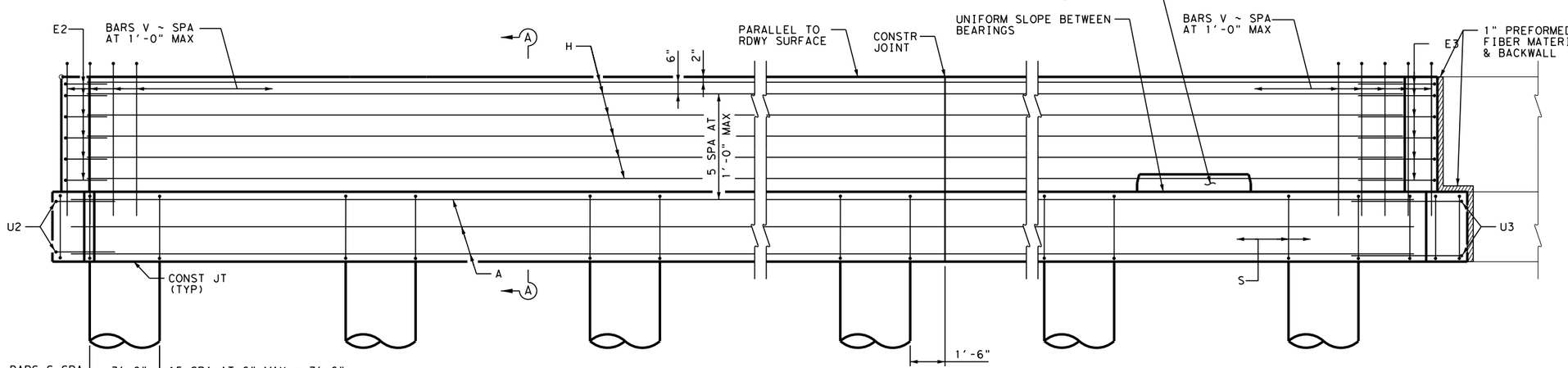


PLAN

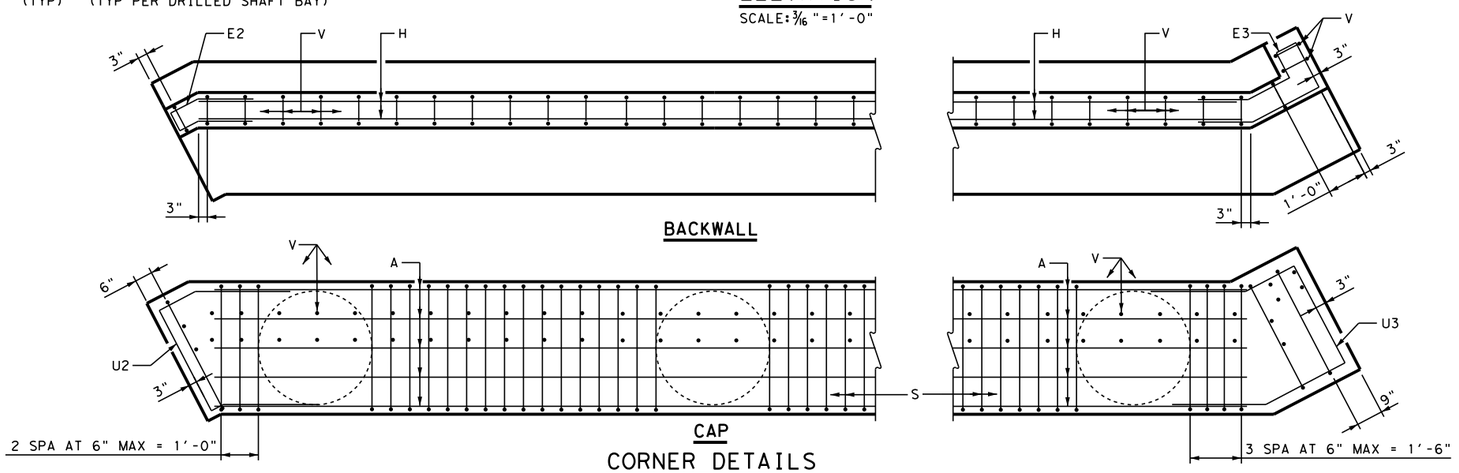
SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"



CORNER DETAILS

SCALE: 1/4"=1'-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 3

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	*96'- 11"	6,179
E2	6	#5	6'- 3"	39
E3	6	#5	9'- 4"	58
H	12	#6	** 93'- 8"	1,688
P1	6	#5	5'- 3"	33
P2	3	#5	4'- 11"	16
S	138	#6	13'- 6"	2,799
U2	2	#6	9'- 6"	29
U3	2	#6	11'- 6"	35
V	94	#5	15'- 4"	1,504
SUBTOTAL STEEL (LB) ***				12,370
CLASS "C" CONC (ABUT) (HPC)(CY)				53.3

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL LICENSED ENGINEER

10/17/2023

NO.	DATE	REVISION	APPROVED

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 3

IH 35 SB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1286
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRABS_0518_SB_002.dgn
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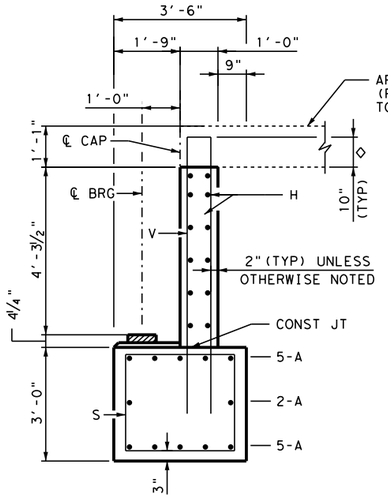
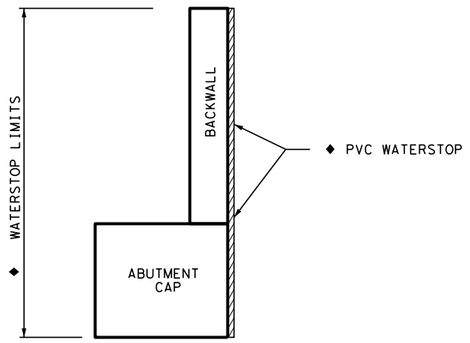


SECTION A-A

SCALE: ¼"=1'-0"

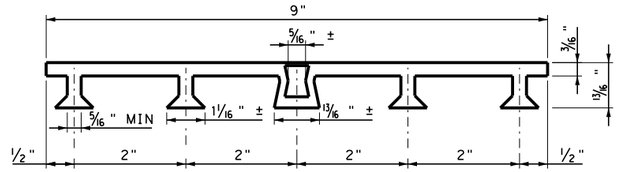
◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



WATERSTOP DETAIL

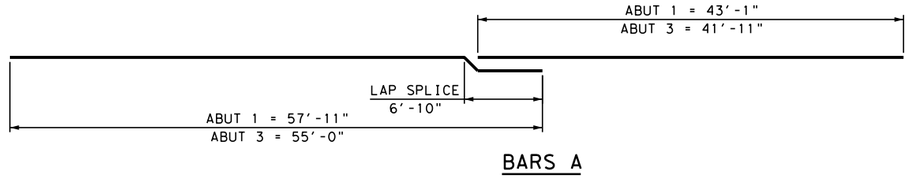
SCALE: ¼"=1'-0"

◆ WATERSTOP SHALL BE CONSIDERED SUBSIDIARY TO CLASS "C" CONCRETE

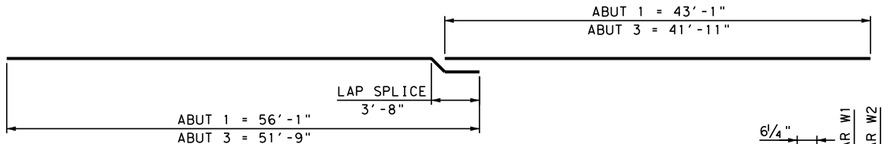


PVC WATERSTOP TYPE "A"

(DIMENSIONS AND SHAPE MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER)



BARS A



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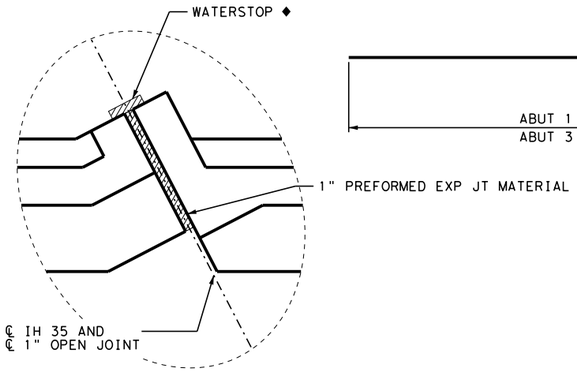
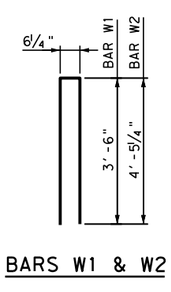
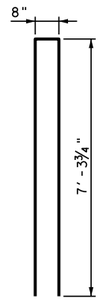


DETAIL "C"



BARS W1 & W2



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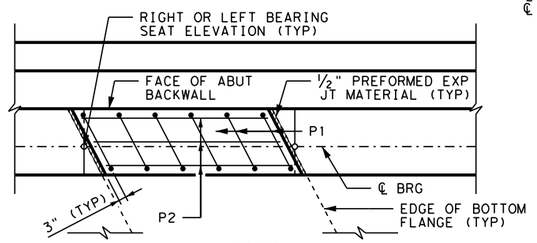
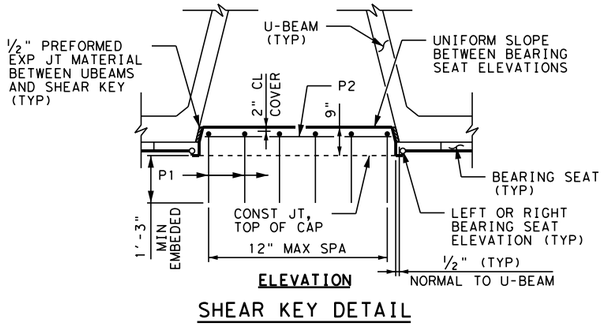
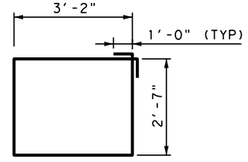


PLAN

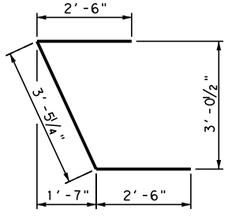


ELEVATION

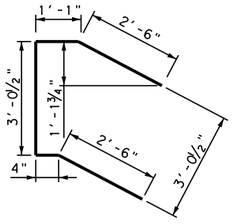
SHEAR KEY DETAIL



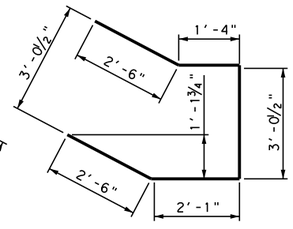
BARS S



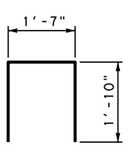
BARS U1



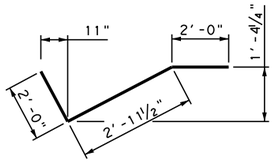
BARS U2



BARS U3

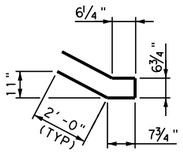


BARS P1

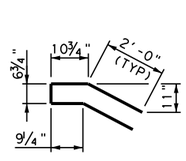


BARS L1

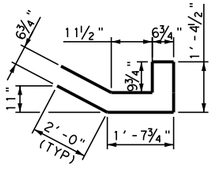
(DIMENSIONS SHOWN ARE C-C OF BAR)



BARS E1



BARS E2



BARS E3

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.
ALL REINFORCING STEEL SHALL BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

CALCULATED FOUNDATION LOADS
ABUTMENT 1= 116 TONS/DRILLED SHAFT.
ABUTMENT 3= 114 TONS/DRILLED SHAFT.

SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT.

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
JORDAN R. GREENE
124925
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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Engineers Architects Planners
Firm Registration Number F-420

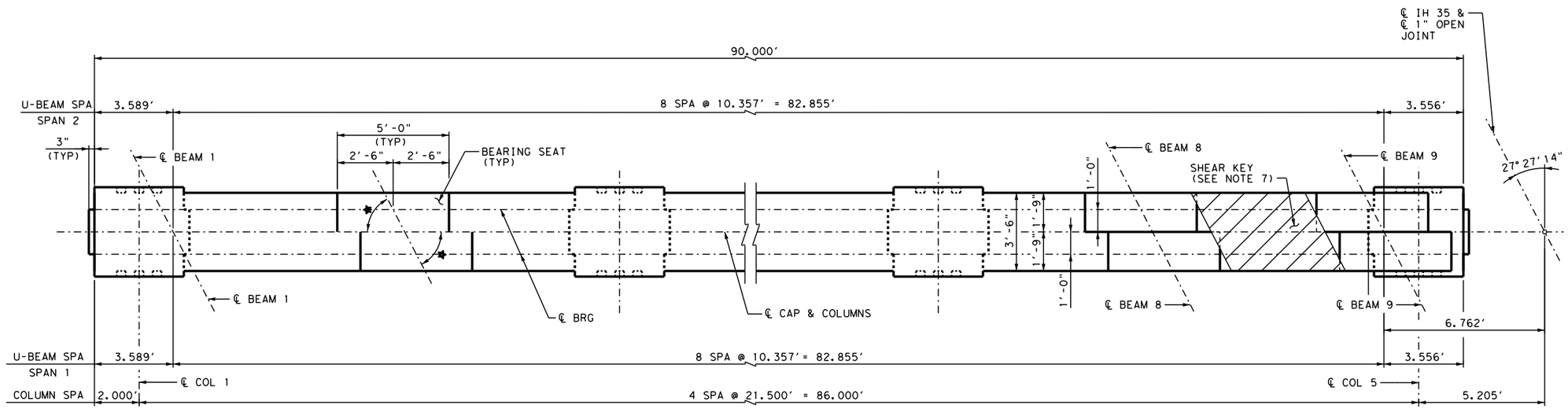
IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

IH 35 SB OVERPASS AT 18TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1287
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

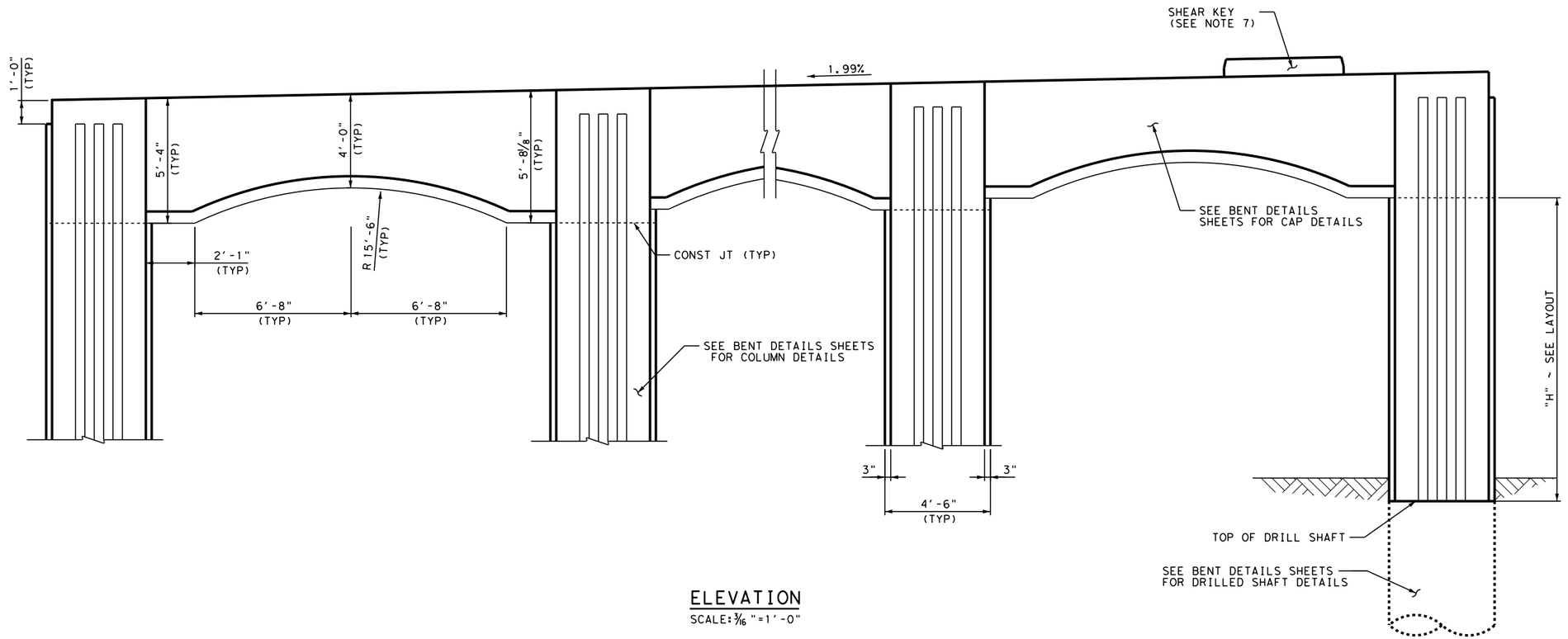
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRAB5_0518_SB_003.dgn
DATE: 10/17/2023 11:55:06 AM USER:



PLAN

SCALE: 3/16 "=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.

STATE OF TEXAS
JORDAN R. GREENE
124925
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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IH 35 FROM S LP 340 TO 12TH ST

BENT 2

IH 35 SB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1288
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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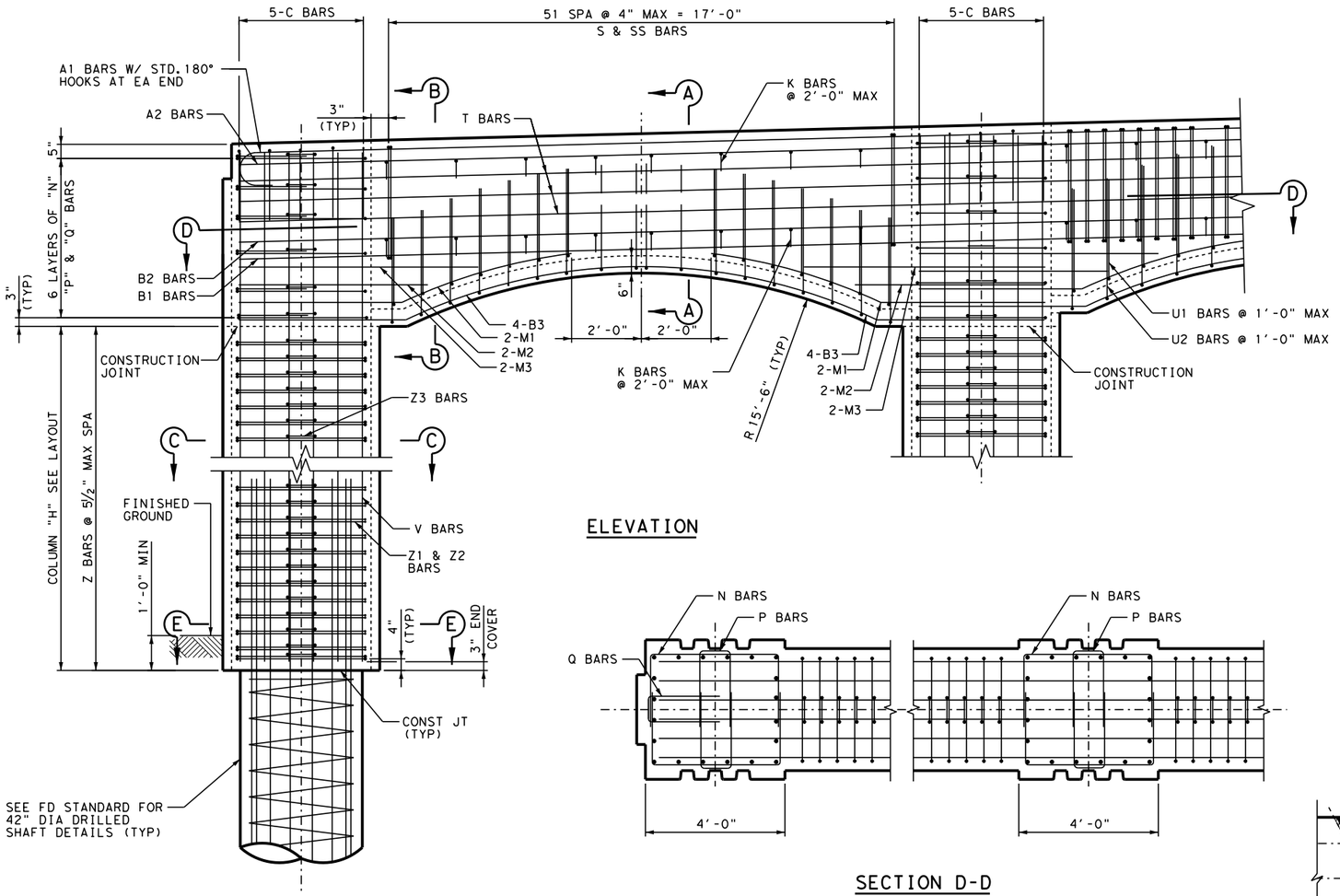
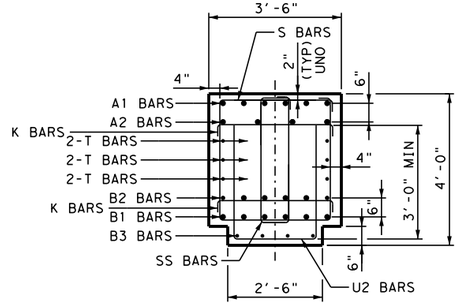
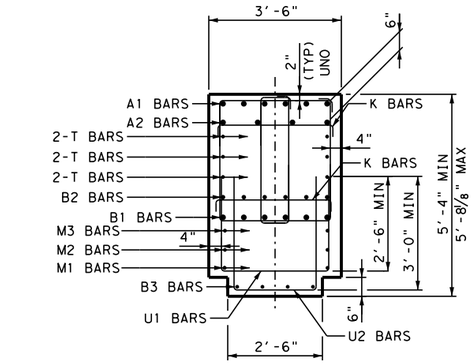


ELEVATION

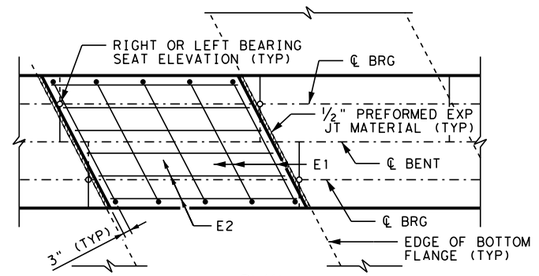
SECTION D-D



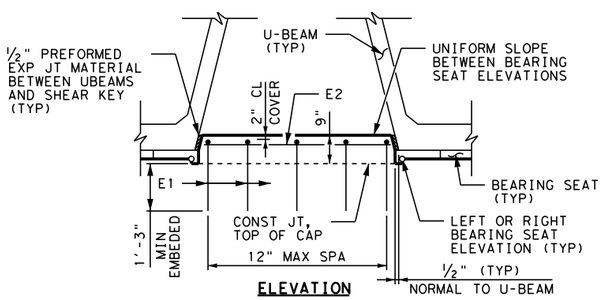
SECTION A-A



SECTION B-B
(AT FACE OF COLUMN)



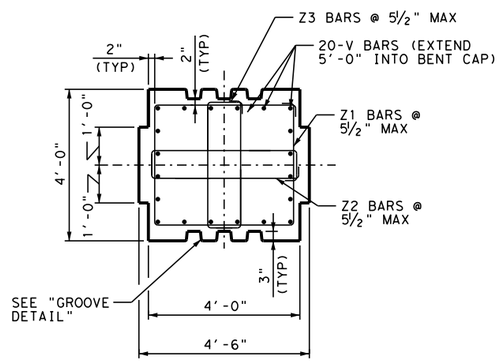
PLAN



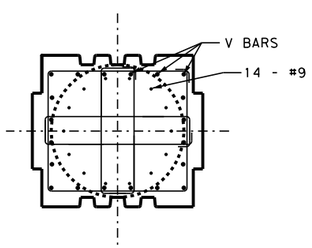
ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.



SECTION C-C



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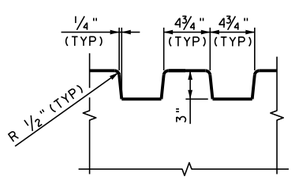

GROOVE DETAIL

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 SB OVERPASS AT 18TH STREET

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1289

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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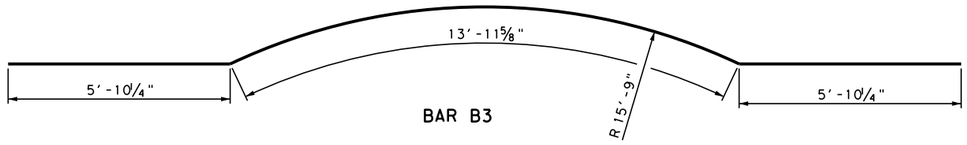

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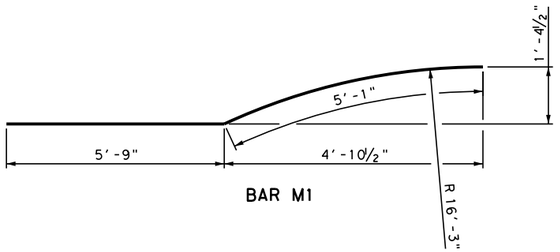

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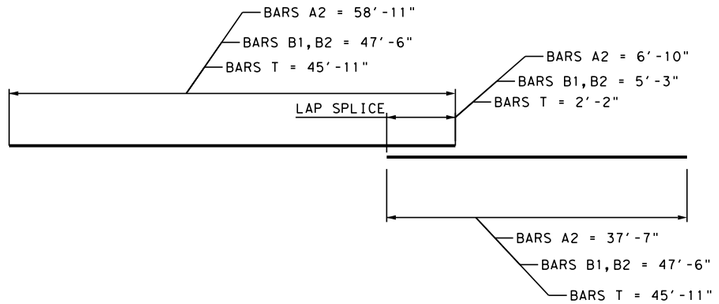
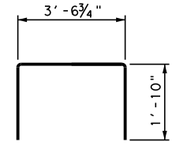
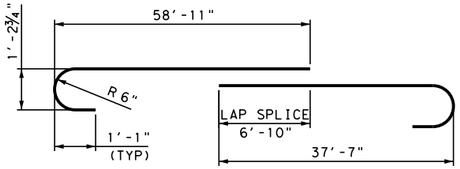


BAR A2, B1, B2, T



BARS E1



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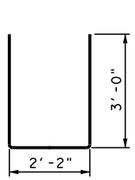

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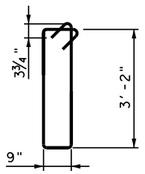

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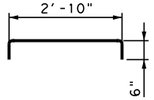

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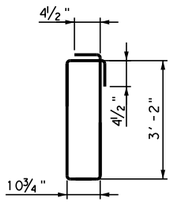

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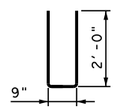

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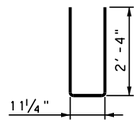

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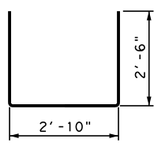

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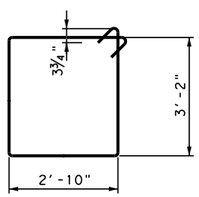

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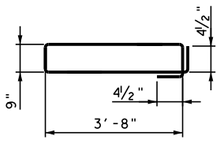

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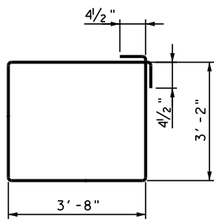

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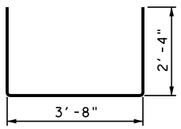

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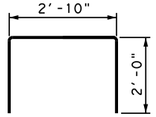

BAR C

TABLE OF QUANTITIES

BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 99′-8"	3,178
A2	4	#11	* 96′-6"	2,051
B1	6	#11	** 95′-0"	3,026
B2	6	#11	** 95′-0"	3,026
B3	16	#8	25′-9"	1,097
C	25	#4	6′-10"	115
E1	5	#5	7′-3"	38
E2	6	#5	4′-11"	31
K	80	#3	3′-10"	116
M1	16	#8	10′-10"	463
M2	16	#8	6′-5"	271
M3	16	#8	7′-10"	333
N	60	#4	8′-4"	334
P	60	#4	5′-8"	225
Q	12	#4	4′-9"	39
S	208	#5	12′-11"	2,803
SS	208	#5	8′-9"	1,899
T	6	#6	*** 91′-10"	828
U1	56	#4	7′-10"	294
U2	72	#4	8′-2"	393
V	100	#11	19′-9"	10,493
Z1	165	#5	14′-5"	2,481
Z2	165	#5	9′-7"	1,649
Z3	165	#5	8′-11"	1,527
SUBTOTAL STEEL (LBS) ****				36,710
CL "C" CONC (BENT) (HPC)(CY)				105.1

* LENGTH SHOWN INCLUDES ONE 6′-10" SPLICE.
** LENGTH SHOWN INCLUDES ONE 5′-3" SPLICE.
*** LENGTH SHOWN INCLUDES ONE 2′-2" SPLICE.
**** FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 SB OVERPASS AT 18TH STREET

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1290

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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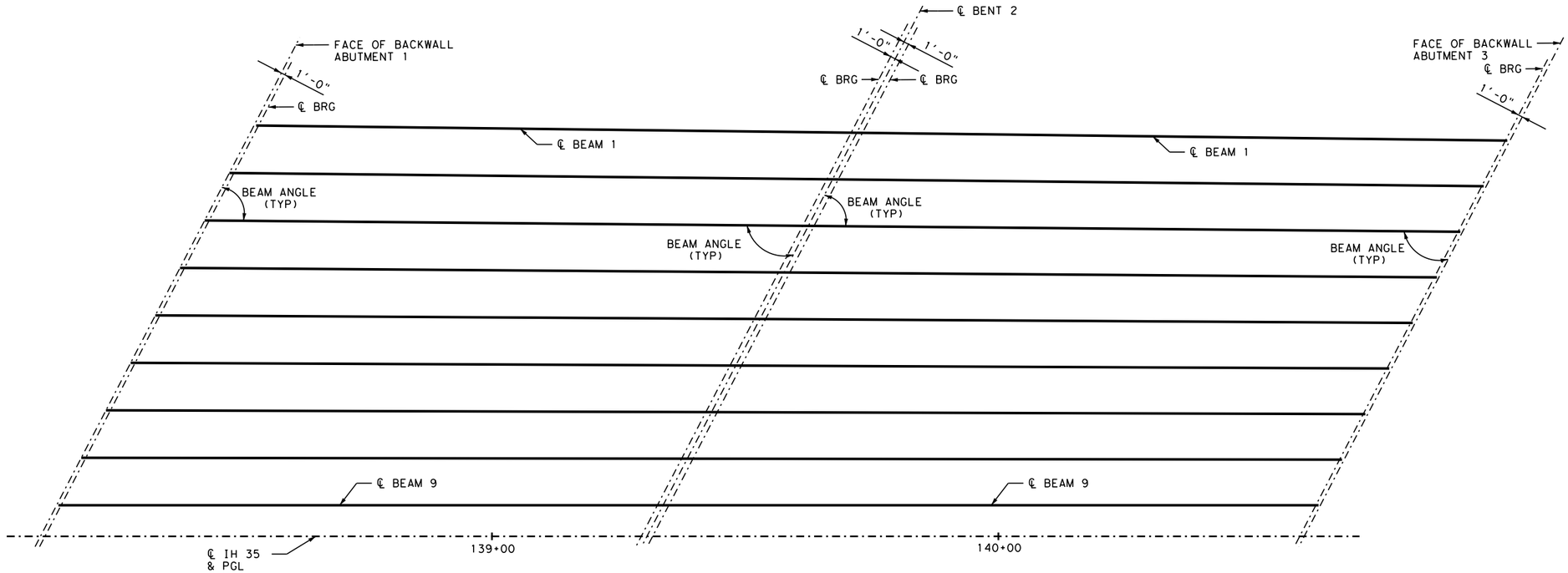

SPAN 1

U54 BEAMS

SPAN 2

U54 BEAMS

BENT REPORT

ABUT NO. 1 (S 48 47 14 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 91.307 L

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM 1	0.000	63 14 17
	BEAM 2	10.568	63 9 4
	BEAM 3	10.568	63 3 51
	BEAM 4	10.568	62 58 39
	BEAM 5	10.568	62 53 28
	BEAM 6	10.568	62 48 17
	BEAM 7	10.568	62 43 6
	BEAM 8	10.568	62 37 56
	BEAM 9	10.568	62 32 46
	TOTAL	84.546	

BENT NO. 2 (S 48 47 14 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 89.617 L

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM 1	0.000	63 14 17
	BEAM 2	10.357	63 9 4
	BEAM 3	10.357	63 3 51
	BEAM 4	10.357	62 58 39
	BEAM 5	10.357	62 53 28
	BEAM 6	10.357	62 48 17
	BEAM 7	10.357	62 43 6
	BEAM 8	10.357	62 37 56
	BEAM 9	10.357	62 32 46
	TOTAL	82.855	

BENT REPORT

BENT NO. 2 (S 48 47 14 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 89.617 L

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM 1	0.000	63 14 17
	BEAM 2	10.357	63 9 4
	BEAM 3	10.357	63 3 51
	BEAM 4	10.357	62 58 39
	BEAM 5	10.357	62 53 28
	BEAM 6	10.357	62 48 17
	BEAM 7	10.357	62 43 6
	BEAM 8	10.357	62 37 56
	BEAM 9	10.357	62 32 46
	TOTAL	82.855	

ABUT NO. 3 (S 48 47 14 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 87.927 L

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM 1	0.000	63 14 17
	BEAM 2	10.146	63 9 4
	BEAM 3	10.146	63 3 51
	BEAM 4	10.146	62 58 39
	BEAM 5	10.146	62 53 28
	BEAM 6	10.146	62 48 17
	BEAM 7	10.146	62 43 6
	BEAM 8	10.146	62 37 56
	BEAM 9	10.146	62 32 46
	TOTAL	81.165	

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	124.230	121.990	123.70	0.0081
BEAM 2	124.325	122.083	123.80	0.0084
BEAM 3	124.421	122.177	123.89	0.0086
BEAM 4	124.517	122.271	123.99	0.0089
BEAM 5	124.613	122.366	124.09	0.0092
BEAM 6	124.709	122.461	124.18	0.0095
BEAM 7	124.806	122.555	124.28	0.0097
BEAM 8	124.903	122.651	124.38	0.0100
BEAM 9	125.000	122.746	124.47	0.0103

BEAM REPORT

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	124.230	121.990	123.70	-0.0000
BEAM 2	124.325	122.083	123.79	0.0003
BEAM 3	124.421	122.177	123.89	0.0005
BEAM 4	124.517	122.271	123.99	0.0008
BEAM 5	124.613	122.366	124.08	0.0011
BEAM 6	124.709	122.461	124.18	0.0014
BEAM 7	124.806	122.555	124.27	0.0016
BEAM 8	124.903	122.651	124.37	0.0019
BEAM 9	125.000	122.746	124.47	0.0022

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT

IH 35 SB OVERPASS AT 18TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1291
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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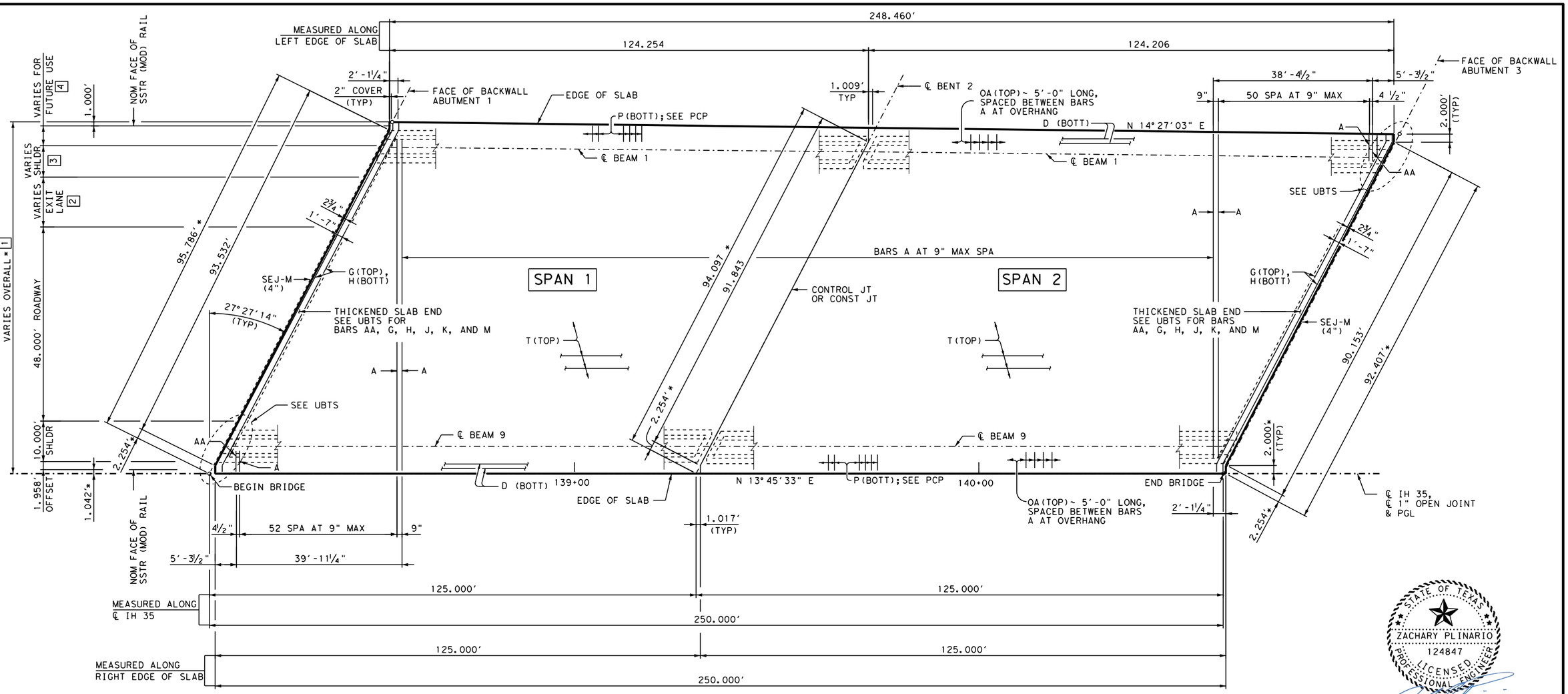
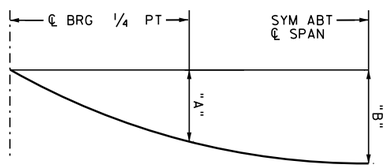


PLAN

* MEASURED TO ℄ IH 35

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1	1	0.162	0.231
1	2 & 3	0.144	0.205
1	4 & 5	0.145	0.206
1	6	0.145	0.207
1	7	0.146	0.207
1	8	0.146	0.208
1	9	0.170	0.241
2	1	0.161	0.229
2	2	0.141	0.201
2	3	0.142	0.201
2	4 & 5	0.142	0.202
2	6-8	0.143	0.203
2	9	0.168	0.239



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

1. 87.000′ MAX TO 84.000′ MIN
2. 12.271′ MAX TO 1.125′ MIN
3. 7.729′ MIN TO 8.875′ MAX
4. 6.000′ MIN TO 13.000′ MAX

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION(2017).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c = 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS;

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1′-7"
~ #5 = 2′-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

250.000′ PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 SB OVERPASS AT 18TH STREET

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1292
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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DATE: 10/17/2023 11:55:18 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

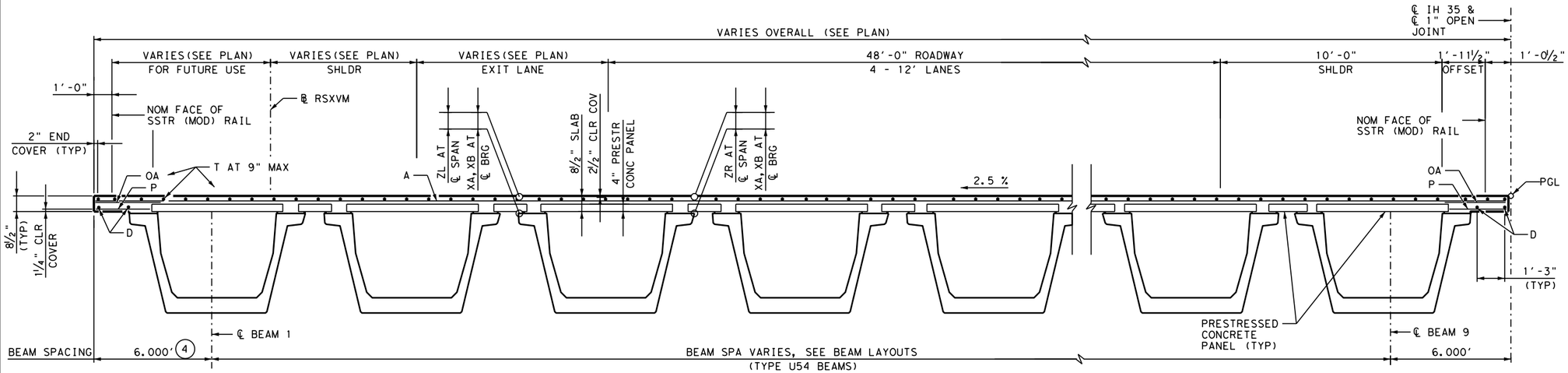
③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U54)	① REINFORCING STEEL
	SF	LF	LB
1	10,775	1,116.78	39,868
2	10,587	1,116.74	39,172
TOTAL	21,362	2,233.52	79,040

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.



TYPICAL TRANSVERSE SECTION

④ MEASURED PERPENDICULAR TO EDGE OF DECK

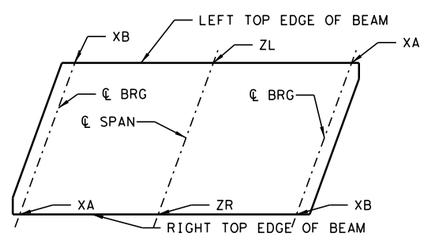
BAR TABLE

BAR	SIZE
AA	#5
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
K	#4
M	#4
OA	#5
P	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN ** (IN)	"ZR" AT ℄ SPAN ** (IN)
1	1	10 1/2	10 3/4	11 1/4	11 1/4
1	2-8	10 1/2	10 3/4	11	11
1	9	10 1/2	10 3/4	11 3/8	11 3/8
2	1&9	10 1/2	10 3/4	11 1/4	11 1/4
2	2-8	10 1/2	10 3/4	11	11

** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

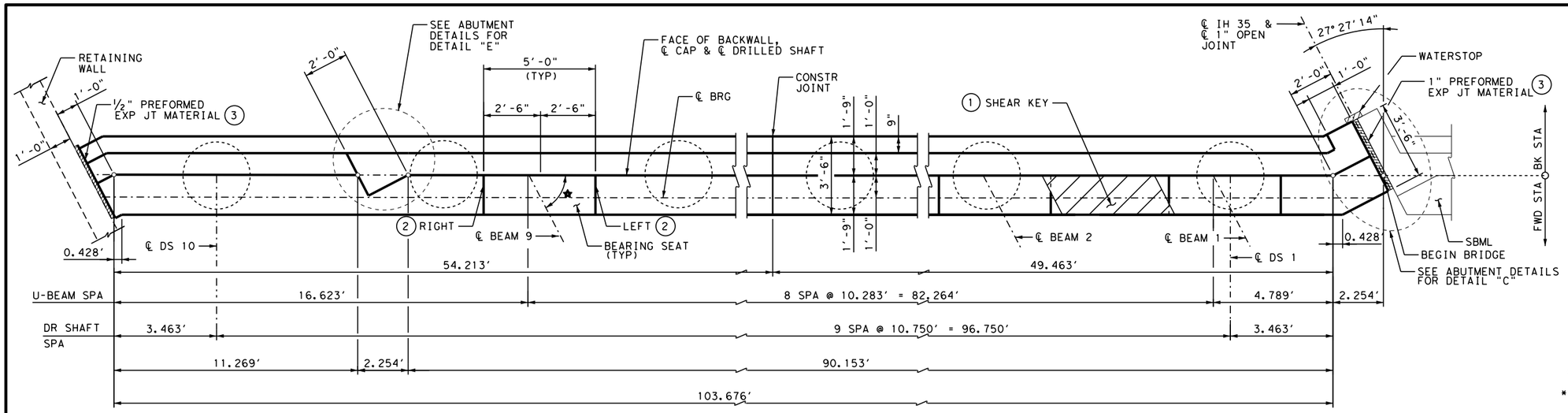
IH 35 FROM S LP 340 TO 12TH ST

250.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 SB OVERPASS AT 18TH STREET

SHEET 2 OF 2

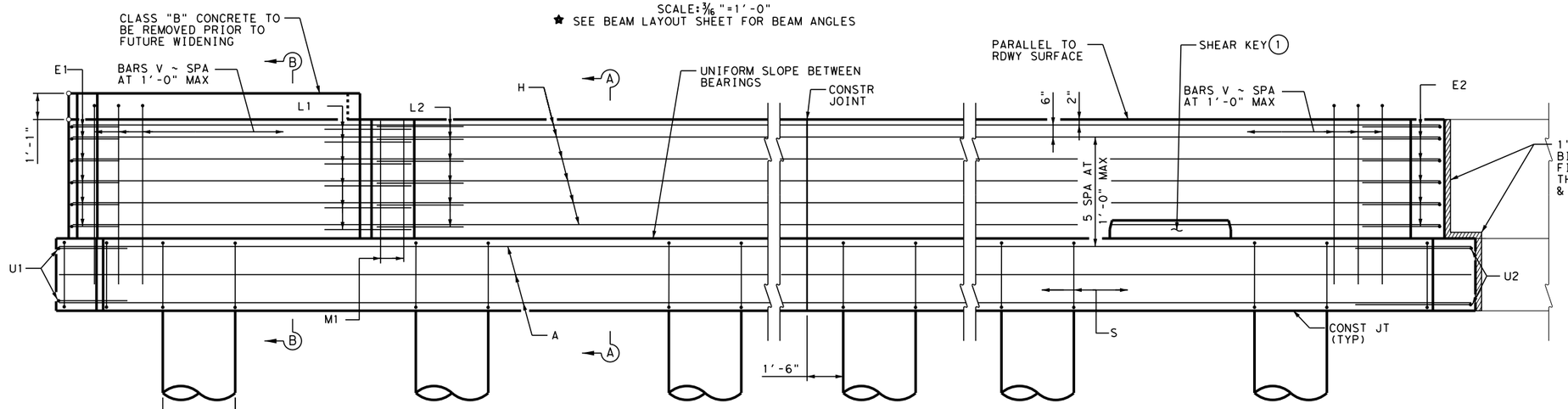
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1293
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



PLAN

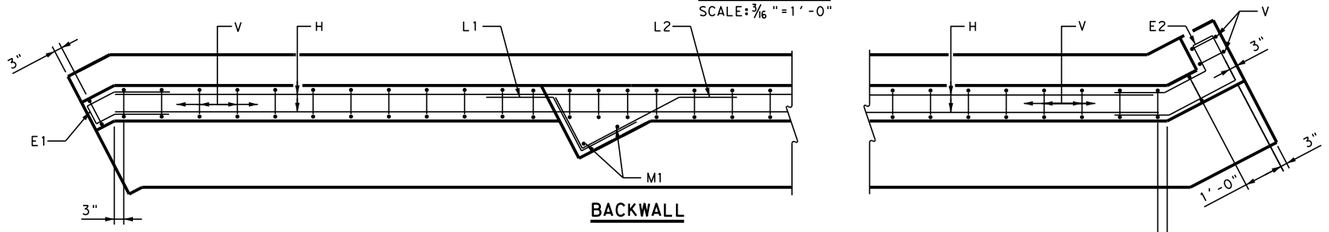
SCALE: 3/16 "=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"



CORNER DETAILS

SCALE: 1/4 "=1'-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	*110'-8"	7,056
E1	6	#5	6'-5"	40
E2	6	#5	9'-5"	59
H	12	#6	**108'-4"	1,953
L1	6	#6	5'-7"	50
L2	6	#6	6'-8"	60
M1	2	#5	6'-4"	14
P1	6	#5	5'-3"	33
P2	3	#5	4'-11"	16
S	163	#6	13'-6"	3,306
U1	2	#6	9'-6"	29
U2	2	#6	11'-6"	35
V	108	#5	15'-4"	1,728
SUBTOTAL STEEL (LB) ***				14,379
CLASS "C" CONC (ABUT) (HPC) (CY)				61.0
CLASS "B" CONC (MISC) (CY)				0.5

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

(1) SEE SHEAR KEY DETAILS SHEET FOR QUANTITY AND DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

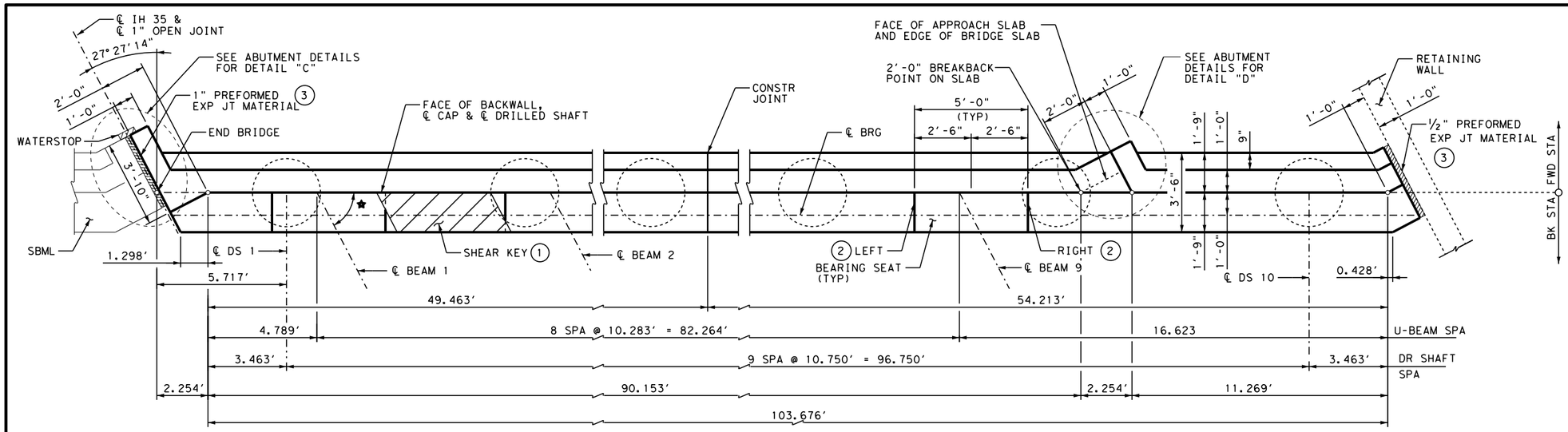
IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 NB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1294
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

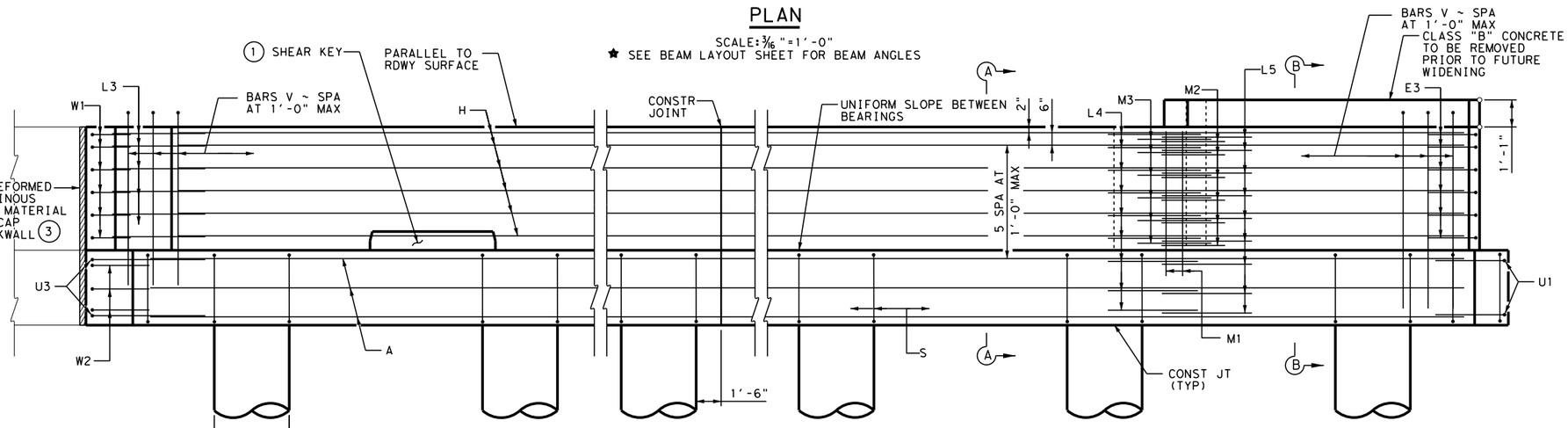
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRAB5_0518_NB_001.dgn
DATE: 10/17/2023 11:55:23 AM USER:



PLAN

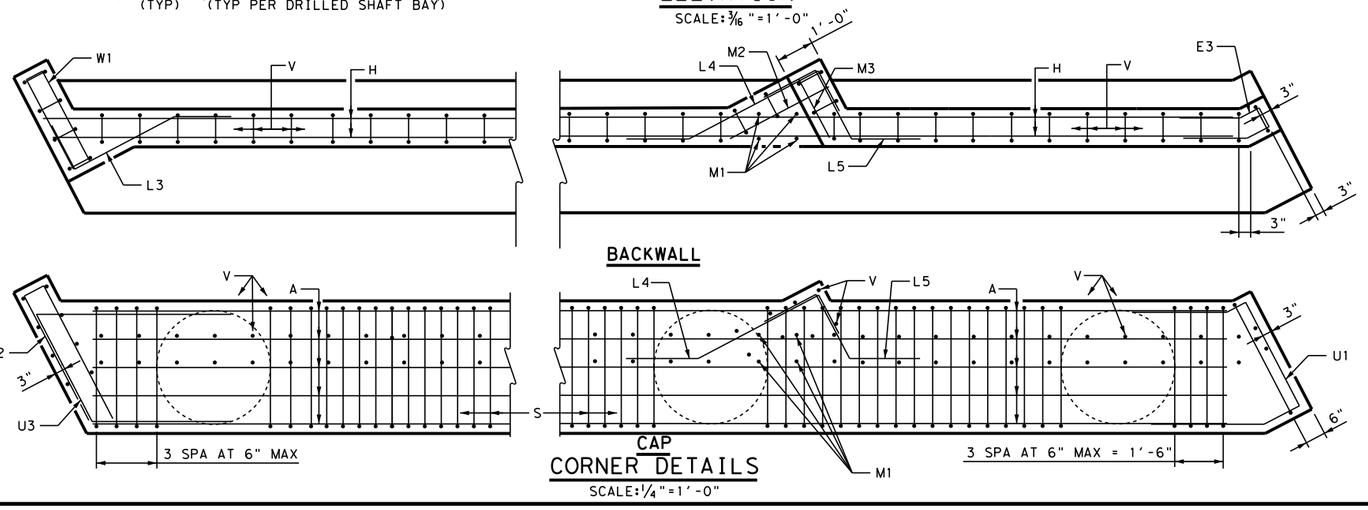
SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"



CAP CORNER DETAILS

SCALE: 1/4"=1'-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 3

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	*110'- 8"	7,056
E3	6	#5	5'- 11"	37
H	12	#6	**108'-4"	1,953
L3	6	#6	7'-0"	63
L4	9	#6	7'-7"	103
L5	9	#6	5'-11"	80
M1	4	#5	6'-4"	26
M2	6	#5	2'-10"	18
M3	6	#5	1'-9"	11
P1	6	#5	5'- 3"	33
P2	3	#5	4'- 11"	16
S	162	#6	13'- 6"	3,285
U1	2	#6	9'- 6"	29
U3	2	#6	8'- 5"	26
V	113	#5	15'- 4"	1,808
W1	6	#5	7'- 7"	47
W2	3	#5	9'- 5"	30
SUBTOTAL STEEL (LB) ***				14,621
CLASS "C" CONC (ABUT) (HPC) (CY)				61.6
CLASS "B" CONC (MISC) (CY)				0.5

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

1 SEE SHEAR KEY DETAILS SHEET FOR QUANTITY AND DETAILS

2 SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

3 INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
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NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 3

IH 35 NB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1295
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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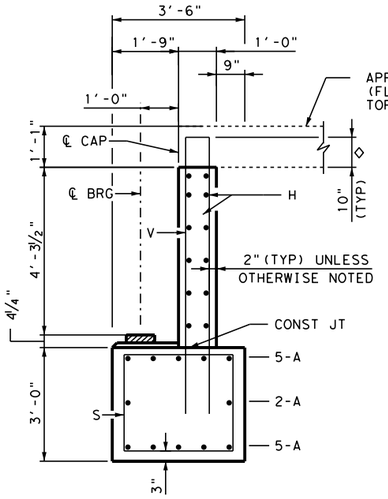
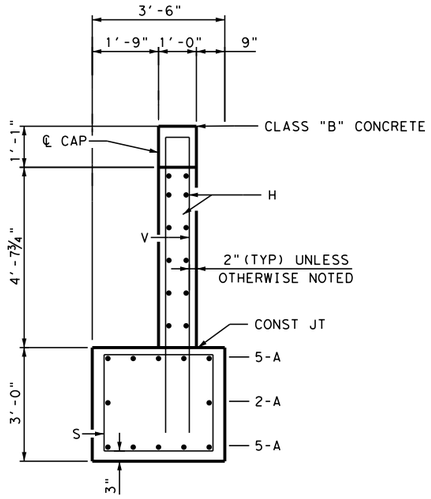


SECTION A-A

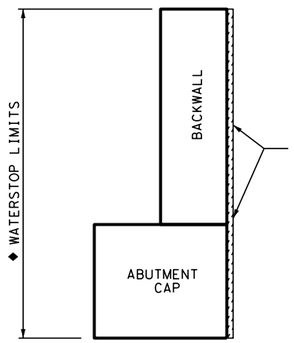
SCALE: ¼"=1'-0"

◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



SECTION B-B

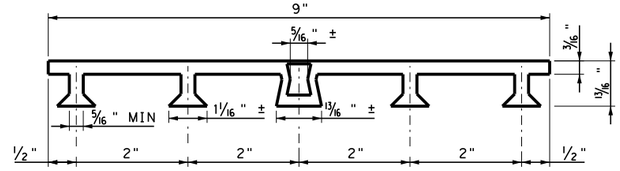
SCALE: ¼"=1'-0"



WATERSTOP DETAIL

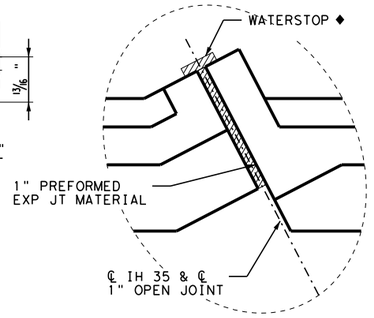
SCALE: ¼"=1'-0"

◆ WATERSTOP SHALL BE CONSIDERED SUBSIDIARY TO CLASS "C" CONCRETE

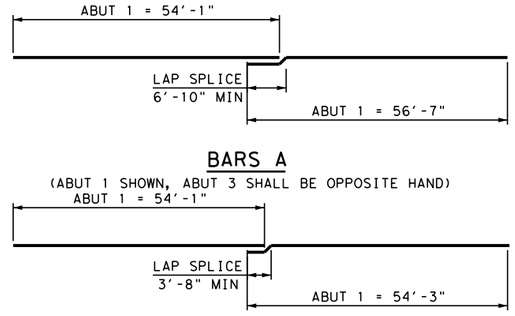


PVC WATERSTOP TYPE "A"

(DIMENSIONS AND SHAPE MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER)



DETAIL "C"



BARS A

(ABUT 1 SHOWN, ABUT 3 SHALL BE OPPOSITE HAND)

BARS H

(ABUT 1 SHOWN, ABUT 3 SHALL BE OPPOSITE HAND)

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

CLASS "B" CONCRETE STRENGTH SHALL BE f'c = 2000 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

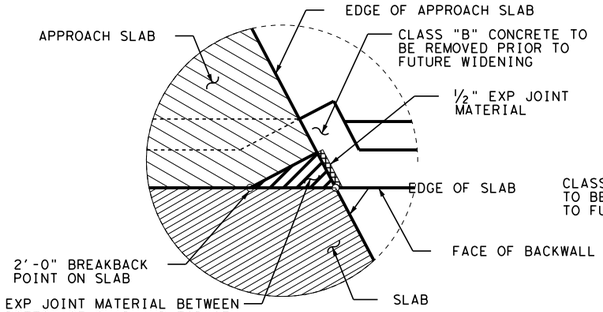
COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

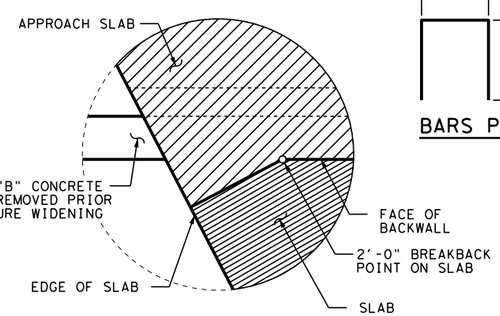
CALCULATED FOUNDATION LOADS
ABUTMENT 1= 108 TONS/DRILLED SHAFT,
ABUTMENT 3= 108 TONS/DRILLED SHAFT.

SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT.

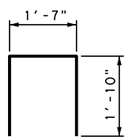
SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.



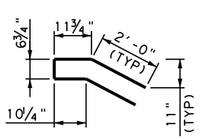
DETAIL "D"



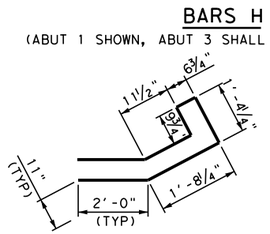
DETAIL "E"



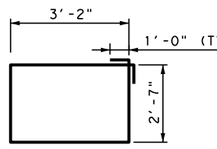
BARS P1



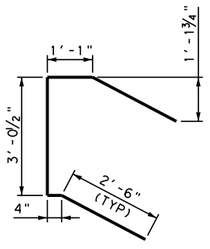
BARS E1



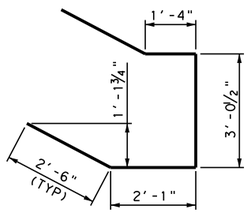
BARS E2



BARS S



BARS U1



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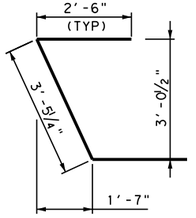

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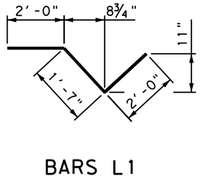
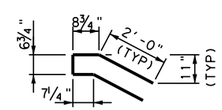
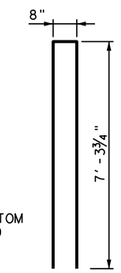


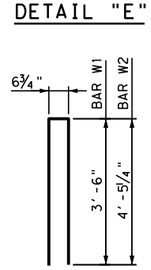
BARS L1



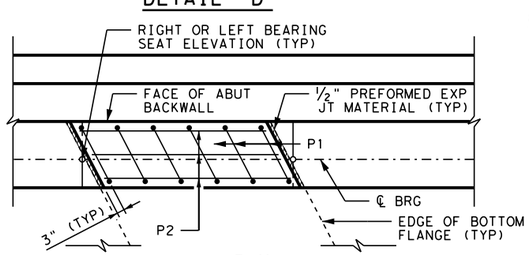
BARS E3



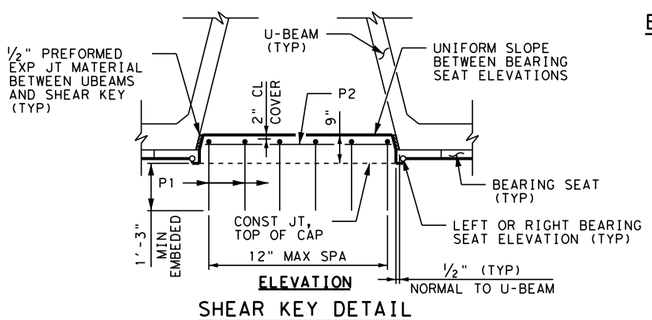
BARS V



BARS W1 & W2

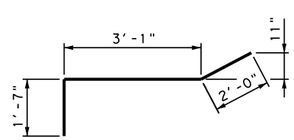


PLAN

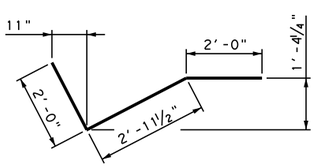


ELEVATION

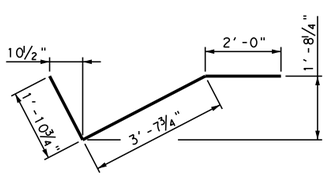
SHEAR KEY DETAIL



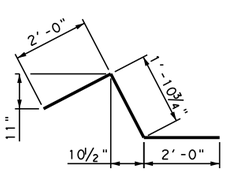
BARS L2



BARS L3



BARS L4



BARS L5

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

IH 35 NB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1296
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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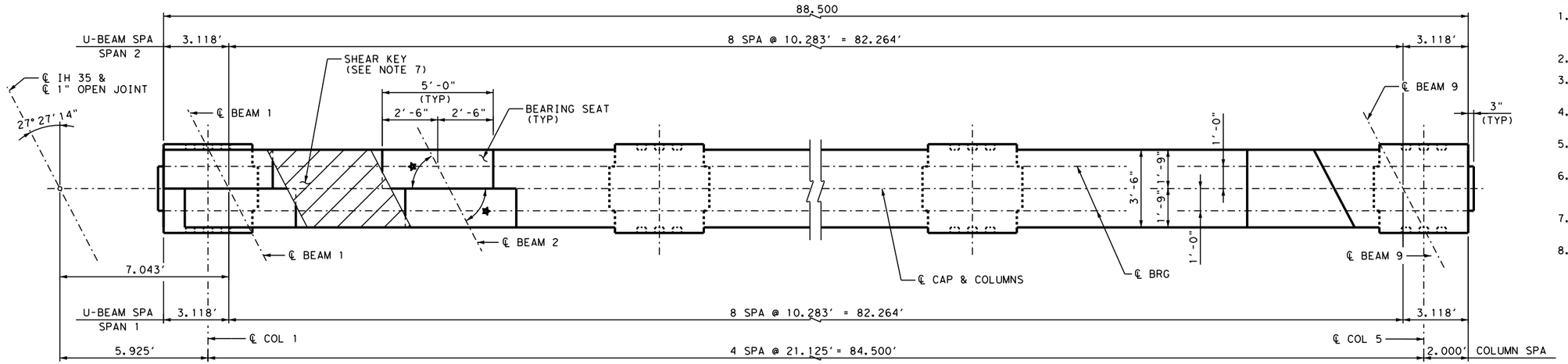
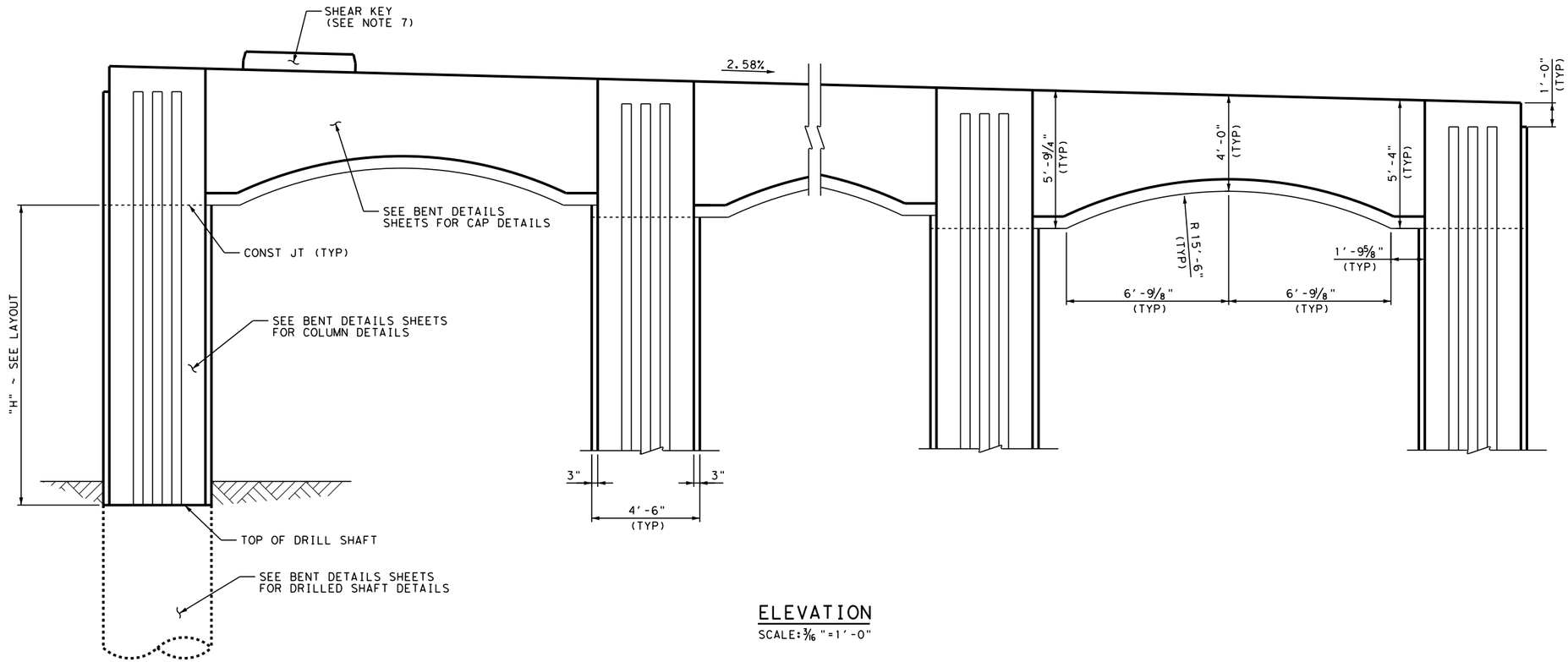


PLAN

SCALE: 3/16"=1'-0"

★SEE GIRDER LAYOUT SHEET FOR GIRDER ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL LICENSED ENGINEER

10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 2

IH 35 NB OVERPASS AT 18TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1297
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\05_18th St\BRBN5_0518_NB_001.dgn
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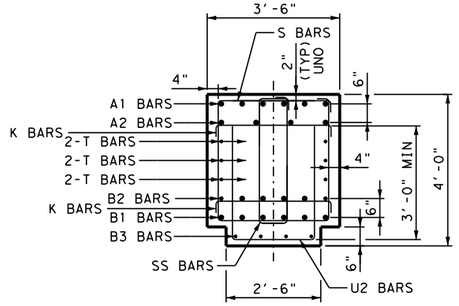
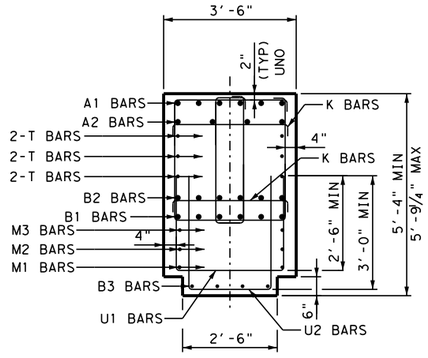
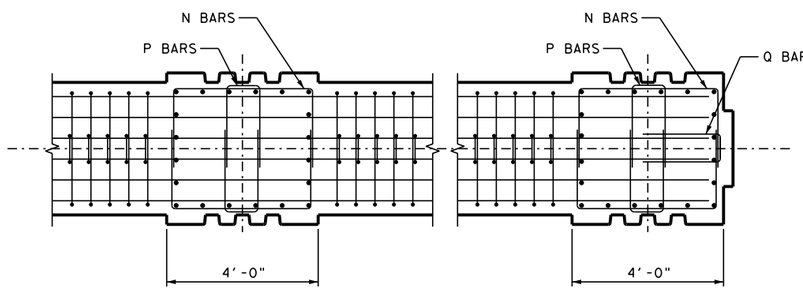


SECTION A-A



SECTION B-B

(AT FACE OF COLUMN)



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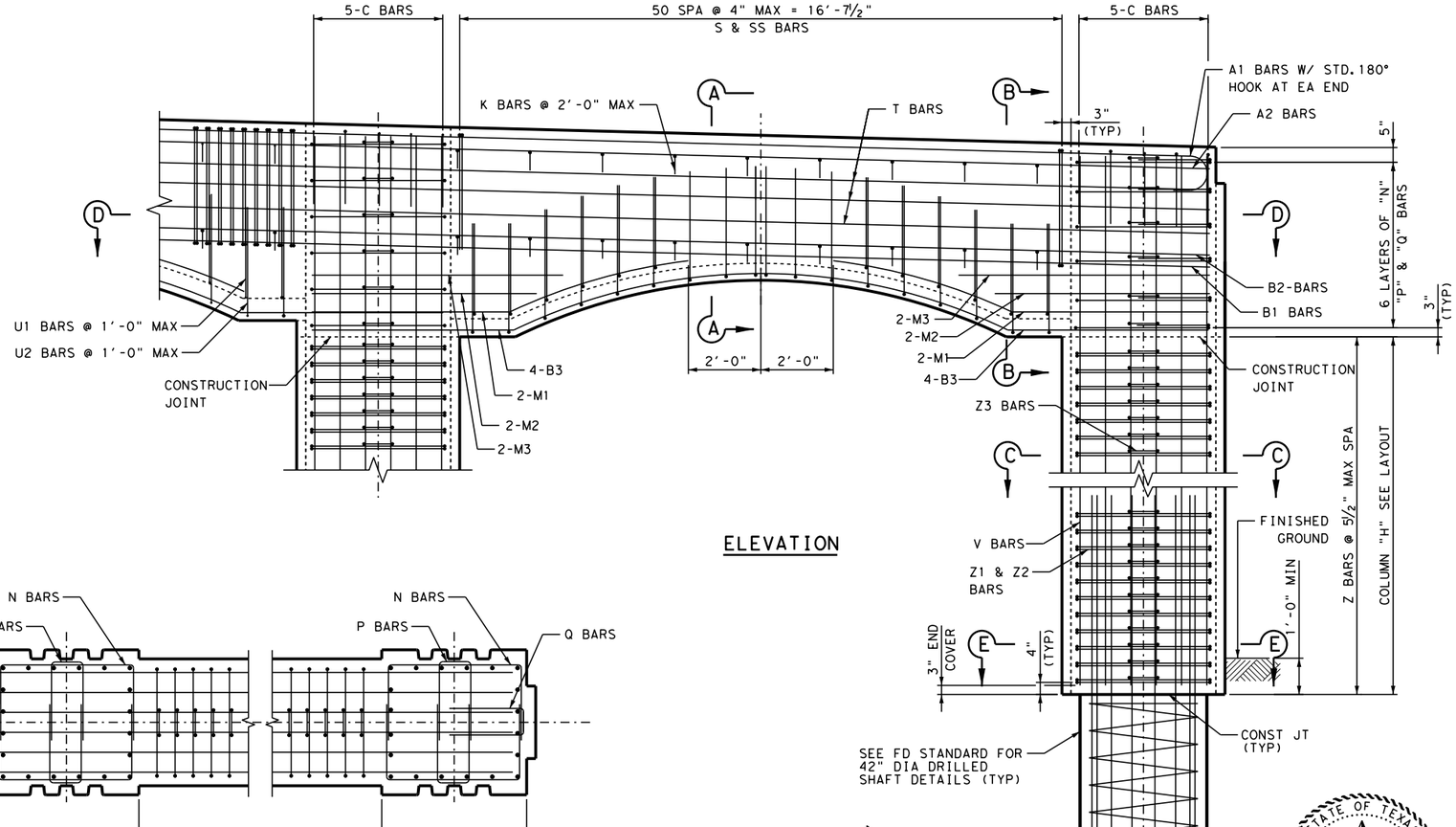
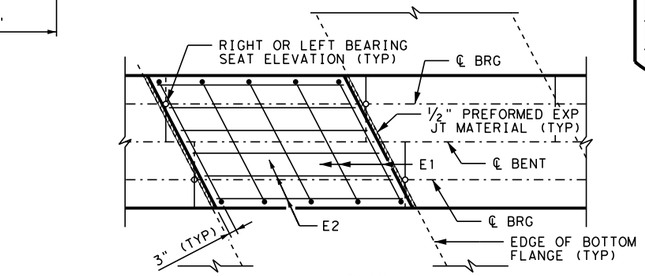
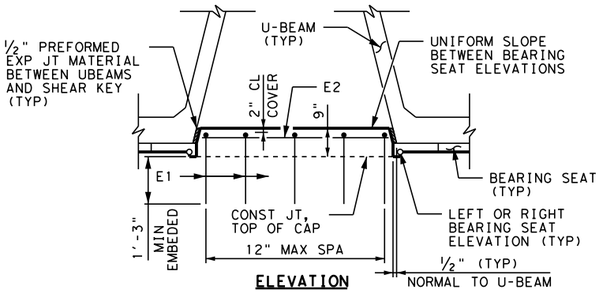


ELEVATION



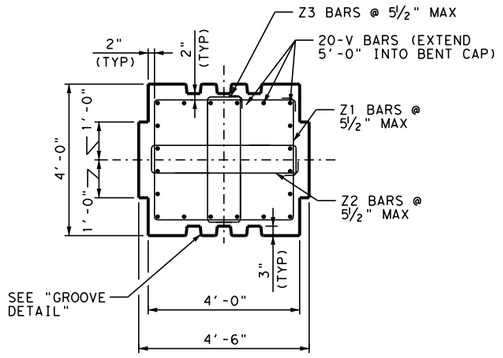
PLAN



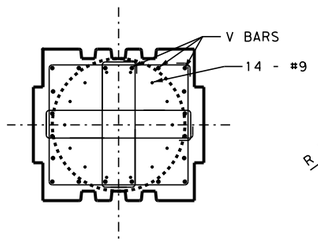
ELEVATION

SHEAR KEY DETAIL

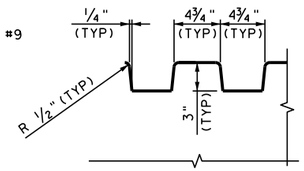
SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.



SECTION C-C



SECTION E-E



GROOVE DETAIL

10/18/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 NB OVERPASS AT 18TH STREET

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1298

STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN

CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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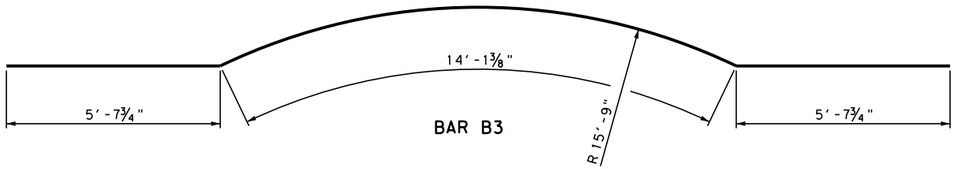

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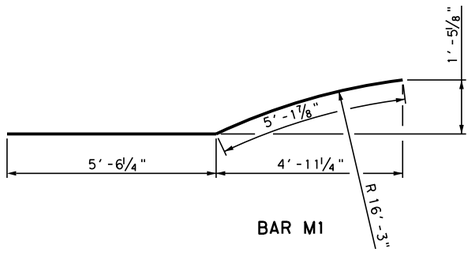

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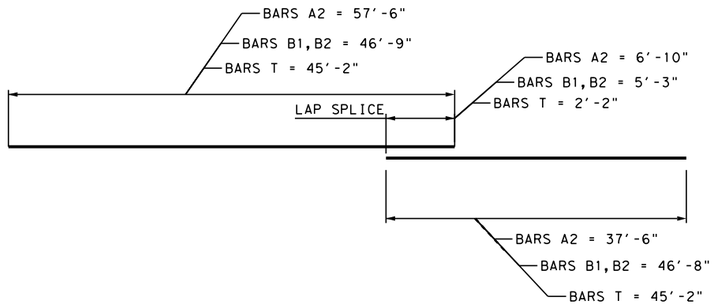
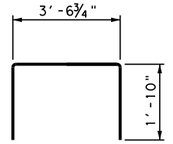
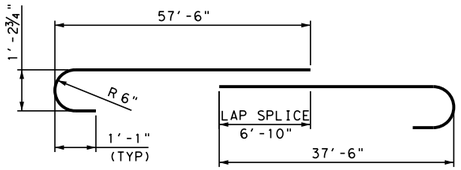


BAR A2, B1, B2, T



BARS E1



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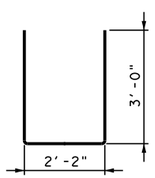

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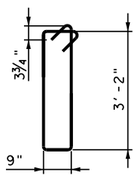
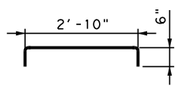


BAR SS



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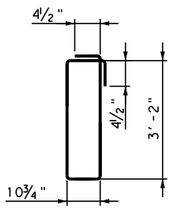

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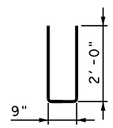

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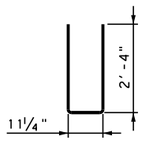

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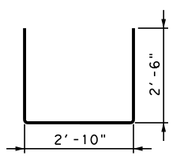

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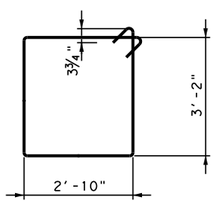
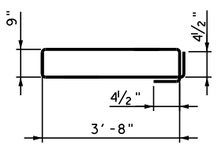


BAR S



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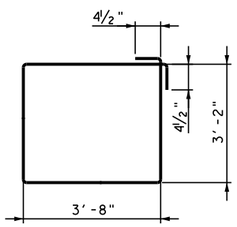

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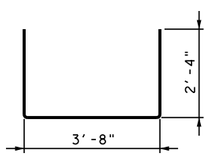

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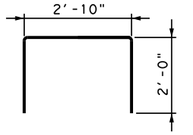

BAR C

TABLE OF QUANTITIES

BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 98′-2″	3,130
A2	4	#11	* 95′-0″	2,019
B1	6	#11	** 93′-5″	2,978
B2	6	#11	** 93′-5″	2,978
B3	16	#8	25′-5″	1,086
C	25	#4	6′-10″	115
E1	5	#5	7′-3″	38
E2	6	#5	4′-11″	31
K	80	#3	3′-10″	116
M1	16	#8	10′-9″	457
M2	16	#8	6′-2″	262
M3	16	#8	6′-11″	293
N	60	#4	8′-4″	334
P	60	#4	5′-8″	225
Q	12	#4	4′-9″	39
S	204	#5	12′-11″	2,749
SS	204	#5	8′-9″	1,862
T	6	#6	*** 90′-4″	815
U1	56	#4	7′-10″	294
U2	72	#4	8′-2″	393
V	100	#11	19′-9″	10,493
Z1	165	#4	14′-5″	2,481
Z2	165	#4	9′-7″	1,649
Z3	165	#4	8′-11″	1,527
SUBTOTAL STEEL (LBS) ****				36,364
CL "C" CONC (BENT) (HPC) (CY)				104.4

* LENGTH SHOWN INCLUDES ONE 6′-10" SPLICE.
** LENGTH SHOWN INCLUDES ONE 5′-3" SPLICE.
*** LENGTH SHOWN INCLUDES ONE 2′-2" SPLICE.
**** FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

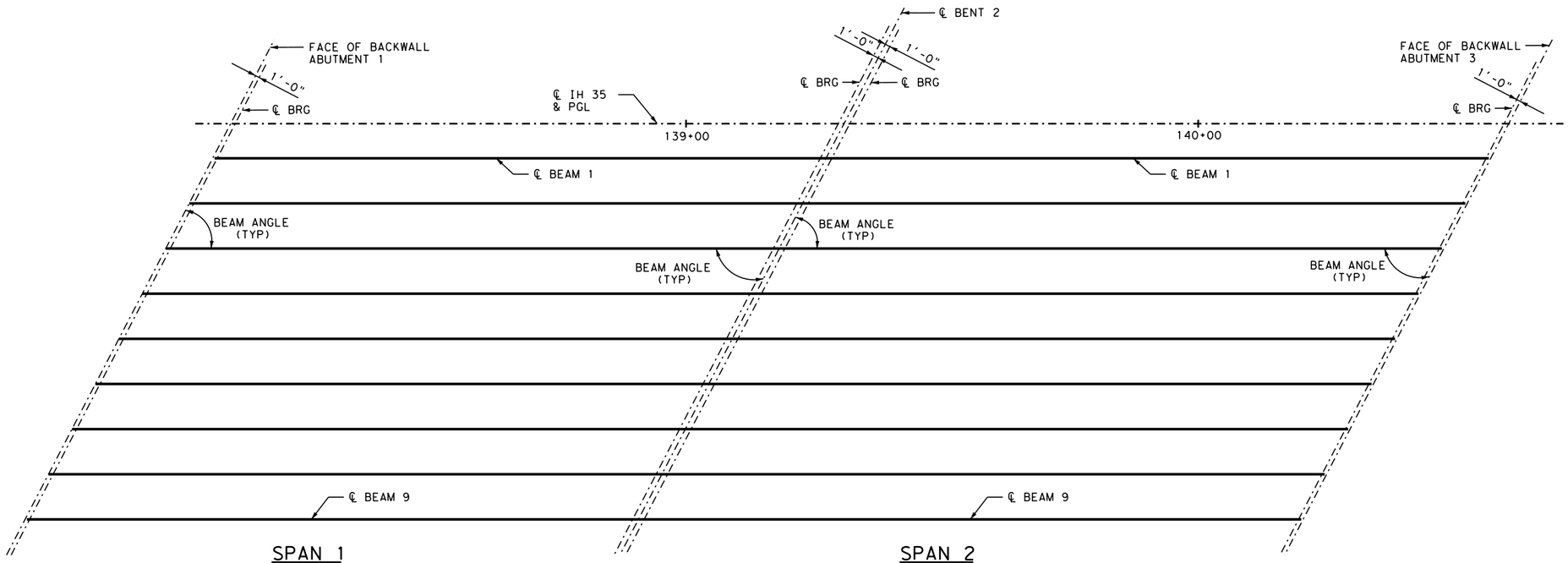
IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 NB OVERPASS AT 18TH STREET

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1299
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

BENT REPORT

ABUT NO. 1 (S 48 47 14 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 7.043 R

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM 1	0.000	62 32 46
	BEAM 2	10.283	62 32 46
	BEAM 3	10.283	62 32 46
	BEAM 4	10.283	62 32 46
	BEAM 5	10.283	62 32 46
	BEAM 6	10.283	62 32 46
	BEAM 7	10.283	62 32 46
	BEAM 8	10.283	62 32 46
	BEAM 9	10.283	62 32 46
	TOTAL	82.264	

BENT NO. 2 (S 48 47 14 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 7.043 R

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM 1	0.000	62 32 46
	BEAM 2	10.283	62 32 46
	BEAM 3	10.283	62 32 46
	BEAM 4	10.283	62 32 46
	BEAM 5	10.283	62 32 46
	BEAM 6	10.283	62 32 46
	BEAM 7	10.283	62 32 46
	BEAM 8	10.283	62 32 46
	BEAM 9	10.283	62 32 46
	TOTAL	82.264	

BENT REPORT

BENT NO. 2 (S 48 47 14 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 7.043 R

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM 1	0.000	62 32 46
	BEAM 2	10.283	62 32 46
	BEAM 3	10.283	62 32 46
	BEAM 4	10.283	62 32 46
	BEAM 5	10.283	62 32 46
	BEAM 6	10.283	62 32 46
	BEAM 7	10.283	62 32 46
	BEAM 8	10.283	62 32 46
	BEAM 9	10.283	62 32 46
	TOTAL	82.264	

ABUT NO. 3 (S 48 47 14 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 7.043 R

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM 1	0.000	62 32 46
	BEAM 2	10.283	62 32 46
	BEAM 3	10.283	62 32 46
	BEAM 4	10.283	62 32 46
	BEAM 5	10.283	62 32 46
	BEAM 6	10.283	62 32 46
	BEAM 7	10.283	62 32 46
	BEAM 8	10.283	62 32 46
	BEAM 9	10.283	62 32 46
	TOTAL	82.264	

ACUTE BEAM ANGLE SHOWN

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	125.000	122.746	124.48	0.0107
BEAM 2	125.000	122.746	124.48	0.0110
BEAM 3	125.000	122.746	124.48	0.0113
BEAM 4	125.000	122.746	124.48	0.0116
BEAM 5	125.000	122.746	124.48	0.0119
BEAM 6	125.000	122.746	124.48	0.0122
BEAM 7	125.000	122.746	124.48	0.0126
BEAM 8	125.000	122.746	124.48	0.0129
BEAM 9	125.000	122.746	124.48	0.0131

BEAM REPORT

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	125.000	122.746	124.47	0.0026
BEAM 2	125.000	122.746	124.47	0.0029
BEAM 3	125.000	122.746	124.47	0.0032
BEAM 4	125.000	122.746	124.47	0.0035
BEAM 5	125.000	122.746	124.47	0.0038
BEAM 6	125.000	122.746	124.47	0.0041
BEAM 7	125.000	122.746	124.47	0.0044
BEAM 8	125.000	122.746	124.47	0.0047
BEAM 9	125.000	122.746	124.47	0.0050

STATE OF TEXAS
ZACHARY PLINARIO
124847
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT

IH 35 NB OVERPASS AT 18TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1300
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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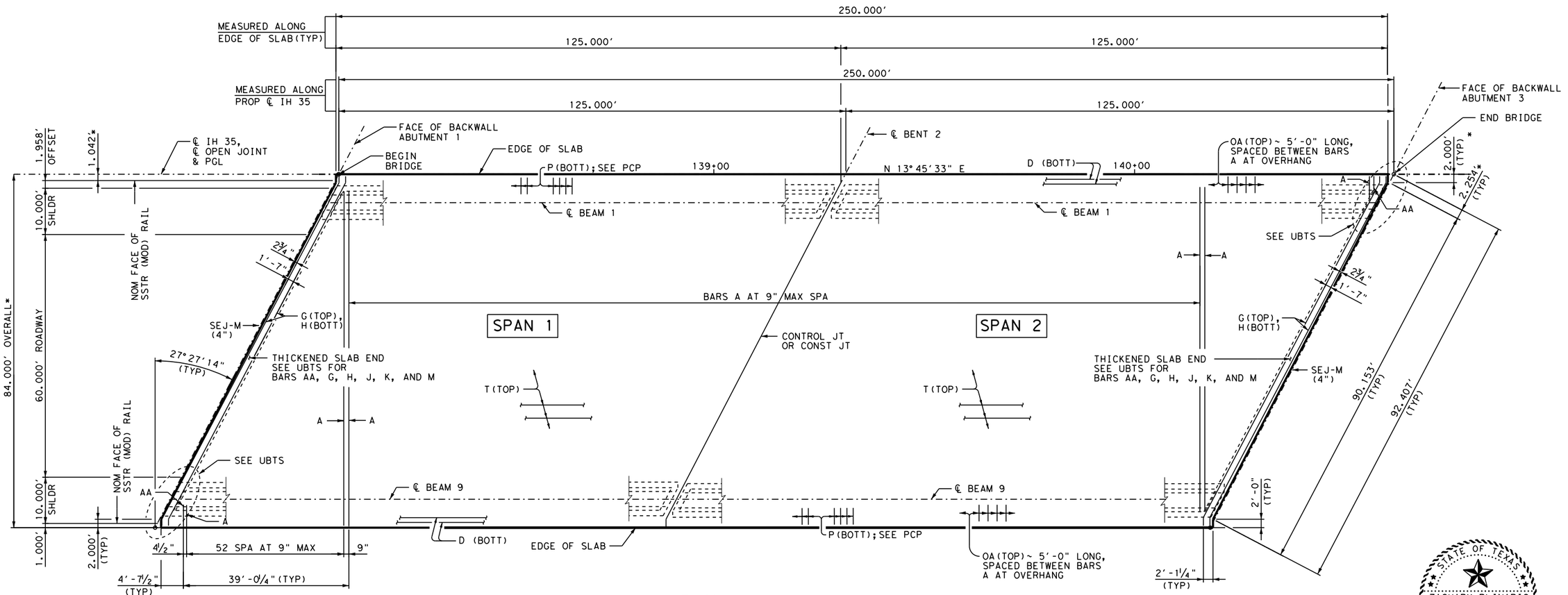
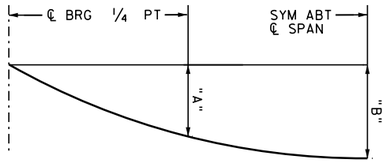


PLAN

* MEASURED TO ℄ IH 35

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1	1&8	0.159	0.223
1	2-7	0.136	0.191
2	1&9	0.208	0.292
2	2-8	0.165	0.232



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION(2017).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c = 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS;

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

250.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 NB OVERPASS AT 18TH STREET

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1301

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:55:41 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

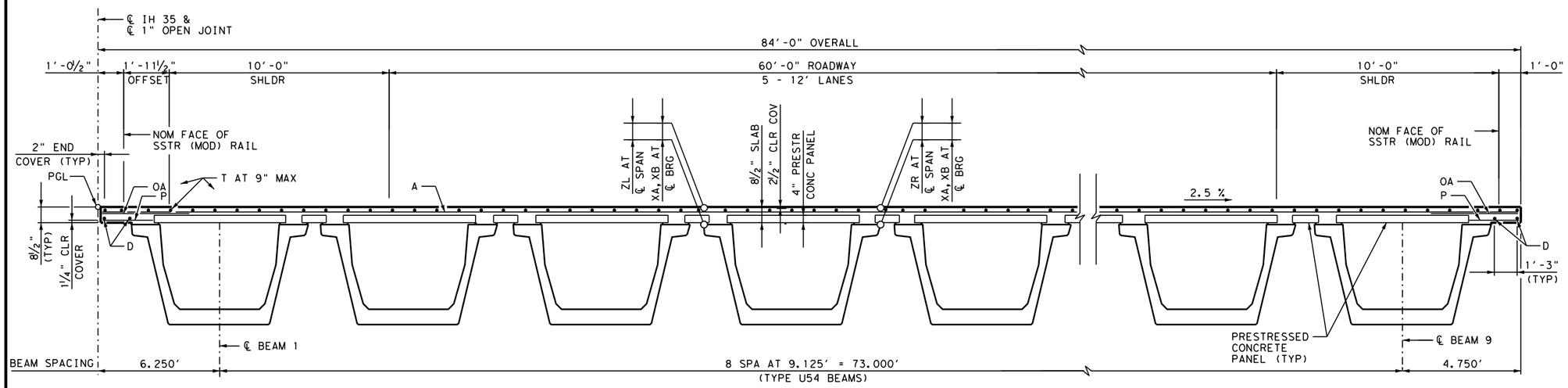
3 SEE PRESTRESSED CONCRETE PANELS (PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U54)	① REINFORCING STEEL
	SF	LF	LB
1	10,495	1,120.32	38,832
2	10,495	1,120.23	38,832
TOTAL	20,990	2,240.55	77,664

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.



TYPICAL TRANSVERSE SECTION

BAR TABLE

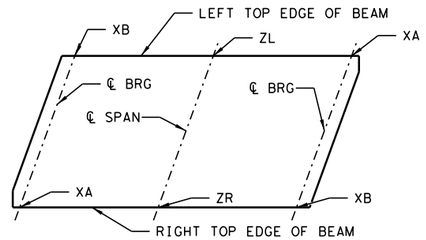
BAR	SIZE
AA	#5
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
K	#4
M	#4
OA	#5
P	#4
T	#4

(SHOWING SPAN 2)

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN ** (IN)	"ZR" AT ℄ SPAN ** (IN)
1	1&8	10 1/2	10 3/4	11 1/8	11 1/8
1	2-7	10 1/2	10 3/4	10 3/4	10 3/4
2	1&9	10 1/2	10 3/4	11 1/2	11 1/2
2	2-8	10 1/2	10 3/4	10 7/8	10 7/8

** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
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Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

250.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 NB OVERPASS AT 18TH STREET

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1302

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE:
FILE:

DESIGNED BEAMS (STRAIGHT STRANDS)

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH fpu (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)	PRESTRESSING STRANDS: TOT NO. DEB	DEBONDED STRAND PATTERN PER ROW: DIST FROM BOTTOM (in)	DEBONDED STRAND PATTERN PER ROW: NO.OF STRANDS: TOTAL	DEBONDED STRAND PATTERN PER ROW: NO.OF STRANDS: DE-BONDED	DEBONDED STRAND PATTERN PER ROW: NUMBER OF STRANDS DEBONDED TO (ft from end): 3	6	9	12	15	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
IH 35 SB OVERPASS AT 18TH STREET	ALL	ALL	U54		53	0.6	270	19.32	19.24	23	2.17 4.14	27 26	13 10	0 4	5 6	4 0	2 0	2 0	5.200	7.700
IH 35 NB OVERPASS AT 18TH STREET	ALL	ALL	U54		56	0.6	270	19.20	19.08	25	2.17 4.14	27 27	13 12	0 4	3 8	6 0	2 0	2 0	5.500	7.800

OPTIONAL DESIGN

STRUCTURE	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	Shear
IH 35 SB OVERPASS AT 18TH STREET	4.890	-4.148	10339	0.577	1.054
IH 35 NB OVERPASS AT 18TH STREET	4.914	-4.295	10845	0.574	1.055

LOAD RATING FACTORS

STRUCTURE	STRENGTH I: Inv	STRENGTH I: Opr	SERVICE III: Inv
IH 35 SB OVERPASS AT 18TH STREET	1.75	2.35	1.01
IH 35 NB OVERPASS AT 18TH STREET	1.79	2.40	1.08

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation.

Optional designs must have a calculated residual camber equal to or greater than that of the designed beam.

Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

The grid pattern for the strands is based on exact conversions from a metric grid spacing of 50mm.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

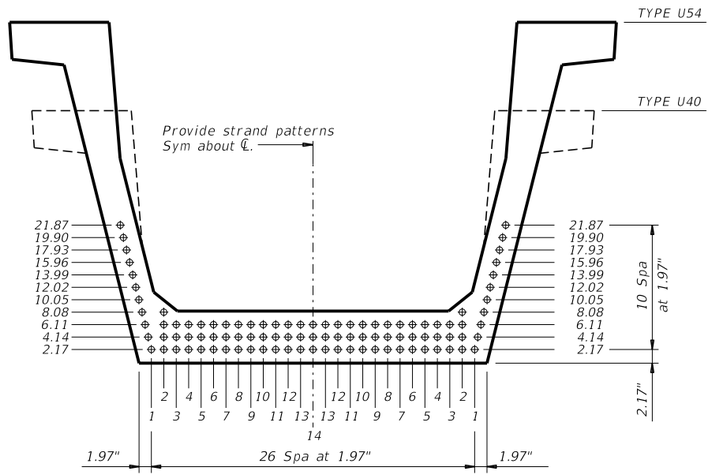
When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

Locate strands for the designed beam as low as possible on the 1.97" grid system unless a non-standard stand pattern is indicated. Fill row "2.17", then row "4.14", then row "6.11", etc., beginning each row in the "1" position and, distributing uniformly as practical, working inward until the required number of strands is reached.

Strand debonding must comply with Item 424.4.2.2.2.4.

Do not debond strands in position "1". Distribute debonded strands equally about the vertical centerline. Decrease debonded lengths working inward, with debonding staggered in each row.

Full-length debonded strands are not permitted in positions "1" and "2".



TxDOT TYPE U54 & TYPE U40 BMS

HL93 LOADING

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

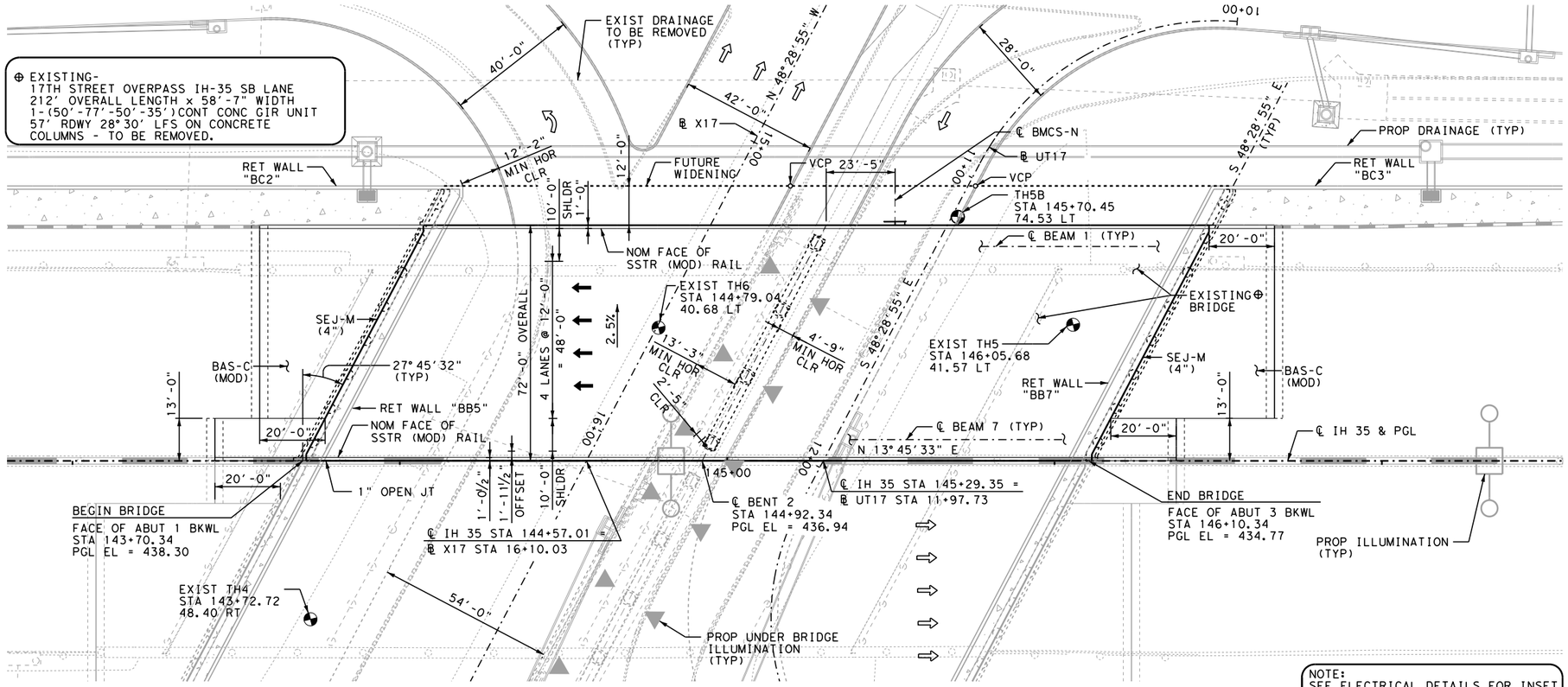
Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE U-BEAM DESIGNS (DESIGN DATA)

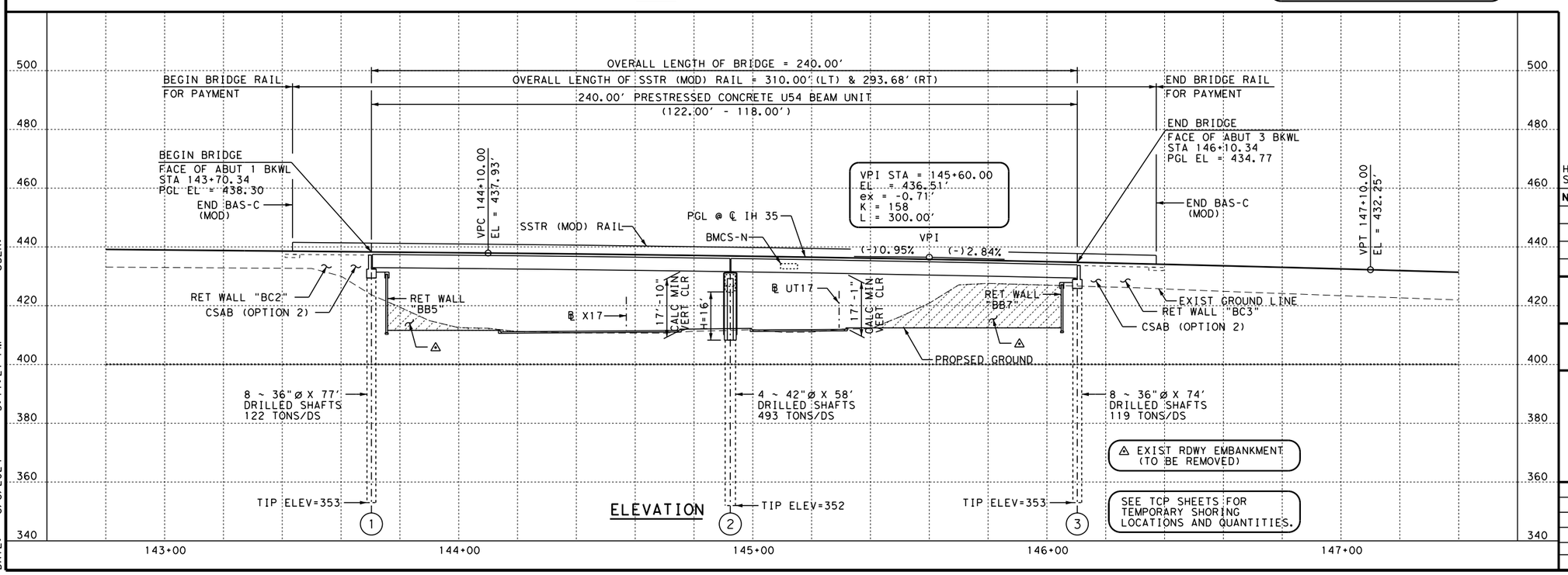
UBND

FILE: ubstds04.dgn	DN: TxDOT	CK: TxDOT	DW: SFS	CK: SDB
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
01-16: Notes. 03-22: Added Load Rating.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1303



PLAN

NOTE:
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT AND/OR CAPS.



ELEVATION

0' 10' 20' 40'

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUT FOR EXISTING STRUCTURE CSJ 0015-01-123, 1989. BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. FOR BRIDGE TYPICAL SECTIONS, SEE "PHASED TYPICAL SECTIONS" SHEET.
6. VCP: CRITICAL VERTICAL CLEARANCE POINT.
7. DRILLED SHAFT SHALL BE FOUNDED AT ELEVATION SHOWN OR DEEPER TO ATTAIN A MINIMUM OF TWO DIAMETER PENETRATION INTO LIMESTONE.
8. FOR PROP ILLUMINATION POLE MOUNTED TO SSTR RAIL AT ℄ IH 35, SEE "SPECIAL MODIFICAITON TO TYPE SSTR RAIL" SHEET.

FUNCT. CLASS = INTERSTATE
DESIGN SPEED = 60 MPH
PROP ADT (2026) = 80115
(2046) = 109240

EXISTING NBI NO = 09-161-0-0015-01-259
EXISTING PSN NO = 259

NEW NBI NO = 09-161-0-0015-01-822
NEW PSN NO = 822

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.06/2.17

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT

IH 35 SB OVERPASS AT 17TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1304
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\06_17th St\BRLY5_0617_SB_001.dgn
DATE: 6/6/2024 3:17:27 PM
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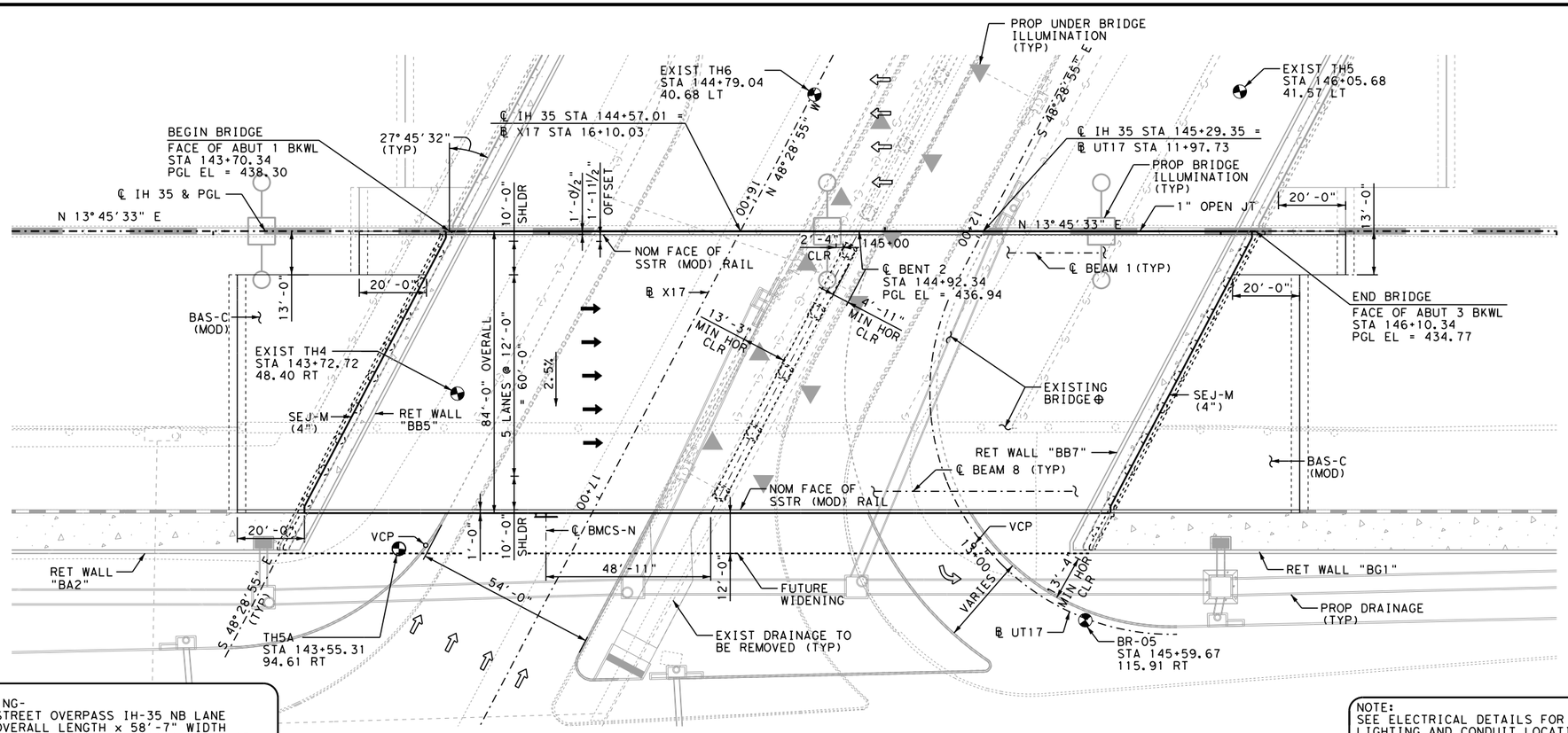


PLAN

⊕ EXISTING-
17TH STREET OVERPASS IH-35 NB LANE
212' OVERALL LENGTH x 58'-7" WIDTH
1-(50'-77'-50'-35')CONT CONC GIR UNIT
57' RDWY 28°30' LFS CONCRETE
COLUMNS - TO BE REMOVED.

NOTE:
SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT AND/OR CAPS.

0' 10' 20' 40'

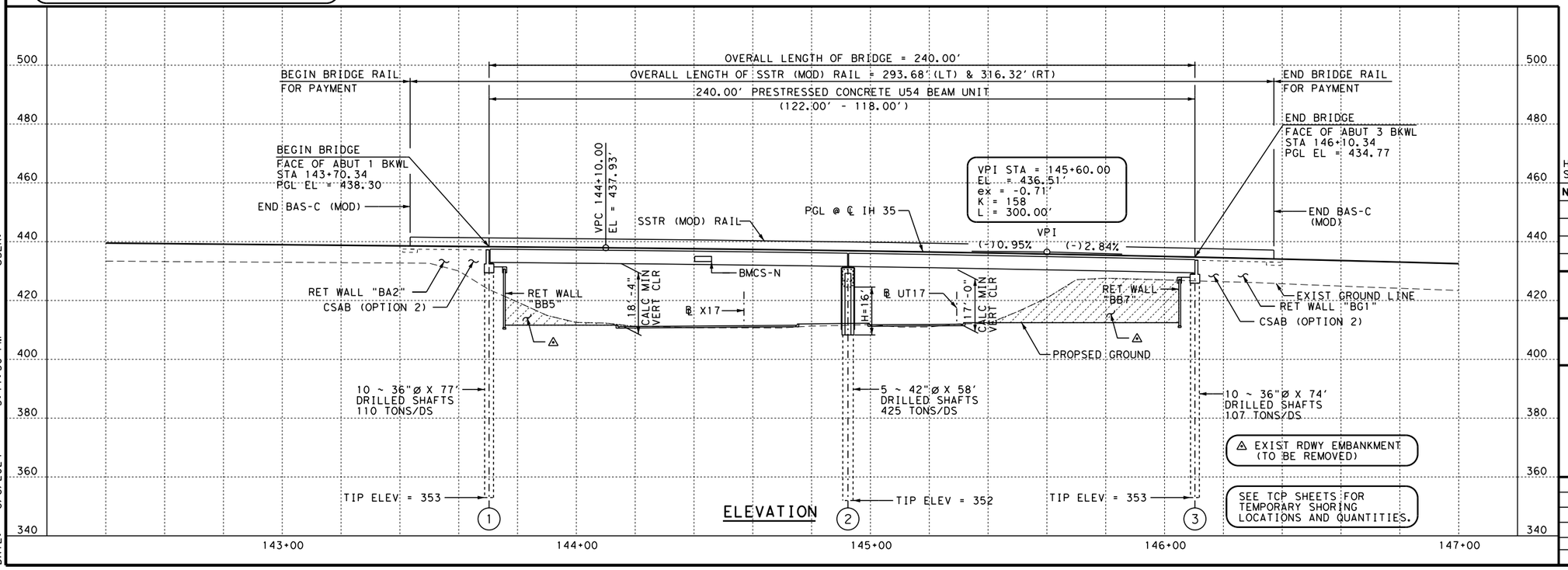
GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION (2017).
2. ⊕ - DENOTES SOIL BORING LOCATION. SEE "TEST HOLE DATA" SHEET FOR TEST HOLE DATA.
3. BORINGS TAKEN FROM BRIDGE LAYOUT FOR EXISTING STRUCTURE CSJ 0015-01-123, 1989. BORING LOCATIONS ARE APPROXIMATE.
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE TO CALCULATE COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. FOR BRIDGE TYPICAL SECTIONS, SEE "PHASED TYPICAL SECTIONS" SHEET.
6. VCP: CRITICAL VERTICAL CLEARANCE POINT.
7. DRILLED SHAFT SHALL BE FOUNDED AT ELEVATION SHOWN OR DEEPER TO ATTAIN A MINIMUM OF TWO DIAMETER PENETRATION INTO LIMESTONE.
8. FOR PROP ILLUMINATION POLE MOUNTED TO SSTR RAIL AT ℄ IH 35, SEE "SPECIAL MODIFICAITON TO TYPE 'SSTR RAIL" SHEET.

FUNCT. CLASS = INTERSTATE
DESIGN SPEED = 60 MPH
PROP ADT (2026) = 69540
(2046) = 94545

EXISTING NBI NO = 09-161-0-0015-01-260
EXISTING PSN NO = 260

NEW NBI NO = 09-161-0-0015-01-823
NEW PSN NO = 823



ELEVATION

⚠ EXIST RDWY EMBANKMENT (TO BE REMOVED)

SEE TCP SHEETS FOR TEMPORARY SHORING LOCATIONS AND QUANTITIES.

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
6/6/2024

HL93 LOADING
SUPERSTRUCTURE INV/OPR RATINGS: 1.04/2.12

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BRIDGE LAYOUT

IH 35 NB OVERPASS AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1305
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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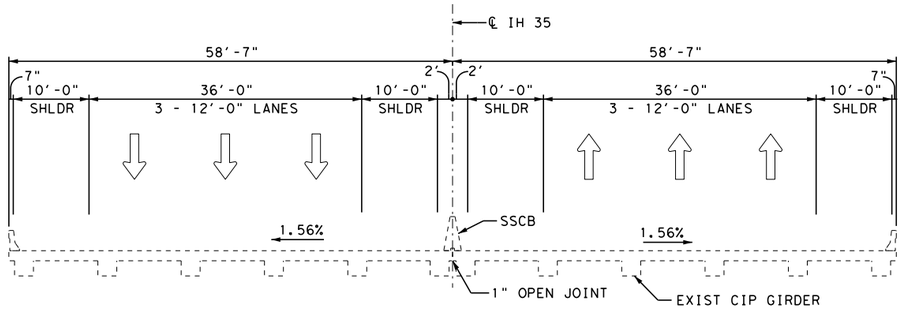
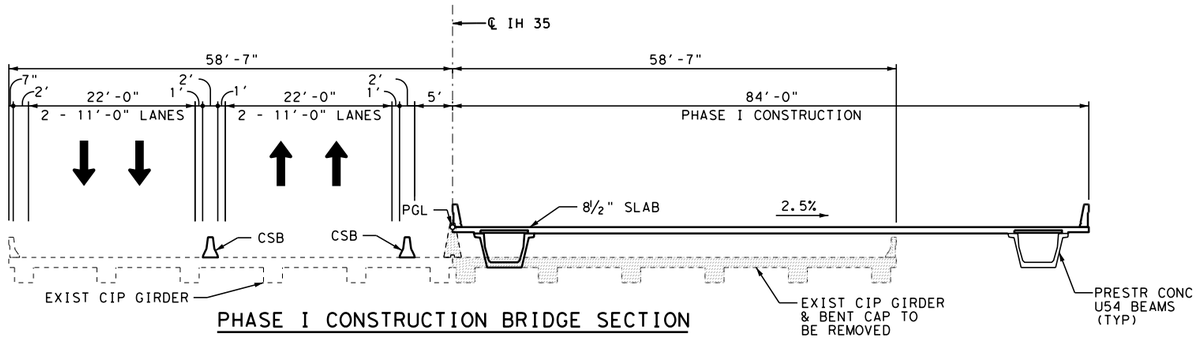
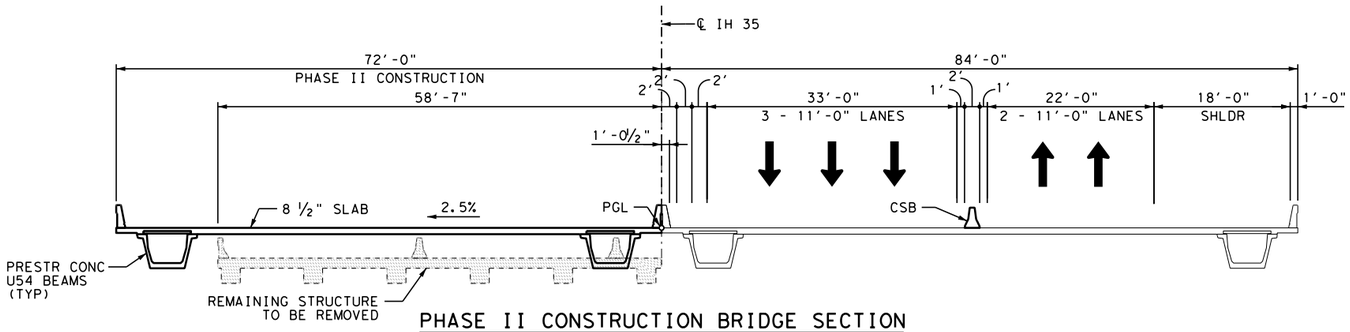
DATE: 6/6/2024 3:17:30 PM USER:



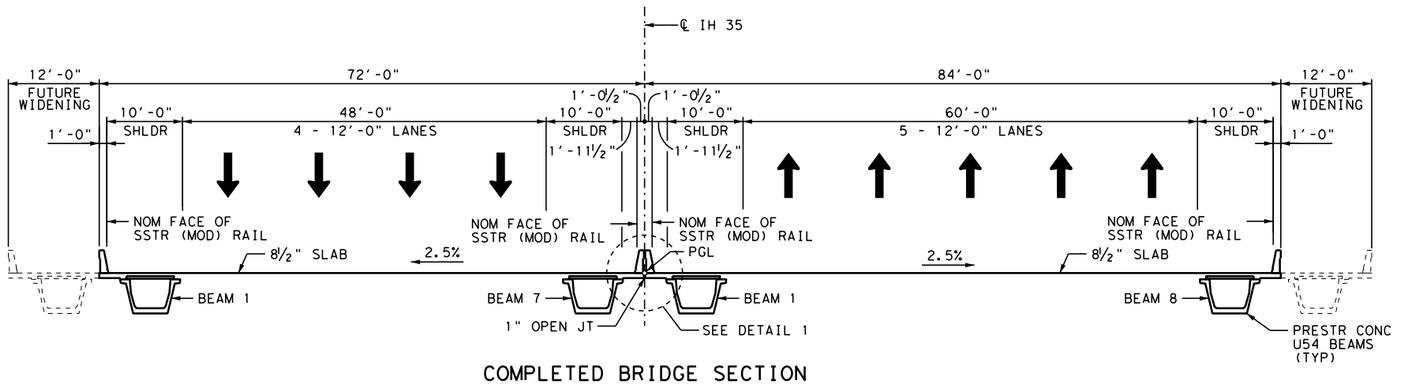
EXISTING BRIDGE SECTION



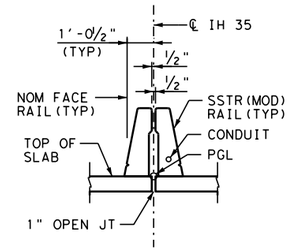
PHASE I CONSTRUCTION BRIDGE SECTION



PHASE II CONSTRUCTION BRIDGE SECTION



COMPLETED BRIDGE SECTION



DETAIL 1

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
7/25/2024

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

PHASED TYPICAL SECTIONS

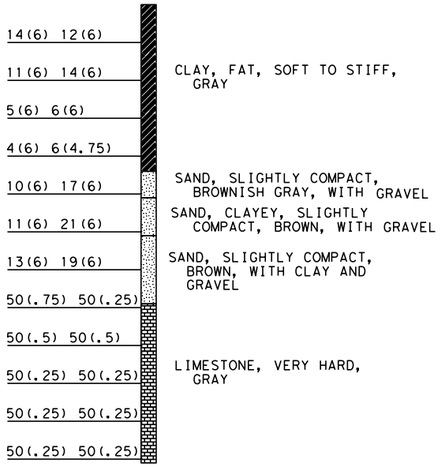
IH 35 SB & NB OVERPASS
AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1306
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\06_17th St\BRTY5_0617_001.dgn
DATE: 7/25/2024 12:40:12 PM USER:

TEST HOLE NO. 5A
STA 143+55.31, 94.61 RT

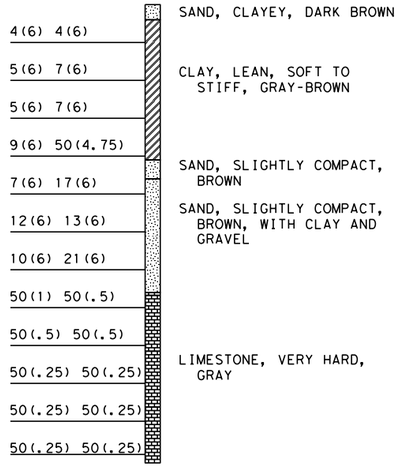
T/H EL = 413.42



TEST HOLE 5A
B/H EL = 352.92

TEST HOLE NO. 5B
STA 145+70.45, 74.53 LT

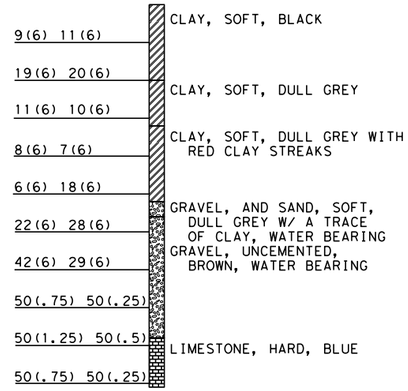
T/H EL = 412.29



TEST HOLE 5B
B/H EL = 351.79

TEST HOLE NO. TH4
STA 143+72.72, 48.40 RT

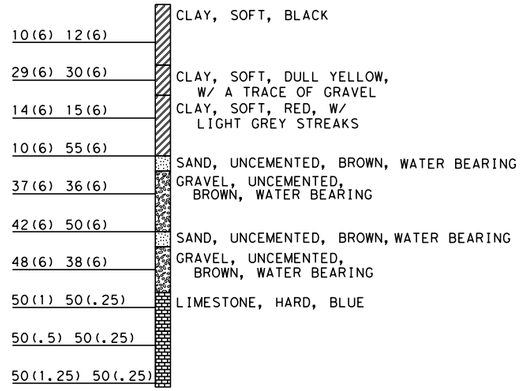
T/H EL = 415.00



EXIST TEST HOLE TH4
B/H EL = 364.50

TEST HOLE NO. TH5
STA 146+05.68, 41.57 LT

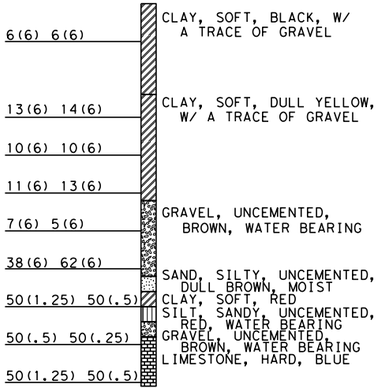
T/H EL = 416.00



EXIST TEST HOLE TH5
B/H EL = 365.50

TEST HOLE NO. TH6
STA 144+79.04, 40.68 LT

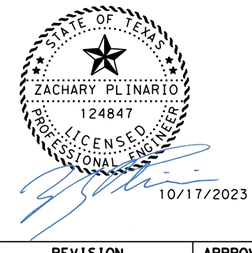
T/H EL = 416.00



EXIST TEST HOLE TH6
B/H EL = 365.50

NOTE

1. FOR TEST HOLE BR-05, SEE "TEST HOLE DATA NORTHBOUND" SHEETS.



NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

TEST HOLE DATA

IH 35 SB & NB OVERPASS
AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1307
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

SUMMARY OF ESTIMATED QUANTITIES

	ITEM - DESCRIPTION CODE	400 6005	416 6004	416 6005	420 6012	420 6014	420 6026	422 6001	422 6015	425 6028	450 6062	454 6018
	ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)	CL B CONC (MISC)	CL C CONC (ABUT) (HPC)	CL C CONC (BENT) (HPC)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC U-BEAM (U54)	RAIL (TY SSTR) (MOD)	SEALED EXPANSION JOINT (4 IN) (SEJ-M)
		CY	LF	LF	CY	CY	CY	SF	CY	LF	LF	LF
SBML	2-ABUTMENTS	435	1,208		1.0	107.8			215.8			160
SBML	1-INTERIOR BENT			232			91.0					
SBML	1-240.00' PRESTR CONC U-BEAM UNIT							17,270		1,672.79	603.7	
SBML												
SBML												
SBML												
	SBML TOTAL	435	1,208	232	1.0	107.8	91.0	17,270	215.8	1,672.79	603.7	160
NBML	2-ABUTMENTS	548	1,510		1.0	123.2			271.3			186
NBML	1-INTERIOR BENT			290			104.6					
NBML	1-240.00' PRESTR CONC U-BEAM UNIT							20,150		1,911.63	610.0	
NBML												
NBML												
NBML												
	NBML TOTAL	548	1,510	290	1.0	123.2	104.6	20,150	271.3	1,911.63	610.0	186
	TOTAL	983	2,718	522	2.0	231.0	195.6	37,420	487.1	3,584.42	1,213.7	346

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ESTIMATED QUANTITIES

IH 35 SB & NB OVERPASS
AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1308
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:56:07 AM USER:

SB BEARING SEAT ELEVATIONS (ft)

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
ABUT 1 (FWD)	430.652	430.794	430.945	431.086	431.238	431.378
	BEAM 4 LEFT	**BEAM 4 RIGHT**	**BEAM 5 LEFT**	**BEAM 5 RIGHT**	**BEAM 6 LEFT**	**BEAM 6 RIGHT**
	431.530	431.670	431.823	431.963	432.116	432.255
	BEAM 7 LEFT	**BEAM 7 RIGHT**				
	432.408	432.547				
	BEAM 1 LEFT	**BEAM 1 RIGHT**	**BEAM 2 LEFT**	**BEAM 2 RIGHT**	**BEAM 3 LEFT**	**BEAM 3 RIGHT**
BENT 2 (BK)	429.099	429.240	429.428	429.569	429.756	429.896
	BEAM 4 LEFT	**BEAM 4 RIGHT**	**BEAM 5 LEFT**	**BEAM 5 RIGHT**	**BEAM 6 LEFT**	**BEAM 6 RIGHT**
	430.082	430.222	430.406	430.546	430.729	430.868
	BEAM 7 LEFT	**BEAM 7 RIGHT**				
	431.049	431.188				
	BEAM 1 LEFT	**BEAM 1 RIGHT**	**BEAM 2 LEFT**	**BEAM 2 RIGHT**	**BEAM 3 LEFT**	**BEAM 3 RIGHT**
BENT 2 (FWD)	429.052	429.211	429.382	429.540	429.711	429.868
	BEAM 4 LEFT	**BEAM 4 RIGHT**	**BEAM 5 LEFT**	**BEAM 5 RIGHT**	**BEAM 6 LEFT**	**BEAM 6 RIGHT**
	430.037	430.193	430.362	430.518	430.685	430.840
	BEAM 7 LEFT	**BEAM 7 RIGHT**				
	431.007	431.161				
	BEAM 1 LEFT	**BEAM 1 RIGHT**	**BEAM 2 LEFT**	**BEAM 2 RIGHT**	**BEAM 3 LEFT**	**BEAM 3 RIGHT**
ABUT 3 (BK)	426.674	426.832	427.041	427.199	427.407	427.564
	BEAM 4 LEFT	**BEAM 4 RIGHT**	**BEAM 5 LEFT**	**BEAM 5 RIGHT**	**BEAM 6 LEFT**	**BEAM 6 RIGHT**
	427.771	427.928	428.134	428.289	428.495	428.649
	BEAM 7 LEFT	**BEAM 7 RIGHT**				
	428.854	429.008				

NB BEARING SEAT ELEVATIONS (ft)

	BEAM 1 LEFT	BEAM 1 RIGHT	BEAM 2 LEFT	BEAM 2 RIGHT	BEAM 3 LEFT	BEAM 3 RIGHT
ABUT 1 (FWD)	432.587	432.504	432.385	432.302	432.184	432.100
	BEAM 4 LEFT	**BEAM 4 RIGHT**	**BEAM 5 LEFT**	**BEAM 5 RIGHT**	**BEAM 6 LEFT**	**BEAM 6 RIGHT**
	431.983	431.899	431.781	431.697	431.580	431.495
	BEAM 7 LEFT	**BEAM 7 RIGHT**	**BEAM 8 LEFT**	**BEAM 8 RIGHT**		
	431.379	431.294	431.178	431.092		
	BEAM 1 LEFT	**BEAM 1 RIGHT**	**BEAM 2 LEFT**	**BEAM 2 RIGHT**	**BEAM 3 LEFT**	**BEAM 3 RIGHT**
BENT 2 (BK)	431.264	431.181	431.088	431.005	430.910	430.826
	BEAM 4 LEFT	**BEAM 4 RIGHT**	**BEAM 5 LEFT**	**BEAM 5 RIGHT**	**BEAM 6 LEFT**	**BEAM 6 RIGHT**
	430.730	430.646	430.549	430.464	430.366	430.281
	BEAM 7 LEFT	**BEAM 7 RIGHT**	**BEAM 8 LEFT**	**BEAM 8 RIGHT**		
	430.181	430.095	429.994	429.908		
	BEAM 1 LEFT	**BEAM 1 RIGHT**	**BEAM 2 LEFT**	**BEAM 2 RIGHT**	**BEAM 3 LEFT**	**BEAM 3 RIGHT**
BENT 2 (FWD)	431.223	431.155	431.048	430.978	430.870	430.800
	BEAM 4 LEFT	**BEAM 4 RIGHT**	**BEAM 5 LEFT**	**BEAM 5 RIGHT**	**BEAM 6 LEFT**	**BEAM 6 RIGHT**
	430.691	430.621	430.511	430.439	430.328	430.256
	BEAM 7 LEFT	**BEAM 7 RIGHT**	**BEAM 8 LEFT**	**BEAM 8 RIGHT**		
	430.144	430.071	429.958	429.884		
	BEAM 1 LEFT	**BEAM 1 RIGHT**	**BEAM 2 LEFT**	**BEAM 2 RIGHT**	**BEAM 3 LEFT**	**BEAM 3 RIGHT**
ABUT 3 (BK)	429.122	429.053	428.985	428.916	428.847	428.777
	BEAM 4 LEFT	**BEAM 4 RIGHT**	**BEAM 5 LEFT**	**BEAM 5 RIGHT**	**BEAM 6 LEFT**	**BEAM 6 RIGHT**
	428.706	428.636	428.564	428.493	428.421	428.348
	BEAM 7 LEFT	**BEAM 7 RIGHT**	**BEAM 8 LEFT**	**BEAM 8 RIGHT**		
	428.275	428.202	428.128	428.054		

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEARING SEAT ELEVATIONS

IH 35 SB & NB OVERPASS
AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1309
STATE	**DIST.**	**COUNTY**
TEXAS	WACO	McLENNAN
CONT.	**SECT.**	**JOB** / **HIGHWAY NO.**
0015	01	246 / IH 35

SB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7
ABUT 1 (FWD)	0.00020	0.00050	0.00079	0.00107	0.00132	0.00157	0.00179
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7
BENT 2 (BK)	0.00020	0.00050	0.00079	0.00107	0.00132	0.00157	0.00179
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7
BENT 2 (FWD)	-0.00654	-0.00625	-0.00596	-0.00568	-0.00539	-0.00510	-0.00482
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7
ABUT 3 (BK)	-0.00654	-0.00625	-0.00596	-0.00568	-0.00539	-0.00510	-0.00482

NB BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
ABUT 1 (FWD)	-0.02121	-0.02101	-0.02083	-0.02067	-0.02052	-0.02039	-0.02028	-0.02018
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
BENT 2 (BK)	-0.02121	-0.02101	-0.02083	-0.02067	-0.02052	-0.02039	-0.02028	-0.02018
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
BENT 2 (FWD)	-0.02771	-0.02741	-0.02712	-0.02682	-0.02652	-0.02623	-0.02593	-0.02563
	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
ABUT 3 (BK)	-0.02771	-0.02741	-0.02712	-0.02682	-0.02652	-0.02623	-0.02593	-0.02563

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

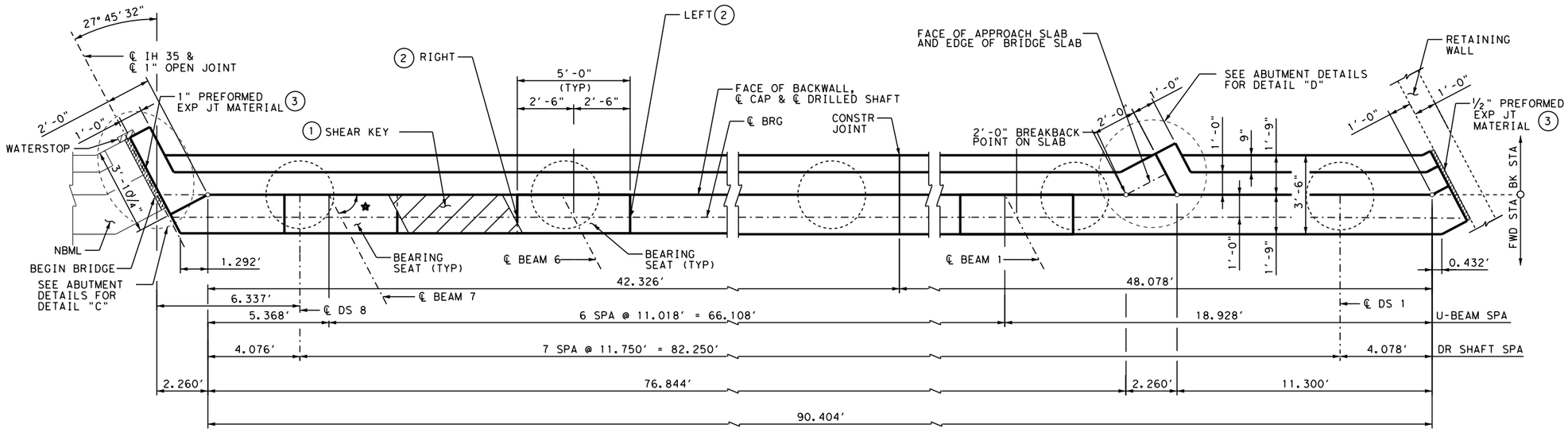
IH 35 FROM S LP 340 TO 12TH ST

BEARING PAD TAPER REPORT

IH 35 SB & NB OVERPASS
AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1310
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

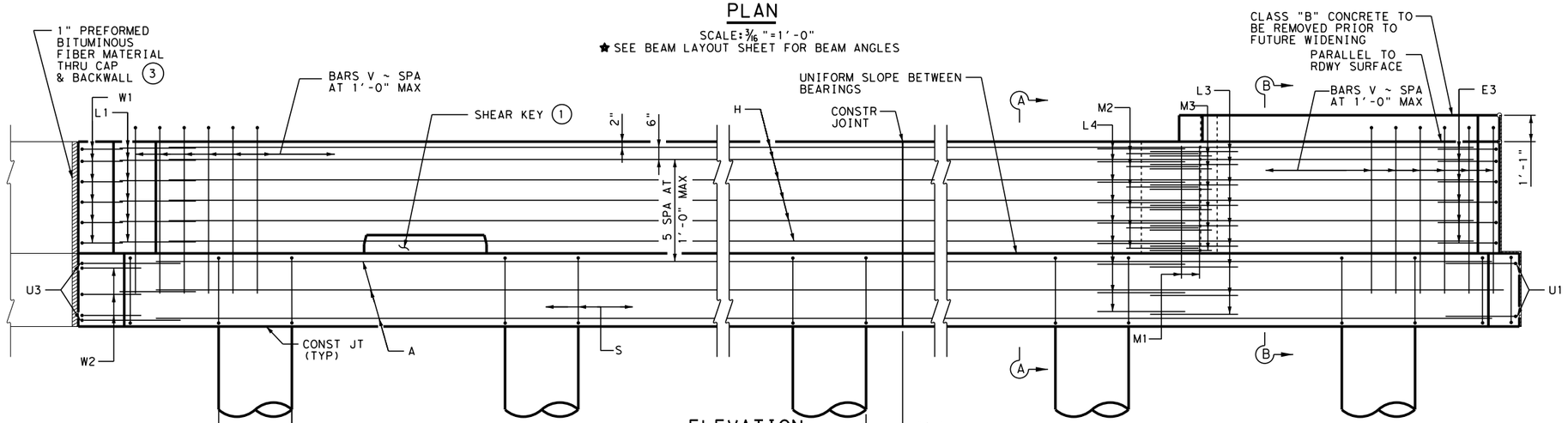
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\06_17th St\BRESS_0617_003.dgn
DATE: 10/17/2023 11:56:12 AM USER:



PLAN

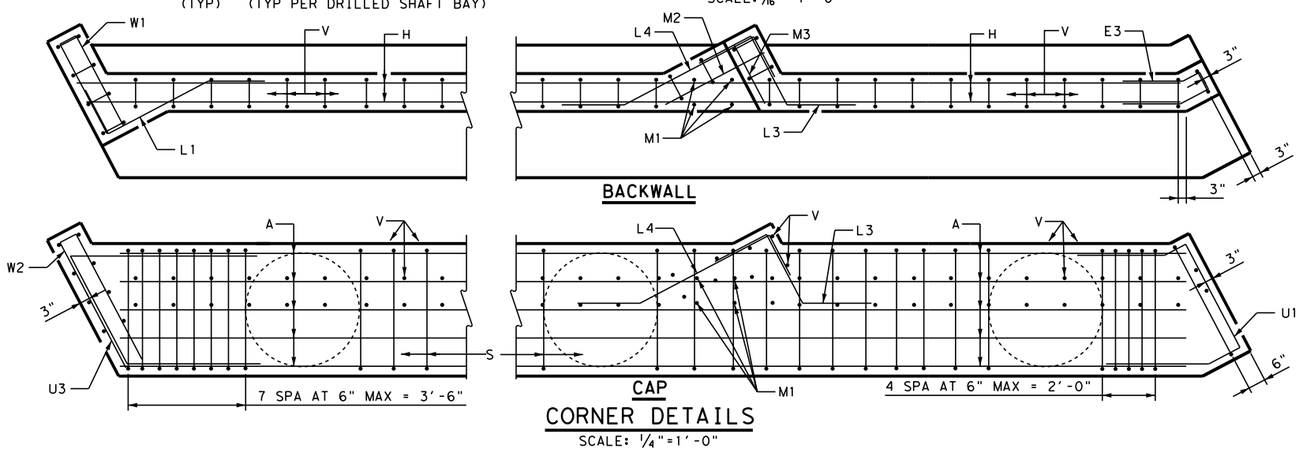
SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"



CORNER DETAILS

SCALE: 1/4"=1'-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	* 98'- 0"	6,248
E3	6	#5	5'- 9"	36
H	12	#6	** 95'- 1"	1,714
L1	6	#6	6'- 8"	60
L3	9	#6	6'-0"	81
L4	9	#6	7'- 10"	106
M1	4	#5	6'- 4"	26
M2	6	#5	2'-11"	18
M3	6	#5	1'- 9"	11
P1	7	#5	5'- 3"	39
P2	3	#5	5'- 9"	18
S	147	#6	13'- 6"	2,981
U1	2	#6	9'- 6"	29
U3	2	#6	8'- 5"	26
V	100	#5	15'- 4"	1,599
W1	6	#5	7'- 7"	47
W2	3	#5	9'- 6"	30
SUBTOTAL STEEL (LB) ***				13,039
CLASS "C" CONC (ABUT) (HPC) (CY)				54.1
CLASS "B" CONC (MISC) (CY)				0.5

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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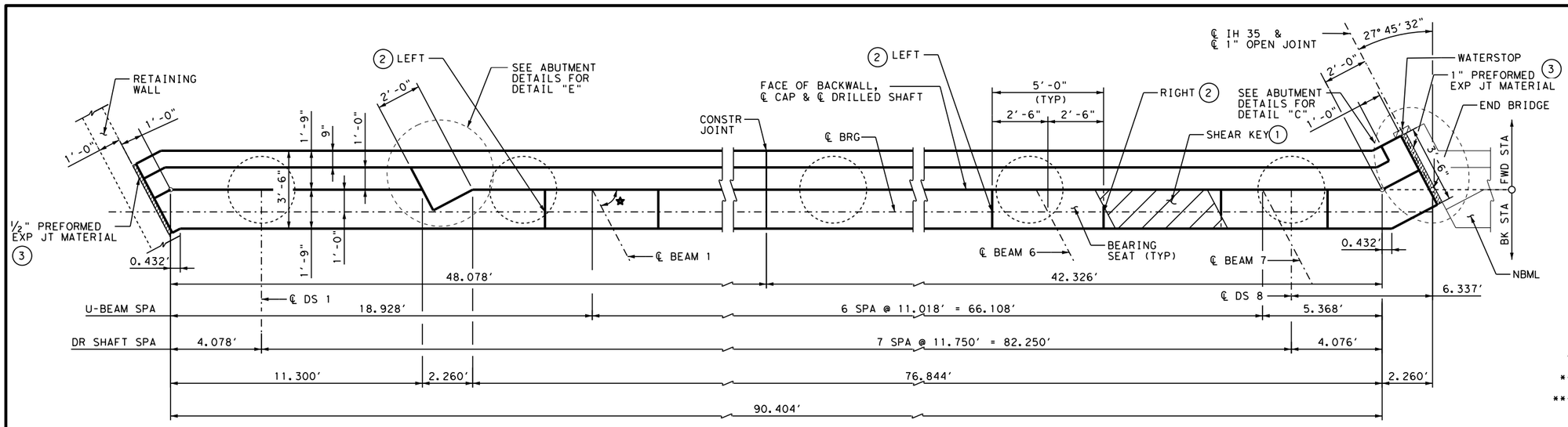
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 SB OVERPASS AT 17TH STREET

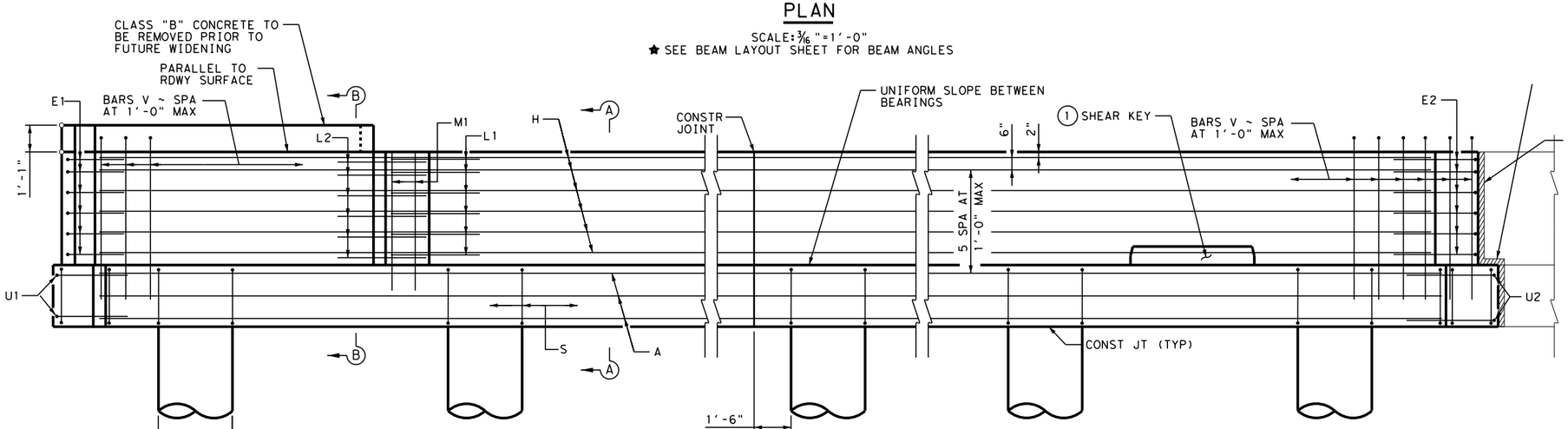
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1311
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



PLAN

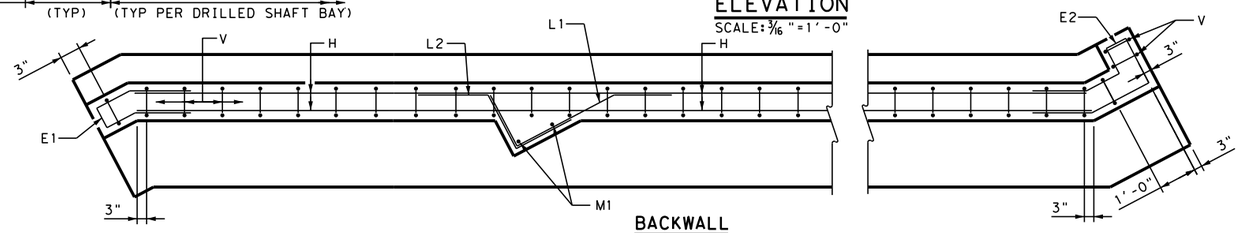
SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES

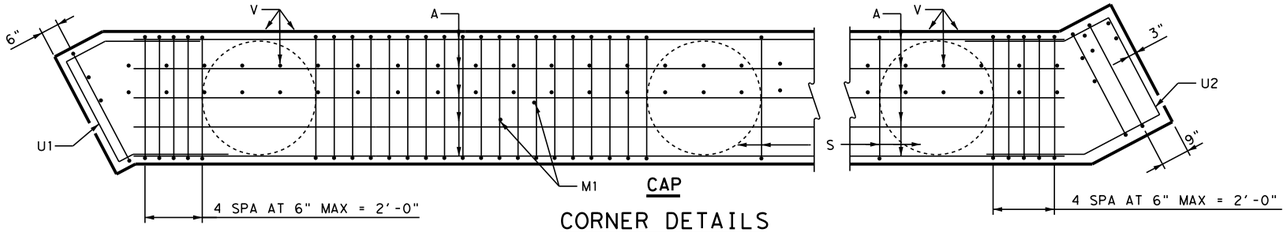


ELEVATION

SCALE: 3/16"=1'-0"



BACKWALL



CAP

CORNER DETAILS

SCALE: 1/4"=1'-0"

TABLE OF ESTIMATED QUANTITIES ABUTMENT 3				
BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	* 97'- 0"	6,184
E1	6	#5	6'- 3"	39
E2	6	#5	9'- 3"	58
H	12	#6	** 94'- 2"	1,697
L1	6	#6	6'- 8"	60
L2	6	#6	5'- 7"	51
M1	2	#5	6'- 4"	14
P1	7	#5	5'- 3"	39
P2	3	#5	5'- 9"	18
S	146	#6	13'- 6"	2,961
U1	2	#6	9'- 6"	29
U2	2	#6	11'- 6"	35
V	96	#5	15'- 4"	1,535
SUBTOTAL STEEL (LB) ***				12,720
CLASS "C" CONC (ABUT) (HPC) (CY)				53.7
CLASS "B" CONC (MISC) (CY)				0.5

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

1 SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

2 SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

3 INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL LICENSED ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 3

IH 35 SB OVERPASS AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1312
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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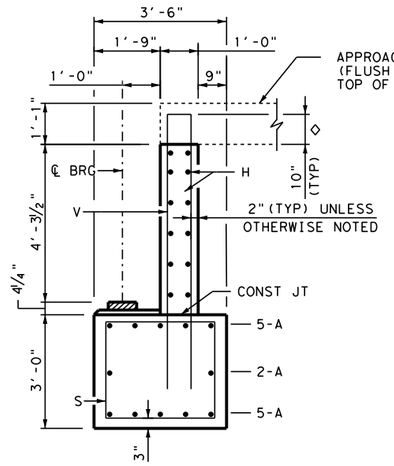
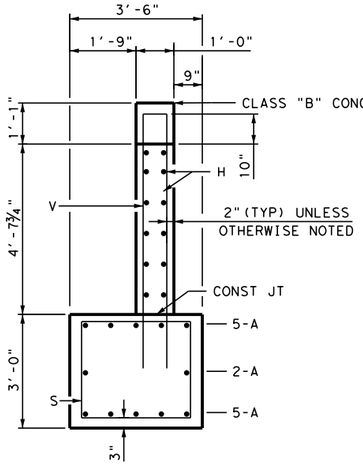


SECTION A-A

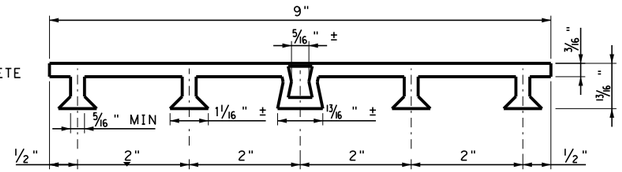
SCALE: ¼"=1'-0"

◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



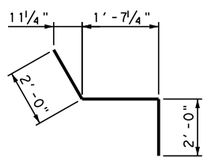
SECTION B-B

SCALE: ¼"=1'-0"

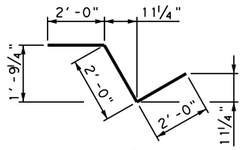


PVC WATERSTOP TYPE "A"

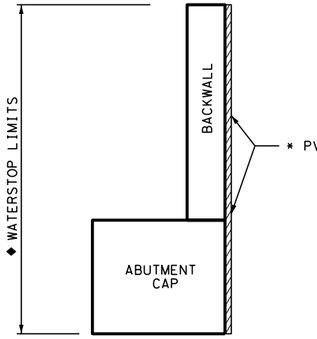
(DIMENSIONS AND SHAPE MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER)



BARS L2



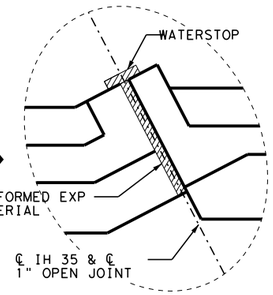
BARS L3



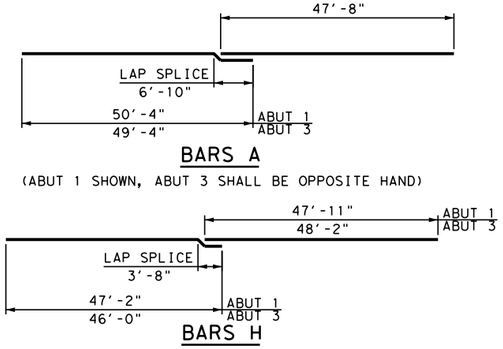
WATERSTOP DETAILS

SCALE: ¼"=1'-0"

◆ WATERSTOP SHALL BE CONSIDERED SUBSIDIARY TO CLASS "C" CONCRETE



DETAIL "C"

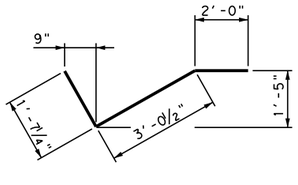


BARS A

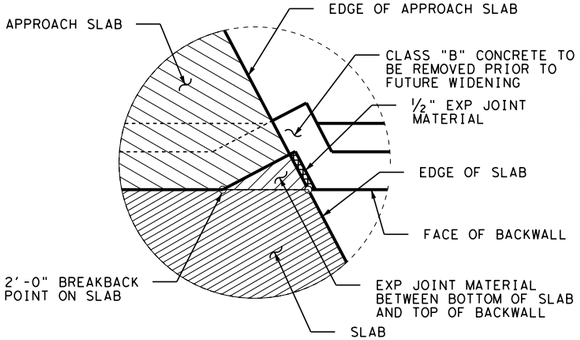
(ABUT 1 SHOWN, ABUT 3 SHALL BE OPPOSITE HAND)

BARS H

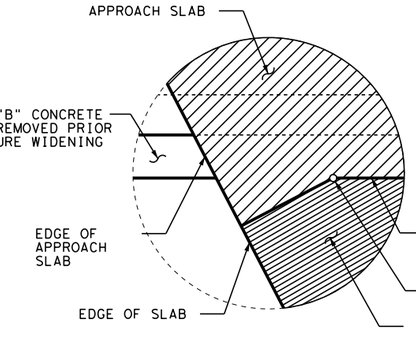
(ABUT 1 SHOWN, ABUT 3 SHALL BE OPPOSITE HAND)



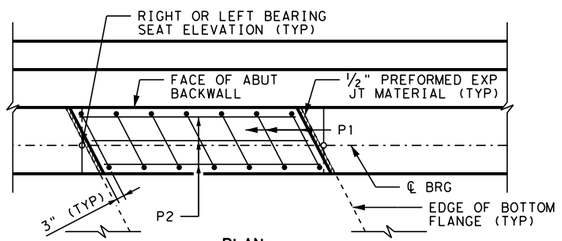
BARS L1



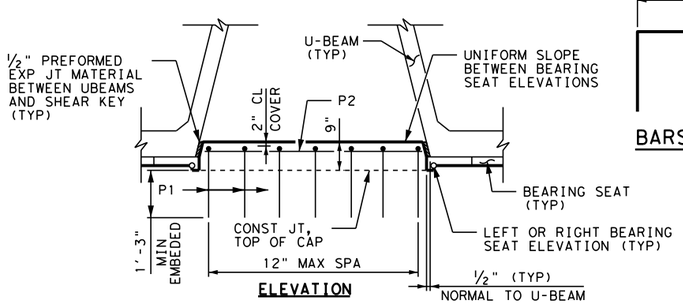
DETAIL "D"



DETAIL "E"

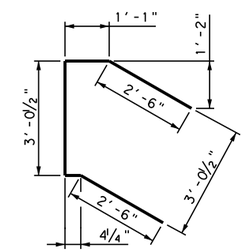


PLAN



ELEVATION

SHEAR KEY DETAIL



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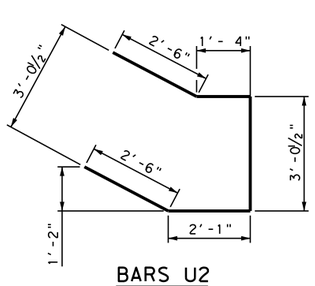
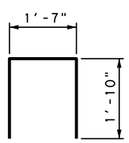
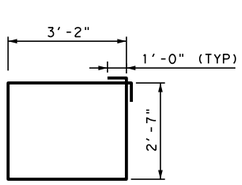


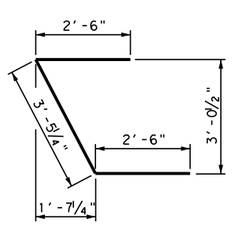
BARS U2



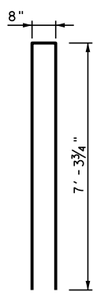
BARS P1



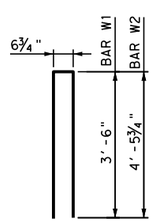
BARS S



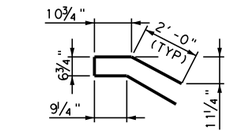
BARS U3



BARS V



BARS W1 & W2



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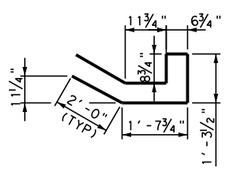
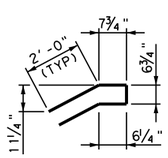


BARS E1



BARS E2

BARS E3

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

CLASS "B" CONCRETE STRENGTH SHALL BE f'c = 2000 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

CALCULATED FOUNDATION LOADS
ABUTMENT 1 = 122 TONS/DRILLED SHAFT
ABUTMENT 3 = 119 TONS/DRILLED SHAFT

SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT.

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL LICENSED ENGINEER

10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

IH 35 SB OVERPASS AT 17TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1313
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\06_17th St\BRAB5_0617_SB_003.dgn
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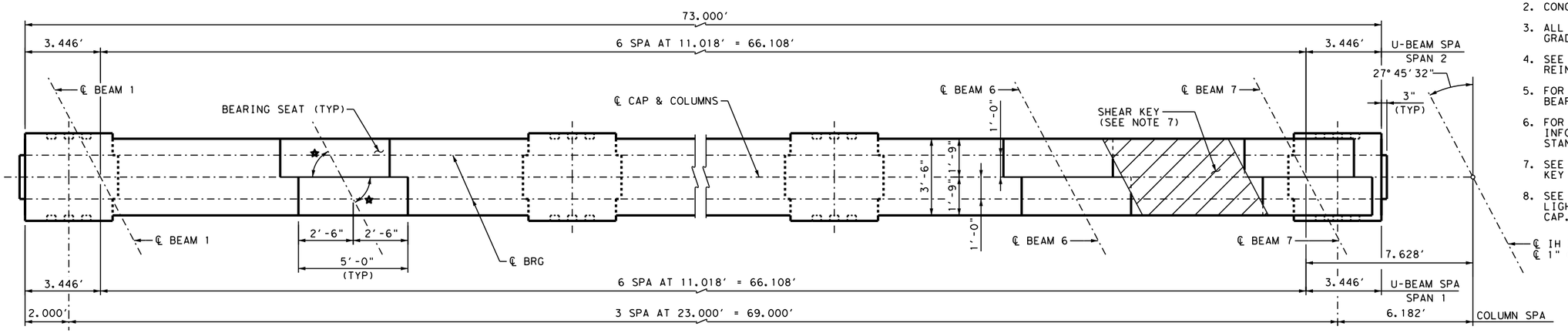
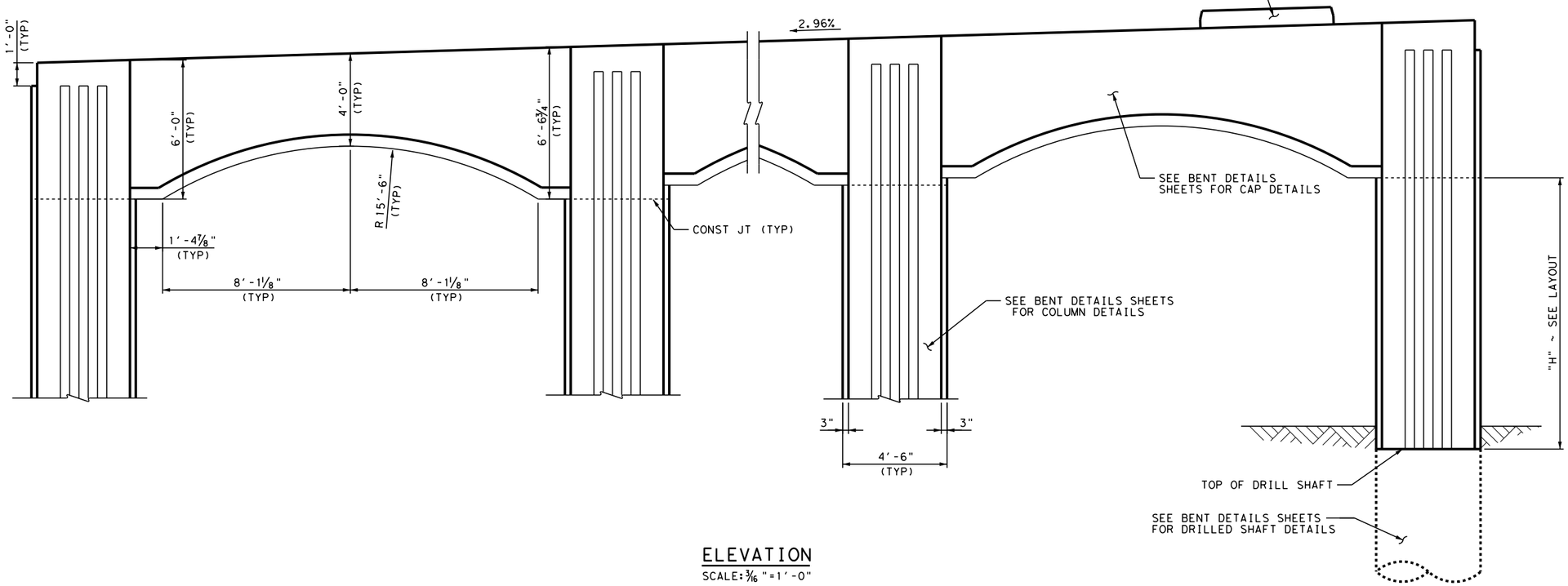


PLAN

SCALE: 3/16 "=1'-0"
★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL LICENSED ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

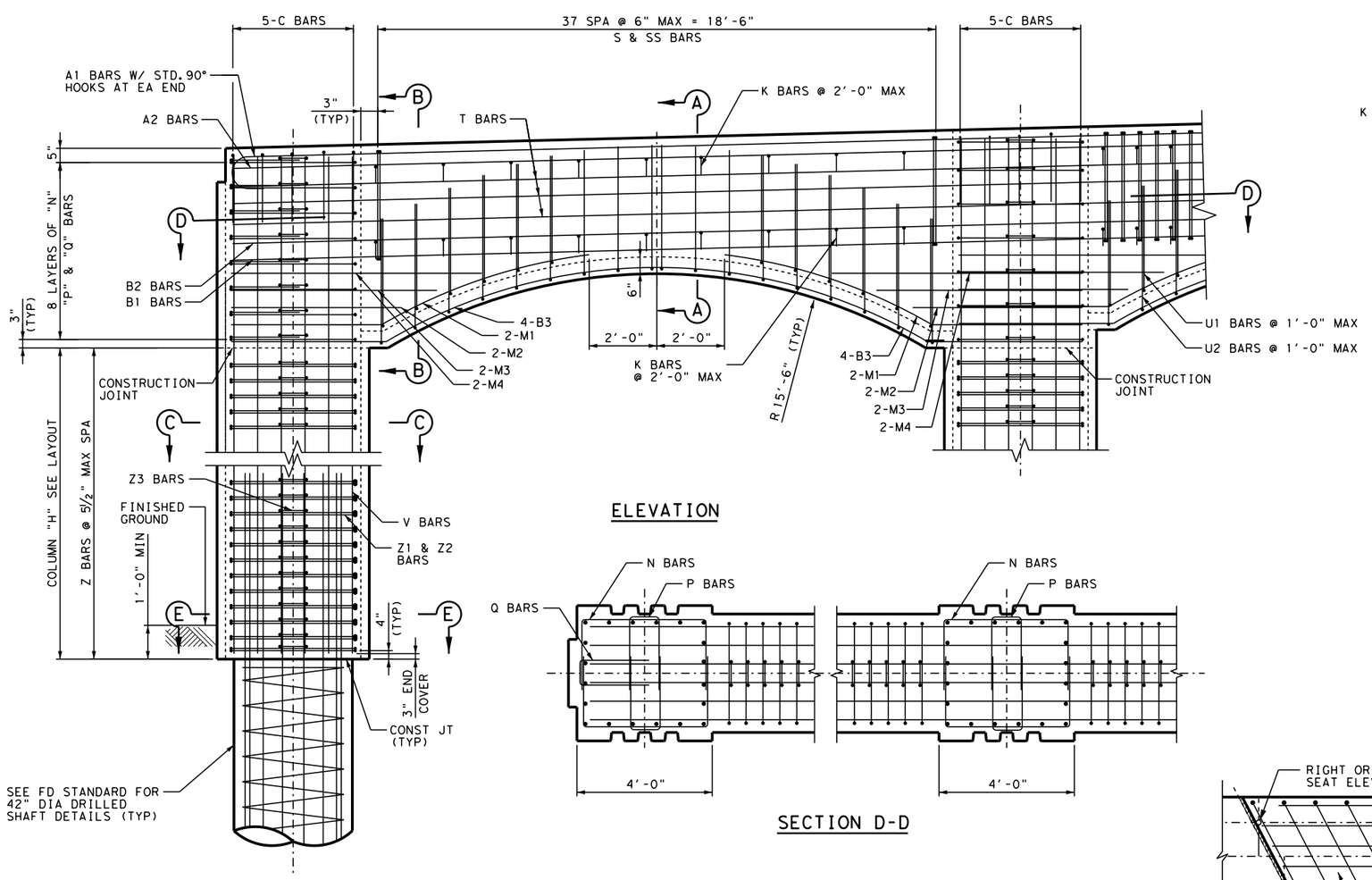
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT 2

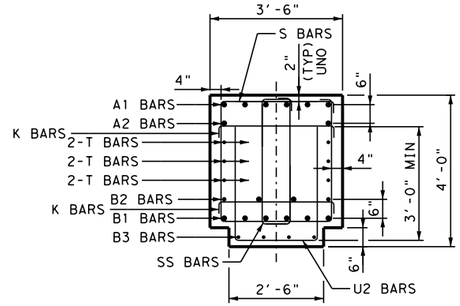
IH 35 SB OVERPASS AT 17TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1314
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

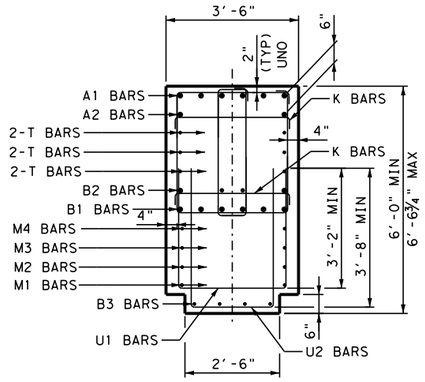


ELEVATION

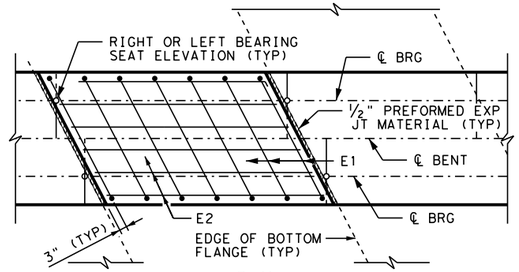
SECTION D-D



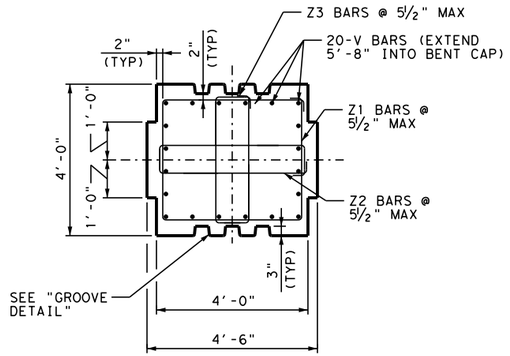
SECTION A-A



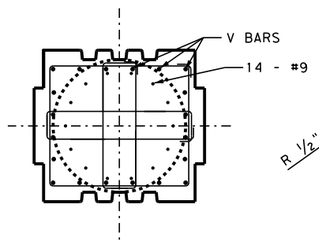
SECTION B-B
(AT FACE OF COLUMN)



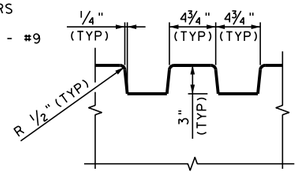
PLAN



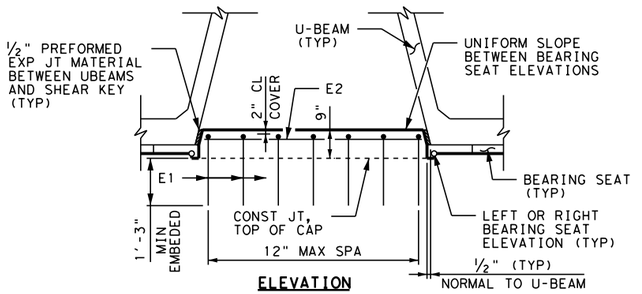
SECTION C-C



SECTION E-E



GROOVE DETAIL



ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL LICENSED ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
© 2023

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 SB OVERPASS AT 17TH STREET

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1315
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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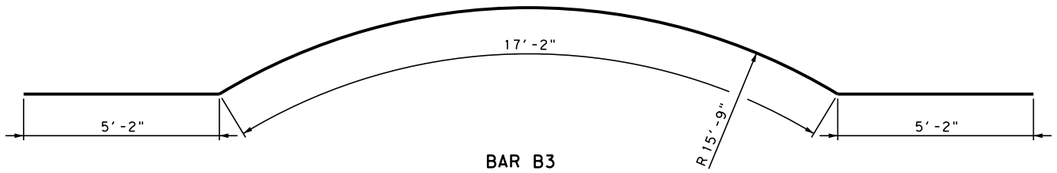

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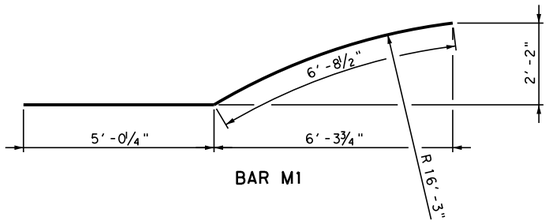

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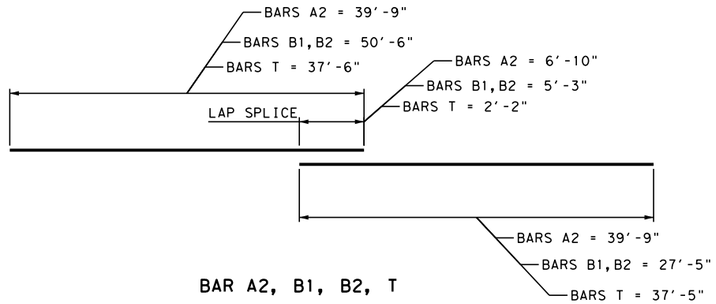
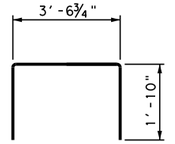
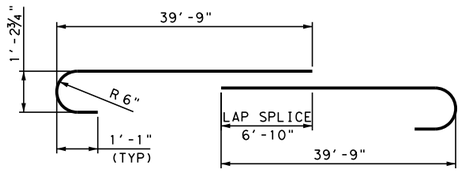


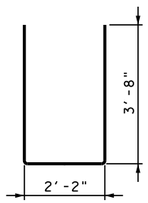
BAR A2, B1, B2, T



BARS E1



BAR A1



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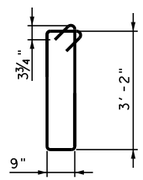
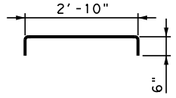
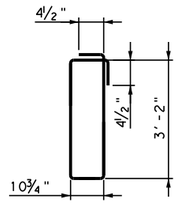


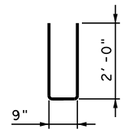
BAR SS



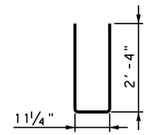
BAR K



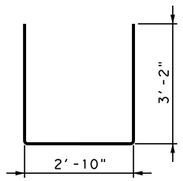
BAR Z3



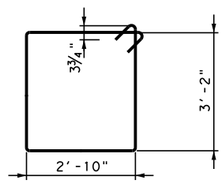
BAR Q



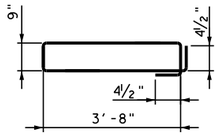
BAR P



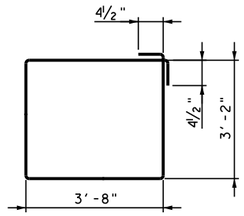
BAR U1



BAR S



BAR Z2



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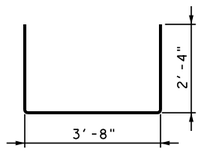
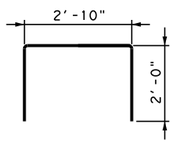


BAR N



BAR C

TABLE OF QUANTITIES

BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 82′-8"	2,636
A2	2	#11	* 79′-6"	845
B1	6	#11	** 77′-11"	2,484
B2	4	#11	** 77′-11"	1,656
B3	12	#8	27′-6"	882
C	20	#4	6′-10"	92
E1	7	#5	7′-3"	53
E2	6	#5	5′-8"	36
K	66	#3	3′-10"	96
M1	12	#8	11′-9"	376
M2	12	#8	5′-6"	175
M3	12	#8	6′-7"	209
M4	12	#8	7′-11"	252
N	64	#4	8′-4"	357
P	64	#4	5′-8"	240
Q	16	#4	4′-9"	51
S	114	#5	12′-11"	1,536
SS	114	#5	8′-9"	1,041
T	6	#6	*** 74′-11"	675
U1	48	#4	9′-2"	294
U2	60	#4	9′-6"	381
V	80	#11	21′-5"	9,103
Z1	140	#4	14′-5"	1,348
Z2	140	#4	9′-7"	896
Z3	140	#4	8′-11"	930
SUBTOTAL STEEL (LBS) ****				26,544
CL "C" CONC (BENT) (HPC) (CY)				91.0

* LENGTH SHOWN INCLUDES ONE 6′-10" SPLICE.
** LENGTH SHOWN INCLUDES ONE 5′-3" SPLICE.
*** LENGTH SHOWN INCLUDES ONE 2′-2" SPLICE.
**** FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
JORDAN R. GREENE
124925
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

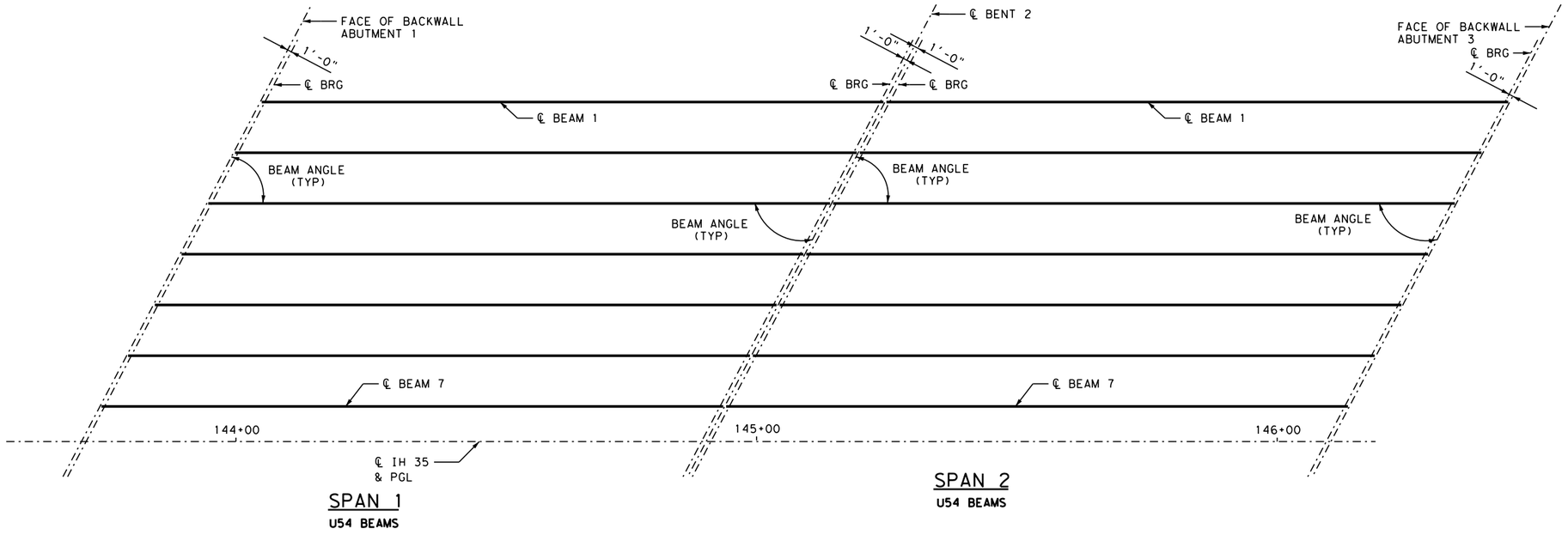
IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 SB OVERPASS AT 17TH STREET

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1316
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35



ACUTE BEAM ANGLE SHOWN

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

BENT REPORT

ABUT NO. 1 (N 48 28 55 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1 73.736 L

		BEAM	BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	1	BEAM 1	0.000	62 14 28
		BEAM 2	11.018	62 14 28
		BEAM 3	11.018	62 14 28
		BEAM 4	11.018	62 14 28
		BEAM 5	11.018	62 14 28
		BEAM 6	11.018	62 14 28
		BEAM 7	11.018	62 14 28
		TOTAL	66.108	

BENT NO. 2 (N 48 28 55 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1 73.736 L

		BEAM	BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	1	BEAM 1	0.000	62 14 28
		BEAM 2	11.018	62 14 28
		BEAM 3	11.018	62 14 28
		BEAM 4	11.018	62 14 28
		BEAM 5	11.018	62 14 28
		BEAM 6	11.018	62 14 28
		BEAM 7	11.018	62 14 28
		TOTAL	66.108	

BENT REPORT

BENT NO. 2 (N 48 28 55 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1 73.736 L

		BEAM	BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	2	BEAM 1	0.000	62 14 28
		BEAM 2	11.018	62 14 28
		BEAM 3	11.018	62 14 28
		BEAM 4	11.018	62 14 28
		BEAM 5	11.018	62 14 28
		BEAM 6	11.018	62 14 28
		BEAM 7	11.018	62 14 28
		TOTAL	66.108	

ABUT NO. 3 (N 48 28 55 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1 73.736 L

		BEAM	BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN	2	BEAM 1	0.000	62 14 28
		BEAM 2	11.018	62 14 28
		BEAM 3	11.018	62 14 28
		BEAM 4	11.018	62 14 28
		BEAM 5	11.018	62 14 28
		BEAM 6	11.018	62 14 28
		BEAM 7	11.018	62 14 28
		TOTAL	66.108	

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	122.000	119.740	121.48	-0.0130
BEAM 2	122.000	119.740	121.48	-0.0127
BEAM 3	122.000	119.740	121.48	-0.0124
BEAM 4	122.000	119.740	121.48	-0.0121
BEAM 5	122.000	119.740	121.48	-0.0118
BEAM 6	122.000	119.740	121.48	-0.0116
BEAM 7	122.000	119.740	121.48	-0.0114

BEAM REPORT

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	118.000	115.740	117.49	-0.0205
BEAM 2	118.000	115.740	117.49	-0.0202
BEAM 3	118.000	115.740	117.49	-0.0199
BEAM 4	118.000	115.740	117.49	-0.0196
BEAM 5	118.000	115.740	117.49	-0.0193
BEAM 6	118.000	115.740	117.49	-0.0189
BEAM 7	118.000	115.740	117.49	-0.0186

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT

IH 35 SB OVERPASS AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1317

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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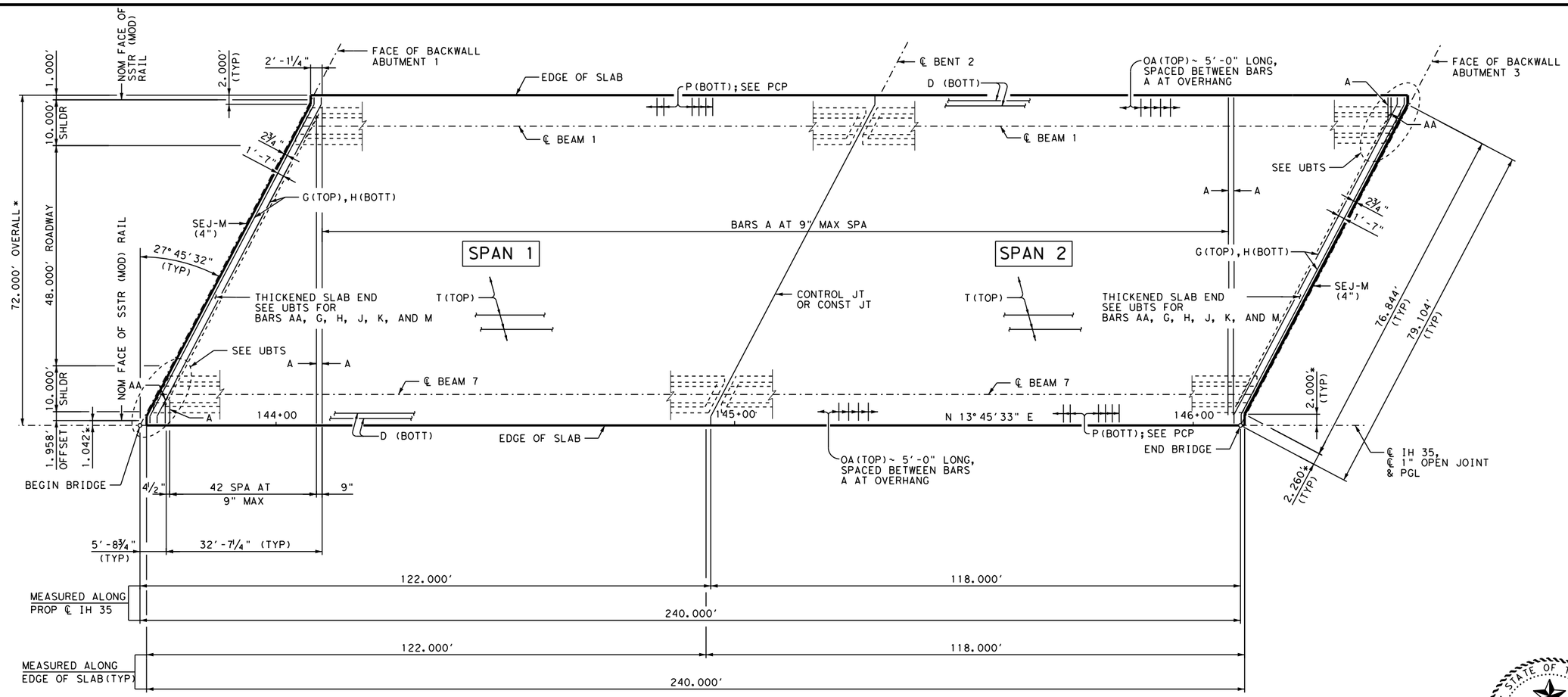
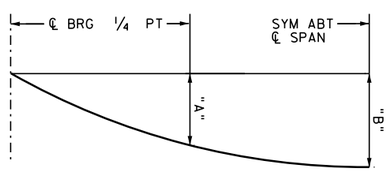


PLAN

* MEASURED TO ℄ IH 35

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1	1	0.164	0.234
1	2-6	0.139	0.198
1	7	0.168	0.238
2	1	0.144	0.204
2	2-6	0.122	0.173
2	7	0.146	0.208



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTRESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION(2017).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINTAIN 2" END COVER ON BARS D AND T.

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c = 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS;

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

240.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 SB OVERPASS AT 17TH STREET

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1318
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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DATE: 10/17/2023 11:56:36 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

③ SEE PRESTRESSED CONCRETE PANELS (PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

TABLE OF ESTIMATED QUANTITIES

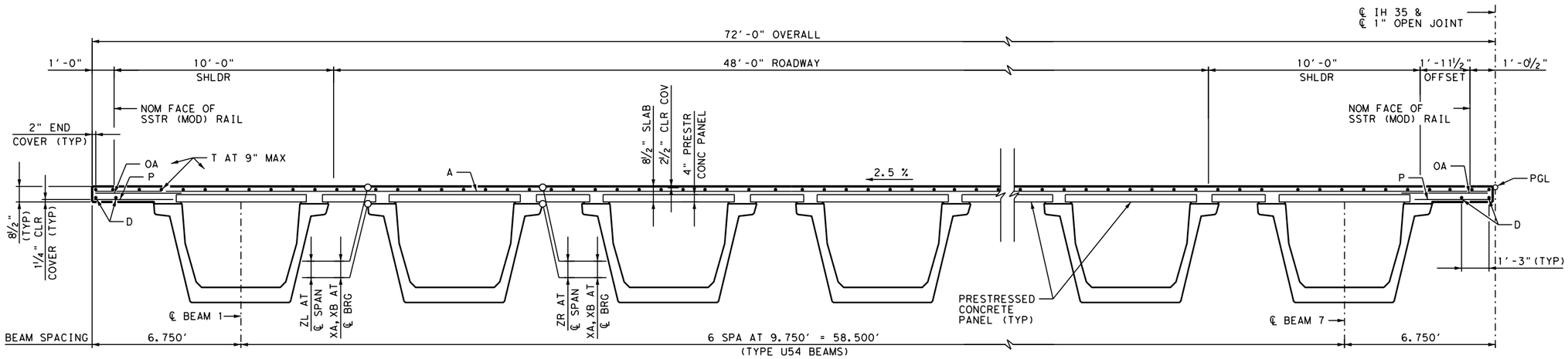
SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U54)	① REINFORCING STEEL
	SF	CY	LB
1	8,779	850.36	32,482
2	8,491	822.43	31,417
TOTAL	17,270	1672.79	63,899

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.

BAR TABLE

BAR	SIZE
AA	#5
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
K	#4
M	#4
OA	#5
P	#4
T	#4



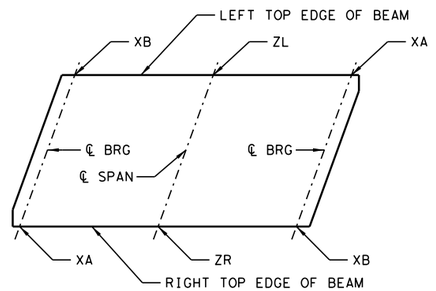
TYPICAL TRANSVERSE SECTION

(SHOWING SPANS 1 & 2)

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN ** (IN)	"ZR" AT ℄ SPAN ** (IN)
1	1	10 1/2	10 3/4	11	11
1	2&3	10 1/2	10 3/4	10 5/8	10 5/8
1	4	10 1/2	10 3/4	10 5/8	10 1/2
1	5	10 1/2	10 3/4	10 1/2	10 1/2
1	6	10 1/2	10 3/4	10 1/2	10 3/8
1	7	10 1/2	10 3/4	10 3/4	10 3/4
2	1&7	10 1/2	10 3/4	11	11
2	2-6	10 1/2	10 3/4	10 5/8	10 5/8

** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
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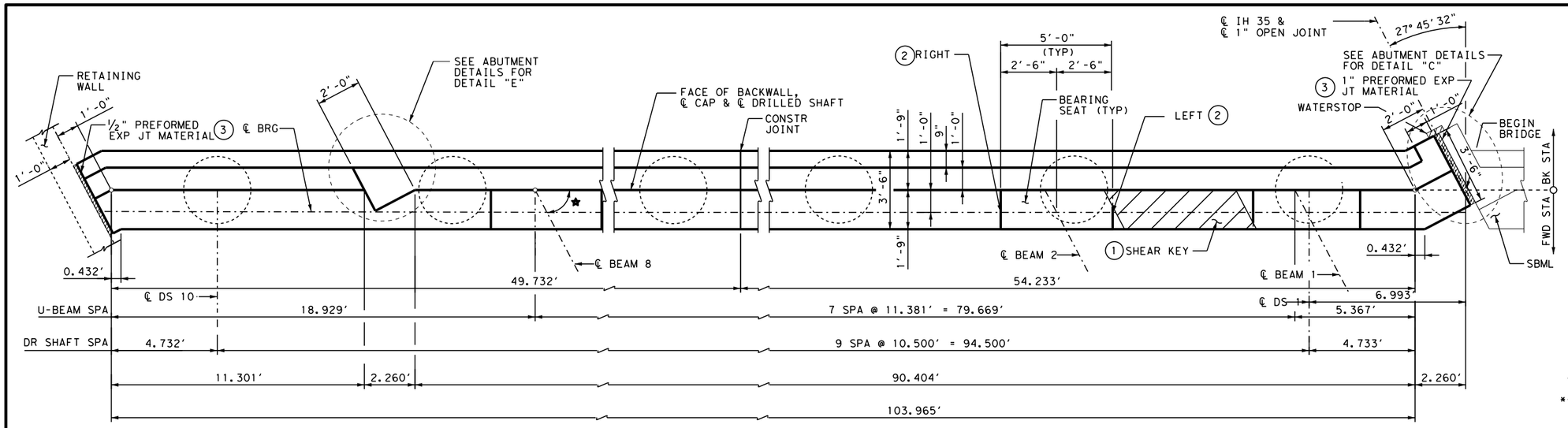
IH 35 FROM S LP 340 TO 12TH ST

240.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 SB OVERPASS AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1319
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

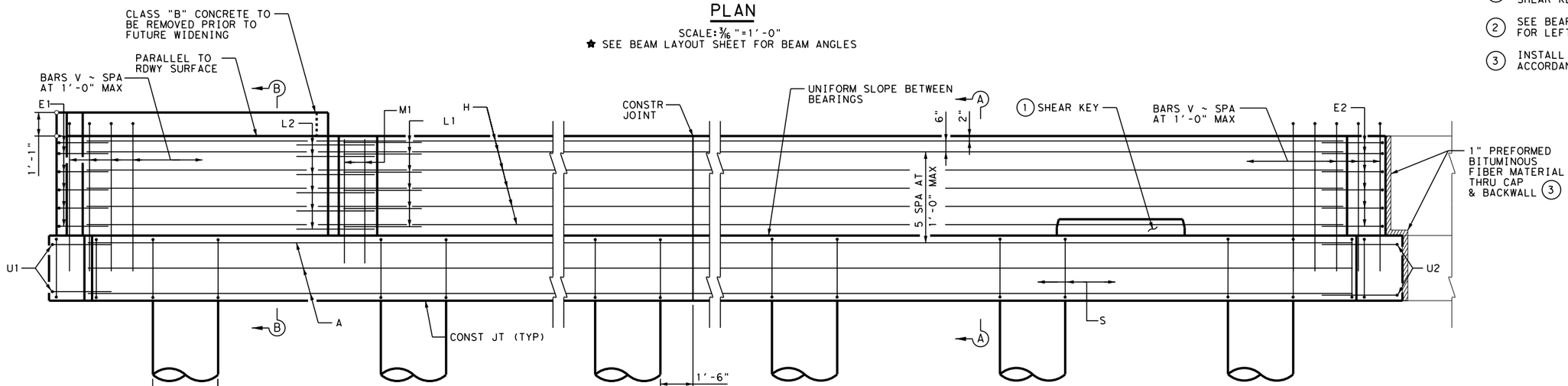
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\06_17th St\BRLD5_0617_SB_002.dgn
DATE: 10/17/2023 11:56:38 AM USER:



PLAN

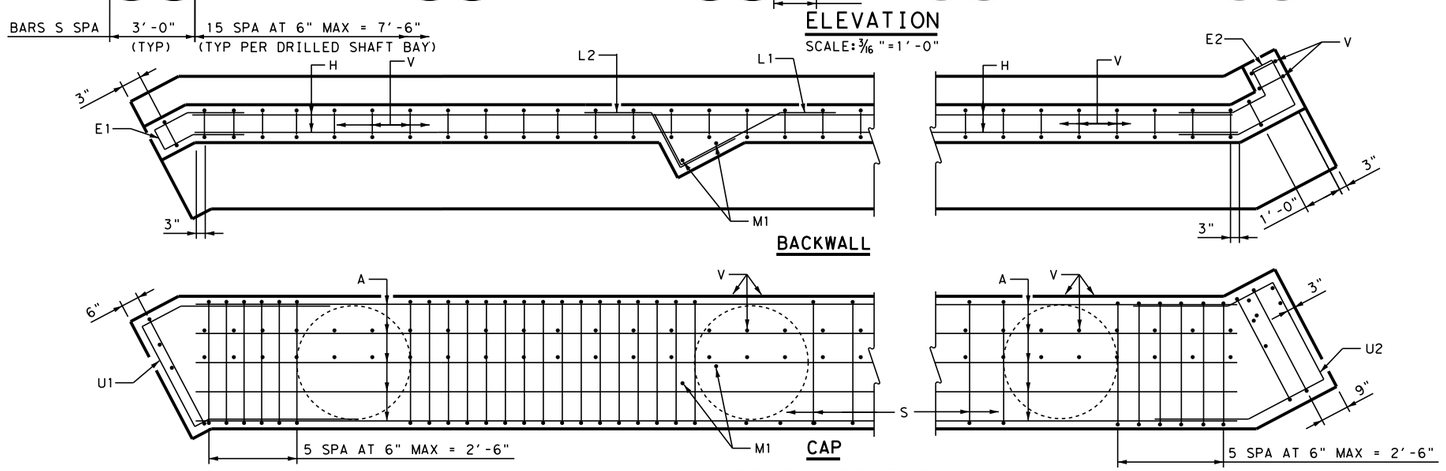
SCALE: 3/16 "=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16 "=1'-0"



CORNER DETAILS

SCALE: 1/4"=1'-0"

TABLE OF ESTIMATED QUANTITIES
ABUTMENT 1

BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	*110'- 7"	7,050
E1	6	#5	6'- 3"	39
E2	6	#5	9'- 3"	58
H	12	#6	**107'- 9"	1,942
L1	6	#6	6'- 8"	60
L2	6	#6	5'- 7"	50
M1	2	#5	6'- 4"	14
P1	7	#5	5'- 3"	39
P2	3	#5	5'- 9"	18
S	159	#6	13'- 6"	3,224
U1	2	#6	9'- 6"	29
U2	2	#6	11'- 6"	35
V	109	#5	15'- 4"	1,743
SUBTOTAL STEEL (LB) ***				14,301
CLASS "C" CONC (ABUT) (CY)				61.3
CLASS "B" CONC (MISC) (CY)				0.5

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 1

IH 35 NB OVERPASS AT 17TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1320
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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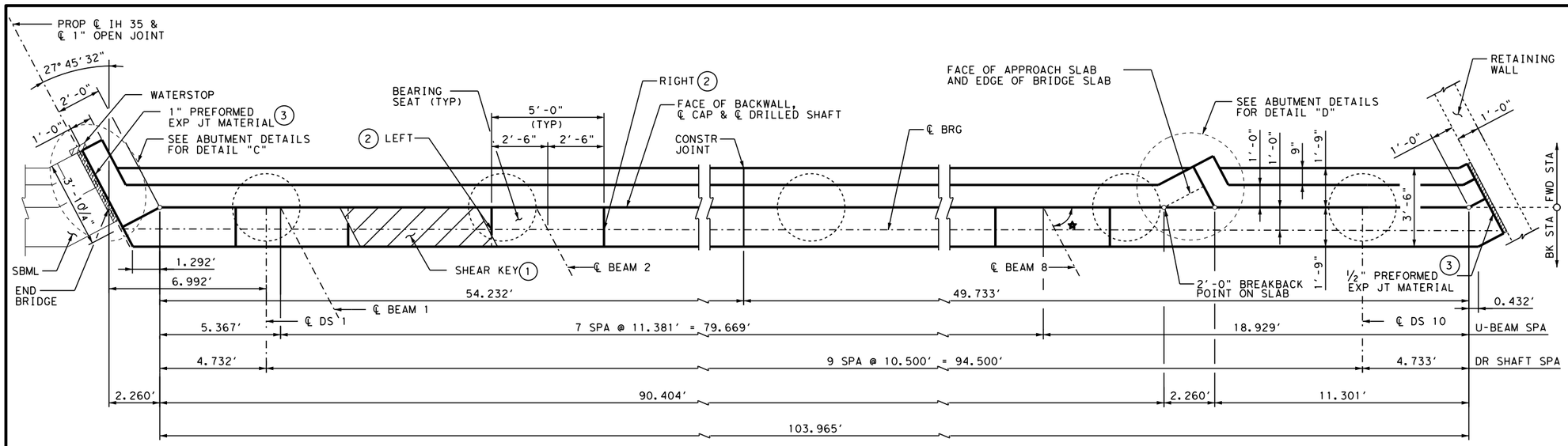
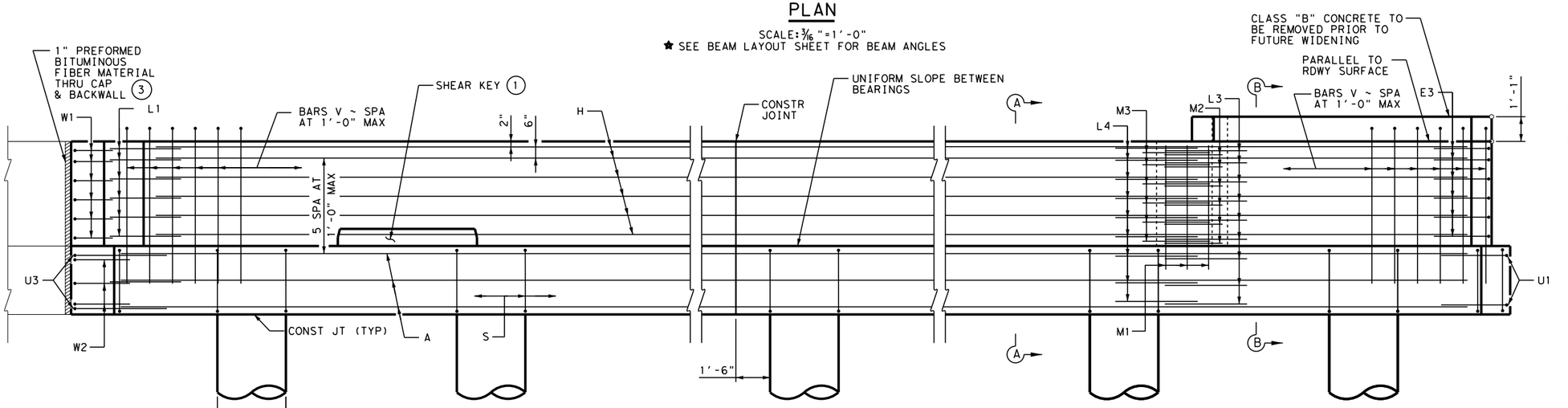


PLAN

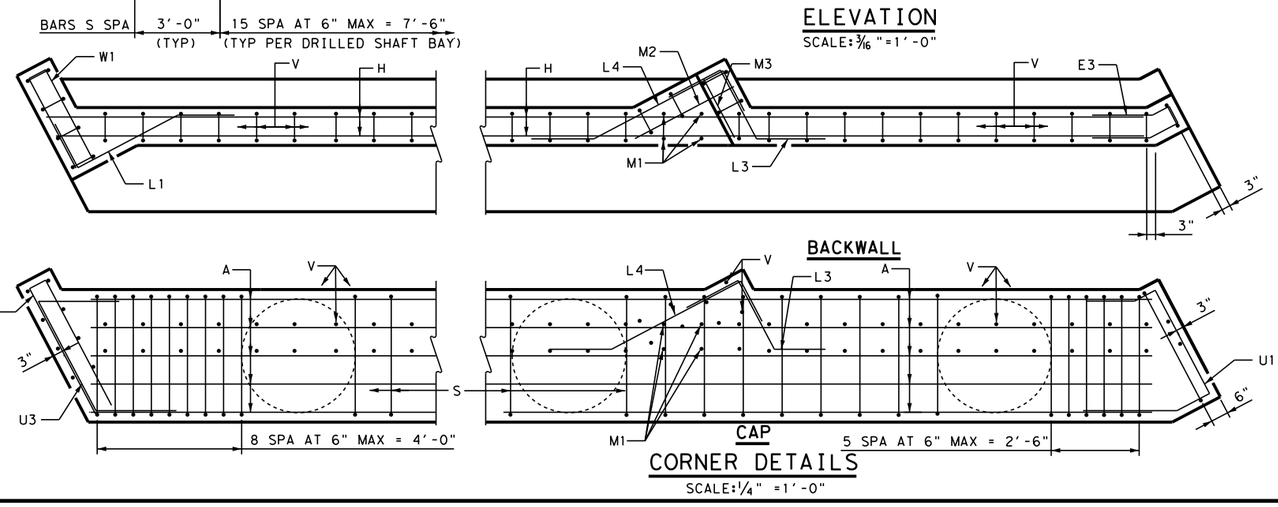
SCALE: 3/16" = 1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16" = 1'-0"



CORNER DETAILS

SCALE: 1/4" = 1'-0"

TABLE OF ESTIMATED QUANTITIES ABUTMENT 3				
BAR	NO	SIZE	LENGTH	WEIGHT
A	12	#11	*11'- 7"	7,114
E3	6	#5	5'- 9"	36
H	12	#6	**10'- 8"	1,959
L1	6	#6	6'- 8"	60
L3	9	#6	6'- 0"	81
L4	9	#6	7'- 10"	106
M1	4	#5	6'- 4"	26
M2	6	#5	2'-11"	18
M3	6	#5	1'- 9"	11
P1	7	#5	5'- 3"	39
P2	3	#5	5'- 9"	18
S	160	#6	13'- 6"	3,245
U1	2	#6	9'- 6"	29
U3	2	#6	8'- 5"	26
V	113	#5	15'- 4"	1,807
W1	6	#5	7'- 7"	47
W2	3	#5	9'- 6"	30
SUBTOTAL STEEL (LB) ***				14,652
CLASS "C" CONC (ABUT) (HPC) (CY)				61.9
CLASS "B" CONC (MISC) (CY)				0.5

* LENGTH SHOWN INCLUDES ONE 6'-10" LAP

** LENGTH SHOWN INCLUDES ONE 3'-8" LAP

*** REINFORCING STEEL QUANTITIES ARE FOR CONTRACTOR'S INFORMATION ONLY.

(1) SEE ABUTMENT DETAILS SHEET FOR SHEAR KEY DETAILS

(2) SEE BEARING SEAT ELEVATIONS SHEET FOR LEFT AND RIGHT ELEVATIONS

(3) INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.2.5.

STATE OF TEXAS
QING LIU
91266
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

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Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT 3

IH 35 NB OVERPASS AT 17TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1321
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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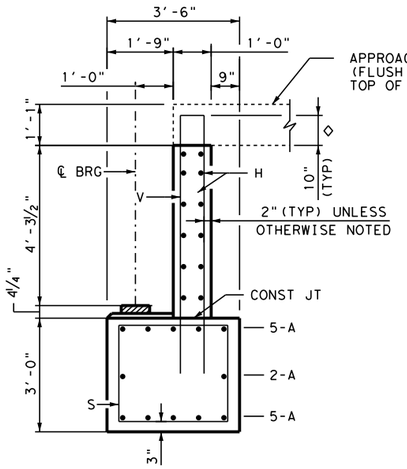
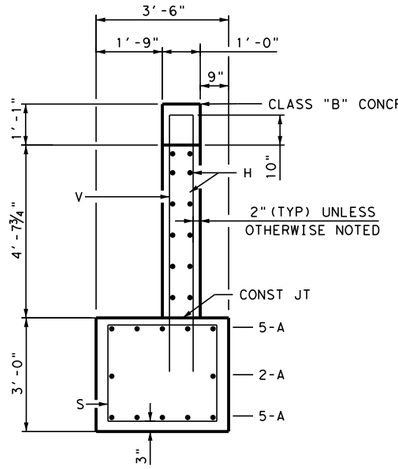


SECTION A-A

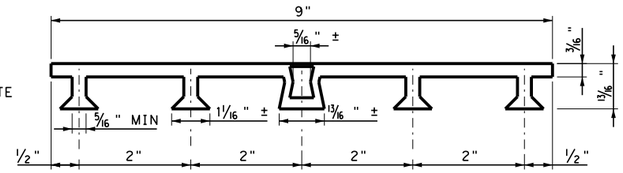
SCALE: 1/4"=1'-0"

◇ INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.



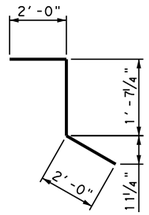
SECTION B-B

SCALE: 1/4"=1'-0"

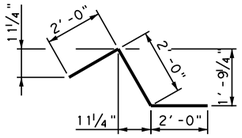


PVC WATERSTOP TYPE "A"

(DIMENSIONS AND SHAPE MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER)



BARS L2



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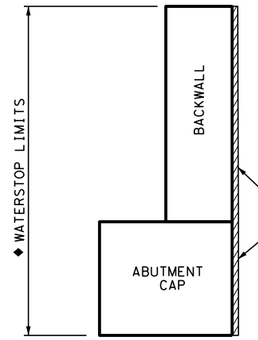
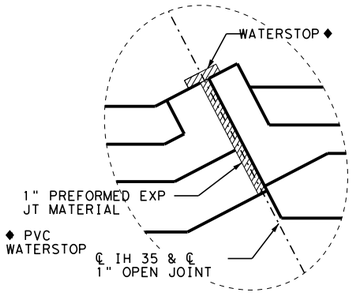


WATERSTOP DETAIL

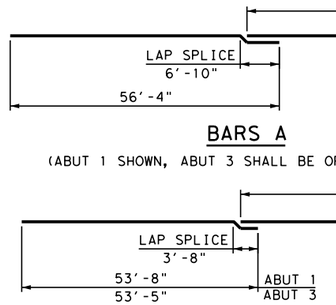
SCALE: 1/4"=1'-0"

◆ WATERSTOP SHALL BE CONSIDERED SUBSIDIARY TO CLASS "C" CONCRETE



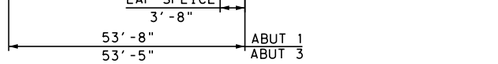
DETAIL "C"

BARS L1



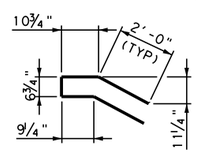
BARS A

(ABUT 1 SHOWN, ABUT 3 SHALL BE OPPOSITE HAND)

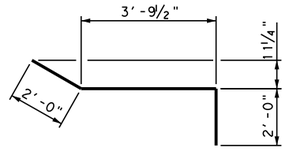


BARS H

(ABUT 1 SHOWN, ABUT 3 SHALL BE OPPOSITE HAND)



BARS E1



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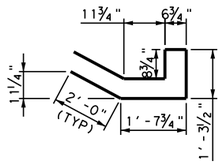
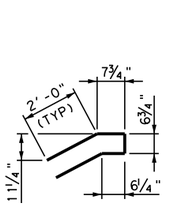


BARS E2



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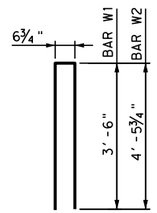
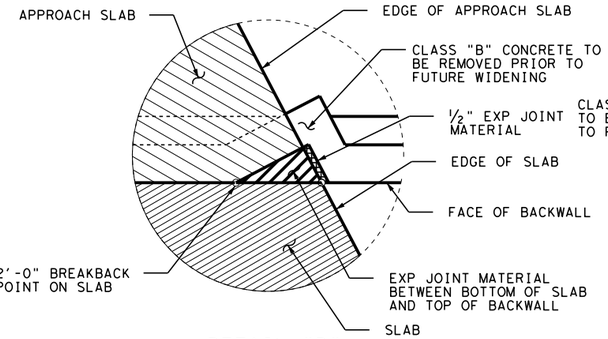


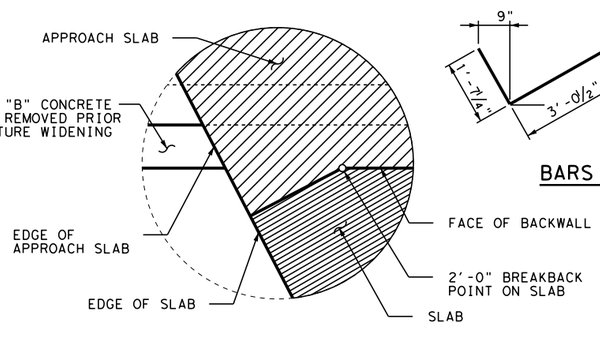
BARS W1 & W2

BARS E3

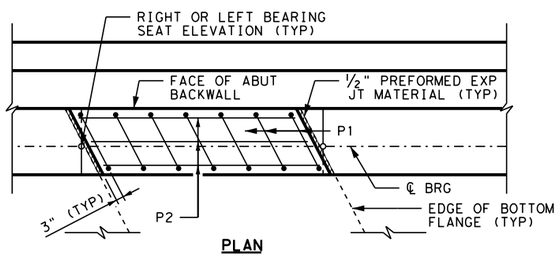
10/17/2023



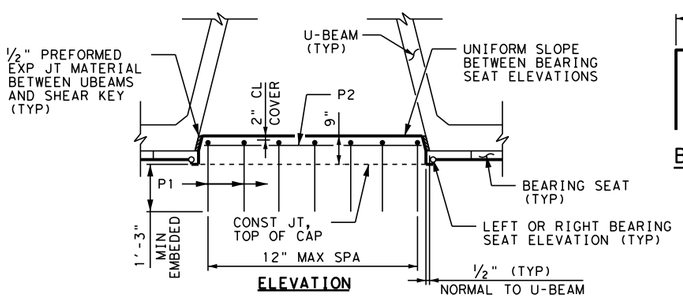
DETAIL "D"



DETAIL "E"

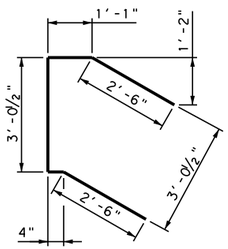


PLAN



ELEVATION

SHEAR KEY DETAIL



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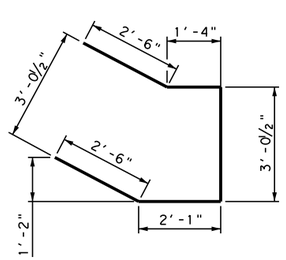

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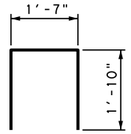
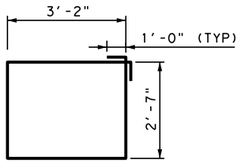


BARS P1



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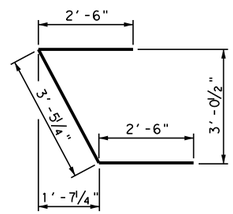

BARS U3

GENERAL NOTES

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTH.

SEE FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.

CLASS "C" CONCRETE STRENGTH SHALL BE f'c = 3600 PSI.

CLASS "B" CONCRETE STRENGTH SHALL BE f'c = 2000 PSI.

ALL REINFORCING STEEL SHALL BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

CALCULATED FOUNDATION LOADS
ABUTMENT 1= 110 TONS/DRILLED SHAFT,
ABUTMENT 3= 107 TONS/DRILLED SHAFT.

SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN ABUTMENT.

SEE ABUTMENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

NO.	DATE	REVISION	APPROVED

HNTB

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

ABUTMENT DETAILS

IH 35 NB OVERPASS AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1322
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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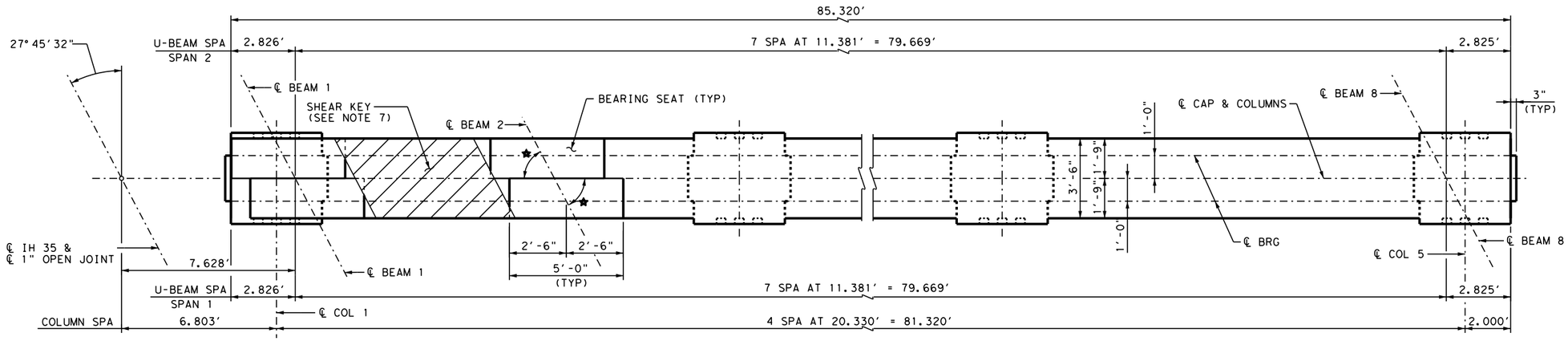
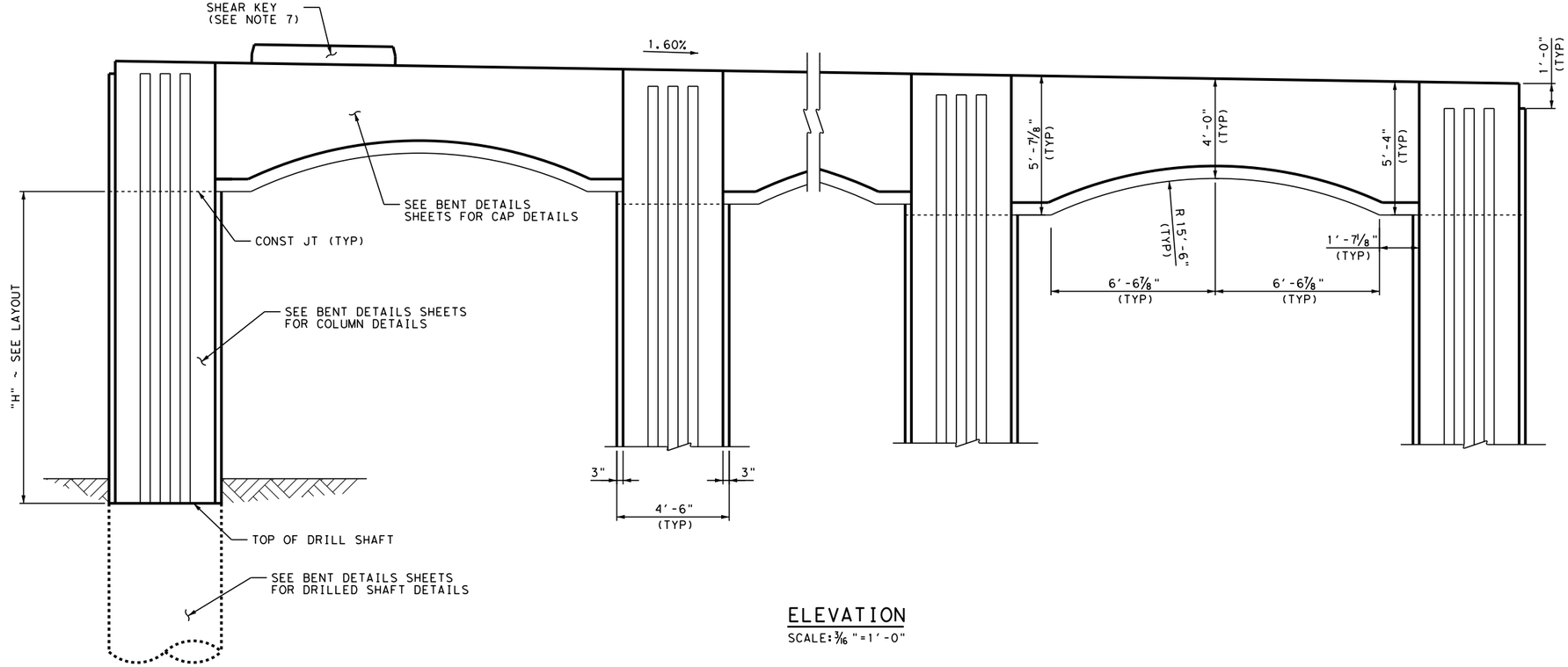


PLAN

SCALE: 3/16"=1'-0"

★ SEE BEAM LAYOUT SHEET FOR BEAM ANGLES



ELEVATION

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
2. CONCRETE STRENGTH f'c = 3600 psi
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. SEE "BENT DETAILS SHEETS" FOR REINFORCING STEEL DETAILS.
5. FOR BEARING SEAT ELEVATION, SEE BEARING SEAT ELEVATION SHEET.
6. FOR BEARING SEAT DETAILS AND INFORMATION NOT SHOWN, SEE "UBEB" STANDARD SHEET.
7. SEE "BENT DETAILS" SHEET FOR SHEAR KEY DETAILS.
8. SEE ELECTRICAL DETAILS FOR INSET LIGHTING AND CONDUIT LOCATIONS IN CAP.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL LICENSED ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

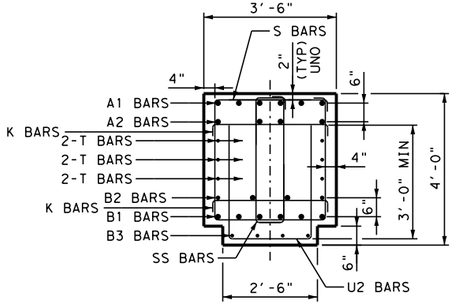
IH 35 FROM S LP 340 TO 12TH ST

BENT 2

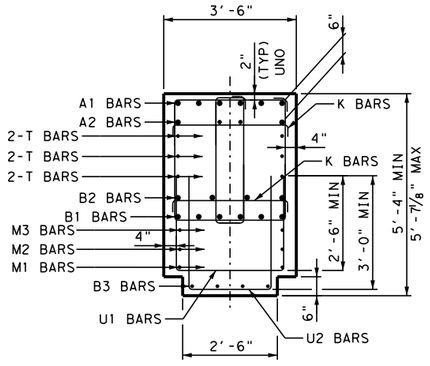
IH 35 NB OVERPASS AT 17TH STREET

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1323
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

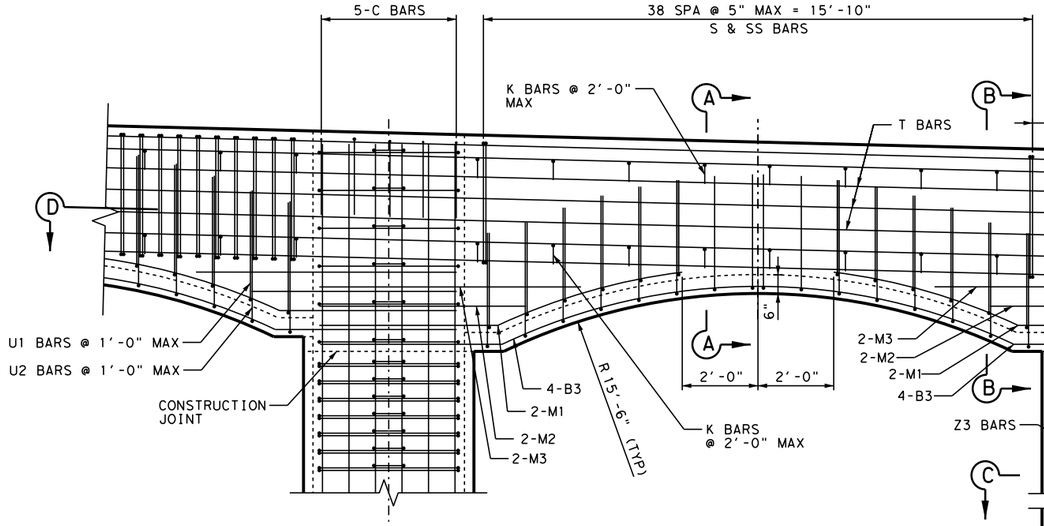
FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\06_17th St\BRBN5_0617_NB_001.dgn
DATE: 10/17/2023 11:56:48 AM USER:



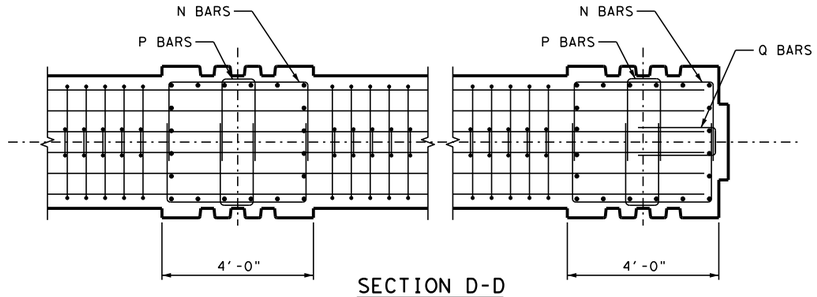
SECTION A-A



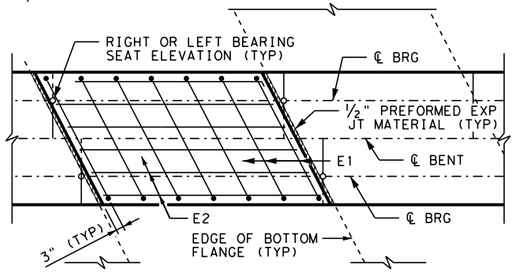
SECTION B-B
(AT FACE OF COLUMN)



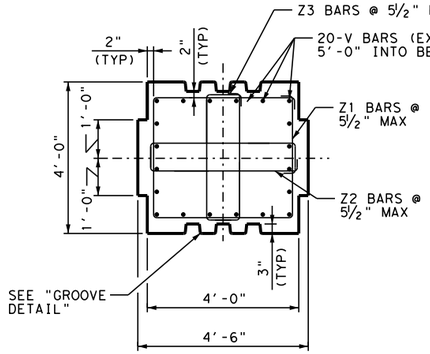
ELEVATION



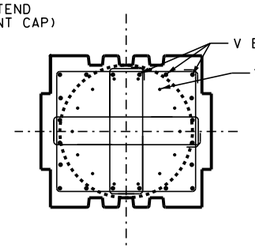
SECTION D-D



PLAN



SECTION C-C



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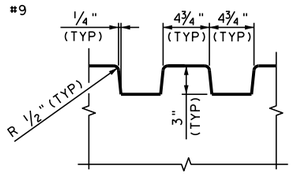
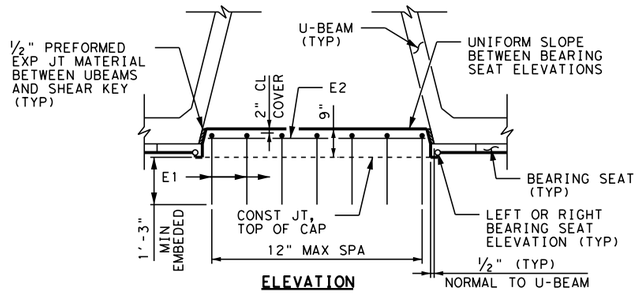


GROOVE DETAIL



ELEVATION

SHEAR KEY DETAIL

SEE BENT SHEETS FOR SHEAR KEY LOCATION. POUR SHEAR KEY CONCRETE AFTER U-BEAMS HAVE BEEN SET IN PLACE. TAKE SUFFICIENT MEASURES TO PREVENT CONCRETE FROM FLOWING UNDER THE U-BEAMS WHEN POURING SHEAR KEY CONCRETE.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 NB OVERPASS AT 17TH STREET

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1324
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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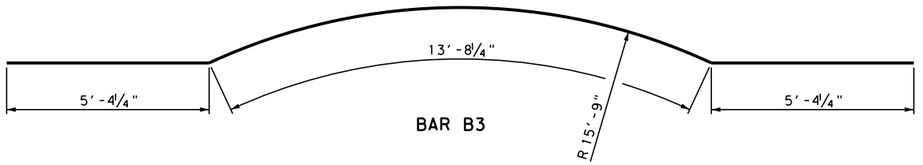
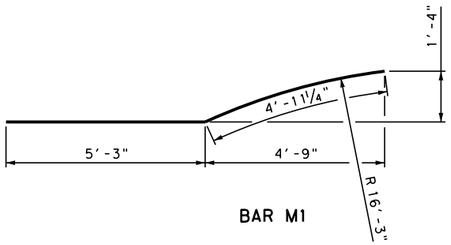
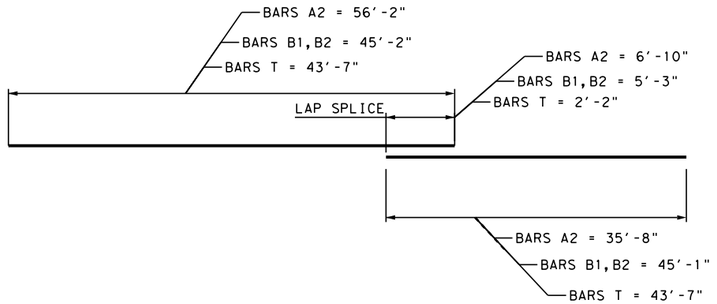


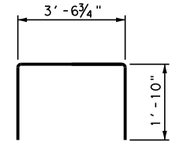
BAR B3



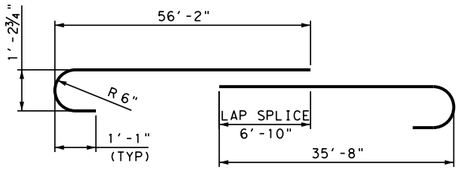
BAR M1



BAR A2, B1, B2, T



BARS E1



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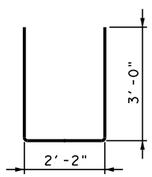
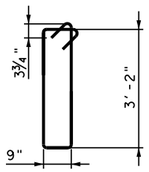
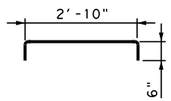


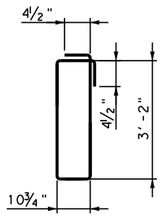
BAR U2



BAR SS



BAR K



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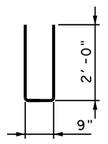
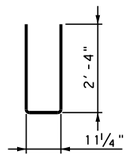
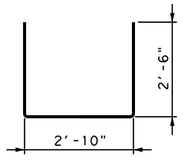


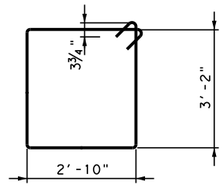
BAR Q



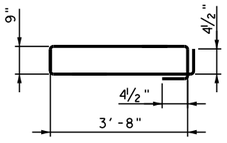
BAR P



BAR U1



BAR S



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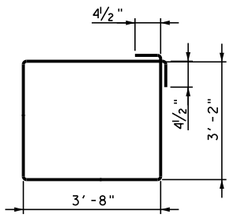

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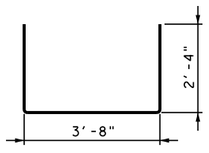

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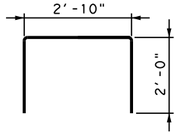

BAR C

TABLE OF QUANTITIES

BAR	NO	SIZE	LENGTH	WEIGHT
A1	6	#11	* 95′-0"	3,028
A2	4	#11	* 91′-10"	1,952
B1	6	#11	** 90′-3"	2,877
B2	4	#11	** 90′-3"	1,918
B3	16	#8	24′-5"	1,043
C	25	#4	6′-10"	115
E1	7	#5	7′-3"	53
E2	6	#5	5′-8"	36
K	72	#3	3′-10"	104
M1	16	#8	10′-3"	436
M2	16	#8	5′-11"	250
M3	16	#8	7′-4"	312
N	60	#4	8′-4"	334
P	60	#4	5′-8"	225
Q	12	#4	4′-9"	39
S	156	#5	12′-11"	2,102
SS	156	#5	8′-9"	1,424
T	6	#6	*** 87′-2"	786
U1	48	#4	7′-10"	252
U2	64	#4	8′-2"	350
V	100	#11	20′-9"	11,024
Z1	175	#4	14′-5"	1,685
Z2	175	#4	9′-7"	1,120
Z3	175	#4	8′-11"	1,037
SUBTOTAL STEEL (LBS) ****				32,502
CL "C" CONC (BENT)(HPC)(CY)				104.6

* LENGTH SHOWN INCLUDES ONE 6′-10" SPLICE.
** LENGTH SHOWN INCLUDES ONE 5′-3" SPLICE.
*** LENGTH SHOWN INCLUDES ONE 2′-2" SPLICE.
**** FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
QING LIU
91266
PROFESSIONAL ENGINEER
LICENSED
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BENT DETAILS

IH 35 NB OVERPASS AT 17TH STREET

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1325

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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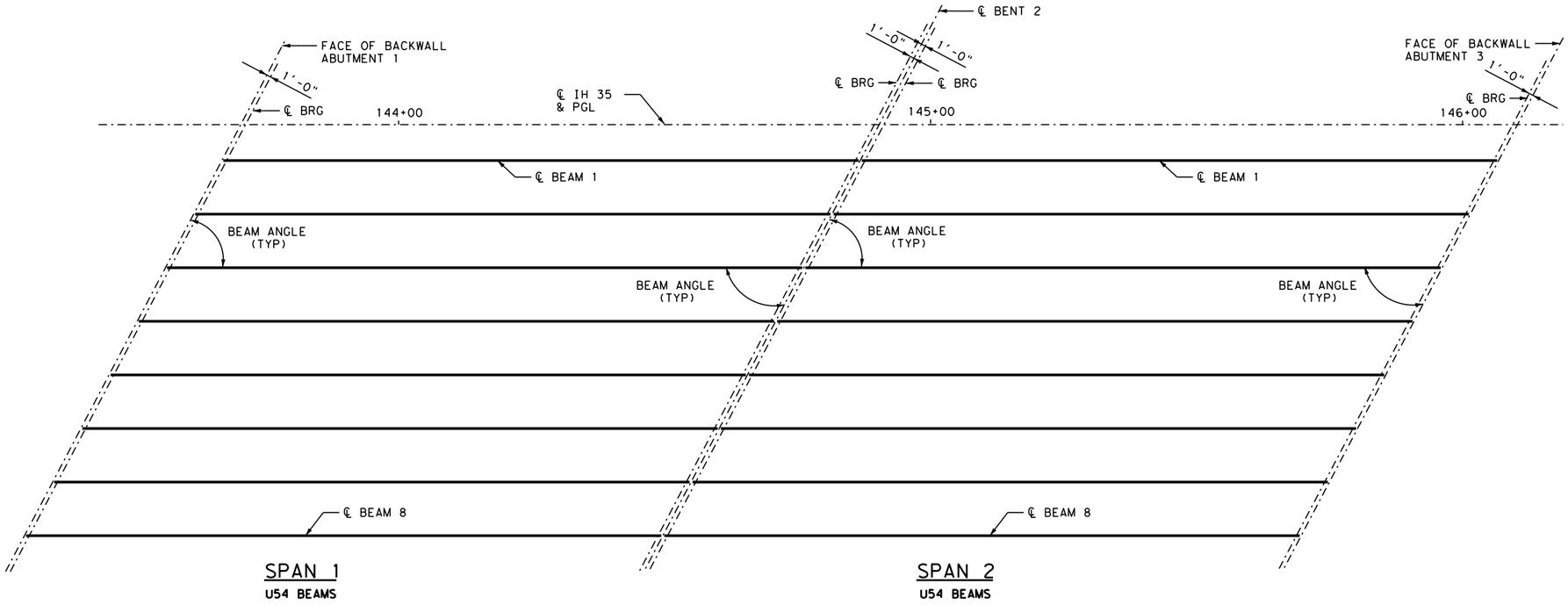

ACUTE BEAM ANGLE SHOWN

GENERAL NOTES:

1. BEAM SPACING SHOWN IS MEASURED AT BOTTOM OF BEAM. SPACING AT TOP OF BEAM MAY VARY DUE TO THE CROSS SLOPE OF U-BEAMS.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTH WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. SEE "ELASTOMERIC BEARING AND BEARING SEAT DETAILS" STANDARD SHEET UBEB FOR BEARING PAD DETAILS.

BENT REPORT

ABUT NO. 1 (N 48 28 55 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1 7.628 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	62 14 28
	BEAM	2	11.381	62 14 28
	BEAM	3	11.381	62 14 28
	BEAM	4	11.381	62 14 28
	BEAM	5	11.381	62 14 28
	BEAM	6	11.381	62 14 28
	BEAM	7	11.381	62 14 28
	BEAM	8	11.381	62 14 28
	TOTAL		79.669	

BENT NO. 2 (N 48 28 55 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1 7.628 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 1	BEAM	1	0.000	62 14 28
	BEAM	2	11.381	62 14 28
	BEAM	3	11.381	62 14 28
	BEAM	4	11.381	62 14 28
	BEAM	5	11.381	62 14 28
	BEAM	6	11.381	62 14 28
	BEAM	7	11.381	62 14 28
	BEAM	8	11.381	62 14 28
	TOTAL		79.669	

BENT REPORT

BENT NO. 2 (N 48 28 55 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1 7.628 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM	1	0.000	62 14 28
	BEAM	2	11.381	62 14 28
	BEAM	3	11.381	62 14 28
	BEAM	4	11.381	62 14 28
	BEAM	5	11.381	62 14 28
	BEAM	6	11.381	62 14 28
	BEAM	7	11.381	62 14 28
	BEAM	8	11.381	62 14 28
	TOTAL		79.669	

ABUT NO. 3 (N 48 28 55 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1 7.628 R

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D M S
SPAN 2	BEAM	1	0.000	62 14 28
	BEAM	2	11.381	62 14 28
	BEAM	3	11.381	62 14 28
	BEAM	4	11.381	62 14 28
	BEAM	5	11.381	62 14 28
	BEAM	6	11.381	62 14 28
	BEAM	7	11.381	62 14 28
	BEAM	8	11.381	62 14 28
	TOTAL		79.669	

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	122.000	119.740	121.47	-0.0110
BEAM 2	122.000	119.740	121.47	-0.0108
BEAM 3	122.000	119.740	121.47	-0.0106
BEAM 4	122.000	119.740	121.47	-0.0105
BEAM 5	122.000	119.740	121.47	-0.0103
BEAM 6	122.000	119.740	121.47	-0.0101
BEAM 7	122.000	119.740	121.47	-0.0100
BEAM 8	122.000	119.740	121.47	-0.0099

BEAM REPORT

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE
BEAM 1	118.000	115.740	117.49	-0.0182
BEAM 2	118.000	115.740	117.49	-0.0178
BEAM 3	118.000	115.740	117.49	-0.0175
BEAM 4	118.000	115.740	117.48	-0.0172
BEAM 5	118.000	115.740	117.48	-0.0168
BEAM 6	118.000	115.740	117.48	-0.0165
BEAM 7	118.000	115.740	117.48	-0.0162
BEAM 8	118.000	115.740	117.48	-0.0158

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

BEAM LAYOUT

IH 35 NB OVERPASS AT 17TH STREET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1326
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB / HIGHWAY NO.
0015	01	246 / IH 35

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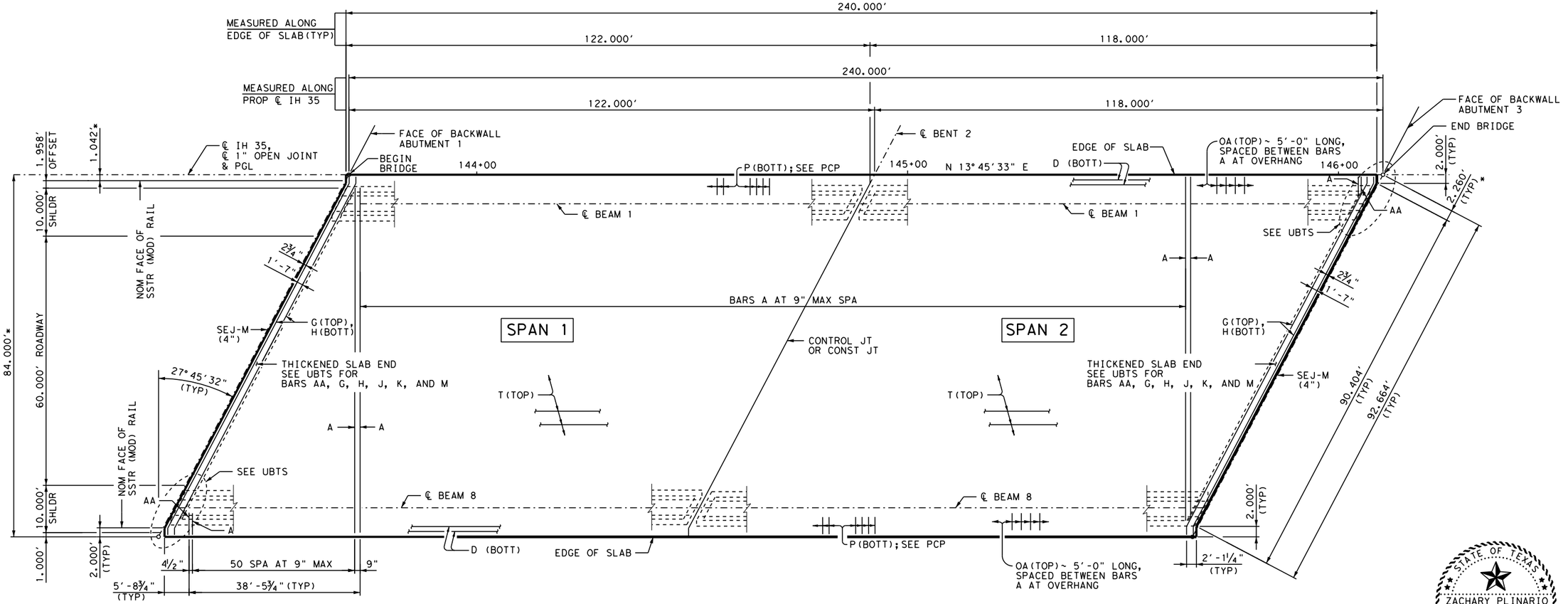
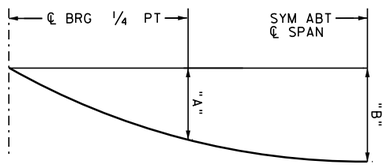


PLAN

* MEASURED TO ℄ IH 35

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO	BEAM NO	"A" (FT)	"B" (FT)
1	1	0.170	0.242
1	2-7	0.145	0.204
1	8	0.167	0.237
2	1	0.148	0.211
2	2-7	0.127	0.178
2	8	0.146	0.207



NOTE: DEFLECTIONS SHOWN ARE DUE TO PRESTESSED CONCRETE PANELS AND CAST-IN-PLACE SLAB ONLY (Ec = 5000 ksi). CALCULATED DEFLECTIONS SHALL BE ADJUSTED BASED ON FIELD OBSERVATIONS.

DEAD LOAD DEFLECTION DIAGRAM

NTS

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 8TH EDITION(2017).

SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS AND BEAM ANGLES.

DETAILS SHOWN ARE BASED ON THE USE OF PRESTRESSED CONCRETE PANELS. SEE PCP STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS.

MAINATAIN 2" COVER ON BARS D AND T

ALL REINFORCING SHALL BE GRADE 60. CONCRETE STRENGTH f'c = 4000 psi.

FOR REINFORCING DETAILS NOT SHOWN OR NOTED, SEE THE FOLLOWING SHEETS;

PRESTRESSED CONCRETE U-BEAM DETAILS UBD.
MISCELLANEOUS SLAB DETAILS UBMS.
THICKENED SLAB END DETAILS UBTS.

BAR LAPS, WHERE REQUIRED, SHALL BE AS FOLLOWS;
UNCOATED ~ #4 = 1'-7"
~ #5 = 2'-0"

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

240.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 NB OVERPASS AT 17TH STREET

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1327
STATE	DIST.	COUNTY
TEXAS	WACO	McLENNAN
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:56:59 AM USER:

① REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 3.7 LBS/SF.

② LENGTHS SHOWN ARE BOTTOM BEAM FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE. SEE BEAM LAYOUT SHEET FOR BEAM LENGTHS.

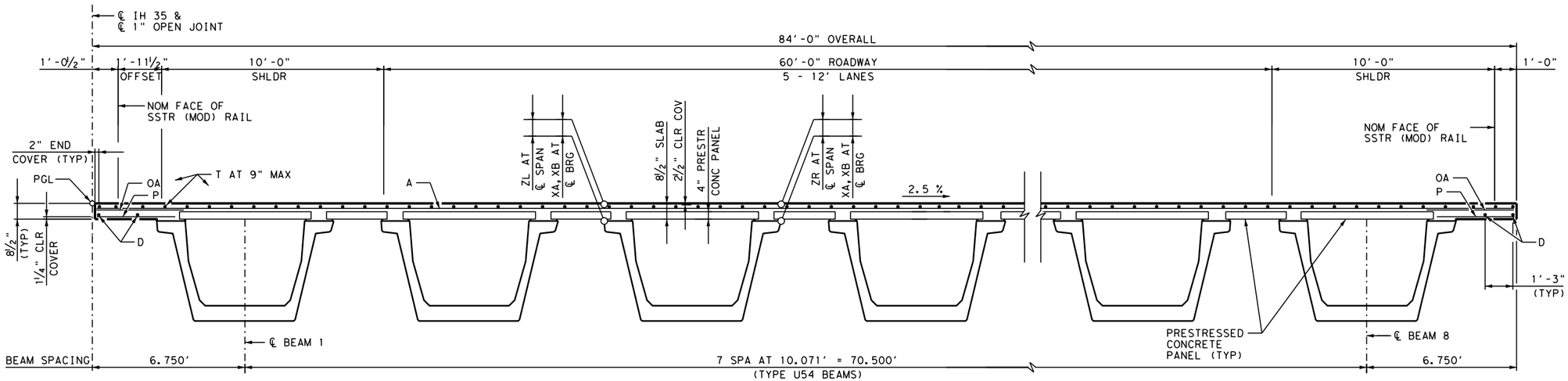
③ SEE PRESTRESSED CONCRETE PANELS(PCP) STANDARDS SHEET FOR DETAILS NOT SHOWN.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONC SLAB	②PRESTR CONC U-BEAM (U54)	① REINFORCING STEEL
	SF	LF	LB
1	10,243	971.76	37,900
2	9,907	939.87	36,656
TOTAL	20,150	1,911.63	74,556

GENERAL NOTES:

FOR GENERAL NOTES SEE SHEET 1 OF 2.



TYPICAL TRANSVERSE SECTION

(SHOWING SPANS 1 & 2)

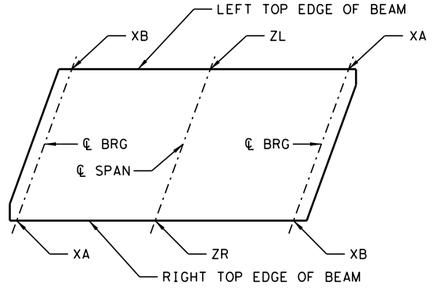
BAR TABLE

BAR	SIZE
AA	#5
A	#4
D ③	#4
E ③	#4
G	#4
H	#6
J	#4
K	#4
M	#4
OA	#5
P	#4
T	#4

TABLE OF SECTION DEPTHS

SPAN NO	BEAM NO	"XA" AT ℄ BRG (IN)	"XB" AT ℄ BRG (IN)	"ZL" AT ℄ SPAN ** (IN)	"ZR" AT ℄ SPAN ** (IN)
1	1	10 ½	10 ¾	11 ½	11 ½
1	2	10 ½	10 ¾	11 ⅛	11
1	3	10 ½	10 ¾	11	10 ⅞
1	4	10 ½	10 ¾	10 ⅞	10 ¾
1	5	10 ½	10 ¾	10 ¾	10 ⅝
1	6	10 ½	10 ¾	10 ⅝	10 ½
1	7	10 ½	10 ¾	10 ½	10 ½
1	8	10 ½	10 ¾	10 ¾	10 ¾
2	1	10 ½	10 ¾	11 ½	11 ½
2	2-7	10 ½	10 ¾	11 ⅛	11 ⅛
2	8	10 ½	10 ¾	11 ⅜	11 ⅜

** THEORETICAL DIMENSION



NOTE: SHOWING PLAN VIEW OF TOP OF BEAM.

LOCATION OF SECTION DEPTHS

NTS

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

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IH 35 FROM S LP 340 TO 12TH ST

240.000' PRESTRESSED CONCRETE U-BEAM UNIT

IH 35 NB OVERPASS AT 17TH STREET

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	1328

STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

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DATE: 10/17/2023 11:57:02 AM USER:

DATE:
FILE:

DESIGNED BEAMS (STRAIGHT STRANDS)

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH fpu (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)	PRESTRESSING STRANDS: TOT NO. DEB	DEBONDED STRAND PATTERN PER ROW: DIST FROM BOTTOM (in)	NO.OF STRANDS: TOTAL	NO.OF STRANDS: DE-BONDED	NUMBER OF STRANDS DEBONDED TO (ft from end): 3	6	9	12	15	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
IH 35 SB OVERPASS AT 17TH STREET	1	ALL	U54		53	0.6	270	19.32	19.24	23	2.17	27	13	0	1	8	2	2	5.200	7.400
											4.14	26	10	6	4	0	0	0		
	2	ALL	U54		49	0.6	270	19.40	19.24	19	2.17	27	13	0	3	8	0	2	5.000	6.900
											4.14	22	6	4	2	0	0	0		
IH 35 NB OVERPASS AT 17TH STREET	ALL	ALL	U54		53	0.6	270	19.32	19.24	23	2.17	27	13	0	1	8	2	2	5.200	7.400
											4.14	26	10	6	4	0	0	0		

OPTIONAL DESIGN

STRUCTURE	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
IH 35 SB OVERPASS AT 17TH STREET	4.735	-4.062	10257	0.615	1.157
	4.444	-3.823	9703	0.621	1.157
IH 35 NB OVERPASS AT 17TH STREET	4.750	-4.087	10366	0.635	1.181

LOAD RATING FACTORS

STRUCTURE	STRENGTH I Inv	STRENGTH I Opr	SERVICE III Inv
IH 35 SB OVERPASS AT 17TH STREET	1.61	2.17	1.07
	1.64	2.20	1.06
IH 35 NB OVERPASS AT 17TH STREET	1.58	2.12	1.04

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation.

Optional designs must have a calculated residual camber equal to or greater than that of the designed beam.

Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

The grid pattern for the strands is based on exact conversions from a metric grid spacing of 50mm.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

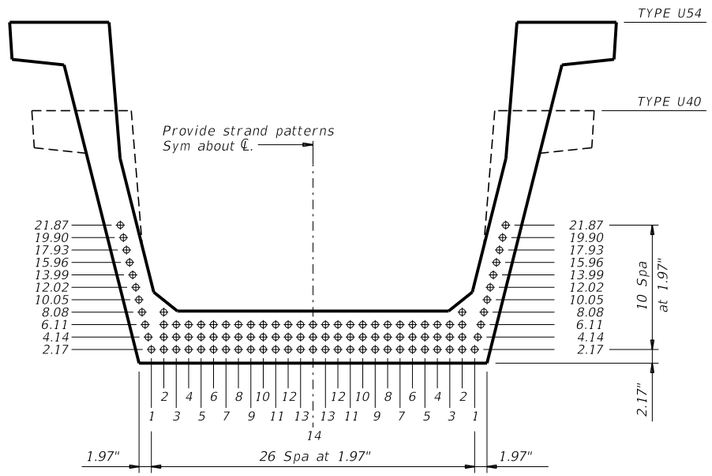
When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

Locate strands for the designed beam as low as possible on the 1.97" grid system unless a non-standard stand pattern is indicated. Fill row "2.17", then row "4.14", then row "6.11", etc., beginning each row in the "1" position and, distributing uniformly as practical, working inward until the required number of strands is reached.

Strand debonding must comply with Item 424.4.2.2.2.4.

Do not debond strands in position "1". Distribute debonded strands equally about the vertical centerline. Decrease debonded lengths working inward, with debonding staggered in each row.

Full-length debonded strands are not permitted in positions "1" and "2".



TxDOT TYPE U54 & TYPE U40 BMS

HL93 LOADING

STATE OF TEXAS
ZACHARY PLINARIO
124847
LICENSED
PROFESSIONAL ENGINEER
10/17/2023

Texas Department of Transportation

Bridge Division Standard

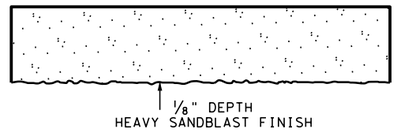
PRESTRESSED CONCRETE U-BEAM DESIGNS (DESIGN DATA)

UBND

FILE: ubstds04.dgn	DN: TxDOT	CK: TxDOT	DW: SFS	CK: SDB
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
01-16: Notes. 03-22: Added Load Rating.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1329

GENERAL NOTES

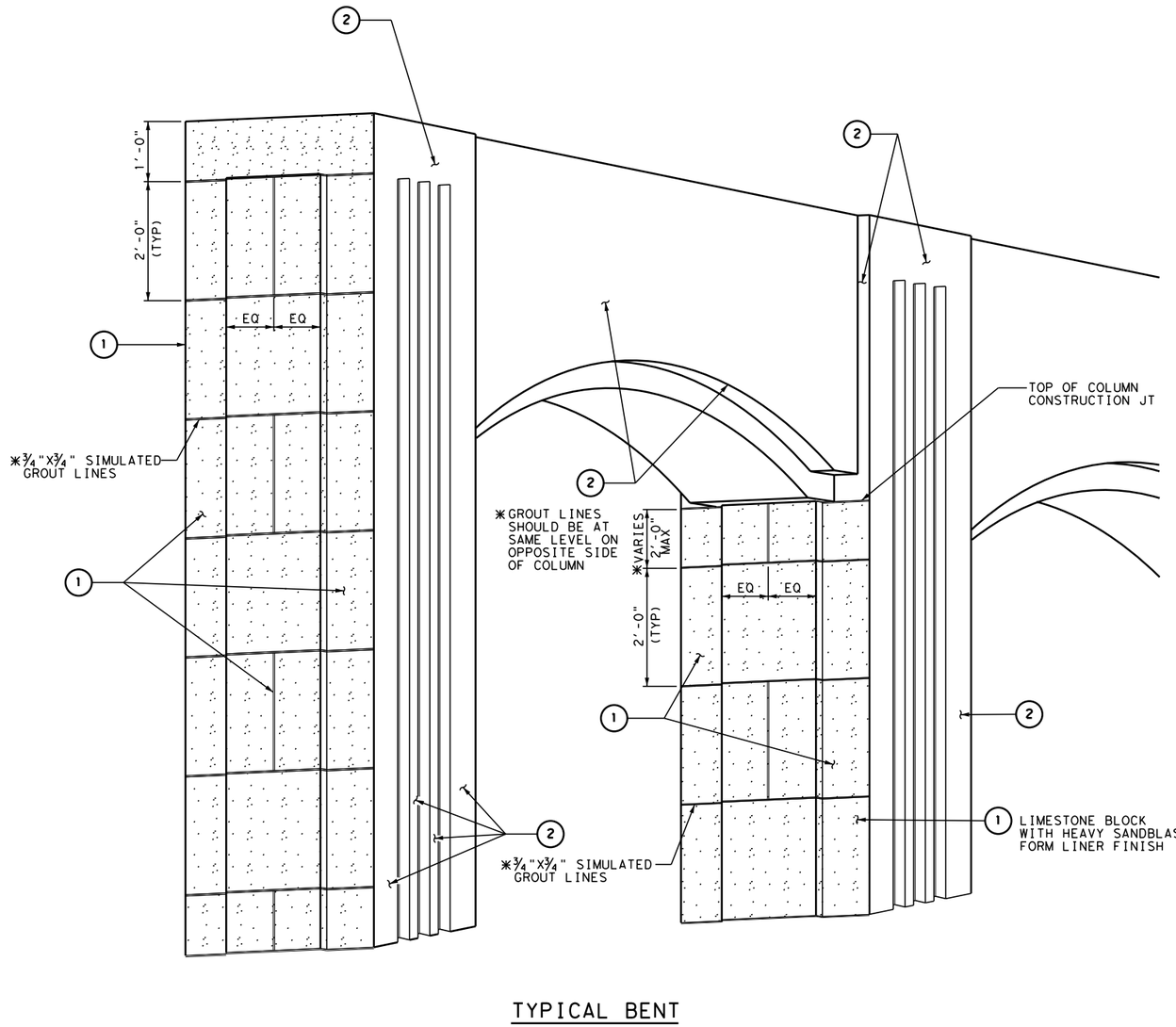
1. SUBMIT SHOP DRAWINGS OF FORM LINERS FOR APPROVAL BEFORE USE.
2. PRIOR TO BEGINNING ANY WORK WHERE FORM LINERS ARE USED, PLACE AND FINISH A MOCK-UP SAMPLE OF EACH APPROVED FORM LINER. SEE GENERAL NOTES FOR OTHER INFORMATION ON MOCK-UPS.



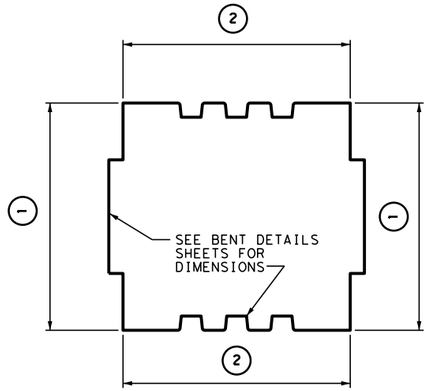
SECTION

(1) LIMESTONE BLOCK WITH HEAVY SANDBLAST FORM LINER FINISH

(2) RUB FINISH



TYPICAL BENT



TYPICAL COLUMN SECTION

STATE OF TEXAS
QING LIU
91266
LICENSED PROFESSIONAL ENGINEER
10/17/2023

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation
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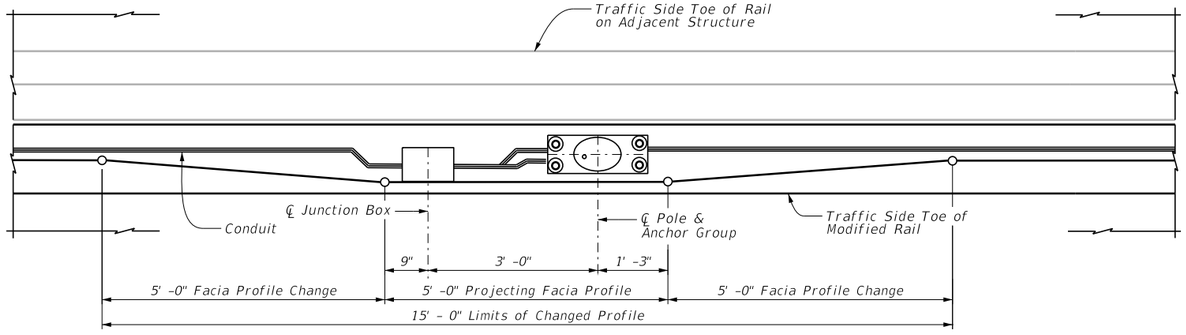
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

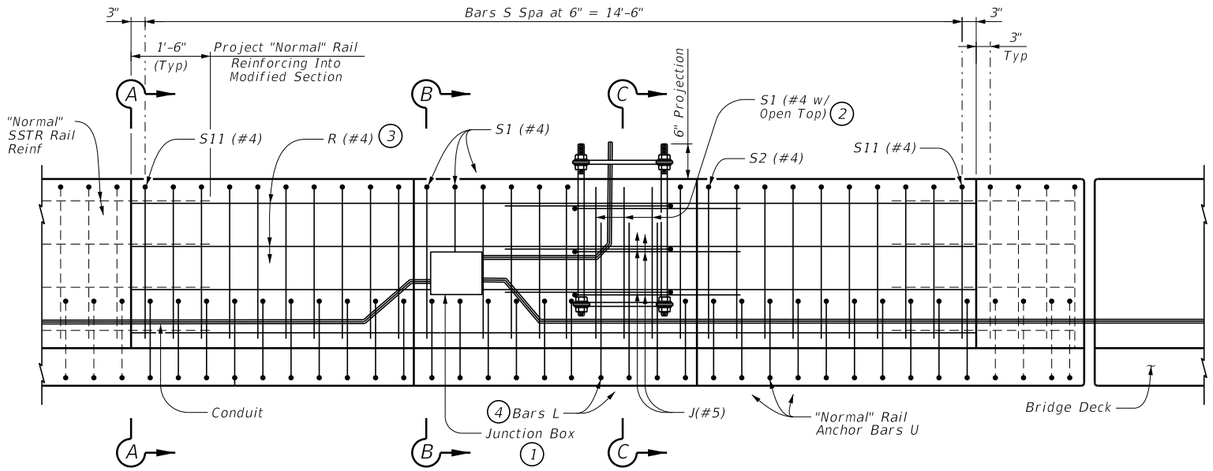
INTERIOR BENT AESTHETIC DETAILS

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1330
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

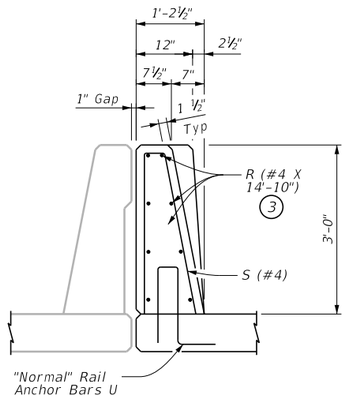


PLAN OF RAIL PROFILE MODIFICATION FOR ILLUMINATION POLE

Reinforcing not shown for clarity

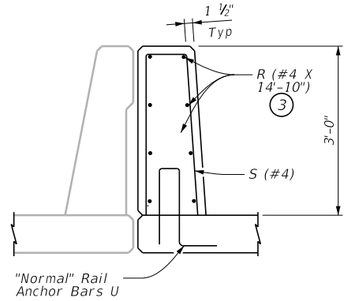


ELEVATION OF RAIL PROFILE MODIFICATION FOR ILLUMINATION POLE



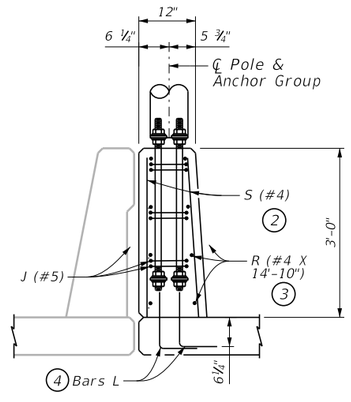
SECTION A-A

Conduit not shown for clarity



SECTION B-B

Conduit, Junction Box, and Pole not shown for clarity



SECTION C-C

Conduit and Junction Box not shown for clarity

1. *Bars R may be trimmed as necessary to install the Junction Box. Do not trim reinforcing to install conduit.*
2. *The top of Bars S may be trimmed as shown and as necessary to install the Pole Anchor Group.*
3. *Field bend Bars R in the traffic side face as necessary to conform to the modified rail profile.*
4. *In lieu of "normal" rail anchor Bars U, replace with two Bars L when in conflict with the Pole Anchor Group.*

GENERAL NOTES:

This Railing Profile Transition has been evaluated and approved to be of equal strength to railings with similar geometry, which have been crash tested to meet TL-3 criteria. This transition may be used for design speeds of 50 mph and greater. See SSTR (MOD) sheets for details not included herein.

This rail modification shall only be used at specified locations within project in which there is a rail-mounted roadway illumination pole.

Railing face profiles shall be gradually changed, over the transition as shown, from the "normal" SSTR rail section to the "special" illumination pole mount section and thence back to the "normal" SSTR rail section.

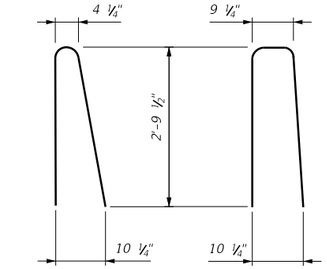
Reinforcing for the railing shall be Grade 60, All concrete shall be Class "C". Chamfer all exposed corners (either 1 ½" x ¾" or ¾" x ¾" chamfers may be used). Joint opening shall have end faces that are perpendicular to the adjacent roadway grade.

Provide anchor bolt assembly per "Concrete Traffic Barrier Base Anchor Bolt Assembly" details shown in "Roadway Illumination Poles" standard sheet. Galvanize anchor bolts, nuts, washers, and anchor bolt plates. Repair galvanizing damage per Item 445 "Galvanizing." Refer to "Roadway Illumination Poles" and "Roadway Illumination Details" standard sheets for illumination details not included herein.

All conduit bends shall be in accordance with the National Electric Code. Junction box shall be polymer concrete and shall be mounted flush with up to ½" recessed in the traffic side railing concrete surface. See the ED standards for additional information.

Illumination Poles mounted on bridge rail shall be grounded using a ground rod and grounding conductor to each pole as shown elsewhere in the plans. Rail transition, anchor bolts, ground rods, junction boxes, and conduit shall not be paid for directly, but will be considered subsidiary to the various bid items.

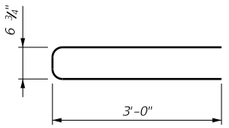
Shop and erection drawings will not be required for this railing.



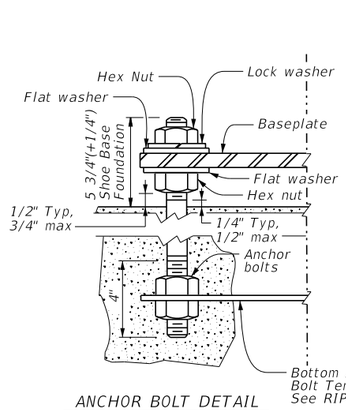
BARS S11 (#4) BARS S1 (#4)

Dimensions at top of Stirrup varies from 9 ¼" for Bars S1 to 4 ¼" for Bars S11 with an average width of 6 ¾".

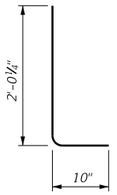
VARIABLE BARS S



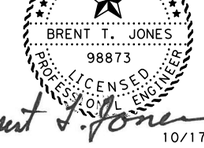
BARS J (#5)



ANCHOR BOLT DETAIL



BARS L (#6)



NO.	DATE	REVISION	APPROVED

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HNTB Corporation
The HNTB Companies
Engineers Architects Planners
Firm Registration Number F-420

IH 35 FROM S LP 340 TO 12TH ST

SPECIAL MODIFICATION TO TYPE SSTR RAIL
(FOR ILLUMINATION POLE MOUNT)

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		1331
STATE	DIST.	COUNTY	
TEXAS	WACO	McLENNAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0015	01	246	IH 35

FILE: pw:\\pw-int.hntb.org:PWCentralDiv\Documents\Dallas Projects\68651 Waco IH 35 4C\CAD\Sheets\07 - Bridge\Standards\BRDG_STD_PROJ\SSTR-LUMINAIRE(MOD).dgn
DATE: 10/17/2023 11:57:12 AM USER:

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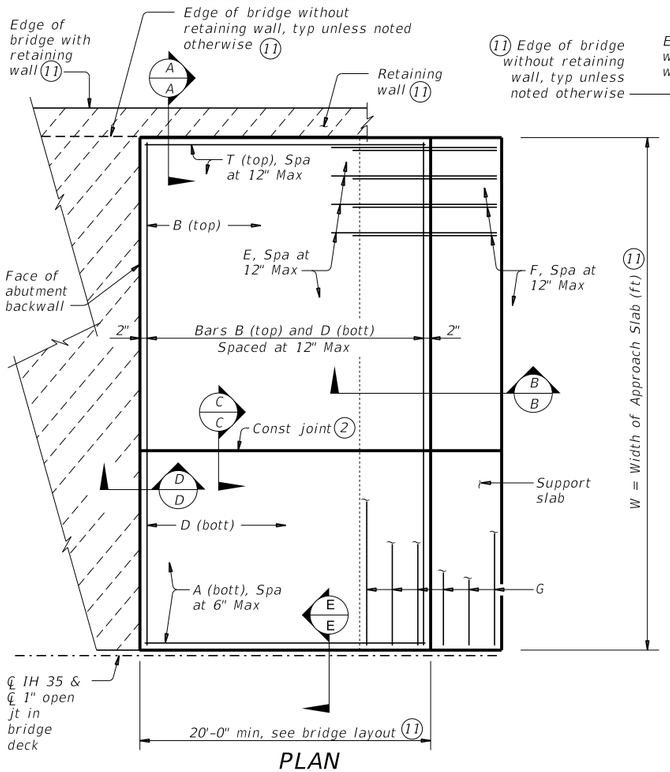
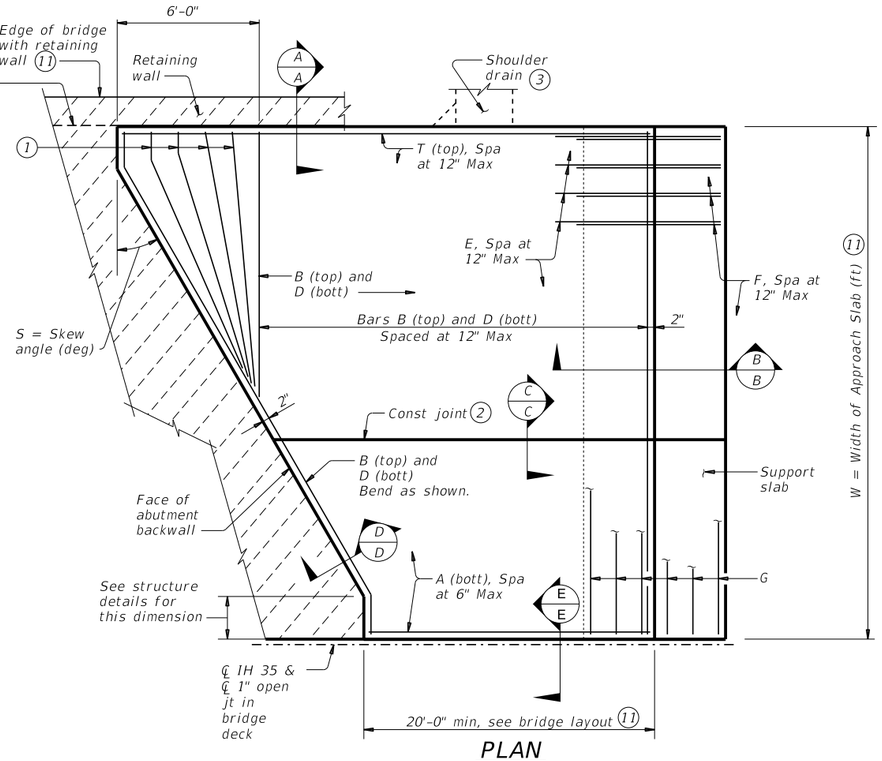


PLAN

(Showing non-skewed approach slab.)



PLAN

(Showing skewed approach slab.)

BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
E	#5
F	#5
G	#5
T	#5

APPROXIMATE QUANTITIES (4)

Reinf steel weight = 8.5 Lbs/SF of Approach Slab
= 18.4 Lbs/LF of Support Slab

Vol of Appr Slab Conc (CY) = 1.057W - 0.008W x T + 0.02W² Tan S (Includes Support Slab)

W = Width of Approach Slab (ft)

T = Conc Pavement Thickness (in)

S = Skew Angle (deg)

(1) Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.

(2) Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.

(3) See details elsewhere in plans for shoulder drain location and details.

(4) For Contractor's information only. Quantities shown are for one approach slab only.

(5) On portion of support slab that supports the concrete pavement, adjust top surface elevation, if required, to accommodate concrete pavement thickness. Smooth trowel finish. Place two layers of 30# roofing felt.

(6) Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.

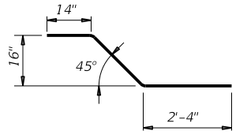
(7) See details elsewhere in plans for required cross-slope.

(8) Place in accordance with Item 438.

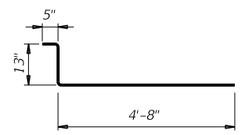
(9) Provide backer rod that is 25% larger than joint opening and compatible with the sealant.

(10) If bridge rail is present at the wingwall or CIP retaining wall, place ½" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

(11) See details elsewhere in plans for edge of bridge conditions, presence of wingwall or retaining wall, approach slab dimensions, and other details not shown.



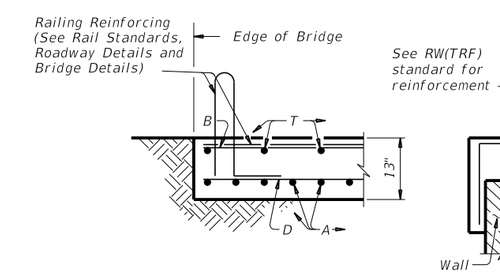
BARS E (#5)



BARS F (#5)

NOTES:

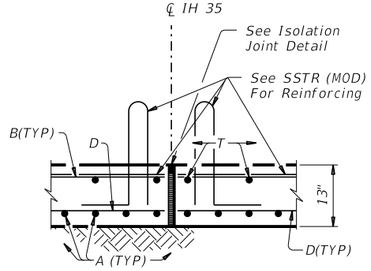
For general notes and additional details, see sheet 2 of 2.



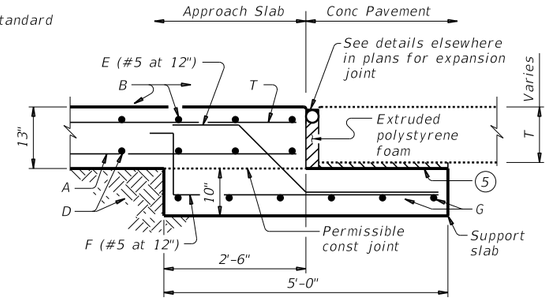
SHOWING NO WINGWALL OR RETAINING WALL
(TYP, UNLESS NOTED OTHERWISE)

SHOWING RETAINING WALL
(EB VM, WB VM and SBML @ 18TH only)

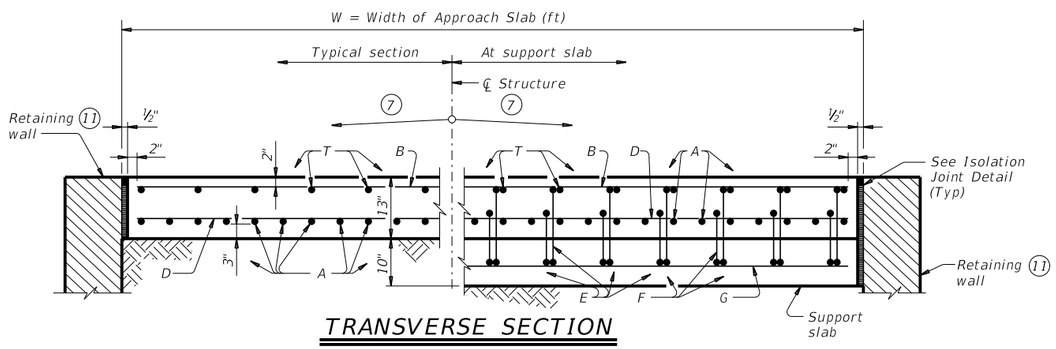
SECTION A-A (11)



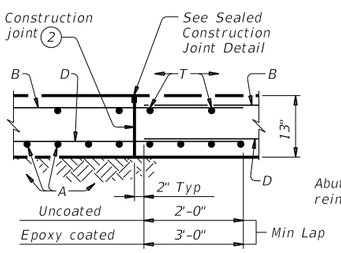
SECTION E-E



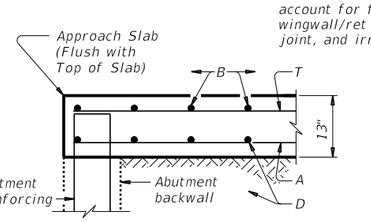
SECTION B-B



TRANSVERSE SECTION



SECTION C-C (6)



SECTION D-D

MODIFICATION NOTES:

Modified/added details to account for following: No wingwall/ret wall, ℄ IH35 joint, and irregular regions

STATE OF TEXAS
BRENT T. JONES
98873
PROFESSIONAL LICENSED ENGINEER

Brent T. Jones
10/17/2023

TBPE Firm Registration No.: 420

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

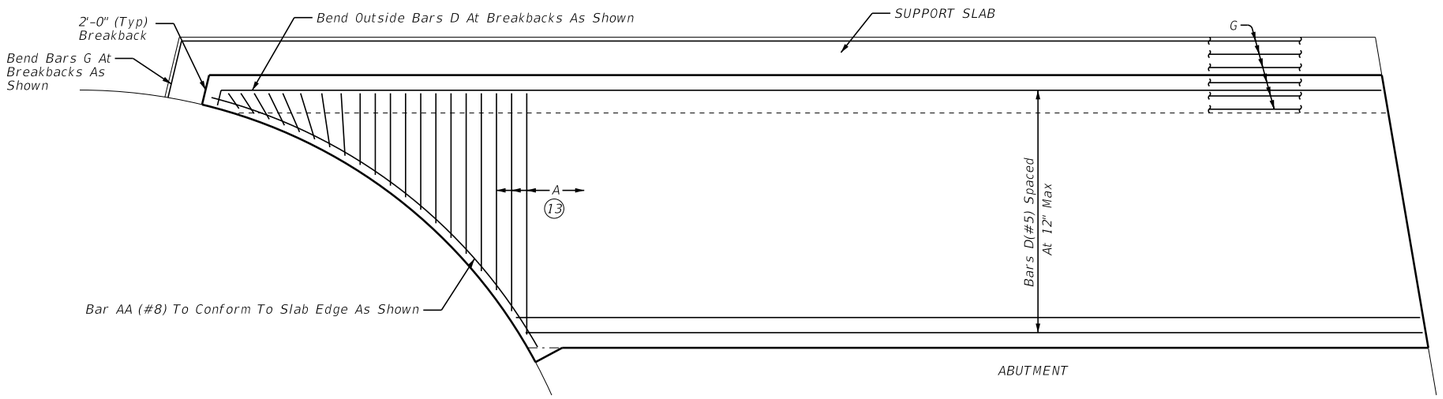
BRIDGE APPROACH SLAB

CONCRETE PAVEMENT

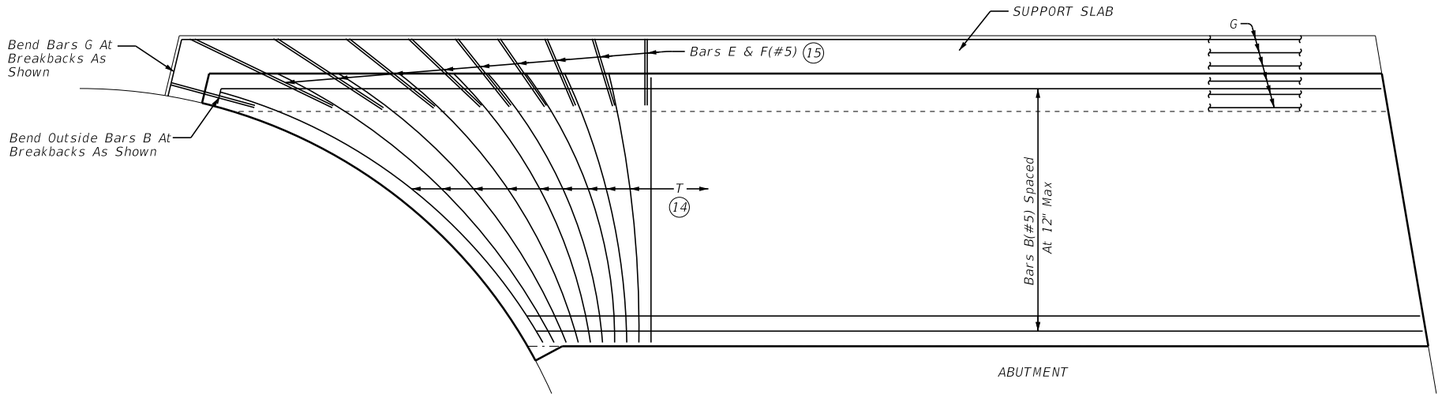
BAS-C(MOD)

FILE: bascste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
02-20: Removed stress relieving pad. 03-23: Note 5 changed.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1332

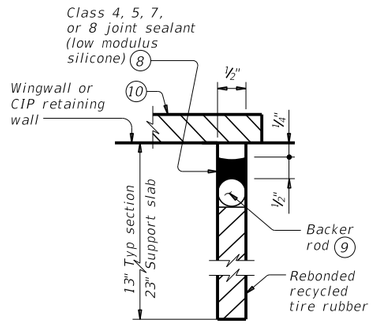
DATE:
FILE:



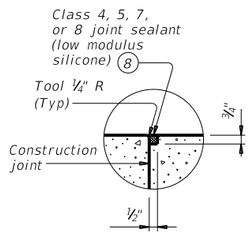
TYPICAL BOTTOM STEEL REINFORCEMENT IN IRREGULAR REGIONS (12)



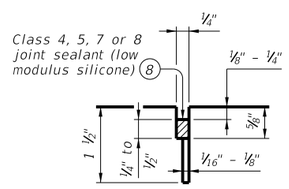
TYPICAL TOP STEEL REINFORCEMENT IN IRREGULAR REGIONS (12)



ISOLATION JOINT DETAIL



SEALED CONSTRUCTION JOINT DETAIL



LONGITUDINAL SAW CUT JOINT DETAIL

12 See BAS-C (MOD) Standard For Other Approach Slab Details. This Sheet Provides Additional Information For Steel Placement Within Regions Of The Slab That Contain Curved Or Tapered Edges.

13 Flare Bars A (#8 Spa At 6" Max) In Corner To Maintain A Minimum Bar Length Of 2'-6".

14 Flare Bars T (#5) In This Region (1'-6" Max Spa, 3" Min Spa). Minimum Flared Bar Length = 2'-6". Bend Bars As Necessary.

15 Flare Bars E And F In Corners As Shown (1'-6" Max Spa, 3" Min Spa). Extend The Length Of The Lower Portion Of Bars As Shown On BAS-C (MOD) Standard To Maintain 2" Clearance.

GENERAL NOTES:

Construct approach slab in accordance with Item 422.

Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.

Provide Grade 60 reinforcing steel.

Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 ½" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 ½" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310. "Joint Sealants and Fillers."

Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.

Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.

Cure for 4 days using water or membrane curing per Item 422.

All details shown herein are subsidiary to bridge approach slab.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

STATE OF TEXAS
BRENT T. JONES
98873
LICENSED PROFESSIONAL ENGINEER

Brent T. Jones
10/17/2023

TBPE Firm Registration No.: 420

SHEET 2 OF 2

MODIFICATION NOTES:

Modified/added details to account for following: No wingwall/ret wall, ℄ IH35 joint, and irregular regions

Texas Department of Transportation

Bridge Division Standard

BRIDGE APPROACH SLAB

CONCRETE PAVEMENT

BAS-C(MOD)

FILE: bascste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
02-20: Removed stress relieving pad. 03-23: Note 5 changed.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1333

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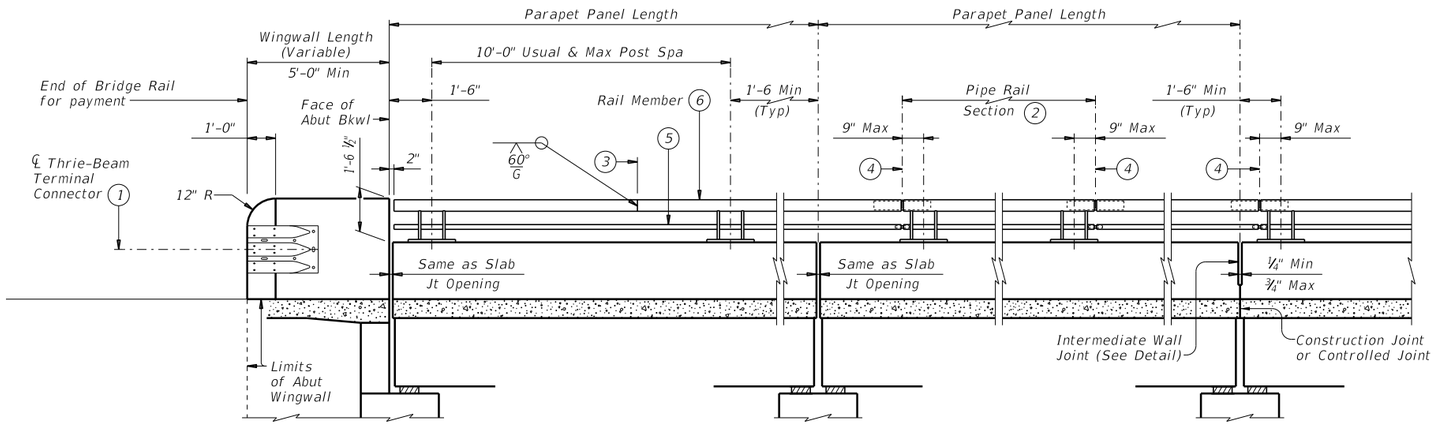
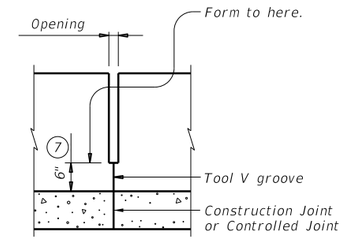


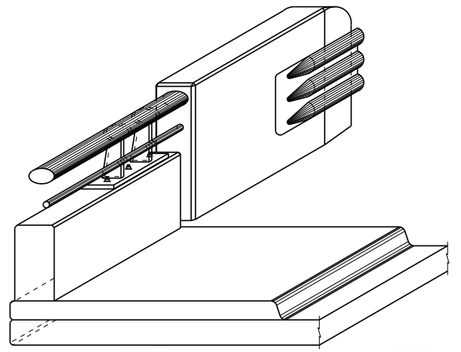
ROADWAY ELEVATION OF RAIL

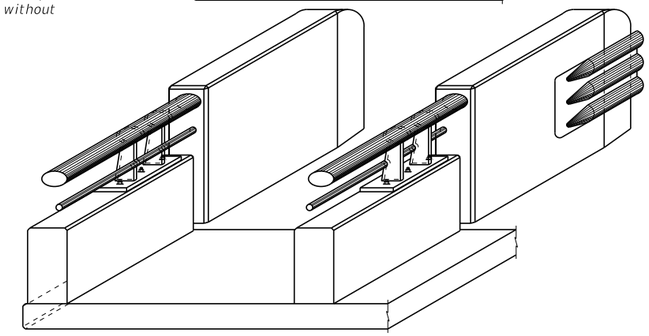
(Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



INTERMEDIATE WALL JOINT DETAIL

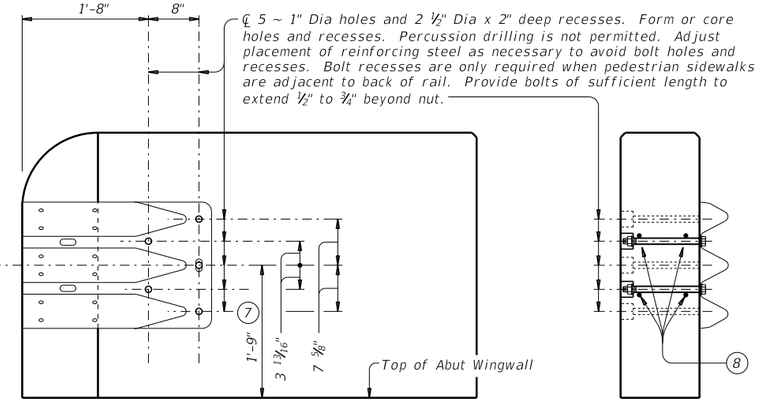
(Showing without raised sidewalk)
Provide at all interior bents without slab expansion joints.



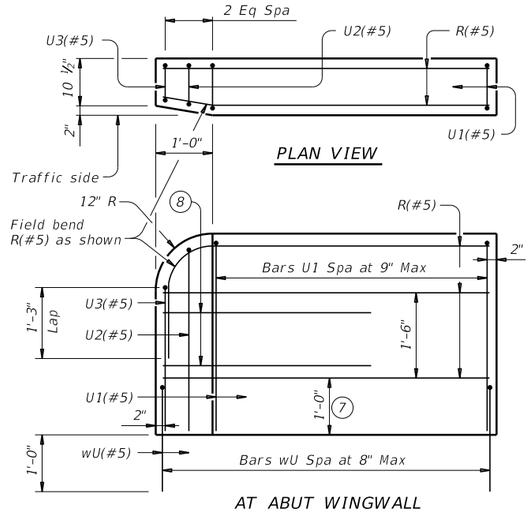


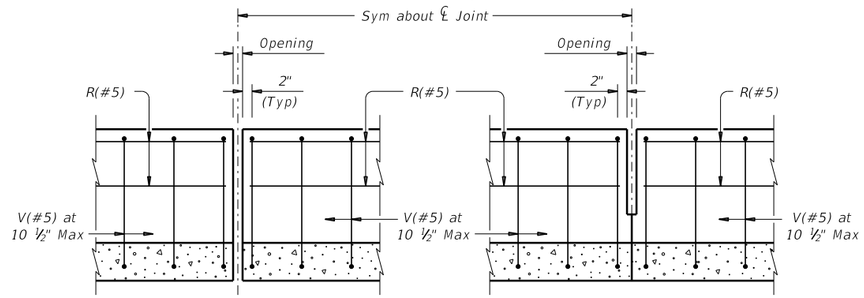
ISOMETRIC VIEWS AT END OF BRIDGE

(Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



TERMINAL CONNECTION DETAILS





ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

(Showing without raised sidewalk)

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Pipe rail sections must have at least two posts but not more than four.
3. One shop splice per pipe rail section is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. ℄ Exp Jt or Splice Jt as required.
5. 2" Dia Std Pipe (2.375" O.D., 0.154" wall thickness) (ASTM A53 Gr B, A1085 or A500 Gr B). Placed on either side of steel rail post.
6. Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.
7. Increase 2" for structures with overlay.
8. Place 4 additional Bars R(#5) 3'-8" in length inside Bars U(#5) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.

STATE OF TEXAS
BRENT T. JONES
98873
PROFESSIONAL LICENSED ENGINEER
10/17/2023
TBPE Firm Registration No.: 420

MODIFICATION NOTES:
ADDED SHEET 5 FOR APPROACH ANCHOR DETAILS

Texas Department of Transportation
Bridge Division Standard

COMBINATION RAIL

TYPE C402(MOD)

FILE:	rlstd020-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT	September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS		0015	01	246	IH 35
		DIST	COUNTY		SHEET NO.
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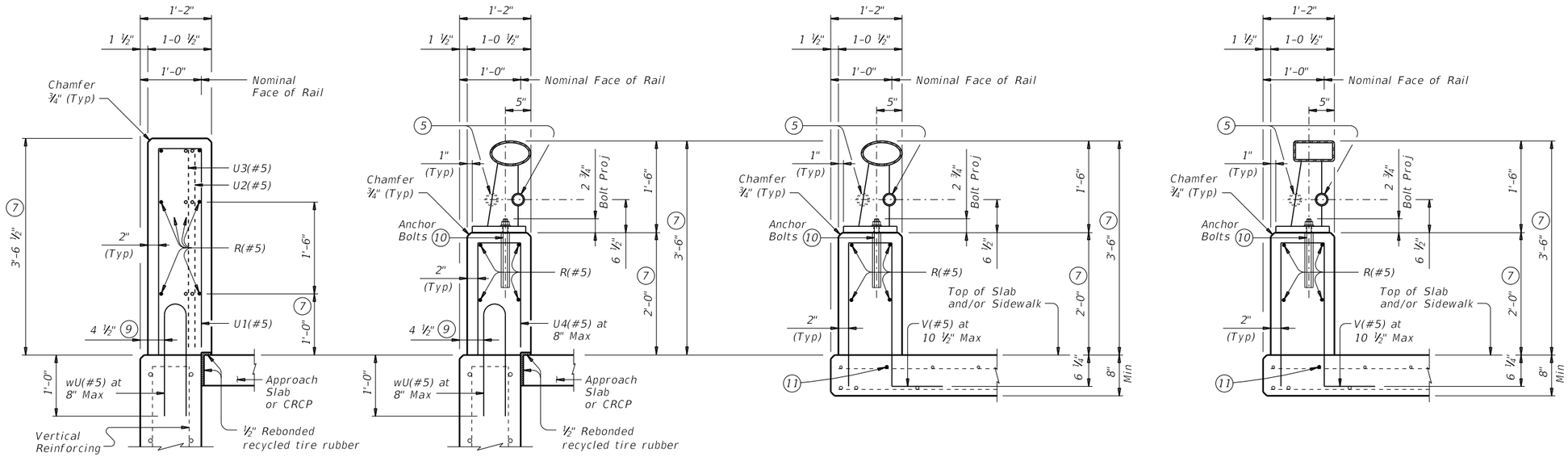


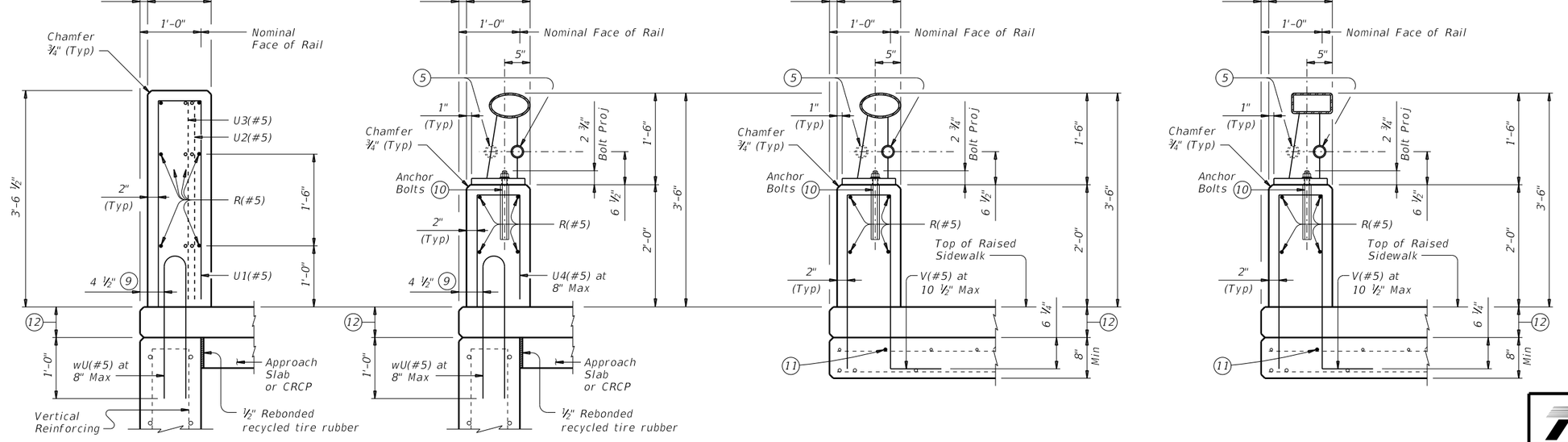
ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

ON CIP RETAINING WALLS
(Showing Elliptical Tube Option)

ON BRIDGE SLAB
(Showing Elliptical Tube Option)

ON BRIDGE SLAB
(Showing Rectangular Tube Option)

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK (6)



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

ON CIP RETAINING WALLS
(Showing Elliptical Tube Option)

ON BRIDGE SLAB
(Showing Elliptical Tube Option)

ON BRIDGE SLAB
(Showing Rectangular Tube Option)

SECTIONS THRU RAIL WITH RAISED SIDEWALK (6)

(5) 2" Dia Std Pipe (2.375" O.D., 0.154" wall thickness) (ASTM A53 Gr B, A1085 or A500 Gr B). Placed on either side of steel rail post.

(6) Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.

(7) Increase 2" for structures with overlay.

(9) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(10) See "Material Notes" for anchor bolt information.

(11) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(12) Raised Sidewalk

MODIFICATION NOTES:
ADDED SHEET 5 FOR APPROACH ANCHOR DETAILS

STATE OF TEXAS
BRENT T. JONES
98873
PROFESSIONAL LICENSED ENGINEER
10/17/2023

TBPE Firm Registration No.: 420

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

TYPE C402(MOD)

FILE: rlstd020-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
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	WACO	McLENNAN		1335

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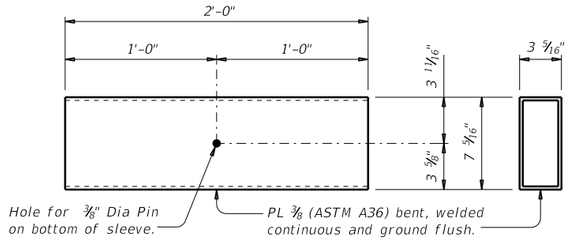
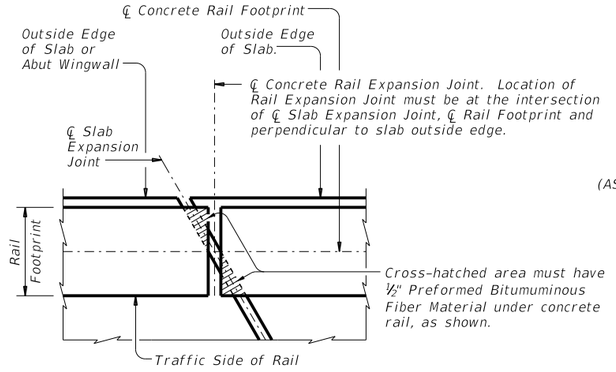


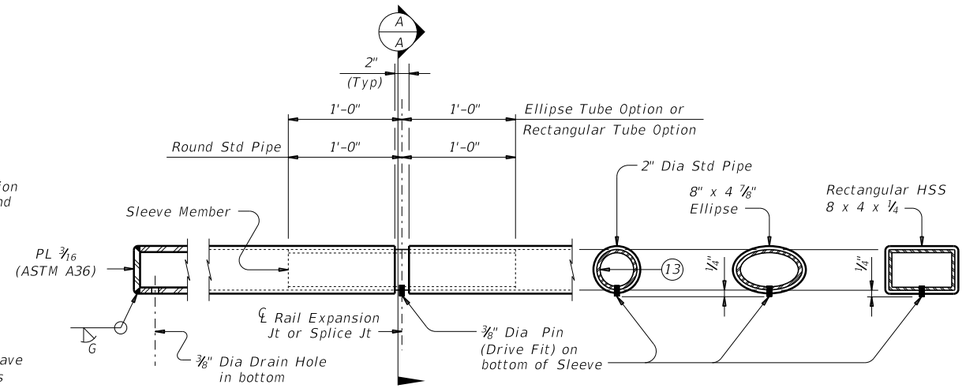
RECTANGULAR TUBE SLEEVE MEMBER DETAIL

(See Tube Fabrication Detail)



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

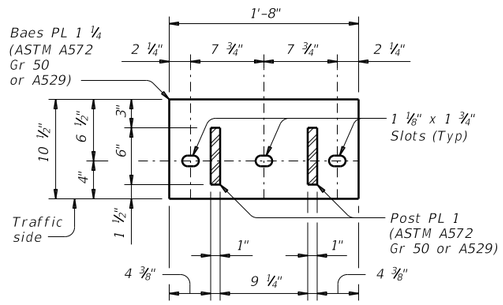


TUBE FABRICATION DETAILS (6)

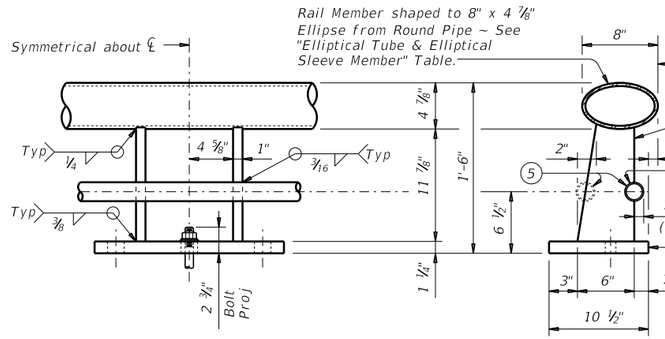
ELLIPTICAL TUBE & ELLIPTICAL SLEEVE MEMBER

8" x 4 7/8" Ellipse	Elliptical Sleeve Member	
Material	Material	Thickness
6" Dia Std Pipe ASTM A53 E or S Gr B)	ASTM A53 Gr B	0.353"
	ASTM A36 or A500 Gr B	0.339"
	API-5LX52	0.224"
6 5/8" O.D. Pipe x 0.188" API-5LX52	ASTM A53 Gr B	0.339"
	ASTM A36 or A500 Gr B	0.325"
	API-5LX52	0.188"

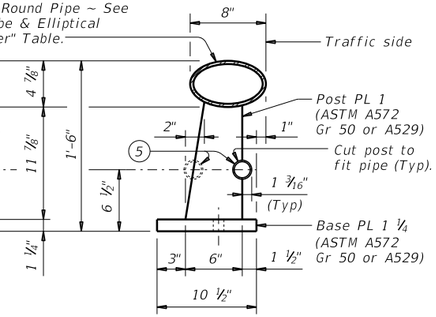
Notes: Other sections of equal or greater strength are acceptable for elliptical sleeves. The major and minor diameters of the rail member may vary +/- 0.1875" from plan dimension. However, the difference between the outside diameters of the elliptical sleeve and the inside diameters of the rail member must not exceed 0.25 inches.



SECTION THRU POST

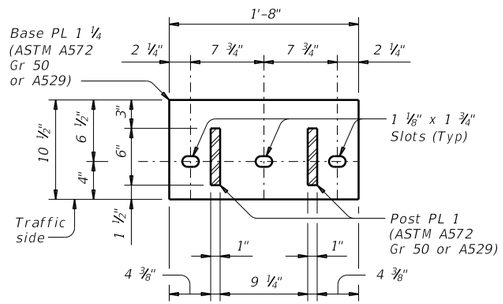


ELEVATION

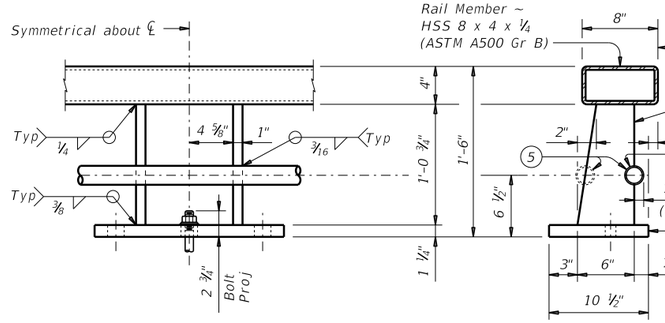


ELLIPTICAL TUBE WITH RAIL POST & ANCHORAGE DETAILS

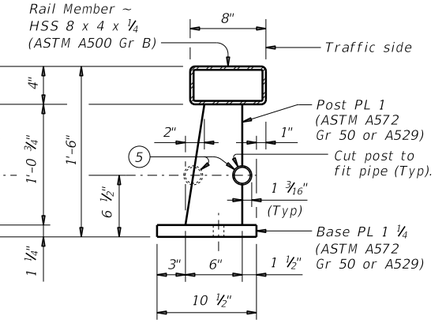
(Showing Elliptical Tube Option)



SECTION THRU POST



ELEVATION



RECTANGULAR TUBE WITH RAIL POST & ANCHORAGE DETAILS (6)

(Showing Rectangular Tube Option)

(5) 2" Dia Std Pipe (2.375" O.D., 0.154" wall thickness) (ASTM A53 Gr B, A1085 or A500 Gr B). Placed on either side of steel rail post.

(6) Unless directed otherwise by the Engineer, the fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.

(13) Sleeve Member 1 ½" Dia Std Pipe (1.90" O.D., 0.145" wall thickness) (ASTM A53 Gr B or A500 Gr B).

Brent T. Jones
10/17/2023

TBPE Firm Registration No.: 420

MODIFICATION NOTES:
ADDED SHEET 5 FOR APPROACH ANCHOR DETAILS

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

TYPE C402(MOD)

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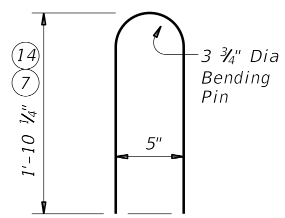
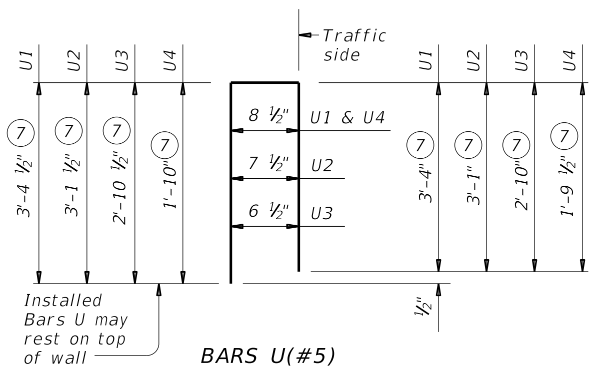
REVISIONS	0015	01	246	IH 35
	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1336

RAIL DATA FOR HORIZONTAL CURVES

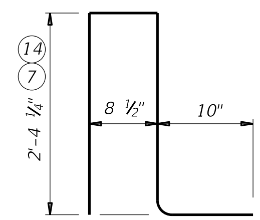
	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
Rail Members	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown (16)
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius (16)



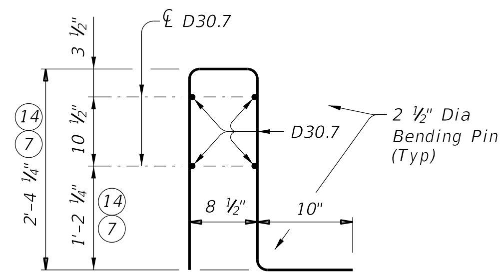
BARS wU(#5)



BARS U(#5)



BARS V(#5)



OPTIONAL WELDED WIRE REINFORCING (WWR)

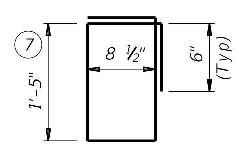
(7) Increase 2" for structures with overlay.

(10) See "Material Notes" for anchor bolt information.

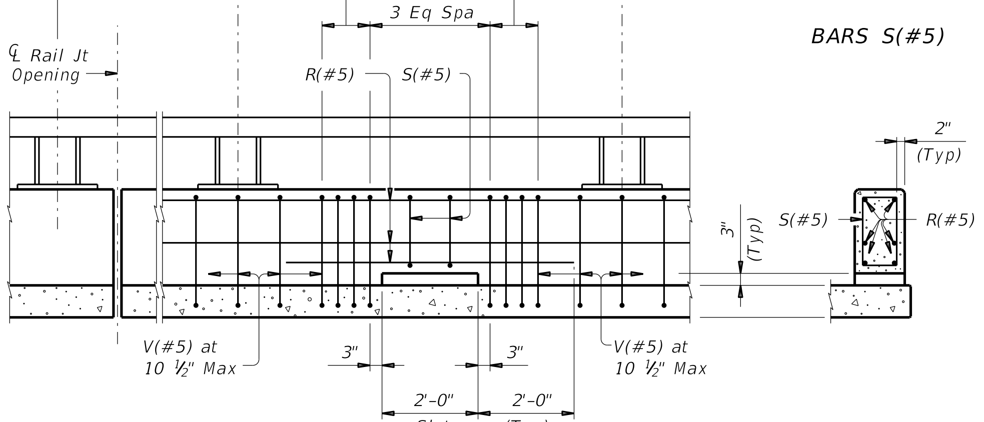
(14) For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.

(15) Slots are not allowed in areas where there is a joint in the concrete parapet between rail post.

(16) Shop drawings for approval required for tubular steel sections.



BARS S(#5)

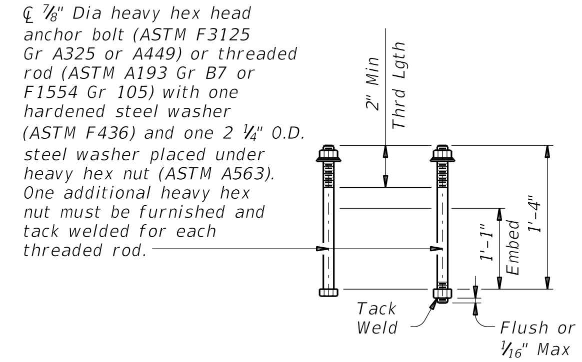


ELEVATION

SECTION THRU SIDE SLOT DRAIN

OPTIONAL SIDE SLOT DRAIN DETAILS

Note: Center Side Slot Drains between rail posts within the limits shown. Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Do not place drains over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



CAST-IN-PLACE ANCHOR BOLT OPTIONS (10)

CONSTRUCTION NOTES:

This rail may be slipformed if approved by the Engineer when adhesive anchor bolts are used.

At the Contractor's option anchor bolts may be cast with the parapet. See "Material Notes". Slipforming parapet is not allowed if anchor bolts are cast with parapet wall.

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

Rail parapet must be plumb unless otherwise approved. Steel posts must be square to the top of parapet. Use Type VIII epoxy mortar under post base plates if gaps larger than 1⁄16" exist.

Cap all ends of tubular steel sections at parapet.

Pipe rail sections must have at least two posts but not more than four.

Round or chamfer all exposed edges of steel components 1⁄16" by grinding prior to galvanizing.

Chamfer all exposed concrete corners.

MATERIAL NOTES:

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over gavanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Anchor bolts must be ⅞" Dia ASTM A193 Gr B7 fully threaded rods with heavy hex nuts, one hardened steel washer (ASTM F436), and one (2 ¼" O.D.) steel washer each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into parapet wall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 17 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing."

Optional cast-in-place anchor bolts must be ⅞" Dia ASTM F3125 Gr A325 or A449 bolts (or A193 Gr B7 or F1554 Gr 105 threaded rods with one tack welded heavy hex nut each) with one heavy hex nut and one hardened steel washer ASTM F436 plus one (2 ¼" O.D.) steel washer at each bolt. Nuts must conform to ASTM A563 requirements.

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) ASTM A1064 may be substituted for Bars R, and V, as shown. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows: Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

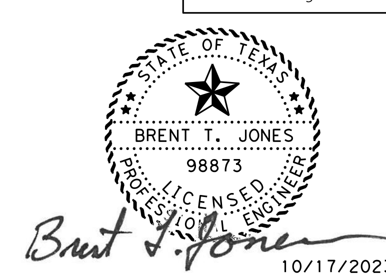
Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Submit erection drawings showing panel lengths, rail post spacing, and anchor bolt setting, to the Engineer for approval.

Average weight of railing with no overlay: 347 plf total
313 plf (Conc)
34 plf (Steel).

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



TBPE Firm Registration No.: 420

MODIFICATION NOTES:

ADDED SHEET 5 FOR APPROACH ANCHOR DETAILS

Texas Department of Transportation — Bridge Division Standard

COMBINATION RAIL

TYPE C402(MOD)

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	DIST		COUNTY	SHEET NO.
	WACO		McLENNAN	1337

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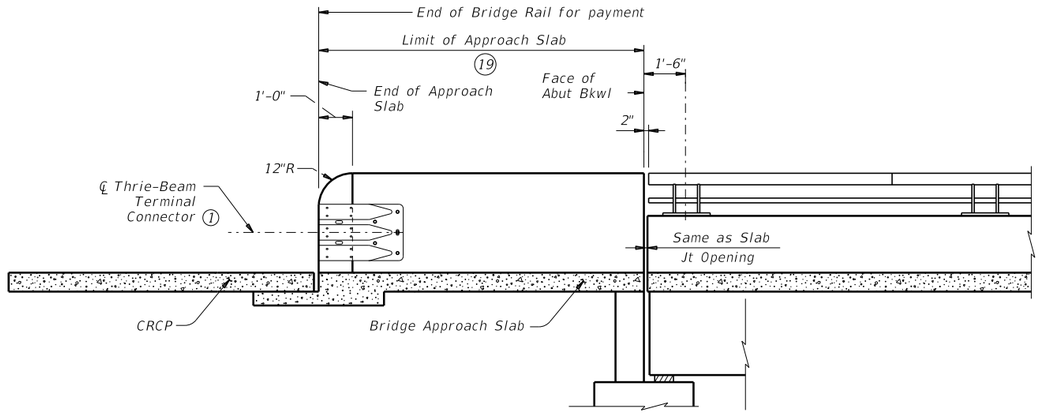
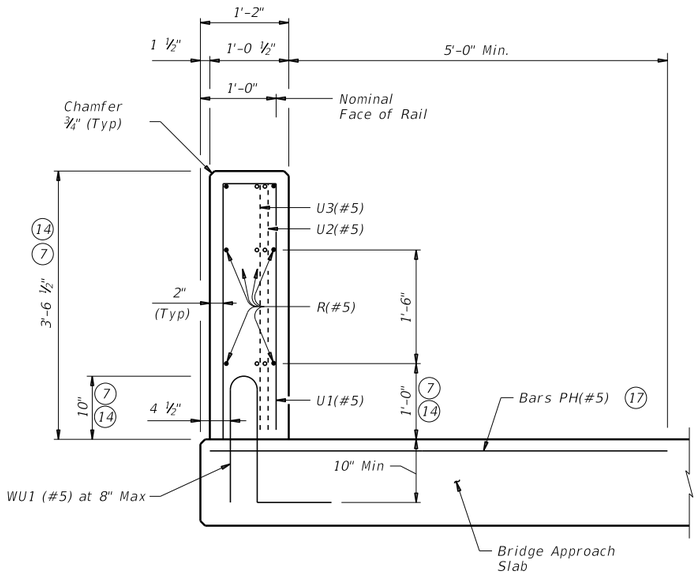
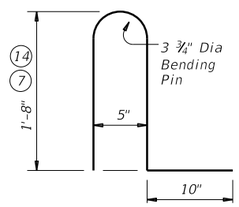


RAIL DETAIL ON APPROACH SLAB 18



RAIL SECTION ON BRIDGE APPROACH SLAB

(Without Raised Sidewalk Shown, Work this Detail with Sheet 2 of 5 for Raised Sidewalk)



BARS WU1(#5)

1 Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

7 Increase 2" for structures with overlay.

14 For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.

17 Bars PH(#5) are Part of Rail Reinforcing and are Included in Unit Price Bid for Railing. Bars PH(#5) are in Addition to Approach Reinforement Shown Elsewhere. Bars PH(#5) Shall be at 6" Spacing and Extend a Minimum of 5'-0" into Pavement from Face of Rail Regardless of Pavement Thickness. Space and Bundle with Adjacent Top Transverse Bars and Match Top Bar Cover.

18 Work Details with Sheets 1-4 of 5.

19 See Bridge Layout for Limits of Approach Slab

STATE OF TEXAS
BRENT T. JONES
98873
LICENSED
PROFESSIONAL ENGINEER

Brent T. Jones
10/17/2023

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MODIFICATION NOTES:
ADDED SHEET 5 FOR APPROACH ANCHOR DETAILS

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

TYPE C402(MOD)

FILE: rlstd020-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
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	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1338

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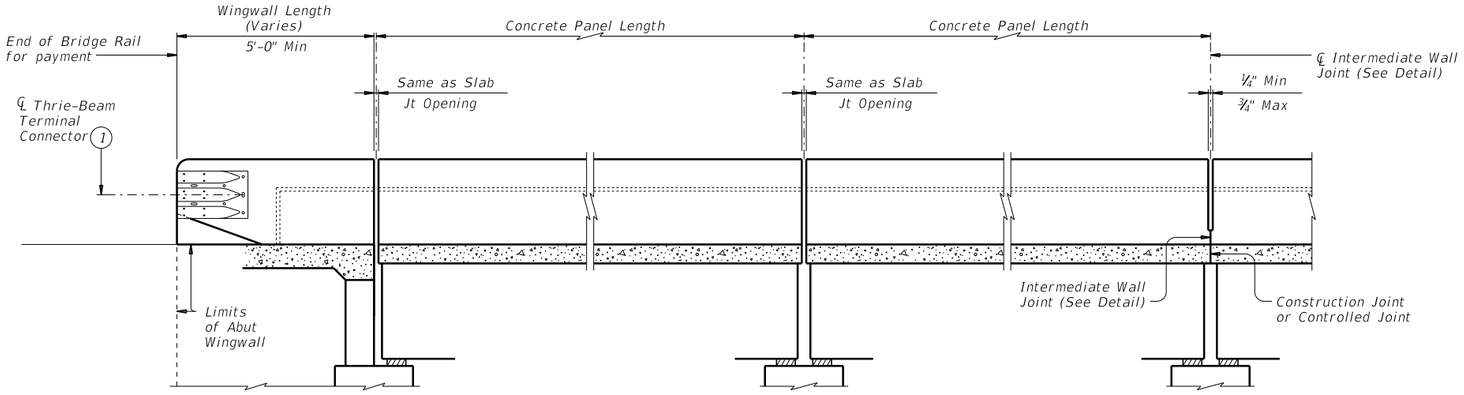
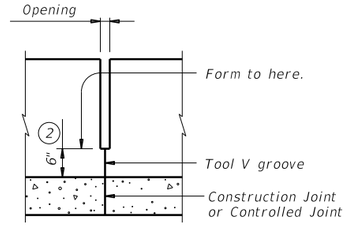


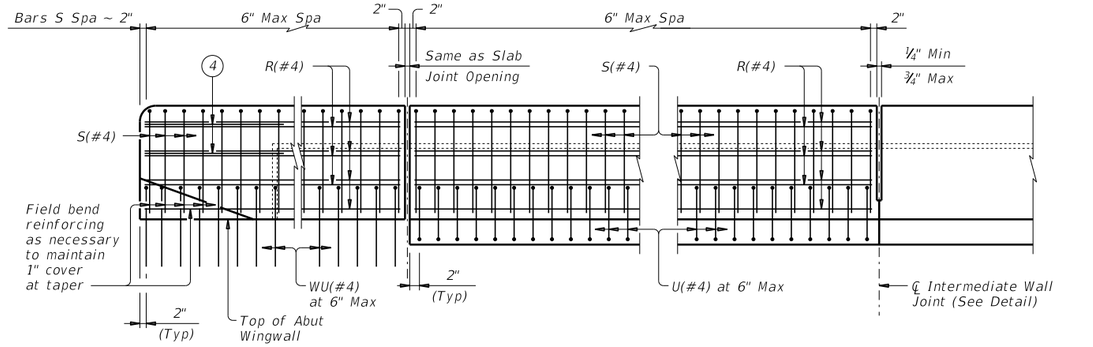
AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

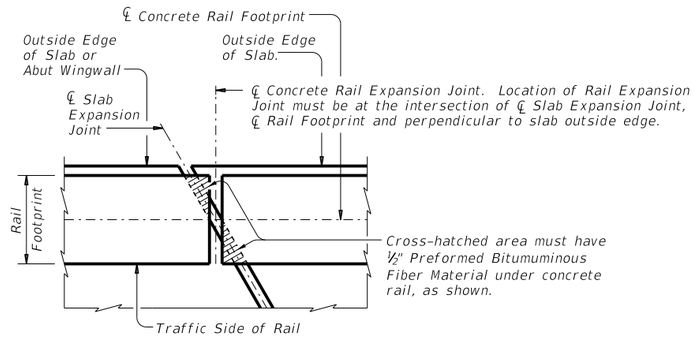


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



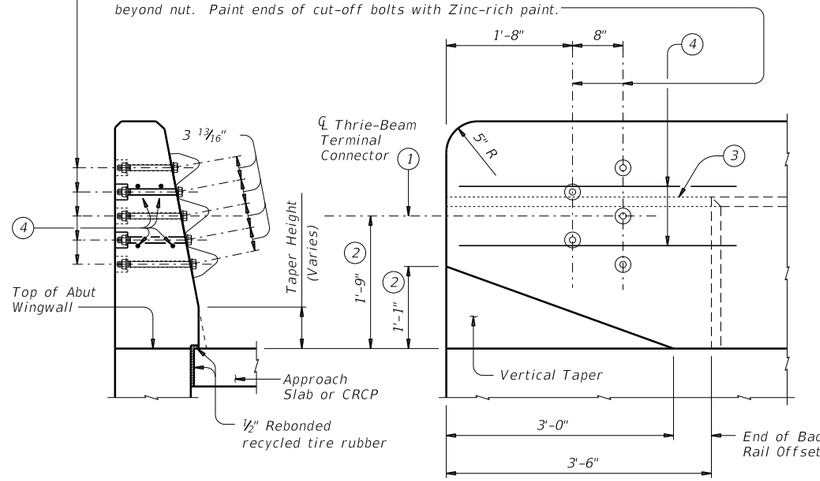
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

℄ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



SECTION | ELEVATION

TERMINAL CONNECTION DETAILS

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Increase 2" for structures with Overlay.
3. Back of rail offset may, with Engineer's approval, be continued to the end of the railing.
4. Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required.

STATE OF TEXAS
BRENT T. JONES
98873
LICENSED
PROFESSIONAL ENGINEER

10/17/2023

TBPE Firm Registration No.: 420

MODIFICATION NOTES:
Added/Sheet 3 for CRCP/Approach Anchor Details

SHEET 1 OF 3

Texas Department of Transportation | Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR(MOD)

FILE: rlstd014-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
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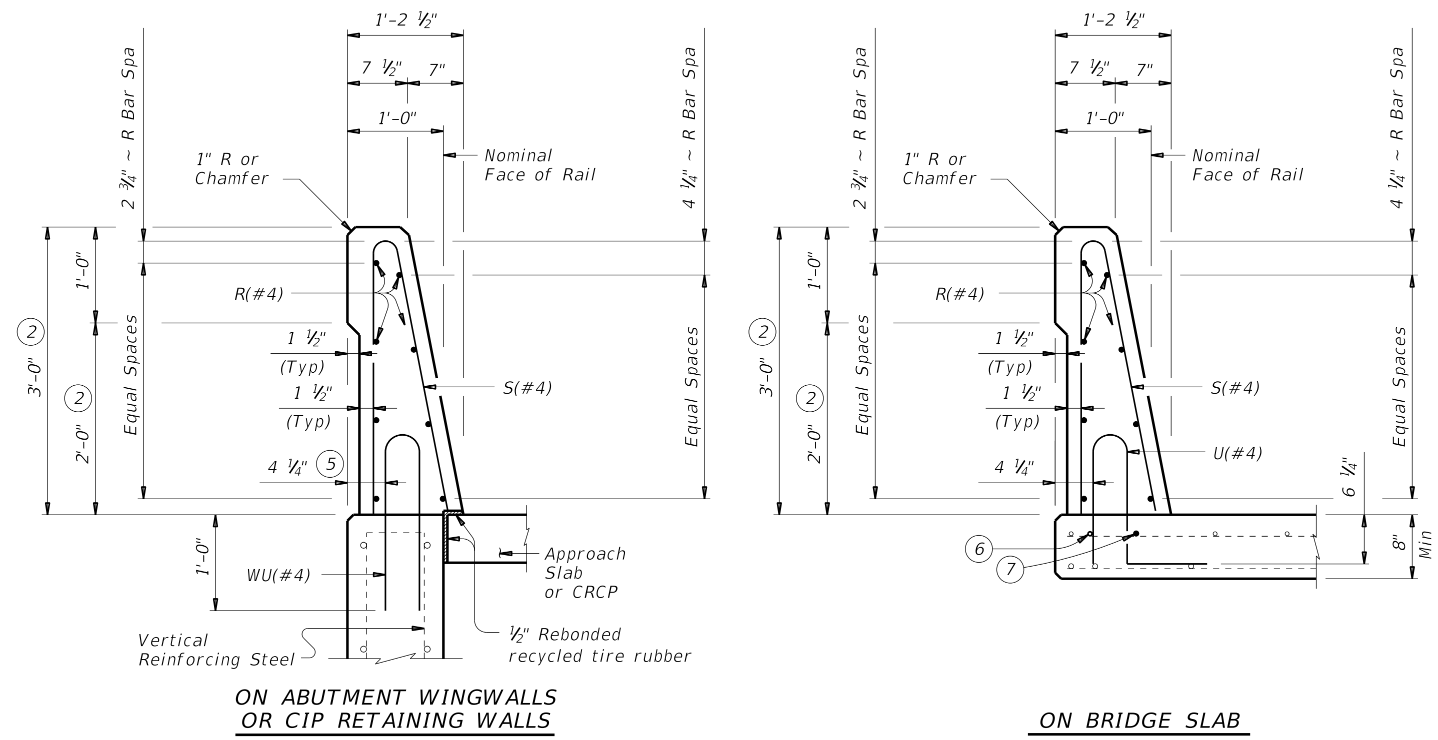
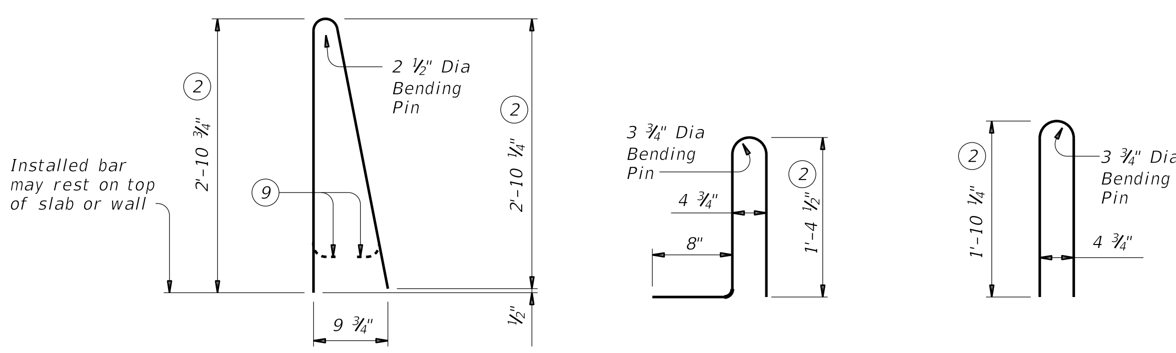
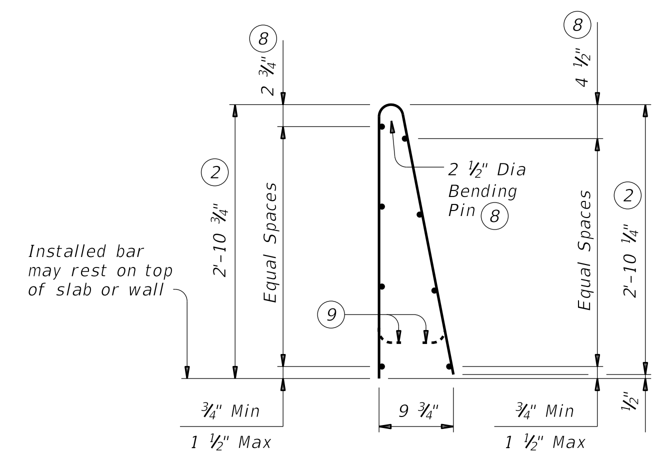
REVISIONS	0015	01	246	IH 35
	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1339



SECTIONS THRU RAIL





OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	

2 Increase 2" for structures with Overlay.

5 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

6 As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.

7 Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

8 No longitudinal wires may be within upper bend.

9 Bend or cut as required to clear drain slots.

10 Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greator to side slot drain.

CONSTRUCTION NOTES:

This railing may be constructed by the slipform process when approved by the Engineer, with equipment approved by the Engineer. Provide sensor control for both line and grade. Tack welding to provide bracing for slipform operations is acceptable. Welding may be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to bars U, WU and S at any location on the cage. If increased bracing is needed, provide additional anchorage devices and weld in the upper two thirds of the cage. Paint welded areas on epoxy coated and/or galvanized reinforcing with an organic zinc rich paint in accordance with Item 445 "Galvanizing".

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

The back of railing must be vertical unless otherwise shown in the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM A1064) may be substituted for Bars R and S, as shown. Combinations of reinforcing steel and WWR or configurations of WWR other than shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #4 = 1'-7"
Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

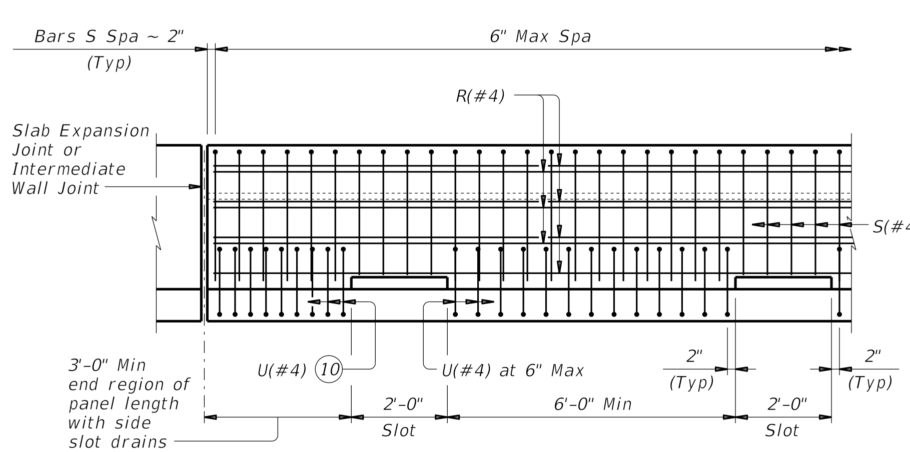
Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

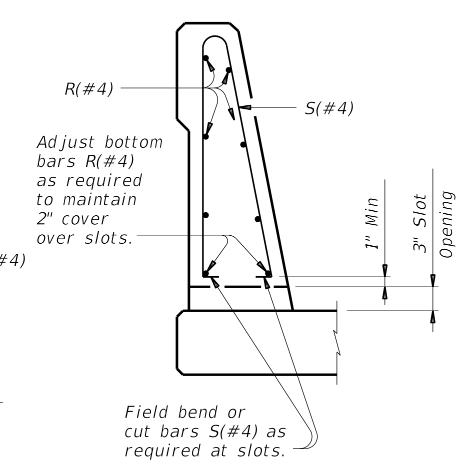
Average weight of railing with no overlay is 376 plf.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



SECTION THRU OPTIONAL SIDE SLOT DRAIN

STATE OF TEXAS
BRENT T. JONES
98873
LICENSED PROFESSIONAL ENGINEER
10/17/2023
TBPE Firm Registration No.: 420

MODIFICATION NOTES:

Added/Sheet 3 for CRCP/Approach Anchor Details

Texas Department of Transportation — Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR(MOD)

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REVISIONS	0015	01	246	IH 35
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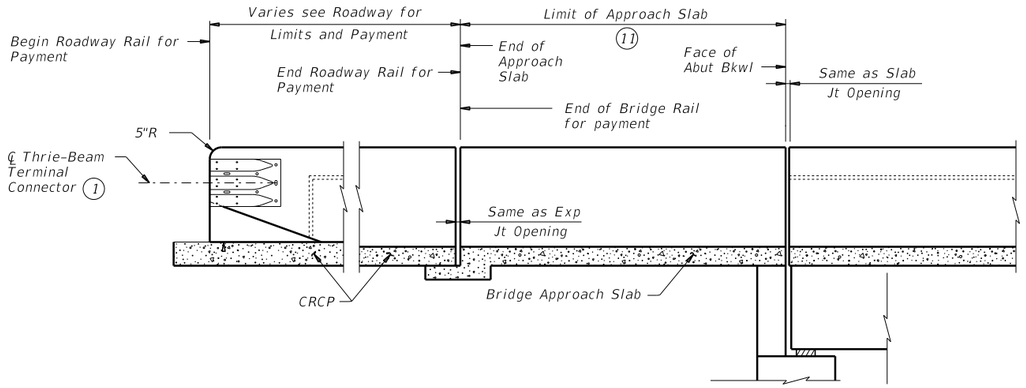
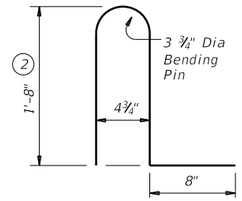
	WACO		McLENNAN	1340

DATE:
FILE:



RAIL DETAILS ON CRCP AND APPROACH SLAB (13)



BARS U1(#4)

RAIL SECTION ON CRCP OR BRIDGE APPROACH SLAB

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Increase 2" for structures with Overlay.

(11) See Bridge Layout for Limits of Approach Slab

(12) Bars PH(#5) are Part of Rail Reinforcing and are Included in Unit Price Bid for Railing. Bars PH(#5) are in Addition to Approach/CRCP Reinforcement Shown Elsewhere. Bars PH(#5) Shall be at 6" Spacing and Extend a Minimum of 5'-0" into Pavement from Face of Rail Regardless of Pavement Thickness. Space and Bundle with Adjacent Top Transverse Bars and Match Top Bar Cover.

(13) Work Details with Sheets 1-2 of 3.

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Brent T. Jones
10/17/2023

TBPE Firm Registration No.: 420

MODIFICATION NOTES:
Added/Sheet 3 for CRCP/Approach Anchor Details

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR(MOD)

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	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1341

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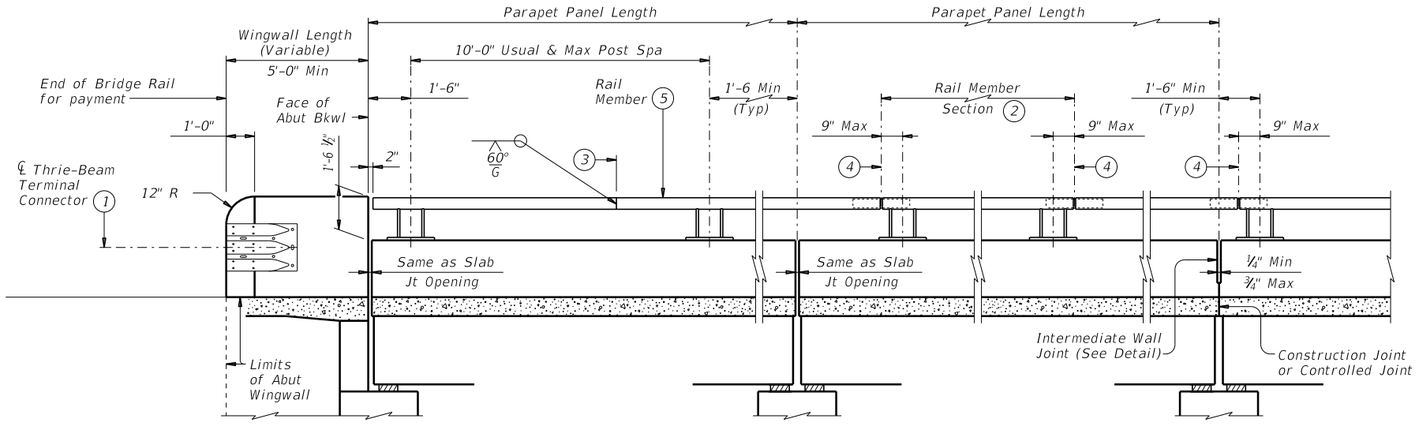
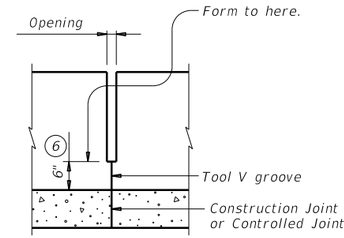


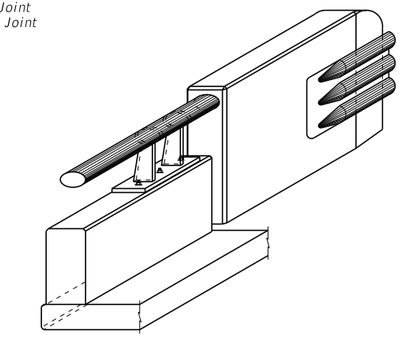
ROADWAY ELEVATION OF RAIL

(Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



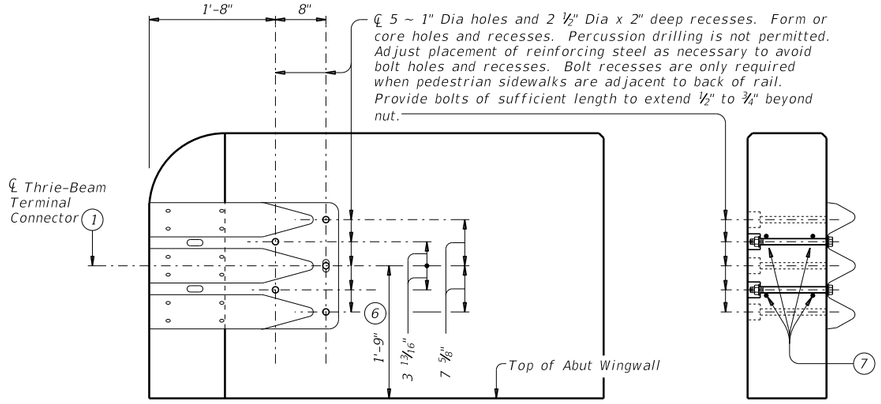
INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



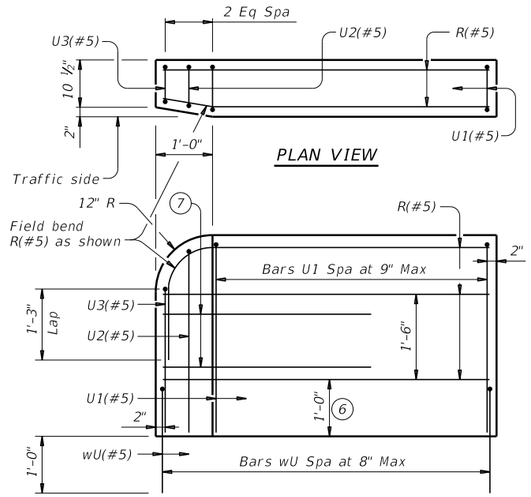
ISOMETRIC VIEW AT END OF BRIDGE

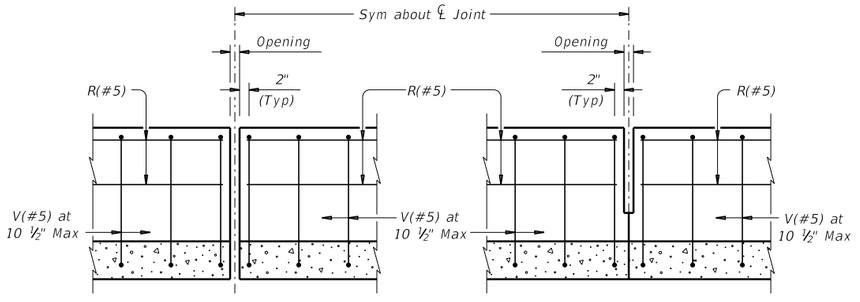
(Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



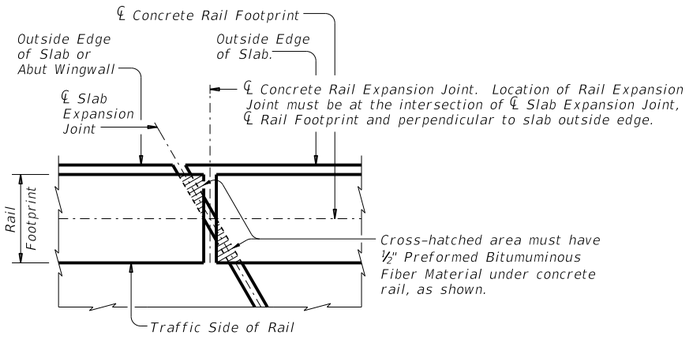
ELEVATION SECTION

TERMINAL CONNECTION DETAILS





ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Rail member sections must have at least two posts but not more than four.
3. One shop splice per rail member section is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. ℄ Exp Jt or Splice Jt as required.
5. Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.
6. Increase 2" for structures with overlay.
7. Place 4 additional Bars R(#5) 3'-8" in length inside Bars U(#5) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.

10/17/2023

TBPE Firm Registration No.: 420

MODIFICATION NOTES:
ADDED SHEET 4 FOR APPROACH ANCHOR DETAILS

SHEET 1 OF 4

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T402(MOD)

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	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1342

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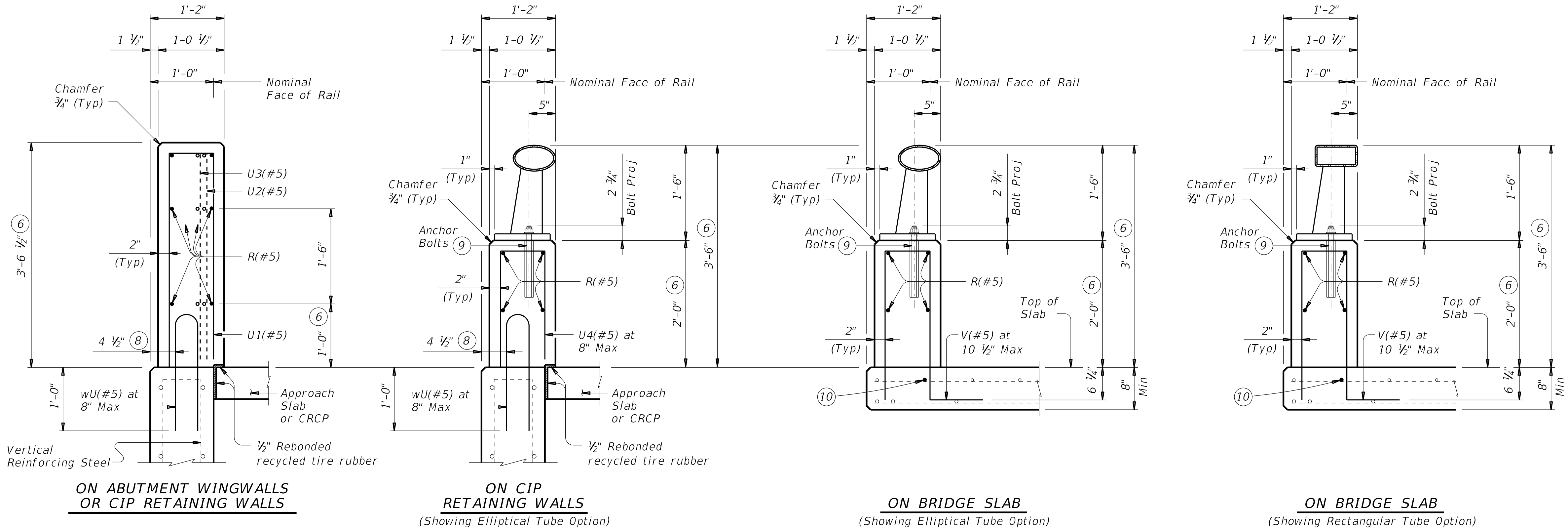
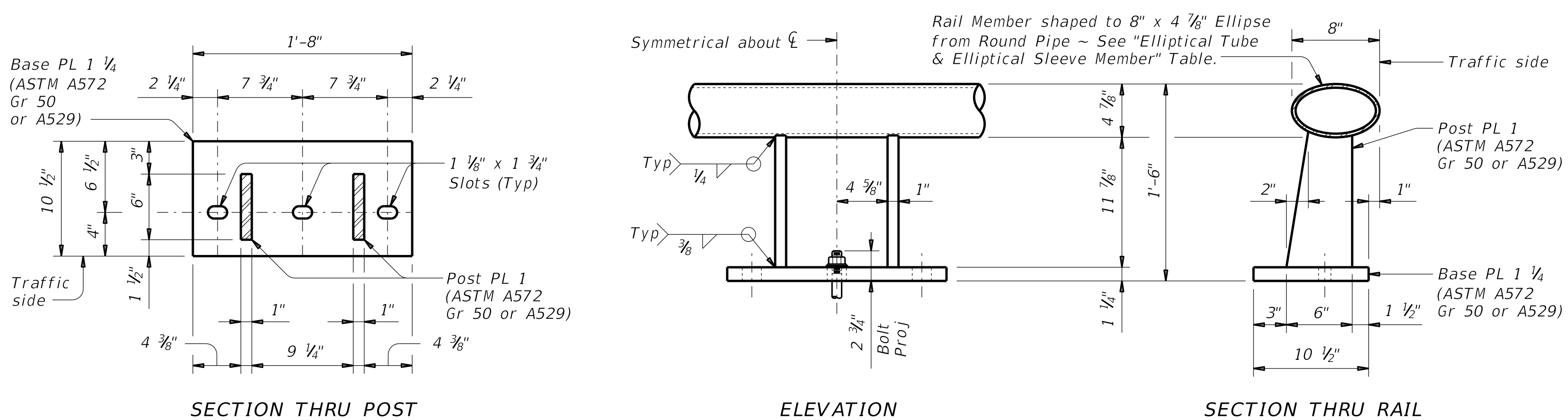
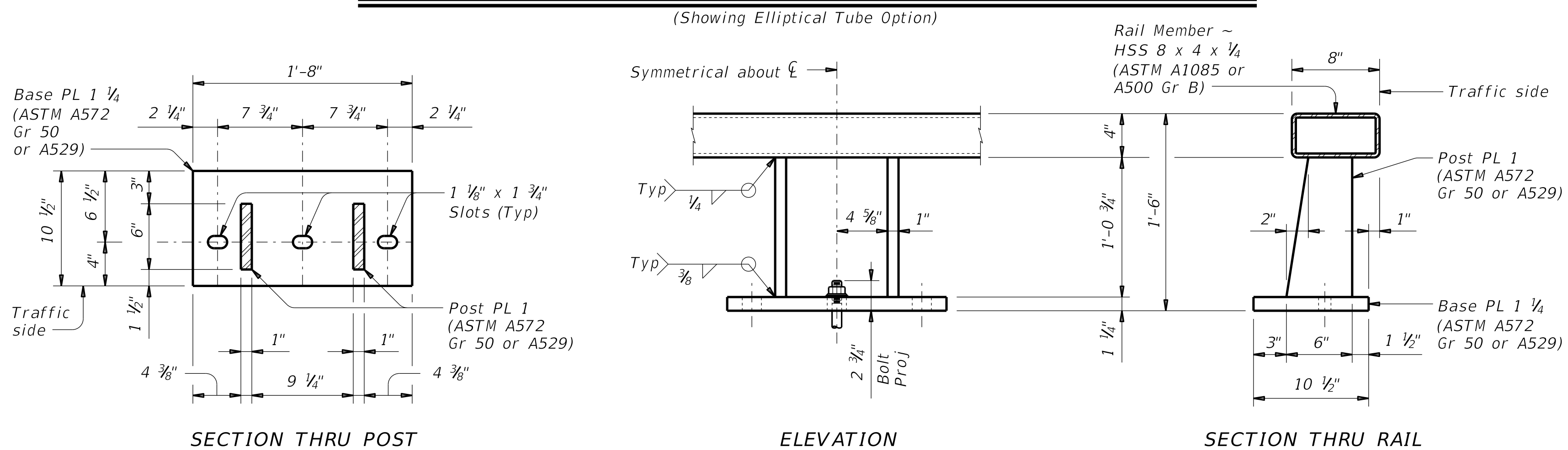


SECTIONS THRU RAIL (5)



ELLIPTICAL TUBE WITH RAIL POST & ANCHORAGE DETAILS

(Showing Elliptical Tube Option)



RECTANGULAR TUBE WITH RAIL POST & ANCHORAGE DETAILS (5)

(Showing Rectangular Tube Option)

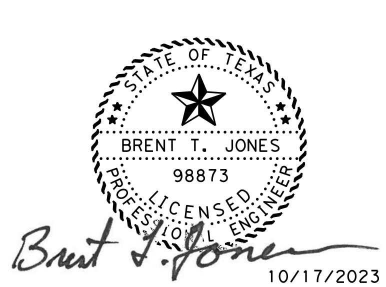
(5) Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.

(6) Increase 2" for structures with overlay.

(8) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(9) See "Material Notes" for anchor bolt information.

(10) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.



10/17/2023

TBPE Firm Registration No.: 420

MODIFICATION NOTES:
ADDED SHEET 4 FOR APPROACH ANCHOR DETAILS

SHEET 2 OF 4

Texas Department of Transportation | Bridge Division Standard

TRAFFIC RAIL

TYPE T402(MOD)

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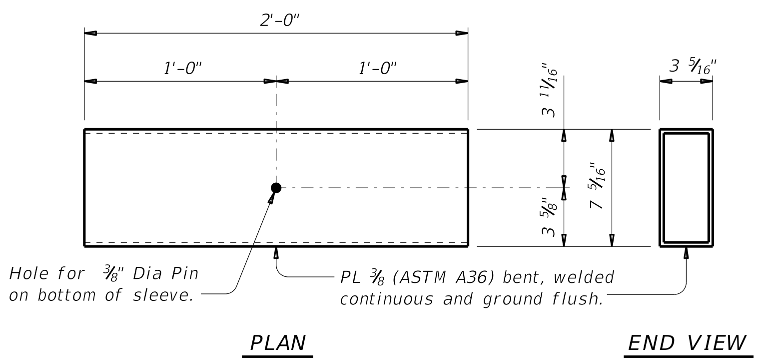
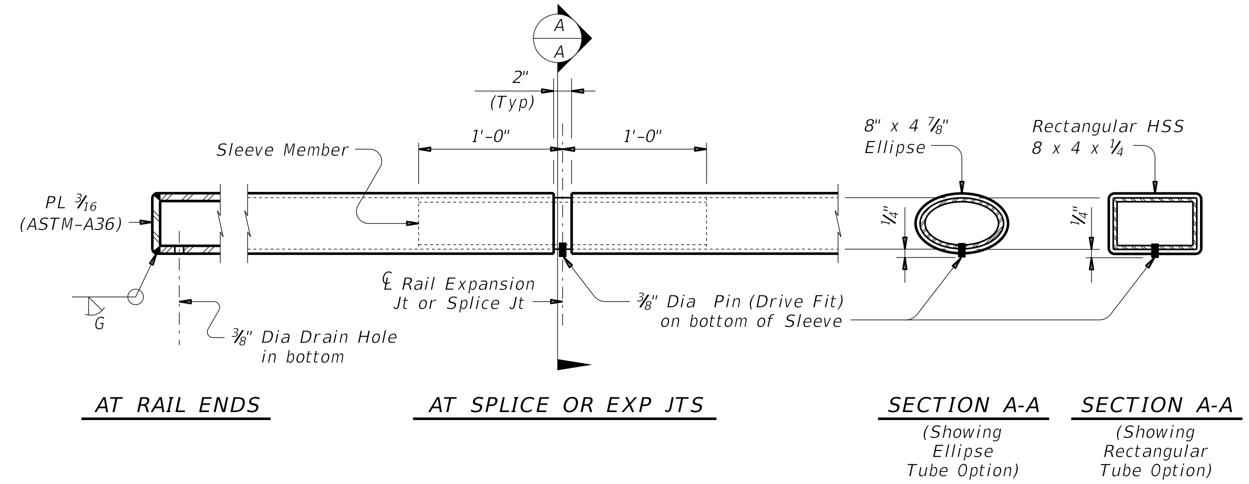


RECTANGULAR TUBE SLEEVE MEMBER DETAIL

(See Tube Fabrication Detail)

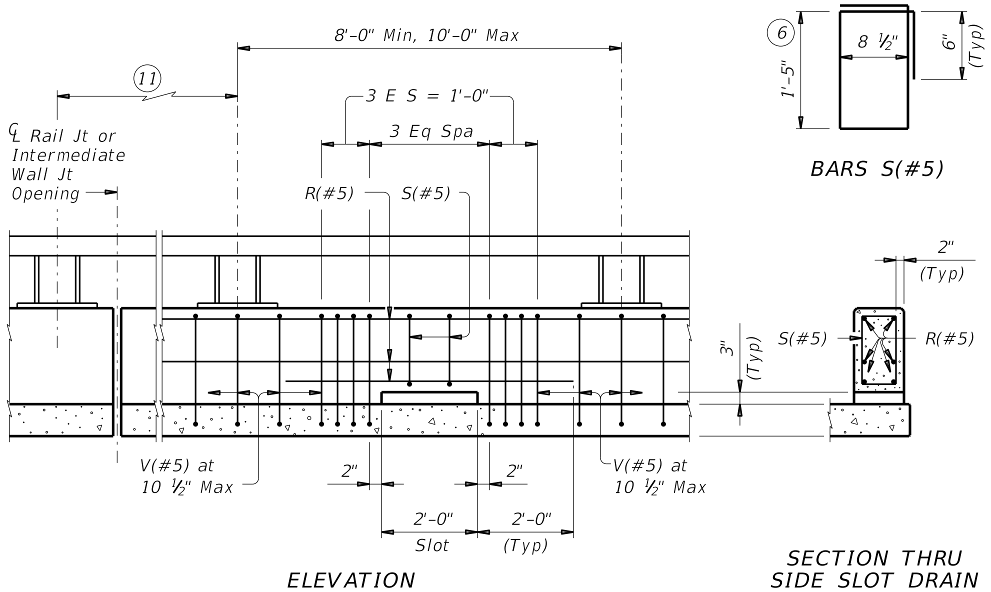


TUBE FABRICATION DETAILS (5)

ELLIPTICAL TUBE & ELLIPTICAL SLEEVE MEMBER

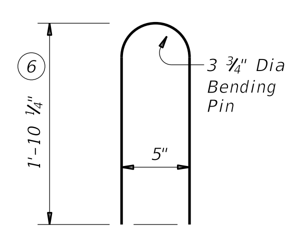
8" x 4 $\frac{7}{8}$" Ellipse	Elliptical Sleeve Member	
Material	Material	Thickness
6" Dia Std Pipe ASTM A53 E or S Gr B)	ASTM A53 Gr B	0.353"
	ASTM A36 or A500 Gr B	0.339"
	API-5LX52	0.224"
6 $\frac{5}{8}$" O.D. Pipe x 0.188" API-5LX52	ASTM A53 Gr B	0.339"
	ASTM A36 or A500 Gr B	0.325"
	API-5LX52	0.188"

Notes: Other sections of equal or greater strength are acceptable for elliptical sleeves. The major and minor diameters of the rail member may vary +/- 0.1875" from plan dimension. However, the difference between the outside diameters of the elliptical sleeve and the inside diameters of the rail member must not exceed 0.25 inches.

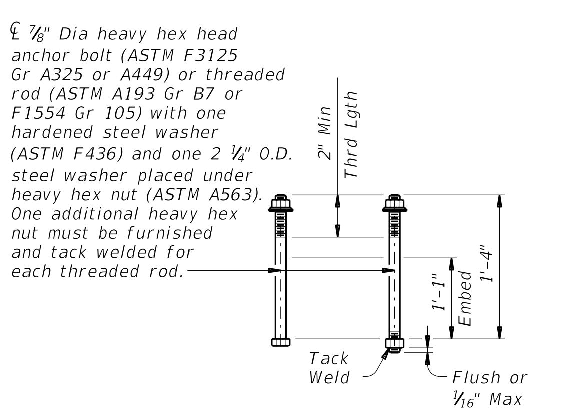


OPTIONAL SIDE SLOT DRAIN DETAILS

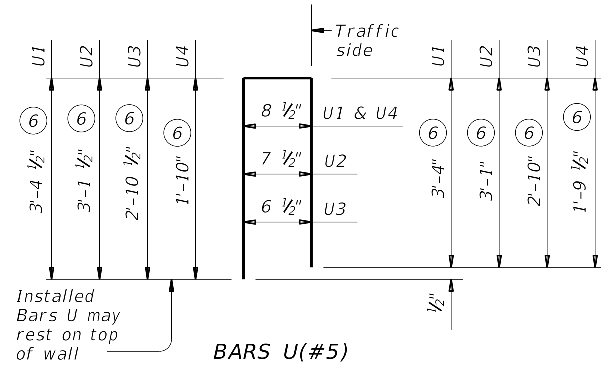
Note: Center Side Slot Drains between rail posts within the limits shown. Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Do not place drains over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



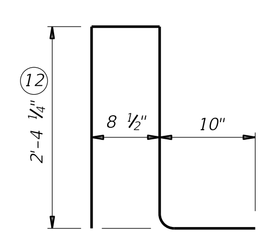
BARS wU(#5)



CAST-IN-PLACE ANCHOR BOLT OPTIONS (9)



BARS U(#5)



BARS V(#5)

(5) Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.

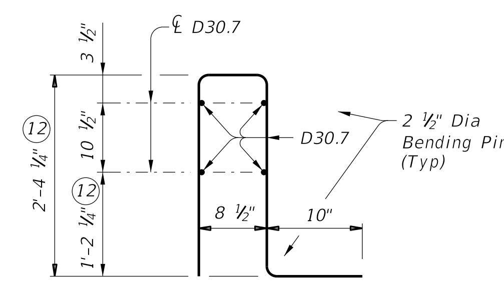
(6) Increase 2" for structures with overlay.

(9) See "Material Notes" for anchor bolt information.

(11) Slots are not allowed in areas where there is a joint in the concrete parapet between rail post.

(12) Length shown for 6 $\frac{1}{4}$" Min bar embedment with no overlay. Adjust as required.

(13) Shop drawings for approval required for tubular steel sections.



OPTIONAL WELDED WIRE REINFORCING (WWR)

MODIFICATION NOTES:

ADDED SHEET 4 FOR APPROACH ANCHOR DETAILS

RAIL DATA FOR HORIZONTAL CURVES

	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
Rail Members	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown (13)
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius (13)

CONSTRUCTION NOTES:

This rail may be slipformed if approved by the Engineer when adhesive anchor bolts are used. At the Contractor's option anchor bolts may be cast with the parapet (See Cast-in-Place Anchor Bolt Options).

Slipforming parapet is not allowed if anchor bolts are cast with parapet wall.

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a $\frac{3}{8}$" width x $\frac{1}{4}$" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

Rail parapet must be plumb unless otherwise approved. Steel posts must be square to the top of parapet. Use Type VIII epoxy mortar under post base plates if gaps larger than $\frac{1}{16}$" exist.

Cap all ends of tubular steel sections at parapet.

Rail member sections must have at least two posts but not more than four.

Round or chamfer all exposed edges of steel components $\frac{1}{16}$" by grinding prior to galvanizing.

Chamfer all exposed concrete corners.

MATERIAL NOTES:

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over gavanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Anchor bolts must be $\frac{7}{8}$" Dia ASTM A193 Gr B7 fully threaded rods with heavy hex nuts, one hardened steel washer (ASTM F436), and one (2 $\frac{1}{4}$" O.D.) steel washer each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into parapet wall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 17 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing."

Optional cast-in-place anchor bolts must be $\frac{7}{8}$" Dia ASTM F3125 Gr A325 or A449 bolts (or A193 Gr B7 or F1554 Gr 105 threaded rods with one tack welded heavy hex nut each) with one heavy hex nut and one hardened steel washer (ASTM F436) plus one (2 $\frac{1}{4}$" O.D.) steel washer at each bolt. Nuts must conform to ASTM A563 requirements.

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) ASTM A1064 may be substituted for Bars R, and V, as shown. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows: Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

This rail has been evaluated and approved to be of equal strength to railing with like geometry, which have been crash tested to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Submit erection drawings showing panel lengths, rail post spacing, and anchor bolt setting, to the Engineer for approval.

Average weight of railing with no overlay: 343 plf total
313 plf (Conc)
30 plf (Steel).

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

STATE OF TEXAS
BRENT T. JONES
98873
LICENSED PROFESSIONAL ENGINEER

10/17/2023

TBPE Firm Registration No.: 420

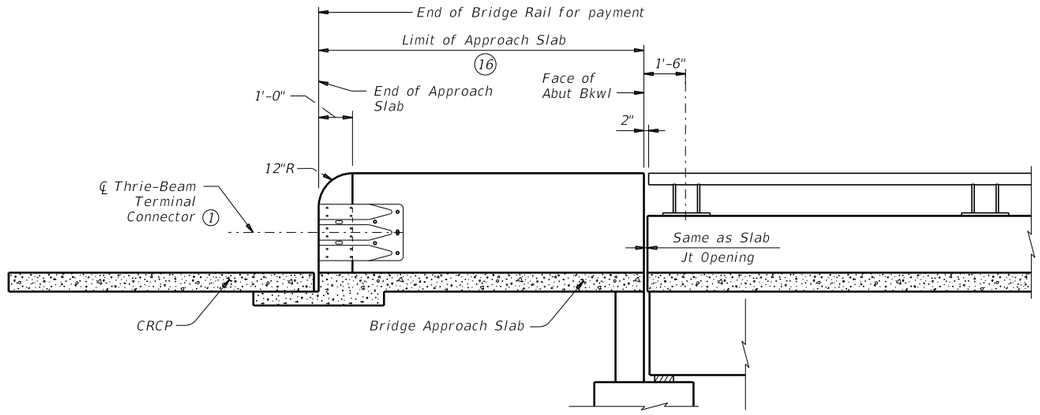
Texas Department of Transportation — Bridge Division Standard

TRAFFIC RAIL

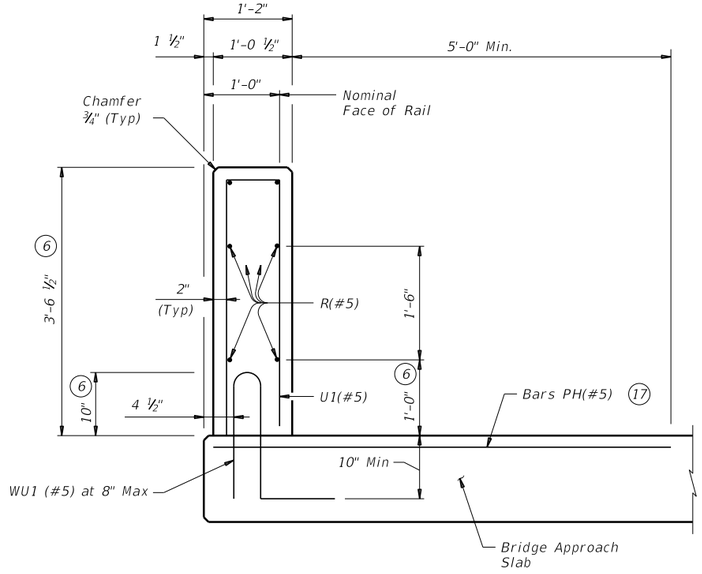
TYPE T402(MOD)

FILE: rlstd007-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
	DIST		COUNTY	SHEET NO.
	WACO		McLENNAN	1344

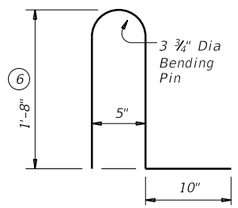
DATE:
FILE:



RAIL DETAIL ON APPROACH SLAB 15



RAIL SECTION ON BRIDGE APPROACH SLAB



BARS WU1(#5)

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(6) Increase 2" for structures with overlay.

(15) Work Details with Sheets 1-3 of 4.

(16) See Bridge Layout for Limits of Approach Slab.

(17) Bars PH(#5) are Part of Rail Reinforcing and are Included in Unit Price Bid for Railing. Bars PH(#5) are in Addition to Approach Reinforement Shown Elsewhere. Bars PH(#5) Shall be at 6" Spacing and Extend a Minimum of 5'-0" into Pavement from Face of Rail Regardless of Pavement Thickness. Space and Bundle with Adjacent Top Transverse Bars and Match Top Bar Cover.

STATE OF TEXAS
BRENT T. JONES
98873
PROFESSIONAL ENGINEER
LICENSED

10/17/2023

TBPE Firm Registration No.: 420

MODIFICATION NOTES:
ADDED SHEET 4 FOR APPROACH ANCHOR DETAILS

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T402(MOD)

FILE: rlstd007-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
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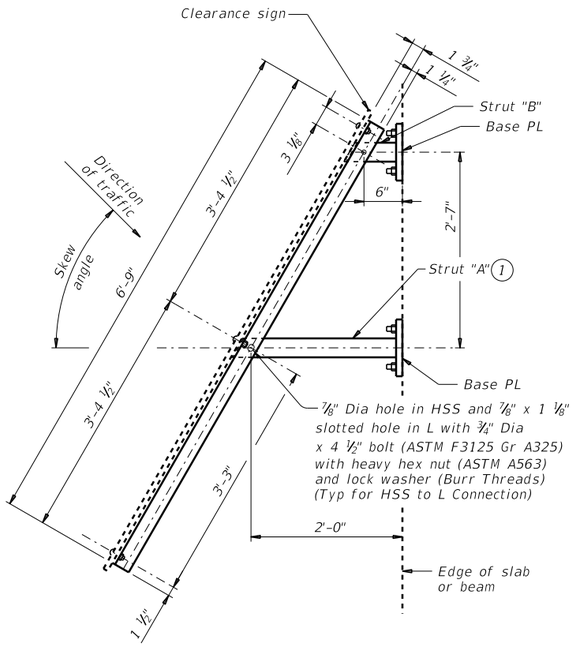
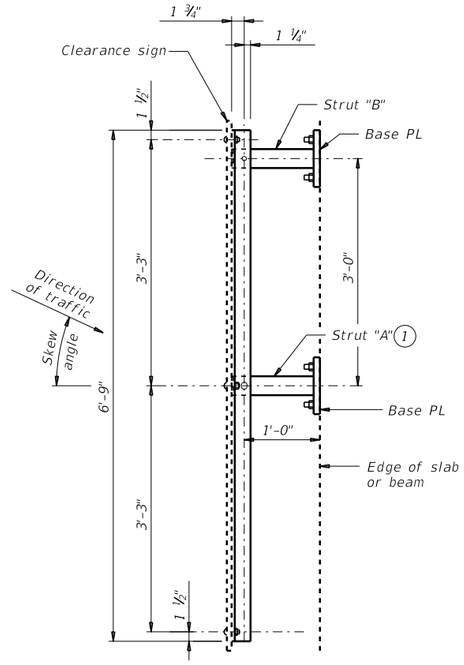


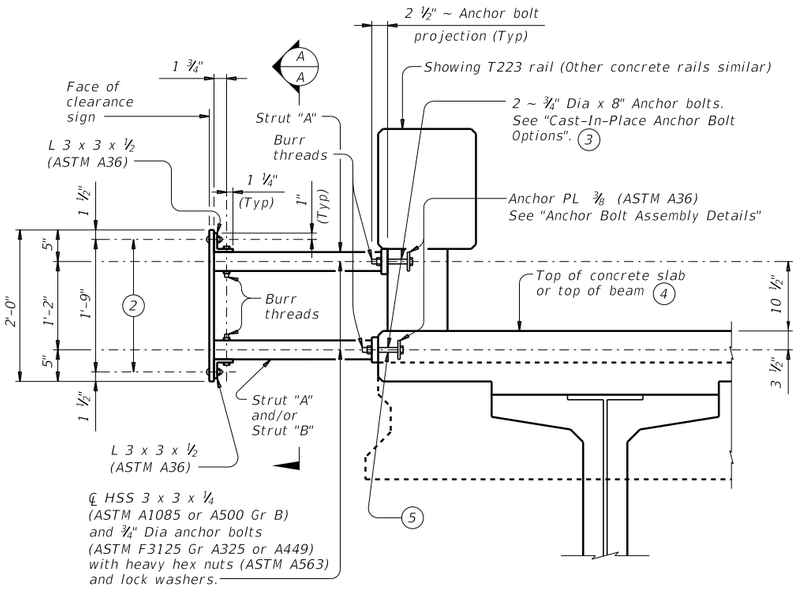
PLAN OF TYPE S MOUNT

(Used for skews over 30°)

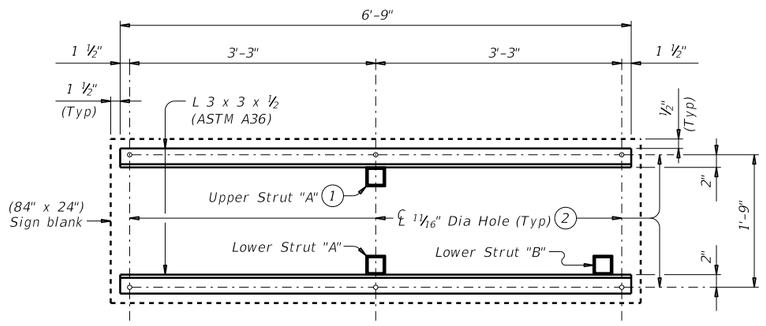


PLAN OF TYPE N MOUNT

(Used for 0° to 30° skews)



SECTION



SECTION A-A

(1) Locate centerline of Strut A no closer than 12" from a vertical concrete edge.

(2) ℄ ⅝" Dia x 2" Hexagon socket button head cap screws (ASTM A574) with hex nuts. Attach hex nuts to L 3 x 3 x ½ by tack welding in two places. Threads must have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.

(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(4) For decked slab beams topped with a 2 course surface treatment and ACP overlay.

(5) Anchor bolts to be cast into decked slab beams topped with a 2 course surface treatment or ACP overlay. Anchor bolts with heavy hex nuts, regular lock washers, hardened washers and anchor plate that is embedded in the beam will be provided by the beam Fabricator.

CONSTRUCTION NOTES:

Install the vertical face of clearance sign plumb unless otherwise approved by the Engineer.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 1 anchor per bridge mounted clearance sign installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Galvanize all steel components after fabrication unless otherwise noted.

GENERAL NOTES:

This standard provides details to mount a vertical clearance sign (84" x 24") to bridges. Rail Types T631, T631LS, PR11, PR22 and PR3 are not accommodated.

The Engineer will furnish the clearance to be shown on the sign.

See Bridge Layout for sign location and mounting type (Type N or S).

Cost of furnishing, installing, relocating or removing a clearance sign, including structural steel for sign mount, is included in unit price bid for Item 644, "Small Roadside Sign Assemblies".

One Sign Blank (84" x 24") is 14 SF.

Average steel weight for one complete Type N Mount is 219 Lb.

Average steel weight for one complete Type S Mount is 233 Lb.

SHEET 1 OF 3

Texas Department of Transportation

Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1346

DATE: 10/17/2023 11:57:52 AM
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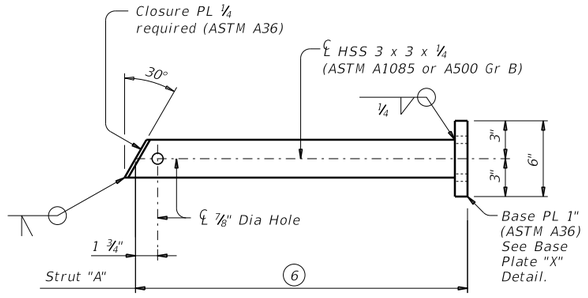
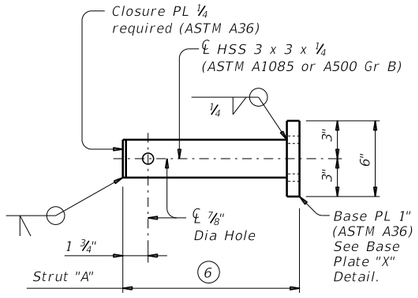
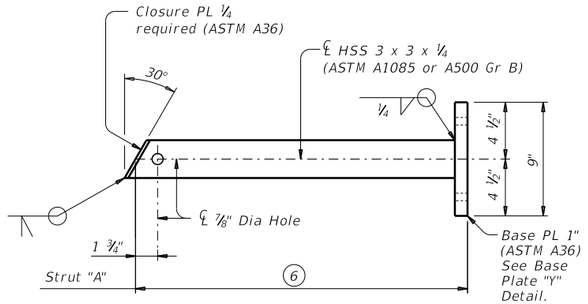


FOR T411 AND C411 RAIL TYPES



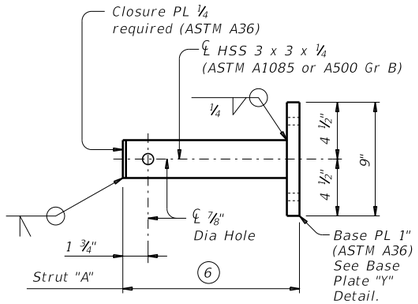
FOR T411 AND C411 RAIL TYPES



FOR T221, C221, T222, T223, C223, T401, T402, C402, T551, T552, T80HT, T80SS AND SSTR RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

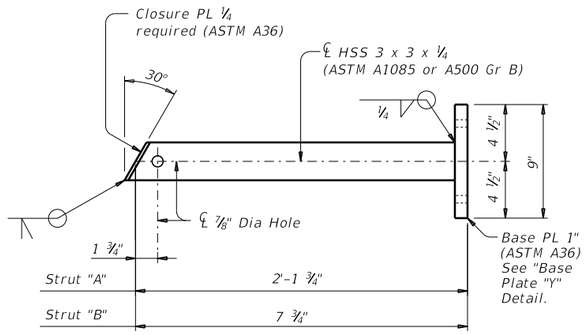
(Used for skews over 30°)



FOR T221, C221, T222, T223, C223, T401, T402, C402, T551, T552, T80HT, T80SS AND SSTR RAIL TYPES

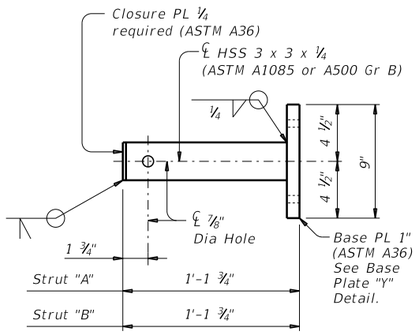
UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



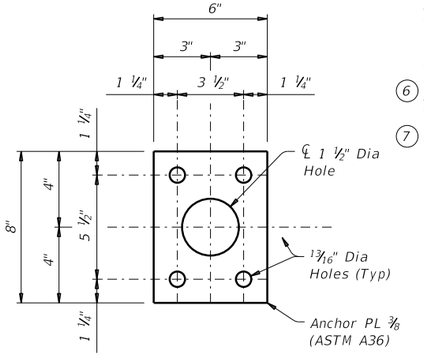
LOWER STRUT DETAILS FOR (TYPE S MOUNT)

(Used for skews over 30°)

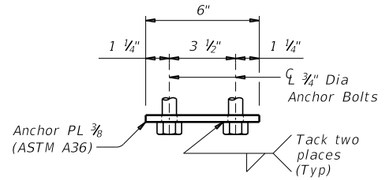


LOWER STRUT DETAILS FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



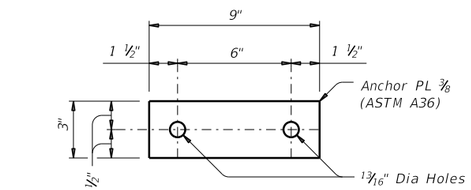
PLAN OF ANCHOR PLATE



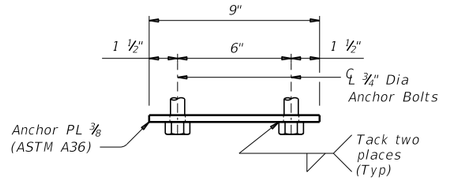
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

(Used on Base Plate "X" with T411 and C411 rail types.)



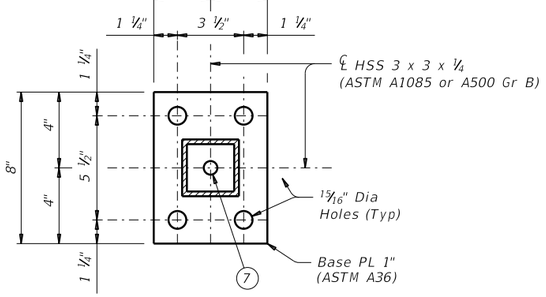
PLAN OF ANCHOR PLATE



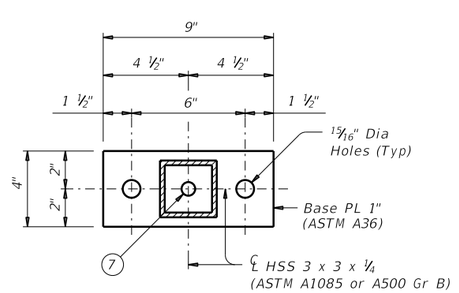
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

(Used on Base Plate "Y" and with T1F, T2P, C2P, T1W, C1W, T66 and C66 rail types.)

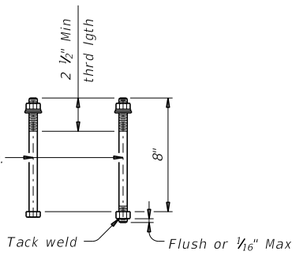


BASE PLATE "X" DETAIL



BASE PLATE "Y" DETAIL

℄ ¾" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ASTM A193 Gr B7 or F1554 Gr 105) with one hardened washer and one regular lock washer placed under heavy hex nut (ASTM A563). Furnish one additional heavy hex nut for each threaded rod.



CAST-IN-PLACE ANCHOR BOLT OPTIONS (3)

(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(6) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

(7) Hole required to drain zinc from base plate during galvanizing.

Texas Department of Transportation

Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
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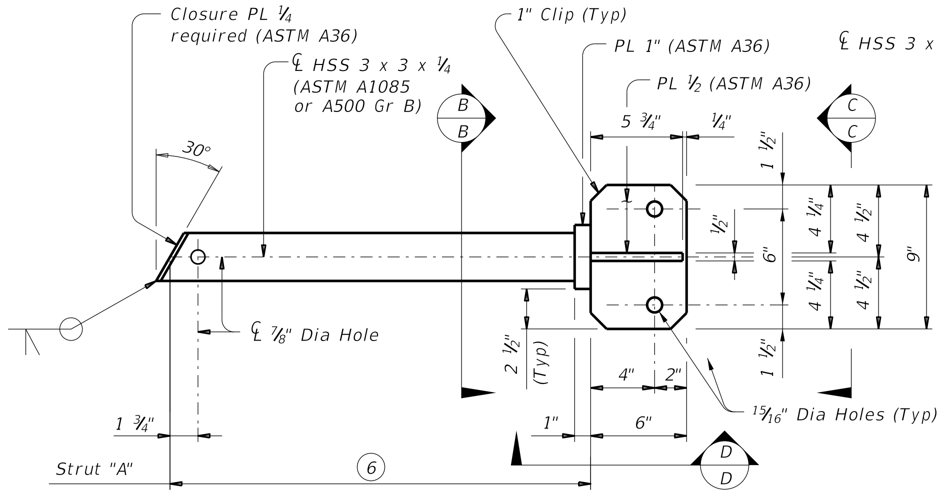
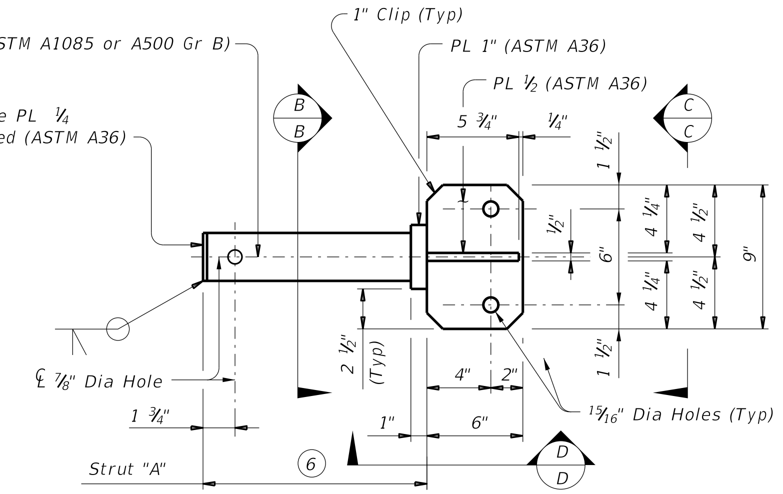
	WACO	McLENNAN		1347



FOR T1F, T2P, C2P, T1W, C1W,
T66 AND C66 RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

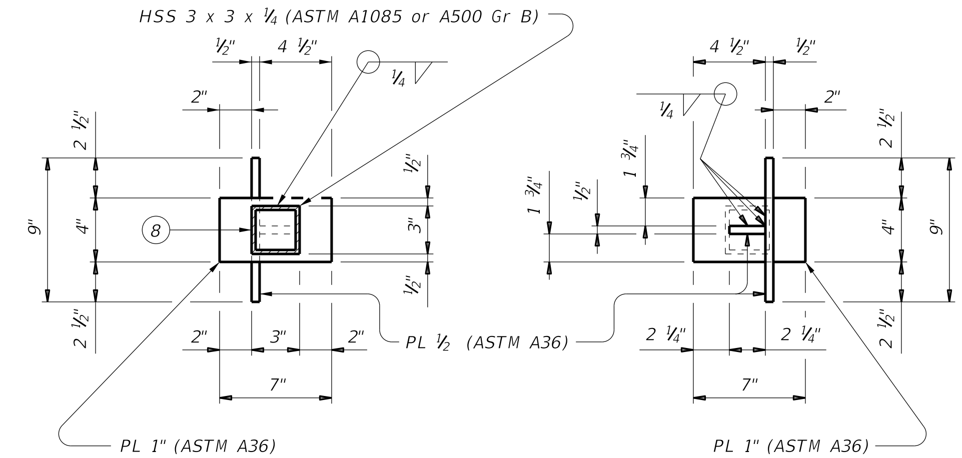
(Used for skews over 30°)



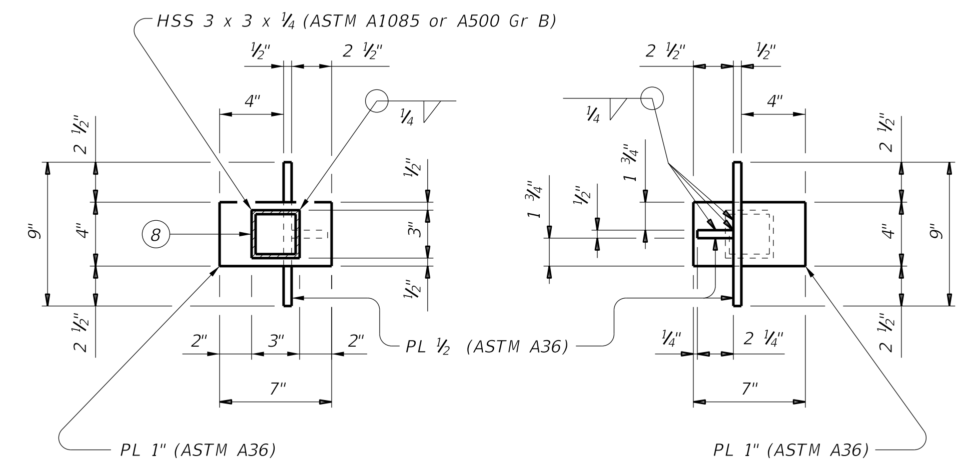
FOR T1F, T2P, C2P, T1W, C1W,
T66 AND C66 RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



FOR 9" HIGH CURBS



FOR 11" HIGH CURBS

SECTION B-B

VIEW C-C

(2) ℄ 3/8" Dia x 2" Hexagon socket button head cap screws (ASTM A574) with hex nuts. Attach hex nuts to L 3 x 3 x 1/2 by tack welding in two places. Threads must have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.

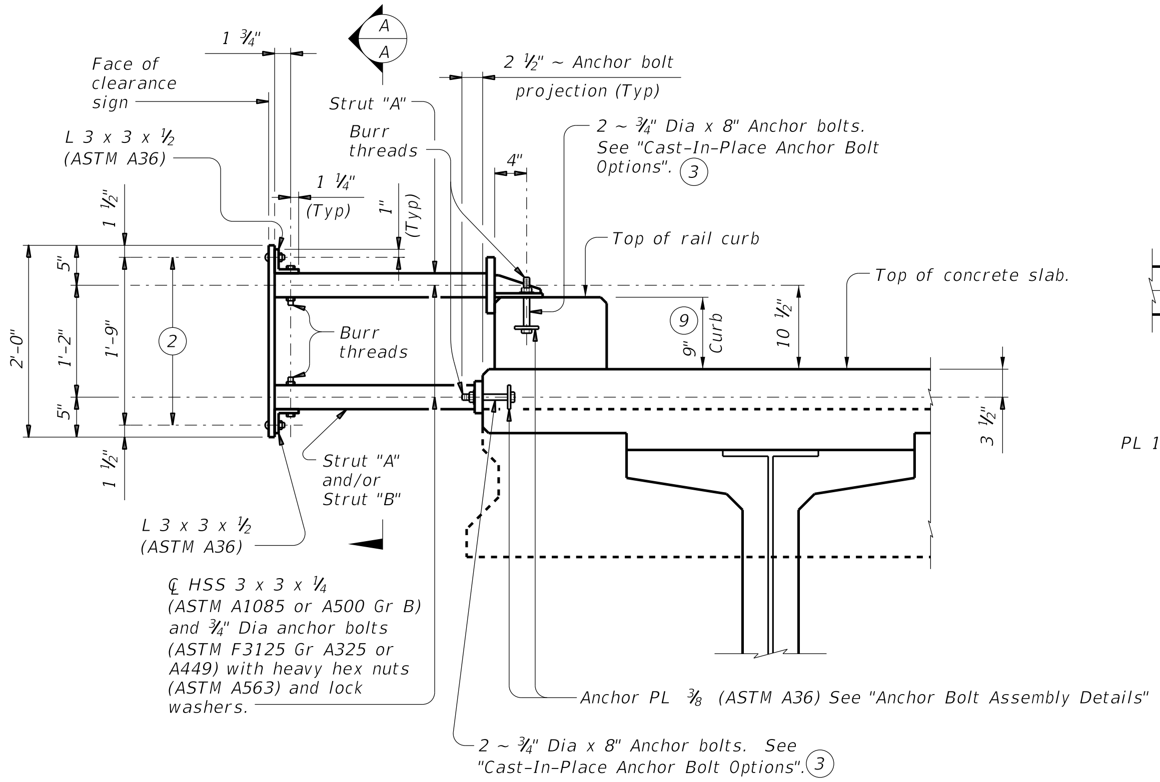
(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are 3/4" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(4) For decked slab beams topped with a 2 course surface treatment and ACP overlay.

(6) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

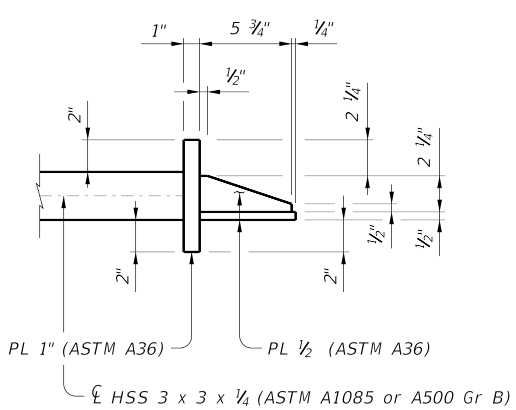
(8) Hole required in bottom of HSS to drain zinc during galvanizing.

(9) 11" curb is for structures with 2" ACP overlay.

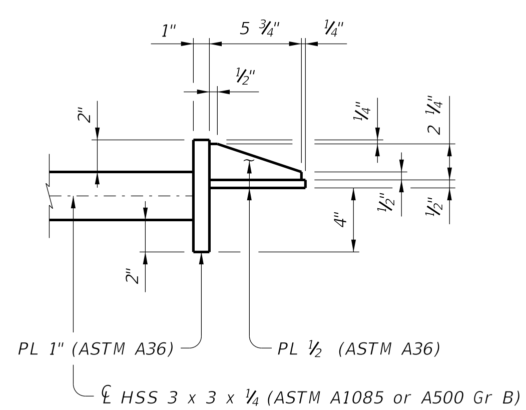


SECTION THRU T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL CURB

Showing sign mount on a 9" high curb, 11" high curb similar.



FOR 9" HIGH CURBS



FOR 11" HIGH CURBS

VIEW D-D

SHEET 3 OF 3

Texas Department of Transportation — Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

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©TxDOT April 2019	CONT 0015	SECT 01	JOB 246	HIGHWAY IH 35
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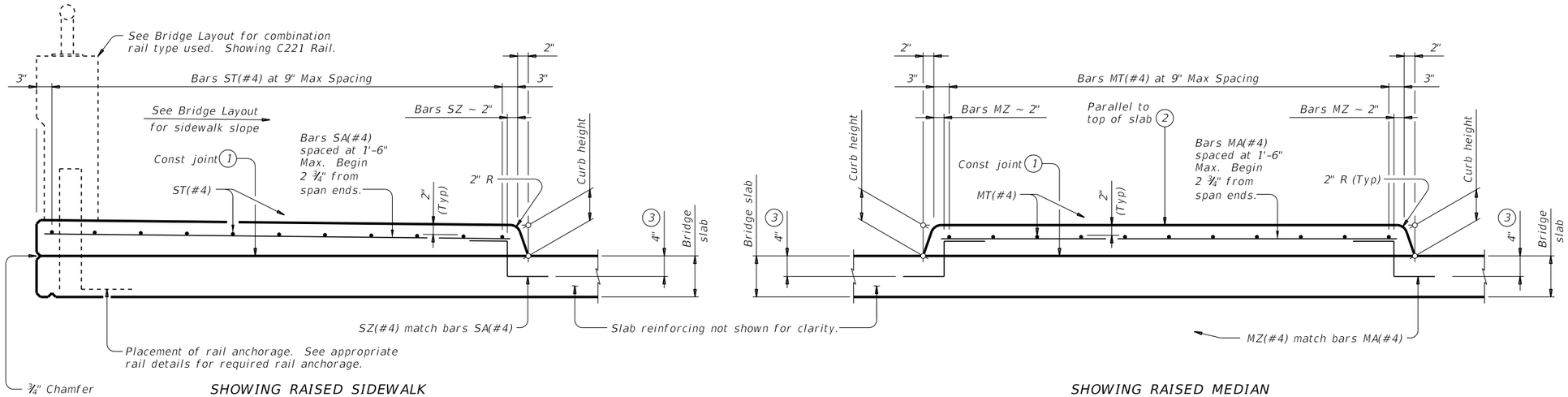
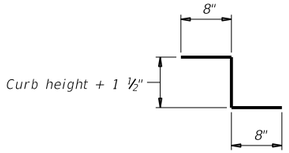


TYPICAL TRANSVERSE SECTIONS

See Span Details for dimensions not shown.

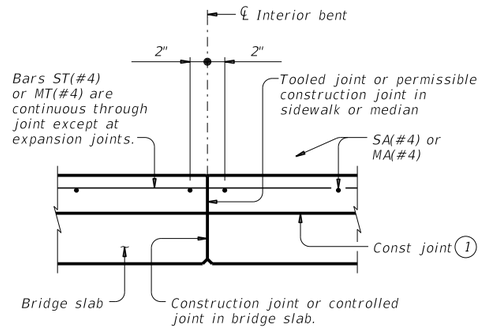
1. Provide broom finish to top of bridge slab where raised sidewalk or raised median area is defined.
2. Unless noted otherwise on the span details.
3. Bars may rest on top of PCPs.



BARS SZ(#4) AND MZ(#4)

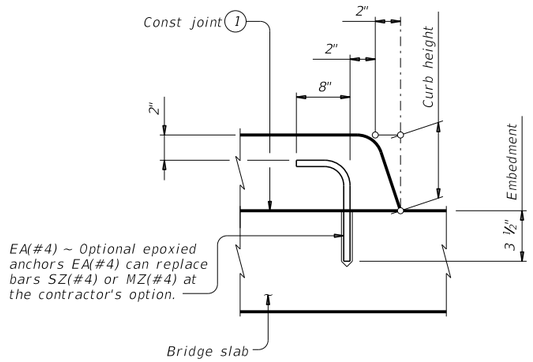
APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT® Grade 2, Steel	www.slipnot.com

Provide drain cover plates fabricated with a product from this list. No exceptions are permitted.



LONGITUDINAL SECTION AT INTERIOR BENT

At bents with expansion joints, provide an open joint in the sidewalk/median matching the deck's joint width.



OPTIONAL EPOXY ANCHORS

Embed EA(#4) bar into concrete with a Type III (Class C, D, E, or F) epoxy meeting the requirements of DMS-6100, "Epoxies and Adhesives". Follow manufacturer's directions for installing the epoxied anchor bars.

MATERIAL NOTES:

Provide the same concrete required for the bridge deck, Class S or Class S (HPC) concrete.

Provide Grade 60 reinforcing steel. Deformed welded wire reinforcement (WWR) meeting ASTM A1064 of equivalent size and spacing may be substituted for bars SA, ST, MA, and MT.

Provide epoxy coat or galvanize reinforcement if bridge deck reinforcement is required to be epoxy coated or galvanized.

Provide hot-dip galvanize slip resistant steel plate after fabrication in accordance with Item 445, "Galvanizing".

Chamfer or round edges approximately 1/16" prior to galvanizing.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Provide the following bar or wire lap lengths when required:
- Uncoated, 1'-7" Min
- Coated, 2'-5" Min

Submittal and approval of drain cover plate shop drawings is not required if fabrication is accordance with these details.

Raised sidewalks will be paid under Item 422 by the SF of Bridge Sidewalk or Bridge Sidewalk (HPC). Raised medians will be paid under Item 422 by the SF of Bridge Median or Bridge Median (HPC).

Payment for drain cover plates will be by the pound of "Structural Steel (Misc Non-Bridge)" as per Item 442, "Metal for Structures". Weight of one drain cover plate is 48 plf.

DESIGNER NOTES:

These details do not apply for longitudinal grades exceeding 5 percent.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

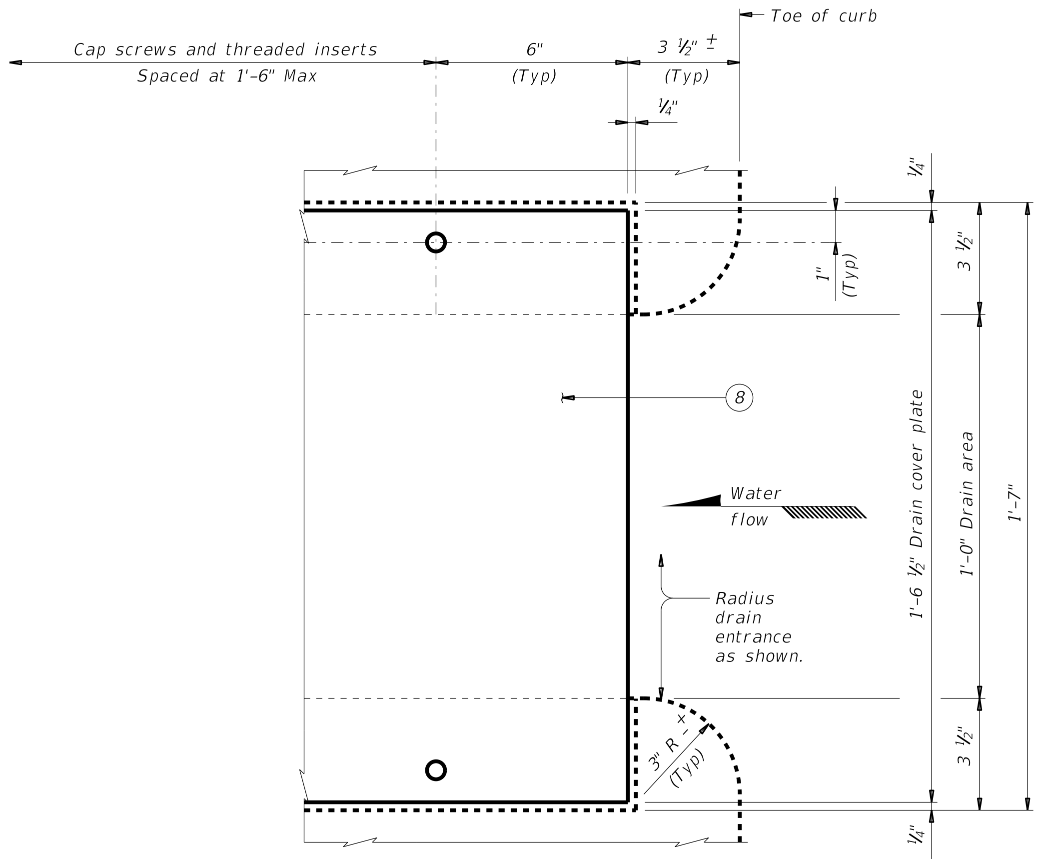
Texas Department of Transportation

Bridge Division Standard

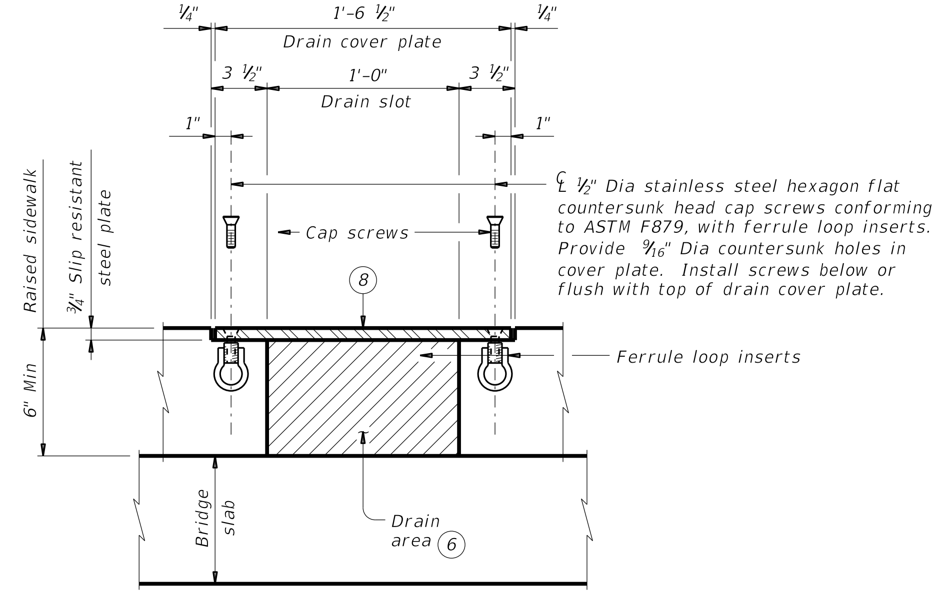
BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS

BRSM

FILE: brsmste1-19.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1349

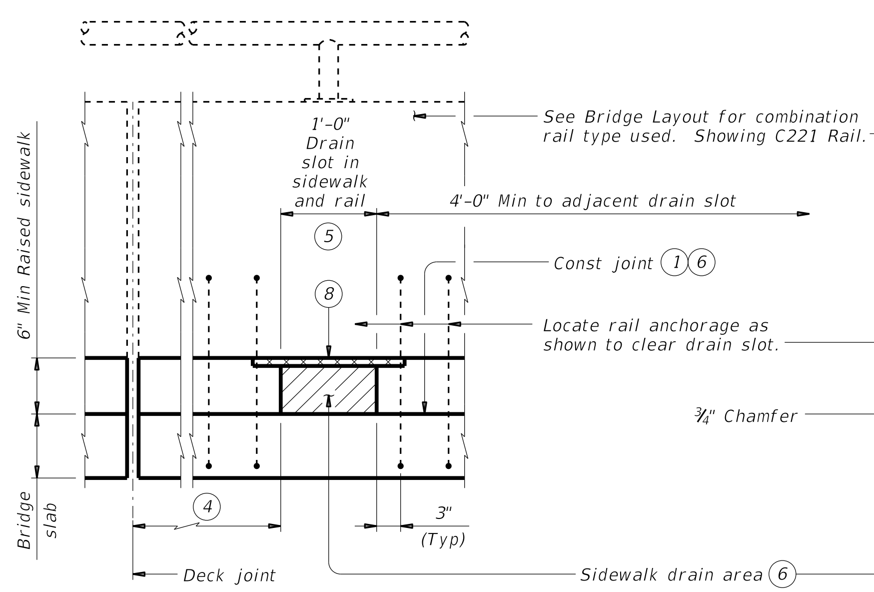


PARTIAL PLAN CURB DRAIN

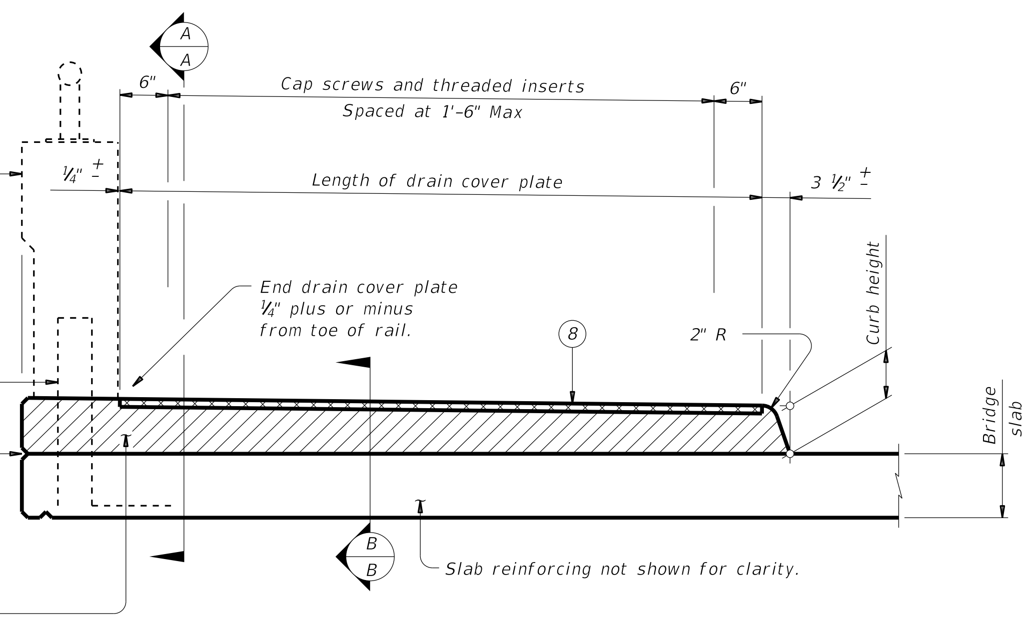


SECTION B-B

Reinforcing not shown for clarity.



SECTION A-A



SHOWING RAISED SIDEWALK WITH DRAIN SLOT

OPTIONAL DRAIN DETAILS (7)

(1) Provide broom finish to top of bridge slab where raised sidewalk or raised median area is defined.

(4) 3'-0" Min at deck expansion joints, deck construction joints or controlled joints, rail intermediate wall joints or from face of substructure.

(5) For rail Type C1W, center drain slots between posts.

(6) Steel trowel top surface of bridge deck in drain locations.

(7) Provide sidewalk drains where shown elsewhere on the plans or as directed by the Engineer. Do not place drains over railroad tracks, lower roadways, or sidewalks. Place drain and cover plate perpendicular to toe of rail.

(8) Drain cover plate (PL ¾ x 18 ½ slip resistant steel plate). Install flush with top of sidewalk.

Texas Department of Transportation — Bridge Division Standard

BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS

BRSM

FILE: brsmste1-19.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1350

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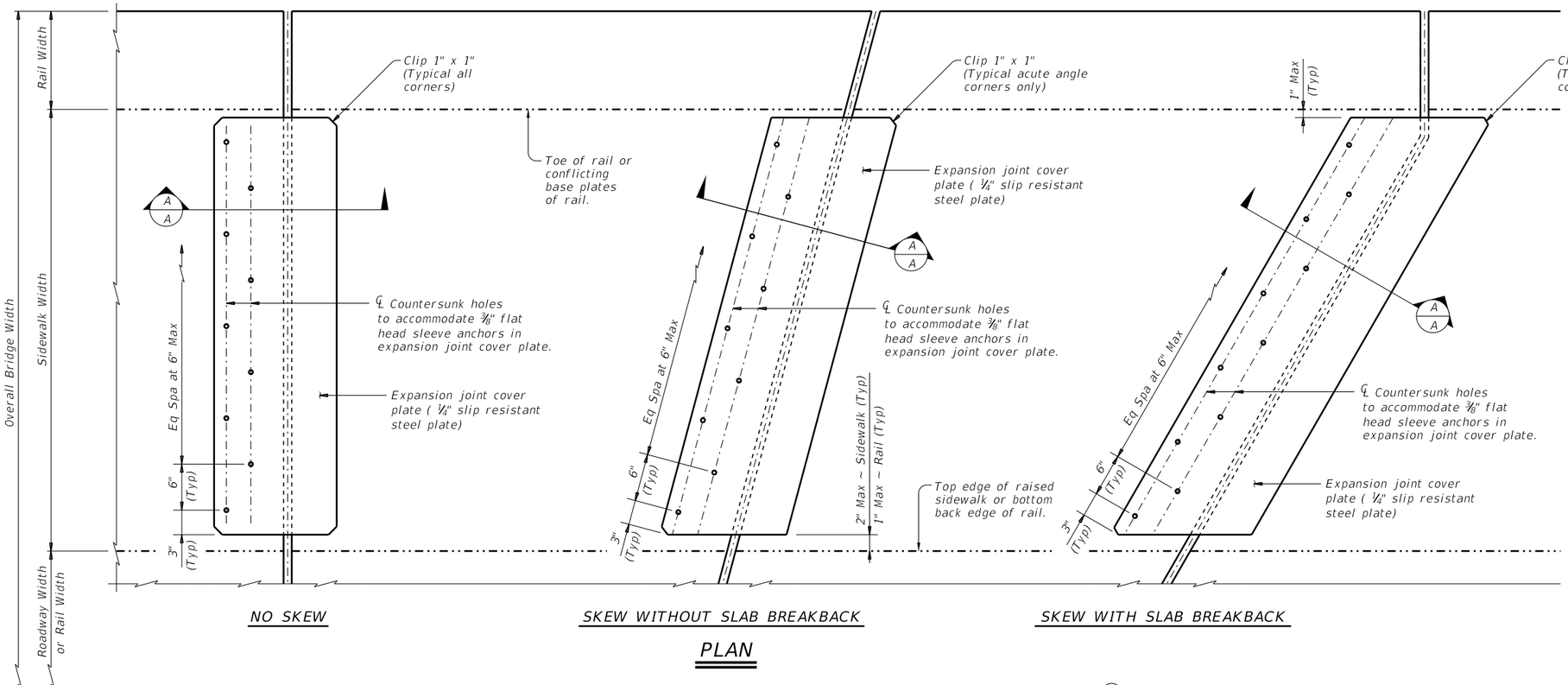
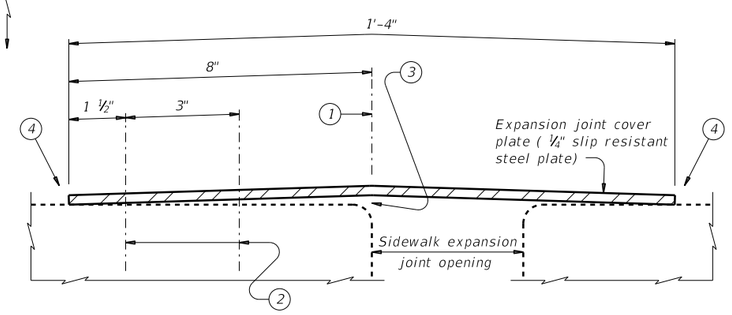
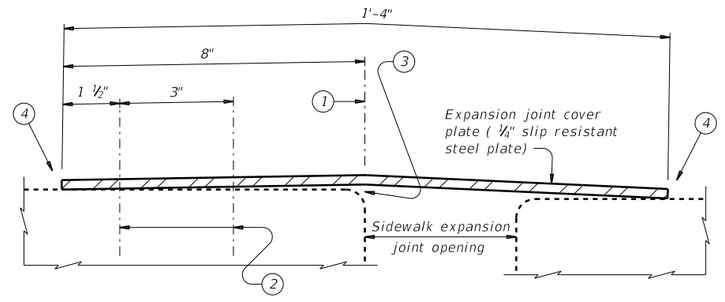


NO SKEW | SKEW WITHOUT SLAB BREAKBACK | SKEW WITH SLAB BREAKBACK

PLAN



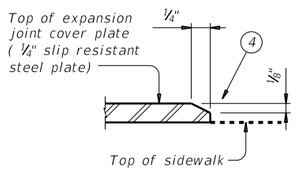
SHOWING LEVEL EXP JOINT



SHOWING UNLEVEL EXP JOINT
(Install sleeve anchors on high side of expansion joint)

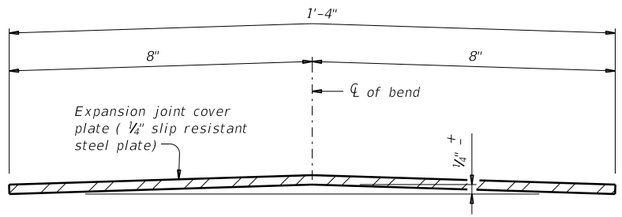
SECTION A-A

1. ℄ Expansion joint cover plate and edge of expansion joint.
2. ℄ ⅜" x 2 ½" Min, Flat Head Sleeve Anchors, Stainless Steel. Countersink Flat Head Sleeve Anchors in ¼" Slip Resistant Steel Plate.
3. It is not necessary to remove plate crown provided the plate is firmly secured to the sidewalk.
4. Transverse edges must be in contact with sidewalk surface after installation.



EXP JOINT COVER PLATE BEVEL DETAIL

Bevel all plate edges as shown.



BENDING DIAGRAM OF EXP JOINT COVER PLATE

APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT® Grade 2, Steel	www.slipnot.com

Provide cover plates fabricated with a product from this list. No exceptions are permitted.

FABRICATION NOTES:

Shop drawings for the fabrication of Bridge Sidewalk Expansion Joint Cover Plate will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

A Bridge Sidewalk Expansion Joint Cover Plate Layout which identifies location side of sleeve anchors and orientation of all cover plate sections must be developed by the fabricator. Mark each steel section in accordance with the Bridge Sidewalk Expansion Joint Cover Plate Layout. A copy of the Bridge Sidewalk Expansion Joint Cover Plate Layout is to be provided to the Engineer.

Sidewalk expansion joint cover plates must be hot-dipped galvanized ¼" slip resistant steel plate. Checker plate or diamond plate is not allowed nor are slip resistant tapes, films and non-metallic coatings.

Minimum required yield strength of steel plate is 36 ksi.

Hot-dip galvanize slip resistant steel plate after fabrication in accordance with Item 445, "Galvanizing".

Provide stainless steel flat head sleeve anchors meeting the requirements of ASTM F 593, Group I, Alloy 304. Countersink holes in slip-resistant plate for sleeve anchors. Drill holes in sidewalk as per sleeve anchor manufacturer's recommendations. Install sleeve anchors flush with, or slightly recessed below, top surface of sidewalk expansion joint cover plate.

GENERAL NOTES:

Sidewalk expansion joint cover plates can only accommodate up to a 7" maximum expansion joint opening.

Details provided are applicable to concrete walkway surfaces only.

Payment for sidewalk expansion joint cover plates are by the pound of "Structural Steel (Misc Non-Bridge)" as per Item 442, "Metal for Structures".

Estimated weight of one sidewalk expansion joint cover plate is 14 plf.

Texas Department of Transportation

Bridge Division Standard

BRIDGE SIDEWALK EXPANSION JOINT COVER PLATE (ALL SKEWS)

BS-EJCP

FILE: bsejste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
8-20: Closer tolerances on cover plate.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1351

DATE: 10/17/2023 11:58:03 AM
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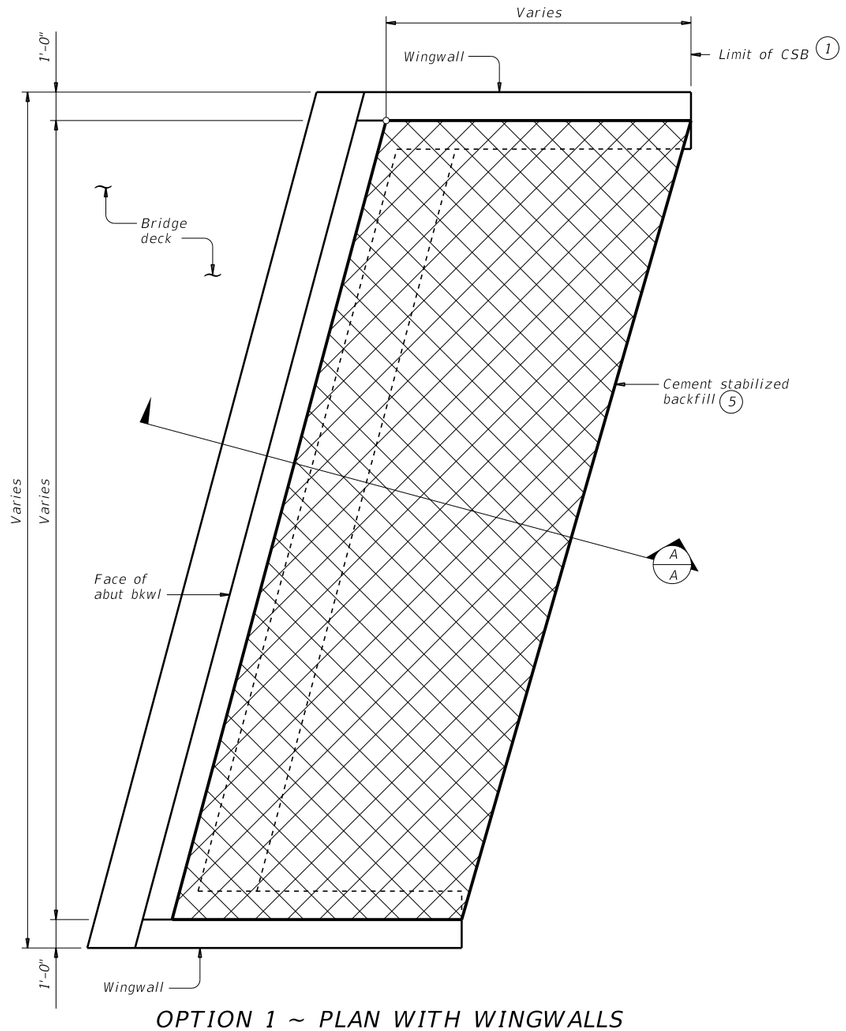
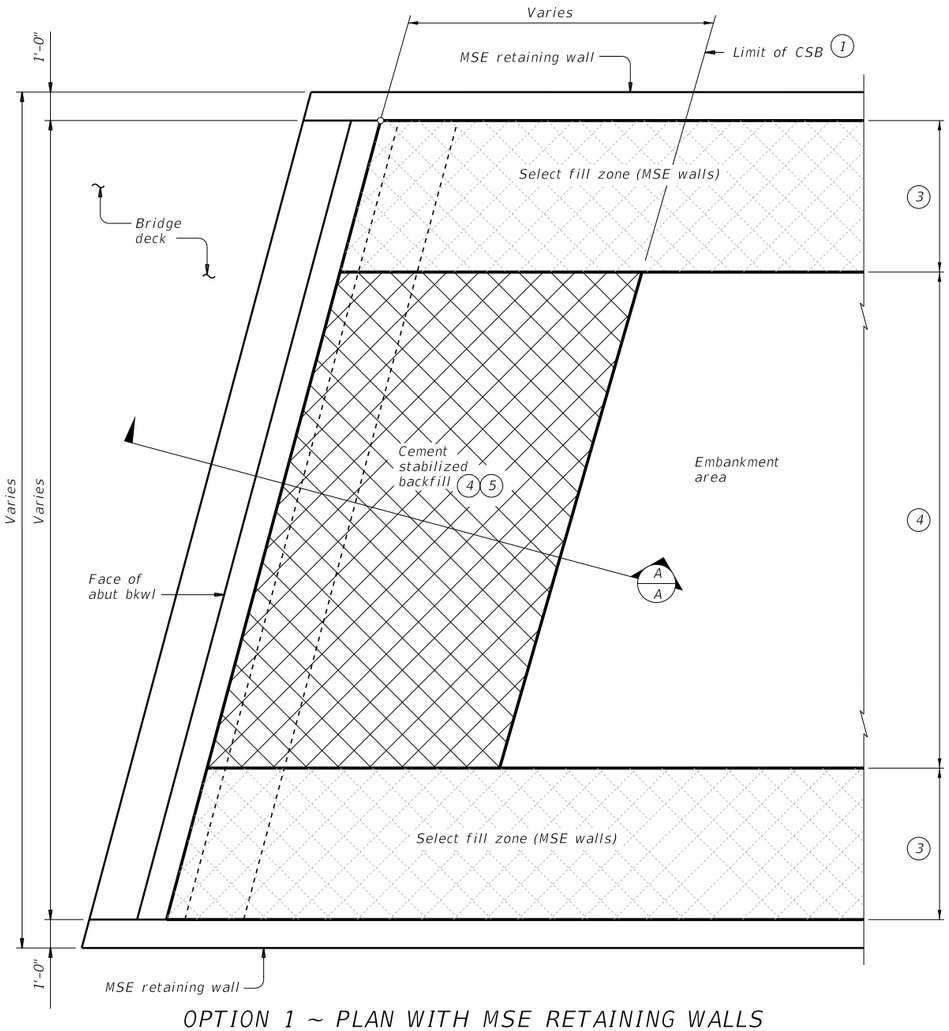


OPTION 1 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.



OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

1. Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
2. Bench backfill as shown with 12" (approximate) bench depths.
3. Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
4. When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.
5. If shown in the plans, flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
   a). If flowable backfill is to be placed over MSE backfill, then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
   b). Place flowable fill in lifts not exceeding 2 feet in height. Place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).

GENERAL NOTES:

See the Bridge Layout for selected Option. Option 1 is intended for construction only requiring plasticity index (PI) controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment. Option 2 is intended for new construction requiring high plasticity embankment fill with a PI greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays.

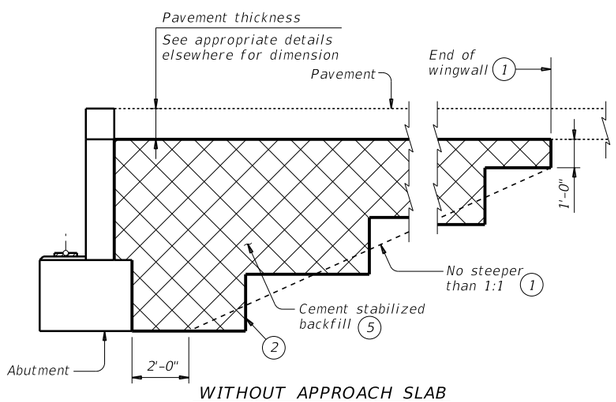
Construct abutment backfill in accordance with Item 400, "Excavation and Backfill for Structures".

Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments.

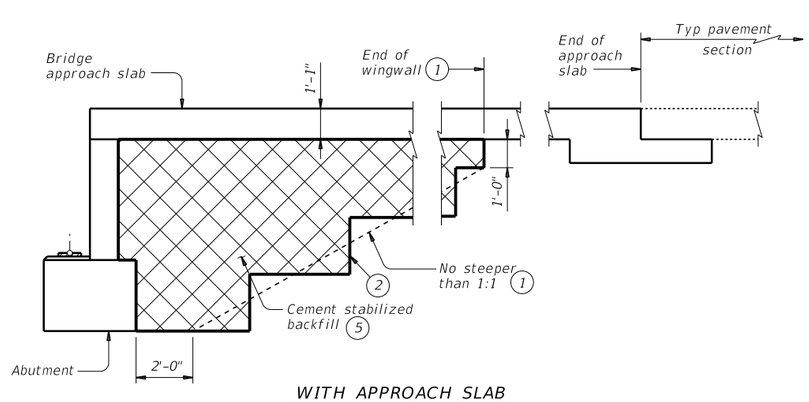
If required elsewhere in the plans, provide Flowable Backfill meeting the requirements of Item 401, "Flowable Backfill", to the limits shown at bridge abutments.

Details are drawn showing left forward skew. See Bridge Layout for actual skew direction.

These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.



WITHOUT APPROACH SLAB



WITH APPROACH SLAB

(Showing BAS-C, BAS-A similar.)

SECTION A-A

Texas Department of Transportation

Bridge Division Standard

CEMENT STABILIZED ABUTMENT BACKFILL

BRIDGE ABUTMENT

CSAB

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
02-20: Added Option 2. 03-23: Updated General Notes.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1352

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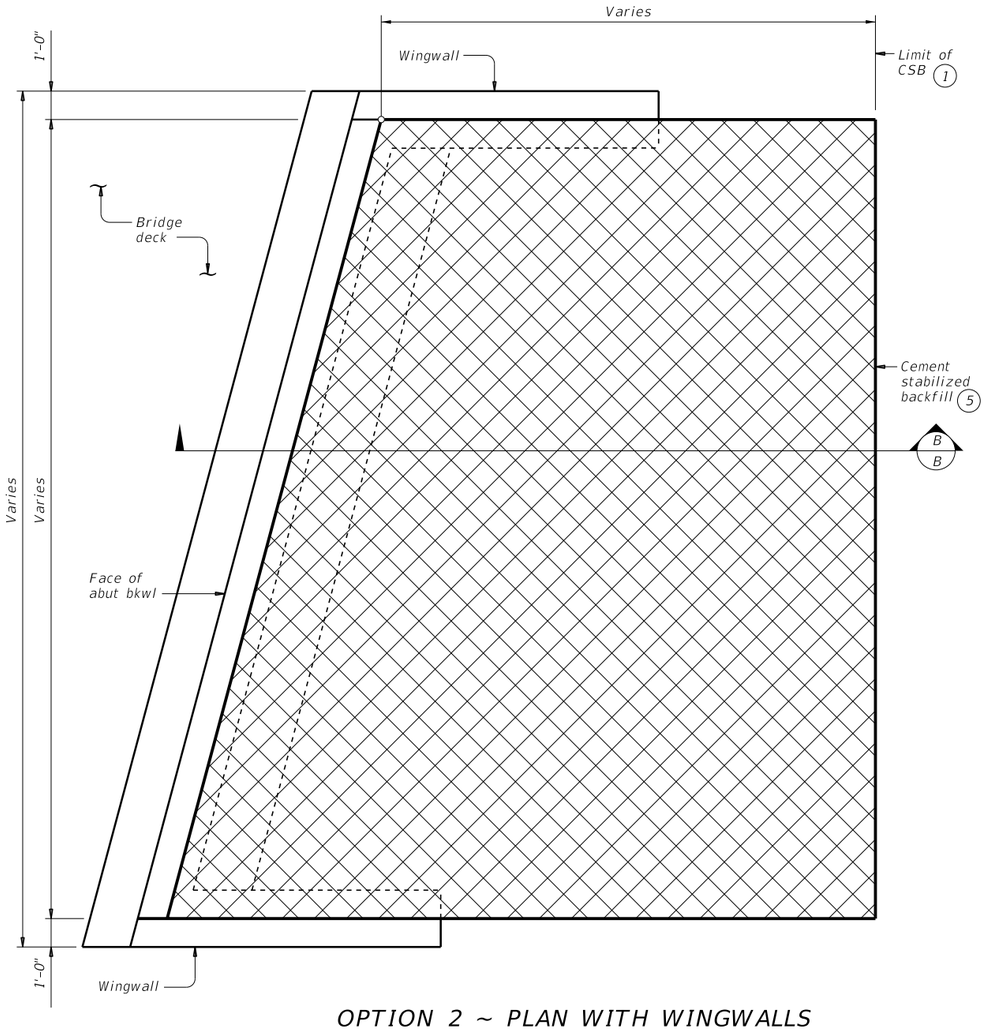
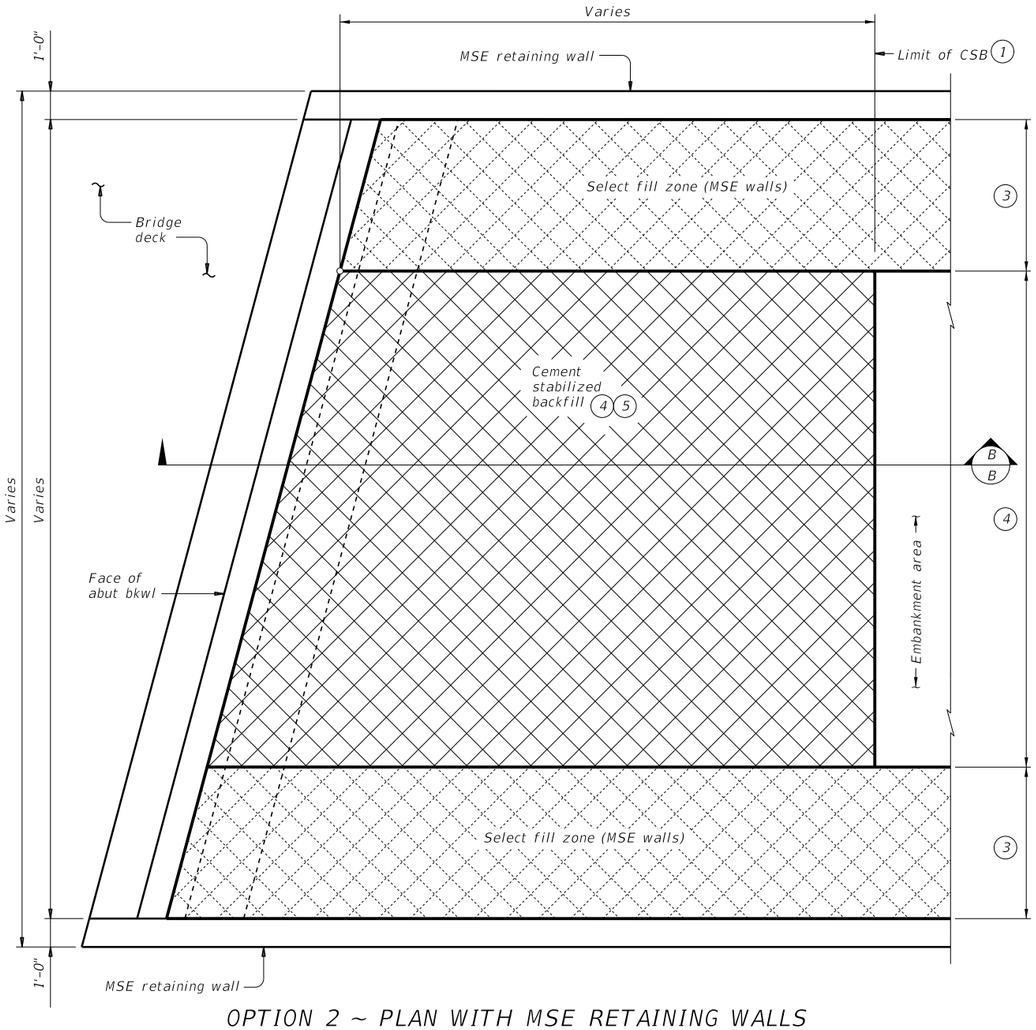


OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.



OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

(1) Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.

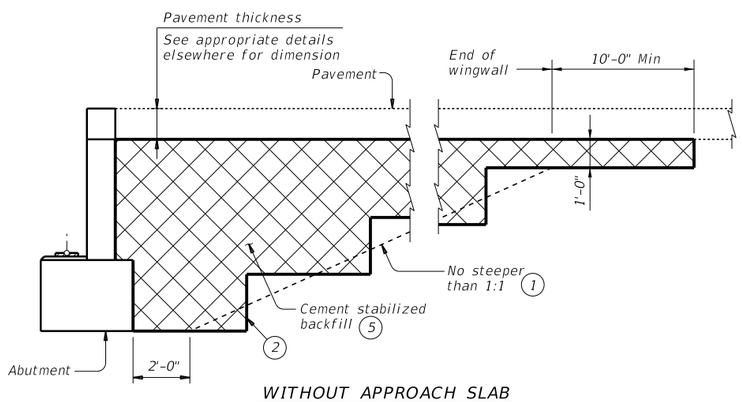
(2) Bench backfill as shown with 12" (approximate) bench depths.

(3) Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.

(4) When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.

(5) If shown in the plans, flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
a). If flowable backfill is to be placed over MSE backfill, then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
b). Place flowable fill in lifts not exceeding 2 feet in height. Place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).

(6) 1'-0" for BAS-A
1'-10" for BAS-C



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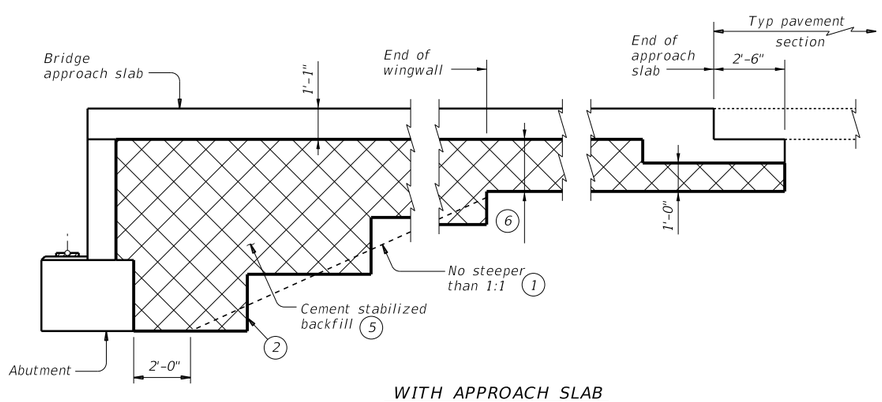

WITH APPROACH SLAB
(Showing BAS-C, BAS-A similar.)

SECTION B-B

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

CEMENT STABILIZED ABUTMENT BACKFILL

BRIDGE ABUTMENT

CSAB

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
02-20: Added Option 2. 03-23: Updated General Notes.	DIST	COUNTY		SHEET NO.
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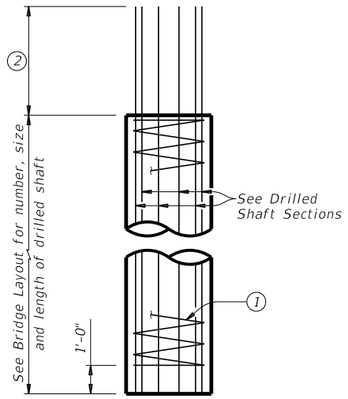
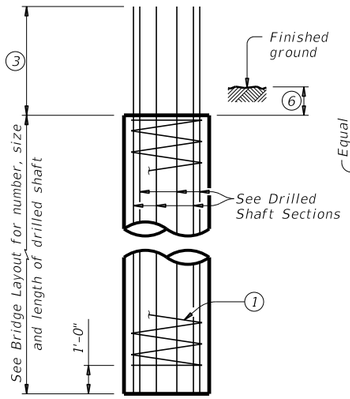
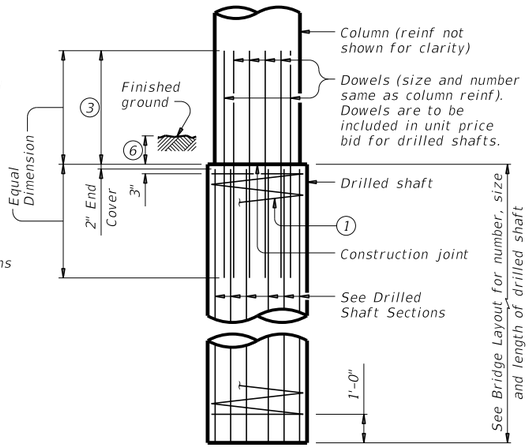


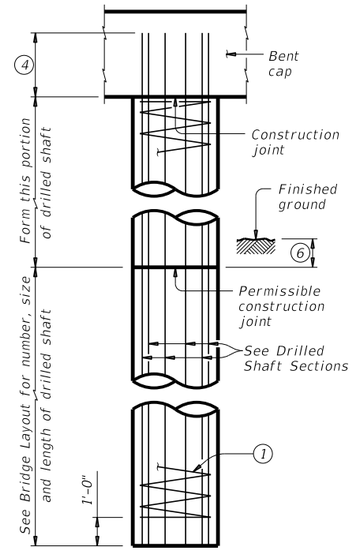
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



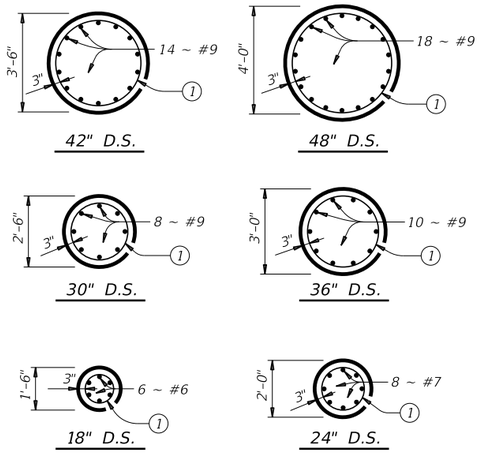
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL (5)

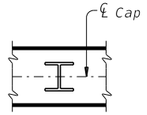


DRILLED SHAFT SECTIONS

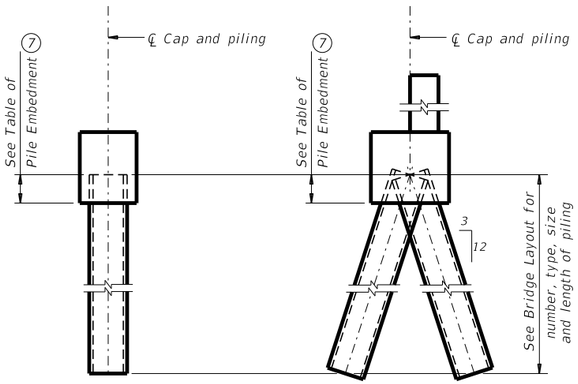
DRILLED SHAFT DETAILS

TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.

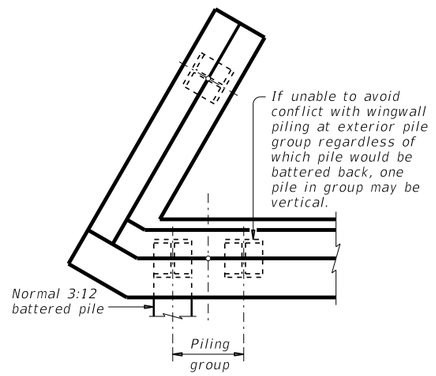


ORIENTATION OF STEEL H-PILING

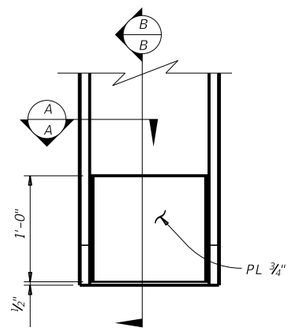


VERTICAL PILE BATTERED PILE

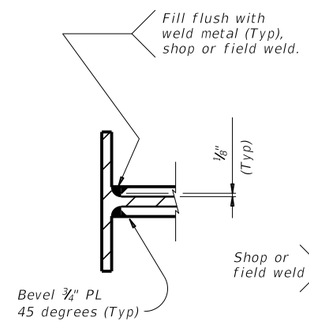
PILING DETAILS
(Concrete or steel H)



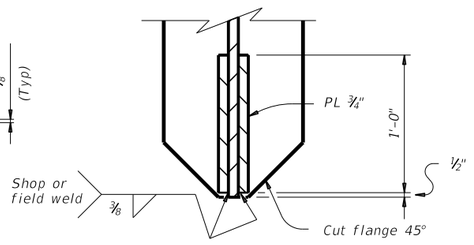
DETAIL "A"
(Showing plan view of a 30° skewed abutment)



ELEVATION



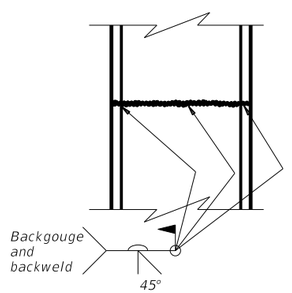
SECTION A-A



SECTION B-B

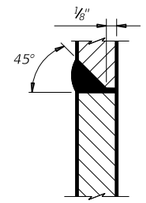
STEEL H-PILE TIP REINFORCEMENT

See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.



STEEL H-PILE SPLICE DETAIL

Use when required.



SECTION THRU FLANGE OR WEB

(1) #3 spiral at 6" pitch (one and a half flat turns top and bottom).

(2) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"

(3) Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(4) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"

(5) Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1354

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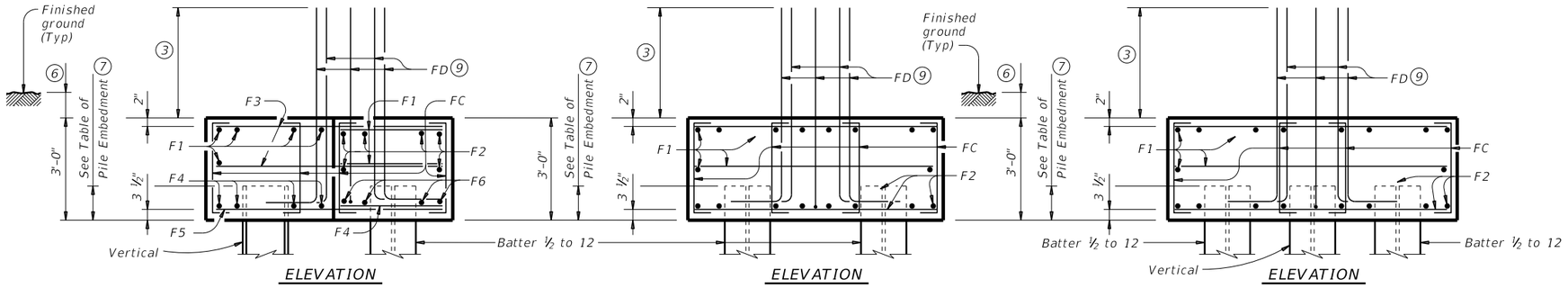
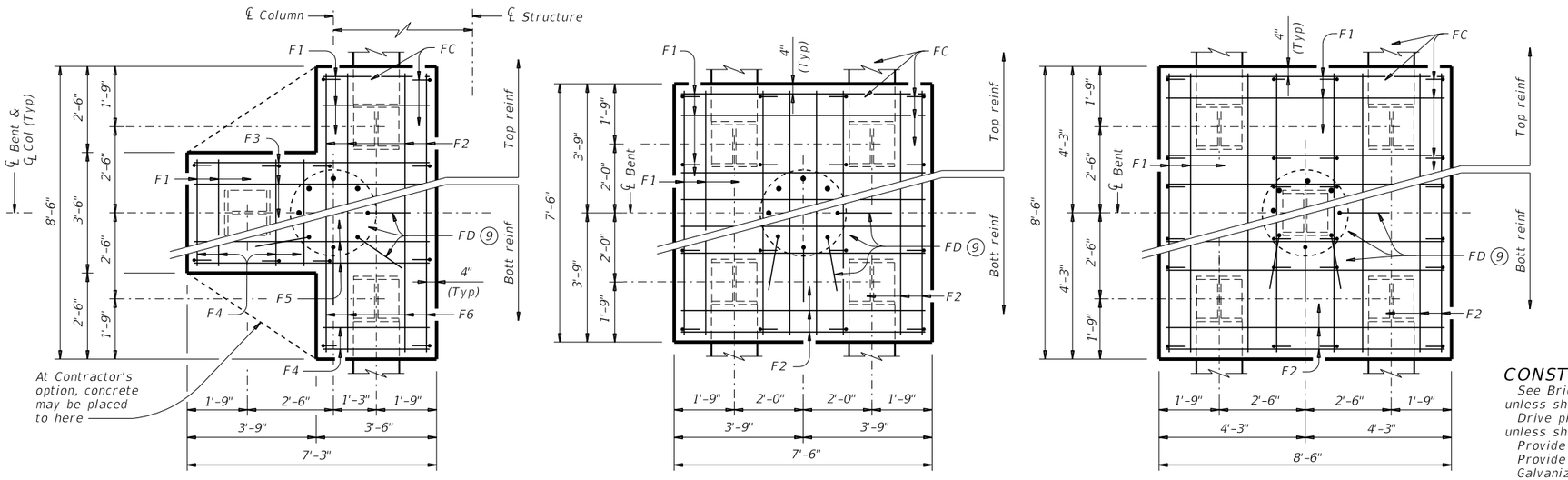




THREE PILE FOOTING (8)

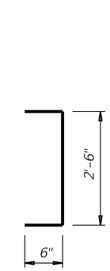
For 36" Dia and smaller columns.

FOUR PILE FOOTING (8)

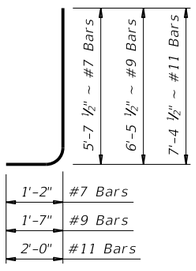
For 42" Dia and smaller columns.

FIVE PILE FOOTING (8)

For 42" Dia and smaller columns.



BARS FC



BARS FD (9)

(3) Min lap with column reinforcing:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

(8) See Bridge Layout for type, size and length of piling.

(9) Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.

(10) Adjust FD quantity, size and weight as needed to match column reinforcing.

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

ONE 3 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	11	#4	3'- 2"	23
F2	6	#4	8'- 2"	33
F3	6	#4	6'- 11"	28
F4	8	#9	3'- 2"	86
F5	4	#9	6'- 11"	94
F6	4	#9	8'- 2"	111
FC	12	#4	3'- 6"	28
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	623
Class "C" Concrete			CY	4.8

ONE 4 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	7'- 2"	96
F2	16	#8	7'- 2"	306
FC	16	#4	3'- 6"	37
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	659
Class "C" Concrete			CY	6.3

ONE 5 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	8'- 2"	109
F2	16	#9	8'- 2"	444
FC	24	#4	3'- 6"	56
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	829
Class "C" Concrete			CY	8.0

CONSTRUCTION NOTES:

See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.

Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.

Provide Class C Concrete (f'c = 3,600 psi), unless shown otherwise.

Provide Grade 60 reinforcing steel.

Galvanize reinforcing if shown elsewhere in the plans.

Provide bar laps for drilled shaft reinforcing, where required, as follows:

Uncoated or galvanized (#6) ~ 2'-6"
Uncoated or galvanized (#7) ~ 2'-11"
Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

DESIGNER NOTES:

Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.

Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.

Maximum allowable pile loads for the footings shown are:

72 Tons/Pile with 24" Dia Columns
80 Tons/Pile with 30" Dia Columns
100 Tons/Pile with 36" Dia Columns
120 Tons/Pile with 42" Dia Columns

Texas Department of Transportation

Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1355

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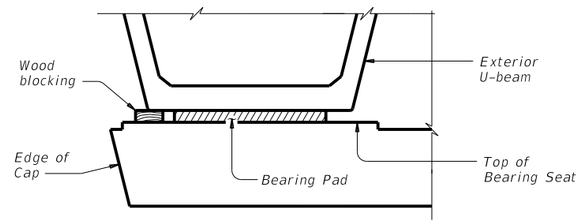
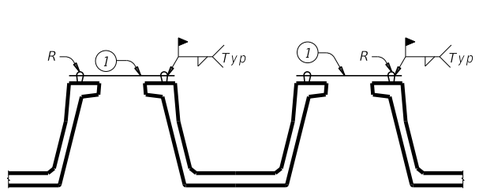


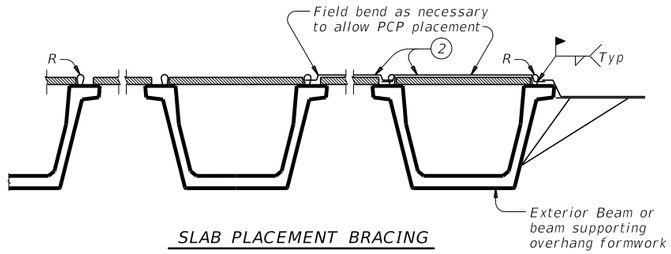
MINIMUM BLOCKING OF EXTERIOR U-BEAM

Required minimum blocking of exterior U-beam must be in place before pouring slab concrete. Leave blocking in place for at least 4 days after slab is cast and afterwards remove at the Contractor's convenience.



ERECTION BRACING

(Reinforcement placement after U-Beam erection)



SLAB PLACEMENT BRACING

(Reinforcement placement after PCP placement)

MINIMUM BEAM BRACING

(1) Weld two #5 bars at each end of each beam to Bars R between all U-Beams immediately after erection. This reinforcement is in addition to that shown for the thickened slab end. This must be in place prior to placing any precast deck panels.

(2) Weld #5 bars at 15' Max spacing along exterior beam and exterior bay after precast deck panels have been placed and prior to placing overhang formwork. This reinforcement is in addition to that shown for the concrete slab.

CONSTRUCTION NOTES:

Systems equal to or better than those shown may be used provided details of such systems are submitted and approved prior to erection.

GENERAL NOTES:

Use of these systems or details does not relieve the Contractor of the responsibility for the adequacy of the bracing and the safety of the structure.

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS

PRESTR CONC U-BEAM SPANS

MEBR(U)

FILE: ubstde06.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
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	WACO	McLENNAN		1356

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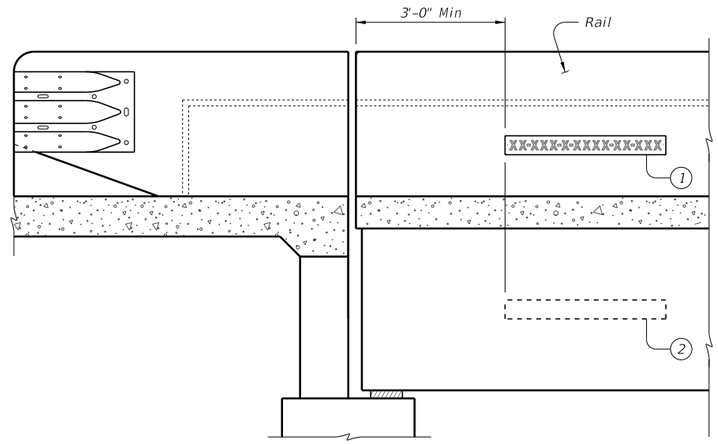
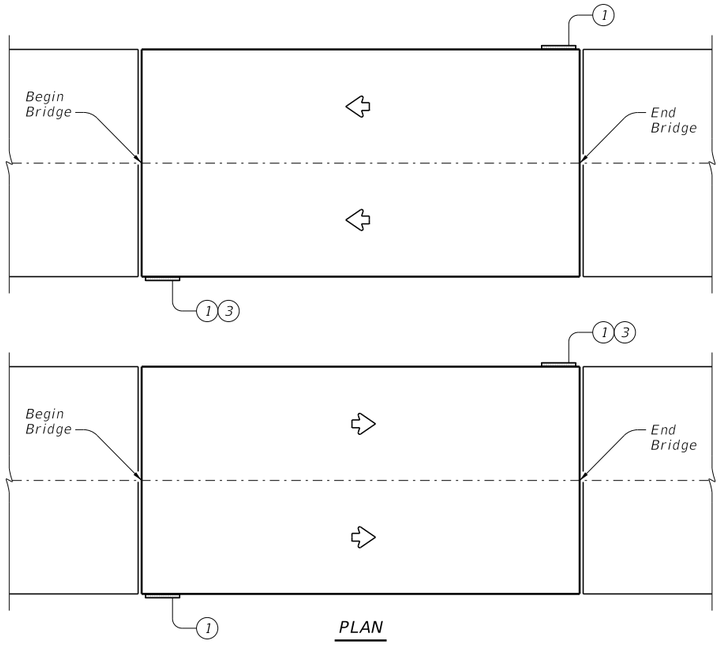
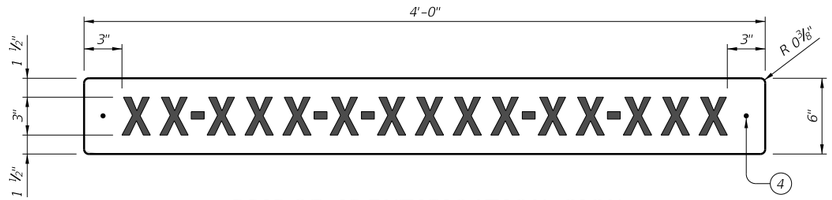


ELEVATION

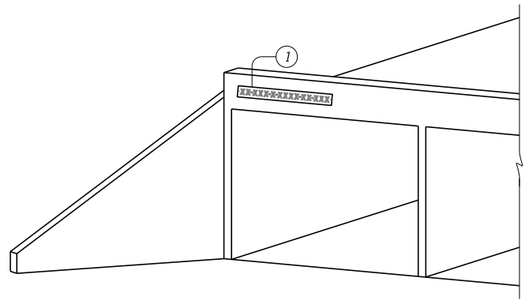


PLAN

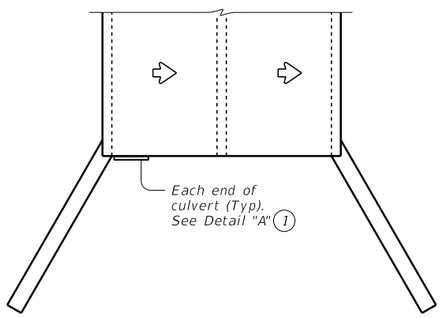
BRIDGE SIGN LOCATIONS



BRIDGE IDENTIFICATION SIGN

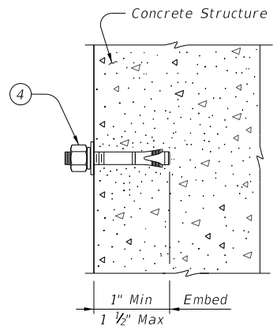


DETAIL "A"



PLAN

BRIDGE CLASS CULVERT SIGN PLACEMENT



ANCHOR DETAIL

SHEETING REQUIREMENTS

Usage	Color	Sign Face Material
Background	White	Type B or C Sheeting
Letters and Symbols	Black	Type B or C Sheeting

(1) Bridge identification sign location

(2) Alternate sign placement location for exterior concrete beams.

(3) If adjacent bridges are less than 2 feet apart, these signs may be omitted.

(4) ¼" Diameter stainless steel expansion anchor with hex nut, washer, and spring-lock washer.

SIGN NOTES:

Standard sign designs can be found in the Standard Highway Sign Designs for Texas (SHSD).

Use the Clearview Alphabet CV-2W for the letters and symbols.

MATERIAL NOTES:

Provide lateral spacing between letters and numerals conforming with the SHSD, and any approved changes thereto. Provide a balanced appearance when spacing is not shown.

Provide aluminum sign blanks with a minimum thickness of 0.080" that meet the requirements of DMS-7110.

Provide sign face materials that meet the requirements of DMS-8300 and the sheeting requirements shown in the table.

Provide ¼" diameter stainless steel expansion anchors with one hex head nut, one flat washer, and one helical spring-lock washer each.

Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). Provide anchor products that have a designated ICC-ES Evaluation Report number. The approval status must be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environments, provide both stainless steel anchor bodies and expansion wedges.

GENERAL NOTES:

Prior to hole drilling, locate rebar to ensure clearing of existing reinforcement and/or strands.

Prior to installation, obtain approval of sign locations from the Engineer. Avoid placement of sign over travel lanes and pedestrian walkways. Submit proposed installation method to Engineer prior to beginning work. Install anchors as shown on plans and in accordance with the anchor manufacturer's published installation instructions.

Do not install anchors sections of members under tension.

For new construction, the signs and anchors are subsidiary to the bridge. For installations on existing structures, the signs and anchors are paid under Item 442, "Metal for Structures." Each sign weighs 28 lbs.

Texas Department of Transportation

Bridge Division Standard

NBIS BRIDGE IDENTIFICATION SIGN STANDARD

NBIS

FILE:	DN: TAR	CK: TxDOT	DW: JER	CK: TAR
©TxDOT March 2023	CONT	SECT	JOB	HIGHWAY
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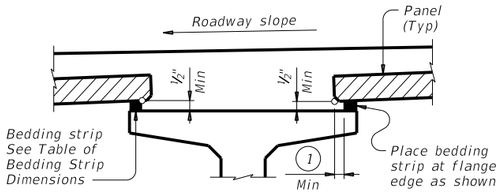
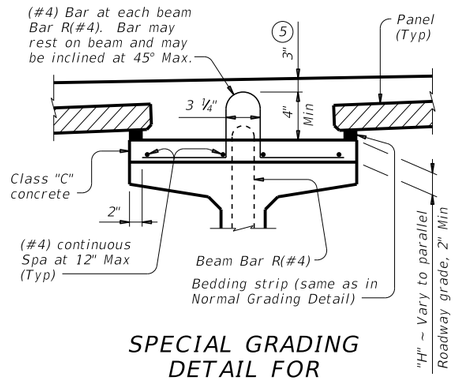


NORMAL GRADING DETAIL (3)

Showing prestressed concrete I-girders.
(Other beam types similar)



SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

Showing prestressed concrete I-girders.
(Other beam types similar)

TABLE OF BEDDING STRIP DIMENSIONS		
WIDTH	HEIGHT (4)	
	Min	Max
1" (Min)	½"	2"
1 ¼"	½"	2 ½"
1 ½"	½"	3"
1 ¾"	½"	3 ½"
2"	½"	4"
2 ¼"	½"	4 ½" (2)
2 ½"	½"	5" (2)
2 ¾"	½"	5 ½" (2)
3" (Max)	½"	6" (2)

(1) 2" Min for I-giders, 1 ½" Min for all other beam types.

(2) Allowed for I-girders, not allowed on other beam types.

(3) To reduce the quantity of cast-in-place concrete, bedding strip thickness may be increased in ¼" increments. Bedding strips must be comprised of one layer. Bond bedding strips to the beams with an adhesive compatible with bedding strips. Bedding strips over 2.5" high may need to be bonded to panels. The same thickness strip must be used under any one panel edge and the maximum change in thickness between adjacent panels is ¼". Alternatively, bedding strips may be cut to grade. Panels may be supported by an alternate method, using a commercial product, if approved by the Engineer of Bridge Design, Bridge Division. If bedding strips exceed 6" high for I-Girders, 4" high for all other beam types, use Special Grading Detail for Concrete Beams or submit an alternate method to the Bridge Division for approval.

(4) Height must not exceed twice the width.

(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(7) Space Bars UP(#4) with Beam Bars R(#4) in all areas where measured haunch exceeds 3 ½" with I-girders, and 3" for all other beam types. Epoxy coating for Bars UP is not required.

(8) Do not locate construction joints on top of a panel.

(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

CONSTRUCTION NOTES:

Erected panels must bear uniformly on bedding strips of extruded polystyrene placed along top flange edges.

Placing panels to minimize joint openings is recommended.

If additional blocking is needed, special grading details for supporting the panels and extra reinforcing between beam and slab will be considered subsidiary to deck construction.

Bars U, shown on PCP-FAB, may be bent over or cut off if necessary.

Care must be taken to ensure proper cleaning of construction debris and consolidation of concrete material under the edges of the panels. Bedding strips must be placed at beam flange edges so that adequate space is provided for the mortar to flow a minimum of 1 ½" under the panels as the slab concrete is placed.

To allow the proper amount of mortar to flow between beam and panel, the minimum vertical opening must be at least ½". Roadway cross-slope reduces the opening available for entry of the mortar. Bedding strips varying in thickness across the beam are therefore required.

For clear span between U-beams less than or equal to 18", see Permissible Slab Forming Detail on Miscellaneous Slab Detail sheets, UBMS.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel in the cast-in-place slab. See Table of Reinforcing Steel for size and spacing of reinforcement.

If the top and bottom layer of reinforcing steel is shown on the Span Details to be epoxy coated, then the D, E, P, & Z bars must be epoxy coated.

Provide bar Laps, where required, as follows:

Uncoated ~ #4 = 1'-7"
Epoxy Coated ~ #4 = 2'-5"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Panel placement may follow either Option 1 or Option 2 except Option 1 must be used if the skew exceeds 45 degrees.

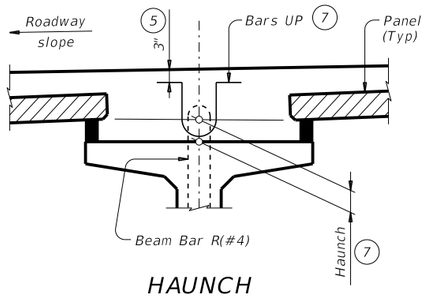
Use of Prestressed Concrete Panels is not permitted for horizontally curved steel plate or tub girders. See Span Details for other possible restrictions on their use.

These details are to be used in conjunction with the Span Details, PCP-FAB and other applicable standard drawings.

When panel support (bedding strips) deviates from what is shown herein, provide details signed and sealed by a professional Engineer.

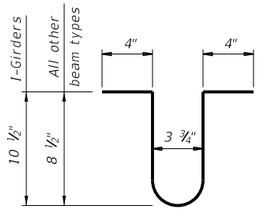
Any additional reinforcement or concrete required on this standard is considered subsidiary to the bid Item "Reinforced Concrete Slab".

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

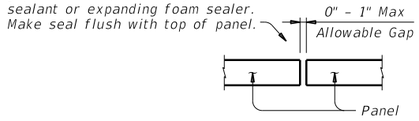


HAUNCH REINFORCING DETAIL

Showing prestressed concrete I-girders.
(Other beam types similar)

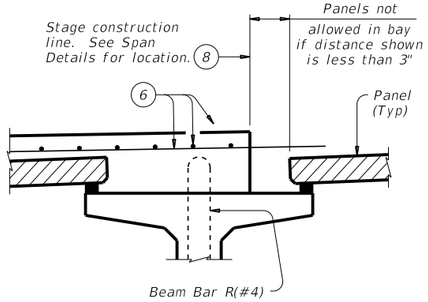


BARS UP (#4) (7)

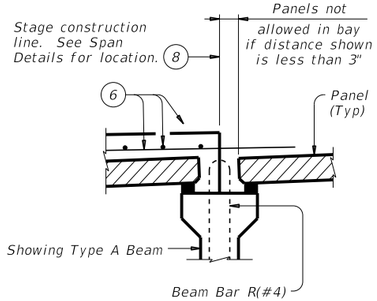


PANEL JOINTS

(Panel reinforcing not shown for clarity.
The gap cannot be considered as a panel fabrication tolerance. Adjust panel placement to minimize joint openings.)



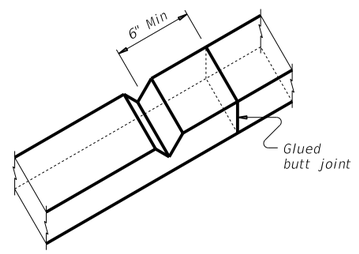
PRESTR CONC I-GIRDERS



PRESTR CONC I-BEAMS

STAGE CONSTRUCTION LIMITATIONS

(Other beam types similar)



BEDDING STRIP DETAIL (9)

HL93 LOADING SHEET 1 OF 4

Texas Department of Transportation | Bridge Division Standard

PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

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©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
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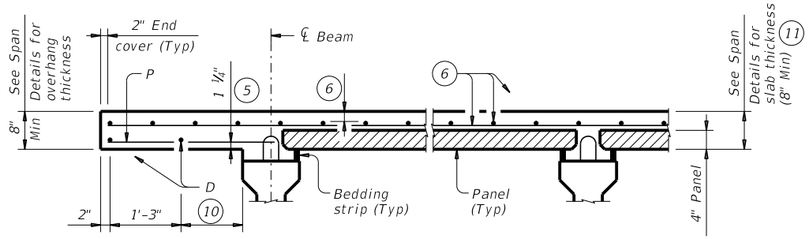
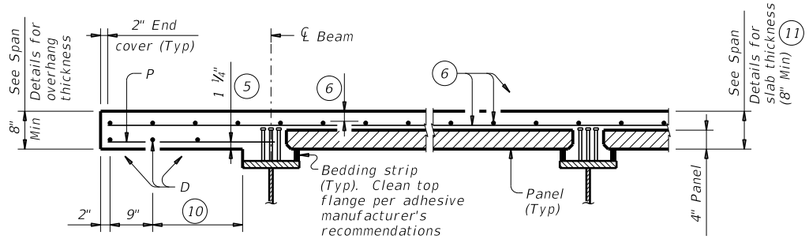
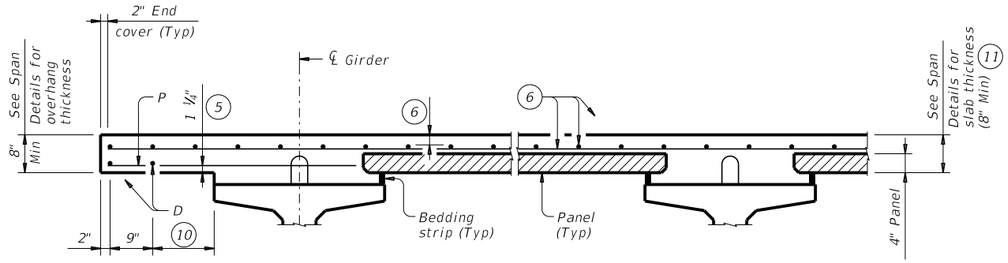


PRESTRESSED CONCRETE I-BEAMS



STEEL BEAMS



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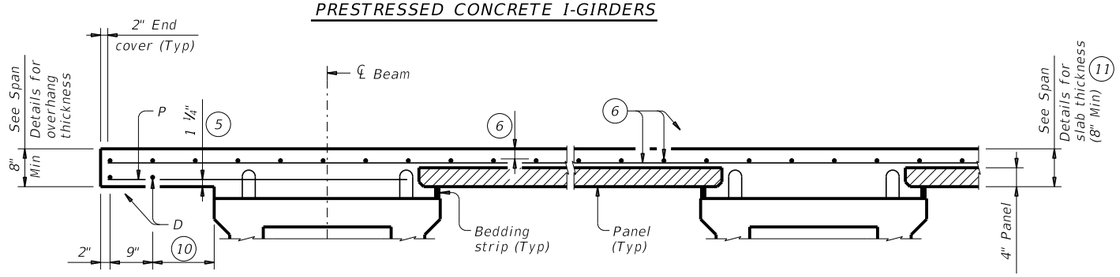
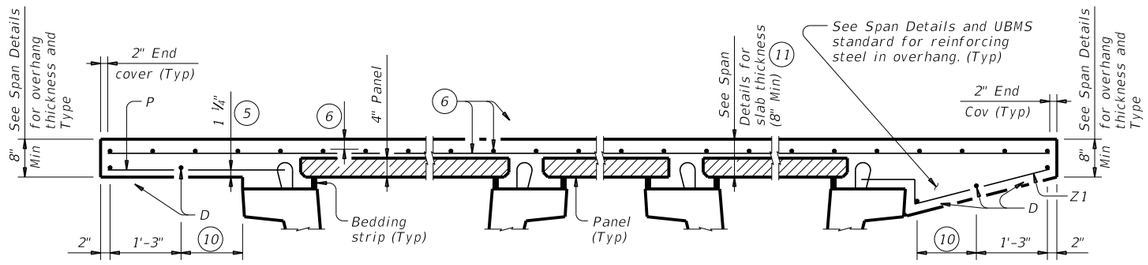


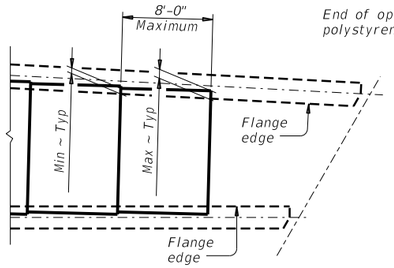
PRESTRESSED CONCRETE X-BEAMS



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

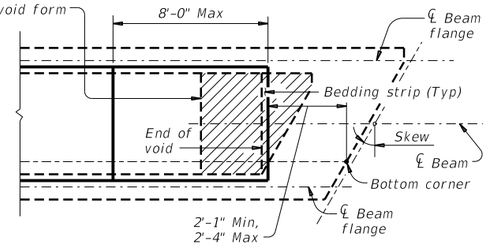
TYPICAL PART TRANSVERSE SECTIONS

SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

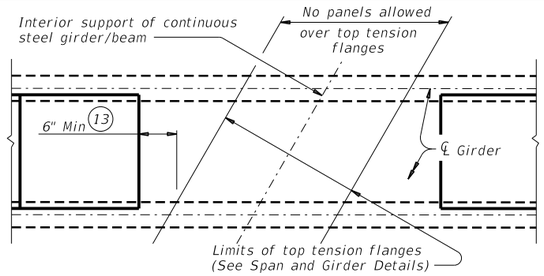


AT FLARED BEAMS OR GIRDERS

See PCP-FAB standard for Min and Max dimensions based on bemm/girder type.



OVER CONC U-BEAMS



AT INT SUPPORTS OF CONTINUOUS STEEL GIRDERS

PART PLANS OF PANEL PLACEMENT

(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

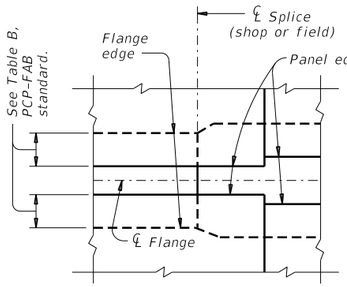
(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

(10) Equally space additional bar if more than 1'-3" Max.

(11) The actual thickness constructed may exceed the slab thickness shown on the Span Details but the extra thickness may be no more than 2" (1" for prestressed concrete U-beams and steel beams). Bearing seat elevations or finished grade may be adjusted.

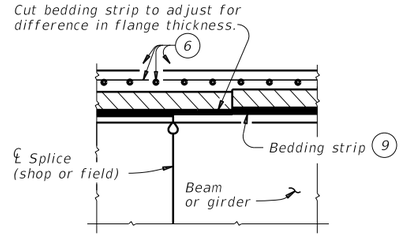
(12) Field adjust Bars Z1(#4) to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inverted-Tee stems only.

(13) Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.



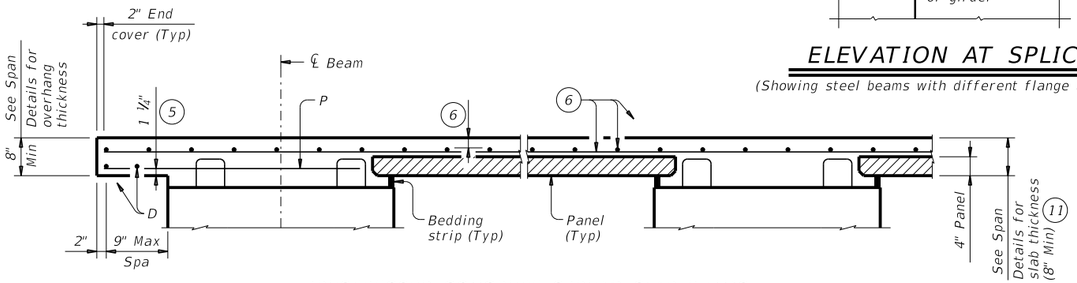
PLAN AT SPLICE

(Showing steel beams with flange width transition)



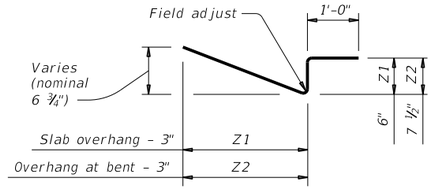
ELEVATION AT SPLICE

(Showing steel beams with different flange thickness)



PRESTRESSED CONCRETE SPREAD SLAB BEAMS

Bars P over exterior beams are still required when no overhang is used. In this case, only one Bar D, 2" from slab edge, is required.



BARS Z (#4) (12)

HL93 LOADING SHEET 2 OF 4

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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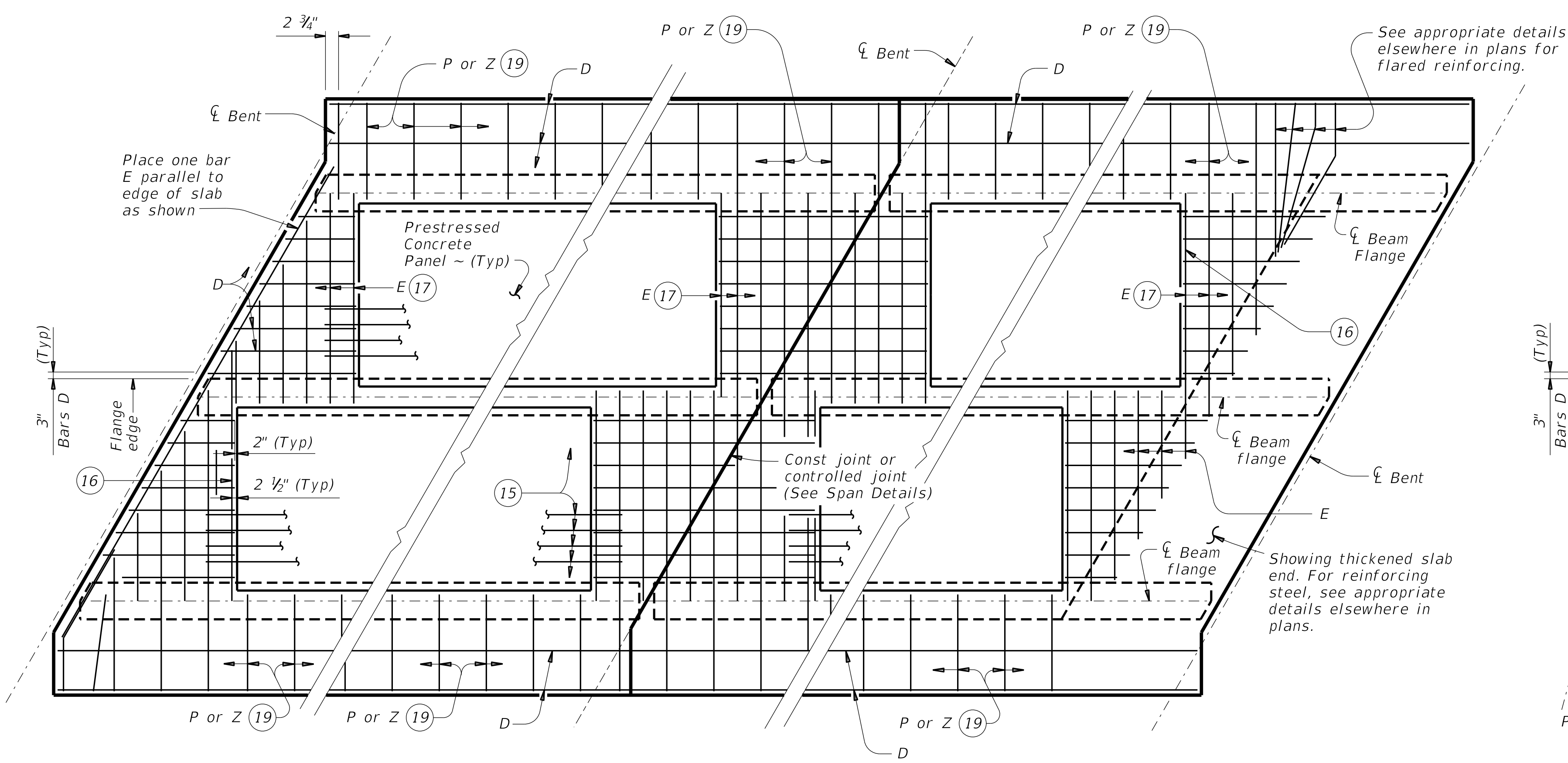
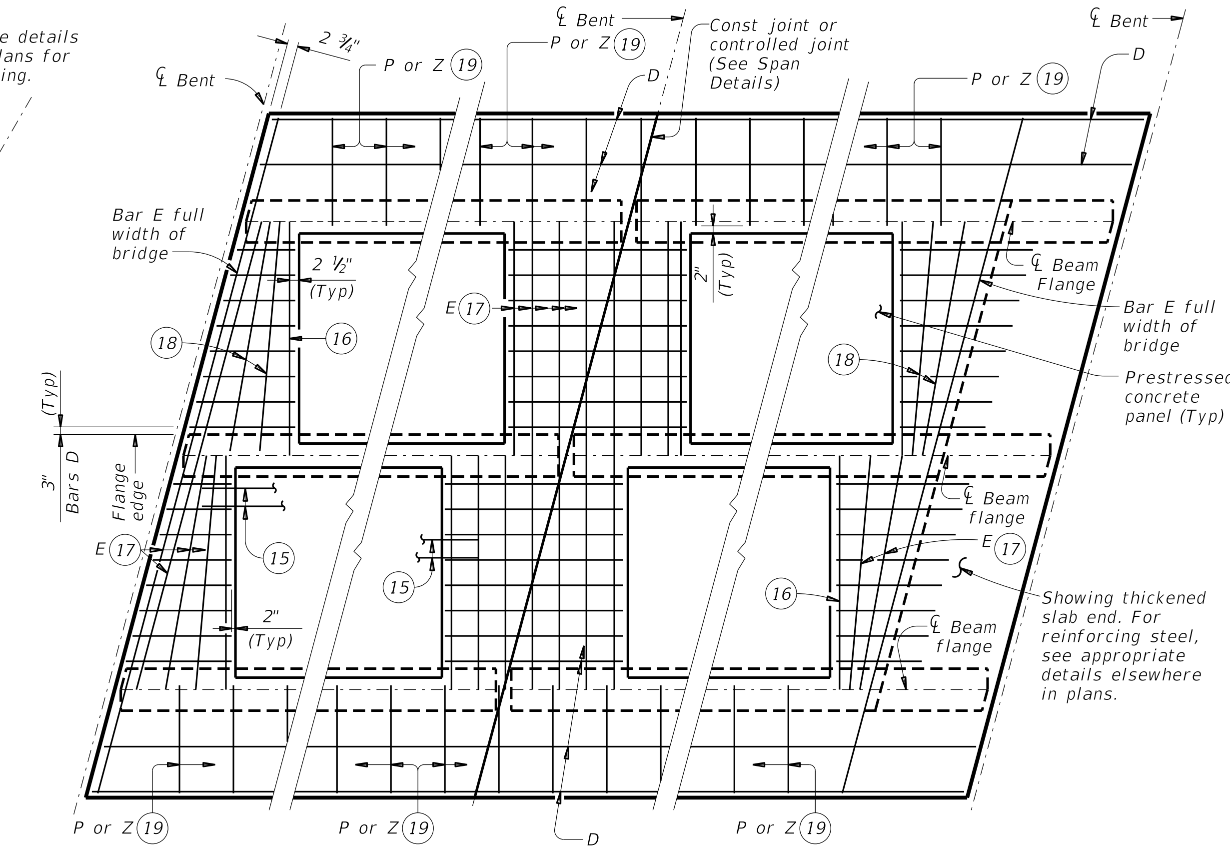


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE

AT INTERIOR BENTS

AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT



AT ALL SPAN ENDS UNLESS NOTED OTHERWISE

AT INTERIOR BENTS

AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH SKEWED REINFORCEMENT

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c.

(14) Max Spacing as listed unless otherwise shown.

(15) At connection with cast-in-place slab, extend longitudinal panel reinforcement. See PCP-FAB for details.

(16) Maintain one Bar E(#4) parallel to panel ends (Typ).

(17) Bars E(#4) not continuous over beam flanges must overlap beam flange 6" Min.

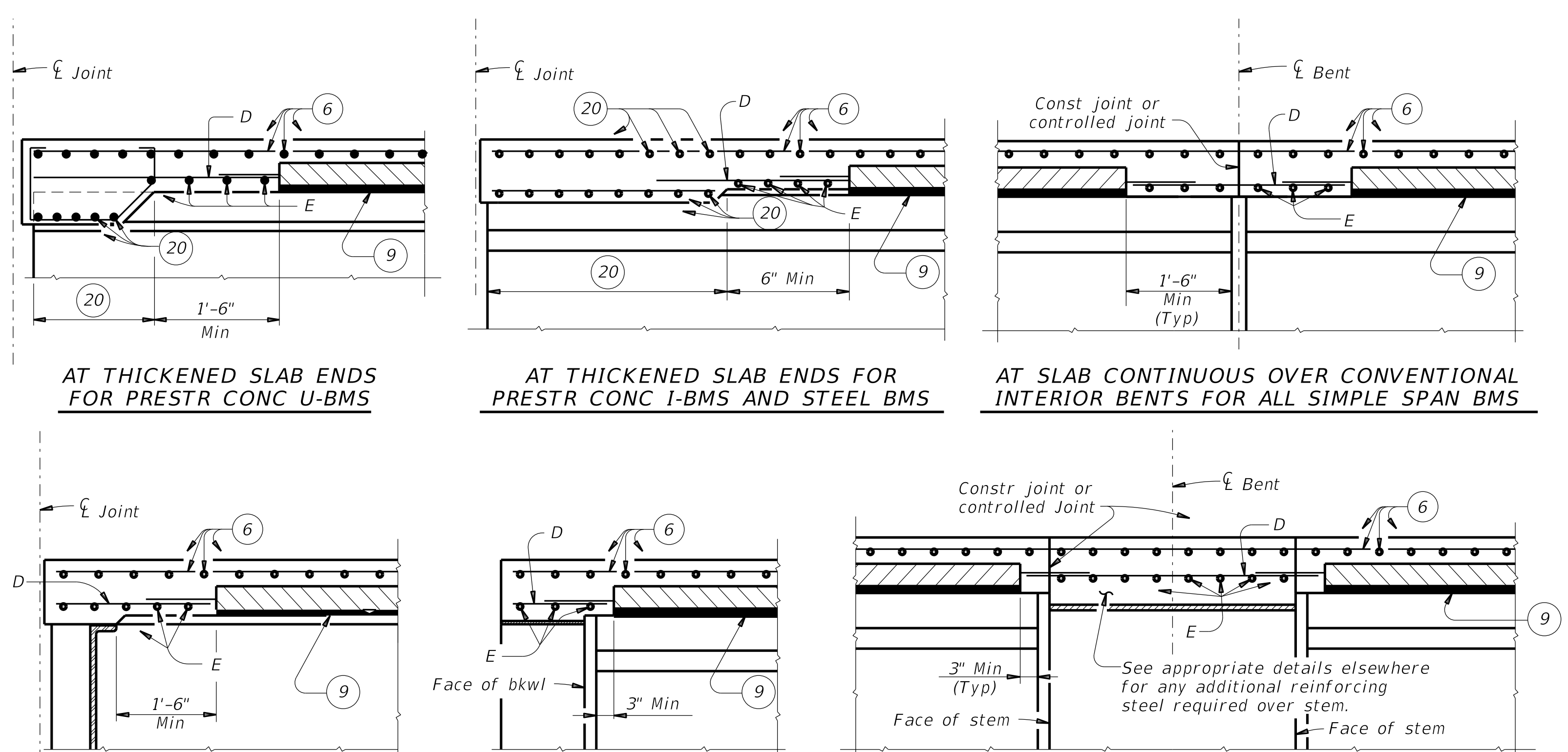
(18) Add flared Bars E(#4) (Min Spa = 6", Max Spa = 12") as required at panel ends.

(19) Where possible, Bars E(#4) may be extended into overhangs to replace Bars P(#4). Bars Z(#4) are required for sloped overhangs with U-Beams.

(20) See appropriate thickened slab end details for reinforcing and limits of thickened slab end.

TABLE OF REINFORCING STEEL (14)

BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18



AT THICKENED SLAB ENDS FOR PRESTR CONC U-BMS

AT THICKENED SLAB ENDS FOR PRESTR CONC I-BMS AND STEEL BMS

AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS

AT CONVENTIONAL END DIAPHRAGMS FOR STEEL BMS

AT SLAB OVER ABUTMENT BACKWALL FOR ALL BMS

AT SLAB CONTINUOUS OVER INVERTED-T BENTS FOR ALL BMS

OPTION 1 ~ ELEVATIONS AT BEAM ENDS

HL93 LOADING   SHEET 3 OF 4

Texas Department of Transportation   Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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©TxDOT April 2019	CONT 0015	SECT 01	JOB 246	HIGHWAY IH 35
REVISIONS	DIST WACO	COUNTY McLENNAN		SHEET NO. 1360

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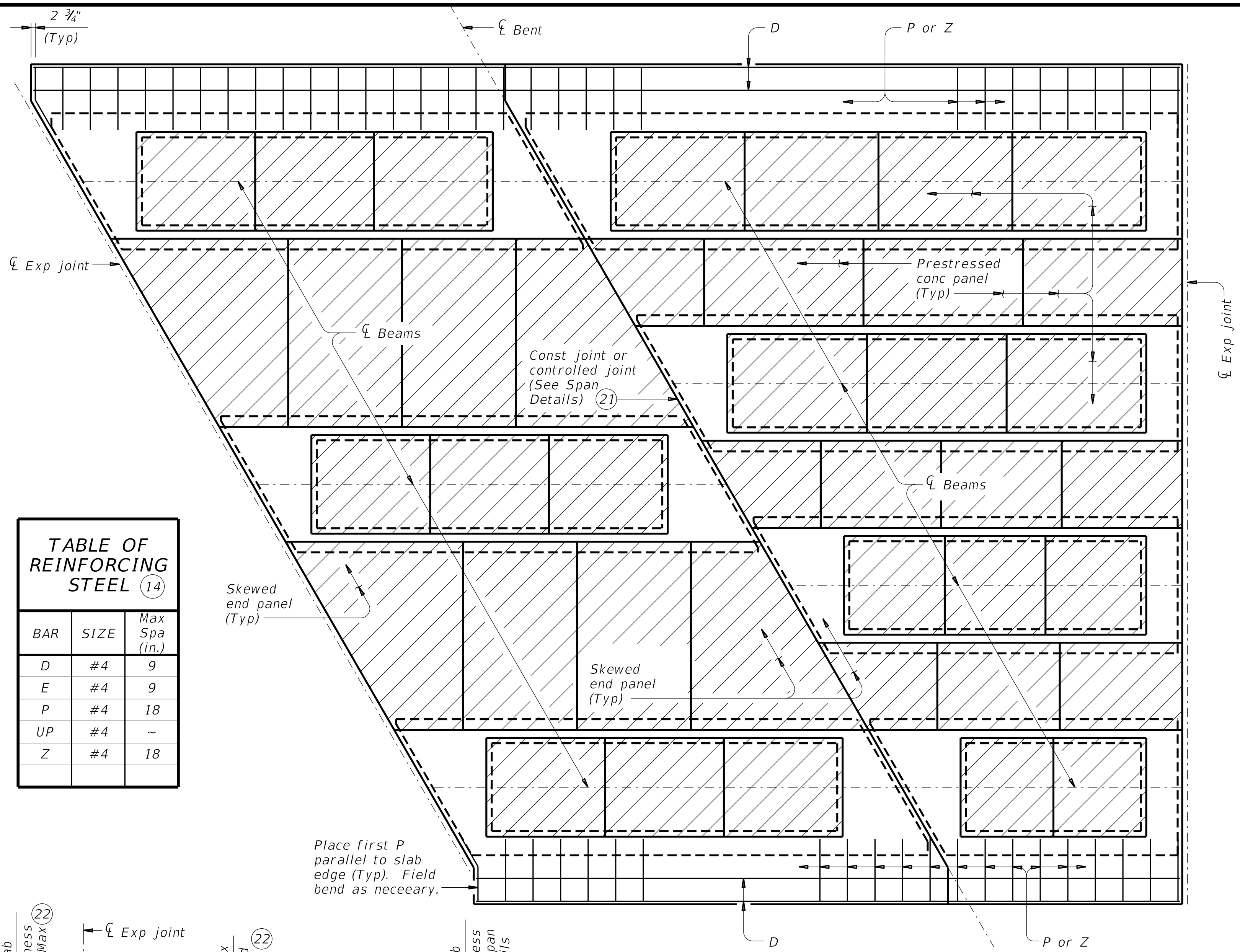
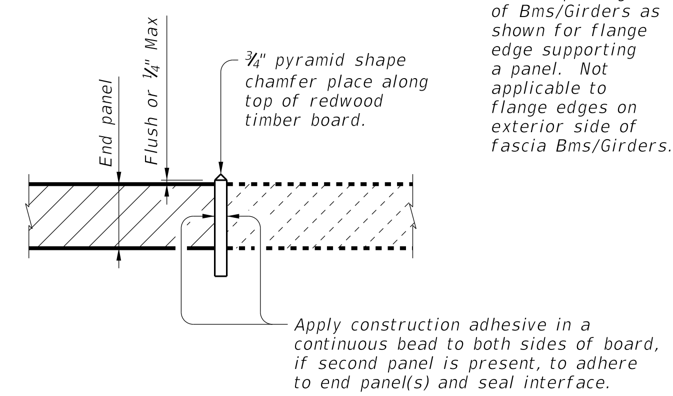


OPTION 2 ~ PLAN OF SLAB

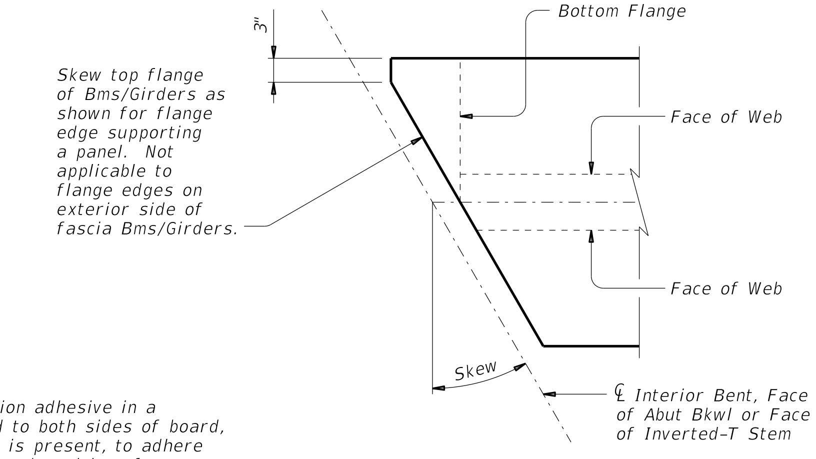
(Showing U-Beams; other beams similar)

TABLE OF REINFORCING STEEL (14)		
BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18



ELEVATION EXAMPLE OF END PANEL AND TIMBER BOARD (23)

See "Option 2 ~ Elevation At Beam Ends".



OPTION 2 ~ SHOWING MODIFICATION TO BEAM/GIRDER TOP FLANGE FOR SKEWS OVER 5°

Showing I-Bm/I-Girder, U-Bms and Steel Bms similar.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(14) Max Spacing as listed unless otherwise shown.

(21) 1 ½" Vinyl or plastic joint former at controlled joints (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

(22) End panel may be set up to 2" lower to accommodate expansion joint hardware, provided bedding strip is not less than ½" thick.

(23) ¾" thick redwood timber board, leave in place. Redwood timber board placed flush with top of panel or within ¼" Max above panel. Place ¾" pyramid shape chamfer along top of timber board. See "Elevation Example of End Panel and Timber Board". Place straight, within ¼" of centerline of bent or face of inverted-tee, across bridge width and end board at exterior flange edge of fascia beams/girders. Do not extend into overhang.

(24) Place panel within ½" of ¾" thick board.

(25) Permanent galvanized steel sheet form. Removable formwork is acceptable.

(26) Place end panel within ½" of expansion joint opening. End panel cannot encroach on required expansion joint opening.

(27) Place additional (#4) bar 5'-0" in length between every slab bars T. Center (#4) bar on Joint.

(28) Place additional (#4) bar continuous 2'-6" beyond each side of Inverted-T Stem between every slab bars T.

SPECIAL OPTION 2 CONSTRUCTION NOTES:

When Option 2 is chosen bottom mat of thickened end slab reinforcing is not required. Use the same top mat as shown on the Thickened Slab End Details sheet.

Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Saw cutting panels to fit is acceptable when approved by the Engineer. Minimum distance from a saw cut edge to a panel strand is 1 ½".

Do not extend the longitudinal panel reinforcement into the cast-in-place slab.

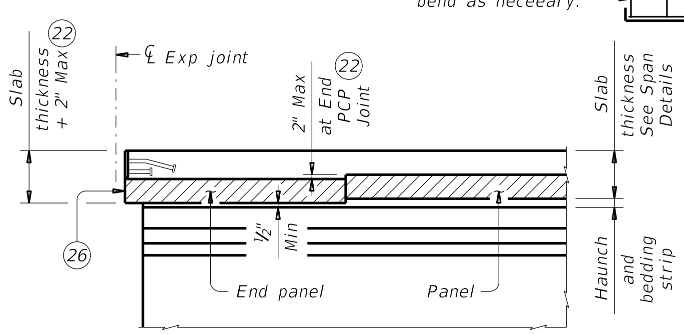
Top flanges of beams and girders on skewed bridges must be modified as shown on this drawing. The Contractor is responsible for coordinating this modification with the beam fabricator prior to submitting shop drawings for approval.

Fabricator may optionally skew the whole end. When electing to skew whole end, girder end details and bearing type at conventional interior bent must be changed to use condition at abutment. Fabricator must coordinate change in bearing type, bearing centerline location, and dowel location with Engineer and Contractor. Show appropriate changes on girder and bearing shop drawings.

Bending of anchor studs of expansion joints shown on standards AJ, SEJ-A and SEJ-S(0) is permissible if necessary to clear top of end panels. The Contractor is responsible for coordinating modifications with the joint fabricator. Submit shop drawings for approval when modifications to expansion joint hardware are made.

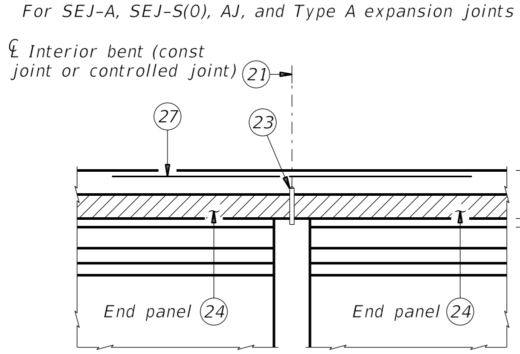
Bedding strips under skewed end panels must conform to the requirements of Item 422 except their minimum compressive strength must be 60 psi.

Provide Bars AA, G, K and OA from standard IGTS in the slab.



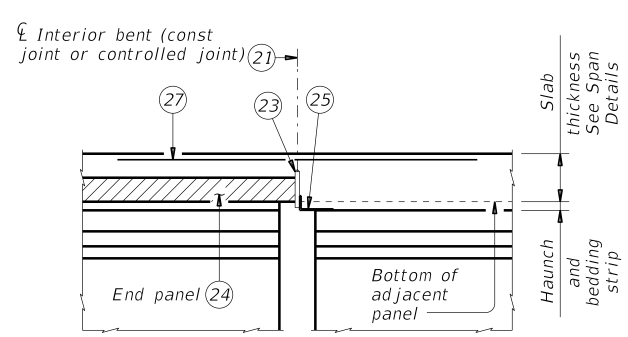
JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)

For SEJ-A, SEJ-S(0), AJ, and Type A expansion joints only.



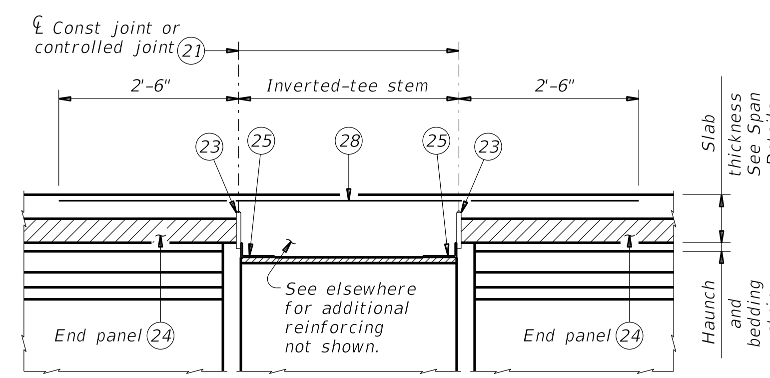
CONVENTIONAL INTERIOR BENT

Panel against panel between beams/girders.



CONVENTIONAL INTERIOR BENT

Panel against beam/girder end in adacent span.



INVERTED-T BENT

Panels against inverted-tee stem

OPTION 2 ~ ELEVATIONS AT BEAM ENDS (6)

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HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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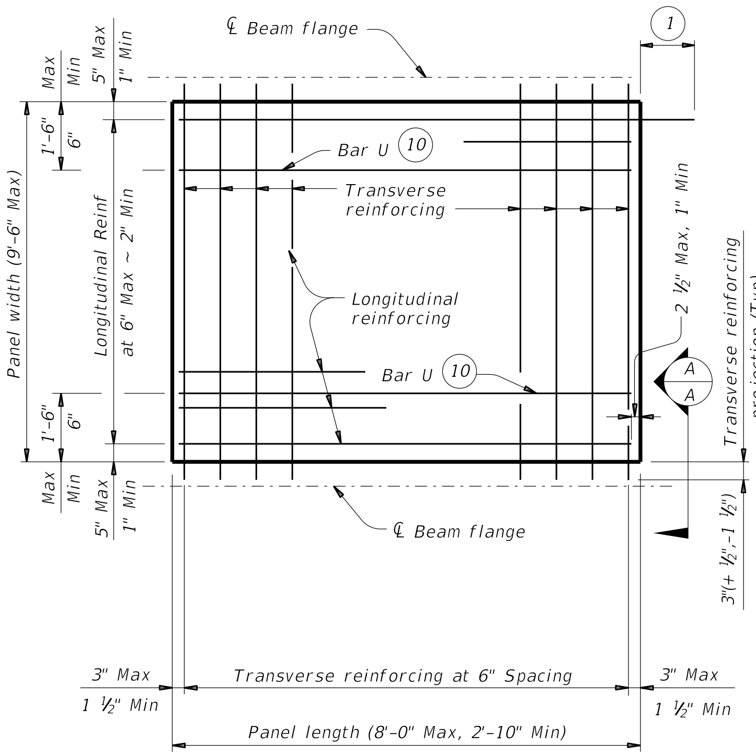
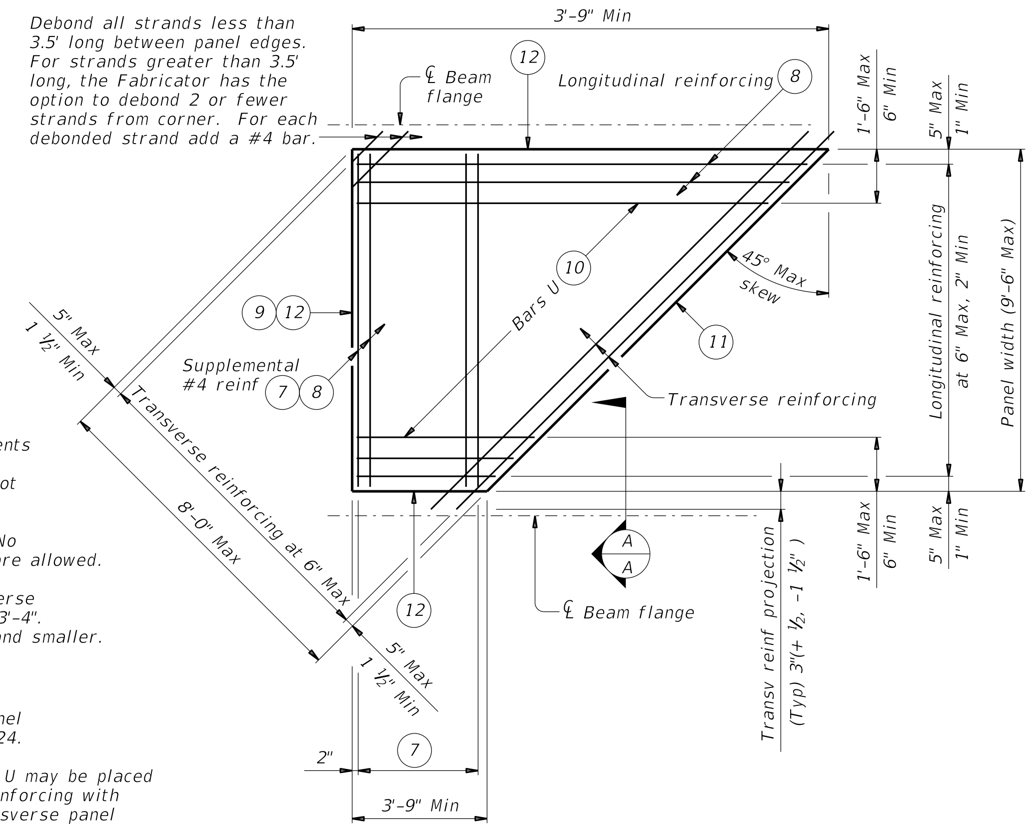
	WACO		McLENNAN	1361



TYPICAL NON-SKEWED PANEL PLAN

1. At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2",-0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max Spacing and extend dowels 1'-0" past panel end.
2. Four loops required per panel.
3. Four loops required per panel. ⅜" or ½" strands may be used.
4. Normal dimensions must be used on spans with parallel beams. Maximum and Minimum dimensions apply only to spans with flared beams.
5. See Normal Grading Detail on PCP standard for lap requirements and bedding strip dimensions. Some laps shown in tables cannot utilize all bedding strip widths.
6. One Splice allowed per panel. No more than two sheets of WWR are allowed.
7. Provide (#4) bars under transverse reinforcing, 10 Spaces at 4" = 3'-4". Omit for 5 degree (1:12) skew and smaller.
8. End Cover 2 ½" Max, 1" Min.
9. Recess strands on indicated panel edge in accordance with Item 424.
10. At the fabricator's option, Bars U may be placed parallel to transverse panel reinforcing with horizontal legs in plane of transverse panel reinforcing.
11. Use length of indicated panel edge as panel width for purpose of determining type of transverse reinforcing.
12. Timber form work permissible this edge.



TYPICAL SKEWED END PANEL PLAN

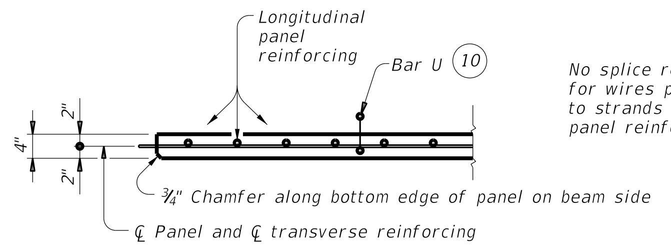
(Only to be used with details shown elsewhere in the plans.)

TABLE A (4) (5)

Beam Type	Normal (In.)	Min (In.)	Max (In.)
A	3	2 ½	3 ½
B	3	2 ½	3 ½
C	4	3	4 ½
IV	6	4	7 ½
VI	6 ½	4 ½"	8 ½
U40 - 54	5 ½	5 ½	7
Tx28-70	6	5	7 ½
XB20 - 40	4	3	4 ½
XSB12 - 15	4	3	4 ½

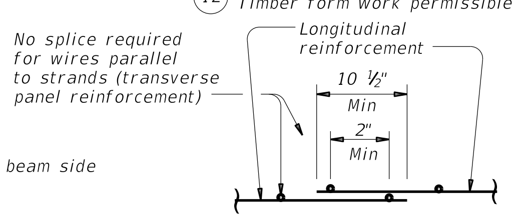
TABLE B (4) (5)

Top Flange Width	Normal (In.)	Min (In.)	Max (In.)
11" to 12"	2 ¾	2 ½	2 ¾
Over 12" to 15"	3 ¼	3	3 ¼
Over 15" to 18"	4	3	4 ¾
Over 18"	5	3 ½	6 ¼

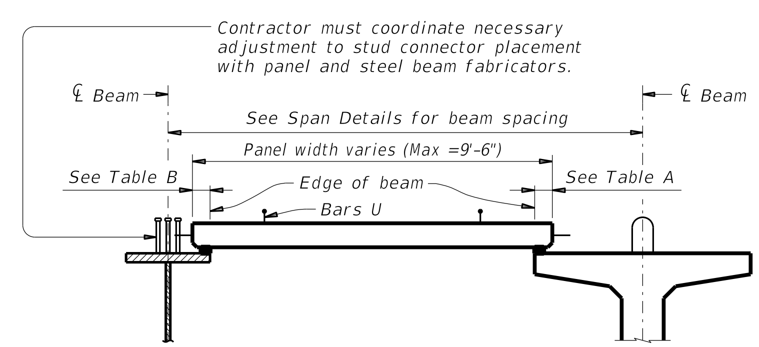


SECTION A-A

(Not showing supplemental #4 bars for skewed end panels.)



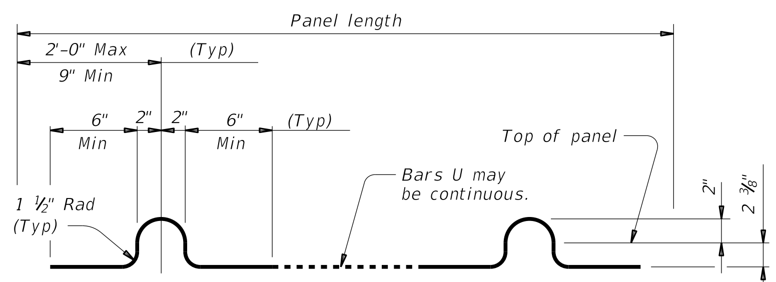
WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL (6)



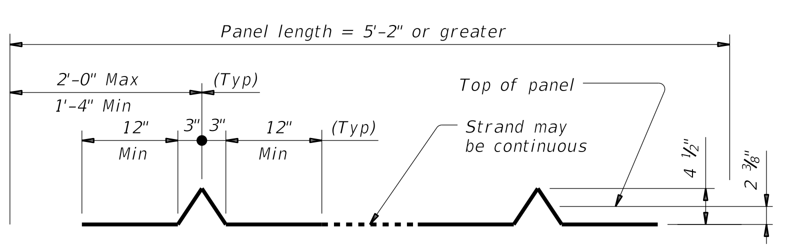
STEEL BEAMS

PRESTRESSED CONCRETE BEAMS OR GIRDERS

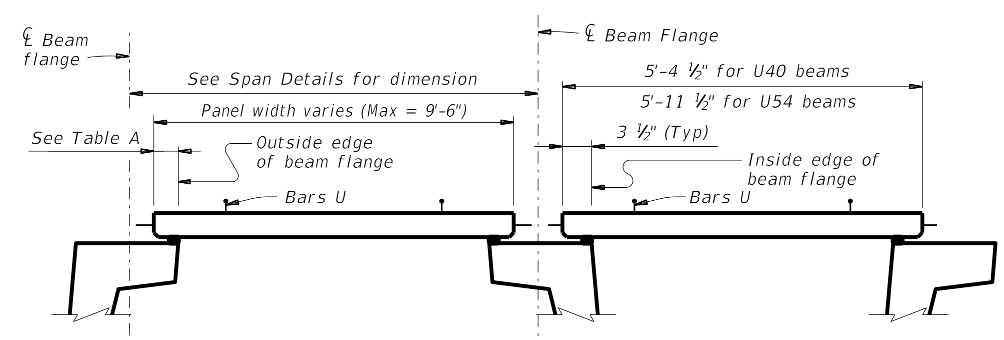
Typ unless noted otherwise



BARS U (#3) (2)



OPTIONAL STRAND FOR BARS U (3)



PRESTRESSED CONCRETE U-BEAMS

TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH

GENERAL NOTES:

Provide Class H concrete for panels. Release strength f'ci=3,500 psi. Minimum 28 day strength f'c=5,000 psi.

Provide ¾" chamfer along bottom edge of panel on beam side.

Do not use epoxy-coated reinforcing steel bar or strand in panels.

Remove laitance from top panel surface.

Finish top of panel to a roughness between a No. 6 and No. 9 concrete surface profile, inclusive, as specified by the International Concrete Repair Institute (ICRI).

Shop drawings for the fabrication of panels will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

A panel layout which identifies location of each panel must be developed by the Fabricator. Permanently mark each panel in accordance with the panel layout. A copy of the layout is to be provided to the Engineer.

TRANSVERSE PANEL REINFORCEMENT:

For panel widths over 5', use ⅜" or ½" Dia (270k) prestressing strands with a tension of 14.4 kips per strand.

For panel widths over 3'-6" up to and including 5', use ⅜" or ½" Dia (270k) prestressing strands with a tension of 14.4 kip per strand. Optionally, (#4) Grade 60 reinforcing bars may be used in lieu of prestressed strands.

For panel widths up to 3'-6", use (#4) Grade 60 reinforcing bars (prestressed strands alone are not allowed).

Place transverse panel reinforcement at panel centroid and space at 6" Max.

LONGITUDINAL PANEL REINFORCEMENT:

Any of the following options may be used for longitudinal panel reinforcement:

1. (#3) Grade 60 reinforcing steel at 6" Max Spacing. No splices allowed.
2. ⅜" Dia prestressing strands at 4 ½" Max Spacing (unstressed). No splices allowed.
3. ½" Dia prestressing strands at 6" Max Spacing (unstressed). No splices allowed.
4. Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) providing 0.22 sq in per foot of panel width. Wires larger than D11 not permitted. Provide transverse wires to ensure proper handling of reinforcing. One splice per panel is allowed. See WWR Splice Detail.

No combination of longitudinal reinforcement options in a panel is allowed.

Place longitudinal panel reinforcement above or below transverse panel reinforcement. Must be placed above transverse panel reinforcement for skewed end panels with supplemental (#4) reinforcement.

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Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE PANEL FABRICATION DETAILS

PCP-FAB

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY	
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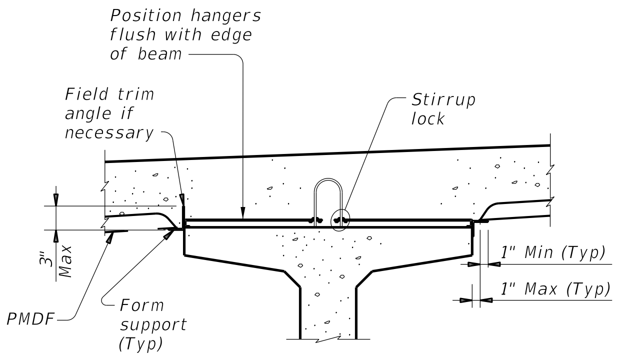
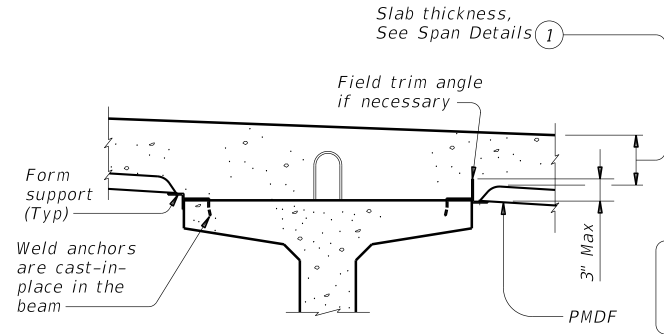
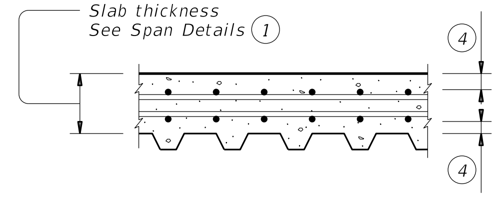


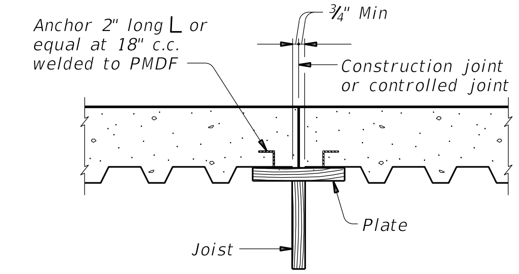
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS



TYP LONGITUDINAL SLAB SECTION



Note: In spans where PMD forms are used, timber forms must be used at construction joints. Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

SECTION THRU CONSTRUCTION JOINT

DESIGN NOTES:

As a minimum, PMDF and support angles must be designed for the dead load of the form, reinforcement and concrete plus 50 psf for construction loads. Flexural stresses due to these design loads must not exceed 75 percent of the yield strength of the steel. Allowable stress for weld metal must be 12,400 psi.

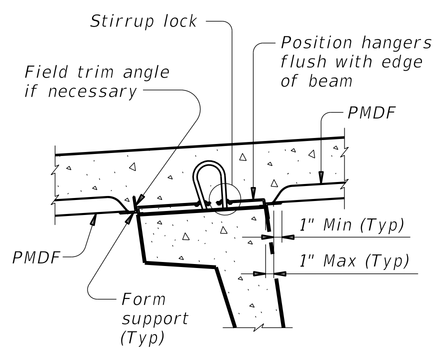
Maximum deflection under the weight of forms, reinforcement and concrete or 120 psf, whichever is greater, shall not exceed the following:

1/180 of the form design span, but not more than 0.50", for design spans of 10' or less.

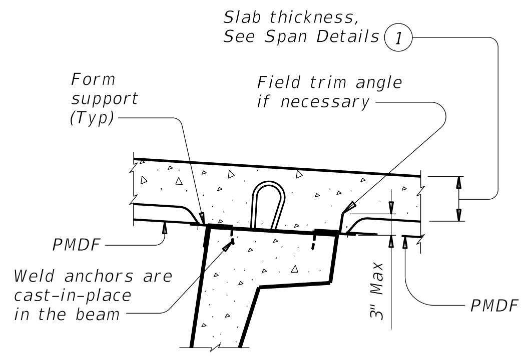
1/240 of the form design span, but not more than 0.75", for design spans greater than 10'.

1/240 of the form design span, but not more than 0.75", for all design spans of railroad overpass bridge spans fully or partially over railroad right-of-way, and for all bridge spans of railroad underpass structures.

The form design span must not be less than the clear distance between beam flanges, measured parallel to the form flutes, minus 2".



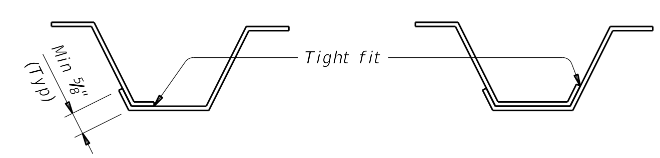
U-BEAMS WITH STIRRUP LOCKS



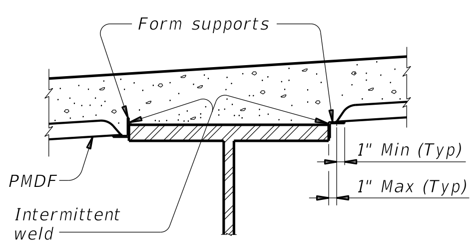
U-BEAMS WITH WELD ANCHORS

FOR PRESTR CONC U-BEAM AND STEEL GIRDER BRIDGES:
Unless shown elsewhere in the plans, size, spacing, and orientation of bottom mat of slab reinforcement must match the top mat of reinforcing shown on the span details except all bottom mat bars are to be #5. Bottom mat reinforcement and additional concrete is subsidiary to Item 422 "Concrete Superstructures."
FOR PRESTR CONC TX-GIRDER BRIDGES:
See Miscellaneous Slab Details, Prestr Concrete I-Girders (IGMS) standard sheet for bottom mat reinforcing.

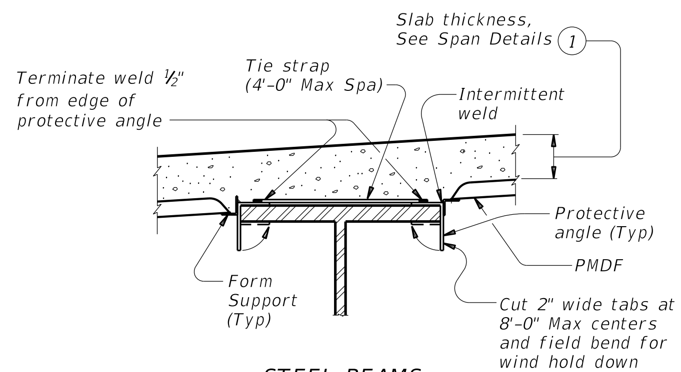
Place concrete in direction of lap 3



SIDE LAP DETAILS



STEEL BEAMS AT COMPRESSION FLANGES



STEEL BEAMS AT TENSION FLANGES 2

TYPICAL TRANSVERSE SECTIONS

1. Slab thickness minus ⅜" if corrugations match reinforcing bars.
2. Welding of form supports to tension flanges will not be permitted. Other methods of providing wind hold down resistance for PMDF in tension flange zones will be considered. At least one layer of sheet metal must be provided between the flange and the weld joint.
3. The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.
4. See Span details for cover requirements.

CONSTRUCTION NOTES:

Form sheets must not be permitted to rest directly on the top of beam flanges. Form sheets must be securely fastened to form supports and must have a minimum bearing length of one inch at each end. Form supports must be placed in direct contact with beam flanges.

All attachments must be made by permissible welds, screws, bolts, clips or other means shown on the the forming plans. All sheet metal assembly screws must be installed with torque-limiting devices to prevent stripping. Only welds or bolts must be used to support vertical loads.

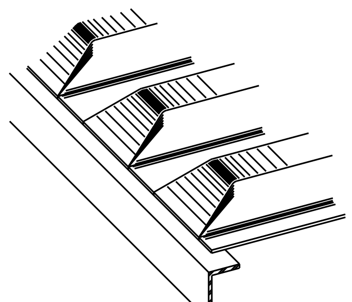
Welding and welds must be in accordance with the provisions of Item 448, "Structural Field Welding", pertaining to fillet welds. All welds must be made by a qualified welder in accordance with Item 448.

All permanently exposed form metal, where the galvanized coating has been damaged, must be thoroughly cleaned and repaired in accordance with Item 445, "Galvanizing". Minor heat discoloration in areas of welds need not be touched up.

Flutes must line up uniformly across the entire width of the structure where main reinforcing steel is located in the flute.

Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.

A sequence for uniform vibration of concrete must be approved by the Engineer prior to concrete placement. Attention must be given to prevent damage to the forms, yet provide proper vibration to prevent voids or honeycomb in the flutes and at headers and/or construction joints.



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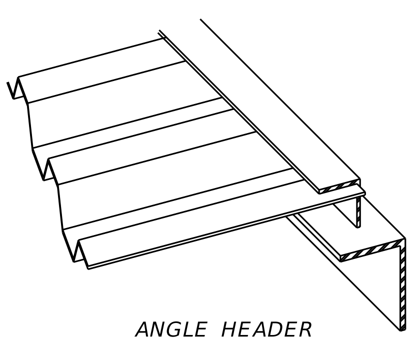

ANGLE HEADER

NOTE: This type is to be used for skewed ends only.

TYPES OF END CLOSURES

GENERAL NOTES:

Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, structural steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.

Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans.

The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.

All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Concrete Superstructures".

Texas Department of Transportation — Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

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©TxDOT	April 2019	CONT	SECT	JOB	HIGHWAY	
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02-20: Modified box note by adding steel beams/girders and subsidiary. 12-21: Updated max deflection for RR.		DIST	COUNTY		SHEET NO.	
		WACO	McLENNAN		1363	

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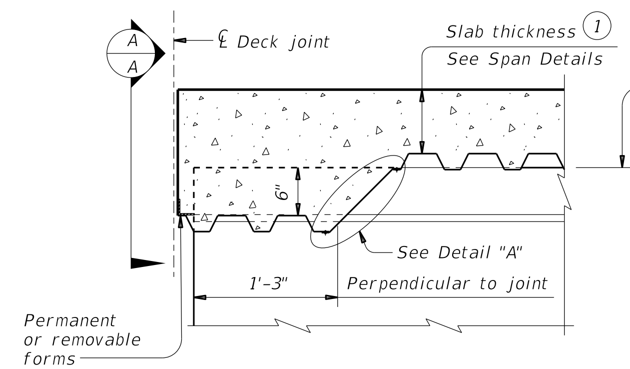
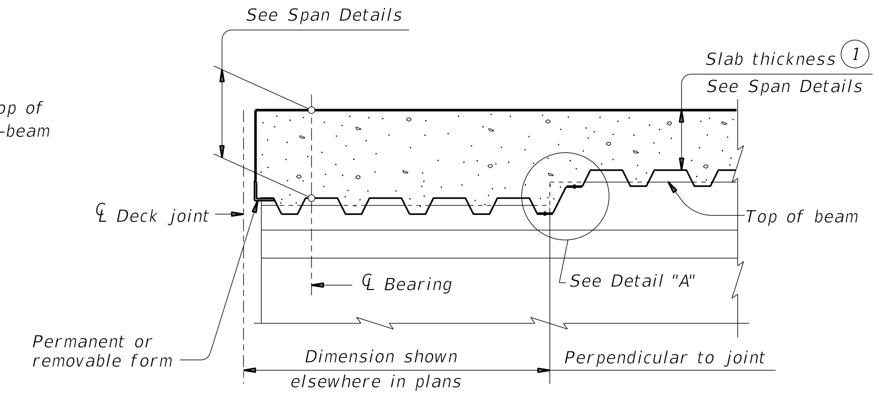
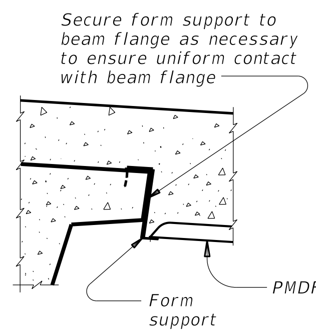


AT THICKENED SLAB END FOR U-BEAMS

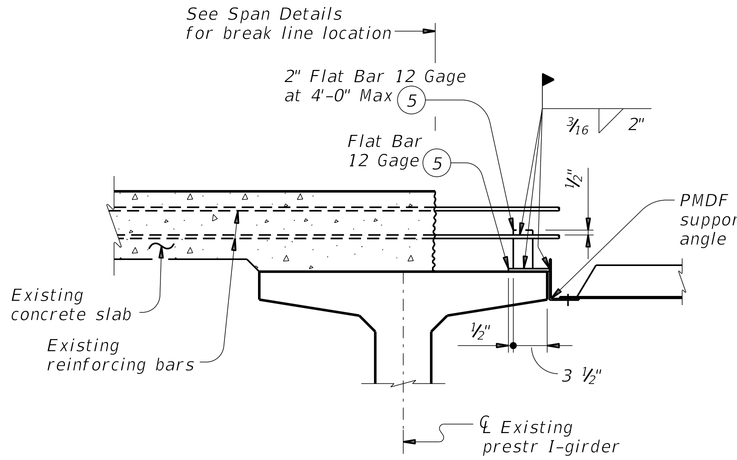


AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS

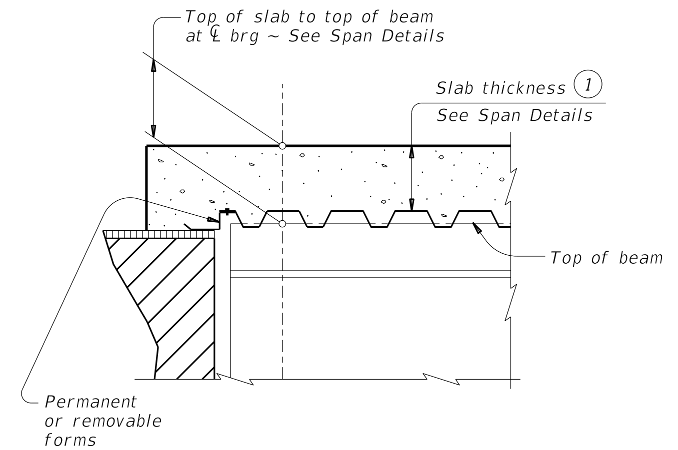
Showing I-beam block-out. No block-out for I-girders or steel beams.



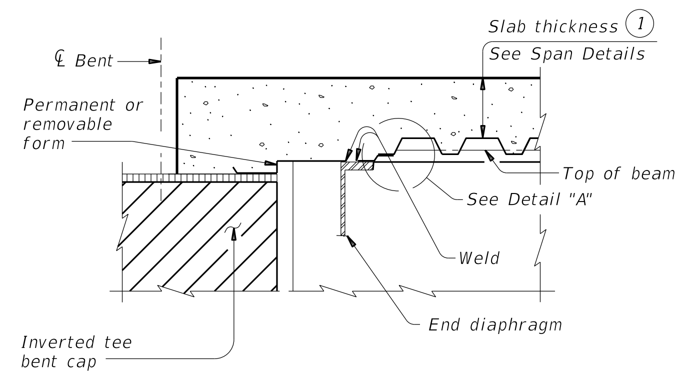
SECTION A-A



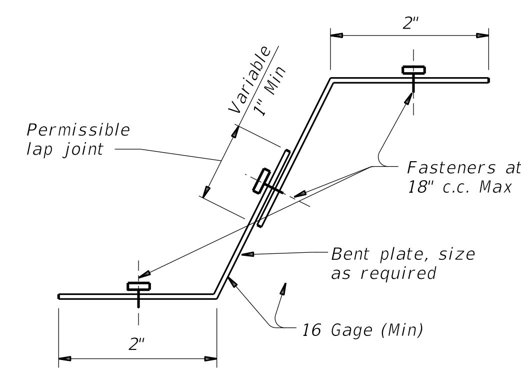
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



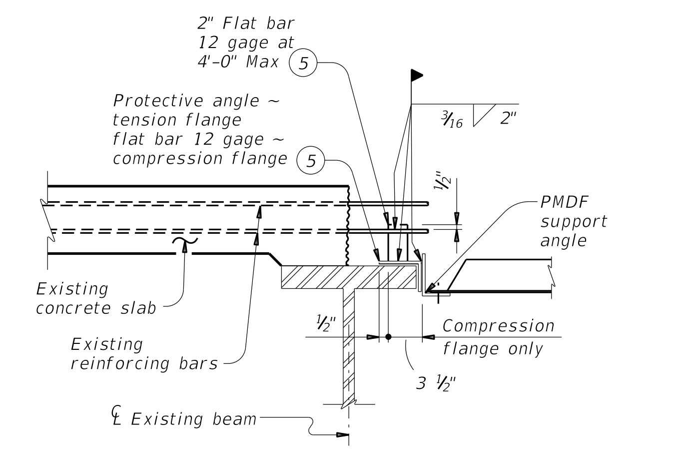
AT SLAB OVER ABUT BKWL OR INV TEE STEM FOR CONC BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INV TEE STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

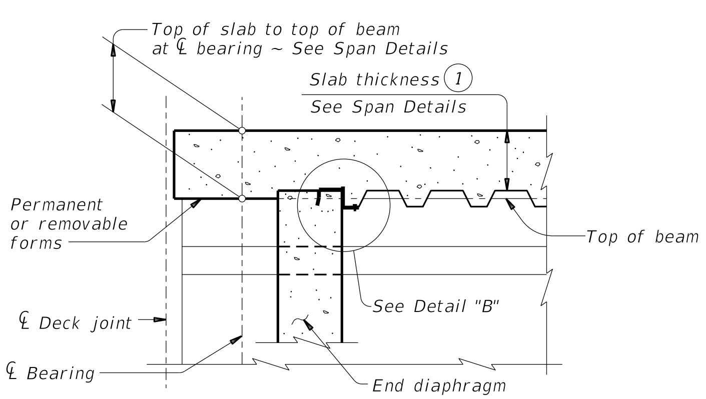


DETAIL "A"

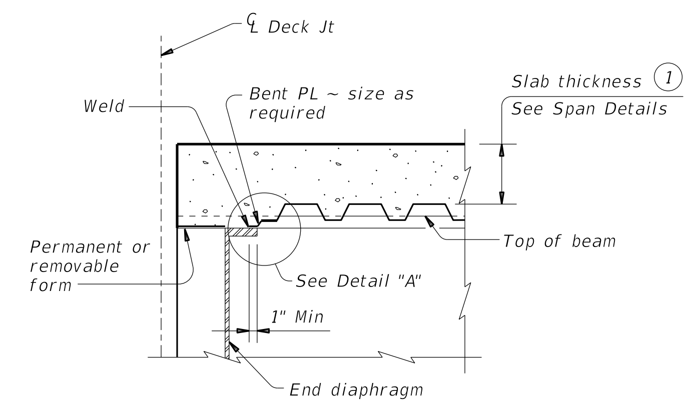


SHOWING STEEL BEAMS

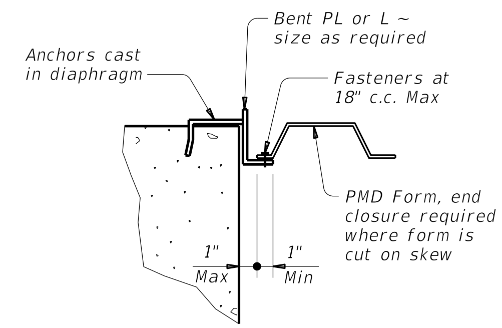
WIDENING DETAILS



AT CONC END DIAPHRAGM FOR PRESTRESSED I-BEAMS AND STEEL BEAMS



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

DETAILS AT ENDS OF BEAMS

1 Slab thickness minus 3/8" if corrugations match reinforcing bars

5 Minimum yield stress of 12 gage bars shall be 40 ksi

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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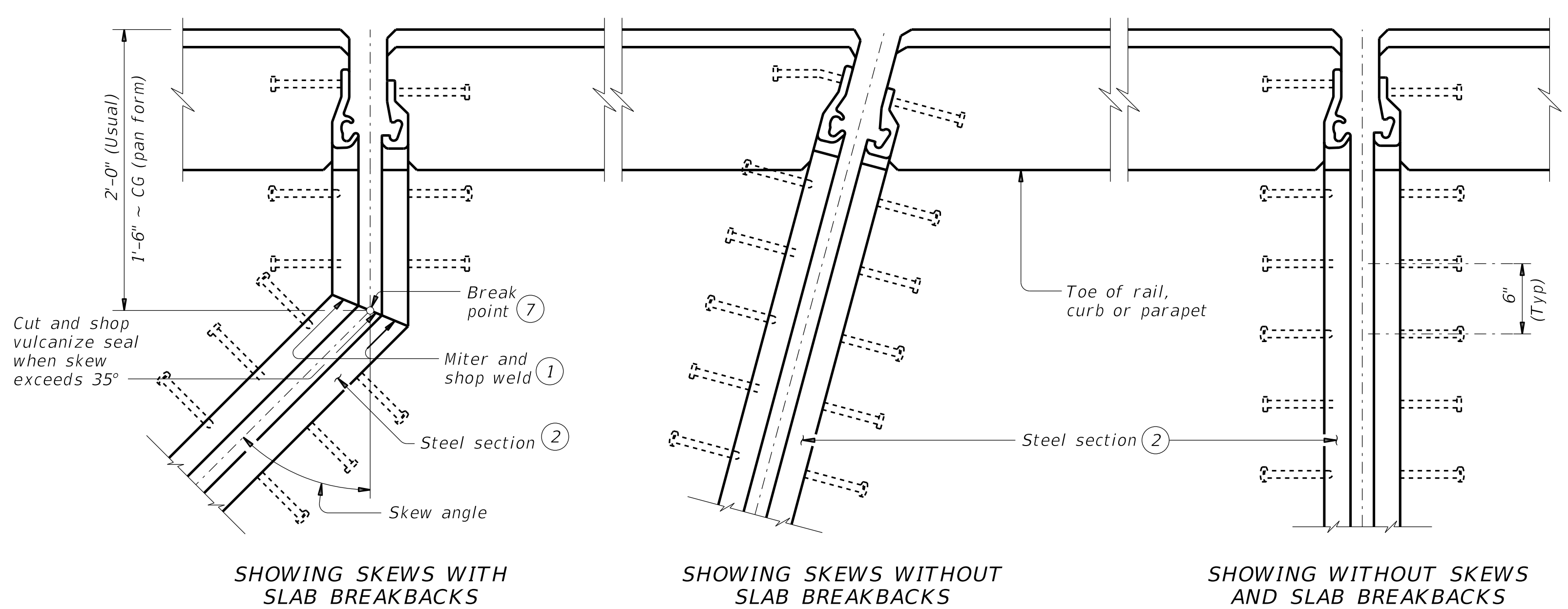
SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

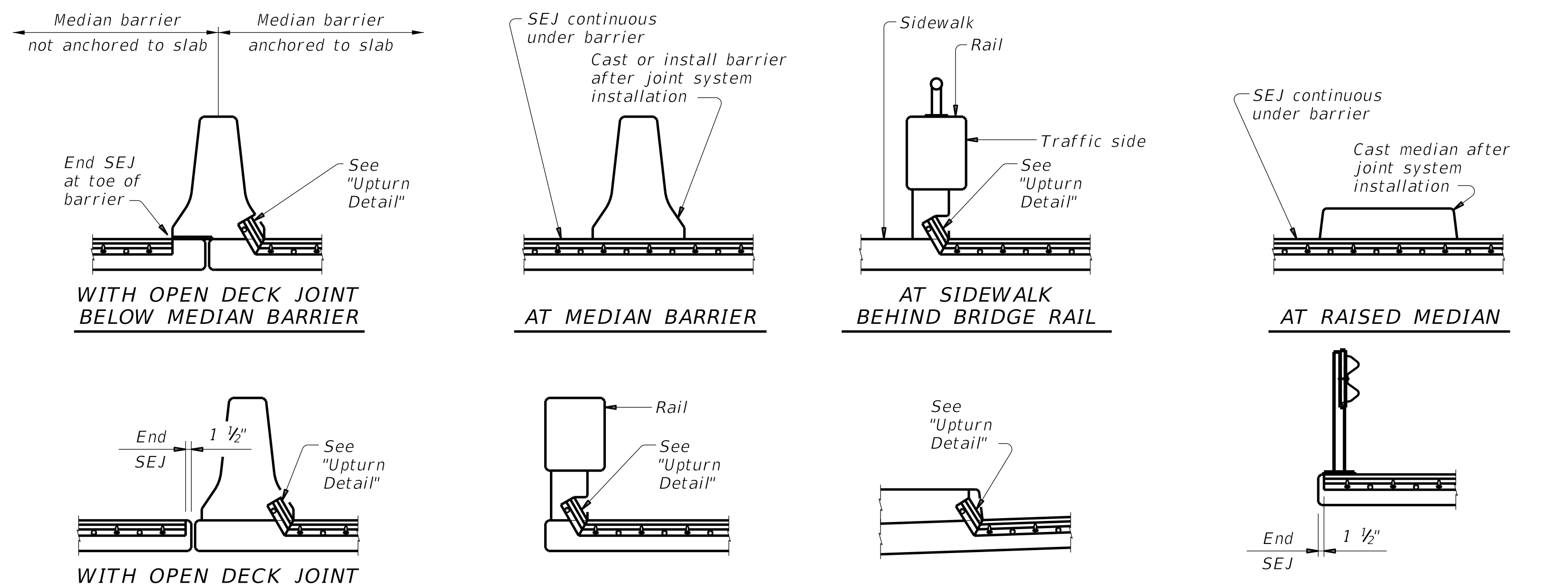
PERMANENT METAL DECK FORMS

PMDF

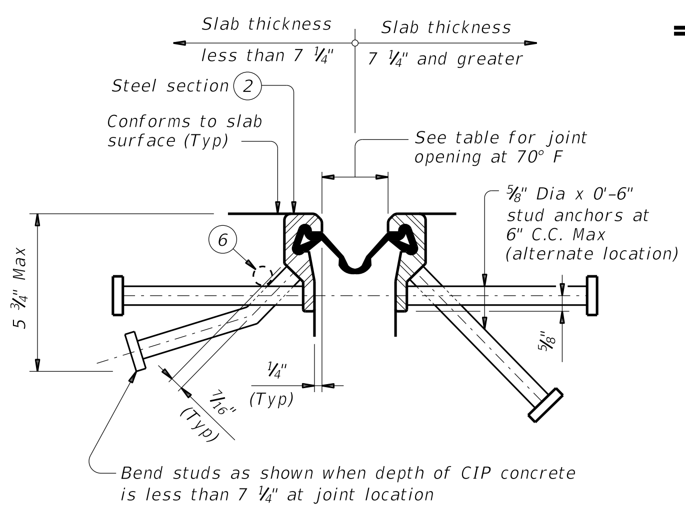
FILE: pmdfste1-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT 0015	SECT 01	JOB 246	HIGHWAY IH 35
REVISIONS: 02-20: Modified box note by adding steel beams/girders and subsidiary. 12-21: Updated max deflection for RR.	DIST WACO	COUNTY McLENNAN		SHEET NO. 1364



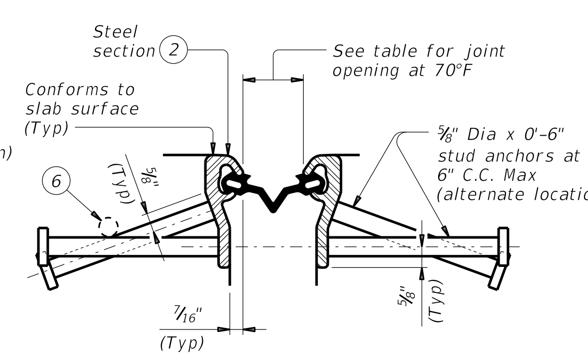
PLANS OF END CONDITIONS



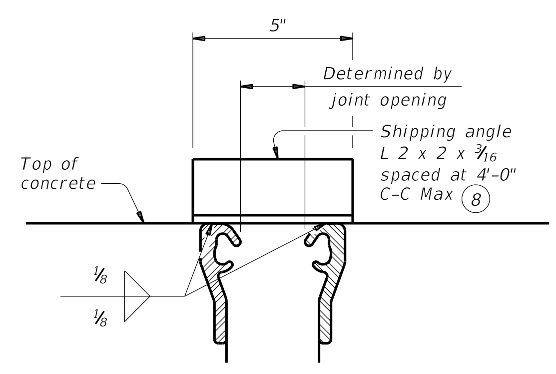
TYPICAL SECTIONS 5



SECTION THRU WATSON BOWMAN ACME (SE-400 OR SE-500) JOINTS



SECTION THRU D.S. BROWN (A2R-400 OR A2R-XTRA) JOINTS



SHOWING D.S. BROWN (Ty SSCM2)
(All joints are similar.) (Studs are not shown for clarity.)

SHIPPING ANGLE

An alternate method of securing joint sections may be used if approved by the Bridge Division. Erection bolts are not allowed.

TABLE OF SEALED EXPANSION JOINT INFORMATION

MANUFACTURER	STEEL SECTION 2	STRIP SEAL			
		4" JOINT		5" JOINT	
		Seal Type	Joint Opening 3	Seal Type	Joint Opening 3
D.S. Brown	Type SSCM2	A2R-400	1 ¾"	A2R-XTRA	2"
Watson Bowman Acme	Type R	SE-400	1 ¾"	SE-500	2"

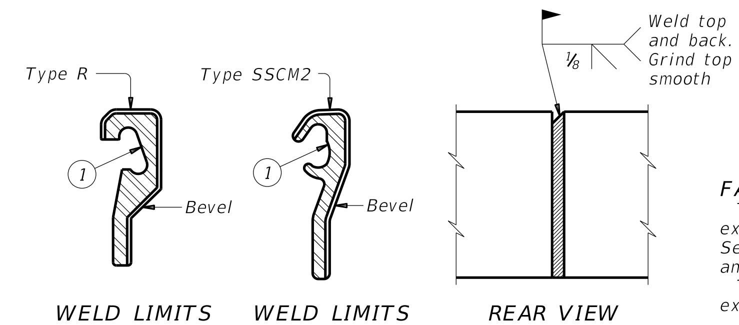
REDUCED LONGITUDINAL MOVEMENT RANGE

SKEW (deg)	JOINT SIZE	
	4"	5"
0	4.0"	5.0"
15	4.0"	5.0"
30	3.5"	4.3"
45	2.8"	3.5"

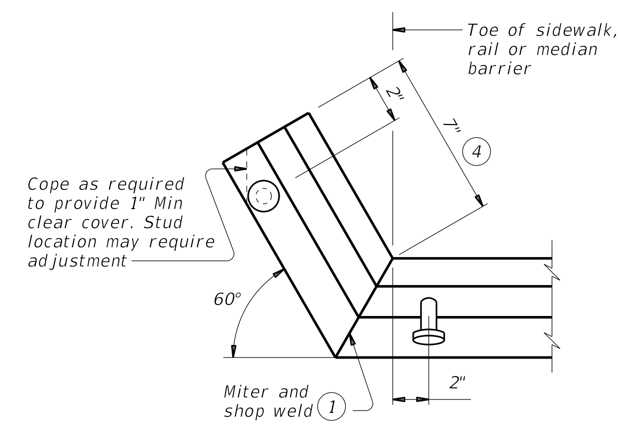
DESIGN NOTES:

Joints installed on a skew have reduced ability to accommodate longitudinal movement. Use table values to determine the correct joint size for skewed installations.
For other skews over 25 degrees, calculate reduced movement range by multiplying joint size by cosine (skew).

1. Remove all burrs which will be in contact with seal prior to making splice.
2. Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.
3. These openings are also the recommended minimum installation openings.
4. Reduce for sidewalk or parapet heights less than 6".
5. Other conditions affecting the joint profile should be noted elsewhere.
6. Move transverse bars that are in conflict with SEJ studs, in either the bridge slab or approach slab, to rest at the junction of the studs.
7. See Span details for location of break point.
8. Align shipping angle perpendicular to joint.



FIELD SPLICE DETAIL



UPTURN DETAIL

FABRICATION NOTES:

Temporarily shop assemble corresponding sections of sealed expansion joints (SEJ), check for fit, and match mark for shipment. Secure corresponding sections together for shipment with shipping angle. Do not use erection bolts.
The seal must be continuous and included in the price bid for sealed expansion joint.
Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max.
Weld studs in accordance with AWS D1.1.
Butt weld all shop and field splices and grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop.
Paint the entire steel section with System II or IV primer in accordance with Item 446, "Feild Cleaning and Painting Steel", unless required to galvanize when shown in the plans. Provide galvanizing in accordance with Item 445, "Galvanizing". Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Item 446.4.7.3 and 446.4.7.4.
Shop drawings for the fabrication of sealed expansion joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

CONSTRUCTION NOTES:

Secure the sealed expansion joint in position and place to the proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for sealed expansion joint.
Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.
Clean and prepare seal cavity for seal installation as per the Manufacturer's installation procedures.

GENERAL NOTES:

Provide sealed expansion joints in the size and at locations shown on the plans.
Minimum slab and overhang thickness required for the use of SEJ-M is 6 ½".

Texas Department of Transportation — Bridge Division Standard

SEALED EXPANSION JOINT TYPE M
WITHOUT OVERLAY

SEJ-M

FILE: sejmste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
	DIST		COUNTY	SHEET NO.
	WACO		McLENNAN	1365

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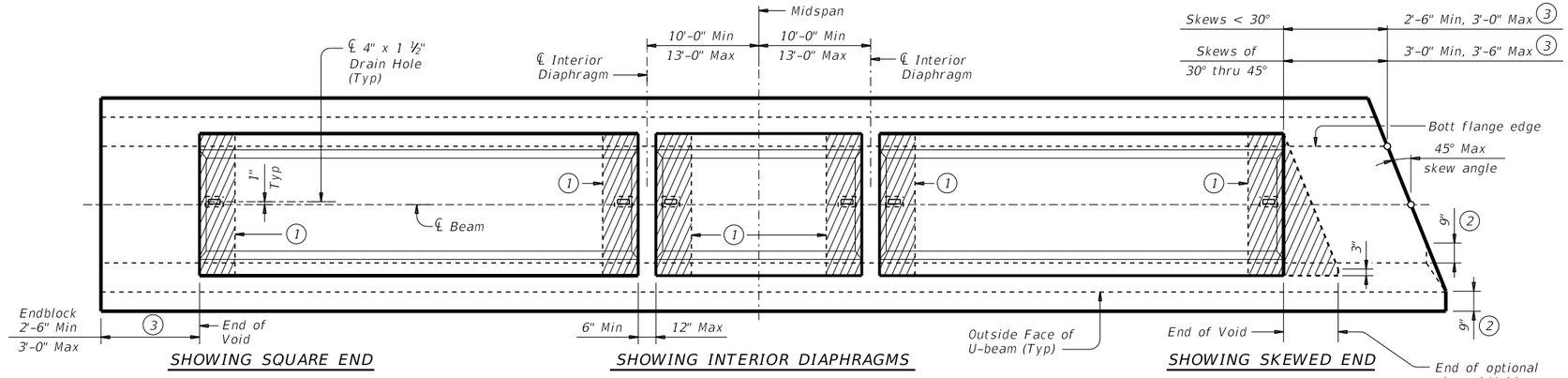
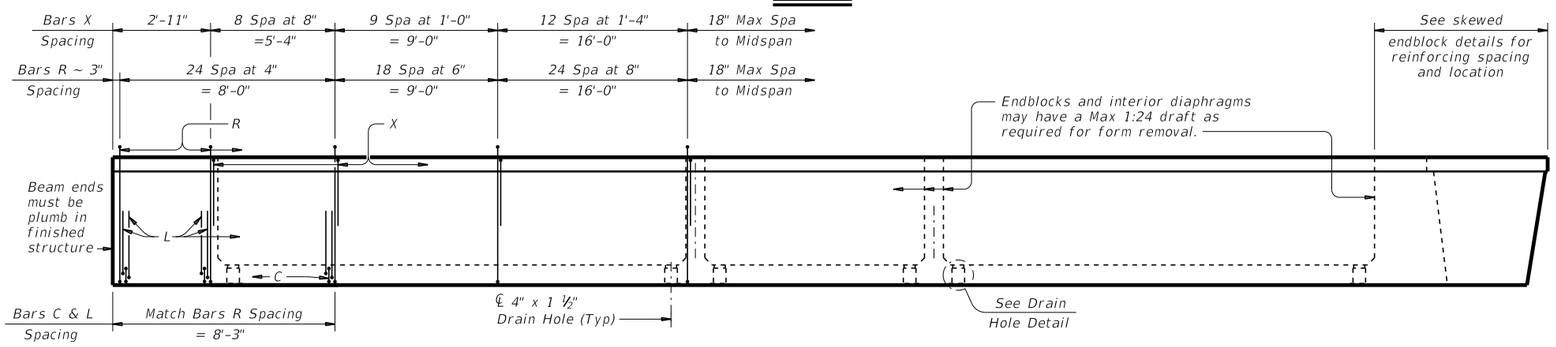
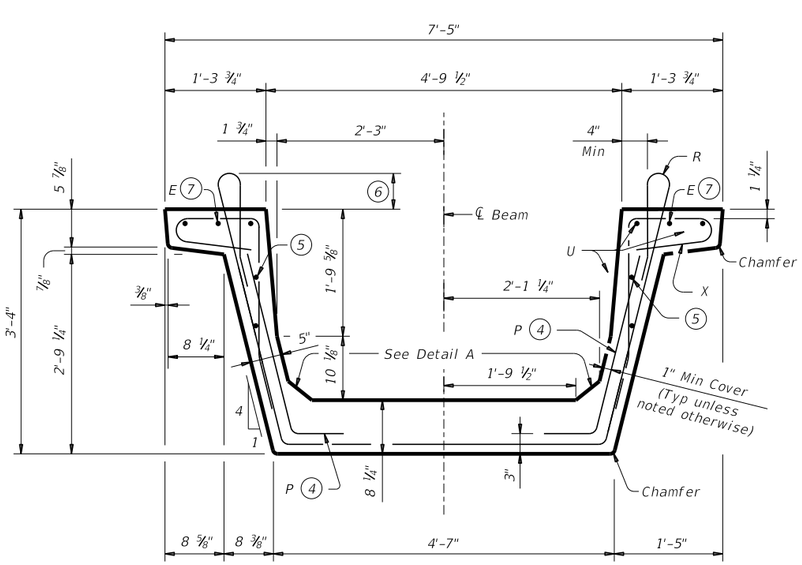


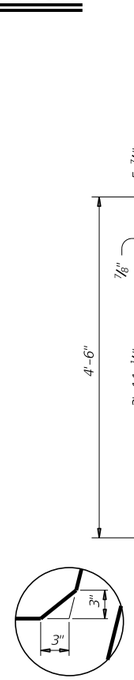
PLAN



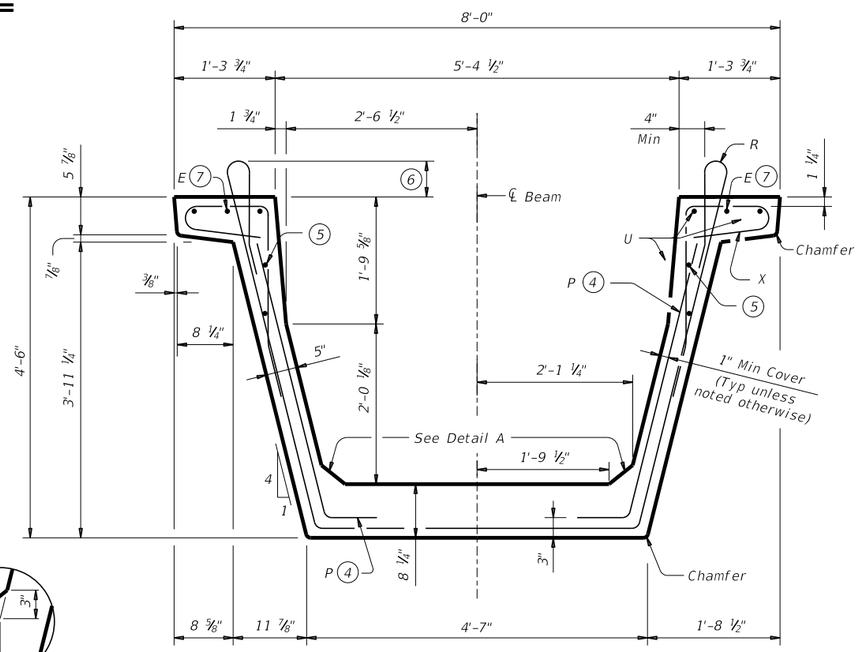
ELEVATION



TYPICAL SECTION - U40

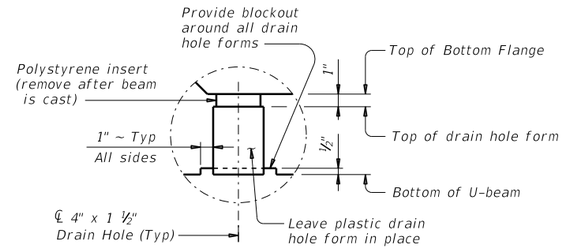


DETAIL A



TYPICAL SECTION - U54

1. Polystyrene may be used at ends of inside forms (12" maximum in length except at optional skewed ends) and left in place. Offset drain holes if not removing polystyrene.
2. For skews greater than 15 degrees, breakback both top and bottom flanges 9" as shown. Provide a smooth transition between top and bottom flange breakbacks. Adjust reinforcement as necessary to maintain minimum clear cover.
3. Minimum and maximum endblock dimensions apply throughout the endblock depth. This dimension control applies to the narrowest portion of endblocks at skewed beam ends.
4. Required for beams that will support cantilevered slab overhang formwork and exterior beams only.
5. Optional Bar U for beams requiring Bars P.
6. 5 ½" for normal Bars R.
   5 ½" – 6 ½" Max for Bars R at skewed beam ends.
7. Provide Bars E (#5 x 15'-0") at beam ends.



DRAIN HOLE DETAIL

Provide ¼" clear between strands and drain hole form.

TABLE OF BEAM SECTION PROPERTIES

Beam Type	Y_t (in.)	Y_b (in.)	Area (in.²)	I (in.⁴)	Weight (plf) (8)
U40	23.66	16.30	979.9	183,108	1021
U54	31.58	22.36	1120.0	403,020	1167

(8) Weights shown assume a concrete density of 150 pcf and are for the typical section only. These weights do not include weight of diaphragms or endblocks.

HL93 LOADING

SHEET 1 OF 3

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE U-BEAM DETAILS

UBD

FILE: ubstds01.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2014 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0015	01	246	IH 35
	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1366

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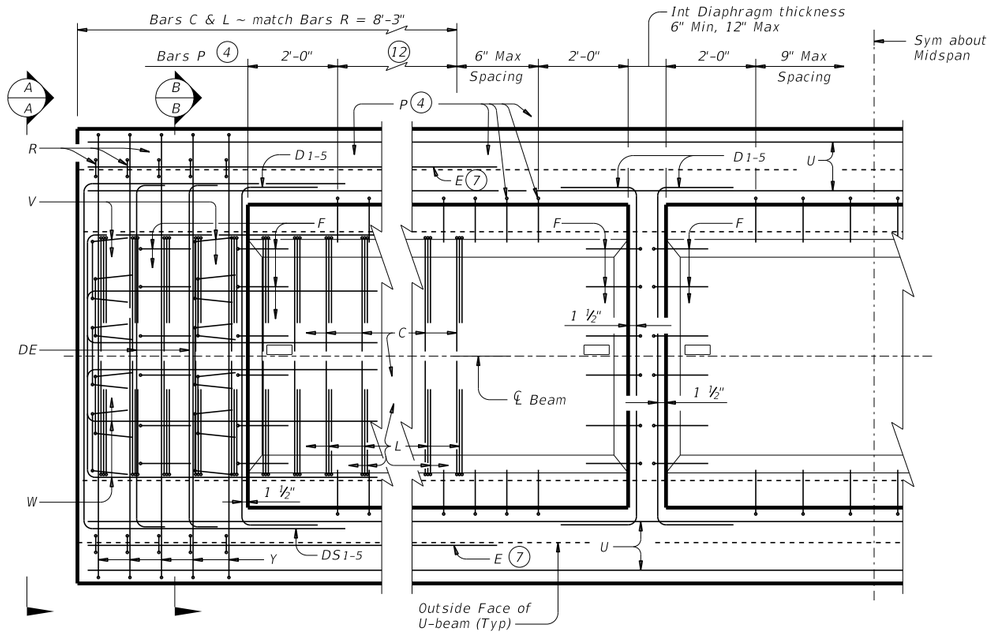
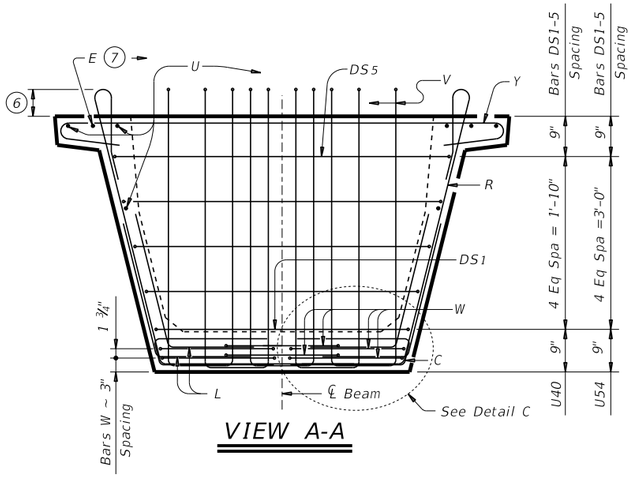
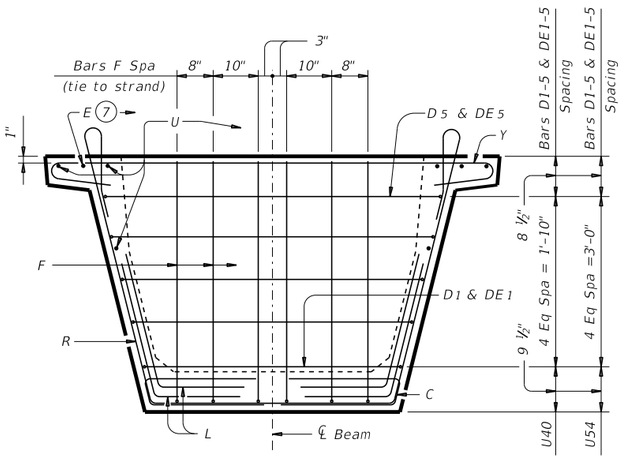


SHOWING SQUARE END SHOWING INTERIOR DIAPHRAGM

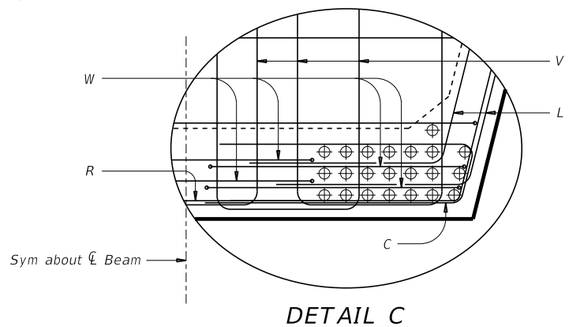
PLAN



VIEW A-A

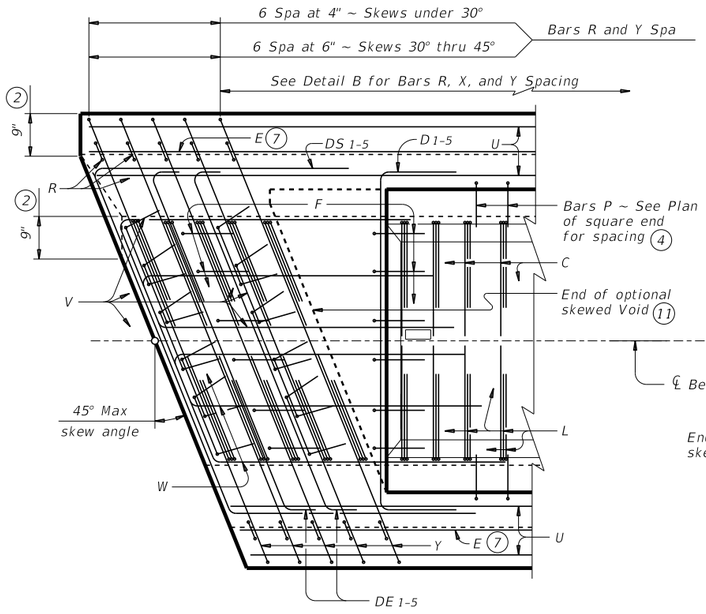


SECTION B-B



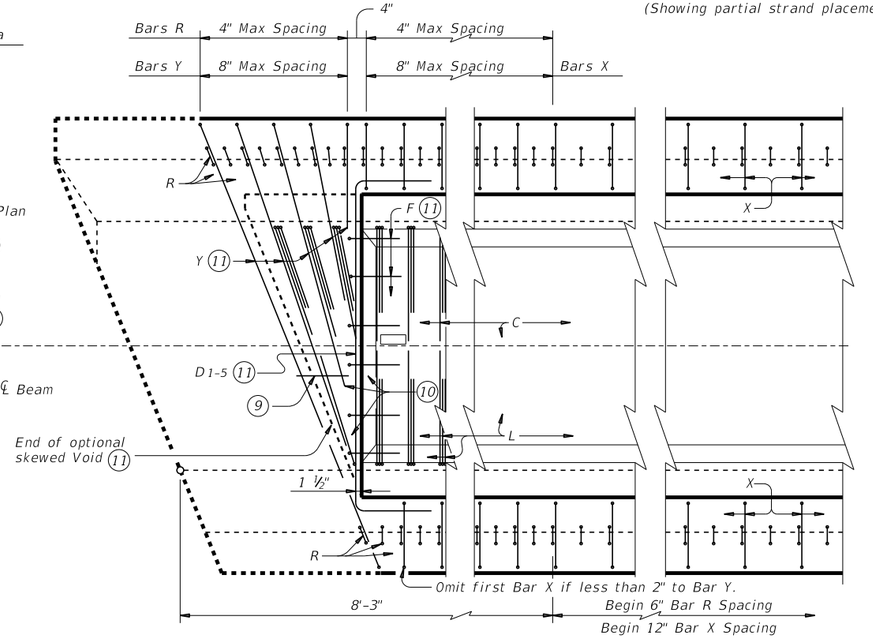
DETAIL C

(Showing partial strand placement)



PLAN ~ SKEWED END

(Skews thru 45°)



DETAIL B

(Bars DE, DS, E, P, U, V and W not shown for clarity)

(2) For skews greater than 15 degrees, breakback both top and bottom flanges 9" as shown. Provide a smooth transition between top and bottom flange breakbacks. Adjust reinforcement as necessary to maintain minimum clear cover.

(4) Required for beams that will support cantilevered slab overhang formwork and exterior beams only.

(6) 5 ½" for normal Bars R.
5 ½" – 6 ½" Max for Bars R at skewed beam ends.

(7) Provide Bars E (#5 x 15'-0") at beam ends.

(9) Add support bars for Bars Y as necessary.

(10) Cut Bars Y and Bars R as necessary to provide 2" clear between adjacent bars.

(11) When fabricating beams using the optional skewed end, replace Bars Y that are shown to be cut with Bars X, adjust location of Bars F, and adjust Bars D1-5 in shape and location. Shop drawings must show details used.

(12) Where Bars P and L overlap, omit one Bar L and place Bar P instead.

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PRESTRESSED CONCRETE U-BEAM DETAILS

UBD

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©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
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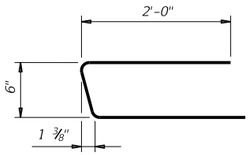
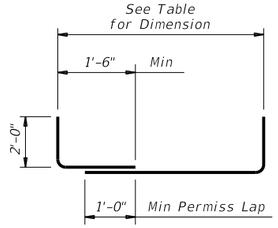
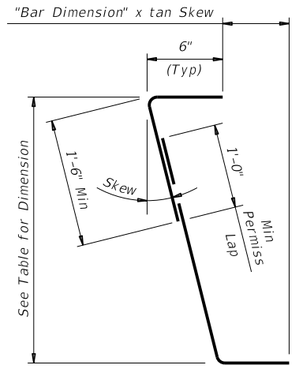


BARS C(#4)



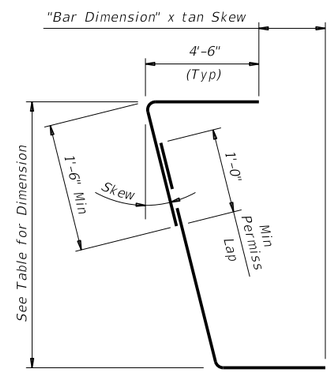
BARS D 1-5 (#4)

BAR D DIMENSION		
Bar	Beam Type	
	U40	U54
D 1	4'-7 ½"	4'-7 ½"
D 2	4'-10 ½"	5'-0"
D 3	5'-1 ½"	5'-4 ½"
D 4	5'-3 ½"	5'-9"
D 5	5'-5"	6'-0 ½"



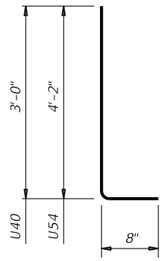
BARS DE 1-5 (#4)

BAR DE DIMENSION		
Bar	Beam Type	
	U40	U54
DE 1	4'-7 ½"	4'-7 ½"
DE 2	4'-10 ½"	5'-0"
DE 3	5'-1 ½"	5'-4 ½"
DE 4	5'-3 ½"	5'-9"
DE 5	5'-5"	6'-0 ½"

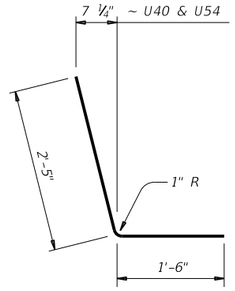


BARS DS 1-5 (#4)

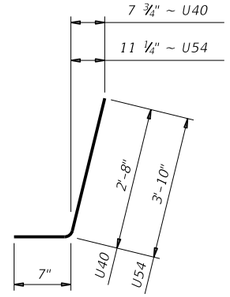
BAR DS DIMENSION		
Bar	Beam Type	
	U40	U54
DS 1	4'-7 ½"	4'-7 ½"
DS 2	4'-10 ½"	5'-0"
DS 3	5'-1"	5'-4"
DS 4	5'-3"	5'-8 ½"
DS 5	5'-4 ½"	6'-0"



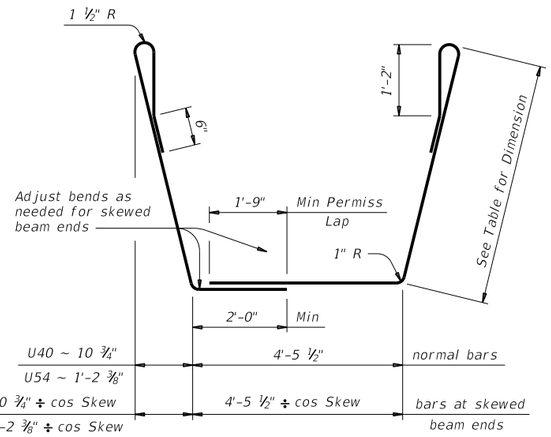
BARS F(#4)



BARS L(#5)

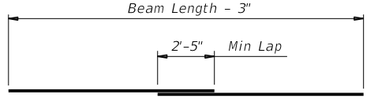


BARS P(#4)



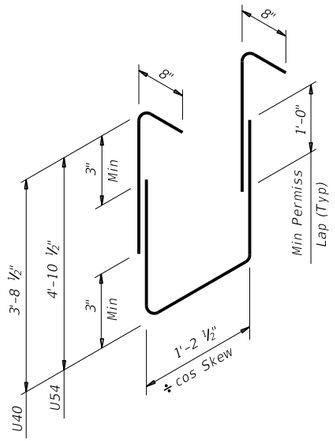
BARS R(#4)

BAR R DIMENSION		
Skew Angle	Beam Type	
	U40	U54
0° thru 15°	3'-9 ¾"	5'-0"
15° thru 30°	3'-10"	5'-0 ½"
30° thru 45°	3'-10 ¾"	5'-1 ½"

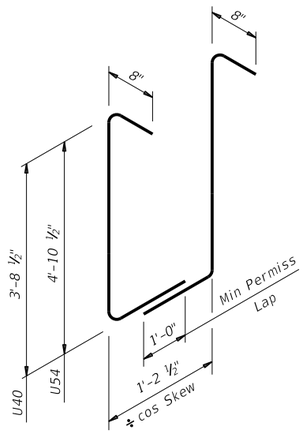


BARS U(#5)

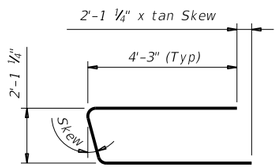
Bars U may be placed with multiple segments, provided no segment is less than 10 ft in length and 40 ft Min C-C splices.



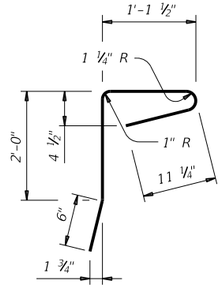
BARS V(#4) ~ Option 1
(ISOMETRIC VIEW)



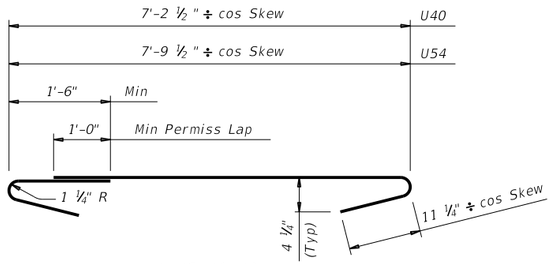
BARS V(#4) ~ Option 2
(ISOMETRIC VIEW)



BARS W(#4)



BARS X(#4)



BARS Y(#4)

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Details are provided for skew angles up to 45 degrees.
Shop drawings can be prepared with horizontal skews rounded to nearest ¼ degree and beam end vertical batter rounded to the nearest ⅛". These shop drawing tolerances are in addition to the fabrication tolerances listed in Item 424, "Precast Concrete Structural Members (Fabrication)".

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

FABRICATION NOTES:

Provide Class H concrete.
Provide Grade 60 reinforcing steel. An equal area of deformed welded wire reinforcement, (WWR) (ASTM A1064), may be substituted for Bars L, P, R, X and Y.
Chamfer all acute corners for skews over 20 degrees. Provide ¾" chamfer or 1 ⅜" radius at all corners noted to require a chamfer.
Horizontal form joints on exterior forms are not permitted.
Refer to standard to UBEB for embedded plate cast in beam end when bearing pad taper exceeds 5 percent, roadway cross-slope exceeds 5 percent, or otherwise required in plans.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE U-BEAM DETAILS

UBD

FILE: ubstds01.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1368

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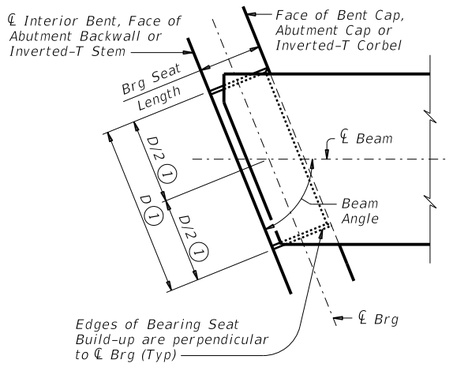
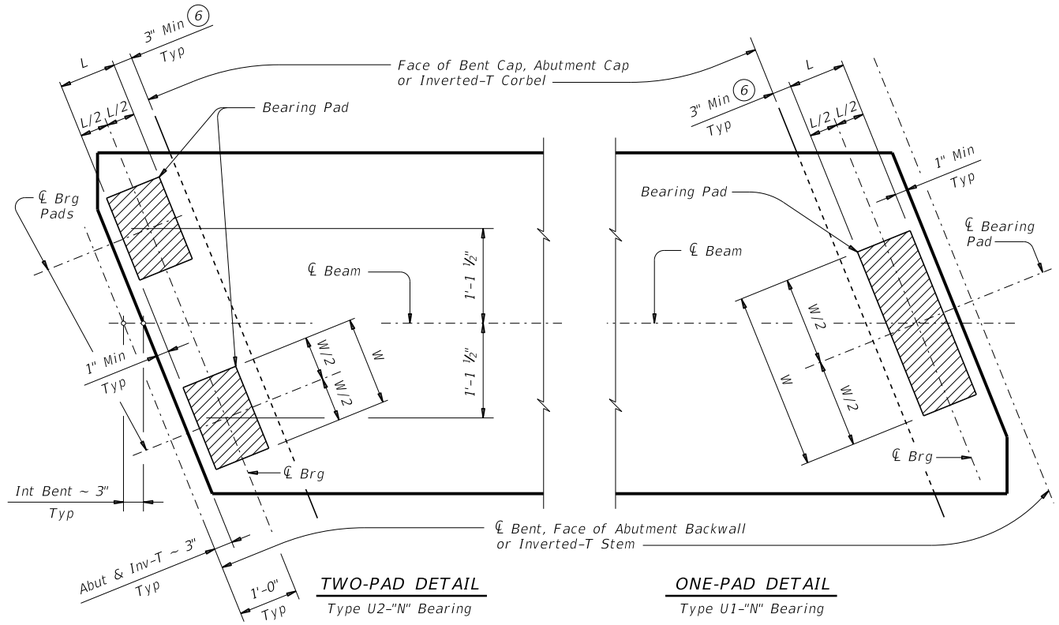


BEARING SEAT DIMENSION "D" (2)	
BEAM ANGLE	"D"
75° + thru 90°	4'-6"
60° + thru 75°	5'-0"
45°thru 60°	5'-6"

BEARING SEAT DIMENSIONS

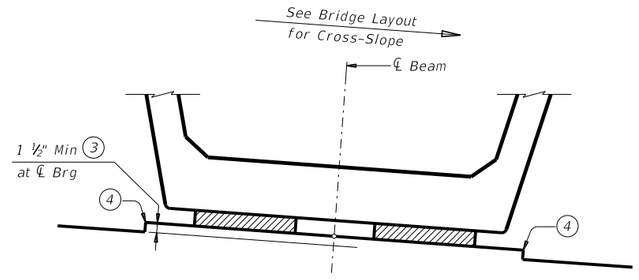


TWO-PAD DETAIL
Type U2-"N" Bearing

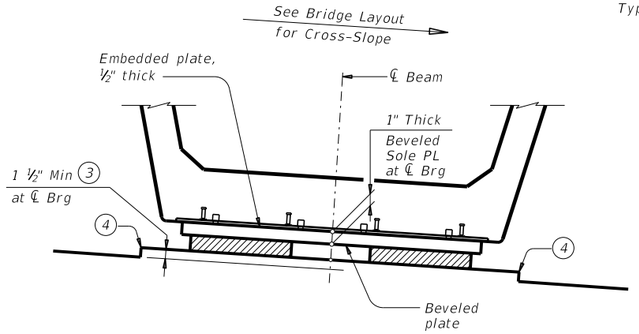
ONE-PAD DETAIL
Type U1-"N" Bearing

BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

Place one bearing pad at forward station beam end.
Place two bearing pads at back station beam end.



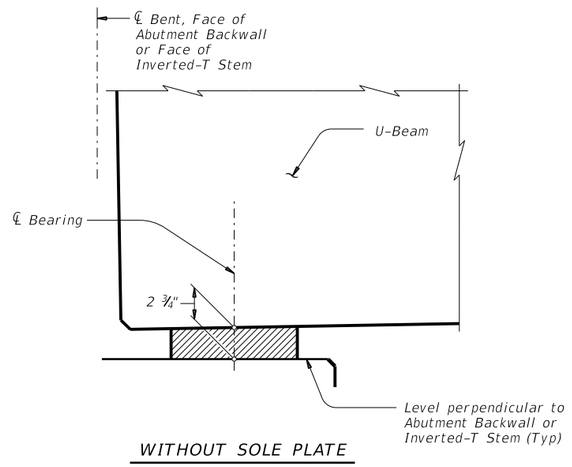
CROSS-SLOPE 5 PERCENT AND LESS AND LONGITUDINAL SLOPE 5 PERCENT AND LESS (5)
Sole Plate not required



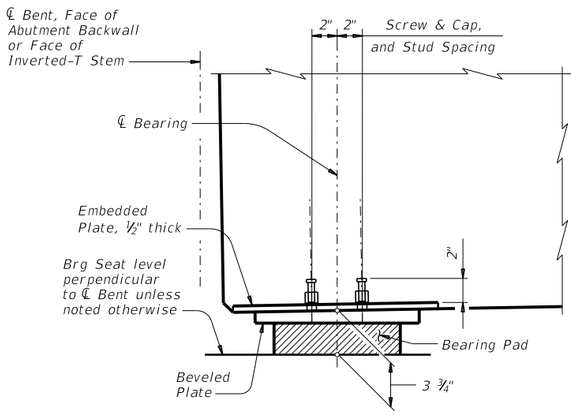
CROSS-SLOPE OVER 5 PERCENT OR LONGITUDINAL SLOPE OVER 5 PERCENT (5)
Sole Plate required

TYPICAL SECTIONS

Showing two pad end, one pad end similar



WITHOUT SOLE PLATE



WITH SOLE PLATE

SHOWING SIDE ELEVATION AT BEAM END

(1) Measured along ℄ of Bearing.

(2) Unless noted otherwise in the plans.

(3) Reinforce bearing seat build-ups greater than 3" high with #4 bars at 12" Max Spa as per Item 420, "Concrete Substructures".

(4) See elsewhere in plans for right and left elevations and locations.

(5) Longitudinal slope is defined as bearing pad taper as shown in Bearing Pad Taper Report.

(6) With or without sole plate.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

ELASTOMERIC BEARING AND BEAM END DETAILS

PRESTR CONC U-BEAMS

UBEB

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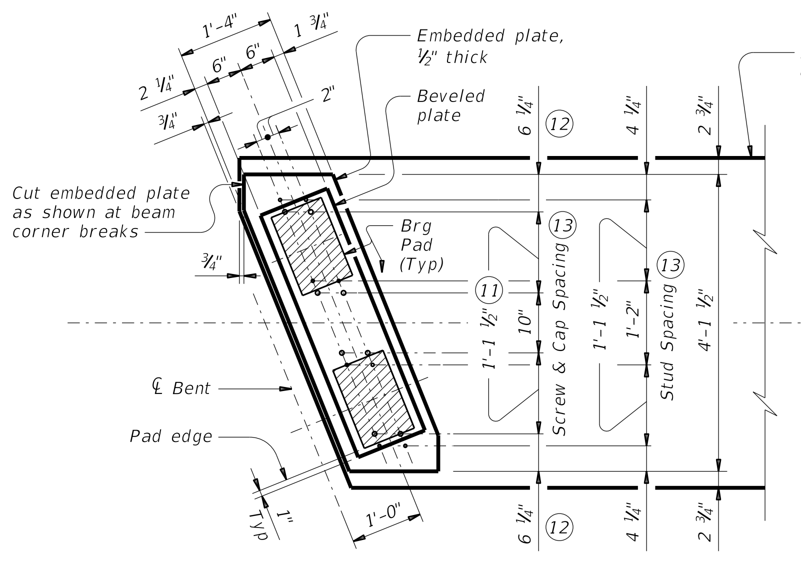
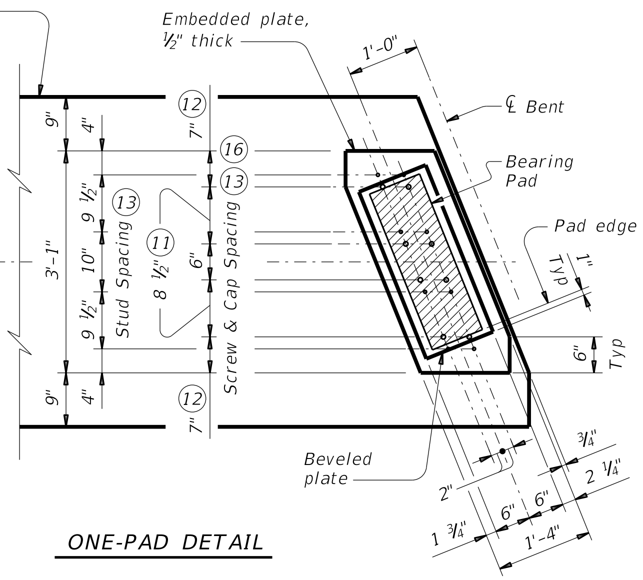
	WACO	McLENNAN		1369



TWO-PAD DETAIL



ONE-PAD DETAIL

PLAN VIEW OF SOLE PLATE DETAILS

Provide ½" Dia x 2" headed studs and ¾" Dia screws. Electric-arc end weld studs to embedded plate with complete fusion.

(7) Locate permanent mark here.

(8) Use beveled sole plate if required bearing pad taper exceeds 5 percent or if cross-slope on span exceeds 5 percent.

(9) Place 0.105" thick steel laminates parallel to the bottom surface of the pad, except the top laminate(s) may be sloped to satisfy maximum and minimum thickness criteria for tapered elastomeric layers.

(10) Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in ⅛" increments) in this mark.
Examples: N=0, (for 0" taper)
N=1, (for ⅛" taper)
N=2, (for ¼" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan bearing pad taper by more than $\left(\frac{0.0625"}{Length}\right)$ (IN/IN).

(11) Decrease by 2" for skews 30° and over.

(12) Increase by 2" for skews 30° and over.

(13) Stud and screw locations may be adjusted slightly to locate them between strand positions.

(14) Bevel to the slope listed in the Bearing Pad Taper Report.

(15) Accommodates bevels up to 0.085 ft per foot.

(16) Omit screws within 1" of beveled plate edge.

GENERAL NOTES:

Shop drawings for approval are required and must include a bearing pad layout which identifies location and orientation of all bearing pads. Permanently mark each bearing pad in accordance with the bearing pad layout. Provide a copy of the bearing pad layout to the Engineer.

Finish Bearing Surface with a wood float finish. Bearing Surface must be clean and free of all loose material before placing Bearing Pads.

For Transition Bents with backwall, the beams and bearing pads must receive the same treatment as shown for Abutments.

See Bearing Pad Taper Report sheet for Fabricator's Report of bearing pad taper.

Cost of furnishing and installing bearing pads, including beveled and embedded steel plates, is included in unit price bid for "Prestressed Concrete U-Beams".

SOLE PLATE NOTES:

Provide constant thickness bearing pads with beveled and embedded steel sole plates in accordance with these details if the required bearing pad taper exceeds 5 percent, if the roadway cross-slope exceeds 5 percent or if otherwise required in the plans. Provide for all beams in the span.

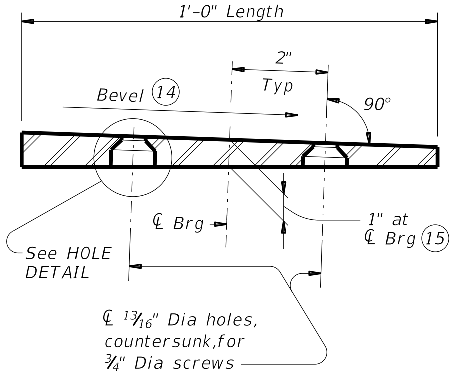
On the shop drawings, dimension sole plates to the nearest ¹⁄₁₆" based on required thickness at centerline of bearing and required bevel. Thickness tolerance variation from the approved shop drawings is ¹⁄₁₆" +/-, except variation from a plane parallel to the theoretical top surface can not exceed ¹⁄₁₆" total. Bearing surface tolerances listed in Item 424 apply to embedded and beveled plates.

Steel plate must conform to ASTM A 36, A 572 Gr 50, or A 709 Gr 36 or Gr 50. Hot dip galvanize both the embedded plate and beveled sole plate after fabrication. Seal weld caps to embedded plate before galvanizing.

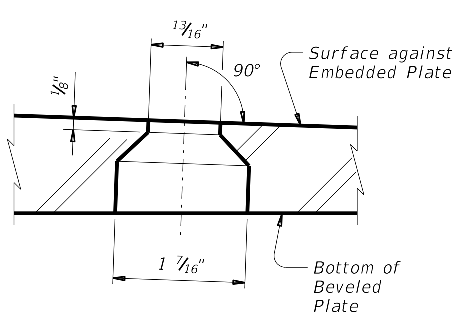
Tap threads in the embedded plate only. Drill and tap prior to galvanizing.

¾" Dia screws must be electroplated, socket flat head countersunk cap screws conforming to ASTM F 835. Electroplating must conform to ASTM B 633, SC 2, Type I. Provide screws long enough to maintain a ¾" minimum embedment into the embedded plate and galvanized cap. Provide galvanized steel caps (16 ga Min) with a nominal 1" inside diameter and deep enough to accommodate the screws, but not less than ½" deep or deeper than 1".

Install beveled sole plates prior to shipping beams. Installed screw heads must not protrude below the bottom of the beveled plate.

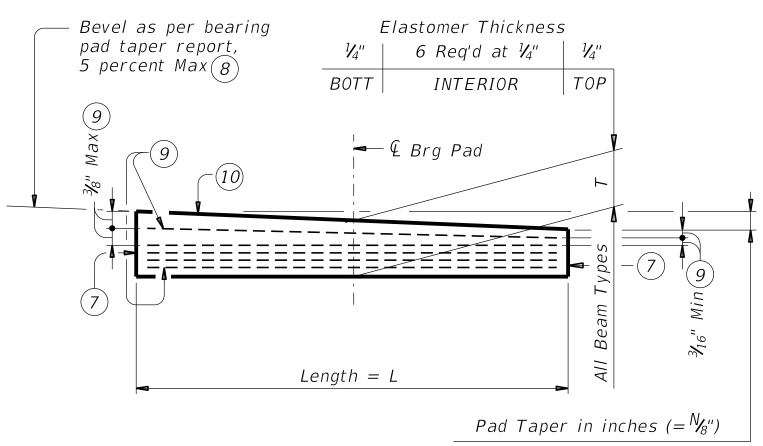


SECTION



HOLE DETAIL

BEVELED PLATE DETAILS



LAMINATED ELASTOMERIC BEARING PAD

(50 DUROMETER)

TABLE OF BEARING PAD DIMENSIONS

Beam Type	One-Pad (Ty U1-"N") (10)			Two-Pad (Ty U2-"N") (10)		
	W	L	T	W	L	T
U40	24"	9"	2 ¾"	12"	9"	2 ¾"
U54	32"	9"	2 ¾"	16"	9"	2 ¾"

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

ELASTOMERIC BEARING AND BEAM END DETAILS
PRESTR CONC U-BEAMS

UBEB

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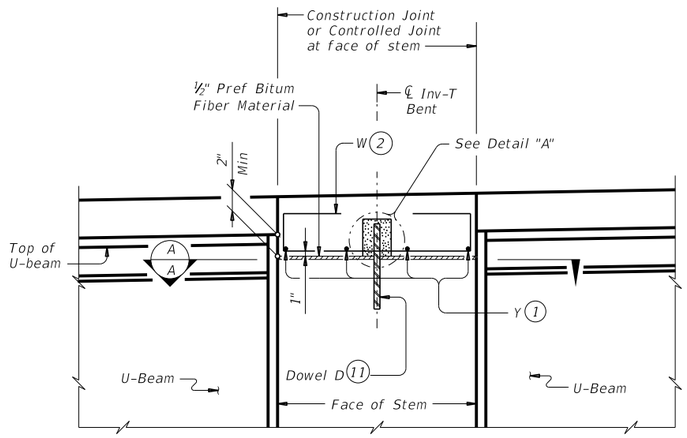
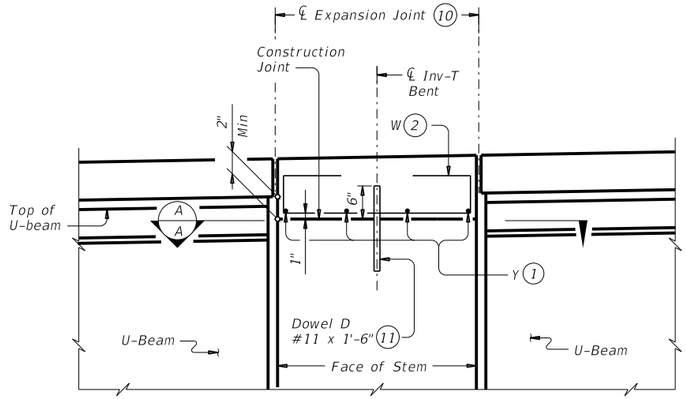


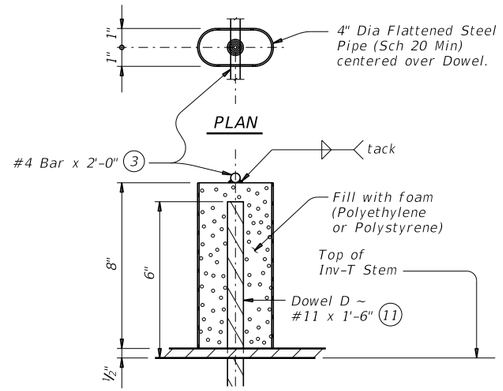
SHOWING CONST JTS OR CONTROLLED JTS



SHOWING EXPANSION JOINTS

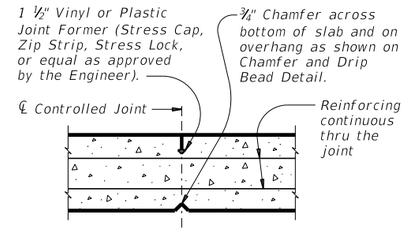
REINFORCEMENT OVER INVERTED-T BENT

Slab reinforcement not shown for clarity.



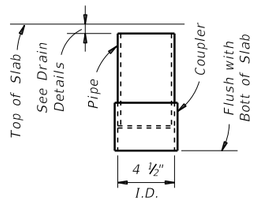
ELEVATION

DETAIL "A"

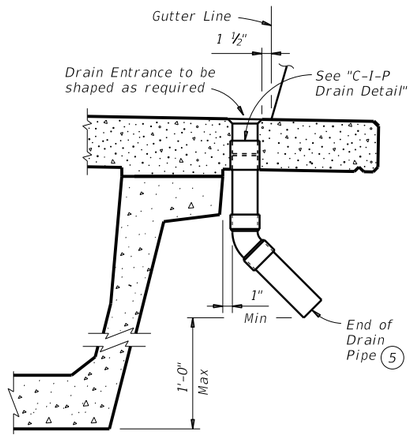


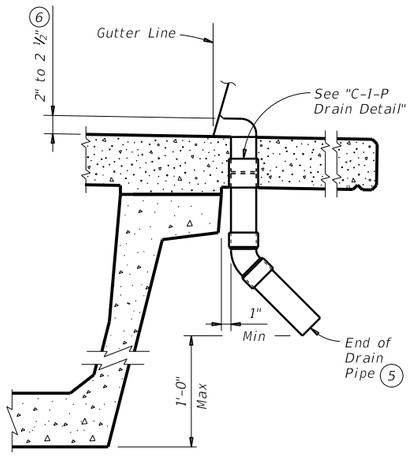
CONTROLLED JOINT DETAIL

(Saw-cutting is not allowed)

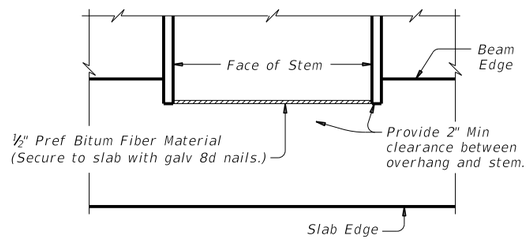


C-I-P DRAIN DETAIL (4)



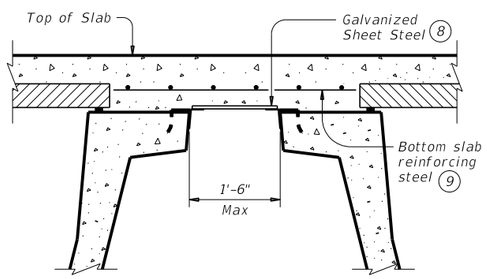


DRAIN DETAILS (7)



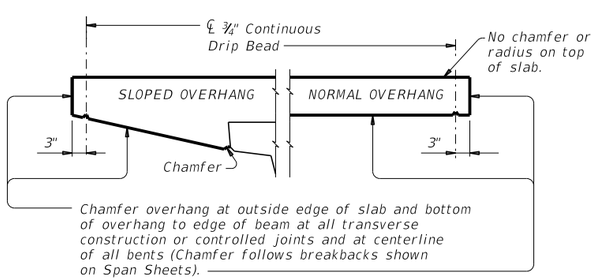
SECTION A-A

Applies to sloped overhang only

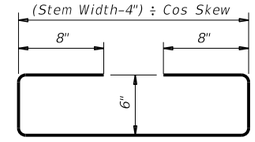


PERMISSIBLE SLAB FORMING DETAIL

See standard PMDF for connection details



CHAMFER AND DRIP BEAD DETAIL



BARS W(#4)

1. Space Bars Y (#4) at 12" Max. Use 2" end cover. Number of Bars Y must satisfy spacing limit. Place parallel to bent.
2. Space Bars W at 12" Max (3" from end of cap). Tilt if necessary to maintain cover requirements. Place parallel to longitudinal slab reinforcement.
3. Field bend #4 Bars and tie securely to slab steel.
4. Roughen outside of PVC with coarse rasp or equal to ensure bond with cast-in-place concrete.
5. Water must not be discharged onto beams.
6. Form Drain Entrance in Rail or Sidewalk.
7. Provide 4" diameter (Sch 40) PVC for all drain pipe and fittings. See Item 481 "Pipe for Drains" for pipe, connections and solvent welding. Bend reinforcing steel to clear PVC 1". Drain length and location will be as directed by the Engineer. No drains will be permitted over roadways or railways, or within 10'-0" of Bent Caps. Degrease outside of exposed PVC, apply acrylic water base primer, then coat with same surface finishing material as used for outside beam face. Variations of the above designs, as required for the type of rail used and its location on the structure, may be installed with the approval and direction of the Engineer.
8. Galvanized sheet steel can be used to form the slab when clear distance between beams is 1'-6" and less. All requirements for permanent metal deck forms shown on standard PMDF apply.
9. Bottom slab reinforcing for Permissible Slab Forming Detail must match the size and spacing of the top mat of steel as shown on the span details unless otherwise noted, except bottom reinforcing steel must be #5 bars. Transverse bottom slab reinforcing must have 1" end clear to edge of panel when used with PCP option.
10. See Layout for Joint Type.
11. Dowel D (#11) spaced at 5 ft Max. See Inverted-T Bents for quantity and location.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

CONSTRUCTION NOTES:
All items (reinforcing steel, drains, joint formers, etc.) shown on this sheet are subsidiary to other bid items.

Texas Department of Transportation

Bridge Division Standard

MISCELLANEOUS SLAB DETAILS
PRESTR CONC U-BEAM SPANS

UBMS

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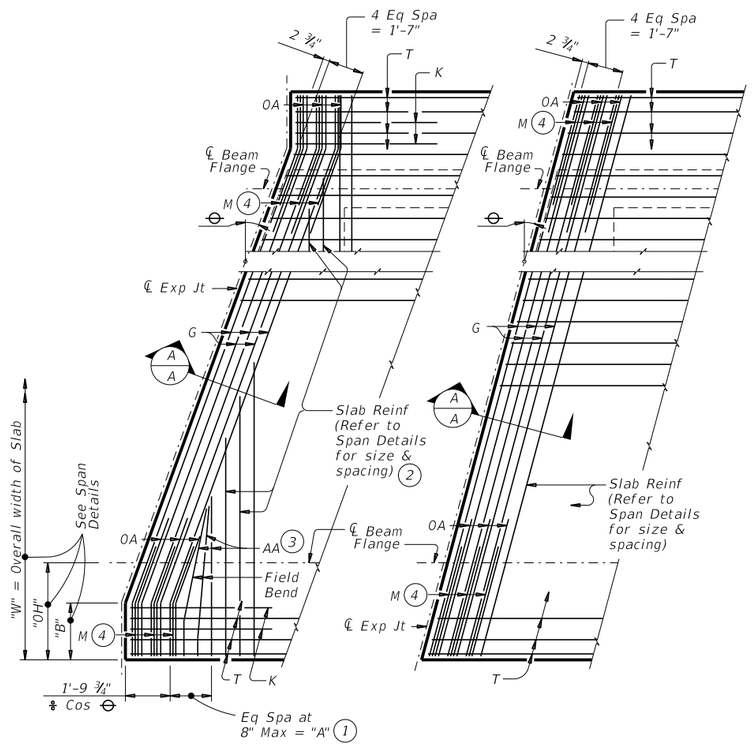
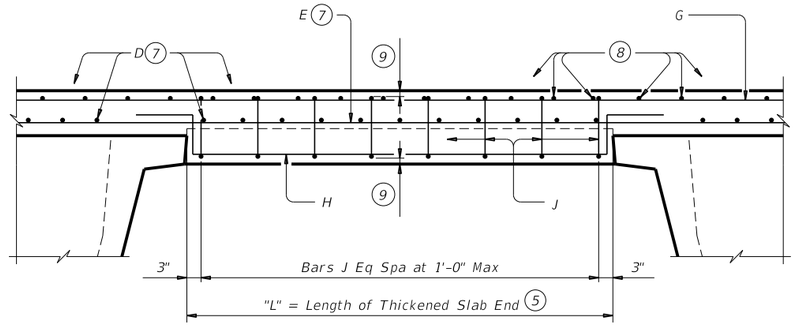


WITH BREAKBACK

WITHOUT BREAKBACK

PARTIAL PLAN

(Showing top reinforcing steel only unless noted otherwise)



TYPICAL TRANSVERSE SECTION

(1) "A"= ("OH" + 2.125' + $\frac{0.052'}{\sin \ominus}$ -"B") x Tan $\ominus$

(2) End the top transverse reinforcement steel at inside Bar G. End the bottom transverse reinforcement steel 1'-0" beyond inside Bar G.

(3) Bars AA (Top & Bott)

(4) Place 3 Bars M (Bott) at 10" Max. Field bend as necessary. Substitute Bars Z1 for Bars M when sloped overhangs are required. Bars Z1 are shown on standard PCP.

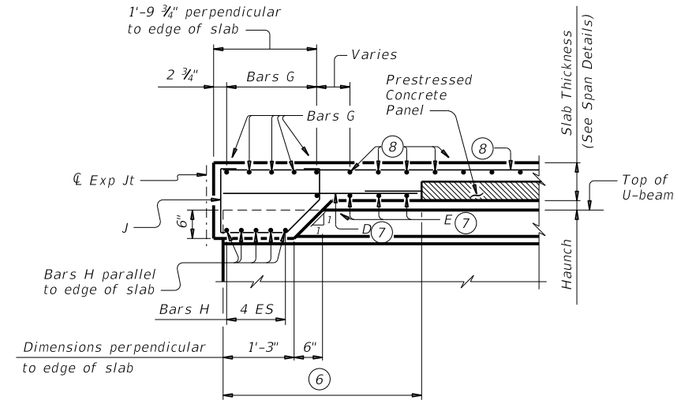
(5) Thickened slab end not required for lengths less than 1'-6".

(6) See standard PCP for panel placement.

(7) See standard PCP for Bars D and E.

(8) See Span Details for reinforcement size and spacing.

(9) Provide clear cover as shown on Span Details.



SECTION A-A

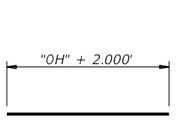
GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Use these details in conjunction with the Span Details and standard PCP (if prestressed concrete panels are used).
When Option 2 from standard PCP is used, provide Bars AA, G, K and OA in the slab.

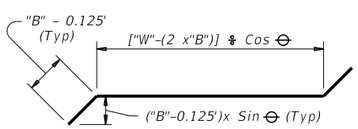
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

CONSTRUCTION NOTES:

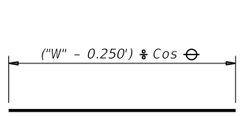
Provide Grade 60 reinforcing steel.
If slab reinforcing steel is shown on the Span Details to be epoxy coated, then Bars AA, G, K, H, J and M must be epoxy coated.
Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-5"
Epoxy Coated ~ #4 = 2'-1"



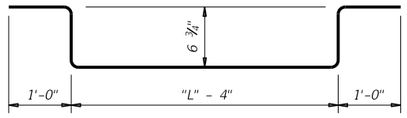
BARS AA (#5)



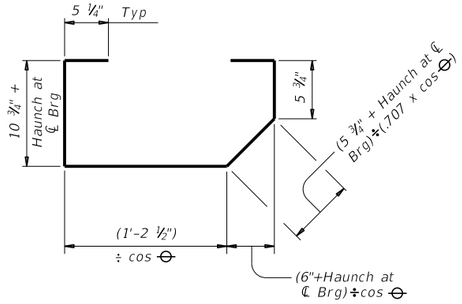
BARS G (#4)
(For Slabs With Breakbacks)



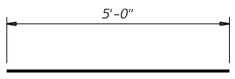
BARS G (#4)
(For Slabs Without Breakbacks)



BARS H (#6)



BARS J (#4)



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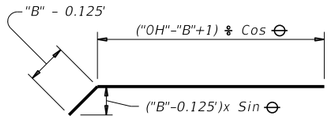
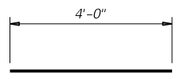
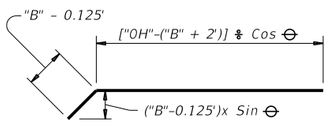


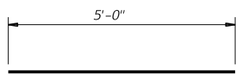
BARS M (#4)
(For Slabs With Breakbacks)



BARS M (#4)
(For Slabs Without Breakbacks)



BARS OA (#5)
(For Slabs With Breakbacks)



BARS OA (#5)
(For Slabs Without Breakbacks)

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

THICKENED SLAB END DETAILS
PRESTR CONC U-BEAM SPANS

UBTS

FILE: ubstde05.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	01	246	IH 35
	DIST	COUNTY		SHEET NO.
	WACO	McLENNAN		1372