



Work Package	M04 - Main Span – Lower Tower
Revision	00
Submittal Stage	RFC
Date	8-17-2018

NOTE: DRAWINGS NHB-75 AND NHB-77 HAVE BEEN UPDATED TO SHOW DRAIN HOLE DETAILS.

FILE: G:\HarborBridge\CADD\Next Submittal Folder\Main*Span\N001*INDEX*OF*DRAWINGS.dgn
DATE: 11/3/2017
TIME: 7:06:08 PM
USER: lcavanough




MAIN SPAN INDEX OF DRAWINGS

NO.	REVISION	TITLE
* NHB01	C0	INDEX OF DRAWINGS I
NHB02	A1	INDEX OF DRAWINGS II
NHB03	A1	INDEX OF DRAWINGS III
NHB04	CO/B1	BRIDGE LAYOUT I
NHB05	C0	BRIDGE LAYOUT II
NHB06	02	FOUNDATION LAYOUT I - TOWERS 1NT & 1ST
NHB07	B0	FOUNDATION LAYOUT II - PIERS 1N & 2N
NHB08	B0	FOUNDATION LAYOUT III - PIERS 1S & 2S
NHB08A	B0	GEOMETRY CONTROL
NHB08B	00	BORING LOGS TERMS AND SYMBOLS
NHB09	00	BORING LOGS I (NP-1) (SHEET 1 OF 4)
NHB10	00	BORING LOGS I (NP-1) (SHEET 2 OF 4)
NHB11	00	BORING LOGS I (NP-1) (SHEET 3 OF 4)
NHB12	00	BORING LOGS I (NP-1) (SHEET 4 OF 4)
NHB13	00	BORING LOGS II (NP-2) (SHEET 1 OF 4)
NHB14	00	BORING LOGS II (NP-2) (SHEET 2 OF 4)
NHB15	00	BORING LOGS II (NP-2) (SHEET 3 OF 4)
NHB16	00	BORING LOGS II (NP-2) (SHEET 4 OF 4)
NHB17	00	BORING LOGS III (SP-1) (SHEET 1 OF 4)
NHB18	00	BORING LOGS III (SP-1) (SHEET 2 OF 4)
NHB19	00	BORING LOGS III (SP-1) (SHEET 3 OF 4)
NHB20	00	BORING LOGS III (SP-1) (SHEET 4 OF 4)
NHB21	00	BORING LOGS IV (SP-2) (SHEET 1 OF 4)
NHB22	00	BORING LOGS IV (SP-2) (SHEET 2 OF 4)
NHB23	00	BORING LOGS IV (SP-2) (SHEET 3 OF 4)
NHB24	00	BORING LOGS IV (SP-2) (SHEET 4 OF 4)
NHB25	B0	BORING LOGS V (AS-11) (SHEET 1 OF 3)
NHB26	B0	BORING LOGS V (AS-11) (SHEET 2 OF 3)
NHB27	B0	BORING LOGS V (AS-11) (SHEET 3 OF 3)
NHB28	B0	BORING LOGS VI (AS-12) (SHEET 1 OF 2)
NHB29	B0	BORING LOGS VI (AS-12) (SHEET 2 OF 2)
NHB29A	B0	PILE DATA TABLE
NHB29B	B0	PILE TENSION DETAILS
NHB30A	B0	DRILLED SHAFT LAYOUT - TOWER 1NT
NHB30B	00	DRILLED SHAFT LAYOUT - TOWER 1ST
NHB31	01	DRILLED SHAFT DETAILS TYPE A
NHB32	01	DRILLED SHAFT DETAILS TYPE B
NHB32A	00	DRILLED SHAFT DETAILS TYPE C
NHB32B	C0	DRILLED SHAFT DETAILS TYPE D
NHB32C	C0	DRILLED SHAFT DETAILS TYPE E
NHB32D	C0	DRILLED SHAFT DETAILS TYPE F
NHB32E	C0	DRILLED SHAFT DETAILS TYPE G (8' DIA)
NHB33		TRANSITION PIER 2N & 2S DIMENSIONS
NHB34		TRANSITION PIER 2N & 2S REINFORCEMENT I
NHB34A		TRANSITION PIER 2N & 2S REINFORCEMENT II
NHB35		TRANSITION PIER 2N & 2S - NB CAP DIMENSIONS
NHB35A		TRANSITION PIER 2N & 2S - NB CAP REINFORCEMENT I
NHB36		TRANSITION PIER 2N & 2S - NB CAP REINFORCEMENT II
NHB37		TRANSITION PIER 2N & 2S - NB CAP REINFORCEMENT III
NHB38	CO	TRANSITION PIER 2N & 2S - SB CAP DIMENSIONS
NHB39		TRANSITION PIER 2N & 2S - SB CAP REINFORCEMENT I
NHB39A		TRANSITION PIER 2N & 2S - SB CAP REINFORCEMENT II
NHB40		TRANSITION PIER 2N & 2S - SB CAP REINFORCEMENT III
NHB41		BACKSPAN PIER 1N & 1S DIMENSIONS
NHB41A		BACKSPAN PIER 1N & 1S REINFORCEMENT I
NHB41B		BACKSPAN PIER 1N & 1S REINFORCEMENT II
NHB42		BACKSPAN PIER 1N & 1S REINFORCEMENT III
NHB42A		BACKSPAN PIER 1N & 1S - NB CAP DIMENSIONS

NO.	REVISION	TITLE
NHB42B		BACKSPAN PIER 1N & 1S - NB CAP REINFORCEMENT I
NHB43		BACKSPAN PIER 1N & 1S - NB CAP REINFORCEMENT II
NHB44		BACKSPAN PIER 1N & 1S - NB CAP REINFORCEMENT III
NHB45		BACKSPAN PIER 1N & 1S - SB CAP DIMENSIONS
NHB46		BACKSPAN PIER 1N & 1S - SB CAP REINFORCEMENT I
NHB47		BACKSPAN PIER 1N & 1S - SB CAP REINFORCEMENT II
NHB48		BACKSPAN PIER 1N & 1S - SB CAP REINFORCEMENT III
NHB49	B1	TOWER 1NT FOOTING DIMENSIONS
NHB50	B1	TOWER 1NT FOOTING REINFORCEMENT I
NHB51	B1	TOWER 1NT FOOTING REINFORCEMENT II
NHB52	B1	TOWER 1NT FOOTING REINFORCEMENT III
NHB53	B1	TOWER 1NT FOOTING REINFORCEMENT IV
NHB54	00	TOWER 1ST FOOTING DIMENSIONS
NHB55	00	TOWER 1ST FOOTING REINFORCEMENT I
NHB56	00	TOWER 1ST FOOTING REINFORCEMENT II
NHB57	00	TOWER 1ST FOOTING REINFORCEMENT III
NHB58	00	TOWER 1ST FOOTING REINFORCEMENT IV
NHB59	B0	TRANSITION PIER 2N NB & SB FOOTING DIMENSIONS
NHB60	A0	TRANSITION PIER 2N NB & SB FOOTING REINFORCEMENT I
NHB61		TRANSITION PIER 2N NB & SB FOOTING REINFORCEMENT II
NHB62	B0	TRANSITION PIER 2S NB & SB FOOTING DIMENSIONS
NHB63	A0	TRANSITION PIER 2S NB & SB FOOTING REINFORCEMENT I
NHB64		TRANSITION PIER 2S NB & SB FOOTING REINFORCEMENT II
NHB65	B0	BACKSPAN PIER 1N NB & SB FOOTING DIMENSIONS
NHB66	A0	BACKSPAN PIER 1N NB & SB FOOTING REINFORCEMENT I
NHB67		BACKSPAN PIER 1N NB & SB FOOTING REINFORCEMENT II
NHB68	B0	BACKSPAN PIER 1S NB & SB FOOTING DIMENSIONS
NHB69	A0	BACKSPAN PIER 1S NB & SB FOOTING REINFORCEMENT I
NHB70		BACKSPAN PIER 1S NB & SB FOOTING REINFORCEMENT II
* NHB71	00	TOWER 1NT ELEVATION & DIMENSIONS I
NHB72		TOWER 1NT ELEVATION & DIMENSIONS II
* NHB73	00	TOWER 1ST ELEVATION & DIMENSIONS I
NHB74		TOWER 1ST ELEVATION & DIMENSIONS II
* NHB75	00	LOWER TOWER DETAILS
* NHB76	00	LOWER TOWER REINFORCEMENT I
* NHB77	00	LOWER TOWER REINFORCEMENT II
* NHB78	00	LOWER TOWER REINFORCEMENT III
* NHB79	00	LOWER TOWER REINFORCEMENT IV
* NHB79A	00	LOWER TOWER REINFORCEMENT V
* NHB79B	00	LOWER TOWER REINFORCEMENT VI
* NHB79C	00	LOWER TOWER REINFORCEMENT VII
NHB80		NODAL ZONE DETAILS I
NHB80A		NODAL ZONE DETAILS II
NHB80B		NODAL ZONE DETAILS III
NHB81		NODAL ZONE REINFORCEMENT I (PRECAST ELEMENT)
NHB82		NODAL ZONE REINFORCEMENT II (SOLID SECTION)
NHB83		NODAL ZONE REINFORCEMENT III
NHB84		TOWER STRUT DIMENSIONS
NHB85		TOWER STRUT REINFORCING I
NHB86		TOWER STRUT REINFORCING II
NHB87		TOWER STRUT REINFORCING III
NHB88	B0	TYPICAL CROSS-SECTIONS I
NHB89	B0	TYPICAL CROSS-SECTIONS II
NHB90		TOWER TABLE DIMENSIONS I
NHB91		TOWER TABLE DIMENSIONS II
NHB91A		TOWER TABLE DIMENSIONS III
NHB91B		TOWER TABLE DIMENSIONS IV
NHB91C		TOWER TABLE DIMENSIONS V

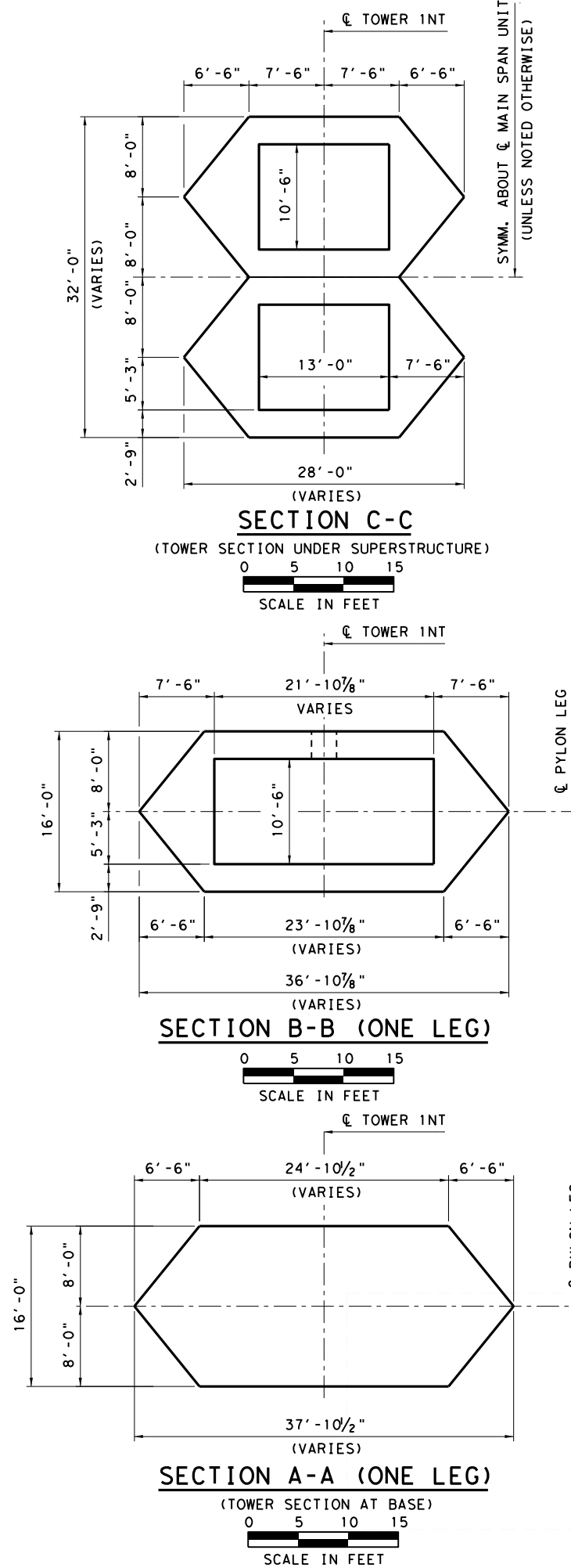
NO.	REVISION	TITLE
NHB92		TOWER TABLE REINFORCEMENT I
NHB93		TOWER TABLE REINFORCEMENT II
NHB94		TOWER TABLE REINFORCEMENT III
NHB95		TOWER TABLE REINFORCEMENT IV
NHB96		TOWER TABLE REINFORCEMENT V
NHB97		TOWER TABLE REINFORCEMENT VI
NHB98		TOWER TABLE REINFORCEMENT VII
NHB99		TOWER TABLE REINFORCEMENT VIII
NHB100		TOWER TABLE 3D INTEGRATED DETAILS I
NHB101		TOWER TABLE 3D INTEGRATED DETAILS II
NHB102		TOWER TABLE 3D INTEGRATED DETAILS III
NHB103		UPPER TOWER DETAILS
NHB104		UPPER TOWER REINFORCEMENT I
NHB105		UPPER TOWER REINFORCEMENT II
NHB106		UPPER TOWER REINFORCEMENT III
NHB107		UPPER TOWER REINFORCEMENT IV
NHB108		UPPER TOWER REINFORCEMENT V
NHB109		UPPER TOWER REINFORCEMENT VI
NHB110		UPPER TOWER REINFORCEMENT VII
NHB111		UPPER TOWER REINFORCEMENT VIII
NHB112		UPPER TOWER REINFORCEMENT IX
NHB113	A0	STAY CABLE LAYOUT TOWER 1NT
NHB113A	A0	STAY CABLE LAYOUT TOWER 1ST
NHB114	A0	STAY CABLE DETAILS I
NHB115	A0	STAY CABLE DETAILS II
NHB115A	A0	STAY CABLE DETAILS III
NHB116	A0	STAY CABLE DETAILS IV
NHB116A	A0	STAY CABLE DETAILS V
NHB117	A0	STAY CABLE DETAILS VI
NHB117A	A0	STAY CABLE DETAILS VII
NHB118	A0	STAY CABLE DETAILS VIII
NHB119	A0	STAY CABLE SUGGESTED FABRICATION
NHB120	A0	STAY CABLE FORCE SCHEDULE
NHB121		NOT USED
NHB122		NOT USED

LEGEND	
AO	= ADVANCED STATUS
B0	= PRE-FINAL
CO	= ESOC OR FINAL
DESIGN	SUBMITTAL
00	= RFC

HL-93 LOADING				
NO.	DATE	REVISION	APRV	
 FLATIRON/DAGRADOS LLC			 FIGG TBPE FIRM #F-4883	
 Texas Department of Transportation ® 2016				
US-181 HARBOR BRIDGE				
MAIN SPAN INDEX OF DRAWINGS I				
DESIGN MF	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS CFR	X	(See Title Sheet)		US-181
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK MF	TEXAS	CRP	NUECES	NHB 1
CHECK	CONTROL	SECTION	JOB	
JMW	0101	06	095	

PRELIMINARY NOT FOR CONSTRUCTION, NOVEMBER 2017




NOTE:
* SHEETS INCLUDED IN MAIN SPAN - LOWER TOWER - RFC SUBMITTAL



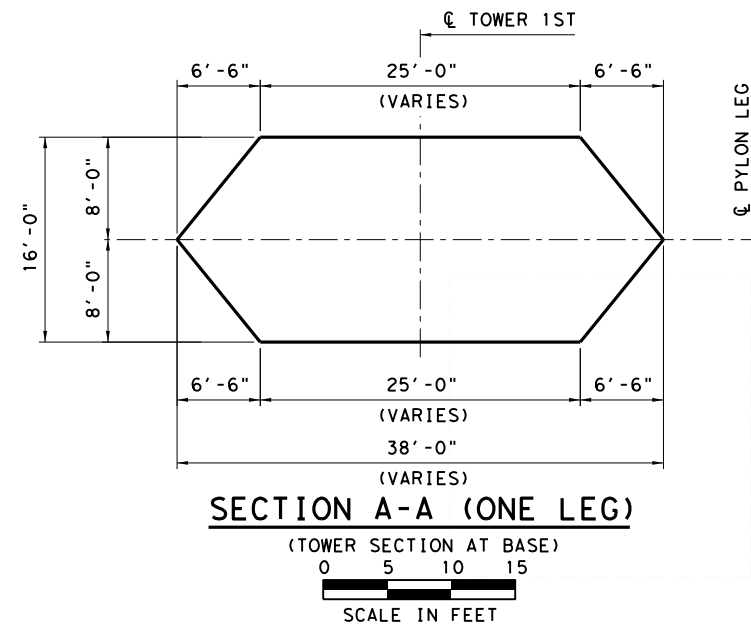
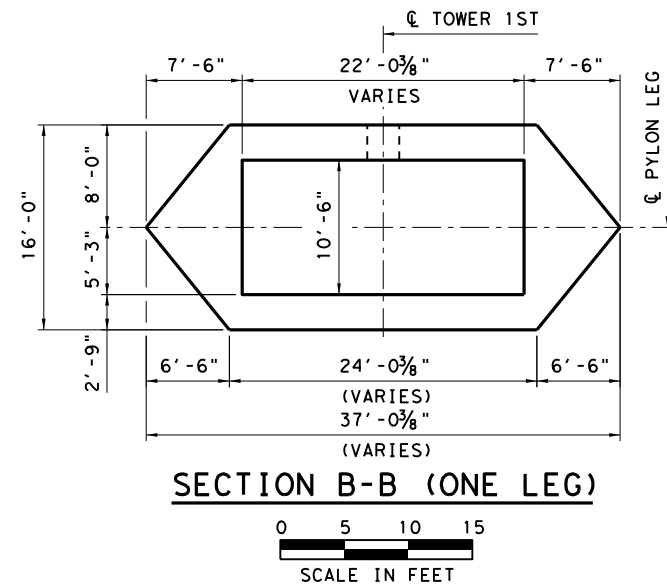
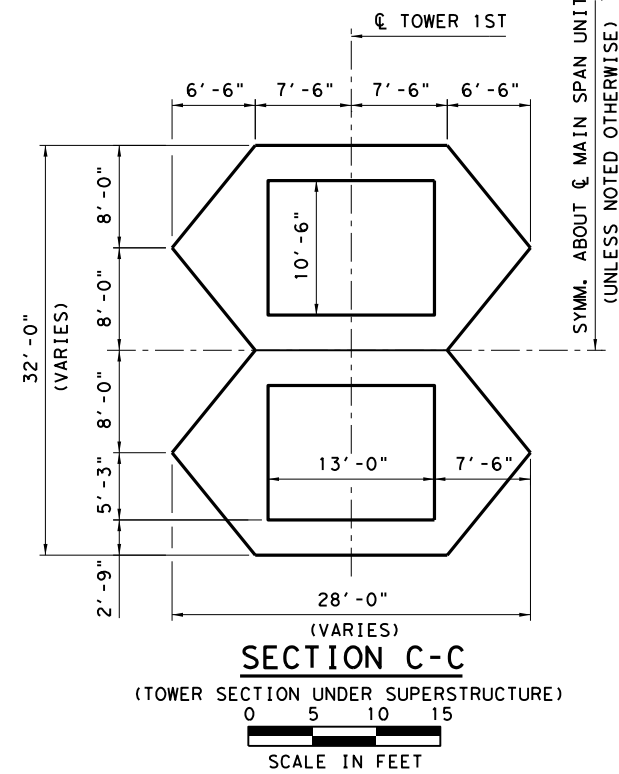
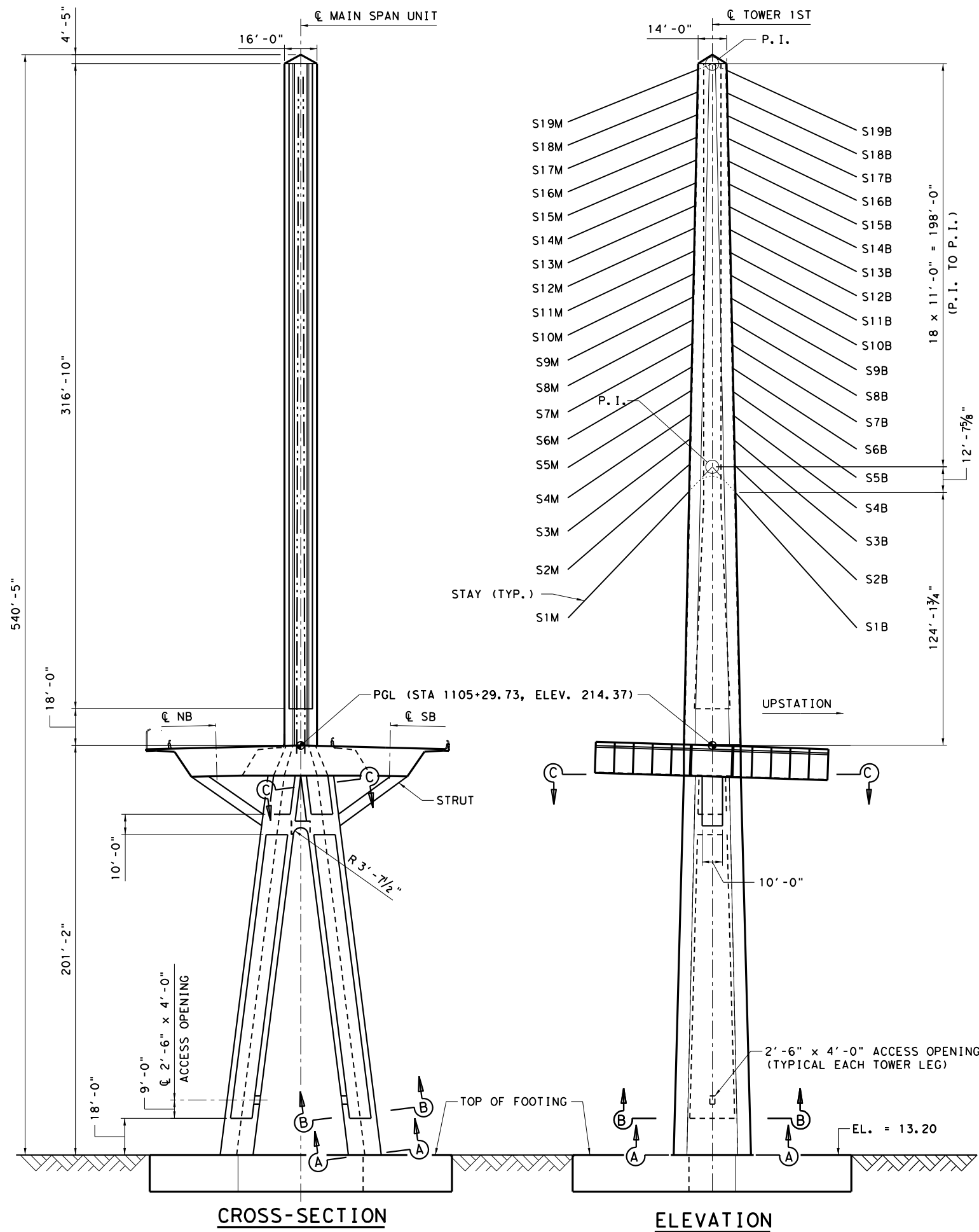
- HL-93 LOADING

HL - 93 LOADING

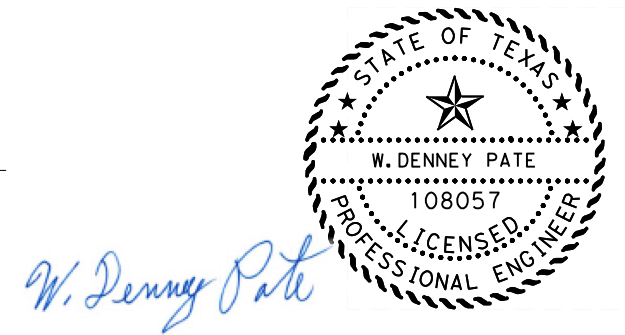
SCALE IN FEET

NO.	DATE	REVISION	APRV	
 FLATIRON/DRAGADOS LLC		 FIGG TBPE FIRM #F-4883		
 <i>Texas Department of Transportation</i> ® 2016				
US-181 HARBOR BRIDGE				
MAIN SPAN TOWER 1NT ELEVATION AND DIMENSIONS I				
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EDL	X	(See Title Sheet)		US-181
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CFR	TEXAS	CRP	NUECES	NHB 71
CHECK	CONTROL	SECTION	JOB	
EDL				
CHECK	0101	06	095	
MF				




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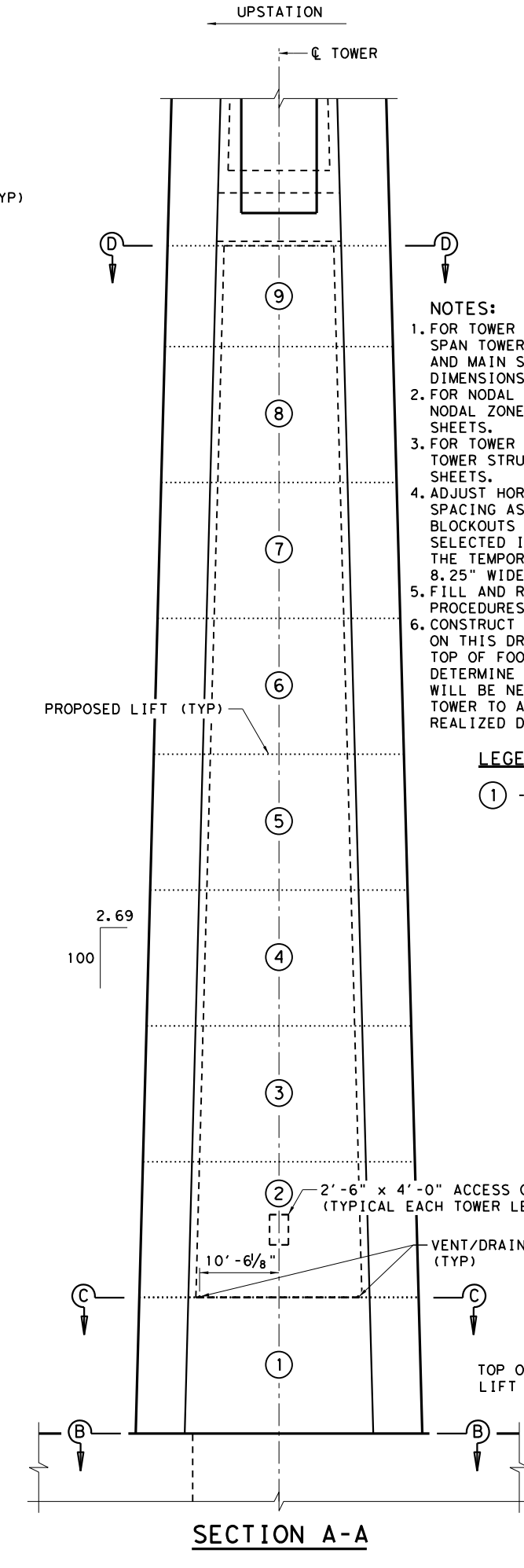
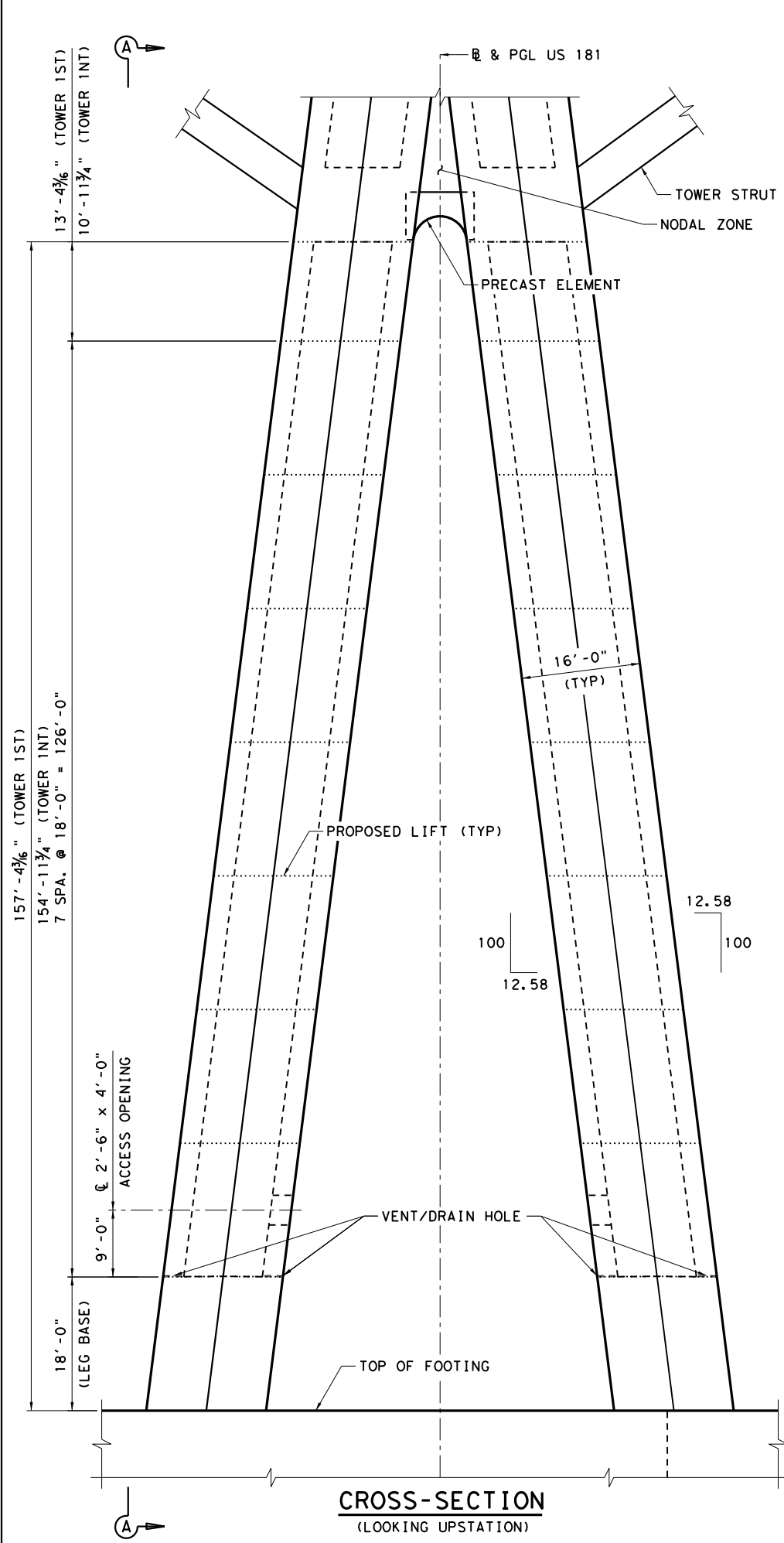


- NOTES:
1. FOR UPPER TOWER CROSS SECTION SEE MAIN SPAN TOWER 1ST ELEVATION AND DIMENSIONS II.
 2. FOR SOUTH TOWER ACCESS DETAILS, SEE TOWER ACCESS DETAILS.
 3. FOR TOWER CONCRETE COMPRESSIVE STRENGTH (F'C), SEE GENERAL NOTES.
 4. FOR ELECTRICAL GROUNDING DETAILS, SEE IEA GROUNDING DETAILS DRAWINGS.



11/03/17
SCALE IN FEET

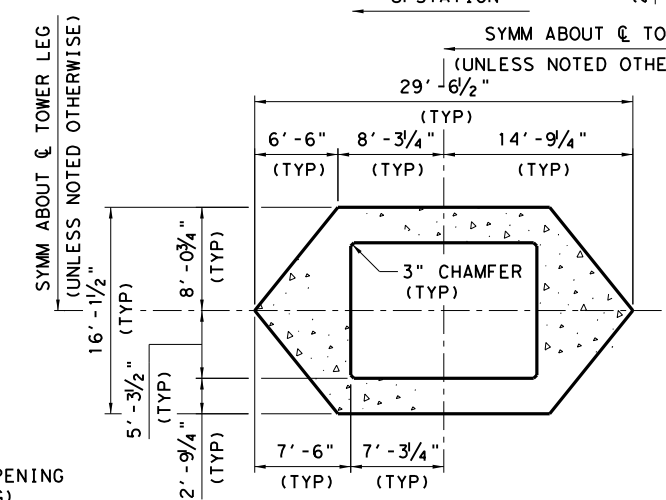
HL -93 LOADING			SCALE IN FEET	
NO.	DATE	REVISION		APRV
 FLATIRON/Dragados LLC		 FIGG TBPE FIRM #F-4883		
 <i>Texas Department of Transportation</i> ® ₂₀₁₆				
US-181 HARBOR BRIDGE				
MAIN SPAN TOWER 1ST ELEVATION AND DIMENSIONS I				
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EDL	X	(See Title Sheet)		US-181
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CFR	TEXAS	CRP	NUECES	NHB 73
CHECK	CONTROL	SECTION	JOB	
EDL				
CHECK				
MF	0101	06	095	



- NOTES:**
1. FOR TOWER DIMENSIONS, SEE MAIN SPAN TOWER INT ELEVATION AND DIMENSIONS I AND MAIN SPAN TOWER 1ST ELEVATION AND DIMENSIONS I SHEETS.
 2. FOR NODAL ZONE DETAILS, SEE MAIN SPAN NODAL ZONE DETAILS AND REINFORCEMENT SHEETS.
 3. FOR TOWER STRUT DETAILS, SEE MAIN SPAN TOWER STRUT DIMENSIONS AND REINFORCEMENT SHEETS.
 4. ADJUST HORIZONTAL AND VERTICAL REINFORCEMENT SPACING AS REQUIRED TO CLEAR THE TEMPORARY BLOCKOUTS REQUIRED FOR SUPPORT OF THE SELECTED INTERNAL VOID FORMING SYSTEM. THE TEMPORARY BLOCKOUTS WILL BE APPROXIMATELY 8.25" WIDE BY 5.75" DEEP BY 10" TALL.
 5. FILL AND REPAIR ALL BLOCKOUTS, USING APPROVED PROCEDURES, TO ALL SURFACES OF TOWER.
 6. CONSTRUCT LOWER TOWER TO THE DIMENSIONS SHOWN ON THIS DRAWING. MONITOR THE ELEVATIONS AT TOP OF FOOTING DURING CONSTRUCTION TO DETERMINE IF ANY INCREMENTAL ADJUSTMENTS WILL BE NEEDED DURING CASTING THE LOWER TOWER TO ACCOUNT FOR ACTUAL SETTLEMENT REALIZED DURING CONSTRUCTION.

LEGEND

① - DENOTES LIFT NUMBER DESIGNATION

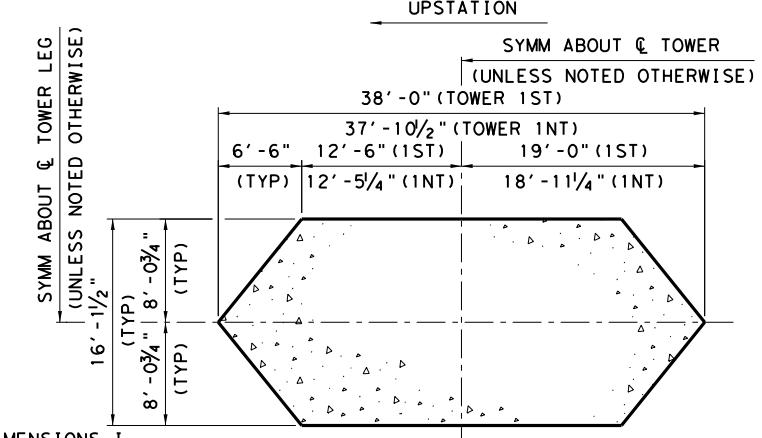


SECTION D-D
NOT TO SCALE

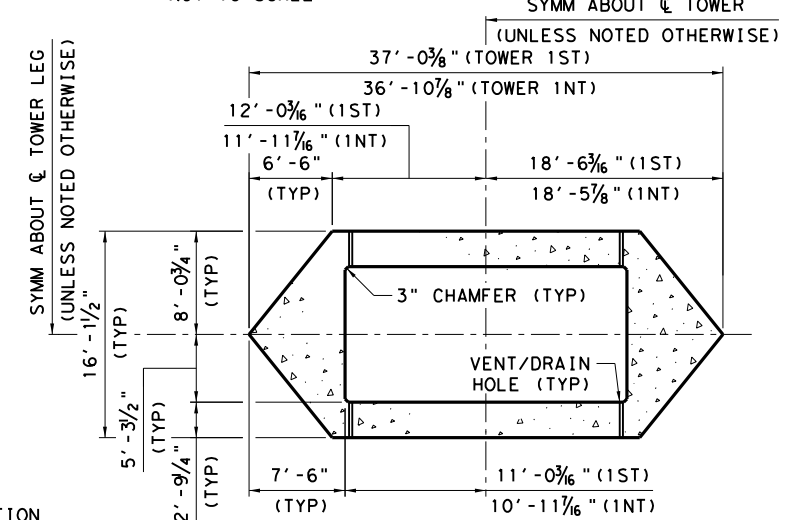
VENT/DRAIN HOLE DETAIL
NOT TO SCALE

HALF SECTION OF 4" NOMINAL PLASTIC PIPE

STATE OF TEXAS
W. DENNEY PATE
108057
PROFESSIONAL ENGINEER

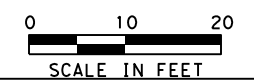


SECTION B-B
NOT TO SCALE



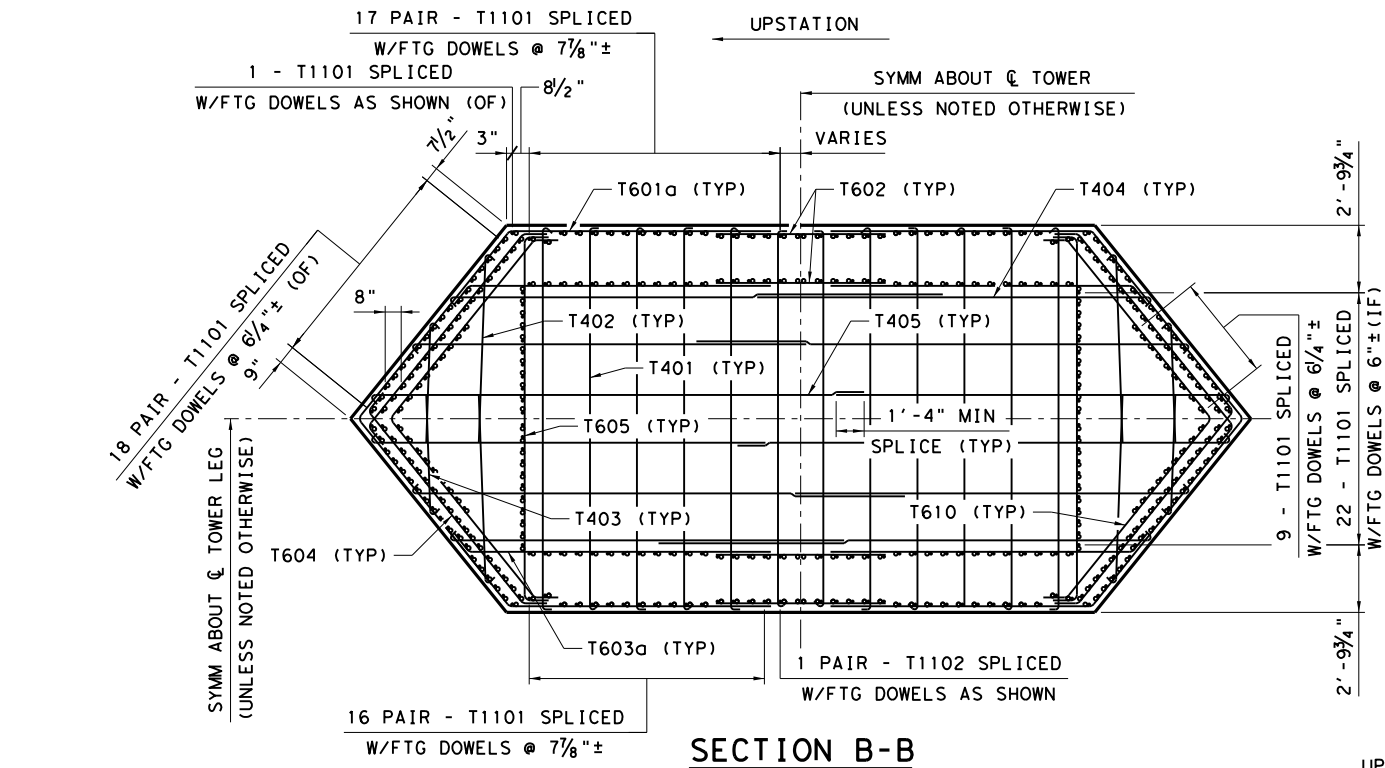
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NOT TO SCALE

HL-93 LOADING

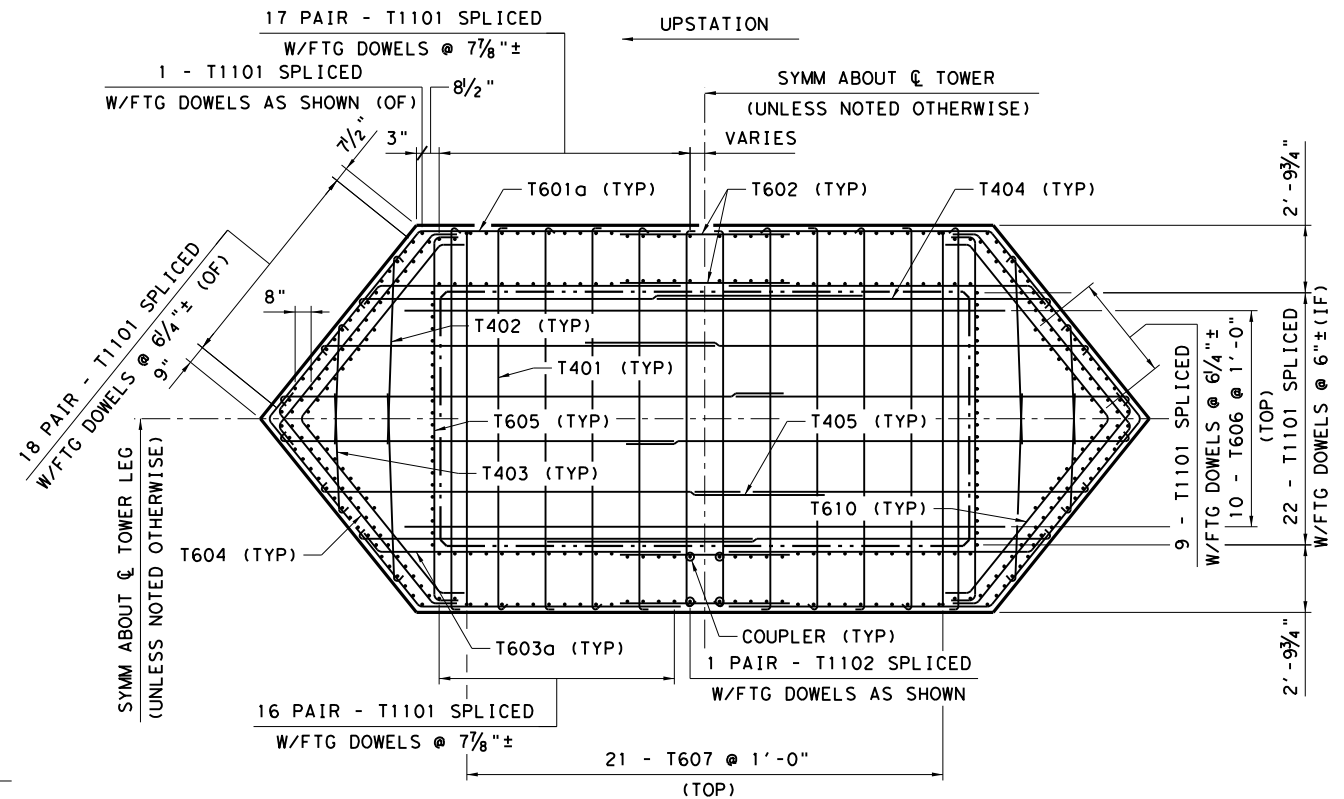


NO.	DATE	REVISION	APRV
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<div><div></div><div>US-181 HARBOR BRIDGE</div></div>			
<div><div>MAIN SPAN</div><div>LOWER TOWER DETAILS</div></div>			
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
EDL	X	(See Title Sheet)	US-181
GRAPHICS	STATE	DISTRICT	COUNTY
DCB	TEXAS	CRP	NUECES
CHECK	CONTROL	SECTION	JOB
EDL	0101	06	095
CHECK	MF		
			NHB 75

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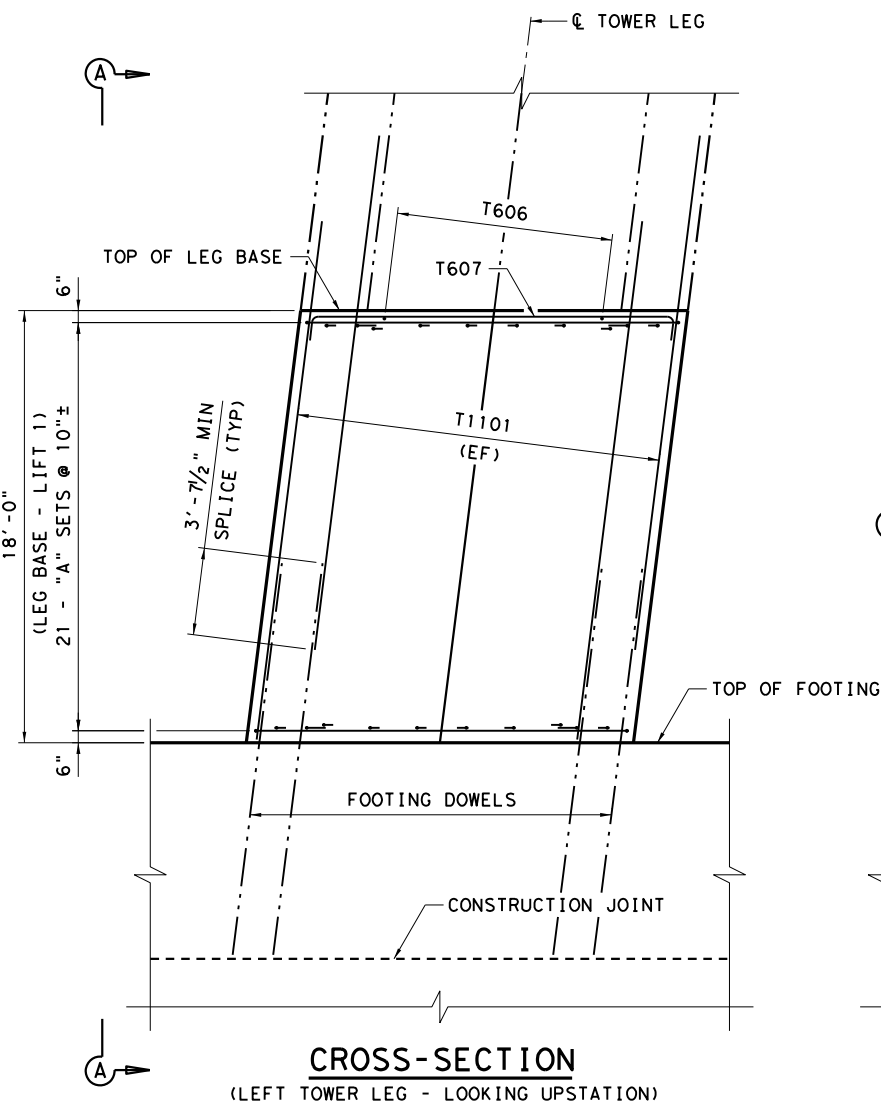
SECTION B-B



SECTION C-C

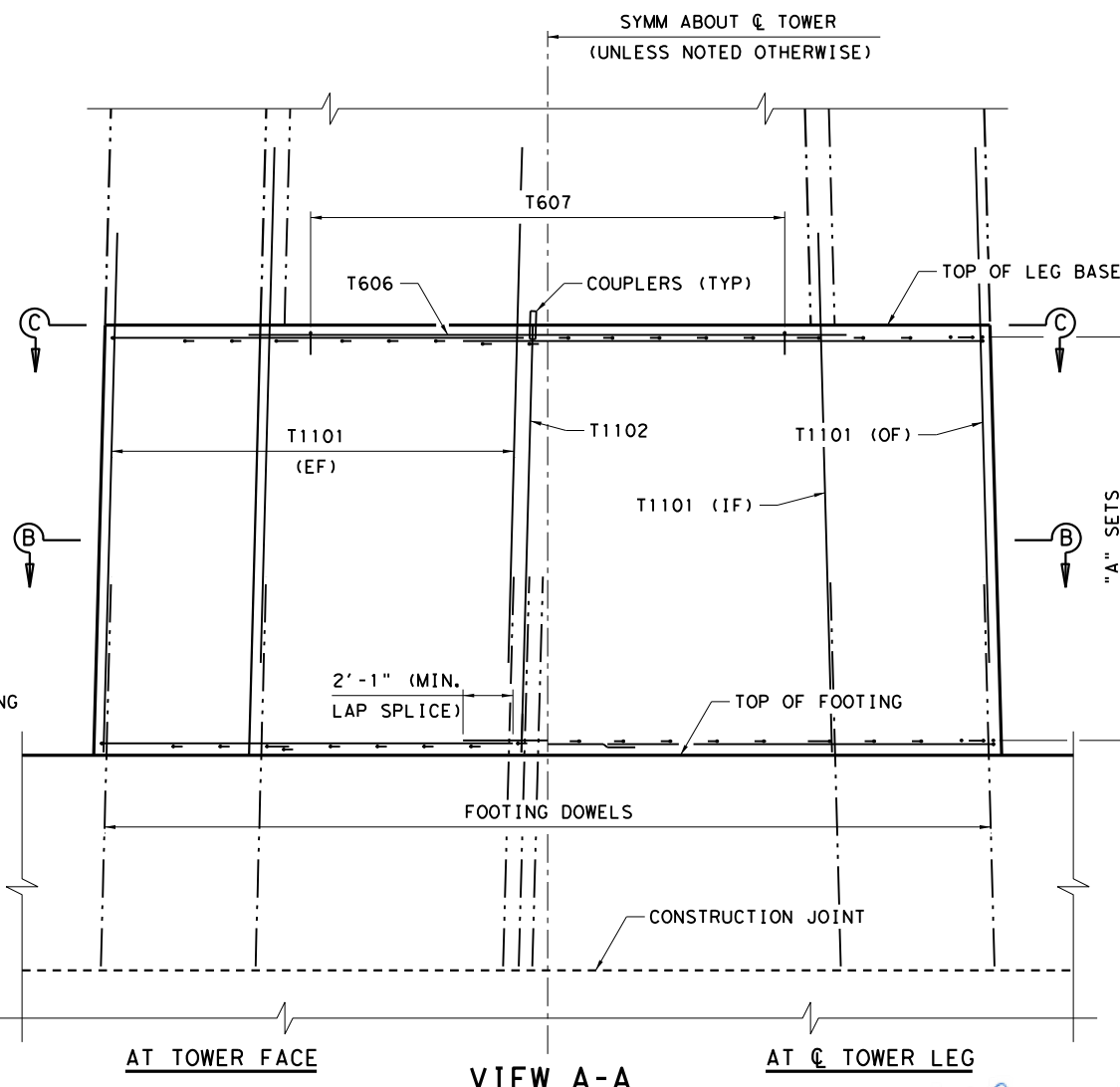
NOTES:

1. MINIMUM CONCRETE COVER IS 3", UNLESS NOTED OTHERWISE.
2. FOR FOOTING DOWEL LOCATIONS, SEE MAIN SPAN TOWER FOOTING REINFORCEMENT SHEETS.
3. "A" SETS INCLUDE 12 - T401, 4 - T402, 4 - T403, 6 - T404, 6 - T405, 2 - T601a, 4 - T602, 4 - T603a, 4 - T604, 2 - T605 AND 2 - T610.

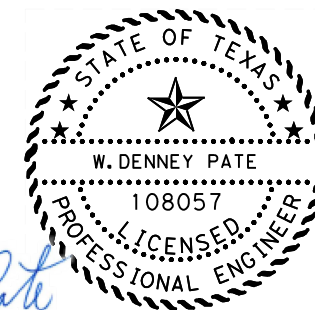


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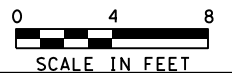
(LEFT TOWER LEG - LOOKING UPSTATION)



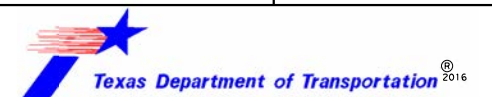
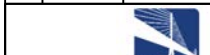
VIEW A-A



HL-93 LOADING



NO. DATE REVISION APRV



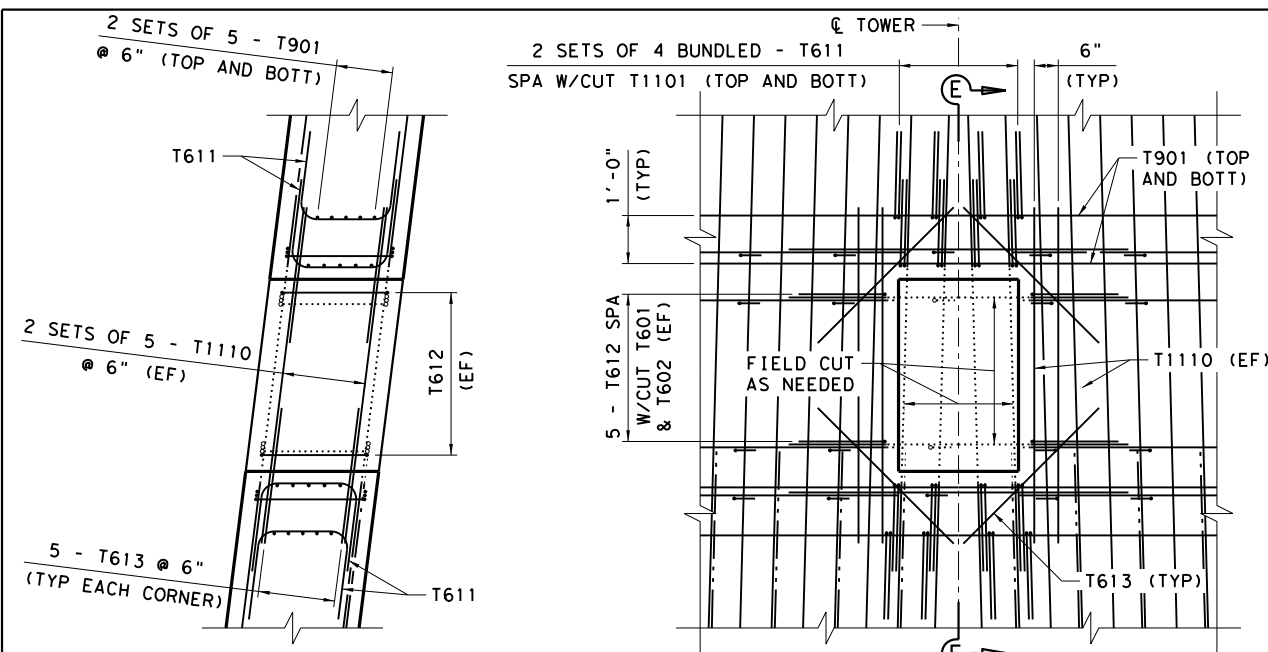
US-181 HARBOR BRIDGE

MAIN SPAN
LOWER TOWER
REINFORCEMENT I

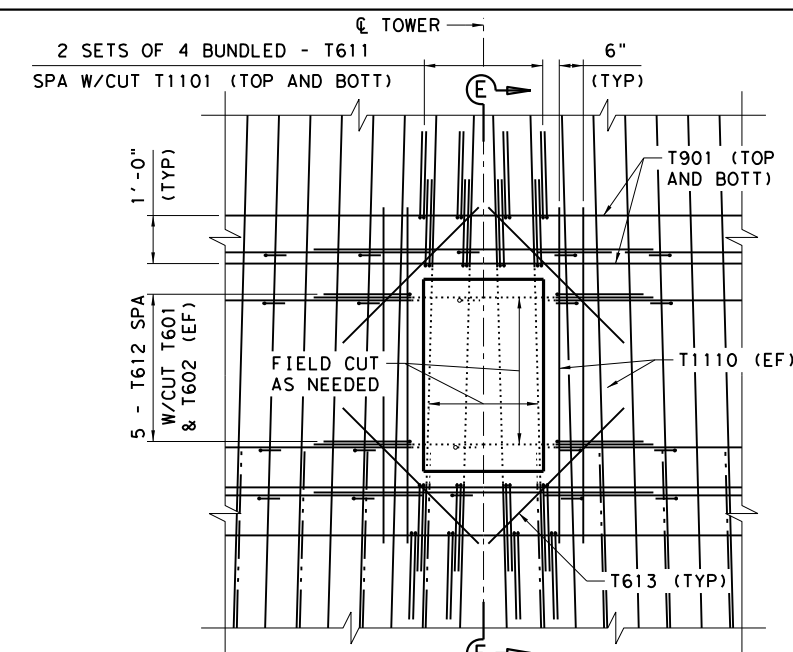
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EDL	X	(See Title Sheet)		US-181
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DCB	TEXAS	CRP	NUECES	NHB
CHECK	CONTROL	SECTION	JOB	76
EDL	MF	0101	06	095
CHECK				

11/03/17

FILE: G:\HarborBridge\CADD\Next Submittal Folder\Main\Span\N075-N079\Lower Tower*Details*Reinforcement.dgn
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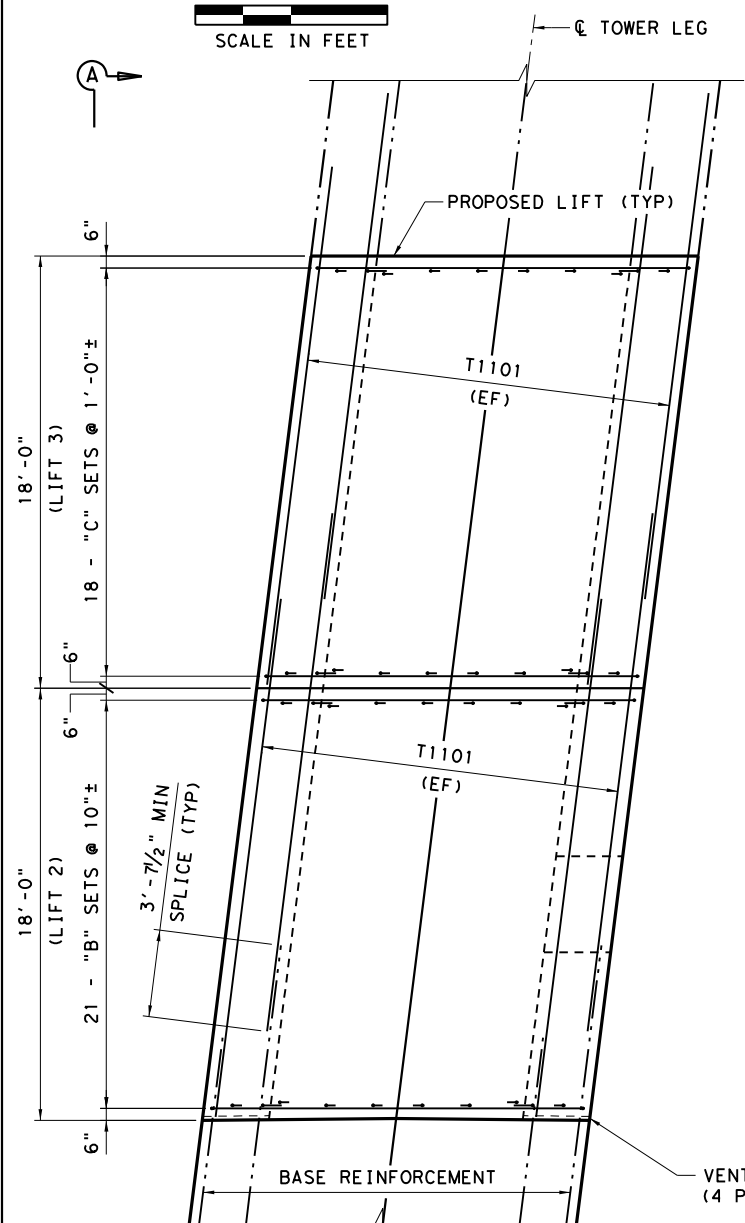


SECTION E-E
SCALE IN FEET

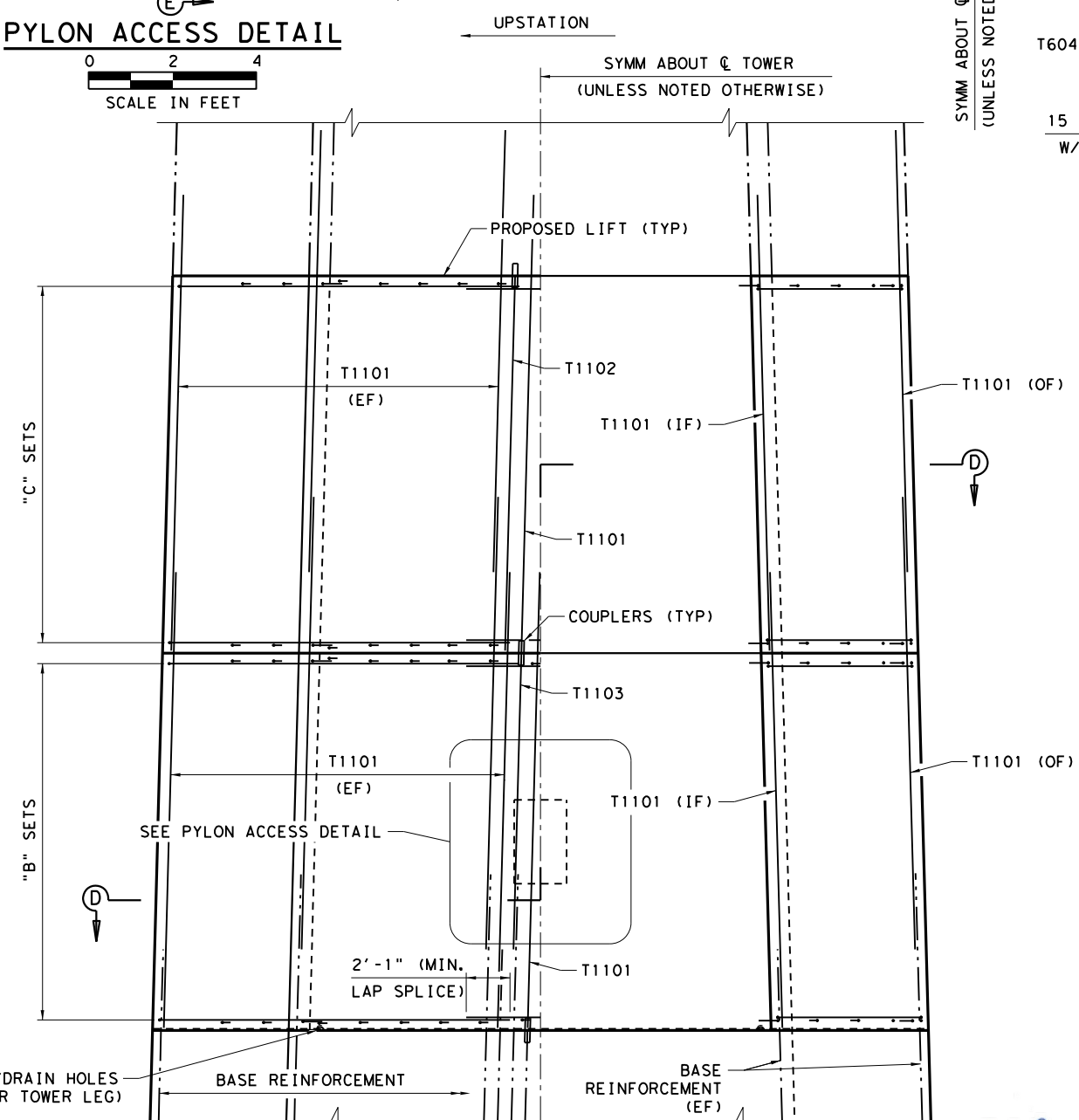


PYLON ACCESS DETAIL
SCALE IN FEET

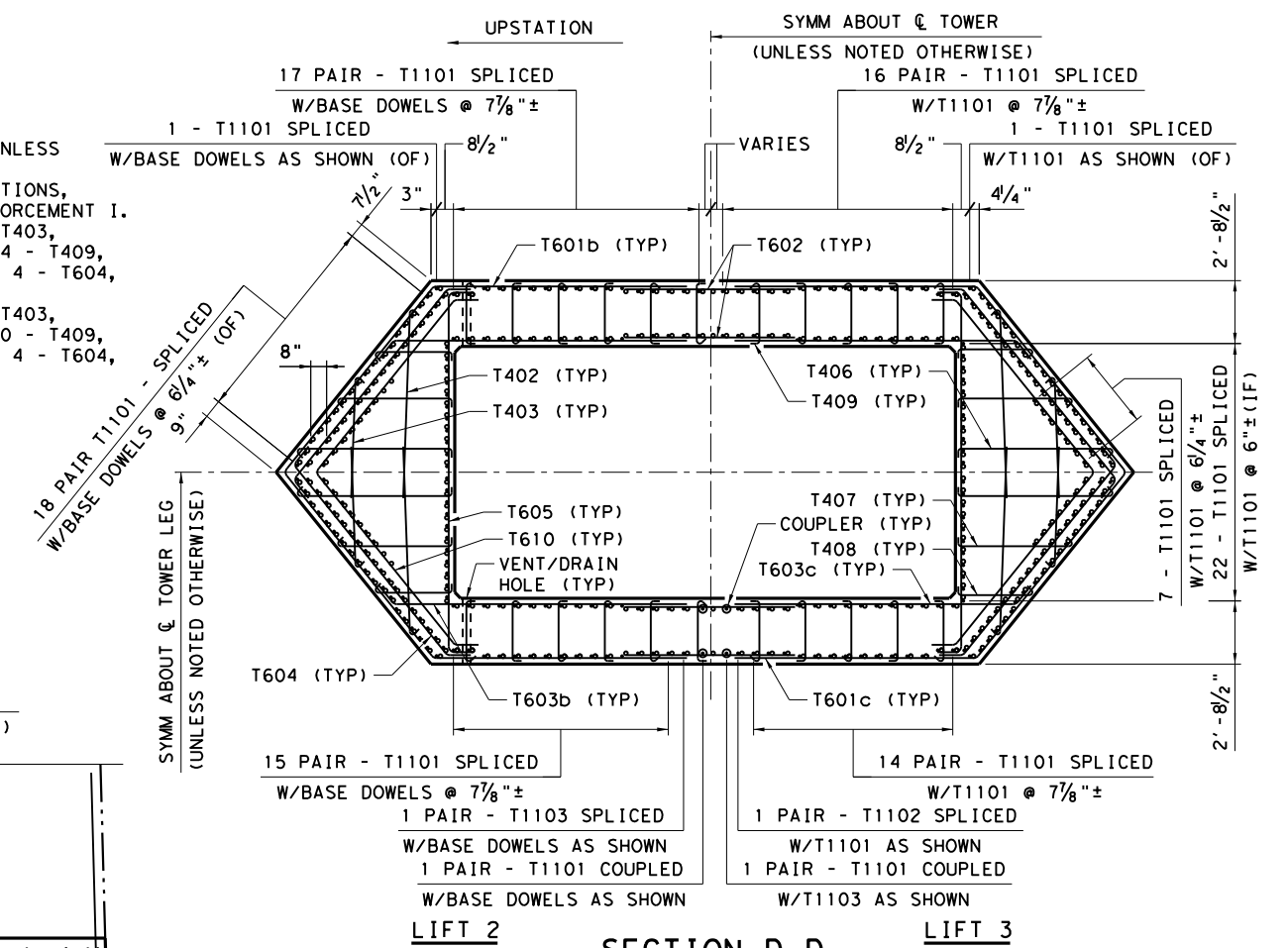
- NOTES:
1. MINIMUM CONCRETE COVER IS 3", UNLESS NOTED OTHERWISE.
 2. FOR LEG BASE REINFORCEMENT LOCATIONS, SEE MAIN SPAN LOWER TOWER REINFORCEMENT I.
 3. "B" SETS INCLUDE 4 - T402, 4 - T403, 4 - T406, 4 - T407, 4 - T408, 24 - T409, 2 - T601b, 4 - T602, 4 - T603b, 4 - T604, 2 - T605 AND 2 - T610.
 4. "C" SETS INCLUDE 4 - T402, 4 - T403, 4 - T406, 4 - T407, 4 - T408, 20 - T409, 2 - T601c, 4 - T602, 4 - T603c, 4 - T604, 2 - T605 AND 2 - T610.



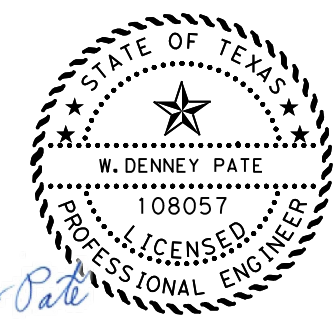
CROSS-SECTION
(LEFT TOWER LEG - LOOKING UPSTATION)






VIEW A-A
AT TOWER FACE AT TOWER LEG



SECTION D-D

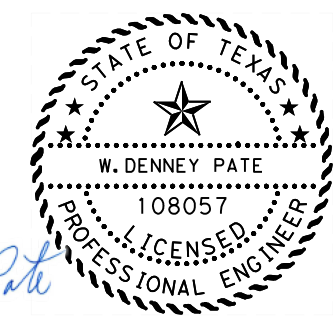
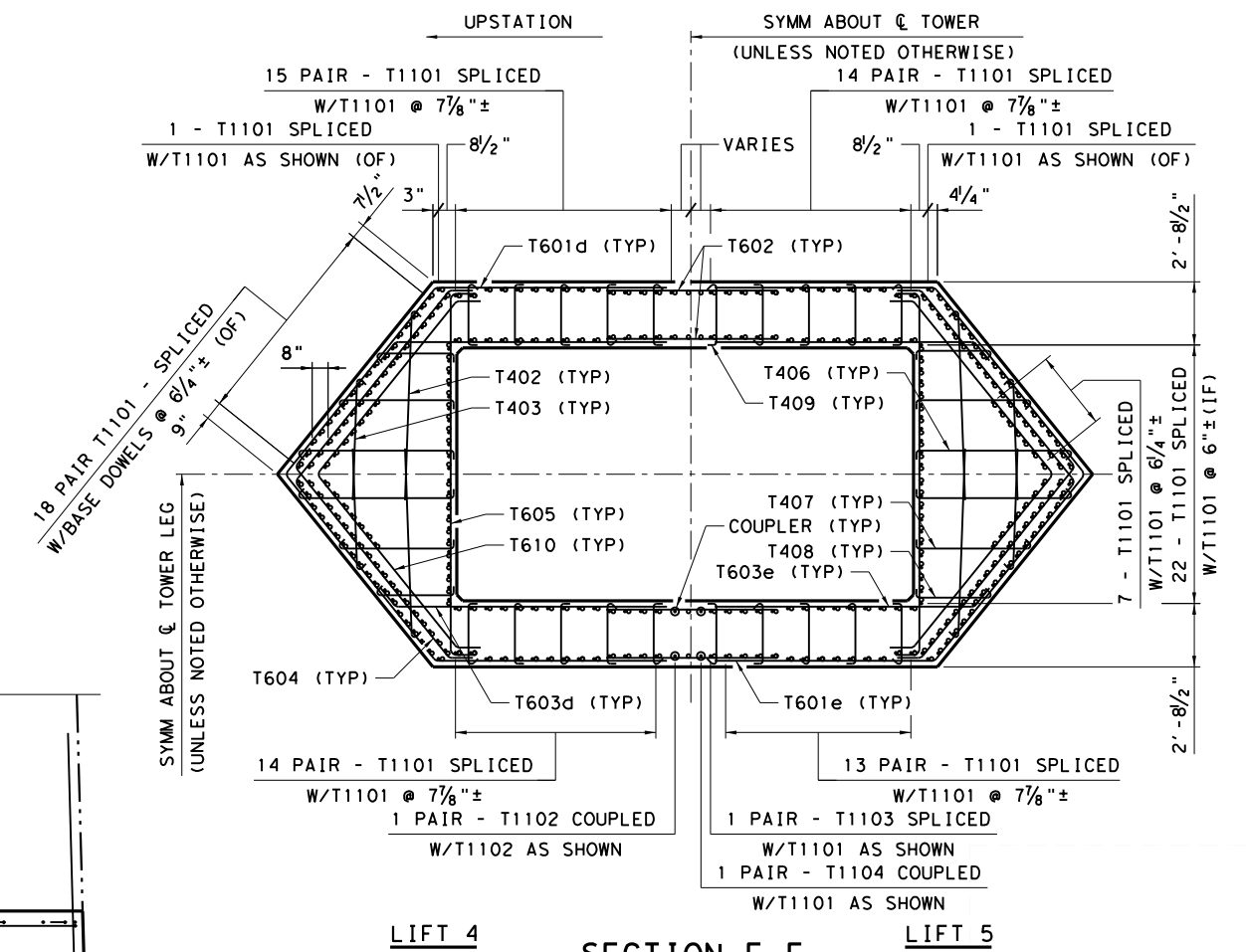
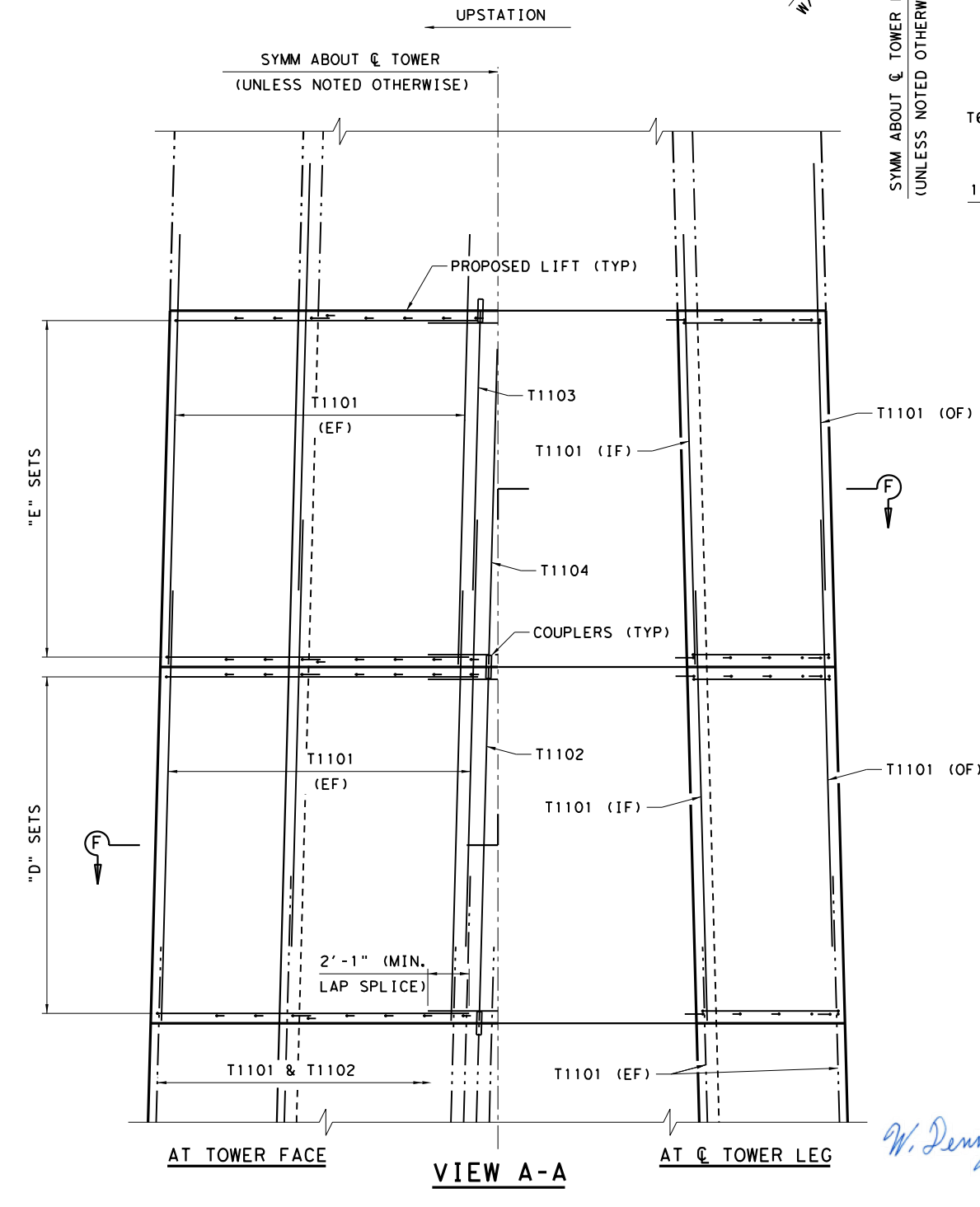
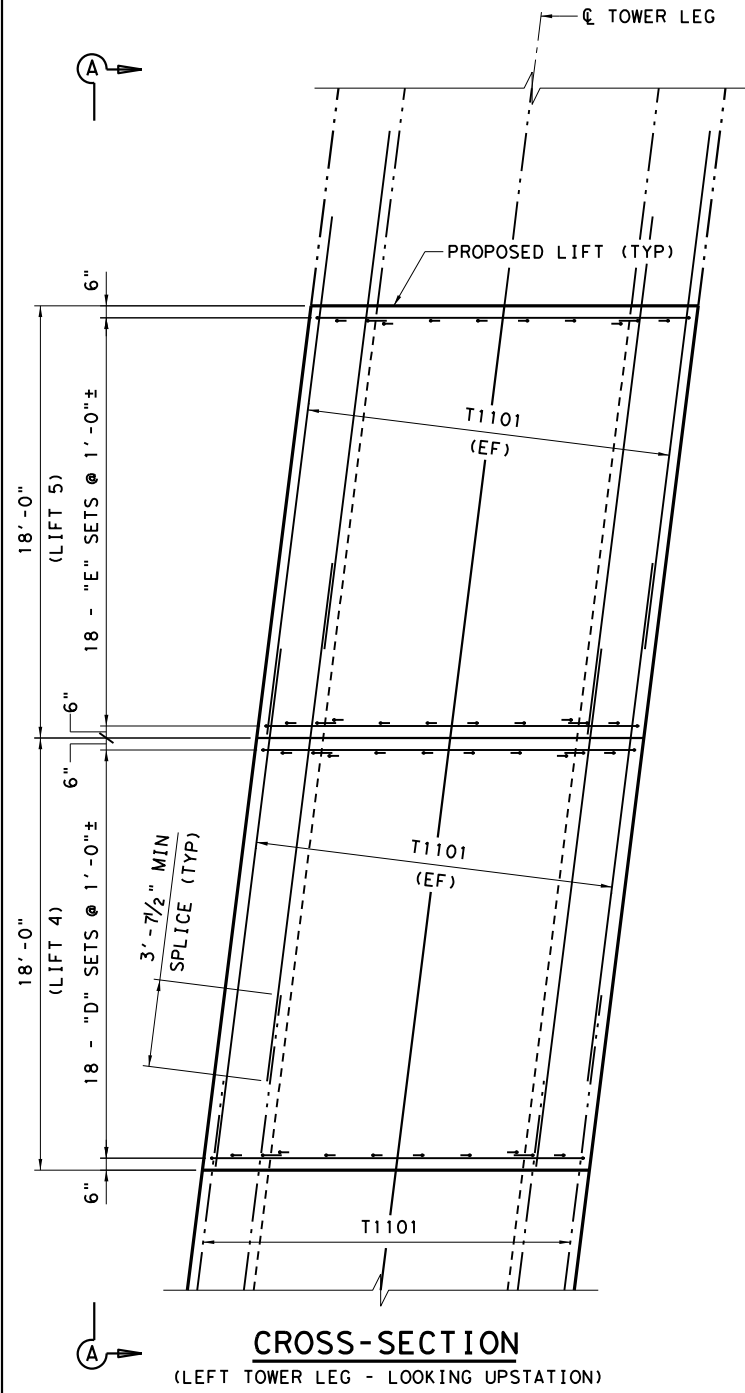





HL - 93 LOADING			SCALE IN FEET	
NO.	DATE	REVISION		APRV
 FLATIRON/DRAGADOS LLC			 FIGG TBPE FIRM #F-4883	
 <i>Texas Department of Transportation</i> ® 2016				
US-181 HARBOR BRIDGE				
MAIN SPAN LOWER TOWER REINFORCEMENT II				
DESIGN EDL	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS DCB	X	(See Title Sheet)		US-181
CHECK EDL	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EDL	TEXAS	CRP	NUECES	NHB 77
CHECK MF	CONTROL	SECTION	JOB	
	0101	06	095	

8/17/18

FILE: G:\HarborBridge\CADD\Next Submittal Folder\Main\Span\N075-N079\Lower Tower*Details*Reinforcement.dgn
DATE: 11/3/2017 TIME: 3:13:21 PM USER: dbrewton

- NOTES:
1. MINIMUM CONCRETE COVER IS 3", UNLESS NOTED OTHERWISE.
 2. "D" SETS INCLUDE 4 - T402, 4 - T403, 4 - T406, 4 - T407, 4 - T408, 20 - T409, 2 - T601d, 4 - T602, 4 - T603d, 4 - T604, 2 - T605 AND 2 - T610.
 3. "E" SETS INCLUDE 4 - T402, 4 - T403, 4 - T406, 4 - T407, 4 - T408, 20 - T409, 2 - T601e, 4 - T602, 4 - T603e, 4 - T604, 2 - T605 AND 2 - T610.

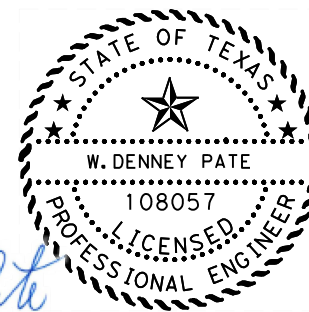
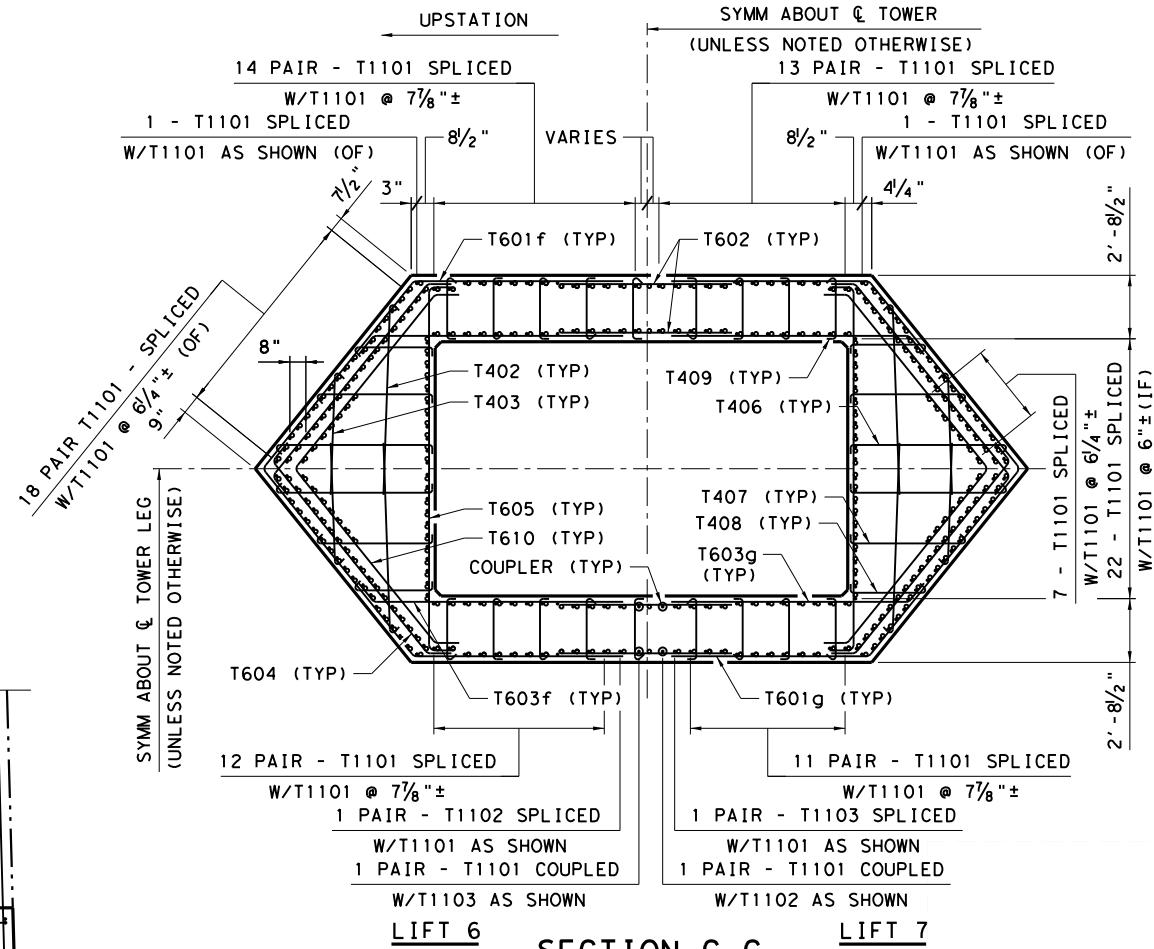
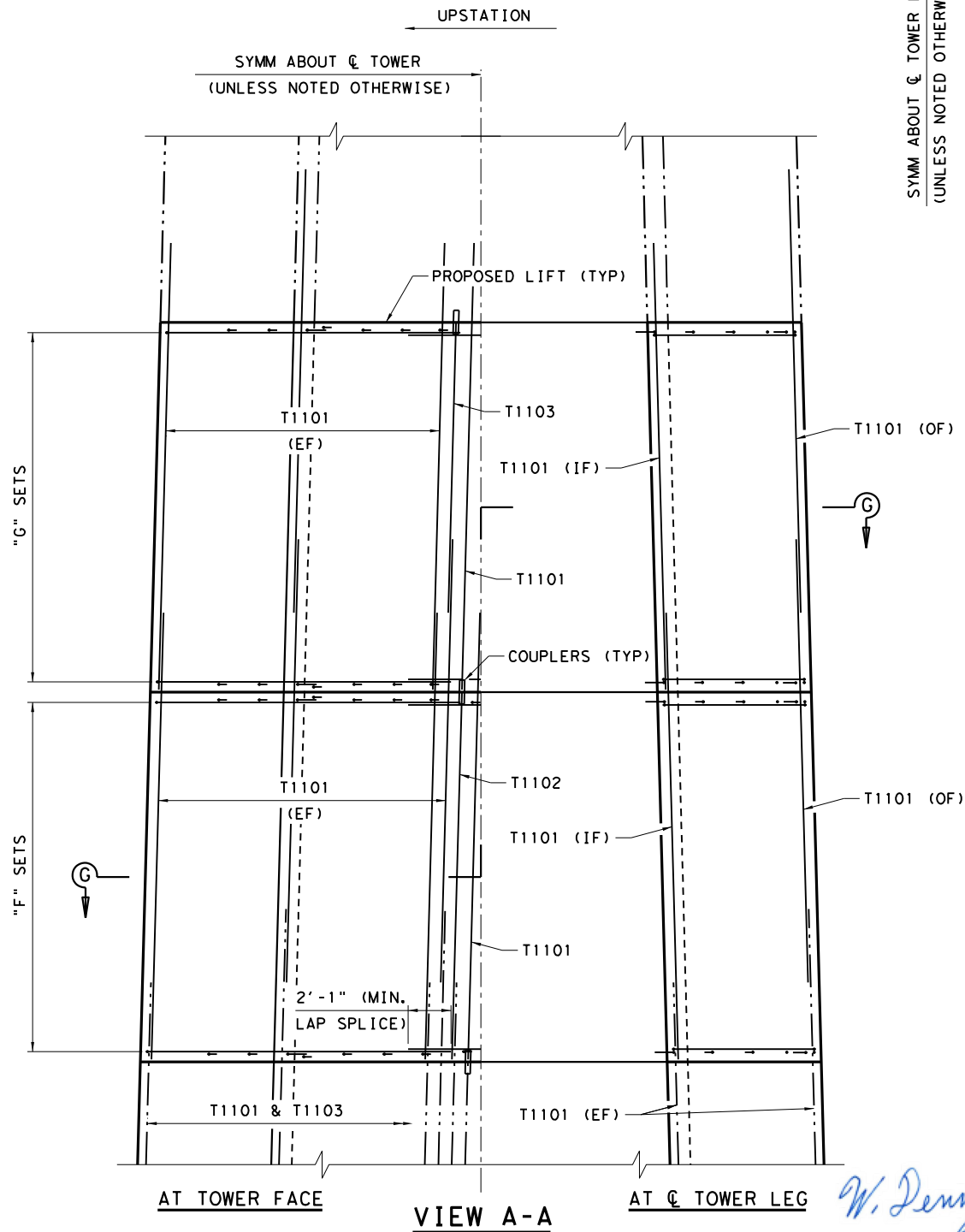
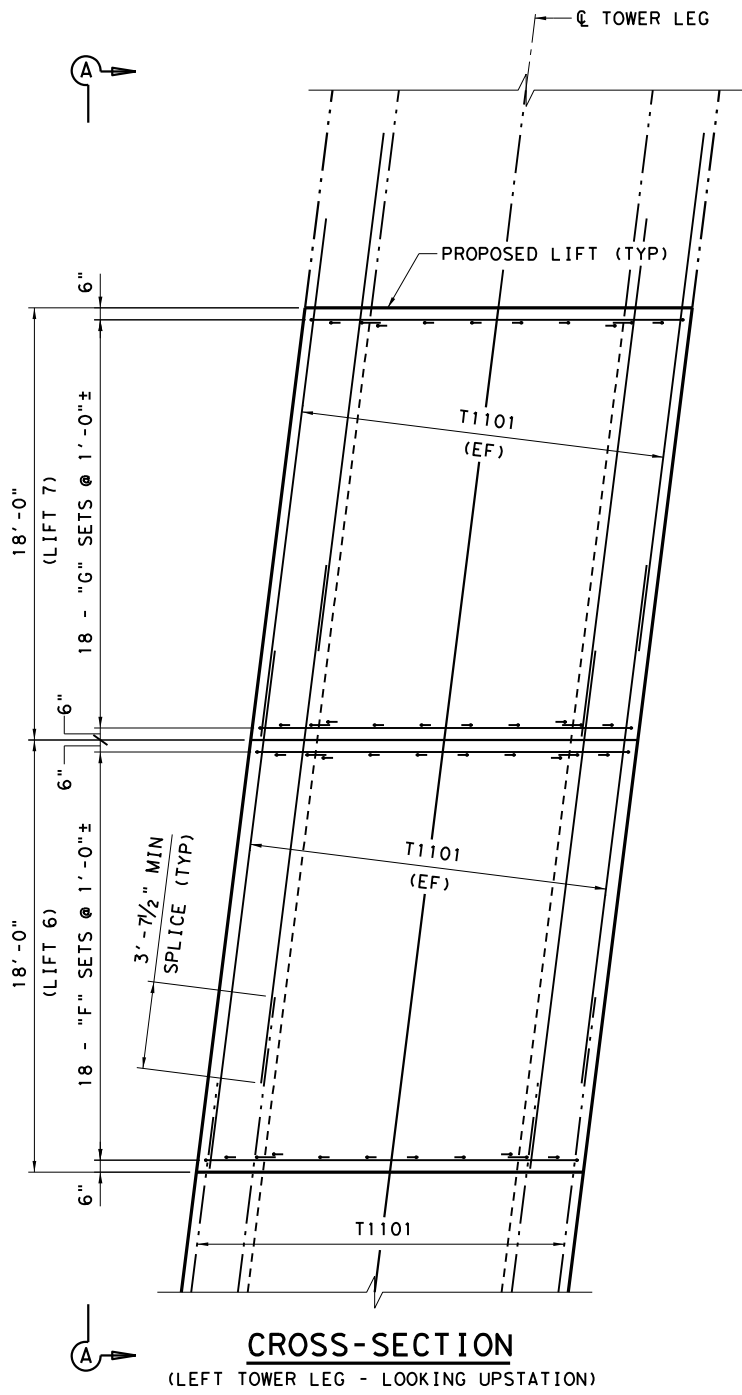


HL-93 LOADING			<div>048</div> <div>SCALE IN FEET</div>	
NO.	DATE	REVISION	APRV	
<div> FLATIRON/DRAGADOS LLC</div>			<div> FIGG TBPE FIRM #F-4883</div>	
<div> Texas Department of Transportation[®] 2016</div>				
US-181 HARBOR BRIDGE				
MAIN SPAN LOWER TOWER REINFORCEMENT III				
DESIGN EDL	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS DCB	X	(See Title Sheet)		US-181
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EDL	TEXAS	CRP	NUECES	NHB 78
CHECK	CONTROL	SECTION	JOB	
MF	0101	06	095	

FILE: G:\HarborBridge\CADD\Next Submittal Folder\Main\Span\N075-N079\Lower Tower*Details*Reinforcement.dgn
DATE: 11/3/2017 TIME: 3:12:47 PM USER: dbrewton




NOTES:

1. MINIMUM CONCRETE COVER IS 3", UNLESS NOTED OTHERWISE.
2. "F" SETS INCLUDE 4 - T402, 4 - T403, 4 - T406, 4 - T407, 4 - T408, 20 - T409, 2 - T601f, 4 - T602, 4 - T603f, 4 - T604, 2 - T605 AND 2 - T610.
3. "G" SETS INCLUDE 4 - T402, 4 - T403, 4 - T406, 4 - T407, 4 - T408, 16 - T409, 2 - T601g, 4 - T602, 4 - T603g, 4 - T604, 2 - T605 AND 2 - T610.



HL-93 LOADING



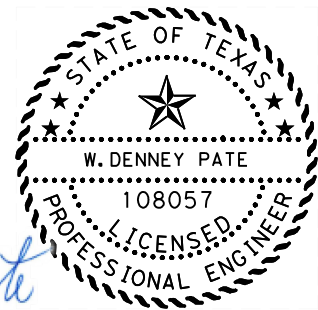
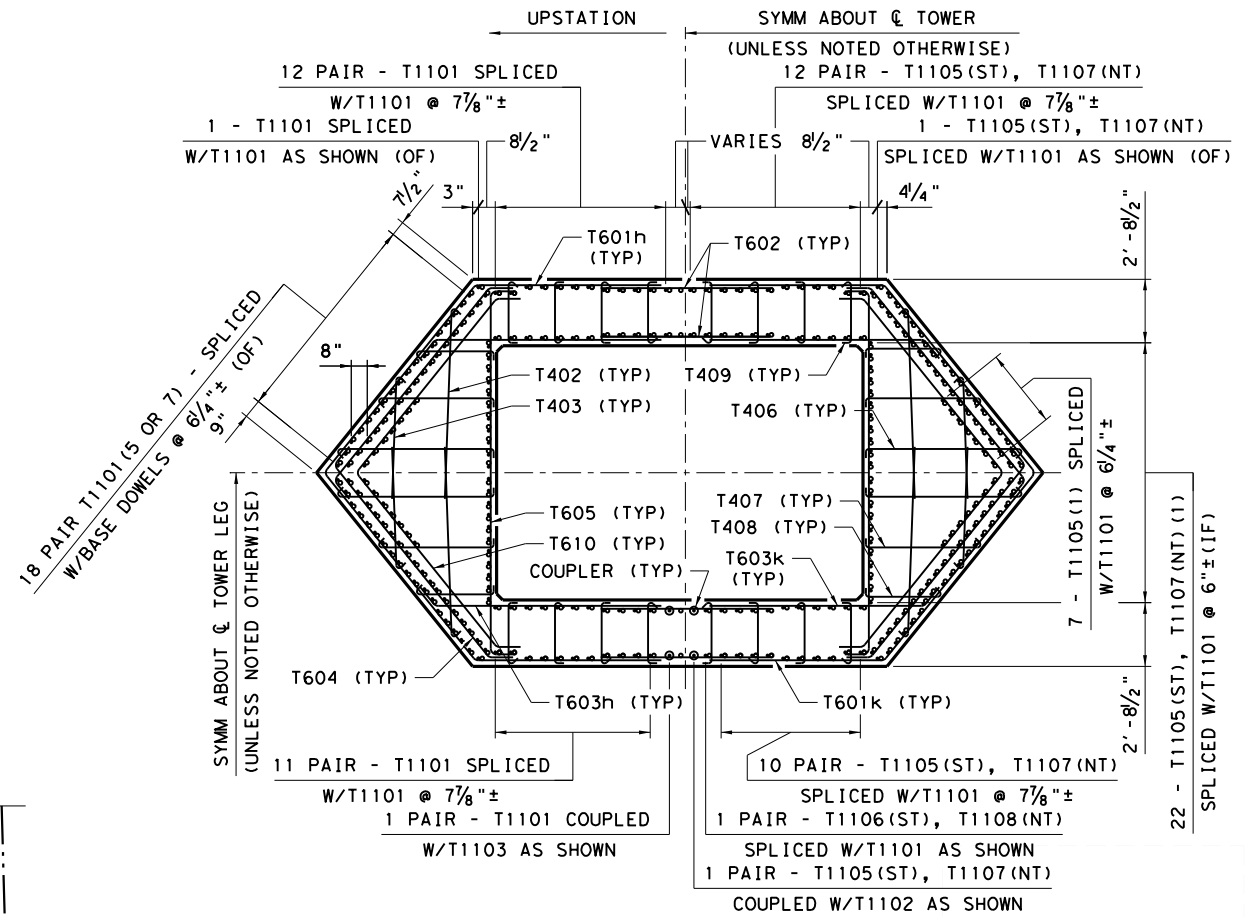
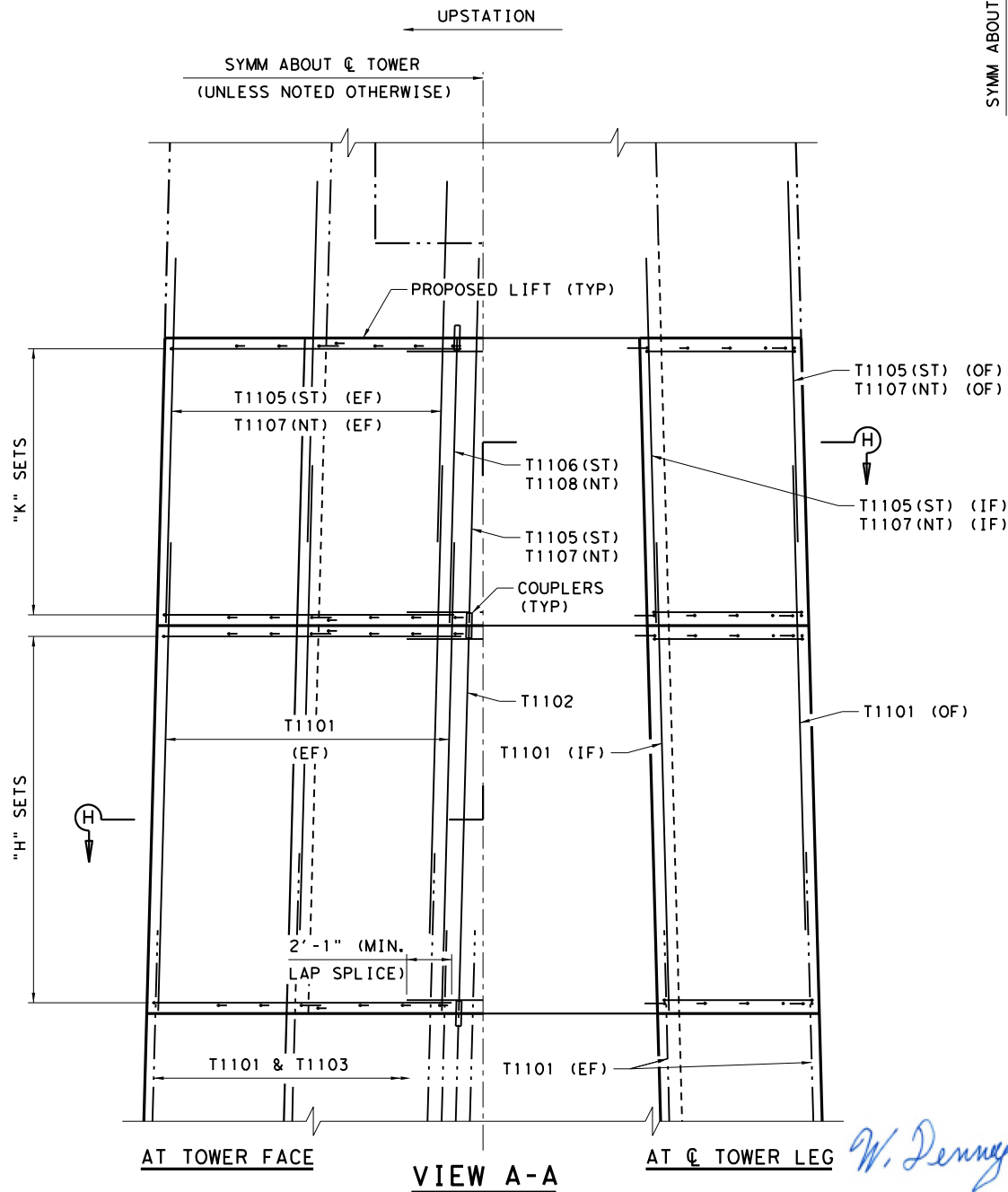
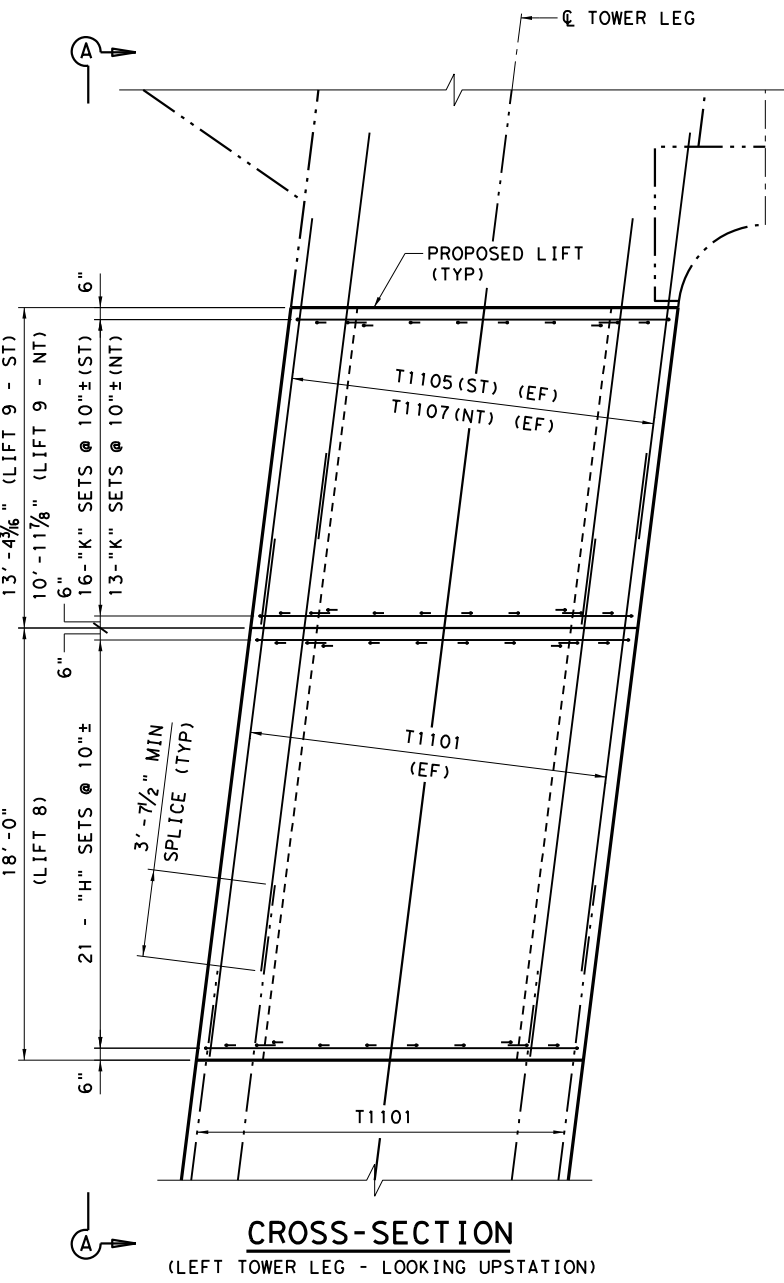
NO.	DATE	REVISION		APRV
 FLATIRON/DRAGADOS LLC			 FIGG TBPE FIRM #F-4883	
 <i>Texas Department of Transportation</i> ® 2016				
US-181 HARBOR BRIDGE				
MAIN SPAN LOWER TOWER REINFORCEMENT IV				
DESIGN EDL	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS DCB	X	(See Title Sheet)		US-181
CHECK EDL	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK MF	TEXAS	CRP	NUECES	NHB 79
	CONTROL	SECTION	JOB	
	0101	06	095	

11/03/17

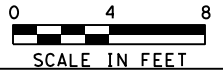
FILE: G:\HarborBridge\CADD\Next Submittal Folder\Main\Span\N075-N079\Lower*Tower*Details*Reinforcement.dgn
DATE: 11/3/2017 TIME: 8:03:15 PM USER: dbrewton




NOTES:

1. MINIMUM CONCRETE COVER IS 3", UNLESS NOTED OTHERWISE.
2. "H" SETS INCLUDE 4 - T402, 4 - T403, 4 - T406, 4 - T407, 4 - T408, 16 - T409, 2 - T601h, 4 - T602, 4 - T603h, 4 - T604, 2 - T605 AND 2 - T610.
3. "K" SETS INCLUDE 4 - T402, 4 - T403, 4 - T406, 4 - T407, 4 - T408, 16 - T409, 2 - T601k, 4 - T602, 4 - T603k, 4 - T604, 2 - T605 AND 2 - T610.



HL-93 LOADING



NO.	DATE	REVISION		APRV
 FLATIRON/DRAGADOS LLC			 FIGG TBPE FIRM #F-4883	
 <i>Texas Department of Transportation</i> ® 2016				
US-181 HARBOR BRIDGE				
MAIN SPAN LOWER TOWER REINFORCEMENT V				
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EDL	X	(See Title Sheet)		US-181
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DCB	TEXAS	CRP	NUECES	NHB 79A
CHECK	CONTROL	SECTION	JOB	
EDL				
CHECK	MF	0101	06	095

11/03/17

BAR LIST - LEG BASE - LIFT 1											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T401	252	4	18	4½"	15'-8½"			4½"			16'-5½"
T402	84	4	4		7'-9¾"	4½"			45°		8'-2¼"
T403	84	4	4		4'-11½"	4½"			45°		5'-4"
T404	126	4	4		16'-5¾"	4½"			45°		16'-10¼"
T405	126	4	4		20'-10"	4½"			45°		21'-2½"
T601a	42	6	28		10'-10¾"	10'-0¾"			102°	129°	41'-10¼"
T602	84	6	1		7'-2"						7'-2"
T603a	84	6	3		12'-8¾"	1'-0"			129°		13'-8¾"
T604	84	6	10		10'-5⅞"	1'-0"	1'-0"		102°	129°	12'-5⅞"
T605	42	6	6		15'-7½"	1'-0"	1'-0"				17'-7½"
T606	10	6	1		25'-0"						25'-0"
T607	21	6	9		15'-5¾"	1'-0"	1'-0"		83°	97°	17'-5¾"
T610	42	6	28		1'-0"	9'-9¼"			102°	129°	21'-6½"
T1101	360	11	1		21'-9¾"						21'-9¾"
T1102	4	11	20		18'-0"						18'-0"

BAR LIST - LIFT 2											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	84	4	4		7'-9¾"	4½"			45°		8'-2¼"
T403	84	4	4		4'-11½"	4½"			45°		5'-4"
T406	84	4	18	4½"	6'-2¾"			4½"			6'-11¾"
T407	84	4	18	4½"	4'-6¼"			4½"			5'-3¼"
T408	84	4	18	4½"	2'-11⅜"			4½"			3'-8⅜"
T409	504	4	18	4½"	2'-4⅜"			4½"			3'-1⅜"
T601b	42	6	28		10'-5"	10'-0¾"			102°	129°	40'-10¾"
T602	84	6	1		7'-2"						7'-2"
T603b	84	6	3		12'-3"	1'-0"			129°		13'-3"
T604	84	6	10		10'-6¾"	1'-0"	1'-0"		102°	129°	12'-6¾"
T605	42	6	6		15'-7½"	1'-0"	1'-0"				17'-7½"
T610	42	6	28		1'-0"	9'-9¼"			102°	129°	21'-6½"
T611	32	6	9		2'-1¼"	1'-10"	1'-10"		82°	98°	5'-9¼"
T612	10	6	6		2'-3¼"	1'-10"	1'-10"				5'-11¼"
T613	20	6	1		4'-0"						4'-0"
T901	20	9	1		20'-0"						20'-0"
T1101	352	11	1		21'-9¾"						21'-9¾"
T1103	4	11	20		14'-4½"						14'-4½"
T1110	20	11	1		7'-0"						7'-0"

BAR LIST - LIFT 3											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	72	4	4		7'-9¾"	4½"			45°		8'-2¼"
T403	72	4	4		4'-11½"	4½"			45°		5'-4"
T406	72	4	18	4½"	6'-2¾"			4½"			6'-11¾"
T407	72	4	18	4½"	4'-6¼"			4½"			5'-3¼"
T408	72	4	18	4½"	2'-11⅜"			4½"			3'-8⅜"
T409	360	4	18	4½"	2'-4⅜"			4½"			3'-1⅜"
T601c	36	6	28		9'-11"	10'-0¾"			102°	129°	39'-10¾"
T602	72	6	1		7'-2"						7'-2"
T603c	72	6	3		11'-9"	1'-0"			129°		12'-9"
T604	72	6	10		10'-6¾"	1'-0"	1'-0"		102°	129°	12'-6¾"
T605	36	6	6		15'-7½"	1'-0"	1'-0"				17'-7½"
T610	36	6	28		1'-0"	9'-9¼"			102°	129°	21'-6½"
T1101	344	11	1		21'-9¾"						21'-9¾"
T1102	4	11	20		18'-0"						18'-0"

BAR LIST - LIFT 4											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	72	4	4		7'-9¾"	4½"			45°		8'-2¼"
T403	72	4	4		4'-11½"	4½"			45°		5'-4"
T406	72	4	18	4½"	6'-2¾"			4½"			6'-11¾"
T407	72	4	18	4½"	4'-6¼"			4½"			5'-3¼"
T408	72	4	18	4½"	2'-11⅜"			4½"			3'-8⅜"
T409	360	4	18	4½"	2'-4⅜"			4½"			3'-1⅜"
T601d	36	6	28		9'-5¼"	10'-0⅜"			102°	129°	38'-11¼"
T602	72	6	1		7'-2"						7'-2"
T603d	72	6	3		11'-3¼"	1'-0"			129°		12'-3¼"
T604	72	6	10		10'-6¾"	1'-0"	1'-0"		102°	129°	12'-6¾"
T605	36	6	6		15'-7½"	1'-0"	1'-0"				17'-7½"
T610	36	6	28		1'-0"	9'-9¼"			102°	129°	21'-6½"
T1101	336	11	1		21'-9¾"						21'-9¾"
T1102	4	11	20		18'-0"						18'-0"

BAR LIST - LIFT 5											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	72	4	4		7'-9¾"	4½"			45°		8'-2¼"
T403	72	4	4		4'-11½"	4½"			45°		5'-4"
T406	72	4	18	4½"	6'-2¾"			4½"			6'-11¾"
T407	72	4	18	4½"	4'-6¼"			4½"			5'-3¼"
T408	72	4	18	4½"	2'-11⅜"			4½"			3'-8⅜"
T409	360	4	18	4½"	2'-4⅜"			4½"			3'-1⅜"
T601e	36	6	28		8'-11½"	10'-0⅜"			102°	129°	37'-11¾"
T602	72	6	1		7'-2"						7'-2"
T603e	72	6	3		10'-9½"	1'-0"			129°		11'-9½"
T604	72	6	10		10'-6¾"	1'-0"	1'-0"		102°	129°	12'-6¾"
T605	36	6	6		15'-7½"	1'-0"	1'-0"				17'-7½"
T610	36	6	28		1'-0"	9'-9¼"			102°	129°	21'-6½"
T1101	324	11	1		21'-9¾"						21'-9¾"
T1103	4	11	20		14'-4½"						14'-4½"
T1104	4	11	1		17'-6½"						17'-6½"

NOTES:
1. FOR BAR BENDS, SEE BAR BENDING DETAILS I SHEET.



US-181 HARBOR BRIDGE

MAIN SPAN
LOWER TOWER
REINFORCEMENT VI

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EDL	X	(See Title Sheet)		US-181
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DCB	TEXAS	CRP	NUECES	NHB 79B
CHECK	CONTROL	SECTION	JOB	
EDL	MF	0101	06	
CHECK	MF	0101	06	095

BAR LIST - LIFT 6											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	72	4	4		7' - 9¾"	4½"			45°		8' - 2¼"
T403	72	4	4		4' - 11½"	4½"			45°		5' - 4"
T406	72	4	18	4½"	6' - 2¾"			4½"			6' - 11¾"
T407	72	4	18	4½"	4' - 6¼"			4½"			5' - 3¼"
T408	72	4	18	4½"	2' - 11⅜"			4½"			3' - 8⅜"
T409	360	4	18	4½"	2' - 4⅜"			4½"			3' - 1⅜"
T601f	36	6	28		8' - 5¾"	10' - 0⅜"			102°	129°	37' - 0¼"
T602	72	6	1		7' - 2"						7' - 2"
T603f	72	6	3		10' - 3¾"	1' - 0"			129°		11' - 3¾"
T604	72	6	10		10' - 6¾"	1' - 0"	1' - 0"		102°	129°	12' - 6¾"
T605	36	6	6		15' - 7½"	1' - 0"	1' - 0"				17' - 7½"
T610	36	6	28		1' - 0"	9' - 9¼"			102°	129°	21' - 6½"
T1101	328	11	1		21' - 9¾"						21' - 9¾"
T1102	4	11	20		18' - 0"						18' - 0"

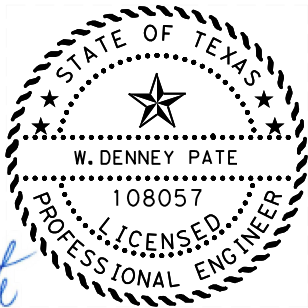
BAR LIST - LIFT 7											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	72	4	4		7' - 9¾"	4½"			45°		8' - 2¼"
T403	72	4	4		4' - 11½"	4½"			45°		5' - 4"
T406	72	4	18	4½"	6' - 2¾"			4½"			6' - 11¾"
T407	72	4	18	4½"	4' - 6¼"			4½"			5' - 3¼"
T408	72	4	18	4½"	2' - 11⅜"			4½"			3' - 8⅜"
T409	288	4	18	4½"	2' - 4⅜"			4½"			3' - 1⅜"
T601g	36	6	28		8' - 0"	10' - 0⅜"			102°	129°	36' - 0¾"
T602	72	6	1		7' - 2"						7' - 2"
T603g	72	6	3		9' - 10"	1' - 0"			129°		10' - 10"
T604	72	6	10		10' - 6¾"	1' - 0"	1' - 0"		102°	129°	12' - 6¾"
T605	36	6	6		15' - 7½"	1' - 0"	1' - 0"				17' - 7½"
T610	36	6	28		1' - 0"	9' - 9¼"			102°	129°	21' - 6½"
T1101	320	11	1		21' - 9¾"						21' - 9¾"
T1103	4	11	20		14' - 4½"						14' - 4½"

BAR LIST - LIFT 8											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	84	4	4		7' - 9¾"	4½"			45°		8' - 2¼"
T403	84	4	4		4' - 11½"	4½"			45°		5' - 4"
T406	84	4	18	4½"	6' - 2¾"			4½"			6' - 11¾"
T407	84	4	18	4½"	4' - 6¼"			4½"			5' - 3¼"
T408	84	4	18	4½"	2' - 11⅜"			4½"			3' - 8⅜"
T409	336	4	18	4½"	2' - 4⅜"			4½"			3' - 1⅜"
T601h	42	6	28		7' - 6"	10' - 0⅜"			102°	129°	35' - 0¾"
T602	84	6	1		7' - 2"						7' - 2"
T603h	84	6	3		9' - 4"	1' - 0"			129°		10' - 4"
T604	84	6	10		10' - 6¾"	1' - 0"	1' - 0"		102°	129°	12' - 6¾"
T605	42	6	6		15' - 7½"	1' - 0"	1' - 0"				17' - 7½"
T610	42	6	28		1' - 0"	9' - 9¼"			102°	129°	21' - 6½"
T1101	312	11	1		21' - 9¾"						21' - 9¾"
T1102	4	11	20		18' - 0"						18' - 0"

BAR LIST - LIFT 9 (ST)											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	64	4	4		7' - 9¾"	4½"			45°		8' - 2¼"
T403	64	4	4		4' - 11½"	4½"			45°		5' - 4"
T406	64	4	18	4½"	6' - 2¾"			4½"			6' - 11¾"
T407	64	4	18	4½"	4' - 6¼"			4½"			5' - 3¼"
T408	64	4	18	4½"	2' - 11⅜"			4½"			3' - 8⅜"
T409	256	4	18	4½"	2' - 4⅜"			4½"			3' - 1⅜"
T601k	32	6	28		7' - 1¾"	10' - 0⅜"			102°	129°	34' - 4¼"
T602	64	6	1		7' - 2"						7' - 2"
T603k	64	6	3		8' - 11¾"	1' - 0"			129°		9' - 11¾"
T604	64	6	10		10' - 6¾"	1' - 0"	1' - 0"		102°	129°	12' - 6¾"
T605	32	6	6		15' - 7½"	1' - 0"	1' - 0"				17' - 7½"
T610	32	6	28		1' - 0"	9' - 9¼"			102°	129°	21' - 6½"
T1105	312	11	1		17' - 1"						17' - 1"
T1106	4	11	20		13' - 4¼"						13' - 4¼"

BAR LIST - LIFT 9 (NT)											
BAR	NO	SIZE	BEND TYPE	A	B	C	D	G	N	O	LENGTH
T402	52	4	4		7' - 9¾"	4½"			45°		8' - 2¼"
T403	52	4	4		4' - 11½"	4½"			45°		5' - 4"
T406	52	4	18	4½"	6' - 2¾"			4½"			6' - 11¾"
T407	52	4	18	4½"	4' - 6¼"			4½"			5' - 3¼"
T408	52	4	18	4½"	2' - 11⅜"			4½"			3' - 8⅜"
T409	256	4	18	4½"	2' - 4⅜"			4½"			3' - 1⅜"
T601k	26	6	28		7' - 1¾"	10' - 0⅜"			102°	129°	34' - 4¼"
T602	52	6	1		7' - 2"						7' - 2"
T603k	52	6	3		8' - 11¾"	1' - 0"			129°		9' - 11¾"
T604	52	6	10		10' - 6¾"	1' - 0"	1' - 0"		102°	129°	12' - 6¾"
T605	26	6	6		15' - 7½"	1' - 0"	1' - 0"				17' - 7½"
T610	26	6	28		1' - 0"	9' - 9¼"			102°	129°	21' - 6½"
T1107	312	11	1		14' - 8¾"						14' - 8¾"
T1108	4	11	20		11' - 0"						11' - 0"

NOTES:
1. FOR BAR BENDS, SEE BAR BENDING DETAILS I SHEET.



W. Denney Pate

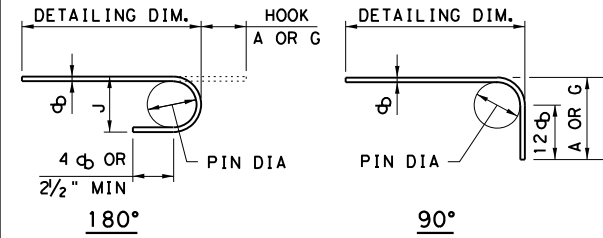
11/03/17

HL-93 LOADING NOT TO SCALE

NO.	DATE	REVISION	APRV
US-181 HARBOR BRIDGE			
MAIN SPAN LOWER TOWER REINFORCEMENT VII			
DESIGN EDL	FED. RD. DIV. NO. X	FEDERAL AID PROJECT NO. (See Title Sheet)	
GRAPHICS DCB	STATE	DISTRICT	COUNTY
CHECK EDL	TEXAS	CRP	NUECES
CHECK MF	CONTROL	SECTION	JOB
	0101	06	095
			HIGHWAY NO. US-181 SHEET NO. NHB 79C

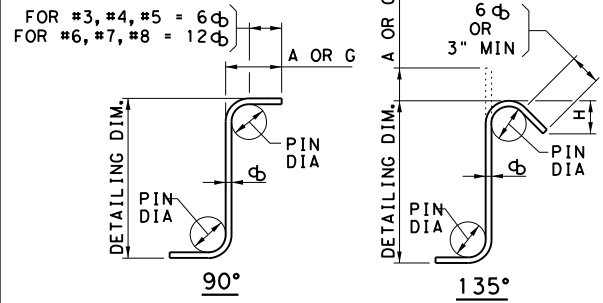
STANDARD HOOK DETAILS

ALL GRADES
 ϕ = BAR DIAMETER



STANDARD HOOK DIMENSIONS

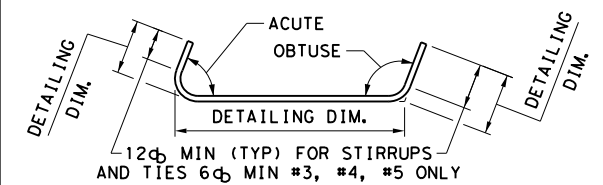
BAR SIZE	PIN DIA	180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	1'-0"
#7	5 1/4"	10"	7"	1'-2"
#8	6"	11"	8"	1'-4"
#9	9/2"	1'-3"	11 3/4"	1'-7"
#10	10 3/4"	1'-5"	1'-1 3/4"	1'-10"
#11	12"	1'-7"	1'-2 3/4"	2'-0"
#14	18 1/4"	2'-3"	1'-9 3/4"	2'-7"
#18	24"	3'-0"	2'-4 1/2"	3'-5"



STIRRUPS (TIES SIMILAR)

STIRRUP & TIE HOOK DIMENSIONS

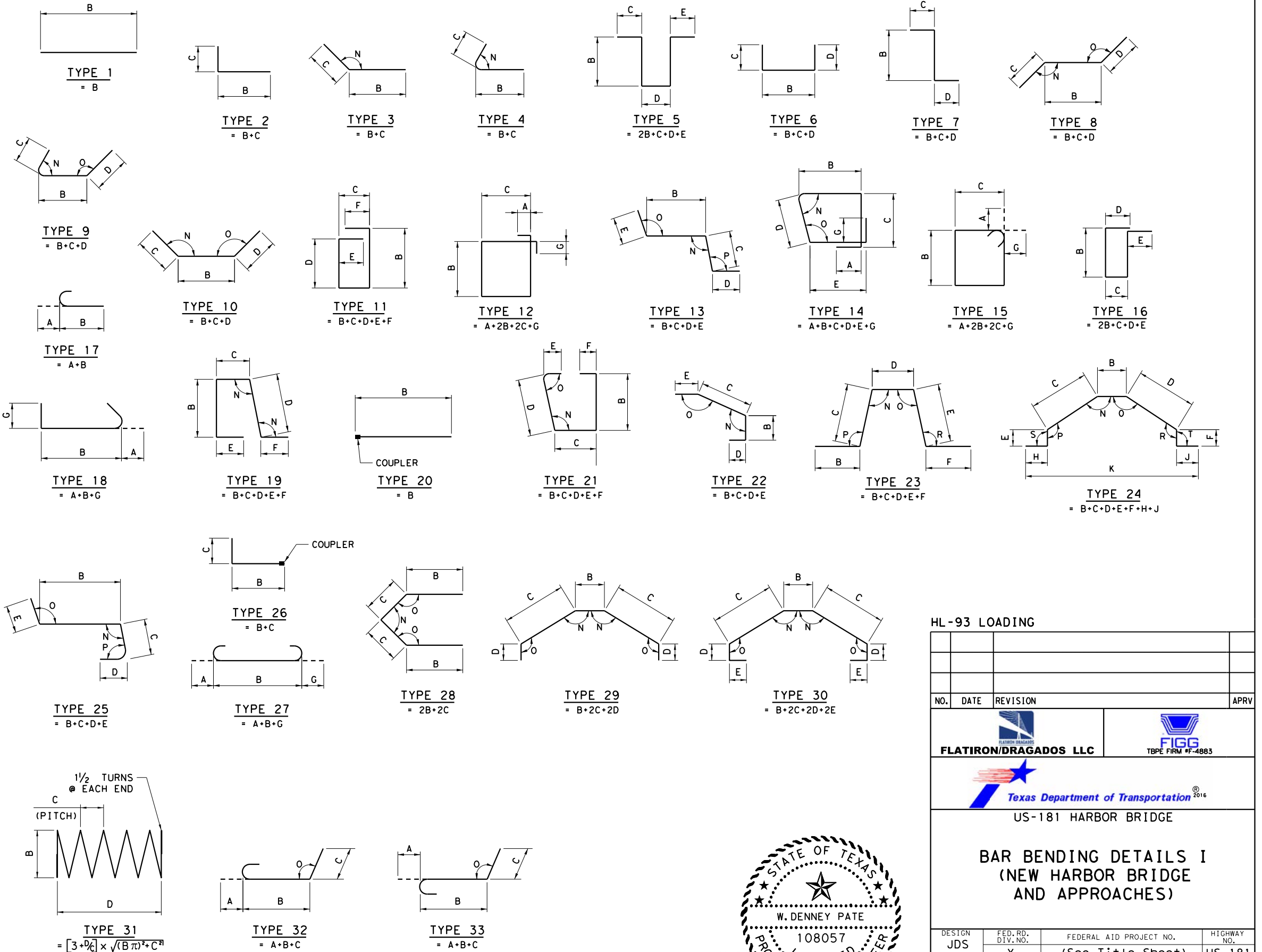
BAR SIZE	PIN DIA	90° HOOKS		135° HOOKS	
		HOOK A OR G	HOOK A OR G	HOOK A OR G	APPROX. H
#3	1 1/2"	4"	4"	4"	2 1/2"
#4	2"	4 1/2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	5 1/2"	3 3/4"
#6	4 1/2"	1'-0"	8"	8"	4 1/2"
#7	5 1/4"	1'-2"	9"	9"	5 1/4"
#8	6"	1'-4"	10 1/2"	10 1/2"	6"



BAR BENDING AND NON-STANDARD HOOK DETAIL

NOTES:

1. ALL DIMENSIONS ARE IN INCHES, UNLESS NOTED OTHERWISE.
2. ALL DIMENSIONS ARE OUT-TO-OUT.
3. ALL HOOK STYLES ARE FOR ILLUSTRATION ONLY.



HL-93 LOADING

NO.	DATE	REVISION	APRV



FLATIRON DRAGADOS LLC



FIGG
TBE FIRM #F-4883

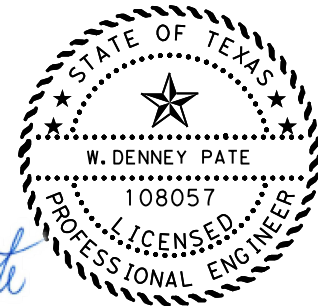


US-181 HARBOR BRIDGE

BAR BENDING DETAILS I (NEW HARBOR BRIDGE AND APPROACHES)

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
JDS	X	(See Title Sheet)		US-181
GRAPHICS	CFR	STATE	DISTRICT	COUNTY
CHECK	JDS	TEXAS	CRP	NUECES
CHECK	JMW	CONTROL	SECTION	JOB
		0101	06	095

BG
015



W. Denney Pate

11/03/17