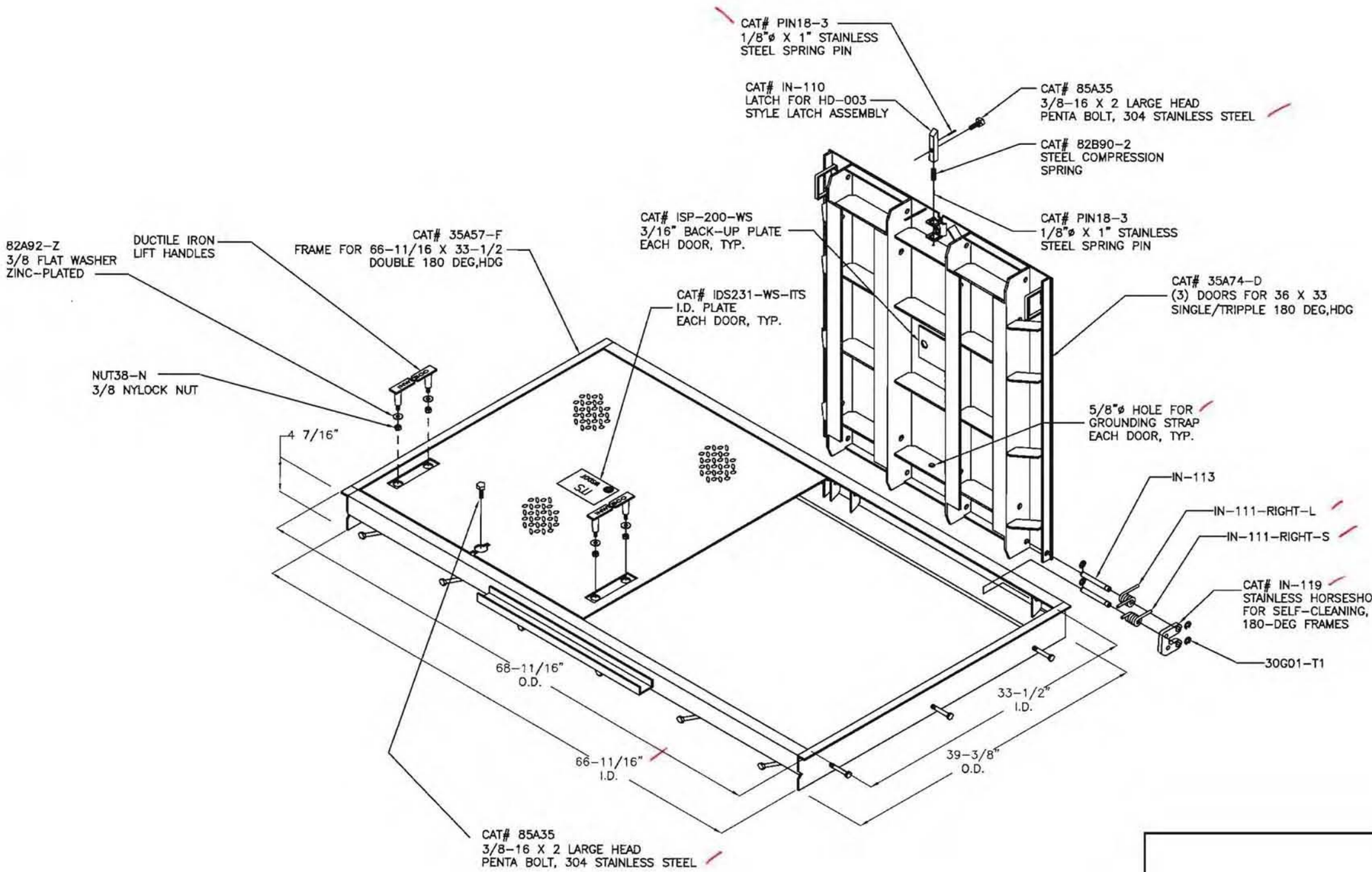


DESIGN CRITERIA

1. ASSUME ASTM A-36 STEEL PLATE & STRUCTURAL SHAPES.
2. DESIGN IN AASHTO H-20 (16.0 KIP WHEEL LOAD) LOADING CRITERIA.
3. USE 16.0 KIP WHEEL LOAD WITH A 40% IMPACT FACTOR (22.500 lbs.)
4. Fb=0.66Fy (Fy=36.0 ksi) Fb=24.00 ksi.
5. Fv=0.40Fy (14.40 ksi).
6. LOAD DISTRIBUTION AREA @ 10"x10".
7. REFER TO ASTM C-857 AS LAST REVISED WHERE APPLICABLE.
8. USE AWS ER70-6 CO_2 GAS SHIELDED WELDING WIRE

NOTES

THIS FRAME AND COVER ASSEMBLY HAS BEEN DESIGNED IN ACCORDANCE WITH THE LOADING CRITERIA SET-FOURTH BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS (AASHTO), AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM C-857 AS LAST REVISED) WHERE APPLICABLE.

THIS FRAME AND COVER ASSEMBLY HAS BEEN DESIGN FOR USE IN TRAFFIC APPLICATION, OR IN AREAS SUBJECTED TO H-20-44 TRAFFIC CONDITIONS.

APPROVED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE November 5, 2009 TAT

REV	DESCRIPTION OF MODIFICATION	DATE	BY

PROPRIETARY INFORMATION

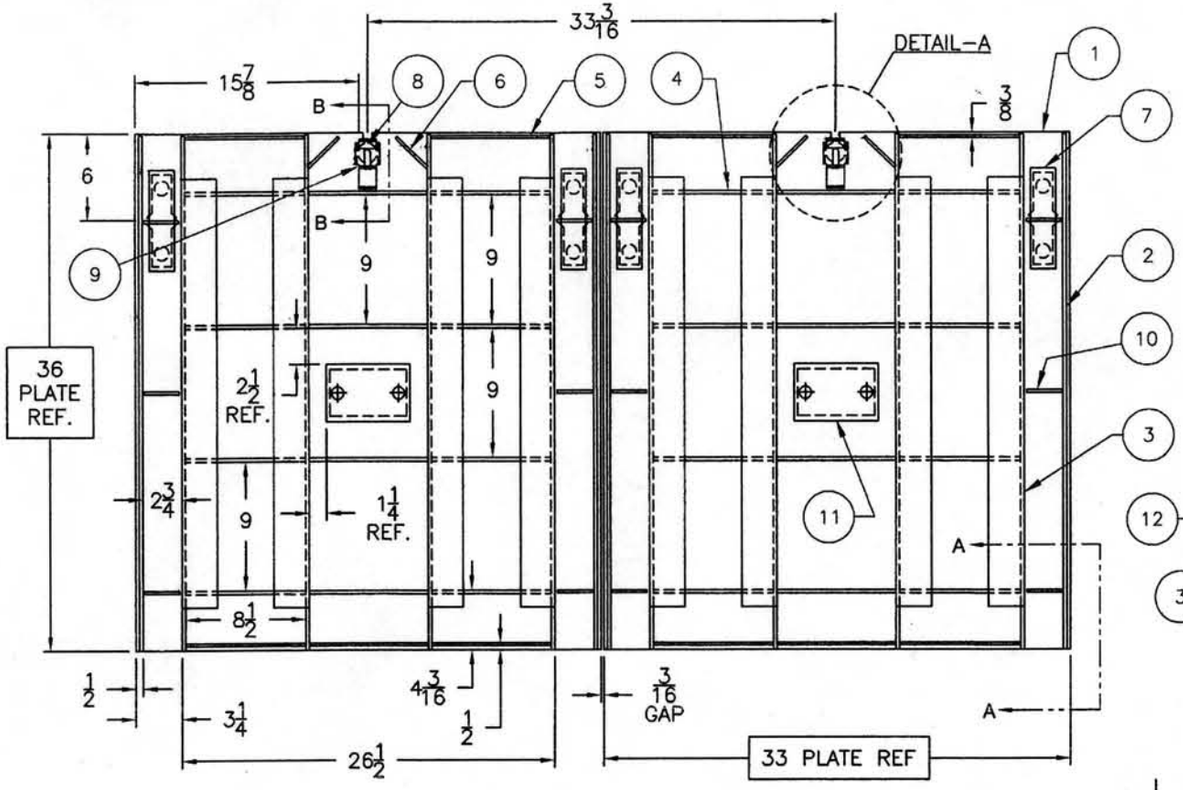
THIS DRAWING EMBODIES PROPRIETARY AND CONFIDENTIAL INFORMATION AND IS LOANED BY INVESCO WITH THE UNDERSTANDING THAT IT WILL NOT BE DISCLOSED IN PART OR WHOLE, AND/OR USED FOR ANY OTHER PURPOSE OTHER THAN MAINTENANCE OR INSTALLATION, UNLESS EXPRESSLY AUTHORIZED IN WRITING BY INVESCO INCORPORATED

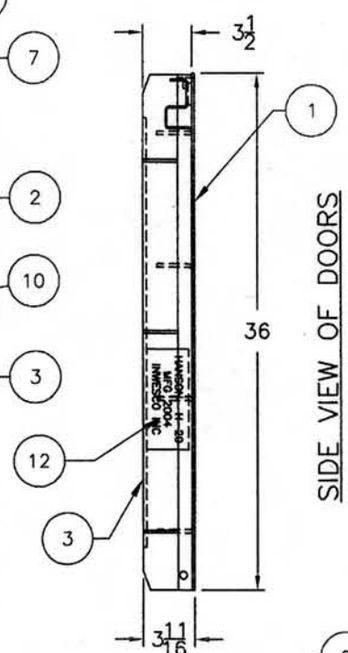
INVESCO INCORPORATED
746 NORTH CONEY AVENUE
AZUSA, CALIFORNIA 91702
PH: (626) 334-9304
FAX: (626) 969-3404

TITLE
COVER AND FRAME FOR SELF-CLEANING
INLINE DOUBLE 180-DEG, FLOOR PLATE, HDG

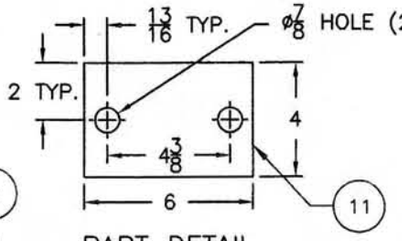
SIZE	MATL	DATE	CAT/DWG#	WEIGHT
		09/29/08	35A57	
	SCALE	DWN BY	SHEET 1 OF 1	REV
		LJN		

BILL OF MATERIALS			
Item	Qty	Name	Material
1	1	CAT# 35A57-P (SET OF 2)	STEEL
2	4	FLAT BAR 1/4 X 1 X 36	STEEL
3	8	CAT# IN-130-H20, SGL/TPL ANGLE STRINGER 35-7/8 LG	STEEL
4	24	CAT# IN-124, CRIPPLE 1/4 X 2-1/2 X 8-3/8	STEEL
5	8	CAT# IN-125, CRIPPLE 3/16 X 1 X 8-3/8	STEEL
6	4	STRIP 3/16 X 1 X 3	STEEL
7	4	CAT# 35A23, LIFT HANDLE BACK-UP PLATE	STEEL
8	2	STRIP 3/16 X 1/2 X 1-1/4	STEEL
9	2	CAT# IN-100-M2, LATCH HOUSING	STEEL
10	12	CAT# IN-101, STD. GUSSET 3/16 X 1 X 3-1/2	STEEL
11	2	CAT# ISP-200-WS, 3/16 BACK-UP PLATE	STEEL
12	1	CAT# IDHP-20DP	STEEL

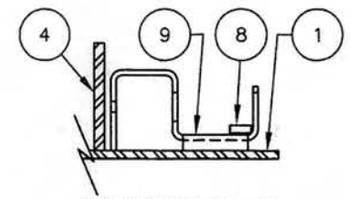




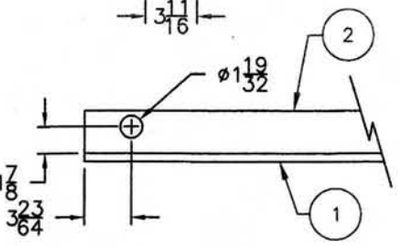
SIDE VIEW OF DOORS



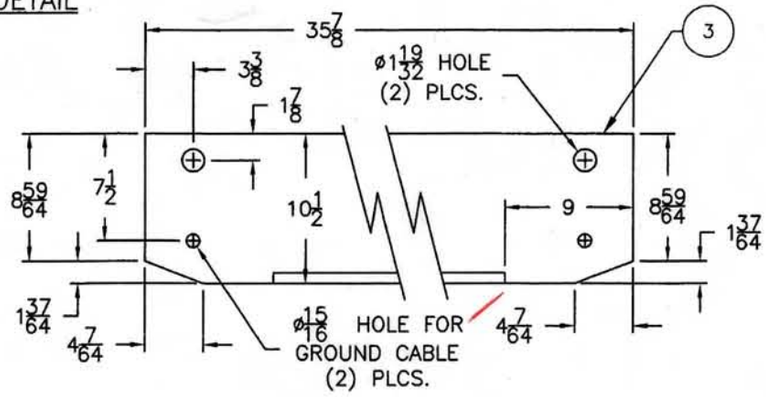
PART DETAIL



SECTION B-B
(TYP BOTH HOLD-DOWNS)

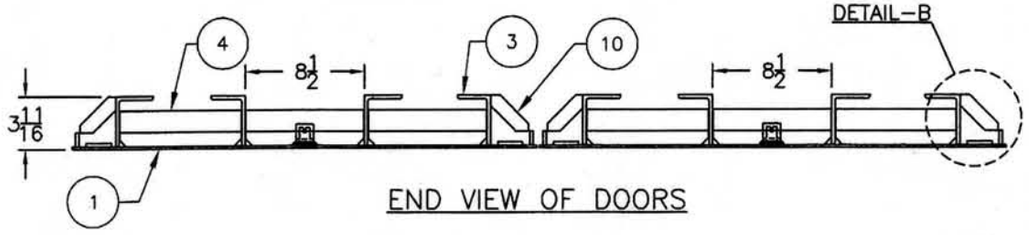


SECTION A-A

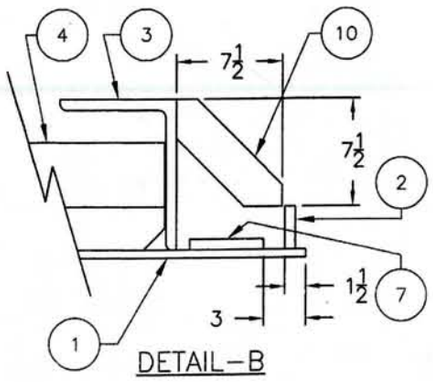


NOTCH DETAIL
IN-130-H20 (REF)

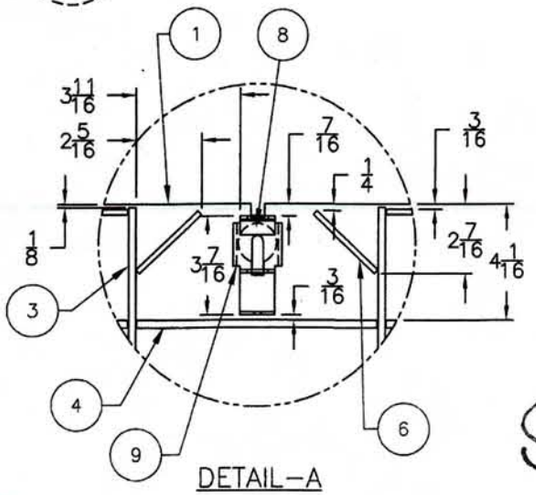
BOTTOM VIEW OF DOORS



END VIEW OF DOORS



DETAIL-B



DETAIL-A

APPROVED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE April 14, 2010 TAT

REGISTERED PROFESSIONAL ENGINEER
DAVID L. MORRIS
No. 36927
Exp. 6-30-10
CIVIL
STATE OF CALIFORNIA

REV	DESCRIPTION OF MODIFICATION	DATE	BY
A	CHG'D. I-9, IN-100 W/ IN-100-M2. REPLACED I-8 W/ STRIP 3/16 X 1/2 X 1-1/4. INCREASED QYT. OF I-4 FR. 22 TO 24.	10/04/07	LJN

PROPRIETARY INFORMATION

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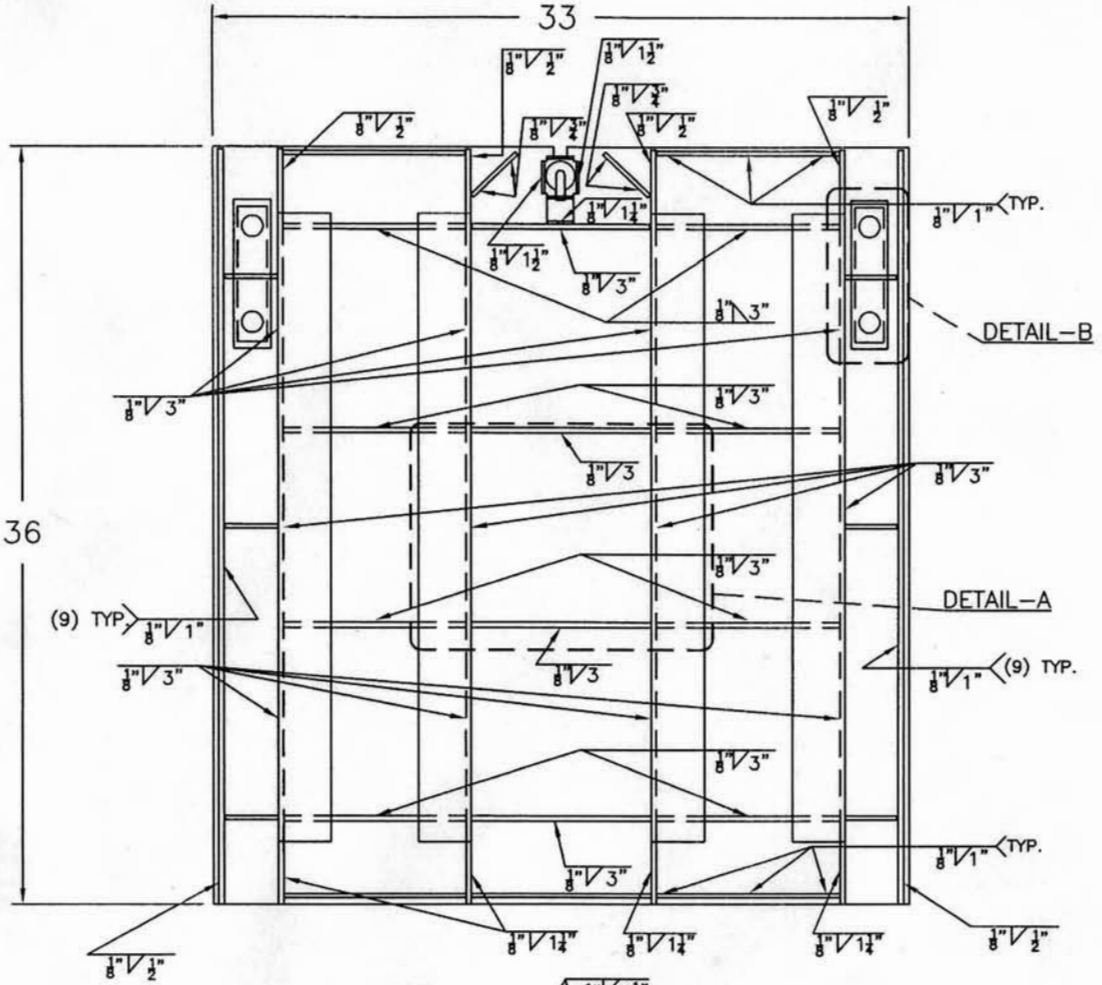
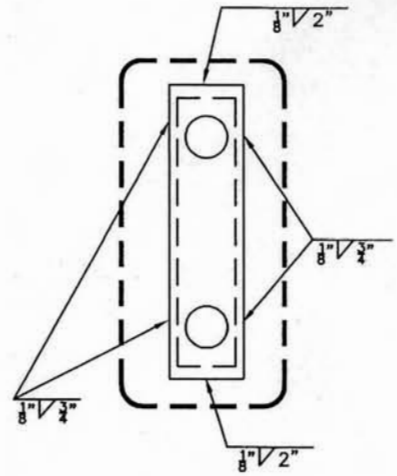
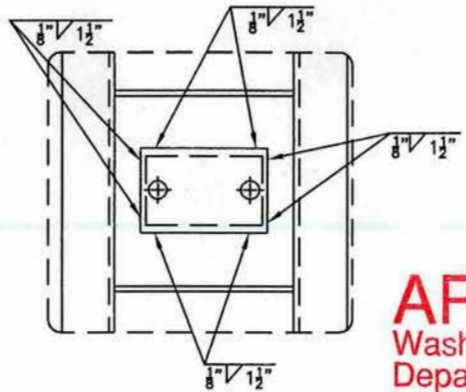
INWESCO
746 N. Coney Avenue
Azusa, California 91702
626.334.9304

TITLE		
DOOR FOR SELF CLEANING DOUBLE 180 DEG, 3/16 DIAMOND PLATE, HDG		
DATE 06/15/07	CAT # 35A57-D	WEIGHT
DRAWN BY LJN		REVISION A





DETAIL–B
(TYP. OF BOTH HANDLES)



DETAIL–A
FOR ID TAG HOLDER

HORIZONTAL WELDS

REV	DESCRIPTION OF MODIFICATION	DATE	BY
D	REVISE WELD SYMBOLS	03/29/10	DHL
C	REVISE WELD SYMBOLS	03/17/10	SJ

INWESCO STANDARD DETAIL

THE PARTS SHOWN IN THIS BORDER MAKE UP A SUB–ASSEMBLY TO BE USED IN EVERY SIMILAR TOP ASSEMBLY. THE BILL OF MATERIALS CONTAINED IN THIS BORDER SHALL NOT BE DUPLICATED IN THE ASSEMBLY BILL OF MATERIALS. THEREFORE THIS SUB–ASSEMBLY IS REFERRED TO AS AN INWESCO STANDARD DETAIL

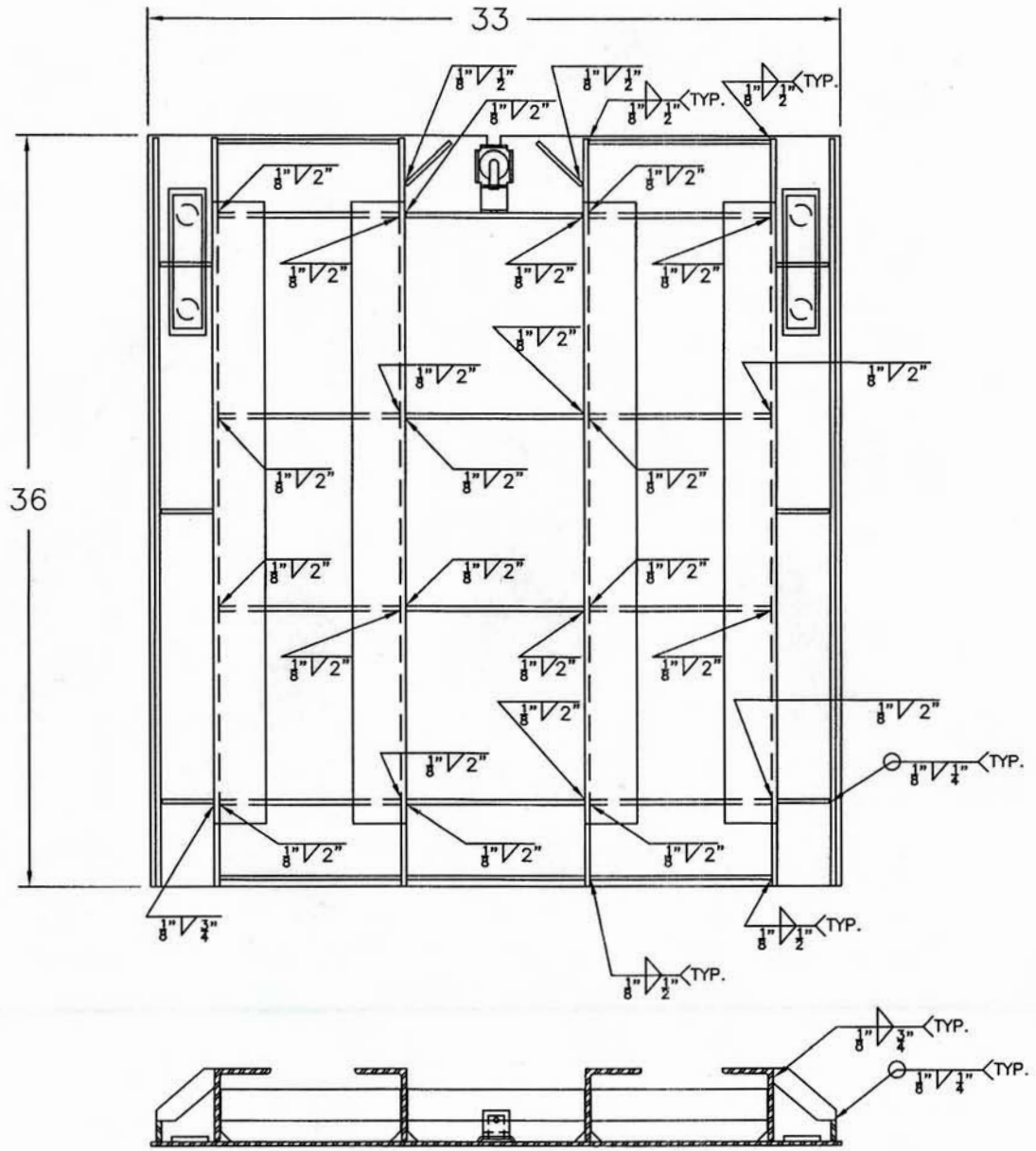
APPROVED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE April 14, 2010 TAT

INWESCO
746 N. Coney Avenue
Azusa, California 91702
626.334.9304

TITLE: WELDING STANDARDS FOR SUBSTRUCTURE

DATE	CAT #	WEIGHT
11–23–04	35A57–DWS–1	
DRAWN BY: RS		REVISION: D

APPROVED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE April 14, 2010 TAT



SECTION VIEW

VERTICAL WELDS

REV	DESCRIPTION OF MODIFICATION	DATE	BY
B	REVISE WELD SYMBOLS	03/29/10	DHL
A	REVISE WELD SYMBOLS	03/17/10	SJ

INWESCO STANDARD DETAIL

THE PARTS SHOWN IN THIS BORDER MAKE UP A SUB-ASSEMBLY TO BE USED IN EVERY SIMILAR TOP ASSEMBLY. THE BILL OF MATERIALS CONTAINED IN THIS BORDER SHALL NOT BE DUPLICATED IN THE ASSEMBLY BILL OF MATERIALS. THEREFORE THIS SUB-ASSEMBLY IS REFERRED TO AS AN INWESCO STANDARD DETAIL.

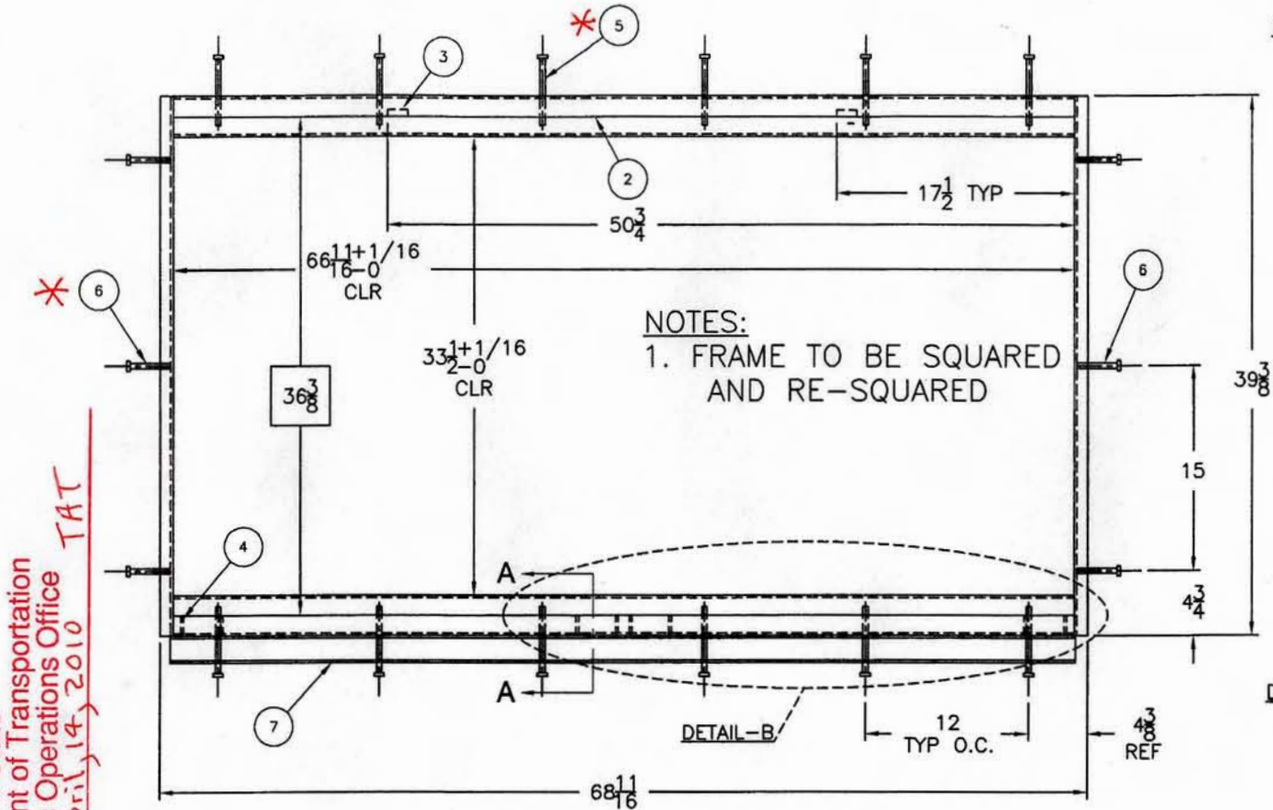
INWESCO
746 N. Coney Avenue
Azusa, California 91702
626.334.9304

TITLE: WELDING STANDARDS FOR SUBSTRUCTURE

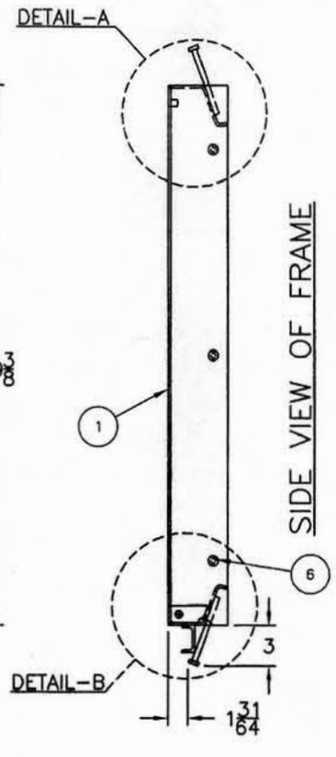
DATE	CAT #	WEIGHT
03/25/10	35A57-DWS-2	
DRAWN BY: SJ		REVISION: B

APPROVED AS NOTED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE April 14, 2010 TAT

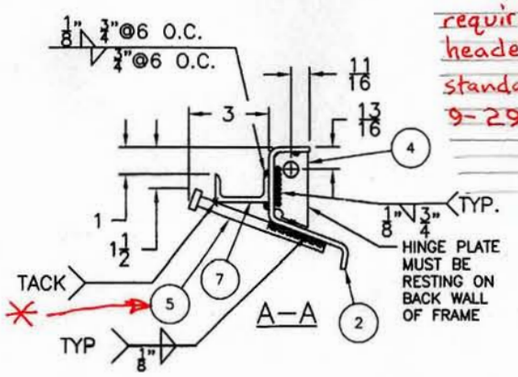
BILL OF MATERIALS			
Item	Qty	Name	Material
1	2	CAT# 35A57-F-1, 39-3/8 LONG	STEEL
2	2	CAT# 35A57-F-2, 66-11/16 LONG	STEEL
3	2	SQ 1/2 X 1-1/2	STEEL
4	8	CAT# IN-103	STEEL
5	12	CAT# BLT38-20 (3/8-16 X 5 BOLT) *	STEEL
6	6	CAT# BLT38-8 (3/8-16 X 3 BOLT) *	STEEL
7	1	C 2 X 1 X 3/16 X 67	STEEL
	0		



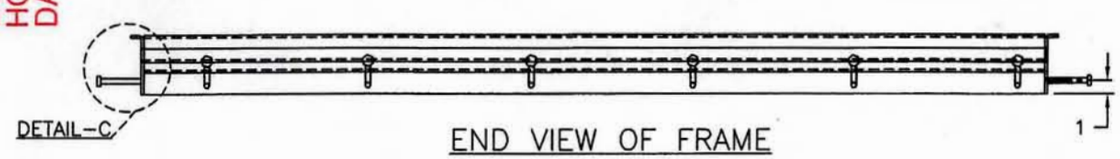
PLAN VIEW OF FRAME



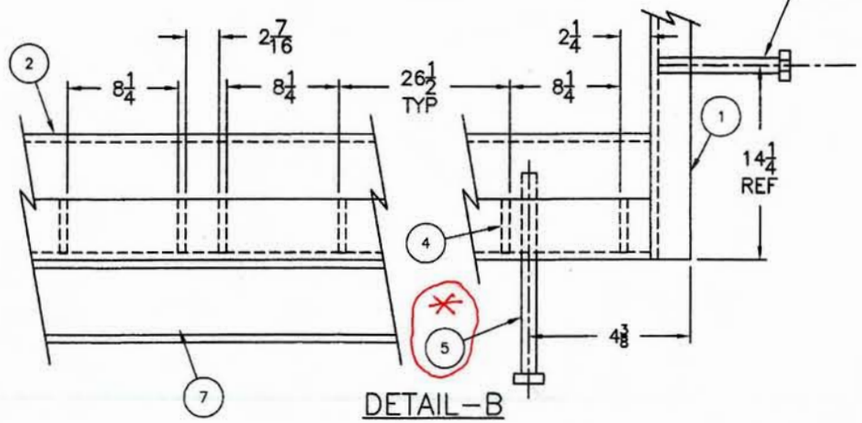
SIDE VIEW OF FRAME



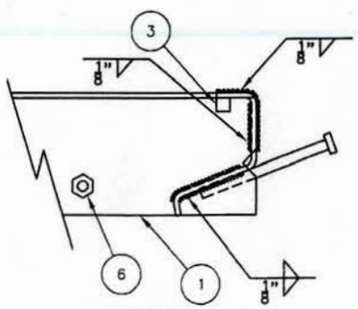
required to be welded headed anchor stud per standard specification 9-29.2(2)A

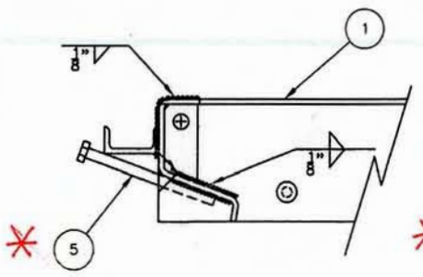


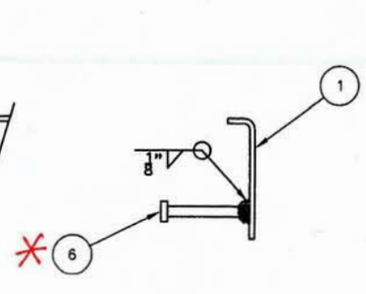
END VIEW OF FRAME

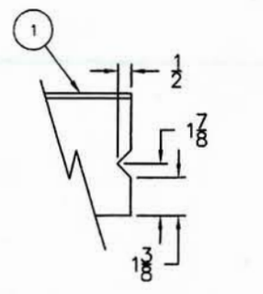


DETAIL-B









NOTCH DETAIL
NOTCH ONE END
(1 LEFT, 1 RIGHT REQ'D)

REGISTERED PROFESSIONAL ENGINEER
DAVID L. MORRIS
No. 36927
Exp. 6-30-10
CIVIL
STATE OF CALIFORNIA

REV	DESCRIPTION OF MODIFICATION	DATE	BY
B	REVISE WELD SYMBOLS ON SECTION A-A	3/31/10	DHL
A	REVISED SQ. BAR FROM 5/8 TO 1/2	11/18/09	SJ

PROPRIETARY INFORMATION
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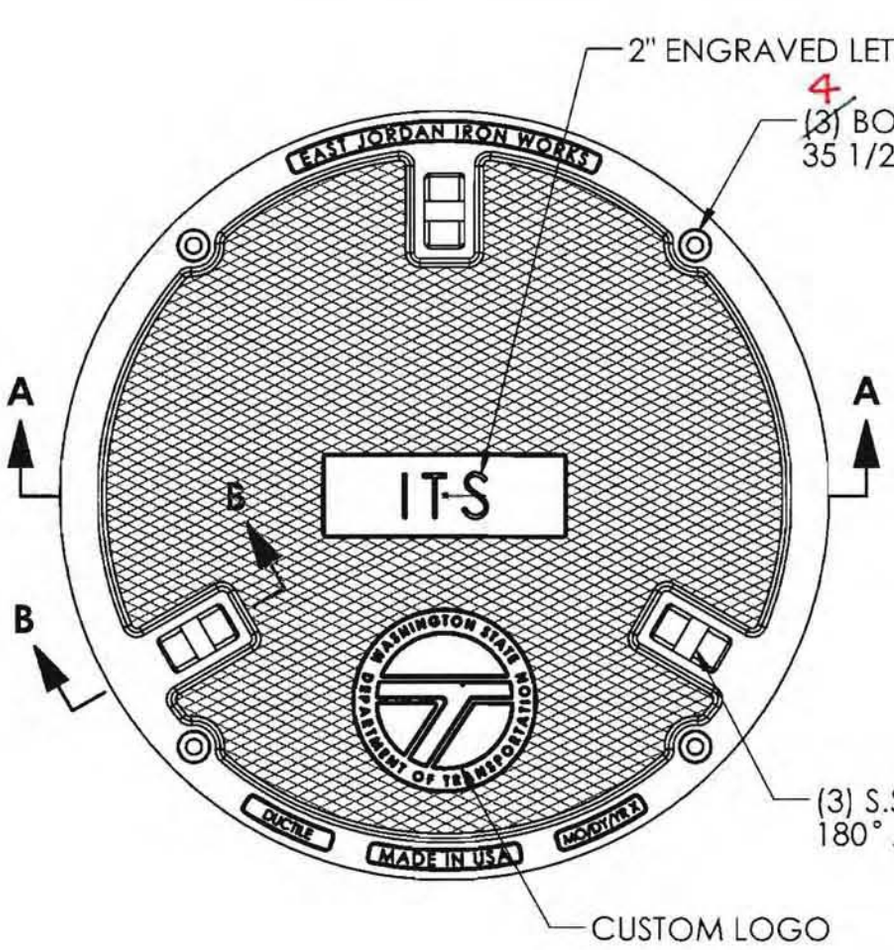
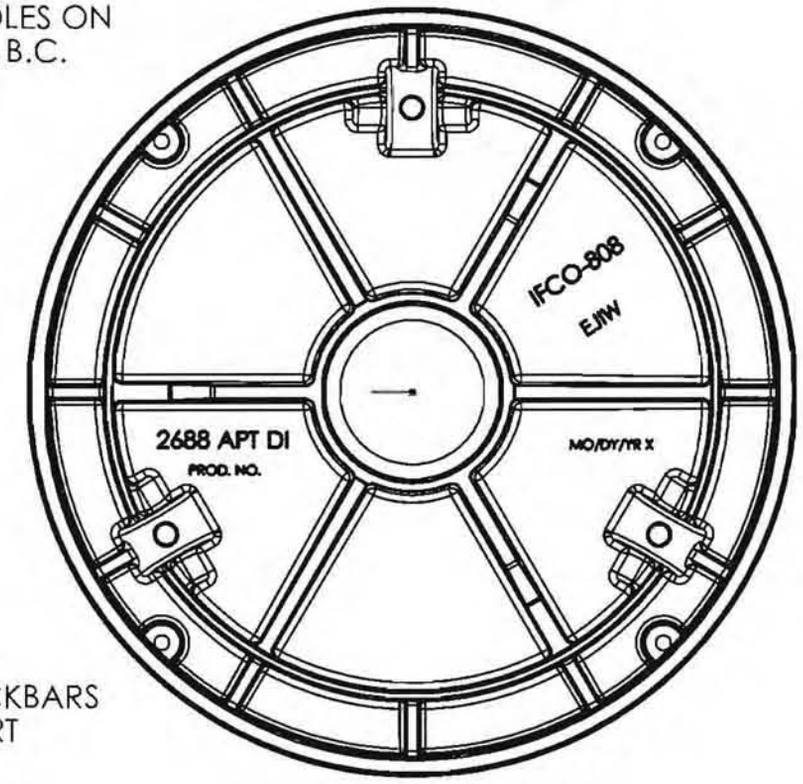
INWESCO
746 N. Coney Avenue
Azusa, California 91702
626.334.9304

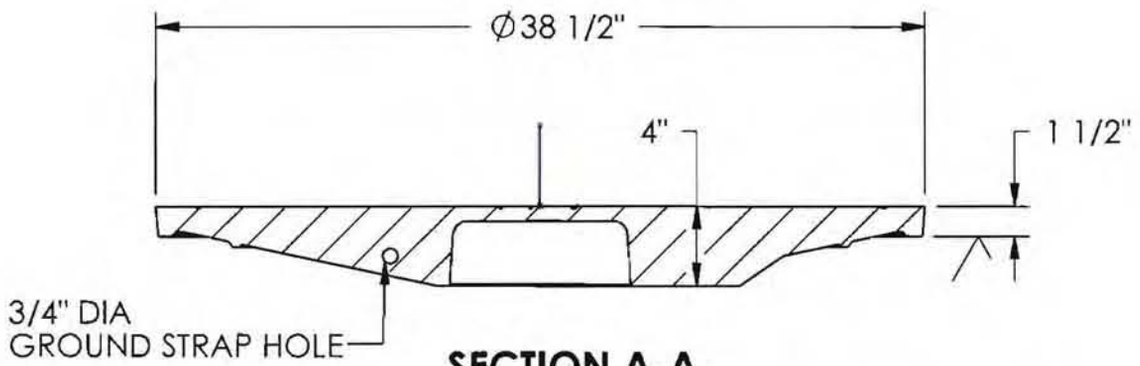
TITLE: FRAME FOR SELF CLEANING DOUBLE, 180-DEG 33-1/2" X 66-11/16" CLEAR OPEN, HDG

DATE	CAT #	WEIGHT
01/05/06	35A57-F	
DRAWN BY: RS		REVISION: B





BOTTOM VIEW



SECTION A-A

SECTION B-B

APPROVED AS NOTED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE November 5, 2009 TAT

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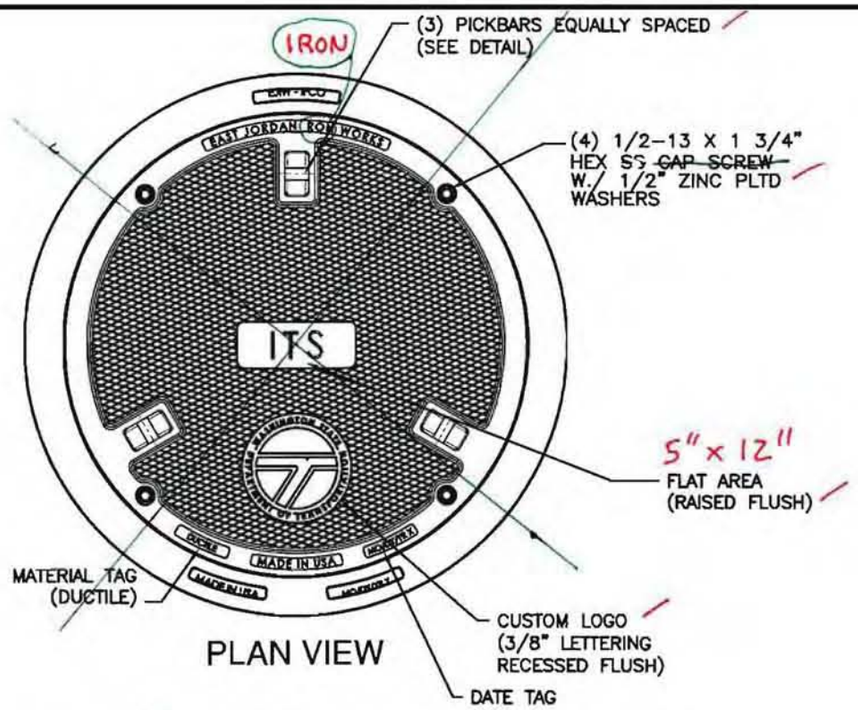
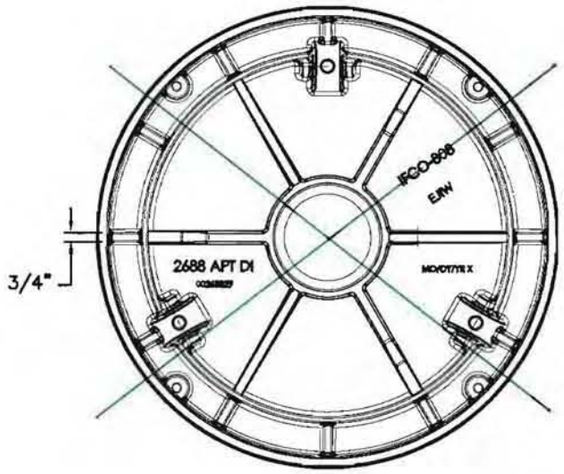
EJIW EAST JORDAN IRON WORKS EST. 1883
800-626-4653
www.ejiw.com
MADE IN USA

PRODUCT NUMBER **00268829**
CATALOG NUMBER **2688APT DI**
COVER
LOAD RATING **HEAVY DUTY**
COATING **UNDIPPED**
SPECIFICATION **COVER-DUCTILE IRON ASTM A536**
OPEN AREA **N/A**
√ DESIGNATES **MACHINED SURFACE**

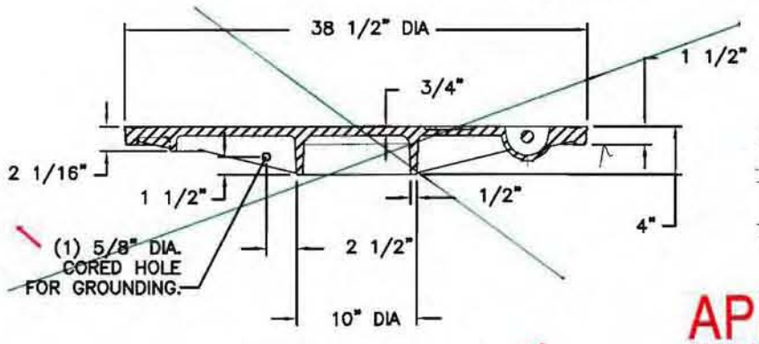
DRAWN DEW	DATE 8/30/2007
LAST REVISED DEW	DATE 5/19/2009



PLAN VIEW



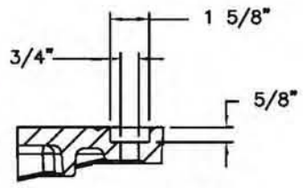
COVER BOTTOM



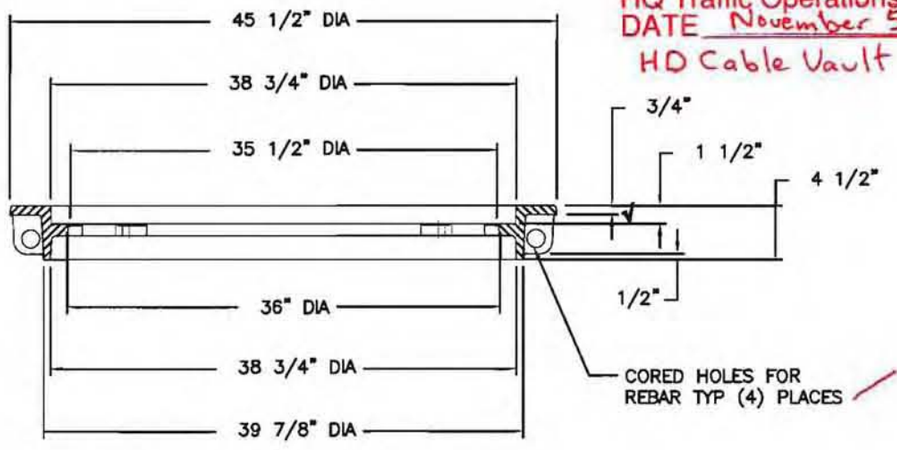
COVER SECTION

USE THIS SHEET FOR FRAME SECTION DETAIL, BOLT HOLE DETAIL & PICKBAR DETAIL. USE SHEET TITLED "COVER", PRODUCT # 00268823, REVISED DATE 5/13/09 FOR COVER DETAIL NOT SHOW ON THIS SHEET.

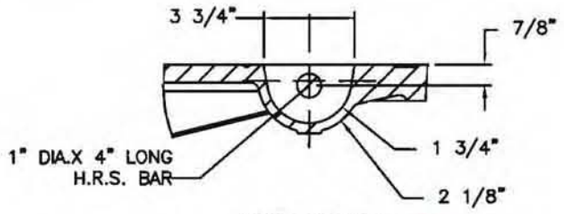
APPROVED AS NOTED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE November 5, 2009 TAT
HD Cable Vault



BOLTHOLE
DETAIL



FRAME SECTION



PICKBAR
DETAIL

√ MACHINED SURFACE

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EJIW EAST JORDAN IRON WORKS EST.1883
800-626-4653
www.ejiw.com
MADE IN USA

PRODUCT NUMBER
00268801

CATALOG NUMBER
2688Z2PT
2688 APT DI

MANHOLE ASSEMBLY

LOAD RATING
HEAVY DUTY

COATING
UNDIPPED

ESTIMATED WEIGHT
COVER: 311 LBS
FRAME: 225 LBS
UNIT: 532 LBS

MATERIAL SPECIFICATION
COVER – ~~GRAY IRON ASTM A48 CL35B~~
FRAME – GRAY IRON ASTM A48 CL35B

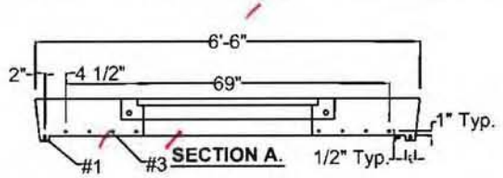
Ductile Iron - ASTM A536

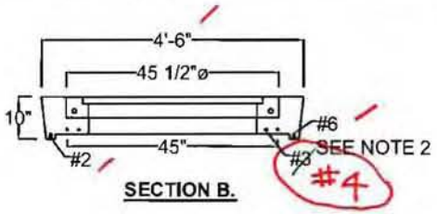
OPEN AREA
N/A

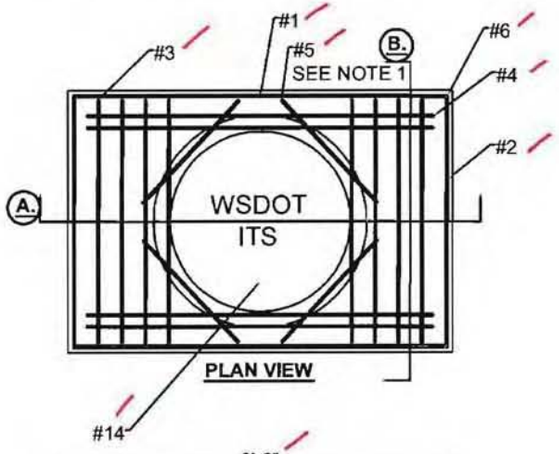
√ DESIGNATES MACHINED SURFACE

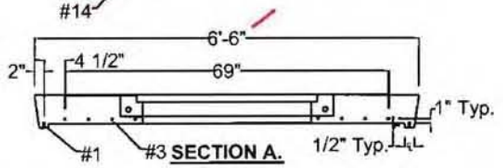
DRAWN	DATE
DEW	05/18/06
LAST REVISED	DATE
JJD	05/22/08

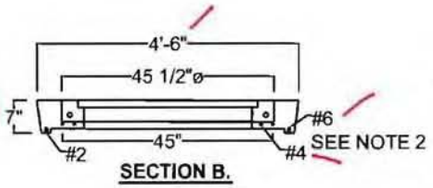
REFERENCE INFORMATION
00XXXXXX

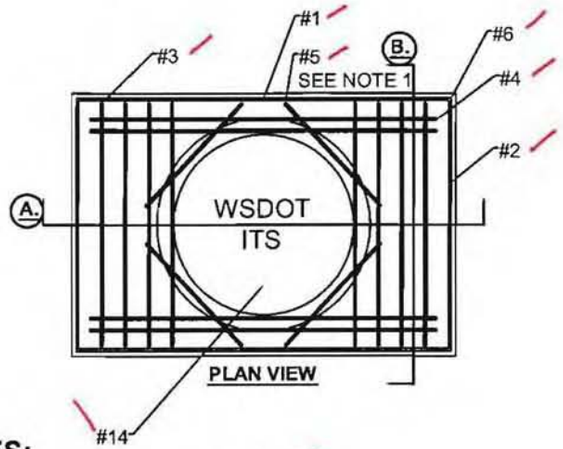


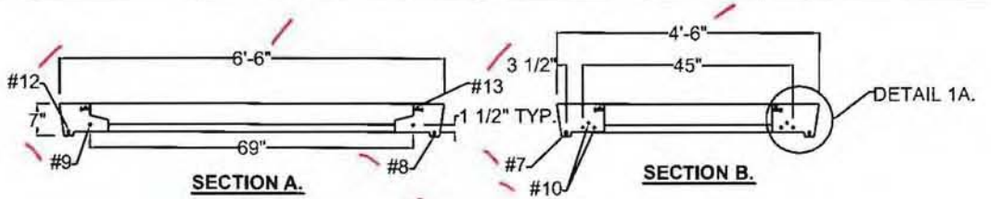


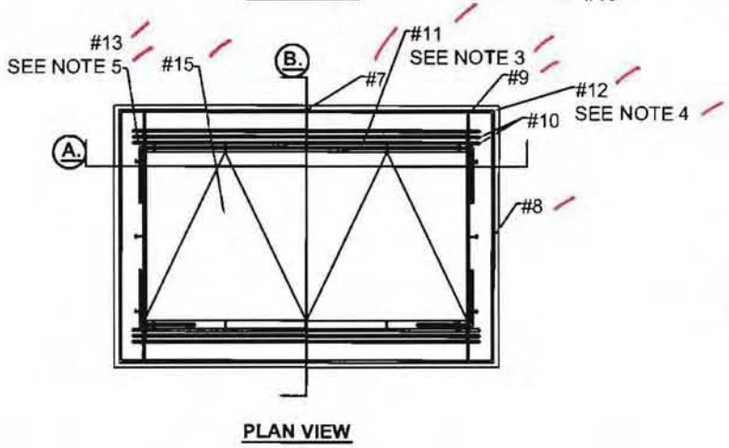


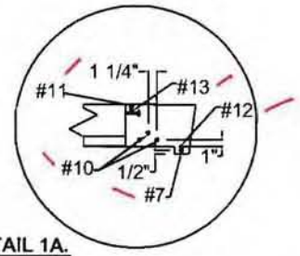












BAR #	DESCRIPTION/SIZE	QTY.	SPACING
1	#3 BAR @ 60"	2	NA
2	#3 BAR @ 24"	2	NA
3	#6 BAR @ 52"	8	5" O.C.E.W.
4	#6 BAR @ 74"	4	2 1/2" O.C.E.W.
5	#3 BAR @ 36"	4	SEE NOTE 1
6	#3 BAR @ 36" BEND @ 90°	4	SEE NOTE 2
7	#3 BAR @ 60"	2	NA
8	#3 BAR @ 24"	2	NA
9	#6 BAR @ 52"	2	69" ℄ TO ℄
10	#5 BAR @ 74"	6	2 1/2" O.C.E.W.
11	#6 BAR @ 60"	1	SEE NOTE 3
12	#3 BAR @ 36" BEND @ 90°	4	SEE NOTE 4
13	#4 BAR @ 24" BEND @ 90°	4	SEE NOTE 5
14	WSDOT ITS 36" RING AND COVER 2688Z2PT	1	N/A
15	INWESCO 23 HATCH 35A57	1	N/A

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- ☐ APPROVED AS SUBMITTED
- ☐ APPROVED AS CORRECTED
- ☐ RESUBMIT

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SIGNED _____

TITLE _____ DATE _____

NOTES:

1.) RUN THROUGH RING LOOPS IN CASTING
2.) PLACED EACH CORNER
3.) TIED TO HATCH STUDS HINGE SIDE
4.) PLACED EACH CORNER
5.) TIED TO HATCH STUDS ALL FOUR CORNERS
6.) ALL REBAR GRADE 60

APPROVED AS NOTED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE November 5, 2009 TAT

DRAWN: R.H.	DATE: 9/1/09	**WSDOT HEAVY DUTY 465 LIDS**
QC: J.T.	SCALE: NTS	
		PAGE: 1 of 2

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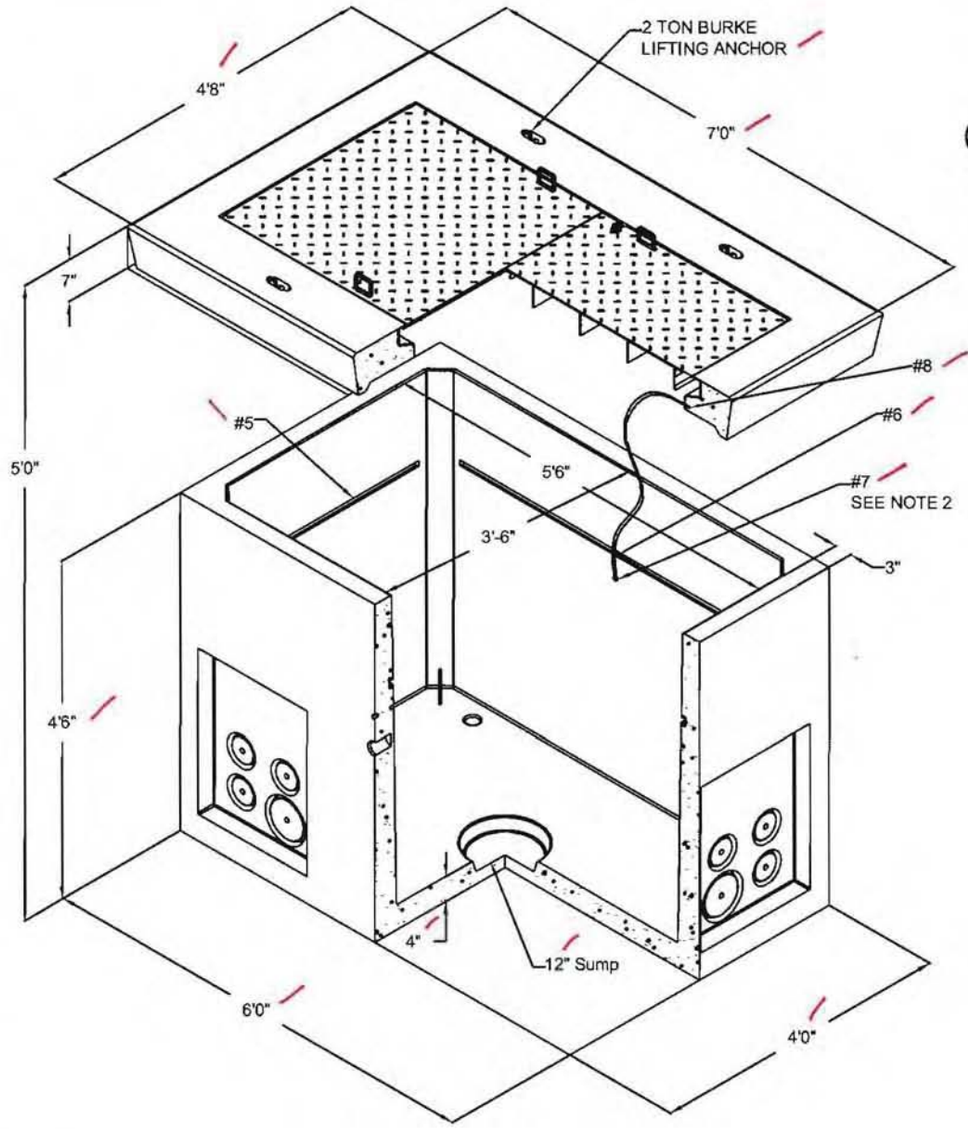
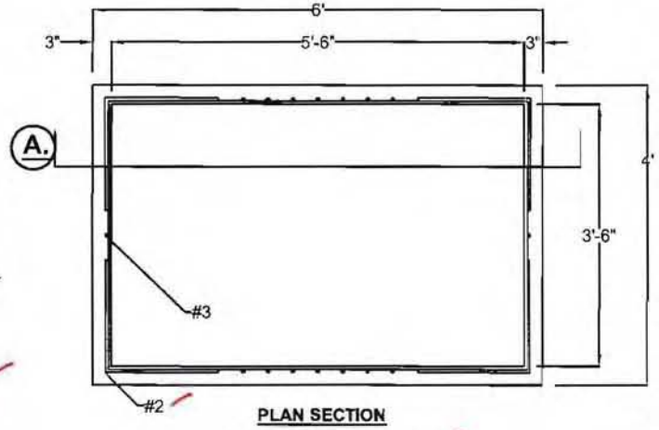
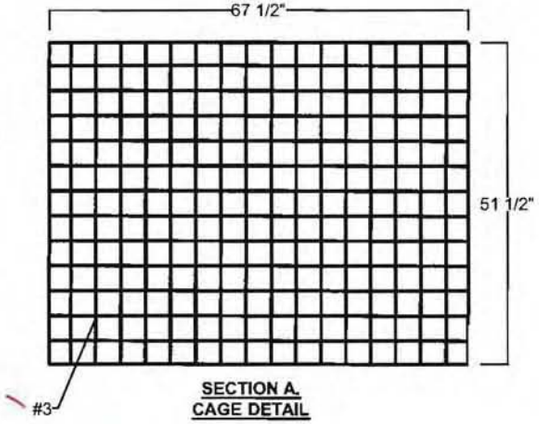
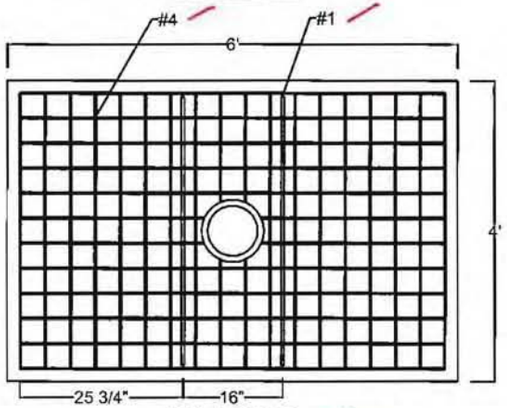




PLAN SECTION



SECTION A.
CAGE DETAIL



BOTTOM SLAB
PLAN SECTION

APPROVED
Washington State
Department of Transportation
HQ Traffic Operations Office
DATE November 5, 2009 TAT

BAR #	DESCRIPTION/SIZE	QTY.	SPACING
1	#5 BAR @ 43"	2	16" ℄ TO ℄
2	#4 BAR @ 36" BEND @ 90°	4	SEE NOTE 1
3	4X4 WWF W2.9XW2.9	1	1030 sq. ft. 20" OVERLAP
4	4X4 WWF W2.9XW2.9	1	334 sq. ft. 8" OVERLAP
5	36" X 1 5/8" X 13/16" STAINLESS STEEL UNISTRUT	2	1 EACH SHORT WALL
6	60" X 1 5/8" X 13/16" STAINLESS STEEL UNISTRUT	2	1 EACH LONG WALL
7	1/2" BRASS GROUNDING INSERT	1	2 INTERNAL
8	1/2" BONDING INSERT	1	IN LID

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TITLE _____ DATE _____

NOTES:

1.) PLACED EACH CORNER

2.) 5/8" X 3/4" SS GROUND STUD WITH SS NUTS AND SS WASHERS SHALL BE ATTATCHED TO BRASS GROUNDING LUG IN VAULT AND BONDING INSERT IN LID.

3.) BRASS GROUNDING LUG AND BONDING INSERT TO BE ATTATCHED VIA #8MIN. X 4' (FT.) TINNED BRAIDED COPPER BONDING JUMPER

4.) ALL REBAR GRADE 60

DRAWN: R.H.	DATE: 9/1/09
QC: J.T.	SCALE: NTS

465 VAULT BASE

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