



U.S. Department of Energy
Office of River Protection

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OCT 24 2008

08-ESQ-248

Ms. Jane A. Hedges, Program Manager
Nuclear Waste Program
Washington State
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

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OCT 28 2008
EDMC

Dear Ms. Hedges:

SUBMITTAL OF HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PERMIT MODIFICATION NOTIFICATION FORM 24590-WTP-PCN-ENV-08-009

Reference: WA7890008967, "Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste, Part III, Operating Unit 10, 'Waste Treatment and Immobilization Plant.'"

This letter transmits Hanford Facility RCRA Permit Modification Notification Form 24590-WTP-PCN-ENV-08-009, attached, for the Washington State Department of Ecology (Ecology) review and approval. The form describes a requested Class 1 modification to the Reference.

Modification Notification Form 24590-WTP-PCN-ENV-08-009 updates the permit Secondary Containment Design document (24590-WTP-PER-CSA-02-001, Revision 8) in Appendix 7.5 of the Reference. The Permit Change Notice form describes the minor updates to the permit Secondary Containment Design document.

If you have any questions, please contact me, or your staff may contact Gae M. Neath, Environmental Compliance Division, (509) 376-7828.

Sincerely,

Shirley J. Olinger, Manager
Office of River Protection

ESQ:GMN

Attachment

cc: See page 2

Ms. Jane A. Hedges
08-ESQ-248

-2-

OCT 24 2008

cc w/attach:

W. S. Elkins, BNI

Administrative Record

BNI Correspondence

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Attachment
08-ESQ-248

Hanford Facility RCRA Permit Modification Notification
Form 24590-WTP-PCN-ENV-08-009

Quarter Ending December 31,
2008

24590-WTP-PCN-ENV-08-009

Hanford Facility RCRA Permit Modification Notification Form																		
Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10																	
<p><u>Description of Modification:</u> The purpose of this modification is to update the Secondary Containment Design document (24590-WTP-PER-CSA-02-001) in Appendix 7.5 of the Dangerous Waste Permit.</p> <p>The following are the major changes to the Secondary Containment Design document:</p> <ul style="list-style-type: none"> • Revision of the HLW and PT Peak Ground Acceleration rates provided in Section 3.1 (Seismic Loads Section). The HLW and PT Peak Horizontal Ground Acceleration rates were changed from 0.36 g. to 0.30 g., and the Peak Vertical Acceleration rates were changed from 0.25 g. to 0.21 g. to reflect the spectra contained in Table 4-1 of the Safety Requirements Document (SRD) • Labels were added to Figures 8 and 11 to identify the "top view", "side view", and "bottom view" on the Laboratory Weir Plug details • A label was added to depict scale for each of the drawing details on Figure 11 to make the labels consistent with the associated "scale" labels on Figure 8 • Addition of Figure 13 - Typical LAW LMP Melter Feed Line Encasement Assembly (LMP-LDB-00001/00002). This sketch provides details on the conductivity cable used to provide leak detection in the Melter Feed Line Encasement Assemblies • Note 6 was added to the notes for Type 4 & 5 Sumps on Figure 10, Sump Details for HLW Building. The note describes the function of sump baskets • Minor editorial comments to update the revision history, provide text clarification, and reflect the addition of the new figure and associated page changes <p>Please update the current revision of the Secondary Containment Design Document in the DWP:</p> <table border="1" style="width:100%; border-collapse: collapse; margin-bottom: 5px;"> <tr> <td colspan="2" style="padding: 2px;">Appendix 7.5</td> </tr> <tr> <td style="padding: 2px;">Replace: 24590-WTP-PER-CSA-02-001, Rev. 7</td> <td style="padding: 2px;">With: 24590-WTP-PER-CSA-02-001, Rev. 8</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse; margin-bottom: 5px;"> <tr> <td style="width: 45%; padding: 2px;">WAC 173-303-830 Modification Class: ^{1 2}</td> <td style="width: 10%; padding: 2px;">Class 1</td> <td style="width: 10%; padding: 2px;">Class ¹1</td> <td style="width: 10%; padding: 2px;">Class 2</td> <td style="width: 15%; padding: 2px;">Class 3</td> </tr> <tr> <td style="padding: 2px;">Please mark the Modification Class:</td> <td style="text-align: center; padding: 2px;">X</td> <td></td> <td></td> <td></td> </tr> </table> <p>Enter Relevant WAC 173-303-830, Appendix I Modification citation number: Appendix I A1. and A3. Enter wording of WAC 173-303-830, Appendix I Modification citation: A. General Permit Provisions 1. Administrative and informational changes. A General Permit Provisions 3. Equipment replacement or upgrading with functionally equivalent components (e.g. pipes, valves, pumps, conveyors, controls).</p>					Appendix 7.5		Replace: 24590-WTP-PER-CSA-02-001, Rev. 7	With: 24590-WTP-PER-CSA-02-001, Rev. 8	WAC 173-303-830 Modification Class: ^{1 2}	Class 1	Class ¹ 1	Class 2	Class 3	Please mark the Modification Class:	X			
Appendix 7.5																		
Replace: 24590-WTP-PER-CSA-02-001, Rev. 7	With: 24590-WTP-PER-CSA-02-001, Rev. 8																	
WAC 173-303-830 Modification Class: ^{1 2}	Class 1	Class ¹ 1	Class 2	Class 3														
Please mark the Modification Class:	X																	
Modification Approved: <input type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial) Reason for denial:		Reviewed by Ecology: <div style="display: flex; justify-content: space-between;"> B. Becker-Khaleel Date </div>																

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.



ISSUED BY
RPP-WTP PDC

Document title: **Secondary Containment Design**

Contract number: DE-AC27-01RV14136

Department: Department title

Author(s): Bryson Bogart Dan Robertson Mike Mudry

Principal author
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Document number: 24590-WTP-PER-CSA-02-001, Rev 8

Checked by: Ryan Fast

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Ryan Fast

Date of issue:

9/29/08 DCB

Issue status:

Approved

Approved by:

James Booth

Approver's position:

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Approver signature:

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Notice

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the US Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

History Sheet

Rev	Date	Reason for revision	Revised by
0	6/24/02	Initial issue	Indra Ghosh
1	9/26/02	Issued for Permitting Use	Indra Ghosh / N. T. Desai
2	10/09/02	<ul style="list-style-type: none"> • Revised text in Section 1 • Added Yard Transfer Lines structural support description. • Changed material type from 304L to 316L on Fig. 4. • Added Reference to "LAB" building in all sections 	Indra Ghosh / N. T. Desai
3	3/27/03	<ul style="list-style-type: none"> • Revised Figures 1,2,3 and 4, and deleted Figure 5 • Replaced Ref. 2.1.5 with Washington Administrative Code • Editorial changes in Section 3.1 as marked. Issued for Permitting Use	Indra Ghosh / N. T. Desai
4	2/12/04	<ul style="list-style-type: none"> • Addition of AEA Statement • Editorial changes in Section 3.2 as marked. • Revise Figure 1 to reflect changes to LAW vessel skirt • Deleted reference to the Lab in Figure 3 • Addition of Figure 5 describing the typical Laboratory vessel support details • Addition of Figures 6 and 7 providing typical Laboratory under sink and fume hood drain secondary containment drip pan details • Addition of Figure 8 describing typical Laboratory piping and pump pit sump weir details 	Harsh Raval
5	8/4/04	Issued for Permitting Use	H. Raval, D. Robertson
6	8/25/04	Issued for Permitting Use	H. Raval, D. Robertson

Rev	Date	Reason for revision	Revised by
7	5/19/05	<ul style="list-style-type: none">• Revised Section 3.1, Seismic Peak Ground Acceleration. Nathan Kyle• Corrected specification callout on Figure 1• Revised typical PT sump and typical wall/mat penetration details on Figure 4• Revised Note 3 and revised details on Figure 7• General revision to Figure 8 (Added Details 1 and 2)• Revised Notes 3 and 4 for cupsink detail, and revised hot cell transfer port drain details on Figure 9. Added Note 5 for cupsink cover.• Revised Note 3, added Note 4 to embed plate detail on Figure 10. Added adjacent embed plate optional detail.• Added Figures 11 and 12. Issued for Permitting Use	Nathan Kyle
8	8/25/08	<ul style="list-style-type: none">• Revised Figures 8 and 11 to provide additional sketch notes for Laboratory weir plans and sections• Addition of Figure 13 LAW Melter Encasement Assembly sketch Issued for Permitting Use	Bryson Bogart

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1 Introduction

In accordance with Chapter 173-303 Washington Administrative Code (Ref. 2.1.5), facilities that manage liquid dangerous waste must provide secondary containment¹. At the Waste Treatment and Immobilization Plant, secondary containment systems have been designed to prevent a release of dangerous waste to the environment as required by the Code.

This report describes and provides references to the design criteria, load definitions, load combinations, material of construction, and methodology for the analysis/design of Pretreatment (PT), High-Level Waste (HLW), Low-Activity Waste (LAW) facilities, and Analytical Laboratory (LAB) building with emphasis on secondary containment components. It also includes several representative typical details.

2 Applicable Documents

2.1 Codes and Standards

- 2.1.1 ACI 349, Code Requirements for Nuclear Safety-Related Concrete Structures.
- 2.1.2 ACI 318, Code Requirements for Structural Concrete.
- 2.1.3 Uniform Building Code (UBC), 1997.
- 2.1.4 ANSI/AISC N690, Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities.
- 2.1.5 Washington Administrative Code, Chapter 173-303.
- 2.1.6 AISC M016-89, Manual of Steel Construction -Allowable Stress Design, Ninth Edition.
- 2.1.7 ASCE 7, Minimum Design Loads for Buildings and Other Structures.
- 2.1.8 ASCE 4, Seismic Analysis of Safety-Related Nuclear Structures and Commentary.
- 2.1.9 Safety Requirements Document, Volume 11, 24590-WTP-SRD-ESH-01-001-02.

¹ With the exception of ancillary equipment as provided by 173-303-640(4)(f) and approved by DWP.

3 Description

3.1 Design Methodology, Material, Loads, and Load Combinations

Methodology	<p>Codes and specifications:</p> <ul style="list-style-type: none"> PT and HLW: General: ASCE 4 (Ref. 2.1.8). Concrete: ACI 349 (Ref. 2.1.1). Steel: ANSI/AISC N690 (Ref. 2.1.4) and AISC (Ref. 2.1.5). LAW and LAB: General: UBC (Ref. 2.1.3). Concrete: ACI 318 (Ref. 2.1.2). Steel: AISC M016 (Ref. 2.1.6).
Dead Loads and Live loads:	ASCE 7 (Ref. 2.1.7), UBC (Ref. 2.1.3), and Tables 4-1 and 4-2 of SRD (Ref. 2.1.9).
Seismic Loads	<p>Site-specific response spectra as specified in SRD (Ref. 2.1.9).</p> <ul style="list-style-type: none"> PT and HLW: Peak Ground Horizontal Acceleration = 0.30g. Peak Ground Vertical Acceleration = 0.21g. LAW and LAB: Seismic Zone 2B (UBC, Ref. 2.1.3). Peak Ground Horizontal Acceleration = 0.24g. Peak Ground Vertical Acceleration = 0.16g.
Material	
Concrete	28-day compressive strength, $f_c = 4,000$ psi and 5,000 psi.
Reinforcing Bar	ASTM A706, deformed.
Steel	W Shape – ASTM A992 or A572 Grade 50; Angles and Channels - ASTM A36 or A529 Grade 50; Plates - ASTM A36; Pipe - ASTM A53; Anchor Rods - ASTM F1554; Welded studs A108; Steel deck-ASTM A653.
Load Combinations	
Concrete	<ul style="list-style-type: none"> HLW and PT: Based on ACI 349 (Ref 2.1.1). LAW and LAB: ACI 318 (Ref. 2.1.2) and UBC (Ref 2.1.3).
Steel	<ul style="list-style-type: none"> HLW and PT: Based on ANSI/AISC N690 (Ref 2.1.4). LAW and LAB: AISC M016-89 (Ref. 2.1.6) and UBC (Ref 2.1.3).
Stainless Steel Liners (SS)	Most commonly used in the process cells. Refer to Figures 2-5 for typical details.
Special Protective Coating	Material for coatings will be compatible with the dangerous waste.
Yard Transfer Lines Structural Support	Structural support for yard transfer lines (intra and inter facility waste transfer lines) is described in Ancillary Equipment Pipe Support Design, 24590-WTP-PER-PS-02-001.

3.2 Typical Details

Figures 1 through 13 show several typical details related to secondary containment for PT, HLW, LAW, and LAB buildings.

Figure 1 Typical Vessel Embed, Support, and Flat Bottom Tank Details for LAW 3 Building

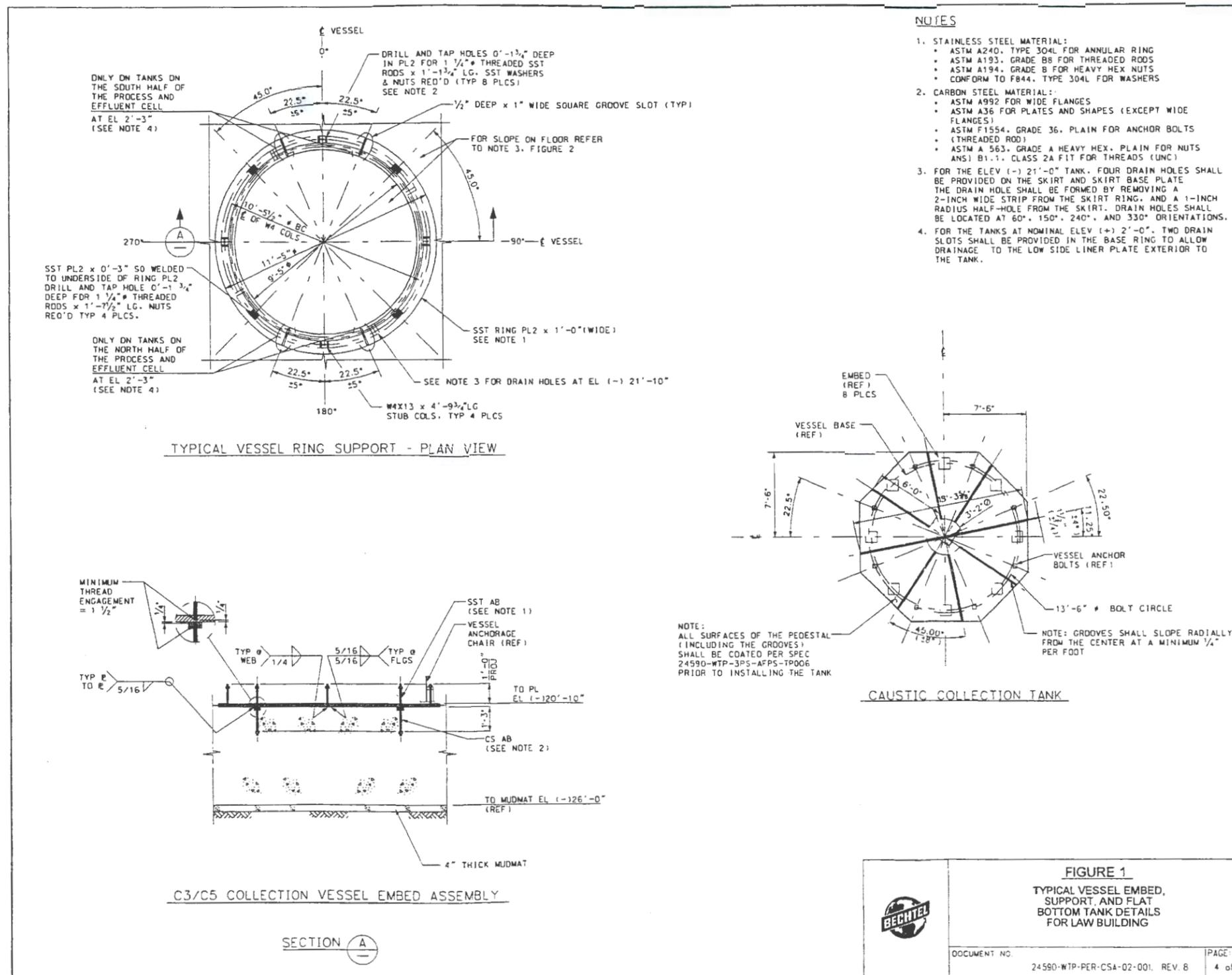


FIGURE 1
TYPICAL VESSEL EMBED, SUPPORT, AND FLAT BOTTOM TANK DETAILS FOR LAW BUILDING

DOCUMENT NO. 24590-WTP-PER-CSA-02-001, REV. 8

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Figure 2 Liner Plate and Grillage Support Details for PT, HLW, LAW and LAB Buildings

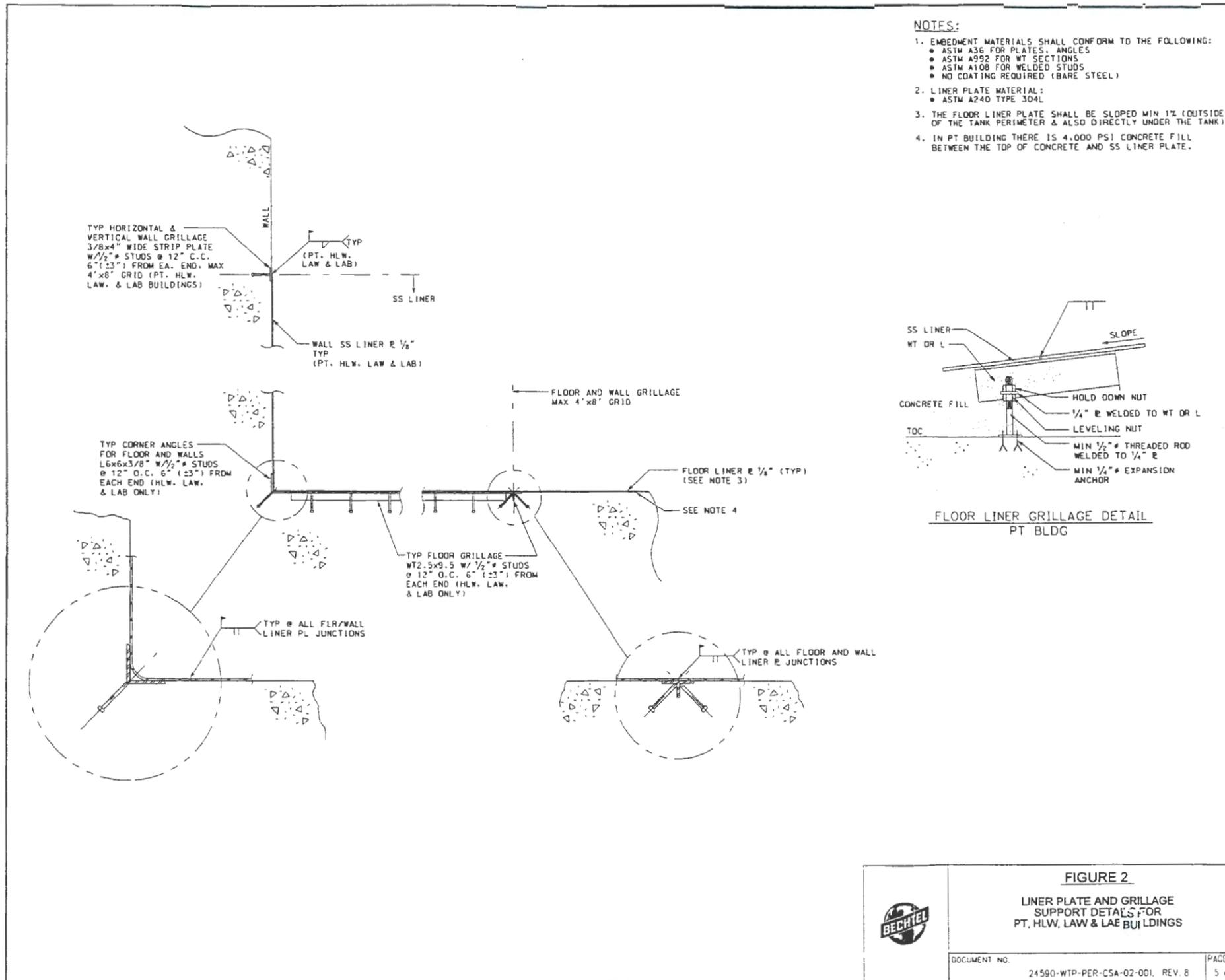


Figure 3 Typical Process Vessel Support Details for PT and HLW Buildings

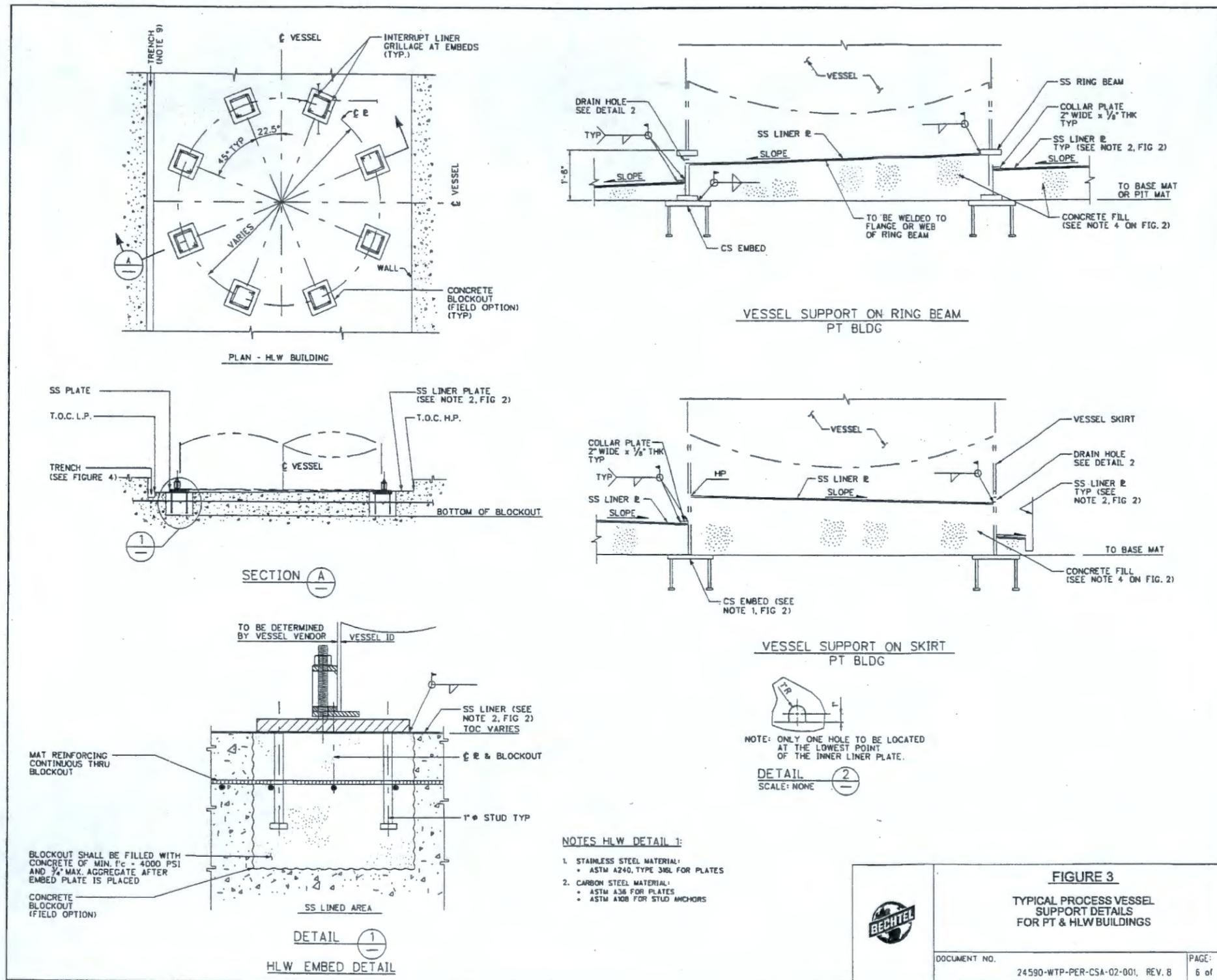
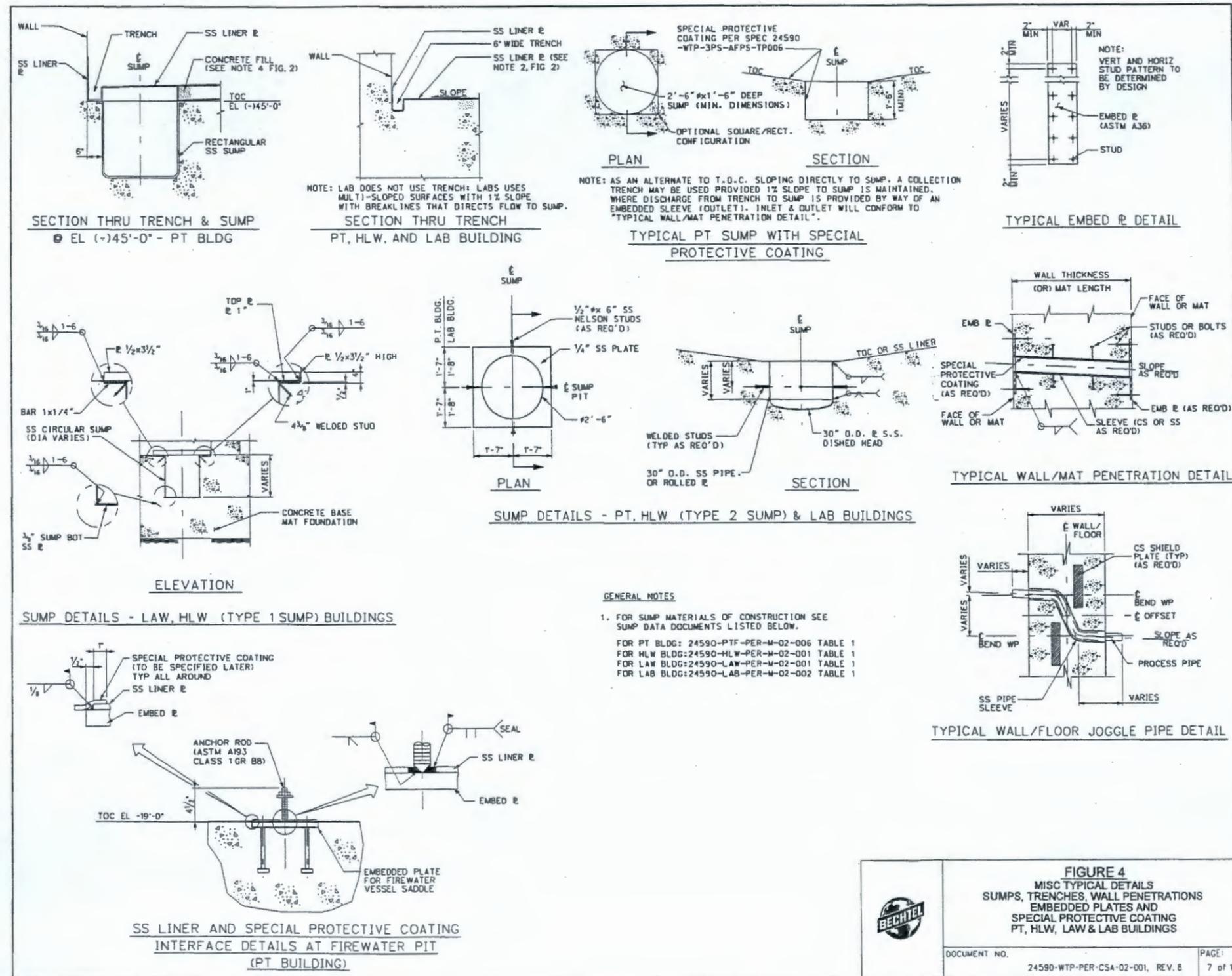


Figure 4 Misc. Typical Details Sumps, Trenches, Wall Penetrations, Embedded Plates and Special Protective Coating PT, HLW, LAW and LAB Buildings



BECHTEL

FIGURE 4
MISC TYPICAL DETAILS
SUMPS, TRENCHES, WALL PENETRATIONS
EMBEDDED PLATES AND
SPECIAL PROTECTIVE COATING
PT, HLW, LAW & LAB BUILDINGS

DOCUMENT NO.	PAGE:
24590-WTP-PER-CSA-02-001, REV. 8	7 of 16

Figure 5 Typical Process Vessel Support Details for LAB Building

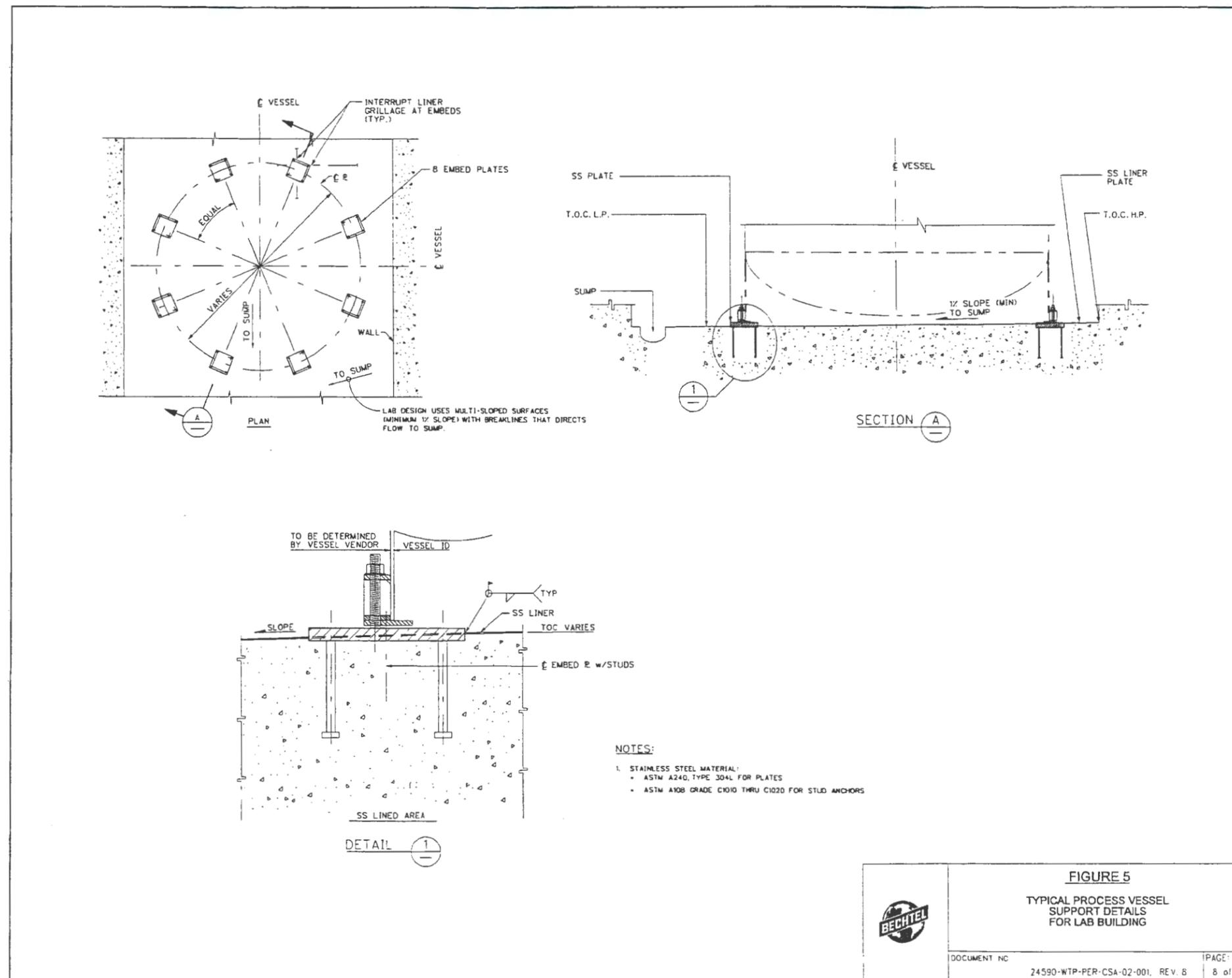
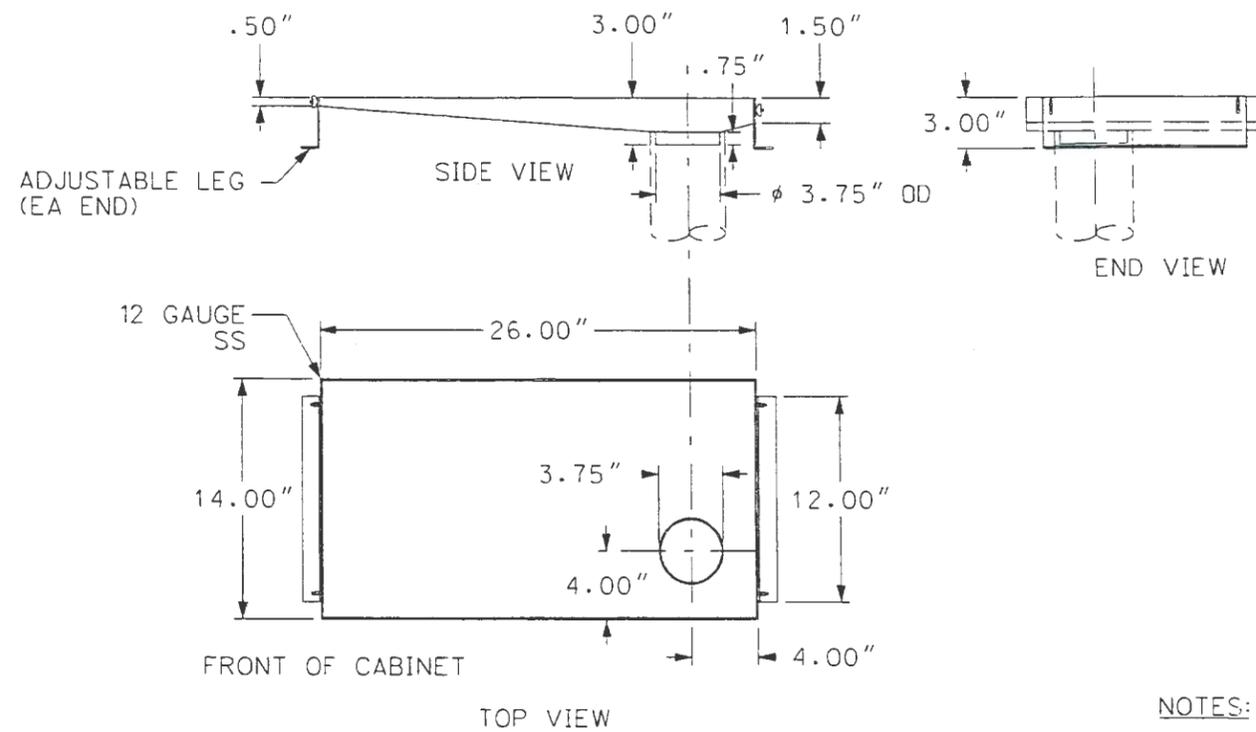


FIGURE 5
 TYPICAL PROCESS VESSEL
 SUPPORT DETAILS
 FOR LAB BUILDING

DOCUMENT NO: 24590-WTP-PER-CSA-02-001, REV. 8 | PAGE: 8 of 16

Figure 6 Plan View of Typical Under Sink and Fume Hood Drain for LAB Bldg Secondary Containment Leak Collection Pan



DETAIL VIEWS

NOTES:

1. PIPE ASSEMBLY SHOP FABRICATED.
2. AIR TIGHT WELDS TO 50 PSIG.
3. LEAK COLLECTION PAN SHOP WELDED IN 12 GAUGE (0.1065"), 304L STAINLESS STEEL.

	FIGURE 6 PLAN VIEW OF TYPICAL UNDER SINK AND FUME HOOD DRAIN FOR LAB BLDG SECONDARY CONTAINMENT LEAK COLLECTION PAN	
	DOCUMENT NO.	PAGE:
	24590-WTP-PER-CSA-02-001, REV 8	9 of 16

Figure 7 Section View of Typical Laboratory Under Sink and Fume Hood Drain for LAB Bldg Secondary Containment Leak Collection Pan, Including Leak Test Plug

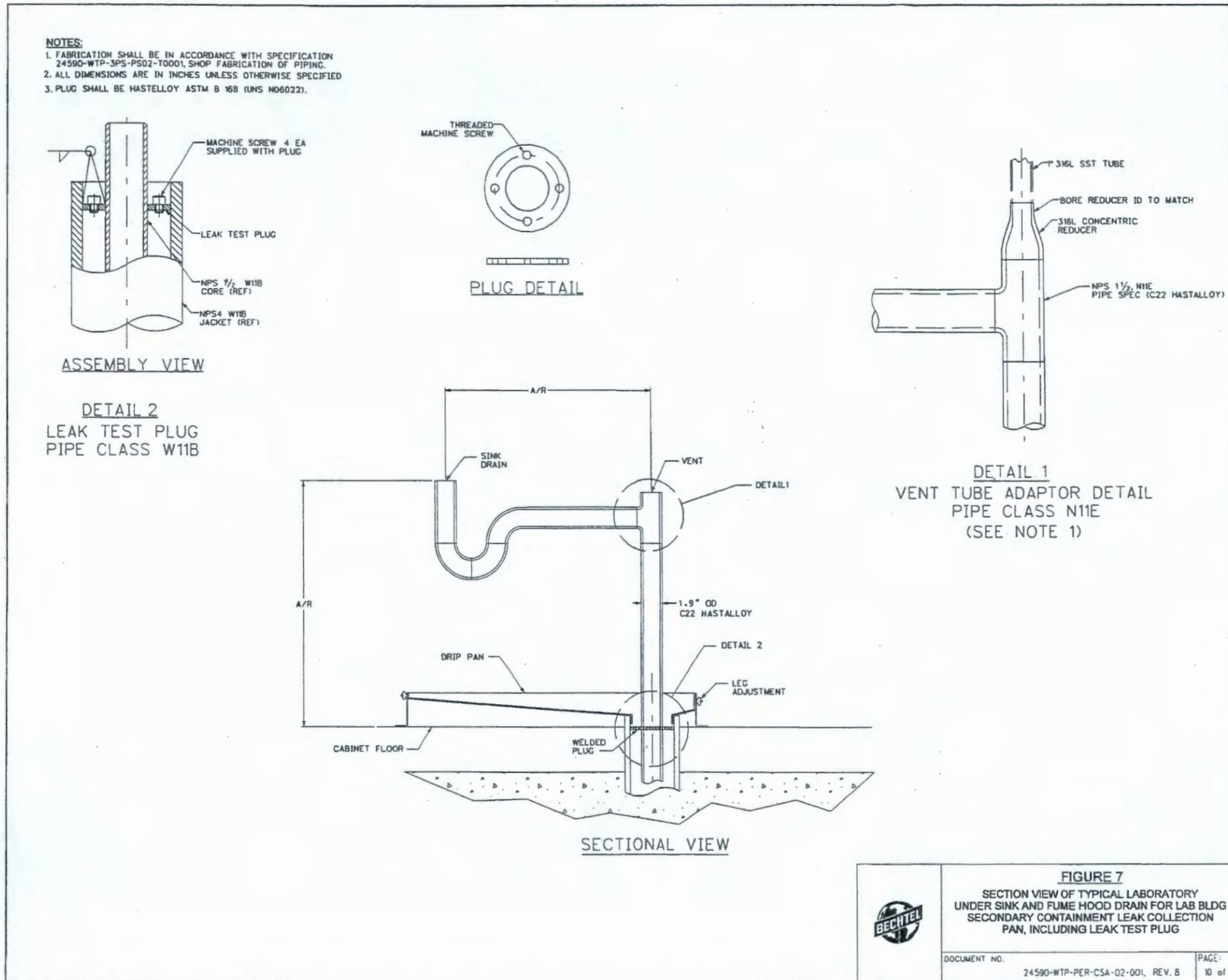


Figure 8 Typical Laboratory Piping and Pump Pit Sump and Weir Details for LAB Building

NOTES:

1. MATERIAL TO BE ASTM A240 TYPE 304 L STAINLESS STEEL
2. THE SLUMP PLUG ACTS AS A WEIR TO CAPTURE LEAKING WATER IN THE PIT. A LEAK GREATER THAN 0.1 GAL PER HOUR WILL BE DETECTED BY THE LEVEL DETECTOR. IF THE LEAK IS SIGNIFICANT, OR NOT DETECTED, IT WILL FLOW OVER THE 1" HIGH WEIR AND EXIT THRU THE DRAIN.
3. ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE SPECIFIED.

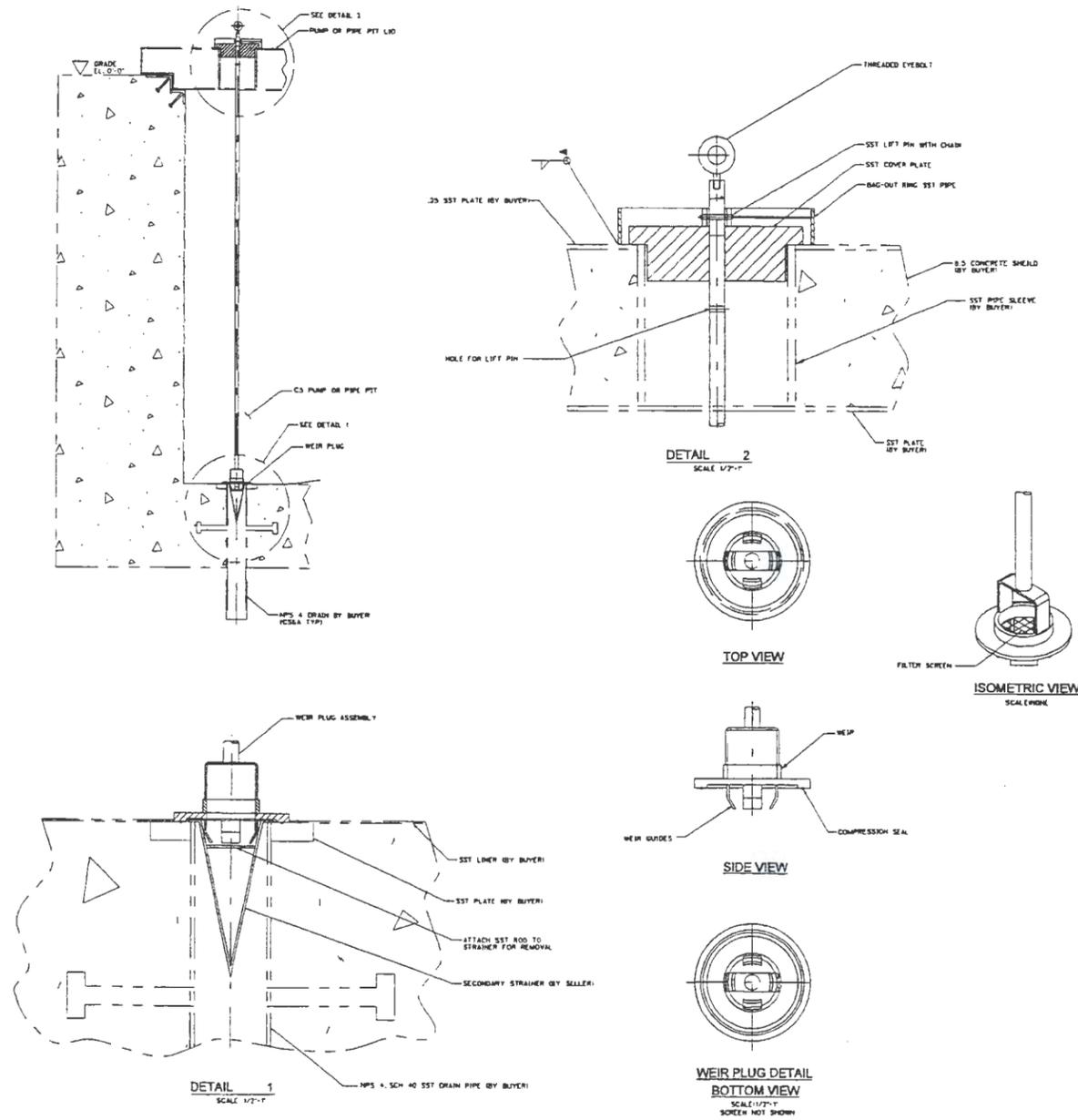
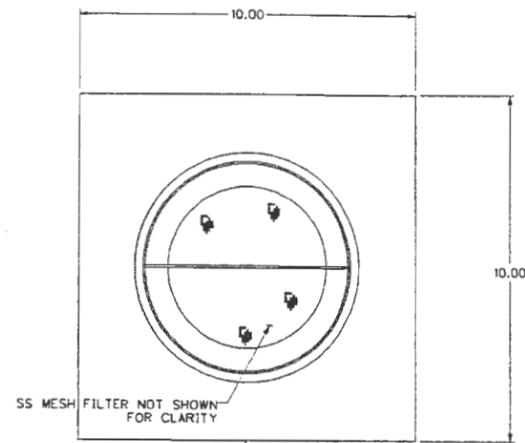


	FIGURE 8 TYPICAL LABORATORY CS PIPING AND PUMP PIT SUMP AND WEIR DETAILS FOR LAB BUILDING	
	DOCUMENT NO. 24590-WTP-PER-CSA-02-001, REV. 8	PAGE: 11 of 16

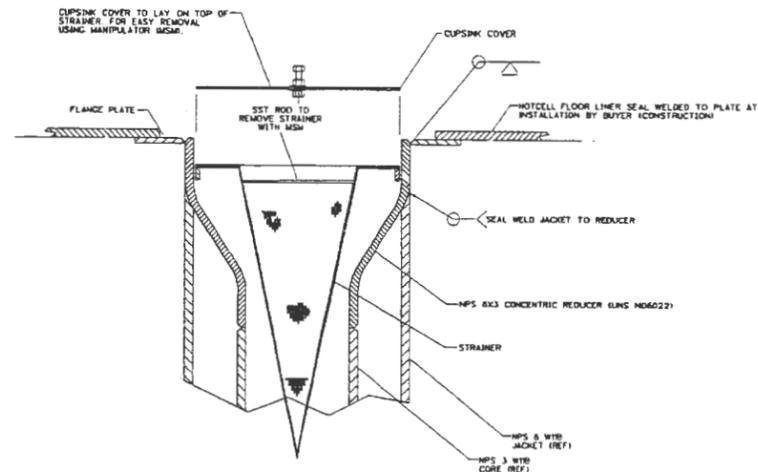
Figure 9 Typical Hot Cell Floor Drain Detail and Transfer Port Drain Detail for LAB Building

NOTES:

1. FABRICATION SHALL BE IN ACCORDANCE WITH SPECIFICATION 24590-WTP-3PS-PS02-10001, SHOP FABRICATION OF PIPING.
2. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
3. MATERIAL FOR THE FLANGE PLATE SHALL BE ASTM A240 TYPE 316L STAINLESS STEEL. ALL OTHER STAINLESS STEEL ITEMS TO BE 300 SERIES.
4. MATERIAL: 14 GA., SST. PERFORATED PLATE $\frac{1}{8}$ " DIA. HOLES ON $\frac{3}{8}$ " CENTERS (40% OPEN AREA, 33 HOLES/SQ. IN.).
5. CUPSINK COVER - SST REFINESH SINTERED WOVEN WIRE MESH GRADE 1 FILTER OR EQUIVALENT.



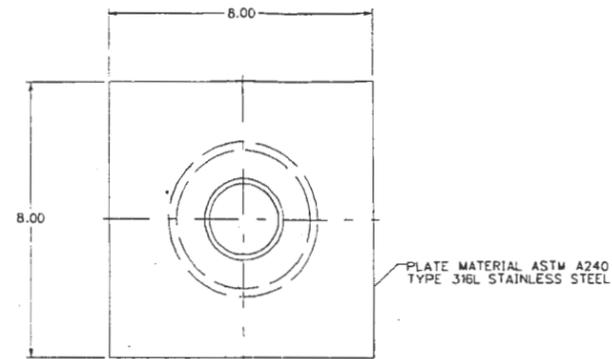
SST FLANGE PLATE
SST FLOOR LINER AND FLOOR NOT SHOWN



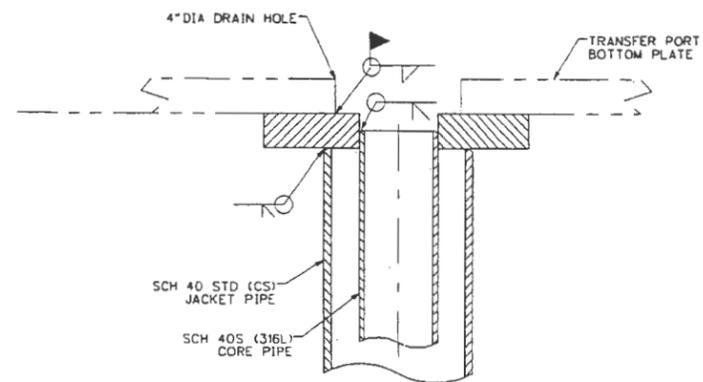
HOTCELL CUPSINK (FLOOR DRAIN) DETAIL
NPS 3 CORE PIPE
PIPE CLASS W16

NOTES:

1. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
2. FABRICATION SHALL BE IN ACCORDANCE WITH SPECIFICATION 24590-WTP-3PS-PS02-10001, SHOP FABRICATION OF PIPING.
3. PIPE CLASS S32B
4. DIMENSION TO SLIP FIT WITH OO OF CORE PIPE.



TOP VIEW



SECTION VIEW

HOT CELL TRANSFER PORT DRAIN

FIGURE 9

TYPICAL HOT CELL FLOOR DRAIN DETAIL
AND TRANSFER PORT DRAIN DETAIL
FOR LAB BUILDING



DOCUMENT NO. 24590-WTP-PER-CSA-02-001, REV. 8 PAGE 12 of 16

Figure 10 Typical HLW Building Sump Details & Typical PT Building SS Liner/CS Embed Detail

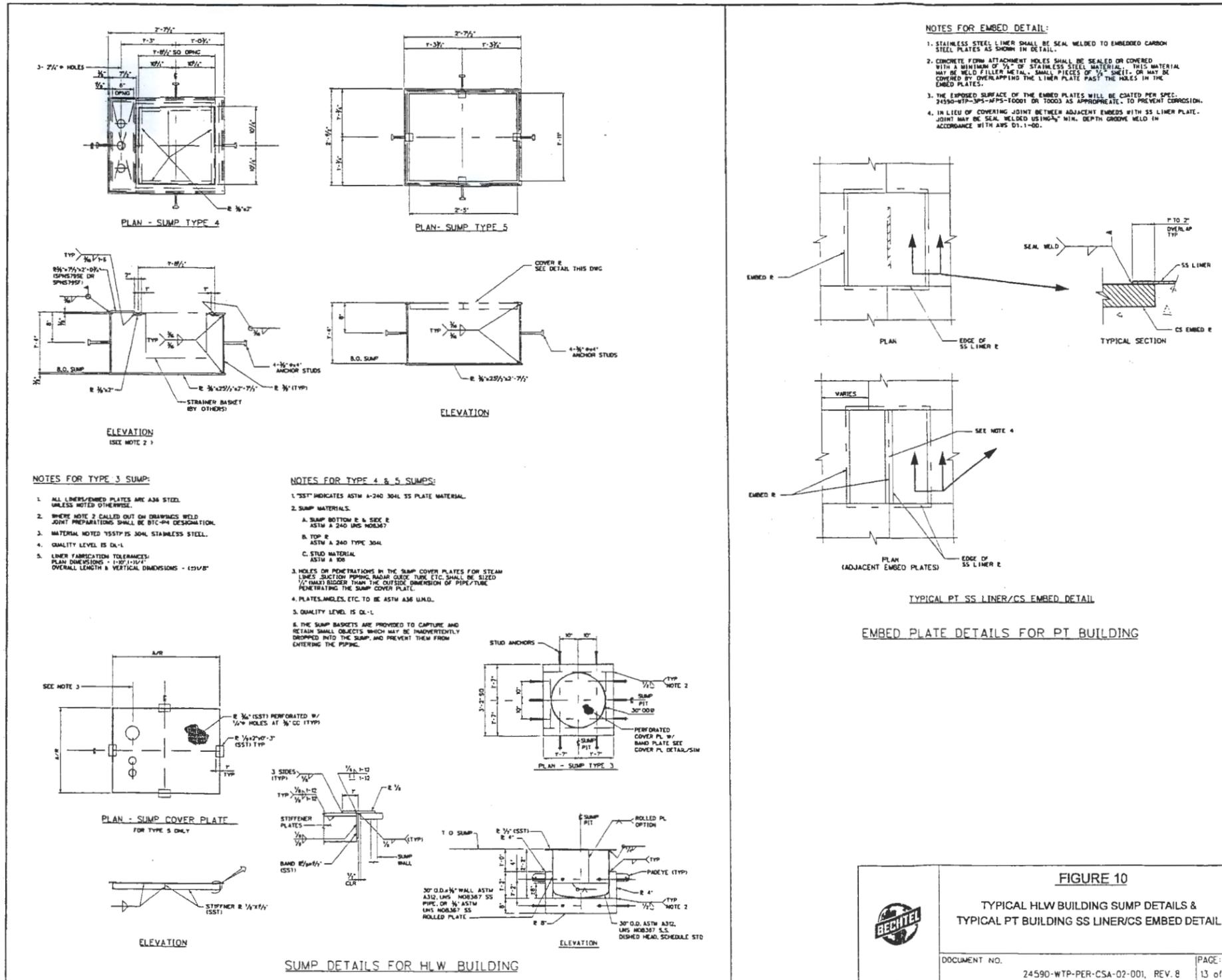


Figure 11 Typical Laboratory C3 Piping and Pump Pit Sump and Weir Details for LAB Building

NOTES:

1. MATERIAL TO BE ASTM A240 TYPE 304 L STAINLESS STEEL.
2. THE SUMP PLUG ACTS AS A WEIR TO CAPTURE LEAKING WATER IN THE PIT. A LEAK GREATER THAN 0.1 GAL PER HOUR WILL BE DETECTED BY THE LEVEL DETECTOR. IF THE LEAK IS SIGNIFICANT, OR NOT DETECTED, IT WILL FLOW OVER THE T-HIGH WEIR AND EXIT THRU THE DRAIN.
3. ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE SPECIFIED.

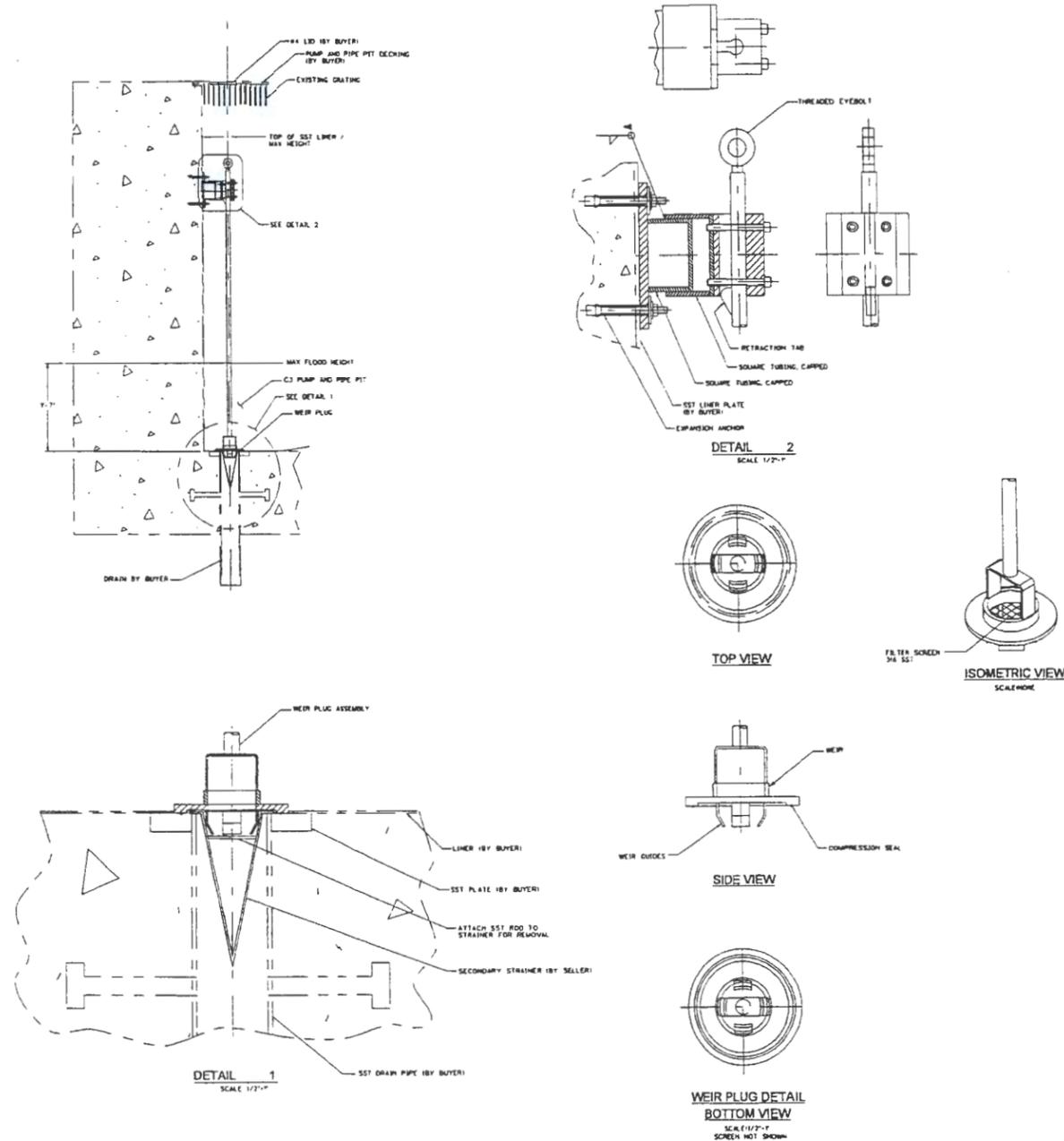


	FIGURE 11 TYPICAL LABORATORY C3 PIPING AND PUMP PIT SUMP AND WEIR DETAILS FOR LAB BUILDING	
	DOCUMENT NO.	PAGE
	24590-WTP-PER-CSA-02-001, REV. 8	14 of 16

Figure 12 Typical RLD Condensate Tank Support Details for PT Building (Exterior)

