U.S. Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

0089512

JUL 2 6 2010

10-ESQ-212

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

Dear Ms. Hedges:

SUBMITTAL OF PERMIT DESIGN PACKAGE NO. LAW-034, REVISION 0, AND PTF-099, REVISION 0, FOR THE WASTE TREATMENT AND IMMOBILIZATION PLANT

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.'"

Attached please find the following permit packages for the Low-Activity Waste (LAW) and Pretreatment Facility (PTF) tank system secondary containment design associated with the Autosampling System (ASX):

- LAW-034, Revision 0, "Tank System Secondary Containment for LAW ASX Samplers," (Attachment 1); and

- PTF-099, Revision 0, "Tank System Secondary Containment for PTF ASX Samplers," (Attachment 2).

Descriptions of the LAW-034 and PTF-099 permit packages are provided in Attachments 1 and 2, respectively. The LAW-034 and PTF-099 permit packages provide the information necessary for the Washington State Department of Ecology (Ecology) to confirm that the secondary containment structures described in the permit packages will comply with the above Reference. This information will allow Ecology to permit the installation of the secondary containment associated with the LAW and PTF ASX sampler cabinets.

The Bechtel National, Inc. and U.S. Department of Energy, Office of River Protection certification statements are provided in Attachment 3. Dangerous Waste Permit (DWP) package submittals are certified coincident with issuance of the integrity assessment report contained in the package. Permit affecting design changes not included in, or occurring after issuance of, the final integrity assessment report will be processed in accordance with DWP requirements for permit modifications prior to construction or installation of affected equipment and components. Installation of equipment and components will be done in accordance with permit packages approved and incorporated into the DWP by Ecology.

H.D.8

In addition to the documents included in Packages LAW-034 and PTF-099, please include the following documents in the public comment period for the proposed modification. The following documents were provided to Ecology under separate transmittals:

- 24590-WTP-PER-M-08-001, Revision 0, "Integrity Assessment Program and Schedule for DWP Regulated Equipment in the Analytical Laboratory and Low-Activity Waste Vitrification Facility;"

- 24590-WTP-PER-M-08-002, Revision 0, "Integrity Assessment Program and Schedule for DWP Regulated Equipment in the Pretreatment Facility and High-Level Waste Vitrification Facility;"

- 24590-PTF-PER-M-04-0010, Revision 2, "Leak Detection Capability in the Pretreatment Facility;" and

- 24590-PTF-PER-M-04-0011, Revision 1, "Waste Removal Capability for the Pretreatment Facility."

Ecology comments resulting from the review of this permit modification and associated information have been resolved.

If you have any questions, please contact me, or your staff may contact Gae M. Neath, Office of Environmental Safety and Quality, (509) 376-7828.

Sincerely,

David A. Brockman, Manager
Office of River Protection

ESQ:GMN

Attachments: (3)

cc: See page 3

Attachment 1
10-ESQ-212
(93 Pages Double-Sided)

Permit Package No. LAW-034, Revision 0
"Tank System Secondary Containment for LAW ASX Samplers"

cc w/attachs:
J. F. Brown, BNI
J. M. Colby, BNI
B. L. Curn, BNI
B. G. Erlandson, BNI
P. A. Fisher, BNI
S. K. Murdock, BNI
D. C. Robertson, BNI
F. M. Russo, BNI
A. S. Carlson, Ecology (20 Copies)
Administrative Record
BNI Correspondence
Environmental Portal, LMSI

cc electronic:
R. K. Biyani, Ecology
M. M. Carhart, Ecology
S. L. Dahl, Ecology
T. Z. Gao, Ecology
T. R. Williams, Ecology
S. A. Thompson, MSA
A. C. McKarns, RL
D. J. Sommer, SCS

cc w/o attachs:
D. M. Busche, BNI
J. Cox, CTUIR
S. G. Harris, CTUIR
G. P. Davis, Ecology
D. McDonald, Ecology
G. P. Bohnee, NPT
K. Niles, Oregon Energy
S. R. Weil, RL
R. Jim, YN

Description of Permit Package LAW-034, Rev. 0

LAW-034, Rev. 0, "Tank System Secondary Containment for LAW ASX Samplers"

Permit package LAW-034 addresses the tank system secondary containment design associated with LAW Autosampling System (ASX) samplers ASX-SMPLR-00012 and ASX-SMPLR-00013. Both autosamplers are located in Room L-0301 at Elevation 48'-0" of the LAW facility. The LAW ASX samplers contain both upper and lower secondary containment liners and leak detection systems. The sloped stainless steel upper containment liner is designed to divert a leak from the incoming sample feed and return lines to a sump where the leak is detected. The sloped stainless steel lower containment area is designed to divert liquids to a sloped collection trough. The trough contains a removable weir that allows liquids to collect and activate the thermal level detection switch and alarms to indicate that a leak may have occurred.

Permit Package LAW-034, Rev. 0, includes:

- An assessment report signed by an independent qualified registered professional engineer (IQRPE) certifying certain portions of the permit package
- General Arrangement Plan for the LAW +48 foot elevation
- Dangerous Waste Permit (DWP) Liner Heights in the LAW Facility. This document renames and replaces Revision 6, 24590-LAW-PER-M-02-002, *Flooding Volume for LAW Facility*
- A revised Secondary Containment Design Document
- A revised Leak Detection in Secondary Containment Systems Document. This document updates and consolidates and replaces permit documents 24590-WTP-PER-J-02-001 and 24590-WTP-PER-J-02-002.

The following components of this package are already included in the Dangerous Waste Permit, the Administrative Record, or are provided with other permit packages, as listed in the Table of Contents:

- Material Selection for Building Secondary Containment/Leak Detection
- Installation of Tank Systems and Miscellaneous Unit Systems
- LAW Facility Sump Data
- Description of Access for Conduction Integrity Assessments
- Integrity Assessment Program and Schedule for DWP Regulated Equipment in the Analytical Laboratory and Low-Activity Waste Vitrification Facility
- Prevention of Hydrogen Accumulation in Tank Systems and Miscellaneous Treatment Unit Systems.

Permit Design Package No. LAW-034, Rev. 0
Tank System Secondary Containment for LAW ASX Samplers
Table of Contents

For Incorporation into the Permit

Engineering Document Title	Document Number	Revision	Permit Condition	Included	Remarks
IQRPE Integrity Assessment Report	CCN 169565		III.10.E.9.b.i	Y	
Permit Design Drawings					
LAW Vitrification Building General Arrangement Plan at El. 48' - 0"	24590-LAW-P1-P01T-00005	3	III.10.E.9.b.ii	Y	Associated DCNs included
Dangerous Waste Permit (DWP) Liner Heights in the LAW Facility.	24590-LAW-PER-M-02-002	7	III.10.E.9.b.ii	Y	Document renamed. Replaces Revision 6, 24590-LAW-PER-M-02-002, *Flooding Volume for LAW Facility* in Attachment 51, Appendix 9.8
Secondary Containment Design	24590-WTP-PER-CSA-02-001	9	III.10.E.9.b.ii III.10.E.9.b.iii	Y	Updated to incorporate ASX sampler secondary containment and leak detection and HLW drum transfer tunnel drip pan.
Underground Pipe Protection	N/A	-	III.10.E.9.b.iv	N/A	Not Applicable for the ASX samplers
Material Selection for Building Secondary Containment/Leak Detection	24590-WTP-PER-M-02-001	3	III.10.E.9.b.v	N	Included in Attachment 51, Appendix 7.9
Installation of Tank Systems and Miscellaneous Unit Systems	24590-WTP-PER-CON-02-001	6	III.10.E.b.vi	N	Included in Attachment 51, Appendix 7.12 as approved in PCN 24590-WTP-PCN-ENV-09-001 (10/01/2009)
Leak Detection in Secondary Containment Systems	24590-WTP-PER-J-02-002	4	III.10.E.9.b.ii III.10.E.9.b.v	Y	Consolidated to replace 24590-WTP-PER-J-02-001 and 24590-WTP-PER-J-02-002 in Attachment 51, Appendix 7.5
LAW Facility Sump Data	24590-PTF-PER-M-02-001	5	III.10.E.9.b.vii	N	Included in Attachment 51, Appendix 9.5
Description of Access for Conducting Integrity Assessments	24590-WTP-PER-M-02-005	1	III.10.E.9.b.ix	N	Included in Attachment 51, Appendix 7.15
Integrity Assessment Program and Schedule for DWP Regulated Equipment in the Analytical Laboratory and Low-Activity Waste Vitrification Facility	24590-WTP-PER-M-08-001	0	III.10.E.9.b.	N	July 7, 2009 letter from Ecology (CCN 201996) for incorporation into the next WTP permit modification.

Permit Design Package No. LAW-034, Rev. 0
Tank System Secondary Containment for LAW ASX Samplers
Table of Contents

For Incorporation into the Administrative Record

Engineering Document Title	Document Number	Revision	Permit Condition	Included	Remarks
Prevention of Hydrogen Accumulation in Tank Systems and Miscellaneous Treatment Unit Systems	24590-WTP-PER-PR-03-001	1	III.10.E.9.b.viii	N	ORP Letter 03-ED-130 dated 8/26/2003 transmitting LAW-029, Rev. 0 to Ecology

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AREVA

ISSUED BY
RPP-WTP PDC

169565

AFS-10-0199

June 3, 2010

RPP-WTP
RECEIVED

JUN 0 3 2010

BY PDC

Ms. Susan Parr
Subcontract Formation Specialist
Bechtel National RPP-WTP Project
2435 Stevens Center Place
Richland, Washington 99354

Dear Ms. Parr:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00211
IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW ASX SECONDARY CONTAINMENT (SAMPLER CABINETS) – IA-3003444-000

The structural integrity assessment of the subject secondary containment has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that the secondary containment is adequately designed and has sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that it will not collapse, rupture, or fail.

If you have any questions, please contact Tarlok Hundal at (509) 371-1975, or via email at tarlok.hundal@areva.com.

Sincerely,

Fred R. Renz
Contract Management
AREVA Federal Services LLC
Richland Office

llm

Enclosure (1)

cc: D. C. Pfluger, MS 5-L w/enclosures (2)

AREVA Federal Services LLC
2101 Horn Rapids Road, RC-19, Richland, WA 99354, P. O. Box 840, Richland, WA 99352
Tel.: 509 375 8096 - Fax: 509 375 8495 - www.areva.com

IA-3003444-000

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW ASX SECONDARY CONTAINMENT (SAMPLER CABINETS)

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. 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.

IA-3003444-000

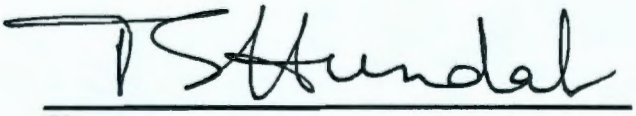
IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW ASX SECONDARY CONTAINMENT (SAMPLER CABINETS)

"I, Tarlok Hundal have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the LAW ASX Secondary Containment (Sampler Cabinets), as required by the Washington Administrative Code, *Dangerous Waste Regulations*, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is ten (10) pages numbered one (1) through ten (10).



Signature

6/3/10

Date

Scope	Scope of this Integrity Assessment	This assessment addresses the structural integrity of LAW ASX Secondary Containment provided by a sampler cabinet housed in each Autosampler Unit (ASX-SMPLR-00012 and -00013). These autosampler units are located in Room L-0301 at Elevation 48'-0" of the LAW facility as shown on General Arrangement Plan drawing 24590-LAW-P1-P01T-00005.
Summary of Assessment		For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design requirements and controls to ensure that the design fully satisfies the requirements of Washington Administrative Code (WAC), Chapter 173-303 WAC, *Dangerous Waste Regulations*, WAC-173-303-640, *Tank Systems*.

References	Engineering & Procurement Subcontract Document, Specifications, and Vendor Drawings	Engineering & Procurement Subcontract Document (EP): 24590-QL-SRA-HAHH-00001, Rev. 13, Autosampling System (ASX), Exhibit D-Scope of Work, Exhibit E-Technical Specifications, and Exhibit F-List of Drawings. Specifications: Following specifications along with their respective revision numbers and change notices are included in EP document listed above: 24590-WTP-3PS-G000-T0001, General Specification for Supplier Quality Assurance Program Requirements; 24590-WTP-3PS-G000-T0002, Engineering Specification for Positive Material Identification (PMI); 24590-WTP-3PS-G000-T0003, General Specification for Packaging, Shipping, Handling, and Storage Requirements; 24590-WTP-3PS-G000-T0014, General Specification for Supplier Design Analysis ; 24590-WTP-3PS-MV00-T0003, Engineering Specification for Pressure Vessel Fatigue Analysis; 24590-WTP-3PS-G000-T0015, General Specification for Environmental Qualification of Mechanical Equipment; 24590-WTP-3PS-FB01-T0001, Engineering Specification for Structural Design Loads for Seismic Category III/IV Equip. and Tanks; 24590-WTP-3PS-SS00-T0001, Engineering Specification for Welding of Structural Steel Carbon; 24590-WTP-3PS-SS00-T0002, Engineering Specification for Welding of Structural Stainless Steel and Welding of Carbon Steel to Stainless Steel; 24590-WTP-3PS-AFPS-T0001, Engineering Specification for Shop Applied Special Protective Coatings for Steel Items and Equipment; 24590-WTP-3PS-MHSS-T0002, Engineering Specification for Autosampling System (ASX). Vendor Drawings (Status Code 1 Drawings *): 24590-QL-HC4-HAHH-00001-06-00057, Rev. 00G, Autosampling System ASX-SMPLR-00012, Outline Dim & Mtg Det Sheet 1 of 2; 24590-QL-HC4-HAHH-00001-06-00058, Rev. 00H, Autosampling System ASX-SMPLR-00012, Outline Dim & Mtg Det Sheet 2; 24590-QL-HC4-HAHH-00001-06-00059, Rev. 00G, Autosampling System ASX-SMPLR-00013, Outline Dim & Mtg Det Sheet 1 of 2; 24590-QL-HC4-HAHH-00001-06-00060, Rev. 00H, Autosampling System ASX-SMPLR-00013, Outline Dim & Mtg Det Sheet 2; 24590-QL-HC4-HAHH-00001-06-00834, Rev. 00B, Autosampling System ASX-SMPLR-00012 and 00013, Internal Base Details Sht 1 of 4; 24590-QL-HC4-HAHH-00001-06-00835, Rev. 00C, Autosampling System ASX-SMPLR-00012 and 13, Internal Base Table Sheet 2; 24590-QL-HC4-HAHH-00001-06-00836, Rev. 00C, Autosampling System ASX-SMPLR-00012 and 13, Internal Base Table Sheet 3; 24590-QL-HC4-HAHH-00001-06-00837, Rev. 00B, Autosampling System ASX-SMPLR-00012 and 13, Internal Base Table Sheet 4; 24590-QL-HC4-HAHH-00001-06-00844, Rev. 00B, Autosampling System ASX-SMPLR-00012 and 00013, Internal Base Table Assembly Sheet 1 of 3; 24590-QL-HC4-HAHH-00001-06-00845, Rev. 00B, Autosampling System ASX-SMPLR-00012/00013, Internal Base Table Assembly Sht 2; 24590-QL-HC4-HAHH-00001-06-00846, Rev. 00B, Autosampling System ASX-SMPLR-00012/00013, Internal Base Table Assembly Sht 3; 24590-QL-HC4-HAHH-00001-06-00847, Rev. 00B, Autosampling System ASX-SMPLR-00012 and 00013 Trough Shield Plate Sheet 1 of 1; 24590-QL-HC4-HAHH-00001-06-00523, Rev. 00E, Autosampling System ASX-SMPLR-00012, Process Pipe & Support Subassy Sht 1 of 3; 24590-QL-HC4-HAHH-00001-06-00771, Rev. 00C, Autosampling System ASX-SMPLR-00012, Process Pipe & Support Subassy Sheet 2; 24590-QL-HC4-HAHH-00001-06-00772, Rev. 00B, Autosampling System ASX-SMPLR-00012, Process Pipe & Support Subassy Sheet 3;

References (cont'd)	Vendor Drawings, Plant Drawings, Data Sheet, System Description, and Permit Document	Vendor Drawings (Status Code 1 Drawings *) (cont'd): 24590-QL-HC4-HAHH-00001-06-00224, Rev. 00G, Autosampling System ASX-SMPLR-00013, Shielded Autosampler Assembly Sht 1 of 6; 24590-QL-HC4-HAHH-00001-06-00225, Rev. 00F, Autosampling System ASX-SMPLR-00013, Shielded Autosampler Assembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-00767, Rev. 00D, Autosampling System ASX-SMPLR-00013, Shielded Autosampler Assembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-00768, Rev. 00D, Autosampling System ASX-SMPLR-00013, Shielded Autosampler Assembly Sheet 4; 24590-QL-HC4-HAHH-00001-06-00769, Rev. 00C, Autosampling System ASX-SMPLR-00013, Shielded Autosampler Assembly Sheet 5; 24590-QL-HC4-HAHH-00001-06-00770, Rev. 00B, Autosampling System ASX-SMPLR-00013, Shielded Autosampler Assembly Sheet 6; 24590-QL-HC4-HAHH-00001-06-00959, Rev. 00B, Autosampling System ASX-SMPLR-00012, Glovebox Subassembly Sheet 1 of 3; 24590-QL-HC4-HAHH-00001-06-00960, Rev. 00B, Autosampling System ASX-SMPLR-00012, Glovebox Subassembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-00961, Rev. 00B, Autosampling System ASX-SMPLR-00012, Glovebox Subassembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-01504, Rev. 00B, Autosampling System ASX-SMPLR-00012, Glovebox Shell Detail Sheet 1 of 2; 24590-QL-HC4-HAHH-00001-06-01505, Rev. 00B, Autosampling System ASX-SMPLR-00012, Glovebox Shell Detail Sheet 2; 24590-QL-HC4-HAHH-00001-06-01506, Rev. 00B, Autosampling System ASX-SMPLR-00013, Glovebox Shell Detail Sheet 1 of 2; 24590-QL-HC4-HAHH-00001-06-01507, Rev. 00B, Autosampling System ASX-SMPLR-00013, Glovebox Shell Detail Sheet 2. * Status Code 1 Drawing: Bechtel National Inc.'s Code indicating that BNI has "reviewed and approved the drawing for fabrication." Plant Drawings: 24590-LAW-P1-P01T-00005, Rev. 3, LAW Vitrification Building General Arrangement Plan at El. 48'-0"; 24590-LAW-P1-P01T-00007, Rev. 8, LAW Vitrification Building General Arrangement Section A-A B-B, C-C, and S-S; 24590-LAW-DB-S13T-00131, Rev. 5, LAW Vitrification Building Main Building Partial Conc Forming Plan, Zone 1 @ El. (+) 48'-0"; 24590-LAW-DB-S13T-00132, Rev. 6, LAW Vitrification Building Main Building Partial Conc Forming Plan, Zone 2 @ El. (+) 48'-0"; 24590-LAW-M6-ASX-00007001, Rev. 0, P&ID LAW Autosampling System Isolok Details ASX-SMPLR-00013; 24590-LAW-M6-ASX-00009001, Rev. 0, P&ID LAW Autosampling System Isolok Details ASX-SMPLR-00012; 24590-LAW-M6-ASX-00009002, Rev. 0, P&ID LAW Autosampling System Isolok Details ASX-SMPLR-00012. Data Sheet: 24590-LAW-M2D-ASX-00001, Rev. 3, LAW Autosampling System (ASX) Data Sheet for Autosamplers (ASX-SMPLR-00012 and 00013). System Description: 24590-WTP-3YD-ASX-00001, Rev. 0, System Description for the Autosampling System (ASX). Permit Document: 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design.

	Information Assessed	Source of Information	Assessment
Design	The sampler cabinets secondary containment design standards and codes used are appropriate and adequate for their intended use.	Drawings, Specifications, Engineering & Procurement Subcontract Document, and Data Sheet listed above under References; AISC-M016-89 Manual of Steel Construction, Allowable Stress Design, 9th Edition, American Institute of Steel Construction; ANSI/AISC N690-1994, Specification for the Design, Fabrication, and Erection of Safety Related Structures for Nuclear Facilities, American National Standards Institute; UBC 1997, Uniform Building Code; AWS D1.1, Structural Welding Code-Steel, American Welding Society; AWS D1.6, Structural Welding Code-Stainless Steel, American Welding Society; ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; ASME B13.3, Pressure Piping, American Society of Mechanical Engineers; ASME AG-1-1997 (including AG-1a-2000 Addenda), Code on Nuclear Air and Gas, American Society of Mechanical Engineers; AGS-G001-1998, Guidelines for Gloveboxes, 2nd Edition.	The Specification for Autosampler System and the Engineering & Procurement Subcontract Document require that the sampler cabinets be designed, fabricated, tested, and delivered in accordance with the requirements specified in the codes and standards listed in the Source of Information column in this section. The Data Sheet for Autosampler Units (ASX-SMPLR-00012 and -00013) requires that these units be designed for temperature range of 59° F to 113° F and pressure range of (-) 4 in. w.g. to (+) 22.3 in. w.g. The Data Sheet also provides applicable nozzle and fatigue loads. The drawings show that overall dimensions of each shielded autosampler unit are about 68" wide x 82" long x 88" high. Each autosampler unit houses the upper and lower secondary containment components (liner plates, leak collection trough, leak detector inside the glovebox). The overall dimensions of each glovebox are about 42" wide x 68" long x 37" high. The autosampler glovebox is built with varying thicknesses of 304L or 316L stainless steel plates, 3/16" being the minimum thickness. The codes and standards listed in the Source of Information column are appropriate and adequate to provide secondary containment for the intended use of collecting and transporting samples of LAW process waste.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	The sampler cabinets component enclosure, supports, and foundation design include full weight of sampler cabinets.	Specifications, Data Sheet, and Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12 Structural Design Criteria; 24590-WTP-DB-ENG-01-001, Rev. 1O Basis of Design; 24590-WTP-DC-ENG-06-001, Rev. 0, Design Criteria for Equipment Seismic and Environmental Qualification; 24590-QL-HC4-HAHH-00001-11-00049, Rev. 00B, Structural Analysis of ASX-SMPLR-00012 & -00013.	The Specification for Autosampling System identifies the system to be of commercial grade (CM) quality and the seismic category to be SC-III. The drawings show that the secondary containment enclosure components, the sampler cabinet, are an integral part of or are located within the bounds of a glovebox structure. All secondary containment liners and components within the glovebox are fully welded to confine any waste spillage within the enclosed sampler cabinet which has the leak detection device to alarm any spillage incidents. The glovebox structure is attached to and supported by structural steel framing members. The framing members are enclosed in shielding steel plates around them on three sides except the rear side that faces the concrete wall. The Structural Design Criteria uses appropriate applicable standards to define design loads and load combinations. The Specification for the Autosampling System, the Design Criteria for Equipment Seismic and Environmental Qualification, and the Data Sheet require that along with dead weights of the components, the weight of the glovebox filled with water, and the specified temperature and pressure environmental conditions should be appropriately included in the loads and load combinations. The Structural Analysis document and drawings reviewed show that the secondary containment components of the sampler cabinets have been adequately designed to provide the required containment for any spilled waste fluids. Review of the autosampler units Structural Analysis also shows that the support system for each unit has adequate strength to sustain the aforementioned loads and is in turn anchored (welded) to the steel embed plates in the concrete floor slab. Furthermore, Chapter 14 of the Basis of Design document requires that the foundation underlying the autosampler units supports must be adequate to sustain the full load of the units, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation slab is part of a separate integrity assessment report for the secondary containment of the plant items on this floor (Elevation 48'-0").

	Information Assessed	Source of Information	Assessment
Design (cont'd)	Design calculation approach and design basis of support and foundation with design standard and codes references such as AISC codes are adequate.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-WTP-DC-ENG-06-001, Rev. 0, Design Criteria for Equipment Seismic and Environmental Qualification; AISC-M016-89 Manual of Steel Construction, Allowable Stress Design, 9th Edition, American Institute of Steel Construction; ANSI/AISC N690-1994, Specification for the Design, Fabrication, and Erection of Safety Related Structures for Nuclear Facilities, American National Standards Institute; 24590-QL-HC4-HAHH-00001-11-00049, Rev. 00B, Structural Analysis of ASX-SMPLR-00012 & -00013.	The Basis of Design document provides many fundamental general requirements for support and foundation design. The Structural Design Criteria document references adequate detailed design criteria for the design of support steel framing and concrete foundations and footings. AISC-M016-89 and ANSI/AISC N690-1994 codes are referenced for support design of SC-III structural steel components. Structural Analysis and drawings reviewed show that the upper and lower secondary containment components housed in the gloveboxes are adequately designed to meet the applicable code requirements.
Foundation Design	Foundation material is compatible with the support structure.	Specification and Drawings listed in above under References.	Specification for Autosampling System requires that stainless steel material be used for the ASX sampler cabinet confinement enclosure components including upper and lower liner plates. The drawings show that the ASX Autosampler Units (ASX-SMPLR-00012 and -00013) are located in Room L-0301 at Elevation 48'-0" level of the LAW building. The carbon steel support structure frame base plates of the autosampler units are welded (anchored) to the carbon steel plates embedded in concrete floor slab. The base plates and embed plates are compatible with each other.

	Information Assessed	Source of Information	Assessment
Foundation Design (cont'd)	Foundation will withstand the effects of frost heave.	24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria.	The Structural Design Criteria requires all structural foundations for outdoor components to extend below the 30" frost line from the finished grade (Elevation 0'-0"). Room L-0301 housing the ASX autosampler units are inside/interior of the building at Elevation 48'-0", therefore, they are not subjected to the detrimental effects of frost heave.
Seismic	Seismic considerations have been adequately addressed.	Drawings listed above under References; 24590-WTP-PER-CSA-02-001, Rev. 9 Secondary Containment Design; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-WTP-DC-ENG-06-001, Rev. 0, Design Criteria for Equipment Seismic and Environmental Qualification; UBC 1997, Uniform Building Code; AISC M016-89, Manual of Steel Construction - Allowable Stress Design, Ninth Edition; ANSI/AISC N690-1994, Specification for the Design, Fabrication, and Erection of Safety Related Structures for Nuclear Facilities, American National Standards Institute; 24590-QL-HC4-HAHH-00001-11-00049, Rev. 00B, Structural Analysis of ASX-SMPLR-00012 & -00013.	The Secondary Containment Design, Structural Design Criteria, and Design Criteria for Seismic and Environmental Qualification documents provide detailed information of design methodology, materials, loads, and load combinations applicable for the Sampler Cabinets. The Specification for Autosampling system identifies the Quality Level of the system to be CM and the Seismic Classification as SC-III. The ASX system design loads combinations are taken from UBC 97 code and analysis for SC-III secondary containment enclosure is performed in accordance with the Specification for Structural Design Loads for Seismic Category III/IV Equipment and Tanks document. The ANSI/AISC N460-1994 code is used for the design of SC-III secondary containment enclosure stainless steel material and AISC M016-89 is used for carbon steel support frame structure. The frame structure is designed to sustain all applicable loads including seismic and its bases are adequately welded to the embedded steel plates in concrete floor slab supporting the autosampler units. The Structural Analysis document and drawings reviewed shows that the sound engineering techniques are used for the analysis purposes.

	Information Assessed	Source of Information	Assessment
Compatibility	The stored waste is compatible with its secondary containment and leak detection hardware based on a detailed chemical and physical analysis of the wastes used and other information sources.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-WTP-PER-J-02-002, Rev. 4, Leak Detection in Secondary Containment Systems; 24590-QL-HC4-HAHH-00001-11-00049, Rev. 00B, Structural Analysis of ASX-SMPLR-00012 & -00013.	The Basis of Design document states that the secondary containment components are to be appropriately lined and any leaks or spills will be removed within 24 hours of a leak detection or in as timely a manner as possible. Based on a detailed chemical and physical analysis of the wastes and other process information sources, the Material Selections document identifies appropriate corrosion resistant materials (stainless steel) for the ASX autosampler units secondary containment components and leak detection hardware. The drawings and Structural Analysis reviewed show that the 304L stainless steel or better material as recommended in Material Selections document is used for the fabrication of the ASX sampler cabinets. The Secondary Containment Design document provides adequate typical construction details including attachment details for the leak detection equipment to be used for secondary containment where required.
Strength	The design shows that the secondary containment has sufficient strength and thickness to prevent failure owing to pressure gradients, static head during a release, physical contact with the waste, climatic conditions, and the stress of daily operations (e.g., vehicular traffic).	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-QL-HC4-HAHH-00001-11-00049, Rev. 00B, Structural Analysis of ASX-SMPLR-00012 & -00013.	The LAW general arrangement drawings show ASX autosampler units are located inside the building. Pressure gradients, static head during a release, physical contact with the waste, climatic conditions, and the stresses of daily operations are adequately stated as design goals in the Basis of Design document. The Secondary Containment Design document describes and provides references to the design methodology, materials of construction, loads, and load combinations (including seismic loads) for the LAW facility secondary containment components. The secondary containment enclosures being considered are located in the room inside the LAW Vitrification Building rather than being directly buried in ground, therefore, pressure gradients and vehicular traffic are not considered applicable load cases. However, the Structural Analysis document reviewed shows that strength of secondary containment enclosure components is sufficient to sustain applicable loads such as static, fluid, and seismic.

	Information Assessed	Source of Information	Assessment
Strength (cont'd)	The secondary containment system has sufficient strength in the presence of operational stresses from site-specific conditions (i.e., frost, precipitation etc.).	Drawings listed above under References; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-WTP-3PS-NLLR-T0002, Rev. 1, Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-QL-HC4-HAHH-00001-11-00049, Rev. 00B, Structural Analysis of ASX-SMPLR-00012 & -00013.	The LAW facility drawings show that the secondary containment being considered is installed inside the building. Because it is located inside the building, precipitation and frost are not applicable load cases. The Secondary Containment Design document identifies the applicable load cases (operational stresses) from site specific conditions that must be considered in the design. The Engineering Specification for Furnishing Stainless Steel Liner Plates includes specific provisions for protection and repair of completed liners during the construction process. The Material Selections for Building Secondary Containment document addresses the potential effects of operations conditions on metal liner and the associated maintenance requirements. The Structural Analysis document reviewed shows that the secondary containment components are adequately designed and have sufficient strength to sustain the applicable design loads.
Foundation Integrity	The secondary containment is adequately supported by the enclosure structure and foundation below has adequate strength	Drawings listed above under References; 24590-QL-HC4-HAHH-00001-11-00049, Rev. 00B, Structural Analysis of ASX-SMPLR-00012 & -00013; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design.	Review of the Structural Analysis and drawings shows that the support system for each sampler cabinet has adequate strength to sustain the applicable design loads and is in turn anchored (welded) to the steel embed plates in the concrete floor slab. Chapter 14 of the Basis of Design document requires that the foundation underlying the cabinet support must be adequate to sustain the loads from the weight of the glovebox filled with water, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation slab is part of a separate integrity assessment report for the secondary containment for the plant items on this floor.

	Information Assessed	Source of Information	Assessment
Infiltration	The design or operation prevents run-on or infiltration of precipitation into the secondary containment.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design.	The Basis of Design document requires the design to provide adequate measures to prevent run-on or infiltration of precipitation. The secondary containment is located inside the LAW Vitrification Building where it is protected from direct precipitation by the building structure as shown in the general arrangement drawings. Therefore this section is not applicable to the secondary containment components being assessed.
	The design includes an external moisture barrier or other means to prevent moisture from entering the room.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design.	The Basis of Design document requires the design include provisions to prevent external moisture intrusion. The ASX Autosampler Units shown on the General Arrangement drawings are inside the LAW Vitrification Building which protects them from precipitation and surface water percolation, therefore, this section is not applicable to them.
Liner System	The containment area is free of cracks or gaps and the design discusses methods of their minimization.	24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection.	The Basis of Design document requires the liner system to be free of cracks and gaps. The Secondary Containment Design document provides current adequate design requirements, and codes and standards to design leak tight liners. This document includes appropriate details for installation of stainless steel components free of cracks and gaps. The Material Selections document provides adequate requirements for the secondary containment components.
	The design has considered the compatibility of the secondary containment elements with the waste and for preventing it from migrating into the concrete slab below.	24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design.	The Material Selections document contains information on the compatibility of secondary containment stainless steel material usage for containing the waste. The Secondary Containment Design document provides standard installation details for the secondary containment components of the sampler cabinets which ensure leak-tight connections that will prevent the migration of the waste onto the concrete slab below.

Master Distribution Schedule for WTP Project Subcontract Management Group

SUBMITTAL TRANSMITTAL: ☐ First Submittal ☐ Re-Submittal ☐ QVRP Package ☐ RFI
☐ No Review Required ☐ No Review Required Re-Submittal ☐ Submittal Supplement

CORRESPONDENCE: ☒ With Attachment ☐ W/O Attachment (letter only) ☐ RFI
☐ Fax as Original (Letter Only) ☐ Fax as Original (With Attachment)

☐ Pre-Award/Award Package ☐ Executed Change Order Package
☐ Executed Amendment Package ☐ Back Charge ☐ Closeout Package

Subcontract Number:	24590-CM-HC4-HXYG-00211
Subcontract Title:	Tank Integrity Design Assessments
Subcontractor Name:	AREVA Federal Services LLC
Subcontract Administrator:	Susan Parr

PDC Document Number	Rev	Document Title	Rev
CCN #169565		IQRPE Structural Integrity Assessment Report For LAW ASX Secondary Containment (Sampler Cabinets) - IA-3003444-000)	

DUE BACK TO SUBCONTRACT ADMINISTRATOR NO LATER THAN: N/A

INCOMING DISTRIBUTION

Name	MSIN/ E-mail	Original	Copy	Copy of cover sheet / transmittal only	Primary File Index	Alternate File Index	Assigned Action or Remarks
PDC		X			B.19		
Susan Parr	X						
Dan Pfluger	X						
Barry Curn	X						
Julie Colby	X						
Dan Robertson	X						

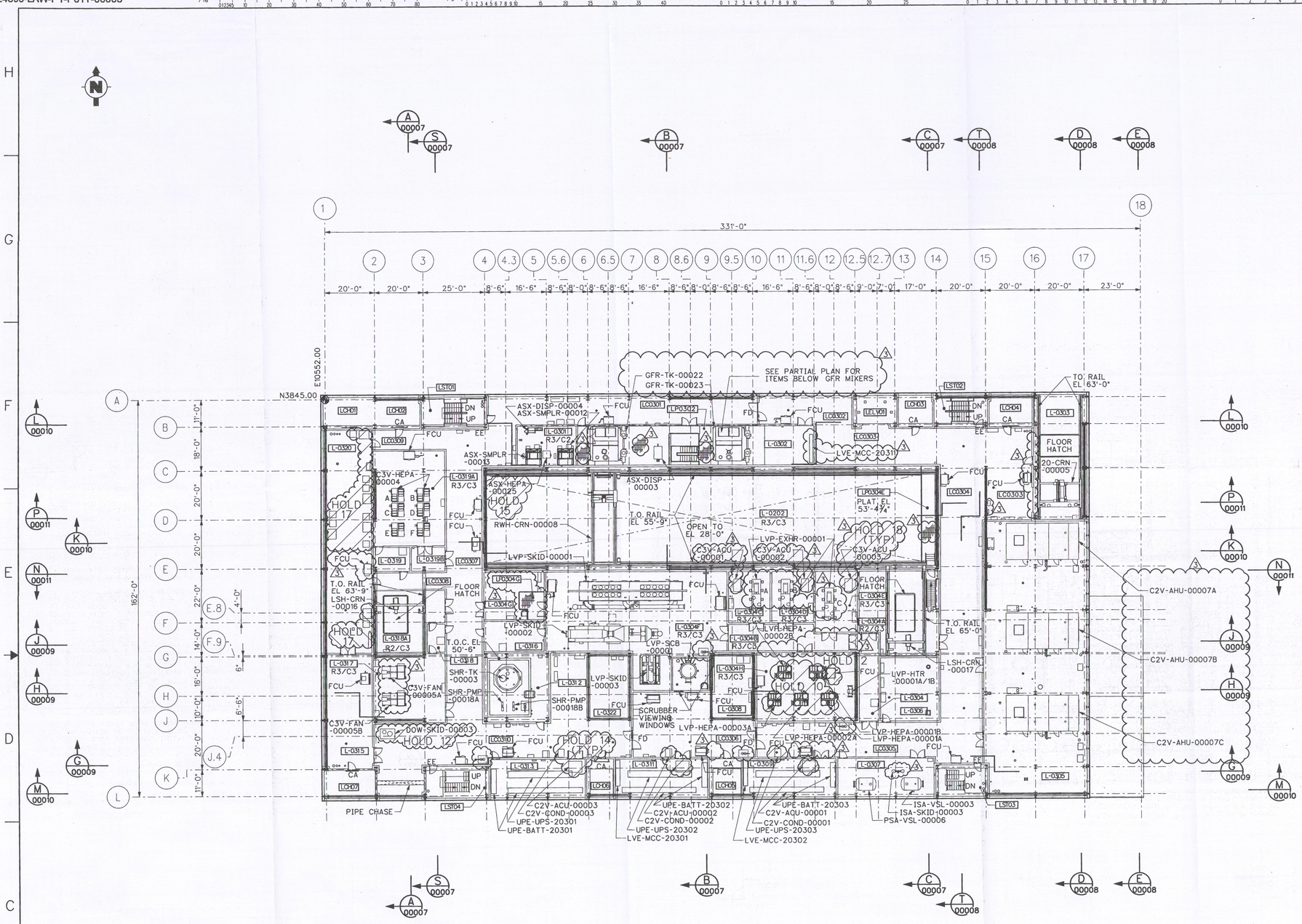
Master Distribution Schedule for WTP Project Subcontract Management Group

Subcontract Number:	24590-CM-HC4-HXYG-00211
Subcontract Title:	Tank Integrity Design Assessments
Subcontractor Name:	AREVA Federal Services LLC
Subcontract Administrator:	Susan Parr

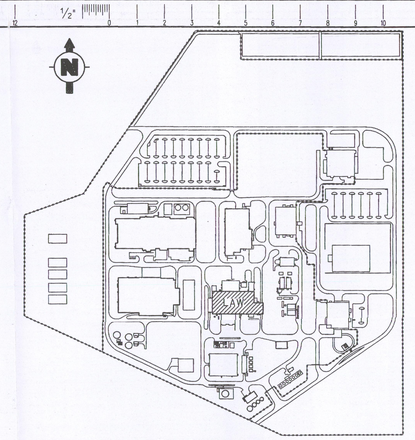
OUTGOING DISTRIBUTION FOR RETURNED STATUSED STICKER SUBMITTALS

Name	MSIN/ E-mail	Original	Copy	Copy of cover sheet / transmittal only	Primary File Index	File Index Alternate	Assigned Action or Remarks

24590-LAW-P1-P01T-00005



PLAN AT EL 48'-0"



KEY PLAN

NOTES:

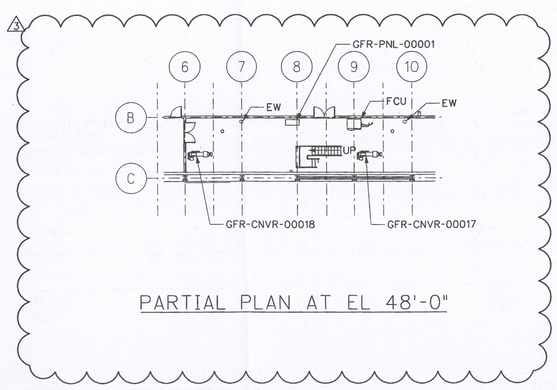
1. FOR GENERAL NOTES, SEE 24590-LAW-P1-P01T-00001.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. REVISIONS:
   RENUMBERED ROOMS: L-0301 TO L-0301A, L-0308A TO L-0304H, L-0304B TO L-0304C, L-0309 TO L-0307, L-0304E TO L-0304A, L-0304C TO L-0304D, L-0310 TO L-0309, L-0304D TO L-0304E.
   ADDED ROOMS: L-0301A (CHANGE ROOM), L-0304G (EQUIPMENT AIRLOCK), L-0322 (SPARE ROOM), LC0310 (CORRIDOR).
   ADDED: FAN COIL UNITS, HOLD NOTES FOR C3 HEPA FILTERS, AIR HANDLING UNITS, MELTER OFFGAS HEPA FILTERS, C3 EXHAUST FANS, TEMPERED WATER SYSTEM, PERSONNEL DOORS AT LCH02,LCH03,LCH04, LCH05,LCH06, AND LCH07.
   DELETED: HOLD NOTE 4 AND 6, MISCELLANEOUS REAGENT SYSTEM, AND WALL BETWEEN LCH01 AND LCH02.
   REDESIGNED SODIUM HYDROXIDE, SECONDARY OFFGAS SYSTEM, RELOCATED ELECTRICAL EQUIPMENT.
   REDESIGNED ROOMS: L-0312 (SODIUM HYDROXIDE), L-0304 (SUB-CHANGE), L-0306 (SPARE ROOM), L-0304A (EAST MAINTENANCE ROOM), L-0304B (EQUIPMENT AIR LOCK), L-0304C/D/E (SECONDARY OFFGAS EXHAUSTER ROOMS), LC0305 AND LC0306 (CORRIDORS).
   REVISED HATCH SIZE (L-0303).
   DELETED COLUMN GRID J.3 AND ADDED COLUMN GRID J.4.

   INCORPORATED DCNS:
   DCN 24590-LAW-P1N-P01T-00009
   DCN 24590-LAW-P1N-P01T-00021
   DCN 24590-LAW-P1N-P01T-00024
   RELEASED HOLDS 1, 3, 5, 7, 8, 9, 11, AND 13. REVISED FCU LOCATIONS REVISED ROOM L-0301 LAYOUT FOR ASX SYSTEM, REVISED TITLE BLOCK, REVISED ELECTRICAL ROOMS L-0309, L-0311, AND L-0313, REVISED GFR-TK-00022 AND 23. REVISED LOCATION OF LSH-CRN-00017 REVISED STAIRS BETWEEN L-0304A AND LP0304E, ADDED HOLD 14, 15, ASX-DISP-00003, ASX-DISP-00004, ASX-HEPA-00025, LVP-SKID-00003, AND MISC. ELECTRICAL EQUIPMENT, MODIFIED LAYOUT OF LVP-EXHR-00001A, B, AND C, ADDED CONTROLLED ACCESS CALL OUTS AT CHASE ACCESSES, REMODELED RWH-CRN-00008, 20-CRN-00005, ASX-SMPLR-00012, AND ASX-SMPLR-00013, DELETED ROOM L-0301A, REVISED ELEVATION OF LP0304E, LSH-CRN-00017.
   REVISED DESCRIPTIONS OF HOLDS 2, 10, AND 16. RELEASED HOLDS ON REMAINING FCU'S. ADDED ISA-SKID-00003 IN ROOM L-0307 ROTATED EW/SS IN ROOM L-0304F. REVISED C3V-FAN-00005A & C3V-FAN-00005B. ADDED PARTIAL PLAN BELOW GFR MIXERS. REVISED SIZE OF LVP-EXHR-00001A/B/C. ADDED LP0304G FOR ACCESS TO RADAR WAVE GUIDE INSTRUMENTATION. ADDED LVE-MCC-20311. RELOCATED DOORS AND WALLS IN ROOM L-0304B. MODIFIED WALL TYPE AND THICKNESS FROM 7¼" TO 8½" FOR L-0304B SOUTH WALL.

HOLDS:

1. DELETED
2. LVP HEPA ROOM (L-0304H) FAN COIL UNIT LOCATION PENDING FINAL SECONDARY OFF-GAS PIPING ARRANGEMENT.
3. DELETED
4. DELETED
5. DELETED
6. DELETED
7. DELETED
8. DELETED
9. DELETED
10. MELTER OFFGAS HEPA FILTERS PENDING VENDOR SELECTION. TO BE PROVIDED BY MECHANICAL SYSTEMS ENGINEERING.
11. DELETED
12. TEMPERED WATER SYSTEM PENDING VENDOR SELECTION. TO BE PROVIDED BY MECHANICAL SYSTEMS.
13. DELETED
14. C2V AIR CONDITIONING UNITS AND AIR CONDENSING UNITS PENDING VENDOR SELECTION TO BE PROVIDED BY HVAC ENGINEERING.
15. ASX HEPA FILTERS PENDING VENDOR INFORMATION TO BE PROVIDED BY MECHANICAL SYSTEMS.
16. DELETED.
17. C&I EQUIPMENT PENDING VENDOR SELECTION FROM CONTROL SYSTEMS.
18. C3V AIR CONDITIONING UNITS PENDING VENDOR SELECTION TO BE PROVIDED BY HVAC ENGINEERING.

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy Office of Environmental Management by DOE acting pursuant to its AEA authority. DOE asserts that DOE acting pursuant to its AEA authority has 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.



PARTIAL PLAN AT EL 48'-0"

LEGEND:

CA	CONTROLLED ACCESS
EE	EMERGENCY EXIT
FCU	FAN COIL UNIT
FD	FIRE DOOR
L-XXXX	ROOM, CELL, (VAULT) OR TUNNEL
LCXXXX	
LMXXXX	MEZZANINE
LPXXXX	ROOM PLATFORM
LPCXXXX	CORRIDOR PLATFORM
LCHXX	CHASE
LELVXX	ELEVATOR
LSTXX	STAIR
	EQUIPMENT LAYDOWN AREA
	CONCRETE
	CHECKERED PLATE
	GRATING
	EMERGENCY EYEWASH
	LADDER
	EMERGENCY SHOWER/EYEWASH
	FLOOR PENETRATION

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
3	REVISED TO INCORPORATE CHANGES IN NOTE 3	TH	CMS	PR	DRJ	11/1/06
2	REVISED TO INCORPORATE CHANGES IN NOTE 3	DLL	CMS	PR	DRJ	12/19/05
0	ISSUED FOR DESIGN - SUPERSEDES					
	DWG-W375LV-PL00046, REV D	TH	CMS	PR	CJW	11/25/03

REVISION HISTORY

ISSUED BY RPP-WTP PDC		
	PROJECT No.	24590
	SITE	HANFORD
	AREA	200E
ISSUE STAMP	BUILDING No.	20
	BY	DATE
ORIGINATOR	TIMOTHY E. HAWKINS	11/25/03
CHECKER	CRAIG M. SALERNO	11/25/03
APPROVER	C. J. WINKLER	11/25/03
REVIEWER	PHIL REICHERT	11/25/03

CONTENT APPLICABLE TO ALARA? [X] YES [ ] NO
ADR NO: 24590-LAW-ADR-PL-03-006 REV: 0
SAFETY SCREEN REQUIRED? [X] YES [ ] NO EMS INITIAL IF YES DEK

BECHTEL

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No: DE-AC27-01RV14136

LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 48'-0"

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

24590-LAW-P1-P01T-00005

REV 3

SAFETY SCREEN IS REQUIRED FOR DRAWING TYPES IDENTIFIED IN 24590-WTP-GPP-SREG-002

'E' SIZE - 44x34
COMPUTER GENERATED - MANUAL CHANGES NOT PERMITTED

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PLOTTED BY: cwalters
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FORM E_SDN.DGN 02/2003

ISSUED BY
RPP-WTP PDC

R11165624

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-A1N-A10T-00029

JOB NO.	TITLE FOR CHANGE NOTICE
24590	Gypsum Board Partition Wall Modification, Deletion and/or Fire Rating Changes - LAW El 48' and 68'

DESIGN DOCUMENT NUMBER	REV	DESIGN DOCUMENT NUMBER	REV
24590-LAW-A1-A10T-01104001	003	24590-LAW-A2-A10T-03200003	003
24590-LAW-A1-A10T-01204001	005	24590-LAW-A2-A10T-03200004	003
24590-LAW-A1-A10T-01204002	003	24590-LAW-A3-A10T-04700006	005
24590-LAW-A1-A10T-01204003	005		
24590-LAW-A1-A10T-01204004	005		
24590-LAW-A1-A10T-01205001	005	24590-LAW-P1-P01T-00005	003

PART OF DESIGN CHANGE PACKAGE (DCP)? ☐ Yes ☒ No DCP No.: Rev:

JUSTIFICATION FOR CHANGE

Supersede previous El 48'-0" and 68'-0" DCN. This DCN includes LAW Plant Design General Arrangement drawing and Architectural Floor Plan drawing adjustments reflecting: review of design associated with the deletion of selected gypsum board partition walls, fire rating reductions, modification due to field routed commodities and installed equipment, fireproofing, interferences in the current model, and additional soffiting at roof framing gusset plates. Add General Note 17. Revise design to include Room L-0301 platform enlargement with additional door and stair reflecting General Arrangement. Add south wall at Room L-0322. Add Q partition walls and change affected drawings to Q from CM (on hold).

CAUSE CODE

42

Supersedes Change Document ☒ Yes ☐ No Document # 24590-LAW-A1N-A10T-00021

ECN Needed ☐ Yes ☒ No

REQUIREMENTS REVIEW

Client Approval Required ☐ Yes ☒ No | Interface Resolution Required * ☐ Yes ☒ No

Address any "yes" answers in the description

DESCRIPTION OF CHANGE

1) Modify General Arrangement drawings to reflect partition wall/door deletion and changes as reflected in the attached Revised Layouts.
2) Delete partition walls including associated doors as indicated in the attached Revised Layouts.
3) Change fire ratings of selected partition walls as indicated in the attached Revised Layouts.
4) Change the locations of walls as noted on the attached Revised Layouts and section drawings.
5) Change wall types or add wall types to indicate wall construction as indicated on the attached Revised Layouts.
6) Add soffits as noted on the drawings to provide a fire rated assembly in areas / locations where steel beams or other interferences prevent construction to approved fire rated construction.
7) Add Room L-0301 door at platform and clarify associated partition wall configuration.
8) Change selected fire barrier partitions from CM to Q to reflect current PDCA and change affected drawings from CM to Q (CCN 211505, Q partition walls placed on hold).
9) Add to GENERAL NOTES on drawing 24590-LAW-A1-A10T-01204001:
   15. Provide soffits as per approved shop drawings in locations where walls connect to steel without fireproofing or metal roof deck with screws that impact fastening of track.
   16. Install mineral wool and fire sealant at walls that fasten to fireproofed beams to provide a continuous fire barrier.
   17. For wall types 0090 and 0100 at non-stair shaft locations: Install 5/8" gypsum board over shaft wall to 7'-6" AFF or platforms/landings, and 40" to any side of platforms/landings or access ways such as ladders/stairs. Gypsum cover board not required in inaccessible locations.

ORIGINATOR
Mark Rees

CHECKER
Lou LaDouceur

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to 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.

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-A1N-A10T-00029

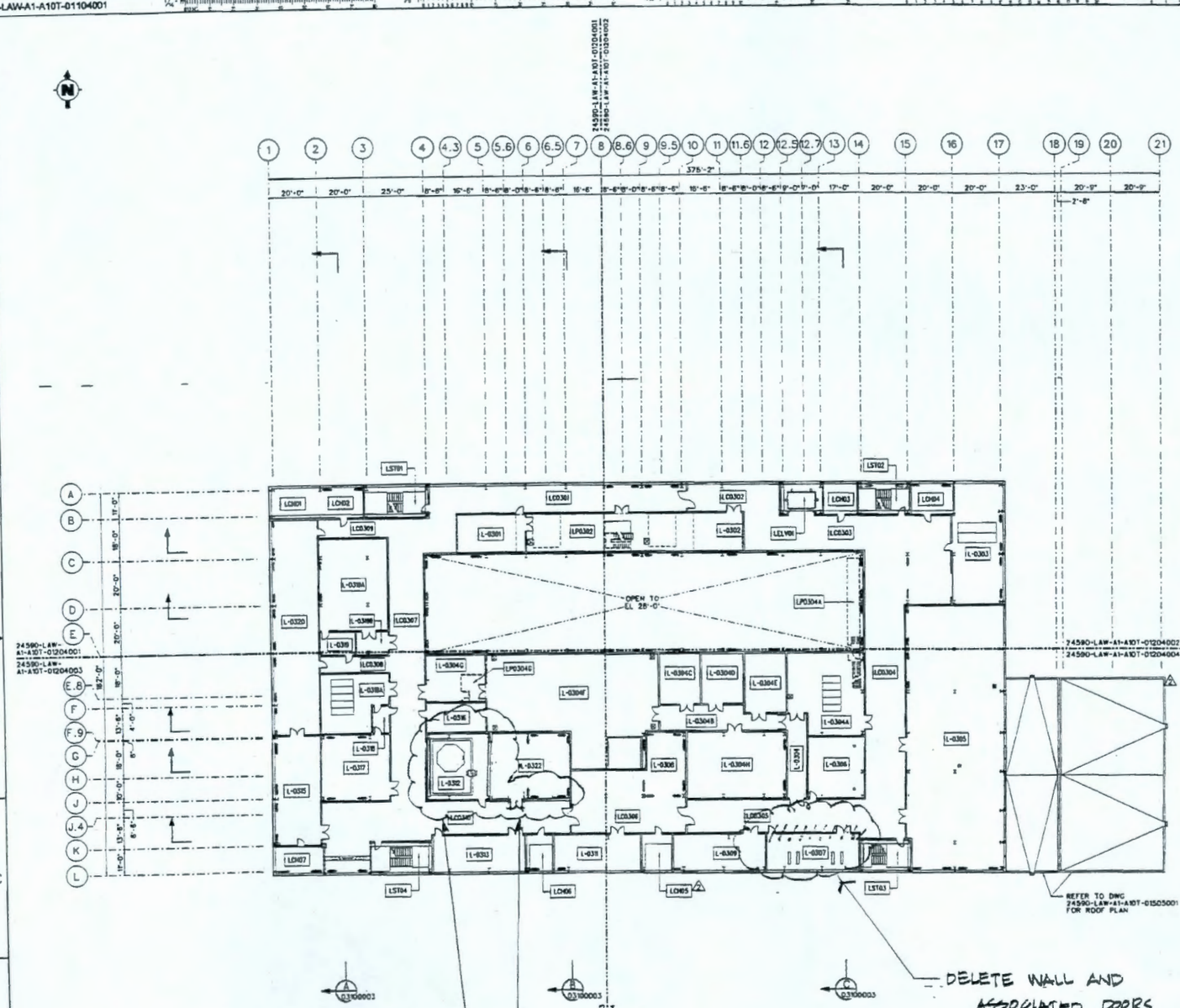
JOB NO.	TITLE FOR CHANGE NOTICE
24590	Gypsum Board Partition Wall Modification, Deletion and/or Fire Rating Changes - LAW El 48' and 68'

Reviews			MSR 2/17/10
CON - Erik Morrison TRACY DAWIN FOR	E&NS - James Jarvi	CS&A - Marlene Kingman	PD - ~~Craig Galeme~~ Roy Slagle
FP - Dale Eggen	HVAC GARY DALTON		

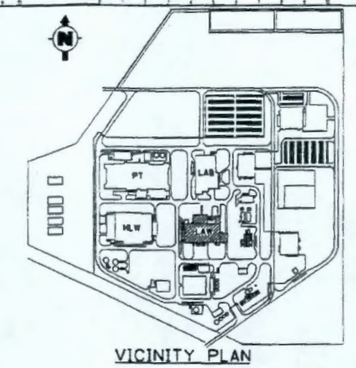
Approval(s)		MSR 2/17/10	
APEM-LBL - John Schneider	CS&A - Mark Braccia	PD - ~~Mark Gober~~ JACK CLINTON	

Date *(inserted by final approver)*: Feb 17, 2010

24590-LAW-A1-A10T-01104001



FLOOR PLAN EL 48'-0"



VICINITY PLAN

GENERAL NOTES:

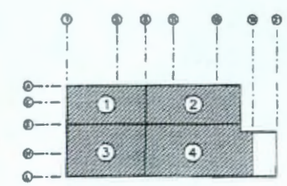
1. REFER TO DWG 24590-LAW-P1-P01T-00005 FOR GENERAL ARRANGEMENT PLAN AT EL 48'-0".
2. FOR DIMENSIONING OF WALLS AND DOORS SEE DRAWINGS 24590-LAW-A1-A10T-01204001 THROUGH 01204004.
3. REFER TO DWG 24590-WTP-AD-A10T-00100002 FOR COMMON ABBREVIATIONS & SYMBOLS.

HOLD LEGEND:

HOLD #1 - CLOSED

REVISION NOTES:

1. REMOVED HOLDS FROM DWG & GEN. NOTE 4. REVISED ACCESS STAIRS & LANDING IN RM L-0304A & PLATFORM LP0304E. ADDED EXT LOUVERS AT COL LINE 17 & HOLD #1.
2. REMOVED ROOM L-0301A, MODIFIED ROOF SLOPE UPDATED WALLS AND DOORS, ADDED PLATFORMS AND CHANGED ROOM NUMBERS.



LAW BUILDING
KEY PLAN

DRAWING INDEX

DWG NO	REV	TITLE
24590-LAW-A1-A10T-01104001	3	LAW VIT BLDG ARCH FL PLAN EL 48'-0"

REFERENCE DRAWINGS

DWG NO	TITLE
24590-LAW-P1-P01T-00005	LAW VIT BLDG GEN. ARRANGEMENT PLN @ EL 48'-0"
24590-LAW-A2-A10T-03100001	LAW VIT BLDG ARCH BLDG SECTIONS K & L
24590-LAW-A2-A10T-03100002	LAW VIT BLDG ARCH BLDG SECTIONS G, H & J
24590-LAW-A2-A10T-03100003	LAW VIT BLDG ARCH BLDG SECTIONS A, B & C
24590-LAW-A1-A10T-01204001	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 1
24590-LAW-A1-A10T-01204002	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 2
24590-LAW-A1-A10T-01204003	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 3
24590-LAW-A1-A10T-01204004	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 4
24590-WTP-AD-A10T-00100002	WTP PROCESS BLDGS ARCH COM ABBRS & SYMBOLS
24590-LAW-A1-A10T-01505001	LAW VIT BLDG ARCH ROOF PLAN

REV	DESCRIPTION	DRG	CHKD	REVIEWED	APVD	DATE
3	CLOSED HOLD 1 AND MOVED REV NOTE 2	TTAD	KLR	MRS	MF	3-16-08
2	SEE REVISION NOTE 2	TTAD	KLR	MRS	MF	03-12-2007
1	SEE REVISION NOTE 1	DBS	KLR	TTB	MF	05-17-2005
0	ISSUED FOR CONSTRUCTION	DBS	KLR	TB	MF	9-19-2003

CM

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

		DATE
DESIGNED BY	S. STUBKJEROLD	9-12-2003
CHECKED	L.R. LABOUCHER	9-12-2003
APPROVED	K. MAHNEY / L. HERSH	9-18-2003
REVIEWED	T. BIVINGS	9-12-2003

CONTENT APPLICABLE TO 24.590? YES NO
ADR NO. 24590-LAW-RPL-03-005 REV. 0

SAFETY SCREEN IS REQUIRED FOR DRAWING TYPES IDENTIFIED IN 24590-WTP-GPP-ENG-001

SAFETY SCREEN IS REQUIRED YES NO

"C" SIZE 44x34
COMPUTER GENERATED - MANUAL CHANGES NOT PERMITTED

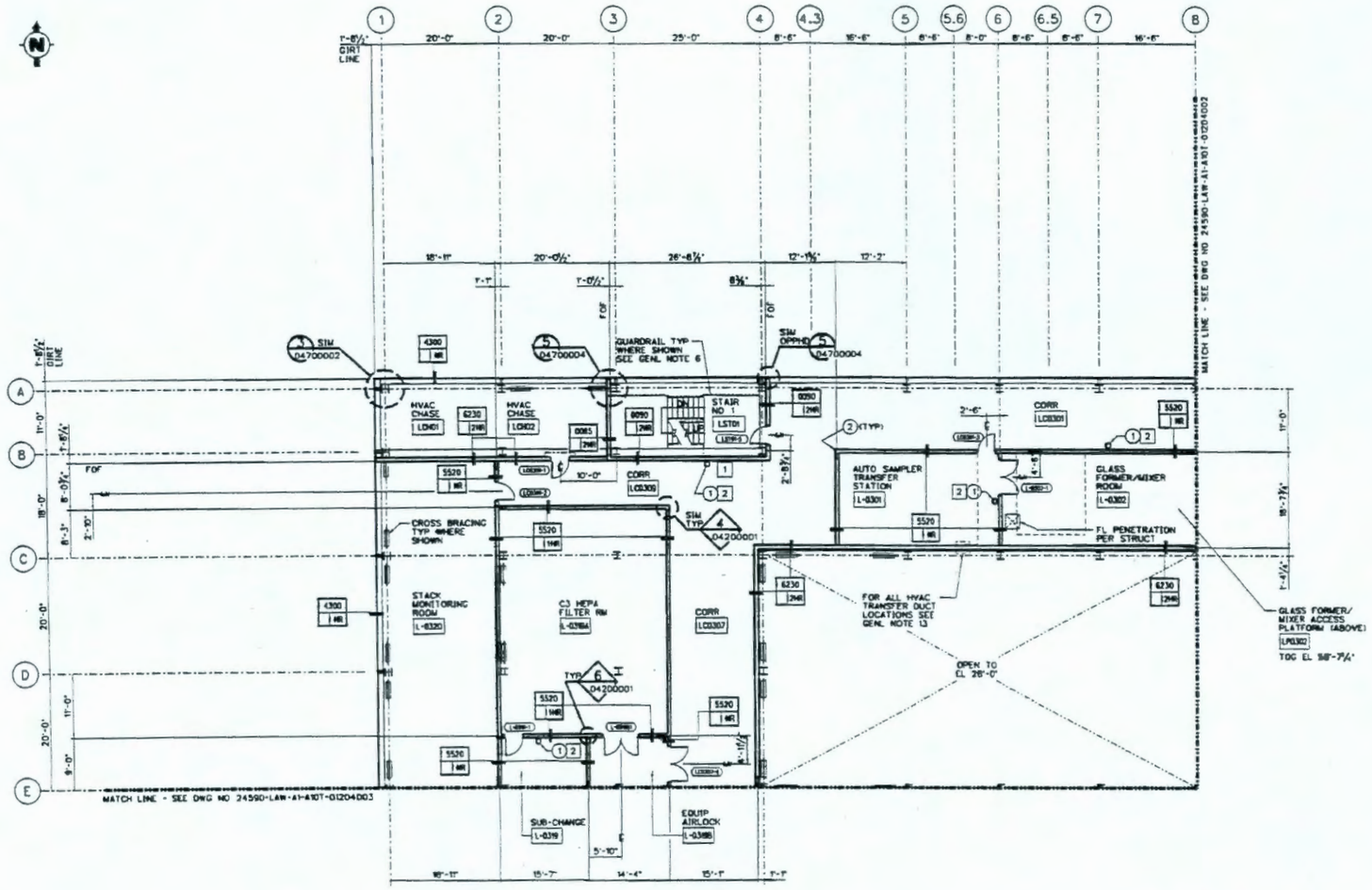
LAW VITRIFICATION BUILDING
ARCHITECTURAL
FLOOR PLAN EL 48'-0"

SCALE 1/4"=1'-0"

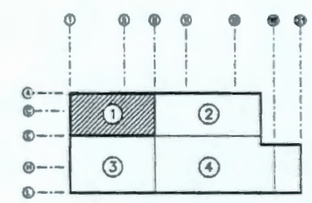
24590-LAW-A1-A10T-01104001

REV 3

24590 - LAW - A1N - A10T - 00009
REVISED LAYOUT
PAGE 3 OF 19



FLOOR PLAN EL 48'-0" ZONE 1



LAW BUILDING

KEY PLAN

GENERAL NOTES:

1. REFER TO DRAWING 24590-LAW-A1-A10T-01204001 FOR OVERALL FLOOR PLAN OF EL 48'-0" LEVEL.
2. REFER TO DWG 24590-WTP-AD-A10T-00100002 FOR COMMON ABBREVIATIONS & SYMBOLS.
3. REFER TO DWG 24590-WTP-AD-A10T-00100003 & 00100004 FOR STANDARD INTERIOR/EXTERIOR WALL TYPES LEGENDS.
4. REFER TO STRUCTURAL DRAWINGS FOR CONCRETE FORMING AND DIMENSIONS.
5. REFER TO STRUCTURAL DRAWINGS FOR STAIR DIMENSIONS AND DETAILS.
6. REFER TO STRUCTURAL DRAWINGS FOR GUARDRAIL/HANDRAIL DIMENSIONS AND DETAILS.
7. REFER TO DRAWING 24590-LAW-AD-A18T-05104001 FOR DOOR SCHEDULE.
8. REFER TO DRAWING 24590-LAW-A5-A19T-05204001 FOR ROOM FINISH SCHEDULE.
9. REFER TO DRAWING 24590-LAW-A5-A10T-05304001 FOR SIGNAGE SCHEDULE.
10. FIRE RATED GYPSUM BOARD AND SHAFT WALL ASSEMBLIES SHALL BE CONTINUOUS FROM FLOOR TO UNDER SIDE OF METAL DECKING. ALL BEAMS ADJACENT TO, INTERSECTING OR WITHIN THE WALL SYSTEM SHALL BE WRAPPED, OR FIRE PROOFED TO MATCH THE RATING OF THE WALL SYSTEM PER BNI ACCEPTED DESIGN FROM A NATIONALLY RECOGNIZED TESTING LABORATORY OR OTHER APPROVED SOURCE OR METHOD.
11. INSTALL GYPSUM WALL BOARD CONTROL JOINTS AT 30' MAXIMUM PER SPECIFICATIONS 24590-WTP-3PS-AFGB-T0001 AND 24590-WTP-3PS-AFGW-T0001.
12. GYPSUM BOARD WALL DIMENSIONAL TOLERANCES: WALL INSTALLATION CAN BE ADJUSTED BASED ON DIMENSION SHOWN: ±1/2" IN A LATERAL DIRECTION. WALL RELOCATIONS GREATER THAN TOLERANCE REQUIRES BNI APPROVAL PRIOR TO MODIFICATION.
13. TRANSFER DUCT LOCATIONS ARE NOT INDICATED ON THE ARCH DWGS. REFER TO BNI AND VENDOR DRAWINGS LISTED BELOW FOR THE LOCATION, SIZE AND SUPPORT REQUIREMENTS OF ALL WALL TRANSFER DUCTS (GRILLES).

    24590-QL-SRA-MDHH-00001-62-00018 AREA 1
    24590-QL-SRA-MDHH-00001-62-00002 AREA 2
    24590-QL-SRA-MDHH-00001-62-00010 AREA 3
    24590-QL-SRA-MDHH-00001-62-00003 AREA 4
    24590-QL-SRA-MDHH-00001-62-00011 AREA 5
    24590-QL-SRA-MDHH-00001-62-00020 AREA 6
    24590-LAW-MO-20-00011 - WALL PENETRATION SCHEDULE EL 48'
    24590-WTP-S1-S1S1-00046 - STRUCT STL PARTITION WALL LOAD LIMITS
14. REFER TO DRAWING 24590-LAW-AD-A18T-05101002 FOR FLOOR MATCHES.

KEYED NOTES:

1. INSTALL 4 WALL MOUNTED FIRE EXTINGUISHER WHERE SHOWN. RELOCATE AS NEEDED TO AVOID INTERFERENCES WITH SURFACE MOUNTED & WALL MOUNTED PANELS, CONDUITS & PIPING.
2. FURNISH AND INSTALL CORNER GUARDS ON ALL EXPOSED GYPSUM WALL BOARD CORNERS IN CORRIDORS: LC0301, LC0302, LC0303, LC0304, LC0305, LC0307, AND LC0310 IN ACCORDANCE WITH SPECIFICATION 24590-WTP-3PS-AYWP-T0001.

HOLD LEGEND:

HOLD #1 - CLOSED

REVISION NOTES:

1. REMOVED.
2. REMOVED

QUALITY LEVEL EXTERIOR WALL NOTE:

QUALITY LEVEL IS C FOR ARCHITECTURAL EXTERIOR WALL PANELS AND ASSOCIATED FASTENERS. ALL OTHER ITEMS ARE CM.

DRAWING INDEX

DWG NO	REV	TITLE
24590-LAW-A1-A10T-01204001	5	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 1
24590-LAW-A1-A10T-01204002	3	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 2
24590-LAW-A1-A10T-01204003	5	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 3
24590-LAW-A1-A10T-01204004	5	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 4

REFERENCE DRAWINGS

DWG NO	TITLE
24590-LAW-A1-A10T-01104001	LAW VIT BLDG ARCH FL PLAN EL 48'-0"
24590-LAW-A1-A10T-01204002	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 2
24590-LAW-A1-A10T-01204003	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 3
24590-WTP-AD-A10T-00100002	WTP PROCESS BLDGS ARCH COM ABBRS & SYMBOLS
24590-WTP-AD-A10T-00100003	WTP PROCESS BUILDINGS ARCH STANDARD INTERIOR/EXTERIOR WALL TYPES LEGEND
24590-WTP-AD-A10T-00100004	WTP PROCESS BUILDINGS ARCH STANDARD INTERIOR/EXTERIOR WALL TYPES LEGEND
24590-LAW-AD-A18T-05104001	LAW VIT BLDG ARCH DOOR SCHEDULE EL 48'-0"
24590-LAW-A5-A19T-05204001	LAW VIT BLDG ARCH RM FINISH SCHED EL 48'-0"
24590-LAW-A5-A10T-05304001	LAW VIT BLDG ARCH SIGNAGE SCHED EL 48'-0"
24590-LAW-A3-A10T-04700002	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-WTP-A3-A10T-04200001	WTP PROCESS BLDGS ARCH COMMON INTR WALL DETS
24590-LAW-A3-A10T-04700004	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-LAW-MO-20-00011	LAW VIT BLDG WALL PENETRATION SCHEDULE EL 24'-0
24590-WTP-S1-S1S1-00046	STRUCT STEEL PARTITION WALL LOAD LIMITS

REVISION HISTORY

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
5	REMOVED QUALITY WALL LEGEND, REVISED SPEC NUMBER IN KEY NOTE 2					
4	REMOVED REVISION NOTES 1 AND 2, MODIFIED REVISION NUMBERS, ADDED KEYED NOTE 2	TAD	ILR	MSR	MK	7-2-2008
0	ISSUED FOR CONSTRUCTION	DBS	ILR	TB	MK	03-18-2005

Q

PROJECT No.	24590		
SITE	HANFORD		
AREA	200E		
BUILDING No.	20		
	BY	DATE	
ORIGINATOR	S. STANSFIELD	3-12-2005	
CHECKER	L.A. LAROCCUR	3-12-2005	
APPROVER	K. BRAME / J. KEISER	3-15-2005	
REVIEWER	L. BRANCH	3-12-2005	

CONTENT APPLICABLE TO ALARA? ☐ YES ☐ NO
ADR NO. 24590-LAW-ADR-N-03-005 REV. 0
SWS SCREENING REQUIRED? ☐ YES ☐ NO (SWS INITIAL IF NO)

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

LAW VITRIFICATION BUILDING
ARCHITECTURAL
FLOOR PLAN EL 48'-0"
ZONE 1

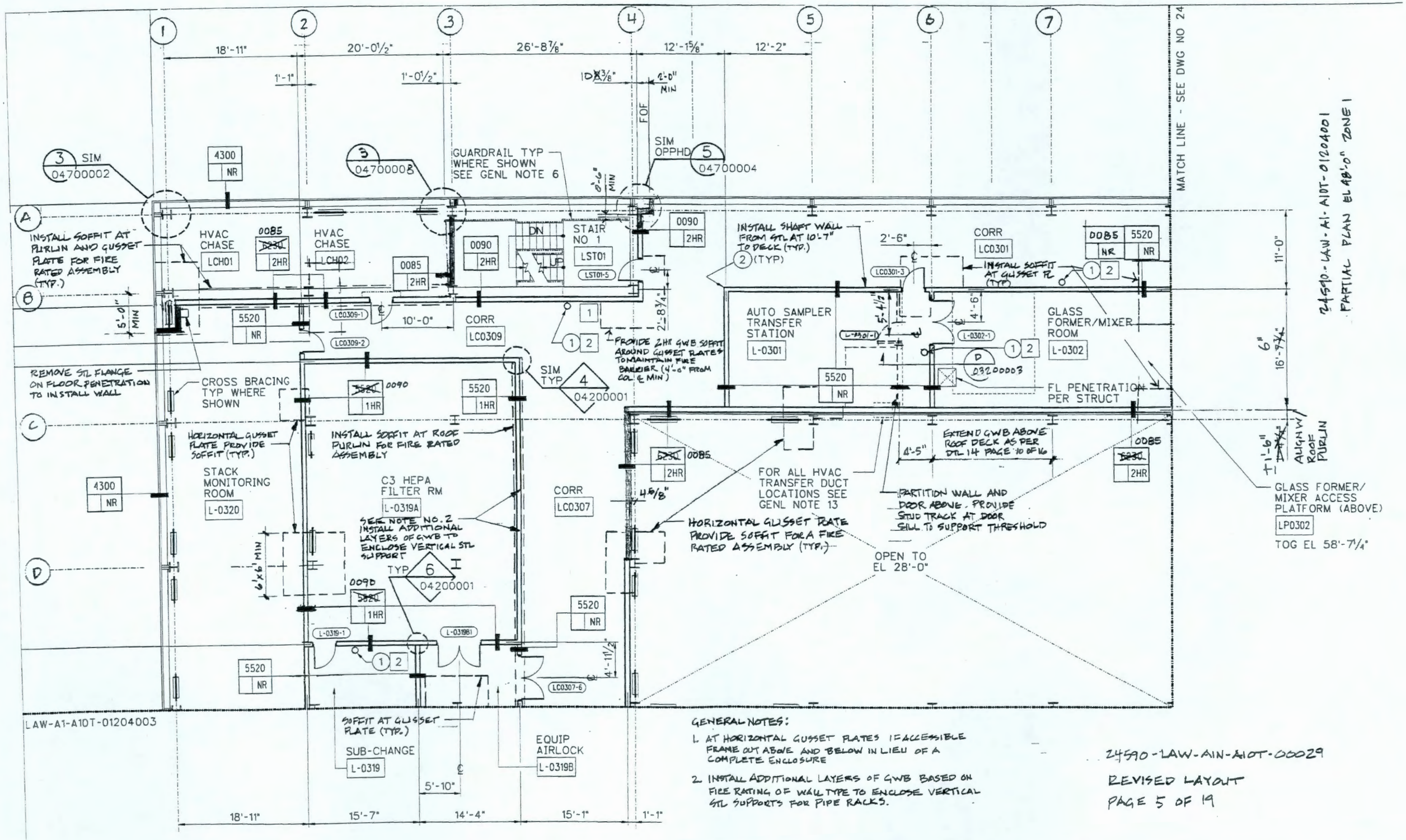
SCALE 1/8"=1'-0" | 24590-LAW-A1-A10T-01204001 | REV 5

SCREENING IS REQUIRED FOR DRAWING TYPES DEFINED IN 24590-WTP-SPM-SRE-00001

C SIZE - 44x34
COMPUTER GENERATED - MANUAL RUSHIN CHANGES NOT PERMITTED

08/29/2008 08:27:03 AM

24590-LAW-AIN-A10T-00029
CURRENT REVISION
PAGE 4 OF 19



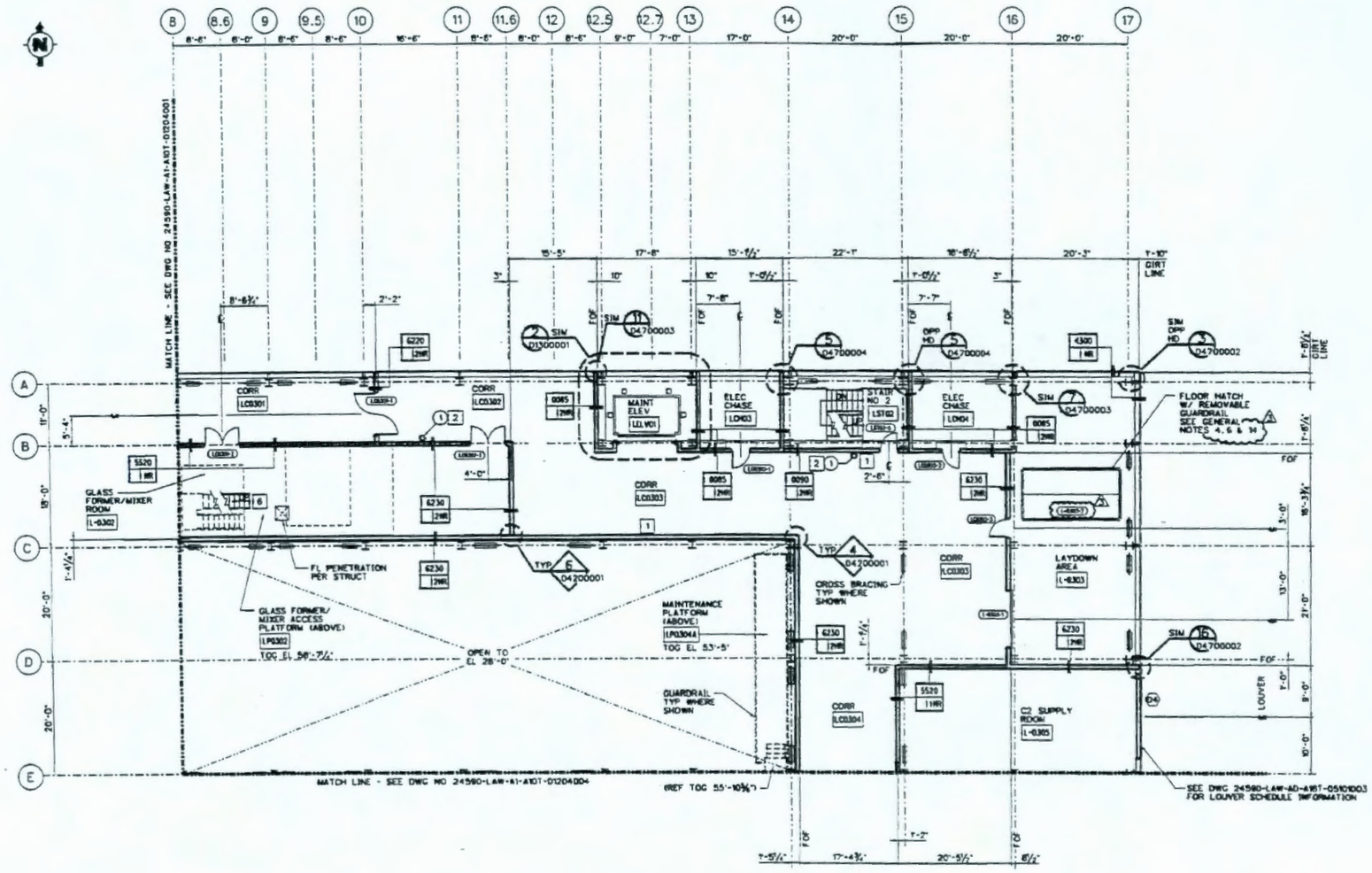
GENERAL NOTES:

1. AT HORIZONTAL GUSSET PLATES IF ACCESSIBLE FRAME OUT ABOVE AND BELOW IN LIEU OF A COMPLETE ENCLOSURE
2. INSTALL ADDITIONAL LAYERS OF GWB BASED ON FIRE RATING OF WALL TYPE TO ENCLOSE VERTICAL STL SUPPORTS FOR PIPE RACKS.

24590-LAW-A1N-A10T-00029

REVISED LAYOUT

PAGE 5 OF 19



FLOOR PLAN EL 48'-0" ZONE 2

NOTES:

1. REFER TO DRAWING 24590-LAW-A1-A10T-01204001 FOR GENERAL NOTES AND REFERENCES.

KEYED NOTES:

1. INSTALL A WALL MOUNTED FIRE EXTINGUISHER WHERE SHOWN. RELOCATE AS NEEDED TO AVOID INTERFERENCES WITH SURFACE MOUNTED & WALL MOUNTED PANELS, CONDUITS & PIPING.

REVISION NOTES:

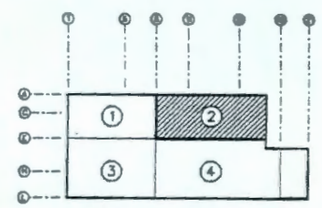
1. REMOVED HOLDS, GENL NOTE 7 & NORTH WALL @ MAINT ELEV. REVISED PLATF LP0304E, KEYED NOTES, REF DWGS & QUALITY DESIGNATOR. ADDED LOUVER, GL WALL NOTE DET & GUARDRAIL @ DOORS.
2. RELOCATED WALLS AND DOORS, MODIFIED DIMS AND RM NAMES, ADDED REVISION NOTES, MODIFIED QUALITY NOTE, DELETED AND MODIFIED GENL NOTES, ADDED HOLD #1.

HOLD LEGEND:

HOLD #1 - CLOSED

QUALITY LEVEL EXTERIOR WALL NOTE:

QUALITY LEVEL IS D FOR ARCHITECTURAL EXTERIOR WALL PANELS AND ASSOCIATED FASTENERS. ALL OTHER ITEMS ARE CM.



LAW BUILDING

KEY PLAN

REFERENCE DRAWINGS

DWG NO	TITLE
24590-LAW-A1-A10T-01204001	LAW VIT BLDG ARCH FL PLAN EL 28'-0" ZONE 1
24590-LAW-A1-A10T-01204004	LAW VIT BLDG ARCH FL PLAN EL 28'-0" ZONE 4
24590-LAW-A1-A10T-01300001	LAW VIT BLDG ARCH ELEVATOR PLANS & SECTIONS
24590-LAW-A3-A10T-04700002	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-LAW-A3-A10T-04700004	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-WTP-A3-A10T-04200001	WTP PROCESS BLDGS ARCH CON INTR WALL DETS
24590-LAW-AD-A10T-05101003	LAW VIT BLDG ARCH WINDOW/LOUVER SCHEDULE
24590-LAW-A3-A10T-04700003	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS

REVISION HISTORY

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
3	CLOSED HOLD 1, ADDED MATCH NUMBER, MODIFIED NOTE					
2	SEE REVISION NOTE 2	TIAD	ILRL	MGR	LPVAR	03-15-2007
1	SEE REVISION NOTE 1	DBS	ILRL	TB	LBAR	05-17-2005
0	ISSUED FOR CONSTRUCTION	DBS	ILRL	TB	NKAR	11-18-2005

Q

	BY	DATE
ORIGINATOR	R. STABLEFIELD	11-17-2005
CHECKER	L.R. LANGSTAFF	11-17-2005
APPROVER	K. KRAMER / L. NESSEL	11-18-2005
REVIEWER	T. BYRNES	11-17-2005

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

LAW VITRIFICATION BUILDING ARCHITECTURAL FLOOR PLAN EL 48'-0" ZONE 2

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

24590-LAW-A1-A10T-01204002 REV 3

24590-LAW-A1N-A10T-00029
CURRENT REVISION
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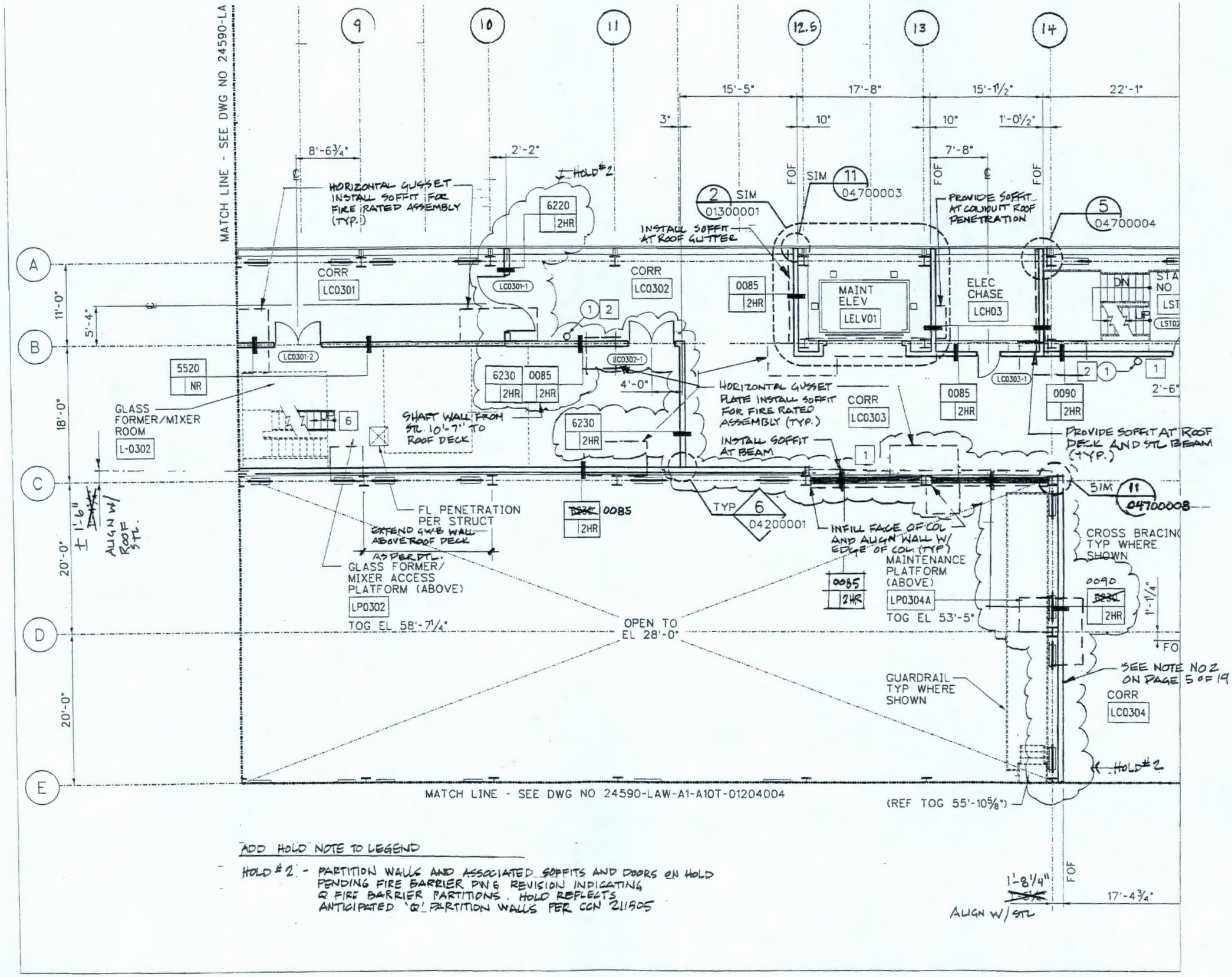
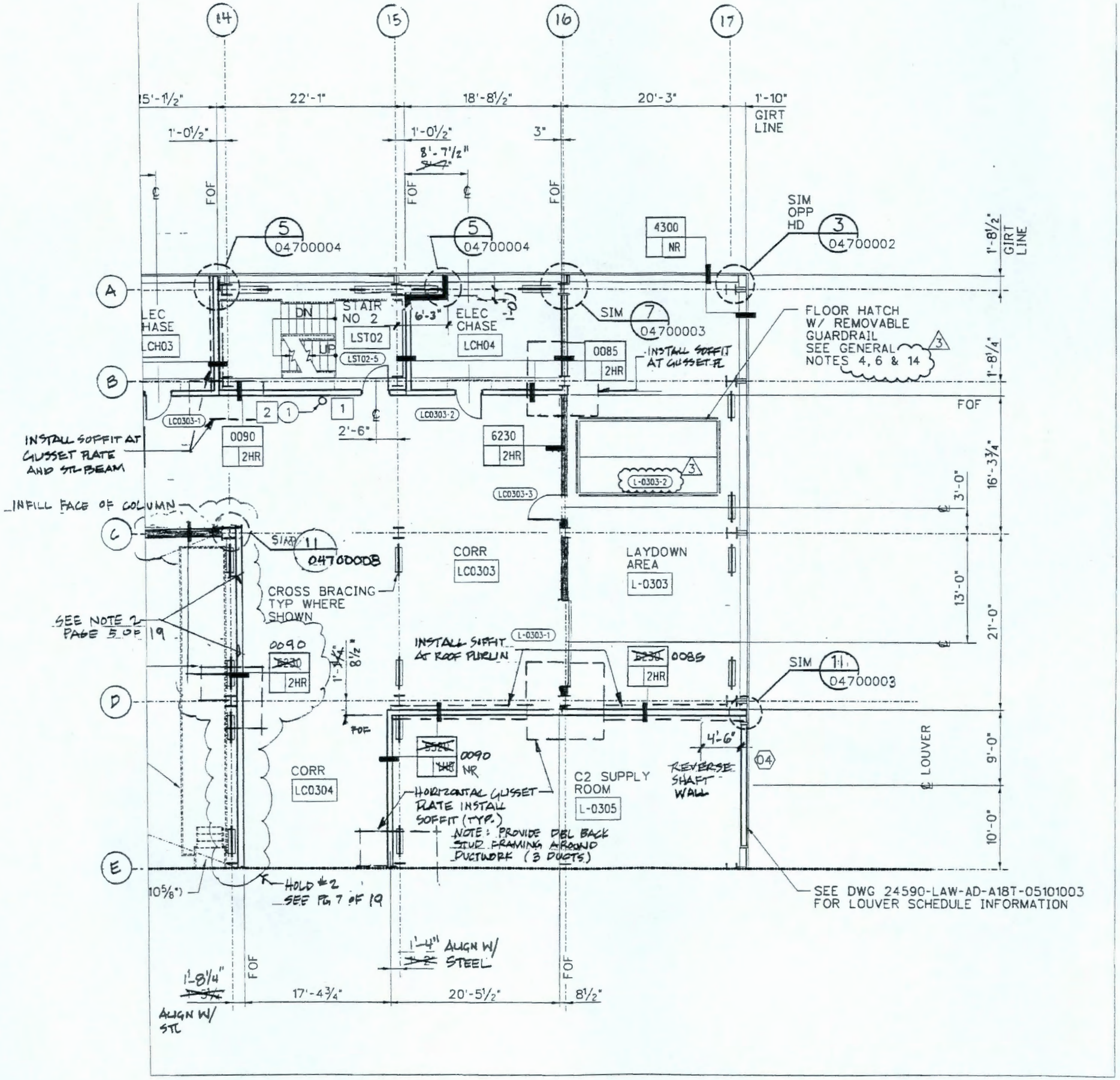


ADD "HOLD" NOTE TO LEGEND

HOLD # 2 - PARTITION WALLS AND ASSOCIATED SOFFITS AND DOORS ON HOLD PENDING FIRE BARRIER DWG REVISION INDICATING Q FIRE BARRIER PARTITIONS. HOLD REFLECTS ANTICIPATED 'Q' PARTITION WALLS PER CCN 211505

24590-LAW-A1-A10T-01204002
PARTIAL PLAN EL 48'-0" ZONE 2

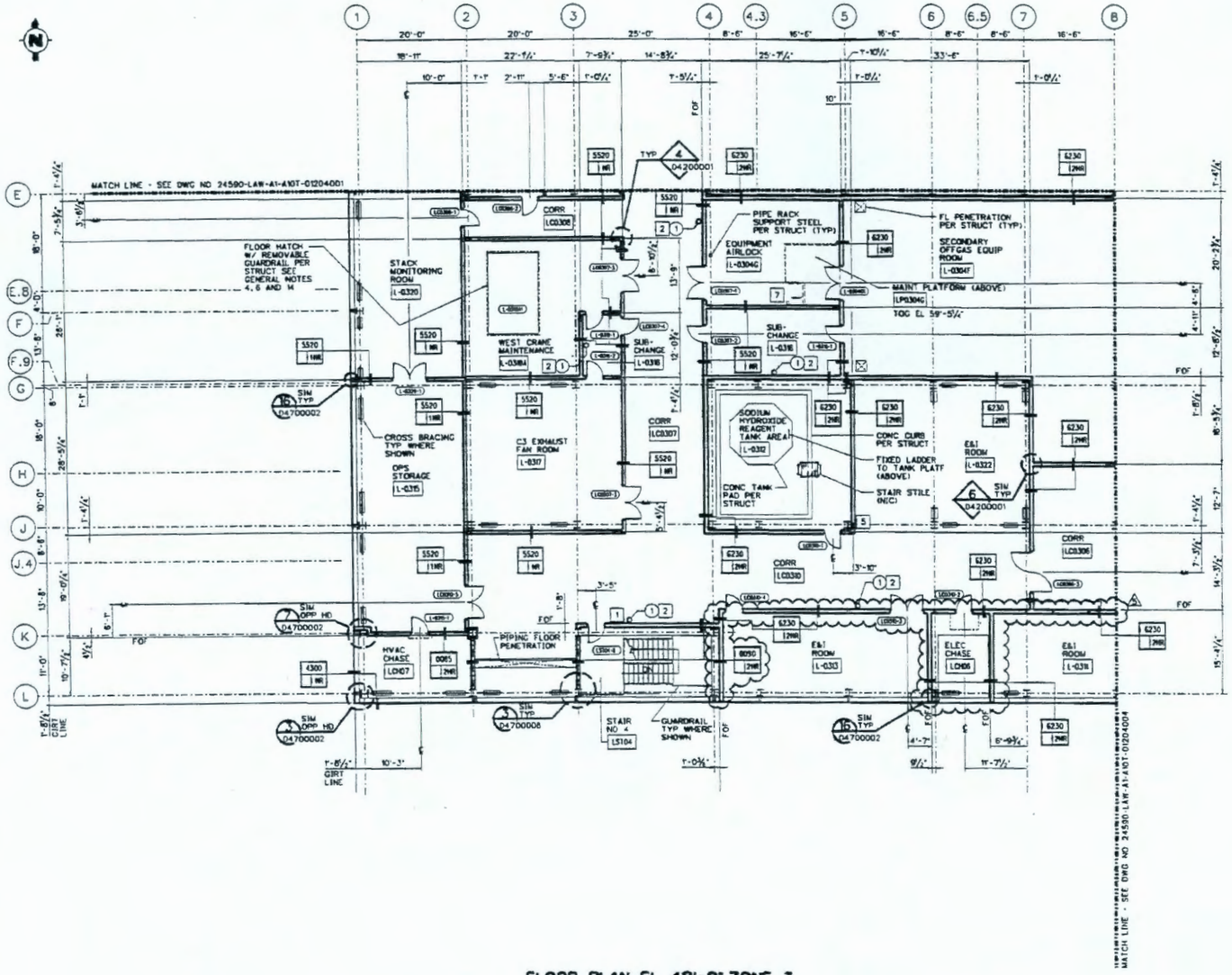
24590-LAW-A1-A10T-00029
REVISED LAYOUT
PAGE 7 OF 19



24590-LAW-A1-A10T-01204002
PARTIAL PLAN EL 48'-0" ZONE 2

24590-LAW-AIN-A10T-00029
REVISED LAYOUT
PAGE 8 OF 19

24590-LAW-A1-A10T-01204003



FLOOR PLAN EL 48'-0" ZONE 3

NOTES:

1. REFER TO DRAWING 24590-LAW-A1-A10T-01204001 FOR GENERAL NOTES AND REFERENCES.

KEYED NOTES:

1. INSTALL A WALL MOUNTED FIRE EXTINGUISHER WHERE SHOWN. RELOCATE AS NEEDED TO AVOID INTERFERENCES WITH SURFACE MOUNTED & WALL MOUNTED PANELS, CONDUITS & PIPING.

REVISION NOTES:

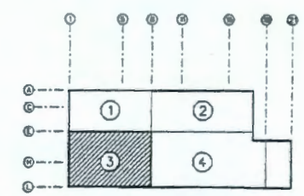
1. REMOVED
2. REMOVED

HOLD LEGEND:

HOLD #1 - CLOSED

QUALITY LEVEL EXTERIOR WALL NOTE:

QUALITY LEVEL IS Q FOR ARCHITECTURAL EXTERIOR WALL PANELS AND ASSOCIATED FASTENERS. ALL OTHER ITEMS ARE CM.



LAW BUILDING
KEY PLAN

REFERENCE DRAWINGS

DWG NO	TITLE
24590-LAW-A1-A10T-01204001	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 1
24590-LAW-A1-A10T-01204004	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 4
24590-WTP-A3-A10T-04200001	WTP PROCESS BLDGS ARCH COM INTR WALL DETS
24590-LAW-A3-A10T-04700002	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-LAW-A3-A10T-04700004	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS

REVISION HISTORY

REV	DESCRIPTION	ORIG	CHKD	RVWD	APVD	DATE
5	REMOVED QUALITY WALL LEGEND, REVISED QUALITY LEVEL EXTERIOR WALL NOTE & WALL TYPE					
4	REMOVED REVISION NOTES 1 AND 2, ADDED FLOOR HATCH NUMBER	TAD	LRL	MSR	MB	7-2-2008
0	ISSUED FOR CONSTRUCTION	DBS	LRL	TB	RGL	11-16-2005

Q

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

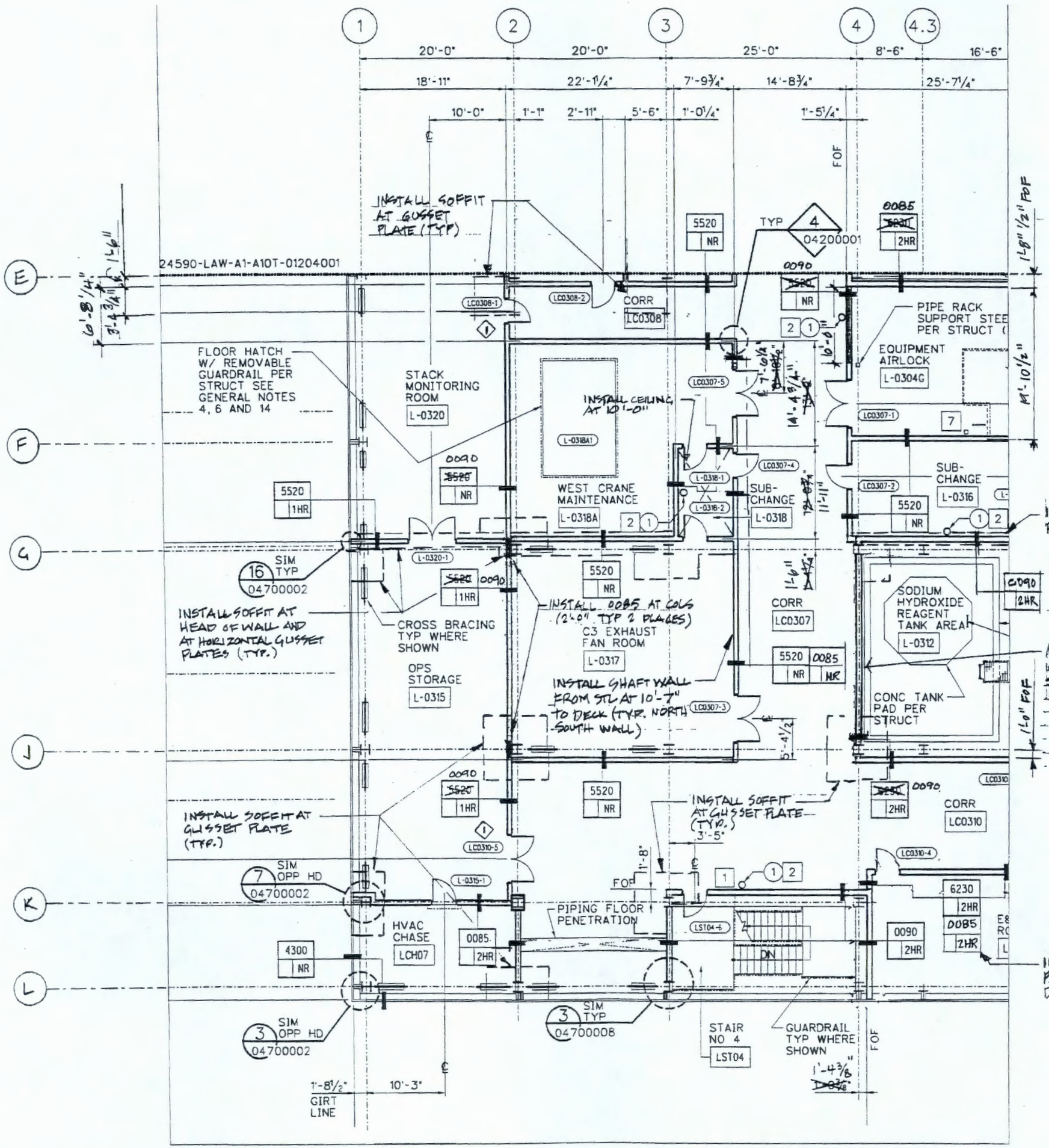
LAW VITRIFICATION BUILDING
ARCHITECTURAL
FLOOR PLAN EL 48'-0"
ZONE 3

SCALE: 1/8"=1'-0"

24590-LAW-A1-A10T-01204003

REV 5

24590-LAW-AIN-AIOT-00029
CURRENT REVISION
PAGE 9 OF 19



GENERAL NOTE:

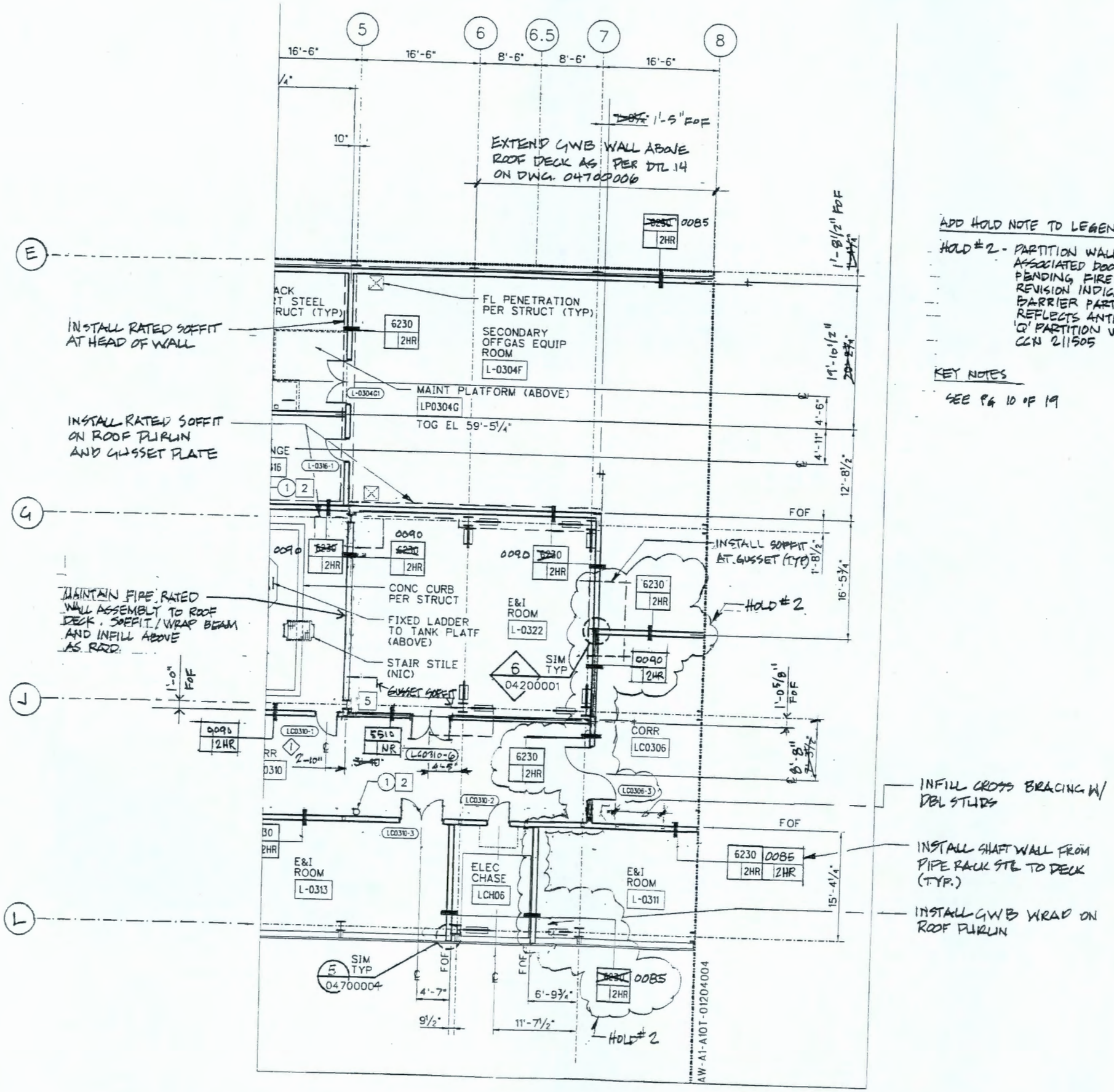
1. PRE DRILL TRACK AS REQ'D TO CLR MISC ROOFING SCREWS (TYP.)
2. INSTALL 0090 SHAFT WALL ONLY WHERE FINISHES ARE REQ'D.

KEY NOTES

1. PROVIDE FRAMING FOR THE MINIMUM REQUIREMENTS NECESSARY TO ALLOW INSTALLATION OF ORIGINAL DOOR FRAME. CORRIDOR SIDE SHALL HAVE NO CHANGE IN PROFILE.

24590-LAW-A1-A10T-01204003
PARTIAL PLAN EL 48'-0" ZONE 3

24590-LAW-A1N-A10T-00029
REVISED LAYOUT
PAGE 10 OF 19



ADD HOLD NOTE TO LEGEND

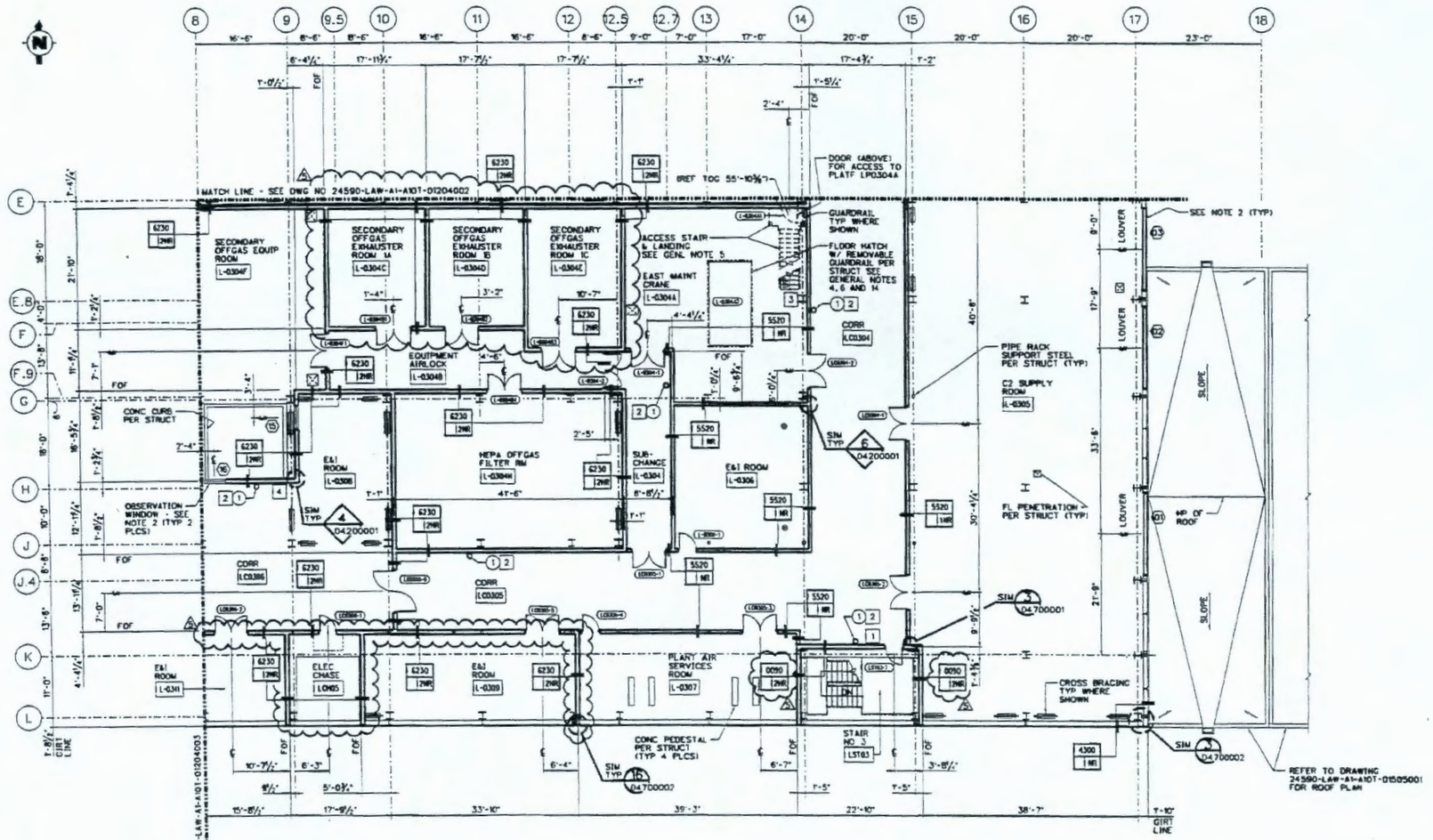
HOLD #2 - PARTITION WALLS, SOFFITS AND ASSOCIATED DOORS ON HOLD PENDING FIRE BARRIER DWG REVISION INDICATING 'Q' FIRE BARRIER PARTITIONS. HOLD REFLECTS ANTICIPATED 'Q' PARTITION WALLS PER CCN 211505

KEY NOTES

SEE PG 10 OF 19

24590-LAW-A1-A10T-01204003
PARTIAL PLAN EL 48'-0" ZONE 3

24590-LAW-A1N-A10T-00029
REVISED LAYOUT
PAGE 11 OF 19



FLOOR PLAN EL 48'-0" ZONE 4

NOTES:

1. REFER TO DRAWING 24590-LAW-A1-A10T-01204001 FOR GENERAL NOTES AND REFERENCES.
2. REFER TO DRAWING 24590-LAW-AD-A18T-05101003 FOR WINDOW/LOUVER SCHEDULE.

KEYED NOTES:

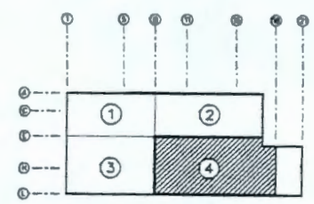
1. INSTALL A WALL MOUNTED FIRE EXTINGUISHER WHERE SHOWN. RELOCATE AS NEEDED TO AVOID INTERFERENCES WITH SURFACE MOUNTED & WALL MOUNTED PANELS, CONDUITS & PIPING.

REVISION NOTES:

1. REMOVED

QUALITY LEVEL EXTERIOR WALL NOTE:

QUALITY LEVEL IS Q FOR ARCHITECTURAL EXTERIOR WALL PANELS AND ASSOCIATED FASTENERS. ALL OTHER ITEMS ARE CM.



LAW BUILDING

KEY PLAN

REFERENCE DRAWINGS	
DWG NO	TITLE
24590-LAW-A1-A10T-01204001	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 1
24590-LAW-A1-A10T-01204002	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 2
24590-LAW-A1-A10T-01204003	LAW VIT BLDG ARCH FL PLAN EL 48'-0" ZONE 3
24590-LAW-A1-A10T-01505001	LAW VIT BLDG ARCH ROOF PLAN
24590-WTP-A3-A10T-04200001	WTP PROCESS BLDGS ARCH CDW INTR WALL DETS
24590-LAW-A3-A10T-04700001	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-LAW-A3-A10T-04700002	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-LAW-AD-A18T-05101003	LAW VIT BLDG ARCH WINDOW/LOUVER SCHEDULE
24590-LAW-A3-A10T-04700003	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
5	REMOVED QUALITY WALL LEGEND, REVISED QUALITY LEVEL EXTERIOR WALL NOTE & WALL TYPE					
4	ADDED FLOOR HATCH NUMBER	TAD	LR	MSR	MB	17-2-2006
3	MODIFIED WALL TAG AND NOTE ON PLAN	TAD	LR	MSR	SP/RH	3-14-2006
0	ISSUED FOR CONSTRUCTION	DES	LR	TR	RK/LR	9-18-2005

REVISION HISTORY

Q

	BY	DATE
ORIGINATOR	B. STANSELL	9-12-2005
CHECKER	L.R. LABOUCEUR	9-12-2005
APPROVER	K. MAHNEY / L. KESSLER	9-18-2005
REVIEWER	T. SYMKO	9-12-2005

CONTENT APPLICABLE TO ALARA? YES NO
ADR NO. 24590-LAW-ADR-PL-03-006 REV: 2
HMS SCREENING REQUIRED? YES EXISTING DESIGN IF YES

BOILERPLATE IS REQUIRED FOR WORKING TYPES IDENTIFIED IN 24590-WTP-CPM-QA-C-002

PROJECT No.	24590
SITE	HANFORD
AREA	200E
BUILDING No.	20

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

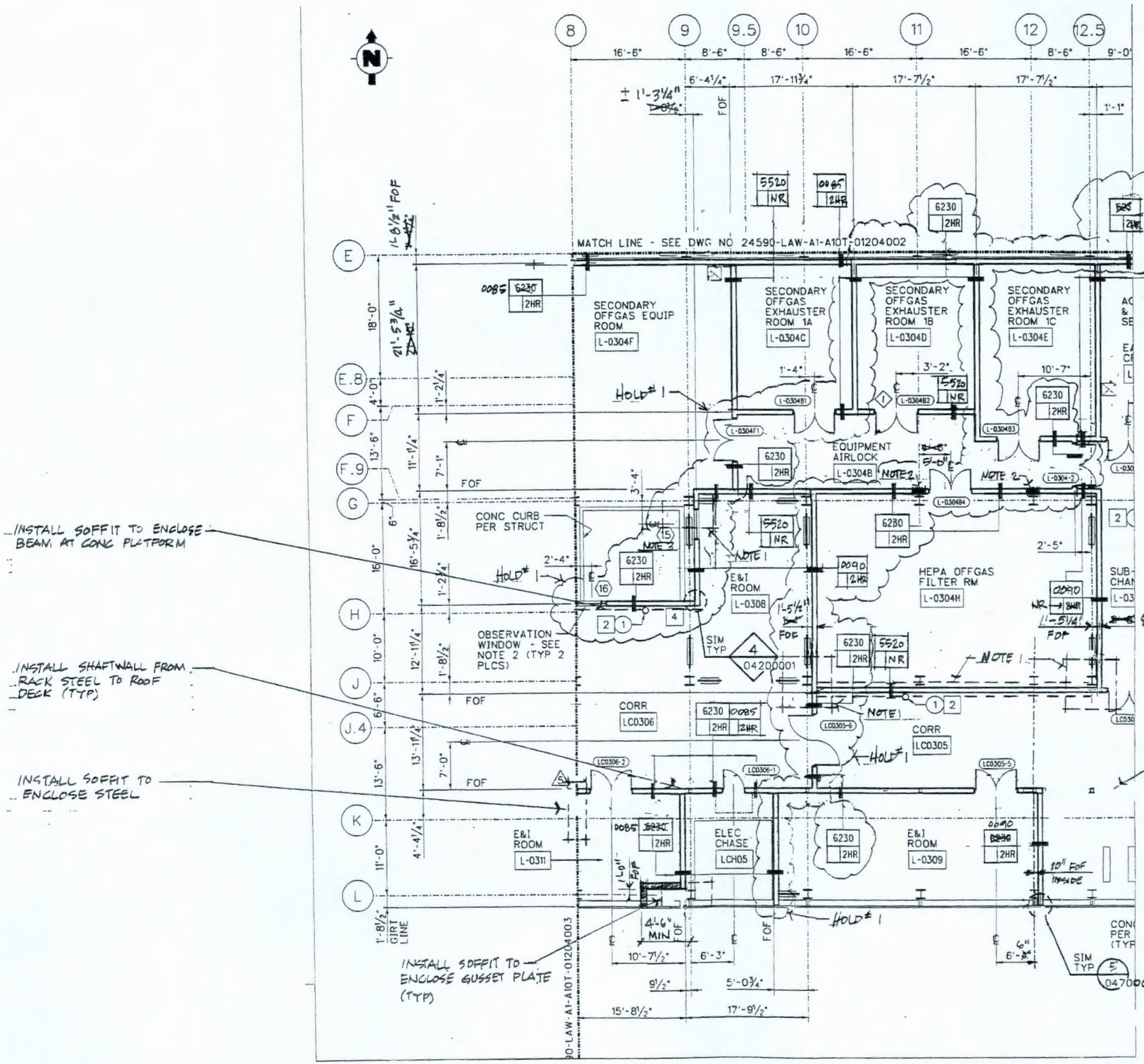
LAW VITRIFICATION BUILDING ARCHITECTURAL FLOOR PLAN EL 48'-0" ZONE 4

SCALE: 1/8"=1'-0"

24590-LAW-A1-A10T-01204004

REV 5

24590-LAW-AIN-A10T-00029
CURRENT REVISION
PAGE 12 OF 19



NOTE

1.) INSTALL SOFFIT AT GUSSET PLATE AND STEEL AT ROOF DECK (TYP)

2.) INSTALL SHAFT WALL AT COLUMN (TYP 2 PLACES)

3) ADD ADDITIONAL LAYERS OF GWB AT 6" STEEL CHANNEL WINDOW SUPPORT AND FRAME FOR 2HR BARRIER.

HOLD LEGEND

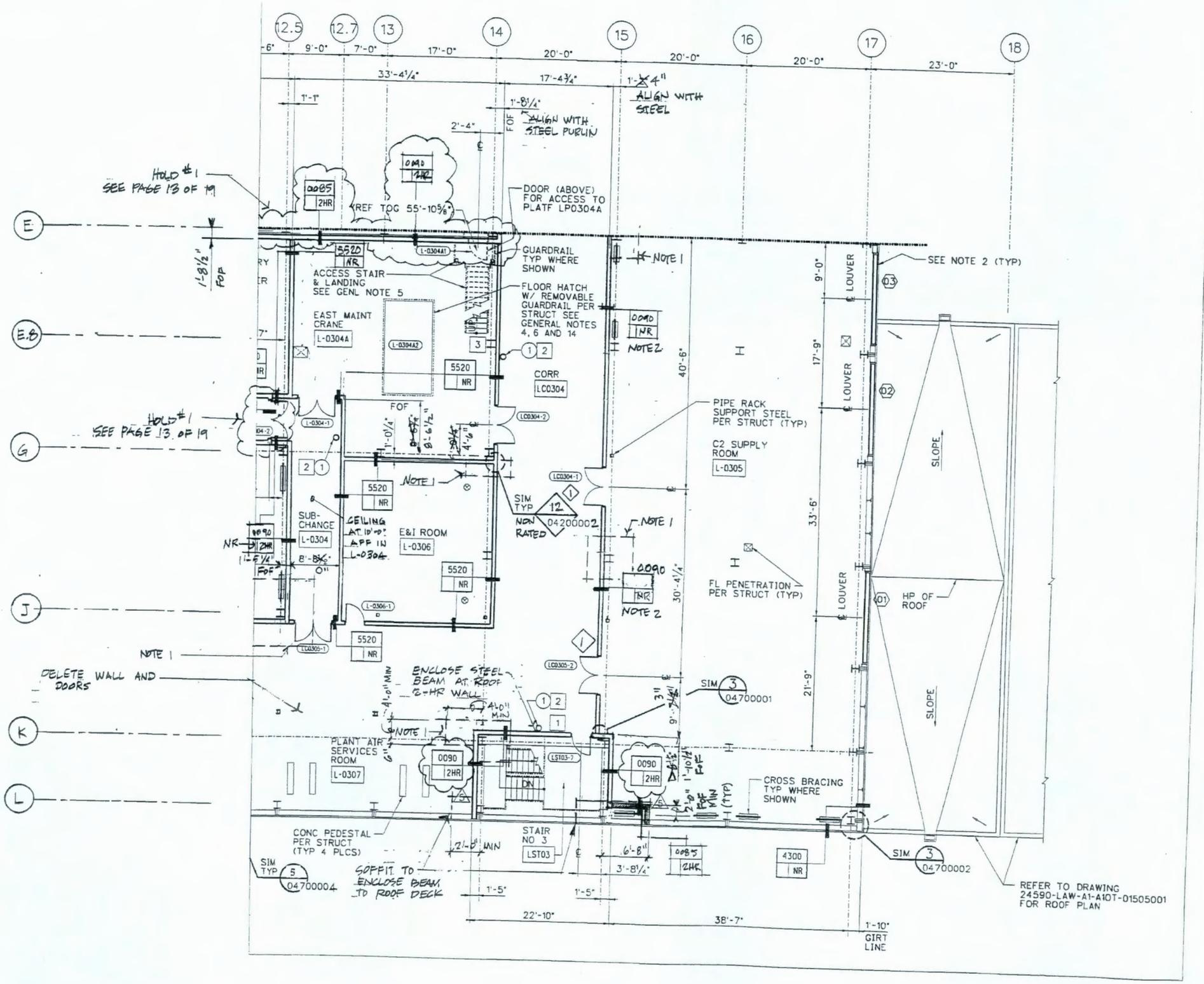
HOLD # 1 - PARTITION WALLS, SOFFITS AND ASSOCIATED DOORS/WINDOWS ON HOLD PENDING FIRE BARRIER DWG REVISION INDICATING 'Q' FIRE BARRIER PARTITIONS. HOLD REFLECTS ANTICIPATED 'Q' PARTITION WALLS PER CCN 211505

KEY NOTES

SEE PG 14 OF 19

124510-LAW-A1-A10T-01204004
PARTIAL PLAN EL 48'-0" ZONE 4

24510-LAW-AIN-A10T-00029
REVISED LAYOUT



NOTE

1) INSTALL SOFFIT AT GUSSET PLATE FOR CONTINUATION OF FIRE RATED ASSEMBLY (TYP

2) PROVIDE DBL BACK STUD EITHER SIDE OF DUCT OPENING FOR FRAMING (TYP 3 DUCTS)

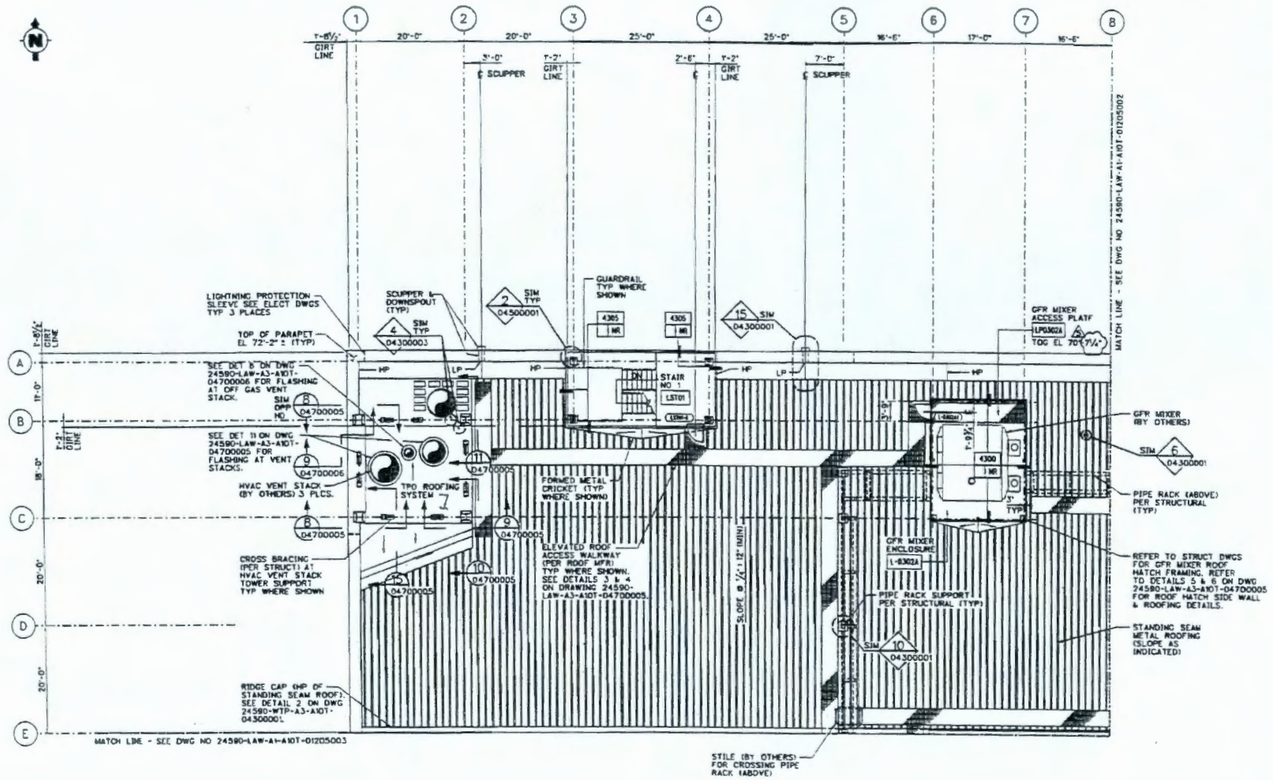
KEY NOTES

1 PROVIDE FRAMING FOR THE MINIMUM REQUIREMENTS NECESSARY TO ALLOW INSTALLATION OF ORIGINAL DOOR FRAME. CORRIDOR SIDE SHALL HAVE NO CHANGE IN PROFILE.

24590-LAW-A1-A10T-01204004
PARTIAL PLAN EL 48'-0" ZONE 4

24590-LAW-A1N-A10T-00029
REVISED LAYOUT
PAGE 14 OF 19

24590-LAW-A1-A10T-01205001



ROOF PLAN EL 68'-0" ZONE 1

GENERAL NOTES:

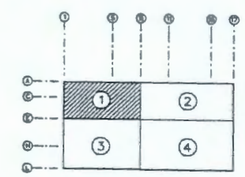
1. REFER TO DRAWING 24590-LAW-A1-A10T-01105001 FOR OVERALL ROOF PLAN OF EL 68'-0" LEVEL.
2. REFER TO DWG 24590-WTP-A0-A10T-00100002 FOR COMMON ABBREVIATIONS & SYMBOLS.
3. REFER TO DWG 24590-WTP-A0-A10T-00100003 & 00100004 FOR STANDARD INTERIOR/EXTERIOR WALL TYPES LEGENDS.
4. REFER TO STRUCTURAL DRAWING 24590-LAW-S5-S15T-00004 FOR STRUCTURAL STEEL FRAMING AND DIMENSIONS.
5. REFER TO STRUCTURAL DRAWING 24590-LAW-S1-S15T-00050 AND -000001 FOR STAIR DIMENSIONS AND DETAILS.
6. REFER TO STRUCTURAL FOR PLATFORM, GUARDRAIL/HANDRAIL, PIPE RACK & PIPE RACK SUPPORT DIMENSIONS AND DETAILS.
7. REFER TO DRAWING 24590-LAW-A0-A18T-05105001 FOR DOOR SCHEDULE.
8. REFER TO DRAWING 24590-LAW-A5-A19T-05205001 FOR ROOM FINISH SCHEDULE.
9. REFER TO DRAWING 24590-LAW-A5-A10T-05305001 FOR SIGNAGE SCHEDULE.
10. REFER TO ELECTRICAL DRAWINGS FOR (GROUNDING) & LIGHTNING PROTECTION NOTES & DETAILS.
11. REFER TO DRAWING 24590-LAW-A1-A10T-01505001 FOR OVERALL ROOF PLAN.

REVISION NOTES:

1. REMOVED

QUALITY LEVEL EXTERIOR WALL NOTE:

QUALITY LEVEL IS Q FOR ARCHITECTURAL EXTERIOR WALL PANELS AND ASSOCIATED FASTENERS. ALL OTHER ITEMS ARE CM.



LAW BUILDING
KEY PLAN

DRAWING INDEX

DWG NO	REV	TITLE
24590-LAW-A1-A10T-01205001	5	LAW VIT BLDG ARCH ROOF PLAN EL 68'-0" ZONE 1
24590-LAW-A1-A10T-01205002	5	LAW VIT BLDG ARCH ROOF PLAN EL 68'-0" ZONE 2
24590-LAW-A1-A10T-01205003	5	LAW VIT BLDG ARCH ROOF PLAN EL 68'-0" ZONE 3
24590-LAW-A1-A10T-01205004	4	LAW VIT BLDG ARCH ROOF PLAN EL 68'-0" ZONE 4

REFERENCE DRAWINGS

DWG NO	TITLE
24590-LAW-A1-A10T-01105001	LAW VIT BLDG ARCH ROOF PLAN EL 68'-0"
24590-LAW-A1-A10T-01205002	LAW VIT BLDG ARCH ROOF PLAN EL 68'-0" ZONE 2
24590-LAW-A1-A10T-01205003	LAW VIT BLDG ARCH ROOF PLAN EL 68'-0" ZONE 3
24590-LAW-A1-A10T-01505001	LAW VIT BLDG ARCH ROOF PLAN
24590-WTP-A0-A10T-00100002	WTP PROCESS BLDGS ARCH COM ABBRS & SYMBOLS
24590-WTP-A0-A10T-00100003	WTP PROCESS BUILDINGS ARCH STANDARD INTERIOR/EXTERIOR WALL TYPES LEGEND
24590-WTP-A0-A10T-00100004	WTP PROCESS BUILDINGS ARCH STANDARD INTERIOR/EXTERIOR WALL TYPES LEGEND
24590-LAW-A0-A18T-05105001	LAW VIT BLDG ARCH DOOR SCHEDULE EL 68'-0"
24590-LAW-A5-A19T-05205001	LAW VIT BLDG ARCH RM FINISH SCHED EL 68'-0"
24590-LAW-A5-A10T-05305001	LAW VIT BLDG ARCH SIGNAGE SCHED EL 68'-0"
24590-WTP-A3-A10T-04300001	WTP PRCS BLDGS ARCH COM MTL PNL ROOFING DETS
24590-WTP-A3-A10T-04300003	WTP PRCS BLDGS ARCH COM SINGLE PLY ROOFING DETS
24590-LAW-S5-S15T-00004	LAW VIT BLDG MAIN BLDG STRUCTURAL STEEL KEY PLAN @ ROOF TOS EL VARIES
24590-LAW-S1-S15T-00050	LAW VIT BLDG MAIN BLDG STAIR NO 1 (STD) STAIR FRAMING PLANS
24590-LAW-A3-A10T-04700005	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-LAW-A3-A10T-04700006	LAW VIT BLDG ARCH MISCELLANEOUS DETAILS
24590-WTP-A3-A10T-04300001	WTP PRCS BLDGS ARCH COM EXT SIDING DETAILS

REVISION HISTORY

REV	DESCRIPTION	DRG	CHKD	RVWD	APVD	DATE
5	CHANGED REVS IN INDEX, REMOVED REV NOTES CHANGED TOG ELEVATION, MODIFIED NOTE 3	MPD				11-05-07
4	MODIFIED ROOFING SYSTEM UNDER STACK, REMOVED ROOF MAIN PIPING, MODIFIED GUTTER SLOPES, ADDED ELECT SLEEVES IN PARAPET, ADDED DET	TAD	LRL	MSR	MAJ	4-24-2006
0	ISSUED FOR CONSTRUCTION	DBS	LRL	TR	LDK	11-05-2005

Q QUALITY INFORMATION

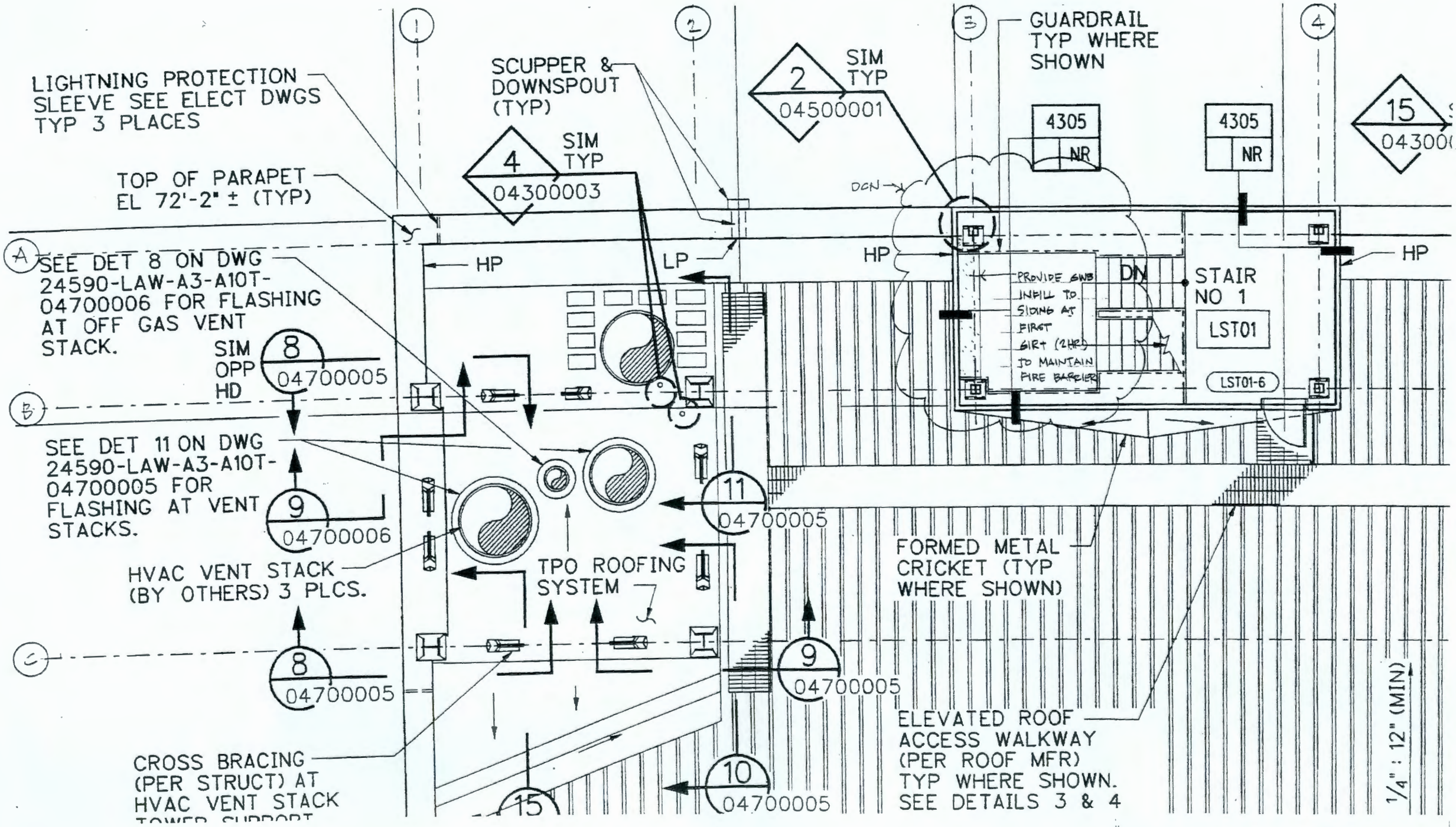
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

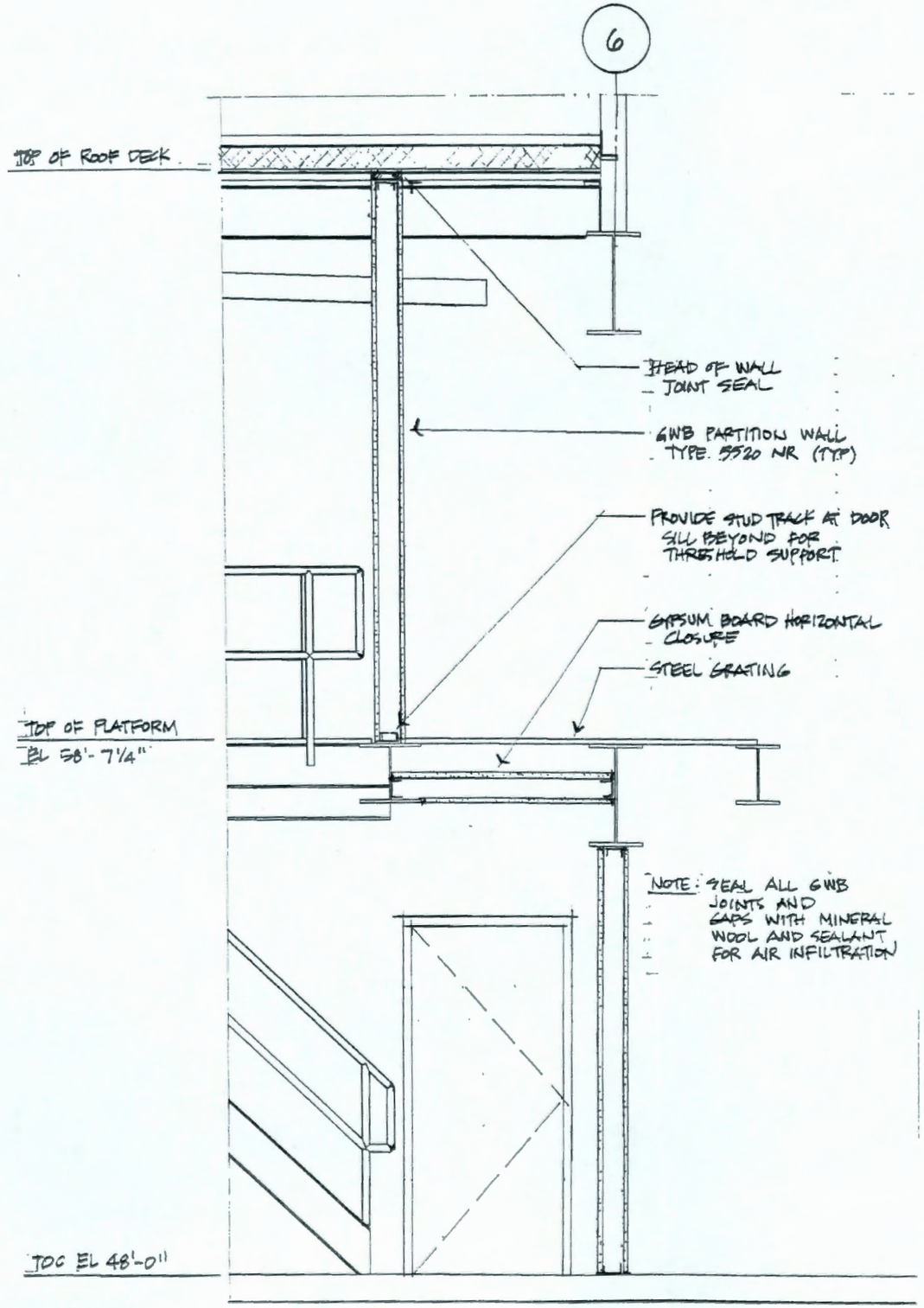
LAW VITRIFICATION BUILDING ARCHITECTURAL ROOF PLAN EL 68'-0" ZONE 1

SCALE 1/4"=1'-0" | 24590-LAW-A1-A10T-01205001 | REV 5

24590-LAW-AIN-A10T-00029
CURRENT REVISION
PAGE 15 OF 19



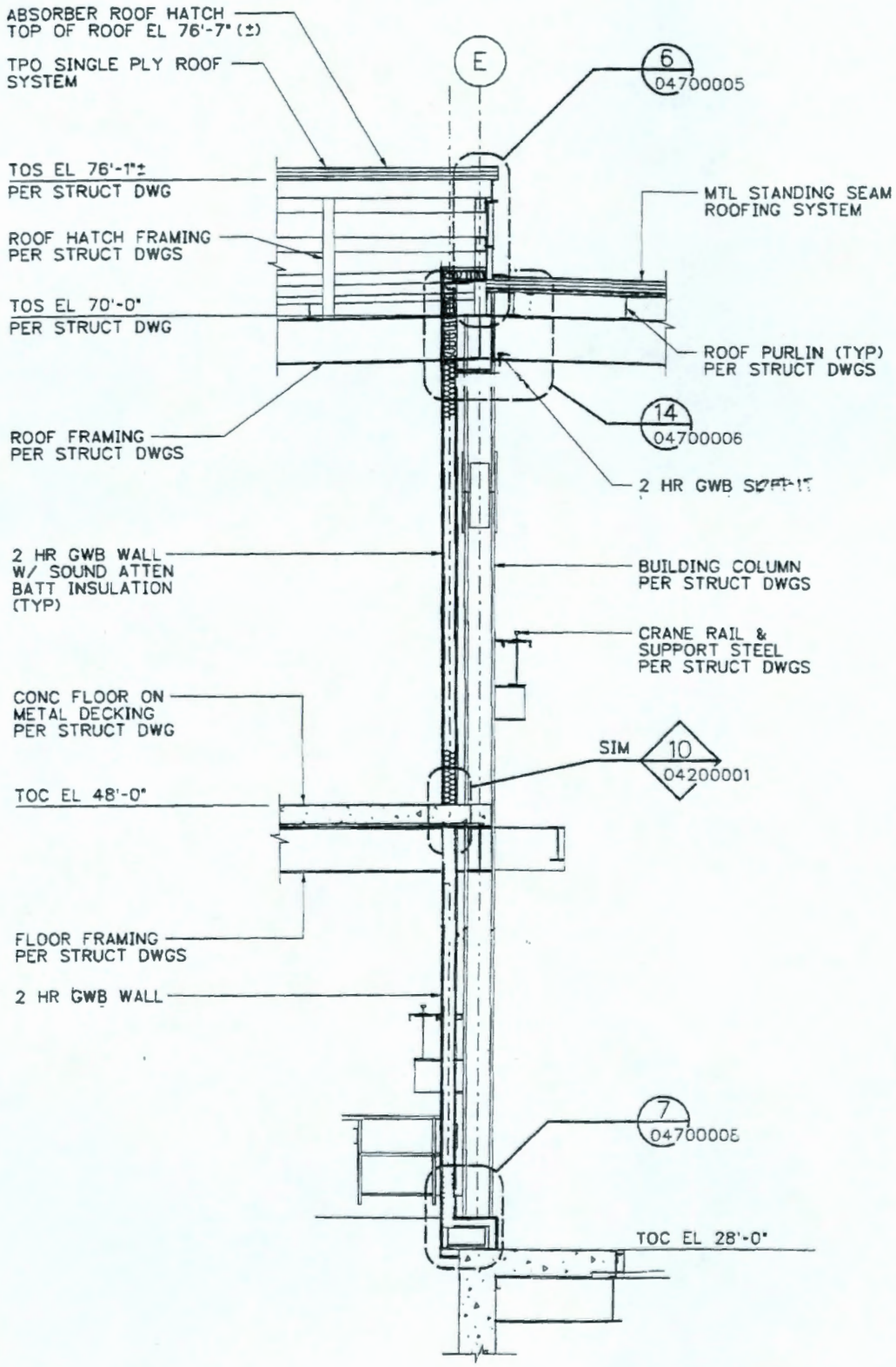
24590 - LAW - A1N - A10T - 00029
PARTIAL FLOOR PLAN LAW EL +68 ZONE 1
(24590-LAW-A1-A10T-01205001)
PAGE 16 OF 19



D SECTION
01204001

24590-LAW-A2-A1DT-03200003
SECTION D

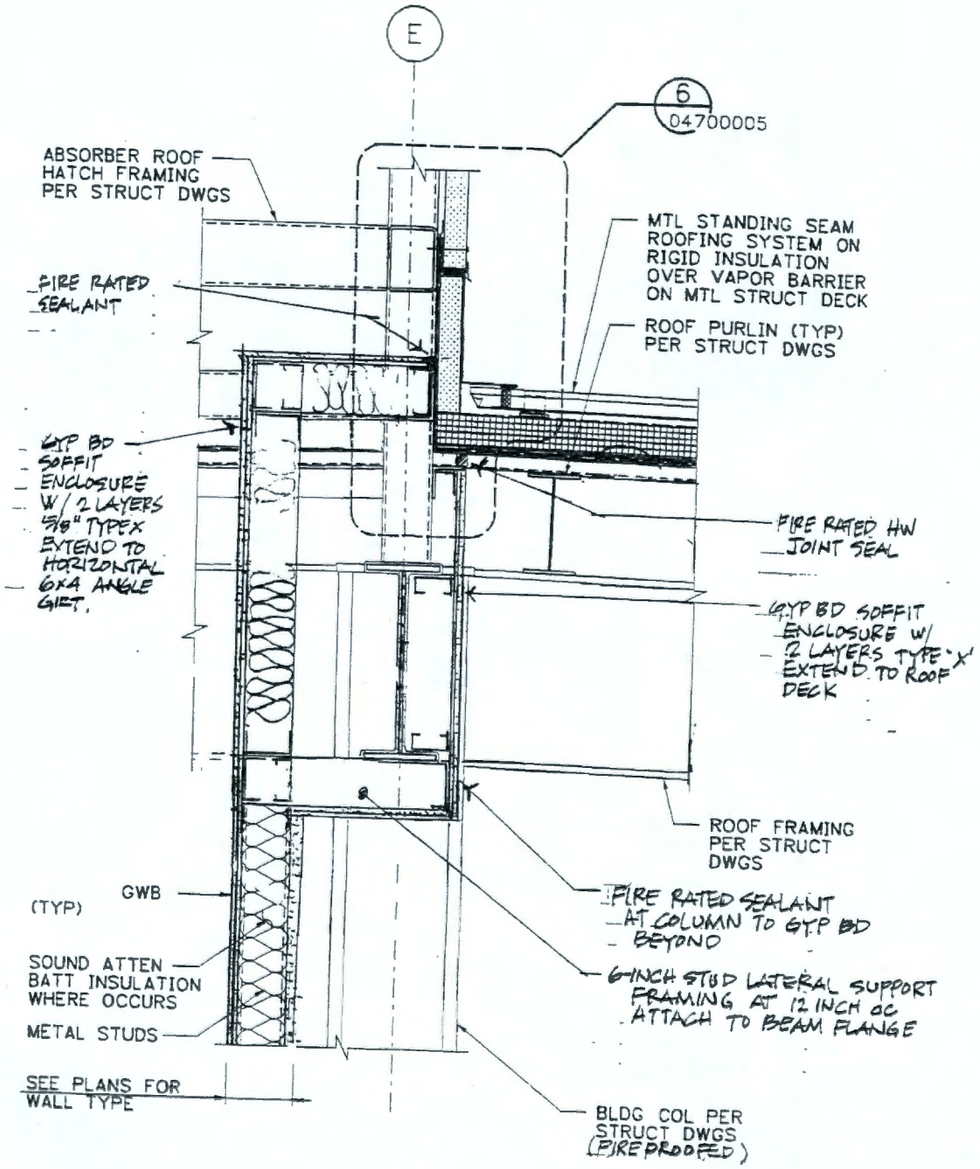
24590-LAW-A1N-A1DT-00029
NEW SECTION
PAGE 17 OF 19



A SECTION
SEE GENERAL NOTE 1

24590 - LAW - A2 - A10T - 03200004
SECTION A - REVISED

24590 - LAW - AIN - A10T - 00029
REVISED SECTION
PAGE 18 OF 19



FIRE-RATED BARRIER AT ABSORBER ROOF HATCH

14 / — DETAIL

24590 - LAW - A3 - A10T - 04700006
DETAIL 14

24590 - LAW - AIN - A10T - 00029
REVISED DETAIL
PAGE 19 OF 19

Drawing Change Notice

R10759374

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00032

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISE DOOR SWING FOR +48FT GENERAL ARRANGEMENT, ROOM LST01

ISSUED BY
RPP-WTP PDC

DESIGN DOCUMENT NUMBER	REV NO	TITLE OF DESIGN DOCUMENT
24590-LAW-P1-P01T-00005	3	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 48'-0"

PART OF DESIGN CHANGE PACKAGE (DCP)? ☒ No ☐ Yes DCP No.: Rev:

JUSTIFICATION FOR CHANGE	TREND CODE-NUMBER
WHEN REVISING DOOR LOCATION DUE TO STRUCTURAL INTERFERENCE, DOOR WAS SHOWN WITH THE SWING IN THE WRONG DIRECTION FOR EGRESS REQUIREMENTS.	N/A

Supersedes Change Document ☒ No ☐ Yes

REQUIREMENTS REVIEW

Client Approval Required *	☐ Yes ☒ No	Permit Review by E&NS Required	☐ Yes ☒ No
Interface Resolution Required *	☐ Yes ☒ No	Safety Screening / Evaluation Required Documents identified in 24590-WTP-GPP-SREG-002 must be checked "Yes" regardless of the change being made, and E&NS signature is required below.	☒ Yes ☐ No
* Address these "yes" answers in the description			

DESCRIPTION OF CHANGE

REVISE DOOR SWING IN LST01

SEE ATTACHMENTS FOR CHANGES REQUIRED.

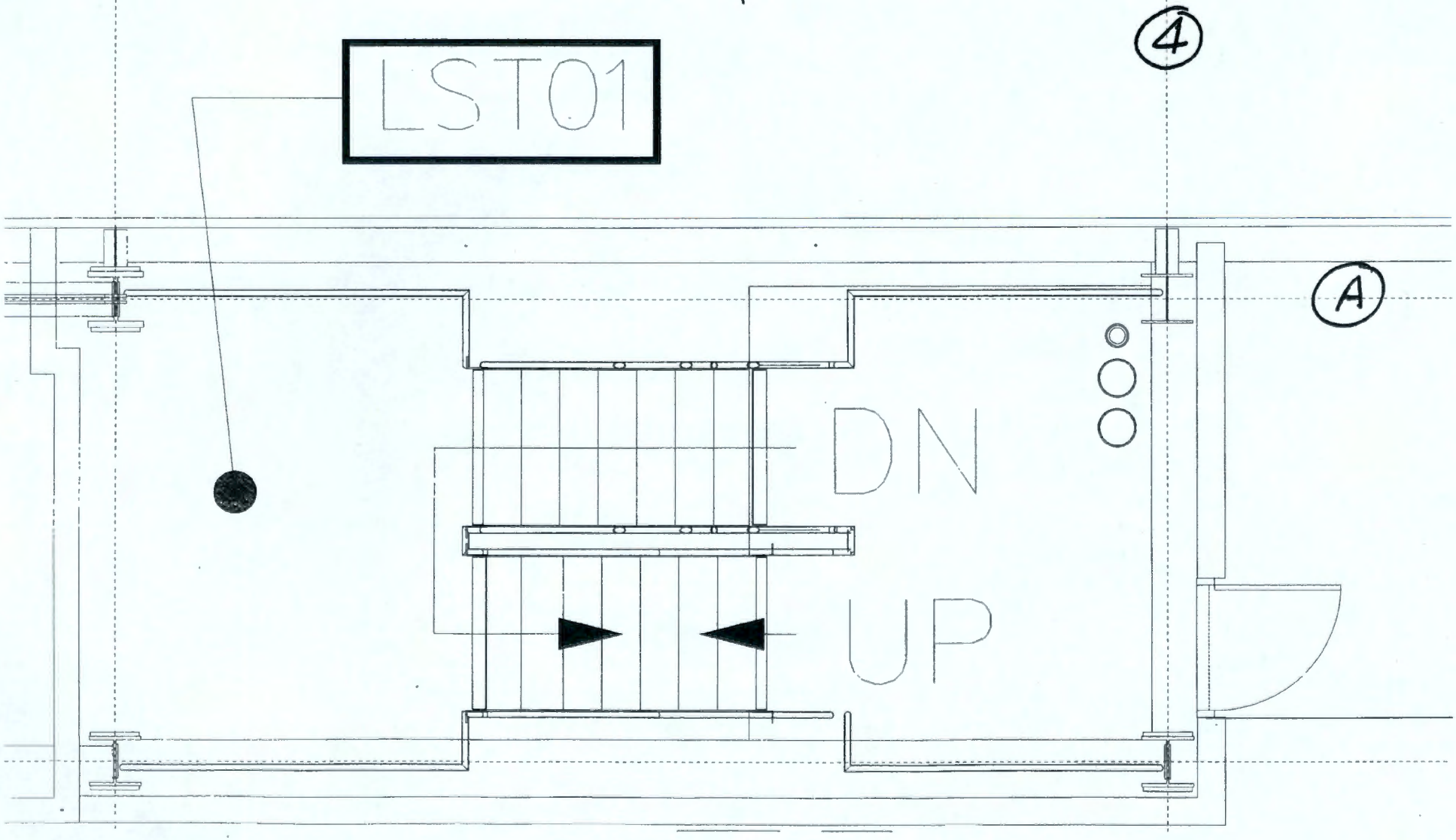
Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility 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.

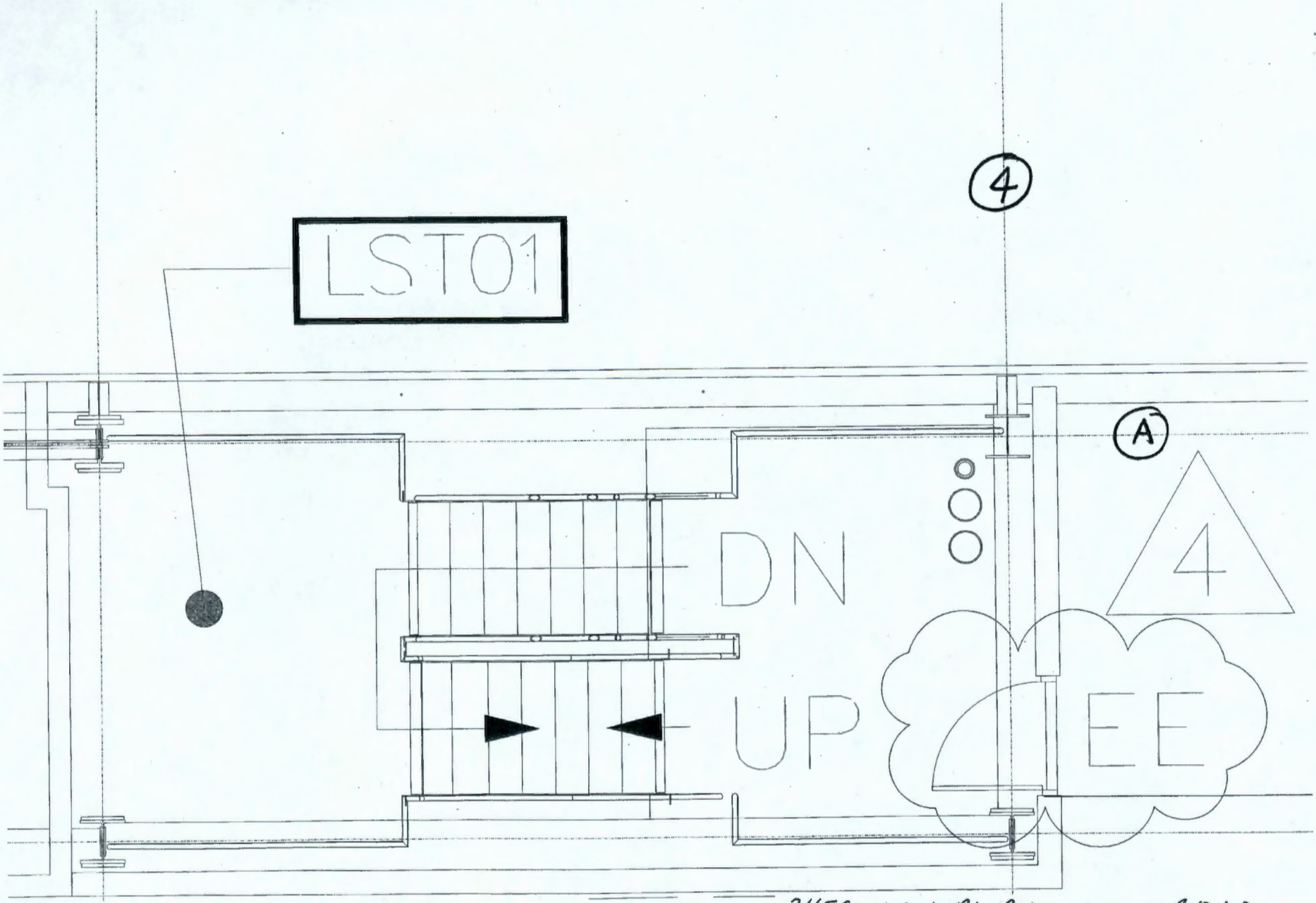
ORIGINATOR	CHECKER	REVIEWER
Jim E. Hawkins	F.E. Eichler II	

QA (when applicable)	E&NS (when applicable)	APPROVER(S)	APPROVAL DATE
N/A	Dwight Beahm	JE Chet GI Roth	03/6/07

24590-LAW-PI-POIT-00005 REV.3
24590-LAW-PIN-POIT-00032
Sheet 2 of 3

Current Layout





NEW LAYOUT

24590-LAW-PI-POIT-00005 REV.3
24590-LAW-PIN-POIT-00032

sheet 3 of 3

Drawing Change Notice

R10802467

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00033

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISE PLATFORM CALL OUT FOR +48FT GENERAL ARRANGEMENT PLAN

ISSUED BY
RPP-WTP PDC

DESIGN DOCUMENT NUMBER	REV NO	TITLE OF DESIGN DOCUMENT
24590-LAW-P1-P01T-00005	3	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 48'-0"

PART OF DESIGN CHANGE PACKAGE (DCP)? ☒ No ☐ Yes DCP No.: Rev:

JUSTIFICATION FOR CHANGE	TREND CODE-NUMBER
ARCHITECTURAL IDENTIFIED THIS INCORRECT PLATFORM DESIGNATION THAT DID NOT FOLLOW THE ESTABLISHED DESIGN GUIDE FOR ROOM LABELS.	N/A

Supersedes Change Document ☒ No ☐ Yes

REQUIREMENTS REVIEW

Client Approval Required *	☐ Yes ☒ No	Permit Review by E&NS Required	☐ Yes ☒ No
Interface Resolution Required *	☐ Yes ☒ No	Safety Screening / Evaluation Required Documents identified in 24590-WTP-GPP-SREG-002 must be checked "Yes" regardless of the change being made, and E&NS signature is required below.	☒ Yes ☐ No
* Address these "yes" answers in the description			

DESCRIPTION OF CHANGE

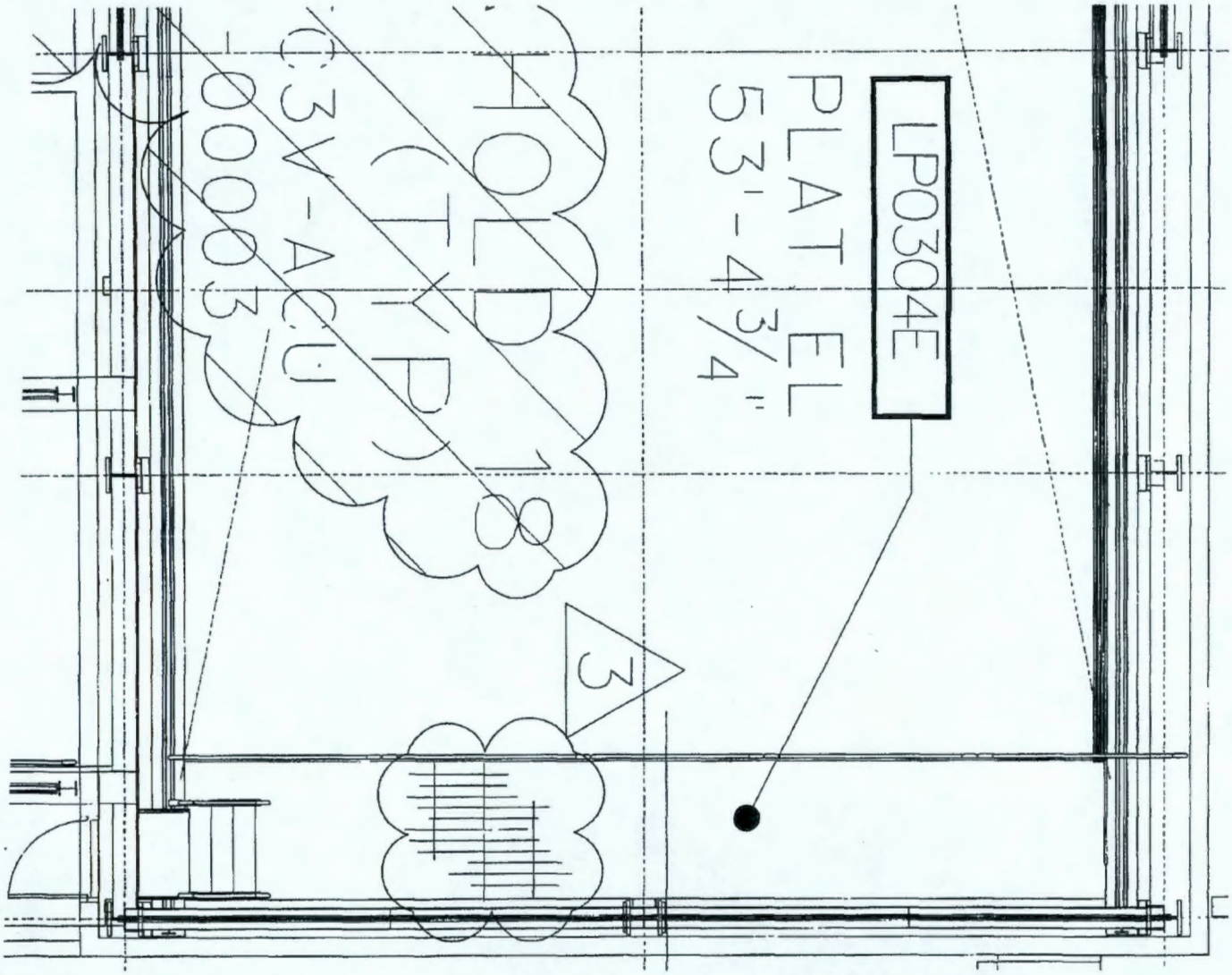
REVISE PLATFORM CALL OUT FROM LP0304E TO LP0304A AND REVISE PLATFORM/HANDRAIL LAYOUT.

SEE ATTACHMENTS FOR CHANGES REQUIRED.

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to 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.

ORIGINATOR	CHECKER	REVIEWER

QA (when applicable)	E&NS (when applicable)	APPROVER(S)	APPROVAL DATE
N/A			07/03/07

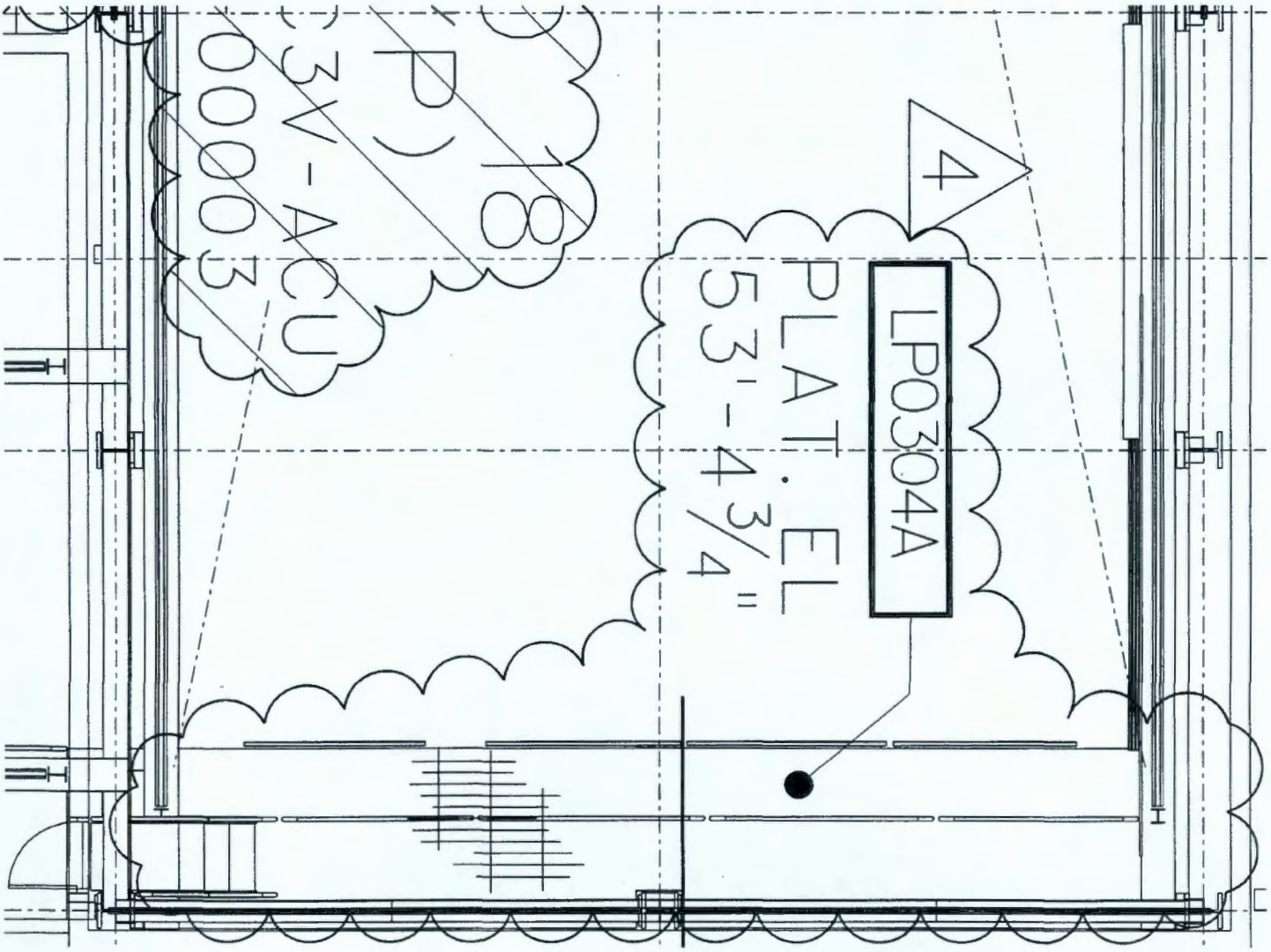


Current Layout

24590-LAW-PI-POIT-00005 Rev3

24590-LAW-PIN-POIT-00033

sheet 2 of 3



NEW
LAYOUT

24590-LAW-PI-PO1T-00005 REV.3

24590-LAW-PIN-PO1T-00033

SHEET 3 of 3

R10848053

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00037

JOB NO.	TITLE FOR CHANGE NOTICE
24590	UPDATE HEPA FILTERS IN ROOM L-0319A

DESIGN DOCUMENT NUMBER	REV NO	TITLE OF DESIGN DOCUMENT
24590-LAW-P1-P01T-00005	3	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 48'-0"

ISSUED BY
RPP-WTP PDC

PART OF DESIGN CHANGE PACKAGE (DCP)? ☒ No ☐ Yes DCP No.: Rev:

JUSTIFICATION FOR CHANGE	TREND CODE-NUMBER
ADDITIONAL HEPA FILTER ADDED TO ROOM L-0319A TO SUPPORT CURRENT HVAC DESIGN CONDITIONS	TN-24590-06-02606

Supersedes Change Document ☒ No ☐ Yes

REQUIREMENTS REVIEW

Client Approval Required *	☐ Yes ☒ No	Permit Review by E&NS Required	☒ Yes ☐ No
Interface Resolution Required *	☐ Yes ☒ No	Safety Screening / Evaluation Required Documents identified in 24590-WTP-GPP-SREG-002 must be checked "Yes" regardless of the change being made, and E&NS signature is required below.	☒ Yes ☐ No
* Address these "yes" answers in the description			

DESCRIPTION OF CHANGE

ADDED ADDITIONAL C3V HEPA FILTER C3V-HEPA-00004G (POINT OF SUPPORT AT 48'-1") TO ROOM L-0319A. RELOCATED C3V-HEPA-00004 A THRU F TO MINIMIZE DUCT REWORK AND PROVIDE SPACE NEAR ACCESS DOOR FOR FUTURE FILTER INSTALLATION.

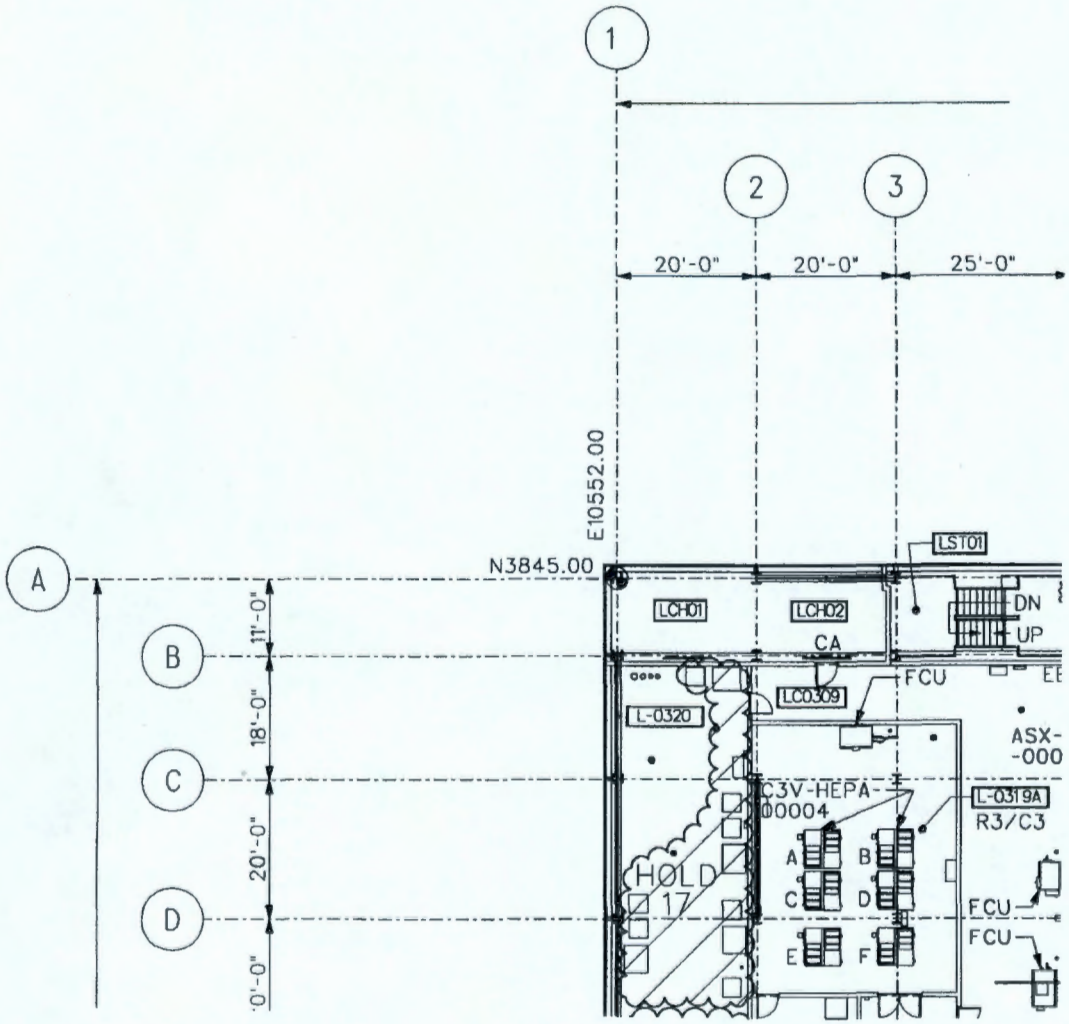
Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility 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.

ORIGINATOR	CHECKER	REVIEWER
Tim Hawkins Tim E. Hawkins	Craig Salerno Craig M. Salerno	Jim McGrath

QA (when applicable)	E&NS (when applicable)	APPROVER(S)	APPROVAL DATE
N/A	R P Carlstrom	H Chf H Chf	12/18/07

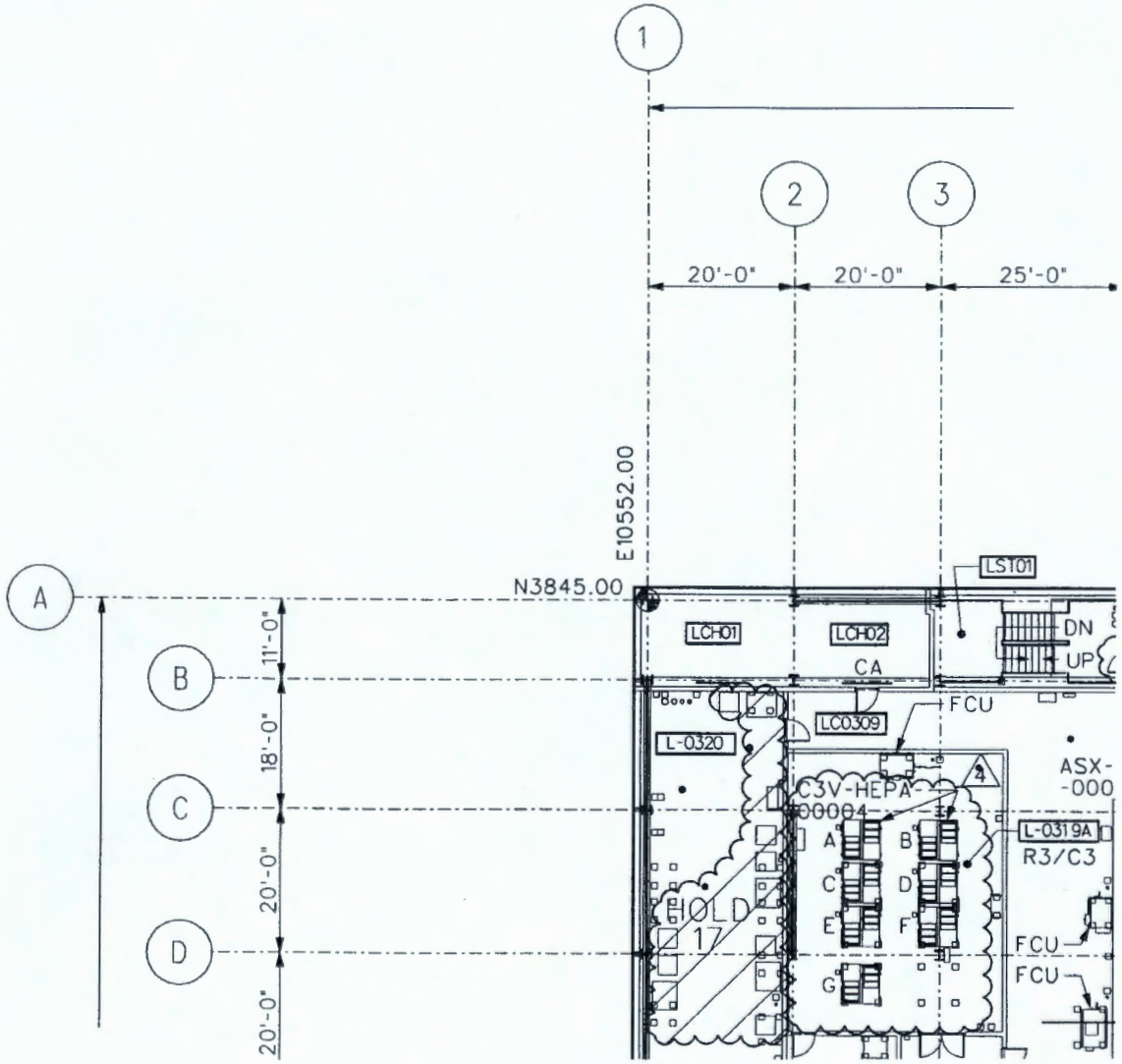
GENERAL ARRANGEMENT
PLAN AT EL. 48'-0"
24590-LAW-P1-P01T-00005 REV 3
CURRENT LAYOUT

24590-LAW-P1N-P01T-00037
SHEET 2 OF 3



GENERAL ARRANGEMENT
PLAN AT EL. 48'-0"
24590-LAW-P1-P01T-00005 REV 3
NEW LAYOUT

24590-LAW-P1N-P01T-00037
SHEET 3 OF 3



Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00049

~~ISSUED BY~~
~~RPP-WTP PDC~~

R10923269

JOB NO.	TITLE FOR CHANGE NOTICE
24590	RELOCATE GYPSUM BOARD WALL ON 48FT

DESIGN DOCUMENT NUMBER	REV NO	TITLE OF DESIGN DOCUMENT
24590-LAW-P1-P01T-00005	3	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 48'-0"

PART OF DESIGN CHANGE PACKAGE (DCP)? ☒ No ☐ Yes DCP No.: Rev:

JUSTIFICATION FOR CHANGE

The gypsum board wall at it present location cannot be constructed - it is located over the shaft area which has no floor system to build from.

TREND CODE-NUMBER

Supersedes Change Document ☒ No ☐ Yes

REQUIREMENTS REVIEW

Client Approval Required *	☐ Yes ☒ No	Permit Review by E&NS Required	☐ Yes ☒ No
Interface Resolution Required *	☐ Yes ☒ No	Safety Screening / Evaluation Required Documents identified in 24590-WTP-GPP-SREG-002 must be checked "Yes" regardless of the change being made, and E&NS signature is required below.	☒ Yes ☐ No
* Address these "yes" answers in the description			

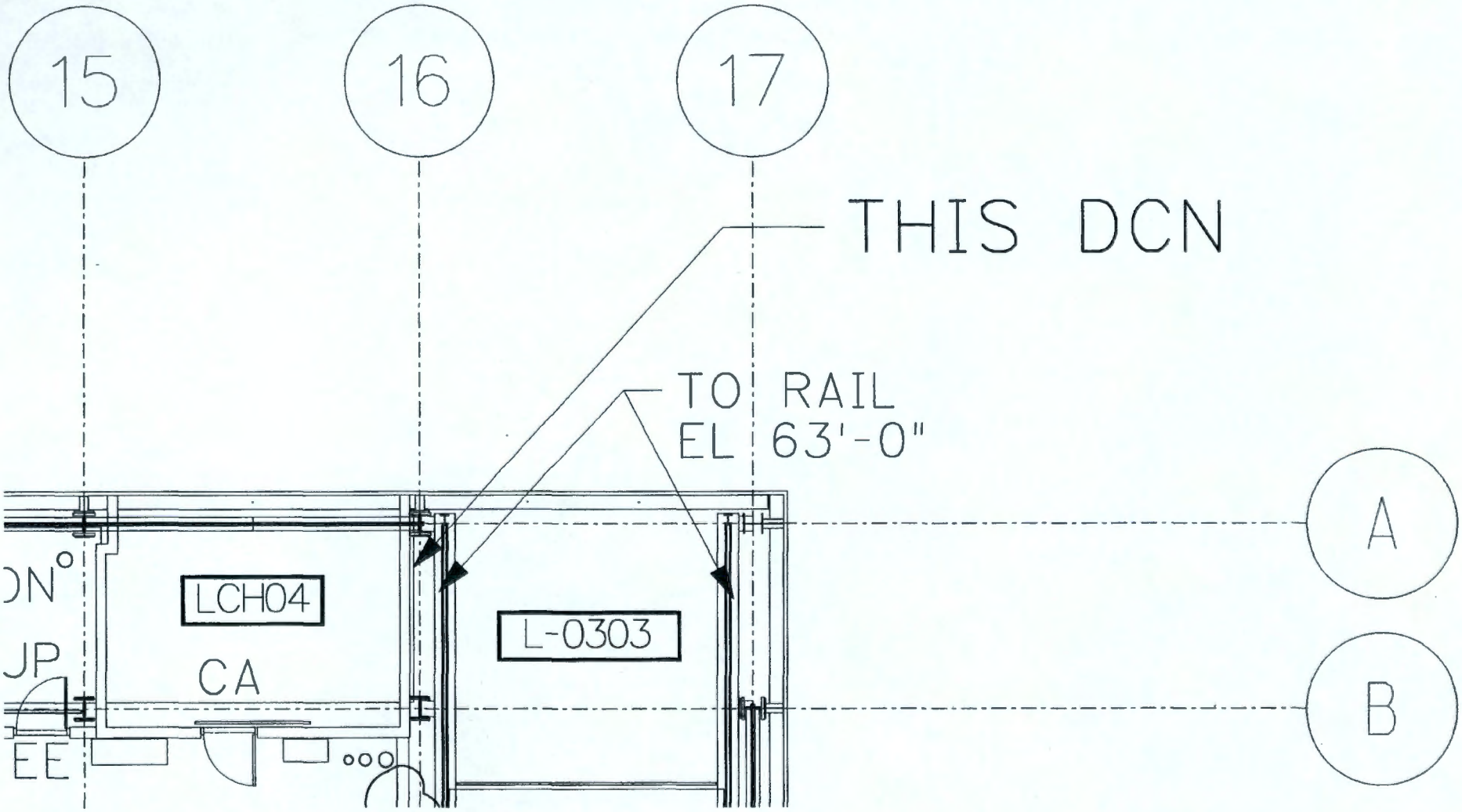
DESCRIPTION OF CHANGE

Relocate existing gypsum board wall west of column line 16 to the new location as indicated in the attached sketches.

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to 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.

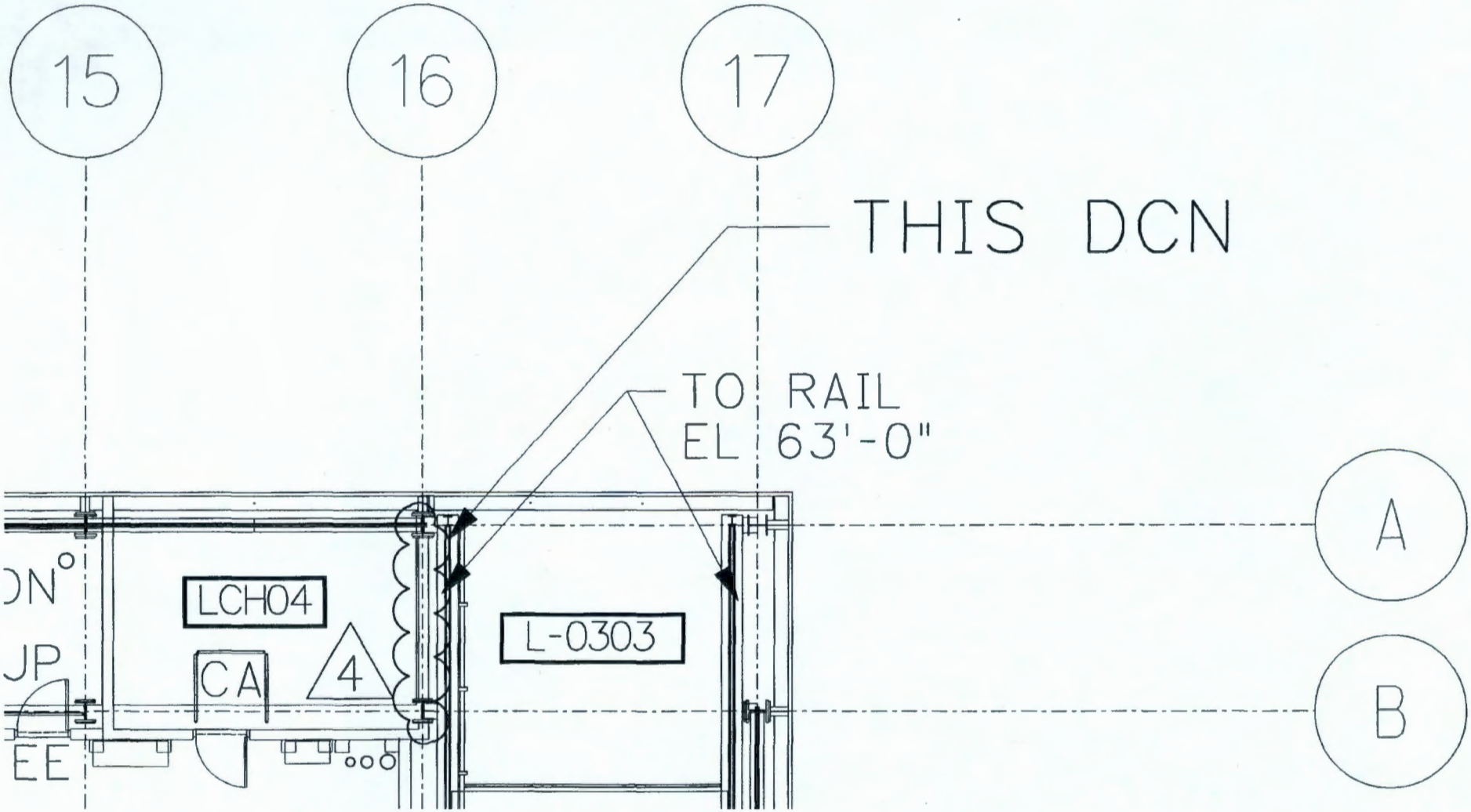
ORIGINATOR	CHECKER	REVIEWER
TIM HAWKINS Tim Hawkins	CRAIG SALERNO Craig M Salerno	TH 6/11/08 ~~JIM MCGRATH~~ Keith Huber

QA (when applicable)	E&NS (when applicable)	APPROVER(S)	APPROVAL DATE
N/A	Dwight Krahn Dwight Krahn	[illegible] [illegible]	6/11/08



LAW VITRIFICATION BUILDING
GENERAL ARRANGEMENT
PLAN AT EL. 48'-0"
24590-LAW-P1-P01T-00005 REV 3
CURRENT LAYOUT

24590-LAW-P1N-P01T-00049
2 OF 3



LAW VITRIFICATION BUILDING
GENERAL ARRANGEMENT
PLAN AT EL. 48'-0"
24590-LAW-P1-P01T-00005 REV 3
NEW LAYOUT

24590-LAW-P1N-P01T-00049
SHEET 3 OF 3

ISSUED BY
RPP-WTP PDC

Drawing Change Notice

R10951977

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00050

JOB NO.	TITLE FOR CHANGE NOTICE
24590	RADIATION/ CONTAMINATION CLASSIFICATION CHANGES

DESIGN DOCUMENT NUMBER	REV NO	TITLE OF DESIGN DOCUMENT
24590-LAW-P1-P01T-00001	2	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN @ EL. (-) 21'-0"
24590-LAW-P1-P01T-00002	5	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN @ EL. 3'-0"
24590-LAW-P1-P01T-00004	3	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN @ EL. 28'-0"
24590-LAW-P1-P01T-00005	3	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN @ EL. 48'-0"

PART OF DESIGN CHANGE PACKAGE (DCP)? ☐ Yes ☒ No DCP No.: Rev:

JUSTIFICATION FOR CHANGE
RECOMMENDATIONS IN MANAGEMENT ASSESMENT 24590-LAW-MAR-ENS-07-0001

TREND CODE-NUMBER
N/A

Supersedes Change Document ☒ Yes ☐ No Document # 24590-LAW-P1N-P01T-00039
24590-LAW-P1N-P01T-00040
24590-LAW-P1N-P01T-00041
24590-LAW-P1N-P01T-00042

ECN Needed ☐ Yes ☒ No

REQUIREMENTS REVIEW

Client Approval Required *	☐ Yes ☒ No	Permit Review by E&NS Required	☐ Yes ☒ No
Interface Resolution Required *	☐ Yes ☒ No	Safety Screening / Evaluation Required Documents identified in 24590-WTP-GPP-SREG-002 must be checked "Yes" regardless of the change being made, and E&NS signature is required below.	☒ Yes ☐ No
* Address these "yes" answers in the description			

DESCRIPTION OF CHANGE

ADD THE FOLLOWING NOTE TO DESIGN DOCUMENTS:

"FOR OPERATIONAL REVISIONS TO RADIATION/ CONTAMINATION CLASSIFICATIONS, REFER TO RECOMMENDATIONS CITED IN MANAGEMENT ASSESSMENT REPORT 24590-LAW-MAR-ENS-07-0001"

ORIGINATOR	CHECKER
C. SALERNO Craig M. Salerno	T. McGEE T. M. G

Reviews

PD - K. HUBER					
KH					

Approval(s) and Date

PD - J. CLINTON	APEM-LBL - R. HANSON		
JLC 7.29.08	RHM 7/30/08		

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to 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.

Drawing Change Notice

ISSUED BY RPP-WTP PDC

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00053

R10981383

JOB NO.	TITLE FOR CHANGE NOTICE
24590	ADDITION OF ASX PLATFORM LP0301

DESIGN DOCUMENT NUMBER	REV NO	TITLE OF DESIGN DOCUMENT
24590-LAW-P1-P01T-00005	3	LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 48'-0"

PART OF DESIGN CHANGE PACKAGE (DCP)? ☐ Yes ☒ No DCP No.: Rev:

JUSTIFICATION FOR CHANGE	TREND CODE-NUMBER
ADD PLATFORM LP0301, DOOR AND MECHANICAL SYSTEMS EQUIPMENT	N/A

Supersedes Change Document ☐ Yes ☒ No

ECN Needed ☐ Yes ☒ No

REQUIREMENTS REVIEW

Client Approval Required *	☐ Yes ☒ No	Permit Review by E&NS Required	☐ Yes ☒ No
Interface Resolution Required *	☐ Yes ☒ No	Safety Screening / Evaluation Required Documents identified in 24590-WTP-GPP-SREG-002 must be checked "Yes" regardless of the change being made, and E&NS signature is required below.	☒ Yes ☐ No
* Address these "yes" answers in the description			

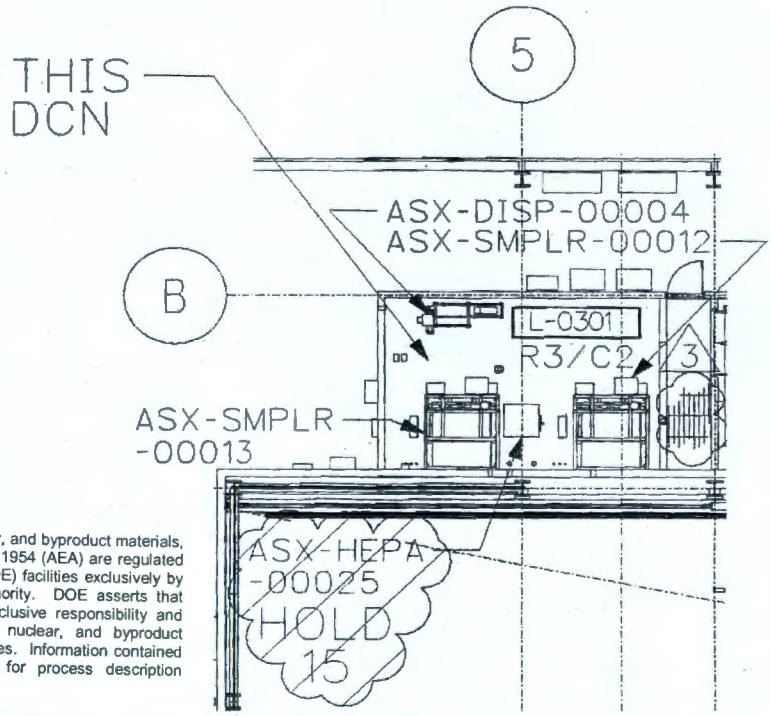
DESCRIPTION OF CHANGE

ADD PLATFORM LP0301, DOOR, ASX-HEPA-00040 AND ASX-PMP-00006/7. REMOVE HOLD 15.

THE FOLLOWING EQUIPMENT ASX-SMPLR-00012, ASX-SMPLR-00013 AND ASX-DISP-00004 WILL BE LOCATED BELOW PLATFORM LP0301 IN ROOM L-0301 AND WILL BE SHOWN ON PARTIAL PLAN. ASX-SMPLR-00012 AND ASX-SMPLR-00013 HAVE BEEN REVISED TO MATCH CURRENT VENDOR DATA.

BEFORE:

24590-LAW-P1-P01T-00005 REV 3



Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to 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.

Drawing Change Notice

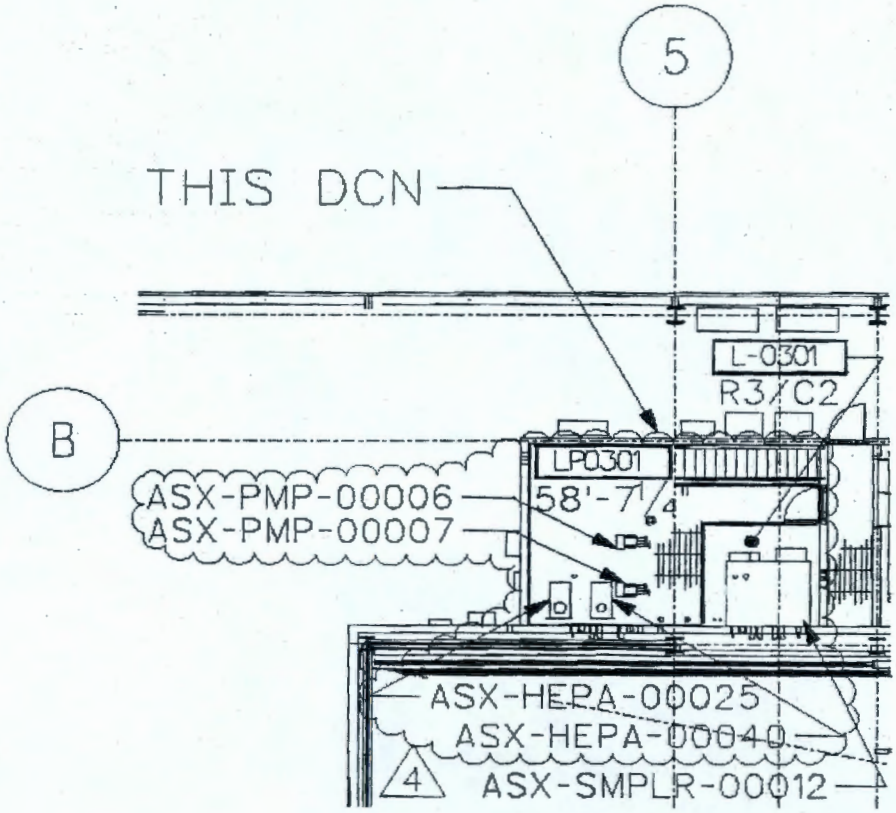
CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00053

JOB NO.	TITLE FOR CHANGE NOTICE
24590	ADDITION OF ASX PLATFORM LP0301

DESCRIPTION OF CHANGE

AFTER:

24590-LAW-P1-P01T-00005 REV 3



Drawing Change Notice

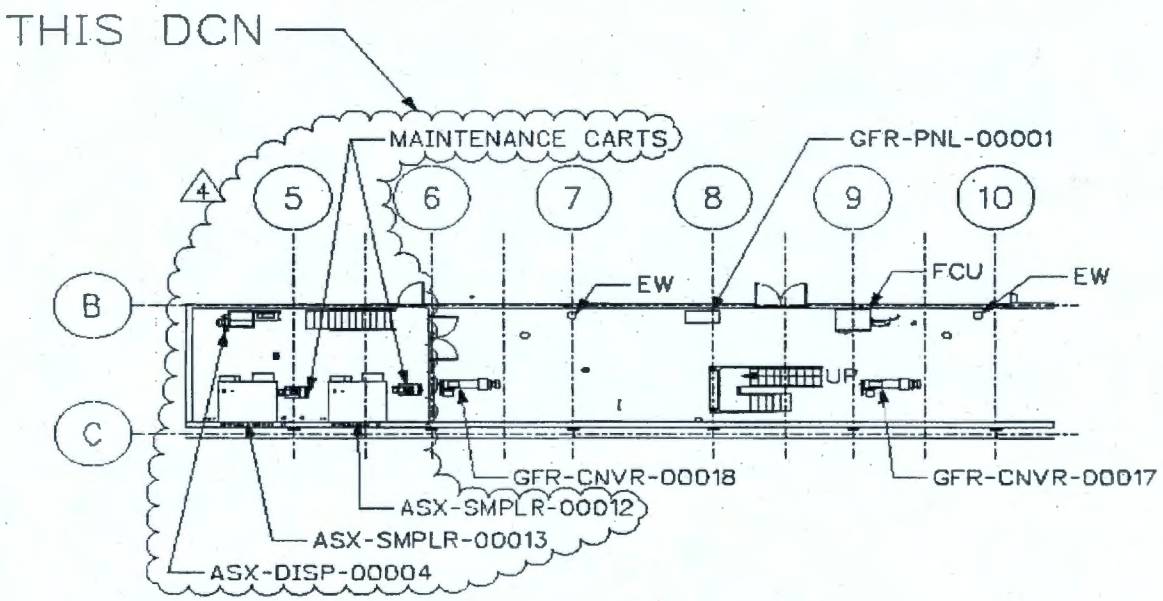
CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00053

JOB NO.	TITLE FOR CHANGE NOTICE
24590	ADDITION OF ASX PLATFORM LP0301

DESCRIPTION OF CHANGE

AFTER:

24590-LAW-P1-P01T-00005 REV 3 (PARTIAL PLAN)



PARTIAL PLAN AT EL 48'-0"

ORIGINATOR	CHECKER
TIM HAWKINS Tim Hawkins	CRAIG SALERNO Craig Salerno

Reviews

E&NS - Dwight Kraha Dwight Kraha	PD - KEITH HUBER				

Approval(s) and Date

PD - JACK CLINTON 10/29/08	APEM-LBL - BOB HANSON 10/30/08		

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00054

JOB NO.	TITLE FOR CHANGE NOTICE
24590	ADD ROOM NAME REFERENCE NOTE

ISSUED BY
RPP-WTP PDC

R10981501

DESIGN DOCUMENT NUMBER	REV NO	TITLE OF DESIGN DOCUMENT
24590-LAW-P1-P01T-00002	5	LAW VITRIFICATION BLDG GENERAL ARRANGEMENT PLAN EL. 3'-0"
24590-LAW-P1-P01T-00003	4	LAW VITRIFICATION BLDG GENERAL ARRANGEMENT PLAN EL. 22'-0"
24590-LAW-P1-P01T-00004	3	LAW VITRIFICATION BLDG GENERAL ARRANGEMENT PLAN EL. 28'-0"
24590-LAW-P1-P01T-00005	3	LAW VITRIFICATION BLDG GENERAL ARRANGEMENT PLAN EL. 48'-0"
24590-LAW-P1-P01T-00006	1	LAW VITRIFICATION BLDG GENERAL ARRANGEMENT PLAN EL. 68'-0"

PART OF DESIGN CHANGE PACKAGE (DCP)? ☐ Yes ☒ No DCP No.: Rev:

JUSTIFICATION FOR CHANGE	TREND CODE-NUMBER
UPDATE THE LAW GAs TO REFERENCE ARCHITECTURAL DRAWINGS FOR ROOM NAMES PER 24590-WTP-PIER-MGT-07-1953-REV 0, ACTION 9	N/A

Supersedes Change Document ☐ Yes ☒ No

ECN Needed ☐ Yes ☒ No

REQUIREMENTS REVIEW

Client Approval Required *	☐ Yes ☒ No	Permit Review by E&NS Required	☒ Yes ☐ No
Interface Resolution Required *	☐ Yes ☒ No	Safety Screening / Evaluation Required Documents identified in 24590-WTP-GPP-SREG-002 must be checked "Yes" regardless of the change being made, and E&NS signature is required below.	☒ Yes ☐ No
* Address these "yes" answers in the description			

DESCRIPTION OF CHANGE

ADD THE FOLLOWING NOTE TO THE ABOVE LISTED GENERAL ARRANGEMENT DRAWINGS:

"Rooms are officially identified by room numbers only. Room numbers are established and controlled on General Arrangement drawings. Only room numbers are needed to identify rooms on engineering discipline documents. While room numbers are controlled, the most common name of rooms associated with each room number are shown for reference only on Architectural Floor Plans."

ORIGINATOR	CHECKER
TIM HAWKINS Tim Hawkins	CRAIG SALERNO Craig L. Salerno

Reviews

E&NS - Dwight Kreh Dwight Kreh	PD - KEITH HUBER				

Approval(s) and Date

PD - JACK CLINTON JR Clinton 10/30/08	APEM-LBL - BOB HANSON Aldi Schnetty FOR BOB HANSON		

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to 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.

ISSUED BY
RPP-WTP PDC

R11167899

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00057

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISION TO LAW UPS BATTERY ROOM LAYOUT

DESIGN DOCUMENT NUMBER	REV	DESIGN DOCUMENT NUMBER	REV
24590-LAW-P1-P01T-00004	4		
24590-LAW-P1-P01T-00005	3		

PART OF DESIGN CHANGE PACKAGE (DCP)? ☐ Yes ☒ No DCP No.: Rev:

JUSTIFICATION FOR CHANGE	CAUSE CODE
INCORPORATE VENDOR DATA FOR SS ACU TO COMPLETE ACTIONS IN 24590-WTP-RITS-QAIS-06-0792. INCORPORATE UPDATED SELLER DESIGN REQUIREMENTS AND ALIGN DESIGN DOCUMENTS.	31

Supersedes Change Document ☐ Yes ☒ No

ECN Needed ☐ Yes ☒ No

REQUIREMENTS REVIEW

Client Approval Required ☐ Yes ☒ No | Interface Resolution Required * ☐ Yes ☒ No

Address any "yes" answers in the description

DESCRIPTION OF CHANGE

NOTES

1. **REFER TO 24590-LAW-P1N-P23T-00058 FOR ADDITIONAL DETAILS AND CALLOUTS**
2. **LABELS FOR MINOR ELECTRICAL AND C&I COMPONENTS (PANELS, TRANSFORMERS, RACKS, AND ENCLOSURES) HAVE BEEN OMITTED FOR CLARITY. REFER TO APPROPRIATE EQUIPMENT LOCATION PLAN FOR LABEL INFORMATION.**

L-0313 (SEE PAGE 4)

1. **REMOVED HOLD CLOUD 14 FOR C2V-ACU-00003**
2. **REVISED SIZE OF C2V-ACU-00003**
3. **REVISED SIZES OF UPE-BATT-20301 AND UPE-UPS-20301**
4. **RELOCATED UPE-XFMR-20350, UPE-PNL-20350, LVP-PNL-20322, LVP-XFMR-20322 FROM CORRIDOR LC0310 (NOTE 1)**
5. **ADDED SS HVAC CONTROL PANELS C2V-PNL-00116 AND C3V-PNL-00015 (NOTE 1)**
6. **DELETED SECTION OF UPE-BATT-20301 AT COLUMN 4**
7. **ADDED BATTERY RACK DISCONNECT SWITCH UPE-SW-20301 (NOTE 1)**

LC0310 (SEE PAGE 4)

1. **REMOVED HOLD CLOUD 14 FOR C2V-COND-00003**
2. **RELOCATED C2V-COND-00003 TO EXTERIOR PLATFORM. (PAGE 5)**
3. **DELETED LVE-ENCL-000023 TO ALIGN WITH C&I DESIGN DOCUMENTS (NOTE 1)**
4. **RELOCATED UPE-XFMR-20350, UPE-PNL-20350, LVP-PNL-20322, LVP-XFMR-20322 TO L-0313 (NOTE 1)**

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Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00057

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISION TO LAW UPS BATTERY ROOM LAYOUT

DESCRIPTION OF CHANGE

L-0311 (SEE PAGE 4)

1. **REMOVED HOLD CLOUD 14 FOR C2V-ACU-00002**
2. **REVISED SIZE OF C2V-ACU-00002**
3. **REVISED SIZES OF UPE-BATT-20302 AND UPE-UPS-20302**
4. **RELOCATED UPE-XFMR-20351, UPE-PNL-20351 FROM CORRIDOR LC0306 (NOTE 1)**
5. **ADDED SS HVAC CONTROL PANELS C2V-PNL-00115 AND C3V-PNL-00014 (NOTE 1)**
6. **DELETED SECTION OF UPE-BATT-20302 AT COLUMN 9**
7. **ADDED BATTERY RACK DISCONNECT SWITCH UPE-SW-20302 (NOTE 1)**

LC0306 (SEE PAGE 4)

1. **REMOVED HOLD CLOUD 14 FOR C2V-COND-00002**
2. **RELOCATED C2V-COND-00002 TO EXTERIOR PLATFORM. (PAGE 5)**
3. **RELOCATED UPE-XFMR-20351, UPE-PNL-20351 TO L-0311 (NOTE 1)**
4. **RELOCATED EMJ-ENCL-00008 TO COLUMN K13. (NOT SHOWN ON THIS DCN)**
5. **ADDED FPW-CAB-00001 (NOTE 1)**
6. **ADDED LVE-ENCL-00002 (NOTE 1)**

L-0309 (SEE PAGE 4)

1. **REMOVED HOLD CLOUD 14 FOR C2V-ACU-00001**
2. **REVISED SIZE OF C2V-ACU-00001**
3. **REVISED SIZES OF UPE-BATT-20303 AND UPE-UPS-20303**
4. **RELOCATED LVE-PNL-20323, LVE-XFMR-20323, LTE-PNL-20301, LTE-XFME-20301 FROM CORRIDOR LC0310 (NOTE 1)**
5. **ADDED SS HVAC CONTROL PANELS C2V-PNL-00114 AND C3V-PNL-00013 (NOTE 1)**
6. **DELETED SECTION OF UPE-BATT-20303 AT COLUMN 12**
7. **ADDED BATTERY RACK DISCONNECT SWITCH UPE-SW-20303 (NOTE 1)**

LC0305 (SEE PAGE 4)

1. **REMOVED HOLD CLOUD 14 FOR C2V-COND-00001**
2. **RELOCATED C2V-COND-00001 TO EXTERIOR PLATFORM (PAGE 5)**
3. **RELOCATED LTE-PNL-20301, LTE-XFMR-20301, LVE-PNL-20323, LVE-XFME-20323, LVE-PNL-20324, LVE-XFMR-20324 TO L-0309 (NOTE 1)**

EXTERIOR CONDENSER PLATFORM (SEE PAGE 5)

1. **REMOVED HOLD CLOUD 16**

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00057

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISION TO LAW UPS BATTERY ROOM LAYOUT

DESCRIPTION OF CHANGE

ROOM L-0304C (SEE PAGES 6 AND 7)

1. **REMOVED HOLD 18, REVISED AND RELOCATED C3V-ACU-00001**
2. **RELOCATED LVP-ASD-00001A**
3. **REVISED PRELIMINARY SIZE OF LVP-EXHR-00001A AND ADDED HOLD 19 PENDING RECEIPT OF NEW CODE 2 SUBMITTALS**
4. **CORRECTED LABEL FROM C3V-ACU-00001 TO C3V-ACU-00003**

ROOM L-0304D (SEE PAGES 6 AND 7)

1. **REMOVED HOLD 18, REVISED AND RELOCATED C3V-ACU-00002**
2. **RELOCATED LVP-ASD-00001B**
3. **REVISED PRELIMINARY SIZE OF LVP-EXHR-00001B AND ADDED HOLD 19 PENDING RECEIPT OF NEW CODE 2 SUBMITTALS**

ROOM L-0304E (SEE PAGES 6 AND 7)

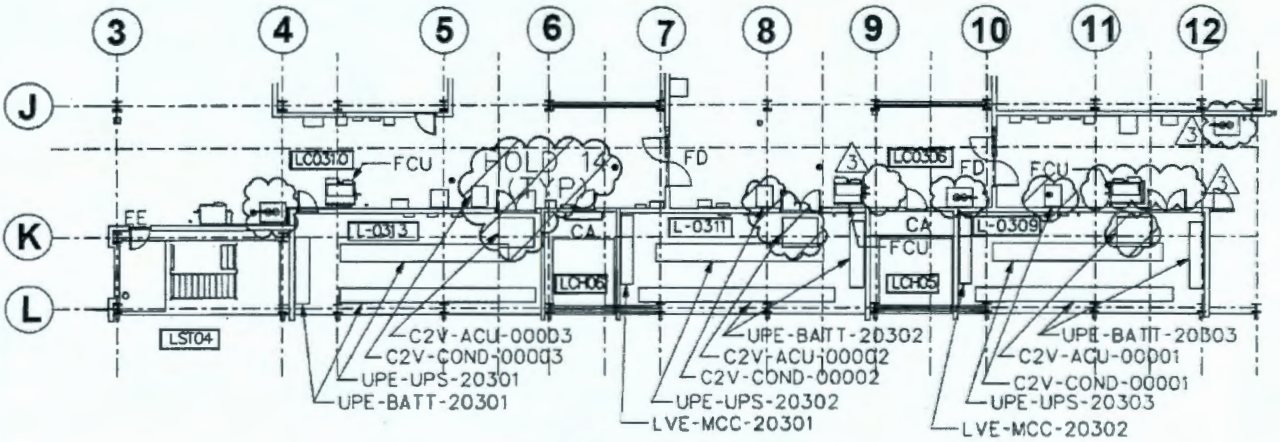
1. **REMOVED HOLD 18, REVISED AND RELOCATED C3V-ACU-00003**
2. **RELOCATED LVP-ASD-00001C**
3. **REVISED PRELIMINARY SIZE OF LVP-EXHR-00001C AND ADDED HOLD 19 PENDING RECEIPT OF NEW CODE 2 SUBMITTALS**
4. **CORRECTED LABEL FROM C3V-ACU-00003 TO C3V-ACU-00001**

Drawing Change Notice

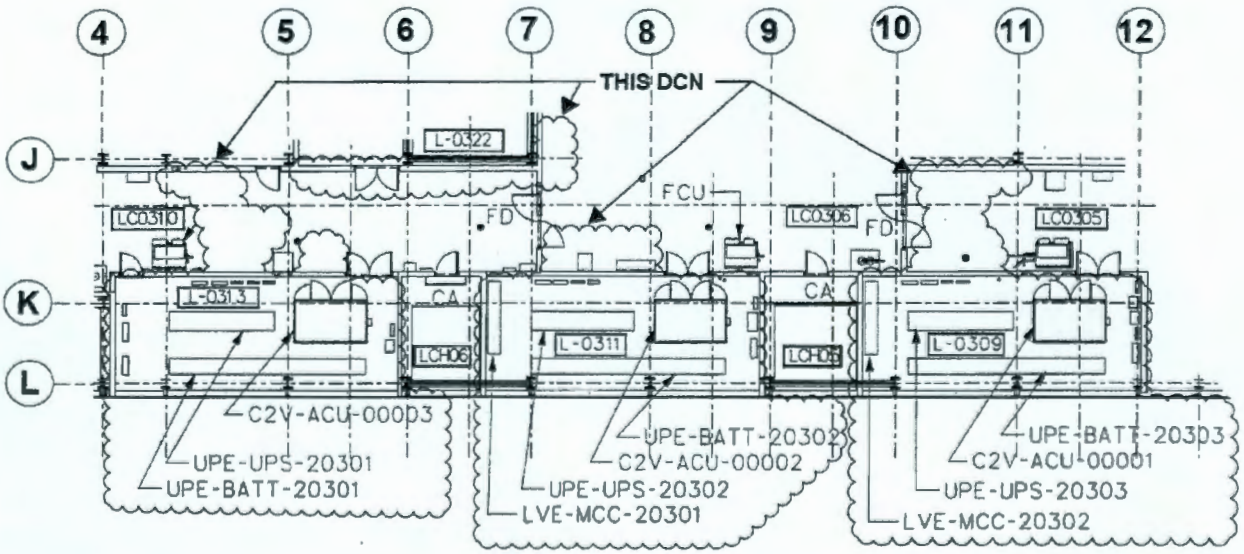
CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00057

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISION TO LAW UPS BATTERY ROOM LAYOUT

DESCRIPTION OF CHANGE



CURRENT LAYOUT
24590-LAW-P1-P01T-00005 REV. 3
24590-LAW-P1N-P01T-00057



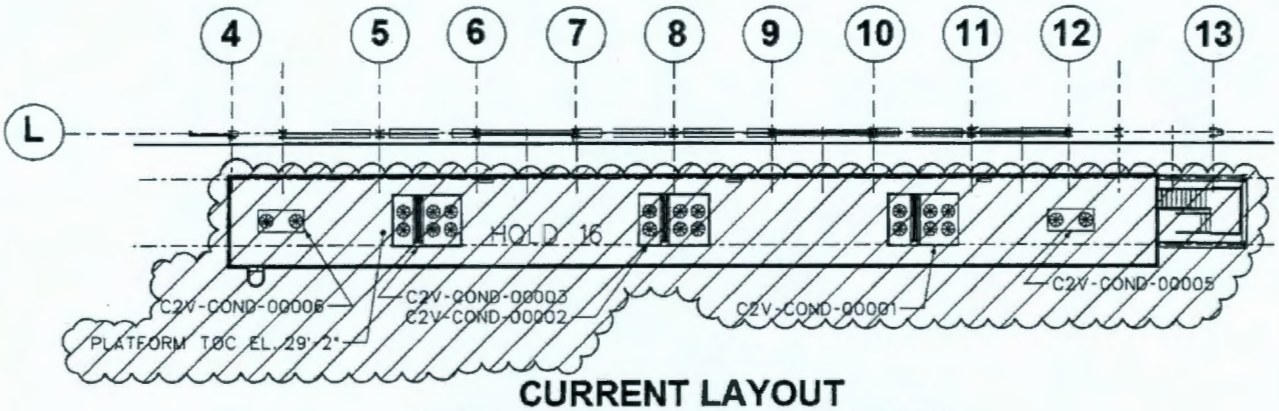
REVISED LAYOUT
24590-LAW-P1-P01T-00005 REV. 3
24590-LAW-P1N-P01T-00057

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00057

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISION TO LAW UPS BATTERY ROOM LAYOUT

DESCRIPTION OF CHANGE



CURRENT LAYOUT
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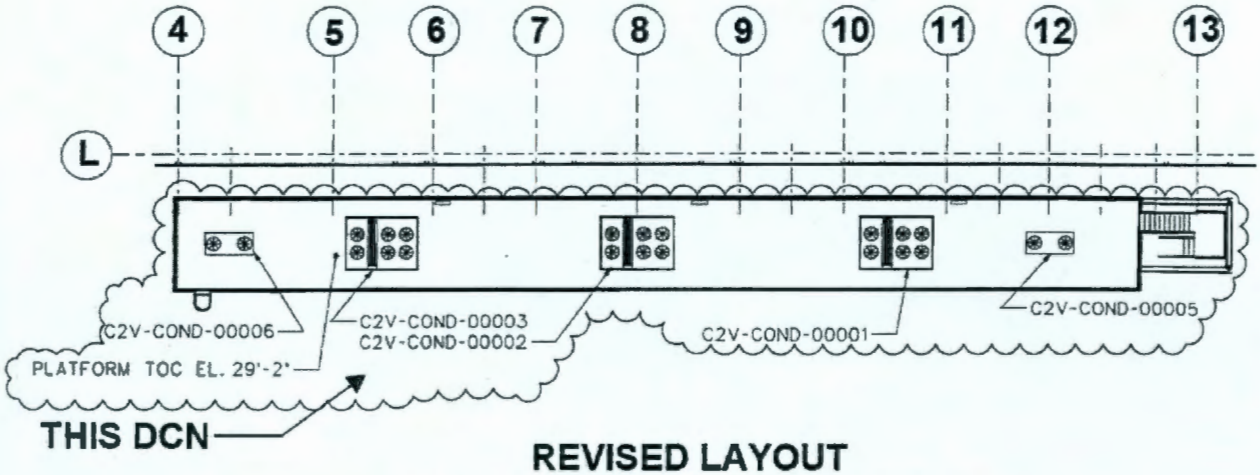
24590-LAW-P1N-P01T-00057



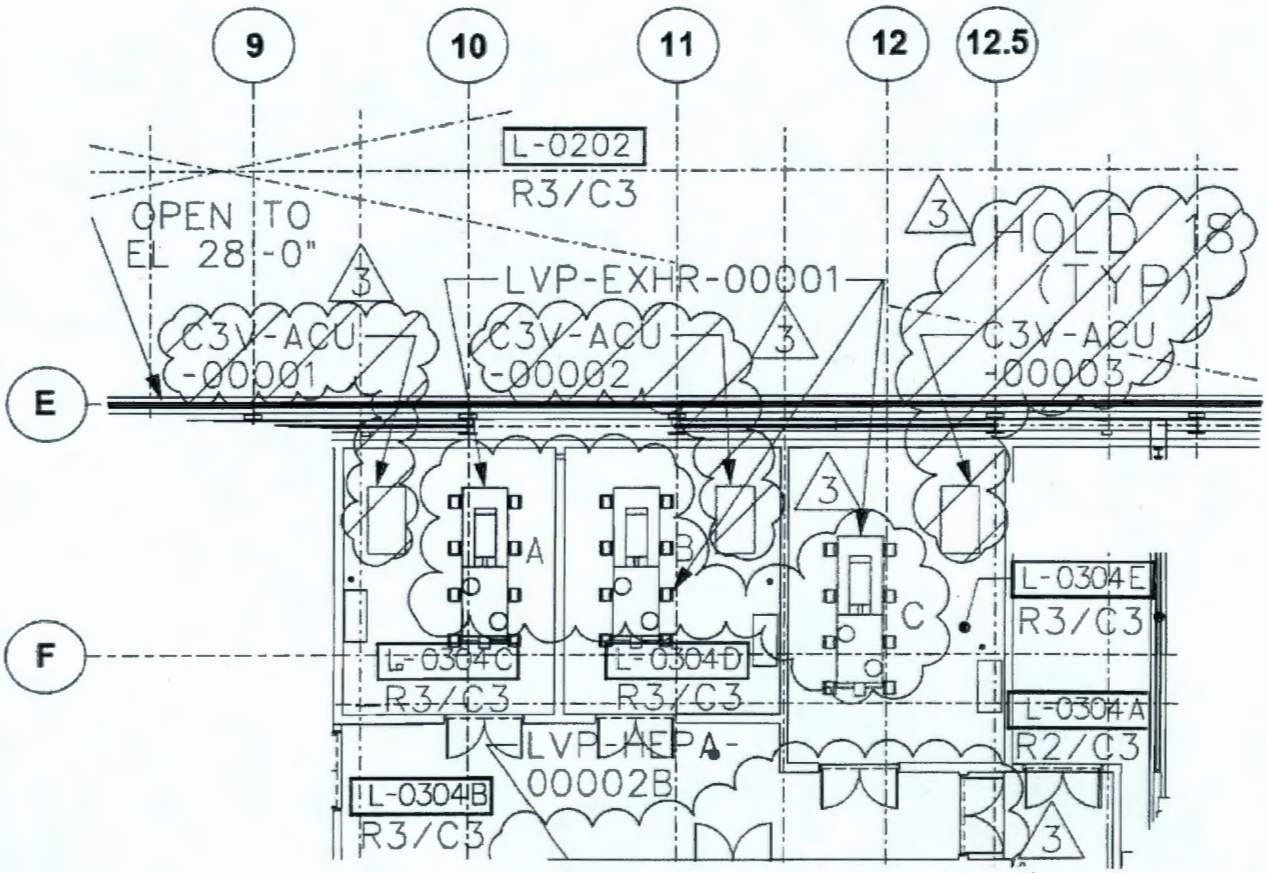
REVISED LAYOUT
24590-LAW-P1-P01T-00004 REV. 4
24590-LAW-P1N-P01T-00057

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00057

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISION TO LAW UPS BATTERY ROOM LAYOUT

DESCRIPTION OF CHANGE



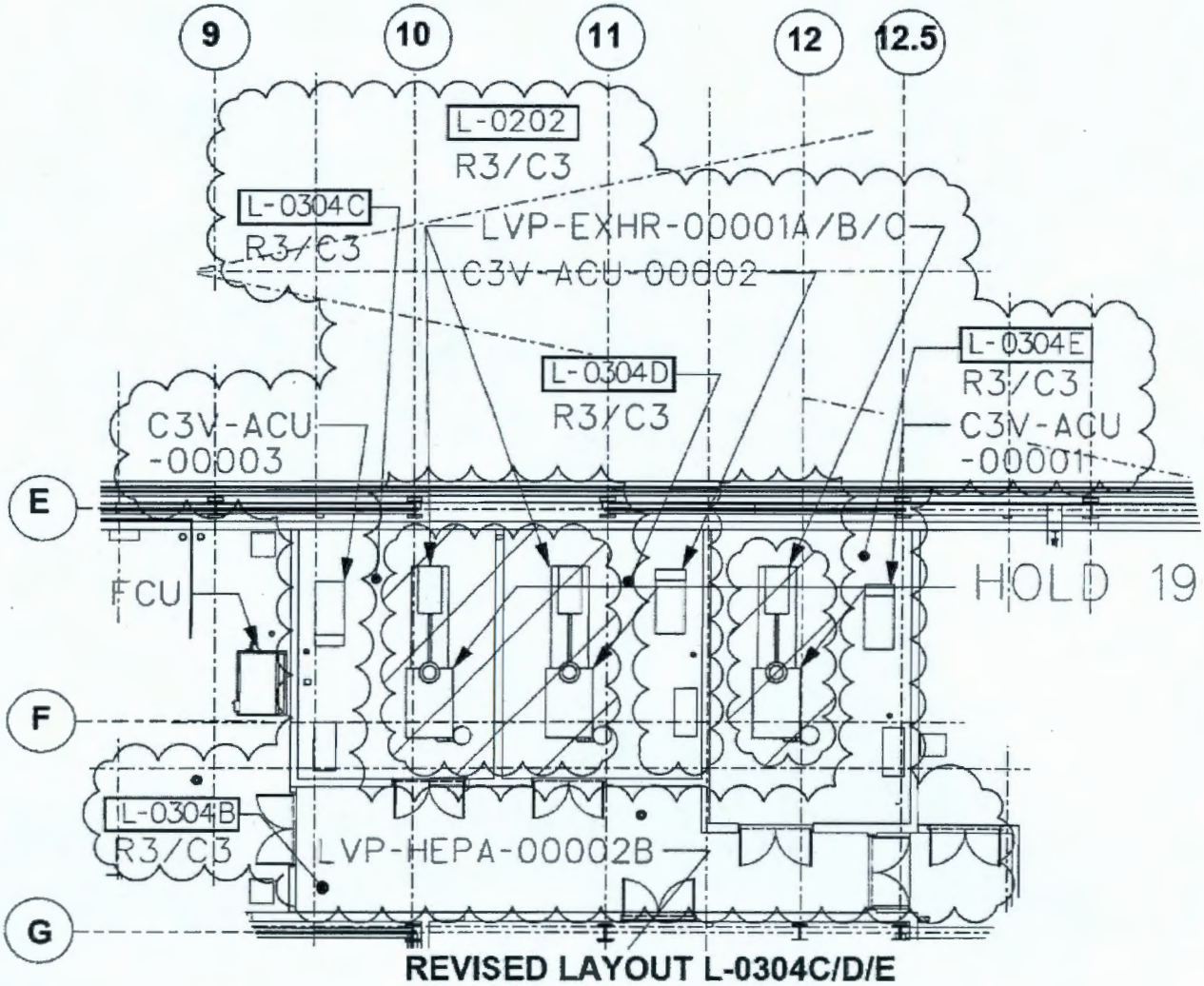
CURRENT LAYOUT L-0304C/D/E
24590-LAW-P1-P01T-00005 REV. 3
24590-LAW-P1N-P01T-00057

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00057

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISION TO LAW UPS BATTERY ROOM LAYOUT

DESCRIPTION OF CHANGE



REVISED LAYOUT L-0304C/D/E
24590-LAW-P1-P01T-00005 REV. 3
24590-LAW-P1N-P01T-00057

Drawing Change Notice

CHANGE DOCUMENT NO.
24590-LAW-P1N-P01T-00057

JOB NO.	TITLE FOR CHANGE NOTICE
24590	REVISION TO LAW UPS BATTERY ROOM LAYOUT

ORIGINATOR	CHECKER
CRAIG SALERNO Craig M. Salerno	EMMITT PACKER Emmett Packer

Reviews			
E&NS - Dwight Krahn Dwight Krahn	PD - KEITH HUBER		

Approval(s)			
APEM-LBL - JOHN SCHNEIDER John F. Schneider	PD - JACK CLINTON		

Date *(inserted by final approver)*: 4/5/10

R10905317

BECHTEL RPP-WTP JOB No: 24590	**FIELD CHANGE PART A**	24590-WTP-FC-E-08-0250
		TITLE: +48 LAW 20 CRANE 5 CONTROL PANEL
		FACILITY: LAW AREA: 20 SYSTEM: N/A
		QUALITY LEVEL: CM Need by date: 7/10/2008
		Page 1 of 4

Affected Document Number	Rev	Remarks
24590-LAW-P1-P01T-00005	3	
24590-LAW-P1-P23T-00050	2	

Reason for Change:

EMBEDDED REBAR PREVENTS ANCHORING OF PANEL SUPPORT BASEPLATES.

Description of Change:

MOVE BASEPLATES 8" EAST AND WELD TO IMBEDS.

☐ Generic Change

ISSUED BY

JUL 21 2008

RPP-WTP PDC

Prepared By: STRICKLIN, GREGORY R 7/3/08 Date Prepared: 6/26/2008

Select Field Change Type:

☐ "Pre-Approved" FCN

☐ "Case-By-Case" FCN

☑ FCR

Engineering Approval required for "Case-By-Case" FCN's Topic only:

Signature Date

Lead Discipline Field Engineering Review and Concurrence

	Civil	Mechanical	Welding
Name	N/A	N/A	N/A
Signature			
Date			

	Electrical	Piping	C&I
Name	Robert Spang	N/A	N/A
Signature	Robert Spang		
Date	7/3/08		

Field Engineering Manager Approval: STEVEN POLVI *Date:* 7/3/08

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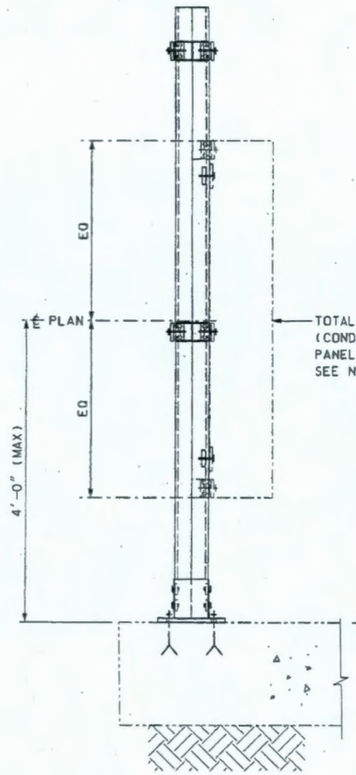
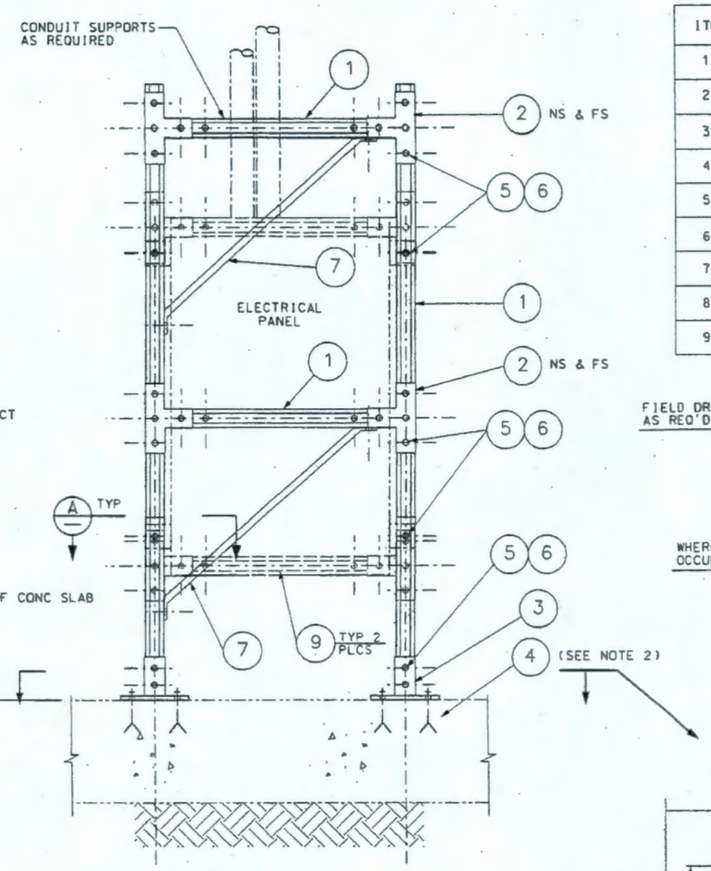


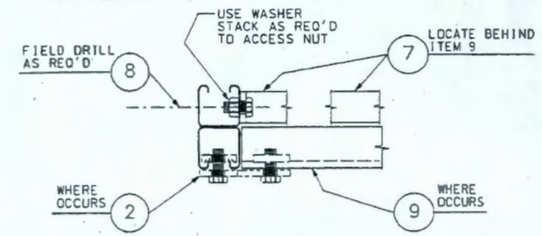
SIDE ELEVATION



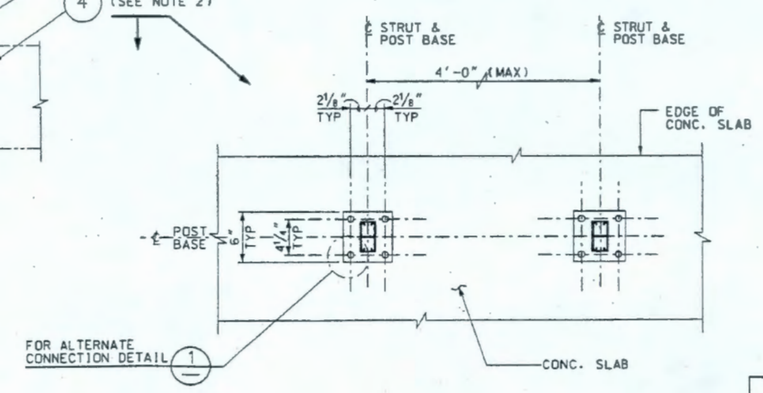
FRONT ELEVATION

FREE STANDING PANEL SUPPORT

ITEM	DESCRIPTION
1	B-Line B22A CHANNEL, ZINC FINISH
2	B-Line B133 FOUR HOLE TEE PLATE, ZINC FINISH
3	B-Line POST BASE FOR B22A B281SQ, ZINC FINISH
4	5/8" ϕ TRU BOLT WEDGE ANCHOR X 2 3/4" MIN EMBED
5	B-Line NUT WITH SPRING, N225
6	1/2" ϕ X 1 1/4" LG HEX HEAD CAP SCREWS (HHCS), ZINC FINISH
7	B-Line B631 KNEE BRACE (SEE NOTE 6)
8	1/2" ϕ HEX HEAD CAP SCREW (HHCS) W/ 1/2"ϕ HEX NUT (HN), WITH ZINC FINISH
9	B-Line B22 CHANNEL, ZINC FINISH (SEE NOTE 9)

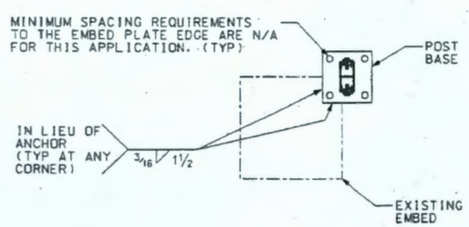


SECTION A



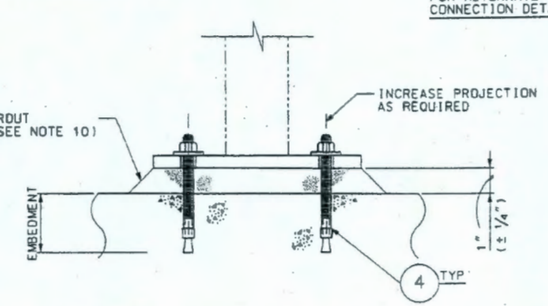
NOTES:

1. FREE STANDING SUPPORT IS APPLICABLE TO INTERIOR COMMERCIAL GRADE (CM) ELECTRICAL PANEL AND/OR CONDUIT. TOTAL WEIGHT OF PANEL AND/OR CONDUIT SHALL NOT EXCEED 150 LBS.
2. ALL POST-INSTALLED ANCHORS ARE ITW RAMSET/RED HEAD TRUBOLT WEDGE CONCRETE ANCHORS. CONCRETE ANCHORS SHALL BE INSTALLED AND TESTED PER SPECIFICATION 24590-WTP-3PS-FA02-T0004 WITH A MINIMUM EDGE DISTANCE OF 3".
3. SLAB THICKNESS SHALL BE THE MINIMUM ANCHOR EMBEDMENT PLUS 4 INCHES OR GREATER.
4. LOCATION OF PANEL SUPPORTS, LENGTH AND SPACING OF STRUTS SHALL BE AS REQUIRED BY EQUIPMENT SIZE AND EQUIPMENT LOCATION DRAWINGS.
5. INSTALLATION OF B-LINE OR ENGINEERING APPROVED COMPONENTS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
6. B-LINE B631 ARE MADE IN LENGTHS FROM 18" TO 96". FIELD SHALL USE THE LONGEST BRACE THAT FITS THE CONFIGURATION. THE ORIENTATION MAY BE REVERSED.
7. MATERIAL QUANTITIES AS REQUIRED BY FIELD.
8. DO NOT USE THIS SUPPORT ABOVE OR ADJACENT TO Q EQUIPMENT/COMMODITY UNLESS A SEISMIC INTERACTION EVALUATION HAS BEEN PERFORMED BY DESIGN ENGINEERING.
9. FIELD HAS THE OPTION OF ADDING 2 (9) AS SHOWN TO SUIT EQUIPMENT ATTACHMENT CONDITIONS. USE ONE (2) PER END FOR ATTACHMENT TO FRAME.
10. USE CEMENTITIOUS GROUT PER SPECIFICATION 24590-WTP-3PS-D000-T0001, SECTION 2.2

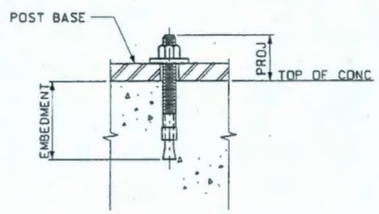


WELD ATTACHMENT ALTERNATIVE

DETAIL 1



ALTERNATE DETAIL FOR UNEVEN FLOOR



TYPICAL POST-INSTALLED ANCHOR
(SEE NOTE 2)

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
0	ISSUED FOR CONSTRUCTION					4/4/06

REVISION HISTORY

CM QUALITY DESIGNATOR

ISSUED BY RPP-WTP PDC

PROJECT No.	24590	
SITE	HANFORD	
AREA	200E	
BUILDING No.		

ISSUE STAMP

	BY	DATE
ORIGINATOR		4/4/06
CHECKER		4/4/06
APPROVER		4/4/06
REVIEWER		4-4-06

CONTENT APPLICABLE TO ALARA? ☐ YES ☒ NO
ADR NO. REV:
SAFETY SCREEN REQUIRED? ☐ YES ☒ NO | EMS INITIAL IF YES

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No: DE-AC27-01RV14136

CIVIL/STRUCTURAL STANDARDS STRUCTURAL STEEL NON-ITS ELECTRICAL PANEL SUPPORT

SCALE: NONE

24590-WTP-S1-S15T-00023 REV 0

FORM D_SDN2DGN 02/2003

SAFETY SCREEN IS REQUIRED FOR DRAWING TYPES IDENTIFIED IN 24590-WTP-GPP-SREQ-002

'D' SIZE - 34x22
COMPUTER GENERATED - MANUAL CHANGES NOT PERMITTED

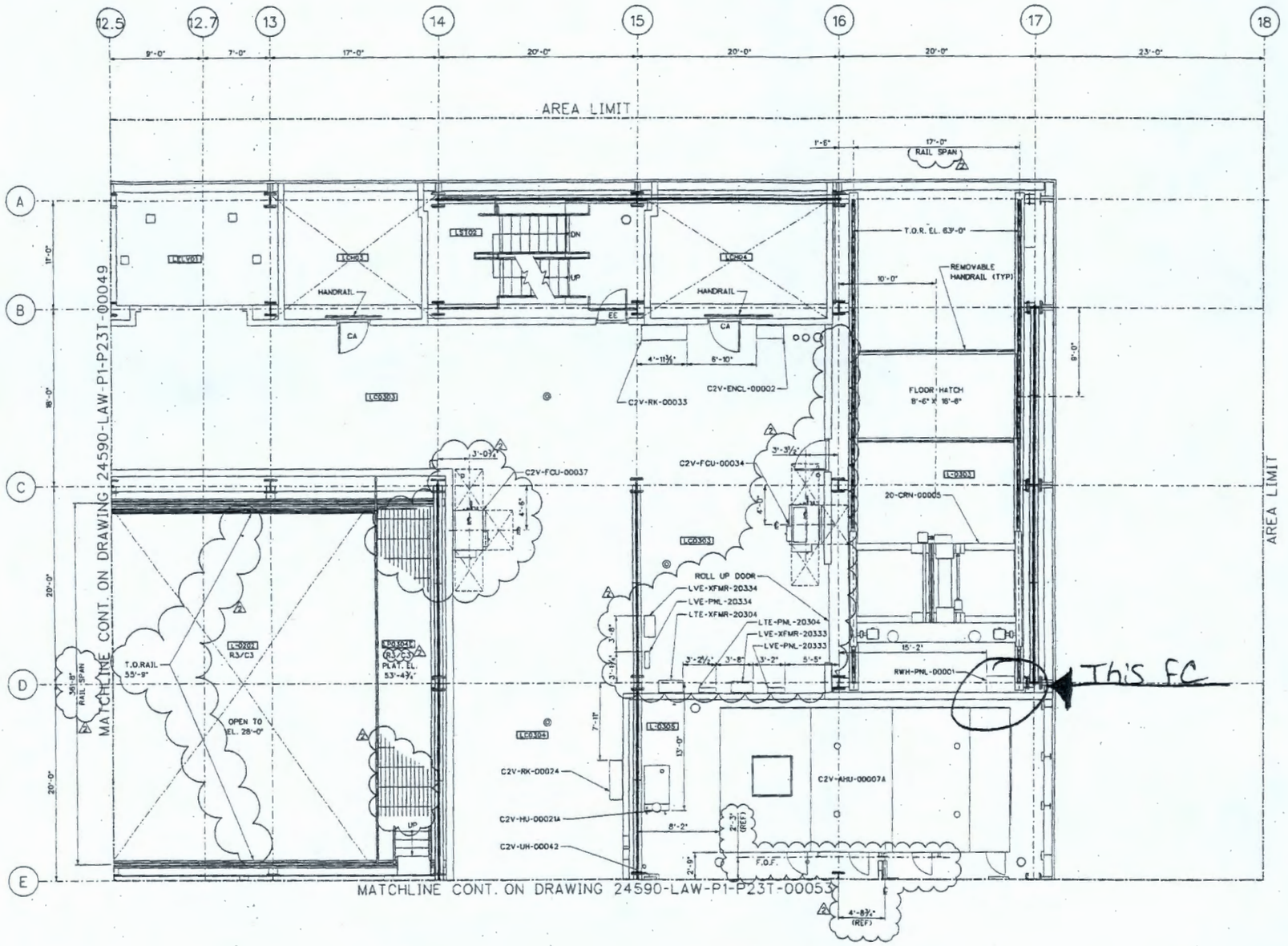
R10434832

04/04/2005 01:35:21 PM

PLOTTED BY: Mcart
C:\Work\dmt07724\wipsts\S100023.dgn

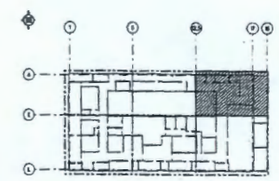
24590-WTP-PC-E-08-0250 pg 2 of 4

24590-LAW-P1-P23T-00050



NOTES:

1. FOR GENERAL NOTES SEE 24590-LAW-P1-P01T-00001
2. FOR EQUIPMENT LOCATION P.O.S./ GENERAL NOTES/ SCHEDULE SEE 24590-LAW-P1-P23T-01009.
3. FOR EQUIPMENT LOCATION ROOM SCHEDULE/ HOLD LIST SEE 24590-LAW-P1-P23T-01010.
4. REVISED TO INCORPORATE THE FOLLOWING: RELEASED HOLDS 8, 13, 18, AND 19, MODIFIED 20-CRN-00005. REVISED ELECTRICAL DIMS FROM CENTER LINE TO EDGE OF UNIT, REVISED FCU LOCATIONS, REVISED TITLE BLOCK, ADDED CONTROLLED ACCESS CALL OUTS AT CHASE ACCESS, REVISED LPD304E ELEVATION, REVISED PARTITION WALLS, ADDED REMOVABLE HANDRAIL.
5. REMOVED HOLD 23. ADDED TOP OF RAIL ELEVATION. RELEASED HOLD 2 AND ADDED DIMENSIONS TO FCU'S. ADDED REFERENCE DIMENSIONS. ADDED RAIL SPAN CALLOUT. REVISED PLATFORMS FROM CHECKER PLATE TO GRATING.



KEY PLAN AT EL 48'-0"

REFERENCE DRAWINGS

DWG NO	TITLE
24590-LAW-P1-P01T-00005	LAW GENERAL ARRANGEMENT PLAN AT EL 48'-0"
24590-LAW-P1-P23T-00001	LAW EQUIPMENT LOCATION PLAN KEY PLAN
24590-LAW-P1-P23T-00048	LAW EQUIPMENT LOCATION PLAN EL. 48'-0"/AREA 1
24590-LAW-P1-P23T-00049	LAW EQUIPMENT LOCATION PLAN EL. 48'-0"/AREA 2
24590-LAW-P1-P23T-00051	LAW EQUIPMENT LOCATION PLAN EL. 48'-0"/AREA 4
24590-LAW-P1-P23T-00052	LAW EQUIPMENT LOCATION PLAN EL. 48'-0"/AREA 5
24590-LAW-P1-P23T-00053	LAW EQUIPMENT LOCATION PLAN EL. 48'-0"/AREA 6
24590-LAW-P1-P23T-01009	LAW EQUIPMENT LOCATION POS/GENERAL NOTES/SCHEDULE
24590-LAW-P1-P23T-01010	LAW EQUIPMENT LOCATION ROOM SCHEDULE/HOLDS LIST

REVISION HISTORY

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
2	REVISED TO INCORPORATE CHANGES IN NOTE 5	TZF	CWB	MHL	DRC	8/1/06
1	REVISED TO INCORPORATE CHANGES IN NOTE 4	DLL	CMS	PR	DRJ	12/19/05
0	ISSUED FOR CONSTRUCTION	CDU	WS	MM	PR	5/20/04

ISSUED BY BNFL INC. FOR CONSTRUCTION

	BY	DATE
ORIGINATOR	CARL D ULRICH	5/20/04
CHECKER	WOODIE STRIPLIN	5/20/04
APPROVER	PHIL BERNHART	5/20/04
REVIEWER	MARK MOORE	5/20/04

PROJECT No. 24590
SITE HANFORD
AREA 2600
BUILDING No. 2004

CONTENT APPLICABLE TO ALARA? ☐ YES ☐ NO
ADR NO. 24590-LAW-ADR-PL-03-006 REV: 0
SAFETY SCREEN REQUIRED? ☐ YES ☐ NO | EWS INITIAL IF YES

SAFETY SCREEN IS REQUIRED FOR DRAWING TYPES IDENTIFIED IN 24590-WTP-RPT-SEQ-002

RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

LAW VITRIFICATION BUILDING EQUIPMENT LOCATION PLAN EL. 48'-0" / AREA 3

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

24590-LAW-P1-P23T-00050

REV 2

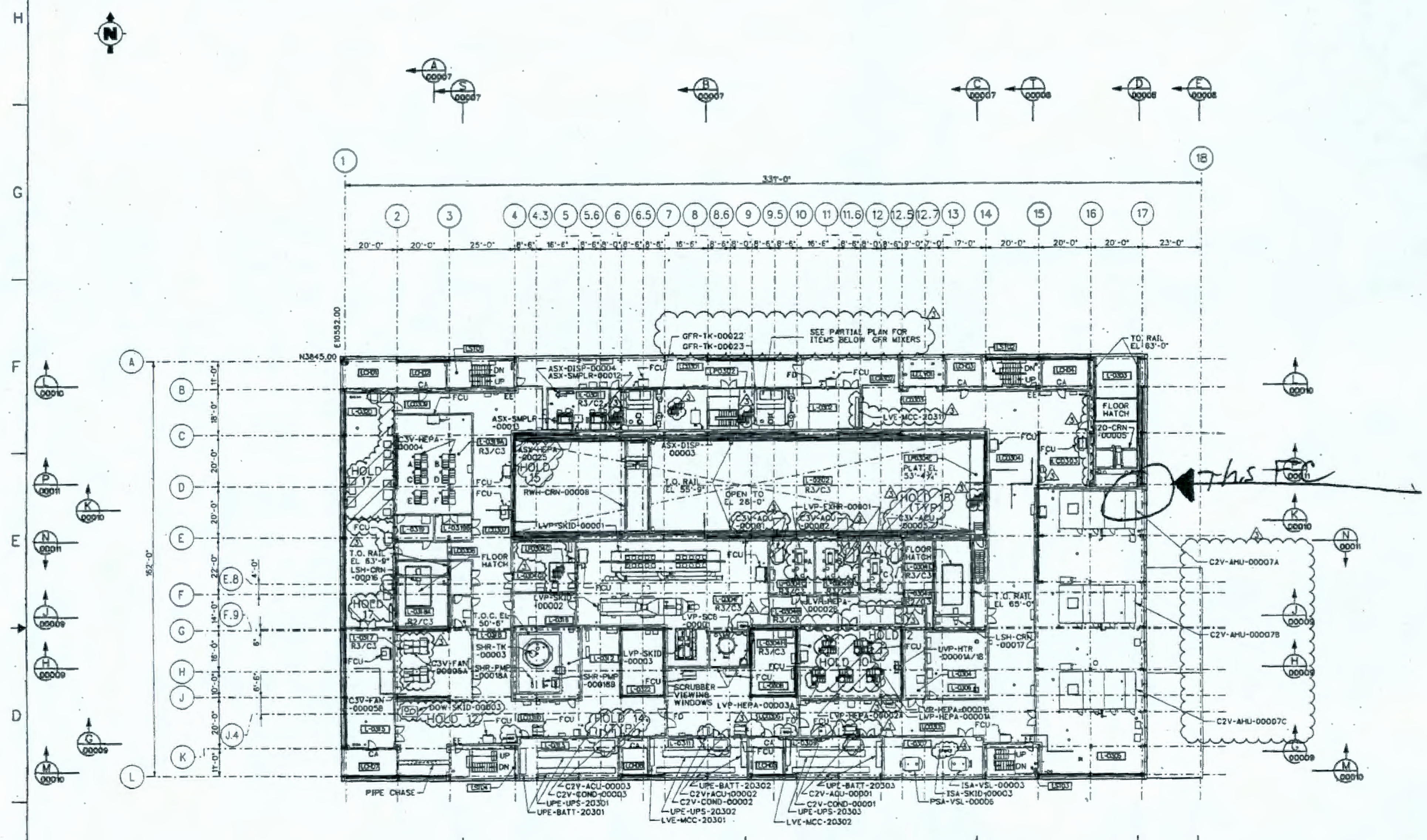
E SIZE - 44x34
COMPUTER GENERATED - MANUAL CHANGES NOT PERMITTED

FORM C_SCH.DOC 03/2003

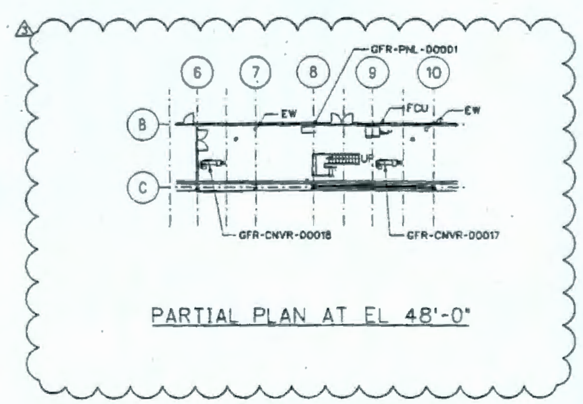
24590-WTP-FC-E-08-0250

Pg 3 of 4

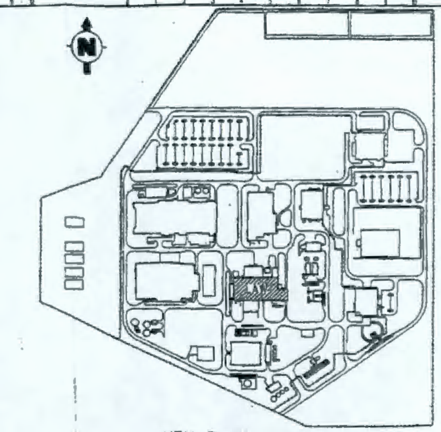
24590-LAW-P1-P01T-00005



PLAN AT EL 48'-0"



PARTIAL PLAN AT EL 48'-0"



KEY PLAN

NOTES:

1. FOR GENERAL NOTES, SEE 24590-LAW-P1-P01T-00001.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. REVISIONS:
   RENUMBERED ROOMS: L-0301 TO L-0301A, L-0308A TO L-0304H, L-0304B TO L-0304C, L-0309 TO L-0307, L-0304E TO L-0304A, L-0304C TO L-0304D, L-0310 TO L-0309, L-0304D TO L-0304E.
   ADDED ROOMS: L-0301A (CHANGE ROOM), L-0304G (EQUIPMENT AIRLOCK), L-0322 (SPARE ROOM), LC0310 (CORRIDOR).
   ADDED: FAN COIL UNITS, HOLD NOTES FOR C3 HEPA FILTERS, AIR HANDLING UNITS, MELTER OFFGAS HEPA FILTERS, C3 EXHAUST FANS, TEMPERED WATER SYSTEM, PERSONNEL DOORS AT LCH02, LCH03, LCH04, LCH05, LCH06, AND LCH07.
   DELETED: HOLD NOTE 4 AND 6, MISCELLANEOUS REAGENT SYSTEM, AND WALL BETWEEN LCH01 AND LCH02.
   REDESIGNED SODIUM HYDROXIDE, SECONDARY OFFGAS SYSTEM, RELOCATED ELECTRICAL EQUIPMENT.
   REDESIGNED ROOMS: L-0312 (SODIUM HYDROXIDE), L-0304 (SUB-CHANGE), L-0306 (SPARE ROOM), L-0304A (EAST MAINTENANCE ROOM), L-0304B (EQUIPMENT AIR LOCK), L-0304C/D/E (SECONDARY OFFGAS EXHAUSTER ROOMS), LC0305 AND LC0308 (CORRIDORS).
   REVISED HATCH SIZE (L-0303).
   DELETED COLUMN GRID J.3 AND ADDED COLUMN GRID J.4.

   INCORPORATED DCNS:
   DCN 24590-LAW-PIN-P01T-00009
   DCN 24590-LAW-PIN-P01T-00021
   DCN 24590-LAW-PIN-P01T-00024
   RELEASED HOLDS 1, 3, 5, 7, 8, 9, 11, AND 13, REVISED FCU LOCATIONS REVISED ROOM L-0301 LAYOUT FOR ASX SYSTEM, REVISED TITLE BLOCK, REVISED ELECTRICAL ROOMS L-0309, L-0311, AND L-0313, REVISED GFR-TK-00022 AND 23, REVISED LOCATION OF LSH-CRN-00017 REVISED STAIRS BETWEEN L-0304A AND LP0304E, ADDED HOLD 14, 15, ASX-DISP-00003, ASX-DISP-00004, ASX-HEPA-00025, LVP-SKID-00003, AND MISC. ELECTRICAL EQUIPMENT, MODIFIED LAYOUT OF LVP-EXHR-00001A, B, AND C, ADDED CONTROLLED ACCESS CALL OUTS AT CHASE ACCESSES, REMODELED RWH-CRN-00008, 20-CRN-00005, ASX-SMPLR-00012, AND ASX-SMPLR-00013, DELETED ROOM L-0301A, REVISED ELEVATION OF LP0304E, LSH-CRN-00017.

   REVISED DESCRIPTIONS OF HOLDS 2, 10, AND 16. RELEASED HOLDS ON REMAINING FCU'S. ADDED ISA-SKID-00003 IN ROOM L-0307. ROTATED EW/SS IN ROOM L-0304F. REVISED C3V-FAN-00005A & C3V-FAN-00005B. ADDED PARTIAL PLAN BELOW GFR MIXERS. REVISED SIZE OF LVP-EXHR-00001A/B/C. ADDED LP0304G FOR ACCESS TO RADAR WAVE GUIDE INSTRUMENTATION. ADDED LVE-MCC-20311. RELOCATED DOORS AND WALLS IN ROOM L-0304B. MODIFIED WALL TYPE AND THICKNESS FROM 7¼" TO 8½" FOR L-0304B SOUTH WALL.

HOLDS:

1. DELETED
2. LVP HEPA ROOM (L-0304H) FAN COIL UNIT LOCATION PENDING FINAL SECONDARY OFF-GAS PIPING ARRANGEMENT.
3. DELETED
4. DELETED
5. DELETED
6. DELETED
7. DELETED
8. DELETED
9. DELETED
10. MELTER OFFGAS HEPA FILTERS PENDING VENDOR SELECTION. TO BE PROVIDED BY MECHANICAL SYSTEMS ENGINEERING.
11. DELETED
12. TEMPERED WATER SYSTEM PENDING VENDOR SELECTION. TO BE PROVIDED BY MECHANICAL SYSTEMS.
13. DELETED
14. C2V AIR CONDITIONING UNITS AND AIR CONDENSING UNITS PENDING VENDOR SELECTION TO BE PROVIDED BY HVAC ENGINEERING.
15. ASX HEPA FILTERS PENDING VENDOR INFORMATION TO BE PROVIDED BY MECHANICAL SYSTEMS.
16. DELETED.
17. C&I EQUIPMENT PENDING VENDOR SELECTION FROM CONTROL SYSTEMS.
18. C3V AIR CONDITIONING UNITS PENDING VENDOR SELECTION TO BE PROVIDED BY HVAC ENGINEERING.

LEGEND:

CA	CONTROLLED ACCESS
EE	EMERGENCY EXIT
FCU	FAN COIL UNIT
FD	FIRE DOOR
L-XXXX	ROOM, CELL, (VAULT) OR TUNNEL
LCXXXX	
LMXXXX	MEZZANINE
LPXXXX	ROOM PLATFORM
LPCXXXX	CORRIDOR PLATFORM
LCHXX	CHASE
ELVXX	ELEVATOR
LSTXX	STAIR
	EQUIPMENT LAYDOWN AREA
	CONCRETE
	CHECKERED PLATE
	GRATING
	EMERGENCY EYEWASH
	LADDER
	EMERGENCY SHOWER/EYEWASH
	FLOOR PENETRATION

REVISION HISTORY

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
3	REVISED TO INCORPORATE CHANGES IN NOTE 3	TH	[illegible]	[illegible]	[illegible]	11/1/06
2	REVISED TO INCORPORATE CHANGES IN NOTE 3	OLL	CMS	PR	DRJ	12/19/05
0	ISSUED FOR DESIGN - SUPERSEDES DWG-W375LV-PL00046, REV D	TH	CMS	PR	CJW	11/25/03

ISSUED BY RPP-WTP PDC	PROJECT No.	24590
	SITE	HANFORD
	AREA	200E
	BUILDING No.	20

	BY	DATE
ORIGINATOR	TIMOTHY E. HAWKINS	11/25/03
CHECKER	CRAIG M. SALERNO	11/25/03
APPROVER	C.J. WINKLER	11/25/03
REVIEWER	PHIL REICHERT	11/25/03

CONTENT APPLICABLE TO ALARA? YES NO
ADR NO. 24590-LAW-ADR-PL-03-006 REV: 0
SAFETY SCREEN REQUIRED? YES NO / EMS REVIEW? YES
SAFETY SCREEN IS REQUIRED FOR DRAWING TYPES IDENTIFIED IN 24590-WTP-GPP-SREG-002

BECHTEL
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354
CONTRACT No: DE-AC27-01RV14136

LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 48'-0"

SCALE 1/16"=1'-0" | 24590-LAW-P1-P01T-00005 | REV 3

"E" SIZE - 44x34
COMPUTER GENERATED - MANUAL CHANGES NOT PERMITTED
10/27/2005 09:27:36 AM

FORM E_50%.DGN 02/2003

pg 4 of 4

RPP-WTP JOB No: 24590	**FIELD CHANGE REQUEST** **PART B** **Engineering Disposition**	FCR # 24590-WTP-FC-E-08-0250 Page 1 of 1

PART OF DESIGN CHANGE PACKAGE? ☐ YES ☒ NO DCP No.: Rev:

ENGINEERING DISPOSITION: ☒ APPROVED ☐ DISAPPROVED

DESIGN DOCUMENTS AFFECTED

The documents that may be listed are limited to specifications, drawings (including datasheets and engineering lists), and material requisitions (changes to Technical Notes only).

Document Number	Rev	Remarks	Incorporated By	
			Design Change	Reference
24590-LAW-P1-P01T-00005	3		X	
24590-LAW-P1-P23T-00050	2		X	

REQUIREMENTS REVIEW

Client Approval Required*	☐ Yes ☒ No	Permit Review by E&NS Required	☐ Yes ☒ No
Interface Resolution Required*	☐ Yes ☒ No	Safety Screening/Evaluation Required Documents identified in 24590-WTP-GPP-SREG-002 must be checked "Yes" regardless of the change being made, and E&NS signature is required	☒ Yes ☐ No
*Address these "yes" answers in the disposition			

DISPOSITION:

Design Engineering concurs with the requested change to relocate the subject panel 8" to the east in order to avoid an interference with rebar.

Basis of Disposition: Relocating the subject panel 8" does not impact its function for the systems its intended for. There are no technical changes with respect to this disposition.

Cause Code: 15

3-D Model Impact: ☒ Yes ☐ No

APPROVALS

	Print/Type Name	Signature	Date
ORIGINATOR:	R. W. Mossbrucker		7/9/08
CHECKER:	CRAIG SALERNO		7/9/08
APPROVER:	Dave Jackson		7/10/08
APPROVER:	Tom HUGHES		7/10/08
E&NS:			7/17/08
QA:	N/A		

ISSUED BY
RPP-WTP PDC

R11222794

Dangerous Waste Permit (DWP) Liner Heights in the LAW Facility

Document title: **Liner Heights in the LAW Facility**

Document number: 24590-LAW-PER-M-02-002, Rev 7

Contract number: DE-AC27-01RV14136

Department: Mechanical Systems

Author(s): K. Bhamidipaty

Checked by: Richard D Peters

Issue status: Approved

Approved by: Stuart Kretzschmar

Approver's position: DEGS, M&PE

Approver's signature: _____ Signature 6/1/10 Date

This bound document contains a total of 23 sheets

River Protection Project
Waste Treatment Plant
2435 Stevens Center Place
Richland, WA 99354
United States of America
Tel: 509 371 2000

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	Reason for revision	Revised by
0	Issued for permitting use.	J. Rewari
1	Revised to include +3 ft elevation and Appendix A	J. Rewari
2	Revised Appendix A	J. Rewari
3	Revised Section 3, Appendix A & Issued for permitting use.	J. Rewari
4	Revised to include +28 ft elevation and remove Melter 3 tankage. Issued for permitting use.	J. Rewari
5	Revised to include changes to -21 and +28 ft elevations	D.F. Miller
6	Revised to correct inconsistencies between text and appendix A	R. Hanson
7	Major Revision of Section 3 and Appendix A to incorporate flooding volumes and associated liner heights to match issued calculations	K. Bhamidipaty

Contents

Notice ii

History Sheet iii

1 Introduction 1

2 Applicable Documents 1

3 Description 1

- **3.1 Flooding Volume Description for LAW Facility at -21 Ft Elevation** 1
- **3.2 Flooding Volume Description for LAW Facility at +3 Ft Elevation** 2
- **3.3 Flooding Volume Description for LAW Facility at +28 Ft Elevation** 4
- **3.4 Curb Height in the Curbed Section of Room L-0304 F (Caustic Scrubber Area) at +48 Ft Elevation)** 5

Appendices

Appendix A Calculation of Volume and Liner Height ..... A-i

Figures

Figure 1 LAW Effluent General Flow Diagram 7

1 Introduction

The Washington Administrative Code, WAC 173-303-640[4][e][i][A], requires that secondary containment systems be designed or operated to contain one hundred percent of the capacity of the largest tank within its boundary containing dangerous waste. Per Washington State Department of Ecology Publication 95-420, *Guidance for Assessing Dangerous Waste Secondary Containment Systems*, page 3, where automatic fire extinguishing systems are used, the Uniform Fire Code requires secondary containment for hazardous materials to be sized with additional volume to contain the design flow rate for 20 minutes. This report discusses the assessment of flooding volume that is required to be contained for the low-activity waste vitrification (LAW) facility.

2 Applicable Documents

- WAC 173-303. *Dangerous Waste Regulations*. Washington Administrative Code.
- Washington State Department of Ecology Publication 95-420, *Guidance for Assessing Dangerous Waste Secondary Containment Systems*
- NFPA 13, Standard for the Installation of Sprinkler Systems, 1999

3 Description

3.1 Flooding Volume Description for LAW Facility at -21 Ft Elevation

LAW facility has the following vessel containing dangerous waste, in the process cells, and effluent cell rooms, at -21 ft elevation:

C3/C5 Drain Collection Cell	Room L-B001B
RLD-VSL-00004	C3/C5 Drains/Sump Collection Vessel

The only vessel in the LAW facility containing dangerous waste at (-) 21 ft elevation is the C3/C5 drains/sump collection vessel (RLD-VSL-00004). In the event of a line break, vessel failure, or tank overflow, flooding could occur in the cell. The C3/C5 drains/sump collection vessel (RLD-VSL-00004) is in an enclosed C3/C5 cell area, in room L-B001B (C3/C5 drain collection cell). The vessel could also receive firewater from the floor above.

To calculate the minimum height of C3/C5 drain collection cell (Room L-B001B) stainless steel liner, the following 2 scenarios are considered:

Scenario a:

This scenario is based on the design of the LAW facility and assumes leakage and spillage of the C3/C5 drains/sump collection vessel (RLD-VSL-00004) when the total volume of fluid contained in the vessel is discharged into the cell. The flooding volume is the larger of 110 % (used as a conservative criteria) of the maximum operating volume of the largest vessel, or 100 % of the total volume of the largest vessel. The vessel total volume is defined as internal volume of the vessel including the shell and both heads.

The total vessel volume of 1034 ft^3 is greater than 110 % of the maximum operating volume. Fire sprinklers are provided in this cell; therefore, 193.5 ft^3 of fire water from 20 minutes of sprinkler discharge (includes 10 % margin for overage i.e. safety factor = 1.1) in the cell is added to the flooding volume. The total volume of fluid that must be contained by the liner in the room = 1034 + 193.5 = 1227.5 ft^3.

The room has a sump and sloping segments of floor. The volume of fluid accommodated on the sloping floor between top of sump and the high point on the floor is calculated to be 7.9 ft^3. Therefore, the volume of fluid that occupies the room space above the high point slope is equal to 1227.5 - 7.9 = 1219.6 ft^3.

The liner height is measured from the top of sump. Therefore, the minimum required liner height is calculated as the sum of two parts: (1) height of high point slope above sump, and (2) height of liner top above the high point slope. The high point of floor is 2 in above the top of sump. The available cross-sectional area of the room is calculated to be 387 ft^2. The required liner height above the high point slope is equal to the volume 1219.6 ft^3 divided by the available cross-sectional area of the room (= 387 ft^2), which is equal to 3.16 ft = 3 ft 2 in (rounded to nearest inch).

The liner height from top of sump for scenario a. is equal to 3 ft 2 in + 2 in = 3 ft 4 in.

Scenario b:

This scenario is based on the design of the LAW facility and uses a conservative volume of firewater flow to calculate the minimum liner height. The Vessel RLD-VSL-00004 is full and intact so only firewater runoff from higher elevation floor drains is considered for the flooding volume. As shown in Figure 1, firewater flow into some floor drains, sumps, and overflow lines drain into the C3/C5 Floor Drain Vessel (RLD-VSL-00004). In the event of a fire, the firewater could collect on the higher elevations and drain to the tank causing the tank to overflow. Since the tank is full and not leaking in this scenario, firewater would flow out of the tank and into the cell via the overflow nozzle. The firewater used in this scenario is the largest design requirement for the LAW facility. Volume of 20 minutes of firewater outside of the cell is calculated to be 11,220 gallons (or 1,500 ft^3).

Therefore, the required liner height for C3/C5 drain collection cell from top of sump for scenario b. is equal to 4 ft 1 in.

3.2 Flooding Volume Description for LAW Facility at +3 Ft Elevation

LAW facility has the following vessels and miscellaneous units, containing dangerous waste, in the process cells, and effluent cell rooms, at +3 ft elevation:

Process Cell Room L-0123

LCP-VSL-00001	Melter 1 Concentrate Receipt Vessel
LFP-VSL-00001	Melter 1 Feed Preparation Vessel
LFP-VSL-00002	Melter 1 Feed Vessel
LOP-VSL-00001	Melter 1 SBS Condensate Vessel
LOP-WESP-00001	Melter 1 Wet Electrostatic Precipitator (WESP)
LOP-SCB-00001	Melter 1 Submerged Bed Scrubber (SBS)

Process Cell Room L-0124

LCP-VSL-00002	Melter 2 Concentrate Receipt Vessel
LFP-VSL-00003	Melter 2 Feed Preparation Vessel
LFP-VSL-00004	Melter 2 Feed Vessel
LOP-VSL-00002	Melter 2 SBS Condensate Vessel
LOP-WESP-00002	Melter 2 Wet Electrostatic Precipitator (WESP)
LOP-SCB-00002	Melter 2 Submerged Bed Scrubber (SBS)

Effluent Cell Room L-0126

RLD-VSL-00003	Plant Wash Vessel
RLD-VSL-00005	SBS Condensate Collection Vessel

3.2.1 Process Cells

The process cells have 6 vessels in each cell. Both process cells are identical in size and contain a similar set of vessels.

For calculating the minimum height of stainless steel liners for process cell rooms L-0123, and L-0124, the following scenario is considered:

The total volume of fluid contained in the largest vessel is discharged by leakage or spillage into the cell. To calculate the available area of the cell where the flooding volume could leak, the largest cross-sectional area of each of the vessels (except the leaking vessel) are subtracted from the cross-sectional area of the rectangular cell.

Conservative values for the vessel volume are used in the calculation of the liner height by using the volume of the vessel without subtracting the volume of the internal equipment. The largest cross-sectional area of the vessel is used to conservatively calculate the cross-sectional area of the rectangular cell, even though the cross-sectional area of the vessel at the bottom is much smaller.

The liners are sized to hold 100 % of the total volume of the largest vessel or 110 % of its maximum operating volume, whichever is greater. In all cases, the total volume is used because this is larger than 110 % of the volume up to the overflow nozzle.

The largest vessel in each cell is the concentrate receipt vessel, (LCP-VSL-00001, -00002), and the total volume of each is 2427.6 ft^3. These rooms have sumps and sloping segments of floor that accommodate 62.1 ft^3 of liquid in each room from the top of sump to the high point slope. Therefore, the volume of fluid that occupies the room space above the high point slope is equal to 2427.6 - 62.1 = 2365.5 ft^3.

The liner height is measured from the top of sump. Therefore, the minimum required liner height is calculated as the sum of two parts: (1) height of high point slope above sump, and (2) height of liner top above the high point slope. The high point of floor is 2 ⅞ in (= 0.24 ft) above the top of sump. The available cross-sectional area of the room is calculated to be 1411.5 ft^2. The required liner height above the high point slope is equal to the volume 2365.5 ft^3 divided by the available cross-sectional area of the room (= 1411.5 ft^2), which is equal to 1.676 ft.

Therefore, the required liner height above the top of sump is equal to 1.676 ft + 0.24 ft = 1.916 ft = 1 ft 11 in (rounded to nearest inch).

3.2.2 Effluent Cell

Effluent cell room L-0126 has 2 vessels in it. Both vessels are identical in size. Using the same method as for the process cells, the total volume of each of these vessels is 3445 ft^3. This room has sumps and sloping segments of floor that accommodate 11.4 ft^3 of liquid in each room from the top of sump to the high point slope. Therefore, the volume of fluid that occupies the room space above the high point slope is equal to 3445 ft^3 - 11.4 ft^3 = 3433.6 ft^3.

Conservative values for the vessel volume are used in the calculation of the liner height by using the volume of the vessel without subtracting the volume of the internal equipment. The largest cross-sectional area of the vessel is used to conservatively calculate the cross-sectional area of the rectangular cell, even though the cross-sectional area of the vessel at the bottom is much smaller.

The liner height is measured from the top of sump. Therefore, the minimum required liner height is calculated as the sum of two parts: (i) height of high point slope above sump, and (ii) height of liner top above the high point slope. The high point slope of floor is 2 ⅛ in (= 0.177 ft) above the top of sump. The available cross-sectional area of the room is calculated to be 996.54 ft^2. The required liner height above the high point slope is equal to the volume 3433.6 ft^3 divided by the available cross-sectional area of the room (= 996.54 ft^2), which is equal to 3.446 ft.

Therefore, the required liner height from top of sump is equal to 3.446 ft + 0.177 ft = 3.623 ft = 3 ft 8 in (rounded to nearest inch).

3.3 Flooding Volume Description for LAW Facility at +28 Ft Elevation

LAW facility has the following tank, containing dangerous waste, at +28 ft elevation:

Caustic Scrubber Blowdown Pump Room, Room L-0218

LVP-TK-00001 Caustic Collection tank

3.3.1 Room L-0218

Caustic Scrubber Blowdown Pump Room, L-0218, at elevation +28 contains the caustic collection tank (LVP-TK-00001). The tank sits on a 6" high octagonal pedestal. The floor in room L-0218 is not sloped, however, the octagonal tank pedestal is provided with grooves that slope from the center of the tank pedestal to divert a potential leak under the tank. Also located in this room are 4 pumps on individual pedestals. The room's concrete vault walls are designed and provided with a special protective coating approved by Ecology in accordance with the *Engineering Specification for Field Applied Special Protective Coatings for Secondary Containment* (24590-WTP-3PS-AFPS-TP006).

For calculating the minimum height of the secondary containment coating on the vault walls, the following scenario is considered:

The total volume of the fluid contained in the tank is discharged by leakage or spillage into the secondary containment. In addition to this, if there is a fire in the area during this event, the automatic fire

protection sprinkler system will activate and add fire protection water to the fluid discharged from the tank. Therefore, the secondary containment wall is sized to handle the volume of the fire protection water from the sprinkler system over the design area for a period of 20 minutes, including a 10 % margin for overage (i.e., safety factor =1.1), in addition to the 100 % capacity of the tank.

To calculate the minimum secondary containment wall coating height, the available volume of the room (this includes the vessel cross-sectional area) and the volume of fire water must also be calculated; altogether, the calculation is done in four steps.

Step 1: Calculate the volume of fluid within the caustic collection tank. This takes into account the entire volume of 1950 ft^3.

Step 2: Calculate the volume of available secondary containment coating up to a height of 6". This step excludes the 6" tank pedestal and the 4 pump pedestals to a height of 6", from the available area of the room. This volume = 204.4 ft^3.

Step 3: Calculate the additional height of the secondary containment coating after the first 6". This step excludes the area above the 4 pump pedestals to a height of the ceiling (height of pump pedestals is considered to be the height of the room for conservatism) from the total area of the room. The remaining wall height is found by dividing the remaining fluid volume by the area available. The available area of the room above the pump pedestals = 595.17 ft^2, and the remaining fluid volume = 1745.6 ft^3. The additional height of the secondary containment after the first 6" is equal to 2.933 ft.

Step 4: Calculate the volume of 20 minutes of firewater from the sprinkler system, multiplied by a safety factor of 1.1. Calculate the height of the secondary containment wall for firewater by dividing the volume of firewater by the area of the room minus the area of the 4 pump pedestals. The firewater volume = 319.423 ft^3 and the additional height of secondary containment required = 319.423 ft^3 / 595.14 ft^2 = 0.537 ft.

The secondary containment wall coating height is then: 6" (Step 1) plus additional height of the wall (Step 3) plus height required for firewater (Step 4).

The secondary containment wall coating height required for this room is 0.5 ft + 2.933ft + 0.537 ft = 3.97 ft, rounded to 4 ft.

3.4 Curb Height in the Curbed Section of Room L-0304 F (Caustic Scrubber Area) at +48 Ft Elevation)

This report addresses the following miscellaneous unit containing dangerous waste at + 48 ft elevation.

Secondary Offgas Equipment Room L-0304 F (curbed section only)

LVP-SCB-00001 Caustic Scrubber (curbed section)

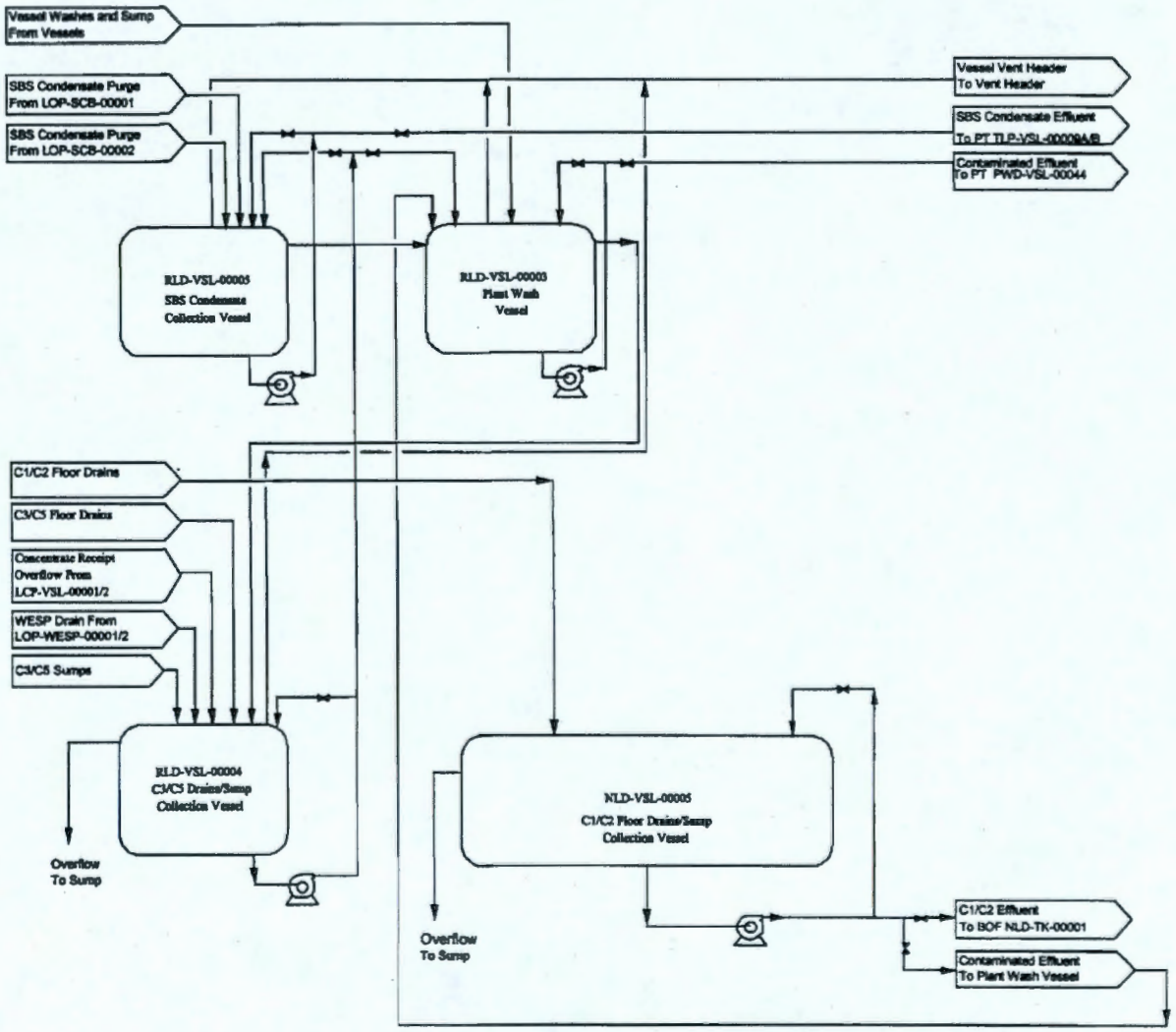
A curbed area with an open floor drain (RLD-FD-00025) has been provided in South-East corner of Room L-0304 F. The LVP Caustic Scrubber is located inside the curbed area that is designed to prevent a potential spill or leak from flowing into the other sections of Secondary Off-gas Equipment Room (L-0304 F). The curbed area is also designed to prevent firewater inflow to the caustic scrubber area due to sprinkler activation in the adjacent part of room L-0304 F. The curbed area is designed

and provided with a special protective coating approved by Ecology in accordance with the *Engineering Specification for Field Applied Special Protective Coatings for Secondary Containment* (24590-WTP-3PS-AFPS-TP006). The floor drain will direct a potential spill or leak from the caustic scrubber LVP-SCB-00001 to RLD-VSL-00004 located at -21 ft. elevation.

The caustic scrubber system continuously recycles scrubber solution between the caustic scrubber and the caustic collection tank (LVP-TK-00001) located directly below the scrubber at the +28 ft. elevation. The caustic scrubber is normally operated under vacuum (-124 in. WC nominal). In the event of any small to moderate leak in the caustic scrubber, room air will be pulled in, which mitigates the out-leakage of scrubber solution. Any large leak in the recirculation piping would trigger a loss of flow interlock that shuts down the recirculation pumps isolating the caustic scrubber from the recirculation piping.

A calculation for the curb height (flood volume) for this area was not completed because the curb height is based principally on the discharge of the fire protection sprinkler system with only minimal contribution from leakage of caustic scrubber and associated ancillary equipment. The floor drains and curbs are sized for 20 minutes of fire sprinkler water flow. The floor and curb area is coated with a special protective coating to the top of the 4 inch curb. This room is shown on drawing 24590-LAW-P1-P01T-00005 (*LAW Vitrification Building General Arrangement Plan at El 48'- 0"*).

Figure 1 LAW Effluent General Flow Diagram



Appendix A

Calculation of Volume and Liner Height

Appendix A: Calculation of Volume and Liner Height

1 Purpose

The purpose of this calculation is to size the height of the liners in the process cells for LAW vitrification facility at elevation -21 ft and elevation +3 ft. C3/C5 drains/sump collection vessel (RLD-VSL-00004) room L-B001B is shown at elevation -21 ft on drawing 24590-LAW-P1-P01T-P0001 (*LAW Vitrification Building General Arrangement Plan at El. -21'- 0'*). Process cell rooms L-0123 and L-0124 and effluent cell room L-0126 at elevation +3 ft are shown on drawing 24590-LAW-P1-P01T-P0002 (*LAW Vitrification Building General Arrangement Plan at El 3'-0"*).

Additionally, this calculation will size the height of the secondary containment with protective coating required for the caustic scrubber blowdown pump room, Room L-0218 at elevation +28. This room is shown on drawing 24590-LAW-P1-P01T-P0004 (*LAW Vitrification Building General Arrangement Plan at El 28'-0"*).

2 Criteria and Design Input

2.1 Process and Effluent Cell Liner Height

Per Assumption 3.1.1, the vessels are conservatively assumed to be completely filled (including the top head) and sitting on the floor. The largest vessel total volume is used as the volume in determining the liner height. To allow for the worst case scenario, the volume of the vessel is assumed to leak completely onto the floor.

The liners are sized to hold 100 % of the total volume of the largest tank or 110 % of its maximum operating volume, whichever is larger. In all cases, the total volume is used because this is larger than 110 % of the volume up to the overflow nozzle.

For the process cells and the effluent cells, the largest vessel total volume is used as the volume in determining the liner height. The fire water spray in these cells is at a density of 0.17 gal/min/ft^2, for 20 minutes and is multiplied by a safety factor of 1.1.

The following vessels are contained within the process and effluent cells.

LCP-VSL-00001	Melter 1 Concentrate Receipt Vessel	Room L-0123	El. +3'
LCP-VSL-00002	Melter 2 Concentrate Receipt Vessel	Room L-0124	El. +3'
LFP-VSL-00001	Melter 1 Feed Preparation Vessel	Room L-0123	El. +3'
LFP-VSL-00002	Melter 1 Feed Vessel	Room L-0123	El. 3.3'
LFP-VSL-00003	Melter 2 Feed Preparation Vessel	Room L-0124	El. +3'
LFP-VSL-00004	Melter 2 Feed Vessel	Room L-0124	El. +3'
RLD-VSL-00003	Plant Wash Vessel	Room L-0126	El. +3'
RLD-VSL-00005	SBS Condensate Collection Vessel	Room L-0126	El. +3'

LOP-VSL-00001	Melter 1 SBS Condensate Vessel	Room L-0123	El. +3'
LOP-SCB-00001	Melter 1 SBS Vessel	Room L-0123	El. +3'
LOP-VSL-00002	Melter 2 SBS Condensate Vessel	Room L-0124	El. +3'
LOP-SCB-00002	Melter 2 SBS Vessel	Room L-0124	El. +3'
LOP-WESP-00001	Melter 1 WESP	Room L-0123	El. +3'
LOP-WESP-00002	Melter 1 WESP	Room L-0124	El. +3'

Location and size of the C3/C5 drain collection cell (room L-B001B) is based on drawing 24590-LAW-P1-P01T-P0001 (*LAW Vitrification Building General Arrangement Plan at El. -21' 0"*). Location and size of process rooms L-0123, and L-0124 and effluent room L-0126, at elevation 3 ft are shown on drawing 24590-LAW-P1-P01T-P0002 (*LAW Vitrification Building General Arrangement Plan at El. 3' 0"*).

2.2 Secondary Containment Vault Liner Height

The caustic collection tank (LVP-TK-00001) is located in the caustic scrubber blowdown tank room L-0218 at elevation +28'-0". The height of the special protective coating on the containment vault wall is sized to handle the volume of fire-protection water from the fire protection system over the design area for a period of 20 minutes, multiplied by a safety factor of 1.1, in addition to the 100 % capacity (or total volume) of the tank. The fire protection water automatic sprinkler design density is 0.17 gpm/sq. ft. Location and size of room L-0218 at elevation +28 ft is shown on drawing 24590-LAW-P1-P01T-P0004 (*LAW Vitrification Building General Arrangement Plan at El. 28' 0"*).

3 Assumptions

3.1 Assumptions Not Requiring Verification

3.1.1 To provide the worst case scenario, the vessels are conservatively assumed to be completely filled (including the top head) and sitting on the floor, and that the largest vessel total volume is used as the volume in determining the liner height. To allow for the worst case scenario, the volume of the vessel is assumed to leak completely onto the floor until it reaches equilibrium with surrounding fluid level.

3.2 Assumptions Requiring Verification

None

4 Methodology

As stated above in the criteria and design input section, to determine the required liner height for the worst case, the calculation methodology (per Assumption 3.1.1) considers that the vessels are completely filled and sitting on the floor and that the largest tank leaks completely into the room. For the C3/C5 drain collection cell (room L-B001B), the maximum leakage volume to the cell is fire water input from higher elevation floor drains to a filled C3/C5 drains/sump collection vessel (RLD-VSL-00004).

4.1 Basic Equations

$\pi = 3.14$

Area of a Rectangle = Length x Width

Inside cross-sectional area of the vessel = $\pi \frac{D_i^2}{4}$, outside cross-sectional area of the vessel = $\pi \frac{D_o^2}{4}$

Volume of Cylinder = $\frac{\pi}{4} \cdot D_i^2 \cdot h$

Volume of Rectangular Room = Length x Width x Height

Area of a Regular Polygon = 1/2 x a x p (where a = apothem and p = perimeter)

4.2 Room Dimensions, Equations and Symbology

L = length of room (ft)

W = width of room (ft)

H = height of room (ft)

A = area of room (ft^2)

Δ = height of high point slope above the top of sump (ft), if the room floor has sloping segments (if floor has no slope, $\Delta = 0$)

4.3 Volume and Liner Height Calculation

Volume of a vessel or tank is calculated by using the following equations:

$$V_S = \frac{\pi D_i^2}{4} L_{T-T}$$

where:

V_S = volume of the cylindrical portion of the vessel or tank

D_i = inside diameter, D_o = outer diameter

L_{T-T} = tangent to tangent length

Volume (V_h) of 1 F&D (flanged and dished) head is calculated using the following equation:

$$V_h = 0.0847 D_i^3$$

$d = 0.162\,D_i$, d = the depth of the F&D head

Refer to *Pressure Vessel Design Manual* (Moss, 1987).

Volume (V_c) of conical head is calculated using the following equation:

$V_c = (1/3)(\pi/4)(D_i^2)d$, d = the height of the conical head

V_V = total volume of the vessel (tank) = volume of the cylindrical portion + volume of top head + volume of bottom head.

V_F = Volume of Firewater = Area of Room x fire water spray density x 20 minutes x 1.1 safety factor
(this is calculated only if the room has automatic sprinkler system installed)

V_{SF} = volume of fluid in the space above the top of sump up to the high point slope
(This is calculated only if the floor has sloping segments. Otherwise, $V_{SF} = 0$. Calculation involves 3-D geometry, which is not included here)

H_L = required liner height (measured from top of sump)
= height of high point slope above top of sump + liner height above the high point slope

Total volume of fluid to be contained by the liner = $V_V + V_F$

Out of this volume, an amount of volume equal to V_{SF} is contained in the space between top of sump and high point slope. This height is equal to Δ.

The remaining volume of fluid $= V_V + V_F - V_{SF}$, which is contained by the portion of the liner above the high point slope.

This height of liner above the high point slope = $\dfrac{V_V + V_F - V_{SF}}{Available\ Area\ of\ Room}$

H_L = required liner height above top of sump = $\Delta + \dfrac{V_V + V_F - V_{SF}}{Available\ Area\ of\ Room}$

4.4 Available Area for Liquid Containment

a) For Cells:

To calculate the possible (available) area that the liquid in the vessel could leak into, the sum of the cross sectional areas of the vessels (except the leaking or failing vessel) is subtracted from the cross sectional area of the room. Thus, the

Available area of the room = area of the room minus sum of the cross sectional areas of the vessels (except the leaking vessel) in the room (ft^2).

The height of liner is equal to the volume of the largest vessel divided by the available area of room.

Height of the liner (ft) = volume of the largest vessel / area available

b) For Room L-0218:

Room L-0218 contains 4 pumps and 1 tank. To calculate the possible area that the liquid could leak into, the available volume of the room and the volume of the firewater must be calculated. This is done in four steps, calculating available volume by height.

1. Calculate total (100%) volume of the tank
2. Calculate the volume of available secondary containment coating up to a height of 6"
3. Calculate additional height required to accommodate the remaining tank volume. Volume of the tank minus the volume calculated in step 2 is divided by the available area of the room. The available area of the room in this step is the area of the room above 6" high octagonal pedestal minus the combined cross-sectional area of the four pump pedestals.
4. Calculate the volume of 20 minutes of firewater from the sprinklers multiplied by a safety factor of 1.1. Calculate the height of the containment wall for firewater by dividing the volume of firewater by the available area of the room calculated in Step 3.

The secondary containment wall height required is then: 0.5 ft (= 6", from Step 2) plus additional height of wall (Step 3) plus height required for containment of firewater (Step 4).

5 Calculations

Complete calculations for the liner height are as follows for each individual cell:

5.1 C3/C5 Drain Collection Cell, Room L-B00lB, Elevation -21 ft

Vessel Number	Diameter (D_i) ft	L_{T-T} ft	Head Type (Flange and Dished)	Total Height (including bottom and top head) ft	Remark
RLD-VSL-00004	10	11	F&D (bottom and top)	14.24	

Two scenarios are considered:

a Leakage and spillage of the C3/C5 drains/sump collection vessel RLD-VSL-00004

b Collection of fire water runoff when the vessel is full and intact with a safety factor of 1.1

5.1.1 Scenario a

In this scenario, liner height is calculated based on firewater discharge (from the in-cell sprinkler system, for a period of 20 minutes, at a discharge rate of 0.17 gpm / ft^2 using the total floor area of the cell i.e. including vessel cross-sectional area) with a safety factor of 1.1 plus 100% of the vessel volume.

V_V = total volume of vessel RLD-VSL-00004 (using formula given in Section 4.3 above)

= Volume of the cylindrical portion + volume of top head + volume of bottom

$= [\pi/4 \times (10)^2 \times 11] + [0.0847 \times (10)^3] + [0.0847 \times (10)^3]$

$= 863.94 + 84.7 + 84.7 = 1033.34$, rounded to 1034 ft^3

Available area of the room = $(16.58 \times 23.33) = 387$ ft^2

V_F = volume of fire water from sprinkler system in the cell

= Area of room x fire water spray density x 20 minutes x 1.1 (= safety factor)

$= 387\ ft^2 \times 0.17$ gal/min/ft^2 x 20 min x 1.1 = 1447 gal = 193.5 ft^3

V_{SF} = volume of fluid in the space above the top of sump up to the high point slope = 7.9 ft^3

Δ = height of high point slope above the top of sump = 2 in $\approx$ 0.167 ft

H_L = required liner height above top of sump = 0.167 ft + $\dfrac{1034 + 193.5 - 7.9}{387}$ ft = 3.318 ft

= 3 ft 4 in (rounded to nearest inch).

5.1.2 Scenario b

The firewater runoff volume is conservatively calculated using an area of 3,000 ft^2, sprinkler discharge density of 0.17 gpm / ft^2, for a duration of 20 minutes, with a safety factor of 1.1. (NFPA 13, Standard for the Installation of Sprinkler Systems, 1999).

V_{RF} = Runoff firewater volume = (3,000 ft^2) x (0.17 gpm / ft^2) x (20 minutes) x (1.1) = 11,220 gallons

= 1,500 ft^3.

Using the values of Δ, V_{SF}, and available area of the room from Sec 5.1.1,

$$H_L = \text{required liner height above top of sump} = \Delta\,(= 0.167\text{ ft}) + \frac{V_{RF} - V_{SF}}{\textit{available area of room}}$$

$$= 0.167\text{ ft} + \frac{1{,}500 - 7.9}{387}\text{ ft} = 0.167\text{ ft} + 3.855\text{ ft} = 4.022\text{ ft} = 4\text{ ft }1\text{ in (rounded to nearest inch).}$$

The greater of the two values (of required liner height) from Sections 5.1.1 and 5.1.2 is taken as the minimum required liner height in this room.

Therefore, the minimum required liner height in the room L-B001B = 4 ft 1 in.

The installed liner height in room L-B001B = 9 ft 6 in.

5.2 Melter 1 and 2 Process Cells, Rooms L-0123 and L-0124, Elevation +3 ft

Room Number	Vessel Number	Outside Diameter (D_o) ft,	Inside Diameter (D_i) ft	$L_{T\text{-}T}$ ft	Total Height (including bottom and top head) ft	Remark
L-0123	LCP-VSL-00001	14.13	14	12.75	17.29	Largest vessel in the room
	LFP-VSL-00001	11.13	11	10.46	14.02	
	LFP-VSL-00002	11.13	11	10.46	14.02	
	LOP-VSL-00001	12.10	12	8.12	12	
	LOP-WESP-00001	8.08	8	17	19	
	LOP-SCB-00001	10.10	10	6.5	9.74	
L-0124	LCP-VSL-00002	14.13	14	12.75	17.29	Largest vessel in the room
	LFP-VSL-00003	11.13	11	10.46	14.02	
	LFP-VSL-00004	11.13	11	10.46	14.02	
	LOP-VSL-00002	12.10	12	8.12	12	
	LOP-WESP-00002	8.08	8	17	19	
	LOP-SCB-00002	10.10	10	6.5	9.74	

note: All vessels have F&D type bottom and top heads.

V_V = volume of largest vessel from table above = volume of cylindrical portion + volume of heads
$= [\pi/4 \times (14)^2 \times 12.75] + [0.0847 \times (14)^3] + [0.0847 \times (14)^3]$
$= 1962.71 + 232.41 + 232.41 = 2427.6\ ft^3$

Available area of the room = $(38.33 \times 48.33) - [\pi/4 \times \{(8.08)^2 + (11.13)^2 + (12.10)^2 + (10.10)^2 + (11.13)^2]$
$= 1411.5\ ft^2$

V_F = 0 (no sprinklers installed in these rooms)

V_{SF} = volume of fluid in the space above the top of sump up to the high point slope
$= 62.1\ ft^3$

Δ = height of high point slope above the top of sump = 2 ⅞ in $\approx$ 0.24 ft

H_L = required liner height above top of sump= 0.24 ft + $\dfrac{2427.6 + 0 - 62.1}{1411.5}$ ft = 1.916 ft
= 1 ft 11 in (rounded to nearest inch).

5.3 Effluent Cell Calculations, Room L-0126, Elevation +3

Room Number	Vessel Number	Diameters (D_o) ft, (D_i) ft	L_{T-T} ft	Head Type	Total Height (including bottom and top head) ft	Remark
L-0126	RLD-VSL-00003	16.13, 16	14.66	Flat top and F&D bottom	18	Both vessels in this room
	RLD-VSL-00005	16.13, 16	14.66	Flat top and F&D bottom	18	

V_V = volume of largest vessel (from the table above)
= volume of the plant wash/SBS condensate collection vessel (RLD-VSL-00003/RLD-VSL-00005)
= volume of cylindrical portion + volume of F&D bottom + volume of flat head (cylindrical) portion
$= [\pi/4 \times (16)^2 \times 14.66] + [0.0847 \times (16)^3] + [\pi/4 \times (16)^2 \times \{18 - 14.66 - (0.162 \times 16)\}]$
$= 2947.57 + 346.93 + 150.39$
$= 3445\ ft^3$

Available area of the room = $(38.33 \times 31.33) - [(\pi/4)\ (16.13)^2\}] = 996.54\ ft^2$

V_F = 0 (no sprinklers installed in these rooms)

V_{SF} = volume of fluid in the space above the top of sump up to the high point slope
= 11.4 ft^3

Δ = height of high point slope above the top of sump = 2 ⅛ in ≈ 0.177 ft

H_L = required liner height above top of sump= 0.177 ft + $\frac{3445+0-11.4}{996.54}$ ft = 3.622 ft
= 3 ft 8 in (rounded to nearest inch).

5.4 Caustic Scrubber Blowdown Pump Room, Room L-0218, Elevation + 28

Caustic Collection Tank, Room L-0218, Elevation +28

Room Number	Tank Number	Diameter (D_i) ft	L_{T-T} ft	Head Type
L-0218	LVP-TK-00001	13	14.33	Flat bottom and conical top with 1: 6 slope

Step 1. Tank volume.

Volume of the tank using the table above
= Volume of the Caustic Collection Tank (LVP-TK-00001)
= Volume of cylindrical portion + Volume of conical head portion
= $[(\pi/4)\ (13\ ft)^2\ (14.33\ ft)] + [(1/3)\ (\pi/4)\ (13\ ft)^2\ (1.083\ ft)]$
= 1,902.054 ft^3 + 47.916 ft^3 = 1,950 ft^3 (rounded to)

Step 2. Containment volume for 6" high wall.

Containment area has 6-in high octagonal pedestal for tank LVP-TK-00001. The distance between the parallel sides of the tank pedestal is 15ft. Each side of the pedestal is 6 ft 2 9/16 in.

Area of the tank pedestal is = 0.5 x 7.5 x 8 x 6.214 = 186.42 ft^2.

Area of the room available for containment up to a height of 6-in is
= Area of the room - Area of the Pump Pedestals - Area of the Tank Pedestal.

Area of the room = (9ft- 2 1/4in) x (21ft- 3in) + (15ft- 3in) x (22ft- 4in) + (5ft- 4 1/4in) x (19ft- 3in)
= (110.25in) x (255in) + (183in) x (268in) + (64.25in) x (231in)
= 638.89 ft^2

Area of the Pump Pedestals = 4 x ((2ft- 1in) x (5ft- 3in))
= 4 x (25in x 63in) = 43.75 ft^2

Area of the room available for containment up to a height of 6-in is
= 638.89 ft^2 - 43.75 ft^2 - 186.42 ft^2 = 408.72 ft^2

Volume of liquid contained by 6" high wall = 408.72 ft^2 x 0.5 ft = 204.4 ft^3

Step 3. Containment wall height needed for remaining fluid.

(Note: VSL is credited for containing volume up to a height equal to the wall height i.e. vessel area is included in the available area of the room)

Volume of tank = 1,950 ft^3

Remaining volume of tank to be contained = Volume tank - Volume contained by 6" high wall (7.2)
= 1,950 ft^3 - 204.4 ft^3
= 1745.6 ft^3

Area of the room available for containment is,
= Area of the room above 6in octagonal pedestal - Cross sectional area of the Pump Pedestals
= 638.89 ft^2 - 43.75 ft^2
= 595.14 ft^2

Height of wall needed to contain remaining volume of fluid from the tank
= 1745.6 ft^3 / 595.14 ft^2
= 2.933 ft

The wall height required to contain the leaking fluid from the tank to a height where the balance of fluids remain inside the tank, or a massive failure of the vessel where the leaking fluids flow back into the area of the ruptured tank.

Wall height for fluid containment = 0.5 ft + 2.933 ft = 3.433 ft.

Step 4. Additional wall height required for firewater.

In the event of a fire in the area and the sprinklers come on, the volume of water added to the containment will be based on the firewater spray density of 0.17 gal/min/ft^2 for a time of 20 minutes multiplied by a safety factor of 1.1.

Volume of firewater = Area of containment in ft^2 x 0.17 gal/min/ft^2 x 20 minutes x 1.1
= 638.89 ft^2 x 0.17 gal/min/ft^2 x 20 minutes x 1.1
= 2389.449 gallons
= 319.423 ft^3

Therefore, additional height of wall required to accommodate firewater volume
= Volume of firewater / (Area of the room - area of pump pedestals)

$= 319.423\ ft^3 / (638.89\ ft^2 - 43.75\ ft^2)$
$= 319.423\ ft^3 / (595.14\ ft^2)$
$= 0.537\ ft$

Wall height required to accommodate for firewater = 0.537 ft

Total wall height for worst-case scenario.
Worst-case scenario includes both a rupture of the tank and the accumulation of 20 minutes of firewater.

Containment wall height required = 0.5 ft + 2.933 ft + 0.537 ft = 3.97 ft ≅ 4 ft.

6 Summary

The minimum required liner heights using the method above for the rooms are as follows:

Table of Liner Height

Cell	Room	Required Liner Height above Top of sump (rounded to nearest inch)	Installed Liner Height
C3/C5 Drain Collection Cell	L-B001B	4 ft 1 in	9 ft 6 in
Melter 1 Process Cell	L-0123	1 ft 11 in	2 ft 2 in
Melter 2 Process Cell	L-0124	1 ft 11 in	2 ft 2 in
Effluent Cell	L-0126	3 ft 8 in	4 ft 8 in

Table of Secondary Containment Wall Height with Special Protective Coating

Room	Room Number	Required Liner Height above Top of sump (rounded to nearest inch)	Installed Liner/ Coating Height
Caustic Scrubber Blowdown Pump Room	L-0128	4 ft 0 in	4 ft 0 in

7 References

24590-LAW-P1-P01T-00001, *LAW Vitrification Building General Arrangement Plan at El. -21'0" Rev. 3*

24590-LAW-P1-P01T-00002, *LAW Vitrification Building General Arrangement Plan at El. 3'0" Rev. 5*

24590-LAW-P1-P01T-00004, *LAW Vitrification Building General Arrangement Plan at El. 28'0" Rev. 4*

24590-LAW-P1-P01T-00005, *LAW Vitrification Building General Arrangement Plan at El. 48'0" Rev. 3*

Moss, Dennis R. 1987. *Pressure Vessel Design Manual*, Gulf Publishing Co.

24590-WTP-3PS-AFPS-TP006, Engineering *Specification for Field Applied Special Protective Coatings for Secondary Containment.*

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Principal author signature: Bryson Bogart

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River Protection Project
Waste Treatment Plant
2435 Stevens Center Place
Richland, WA 99354
United States of America
Tel: 509 371 2000

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History Sheet

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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	• 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	• 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	• 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	• 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	• 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
9	2/8/10	• Added Figures 14 through 16, revised Figure 13 Issued for Permitting Use	Bryson Bogart, Dan Robertson

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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 containment[1]. 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	Codes and specifications: • 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. 2.1.6). • 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	Site-specific response spectra as specified in SRD (Ref. 2.1.9). • 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,' = 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	• 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	• HLW and PT: Based on ANSI/AISC N690 (Ref 2.1.4) and AISC (Ref 2.1.6). • 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. Refer to Figures 14 and 15 for ASX liner 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 16 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

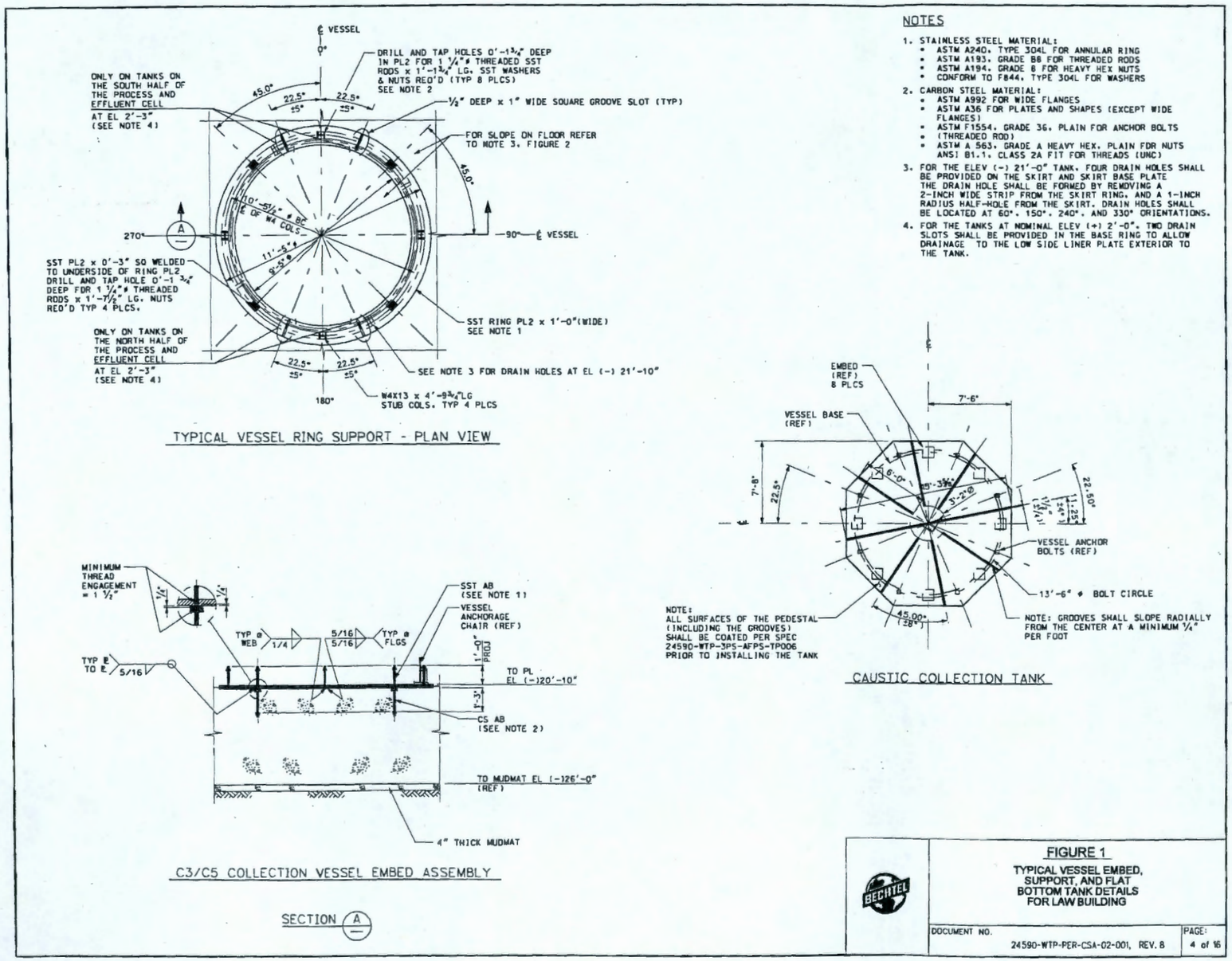


Figure 2 Liner Plate and Grillage Support Details for PT, HLW, LAW and LAB Buildings

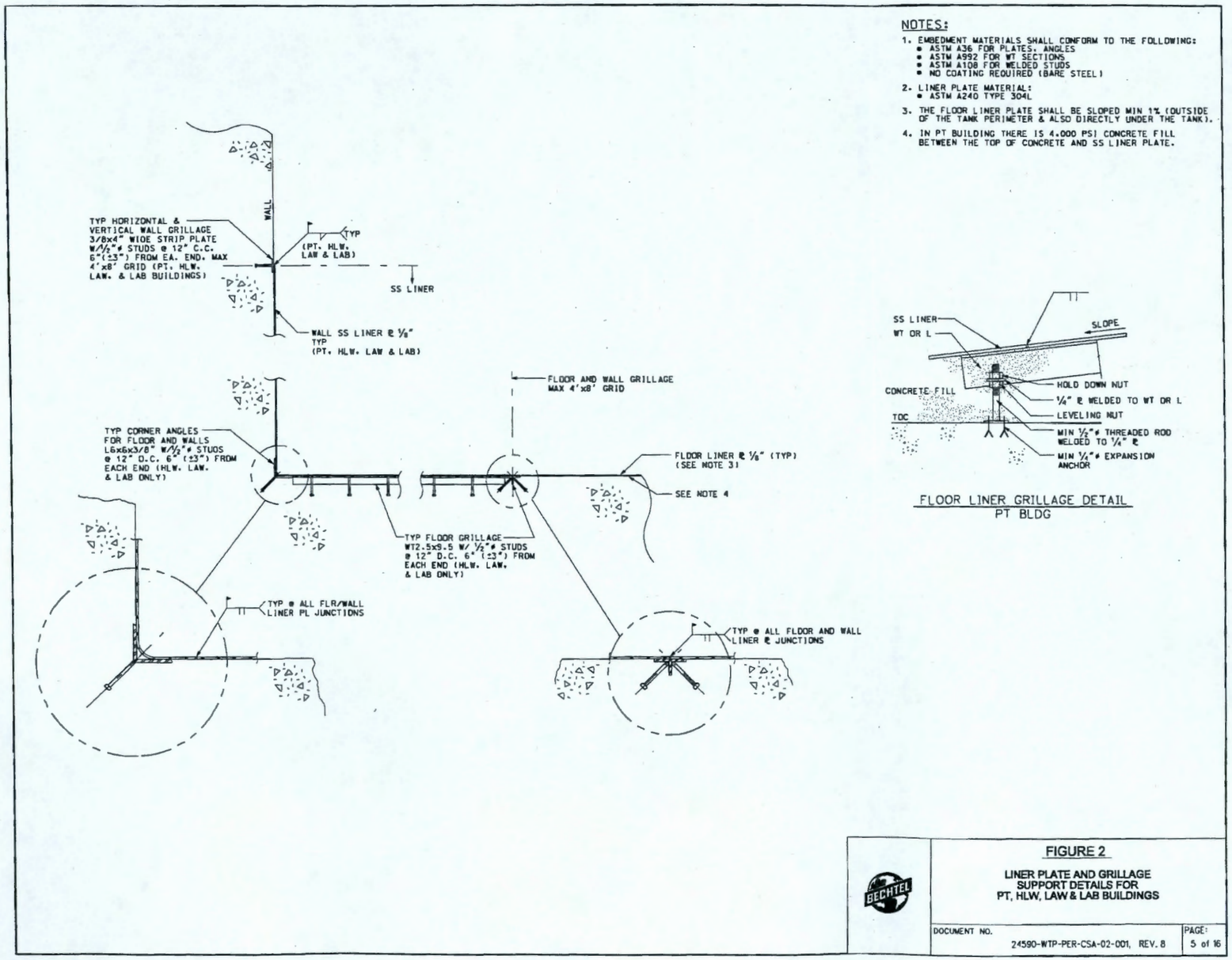


Figure 3 Typical Process Vessel Support Details for PT and HLW Buildings

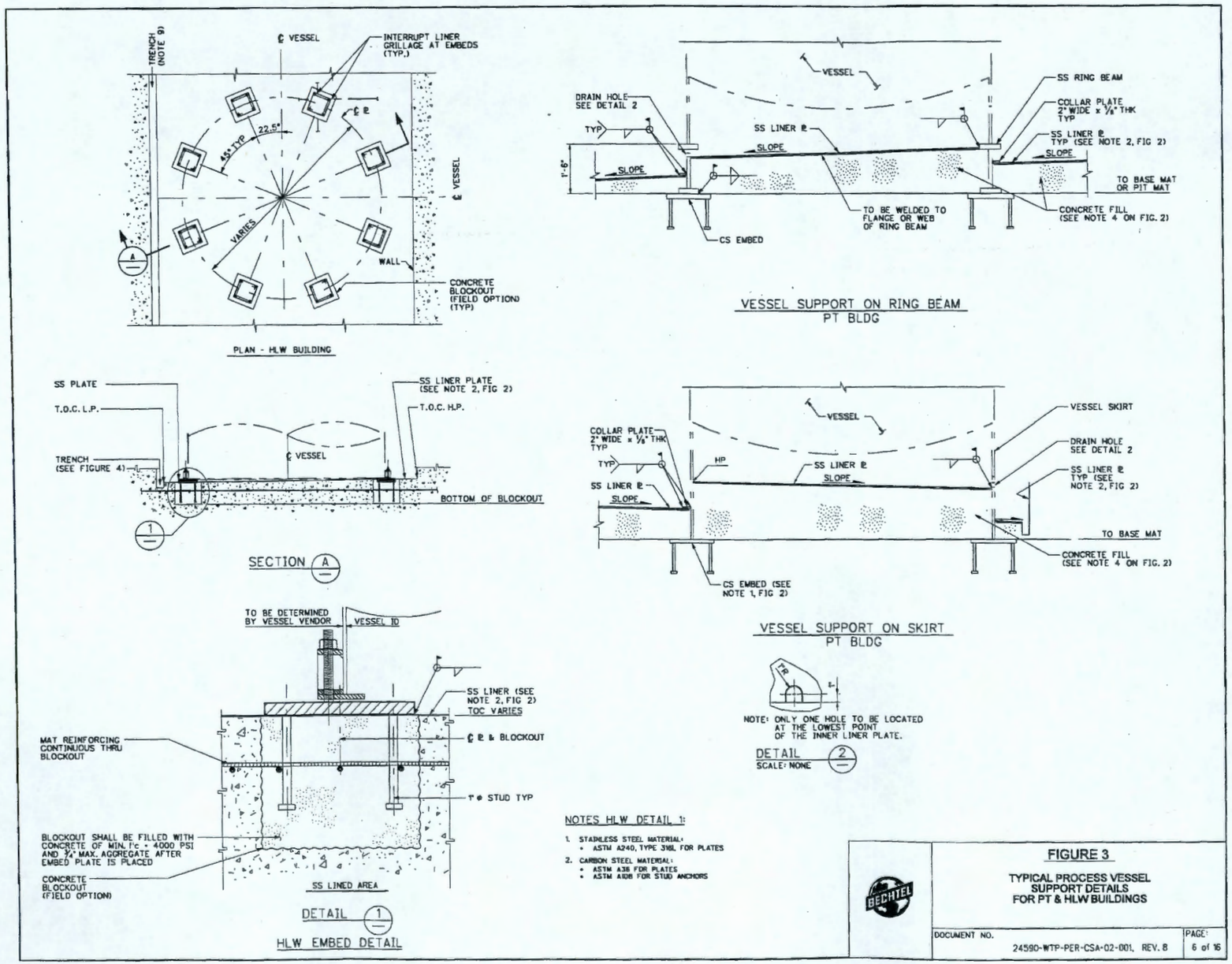


Figure 4 Misc. Typical Details Sumps, Trenches, Wall Penetrations, Embedded Plates and Special Protective Coating PT, HLW, LAW and LAB Buildings

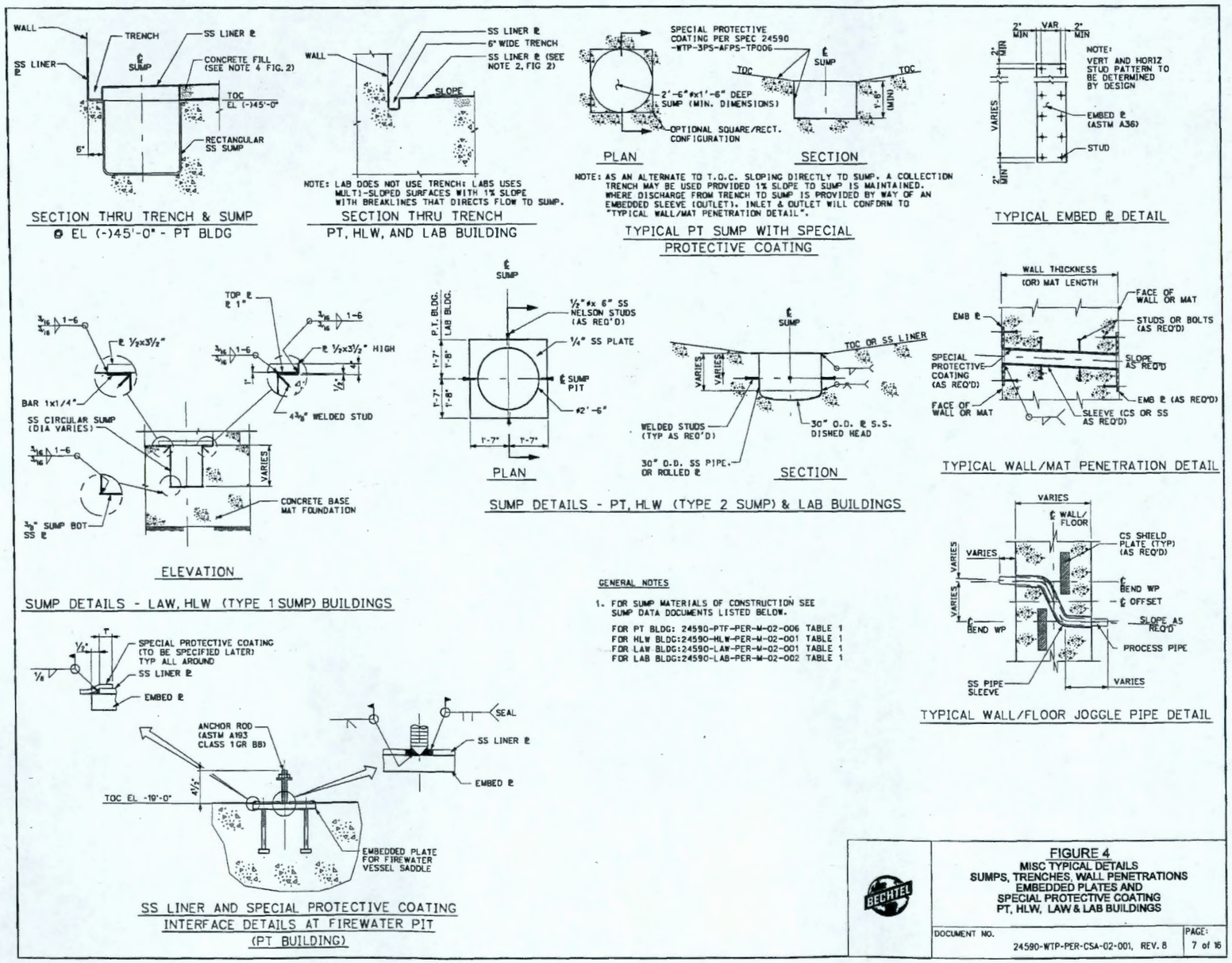


Figure 5 Typical Process Vessel Support Details for LAB Building

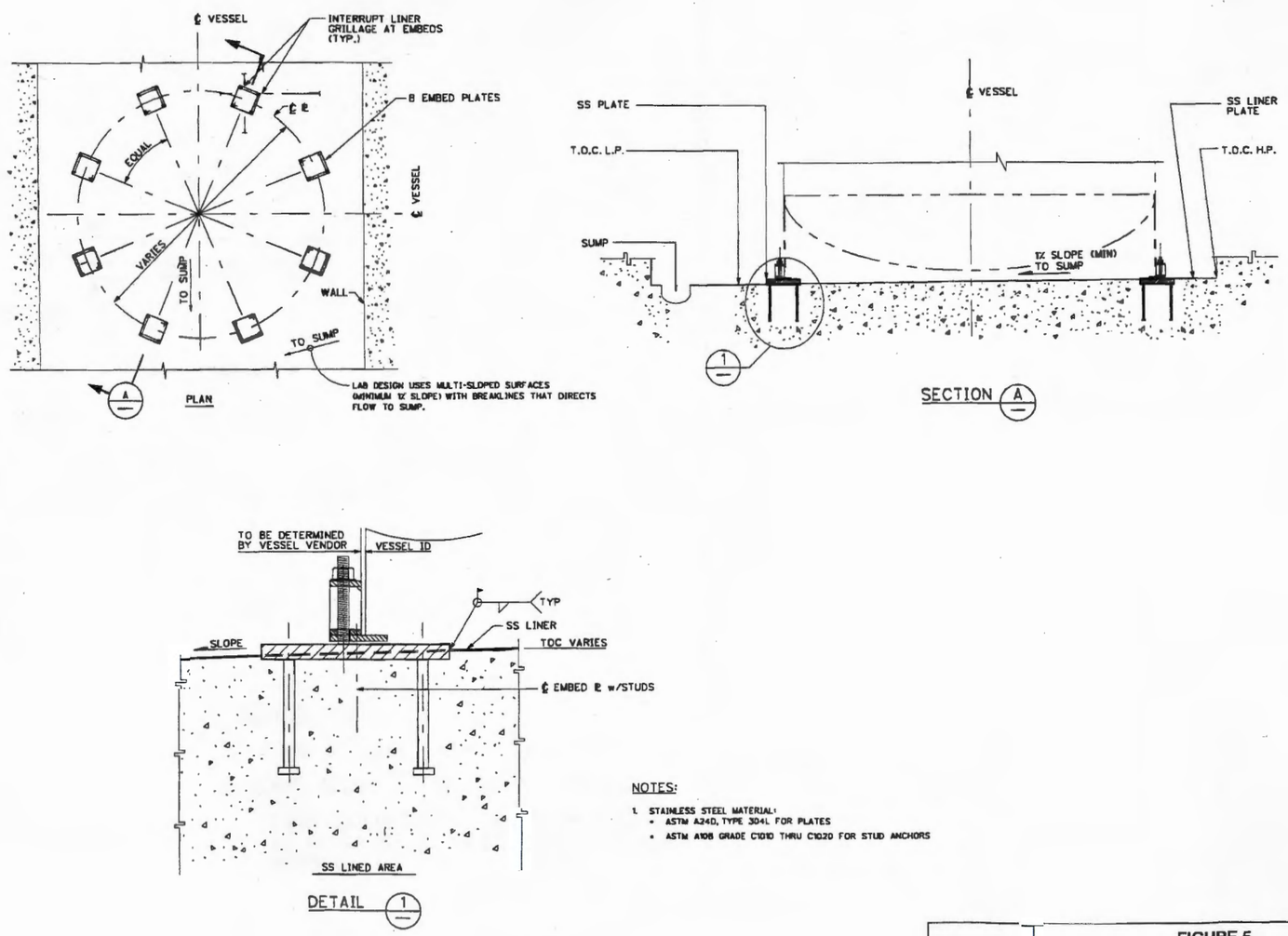
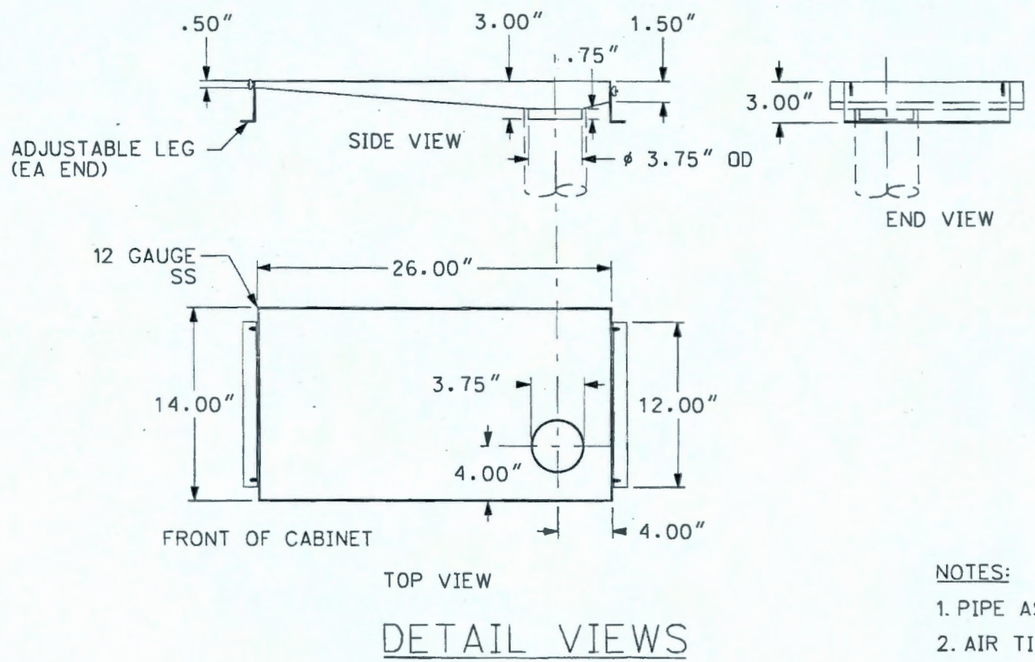


Figure 6 **Plan View of Typical Under Sink and Fume Hood Drain for LAB Bldg Secondary Containment Leak Collection Pan**



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

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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

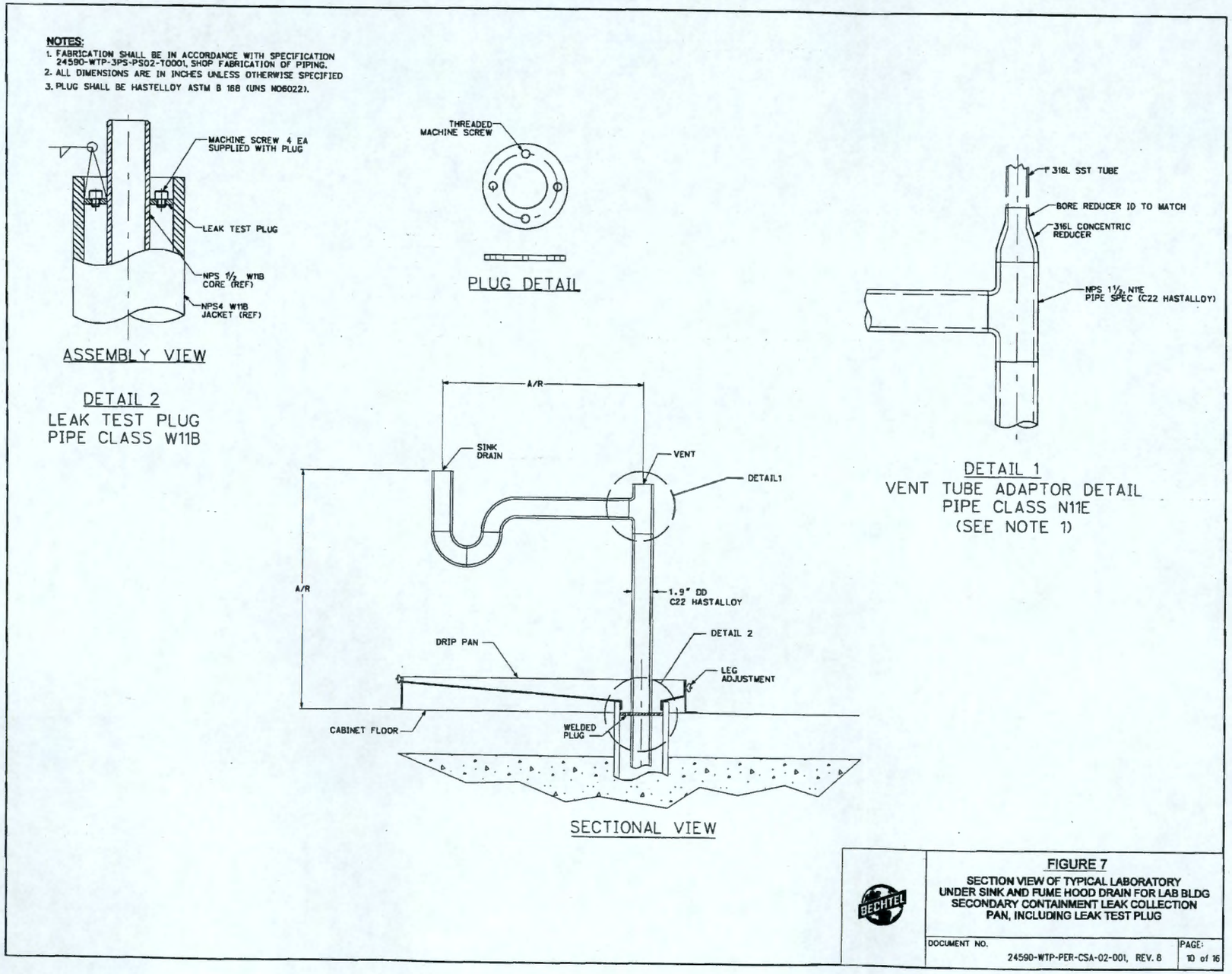


Figure 8 Typical Laboratory Piping and Pump Pit Sump and Weir Details for LAB Building

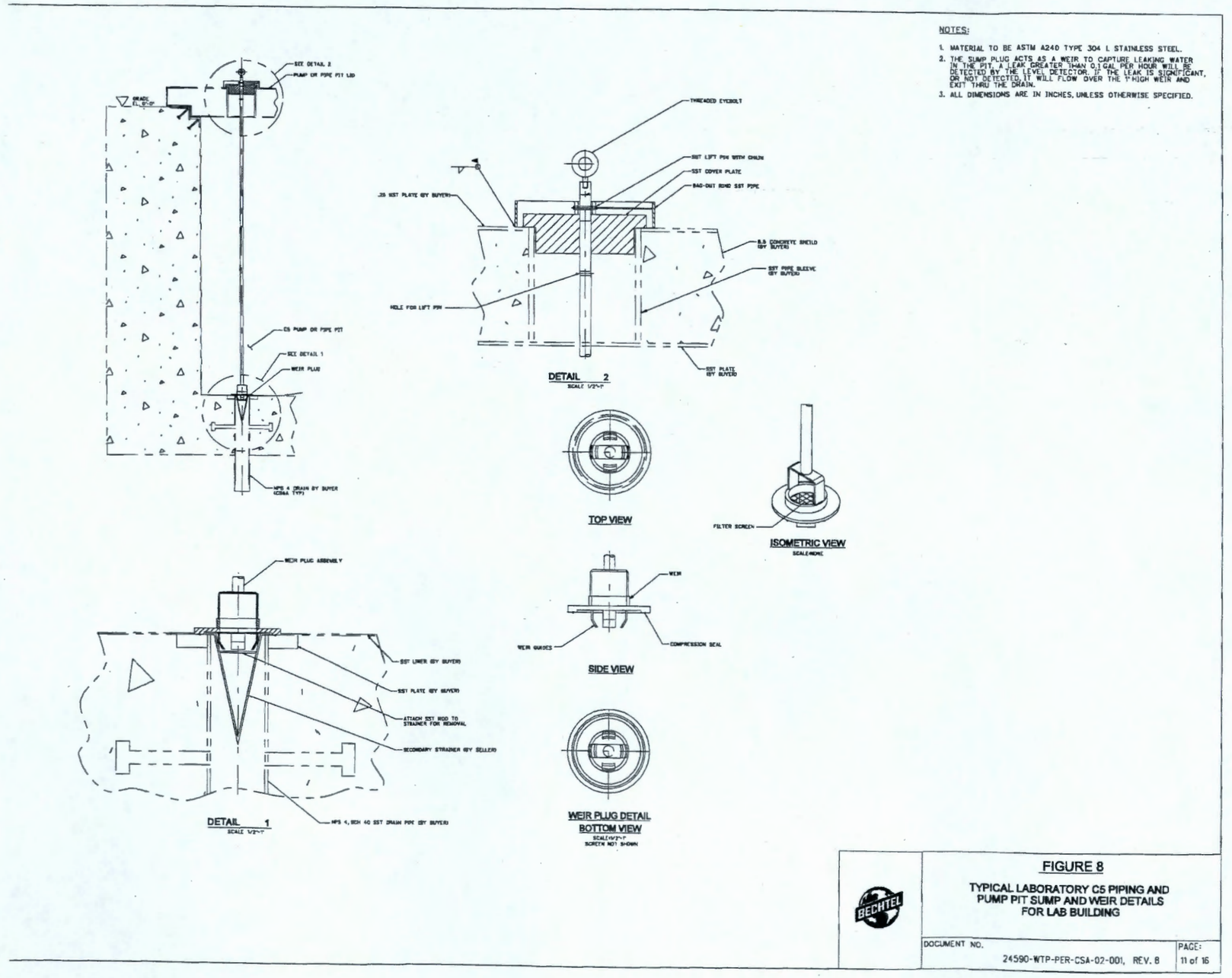


Figure 9 Typical Hot Cell Floor Drain Detail and Transfer Port Drain Detail for LAB Building

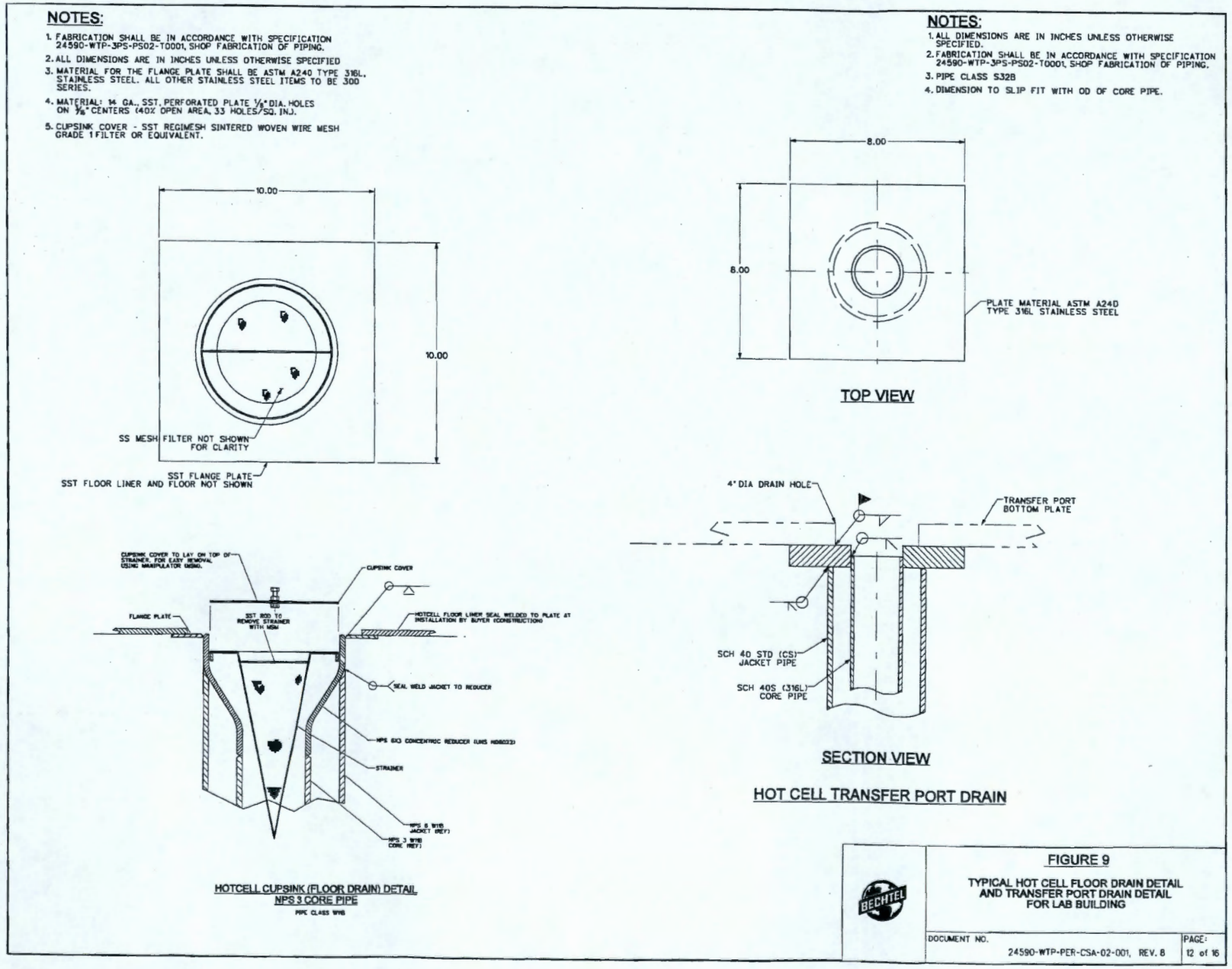
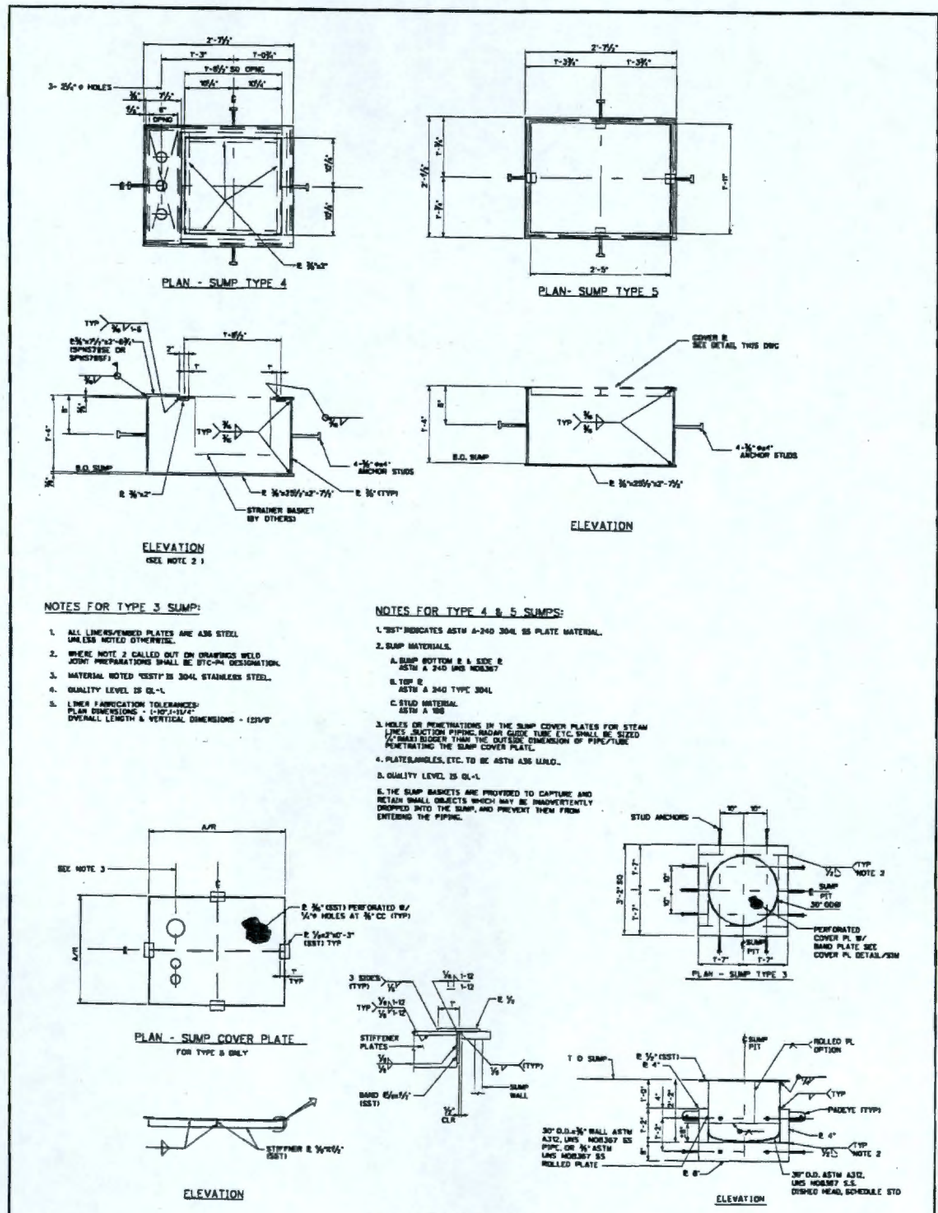


Figure 10 Typical HLW Building Sump Details & Typical PT Building SS Liner/CS Embed Detail



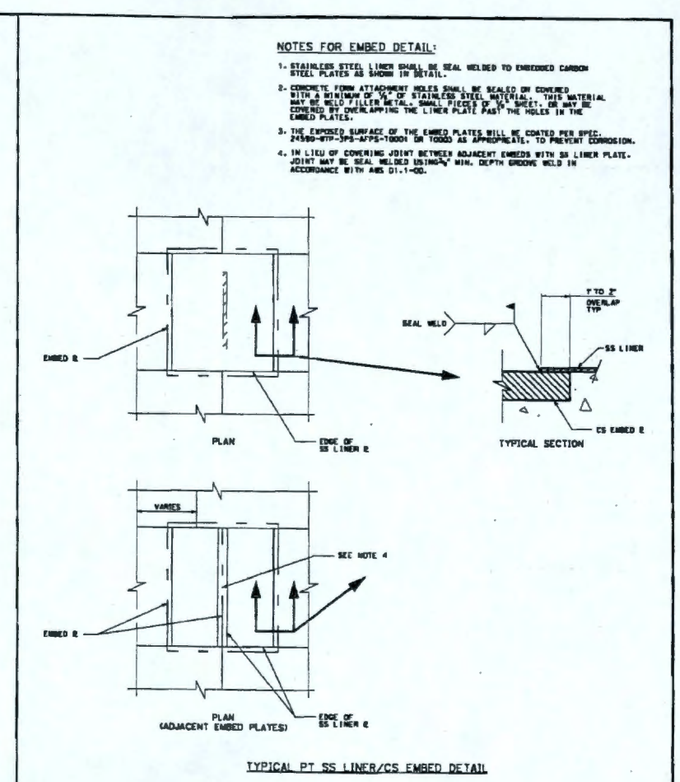


FIGURE 10

TYPICAL HLW BUILDING SUMP DETAILS & TYPICAL PT BUILDING SS LINER/CS EMBED DETAIL

DOCUMENT NO. 24590-WTP-PER-CSA-02-001, REV. 8 | PAGE: 13 of 16

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

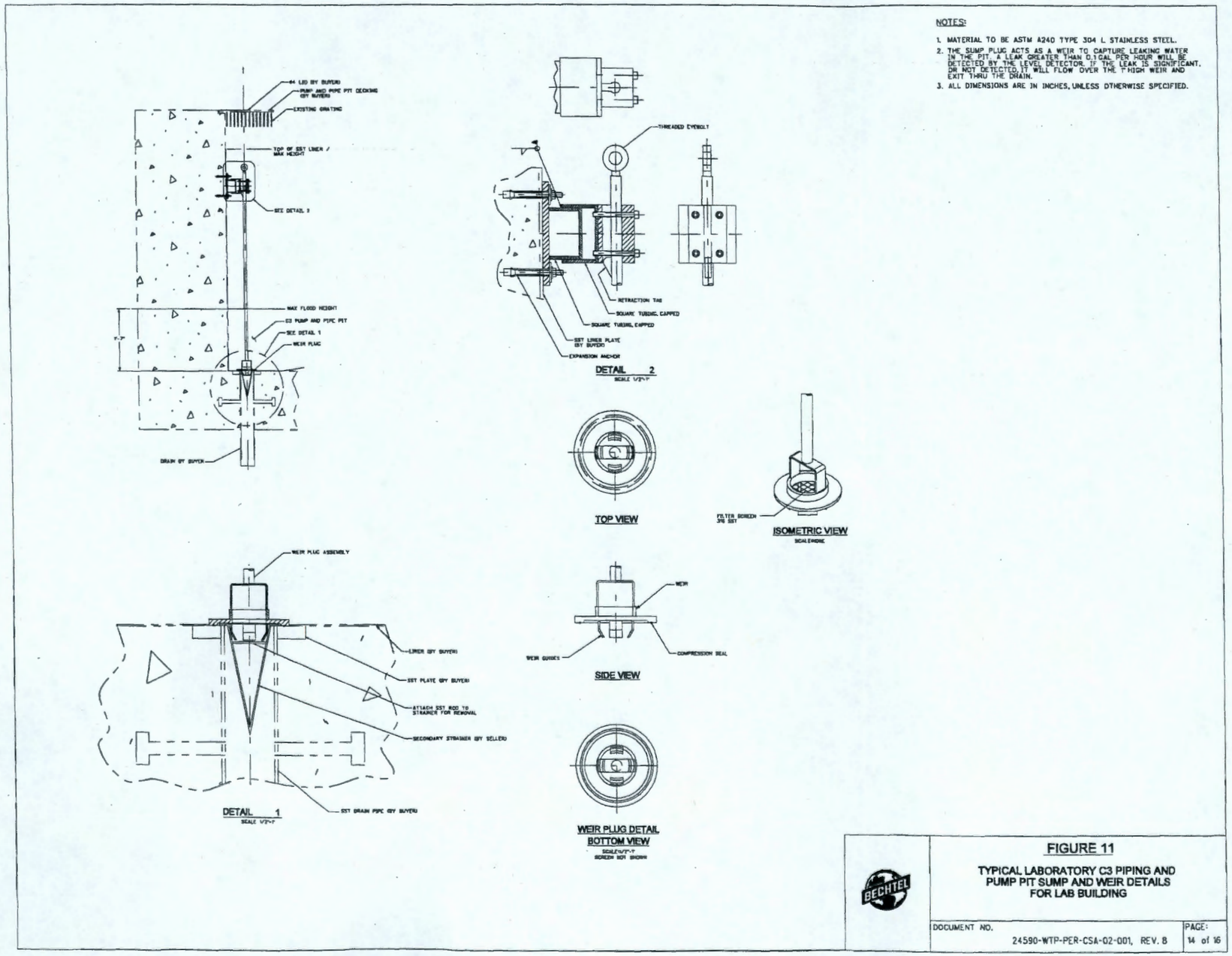


Figure 12 Typical RLD Condensate Tank Support Details for PT Building (Exterior)

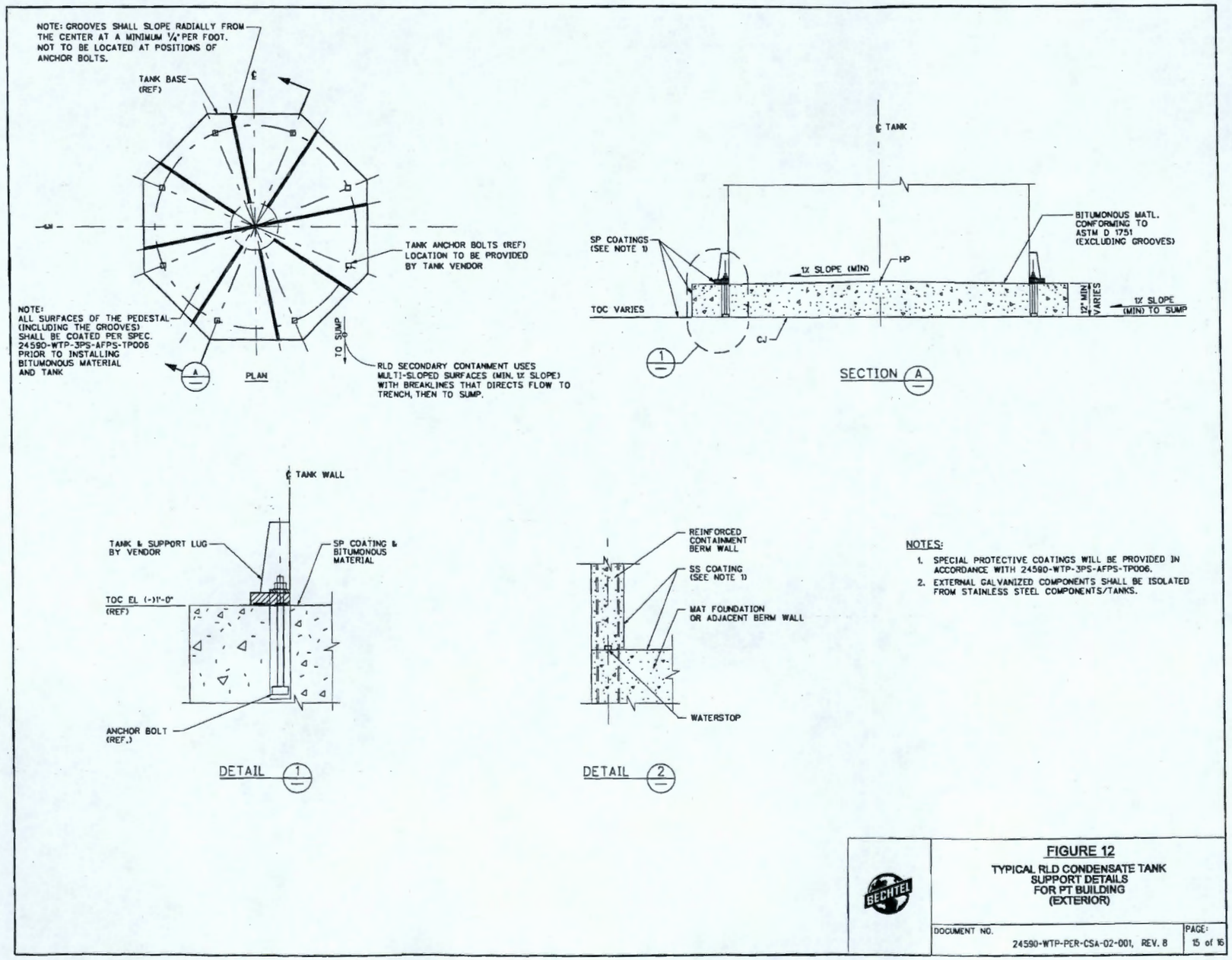


Figure 13 LAW Melter Encasement Assembly Secondary Containment Details

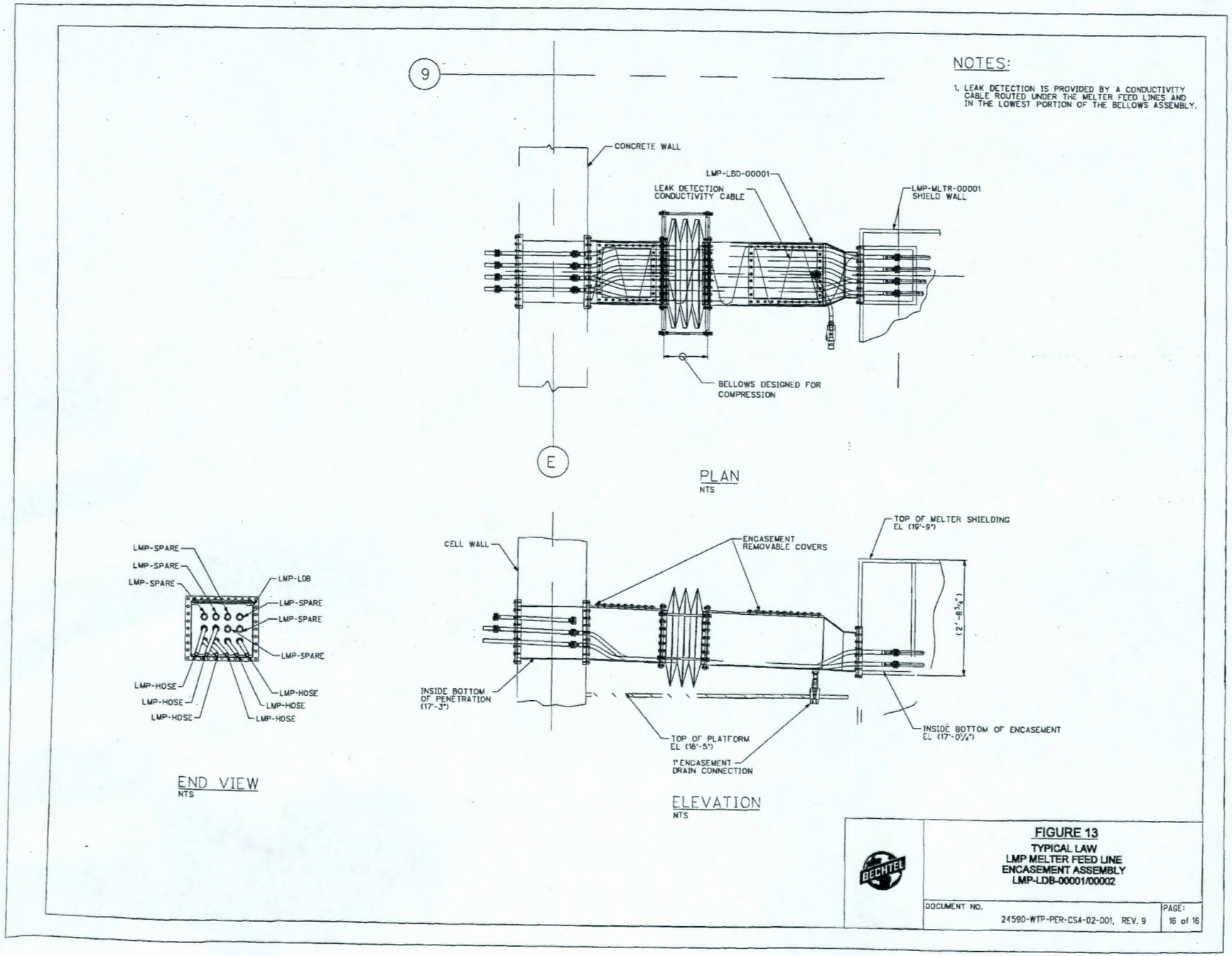


Figure 14 Typical Autosampling System ASX Sampler Full Half Section

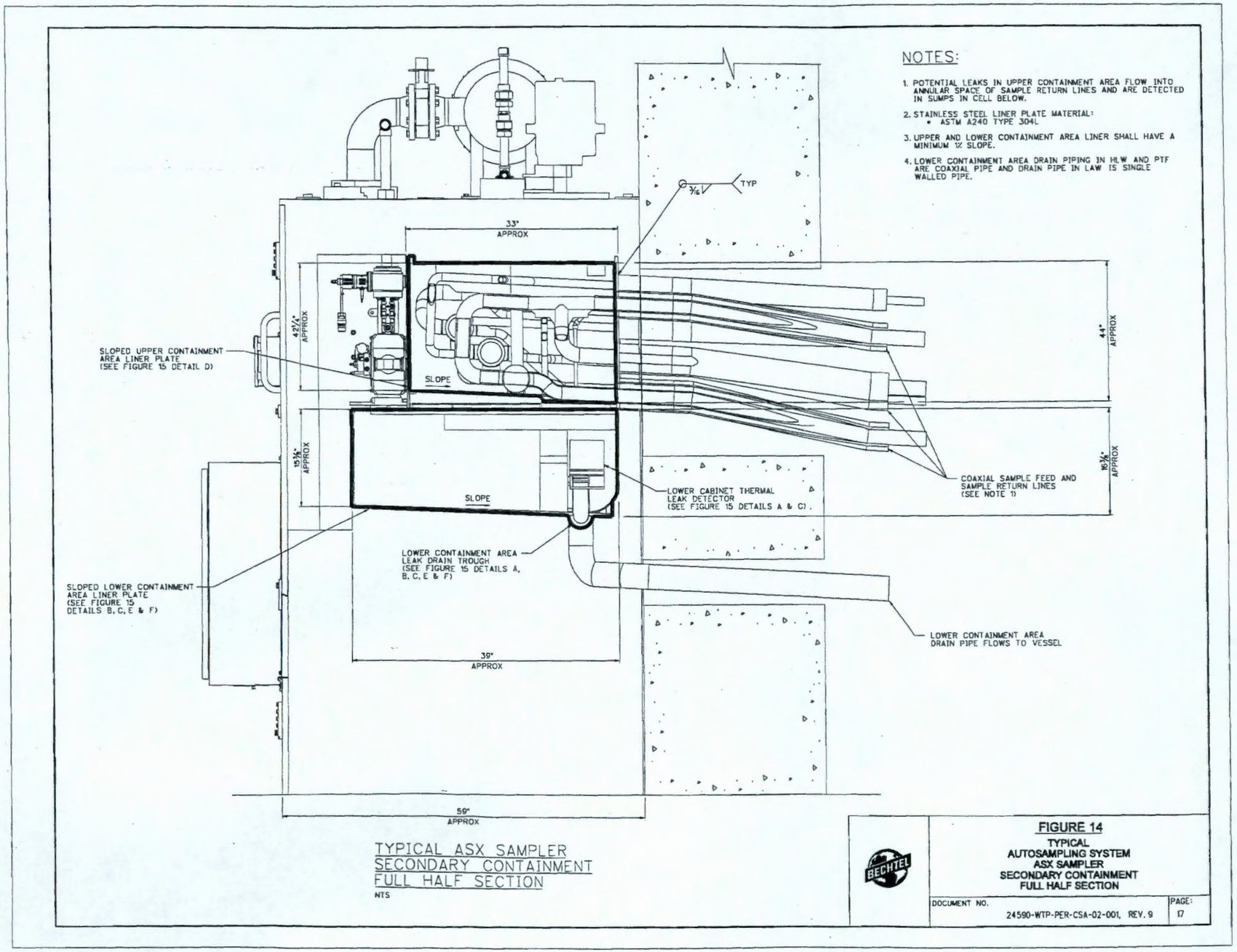


Figure 15 Typical Autosampling System Lower Containment Area Leak Detection Details

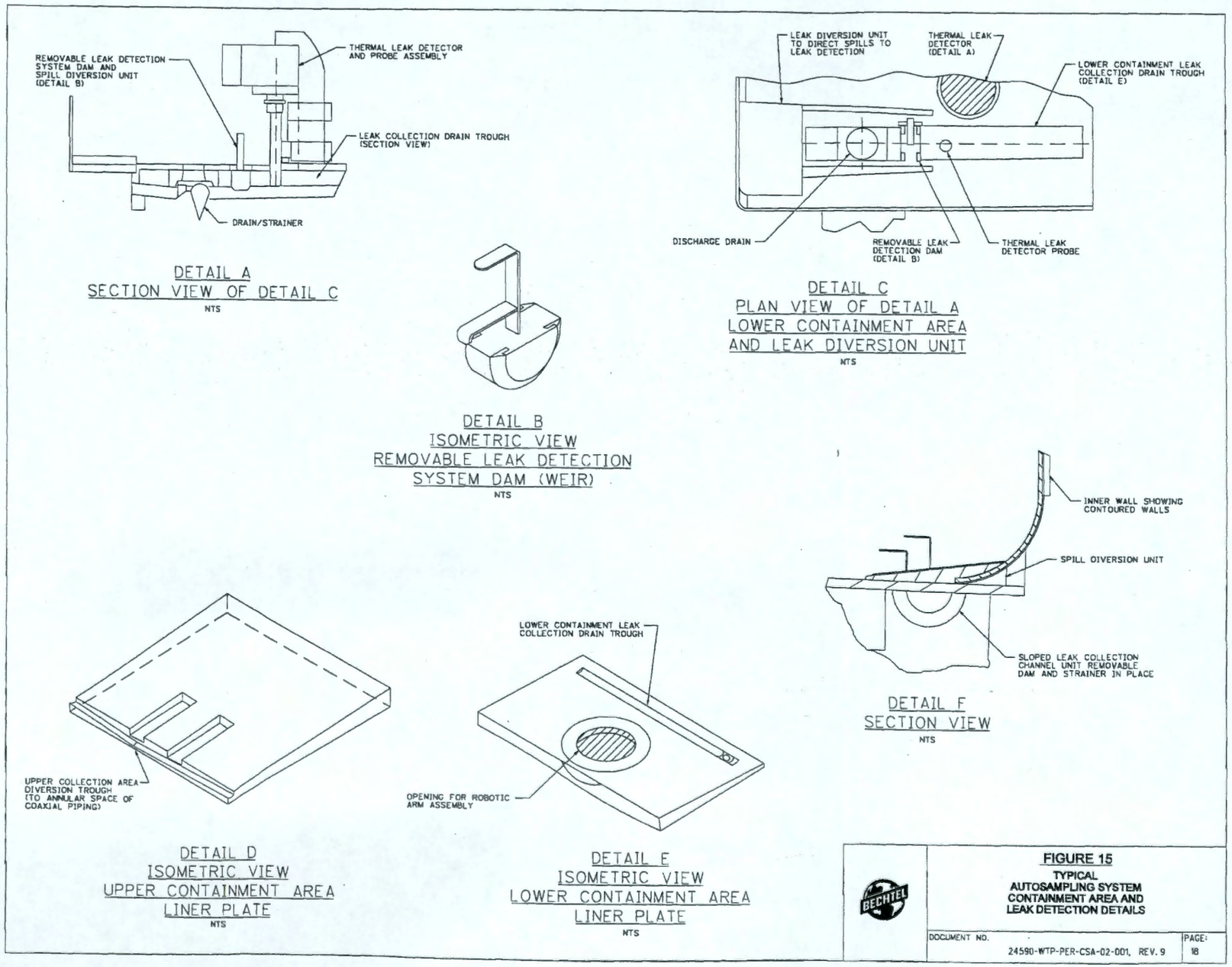
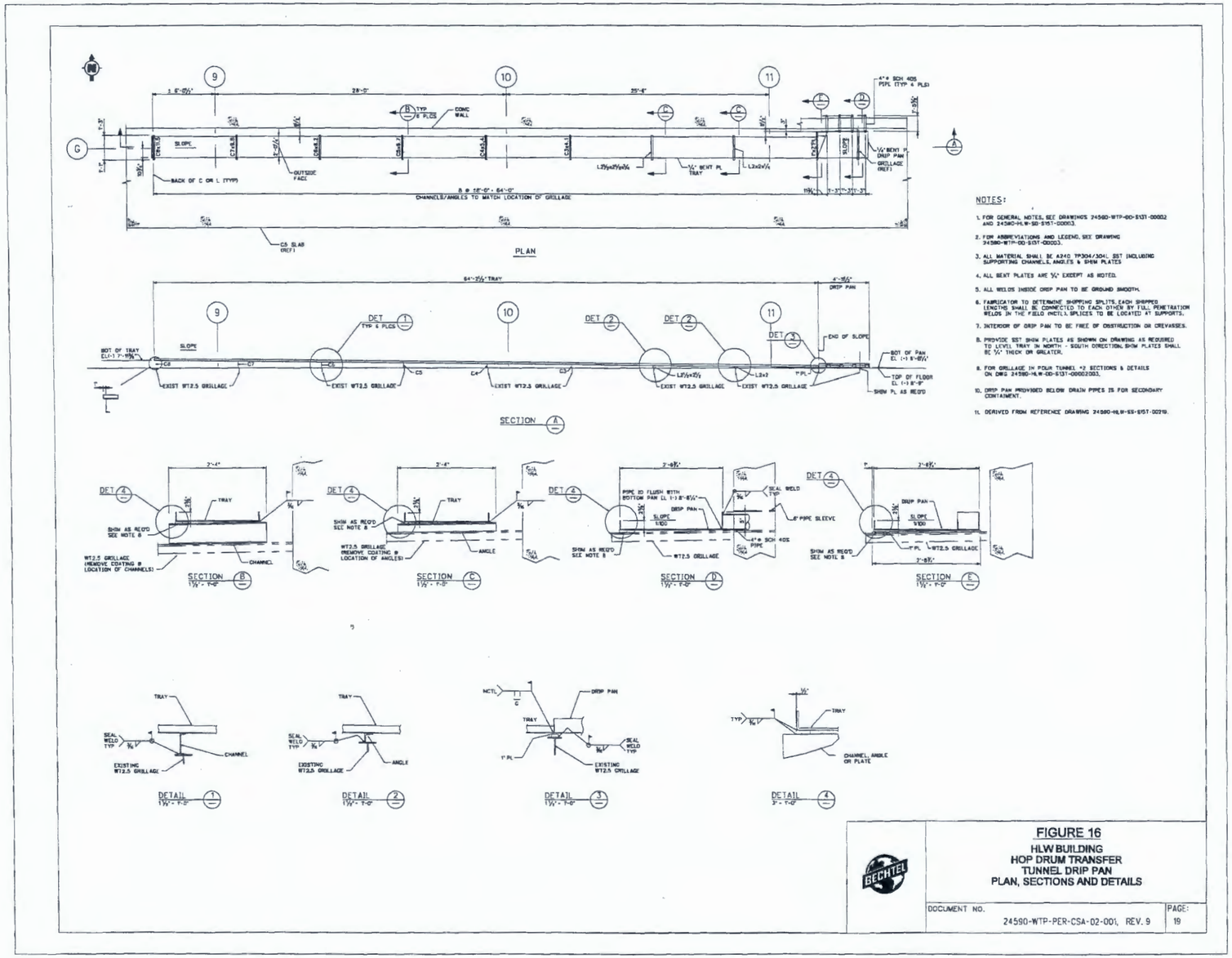


Figure 16 HLW Building HOP Drum Transfer Tunnel Drip Pan Plan, Sections and Details



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River Protection Project
Waste Treatment Plant
2435 Stevens Center Place
Richland, WA 99354
United States of America
Tel: 509 371 2000

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History Sheet

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0	Issued for Permitting Use	MCK/NJS
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3	Format changes	BAS
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Acronyms, Executive Summary, etc.

AEA	Atomic Energy Act
DOE	US Department of Energy
DWP	Dangerous Waste Permit
HLW	high-level waste/ high-level waste vitrification facility
LAB	analytical laboratory
LAW	low-activity waste/ low-activity waste vitrification facility
LDB	leak detection box
P&ID	piping and instrumentation diagram
PCJ	process control system
PTF	pretreatment waste vitrification facility
WAC	Washington Administrative Code
WTP	Hanford Tank Waste Treatment and Immobilization Plant

1 Introduction

The purpose of this document is to describe the leak detection methodology that will be used to meet the requirements of Washington Administrative Code (WAC) 173-303-640(4)(c)(iii) and Dangerous Waste Permit (DWP) condition III.10.E.9.b. The scope of this document covers the description of the leak detection technology employed for secondary containment systems at the Hanford Tank Waste Treatment and Immobilization Plant (WTP) facilities. The installation and functional testing of the leak detection technology is described herein.

2 Applicable Documents

WAC 173-303 - Dangerous Waste Regulations.

3 Description

This document describes the leak detection methods and leak detection technologies currently used in dangerous waste secondary containment areas. Dangerous Waste Permitted WTP tanks, miscellaneous units, autosamplers, Pretreatment Facility (PTF) bulges, confinement enclosures, Low-Activity Waste (LAW) melter encasement assemblies, and underground waste transfer lines use leak detection methods and technologies described in this document.

3.1 Leak Detection Method

Low-point design features and local monitoring/indication are the two methods employed at the WTP for secondary containment leak detection.

- Low-point leak detection consists of a continuously monitored leak collection point located at the lowest point in a containment area.
- Local leak monitoring/indication uses sensing instruments arranged around regulated equipment or piping.

These leak detection methods are used in WTP secondary containment systems that include:

- sumps
- leak detection boxes
- drains with a weir
- melter encasement assemblies
- confinement enclosures
- rack rooms.

Leak detection technologies could be used to support daily inspection for regulated piping and equipment that have no secondary containment requirements.

3.1.1 Leak Detection in Sumps

Sumps are typically stainless steel structures located in the secondary containment areas for tank and miscellaneous unit systems that manage liquid dangerous waste where personnel access is restricted or limited due to high radiation exposure and/or radioactive contamination. Sumps serve as the low point for the containment area and provide a means of detecting leaks and collecting liquid for removal. Each sump is equipped with leak detection monitoring instrumentation. Most sumps are equipped with either fluidic ejectors or pumps for removal of liquid, but some are drained by an operator using a portable pump or are gravity drained and have a weir (Section 3.1.3). The sumps are sized to allow detection of liquids using a radar or bubbler type monitoring instrument.

Typical sump design features are shown in 24590-WTP-PER-CSA-02-001, *Secondary Containment Design.* The leak detection instrumentation for each sump is shown on the Piping and Instrumentation Diagrams (P&IDs).

3.1.2 Leak Detection Box

Leak detection boxes (LDB) are used to provide leak detection in the co-axial waste transfer lines. Leak detection boxes are provided at the low point on waste transfer lines so that a leak in the inner process pipe will drain to the annular space of the outer containment pipe and into the leak detection box. Leak detection boxes are located in vessel cells, waste transfer line piping pits at the interface with other systems, and process tunnels where coaxial piping terminates and becomes single-walled piping.

Each LDB is monitored for liquid using a level switch (for example, ultrasonic gap or thermal dispersion) to detect leaks. Once the sensing element of the switch detects a leak, the switch will send a signal to the Process Control System (PCJ) to activate a leak detection alarm.

Leak detection boxes are horizontal stainless steel enclosures provided with a normal drain, an overflow drain, and weir (Figure 1). The drain located on the side of the weir into which the transfer line drains (that is, the containment side of the weir), is normally closed by a plug attached to a rod extending to a area above the leak detection box. The overflow drain, located in the non-containment side of the weir, will have a similar apparatus. The leak detector is a level switch located in the containment side of the weir. The overflow drain remains open for leak detection boxes located in vessel cells and piping tunnels and drain to a sump. For leak detection boxes located in open pit installations, the overflow drain will remain closed and will be opened by operations personnel to drain as needed after placement of appropriate overflow containment receptacle.

Typical LDB design features are shown in Figure 1. The leak detection instrumentation for each LDB is shown on the P&IDs.

3.1.3 Drain and Weir/Plug Assemblies

Drain and weir leak detection design is typically used in PTF bulges, WTP autosamplers , and the Laboratory piping and pump pit sumps. In these areas, the secondary containment liner slopes to a drain. A special weir or plug assembly at the drain retains the leaking fluid allowing the activation of the leak detection device. A leak will be detected by a sensing element such as a radar level detector, thermal switch, or ultrasonic gap switch. The leaking fluid is retained behind the weir or plug allowing detection before flowing over the weir/plug into the drain. Once the sensing element detects a leak, the level switch will send a signal to the PCJ to activate a leak detection alarm.

Typical drawings for drain and weir leak detection designs are provided in the *Engineering Specification for Process Bulge Design and Fabrication* (24590-WTP-3PS-MX00-T0001) and the *Secondary Containment Design* (24590-WTP-PER-CSA-02-001)

Specific design and instrumentation for each drain and weir/plug type leak detection system is shown on the P&IDs.

3.1.4 LAW Melter Feed Line Encasement Assemblies

The two LAW Melter Feed Line Encasement Assemblies provide leak detection for the LAW melter feed lines, between each process cell wall penetrations and each melter shield wall. The feed lines are surrounded by a sloped bellows assembly. Leak detection is provided by a conductivity cable located under the feed lines, in the lower portion of the bellows assembly. Once a leak is detected, the level switch will send a signal to the PCJ to activate a leak detection alarm. A low-point drain is provided to allow removal of potential leaks.

Melter Encasement Assembly design features are shown in 24590-WTP-PER-CSA-02-001, *Secondary Containment Design*.

3.1.5 Confinement Enclosures and Rack Rooms

A confinement enclosure is a walk-in, bulge-like area housing ancillary equipment, such as process piping, valves, and pumps. Confinement enclosures allow hands-on maintenance of equipment while controlling radioactive contamination and shielding personnel outside the enclosure. Rack rooms typically house piping racks; some of which are DWP ancillary equipment piping.

Typically, rack rooms and confinement enclosures provide secondary containment and leak detection for DWP ancillary equipment using a sensing element such as conductivity cable, or a combination of leak detection methods. Localized leak detection will be used primarily around ancillary equipment where either daily visual inspections are not feasible due to obstructed vision by an elevated grating or low-point leak detection is not available because of floor sloping requirements.

3.2 Leak Detection Technologies

Several leak detection technologies are utilized at the WTP, including the following:

- radar level detection
- bubbler
- thermal dispersion
- ultrasonic gap
- conductivity cable.

The leak detection technologies utilized at the WTP secondary containment areas are described below.

3.2.1 Radar

The radar level detection is provided for most of the WTP secondary containment sumps and some drain and weir assemblies. A typical radar level method employs a radar level transmitter. Radar transmitters are designed to transmit a signal using an antenna, and to receive the return signal with a cone designed to pick up radar high frequency, pulsed signals. Much of the transmitted signal is reflected by the liquid

surface and received at its source. A waveguide is used to channel the signals through different geometry or to avoid nearby equipment that might affect signal quality. Additionally, waveguides are used to move the location of the transmitter out of a high radiation environment into one that can be accessed by service personnel. The transmitter compares the time when the signal was sent to the time when the reflected signal returns. This time difference is then transferred to the PCJ as a level signal. The radar leak detection method will use one radar level detection transmitter.

Secondary containment sumps are designed to be dry with a liquid normally not present. The PCJ will monitor and alarm at a high level. A high-level alarm permits the operator to determine if a breach in the primary containment has occurred and has allowed fluid to flow into the secondary containment sump.

The PCJ will constantly monitor and perform diagnostics on the transmitter/foundation fieldbus data-communications link, and an alarm will result from a number of conditions, including loss of signal power, as required. A transmitter bad-data-quality PCJ alarm will be provided, as required.

Typical configurations of the sump radar leak detection are illustrated in Figure 2.

3.2.2 Bubbler

The bubbler level detection is provided for some of the WTP secondary containment sumps. The air bubbler leak-detection uses a dip pipe that extends into the sump. The dip pipe serves as a conduit for air at the pressure slightly greater than the opposed by the hydrostatic head of the liquid being collected in the sump. A differential pressure transmitter measures differences in pressure across the transmitter diaphragm because one side of the diaphragm is connected to the bubbler dip pipe/sensing line and the other side is referenced by a sensing line to the atmospheric pressure above the sump. Presence of liquid in the sump creates a greater air pressure in the dip pipe/sensing line and on the high pressure (HP) side of the diaphragm, resulting in a higher differential pressure, which is converted into a higher level signal to the PCJ. Multiple bubblers will be installed if a lack of maintenance access after the start of operations is expected and no other means of leak detection is provided.

Sumps are designed to be dry with a liquid normally not present. The PCJ will monitor the level and alarm "high level". A high-level alarm permits the operator to determine if a breach in the primary containment has occurred and has allowed fluid to flow into the secondary containment sump.

Additional alarms will be evaluated during design for the leak detection system. The PCJ will constantly monitor and perform diagnostics on the transmitter/foundation fieldbus data-communications link, and an alarm will result from a number of conditions, including loss of signal power, as required. A transmitter bad-data-quality PCJ alarm will allow the operator to indirectly infer a number of conditions, including a loss of bubbler air-purge flow, as required.

A typical configuration of the sump bubbler leak detection is illustrated in Figure 3.

3.2.3 Thermal Dispersion

The thermal dispersion level detection is provided for some of the WTP secondary containment systems, such as leak detection boxes and ASX sampler cabinets. The leak detection (level) switch method uses thermal dispersion technology. The measuring element of the level switch contains two temperature-sensitive probes. One probe contains a heated resistance temperature detector (RTD), and the other probe contains an unheated RTD reference at a thermal difference when no liquid is present.

When liquid contacts the probes, the thermal difference decreases and is measured, this will generate a high-level alarm to the PCJ.

A typical configuration of the thermal dispersion leak detection is illustrated in Figure 4.

3.2.4 Ultrasonic Gap

Ultrasonic gap leak detection uses a probe with two in-line crystals, a transmitter and a receiver, that have an air gap between them. The transmitting crystal typically sends an inaudible acoustic signal across the air gap to the receiving crystal. When the gap is filled with a liquid the signal strength increases, which causes the instrument to send a high level signal to PCJ.

A typical configuration of the ultrasonic gap leak detection is illustrated in Figure 5.

3.2.5 Conductivity Cable

Conductivity cable leak detection is provided for some WTP secondary containment systems, such as LAW Melter Feed Line Encasement Assemblies and may be used in other areas without low-point leak detection, such as rack rooms. Conductivity cable leak detection uses a cable and a resistance sensor to detect the presence of liquid. A conductive sensing cable is run through the area that is being monitored. The cable is terminated on both ends, one end is connected to a modular termination, while the other is connected to an alarm module. When liquid is present on any part of the cable, the resistance of the cable changes and is measured by the alarm module. The alarm module then sends a high-level signal back to the PCJ. The *Secondary Containment Design* (24590-WTP-PER-CSA-02-001), provides a typical configuration of the conductivity cable leak detection technology for the LAW Melter Feed Line Encasement Assemblies.

Conductivity cables can also be used to support daily visual inspection for regulated piping and equipment that is not provided with secondary containment and leak detection. For this application the conductivity cable is run along the bottom section of the pipe or equipment. Figure 6 shows this configuration in a pipe application.

3.3 Installation and Functional Testing

Prior to installation, the leak detection sensors will be tested for functionality and then installed and tested in accordance with manufacturer specifications. Leak detection instruments will be accessible for maintenance and periodically self-tested in-situ to verify functionality.

Once installed, the leak detection system, including all instrumentation and other associated equipment, will be tested as a system during initial startup testing. The system will be checked and verified for the proper alarm response.

After installation, instruments used for leak detection will be periodically tested per the manufacturer specifications to ensure they continue to operate per their design.

Figures 1 through 6 generally illustrate the typical installation of the leak-detection system.

3.3.1 Radar

The radar transmitter will be located in an area where maintenance will be performed under administrative control. The waveguide will be installed so that the waveguide enters the sump and is placed open-ended, with a gap from the sump bottom. Venting of the waveguide above the liner or berm is required; vent slots will be included as required. As shown in Figure 2, the radar waveguide will go through shielding (the floor or wall using a joggle in the waveguide) to protect the instrument, as well as personnel conducting maintenance operations on the transmitter from the radioactive environment of the cell.

The piping (waveguide) inserted into the process will primarily be welded pipe and will have the capability to be flushed.

3.3.2 Bubbler

The air bubbler differential pressure transmitter will be located at least 1 barometric head (approximately 34 feet) above the highest expected liquid surface level. This minimizes the possibility that the transmitter might be contaminated due to possible moisture collection or flow of the liquid up into the dip pipe/sensing line upon the loss of purge air. The transmitter will be located in an area where maintenance will be performed under administrative control.

Figure 3 shows a general sketch of the air bubbler leak-detection system. The sensing lines will go through radiation shielding to protect the instrument. Personnel conducting maintenance operations on the transmitter will be shielded from the radioactive environment of the cell. The bubbler sensing-line air-purge flow will be controlled to provide a minimum bubble rate.

The piping (bubbler dip pipe/sensing line) will have the capability to be flushed.

3.3.3 Thermal Dispersion & Ultrasonic Gap

Figures 4 & 5 show general sketches for the level switch configuration to detect liquid in a normally dry sump. The level switch electronics and element connector will be located in an area where maintenance will be performed under administrative control. A pipe protects and supports (and physically guides replacement of) the level switch element from the connector to the pit sump. The level element probes are positioned to properly monitor for liquid at the open end of the pipe.

3.3.4 Conductivity Cable

Conductivity cable installed in areas such as the LAW Melter Feed Line Encasement Assemblies is configured in a way such that all low points contain a part of the cable. Typically this means that the cables will lay across the bottom of the encasement assembly.

Conductivity cable used on piping to support daily visual inspection is installed along the bottom of the pipe, with care taken to ensure that all low points are covered.

Figure 1 Typical Leak Detection Box Level Measurement

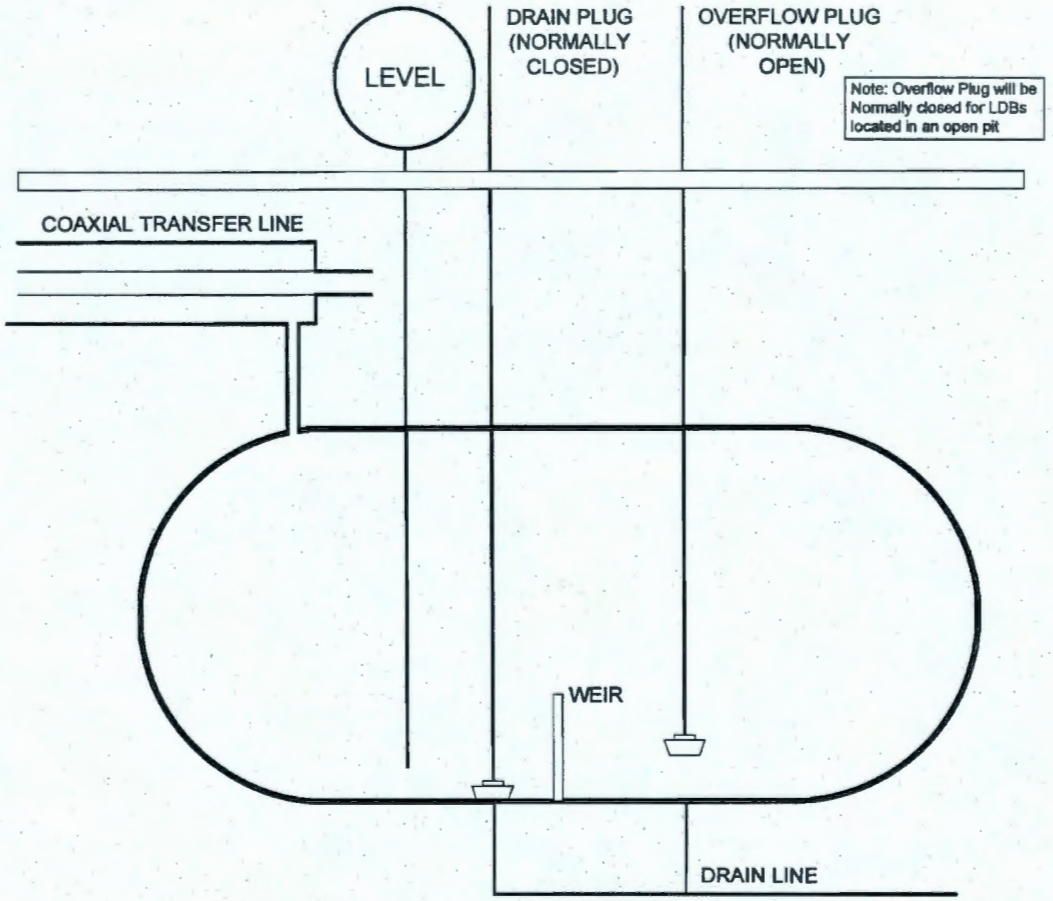


Figure 2 **Typical Radar Level Measurement for Sumps in C5 Area**

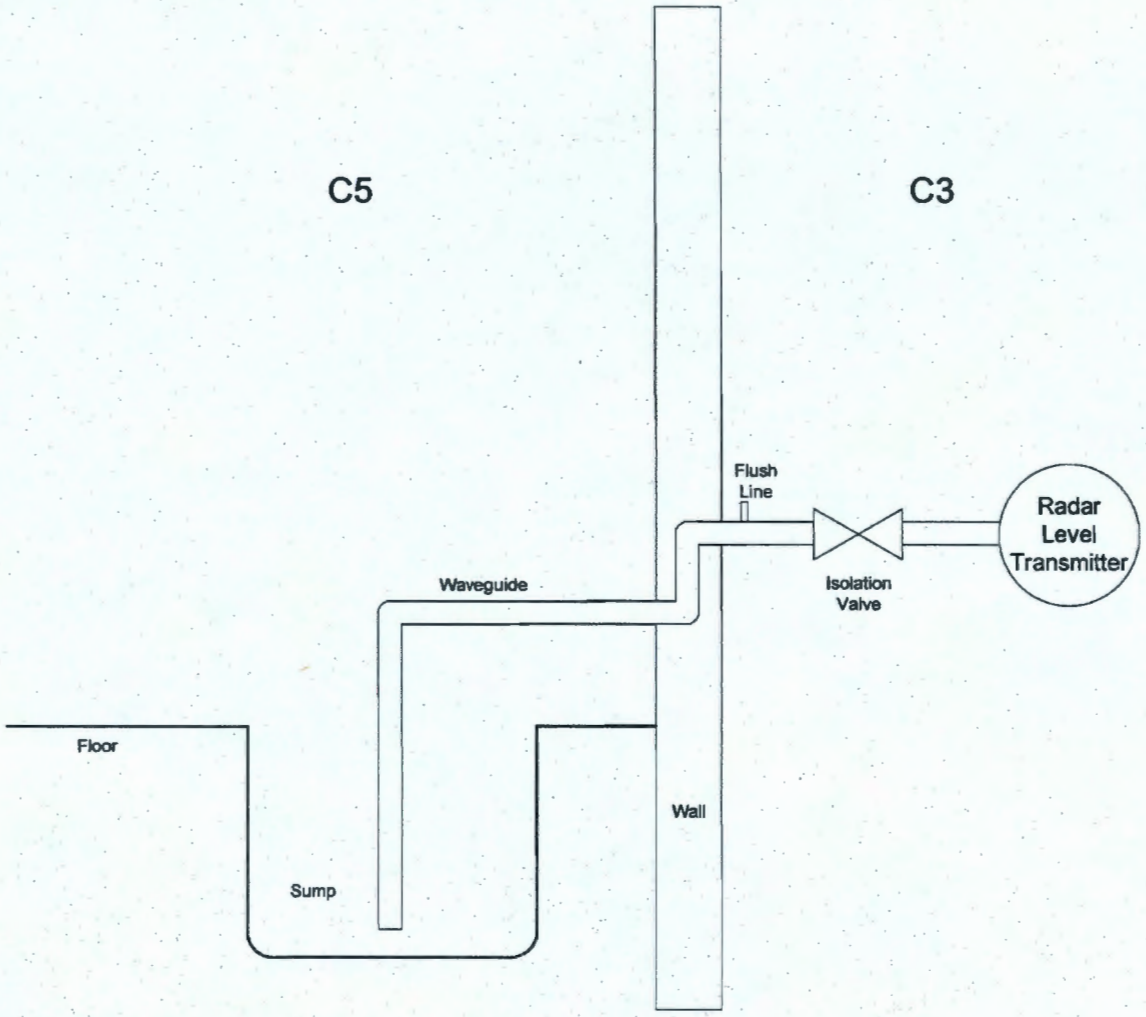


Figure 3 Typical Bubbler Level Measurement

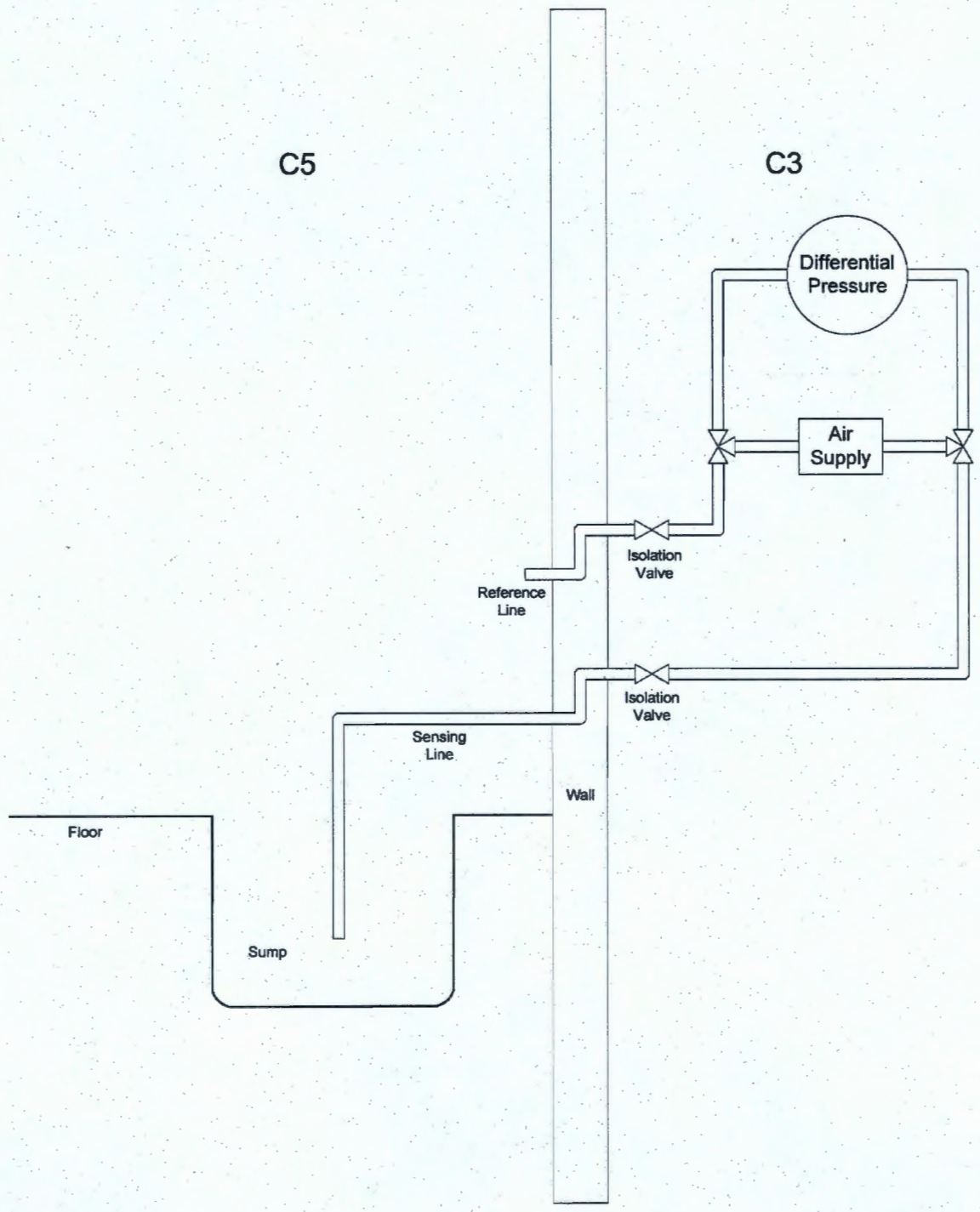


Figure 4 **Typical Thermal Dispersion Level Measurement**

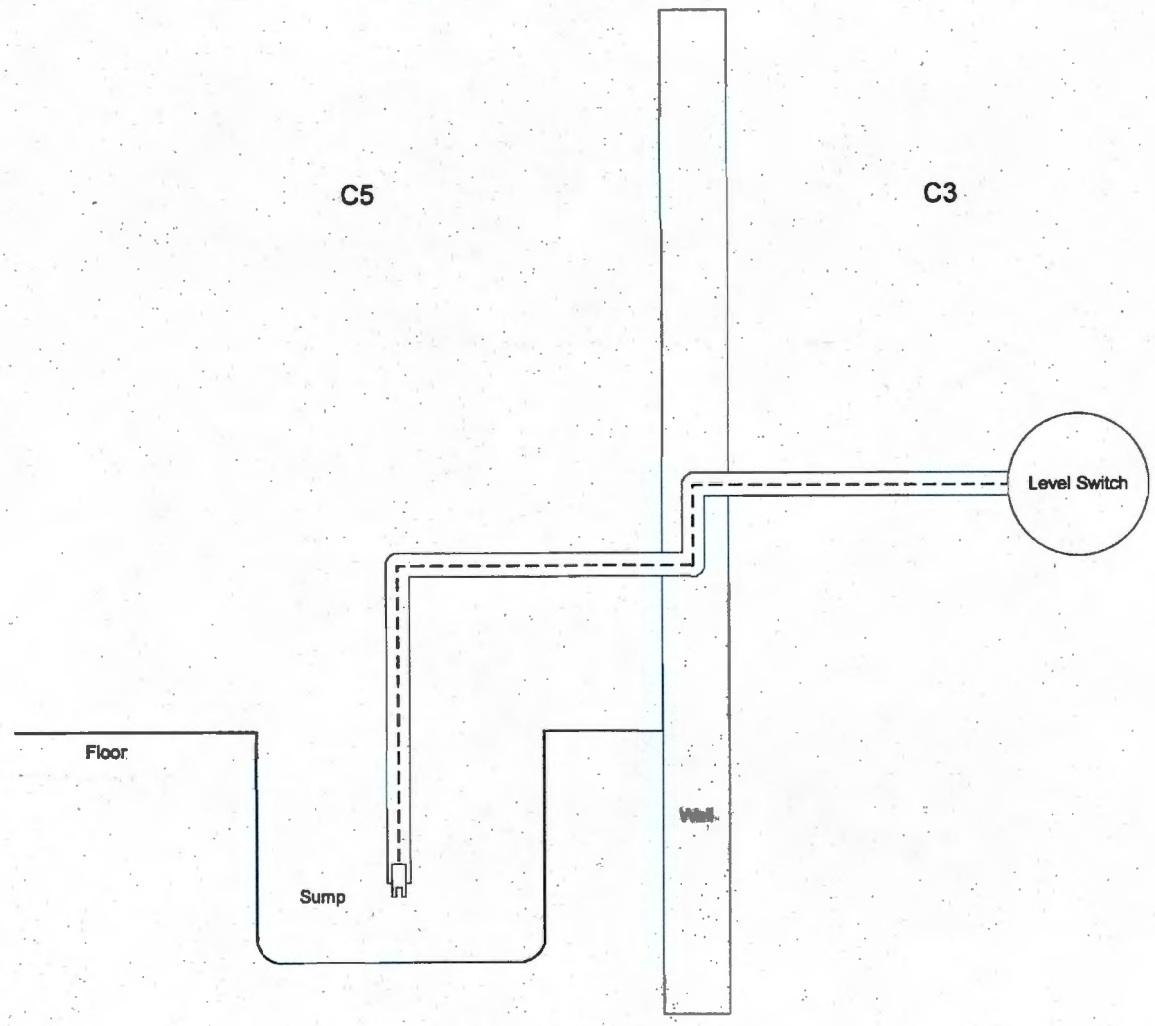


Figure 5 Ultrasonic Gap Level Measurement

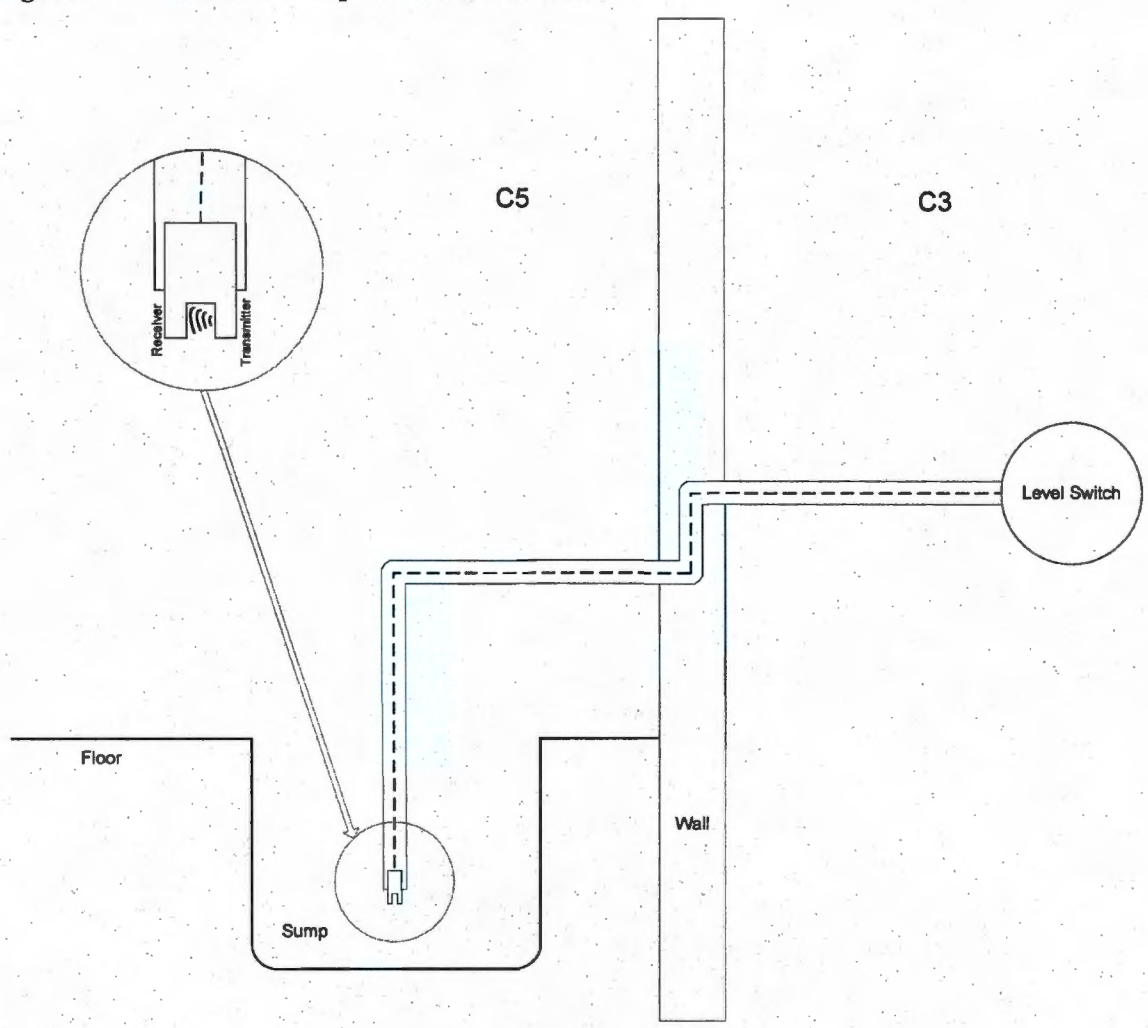
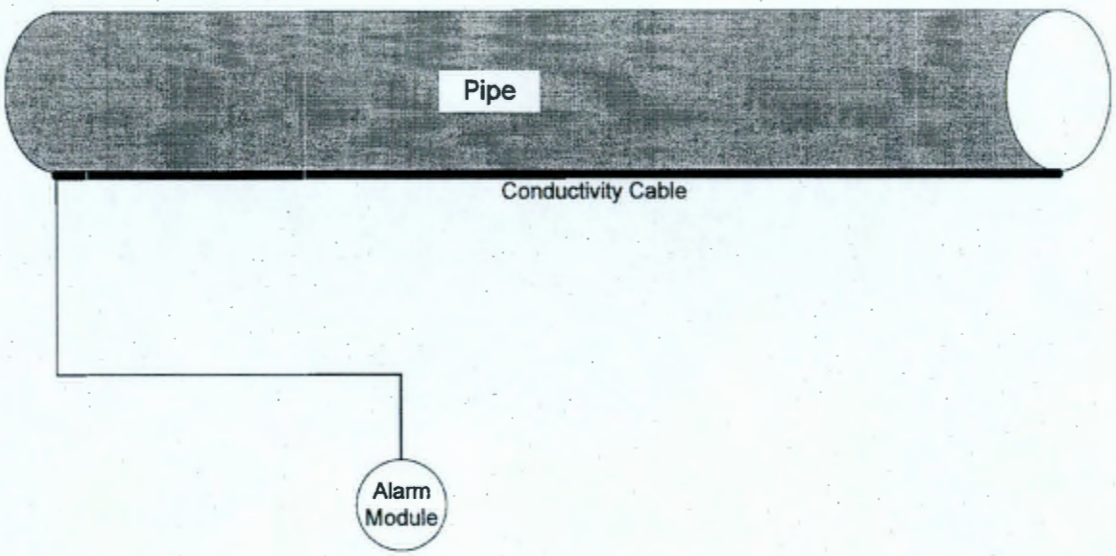


Figure 6 **Typical Conductivity Cable Level Measurement for Pipe and Equipment Monitoring**



Attachment 2
10-ESQ-212
(12 Pages Double-Sided)

Permit Package No. PTF-099, Revision 0
"Tank System Secondary Containment for PTF ASX Samplers"

Description of Permit Package PTF-099, Rev. 0

PTF-099, Rev. 0, "Tank System Secondary Containment for PTF ASX Samplers"

Permit package PTF-099 addresses the tank system secondary containment design associated with PTF Autosampling System (ASX) sampler cabinets (ASX-SMPLR-00015, -00017, -00019, -00020, and -00025). The autosamplers are located in Rooms P-0311C, P-0311B, P-0302, P-0301, and P-0307 respectively, at Elevation 56'-0" of PTF.

The PTF ASX autosampler cabinets have both upper and lower secondary containment liners and leak detection for ancillary equipment. The sloped stainless steel upper containment liner routes a leak from the sample feed and return lines to a sump for leak detection. The sloped stainless steel lower containment area diverts liquid to a collection trough. The trough contains a removable weir where liquids collect, activating the thermal level detection switch and alarm to indicate that a leak may have occurred.

Permit Package PTF-099, Rev. 0, includes only an assessment report signed by an independent qualified registered professional engineer (IQRPE) certifying certain portions of the permit package

The following components of this package are already included in the Dangerous Waste Permit, the Administrative Record, or are provided with other permit packages, as listed in the Table of Contents:

- General Arrangement Plan, Elevation 56'0"
- Secondary Containment Design (Submitted with package LAW-034)
- Material Selections for Building Secondary Containment/Leak Detection
- Installation of Tank Systems and Miscellaneous Unit Systems
- Leak Detection in Secondary Containment Systems (Submitted with LAW-034, this document updates and combines permit documents 24590-WTP-PER-J-02-001 and 24590-WTP-PER-J-02-002)
- Sump Data for PTF Facility
- Description of Access for Conducting Integrity Assessments
- Integrity Assessment Program and Schedule for DWP Regulated Equipment in the Pretreatment Facility and High-Level Waste Vitrification Facility
- Prevention of Hydrogen Accumulation in Tank Systems and Miscellaneous Treatment Unit Systems.

Permit Design Package No. PTF-099, Rev. 0
Tank System Secondary Containment for PTF ASX Samplers
Table of Contents

For Incorporation into the Permit

Engineering Document Title	Document Number	Revision	Permit Condition	Included	Remarks
IQRPE Integrity Assessment Report	CCN 169566		III.10.E.9.b.i	Y	
Permit Design Drawings					
PTF Vitrification Building General Arrangement Plan at El. 56'-0"	24590-PTF-P1-P01T-00003	4	III.10.E.9.b.ii	N	Provided in 24590-PTF-PCN-ENV-09-006, approved 11/24/09, CCN 209892 (Appendix 8.4)
Secondary Containment Design	24590-WTP-PER-CSA-02-001	9	III.10.E.9.b.ii III.10.E.9.b.iii	N	Included in Package LAW-034
Underground Pipe Protection	N/A	-	III.10.E.9.b.iv	N/A	Not Applicable to the ASX samplers
Material Selections for Building Secondary Containment/Leak Detection	24590-WTP-PER-M-02-001	3	III.10.E.9.b.v	N	Included in Attachment 51, Appendix 7.9
Installation of Tank Systems and Miscellaneous Unit Systems	24590-WTP-PER-CON-02-001	6	III.10.E.b.vi	N	Included in Attachment 51, Appendix 7.12 as approved in PCN 24590-WTP-PCN-ENV-09-001 (10/01/09)
Leak Detection in Secondary Containment Systems	24590-WTP-PER-J-02-002	4	III.10.E.9.b.ii III.10.E.9.b.v	N	Included in LAW-034 (consolidation of 24590-WTP-PER-J-02-001 and 24590-WTP-PER-J-02-002)
Sump Data for PT Facility	24590-PTF-PER-M-02-006	5	III.10.E.9.b.vii	N	Included in Attachment 51, Appendix 8.5
Description of Access for Conducting Integrity Assessments	24590-WTP-PER-M-02-005	1	III.10.E.9.b.ix	N	Included in Attachment 51, Appendix 7.15
Integrity Assessment Program and Schedule for DWP Regulated Equipment in the Pretreatment Facility and High-Level Waste Vitrification Facility	24590-WTP-PER-M-08-002	0	III.10.E.9.b	N	April 29, 2010 letter from Ecology (CCN 217892) for incorporation into the next WTP permit modification

For Incorporation into the Administrative Record

Engineering Document Title	Document Number	Revision	Permit Condition	Included	Remarks
Prevention of Hydrogen Accumulation in Tank Systems and Miscellaneous Treatment Unit Systems	24590-WTP-PER-PR-03-001	1	III.10.E.9.b.viii	N	ORP Letter 03-ED-130 dated 8/26/2003 transmitting LAW-029, Rev. 0 to Ecology

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AREVA

ISSUED BY
RPP-WTP PDC

AFS-10-0200

169566

June 3, 2010

RPP-WTP
RECEIVED

JUN 0 3 2010

BY PDC

Ms. Susan Parr
Subcontract Formation Specialist
Bechtel National RPP-WTP Project
2435 Stevens Center Place
Richland, Washington 99354

Dear Ms. Parr:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00211
IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR PTF ASX SECONDARY CONTAINMENT (SAMPLER CABINETS) – IA-3003445-000

The structural integrity assessment of the subject secondary containment has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that the secondary containment is adequately designed and has sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that it will not collapse, rupture, or fail.

If you have any questions, please contact Tarlok Hundal at (509) 371-1975, or via email at tarlok.hundal@areva.com.

Sincerely,

Fred R. Renz
Contract Management
AREVA Federal Services LLC
Richland Office

llm

Enclosure (1)

cc: D. C. Pfluger, MS 5-L w/enclosures (2)

AREVA Federal Services LLC
2101 Horn Rapids Road, RC-19, Richland, WA 99354, P. O. Box 840, Richland, WA 99352
Tel.: 509 375 8096 - Fax: 509 375 8495 - www.areva.com

IA-3003445-000

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR PTF ASX SECONDARY CONTAINMENT (SAMPLER CABINETS)

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. 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.

IA-3003445-000

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT
FOR
PTF ASX SECONDARY CONTAINMENT (SAMPLER CABINETS)

"I, Tarlok Hundal have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the PTF ASX Secondary Containment (Sampler Cabinets), as required by the Washington Administrative Code, *Dangerous Waste Regulations*, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is fourteen (14) pages numbered one (1) through fourteen (14).

TARLOK SINGH HUNDAL
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

Signature

6/3/10
Date

Scope	Scope of this Integrity Assessment	This assessment addresses the structural integrity of PTF ASX Secondary Containment provided by a sampler cabinet housed in each Autosampler Unit (ASX-SMPLR-00015, -00017, -00019, -00020, and -00025). These autosampler units are located in Room P-0311C, P-0311B, P-0302, P-0301, and P-0307 respectively, at Elevation 56'-0" of the PTF building as shown on the General Arrangement Plan drawing 24590-PTF-P1-P01T-00003.
Summary of Assessment		For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design requirements and controls to ensure that the design fully satisfies the requirements of Washington Administrative Code (WAC), Chapter 173-303 WAC, *Dangerous Waste Regulations,* WAC-173-303-640, *Tank Systems.*

References	Engineering & Procurement Subcontract Document, Specifications, and Vendor Drawings	Engineering & Procurement Subcontract Document (EP): 24590-QL-SRA-HAHH-00001, Rev. 13, Autosampling System (ASX), Exhibit D-Scope of Work, Exhibit E-Technical Specifications, and Exhibit F-List of Drawings. Specifications: Following specifications along with their respective revision numbers and change notices are included in EP document listed above: 24590-WTP-3PS-G000-T0001, General Specification for Supplier Quality Assurance Program Requirements; 24590-WTP-3PS-G000-T0002, Engineering Specification for Positive Material Identification (PMI); 24590-WTP-3PS-G000-T0003, General Specification for Packaging, Shipping, Handling, and Storage Requirements; 24590-WTP-3PS-G000-T0014, General Specification for Supplier Design Analysis ; 24590-WTP-3PS-MV00-T0003, Engineering Specification for Pressure Vessel Fatigue Analysis; 24590-WTP-3PS-G000-T0015, General Specification for Environmental Qualification of Mechanical Equipment; 24590-WTP-3PS-SS90-T0001, Engineering Specification for Seismic Qualification of Seismic Category I/II Equip. and Tanks; 24590-WTP-3PS-FB01-T0001, Engineering Specification for Structural Design Loads for Seismic Category III/IV Equip. and Tanks; 24590-WTP-3PS-SS00-T0001, Engineering Specification for Welding of Structural Steel Carbon; 24590-WTP-3PS-SS00-T0002, Engineering Specification for Welding of Structural Stainless Steel and Welding of Carbon Steel to Stainless Steel; 24590-WTP-3PS-AFPS-T0001, Engineering Specification for Shop Applied Special Protective Coatings for Steel Items and Equipment; 24590-WTP-3PS-MHSS-T0002, Engineering Specification for Autosampling System (ASX). Vendor Drawings (Status Code 1 & 2 Drawings *): 24590-QL-HC4-HAHH-00001-06-00041, Rev. 00F, Autosampling System ASX-SMPLR-00015, Outline Dim & Mtg Dets Sheet 1 of 3; 24590-QL-HC4-HAHH-00001-06-00042, Rev. 00F, Autosampling System ASX-SMPLR-00015, Outline Dim & Mtg Dets Sheet 2; 24590-QL-HC4-HAHH-00001-06-01842, Rev. 00C, Autosampling System ASX-SMPLR-00015, Outline Dim & Mtg Dets Sheet 3; 24590-QL-HC4-HAHH-00001-06-00043, Rev. 00F, Autosampling System ASX-SMPLR-00017, Outline Dim & Mtg Dets Sheet 1 of 2; 24590-QL-HC4-HAHH-00001-06-00044, Rev. 00F, Autosampling System ASX-SMPLR-00017, Outline Dim & Mtg Dets Sheet 2; 24590-QL-HC4-HAHH-00001-06-00045, Rev. 00F, Autosampling System ASX-SMPLR-00019, Outline Dim & Mtg Dets Sheet 1 of 2; 24590-QL-HC4-HAHH-00001-06-00046, Rev. 00F, Autosampling System ASX-SMPLR-00019, Outline Dim & Mtg Dets Sheet 2; 24590-QL-HC4-HAHH-00001-06-00047, Rev. 00F, Autosampling System ASX-SMPLR-00020, Outline Dim & Mtg Dets Sheet 1 of 2; 24590-QL-HC4-HAHH-00001-06-00048, Rev. 00F, Autosampling System ASX-SMPLR-00020, Outline Dim & Mtg Dets Sheet 2; 24590-QL-HC4-HAHH-00001-06-00049, Rev. 00F, Autosampling System ASX-SMPLR-00025, Outline Dim & Mtg Dets Sheet 1 of 2; 24590-QL-HC4-HAHH-00001-06-00050, Rev. 00F, Autosampling System ASX-SMPLR-00025, Outline Dim & Mtg Dets Sheet 2; 24590-QL-HC4-HAHH-00001-06-01178, Rev. 00C, Autosampling System PTF and HLW Internal Base Table Assembly Sheet 1 of 1; 24590-QL-HC4-HAHH-00001-06-01179, Rev. 00C, Autosampling System PTF and HLW Internal Base Table Upper Plate Subassembly Sheet 1 of 1; 24590-QL-HC4-HAHH-00001-06-01275, Rev. 00C, Autosampling System PTF and HLW Support Frame Assy Sht. 1 of 3; 24590-QL-HC4-HAHH-00001-06-01276, Rev. 00C, Autosampling System PTF and HLW Support Frame Assy Sht. 2; 24590-QL-HC4-HAHH-00001-06-01277, Rev. 00B, Autosampling System PTF and HLW Support Frame Assy Sht. 3; 24590-QL-HC4-HAHH-00001-06-01201, Rev. 00B, Autosampling System ASX-SMPLR-00017 Support Frame Assy Sht. 1 of 3; 24590-QL-HC4-HAHH-00001-06-01202, Rev. 00B, Autosampling System ASX-SMPLR-00017 Support Frame Assy Sht. 2; 24590-QL-HC4-HAHH-00001-06-01821, Rev. 00A, Autosampling System ASX-SMPLR-00017 Support Frame Assy Sht. 3;

References (cont'd)	Vendor Drawings	Vendor Drawings (Status Code 1 & 2 Drawings *) (cont'd): 24590-QL-HC4-HAHH-00001-06-01883, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Subassembly Sheet 1 of 6; 24590-QL-HC4-HAHH-00001-06-01884, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Subassembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-01885, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Subassembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-01886, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Subassembly Sheet 4; 24590-QL-HC4-HAHH-00001-06-01887, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Subassembly Sheet 5; 24590-QL-HC4-HAHH-00001-06-01888, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Subassembly Sheet 6; 24590-QL-HC4-HAHH-00001-06-01250, Rev. 00B, Autosampling System ASX-SMPLR-00017, Glovebox Subassembly Sheet 1 of 5; 24590-QL-HC4-HAHH-00001-06-01204, Rev. 00B, Autosampling System ASX-SMPLR-00017, Glovebox Subassembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-01205, Rev. 00B, Autosampling System ASX-SMPLR-00017, Glovebox Subassembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-01206, Rev. 00B, Autosampling System ASX-SMPLR-00017, Glovebox Subassembly Sheet 4; 24590-QL-HC4-HAHH-00001-06-01207, Rev. 00B, Autosampling System ASX-SMPLR-00017, Glovebox Subassembly Sheet 5; 24590-QL-HC4-HAHH-00001-06-01889, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Shell Subassembly Sheet 1 of 3; 24590-QL-HC4-HAHH-00001-06-01890, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Shell Subassembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-01891, Rev. 00B, Autosampling System ASX-SMPLR-00015, Glovebox Shell Subassembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-01143, Rev. 00B, Autosampling System ASX-SMPLR-00017, 19, 20, 25, & 28 Glovebox Shell Assembly Sheet 1 of 3; 24590-QL-HC4-HAHH-00001-06-01144, Rev. 00B, Autosampling System ASX-SMPLR-00017, 19, 20, 25, & 28 Glovebox Shell Assembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-01145, Rev. 00B, Autosampling System ASX-SMPLR-00017, 19, 20, 25, & 28 Glovebox Shell Assembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-01147, Rev. 00B, Autosampling System ASX-SMPLR-00017, 19, 20, 25, & 28 Glovebox Shell Assembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-00725, Rev. 00C, Autosampling System ASX-SMPLR-00019, Glovebox Subassembly Sheet 1 of 5; 24590-QL-HC4-HAHH-00001-06-00726, Rev. 00C, Autosampling System ASX-SMPLR-00019, Glovebox Subassembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-00727, Rev. 00C, Autosampling System ASX-SMPLR-00019, Glovebox Subassembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-01163, Rev. 00B, Autosampling System ASX-SMPLR-00019, Glovebox Subassembly Sheet 4; 24590-QL-HC4-HAHH-00001-06-01135, Rev. 00B, Autosampling System ASX-SMPLR-00019, Glovebox Subassembly Sheet 5; 24590-QL-HC4-HAHH-00001-06-01219, Rev. 00B, Autosampling System ASX-SMPLR-00020, Glovebox Subassembly Sheet 1 of 5; 24590-QL-HC4-HAHH-00001-06-01220, Rev. 00B, Autosampling System ASX-SMPLR-00020, Glovebox Subassembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-01221, Rev. 00B, Autosampling System ASX-SMPLR-00020, Glovebox Subassembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-01222, Rev. 00B, Autosampling System ASX-SMPLR-00020, Glovebox Subassembly Sheet 4; 24590-QL-HC4-HAHH-00001-06-01223, Rev. 00B, Autosampling System ASX-SMPLR-00020, Glovebox Subassembly Sheet 5;

References (cont'd)	Vendor Drawings, Plant Drawings, Data Sheet, System Description, and Permit Document	Vendor Drawings (Status Code 1 & 2 Drawings *) (cont'd): 24590-QL-HC4-HAHH-00001-06-01241, Rev. 00B, Autosampling System ASX-SMPLR-00020, Glovebox Subassembly Sheet 1 of 5; 24590-QL-HC4-HAHH-00001-06-01242, Rev. 00B, Autosampling System ASX-SMPLR-00025, Glovebox Subassembly Sheet 2; 24590-QL-HC4-HAHH-00001-06-01243, Rev. 00B, Autosampling System ASX-SMPLR-00025, Glovebox Subassembly Sheet 3; 24590-QL-HC4-HAHH-00001-06-01244, Rev. 00B, Autosampling System ASX-SMPLR-00025, Glovebox Subassembly Sheet 4; 24590-QL-HC4-HAHH-00001-06-01245, Rev. 00B, Autosampling System ASX-SMPLR-00025, Glovebox Subassembly Sheet 5; * Status Code 1 Drawing: Bechtel National Inc.'s Code indicating that BNI has "reviewed and approved the drawing for fabrication." Status Code 2 Drawing: Bechtel National Inc.'s Code indicating that BNI has "reviewed and approved the drawing for fabrication, with comments." Plant Drawings: 24590-PTF-P1-P01T-00003, Rev. 4, Pretreatment Facility General Arrangement Plan at El. 56'-0"; 24590-PTF-P1-P01T-00007, Rev. 9, Pretreatment Facility General Arrangement Section A-A; 24590-PTF-DB-S13T-00046, Rev. 11, Pretreatment Facility Structural Concrete Embedments Partial Plan, El. 56'-0", Sh. 1; 24590-PTF-DB-S13T-00047, Rev. 13, Pretreatment Facility Structural Concrete Embedments Partial Plan, El. 56'-0", Sh. 2; 24590-PTF-DB-S13T-00051, Rev. 9, Pretreatment Facility Structural Concrete Embedments Partial Plan, El. 56'-0", Sh. 6; 24590-PTF-DB-S13T-00052, Rev. 11, Pretreatment Facility Structural Concrete Embedments Partial Plan, El. 56'-0", Sh. 7; 24590-PTF-M6-ASX-00001, Rev. 2, P&ID PTF Autosampling System Sample Cabinet ASX-SMPLR-00015; 24590-PTF-M6-ASX-00003, Rev. 2, P&ID PTF Autosampling System Sample Cabinet ASX-SMPLR-00017; 24590-PTF-M6-ASX-00005, Rev. 2, P&ID PTF Autosampling System Sample Cabinet ASX-SMPLR-00019; 24590-PTF-M6-ASX-00006, Rev. 2, P&ID PTF Autosampling System Sample Cabinet ASX-SMPLR-00020; 24590-PTF-M6-ASX-00007, Rev. 2, P&ID PTF Autosampling System Sample Cabinet ASX-SMPLR-00025. Data Sheet: 24590-PTF-M2D-ASX-00001, Rev. 5, PTF Autosampling System (ASX) Data Sheet for Autosamplers (ASX-SMPLR-00015, -00017, -00019, -00020, and -00025). System Description: 24590-WTP-3YD-ASX-00001, Rev. 0, System Description for the Autosampling System (ASX). Permit Document: 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design.

	Information Assessed	Source of Information	Assessment
Design	The sampler cabinets secondary containment design standards and codes used are appropriate and adequate for their intended use.	Drawings, Specifications, Engineering & Procurement Subcontract Document, and Data Sheet listed above under References; ANSI/AISC N690-1994, Specification for the Design, Fabrication, and Erection of Safety Related Structures for Nuclear Facilities, American National Standards Institute; AWS D1.1, Structural Welding Code-Steel, American Welding Society; AWS D1.6, Structural Welding Code-Stainless Steel, American Welding Society; ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; ASME B13.3, Pressure Piping, American Society of Mechanical Engineers; ASME AG-1-1997 (including AG-1a-2000 Addenda), Code on Nuclear Air and Gas, American Society of Mechanical Engineers; AGS-G001-1998, Guidelines for Gloveboxes, 2nd Edition.	The Specification for Autosampler System and the Engineering & Procurement Subcontract Document require that the sampler cabinets be designed, fabricated, tested, and delivered in accordance with the requirements specified in the codes and standards listed in the Source of Information column in this section. The Data Sheet for Autosampler Units (ASX-SMPLR-00015, -00017, -00019, -00020, and -00025) requires and lists that each unit should be designed with specific ranges of temperature varying from 40° F to 152° F and pressure [(-) 7.3 in. w.g. to (+) 4 in. w.g.] application. The Data Sheet also provides applicable nozzle and fatigue loads. The drawings show that overall dimensions of each shielded autosampler unit (ASX-SMPLR-000015, -000019, -000020, and -000025) are about 82" wide x 59" deep x 96" high and that of ASX-SMPLR-00017 is about 86" wide x 105" deep x 96" high. Each autosampler unit houses the upper and lower secondary containment components (liner plates, leak collection trough, leak detector inside the glovebox). The overall typical dimensions of each glovebox are about 43" wide x 68" long x 42" high. The autosampler gloveboxes are built with varying thicknesses of 304L or 316L stainless steel plates, 3/16" being the minimum thickness. The codes and standards listed in the Source of Information column are appropriate and adequate to provide secondary containment for the intended use of collecting and transporting samples of PTF process waste.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	The sampler cabinets component enclosure, supports, and foundation design include full weight of sampler cabinets.	Specifications, Data Sheet, and Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-DC-ENG-06-001, Rev. 0, Design Criteria for Equipment Seismic and Environmental Qualification; 24590-QL-HC4-HAHH-00001-11-00038, Rev. 00B, Structural Analysis of ASX-SMPLR-00020; 24590-QL-HC4-HAHH-00001-11-00039, Rev. 00C, Structural Analysis of ASX-SMPLR-00019; 24590-QL-HC4-HAHH-00001-11-00040, Rev. 00C, Structural Analysis of ASX-SMPLR-00017; 24590-QL-HC4-HAHH-00001-11-00042, Rev. 00B, Structural Analysis of ASX-SMPLR-00025; 24590-QL-HC4-HAHH-00001-11-00051, Rev. 00B, Structural Analysis of ASX-SMPLR-00015.	The Specification for AutoSampling system (ASX) identifies the secondary containments enclosure, shielding, and supporting steel framing components to be Safety Significant (SS) of Quality Level (Q-2) and the Seismic Category (SC-II). The drawings show that the secondary containment enclosure components (the sampler cabinet) are an integral part of or are located within the bounds of a glovebox structure of each autosampler unit. All secondary containment liners and components within the glovebox are fully welded to confine any waste spillage within the enclosed sampler cabinet which has the leak detection device to alarm any spillage incidents. The leak detection alarm components are SS, Q, and SC-III category are also housed in each glovebox. The glovebox structure is attached to and supported by structural steel framing members. The framing members are enclosed in shielding steel plates around them on top and three sides except the rear side that faces the concrete wall. The Structural Design Criteria uses appropriate applicable standards to define design loads and load combinations. The Specification for the Autosampling System, the Design Criteria for Equipment Seismic and Environmental Qualification, and the Data Sheet require that along with dead weights of the components, the weight of the glovebox filled with water, and the specified temperature and pressure environmental conditions should be appropriately included in the loads and load combinations. The Structural Analysis documents and drawings reviewed show that the secondary containment components of the sampler cabinets have been adequately designed to provide the required containment for any spilled waste fluids. Review of the autosampler units Structural Analysis documents also show that the support system for each unit has adequate strength to sustain the aforementioned loads and is in turn anchored (welded) to the steel embed plates in the concrete floor slab. Furthermore, Chapter 14 of the Basis of Design document requires that the foundation underlying the autosampler units' supports must be adequate to sustain the full load of the units, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation slab is part of a separate integrity assessment report for the secondary containment of the plant items on this floor (Elevation 56'-0").

	Information Assessed	Source of Information	Assessment
Design (cont'd)	Design calculation approach and design basis of support and foundation with design standard and codes references such as AISC code, are adequate.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-WTP-DC-ENG-06-001, Rev. 0, Design Criteria for Equipment Seismic and Environmental Qualification; ANSI/AISC N690-1994, Specification for the Design, Fabrication, and Erection of Safety Related Structures for Nuclear Facilities, American National Standards Institute; 24590-QL-HC4-HAHH-00001-11-00038, Rev. 00B, Structural Analysis of ASX-SMPLR-00020; 24590-QL-HC4-HAHH-00001-11-00039, Rev. 00C, Structural Analysis of ASX-SMPLR-00019; 24590-QL-HC4-HAHH-00001-11-00040, Rev. 00C, Structural Analysis of ASX-SMPLR-00017; 24590-QL-HC4-HAHH-00001-11-00042, Rev. 00B, Structural Analysis of ASX-SMPLR-00025; 24590-QL-HC4-HAHH-00001-11-00051, Rev. 00B, Structural Analysis of ASX-SMPLR-00015.	The Basis of Design document provides many fundamental general requirements for support and foundation design. The Structural Design Criteria document references adequate detailed design criteria for the design of support steel framing and concrete foundations and footings. The ANSI/AISC N690-1994 code is referenced for support design of SC-II structural steel components. Structural Analysis documents and drawings reviewed show that the upper and lower secondary containment components housed in the gloveboxes are adequately designed and supported to meet the applicable code requirements.

	Information Assessed	Source of Information	Assessment
Foundation Design	Foundation material is compatible with the support structure.	Specification and Drawings listed in above under References.	Specification for Autosampling System requires that stainless steel material be used for the ASX sampler cabinet confinement enclosure components including upper and lower liner plates. The drawings show that the ASX Autosampler Units (ASX-SMPLR-00015, -000017, -00019, -00020, and -00025) are located at Elevation 56'-0" level of the PTF building. The carbon steel support structure frame base plates of the autosampler units are welded (anchored) to the carbon steel plates embedded in concrete floor slab. The base plates and embed plates are compatible with each other.
	Foundation will withstand the effects of frost heave.	24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria.	The Structural Design Criteria requires all structural foundations for outdoor components to extend below the 30" frost line from the finished grade (Elevation 0'-0"). Rooms housing the ASX Autosampler Units are inside/interior of the PTF building at Elevation 56'-0", therefore, they are not subjected to the detrimental effects of frost heave.

	Information Assessed	Source of Information	Assessment
Seismic	Seismic considerations have been adequately addressed.	Drawings listed above under References; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-WTP-DC-ENG-06-001, Rev. 0, Design Criteria for Equipment Seismic and Environmental Qualification; ANSI/AISC N690-1994, Specification for the Design, Fabrication, and Erection of Safety Related Structures for Nuclear Facilities, American National Standards Institute; 24590-QL-HC4-HAHH-00001-11-00038, Rev. 00B, Structural Analysis of ASX-SMPLR-00020; 24590-QL-HC4-HAHH-00001-11-00039, Rev. 00C, Structural Analysis of ASX-SMPLR-00019; 24590-QL-HC4-HAHH-00001-11-00040, Rev. 00C, Structural Analysis of ASX-SMPLR-00017; 24590-QL-HC4-HAHH-00001-11-00042, Rev. 00B, Structural Analysis of ASX-SMPLR-00025; 24590-QL-HC4-HAHH-00001-11-00051, Rev. 00B, Structural Analysis of ASX-SMPLR-00015.	The Secondary Containment Design, Structural Design Criteria, and Design Criteria for Seismic and Environmental Qualification documents provide detailed information of design methodology, materials, loads, and load combinations applicable for the sampler cabinets. The Specification for Autosampling system identifies the Quality Level of the system to be QL-2 and the Seismic Classification as SC-II. The ASX system design loads combinations are taken from ANSI/AISC N 690-1994 and analysis for SC-II secondary containment enclosure is performed in accordance with the Specification for Seismic Qualification of Seismic Category I/II Equip. and Tanks document. The secondary containment enclosure and support frame structures are designed in accordance with the requirement of ANSI/AISC N460-1994 code. The frame structure is designed to sustain all applicable loads including seismic and its bases are adequately welded to the embedded steel plates in concrete floor slab supporting the autosampler units. The Structural Analysis documents and drawings reviewed show that the sound engineering techniques are used for the analyses purposes.

	Information Assessed	Source of Information	Assessment
Compatibility	The stored waste is compatible with its secondary containment and leak detection hardware based on a detailed chemical and physical analysis of the wastes used and other information sources.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-WTP-PER-J-02-002, Rev. 4, Leak Detection in Secondary Containment Systems; 24590-QL-HC4-HAHH-00001-11-00038, Rev. 00B, Structural Analysis of ASX-SMPLR-00020; 24590-QL-HC4-HAHH-00001-11-00039, Rev. 00C, Structural Analysis of ASX-SMPLR-00019; 24590-QL-HC4-HAHH-00001-11-00040, Rev. 00C, Structural Analysis of ASX-SMPLR-00017; 24590-QL-HC4-HAHH-00001-11-00042, Rev. 00B, Structural Analysis of ASX-SMPLR-00025; 24590-QL-HC4-HAHH-00001-11-00051, Rev. 00B, Structural Analysis of ASX-SMPLR-00015.	The Basis of Design document states that the secondary containment components are to be appropriately lined and any leaks or spills will be removed within 24 hours of a leak detection or in as timely a manner as possible. Based on a detailed chemical and physical analysis of the wastes and other process information sources, the Material Selections document identifies appropriate corrosion resistant materials (stainless steel) for the ASX autosampler units' secondary containment components and leak detection hardware. The drawings and Structural Analysis documents reviewed show that the 304L stainless steel or better material as recommended in Material Selections document is used for the fabrication of the ASX sampler cabinets. The Secondary Containment Design document provides adequate typical construction details including attachment details for the leak detection equipment to be used for secondary containment where required.

	Information Assessed	Source of Information	Assessment
Strength	The design shows that the secondary containment has sufficient strength and thickness to prevent failure owing to pressure gradients, static head during a release, physical contact with the waste, climatic conditions, and the stress of daily operations (e.g., vehicular traffic).	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-QL-HC4-HAHH-00001-11-00038, Rev. 00B, Structural Analysis of ASX-SMPLR-00020; 24590-QL-HC4-HAHH-00001-11-00039, Rev. 00C, Structural Analysis of ASX-SMPLR-00019; 24590-QL-HC4-HAHH-00001-11-00040, Rev. 00C, Structural Analysis of ASX-SMPLR-00017; 24590-QL-HC4-HAHH-00001-11-00042, Rev. 00B, Structural Analysis of ASX-SMPLR-00025; 24590-QL-HC4-HAHH-00001-11-00051, Rev. 00B, Structural Analysis of ASX-SMPLR-00015.	The PTF general arrangement drawings show ASX autosampler units are located inside the building. Pressure gradients, static head during a release, physical contact with the waste, climatic conditions, and the stresses of daily operations are adequately stated as design goals in the Basis of Design document. The Secondary Containment Design document describes and provides references to the design methodology, materials of construction, loads, and load combinations (including seismic loads) for the PTF facility secondary containment components. The secondary containment enclosures being considered are located in the room inside the PTF Vitrification Building rather than being directly buried in ground, therefore, pressure gradients and vehicular traffic are not considered applicable load cases. However, the Structural Analysis documents reviewed show that the strength of secondary containment enclosure components is sufficient to sustain applicable loads such as static, fluid, and seismic.

	Information Assessed	Source of Information	Assessment
Strength (cont'd)	The secondary containment system has sufficient strength in the presence of operational stresses from site-specific conditions (i.e., frost, precipitation etc.).	Drawings listed above under References; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-WTP-3PS-NLLR-T0002, Rev. 1, Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-QL-HC4-HAHH-00001-11-00038, Rev. 00B, Structural Analysis of ASX-SMPLR-00020; 24590-QL-HC4-HAHH-00001-11-00039, Rev. 00C, Structural Analysis of ASX-SMPLR-00019; 24590-QL-HC4-HAHH-00001-11-00040, Rev. 00C, Structural Analysis of ASX-SMPLR-00017; 24590-QL-HC4-HAHH-00001-11-00042, Rev. 00B, Structural Analysis of ASX-SMPLR-00025; 24590-QL-HC4-HAHH-00001-11-00051, Rev. 00B, Structural Analysis of ASX-SMPLR-00015.	The PTF facility drawings show that the secondary containment being considered is installed inside the building. Because it is located inside the building, precipitation and frost are not applicable load cases. The Secondary Containment Design document identifies the applicable load cases (operational stresses) from site specific conditions that must be considered in the design. The Engineering Specification for Furnishing Stainless Steel Liner Plates includes specific provisions for protection and repair of completed liners during the construction process. The Material Selections for Building Secondary Containment document addresses the potential effects of operations conditions on metal liner and the associated maintenance requirements. The Structural Analysis documents reviewed show that the secondary containment components are adequately designed and have sufficient strength to sustain the applicable design loads.

	Information Assessed	Source of Information	Assessment
Foundation Integrity	The secondary containment is adequately supported by the enclosure structure and foundation below has adequate strength	Drawings listed above under References; 24590-QL-HC4-HAHH-00001-11-00038, Rev. 00B, Structural Analysis of ASX-SMPLR-00020; 24590-QL-HC4-HAHH-00001-11-00039, Rev. 00C, Structural Analysis of ASX-SMPLR-00019; 24590-QL-HC4-HAHH-00001-11-00040, Rev. 00C, Structural Analysis of ASX-SMPLR-00017; 24590-QL-HC4-HAHH-00001-11-00042, Rev. 00B, Structural Analysis of ASX-SMPLR-00025; 24590-QL-HC4-HAHH-00001-11-00051, Rev. 00B, Structural Analysis of ASX-SMPLR-00015; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design.	Review of the Structural Analysis documents and drawings shows that the support system for each sampler cabinet has adequate strength to sustain the applicable design loads and is in turn anchored (welded) to the steel embed plates in the concrete floor slab. Chapter 14 of the Basis of Design document requires that the foundation underlying the cabinet support must be adequate to sustain the loads from the weight of the glovebox filled with water, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation slab is part of a separate integrity assessment report for the secondary containment for the plant items on this floor.
Infiltration	The design or operation prevents run-on or infiltration of precipitation into the secondary containment.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design.	The Basis of Design document requires the design to provide adequate measures to prevent run-on or infiltration of precipitation. The secondary containment is located inside the PTF Vitrification Building where it is protected from direct precipitation by the building structure as shown in the general arrangement drawings. Therefore this section is not applicable to the secondary containment components being assessed.
	The design includes an external moisture barrier or other means to prevent moisture from entering the room.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design.	The Basis of Design document requires the design include provisions to prevent external moisture intrusion. The ASX Autosampler Units shown on the General Arrangement drawings are inside the PTF Vitrification Building at floor Elevation 56'-0" which protects them from precipitation and surface water percolation, therefore, this section is not applicable to them.

	Information Assessed	Source of Information	Assessment
Liner System	The containment area is free of cracks or gaps and the design discusses methods of their minimization.	24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection.	The Basis of Design document requires the liner system to be free of cracks and gaps. The Secondary Containment Design document provides current adequate design requirements, and codes and standards to design leak tight liners. This document includes appropriate details for installation of stainless steel components free of cracks and gaps. The Material Selections document provides adequate requirements for the secondary containment components.
	The design has considered the compatibility of the secondary containment elements with the waste and for preventing it from migrating into the concrete slab below.	24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-WTP-PER-CSA-02-001, Rev. 9, Secondary Containment Design.	The Material Selections document contains information on the compatibility of secondary containment stainless steel material usage for containing the waste. The Secondary Containment Design document provides standard installation details for the secondary containment components of the sampler cabinets which ensure leak-tight connections that will prevent the migration of the waste onto the concrete slab below.

Master Distribution Schedule for WTP Project Subcontract Management Group

SUBMITTAL TRANSMITTAL: ☐ First Submittal ☐ Re-Submittal ☐ QVRP Package ☐ RFI
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☐ Pre-Award/Award Package ☐ Executed Change Order Package
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Subcontract Number:	24590-CM-HC4-HXYG-00211
Subcontract Title:	Tank Integrity Design Assessments
Subcontractor Name:	AREVA Federal Services LLC
Subcontract Administrator:	Susan Parr

PDC Document Number	Rev	Document Title	Rev
CCN #169566		IQRPE Structural Integrity Assessment Report For PTF ASX Secondary Containment (Sampler Cabinets) - IA-3003445-000)	

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Master Distribution Schedule for WTP Project Subcontract Management Group

Subcontract Number:	24590-CM-HC4-HXYG-00211
Subcontract Title:	Tank Integrity Design Assessments
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Attachment 3
10-ESQ-212
(2 Pages)

Bechtel National, Inc. and U.S. Department of Energy,
Office of River Protection Certification Statements

Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of permit package LAW-034, Revision 0, *Tank System Secondary Containment for LAW ASX Samplers*, and PTF-099, Revision 0, *Tank System Secondary Containment for PTF ASX Samplers*.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

F. M. Russo
Project Director

6/23/10
Date

U.S. Department of Energy, Office of River Protection Certification

The following certification statement is provided for the submittal of permit package LAW-034, Revision 0, *Tank System Secondary Containment for LAW ASX Samplers*, and PTF-099, Revision 0, *Tank System Secondary Containment for PTF ASX Samplers*.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

7/26/10

D. A. Brockman, Manager
U.S. Department of Energy
Office of River Protection

Date