

## PMSTPCOL NPEmails

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**From:** Tai, Tom  
**Sent:** Thursday, August 19, 2010 4:34 PM  
**To:** Chakrabarti, Samir; Jeng, David  
**Cc:** Chakravorty, Manas; Tai, Tom; Hawkins, Kimberly; Foster, Rocky  
**Subject:** FW: Transmittal of Letter U7-C-STP-NRC-100193  
**Attachments:** U7-C-STP-NRC-100193.pdf

Samir, David,

Attached for your use are supplemental responses from STP on RAI 03.04.02-8 (eRAI 4058) and 03.08.04-18 (eRAI 4046).

Rocky,

You may want to alert your reviewer that supplemental responses on 03.08.04-18 is here to see if it helps to progress his chapter.

Regards

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**From:** Elton, Loree [<mailto:leelton@STPEGS.COM>]  
**Sent:** Thursday, August 19, 2010 3:48 PM  
**To:** Muniz, Adrian; Wunder, George; Tonacci, Mark; Eudy, Michael; Kallan, Paul; Plisco, Loren; Anand, Raj; Foster, Rocky; Smith, Lona I; Joseph, Stacy; Govan, Tekia; Tai, Tom  
**Subject:** Transmittal of Letter U7-C-STP-NRC-100193

Please find attached a courtesy copy of letter number U7-C-STP-NRC-100193, which provides revised responses to NRC staff questions included in Request for Additional Information (RAI) letter numbers 345 and 299 related to Combined License Application (COLA) Part 2, Tier 2, Sections 3.4 and 3.8.

The official version of this correspondence will be placed in today's mail. Please call John Price at 972-754-8221 if you have any questions concerning this letter.

Thank you,

*Loree Elton*  
Licensing, STP 3 & 4  
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**Hearing Identifier:** SouthTexas34NonPublic\_EX  
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**Sent Date:** 8/19/2010 4:33:48 PM  
**Received Date:** 8/19/2010 4:33:00 PM  
**From:** Tai, Tom

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**Recipients Received:**



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

August 19, 2010  
U7-C-STP-NRC-100193

U. S. Nuclear Regulatory Commission  
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South Texas Project  
Units 3 and 4  
Docket Nos. 52-012 and 52-013  
Revised Response to Request for Additional Information

Attached are revised responses to NRC staff questions included in Request for Additional Information (RAI) letter numbers 345 and 299 related to Combined License Application (COLA) Part 2, Tier 2, Sections 3.4 and 3.8, respectively. The two attachments address the revised responses to the RAI questions listed below:

03.04.02-8 and 03.08.04-18

There are no commitments in this response.

Where there are COLA markups, they will be made at the first routine COLA update following NRC acceptance of the RAI response.

If you have any questions regarding these responses, please contact Scott Head at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 8/19/2010

Mark McBurnett  
Vice-President, Oversight and Regulatory Affairs  
South Texas Project Units 3 & 4

jep

Attachments:

1. RAI 03.04.02-8, Revision 1
2. RAI 03.08.04-18, Revision 1, Supplement 1

cc: w/o attachment except\*  
(paper copy)

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**RAI 03.04.02-8, Revision 1****QUESTION:**

In its response to RAI 3.4.2-4 (RAI 3322, Question 13165), the applicant has confirmed that nonseismic category I SSC will be designed against collapse when exposed to a DBF. Since the acceptance criteria in SRP (3.7.2.II.8) and the ABWR DC FSER, NUREG 1503 (Section 3.7.2) allow for design against collapse of interacting SSC, the applicant should provide design procedures for SSC with interaction potential, to resist the site-specific external events including design basis floods. Such procedures should include the corresponding ITAAC, the load parameters, load combinations, design acceptance criteria and the safety margins against failure that are equivalent to that of seismic category I SSC. The staff needs this information to conclude that there will be no adverse II/I interactions associated with the design basis flood.

**RESPONSE:**

The original response to this RAI, submitted with STPNOC letter U7-C-STP-NRC-100141 (ML101690150), dated June 15, 2010, referred to values for hydrodynamic and hydrostatic flood forces that were anticipated to be provided in STPNOC's response to RAI 03.04.02-9. The following revised response provides this information directly rather than referring to the response to another RAI. This response completely supersedes the previous response. The revised portion of the response is marked with a revision bar.

As discussed in STPNOC's response to RAI 03.04.02-4 (letter U7-C-STP-NRC-090161 dated October 7, 2009), non-safety-related Structures, Systems, and Components (SSCs) that are located such that they could collapse onto safety-related SSC will be designed for design basis flood loads. SSCs with potential for interaction with Seismic Category I structures are those non-Seismic Category I structures that are within one building height above grade of a Seismic Category I structure; for example, a non-Seismic Category I building that extends 50 feet above grade and is less than 50 feet away from a Seismic Category I building.

Consistent with the values presented in COLA Part 2, Section 2.4S.4, flood loads will be the sum of 1) a hydrostatic load based on a flood level of 40.0 ft MSL and 2) a hydrodynamic drag load of 44 psf.

ACI 349-97, Section 9.2.1 provides for other extreme environmental loads such as extreme floods by substituting the extreme environmental load for  $W_t$  in Load Combination number 5. In the case of extreme flood loads,  $F_a$  is substituted for  $W_t$ , as shown below. Safety margin is satisfied by maintaining the required strength,  $U$ , considering this load combination:

$$U = D + F + L + H + T_o + R_o + F_a$$

Where:  $U$  = required strength to resist factored loads or related internal moments and forces

$D$  = dead loads, or related internal moments and forces, including piping and equipment dead loads

$F$  = loads due to weight and pressures of fluids with well-defined densities and controllable maximum heights, or related internal moments and forces

$L$  = live loads, or related internal moments and forces

$H$  = loads due to weight and pressure of soil, water in soil, or other materials, or related internal moments and forces

$T_o$  = internal moments and forces caused by temperature distributions within the concrete structure occurring as a result of normal operating or shutdown conditions

$R_o$  = piping and equipment reactions, or related internal moments and forces, which occur under normal operating and shutdown conditions, excluding dead load and earthquake reactions

$F_a$  = extreme flood load (as described in response to RAI 03.04.02-9)

The acceptance criteria for the required strength,  $U$ , are given in ACI 349-97.

SRP 3.7.2.II.8 referenced in this RAI is specific to the analysis of the potential for interaction between non-Seismic Category I structures for seismic events and does not address flooding or other non-seismic events. Compliance with the acceptance criterion of SRP 3.7.2.II.8 is addressed by various ITAAC contained in Tier 1 of the certified design control document (e.g., Section 2.15.11, Turbine Building, Table 2.15.11). These ITAAC require a structural analysis report which concludes that under seismic loads corresponding to the safe-shutdown earthquake ground acceleration the as-built structure does not damage safety-related functions.

For non-Seismic Category I structures with potential for interaction with Seismic Category I structures during flooding events, evidence of the analysis for flooding loads will be included in the structural analysis report for the respective non-Seismic Category I building.

No COLA revision is required as a result of this RAI response.

**RAI 03.08.04-18, Revision 1, Supplement 1****QUESTION:****Follow-up to Question 03.08.04-2 (RAI 2964)**

The applicant's response to Question 03.08.04-2 states that the Radwaste Building (RWB) will be designed in accordance with the requirements of RG 1.143, Revision 2. The applicant also discussed the design criteria for this building for seismic category II/I evaluation. In order for the staff to conclude that the Radwaste Building design meets the requirements of RG 1.143, and also meets the requirement in ABWR DCD Section 3.7.2.8, item (3), the FSAR needs to include sufficient design information for the building to demonstrate that the design meets the pertinent design criteria. Guidance provided in SRP Section 3.8.4 may be used for providing such information. Therefore, the applicant is requested to provide design information for the RWB in the FSAR that includes more detailed description of the structure; applicable codes, standards and specifications; loads and load combinations including live loads, seismic loads, thermal loads, flood loads, tornado loads, lateral soil pressure, etc.; design and analysis procedures; structural acceptance criteria; materials and quality control; design of critical sections, stability evaluation, etc.

**SUPPLEMENTAL RESPONSE:**

The Revision 1 response to RAI 03.08.04-18 was submitted with letter U7-C-STP-NRC-100124 dated June 2, 2010. The structural analysis of the Radwaste Building (RWB) described in this RAI response was based on a model that included changes to the RWB general arrangement (GA) that were expected to be handled in accordance with the Interim Staff Guidance, "Finalizing Licensing-Basis Information" (DC/COL-ISG-011). Because of these changes in the GA it became necessary to evaluate the impact of these changes on other licensing documents. Therefore, the response to this RAI contained the following commitment.

"This RAI response will also impact other COLA sections beyond the structural details presented herein. Specifically, the general arrangement drawings of the RWB (Figures 1.2-23a through 1.2-23e) and other applicable text, table and figures in associated COLA sections (e.g., radiation zone maps, fire protection, area radiation monitors, etc.) will be revised and submitted as a supplement to this RAI response by July 30, 2010. This supplement will include an assessment of previous RAI responses associated with these COLA sections and will provide any RAI response revisions consistent with the design and analysis presented in this response."

This supplemental response provides the above information. No changes are made to the previous response.

In order to assess the impact of the RWB GA changes, a detailed review of the Draft Safety Evaluation Report (SER) for COLA Chapters 11 and 12, the Standard Review Plan for Chapters 11 and 12, and the RAI's that are associated with the RWB and Chapters 11 and 12 was performed.

### Conclusions

It was concluded from this review that the impact of GA changes is negligible. The changes do not affect the conclusions of the SER and previously submitted RAI responses, and the design continues to meet the acceptance criteria in the SRP. The impact on the COLA is limited to revisions to some figures and tables to reflect the rearrangement of some rooms and changes in the thickness of some shield walls to maintain the radiation zone classifications. The changes have no impact on offsite releases and doses, in-plant radiation exposure, and operating procedures.

The information in this supplemental response includes the following COLA changes which are included in Enclosure 1:

1. Revised RWB GA (FSAR Figures 1.2-23a through 1.2-23e).
2. Additional changes to the FSAR that are required to be consistent with the changes to the RWB GA figures. These changes include:
  - a. Changes to the RWB radiation zone maps (FSAR Figures 12.3-37 through 12.3-41).
  - b. Changes to the RWB area radiation monitor locations (FSAR Figures 12.3-66 and 12.3-67).
  - c. Changes to the RWB fire protection drawings (FSAR Figures 9A.4-28 through 9A.4-32).
  - d. Changes to the RWB HVAC P&IDs (FSAR Figure 9.4-10).
  - e. Changes to FSAR Tables 12.2-5a, 12.2-5c, and 12.3-6

### **Description of Changes to the Radwaste Building General Arrangement Drawings**

The rooms in the Radwaste Building (RWB) were rearranged to improve the operability of the facility and to reduce radiation exposure to operating personnel. Changes to the RWB GAs have been made as a result of a review of the internal space configuration and equipment arrangement driven primarily by system performance, operational efficiency, and ALARA considerations. No changes were made to the number, capacity, or performance of the equipment in the RWB. The function of the RWB with respect to radiation protection and control of radiological releases is unchanged.

The following summarizes the changes to the RWB layout as reflected in the revised FSAR GA figures (Figures 1.2-23a through 1.2-23e), which are included in Enclosure 1.



Equipment Arrangement (Figures 1.2-23a and 1.2-23b)

- The phase separator tanks and associated pumps are moved from the west end of the building to the east end. This change shortens the piping runs from the radwaste piping tunnel (which provides the connection to the Reactor Building and Turbine Building) to the tanks and from the tanks to the dewatering equipment. The shorter piping runs for this system, which has a high solids content, reduce demand on components of the system, helps prevent crud buildup, and minimize and localize the sources associated with the phase separator tanks.
- The decant pumps for the phase separator and spent resin tanks were separated from the transfer pumps and placed in separate rooms for ALARA purposes (see “Partial Floor Plan” on Figure 1.2-23a). The decant pumps are expected to handle liquid with a much lower activity than the transfer pumps, so this is an implementation of the ALARA concept of separating low activity components from high activity components.
- The two rows of tanks were shifted to the west against the west wall to utilize the space formerly occupied by the phase separator tanks. The corridor along the west wall, which was used to access the phase separator tanks, was eliminated as no longer necessary, and to save space. The removal of the corridor required the addition of a stairwell in the northwest corner of the building for life safety reasons.
- The liquid waste (LW) backwash receiving tank and associated pumps were moved from the northwest corner of the RWB to the approximate center of the RWB adjacent to the west wall of the spent resin tanks. This move also locates this tank near the other sludge tanks so that all sludge tanks are located in the same area of the RWB. This move shortens the pipe runs from the processing equipment located on the floor above, which is the primary input to the tank. This also locates the LW backwash receiving tank closer to the phase separator, which is used to process the contents of the LW backwash receiving tank. In a manner similar to the relocation of the phase separator tank, the shorter piping runs for this system, which has a high solids content, reduce demand on the components of the system, help prevent crud buildup, and minimize and localize the sources associated with the LW backwash receiving tank.
- The row of sample tanks along the north wall was shifted west to the west wall to utilize the space formerly occupied by the LW backwash receiving tank. A wall was added between the two high conductivity waste (HCW) sample tanks to provide shielding between two passive components. This provides shielding that may be required in the unlikely event that one of the HCW sample tanks becomes contaminated to ensure that the radiation zones are not adversely impacted.
- The hot shower drains (HSD) receiver and sample tanks and pumps were moved from the center of the RWB to the north wall east of the sample tanks. This move makes room for the LW backwash receiving tank in the center of the RWB and utilizes space vacated by the relocation of the LW backwash receiving tank. The HSD receiver and sample tanks are low activity tanks, and this move groups them with the low activity sample tanks. Both tanks and the pumps are accessed from El 12'-0", and the lower region serves as a stainless steel lined leak retention space similar to the other tank rooms (this is unchanged from the current design).

- The chemical drain tank and pumps were moved from the second floor (Figure 1.2-23b) to the basement (Figure 1.2-23a) along the north wall east of the HSD tanks. This made use of available space and freed up space for a valve aisle on the second floor (this places the valves and pumps in separate rooms to reduce radiation exposure). When combined with the relocation of the HSD tanks, all low activity tanks are located along the north wall of the RWB (this will facilitate operations and reduce operational radiation doses).
- The electrical equipment room was moved from the El 5300 mm floor (Figure 1.2-23b) to the Grade floor (Figure 1.2-23c) to locate it adjacent to the control room (this places the clean electrical areas in adjacent locations). The area on the El 5300 mm floor is now used as a cable spreading area (this will facilitate construction and maintenance).
- Because of the room rearrangement, the thickness of ten (10) radiation shielding walls for seven (7) rooms was changed to maintain the radiation levels and zones outside of the rooms. This is shown on the markup of FSAR Table 12.2-5c.
- In addition, the room numbers and column row designations have been changed. This does not result in physical changes to the RWB.

#### Building Size (Figure 1.2-23e)

- The height of the roof above the ground floor has increased from 44'-0" to 61'-4" to accommodate the size and lifting height requirements of the overhead crane. This will improve the operability of the facility (e.g., radioactive waste cask loading operations) by increasing the crane hook clearance.
- The changes in thickness of the RWB outside walls and the configuration of the basement as shown in the revised Figure 1.2-23e are based on the detailed structural analysis. The interior dimensions of the RWB are not changed.

The above building size changes reflect the dimensions incorporated into the building structural analysis as described in the June 2, 2010 response to this RAI.

#### Drawing Formatting

- The section views on Figure 1.2-23e were separated onto two sheets (maintaining the same figure number) to improve legibility as required for the larger scale used for the revised figures.

The changes to the RWB GA figures described above affect other parts of the FSAR only in a limited way. Configuration and layout changes made to the RWB GAs are carried over to the Radiation Zone Maps, Fire Protection figures, Area Radiation Monitors figures, and HVAC P&IDs. These changes do not result in any functional or basic design changes, as explained in the following paragraphs. The corresponding COLA markups are contained in Enclosure 1.

## **DESCRIPTION OF FSAR CHANGES**

### **A. FSAR Figures**

#### Radiation Zone Maps (Figures 12.3-37 through 12.3-41)

The changes in the arrangement shown on the RWB GAs do not result in any changes to the radiation zone designations for the various areas (equipment rooms, pipe chases, hallways, etc) in the RWB. The radiation sources in the individual rooms remain the same (i.e., the room and the source in it are moved), and the shielding is adjusted as necessary to ensure the radiation levels in protected areas correspond to the established radiation zone (the shield wall thickness changes are associated with situations where the area outside of the room has a different radiation zone). The changes in the shielding wall thicknesses are described in the markup of FSAR Table 12.2-5c (see below).

#### Fire Protection (Figures 9A.4-28 through 9A.4-32)

The Fire Protection figures for the RWB are revised to reflect some changed locations of hose racks, stand pipes, extinguishers, and fire barriers (walls and floors). None of these items is deleted or added. The relocation is due to the interior reconfiguration of the RWB discussed in Attachment 1. There are no functional changes to the RWB fire protection provisions.

#### Area Radiation Monitors (Figures 12.3-66 and 12.3-67)

The radiation monitors shown on these figures are listed in Table 12.3-6. The functions of the area radiation monitors (ARMs) in the RWB are unchanged. Internal reconfiguration of the RWB resulted in some changed locations of ARMs depicted on Figures 12.3-66 and 12.3-67, but the total number of ARMs in the building is unchanged (no ARMs added or removed). There are no functional changes to the RWB area radiation monitoring provisions (i.e., the same radiation sources or rooms are being monitored). The following provides the specifics of these changes.

#### Figure 12.3-66

- The Electrical Equipment Room radiation monitor (No. 1) is removed from this figure, and is now shown on Figure 12.3-67 because the room was moved to that elevation. It serves the same function.
- The phase separator tank room monitors (No. 10 and 11) were moved from the west end of the RWB to near the east end because the phase separator tank rooms were moved. The radiation monitors are still located inside the phase separator tank rooms. They are relocated with the tanks and serve the same function,
- The spent resin tank room monitors (No. 3 and 4) were moved west one column row because the spent resin tank rooms were moved. The radiation monitors are still located inside the spent resin tank rooms. They are relocated with the tanks and serve the same function.

Figure 12.3-67

- The Electrical Equipment Room radiation monitor (No. 1) is added to this figure because the room was moved to this elevation. It was previously shown on Figure 12.3-66. This location is comparable to previous location and the function is the same.

#### HVAC P&IDs (Figure 9.4-10)

The room numbers and room descriptions for several of the rooms shown on this figure (e.g., Control Room, Electrical Equipment Room, etc.) have been changed to match the room numbers and descriptions shown on the RWB GA figures. These are administrative changes which do not affect the operation or function of the equipment or facility.

### **B. Changes Required to FSAR Tables**

The revised RWB GA figures, RWB Radiation Zone Maps and RWB Radiation Monitor locations result in changes to Tables 12.2-5a, 12.2-5c and 12.3-6. The changes are summarized by table number below. The markups for the tables are provided in Enclosure 1.

#### Table 12.2-5a Radiation Sources – Radiation Sources

This table cites the radiation zone map figure that contains the radiation source. Since some of the sources have been moved, the applicable figure has also changed. These are editorial changes that do not affect any technical information in the table.

- The HSD receiver and sample tanks are now located in the same room. This room shows up on more than one figure, so the additional figure number (Figures 12.3-37 and 12.3-38) has been added.
- The chemical drain tank is moved to the lowest elevation, so the figure reference is changed to Figure 12.3-37.

#### Table 12.2-5c Radiation Sources – Shielding Geometry in Meters

Since some sources have been moved, some of the areas protected by shielding have changed, resulting in a change in shield thickness requirements. Note that since the radiation zones identified for each area of the RWB remain the same, these changes are made to ensure the level of radiation protection provided by the revised RWB layout is the same as the RWB layout currently in the FSAR.

- The phase separator tank rooms have moved to an area surrounded by general access areas. The current table has one set of shield walls that applies to both tank rooms, so separate shield wall thicknesses are specified for each room to reflect the location of the general access areas. The only shield thicknesses that have changed are the north wall of the Tank A room, which was previously adjacent to a pump room and is now adjacent to a general access area, and the south wall of Tank A room, which was previously adjacent

to a general access area and is now adjacent to the pump room. The shield wall thicknesses between the phase separator tank room and the general access area and between the phase separator tank room and the pump room remain the same.

- The HSD receiver and sample tanks are combined into a single room, so one room is deleted and the dimension of the remaining room increased. The tank is moved to be adjacent to low activity tanks, so the south wall thickness is decreased slightly.
- The LW backwash receiving tank is smaller with less activity than previously specified, as documented in the response to RAI 12.02-11. For these reasons, the room is smaller and shield thicknesses have decreased.
- The chemical drain collector tank has been moved to the lowest elevation, so the dimensions of the room changed. The east wall separates the tank room from the pump rooms so the shield thickness is smaller.
- Required shield thicknesses for one wall of the HCW sample tank room and the spent resin tank room have decreased because adjacent areas are not general access.

#### Table 12.3-6 Area Radiation Monitors Radwaste Building

This table is revised as a result of the Electrical Equipment Room being moved to elevation 12300 (Figure 12.3-67) from elevation 5300 (Figure 12.3-66). Although some other monitors were moved, they remain on the same set of figures.

#### **Evaluation of the Impact on the Draft Safety Evaluation Reports (SER) for COLA Chapters 11 and 12**

STPNOC has reviewed the draft Safety Evaluation Reports for chapters associated with the functions of the RWB (Chapters 11 and 12), to determine if any statements made in these SERs are affected by the COLA changes described above. This review did not identify any statements in these draft SERs that could be affected by these COLA changes. The following is a summary of the bases for this conclusion:

#### Releases of Radioactive Effluents from the Radwaste System and the Resulting Offsite Dose

The changes in the RWB GA drawings do not affect the amount of activity released or the dispersion of the activity in the environment. Consequently, these changes do not affect the SER conclusions concerning compliance with the release limits in 10 CFR 20, or the dose limits in 10 CFR 50 Appendix I, and 40 CFR 190.

- The amount of activity released is not affected. The amount of activity released is determined by the design and operation of the radwaste treatment systems. The change in the layout of the RWB reflected in the RWB GA drawing changes does not affect the functional design of the radwaste treatment systems. Although individual components have been relocated, these changes do not add or remove any equipment, or change the function of any components. Therefore the amount of activity released is not changed.

- The location of the release and the dispersion of the activity in the environment are not affected. For liquid releases, the release point is into the main cooling reservoir, which is outside the RWB. This release point is not changed. For gaseous activity, most is released through the offgas system, which is located in the Turbine Building. The actual release point is the plant stack, which is the same release point for other buildings (including the RWB) and is located on the Reactor Building. The change in the RWB does not change the location of the plant stack. Atmospheric dispersion may theoretically be affected by the size of the building due to wake effects. However, the receptor locations are located beyond the area where wake effects are important, so the change in the RWB layout will have no effect on the dispersion calculations.

### Radwaste System Sources

The activities of the radiation sources in the RWB, including the LW backwash receiving tank and the mobile radwaste system processing skids, are a function of the operation of the systems and are not affected by the location of the equipment. Therefore, the changes to the RWB GA figures will not affect the statements related to the activities of the radiation sources. However, the shielding requirements for the sources may be affected by the RWB GA figure changes if the areas protected by the shielding are different for the new arrangement. This effect has been evaluated, and the results are reflected in the changes to FSAR Table 12.2-5c identified above.

### Procedural Controls

Statements regarding the implementation of procedural controls, such as the Offsite Dose Calculation Manual (ODCM), the Process Control Manual (PCM), and instrument calibration procedures, are not affected by the change in arrangement of the RWB. The COLA changes do not affect STPNOC's commitments regarding these operational programs.

### Evaluation of Impact on Compliance with SRP Sections 11.0 and 12.0

The impact of the RWB GA changes on the draft SERs for Chapters 11 and 12 has been evaluated by a detailed review of the technical evaluation portions of the SERs, as described above. The basis for the review of the COLA is described in the Standard Review Plan (SRP), which contains a list of acceptance criteria for the review of each section of the COLA. In addition to the review of the SERs, a review of the acceptance criteria contained in Chapters 11 and 12 of the SRP was performed to document that STPNOC continues to meet these acceptance criteria.

Based on a review of the acceptance criteria from the SRP and an evaluation of the impact of the RWB GA changes we have concluded that we continue to meet the acceptance criteria.

### Evaluation of Impact on RAI Responses

STPNOC has reviewed all of its responses to requests for additional information (RAIs) concerning the FSAR chapters associated with the functions of the RWB (Chapters 11 and 12) to



determine if the responses are affected by the GA changes. This review concluded that no changes to any of the responses are needed as a result of these GA changes. A list of the RAI responses reviewed is provided in the table below.

RAI Responses Reviewed for Impact of GA Changes

RAI #	RAI #	RAI #	RAI #
02.03.04-5	11.02-06	11.05-07	12.03-12.04-03
02.05.04-4	11.02-07	11.05-07 Revised Response	12.03-12.04-04
02.04.12-1	11.02-07 Supp Response	11-05	12.03-12.04-05
02.04.12-17	11.02-08	12.01-01	12.03-12.04-06
02.04.12-21	11.02-08 Supp Response	12.02-01	12.03-12.04-07
02.05.04-28	11.02-09	12.02-02	12.03-12.04-08
02.04.12-22	11.02-09 Supp Response	12.02-03	12.03-12.04-09
02.04.12-28	11.02-10	12.02-04	12.03-12.04-10
02.04.12-28 Supp. Response 1	11.03-01	12.02-04 Supp Response	12.03-12.04-10 Supplement
02.04.12-29	11.03-02	12.02-05	12.03-12.04-11
02.04.12-31	11.03-03	12.02-06	12.03-12.04-11 Revised Response
02.04.13-2	11.03-04	12.02-07	12.03-12.04-12
02.04.13-3	11.03-05	12.02-07 Supp Response	12.03-12.04-13
02.04.13-9	11.03-06	12.02-08	12.03-12.04-13 Supplement
02.04.13-10	11.03-07	12.02-09	12.03-12.04-14
02.04.13-12	11.04-01	12.02-10	12.03-12.04-14 R1
02.04.13-13	11.04-02	12.02-11	12.03-12.04-15
02.04.13-14	11.04-03	12.02-12	12.05-01
02.05.04-1	11.04-04	12.02-13	12.05-02
03.02.01-6 Supp Response 1	11.04-05	12.02-14	12.05-03
03.05.01.06-1	11.04-06	12.02-15	12.05-04
09.03.03-5, Revision 1	11.05-01	12.02-16	12.05-05
11.02-01	11.05-01 Supp Response	12.02-17	12.05-06
11.02-02	11.05-02	12.02-17 Revised Response	19-24
11.02-03	11.05-03	12.02-18	

## RAI Responses Reviewed for Impact of GA Changes

RAI #	RAI #	RAI #	RAI #
11.02-04	11.05-04	12.02-19	
11.02-05	11.05-05	12.03-12.04-01	
11.02-05 Supp Response	11.05-06	12.03-12.04-02	

A review of RAIs other than in Chapters 11 and 12 was also performed. This review identified no impacts associated with RWB general arrangement changes. However, RWB dimensions were included in six previous RAI responses (see the list in the table below). These dimensions have been slightly revised in the building design submitted with the June 2, 2010 response to this RAI. A review of these dimension changes has been performed. Based on this review it was determined that there is no technical impact to the responses provided in these RAIs. They do not affect the interior dimensions of the RWB or the operations and performance of the equipment. Therefore, no changes to these RAI responses are needed.

## RAI Responses Affected by Revised Building Dimensions

RAI #	RAI #
02.05.04-4	02.05.04-1
02.05.04-28	03.05.01.06-1
02.04.13-3	19-24



**RAI 03.08.04-18, Revision 1, Supplement 1  
Enclosure 1**

**COLA Markups**

**Table 12.2-5a Radiation Sources – Radiation Sources**

<b>Source Table</b>	<b>For</b>	<b>Drawing</b>		<b>Approximate Geometry</b>
12.2-13h	HSD Receiver Tank	12.3-37 & 38		Cylinder (r=1.98m, l=4.4m)
12.2-13i	HSD Sample Tank	12.3-37 & 38		Cylinder (r=1.98m, l=4.4m)
12.2-13j	Chem Drain Tank	12.3-387		Cylinder (r=0.91 m, l=2.6m)

Table 12.2-5c Radiation Sources – Shielding Geometry in Meters

Component	Room Dimensions			Wall Thickness in Meters					
	Length	Width	Height	East	West	North	South	Floor	Ceiling
Phase Separator (2 Tanks-2 Rooms)	5.4	8.6	13	1.2	1.2	0.6	1.2	Ground	0.8
Tank A	5.4	8.6	13	1.2	1.2	0.6	1.2	Ground	0.8
Tank B	5.4	8.6	13	1.2	1.2	0.6	1.2	Ground	0.8
HSD Receiver and Sample Tanks	7.7	7.2	6.2	0.6	0.6	0.6	0.6	Ground	0.6
HSD Sample Tank	7.7	7.2	6.2	0.6	0.6	0.6	0.9	0.6	0.6
LW Backwash Receiving	5.6	8.3	13	0.6	1.2	0.6	1.2	Ground	0.8
Chem Drain Collector Tank	4.4	3.7	3.4	0.6	0.6	0.6	0.6	0.6	0.6
HCW Sample Tank (2 Tanks)	15	7.7	13	0.6	0.6	1.2	0.6	Ground	0.8
Spent Resin Storage Tank									
Tank B	5.2	5.2	10.1	0.9	0.9	1.2	0.9	Ground	0.6

**Table 12.3-6 Area Radiation Monitors Radwaste Building**

No.	Location and Description	Figure #	Sensitivity Range	Local Alarms
1	Electrical Equipment Room El <del>5300</del> 12300	12.3-6 <del>67</del>	H	X

NOTES: \_\_\_\_\_

NOTES: ALL TANK ROOMS ARE LINED WITH A SS LINER FROM THE FLOOR TO AN ELEVATION REQUIRED TO CONTAIN LIQUID.

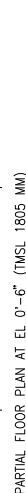
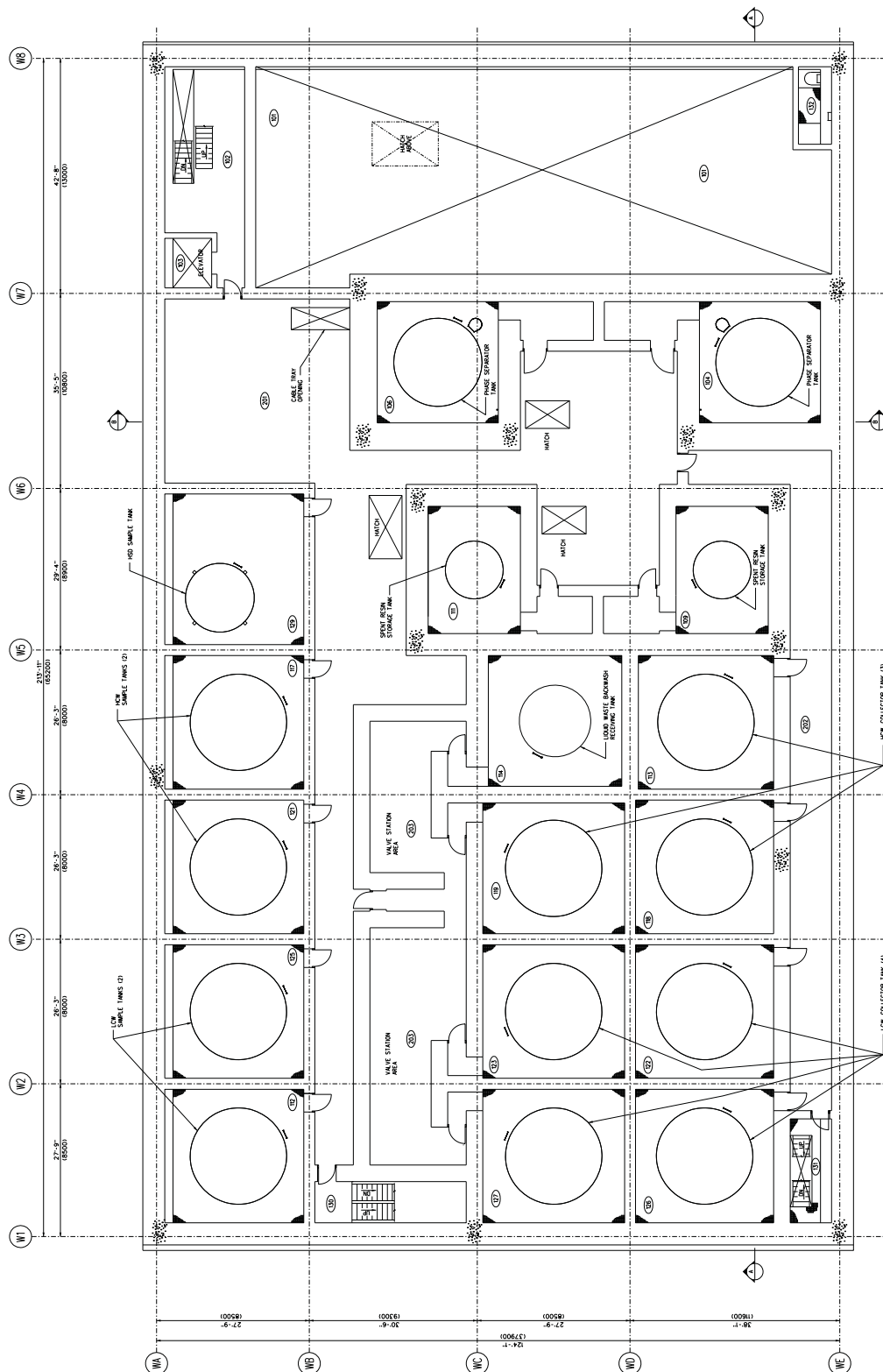


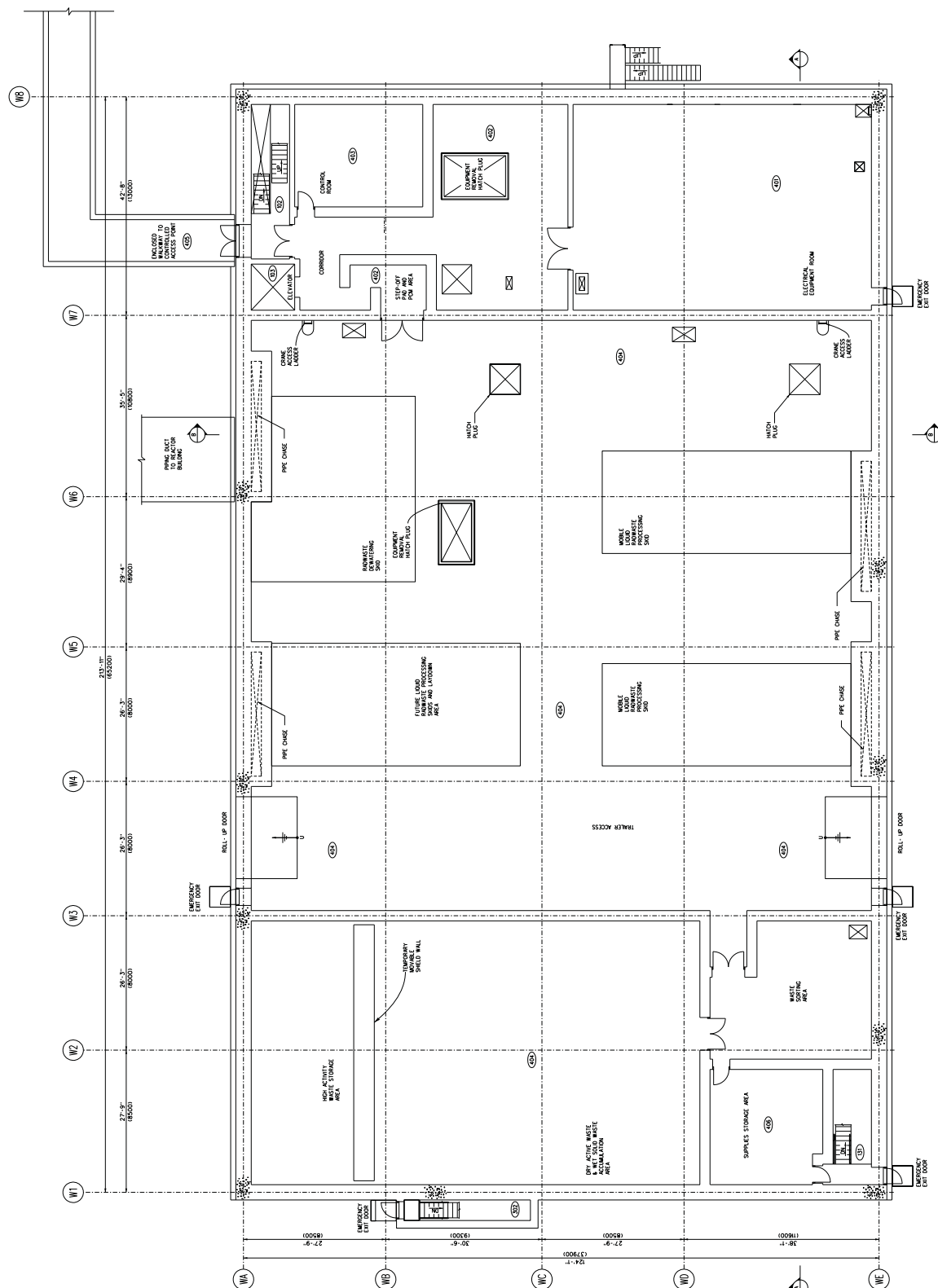
FIGURE 1.2-23A RADWASTE BUILDING AT ELEVATION -1700 MM

[illegible]

RADWASTE BUILDING FLOOR PLAN AT EL 12'-0" (TMSL 5300 MM)

FIGURE 1.2-23B RADWASTE BUILDING AT ELEVATION 5300 MM

ROOM NO	ROOM DESCRIPTION
102	STAIRWELL
103	ELEVATOR
131	STAIRWELL
132	STAIRWELL
401	ELECTRICAL EQUIPMENT ROOM
402	COORIDOR
403	CONTROL ROOM
404	LOW SYSTEM SHOES
405	ENCLOSED WALKWAY
406	SUPPLIES STORAGE AREA



RADWASTE BUILDING PLAN AT EL 35'-0" (TMSL 12300 MM)

FIGURE 1.2-23C RADWASTE BUILDING AT ELEVATION 12300 MM

ROOM NO	ROOM DESCRIPTION
102	STARWELL
103	ELEVATOR
404	LOW SYSTEM SADS
501	AIR CONDITIONING ROOM / AIR INTAKE

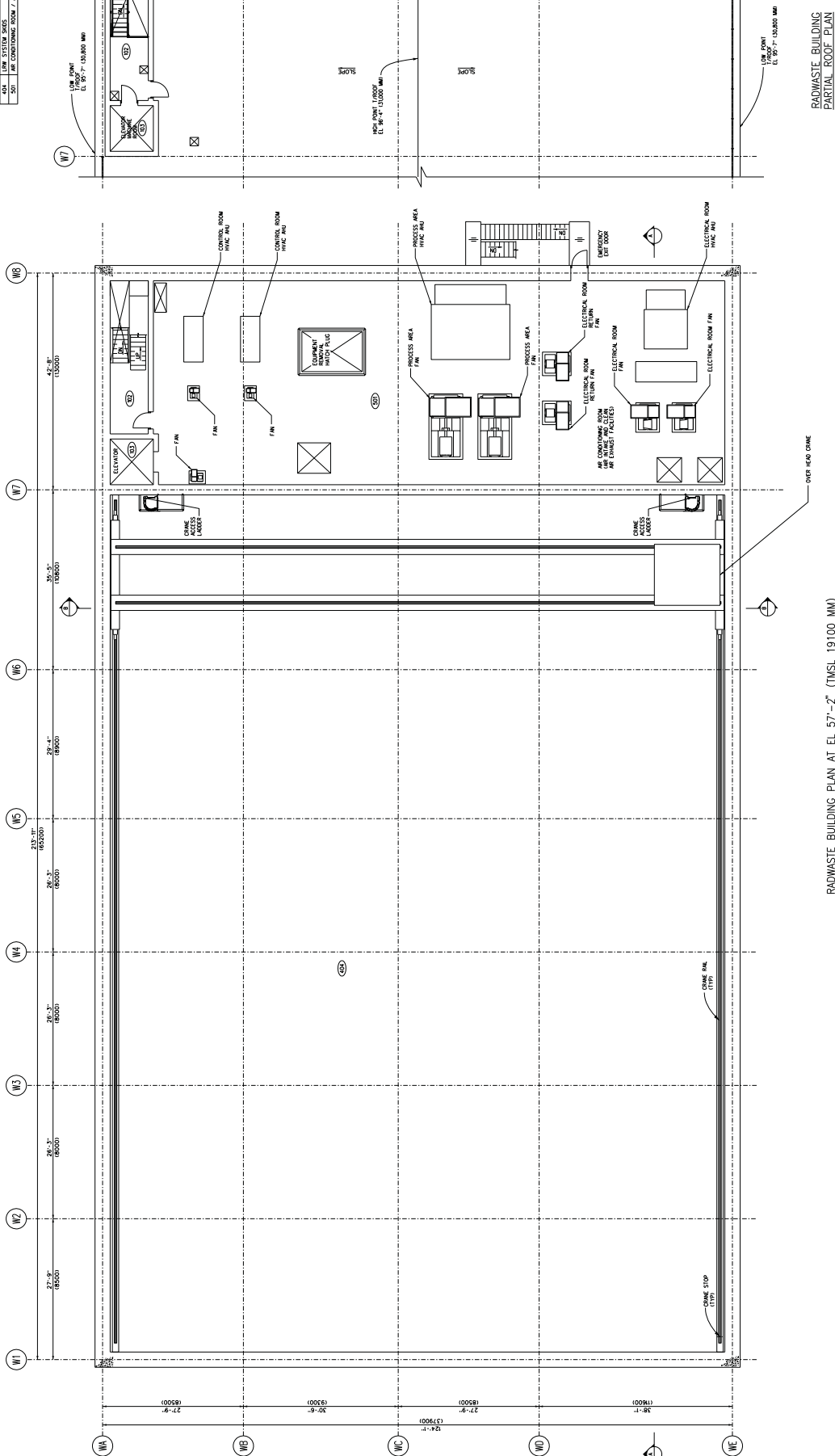


FIGURE 1.2-23D RADWASTE BUILDING AT ELEVATION 19100 MM



ROOM NO	ROOM DESCRIPTION
101	FILTRATION ROOM
104	PHASE SEPARATOR TANK & ROOM
109	SPENT RESIN TANK & ROOM
113	HOW COLLECTOR TANK & ROOM
118	HOW COLLECTOR TANK & ROOM
122	ICW COLLECTOR TANK & ROOM
128	ICW COLLECTOR TANK & ROOM
130	ICW COLLECTOR TANK & ROOM
401	ELECTRICAL EQUIPMENT ROOM
501	AIR COMPRESSOR ROOM

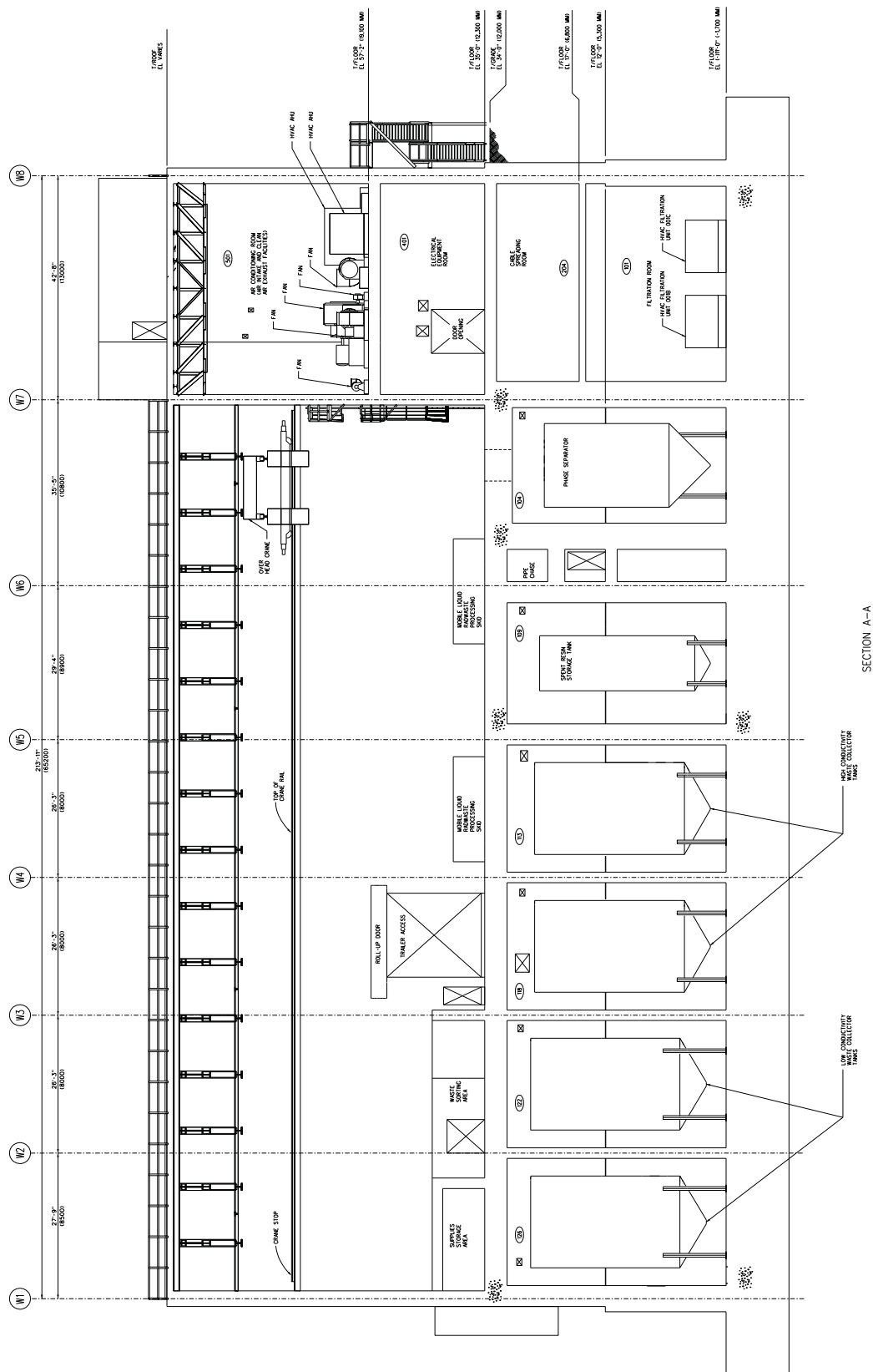


FIGURE 1.2-23E RADWASTE BUILDING, SECTIONS A-A, B-B (SHEET 1)

ROOM	ROOM DESCRIPTION
101	PHASE SEPARATOR TANK B ROOM
102	PHASE SEPARATOR TANK A & SLUDGE PUMPS A & B
103	PHASE SEPARATOR TANK A ROOM
104	PHASE SEPARATOR TANK B ROOM
105	PHASE SEPARATOR TANK A ROOM
106	PHASE SEPARATOR TANK B ROOM
107	PHASE SEPARATOR TANK A ROOM
108	PHASE SEPARATOR TANK B ROOM
109	PHASE SEPARATOR TANK A ROOM
110	PHASE SEPARATOR TANK B ROOM

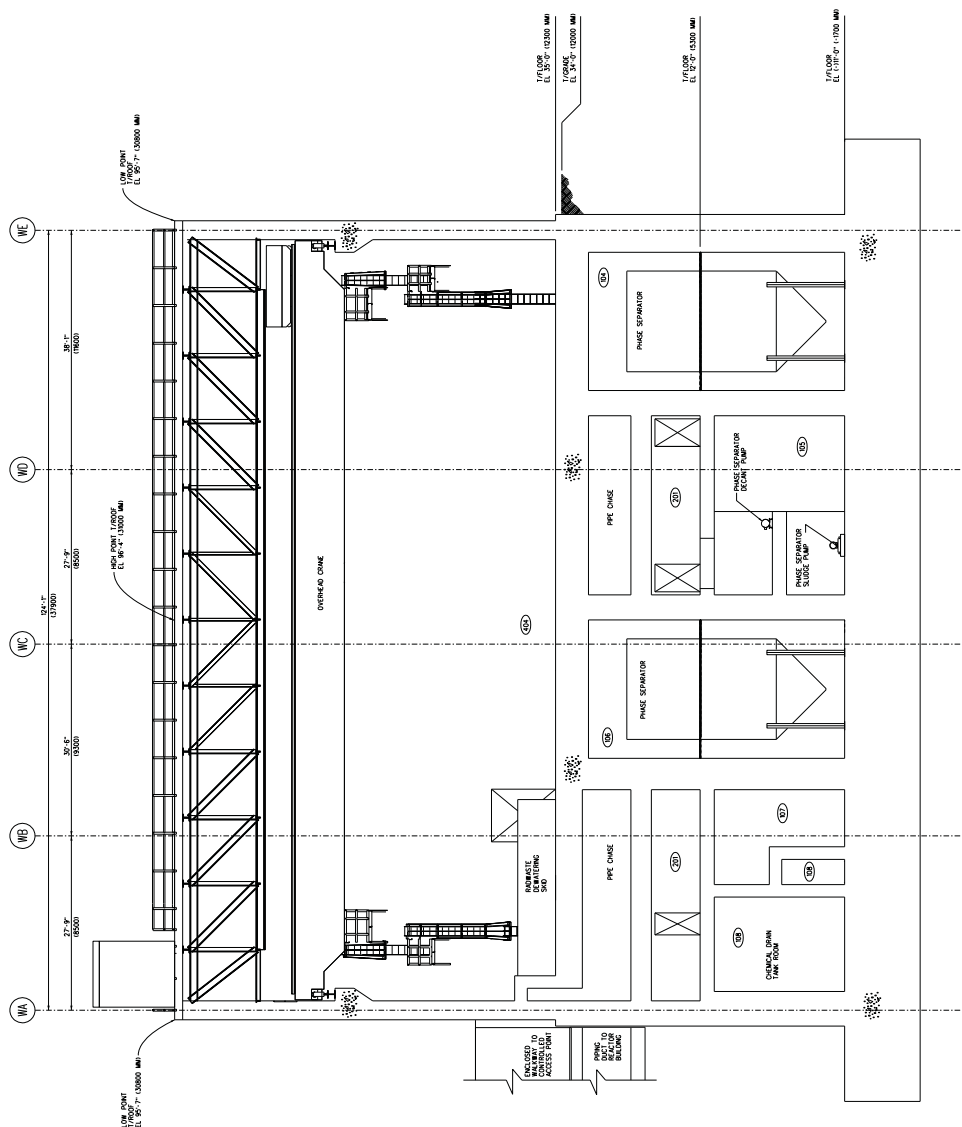


FIGURE 1.2-23E RADWASTE BUILDING, SECTIONS A-A, B-B (SHEET 2)

NOTES:

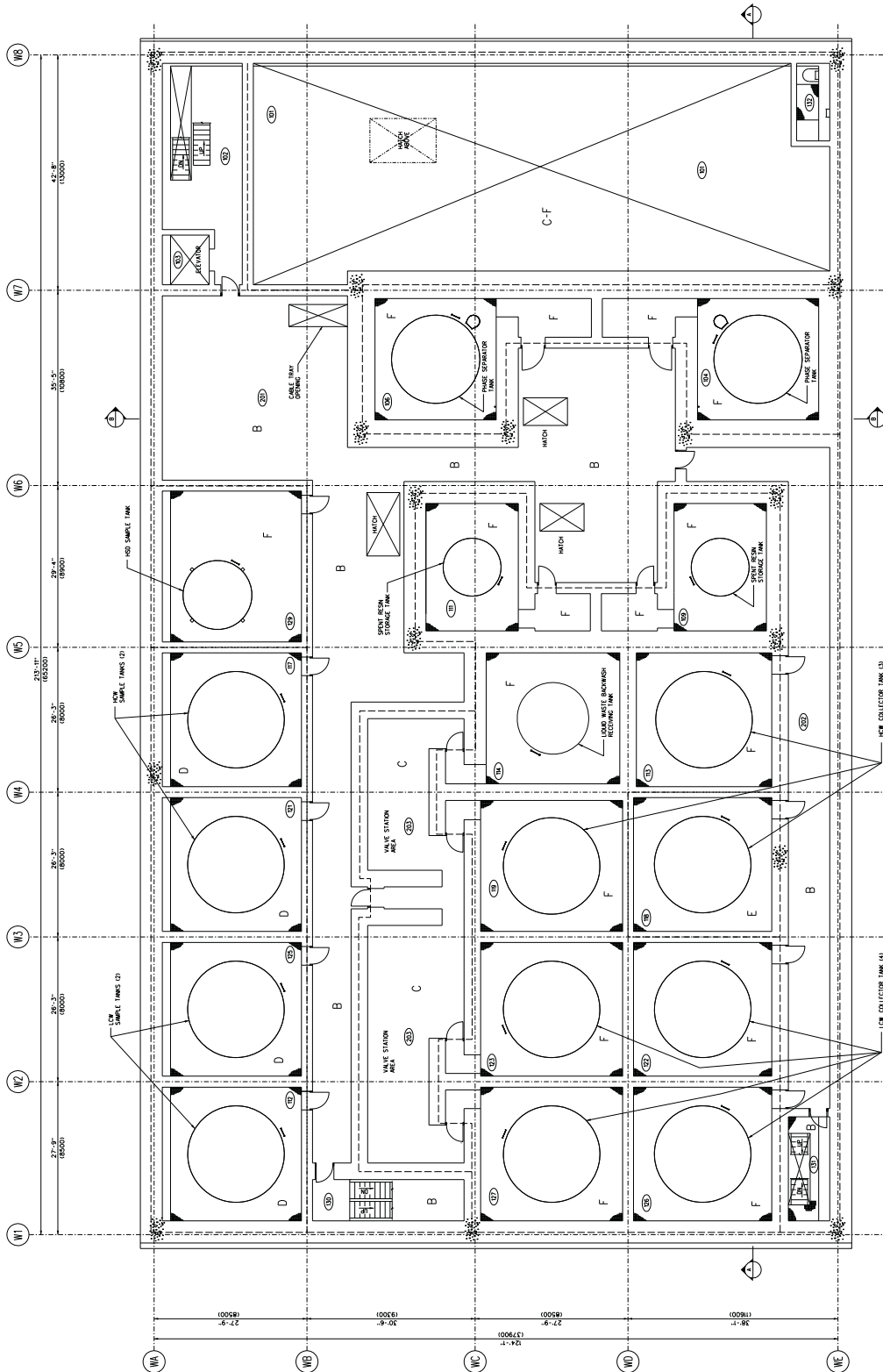
-ALL TANK ROOMS ARE LINED WITH A SS LINER FROM THE FLOOR TO AN ELEVATION REQUIRED TO CONTAIN LIQUID.



FIGURE 12.3-37 RADWASTE BUILDING, RADIATION ZONE MAP, NORMAL OPERATION AT ELEVATION -1700 MM



ROOM NO.	ROOM DESCRIPTION
01	STATION ROOM
02	STATION ROOM
03	STATION ROOM
04	STATION ROOM
05	STATION ROOM
06	STATION ROOM
07	STATION ROOM
08	STATION ROOM
09	STATION ROOM
10	STATION ROOM
11	STATION ROOM
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299	STATION ROOM
300	STATION ROOM



RADWASTE BUILDING FLOOR PLAN AT EL 12'-0" (TMSL 5300 MM)

LEGEND:  
 A 1 6  
 B 1 0  
 C 1 50  
 D 1 500  
 E 1 1000  
 F 2 1000  
 --- DENOTES ZONE EDGE BNT (d/n/n)  
 --- DENOTES RADIATION ZONE BOUNDARY

FIGURE 12.3-38 RADWASTE BUILDING, RADIATION ZONE MAP, NORMAL OPERATION AT ELEVATION 5300 MM

[illegible]

**LEGEND:**

A ≤ 6  
B < 10  
C < 50  
D < 250  
E < 1000  
F ≥ 1000

- - - - DENOTES ZONE DOSE RATE ( $\mu\text{Sv/h}$ )

- - - - DENOTES RADIATION ZONE BOUNDARY

FIGURE 12.3-39 RADWASTE BUILDING, RADIATION ZONE MAP, NORMAL OPERATION AT ELEVATION 12300 MM

ROOM NO	ROOM DESCRIPTION
102	STARWELL
103	ELEVATOR
404	LOW SYSTEM SHOPS
501	AIR CONDITIONING ROOM / AIR INTAKE

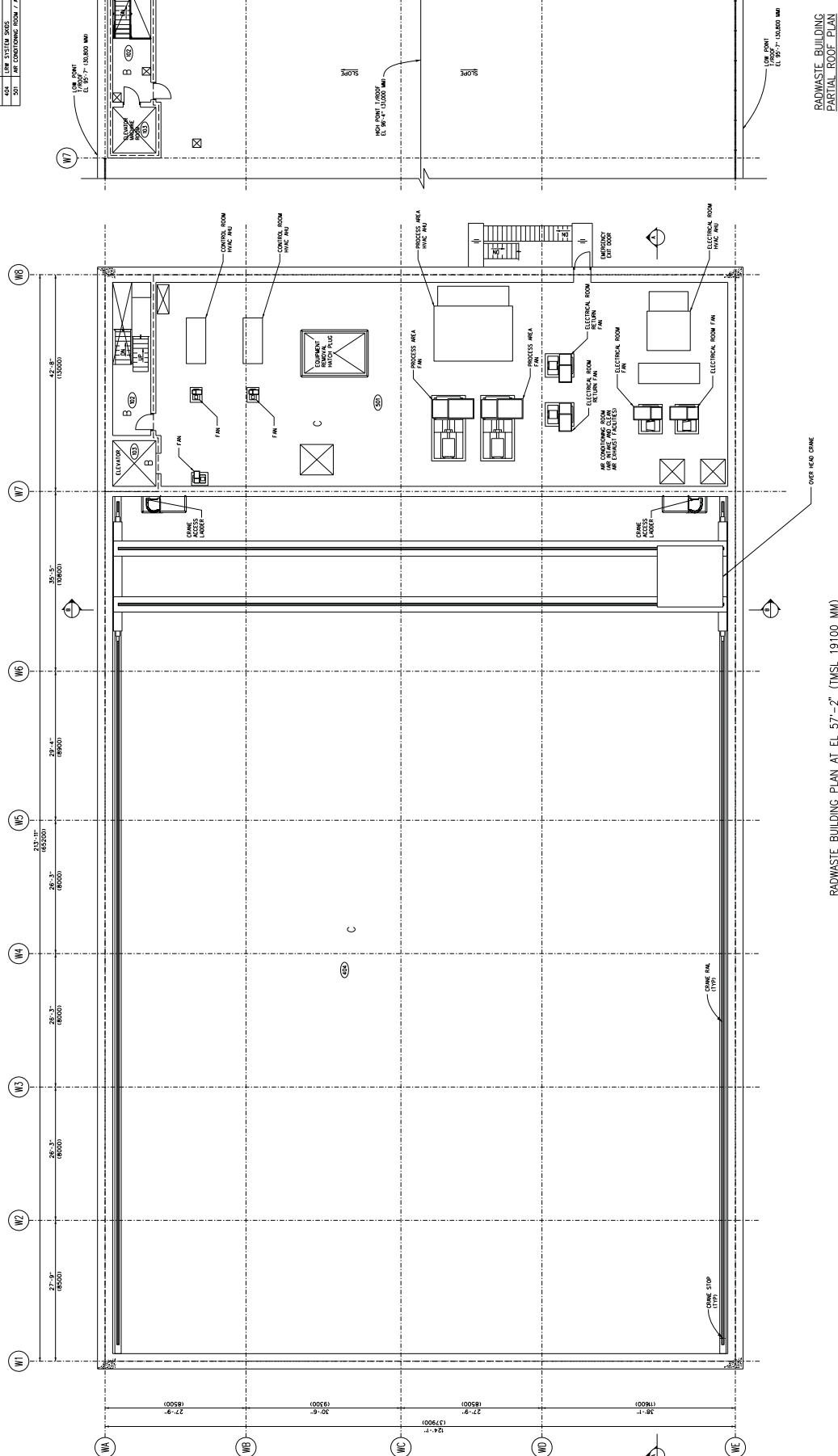
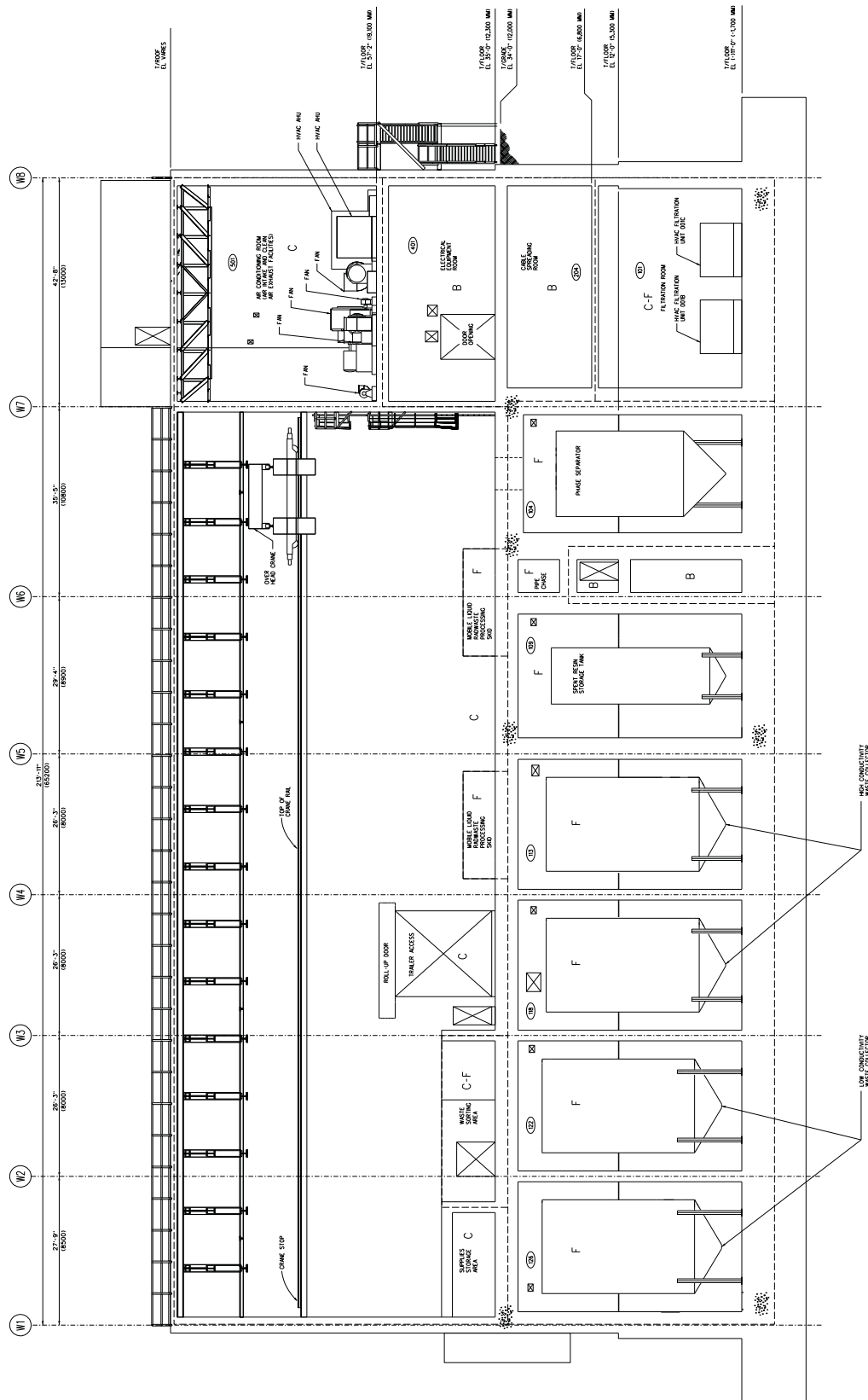


FIGURE 12.3-40 RADWASTE BUILDING, RADIATION ZONE MAP, NORMAL OPERATION AT ELEVATION 19100 MM

ROOM NO	ROOM DESCRIPTION
01	FILTRATION ROOM
04	PHASE SEPARATOR TANK B ROOM
09	SPENT RESIN TANK B ROOM
10	HOW COLLECTOR TANK C ROOM
11	HOW COLLECTOR TANK B ROOM
18	HOW COLLECTOR TANK A ROOM
22	LCB COLLECTOR TANK B ROOM
23	LCB COLLECTOR TANK A ROOM
24	LCB COLLECTOR TANK C ROOM
25	LCB COLLECTOR TANK D ROOM
40	ELECTRICAL EQUIPMENT ROOM
401	AIR CONDITIONING ROOM



LEGEND:

A  $\leq 6$       - - - - - DENOTES ZONE DOSE RATE ( $\sqrt{Sv/h}$ )

B < 10  
C < 50

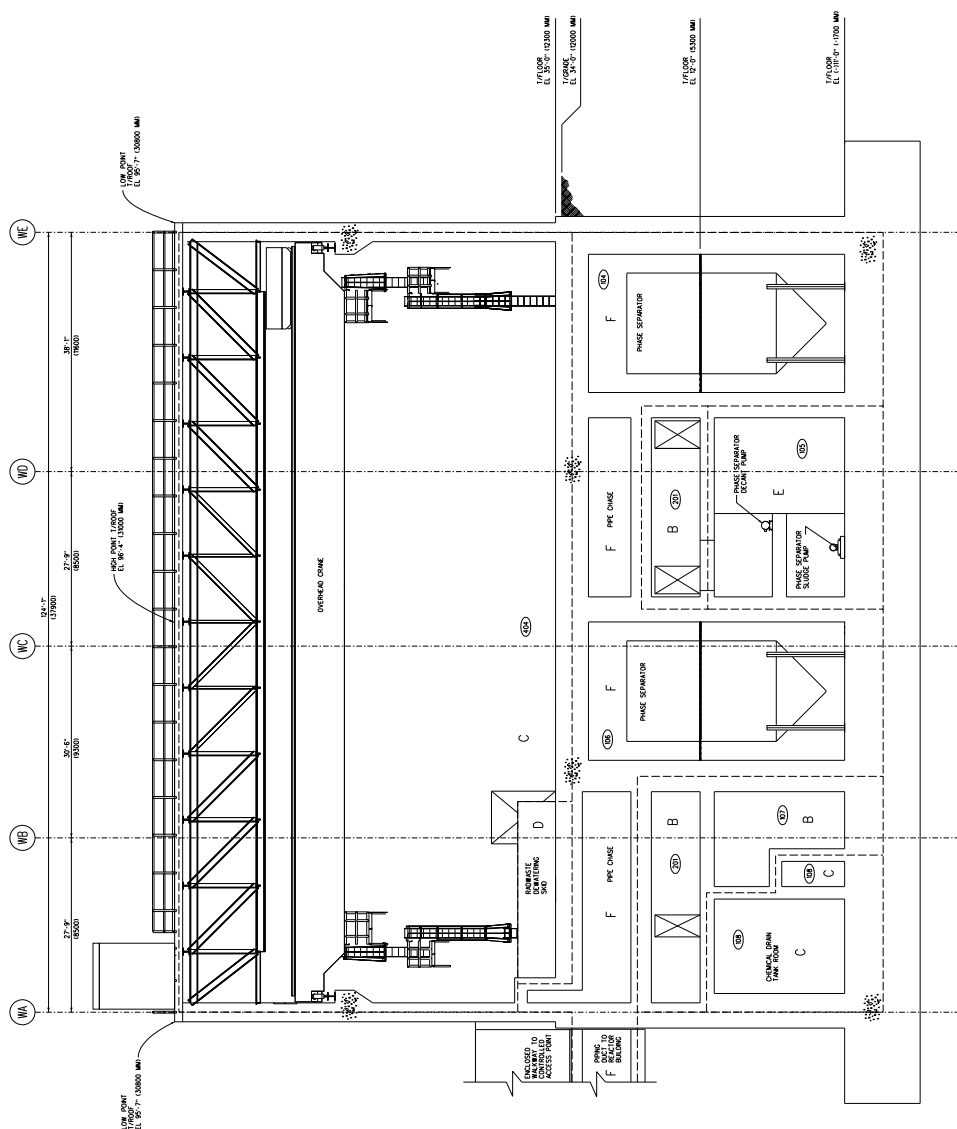
0 < 250  
E < 1000

$F \geq 1000$

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FIGURE 12.3-41 RADWASTE BUILDING, RADIATION ZONE MAP, NORMAL OPERATION AT SECTION A-A (SHEET 1)

ROOM NO	ROOM DESCRIPTION
104	PHASE SEPARATOR TANK B ROOM
105	PHASE SEPARATOR DECANT & SLODEG PUMPS A & B
106	PHASE SEPARATOR TANK A ROOM
107	PASSAGEWAY
108	CHEMICAL DRAIN TANK ROOM
201	PASSAGEWAY
404	LOW SYSTEM SLODS



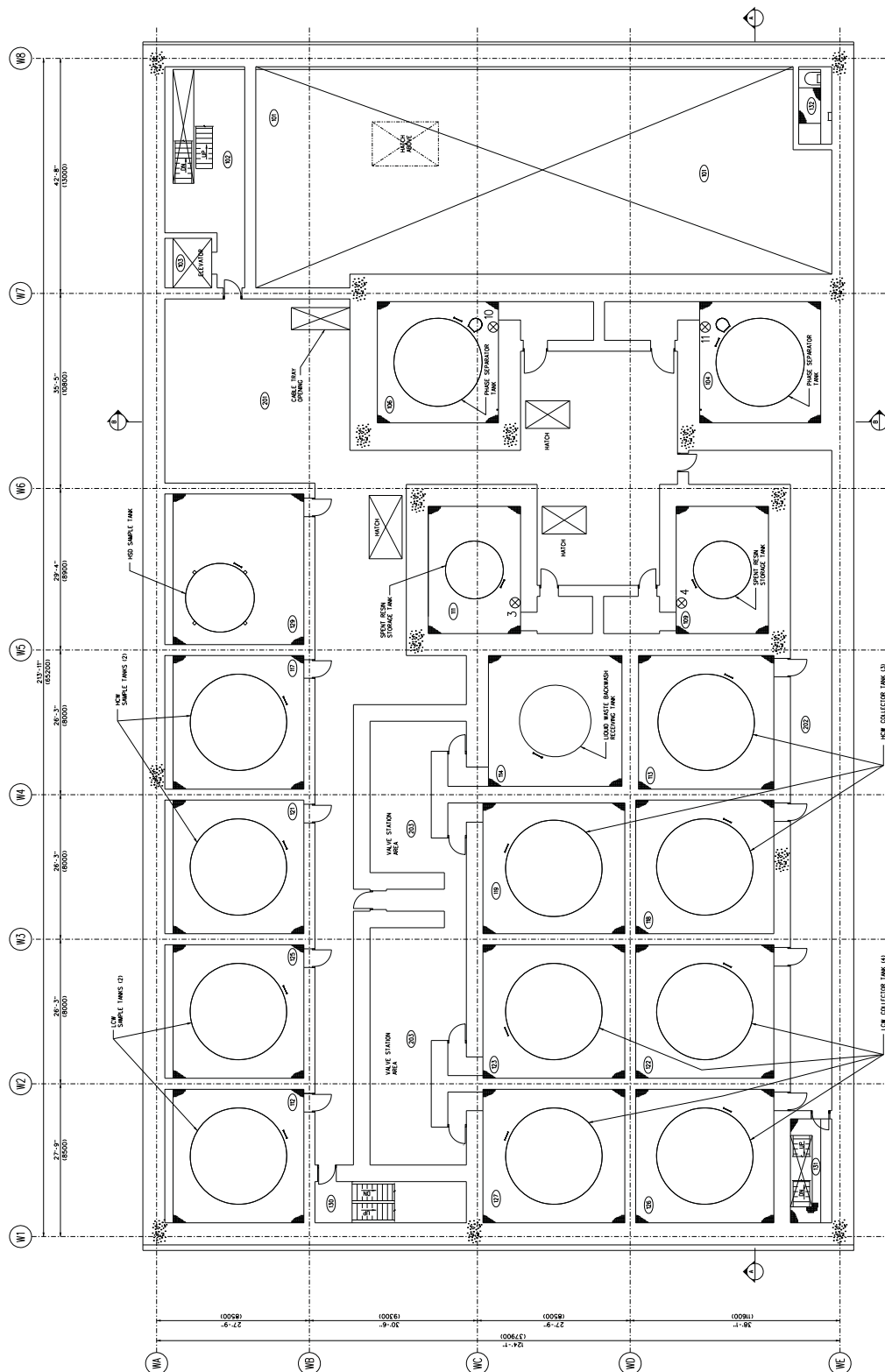
SECTION B-B

**LEGEND:**

A $\leq 6$	--- -- DENOTES ZONE DOSE RATE ( $\mu\text{R/hr}$ )
B $< 10$	
C $\leq 50$	
D $< 250$	
E $< 1000$	
F $\geq 1000$	--- -- DENOTES RADIATION ZONE BOUNDARY

FIGURE 12.3-41 RADWASTE BUILDING, RADIATION ZONE MAP, NORMAL OPERATION AT SECTION A-A (SHEET 2)



[illegible]

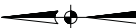
RADWASTE BUILDING FLOOR PLAN AT EL 12'-0" (TMSL 5300 MM)

LEGEND:

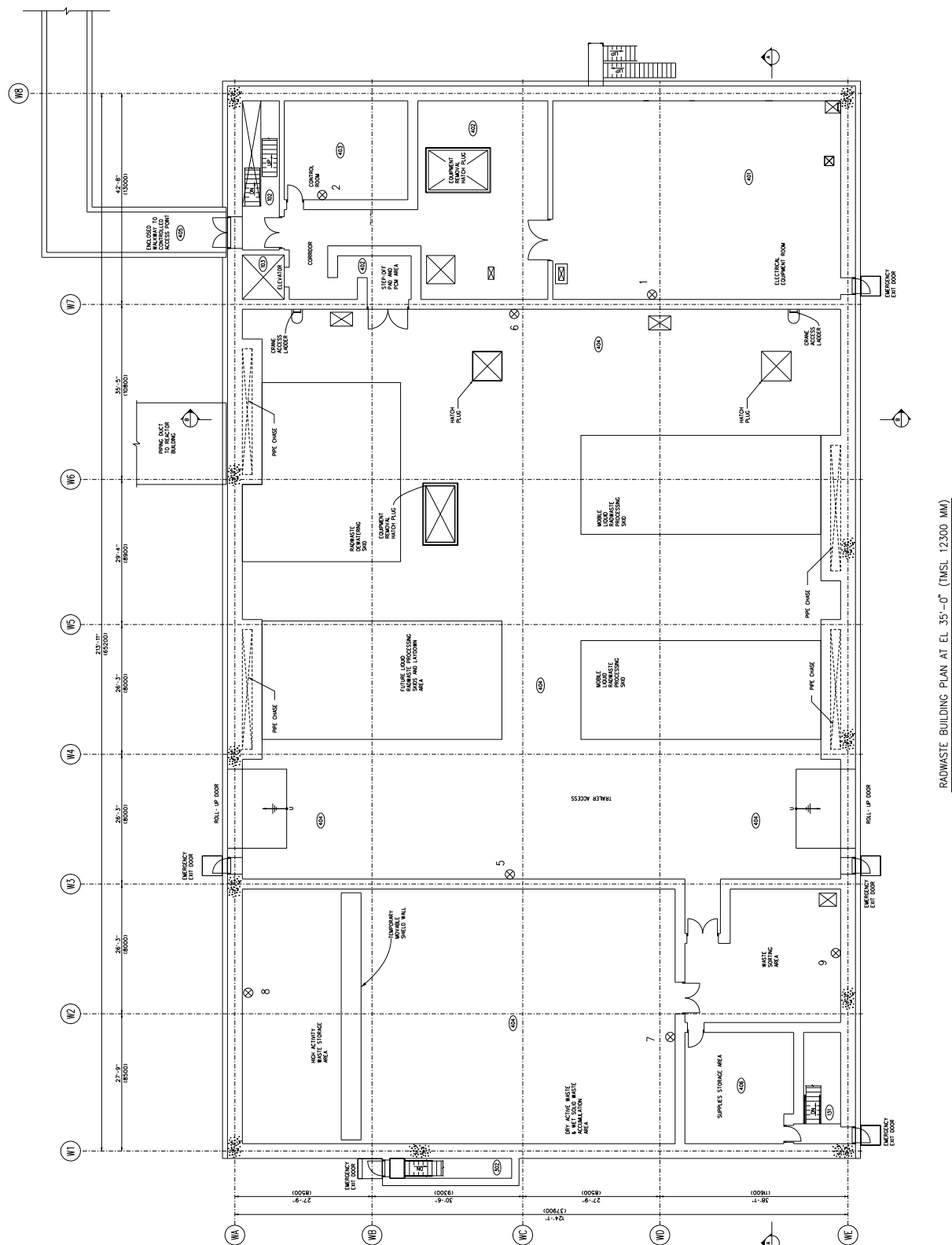
① ----- NEWIES RADIATION MONITORING

3 ----- DENOTES MONITOR ASSIGNED NUMBER

FIGURE 12.3-66 RADWASTE BUILDING, AREA RADIATION MONITORS AT ELEVATION 5300 MM



ROOM NO.	ROOM DESCRIPTION
101	STAIRWELL
102	STAIRWELL
103	STAIRWELL
104	STAIRWELL
105	STAIRWELL
106	STAIRWELL
107	STAIRWELL
108	STAIRWELL
109	STAIRWELL
110	STAIRWELL
111	STAIRWELL
112	STAIRWELL
113	STAIRWELL
114	STAIRWELL
115	STAIRWELL
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200	STAIRWELL

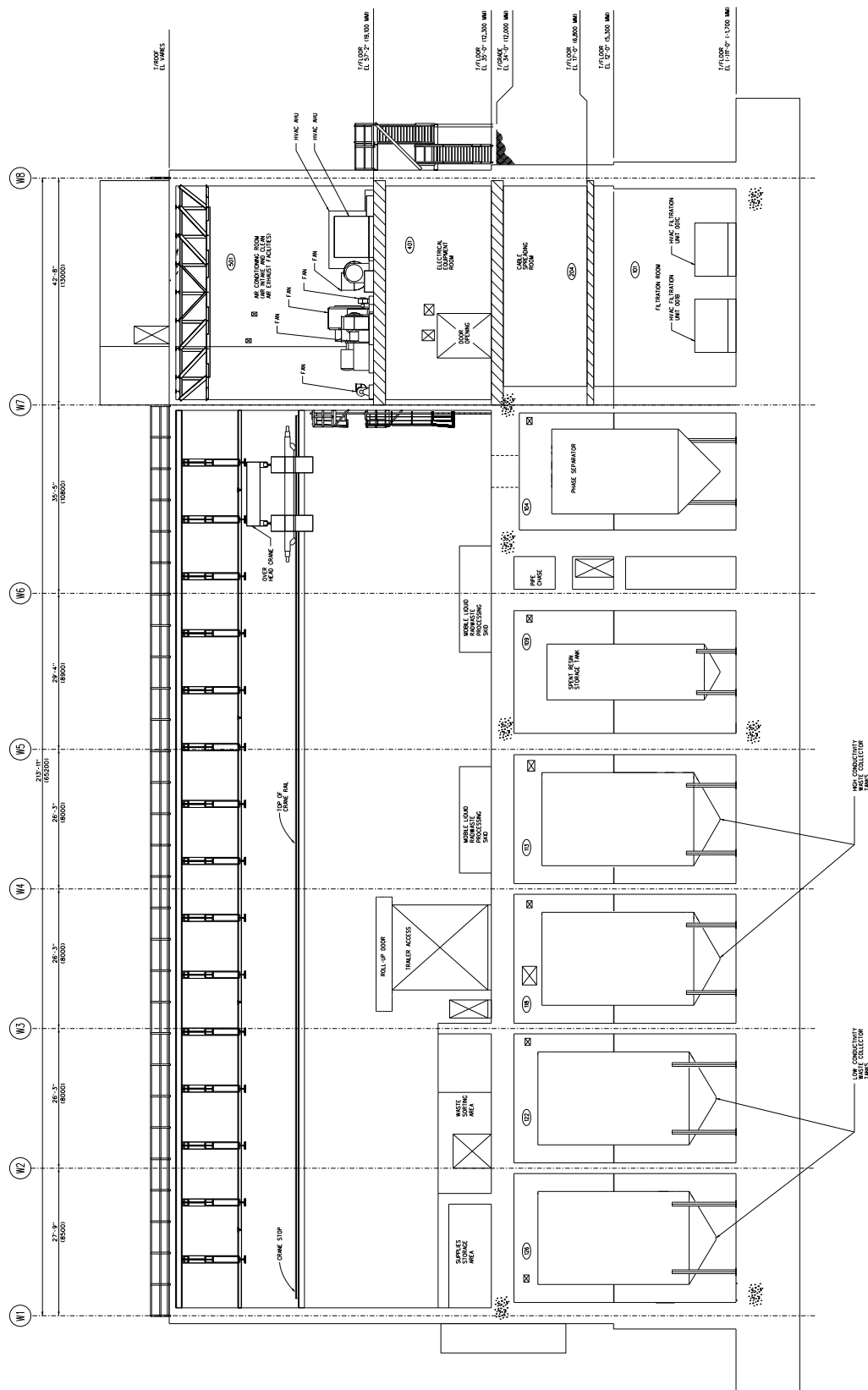


RADWASTE BUILDING PLAN AT EL 35'-0" (TMSL 12300 MM)

LEGEND:  
 ⊗ DENOTES RADWASTE MONITOR  
 1 DENOTES MONITOR ASSIGNED NUMBER

FIGURE 12.3-67 RADWASTE BUILDING, AREA RADIATION MONITORS AT ELEVATION 12300 MM

ROOM NO	ROOM DESCRIPTION
101	FILTRATION ROOM
104	PHASE SEPARATOR TANK & ROOM
109	SPENT RESIN TANK & ROOM
113	HOW COLLECTOR TANK & ROOM
118	HOW COLLECTOR TANK & ROOM
122	ICW COLLECTOR TANK & ROOM
128	ICW COLLECTOR TANK & ROOM
130	ICW COLLECTOR TANK & ROOM
401	ELECTRICAL EQUIPMENT ROOM
501	AIR COMPRESSOR ROOM



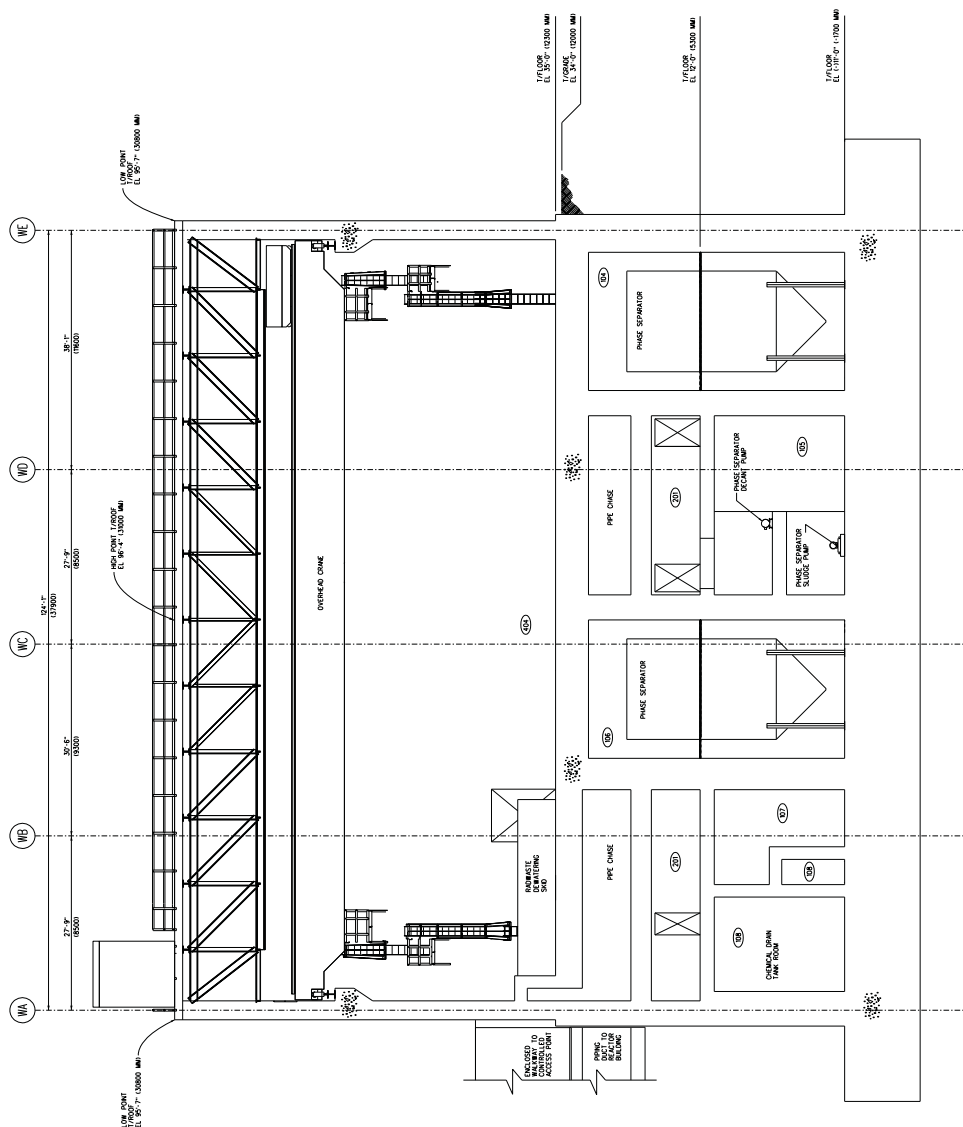
LEGEND:

- |   |  |
|---|--|
|  | --- DENOTES HOSE RACK                  |
|  | --- DENOTES STAND PIPE                 |
|  | --- DENOTES PORTABLE EXTINGUISHER      |
|  | --- DENOTES RATED FIRE BARRIER (WALL)  |
|  | --- DENOTES RATED FIRE BARRIER (FLOOR) |

THE BREAKDOWN OF FIRE AREAS/ZONES IDENTIFIED IN THIS DRAWING MAY NOT BE CONSISTENT WITH THE FIRE HAZARD ANALYSIS. THE DRAWINGS AND FIRE HAZARD ANALYSIS WILL BE RECONCILED BASED ON THE AS-BUILT BUILDING ARRANGEMENT DRAWINGS.

FIGURE 9A.4-28 RADWASTE BUILDING, FIRE PROTECTION, SECTIONS A-A AND B-B (SHEET 1)

ROOM	ROOM DESCRIPTION
101	PHASE SEPARATOR TANK B ROOM
102	PHASE SEPARATOR TANK A & B ROOM
103	PHASE SEPARATOR TANK A ROOM
104	PHASE SEPARATOR TANK B ROOM
105	GENERAL DRAIN TANK ROOM
106	PHASE SEPARATOR TANK A ROOM
107	PHASE SEPARATOR TANK B ROOM

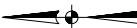


SECTION B-B

- LEGEND:
- IDENTIFY HOSE INCH
  - IDENTIFY STAND PIPE
  - IDENTIFY FIRE BARRIER (FIRE WALL)
  - IDENTIFY FIRE BARRIER (FLOOR)

THE BREAKDOWN OF FIRE AREAS/ZONES SHOWN IN THIS DRAWING MAY NOT BE CONSISTENT WITH THE FIRE PROTECTION ANALYSIS PERFORMED ON THE AS-BUILT BUILDING ARRANGEMENT DRAWINGS.

FIGURE 9A.4-28 RADWASTE BUILDING, FIRE PROTECTION, SECTIONS A-A AND B-B (SHEET 2)



ROOM NO.	ROOM DESCRIPTION
101	WASTE ROOM
102	ELEVATOR
103	ELEVATOR
104	PHASE SEPARATOR TANK B ROOM
105	PHASE SEPARATOR TANK C ROOM
106	PHASE SEPARATOR TANK A ROOM
107	PHASE SEPARATOR TANK B ROOM
108	PHASE SEPARATOR TANK C ROOM
109	PHASE SEPARATOR TANK A ROOM
110	PHASE SEPARATOR TANK B ROOM
111	PHASE SEPARATOR TANK C ROOM
112	PHASE SEPARATOR TANK A ROOM
113	PHASE SEPARATOR TANK B ROOM
114	PHASE SEPARATOR TANK C ROOM
115	PHASE SEPARATOR TANK A ROOM
116	PHASE SEPARATOR TANK B ROOM
117	PHASE SEPARATOR TANK C ROOM
118	PHASE SEPARATOR TANK A ROOM
119	PHASE SEPARATOR TANK B ROOM
120	PHASE SEPARATOR TANK C ROOM
121	PHASE SEPARATOR TANK A ROOM
122	PHASE SEPARATOR TANK B ROOM
123	PHASE SEPARATOR TANK C ROOM
124	PHASE SEPARATOR TANK A ROOM
125	PHASE SEPARATOR TANK B ROOM
126	PHASE SEPARATOR TANK C ROOM
127	PHASE SEPARATOR TANK A ROOM
128	PHASE SEPARATOR TANK B ROOM
129	PHASE SEPARATOR TANK C ROOM
130	PHASE SEPARATOR TANK A ROOM
131	PHASE SEPARATOR TANK B ROOM
132	PHASE SEPARATOR TANK C ROOM

NOTES:

1. ALL TANK ROOMS ARE LINED WITH A SS LINER FROM THE FLOOR TO AN ELEVATION REQUIRED TO CONTAIN LIQUID.

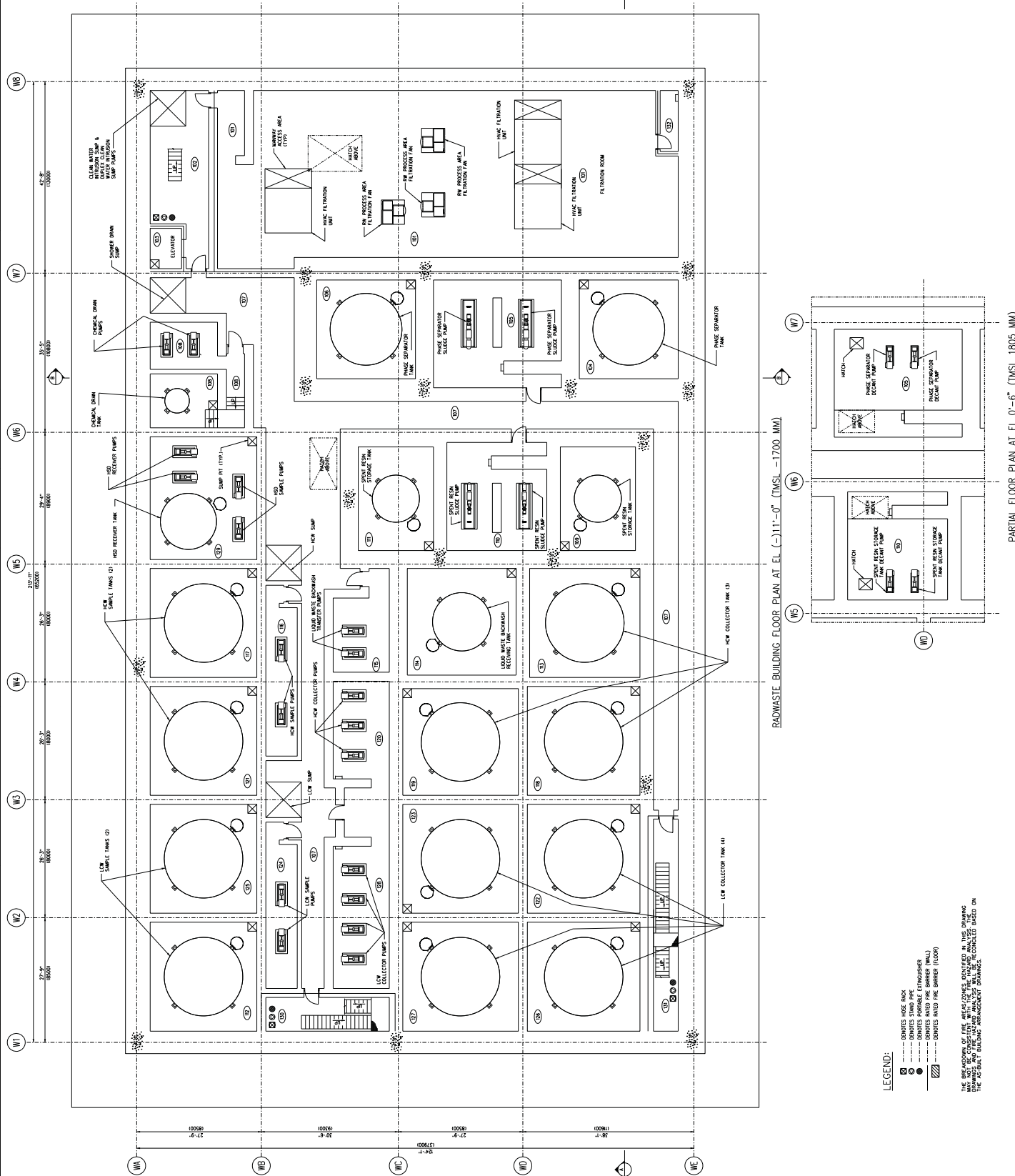


FIGURE 9A.4-29 RADWASTE BUILDING, FIRE PROTECTION, AT ELEVATION -1700 MM

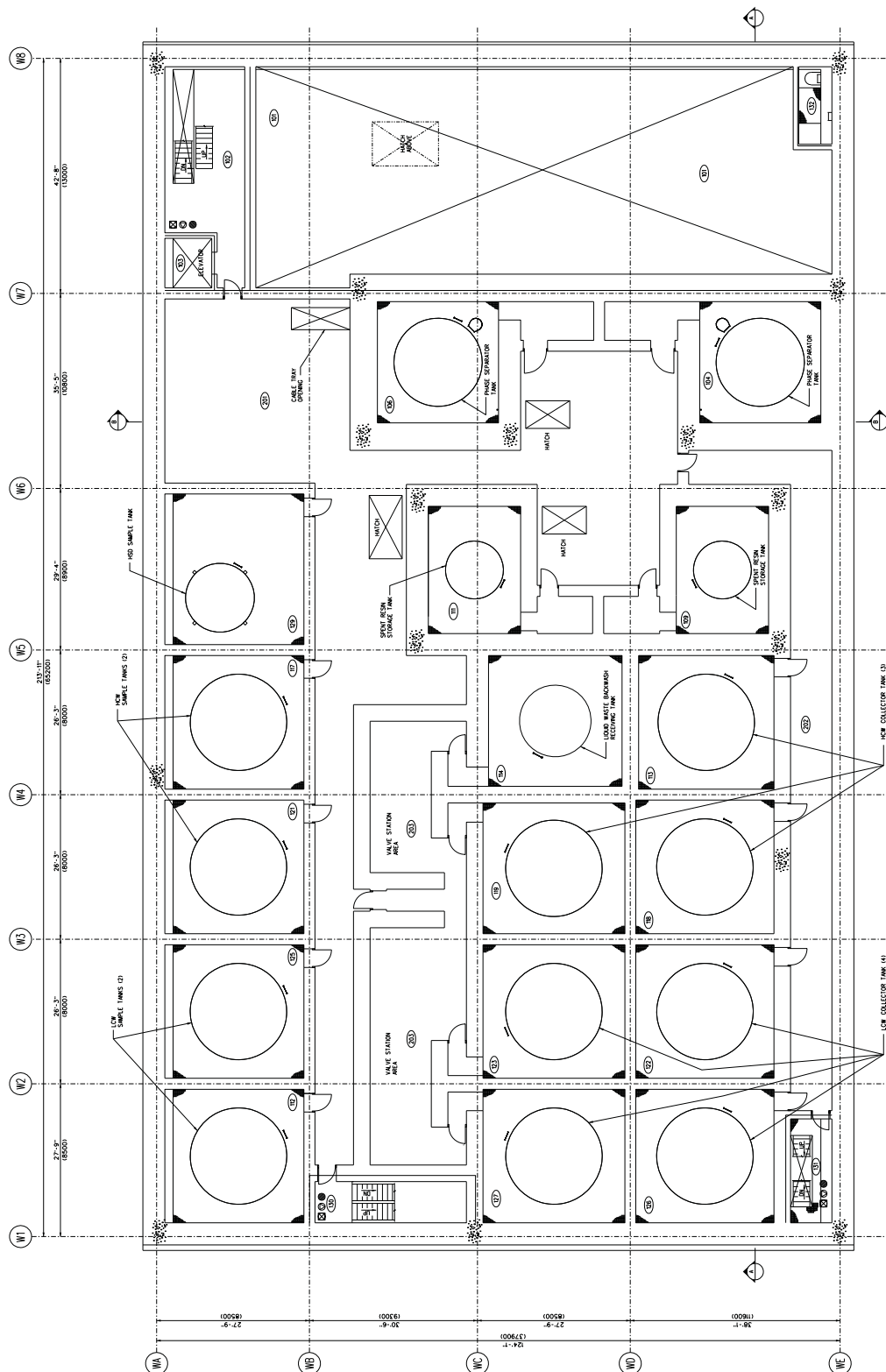
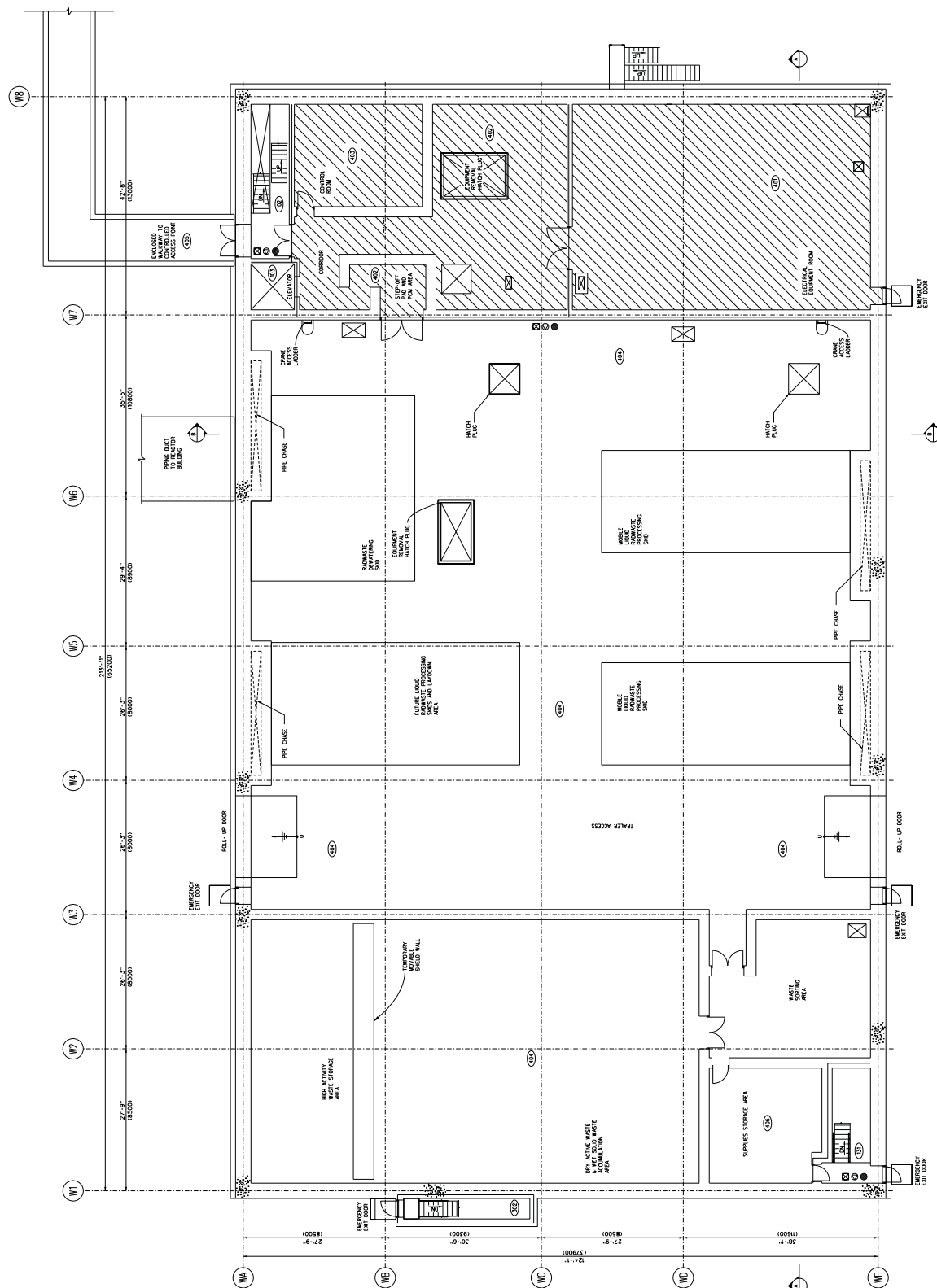
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FIGURE 9A.4-30 RADWASTE BUILDING, FIRE PROTECTION, AT ELEVATION 5300 MM

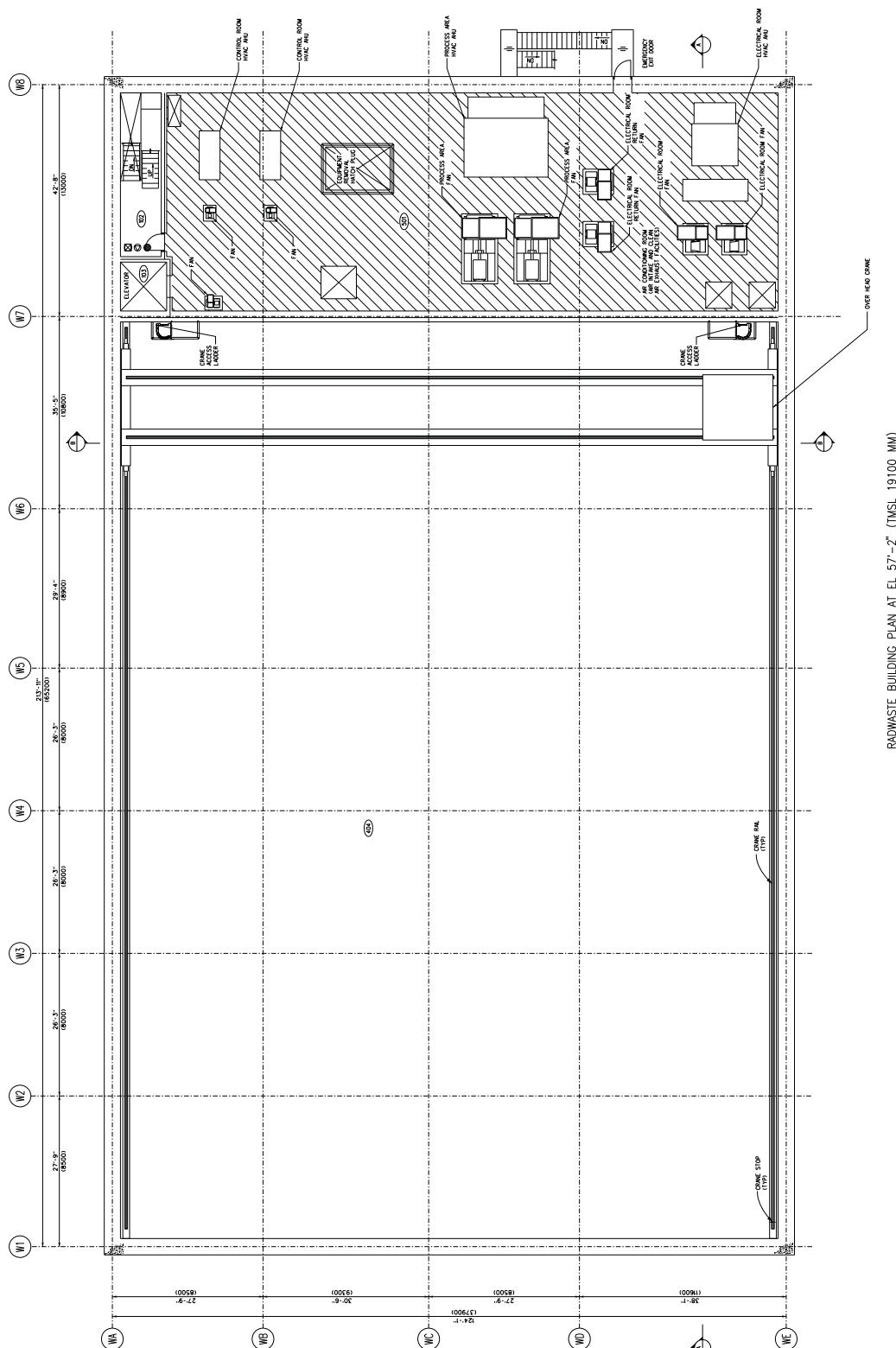
ROOM NO	ROOM DESCRIPTION
102	STAIRWELL
103	ELEVATOR
131	STAIRWELL
302	STAIRWELL
401	ELECTRICAL EQUIPMENT ROOM
403	ELECTRICAL EQUIPMENT ROOM
403	CONTROL ROOM
404	LOW SYSTEM SHOES
405	ENCLOSED WALKWAY
406	SUPPLIES STORAGE AREA



RADWASTE BUILDING PLAN AT EL 35'-0" (TMSL 12300 MM)

FIGURE 9A.4-31 RADWASTE BUILDING, FIRE PROTECTION, AT ELEVATION 12300 MM

ROOM NO	ROOM DESCRIPTION
102	STARWELL
103	ELEVATOR
404	LOW SYSTEM SHOPS
501	AIR CONDITIONING ROOM / AIR INTAKE



LEGEND:

-  DENOTES HOSE RACK  
 DENOTES STAND PIPE  
 DENOTES PORTABLE EXTINGUISHER  
 DENOTES RATED FIRE BARRIER (WALL)  
 DENOTES RATED FIRE BARRIER (FLOOR)

THE BREAKDOWN OF FIRE AREAS/ZONES IDENTIFIED IN THIS DRAWING MAY NOT BE CONSISTENT WITH THE FIRE HAZARD ANALYSIS. THE DRAWINGS AND FIRE HAZARD ANALYSIS WILL BE RECONCILED BASED ON THE AS-BUILT BUILDING ARRANGEMENT DRAWINGS.

FIGURE 9A. 4-32 RADWASTE BUILDING, FIRE PROTECTION, AT ELEVATION 19100 MM



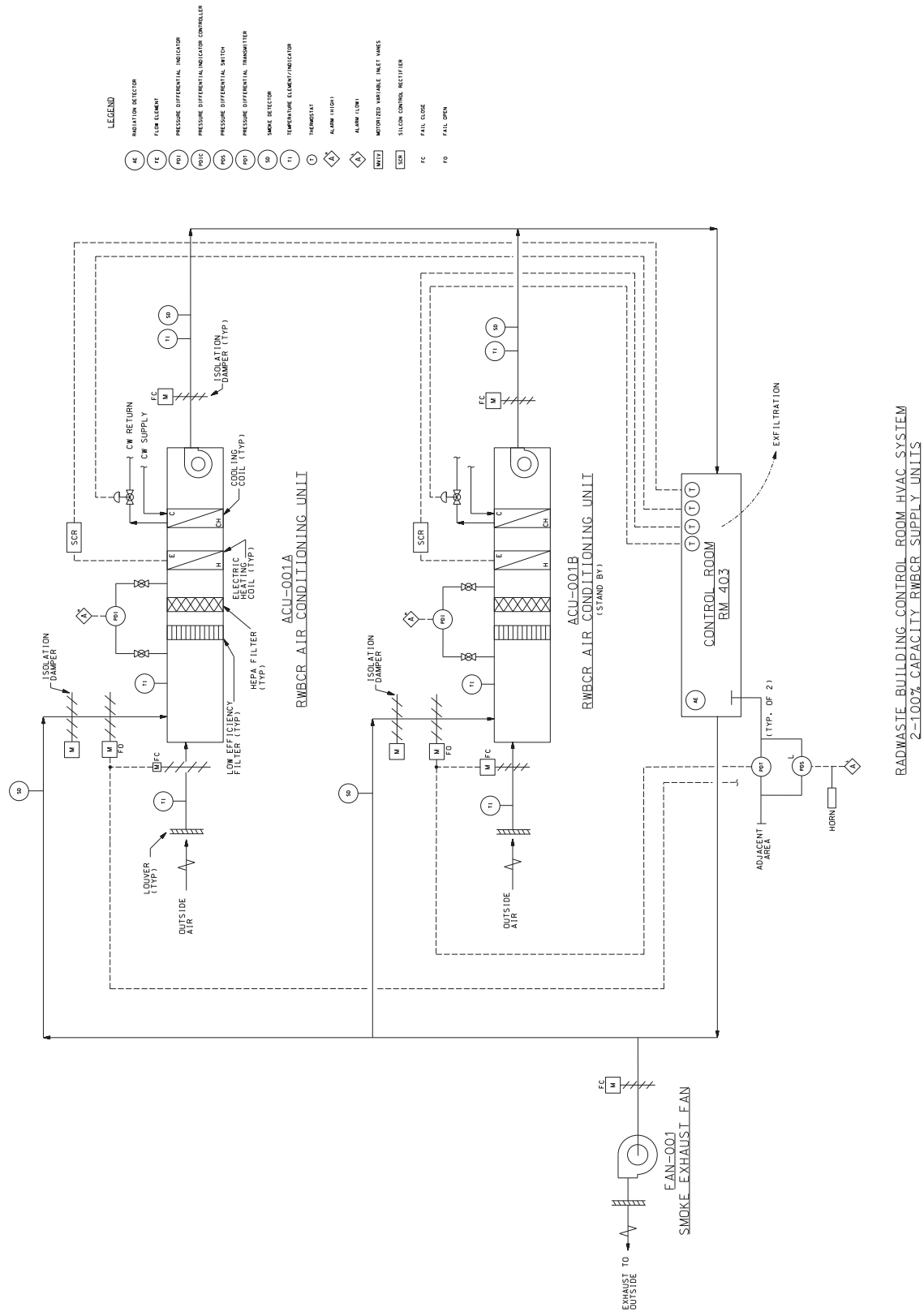


Figure 9.4-10 - Radwaste Building HVAC P&amp;ID (Sheet 1 of 3)

NOTE:  
FOR LEGEND SEE SHEET 1 OF 3.

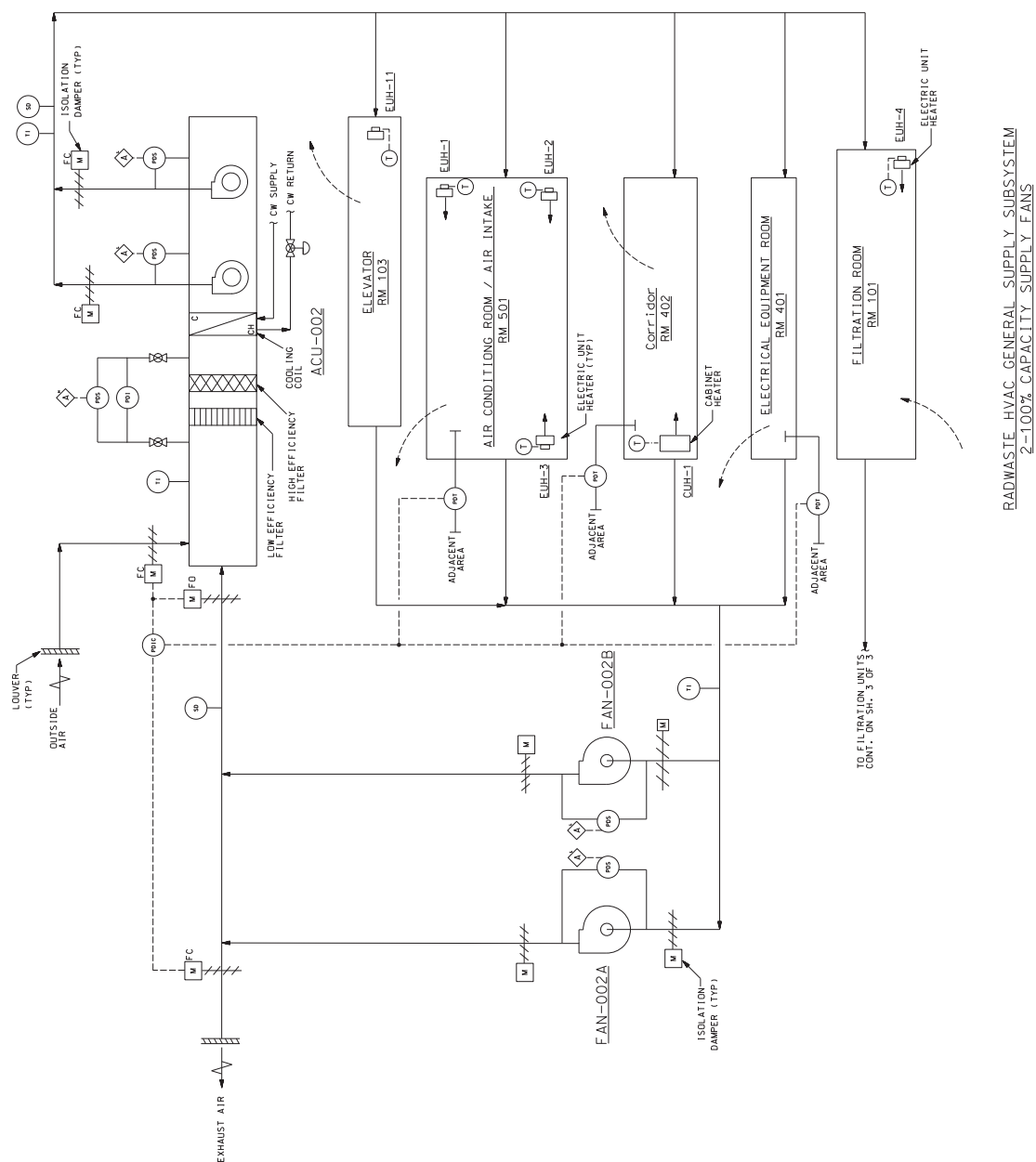


Figure 9.4-10 - Radwaste Building HVAC P&amp;ID (Sheet 2 of 3)

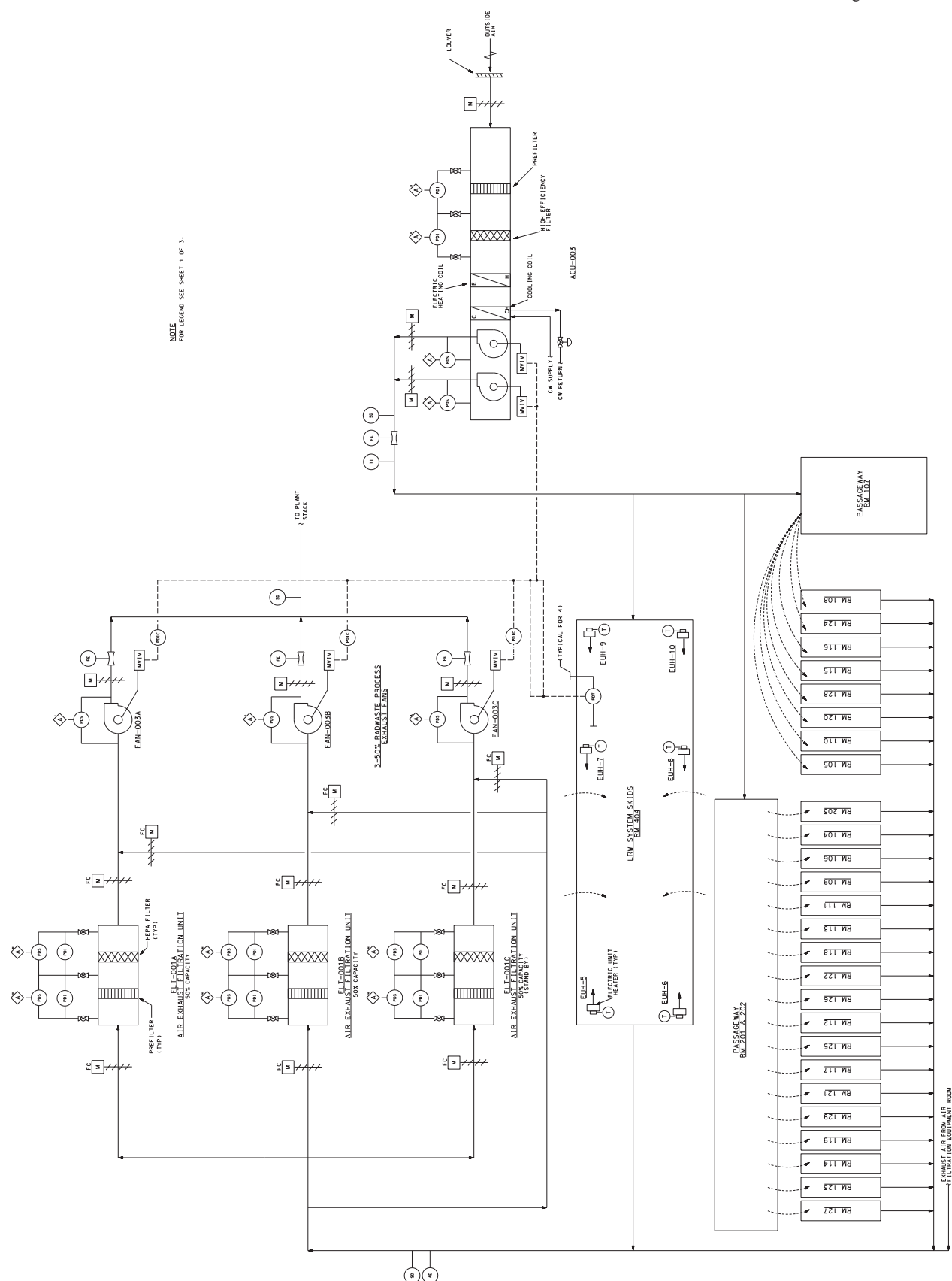


Figure 9.4-10 - Radwaste Building HVAC P&ID (Sheet 3 of 3)