April R. Rice
Manager
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December 21, 2016
NND-16-0563
10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3
Combined License Nos. NPF-93 and NPF-94
Docket Nos. 52-027 & 52-028

Subject: VCSNS Units 2 & 3 LAR 14-14 R3 S1: Supplement 1 to Revision 3 of Request for License Amendment: Structural Design of Auxiliary Building Floors

Reference:

1. NND-16-0204, South Carolina Electric & Gas Company (SCE&G), LAR 14-14: Request for License Amendment: Structural Design of Auxiliary Building Floors, dated June 16, 2016 (ML16168A282)

2. NND-16-0242, South Carolina Electric & Gas Company (SCE&G), LAR 14-14 R1: Revision 1 to Request for License Amendment: Structural Design of Auxiliary Building Floors, dated July 7, 2016 (ML16189A453)

3. NND-16-0332, South Carolina Electric & Gas Company (SCE&G), LAR 14-14 R2: Revision 2 to Request for License Amendment: Structural Design of Auxiliary Building Floors, dated August 16, 2016 (ML16230A179)

4. NND-16-0436, South Carolina Electric & Gas Company (SCE&G), LAR 14-14 R3: Revision 3 to Request for License Amendment: Structural Design of Auxiliary Building Floors, dated October 24, 2016 (ML16299A064)

5. ND-16-2664, Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Supplement to Revised Request for License Amendment: Structural Design of Auxiliary Building Floors (LAR-16-009R3S), dated December 16, 2016

Pursuant to 10 CFR 52.98(c) and in accordance with the provisions of 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G), acting on behalf of itself and the South Carolina Public Service Authority (Santee Cooper), requested an amendment to the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 combined license (COL)

numbers NPF-93 and NPF-94, respectively. The requested amendment proposed to depart from Tier 2* and associated Tier 2 information in the Updated Final Safety Analysis Report (UFSAR) (which includes the plant-specific DCD Tier 2 information) to revise details of the structural design of auxiliary building floors.

SCE&G submitted a revised request as LAR 14-14 R3 (via Reference 4) to revise and supplement the previous versions of this LAR to address NRC Staff comments. On November 1, 2016, the NRC Staff made Southern Nuclear Operating Company (SNC) aware of additional questions related to dose evaluations. SNC responded to these questions in Reference 5. It was determined that the questions identified by the NRC also relate to LAR 14-14 R3. These additional questions are addressed in Enclosure 11. Enclosures 1 through 10 were provided with previous submittals.

The scope and nature of the Significant Hazards Consideration Determination and the environmental considerations for the proposed changes are not impacted by this additional information.

In order to support the VCSNS Unit 2 construction schedule, SCE&G requests NRC staff review and approval of the license amendment no later than March 24, 2017. Approval by this date will allow sufficient time to implement licensing basis changes prior to affected construction activities. SCE&G expects to implement the proposed amendment within thirty days of approval. SNC has stated that the current requested approval date for Vogtle Electric Generating Plant (VEGP) Unit 3 is January 7, 2017.

SCE&G previously submitted Preliminary Amendment Requests (PARs), PAR 14-14, PAR 14-14-02 and PAR 14-14-02S. These PARs requested to proceed with installation of various non-finned CA20 floors along with installation of reinforcement at portions of column line I and the shield building wall. This revised LAR continues to support these PARs and their associated notice of no objection letters received [ML16197A566, ML16279A411, and ML16342C301 respectively] for these activities.

In accordance with 10 CFR 50.91, SCE&G is notifying the State of South Carolina of this LAR supplement by transmitting a copy of this letter and publicly-available enclosures to the designated State Official.

Should you have any questions, please contact Mr. Nick R. Kellenberger by telephone at (803) 941-9834, or by email at nicholas.r.kellenberger@scana.com.

This letter contains no regulatory commitments.

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

Executed on this 21st day of December 2016.

Sincerely,

April R. Rice
Manager
New Nuclear Licensing

MHK/ARR/mhk

Enclosure 1: Provided in Reference 1 (Replaced by Enclosure 3 in Reference 2)

Enclosure 2: Provided in Reference 1 (Replaced by Enclosure 4 in Reference 2)

Enclosure 3: Provided in Reference 2 (Replaced by Enclosure 5 in Reference 3)

Enclosure 4: Provided in Reference 2 (Replaced by Enclosure 6 in Reference 3)

Enclosure 5: Provided in Reference 3 (Replaced by Enclosure 7)

Enclosure 6: Provided in Reference 3 (Replaced by Enclosures 9 & 10)

Enclosure 7: Provided in Reference 4

Enclosure 8: Provided in Reference 4

Enclosure 9: Provided in Reference 4

Enclosure 10: Provided in Reference 4

Enclosure 11: Responses to NRC Staff Questions Regarding LAR 14-14 R3

Copy with all Enclosures:

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South Carolina Electric and Gas Company

Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3

NND-16-0563

Enclosure 11

Responses to NRC Staff Questions Regarding LAR 14-14 R3

(LAR 14-14 R3 S1)

(This enclosure contains 8 pages, including this cover sheet.)

Below are the NRC questions to Southern Nuclear Operating Company (SNC) provided on November 1, 2016 pertaining to SNC LAR-16-009R3. The responses below were submitted by SNC via SNC LAR-16-009R3S and have been modified by SCE&G in green text to conform with SCE&G LAR 14-14 R3.

NRC Staff Question #1:

In the LAR, the licensee proposes moving the penetrations for the removable ducts in the "VBS MCR/A&C Equipment Room" (which is located directly above the MCR). The removal of duct sections is a vital function. Additional travel time is required to reach the new location and the licensee indicates the additional travel time will result in a dose increase of less than 20 mrem, which the licensee claims is not significant because there was more than 1 rem of available margin in the original calculations. However, the location of the new penetrations are on the opposite side of the wall from the "Upper MSIV Compartment B Room" which is radiation zone VIII (between 100 Rem/hour and 500 Rad/hour) during accident conditions. Therefore, it would appear that the operator would receive a higher dose working on the ducting at this location than they would working at the original location. So while the LAR discusses the additional dose received for additional travel time, it does not discuss additional dose received due to the work now being performed at the potentially higher dose rate location. This dose and how the dose increase effects the total dose should be discussed in the LAR.

Response to NRC Staff Question #1:

The dose rate assumed for the operator in the nuclear island nonradioactive ventilation system (VBS) main control room (MCR)/A&C Equipment Room (Room 12501) is the room-maximum value and is consistent with the stated radiation zone (Zone VI). The dose rate calculation explicitly considers the potential for radiation streaming into neighboring rooms and impacting Room 12501. Since the room-maximum dose rate values are applied to the entire room, the location of the operator does not impact the calculated results. As implied by the Staff's Question, actual dose rates would be expected to vary spatially within Room 12501; and so practically, the change would result in an increase in operator dose for this post-accident action compared to the previous configuration. However, this level of detail is not included in the design basis calculation and a single, bounding dose rate is used. Therefore, the conservative licensing basis dose calculated is not changed, and the total operator dose is maintained below the applicable limit with margin between the conservatively calculated operator dose and the 5 rem criterion.

NRC Staff Question #2:

As discussed in item 1, the new penetrations are now closer to the high dose rate "Upper MSIV Compartment B Room." The licensee should evaluate and document the dose into the MCR envelope due to radiation streaming through the new penetration locations. This should be discussed in the LAR.

Response to NRC Staff Question #2:

The updated penetration locations were evaluated by explicitly including the penetrations in the direct dose calculation models and recalculating dose rates in the MCR envelope. Note that MCR direct dose (i.e., dose from sources within containment) is calculated based on the maximum dose rate within the MCR envelope. The added penetrations are a significant distance away from the maximum-dose location, which is much closer to containment. The implication of the Staff's question that added penetrations will potentially increase local dose rates near the penetration locations is correct. However, this potential impact was explicitly evaluated and the presence of these penetrations does not impact the reported, conservative dose accumulated by operators in the MCR following a design basis accident.

NRC Staff Question #3:

UFSAR Figure 3H.5-9 initially implied that those areas that had finned floors included ½ inch of steel at the bottom of the finned floors. However, in the LAR, the licensee adds Note 1 to Figure 3H.5-9. Note 1 indicates that the details shown in the figure are specific to the floor at elevation 135'-3" (main control room ceiling). In addition, in the LAR the licensee revised UFSAR Section 3H.5.4 which now specifies that Figure 3H.5-9 shows the finned floor above the main control room only, (instead of the figure applying to all of the finned floors). Therefore, it is no longer clear if the ceiling below the main control room will still include ½ inch of steel. The ½ inch of steel provides additional shielding for the main control room. In a departure in the Levy application, the staff relied on this steel thickness to reach their safety finding that the design met the requirements of GDC 19. Summer and Vogtle are expected to make a similar change in a future LAR. Please clarify that the thickness is still ½ inch or provide an evaluation for a change (If the new thickness is less than ½ inch, the licensee should evaluate the effects of this change on the dose inside the main control room). In addition, please clarify that the change to this Tier 2* information will remain Tier 2*, i.e., information in Figure 3H.5-9 specifying the steel thickness for the ceiling below the main control room remains Tier 2*.

Response to NRC Staff Question #3:

As indicated, the added Note 1 for Figure 3H.5-9 does indicate that the details shown in the figure are specific to the floor at elevation 135'-3" (MCR ceiling). However, Note 1 also indicates that the reader should "Refer to this and other notes for additional information about design details for other floor sections and for connections to other walls." Per UFSAR Subsection 3H.5.4, Figure 3H.5-9 is still the typical figure of finned floors. In particular, Note 8 addresses "Additional bottom layer reinforcing steel" for the finned floors at elevation 117'-6" indicating that the figure does apply to other floor sections. The design information on Figure 3H.5-9, Sheet 3, is applicable to all finned floors. For clarification purposes, Note 16 is added to Figure 3H.5-9 with the statement of "The design information shown on Sheet 3 is applicable to finned floors for locations away from

openings, penetrations, embedments, and other obstructions." Thus, the licensing basis still requires ½" steel plates at the bottom of finned floors on elevation 117'-6" (ceiling below the MCR).

As indicated above, the Tier 2* Figure 3H.5-9 and associated notes, address the ceiling below the MCR and the Tier 2* information remains Tier 2*, and is not impacted by the LAR.

An updated (revised) markup of Figure 3H.5-9 (Sheets 1, 2 and 3) is included within this enclosure. The revised figure replaces the previously provided markups of this figure.

Please note that in addition to adding Note 16 on Figure 3H.5-9, Sheet 1, the following notes are also identified on corresponding sheets of Figure 3H.5-9 for clarification purposes:

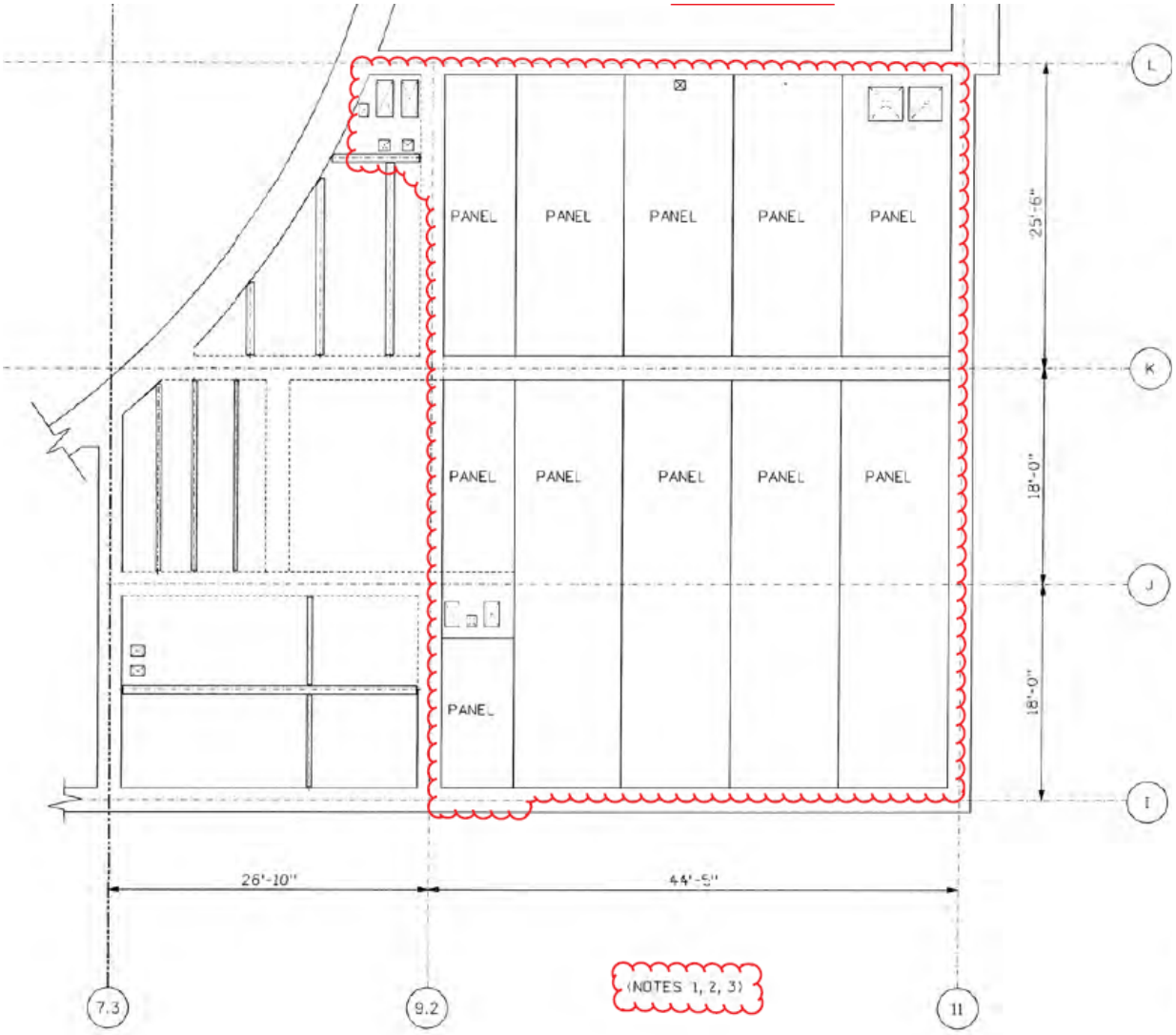
- Add identification of applicability of Note 15 on the bottom of Figure 3H.5-9, Sheet 2.
- Add identification of applicability of Notes 1, 13, and 16 on the bottom of Figure 3H.5-9, Sheet 3.

In addition, Figure 3H.5-9, Sheet 2, is revised to remove an unintended change to the depth of the fins inadvertently included with the previous revision. The fins are again identified on the figure as 9 inches in depth.

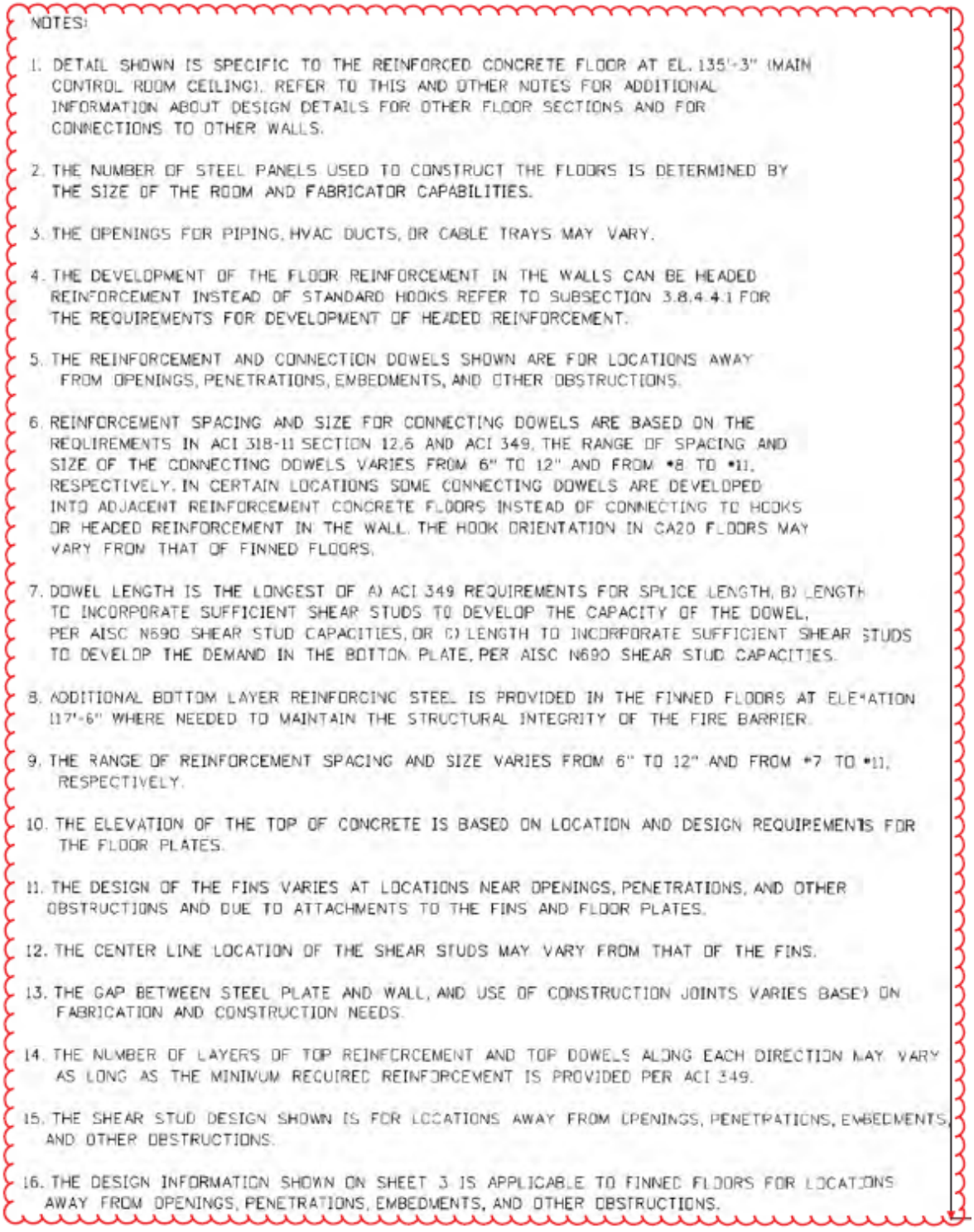
The text of the LAR (Enclosure 7 of LAR 14-14 R3) is also updated (revised) to identify the new changes. Proposed revisions to the Licensing Basis Change Descriptions in the text of the LAR as shown below:

- On page 14 of 28, Enclosure 7 of LAR 14-14 R3, add bullet p after bullet o of item M.3: "p. State that the design information shown on Sheet 3 is applicable to finned floors for locations away from obstructions. (Note 16)"
- On page 14 of 28, Enclosure 7 of LAR 14-14 R3, revise bullet 10 of item N to: "10. Add identification of applicability of Notes 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, ~~and~~ 14, and 15 on the figure."
- On page 15 of 28, Enclosure 7 of LAR 14-14 R3, revise bullet 1 of item O to: "1. Add identification of applicability of Notes 1, 11, 12, 13, ~~and~~ 15, and 16 on the figure."

UFSAR Figure 3H.5-9 (Sheet 1 of 3), Auxiliary Building Finned Floor – Revise the information as shown below. (Replacement for corresponding figure in LAR 14-14 R3.)



UFSAR Figure 3H.5-9 (Sheet 1 of 3), Auxiliary Building Finned Floor – Revise the information to add the Notes shown below.
(Replacement for corresponding figure in LAR 14-14 R3.)



NOTES:

1. DETAIL SHOWN IS SPECIFIC TO THE REINFORCED CONCRETE FLOOR AT EL. 135'-3" (MAIN CONTROL ROOM CEILING). REFER TO THIS AND OTHER NOTES FOR ADDITIONAL INFORMATION ABOUT DESIGN DETAILS FOR OTHER FLOOR SECTIONS AND FOR CONNECTIONS TO OTHER WALLS.

2. THE NUMBER OF STEEL PANELS USED TO CONSTRUCT THE FLOORS IS DETERMINED BY THE SIZE OF THE ROOM AND FABRICATOR CAPABILITIES.

3. THE OPENINGS FOR PIPING, HVAC DUCTS, OR CABLE TRAYS MAY VARY.

4. THE DEVELOPMENT OF THE FLOOR REINFORCEMENT IN THE WALLS CAN BE HEADED REINFORCEMENT INSTEAD OF STANDARD HOOKS REFER TO SUBSECTION 3.8.4.4.1 FOR THE REQUIREMENTS FOR DEVELOPMENT OF HEADED REINFORCEMENT.

5. THE REINFORCEMENT AND CONNECTION DOWELS SHOWN ARE FOR LOCATIONS AWAY FROM OPENINGS, PENETRATIONS, EMBEDMENTS, AND OTHER OBSTRUCTIONS.

6. REINFORCEMENT SPACING AND SIZE FOR CONNECTING DOWELS ARE BASED ON THE REQUIREMENTS IN ACI 318-11 SECTION 12.6 AND ACI 349, THE RANGE OF SPACING AND SIZE OF THE CONNECTING DOWELS VARIES FROM 6" TO 12" AND FROM #8 TO #11, RESPECTIVELY. IN CERTAIN LOCATIONS SOME CONNECTING DOWELS ARE DEVELOPED INTO ADJACENT REINFORCEMENT CONCRETE FLOORS INSTEAD OF CONNECTING TO HOOKS OR HEADED REINFORCEMENT IN THE WALL. THE HOOK ORIENTATION IN CA20 FLOORS MAY VARY FROM THAT OF FINNED FLOORS.

7. DOWEL LENGTH IS THE LONGEST OF A) ACI 349 REQUIREMENTS FOR SPLICE LENGTH, B) LENGTH TO INCORPORATE SUFFICIENT SHEAR STUDS TO DEVELOP THE CAPACITY OF THE DOWEL, PER AISC N690 SHEAR STUD CAPACITIES, OR C) LENGTH TO INCORPORATE SUFFICIENT SHEAR STUDS TO DEVELOP THE DEMAND IN THE BOTTOM PLATE, PER AISC N690 SHEAR STUD CAPACITIES.

8. ADDITIONAL BOTTOM LAYER REINFORCING STEEL IS PROVIDED IN THE FINNED FLOORS AT ELEVATION 117'-6" WHERE NEEDED TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE FIRE BARRIER.

9. THE RANGE OF REINFORCEMENT SPACING AND SIZE VARIES FROM 6" TO 12" AND FROM #7 TO #11, RESPECTIVELY.

10. THE ELEVATION OF THE TOP OF CONCRETE IS BASED ON LOCATION AND DESIGN REQUIREMENTS FOR THE FLOOR PLATES.

11. THE DESIGN OF THE FINS VARIES AT LOCATIONS NEAR OPENINGS, PENETRATIONS, AND OTHER OBSTRUCTIONS AND DUE TO ATTACHMENTS TO THE FINS AND FLOOR PLATES.

12. THE CENTER LINE LOCATION OF THE SHEAR STUDS MAY VARY FROM THAT OF THE FINS.

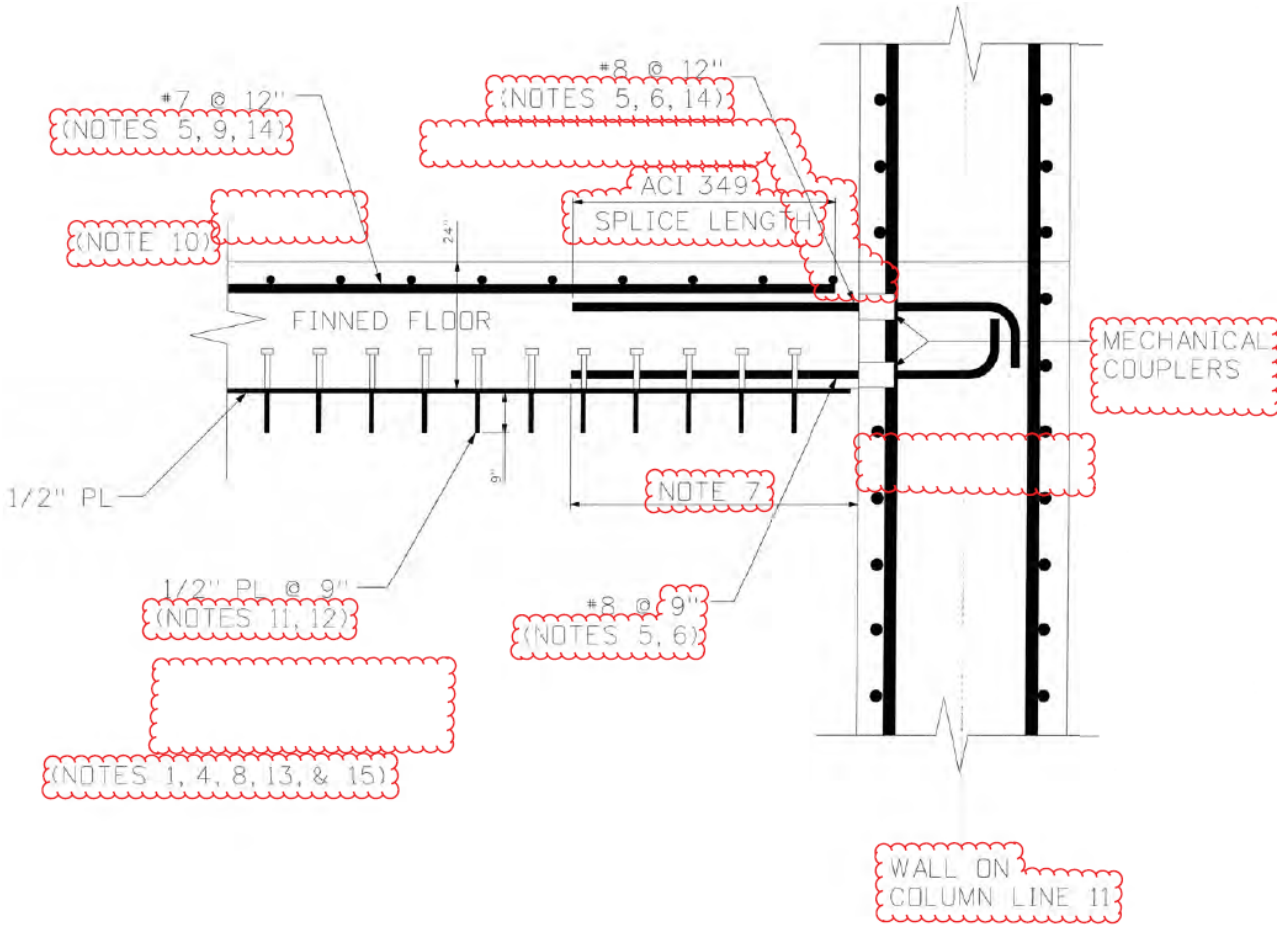
13. THE GAP BETWEEN STEEL PLATE AND WALL, AND USE OF CONSTRUCTION JOINTS VARIES BASED ON FABRICATION AND CONSTRUCTION NEEDS.

14. THE NUMBER OF LAYERS OF TOP REINFORCEMENT AND TOP DOWELS ALONG EACH DIRECTION MAY VARY AS LONG AS THE MINIMUM REQUIRED REINFORCEMENT IS PROVIDED PER ACI 349.

15. THE SHEAR STUD DESIGN SHOWN IS FOR LOCATIONS AWAY FROM OPENINGS, PENETRATIONS, EMBEDMENTS, AND OTHER OBSTRUCTIONS.

16. THE DESIGN INFORMATION SHOWN ON SHEET 3 IS APPLICABLE TO FINNED FLOORS FOR LOCATIONS AWAY FROM OPENINGS, PENETRATIONS, EMBEDMENTS, AND OTHER OBSTRUCTIONS.

UFSAR Figure 3H.5-9 (Sheet 2 of 3), Auxiliary Building Finned Floor – Revise the information to add the Notes shown below.
(Replacement for corresponding figure in LAR 14-14 R3.)



UFSAR Figure 3H.5-9 (Sheet 3 of 3), Auxiliary Building Finned Floor – Revise the information to add Notes as shown below. (Replacement for corresponding figure in LAR 14-14 R3.)