



Alfred M. Paglia
Manager
Nuclear Licensing
New Nuclear Deployment

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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: LAR 13-38R Revised License Amendment Request:
Auxiliary Building Structural Floor and Roof Details

Reference: 1. South Carolina Electric and Gas Company, NND-13-0642, Virgil C.
Summer Nuclear Station Units 2 and 3 LAR 13-38 License Amendment
Request: Auxiliary Building Structural Floor and Roof Details
(Adams Accession Number ML13316A370)

In accordance with the provisions of 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G) requests an amendment to the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 combined licenses (COLs) numbers NPF-93 and NPF-94, respectively. This revised submittal (LAR 13-38R) of the License Amendment Request (LAR) replaces in its entirety the submittal of LAR 13-38 made on November 7, 2013, via NND-13-0642, Adams Accession Number ML13316A370 (Reference 1). The proposed amendment would depart from VCSNS Units 2 and 3 plant-specific Design Control Document (DCD) Tier 2 and Tier 2* material contained within the Updated Final Safety Analysis Report (UFSAR) to identify that design details of the floors and roof of the auxiliary building may vary as a result of design finalization and will comply with applicable code requirements. These revisions address NRC comments and questions relative to Reference 1 of this letter, which were discussed during a public meeting / teleconference on November 21, 2013.

Enclosure 1 provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration determination) and environmental considerations for the proposed changes. Enclosure 2 provides markups depicting the requested changes to the VCSNS Units 2 and 3 UFSAR.

This revised submittal and the information contained in Enclosures 1 and 2 to this letter do not change the scope of the original request, nor revise the No Significant Hazards Consideration determination.

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Following the discussions with the Nuclear Regulatory Commission (NRC) staff regarding our initial submittal in Reference 1, the requested date has been reevaluated and is now tied to the first affected work for the critical sections relevant to the proposed changes. Based on this reevaluated construction tie, SCE&G requests NRC staff review and approval of the license amendment by January 15, 2015. Approval by this date will allow sufficient time to implement the licensing basis changes prior to installation of affected auxiliary building floors. SCE&G expects to implement the proposed amendment within 30 days of approval.

This letter contains no regulatory commitments.

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

Should you have any questions, please contact April R. Rice by telephone at (803) 941-9858, or by email at arice@scana.com.

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

Executed on this 5 day of DECEMBER, 2013.

Sincerely,



Alfred M. Paglia
Manager, Nuclear Licensing
New Nuclear Deployment

JRB/AMP/jrb

Enclosure 1: Virgil C. Summer Nuclear Station Units 2 and 3 – License Amendment
Request: Auxiliary Building Structural Floor and Roof Details
(LAR 13-38R)

Enclosure 2: Virgil C. Summer Nuclear Station Units 2 and 3 – Proposed Changes to
Licensing Basis Documents (LAR 13-38R)

c: Denise McGovern
Ravindra Joshi
David Jaffe
Rahsean Jackson
Victor McCree
Jim Reece
Stephen A. Byrne
Jeffrey B. Archie
Ronald A. Jones
Al Paglia
April Rice
Alvis J. Bynum
Kathryn M. Sutton
Justin Bouknight
Julie Ezell
Dean Kersey
Kyle Young
Margaret Felkel
Cynthia Lanier
Amy Aughtman
Christopher Levesque
Dan Churchman
Joel Hjelseth
Brian McIntyre
Zach Harper
William E. Hutchins
Curt Castell
Hal Thornberry
Susan E. Jenkins
William M. Cherry
Rhonda O'Banion
VCSummer2&3ProjectMail@cbi.com
vcsummer2&3project@westinghouse.com
DCRM-EDMS@SCANA.COM

South Carolina Electric and Gas Company
Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3

NND-13-0710

Enclosure 1

Revised License Amendment Request:
Auxiliary Building Structural Floor and Roof Details
(LAR 13-38R)

NND-13-0710

Enclosure 1

Revised License Amendment Request: Auxiliary Building Structural Floor and Roof Details
LAR 13-38R

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1. Summary Description

In accordance with 10 CFR 50.90, South Carolina Electric and Gas Company (SCE&G), the licensee for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, requests an amendment to Combined License (COL) Numbers NPF-93 and NPF-94, for VCSNS Units 2 and 3, respectively.

Changes are proposed to the Updated Final Safety Analysis Report (UFSAR) descriptions and figures to address the structural design of the floors and roof in the auxiliary building. The UFSAR text and figures proposed to be changed provide information for critical sections and are identified as Tier 2* information or related Tier 2 information that involves changes to Tier 2* information.

The floors and roof are constructed with concrete placed on metal decking set on structural steel beams. Floors are also constructed with cast-in-place concrete over precast concrete panels. Changes to the figure showing the critical section for concrete placed on precast panels are also proposed to change the representation of the reinforcement in the precast panel and the cast-in-place panel. This figure is also changed to incorporate the requirements for development and anchoring of headed reinforcement from ACI 318-11, Section 12.6, which were previously incorporated to the UFSAR via SCE&G COL Amendments 2 and 5 (Adams Accession Numbers ML13056A183 and ML13149A314, respectively).

2. Detailed Description

The affected UFSAR subsections and figures are proposed to be modified as discussed below and shown in Enclosure 2.

- A. UFSAR Subsection 3H.1, second paragraph, is revised to clarify the use of critical sections described in Subsection 3H.5 and the applicability to structures away from critical sections.
- B. UFSAR Subsection 3H.5, first paragraph, is revised to clarify the purpose of critical section to illustrate main characteristics and overall design approach.
- C. UFSAR Subsection 3H.5, a paragraph is added to address applicability of critical section figures to structures away from critical sections.
- D. UFSAR Subsection 3H.5, Items (6) and (7), are revised to remove "typical."
- E. UFSAR Subsection 3H.5.2, first paragraph, is revised to note that the span and spacing of beams may be less in structures away from the critical section.
- F. UFSAR Subsection 3H.5.2, second paragraph, is revised to replace "typical" with "representative" and to note that some concrete on metal deck floors outside of the

critical section may have different size metal deck ribs than described because of area geometry considerations or as a result of the use of heavier decking.

- G. UFSAR Subsection 3H.5.2.2, first paragraph, is revised to remove “typical” and to note that the description of the floors is applicable to the critical section. Also, an editorial correction is made to the number for Table 3H.5-11 by removing an extra period.
- H. UFSAR Subsection 3H.5.3, first paragraph, is revised to identify that the size of the precast concrete panels varies from 8 to 12 inches thick in structures away from the critical section. The thickness values for the cast-in-place reinforced concrete based on a specific 8 inch precast panel thickness are removed. Also the description of the loading of the floor and analysis assumptions is changed. A statement is added that the cast-in-place concrete supports the precast panel for seismic loads.
- I. UFSAR Subsection 3H.5.3.1, first paragraph, is revised to remove “typical” and to note that Figure 3H.5-8 applies to the critical section. A paragraph is added to identify that dimensions and reinforcement may vary at other locations. Also, an editorial correction is made to the number for Table 3H.5-12 by removing an extra period.
- J. UFSAR Figure 3H.5-6 is revised as follows:
 - 1. In Section A-A; remove the “TYP” from the W14x26 floor beam designation
 - 2. Delete the word “Typical” from the Figure Title
- K. UFSAR Figure 3H.5-8 is revised as follows:
 - 1. In Section F Looking North, replace the bottom #8@12” reinforcement bar extending into the walls with a bar that is contained within the precast panel.
 - 2. In Section F Looking North, add a #8@12” reinforcement bar extending into the walls with headed reinforcement to the lower portion of the cast-in-place concrete. Add a label to this bar identifying the #8 @ 12” reinforcement arrangement.
 - 3. In Section F Looking North, extend the length of the reinforcement bars terminated with headed reinforcement
 - 4. In Section F Looking North, on the left side of the section view, replace “Anchor Plate” with “T-Head”
 - 5. In the floor in the left side of the Section F View shift the misplaced small circle representing a north south reinforcement bar to the correct location above the east west rebar.
 - 6. At each end of the Section F View the drawing convention to define the 3 inch distance is changed to move the arrows.
 - 7. To the Label “Section F Looking North” add “Note 1”

8. In Section C Looking West, extend the length of the reinforcement bars terminated with headed reinforcement
9. In Section C Looking West, add designation of perpendicular longitudinal reinforcement above lower reinforcement bar in cast-in-place concrete and add arrow from #8@12" to rebar.
10. In Section C Looking West, replace "Anchor Plate" with "T-Head"
11. At the left end of the Section C View, drawing convention to define the 3 inch distance is changed to move the arrows.
12. Remove the view showing the details of the precast panel reinforcement for floor elevation 133' 11". [The thickness of the precast panel is discussed in UFSAR Subsection 3H.5.3 and the reinforcement for the precast panels is provided in Section C and Section F of Figure 3H.5-8.]
13. To Label "Section C Looking West" add "Note 1"
14. In FLOOR EL. 135' 3" view add "B" to #8@12" to designate Bottom rebar.
15. Add the following Note 1 to the figure "Refer to Subsection 3.8.4.4.1 for the requirements for development of headed reinforcement"

Basis for the Requested Changes

The proposed changes revise the descriptions of the design of the floors and auxiliary building roof in UFSAR Subsection 3H.5 and the associated figures to change the descriptions of the floor structures to identify information that may vary in final design of the floors outside of the critical sections. Design of the critical sections does not vary from the details provided in the UFSAR. The changes in the description identify differences between the critical section design and the design of similar floors in other locations. The descriptions are revised to remove the term "typical" or to replace the use of the term "typical" with "representative". The meaning of "representative" section is added. The term "representative" is used when the description applies to structural sections away from the critical sections. The descriptions of the floors are rewritten to separate the general description of the floor design from the description from the critical sections. Subsection 3H.1 is rewritten to describe the critical sections and to clarify the use of the critical section descriptions and figures in the licensing basis.

In the introductory portion of UFSAR Subsection 3H.5, Items 6 and 7 of UFSAR Subsection 3H.5 are revised to remove the term "typical." The term representative is considered more appropriate for the way these descriptions are used in the licensing basis. There may be, and in many cases are, variations between the description and figures depicting design of the critical sections in the licensing basis and similar sections in the AP1000 structures. The use of the term "typical" is replaced because it may imply an exact replication of the design details.

The proposed changes revise the description of the design of the floor with concrete placed on metal decking in UFSAR Subsection 3H.5.2 to change the description of the floor structure to identify information that may vary from that shown in UFSAR Figure 3H.5-6 for structural design elements away from the critical sections. The metal decking is corrugated to provide strength and stiffness to resist the load of wet concrete prior to the concrete setting. This metal decking floor design is also used for the auxiliary building roof. The changes in the description identify differences between the critical section design and the design of similar floors in other locations. The term "typical" in reference to design details is deleted or replaced with "representative." The changes include allowance for changes in the depth and spacing of the corrugations on the bottom of the concrete slab. The text referencing UFSAR Figure 3H.5-6 for the critical section is changed to note that the reinforcement arrangement and beam size may vary in locations away from the critical sections. An editorial change corrects the number for UFSAR Table 3H.5-11 by removing an extra period.

The proposed changes revise the description of the design of the floors in the UFSAR Subsection 3H.5.3 to change the description of the precast concrete panels and cast-in-place concrete used in the floor structure to identify information that may vary in final design for structural design elements away from the critical sections. The thickness values for the cast-in-place reinforced concrete based on a specific 8 inch precast panel thickness are removed except in the portion of the write-up describing the critical section. The description of floors using precast panels is changed to identify a range of precast panel thickness used in the final design. The overall thickness of the floor is not changed. The description of floors using precast panels is changed to remove the references to reinforcement tying together the precast and cast-in-place portions of the floor and the statement that the portions act together. A sentence is added to note that the cast-in-place portion of the floor handles all the loads. A statement is added to note that reinforcement ties the precast panel to the cast-in-place concrete and that the cast-in-place concrete supports the precast panel during seismic events. A paragraph is added to note that the figure is representative of this type of floor at other locations. The added paragraph clarifies that the design of other similar floors may vary from the details used for the critical section. The term "typical" in reference to critical sections is deleted. An editorial change corrects the number for UFSAR Table 3H.5-12 by removing an extra period.

Changes to Figure 3H.5-6 remove the "typical" designation from the figure title and remove the designation of the floor beam size as typical (TYP) since the figure describes a specific critical section. The design of the critical section depicted in UFSAR Figure 3H.5-6 is unchanged.

UFSAR Figure 3H.5-8 is revised to change the representation of the flexural reinforcement design shown in the figure. The original figure shows reinforcement extending from the precast panel into the adjacent wall. This design is changed to support construction sequencing in which concrete for the walls is placed before the precast panel is put in place. The figure is changed to show the reinforcement

terminating within the precast slab and reinforcement added to the bottom of the cast-in-place portion. This additional reinforcement in the cast-in-place portion extends into the wall. A plan view showing the reinforcement for the precast panels is removed because the information is provided elsewhere on the figure and in the licensing basis. The figure is also changed to fix discrepancies with drawing convention.

UFSAR Figure 3H.5-8 is also changed to modify the location of the T-Heads on headed reinforcements to be consistent with the criteria for development of headed reinforcement. The description on the figure for the anchoring of reinforcement is changed from Anchor Plate to T-Head to accurately reflect the used of headed reinforcement. A note referring to UFSAR Subsection 3.8.4.4.1 for the requirements for development of headed reinforcement is added to the figure. These criteria use ACI 318-11, Section 12.6, requirements and have been previously approved and incorporated into the licensing basis as part of the license amendment to include the use of headed reinforcement above the basemat. UFSAR Subsections 3.8.3.5, 3.8.4.4.1, and 3.8.4.5.1 of the licensing basis were previously revised with a license amendment request to incorporate these criteria. See SCE&G COL Amendments 2 and 5 (Adams Accession Numbers ML13056A183 and ML13149A314, respectively). The figure is also changed for consistency with drawing conventions.

3. Technical Evaluation

Structure, System, Component and/or Analysis Description

The nuclear island structures consist of the containment, shield building, and auxiliary building. The functions of the nuclear island structures are to provide support, protection, and separation for the seismic Category I mechanical and electrical equipment located in the nuclear island.

The nuclear island structures provide protection for the safety-related equipment against the consequences of either a postulated internal or external event. The nuclear island structures are designed to withstand the effects of natural phenomena such as hurricanes, floods, tornados, tsunamis, and earthquakes without loss of capability to perform safety functions. The nuclear island structures are designed to withstand the effects of postulated internal events such as fires and flooding without loss of capability to perform safety functions.

The floors and roof in the auxiliary building are seismic Category I structures and provide support and anchorage for component and piping supports and other attachments. Floor and roof structures in the auxiliary building are designed as reinforced concrete slabs in accordance with ACI-349. Floor structures in the auxiliary building are constructed with metal decking or precast concrete panels supporting the wet concrete prior to the concrete setting.

The design of headed reinforcement is consistent with the criteria for development of headed reinforcement. These criteria use ACI 318-11, Section 12.6 requirements and have been previously approved and incorporated into UFSAR Subsections 3.8.3.5, 3.8.4.4.1, and 3.8.4.5.1 of the licensing basis.

Supporting Technical Details

The floors and auxiliary building roof are seismic Category I structures and are designed for dead, live, thermal, pressure, and safe shutdown earthquake loads, as well as loads due to postulated pipe breaks. The variation in these loads and in the geometry of the structure results in the variation of design details, including reinforcement arrangement, size of supporting beams, and the size of ribs from the use of corrugated metal decking. The licensing basis changes note that floors in the auxiliary building, other than the critical sections, will vary in design details from the details shown in the UFSAR figures. The detail design changes do not change the design loads. The design of the floors, including those with variances with the details shown in the figures, remains in conformance with applicable requirements in ACI-349, AISC N690, and supplemental requirements in Section 3.8 of the UFSAR. These requirements were confirmed during the review of the design certification and provide a sufficient margin of safety to structural failure for the design basis loads. Conformance with these requirements is sufficient to demonstrate that the design is in conformance with NRC regulations. The editorial changes to the table and figure numbers do not change the design or the design requirements, nor alter a technical basis utilized by previous safety evaluations.

The changes to the UFSAR in Appendix 3H more clearly separate the description of the floor design from the description of the critical sections. The changes clarify the use of critical section information and the applicability of this information for structures away from the critical section. The changes clarify that the variances in design details do not apply to critical sections.

The changes in the description of the cast-in-place concrete over precast concrete panel type of floor identify possible differences in the details for this type of floor design, including the thickness of the precast panels, in areas other than critical sections. The changes in the description of this type of floor replace a write-up based on the precast panel tied to the cast-in-place and acting as a composite panel with a write-up that states that the cast-in-place portion of the floor is designed and analyzed to resist the loads without contribution of the precast panel. The precast concrete panel is anchored to the cast-in-place concrete through the shear stirrups provided on a 12"x24" pattern. The composite behavior is conservatively ignored in the strength design of the floor. Only the cast-in-place concrete and the reinforcement located within the cast-in-place concrete is considered to resist post construction loading. The design of these floors, with the reliance on only the cast-in-place concrete to resist design loads, is in conformance with applicable requirements in ACI-349, and supplemental requirements in Section 3.8 of the UFSAR.

Out-of-plane shear forces from the precast panel and cast-in-place concrete portion of the floor slab are transferred to the supporting wall by means of the horizontal floor slab reinforcement located within the cast-in-place portion of the floor. The floor reinforcement transfers the out-of-plane shear forces through shear friction in accordance with ACI 349 Section 11.7. The floor reinforcement located in the cast-in-place portion of the floor is developed in the walls in accordance with ACI 349 Chapter 12 and Chapter 21.

The precast panel is part of the Seismic Category I floor slab. The shear stirrups connecting the precast panel with the cast-in-place concrete support the precast panel to resist seismic loads acting on the precast panel. The weight of the precast panel is included in the analysis of the floor and is not considered as a separate element, in accordance with ACI 349, Chapter 17.

For the floors with precast concrete panels, the stiffness of the floor is based on the combined thicknesses of the cast-in-place portion and the precast concrete panel. The small gap between the precast panel and the walls has an insignificant impact on the overall floor behavior and the results of the seismic analysis. The mass of the precast panel is considered in the seismic analysis of the floor. The impact of the mass change in the finite element model due to the small gap is insignificant. Therefore the existing seismic analysis finite element model is not significantly impacted by this design change.

The variation in the design of a floor over metal decking is based on the use of stronger, heavier metal decking where geometry considerations require longer spans between beams. The heavier decking is manufactured with thicker plate and shallower corrugations (ribs). There is no adverse impact on the floor design because the more shallow corrugations result in a thicker floor above the ribs.

The term "typical" in reference to design details is deleted or replaced with "representative" in text because the term typical may suggest an exact replication of design detail in different locations that is not intended. The term representative is used to indicate that the design of the floors and auxiliary building roof in other locations away from the critical sections is similar but not identical to that shown in the critical sections. Reference to "typical" for critical section information is not appropriate because the information is applicable to the specific critical section described. The critical section figures are intended to show the design approach and use of design features for similar sections and not the exact design details, except at the critical sections. The change in the terms from "typical" to "representative" does not change the design basis or conformance with design requirements.

The proposed changes include implementation of requirements for development of headed reinforcement. These changes include, changing the term "Anchor Plates" to "T-Heads", extending the lengths of the reinforcement into the walls, and adding a note to the drawing identifying the requirements for development of headed reinforcement on

Figure 3H.5-8. These requirements are based on requirements in ACI 318-11, Section 12.6. The use of these requirements was approved in previous license amendments and incorporated into Subsections 3.8.3.5, 3.8.4.4.1, and 3.8.4.5.1 of the licensing basis. See SCE&G COL Amendments 2 and 5 (Adams Accession Numbers ML13056A183 and ML13149A314, respectively).

The changes to the reinforcement in USFAR Figure 3H.5-8 are incorporated to provide reinforcement in the cast-in-place concrete consistent with the analysis to resist the loads in the cast-in-place concrete without relying on the reinforcement in the precast panels. The figure is also revised to make an editorial change to be consistent with drawing conventions. The revised design continues to be in conformance with ACI 349. The drafting convention changes do not change design information or design requirements. The removal of the plan view showing the reinforcement for the precast panels does not remove or change design information because the information is provided elsewhere on the figure and in the licensing basis. The thickness of the precast panel is discussed in UFSAR Subsection 3H.5.3 and the reinforcement for the precast panels is provided in Section C and Section F of UFSAR Figure 3H.5-8.

The proposed changes do not change the function, design, or operation of the systems and components supported by and located under the floors and roof in the auxiliary building. The proposed changes do not change the function, design, or operation of the containment vessel and passive containment cooling system. The thickness and strength of the auxiliary building roof is not changed. The proposed changes do not affect the prevention and mitigation of abnormal events, e.g., accidents, anticipated operational occurrences, earthquakes, floods and turbine missiles, or their safety or design analyses. The proposed changes do not involve, nor interface with, any structure, system or component accident initiator or initiating sequence of events, and thus, the probabilities of the accidents evaluated in the UFSAR are not affected.

The detail design changes to the floors and roof in the auxiliary building do not interface with or affect safety-related equipment or a fission product barrier. No system or design function or equipment qualification would be adversely affected by the proposed changes. The changes do not result in a new failure mode, malfunction or sequence of events that could adversely affect a radioactive material barrier or safety-related equipment. The proposed changes do not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures.

The proposed changes do not adversely affect any safety-related system or component, equipment, design code, design code allowable value, function or design analysis, nor do they adversely affect any safety analysis input or result, or design/safety margin.

The proposed activity has no adverse effect on the ex-vessel severe accident. The design, geometry, and strength of the containment internal structures are not changed. The design and material selection of the concrete floor beneath the reactor vessel is not

altered. The response of the containment to a postulated reactor vessel failure, including direct containment heating, ex-vessel steam explosions, and core concrete interactions is not altered by the changes to the detail design of floors and roof in the auxiliary building. The design of the reactor vessel and the response of the reactor vessel to a postulated severe accident are not altered by the changes to the detail design of floors and roof in the auxiliary building.

The proposed activity has no impact on the Aircraft Impact Assessment. The changes described to the floors are internal to the structures and do not impact the design or response of the containment vessel and shield building. The changes to the auxiliary building roof do not change the thickness or strength of the shield building roof. There is no change to protection of plant structures, systems, and components against aircraft impact provided by the design of the shield building. There is no change to the design of any of the key design features described in UFSAR Appendix 19F. The activity described does not change the overall design or construction of the shield building.

The proposed changes associated with this license amendment request include a change in the detail design of floors and roof in the auxiliary building. The changes are internal to the structures and the configuration, thickness, and density of the structures are not changed. The proposed changes do not affect the radiological source terms (i.e., amounts and types of radioactive materials released, their release rates and release durations) used in the accident analyses, thus, the consequences of accidents are not affected. These changes do not affect the containment, control, channeling, monitoring, processing or releasing of radioactive and non-radioactive materials. The location and design of penetrations and the permeability of the concrete structures is not changed. No effluent release path is affected. The types and quantities of expected effluents are not changed. The functionality of the design and operational features that are credited with controlling the release of effluents during plant operation is not diminished. Therefore, neither radioactive nor non-radioactive material effluents are affected.

The thickness of the floors and the density of the concrete are not changed; therefore, there is no adverse change to the shielding provided by the floors. There is no change to plant systems or the response of systems to postulated accident conditions. There is no change to the predicted radioactive releases due to normal operation or postulated accident conditions. Plant radiation zones, controls under 10 CFR Part 20, and expected amounts and types of radiologically controlled materials are not affected by the proposed changes. Therefore, individual and cumulative radiation exposures do not change.

The change activity has no impact on the emergency plans or the physical security evaluation since there are no changes to the external configuration of the roof, walls, doors, or access to the Nuclear Island.

Summary

The proposed changes would revise Tier 2* information and associated Tier 2 information in the UFSAR in regard to requirements for detail design of floors and roof in the auxiliary building. These changes include design changes to the design elements of precast concrete panels, and the rearrangement of reinforcement bars to make the design practicable, and the size of metal decking supporting wet concrete. The proposed changes also incorporate the requirements for development and anchoring of headed reinforcement previously approved. The proposed changes do not adversely affect the strength or response of the nuclear island seismic Category I structures.

The above proposed changes do not adversely affect any safety-related equipment or function, design function, radioactive material barrier or safety analysis.

4. Regulatory Evaluation

4.1 Applicable Regulatory Requirements/Criteria

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 1 requires that structures be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety functions to be performed. The proposed changes do not change the criteria for the design, analysis, and construction of the floors and roof in the auxiliary building. The design of the portions of the auxiliary building affected by this activity remains in conformance with the code requirements identified and supplemented in the UFSAR.

10 CFR Part 50, Appendix A, GDC 2 states structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their safety functions. The structures affected by this activity maintain compliance with GDC 2. The thickness, geometry, and strength of the structures are not altered. The response of the structure to seismic motions is not altered by the changes in the design details of the floors or roof.

10 CFR Part 50, Appendix A, GDC 4 states structures, systems, and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. The structures affected by this activity maintain compliance with GDC 4. The thickness, geometry, and strength of the structures are not altered. The response of the structure to the effects of

seismic ground motion, extreme winds and external missiles is not altered by the change in the design details of the structure.

10 CFR Part 52, Appendix D, Section VIII.B.6 and VIII.B.5a require prior NRC approval for Tier 2* information departures and for Tier 2 information departures that involve changes to Tier 2* information respectively. Although this departure does not adversely affect safety, it does involve departures from Tier 2* and related Tier 2 information. Therefore, NRC approval is required prior to implementing the Tier 2* and associated Tier 2 departures addressed in this departure.

4.2 Precedent

T-headed reinforcement was modified to follow the requirements of ACI 318-11, Section 12.6. These requirements for development of headed reinforcement were previously approved and incorporated into UFSAR Subsections 3.8.3.5, 3.8.4.4.1, and 3.8.4.5.1 of the licensing basis. See SCE&G COL Amendments 2 and 5 (Adams Accession Numbers ML13056A183 and ML13149A314, respectively).

4.3 Significant Hazards Consideration Determination

The proposed amendment would revise the plant-specific design control document (DCD) Tier 2* and associated Tier 2 material incorporated into the Updated Final Safety Analysis Report (UFSAR) to incorporate changes to UFSAR descriptions and figures which are proposed to address changes in the design of floors and roof in the auxiliary building.

An evaluation to determine whether or not a significant hazards consideration is involved with the proposed amendment was completed by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

4.3.1 Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The design functions of the auxiliary building floors and roof are to provide support, protection, and separation for the seismic Category I mechanical and electrical equipment located outside the containment building. The auxiliary building is a seismic Category I structure and is designed for dead, live, thermal, pressure, safe shutdown earthquake loads, and loads due to postulated pipe breaks. The proposed changes to UFSAR descriptions and figures are intended to address changes in the detail design of floors and the roof in the auxiliary building. The

proposed changes also incorporate requirements for development and anchoring of headed reinforcement. The properties of the concrete and reinforcement included in the auxiliary building structure are not altered. As a result, the design function of the auxiliary building structure is not adversely affected by the proposed changes. There is no change to plant systems or the response of systems to postulated accident conditions. There is no change to the predicted radioactive releases due to postulated accident conditions. The plant response to previously evaluated accidents or external events is not adversely affected, nor do the changes described create any new accident precursors. Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

4.3.2 Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes to UFSAR descriptions and figures are proposed to address changes in the detail design of floors and roof in the auxiliary building. The proposed changes also incorporate the requirements for development and anchoring of headed reinforcement which were previously approved. The thickness, geometry, and strength of the structures are not adversely altered. The concrete and reinforcement materials are not altered. The properties of the concrete are not altered. The changes to the design details of the auxiliary building structure do not create any new accident precursors. As a result, the design function of the auxiliary building structure is not adversely affected by the proposed changes. Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

4.3.3 Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The criteria and requirements of American Concrete institute (ACI) 349 and American Institute of Steel Construction (AISC) N690 provide a margin of safety to structural failure. The design of the auxiliary building structure conforms to applicable criteria and requirements in ACI 349 and AISC N690 and therefore maintains the margin of safety. The proposed changes to the UFSAR address changes in the detail design of floors and roof in the auxiliary building. The proposed changes also incorporate the requirements for development and anchoring of headed reinforcement

which were previously approved. There is no change to design requirements of the auxiliary building structure. There is no change to the method of evaluation from that used in the design basis calculations. Therefore the proposed amendment does not result in a significant reduction in a margin of safety.

Based on the above, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5. Environmental Considerations

The proposed amendment departs from Tier 2* and associated Tier 2 material in the UFSAR (Appendix 3H) structural detail design of the floors and roof for the auxiliary building. The proposed amendment includes changes to allow variances in the thickness of precast panels and nominal size of metal decking outside of the critical section. The proposed amendment also departs from information on a Tier 2* figure in the UFSAR by implementing in the floor detail design development requirements for headed reinforcement.

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20, or would change an inspection or surveillance requirement. However, facility construction and operation following implementation of the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

- (i) *There is no significant hazards consideration.*

As documented in Section 4.3, Significant Hazards Consideration Determination, of this license amendment request, an evaluation was completed to determine

whether or not a significant hazards consideration is involved by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment." The Significant Hazards Consideration determined that (1) the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the proposed amendment does not involve a significant reduction in a margin of safety. Therefore, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

- (ii) *There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.*

The proposed amendment involves structural design changes which do not change the as-built configuration of the plant systems and thus do not introduce any changes to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents) or affect any plant radiological or non-radiological effluent release quantities. Furthermore, these changes do not diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

- (iii) *There is no significant increase in individual or cumulative occupational radiation exposure.*

The proposed amendment involves structural detail design changes to floors and roof and inclusion in the floor detail design of development requirements for headed reinforcement without impacting the bulk of the material utilized for radiation protection, and thus, do not affect any plant structure, system or component, their function, plant effluent, or radiation controls. This proposed amendment does not change the as-built configuration of the plant systems. Consequently, these changes have no effect on individual or cumulative occupational radiation exposure during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

NND-13-0710

Enclosure 1

Revised License Amendment Request: Auxiliary Building Structural Floor and Roof Details
LAR 13-38R

Based on the above review of the proposed amendment, it has been determined that anticipated construction and operational impacts of the proposed amendment do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

NND-13-0710
Enclosure 2
Proposed Changes to Licensing Basis Documents
LAR 13-38R

**South Carolina Electric and Gas Company
Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3**

NND-13-0710

Enclosure 2

**Proposed Changes to Licensing Basis Documents
(LAR 13-38R)**

UFSAR Subsection 3H.1, Introduction – Revise the second paragraph and add a third paragraph, as shown below.

*subsections 3H.2 through 3H.4~~5~~ include a general description of the auxiliary building and shield building, a summary of the design criteria and the global analyses. Subsection 3H.5 describes the design of the critical sections. ~~Examples of The 3H.5 figures referenced in the descriptions show the structural designs are shown~~ for 14 critical sections which are identified in subsection 3H.5 and shown in Figures 3H.5-1 (3 sheets). The exact locations of the critical sections related to the shield building cylinder are shown in Figures 3H.5-16. ~~Representative~~ Design details are provided for the critical sections ~~these structures~~ in subsection 3H.5 and associated figures.]**

Subsection 3H.5 includes descriptions of structural design elements in the auxiliary building and shield building that are similar to the critical sections. The figures referenced in subsection 3H.5 are representative of the similar structures at locations away from the critical sections.

UFSAR Subsection 3H.5, Structural Design of Critical Sections – Revise to include additional Tier 2* information in the first paragraph as shown below.

[This subsection summarizes the structural design of ~~representative~~ seismic Category I structural elements in the auxiliary building and shield building. The critical sections are identified for several structural design elements in the auxiliary building and shield building. These critical sections are intended to illustrate the main characteristics of the design and show the overall design approach and use of major design elements in the auxiliary building and shield building. ~~These structures~~ The critical sections are listed below and the corresponding location numbers are shown on Figure 3H.5-1. The basis for their selection to this list is also provided for each structure.

UFSAR Subsection 3H.5, Structural Design of Critical Sections – Revise Tier 2* information in critical section items (6) and (7) as shown below.

- (6) Floor slab on metal decking at elevation 135'-3". (This is a ~~typical~~ slab on metal decking and structural steel framing.) – see subsection 3H.5.2.2 and Figure 3H.5-6
- (7) 2'-0" slab in auxiliary building (operations work area (tagging room) ceiling) at elevation 135'-3". (This illustrates the design of a ~~typical~~ 2'-0" thick concrete slab.) – see subsection 3H.5.3.1 and Figure 3H.5-8. (Note: The 'Tagging Room' has been renamed as "Operations Work Area." However, to avoid changing the associated design and analysis documents, this room is referred to as the 'Tagging Room'.)

UFSAR Subsection 3H.5, Structural Design of Critical Sections – Add a third paragraph at the end of the subsection, as shown below.

... design for the key structural elements.

*These critical sections are intended to illustrate the main characteristics of the design and show the overall design approach and use of major design elements for similar sections. The exact design details (e.g., size, spacing, and configuration) of reinforcement, structural shapes, or other design elements in these similar sections may vary from that shown in the critical sections.]**

UFSAR Subsection 3H.5.2, Composite Structures (Floors and Roof) – Revise the first and second paragraphs, as shown below.

...For the floors, beams are typically spaced at about 6-foot intervals and spans are between 16 feet and 25 feet.] Where required by geometry or loads, the span and spacing of beams may be less.*

Structural Description

~~[A typical-~~ *representative layout of these floors is shown in Figure 3H.5-6. The metal deck rests on the top flange of the structural steel floor beam, with the longitudinal axes of the metal deck ribs and floor beams placed perpendicular to each other. The depth of the ribs for most 9-inch concrete floor slabs and 15-inch deep concrete roof slabs are 3 inches and 4.5 inches respectively. The depth of the ribs may be less for floors in some places due to area geometry considerations or the use of heavier metal decking. The concrete slab is tied to the structural steel floor beam by shear connectors, which are welded to the top flange of the floor beam. The concrete slab and the floor beams form a composite floor system. For the design loads after hardening of concrete, the transformed section is used to check the stresses.*

UFSAR Subsection 3H.5.2.2, Floor at Elevation 135'-3", Area 1 (Between Column Lines M and P) – Revise the Tier 2* text in the first paragraph and add a second paragraph, as shown below.

[The design of a ~~typical~~ composite floor for the critical section is shown in Figure 3H.5-6. The design summary for the critical section is shown in ~~Table 3.H.5-11~~ Table 3H.5-11. The critical section concrete slab is 9 inches thick, plus 3-inch deep metal deck ribs. The floor beams are ~~typically~~ W14x26 for the critical section.

Figure 3H.5-6 is representative of the major design elements in composite floors at locations away from the critical sections. The reinforcement size and arrangement and beam size may vary based on loads and spans for this type of floor in locations away from the critical sections.

- *The floor beams are designed for construction load...*

UFSAR Subsection 3H.5.3, Reinforced Concrete Slabs - Revise Tier 2* information in the paragraph to include revised information in the locations shown below.

*[Reinforced concrete floors in auxiliary building are 24 inch or 36 inch thick. These floors are constructed with ~~16" or 28"~~ of reinforced concrete placed on the top of 8 to 12 inch thick precast concrete panels. The ~~8" thick~~ precast concrete panels are installed at the bottom to serve as the formwork and withstand the load of wet concrete slab. ~~The main reinforcement is provided in the precast panels which are connected to the concrete placed above it by shear reinforcement. The precast panels and the cast-in-place concrete act together as a composite reinforced concrete slab. After setting, the cast-in-place concrete portion of the reinforced concrete slab is relied on to resist the loads without contribution from the strength of the precast panel. Reinforcement extending out of the precast panel connects the panel to the concrete above and secures the precast panel for seismic events.~~ Examples of such floors are the Operations Work Area (Tagging Room) ceiling slab at elevation 135 ft 3 inches in Area 2, and the Area 5/6 elevation 100'-0" slab between column lines 1 & 2.]**

**UFSAR Subsection 3H.5.3.1, Operations Work Area (Tagging Room) Ceiling -
Revise subsection as shown below.**

The tagging room (room number 12401) location is shown on *Figure 1.2-8*. [*Figure 3H.5-8 shows the ~~typical~~ cross section and reinforcement for the critical section. The critical section design summary is shown in ~~Table 3H.5-12~~ Table 3H.5-12. Design dimensions of the Operations Work Area (Tagging Room) Ceiling are as follows:*

Room Size:	16'-0" x 11'-10"
Boundary Conditions:	Fixed at Walls J and K
Clear Span:	16'-0"
Slab Thickness:	Total = 24 inches Precast Panel = 8 inches Cast-in-Place = 16 inches

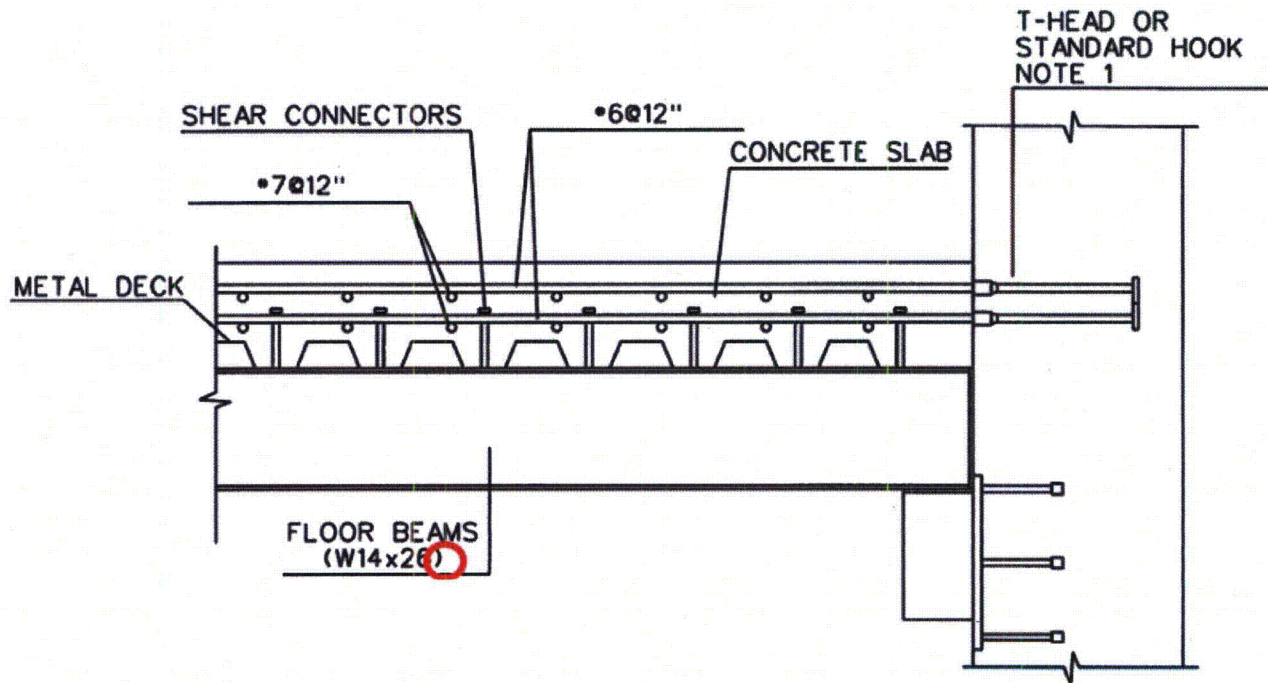
The two precast concrete panels, each 5'-11" wide and spanning over 16'-0" clear span, are installed to serve as the formwork.

*Figure 3H.5-8 is representative of this type of floor at locations away from the critical sections with variation in the dimensions of the floor and panel thickness as noted above in subsection 3H.5.3. The reinforcement size and arrangement for this type of floor at other locations also may vary from that shown in Figure 3H.5-8.]**

UFSAR Chapter 3, Appendix 3H, Figure 3H.5-6, [Auxiliary Building Typical Composite Floor]* - Revise Tier 2* information as shown in the figures following this page.

UFSAR Chapter 3, Appendix 3H, Figure 3H.5-8, [Auxiliary Building Operations Work Area (Tagging Room) Ceiling]* - Revise Tier 2* information as shown in the figures following this page.

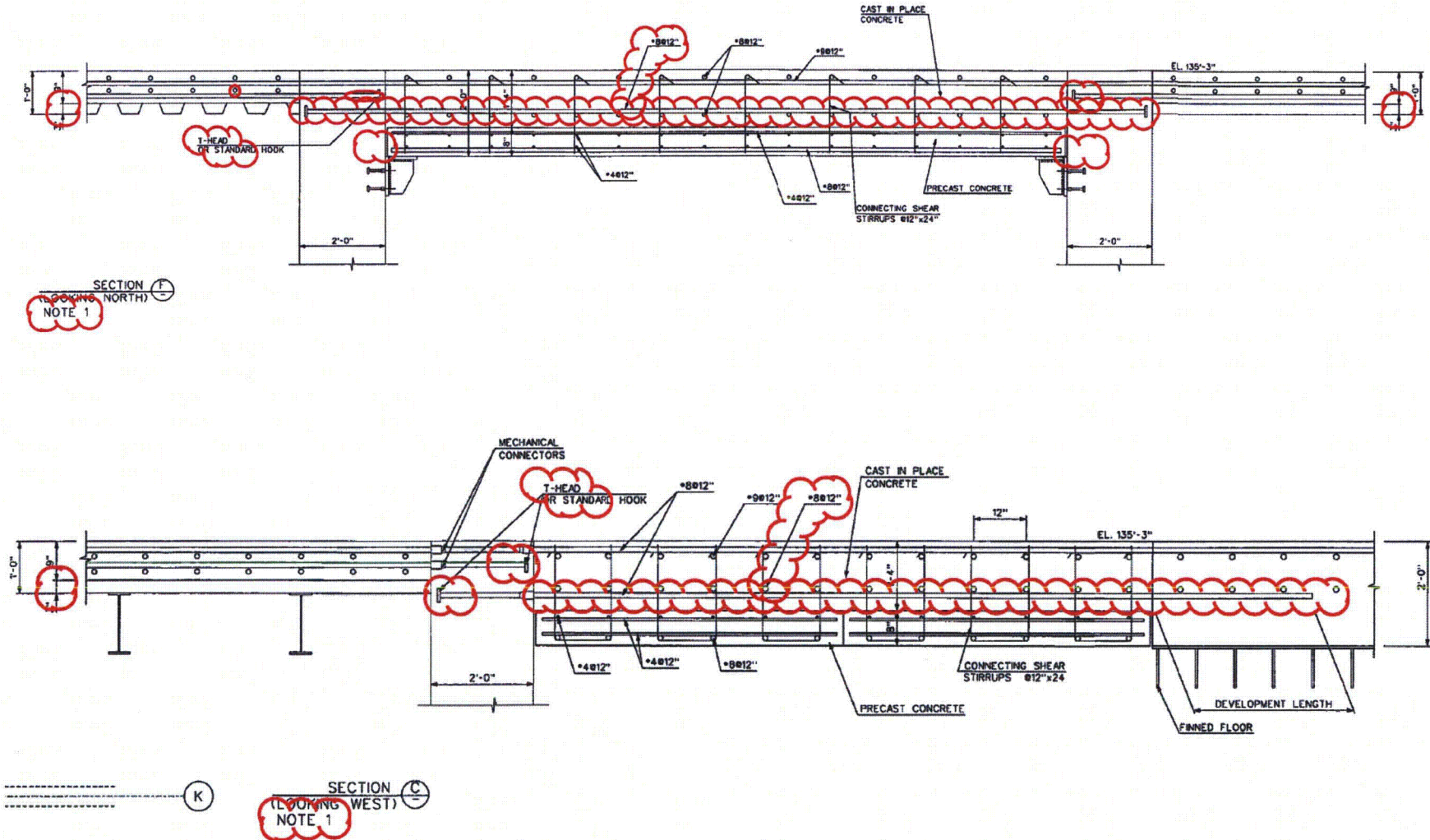
UFSAR Figure 3H.5-6 markups



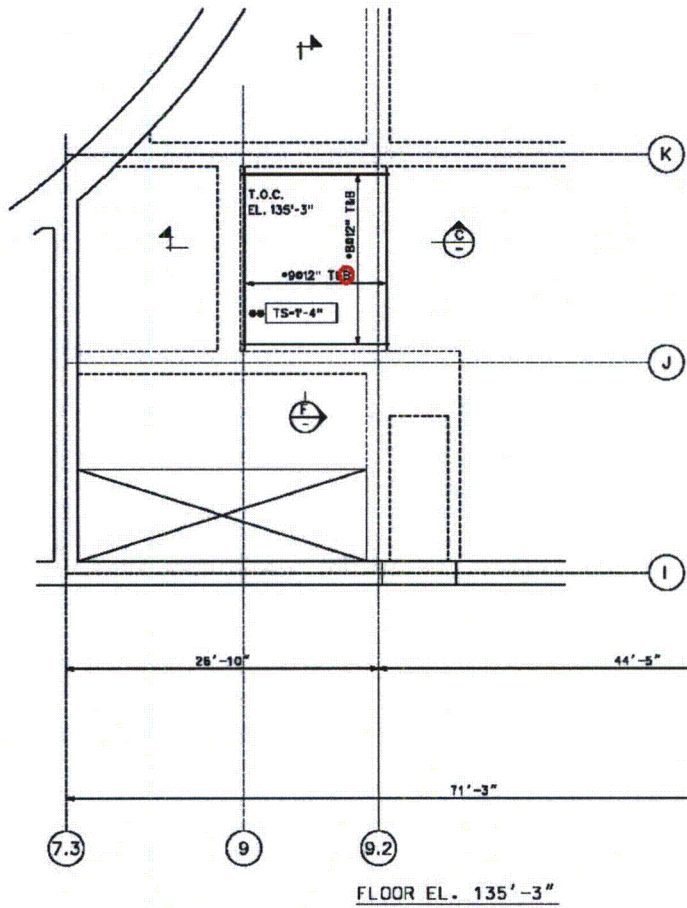
SECTION A-A

[Auxiliary Building ~~Typical~~ Composite Floor]*

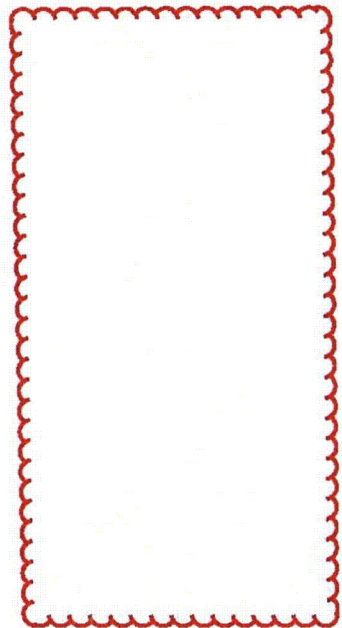
UFSAR Figure 3H.5-8 markups



UFSAR Figure 3H.5-8 markups (continued)



SECTION C
(LOOKING WEST)
NOTE 1



NOTE 1:
REFER TO SUBSECTION 3.8.4.4.1 FOR THE REQUIREMENTS
FOR DEVELOPMENT OF HEADED REINFORCEMENT.