Date: Tuesday February 13th, 2025

To:

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Cc:

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From: Chris Krumrei

RE: STORM SHELTER PEER REVIEW COMMENTS

Permit No: PRCOM20245783

Project Title: LEE'S SUMMIT JOINT OPERATIONS FACILITY

Project Address: 2 NE TUDOR RD, LEES SUMMIT, MO 64086

Parcel Number: 52900043700000000

Location / Legal Description: NEW LEES SUMMIT POLICE & COURT FACILITY---LOT 1A (EX THAT PT TAKEN FOR ROW)

Type of Work: NEW COMMERCIAL

Occupancy Group: BUSINESS

Description: JOINT OPERATIONS FACILITY - NEW FIRE DISPATCH, ADMIN, FIRE TRAINING, AND EMERGENCY OPERATIONS CENTER

ARCHITECTURAL STORM SHELTER PEER REVIEW COMMENTS

1. Sheet G-103 – Required Design Information Note 2**:** ICC 500 2014 Section 107.2.2 - This requirement is called out on sheet S-000 under Design, but the reference says 22020 should be 2020.

    a Response: Revised on sheet S-000.

2. Sheet G-103 – Required Design Information Note 4: ICC 500 2014 Section 107.2.4 - Specify which structural sheet this information is located on.

    a Response: Included on sheet S-000. This reference has been updated on G-103.

3. Sheet G-103 – Required Design Information Note 5: ICC 500 2014 Section 107.2.5 - Specify which structural sheet this information is located on.

   a Response: Included on sheet S-000. This reference has been updated on G-103.

4. Sheet G-103 – Required Design Information Note 6: ICC 500 2014 Section 107.2.6 - Specify which structural sheet this information is located on. I could not find this information.

   a Response: Included on sheet S-000. This reference has been updated on G-103.

5. Sheet G-103 – Required Design Information Note 7: ICC 500 2014 Section 107.2.7 - Specify which structural sheet this information is located on. I could not find this information.

   a Response: Included on sheet S-000. This reference has been updated on G-103.

6. Sheet G-103 – Required Design Information Note 10: ICC 500 2014 Section 107.2.10 - Plans say to reference architectural drawings for doors and overhead coiling door information. The details for these doors are either not provided on the drawings or they do not show how the doors will be anchored to the building. Spec section 081113 does not call out any anchorage for concrete. Section 107.2.5 Special details the construction documents shall provide or include any special manufacturer's details or installation instructions for systems or equipment designed for the storm shelter.

   a Response: Notes have been added to the ICC 500 storm window and door details to state that the anchoring is to be per manufactures ICC 500 standard details. Our documentation set does not include these details specifically from the manufacturer since their connection is not part of our design. Reference revised sheets A-502, A-521, A-522, A-601.

7. Sheet G-103 – Required Design Information Note 16: ICC 500 2014 Section 107.2.16 - Venting area is required to be listed on the plans.

   a Response: Note 16 updated to include venting area. Reference revised G-103.

8. Sheet G-103 – Required Design Information Note 18: ICC 500 2014 Section 107.2.18 - Specify which structural sheet this information is located on. I could not find this information.

   a Response: Included on sheet S-000. This reference has been updated on G-103.

9. ICC 500 2014 Section 106.4 – Structural observations shall be provided during construction of the shelter by a registered professional. This should be listed on the construction documents.

   a Response: See Special Inspection requirements on Sheet S-000.

10. ICC 500 2014 Section 306.8 – Joints, gaps, or voids in the shelter envelope. Concrete expansion joints or precast concrete panel joints 3/8" or less in width sealed with a joint material in accordance with ASTM C920 for concrete. I could not find any information on the joint sizes, nor did I have the specification for joint material to review.

- a Response: Joints must be ¾" to accommodate precast tolerance. Joints to be sealed on each face with Type S joint material in accordance with ASTM C920. Further discussion with structural engineer of record, and precast concrete engineers can occur if needed.

STRUCTURAL STORM SHELTER PEER REVIEW COMMENTS

1. Section 106.4 – Structural observations by a registered professional are required during the construction of the storm shelter. This requirement needs to be listed in the construction documents.

- a Response: See Special Inspection requirements on Sheet S-000.

2. Section 107.2.1 – Sheet G-103, Note 16 states "Venting area provided and locations within shelter: refer to mechanical documents." Venting area and locations for the storm shelter were not found in the mechanical drawings provided. It is recommended that these items be provided in the construction documents.

- a Response: Note 16 on sheet G-103 updated to include venting area.

3. Section 107.2.2 – When a storm shelter is to be constructed as a portion of a host building, the walls and floors enclosing the shelter shall be clearly indicated on the drawings. Sheets S-100, S- 200, and S-201 don't appear to have the walls and floors of the storm shelter clearly defined. It is suggested to add information that defines what walls and floors are part of the storm shelter.

- a Response: Structural sheets S-100, S-200 and S-201 have been updated for defined area.

4. Section 302.1 – EOR to ensure that the storm shelter is designed using ASCE 7, section 2.3 load combinations with W determined in accordance with Section 304 of the 2014 ICC 500. This information was not apparent in the received calculation set.

- a Response: Load combinations added to calculations.

5. Section 303.1.1 – The design team is to ensure that the design rainfall rates have been calculated by adding 6 inches of rainfall per hour to the rainfall rates established from Figure 303.2 of the 2014 ICC 500. This information was not apparent in the construction documents received.

- a Response: Rainfall loading added on S-000.

6. EOR to ensure that any underground portions of the storm shelter have been designed for buoyancy forces and hydrostatic loads assuming the ground water level is at the surface of the ground at the entrance to the storm shelter, or adequate drainage is available to justify designing for a lower ground water level.

- a Response: Buoyance forces have been considered and added to calculations. This is shown on S-001.

7. Section 304.3 – The wind load calculation for the storm shelter show that the wind loads have been calculated using a Wind Directionality Factor (K_d) = 0.85. Section 304.3 of the 2014 ICC 500 requires the wind loads to storm shelters be calculated using a K_d = 1.0. It is recommended that the EOR confirm that the correct coefficient was used in the MFWRS pressure calculations and that the storm shelter has been designed for the correct wind forces.

- a Response: K_d – 1.0, this was coordinated with precast engineer and loads have been updated.

8. Section 306.3 – The design team is to ensure that all openings in the shelter envelope are protected by doors complying with section 306.3.1, windows complying with section 306.3.2, other impact- protective systems complying with section 306.4 or baffled to prevent wind-borne debris from entering the shelter protected occupant area in accordance with Section 306.5.

- a Response: Additional notation has been added to S-000.

9. Section 309.1 – The design team is to ensure that all penetrations through the storm shelter envelope comply with section 309 of the 2014 ICC 500.

- a Response: Notation has been added to S-000 to reference all drawings for mechanical, electrical and plumbing systems for specific systems.

10. Sheet S-311 Detail 24 shows the connection of the diaphragm to the precast walls with an embed. Loading to the precast embed is shown as vertical dead and live load only. It is anticipated that diaphragm shear load would be present at this connection as well. It is recommended that the diaphragm shear transfer loading be listed to ensure the proper design of the embedded plate in the supporting precast concrete walls.

- a Response: The loading for the diaphragm is provided on S002 as requested by precast manufacturer and the maximum shear load has been added to 24/S-311.