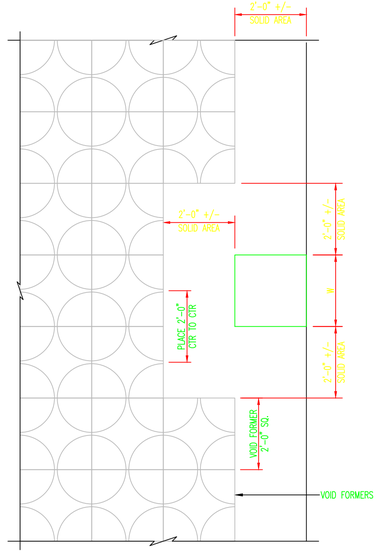
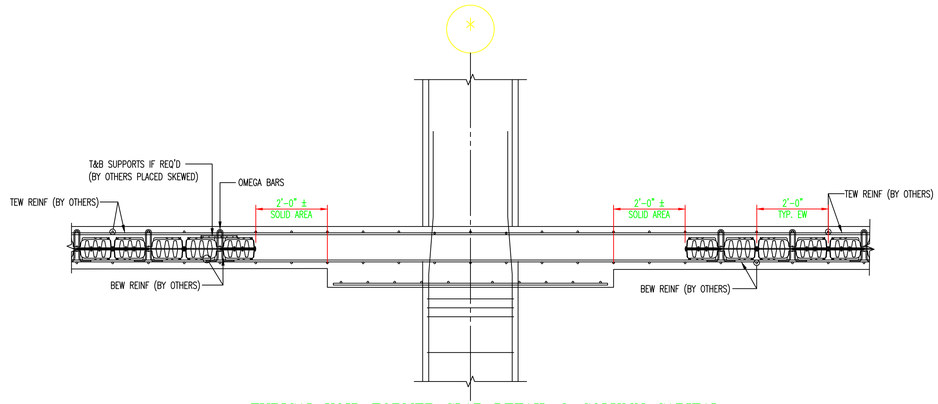


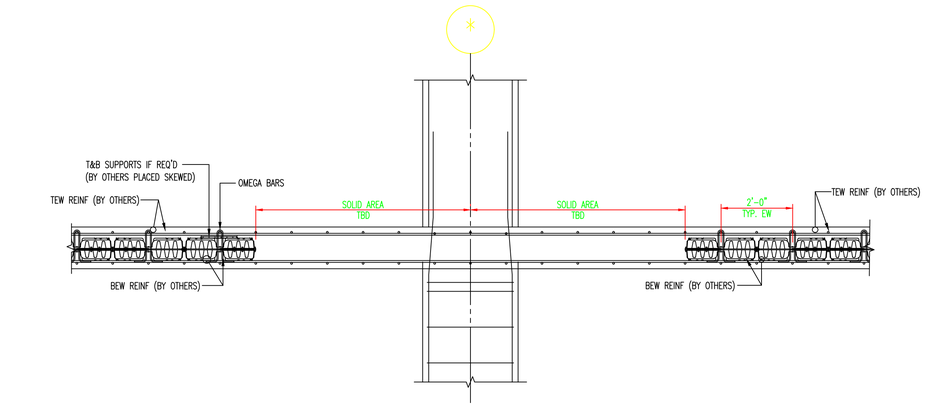
NOTES:
1. PROVIDE FULL SLAB THICKNESS AT ALL SLAB EDGES.
2. SEE PLAN FOR SLAB THICKNESS AND EXTENT.

TYPICAL COBIAX VOIDED SLAB DETAIL

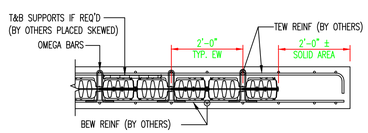
USE AT SLAB EDGE, MEP OPNG'S, AND BEAMS



TYPICAL VOID FORMER SLAB DETAIL @ COLUMN CAPITAL



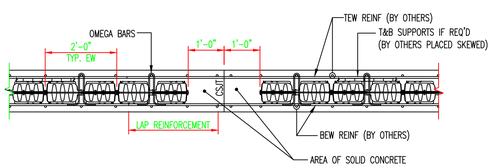
TYPICAL VOID FORMER SLAB DETAIL @ COLUMN



TYPICAL VOID FORMER SLAB EDGE DETAIL @ PERIMETER AND OPENINGS

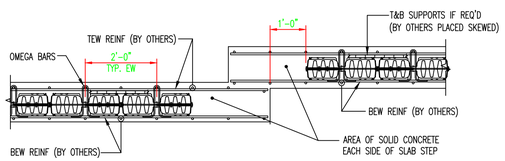
POSITION BOTTOM UPPER BARS @ PERIMETER OF SLAB SO THAT EDGE VOID FORMER SITS ON AT LEAST 1 BOTTOM UPPER LAYER BAR TO AVOID DIPPING.

NOTE TO ENGINEER:
INTENT OF DETAIL IS TO SHOW MINIMUM LIMITS OF SOLID CONCRETE AT SLAB EDGE CONDITION IN RELATION TO VOIDS.



TYPICAL VOID FORMER SLAB CONSTRUCTION DETAIL

NOTE TO ENGINEER:
INTENT OF DETAIL IS TO SHOW MINIMUM LIMITS OF SOLID CONCRETE AT SLAB CJ IN RELATION TO VOIDS.



TYPICAL VOID FORMER SLAB AT STEP DETAIL

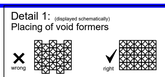
NOTE TO ENGINEER:
INTENT OF DETAIL IS TO SHOW MINIMUM LIMITS OF SOLID CONCRETE AT SLAB STEP IN RELATION TO VOIDS.
REINFORCEMENT AT STEP OMITTED.

Revision	Description	Date	Drawn	Checked
4				
3				
2				
1				
0	SUBMIT FOR APPROVAL	00/00/21	SWB	

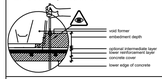
Specifications of CLS - Void Former Modules

Level	Slab-Type	CLS-Type	Quantity of Void Modules	Void Form Area [sq ft]	Concrete Displaced in Total [cu. yd.]
XX	XX	CLS-P-XXX	XXXX	XXXX	XXX

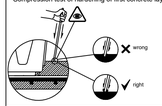
Detail 1: (displayed schematically)
Placing of void formers



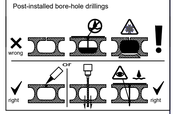
Detail 2: (void former shown schematically)
Embedding depth of void former



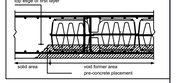
Detail 3: (void former shown schematically)
Compression test of hardening of first concrete layer



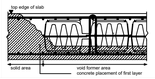
Detail 4:
Post-installed bore-hole drillings



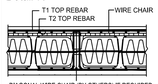
Detail 5: (void former shown schematically)
Concreting Option 1



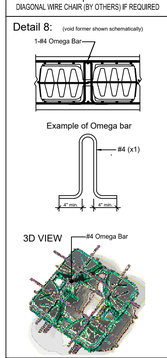
Detail 6: (void former shown schematically)
Concreting Option 2



Detail 7:



Detail 8: (void former shown schematically)



Installation instructions for Cobiax Structural Formers CLS:
The structural former half parts (CLS-"H"-xxx) are transported by the manufacturer on pallets to the construction site, where they are unloaded and assembled on-site to form structural formers (CLS-"V"-xxx). The structural formers are to be installed between the reinforcement layers of a reinforced concrete slab to reduce the dead load. For an efficient execution of the RC-slab with Cobiax structural formers, construction documents as well as this layout drawing with all recommendations need to be observed and fulfilled.

Installation procedure:
For a conventional solid RC-slab, first the lower reinforcement is installed. In the next step, the structural formers are installed according to this plan, ensuring the first structural former to be placed rests on the upper layer of these bottom bars. The remaining formers will then follow suit. Then the upper reinforcement level is installed right on top of the structural formers, such that the bottom layer of this top reinforcement rests on the structural formers, if not required to be higher. There may be cases where an additional spacer is required above the formers to get upper reinforcement to it's specified height (Detail 7). The structural formers are placed next to each other without gaps, so that a grid of 2'-0" x 2'-0" results.

Special instructions:
The structural formers need to be installed in accordance with the specified grid layout. An offset arrangement is not permitted (Detail 1). Damaging the void formers needs to be excluded during transport, storage and installation. Only undamaged void formers may be used. The form stability of the structural formers has to be tested and ensured prior to concreting, especially during higher summer temperatures. Cobiax void formers are not entirely waterproof. Before installation, it has to be ensured that there is no water inside structural formers. Furthermore, the structural formers have to be protected against water infiltration during intermediate construction stages. Protection has to be by the executing construction company in appropriate manner.

While concreting:
During concreting, a buoyancy force exerts on the structural formers as a result of the cavities. The structural formers are therefore to be fixed by suitable measures in their position. If these precautionary measures are not sufficient, two concreting sections/ layers with controlled working joints are required in the areas with structural formers (Details 5-6). In order to ensure the bonding of the two concrete layers, a minimum composite reinforcement (1 #4 omega bar each former) must be installed (Detail 8).

Fresh concrete consistency:
Normally the consistency of the fresh concrete should have a slump not higher than 8". The sieve curve and the largest aggregate must be determined taking into account the smallest permissible distance of the Cobiax elements. The largest aggregate is 3/4". In special cases (for example, with dense reinforcement), the fresh concrete properties required in this case must be specifically planned and monitored in terms of concrete technology. A practicable concrete compaction is important for the execution. The concrete must be carefully brought in and compacted, so that the reinforcement and the structural formers are sealed tightly with concrete. It is to be compacted in each intermediate area of the structural formers. The concrete quantities of the first concrete layer and the concreting heights are to be planned, controlled and documented. Care must be taken to ensure a uniform and flat concrete distribution, while maintaining the concreting heights. Concrete accumulations must be avoided. Furthermore, sufficient compaction of the first concrete layer has to be ensured, so that air inclusions are avoided also in the areas beneath the structural formers. For example, the use of a marked auxiliary rod (Detail 2) in the concreting process can serve to control the concreted height and the structural position. The markings are based on the specifications of the layout plan. Once, the first concrete layer is hard and stiff enough, the structural formers are held down when introducing the second concrete layer. Hence, the introduction of the second concrete layer may only take place after sufficient stiffening of the first layer. The right time for the execution of the second layer is just when the structural formers can no longer be pulled out of the first layer. An indicator for this time is e.g. a pressure test (Detail 3) by means of an object (footprint approx. 1 1/2" x 1 1/2") The lower concrete layer must no longer be plastically deformed under pressure exertion on the surface. Before applying the second layer of concrete, the construction joint must be cleaned completely and pre-wetted. In addition,the anchoring depth of the bond reinforcement needs to be checked. The concrete of the second layer has to be compacted carefully and cautiously in order not to cause structural and composite disturbances in the first layer which has already been applied. The void formers must not float. In addition, the anchoring depth of the composite reinforcement must be checked.

Conduits:
When installing conduits, the designer's specifications and the rules of the approval corresponding to the type of structural former must be observed and fulfilled. The position of the pipes and built-in units, their center distances and fastening must be checked and documented. Conduits may be routed in the area of the structural formers, provided that their outer diameter is not more than 1" and a minimum distance of 24 " is maintained. These must be placed on the upper or lower reinforcement outside the required concrete cover, secured in place and may be led from there only to the nearest point of surface. If more than one pipe is to be arranged or if the outside diameter is more than 1", additional solid areas have to be created. In the area of conduit intersections, solid areas may be formed without structural formers. The structural formers can be cut right in the middle of two void-quarters.

Drill-holes:
In the case of break-throughs, the designer's specifications and the rules of the approval corresponding to the type of structural former must be observed and fulfilled. Holes - also as a result of dowel fixtures - in the voided area, must be subsequently closed in order to prevent possible water entry (Detail 4). Water filled structural formers can lead to flaking of the slab surfaces during frost. Damaged structural formers may be repaired or replaced. Contact the EOR for core drilling over 13.5" in diameter in voided slab section.

Notes on openings and built-in units:
Openings and built-in components up to a single size of 5 sf are not taken into account during the planning process, neither in the drawing of the layout plan, nor in the determination of the quantity of structural formers to be delivered. The corresponding structural formers can be removed locally as per requirement.

Notes on spacers and the use of single bars:
In order to compensate height differences within the cross-section, it is an option to use wire chairs, spread diagonally through the provided counter-openings of the CLS structural formers, so that the single bars have a common base to be installed on (see schematic top view). These spacers are not within the scope of Cobiax delivery. Additional spacers can also be used (Detail 7).

Single voids can be removed on site if required for other inserts.

Attention:
This layout drawing shows only the Cobiax void former positioning. Openings and other inserts are not shown for clarity. The layout drawing does not replace other relevant drawings.

All dimensions to be checked on site by contractor!
Discrepancies need to be reported to the engineer and Cobiax USA.

Void former layout drawing
This drawing is valid (although not to scale) by the use of shown dimensions and installation directions. It is to be used with the relevant installation instructions and the latest technology handbook.

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Project: PROJECT1
ADDRESS1
ADDRESS2

Customer: CUSTOMER1
ADDRESS1
ADDRESS2

Architect: ARCHITECT1
ADDRESS1
ADDRESS2

Structural Engineer: STRUCTENG1
ADDRESS1
ADDRESS2

Drawing: VOIDED SLAB DETAILS

Date:	Drawn by	Checked by	Scale	Project - No.	Drawing No.
11/23/24	SWB	SWB	NTS	J-NO	SK-002