Comments received by TCP (#000-0148)			
TCP Comment ID	**Organization**	**Comment**	**Discussion/ Response**

1	**DECAST**	**MTOD – 3960.100**
		
		- Which tolerances will govern, MTOD -3960.100 or the tolerances reported in SSP999S31?
		- For consistency can Table 1 of MTOD – 3960.100 be incorporated into SSP999S31?
		- The following fabrication tolerances are not reported but are in SSP999S31:
		  o Stirrup projection (SSP 999S31 = +/- 15)
		  o Location of inserts (SSP 999S31 = +/- 25)
		  o Location and size of blockouts (SSP 999S31 = +/- 25)
		  o Concrete cover for 90/100/110mm panels.
		
		As a result, these tolerances would revert to +/- 5mm as per No. 6 of the Notes in MTOD – 3960.100. Can these tolerances be added to Table 1?
			The governing document is contract specific and is interpreted according to the MTO General Conditions of Contract (OPSS 100), GC 2.02 Order of Precedence. As Special Provisions are higher on the order of precedence than Standard Drawings, contracts which contain both SSP 999S31 and MTOD 3960.100 should resolve conflicts by deferring to SSP 999S31. It is intended that SSP 999S31 will be replaced with several new Ontario Provincial Standard Specifications (OPSS) and there will not be a conflict between the OPSS contents and this MTOD.
			
			SSP 999S31 is being replaced by OPSS so MTOD 3960.100 will not be incorporated into the SSP. It was decided that a visual representation of the fabrication tolerances was easier to interpret so this MTOD was created for the most common pre-cast concrete element procured for MTO construction contracts.
			
			Tolerances for stirrup projections, location of inserts, location will be added to MTOD 3960.100.

2	**DECAST**	**SS109-42** 1. Can the jacking force in Table 1 be lowered to 74.5% Fpu (76 KN/Strand) to allow extra pull for additional losses? This would eliminate the need to modify jacking forces and add strands for corrections considering bed shortening and chuck slippage while maintaining the approximate original prestress design and not exceeding the 78% Fpu limit.	**Drawing is updated to reflect this change**

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TCP Comment ID	**Organization**	**Comment**	**Discussion/ Response**
3	**DECAST**	**SS109-42** 2. Note 5 - Projected stirrups will add additional costs to the fabrication of precast deck panels. Costs include additional materials, labour required to tie in stirrups, thicker bunking to clear the tops of the stirrups when stacking panels, and additional storage and shipping costs. Storage and shipping costs would increase since less panels could be safely placed in each stack. Although the stacks would be lighter the overall square footage of the stacks would increase resulting in a greater storage area and more trucks would be required to ship the stacks to site. Additionally, the stirrups impede the use of a vibratory screed rail, which in turn affects the production rate and the surface finish. It should also be noted that Detail 1 shows the leg of the stirrup sitting below the bottom most 10M rebar. This will compromise the concrete cover. Can the stirrup leg be located in the same plane as the strand so that concrete cover is not compromised?	**Projected stirrups are provided to hold reinforcing bar of concrete toping at construction site on request of some contractors. These stirrups are optional Note 5 is updated to reflect this.** **Our understanding is that the projected stirrups have similar physical impact as lifting hooks in terms of storage.** **Detail 1 is updated to show stirrups in the same plan as strand.**
4	**DECAST**	**SS109-42** 3. Note 7 – The bearing strips shall be detailed by the Contractor and not the Precaster.	**Agreed, note on the drawing is corrected**
5	**DECAST**	**SS109-42** 4. Note 11 – Can resistance welding approvals be granted on an annual basis for precast deck panel projects? A welded rebar mat test report for each month of production, which includes a tensile test (requirements as per CSA G30.18, Table 4), an elongation test (requirements as per CSA G30.18, Table 4), a bend test (requirements as per CSA G30.18, Table 5) and a static load test (requirements as per ASTM A 184M-17), can be submitted as part of the precast report package.	**MTO will be updating OPSS 905 & OPSS 1440. The suggested testing and other requirements will be specified in these specifications.**
6	**DECAST**	**SS109-42** 5. Note 12 – Coring of panels poses several issues. SSP999S31 specifies that the length/diameter ratio must be greater than or equal to 1.5 and the minimum core diameter is 75mm. For 90mm panels, if a 75mm diameter core is taken, then the L/D ratio = 1.2. For 100mm panels, if a 75mm diameter core is taken, then the L/D ratio = 1.33. For 110mm panels, if a 75mm diameter core is taken, then the L/D ratio = 1.46. All of which do not meet the minim L/D ratio of 1.5. SSP999S31 specifies that 1 core should be taken for AVS. A single 75mm diameter core, with a nominal max aggregate size of 13.2mm may not provide sufficient surface area (as per ASTM C457-16, Table 1) to complete AVS testing. Additionally, MTO test method LS-432 states, "when a specimen length is less than 200 mm, the laboratory staff shall notify the requestor of the test and obtain confirmation that the specimen dimensions meet applicable requirements before proceeding with specimen preparation and testing. Specimens that do not meet the requirements shall not be tested." As per ASTM C1202, cores or cylinders for RCP testing are required to have a nominal diameter of 100mm. If a 100mm core is extracted from a 90mm deck panel, this would result in a L/D ratio of 0.9, which does not meet the requirements of SSP999S31.	**MTO's Engineering and Material Office is currently reviewing this issue to address & it will be handled at the specification level. Such requirements do not need to be included in Structural Standard Drawings.**

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7	**DECAST**	**SS109-42** 6. Detail C (Chamfer Detail) – Note that with long line casting beds it is not possible to terminate the bottom chamfer 150mm from the ends of the panels. The formwork has a 9.5mm radius along the entire length of the bed. We have not heard of any issues to date regarding leakage during the deck pour.	**Note is removed from detail C.**
8	**DECAST**	**SS109-42** 7. How has the strand projection over interior and exterior girders been calculated?	**There is some uncertainty with the development length of non-prestressed strand. These lengths were established based on looking at various methods of calculating length, and an assessment of what is considered adequate to meet the intent of developing the bottom transverse reinforcement over the flanges for the empirical method of deck slab design.**
9	**DECAST**	**SS109-43** **Same comments as SS109-42**	**See above responses**
10	**DECAST**	**SS109-43** 8. Section 1 (Deck Cross – Section) does not show the distance from the outside edge of the bearing strip to the edge of the top flange. This dimension was 50mm on previous drawings. Assuming a dimension of 50mm, a bearing strip width of 75mm, and a panel overhang of 85mm, the space between opposing deck panels equates to 815mm. With a minimum interior strand projection of 850mm the strands will collide into the opposing panel. Please provide an explanation for the 850mm minimum strand projection.	**Bearing strip distance from the outside edge will be added in updated SSD. Agreed the Min strand projected will be changed to 800mm.**
11	**DECAST**	**SS109-43** 9. Section 1 (Typical Section) details an 850mm minimum strand projection for interior girders. To achieve the minimum lap length of 625mm a projection length of 800mm is adequate and has been used on previous projects. Please note that an increase in strand projection results in increased material and fabrication costs. The fabrication cost increases because less panels can be cast per day, resulting in additional casting days. Additionally, it would be helpful if the designer specifies on the drawings the length of the strand projection for interior girders in lieu of referring to the 625mm min lap detail.	**See response above (Comment #10)**
12	**DECAST**	**SS109-43** 10. How has the minimum lap length of 625mm been calculated for the 9.5mm diameter strand?	**See response above (Comment #8)**
11	**CPCI**	**General** - Jacking force needs to be clearly defined whether chucks settings are excluded or not. - Direction of surface roughness needs to be noted: transversely or longitudinally. - To distinguish stirrups and lifting loops, square stirrup shapes are preferred over round shapes.	**- Refer response to comment No. 2** **- The Surface roughness is not directional.** **-There is a note already included on the drawing to have obvious difference between lifting loops & projected stirrups. The shape of both items should be shown on shop drawings and may be changed by fabricator.**

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12	**CPCI**	**MTOD – 3960.100** - Which tolerances will govern, MTOD -3960.100 or the tolerances reported in SSP999S31? - For consistency can Table 1 of MTOD – 3960.100 be incorporated into SSP999S31? - The following fabrication tolerances are not reported but are in SSP999S31: o Stirrup projection (SSP 999S31 = +/- 15) o Location of inserts (SSP 999S31 = +/- 25) o Location and size of blockouts (SSP 999S31 = +/- 25) o Concrete cover for 90/100/110mm panels. As a result, these tolerances would revert to +/- 5mm as per No. 6 of the Notes in MTOD – 3960.100. Can these tolerances be added to Table 1?	**Refer to response to Comment #1**
13	**CPCI**	**SS109-42** - Can the jacking force in Table 1 be lowered to 74.5% Fpu (76 KN/Strand) to allow extra pull for additional losses? This would eliminate the need to modify jacking forces and add strands for corrections considering bed shortening and chuck slippage while maintaining the approximate original prestress design and not exceeding the 78% Fpu limit.	**Refer to response to Comment #2**
14	**CPCI**	**SS109-42** - Concrete cover for strands is not shown.	**The drawing is updated to show concrete cover.**
15	**CPCI**	**SS109-42** - Note 5 - Projected stirrups will add additional costs to the fabrication of precast deck panels. Costs include additional materials, labour required to tie in stirrups, thicker bunking to clear the tops of the stirrups when stacking panels, and additional storage and shipping costs. Storage and shipping costs would increase since less panels could be safely placed in each stack. Although the stacks would be lighter the overall square footage of the stacks would increase resulting in a greater storage area and more trucks would be required to ship the stacks to site. Additionally, the stirrups impede the use of a vibratory screed rail, which in turn affects the production rate and the surface finish. It should also be noted that Detail 1 shows the leg of the stirrup sitting below the bottom most 10M rebar. This will compromise the concrete cover.	**Refer to response to Comment #3**
16	**CPCI**	**SS109-42** - Note 7 – The bearing strips shall be detailed by the Contractor and not the Precaster.	**Refer to response to Comment #4**
17	**CPCI**	**SS109-42** - Note 11 – Can resistance welding approvals be granted on an annual basis for precast deck panel projects? A welded rebar mat test report for each month of production, which includes a tensile test (requirements as per CSA G30.18, Table 4), an elongation test (requirements as per CSA G30.18, Table 4), a bend test (requirements as per CSA G30.18, Table 5) and a static load test (requirements as per ASTM A 184M-17), can be submitted as part of the precast report package.	**Refer to response to Comment #5**

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18	**CPCI**	**SS109-42** - Note 12 – Coring of panels poses several issues. SSP999S31 specifies that the length/diameter ratio must be greater than or equal to 1.5 and the minimum core diameter is 75mm. For 90mm panels, if a 75mm diameter core is taken, then the L/D ratio = 1.2. For 100mm panels, if a 75mm diameter core is taken, then the L/D ratio = 1.33. For 110mm panels, if a 75mm diameter core is taken, then the L/D ratio = 1.46. All of which do not meet the minim L/D ratio of 1.5. SSP999S31 specifies that 1 core should be taken for AVS. A single 75mm diameter core, with a nominal max aggregate size of 13.2mm may not provide sufficient surface area (as per ASTM C457-16, Table 1) to complete AVS testing. Additionally, MTO test method LS-432 states, "when a specimen length is less than 200 mm, the laboratory staff shall notify the requestor of the test and obtain confirmation that the specimen dimensions meet applicable requirements before proceeding with specimen preparation and testing. Specimens that do not meet the requirements shall not be tested." As per ASTM C1202, cores or cylinders for RCP testing are required to have a nominal diameter of 100mm. If a 100mm core is extracted from a 90mm deck panel, this would result in a L/D ratio of 0.9, which does not meet the requirements of SSP999S31.	**Refer to response to Comment #6**
19	**CPCI**	**SS109-42** - Detail C (Chamfer Detail) – Note that with long line casting beds it is not possible to terminate the bottom chamfer 150mm from the ends of the panels. The formwork has a 9.5mm radius along the entire length of the bed. We have not heard of any issues to date regarding leakage during the deck pour.	**Refer to response to Comment #7**
20	**CPCI**	**SS109-42** - How has the strand projection over interior and exterior girders been calculated?	**Refer to response to Comment #8**
21	**CPCI**	**SS109-43** **SS109-43 - Same notes as SS109-42 and additional comments**	**See above responses**
22	**CPCI**	**SS109-43** - Section 1 (Deck Cross – Section) does not show the distance from the outside edge of the bearing strip to the edge of the top flange. This dimension was 50mm on previous drawings. Assuming a dimension of 50mm, a bearing strip width of 75mm, and a panel overhang of 85mm, the space between opposing deck panels equates to 815mm. With a minimum interior strand projection of 850mm the strands will collide into the opposing panel. Please provide an explanation for the 850mm minimum strand projection.	**Refer to response to Comment #10**

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23	**CPCI**	**SS109-43** - Section 1 (Typical Section) details an 850mm minimum strand projection for interior girders. To achieve the minimum lap length of 625mm a projection length of 800mm is adequate and has been used on previous projects. Please note that an increase in strand projection results in increased material and fabrication costs. The fabrication cost increases because less panels can be cast per day, resulting in additional casting days. Additionally, it would be helpful if the designer specifies on the drawings the length of the strand projection for interior girders in lieu of referring to the 625mm min lap detail.	**Refer to response to Comment #10**
24	**CPCI**	**SS109-43** - How has the minimum lap length of 625mm been calculated for the 9.5mm diameter strand?	**Refer to response to Comment #12**