FRACTURE CRITICAL CAP BEAMS

Bridge 69839

MnDOT Contract No. 1026462

FINAL REPORT

REDUNDANCY ASSESSMENT AND REPAIR REPORT

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PREPARED FOR

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Executive Summary

This report summarizes the approach, findings and recommendations for the redundancy investigation of Bridge 69839 for the integral steel box girder cap beam at Piers 1 and 2.

HNTB has contracted with MnDOT to determine if the noted pier caps in Bridge 69839 are truly fracture critical as currently designated or if redundancy can be demonstrated through analysis in accordance FHWA Technical Memorandum, “Clarification of Requirements for Fracture Critical Members”, and the application of criteria established in NCHRP Report 406, “Redundancy in Highway Bridge Superstructures.” The investigation of redundancy includes developing detailed FEM models and member capacities upon which to compare demand. In locations where structural redundancy is not present, repairs to provide load path, structural or internal member redundancy were developed to reduce the risk of fracture critical failure. The project also aims to extend the bridge service life through painting and repair recommendations. Details of the bridge, the redundancy evaluation and structural recommendations are included.

Applying the criteria from NCHRP 406 and based on the results of these analyses, Bridge 69839 is currently considered overall non-redundant, as shown:

$r_1 = 2.97 > 1.0$, $r_u = 0.79 < 1.0$, $r_d = 0.002 < 1.0$, NOT REDUNDANT

The classification as non-redundant is due to the integral steel box girder cap beam at Piers 1 and 2. Analysis results indicate a fracture of the pier cap will reduce the load carrying capacity of the structure below established thresholds for redundancy.

The bridge can be classified as redundant if an alternative load path can be designed. This can be achieved by providing system redundancy by modifying the framing layout to include additional members carrying the girder loads to the supports. Alternatively, internal member redundancy may be achieved by providing an alternate path for the loads to be resisted by built up sections and plates connected to the box girder cap beam top and bottom flanges. Concept designs for both repair alternatives were prepared and submitted to MnDOT for review.

A scoping level cost estimate was developed for both repair concepts. The estimated cost of the load path redundancy repair is approximately $339,000, while the estimated cost of the internal member redundancy repair is $209,600. Details of the cost estimate are included in Appendix 5 – Scoping Level Cost Estimate of Repairs.

The load path redundancy repair was the preferred concept for advancement to final design.

The redundancy of the structure was re-evaluated with consideration of the load path redundancy repair option. The conceptual design was further refined to address the unique redundancy needs of Bridge 69839. The refined redundancy repair concepts and their influence on the structural behavior are described in detail in this report.

Based on the criteria from NCHRP 406, the redundancy of Bridge 69839 in the repaired condition is improved, but still considered overall non-redundant:

$r_1 = 2.97 > 1.0$, $r_u = 0.79 < 1.0$, $r_d = 0.88 < 1.0$, NOT REDUNDANT

The plans and cost estimate for the refined redundancy repair design are included in Appendix 7 – Advanced Redundancy Repair Plans and Cost Estimate. The revised cost estimate for the repairs is $460,900.

Additional repairs proposed to improve load ratings and extend the service life of the bridge include deck replacement, making the girders composite with the new deck in the negative moment region, bearing reconstruction, concrete surface repairs on the bridge abutments and full repainting of the steel superstructure and substructure components.

Introduction

This report summarizes the approach, findings, and recommendations for the redundancy investigation of Bridge 69839 for the integral hammerhead cap beam at Piers 1 and 2.

HNTB has contracted with MnDOT to determine if the noted pier caps in Bridge 69839 are truly fracture critical as currently designated or if system redundancy can be demonstrated through analysis in accordance FHWA Technical Memorandum, “Clarification of Requirements for Fracture Critical Members”, and the application of criteria established in NCHRP Report 406, “Redundancy in Highway Bridge Superstructures.” The investigation of redundancy includes developing detailed FEM models and member capacities upon which to compare demand. In locations where structural redundancy is not present, repairs to provide load path, structural or internal member redundancy were developed to reduce the risk of fracture critical failure. While addressing redundancy, the project aims to also extend the bridge service life through painting and repair recommendations. Details of the bridge, the redundancy evaluation, and recommendations are included.

Bridge Description

Bridge No. 69839 carries northbound Michigan St. over southbound TH-194. The zero skew bridge was constructed in 1969. The three-span structure is 317.5 feet in overall length and is composed of curved continuous welded steel plate girders, two hammerhead type piers and two reinforced concrete parapet abutments.

The two piers are comprised of an integral steel box girder cap welded directly to a cylindrical steel column. The exterior girders are continuous through the cap beam while the two interior girder webs terminate at the box girder and are replaced with a ½-inch stiffener plate with a hole to allow access. The girders are not made composite with the concrete deck in the negative moment regions near the piers. The bridge was designed and constructed prior to the introduction of Fracture Critical Plan requirements. As such, the cap beams and columns were not fabricated to meet the Fracture Critical Plan material or welding requirements defined by AASHTO and AWS. Both piers are currently considered fracture critical elements.

The bridge deck carries two lanes of traffic. The traffic barrier is original and is made up of a 6-inch curb with concrete rail posts and a concrete railing. The original concrete deck has uncoated reinforcement and a thickness of 7 inches. In 1982 the deck was scarified ½” ± and a 2-inch, low-slump overlay was applied. New expansion joints on the bridge were constructed at that time.

Analysis and Redundancy Investigation

The redundancy investigation was based upon the approach outlined in the NCHRP 406 “Redundancy in Highway Bridge Superstructures” with bridge redundancy defined by considering member, ultimate, damaged, and functionality limit states. Each limit state was investigated through extensive finite element modeling efforts including both linear and nonlinear approaches. Given the complexity of the structures and related modeling, two models, a record model in Larsa and an independent check model in CSi Bridge, were created to assess the structural behavior.

Modeling Description

The models for Bridge No. 69839 from west abutment to east abutment implement various assumptions to accurately represent the structural behavior of the superstructure and its interaction with the steel substructure. The models include multiple material property manipulations as well as precise element selection to capture local and global behavior. The Larsa 4D (record) model of Bridge 69839 is shown in Figure 1.

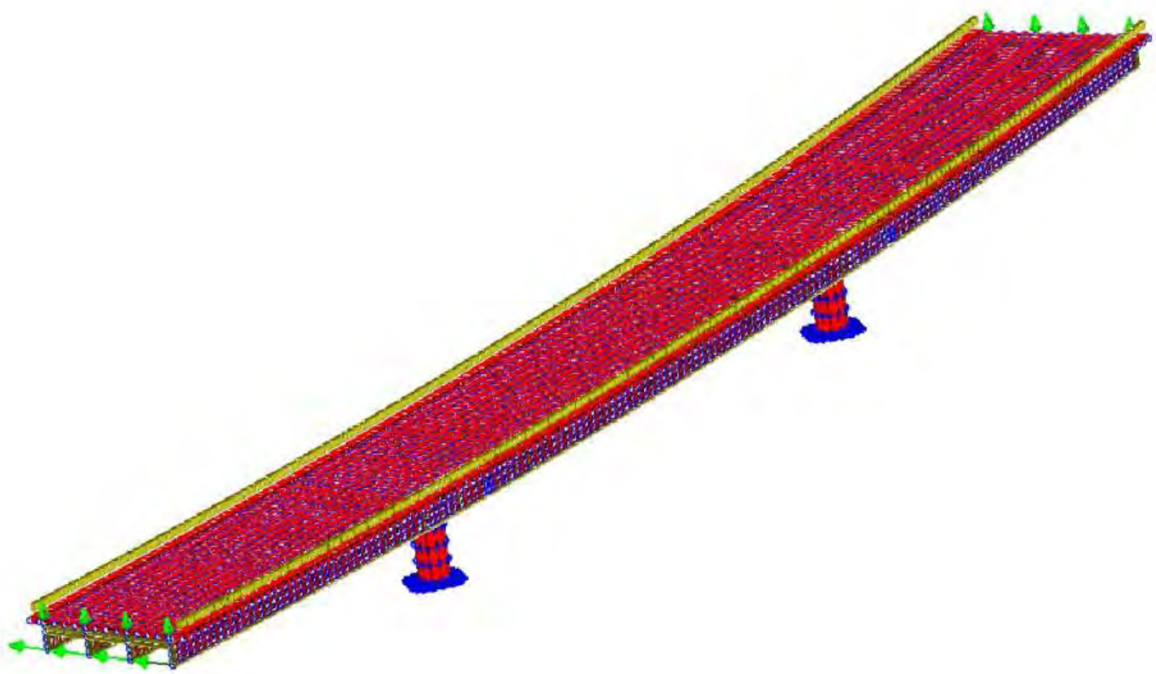


Figure 1: Larsa (Record) Model of Bridge 69839

The steel girders are modeled using four shell elements for the 54-inch deep web discretized into approximately 2-foot increments longitudinally. The top and bottom nodes are shared with the top and bottom girder flanges which are modeled as beam elements. Beam elements are used to represent the intermediate and bearing stiffeners which also serve as connection plates for the diaphragms and cross frames to the webs. The stiffeners are offset from the web and discretized into four vertical frame elements each and share nodes with each node of the web.

The deck is modeled with shell elements connected to the top node of the girder via rigid beam elements to represent a composite deck condition. In the non-composite regions near the piers, axial-only constraints link the vertical translation of the deck and girder nodes. The stiffness of the deck shells in the negative bending region is reduced to 10% of their respective modulus of elasticity. The concrete railing was added as a plate pressure on the deck elements. No elements were added to model the single line railing since its contribution to the structure's stiffness is negligible.

The diaphragms, cross frames, and lateral bracing are modeled with beam elements that have moment releases at each end. These elements are defined to share nodes with the girders (generally the top and bottom flange nodes) and are offset accordingly to imitate the existing plan connection configuration.

The cap beams and columns are modeled with shell elements. The cap beam webs are discretized vertically with four to five shells, depending on the depth of the section. The top and bottom flanges are discretized to four elements along the bridge alignment. The transverse stiffeners are discretized to five elements vertically and four elements longitudinally and incorporate the access holes by having the appropriate middle shells removed. The girders frame into the cap beams by sharing the same nodes at the connections. Since there is a gap only at the top flanges of girders C and B (i.e. the interior girders), the interior three nodes of the top flanges of the caps at these girders are not shared with the girder nodes. The circular hollow shape columns are discretized into 12 elements in section view and 10 elements vertically. The pier column bases are modeled to resist all six degrees of freedom at all 12 joints while the abutment bearings are modeled to resist vertical and transverse translation only.

The material properties are taken from the 1968 original plans. A36 steel, with a modulus of elasticity of 29,000 ksi, is used for all steel elements. All concrete elements are 4,000 psi with a modulus of elasticity of 3,605 ksi, except for the deck shells in the non-composite region which are softened to 360.5 ksi.

Dead load was applied both using the self-weight feature of Larsa 4D, which uses the geometry of the modeled elements to calculate volume which is then multiplied by the density, as well as shell pressure for items like wearing surface and barriers. The weight of steel and deck were applied to the bare steel sections, while superimposed dead loads were applied to the long-term composite section. Controlling live load cases were obtained using the Larsa 4D influence surface generator feature that defines thousands of influence surfaces for every compound section in the girders at every location in the structure. These loads were then used to identify the controlling most critical members in the structure.

Independent Modeling Description

The independent check model developed in CSi Bridge was built using the same boundary conditions, element types, material properties, and similar element refinement as described above for the Larsa (record) model. The CSi bridge model is shown in Figure 2 and the CSi bridge model pier can be seen in Figure 3. HL-93 live loading was applied using CSi’s moving load analysis capabilities. The software calculates an influence surface of maximum response for each element in the model. The lane placement and vehicle are defined by the user in accordance with AASTHO specifications, and the software calculates the envelope of maximum and minimum response for any member in the model.

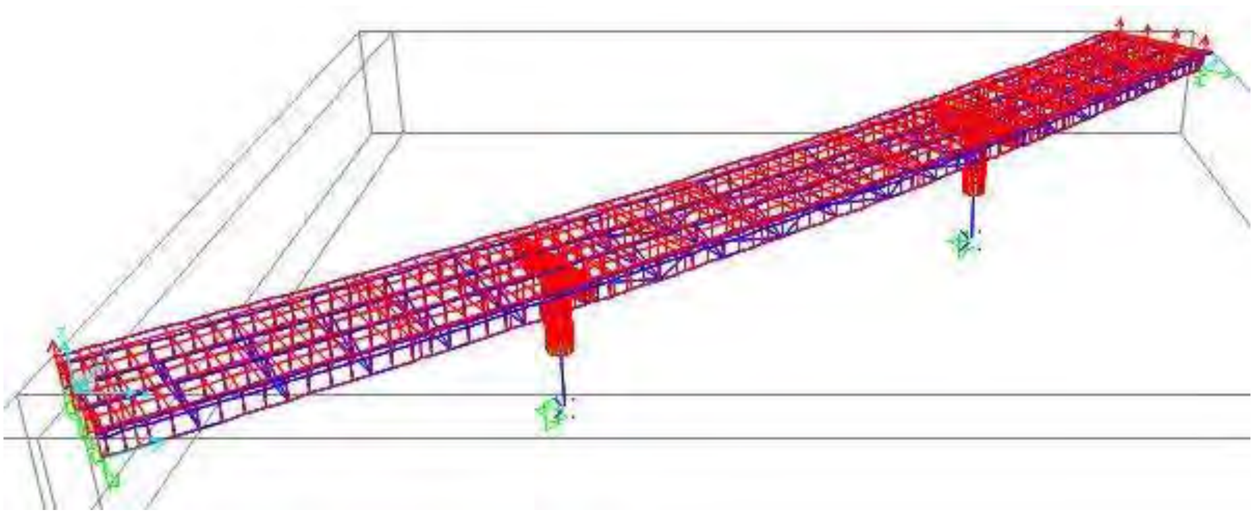


Figure 2: Independent model of Bridge 69839 in CSi

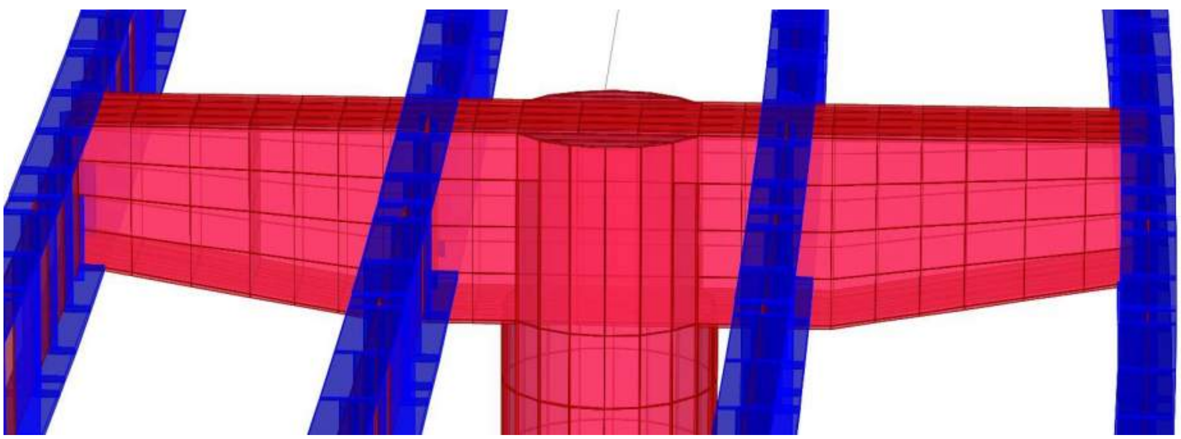


Figure 3: Independent Model Pier

Elastic models for both the record and independent check were developed and selective descriptive members compared to establish correlation between the models. This was accomplished through an iterative review process. The models were refined to establish a 1% variance between models for dead load reactions and dead load member demands (moment, shear) and a 10% variance for live load member demands. Results of the elastic comparison are summarized in Appendix 1 – Elastic Model Comparison.

Member Capacities

The member capacities were developed external to the modeling by applying AASHTO LRFD standards and considered the findings from the inspection of the fracture critical members. For each member, the demand from the record model was then compared to the established member capacities. Member capacities calculated for Bridge 69839 are summarized in Appendix 2 – Member Capacity Calculations.

Redundancy Procedure

The following procedure was used to evaluate the redundancy of the system:

1. Run elastic analyses for Dead Loads and Live Loads on the bridge and obtain all the demands for DC, DW, and LL min and max.

2. Determine ϕR_{req} based on required demands, using the Strength I combination:

$$\phi R_{req} = 1.25\,DL + 1.5\,DW + 1.75\,(LL + I) \quad \text{(including Impact)}$$

3. Find the minimum required member capacities for all the sections/members of the structure:

4. Using AASHTO Specifications calculate $R_{provided}$ at every section based on section geometry, bracing conditions and inspection conditions.

5. Using Larsa4D influence surface based LL modeler identify the controlling HL-93 truck and lane position that would maximize the moments at all locations in the bridge (Live Load Envelopes).

6. Apply the HL-93 loading (without impact) at all the positions and perform a linear elastic analysis to calculate L_{HL93}, which gives the effect of the HL-93 load on all the members. Calculate LF_{1Req} from:

$$LF_{1Req} = \frac{\mathrm{R_{Req}} - \mathrm{D}}{\mathrm{L_{HL93}}}$$

   Based on LF_{1Req}, identify the controlling members in the structure. Once these members are identified, referencing the influence surfaces stored within Larsa 4D, the individual controlling HL-93 truck and lane load position for the controlling members is applied in the subsequent steps.

7. Increment the HL-93 loading until the first member reaches its limiting capacity. Note the load factor LF_1 by which the original trucks are scaled for the first member failure to occur. Calculate the member reserve ratio for each member:

$$r_1 = \frac{\mathrm{LF_1}}{\mathrm{LF_{1Req}}} = \frac{\mathrm{R_{provided}} - D}{\mathrm{R_{Req}} - D}$$

   Identify the most critical member with the lowest r_1. The controlling LF_1 is the load factor associated with the first member failure and the member with the lowest r_1. This is the LF_1 used in all subsequent redundancy equations at all locations.

8. Continue beyond the elastic state and into nonlinear analyses with nonlinear geometry and material properties. Increment the applied HL-93 loading until the maximum vertical deflection

of a primary member reaches a deflection equal to span length/100. Note that load factor LF_f by which the original HL-93 loads are scaled to achieve the span length/100 displacement level. If the ratio $R_f = LF_f/LF_1$ is greater than 1.1, then the bridge has sufficient redundancy to satisfy the functionality limit state. Calculate the redundancy ratio for functionality:

$$r_f = \frac{\mathrm{R_f}}{1.1}$$

9. Continue the nonlinear analyses, incrementing the HL-93 loading until a mechanism forms causing structural collapse. Note the load factor LF_u by which the original HL-93 loads are scaled to cause collapse. If the ratio $R_u = LF_u/LF_1$ is greater than 1.3, then the bridge has sufficient redundancy to satisfy the ultimate limit state. Calculate the redundancy ratio:

$$r_u = \frac{\mathrm{R_u}}{1.3}$$

10. Evaluate the damaged condition by initiating a fracture in the model at the critical location, and repeat the nonlinear analysis. Determine the load factor LF_d for the damaged bridge in terms of HL-93 loading that would cause collapse of any main members. If the ratio $R_d = LF_d/LF_1$ is greater than 0.5, the bridge provides a sufficient level of redundancy to meet the damaged limit state. Calculate the redundancy ratio for the damaged condition:

$$r_d = \frac{\mathrm{R_d}}{0.5}$$

Summary of Redundancy Results

Critical locations for redundancy assessment were based on regions of highest demand to capacity and at fracture critical members:

- Positive moment region of the fascia girder in Span 2
- Negative bending in pier 1 cap beam between girders B and C

The integral cap beams at pier 1 and 2 are both designated as fracture critical members. Due to the approximate symmetry of the bridge spans, and the similarity in cap beam dimensions, only the cap beam with the larger demand to capacity ratio was evaluated for redundancy. The results of the redundancy assessment at each location are summarized in the table below. Further description of analyses at each location follow.

Location	LF_1	r_1	LF_u	R_u	r_u	LF_f	R_f	r_f	LF_d	R_d	r_d
Fascia Girder D at Span 2	**3.39**	1.27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pier Cap 1 between Girders B and C	7.30	2.97	3.5	1.03	0.79	3.5	1.03	0.94	0.03	0.009	0.002

Member Limit State for Structure

Based on the LF_{1Req} values calculated for each member, the critical location for first member failure is fascia girder D at mid-span of span 2. Using Larsa4D influence surface based LL modeler, the controlling HL-93 truck plus lane position that would maximize the moments at this location was identified as shown in Figure 4.

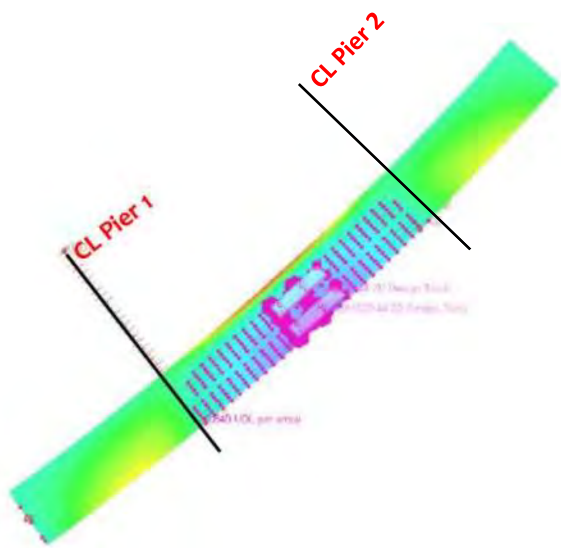


Figure 4: Larsa4D influence surface of controlling case at member limit state

This HL-93 loading was incremented until the first member reached its limiting capacity. The controlling member reserve ratio for the fascia girder was calculated as:

$$r_1 = \frac{\mathrm{LF}_1}{\mathrm{LF}_{1\mathrm{Req}}} = \frac{\mathrm{R}_{\mathrm{provided}} - D}{\mathrm{R}_{\mathrm{Req}} - D} = \frac{3.39}{2.67} = 1.27$$

This value of LF_1 was used to calculate R_f, R_u, and R_d at all subsequent areas of investigation.

Ultimate Limit State - Integral Pier Cap Between Girders B and C

The Larsa4D influence surface based LL modeler was used to identify the controlling HL-93 load position that would maximize the moments at the critical location in the cap beam at pier 1. For this case, the critical section in the cap beam is at the transverse section adjacent to the face of the column shown in Figure 5.

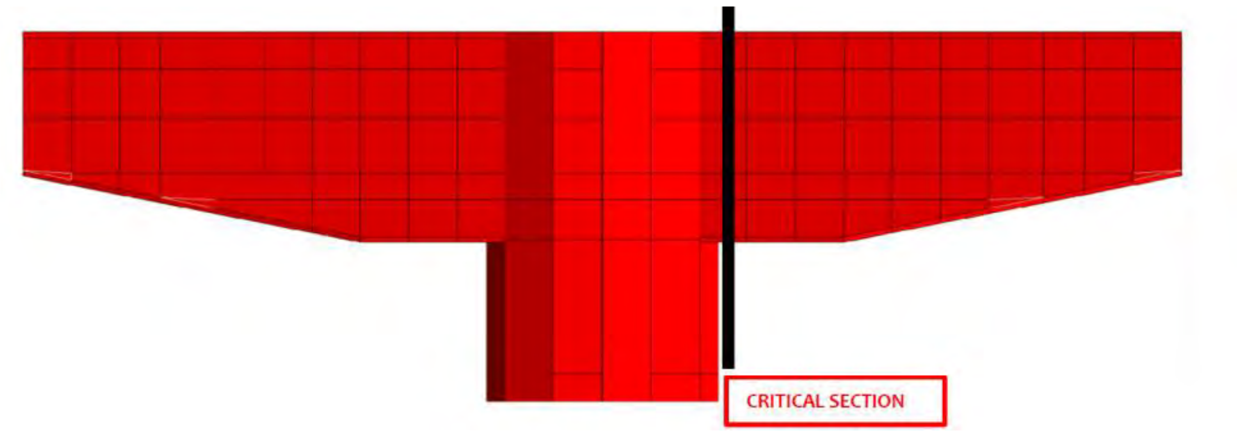


Figure 5: Pier cap elevation with critical section

The controlling load case is 2 lanes of HL-93 loaded with the Double HL-93 trucks plus lane load. Figure 6 shows the Larsa4D influence surface feature.

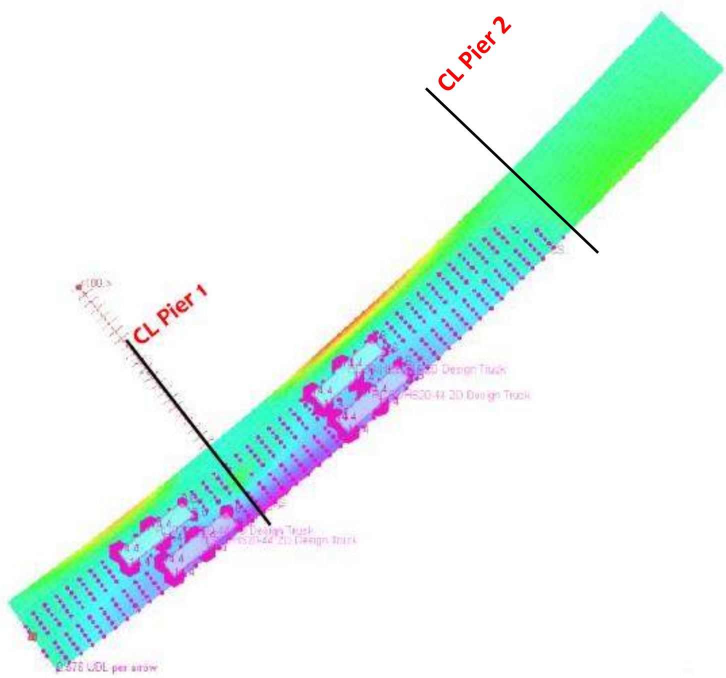


Figure 6: Larsa4D influence surface with controlling case at the Pier 1 critical section

Initial testing increments increased the loading to 3.5 x HL-93 loading which resulted in a progressive collapse followed with a succession of hinges forming until the structure became unstable. The corresponding design checks suggested that the collapse initiated when girders C and D reached their capacity in negative bending at pier 1. Per AASHTO, the section is considered to fail in lateral torsional bending. However, based on discussions with MnDOT and applying engineering judgement, it was assumed that the buckling of these flanges is not enough to collapse the bridge. Therefore, these locations were converted into elastic hinges and the analysis was continued. The elastic hinges were modeled by removing the flanges and softening the web shells adjacent to the cap beam such that the resultant moment is equal to about 10% of the maximum moment capacity, M_y, of the beam section. However, there is no way to ensure that the member will still preserve the assumed integrity beyond the AASHTO defined capacity without further, more refined analyses or tests. Once these two assumed hinges were formed, girder B also reached its capacity at pier 1, so this process was repeated to create a third assumed elastic hinge. The deformed shape of the bridge through the progression of the elastic hinging at 3.5 x HL-93 is shown in Figures 7 – 9.

Figure 7: Deformed shape at 3.5 x HL-93 before hinging (Deck not shown for clarity)

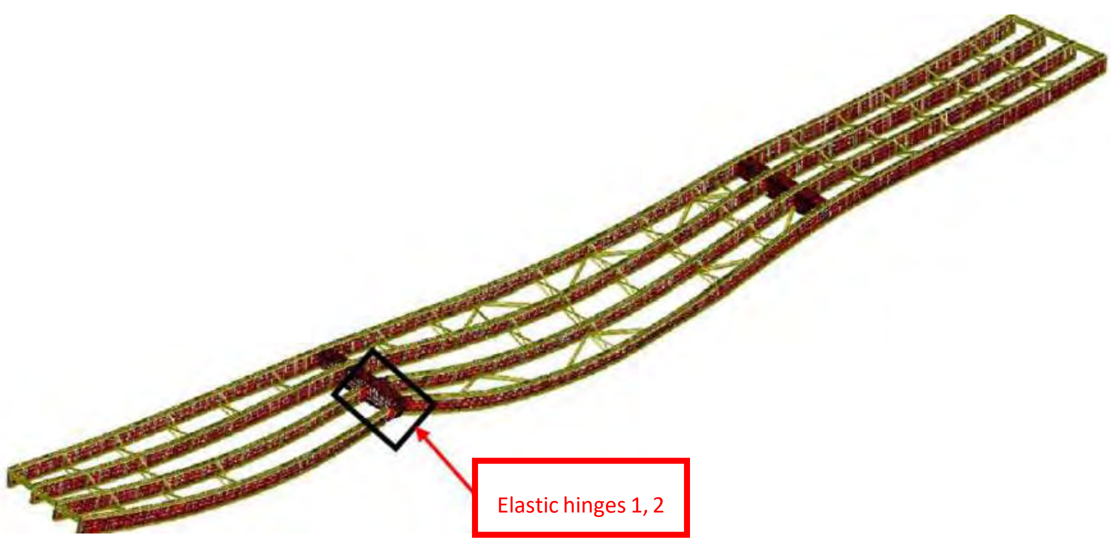


Figure 8: Deformed shape at 3.5 x HL-93 with elastic hinges at girders C and D (Deck not shown for clarity)

Figure 9: Deformed shape at 3.5 x HL-93 with elastic hinges at girders B, C, and D (Deck not shown for clarity)

In addition to the girders reaching their negative bending limit, several cross frames and lateral braces reached their compression limits. Once one member of the cross frame reached limiting code capacity, all three components were removed. Cross frames were removed sequentially after the three hinges at 3.5 x HL-93 until all remaining member demand was within its capacity. Then, lateral braces were removed until all remaining member demand was within calculated capacity. If a lateral brace removal caused a cross frame to fail, the cross frame was removed first and the process was repeated. The bracing removals are illustrated in Figures 10-13.

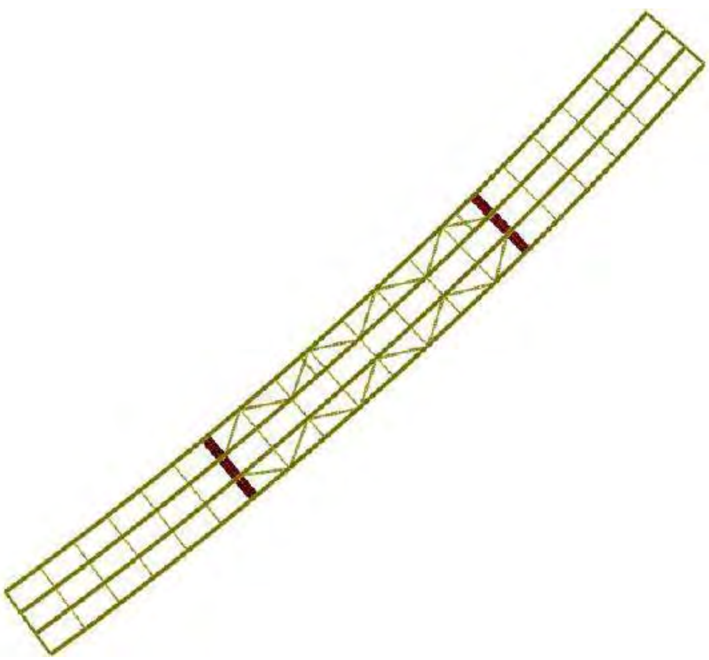


Figure 10: Framing plan prior to removals at 3.5 x HL-93 (Deck not shown for clarity)

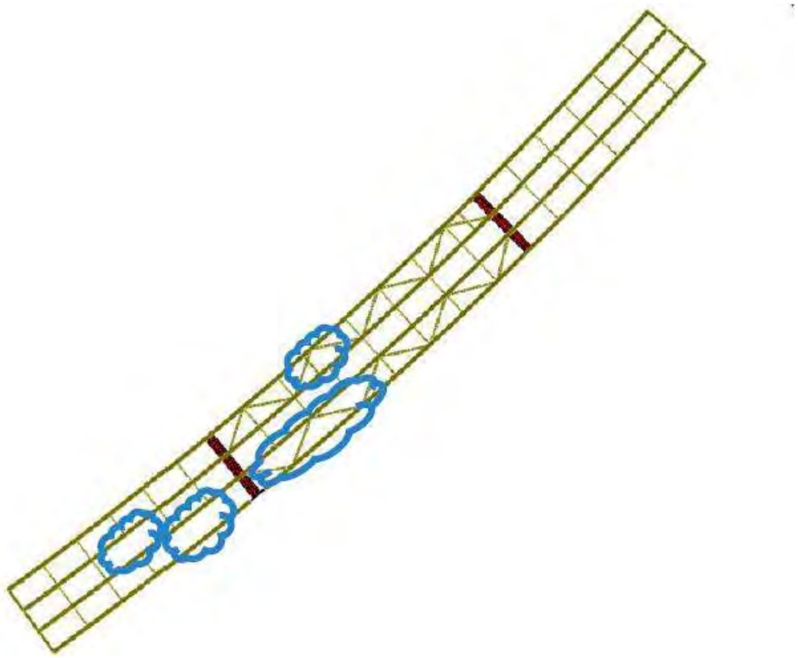


Figure 11: Framing plan after removals at 3.5 x HL-93 and formation of Elastic Hinge 1 (Deck not shown for clarity)

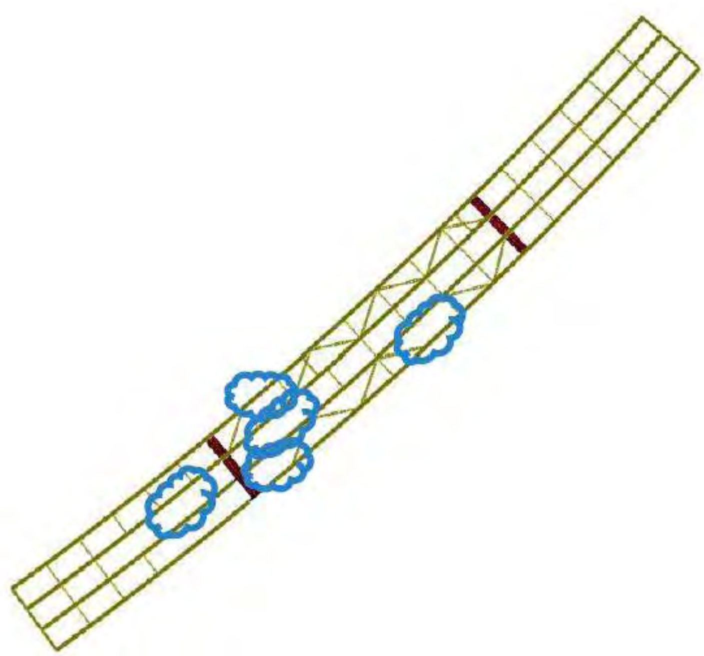


Figure 12: Framing plan after removals at 3.5 x HL-93 and formation of Elastic Hinge 2 (Deck not shown for clarity)

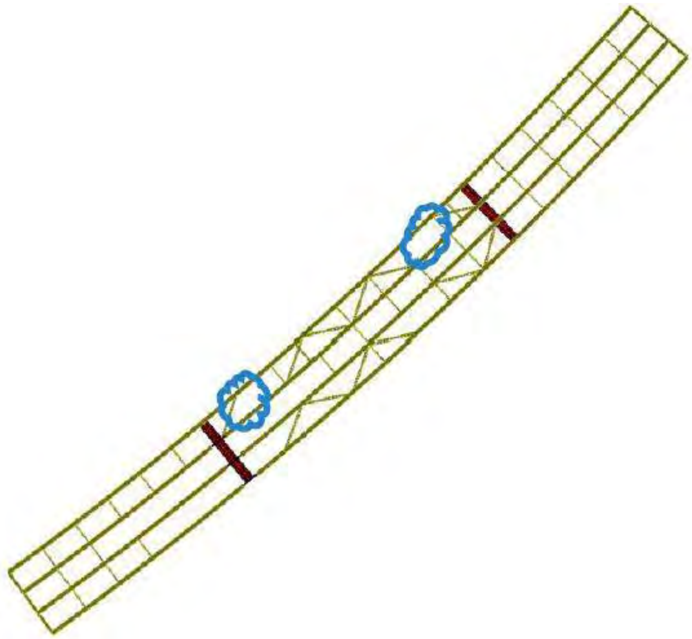


Figure 13: Framing plan after removals at 3.5 x HL-93 and formation of Elastic Hinge 3 (Deck not shown for clarity)

After the third assumed elastic hinge was formed, girder D reached its positive bending capacity in the middle of span 2. However, AASHTO does not allow curved girder bridges to extend past yielding. Therefore, this location was converted into the fourth elastic hinge. After the appropriate cross frames and lateral braces were removed, five more locations had reached their capacities: girder D at pier 2, in spans 1 and 3, and girder C in spans 2 and 3. Each location was modeled as an assumed elastic hinges as described above. The elastic hinge locations and brace removals are shown in Figures 14 – 16. After the ninth assumed elastic hinge was formed, the structure failed.

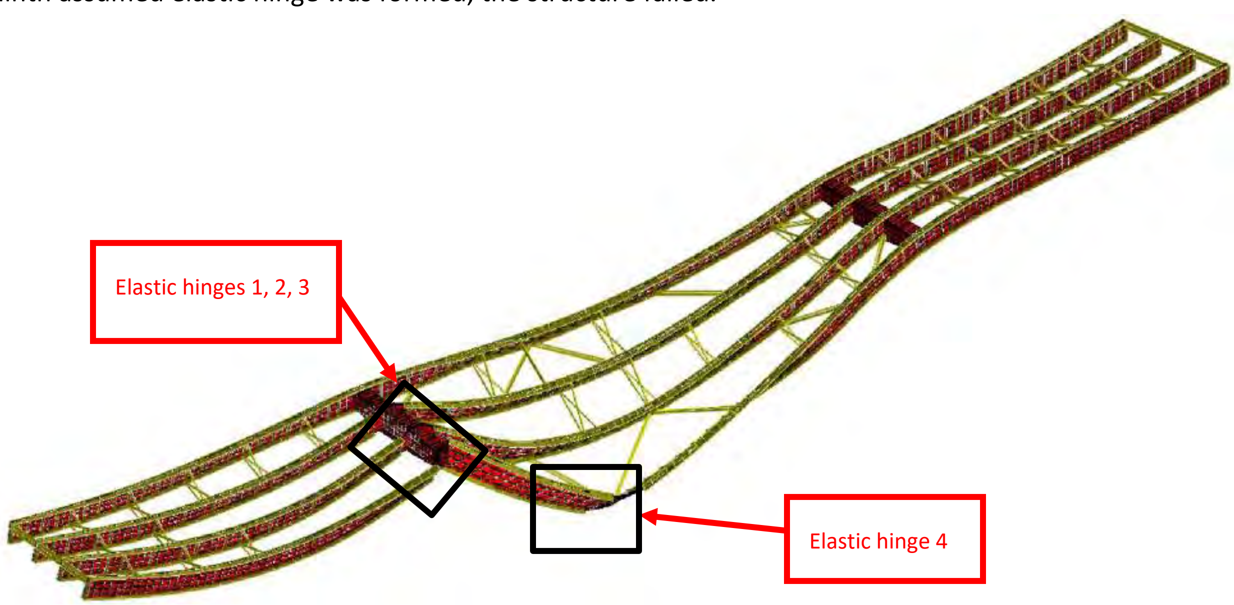


Figure 14: Deformed shape at 3.5 x HL-93 with four total elastic hinges (Deck not shown for clarity)

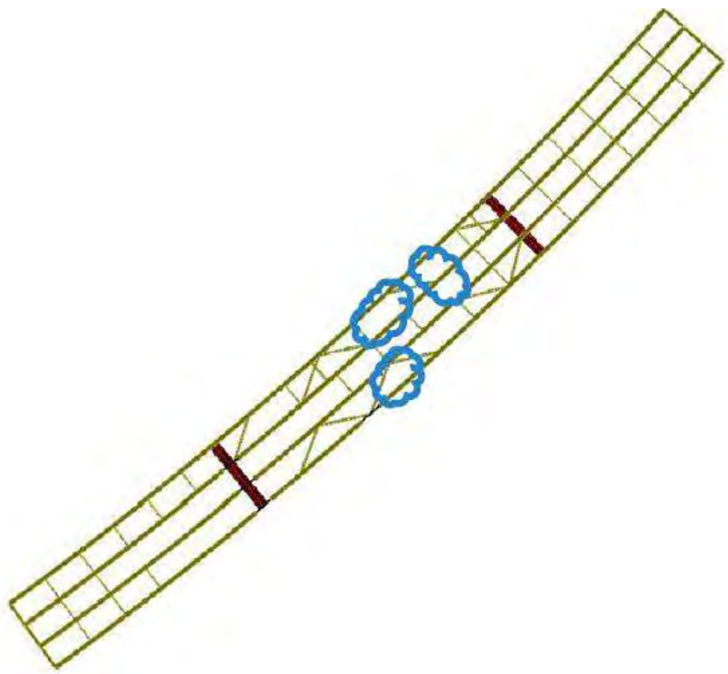


Figure 15: Framing plan after removals at 3.5 x HL-93 and fourth elastic hinge (Deck not shown for clarity)

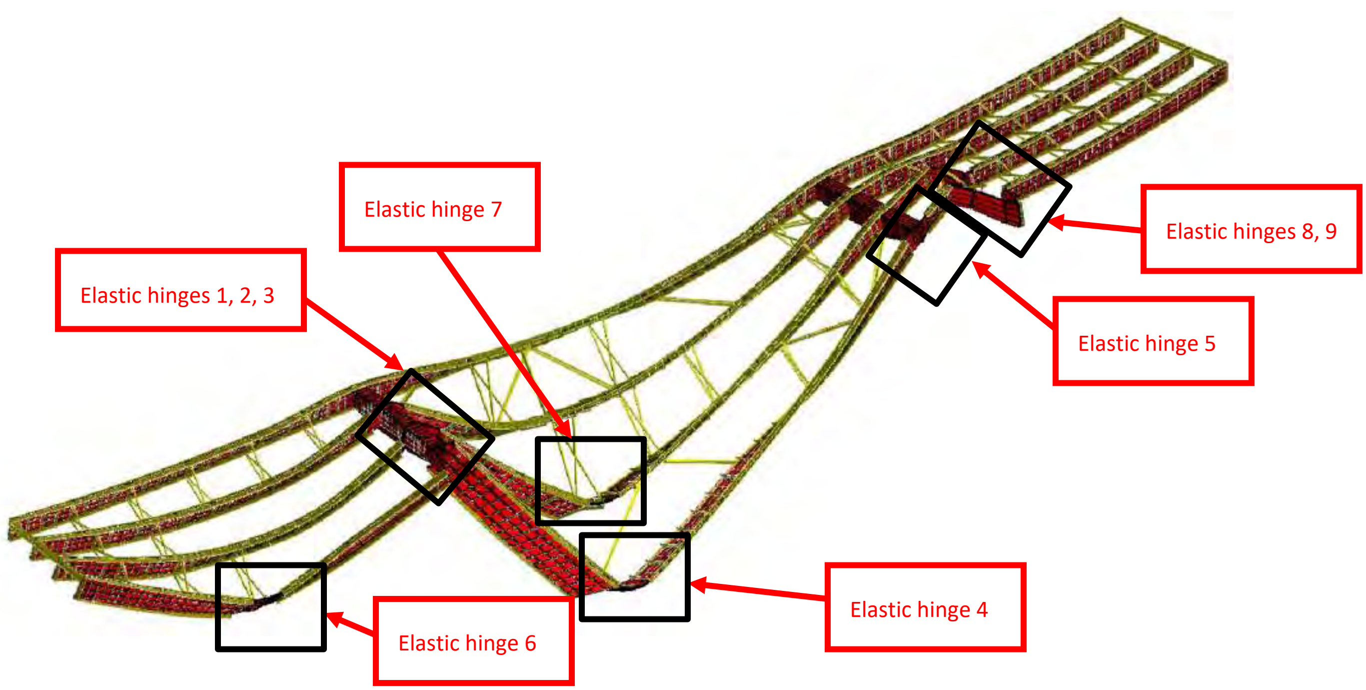


Figure 16: Deformed shape at 3.5 x HL-93 with nine total elastic hinges (Deck not shown for clarity)

The load factor calculated in this step as $LF_u = 3.5$ shows that $R_u = LF_u / LF_1 = 3.5 / 3.39 = 1.03 < 1.3$. The bridge does not exhibit a sufficient level of redundancy to satisfy the ultimate limit state. The calculated redundancy ratio r_u:

$$r_u = \frac{\mathrm{R_u}}{1.3} = \frac{1.03}{1.3} = 0.79 < 1.0$$

does not meet the criterion for being classified as redundant structure.

Functionality Limit State - Integral Pier Cap Between Girders B and C

The displacement was measured for when the structure reached the ultimate capacity at 3.5 x HL-93 loading. The downward deflection, D, was 16.33 inches at the fascia girder in Span 2, and was reached after formation of the fourth elastic hinge, as shown in Figure 17. After the ninth elastic hinge formed the maximum deflection at this stage was 27.95 inches downward on the fascia girder in span 2. This was almost double the L/100 = 130'*12/100 = 15.6 inches functionality limit.

The redundancy ratio for functionality was calculated as:

$$r_f = \frac{\mathrm{R_f}}{1.1} = \frac{1.03}{1.1} = 1.03$$

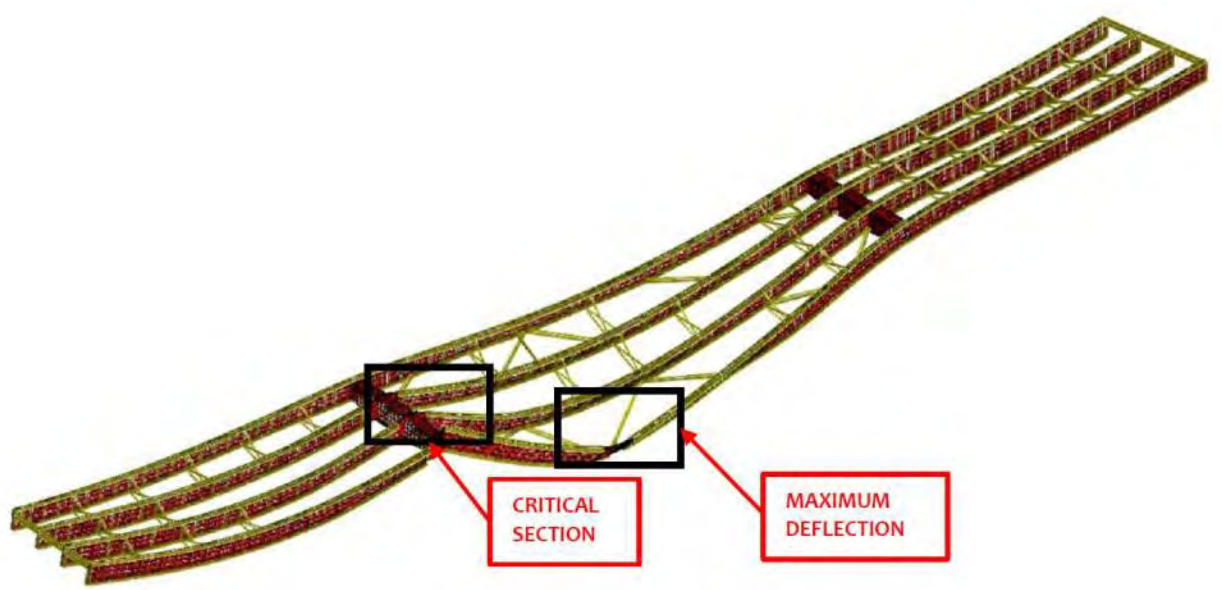


Figure 17: Structure framing plan with deformed shape (Deck not sown for clarity)

Damaged Limit State - Integral Pier Cap Between Girders B and C

A total section of the pier cap adjacent to the face of the column in the middle bay was fractured and the nonlinear analysis was repeated.

The nonlinear model was altered to reflect the critical damaged condition. A critical section was removed, immediately after all dead load had been added and before the first increment of live loading was applied. The pier cap model was altered as shown in Figure 18.

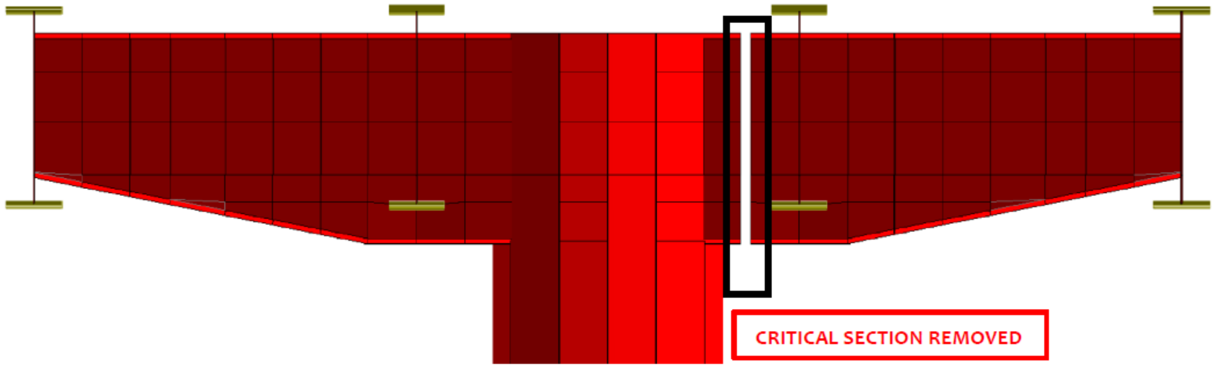


Figure 18: Pier Cap with fractured elements removed

After the section was removed, the worst load case live loading was applied to the structure incrementally until an element has reached its capacity. The same position of live load used in the ultimate loading condition for the pier cap section adjacent to the column, as shown in Figure 6, was implemented for the damaged condition.

Following the pier cap fracture and under dead load only, three cross frames and one lateral brace in the bay between girders A and B, 11 cross frames between girders B and C, and four cross frames and two lateral braces between girders C and D were removed. As in the ultimate loading condition, the cross frames and lateral braces are removed sequentially until the all member demands were within their capacity limits. A removal schedule is attached in Appendix 6. The deformed shape and framing plan of this condition are shown in Figure 19 and Figure 20.

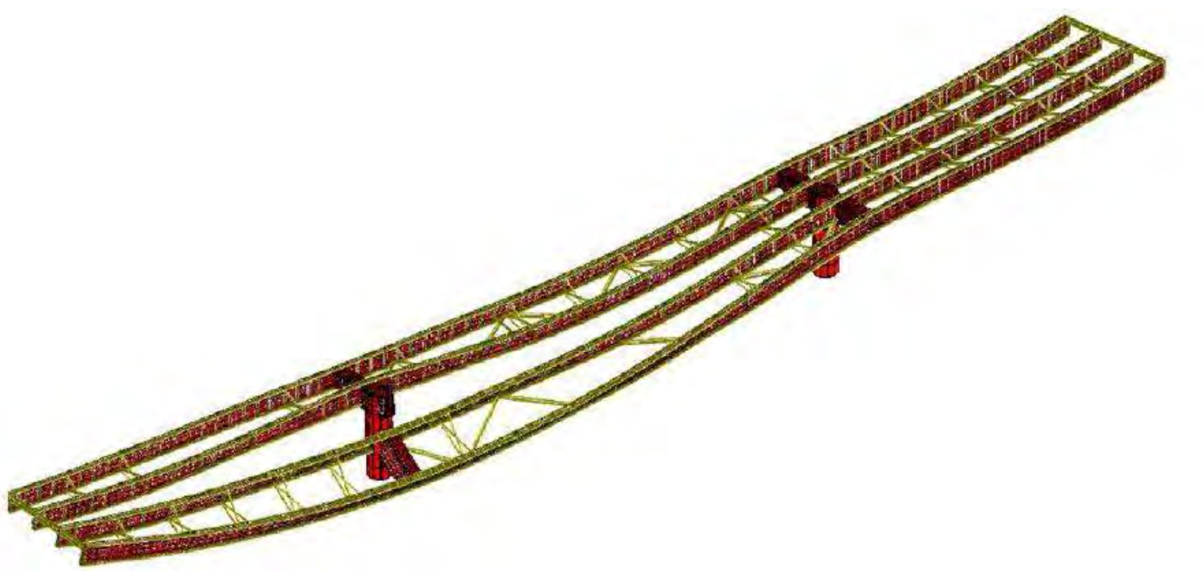


Figure 19: Framing plan after pier fracture near column, prior to live load (Deck not shown for clarity)

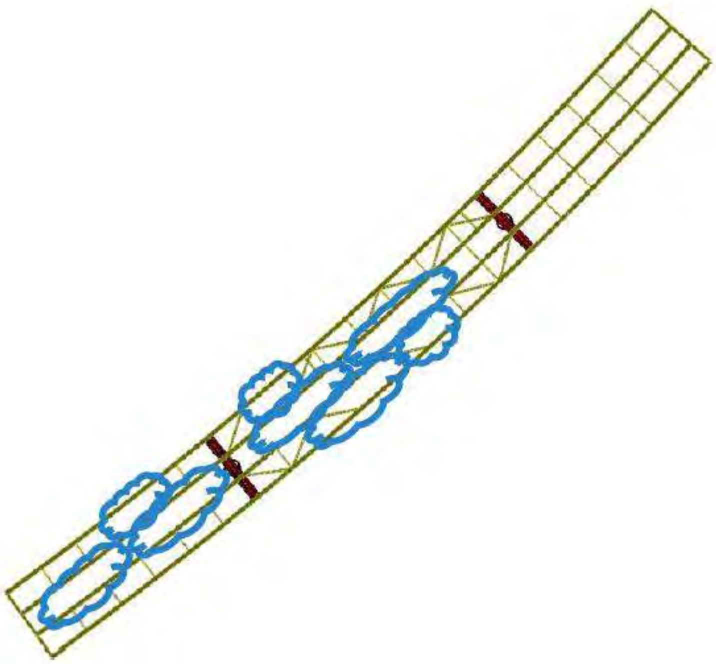


Figure 20: Framing plan showing remaining members following pier cut prior to live load

Initial testing increments increased the loading to 0.03 x HL-93 loading and corresponding design checks suggested that girder B would reach its capacity in negative bending at pier 1. Per AASHTO, the section is considered to fail in lateral torsional bending. However, based on discussions with MnDOT and applying engineering judgment, it was assumed that the buckling of these flanges is not enough to collapse the bridge. Therefore, these locations were converted into elastic hinges and the analysis was continued. The elastic hinges were modeled by removing the flanges and softening the web shells adjacent to the cap beam such that the resultant moment is equal to about 10% of the maximum moment capacity, M_y, of the beam section. This assumed hinge formation caused additional cross frames and lateral braces to reach their capacity, and they were removed. The deformed shape and framing plan of this condition are shown in Figure 21 and Figure 22.

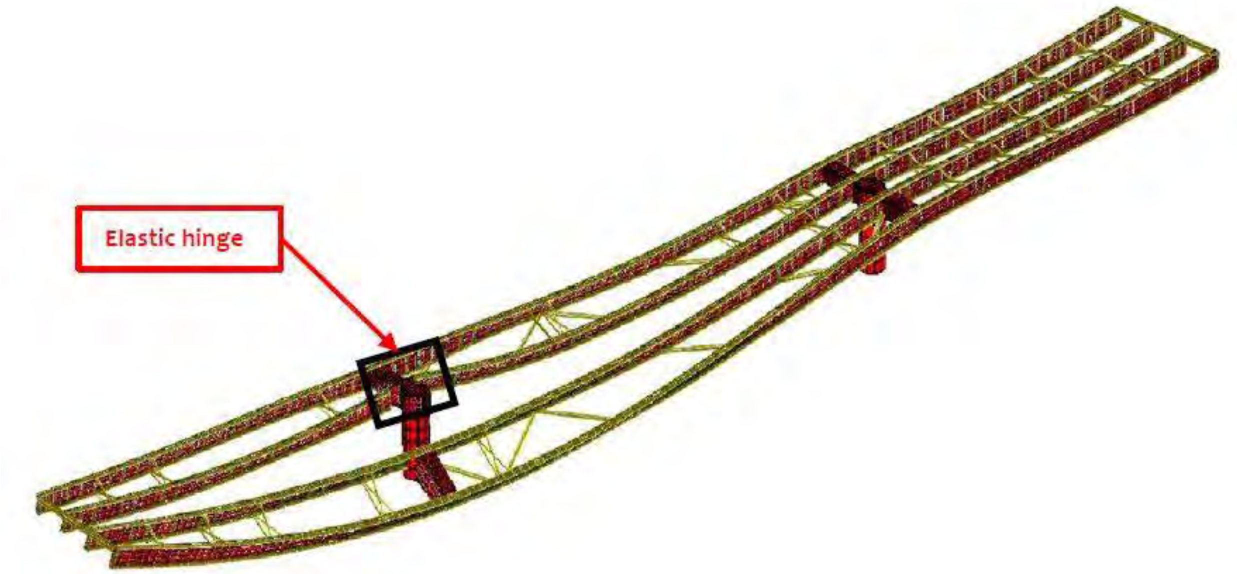


Figure 21: Framing plan after forming elastic hinge in girder B at pier 1 at 0.03 x HL-93 (Deck not shown for clarity)

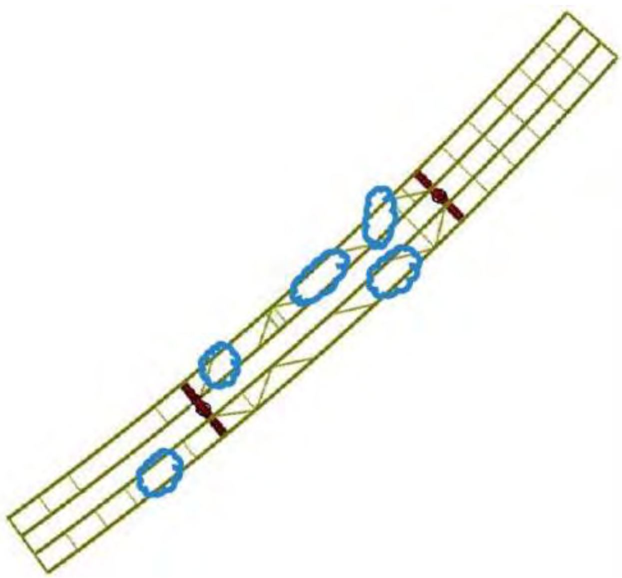


Figure 22: Framing plan of remaining members after first elastic hinge on girder B at 0.03 x HL-93 (Deck not shown for clarity)

After forming the first elastic hinge and redistribution of the loads, the design checks indicated that three more girder sections had reached their capacities: girder B in positive bending in spans 1 and 2 near pier 1 and girder D in negative bending at pier 2. As described in the ultimate limit state analysis, AASHTO does not allow plastic hinging for curved bridges. Therefore, all three of these locations were converted into elastic hinges. There is no way to ensure that the member will preserve integrity beyond its AASHTO defined capacity without further, more refined analyses or tests. After the elastic hinge formation, more cross frames and lateral bracing were removed. The deformed shape and framing plan of this condition are shown in Figure 23 and Figure 24.

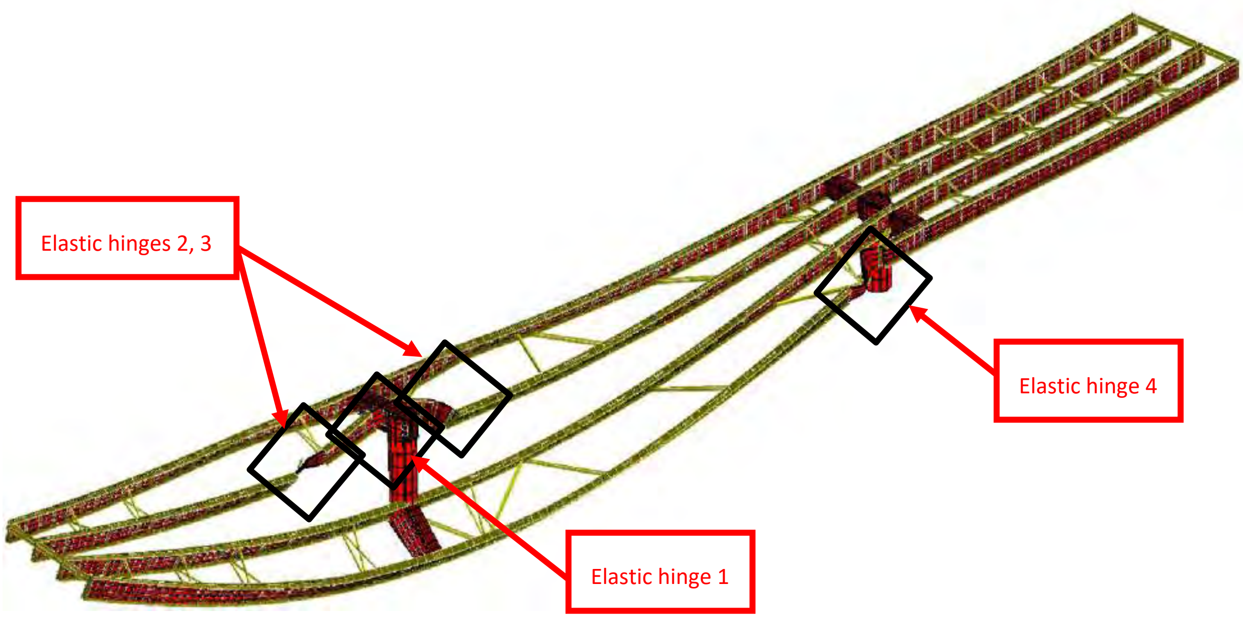


Figure 23: Framing plan after formation of four total elastic hinges at 0.03 x HL-93 (Deck not shown for clarity)

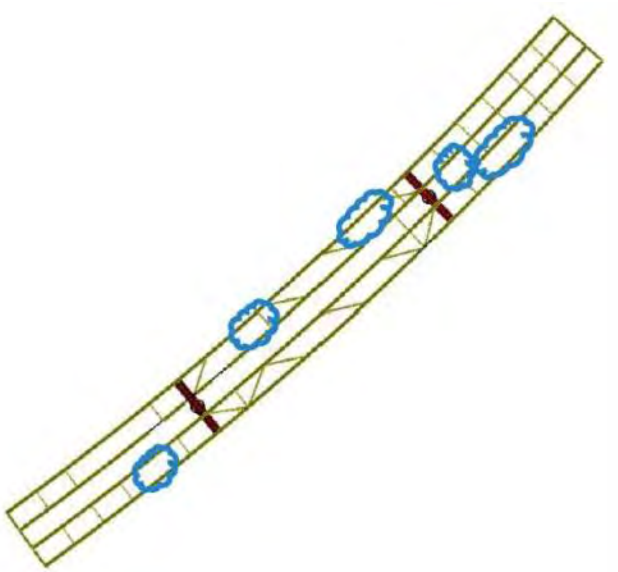


Figure 24: Framing plan of remaining members after four total elastic hinges at 0.03 x HL-93 (Deck not shown for clarity)

At this stage, a maximum deflection of 21.7 inches was noted in girder D and deemed the structure to have failed. Therefore, $R_d = LF_d / LF_1 = 0.03 / 3.39 = 0.009 < 0.5$. The calculated redundancy ratio r_d:

$$r_d = \frac{\mathrm{R_d}}{0.5} = \frac{0.009}{0.5} = 0.0177 < 1.0$$

Therefore, the bridge does not meet the criterion for being classified as a redundant structure.

Given that the structure was found to be non-redundant in the damaged condition at such low levels of live load, there was no need to evaluate a second damaged condition case considering fracture in the pier cap between girders C and D. However, after the redundancy repair concept was selected, the damaged condition scenario CD with total section loss in the exterior bay was considered.

Independent Analysis of Pier Cap 1 - Damaged Limit State BC

Pier 1 hammerhead fracturing was induced between the column and Girder C. After fracture, 18 sets of cross-frames buckled or yielded and three lateral braces buckled. These members were removed from the model, and the structure was stable with no hinging in the girders and a maximum deflection of 12" at Girder D near Pier 1.

After application of 0.03 x HL-93 loading, a negative moment hinge occurred in Girder B at Pier 1. The redistribution in loading due to this hinging caused more cross-frames and lateral braces to fail, so they were removed. At this point, Girder D reached hinging in negative moment at Pier 2, and nearly reached positive moment hinging near Pier 1. Girder B did exceed the positive moment load carrying capacity, and elastic hinges were introduced in Span 1 and Span 2. At this point the analysis could have stopped since a collapse mechanism was formed, but one final step was taken to redistribute loads and remove yet more cross-frames and lateral braces that failed.

See Figures 25 and 26 for the deflected shape at the last stage. The maximum deflection of 21" occurs in Girder D at Pier 1. There is a loss in stability in Girder B between points of elastic hinging, which is evident from the buckled shape of the web.

Comparisons between the record and independent models indicate a similar progression of failure of the bridge, confirming a lack of redundancy in the presented damaged limit state.

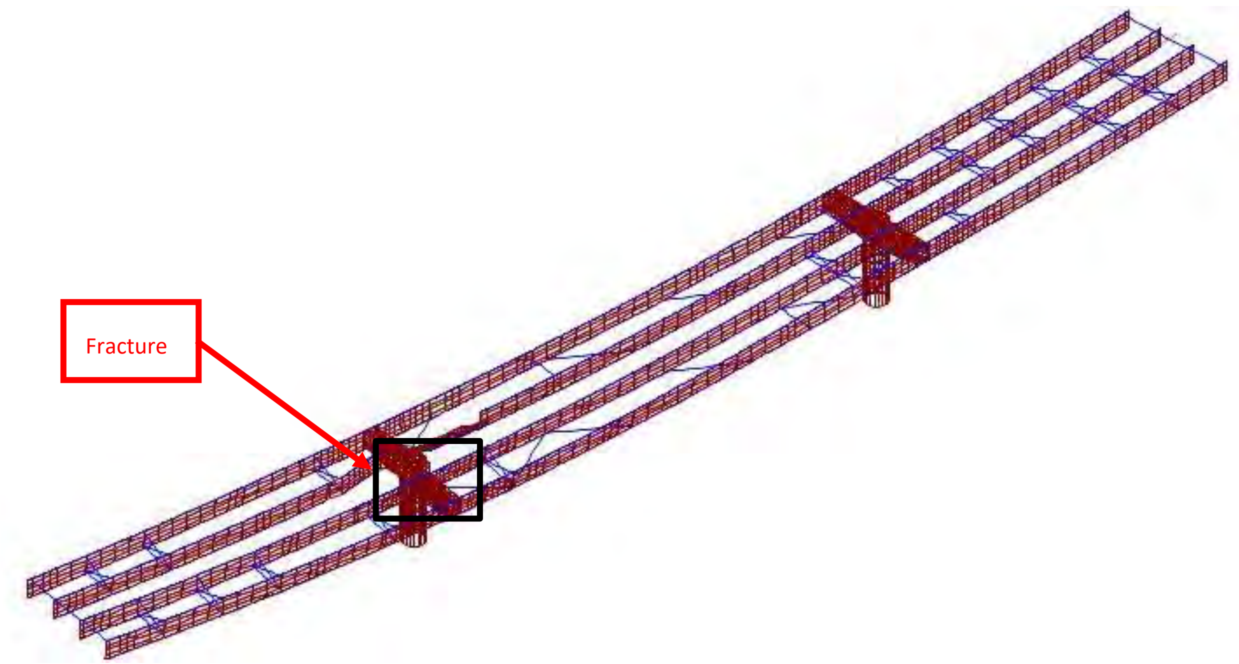


Figure 25: Deformed shape of CSi Bridge Independent Model at last stage of analysis (Deck not shown for clarity)

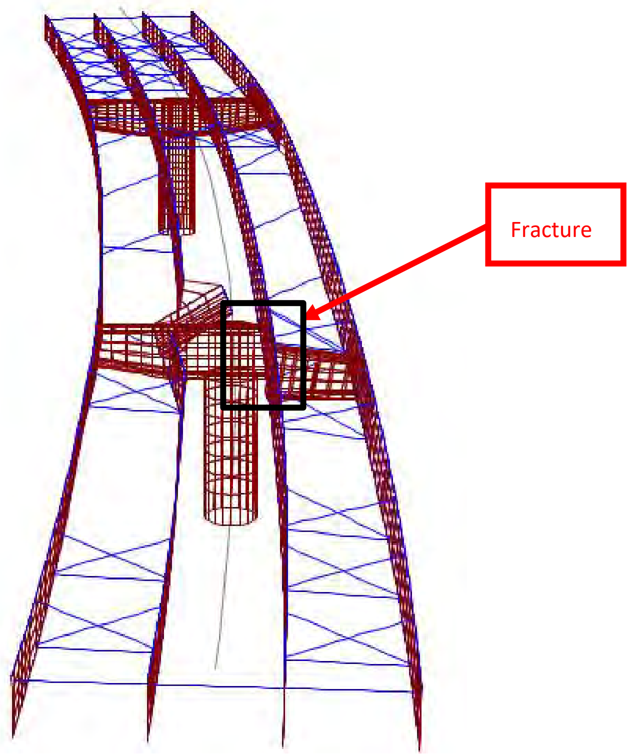


Figure 26: Deformed shape of CSi Bridge Independent Model at last stage of analysis (Deck not shown for clarity)

Repaired Condition Redundancy Analysis

The same model used for the existing condition redundancy analysis was modified to include the proposed load path redundancy repair concept shown in Appendix 4 – Proposed Redundancy Repairs. A load path redundancy diaphragm was added to the model on each side of both piers, approximately ten feet upstation and downstation of each pier. These diaphragms provide an alternate load path to resist dead and live loads in the event a fracture in the pier cap or failure of the fascia girder occurs. An elevation view of the proposed diaphragms from the Larsa model is shown in Figure 27.

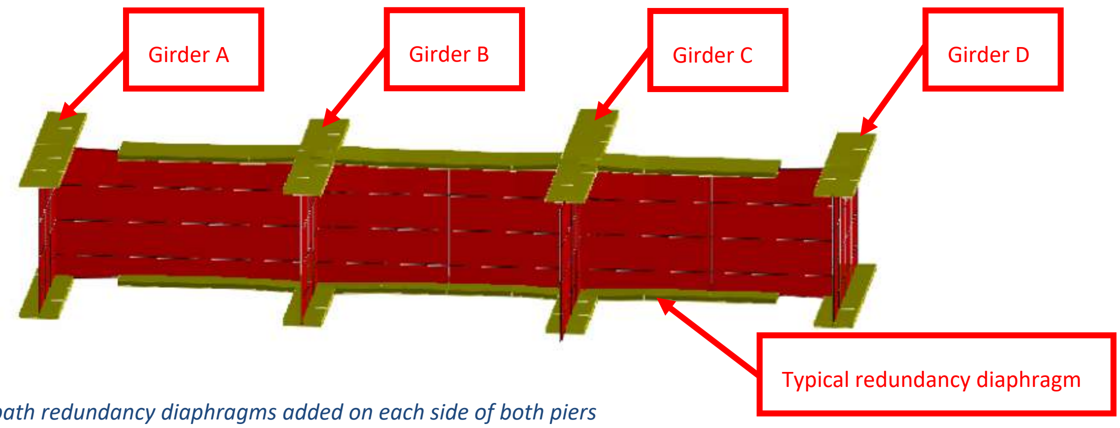


Figure 27: Load path redundancy diaphragms added on each side of both piers

In addition to the diaphragms, a pair of brackets were assumed on the exterior of the pier column under interior girders B and C. These brackets are intended to transfer reactions from the girders to the columns in the event a fracture occurs in the pier cap adjacent to the column. Due to this retrofit, the damaged limit state considering fracture in the pier cap between the column and interior girder was not evaluated for the repaired structure.

<u>Member, Ultimate and Functionality Limit States for Repaired Structure</u>

The addition of the load path redundancy diaphragms and the column brackets are assumed to have no significant effect on the behavior of the structure in an undamaged state. The member, functionality and ultimate limit states of the repaired structure are the same as the existing structure. The controlling LF_1 for all members is 3.39. This LF_1 is used to calculate R_d at all areas of investigation for the repaired condition.

<u>Damaged Limit State - Integral Pier Cap Between Girders C and D</u>

A total section of the pier cap adjacent to interior girder C in the exterior bay was fractured and the nonlinear analysis repeated. The model was adjusted to reflect the damaged condition by removing Pier 1 cap beam elements at the fracture location, as shown in Figure 28, after all dead load had been applied and before the first increment of live load.

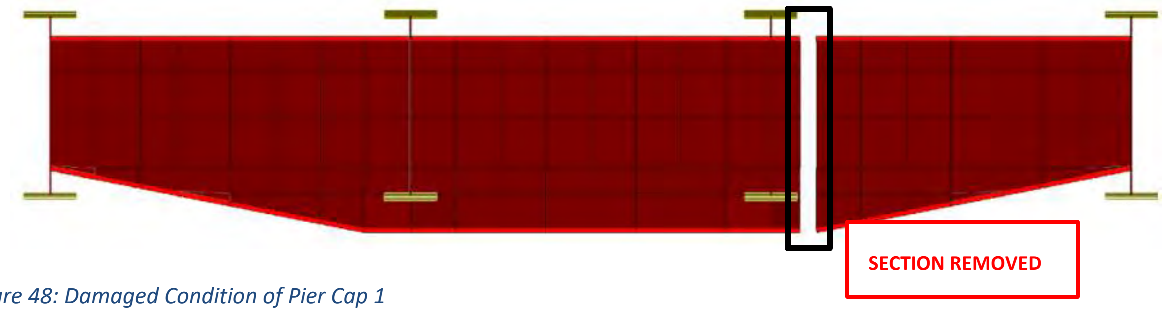


Figure 48: Damaged Condition of Pier Cap 1

After the section was removed, the worst case positioning of live loading was applied to the structure incrementally until an element reached its capacity. The same position of live load as used in the existing condition and shown in Figure 6 was again applied in the repaired condition.

Initial testing increments increased the applied load to 1.5 x HL-93 loading and corresponding design checks indicated that interior girder C would reach its capacity in shear. This capacity was determined using a web shear coefficient C = 1.0, which maximizes the shear capacity of the web; the analysis was stopped at this point. A deflected shape of the structure at this stage is shown in Figure 29.

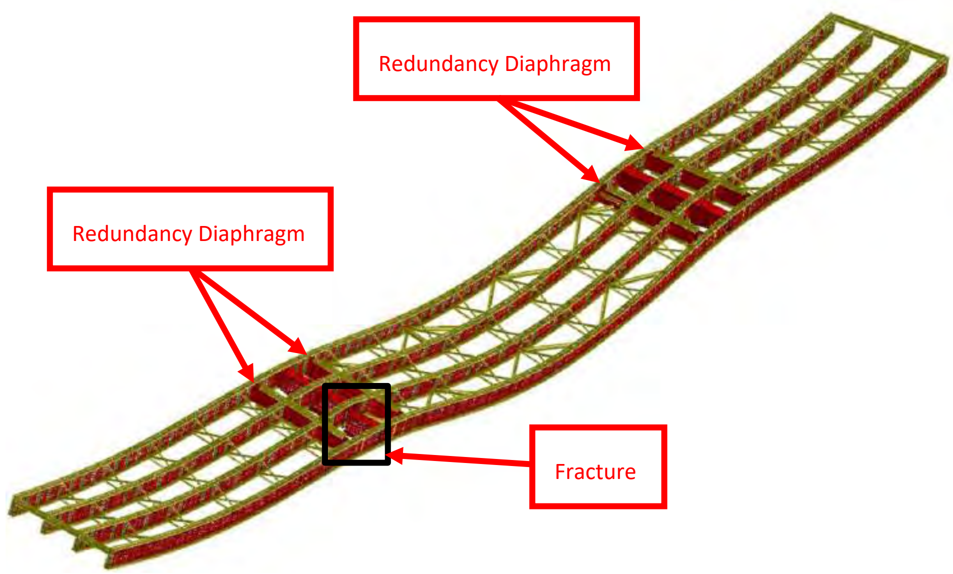


Figure 29: Deformed shape of repaired structure at 1.5xHL-93 loading (Deck not shown for clarity)

Thus, $R_d = LF_d / LF_1 = 1.50 / 3.39 = 0.442 < 0.5$. The calculated redundancy ratio r_d:

$$r_d = \frac{R_d}{0.5} = \frac{0.442}{0.5} = 0.885 < 1.0$$

Therefore, the bridge does not meet the criterion for being classified as a redundant element. However, per discussions with MnDOT, this level of redundancy is acceptable for the damaged condition. Due to the material and fabrication methods used in the original construction, the structure would still be considered fracture critical regardless of the redundancy finding, requiring subsequent annual inspections. The redundancy findings for both the existing and repaired condition are summarized in the table below.

Location	**LF_1**	**r_1**	**LF_u**	**R_u**	**r_u**	**LF_f**	**R_f**	**r_f**	**LF_d**	**R_d**	**r_d**
Existing Condition											
Fascia Girder D at Span 2	**3.39**	1.27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pier Cap 1 between Girders B and C	7.30	2.97	3.5	1.03	0.79	3.5	1.03	0.94	0.03	0.009	0.002
Repaired Condition											
Pier Cap 1 between Girders C and D	N/A	N/A	N/A	1.03	0.79	3.5	1.03	0.94	1.5	0.442	0.885

Conclusions and Recommendations

Using the criteria from NCHRP 406 and based on the results of these analyses, Bridge 69839 is considered overall non-redundant in the existing condition, as shown:

Integral steel box girder cap beam at Piers 1 and 2

$r_1 = 2.97 > 1.0$, $r_u = 0.79 < 1.0$, $r_d = 0.002 < 1.0$, NOT REDUNDANT

When the results are inspected closely, the non-redundancy of the structure is influenced by the girder flexural capacity in the ultimate condition, and the integral box cap beam response to fracture in the damaged condition.

Therefore, based on the above results, the bridge may be classified as redundant if the girder flexural capacity can be increased and the integral steel box girder cap beam can be designed to have an alternate load path. The following repair methods may be considered to improve the redundancy of the bridge:

- Adding capacity to the girder bottom flange in the positive moment region with an extra plate to avoid formation of the positive moment hinges that resulted in the ultimate condition failure.
- During deck replacement, adding shear studs to make the negative moment region girders composite to the deck, to redistribute live load moments and reduce demand in the positive moment region while also increasing the sectional capacity.
- Providing redundancy to the pier cap by one of the following methods:
    - Incorporate load path redundancy by modifying the framing layout to include an alternate load path that would carry the load shed from the fractured cap. The additional redundant load path diaphragms would also reduce the unbraced length of the girders near the piers, increasing resistance to lateral torsional buckling.
    - Internal member redundancy could be achieved by providing an alternate path for the loads to be resisted by built up sections and plates added to the box girder cap beam top and bottom flanges.

Conceptual drawings of both pier cap redundancy repair alternatives are included in Appendix 4 – Proposed Redundancy Repairs.

A scoping level cost estimate was developed for both pier cap repair concepts. The estimated cost of the load path redundancy repair is approximately $339,000, while the estimated cost of the internal member redundancy repair is $209,600. Details of the scoping cost estimate are included in Appendix 5 – Scoping Level Cost Estimate of Repairs.

The redundancy of the structure was re-evaluated with consideration of the load path redundancy repair option. The conceptual design was further refined to address the unique redundancy needs of Bridge 69839. The following repairs were considered in the repaired condition redundancy evaluation:

- Corbel brackets were included at the exterior of the pier column under interior girders B and C. These brackets are intended to transfer reactions from the girders to the columns in the event a fracture occurs in the pier cap adjacent to the column. This retrofit is intended to address a fracture in the pier cap between the column and interior girder.
- Load path redundancy diaphragms were added on each side of both piers. These diaphragms provide an alternate load path to resist dead and live loads in the event a fracture in the pier cap or failure of the fascia girder occurs.
- Additional intermediate stiffeners were added to girders near the piers to maximize the shear capacity in the damaged condition.

Based on the criteria from NCHRP 406, the redundancy of Bridge 69839 in the repaired condition is improved, but still considered overall non-redundant, as shown:

$r_1 = 2.97 > 1.0$, $r_u = 0.79 < 1.0$, $r_d = 0.88 < 1.0$, NOT REDUNDANT

The plans and cost estimate for the refined redundancy repair design are included in Appendix 7 – Advanced Redundancy Repair Plans and Cost Estimate. The revised cost estimate for the repairs is $460,900.

Additional repairs proposed to improve load ratings and extend the service life of the bridge include deck replacement, making the girders composite with the new deck in the negative moment region, bearing reconstruction, concrete surface repairs on the bridge abutments and full repainting of the steel superstructure and substructure components.

Appendices

Appendix 1. Elastic Model Comparisons
Appendix 2. Member Capacity Calculations
Appendix 3. Redundancy Analysis Comparisons
Appendix 4. Proposed Redundancy Repairs
Appendix 5. Scoping Level Cost Estimate of Repairs
Appendix 6. Cross Frame Removal Schedule
Appendix 7. Advanced Redundancy Repair Plans and Cost Estimate

Appendix 1

Elastic Model Comparisons

	Record	Independent	Difference	
Stage	[k]	[k]	[k]	[%]
Steel	384.5	386.8	-2.37	0.61%
Concrete	1111.4	1111.0	0.4	0.03%
SDL	248.1	251.0	-2.9	1.16%
Total	1743.9	1748.8	-4.89	-0.28%

Figure 1: Dead Load Reactions

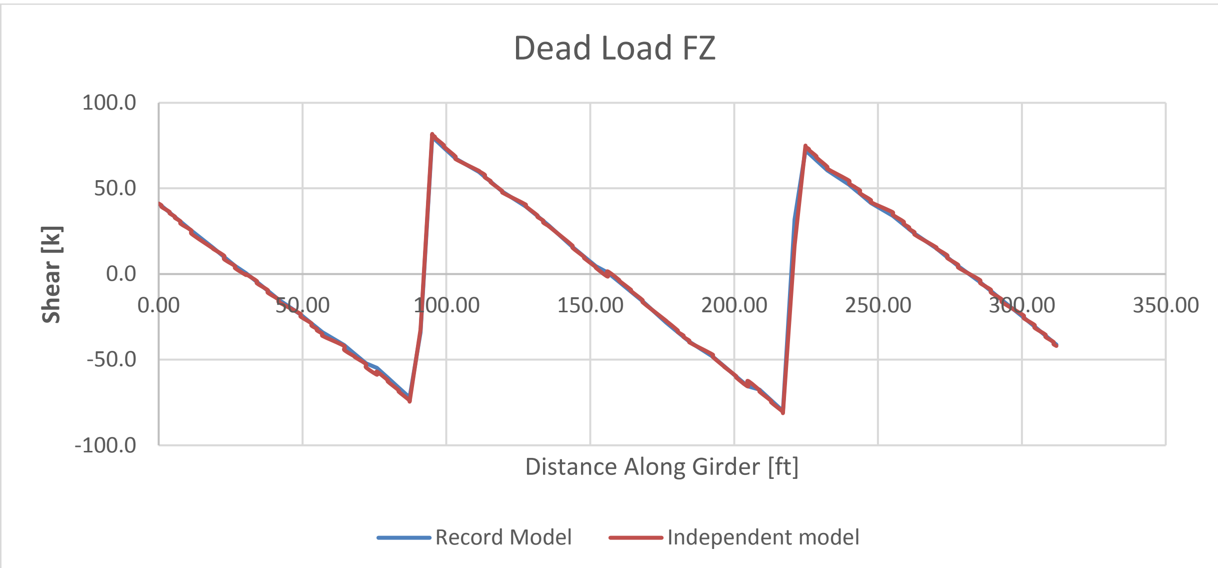


Figure 2: Girder D Dead Load Shear

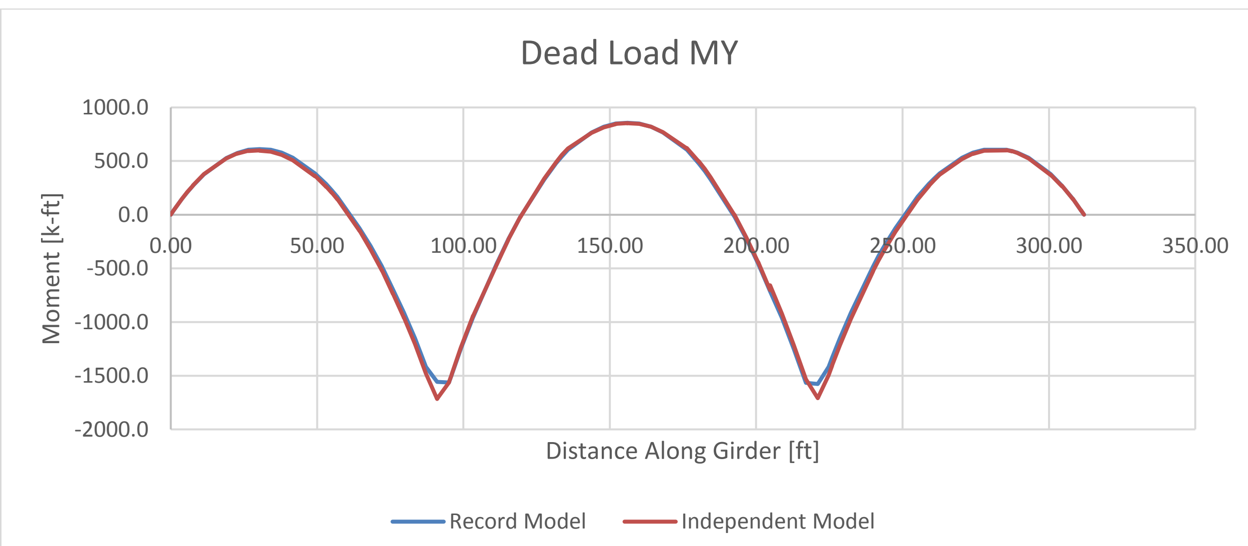


Figure 3: Girder D Dead Load Moment

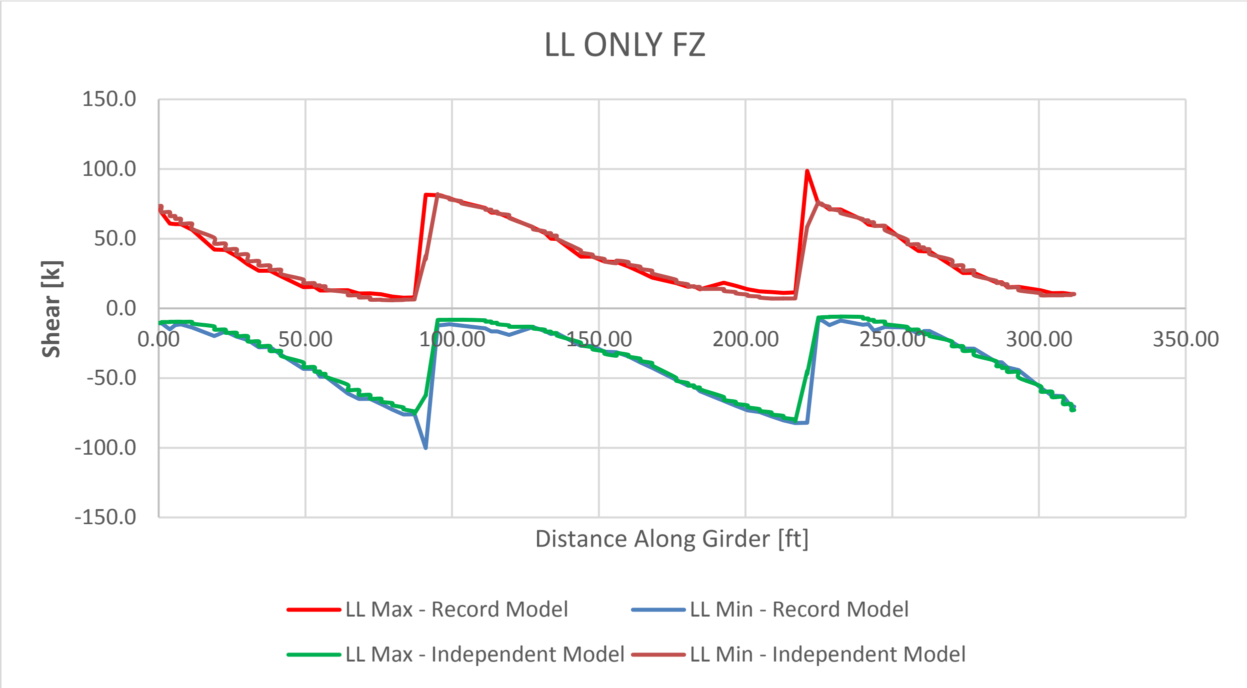


Figure 4: Girder D Live Load Shear

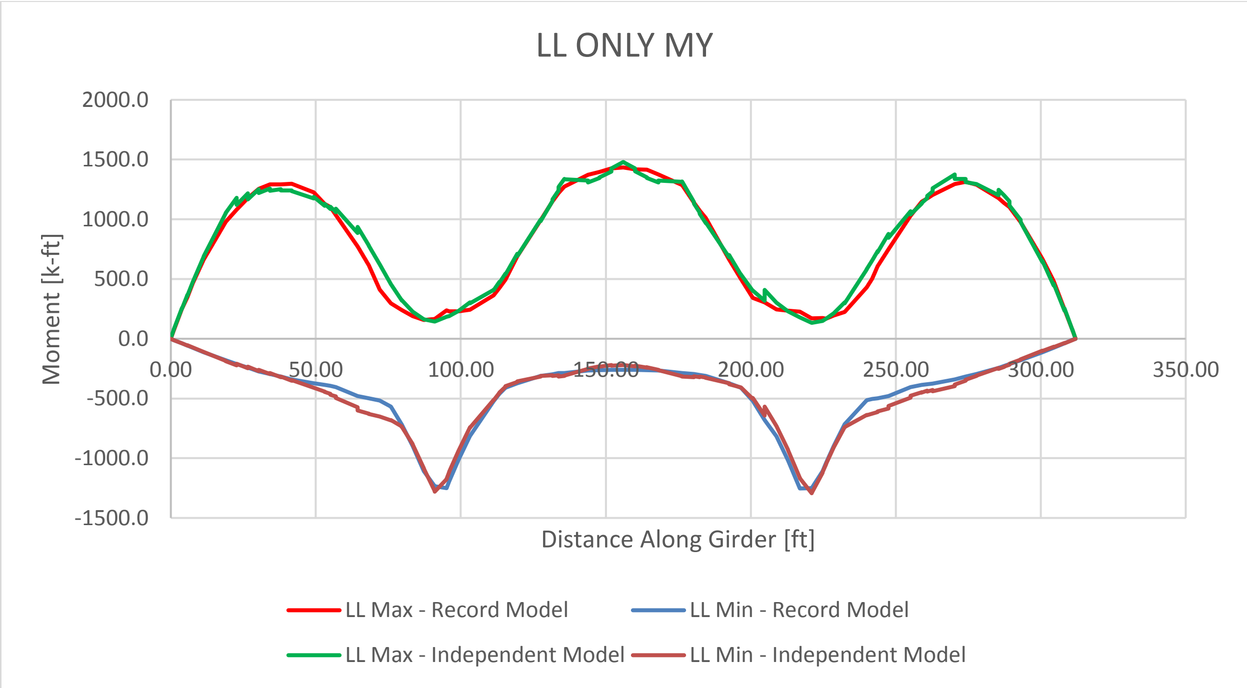


Figure 5: Girder D Live Load Moment

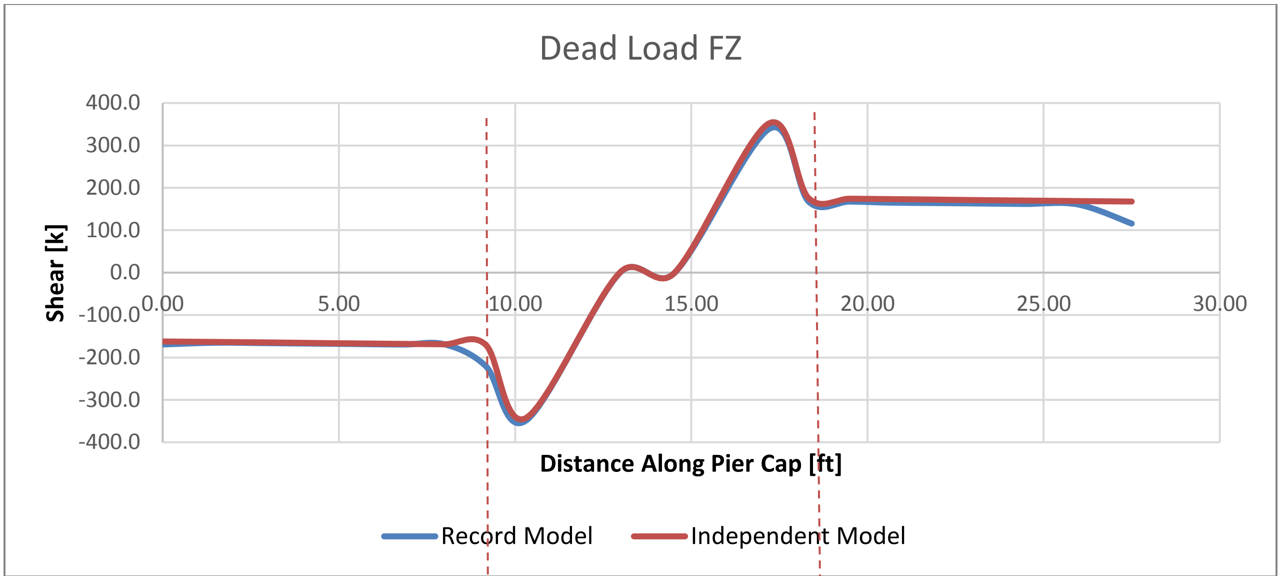
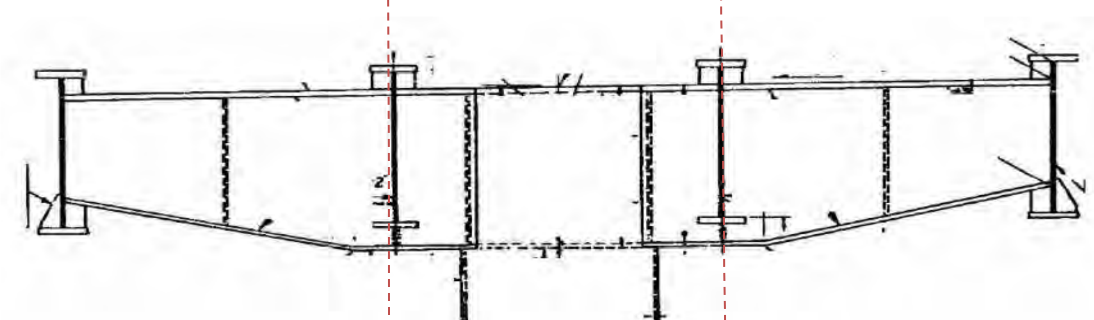


Figure 6: Pier 1 Cap Beam Dead Load Shear



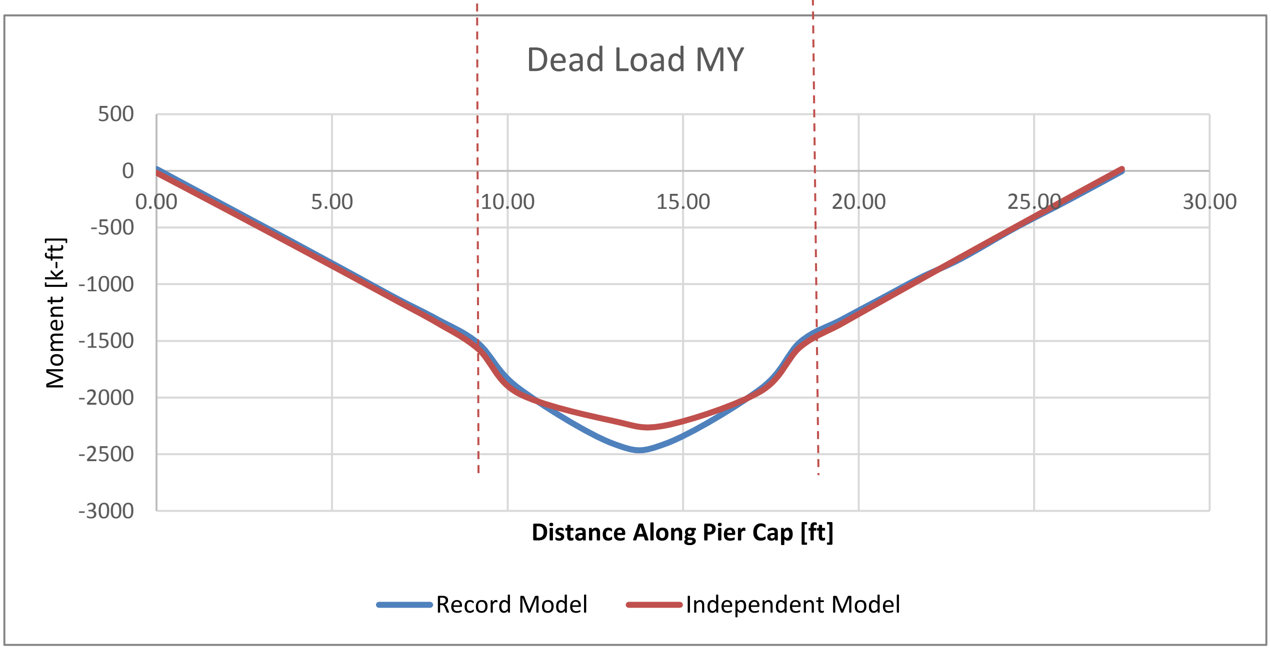


Figure 7: Pier 1 Cap Beam Dead Load Moment

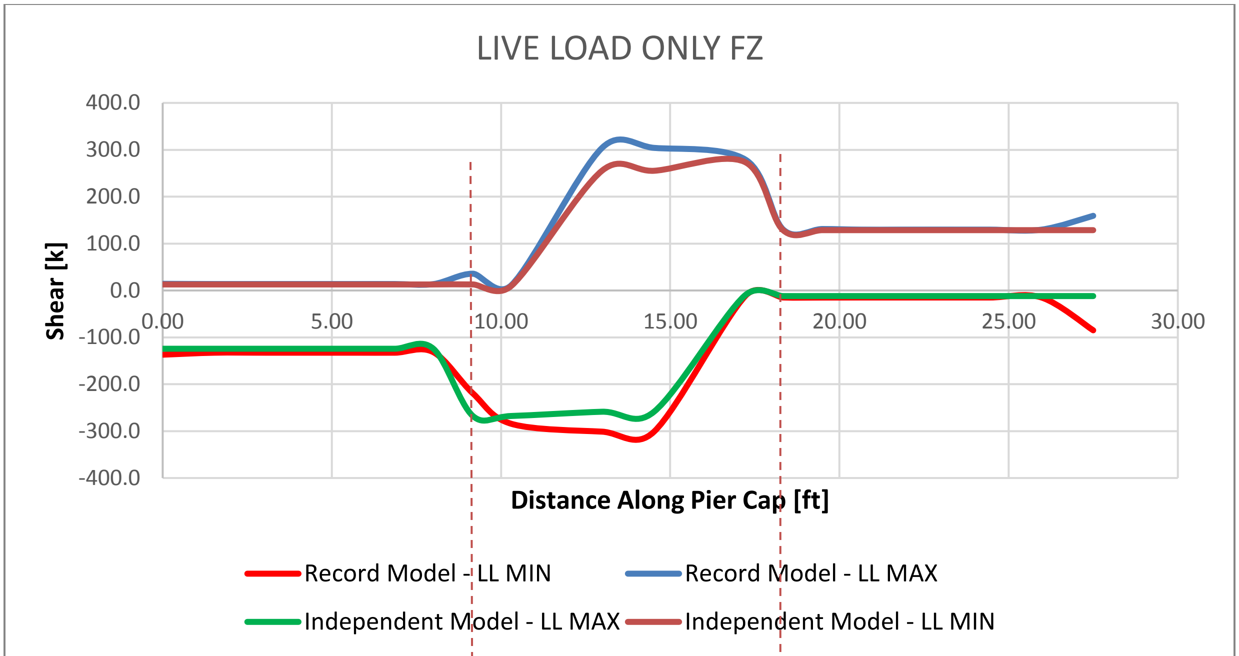
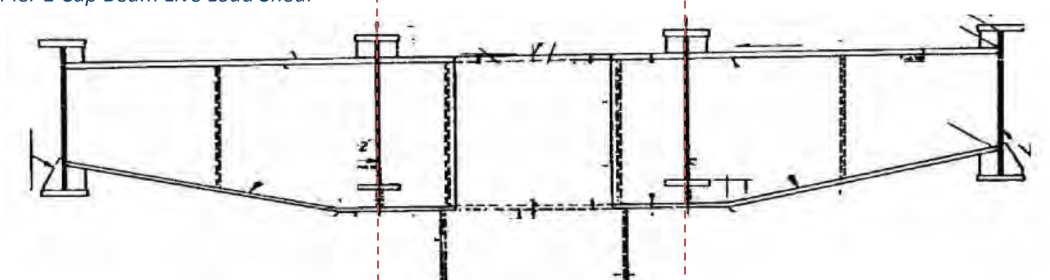


Figure 8: Pier 1 Cap Beam Live Load Shear



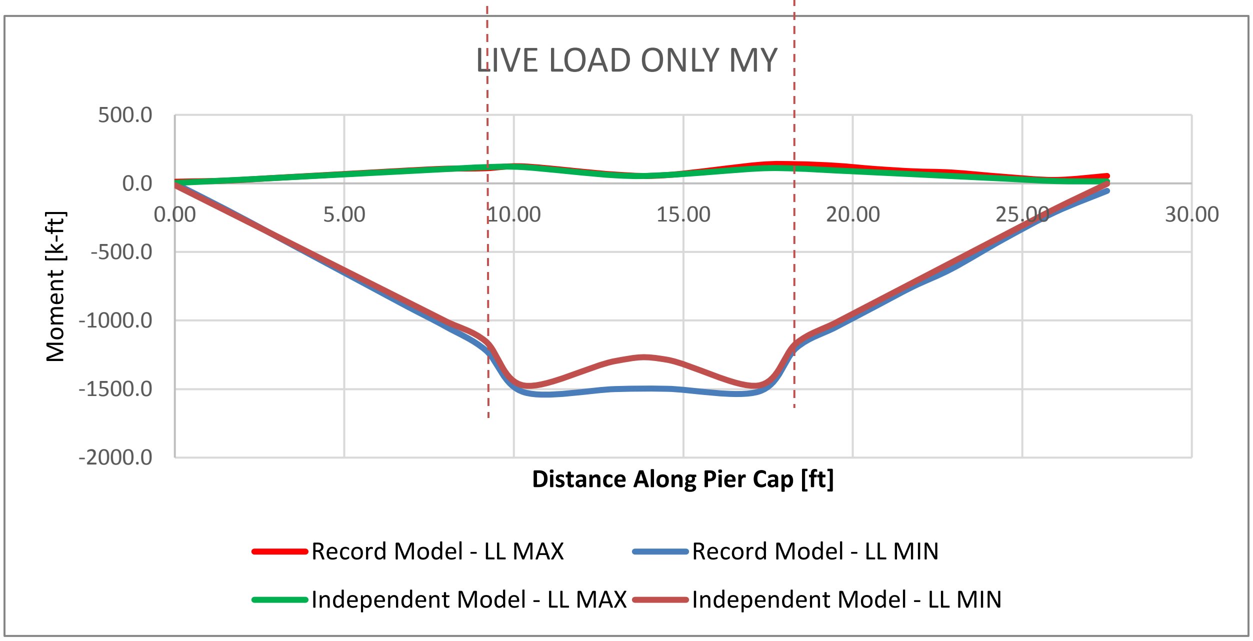


Figure 9: Pier 1 Cap Beam Live Load Moment

Appendix 2

Member Capacity Calculations

HNTB	Prepared by: Craig Hetue	Approved by:	Document number: QF 06
Calculation Cover Sheet	Revision Number: 0	Revision Date: 6/19/2017	Page 1 of __

Project: Fracture Critical Pier Caps – Br 69839	Job No: 64517	Design Criteria Document:
Client: MnDOT	Discipline:	Calculation No:

Name or Description of Calculation: Bridge 68939 Member Capacity and Redundancy Calculations.

Calc. Rev. No.	Originator	Checker	Senior Technical Reviewer (if required)	Confirmation Required (Y/N)

Calculation Objective: Establish the Member Capacity and redundancy values for Member and Ultimate loading conditions.

Calculation Methodology/List of Assumptions:
Applied AASHTO design and NCHRP 406 criteria to establish the redundancy limit states.

References/Inputs:

Attachments: (List each attachment following the subject calculation)
Bridge 69839 Design Calculations

Conclusions:

Document Check:	Name	Signature	Date
Originator:	Michael Xin	[signature]	9/5/17
Checker:	Travis Konda/Jay Carter	[signature] [signature]	9/07/17 9/5/17
BackChecker:	Michael Xin	[signature]	9/6/17
Updater:	Michael Xin	[signature]	9/6/17
Verifier:	Travis Konda/Jay Carter	[signature] [signature]	9/07/17 9/6/17

BRIDGE 69839 DESIGN CALCULATION

HNTB JOB #: 64517

INDEX OF DESIGN CALCULATION

1. Design Summary

HNTB	By: MX	Date: 08/29/17	Job No. 64517
	Chkd By: JWC/EPP	Date: 9/8/2017	
HNTB Corp.	Bckchk By: MX	Date: 9/8/2017	Sht. No.

BR 69839

	Marco ID	LF1	r_1	LF_u	$LF_u/LF1$	LF_d	$LF_d/LF1$	r_d
Girder D_CF9	1024	3.39	1.27	N/A	N/A	N/A	N/A	N/A
Pier 1 Cap Beam	1192	7.30	2.97	3.50	1.03	0.03	0.009	0.0177

Summary of Results for Bridge 69839

	Location	Macro ID	Larsa Sta. (ft)	LF1	r_1
Girder D	West Abutment	1001	0.0	6.45	2.79
Span 1 (Girder D)		1002	7.6	7.96	3.46
	CF1	1003	15.2	5.75	2.13
		1004	22.8	4.34	1.70
	CF2	1005	30.3	3.57	1.36
		1006	37.9	3.60	1.45
	CF3	1007	45.5	3.77	1.50
		1008	53.1	4.59	1.97
	CF4	1009	60.7	5.78	2.44
		1010	72.9	4.45	1.89
	Section Change	1011	73.0	6.22	2.60
	CF5	1012	75.8	5.85	2.46
	Section Change	1013	81.0	5.39	2.25
	Pier 1	1014	89.5	4.05	1.55
	Pier 1	1015	91.0	4.07	1.66
	Pier 1	1016	92.5	3.45	1.41
Span 2 (Girder D)	Section Change	1017	100.0	4.02	1.65
	CF6/Section Change	1018	107.0	4.96	2.11
	CF6	1019	107.1	3.45	1.43
	CF7	1020	123.5	6.52	2.81
		1021	131.6	4.91	2.01
	CF8	1022	139.8	3.62	1.39
		1023	147.9	3.63	1.41
	CF9	1024	156.0	3.39	1.27
		1025	164.1	3.59	1.40
	CF10	1026	172.3	3.95	1.48
		1027	180.4	4.98	2.05
	CF11	1028	188.5	6.43	2.76
		1029	204.9	3.44	1.43
	CF12/Section Change	1030	205.0	3.41	1.41
	Section Change	1031	212.0	3.98	1.63
	Pier 2	1032	219.5	3.47	1.42
	Pier 2	1033	221.0	3.99	1.52
	Pier 2	1034	222.5	4.05	1.61
Span 3 (Girder D)	Section Change	1035	231.0	5.53	2.30
		1036	231.1	5.23	2.13
	Section Change	1037	239.0	6.34	2.65
		1038	239.1	4.47	1.90
	CF14	1039	251.3	5.98	2.61
		1040	258.9	4.54	1.96
	CF15	1041	266.5	3.71	1.46
		1042	274.1	3.53	1.42
	CF16	1043	281.7	3.56	1.35
		1044	289.3	4.25	1.68
	CF17	1045	296.8	5.72	2.13
		1046	304.4	7.69	3.34
	East Abutment	1047	312.0	6.64	2.85

Summary of Results for Bridge 69839

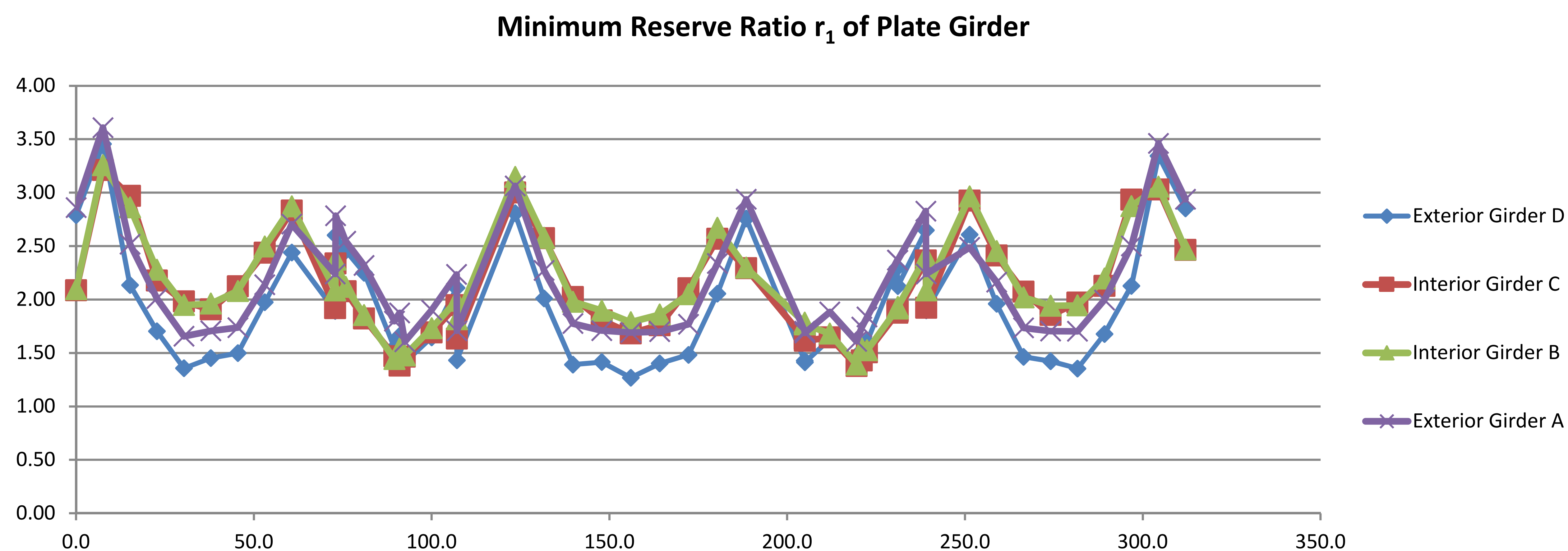
	Location	Macro ID	Larsa Sta. (ft)	LF1	r_1
Girder C	West Abutment	1048	0.0	4.83	2.09
Span 1 (Girder C)		1049	7.6	7.47	3.21
	CF1	1050	15.2	7.10	2.97
		1051	22.8	5.29	2.18
	CF2	1052	30.3	4.72	1.98
		1053	37.9	4.54	1.91
	CF3	1054	45.5	4.94	2.12
		1055	53.1	5.60	2.44
	CF4	1056	60.7	6.69	2.83
		1057	72.9	4.63	1.92
	Section Change	1058	73.0	5.61	2.34
	CF5	1059	75.8	4.96	2.08
	Section Change	1060	81.0	4.34	1.82
	Pier 1	1061	89.5	3.50	1.47
	Pier 1	1062	91.0	3.54	1.38
	Pier 1	1063	92.5	3.48	1.46
Span 2 (Girder C)	Section Change	1064	100.0	4.05	1.69
	CF6/Section Change	1065	107.0	4.66	1.95
	CF6	1066	107.1	4.07	1.63
	CF7	1067	123.5	7.17	3.00
		1068	131.6	6.01	2.57
	CF8	1069	139.8	4.89	2.02
		1070	147.9	4.37	1.80
	CF9	1071	156.0	4.13	1.68
		1072	164.1	4.26	1.76
	CF10	1073	172.3	5.03	2.10
		1074	180.4	6.07	2.57
	CF11	1075	188.5	5.38	2.29
		1076	204.9	4.06	1.63
	CF12/Section Change	1077	205.0	4.02	1.61
	Section Change	1078	212.0	3.94	1.65
	Pier 2	1079	219.5	3.28	1.38
	Pier 2	1080	221.0	3.65	1.43
	Pier 2	1081	222.5	3.96	1.51
Span 3 (Girder C)	Section Change	1082	231.0	4.50	1.88
		1083	231.1	4.53	1.89
	Section Change	1084	239.0	5.72	2.36
		1085	239.1	4.64	1.92
	CF14	1086	251.3	6.93	2.93
		1087	258.9	5.51	2.41
	CF15	1088	266.5	4.86	2.07
		1089	274.1	4.43	1.85
	CF16	1090	281.7	4.71	1.97
		1091	289.3	5.15	2.13
	CF17	1092	296.8	7.03	2.93
		1093	304.4	7.02	3.03
	East Abutment	1094	312.0	5.73	2.46

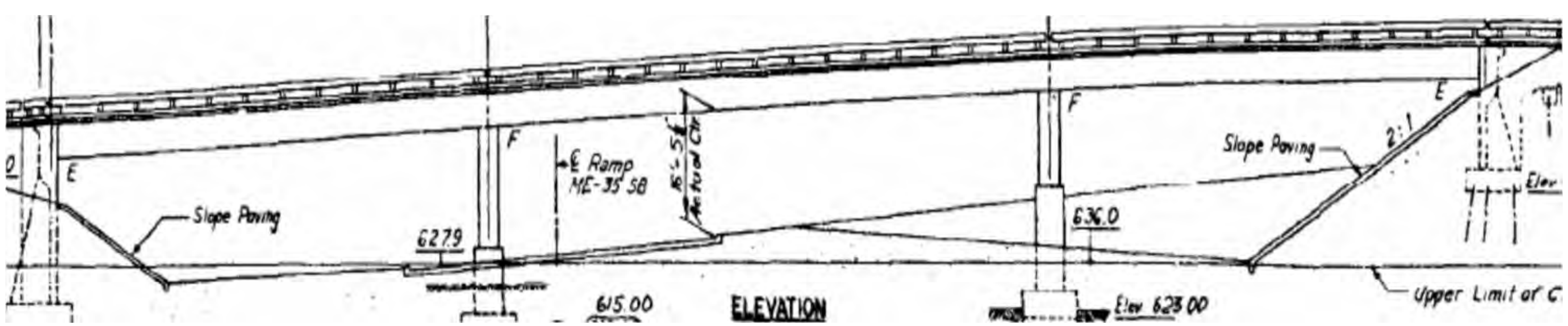
	Summary of Results for Bridge 69839				
	Location	Macro ID	Larsa Sta. (ft)	LF1	r_1
Girder B	West Abutment	1095	0.0	4.85	2.10
Span 1 (Girder B)		1096	7.6	7.56	3.26
	CF1	1097	15.2	7.04	2.86
		1098	22.8	5.47	2.28
	CF2	1099	30.3	4.75	1.95
		1100	37.9	4.66	1.96
	CF3	1101	45.5	4.94	2.08
		1102	53.1	5.69	2.50
	CF4	1103	60.7	6.78	2.87
		1104	72.9	5.07	2.08
	Section Change	1105	73.0	5.70	2.37
	CF5	1106	75.8	5.06	2.12
	Section Change	1107	81.0	4.42	1.85
	Pier 1	1108	89.5	3.41	1.44
	Pier 1	1109	91.0	3.88	1.54
	Pier 1	1110	92.5	3.50	1.48
Span 2 (Girder B)	Section Change	1111	100.0	4.15	1.73
	CF6/Section Change	1112	107.0	4.76	1.99
	CF6	1113	107.1	4.58	1.82
	CF7	1114	123.5	7.53	3.15
		1115	131.6	6.10	2.58
	CF8	1116	139.8	4.91	1.98
		1117	147.9	4.53	1.90
	CF9	1118	156.0	4.33	1.79
		1119	164.1	4.44	1.86
	CF10	1120	172.3	5.04	2.05
		1121	180.4	6.25	2.67
	CF11	1122	188.5	5.37	2.30
		1123	204.9	4.24	1.78
	CF12/Section Change	1124	205.0	4.20	1.77
	Section Change	1125	212.0	4.02	1.68
	Pier 2	1126	219.5	3.29	1.39
	Pier 2	1127	221.0	3.91	1.54
	Pier 2	1128	222.5	3.67	1.52
Span 3 (Girder B)	Section Change	1129	231.0	4.58	1.92
		1130	231.1	4.61	1.93
	Section Change	1131	239.0	5.82	2.40
		1132	239.1	5.08	2.08
	CF14	1133	251.3	7.02	2.96
		1134	258.9	5.59	2.45
	CF15	1135	266.5	4.86	2.02
		1136	274.1	4.58	1.94
	CF16	1137	281.7	4.75	1.94
		1138	289.3	5.27	2.20
	CF17	1139	296.8	7.03	2.87
		1140	304.4	7.08	3.06
	East Abutment	1141	312.0	5.75	2.47

Summary of Results for Bridge 69839

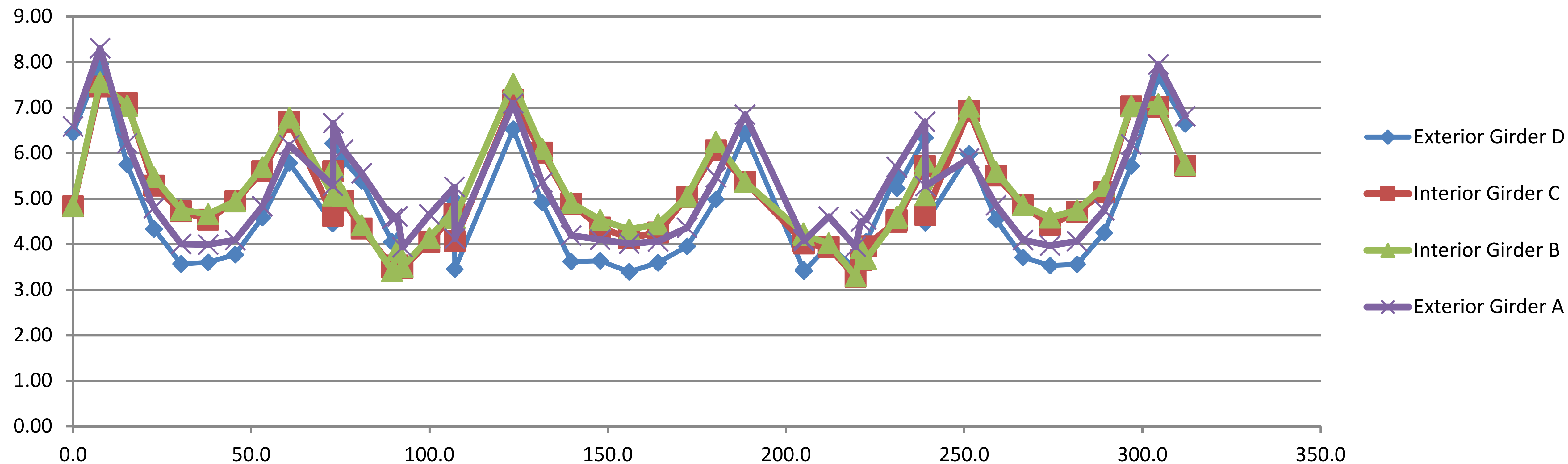
	Location	Macro ID	Larsa Sta. (ft)	LF1	r_1
Girder A	West Abutment	1142	0.0	6.59	2.86
Span 1 (Girder A)		1143	7.6	8.30	3.61
	CF1	1144	15.2	6.22	2.52
		1145	22.8	4.79	2.01
	CF2	1146	30.3	4.00	1.66
		1147	37.9	3.99	1.71
	CF3	1148	45.5	4.09	1.74
		1149	53.1	4.83	2.14
	CF4	1150	60.7	6.18	2.71
		1151	72.9	5.28	2.24
	Section Change	1152	73.0	6.66	2.78
	CF5	1153	75.8	6.08	2.55
	Section Change	1154	81.0	5.56	2.32
	Pier 1	1155	89.5	4.56	1.80
	Pier 1	1156	91.0	4.61	1.87
	Pier 1	1157	92.5	3.93	1.61
Span 2 (Girder A)	Section Change	1158	100.0	4.65	1.90
	CF6/Section Change	1159	107.0	5.26	2.23
	CF6	1160	107.1	4.12	1.71
	CF7	1161	123.5	7.09	3.06
		1162	131.6	5.35	2.27
	CF8	1163	139.8	4.19	1.77
		1164	147.9	4.10	1.71
	CF9	1165	156.0	4.01	1.69
		1166	164.1	4.06	1.70
	CF10	1167	172.3	4.36	1.77
		1168	180.4	5.47	2.34
	CF11	1169	188.5	6.85	2.94
		1170	204.9	4.11	1.70
	CF12/Section Change	1171	205.0	4.07	1.69
	Section Change	1172	212.0	4.60	1.88
	Pier 2	1173	219.5	3.94	1.61
	Pier 2	1174	221.0	4.50	1.74
	Pier 2	1175	222.5	4.54	1.84
Span 3 (Girder A)	Section Change	1176	231.0	5.70	2.37
		1177	231.1	5.69	2.37
	Section Change	1178	239.0	6.69	2.83
		1179	239.1	5.28	2.24
	CF14	1180	251.3	5.88	2.49
		1181	258.9	4.86	2.16
	CF15	1182	266.5	4.09	1.73
		1183	274.1	3.97	1.70
	CF16	1184	281.7	4.07	1.70
		1185	289.3	4.74	2.00
	CF17	1186	296.8	6.19	2.50
		1187	304.4	7.95	3.46
	East Abutment	1188	312.0	6.81	2.94
CB @ Facial girder D	Section_A	1189	0.1	10.75	4.37
	Section_B	1190	4.6	14.63	5.93
CB @ Pier Face	Section_C	1191	11.2	7.32	2.98
CB @ Pier Face	Section_C	1192	18.3	7.30	2.97

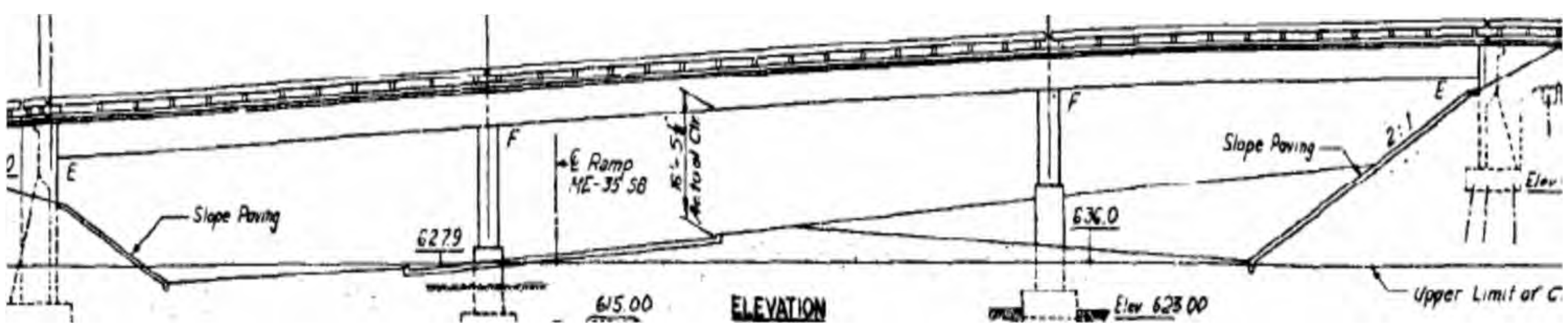
	Summary of Results for Bridge 69839				
	Location	Macro ID	Larsa Sta. (ft)	LF1	r_1
	Section_B	1193	22.9	15.03	6.11
CB @ Facial girder A	Section_A	1194	27.5	11.02	4.50


Minimum Reserve Ratio r_1 of Plate Girder
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
Exterior Girder D
Interior Girder C
Interior Girder B
Exterior Girder A

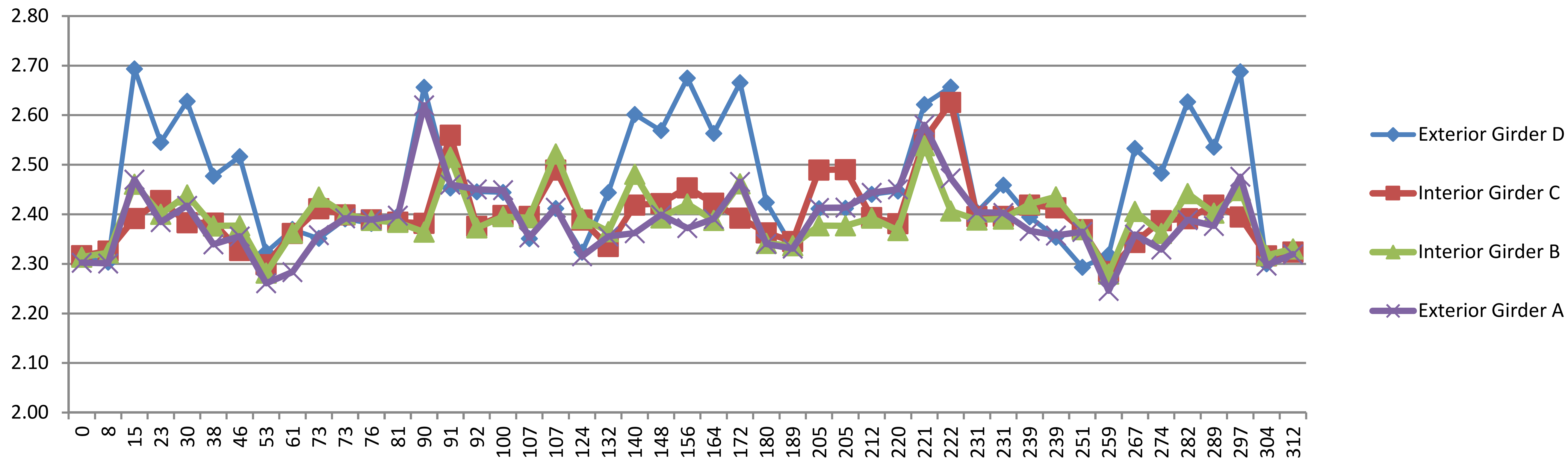

Slope Paving
627.9
℄ Ramp ME-35 SB
Actual Clr
615.00
ELEVATION
636.0
Elev 623.00
Slope Paving
2:1
Upper Limit of C

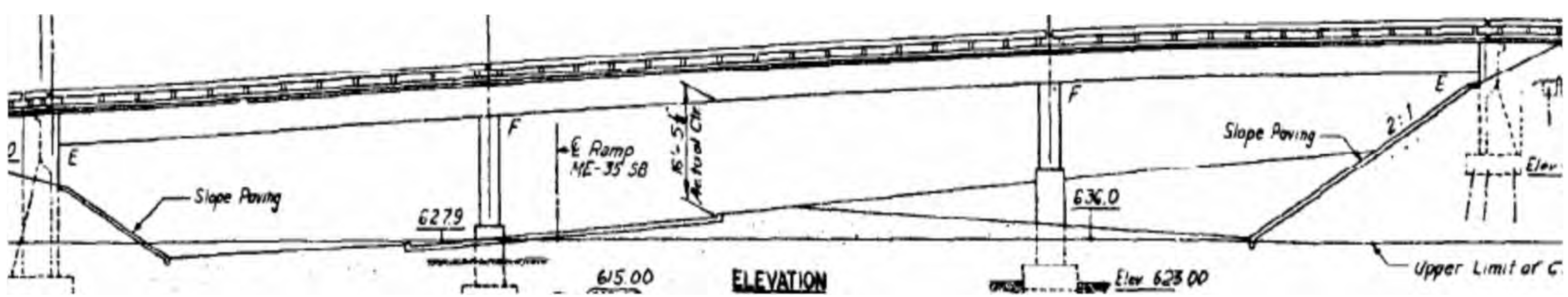
LF1 of Plate Girder w/respect with Minimum r_1

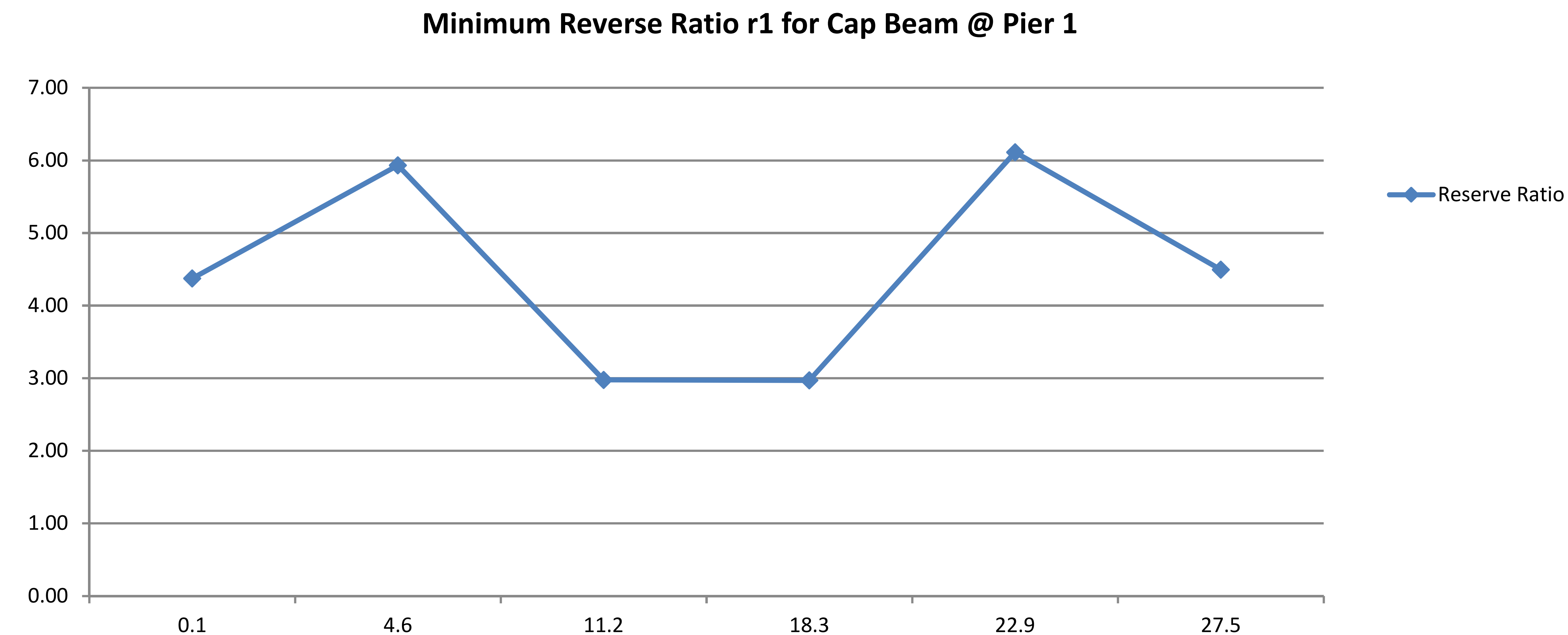


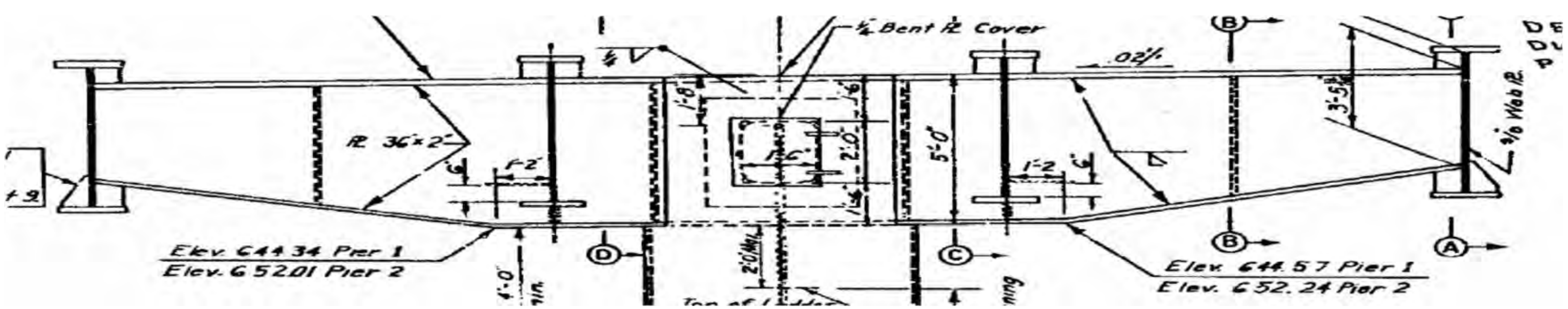


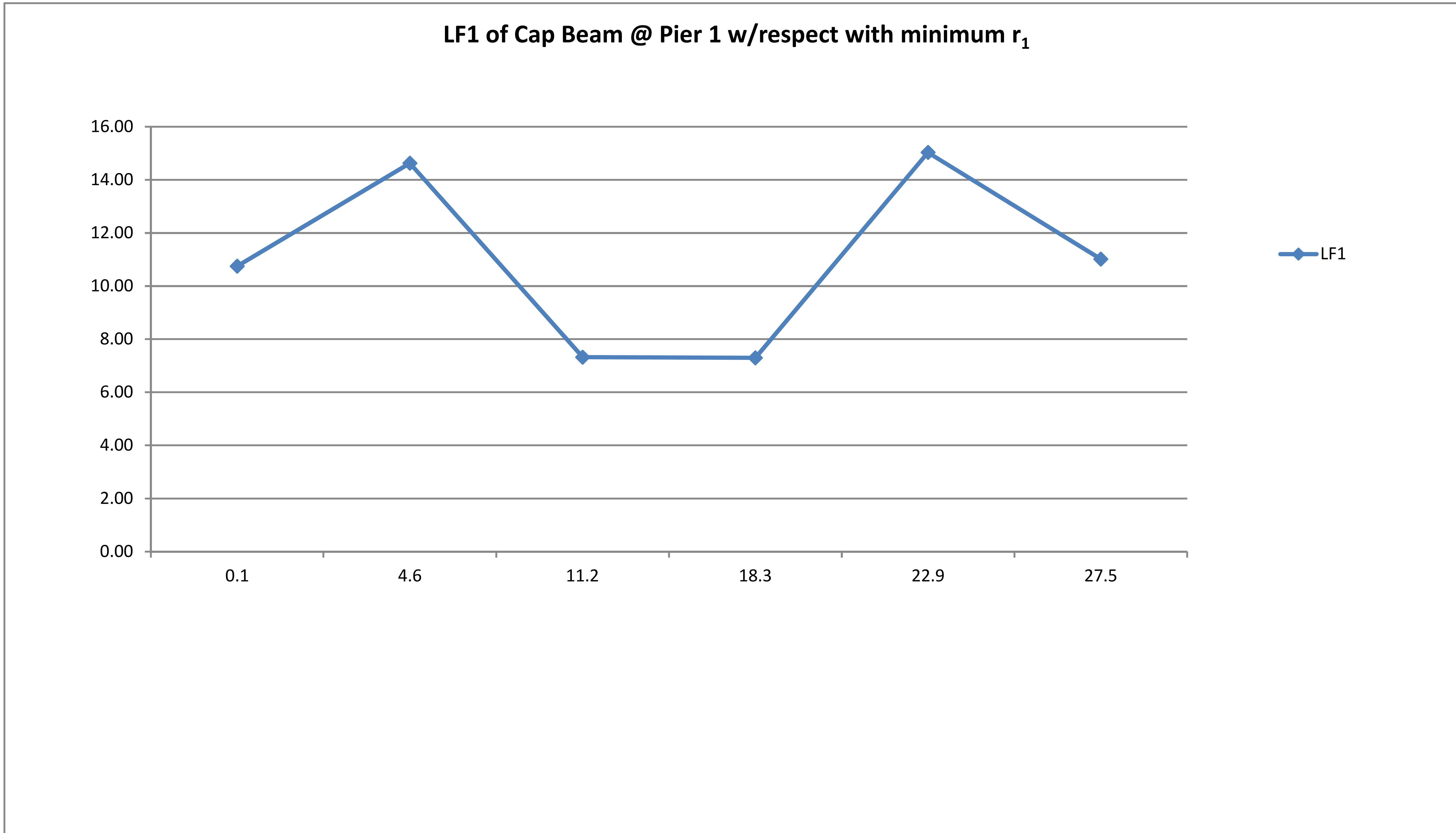
LF1_req'd of Plate Girder w/respect with Minimum r_1

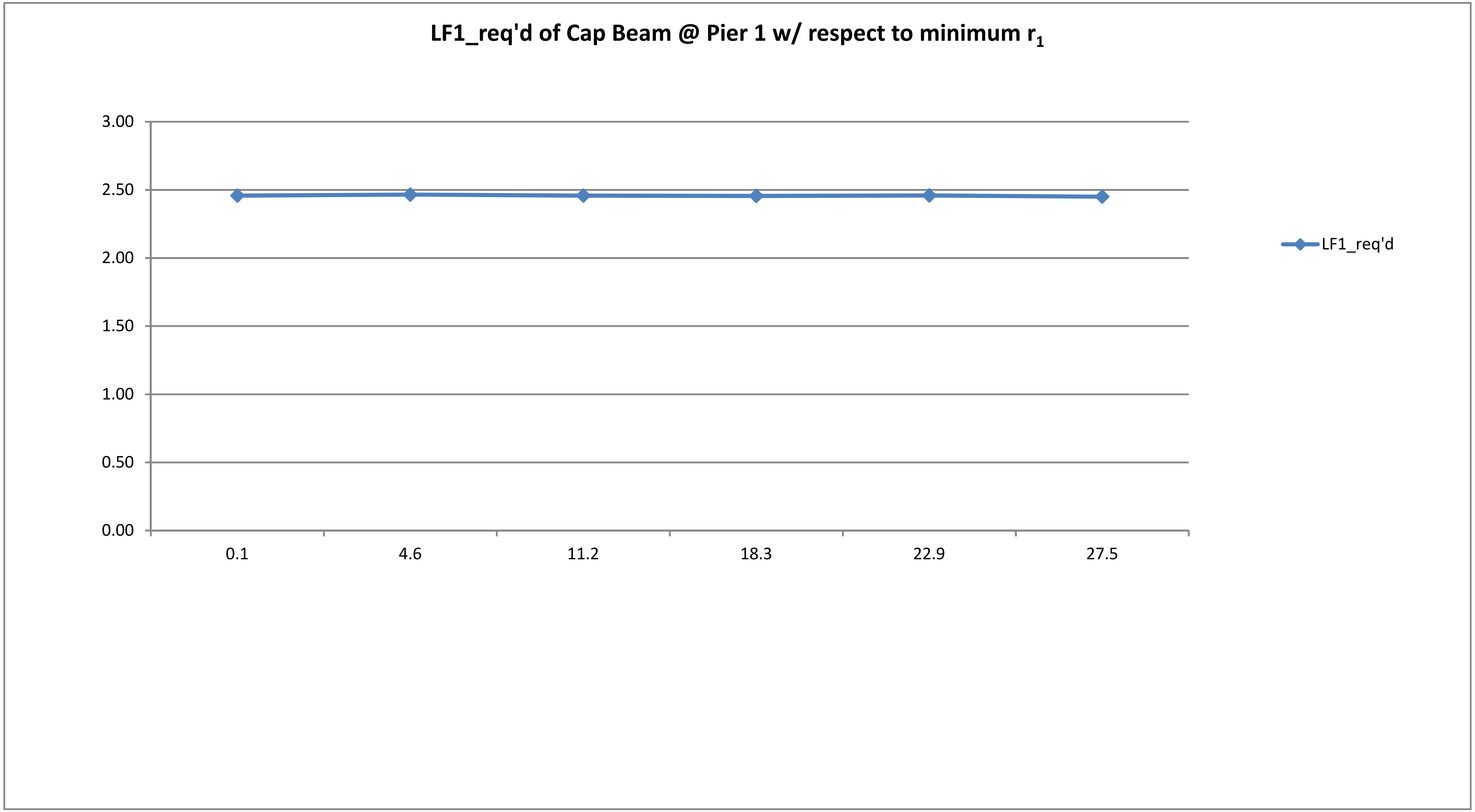





Minimum Reverse Ratio r1 for Cap Beam @ Pier 1
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.1
4.6
11.2
18.3
22.9
27.5
Reserve Ratio


Bent ℞ Cover
.02%
℞ 36"x2"
5'-0"
Elev. 644.34 Pier 1
Elev. 652.01 Pier 2
Elev. 644.57 Pier 1
Elev. 652.24 Pier 2


LF1 of Cap Beam @ Pier 1 w/respect with minimum r1
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.1
4.6
11.2
18.3
22.9
27.5
LF1


LF1_req'd of Cap Beam @ Pier 1 w/ respect to minimum r1
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.1
4.6
11.2
18.3
22.9
27.5
LF1_req'd

2. Design Data

Bridge # 69839

Designed by: MX on 08/20/2017
Checked by: TFK on 08/30/2017
Backchecked by: MX on 08/30/2017

						Load Factor		Resistance Factor		Longitudinal Stiffener dist to Bott Flange		Transverse Stiffener			Hybrid factor	Material Properties								Area of deck rebar within effective width	Deck thickness	Haunch thickness	Effective width of the deck	Shear Stud Location	Unbracing length for M-	Is Section Loss Considered /
	Location	Girder Node ID	Is plate girder or box girder ?	Larsa Station	Flange lateral bending stress			Flexual	Shear	No. of Longitudinal stiffener provided ?	Dist from stiffener to bottom flg	Is transverse stiffener provided?	Transverse Stiffener Spacing	Is end panel or interior panel?		Specified min flg yield strength	Specified web flg yield strength	Specified min yield strength of comp. flg	Rebar yield strength	Conc deck	Girder E	Conc deck	Modular Ratio							
					f_l	Condition Factor ϕ_c	System Factor ϕs	ϕ_f	ϕ_v		d_s	(Yes =0,No=1)	d_o	(Interior =0, End=1)	R_h	F_{yf}	F_{yw}	F_{yc}	F_{y_rebar}	f_c	$E_{\_steel}$	$E_{\_deck}$	n	A_{rs}	$t_{\_deck}$	$h_{\_haunch}$	b_{eff}	(Stud provided =Yes: No shear stud = No)	L_b	
								6.5.4.2	6.5.4.2						6.10.1.10.1															
				(ft)	(ksi)						(in)		(ft)			(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)		(in^2)	(in)	(in)	(ft)		(in)	
	West Abutment	1001	Plate Girder	0.010		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	1	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
Span 1 -Girder D		1002	Plate Girder	7.58		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
	CF1	1003	Plate Girder	15.17		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
		1004	Plate Girder	22.75		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
	CF2	1005	Plate Girder	30.33		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
		1006	Plate Girder	37.92		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
	CF3	1007	Plate Girder	45.50		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
		1008	Plate Girder	53.08		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
	CF4	1009	Plate Girder	60.67		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
		1010	Plate Girder	72.90		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.6	No
	Section Change	1011	Plate Girder	73.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.6	No
	CF5	1012	Plate Girder	75.83		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.6	No
	Section Change	1013	Plate Girder	81.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.6	No
	Pier 1	1014	Plate Girder	89.54		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	165.6	No
	Pier 1	1015	Plate Girder	91.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	Pier 1	1016	Plate Girder	92.46		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	178.9	No
Span 2 -Girder D	Section Change	1017	Plate Girder	100.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	CF6/Section Change	1018	Plate Girder	107.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	CF6	1019	Plate Girder	107.10		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	CF7	1020	Plate Girder	123.50		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1021	Plate Girder	131.63		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
	CF8	1022	Plate Girder	139.75		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1023	Plate Girder	147.88		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
	CF9	1024	Plate Girder	156.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1025	Plate Girder	164.13		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
	CF10	1026	Plate Girder	172.25		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1027	Plate Girder	180.38		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
	CF11	1028	Plate Girder	188.50		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1029	Plate Girder	204.90		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	CF12/Section Change	1030	Plate Girder	205.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	Section Change	1031	Plate Girder	212.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	Pier 2	1032	Plate Girder	219.54		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	178.9	No
	Pier 2	1033	Plate Girder	221.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	Pier 2	1034	Plate Girder	222.46		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	165.8	No
Span 3 - Girder D	Section Change	1035	Plate Girder	231.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.8	No
		1036	Plate Girder	231.10		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.8	No
	Section Change	1037	Plate Girder	239.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.8	No
		1038	Plate Girder	239.10		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.8	No
	CF14	1039	Plate Girder	251.33		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
		1040	Plate Girder	258.92		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
	CF15	1041	Plate Girder	266.50		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
		1042	Plate Girder	274.08		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
	CF16	1043	Plate Girder	281.67		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
		1044	Plate Girder	289.25		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
	CF17	1045	Plate Girder	296.83		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
		1046	Plate Girder	304.42		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
	East Abutment	1047	Plate Girder	312.00		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	1	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No

					Non-Composite Section																
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Top steel flange width	Top steel flange thk	Top steel flange area	Bott steel flange width	Bott steel flange thk	Bott steel flange area	Girder Web Depth	Girder Web thk	Girder web area	Total Steel Area	Moment of inertia	CG to Top/Flange	CG to Bott/Flange	Section Modulus about major bending axis		Moment of Inertia of top Flange	Moment of Inertia of bott Flange
					b_{f_top}	$t_{\_top\ flg}$	$A_{\_st\_top\_flg}$	b_{f_bott}	$t_{\_bott\ flg}$	$A_{\_st\_bott\_flg}$	$D_{\_web}$	$t_{\_web}$	$A_{\_web}$	$A_{\_steel}$	$I_{\_steel}$	Y_T	Y_D	$S_{\_top\_flg}$	$S_{\_bott\_flg}$	$I_{y\_top\_flg}$	$I_{y\_bott\_flg}$
				(ft)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^4)	(in^4)
	West Abutment	1001	Plate Girder	0.010	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
Span 1 -Girder D		1002	Plate Girder	7.58	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF1	1003	Plate Girder	15.17	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1004	Plate Girder	22.75	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF2	1005	Plate Girder	30.33	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1006	Plate Girder	37.92	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF3	1007	Plate Girder	45.50	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1008	Plate Girder	53.08	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF4	1009	Plate Girder	60.67	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1010	Plate Girder	72.90	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	Section Change	1011	Plate Girder	73.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	CF5	1012	Plate Girder	75.83	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	Section Change	1013	Plate Girder	81.00	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 1	1014	Plate Girder	89.54	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 1	1015	Plate Girder	91.00	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 1	1016	Plate Girder	92.46	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
Span 2 -Girder D	Section Change	1017	Plate Girder	100.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	CF6/Section Change	1018	Plate Girder	107.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	CF6	1019	Plate Girder	107.10	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF7	1020	Plate Girder	123.50	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1021	Plate Girder	131.63	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF8	1022	Plate Girder	139.75	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1023	Plate Girder	147.88	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF9	1024	Plate Girder	156.00	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1025	Plate Girder	164.13	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF10	1026	Plate Girder	172.25	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1027	Plate Girder	180.38	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF11	1028	Plate Girder	188.50	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1029	Plate Girder	204.90	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF12/Section Change	1030	Plate Girder	205.00	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	Section Change	1031	Plate Girder	212.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	Pier 2	1032	Plate Girder	219.54	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 2	1033	Plate Girder	221.00	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 2	1034	Plate Girder	222.46	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
Span 3 - Girder D	Section Change	1035	Plate Girder	231.00	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
		1036	Plate Girder	231.10	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	Section Change	1037	Plate Girder	239.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
		1038	Plate Girder	239.10	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF14	1039	Plate Girder	251.33	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1040	Plate Girder	258.92	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF15	1041	Plate Girder	266.50	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1042	Plate Girder	274.08	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF16	1043	Plate Girder	281.67	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1044	Plate Girder	289.25	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF17	1045	Plate Girder	296.83	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1046	Plate Girder	304.42	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	East Abutment	1047	Plate Girder	312.00	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7

					Composite Section with Modular Ratio = n (at Positive Moment Region)							Composite Section with Modular Ratio = 3n(at Positive Moment Reigion)							Composite Section with Modular Ratio = n (at Negative Moment Region)								
	Location	Girder Node ID	Is plate girder or box girder ?	Larsa Station	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Joint	Steel Section No.
					$A_{c(n)}$	$I_{c(n)}$	$Y_{slabc(n)}$	$Y_{tc(n)}$	$Y_{bc(n)}$	$S_{tc(n)}$	$S_{bc(n)}$	$A_{c(3n)}$	$I_{c(3n)}$	$Y_{slabc(3n)}$	$Y_{tc(3n)}$	$Y_{bc(3n)}$	$S_{tc(3n)}$	$S_{bc(3n)}$	A_c	I_c	Y_{slabc}	Y_{tc}	Y_{bc}	$S_{tc(n)}$	$S_{bc(n)}$		
				(ft)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)		
	West Abutment	1001	Plate Girder	0.010	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	West Abutment	D_Sect_1
Span 1 -Girder D		1002	Plate Girder	7.58	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		D_Sect_1
	CF1	1003	Plate Girder	15.17	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF1	D_Sect_1
		1004	Plate Girder	22.75	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		D_Sect_1
	CF2	1005	Plate Girder	30.33	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF2	D_Sect_1
		1006	Plate Girder	37.92	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		D_Sect_1
	CF3	1007	Plate Girder	45.50	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF3	D_Sect_1
		1008	Plate Girder	53.08	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		D_Sect_1
	CF4	1009	Plate Girder	60.67	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF4	D_Sect_1
		1010	Plate Girder	72.90	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6		D_Sect_1
	Section Change	1011	Plate Girder	73.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	Section Change	D_Sect_2
	CF5	1012	Plate Girder	75.83	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	CF5	D_Sect_2
	Section Change	1013	Plate Girder	81.00	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Section Change	D_Sect_3
	Pier 1	1014	Plate Girder	89.54	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 1	D_Sect_3
	Pier 1	1015	Plate Girder	91.00	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 1	D_Sect_3
	Pier 1	1016	Plate Girder	92.46	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 1	D_Sect_3
Span 2 -Girder D	Section Change	1017	Plate Girder	100.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	Section Change	D_Sect_4
	CF6/Section Change	1018	Plate Girder	107.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	F6/Section Chan	D_Sect_4
	CF6	1019	Plate Girder	107.10	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	CF6	D_Sect_5
	CF7	1020	Plate Girder	123.50	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF7	D_Sect_5
		1021	Plate Girder	131.63	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		D_Sect_5
	CF8	1022	Plate Girder	139.75	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF8	D_Sect_5
		1023	Plate Girder	147.88	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		D_Sect_5
	CF9	1024	Plate Girder	156.00	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF9	D_Sect_5
		1025	Plate Girder	164.13	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		D_Sect_5
	CF10	1026	Plate Girder	172.25	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF10	D_Sect_5
		1027	Plate Girder	180.38	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		D_Sect_5
	CF11	1028	Plate Girder	188.50	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF11	D_Sect_5
		1029	Plate Girder	204.90	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0		D_Sect_5
	CF12/Section Change	1030	Plate Girder	205.00	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	12/Section Char	D_Sect_5
	Section Change	1031	Plate Girder	212.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	Section Change	D_Sect_6
	Pier 2	1032	Plate Girder	219.54	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 2	D_Sect_7
	Pier 2	1033	Plate Girder	221.00	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 2	D_Sect_7
	Pier 2	1034	Plate Girder	222.46	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 2	D_Sect_7
Span 3 - Girder D	Section Change	1035	Plate Girder	231.00	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Section Change	D_Sect_7
		1036	Plate Girder	231.10	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1		D_Sect_8
	Section Change	1037	Plate Girder	239.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	Section Change	D_Sect_8
		1038	Plate Girder	239.10	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6		D_Sect_9
	CF14	1039	Plate Girder	251.33	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF14	D_Sect_9
		1040	Plate Girder	258.92	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		D_Sect_9
	CF15	1041	Plate Girder	266.50	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF15	D_Sect_9
		1042	Plate Girder	274.08	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		D_Sect_9
	CF16	1043	Plate Girder	281.67	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF16	D_Sect_9
		1044	Plate Girder	289.25	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		D_Sect_9
	CF17	1045	Plate Girder	296.83	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF17	D_Sect_9
		1046	Plate Girder	304.42	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		D_Sect_9
	East Abutment	1047	Plate Girder	312.00	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	East Abutment	D_Sect_9

	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Top Flange PL width	Bottom Flange PL width	Top Flange PL thickness	Bottom Flange PL thickness	Web thickness	Web depth	Effective Width (Link from plan)	Total thickness of concrete deck	Thickness of wearing surface	Effective thickness of concrete deck	Fillet Height	Fillet Width	% of rebar within effective of deck	Area of rebar within effective deck width
					$W_{\_tc1}$	$W_{\_bc1}$	$T_{\_tc1}$	$T_{\_bc1}$	$T_{\_web}$	$D_{\_web}$	$B_{\_effective}$	$t_{\_deck\_total}$	$t_{\_wearing}$	$t_{\_deck\_effective}$	$H_{\_fillet}$	$b_{\_fillet}$		A_{rs}
				(ft)	(in)	(in)	(in)	(in)	(in)	(in)	(ft)	(in)	(in)	(in)	(in)	(in)		(in^2)
	West Abutment	1001	Plate Girder	0.010	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16.0	0.614%	4.423
Span 1 -Girder D		1002	Plate Girder	7.58	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF1	1003	Plate Girder	15.17	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1004	Plate Girder	22.75	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF2	1005	Plate Girder	30.33	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1006	Plate Girder	37.92	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF3	1007	Plate Girder	45.50	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1008	Plate Girder	53.08	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF4	1009	Plate Girder	60.67	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1010	Plate Girder	72.90	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1011	Plate Girder	73.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF5	1012	Plate Girder	75.83	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1013	Plate Girder	81.00	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 1	1014	Plate Girder	89.54	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 1	1015	Plate Girder	91.00	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 1	1016	Plate Girder	92.46	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
Span 2 -Girder D	Section Change	1017	Plate Girder	100.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF6/Section Change	1018	Plate Girder	107.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF6	1019	Plate Girder	107.10	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF7	1020	Plate Girder	123.50	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1021	Plate Girder	131.63	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF8	1022	Plate Girder	139.75	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1023	Plate Girder	147.88	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF9	1024	Plate Girder	156.00	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1025	Plate Girder	164.13	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF10	1026	Plate Girder	172.25	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1027	Plate Girder	180.38	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF11	1028	Plate Girder	188.50	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1029	Plate Girder	204.90	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF12/Section Change	1030	Plate Girder	205.00	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1031	Plate Girder	212.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 2	1032	Plate Girder	219.54	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 2	1033	Plate Girder	221.00	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 2	1034	Plate Girder	222.46	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
Span 3 - Girder D	Section Change	1035	Plate Girder	231.00	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
		1036	Plate Girder	231.10	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1037	Plate Girder	239.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
		1038	Plate Girder	239.10	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF14	1039	Plate Girder	251.33	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1040	Plate Girder	258.92	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF15	1041	Plate Girder	266.50	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1042	Plate Girder	274.08	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF16	1043	Plate Girder	281.67	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1044	Plate Girder	289.25	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF17	1045	Plate Girder	296.83	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1046	Plate Girder	304.42	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	East Abutment	1047	Plate Girder	312.00	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423

Designed by: MX on 08/20/2017
Checked by: TFK on 08/30/2017
Backchecked by: MX on 08/30/2017

								Resistance Factor		Longitudinal Stiffener dist to Bott Flange		Transverse Stiffener			Hybrid factor	Material Properties													
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Flange lateral bending stress	Load Factor		Flexual	Shear	No, of Longitudinal stiffener provided ?	Dist from stiffener to bottom flg	Is transverse stiffener provided?	Transverse Stiffener Spacing	Is end panel or interior panel?		Specified min flg yield strength	Specified web flg yield strength	Specified min yield strength of comp. flg	Rebar yield strength	Conc deck	Girder E	Conc deck	Modular Ratio	Area of deck rebar within effective width	Deck thickness	Haunch thickness	Effective width of the deck	Shear Stud Location	Unbracing length for M-	Is Section Loss Considered /
					f_l	Condition Factor ϕ_c	System Factor ϕs	ϕ_f	ϕ_v		d_s	(Yes =0,No=1)	d_o	(Interior =0, End=1)	R_h	F_{yf}	F_{yw}	F_{yc}	F_{y_rebar}	f_c	$E_{\_steel}$	$E_{\_deck}$	n	A_{rs}	$t_{\_deck}$	$h_{\_haunch}$	b_{eff}	(Stud provided =Yes: No shear stud = No)	L_b	
								6.5.4.2	6.5.4.2						6.10.1.10.1															
				(ft)	(ksi)						(in)		(ft)			(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)		(in^2)	(in)	(in)	(ft)		(in)	
	West Abutment	1048	Plate Girder	0.010		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	1	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
Span 1 -Girder C		1049	Plate Girder	7.58		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
	CF1	1050	Plate Girder	15.17		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
		1051	Plate Girder	22.75		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
	CF2	1052	Plate Girder	30.33		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
		1053	Plate Girder	37.92		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
	CF3	1054	Plate Girder	45.50		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
		1055	Plate Girder	53.08		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
	CF4	1056	Plate Girder	60.67		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
		1057	Plate Girder	72.90		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.6	No
	Section Change	1058	Plate Girder	73.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.6	No
	CF5	1059	Plate Girder	75.83		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.6	No
	Section Change	1060	Plate Girder	81.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.6	No
	Pier 1	1061	Plate Girder	89.54		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	165.6	No
	Pier 1	1062	Plate Girder	91.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	Pier 1	1063	Plate Girder	92.46		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	178.9	No
Span 2 -Girder C	Section Change	1064	Plate Girder	100.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	CF6/Section Change	1065	Plate Girder	107.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	CF6	1066	Plate Girder	107.10		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	CF7	1067	Plate Girder	123.50		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1068	Plate Girder	131.63		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
	CF8	1069	Plate Girder	139.75		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1070	Plate Girder	147.88		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
	CF9	1071	Plate Girder	156.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1072	Plate Girder	164.13		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
	CF10	1073	Plate Girder	172.25		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1074	Plate Girder	180.38		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
	CF11	1075	Plate Girder	188.50		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1076	Plate Girder	204.90		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	CF12/Section Change	1077	Plate Girder	205.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	Section Change	1078	Plate Girder	212.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	Pier 2	1079	Plate Girder	219.54		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	178.9	No
	Pier 2	1080	Plate Girder	221.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	Pier 2	1081	Plate Girder	222.46		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	165.8	No
Span 3 - Girder C	Section Change	1082	Plate Girder	231.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.8	No
		1083	Plate Girder	231.10		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.8	No
	Section Change	1084	Plate Girder	239.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.8	No
		1085	Plate Girder	239.10		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.8	No
	CF14	1086	Plate Girder	251.33		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
		1087	Plate Girder	258.92		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
	CF15	1088	Plate Girder	266.50		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
		1089	Plate Girder	274.08		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
	CF16	1090	Plate Girder	281.67		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
		1091	Plate Girder	289.25		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
	CF17	1092	Plate Girder	296.83		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
		1093	Plate Girder	304.42		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
	East Abutment	1094	Plate Girder	312.00		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	1	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No

					Non-Composite Section																
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Top steel flange width	Top steel flange thk	Top steel flange area	Bott steel flange width	Bott steel flange thk	Bott steel flange area	Girder Web Depth	Girder Web thk	Girder web area	Total Steel Area	Moment of inertia	CG to Top/Flange	CG to Bott/Flange	Section Modulus about major bending axis		Moment of Inertia of top Flange	Moment of Inertia of bott Flange
					b_{f_top}	$t_{\_top\ flg}$	$A_{\_st\_top\_flg}$	b_{f_bott}	$t_{\_bott\ flg}$	$A_{\_st\_bott\_flg}$	$D_{\_web}$	$t_{\_web}$	$A_{\_web}$	$A_{\_steel}$	$I_{\_steel}$	Y_T	Y_D	$S_{\_top\_flg}$	$S_{\_bott\_flg}$	$I_{y\_top\_flg}$	$I_{y\_bott\_flg}$
				(ft)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^4)	(in^4)
	West Abutment	1048	Plate Girder	0.010	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1049	Plate Girder	7.58	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF1	1050	Plate Girder	15.17	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1051	Plate Girder	22.75	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF2	1052	Plate Girder	30.33	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1053	Plate Girder	37.92	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
Span 1 -Girder C	CF3	1054	Plate Girder	45.50	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1055	Plate Girder	53.08	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF4	1056	Plate Girder	60.67	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1057	Plate Girder	72.90	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	Section Change	1058	Plate Girder	73.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	CF5	1059	Plate Girder	75.83	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	Section Change	1060	Plate Girder	81.00	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 1	1061	Plate Girder	89.54	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 1	1062	Plate Girder	91.00	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 1	1063	Plate Girder	92.46	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Section Change	1064	Plate Girder	100.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	CF6/Section Change	1065	Plate Girder	107.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	CF6	1066	Plate Girder	107.10	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF7	1067	Plate Girder	123.50	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1068	Plate Girder	131.63	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF8	1069	Plate Girder	139.75	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1070	Plate Girder	147.88	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
Span 2 -Girder C	CF9	1071	Plate Girder	156.00	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1072	Plate Girder	164.13	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF10	1073	Plate Girder	172.25	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1074	Plate Girder	180.38	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF11	1075	Plate Girder	188.50	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1076	Plate Girder	204.90	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF12/Section Change	1077	Plate Girder	205.00	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	Section Change	1078	Plate Girder	212.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	Pier 2	1079	Plate Girder	219.54	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 2	1080	Plate Girder	221.00	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 2	1081	Plate Girder	222.46	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Section Change	1082	Plate Girder	231.00	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
		1083	Plate Girder	231.10	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	Section Change	1084	Plate Girder	239.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
		1085	Plate Girder	239.10	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF14	1086	Plate Girder	251.33	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1087	Plate Girder	258.92	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
Span 3 - Girder C	CF15	1088	Plate Girder	266.50	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1089	Plate Girder	274.08	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF16	1090	Plate Girder	281.67	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1091	Plate Girder	289.25	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF17	1092	Plate Girder	296.83	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1093	Plate Girder	304.42	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	East Abutment	1094	Plate Girder	312.00	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0

Designed by: MX on 08/20/2017
Checked by: TFK on 08/30/2017
Backchecked by: MX on 08/30/2017

					Composite Section with Modular Ratio = n (at Positive Moment Region)							Composite Section with Modular Ratio = 3n(at Positive Moment Reigion)							Composite Section with Modular Ratio = n (at Negative Moment Region)								
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Joint	Steel Section No.
					$A_{c(n)}$	$I_{c(n)}$	$Y_{slabc(n)}$	$Y_{tc(n)}$	$Y_{bc(n)}$	$S_{tc(n)}$	$S_{bc(n)}$	$A_{c(3n)}$	$I_{c(3n)}$	$Y_{slabc(3n)}$	$Y_{tc(3n)}$	$Y_{bc(3n)}$	$S_{tc(3n)}$	$S_{bc(3n)}$	A_c	I_c	Y_{slabc}	Y_{tc}	Y_{bc}	$S_{tc(n)}$	$S_{bc(n)}$		
				(ft)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)		
	West Abutment	1048	Plate Girder	0.010	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	West Abutment	C_Sect_1
Span 1 -Girder C		1049	Plate Girder	7.58	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		C_Sect_1
	CF1	1050	Plate Girder	15.17	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF1	C_Sect_1
		1051	Plate Girder	22.75	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		C_Sect_1
	CF2	1052	Plate Girder	30.33	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF2	C_Sect_1
		1053	Plate Girder	37.92	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		C_Sect_1
	CF3	1054	Plate Girder	45.50	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF3	C_Sect_1
		1055	Plate Girder	53.08	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		C_Sect_1
	CF4	1056	Plate Girder	60.67	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF4	C_Sect_1
		1057	Plate Girder	72.90	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0		C_Sect_1
	Section Change	1058	Plate Girder	73.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	Section Change	C_Sect_2
	CF5	1059	Plate Girder	75.83	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	CF5	C_Sect_2
	Section Change	1060	Plate Girder	81.00	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Section Change	C_Sect_3
	Pier 1	1061	Plate Girder	89.54	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 1	C_Sect_3
	Pier 1	1062	Plate Girder	91.00	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 1	C_Sect_3
	Pier 1	1063	Plate Girder	92.46	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 1	C_Sect_3
Span 2 -Girder C	Section Change	1064	Plate Girder	100.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	Section Change	C_Sect_4
	CF6/Section Change	1065	Plate Girder	107.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	F6/Section Chan	C_Sect_4
	CF6	1066	Plate Girder	107.10	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	CF6	C_Sect_5
	CF7	1067	Plate Girder	123.50	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF7	C_Sect_5
		1068	Plate Girder	131.63	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1		C_Sect_5
	CF8	1069	Plate Girder	139.75	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF8	C_Sect_5
		1070	Plate Girder	147.88	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1		C_Sect_5
	CF9	1071	Plate Girder	156.00	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF9	C_Sect_5
		1072	Plate Girder	164.13	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1		C_Sect_5
	CF10	1073	Plate Girder	172.25	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF10	C_Sect_5
		1074	Plate Girder	180.38	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1		C_Sect_5
	CF11	1075	Plate Girder	188.50	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF11	C_Sect_5
		1076	Plate Girder	204.90	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5		C_Sect_5
	CF12/Section Change	1077	Plate Girder	205.00	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	12/Section Char	C_Sect_5
	Section Change	1078	Plate Girder	212.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	Section Change	C_Sect_6
	Pier 2	1079	Plate Girder	219.54	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 2	C_Sect_7
	Pier 2	1080	Plate Girder	221.00	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 2	C_Sect_7
	Pier 2	1081	Plate Girder	222.46	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 2	C_Sect_7
Span 3 - Girder C	Section Change	1082	Plate Girder	231.00	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Section Change	C_Sect_7
		1083	Plate Girder	231.10	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4		C_Sect_8
	Section Change	1084	Plate Girder	239.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	Section Change	C_Sect_8
		1085	Plate Girder	239.10	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0		C_Sect_9
	CF14	1086	Plate Girder	251.33	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF14	C_Sect_9
		1087	Plate Girder	258.92	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		C_Sect_9
	CF15	1088	Plate Girder	266.50	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF15	C_Sect_9
		1089	Plate Girder	274.08	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		C_Sect_9
	CF16	1090	Plate Girder	281.67	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF16	C_Sect_9
		1091	Plate Girder	289.25	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		C_Sect_9
	CF17	1092	Plate Girder	296.83	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF17	C_Sect_9
		1093	Plate Girder	304.42	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		C_Sect_9
	East Abutment	1094	Plate Girder	312.00	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	East Abutment	C_Sect_9

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Designed by: MX on 08/20/2017
Checked by: TFK on 08/30/2017
Backchecked by: MX on 08/30/2017

	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Top Flange PL width	Bottom Flange PL width	Top Flange PL thickness	Bottom Flange PL thickness	Web thickness	Web depth	Effective Width (Link from plan)	Total thickness of concrete deck	Thickness of wearing surface	Effective thickness of concrete deck	Fillet Height	Fillet Width	% of rebar within effective of deck	Area of rebar within effective deck width
					$W_{\_tc1}$	$W_{\_bc1}$	$T_{\_tc1}$	$T_{\_bc1}$	$T_{\_web}$	$D_{\_web}$	$B_{\_effective}$	$t_{\_deck\_total}$	$t_{\_wearing}$	$t_{\_deck\_effective}$	$H_{\_fillet}$	$b_{\_fillet}$		A_{rs}
				(ft)	(in)	(in)	(in)	(in)	(in)	(in)	(ft)	(in)	(in)	(in)	(in)	(in)		(in^2)
	West Abutment	1048	Plate Girder	0.010	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16.0	0.614%	5.406
Span 1 -Girder C		1049	Plate Girder	7.58	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF1	1050	Plate Girder	15.17	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1051	Plate Girder	22.75	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF2	1052	Plate Girder	30.33	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1053	Plate Girder	37.92	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF3	1054	Plate Girder	45.50	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1055	Plate Girder	53.08	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF4	1056	Plate Girder	60.67	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1057	Plate Girder	72.90	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Section Change	1058	Plate Girder	73.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF5	1059	Plate Girder	75.83	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Section Change	1060	Plate Girder	81.00	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 1	1061	Plate Girder	89.54	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 1	1062	Plate Girder	91.00	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 1	1063	Plate Girder	92.46	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
Span 2 -Girder C	Section Change	1064	Plate Girder	100.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF6/Section Change	1065	Plate Girder	107.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF6	1066	Plate Girder	107.10	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF7	1067	Plate Girder	123.50	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1068	Plate Girder	131.63	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF8	1069	Plate Girder	139.75	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1070	Plate Girder	147.88	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF9	1071	Plate Girder	156.00	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1072	Plate Girder	164.13	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF10	1073	Plate Girder	172.25	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1074	Plate Girder	180.38	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF11	1075	Plate Girder	188.50	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1076	Plate Girder	204.90	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF12/Section Change	1077	Plate Girder	205.00	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Section Change	1078	Plate Girder	212.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 2	1079	Plate Girder	219.54	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 2	1080	Plate Girder	221.00	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 2	1081	Plate Girder	222.46	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
Span 3 - Girder C	Section Change	1082	Plate Girder	231.00	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
		1083	Plate Girder	231.10	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Section Change	1084	Plate Girder	239.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
		1085	Plate Girder	239.10	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF14	1086	Plate Girder	251.33	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1087	Plate Girder	258.92	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF15	1088	Plate Girder	266.50	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1089	Plate Girder	274.08	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF16	1090	Plate Girder	281.67	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1091	Plate Girder	289.25	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF17	1092	Plate Girder	296.83	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1093	Plate Girder	304.42	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	East Abutment	1094	Plate Girder	312.00	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406

						Load Factor		Resistance Factor		Longitudinal Stiffener dist to Bott Flange		Transverse Stiffener			Hybrid factor	Material Properties														
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Flange lateral bending stress			Flexual	Shear	No. of Longitudinal stiffener provided ?	Dist from stiffener to bottom flg	Is transverse stiffener provided?	Transverse Stiffener Spacing	Is end panel or interior panel?		Specified min flg yield strength	Specified web flg yield strength	Specified min yield strength of comp. flg	Rebar yield strength	Conc deck	Girder E	Conc deck	Modular Ratio	Area of deck rebar within effective width	Deck thickness	Haunch thickness	Effective width of the deck	Shear Stud Location	Unbracing length for M-	Is Section Loss Considered /
					f_l	Condition Factor ϕ_c	System Factor ϕs	ϕ_f	ϕ_v		d_s	(Yes =0,No=1)	d_o	(Interior =0, End=1)	R_h	F_{yf}	F_{yw}	F_{yc}	F_{y_rebar}	f_c	$E_{\_steel}$	$E_{\_deck}$	n	A_{rs}	$t_{\_deck}$	$h_{\_haunch}$	b_{eff}	(Stud provided =Yes: No shear stud = No)	L_b	
								6.5.4.2	6.5.4.2						6.10.1.10.1															
				(ft)	(ksi)						(in)		(ft)			(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)		(in^2)	(in)	(in)	(ft)		(in)	
	West Abutment	1095	Plate Girder	0.010		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	1	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
Span 1 -Girder B		1096	Plate Girder	7.58		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
	CF1	1097	Plate Girder	15.17		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
		1098	Plate Girder	22.75		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
	CF2	1099	Plate Girder	30.33		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
		1100	Plate Girder	37.92		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
	CF3	1101	Plate Girder	45.50		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
		1102	Plate Girder	53.08		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
	CF4	1103	Plate Girder	60.67		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.6	No
		1104	Plate Girder	72.90		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.6	No
	Section Change	1105	Plate Girder	73.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.6	No
	CF5	1106	Plate Girder	75.83		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.6	No
	Section Change	1107	Plate Girder	81.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.6	No
	Pier 1	1108	Plate Girder	89.54		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	165.6	No
	Pier 1	1109	Plate Girder	91.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	Pier 1	1110	Plate Girder	92.46		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	178.9	No
Span 2 -Girder B	Section Change	1111	Plate Girder	100.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	CF6/Section Change	1112	Plate Girder	107.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	CF6	1113	Plate Girder	107.10		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	CF7	1114	Plate Girder	123.50		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1115	Plate Girder	131.63		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
	CF8	1116	Plate Girder	139.75		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1117	Plate Girder	147.88		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
	CF9	1118	Plate Girder	156.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1119	Plate Girder	164.13		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
	CF10	1120	Plate Girder	172.25		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1121	Plate Girder	180.38		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
	CF11	1122	Plate Girder	188.50		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	196.9	No
		1123	Plate Girder	204.90		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	CF12/Section Change	1124	Plate Girder	205.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	Section Change	1125	Plate Girder	212.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	Pier 2	1126	Plate Girder	219.54		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	178.9	No
	Pier 2	1127	Plate Girder	221.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	196.9	No
	Pier 2	1128	Plate Girder	222.46		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	165.8	No
Span 3 - Girder B	Section Change	1129	Plate Girder	231.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.8	No
		1130	Plate Girder	231.10		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.8	No
	Section Change	1131	Plate Girder	239.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.8	No
		1132	Plate Girder	239.10		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	9.2	No	183.8	No
	CF14	1133	Plate Girder	251.33		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
		1134	Plate Girder	258.92		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
	CF15	1135	Plate Girder	266.50		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
		1136	Plate Girder	274.08		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
	CF16	1137	Plate Girder	281.67		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
		1138	Plate Girder	289.25		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
	CF17	1139	Plate Girder	296.83		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
		1140	Plate Girder	304.42		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No
	East Abutment	1141	Plate Girder	312.00		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	1	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	5.4	8.0	1.5	9.2	Yes	183.8	No

					Non-Composite Section																
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Top steel flange width	Top steel flange thk	Top steel flange area	Bott steel flange width	Bott steel flange thk	Bott steel flange area	Girder Web Depth	Girder Web thk	Girder web area	Total Steel Area	Moment of inertia	CG to Top/Flange	CG to Bott/Flange	Section Modulus about major bending axis		Moment of Inertia of top Flange	Moment of Inertia of bott Flange
					b_{f_top}	$t_{\_top\ flg}$	$A_{\_st\_top\_flg}$	b_{f_bott}	$t_{\_bott\ flg}$	$A_{\_st\_bott\_flg}$	$D_{\_web}$	$t_{\_web}$	$A_{\_web}$	$A_{\_steel}$	$I_{\_steel}$	Y_T	Y_D	$S_{\_top\_flg}$	$S_{\_bott\_flg}$	$I_{y\_top\_flg}$	$I_{y\_bott\_flg}$
				(ft)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^4)	(in^4)
	West Abutment	1095	Plate Girder	0.010	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
Span 1 -Girder B		1096	Plate Girder	7.58	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF1	1097	Plate Girder	15.17	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1098	Plate Girder	22.75	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF2	1099	Plate Girder	30.33	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1100	Plate Girder	37.92	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF3	1101	Plate Girder	45.50	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1102	Plate Girder	53.08	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF4	1103	Plate Girder	60.67	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1104	Plate Girder	72.90	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	Section Change	1105	Plate Girder	73.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	CF5	1106	Plate Girder	75.83	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	Section Change	1107	Plate Girder	81.00	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 1	1108	Plate Girder	89.54	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 1	1109	Plate Girder	91.00	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 1	1110	Plate Girder	92.46	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
Span 2 -Girder B	Section Change	1111	Plate Girder	100.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	CF6/Section Change	1112	Plate Girder	107.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	CF6	1113	Plate Girder	107.10	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF7	1114	Plate Girder	123.50	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1115	Plate Girder	131.63	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF8	1116	Plate Girder	139.75	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1117	Plate Girder	147.88	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF9	1118	Plate Girder	156.00	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1119	Plate Girder	164.13	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF10	1120	Plate Girder	172.25	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1121	Plate Girder	180.38	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF11	1122	Plate Girder	188.50	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
		1123	Plate Girder	204.90	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	CF12/Section Change	1124	Plate Girder	205.00	16.0	0.750	12.00	16.0	1.750	28.0	54.0	0.3750	20.3	60.3	32286.6	35.3	21.2	915.9	1519.5	256.0	597.3
	Section Change	1125	Plate Girder	212.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	Pier 2	1126	Plate Girder	219.54	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 2	1127	Plate Girder	221.00	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
	Pier 2	1128	Plate Girder	222.46	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
Span 3 - Girder B	Section Change	1129	Plate Girder	231.00	16.0	2.375	38.00	16.0	2.375	38.0	54.0	0.3750	20.3	96.3	65341.1	29.4	29.4	2224.4	2224.4	810.7	810.7
		1130	Plate Girder	231.10	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
	Section Change	1131	Plate Girder	239.00	16.0	1.500	24.00	16.0	2.375	38.0	54.0	0.3750	20.3	82.3	51621.5	33.4	24.4	1544.4	2111.4	512.0	810.7
		1132	Plate Girder	239.10	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF14	1133	Plate Girder	251.33	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1134	Plate Girder	258.92	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF15	1135	Plate Girder	266.50	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1136	Plate Girder	274.08	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF16	1137	Plate Girder	281.67	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1138	Plate Girder	289.25	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF17	1139	Plate Girder	296.83	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1140	Plate Girder	304.42	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	East Abutment	1141	Plate Girder	312.00	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0

	Location	Girder Node ID	Is plate girder or box girder ?	Larsa Station	Composite Section with Modular Ratio = n (at Positive Moment Region) Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel
					$A_{c(n)}$	$I_{c(n)}$	$Y_{slabc(n)}$	$Y_{tc(n)}$	$Y_{bc(n)}$	$S_{tc(n)}$	$S_{bc(n)}$
				(ft)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)
	West Abutment	1095	Plate Girder	0.010	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
Span 1 -Girder B		1096	Plate Girder	7.58	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
	CF1	1097	Plate Girder	15.17	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
		1098	Plate Girder	22.75	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
	CF2	1099	Plate Girder	30.33	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
		1100	Plate Girder	37.92	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
	CF3	1101	Plate Girder	45.50	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
		1102	Plate Girder	53.08	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
	CF4	1103	Plate Girder	60.67	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
		1104	Plate Girder	72.90	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0
	Section Change	1105	Plate Girder	73.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
	CF5	1106	Plate Girder	75.83	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
	Section Change	1107	Plate Girder	81.00	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
	Pier 1	1108	Plate Girder	89.54	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
	Pier 1	1109	Plate Girder	91.00	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
	Pier 1	1110	Plate Girder	92.46	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
Span 2 -Girder B	Section Change	1111	Plate Girder	100.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
	CF6/Section Change	1112	Plate Girder	107.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
	CF6	1113	Plate Girder	107.10	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5
	CF7	1114	Plate Girder	123.50	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
		1115	Plate Girder	131.63	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
	CF8	1116	Plate Girder	139.75	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
		1117	Plate Girder	147.88	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
	CF9	1118	Plate Girder	156.00	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
		1119	Plate Girder	164.13	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
	CF10	1120	Plate Girder	172.25	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
		1121	Plate Girder	180.38	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
	CF11	1122	Plate Girder	188.50	173.3	97798.7	18.3	8.8	47.7	11171.5	2048.3
		1123	Plate Girder	204.90	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5
	CF12/Section Change	1124	Plate Girder	205.00	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5
	Section Change	1125	Plate Girder	212.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
	Pier 2	1126	Plate Girder	219.54	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
	Pier 2	1127	Plate Girder	221.00	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
	Pier 2	1128	Plate Girder	222.46	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
Span 3 - Girder B	Section Change	1129	Plate Girder	231.00	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
		1130	Plate Girder	231.10	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
	Section Change	1131	Plate Girder	239.00	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
		1132	Plate Girder	239.10	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0
	CF14	1133	Plate Girder	251.33	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
		1134	Plate Girder	258.92	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
	CF15	1135	Plate Girder	266.50	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
		1136	Plate Girder	274.08	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
	CF16	1137	Plate Girder	281.67	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
		1138	Plate Girder	289.25	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
	CF17	1139	Plate Girder	296.83	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
		1140	Plate Girder	304.42	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5
	East Abutment	1141	Plate Girder	312.00	169.3	88513.4	17.1	7.6	48.6	11602.4	1820.5

Girder Node ID	Composite Section with Modular Ratio = 3n(at Positive Moment Reigion) Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel
	$A_{c(3n)}$	$I_{c(3n)}$	$Y_{slabc(3n)}$	$Y_{tc(3n)}$	$Y_{bc(3n)}$	$S_{tc(3n)}$	$S_{bc(3n)}$
	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)
1095	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1096	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1097	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1098	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1099	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1100	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1101	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1102	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1103	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1104	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0
1105	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
1106	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
1107	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
1108	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
1109	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
1110	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
1111	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
1112	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
1113	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5
1114	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1115	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1116	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1117	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1118	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1119	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1120	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1121	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1122	97.9	70757.3	29.1	19.6	36.9	3605.6	1918.8
1123	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5
1124	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5
1125	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
1126	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
1127	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
1128	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
1129	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4
1130	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
1131	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4
1132	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0
1133	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1134	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1135	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1136	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1137	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1138	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1139	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1140	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2
1141	93.9	65124.7	27.6	18.1	38.2	3606.3	1705.2

Girder Node ID	Composite Section with Modular Ratio = n (at Negative Moment Region) Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Joint	Steel Section No.
	A_c	I_c	Y_{slabc}	Y_{tc}	Y_{bc}	$S_{tc(n)}$	$S_{bc(n)}$		
	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)		
1095	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	West Abutment	B_Sect_1
1096	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		B_Sect_1
1097	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF1	B_Sect_1
1098	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		B_Sect_1
1099	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF2	B_Sect_1
1100	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		B_Sect_1
1101	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF3	B_Sect_1
1102	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		B_Sect_1
1103	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF4	B_Sect_1
1104	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0		B_Sect_1
1105	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	Section Change	B_Sect_2
1106	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	CF5	B_Sect_2
1107	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Section Change	B_Sect_3
1108	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 1	B_Sect_3
1109	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 1	B_Sect_3
1110	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 1	B_Sect_3
1111	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	Section Change	B_Sect_4
1112	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	F6/Section Chan	B_Sect_4
1113	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	CF6	B_Sect_5
1114	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF7	B_Sect_5
1115	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1		B_Sect_5
1116	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF8	B_Sect_5
1117	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1		B_Sect_5
1118	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF9	B_Sect_5
1119	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1		B_Sect_5
1120	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF10	B_Sect_5
1121	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1		B_Sect_5
1122	65.7	40525.5	41.4	31.9	24.6	1270.5	1647.1	CF11	B_Sect_5
1123	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5		B_Sect_5
1124	60.3	32286.6	N/A	35.3	21.2	915.9	1519.5	12/Section Char	B_Sect_5
1125	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	Section Change	B_Sect_6
1126	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 2	B_Sect_7
1127	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 2	B_Sect_7
1128	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Pier 2	B_Sect_7
1129	96.3	65341.1	N/A	29.4	29.4	2224.4	2224.4	Section Change	B_Sect_7
1130	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4		B_Sect_8
1131	82.3	51621.5	N/A	33.4	24.4	1544.4	2111.4	Section Change	B_Sect_8
1132	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0		B_Sect_9
1133	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF14	B_Sect_9
1134	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		B_Sect_9
1135	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF15	B_Sect_9
1136	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		B_Sect_9
1137	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF16	B_Sect_9
1138	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		B_Sect_9
1139	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	CF17	B_Sect_9
1140	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8		B_Sect_9
1141	61.7	37973.2	39.8	30.3	25.9	1252.9	1463.8	East Abutment	B_Sect_9

	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Top Flange PL width	Bottom Flange PL width	Top Flange PL thickness	Bottom Flange PL thickness	Web thickness	Web depth	Effective Width (Link from plan)	Total thickness of concrete deck	Thickness of wearing surface	Effective thickness of concrete deck	Fillet Height	Fillet Width	% of rebar within effective of deck	Area of rebar within effective deck width
					$W_{\_tc1}$	$W_{\_bc1}$	$T_{\_tc1}$	$T_{\_bc1}$	$T_{\_web}$	$D_{\_web}$	$B_{\_effective}$	$t_{\_deck\_total}$	$t_{\_wearing}$	$t_{\_deck\_effective}$	$H_{\_fillet}$	$b_{\_fillet}$		A_{rs}
				(ft)	(in)	(in)	(in)	(in)	(in)	(in)	(ft)	(in)	(in)	(in)	(in)	(in)		(in^2)
	West Abutment	1095	Plate Girder	0.010	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16.0	0.614%	5.406
Span 1 -Girder B		1096	Plate Girder	7.58	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF1	1097	Plate Girder	15.17	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1098	Plate Girder	22.75	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF2	1099	Plate Girder	30.33	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1100	Plate Girder	37.92	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF3	1101	Plate Girder	45.50	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1102	Plate Girder	53.08	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF4	1103	Plate Girder	60.67	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1104	Plate Girder	72.90	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Section Change	1105	Plate Girder	73.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF5	1106	Plate Girder	75.83	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Section Change	1107	Plate Girder	81.00	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 1	1108	Plate Girder	89.54	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 1	1109	Plate Girder	91.00	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 1	1110	Plate Girder	92.46	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
Span 2 -Girder B	Section Change	1111	Plate Girder	100.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF6/Section Change	1112	Plate Girder	107.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF6	1113	Plate Girder	107.10	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF7	1114	Plate Girder	123.50	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1115	Plate Girder	131.63	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF8	1116	Plate Girder	139.75	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1117	Plate Girder	147.88	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF9	1118	Plate Girder	156.00	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1119	Plate Girder	164.13	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF10	1120	Plate Girder	172.25	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1121	Plate Girder	180.38	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF11	1122	Plate Girder	188.50	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1123	Plate Girder	204.90	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF12/Section Change	1124	Plate Girder	205.00	16.0	16.0	0.750	1.750	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Section Change	1125	Plate Girder	212.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 2	1126	Plate Girder	219.54	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 2	1127	Plate Girder	221.00	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Pier 2	1128	Plate Girder	222.46	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
Span 3 - Girder B	Section Change	1129	Plate Girder	231.00	16.0	16.0	2.375	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
		1130	Plate Girder	231.10	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	Section Change	1131	Plate Girder	239.00	16.0	16.0	1.500	2.375	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
		1132	Plate Girder	239.10	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16		
	CF14	1133	Plate Girder	251.33	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1134	Plate Girder	258.92	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF15	1135	Plate Girder	266.50	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1136	Plate Girder	274.08	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF16	1137	Plate Girder	281.67	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1138	Plate Girder	289.25	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	CF17	1139	Plate Girder	296.83	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
		1140	Plate Girder	304.42	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406
	East Abutment	1141	Plate Girder	312.00	16.0	16.0	0.750	1.500	0.375	54.0	9.167	8.500	2.000	8.00	1.500	16	0.614%	5.406

	Location	Girder Node ID	Is plate girder or box girder ?	Larsa Station	Flange lateral bending stress	Load Factor		Resistance Factor		Longitudinal Stiffener dist to Bott Flange		Transverse Stiffener			Hybrid factor	Material Properties								Area of deck rebar within effective width	Deck thickness	Haunch thickness	Effective width of the deck	Shear Stud Location	Unbracing length for M-	Is Section Loss Considered /
								Flexual	Shear	No, of Longitudinal stiffener provided ?	Dist from stiffener to bottom flg	Is transverse stiffener provided?	Transverse Stiffener Spacing	Is end panel or interior panel?		Specified min flg yield strength	Specified web flg yield strength	Specified min yield strength of comp. flg	Rebar yield strength	Conc deck	Girder E	Conc deck	Modular Ratio							
					f_l	Condition Factor ϕ_c	System Factor ϕs	ϕ_f	ϕ_v		d_s	(Yes =0,No=1)	d_o	(Interior =0, End=1)	R_h	F_{yf}	F_{yw}	F_{yc}	F_{y_rebar}	f_c	$E_{\_steel}$	$E_{\_deck}$	n	A_{rs}	$t_{\_deck}$	$h_{\_haunch}$	b_{eff}	(Stud provided =Yes: No shear stud = No)	L_b	
								6.5.4.2	6.5.4.2						6.10.1.10.1															
				(ft)	(ksi)						(in)		(ft)			(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)		(in^2)	(in)	(in)	(ft)		(in)	
	West Abutment	1142	Plate Girder	0.010		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	1	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
Span 1 -Girder A		1143	Plate Girder	7.58		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
	CF1	1144	Plate Girder	15.17		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
		1145	Plate Girder	22.75		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
	CF2	1146	Plate Girder	30.33		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
		1147	Plate Girder	37.92		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
	CF3	1148	Plate Girder	45.50		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
		1149	Plate Girder	53.08		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
	CF4	1150	Plate Girder	60.67		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.6	No
		1151	Plate Girder	72.90		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.6	No
	Section Change	1152	Plate Girder	73.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.6	No
	CF5	1153	Plate Girder	75.83		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.6	No
	Section Change	1154	Plate Girder	81.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.6	No
	Pier 1	1155	Plate Girder	89.54		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	165.6	No
	Pier 1	1156	Plate Girder	91.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	Pier 1	1157	Plate Girder	92.46		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	178.9	No
Span 2 -Girder A	Section Change	1158	Plate Girder	100.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	CF6/Section Change	1159	Plate Girder	107.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	CF6	1160	Plate Girder	107.10		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	CF7	1161	Plate Girder	123.50		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1162	Plate Girder	131.63		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
	CF8	1163	Plate Girder	139.75		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1164	Plate Girder	147.88		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
	CF9	1165	Plate Girder	156.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1166	Plate Girder	164.13		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
	CF10	1167	Plate Girder	172.25		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1168	Plate Girder	180.38		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
	CF11	1169	Plate Girder	188.50		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	196.9	No
		1170	Plate Girder	204.90		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	CF12/Section Change	1171	Plate Girder	205.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	Section Change	1172	Plate Girder	212.00		1.00	1.00	1.0	1.0	0	10000.0	0	4.10	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	Pier 2	1173	Plate Girder	219.54		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	178.9	No
	Pier 2	1174	Plate Girder	221.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	196.9	No
	Pier 2	1175	Plate Girder	222.46		1.00	1.00	1.0	1.0	0	10000.0	0	3.50	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	165.8	No
Span 3 - Girder A	Section Change	1176	Plate Girder	231.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.8	No
		1177	Plate Girder	231.10		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.8	No
	Section Change	1178	Plate Girder	239.00		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.8	No
		1179	Plate Girder	239.10		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	0.0	8.0	1.5	7.5	No	183.8	No
	CF14	1180	Plate Girder	251.33		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
		1181	Plate Girder	258.92		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
	CF15	1182	Plate Girder	266.50		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
		1183	Plate Girder	274.08		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
	CF16	1184	Plate Girder	281.67		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
		1185	Plate Girder	289.25		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
	CF17	1186	Plate Girder	296.83		1.00	1.00	1.0	1.0	0	10000.0	0	3.83	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
		1187	Plate Girder	304.42		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	0	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No
	East Abutment	1188	Plate Girder	312.00		1.00	1.00	1.0	1.0	0	10000.0	0	2.00	1	1.0	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	Yes	183.8	No

					Non-Composite Section																
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Top steel flange width	Top steel flange thk	Top steel flange area	Bott steel flange width	Bott steel flange thk	Bott steel flange area	Girder Web Depth	Girder Web thk	Girder web area	Total Steel Area	Moment of inertia	CG to Top/Flange	CG to Bott/Flange	Section Modulus about major bending axis		Moment of Inertia of top Flange	Moment of Inertia of bott Flange
					b_{f_top}	$t_{\_top\ flg}$	$A_{\_st\_top\_flg}$	b_{f_bott}	$t_{\_bott\ flg}$	$A_{\_st\_bott\_flg}$	$D_{\_web}$	$t_{\_web}$	$A_{\_web}$	$A_{\_steel}$	$I_{\_steel}$	Y_T	Y_D	$S_{\_top\_flg}$	$S_{\_bott\_flg}$	$I_{y\_top\_flg}$	$I_{y\_bott\_flg}$
				(ft)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^4)	(in^4)
	West Abutment	1142	Plate Girder	0.010	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1143	Plate Girder	7.58	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF1	1144	Plate Girder	15.17	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1145	Plate Girder	22.75	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF2	1146	Plate Girder	30.33	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1147	Plate Girder	37.92	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
Span 1 -Girder A	CF3	1148	Plate Girder	45.50	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1149	Plate Girder	53.08	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF4	1150	Plate Girder	60.67	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1151	Plate Girder	72.90	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	Section Change	1152	Plate Girder	73.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	CF5	1153	Plate Girder	75.83	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	Section Change	1154	Plate Girder	81.00	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 1	1155	Plate Girder	89.54	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 1	1156	Plate Girder	91.00	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 1	1157	Plate Girder	92.46	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Section Change	1158	Plate Girder	100.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	CF6/Section Change	1159	Plate Girder	107.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	CF6	1160	Plate Girder	107.10	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF7	1161	Plate Girder	123.50	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1162	Plate Girder	131.63	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF8	1163	Plate Girder	139.75	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1164	Plate Girder	147.88	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
Span 2 -Girder A	CF9	1165	Plate Girder	156.00	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1166	Plate Girder	164.13	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF10	1167	Plate Girder	172.25	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1168	Plate Girder	180.38	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF11	1169	Plate Girder	188.50	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1170	Plate Girder	204.90	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	CF12/Section Change	1171	Plate Girder	205.00	16.0	0.750	12.00	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
	Section Change	1172	Plate Girder	212.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	Pier 2	1173	Plate Girder	219.54	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 2	1174	Plate Girder	221.00	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Pier 2	1175	Plate Girder	222.46	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
	Section Change	1176	Plate Girder	231.00	16.0	2.125	34.00	16.0	2.125	34.0	54.0	0.3750	20.3	88.3	58496.6	29.1	29.1	2008.5	2008.5	725.3	725.3
		1177	Plate Girder	231.10	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
	Section Change	1178	Plate Girder	239.00	16.0	1.500	24.00	16.0	2.125	34.0	54.0	0.3750	20.3	78.3	49133.8	32.2	25.4	1526.7	1931.1	512.0	725.3
		1179	Plate Girder	239.10	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF14	1180	Plate Girder	251.33	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1181	Plate Girder	258.92	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
Span 3 - Girder A	CF15	1182	Plate Girder	266.50	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1183	Plate Girder	274.08	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF16	1184	Plate Girder	281.67	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1185	Plate Girder	289.25	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	CF17	1186	Plate Girder	296.83	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
		1187	Plate Girder	304.42	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7
	East Abutment	1188	Plate Girder	312.00	16.0	0.750	12.00	16.0	1.250	20.0	54.0	0.3750	20.3	52.3	28219.1	32.0	24.0	880.8	1177.6	256.0	426.7

					Composite Section with Modular Ratio = n (at Positive Moment Region)							Composite Section with Modular Ratio = 3n(at Positive Moment Reigion)							Composite Section with Modular Ratio = n (at Negative Moment Region)								
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Joint	Steel Section No.
					$A_{c(n)}$	$I_{c(n)}$	$Y_{slabc(n)}$	$Y_{tc(n)}$	$Y_{bc(n)}$	$S_{tc(n)}$	$S_{bc(n)}$	$A_{c(3n)}$	$I_{c(3n)}$	$Y_{slabc(3n)}$	$Y_{tc(3n)}$	$Y_{bc(3n)}$	$S_{tc(3n)}$	$S_{bc(3n)}$	A_c	I_c	Y_{slabc}	Y_{tc}	Y_{bc}	$S_{tc(n)}$	$S_{bc(n)}$		
				(ft)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)		
	West Abutment	1142	Plate Girder	0.010	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	West Abutment	A_Sect_1
Span 1 -Girder A		1143	Plate Girder	7.58	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		A_Sect_1
	CF1	1144	Plate Girder	15.17	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF1	A_Sect_1
		1145	Plate Girder	22.75	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		A_Sect_1
	CF2	1146	Plate Girder	30.33	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF2	A_Sect_1
		1147	Plate Girder	37.92	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		A_Sect_1
	CF3	1148	Plate Girder	45.50	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF3	A_Sect_1
		1149	Plate Girder	53.08	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		A_Sect_1
	CF4	1150	Plate Girder	60.67	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF4	A_Sect_1
		1151	Plate Girder	72.90	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6		A_Sect_1
	Section Change	1152	Plate Girder	73.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	Section Change	A_Sect_2
	CF5	1153	Plate Girder	75.83	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	CF5	A_Sect_2
	Section Change	1154	Plate Girder	81.00	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Section Change	A_Sect_3
	Pier 1	1155	Plate Girder	89.54	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 1	A_Sect_3
	Pier 1	1156	Plate Girder	91.00	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 1	A_Sect_3
	Pier 1	1157	Plate Girder	92.46	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 1	A_Sect_3
Span 2 -Girder A	Section Change	1158	Plate Girder	100.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	Section Change	A_Sect_4
	CF6/Section Change	1159	Plate Girder	107.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	F6/Section Chan	A_Sect_4
	CF6	1160	Plate Girder	107.10	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	CF6	A_Sect_5
	CF7	1161	Plate Girder	123.50	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF7	A_Sect_5
		1162	Plate Girder	131.63	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		A_Sect_5
	CF8	1163	Plate Girder	139.75	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF8	A_Sect_5
		1164	Plate Girder	147.88	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		A_Sect_5
	CF9	1165	Plate Girder	156.00	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF9	A_Sect_5
		1166	Plate Girder	164.13	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		A_Sect_5
	CF10	1167	Plate Girder	172.25	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF10	A_Sect_5
		1168	Plate Girder	180.38	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		A_Sect_5
	CF11	1169	Plate Girder	188.50	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8	CF11	A_Sect_5
		1170	Plate Girder	204.90	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0		A_Sect_5
	CF12/Section Change	1171	Plate Girder	205.00	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	56.3	30375.0	N/A	33.8	22.5	900.0	1350.0	12/Section Char	A_Sect_5
	Section Change	1172	Plate Girder	212.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	Section Change	A_Sect_6
	Pier 2	1173	Plate Girder	219.54	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 2	A_Sect_7
	Pier 2	1174	Plate Girder	221.00	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 2	A_Sect_7
	Pier 2	1175	Plate Girder	222.46	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Pier 2	A_Sect_7
Span 3 - Girder A	Section Change	1176	Plate Girder	231.00	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	88.3	58496.6	N/A	29.1	29.1	2008.5	2008.5	Section Change	A_Sect_7
		1177	Plate Girder	231.10	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1		A_Sect_8
	Section Change	1178	Plate Girder	239.00	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	78.3	49133.8	N/A	32.2	25.4	1526.7	1931.1	Section Change	A_Sect_8
		1179	Plate Girder	239.10	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6	52.3	28219.1	N/A	32.0	24.0	880.8	1177.6		A_Sect_9
	CF14	1180	Plate Girder	251.33	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF14	A_Sect_9
		1181	Plate Girder	258.92	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		A_Sect_9
	CF15	1182	Plate Girder	266.50	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF15	A_Sect_9
		1183	Plate Girder	274.08	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		A_Sect_9
	CF16	1184	Plate Girder	281.67	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF16	A_Sect_9
		1185	Plate Girder	289.25	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		A_Sect_9
	CF17	1186	Plate Girder	296.83	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	CF17	A_Sect_9
		1187	Plate Girder	304.42	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0		A_Sect_9
	East Abutment	1188	Plate Girder	312.00	145.3	75519.4	17.6	8.1	47.9	9322.1	1576.6	83.3	55592.6	27.6	18.1	37.9	3068.6	1467.5	56.7	33965.1	38.6	29.1	26.9	1166.9	1263.0	East Abutment	A_Sect_9

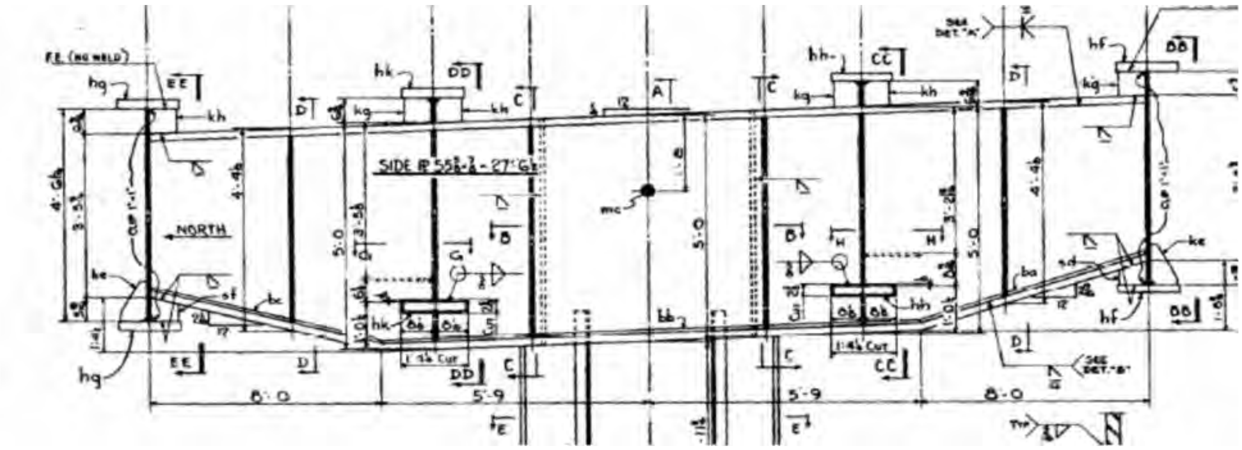
	Location	**Girder Node ID**	Is plate girder or box girder ?	Larsa Station	Top Flange PL width	Bottom Flange PL width	Top Flange PL thickness	Bottom Flange PL thickness	Web thickness	Web depth	Effective Width (Link from plan)	Total thickness of concrete deck	Thickness of wearing surface	Effective thickness of concrete deck	Fillet Height	Fillet Width	% of rebar within effective of deck	Area of rebar within effective deck width
					W_{tc1}	W_{bc1}	T_{tc1}	T_{bc1}	T_{web}	D_{web}	$B_{effective}$	t_{deck_total}	$t_{wearing}$	$t_{deck\_effective}$	H_{fillet}	b_{fillet}		A_{rs}
				(ft)	(in)	(in)	(in)	(in)	(in)	(in)	(ft)	(in)	(in)	(in)	(in)	(in)		(in^2)
	West Abutment	1142	Plate Girder	0.010	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16.0	0.614%	4.423
		1143	Plate Girder	7.58	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF1	1144	Plate Girder	15.17	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1145	Plate Girder	22.75	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF2	1146	Plate Girder	30.33	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
Span 1 -Girder A		1147	Plate Girder	37.92	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF3	1148	Plate Girder	45.50	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1149	Plate Girder	53.08	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF4	1150	Plate Girder	60.67	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1151	Plate Girder	72.90	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1152	Plate Girder	73.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF5	1153	Plate Girder	75.83	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1154	Plate Girder	81.00	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 1	1155	Plate Girder	89.54	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 1	1156	Plate Girder	91.00	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 1	1157	Plate Girder	92.46	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1158	Plate Girder	100.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF6/Section Change	1159	Plate Girder	107.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF6	1160	Plate Girder	107.10	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF7	1161	Plate Girder	123.50	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1162	Plate Girder	131.63	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF8	1163	Plate Girder	139.75	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
Span 2 -Girder A		1164	Plate Girder	147.88	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF9	1165	Plate Girder	156.00	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1166	Plate Girder	164.13	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF10	1167	Plate Girder	172.25	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1168	Plate Girder	180.38	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF11	1169	Plate Girder	188.50	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1170	Plate Girder	204.90	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF12/Section Change	1171	Plate Girder	205.00	16.0	16.0	0.750	1.500	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1172	Plate Girder	212.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 2	1173	Plate Girder	219.54	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 2	1174	Plate Girder	221.00	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Pier 2	1175	Plate Girder	222.46	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1176	Plate Girder	231.00	16.0	16.0	2.125	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
		1177	Plate Girder	231.10	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	Section Change	1178	Plate Girder	239.00	16.0	16.0	1.500	2.125	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
		1179	Plate Girder	239.10	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16		
	CF14	1180	Plate Girder	251.33	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1181	Plate Girder	258.92	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
Span 3 - Girder A	CF15	1182	Plate Girder	266.50	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1183	Plate Girder	274.08	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF16	1184	Plate Girder	281.67	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1185	Plate Girder	289.25	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	CF17	1186	Plate Girder	296.83	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
		1187	Plate Girder	304.42	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423
	East Abutment	1188	Plate Girder	312.00	16.0	16.0	0.750	1.250	0.375	54.0	7.500	8.500	2.000	8.00	1.500	16	0.614%	4.423

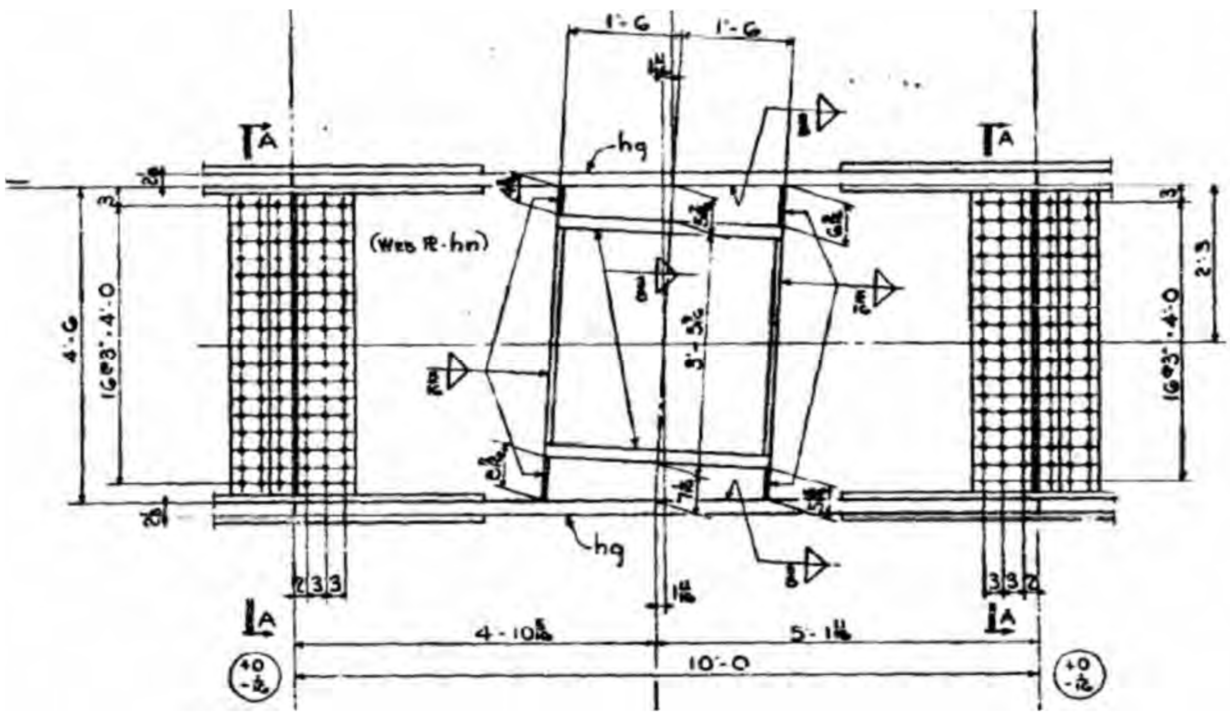
3. Connection Capacities

HNTB	By: MX	Date: 08/23/17	Job No. 64517
	Chkd By: JWC	Date: 8/30/2017	
HNTB Corp.	Bckchk By: MX	Date: 8/30/2017	Sht. No.

BR 69839

1. CONNECTION CAPACITY @ EXTERIOR GIRDER AND CAP BEAM





1) Assumptions

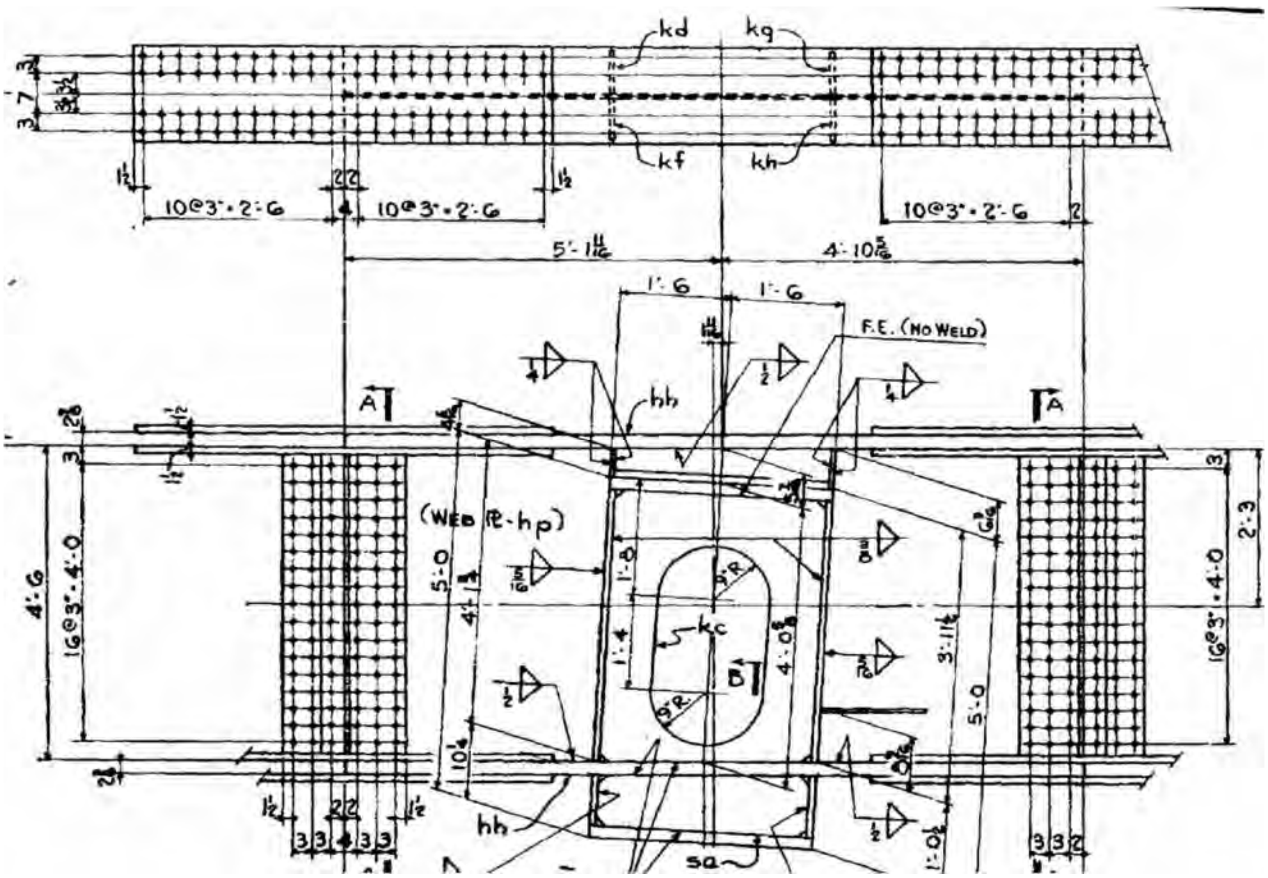
F_{exx} =	70	ksi	(Need to verify)
Fillet weld size =	0.3125	in	(Per shop drawing from 1969)
$t_{\_eff}$ =	0.2209	in	
weld length =	38.70	in	
No. of weld at the connection	4	weld per connection	
Steel F_u =	66	ksi	(Per Table 6A.6.2.1-1 in MBE)

2) Shear Capacity of the Weld, R_r

$R_r = 0.6\Phi_{e2}F_{exx}$ =	34	ksi
Weld Shear Capacity, $F_{\_weld}$ =	**1149**	kips @ Edge Girder/Cap Beam Connection

2. CALCULATE CAPACITY OF FIELD SPLICE OF INTERIOR GIRDERS B & C NEAR THE CAP BEAM

1) Calculate Bolt Capacity on Splice PL (By inspection, shear capacity control)



Connection Input Data

Insider Splice = two 7.5"x1.5"
Outside Splice = One 16"x1.5"

Splice PL Thickness =	1.5	in
Bolt Diameter =	0.875	inch
Bolt Area =	0.601	in^2
Bolt hole diameter =	1.00	inch
Connection plate yield strength =	36	ksi
Connection plate ultimate strength =	65	ksi (Per Table 6A.6.2.1-1 in MBE
Surface condition specification =	A	

Input Bolt Pattern (Each side)

Vertical:

Spacing =	3	inch
End Distance =	1.5	inch
Bolt clear distance =	2.000	inch

6.13.2.7 Shear Resistance

$\phi_{bolt\ shear}$ = 0.8
Length Factor = 1

"The nominal shear resistance of a high-strength bolt or an ASTM A307 bolt at the strength limit state in joints whose length between extreme fasteners measured parallel to the line of action of the force is less than 50.0 inches shall be taken as…where threads are included" in the shear plane:"

$R_n = 0.38A_bF_{ub}N_s$ **BOLT THREADS INCLUDED FROM SHEAR PLANE**

Fub =	120	ksi, Reference 6.4.3
Ns =	2	
Rn =	54.8	kips/bolt
ϕRn x Length Factor =	43.9	kips/bolt

Bearing Resistance will be not control

Total No of HS 7/8" dia bolts per rod =	44	per bolts
Bolt Capacity T =	1930	kips (Top or Bottom Splice)

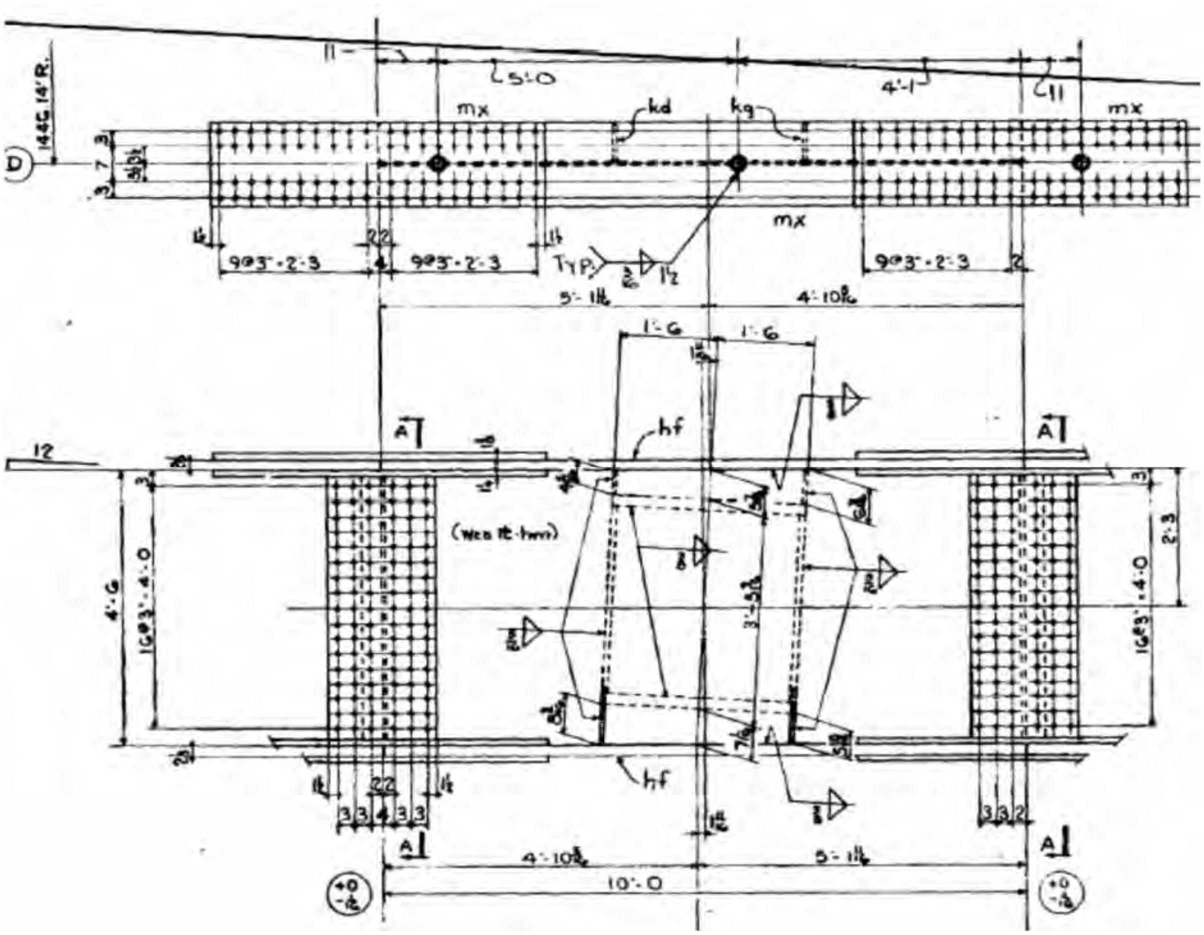
2) Calculate Tension Capacity of Splice PL

Φ_y =	0.95		
Φ_u =	0.8		
A_g = 2*7.5"*1.25"+16"*1.375" =	40.75	in^2	
A_n = 2*(7.5"-2")*1.25"+(16-4)"*1.375" =	30.25	in^2	
For yielding, $T_y = \Phi_y A_g F_y$ =	1394	kips	(control)
For fracture, $T_u = \Phi_u A_g F_y$ =	1573	kips	
Moment Arm =Web Height + (Top FLG Thk + Bott FLG Thk)/2 =	56.375	in	
Estimated Moment Capacity of FS = T_y*Moment Arm =	**6547**	k-ft (For Girders B & C)	

HNTB	By: MX	Date: 08/23/17	Job No. 64517
	Chkd By: JWC	Date: 8/30/2017	
HNTB Corp.	Bckchk By: MX	Date: 8/30/2017	Sht. No.

3. CALCULATE CAPACITY OF FIELD SPLICE OF EXTERIOR GIRDERS A & D NEAR THE CAP BEAM

1) Calculate Bolt Capacity on Splice PL (By inspection, shear capacity control)



Connection Input Data

Insider Splice = two 7.5"x1.25"
Outside Splice = One 16"x1.375"

Splice PL Thickness =	1.5	in
Bolt Diameter =	0.875	inch
Bolt Area =	0.601	in^2
Bolt hole diameter =	1.00	inch
Connection plate yield strength =	36	ksi
Connection plate ultimate strength =	65	ksi (Per Table 6A.6.2.1-1 in MBE
Surface condition specification =	A	

Input Bolt Pattern (Each side)

Vertical:

Spacing =	3	inch
End Distance =	1.5	inch
Bolt clear distance =	2.000	inch

6.13.2.7 Shear Resistance

$\phi_{bolt\ shear}$ = 0.8
Length Factor = 1

"The nominal shear resistance of a high-strength bolt or an ASTM A307 bolt at the strength limit state in joints whose length between extreme fasteners measured parallel to the line of action of the force is less than 50.0 inches shall be taken as…where threads are included" in the shear plane:"

$R_n = 0.38A_bF_{ub}N_s$

BOLT THREADS INCLUDED FROM SHEAR PLANE

Fub =	120	ksi, Reference 6.4.3
Ns =	2	
Rn =	54.8	kips/bolt
ϕRn x Length Factor =	43.9	kips/bolt

Bearing Resistance will be not control

Total No of HS 7/8" dia bolts per rod =	40	per bolts
Bolt Capacity T =	1755	kips (Top or Bottom Splice)

2) Calculate Tension Capacity of Splice PL

Φ_y =	0.95	
Φ_u =	0.8	
A_g = 2*7.5"*1.5"+16"*1.5" =	40.75	in^2
A_n = 2*(7.5"-2")*1.5"+(16-4)"*1.5" =	30.25	in^2

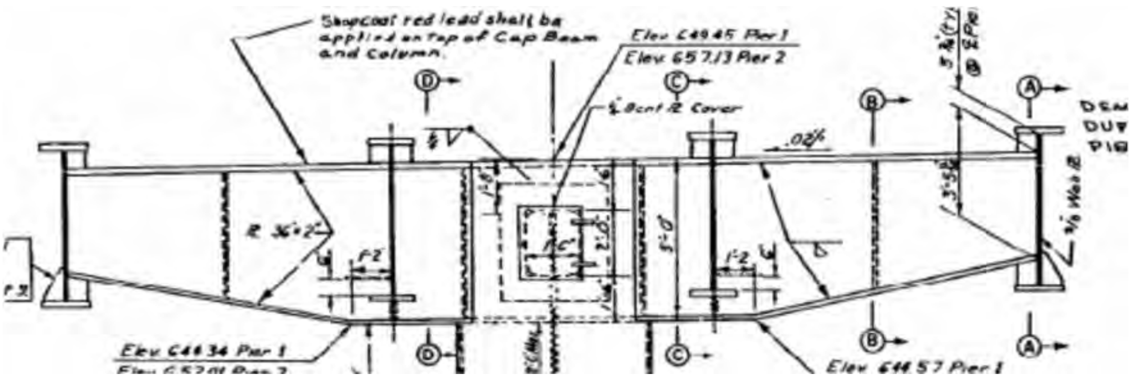
For yielding, $T_y = \Phi_y A_g F_y$ =	1394	kips	(control)
For fracture, $T_u = \Phi_u A_n F_u$ =	1573	kips	

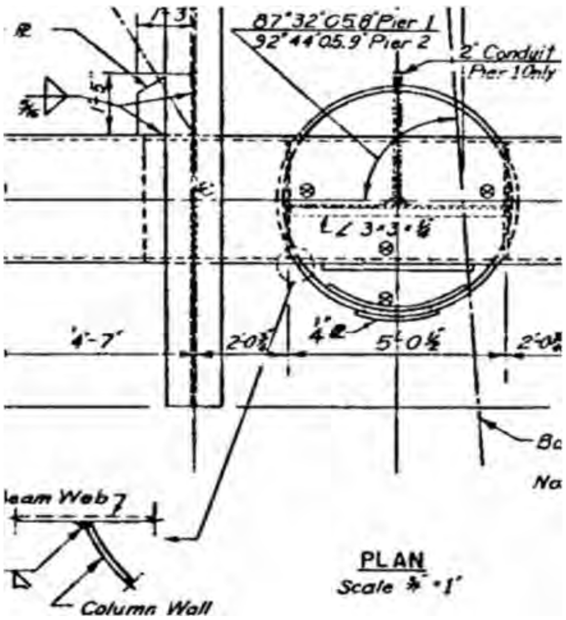
Moment Arm =Web Height + (Top FLG Thk + Bott FLG Thk)/2 = 56.125 in

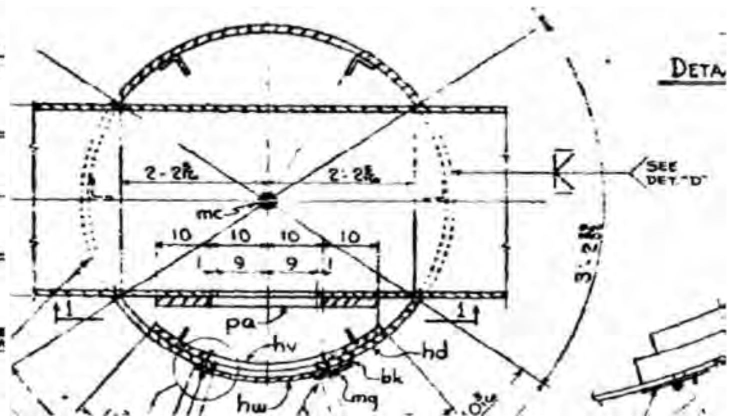
Estimated Moment Capacity of FS = T_y*Moment Arm = **6518** k-ft (For Girders A & D)

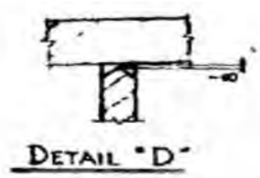
HNTB	By: MX	Date: 08/23/17	Job No. 64517
	Chkd By: JWC	Date: 8/30/2017	
HNTB Corp.	Bckchk By: MX	Date: 8/30/2017	Sht. No.

4. CAPACITY OF COLUMN TO CAP BEAM CONNECTION









Thickness of Column Wall =	1.125	in
Column Wall, F_y =	36	ksi
For shear weld strength with full pen weld		
Φ_{e1} =	0.85	
For full pen weld, $R_r = 0.6\Phi_{e1}F_{exx}$ =	20.52	ksi
Weld area per side, A_{weld} = 1.125"x2x56" =	126.0	in^2
Shear strength per side, $F_v = R_r * A_{weld}$ =	2586	kips
For tension weld strength per side with full pen weld		
Φ_y =	0.95	
A_g = 36"x1.125" =	40.5	in^2
$T_r = \Phi_y A_g F_y$=	1385	kips
Moment Arm, H =	4.5	ft
Moment capacity from weld = $(F_v + T_r)*H$ =	**17868**	k-ft

5. Cross Frame Capacity (L4x4x5/16)

1. Assumptions

F_y =	36	ksi	
F_u =	66	ksi	(Per Table 6A.6.2.1-1 in MBE)
A_g =	2.40	in^2	
KL =	8.85	ft	

2. Tensile Resistance

$P_r = \Phi_y F_y A_g$ = **82.1** kips (control since no hole in the member)

3. Compressive Resistance

P_r = **28.4** kips (from AISC LRFFD Table 4-11)

6. Lateral Bracing Capacity (L8x8x1/2)

1. Assumptions

F_y = 36 ksi

F_u = 66 ksi (Per Table 6A.6.2.1-1 in MBE)

A_g = 7.84 in^2

KL = 18.75 ft

2. Tensile Resistance

$P_r = \Phi_y F_y A_g$ = **268.1** kips (control since no hole in the member)

3. Compressive Resistance (from AISC LRFFD Table 4-11)

P_r = **105** kips with KL =17 ft

P_r = **95.5** kips with KL =18 ft

P_r = **86.5** kips with KL =19 ft

P_r = **104.0** kips with KL =17.11 ft (Exterior bay near the pier)

P_r = **90.4** kips with KL =18.57 ft (Interior Bay)

4. Sample Calculation at the Point 65 feet from Pier 1 on Span 2 of Girder D

A design spreadsheet is developed to calculate the capacities, LF1, r1, D/C ratio of the girders and cap beams. The calculations were performed on several locations along those structural elements using Microsoft Macro. The following shows an example calculation at the point about 65 feet from Pier 1 on Span 2 of Girder D

HNTB	By:	MX	Date:	08/29/17	Job No.	64517
	Chkd By:	JWC	Date:	9/5/2017		
HNTB Corp.	Bckchk By:	MX	Date:	9/6/2017	Sht. No.	

BR 69839

Node ID : 1024
Iarsa ID: 156.0 (Station)

Evaulation Factors (for Strength Limit States)
1. Condition Factor ϕ_c = 1.00
2. System Factor ϕ_S = 1.00

Fy_Rebar = 40 ksi
Deck rebar Area, Ars = 4.423201868 in^2
Is plate girder or box girder ? Plate Girder
No of Webs of the Box Girder = 1 webs
Is transverse bending consider? Yes

Is it Cap Beam ? 0
Is redundant Load Path Diaphragm ? 0
Is Continuous span ? Yes
Is Curve Girder ? Yes

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Location	Node ID	Iarsa Sta	Inventory Rating				For Composite Positive Moment		For Non -Composite Positive Moment (Comp Flg full Bracing)		For Negative Moment for plate girders or positive moment for Steel Box Beam Strandel Bent				Positive Moment Capacity	Negative Moment Capacity
		Iarsa	$RF_{\_flexure}$		$RF_{\_shear}$	$RF_{\_inv}$	M_n	Positive $1.3R_hM_y$	Positive M_p (Use if θ_{RL} >0.009 Radians)	Positive $1.3R_hM_y$	Negative M_p (For Comparsion purpose only)	M_{nc} (Yield)	F_{nc_final}	M_c (Based on F_{nc}) (failure before yielding)	To use	To use
			Top Flange	Bott Flange			k-ft	k-ft	k-ft	k-ft	k-ft	k-ft	(ksi)	k-ft	k-ft	k-ft
Controlling Rating	1024	156.0	6.90	1.48	6.09	1.48	6690	6706	N/A	N/A	Not to Yield	Not to Yield	35.97	-4170	6690	-4170
	1024	156.0	6.90	1.48	6.09	1.48	6690	6706	N/A	N/A	Not to Yield	Not to Yield	35.97	4170		

Is it composite section ? **Yes**

(+) Stress indicates Tension

HNTB	By:	MX	Date:	08/20/17	Job No.	64517
	Chkd By:	JWC	Date:	8/30/2017		
HNTB Corp.	Bckchk By:	MX	Date:	8/30/2017	Sht. No.	

BR 69839

Node ID : 1024
Iarsa ID: 156.0 (Station)

Evaulation Factors (for Strength Limit States)
1. Condition Factor ϕ_c = 1.00
2. System Factor ϕ_S = 1.00

	3	4	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Location	Node ID	Iarsa Sta	Maximum Positive M_u	Max Negative M_u	Web Shear			LF1 with respect to Minimum r_1	$LF1_{\_Top\_Flg}$	$LF1_{\_Bott\_Flg}$	$LF1_{\_Shear}$	$LF1_{req'd\_Top\_Flg}$	$LF1_{req'd\_bott\_Flg}$	$LF1_{req'd\_shear}$	Min Reserve ratio r_1	$LF1_{req'd}$ with respect to Minimum r_1
		Iarsa	To use	To use	Demand/ Capacity	Ultimate Shear Force, V_u (kips)	Capacity, $\Phi_v V_n$ (kips)									
			k-ft	k-ft												
Controlling Rating	1024	156.0	3581.1	629.6	0.1685	62.92	373.31	3.393	16.319	3.393	133.759	3.79	2.67	2.55	1.27	2.67
	1024	156.0			0.1685	62.92	373.31									
											1.27	4.31	1.27	52.54		3
											1.27	3.79	2.67	2.55		

Is it composite section ? **Yes**

(+) Stress indicates Tension

HNTB	By:	MX	Date:	08/20/17	Job No.	64517
	Chkd By:	JWC	Date:	8/30/2017		
HNTB Corp.	Bckchk By:	MX	Date:	8/30/2017	Sht. No.	

BR 69839

Node ID : 1024
Iarsa ID: 156.0 (Station)

Evaulation Factors (for Strength Limit States)
1. Condition Factor ϕ_c = 1.00
2. System Factor ϕs = 1.00

	3	4	33	34	35	36	37	38	39	40	41	42	43	44
			1.1 Strength I - 1.25DC + 1.5DW + 1.75LL+I											
Location	Node ID	Iarsa Sta	Top Flange Flexural Bending			Bottom Flange Flexural Bending			Web Shear			Maximum	$M_{\_DL}$	$M_{\_LL}$
		Iarsa	D/C	Ultimate Stress f_u (ksi)	Capacity, F_{nc} or F_{nt} (ksi)	D/C	Ultimate Stress f_u (ksi)	Capacity, F_{nc} or F_{nt} (ksi)	D/C	Ultimate Shear Force, V_u (kips)	Capacity, V_n (kips)	D/C	(k-ft)	(k-ft)
Controlling Rating	1024	156.0	0.454	-16.362	-36.000	0.774	27.871	36.000	0.169	62.918	373.315	0.77	857.19	1187.15
	1024	156.0												

Is it composite section ? **Yes**

(+) Stress indicates Tension

Load Cases and Load Combination	Live Load Consider	Macro Node No	Iarsa Station	Member Forces from Iarsa				Flange lateral bending stress
				Axial (FX)	Shear (Fz)	Weak Axis Moment (Mz)	Strong Axis Moment (My)	f_l
			(ft)	(kips)	(kips)	(k-ft)	(k-ft)	(ksi)
DC1		1024	156.0	-17.9	0.3	-2.4	716.0	0.23
		1024	156.0	-17.9	0.3	-2.4	716.0	0.23
DC2		1024	156.0	-1.1	1.2	25.3	141.1	4.74
		1024	156.0	-1.1	1.2	25.3	141.1	4.74
DW		1024	156.0	0.1	0.1	0.1	0.1	0.02
		1024	156.0	0.1	0.1	0.1	0.1	0.02
1.25DC1+1.25DC2+1.5DW		1024	156.0	-23.6	2.0	28.7	1071.5	6.24
		1024	156.0	-23.6	2.0	28.7	1071.5	6.24
LL+I_MaxFX (LL+IM)	HL-93	1024	156.0	38.8	15.6	3.3	600.3	0.63
		1024	156.0	38.8	15.6	3.3	600.3	0.63
LL+I_MINFX (LL+IM)		1024	156.0	-48.6	2.7	-1.2	493.1	0.22
		1024	156.0	-48.6	2.7	-1.2	493.1	0.22
LL+I_MaxFZ (LL+IM)		1024	156.0	20.4	30.1	1.2	894.7	0.23
		1024	156.0	20.4	30.1	1.2	894.7	0.23
LL+I_MINFZ (LL+IM)		1024	156.0	21.5	34.8	1.1	950.8	0.21
		1024	156.0	21.5	34.8	1.1	950.8	0.21
LL+I_MaxMY (LL+IM)		1024	156.0	1.4	3.8	2.5	1434.1	0.46
		1024	156.0	1.4	3.8	2.5	1434.1	0.46
LL+I_MINMY (LL+IM)		1024	156.0	14.8	0.3	1.2	-258.4	0.22
		1024	156.0	14.8	0.3	1.2	-258.4	0.22

DC1_Bracing Start		1024	156.0	-17.890	0.275	-2.4	715.991	
DC1_Bracing End		1026	172.250	-17.888	17.118	-8.2	573.278	
DC2_Bracing Start		1024	156.000	-1.113	1.183	25.3	141.097	
DC2_Bracing End		1026	172.250	-1.771	4.258	20.4	117.443	
DW_Bracing Start		1024	156.000	0.100	0.100	0.1	0.100	
DW_Bracing End		1026	172.250	0.100	0.100	0.1	0.100	
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024	156.000	38.756	15.588	3.3	600.256	
LL+I_MaxFX_Bracing End (LL+IM)		1026	172.250	39.211	10.357	-7.9	507.935	
LL+I_MINFX_Bracing_Start (LL+IM)		1024	156.000	-48.609	2.704	-1.2	493.093	
LL+I_MINFX_Bracing_End (LL+IM)		1026	172.250	-48.732	3.592	1.5	532.132	
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	156.000	20.422	30.105	1.2	894.650	
LL+I_MaxFZ_Bracing_End (LL+IM)		1026	172.250	29.126	22.135	-2.8	716.943	
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	156.000	21.457	34.826	1.1	950.788	
LL+I_MINFZ_Bracing_End (LL+IM)		1026	172.250	7.708	42.752	0.3	838.405	
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	156.000	1.414	3.806	2.5	1434.067	
LL+I_MaxMY_Bracing_End (LL+IM)		1026	172.250	-4.469	14.634	-2.8	1306.085	
LL+I_MINMY_Bracing_Start (LL+IM)		1024	156.000	14.776	0.306	1.2	-258.364	
LL+I_MINMY_Bracing_End (LL+IM)		1026	172.250	17.324	0.409	0.3	-268.686	
1.25DC+1.5DW_Bracing Start		1024	156.000	-23.604	1.973	28.7	1071.509	
1.25DC+1.5DW_Bracing End		1026	172.250	-24.423	26.870	15.4	863.551	
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	156.000	44.218	29.252	34.5	2121.957	

Load Cases and Load Combination	Live Load Consider	Member Forces from larsa						Flange lateral bending stress
		Macro Node No	larsa Station	Axial (FX)	Shear (Fz)	Weak Axis Moment (Mz)	Strong Axis Moment (My)	f_l
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	172.250	44.197	44.994	1.5	1752.436	
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	156.000	-108.669	6.705	26.6	1934.421	
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	172.250	-109.705	33.155	18.0	1794.782	
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	156.000	12.133	54.657	30.8	2637.147	
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	172.250	26.548	65.606	10.5	2118.201	
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	156.000	13.945	62.918	30.7	2735.388	
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	172.250	-10.933	101.686	15.9	2330.760	
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	156.000	-21.131	8.634	33.0	3581.126	
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	172.250	-32.243	52.480	10.5	3149.199	
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	156.000	2.253	2.508	30.8	619.373	
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	172.250	5.895	27.586	15.9	393.349	

		Macro Node No	larsa Station	Axial (FX)	Shear (Fz)	Weak Axis Moment (Mz)	Strong Axis Moment (My)	fl
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	156.0	44.2	29.3	34.5	2122.0	7.34
		1024	156.0	44.2	29.3	34.5	2122.0	7.34
1.25DC+1.5DW+1.75LL+I_MinFX		1024	156.0	-108.7	6.7	26.6	1934.4	6.63
		1024	156.0	-108.7	6.7	26.6	1934.4	6.63
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	156.0	12.1	54.7	30.8	2637.1	6.63
		1024	156.0	12.1	54.7	30.8	2637.1	6.63
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	156.0	13.9	62.9	30.7	2735.4	6.61
		1024	156.0	13.9	62.9	30.7	2735.4	6.61
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	156.0	-21.1	8.6	33.0	3581.1	7.05
		1024	156.0	-21.1	8.6	33.0	3581.1	7.05
1.25DC+1.5DW+1.75LL+I_MinMY		1024	156.0	2.3	2.5	30.8	619.4	6.63
		1024	156.0	2.3	2.5	30.8	619.4	6.63

Load Cases and Load Combination	Live Load Consider	Member Forces from larsa						Flange lateral bending stress
		Macro Node No	larsa Station	Axial (FX)	Shear (Fz)	Weak Axis Moment (Mz)	Strong Axis Moment (My)	f_l
			(ft)	(kips)	(kips)	(k-ft)	(k-ft)	(ksi)
DC1		1024	156.0	-17.9	0.3	-2.4	716.0	0.23
		1024	156.0	-17.9	0.3	-2.4	716.0	0.23
DC2		1024	156.0	-1.1	1.2	25.3	141.1	4.74
		1024	156.0	-1.1	1.2	25.3	141.1	4.74
DW		1024	156.0	0.1	0.1	0.1	0.1	0.02
		1024	156.0	0.1	0.1	0.1	0.1	0.02
DC1+DC2+DW		1024	156.0	-18.9	1.6	22.9	857.2	4.99
		1024	156.0	-18.9	1.6	22.9	857.2	4.99

Load Cases and Load Combination	Live Load Consider		Member Forces from larsa					Flange lateral bending stress
		Macro Node No	larsa Station	Axial (FX)	Shear (Fz)	Weak Axis Moment (Mz)	Strong Axis Moment (My)	f_l
LL_MaxFX (LL)	HL-93	1024	156.0	33.3	12.0	2.9	512.0	0.54
		1024	156.0	33.3	12.0	2.9	512.0	0.54
LL_MINFX (LL)		1024	156.0	-41.0	2.2	-1.0	397.7	0.18
		1024	156.0	-41.0	2.2	-1.0	397.7	0.18
LL_MaxFZ (LL)		1024	156.0	17.6	24.5	2.0	708.9	0.38
		1024	156.0	17.6	24.5	2.0	708.9	0.38
LL_MINFZ (LL)		1024	156.0	18.5	28.3	0.9	753.0	0.17
		1024	156.0	18.5	28.3	0.9	753.0	0.17
LL_MaxMY (LL)		1024	156.0	2.3	2.8	2.0	1187.1	0.38
		1024	156.0	2.3	2.8	2.0	1187.1	0.38
LL_MINMY (LL)		1024	156.0	12.5	0.3	1.0	-213.4	0.18
		1024	156.0	12.5	0.3	1.0	-213.4	0.18

Load Cases and Load Combination	Live Load Consider		Load Factor					Resistance Factor		Longitudinal Stiffener		Transverse Stiffener			Hybrid factor
								Flexual	Shear	No, of Longitudinal stiffener provided ?	Dist from stiffener to comp. flg	Is transverse stiffener provided?	Transverse Stiffener Spacing	Is end panel or interior panel?	
		Macro Node No	Y_{DC1}	Y_{DC2}	Y_{PL}	Y_{DW}	Y_{LL}	ϕ_f	ϕ_v		d_s	(Yes =0,No=1)	d_o	(Interior =0, End=1)	R_h
								6.5.4.2	6.5.4.2						6.10.1.10.1
											(in)		(ft)		
DC1		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
DC2		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
DW		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
1.25DC1+1.25DC2+1.5DW		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
LL+I_MaxFX (LL+IM)	HL-93	1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
LL+I_MINFX (LL+IM)		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
LL+I_MaxFZ (LL+IM)		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
LL+I_MINFZ (LL+IM)		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
LL+I_MaxMY (LL+IM)		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
LL+I_MINMY (LL+IM)		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4	0	1.0

DC1_Bracing Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
DC1_Bracing End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
DC2_Bracing Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
DC2_Bracing End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
DW_Bracing Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
DW_Bracing End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MaxFX_Bracing End (LL+IM)		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MINFX_Bracing_Start (LL+IM)		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MINFX_Bracing_End (LL+IM)		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MaxFZ_Bracing_End (LL+IM)		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MINFZ_Bracing_End (LL+IM)		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MaxMY_Bracing_End (LL+IM)		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MINMY_Bracing_Start (LL+IM)		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
LL+I_MINMY_Bracing_End (LL+IM)		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
1.25DC+1.5DW_Bracing Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
1.25DC+1.5DW_Bracing End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4	0	1.000
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000

Load Cases and Load Combination	Live Load Consider	Macro Node No	Load Factor Y_{DC1}	Y_{DC2}	Y_{PL}	Y_{DW}	Y_{LL}	Resistance Factor: Flexual ϕ_f	Resistance Factor: Shear ϕ_v	Longitudinal Stiffener: No, of Longitudinal stiffener provided ?	Longitudinal Stiffener: Dist from stiffener to comp. flg d_s	Transverse Stiffener: Is transverse stiffener provided? (Yes =0,No=1)	Transverse Stiffener: Transverse Stiffener Spacing d_o	Transverse Stiffener: Is end panel or interior panel? (Interior =0, End=1)	Hybrid factor R_h
								6.5.4.2	6.5.4.2						6.10.1.10.1
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	1.250	1.250	1.750	1.500	1.750	1.00	1.00	0	10000.00	0	4.1	0	1.000

		Macro Node No	YDC1	YDC2	YPL	YDW	YLL	ϕf	ϕv		ds	(Yes =0,No=1)	do	terior =0, End=	Rh
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
1.25DC+1.5DW+1.75LL+I_MinFX		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
1.25DC+1.5DW+1.75LL+I_MinMY		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0
		1024	1.25	1.25	1.75	1.50	1.75	1.00	1.00	0	10000.00	0	4.1	0	1.0

Load Cases and Load Combination	Live Load Consider	Macro Node No	Load Factor Y_{DC1}	Y_{DC2}	Y_{PL}	Y_{DW}	Y_{LL}	Resistance Factor: Flexual ϕ_f	Resistance Factor: Shear ϕ_v	Longitudinal Stiffener: No, of Longitudinal stiffener provided ?	Longitudinal Stiffener: Dist from stiffener to comp. flg d_s	Transverse Stiffener: Is transverse stiffener provided? (Yes =0,No=1)	Transverse Stiffener: Transverse Stiffener Spacing d_o	Transverse Stiffener: Is end panel or interior panel? (Interior =0, End=1)	Hybrid factor R_h
								6.5.4.2	6.5.4.2						6.10.1.10.1
											(in)		(ft)		
DC1		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
DC2		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
DW		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
DC1+DC2+DW		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0

Load Cases and Load Combination	Live Load Consider		Load Factor					Resistance Factor		Longitudinal Stiffener		Transverse Stiffener			Hybrid factor
								Flexual	Shear	No, of Longitudinal stiffener provided ?	Dist from stiffener to comp. flg	Is transverse stiffener provided?	Transverse Stiffener Spacing	Is end panel or interior panel?	
		Macro Node No	Y_{DC1}	Y_{DC2}	Y_{PL}	Y_{DW}	Y_{LL}	ϕ_f	ϕ_v		d_s	(Yes =0,No=1)	d_o	(Interior =0, End=1)	R_h
								6.5.4.2	6.5.4.2						6.10.1.10.1
LL_MaxFX (LL)	HL-93	1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
LL_MINFX (LL)		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
LL_MaxFZ (LL)		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
LL_MINFZ (LL)		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
LL_MaxMY (LL)		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
LL_MINMY (LL)		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0
		1024	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	10000.00	0	4	0	1.0

			Material Properties														
Load Cases and Load Combination	Live Load Consider		Specified min flg yield strength	Specified web flg yield strength	Specified min yield strength of comp. flg	rebar yield strength	conc deck	Girder	conc deck	Modular Ratio	Area of deck rebar within effective width	Deck thickness	Haunch thickness	Effective width of the deck	Area of Concrete Deck	Unbacing length	$(LL+I)_{\_long}+1/3*(LL+I)_{\_Trans}$ (At Bottom Flange)
		Macro Node No	F_{yf}	F_{yw}	F_{yc}	F_{y_rebar}	f_c	$E_{\_steel}$	$E_{\_deck}$	n	A_{rs}	$t_{\_deck}$	$h_{\_haunch}$	b_{eff}	As	L_b	
			(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)		(in^2)	(in)	(in)	(ft)	(in^2)	(in)	
DC1		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	
DC2		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	
DW		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	
1.25DC1+1.25DC2+1.5DW		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	
LL+I_MaxFX (LL+IM)	HL-93	1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	4.46
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	4.46
LL+I_MINFX (LL+IM)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	3.03
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	3.03
LL+I_MaxFZ (LL+IM)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	6.17
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	6.17
LL+I_MINFZ (LL+IM)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	6.54
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	6.54
LL+I_MaxMY (LL+IM)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	9.71
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	9.71
LL+I_MINMY (LL+IM)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	-1.97
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	-1.97

DC1_Bracing Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
DC1_Bracing End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
DC2_Bracing Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
DC2_Bracing End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
DW_Bracing Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
DW_Bracing End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MaxFX_Bracing End (LL+IM)		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MINFX_Bracing_Start (LL+IM)		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MINFX_Bracing_End (LL+IM)		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MaxFZ_Bracing_End (LL+IM)		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MINFZ_Bracing_End (LL+IM)		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MaxMY_Bracing_End (LL+IM)		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MINMY_Bracing_Start (LL+IM)		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
LL+I_MINMY_Bracing_End (LL+IM)		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW_Bracing Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW_Bracing End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	

Load Cases and Load Combination	Live Load Consider		Material Properties								Area of deck rebar within effective width	Deck thickness	Haunch thickness	Effective width of the deck	Area of Concrete Deck	Unbacing length	$(LL+I)_{long}+1/3*(LL+I)_{Trans}$ (At Bottom Flange)
			Specified min flg yield strength	Specified web flg yield strength	Specified min yield strength of comp. flg	rebar yield strength	conc deck	Girder	conc deck	Modular Ratio							
		Macro Node No	F_{yf}	F_{yw}	F_{yc}	F_{y_rebar}	f_c	$E_{\_steel}$	$E_{\_deck}$	n	A_{rs}	$t_{\_deck}$	$h_{\_haunch}$	b_{eff}	As	L_b	
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	36.000	36.000	36.000	40.000	4.000	29000.000	3604.997	8.000	4.423	8.000	1.500	7.500	720.000	196.875	

		Macro Node No	Fyf	Fyw	Fyc	Fy_rebar	fc	E_steel	E_deck	n	Ars	t_deck	h_haunch	beff		Lb	
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	21.14
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	21.14
1.25DC+1.5DW+1.75LL+I_MinFX		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	18.39
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	18.39
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	23.89
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	23.89
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	24.54
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	24.54
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	30.22
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	30.22
1.25DC+1.5DW+1.75LL+I_MinMY		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	9.90
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	9.90
															Max =	**196.9**	

Load Cases and Load Combination	Live Load Consider		Material Properties								Area of deck rebar within effective width	Deck thickness	Haunch thickness	Effective width of the deck	Area of Concrete Deck	Unbacing length	$(LL+I)_{long}+1/3*(LL+I)_{Trans}$ (At Bottom Flange)
			Specified min flg yield strength	Specified web flg yield strength	Specified min yield strength of comp. flg	rebar yield strength	conc deck	Girder	conc deck	Modular Ratio							
		Macro Node No	F_{yf}	F_{yw}	F_{yc}	F_{y_rebar}	f_c	$E_{\_steel}$	$E_{\_deck}$	n	A_{rs}	$t_{\_deck}$	$h_{\_haunch}$	b_{eff}	As	L_b	
			(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)		(in^2)	(in)	(in)	(ft)	(in^2)	(in)	
DC1		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	6.1
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	6.1
DC2		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	2.6
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	2.6
DW		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	0.0
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	0.0
DC1+DC2+DW		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	8.7
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	8.7

Load Cases and Load Combination	Live Load Consider		Material Properties								Area of deck rebar within effective width	Deck thickness	Haunch thickness	Effective width of the deck	Area of Concrete Deck	Unbacing length	(LL+I)$_{\_long}$+1/3*(LL+I)$_{\_Trans}$ (At Bottom Flange)
			Specified min flg yield strength	Specified web flg yield strength	Specified min yield strength of comp. flg	rebar yield strength	conc deck	Girder	conc deck	Modular Ratio							
		Macro Node No	F_{yf}	F_{yw}	F_{yc}	F_{y_rebar}	f_c	$E_{\_steel}$	$E_{\_deck}$	n	A_{rs}	$t_{\_deck}$	$h_{\_haunch}$	b_{eff}	As	L_b	
LL_MaxFX (LL)	HL-93	1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	3.81
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	3.81
LL_MINFX (LL)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	2.43
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	2.43
LL_MaxFZ (LL)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	4.96
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	4.96
LL_MINFZ (LL)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	5.19
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	5.19
LL_MaxMY (LL)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	8.04
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	8.04
LL_MINMY (LL)		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	-1.63
		1024	36.0	36.0	36.0	40.0	4.0	29000.0	3605.0	8.0	4.4	8.0	1.5	7.5	720.0	196.9	-1.63

Load Cases and Load Combination	Live Load Consider		Non-Composite Section																
			Top steel flange width	Top steel flange thk	Top steel flange area	Bott steel flange width	Bott steel flange thk	Bott steel flange area	Girder Web Depth	Girder Web thk	Girder web area	Total Steel Area	Moment of inertia	CG to Top/Flange	CG to Bott/Flange	Section Modulus about major bending axis		Moment of Inertia of top Flange	Moment of Inertia of bott Flange
		Macro Node No	b_{f_top}	$t_{\_top\ flg}$	$A_{\_st\_top\_flg}$	b_{f_bott}	$t_{\_bott\ flg}$	$A_{\_st\_bott\_flg}$	$D_{\_web}$	$t_{\_web}$	$A_{\_web}$	$A_{\_steel}$	$I_{\_steel}$	Y_T	Y_D	$S_{\_top\_flg}$	$S_{\_bott\_flg}$	$I_{y\_top\_flg}$	$I_{y\_bott\_flg}$
			(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^4)	(in^4)
DC1		1024	16.0	0.750	12.0	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
DC2		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
DW		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
1.25DC1+1.25DC2+1.5DW		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
LL+I_MaxFX (LL+IM)	HL-93	1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
LL+I_MINFX (LL+IM)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
LL+I_MaxFZ (LL+IM)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
LL+I_MINFZ (LL+IM)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
LL+I_MaxMY (LL+IM)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
LL+I_MINMY (LL+IM)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
DC1_Bracing Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
DC1_Bracing End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
DC2_Bracing Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
DC2_Bracing End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
DW_Bracing Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
DW_Bracing End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MaxFX_Bracing End (LL+IM)		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MINFX_Bracing_Start (LL+IM)		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MINFX_Bracing_End (LL+IM)		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MaxFZ_Bracing_End (LL+IM)		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MINFZ_Bracing_End (LL+IM)		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MaxMY_Bracing_End (LL+IM)		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MINMY_Bracing_Start (LL+IM)		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
LL+I_MINMY_Bracing_End (LL+IM)		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW_Bracing Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW_Bracing End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000

Load Cases and Load Combination	Live Load Consider	Macro Node No	Non-Composite Section: Top steel flange width b_{f_top}	Top steel flange thk $t_{\_top\ flg}$	Top steel flange area $A_{\_st\_top\_flg}$	Bott steel flange width b_{f_bott}	Bott steel flange thk $t_{\_bott\ flg}$	Bott steel flange area $A_{\_st\_bott\_flg}$	Girder Web Depth $D_{\_web}$	Girder Web thk $t_{\_web}$	Girder web area $A_{\_web}$	Total Steel Area $A_{\_steel}$	Moment of inertia $I_{\_steel}$	CG to Top/Flange Y_T	CG to Bott/Flange Y_D	Section Modulus about major bending axis $S_{\_top\_flg}$	$S_{\_bott\_flg}$	Moment of Inertia of top Flange $I_{y\_top\_flg}$	Moment of Inertia of bott Flange $I_{y\_bott\_flg}$
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	16.000	0.750	12.000	16.000	1.500	24.000	54.000	0.375	20.250	56.250	30375.000	33.750	22.500	900.000	1350.000	256.000	512.000

		Macro Node No	bf_top	t_top flg	A_st_top_flg	bf_bott	t_bott flg	A_st_bott_flg	D_web	t_web	A_web	A_steel	I_steel	YT	YD	S_top_flg	S_bott_flg	Iy_top_flg	Iy_bott_flg
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
1.25DC+1.5DW+1.75LL+I_MinFX		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
1.25DC+1.5DW+1.75LL+I_MinMY		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.8	12.0	16.0	1.500	24.0	54.0	0.375	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0

Load Cases and Load Combination	Live Load Consider	Macro Node No	Non-Composite Section: Top steel flange width b_{f_top}	Top steel flange thk $t_{\_top\ flg}$	Top steel flange area $A_{\_st\_top\_flg}$	Bott steel flange width b_{f_bott}	Bott steel flange thk $t_{\_bott\ flg}$	Bott steel flange area $A_{\_st\_bott\_flg}$	Girder Web Depth $D_{\_web}$	Girder Web thk $t_{\_web}$	Girder web area $A_{\_web}$	Total Steel Area $A_{\_steel}$	Moment of inertia $I_{\_steel}$	CG to Top/Flange Y_T	CG to Bott/Flange Y_D	Section Modulus about major bending axis $S_{\_top\_flg}$	$S_{\_bott\_flg}$	Moment of Inertia of top Flange $I_{y\_top\_flg}$	Moment of Inertia of bott Flange $I_{y\_bott\_flg}$
			(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in)	(in)	(in^2)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^4)	(in^4)
DC1		1024	16.0	0.750	12.0	16.0	1.500	24.0	54.0	0.3750	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
DC2		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
DW		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
DC1+DC2+DW		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0

			Non-Composite Section																	
Load Cases and Load Combination	Live Load Consider		Top steel flange width	Top steel flange thk	Top steel flange area	Bott steel flange width	Bott steel flange thk	Bott steel flange area	Girder Web Depth	Girder Web thk	Girder web area	Total Steel Area	Moment of inertia	CG to Top/Flange	CG to Bott/Flange	Section Modulus about major bending axis		Moment of Inertia of top Flange	Moment of Inertia of bott Flange	
		Macro Node No	b_{f_top}	$t_{\_top\ flg}$	$A_{\_st\_top\_flg}$	b_{f_bott}	$t_{\_bott\ flg}$	$A_{\_st\_bott\_flg}$	$D_{\_web}$	$t_{\_web}$	$A_{\_web}$	$A_{\_steel}$	$I_{\_steel}$	Y_T	Y_D	$S_{\_top\_flg}$	$S_{\_bott\_flg}$	$I_{y\_top\_flg}$	$I_{y\_bott\_flg}$	
LL_MaxFX (LL)	HL-93	1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
LL_MINFX (LL)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
LL_MaxFZ (LL)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
LL_MINFZ (LL)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
LL_MaxMY (LL)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
LL_MINMY (LL)		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	
		1024	16.0	0.75	12.0	16.0	1.50	24.0	54.0	0.4	20.3	56.3	30375.0	33.8	22.5	900.0	1350.0	256.0	512.0	

Load Cases and Load Combination	Live Load Consider		Composite Section with Modular Ratio = n (at Positive Moment Region)							Composite Section with Modular Ratio = 3n (at Positive Moment Reigion)						
			Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel
		Macro Node No	$A_{c(n)}$	$I_{c(n)}$	$Y_{slabc(n)}$	$Y_{tc(n)}$	$Y_{bc(n)}$	$S_{tc(n)}$	$S_{bc(n)}$	$A_{c(3n)}$	$I_{c(3n)}$	$Y_{slabc(3n)}$	$Y_{tc(3n)}$	$Y_{bc(3n)}$	$S_{tc(3n)}$	$S_{bc(3n)}$
			(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)
DC1		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
DC2		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
DW		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
1.25DC1+1.25DC2+1.5DW		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL+I_MaxFX (LL+IM)	HL-93	1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL+I_MINFX (LL+IM)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL+I_MaxFZ (LL+IM)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL+I_MINFZ (LL+IM)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL+I_MaxMY (LL+IM)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL+I_MINMY (LL+IM)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2

DC1_Bracing Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
DC1_Bracing End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
DC2_Bracing Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
DC2_Bracing End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
DW_Bracing Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
DW_Bracing End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MaxFX_Bracing End (LL+IM)		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MINFX_Bracing_Start (LL+IM)		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MINFX_Bracing_End (LL+IM)		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MaxFZ_Bracing_End (LL+IM)		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MINFZ_Bracing_End (LL+IM)		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MaxMY_Bracing_End (LL+IM)		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MINMY_Bracing_Start (LL+IM)		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
LL+I_MINMY_Bracing_End (LL+IM)		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW_Bracing Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW_Bracing End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154

Load Cases and Load Combination	Live Load Consider	Composite Section with Modular Ratio = n (at Positive Moment Region)								Composite Section with Modular Ratio = 3n (at Positive Moment Reigion)						
			Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel
		Macro Node No	$A_{c(n)}$	$I_{c(n)}$	$Y_{slabc(n)}$	$Y_{tc(n)}$	$Y_{bc(n)}$	$S_{tc(n)}$	$S_{bc(n)}$	$A_{c(3n)}$	$I_{c(3n)}$	$Y_{slabc(3n)}$	$Y_{tc(3n)}$	$Y_{bc(3n)}$	$S_{tc(3n)}$	$S_{bc(3n)}$
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	149.250	84497.4	18.888	9.388	46.862	9000.392	1803.119	87.250	61106.278	29.359	19.859	36.391	3077.025	1679.154

		Macro Node No	Ac(n)	Ic(n)	Yslabc(n)	Ytc(n)	Ybc(n)	Stc(n)	Sbc(n)	Ac(3n)	Ic(3n)	Yslabc(3n)	Ytc(3n)	Ybc(3n)	Stc(3n)	Sbc(3n)
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
1.25DC+1.5DW+1.75LL+I_MinFX		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
1.25DC+1.5DW+1.75LL+I_MinMY		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2

Load Cases and Load Combination	Live Load Consider	Composite Section with Modular Ratio = n (at Positive Moment Region)								Composite Section with Modular Ratio = 3n (at Positive Moment Reigion)						
			Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel
		Macro Node No	$A_{c(n)}$	$I_{c(n)}$	$Y_{slabc(n)}$	$Y_{tc(n)}$	$Y_{bc(n)}$	$S_{tc(n)}$	$S_{bc(n)}$	$A_{c(3n)}$	$I_{c(3n)}$	$Y_{slabc(3n)}$	$Y_{tc(3n)}$	$Y_{bc(3n)}$	$S_{tc(3n)}$	$S_{bc(3n)}$
			(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)	(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)
DC1		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
DC2		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
DW		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
DC1+DC2+DW		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2

Load Cases and Load Combination	Live Load Consider		Composite Section with Modular Ratio = n (at Positive Moment Region)							Composite Section with Modular Ratio = 3n (at Positive Moment Reigion)						
			Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel	Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel
		Macro Node No	$A_{c(n)}$	$I_{c(n)}$	$Y_{slabc(n)}$	$Y_{tc(n)}$	$Y_{bc(n)}$	$S_{tc(n)}$	$S_{bc(n)}$	$A_{c(3n)}$	$I_{c(3n)}$	$Y_{slabc(3n)}$	$Y_{tc(3n)}$	$Y_{bc(3n)}$	$S_{tc(3n)}$	$S_{bc(3n)}$
LL_MaxFX (LL)	HL-93	1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL_MINFX (LL)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL_MaxFZ (LL)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL_MINFZ (LL)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL_MaxMY (LL)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
LL_MINMY (LL)		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2
		1024	149.3	84497.4	18.9	9.4	46.9	9000.4	1803.1	87.3	61106.3	29.4	19.9	36.4	3077.0	1679.2

Load Cases and Load Combination	Live Load Consider		Composite Section with Modular Ratio = n (at Negative Moment Region)								Check if it is compact composite section for M+ (6.10.6.2.2)				
			Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel		Depth of web in compression at the M_p	Is flg strength ≤70 ksi ?	Is $D/t_w \leq 150$?	Is $2D_{cp}/t_w \leq 3.76^*(E/F_{yc})^{1/2}$?	Is compact composite section?
		Macro Node No	A_c	I_c	Y_{slabc}	Y_{tc}	Y_{bc}	$S_{tc(n)}$	$S_{bc(n)}$		D_{cp}	Yes =0, No=1	Yes =0,No=1	Yes =0, No=1	
											(D6.3.2-1)				AASHTO 6.10.6.2.2
			(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)		(in)				
DC1		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
DC2		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
DW		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
1.25DC1+1.25DC2+1.5DW		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
LL+I_MaxFX (LL+IM)	HL-93	1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
LL+I_MINFX (LL+IM)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
LL+I_MaxFZ (LL+IM)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
LL+I_MINFZ (LL+IM)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
LL+I_MaxMY (LL+IM)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
LL+I_MINMY (LL+IM)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1

DC1_Bracing Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
DC1_Bracing End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
DC2_Bracing Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
DC2_Bracing End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
DW_Bracing Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
DW_Bracing End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MaxFX_Bracing End (LL+IM)		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MINFX_Bracing_Start (LL+IM)		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MINFX_Bracing_End (LL+IM)		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MaxFZ_Bracing_End (LL+IM)		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MINFZ_Bracing_End (LL+IM)		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MaxMY_Bracing_End (LL+IM)		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MINMY_Bracing_Start (LL+IM)		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
LL+I_MINMY_Bracing_End (LL+IM)		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
1.25DC+1.5DW_Bracing Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
1.25DC+1.5DW_Bracing End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1

Load Cases and Load Combination	Live Load Consider		Composite Section with Modular Ratio = n (at Negative Moment Region)								Check if it is compact composite section for M+ (6.10.6.2.2)					
			Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel		Depth of web in compression at the M_p	Is flg strength ≤70 ksi ?	Is D/t_w≤150 ?	Is $2D_{cp}/t_w$≤3.76*$(E/F_{yc})^{1/2}$?	Is compact composite section?	
		Macro Node No	A_c	I_c	Y_{slabc}	Y_{tc}	Y_{bc}	$S_{tc(n)}$	$S_{bc(n)}$		D_{cp}	Yes =0, No=1	Yes =0,No=1	Yes =0, No=1		
											(D6.3.2-1)				AASHTO 6.10.6.2.2	
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	60.673	36692.448	40.389	30.889	25.361	1187.896	1446.783		0.000	0.000	0.000	0.000	compact, follow 6.10.7.1	

		Macro Node No	Ac	Ic	Yslabc	Ytc	Ybc	Stc(n)	Sbc(n)		Dcp	Yes =0, No=1	Yes =0,No=1	Yes =0, No=1		
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MinFX		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
1.25DC+1.5DW+1.75LL+I_MinMY		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		-54.2	0.0	0.0	0.0	compact, follow 6.10.7.1	

Load Cases and Load Combination	Live Load Consider		Composite Section with Modular Ratio = n (at Negative Moment Region)								Check if it is compact composite section for M+ (6.10.6.2.2)					
			Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel		Depth of web in compression at the M_p	Is flg strength ≤70 ksi ?	Is D/t_w≤150 ?	Is $2D_{cp}/t_w$≤3.76*$(E/F_{yc})^{1/2}$?	Is compact composite section?	
		Macro Node No	A_c	I_c	Y_{slabc}	Y_{tc}	Y_{bc}	$S_{tc(n)}$	$S_{bc(n)}$		D_{cp}	Yes =0, No=1	Yes =0,No=1	Yes =0, No=1		
											(D6.3.2-1)				AASHTO 6.10.6.2.2	
			(in^2)	(in^4)	(in)	(in)	(in^3)	(in^3)	(in^3)		(in)					
DC1		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
DC2		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
DW		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
DC1+DC2+DW		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	

Load Cases and Load Combination	Live Load Consider		Composite Section with Modular Ratio = n (at Negative Moment Region)								Check if it is compact composite section for M+ (6.10.6.2.2)					
			Area	Moment of inertia	Distance from CG to top of deck	Distance from CG to top of steel	Distance from CG to bott of steel	Section Modulus to top of steel	Section Modulus to bott of steel		Depth of web in compression at the M_p	Is flg strength ≤70 ksi ?	Is D/t_w≤150 ?	Is $2D_{cp}/t_w \le 3.76^*(E/F_{yc})^{1/2}$?	Is compact composite section?	
		Macro Node No	A_c	I_c	Y_{slabc}	Y_{tc}	Y_{bc}	$S_{tc(n)}$	$S_{bc(n)}$		D_{cp}	Yes =0, No=1	Yes =0,No=1	Yes =0, No=1		
											(D6.3.2-1)				AASHTO 6.10.6.2.2	
LL_MaxFX (LL)	HL-93	1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
LL_MINFX (LL)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
LL_MaxFZ (LL)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
LL_MINFZ (LL)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
LL_MaxMY (LL)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
LL_MINMY (LL)		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	
		1024	60.7	36692.4	40.4	30.9	25.4	1187.9	1446.8		0.0	0.0	0.0	0.0	compact, follow 6.10.7.1	

										6.10.1.9 - Web Bend-Buckling Resistance F_{crw}				
			Check if it is compact composite section for M- (6.10.6.2.3)							6.10.1.9.1 without longitudinal stiffeners				
Load Cases and Load Combination	Live Load Consider		D_{cp}	Is flg strength ≤70 ksi ?	Is D/t_w≤150 ?	Is $2D_{cp}/t_w$≤ $5.76*(E/F_{yc})^{1/2}$?	Is I_{yc}/I_{yt} ≥ 0.3 ?	Is compact composite section?		Sum of Top -flange stress	Sum of Bottom -flange stress	Depth of web in compression	Bend-buckling coefficient	Nominal bend-buckling resistance
		Macro Node No	(D6.3.2-2)	Yes =0,No=1	Yes =0,No=1	Yes =0,No=1				f_top	f_bottom	D_c	k	F_{crw}
								AASHTO 6.10.6.2.2		D6.3.1	D6.3.1	D6.3.1-1	6.10.1.9.1-2	6.10.1.9.1-1
			(in)							(ksi)	(ksi)	(in)		
DC1		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-9.86	6.05	34.1	22.5	28.4
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-9.86	6.05	34.1	22.5	28.4
DC2		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.563	0.996	19.6	68.5	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.56	1.00	19.6	68.5	36.0
DW		1024	17.6	0.0	0.0	0.0	0.0	Compact section		0.00	0.00	10.8	223.5	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		0.00	0.00	10.8	223.5	36.0
1.25DC1+1.25DC2+1.5DW		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-13.03	8.80	32.8	24.4	30.7
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-13.03	8.80	32.8	24.4	30.7
LL+I_MaxFX (LL+IM)	HL-93	1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.54	4.25	5.6	839.2	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.54	4.25	5.6	839.2	36.0
LL+I_MINFX (LL+IM)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.98	2.96	13.3	148.6	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.98	2.96	13.3	148.6	36.0
LL+I_MaxFZ (LL+IM)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-1.06	6.09	7.6	459.0	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-1.06	6.09	7.6	459.0	36.0
LL+I_MINFZ (LL+IM)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-1.12	6.47	7.6	457.6	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-1.12	6.47	7.6	457.6	36.0
LL+I_MaxMY (LL+IM)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-1.90	9.55	8.6	355.5	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-1.90	9.55	8.6	355.5	36.0
LL+I_MINMY (LL+IM)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		2.85	-1.90	21.0	59.6	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		2.85	-1.90	21.0	59.6	36.0

DC1_Bracing Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-9.9	6.0	34.124	22.537	28.367
DC1_Bracing End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-8.0	4.8	34.404	22.172	27.908
DC2_Bracing Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-0.563	1.0	19.569	68.530	36.000
DC2_Bracing End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-0.478	0.8	19.989	65.684	36.000
DW_Bracing Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		0.00	0.00	10.835	223.534	36.000
DW_Bracing End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		0.00	0.00	10.835	223.534	36.000
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024	17.553	0.000	0.000	0.000	0.000	Compact section		-0.5	4.3	5.592	839.233	36.000
LL+I_MaxFX_Bracing End (LL+IM)		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-0.4	3.6	4.996	1051.403	36.000
LL+I_MINFX_Bracing_Start (LL+IM)		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-1.0	3.0	13.289	148.608	36.000
LL+I_MINFX_Bracing_End (LL+IM)		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-1.0	3.2	12.959	156.279	36.000
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-1.1	6.1	7.561	459.029	36.000
LL+I_MaxFZ_Bracing_End (LL+IM)		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-0.8	5.0	6.722	580.889	36.000
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-1.1	6.5	7.573	457.550	36.000
LL+I_MINFZ_Bracing_End (LL+IM)		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-1.1	5.6	8.204	389.883	36.000
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-1.9	9.6	8.592	355.528	36.000
LL+I_MaxMY_Bracing_End (LL+IM)		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-1.8	8.7	8.800	338.924	36.000
LL+I_MINMY_Bracing_Start (LL+IM)		1024	17.553	0.000	0.000	0.000	0.000	Compact section		2.9	-1.9	20.979	59.628	36.000
LL+I_MINMY_Bracing_End (LL+IM)		1026	17.553	0.000	0.000	0.000	0.000	Compact section		3.0	-1.9	20.612	61.772	36.000
1.25DC+1.5DW_Bracing Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-13.03	8.80	32.822	24.361	30.662
1.25DC+1.5DW_Bracing End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-10.55	7.00	33.068	24.001	30.209
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-13.98	16.25	25.263	41.121	36.000

6.10.1.9 - Web Bend-Buckling Resistance F_{crw}

Load Cases and Load Combination	Live Load Consider		Check if it is compact composite section for M- (6.10.6.2.3)							6.10.1.9.1 without longitudinal stiffeners				
			D_{cp}	Is flg strength ≤70 ksi ?	Is D/t_w≤150 ?	Is $2D_{cp}/t_w$≤ $5.76*(E/F_{yc})^{1/2}$?	Is I_{yc}/I_{yt} ≥ 0.3 ?	Is compact composite section?		Sum of Top -flange stress	Sum of Bottom -flange stress	Depth of web in compression	Bend-buckling coefficient	Nominal bend-buckling resistance
		Macro Node No	(D6.3.2-2)	Yes =0,No=1	Yes =0,No=1	Yes =0,No=1				f_top	f_bottom	D_c	k	F_{crw}
								AASHTO 6.10.6.2.2		D6.3.1	D6.3.1	D6.3.1-1	6.10.1.9.1-2	6.10.1.9.1-1
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	17.553	0.000	0.000	0.000	0.000	Compact section		-11.27	13.37	24.980	42.059	36.000
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-14.75	13.98	28.135	33.153	36.000
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-12.36	12.62	27.080	35.788	36.000
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-14.88	19.46	23.623	47.030	36.000
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-11.88	15.69	23.489	47.567	36.000
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-15.00	20.13	23.268	48.472	36.000
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-12.41	16.85	23.110	49.140	36.000
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-16.36	25.52	21.224	58.260	36.000
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-13.65	22.16	20.692	61.298	36.000
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	17.553	0.000	0.000	0.000	0.000	Compact section		-8.04	5.48	32.700	24.543	30.891
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	17.553	0.000	0.000	0.000	0.000	Compact section		-5.30	3.60	32.756	24.460	30.787

		Macro Node No	(D6.3.2-2)	Yes =0,No=1	Yes =0,No=1	Yes =0,No=1				f_top	f_bottom	Dc	k	Fcrw
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	17.6	0.0	0.0	0.0	0.0	Compact section		-13.98	18.69	23.3	48.3	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-13.98	18.69	23.3	48.3	36.0
1.25DC+1.5DW+1.75LL+I_MinFX		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-14.75	16.19	26.1	38.6	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-14.75	16.19	26.1	38.6	36.0
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-14.88	21.67	22.1	53.5	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-14.88	21.67	22.1	53.5	36.0
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-15.00	22.33	21.9	55.0	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-15.00	22.33	21.9	55.0	36.0
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-16.36	27.87	20.1	65.2	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-16.36	27.87	20.1	65.2	36.0
1.25DC+1.5DW+1.75LL+I_MinMY		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-8.04	7.69	28.0	33.5	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-8.04	7.69	28.0	33.5	36.0

Load Cases and Load Combination	Live Load Consider		Check if it is compact composite section for M- (6.10.6.2.3)							6.10.1.9.1 without longitudinal stiffeners				
			D_{cp}	Is flg strength ≤70 ksi ?	Is D/t_w≤150 ?	Is $2D_{cp}/t_w$≤ $5.76*(E/F_{yc})^{1/2}$?	Is I_{yc}/I_{yt} ≥ 0.3 ?	Is compact composite section?		Sum of Top -flange stress	Sum of Bottom -flange stress	Depth of web in compression	Bend-buckling coefficient	Nominal bend-buckling resistance
		Macro Node No	(D6.3.2-2)	Yes =0,No=1	Yes =0,No=1	Yes =0,No=1				f_top	f_bottom	D_c	k	F_{crw}
								AASHTO 6.10.6.2.2		D6.3.1	D6.3.1	D6.3.1-1	6.10.1.9.1-2	6.10.1.9.1-1
			(in)							(ksi)	(ksi)	(in)		
DC1		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-9.86	6.05	34.1	22.5	28.4
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-9.86	6.05	34.1	22.5	28.4
DC2		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.563	0.996	19.6	68.5	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.56	1.00	19.6	68.5	36.0
DW		1024	17.6	0.0	0.0	0.0	0.0	Compact section		0.00	0.00	10.8	223.5	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		0.00	0.00	10.8	223.5	36.0
DC1+DC2+DW		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-10.43	7.04	32.8	24.4	30.7
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-10.43	7.04	32.8	24.4	30.7

Load Cases and Load Combination	Live Load Consider		Check if it is compact composite section for M- (6.10.6.2.3)							6.10.1.9 - Web Bend-Buckling Resistance F_{crw} — 6.10.1.9.1 without longitudinal stiffeners				
			D_{cp}	Is flg strength ≤70 ksi ?	Is D/t_w≤150 ?	Is $2D_{cp}/t_w \le 5.76^*(E/F_{yc})^{1/2}$?	Is I_{yc}/I_{yt} ≥ 0.3 ?	Is compact composite section?		Sum of Top -flange stress	Sum of Bottom -flange stress	Depth of web in compression	Bend-buckling coefficient	Nominal bend-buckling resistance
		Macro Node No	(D6.3.2-2)	Yes =0,No=1	Yes =0,No=1	Yes =0,No=1				f_top	f_bottom	D_c	k	F_{crw}
								AASHTO 6.10.6.2.2		D6.3.1	D6.3.1	D6.3.1-1	6.10.1.9.1-2	6.10.1.9.1-1
LL_MaxFX (LL)	HL-93	1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.459	3.63	5.6	847.3	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.459	3.63	5.6	847.3	36.0
LL_MINFX (LL)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.805	2.37	13.5	143.9	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.805	2.37	13.5	143.9	36.0
LL_MaxFZ (LL)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.827	4.84	7.5	470.7	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.827	4.84	7.5	470.7	36.0
LL_MINFZ (LL)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.880	5.14	7.5	469.2	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-0.880	5.14	7.5	469.2	36.0
LL_MaxMY (LL)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-1.567	7.92	8.5	359.4	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		-1.567	7.92	8.5	359.4	36.0
LL_MINMY (LL)		1024	17.6	0.0	0.0	0.0	0.0	Compact section		2.361	-1.56	20.9	60.0	36.0
		1024	17.6	0.0	0.0	0.0	0.0	Compact section		2.361	-1.56	20.9	60.0	36.0

Load Cases and Load Combination	Live Load Consider	Macro Node No	6.10.1.9.2 with longitudinal stiffeners: Bend-buckling coefficient k	6.10.1.9.2 with longitudinal stiffeners: Nominal bend-buckling resistance F_{crw}	Nominal bend-buckling resistance (Use) F_{crw}		6.10.1.10.2 - We… R_b without longitudinal stiffener: Limiting slenderness ratio for a noncompact web λ_{rw}	Full width of compression flg b_{fc}	Thickness of compression flg t_{fc}	a_{wc}	Web Load-Shedding Factor R_b Exclude composite in positive flexure with	Web Load-Shedding Factor R_b Composite in positive flexure	Web Load-Shedding Factor R_b ("0" means not applicable)
			6.10.1.9.2-1	6.10.1.9.1-1			6.10.1.10.2-4			6.10.1.10.2-5			
					(ksi)			(in)	(in)				
DC1		1024	22.5	28.4	28.4		161.8	16.0	0.8	2.1	0.977	1.0	1.0
		1024	22.5	28.4	28.4		161.8	16.0	0.8	2.1	0.977	1.0	1.0
DC2		1024	68.5	36.0	36.0		161.8	16.0	0.8	1.2	1.000	1.0	1.0
		1024	68.5	36.0	36.0		161.8	16.0	0.8	1.2	1.000	1.0	1.0
DW		1024	223.5	36.0	36.0		161.8	16.0	0.8	0.7	1.000	1.0	1.0
		1024	223.5	36.0	36.0		161.8	16.0	0.8	0.7	1.000	1.0	1.0
1.25DC1+1.25DC2+1.5DW		1024	24.4	30.7	30.7		161.8	16.0	0.8	2.1	0.985	1.0	1.0
		1024	24.4	30.7	30.7		161.8	16.0	0.8	2.1	0.985	1.0	1.0
LL+I_MaxFX (LL+IM)		1024	839.2	36.0	36.0		161.8	16.0	0.8	0.3	1.000	1.0	1.0
		1024	839.2	36.0	36.0		161.8	16.0	0.8	0.3	1.000	1.0	1.0
LL+I_MINFX (LL+IM)		1024	148.6	36.0	36.0		161.8	16.0	0.8	0.8	1.000	1.0	1.0
		1024	148.6	36.0	36.0		161.8	16.0	0.8	0.8	1.000	1.0	1.0
LL+I_MaxFZ (LL+IM)		1024	459.0	36.0	36.0		161.8	16.0	0.8	0.5	1.000	1.0	1.0
	HL-93	1024	459.0	36.0	36.0		161.8	16.0	0.8	0.5	1.000	1.0	1.0
LL+I_MINFZ (LL+IM)		1024	457.6	36.0	36.0		161.8	16.0	0.8	0.5	1.000	1.0	1.0
		1024	457.6	36.0	36.0		161.8	16.0	0.8	0.5	1.000	1.0	1.0
LL+I_MaxMY (LL+IM)		1024	355.5	36.0	36.0		161.8	16.0	0.8	0.5	1.000	1.0	1.0
		1024	355.5	36.0	36.0		161.8	16.0	0.8	0.5	1.000	1.0	1.0
LL+I_MINMY (LL+IM)		1024	59.6	36.0	36.0		161.8	16.0	1.5	0.7	1.000	1.0	1.0
		1024	59.6	36.0	36.0		161.8	16.0	1.5	0.7	1.000	1.0	1.0

DC1_Bracing Start		1024	22.537	28.367	28.367		161.779	16.000	0.750	2.133	0.977	1.000	1.000
DC1_Bracing End		1026	22.172	27.908	27.908		161.779	16.000	0.750	2.150	0.975	1.000	1.000
DC2_Bracing Start		1024	68.530	36.000	36.000		161.779	16.000	0.750	1.223	1.000	1.000	1.000
DC2_Bracing End		1026	65.684	36.000	36.000		161.779	16.000	0.750	1.249	1.000	1.000	1.000
DW_Bracing Start		1024	223.534	36.000	36.000		161.779	16.000	0.750	0.677	1.000	1.000	1.000
DW_Bracing End		1026	223.534	36.000	36.000		161.779	16.000	0.750	0.677	1.000	1.000	1.000
LL+I_MaxFX_Bracing Start (LL+IM)		1024	839.233	36.000	36.000		161.779	16.000	0.750	0.350	1.000	1.000	1.000
LL+I_MaxFX_Bracing End (LL+IM)		1026	1051.403	36.000	36.000		161.779	16.000	0.750	0.312	1.000	1.000	1.000
LL+I_MINFX_Bracing_Start (LL+IM)		1024	148.608	36.000	36.000		161.779	16.000	0.750	0.831	1.000	1.000	1.000
LL+I_MINFX_Bracing_End (LL+IM)		1026	156.279	36.000	36.000		161.779	16.000	0.750	0.810	1.000	1.000	1.000
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	459.029	36.000	36.000		161.779	16.000	0.750	0.473	1.000	1.000	1.000
LL+I_MaxFZ_Bracing_End (LL+IM)	HL-93	1026	580.889	36.000	36.000		161.779	16.000	0.750	0.420	1.000	1.000	1.000
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	457.550	36.000	36.000		161.779	16.000	0.750	0.473	1.000	1.000	1.000
LL+I_MINFZ_Bracing_End (LL+IM)		1026	389.883	36.000	36.000		161.779	16.000	0.750	0.513	1.000	1.000	1.000
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	355.528	36.000	36.000		161.779	16.000	0.750	0.537	1.000	1.000	1.000
LL+I_MaxMY_Bracing_End (LL+IM)		1026	338.924	36.000	36.000		161.779	16.000	0.750	0.550	1.000	1.000	1.000
LL+I_MINMY_Bracing_Start (LL+IM)		1024	59.628	36.000	36.000		161.779	16.000	1.500	0.656	1.000	1.000	1.000
LL+I_MINMY_Bracing_End (LL+IM)		1026	61.772	36.000	36.000		161.779	16.000	1.500	0.644	1.000	1.000	1.000
1.25DC+1.5DW_Bracing Start		1024	24.361	30.662	30.662		161.779	16.000	0.750	2.051	0.985	1.000	1.000
1.25DC+1.5DW_Bracing End		1026	24.001	30.209	30.209		161.779	16.000	0.750	2.067	0.983	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	41.121	36.000	36.000		161.779	16.000	0.750	1.579	1.000	1.000	1.000

							6.10.1.10.2 - We						
Load Cases and Load Combination	Live Load Consider		6.10.1.9.2 with longitudinal stiffeners		Nominal bend-buckling resistance (Use)		R_b without longitudinal stiffener						
			Bend-buckling coefficient	Nominal bend-buckling resistance			Limiting slenderness ratio for a noncompact web	Full width of compression flg	Thickness of compression flg	α_{wc}	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b
		Macro Node No	k	F_{crw}	$\mathbf{F_{crw}}$		λ_{rw}	b_{fc}	t_{fc}		Exclude composite in positive flexure with	Composite in positive flexure	("0" means not applicable)
			6.10.1.9.2-1	6.10.1.9.1-1			6.10.1.10.2-4			6.10.1.10.2-5			
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	42.059	36.000	36.000		161.779	16.000	0.750	1.561	1.000	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	33.153	36.000	36.000		161.779	16.000	0.750	1.758	1.000	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	35.788	36.000	36.000		161.779	16.000	0.750	1.693	1.000	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	47.030	36.000	36.000		161.779	16.000	0.750	1.476	1.000	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	47.567	36.000	36.000		161.779	16.000	0.750	1.468	1.000	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	48.472	36.000	36.000		161.779	16.000	0.750	1.454	1.000	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	49.140	36.000	36.000		161.779	16.000	0.750	1.444	1.000	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	58.260	36.000	36.000		161.779	16.000	0.750	1.327	1.000	1.000	1.000
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	61.298	36.000	36.000		161.779	16.000	0.750	1.293	1.000	1.000	1.000
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	24.543	30.891	30.891		161.779	16.000	0.750	2.044	0.986	1.000	1.000
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	24.460	30.787	30.787		161.779	16.000	0.750	2.047	0.985	1.000	1.000

		Macro Node No	k	Fcrw	Fcrw		λ_{rw}	bfc	tfc		Rb	Rb	Rb
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	48.3	36.0	36.0		161.8	16.0	0.750	1.5	1.000	1.0	1.0
		1024	48.3	36.0	36.0		161.8	16.0	0.750	1.5	1.000	1.0	1.0
1.25DC+1.5DW+1.75LL+I_MinFX		1024	38.6	36.0	36.0		161.8	16.0	0.750	1.6	1.000	1.0	1.0
		1024	38.6	36.0	36.0		161.8	16.0	0.750	1.6	1.000	1.0	1.0
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	53.5	36.0	36.0		161.8	16.0	0.750	1.4	1.000	1.0	1.0
		1024	53.5	36.0	36.0		161.8	16.0	0.750	1.4	1.000	1.0	1.0
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	55.0	36.0	36.0		161.8	16.0	0.750	1.4	1.000	1.0	1.0
		1024	55.0	36.0	36.0		161.8	16.0	0.750	1.4	1.000	1.0	1.0
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	65.2	36.0	36.0		161.8	16.0	0.750	1.3	1.000	1.0	1.0
		1024	65.2	36.0	36.0		161.8	16.0	0.750	1.3	1.000	1.0	1.0
1.25DC+1.5DW+1.75LL+I_MinMY		1024	33.5	36.0	36.0		161.8	16.0	0.750	1.8	1.000	1.0	1.0
		1024	33.5	36.0	36.0		161.8	16.0	0.750	1.8	1.000	1.0	1.0

Load Cases and Load Combination	Live Load Consider		6.10.1.9.2 with longitudinal stiffeners		Nominal bend-buckling resistance (Use)
			Bend-buckling coefficient	Nominal bend-buckling resistance	
		Macro Node No	k	F_{crw}	$\mathbf{F_{crw}}$
			6.10.1.9.2-1	6.10.1.9.1-1	
					(ksi)
DC1		1024	22.5	28.4	28.4
		1024	22.5	28.4	28.4
DC2		1024	68.5	36.0	36.0
		1024	68.5	36.0	36.0
DW		1024	223.5	36.0	36.0
		1024	223.5	36.0	36.0
DC1+DC2+DW		1024	24.4	30.7	30.7
		1024	24.4	30.7	30.7

6.10.1.10.2 - We						
R_b without longitudinal stiffener						
Limiting slenderness ratio for a noncompact web	Full width of compression flg	Thickness of compression flg	α_{wc}	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b
Υ_{rw}	b_{fc}	t_{fc}		Exclude composite in positive flexure with	Composite in positive flexure	("0" means not applicable)
6.10.1.10.2-4			6.10.1.10.2-5			

Load Cases and Load Combination	Live Load Consider		6.10.1.9.2 with longitudinal stiffeners		Nominal bend-buckling resistance (Use)	6.10.1.10.2 - We R_b without longitudinal stiffener						
			Bend-buckling coefficient	Nominal bend-buckling resistance		Limiting slenderness ratio for a noncompact web	Full width of compression flg	Thickness of compression flg	α_{wc}	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b
		Macro Node No	k	F_{crw}	$\mathbf{F_{crw}}$	λ_{rw}	b_{fc}	t_{fc}		Exclude composite in positive flexure with	Composite in positive flexure	("0" means not applicable)
			6.10.1.9.2-1	6.10.1.9.1-1		6.10.1.10.2-4			6.10.1.10.2-5			
						λ_{rw}	bfc	tfc		Rb	Rb	Rb
LL_MaxFX (LL)	HL-93	1024	847.3	36.0	36.0	161.8	16.0	0.750	1.5	1.000	1.0	1.0
		1024	847.3	36.0	36.0	161.8	16.0	0.750	1.5	1.000	1.0	1.0
LL_MINFX (LL)		1024	143.9	36.0	36.0	161.8	16.0	0.750	1.6	1.000	1.0	1.0
		1024	143.9	36.0	36.0	161.8	16.0	0.750	1.6	1.000	1.0	1.0
LL_MaxFZ (LL)		1024	470.7	36.0	36.0	161.8	16.0	0.750	1.4	1.000	1.0	1.0
		1024	470.7	36.0	36.0	161.8	16.0	0.750	1.4	1.000	1.0	1.0
LL_MINFZ (LL)		1024	469.2	36.0	36.0	161.8	16.0	0.750	1.4	1.000	1.0	1.0
		1024	469.2	36.0	36.0	161.8	16.0	0.750	1.4	1.000	1.0	1.0
LL_MaxMY (LL)		1024	359.4	36.0	36.0	161.8	16.0	0.750	1.3	1.000	1.0	1.0
		1024	359.4	36.0	36.0	161.8	16.0	0.750	1.3	1.000	1.0	1.0
LL_MINMY (LL)		1024	60.0	36.0	36.0	161.8	16.0	0.750	1.8	1.000	1.0	1.0
		1024	60.0	36.0	36.0	161.8	16.0	0.750	1.8	1.000	1.0	1.0

Load Cases and Load Combination	Live Load Consider		eb Load-Shedding Factor R_b / R_b with longitudinal stiffener								R_{b_final}		6.10.7 - Flexural Resistance -Composite Sections in Positive Flexure / 6.10.7.1 - Flexural Resistance - Composite Compact Section in Positive Flexure					6.10.7.2 - Flexural Resistance - Composite Non Compact Section in Positive Flexure					Comp Section in Postive Flexure
			Bend-buckling coefficient	Is $D/t_w \le 0.95(Ek/F_{yc})^{1/2}$?	Is $2D_c/t_w \le \lambda_{rw}$?	α_{wc}	α_{wc}	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b		Apply ?	Dist from T/deck to comp sect NA	Plastic Moment	Nominal flexural resistance		Apply ?	Dist from T/deck to comp sect NA	$D_p \le 0.42\ D_t$?	Nominal flexural resistance of compression flange	Nominal flexural resistance of tension flange	D6.2.2-2
		Macro Node No	k	Yes =0, No=1	Yes =0,No=1	(For positive Moment)	(for others)	Exclude composite in positive flexure	Composite in positive flexure	("0" means not applicable)	Use		Yes =0, No=1	D_p	M_p	M_n		Yes =0, No=1	D_p	Yes=OK, No=NG	F_{nc}	F_{nt}	My
						6.10.1.10.2-6	6.10.1.10.2-5								D6.1	6.10.7.1.2				6.10.7.3-1	6.10.7.2.2-1	6.10.7.2.2-2	D6.2.2-2
															(k-ft)	(k-ft)					(ksi)	(ksi)	(k-ft)
DC1		1024	22.5	1.0	1.0	0.76	2.13	0.977	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	22.5	1.0	1.0	0.76	2.13	0.977	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
DC2		1024	68.5	0.0	0.0	0.43	1.22	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	68.5	0.0	0.0	0.43	1.22	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
DW		1024	223.5	0.0	0.0	0.24	0.68	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	223.5	0.0	0.0	0.24	0.68	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
1.25DC1+1.25DC2+1.5DW		1024	24.4	1.0	1.0	0.73	2.05	0.985	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	24.4	1.0	1.0	0.73	2.05	0.985	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
LL+I_MaxFX (LL+IM)	HL-93	1024	839.2	0.0	0.0	0.12	0.35	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	839.2	0.0	0.0	0.12	0.35	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
LL+I_MINFX (LL+IM)		1024	148.6	0.0	0.0	0.30	0.83	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	148.6	0.0	0.0	0.30	0.83	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
LL+I_MaxFZ (LL+IM)		1024	459.0	0.0	0.0	0.17	0.47	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	459.0	0.0	0.0	0.17	0.47	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
LL+I_MINFZ (LL+IM)		1024	457.6	0.0	0.0	0.17	0.47	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	457.6	0.0	0.0	0.17	0.47	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
LL+I_MaxMY (LL+IM)		1024	355.5	0.0	0.0	0.19	0.54	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	355.5	0.0	0.0	0.19	0.54	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
LL+I_MINMY (LL+IM)		1024	59.6	0.0	0.0	0.34	0.66	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	
		1024	59.6	0.0	0.0	0.34	0.66	1.000	1.000	0.000	1.000		0	10.3	6690.0	6690.0		1.0	N/A	N/A	36.0	36.0	

DC1_Bracing Start		1024	22.537	1.000	1.000	0.76	2.13	0.977	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
DC1_Bracing End		1026	22.172	1.000	1.000	0.76	2.15	0.975	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
DC2_Bracing Start		1024	68.530	0.000	0.000	0.43	1.22	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
DC2_Bracing End		1026	65.684	0.000	0.000	0.44	1.25	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
DW_Bracing Start		1024	223.534	0.000	0.000	0.24	0.68	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
DW_Bracing End		1026	223.534	0.000	0.000	0.24	0.68	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024	839.233	0.000	0.000	0.12	0.35	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MaxFX_Bracing End (LL+IM)		1026	1051.403	0.000	0.000	0.11	0.31	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MINFX_Bracing_Start (LL+IM)		1024	148.608	0.000	0.000	0.30	0.83	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MINFX_Bracing_End (LL+IM)		1026	156.279	0.000	0.000	0.29	0.81	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	459.029	0.000	0.000	0.17	0.47	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MaxFZ_Bracing_End (LL+IM)		1026	580.889	0.000	0.000	0.15	0.42	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	457.550	0.000	0.000	0.17	0.47	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MINFZ_Bracing_End (LL+IM)		1026	389.883	0.000	0.000	0.18	0.51	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	355.528	0.000	0.000	0.19	0.54	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MaxMY_Bracing_End (LL+IM)		1026	338.924	0.000	0.000	0.20	0.55	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MINMY_Bracing_Start (LL+IM)		1024	59.628	0.000	0.000	0.34	0.66	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
LL+I_MINMY_Bracing_End (LL+IM)		1026	61.772	0.000	0.000	0.34	0.64	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW_Bracing Start		1024	24.361	1.000	1.000	0.73	2.05	0.985	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW_Bracing End		1026	24.001	1.000	1.000	0.73	2.07	0.983	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	41.121	0.000	0.000	0.56	1.58	1.000	1.000	0.000	1.000		0	10.250	6690.0	6690.0		1.000	N/A	N/A	36.000	36.000	

Load Cases and Load Combination	Live Load Consider		eb Load-Shedding Factor R_b — R_b with longitudinal stiffener								R_{b_final}	6.10.7 - Flexural Resistance -Composite Sections in Positive Flexure — 6.10.7.1 - Flexural Resistance - Composite Compact Section in Positive Flexure				6.10.7.2 - Flexural Resistance - Composite Non Compact Section in Positive Flexure					Comp Section in Postive Flexure
			Bend-buckling coefficient	Is $D/t_w \le 0.95(Ek/F_{yc})^{1/2}$?	Is $2D_c/t_w \le \lambda_{rw}$?	α_{wc}	α_{wc}	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Apply ?	Dist from T/deck to comp sect NA	Plastic Moment	Nominal flexural resistance	Apply ?	Dist from T/deck to comp sect NA	$D_p \le 0.42\ D_t$?	Nominal flexural resistance of compression flange	Nominal flexural resistance of tension flange	D6.2.2-2
		Macro Node No	k	Yes =0, No=1	Yes =0,No=1	(For positive Moment)	(for others)	Exclude composite in positive flexure	Composite in positive flexure	("0" means not applicable)	Use	Yes =0, No=1	D_p	M_p	M_n	Yes =0, No=1	D_p	Yes=OK, No=NG	F_{nc}	F_{nt}	My
						6.10.1.10.2-6	6.10.1.10.2-5							D6.1	6.10.7.1.2			6.10.7.3-1	6.10.7.2.2-1	6.10.7.2.2-2	D6.2.2-2
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	42.059	0.000	0.000	0.55	1.56	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	33.153	0.000	0.000	0.62	1.76	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	35.788	0.000	0.000	0.60	1.69	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	47.030	0.000	0.000	0.52	1.48	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	47.567	0.000	0.000	0.52	1.47	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	48.472	0.000	0.000	0.52	1.45	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	49.140	0.000	0.000	0.51	1.44	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	58.260	0.000	0.000	0.47	1.33	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	61.298	0.000	0.000	0.46	1.29	1.000	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	24.543	1.000	1.000	0.73	2.04	0.986	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	24.460	1.000	1.000	0.73	2.05	0.985	1.000	0.000	1.000	0	10.250	6690.0	6690.0	1.000	N/A	N/A	36.000	36.000	

		Macro Node No	k	es =0, No=	s =0,No	α_{wc}	α_{wc}	Rb	Rb	Rb	Rb_final	Yes =0, No=1	Dp	Mp	Mn	Yes =0, No=	Dp	es=OK, No=N	Fnc	Fnt	My
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	48.3	0.0	0.0	0.52	1.46	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	48.3	0.0	0.0	0.52	1.46	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
1.25DC+1.5DW+1.75LL+I_MinFX		1024	38.6	0.0	0.0	0.58	1.63	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	38.6	0.0	0.0	0.58	1.63	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	53.5	0.0	0.0	0.49	1.38	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	53.5	0.0	0.0	0.49	1.38	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	55.0	0.0	0.0	0.49	1.37	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	55.0	0.0	0.0	0.49	1.37	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	65.2	0.0	0.0	0.45	1.25	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	65.2	0.0	0.0	0.45	1.25	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
1.25DC+1.5DW+1.75LL+I_MinMY		1024	33.5	0.0	0.0	0.62	1.75	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	33.5	0.0	0.0	0.62	1.75	1.000	1.000	0.000	1.000	0	-44.0	6690.0	6690.0	1.0	N/A	N/A	36.0	36.0	5158.1

Load Cases and Load Combination	Live Load Consider		eb Load-Shedding Factor R_b — R_b with longitudinal stiffener								R_{b_final}	6.10.7 - Flexural Resistance -Composite Sections in Positive Flexure — 6.10.7.1 - Flexural Resistance - Composite Compact Section in Positive Flexure				6.10.7.2 - Flexural Resistance - Composite Non Compact Section in Positive Flexure					Comp Section in Postive Flexure
			Bend-buckling coefficient	Is $D/t_w \le 0.95(Ek/F_{yc})^{1/2}$?	Is $2D_c/t_w \le \lambda_{rw}$?	α_{wc}	α_{wc}	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Web Load-Shedding Factor R_b	Apply ?	Dist from T/deck to comp sect NA	Plastic Moment	Nominal flexural resistance	Apply ?	Dist from T/deck to comp sect NA	$D_p \le 0.42\ D_t$?	Nominal flexural resistance of compression flange	Nominal flexural resistance of tension flange	D6.2.2-2
		Macro Node No	k	Yes =0, No=1	Yes =0,No=1	(For positive Moment)	(for others)	Exclude composite in positive flexure	Composite in positive flexure	("0" means not applicable)	Use	Yes =0, No=1	D_p	M_p	M_n	Yes =0, No=1	D_p	Yes=OK, No=NG	F_{nc}	F_{nt}	My
						6.10.1.10.2-6	6.10.1.10.2-5							D6.1	6.10.7.1.2			6.10.7.3-1	6.10.7.2.2-1	6.10.7.2.2-2	D6.2.2-2
DC1		1024																			
		1024																			
DC2		1024																			
		1024																			
DW		1024																			
		1024																			
DC1+DC2+DW		1024																			
		1024																			

Load Cases and Load Combination	Live Load Consider	Macro Node No	eb Load-Shedding Factor R_b — R_b with longitudinal stiffener: Bend-buckling coefficient k	Is $D/t_w \le 0.95(Ek/F_{yc})^{1/2}$? Yes =0, No=1	Is $2D_c/t_w \le \lambda_{rw}$? Yes =0,No=1	α_{wc} (For positive Moment)	α_{wc} (for others)	Web Load-Shedding Factor R_b Exclude composite in positive flexure	Web Load-Shedding Factor R_b Composite in positive flexure	Web Load-Shedding Factor R_b ("0" means not applicable)	R_{b_final}: Web Load-Shedding Factor R_b Use		6.10.7 - Flexural Resistance -Composite Sections in Positive Flexure — 6.10.7.1 - Flexural Resistance - Composite Compact Section in Positive Flexure: Apply ? Yes =0, No=1	Dist from T/deck to comp sect NA D_p	Plastic Moment M_p	Nominal flexural resistance M_n		6.10.7.2 - Flexural Resistance - Composite Non Compact Section in Positive Flexure: Apply ? Yes =0, No=1	Dist from T/deck to comp sect NA D_p	$D_p \le 0.42 D_t$? Yes=OK, No=NG	Nominal flexural resistance of compression flange F_{nc}	Nominal flexural resistance of tension flange F_{nt}	Comp Section in Postive Flexure D6.2.2-2 My
						6.10.1.10.2-6	6.10.1.10.2-5								D6.1	6.10.7.1.2				6.10.7.3-1	6.10.7.2.2-1	6.10.7.2.2-2	D6.2.2-2
			k	es =0, No=	s =0,No	α_{wc}	α_{wc}	Rb	Rb	Rb	Rb_final		Yes =0, No=1	Dp	Mp	Mn		Yes =0, No=	Dp	es=OK, No=N	Fnc	Fnt	My
LL_MaxFX (LL)	HL-93	1024	48.3	0.0	0.0	0.52	1.46	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	48.3	0.0	0.0	0.52	1.46	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
LL_MINFX (LL)		1024	38.6	0.0	0.0	0.58	1.63	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	38.6	0.0	0.0	0.58	1.63	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
LL_MaxFZ (LL)		1024	53.5	0.0	0.0	0.49	1.38	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	53.5	0.0	0.0	0.49	1.38	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
LL_MINFZ (LL)		1024	55.0	0.0	0.0	0.49	1.37	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	55.0	0.0	0.0	0.49	1.37	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
LL_MaxMY (LL)		1024	65.2	0.0	0.0	0.45	1.25	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	65.2	0.0	0.0	0.45	1.25	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
LL_MINMY (LL)		1024	33.5	0.0	0.0	0.62	1.75	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1
		1024	33.5	0.0	0.0	0.62	1.75	1.000	1.000	0.000	1.000	0.0	0	-44.0	6690.0	6690.0	0.0	1.0	N/A	N/A	36.0	36.0	5158.1

			6.10.8 - Flexural Resistance -Composite Sections in Negative Flexure and Noncomposite Sections																		Comp Section in Negative Flexure
			6.10.8.2.2 - Compression Flange Flexural Restance due to Local Buckling						6.10.8.2.3 - Compression Flange Flexure Resistance due to Lateral Torsional Buckling											6.10.8.3 - Tension-Flg Flexural Resistance	
Load Cases and Load Combination	Live Load Consider		Slenderness ratio for the compression flange		Slenderness ratio for a noncompact flange	Compression-flange at the onset of nominal yielding, incuding residual stress	Local buckling resistance of comp flg		Effective radius of gyration for lateral torsional buckling			Stress in the compression flange at brace pt w/ small force due to factored loading	Moment gradient modifier	Elastic lateral torsional buckling stress	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistance	F_{nc_final}	Nominal Flexural Resistance of Tension Flange	D6.2.2-2
		Macro Node No	λ_f	λ_{pf}	λ_{rf}	F_{yr}	F_{nc}		r_t	L_p	L_r	f_1/f_2	C_b	F_{cr}	F_{nc} (For $L_b \le L_p$)	F_{nc} (For $L_p \le L_b \le L_r$)	F_{nc} (For $L_p \ge L_r$)	F_{nc}		F_{nt}	M_{yc}
			6.10.8.2.2-3	6.10.8.2.2-4	6.10.8.2.2-5		6.10.8.2.2-1 or 2		6.10.8.2.3-9	6.10.8.2.3-4	6.10.8.2.3-5		6.10.8.2.3-6 or 7	6.10.8.2.3-8	6.10.8.2.3-1	6.10.8.2.3-1	6.10.8.2.3-1			6.10.8.3-1	D6.2.2-2
						(ksi)	(ksi)		(in)	(in)	(in)				(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	(k-ft)
DC1		1024	10.7	10.8	19.0	25.2	36.0		4.0	112.6	422.8	0.8	1.1	127.6	36.0	36.0	36.0	36.0	36.0	36.0	
		1024	10.7	10.8	19.0	25.2	36.0		4.0	112.6	422.8	0.8	1.1	127.6	36.0	36.0	36.0	36.0	36.0	36.0	
DC2		1024	10.7	10.8	19.0	25.2	36.0		4.2	119.5	448.6	0.8	1.1	140.6	36.0	36.0	36.0	36.0	36.0	36.0	
		1024	10.7	10.8	19.0	25.2	36.0		4.2	119.5	448.6	0.8	1.1	140.6	36.0	36.0	36.0	36.0	36.0	36.0	
DW		1024	10.7	10.8	19.0	25.2	36.0		4.4	124.3	466.6	1.0	1.0	141.5	36.0	33.7	36.0	33.7	33.7	36.0	
		1024	10.7	10.8	19.0	25.2	36.0		4.4	124.3	466.6	1.0	1.0	141.5	36.0	33.7	36.0	33.7	33.7	36.0	
1.25DC1+1.25DC2+1.5DW		1024	10.7	10.8	19.0	25.2	36.0		4.0	113.2	424.9	0.8	1.1	128.7	36.0	36.0	36.0	36.0	36.0	36.0	
		1024	10.7	10.8	19.0	25.2	36.0		4.0	113.2	424.9	0.8	1.1	128.7	36.0	36.0	36.0	36.0	36.0	36.0	
LL+I_MaxFX (LL+IM)		1024	10.7	10.8	19.0	25.2	36.0		4.5	127.4	478.5	0.8	1.1	166.9	36.0	36.0	36.0	36.0	36.0	36.0	
		1024	10.7	10.8	19.0	25.2	36.0		4.5	127.4	478.5	0.8	1.1	166.9	36.0	36.0	36.0	36.0	36.0	36.0	
LL+I_MINFX (LL+IM)		1024	10.7	10.8	19.0	25.2	36.0		4.3	122.9	461.3	0.9	1.0	141.7	36.0	34.4	36.0	34.4	34.4	36.0	
		1024	10.7	10.8	19.0	25.2	36.0		4.3	122.9	461.3	0.9	1.0	141.7	36.0	34.4	36.0	34.4	34.4	36.0	
LL+I_MaxFZ (LL+IM)		1024	10.7	10.8	19.0	25.2	36.0		4.4	126.2	473.9	0.7	1.1	167.8	36.0	36.0	36.0	36.0	36.0	36.0	
	HL-93	1024	10.7	10.8	19.0	25.2	36.0		4.4	126.2	473.9	0.7	1.1	167.8	36.0	36.0	36.0	36.0	36.0	36.0	
LL+I_MINFZ (LL+IM)		1024	10.7	10.8	19.0	25.2	36.0		4.4	126.2	473.9	0.9	1.0	149.5	36.0	34.6	36.0	34.6	34.6	36.0	
		1024	10.7	10.8	19.0	25.2	36.0		4.4	126.2	473.9	0.9	1.0	149.5	36.0	34.6	36.0	34.6	34.6	36.0	
LL+I_MaxMY (LL+IM)		1024	10.7	10.8	19.0	25.2	36.0		4.4	125.6	471.6	0.9	1.0	149.3	36.0	34.9	36.0	34.9	34.9	36.0	
		1024	10.7	10.8	19.0	25.2	36.0		4.4	125.6	471.6	0.9	1.0	149.3	36.0	34.9	36.0	34.9	34.9	36.0	
LL+I_MINMY (LL+IM)		1024	5.3	10.8	19.0	25.2	36.0		4.4	124.5	467.4	1.0	1.0	143.5	36.0	34.1	36.0	34.1	34.1	36.0	
		1024	5.3	10.8	19.0	25.2	36.0		4.4	124.5	467.4	1.0	1.0	143.5	36.0	34.1	36.0	34.1	34.1	36.0	

DC1_Bracing Start		1024	10.667	10.785	18.997	25.200	36.000		3.967	112.599	422.8	0.807
DC1_Bracing End		1026	10.667	10.785	18.997	25.200	36.000		3.963	112.478	422.3	
DC2_Bracing Start		1024	10.667	10.785	18.997	25.200	36.000		4.210	119.479	448.6	0.850
DC2_Bracing End		1026	10.667	10.785	18.997	25.200	36.000		4.202	119.263	447.8	
DW_Bracing Start		1024	10.667	10.785	18.997	25.200	36.000		4.378	124.267	466.6	1.000
DW_Bracing End		1026	10.667	10.785	18.997	25.200	36.000		4.378	124.267	466.6	
LL+I_MaxFX_Bracing Start (LL+IM)		1024	10.667	10.785	18.997	25.200	36.000		4.490	127.433	478.5	0.767
LL+I_MaxFX_Bracing End (LL+IM)		1026	10.667	10.785	18.997	25.200	36.000		4.503	127.809	479.9	
LL+I_MINFX_Bracing_Start (LL+IM)		1024	10.667	10.785	18.997	25.200	36.000		4.329	122.864	461.3	0.949
LL+I_MINFX_Bracing_End (LL+IM)		1026	10.667	10.785	18.997	25.200	36.000		4.335	123.050	462.0	
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024	10.667	10.785	18.997	25.200	36.000		4.447	126.216	473.9	0.720
LL+I_MaxFZ_Bracing_End (LL+IM)	HL-93	1026	10.667	10.785	18.997	25.200	36.000		4.465	126.731	475.8	
LL+I_MINFZ_Bracing_Start (LL+IM)		1024	10.667	10.785	18.997	25.200	36.000		4.447	126.208	473.9	0.949
LL+I_MINFZ_Bracing_End (LL+IM)		1026	10.667	10.785	18.997	25.200	36.000		4.433	125.826	472.5	
LL+I_MaxMY_Bracing_Start (LL+IM)		1024	10.667	10.785	18.997	25.200	36.000		4.425	125.593	471.6	0.931
LL+I_MaxMY_Bracing_End (LL+IM)		1026	10.667	10.785	18.997	25.200	36.000		4.421	125.468	471.1	
LL+I_MINMY_Bracing_Start (LL+IM)		1024	5.333	10.785	18.997	25.200	36.000		4.385	124.468	467.4	0.978
LL+I_MINMY_Bracing_End (LL+IM)		1026	5.333	10.785	18.997	25.200	36.000		4.389	124.576	467.8	
1.25DC+1.5DW_Bracing Start		1024	10.667	10.785	18.997	25.200	36.000		3.987	113.166	424.9	0.809
1.25DC+1.5DW_Bracing End		1026	10.667	10.785	18.997	25.200	36.000		3.983	113.059	424.5	
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024	10.667	10.785	18.997	25.200	36.000		4.110	116.640	438.0	0.806

6.10.8 - Flexural Resistance -Composite Sections in Negative Flexure and Noncomposite Sections

Load Cases and Load Combination	Live Load Consider	Macro Node No	6.10.8.2.2 - Compression Flange Flexural Restance due to Local Buckling: Slenderness ratio for the compression flange		Slenderness ratio for a noncompact flange	Compression-flange at the onset of nominal yielding, incuding residual stress	Local buckling resistance of comp flg		6.10.8.2.3 - Compression Flange Flexure Resistance due to Lateral Torsional Buckling: Effective radius of gyration for lateral torsional buckling			Stress in the compression flange at brace pt w/ small force due to factored loading	Moment gradient modifier	Elastic lateral torsional buckling stress	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistanc e	Lateral Torsional Buckling Resistanc e	F_{nc_final}	6.10.8.3 - Tension-Flg Flexural Resistance: Nominal Flexural Resistance of Tension Flange	Comp Section in Negative Flexure: D6.2.2-2
		Macro Node No	λ_f	λ_{pf}	λ_{rf}	F_{yr}	F_{nc}		r_t	L_p	L_r	f_1/f_2	C_b	F_{cr}	F_{nc} (For $L_b \le L_p$)	F_{nc} (For $L_p \le L_b \le L_r$)	F_{nc} (For $L_p \ge L_r$)	F_{nc}		F_{nt}	M_{yc}
			6.10.8.2.2-3	6.10.8.2.2-4	6.10.8.2.2-5		6.10.8.2.2-1 or 2		6.10.8.2.3-9	6.10.8.2.3-4	6.10.8.2.3-5		6.10.8.2.3-6 or 7	6.10.8.2.3-8	6.10.8.2.3-1	6.10.8.2.3-1	6.10.8.2.3-1			6.10.8.3-1	D6.2.2-2
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026	10.667	10.785	18.997	25.200	36.000		4.114	116.777	438.5										
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024	10.667	10.785	18.997	25.200	36.000		4.062	115.283	432.9	0.838									
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026	10.667	10.785	18.997	25.200	36.000		4.079	115.776	434.7										
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024	10.667	10.785	18.997	25.200	36.000		4.138	117.437	441.0	0.798									
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026	10.667	10.785	18.997	25.200	36.000		4.140	117.503	441.2										
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024	10.667	10.785	18.997	25.200	36.000		4.144	117.612	441.6	0.828									
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026	10.667	10.785	18.997	25.200	36.000		4.147	117.690	441.9										
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024	10.667	10.785	18.997	25.200	36.000		4.180	118.633	445.4	0.834									
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026	10.667	10.785	18.997	25.200	36.000		4.189	118.903	446.5										
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024	10.667	10.785	18.997	25.200	36.000		3.989	113.220	425.1	0.659									
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026	10.667	10.785	18.997	25.200	36.000		3.988	113.195	425.0										

		Macro Node No	λf	λpf	λrf	Fyr	Fnc		rt	Lp	Lr	f1/f2	Cb	Fcr	Fnc (For Lb ≤ Lp)	Fnc (For Lp ≤ Lb ≤ Lr	Fnc (For Lp ≥ Lr)	F_{nc}	F_{nc_final}	F_{nt}	M_{yc}
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	10.7	10.8	19.0	25.2	36.0		4.1	117.6	441.5	0.8	1.10	139.2	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0		4.1	117.6	441.5	0.8	1.10	139.2	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
1.25DC+1.5DW+1.75LL+I_MinFX		1024	10.7	10.8	19.0	25.2	36.0		4.1	116.3	436.5	0.8	1.08	133.9	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0		4.1	116.3	436.5	0.8	1.08	133.9	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	10.7	10.8	19.0	25.2	36.0		4.2	118.2	443.7	0.8	1.10	141.2	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0		4.2	118.2	443.7	0.8	1.10	141.2	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	10.7	10.8	19.0	25.2	36.0		4.2	118.3	444.3	0.8	1.09	139.4	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0		4.2	118.3	444.3	0.8	1.09	139.4	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	10.7	10.8	19.0	25.2	36.0		4.2	119.2	447.7	0.8	1.08	141.1	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0		4.2	119.2	447.7	0.8	1.08	141.1	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
1.25DC+1.5DW+1.75LL+I_MinMY		1024	10.7	10.8	19.0	25.2	36.0		4.1	115.3	433.1	0.7	1.19	144.9	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0		4.1	115.3	433.1	0.7	1.19	144.9	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
									Min =	**115.3**	433.1										

6.10.8 - Flexural Resistance -Composite Sections in Negative Flexure and Noncomposite Sections

Load Cases and Load Combination	Live Load Consider	Macro Node No	6.10.8.2.2 - Compression Flange Flexural Restance due to Local Buckling: Slenderness ratio for the compression flange		Slenderness ratio for a noncompact flange	Compression-flange at the onset of nominal yielding, incuding residual stress	Local buckling resistance of comp flg		6.10.8.2.3 - Compression Flange Flexure Resistance due to Lateral Torsional Buckling: Effective radius of gyration for lateral torsional buckling			Stress in the compression flange at brace pt w/ small force due to factored loading	Moment gradient modifier	Elastic lateral torsional buckling stress	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistanc e	Lateral Torsional Buckling Resistanc e	F_{nc_final}	6.10.8.3 - Tension-Flg Flexural Resistance: Nominal Flexural Resistance of Tension Flange	Comp Section in Negative Flexure: D6.2.2-2
		Macro Node No	λ_f	λ_{pf}	λ_{rf}	F_{yr}	F_{nc}		r_t	L_p	L_r	f_1/f_2	C_b	F_{cr}	F_{nc} (For $L_b \le L_p$)	F_{nc} (For $L_p \le L_b \le L_r$)	F_{nc} (For $L_p \ge L_r$)	F_{nc}		F_{nt}	M_{yc}
			6.10.8.2.2-3	6.10.8.2.2-4	6.10.8.2.2-5		6.10.8.2.2-1 or 2		6.10.8.2.3-9	6.10.8.2.3-4	6.10.8.2.3-5		6.10.8.2.3-6 or 7	6.10.8.2.3-8	6.10.8.2.3-1	6.10.8.2.3-1	6.10.8.2.3-1			6.10.8.3-1	D6.2.2-2
DC1		1024																			
		1024																			
DC2		1024																			
		1024																			
DW		1024																			
		1024																			
DC1+DC2+DW		1024																			
		1024						1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0

Load Cases and Load Combination	Live Load Consider		6.10.8 - Flexural Resistance -Composite Sections in Negative Flexure and Noncomposite Sections																		Comp Section in Negative Flexure
			6.10.8.2.2 - Compression Flange Flexural Restance due to Local Buckling						6.10.8.2.3 - Compression Flange Flexure Resistance due to Lateral Torsional Buckling											6.10.8.3 - Tension-Flg Flexural Resistance	
			Slenderness ratio for the compression flange		Slenderness ratio for a noncompact flange	Compression-flange at the onset of nominal yielding, incuding residual stress	Local buckling resistance of comp flg		Effective radius of gyration for lateral torsional buckling			Stress in the compression flange at brace pt w/ small force due to factored loading	Moment gradient modifier	Elastic lateral torsional buckling stress	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistance	Lateral Torsional Buckling Resistance	**F_{nc_final}**	Nominal Flexural Resistance of Tension Flange	D6.2.2-2
		Macro Node No	λ_f	λ_{pf}	λ_{rf}	F_{yr}	F_{nc}		r_t	L_p	L_r	f_1/f_2	C_b	F_{cr}	F_{nc} (For $L_b \le L_p$)	F_{nc} (For $L_p \le L_b \le L_r$)	F_{nc} (For $L_p \ge L_r$)	F_{nc}		F_{nt}	M_{yc}
			6.10.8.2.2-3	6.10.8.2.2-4	6.10.8.2.2-5		6.10.8.2.2-1 or 2		6.10.8.2.3-9	6.10.8.2.3-4	6.10.8.2.3-5		6.10.8.2.3-6 or 7	6.10.8.2.3-8	6.10.8.2.3-1	6.10.8.2.3-1	6.10.8.2.3-1			6.10.8.3-1	D6.2.2-2
			λf	λpf	λrf	Fyr	Fnc	**Revise ratio r_1**	rt	Lp	Lr	f1/f2	Cb	Fcr	Fnc (For Lb ≤ Lp)	Fnc (For Lp ≤ Lb ≤ Lr	Fnc (For Lp ≥ Lr)	F_{nc}	F_{nc_final}	F_{nt}	M_{yc}
LL_MaxFX (LL)	HL-93	1024	10.7	10.8	19.0	25.2	36.0	2.195	4.1	117.6	441.5	0.8	1.10	139.2	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0	2.195	4.1	117.6	441.5	0.8	1.10	139.2	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
LL_MINFX (LL)		1024	10.7	10.8	19.0	25.2	36.0	2.817	4.1	116.3	436.5	0.8	1.08	133.9	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0	2.817	4.1	116.3	436.5	0.8	1.08	133.9	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
LL_MaxFZ (LL)		1024	10.7	10.8	19.0	25.2	36.0	1.798	4.2	118.2	443.7	0.8	1.10	141.2	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0	1.798	4.2	118.2	443.7	0.8	1.10	141.2	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
LL_MINFZ (LL)		1024	10.7	10.8	19.0	25.2	36.0	1.724	4.2	118.3	444.3	0.8	1.09	139.4	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0	1.724	4.2	118.3	444.3	0.8	1.09	139.4	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
LL_MaxMY (LL)		1024	10.7	10.8	19.0	25.2	36.0	1.269	4.2	119.2	447.7	0.8	1.08	141.1	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0	1.269	4.2	119.2	447.7	0.8	1.08	141.1	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
LL_MINMY (LL)		1024	10.7	10.8	19.0	25.2	36.0	100.000	4.1	115.3	433.1	0.7	1.19	144.9	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
		1024	10.7	10.8	19.0	25.2	36.0	100.000	4.1	115.3	433.1	0.7	1.19	144.9	36.0	36.0	36.0	36.0	36.0	36.0	4330.2
								1.269													

Load Cases and Load Combination	Live Load Consider		**Flexural Resistance**		**Rating Factor for Flexure RF $_{\_flexural}$**			Shear Resistance									
								Plastic Shear Force	Unstiffened Web			Stiffener Web				$\phi_v V_{n\_use}$	Rating Factor for Shear RF $_{\_shear}$
			Flexural Resistance for Compression Flange $\phi_f F_{nc}$	Flexural Resistance for Tension Flange $\phi_f F_{nt}$	$RF=(\phi_c\phi_s\phi F_n-Y_{DC}f_{DC}-Y_{DW}f_{DW}-Y_{PL}f_{PL}-Y_{TU}f_{TU})/(Y_{LL}f_{LL})$				Shear Buckling Coefficient	Ratio of the shear-bucking resistance to shear yield strength	Nominal Shear Resistance	Shear Buckling Coefficient	Ratio of the shear-bucking resistance to shear yield strength	End Panel Nominal Shear Resistance	Interior Panel Nominal Shear Resistance		$RF=(\phi_c\phi_s\phi V_n-Y_{DC}V_{DC}-Y_{DW}V_{DW}-Y_{PL}V_{PL}-Y_{TU}V_{TU})/(Y_{LL}V_{LL})$
		Macro Node No	$\phi_f F_{nc}$	$\phi_f F_{nt}$	Top Flange	Bottom Flange		V_p	k	C	V_n	k	C	V_{n_end}	$V_{n\_interior}$		
								6.10.9.2-2	C6.10.9.2	6.10.9.3.2-4 to 6	6.10.9.2-1	C6.10.9.3.2-7	6.10.9.3.2-4 to 6	6.10.9.2-1	6.10.9.2-1		
								(kips)						(kips)	(kips)	(kips)	
DC1		1024	36.0	36.0				422.8	5.0	0.30	128.9	11.0	0.672	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
DC2		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
DW		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
1.25DC1+1.25DC2+1.5DW		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
LL+I_MaxFX (LL+IM)	HL-93	1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
LL+I_MINFX (LL+IM)		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
LL+I_MaxFZ (LL+IM)		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
LL+I_MINFZ (LL+IM)		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
LL+I_MaxMY (LL+IM)		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	36.0	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
LL+I_MINMY (LL+IM)		1024	34.1	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	
		1024	34.1	36.0				422.8	5.0	0.3	128.9	11.0	0.7	284.2	373.3	373.3	

DC1_Bracing Start		1024
DC1_Bracing End		1026
DC2_Bracing Start		1024
DC2_Bracing End		1026
DW_Bracing Start		1024
DW_Bracing End		1026
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024
LL+I_MaxFX_Bracing End (LL+IM)		1026
LL+I_MINFX_Bracing_Start (LL+IM)		1024
LL+I_MINFX_Bracing_End (LL+IM)		1026
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024
LL+I_MaxFZ_Bracing_End (LL+IM)		1026
LL+I_MINFZ_Bracing_Start (LL+IM)		1024
LL+I_MINFZ_Bracing_End (LL+IM)		1026
LL+I_MaxMY_Bracing_Start (LL+IM)		1024
LL+I_MaxMY_Bracing_End (LL+IM)		1026
LL+I_MINMY_Bracing_Start (LL+IM)		1024
LL+I_MINMY_Bracing_End (LL+IM)		1026
1.25DC+1.5DW_Bracing Start		1024
1.25DC+1.5DW_Bracing End		1026
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024

								Shear Resistance									
Load Cases and Load Combination	Live Load Consider		**Flexural Resistance**		**Rating Factor for Flexure $RF_{\_flexural}$**			Plastic Shear Force	Unstiffened Web			Stiffener Web				$\phi_v V_{n\_use}$	Rating Factor for Shear $RF_{\_shear}$
			Flexural Resistance for Compression Flange $\phi_f F_{nc}$	Flexural Resistance for Tension Flange $\phi_f F_{nt}$	$RF=(\phi_c\phi_s\phi F_n-Y_{DC}f_{DC}-Y_{DW}f_{DW}-Y_{PL}f_{PL}-Y_{TU}f_{TU})/(Y_{LL}f_{LL})$				Shear Buckling Coefficient	Ratio of the shear-bucking resistance to shear yield strength	Nominal Shear Resistance	Shear Buckling Coefficient	Ratio of the shear-bucking resistance to shear yield strength	End Panel Nominal Shear Resistance	Interior Panel Nominal Shear Resistance		$RF=(\phi_c\phi_s\phi V_n-Y_{DC}V_{DC}-Y_{DW}V_{DW}-Y_{PL}V_{PL}-Y_{TU}V_{TU})/(Y_{LL}V_{LL})$
		Macro Node No	$\phi_f F_{nc}$	$\phi_f F_{nt}$	Top Flange	Bottom Flange		V_p	k	C	V_n	k	C	V_{n_end}	$V_{n\_interior}$		
								6.10.9.2-2	C6.10.9.2	6.10.9.3.2-4 to 6	6.10.9.2-1	C6.10.9.3.2-7	6.10.9.3.2-4 to 6	6.10.9.2-1	6.10.9.2-1		
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026															
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024															
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026															
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024															
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026															
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024															
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026															
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024															
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026															
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024															
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026															

		Macro Node No	$\phi_f F_{nc}$	$\phi_f F_{nt}$	$RF_{\_Top\_Flg}$	$RF_{\_Bottom\_Flg}$	$M_{c\text{ (Based on Fnc)}}$	Vp	k	C	Vn	k	C	Vn_end	Vn_interior	V_n_final	$RF_{\_Shear}$
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	36.0	36.0	24.28	3.22	4330.2	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	13.61
		1024	36.0	36.0	24.28	3.22	4330.2	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	13.61
1.25DC+1.5DW+1.75LL+I_MinFX		1024	36.0	36.0	13.35	4.74	4337.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	78.48
		1024	36.0	36.0	13.35	4.74	4337.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	78.48
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	36.0	36.0	12.43	2.33	4253.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	7.05
		1024	36.0	36.0	12.43	2.33	4253.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	7.05
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	36.0	36.0	11.68	2.19	4203.6	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	6.09
		1024	36.0	36.0	11.68	2.19	4203.6	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	6.09
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	36.0	36.0	6.90	1.48	4180.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	55.75
		1024	36.0	36.0	6.90	1.48	4180.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	55.75
1.25DC+1.5DW+1.75LL+I_MinMY		1024	36.0	36.0	100.000	100.00	4169.8	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	694.52
		1024	36.0	36.0	100.00	100.000	4169.8	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	694.52

								Shear Resistance										
Load Cases and Load Combination	Live Load Consider		**Flexural Resistance**		**Rating Factor for Flexure $RF_{\_flexural}$**			Plastic Shear Force	Unstiffened Web			Stiffener Web				$\phi_v V_{n\_use}$	Rating Factor for Shear $RF_{\_shear}$	
			Flexural Resistance for Compression Flange $\phi_f F_{nc}$	Flexural Resistance for Tension Flange $\phi_f F_{nt}$	$RF=(\phi_c\phi_s\phi F_n-Y_{DC}f_{DC}-Y_{DW}f_{DW}-Y_{PL}f_{PL}-Y_{TU}f_{TU})/(Y_{LL}f_{LL})$				Shear Buckling Coefficient	Ratio of the shear-bucking resistance to shear yield strength	Nominal Shear Resistance	Shear Buckling Coefficient	Ratio of the shear-bucking resistance to shear yield strength	End Panel Nominal Shear Resistance	Interior Panel Nominal Shear Resistance		$RF=(\phi_c\phi_s\phi V_n-Y_{DC}V_{DC}-Y_{DW}V_{DW}-Y_{PL}V_{PL}-Y_{TU}V_{TU})/(Y_{LL}V_{LL})$	
		Macro Node No	$\phi_f F_{nc}$	$\phi_f F_{nt}$	Top Flange	Bottom Flange		V_p	k	C	V_n	k	C	V_{n_end}	$V_{n\_interior}$			
								6.10.9.2-2	C6.10.9.2	6.10.9.3.2-4 to 6	6.10.9.2-1	C6.10.9.3.2-7	6.10.9.3.2-4 to 6	6.10.9.2-1	6.10.9.2-1			
DC1		1024																
		1024																
DC2		1024																
		1024																
DW		1024																
		1024																
DC1+DC2+DW		1024																
		1024	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0

Load Cases and Load Combination	Live Load Consider		**Flexural Resistance**		**Rating Factor for Flexure RF $_{flexural}$**			Shear Resistance										
								Plastic Shear Force	Unstiffened Web			Stiffener Web				$\phi_v V_{n\_use}$	Rating Factor for Shear RF $_{shear}$	
			Flexural Resistance for Compression Flange $\phi_f F_{nc}$	Flexural Resistance for Tension Flange $\phi_f F_{nt}$	RF=($\phi_c\phi_s\phi F_n$-$Y_{DC}f_{DC}$-$Y_{DW}f_{DW}$-$Y_{PL}f_{PL}$-$Y_{TU}f_{TU}$)/($Y_{LL}f_{LL}$)				Shear Buckling Coefficient	Ratio of the shear-bucking resistance to shear yield strength	Nominal Shear Resistance	Shear Buckling Coefficient	Ratio of the shear-bucking resistance to shear yield strength	End Panel Nominal Shear Resistance	Interior Panel Nominal Shear Resistance		RF=($\phi_c\phi_s\phi V_n$-$Y_{DC}V_{DC}$-$Y_{DW}V_{DW}$-$Y_{PL}V_{PL}$-$Y_{TU}V_{TU}$)/($Y_{LL}V_{LL}$)	
		Macro Node No	$\phi_f F_{nc}$	$\phi_f F_{nt}$	Top Flange	Bottom Flange		V_p	k	C	V_n	k	C	V_{n_end}	$V_{n\_interior}$			
								6.10.9.2-2	C6.10.9.2	6.10.9.3.2-4 to 6	6.10.9.2-1	C6.10.9.3.2-7	6.10.9.3.2-4 to 6	6.10.9.2-1	6.10.9.2-1			
			$\phi_f F_{nc}$	$\phi_f F_{nt}$	**LF1 $_{Top\_Flg}$**	**LF1 $_{Bottom\_Flg}$**	M_c (Based on Fnc)	Vp	k	C	Vn	k	C	Vn_end	Vn_interior	V_n_final	**LF1 $_{Shear}$**	**LF1 $_{min}$**
LL_MaxFX (LL)	HL-93	1024	36.0	36.0	55.69	7.16	4330.2	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	31.01	7.16
		1024	36.0	36.0	55.69	7.16	4330.2	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	31.01	7.16
LL_MINFX (LL)		1024	36.0	36.0	31.77	11.22	4337.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	171.79	11.22
		1024	36.0	36.0	31.77	11.22	4337.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	171.79	11.22
LL_MaxFZ (LL)		1024	36.0	36.0	30.92	5.50	4253.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	15.18	5.50
		1024	36.0	36.0	30.92	5.50	4253.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	15.18	5.50
LL_MINFZ (LL)		1024	36.0	36.0	29.06	5.26	4203.6	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	13.14	5.26
		1024	36.0	36.0	29.06	5.26	4203.6	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	13.14	5.26
LL_MaxMY (LL)		1024	36.0	36.0	16.32	3.39	4180.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	133.76	3.39
		1024	36.0	36.0	16.32	3.39	4180.0	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	133.76	3.39
LL_MINMY (LL)		1024	36.0	36.0	100.00	100.00	4169.8	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	1458.64	100.00
		1024	36.0	36.0	100.00	100.00	4169.8	422.8	5.0	0.3	128.9	11.0	0.672	284.2	373.3	373.3	1458.64	100.00
					16.319	3.393											133.759	3.393

Load Cases and Load Combination	Live Load Consider	Macro Node No	D_n	A_{fn}	$\beta = 2D_nt_w/A_{fn}$	ρ	$R_h = (12+\beta(3\rho-\rho^3))/(12+2\beta)$
			6.10.1.10.1	6.10.1.10.1	6.10.1.10.1-2	6.10.1.10.1	6.10.1.10.1-1
			(in)	(in^2)			
DC1		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
DC2		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
DW		1024	33.0	12.0	2.063	1.0	1.0
		1024	33.0	12.0	2.063	1.0	1.0
1.25DC1+1.25DC2+1.5DW		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL+I_MaxFX (LL+IM)	HL-93	1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL+I_MINFX (LL+IM)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL+I_MaxFZ (LL+IM)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL+I_MINFZ (LL+IM)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL+I_MaxMY (LL+IM)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL+I_MINMY (LL+IM)		1024	33.0	12.0	2.063	1.0	1.0
		1024	33.0	12.0	2.063	1.0	1.0

DC1_Bracing Start		1024
DC1_Bracing End		1026
DC2_Bracing Start		1024
DC2_Bracing End		1026
DW_Bracing Start		1024
DW_Bracing End		1026
LL+I_MaxFX_Bracing Start (LL+IM)	HL-93	1024
LL+I_MaxFX_Bracing End (LL+IM)		1026
LL+I_MINFX_Bracing_Start (LL+IM)		1024
LL+I_MINFX_Bracing_End (LL+IM)		1026
LL+I_MaxFZ_Bracing_Start (LL+IM)		1024
LL+I_MaxFZ_Bracing_End (LL+IM)		1026
LL+I_MINFZ_Bracing_Start (LL+IM)		1024
LL+I_MINFZ_Bracing_End (LL+IM)		1026
LL+I_MaxMY_Bracing_Start (LL+IM)		1024
LL+I_MaxMY_Bracing_End (LL+IM)		1026
LL+I_MINMY_Bracing_Start (LL+IM)		1024
LL+I_MINMY_Bracing_End (LL+IM)		1026
1.25DC+1.5DW_Bracing Start		1024
1.25DC+1.5DW_Bracing End		1026
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_Start		1024

Load Cases and Load Combination	Live Load Consider	Macro Node No	D_n	A_{fn}	$\beta = 2D_nt_w/A_{fn}$	ρ	$R_h = (12+\beta(3\rho-\rho^3))/(12+2\beta)$
			6.10.1.10.1	6.10.1.10.1	6.10.1.10.1-2	6.10.1.10.1	6.10.1.10.1-1
1.25DC+1.5DW+1.75LL+I_MaxFX_Bracing_End	HL-93	1026					
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_Start		1024					
1.25DC+1.5DW+1.75LL+I_MinFX_Bracing_End		1026					
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_Start		1024					
1.25DC+1.5DW+1.75LL+I_MaxFZ_Bracing_End		1026					
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing Start		1024					
1.25DC+1.5DW+1.75LL+I_MinFZ_Bracing End		1026					
1.25DC+1.5DW+1.75LL+I_MaxMY_Bracing Start		1024					
1.25DC+1.5DW+1.75PL+I_MaxMY_Bracing End		1026					
1.25DC+1.5DW+1.75PL+I_MinMY_Bracing Start		1024					
1.25DC+1.5DW+1.75LL+I_MinMY_Bracing End		1026					

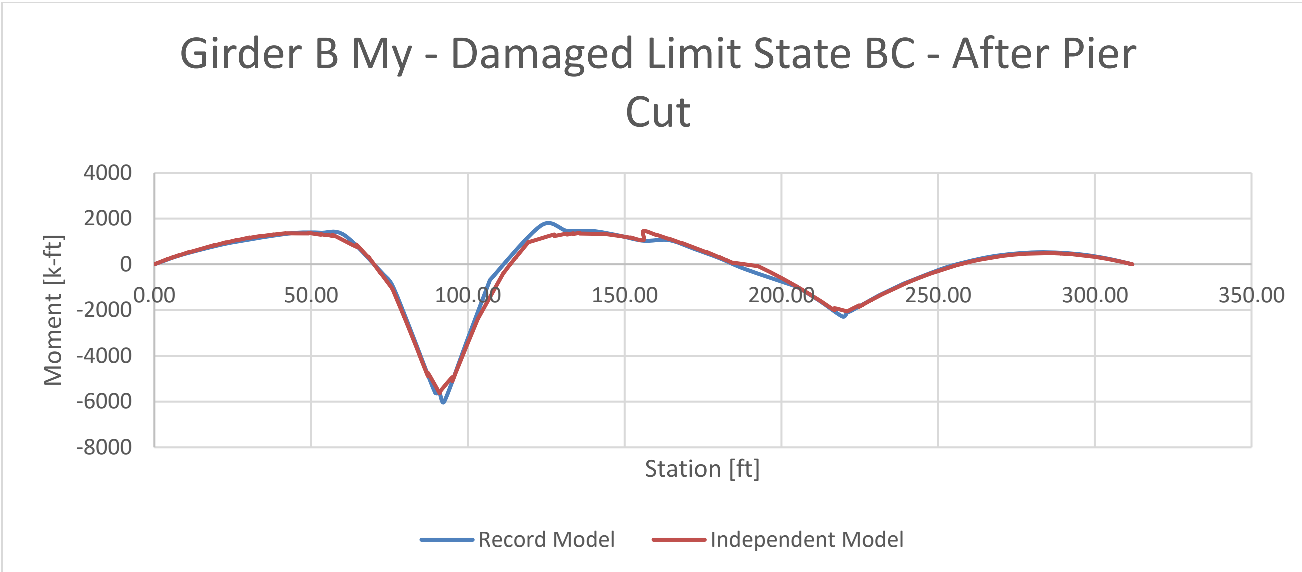
		Macro Node No	D_n	A_{fn}	$\beta = 2D_nt_w/A_{fn}$	ρ	R_h
1.25DC+1.5DW+1.75LL+I_MaxFX	HL-93 for Inventory Rating	1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
1.25DC+1.5DW+1.75LL+I_MinFX		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
1.25DC+1.5DW+1.75LL+I_MaxFZ		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
1.25DC+1.5DW+1.75LL+I_MinFZ		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
1.25DC+1.5DW+1.2Tu+1.75LL+I_MaxMY		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
1.25DC+1.5DW+1.75LL+I_MinMY		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0

Load Cases and Load Combination	Live Load Consider	Macro Node No	D_n	A_{fn}	$\beta = 2D_nt_w/A_{fn}$	ρ	$R_h = (12+\beta(3\rho-\rho^3))/(12+2\beta)$
			6.10.1.10.1	6.10.1.10.1	6.10.1.10.1-2	6.10.1.10.1	6.10.1.10.1-1
DC1		1024					
		1024					
DC2		1024					
		1024					
DW		1024					
		1024					
DC1+DC2+DW		1024					
		1024					

Load Cases and Load Combination	Live Load Consider	Macro Node No	D_n	A_{fn}	$\beta = 2D_nt_w/A_{fn}$	ρ	$R_h = (12+\beta(3\rho-\rho^3))/(12+2\beta)$
			6.10.1.10.1	6.10.1.10.1	6.10.1.10.1-2	6.10.1.10.1	6.10.1.10.1-1
			D_n	A_{fn}	$\beta = 2D_nt_w/A_{fn}$	ρ	R_h
LL_MaxFX (LL)	HL-93	1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL_MINFX (LL)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL_MaxFZ (LL)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL_MINFZ (LL)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL_MaxMY (LL)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0
LL_MINMY (LL)		1024	21.0	24.0	0.656	1.0	1.0
		1024	21.0	24.0	0.656	1.0	1.0

Appendix 3

Redundancy Analysis Comparisons


Girder B My - Damaged Limit State BC - After Pier Cut
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-2000
-4000
-6000
-8000
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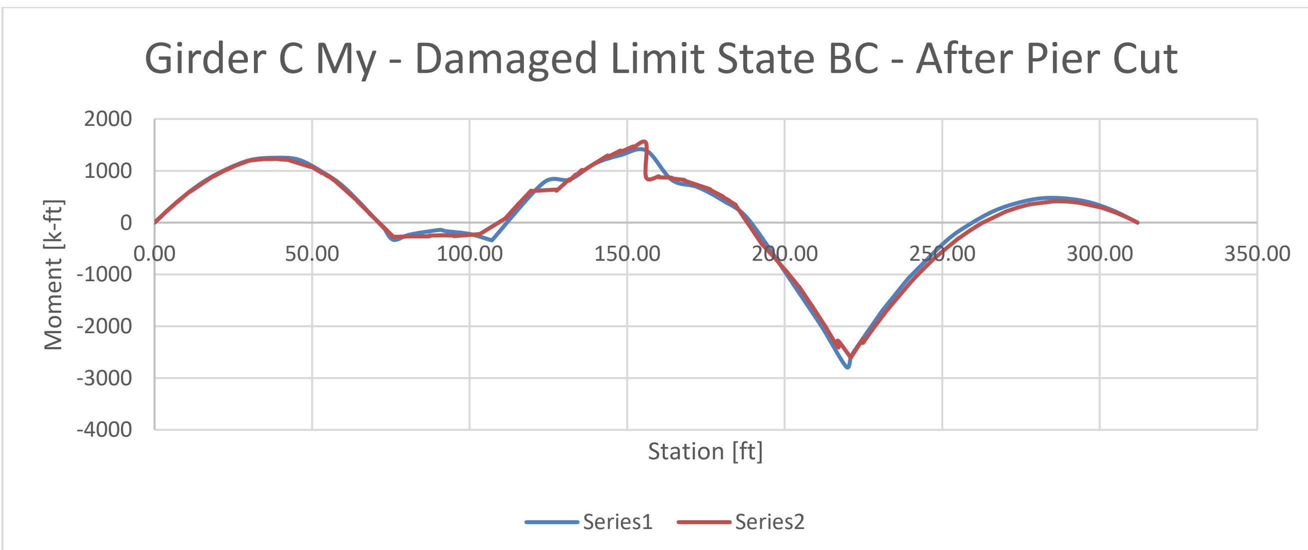
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Record Model
Independent Model


Girder C My - Damaged Limit State BC - After Pier Cut
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-1000
-2000
-3000
-4000
Moment [k-ft]
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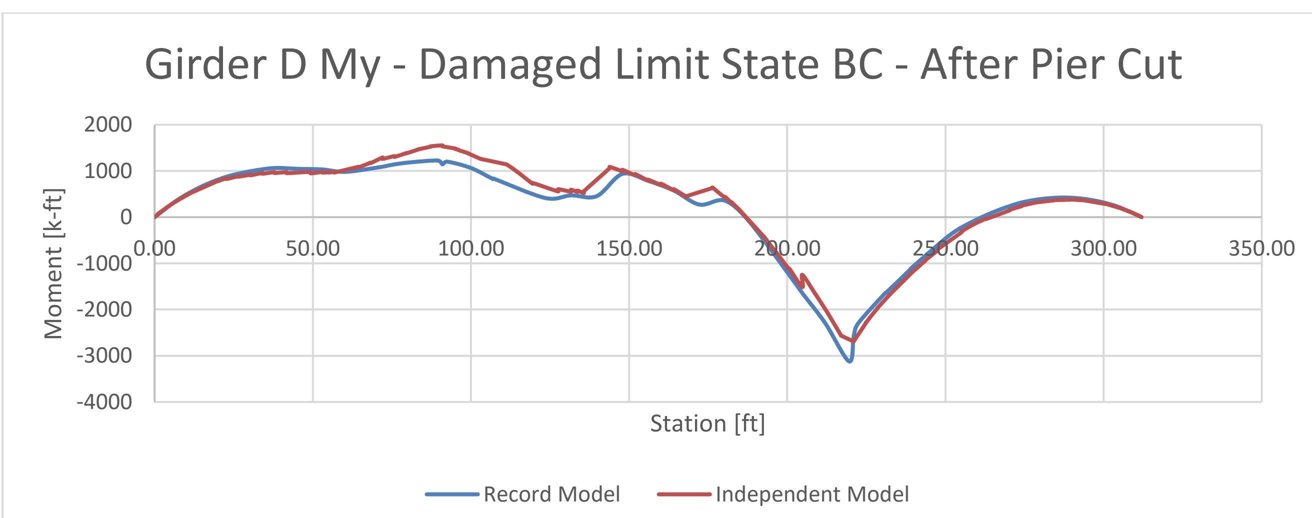
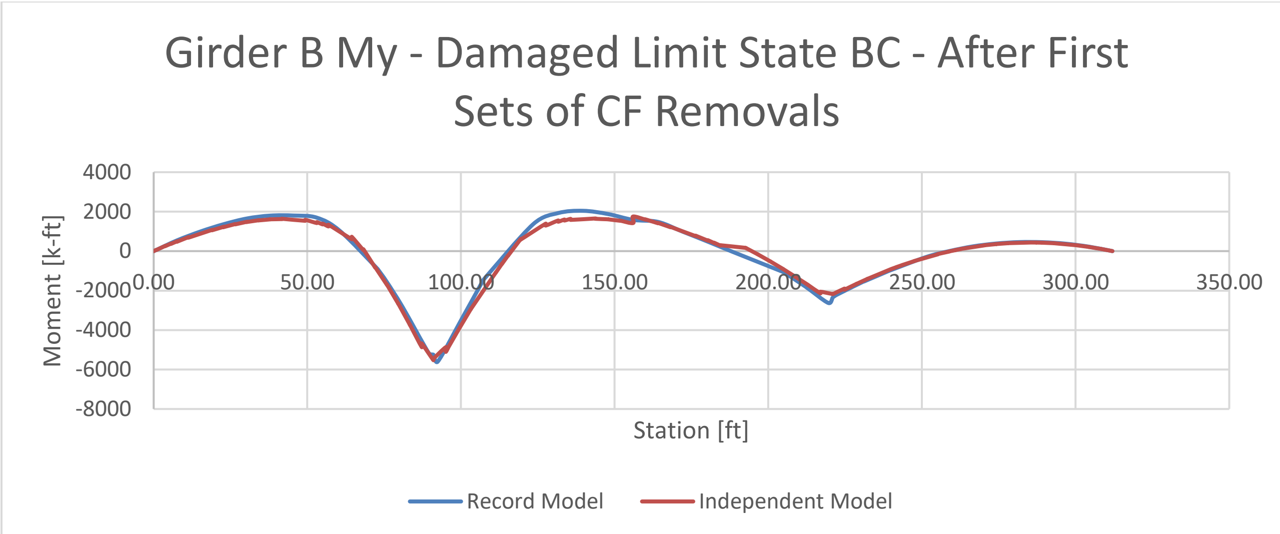
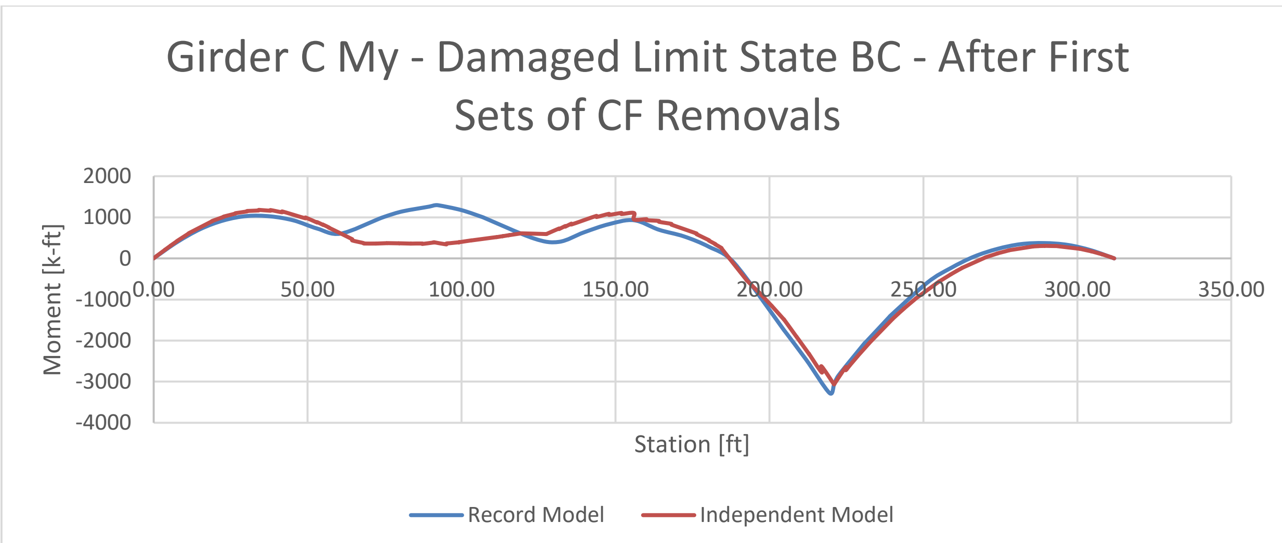
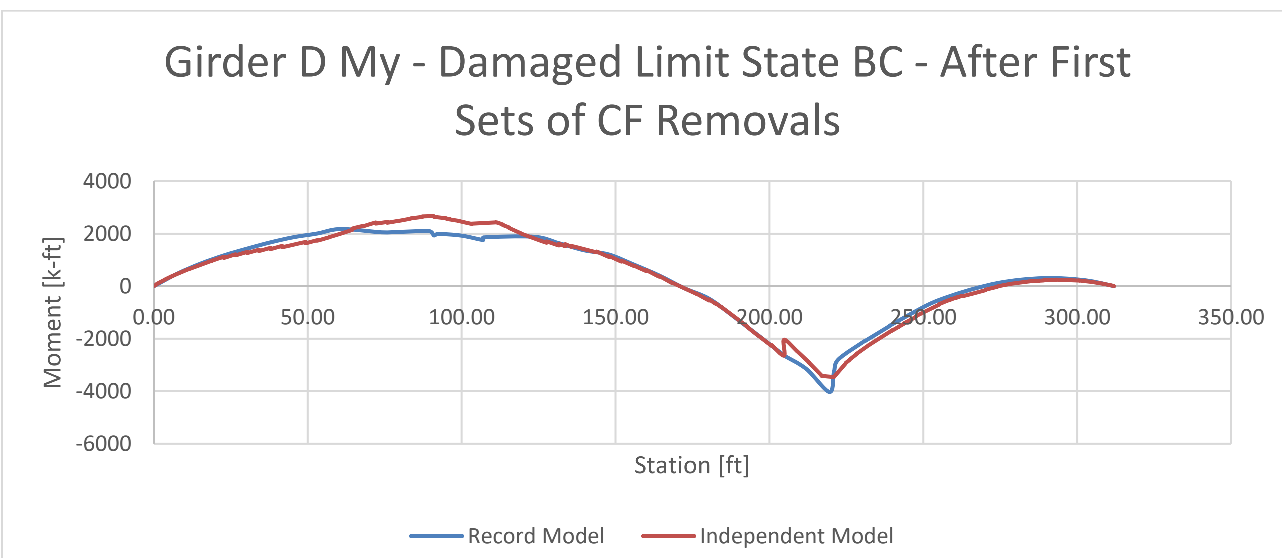
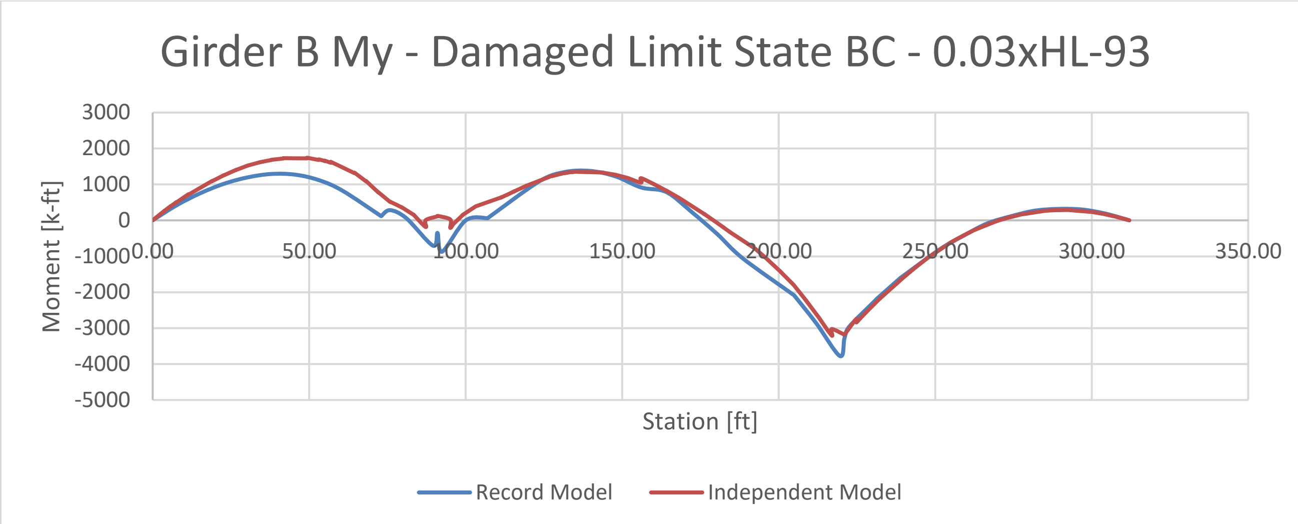
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Series1
Series2

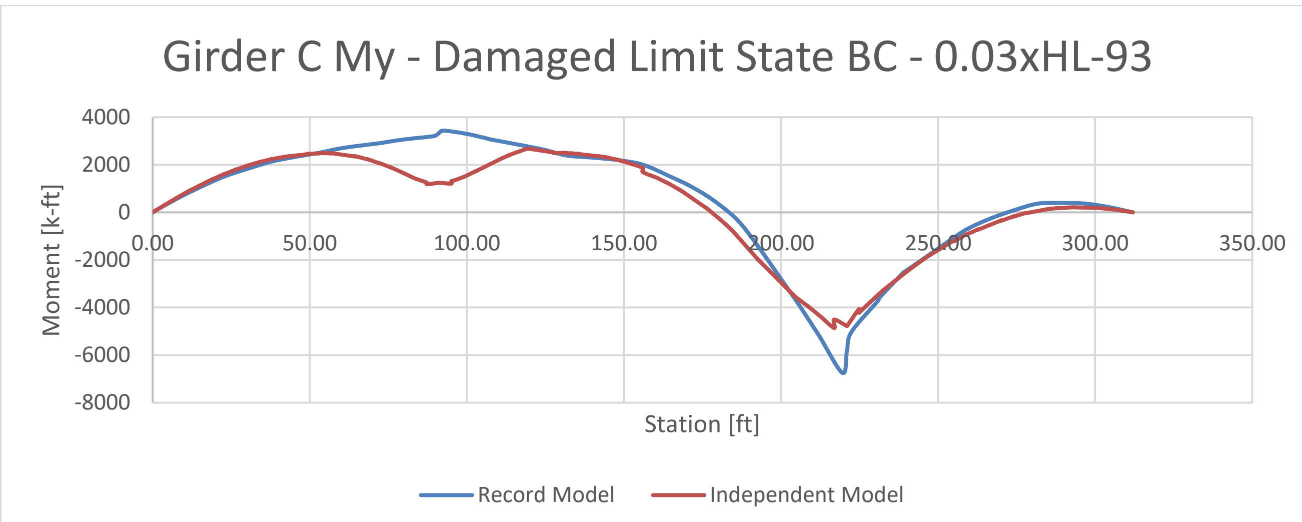

Girder D My - Damaged Limit State BC - After Pier Cut
2000
1000
0
-1000
-2000
-3000
-4000
Moment [k-ft]
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Record Model
Independent Model

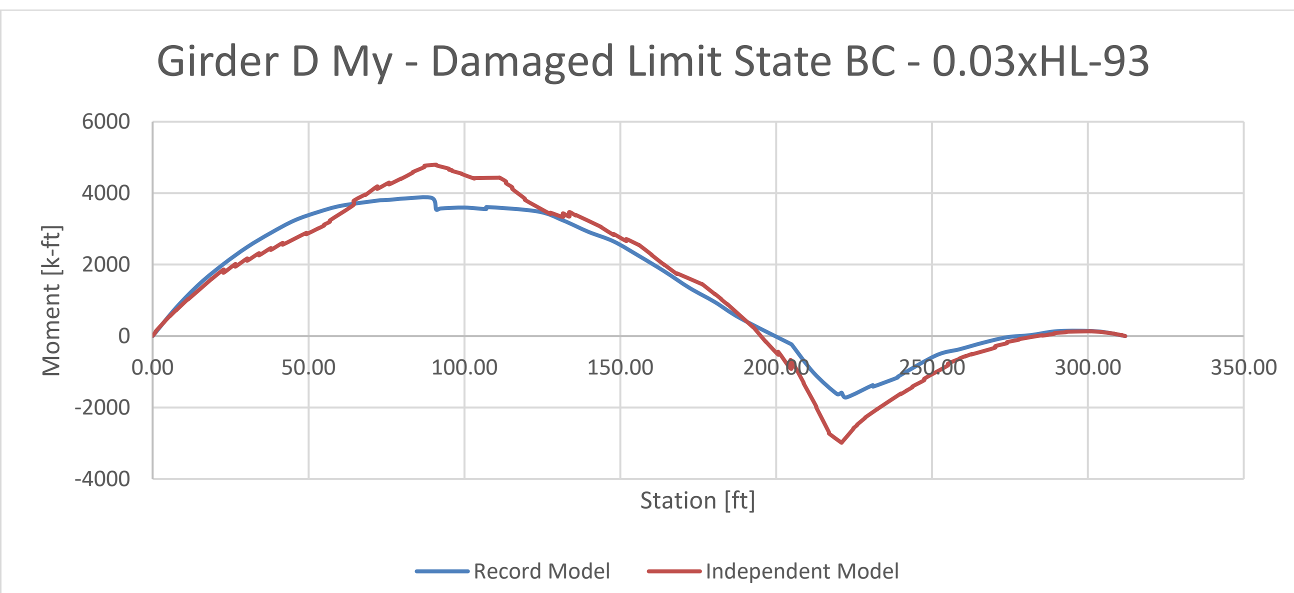

Girder B My - Damaged Limit State BC - After First Sets of CF Removals
Moment [k-ft]
4000
2000
0
-2000
-4000
-6000
-8000
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Record Model
Independent Model


Girder C My - Damaged Limit State BC - After First Sets of CF Removals
Moment [k-ft]
2000
1000
0
-1000
-2000
-3000
-4000
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Record Model
Independent Model


Girder D My - Damaged Limit State BC - After First Sets of CF Removals
Moment [k-ft]
4000
2000
0
-2000
-4000
-6000
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Record Model
Independent Model

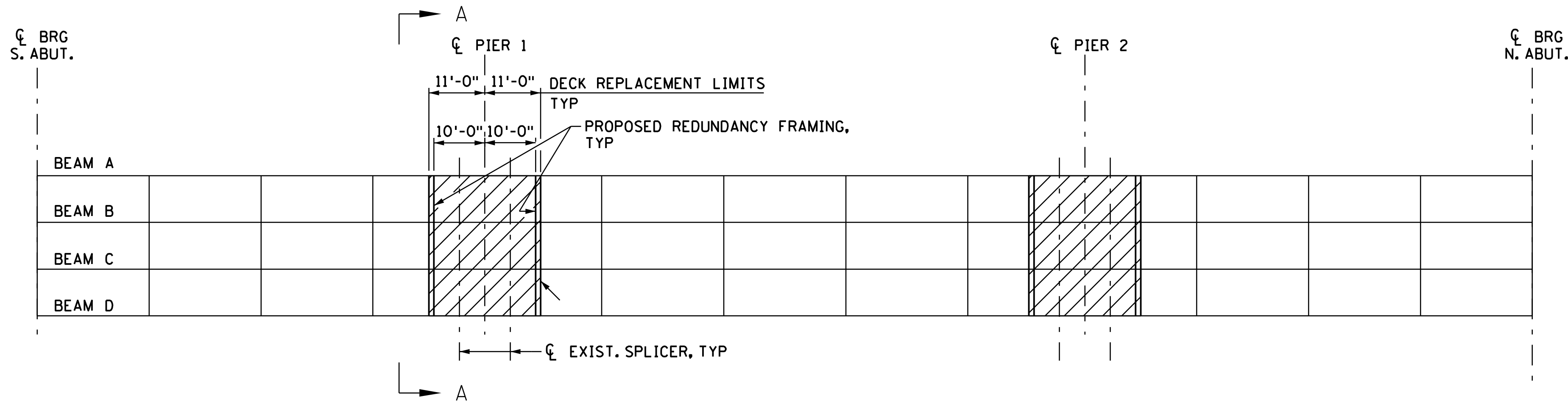

Girder B My - Damaged Limit State BC - 0.03xHL-93
Moment [k-ft]
3000
2000
1000
0
-1000
-2000
-3000
-4000
-5000
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Record Model
Independent Model


Girder C My - Damaged Limit State BC - 0.03xHL-93
Moment [k-ft]
4000
2000
0
-2000
-4000
-6000
-8000
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Record Model
Independent Model

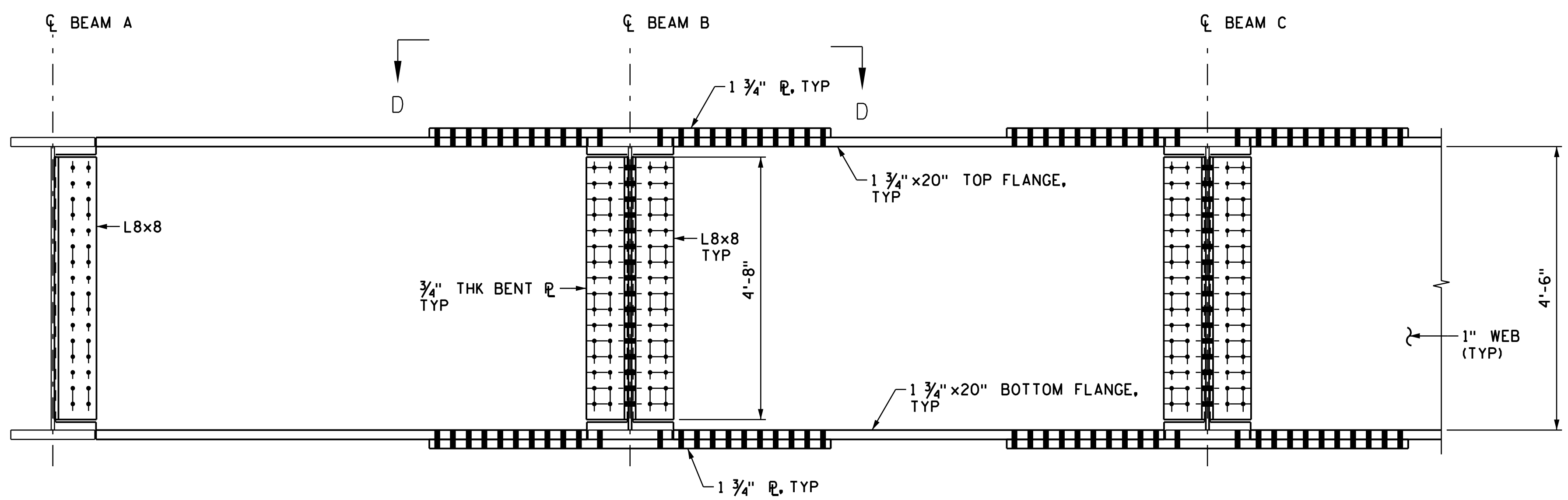

Girder D My - Damaged Limit State BC - 0.03xHL-93
Moment [k-ft]
6000
4000
2000
0
-2000
-4000
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
Station [ft]
Record Model
Independent Model

Appendix 4

Proposed Redundancy Repairs



FRAMING PLAN

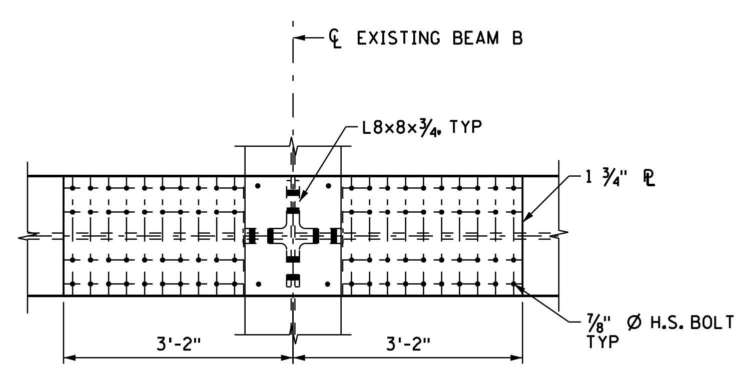


SECTION A-A
(NO OF BOLTS AS SHOWN)

Bridge 69840 shown,
Bridge 69839 similar

NOTES:

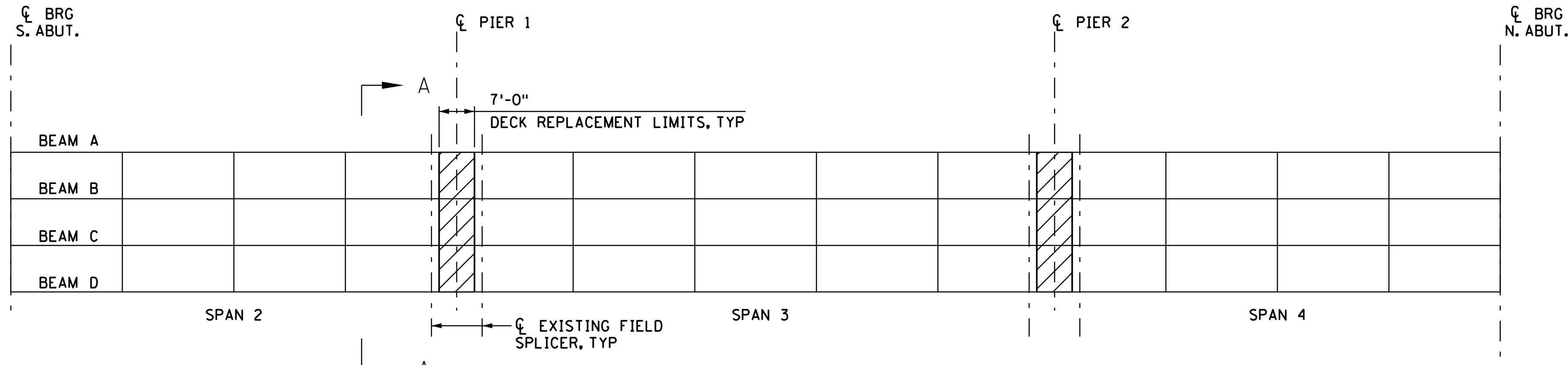
1. ALL STEEL TO BE Fy = 50 ksi
2. ALL BOLTS TO BE ⅞" Ø H.S. ASTM A325 BOLTS



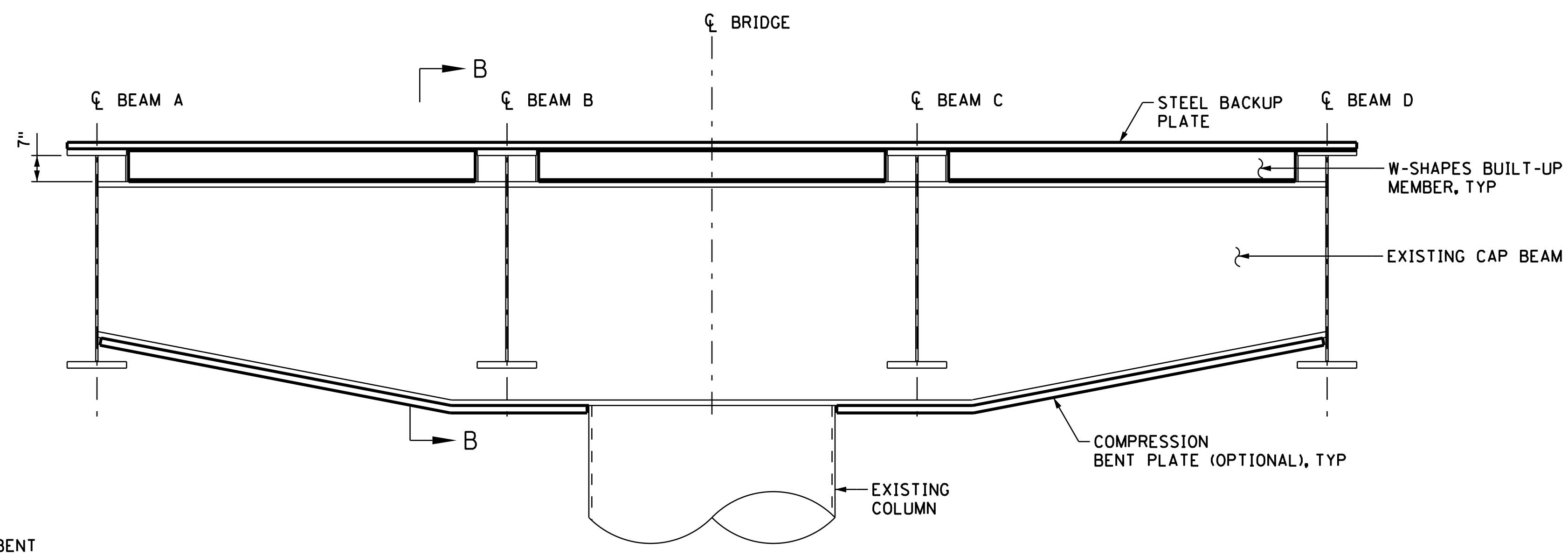
VIEW D

HNTB	CERTIFIED BY ______ LICENSED PROFESSIONAL ENGINEER ______ DATE NAME: LIC. NO. ______	TITLE: ALTERNATE PATH FRAMING REDUNDANCY OPTION 1	DES: DR: CHK: CHK: APPROVED: SHEET NO. OF SHEETS	BRIDGE NO. 69840

8/23/2017 b69840_S001.dgn
...\60477\CADD\cds\b69840_S001.dgn

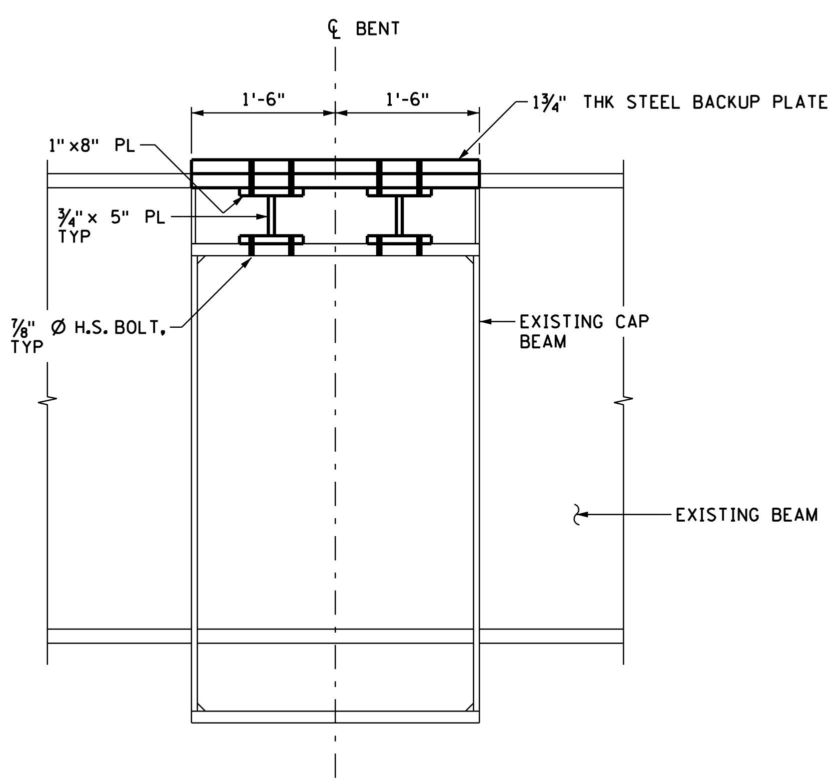


FRAMING PLAN



SECTION A-A

Bridge 69840 shown,
Bridge 69839 similar



SECTION B-B

NOTES:

1. ALL CONCRETE TO BE fc' = 4 ksi
2. ALL STEEL TO BE Fy = 50 ksi
3. ALL BOLTS TO BE ⅞" Ø H.S. ASTM A325 BOLTS.

HNTB	CERTIFIED BY ______ LICENSED PROFESSIONAL ENGINEER ______ DATE NAME: LIC. NO. ______	TITLE: MEMEBER REDUNDANCY OPTION 2	DES: DR: CHK: CHK:	APPROVED:	BRIDGE NO. 69840
			SHEET NO. OF SHEETS		

8/23/2017 b69840_S002.dgn

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Appendix 5

Scoping Level Cost Estimate Repairs

1.0 PROJECT

Sponsor (Lead Agency):	MnDOT
Design Organization (Sponsor or Consultant):	HNTB
Estimator:	Steven Schantzen
Estimator's Organization:	HNTB
Project Location (County):	St. Louis
Date of Estimate Submittal:	September 11, 2017
Anticipated Contract Method:	Design Bid Build
Start of Construction:	1st Quarter 2018
Anticipated Mid-Point of Construction:	2018
Estimating Processing Software:	Excel
Design Development (%, or level of design developed):	Conceptual Level
Project Identification No.	SP 6937-102 T.H. US2

2.0 PURPOSE

The purpose of this document is to provide a basis of estimate for the rehabilitation of fracture critical bridges in Duluth, MN and provide a conceptual cost estimate for two alternative designs.

The following estimates were grouped into general cost categories as listed below. For future iterations, the estimate will utilize MNDOT bid items.

- Erosion Control
- Maintenance of Traffic
- Striping
- Bridge Deck Demolition
- Structural Steel
- Bridge Deck Concrete
- Concrete Rail
- Rebar

The Basis of Estimate (BOE) Report defines the estimate parameters, scope of work, estimate structure, assumptions and exclusions. Separate reports may be developed if new alternatives are evaluated during the review process. As the design develops and advances, it is recommended the cost estimate be updated with new information to understand potential impacts or savings to the project.

3.0 SCOPE & PARAMETERS

Summary of Key elements:

Hazardous Materials:	None – Excluded and not anticipated
Wetlands Issues:	None, Excluded

Archeological Impacts:	None, Excluded
Native American (Tribal) Issues:	None, Excluded

3.1 Erosion Control

A lump sum allowance of $8,000 was assumed for each alternative. This cost would include temporary and permanent erosion control means and methods.

3.2 Maintenance of Traffic

A lump sum allowance of $20,000 and $15,000 was included for options 1 and 2 respectively. This would include temporary detours, road closures and temporary lane closures.

3.3 Striping

A lump sum allowance of $2,000 was assumed for restriping portions of the bridge decks that will be removed and replaced during bridge rehabilitation.

3.4 Bridge Deck Demolition

Portions of the bridge deck will be removed over Piers 1 and 2 to complete steel repairs. It was assumed that the bridge deck will be removed to 11' past the centerline of pier (22' total) on both sides for alternative 1 and 7' total for alternative 2. The cost includes protecting the roadway under the bridges, demolition of the bridge deck and concrete rail, and hauling away rubble. It was assumed that the contractor would borrow soil from the existing shoulders to cover the road during bridge deck demolition.

3.5 Structural Steel

Structural steel is assumed to be fabricated at a MNDOT approved fabricator and shipped to the project site. Gusset plates and connection angles are assumed to be fully drilled and attached to framing. The connection angles will be used as a template to drill holes in the existing steel. A similar method will be used in alternative 2. To complete bolting of the steel in alternative 2, an access hole will have to be cut in the side of the straddle bent. It was assumed that this access hole will have a cover plate bolted over the opening after all steel work is complete.

A compression plate was not included.

3.6 Bridge Deck Concrete

Cost for replacement of the concrete deck is included in this item. A full depth deck was assumed to be poured in place.

3.7 Concrete Rail

Cost for replacement of the concrete rail is included in this item

3.8 Rebar

Rebar for bridge deck and concrete rail is included in this item. All rebar is assumed to be epoxy coated.

4.0 DESIGN BASIS

It is understood that the current design is at a preliminary/conceptual level. Elements of the project have not yet been fully detailed and designed, therefore estimating assumptions were utilized when required to generate the quantities and costs. Minnesota Department of Transportation (MnDOT) standards and specifications were utilized for reference where applicable. The documents provided for use in the preparation of the estimate include concept level drawings.

5.0 PLANNING BASIS

The project is expected to be delivered by a design/bid/build contract method. The contract is tentatively expected to be awarded in the first quarter of 2018 with work completed by the end of 2018.

Access for work associated with these bridges will require the bridges to be closed as well as the roadway beneath them. It is expected that the contractor will stage cranes and aerial lifts on adjacent shoulders under the bridges.

6.0 COST BASIS

Where details were missing or not available, assumptions were made and documented to progress the estimate. In certain scenarios where quantities and/or responsible assumptions were not viable, allowances were used to serve as place holders for known cost. As design progresses and details/scope advance, the estimate should be adjusted and the allowance dollars re-defined as hard cost.

Prices are calculated in 2017 dollars. All rates are taken from prevailing wages or estimator experience.

Current Year Dollars	Estimate is priced utilizing 2017 dollars
Labor Rates & Burden	Labor rates are based off of St. Louis County
Overtime	No overtime has been included
Standard Shift Assumption	Mon-Fri 40 hours / week
Bonds and Insurances	Bonds & Insurances are included at 1.5% of construction
Overhead and Profit	Overhead and Profit is included at 15%
Material Tax Rate	7.0%
Escalation	Labor rates have been escalated by 2.5%
Unallocated Contingency	No contingency is included. Assumed to be added at the project level
Mobilization	No mobilization is included. Assumed to be added at the project level
Maintenance of Traffic	Lump sum allowance
Betterments (or potentials)	NA
Warranties	NA
Right of Way / Easements	Not Included

7.0 ALLOWANCES

The following items have been assigned a lump sum allowance

- Erosion control was given a value of $8,000
- MOT was given a $20,000 allowance for option 1 and $15,000 for option 2
- Striping was given an allowance of $2,000
- Bonds and insurance was calculated at 1.5%

8.0 ASSUMPTIONS

The following assumptions have been made in this estimate:

- Materials needed for construction are readily available
- All work can be completed as listed above

9.0 EXCLUSIONS

The following items were not included in the pricing of the work and are thereby excluded from the estimate:

- Archeological finds and/or any delays caused by them
- Hazardous materials or contaminated materials due to asbestos, lead, or soils
- 3rd party utility impacts
- Right of way, special permits, or easement costs
- Unforeseen conditions due to geotechnical investigations
- Special environmental considerations or mitigation
- Mobilization. This is understood to be carried at the project level
- Contingency

10.0 RISKS

A general risk occurs because of the preliminary stage of design. The estimate should be updated as design progresses.

11.0 ATTACHMENTS

Attachment A: Estimate

Attachment B: Takeoffs

Estimate

Minnesota Department of Transportation
Bridges 69839
Fracture Critical Bridges
Option 1 - Alternate Path Framig Redundancy
Cost Estimate

	No. Each	Unit	Qty	Unit Cost	Extended Amount
Erosion Control	**1**	**LS**		**$ 4,000.00**	**$ 4,000.00**
MOT	**1**	**LS**		**$ 7,500.00**	**$ 7,500.00**
Striping	**1**	**LS**		**$ 1,000.00**	**$ 1,000.00**
Demo Deck	**1**	**LS**		**$ 7,670.00**	**$ 7,670.00**
Sawcutting	1		130	$ 3.00	*$ 390.00*
Labor Foreman	*1*		*16*	*$ 66.00*	*$ 1,056.00*
Laborers	*3*		*16*	*$ 65.00*	*$ 3,120.00*
Bobcat & Breaker	*1*		*16*	*$ 55.00*	*$ 880.00*
Manlift	*1*		*16*	*$ 40.00*	$ 640.00
Operator	*1*		*16*	*$ 74.00*	*$ 1,184.00*
Dump Truck & Operator	*1*		*4*	*$ 100.00*	*$ 400.00*
Structural Steel	***72900***	**LBS**		**$ 2.77**	**$ 202,286.00**
Furnish Steel	72900			*$ 1.50*	*$ 109,350.00*
45 Ton RT Crane	*1*		*176*	*$ 100.00*	$ 17,600.00
Manlift	*1*		*176*	*$ 40.00*	$ 7,040.00
Ironworker	*2*		*176*	*$ 75.00*	$ 26,400.00
Ironworker Foreman	*1*		*176*	*$ 76.00*	$ 13,376.00
Crane Operator	*1*		*176*	*$ 75.00*	$ 13,200.00
Oiler	*1*		*176*	*$ 70.00*	$ 12,320.00
Mag Drill, Bits	*1*			$ 3,000.00	$ 3,000.00
Bridge Deck Concrete	***40***	**CY**		**$ 967.50**	**$ 38,700.00**
Carpenter Foreman	*1*		*50*	*$ 76.00*	$ 3,800.00
Carpenter	*3*		*50*	*$ 75.00*	$ 11,250.00
Crane Operator	*1*		*50*	*$ 75.00*	$ 3,750.00
Oiler	*1*		*50*	*$ 70.00*	$ 3,500.00
45 Ton RT Crane	*1*		*50*	*$ 100.00*	$ 5,000.00
Manlift	*1*		*50*	*$ 40.00*	$ 2,000.00
Concrete	*40*			*$ 110.00*	$ 4,400.00
Tools, Forming Material	*1*			*$ 5,000.00*	$ 5,000.00
Concrete Railing	***88***	**LF**		**$ 245.14**	**$ 21,572.00**
Carpenter Foreman	*1*		*32*	*$ 76.00*	$ 2,432.00
Carpenter	*3*		*32*	*$ 75.00*	$ 7,200.00
Crane Operator	*1*		*32*	*$ 75.00*	$ 2,400.00

Oiler	*1*		*32*	*$ 70.00*	$ 2,240.00
45 Ton RT Crane	*1*		*32*	*$ 100.00*	$ 3,200.00
Concrete	*10*			*$ 110.00*	$ 1,100.00
Tools, Forming Material	*1*			*$ 3,000.00*	$ 3,000.00
Rebar	***7500***	**LBS**		**$ 1.03**	**$ 7,750.00**
Ironworker Foreman	*1*		10	*$ 75.00*	$ 750.00
Ironworker	*1*		10	*$ 75.00*	$ 750.00
Rebar	*7500*			$ 0.70	$ 5,250.00
General Contractor Support	*1*			*$ 1,000.00*	$ 1,000.00
Bonds and Insurance (1.5%)					**$ 4,357.17**
Labor Escalation (2.5%)					**$ 2,688.60**
Overhead Profit(15%)					**$ 44,225.28**
Option 1 Summary					**$ 339,060.45**

Minnesota Department of Transportation
Bridge 69839
Fracture Critical Bridges
Option 2 - Member Redundancy
Cost Estimate

	No. Each	Unit	Qty	Unit Cost	Extended Amount
Erosion Control	**1**	**LS**		**$ 4,000.00**	**$ 4,000.00**
MOT	**1**	**LS**		**$ 7,500.00**	**$ 7,500.00**
Striping	**1**	**LS**		**$ 1,000.00**	**$ 1,000.00**
Demo Deck	**1**	**LS**		**$ 5,800.00**	**$ 5,800.00**
Sawcutting	1		130	$ 3.00	*$ 390.00*
Labor Foreman	*1*		*12*	*$ 66.00*	*$ 792.00*
Laborers	*3*		*12*	*$ 65.00*	*$ 2,340.00*
Bobcat & Breaker	*1*		*12*	*$ 55.00*	*$ 660.00*
Manlift	*1*		*12*	*$ 40.00*	$ 480.00
Operator	*1*		*12*	*$ 74.00*	*$ 888.00*
Dump Truck & Operator	*1*		*2.5*	*$ 100.00*	*$ 250.00*
Structural Steel	***33600***	**LBS**		**$ 3.40**	**$ 114,209.00**
Furnish Steel	33600			*$ 1.50*	*$ 50,400.00*
45 Ton RT Crane	*1*		*119*	*$ 100.00*	$ 11,900.00
Manlift	*1*		*119*	*$ 40.00*	$ 4,760.00
Ironworker	*2*		*119*	*$ 75.00*	$ 17,850.00
Ironworker Foreman	*1*		*119*	*$ 76.00*	$ 9,044.00
Crane Operator	*1*		*119*	*$ 75.00*	$ 8,925.00
Oiler	*1*		*119*	*$ 70.00*	$ 8,330.00
Mag Drill, Bits	*1*			$ 3,000.00	$ 3,000.00
Bridge Deck Concrete	***13***	**CY**		**$ 1,783.23**	**$ 23,182.00**
Carpenter Foreman	*1*		*32*	*$ 76.00*	$ 2,432.00
Carpenter	*3*		*32*	*$ 75.00*	$ 7,200.00
Crane Operator	*1*		*32*	*$ 75.00*	$ 2,400.00
Oiler	*1*		*32*	*$ 70.00*	$ 2,240.00
45 Ton RT Crane	*1*		*32*	*$ 100.00*	$ 3,200.00
Manlift	*1*		*32*	*$ 40.00*	$ 1,280.00
Concrete	*13*			*$ 110.00*	$ 1,430.00
Tools, Forming Material	*1*			*$ 3,000.00*	$ 3,000.00
Concrete Railing	***28***	**LF**		**$ 664.93**	**$ 18,618.00**
Carpenter Foreman	*1*		*28*	*$ 76.00*	$ 2,128.00
Carpenter	*3*		*28*	*$ 75.00*	$ 6,300.00
Crane Operator	*1*		*28*	*$ 75.00*	$ 2,100.00
Oiler	*1*		*28*	*$ 70.00*	$ 1,960.00
45 Ton RT Crane	*1*		*28*	*$ 100.00*	$ 2,800.00

Concrete	*3*			*$ 110.00*	$ 330.00
Tools, Forming Material	*1*			*$ 3,000.00*	$ 3,000.00
Rebar	***2400***	**LBS**		**$ 1.39**	**$ 3,330.00**
Ironworker Foreman	*1*		6	*$ 75.00*	$ 450.00
Ironworker	*1*		6	*$ 75.00*	$ 450.00
Rebar	*2400*			$ 0.70	$ 1,680.00
General Contractor Support	*1*			*$ 750.00*	$ 750.00
Bonds and Insurance(1.5%)					**$ 2,664.59**
Labor Escalation (2.5%)					**$ 1,895.73**
Overhead & Profit (15%)	***1***				**$ 27,329.90**
Option 2 Summary					**$ 209,529.21**

Quantity Takeoffs

Bridge 69840

Option 1

Web	Web thickness	1	in
	Web depth	57.5	in
	Length	27.5	Ft
	Volume	10.98	Cu. Ft.
Flanges	Top Flange area	35	in^2
	Bottom flange area	35	in^2
	Length	26.17	Ft
	Volume	12.72	Cu. Ft.
1.75" Plates	Area Per Plate	35	in^2
	Length Per Plate	6.33	ft
	Number of Plates	4	Plates
	Volume	6.16	Cu. Ft.
L8x8	Area Per Angle	11.5	in^2
	Length Per Angle	4	ft
	Total Angles	12	angles
	Volume	3.83	Cu. Ft.

Per Diaphragm	Total Volume	33.69	Cu. Ft.
	Unit weight of Steel	490	Lb/kcf
	Weight of Steel	16509.16	Lbs
	5% additional for Bolts	17334.6	Lbs

Total Weight of steel for Option 1 **69400** **Lbs**

Bridge 69839

Assume an additional 5% steel weight due to curve on 69839

Total Weight of steel for Option 1 (Bridge 69839) **72900** **Lbs**

Bridge 69840

Option 2

Web	Web Thickness	0.75	in
	Web Depth	5	in
	Length	23.5	ft
	Volume (2 built up shapes)	1.22	Cu. Ft.
Flanges	Top Flange area	8	in^2
	Bottom flange area	8	in^2
	Length	23.50	Ft
	Volume (2 built up shapes)	5.22	Cu. Ft.
1.75" backup Plate	Area	63	in^2
	Length	28.83	Ft
	Volume	12.61	Cu. Ft.
Compression Plate	Area	63	in^2
	Length	27.5	Ft
	Volume	12.03	Cu. Ft.

Per Pier	Total Volume	31.09	Cu. Ft.
	Unit weight of Steel	490	Lb/cf
	Weight of Steel	15235.10	Lbs
	5% additional for Bolts	15996.9	Lbs

Total Weight of steel for Option 2 32000 Lbs

Bridge 69839

Assume an additional 5% steel weight due to curve on 69839

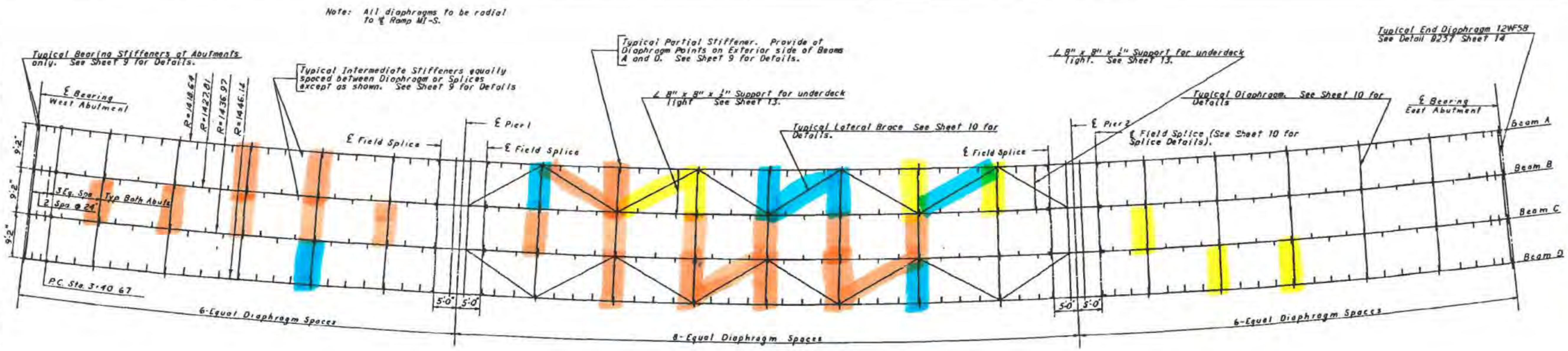
Total Weight of steel for Option 1 (Bridge 69839) 33600.0 Lbs

Appendix 6

Cross Frame Removal Schedule

69839 DAMAGED ANALYSIS

Note: All diaphragms to be radial to ℄ Ramp MI-S.



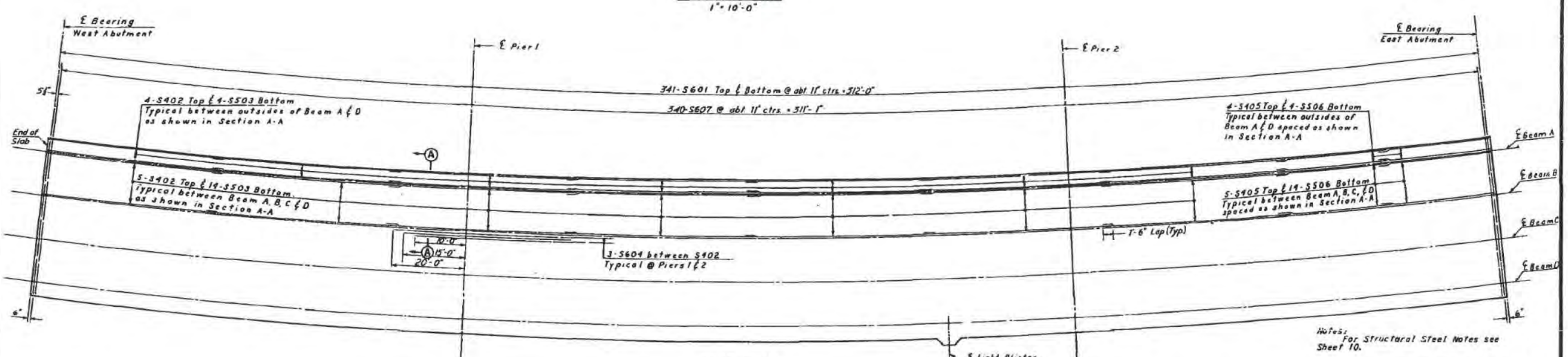
Removed after Pier Cut

Removed after 3% LL & EH1

Removed after 3% LL & EH2 to EH4

FRAMING PLAN

1" = 10'-0"



SLAB PLAN

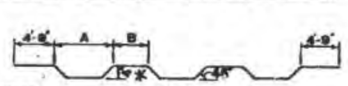
1" = 10'-0"

Notes:
Slab concrete to be Mix 3Y43.
Curb, Post, and Handrail to be Mix 3Y46A.
Slab shall be poured up-grade
The volume of deck concrete for payment shall be computed using an average stool height 2¼".

Notes:
For Structural Steel Notes see Sheet 10.

12. For Light Blister Details see Sheet
For Curb Steel see Sheet 11.

BILL OF REINFORCEMENT							
BAR	NO.	SIZE	LENGTH	TYPE	DIMENSIONS A	DIMENSIONS B	LOCATION
S601	682	6	33-0	Str			Transverse
S402	161	4	40-0	Str			Longitudinal
S503	350	5	40-0	Str			Longitudinal
S604	96	6	30-0	Str			Longitudinal
S405	46	4	13-0	Str			Longitudinal
S506	100	5	13-0	Str			Longitudinal
S607	340	6	33-10	115	5-2	4-0	Transverse



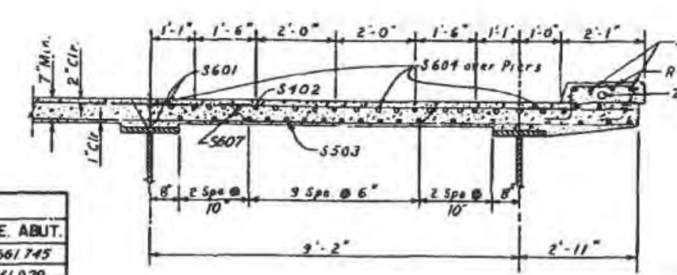
* Bending Tolerance Note (f *)

115

BENDING DIAGRAM

No Scale

TOP OF SLAB ELEVATIONS				
BEAMS	W. ABUT.	PIER 1	PIER 2	E. ABUT.
A	646.022	650.426	658.100	661.745
B	646.091	650.609	658.283	661.928
C	646.160	650.795	658.467	662.112
D	646.228	650.976	658.650	662.295



SECTION A-A

¾" = 1'-0"

SUPERSTRUCTURE QUANTITY SUMMARY		
	Concrete Mix 3Y43	240 Cu. Yds.
①	Concrete Mix 3Y46A	53 Cu. Yds.
①	Reinforcement Bars	96010 Lbs.
②	Structural Steel (3306)	451180 Lbs.
	Conduit System (Type C)	1 System
③	Name Plate	1 Unit

① Includes railing quantity
② Includes steel cap beams, column. Base plate and protection angle at abutment.
③ For Bridge 69839 F.A.I. 035-6-100 Dated 1969 To be included in price bid for other items.

H.N.T.B. BR. NO. 16

TRUNK HIGHWAY NO. 35
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

INTERSTATE ROUTES IN DULUTH

BRIDGE NO. 69839

MICRO-FILMED

FRAMING PLAN AND SLAB PLAN

APPROVED: 7-16-68

DES.	CNS
DCH.	HN
DR.	DWS
CH.	HN

SHEET NO. 8 OF 20 SHEETS | 69839

Appendix 7

Advanced Redundancy Repair Plans and Cost Estimate

ENGINEER'S ESTIMATE
SP 6937-102

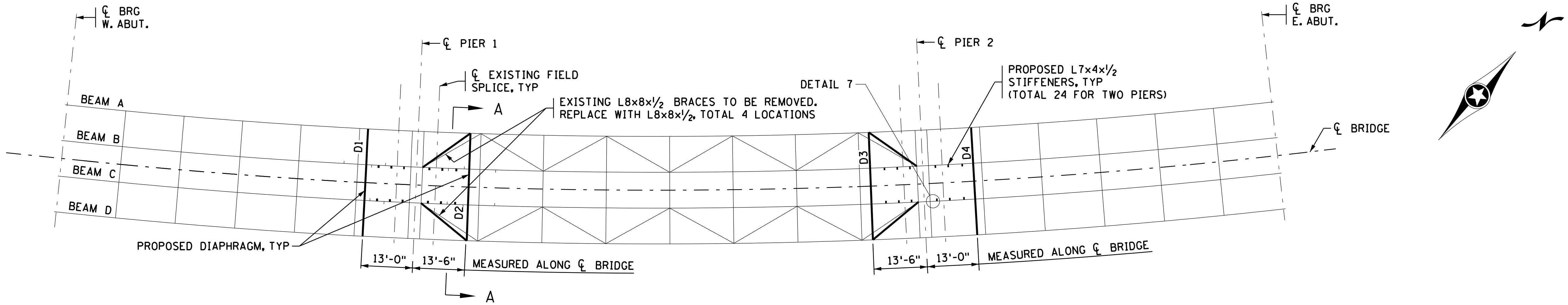
MICHIGAN ST. (N.B) TO MESABA AVE. & SUPERIOR ST. OVER MESABA AVE. & SUPERIOR ST. TO T.H. 35 S.B.
0.8 MILES NOTH OF JCT. I-35 & T.H.2 IN DULUTH

BR. NO: 69839

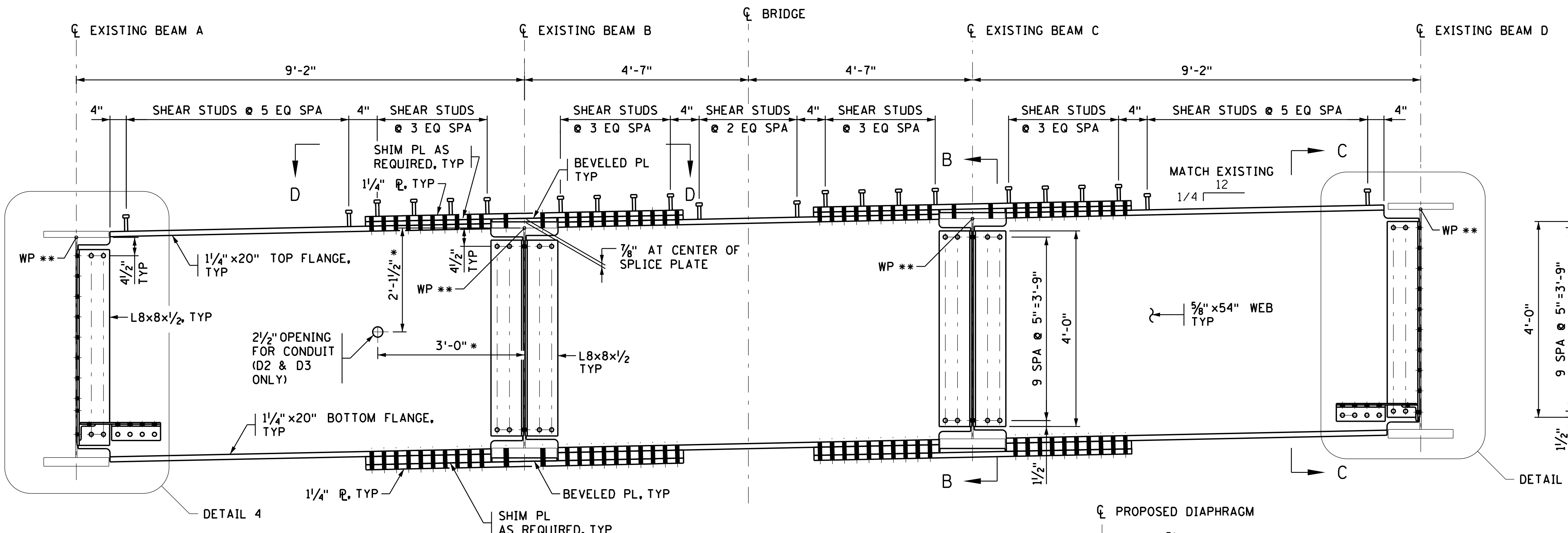
STRUCTURE ID:	3 SPAN (91'-130'-91') 401
WORK TYPE:	Bridge Repair
FUND CODE:	
LENGTH:	317.5'
DECK AREA:	10584 S.F.
OVERLAY:	Yes
WIDEN AREA:	None, New Bridge Deck

PRICED:	S. Schantzen
REVIEWED:	M. Stowman
LET DATE:	2/23/2018
TYPE CODE:	
RDWY WIDTH:	33.33 FT
SKEW:	N/A
SDWKS:	N/A

ITEM NO.	ITEM	UNIT	QUANTITIY	UNIT PRICE	ENG AMOUNT
2013.602	TCLP TEST	EACH	1	$ 512.77	$ 512.77
2104.601	REMOVE CONDUIT SYSTEM	LUMP SUM	1	$ 3,914.60	$ 3,914.60
2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LUMP SUM	1	$ 10,717.43	$ 10,717.43
2401.503	TYPE S (TL-4) 36" BARRIER CONCRETE (3S52)	LIN. FT.	713	$ 78.00	$ 55,610.44
2401.508	REINFORCEMENT BARS (EPOXY COATED)	POUND	85310	$ 1.30	$ 110,476.45
2401.618	BRIDGE SLAB CONCRETE (3YHPC-M)	SQ. FT.	10483	$ 25.54	$ 267,735.82
2401.618	SPECIAL SURFACE FINISH (INPLACE)	SQ. FT.	1295	$ 2.53	$ 3,276.35
2402.503	EXPANSION JOINT DEVICES TYPE 5	LIN. FT.	67	$ 161.35	$ 10,810.45
2402.602	SHEAR STUDS	EACH	4300	$ 9.08	$ 39,029.67
2402.602	SUPPLEMENTAL STEEL DIAPHRAGM	EACH	4	$ 84,035.00	$ 336,140.00
2402.602	SUPPLEMENTAL STIFFENER	EACH	24	$ 328.59	$ 7,886.16
2402.602	BRACING	EACH	4	$ 2,963.52	$ 11,854.08
2402.602	STEEL CORBEL BRACKET	EACH	4	$ 26,239.50	$ 104,958.00
2433.502	ANCHORAGES TYPE REINF BARS	EACH	48	$ 25.72	$ 1,234.44
2433.518	REMOVE CONCRETE SLAB, CURBS, OVERLAY, AND BARRIER	SQ. FT.	10689	$ 33.52	$ 358,259.65
2433.601	PRE-REMOVAL SURVEY	LUMP SUM	1	$ 4,500.00	$ 4,500.00
2433.602	GREASE EXPANSION BEARING ASSEMBLIES	EACH	8	$ 574.28	$ 4,594.20
2433.603	RECONSTRUCT PAVING BRACKET AND WALL	SQ. FT.	212	$ 182.54	$ 38,698.57
2433.618	CONCRETE SURFACE REPAIR	SQ. FT.	400	$ 128.61	$ 51,443.00
2476.601	LEAD SUBSTANCES COLLECTION AND DISPOSAL	LUMP SUM	1	$ 25,783.00	$ 25,783.00
2478.518	ORGANIC ZINC-RICH PAINT SYSTEM (OLD)	SQ. FT.	21256	$ 7.82	$ 166,221.92
2478.618	CLEAN AND PAINT STEEL	SQ. FT.	2087	$ 7.22	$ 15,065.73
2545.501	CONDUIT SYSTEM TYPE 1	LUMP SUM	1	$ 13,728.56	$ 13,728.56



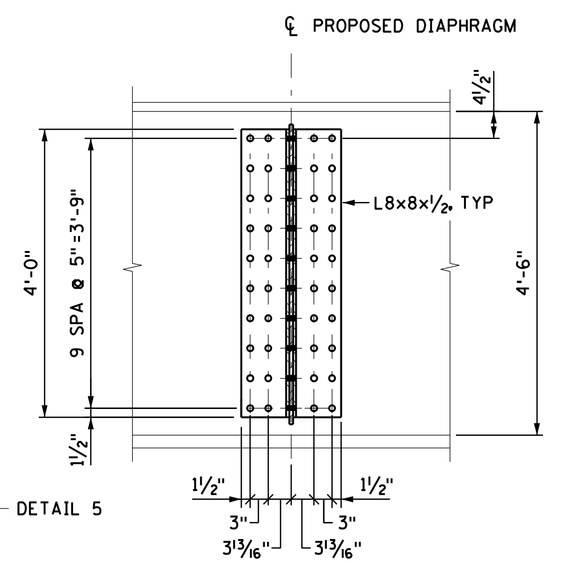
FRAMING PLAN



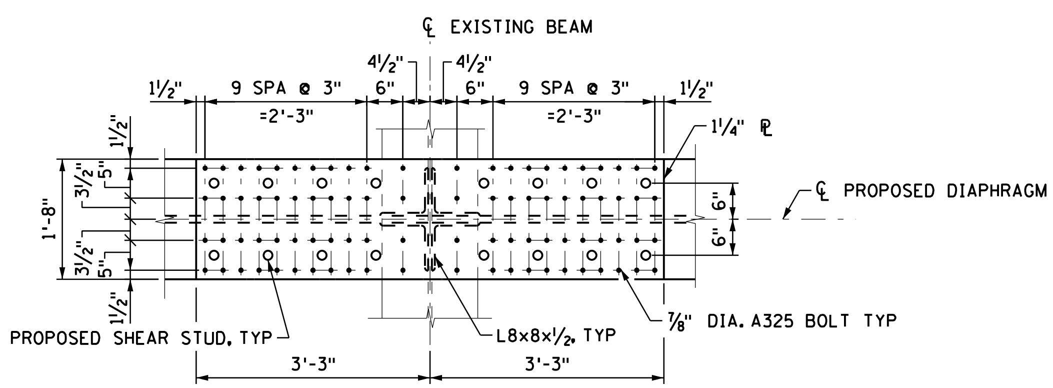
SECTION A-A
(TOTAL 4)

* VERIFY THE DIMENSIONS IN THE FIELD BEFORE FABRICATING STEEL DIAPHRAGMS.

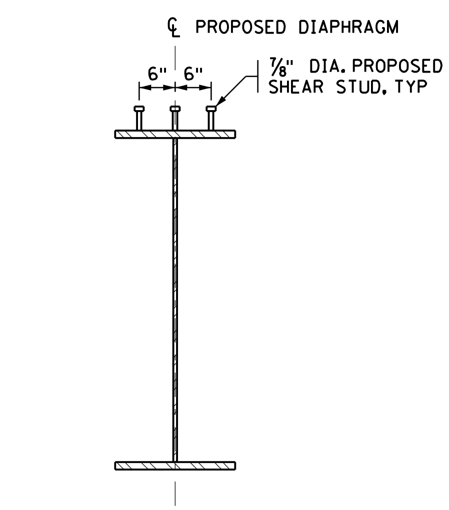
** WP'S ARE AT THE TOP WEB OF THE EXISTING BEAM. TOP OF WEBS OF DIAPHRAGM AND EXISTING BEAMS TO LINE UP.



SECTION B-B
(TOP & BOTTOM SPLICE PLATES NOT SHOWN FOR CLARITY)



VIEW D-D
(STUDS AS SHOWN OVER SPLICE)



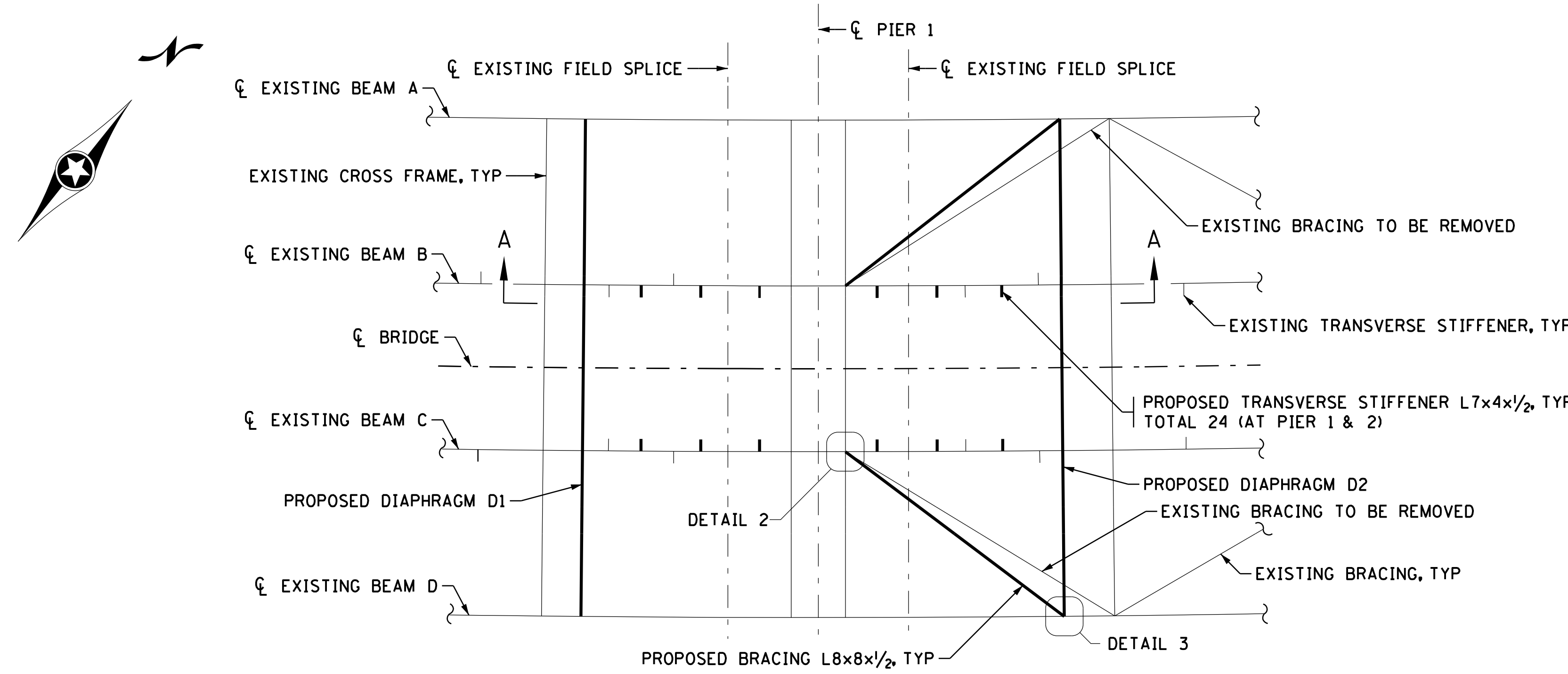
SECTION C-C
(BEAM NOT SHOWN FOR CLARITY)

NOTES:

1. FIELD VERIFY ALL DIMENSIONS, LOCATIONS AND ELEVATIONS SHOWN IN THE PLAN FOR EXISTING STRUCTURES. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
2. ALL STEEL SHALL CONFORM TO SPEC.3309, Fy = 50 ksi, UNLESS OTHERWISE NOTED.
3. ALL BOLTED CONNECTIONS SHALL BE MADE WITH ⅞" DIA. A325 BOLTS, EXCEPT AS NOTED.
4. SHEAR STUDS ON THE TOP OF FLANGE OF GIRDER SHALL BE INSTALLED IN THE FILED.
5. SHEAR CONNECTOR TO PROJECT A MINIMUM 2" INTO DECK STRUCTURAL SLAB. IN NO CASE SHALL SHEAR CONNECTORS PROJECT CLOSER THAN 1" TO TOP OF DECK STRUCTURAL SLAB. ENGINEER TO FIELD VERIFY BEAM ELEVATION AND AUTHORIZE STUD LENGTH.
6. SEE SHEET 11 FOR PROPOSED STIFFENER PLACEMENT ELEVATION.
7. FOR DETAILS 4, 5 AND 7 SEE SHEET 14.

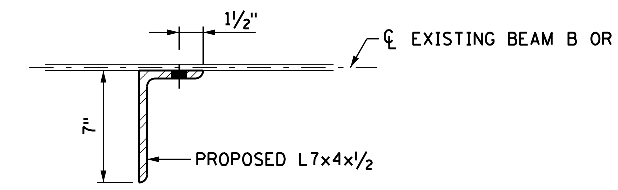
11/13/2017 CBR69839_SUP01.dgn

CERTIFIED BY ____ LICENSED PROFESSIONAL ENGINEER ____ DATE NAME: TONY SHKURTI LIC. NO. 48479	TITLE: STEEL REPAIR DETAILS - 1	DES: TFS DR: LK APPROVED: CHK: MX CHK: EPP SHEET NO. 10 OF 25 SHEETS	BRIDGE NO. 69839

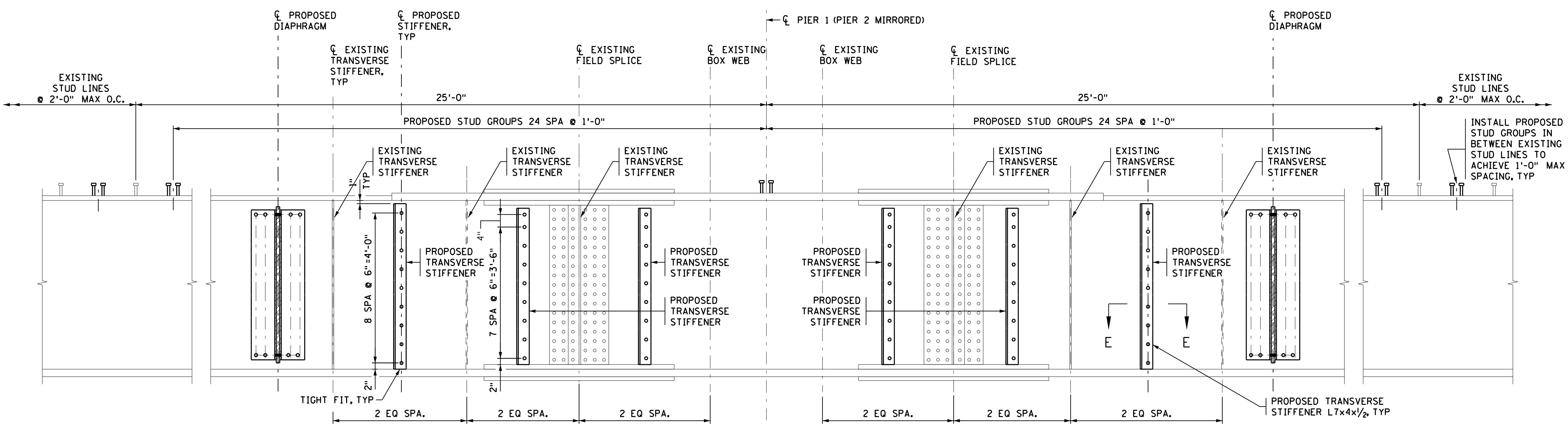


RETROFIT PARTIAL PLAN

(PIER 1 SHOWN, PIER 2 MIRRORED)



SECTION E-E



VIEW A-A

PROPOSED STIFFENER PLACEMENT ELEVATION

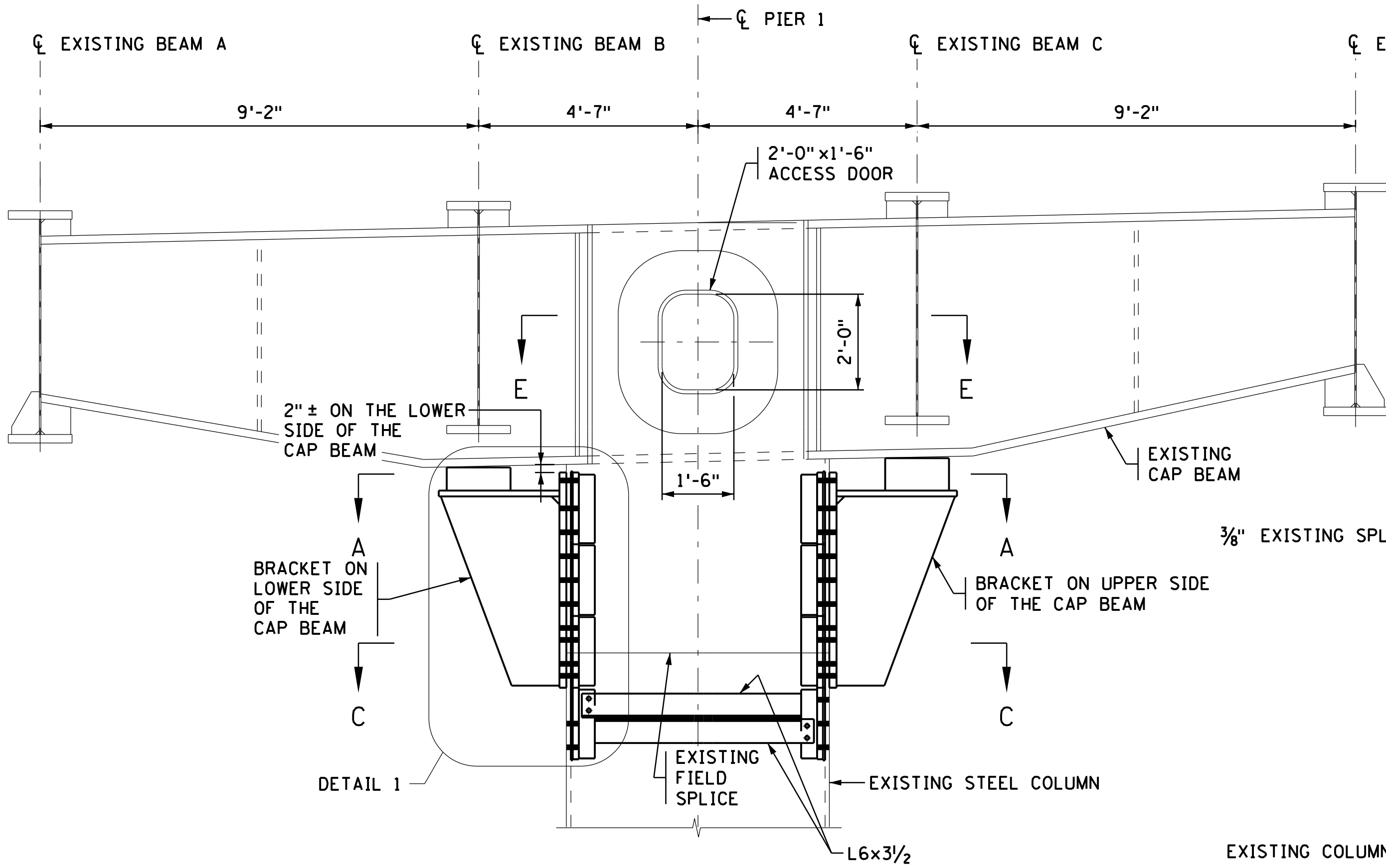
(TYPICAL FOR EXISTING BEAMS B & C)
(EXISTING BOX BEAM NOT SHOWN FOR CLARITY)

NOTES:

1. SEE ADDITIONAL NOTES ON SHEET 10.
2. EACH EXISTING STUD LINE AND PROPOSED STUD GROUP CONTAINS FIVE 7/8" DIA. STUDS. SEE SUPERSTRUCTURE DETAILS SHEETS FOR ADDITIONAL INFORMATION AND QUANTITY.

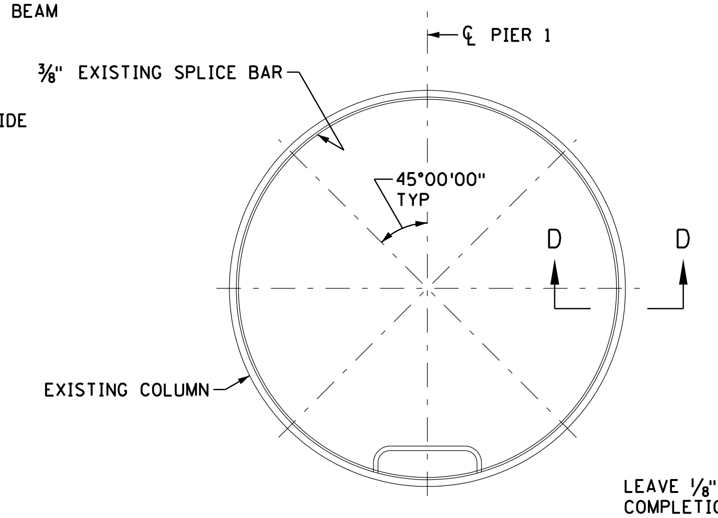
11/13/2017 CBR69839_SUP02.dgn

CERTIFIED BY ______ LICENSED PROFESSIONAL ENGINEER ______ DATE	TITLE: STEEL REPAIR DETAILS - 2	DES: TFS	DR: LK	APPROVED:	BRIDGE NO. 69839
		CHK: MX	CHK: EPP		
NAME: TONY SHKURTI LIC. NO. 48479		SHEET NO. 11 OF 25 SHEETS			



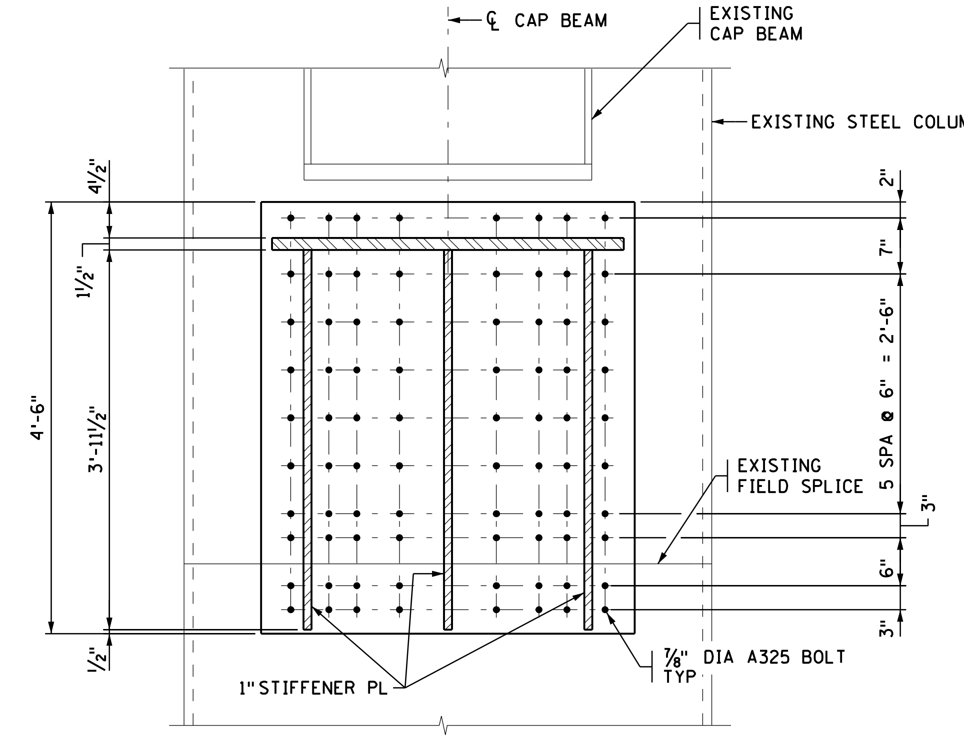
ELEVATION

(PIER 1 SHOWN, PIER 2 SIMILAR)
(BRACKET ON LOWER SIDE AND UPPER SIDE OF THE CAP BEAM ARE LEVEL)



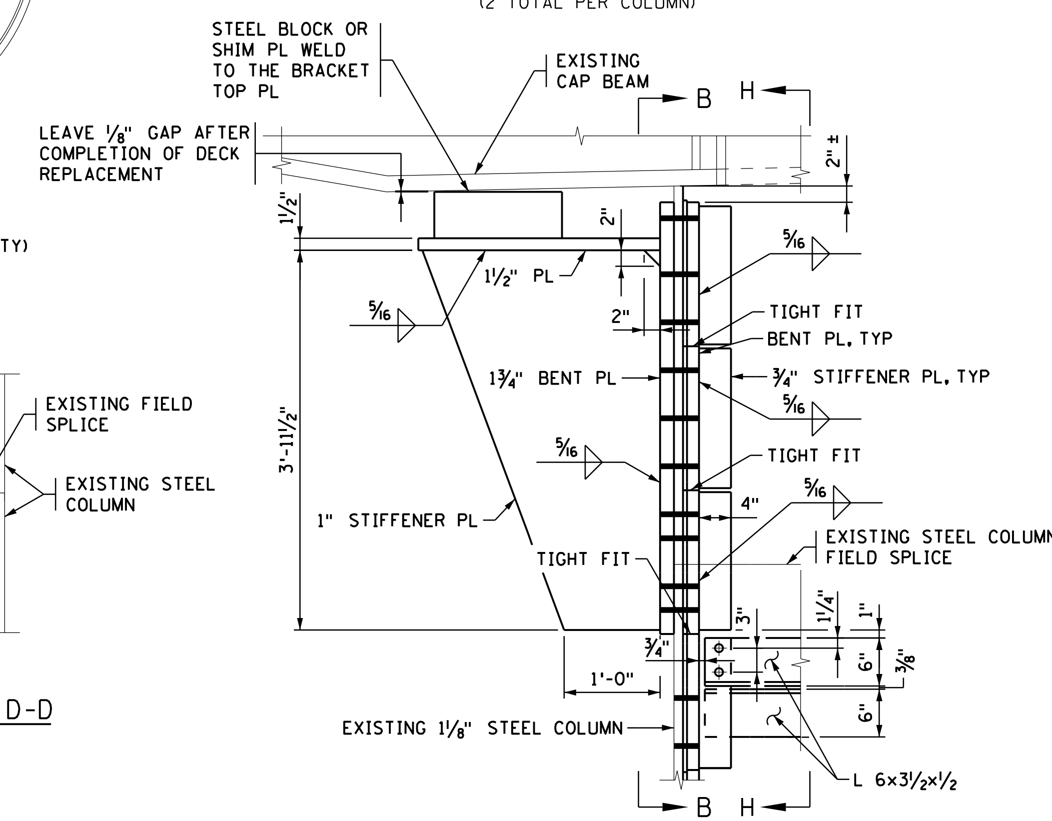
SECTION C-C

(EXISTING SHOWN)
(PROPOSED NOT SHOWN FOR CLARITY)

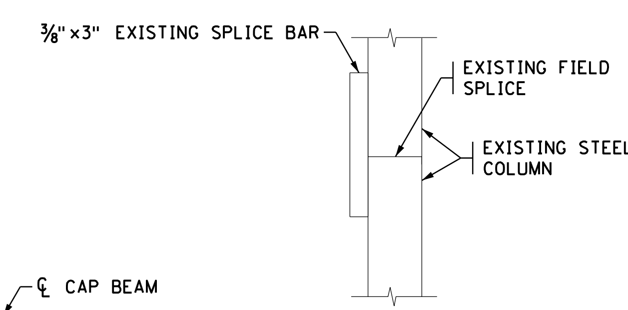


SECTION B-B

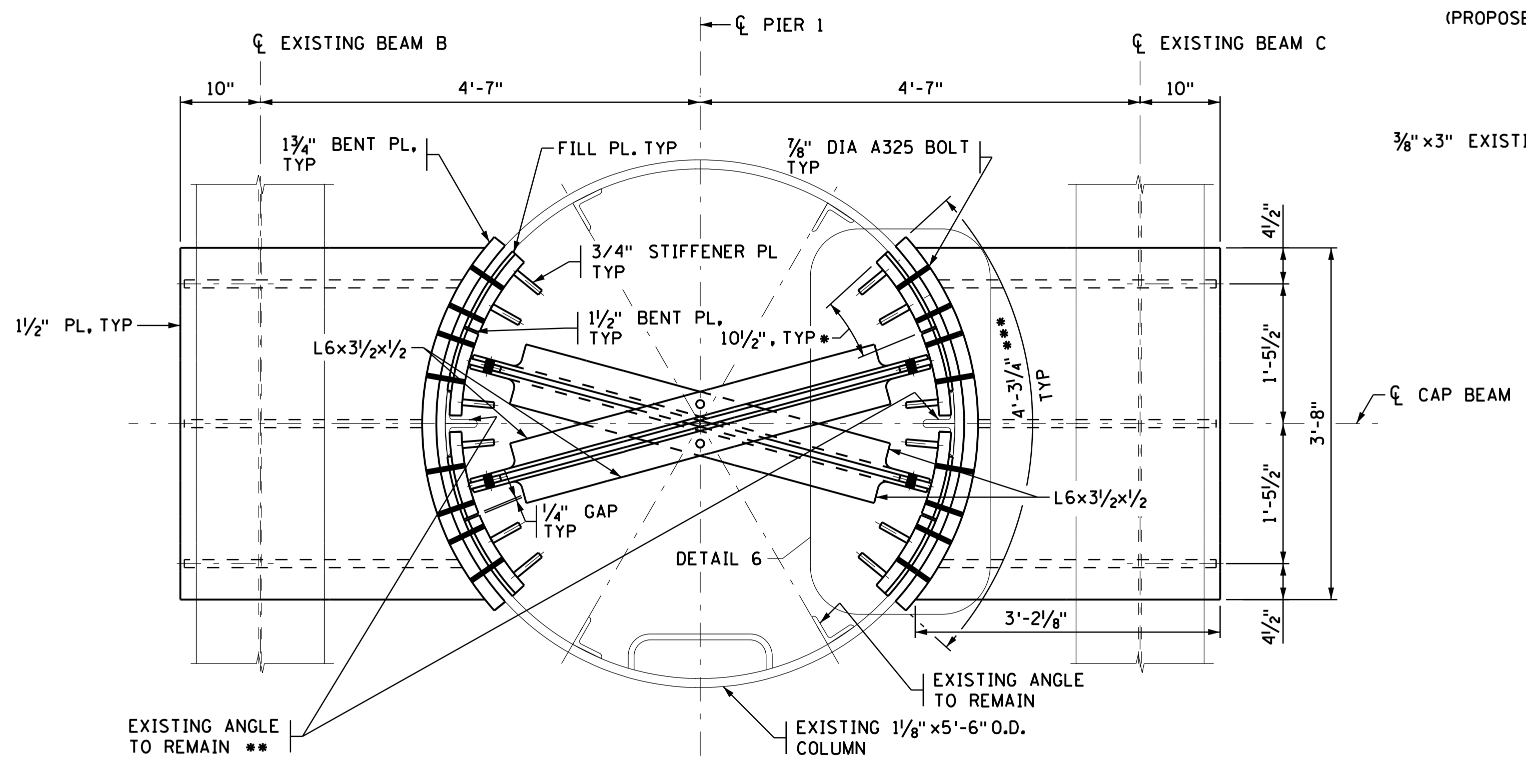
(NUMBER OF A325 BOLT AS SHOWN)
(2 TOTAL PER COLUMN)



DETAIL 1
PROPOSED BRACKET



SECTION D-D



* MEASURED INSIDE FACE OF 1½" BENT PLATE
** EXISTING ANGLE FLIPPED BELOW COLUMN FIELD SPLICE LINE
*** MEASURED OUTSIDE FACE OF 1¾" BENT PLATE

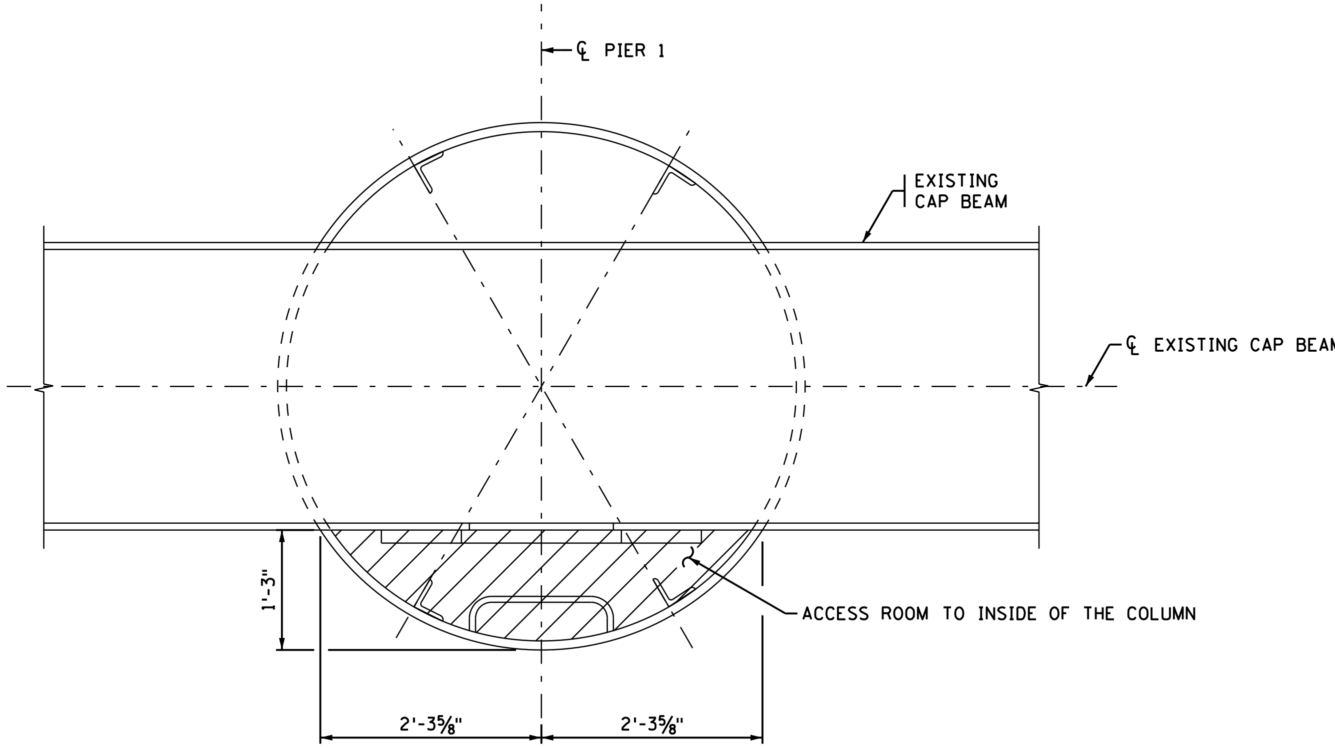
SECTION A-A

NOTES:

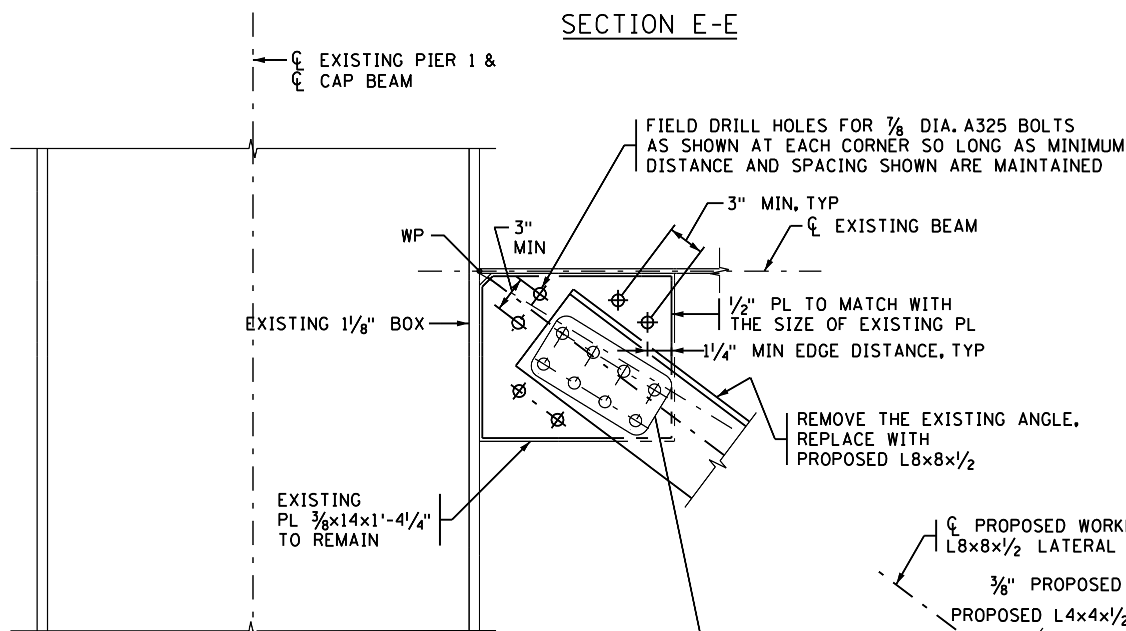
1. SEE ADDITIONAL NOTES ON SHEET 10.
2. CONTRACTOR TO VERIFY THAT BRACKET DOES NOT EXTEND TO ROADWAY AND THAT ALL VERTICAL AND HORIZONTAL CLEARANCE REQUIREMENTS ARE NOT VIOLATED.
3. FOR SECTION E-E AND SECTION H-H, SEE SHEET 13.
4. FOR DETAIL 6, SEE SHEET 14.

CERTIFIED BY ____ LICENSED PROFESSIONAL ENGINEER ____ DATE	TITLE: STEEL REPAIR DETAILS - 3	DES: MX	DR: LK	APPROVED:	BRIDGE NO. 69839
NAME: TONY SHKURTI LIC. NO. 48479		CHK: TFS	CHK: TFS		
		SHEET NO. 12 OF 25 SHEETS			

11/13/2017 CBR69839_SUP03.dgn

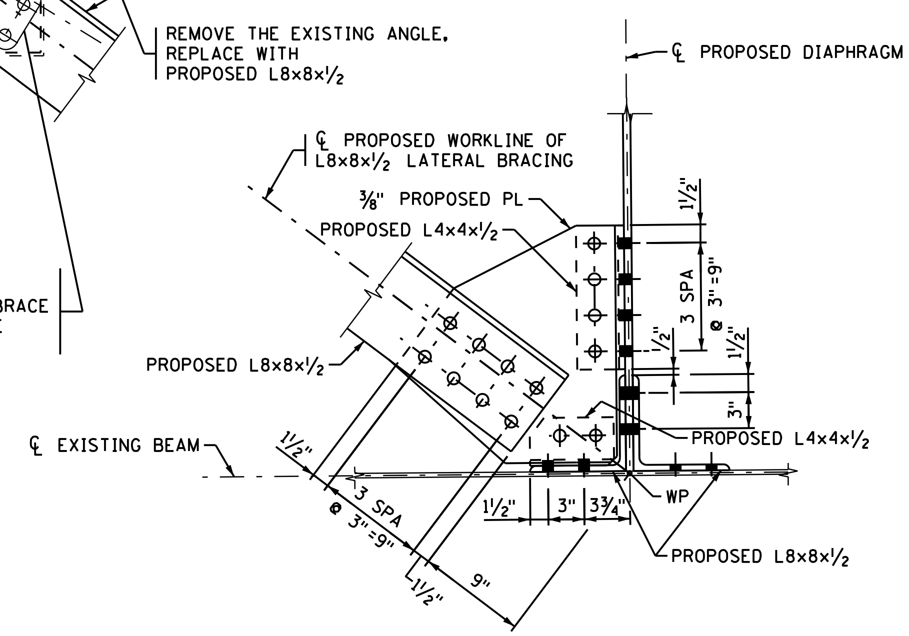


SECTION E-E

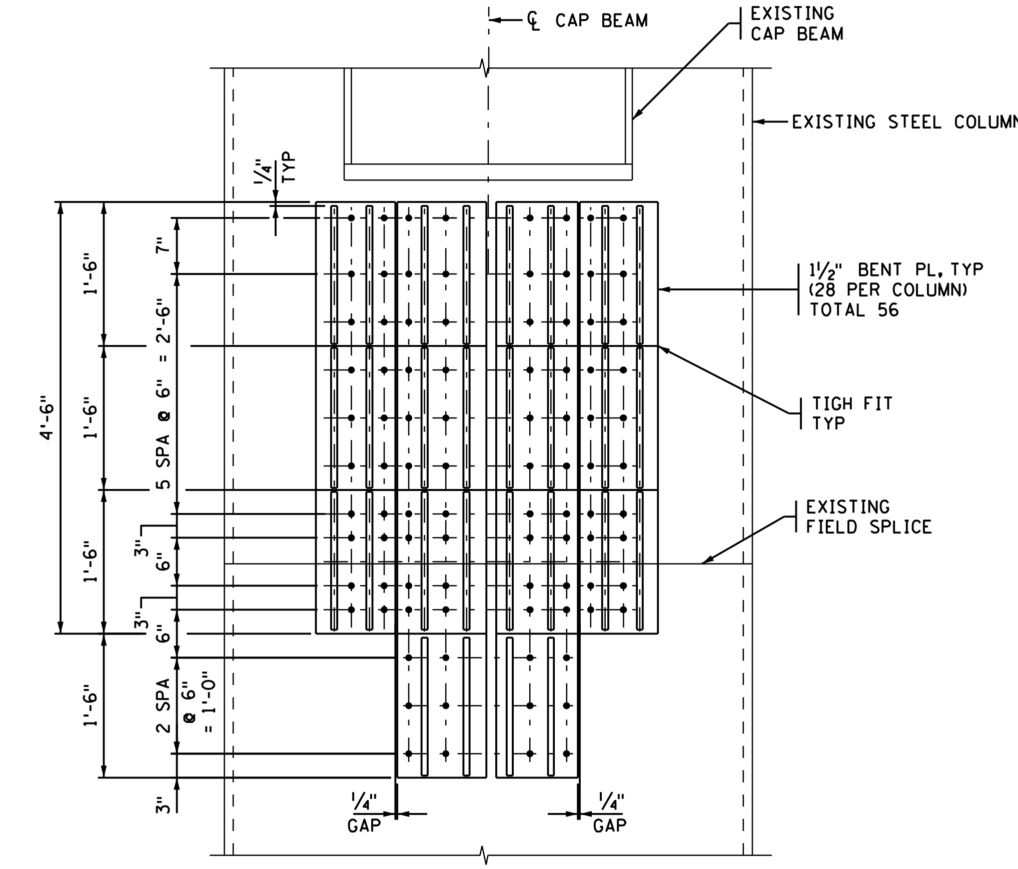


USE BOLT HOLES IN EXISTING PL⅜x14x1'-4¼" AS TEMPLATE FOR PROPOSED ⅞" DIA. A325 BOLTS IN PROPOSED L8x8x1/2 BRACE AND ½" PLATE. PROCEED TO DRILL HOLES ONLY IF 1¼" EDGE DISTANCE IS MAINTAINED AS SHOWN.

DETAIL 2



DETAIL 3



SECTION H-H

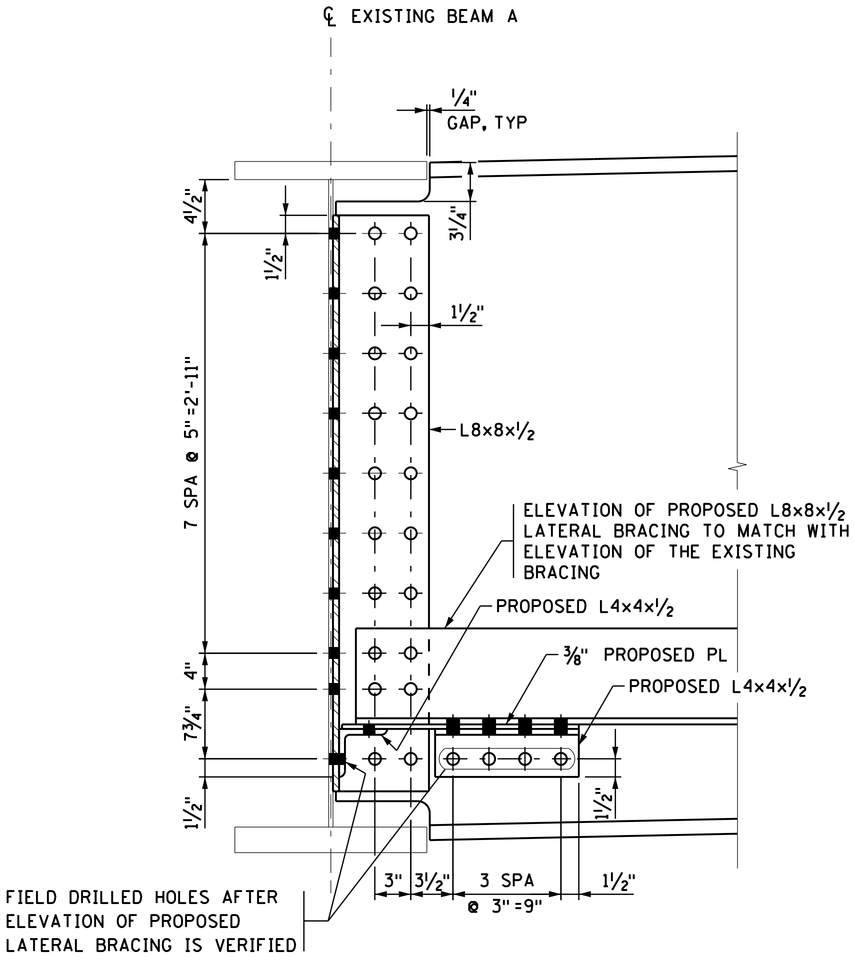
(COLUMN INSIDE BRACKET DETAIL)
(NUMBER OF BOLTS AS SHOWN)

NOTES:

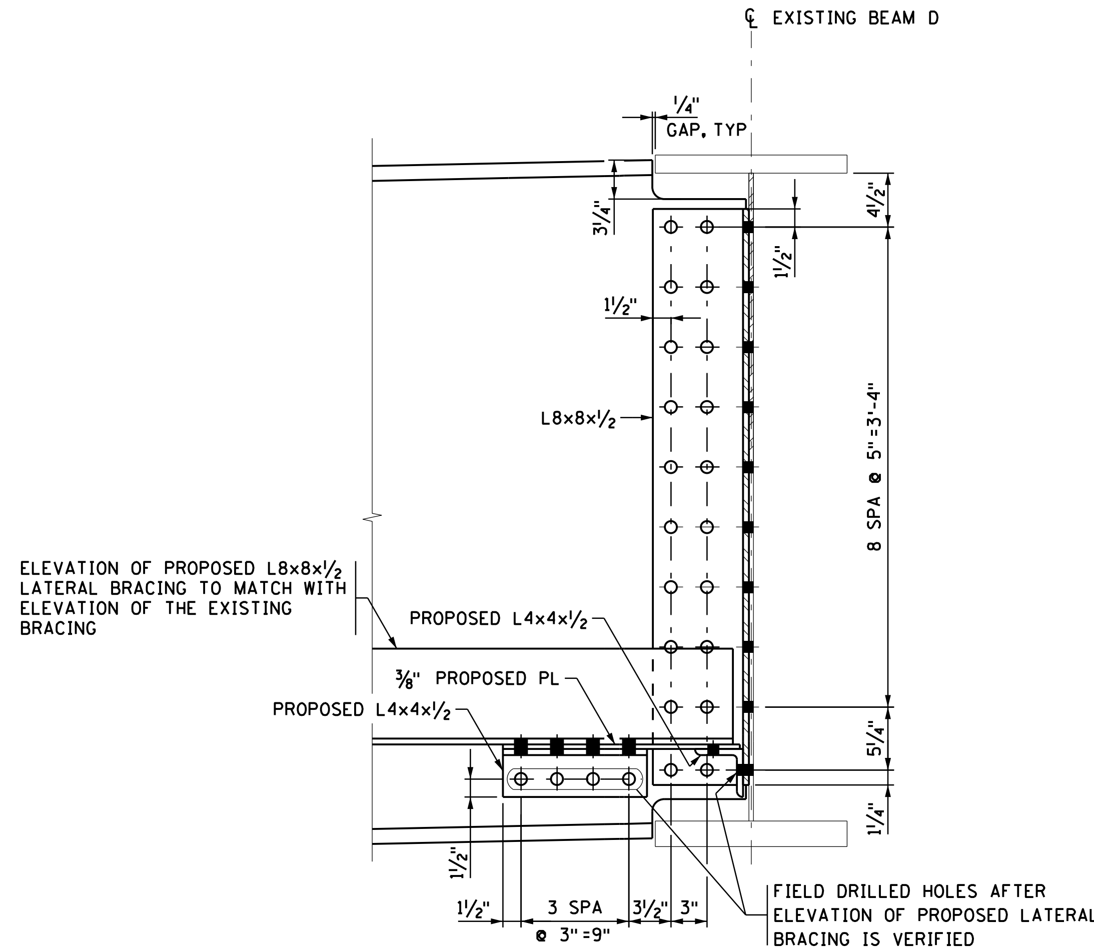
1. SEE ADDITIONAL NOTES ON SHEET 10.
2. FOR LOCATIONS OF DETAILS 2 & 3, SEE SHEET 11.
3. FOR LOCATIONS OF SECTIONS E-E & H-H, SEE SHEET 12.

CERTIFIED BY ___ LICENSED PROFESSIONAL ENGINEER ___ DATE	TITLE: STEEL REPAIR DETAILS - 4	DES: MX / CHK: TFS	DR: LK / CHK: TFS	APPROVED:
NAME: TONY SHKURTI LIC. NO. 48479		SHEET NO. 13 OF 25 SHEETS		BRIDGE NO. 69839

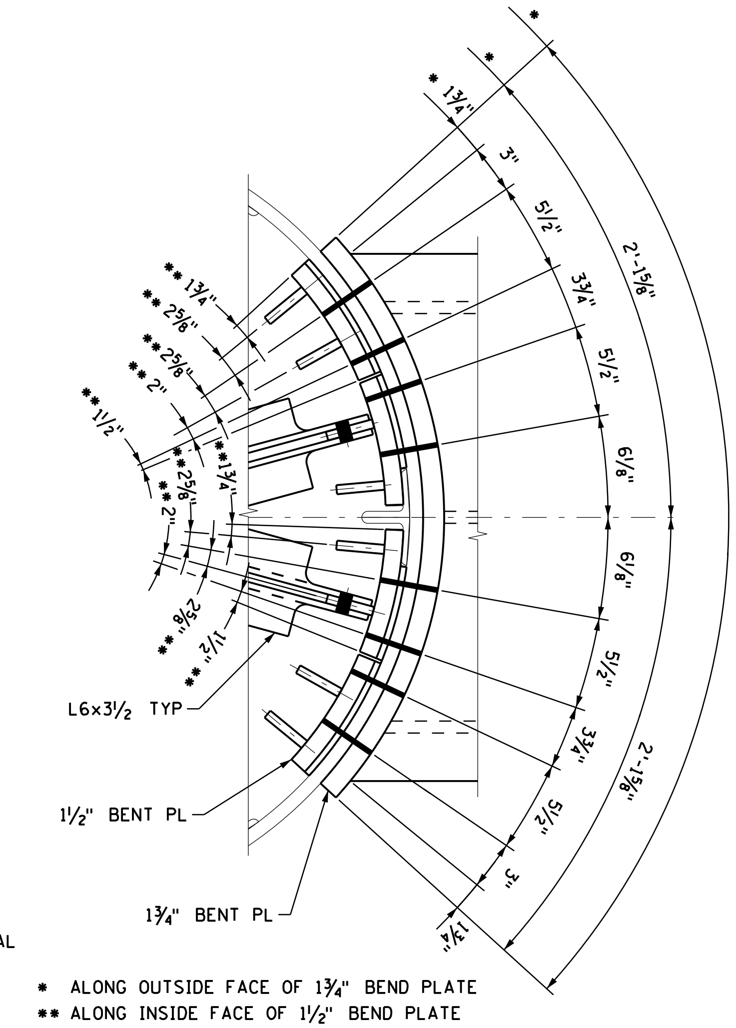
$DATE$ $FILES$



DETAIL 4



DETAIL 5



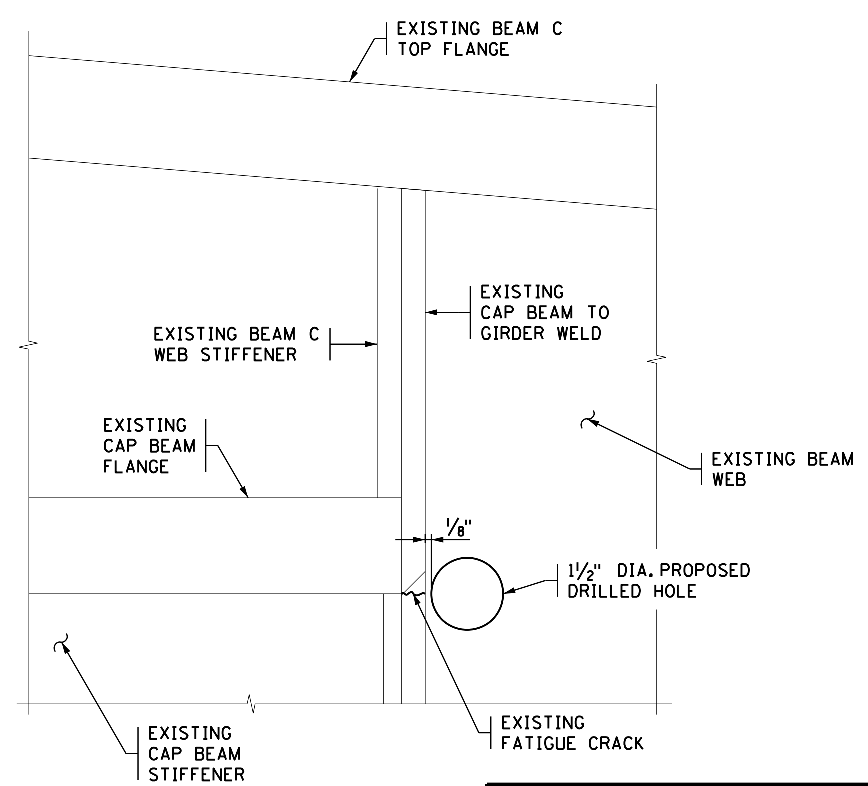
DETAIL 6

FATIGUE CRACK REPAIR NOTES:

1. CARBIDE-TIPPED OR HIGH-SPEED ANNULAR CUTTER TO BE USED TO DRILL PROPOSED HOLE.
2. FLAME-CUTTING HOLE IS NOT PERMITTED.
3. MAGNETIC PARTICLE TESTING TO BE USED TO LOCATE CRACK.
4. IF CRACK HAS BEEN DETECTED TO HAVE PROPAGATED INTO THE WEB, THE HOLE EDGE SHOULD PASS THROUGH THE CRACK TIP.
5. IF CRACK HAS NOT SPREAD INTO THE WEB, EDGE OF HOLE SHOULD BE 1/8 INCH AWAY FROM TOE OF WELD AT CRACK AS INDICATED IN DETAIL.
6. HOLE EDGES TO BE GROUND TO ANSI ROUGHNESS OF 500 OR LESS.

PROPOSED PROCEDURE

1. PERFORM MAGNETIC PARTICLE TESTING TO DETECT EXTENT OF CRACK PROPAGATION.
2. IF CRACK HAS PROPAGATED INTO GIRDER WEB, MARK ITS TIP WITH A CENTER PUNCH.
3. DRILL A HOLE SUCH THAT THE TIP OF THE CRACK LIES AT THE EDGE OF THE CORED HOLE AND ON A HORIZONTAL DIAMETER OF THE CIRCULAR HOLE.
4. IF CRACK HAS NOT PROPAGATED INTO THE GIRDER WEB, IDENTIFY TIP OF CRACK ON THE WELD. MARK CENTER OF THE HOLE TO BE LOCATED AT 7/8 INCH AWAY FROM TIP OF CRACK ALONG A HORIZONTAL DIAMETER OF HOLE THAT STARTS AT TIP OF CRACK AS SHOWN IN DETAIL. DISTANCE FROM EDGE OF HOLE TO END OF CRACK SHOULD BE 1/8 INCH.
5. DRILL HOLE USING APPROPRIATE BIT SIZE AND DRILL TYPE.
6. SMOOTH ALL EDGES OF HOLE TO BE SPECIFIED ROUGHNESS.
7. PAINT AND PRIME ALL BARE SURFACES.
8 FILL HOLE WITH A RUBBER OR WOODEN PLUG OR TENSIONED BOLT.



DETAIL 7

NOTES:

1. SEE ADDITIONAL NOTES ON SHEET 10.
2. FOR LOCATION OF DETAILS 4 & 5, SEE SHEET 10.
3. FOR LOCATION OF DETAIL 6, SEE SHEET 12.

CERTIFIED BY ____ LICENSED PROFESSIONAL ENGINEER ____ DATE NAME: TONY SHKURTI LIC. NO. 48479	TITLE: STEEL REPAIR DETAILS - 5	DES: TFS DR: LK CHK: MX CHK: EPP APPROVED: SHEET NO. 14 OF 25 SHEETS	BRIDGE NO. 69839

11/13/2017 CBR69839_SUP04_1.dgn