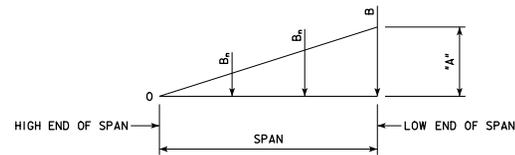


PART PLAN SHOWING LONGITUDINAL UHPC JOINTS BETWEEN BEAMS
(SKEWED BRIDGE SHOWN, 0 DEGREE SKEW BRIDGE SIMILAR)



DEAD WEIGHT LOADING DIAGRAM

UHPC JOINT NOTES:

LONGITUDINAL JOINTS BETWEEN BEAMS SHALL BE CONSTRUCTED OF ULTRA HIGH PERFORMANCE CONCRETE (UHPC). THE CONTRACTOR SHALL BE REQUIRED TO BATCH AND PLACE ALL UHPC MATERIAL IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE ULTRA HIGH PERFORMANCE CONCRETE NOTES ON SHEETS B24-26-16.

THE CONTRACTOR SHALL BE REQUIRED TO COORDINATE WITH THE MANUFACTURER OF THE UHPC MATERIALS TO DETERMINE THE OPTIMUM TIMEFRAME FOR GRINDING OF THE UHPC. SPECIALIZED GRINDING EQUIPMENT MAY BE REQUIRED TO GRIND THE UHPC MATERIALS. COST FOR GRINDING IS TO BE INCLUDED IN PRICE BID FOR UHPC JOINT.

UHPC FORMWORK NOTES:

MATERIAL PROPERTIES OF UHPC VARY CONSIDERABLY FROM CONVENTIONAL CONCRETE, BOTH DURING THE PLASTIC STATE AND AT THE HARDENED STATE. THE CONTRACTOR SHALL NOTE THAT ADDITIONAL FORMING EFFORT WILL BE REQUIRED TO ENSURE THE FORMS ARE PROPERLY SEALED AND ARE CAPABLE OF RESISTING THE ANTICIPATED FORM PRESSURES.

THE CONTRACTOR SHALL NOTE THAT UHPC PLACEMENT ON GRADE TYPICALLY REQUIRES TOP FORMS FOR CONTAINMENT OF THE MATERIAL WITHIN THE DESIGNATED PLACEMENT AREA. TOP FORMS COMMONLY REQUIRE APPLICATION OF DEAD WEIGHT AS DEPICTED ON THIS SHEET TO RESIST PRESSURES CREATED BY THE FLUID UHPC MATERIALS. OTHER MEANS TO RESIST THE HYDROSTATIC PRESSURE ARE FEASIBLE AND MAY BE PROPOSED BY THE CONTRACTOR FOR REVIEW. MECHANICAL INSERTS IN THE TOP OF THE BEAMS ARE NOT ALLOWED. IF STEEL TIES ARE USED TO TIE THE FORMWORK TO THE INSIDE SURFACE OF THE JOINT, THE TIES SHALL BE STAINLESS STEEL.

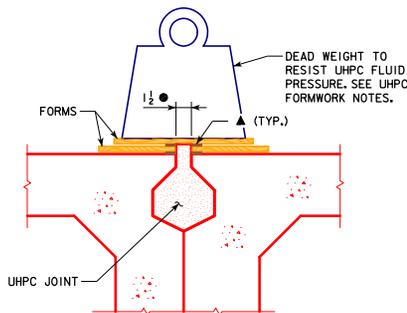
IF DEAD WEIGHT IS USED TO RESIST THE HYDROSTATIC FORCE, A TRIANGULAR LOAD WITH A MAXIMUM VALUE "A" AT THE LOW END OF THE SPAN SHALL BE APPLIED ALONG THE LENGTH OF THE JOINT FORMWORK AS SHOWN IN TABLE 1. ADDITIONALLY, POINT LOADS WITH A MAXIMUM VALUE "B" AS SHOWN IN TABLE 2 SHALL BE APPLIED AT EACH BLOCK-OUT LOCATION. POINT LOADS "B" ARE FOR BLOCK-OUTS AT THE LOW END OF THE SPAN AND POINT LOADS "B₁" AT OTHER BLOCK-OUTS ALONG THE LENGTH OF THE SPAN SHALL BE REDUCED PROPORTIONALLY DEPENDING ON THEIR LOCATION ALONG THE SPAN. DEAD WEIGHTS FOR FORMS ARE COMPUTED ASSUMING A UHPC UNIT WEIGHT OF 156 PCF. DEAD WEIGHTS SHALL BE APPLIED TO ALL JOINTS CONCURRENTLY AND SHALL NOT BE REMOVED UNTIL THE UHPC JOINTS HAVE ATTAINED A MINIMUM REQUIRED STRENGTH OF 10 KSI.

TABLE 1: TRIANGULAR LOAD DEAD WEIGHT "A" ALONG JOINT (PLF)

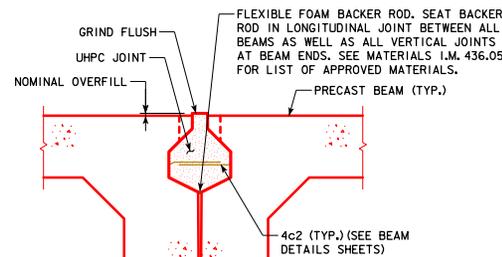
BEAM SPAN	GRADE					
	1%	30'-0"	40'-0"	50'-0"	60'-0"	70'-0"
1%	6	8	10	12	14	
2%	12	16	20	23	27	
3%	18	23	29	35	41	
4%	23	31	39	47	55	
5%	29	39	49	59	68	

TABLE 2: POINT LOAD DEAD WEIGHT "B" AT JOINT BLOCK-OUTS (LBS)

BEAM SPAN	GRADE					
	1%	30'-0"	40'-0"	50'-0"	60'-0"	70'-0"
1%	16	21	26	31	36	
2%	31	42	52	62	73	
3%	18	23	29	35	41	
4%	62	83	104	125	146	
5%	78	104	130	156	182	



TYPICAL SECTION THRU UHPC JOINT
(FOAM STRIPS SHOWN UNCOMPRESSED FOR CLARITY)



DETAIL A
(SHOWN AT ROADWAY CROWN)

NOTES:
 FOR LOCATION OF DETAIL A, SEE SHEET B24-06-16.
 FOR KEYWAY JOINT PREPARATION NOTES AND BLOCK-OUT DETAIL, SEE SHEET B24-32-16.
 ▲ EPDM FOAM STRIP WITH ADHESIVE BACK.
 ● MAXIMUM DISTANCE BETWEEN FOAM STRIPS.

UHPC JOINT QUANTITY TABLE

SPAN (FT.)	"U" END TO END OF BEAM (FT.)			NO. OF JOINTS	TOTAL (L.F.)		
	0° SKEW	15° SKEW	30° SKEW		0° SKEW	15° SKEW	30° SKEW
30	31.17	31.21	31.34	5	156	156	157
40	41.17	41.21	41.34		206	206	207
50	51.17	51.21	51.34		256	256	257
60	61.17	61.21	61.34		306	306	307
70	71.17	71.21	71.34		356	356	357

LATEST REVISION DATE
 Approved by Bridge Engineer
 [Signature]

IOWADOT Highway Division

STANDARD DESIGN - 24'-0 ROADWAY, SINGLE SPAN
CONCRETE BOX BEAM BRIDGES

DECEMBER, 2016

UHPC JOINT DETAILS
(SHEET 1 OF 2)

B24-25-16