



January 7, 2026

Zachariah Farrell
John R. Jurgensen Company

Re: ODOT Step 1 Response – ODOT 233008 FAY-435 Ramp Cracking

Dear Zac:

Here is our response to the recent ODOT Step 1 Decision Letter denying Jurgensen's Step 1 claim. ODOT's basis for this denial purportedly links some batching issues of the QC1P Paving mix (JMF C750291P1A) with concrete cracking that subsequently developed on the exit ramp from US 35 to SR 435 (Ramp D). Specifically, the denial cited that some of the QC1P mix provided by Ernst Concrete exceeded the +/- 1% Batching Tolerances set out in Table 499.06-1 for cement and cumulative cementitious (slag) powders.

Background

Ernst Concrete provided concrete to Jurgensen for Ramp D which consisted of several placements from August through October of 2024. The project encompassed expansion of the existing ramp with widening and adding an additional left turn lane. The two mixes provided included approximately 1,170 cubic yards of QC1 Paving Mix (JMF C750291P1A) and approximately 340 cubic yards of QCMS Mix (JMF C75029MS1B). The QC1P mix specifically was designed by Ernst using ODOT approved sources of cement (Amrize – Bloomsdale) and slag cement (Skyway – Chicago) to meet the applicable strength and permeability requirements and was approved by ODOT. This mix design included a total of 564# of cementitious (#395 cement & #169 slag).¹

The Ramp D roadway was constructed with 10" thick QC1P concrete using a combination of roller screed or slip form placement methods. The widened SR 435 approach/turn area was constructed primarily with QCMS concrete placed by roller screed. Any subsequent panel replacements used QCMS as well. It is our

¹ This QC1P mix design has less than a 28% paste factor. Even if this mix was over-batched by 30# per CY cementitious, the paste factor would still not exceed 28%.

understanding that all of the QC1P and QCMS concrete supplied met the project strength requirements.

During construction, it was necessary to keep one active lane of traffic throughout the Ramp D project and newly placed concrete sections were typically opened to unrestricted traffic within 5 days of placement.

Based on the information provided, some cracking was noticed as early as September 13, 2024 and Jurgensen replaced approximately 7 panels with the QCMS mix in early October 2024. It is our understanding that additional cracking was observed in June of 2025 and 11 additional panels were replaced in September of 2025 using QCMS. In addition, a comprehensive map of observed cracking was created on October 27, 2025. This map noted cracks in almost all of the panels which were replaced with QCMS in early October 2024, which is at odds with the Table created by ODOT and included in their denial letter.

Observations

Ernst Concrete personnel recently visited the site and observed that the majority of the cracks are in the upper half section of the ramp and most all of the cracking occurs mid third-panel, referred to as mid-panel. The cracking does not appear to be early plastic shrinkage cracking as the cracks go through aggregates which indicates that the cracking is more likely settlement, structural, or the result of constrained drying shrinkage. It was also observed that there is a tremendous amount of truck traffic utilizing the newly constructed left turn lane.

Per the placement sequence, it is important to recognize that many of the QC1P mix placements did not exhibit mid-panel cracking. It was also confirmed that the 2024 QCMS replacement panels also developed mid-panel cracking.

Batching Tolerances

On the QC1P Paving mix, there were a total of 116 loads placed on this project from August to September of 2024.² As noted ODOT's denial letter, 64 loads of QC1P mix were slightly outside of the +/- 1% batching tolerances. A more detailed analysis of the involved 64 QC1P loads demonstrates that the tolerances exceeded were negligible at best and the vast majority were slight overweighs. See Exhibit A.

Of those 61 loads outside of the cumulative tolerances:

² There were actually 116 loads of QC1P and 29 loads of QCMS (the total ticket count in the table compiled by ODOT is inaccurate).

- 49 of those loads were overweighs with only 8 of those loads at or exceeding 102% of target (or roughly 11# per cubic yard).
- 12 of those loads were underweighs, with all underweighs except for one being at 98.5% or higher. The underweighs averaged only a few #s per cubic yard.
- Looking only at the loads that exceeded the cement batching tolerance only, 3 of 4 of those loads were slight overweighs (one was for a 3 cubic yard load).³ The single underweigh was 98.86% of target or less than 1# per cubic yard out of tolerance.

The data set out in Exhibit A has been set out in two scatter graphs - Exhibit B ALL QC1P LOADS COMPARED TO TARGET BATCHING REQUIREMENTS and Exhibit C QC1P LOADS BY POUR DATE COMPARED TO BATCHING TOLERANCES also attached at the end of this response.

Impact of Concrete Batched Out Of Tolerance

It is important to note at the outset that the approved QC1P mix used in this project was designed by Ernst Concrete to meet the performance requirements such as strength, permeability, air entrainment, and well graded & durable aggregate requirements. The amount of cementitious materials in this mix was selected by Ernst and was not prescribed by ODOT. Ernst could have created any number of cementitious combinations and weights which would have also been approved provided the designed mix met the requirements. ODOT has likely approved other QC1P designs with more or less cementitious as Ernst Concrete.

As ODOT moves more and more towards performance requirements as opposed to prescriptive requirements, the primary purpose and function of Table 499.06-1 is for consistency. As such, the focus on whether a cubic yard of concrete had a few more or less pounds of cementitious than its design is somewhat misplaced as long as the performance criteria is met.⁴ And based on the information available, the QC1P mix met all of the performance requirements, such as air entrainment, strength, and permeability.

From the data, roughly half of the 116 QC1P loads delivered for the Ramp D were batched slightly outside of the batching tolerances set out in TABLE 499.06-1 with 12 loads slightly below and 49 slightly above. In comparing the data to the crack map, which shows widespread mid-panel cracking throughout the top half of the

³ This small load would technically meet the +4% tolerance set out for small batches per ACI 117 and ASTM 94.

⁴ It is reported that ODOT's updated January 16, 2026 concrete mix design requirements Table 499.03-1 even removes minimum cementitious requirements as the "cementitious minimum requirement is unnecessarily prescriptive."

ramp, it is fair to say that even concrete batched within the cementitious tolerances also had cracking. The cracking is not limited to nor confined to only those areas with the “out of tolerance” concrete. For example, the QC1P placements of 9/9/24 and 9/20/25 show very little cracking but these placements showed similar or even more over/under batching results as the other placements. The data shows that there is no correlation between concrete batched slightly outside of the tolerances (primarily 1% outside the tolerances) and the mid-panel cracking that subsequently occurred.

Conclusion

The most important outcome of this process should be to gain an understanding of what is creating this widespread mid-panel cracking on Ramp D. Possible causes of the cracking could include the concrete mix as delivered, placement methods, subgrade, weather conditions, curing methods, reinforcement binding the concrete’s ability to shrink as needed, non-activated joints (timing of sawcuts or sawcuts not deep enough), insufficient concrete depth (10” pavement) to handle frequent heavy truck traffic, opening to unrestricted traffic within 5 days of placement, design inadequacies, or a number of other reasons. More than likely, the cracking is the result of a number of factors working in combination. If this Step dispute resolution process ends and we don’t truly understand the cause of the cracking, the same issue is likely to repeat itself.

To our knowledge, all of the QC1P concrete provided for this project met all the ODOT performance requirements of air content, strength, and permeability. The assertion that since some QC1P concrete loads (about half) were batched only a few #s per cubic yard outside of arguably inapplicable and inexact tolerances and then determining that to be the one and only cause of all of the ramp cracking, without taking into account all of the other potential causes, runs counter to sound investigative engineering principles.

Ernst Concrete has built its reputation on quality, reliability, and customer partnership as a leading ready-mix concrete provider. We do, however, take strong objections to ODOT’s connection of cracked concrete pavement panels to any of the slight out-of-tolerance batching percentages.

Sincerely,



Daniel D. Ernst

Vice President

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Exhibit A – Data QC1P Tickets Compared to Target Batching Tolerances

Date	Ticket #	Mix	Yds / Load	Target Cement	Actual Cement	499.06-1 CMT Tolerance	Target Slu	Actual Slu	499.06-1 Pozz Cumulative %	Total Target Cementitious s	Total Actual Cementitious s	Total # Vd	# Var / Yd	Tolerance PY (Abs)	# / Yd Out of Tolerance
8/15	459478	C750291P1A	10.0	3950	3920	99.24	1690	1705	99.73	5640	5625	15	(1.5)	5.6	-
8/15	459482	C750291P1A	10.0	3950	3930	99.49	1690	1815	101.86	5640	5745	105	10.5	5.6	4.9
8/15	459485	C750291P1A	10.0	3950	3920	99.24	1690	1720	100.00	5640	5640	0	-	5.6	-
8/15	459488	C750291P1A	10.0	3950	3915	99.11	1690	1805	101.42	5640	5720	80	8.0	5.6	2.4
8/15	459489	C750291P1A	10.0	3950	3925	99.37	1690	1810	101.68	5640	5735	95	9.5	5.6	3.9
8/15	459490	C750291P1A	10.0	3950	3935	99.62	1690	1785	101.42	5640	5720	80	8.0	5.6	2.4
8/20	459520	C750291P1A	10.0	3950	3935	99.11	1690	1740	100.27	5640	5655	15	1.5	5.6	-
8/20	459522	C750291P1A	10.0	3950	3940	99.75	1690	1670	99.47	5640	5610	-30	(3.0)	5.6	-
8/20	459523	C750291P1A	10.0	3950	3920	99.24	1690	1745	100.44	5640	5665	25	2.5	5.6	-
8/20	459524	C750291P1A	10.0	3950	3935	99.62	1690	1740	100.62	5640	5675	35	3.5	5.6	-
8/20	459526	C750291P1A	10.0	3950	3925	99.37	1690	1760	100.80	5640	5685	45	4.5	5.6	-
8/20	459527	C750291P1A	10.0	3950	3945	99.87	1690	1720	100.44	5640	5665	25	2.5	5.6	-
8/20	459528	C750291P1A	10.0	3950	3920	99.24	1690	1685	99.47	5640	5605	-35	(3.5)	5.6	-
8/20	459529	C750291P1A	10.0	3950	3925	99.37	1690	1770	100.98	5640	5695	55	5.5	5.6	-
8/20	459531	C750291P1A	10.0	3950	3920	99.24	1690	1775	100.98	5640	5695	55	5.5	5.6	-
8/20	459532	C750291P1A	10.0	3950	3925	99.37	1690	1750	100.62	5640	5675	35	3.5	5.6	-
8/20	459534	C750291P1A	10.0	3950	3940	99.75	1690	1710	100.18	5640	5650	10	1.0	5.6	-
8/20	459535	C750291P1A	10.0	3950	3950	100.00	1690	1815	102.22	5640	5765	125	12.5	5.6	6.9
8/20	459536	C750291P1A	10.0	3950	3920	99.37	1690	1685	99.47	5640	5610	-30	(3.0)	5.6	-
8/20	459537	C750291P1A	10.0	3950	3965	100.38	1690	1670	99.91	5640	5635	-5	(0.5)	5.6	-
8/20	459538	C750291P1A	10.0	3950	3930	99.49	1690	1775	101.15	5640	5705	65	6.5	5.6	0.9
8/20	459540	C750291P1A	10.0	3950	3920	99.24	1690	1765	100.80	5640	5685	45	4.5	5.6	-
8/20	459541	C750291P1A	10.0	3950	3935	99.62	1690	1825	102.13	5640	5760	120	12.0	5.6	6.4
8/20	459542	C750291P1A	10.0	3950	3925	99.37	1690	1780	101.15	5640	5705	65	6.5	5.6	0.9
8/20	459543	C750291P1A	10.0	3950	3935	99.62	1690	1640	98.85	5640	5575	-65	(6.5)	5.6	(0.9)
8/20	459544	C750291P1A	10.0	3950	3920	99.24	1690	1650	98.76	5640	5570	-70	(7.0)	5.6	(1.4)
8/20	459545	C750291P1A	10.0	3950	3930	99.49	1690	1805	101.68	5640	5735	95	9.5	5.6	3.9
9/9	450162	C750291P1A	10.0	3950	3925	99.37	1690	1780	101.15	5640	5705	65	6.5	5.6	0.9
9/9	450164	C750291P1A	10.0	3950	3940	99.75	1690	1805	101.86	5640	5745	105	10.5	5.6	4.9
9/9	450170	C750291P1A	10.0	3950	3915	99.11	1690	1805	101.42	5640	5720	80	8.0	5.6	2.4
9/9	450173	C750291P1A	10.0	3950	3920	99.24	1690	1765	100.80	5640	5685	45	4.5	5.6	-
9/9	450174	C750291P1A	10.0	3950	3985	100.89	1690	1775	102.13	5640	5780	120	12.0	5.6	6.4
9/9	450178	C750291P1A	10.0	3950	3915	99.11	1690	1645	98.58	5640	5560	-80	(8.0)	5.6	(2.4)
9/9	450180	C750291P1A	10.0	3950	3915	99.11	1690	1810	101.51	5640	5725	85	8.5	5.6	2.9
9/9	450185	C750291P1A	10.0	3950	3940	99.75	1690	1670	99.47	5640	5610	-30	(3.0)	5.6	-
9/9	450188	C750291P1A	10.0	3950	3950	100.00	1690	1680	99.82	5640	5630	-10	(1.0)	5.6	-
9/9	450190	C750291P1A	10.0	3950	3930	99.49	1690	1795	101.33	5640	5715	75	7.5	5.6	1.9
9/9	450192	C750291P1A	10.0	3950	3950	100.00	1690	1815	102.22	5640	5765	125	12.5	5.6	6.9
9/9	450193	C750291P1A	10.0	3950	3960	100.25	1690	1660	99.65	5640	5620	-20	(2.0)	5.6	-
9/9	450197	C750291P1A	10.0	3950	3920	99.24	1690	1735	100.27	5640	5655	15	1.5	5.6	-
9/9	450200	C750291P1A	10.0	3950	3935	99.62	1690	1775	101.24	5640	5710	70	7.0	5.6	1.4
9/9	450202	C750291P1A	10.0	3950	3970	100.51	1690	1755	101.51	5640	5725	85	8.5	5.6	2.9
9/9	450204	C750291P1A	10.0	3950	3950	100.00	1690	1775	101.51	5640	5725	85	8.5	5.6	2.9
9/9	450206	C750291P1A	10.0	3950	3965	100.38	1690	1785	101.68	5640	5735	95	9.5	5.6	3.9
9/9	450208	C750291P1A	10.0	3950	3970	100.51	1690	1750	101.42	5640	5720	80	8.0	5.6	2.4
9/9	450212	C750291P1A	10.0	3950	3925	99.37	1690	1755	100.71	5640	5680	40	4.0	5.6	-
9/9	450217	C750291P1A	10.0	3950	3935	99.62	1690	1650	99.02	5640	5585	-55	(5.5)	5.6	-
9/9	450220	C750291P1A	10.0	3950	3945	99.87	1690	1795	101.77	5640	5740	100	10.0	5.6	4.4
9/9	450223	C750291P1A	10.0	3950	3915	99.11	1690	1765	100.71	5640	5680	40	4.0	5.6	-
9/9	450226	C750291P1A	10.0	3950	3915	99.11	1690	1795	101.24	5640	5710	70	7.0	5.6	1.4
9/9	450228	C750291P1A	10.0	3950	3935	99.62	1690	1790	101.51	5640	5725	85	8.5	5.6	2.9
9/9	450230	C750291P1A	10.0	3950	3915	99.11	1690	1615	98.05	5640	5530	-110	(11.0)	5.6	(5.4)
9/9	450231	C750291P1A	10.0	3950	3940	99.75	1690	1750	100.89	5640	5690	50	5.0	5.6	-
9/9	450233	C750291P1A	10.0	3950	3965	100.38	1690	1630	99.20	5640	5595	-45	(4.5)	5.6	-
9/9	450238	C750291P1A	10.0	3950	3925	99.37	1690	1805	101.60	5640	5705	65	6.5	5.6	3.4
9/10	450253	C750291P1A	10.0	3950	3930	99.49	1690	1725	100.27	5640	5665	25	2.5	5.6	-
9/10	450256	C750291P1A	10.0	3950	3925	99.37	1690	1790	101.33	5640	5715	75	7.5	5.6	1.9
9/10	450259	C750291P1A	10.0	3950	3915	99.11	1690	1780	100.98	5640	5695	55	5.5	5.6	-
9/10	450261	C750291P1A	10.0	3950	3925	99.37	1690	1815	101.77	5640	5740	100	10.0	5.6	4.4
9/10	450264	C750291P1A	10.0	3950	3945	99.87	1690	1620	98.67	5640	5565	-75	(7.5)	5.6	(1.9)
9/10	450265	C750291P1A	10.0	3950	3930	99.49	1690	1625	98.49	5640	5585	-55	(5.5)	5.6	(2.9)
9/10	450267	C750291P1A	10.0	3950	3915	99.11	1690	1780	100.98	5640	5685	45	4.5	5.6	-
9/10	450277	C750291P1A	10.0	3950	3925	99.37	1690	1775	101.06	5640	5700	60	6.0	5.6	0.4
9/10	450280	C750291P1A	10.0	3950	3935	99.62	1690	1765	101.06	5640	5700	60	6.0	5.6	0.4
9/10	450284	C750291P1A	10.0	3950	3915	99.11	1690	1760	100.62	5640	5675	35	3.5	5.6	-
9/10	450286	C750291P1A	10.0	3950	3930	99.49	1690	1780	101.24	5640	5710	70	7.0	5.6	1.4
9/10	450290	C750291P1A	10.0	3950	3935	99.62	1690	1775	101.24	5640	5710	70	7.0	5.6	1.4
9/10	450292	C750291P1A	10.0	3950	3925	99.37	1690	1795	100.89	5640	5695	55	5.5	5.6	-
9/10	450294	C750291P1A	10.0	3950	3935	99.62	1690	1790	101.51	5640	5725	85	8.5	5.6	2.9
9/10	450296	C750291P1A	10.0	3950	3945	99.87	1690	1820	102.22	5640	5765	125	12.5	5.6	6.9
9/10	450298	C750291P1A	10.0	3950	3930	99.49	1690	1765	100.98	5640	5695	55	5.5	5.6	-
9/10	450302	C750291P1A	10.0	3950	3920	99.24	1690	1730	100.18	5640	5650	10	1.0	5.6	-
9/10	450304	C750291P1A	10.0	3950	3950	100.00	1690	1815	102.22	5640	5765	125	12.5	5.6	6.9
9/10	450306	C750291P1A	10.0	3950	3940	99.75	1690	1640	98.85	5640	5560	-20	(2.0)	5.6	-
9/10	450308	C750291P1A	10.0	3950	3935	99.62	1690	1755	100.89	5640	5690	50	5.0	5.6	-
9/10	450309	C750291P1A	10.0	3950	3935	99.62	1690	1655	99.11	5640	5590	-50	(5.0)	5.6	-
9/10	450311	C750291P1A	10.0	3950	3940	99.75	1690	1685	99.73	5640	5625	-15	(1.5)	5.6	-
9/10	450320	C750291P1A	10.0	3950	3915	99.11	1690	1660	98.85	5640	5575	-65	(6.5)	5.6	(0.9)
9/10	450323	C750291P1A	10.0	3950	3945	99.87	1690	1680	99.73	5640	5625	-15	(1.5)	5.6	-
9/12	450450	C750291P1A	10.0	3950	3965	100.38	1690	1785	101.42	5640					

EXHIBIT B – All QC1P Loads Compared to Target Batching Tolerances

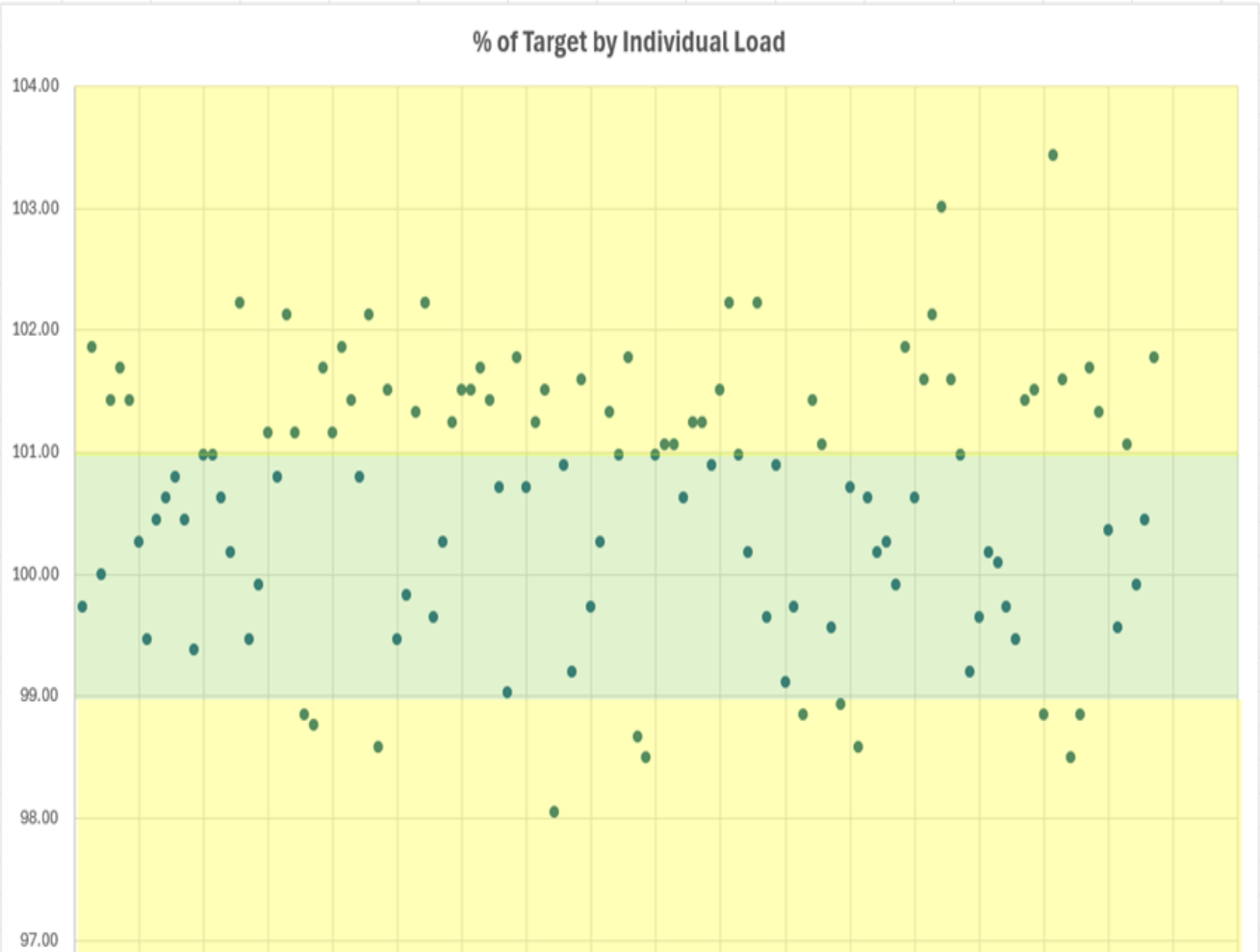


EXHIBIT C – QC1P Loads By Pour Date Compared to Batching Tolerances

