APPENDIX A

Lot Drawings and General Requirements

AMERICAN FAMILY FIELD - UECKER LOT

RFP

MILWAUKEE, WI
CIVIL ENGINEERING PLANS

PREPARED BY:

THE SIGMA GROUP
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1300 West Canal Street
Milwaukee, WI 53233
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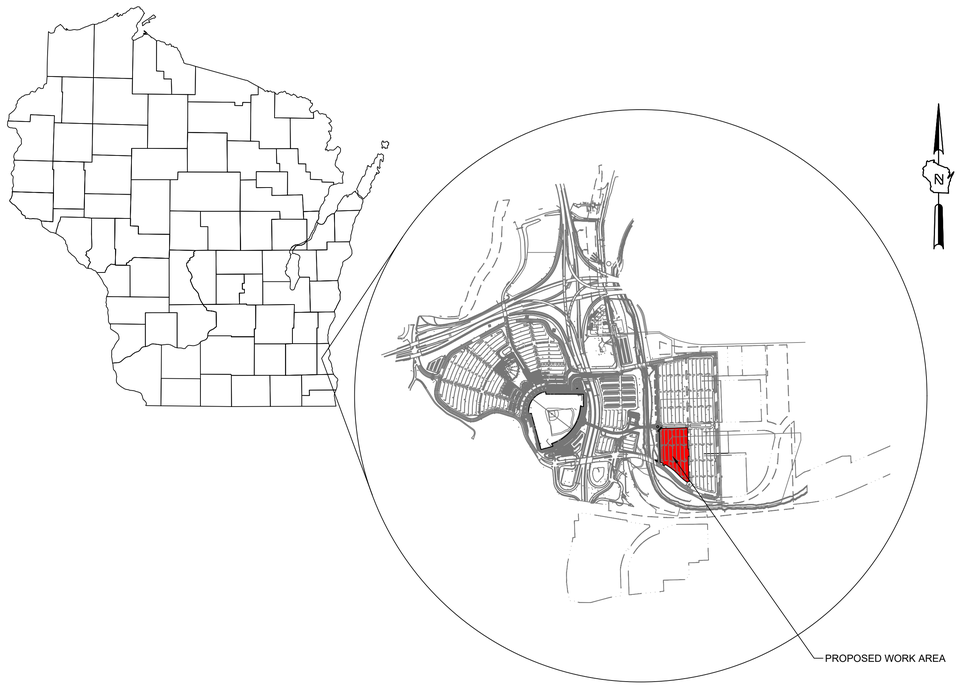
SITE LOCATION MAP:

NOT TO SCALE



Sheet List Table

Sheet No.	Sheet Name	SHEET ISSUE DATE	NUMBER	DATE
000	Title Sheet			
C001	EXISTING CONDITIONS			
C002	SITE PREPARATION & EROSION CONTROL			
C100	SITE PLAN - UECKER LOT			
C400	DETAILS			
C500	SPECIFICATIONS - UECKER LOT			

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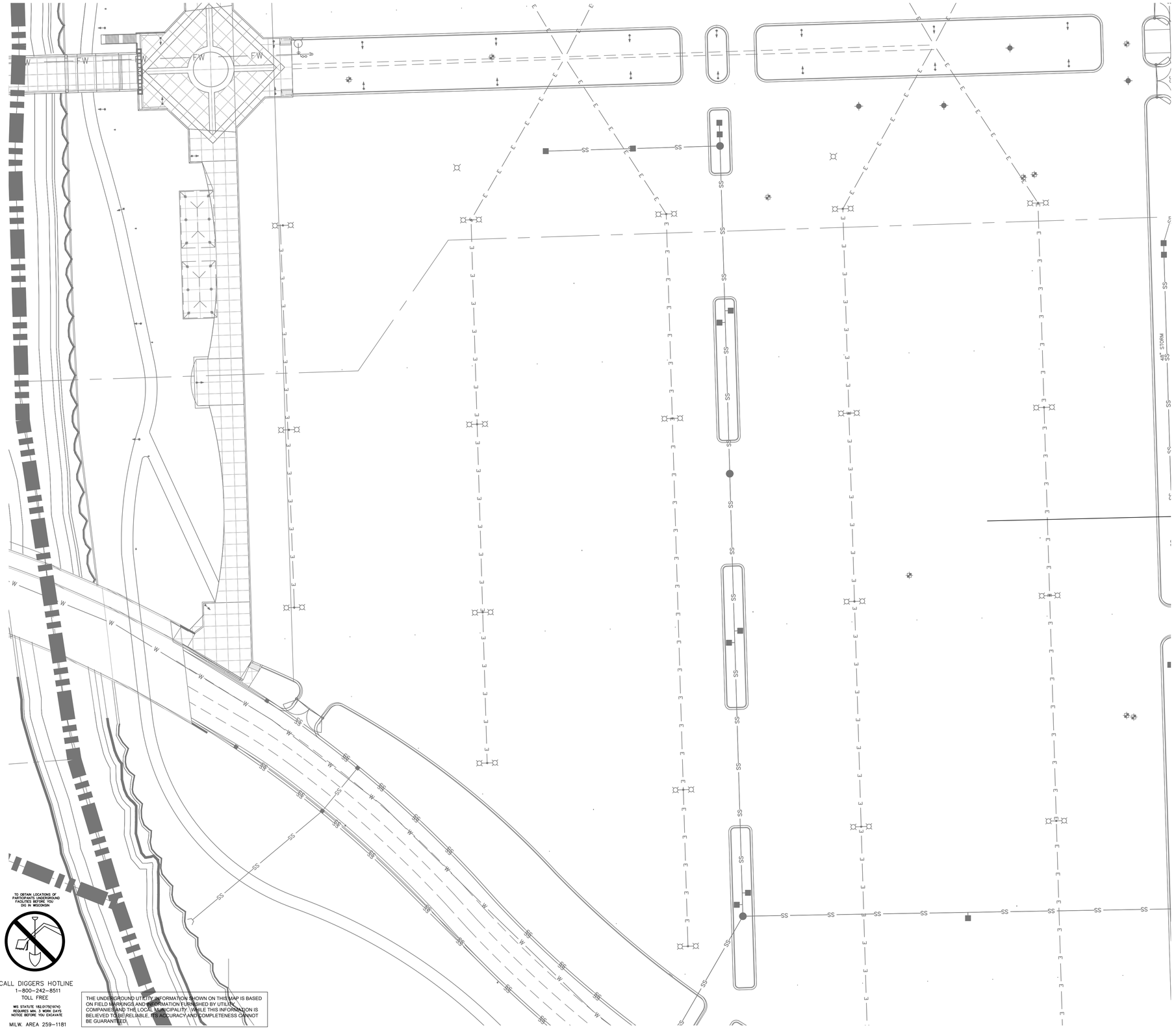

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GRAPHIC SCALE
0 40 80

AMERICAN FAMILY FIELD - UECKER LOT RFP
UECKER GENERAL LOT
MILWAUKEE, WI 53214

EXISTING CONDITIONS

PRELIMINARY NOT FOR CONSTRUCTION

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PROJECT NO:	22466
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SHEET NO:
C001

CTRAUTSCHOLD
C001
22466

I:\SEWPBPD\22466 - 2024 Services\060 CAD\030_Production Sheets\100_Civil\C001 EXISTING CONDITIONS.dwg

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CONTRACTOR TO REMOVE, PROTECT, AND REPLACE SIGN DURING CONSTRUCTION.

SAW CUT EXISTING SIDEWALK AT NEAREST JOINT (TYP.)

EXISTING DUMPSTERS TO BE MOVED TO BE RELOCATED DURING CONSTRUCTION.

EXISTING ELECTRICAL LINES AND POLES TO BE PROTECTED DURING CONSTRUCTION (TYP.)

EXISTING ELECTRICAL LINES AND POLES TO BE PROTECTED DURING CONSTRUCTION (TYP.)

INLET PROTECTION (TYP.)

SAWCUT EXISTING PAVEMENT TO INSTALL NEW 6" DRAINTILE

EXISTING ELECTRICAL LINES AND POLES TO BE PROTECTED DURING CONSTRUCTION (TYP.)

SAW CUT EXISTING SIDEWALK AT NEAREST JOINT (TYP.)

CONSTRUCTION ENTRANCE (TYP.)

INLET PROTECTION (TYP.)

LEGEND:

- SIDEWALK SAWCUT
- MILL EXISTING PAVEMENT
- PROPOSED INLET PROTECTION (B / C400)
- CONSTRUCTION ENTRANCE (A / C400)

TO OBTAIN LOCATIONS OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN

CALL DIGGERS HOTLINE
1-800-242-8511
TOLL FREE

WIS STATUTE 182.0175(1974) REQUIRES MIN. 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE

MILW. AREA 259-1181

THE UNDERGROUND UTILITY INFORMATION SHOWN ON THIS MAP IS BASED ON FIELD MARKINGS AND INFORMATION FURNISHED BY UTILITY COMPANIES AND THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED.

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AMERICAN FAMILY FIELD - UECKER LOT RFP
UECKER GENERAL LOT
MILWAUKEE, WI 53214

SITE PREPARATION & EROSION CONTROL

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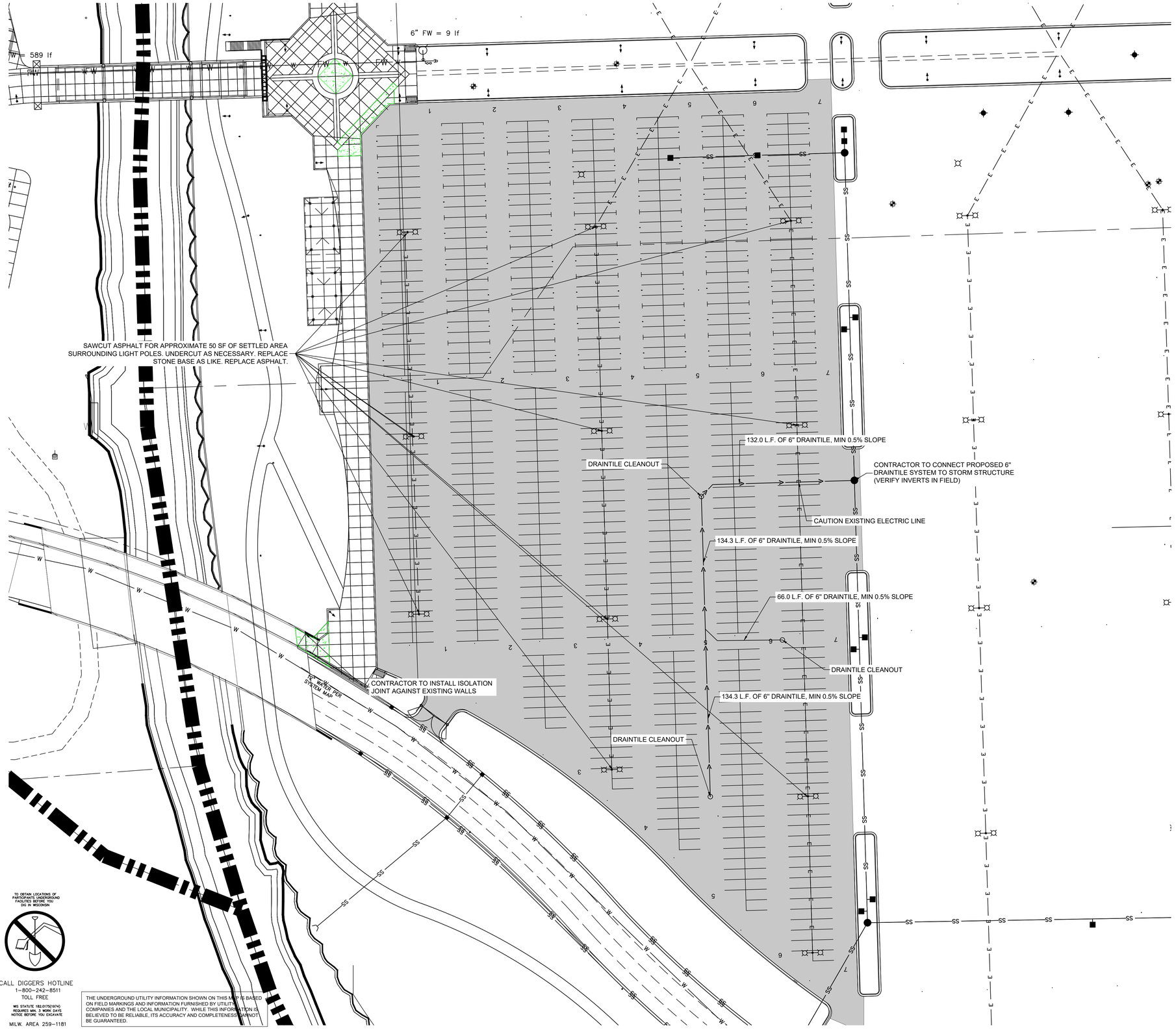

SITE INFORMATION			
SITE AREA	260037	5.970 AC	
SITE DISTURBED AREA	260037	5.970 AC	
EXISTING IMPERVIOUS AREA	260037	5.970 AC	100.0 %
PROPOSED IMPERVIOUS AREA	260037	5.970 AC	100.0 %
TOTAL PARKING SPACES	830		

LEGEND:

- C / C400 — 5" THICK CONCRETE WALK (1,927 S.F.)
- 2" MILL/PULVERIZE AND OVERLAY (258,110 S.F.)
- 6" WRAPPED DRAINTILE (466.6 L.F.)
- # / C400 — DRAINTILE CLEANOUT (3 QTY)

NOTE: LIGHT POLE BASES ARE INSUBSTANTIAL. CAUTION SHOULD BE TAKEN IN IMMEDIATE SURROUNDING AREAS TO PREVENT DAMAGE.

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AMERICAN FAMILY FIELD - UECKER LOT RFP
UECKER GENERAL LOT
MILWAUKEE, WI 53214

SITE PLAN - UECKER LOT

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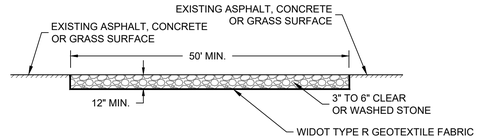
EROSION CONTROL NOTES:

1. CONSTRUCTION SITE EROSION CONTROL AND SEDIMENTATION CONTROL SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL MUNICIPALITY AND SHALL EMPLOY EROSION CONTROL METHODS AS SHOWN AND SPECIFIED IN THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARDS.
2. ALL EROSION CONTROL MEASURES SHALL BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND SHALL BE INSTALLED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON THE SITE.
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED FOR STABILITY AND OPERATION AFTER A RAINFALL OF 0.5 INCHES OR MORE, BUT NO LESS THAN ONCE EVERY WEEK. MAINTENANCE OF ALL EROSION CONTROL STRUCTURES SHALL BE PROVIDED TO INSURE INTENDED PURPOSE IS ACCOMPLISHED. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP AND REMOVAL OF ALL SEDIMENT WHEN LEAVING PROPERTY. EROSION CONTROL MEASURES MUST BE IN WORKING CONDITION AT END OF EACH WORK DAY. DOCUMENT AND MAINTAIN RECORDS OF INSPECTIONS IN ACCORDANCE WITH WDNR NR216 REQUIREMENTS.
4. SILT FENCE SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE CONSTRUCTION PLANS. SEDIMENT DEPOSITS SHALL BE REMOVED FROM BEHIND THE SILT FENCE WHEN DEPOSITS REACH A DEPTH OF 6 INCHES. THE SILT FENCE SHALL BE REPAIRED OR REPLACED AS NECESSARY TO MAINTAIN A BARRIER.
5. FILTER FABRIC SHALL BE INSTALLED BENEATH INLET COVERS TO TRAP SEDIMENT PER INLET PROTECTION DETAIL IN THE LOCATIONS SHOWN ON THE CONSTRUCTION PLANS.
6. EROSION CONTROL MEASURES SHALL BE MAINTAINED ON A CONTINUING BASIS UNTIL SITE IS FULLY STABILIZED.
7. PERIODIC STREET SWEEPING SHALL BE COMPLETED TO MAINTAIN ADJACENT STREETS FREE OF DUST AND DIRT.
8. SILT FENCE SHALL BE INSTALLED IN HORSESHOE FASHION AROUND ANY TOPSOIL AND FILL STOCKPILES.
9. SITE DEWATERING. WATER PUMPED FROM THE SITE SHALL BE TREATED BY SEDIMENT BASINS OR OTHER APPROPRIATE MEASURES SPECIFIED IN THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARDS. WATER MAY NOT BE DISCHARGED IN A MANNER THAT CAUSES EROSION OF THE SITE, ADJACENT SITES, OR RECEIVING CHANNELS.
10. WASTE AND MATERIAL DISPOSAL. ALL WASTE AND UNUSED BUILDING MATERIALS (INCLUDING GARBAGE, DEBRIS, CLEANING WASTES, WASTEWATER, TOXIC MATERIALS, OR HAZARDOUS MATERIALS) SHALL BE PROPERLY DISPOSED AND NOT ALLOWED TO BE CARRIED OFF-SITE BY RUNOFF OR WIND.
11. TRACKING. EACH SITE SHALL HAVE GRAVELED ROADS, ACCESS DRIVES AND PARKING AREAS OF SUFFICIENT WIDTH AND LENGTH TO PREVENT SEDIMENT FROM BEING TRACKED ONTO PUBLIC OR PRIVATE ROADWAYS. ANY SEDIMENT REACHING A PUBLIC OR PRIVATE ROAD SHALL BE REMOVED BY STREET CLEANING, TO THE SATISFACTION OF THE MILWAUKEE, BEFORE THE END OF EACH WORKDAY. FLUSHING MAY NOT BE USED UNLESS SEDIMENT WILL BE CONTROLLED BY A SEDIMENT BASIN OR PRACTICE SPECIFIED IN THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARDS. NOTIFY MILWAUKEE OF ANY CHANGES IN STABILIZED CONSTRUCTION ENTRANCE LOCATION.
12. SEDIMENT CLEANUP. ALL OFF-SITE SEDIMENT DEPOSITS OCCURRING AS A RESULT OF A STORM EVENT SHALL BE CLEANED UP BY THE END OF THE NEXT WORKDAY. ALL OTHER OFF-SITE SEDIMENT DEPOSITS OCCURRING AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE CLEANED UP BY THE END OF THE WORKDAY.
13. ALL DISTURBED GROUND LEFT INACTIVE FOR SEVEN OR MORE DAYS SHALL BE STABILIZED BY TEMPORARY OR PERMANENT SEEDING, MULCHING, SODDING, COVERING WITH TARPS, OR EQUIVALENT PRACTICE FOUND IN THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARD. IF TEMPORARY SEEDING IS USED, A PERMANENT COVER SHALL ALSO BE REQUIRED AS PART OF THE FINAL SITE STABILIZATION. SEEDING OR SODDING SHALL BE REQUIRED AS PART OF THE FINAL SITE STABILIZATION.
14. SOIL OR DIRT STORAGE PILES SHALL BE LOCATED A MINIMUM OF TWENTY-FIVE FEET FROM ANY DOWNSLOPE ROAD, LAKE, STREAM, WETLAND, OR DRAINAGE CHANNEL. STRAW BALE OR FILTER FABRIC FENCES SHALL BE PLACED ON THE DOWN SLOPE SIDE OF THE PILES. IF REMAINING FOR MORE THAN THIRTY DAYS, PILES SHALL BE STABILIZED BY MULCHING, VEGETATIVE COVER, TARPS OR OTHER MEANS.
15. WHEN THE DISTURBED AREA HAS BEEN STABILIZED BY PERMANENT VEGETATION OR OTHER MEANS, TEMPORARY PRACTICES, SUCH AS FILTER FABRIC FENCES, STRAW BALES, SEDIMENT AND SEDIMENT TRAPS, FOUND IN THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARDS SHALL BE REMOVED.
16. NOTIFY THE LOCAL MUNICIPALITY HAVING JURISDICTION WITHIN TWO WORKING DAYS OF COMMENCING ANY LAND DEVELOPMENT OR LAND DISTURBING ACTIVITY.
17. OBTAIN PERMISSION FROM THE LOCAL MUNICIPALITY HAVING JURISDICTION PRIOR TO MODIFYING THE EROSION CONTROL PLAN.
18. REPAIR ANY SILTATION OR EROSION DAMAGE TO ADJOINING SURFACES AND DRAINAGE WAYS RESULTING FROM LAND DEVELOPMENT OR LAND DISTURBING ACTIVITIES.
19. KEEP A COPY OF THE EROSION CONTROL PLAN ON SITE.
20. CONTRACTOR SHALL, TO THE EXTENT POSSIBLE, MINIMIZE DISTURBANCE OF EXISTING VEGETATION DURING CONSTRUCTION.
21. CONTRACTOR SHALL, TO THE EXTENT POSSIBLE, MINIMIZE COMPACTION OF TOPSOIL AND PRESERVE TOPSOIL IN GREENSPACE AREAS.
22. WASH WATER FROM VEHICLES AND WHEEL WASHING SHALL BE CONTAINED AND TREATED PRIOR TO DISCHARGE.
23. CONTRACTOR SHALL MAINTAIN SPILL KITS ON-SITE.
24. PERMANENT TURF SEEDING OF DISTURBED AREA MUST OCCUR PRIOR TO SEPTEMBER 15TH. IF ADEQUATE TIME IS NOT AVAILABLE TO APPLY PERMANENT SEEDING PRIOR TO SEPTEMBER 15TH, THEN DISTURBED AREAS SHALL BE TEMPORARILY SEEDED WITH AN ANNUAL RYE GRASS PER WDNR TECHNICAL STANDARD 1059, WHERE THE TEMPORARY SEEDING MUST OCCUR PRIOR TO OCTOBER 15TH.
25. IF TEMPORARY SEEDING IS NOT COMPLETED BY OCTOBER 15TH, APPLY SOIL STABILIZERS AND DORMANT SEED TO DISTURBED AREA PER WDNR TECHNICAL STANDARD 1050. INSPECT ANIONIC PAM APPLICATION AT A MINIMUM FREQUENCY OF EVERY TWO MONTHS AND REAPPLY AS NECESSARY

CONSTRUCTION SEQUENCE FOR EROSION CONTROL INCLUDES:

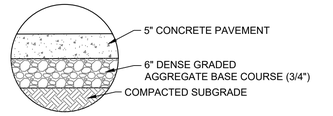
1. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
2. INSTALL SILT FENCING AND INLET PROTECTION.
3. INITIATE STOCKPILING OF IMPORTED MATERIAL. PLACE SILT FENCE AROUND STOCKPILE(S).
4. PERFORM ROUGH SITE GRADING. STABILIZE FINISHED AREAS AS THE WORK PROGRESSES.PREPARE BUILDING PAD AND BEGIN FOUNDATIONS WORK FOR BUILDING.
5. INSTALL UTILITIES. INSTALL ANY ADDITIONAL INLET PROTECTION ON NEW STORM SEWER.
6. INSTALL PAVEMENTS.
7. STABILIZE AREAS REMAINING AREAS WITHIN 7 DAYS OF COMPLETION OF FINAL GRADING.
8. REMOVE EROSION CONTROL MEASURES ONLY WHEN SITE IS FULLY STABILIZED.



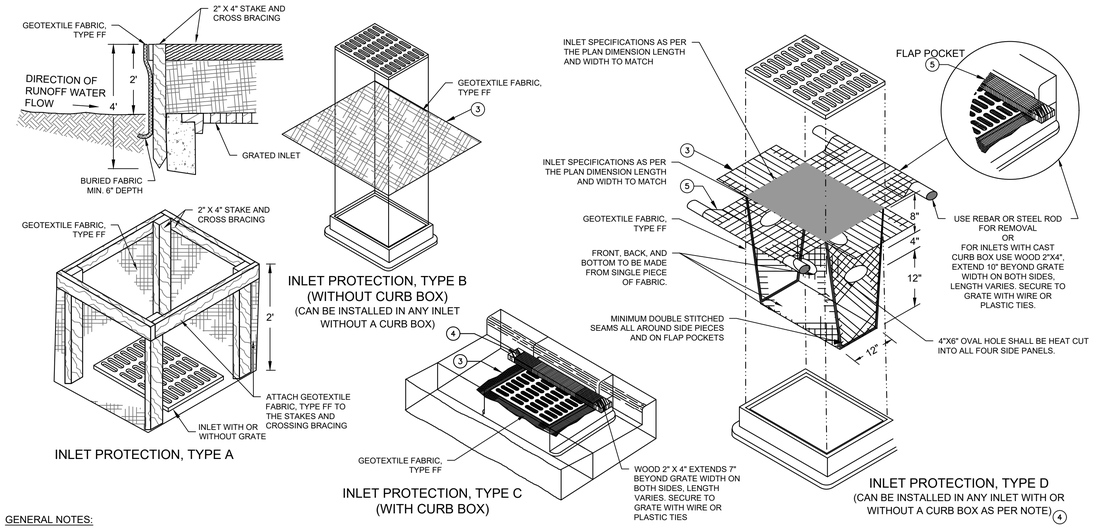
GENERAL NOTE:

1. STONE TRACKING PAD SHALL CONFORM TO WDNR CONSERVATION PRACTICE STANDARD #1057
2. AN APPROVED MANUFACTURED TRACKOUT CONTROL DEVICE SYSTEM CONFORMING TO WDNR TECHNICAL STANDARD #1057 MAY BE USED AS AN ALTERNATIVE TO A STONE TRACKING PAD

A CONSTRUCTION ENTRANCE - WDNR TS-1057
SCALE:1" = 1'



C CONCRETE SIDEWALK SECTION
SCALE:1" = 1'



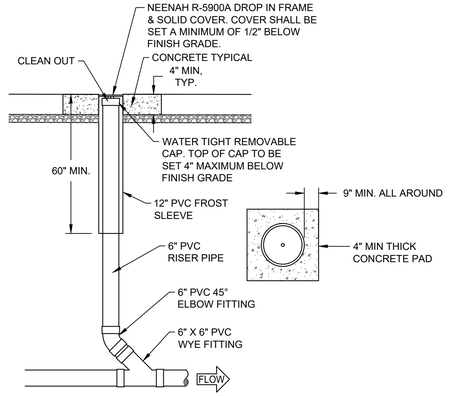
GENERAL NOTES:

1. MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.
2. WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.
3. FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL
4. FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
5. FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.
6. INLET PROTECTION SHALL CONFORM TO WDNR CONSERVATION PRACTICE STANDARD #1060
7. THIS DRAWING IS BASED ON WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD DETAIL DRAWING 8 E 10-2

INSTALLATION NOTES:
TYPE B & C
TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE. THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D
DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE. THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACES AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

B INLET PROTECTION - WDNR TS-1060
SCALE:1" = 1'



COMM TABLE 82.35		
DIA. OF LATERAL	MIN. DI. OF CLEANOUT RISER	MIN. DI. OF RISER CAP
1.5	1.5	1.5
2	1.5	1.5
3	3	2.5
4	4	3.5
5	5	4
6	6	5
8+	6	6

D CLEANOUT
SCALE:1" = 1'

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DETAILS

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GENERAL:

1. EXISTING UTILITIES ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY, AND NO RESPONSIBILITY IS ASSUMED BY THE OWNER OR ENGINEER FOR THEIR ACCURACY OR COMPLETENESS.
2. CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTRACTOR SHALL HAVE SITE MARKED BY DIGGER'S HOTLINE AND SHALL HAVE PRIVATE UTILITIES MARKED BY A PRIVATE UTILITY LOCATOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY ALL ELEVATIONS, LOCATIONS, AND SIZES OF EXISTING UTILITIES AND SHALL CHECK ALL UTILITY CROSSINGS AND PROPOSED CONNECTIONS FOR CONFLICTS/DISCREPANCIES PRIOR TO INITIATING CONSTRUCTION. REPORT ANY CONFLICTS OR DISCREPANCIES TO THE ENGINEER SO REDESIGN MAY OCCUR IF NEEDED.
3. LENGTHS OF ALL UTILITIES ARE TO CENTER OF STRUCTURES OR FITTINGS AND MAY VARY SLIGHTLY FROM PLANS. LENGTHS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.

SITE CLEARING:

1. EXCEPT FOR STRIPPED TOPSOIL OR OTHER MATERIALS INDICATED TO REMAIN ON OWNER'S PROPERTY, CLEARED MATERIALS SHALL BECOME CONTRACTOR'S PROPERTY AND SHALL BE REMOVED FROM PROJECT SITE.
2. MINIMIZE INTERFERENCE WITH ADJOINING ROADS, STREETS, WALKS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES DURING SITE-CLEARING OPERATIONS.
3. SALVABLE IMPROVEMENTS: CAREFULLY REMOVE ITEMS INDICATED TO BE SALVAGED AND STORE ON OWNER'S PREMISES WHERE INDICATED.
4. UTILITY LOCATOR SERVICE: NOTIFY UTILITY LOCATOR SERVICE FOR AREA WHERE PROJECT IS LOCATED BEFORE SITE CLEARING.
5. DO NOT COMMENCE SITE CLEARING OPERATIONS UNTIL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES ARE IN PLACE.
6. PROTECT AND MAINTAIN BENCHMARKS AND SURVEY CONTROL POINTS FROM DISTURBANCE DURING CONSTRUCTION.
7. LOCATE AND CLEARLY FLAG TREES AND VEGETATION TO REMAIN OR TO BE RELOCATED.
8. PROTECT EXISTING SITE IMPROVEMENTS TO REMAIN FROM DAMAGE DURING CONSTRUCTION; RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE TO OWNER.
9. LOCATE, IDENTIFY, DISCONNECT, AND SEAL OR CAP OFF UTILITIES INDICATED TO BE REMOVED; ARRANGE WITH UTILITY COMPANIES TO SHUT OFF INDICATED UTILITIES.
10. EXISTING UTILITIES: DO NOT INTERRUPT UTILITIES SERVING FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED BY THE OWNER AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY UTILITY SERVICES.
11. FILL DEPRESSIONS CAUSED BY CLEARING AND GRUBBING OPERATIONS WITH SATISFACTORY SOIL MATERIAL UNLESS FURTHER EXCAVATION OR EARTHWORK IS INDICATED; PLACE FILL MATERIAL IN HORIZONTAL LAYERS NOT EXCEEDING A LOOSE DEPTH OF 8 INCHES, AND COMPACT EACH LAYER TO A DENSITY EQUAL TO ADJACENT ORIGINAL GROUND.
12. REMOVE SOD AND GRASS BEFORE STRIPPING TOPSOIL.
13. STRIP TOPSOIL TO WHATEVER DEPTHS ARE ENCOUNTERED IN A MANNER TO PREVENT INTERMINGLING WITH UNDERLYING SUBSOIL OR OTHER WASTE MATERIALS.
14. STOCKPILE TOPSOIL MATERIALS AWAY FROM EDGE OF EXCAVATIONS WITHOUT INTERMIXING WITH SUBSOIL. GRADE AND SHAPE STOCKPILES TO DRAIN SURFACE WATER. COVER TO PREVENT WINDBLOWN DUST.
15. REMOVE EXISTING ABOVE- AND BELOW-GRADE IMPROVEMENTS AS INDICATED AND AS NECESSARY TO FACILITATE NEW CONSTRUCTION.
16. SAWCUT ALL PAVEMENTS FULL DEPTH PRIOR TO REMOVAL; SAWCUTS SHALL BE IN STRAIGHT LINES PERPENDICULAR AND/OR PARALLEL TO EXISTING PAVEMENT JOINTS AND PAVEMENT EDGES.
17. REMOVE SURPLUS SOIL MATERIAL, UNSUITABLE TOPSOIL, OBSTRUCTIONS, DEMOLISHED MATERIALS, AND WASTE MATERIALS INCLUDING TRASH AND DEBRIS, AND LEGALLY DISPOSE OF THEM OFF OWNER'S PROPERTY.
18. SEPARATE RECYCLABLE MATERIALS PRODUCED DURING SITE CLEARING FROM OTHER NONRECYCLABLE MATERIALS. STORE OR STOCKPILE WITHOUT INTERMIXING WITH OTHER MATERIALS AND TRANSPORT THEM TO RECYCLING FACILITIES.

STORM DRAINAGE:

1. ALL PRIVATE STORM SEWER WORK SHALL BE IN ACCORDANCE WITH THE DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES (DSPS) PLUMBING CODE - CHAPTERS SPS 382 AND SPS 384 AND LOCAL MUNICIPAL REQUIREMENTS.
2. ALL PUBLIC STORM SEWER WORK SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION (STANDARD SPECIFICATIONS) AND LOCAL MUNICIPAL REQUIREMENTS.
3. PVC SEWER PIPE AND FITTINGS: ASTM D 3034, SDR 35, WITH BELL-AND-SPIGOT ENDS WITH RUBBER GASKETED JOINTS IN ACCORDANCE WITH CHAPTER 8.10.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION. JOINTS SHALL CONFORM TO ASTM D-3212.
4. REINFORCED CONCRETE PIPE: ASTM C76 WITH BELL AND SPIGOT ENDS AND GASKETED JOINTS WITH ASTM C443 RUBBER GASKETS IN ACCORDANCE WITH CHAPTER 8.6.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
5. HDPE PIPE: ADS N12 PIPE AS APPROVED ON THE DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES PLUMBING PRODUCT REGISTER.
6. CATCH BASINS: STANDARD PRECAST CONCRETE CATCH BASINS CONFORMING TO CHAPTER 3.6.0 OF THE STANDARD SPECIFICATIONS AND IN GENERAL CONFORMANCE WITH FILE NO. 26 OF THE STANDARD SPECIFICATIONS. DEPTH AND DIAMETER AS INDICATED ON PLANS. CATCH BASIN SIZES TO BE VERIFIED BY CONTRACTOR AND SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING STRUCTURES.
7. FRAMES AND GRATES: AS INDICATED ON PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING SPECIFIED FRAME/GRATE IS COMPATIBLE WITH STRUCTURE; IF NOT, NOTIFY ENGINEER.
8. MANHOLES: STANDARD PRECAST REINFORCED CONCRETE MANHOLES CONFORMING TO ASTM C478, SECTION 8.39.0 OF THE STANDARD SPECIFICATIONS AND CONFORMING TO FILE NOS. 12, 13 AND 15 OF THE STANDARD SPECIFICATIONS. DIAMETER AND DEPTH AS INDICATED ON PLANS. MANHOLE SIZES TO BE VERIFIED BY CONTRACTOR AND SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING STRUCTURES.
9. MANHOLES AND CATCH BASINS DEEPER THAN FOUR FEET SHALL BE PROVIDED WITH MANHOLE STEPS CONFORMING TO SECTION 8.40.0 OF THE STANDARD SPECIFICATIONS.
10. SEWERS SHALL BE INSTALLED IN CONFORMANCE WITH SECTION 3.2.0 OF THE STANDARD SPECIFICATIONS. INSTALL PROPER SIZE INCREASERS, REDUCERS AND COUPLINGS WHERE DIFFERENT SIZES OR MATERIALS OF PIPES AND FITTINGS ARE CONNECTED. INSTALL TRACER PIPE OVER NON-METALLIC PIPING IN ACCORDANCE WITH SPS SECTION 382.30(11)(H) AND 382.36(7)(D).
11. PROVIDE AND INSTALL CLEANOUTS IN ACCORDANCE WITH SPS CHAPTER 382.35. INSTALL CLEANOUTS AND RISER EXTENSIONS FORM SEWER PIPES TO PROPOSED GRADE. INSTALL PIPING SO CLEANOUTS OPEN IN DIRECTION OF FLOW IN SEWER PIPE. USE LIGHT DUTY, TOP LOADING CLASSIFICATION CLEANOUTS IN EARTH OR UNPAVED FOOT TRAFFIC AREAS; USE MEDIUM DUTY, TOP-LOADING CLASSIFICATION CLEANOUTS IN PAVED FOOT TRAFFIC AREAS; USE HEAVY DUTY, TOP-LOADING CLASSIFICATION CLEANOUTS IN VEHICULAR TRAFFIC AREAS. SET CLEANOUT FRAMES AND COVERS IN PAVEMENT AREAS FLUSH WITH PAVEMENT SURFACE.
12. CLASS B COMPACTED TRENCH SECTION (FILE NO. NO. 4 OF STANDARD SPECIFICATIONS) SHALL BE UTILIZED. BEDDING AND COVER MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 8.43.0 OF THE STANDARD SPECIFICATIONS.
13. TRENCH BACKFILL MATERIAL SHALL BE GRANULAR BACKFILL IN ACCORDANCE WITH SECTION 8.43.4 OF THE STANDARD SPECIFICATIONS BENEATH AND WITHIN FIVE FEET OF PAVEMENT AREAS; COMPACTED SPOIL BACKFILL IN ACCORDANCE WITH SECTION 8.43.5 OF THE STANDARD SPECIFICATIONS MAY BE USED BENEATH LANDSCAPE AREAS.
14. MANHOLE INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 3.5.0 OF THE STANDARD SPECIFICATIONS. SET MANHOLE RIMS TO ELEVATIONS INDICATED ON PLANS.
15. CATCH BASIN INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 3.6 OF THE STANDARD SPECIFICATIONS. CATCH BASIN EXCAVATION AND PREPARATION SHALL BE IN ACCORDANCE WITH SECTION 3.5.4(A) AND (B) OF THE STANDARD SPECIFICATIONS. FRAMES AND GRATES SHALL BE SET TO THE ELEVATIONS SHOWN ON THE PLANS.
16. AFTER INSTALLATION OF SEWER PIPE CLEAN ALL DEBRIS FROM SEWER AND INSPECT INTERIOR OF PIPING TO DETERMINE WHETHER LINE DISPLACEMENT OR OTHER DAMAGE HAS OCCURRED. CONDUCT DEFLECTION TESTING OF INSTALLED PIPE IN ACCORDANCE WITH SECTION 3.2.6(I)4 OF THE STANDARD SPECIFICATIONS; REPLACE ANY PIPE SECTION NOT PASSING THE DEFLECTION TESTING USING NEW PIPE MATERIALS.

EARTH MOVING:

1. ALL EARTH WORK SHALL BE DONE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER AND PROVIDED REPORTS. IN THE FIELD AND THESE SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN THESE SPECIFICATIONS AND THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER, THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER SHALL GOVERN.
2. CONTRACTOR SHALL PROVIDE MATERIAL TEST REPORTS FROM A QUALIFIED TESTING AGENCY INDICATING TEST RESULTS FOR CLASSIFICATION ACCORDING TO ASTM D2487 AND LABORATORY COMPACTION CURVES ACCORDING TO ASTM D 1557 FOR EACH ON-SITE AND OFF-SITE SOIL MATERIAL PROPOSED FOR FILL AND BACKFILL.
3. CONTRACTOR SHALL PROVIDE PREEXCAVATION PHOTOS OR VIDEOS SHOWING EXISTING CONDITIONS OF ADJOINING STRUCTURES AND SITE IMPROVEMENTS THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY EARTHWORK OPERATIONS.
4. THE SITE IS KNOWN TO CONTAIN ENVIRONMENTALLY CONTAMINATED SOILS. REFER TO THE REMEDIAL ACTION PLAN PREPARED BY THE SIGMA GROUP, INC. FOR DETAILS. SOILS SHALL BE MANAGED IN ACCORDANCE WITH THE SOIL MANAGEMENT PLAN. ANY SOILS OR MATERIAL HAULED OFF SITE SHALL BE DISPOSED OF IN A LEGAL FASHION.
5. OLD BUILDING FOUNDATIONS, BUILDING REMNANTS OR UNSUITABLE BACKFILL MATERIAL SHALL BE COMPLETELY REMOVED FROM WITHIN AND A MINIMUM OF 10 FEET BEYOND THE NEW BUILDING PAD AREAS. THE RESULTING EXCAVATION SHALL BE BACKFILLED WITH COMPACTED ENGINEERED FILL.
6. FOUNDATIONS, FOUNDATION WALLS OR CONCRETE FLOOR SLABS SHALL BE REMOVED TO A MINIMUM OF TWO FEET BELOW PROPOSED SUBGRADE WITHIN PROPOSED PARKING AND GREENSPACE AREAS. BASEMENT SLABS LOCATED BELOW 2 FEET FROM PLANNED SUBGRADE ELEVATION MAY BE LEFT IN PLACE BUT SHALL BE BROKEN INTO MAXIMUM 6 INCH PIECES TO FACILITATE DRAINAGE.
7. SATISFACTORY SOILS FOR FILL: ASTM D 2487 SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP, AND SM OR A COMBINATION OF THESE GROUPS; FREE OF ROCK OR GRAVEL LARGER THAN 3 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER OR ANY SOIL GROUP OR COMBINATION OF GROUPS APPROVED OF BY THE PROJECT GEOTECHNICAL ENGINEER.
8. UNSATISFACTORY SOILS FOR FILL: SOIL CLASSIFICATION GROUPS GC, SC, CL, ML, OL, CH, MH, OH, AND PT ACCORDING TO ASTM D 2487 OR A COMBINATION OF THESE GROUPS UNLESS DEEMED SATISFACTORY BY THE PROJECT GEOTECHNICAL ENGINEER. UNSATISFACTORY SOILS ALSO INCLUDE SOILS NOT MAINTAINED WITHIN 3 PERCENT OF OPTIMUM SOIL MOISTURE CONTENT AT THE TIME OF COMPACTION.
9. AGGREGATE BASE COURSE BENEATH PAVEMENTS: SHALL BE 1-1/4” DENSE GRADED BASE COURSE CONFORMING TO SECTION 305 OF THE STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION.
10. ENGINEERED FILL: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND; ASTM D 2940; WITH AT LEAST 90 PERCENT PASSING A 1-1/2-INCH (37.5-MM) SIEVE AND NOT MORE THAN 12 PERCENT PASSING A NO. 200 SIEVE OR ANY SOIL DEEMED ACCEPTABLE FOR ENGINEERED FILL BY THE PROJECT GEOTECHNICAL ENGINEER. ENGINEERED FILL SHALL BE FREE OF ORGANIC, FROZEN, OR OTHER DELETERIOUS MATERIAL AND HAVE A MAXIMUM PARTICLE SIZE LESS THAN 3 INCHES. CLAY FILLS SHALL HAVE A LIQUID LIMIT OF LESS THAN 49 AND PLASTICITY INDEX BETWEEN 11 AND 25.
11. BEDDING COURSE FOR SEWERS AND WATER SERVICE: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND CONFORMING TO THE REQUIREMENTS OF SECTION 8.43.2 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
12. DRAINAGE COURSE BENEATH BUILDING SLABS: NARROWLY GRADED MIXTURE OF WASHED, CRUSHED STONE, OR CRUSHED OR UNCRUSHED GRAVEL; ASTM D 448; COARSE-AGGREGATE GRADING SIZE 57; WITH 100 PERCENT PASSING A 1-1/2-INCH (37.5-MM) SIEVE AND 0 TO 5 PERCENT PASSING A NO. 8 SIEVE.
13. TRENCH BACKFILL MATERIAL SHALL BE GRANULAR BACKFILL IN ACCORDANCE WITH SECTION 8.43.4 OF THE STANDARD SPECIFICATIONS BENEATH AND WITHIN FIVE FEET OF PAVEMENT AREAS; COMPACTED SPOIL BACKFILL IN ACCORDANCE WITH SECTION 8.43.5 OF THE STANDARD SPECIFICATIONS MAY BE USED BENEATH LANDSCAPE AREAS.
14. PIPE COVER MATERIAL: CONFORM TO SECTION 8.43.3 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
15. PREVENT SURFACE WATER AND GROUND WATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE AND SURROUNDING AREA.
16. SHORING, SHEETING AND BRACING: SHORE, BRACE OR SLOPE BANKS OF EXCAVATION TO PROTECT WORKWEN, BANKS, ADJACENT PAVING, STRUCTURES, AND UTILITIES TO MEET OSHA REQUIREMENTS. DESIGN OF TEMPORARY SUPPORT OF EXCAVATION IS THE RESPONSIBILITY OF THE CONTRACTOR.
17. EXCAVATE TO SUBGRADE ELEVATIONS REGARDLESS OF THE CHARACTER OF SURFACE AND SUBSURFACE CONDITIONS ENCOUNTERED. UNCLASSIFIED EXCAVATED MATERIALS MAY INCLUDE ROCK, SOIL MATERIALS, AND OBSTRUCTIONS. NO CHANGES IN THE CONTRACT SUM OR THE CONTRACT TIME WILL BE AUTHORIZED FOR ROCK EXCAVATION OR REMOVAL OF OBSTRUCTIONS.
18. PROOF-ROLL SUBGRADE BELOW THE BUILDING SLABS AND PAVEMENTS WITH FULLY LOADED TANDEM AXLE DUMP TRUCK OR RUBBER TIRED VEHICLE OF SIMILAR SIZE AND WEIGHT, TYPICALLY 9 TONS/AXLE, WHERE COHESIVE SOILS ARE ENCOUNTERED OR WITH A SMOOTH DRUMMED VIBRATORY ROLLER WHERE GRANULAR SOILS ARE PRESENT. DO NOT PROOF-ROLL WET OR SATURATED SUBGRADES AND PROOFROLL IN DRY WEATHER. PROOF ROLL IN PRESENCE OF PROJECT GEOTECHNICAL ENGINEER OR TECHNICIAN. SOILS THAT ARE OBSERVED TO RUT OR DEFLECT EXCESSIVELY UNDER THE MOVING LOAD (TYPICALLY >1”) SHALL BE UNDERCUT AND REPLACED WITH PROPERLY COMPACTED ENGINEERED FILL. IN PAVEMENT AREAS WHERE UNDERCUTS ARE PERFORMED, THE EDGES OF THE OVEREXCAVATIONS SHALL BE FEATHERED INOT THE SURROUNDING SUITABLE SOIL SO THAT EDGE FAILURE OF THE OVEREXCAVATED AREA DOES NOT OCCUR.
19. DUE TO CLAYEY SOILS, IF UNDERCUTS OCCUR WITHIN PAVEMENT AREAS AND THEY ARE BACKFILLED WITH GRANULAR SOILS, THE BOTTOM OF THE OVEREXCAVATION SHALL BE SLOPED TO A DRAINTILE THAT IS IN KIND SLOPED TOWARD THE NEAREST STORM SEWER. MINIMUM SLOPES OF SUCH DRAINTILES SHALL BE 0.5%.
20. CONVENTIONAL DISKING AND AERATION TECHNIQUES SHALL BE USED TO DRY SOILS BEFORE PROOF ROLLING. ALLOT FOR PROPER DRYING TIME IN PROJECT SCHEDULE.
21. ENGINEERED FILL SHALL BE PLACED IN MAXIMUM LIFTS OF EIGHT INCHES OF LOOSE MATERIAL AND COMPACTED WITHIN 3% OF OPTIMUM SOIL MOISTURE CONTENT VALUE AND A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE MODIFIED PROCTOR TEST ASTM D1557. EACH LIFT OF COMPACTED ENGINEERED FILL SHALL BE OBSERVED AND TESTED BY A QUALIFIED GEOTECHNICAL ENGINEER OR TECHNICIAN.
22. EXISTING OLD FILL MATERIAL SHALL BE REMOVED BELOW FOOTINGS OR FOUNDATION SUPPORTING FILL. ENGINEERED FILL BELOW FOOTINGS SHOULD HAVE AN IN-PLACE DENSITY OF 95% OF THE MAXIMUM DRY DENSITY AND A MOISTURE CONTENT WITHIN 3% OF OPTIMUM AS DETERMINED BY ASTM D1557. ENGINEERED FILL BELOW FOOTINGS SHALL BE EVALUATED BY IN-FIELD DENSITY TESTS DURING CONSTRUCTION.
23. WHERE UNSUITABLE BEARING SOILS ARE ENCOUNTERED IN A FOOTING EXCAVATION, THE EXCAVATION SHALL BE DEEPENED TO COMPETENT BEARING SOIL AND THE FOOTING LOWERED OR AN OVEREXCAVATION AND BACKFILL PROCEDURE PERFORMED. OVEREXCATION AND BACKFILL TREATMENT REQUIRES WIDENING THE DEEPENED EXCAVATION IN ALL DIRECTIONS AT LEAST 6 INCHES BEYOND THE EDGE OF THE FOOTING FOR EACH 12 INCHES OF OVEREXCAVATION DEPTH. THE OVEREXCAVATION SHALL BE BACKFILLED UP TO FOOTING BASE ELEVATION IN MAXIMUM 8 INCH LOOSE LIFTS WITH SUITABLE GRANULAR FILL MATERIAL AND COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AND A MOISTURE CONTENT WITHIN 3% OF OPTIMUM AS DETERMINED BY ASTM D1557. SOILS AT FOUNDATION BEARING ELEVATION IN THE FOOTING EXCAVATIONS SHALL BE OBSERVED AND TESTED BY A QUALIFIED GEOTECHNICAL ENGINEER OR TECHNICIAN.
24. A MINIMUM OF FOUR INCHES OF DRAINAGE COURSE MAT SHALL BE PLACED BELOW BUILDING FLOOR SLABS. DRAINAGE COURSE SHALL BE COMPACTED TO A MINIMUM OF 95% COMPACTION WITH RESPECT TO THE MODIFIED PROCTOR (ASTM D1557)
25. UTILITY TRENCHES FOR SEWER AND WATER SHALL CONFORM TO CLASS B COMPACTED TRENCH SECTION IN ACCORDANCE WITH FILE NO. 4 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
25. BACKFILL UTILITY TRENCHES IN 4 TO 6 INCH LOOSE LIFTS COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557. BACKFILL SHALL BE MOISTURE CONDITIONED TO BE WITH 3% OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557.
26. UTILITY BEDDING PLACEMENT: CONFORM TO SECTION 3.2.6 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION. BEDDING MATEERIAL SHALL BE COMPACTED TO A MINIMUM OF 90% COMPACTION WITH RESPECT TO THE MODIFIED PROCTOR (ASTM D1557).
27. COMPACTION TESTING OF UTILITY TRENCHES SHALL BE PERFORMED FOR EVERY 200 CUBIC YARDS OF BACKFILL PLACED OR EACH LIFT WITHIN 200 LINEAR FEET OF TRENCH, WHICHEVER IS LESS.
28. AGGREGATE BASE COURSE BENEATH PAVEMENTS SHALL BE PLACED AND COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN 3% OF OPTIMUM AS DETERMINED BY ASTM D1557. AGGREGATE BASE SHALL BE OBSERVED AND TESTED BY A QUALIFIED GEOTECHNICAL ENGINEER OR TECHNICIAN.
29. GRADING GENERAL: UNIFORMLY GRADE AREAS TO A SMOOTH SURFACE, FREE OF IRREGULAR SURFACE CHANGES. COMPLY WITH COMPACTION REQUIREMENTS AND GRADE TO CROSS SECTIONS, LINES, AND ELEVATIONS INDICATED. SLOPE GRADES TO DIRECT WATER AWAY FROM BUILDINGS AND TO PREVENT PONDING.
30. TESTING AGENCY: CONTRACTOR SHALL ENGAGE A QUALIFIED INDEPENDENT GEOTECHNICAL ENGINEERING TESTING AGENCY TO PERFORM FIELD QUALITY-CONTROL TESTING.
31. FOOTING SUBGRADE TESTING: EACH ISOLATED FOOTING SHALL INCLUDE AT LEAST ONE TEST PROBE. TEST PROBES SHALL BE PERFORMED EVERY 20 LINEAR FEET IN CONTINUOUS FOOTINGS.
32. BUILDING SLAB AREA TESTING: AT SUBGRADE AND AT EACH COMPACTED FILL AND BACKFILL LAYER, AT LEAST 1 TEST PER LIFT FOR EVERY 2500 SQ. FT. OR LESS OF BUILDING SLAB, BUT IN NO CASE FEWER THAN 3 TESTS.
33. PAVEMENT AREA TESTING: AT SUBGRADE AND AT EACH COMPACTED FILL AND BACKFILL LAYER, AT LEAST ONE TEST FOR EVERY LIFT FOR EVERY 2,500 SQUARE FEET OF PAVEMENT AREA, BUT IN NO CASES FEWER THAN 3 TESTS.
34. UTILITY TRENCH BACKFILL TESTING: ONE TEST FOR EACH 200 CUBIC YARDS OF FILL BACKFILL PLACED OR ONE TEST PER 200 LINEAR FEET OF TRENCH FOR EACH LIFT; WHICHEVER IS LESS.
35. FOUNDATION WALL BACKFILL: AT EACH COMPACTED BACKFILL LAYER, AT LEAST 1 TEST PER LIFT FOR EACH 50 FEET OR LESS OF WALL LENGTH, BUT NO FEWER THAN 2 TESTS.
36. WHEN TESTING AGENCY REPORTS THAT SUBGRADES, FILLS, OR BACKFILLS HAVE NOT ACHIEVED DEGREE OF COMPACTION SPECIFIED, SCARIFY AND MOISTEN OR AERATE, OR REMOVE AND REPLACE SOIL TO DEPTH REQUIRED; RECOMPACT AND RETEST UNTIL SPECIFIED COMPACTION IS OBTAINED.
37. DISPOSAL: REMOVE SURPLUS SOIL AND WASTE MATERIAL, INCLUDING UNSATISFACTORY SOIL, TRASH, AND DEBRIS, AND LEGALLY DISPOSE OF IT OFF OWNER'S PROPERTY.

CONCRETE PAVING:

1. THE COMPOSITION, PLACING AND CONSTRUCTION OF CONCRETE PAVEMENTS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF SECTIONS 415, 416, 501, 601, AND 602 OF THE STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION (WISDOT STANDARD SPECIFICATIONS) AND LOCAL MUNICIPAL REQUIREMENTS AND SPECIFICATIONS.
2. CONTRACTOR SHALL PROVIDE PRODUCT DATA FOR EACH TYPE OF PRODUCT INDICATED - INCLUDE TECHNICAL DATA AND TESTED PHYSICAL AND PERFORMANCE PROPERTIES; JOB-MIX DESIGNS: CERTIFICATION THAT MIX MEETS OR EXCEEDS WISDOT STANDARD SPECIFICATIONS; AND MATERIAL CERTIFICATES CERTIFYING COMPLIANCE WITH WISDOT STANDARD SPECIFICATIONS.
3. MANUFACTURER QUALIFICATIONS: MANUFACTURER OF READY-MIXED CONCRETE PRODUCTS WHO COMPLIES WITH ASTM C 94/C 94M REQUIREMENTS FOR PRODUCTION FACILITIES AND EQUIPMENT AND APPROVED BY THE WISCONSIN DEPARTMENT OF TRANSPORTATION.
4. CONCRETE GRADE: GRADE A, GRADE A-2, OR A-FA CONFORMING TO SECTION 501.3.1.3 OF THE WISDOT STANDARD SPECIFICATIONS
5. AGGREGATES: CONFORM TO SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS. PROVIDE AGGREGATES FROM A SINGLE SOURCE.
6. WATER: ASTM C 94/C 94M AND SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS.
7. AIR-ENTRAINING ADMIXTURE: ASTM C 260 AND SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS.
8. CHEMICAL ADMIXTURES: PER SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS.
9. CURING MATERIALS IN ACCORDANCE WITH SECTION 415.3.12 OF THE WISDOT STANDARD SPECIFICATIONS.
10. EXPANSION JOINT MATERIAL: CONFORM TO SECTION 415.2.3 OF THE WISDOT STANDARD SPECIFICATIONS.
11. MEASURE, BATCH, AND MIX CONCRETE MATERIALS AND CONCRETE IN ACCORDANCE WITH SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS.
12. GENERAL EXECUTION: CONFORM TO SECTION 415 OF THE WISDOT STANDARD SPECIFICATIONS.
13. PROOFROLL SUBGRADE AND AGGREGATE BASE AS OUTLINED IN EARTH MOVING SPECIFICATION PRIOR TO PLACEMENT OF PAVEMENTS.
14. SET, BRACE, AND SECURE EDGE FORMS, BULKHEADS, AND INTERMEDIATE SCREED GUIDES FOR PAVEMENT TO REQUIRED LINES, GRADES, AND ELEVATIONS. INSTALL FORMS TO ALLOW CONTINUOUS PROGRESS OF WORK AND SO FORMS CAN REMAIN IN PLACE AT LEAST 24 HOURS AFTER CONCRETE PLACEMENT.
15. CLEAN FORMS AFTER EACH USE AND COAT WITH FORM-RELEASE AGENT TO ENSURE SEPARATION FROM CONCRETE WITHOUT DAMAGE.
16. JOINTS GENERAL: FORM CONSTRUCTION, ISOLATION, AND CONTRACTION JOINTS AND TOOL EDGINGS TRUE TO LINE WITH FACES PERPENDICULAR TO SURFACE PLANE OF CONCRETE. CONSTRUCT TRANSVERSE JOINTS AT RIGHT ANGLES TO CENTERLINE, UNLESS OTHERWISE INDICATED. CONFORM TO SECTION 415 OF THE WISDOT STANDARD SPECIFICATIONS
17. CONSTRUCTION JOINTS: SET CONSTRUCTION JOINTS AT SIDE AND END TERMINATIONS OF PAVEMENT AND AT LOCATIONS WHERE PAVEMENT OPERATIONS ARE STOPPED FOR MORE THAN ONE-HALF HOUR UNLESS PAVEMENT TERMINATES AT ISOLATION JOINTS.
18. ISOLATION JOINTS: FORM ISOLATION JOINTS OF PREFORMED JOINT-FILLER STRIPS ABUTTING CONCRETE CURBS, CATCH BASINS, MANHOLES, INLETS, STRUCTURES, WALKS, OTHER FIXED OBJECTS, AND WHERE INDICATED.
19. CONTRACTION JOINTS: FORM WEAKENED-PLANE CONTRACTION JOINTS, SECTIONING CONCRETE INTO AREAS AS INDICATED. CONSTRUCT CONTRACTION JOINTS FOR A DEPTH EQUAL TO AT LEAST ONE-FOURTH OF THE CONCRETE THICKNESS TO MATCH JOINTING OF EXISTING ADJACENT CONCRETE PAVEMENT.
20. EDGING: TOOL EDGES OF PAVEMENT, GUTTERS, CURBS, AND JOINTS IN CONCRETE AFTER INITIAL FLOATING WITH AN EDGING TOOL TO A 1/4-INCH RADIUS. REPEAT TOOLING OF EDGES AFTER APPLYING SURFACE FINISHES. ELIMINATE TOOL MARKS ON CONCRETE SURFACES.
21. CURBING: COMPLY WITH SECTION 601 OF THE WISDOT STANDARD SPECIFICATIONS.
22. SIDEWALKS: COMPLY WITH SECTION 602 OF THE WISDOT STANDARD SPECIFICATIONS.
23. MOISTEN AGGREGATE TO PROVIDE A UNIFORM DAMPENED CONDITION AT TIME CONCRETE IS PLACED.
24. FINISH CURBING IN ACCORDANCE WITH SECTION 601.3.5 OF THE WISDOT STANDARD SPECIFICATIONS.
25. FINISH SIDEWALK AND PATIO IN ACCORDANCE WITH SECTION 602.3.2.3 OF THE WISDOT STANDARD SPECIFICATIONS (LIGHT BROOM FINISH).
26. FINISH CONCRETE VEHICULAR PAVEMENTS AND PADS IN ACCORDANCE WITH SECTION 415.3.8 OF THE WISDOT STANDARD SPECIFICATIONS (ARTIFICIAL TURF DRAG FINISH).
27. PROTECT AND CURE SIDEWALK IN ACCORDANCE WITH SECTION 602.3.2.6 OF THE WISDOT STANDARD SPECIFICATIONS.
28. PROTECT AND CURE CURBING IN ACCORDANCE WITH SECTION 601.3.7 OF THE WISDOT STANDARD SPECIFICATIONS.
29. PROTECT AND CURE VEHICULAR CONCRETE PAVING IN ACCORDANCE WITH SECTION 415.3.12 OF THE WISDOT STANDARD SPECIFICATIONS.
30. REMOVE AND REPLACE CONCRETE PAVEMENT THAT IS BROKEN, DAMAGED, OR DEFECTIVE OR THAT DOES NOT COMPLY WITH REQUIREMENTS IN THIS SECTION.
31. PROTECT CONCRETE FROM DAMAGE. EXCLUDE TRAFFIC FROM PAVEMENT FOR AT LEAST 7 DAYS AFTER PLACEMENT.
32. MAINTAIN CONCRETE PAVEMENT FREE OF STAINS, DISCOLORATION, DIRT, AND OTHER FOREIGN MATERIAL. SWEEP CONCRETE PAVEMENT NOT MORE THAN TWO DAYS BEFORE DATE SCHEDULED FOR SUBSTANTIAL COMPLETION INSPECTIONS.

ASPHALTIC PAVING:

1. THE COMPOSITION, PLACING AND CONSTRUCTION OF ASPHALTIC PAVEMENTS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTIONS 450, 455, 460, 465, AND 475 OF THE STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION (WISDOT STANDARD SPECIFICATIONS).
2. CONTRACTOR SHALL PROVIDE PRODUCT DATA FOR EACH TYPE OF PRODUCT INDICATED - INCLUDE TECHNICAL DATA AND TESTED PHYSICAL AND PERFORMANCE PROPERTIES; JOB-MIX DESIGNS: CERTIFICATION THAT MIX MEETS OR EXCEEDS WISDOT STANDARD SPECIFICATIONS; AND MATERIAL CERTIFICATES CERTIFYING COMPLIANCE WITH WISDOT STANDARD SPECIFICATIONS.
3. MANUFACTURER QUALIFICATIONS: MANUFACTURER SHALL BE REGISTERED WITH AND APPROVED BY THE DOT OF THE STATE IN WHICH PROJECT IS LOCATED.
4. ENVIRONMENTAL LIMITATIONS: DO NOT APPLY ASPHALT MATERIALS IF BASE COURSE IS WET OR EXCESSIVELY DAMP OR IF THE FOLLOWING CONDITIONS ARE NOT MET: APPLY TACK COAT WHEN AMBIENT TEMPERATURE IS ABOVE 50 DEGREES FAHRENHEIT AND WHEN TEMPERATURE HAS NOT BEEN BELOW 35 DEGREES FAHRENHEIT FOR 12 HOURS IMMEDIATELY PRIOR TO APPLICATION; PLACE ASPHALTIC CONCRETE SURFACE COURSE WHEN TEMPERATURE IS ABOVE 40 DEGREES FAHRENHEIT; BASE COURSE MAY BE PLACED WHEN AIR TEMPERATURE IS ABOVE 30 DEGREES FAHRENHEIT AND RISING. PROCEED WITH PAVEMENT MARKING ONLY ON CLEAN, DRY SURFACES. DO NOT APPLY BELOW THE MINIMUM PAVEMENT TEMPERATURE AS RECOMMENDED BY THE MANUFACTURER.
5. AGGREGATES SHALL BE IN ACCORDANCE WITH SECTION 460.2.2 OF THE WISDOT STANDARD SPECIFICATIONS.
6. ASPHALT MATERIALS SHALL BE IN ACCORDANCE WITH CHAPTER 455 OF THE WISDOT STANDARD SPECIFICATIONS.
7. PAVEMENT MARKING PAINT: PROVIDE PAINT FROM THE WISCONSIN DEPARTMENT OF TRANSPORTATION'S APPROVED PRODUCTS LIST. COLOR SHALL BE WHITE UNLESS INDICATED OTHERWISE ON PLANS.
8. HOT-MIX ASPHALT: ASPHALTIC BINDER COURSE AND SURFACE COURSE SHALL BE MIXTURE LT FOR REGULAR DUTY PAVEMENT AND LT FOR HEAVY DUTY PAVEMENT COMPLYING WITH THE WISDOT STANDARD SPECIFICATIONS. ASPHALTIC BINDER SHALL BE 58-28 S UNLESS NOTED.
9. AGGREGATE BASE COURSE BENEATH PAVEMENTS: SHALL BE 1-1/4” DENSE GRADED BASE COURSE CONFORMING TO SECTION 305 OF THE WISDOT STANDARD SPECIFICATIONS.
10. PAVEMENT PLACEMENT GENERAL: ASPHALT CONCRETE PAVING EQUIPMENT, WEATHER LIMITATIONS, JOB-MIX FORMULA, MIXING, CONSTRUCTION METHODS, COMPACTION, FINISHING, TOLERANCE AND PROTECTION SHALL CONFORM TO THE REQUIREMENTS OF THE APPROPRIATE SECTIONS OF THE WISDOT STANDARD SPECIFICATIONS.
11. PREPARE AND PROOFROLL SUBGRADES AND AGGREGATE BASE COURSE AS OUTLINED IN EARTH MOVING SPECIFICATIONS PRIOR TO PLACEMENT OF ASPHALT PAVEMENTS.
12. SWEEP LOOSE GRANULAR PARTICLES FROM SURFACE OF AGGREGATE BASE COURSE PRIOR TO PAVEMENT PLACEMENT. DO NOT DISLODGE OR DISTURB AGGREGATE EMBEDDED IN COMPACTED SURFACE OF BASE COURSE.
13. SPREAD AND FINISH ASPHALTIC MIXTURE IN ACCORDANCE WITH SECTION 450.3.2.5 OF THE WISDOT STANDARD SPECIFICATIONS. PAVEMENT THICKNESSES SHALL BE AS INDICATED ON THE PLANS.
14. PROMPTLY CORRECT SURFACE IRREGULARITIES IN PAVING COURSE BEHIND PAVER. USE SUITABLE HAND TOOLS TO REMOVE EXCESS MATERIAL FORMING HIGH SPOTS. FILL DEPRESSIONS WITH HOT-MIX ASPHALT TO PREVENT SEGREGATION OF MIX; USE SUITABLE HAND TOOLS TO SMOOTH SURFACE.
15. COMPACT ASPHALTIC PAVEMENT IN ACCORDANCE WITH SECTION 450.3.2.6 OF THE WISDOT STANDARD SPECIFICATIONS.
16. PROTECTION: AFTER FINAL ROLLING, DO NOT PERMIT VEHICULAR TRAFFIC ON PAVEMENT UNTIL IT HAS COOLED AND HARDENED. ERECT BARRICADES TO PROTECT PAVING FROM TRAFFIC UNTIL MIXTURE HAS COOLED ENOUGH NOT TO BECOME MARKED.
17. THICKNESS TOLERANCE: COMPACT EACH COURSE TO PRODUCE THE THICKNESS INDICATED WITHIN PLUS/MINUS ¼ INCH FOR BINDER COURSE AND PLUS ¼ INCH FOR SURFACE COURSE, NO MINUS.
18. SURFACE SMOOTHNESS TOLERANCE: COMPACT EACH COURSE TO PRODUCE A SURFACE SMOOTHNESS WITHIN THE FOLLOWING TOLERANCES AS DETERMINED BY USING A 10-FOOT STRAIGHTEDGE APPLIED TRANSVERSELY OR LONGITUDINALLY TO PAVED AREAS: BINDER COURSE: ¼ INCH; SURFACE COURSE: 1/8 INCH. REMOVE AND REPLACE ALL HUMPS OR DEPRESSIONS EXCEEDING THE SPECIFIED TOLERANCES.
19. DO NOT APPLY PAVEMENT-MARKING PAINT UNTIL LAYOUT, COLORS, AND PLACEMENT HAVE BEEN VERIFIED WITH ENGINEER.
20. APPLY MARKINGS TO A DRY SURFACE FREE FROM FROST. REMOVE DUST, DIRT, OIL, GREASE, GRAVEL, DEBRIS OR OTHER MATERIAL THAT MAY PREVENT BONDING TO THE PAVEMENT.
21. APPLY PAINT AS THE MANUFACTURER SPECIFIES WITH MECHANICAL EQUIPMENT TO PRODUCE PAVEMENT MARKINGS, OF DIMENSIONS INDICATED, WITH UNIFORM, STRAIGHT EDGES. APPLY AT MANUFACTURER'S RECOMMENDED RATES AT A MINIMUM RATE OF 17.6 GALLONS/MILE FOR A CONTINUOUS 4” LINE.
22. TESTING AGENCY: CONTRACTOR SHALL ENGAGE A QUALIFIED INDEPENDENT TESTING AND INSPECTING AGENCY TO PERFORM FIELD TESTS AND INSPECTIONS AND TO PREPARE TEST REPORTS.

THE SIGMA GROUP
Single Source. Sound Solutions.
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1300 West Canal Street
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Fax: 414-643-4210

AMERICAN FAMILY FIELD - UECKER LOT RFP
UECKER GENERAL LOT
MILWAUKEE, WI 53214

SPECIFICATIONS - UECKER LOT

PRELIMINARY NOT FOR CONSTRUCTION

ISSUANCE	DATE

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NO. REVISION	DATE

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PROJECT NO:	22466
DESIGN DATE:	----
PLOT DATE:	2024.07.12
DRAWN BY:	----
CHECKED BY:	----
APPROVED BY:	----

SHEET NO:
C500

CTRAUTSCHOLD
C500
22466

I:\SEWPBPD\22466 - 2024 Services\060 CAD\030_Production Sheets\100_Civil\C500 SPECIFICATIONS - UECKER LOT.dwg


AMERICAN FAMILY FIELD
WELCOME TO THE HOME OF THE BREWERS
BAG POLICY
RIDE SHARE LOT
WALKWAY TO AMERICAN FAMILY FIELD
RESTROOMS
TAILGATE HAUS
COURTESY SHUTTLE
HANK AARON
THE TRAIL
WISCONSIN DEPARTMENT OF
Conctractor to remove, protect, and replace sign.
Cut and replace concrete.


AMERICAN FAMILY FIELD
WELCOME TO THE HOME OF THE BREWERS
BAG POLICY
HANK AARON STATE TRAIL
Cut and replace concrete.


Cut and replace concrete.


Slope concrete to drain here.
Cut and replace concrete.

Section 450 General Requirements for Asphaltic Pavements

450.1 Description

(1) This section describes requirements common to plant mixed asphaltic bases and pavements. Exceptions and additional requirements are specified in 455 through 475.

450.2 Materials

450.2.1 Acronyms and Definitions

(1) Interpret materials related acronyms used in sections 450 through 499 as follows:

FRAP	Fractioned reclaimed asphaltic pavement
HMA	Hot mix asphalt
JMF	Job mix formula
PG	Performance graded
RAP	Reclaimed asphaltic pavement
RAS	Recycled asphalt shingles
SMA	Stone matrix asphalt
VMA	Voids in mineral aggregate
WMA	Warm mix asphalt

(2) Interpret materials related definitions used in sections 450 through 499 as follows:

Additive	A material blended with asphaltic binder or aggregate to enhance the characteristics of the final HMA blend, but that does not alter the binder performance grade.
Asphaltic binder	The predominant asphalt cement in HMA.
Filler	Mineral fillers, used primarily to fill voids between aggregate particles to meet gradation requirements.
Fractionated reclaimed asphaltic pavement	Reclaimed asphalt pavement processed by screening and separating by maximum and minimum particle size, asphalt content, asphalt performance grade, and aggregate characteristics.
Leveling layer	A thin HMA layer placed to eliminate irregularities in the profile or thickness of underlying pavement layers.
Lower layer	An asphaltic pavement layer below the upper layer in the completed pavement structure. There may be multiple lower layers.
Modifier	A material blended with the asphaltic binder to enhance its characteristics by modifying the performance grade of the binder.
Reclaimed asphaltic pavement	Material resulting from cold milling or crushing existing asphaltic pavement.
Recycled asphalt shingles	Waste material from a shingle manufacturing facility, either new or used material salvaged from residential roofing operations, or any combination of these materials ground to ensure that 100 percent will pass a 3/8 sieve and processed to remove deleterious material.
Upper layer	The top asphaltic pavement layer in direct contact with traffic in the completed pavement structure. There is only one upper layer.
Warm mix asphalt	Asphaltic mixture containing a warm mix additive or using a warm mix process that reduces the mixing and compaction temperatures typically required for that application.
Wedging	A tapered layer of asphaltic pavement used to build up an existing surface. Wedging layers may be thicker or thinner than standard pavement layers.

450.2.2 Aggregate Sampling and Testing

(1) The department and the contractor will sample and test according to the following methods, except as revised with the engineer's approval:

Sampling aggregates	AASHTO T2
Material finer than No. 200 sieve	AASHTO T11
Sieve analysis of aggregates	AASHTO T27
Mechanical analysis of extracted aggregate	AASHTO T30
Sieve analysis of mineral filler	AASHTO T37
Los Angeles abrasion of coarse aggregate	AASHTO T96
Freeze-thaw soundness of coarse aggregate	AASHTO T103

Sodium sulfate soundness of aggregates (R-4, 5 cycles)	AASHTO T104
Extraction of bitumen	AASHTO T164

450.3 Construction

450.3.1 Equipment

450.3.1.1 Asphalt Plants

450.3.1.1.1 Plant Scales

(1) Provide beam, springless, dial, or digital scales on weigh boxes and silos. Use scales of a standard make and design accurate to within 0.5 percent of the maximum required load. For each plant, provide at least ten standard 50 pound weights accurate to within 0.1 percent. For each scale, provide a suitable cradle or platform for applying test loads.

(2) If using beam scales for aggregate, provide a separate beam for each size of aggregate. Also provide a device that warns when the applied load is within 200 pounds of the required load.

(3) If using beam scales for asphaltic materials, provide a tare beam and a full capacity beam with a minimum graduation no greater than 2 pounds. Also provide a device that warns when the applied load is within 20 pounds of the required load.

(4) If using dial scales, provide a standard make springless scale designed, constructed, and installed to be vibration free. Ensure that all dials are plainly visible to the operator at all times. Equip with adjustable pointers for marking the weight of each material batched.

(5) If using digital scales, conform to National Bureau of Standards Handbook 44.

450.3.1.1.2 Automatic Batching

(1) On contracts with 10,000 tons or more, provide automated batch plants. Ensure that the plants' control system can coordinate mixture proportioning, timing, and discharge by the operation of a single control. Also provide an automatic batch weighing, cycling, and monitoring system.

(2) On contracts with less than 10,000 tons, if the contractor elects to use batch plant automatic systems, conform to the requirements here under 450.3.1.1.2. The contractor need not use automatic recordation. If the contractor elects to use automatic recordation, conform to 450.3.1.1.4 for truck loads, or 450.3.1.1.3 for batch weights.

(3) Ensure that the system accurately proportions mixture components by weight or volume in the proper order and controls the mixing cycle sequence and timing. Provide interlocks that ensure that the scale is at zero before a batch can start and that the batch is mixed completely before discharge. Do not start subsequent batches before completely discharging the previous batch. Also provide interlocks that ensure that all batch materials are in the mixer before the batch can discharge. Ensure that unauthorized personnel cannot alter mix designs and that equipment emits an audible signal if discharging a batch with out-of-tolerance component weights. Ensure that this signal is loud enough to hear throughout the plant area under normal operating conditions.

(4) Provide adjustable timing devices to control individual component batching and mixing operations. Provide auxiliary interlock cutoff circuits necessary to stop automatic cycling whenever an weighing error exceeding a specified tolerance occurs or when another part of the control system malfunctions.

(5) Ensure that the batching system automatic control can stop the cycle in the underweight check position and the overweight check position for each material to check tolerance limits.

(6) Ensure that the scale system is equipped with a device that applies pressure to a scale lever to simulate batching operations for tolerance checks.

(7) Consistently deliver materials within the full range of batch sizes within the following tolerances:

MATERIAL	PERCENT OF TOTAL MATERIAL BATCH WEIGHT
Coarse aggregate	+ 1.0
Fine aggregate	+ 1.0
Aggregate for use with salvaged or reclaimed pavement materials	+ 1.5
Mineral filler	+ 0.5
Salvaged or reclaimed asphaltic pavement material	+ 1.5
Asphaltic material	+ 0.1
Zero return for aggregate	+ 0.5
Zero return for salvaged or reclaimed material	+ 0.5
Zero return for asphaltic material	+ 0.1

(8) Unless providing separate tolerance controls for batching mineral filler, reduce aggregate tolerances to +/- 0.5 percent for aggregates delivered before the filler.

(9) Ensure that the total weight of the batch does not vary by more than +/- 2.0 percent of the designated batch weight.

(10) Ensure that the electrical circuits for the above delivery tolerances of each cutoff interlock are capable of providing the total span for the full allowable tolerance for maximum batch size. Provide tolerance controls automatically or manually adjustable to provide spans suitable for less than full-size batches. Ensure that the automatic controls and interlock cutoff circuits are consistently coordinated with the batching scale or meter within an accuracy of 0.2 percent of the scale or meter nominal capacity[1] throughout the full range of the batch sizes.

[1] Nominal capacity of a scale is defined as the maximum quantity which the scale or meter can measure.

(11) If the automatic control or monitoring systems break down, the contractor may operate the plant manually for up to 2 working days.

450.3.1.1.3 Recording Batch Weights

(1) On contracts involving 10,000 tons or more of asphaltic mixtures, unless the contractor elects to record truck loads as provided in 450.3.1.1.4, produce an automatic digital record for each batch indicating the proportions of each aggregate component, mineral filler, and asphaltic material.

(2) Provide a digital recorder that can print multiple copies of mixture reports that give the total weight of asphaltic mixture and asphaltic material both per load and per batch. Include weights of the individual aggregates and fillers. Reports need not provide tare weight and may use accumulative weights. Ensure that reported weights are accurate within +/- 1 kg/500 kg. Allow sufficient time for the scale to come to rest before printing each weight.

(3) The contractor may use mixture storage silos with digital recorder equipped batch plants if the department determines the storage silo output is coordinated with the recorded batch weights.

(4) If the recording system breaks down, the contractor may operate the plant without automatic recording for up to 2 working days.

450.3.1.1.4 Recording Truck Loads

Revise 450.3.1.1.4 to add more required load ticket information including cold weather paving information. This change was implemented in ASP 6 effective with the December 2016 letting.

(1) If not using automatic batch recording, install a digital recorder as part of the platform truck or storage silo scales. Ensure that the recorder can produce a printed digital record of at least the gross or net weights of delivery trucks. Provide gross, tare, net weights, load count, and the cumulative tonnage; the date, time, ticket number, WisDOT project ID, and mix 250 number; and the mix type including the traffic, binder, and mix designation codes specified in 460.3.1. Ensure that scales cannot be manually manipulated during the printing process. Provide an interlock to prevent printing until the scales come to rest. Size the scales and recorder to accurately weigh the heaviest loaded trucks or tractor-trailers hauling asphaltic mixture. Ensure that recorded weights are accurate to within 0.1 percent of the nominal capacity of the scale.

(2) Ensure that tickets identify additives not included in the mix design submittal or cold weather paving plan. Indicate on the ticket if the mixture is placed under a cold weather paving plan.

450.3.1.2 Asphaltic Mixture Hauling Vehicles

(1) Provide trucks for hauling asphaltic mixtures with tight, clean, and smooth boxes. The contractor may thinly coat boxes with a release agent chosen from the department's APL. Drain excess release agent after coating. Equip each box with a cover big enough to protect the mixture. Do not use trucks that show oil leaks of any magnitude.

450.3.1.3 Transfer Devices

(1) Ensure that transfer devices have surge bin capacity adequate to pave continuously at a uniform speed. If maintaining uniform and continuous paving, the engineer may allow the contractor to omit the surge bin. Do not use devices that cause vibrations or other motion that adversely affect the finished ride.

450.3.1.4 Pavers

(1) Ensure that the screed or strike-off assembly produces a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Use a screed adjustable for the required crown and cross-section of the finished pavement.

(2) Ensure that pavers are equipped with an activated screed or strike-off assembly and use activation at all times during paving unless the engineer allows otherwise. Do not extend the screed with one or

more static extensions totaling more than 12 inches at either screed end, except at the shoulder end for paving shoulders.

(3) Provide pavers with department-approved automatics that control the elevation and slope of the screed. The department will not require automatic controls when paving entrances, approaches, side road connections, small irregular areas, or if the engineer determines using automatic controls is impracticable. Use both grade and slope controls whenever automatics are required, except the engineer may waive the longitudinal or grade control requirement for the final surface. Ensure that the operator can adjust or vary the slope throughout super elevated curves and transitions. Also ensure that the system allows the sensor to operate on either side of the paver.

(4) If automatics break down, the contractor may pave under manual control only until the end of that working day.

450.3.1.5 Compaction Equipment

(1) Ensure rollers are in good mechanical condition, capable of operating both forwards and backwards, and the operating mechanism allows for starting, stopping, or reversing direction in a smooth manner, without loosening or distorting the surface being rolled.

(2) Equip rollers with a drum or tire lubricator. Do not lubricate with petroleum or tar products.

450.3.2 Constructing Asphaltic Mixtures

450.3.2.1 General

450.3.2.1.1 Preparation and Paving Operations

(1) Do not place asphaltic mixture when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 36 F for upper layers or 32 F for lower layers unless the engineer allows in writing. The contractor should place HMA pavement for projects in the northern asphalt zone between May 1 and October 15 inclusive and for projects in the southern asphalt zone between April 15 and November 1 inclusive. CMM 4-53 figure 2 defines asphalt zones. Notify the engineer at least one business day before paving.

(2) Unless the contract specifies otherwise, conform to the following:

- Keep the road open to all traffic during construction.
- Prepare the existing foundation for treatment as specified in 211.
- Incorporate loose roadbed aggregate as a part of preparing the foundation, in shoulder construction, or dispose of as the engineer approves.

(3) Place asphaltic mixture only on a prepared, firm, and compacted base, foundation layer, or existing pavement substantially surface-dry and free of loose and foreign material. Do not place over frozen subgrade or base, or where the roadbed is unstable.

450.3.2.1.2 Cold Weather Paving

450.3.2.1.2.1 General

(1) Conform to these cold weather paving provisions for work performed under the following:

- The 460 HMA Pavement bid items.
- The 465 Asphaltic Surface bid items.
- Special provisions that require placing mixture conforming to the contract requirements under 460 for HMA pavement or under 465 for asphaltic surface.

450.3.2.1.2.2 Cold Weather Paving Plan

(1) Submit a written cold weather paving plan to the engineer at the preconstruction meeting. In that plan outline material, operational, and equipment changes for paving when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 40 F. Include the following:

- Use a department-accepted HMA mix design that incorporates a warm mix additive from the department's APL. Do not use a foaming process that introduces water into the mix.
- Identify the warm mix additive and dosage rate.
- Identify modifications to the compaction process and when to use them.

(2) Engineer written acceptance is required for the cold weather paving plan. Engineer acceptance of the plan does not relieve the contractor of responsibility for the quality of HMA pavement placed in cold weather except as specified in 450.5.2(3).

450.3.2.1.2.3 Cold Weather Paving Operations

(1) Do not place asphaltic mixture when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 40 F unless a valid engineer-accepted cold weather paving plan is in effect.

(2) If the national weather service forecast for the construction area predicts ambient air temperature less than 40 F at the projected time of paving within the next 24 hours, confirm or submit revisions to the cold weather paving plan for engineer validation. Update the plan as required to accommodate the conditions anticipated for the next day's operations. Upon validation of the plan, the engineer will allow paving for the next day. Once in effect, pave conforming to the engineer-accepted cold weather paving plan for the balance of that work day or shift regardless of the temperature at the time of paving.

450.3.2.2 Preparing and Storing Mixtures

(1) Heat and combine aggregate and asphaltic material to produce a mixture within the temperature range the mixture design specifies when discharged from the mixer. Mix until achieving a homogeneous mixture with uniformly coated aggregate. The contractor may store the mixture in silos.

450.3.2.3 Transporting and Delivering Mixtures

(1) Deliver the mixture to the paver receiving hopper at a temperature within 20 F of the temperature the asphaltic material supplier recommends. Cover loads during inclement weather or when the ambient air temperature falls below 65 F.

(2) If depositing asphaltic mixture on the roadway, provide equipment to pick up substantially all of the asphaltic mixture from the roadway and load it directly into the paver receiving hopper. Use either a device integral to the paver or intermediate transfer equipment.

450.3.2.4 Correcting Base

(1) Before placing asphaltic base or surface courses, correct the existing pavement by filling potholes, sags, and depressions; altering the existing crown; or other corrections the engineer requires. Place asphaltic lower layer mixtures where and as the engineer directs. The contractor may hand place or use blade graders or mechanical spreaders to place mixture used for wedging, leveling layers, or filling holes. Feather the mixture out to become co-planar with adjoining areas and, unless the engineer directs otherwise, compact uniformly as specified in 450.3.2.6.2.

450.3.2.5 Spreading and Finishing Mixture

(1) Place asphaltic mixtures in layers to the typical sections the plans show with self-propelled pavers. Pave at a constant speed, appropriate for the paver and mixture, that ensures uniform spreading and strike-off with a smooth, dense texture and no tearing or segregation. Do not pave faster than the average delivery rate of asphaltic mixture to ensure, as nearly as possible, continuous paving.

(2) If placing the initial lane of a given layer, sense off a tight string line, a mobile string line, or a traveling straightedge whichever the engineer approves for the specific field conditions. On subsequent lanes of the layer, the contractor may sense off the adjacent lane surface.

(3) Avoid raking over machine spread and finished material on surface courses to the extent possible to prevent segregation.

(4) The contractor may spread material by hand in areas not accessible to pavers. Dump material outside the placement area, spread into place with shovels, and shape to the required grade and contour with rakes and lutes. Do not rake material from a pile of dumped material.

(5) Do not haul over any portion of a placed layer until after the final rolling is complete on that portion.

(6) If a longitudinal joint other than the notched wedge joint is constructed, place multi-lane pavement so that each day's placement in all lanes ends at the same station, unless the engineer directs or allows otherwise.

450.3.2.6 Compaction

450.3.2.6.1 General

(1) Unless the contract specifies otherwise for the particular type of work, compact using the ordinary compaction procedure. After spreading and strike-off and while still hot, compact each layer thoroughly and uniformly by rolling. Roll during daylight hours unless providing artificial light the engineer finds satisfactory. Use the appropriate number of rollers to achieve the specified compaction, surface finish, and smoothness requirements. Ensure that the compacted surface is smooth and true to the established crown and grade.

(2) Roll the entire surface until achieving the specified compaction and, to the extent practicable, eliminate roller marks. If turning or reversing the roller, or other operations, causes any scuffing or displacement, immediately correct the damage and revise the rolling procedure to prevent further damage. Keep

roller wheels moistened to keep mixture from sticking to them. Do not use excess water. Do not disturb the line and grade elevation of edges of the asphaltic pavement or surfacing.

(3) Along forms, curbs, headers, walls, and at other places not accessible to the roller, compact the mixture thoroughly with hot hand tampers or mechanical tampers giving equivalent compression. On depressed areas, use a trench roller or other engineer-approved equipment.

(4) Remove and replace material that is loose and broken, mixed with dirt, or is otherwise unacceptable with fresh hot mixture. Also remove and replace areas with excess asphaltic material. Compact replaced mixture immediately flush with the adjacent placement.

450.3.2.6.2 Ordinary Compaction

(1) Unless the contract specifies otherwise, compact patching, leveling, and wedging layers of asphaltic pavement or surfacing; all layers of plant mixed asphaltic base and base widening; driveways; and other non-traffic areas until no further appreciable consolidation is visible under the action of the compaction equipment. Use 2 or more rollers per paver if placing more than approximately 165 tons of mixture per hour.

(2) The engineer will assess the compacted density using the methods specified for the particular type of work.

450.3.2.7 Applying Tack Coat

(1) Apply tack coat as specified in 455.3.2 to each layer of a plant-mixed asphaltic base or pavement that will be overlaid with asphaltic mixture under the same contract.

450.3.2.8 Jointing

(1) Place all layers as continuously as possible without joints. Do not roll over an unprotected end of freshly laid mixture unless interrupting placement long enough for the mixture to cool. If interrupting placement, ensure proper bond with the new surface. Form joints by cutting back on the previous run to expose the full depth of the layer. After resuming placement, place the fresh mixture against the joint to form intimate contact and be co-planar with the previously completed work after consolidation.

(2) Where placing against existing HMA pavement, cut back the existing mat to form a full-depth butt joint.

(3) Construct notched wedge longitudinal joints for mainline paving if the pavement thickness conforms to the minimums specified in 460.3.2, unless the engineer directs or allows an alternate joint. Taper each layer at a slope no greater than 12:1. Extend the taper beyond the normal lane width, or as the engineer directs. Ensure that tapers for all layers directly overlap and slope in the same direction.

(4) Place a 1/2 to one inch vertical notch after compaction at the top of tapers on all layers. Place the finished longitudinal joint line of the upper layer at the pavement centerline for 2-lane roadways, or at the lane lines if the roadway has more than 2 lanes.

(5) Construct the tapered portion of each layer using an engineer-approved strike-off device that will provide a uniform slope and will not restrict the main screed. Apply a weighted steel side roller wheel, as wide as the taper, to the tapered section. Compact the initial taper section to as near the final density as possible. Apply a tack coat to the taper surface before placing the adjacent lane.

(6) Clean longitudinal and transverse joints coated with dust and, if necessary, paint with hot asphaltic material, a cutback, or emulsified asphalt to ensure a tightly bonded, sealed joint.

450.3.2.9 Surface Requirements

(1) Test the surface at engineer-selected locations with a 10-foot straightedge or other engineer-specified device. Ensure that upper layers show no variation greater than 1/8 inch between any 2 surface contacts. Ensure that lower layers, shoulder surfacing, and surfacing on temporary connections and bypasses show no variation greater than 1/4 inch between any 2 surface contacts.

(2) Remove and replace or otherwise correct, using engineer-approved methods, humps or depressions exceeding the specified tolerance.

450.3.2.10 Paving Shoulders

(1) Conform to the other requirements under 450.3.2 except, if constructing shoulders separately and the placement width is too narrow to accommodate the required pavers and rollers, the contractor may use engineer-approved alternate spreading and compaction equipment. Alternate equipment must be capable of satisfactorily laying mixture to the required width, thickness, texture, and smoothness.

450.3.2.11 Safety Edge[SM]

(1) Construct safety edge monolithically with and extending beyond the edge of pavements that have no paved shoulder, have paved shoulders 3 feet wide or less, and at other locations the plans show.

Safety edge is not required on edges that abut other HMA or concrete elements or where the engineer excludes for constructability issues.

(2) Compact conforming to 450.3.2.6. Ensure that after final rolling the safety edge angle is within the tolerances the plans show. The contractor may use full depth sawing to remove formed edges integrally placed with pavement where safety edge is not required.

(3) Use a paver equipped with a wedge maker from the department's APL capable of constructing the specified edge cross-section. Do not use a single plate strike off.

(4) Place the finished shoulder material to the top of the safety edge conforming to 305.3.3.

450.3.3 Maintaining the Work

(1) Protect and repair the prepared foundation, tack coat, base, paved traffic lanes, shoulders, and seal coat. Correct rich or bleeding areas, breaks, raveled spots, or other nonconforming areas in the paved surface.

450.4 Measurement

(1) The department will measure asphaltic mixtures by the ton of mixed aggregate and asphaltic material incorporated in the work unless the measurement subsection for a particular application specifies otherwise. Provide the engineer with weigh tickets showing the net weight of each load of material delivered. The department or department-authorized testing firms or agencies will test the contractor's truck, storage silo, or plant scales.

(2) For minor quantities of mixtures and if the engineer approves, the contractor may report batch weights from plant scales as described in 450.3.1.1.1, instead of truck or storage silo scale weights.

(3) The department will measure HMA Cold Weather Paving by the ton of HMA mixture placed conforming to an engineer-accepted cold weather paving plan.

450.5 Payment

450.5.1 General

(1) All costs of furnishing, maintaining, and operating the truck scale or other weighing equipment and furnishing the weigh tickets are incidental to the contract.

(2) Nonconforming material allowed to remain in place is subject to price adjustment under 105.3.2.

(3) Full-depth sawing to remove integrally placed safety edge where not required is incidental to the contract.

(4) The contractor is responsible for the quality of HMA placed in cold weather.

450.5.2 Cold Weather Paving

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
450.4000	HMA Cold Weather Paving	TON

(2) Payment for HMA Cold Weather Paving is full compensation for additional materials and equipment specified for cold weather paving under 450.3.2.1.2 including costs for preparing, administering, and following the contractor's cold weather paving plan. The department will not pay for HMA Cold Weather Paving for HMA placed as follows:

- If the lot density is less than the minimum specified in table 460-3 for mixture placed under 460.
- On days when the department is assessing liquidated damages.

(3) If because of an excusable compensable delay under 108.10.3, the engineer directs the contractor to pave when the temperature is less than 36 F for the upper layer or less than 32 F for lower layers, the department:

- Will relieve the contractor of responsibility for damage and defects the engineer attributes to cold weather paving.
- Will not assess disincentives for density or ride.

(4) If HMA pavement is placed under 450.3.2.1.2 and the HMA Cold Weather Paving bid item is not in the contract, the department will pay for the additional costs specified in 450.5.2(2) as extra work. The department will pay separately for providing HMA pavement and HMA surface under 460.5, 465.5, and the contract special provisions.

204 Removing or Abandoning Miscellaneous Structures

204.1 Description

(1) This section describes wholly or partially removing or abandoning existing miscellaneous structures, disposing of the resulting materials, or if required, salvaging and storing designated materials.

204.2 (Vacant)

204.3 Construction

204.3.1 General

204.3.1.1 General Requirements

(1) If retaining a portion of the existing structure, avoid damaging that portion during construction operations. Do not use any equipment or devices that might damage structures, facilities, or property to be preserved and retained. Complete operations necessary to remove or abandon an existing structure and that might endanger the new construction before constructing new work.

204.3.1.2 Backfilling

(1) Backfill trenches, holes, and pits resulting from breaking down, removing, or abandoning miscellaneous structures as specified for backfilling trenches in 203.3.6.

(2) Unless the contract specifies otherwise, backfill to the elevation of the natural ground, the proposed finished earth subgrade, or finished slopes, as necessary due to the location of the removed structure.

204.3.1.3 Salvaging or Disposing of Materials

(1) Carefully remove materials designated for salvage to avoid damage. Place salvaged materials in neat piles outside construction limits but within the right-of-way, at locations the engineer approves. Stockpile materials designated for salvage at locations the engineer approves, without contaminating the material with dirt or foreign matter.

(2) Dispose of concrete, stone, brick, and other material not designated for salvage as specified for disposing of materials under 203.3.4.

204.3.2 Breaking Down and Removing

204.3.2.1 General

(1) Unless specified otherwise, remove structures that the contract designates for removal or that interfere with the new construction as follows:

- From within the roadway.
- From within the removal limits the plans show.
- From within the limits designated under the Obliterating Old Road bid item, whether specified or subsequently found necessary and required.
- If the contract specifies, also wholly or partially remove structural elements occurring outside the limits of construction and beyond the limits of Obliterating Old Road.

(2) Unless the plans show otherwise, remove entirely or break down walls, piers, surface drains, foundations, and similar masonry structures as follows:

1. Within the roadbed, to a depth at least 2 feet below the subgrade.
2. Outside the roadbed, to a depth at least 2 feet below the finished grade.
3. At any location, to the extent required to avoid interfering with the work.

(3) If removing pavement, curb, gutter, sidewalk, crosswalk, and similar structures and portions of the existing structure are to remain in the surface of the finished work, remove the structure to an existing joint, or saw and chip the structure to a true line with a face perpendicular to the surface of the existing structure. Remove enough of the structure to provide proper grades and connection to the new work. Maintain drainage as specified for drainage during construction in 205.3.3.

(4) The contractor becomes the owner of the removed asphaltic pavement or surfacing and is responsible for its disposal as specified for disposing of materials under 204.3.1.3.

204.3.2.2 Removing Items

204.3.2.2.1 General

(1) Under the Removing Concrete Pavement bid item, remove concrete pavements, concrete alleys, concrete driveways, or rigid base including surfaces or other pavements superimposed on them.

(2) Under the Removing Concrete Pavement Butt Joints bid item, remove concrete pavements to allow the construction of butt joints. Remove existing pavement to the depth the plans show sawing, milling, or other engineer-approved methods.

(3) Under the Removing Asphaltic Surface bid item, remove all types of asphaltic pavement or surfacing not supported on rigid bases or not underlain by proposed excavation. Also, remove asphaltic overlays of existing concrete pavements, bases, or bridge decks designated to remain in place.

(4) Under the Removing Asphaltic Surface Butt Joints bid item, remove asphaltic pavement or surfacing to allow the construction of butt joints. Remove existing asphaltic pavements or surfacing to the depth the plans show by sawing, milling, or other engineer-approved methods.

(5) Under the Removing Concrete Sidewalk bid item, remove concrete sidewalk, crosswalk, and steps.

(6) Under the Removing Lip Curb bid item, remove lip curb to the plane of the pavement surface, +/- one inch.

(7) Under the Removing Concrete Slope Paving bid item, restore the slope in front of the abutment to a smooth, plane surface after removing the slope paving.

(8) Under the Removing Delineators and Markers bid item, remove delineators and markers.

(9) Under the Removing Railroad Track bid item, remove rails, paving, ties, track encasement, and other appurtenances. Remove concrete foundation and leave the ballast aggregate in place.

(10) Under the Removing Manholes, Removing Catch Basins, and Removing Inlets bid items, rebuild, and properly reconnect live sewers connected with them. Maintain satisfactory bypass service during these operations. Plug unused sewers as specified for abandoning pipes and structures under 204.3.3.1.

(11) Under the Removing Septic Tanks bid item, first completely remove the contents of the tank. Conform to the WDNR requirements for removal and disposal of these contents. Break down and remove the tank, to an elevation not less than 2 feet below the proposed ground surface, or 2 feet below the finished slopes or natural ground surface, as required due to the location of the tank. Before backfilling, break a hole in the bottom of any remaining portion of the tank to allow drainage. Backfill as specified for trenches, holes, and pits in 204.3.1.2. If the septic tank disposal system includes a dry well, remove the dry well to not less than 2 feet below ground surface, and backfill it in the manner specified above for the septic tank.

(12) Under the Site Clearance bid items, remove building foundations and concrete slabs, backfill exposed openings, and clear the site within the right-of-way at the locations the plans show. Materials removed from building sites under this bid item become the contractor's property. The contractor may incorporate these materials in the roadway embankment if the engineer approves. Clear the entire premises of decomposable and combustible refuse, debris, and materials resulting from the removals and leave the premises in a neat condition.

(13) Under the Removing Storm Sewer bid items, remove existing storm sewer. Backfill resulting trenches with granular backfill conforming to 209.2.

204.3.2.2.2 Removing Asphaltic Surface Milling

(1) Under the Removing Asphaltic Surface Milling bid item, remove existing asphaltic pavement or surfacing by milling at the location and to the depth the plans show. The contractor may incorporate suitable material into the work or dispose of it outside the project limits.

(2) If stockpiling material for subsequent incorporation into the work, store material at an engineer-approved location that will minimize the hauling required to place the material. Prepare the stockpile foundation to minimize contamination. Ensure that the stockpile foundation is free of clods, lumps, or stones larger than 2 inches in any dimension.

(3) Remove the existing asphaltic pavement or surfacing without incorporating or damaging underlying material that will remain in place. Provide a uniform milled surface that is reasonably plane, free of large scarification marks, and has the grade and transverse slope the plans show or the engineer directs.

(4) Use a self-propelled milling machine with depth, grade, and slope controls. Shroud the drum to prevent discharging loosened material into adjacent work areas or live traffic lanes. Provide an engineer-approved dust control system.

(5) Maintain one lane of traffic during working hours. Unless using a continuous removal and pick-up operation, do not windrow or store material on the roadway. Clear the roadway of materials and equipment during non-working hours. Grade shoulders adjacent to milled areas by the end of each work day to provide positive drainage of the pavement. Do not allow abrupt longitudinal differences of 2 inches or more between lanes during non-working hours. The engineer may waive one or more of these requirements if the highway is closed to traffic or if a particular operation does not endanger traffic.

204.3.2.3 Removing Buildings

(1) Under the Removing Building and Removing Buildings bid items, remove buildings, dispose of material and debris resulting from removing buildings, and backfill resulting holes.

(2) Buildings removed and materials resulting from building removal become the contractor's property unless the contract specifies otherwise. Dispose of unclaimed and removed material as specified for disposing of materials in 203.3.4.

(3) The department assumes no responsibility for the condition of any building at any time. The department makes or implies no guarantee that any building will remain in the condition the bidder finds it in when the bidder prepares its proposal.

(4) Obtain permits necessary for removing buildings, including those necessary if the contractor's operations obstruct streets or alleys.

(5) Remove buildings and building materials safely and according to the requirements of the Wisconsin department of workforce development, applicable ordinances of the municipality where the building is located, and the WDNR. Pay close attention to the requirements regulating the handling and disposal of asbestos, lead paint, and other hazardous substances. If creating hazardous conditions incident to the contract operations, furnish, erect, and maintain suitable barricades to safeguard the public.

(6) Notify public utility companies serving the building in sufficient time, before removal operations, to allow them to disconnect and remove their facilities from the building.

(7) Shut off municipal water service lines at the curb boxes. Tightly plug or seal sewer connections. If municipal ordinances or permits specify the manner of sealing a sewer service connection, then perform the work accordingly.

(8) Unless the contract specifies otherwise, when removing a building also remove that portion of its foundation, including any masonry floors, to an elevation not less than 2 feet below the ground surface, the proposed finished earth subgrade, or finished slope grade, as necessary due to the location of the building.

(9) Remove heating units, plumbing fixtures, and similar appurtenances to the elevation of the basement floor.

(10) Before backfilling, remove debris not suitable for backfilling. Break holes comprising at least 10 percent of the floor area in basement floors to allow drainage.

204.3.2.4 Removing Ancillary Structures

(1) Remove individual ancillary structures, designated with structure ID numbers beginning with "S" or "L", and their concrete foundations. Unless the contract specifies otherwise, dispose of structure components off-site.

(2) Under the Removing Ancillary Structure with Restoration bid items, also restore areas disturbed by construction activities to the final grade lines with topsoil, mulch, seed, and seed water that meet the requirements of 625, 627, and 630.

204.3.3 Abandoning Pipes and Structures

204.3.3.1 General

(1) If the contract calls for abandoning manholes, catch basins, or inlets, clean them thoroughly. Plug the existing pipe connections with brick or concrete block masonry, or with any grade of concrete specified under 501.3.1, or any engineer-approved commercial grade of concrete. Unless the plans show otherwise, remove the walls of the structures as follows:

1. Within the roadbed, to a depth at least 2 feet below the subgrade.
2. Outside the roadbed, to a depth at least 2 feet below the finished grade.
3. At any location, to the extent required to avoid interfering with the work.

204.3.3.2 Abandoning, Closing, and Sealing Items

(1) Under the Abandoning Culvert Pipes bid item, plug both ends of the abandoned pipe as specified in 204.3.3.1.

(2) Under the Closing Culvert Pipes bid item, close both ends of the abandoned pipe as specified for closing culverts in 203.3.3.

(3) Under the Sealing Pipes bid item, thoroughly clean the ends of the abandoned pipe, and seal them with brick, concrete block, or any grade of concrete specified under 501.3.1.

204.3.3.3 Abandoning Wells

(1) Under the Abandon Wells bid item, fill and seal wells conforming to the Wisconsin administrative code as follows:

For monitoring wells.....NR 141

For community wells or high capacity wells .....NR 811

For private water supply wells .....NR 812

204.4 Measurement

(1) Unless specified otherwise, the department will measure this work in the original position of the removed structures. If the contract does not include bid items for removing the listed miscellaneous structures from within the roadway, the department will measure the excavation for those removals as common excavation. The department will determine the volume of excavation for removing concrete structures as the area of the structure times the depth removed.

(2) The department will measure Removing Concrete Pavement, Removing Concrete Pavement Butt Joints, Removing Asphaltic Surface, and Removing Asphaltic Surface Butt Joints by the square yard acceptably complete regardless of the depth or number of courses encountered. The department will measure Removing Asphaltic Surface Milling by the square yard, or by the ton acceptably completed.

(3) If removing curb, gutter, or curb & gutter is required in conjunction with removing pavement, the department will measure removing these structures by the square yard acceptably completed, under the Removing Concrete Pavement bid item. If removing a rigid base with an asphaltic surface extending beyond the lateral limits of the rigid base, as in a widened pavement, the department will measure only the area occupied by the rigid base under the Removing Concrete Pavement bid item. The department will measure the portion of the asphaltic surfacing beyond the rigid base removed under the Excavation bid items or the Obliterating Old Road bid item. The department will make no deductions for any opening in the removed pavement having an area of 3 square yards or less.

(4) The department will make no deductions from the volume measured under the Excavation bid items for pavement removed under the Removing Concrete Pavement bid item.

(5) If removing curb, gutter, or curb & gutter that is separate from and not removable in conjunction with removing pavement, the department will measure Removing Curb, Removing Gutter, and Removing Curb & Gutter by the foot acceptably completed, measured along the flow line of gutter for gutter, or curb & gutter, and along face of curb for curb.

(6) The department will measure Removing Concrete Sidewalk by the square yard acceptably completed. The department will include steps based on the area of the horizontal projection of the steps.

(7) The department will measure Removing Concrete Barrier, Removing Lip Curb, Removing Guardrail including end sections or anchorages, and Removing Fence by the linear foot acceptably completed.

(8) The department will measure Removing Concrete Slope Paving by the square yard acceptably completed, measured in the plane of the removal surface.

(9) The department will measure Removing Delineators and Markers as each individual delineator or marker acceptably completed.

(10) The department will measure Removing Masonry by the cubic yard acceptably completed.

(11) The department will measure Removing Surface Drains as each individual surface drain acceptably completed.

(12) The department will measure Removing Concrete Bases as each individual concrete base acceptably completed.

(13) The department will measure Removing Railroad Track by the linear foot acceptably completed, measured along single track lines, tracks with 2 rails.

(14) The department will measure Removing Utility Poles as each individual pole, or pole stub acceptably completed, including attached parts and connections.

(15) The department will measure Removing Manholes, Removing Catch Basins, and Removing Inlets as each individual manhole, catch basin, or inlet acceptably completed, including attached parts and connections.

(16) The department will measure Removing Septic Tanks as each individual septic tank acceptably completed, including any dry wells in the tank's disposal system.

(17) The department will measure the Removing Building (station) bid items as each individual building acceptably removed. The department will measure the Removing Building (parcel) bid items as each individual parcel with all buildings acceptably removed.

(18) The department will measure the Site Clearance (parcel) bid items as each individual parcel acceptably cleared.

(19) The department will measure the Removing Storm Sewer bid items by the linear foot acceptably completed, measured along the centerline of the pipe.

(20) The department will measure the Removing Ancillary Structure and the Removing Ancillary Structure with Restoration bid items by each individual structure, including its associated concrete foundation, acceptably completed.

(21) The department will measure the Abandoning Manholes, Abandoning Catch Basins, Abandoning Inlets, and Abandoning Wells bid items as each individual unit acceptably completed.

(22) The department will measure Abandoning Culvert Pipes, Closing Culvert Pipes, and Sealing Pipes as each individual pipe acceptably completed, having both ends plugged.

204.5 Payment

204.5.1 Change Removing Building & Site Clearance bid items - LS (station) or (parcel) to EACH (station) or (parcel)

204.5.1 General

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
204.0100	Removing Concrete Pavement	SY
204.0105	Removing Concrete Pavement Butt Joints	SY
204.0110	Removing Asphaltic Surface	SY
204.0115	Removing Asphaltic Surface Butt Joints	SY
204.0120	Removing Asphaltic Surface Milling	SY
204.0125	Removing Asphaltic Surface Milling	TON
204.0130	Removing Curb	LF
204.0140	Removing Gutter	LF
204.0150	Removing Curb & Gutter	LF
204.0155	Removing Concrete Sidewalk	SY
204.0157	Removing Concrete Barrier	LF
204.0160	Removing Lip Curb	LF
204.0165	Removing Guardrail	LF
204.0170	Removing Fence	LF
204.0175	Removing Concrete Slope Paving	SY
204.0180	Removing Delineators and Markers	EACH
204.0185	Removing Masonry	CY
204.0190	Removing Surface Drains	EACH
204.0195	Removing Concrete Bases	EACH
204.0200	Removing Railroad Track	LF
204.0205	Removing Utility Poles	EACH
204.0210	Removing Manholes	EACH
204.0215	Removing Catch Basins	EACH
204.0220	Removing Inlets	EACH
204.0225	Removing Septic Tanks	EACH
204.0231	Removing Building (station)	EACH
204.0236	Removing Building (parcel)	EACH
204.0241	Site Clearance (parcel)	EACH
204.0245	Removing Storm Sewer (size)	LF
204.0246	Removing Ancillary Structure (structure)	EACH
204.0247	Removing Ancillary Structure with Restoration (structure)	EACH
204.0250	Abandoning Manholes	EACH
204.0255	Abandoning Catch Basins	EACH
204.0260	Abandoning Inlets	EACH
204.0265	Abandoning Wells	EACH
204.0270	Abandoning Culvert Pipes	EACH
204.0275	Closing Culvert Pipes	EACH
204.0280	Sealing Pipes	EACH

(2) Payment for removing or abandoning miscellaneous structures is full compensation for breaking down, removing, closing, plugging, or sealing; for removing headwalls; for obtaining any required work permits; for providing any required bentonite, soil, brick, concrete block, or concrete; for restoring the roadway cross-section; and, unless the contract specifies granular backfill, for backfilling.

(3) Payment for the Removing Ancillary Structures and the Removing Ancillary Structure with Restoration bid items also includes removing associated concrete foundations and, for the Removing Ancillary Structure with Restoration bid items, the required topsoil, mulch, and seed.

(4) If the contract specifies or the engineer directs backfilling with granular backfill, the department will pay separately for that backfilling under the Backfill Granular bid items as specified in 209.5.

(5) Except for storm sewer, if the contract does not include:

1. Bid items for removing the listed miscellaneous structures from within the roadway, the department will pay for excavating these removals under the Excavation Common bid item. The department will pay for excavation for removing concrete structures exceeding one cubic yard, that were not specified for removal in the contract, at 5 times the unit price bid for Excavation Common under the Removing Miscellaneous Concrete Structures administrative item. Other work involved in removing or abandoning miscellaneous structures within the roadway is incidental to the work.
2. A separate bid item for removing miscellaneous structures listed above from within the limits of Obliterating Old Road, work involved in the removal thereof, whether specified or subsequently found necessary and required, is incidental to Obliterating Old Road.
3. A separate bid item for removing miscellaneous structures listed above from beyond the roadway and outside the limits of Obliterating Old Road, work involved in the removal, if the removal is specified in the contract, is incidental to other bid items of work. If this removal is not specified but later found necessary and required, the department will pay for work involved in this removal as extra work.

204.5.2 Storm Sewer

(1) If the contract or the engineer requires storm sewer removal and the contract does not include the Removing Storm Sewer bid item, the department will pay for that removal as extra work.

305 Dense-Graded Base

305.1 Description

(1) This section describes constructing a dense-graded base using one or more of the following aggregates at the contractor's option:

Crushed stone	Reclaimed asphalt
Crushed gravel	Reprocessed material
Crushed concrete	Blended material

305.2 Materials

305.2.1 General

(1) Provide aggregate conforming to 301.2 for crushed stone, crushed gravel, crushed concrete, reclaimed asphalt, reprocessed material, or blended material. Provide QMP for dense-graded base as specified in 730.

(2) Where the contract specifies or allows 1 1/4-inch base, do not place reclaimed asphalt, reprocessed material, or blended materials below virgin aggregate materials unless the contract specifies or the engineer allows in writing. The department will allow virgin aggregate above reclaimed asphalt, reprocessed material, or blended materials in shoulder areas adjacent to concrete pavement.

305.2.2 Gradations

305.2.2.1 General

(1) Except for reclaimed asphalt, conform to the following gradation requirements:

	PERCENT PASSING BY WEIGHT		
SIEVE	3-INCH	1 1/4-INCH	3/4-INCH
3-inch	90 - 100	___	___
1 1/2-inch	60 - 85	___	___
1 1/4-inch	___	95 - 100	___
1-inch	___	___	100
3/4-inch	40 - 65	70 - 93	95 - 100
3/8-inch	___	42 - 80	50 - 90
No. 4	15 - 40	25 - 63	35 - 70
No. 10	10 - 30	16 - 48	15 - 55
No. 40	5 - 20	8 - 28	10 - 35
No. 200	2.0 - 12.0	2.0 - 12.0[1] [3]	5.0 - 15.0[2]

[1] Limited to a maximum of 8.0 percent for base placed between old and new pavement.

[2] 8.0 - 15.0 percent if base is >= 50 percent crushed gravel.

[3] 4.0 - 10.0 percent if base is >= 50 percent crushed gravel.

(2) Unless the plans or special provisions specify otherwise, do the following:

1. Use 1 1/4-inch in base course layers. Always use 1 1/4-inch in the top 4 inches of base. The contractor may substitute 3-inch for 1 1/4-inch in lower base zones including material underlying the shoulder.
2. Use 3/4-inch in shoulders. Always use 3/4-inch to match the thickness of the paved shoulder in the unpaved portion of the shoulder and on exposed shoulder foreslopes. The contractor may substitute 1 1/4-inch for 3/4-inch elsewhere in shoulders and shoulder foreslopes. If using 1 1/4-inch, limit the allowable reclaimed asphalt content to 50 percent or less.

305.2.2.2 Reclaimed Asphalt

(1) The contractor may use reclaimed asphalt with 100 percent passing a 1 1/4-inch sieve as 1 1/4-inch base. The engineer will assess gradation primarily by visual inspection but may test questionable material.

305.3 Construction

305.3.1 General

(1) Construct dense-graded base conforming to 301.3.

305.3.2 Compaction

305.3.2.1 General

(1) Compact each base layer, including shoulder foreslopes, with equipment specified in 301.3.1. Use standard compaction conforming to 301.3.4.2. Final shaping of shoulder foreslopes does not require compaction.

305.3.2.2 Compacting 1 1/4-Inch Base and 3/4-Inch Base

(1) If using a pneumatic roller, do not exceed a compacted thickness of 6 inches per layer. For the first layer placed over a loose sandy subgrade, the contractor may, with the engineer's approval, increase the compacted layer thickness to 8 inches.

(2) If using a vibratory roller, do not exceed a compacted thickness of 8 inches per layer.

305.3.2.3 Compacting 3-Inch Base

(1) Compact with a vibratory or pneumatic roller. Do not exceed a compacted thickness of 9 inches per layer.

305.3.3 Constructing Aggregate Shoulders

305.3.3.1 General

(1) Construct aggregate shoulders to the elevations and typical sections the plans show, except for minor modifications needed to conform to other work.

(2) Use equipment that does not damage or mar the pavement surface, curbs, or appurtenances.

(3) Place aggregate directly on the shoulder area between the pavement edge and the outer shoulder limits. Recover uncontaminated material deposited outside the limits and place within the limits.

(4) Do not deposit aggregate on the pavement during placement, unless the engineer specifically allows. Do not leave aggregate on the pavement overnight. After placing the shoulder aggregate, keep the pavement surface free of lose aggregate.

(5) Spread and compact the aggregate in compacted layers of 6 inches or less. Use standard compaction conforming to 301.3.4.2.

(6) After final compaction, shape the shoulders to remove longitudinal ridges to ensure proper drainage.

305.3.3.2 Shoulders Adjacent to Concrete Pavement or Base

(1) Construct shoulders along concrete pavement or concrete base so the completed shoulder is at the approximate grade and cross-section before opening the pavement to public traffic.

305.3.3.3 Shoulders Adjacent to Asphaltic Pavement or Surfacing

(1) If the roadway is closed to through traffic during construction, construct the aggregate shoulders before opening the road.

(2) If the roadway remains open to through traffic during construction and a greater than 2-inch drop-off occurs within 3 feet or less from the edge of the traveled way, eliminate the drop-off within 48 hours after completing that days paving. Unless the special provisions specify otherwise, provide aggregate shoulder material compacted to a temporary 3:1 or flatter cross slope from the surface of the pavement edge.

(3) Provide and maintain signing and other traffic protection and control devices, as specified in 643, until completing shoulder construction to the required cross-section and flush with the asphaltic pavement or surfacing.

305.3.4 Shaping Shoulders

(1) Under the Shaping Shoulders bid item, blade, shape, and compact the existing shoulder aggregate, before the end of the day's work, to ensure proper drainage while salvaging existing pavement and constructing new pavement. Do not contaminate the shoulder aggregate with deleterious material. Incorporate material obtained from shaping shoulders in the new shoulder, in widening the roadbed, or as the plans show.

305.3.5 Constructing Detours

(1) Under the Aggregate Detours bid item, provide aggregate on the designated detour at the locations the plans show or the engineer directs. Use 3/4-inch base unless the plans or special provisions specify otherwise.

305.4 Measurement

(1) The department will measure the Base Aggregate Dense and Aggregate Detours bid items under this section by the ton or cubic yard acceptably completed. The department may deduct for contaminated aggregate or unrecovered aggregate deposited outside the outer shoulder limits.

(2) If the department converts volume to weight as specified in 109.1, the conversion factor for the acceptably completed in-place Base Aggregate Dense bid items is 1.85 tons per cubic yard.

(3) The department will measure Shaping Shoulders by the station acceptably completed, measured along the centerline for each shoulder separately.

305.5 Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
305.0110	Base Aggregate Dense 3/4-Inch	TON
305.0115	Base Aggregate Dense 3/4-Inch	CY
305.0120	Base Aggregate Dense 1 1/4-Inch	TON
305.0125	Base Aggregate Dense 1 1/4-Inch	CY
305.0130	Base Aggregate Dense 3-Inch	TON
305.0135	Base Aggregate Dense 3-Inch	CY
305.0410	Aggregate Detours	TON
305.0415	Aggregate Detours	CY
305.0500	Shaping Shoulders	STA

(2) Payment for the Base Aggregate Dense and the Aggregate Detours bid items is full compensation for preparing the foundation; and for placing, shaping, compacting, and maintaining the base.

(3) Payment for Shaping Shoulders is full compensation for blading, shaping, compacting, and maintaining the existing aggregate shoulders.

(4) If the contractor substitutes 3-inch in base course or 1 1/4-inch in shoulders as allowed under 305.2.2.1, the department will pay for the substitute material as follows:

- At the Base Aggregate Dense 1 1/4-Inch unit price if substituting 3-inch in base course.
- At the Base Aggregate Dense 3/4-Inch unit price if substituting 1 1/4-inch in shoulders.

415 Concrete Pavement

415.1 Description

(1) This section describes constructing concrete pavement as well as approach slabs, alleys, and pavement gaps.

415.2 Materials

415.2.1 Concrete

(1) Furnish grade A concrete conforming to 501 as modified for class I pavement concrete in 715. Provide QMP for class I pavement concrete as specified in 715.

(2) Furnish high early strength concrete under the HES bid items. The contractor may use special high early strength concrete as specified for SHES concrete repair and replacement in 416.2 for pavement placed in conjunction with the SHES repair and SHES replacement items for repair areas 300 feet long or longer.

(3) Maintain a uniform consistency in consecutive batches of concrete. Use the following slumps for the technique used:

SLIP-FORMED	NOT SLIP-FORMED
2.5 inches or less	4 inches or less

415.2.2 Reinforcement

(1) Furnish steel reinforcement conforming to 505.2.4. Furnish dowel bars and tie bars as the plans show and conforming to 505.2.6.

415.2.3 Expansion Joint Filler

(1) Furnish expansion joint filler conforming to AASHTO M153, AASHTO M213, or ASTM D8139 in lengths equal to the pavement lane width and of the thickness and height the plans show. Where dowel bars are required, use filler with factory-punched holes at the dowel bar locations and with a diameter not greater than 1/8 inch larger than the nominal dowel bar diameter.

415.2.4 Concrete Curing Compounds

(1) Furnish poly-alpha-methylstyrene (PAM) liquid curing compound conforming to ASTM C309, type 2, class B as modified here in 415.2.4.

(2) Furnish curing compound with a resin consisting of 100 percent poly-alpha-methylstyrene and with, by weight, 42 percent or more total solids. Modify ASTM C309 to ensure the following:

- Loss of water in 24 hours does not exceed 0.15 kg/m^2.
- Loss of water in 72 hours does not exceed 0.40 kg/m^2.
- Reflectance in 72 hours is greater than or equal to 65 percent.
- The volatile organic compound (VOC) content does not exceed 350 g/L.

415.2.5 Concrete Pavement Gaps

(1) Use concrete of the same mix design used for the contiguous pavement. If the engineer allows paving through the gap, use a concrete mix design that will develop 2500 psi opening strength in an engineer-approved maximum time.

415.2.6 Joint Filler

(1) Furnish a hot-poured elastic joint sealer according to ASTM D6690 type II.

415.3 Construction

415.3.1 General

(1) Use handling, weighing, batching, mixing, and hauling equipment and procedures conforming to 501. In addition proportion aggregates and cement for concrete pavement in batching plants by weight using semi-automatic or automatic batching plants.

(2) If using ready-mixed concrete, ensure production and uniform delivery of at least 80 cubic yards per hour to support two-lane slip-form operations and at least 40 cubic yards per hour for single-lane slip-form or hand placement operations.

415.3.2 Concrete Placement and Finishing Equipment

415.3.2.1 Slip-Form Paver

(1) Use an engineer-approved, self-propelled slip-form paver capable of consolidating, screeding, and float-finishing freshly placed concrete in one complete pass of the machine for the required thickness. Use machines equipped to internally vibrate the concrete for the full width and depth placed in a single pass as required to produce a dense, homogeneous pavement. Equip the slip-form paver with devices

that accurately space and position required tie bars and that allows for automatic or manual tie bar insertion.

(2) Ensure that paver vibration equipment is capable of producing the frequency and amplitude the paver manufacturer recommends for the placement at hand.

415.3.2.2 Hand Vibrators

(1) Use hand-operated single spud internal vibrators capable of consolidating concrete pavement adjacent to forms, joints, or fixtures. Ensure that vibrators produce a minimum of 7000 impulses per minute.

415.3.2.3 Screeds for Formed Pavement

(1) Use air-vibrated or mechanically-vibrated truss screeds designed for and capable of striking off fixed-form concrete pavement for the size of placement at hand.

415.3.2.4 Forms

(1) Use clean, straight, un-warped steel forms with a vertical face as high or higher than the pavement thickness minus 1 1/2 inches. Ensure that forms have side and base supports capable of supporting finishing equipment and are sufficiently strong to resist concrete pressure without bulging.

(2) The contractor may use wood or plastic forms for forming fillets, widened areas in intersections, curves less than 100-foot radius, and in other engineer-approved locations.

415.3.2.5 Hand Finishing Tools

(1) Use aluminum, magnesium, or wooden hand finishing tools. Do not use steel hand finishing tools.

415.3.2.6 Concrete Saws

(1) Use saws light enough to operate on and capable of sawing new concrete with minimal raveling, chipping, spalling, or otherwise damaging the pavement. Ensure that saws have diamond blades with functioning blade guards and are equipped with guides or other devices to control cut alignment and depth.

415.3.3 Preparing the Foundation

(1) Prepare the base course as specified in 211.3.4 before placing concrete. Repair and re-compact rutted or disturbed base resulting from hauling or paving operations. The engineer may suspend paving operations if the contractor fails to repair and maintain the base course in advance of the paving operation.

(2) Identify areas of yielding subgrade. The engineer may direct or allow EBS to correct subgrade problems as specified in 301.3.5.

415.3.4 Setting Forms

(1) Set forms to the required grade and alignment. Firmly support and anchor forms in a manner that prevents movement during concrete placement. Ensure that forms are sufficiently tight to prevent loss of concrete either under or through the forms.

(2) Immediately before placing concrete recheck the foundation as well as the grade and alignment of the forms. Ensure that the forms are not twisted. Make necessary corrections to the forms and foundation before placing concrete.

415.3.5 Reinforcement

(1) Reinforce the concrete if and as the plans specify. Keep reinforcement clean, free of rust and scale, and supported to prevent distortion. Store reinforcement steel, received on the job, in engineer-approved storage and distribute only as needed for placement.

(2) Protect epoxy coated steel from cumulative exposure to sunlight for more than 2 months by covering with an opaque engineer-approved material. Clear plastic shrink wrap for dowel bar bars and dowel baskets is sufficient protection for up to 4 months exposure.

415.3.6 Placing Concrete

415.3.6.1 General

(1) Unless the engineer allows otherwise, slip-form work that is 300 feet or more in length, a minimum of 10 feet in width or greater, and a constant width. Also use slip-formed placement wherever practicable for other work unless the engineer directs or allows otherwise. In irregular areas or areas inaccessible to self-propelled slip-form paving equipment, construct the pavement using fixed forms.

(2) Use machine methods to strike-off and consolidate the concrete. The contractor may, if the engineer allows, use hand methods for areas with variable slab width, for strips or lanes of pavement uniformly

less than 10 feet wide, for transition sections on curves or at other points with variable pavement crown, and for other areas where it is impracticable to use machine methods.

(3) Deposit concrete on the base course continuously in a manner that minimizes segregation. Place to a depth sufficiently above grade so, after consolidating and finishing, the required slab thickness is obtained and the surface conforms to the specified grade and slope.

(4) Use two-lane placement for rural pavement unless staging dictates single-lane paving. Delay placement of adjoining lanes until completed lanes are sufficiently cured to preclude damage to work already placed. Do not operate paving equipment on pavement not meeting the opening to service criteria specified in 415.3.15.

(5) Shut down placement if paving train equipment breaks down, finishing and curing operations are delayed, or if the materials or work are nonconforming. Cover the concrete at the unfinished end of the placement to maintain moisture during temporary shutdowns. Provide construction joints if interruptions are long enough for the concrete to develop its initial set.

(6) Check the surface of the newly placed concrete with a long-handled 10-foot or longer straightedge. Overlap successive passes by about 1/2 the straightedge length. Cut down high areas. Fill depressions immediately with freshly mixed concrete and strike off, consolidate, and refinish the concrete. Do not add water to correct surface deficiencies except in emergency cases or with engineer authorization.

(7) Set castings and frames for manholes, catch basins, inlets, and other fixtures conforming to 611.3.3. Adjust to required alignment and grade while adjacent concrete is plastic. Hand vibrate concrete adjacent to fixtures to fill voids and openings between fixtures and support structures. Fill remaining voids beneath the base of these fixtures with an engineer-approved non-shrink grout before opening to traffic.

415.3.6.2 Slip-Formed Placement

(1) Coordinate the mixing, delivering, and spreading operations to provide uniform progress. Check and adjust string lines, sensors, and other paver guidance equipment during paving to assure uninterrupted placement to the plan alignment and grade.

(2) Advance the paving train at a slow uniform pace stopping and starting the paver as little as possible. If it is necessary to stop the forward movement of the paver, stop vibrating and tamping immediately, and restart when forward motion resumes.

(3) Ensure that concrete is uniformly consolidated throughout its width and depth, free from honeycombed areas, and has a consistent void-free closed surface.

(4) Keep hand finishing efforts on the surface to a minimum to avoid over finishing. Hand-float the surface only as needed to produce a uniform surface and sharp corners. Do not use excess mortar to build up slab edges or round the slab corners.

(5) Maintain an edge slump, exclusive of edge rounding, no greater than of 3/8 inch at free edges or 1/8 inch, where abutting other concrete. Correct excessive edge slump before concrete hardens and adjust operations to reduce edge slump to an acceptable level. Tool pavement edges to a 1/4-inch radius ensuring that edges are smooth and true to line.

415.3.6.3 Formed Placement

(1) Deposit concrete as near a possible to its final location to minimize segregation. Consolidate uniformly throughout the depth and systematically across the area of the placement to produce a dense, homogeneous pavement.

(2) Strike off with vibrating screeds unless the engineer directs or allows otherwise. Maintain a uniform quantity of concrete in front of the screed sufficient to fill voids or low areas. Do not allow excessive concrete accumulation in front of the screed, causing the concrete to surge under the screed, or produce ridges or waves in the surface. Do not make more than 2 passes of the vibratory screed on a given area of concrete. Coordinate forward movement of the screed with vibration frequency to optimize consolidation. Do not vibrate the concrete with the screed in a stationary position.

(3) Augment vibrating screeds with internal vibration in front of the screed for placements over 5 inches deep. Insert single spud hand vibrators vertically in a grid pattern just long enough to bring mortar to the surface. Ensure that areas visibly affected by successive vibrator insertions overlap by 2 - 3 inches. Do not drag spud vibrators through the concrete or move concrete laterally by vibration.

(4) Use single spud hand vibrators to consolidate the concrete adjacent to transverse construction joints and along the full length of dowel basket assemblies. Vibrate to a depth that consolidates the concrete above and below the dowel bars. Vibrate along the forms as required to achieve a void-free formed edge. Do not allow vibrators to contact reinforcement, forms, or the grade during vibration.

(5) Float the surface as needed to produce a uniform surface. Before the concrete's initial set, tool the pavement edges and along each side of transverse isolation joints, formed joints, transverse construction joints, and fixed forms to produce a true-to-line 1/4-inch radius with a smooth, dense mortar finish.

(6) Remove forms after pavement has cured sufficiently to avoid damaging the concrete. The contractor may remove individual forms sooner to saw transverse joints. Fill surface voids as soon as practicable after form removal using a well-mixed grout composed of one part cement and 3 parts fine aggregate.

415.3.7 Jointing

415.3.7.1 General

(1) Construct joints as and where the plans show perpendicular to the pavement surface.

(2) For intersections, plan and locate points necessary to establish the horizontal position of transverse and longitudinal joints to prevent uncontrolled cracking. Submit a joint layout design to the engineer at least 7 calendar days before paving each intersection. Do not lay out joints until the engineer has reviewed the joint layout design. Mark the location of concrete joints in the field. Follow the concrete pavement jointing plan details making adjustments as required to fit field conditions. For unique project circumstances not covered in the plan details, review the joint layout plan with the engineer.

(3) Use construction joints as dictated by contractor operations to join together work at locations where the plans show no joints. Join new work to existing concrete pavement using tie bars epoxied into the existing pavement as specified in 416.3.3.2 or dowel bars epoxied into the existing pavement as specified in 416.3.4. The contractor may use cast-in-place tie bars or dowel bars in construction joints of pavement placed under the contract.

(4) Maintain the alignment of dowel bars, tie bars, and other reinforcing or embedments when placing joints. Augment machine vibration with hand vibrators if necessary to ensure complete consolidation at joints.

(5) Test joints with a straightedge before the concrete sets. Correct if one side of the joint is higher than the other or if higher or lower than adjacent slabs. Remove any concrete, mortar, or laitance resulting from paving operations before it hardens. Remove concrete fins extending across isolation joints, doweled joints, and expansion joints after the concrete hardens.

(6) Saw joints in a single cut to the width and depth the plans show. Begin sawing as soon as the concrete hardens sufficiently to prevent excessive raveling along the saw cut and finish before conditions induce uncontrolled cracking. Provide artificial light if sawing between sunset and sunrise.

(7) The contractor may saw the transverse joints by the skip method, wherein every third joint is sawed as soon as possible. Following this skip sawing, make the cuts of the remaining intermediate joints.

(8) The contractor may temporarily hand tool joints to reduce the potential for early cracking. Ensure that hand-tooled joints have a 1/4-inch radius and are smooth and true to line. Saw hand tooled joints to the plan depth as soon as practicable.

415.3.7.2 Longitudinal Joints

(1) If the plans do not show a specific location, construct parallel to the centerline along lane edges. On two-lane pavements, construct along the pavement centerline. On multilane pavements, construct along traffic and taper lane edges. Make joints perpendicular to the pavement surface. Do not deviate more than 1/2 inch in 10 feet from the required line.

415.3.7.3 Transverse Joints

(1) Extend transverse joints across the entire width of paving and through curb or median placed integrally with pavement. When the pavement abuts existing pavement, curb and gutter, or median, construct transverse joints in locations matching existing joints or cracks.

(2) Install dowel bars as follows:

- Within one inch of the planned transverse location and depth.
- Within 2 inches of the planned longitudinal location.
- Parallel to the pavement surface and centerline within a tolerance of 1/2 inch in 18 inches.

(3) Hold dowel bars in the correct position and alignment using an engineer-approved device during construction. Do not allow bonded longitudinal bars or reinforcement to extend across transverse expansion or contraction joints. The contractor need not cut dowel basket tie wires.

(4) If using a mechanical device to install dowel bars, conform to the following:

- Place and consolidate the pavement to full depth before inserting the dowel bars.
- Insert the dowel bars into the plastic concrete in front of the finishing beam or screed.

- Ensure that the installing device consolidates the concrete with no voids around the dowel bars.
- Do not interrupt the forward movement of the finishing beam or screed while inserting the dowel bars.
- Provide a positive method of marking the locations of the transverse joints.

(5) Remove concrete directly above expansion joint filler, if necessary, by sawing the full width of the filler to remove concrete bridging the joint.

(6) Form a construction joint at the end of each day's run or when an interruption long enough for the concrete to develop its initial set occurs by doing one of the following:

- Set a header board to support dowel bars. Use production quality concrete, hand vibrated behind the header board, and protect protruding steel from anything that might damage the bars or weaken the bond.
- Saw back the concrete full depth to expose solid concrete then drill and epoxy in dowel bars.

415.3.8 Surface Finishing

415.3.8.1 General

(1) Finish the pavement surface after straightedging, after excess moisture disappears, and while it is still possible to produce a uniform striated surface texture.

415.3.8.2 Design Speed Less Than 40 MPH

(1) Provide an artificial turf drag surface finish. Use a seamless strip of artificial turf approximately full pavement width and of sufficient length to provide approximately 2 feet of turf in contact with the pavement surface. Pull the drag with a device that allows control of the time and rate of texturing. Operate the drag in a longitudinal direction parallel with the centerline to produce a straight finish. Weight the drag as necessary to maintain contact with the pavement. Keep the drag clean and free of particles of hardened concrete.

(2) Where it is impracticable to apply a turf finish, apply a broom finish.

(3) Restore pavement texture damaged by rain by re-dragging the concrete while still plastic.

415.3.8.3 Design Speed - 40 MPH and Higher

415.3.8.3.1 General

(1) Texture and tine freshly placed pavement as soon as practicable after floating. Texture with an artificial turf drag as specified in 415.3.8.2.

(2) Longitudinally tine with a self-propelled tining machine. Where using a tining machine is impracticable, tine by hand. Produce uniformly deep grooves approximately 1/8 to 3/16 inch deep. Provide a finished surface free of tining defects. Complete before tining tears or unduly roughens the concrete.

(3) For hand work, use longitudinal tining unless the engineer directs or allows otherwise.

(4) When paving next to existing pavement and for repair work, match the existing tining direction whether using machine or hand methods. The contractor may apply transverse tining where the engineer directs or allows.

415.3.8.3.2 Longitudinal Tining

(1) Use a tining machine with an automated horizontal and vertical alignment control system to ensure that tining runs straight and parallel to the longitudinal axis of the pavement. Use a rake with individual 1/8-inch wide tines spaced uniformly 3/4 inches on center. Do not tine, but instead apply an artificial turf drag finish, within 2 inches of a longitudinal sawed joint.

415.3.8.3.3 Transverse Tining

(1) Use a rake with individual 1/8-inch wide tines spaced uniformly 5/8 inches on center. For machine work, use a 10-foot rake drawn transversely across the full pavement width without overlapping passes.

415.3.9 Stamping

(1) At the beginning of each day's run and at the end of the job, stamp the contractor's name and the year of pavement construction into the pavement. Use 2-inch numbers for the year of construction.

415.3.10 Surface Testing

415.3.10.1 Smoothness

(1) Test the pavement surface at engineer-selected locations with a 10-foot straightedge or other engineer-specified device. The engineer may direct the contractor to mark and grind down areas showing high spots greater than 1/8 inch but not exceeding 1/2 inch in 10 feet. Grind until there are no deviations greater than 1/8 inch when retested with the straightedge. The engineer may direct the contractor to remove and replace areas with deviations greater than 1/2 inch in 10 feet.

(2) Perform grinding as specified in 415.3.11.

(3) If the engineer directs removal, remove an area at least 6 feet long and extending across the full lane width. Also remove adjacent pavement less than 6 feet from a transverse joint.

415.3.10.2 Ride Quality

(1) Provide QMP for concrete pavement ride quality as specified in 740.

415.3.11 Pavement Grinding

(1) Perform grinding with an engineer-approved device specifically designed for pavement grinding having diamond blades uniformly spaced with at least 50 blades per linear foot. Perform additional light grinding as necessary to provide a neat rectangular area of uniform appearance. Perform the grinding parallel with the centerline. Do not use a bush hammer or other impact device.

(2) Complete required grinding or replacement before determining the pavement thickness.

415.3.12 Curing Concrete

415.3.12.1 General

(1) Maintain adequate moisture throughout the concrete mass to support hydration until the concrete develops sufficient strength to open it to service. Except as allowed under 415.3.12.3, apply curing compound as specified in 415.3.12.2. Use PAM except, use curing compound conforming to 501.2.8 on pavement that will get an overlay under the contract.

(2) If the contractor does not cure concrete as specified in this subsection, the engineer may suspend concrete placement.

415.3.12.2 Impervious Coating Method

(1) After finishing operations, and as soon as the free water disappears, spray the concrete surface with a uniform coating of curing compound. Seal moisture in the concrete by applying a continuous water-impermeable film on exposed concrete surfaces.

(2) Provide sufficient agitation while spraying to ensure uniform consistency and dispersion of pigment within the curing compound during application.

(3) Apply the curing compound with an engineer-approved self-propelled mechanical power sprayer whenever practicable. The contractor may use hand-operated spraying equipment for the following:

- Irregular, narrow, or variable width sections.
- Re-coating applications or after form removal.
- Special applications the engineer approves.

(4) For tined surfaces, apply the curing compound uniformly at or exceeding a minimum rate of one gallon per 150 square feet. For other surface finishes, apply the curing compound uniformly at or exceeding a minimum rate of one gallon per 200 square feet.

(5) If the curing compound coating is damaged within 72 hours after application, immediately recoat the affected area. If removing forms within 72 hours after placing the concrete, coat newly exposed surfaces within 30 minutes after form removal.

415.3.12.3 Alternate Curing Methods

(1) If the contractor requests, the engineer may approve the use of alternate materials or curing methods. If the engineer requests, supply technical specifications, test results, or performance records to support the proposed alternative method.

(2) The engineer will approve delayed application of curing compound if the contractor uses the impervious sheeting method as specified in 502.3.8.1.2 to protect freshly placed concrete from rain damage, protect adjacent property from overspray damage, or to otherwise accommodate specific job conditions. Apply PAM curing compound immediately after removing the impervious sheeting.

415.3.13 Cold Weather Concreting

415.3.13.1 General

(1) The contractor is responsible for the quality of the concrete placed in cold weather. Take precautions necessary to prevent freezing of the concrete until it has developed sufficient strength to open it to service. Remove and replace frozen or frost damaged concrete.

(2) Unless the engineer gives written permission to continue, suspend concreting operations if a descending air temperature in the shade and away from artificial heat falls below 35 F. Do not resume concreting until an ascending air temperature in the shade and away from artificial heat reaches 30 F. The engineer may require the contractor to measure the concrete temperature, at the point of placement, if the ambient air temperature falls below 40 F. Maintain the temperature of the concrete at or above 50 F at the point of placement.

(3) If necessary to maintain placement temperature, the contractor may heat the water, aggregates, or both. Uniformly heat, with steam or by other means, aggregates frozen or containing frost. Accurately control the temperature of the mixing water as it is heated. Do not allow the temperature of either the mixing water or the aggregates to exceed 100 F when placed together with the cement in the mixer. Control the temperature of the water and the aggregates so that the temperature of the concrete discharged from the mixer is between 50 and 80 F inclusive.

(4) Do not heat the cement, add salt or chemical admixtures to the concrete mix to prevent freezing, or place concrete on a frozen base or subgrade.

415.3.13.2 Protective Covering

(1) Arrange to have available a sufficient quantity of material to provide thermal protection for concrete that has yet to conform to the opening criteria specified in 415.3.15. The contractor may provide clear, black, or white polyethylene sheeting conforming to 501.2.8, except for color and reflectance. The engineer may allow other curing materials with suitable water resistance, strength, and insulating properties.

(2) If the national weather service forecast for the construction area predicts temperatures of less than 17 F within the next 24 hours, arrange to have available a sufficient quantity of straw or hay to protect concrete that has yet to conform to the opening criteria specified in 415.3.15. If the engineer approves, the contractor may use other materials placed to the thickness necessary to provide the same insulating protection as the required thickness of loose, dry straw or hay.

(3) At any time of the year, if the national weather service forecast for the construction area predicts freezing temperatures within the next 24 hours, or when freezing temperatures actually occur, provide the minimum level of thermal protection specified below for concrete that has yet to conform to the opening criteria specified in 415.3.15.

PREDICTED OR ACTUAL AIR TEMPERATURE	MINIMUM EQUIVALENT LEVEL OF PROTECTION
22 to <28 F	single layer of polyethylene
17 to <22 F	double layer of polyethylene
<17 F	6" of loose, dry straw or hay between 2 layers of polyethylene

(4) Place protective material as soon as the concrete is finished and sets sufficiently to prevent excessive surface marring. Maintain protective material in place until the concrete conforms to opening criteria specified in 415.3.15. If removing coverings to saw joints or perform other required work, and if the engineer approves, the contractor may remove the covering for the minimum time required to complete that work.

415.3.14 Protecting Concrete

(1) Erect and maintain suitable barricades and, if necessary, provide personnel to keep traffic off the newly constructed pavement until it is opened for service as specified in 415.3.15. Conform to 104.6 for methods of handling and facilitating traffic.

(2) Protect the pavement against both public traffic and construction activities. Repair or replace, as the engineer directs, pavement damaged by traffic or otherwise damaged before acceptance.

(3) Arrange to have available materials for protecting the unhardened concrete against rain damage. If rain is imminent, cover unhardened concrete immediately with plastic or other engineer-approved material secured along pavement edges. Provide drainage as required to protect the work.

415.3.15 Opening to Service

415.3.15.1 General

(1) Maintain moisture, temperature, and physical protection for concrete until it develops sufficient strength to open it to service. The engineer will use the same criteria to allow opening of non-pavement concrete to service as are used to allow opening of pavement to traffic.

(2) The engineer will allow the contractor to open pavement to construction and public traffic when the concrete attains a verified compressive strength of 3000 psi. Absent compressive strength information, the engineer may allow the contractor to open pavement after the following minimum times, as adjusted for changes in the ambient air temperature on the project:

APPLICATION	EQUIVALENT CURING DAYS
High early strength concrete	3
Grade A general purpose concrete Without blended cements or field-added supplementary cementitious materials	4
Grade A general purpose concrete With blended cements or field-added supplementary cementitious materials	7

(3) The equivalent curing day is based on a daily average ambient temperature of 60 F. The daily average ambient temperature is the average of the high and low engineer-recorded temperatures on the project site for each day. If this daily average ambient temperature falls below 60 F, accumulate equivalent curing days at a reduced rate. For a daily average ambient temperature of:

1. 60 F or more; accumulate one equivalent curing day per calendar day.
2. 40 to less than 60 F; accumulate 0.6 equivalent curing day per calendar day.
3. Less than 40 F; accumulate 0.3 equivalent curing day per calendar day.

(4) The contractor may operate concrete saws and lightweight profilers on concrete that does not conform to these opening criteria. If the engineer approves, the contractor may operate other necessary light equipment on concrete that does not conform to these opening criteria. The engineer may suspend or delay operations that injure the surface or otherwise damage the concrete. Clean the surface before allowing traffic of any kind on the pavement.

415.3.15.2 Opening Strength

415.3.15.2.1 General

(1) Determine opening strength and provide the engineer with the information required to verify that strength by one or a combination of the following methods:

1. Compressive strength testing of cylinders.
2. Maturity method.
3. Compressive strength testing of cores.

(2) The resulting opening strength, after engineer verification, will apply to concrete on the same project conforming to the following criteria:

- Of the same mix design as the test location.
- Cured under similar or more desirable conditions.
- Placed on or before the test location.

(3) If direct compressive strength test results and maturity data are not available, the engineer may estimate compressive strength based on test results of concrete of the same mix design placed contiguously under similar conditions on the same project.

415.3.15.2.2 Compressive Strength Testing of Cylinders

(1) Submit the compressive strength test results to the engineer for verification. Compute the opening strength as the average of compressive strength test results for 2 cylinders. If the strength of a cylinder is less than 90 percent of the required strength, the engineer will reject the resulting average. Field cure cylinders under conditions similar to those prevailing for the pavement they represent. Fabricate cylinders according to AASHTO T23 and test the cylinders according to AASHTO T22.

415.3.15.2.3 Compressive Strength Testing of Cores

(1) Submit core test results to the engineer for verification. Determine opening strength from the compressive strength of cores obtained and tested according to AASHTO T24.

415.3.15.2.4 Maturity Method

(1) Conform to the concrete maturity method requirements of 502.3.10.1.3.3.

415.3.16 Incorporate project reference plate and adopt ASTM procedure. ASP 6 Nov 21 let.

415.3.16 Tolerance in Pavement Thickness

415.3.16.1 General

(1) Construct the plan thickness or thicker. The department will accept pavement thickness based on the results of department-performed acceptance testing conforming to:

Magnetic Pulse Induction.....CMM 870: ASTM E3209 WTM
Probing .....CMM 870: WTP C-002

415.3.16.2 Pavement Units

415.3.16.2.1 Basic Units

(1) Basic unit is defined as a slip formed, single lane, with a minimum lane width of 10 feet. Width is measured from the pavement edge to the adjacent longitudinal joint; from one longitudinal joint to the next; or between pavement edges if there is no longitudinal joint.

415.3.16.2.2 Special Units

(2) Establish special units for areas of fillets, intersections, gaps, gores, shoulders, ramps, pavement lanes less than 10 feet wide and other areas not included in basic units.

415.3.16.3 Test Plate Locations

(1) Place department-furnished test plates. Within 5 business days after paving, enter the sequential number and associated position data into MRS available at:

http://www.atwoodsystems.com/

(2) Maintain plate location markings for 10 business days after paving.

415.3.16.4 Acceptance Testing

415.3.16.4.1 Basic Units

415.3.16.4.1.2 Magnetic Pulse Induction

(1) The department will measure thickness within 10 business days of paving. Upon completion of the project thickness testing, the department will provide the test results to the contractor within 5 business days.

(2) The department will establish a project reference plate at the start of each paving stage. The department will notify the contractor of project reference plate locations before testing. The department will measure the project reference plate before each day of testing.

(3) If the random plate test result falls within 80 to 50 percent pay range specified in 415.5.2, the department will measure the second plate in that unit. The department will notify the contractor immediately if the average of the 6 readings fall within the 80 to 50 percent pay range.

(4) If an individual random plate test result is more than 1 inch thinner than contract plan thickness, the department will measure the second plate in that unit. If both plates are required to be measured, then all six thickness measurements will be averaged for that unit. If the average of the six measurements is more than 1 inch thinner than contract plan thickness, the pavement is unacceptable.

415.3.16.4.2 Special Units

415.3.16.4.2.1 Magnetic Pulse Induction

(1) The department will measure thickness within 10 business days of paving. Upon completion of the project thickness testing, the department will provide the test results to the contractor within 5 business days.

(2) Department will establish a project reference plate at the start of each paving stage. Project reference plate will be measured before each day of testing. Department will notify the contractor of project reference plate locations before testing.

(3) If the random plate test result falls within 80 to 50 percent pay range specified in 415.5.2, the department will measure the second plate in that unit. The department will notify the contractor immediately if the average of the 6 readings fall within the 80 to 50 percent pay range.

(4) If an individual random plate test result is more than 1 inch thinner than contract plan thickness, the department will measure the second plate in that unit. If both plates are required to be measured, then all six thickness measurements will be averaged for that unit. If the average of the six measurements is more than 1 inch thinner than contract plan thickness, the pavement is unacceptable.

415.3.16.4.2.2 Probing

(1) The department will measure slip form special units during concrete placement. Upon completion of the project thickness testing, the department will provide the test results to the contractor within 5 business days.

(2) The department will probe 2 random locations within the special unit. The average of the two readings is the reported thickness measurement for the special unit.

415.3.16.4.2.3 Preplacement Measurement

(1) The department will measure non-slip form special units before concrete placement.

(2) Correct the thickness until conforming by reshaping the base aggregate before the placing pavement.

415.3.17 Concrete Crack Repair

(1) The engineer will inspect concrete pavement for transverse cracking, twice, as follows:

1. After attaining opening strength as specified in 415.3.15 but before opening to construction or public service.
2. Before opening to public service or before partial acceptance as defined in 105.11.1, whichever comes first.

(2) The engineer will determine if a transverse crack needs repair and the type of repair needed. Repair the cracked concrete as the engineer directs.

415.3.18 Pavement Gaps

(1) Construct gaps using either doweled or tied construction joints. Locate construction joints and joints within the gap ensuring that the resulting slab lengths are greater than or equal to 6 and less than or equal to 15 feet long. Alternatively, if the engineer approves, the contractor may pave continuously through the gap using concrete conforming to 415.2.5.

415.3.19 Approach Slabs

(1) Unless the engineer directs otherwise, the contractor may construct the approach slab before, at the time of, or after constructing the roadway pavement.

(2) The contractor may use built-up forms instead of full depth metal side forms. Place reinforcing steel as the plans show. Employ engineer-approved methods to support bar steel and dowel bars in their plan position during concrete placing and finishing.

415.3.20 Filling Joints

(1) Fill joints in concrete pavement, not requiring tining under 415.3.8, and in the adjacent curb and gutter with filler conforming to 415.2.6 as soon as practicable after the engineer inspects them.

(2) Clean joints of laitance, curing compound, and other contaminants before filling. Saw construction joints at least 3/4 inches deep before filling. Sawing is not required for tooled joints in curb and gutter. Sandblast or waterblast exposed joint faces using multiple passes as required to clean joints surfaces of material that might prevent bonding. Blow clean and dry with oil-free compressed air immediately before filling.

(3) Heat filler to the manufacturer's recommended pouring temperature in an engineer-approved double boiler with the space between the inner and outer shells filled with oil or other engineer-approved heat transfer medium. Ensure that the heating kettle is equipped with a mechanical agitator, positive temperature control, and an engineer-approved thermometer. Do not operate the heating kettle on concrete without insulation or a heat shield to protect the concrete surface. If applying only a small amount of filler, the engineer may allow alternate heating equipment.

(4) Do not heat above the maximum safe temperature the filler manufacturer recommends. Discard over-heated material.

(5) Maintain a uniform filler temperature within the manufacturer's recommended working range throughout the filling operation. Cease filling if the temperature in the applicator falls more than I0 F below the manufacturer's recommended pouring temperature.

(6) Completely fill joints without overflowing so that the finished filler is approximately flush with the adjoining surfaces after shrinking. If one pass gives unsatisfactory filling, use 2 passes making sure that at least half of the required filler is poured on the first pass. Make the second pass as soon as practicable after the first pour attains maximum shrinkage but not later than an hour after the first pour.

415.4 Measurement

(1) The department will measure the Concrete Pavement and Concrete Alley bid items by the square yard acceptably completed, measured using the centerline length and the width from outside to outside of completed pavement, but limited to the width the plans show or the engineer directs. The department will include fillets for widened sections, or at drain basins and similar locations, placed monolithic with the pavement. The department will not deduct for fixtures with an area of one square yard or less as measured in the plane of the pavement surface.

(2) The department will measure the Concrete Pavement Approach Slab bid items by the square yard acceptably completed, based on the pay limits the plans show.

(3) The department will measure Concrete Pavement Gaps as each individual gap acceptably completed including eliminated gaps the engineer allows the contractor to pave through, measured separately for each roadway. The department will measure multiple gaps at one roadway location as required to

conform to contract staging provisions, but not solely to accommodate the contractor's means and methods.

(4) The department will measure Concrete Pavement Joint Filling by the square yard acceptably completed, measured as the concrete pavement area plus the length times nominal width of adjacent curb and gutter.

415.5 Payment

415.5.1 General

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
415.0060 - 0199	Concrete Pavement (inch)	SY
415.0210	Concrete Pavement Gaps	EACH
415.0310	Concrete Alley	SY
415.0410	Concrete Pavement Approach Slab	SY
415.1080 - 1199	Concrete Pavement HES (inch)	SY
415.1310	Concrete Alley HES	SY
415.1410	Concrete Pavement Approach Slab HES	SY
415.4100	Concrete Pavement Joint Filling	SY

(2) Payment for the Concrete Pavement bid items is full compensation for providing pavement; for preparing the foundation, unless provided otherwise; for placing thickness plates; and for thickness coring and filling core holes as required under 415.3.16.4. Payment also includes providing tie bars and dowel bars within concrete placed under the contract. The department will pay separately for tie bars and dowel bars used to connect the work to concrete not placed under the contract under the Drilled Tie Bars and Drilled Dowel Bars bid items as specified in 416.5. The department will not pay for removal and replacement of pavement not meeting the surface smoothness tolerances specified in 415.3.10.

(3) Payment for Concrete Pavement Gaps is full compensation for providing pavement gaps. If the engineer allows paving through a gap, the department will pay the full contract price for each gap eliminated. Payment for furnishing and placing concrete material is included under Concrete Pavement.

(4) Payment for the Concrete Pavement Approach Slab bid items is full compensation for providing the approach slab; and for bar steel reinforcement, dowel and tie bars, and jointing materials.

(5) The department will pay for engineer-approved EBS to correct subgrade problems beyond the contractor's control as specified in 301.5.

(6) Payment for Concrete Pavement Joint Filling is full compensation for filling concrete pavement joints; for filling adjacent curb and gutter joints; and for sawing.

415.5.2 Define threshold for pavement replacement. ASP 6 Nov 21 let.

415.5.2 Adjusting Pay for Thickness

(1) The department will adjust pay for pavement thickness under the Nonconforming Thickness Concrete Pavement administrative item as follows:

FOR PAVEMENT THINNER THAN PLAN THICKNESS BY:	PERCENT OF THE CONTRACT UNIT PRICE
> 1/4 inch but <= 1/2 inch	80
> 1/2 inch but <= 3/4 inch	60
> 3/4 inch but <= 1 inch	50

(2) If the department determines areas of pavement have unacceptable final thickness, as specified in 415.3.16.4, the department will direct the contractor to either:

1. Remove and replace unacceptable concrete pavement to the nearest joint with new concrete pavement of conforming thickness. The department will pay once for the area at the full contract price.
2. If the unacceptable pavement is less than 100 LF, the department may allow the concrete to remain in place without payment for the unacceptable area.

415.5.3 Adjusting Pay for Pavement Crack Repairs

(1) The engineer will allocate responsibility and costs for crack repairs, mobilization for traffic control, and traffic control devices, according to CMM 424. The department will adjust pay under the Crack Repair Concrete Pavement administrative item.

(2) Pay adjustment for crack repair costs, based on the total repair area in a single panel, includes mobilization for the repair work; sawing; removing pavement; furnishing and placing materials including dowel bars; drilling in tie and dowel bars; and incidentals. The department will adjust pay for contiguous repair areas in adjacent panels separately. The engineer will compute the pay adjustment for repair costs as follows:

Total Reimbursement = (unit price x repair area + $1700)

Shared Reimbursement = 1/2 of the total reimbursement amount

(3) The department will adjust pay for traffic control devices and mobilization for traffic control separately.

416 Concrete Pavement - Appurtenant Construction

416.1 Description

(1) This section describes constructing concrete driveways; truck aprons; drilling in tie bars to tie existing to new concrete and drilling in dowel bars to transfer load between existing and new concrete; concrete surface drains; concrete rumble strips; and concrete pavement repair and replacement.

416.2 Materials

416.2.1 General

(1) Furnish concrete conforming to 501 as modified for class II concrete in 716. Provide QMP for class II ancillary concrete as specified in 716.

(2) Furnish high early strength concrete under the HES bid items. The contractor may use HES concrete even where the contract does not require it.

(3) Furnish calcium chloride for concrete placed under SHES bid items as follows:

1. For use in solid form or on the job preparation of admixture solutions, conform to AASHTO M144, type S, grade 1 or grade 2.
2. For admixture delivered in premixed solution form, conform to AASHTO M144, type L, in a concentration of approximately 30 percent.

416.2.2 Concrete Driveways, Truck Aprons, and Surface Drains

(1) Use grade A concrete as specified in 501.

416.2.3 Tie bars and Dowel bars

416.2.3.1 General

(1) Furnish tie bars and dowel bars conforming to 505.2.6.

416.2.3.2 Epoxy for Anchoring Dowel Bars and Tie Bars

(1) Furnish epoxy consisting of a 2-component epoxy material of contrasting colors and conforming to AASHTO M235, grade 3 - non-sagging consistency, type IV epoxy, except as modified below:

1. Use class B material for mid-depth slab temperatures between 40 and 60 F.
2. Use class C material for mid-depth slab temperatures between 60 F and the highest temperature allowed by the manufacturer of the product.

(2) Bond strength, tensile strength, and elongation testing is not required.

(3) Achieve a minimum compressive yield strength of 5000 psi at 8 hours for special high early strength concrete, or at 3 days for grades A, C, and E concrete. Test according to AASHTO M235 and ASTM D695, with the following restrictions:

1. Mold and cure compressive test specimens in cylinders with a one-inch nominal diameter.
2. Machine specimen ends square to produce a final specimen length of 2 inches.

(4) Before using the epoxy submit a manufacturer's certificate of compliance, and a certified report of test or analysis from a qualified independent laboratory, to the engineer certifying that the epoxy conforms to these specifications. Identify the temperature classes and compressive strength cure times for which the product is certified.

(5) The contractor may furnish an engineer-approved acrylic adhesive that meets the same physical requirements specified for epoxy.

416.2.4 Concrete Pavement Repair and Replacement

(1) Except as specified in 416.3.6 for inlaid rumble strips, use grade C concrete as specified in 501.

416.2.5 Special High Early Strength Concrete Pavement Repair and Replacement

416.2.5.1 Composition and Proportioning of Concrete

(1) For the concrete mixture, use a minimum of 846 pounds of cementitious material per cubic yard of concrete. Determine materials and proportions of the concrete mixture to obtain a minimum compressive strength in the concrete of 3000 psi within 8 hours of placement. The contractor may add one or a combination of admixtures to the ingredients or to the mixture in order to obtain the required minimum strength and required air content. Do not retemper the concrete mixture.

(2) Provide calcium chloride, if used in the mix, either as a pre-mixed solution or as a job-mixed solution. Ensure that job-mixed solutions contain 1.0 pounds per quart of 77 percent calcium chloride or 0.9 pounds per quart of 90 percent calcium chloride. Do not exceed the manufacturer's recommended maximum dosage. If the engineer requests, provide a written copy of the manufacturer's dosage recommendations.

(3) Add calcium chloride, in solution, by an engineer-approved procedure to the batch ingredients while placing them in the mixer. Provide sufficient water in job-mixed solutions to dissolve the calcium chloride completely, and ensure that the solution is of a uniform and known concentration. Reduce the quantity of mixing water by the quantity of solution used. Introduce the correct quantity of calcium chloride into the mixer using a method by which the quantity added cannot vary appreciably from the target value.

(4) Discharge concrete within 45 minutes after adding mixing water to the cement, or the cement to the aggregates, or within 30 minutes after adding an accelerating admixture, whichever comes sooner.

416.2.5.2 Evaluating Strength

(1) At least 3 business days before starting construction, provide the engineer with adequate evidence that the required strength is obtainable in the field with the materials used and at the various temperatures encountered. Conduct a continued strength evaluation, if the engineer requires, during the course of the work to ensure continued compliance with the strength requirements.

(2) Notify the engineer before making test cylinders and, if the engineer chooses, make arrangements for the engineer to observe cylinder production. Use a department qualified laboratory and an HTCP-certified technician to conduct preliminary and continued strength evaluations. Base each reported value on a minimum of 2 cylinders. After submitting data showing obtainment of the required strength, do not change the mix without first submitting a complete new set of test data showing compliance with the requirements.

416.3 Construction

416.3.1 General

(1) The engineer will inspect ancillary concrete, as defined in 416.5.2 and built under 416, for transverse cracking as specified in 415.3.17. Repair cracked concrete as the engineer directs.

416.3.2 Concrete Driveways and Truck Aprons

(1) Construct concrete driveways and truck aprons conforming to 415.3 except the contractor may use engineer-approved wood or plastic forms. Color concrete for roundabout truck aprons red as specified in 405.

416.3.3 Placing Tie Bars in Existing Concrete

416.3.3.1 Force Driven

(1) Drill a suitably sized hole into the edge of the existing concrete. Force drive the tie bar to a depth of 6 inches into the prepared hole as the plans show.

416.3.3.2 Epoxied

(1) Drill holes into the edge of the existing concrete to the dimensions the plans show. Anchor the tie bars into the existing concrete with an epoxy conforming to 416.2.3.2 and install conforming to 416.3.4 except no bond breaker is required.

416.3.4 Placing Dowel Bars in Existing Concrete

(1) Drill holes into the edge of the existing concrete to the dimensions the plans show. Anchor the dowel bars into the existing concrete with an epoxy conforming to 416.2.3.2.

(2) Clean drilling dust, debris, and excess moisture from holes before inserting the epoxy and dowel bar.

(3) Inject the epoxy into the back of the drill hole. Use an epoxy with a workable viscosity, pumpable, yet thick enough to remain in the hole. Insert a sufficient volume of epoxy into the hole to provide a small quantity of excess material at the face of the concrete after fully inserting the dowel.

(4) Insert dowel bars in the drill holes and rotate 1/2 turn. Do not force drive dowel bars into the drill holes.

(5) Completely fill the annular space between the dowel bar and the concrete with epoxy. Insert a retaining ring over the bar, and push the ring flush against the concrete surface to retain the epoxy.

(6) Coat the protruding portion of each dowel bar with a thin uniform layer of bond breaking lubricant.

(7) Use a positive fixed displacement dispensing system, equipped with a nozzle of sufficient length to deposit the epoxy at the back of the drilled hole. Use a system equipped with a means of checking the mix ratio of the epoxy components. Use the manufacturer's recommended mix ratio and check the ratio at least once a day.

(8) For minor quantities of dowel bars, the contractor may use hand-powered mixing and injecting equipment capable of thoroughly mixing and depositing the epoxy at the back of the drill hole.

416.3.5 Surface Drains

(1) Install and maintain temporary surface drains at locations designated for permanent drains until permanent drains are completed.

(2) Place and secure steel reinforcement and tie bars in their plan position before placing concrete. Place and cure the concrete conforming to 415.3.

(3) Excavate, prepare the subgrade and aggregate base, and backfill as required to place the drains and restore the grade after placement.

416.3.6 Concrete Rumble Strips

(1) Mill shoulder rumble strips into new or existing concrete shoulders. Mill or form intersection rumble strips into new concrete pavement or, if inlaid into existing HMA or concrete pavements, into work built under the Concrete Pavement Replacement bid item except use concrete conforming to 416.2.2. Do not apply rumble strips across bridges.

(2) If milling, use a rotary head mill with a cutting tip pattern that will produce a relatively smooth cut of the size, shape, spacing, and alignment the plans show. Ensure that cutting heads are on a suspension independent from the power unit to allow the heads to self-align with slopes and irregularities. Ensure that the machine has a guidance system that consistently provides the rumble strip plan alignment.

(3) If forming rumble strips into freshly placed concrete, form or finish the concrete to consistently produce the size, shape, spacing, alignment, and smoothness the plans show.

(4) Before beginning the work, demonstrate to the engineer that the proposed operation achieves the desired surface inside each depression without damaging the pavement. Place rumble strips in the pattern and shape the plans show. For shoulders carrying temporary traffic during construction, do not install rumble strips until after routing traffic back to the mainline.

(5) At the end of each work day, move equipment and material out of the clear zone and sweep or vacuum the traveled way pavement and shoulder areas. Sweep away or vacuum up milling debris before opening adjacent lanes to traffic. Dispose of waste material as specified in 203.3.4; do not place on the finished shoulder surface.

416.3.7 Concrete Pavement Repair and Replacement

(1) Repair concrete pavement at the locations the plans show or where the engineer directs. Conform to the pavement repair plan details. For individual repair areas at least one lane wide and greater than 15 feet to less than 300 feet long, conform to the pavement replacement plan details.

(2) Construct conforming to the following:

- Remove concrete pavement, remove asphaltic patch, and prepare the base as specified under 416.3.8.1.
- Place concrete in repair areas as specified under 416.3.8.2. Disregard the same-day requirements for completion of curing and opening to traffic and instead conform to 415.3.12 through 415.3.15.
- Place concrete in replacement areas conforming to 416.3.8.3 except disregard the same-day requirements for completion of curing and opening to traffic.

416.3.8 Special High Early Strength Concrete Pavement Repair and Replacement

416.3.8.1 General

(1) Repair concrete pavement at the locations the plans show or where the engineer directs. Conform to pavement repair plan details. For individual repair areas at least one lane wide and greater than 15 feet to less than 300 feet long, conform to pavement replacement plan details.

416.3.8.1.1 Removing Concrete Pavement

(1) Remove deteriorated slabs without damaging adjacent pavement. If removing only a portion of an existing slab, make a straight full lane-width full depth saw cut to facilitate removal without damaging the remaining pavement. Ensure that repair areas in adjacent lanes match longitudinally.

(2) If the contractor damages pavement remaining in place, repair as the concrete pavement repair and replacement details show. Ensure that the length of the damage repair and the adjacent planned repair are the same and both are a full lane wide. If damage is done to pavement not adjacent to a planned repair, conform to the minimum removal length the repair and replacement details show and remove and repair the full lane width.

(3) Remove concrete with minimal disturbance to the aggregate base. At the close of each day's work, ensure that slabs have been removed from the project limits and stored away from the roadway. Incorporate or dispose of removed pavement as specified in 203.3.4.

(4) Replace areas of the asphaltic shoulder removed during these pavement removal operations to the elevation of the adjacent shoulder using a commercially produced asphaltic patching material. Before patching, clean, dry, and provide a uniform edge for the repair area.

416.3.8.1.2 Removing Asphaltic Patches

(1) Remove existing asphaltic patches. Saw back the existing pavement full depth, in an area of sound concrete, as the plans show.

416.3.8.1.3 Base Course

(1) Place the concrete on existing base course shaped to the required cross-section. Remove concrete rubble and foreign material with minimal disturbance of the base. Fill low areas or depressions in the base following removal operations with either compacted aggregate base or additional concrete.

416.3.8.2 Placing Concrete in Repair Areas

(1) Place, cure, and open special high early strength concrete to traffic on the same day removing the old pavement. Place each repair in one continuous, full depth operation. Consolidate the concrete in place using an immersion type vibrator. Finish the surface by screeding twice, floating, and texturing. Orient the length of the screed parallel to the pavement centerline, unless the repair is over 12 feet in length.

(2) Make transverse edges of the finished repair flush with the edges of the existing concrete pavement. Make the longitudinal surface form a straight line from edge to edge with a tolerance of +/- 1/8 inch.

(3) Finish the final surface of full depth concrete repairs to match the edge of existing HMA or concrete pavement and, if the abutting pavement is concrete, match the existing pavement texture. Cure, protect, and open to service as specified in 415.3.12 through 415.3.15.

416.3.8.3 Placing Concrete in Replacement Areas

(1) Place, cure, and open special high early strength concrete to traffic by sunset on the same day removing the old pavement. Place each repair in one continuous, full-depth operation conforming to 415.3.6 through 415.3.15 except date each replacement slab with the month and year of construction.

416.4 Measurement

(1) The department will measure the Concrete Driveway bid items by the square yard acceptably completed, measured as specified in 415.4 for Concrete Pavement including the intersection with the sidewalk and the associated driveway apron. The department will only measure area outside the specified limits for the pavement, curbs, gutters, combination curb & gutter or other structures.

(2) The department will measure the Concrete Truck Apron bid items by the square yard acceptably completed.

(3) The department will measure the Drilled Tie Bars and Drilled Dowel Bars bid items as each individual bar acceptably completed.

(4) The department will measure the Concrete Surface Drains bid items by the cubic yard acceptably completed, based on the dimensions the plans show or the engineer directs.

(5) The department will measure Concrete Shoulder Rumble Strips by the linear foot acceptably completed, measured as the length along each side of the traveled way from the center of the first groove in a segment to the center of the last groove in that segment. A segment is a series of grooves including 50-foot and shorter gaps as well as skips at transverse joints the plans show. Gaps greater than 50 feet define a new segment. The department will deduct for skips at transverse joints greater than the plans show.

(6) The department will measure Concrete Intersection Rumble Strips by the square yard acceptably completed, measured to include the area between the milled or cast-in-place grooves, or if inlaid into existing HMA or concrete pavement, the area of the inlay. The department will not deduct for embedded fixtures with an area less than one square yard as measured in the plane of the pavement.

(7) The department will measure the Concrete Pavement Repair and Concrete Pavement Replacement bid items by the square yard acceptably completed.

416.5 Payment

416.5.1 General

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
416.0160 - 0199	Concrete Driveway (inch)	SY
416.0260 - 0299	Concrete Driveway HES (inch)	SY
416.0508 - 0520	Concrete Truck Apron (inch)	SY

416.0610	Drilled Tie Bars	EACH
416.0620	Drilled Dowel Bars	EACH
416.1010	Concrete Surface Drains	CY
416.1015	Concrete Surface Drains HES	CY
416.1110	Concrete Shoulder Rumble Strips	LF
416.1180	Concrete Intersection Rumble Strips	SY
416.1710	Concrete Pavement Repair	SY
416.1715	Concrete Pavement Repair SHES	SY
416.1720	Concrete Pavement Replacement	SY
416.1725	Concrete Pavement Replacement SHES	SY

(2) The department will pay for the Concrete Driveway and Concrete Truck Apron bid items as specified in 415.5.1 and 415.5.2 for Concrete Pavement. The department will pay separately for coloring concrete as required for roundabout truck aprons under the Coloring Concrete Red bid item.

(3) Payment for Drilled Tie Bars is full compensation for providing tie bars, including coating; for drilling holes in concrete not placed under the contract; and for epoxying or driving.

(4) Payment for Drilled Dowel Bars is full compensation for providing dowel bars, including coating; for drilling holes in concrete not placed under the contract; and for epoxying.

(5) Payment for the Concrete Surface Drains bid items is full compensation for providing surface drains; for steel reinforcement and dowel and tie bars; and for excavating, preparing the subgrade and aggregate base, and backfilling.

(6) Payment for Concrete Shoulder Rumble Strips is full compensation for milling; for sweeping or vacuuming; and for disposing of waste.

(7) Payment for Concrete Intersection Rumble Strips is full compensation for milling or forming grooves; for sweeping or vacuuming; and for disposing of waste. The department will pay separately for new concrete pavement under the Concrete Pavement bid items; and for concrete inlaid in existing HMA or concrete pavement under the Concrete Pavement Replacement bid item.

(8) Payment for the Concrete Pavement Repair and the Concrete Pavement Replacement bid items is full compensation for furnishing, hauling, preparing, placing, curing, and protecting materials; for replacing damaged pavement designated to remain in place; for removing existing pavements and excavated materials; for repairing asphaltic shoulders; for sawing joints; for preparing the foundation; for backfilling; and for testing concrete cylinders. The department will pay for individual repairs at least one lane wide and greater than 15 feet to less than 300 feet long as Concrete Pavement Replacement. Payment includes jointing and providing tie bars and dowel bars in unhardened concrete. The department will pay separately for associated work as follows:

- For tie bars and dowel bars in concrete not placed under the contract, exclusive of those necessary to repair contractor-caused damage, under the Drilled Tie Bars and Drilled Dowel Bars bid items.
- For sawing existing concrete for removal, under the Sawing Concrete bid item as specified in 690.5.
- For repairs 300 feet long or longer, under the Removing Concrete Pavement bid item as specified in 204.5 and the Concrete Pavement bid items as specified in 415.5.

416.5.2 Adjusting Pay for Concrete Crack Repairs

(1) The department will adjust pay for crack repairs on curb & gutter whether separately or integrally placed, curb, gutter, medians, sidewalks, loading zones, safety islands, steps, concrete surface drains, truck aprons, and driveways. The engineer will allocate responsibility and costs for crack repairs, mobilization for traffic control, and traffic control devices, according to CMM 424. The department will adjust pay under the Crack Repair Ancillary Concrete administrative item.

(2) Pay adjustment for crack repair costs includes mobilization for the repair work; sawing; removals; furnishing and placing materials including dowel bars and steel reinforcement; drilled tie and dowel bars; and incidentals. The engineer will compute the pay adjustment for repair costs as the contract unit price for the item, times the quantity replaced, multiplied by the appropriate multiplier as follows:

CONCRETE CRACK REPAIR MULTIPLIER

ITEM REPLACED	SHARED REIMBURSEMENT MULTIPLIER	TOTAL REIMBURSEMENT MULTIPLIER
Quantity replaced	6	12

(3) The department will adjust pay for traffic control devices and mobilization for traffic control separately.

690 Sawing

690.1 Description

(1) This section describes sawing of existing concrete or asphalt including pavement, curb & gutter, driveways, sidewalks, and similar work.

690.2 (Vacant)

690.3 Construction

690.3.1 Equipment

(1) Use diamond blades for sawing concrete where a full-depth cut is required. The contractor may use carbide cutting wheels to saw concrete that will be overlaid or for full-depth cuts where the cut face does not join the new concrete.

690.3.2 Sawing Asphalt

(1) Make straight saw cuts at least 2 inches deep. Saw so the surface remaining is generally vertical over its full depth. Saw to the depth the plan indicates or as the engineer directs or allows.

690.3.3 Sawing Concrete

(1) Do not extend saw cuts into newly placed concrete pavement or into existing pavements more than 12 inches beyond the limits the engineer designates. Saw full-depth unless the plans indicate otherwise or the engineer directs or allows otherwise.

(2) Remove sawing sludge after completing each saw cut. Minimize sludge on live traffic lanes. Remove sludge from traffic control devices each day before dark. Dispose of sludge at an acceptable material disposal site or on engineer-approved areas of the roadway or roadside.

690.4 Measurement

(1) The department will measure Sawing Asphalt and Sawing Concrete by the linear foot acceptably completed. The department will not measure overcuts beyond the limits the plans show or the engineer directs.

(2) If performing Sawing Concrete in conjunction with concrete pavement repair and replacement or concrete base patching, the department will measure the applicable total quantity of the following:

1. One full-depth longitudinal cut through the repair area if the engineer deems that cut necessary.
2. Two full-depth transverse cuts, one at each limit of the repair area.
3. Additional transverse cuts as necessary to reduce the removal slabs to a transportable size. The department will not measure cuts made to reduce removal slabs to a width less than 7 feet.
4. Additional full-depth cuts the engineer directs to extend the repair limits, unless those cuts were required because of damage contractor operations caused.

(3) The department will measure and pay for composite cuts through both asphalt and concrete as concrete.

690.5 Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
690.0150	Sawing Asphalt	LF
690.0250	Sawing Concrete	LF

(2) Payment is full compensation for sawing and sludge removal.

701 General QMP Requirements

701.1 Description

701.1.1 General

(1) This section describes contractor responsibilities common to QMPs under 700 including quality control plans; personnel and laboratory certification; quality control testing; data submission; and record keeping. This section also describes department responsibilities, common to all QMPs under 700, for verification and quality assurance testing. Exceptions and additional requirements under the QMP program are specified in individual QMP specifications.

701.1.2 Quality Control Program

701.1.2.1 General

(1) Provide and maintain a quality control program, defined as all contractor activities and documentation of the following:

1. Gradation and mix design.
2. Control and inspection of production and placement processes.
3. Material sampling, testing, and correction of in-place work.

(2) CMM 800 provides additional detailed guidance for QMP work and describes required sampling and testing procedures.

(3) Use MRS to report contract-required test results to the department electronically, estimate pay adjustments, and print reports. Qualified personnel may obtain MRS software at:

http://www.atwoodsystems.com/

701.1.2.2 Quality Control Plan

(1) Prepare a project-specific written quality control plan for each individual QMP specification and construct the project as that plan provides. Submit each individual quality control plan to the engineer no later than 10 business days before placing the respective material. Obtain engineer approval before making process or material changes that differ from those provided in approved QC plans. Update QC plans with changes as they become effective. Provide current plans to the engineer and post in each contractor laboratory before producing material and as changes are adopted.

(2) Ensure that quality control plans include the following elements:

1. Organizational chart including names, telephone numbers, current certifications, and roles and responsibilities of quality control personnel.
2. Process for disseminating quality control and corrective action information to appropriate persons. Include a list of recipients, the communication means used, and action time frames.
3. Locations of QC laboratories.
4. Material sources; include unique identifier for each aggregate source.
5. Batch plants and processing locations.
6. Initial and routine equipment checks and documentation.
7. Frequency of contractor quality control testing.
8. Process control testing the contractor intends to perform, and associated control charts or other documentation the contractor will make available to the department.
9. Procedures for identifying and documenting the locations of yielding foundation before placing material.

701.1.2.3 Small Quantities

(1) For contracts with small quantities of material, as defined in individual QMP specifications, the contractor may submit an abbreviated quality control plan consisting of only items 1, 4, 5, and 7 of 701.1.2.2(2) or integrate that small-quantity work into another contract QC plan.

701.1.2.4 Personnel Certification

(1) Have personnel that are HTCP-certified at or above the minimum levels specified in table 701-1 perform sampling, testing, and documentation.

(2) A certified technician coordinates and is responsible for work an assistant certified technician (ACT) performs. The certified technician ensures that sampling and testing is performed correctly, analyzes test results, and posts resulting data. No more than one ACT can work under a single certified technician.

701.1.2.5 Laboratory Qualification

(1) Ensure that contractor portable and fixed laboratories, as well as commercial laboratories performing testing under the contract, are qualified to perform the work in question. Obtain information on the Wisconsin laboratory qualification program from the department's web site at:

https://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/tools/appr-prod/qual-labs.aspx

701.1.2.6 Equipment

(1) Furnish the necessary equipment and supplies for performing quality control testing. The engineer may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate testing equipment according to CMM 830 and maintain a calibration record at the laboratory.

701.1.2.7 Documentation

(1) Document observations, material adjustments, process adjustments, and nonconforming material investigations daily in a permanent field record. Note additional process control information enumerated in the contractor's quality control plan.

(2) Use forms described in CMM 800. When electronic reporting is required, submit the data using MRS within 5 business days after results are available.

(3) Submit final testing records, control charts, source documents, and other documentation in a manner acceptable to the engineer within 10 business days after placement. For long-term test results, submit final records within 10 business days after contract-required information becomes available. The engineer may allow submission of scanned copies of hand-written documentation.

701.2 (Vacant)

701.3 Testing

701.3.1 Allow SAM meter to be used for air content test. ASP 6 Nov 21 let. Correct errata with AGGTEC-I.

701.3.1 General

(1) Perform contract required QC tests for samples randomly located according to CMM 830. Use the test methods specified in table 701-1.

TABLE 701-1 TESTING AND CERTIFICATION STANDARDS

TEST	TEST STANDARD	MINIMUM REQUIRED CERTIFICATION (any one of the certifications listed for each test)
Random Sampling	CMM 830.9.2	Transportation Materials Sampling Technician (TMS) TMS Assistant Certified Technician (ACT-TMS) Aggregate Technician I (AGGTEC-I) AGGTEC-I Assistant Certified Technician (ACT-AGG) PCC Technician I (PCCTEC-I) PCCTEC-I Assistant Certified Technician (ACT-PCC) Grading Technician I (GRADINGTEC-I) Grading Assistant Certified Technician (ACT-GRADING)
Sampling Aggregates	AASHTO T2[1] [4]	TMS, ACT-TMS, AGGTEC-I, ACT-AGG
Percent passing the No. 200 sieve	AASHTO T11[1]	AGGTEC-I, ACT-AGG
Fine & coarse aggregate gradation	AASHTO T27[1]	
Aggregate moisture content	AASHTO T255[1]	
Fractured faces	ASTM D5821[1]	
Liquid limit	AASHTO T89	Aggregate Testing for Transportation Systems (ATTS) GRADINGTEC-I, or ACT-GRADING
Plasticity index	AASHTO T90[3]	
Sampling freshly mixed concrete	AASHTO R60	PCCTEC-1 ACT-PCC
Air content of fresh concrete	AASHTO T152[2] AASHTO TP118[5]	
Air void system of fresh concrete	AASHTO TP118[5]	
Concrete slump	AASHTO T119[2]	
Concrete temperature	ASTM C1064	
Making and curing concrete specimens	AASHTO T23	
Moist curing for concrete specimens	AASHTO M201	
Concrete compressive strength	AASHTO T22	Concrete Strength Tester (CST) CST Assistant Certified Technician (ACT-CST)
Concrete flexural strength	AASHTO T97	
Concrete surface resistivity[2]	AASHTO T358	
Voids in aggregate	AASHTO T19	PCCTEC-II
Profiling	—	PROFILER

[1] As modified in CMM 860.

[2] As modified in CMM 870.

[3] A plasticity check, if required under individual QMP specifications, may be performed by an AGGTEC-I in addition to the certifications listed for liquid limit and plasticity index tests.

[4] Plant personnel may operate equipment to obtain samples under the direct observation of a TMS or higher.

[5] Consolidate by rodding.

701.3.2 Contractor QC Testing

(1) Generate random numbers, determine sample and test locations according to CMM 830, and provide to the engineer before placing material within the corresponding test increment. Perform contract required QC tests at the predetermined random location. Also, perform other tests as necessary to control production and construction processes, and additional testing enumerated in the contractor's quality control plan or that the engineer directs. Report test results to the engineer within timeframes specified in individual QMP specifications.

(2) Notify the engineer when an individual test exceeds a spec limit. Material from the first out-of-spec test up to, but not including, material from the first subsequent in-spec test is nonconforming. The department may reject or otherwise determine the final disposition of nonconforming material as specified in 106.5.

(3) The department may periodically observe contractor sampling and testing, and direct additional contractor sampling and testing for department evaluation.

701.3.3 Department Testing

701.3.3.1 General

(1) The department conducts verification testing to validate product quality and independent assurance testing to evaluate sampling and testing. The department will use the same sampling and testing methods required for contractor testing under 701.3.1. The department will provide the contractor with a list of names and telephone numbers of project verification and independent assurance personnel upon approval of the QC plan.

(2) The department will provide test results to the contractor within timeframes specified in individual QMP specifications.

(3) Correct department-identified deficiencies. If the contractor fails to correct deficiencies or resolve discrepancies, the engineer may suspend production.

701.3.3.2 Quality Verification Testing

(1) The department will have an HTCP-certified technician, or ACT working under a certified technician, perform QV sampling and testing. Department QV testing personnel must meet the same certification requirements specified in 701.1.2.4.

(2) The department will sample and test randomly at locations independent of the contractor's QC tests and use separate equipment and laboratories. The department will notify the contractor before sampling so the contractor can observe QV sampling. The department will conduct a minimum of one verification test for each 5 contractor QC tests unless individual QMP specifications specify otherwise.

(3) If verification tests conform to specifications, no further action is required. If verification tests do not conform to specifications, the department will notify the contractor immediately and the two parties will jointly investigate. The investigation may include additional testing as well as review and observation of both department and contractor sampling and testing procedures, equipment, and other documented test results. Both parties will document investigative work.

701.3.3.3 Independent Assurance Testing

(1) The department performs independent assurance testing to evaluate department verification and contractor's QC sampling and testing including personnel qualifications, procedures, and equipment. The department will perform independent assurance reviews according to the department's independent assurance program, which may include one or more of the following:

1. Split sample testing.
2. Proficiency sample testing.
3. Witnessing sampling and testing.
4. Test equipment calibration checks.
5. Reviewing contract-required data and available contractor process control information.
6. Requesting that testing personnel perform additional sampling and testing.

701.3.4 Dispute Resolution

(1) The engineer and contractor will jointly investigate any testing discrepancies and potentially nonconforming materials. Attempt to seek a mutually agreeable solution. Abide to the dispute resolution procedures in 106.3.4.3.5.

701.3.5 Corrective Action

(1) Conform to corrective action specified in individual QMP specifications or as directed by the engineer.

701.4 (Vacant)

701.5 Payment

(1) Costs for sampling, testing, and documentation under 700 are incidental to the work. If the contractor fails to perform required QMP work, the department may reduce the contractor's pay. The department will administer pay reductions under the Non-performance of QMP administrative item.

710 General Concrete QMP

710.1 Description

(1) This section describes contractor QC testing requirements common to all concrete classes under 700. Exceptions and additional requirements for concrete testing are specified in:

- 715 for class I concrete used in structures and pavement.
- 716 for class II and class III concrete used in ancillary applications.

710.2 Update class II small quantity and clarify aggregate reporting. ASP 6 Nov 21 let. Require mix design submittal in small quantity control plan.

710.2 Small Quantities

(1) The department defines small quantities as follows:

- As specified in 715.1.1.2 for class I concrete.
- Less than 50 cubic yards of class II ancillary concrete placed under a single bid item.

(2) For contracts with only small quantities of material subject to testing, modify the requirements of 710 as follows:

1. The contractor may submit an abbreviated quality control plan as allowed in 701.1.2.3 that also includes concrete mix design documentation from 710.4.
2. Provide one of the following for aggregate process control:
    - Documented previous testing dated within 120 calendar days. Provide gradation test results to the engineer before placing material.
    - Non-random start-up gradation testing.

710.3 Certification Requirements

(1) Have a certified PCC technician I, or ACT-PCC working under a certified technician, on the project site, prepared and equipped to perform required sampling and testing whenever placing concrete.

710.4 Define workability test for slip-form concrete. ASP 6 Nov 21 let.

710.4 Concrete Mixes

(1) The contractor is responsible for mix performance.

(2) At least 7 business days before producing concrete, document that materials conform to 501 unless the engineer allows or individual QMP specifications provide otherwise. Include the following:

1. For mixes: quantities per cubic yard expressed as SSD weights and net water, water to cementitious material ratio, air content, and SAM number.
2. For cementitious materials and admixtures: type, brand, and source.
3. For aggregates: absorption, SSD bulk specific gravity, wear, soundness, freeze thaw test results if required, and air correction factor. Also include aggregate production records dated within 2 years if using those results in the design. Submit component aggregate gradations, aggregate proportions, and target combined blended aggregate gradations using the following:
    - DT2220 for combined aggregate gradations.
    - DT2221 for optimized aggregate gradations.
4. For optimized concrete mixtures:
    - Complete the worksheets within DT2221 according to the directions.
    - Ensure the optimized aggregate gradations and the optimized mix design conform to WisDOT specifications and pass the built-in tests within DT2221.
    - Verify slip-form mixture workability according to AASHTO TP137 and conformance to specifications through required trial batching.
    - Submit the completed DT2221 to the engineer electronically. Include the trial batch test results with the mix design submittal.

(3) Document mix adjustments daily during concrete production.

710.4 Establish mix modification submittal timeframe during concrete production. ASP 6 Nov 21 let.

(4) Prepare and submit modifications to a concrete mix to the engineer for approval 3 business days before using that modified mix. Modifications requiring the engineer's approval include changes in:

1. Source of any material except for the following:
    - Water: Concrete plants with multiple water sources are not required to provide a mix change if all other components of the mix design are the same source and all water sources are approved per CMM 850.

- Fly Ash: For class I pavement and cast-in-place barrier and class II concrete mixes a source change for fly ash of the same class does not constitute a mix design change.

2. Quantities of cementitious materials.
3. Addition or deletion of admixtures. Minor admixture dosage adjustments required to maintain air content or slump do not require engineer review or approval.

(5) When the department requires or allows high early strength concrete, use one of the following:

- Add at least 95 pounds but no more than 280 pounds of cement per cubic yard to a previously accepted mix along with enough water to maintain workability without raising the w/cm.
- Use type III cement.
- Substitute regular grade C for grade A high early strength concrete.
- Substitute regular grade A for grade B high early strength concrete.

(6) Submit concrete mix designs into MRS as specified in 701.1.2.7.

710.5 Sampling and Testing

710.5.1 General

(1) Sample fresh concrete at the point of placement. Use the test methods specified in table 701-1.

710.5.2 Slump

(1) Provide material conforming to the slumps specified in 501.3.7.1. The contractor need not test slump for concrete placed by slip-form methods unless the engineer requests. For other placement methods, test slump whenever an air content test is performed, strength specimens are made, and as the engineer directs.

710.5.3 Air Content

(1) Provide material conforming to the air contents specified in 501.3.2.4.2. On each day of production, test each mix design at start-up and as frequently as practicable until concrete is conforming and concrete production is under control. Subsequently, test at the QC testing frequency specified in individual QMP specifications and as the engineer directs.

(2) If an individual air test is outside the spec limits, notify the engineer and test as often as practicable on subsequent loads until the air content is conforming.

710.5.4 Concrete Temperature

(1) Measure concrete temperature of the same sample used for air content testing and report the results along with the air content.

710.5.5 Specify the required size for flexural strength beams. ASP 6 Nov 21 let.

710.5.5 Strength

(1) Cast all 6" x 12" cylinders or all 6" x 6" x 21" beams in a set from the same sample. Do not cast more than one set of specimens from a single truckload of concrete. Mark each specimen to identify the lot and sublot or location on the project it represents.

(2) Provide facilities for initial curing. For up to 48 hours after casting, maintain the temperature adjacent to the specimens in the range of 60 to 80 F and prevent moisture loss. Between 24 and 48 hours after casting, transport the specimens to a department-qualified laboratory for standard curing until testing at 28 days.

(3) Determine the 28-day strength of specimens in psi. Test specimens to failure. Use a testing machine that automatically records the date, time, rate of loading, and maximum load of each specimen. Provide a printout of this information for each specimen tested.

710.5.6 Modify testing frequencies. ASP 6 Nov 21 let. Define QV small quantity testing frequency.

710.5.6 Aggregate Testing During Concrete Production

710.5.6.1 General

(1) The department will accept gradation based on the results of department-performed acceptance testing.

(2) The department and contractor must obtain samples using the same method. When belt sampling, contractor personnel shall obtain samples for the department under the direct observation of department personnel. Define the sampling method in the contractor's quality control plan or in the contractor's abbreviated quality control plan.

710.5.6.2 Contractor Control Charts

710.5.6.2.1 General

(1) Test aggregate gradations during concrete production except as allowed for small quantities under 710.2. Perform required contractor testing using non-random samples.

(2) Sample aggregates from either the conveyor belt or from the working face of the stockpiles.

(3) Sample aggregates within 2 business days before placement for each mix design. Include this gradation on the control charts.

(4) Report gradation test results and provide control charts to the engineer within 1 business day of obtaining the sample. Submit results to the engineer and electronically into MRS as specified in 701.1.2.7.

(5) Conduct aggregate testing at the minimum frequency shown based on the anticipated daily cumulative plant production for each mix design. The contractor's concrete production tests can be used for the same mix design on multiple contracts.

TABLE 710-1 CONTRACTOR GRADATION TESTING FREQUENCY - CLASS I

DAILY PLANT PRODUCTION RATE FOR WisDOT WORK	MINIMUM FREQUENCY
Gradation Report Before Placement	
1000 cubic yards or less	one test per day
more than 1000 cubic yards	two tests per day

TABLE 710-2 CONTRACTOR GRADATION TESTING FREQUENCY - CLASS II

MINIMUM FREQUENCY
Gradation Report Before Placement
One test per calendar week of production

710.5.6.2.2 Optimized Aggregate Gradation Control Charts

(1) Determine the complete gradation using a washed analysis for both fine and coarse aggregates. Report results for the following:

- 1 1/2", 1", 3/4", 1/2", 3/8", #4, #8, #16, #30, #50, #100, and #200 sieves.
- Sum of volumetric percentages retained on #8, #16, and #30 sieves.
- Sum of volumetric percentages retained on #30, #50, #100, and #200 sieves.

(2) Calculate blended aggregate gradations using the mix design batch percentages for the component aggregates. Ensure the blended aggregate gradation conforms to the volumetric percent retained of the optimized aggregate gradation limits specified in table 501-4.

(3) Throughout the contract, construct a 4-point running average of the volumetric percent retained for each sieve to determine if the blended aggregate gradation is within the tarantula curve limits specified in table 501-4.

710.5.6.2.3 Combined Aggregate Gradation Control Charts

(1) Determine the complete gradation using a washed analysis for both fine and coarse aggregates. Report results for the 1 1/2", 1", 3/4", 1/2", 3/8", #4, #8, #16, #30, #50, #100, and #200 sieves.

(2) Calculate blended aggregate gradations using the mix design batch percentages for the component aggregates. Ensure the blended aggregate gradation conforms to the percent passing by weight requirements of the combined aggregate gradation limits specified in table 501-4.

(3) Throughout the contract, construct a 4-point running average of the percent passing by weight for each sieve to determine if the blended aggregate gradation is within the combined aggregate gradation limits specified in table 501-4.

710.5.6.3 Department Acceptance Testing

(1) Department testing frequency is based on the quantity of each mix design placed under each individual WisDOT contract.

(2) The department will split each sample, test for acceptance, and retain the remainder for a minimum of 10 calendar days.

(3) The department will obtain the sample and deliver to the regional testing lab in the same day. The department will report gradation test results to the contractor within 1 business day of being delivered to the lab. The department and contractor can agree to an alternative test result reporting timeframe. Document alternative timeframes in the contractor's quality control plan.

(4) Additional samples may be taken at the engineer's discretion due to a changed condition.

TABLE 710-3 DEPARTMENT GRADATION TESTING FREQUENCY

CONCRETE CLASSIFICATION	MINIMUM DEPARTMENT FREQUENCY
Small Quantity: Class I: Pavement Class I: Structures Class I: Cast-in-Place Barrier	1 test on first day of placement
Class I: Pavement	1 test per placement day for first 5 days of placement. If all samples are passing, reduced frequency is applied.
	Reduced frequency: 1 test per calendar week of placement
Class I: Structures	1 test per 250 CY placed - Minimum of 1 test per substructure - Minimum of 1 test per superstructure
Class I: Cast-in-Place Barrier	1 test per 500 CY placed
Class II	No minimum testing

710.5.7 Incorporate Class I: Pavements testing frequency in corrective action. ASP 6 Nov 21 let.

710.5.7 Corrective Action

710.5.7.1 Optimized Aggregate Gradations

(1) If the contractor's 4-point running average or a department test result of the volumetric percent retained exceeds the tarantula curve limits by less than or equal to 1.0 percent on a single sieve size, do the following:

1. Notify the other party immediately.
2. Perform corrective action documented in the QC plan or as the engineer approves.
3. Document and provide corrective action results to the engineer as soon as they are available.
4. Department will conduct two tests within the next business day after corrective action is complete.
5. If blended aggregate gradations are within the tarantula curve limits by the second department test:
   - Continue with concrete production.
   - Include a break in the 4-point running average.
   - For Class I Pavements: The department will discontinue reduced frequency testing and will test at a frequency of 1 test per placement day. Once 5 consecutive samples are passing at the 1 test per placement day frequency, the reduced frequency testing will be reapplied.
6. If blended aggregate gradations are not within the tarantula curve limits by the second department test:
   - Provide a new mix design with an increased cementitious content.
   - If the mix design already has a cementitious content of 565 or more pounds per cubic yard, provide a new mix design.
   - If the contract requires optimized aggregate gradations under 501.2.7.4.2.1(2), stop concrete production and submit a new mix design.

(2) If the contractor's 4-point running average or a department test result of the volumetric percent retained exceeds the tarantula curve limits by more than 1.0 percent on one or more sieves, stop concrete production and submit a new mix design.

(3) Both the department and contractor must sample and test aggregate of the new mix design at the frequency specified in 710.5.6.1.

710.5.7.2 Combined Aggregate Gradations

(1) If the contractor's 4-point running average or a department test result of the percent passing by weight exceeds the combined aggregate gradation limits by less than or equal to 1.0 percent on a single sieve size, do the following:

1. Notify the other party immediately.
2. Perform corrective action documented in the QC plan or as the engineer approves.

3. Document and provide corrective action results to the engineer as soon as they are available.
4. The department will conduct two tests within the next business day after corrective action is complete.
5. If blended aggregate gradations are within the combined aggregate gradation limits by the second department test:
    - Continue with concrete production.
    - Include a break in the 4-point running average.
    - For Class I Pavements: The department will discontinue reduced frequency testing and will test at a frequency of 1 test per placement day. Once 5 consecutive samples are passing at the 1 test per placement day frequency, the reduced frequency testing will be reapplied.
6. If blended aggregate gradations are not within the combined aggregate gradation limits by the second department test, stop concrete production and submit a new mix design.

(2) If the contractor's 4-point running average or a department test result of the percent passing by weight exceeds the combined aggregate gradation limits by more than 1.0 percent on one or more sieves, stop concrete production and submit a new mix design.

(3) Both the department and contractor must sample and test aggregate of the new mix design at the frequency specified in 710.5.6.1.

715 QMP Concrete Pavement, Cast-in-Place Barrier and Structures

715.1 Description

(1) This section describes contractor mix design, testing, and documentation requirements for class I concrete used in concrete structures, cast-in-place concrete barrier, and concrete pavement.

715.1.1 Quality Control Program

715.1.1.1 General

(1) Conform to general requirements under 701 and 710 as well as additional requirements for class I concrete specified here in section 715. The department defines class I concrete as cast-in-place concrete used in pavement, barrier, or structure applications where all of the following apply:

- Mix design requires review by the engineer.
- The contract defines spec limits for strength.
- The contractor may earn statistically based incentives for superior concrete strength.[1]

[1] HES and SHES concrete are not eligible for 28-day strength incentives.

715.1.1.2 Change structure concrete small quantity to 250 cy.

715.1.1.2 Small Quantities

(1) The department defines small quantities of class I concrete, subject to the reduced requirements under 710.2, as follows:

- Less than 250 cubic yards of structure concrete placed under a single bid item.
- Less than 150 cubic yards of barrier concrete placed under the contract.
- Less than 2500 cubic yards of slip-formed pavement placed under the contract.
- Less than 1000 cubic yards of non-slip-formed pavement placed under the contract.

715.1.1.3 Pre-Pour Meetings for Structure Concrete

(1) Arrange at least two pre-pour meetings to discuss concrete placement. Discuss the placement schedule, personnel roles and responsibilities, testing and quality control, and how test results will be communicated. Schedule the first meeting before placing any concrete and the second before placing any bridge deck concrete. Ensure that representatives from all parties involved with concrete work, including contractor, sub-contractor, ready-mix supplier, testers, and the project manager, attend these meetings.

715.1.1.4 Define timeline of quality control plan submittal.

715.1.1.4 Quality Control Plan

(1) Submit a quality control plan 7 business days before producing concrete, conforming to 701.1.2.2 and include the following:

1. Concrete mix design documentation as required in 710.4.
2. Proposed methods for monitoring and recording batch weights.
3. Aggregate gradation acceptance method for class I concrete items.
4. Methods for monitoring and adjusting blended aggregate gradations before corrective action is required under 710.5.7; and methods for documenting corrective action.

715.1.1.5 Documentation

(1) Submit results electronically into MRS within 5 business days after those results become available for the following, if required under the contract:

- QC tests.
- Engineer-directed tests.
- Corrective-action tests.

(2) Submit aggregate gradation test results as specified in 710.5.6.1(2).

715.2 Materials

715.2.1 Coordinate mix design submittal requirements with DT2220 and DT2221 required under 710.4.

715.2.1 General

(1) Determine mixes for class I concrete used under the contract using one or more of the following methods:

- Have a HTCP-certified PCC technician II develop new concrete mixes qualified based on the results of mix development tests performed by a department-qualified laboratory.

(2) The contractor need not provide separate laboratory mix designs for high early strength concrete nor provide routine 28-day compressive strength tests during placement for high early strength concrete.

(3) In addition to the mix information required under 710.4, at least 3 business days before producing concrete, submit the following to the engineer:

- Strength data from trial batching.
- Test dates of each trial batch.
- Name and location of laboratory that performed the trial batching.

(4) The engineer will review the submitted mix design within 3 business days of receiving the mix design submittal and complete Project Staff Review section of mix design certification within DT2220 or DT2221.

715.2.2 Class I Concrete Mixes

715.2.2 Field strength data not allowed. SCM requirements listed in 501.3.2.2.2.

715.2.2.1 Pavements and Cast-in-Place Barrier

(1) Use at least 5 pairs of cylinders from 5 separate trial batches to demonstrate the compressive strength of a mix design.

(2) For concrete pavement, also demonstrate the flexural strength of the mix design using at least 5 pairs of beams from 5 separate trial batches.

(3) Demonstrate that the strength or the 28-day flexural strength of the proposed mix will equal or exceed the following:

- For pavement: the 85 percent within limits criterion specified in 715.5.2.
- For barrier: the 90 percent within limits criterion specified in 715.5.3.

(4) Use a SCM as a partial replacement for cement as specified in 501.3.2.2.2.

(5) Ensure that the target ratio of net water to cementitious material for the submitted mix design does not exceed 0.42 by weight. Include free water on the aggregate surface but do not include water absorbed within aggregate particles. Control the w/cm ratio throughout production by adjusting batch weights for changes in the aggregate moisture as required under 715.3.3.

(6) Do not use chloride based accelerators in mixes for new construction.

715.2.2.2 Structures

(1) Qualify compressive strength according to ACI 301 - Specifications for Structural Concrete - subsections 4.2.3.1 through 4.2.3.4. Demonstrate that the 28-day compressive strength of the proposed mix will equal or exceed the 90 percent within limits criterion specified in 715.5.3.

(2) Provide grade A concrete with SCM as a partial replacement for cement as specified in 501.3.2.2.2.

(3) Ensure that the target ratio of net water to cementitious material (w/cm) for the submitted mix design does not exceed 0.45 by weight. Include free water on the aggregate surface but do not include water absorbed within aggregate particles. Control the w/cm ratio throughout production by adjusting batch weights for changes in the aggregate moisture as required under 715.3.3.

(4) Do not use mixes containing accelerators, except the contractor may use mixes containing non-chloride accelerators in substructure elements.

715.3 Testing and Acceptance

715.3.1 Class I Concrete Testing

715.3.1.1 Clarify test results for reporting, update lot sizes. ASP 6 Nov 21 let.

715.3.1.1 General

(1) Test slump, air content, concrete temperature and concrete strength as specified in 710.5. Conduct a battery of QC tests for each specified property, using a single sample randomly located within each sublot. If a sublot random test location falls within a mainline pavement gap, relocate the test to a different location within the sublot. Cast three cylinders for strength evaluation.

715.3.1.1.1 Flexural Strength

(1) For contracts with 50,000 square yards or more of concrete pavement, cast a set of 3 beams instead of cylinders for flexural strength acceptance testing at 28 days.

715.3.1.1.2 Surface Resistivity

(1) Cast a set of 3 additional 6"x12" cylinders and test the concrete surface resistivity according to AASHTO T358. Submit the resistivity to the nearest tenth into MRS for information only. Perform this testing at least once per lot if total contract quantities are greater than or equal to the following:

- 20,000 square yards for pavements.
- 5,000 linear feet for barriers.
- 500 cubic yards for structure concrete.

Resistivity testing is not required for the following:

- Lot with less than 3 sublots.
- Concrete items classified as ancillary.
- Concrete placed under the following bid items:
  - Concrete Pavement Approach Slab
  - Concrete Masonry Culverts
  - Concrete Masonry Retaining Walls

715.3.1.1.3 Air Void System

(1) Test the air void system at least once per lot and enter the SAM number in MRS for information only. SAM testing is not required for the following:

- For lots with less than 3 sublots.
- High early strength (HES) concrete.
- Special high early strength (SHES) concrete.
- Concrete placed under the following bid items:
  - Concrete Pavement Approach Slab
  - Concrete Masonry Culverts
  - Concrete Masonry Retaining Walls
  - Steel Grid Floor Concrete Filled
  - Crash Cushions Permanent
  - Crash Cushions Permanent Low Maintenance
  - Crash Cushions Temporary

715.3.1.2 Lot and Sublot Definition

715.3.1.2.1 General

(1) Designate the location and size of all lots before placing concrete. Ensure that no lot contains concrete of more than one mix design or placement method defined as follows:

Mix design change A modification to the mix requiring the engineer's approval under 710.4(4).

For paving and barrier mixes, a source change under item 1 of 710.4(4) for fly ash of the same class that does not require a modification under items 2 or 3 of 710.4(4) does not constitute a mix design change.

Placement method Either slip-formed, not slip-formed, or placed under water.

(2) Lots and sublots include ancillary concrete placed integrally with the class I concrete.

715.3.1.2.2 Lots by Lane-Feet

(1) The contractor may designate slip-formed pavement lots and sublots conforming to the following:

- Lots and sublots are one paving pass wide and may include one or more travel lanes, integrally placed shoulders, integrally placed ancillary concrete, and pavement gaps regardless of mix design and placement method used in the gaps.
- Sublots are 1000 feet long for single-lane and 500 feet long for two-lane paving. Adjust terminal sublot lengths to match the project length or, for staged construction, the stage length. The contractor may include sublots less than or equal to 25 percent of the standard length in the previous sublot. For partial sublots exceeding 25 percent of the standard length, notify the engineer who will direct additional testing to represent that partial sublot.
- Ensure that sublot limits match for adjacent paving passes. Pavement gaps do not affect the location of sublot limits.
- Create lots by grouping 5 adjacent sublots matching lots created for adjacent paving passes.

(2) If a sublot random test location falls in a pavement gap, test at a different random location within that sublot.

715.3.1.2.3 Update lot and sublot sizes. ASP 6 Nov 21 let.

715.3.1.2.3 Lots by Cubic Yard

(1) Define standard lots and sublots conforming to the following:

TABLE 715-1 CLASS I - LOT AND SUBLOT SIZES

CONCRETE CLASSIFICATION	LOT SIZE	SUBLOT SIZE	NUMBER OF SUBLOTS PER LOT
Class I: Pavement	1250 cubic yards	250 cubic yards	5
Class I: Structures	250 cubic yards	50 cubic yards	5
Class I: Cast-in-Place Barrier	500 cubic yards	100 cubic yards	5

(2) The contractor may include sublots less than or equal to 25 percent of the standard volume in the previous sublot. For partial sublots exceeding 25 percent of the standard volume, notify the engineer who will direct additional testing to represent that partial sublot.

(3) An undersized lot is eligible for incentive payment under 715.5 if the lot has 3 or more sublots for that lot.

715.3.1.3 Department Verification Testing

(1) The department will perform verification testing once for each 5 contractor QC tests with additional testing as required to obtain at least 1 verification test per lot for air content, slump, temperature, and compressive strength.

(2) The department will report QV test results to the contractor within 2 business days after the department obtains the sample, or in the case of long-term testing, within 2 business days after conducting the test.

715.3.2 Removed fixed strength disincentive cost. ASP 6 Nov 21 let. Update removal and replacement process.

715.3.2 Strength Evaluation

715.3.2.1 General

(1) The department will make pay adjustments for strength on a lot-by-lot basis using the compressive strength of contractor QC cylinders or the flexural strength of contractor QC beams.

(2) Randomly select 2 QC specimens to test at 28 days for percent within limits (PWL). Compare the strengths of the 2 randomly selected QC specimens and determine the 28-day sublot average strength as follows:

- If the lower strength divided by the higher strength is 0.9 or more, average the 2 QC specimens.
- If the lower strength divided by the higher strength is less than 0.9, break one additional specimen and average the 2 higher strength specimens.

(3) The department will evaluate the sublot for possible removal and replacement if the 28-day sublot average strength is:

- Pavement (Compressive): < 2500 psi
- Pavement (Flexural): < 500 psi
- Structure: < f'c - 500 psi [1]
- Cast-in-Place Barrier: < f'c - 500 psi [1]

[1] f'c is design strength found in plans or specials.

715.3.2.2 Removal and Replacement

715.3.2.2.1 Pavement

(1) The department will direct the contractor to core the affected sub lot to determine structural adequacy. Timeframe of coring operations and locations will be agreed upon between department and contractor.

(2) Obtain three cores from the sublot in question. Perform coring according to CMM 870 Attachment 9: WTM AASHTO T24

(3) Have an independent consultant test cores according to CMM 870 Attachment 9: WTM AASHTO T24.

(4) The department will assess concrete for removal and replacement based on a sublot-by-sublot analysis of core strength. Perform coring and testing, fill specimen voids with an engineer-approved non-shrink grout or concrete, and provide traffic control during operations.

(5) The pavement sublot will remain in place if the compressive strength of all cores from the sublot are 2500 psi or greater. The pavement 28-day QC average sublot strength will be included in the respective compressive or flexural strength PWL equation of 715.5.2 or 715.5.3.

(6) If the compressive strength of any core from the sublot is less than 2500 psi, the dearptment will direct the contractor to either:

1. Remove and replace unacceptable concrete pavement sublot ot the nearest joint with new concrete pavement of conforming strength. There is no incentive for replaced pavement, but the department will adjust pay for PWL values of < 85 according to 715.5.2 or 715.5.3. The department will pay once for the area at the full contract price.
2. Permit concrete pavement to remain in place. The original 28-day QC average sublot strength will be included in the relevant strength PWL equation of 715.5.2 or 715.5.3.

715.3.2.2.2 Structures and Cast-in-Place Barrier

(1) The department will direct the contractor to core the affected sublot to determine the structural adequacy. Timeframe of coring operations and locations will be agreed upon between department and contractor. Determine core locations that do not interfere with structural steel.

(2) Perform coring according to CMM 870 Attachment 9: WTM AASHTO T24.

(3) Have an independent consultant test cores according to CMM 870 Attachment 9: WTM AASHTO T24. The department will assess concrete for removal and replacement based on a sublot-by-sublot analysis of core strength. Perform coring and testing, fill voids with an engineer-approved non-shrink grout or concrete, and provide traffic control during operations.

(4) The sublot will remain in place if the 3-core average is greater than or equal to 85 percent of f'c, and no individual core is less than 75 percent of f'c. The 28-day QC average sublot strength will be included in the compressive strength PWL equation of 715.5.2.

(5) If the compressive strength of the 3-core average is less than 85 percent of f'c or an individual core is less than 75 percent f'c, the department will direct the contractor to either:

1. Remove and replace unacceptable structure or cast-in-place barrier sublot with new concrete of conforming strength. There is no incentive for replaced concrete, but the department will adjust pay for PWL values < 85 according to 715.5.2. The department will pay once for the area at the full contract price.
2. Permit concrete to remain in place. The original 28-day QC average sublot strength will be included in the compressive strength PWL equation of 715.5.2.

715.3.3 Establish when aggregate moisture content corrections are required for concrete mixtures. ASP 6 Nov 21 let.

715.3.3 Aggregate

715.3.3.1 General

(1) Except as allowed for small quantities in 710.2, test aggregate conforming to 710.5.6.

715.3.3.2 Structures

(1) In addition to the aggregate testing required under 710.5.6, determine the fine and coarse aggregate moisture content for each sample.

(2) Calculate target batch weights for each mix when production of that mix begins. Whenever the moisture content of the fine or coarse aggregate changes by more than 0.5 percent, adjust the batch weights to maintain the design w/cm ratio.

715.4 Measurement

(1) The department will measure the Incentive bid items under this section by the dollar, calculated as specified in 715.5.

715.5 Payment

715.5.1 General

(1) The department will pay incentive for concrete strength under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
715.0502	Incentive Strength Concrete Structures	DOL
715.0603	Incentive Strength Concrete Barrier	DOL
715.0715	Incentive Flexural Strength Concrete Pavement	DOL
715.0720	Incentive Compressive Strength Concrete Pavement	DOL

(2) Incentive payment may be more or less than the amount the schedule of items shows.

(3) The department will administer disincentives for strength under the Disincentive Strength Concrete Structures, Disincentive Strength Concrete Barrier, Disincentive Flexural Strength Concrete Pavement, and Disincentive Compressive Strength Concrete Pavement,administrative items.

715.5.1(4) Pay for cast-in-place barrier based on specified cost per CY instead of per LF.

(4) The pay factor calculated from the equations in 715.5.2(2) and 715.5.3(2) is applied to the following unit costs:

- Pavement: $45 per SY.
- Structure: $635 per CY.
- Cast-in-place barrier: $285 per CY.

(5) The 28-day strength average for a lot is the average of the individual sublot strengths within that lot.

(6) The department will not pay a strength incentive for concrete that is nonconforming in another specified property, for ancillary concrete accepted based on tests of class I concrete, or for high early strength concrete unless placed in pavement gaps as allowed under 715.3.1.2.2.

(7) Submit test results to the department electronically using MRS software. The department will validate contractor data before determining pay adjustments.

(8) All coring and testing costs under 715.3.2.2 including filling core holes and providing traffic control during coring are incidental to the contract.

715.5.2 New pay equations for compressive and flexural strength.

715.5.2 Compressive Strength

(1) The department will measure PWL relative to strength lower specification limits as follows:

- Compressive strength of 3700 psi for pavements.
- Compressive strength of 4000 psi for structures and cast-in-place barrier.

(2) The department will adjust pay for each lot using equation "Comp2022" as follows:

Percent within Limits (PWL)	Pay Factor (percent)
>= 90 to 100	(1/5 x PWL) + 82
>= 85 to < 90	100
>= 50 to < 85	(5/7 x PWL) + (275/7)
< 50	50 [1]

[1] The department will evaluate material resulting in a lot PWL value less than 50 as specified in 715.3.2. The department will pay 50 percent of the contract unit price of the associated concrete bid item for material the department allows to remain in place.

(3) The department will not pay incentive if the lot standard deviation is greater than the following:

- 400 psi for pavement.
- 350 psi for structure and cast-in-place barrier

(4) For lots with less than 3 sublots, there is no incentive, but the department will reduce pay by 50 percent of the contract unit price for sublots with an average compressive strength below the following:

- 3700 psi for pavements.
- 4000 psi for structures and cast-in-place barrier.

715.5.3 Flexural Strength

(1) The department will measure PWL relative to strength lower specification limits as follows:

- Flexural strength of 650 psi for pavements.

(2) The department will adjust pay for each lot using equation "Flex2022" as follows:

Percent within Limits (PWL)	Pay Factor (%)
>= 90 to 100	(2/5 x PWL) + 64
>= 85 to < 90	100
>= 50 to < 85	(5/7 x PWL) + (275/7)
< 50	50 [1]

[1] The department will evaluate material resulting in a lot PWL value less than 50 as specified in 715.3.2. The department will pay 50 percent of the contract unit price of the associated concrete bid item for material the department allows to remain in place.

(3) The department will not pay incentive if the lot standard deviation is greater than 60 psi.

(4) For lots with less than 3 sublots, there is no incentive, but the department will reduce pay by 50 percent of the contract unit price for sublots with an average flexural strength below 650 psi.

716 QMP Ancillary Concrete

716.1 Description

(1) This section describes contractor mix design and testing requirements for class II and class III concrete.

716.1.1 Quality Control Program

716.1.1.1 General

(1) Conform to general requirements under 701 and 710 as modified here in 716 for class II and class III concrete defined as follows:

- Class II: ancillary concrete the department accepts based on field testing during placement.
- Class III: ancillary concrete the department accepts by certification.

716.1.1.2 Quality Control Plan

716.1.1.2 Define mix design requirements.

(1) The contractor need only submit an abbreviated quality control plan as defined in 701.1.2.3; include the following:

1. Identify concrete items to be designed and accepted with optimized aggregate gradations, as allowed in 501.2.7.4.2.1.
2. Methods for monitoring and adjusting blended aggregate gradations, and methods for documenting corrective action.
3. Concrete mix design conforming to one of the following:
   - Mix design for only class II concrete conforming to 710.4. Trial batching is not required.
   - Mix design for class II concrete also being used for class I conforming to 710.4 and 715.2.

716.2 Materials

716.2.1(1) Documentation requirements for integral concrete.

716.2.1 Class II Concrete

(1) Ancillary concrete placed integrally with mainline pavement is accepted using tests of class I concrete but not eligible for incentive payment under 715.5. Document the locations and quantities of integral concrete and identify the class I sublot tests used for acceptance.

716.2.1(2) Test temperature for each 100 CY. Cast cylinders for each 200 CY per mix design. ASP 6 May 2022 let.

(2) Perform random QC testing at the following frequencies:

1. Test air content, temperature, and slump a minimum of once per 100 cubic yards for each mix design and placement method.
2. Cast one set of 2 cylinders per 200 cubic yards for each mix design and placement method. Cast a minimum of one set of 2 cylinders per contract for each mix design and placement method. Random 28-day compressive strength cylinders are not required for HES or SHES concrete.
3. For deck overlays, perform tests and cast cylinders once per 50 cubic yards of grade E concrete placed.
4. For concrete base, one set of tests and one set of cylinders per 250 cubic yards.

The department will allow concrete startup test results for quantities under 50 cubic yards. Cast one set of 2 cylinders if using startup testing for acceptance.

(3) Report concrete test results to the engineer on the day sampled, except for long-term testing, report on the day tested.

(4) Conform to the initial curing requirements under 710.5.5 except the contractor may extend initial curing for 72 hours before transporting the cylinders to a department-qualified laboratory.

(5) Except as allowed for small quantities in 710.2, test aggregate conforming to 710.5.6.

(6) Provide concrete with a 28-day compressive strength that equals or exceeds the following:

- If the contract specifies f'c, then f'c.
- If the contract does not specify f'c, then 3000 psi.

716.2.2 Class III Concrete

(1) Acceptance of class III concrete is based on a certificate of compliance. Submit the certificate of compliance at least 3 business days before producing concrete along with the initial concrete mix documentation as required under 710.4(2).

(2) Contractor testing for the mix and mix aggregates is not required for the items contained within the certificate of compliance. Conform to 716.2.1 for items not contained within the certificate of compliance.

(3) Department verification testing is optional for class III concrete. Correct any deficiencies found during the QV testing.

716.3 (Vacant)

716.4 (Vacant)

716.5 (Vacant)

730 QMP Base Aggregate

730.1 Description

730.1.1 General

(1) This section describes contractor QC and department QV testing and documentation for base aggregates. Apply to Base Aggregate Open Graded bid items and to Base Aggregate Dense bid items except reclaimed asphaltic pavement placed under the Base Aggregate Dense bid items.

(2) Do not apply to Aggregate Detours, Breaker Run, Select Crushed, Pit Run, Subbase, or Riprap bid items.

(3) Conform to the general QMP requirements under 701, to the base aggregate requirements under 301, 305, and 310, and to the additional requirements specified here in 730.

730.1.2 Quality Control Program

730.1.2.1 Quality Control Plan

(1) Submit a plan conforming to 701.1.2.2 and include additional information as follows:

1. Section and quarter descriptions for all aggregates that require QC testing.
2. Description of stockpiling and hauling methods.

730.1.2.2 Small Quantities

(1) The department defines a small quantity of base aggregate as a contract quantity of 6000 tons or less placed under a single bid item.

(2) For small quantity contracts:

- An abbreviated quality control plan is allowed under 701.1.2.3.
- Contractor QC placement testing is modified as specified in 730.3.4.1.

730.1.2.3 Documentation

(1) Submit gradation, fracture, liquid limit, and plasticity test results to the engineer within 1 business day of obtaining the sample and submit data electronically using MRS as specified in 701.1.2.7.

(2) Maintain standardized control charts according to CMM 830.

(3) Maintain separate gradation control charts for each sieve size specified in 305 or 310 for each base aggregate size, source or classification, and type. Set the control limits and warning limits as follows:

1. The control limits are the upper and lower gradation specification limits.
2. Warning limits:
    - There are no upper warning limits for sieves requiring or allowing 100 percent passing.
    - There are no lower warning limits for sieves allowing 0 percent passing.
    - Dense-graded No. 200 sieve: warning limits are 0.5 percent within the upper and lower control limits.
    - Dense-graded for all other sieves: warning limits are 2 percent within the upper and lower control limits.
    - Open-graded 1-inch, 3/8-inch, and No. 4 sieves: warning limits are 2 percent within the upper and lower control limits.
    - Open-graded No. 10, No. 40, and No. 200 sieves: warning limits are 1 percent within the upper and lower control limits.

(4) Maintain a separate fracture control chart for each base aggregate size, source or classification, and type. Set the lower control limit to the value specified in table 301-2. Set the lower warning limit 2 percent above the lower control limit. There is no upper warning limit.

(5) Plot QC and QV test results and the 4-point running average on control charts. Include only QC placement tests in the running average unless a QV test result is out of spec, then include it as specified in 730.3.5(5). Document corrective action on control charts. Update control charts and submit copies to the engineer daily.

730.2 Materials

(1) Provide materials conforming to 301, 305, and 310.

(2) Use the definitions in 301.2.2 and the following:

Stockpile Sampling	Coordinated QC or QV sample before beginning placement of aggregate materials.
Loadout Sampling	Sample taken from the working face of a stockpile during placement of aggregate materials.

730.3 Testing

730.3.1 Waive fracture testing for recycled materials.

730.3.1 General

(1) Test gradation, fracture, liquid limit, and plasticity for each base aggregate size, source or classification, and type. Production tests only apply to small quantity projects under 730.3.4. Use the test methods specified in table 701-1 and conform to the following:

1. Gradation
   - Determine the complete gradation, including P200, using a washed analysis.
   - For 3-inch base, if three consecutive 4-point running averages for percent passing the No 200 sieve are 8.5 percent or less, the contractor may use an unwashed analysis for 9 out of 10 tests; one out of every 10 must be washed. If a single 4-point running average for percent passing the No. 200 sieve exceeds 8.5 percent, resume using a washed analysis until three consecutive running averages are 8.5 percent or less.
2. Fracture
   - Perform fracture testing on the individual component materials before blending.
   - Fracture testing is not required on material classified as quarried stone, reclaimed asphalt, reprocessed material, or recycled concrete.
3. Liquid limit and plasticity
   - Determine the liquid limit and plasticity index using material passing the No. 40 sieve of each individual component material and then on the blended material.
   - Perform plasticity checks, as specified under 730.3.2, by using the Hand Rolling Method detailed in section 5 of AASHTO T90.
   - Liquid limit and plasticity testing are not required on reclaimed asphalt or reprocessed material.

(2) Ensure that both QC and QV stockpile test results conform to the specifications before placing material. If either the QC or the QV test fails, both the QC and QV technicians will resample the stockpile side-by-side and rerun the tests. If either side-by-side test fails, submit a written description of corrective action taken. If the corrective action results in a passing process control test, the department will retest to confirm that the resulting material is conforming.

(3) Stockpile tests[1] can be used for multiple projects. If placement on a project does not begin within 120 calendar days after the date the stockpile sample was obtained, retest the stockpile before placement begins.

[1] Replace the stockpile test with an in-place production test for concrete pavement recycled and processed on-site; test on the first day of production.

(4) Obtain placement samples after the material is bladed, mixed, and shaped, but before watering and compacting, except as follows:

1. Sample 3-inch material and lift thicknesses of 3-inch or less from the stockpile at loadout.
2. Do not sample from material used to maintain local traffic or from other areas of temporary base that will not remain in place after the contract.
3. No placement testing is required on days when only temporary base material is placed. Acceptance of temporary base materials is based on visual inspection.

730.3.2 Increase allowed reporting time for aggregate with recycled material.

730.3.2 Contractor QC Testing

(1) Provide stockpile test results to the engineer before placing material.

(2) Split and label each QC sample. Retain the split for 10 calendar days in a dry, protected location. If requested for department comparison testing, deliver the split to the engineer within one business day.

(3) Perform QC gradation, fracture, liquid limit, and plasticity testing of each base aggregate size, source or classification, and type at the following frequencies:

- One stockpile test before placement including gradation, fracture, liquid limit, and plasticity.
- Conduct one gradation test per lot. One lot is defined as 3000 tons of material placed. The contractor may include partial quantities of less than or equal to 750 tons with the previous lot. For partial lots exceeding 750 tons, notify the engineer who will direct additional testing to represent that partial lot.
- One fracture test for each gradation test. When the fracture 4-point running average is above the lower warning limit, the testing frequency may be reduced to one fracture test per ten gradation tests or fraction thereof. The reduced test frequency applies only as long as the running average remains above the lower warning limit.

- One plasticity and liquid limit test for the first gradation test. Thereafter, perform one plasticity check, per ten gradation tests or fraction thereof. If the soil cannot be rolled into a 3 mm-diameter thread, then it is non-plastic (NP) and the complete test need not be performed; report the plasticity Index as NP. If the material can be rolled into a thread, then perform both complete tests to determine the liquid limit and the plasticity index.

(4) Submit test results to the engineer within 1 business day of sampling, except an aggregate classification with recycled asphalt may be submitted within 3 business days of sampling.

730.3.3 Increase retain time and QV testing frequency, and for aggregate with recycled material, reporting time.

730.3.3 Department QV Testing

(1) The department will notify the contractor's project materials coordinator before obtaining a sample.

(2) The department will split each sample, test half for QV, and retain the other half for 10 calendar days.

(3) The department will conduct QV testing for gradation, fracture, liquid limit, and plasticity of each base aggregate size, source or classification, and type as follows:

1. One stockpile QV test from each source before placement.
2. At least one QV test per 15,000 tons of material placed, or fraction thereof.

(4) The department will provide test results to the contractor within 2 business days of sampling, or for an aggregate classification with recycled asphalt, within 3 business days of sampling.

730.3.4 Small Quantity Testing

730.3.4.1 Revise small quantity threshold and clarify QC testing requirements.

730.3.4.1 Contractor QC Testing

(1) For small quantity contracts with <= 750 tons, submit 2 gradation, fracture, liquid limit, and plasticity production tests or conduct 1 QC gradation, fracture, liquid limit, and plasticity stockpile test. Production tests are valid for 3 years from the date the production sample was obtained. Begin placement within 3 years of the date sampled.

(2) For small quantity contracts with <= 6000 tons and >750 tons, perform gradation, fracture, liquid limit, and plasticity testing of each base aggregate size, source or classification, and type at the following frequencies:

1. Conduct one QC stockpile test before placement.
2. Submit 2 production tests or conduct 1 QC loadout test instead of placement tests. Production tests are valid for 3 years from the date the production sample was obtained; the first day of placement must be within 3 years of the date sampled.
3. If the actual quantity placed is more than 6000 tons, on the next day of placement perform one additional random QC test for each 3000 tons of overrun, or fraction thereof.

(3) Submit test results to the engineer within 1 business days of sampling, except an aggregate classification with recycled asphalt may be submitted within 3 business days of sampling

730.3.4.2 Department QV Testing

(1) The department will conform to 730.3.3 but may waive QV testing for contract bid item quantities of 6000 tons or less.

730.3.5 Corrective Action

(1) Do not blend additional material on the roadbed to correct gradation problems.

(2) Consider corrective action when a running average trends toward a warning limit.

(3) Notify the engineer when a running average exceeds a warning limit. When two consecutive running averages exceed a warning limit, the engineer and contractor will discuss appropriate corrective action. Perform the engineer's recommended corrective action and increase the testing frequency as follows:

1. Increase gradation testing to at least one test per 1000 tons placed.
2. Increase fracture testing to at least one fracture test for each gradation test.

(4) If corrective action improves the property in question such that the running average is within the warning limits, the contractor may return to the testing frequency specified in 730.3.2. If corrective action does not improve the property in question, and the running average is still in the warning band, then repeat the steps outlined above starting with engineer notification.

(5) If a QV test result does not conform to the specifications, the engineer will inform the contractor and the QV test will be added to the QC data and included in the running average, as if it were an additional QC test.

(6) If a running average is never established, individual placement tests are used for acceptance.

(7) If an individual QC or QV test result is significantly out of specification limits, notify the other party, stop placing base, suspend other activities that may affect the area in question, and jointly investigate to determine the extent of nonconforming material. Both parties must document the investigative work.

(8) Test results are considered significantly out of spec limits if meeting one or more of the following:

1. A gradation spec limit for the No. 200 sieve is exceeded by more than 3.0 percent.
2. A gradation spec limit for any sieve, other than the No. 200, is exceeded by more than 5 percent.
3. The fracture spec limit is exceeded by more than 10 percent.

(9) The engineer may direct the contractor to remove and replace any nonconforming material. If the engineer allows the nonconforming material to remain in place, it is subject to a pay reduction.

730.3.6 Nonconforming Material

(1) The department will determine the extent of nonconforming material as follows:

1. If an individual QC or QV gradation or fracture test is out of spec and a 4-point running average is never established, the material starting from the first out-of-spec QC or QV test and ending at the first subsequent QC or QV test that is within spec limits is nonconforming.
2. If a gradation or fracture 4-point running average exceeds a control limit, the material starting from the first running average outside of the control limit and ending at the first subsequent running average that is within the control limit is nonconforming.
3. If any individual QC or QV plasticity test is out of spec, the material starting from the first out-of-spec QC or QV test and ending at the first subsequent QC or QV test that is within spec limits is nonconforming.
4. If an individual QC or QV gradation or fracture test is significantly out of spec, the material starting from the first significantly out-of-spec QC or QV test and ending at the first subsequent QC or QV test that is within spec limits is nonconforming, even if the 4-point running average, that includes the significantly out-of-spec test, is within spec limits.

730.4 (Vacant)

730.5 Payment

(1) The department will administer pay reductions for nonconforming material under the Nonconforming QMP Base Aggregate Gradation, Nonconforming QMP Base Aggregate Fracture, and Nonconforming QMP Base Aggregate Plasticity administrative items.

(2) The department will calculate pay reductions for base aggregate with nonconforming gradation and fracture using the nonconforming quantity that remains in place, the bid item contract unit price, and a pay reduction percentage from table 730-1. The department will administer a 50 percent pay reduction for base aggregate with nonconforming plasticity or liquid limit that remains in place.

TABLE 730-1 Pay Reductions for Nonconforming Base Aggregate

% PAY REDUCTION	NONCONFORMING GRADATION		NONCONFORMING FRACTURE
	NO 200 SIEVE	SIEVES OTHER THAN NO 200	
5% to 10%	<= 1.5%	<= 3%	<= 5%
10% to 20%	> 1.5% to <= 3%	> 3% to <= 5%	> 5% to <= 10%
SIGNIFICANTLY OUT OF SPEC[1]			
20% to 40%	> 3%	> 5%	> 10%

[1] The engineer may assess pay reductions for individual QC or QV test results that are significantly out of spec even if the running average is within spec limits.

(3) The department will not apply more than one pay adjustment to a given quantity of material. If a quantity of material is nonconforming in more than one property, the department will apply the greater pay reduction.