

PART 1 - GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 013529.06 – Health and Safety Requirements
 - .2 Section 017421 – Construction/Demolition Waste Management and Disposal
 - .3 Section 310516 – Aggregate Materials
 - .4 Section 311123 - Aggregate Base Courses
 - .5 Section 321615 – Concrete Walks, Curbs Gutters and Medians
- 1.2 MEASUREMENT FOR PAYMENT
- .1 No measurement for payment will be made under this section. Include costs in items where required including all labour, materials and equipment.
- 1.3 REFERENCES
- .1 Reference Standards:
 - .1 ASTM International
 - .1 ASTM C 260-06, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .2 ASTM C 309-07, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .3 ASTM C 494/C 494M-08a, Standard Specification for Chemical Admixtures for Concrete.
 - .4 ASTM C 1017/C 1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - .5 ASTM D 412-06ae1, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
 - .6 ASTM D 624-00(2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
 - .7 ASTM D 1751-04, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - .8 ASTM D 1752-04a, Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
 - .2 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .3 CSA International
 - .1 CSA A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

- .2 CSA A283-06, Qualification Code for Concrete Testing Laboratories.
 - .3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- 1.4 ADMINISTRATIVE REQUIREMENTS .1 Pre-installation Meetings: in accordance with Section 013216.06 - Construction Progress Schedule - Critical Path Method (CPM), convene pre-installation meeting one week prior to beginning concrete works.
- .1 Ensure key personnel, site supervisor, Departmental Representative, specialty contractor – finishing/forming attend.
 - .1 Confirm project requirements.
- 1.5 ACTION AND INFORMATIONAL SUBMITTALS .1 Provide submittals in accordance with Section 013300 - Submittal Procedures.
- .2 Provide testing results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.
 - .3 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken.
 - .4 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.
 - .5 Provide two copies of WHMIS MSDS in accordance with Section 013529.06 - Health and Safety Requirements 013543 - Environmental Procedures.
- 1.6 QUALITY ASSURANCE .1 Quality Assurance: in accordance with Section 014500 - Quality Assurance.
- .2 Provide Departmental Representative, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.
 - .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.
 - .3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items:
 - .1 Curing.
 - .2 Finishes.
 - .3 Joints.
 - .4 Quality Control Plan: provide written report to Departmental Representative confirming compliance that concrete in place

meets performance requirements of concrete.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
 - .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.
 - .2 Deviations to be submitted for review by Departmental Representative.
 - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- .1 Performance: to CSA A23.1/A23.2.

2.2 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance.

2.3 MATERIALS

- .1 Portland Cement: to CSA A3001, Type GU.
- .2 Water: to CSA A23.1.
- .3 Aggregates: to CSA A23.1/A23.2.
- .4 Admixtures:
 - .1 Air entraining admixture: to ASTM C 260.
 - .2 Chemical admixture: to ASTM C 494 ASTM C 1017. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .5 Curing compound: to CSA A23.1/A23.2 white.
- .6 Premoulded joint fillers: Bituminous impregnated fiber board: to ASTM D 1751

2.4 MIXES

- .1 Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
 - .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.
 - .1 Compressive strength at 28 days: 35 Mpa minimum.
 - .2 Workability: free of surface blemishes and segregation.
- .2 Provide quality management plan to ensure verification of concrete quality to specified performance.

- .3 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete.
 - .1 Provide 24 hours minimum notice prior to placing of concrete.
- .2 During concreting operations:
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .3 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .4 Protect previous Work from staining.
- .5 Clean and remove stains prior to application for concrete finishes.
- .6 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .7 Do not place load upon new concrete until authorized by Departmental Representative.
- .8 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
 - .1 Place steel dowels of deformed steel reinforcing bars and pack solidly with shrinkage compensating grout to anchor and hold dowels in positions as indicated.

3.2 INSTALLATION APPLICATION

- .1 Do cast-in-place concrete work to CSA A23.1/A23.2.
 - .1 Finishing and curing:
 - .1 Finish concrete to CSA A23.1/A23.2.
 - .2 Use procedures as reviewed by Departmental Representative or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.
 - .3 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.
- .2 Joint fillers:
 - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative.
 - .2 When more than one piece is required for joint, fasten

abutting ends and hold securely to shape by stapling or other positive fastening.

- .3 Locate and form expansion joints per OPSD Standards.
- .4 Install joint filler.
- .5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.

3.3 SURFACE TOLERANCE

- .1 Concrete tolerance to CSA A23.1.

3.4 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 014500 - Quality Assurance and submit report for the following:
 - .1 Concrete pours.
 - .2 Slump.
 - .3 Air content.
 - .4 Compressive strength at 7 and 28 days.
 - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
 - .1 Ensure laboratory is certified to CSA A283.
- .3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Departmental Representative.
- .4 Contractor will pay for costs of tests as specified in Section 012983 - Payment Procedures for Testing Laboratory Services.
- .5 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .6 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.
- .7 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.5 CLEANING

- .1 Clean in accordance with Section 017411 - Cleaning.
 - .1 Divert unused concrete materials to local quarry.
 - .2 Provide appropriate area on job site where concrete trucks can be safely washed.
 - .3 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by Departmental Representative.
 - .4 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
 - .5 Prevent admixtures and additive materials from entering drinking water supplies or streams.

- .6 Using appropriate safety precautions, collect liquid or solidify liquid with inert, noncombustible material and remove for disposal.
- .7 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

***** END OF SECTION *****