

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials (ASTM).
 - .1 ASTM C109/C109M-05, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50-mm Cube Specimens.).
 - .2 ASTM C827/C827 - 16(2005), Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
 - .3 ASTM C939-02, Test Method for Flow of Grout for Preplaced Aggregate Concrete.
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A5-93, Portland cement..CAN/CSA-A23.1-94, Concrete Materials and Methods of Concrete Construction.
 - .2 CAN/CSA-A23.1-94, Concrete Materials and Methods of Concrete Construction.
 - .3 CAN/CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.
 - .4 CAN/CSA-A23.2-00, Methods of Test for Concrete.

1.2 SAMPLES

- .1 At least 4 weeks prior to commencing Work, inform Contract Administrator of proposed source of aggregates and provide access for sampling.
 - .1 10 kg of each type of Portland cement.
 - .2 5 L of curing compound.
 - .3 1 m length of each type of joint filler.

1.3 CERTIFICATES

- .1 Minimum 4 weeks prior to starting concrete Work submit to Contract Administrator manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:
 - .1 Portland cement
 - .2 Blended hydraulic cement
 - .3 Supplementary cementing materials
 - .4 Grout
 - .5 Admixtures
 - .6 Aggregates
 - .7 Water
 - .8 Joint filler
- .2 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1-00.
- .3 Provide certification that plant, equipment and materials to be used in concrete comply with requirements of CAN/CSA-A23.1-00.

1.4 QUALITY ASSURANCE

- .1 Minimum 4 weeks prior to starting concrete Work, submit proposed quality control procedures for Contract Administrator's approval for the following items:
 - .1 Falsework erection
 - .2 Hot weather concrete
 - .3 Cold weather concrete
 - .4 Curing
 - .5 Finishes
 - .6 Formwork removal
 - .7 Joints

Part 2 Products

2.1 MATERIALS

- .1 Portland cement to CAN/CSA-A5 Type 10.
- .2 Water to CAN/CSA-A23.1-00.
- .3 Aggregates fine and coarse to CAN/CSA-A23.1-00.
- .4 Shrinkage compensating grout: premixed compound consisting of metallic, non-metallic aggregate, Portland cement, water reducing and plasticizing agents.
 - .1 Compressive strength: 50 MPa at 28 days.
 - .2 Consistency:
 - .1 Fluid: to ASTM C827. Time of efflux through flow cone (ASTM C939), under 30s.
 - .2 Flowable: to ASTM C827. Flow table, 5 drops in 3s, (ASTM C109, applicable portion) 125 to 145%.
 - .3 Plastic: to ASTM C827. Flow table, 5 drops in 3 s, (ASTM C109, applicable portion) 100 to 125%.
 - .4 Dry pack to manufacturer's requirements.
 - .5 Non-premixed dry pack grout: composition of non-metallic aggregate Portland cement with sufficient water for the mixture to retain its shape when made into a ball by hand and capable of developing compressive strength of 50 MPa at 28 days.
 - .6 Provide vapour retarder membrane as indicated under all slabs on grade. Lap and seal membrane as per manufacturer's recommendations.

2.2 REINFORCEMENT

- .1 Reinforcing Steel: 276 MPa yield grade. Dowels: ASTM A615; 276 MPa.

2.3 CONCRETE MATERIALS

- .1 Cement: CAN/CSA-A438, Air Entrained Portland type, grey colour.
- .2 Edit the following paragraph to suit local availability. Specify if special aggregates are required.

.3 Fine and Coarse Mix Aggregates: CAN/CSA-A438.

.4 Water: Potable, not detrimental to concrete.

2.4 ACCESSORIES

.1 Curing Compound: Type 2 Standard of Acceptance: conforming to ASTM D175.

.2 Liquid Surface Sealer: coli film. Standard of Acceptance: manufactured by Master Builders.

.3 Joint Sealers: The Isolation or expansion joint filler shall be a pre-formed, rot proof, non-extruded, resilient type bituminous fibre, conforming to the requirements of ASTM D1751. Isolation/Expansion Joint Filler shall be Flexcell by Sternsom Limited or approved equal.

2.5 CONCRETE MIX

.1 Mix and deliver concrete in accordance with CAN/CSA-A438.

Part 3 Execution

3.1 SUBBASE

.1 Section 31 23 10 – Excavating, Trenching & Backfilling.

.2 Section 32 11 23 – Aggregate Base Courses

3.2 PREPARATION

.1 Moisten base to minimize absorption of water from fresh concrete.

3.3 FORMING

.1 Form vertical surfaces to full depth; place and secure to correct location, profile, and gradient.

.2 Coat forms with form release agent to permit easy stripping and dismantling without damaging concrete.

.3 Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.4 REINFORCEMENT

.1 Place reinforcement at mid-height of slabs-on-grade.

3.5 PLACING CONCRETE

.1 Place concrete continuously over the full width of the panel and between predetermined construction joints.

.2 Place concrete to broom pattern.

.3 Cure and protect concrete in accordance with CAN/CSA-A438.

3.6 JOINTS

- .1 Saw cut contraction joints 5 at 2.0m on centre at an optimum time after finishing. Cut 1/3 into depth of slab.

3.7 FINISHING

- .1 Finish exposed surface to a smooth, uniform finish, free of open texturing and exposed aggregate.
- .2 Wood float finish surface to provide none-skid texture.
- .3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep.
- .4 Curbs: Light broom.
- .5 Direction of Texturing: Transverse to pavement direction.
- .6 Place sealer on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.8 JOINT SEALING

- .1 Separate pavement from vertical surfaces with 13 mm thick joint filler.
- .2 Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- .3 Extend joint filler from bottom of pavement to within 13 mm of finished surface.

3.9 PROTECTION

- .1 Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-25.20- [95], Surface Sealer for Floors.
- .2 Canadian Standards Association (CSA)
 - .1 CSA-A23.1- [94], Concrete Materials and Methods of Concrete Construction.

1.2 PERFORMANCE REQUIREMENTS

- .1 Product quality and quality of Work in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Submit written declaration that components used are compatible and will not adversely affect finished flooring products and their installation adhesives.

1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Include application instructions for concrete floor treatment.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.
- .6 Dispose of waste from stripping of floors in a manner that will not have unfavourable effects on the environment.

1.5 ENVIRONMENTAL REQUIREMENTS

- .1 Temporary lighting:
 - .1 Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 sq m of floor being treated.
- .2 Electrical power:
 - .1 Provide sufficient electrical power to operate equipment normally used during construction.
- .3 Work area:

- .1 Make the Work area water tight protected against rain and detrimental weather conditions.
- .4 Temperature:
 - .1 Maintain ambient temperature of not less than [10] EC from [7] days before installation to at least 48 hours after completion of Work and maintain relative humidity not higher than 40% during same period.
- .5 Moisture:
 - .1 Ensure concrete substrate is within moisture limits prescribed by [flooring] manufacturer.
- .6 Safety:
 - .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .7 Ventilation:
 - .1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
 - .2 Provide continuous ventilation during and after coating application.

Part 2 Products

2.1 CHEMICAL HARDENERS

- .1 Type 1- Sodium silicate.
- .2 Water: potable.

2.2 SEALING COMPOUNDS

- .1 Surface sealer: to CAN/CGSB-25.20, Type 2 - water based.
- .2 Surface sealers may not be manufactured or formulated with aromatic solvents formaldehyde halogenated solvents mercury lead cadmium hexavalent chromium and their compounds.

2.3 WET CURE

- .1 Clear polyethylene film to ASTM C171, minimum thickness 0.15 mm.

2.4 MIXES

- .1 Mixing, ratios and application in accordance with manufacturer's instructions.

2.5 JOINT SEALANT

- .1 Joint sealants to Section 07 92 00 – Joint Sealants.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify that surfaces are ready to receive Work and elevations are as indicated on drawings.

3.2 PREPARATION OF SLAB

- .1 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radiused edges [unless otherwise indicated].
- .2 Saw cut control joints to CSA-A23.1, 24 hours maximum after placing of concrete.

3.3 APPLICATION

- .1 After floor treatment is dry, seal control joints and joints at junction with vertical surfaces with sealant.
- .2 Apply floor treatment in accordance with Sealer manufacturer's written instructions.
- .3 Clean overspray. Clean sealant from adjacent surfaces.
- .4 Finish concrete floor surfaces in accordance with CAN3-A23.1M.
- .5 Uniformly spread, screed, and float concrete. Do not use grate tampers or mesh rollers. Do not spread concrete by vibration.
- .6 Steel trowel surfaces that will receive carpeting, resilient flooring.
- .7 Steel trowel all surfaces left exposed to view.
- .8 Apply hardener on concrete floor surfaces that do not receive additional flooring material. Apply in accordance with manufacturer's recommendations.
- .9 Apply sealer on floor surfaces to receive hardener. Apply in accordance with manufacturer's recommendations.
- .10 Saw cut control joints as called for to CAN3-A23.3-M94.

3.4 TOLERANCES

- .1 Maintain surface flatness, with maximum variation of 3 mm in 3 m.
- .2 In areas with floor drains, maintain floor level at walls and pitch surfaces uniformly to drains at 20 mm per meter nominal as indicate on drawings.

3.5 PROTECTION

- .1 Protect finished installation in accordance with manufacturer's instructions.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA A23.4-00/A251-00 Precast Concrete - Materials and Construction/Qualification Code for Architectural and Structural Precast Concrete Products

1.2 SCOPE OF WORK

- .1 Provide precast splash pads where required and shown on drawings to ensure positive drainage away from building at downspout or drain outlet locations.

1.3 DRAINAGE STANDARD

- .1 Install splash pads to guarantee a minimum slope of 3% away from building without settlement for a minimum distance of 3 meters.

1.4 PROTECTION

- .1 Protect bench marks and existing structures, lawns, roads, sidewalks, paving and curbs against damage from vehicular or foot traffic.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.
- .6 Dispose of waste from stripping of floors in a manner that will not have unfavourable effects on the environment.

1.6 WARRANTY

- .1 Make good any settlement of splash/pads fill and topsoil for a period of one year from Substantial Completion of the project. Pay all costs in making good paving, lawns, etc., damaged by such settlement, at no cost to The City or Contract Administrator.

Part 2 Products

2.1 PRECAST CONCRETE SPLASH PADS

- .1 Precast Concrete Splash Pads: to be Barkman Concrete Ltd. 12" mm (305 mm) wide x 30" (762 mm) long, Natural, model No: 105604. Locate at all rainwater leader locations.

- .1 Provide mounting brackets at all splashpad locations and install as per manufacturer instructions.
- .2 Levelling course: shall be 6 mm dia. crushed limestone down
- .3 Contact for Splash Pads and Mounting Brackets:
Barkman Concrete
909 Gateway Road
Winnipeg. MB R2K 3L1
Telephone No. (204) 667-3310

2.2 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 630-2016.

2.3 FILL MATERIALS

- .1 Sub-surface gravel: Pit-run, crushed natural stone, free from shale, clay, friable materials and debris.
- .2 Surface Gravel (exposed): Clean natural stone, free from clay, shale and organic matter, 19mm to 38mm (5/8" to 1 1/2") size.
- .3 Sand: Clean natural river or bank sand, free from silt, clay, loam friable or soluble materials, and organic matter.
- .4 Crushed Stone: Angular crushed natural limestone, free from shale, organic matter and debris, maximum stone size 12mm (1/2") (75% passing).
- .5 Sub-soil: Free from roots, rock larger than 76mm (3") in size and building debris.

2.4 TOPSOIL

- .1 In accordance with Section 32 91 19 – Topsoil Placement and Grading.

2.5 SOD

- .1 In accordance with Section 32 92 23 – Sodding.

Part 3 Execution

3.1 PREPARATION

- .1 Determine extent of modification required to existing surface conditions to accommodate new splash pads.
- .2 Locate splash pads to ensure best drainage away from building and the least interference with landscape or building elements such as shrubs, walkways, windows etc.
- .3 Perform minor excavations as required to sub-surface for final grades.
- .4 Carefully remove existing sod and retain for replacement as required.
- .5 Firmly compact sub-soil to receive any required fill.

3.2 BACKFILLING AND TOPSOIL

- .1 In accordance with Sections 31 23 10 – Excavation, Trenching and Backfilling and 32 91 19 – Topsoil Placement and Grading.
- .2 Backfill areas to grades, levels and elevations as required with appropriate fill and topsoil materials to ensure positive drainage away from the building.
- .3 Perform backfilling and topsoil operations systematically and as early as possible to allow maximum time for natural settlement and required compaction.
- .4 Firmly compact fill to receive finished surface material.

3.3 GRAVEL BED

- .1 In accordance with Section 32 11 23 – Aggregate Base Courses.
- .2 Provide a compacted gravel bed of minimum 100 mm (4") depth beneath new splash pads.
- .3 Gravel levelling base to extend min. 75 mm (3") past splash pads.

3.4 PLACING OF SOD

- .1 In accordance with Section 32 92 23 – Sodding.

3.5 SPLASH PADS PLACEMENT

- .1 Place splash pads on compacted material to fully support concrete with no hollows or bows below.
- .2 Ensure required 3% slope.
- .3 Install Barkman Concrete Natural Splash Pads as per manufacturer's specifications.
- .4 Install Barkman Concrete Mounting Brackets as per manufacturer's specifications

3.6 CLEAN-UP

- .1 Remove all excess materials and leave the Site finished and in clean condition in accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION