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Produced by Reed Construction Data, this 3-part Specification utilizes Construction Specifications Canada's (CSC) *Manual of Practice* (MoP), including *MasterFormat™*, *SectionFormat™* and *PageFormat™*. Each publication is available from CSC. A 3-part Specification is a manufacturer-specific product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets, []. SPEC NOTES precede specification text. Trade/brand names with appropriate product model numbers, styles and types are used in SPEC NOTES and in the specification text Article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion. This 3-part Specification specifies concrete concentrate admixture for concrete mix, as manufactured by Xypex Chemical Corporation. Revise 3-part Specification section number and title below to suit project requirements, specification practices and section content. Refer to CSI/CSC *MasterFormat* for other section numbers and titles. Delete unused optional text and SPEC NOTES in final copy of specification in accordance with CSC recommended specification writing practice.

SECTION 03 05 00
COMMON WORK RESULTS FOR CONCRETE
(XYPEX CONCRETE CONCENTRATE ADMIXTURE)

1 General

1.1 SECTION INCLUDES

- .1 This Section specifies concrete concentrate admixture for concrete mix.

1.2 RELATED SECTIONS

SPEC NOTE: Include in this Article only those sections that directly affect the work of this section and are referenced in the project section. Do not include Division 00 or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 and Division 01 sections to some degree.

- .1 Section [03 33 00 - Cast-in-Place Concrete].

SPEC NOTE: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list only standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Division 01 Section 01 42 19 - Reference Standards may include the full names and addresses of the organizations whose standards are referenced in a project. The section can also be used for the editions or dates of referenced standards not otherwise indicated. Edit the following lists and delete standards not required for the specific project.

1.3 REFERENCES

- .1 American Concrete Institute (ACI).
 - .1 ACI 308, Standard for Curing Concrete.
- .2 ASTM International (ASTM).

- .1 ASTM C 39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- .2 ASTM C 666, Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
- .3 US Army Corps of Engineers (USACE).
 - .1 USACE CRD C-48, Permeability of Concrete.

1.4 ADMINISTRATIVE PROCEDURES

SPEC NOTE: Describe requirements for meetings to co-ordinate materials and techniques, and to sequence related work for sensitive and complex items.

- .1 Pre-installation Meetings: Conduct pre-installation meeting [one week] prior to commencing [work of this Section] [and] [on-site installations] to verify project requirements, substrate conditions, co-ordination with other building subtrades, and to review manufacturer's installation instructions and warranty requirements. Comply with [Section 01 31 19 - Project Meetings].
- .2 Sequencing: Sequence with other work in accordance with Section [01 12 16 - Work Sequence]. Comply with manufacturer's written recommendations for sequencing construction operations.

SPEC NOTE: Include requirements for coordinating work that requires unusual scheduling with work in another Section.

- .3 Scheduling: Schedule with other work in accordance with Section [01 32 13 - Scheduling of Work].

1.5 ACTION SUBMITTALS

- .1 General: Submit listed action submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- .2 Product Data: Submit product data, including manufacturer's manufacturer's printed data sheets and catalog pages illustrating products to be incorporated into project for specified products.
 - .1 Submit [2] copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).

1.6 INFORMATION SUBMITTALS

SPEC NOTE: Describe certificates intended to document affirmations by the Contractor or other entities that the work is in accordance with the Contract Documents.

- .1 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

SPEC NOTE: Specify submittals intended to document manufacturer installation, storage, and other instructions.

- .3 Installation Instructions:
 - .1 Submit manufacturer's installation [,storage] [and] [handling] instructions.

1.7 CLOSEOUT SUBMITTALS

- .1 Warranty Documentation: Submit warranty documents specified.

SPEC NOTE: Include standards, limitations and criteria that establish an overall level of quality for products and quality of work for this Section. Co-ordinate with Section 01 43 00 - Quality Assurance.

1.8 QUALITY ASSURANCE

.2 Qualifications

- .1 Manufacturer: Capable of providing field service representation during construction and approving application method.
- .2 Applicator: Experienced in performing work of this section and who has specialized in installation of work similar to that required for this project.

SPEC NOTE: Specify special and unique packing, shipping or handling instructions, and special measures needed to prevent damage to products prior to application or installation. Co-ordinate with Section 01 61 00 - Common Product Requirements.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements

- .1 Deliver material in accordance with Section [01 61 00 - Common Product Requirements] and in accordance with manufacturer's written instructions.
- .2 Deliver materials in manufacturer's original packaging with identification labels intact and in sizes to suit project

.2 Storage and Handling Requirements

- .1 Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store concrete concentrate admixture products dry at [4]°C ([40]°F) minimum.

.3 Packaging Waste Management

SPEC NOTE: Include the following paragraphs to specify information that will provide direction to the Contractor for the disposal of construction waste materials using environmentally responsible methodology which divert waste from landfill sites.

- .1 Separate waste materials for [reuse] [and] [recycling] in accordance with [Section 01 74 19 - Construction Waste Management and Disposal].

SPEC NOTE: Manufacturer may take back packaging and delivery materials for recycling.

- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] [metal banding] packaging material [in appropriate onsite bins] for recycling
- .4 Fold up metal and plastic banding, flatten and place in designated area for recycling.
- .5 Remove pallets from site and return to supplier or manufacturer.

SPEC NOTE: Co-ordinate this Article with CCDC 2, or other Agreement documents, Contract Conditions and with Section 01 78 36 - Warranties. Consult with manufacturer for specific warranty requirements.

1.10 WARRANTY

- .1 Project warranty: Refer to [CCDC 2] for project warranty provisions and co-ordinate with Section [01 78 36 - Warranties].
- .2 Manufacturer's warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and does not limit other rights Owner may have under Contract Documents, or Canadian Law.

SPEC NOTE: Co-ordinate this Article with manufacturer's warranty requirements.

- .3 Warranty period: [1 - year], commencing on Date of Substantial Performance of Work.

2 Products

2.1 MANUFACTURERS

- .1 Ensure manufacturer has minimum [5] years experience in manufacturing components similar to or exceeding requirements of project.
- .2 Manufacturer List

- .1 Xypex Chemical Corporation, 13731 Mayfield Place, Richmond, BC Canada V6V 2G9; Telephone: (800) 961-4477, (604) 273-5265; Fax: (604) 270-0451; E-mail: info@xypex.com; website: www.xypex.com.

SPEC NOTE: If a Division 01 Section covers this substitution on a project-wide basis, do not repeat that requirement here. Do not include substitution procedures here unless not defined elsewhere.

- .3 Substitution Limitations

- .1 Substitutions: [In accordance with Section 01 25 13 - Product Substitution Procedures] [No substitutions permitted].

2.2 PERFORMANCE CRITERIA

- .1 Permeability: Tested to USACE CRD C - 48 treated concrete samples pressure tested to 412 m (1350 feet) water head of 1.034 MPa (150 psi).
 - .1 Ensure untreated sample results show moisture and permeated water throughout untreated sample after 24 hours.
 - .2 Ensure concrete concentrate admixture treated samples show no leakage, and penetration of only 1.2 mm (3/64 inch) after 5 days.
- .2 Chemical Resistance: Test concrete concentrate admixture treated samples against control samples to determine resistance to corrosion and deterioration caused by contact with aggressive chemicals. Ensure control samples have been soaked in a 5% solution of sulfuric acid at 20°C (68°F) for 6 months minimum.
 - .1 Ensure concrete concentrate admixture treated samples were subjected to acid conditions and results confirmed that concrete concentrate admixture treated samples had best performance of samples tested.
- .3 Freeze and Thaw Durability: Ensure concrete concentrate admixture treated samples tested to ASTM C 666 indicate 94% minimum relative durability after 300 cycles.
- .4 Compressive Strength: Ensure concrete concentrate admixture treated samples are tested to ASTM C 39 at various dosage rates (1, 2 and 5%) and tested against untreated concrete control sample.
 - .1 Ensure compressive strength test results after 28 days for reference sample are at 45 MPa (6460 psi) minimum.

- .2 Ensure compressive strength test results after 28 days for concrete concentrate admixture treated samples measured are 49 MPa (7160 psi) minimum, representing 10% increase in compressive strength over control sample.

2.3 MATERIALS

SPEC NOTE: Specify the following admixture for cold weather pours or when increased dosage rates are required.

- .1 Concrete concentrate admixture: To ACI 308, ASTM C 39, ASTM C 666 and USACE CRD C - 48, integral waterproofing admixture included in concrete mix at time of batching for cold weather pours.

SPEC NOTE: Use the following Article to indicate manufacturer's name, address, product name, model number, style number or other product identifier, as well as means of contacting manufacturer, if not listed elsewhere.

- .1 Acceptable material: Xypex Chemical Corporation, Xypex Admix C-1000.

- .2 Concrete concentrate admixture: To ACI 308, ASTM C 39, ASTM C 666 and USACE CRD C - 48, integral waterproofing admixture included in the concrete mix at the time of batching.

SPEC NOTE: Use the following Article to indicate manufacturer's name, address, product name, model number, style number or other product identifier, as well as means of contacting manufacturer, if not listed elsewhere.

- .1 Acceptable material: Xypex Chemical Corporation, Xypex Admix C-2000.

2.4 MIXES

SPEC NOTE: Add Xypex Admix to concrete mix at time of batching. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment.

- .1 Mixing: Mix proprietary materials in accordance with manufacturer's instructions, including product data and product technical bulletins.

2.5 SOURCE QUALITY CONTROL

- .1 Ensure concrete concentrate admixture materials are from single manufacturer.

3 Execution

3.1 INSTALLERS

- .1 Provide experienced and qualified technicians to carry out application and installation of concrete concentrate admixture.

3.2 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written recommendations, specifications, including product technical bulletins, catalogue installation instructions, product carton handling, storage and installation instructions.

3.3 APPLICATION

SPEC NOTE: The setting time of concrete is affected by the chemical and physical composition of ingredients, temperature of the concrete and climatic conditions. Retardation of set may occur when using Xypex Admix. The amount of retardation will depend upon the concrete mix design and the dosage rate of the Admix. However, under normal conditions, Admix C-1000 will provide a normal set time for concrete. Concrete containing Xypex Admix may develop higher ultimate strengths than plain concrete. Trial mixes should be carried out under project conditions to determine setting time and strength of the concrete.

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- .1 Apply products in accordance with manufacture's written instructions and co-ordinate with Section [01 73 00 - Execution] and Section [01 73 13 - Application].
 - .2 Add concrete concentrate admixture materials to concrete mix at time of batching. Sequence of procedures for addition will vary with type of batch plant operation and equipment.
 - .3 Ready-Mix Plant, Dry Batch Operation:
 - .1 Add concrete concentrate admixture materials in powder form to ready-mix truck drum.
 - .2 Drive truck under batch plant and add 60 - 70% of required water along with 136kg - 227kg (300 lb - 500 lb) of aggregate.
 - .3 Mix materials for 2 - 3 minutes to ensure concrete concentrate admixture materials are distributed evenly throughout mix water.
 - .4 Add balance of materials to ready-mix truck in accordance with standard batch practices.
 - .4 Ready-Mix Plant, Central Mix Operation:
 - .1 Mix concrete concentrate admixture materials with water to form very thin slurry (i.e., 7kg – 9kg (15 lb - 20 lb) of powder mixed with 11 L (3 gal) of water).
 - .2 Pour required amount of material into ready-mix truck drum.
 - .3 Plant batch and mix aggregate, cement and water in accordance with standard practices (taking into account quantity of water that has already been placed in ready-mix truck).
 - .4 Pour concrete into truck and mix for at least 5 minutes to ensure even distribution of concrete concentrate admixture materials throughout the concrete.
 - .5 Precast Batch Plant, Pan-Type Mixer:
 - .1 Add concrete concentrate admixture materials to rock and sand, then mix thoroughly for 2 - 3 minutes before adding cement and water.
 - .2 Blend total concrete mass using standard practices.
 - .3 Obtain homogeneous mixture of concrete concentrate admixture materials with concrete; do not add dry concrete concentrate admixture materials directly to wet concrete as this may cause clumping and thorough dispersion will not occur.
- 3.4 PROTECTION
- .1 Protect installed product from damage during construction in accordance with Section [01 76 00 - Protecting Installed Construction].

END OF SECTION