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This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat*™, *SectionFormat*™ and *PageFormat*™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies concrete concentrate admixture, marketed under the Xypex Admix C Series trade name, manufactured by Xypex Chemical Corporation. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles, including 03 30 00 Cast-in-Place Concrete and 03 30 53 Miscellaneous Cast-in-Place Concrete.

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

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Concrete concentrate admixture for concrete mix.

Specifier Note: Revise paragraph below to suit project requirements. Add section numbers and titles per CSI *MasterFormat* and specifier's practice.

- B. Related Sections: Section(s) related to this section include:
 1. Concrete: Division 03 Concrete Sections.

Specifier 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 standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 01 References Section may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section.

1.02 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. ASTM International:
 1. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 2. ASTM C666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
- C. American Concrete Institute (ACI):
 1. ACI 308 Standard for Curing Concrete.

- D. US Army Corps of Engineers (USACE):
1. CRD C-48 Permeability of Concrete.

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide concrete concentrate admixture which has been manufactured and added to concrete mix at time of concrete batching to maintain performance criteria stated by manufacturer without defects, damage or failure.
1. Coordinate and schedule addition of concrete admixture with concrete batching.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Division 01 Submittal Procedures Section.

1.04 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 01 Submittal Procedures Section.
- B. Product Data: Submit product data, including manufacturer's SPEC-DATA® product sheet, for specified products.
- C. Quality Assurance Submittals: Submit the following:
1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 3. Manufacturer's Instructions: Manufacturer's application instructions.
- D. Closeout Submittals: Submit the following:
1. Warranty: Warranty documents specified herein.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Division 01 Regulatory Requirements Section. Repetitive statements should be avoided.

- B. Regulatory Requirements: [Specify applicable requirements of regulatory agencies.]

Specifier Note: Edit paragraph below to suit project requirements.

1. Approvals: [Specify applicable requirements for approvals of regulatory agencies.]
- C. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 01 Project Management and Coordination (Project Meetings) Section.

1.06 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 01 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store Xypex products dry at a minimum temperature of 40 degrees F (4 degrees C).

Specifier Note: Coordinate article below with Conditions of the Contract and with Division 01 Closeout Submittals (Warranty) Section.

1.07 WARRANTY



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- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
 - B. 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 not a limitation of, other rights Owner may have under Contract Documents.

Specifier Note: Coordinate paragraph below with manufacturer's warranty requirements.

1. Warranty Period: [Specify term.] years commencing on Date of Substantial Completion.

PART 2 PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 CONCRETE CONCENTRATE ADMIXTURE

- A. Manufacturer: Xypex Chemical Corporation.

Specifier Note: Paragraph below is an addition to CSI *SectionFormat* and a supplement to MANU-SPEC. Retain or delete paragraph below per project requirements and specifier's practice.

1. Contact: 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.
- B. Proprietary Product(s): Xypex Concrete Concentrate Admix C Series.

Specifier Note: For paragraphs below, Xypex Admix C-1000 is recommended for cold weather or where increased dosage rates are required. Xypex Admix C-500 is recommended for concrete mixes that include a high proportion of fly ash or slag.

1. Xypex Admix C-500: Integral waterproofing admixture included in the concrete mix at the time of batching.
2. Xypex Admix C-1000: Integral waterproofing admixture included in the concrete mix at the time of batching.
3. Xypex Admix C-2000: Integral waterproofing admixture included in the concrete mix at the time of batching.
4. Product(s) Testing: Provide concrete concentrate to comply with ACI 308, ASTM C39, ASTM C666 and USACE CRD C-48-73, and the following attributes:
 - a. Permeability: USACE CRD C-48 Xypex treated concrete samples were pressure tested up to a 1350 foot (412 m) water head of 150 psi (1.034 MPa), which was the limit of the testing apparatus. Results showed moisture and permeated water throughout the untreated sample after 24 hours. The Xypex Admix samples showed no leakage, and penetration of only 3/64 inch (1.2 mm) after 5 days.
 - b. Chemical Resistance: Concrete samples containing Xypex Admix were tested against control samples to determine resistance to corrosion and deterioration caused by contact with aggressive chemicals. Samples were soaked in a 5% solution of sulfuric acid at 68 degrees F (20 degrees C) for 6 months. Xypex Admix samples were subjected to acid conditions well outside their published ranges; the results confirmed that Xypex had the best performance of the samples tested.
 - c. Freeze/Thaw Durability: ASTM C666 Xypex Admix treated samples indicated 94% relative durability after 300 cycles.
 - d. Compressive Strength: ASTM C39 Compressive Strength of Cylindrical Concrete Specimens: Concrete samples containing Xypex Admix at various dosage rates (1, 2 and 5%) were tested against an untreated concrete control sample. Compressive strength test results after 28 days indicated a significant strength increase in the samples incorporating Xypex Admix. The compressive strength increase varied between 5 and 20% (depending on the Xypex Admix dosage rate) over that of the reference sample. At 28 days, the compressive strength test of the concrete containing Xypex Admix measured 7160 psi (49 MPa) as compared to the reference sample at 6460 psi (45 MPa), a 10% increase.

Specifier Note: Edit article below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 01 Project Requirements (Product Substitutions Procedures) Section.

2.02 PRODUCT SUBSTITUTIONS

- A. Substitutions: No substitutions permitted.

2.03 RELATED MATERIALS

- A. Related Materials: Refer to other sections listed in Related Sections paragraph herein for related materials.

2.04 MIXES

Specifier 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. Refer to Part 3 Application article herein.

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

1. Batch Mix: Add proprietary admixtures to concrete mix at time of concrete batch mixing.

2.05 SOURCE QUALITY

- A. Source Quality: Obtain concrete concentrate admixture products from a single manufacturer.

PART 3 EXECUTION

Specifier Note: Article below is an addition to the CSI *SectionFormat* and a supplement to MANU-SPEC. Revise article below to suit project requirements and specifier's practice.

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

Specifier Note: Coordinate article below with manufacturer's recommended installation requirements.

3.02 APPLICATION PROCEDURES

- A. Add Xypex Admix C-1000 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. Ready-Mix Plant, Dry Batch Operation: Add Xypex Admix in powder form to the drum of the ready-mix truck. Drive the truck under the batch plant and add 60 - 70% of the required water along with 300 - 500 lb (136 - 227 kg) of aggregate. Mix the materials for 2 - 3 minutes to ensure the Xypex Admix is distributed evenly throughout the mix water. Add the balance of materials to the ready-mix truck in accordance with standard batch practices.
 2. Ready-Mix Plant, Central Mix Operation: Mix Xypex Admix with water to form a very thin slurry (i.e., 15 - 20 lb (7 - 9 kg) of powder mixed with 3 gal (11 L) of water). Pour the required amount of material into the drum of the ready-mix truck. The aggregate, cement and water should be batched and mixed in the plant in accordance with standard practices (taking into account the quantity of water that has already been placed in the ready-mix truck). Pour the concrete into the truck and mix for at least 5 minutes to ensure even distribution of the Xypex Admix throughout the concrete.
 3. Precast Batch Plant, Pan-Type Mixer: Add Xypex Admix to the rock and sand, then mix thoroughly for 2 - 3 minutes before adding the cement and water. The total concrete mass should be blended using standard practices. Obtain a homogeneous mixture of Xypex Admix with the concrete; do not add dry Admix powder directly to wet concrete as this may cause clumping and thorough dispersion will not occur.
 4. Setting Time and Strength: 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 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.
- B. Related Products Installation: Refer to other sections listed in Related Sections paragraph herein for related products installation.
1. Concrete Installation: Refer to Division 03 Sections for concrete installation.

3.03 PROTECTION

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- A. Protection: Protect installed product and finish surfaces from damage during construction.

END OF SECTION