ST. TAMMANY PARISH

MICHAEL B. COOPER
PARISH PRESIDENT

April 23, 2024

Please find the following addendum to the below-mentioned BID.

Addendum No.: 2

Bid#: 24-11-2

Project Name: Les Bois Sewer Consolidation

Bid Due Date: May 1, 2024

GENERAL INFORMATION:

Receipt of this addendum shall be acknowledged by inserting its number in the space provided on the proposal.

1. There was a Non-Mandatory Pre-Bid Meeting held at 10:00 A.M. on April 16, 2024. A formal site visit was offered for the afternoon of April 16, 2024, at 1:30 P.M., but no one was interested. Attached is the Sign-In Sheet.

2. Project Manual, Section 04, LA Uniform Public Work Bid Form Unit Price Form. Delete this section in its entirety and replace it with Section 04, LA Uniform Public Work Bid Form Unit Price Form - Revised (attached).

3. Drawings, Note: The length of the 3950 LF 4" sewer force main (HDPE) shall be revised to 3706 LF 4" sewer force main (HDPE) on all of the plans.

4. Drawings, Sheet No. 2, General Notes and Summary of Quantities, Summary of Materials Table. Delete this table and replace it with the attached Summary of Materials Table - Revised (attached).

5. Drawings, Sheet No. 16, Lift Station Electrical Site Plan, General Notes This Sheet. Add the following note:

   P. Contractor shall include approximately (+/-) 570 linear feet of gas piping as shown on Sheet 4, from the edge of road on LeCirque to the location of the generator as

part of this contract work. This item shall be paid for under Item No. 21 "Generator".

6. Drawings, Sheet No. C-513, Sewer Standard Details Sewer Force Mains and Ancillary Structures, Air Release Valve & Vault Detail Notes, Note Nos. 2 and 3. Delete these notes in their entirety and replace with the following:

   2. Concrete shall have a minimum 28-day compressive strength of 4,000 PSI. Reinforcing steel shall be grade 60 and conform to ASTM A615.
   3. Concrete shall be fortified with: "Con-Shield" and Xypex Admix C1000R in accordance with manufacturer's instructions or Xypex Bio San at a rate of 1% by weight of cementitious (see attached specification).

7. Approved Equals: Listed below are manufacturers who are recognized as capable of producing materials, manufactured items, and articles of equipment equal to those specified. Equipment will be considered acceptable providing the equipment meets, or exceeds specification requirements, has the capacity and performance requirements, fits the space available to the satisfaction of the Engineer, conforms in every respect with the applicable regulatory agencies. The contractor shall submit for approval large-scale drawings of proposed layouts and arrangements of substitute equipment when requested.

   The listed prior approvals are not given with respect to any specific model, series, catalog number, etc. Suppliers are cautioned that before their equipment is actually approved, it will be incumbent upon them to demonstrate to the Engineer that it is in fact equal to the requirements specified and conforms fully to all specification requirements.

MATERIAL/EQUIPMENT	MANUFACTURER
Lining Systems	Nukote, Epoxytec

QUESTIONS & ANSWERS:

Question 1. Can you please tell me what type of coatings are required for this project?

Answer 1. The questioner shall review the specifications and notes in the drawings. In particular, Section 09800 Protective Coatings addresses many of these coatings.

Question 2. Can we please have a bid item for the required fencing around the new lift station?

Answer 2. Bid Item No. 28 has been added for fencing.

ATTACHMENTS:

1. Non-Mandatory Pre-Bid Meeting Sign-In Sheet
2. Section 04, LA Uniform Public Work Bid Form, Unit Price Form - Revised
3. Summary of Materials - Revised
4. Xypex Specification

End of Addendum # 2

St. Tammany Parish Government
Office Complex, 21454 Koop Dr.
Mandeville, LA 70471

Pre-Bid Sign-In Sheet

April 16, 2024; 10:00 AM

Les Bois Sewer Consolidation; BID No.: 24-11-2

Page:

Name	Company	Email	Phone
Bob Moeinian	STP gov.	BMoeinian@STPgov.org	985-893-1717
Tim Arguin	Byron E. Talbot	bsanchez@byronetalbot.com	985-447-5764
Kirk VanCamp	KVC LLC	Kirk@KVCLLC.net	504-415-3319
MATT FALATI	MEYER ENGINEERS	MFALATI@MEYER-EL.com	5048859892
Mario Bello	Python Corp	mdominguez@Python-corp.com	985-718-2197
Evan Carravey	Subterranean Const. LLC	ecarravey@subtllc.com	985-246-6767
NOTE: Site visit for 1:30 today was offered			
but noone was interested.			

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: St. Tammany Parish Government
21454 Koop Dr., Suite 2F
Mandeville, La 70471

(Owner to provide name and address of owner)

BID FOR: Les Bois Sewer Consolidation
Bid No.: 24-11-2

(Owner to provide name of project and other identifying information.)

The undersigned bidder hereby declares and represents that she/he; a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: Meyer Engineers, Ltd. and dated: March 7, 2024 .

(Owner to provide name of entity preparing bidding documents.)

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging) _____.

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

_____Dollars ($ _____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1 *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

N/A _____Dollars ($ _____)

Alternate No. 2 *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

N/A _____Dollars ($ _____)

Alternate No. 3 *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

N/A _____Dollars ($ _____)

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

_____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **: _____

DATE: _____

THE FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM:

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

** **A CORPORATE RESOLUTION OR WRITTEN EVIDENCE** of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA R.S. 38:2218(A) attached to and made a part of this bid.

Revised

LOUISIANA UNIFORM PUBLIC WORK BID FORM

UNIT PRICE FORM

TO: ST. TAMMANY PARISH GOVERNMENT
21454 KOOP DRIVE, SUITE 2F
MANDEVILLE, LA 70471

(Owner to provide name and address of owner)

BID FOR: LES BOIS SEWER CONSOLIDATION
BID NO. 24-11-2
PROJECT NO. TU23000174

(Owner to provide name of project and other identifying information)

UNIT PRICES: This form shall be used for any and all work required by the Bidding Documents, and described as unit prices. Amounts shall be stated in figures and only in figures.

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	MOBILIZATION		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
1	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	TEMPORARY SIGNS AND BARRICADES		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
2	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	PAVEMENT REMOVAL (ALL TYPES, ALL THICKNESSES)*		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
3	150	SY		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	DEMOLITION		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
4	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	CLASS II BASE COURSE (THEORETICAL MEASURE)*		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
5	50	CY		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	MODIFY EXISTING WET WELL		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
6	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	NEW WET WELL		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
7	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	SELF-PRIMING CENTRIFUGAL WASTEWATER PUMP AND ACCESSORIES		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
8	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	STATION PIPING, VALVES, AND ACCESSORIES		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
9	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	SETUP FOR HORIZONTAL DIRECTIONAL DRILL		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
10	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	SANITARY SEWER FORCE MAIN, HDPE DR17 BY HORITONZAL DIRECTIONAL DRILL		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
11	3,706	LF		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	SANITARY SEWER FORCE MAIN, HDPE DR17 BY OPEN CUT		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
12	472	LF		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	PLASTIC SANITARY SEWER GRAVITY LINE		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
13	500	LF		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	SEWER MANHOLE		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
14	2	EA		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	4" AIR RELEASE VALVE (ARV) AND VAULT		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
15	3	EA		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	DUCTILE IRON FITTINGS		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
16	1500	LB		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	CONTROL PANEL AND SENSORS		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
17	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	ELECTRICAL WORK		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
18	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	PORTLAND CEMENT CONCRETE APRON (6" THICK)*		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
19	150	SY		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	LIFT STATION COVER STRUCTURE		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
20	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	GENERATOR		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
21	1	EA		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	SITE RESTORATION		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
22	1	LS		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	LINING MANHOLE COATING*		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
23	50	SF		

DESCRIPTION:	✓ BASE BID OR □ ALT.#	INSERTION OF 6.00MM CIPP IN 8 INCH PIPE*		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
24	400	LF		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	REMOTE CUT AND BRUSH SERVICES*		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
25	5	EA		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	INTERNALLY TRIM PROTRUDING SERVICE CONNECTIONS*		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
26	5	EA		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	ADJUSTING ELEVATION OF EXISTING MANHOLE (NOT MORE THAN 18" UP OR DOWN)		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
27	5	EA		

DESCRIPTION:	✓ BASE BID OR □ ALT.# ___	FENCING		
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
28	1	LS		

Wording for "DESCRIPTION" is to be provided by Owner.
All quantities are estimated. The contractor will be paid upon actual quantities as verified by Owner.

* ITEM TO BE USED AT THE DISCRETION OF A/E & ST. TAMMANY PARISH REPRESENTATIVE.

Revised

SUMMARY OF MATERIALS			
ITEM No.	ITEM DESCRIPTION	QUANTITY	UNIT
001	MOBILIZATION	1	LS
002	TEMPORARY SIGNS AND BARRICADES	1	LS
003	PAVEMENT REMOVAL (ALL TYPES, ALL THICKNESSES) *	150	SY
004	DEMOLITION	1	LS
005	CLASS II BASE COURSE (THEORETICAL MEASURE)	1	LS
006	MODIFY EXISTING WET WELL	1	LS
007	NEW WET WELL	1	LS
008	SELF-PRIMING CENTRIFUGAL WASTEWATER PUMP AND ACCESSORIES	1	LS
009	STATION PIPING, VALVES, AND ACCESSORIES	1	LS
010	SETUP FOR HORIZONTAL DIRECTIONAL DRILL	1	LS
011	SANITARY SEWER FORCE MAIN, HDPE DR17 BY HORIZONTAL DIRECTIONAL DRILL	3,706	LF
012	SANITARY SEWER FORCE MAIN, HDPE DR17, BY OPEN CUT	472	LF
013	PLASTIC SANITARY SEWER GRAVITY LINE	500	LF
014	SEWER MANHOLE	2	EA
015	4" AIR RELEASE VALVE (ARV) AND VAULT	3	EA
016	DUCTILE IRON FITTINGS	1,500	LB
017	CONTROL PANEL AND SENSORS	1	LS
018	ELECTRICAL WORK	1	LS
019	PORTLAND CEMENT CONCRETE APRON (6" THICK) *	150	SY
020	LIFT STATION COVER STRUCTURE	1	LS
021	GENERATOR, KW & AUTOMATIC TRANSFER SWITCH	1	EA
022	SITE RESTORATION	1	LS
023	LINING MANHOLE COATING *	50	SF
024	INSERTION OF 6.00MM CIPP IN 8 INCH PIPE *	400	LF
025	REMOTE CUT AND BRUSH SERVICES *	5	EA
026	INTERNALLY TRIM PROTRUDING SERVICE CONNECTIONS *	5	EA
027	ADJUSTING ELEVATION OF EXISTING MANHOLE (NOT MORE THAN 18" UP OR DOWN) *	5	EA
028	FENCING	1	LS
*	ITEM TO BE USED AT THE DISCRETION OF A/E & ST. TAMMANY PARISH REPRESENTATIVE		

NOTES:

1. ALL MATERIAL QUANTITIES ARE ESTIMATED BASED ON THE CONSTRUCTION PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL MATERIAL QUANTITIES.
2. THE COST OF LABOR, EQUIPMENT, TOOLS AND OTHER INCIDENTAL ITEMS SHALL BE INCLUDED UNIT PRICE OF THE RESPECTIVE BID ITEM(S).
3. LAUNCHING AND RECEIVING PITS SHALL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE BID ITEM(S). THEREFORE, THE COST OF CONSTRUCTING LAUNCHING AND RECEIVING PITS SHALL BE INCLUDED IN UNIT PRICE OF THE RESPECTIVE BID ITEM(S).
4. LAUNCHING AND RECEIVING PITS SHALL BE BACKFILLED IN ACCORDANCE WITH THE TAMMANY UTILITIES WATER STANDARD DETAILS ON SHEETS C-501 AND C-502. REQUIRED BACKFILL MATERIALS SHALL BE INCIDENTAL TO THE RESPECTIVE BID ITEM(S).

BIO-SAN® C500

PRECAST & CAST-IN-PLACE CONCRETE

Protection Against Microbial Induced Corrosion
and Chemical Attack – Provision of Waterproofing

Description

Xypex Bio-San C500 is a uniquely designed admixture for integral, long-term protection of concrete in harsh sewage conditions with high levels of H_2S that cause microbial induced corrosion. Bio-San C500 combines potent antimicrobial protection along with the unique crystalline technology of the Xypex C-Series. Bio-San contains bio-active mineral solids that become permanently fixed within the cement matrix impairing bio-film formation thus inhibiting the growth of acid causing sewer bacteria such as Thiobacillus due to high concentrations of H_2S. The unique Xypex crystalline technology creates a permanent structure throughout the pores and capillary tracts providing waterproofing and enhanced chemical protection including acid and sulphate resistance. Bio-San C500 prevents microbial induced corrosion, stops infiltration/exfiltration of water, and provides acid and sulphate resistance, significantly extending the service life of concrete sewage collection systems and waste water infrastructure.

Recommended for:

- Manholes / Sewer Pipes
- Pump and Lift Stations
- Head Works
- Septic Tanks
- Digesters
- Clarifiers
- Industrial Structures

Advantages

- Inhibits microbial induced corrosion
- Resists extreme hydrostatic pressure
- Resistant to aggressive chemicals (acids and sulphates)
- Can seal static hairline cracks up to 0.4 mm
- Becomes a permanent, integral part of the substrate and cannot be punctured, damaged or lose adhesion
- Does not contain any VOCs
- Less costly to apply than most other methods
- Added to the concrete at the time of batching and therefore not subject to weather and surface moisture constraints

Dosage Rates

Xypex Bio-San C500:

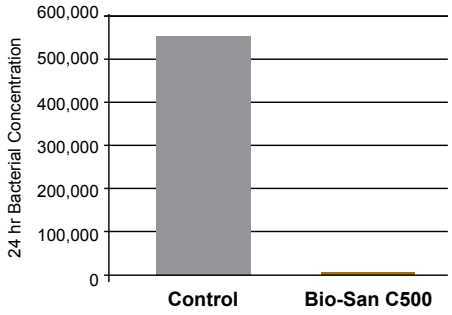
1% by weight of total cementitious content.

Test Data

ANTIMICROBIAL EFFECT & CORROSION RATE

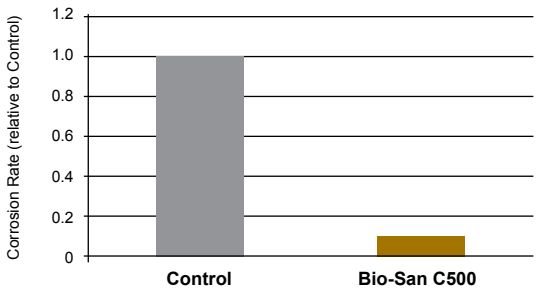
ISO 22196 (Modified) "Evaluation of Antimicrobial Effect of Xypex Bio-San C500 and Corrosion Rate", McGrath Engineering Ltd, North Vancouver, B.C., Canada

Xypex Bio-San C500 was added at 1% dosage rate to Portland cement mortar and compared to untreated control samples for antimicrobial performance. A substantial reduction in the sewer bacteria *Thiobacillus novellus / Starkeya novella* was found indicating a definite antimicrobial effect.



Concrete was cast in 100 x 200 mm cylinders with both control and treated mixes. A wastewater facility was chosen that had elevated H_2S levels and substantial existing MIC corrosion damage. Test samples were suspended in the air space of the tank for 10 years. Exposure trials showed that treated concrete had nine times less concrete mass loss compared to control samples.

Corrosion Rate at 50 ppm H_2S



After exposure of 10 years, the bacterial concentration on the treated samples was minimal, indicating continued antimicrobial action and efficacy.

PERMEABILITY

U.S. Army Corps of Engineers CRD C48, "Permeability of Concrete", Aviles Engineering Corp., Houston, USA

Two concrete samples containing Xypex Admix and an untreated control sample were tested for water permeability. Both the treated and untreated samples were subjected to a pressure of 150 psi / 1.04 MPa (350 ft. / 106.7 m water head). Results showed moisture and permeated water throughout the untreated sample after 24 hours. However, the Xypex Admix samples showed no leakage, and water penetration of only 1.5 mm / 0.06 inches after 120 hours (5 days).

ACCI Water Permeability Test, "Water Permeability of Concrete", Australia Centre of Construction and Innovation, University of New South Wales, Sydney, Australia

Concrete samples containing Xypex Admix NF at a dosage rate of 0.8% and 1.2% were tested for water permeability against control samples. All the samples were subjected to a pressure of 10 bars (100 meters / 328 ft. water head) for 2 weeks. Water permeability coefficients were calculated and the Xypex Admix-treated concrete showed significant reduction in water permeability by up to 93% at a dosage rate of 1.2%.

STN EN 12390-8 "Testing of Hardened Concrete; Depth of Water Penetration Under Pressure", Technical and Testing Construction Institute, Bratislava, Slovakia

Concrete cubes were prepared with Admix C-1000 at 2% and Admix C-1000 NF at 1% along with control cubes. A water pressure of 0.5 MPa was applied for 72 hrs and specimens were subsequently split transversely to measure depth of water penetration. Depth results for C-1000/C-1000 NF were 10.3 mm and 25 mm respectively, whereas penetration on control samples was 113 mm. In using the Valenta equation to calculate the water permeability coefficient, the C-1000/C-1000 NF treated concrete showed a 20 to 120x reduction compared to the control concrete.

COMPRESSIVE STRENGTH

ASTM C 39, "Compressive Strength of Cylindrical Concrete Specimens", Kleinfelder Laboratories, San Francisco, USA

At 28 days, the compressive strength test of the concrete containing Xypex Admix measured 7160 psi / 49.5 MPa as compared to the reference sample at 6460 psi / 44.5 MPa (a 10% increase).

CHEMICAL RESISTANCE

CSN 73 1326 "Measuring Loss of Surface Due to Sulphate Attack of Concrete Treated with Admix C-1000/C-1000 NF", Betonconsult, Building Materials Testing Laboratory, Prague, Czech Republic

Concrete specimens treated with Admix C-1000 at 1% and 2%, and Admix C-1000 NF at 0.5% and 1% were cast along with non-treated concrete specimens. The specimens were exposed to a highly concentrated sulfate solution (i.e. 36,000 mg/ℓ) for 4 months and samples were periodically weighed to determine mass loss. The Admix treated samples recorded a mass loss between 5 and 50 g/m^2 and showed no surface deterioration, while the non-treated specimens measured an average mass loss of 4,860 g/m^2 with significant surface deterioration.

"Sulfuric Acid Resistance Test", Aviles Engineering Corporation, Houston, USA

Concrete containing Xypex Admix at different dosage rates including 3% specimens were tested against untreated control samples for sulfuric acid resistance. After immersion in the sulfuric acid, each sample was tested for weight loss on a daily basis until a weight loss of 50% or a definite response trend was obtained. The percentage weight loss of the samples containing Xypex Admix tested significantly lower than the control samples.

CRACK SEALING

"Testing of Xypex Admix C-1000 NF Crack Healing Capabilities" CH Karnchang (Lao) Company Ltd., Xayaburi Laboratory, Ban Xieng Yeun, Vientiane, Laos

Prior to construction of a Mekong River dam, testing was undertaken to substantiate the ability of Xypex Admix to self-heal static cracks up to 0.4 mm. Three large concrete slabs treated with Admix C-1000 NF at 0.8% were cast along with three control slabs. Following curing, a force was applied at the mid-point of each slab to create cracks; on average measuring 0.4 mm width. Water was ponded above the cracked area. Initially all cracks leaked; at 4 days all dripping had ceased from the cracks of the Xypex treated panels, while leaking continued through the cracks of the control slab until the end of the test period (25 days). SEM photographs showed significant crystalline growth throughout the cracks of the Admix treated slab.

SCANNING ELECTRON MICROSCOPY

SEM "Microscopic Examination of Crystalline Products in Three Xypex Admix Modified Mortars", Australian Centre for Construction Innovation, University of New South Wales, Sydney, Australia

Slag and fly ash blended cement samples were treated with Xypex Admix and examined for evidence of crystalline growth at ages ranging from 8 months to 2 years. Samples were sliced and/or split and examined at magnifications between 500x and 5000x. Characteristic Xypex crystalline growth was observable on all Xypex treated samples, providing evidence of Xypex crystalline reactions with fly ash and slag blended cements.

FREEZE/THAW DURABILITY

ASTM C 666, "Freeze/Thaw Durability", Independent Laboratory, Cleveland, USA

After 300 freeze/thaw cycles, the Xypex Admix-treated samples indicated 94% relative durability.

Packaging

Xypex Bio-San C500 is packaged in 50 lb. (22.7 kg) pails. Contact the manufacturer for availability of custom-sized packaging to meet the requirements of your specific project.

Storage

Xypex products must be stored dry at a minimum temperature of 45ºF (7ºC). Shelf life is one year when stored under proper conditions.

Directions for Use

Xypex Bio-San C500 is added to the concrete at the time of batching. It is important to obtain a homogeneous mixture of Xypex Bio-San C500 with the concrete. Do not add dry Bio-San C500 powder directly to wet mixed concrete as this could cause clumping and thorough dispersion may not occur. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment. The following methods have been used successfully in the past and it is recommended that the local Xypex Technical Services Representative be consulted about the best method to use.

1. ADDITION TO COARSE AGGREGATE BELT Add Xypex Bio-San C500 powder directly to the coarse aggregate conveyor belt manually or through computer controlled mass batching system. Account for worker health and safety issues with moving belts and wind-blown dust issues.

2. ADDITION TO CENTRAL MIXER Load the Bio-San C500 in bulk powder form along with the other components. Mix as per standard batching practices to ensure thorough dispersal of the Bio-San powder resulting in a homogeneous mixture. Account for worker safety issues when accessing the equipment.

3. TRUCK ADDITION (AT PLANT) Add Xypex Bio-San C500 in bulk powder form to the drum of the ready-mix truck immediately prior to driving the truck under the batch plant and adding the balance of the materials in accordance with standard concrete batching practices. Avoid delays in adding other components and utilize high speed mixing to ensure homogeneity of mix. Where there may be insufficient water for thorough dispersion of the bulk powder a water slurry can be made with the Bio-San C500 and added to the truck mixer drum prior to batching. Account for added water in the mix design and slump.

NOTE:

i. For installations involving pan mixers, the recommended procedure would be to initially add some of the mix water and coarse aggregate to the pan mixer begin mixing and slowly add the Xypex Bio-San C500 powder. Mix until the Bio-San C500 powder is thoroughly dispersed and forms a slurry, then add the balance of the materials and continue to mix as per normal.

ii. Concrete containing the Xypex Bio-San C500 does not preclude the requirement for design of crack control, construction joint detailing, proper placement, consolidation and curing of the concrete and measures for repairing defects such as honeycombing, tie holes, cracks beyond specified limits.

iii. Further guidelines are available that address the use of Xypex Bio-San for a specific situation, (e.g. dry mixes, use of ice in hot ambient conditions, cold-weather concreting, etc.). Consult with a local Xypex Technical Services Representative or Xypex's Technical Services Department for further information.

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. Xypex Bio-San C500 is designed for concrete mix designs where a normal or mildly delayed set is desired. Concrete containing the Bio-San C500 may develop higher ultimate strengths than plain concrete. Trial mixes should be carried out under project conditions to determine the setting time and strength of the concrete dosed with Bio-San C500. Concrete should be a minimum of 28 days age prior to placement into service.

Limitations

When incorporating Xypex Bio-San C500, the temperature of the concrete mix should be above 40ºF (4ºC).

Technical Services

For more instructions, alternative installation methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Services Department of Xypex Chemical Corporation or your local Xypex Technical Services Representative.

Safe Handling Information

Xypex is alkaline. As a cementitious powder or mixture, Xypex may cause significant skin and eye irritation. Directions for treating these problems are clearly detailed on all Xypex pails and packaging. The Manufacturer also maintains comprehensive and up-to-date Safety Data Sheets on all its products. Each sheet contains health and safety information for the protection of workers and customers. Xypex Bio-San C500 is EPA registered (No. 92393-2). The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex Technical Services Representative to obtain copies of Safety Data Sheets prior to product storage or use.

Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.

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