

DATE:	8/8/19	CO #:	Four (04)
TO:	BCD, Inc. 1962 Filiatreau Lane Bardstown, Kentucky 40004	PROJECT:	Mercer County District Improvements Harrodsburg, Kentucky RTA 1832 BG 19-065
CONTRACT DATE:	February 14, 2019	CONTRACT FOR:	General Construction

THE CONTRACT IS CHANGED AS FOLLOWS:
(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives.)

PR-04: \$47,846.42: KMS classroom wing wall repairs

TOTAL AMOUNT OF THIS CHANGE ORDER: \$47,846.42

The original Contract Sum was	\$555,500.00
The net change by previously authorized Change Orders	\$12,230.40
The Contract Sum prior to this Change Order was	\$567,730.40
The Contract Sum will be Increased by this Change Order in the amount of	\$47,846.42
The new Contract Sum including this Change Order will be	\$615,576.82

The Date of Substantial Completion as of the date of this Change Order is therefore November 1, 2019

NOTE: This Change Order does not include changes in the Contract Sum, Contract Time or Guaranteed Maximum Price which have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

RossTarrant Architects, Inc.
101 Old Lafayette Avenue
Lexington, Kentucky 40502

ARCHITECT *(Firm name and address)*

Beth Bauer

BY *(Signature)*

Beth Bauer

(Typed or printed name)

8/9/19

DATE

BCD, Inc.
1962 Filiatreau Lane
Bardstown, Kentucky 40004

CONTRACTOR *(Firm name and address)*

Jason Hanon

BY *(Signature)*

JASON HANON

(Typed or printed name)

8/9/19

DATE

Mercer Co. Board of Education
530 Perryville Rd.
Harrodsburg, Kentucky 40330

OWNER *(Firm name and address)*

BY *(Signature)*

(Typed or printed name)

DATE

FACPAC Contract Change Order Supplemental Information Form (Ref# 51728)

Form Status: Saved

Tier 3 Project: District Improvements FY19

BG Number: 19-065

Status: Active

District: Mercer County (421)

Phase: Project Initiation (View Checklist)

Contract: BCD, Inc., 0001, General Contractor

Type: General Contractor

Proposed

Change Order Number	4
Time Extension Required	Yes
If Yes Number Of Days	30
Date Of Change Order	8/8/2019
Change Order Amount To Date	Increase

Construction Contingency

Calculations below are project wide. Remaining negative Construction Contingency may require the submission of a revised BG1.

Current Approved Amount	\$32,462.00
Net Approved COs	\$-8,193.00
Remaining After Approved COs	\$40,655.00
Net All COs	\$60,076.82
Remaining After All COs	\$-27,614.82

This Requested Change Order Amount +/-	\$47,846.42
Change In A/E Fee This Change Order +/-	\$4,605.22
Change In CM Fee This Change Order +/-	
Remaining Construction Contingency Balance	(\$27,614.82)
Contract Change Requested By	Local Board of Education
Contract Change Reason Code	Expansion of Scope
Change Order Description And Justification	
PR-04: \$47,846.45: KMS classroom wing wall repairs	

Cost Benefit To Owner

Owner requested additional scope. Pricing has been reviewed and is acceptable.

Contract unit prices have been utilized to support No
the cost associated with this change order.

Detailed Cost Breakdown

Contract unit prices have not been utilized, provide a detailed cost breakdown which separates labor, material, profit and overhead.

Detail Item	Amount	Percent of Total
Labor	\$19,390.00	40.53 %
Materials	\$22,215.58	46.43 %
Profit and Overhead	\$6,240.84	13.04 %
Bond Insurance		0.00 %
Cost Breakdown Total:	\$47,846.42	
Cost for this Change Order supported by an alternate bid or competitive price quote	No	
Explain Why		

**Change Order Supplemental Information Form Signature
Page (Online Form Ref# 51728)**

Beth Bauer

Architect

8/9/19

Date

Construction Manager

Date

Finance Officer

Date

Local Board of Education Designee

Date

1962 Filiatreau Lane
Bardstown, Kentucky 40004

Phone: 502-348-2305
Fax: 502-348-2008
www.bcdinc.us



July 29, 2019

Ross Tarrant Architects
101 Old Lafayette Avenue
Lexington, KY 40502
Attn: Beth Bauer

RE: Mercer County District
Improvements – Proposal Request 04
Change Order Request 6 – **Revised 8/8/19**

Dear Beth:

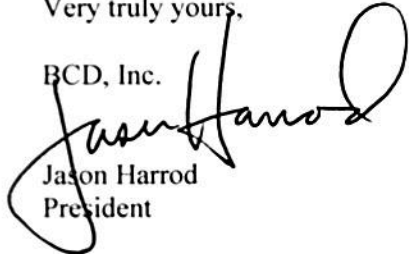
In response to PR-04 for King Middle School roof repairs, BCD, Inc. proposes the following:

Spray Tec Roofing (Proposal attached with breakdown Of material and labor)	\$19,340.00
Xypex Coating (Proposal attached with breakdown Of material and labor)	\$13,500.00
Metal ERA Gravel Stop/Fascia	\$ 6,326.58
Demo:	
Supervisor 12 hrs @ \$30.00/hr	\$ 360.00
Field Employee 24 hrs @ \$25.00/hr	\$ 600.00
Install Gravel Stop/Fascia	
Supervisor 8 hrs @ \$30.00/hr	\$ 240.00
Field Employee 16 hrs @ \$25.00/hr	\$ 400.00
Misc. Material (ice/water shield/fastener)	<u>\$ 839.00</u>
Subtotal	\$41,605.58
Overhead/Profit	<u>\$ 6,240.84</u>
Total	\$47,846.42

Contract extension to be determined when/if accepted by owner. Existing copper to be removed and stored for owner to recycle.

Very truly yours,

BCD, Inc.


Jason Harrod
President

JH/bcl

Enclosures
J:\wpdata\mercerc\coreq6.doc



1132 Equity Street Shelbyville, KY 40065
(O) 502.633.5499 | (F) 502.633.1477
www.spray-tec.com



July 26, 2019

Mr. Jason Harrod, President
BCD, Inc.
1962 Filiatreau Lane
Bardstown, KY 40004

PROPOSAL/CONTRACT

Roof Perimeter Repair – King Middle School (Mercer Co. Schools)

SCOPE:

Provide labor, materials, and equipment to properly tie-in new edge metal to existing coated polyurethane foam roof, as follows:

- Clean/prep approx. 438 lin. ft. of perimeter edge to prep for polyurethane foam application and ensure proper adhesion. *Note: All demo work, i.e. tear-out, is to be completed and new perimeter edge metal is to be fully installed (by others) prior to mobilization of Spray-Tec crew and equipment. BCD, Inc. will coordinate new edge metal installation with Spray-Tec to assure roof is not left open/unprotected.*
- Spray polyurethane foam at a nominal thickness of 1.5" to properly tie-in newly installed (by others) perimeter edge metal to existing coated polyurethane foam roof system.
- Apply base coat of silicone coating over newly-applied polyurethane foam.
- Reinforce all transition edges using silicone sealant and reinforced silicone coating to accommodate expansion and contraction at the new foam tie-in areas.
- Apply top coat of silicone coating over base coat of silicone; final color to be tan.
- Broadcast 3M ceramic granules into wet top coat of silicone; final color to be tan.
- Complete necessary touch-up details and remove work-related trash and debris.
- All work performed will satisfy current warranty provisions on existing coated foam roof system.

COST: \$19,340.00*

(Materials \$10,050.00/Labor \$9,290.00)

TERMS: 25% due upon start of project;
75% due upon completion

**Prevailing wage rates were not factored into labor costs; if Spray-Tec is required to pay PW rates, a change order will be required to include additional labor costs.*

NOTE:

- *No demo, tear-out of roofing materials or removal/replacement of edge metal is included in price above. Roof repair(s) beyond 438 lin. ft. or deck reinforcement for weak decking will require a change order prior to the commencement of additional work, if necessary.*
- *Dumpster and Port-a-John to be provided by BCD, Inc.*
- *Owner to provide water/electrical hook-up, staging area for Spray-Tec's equipment and staging for vehicles and dumpsters, as well as roof access enabling roofing crew to work for a minimum of twelve hours per day.*
- *Price quoted above is good for 30 days and is based on scope of work listed above. Any additional work will require a signed change order prior to start of same.*
- *Weather conditions must be dry and sunny with calm winds and a minimum consistent temperature of 50° F.*

Respectfully submitted,

Aaron Martin – Estimator

Mercer Co. Schools
King Middle School
Roof Perimeter Repair
Proposal/Contract
Page Two of Two

ACCEPTANCE:

The foregoing proposal is hereby accepted and Spray-Tec, Inc. is authorized to complete the project as specified above.

DATE: _____

SIGNATURE: _____
Authorized Representative



RENOVATION • RESTORATION • PRESERVATION

July 25, 2019

Attn: Brenda Leake
BCD
1962 Filiatreau Ln
Bardstown, KY 40004

Ref: King Middle School Renovation
961 Moberly Rd.
Harrodsburg, KY 40030

We propose to provide all the labor, materials and equipment to perform the following scope of work at the above referenced location.

- Installation of Xypex waterproofing and sealant at top band around building as shown on proposal request 4 PR4.2 (Approx. 660 sqft)
 - a. Mobilize access
 - b. Install Xypex waterproofing as specified by manufacturer
 - c. Apply bead of sealant where Xypex terminates
 - d. Cleanup workspace

Labor: \$8,500.00

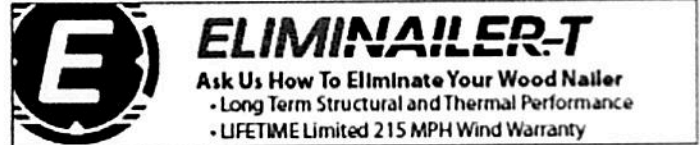
Equipment: \$2,000.00

Material: \$3,000.00

PRICE: \$13,500.00

BJB, Inc. guarantees above pricing for 90 days from date of proposal. Please feel free to contact me with any questions, comments, or concerns you may have.

Respectfully,
Michael Tallarico
Sr. Project Manager/Estimator
(502) 298-3143



Quote No. 298446-1

Attention: Randy Harding
Customer: RMH Architectural Inc
1600 Airport Road
Waukesha, WI 46819

Quote Date: 7/22/19 2:31 pm
Estimator: Sergio Brumfield
Project Name: : MERCER CO. MIDDLE SCHOOL

Phone: 260-402-5315

Notes: - NET PRICES, DELIVERED, UNLESS OTHERWISE NOTED.
- THE QUOTE NUMBER MUST APPEAR ON YOUR PURCHASE ORDER.
- Lead time begins after receipt of purchase order and signed approvals.
- MATERIALS MUST BE KEPT DRY AND COOL DURING TRANSIT AND STORAGE - Failure could result in Damage or Wet -Storage Staining.
- Customer is responsible within 72 hours of receipt of order to notify Metal-Era of any issues

#	Description	Qty	Units	Price/Unit	Ext. Price
1	One Gravel Stop - (12' lengths w/ 90° Cleat) Face Height:6 Rise:1 Roof Flange:3 24 Gauge Pre-Finished Kynar Steel	408	per LF	\$6.10	\$2,488.80
1	Miter Face Height:6 Rise:1 Roof Flange:3 24 Gauge Pre-Finished Kynar Steel	1	each	\$22.70	\$22.70
1	Endcap Face Height:6 Rise:1 Roof Flange:3 24 Gauge Pre-Finished Kynar Steel	1	each	\$20.80	\$20.80
2	Brick/Wall Cap - (12' lengths) Face Height:3 Wall Width (B):4 Return:5.5 24 Gauge Pre-Finished Kynar Steel	408	per LF	\$7.70	\$3,141.60
2	Quicklock Miter Face Height:3 Wall Width (B):4 Return:5.5 24 Gauge Pre-Finished Kynar Steel	1	each	\$29.71	\$29.71
2	Quicklock Endcap Face Height:3 Wall Width (B):4 Return:5.5 24 Gauge Pre-Finished Kynar Steel	1	each	\$14.86	\$14.86

ADDS	Price
- Transportation Surcharge (see prefilled notes)	\$250.00

QUOTE TOTAL **\$5,968.47**

+ Tax
6326.58

Additional Notes

*****Direct Pricing*****

- Lead Time: 7-10 Working Days (PLUS TRANSIT)

Lead times are quoted as a range based upon conditions at the time of quote. Actual lead time may vary due to conditions at time of order. For the most accurate lead times please verify lead time at time of order.

- Metal-Era, Inc's Edge Systems One product line includes up to a 10 Year performance Warranty covering blow-off up to 90 m.p.h. Fasteners are included and must be used for warranty and all accessories must be manufactured by Metal-Era, Inc. No other warranties, either expressed or implied are applicable.

- Manufacturer does not provide lump-sum pricing. Quantities and sizes quoted are for estimating purposes only. Customer is responsible for actual quantities and sizes and must field verify prior to fabrication. ANY CHANGES IN THE SCOPE OF THIS QUOTE VERSION MAY AFFECT UNIT PRICING. Pricing is protected for 60 days. **** Residential deliveries may be subject to an additional surcharge determined at the time of invoicing ****

** Customer is responsible within 72 hours of receipt of order to notify Metal-Era of any issues **

** Additional charges may occur if a flatbed is required. **

**If welded aluminum accessories are required and steel straight sections are being ordered, Manufacturer reserves the right to change to one vendor for the material to prevent any shade variation when using both steel and aluminum substrates. In some instances, the project will need to be requoted changing the straight sections to aluminum. If a particular vendor is requested at time of order which would cause a shade variation we will need the customer's written approval stating the colors will not match but we are to proceed anyways. **

- Manufacturer has instituted a \$250 Transportation Surcharge for all orders. Please make sure to include this charge into your bid.

Customer Purchase Order #: _____

Print Name: _____

Ship To Address (if available): _____

Signature: _____

Date Signed: _____

Email Address: _____

Contact Number for Delivery: _____

- To place an order:

- If you have an account with Metal-Era, please send the following to orders@metalera.com:

- Billing information and purchase order number that applies
- Filled out and completed print approvals
- Signed Quote that pertains to the order with completed ship to address and contact name and number for delivery
- If applicable please provide payment by filling out the proper payment forms
 - Check by fax
 - Credit Card
 - Joint check agreement
 - New customer credit application
- Contact orders@metalera.com if forms are needed

- If you do not have an account and plan on ordering through distribution, please send the following to the distributor you would like to use:

- Your purchase order to the distributor indicating the ship to address that needs to be used for the order
- Filled out and completed print approvals
- Signed Quote that pertains to the order with completed ship to address



Proposal Request Transmittal

RossTarrant Architects | 101 Old Lafayette Ave Lexington KY 40502 United States

PROJECT: Mercer County District Improvements 1832 DATE SENT: 7/8/2019

SUBJECT: PR-04 King MS - classroom wing wall repairs PROPOSAL REQUEST ID: PR-04

TYPE: Proposal Request TRANSMITTAL ID: 00107

PURPOSE: For Contractor's Pricing VIA: Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
Beth Bauer	RossTarrant Architects	bbauer@rosstarrant.com	859-254-4018

TO

NAME	COMPANY	EMAIL	PHONE
Jason Harrod	BCD, Inc.	jharrod@bardstown.com	

REMARKS: **REVISED 7/8/19**

Please provide pricing for labor and materials for the following:

Refer to sketch PR4.1 for location of repairs at the King Middle School west wing.

- Remove minimum of 1'-0" existing foam roofing down to existing wood fiber board and remove existing copper fascia and trim at roof edge.

Contractor to return value of copper back to owner as PR credit. Prep existing concrete beam for new work per manufacturer's installation instructions. Existing blocking to remain - field verify existing condition.

Refer to sketch PR4.2 for the following repairs:

- Install new 6" fascia (Metal Era One Gravel Stop). Install new foam insulation and coating to match existing roofing thickness (min. 1"); maintain existing roof warranty.

- Provide peel and stick ice and water shield at roof edge and turn down wall onto existing concrete beam - turn down minimum of 1" onto vertical face of existing concrete beam.

- Provide new break metal trim (24 ga. prefin (Kynar 70%) paint) with hemmed edge and overlap butt joints 2" (hemmed edge); seal joints with butyl tape.

- Provide a concrete waterproofing by crystallization process product (Xypex

Proposal Request Transmittal

DATE: 7/8/2019

ID: 00107

Concentrate - see attachment) at the concrete beam on the south exterior wall of Classroom 101, Classroom 102, Classroom 103, Classroom 104, and Girls Restroom 105A. Follow manufacturer's installation instructions (see attachment). (McKinney Painting in Versailles is an approved installer of this product.)

-Provide new sealant at V-groove where the foam meets fascia. Remove existing sealant at the joint of the concrete beam and brick, and replace with new sealant.

Field Verify all dimensions. New edge metals to match existing gutter/downspout color of the adjacent Lobby roof. Submit data sheets for each product before installation.

This Proposal Request will not be required to be completed within the base bid timeline of Substantial Completion. Contractor to provide anticipated start and completion dates for this PR for review and inclusion in the executed change order.

Attachments:

PR4.1.pdf

PR4.2.pdf

Xypex-coating-installation.pdf

Xypex-concentrate.pdf

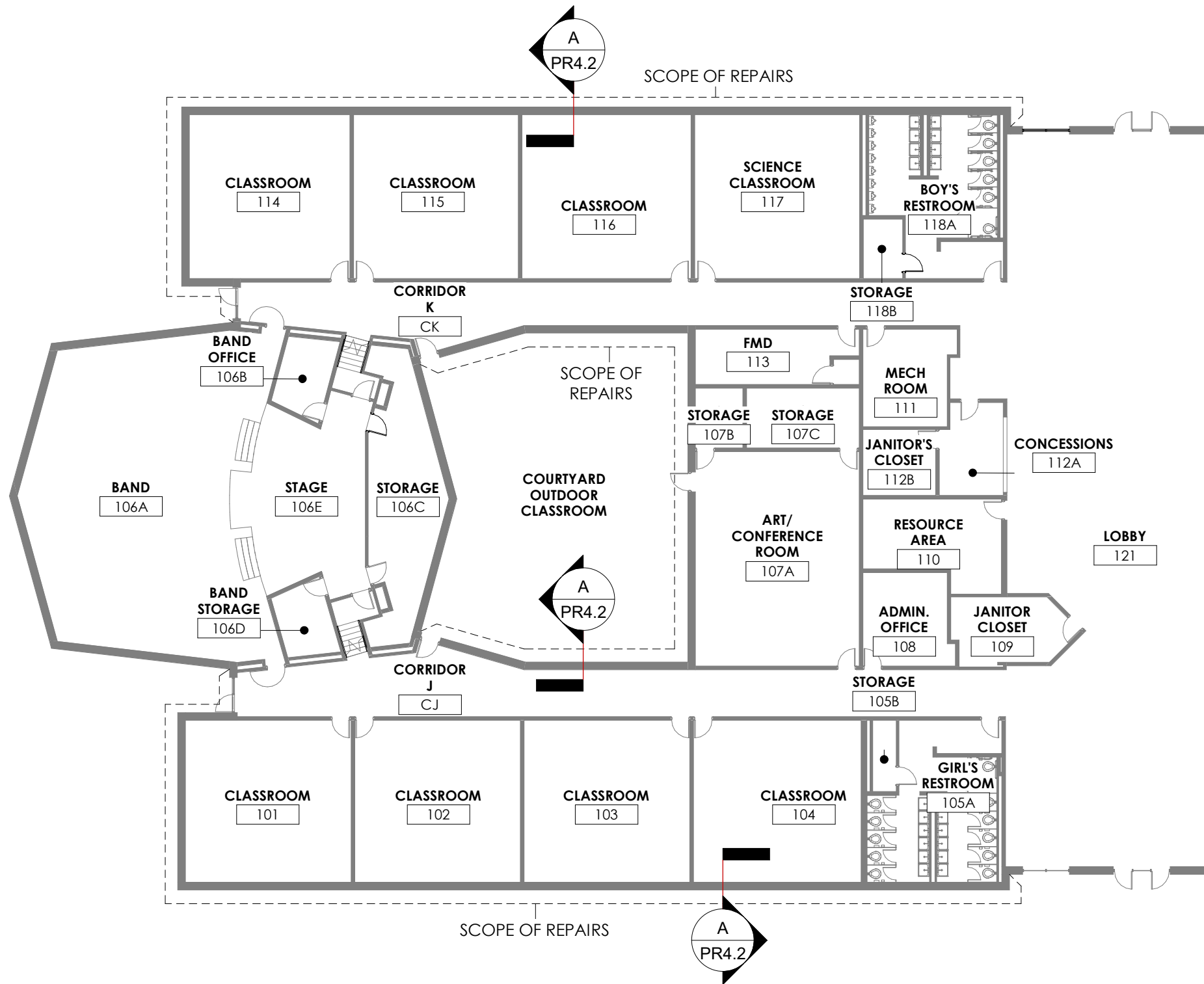
DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NUMBER	SCALE	SIZE	NOTES
1	6/27/2019	PR4.1.pdf				
1	6/27/2019	PR4.2.pdf				
1	6/27/2019	Xypex-coating-installation.pdf				
1	6/27/2019	Xypex-concentrate.pdf				

COPIES:

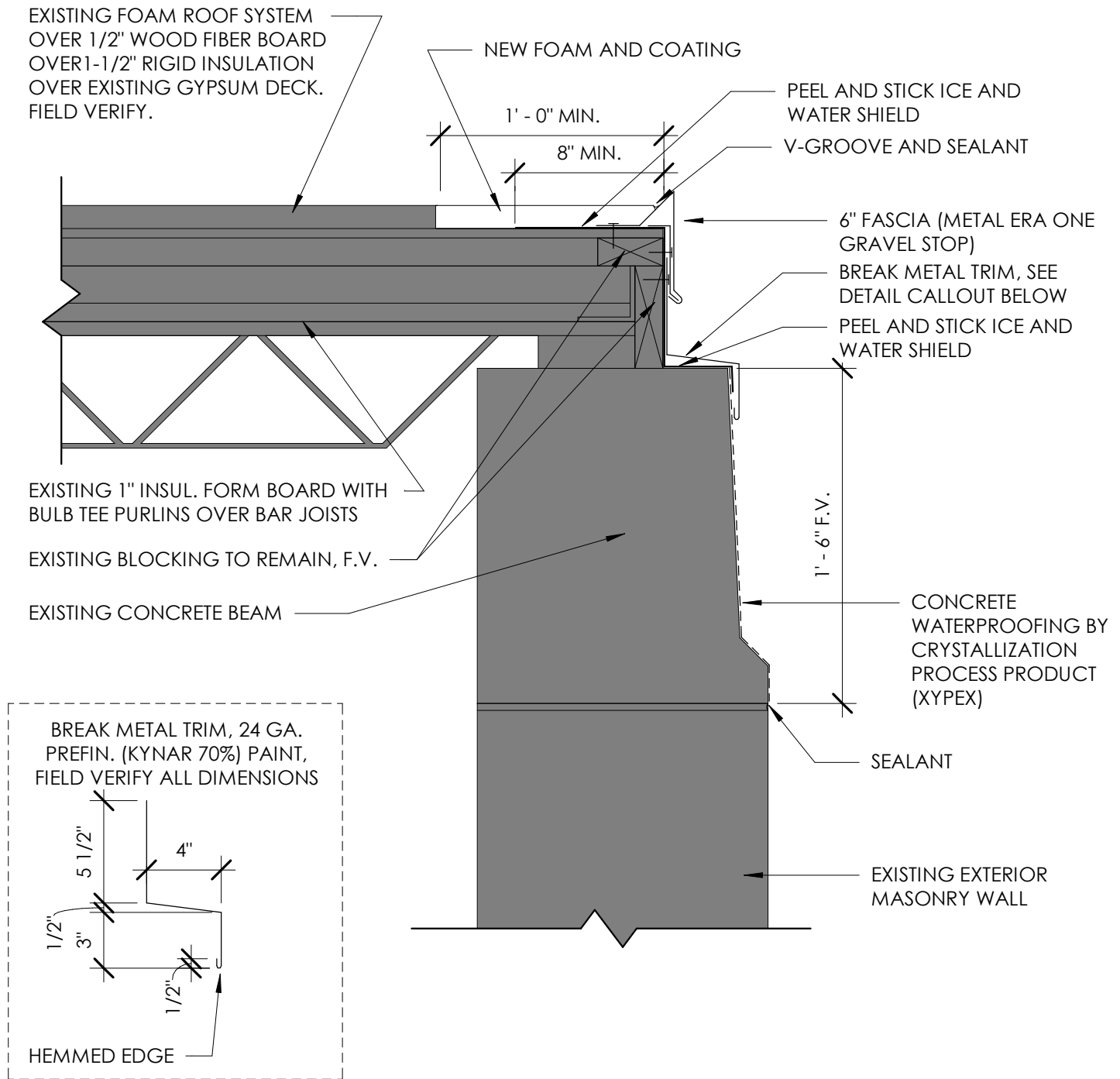
Ron Murrell

(RossTarrant Architects)



FLOOR PLAN - KMS
3/64" = 1'-0"

A
PR4.1



ROOF EDGE DETAIL

1 1/2" = 1'-0"

A
PR4.2



101 old lafayette avenue | lexington, kentucky 40502 | p 859.254.4018 | f 859.231.5046

PROPOSAL REQUEST #4

KING MIDDLE SCHOOL RENOVATIONS

FOR:

MERCER COUNTY BOARD OF EDUCATION
HARRODSBURG, KENTUCKY

DATE	06/26/19
PROJECT	1832
DRAWN	Author
CHECKED	Checker
SHEET REF.	
REVISIONS	
Copyright © Rosstarrant Architects 2018	

SKETCH NUMBER

PR4.2

CONCRETE COATING INSTALLATION AND PROCEDURES

General Information & Standard Xypex Coating Installation Procedures for Use on Concrete

2016-02

The following are general directions on the installation and use of Xypex Concentrate and Modified coatings for Xypex modification of poured in place concrete elements. The information presented is in addition to Xypex product data sheets and is not meant to replace these or any other installation guides but rather is meant to give a general description of the installation practices, curing procedures and other information surrounding the use of Xypex products for waterproofing and protecting concrete and while they normally provide an acceptable final appearance they are not meant as aesthetic finishes.

Weather and Concrete Conditions

1. The Xypex treatment must not be applied under rainy conditions or when ambient temperature is below 40°F (4°C).
2. Because Xypex requires water as a diffusion medium and to initiate the crystalline waterproofing process, all concrete, whether fresh or old, must be in a saturated surface dry (SSD) condition prior to coating application. (See Wetting Concrete below.)
3. The concrete surface must be a minimum of 20 hours old before application of the Xypex coating treatment.
4. For fresh concrete, the period between 24 hours and 72 hours is the optimum time within which to apply Xypex, as the new concrete is still “green” and requires very little pre-watering.

Coverage

For normal surface conditions, the coverage rate for each Xypex coat is 1.25 - 1.5 lb./sq.yd. (0.65 - 0.8 kg/m²). Where a single heavy coat is to be used the coverage rate is 2.0 lb./sq.yd. (1.0 kg/m²).

Surface Preparation

1. The concrete surface to be treated must be clean and free of laitance, dirt, film, paint, coatings or other foreign matter. The surface must also have an open capillary system to provide “tooth and suction” for the Xypex treatment. A CSP-3 per the International Concrete Repair Institute Guidelines and Surface Profile Chips is recommended.
2. If surface is too smooth (e.g. where steel forms are used) or if surface is covered with excess form oil or other foreign matter, the concrete should be lightly sand-blasted, water-blasted, or etched with acid.
3. Horizontal surfaces should have a rough wood float or broom finish. Concrete laitance must be removed from surface by light sand-blasting, water-blasting or etching with acid.

4. Surfaces to be etched with acid should be dampened with water before application of the acid. After acid etching flush concrete thoroughly with clean water.

Repairs Prior to Coating Application

For cracks larger than 1/64” (0.4 mm) or for actively leaking cracks the following repair procedures are recommended.

1. Chip out cracks, faulty construction joints and other structural defects to a depth of 1.5” (37 mm) and a width of one inch (25 mm). A “V” shaped slot is not acceptable. The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage.
2. Clean slot, wet concrete and apply a brush coat of Xypex Concentrate (as described below) in cavity and allow to dry for 10 minutes.
3. Fill cavity by tightly compressing Dry-Pac into the groove with pneumatic packing tool or with hammer and wood block. (See below for Dry-Pac mixing instructions.)
4. Against a direct flow of water (leakage) or where there is excess moisture due to seepage, use Xypex Patch’n Plug in lieu of Dry-Pac followed by a brush coat of Xypex Concentrate. For expansion joints or chronic moving cracks, flexible materials such as expansion joint sealants should be used.

All areas of poor concrete consolidation (honeycomb or rock pockets) should also be repaired. Refer to Xypex Method Statements (www.xypex.com) or contact Xypex’s Technical Services Department or your local Xypex Technical Services Representative for more information.

Wetting Concrete

Xypex requires a saturated substrate and a dry surface. This is commonly referred to as a saturated surface dry or SSD condition. SSD concrete will not absorb any more water but has no glistening water on the surface. Concrete surfaces, therefore, must be thoroughly saturated

CONCRETE COATING INSTALLATION AND PROCEDURES

General Information & Standard Xypex Coating Installation Procedures for Use on Concrete

with clean water prior to the application so as to aid the proper diffusion of the Xypex chemistry and to ensure the growth of the crystalline formation deep within the pores of the concrete. Remove excess water before the application such that there is no glistening water on the surface. If concrete dries out before application, it must be re-wetted.

Mixing

1. Mix Xypex with clean water only (potable water that is free of salt and other deleterious materials).
2. Mix Xypex powder into the clean water with a paddle on a slow speed electric drill (250 RPM) or with other equipment that ensures adequate mixing. For small jobs, Xypex may be mixed by gloved hand or by trowel.
3. Be sure that the quantity mixed can be applied within 20 minutes. As the mixture thickens, stir briefly to refluidize the mix but do not add water.

Mixing For Slurry Coat

Mix Xypex powder with clean water to a creamy consistency in the following volume proportions:

For Brush Application

1.25 - 1.5 lb./sq.yd. (0.65 - 0.8 kg/m²)
5 parts powder to 2 parts water

2.0 lb./sq.yd. (1.0 kg/m²)

3 parts powder to 1 part water

For Spray Application

1.25 - 1.5 lb./sq.yd. (0.65 - 0.8 kg/m²)
5 parts powder to 3 parts water
(ratio may vary with equipment type)

Mixing Dry-Pac

Using a trowel, mix one part clean water with six parts Xypex Concentrate powder by volume for 10 - 15 seconds. Lumps should be present in this mixture. Do not mix more than can be applied in 20 minutes.

Applying Xypex

1. Apply Xypex with a semi-stiff nylon bristle brush, push broom (for large horizontal surfaces), or specialized spray equipment. Do not apply Xypex with a trowel, roller, paintbrush or paint sprayer. Contact Xypex's Technical Services Department or your local Xypex Technical Services Representative for further information.

2. The Xypex coating must be uniformly applied and should be just under 1/16" (1.25 mm) thick. A thicker coating can cause curing or other difficulties, especially in warm weather.

3. When a second coat (Xypex Concentrate or Modified) is required, it should be applied after the first coat has reached an initial set but while it is still "green" (less than 48 hours). Curing by misting the coating with water should be done between coats. Ensure first coat is in SSD condition before application of the second coat.

4. For slab (horizontal) applications, care should be taken to spread the Xypex evenly, pulling a heavy broom over the fresh Xypex. This should be done in long strips and will serve to eliminate settlement of the Xypex in low spots on the slab and also to remove excess material which may have been applied.

5. In hot weather it is advisable to apply Xypex either early in the morning or late in the day. This will prevent the Xypex coating from drying out too quickly.

Note: Where a smooth, steel-trowelled finish is required for horizontal slab or where slab will be exposed to traffic (e.g. parking deck), apply Xypex Concentrate DS-1 or DS-2 by dry shake method. The wearability of Xypex Concentrate and Modified can be improved through an application of Xypex Quickset after the coatings have been cured and dried. Contact Xypex's Technical Services Department or your local Xypex Technical Services Representative for further information.

Curing

1. Generally a misty fog spray of clean water is used for curing the Xypex treatment. Curing should begin as soon as the Xypex has set to the point where it will not be damaged by a fine spray of water.

2. Under normal conditions, it is sufficient to spray Xypex treated surfaces three times per day for 2 - 3 days. In hot or arid climates, spraying may be required more frequently to prevent premature drying of the coating. Wet burlap and some specialty curing blankets are also effective for curing. If plastic sheeting is used as protection, it must be raised off the Xypex treatment to allow the coating to breathe.

3. During the curing period, the coating must be protected from rainfall, frost, wind, the puddling of water and temperatures below 36°F (2°C) for a period of not less than 48 hours after application.

CONCRETE COATING INSTALLATION AND PROCEDURES

General Information & Standard Xypex Coating Installation Procedures for Use on Concrete

4. For concrete structures that hold liquids (e.g. swimming pools, reservoirs, wet wells, tanks, etc.), Xypex should be cured for three days and then allowed to set for 12 days before filling the structure with liquid.

5. For structures holding particularly hot and/or corrosive liquids, Xypex should be cured for three days and allowed to set for 18 days before filling.

6. In situations where there is very high humidity and poor air circulation (e.g. small, enclosed reservoirs or wet wells), fans or blown air to create air movement within the space may be necessary to aid the curing of Xypex.

7. Xypex Gamma Cure may be used in lieu of water curing for certain applications: contact Xypex's Technical Services Department or your local Xypex Technical Services Representative. Gamma Cure should be applied using a garden type sprayer and must be diluted as per directions before use. Do not apply more Gamma Cure than is specified.

Backfilling

Backfilling can take place 36 hours after the Xypex application. If backfilling takes place within seven days after the application, the backfilling material should be moist so as not to draw moisture from the Xypex coating.

Application of Paints, Epoxies or Similar Coatings

Xypex requires a minimum of 21 days of curing and crystal generation before the application of any paint or epoxy. Consult epoxy and paint manufacturer for additional coating instructions and restrictions. Removal of the Xypex coating by high pressure washing or abrasive blasting following full curing is the best practice. Alternately, moderate pressure washing, light abrasive blasting or washing the Xypex surface with a 3 - 5% muriatic acid solution followed by a rigorous rinse with clean water is recommended before applying the coating. Be sure to flush all acid off the surface. Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond.

Application of Grout, Cement Parge Coat, Plaster or Stucco

It is recommended that any other cementitious system be applied over the Xypex coating after the Xypex has com-

pletely set but while it is still "green" (8 to 48 hours). The 12 to 24 hour window is considered ideal. applications: Contact Xypex's Technical Services Department or your local Xypex Technical Services Representative regarding surface preparation and other procedures for installations of other materials onto Xypex coatings older than 48 hours. Use of a polymer additive to help improve bond in the over coating mortar mix should be considered. Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond.

Note: Xypex Chemical Corporation makes no representations or warranties regarding the compatibility of Xypex products with plasters, stuccos, tiles and other surface applied materials. It is the responsibility of the installer of these surface-applied materials to take whatever measures are necessary, including testing, to ensure acceptance by or adhesion to the Xypex treated surface.

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

Caution

Xypex is highly alkaline.

1. Avoid contact with skin or eyes.
2. Protect hands with rubber gloves when handling dry powder or wet mixture.
3. If skin comes into contact with Xypex material, wash immediately and thoroughly with water for 15 minutes. If discomfort continues, seek prompt medical attention.
4. Wear eye protection. If dry powder or wet mixture gets into eyes, flush immediately and thoroughly with water and seek medical aid.
5. Wear a suitable mask where there is potential for generating dust. If Xypex is ingested, do not induce vomiting; have affected person drink two glasses of water and obtain immediate medical attention.
6. For Safety Data Sheets, contact Xypex Chemical Corporation at 604.273.5265, toll-free 800-961-4477 or refer to SDS located at: www.xypex.com.



CONCENTRATE

071616 CEMENTITIOUS CRYSTALLINE

Concrete Waterproofing

Description

Xypex is a unique chemical treatment for the waterproofing, protection and repair of concrete. XYPEX CONCENTRATE consists of Portland cement, finely graded sand and active proprietary chemicals; it is applied as a cementitious slurry to the pre-saturated surface of existing above and below-grade structures. The active chemicals diffuse into the substrate and react with moisture and the constituents of hardened concrete to cause a catalytic reaction. This reaction generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete, as well as cracks, permanently sealing the concrete and preventing the penetration of water and other liquids from any direction, even under high hydrostatic pressure. Xypex Concentrate is also mixed in a Dry-Pac form for sealing strips at construction joints, or for the repairing of leaking cracks, faulty construction joints and other defects.

Recommended for:

- Reservoirs
- Sewage and Water Treatment Plants
- Underground Vaults
- Secondary Containment Structures
- Foundations
- Tunnels and Subway Systems
- Swimming Pools
- Parking Structures

Advantages

- Resists extreme hydrostatic pressure
- Becomes an integral part of the substrate
- Can seal static hairline cracks up to 0.4 mm
- Can be applied to the positive or the negative side of the concrete surface
- Allows concrete to breathe
- Highly resistant to aggressive chemicals
- Non-toxic / no VOCs
- Does not require a dry surface
- Cannot puncture, tear or come apart at the seams
- No costly surface priming or leveling prior to application
- Does not require sealing, lapping and finishing of seams at corners, edges or between membranes
- Does not require protection during backfilling or during placement of steel, wire mesh or other materials
- Less costly to apply than most other methods
- Not subject to deterioration
- Permanent
- Available in white for enhanced illumination

Packaging

Xypex Concentrate is available in 20 lb. (9.1 kg) pails, 60 lb. (27.2 kg) pails and 50 lb. (22.7 kg) bags.

Storage

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

Coverage

For normal surface conditions, the coverage rate for each Xypex coat is 6 to 7.2 sq. ft./lb. (1.25 - 1.5 lb./sq. yd. or 0.65 - 0.8 kg/m²).

Test Data

PERMEABILITY

U.S. Army Corps of Engineers (USACE) CRD C48, "Permeability of Concrete", Pacific Testing Labs, Seattle, USA

Two in. (51 mm) thick, 2000 psi (13.8 MPa) Xypex-treated concrete samples were pressure tested up to a 405 ft. (124 m) water head (175 psi/1.2 MPa), the limit of the testing apparatus. While untreated samples showed marked leakage, the Xypex-treated samples (as a result of the crystallization process) became totally sealed and exhibited no measurable leakage.

DIN 1048 (equivalent to EN 12390-8), "Water Impermeability of Concrete", Bautest – Corporation for Research & Testing of Building Materials, Augsburg, Germany

Twenty cm thick Xypex-treated concrete samples were pressure tested up to 7 bars (230 ft./70 m water head) for 24 hours to determine water impermeability. While the reference specimens measured water penetration up to a depth of 92 mm, Xypex-treated samples measured water penetration of zero to an average of 4 mm.

EN 12390-8, "Depth of Water Penetration on Samples Treated with Concentrate Coating", OL-123, Czech Technical University, Prague, Czech Republic

Three replicate 150 mm concrete cubes from four different mix designs (strength classes) were coated with Xypex Concentrate at a thickness of 0.8 mm to 1 mm. Controls for each of the different mix designs were also cast for comparison purposes. All samples were exposed to 0.5 MPa (73 psi) of water pressure for 72 hours from the opposite side of the treated surface. Specimens from each

set were split transversely from the treated surface at 28 and 91 days to measure depth of water penetration from the exposed surface. After 28 days, the Xypex coating reduced the depth of water penetration by 90 to 94% compared to the control mixes for the four mix types. At 91 days all Xypex-treated samples measured <1 mm of water penetration.

DEPTH OF PENETRATION

***“Measurement of Mass Concrete Humidity”,
Czech Technical University, (CVUT) Faculty of Civil
Engineering, Prague, Czech Republic***

A coating of Xypex Concentrate was applied to one face of a 300 mm x 300 mm x 220 mm set of concrete blocks; two replicate sets of blocks were left untreated. Water filled containers were tightly sealed onto the opposite face of the treated blocks and one set of the untreated blocks while the third untreated block set was kept in the laboratory as a control. Humidity probes were installed in 6 mm diameter holes that were drilled to within 30 - 40 mm of the water exposed surface. Mass humidity was recorded at intervals of 28, 45, 90, 125 and 132 days. Final results showed that the Xypex-treated specimens had an average humidity reading of 4.6%, the untreated sample measured 7.9% and the control block with no water exposure was 4.4%, essentially equivalent to the Xypex specimens' results. The Xypex reactive chemicals had diffused at least 190 mm in 132 days.

***“An Enhancement in the Nature of Concrete with a
Multiplicative Cement Crystal-Type Concrete Material”,
Central Research Laboratory of Nikki Shoji in
Association with Hosei University, Japan***



A 60 cm x 70 cm x 40 cm concrete block was cast and a Concentrate coating was applied to the surface and cured. The block was left outdoors for approximately 1 year. Subsequently, a 40 cm (15.75 in.) long cylinder was then cored perpendicular to the Xypex

treatment and cut into 18 slices of equal length. SEM photographs utilizing a 1000x magnification were taken of slices from various depths from the treated surface to determine the extent of crystalline growth. While the crystalline structure was most dense in specimens located closest to the treated surface, there was evidence of the crystalline structure at 30 cm (12 inches) from the treated surface.

CRACK SEALING

***ASTM C856 “Standard Practice for Petrographic
Examination of Hardened Concrete”, Setsco Services
Pte, Ltd., Singapore***

A coat of Xypex Concentrate was applied to a slab that had developed numerous hairline cracks. To determine the crack sealing ability of the Xypex treatment, cores were extracted from a slab at 3, 10, 14 and 20 days following

application. Thin sections were taken from each core in order to examine hairline cracks utilizing a polarizing and fluorescent microscope (PFM). In each case, there was evidence of the Xypex crystalline structure in the cracks to a depth of about 20 mm. Photographs taken this depth at 100x magnification showed the Xypex crystalline structure had reduced the width of the cracks dramatically.

TENSILE BOND STRENGTH

***EN 1542 “Products and Systems for the Protection
and Repair of Concrete Structures – Test Methods
– Measurement by Pull-off”, Trow Associates Inc.,
Burnaby, B.C., Canada***

Two coats of Xypex Concentrate were applied at 0.8 kg per m² with a total cured thickness of 0.9 mm to a standard concrete substrate meeting EN 1766 MC (0,40) (meeting ICRI CSP-4). The coating was applied and cured to the manufacturer's technical specifications and tested at 30 days age for bond strength. The average tensile bond strength of five replicates was 1.23 MPa.

CHEMICAL RESISTANCE

***ASTM C 267, “Chemical Resistance to Mortars”,
Pacific Testing Labs, Seattle, USA***

Xypex-treated cylinders and untreated cylinders were exposed to hydrochloric acid, caustic soda, toluene, mineral oil, ethylene glycol, pool chlorine, brake fluid and other chemicals. Results indicated that chemical exposure did not have any detrimental effects on the Xypex coating. Tests following chemical exposure measured an average 17% higher compressive strength in the Xypex-treated specimens over the untreated control samples.

***IWATE University Technical Report,
“Resistance to Acid Attack”, Tokyo, Japan***



Xypex-treated mortar and untreated mortar were measured for acid resistance after exposure to a 5% H₂SO₄ solution for 100 days. Xypex suppressed concrete erosion to 1/8 of the reference samples.

***ASTM C876 “Influence of Xypex Coating System
on Residual Service Life of Concrete Structures”
Durability Assessment Section, Xypex Australia***

A bridge pier exposed to seawater in a tidal splash zone for over 40 years experienced different types of deterioration mechanisms including surface abrasion (skin loss), cracking, and corrosion of steel reinforcement. Corrosion monitoring was conducted before and six months after application of Xypex Concentrate. This non-destructive testing (NDT) included a measurement of the corrosion rate, cor-

rosion potential, and concrete resistivity. Results indicated a reduction of corrosion rate and corrosion potential up to 50% and 40% respectively, and significant enhancement of the concrete resistivity.

RILEM CPC-18 “Carbonation Resistance of Samples Treated with a Xypex Concentrate Coating”, Construction and Maintenance Technology Research Center (CONTEC), Sirindhorn International Institute of Technology (SIIT) – Thammasat University, Bangkok, Thailand

Control and Xypex Concentrate coated samples were carbonated in an accelerated carbonation chamber. The average depths of carbonation were measured at 28, 56, 77 and 91 days. The depth of carbonation of these Xypex Concentrate coated samples was reduced by 35 - 40% compared to the controls. Following initial carbonation, one set of samples was coated with Xypex Concentrate to model old concrete already damaged by carbonation. For these specimens, testing indicated that carbonation was arrested and in one specimen reduced.

FREEZE/THAW DURABILITY

ASTM C 672, “Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to De-Icing Chemicals”, Twin City Testing Lab, St. Paul, USA

Xypex-treated samples restricted chloride ion concentration to below the level necessary to promote electrolytic corrosion of reinforcing steel. Visual examination of untreated panels after 50 freeze/thaw cycles showed a marked increase in surface deterioration compared to Xypex-treated samples.

POTABLE WATER EXPOSURE

NSF 61, “Drinking Water System Component-Health Effects”, NSF International, Ann Arbor, USA

Exposure testing of potable water in contact with Xypex-treated samples indicated no harmful effects.

RADIATION RESISTANCE

U.S.A. Standard No. N69, “Protective Coatings for the Nuclear Industry”, Pacific Testing Labs, Seattle, USA

After exposure to 5.76×10^4 rads of gamma radiation, the Xypex treatment revealed no ill effects or damages.

Application Procedures

1. SURFACE PREPARATION Concrete surfaces to be treated must be clean and free of laitance, dirt, film, paint, coating or other foreign matter. Surfaces must also have an open capillary system to provide “tooth and suction” for the Xypex treatment. A CSP-3 per the International Concrete Repair Institute Guidelines and Surface Profile Chips is recommended. If surface is too smooth (e.g. where steel forms are used) or covered with excess form oil or other

foreign matter, the concrete should be lightly sandblasted, waterblasted, or etched with muriatic (HCL) acid.

2. STRUCTURAL REPAIRS – PRIOR TO COATING APPLICATION

For cracks larger than 1/64” (0.4 mm) or for actively leaking cracks the following repair procedures are recommended. Chip out cracks, faulty construction joints and other structural defects to a depth of 1.5 inches (37 mm) and a width of 1 inch (25 mm). A “V” shaped slot is not acceptable. The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage. Clean and wet the slot and apply a brush coat of Xypex Concentrate as described in steps 5 & 6 and allow to dry for 10 minutes. Fill cavity by tightly compressing Dry-Pac into the groove with pneumatic packing tool or with hammer and wood block.

NOTE:

- i. Areas of poor concrete consolidation that show evidence of leakage should also be repaired.
- ii. Against a direct flow of water (leakage) or where there is excess moisture due to seepage, use Xypex Patch’n Plug, then Xypex Dry-Pac followed by a brush coat of Xypex Concentrate.
- iii. For expansion joints or chronic moving cracks, flexible materials such as expansion joint sealants should be used.

3. WETTING CONCRETE Xypex requires a saturated surface dry (SSD) condition. Concrete surfaces must be thoroughly saturated with clean water prior to the application so as to aid the diffusion of the Xypex chemistry and to ensure growth of the crystalline formation deep within the pores of the concrete. Remove excess water before the application such that there is no glistening water on the surface. If concrete dries out before application, it must be re-wetted.

4. MIXING FOR SLURRY COAT Mix Xypex powder with clean water to a creamy consistency in the following proportions:

For Brush Application

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m²)
5 parts powder to 2 parts water

2.0 lb./sq. yd. (1.0 kg/m²)
3 parts powder to 1 part water

For Spray Application

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m²)
5 parts powder to 3 parts water
(ratio may vary with equipment type)

Do not mix more Xypex material than can be applied in 20 minutes. As the mixture thickens, stir briefly to ensure mixture remains fluid; but do not add water.

Mixing Dry-Pac

Using a trowel, mix 6 parts Xypex Concentrate powder by volume to 1 part clean water for 10 to 15 seconds. Lumps should be present in this mixture. Do not mix more than can be applied in 20 minutes.

5. APPLYING XYPEX Apply Xypex with a semi-stiff nylon bristle brush, push broom (for large horizontal surfaces) or specialized spray equipment. The coating must be uniformly applied and should be just under 1/16 in. (1.25 mm). When a second coat (Xypex Concentrate or Xypex Modified) is required, it should be applied after the first coat has reached an initial set but while it is still "green" (less than 48 hours). Curing by misting the coating with water should be done between coats. Ensure first coat is in SSD condition before application of the second coat. The Xypex treatment must not be applied under rainy conditions or when ambient temperature is below 40°F (4°C). Avoid application of the Xypex coating in hot and windy conditions as the coating may dry out prematurely. For recommended equipment, contact Xypex's Technical Services Department or your local Xypex Technical Services Representative.

6. CURING Generally a misty fog spray of clean water is used for curing the Xypex treatment. Curing should begin as soon as the Xypex has set to the point where it will not be damaged by a fine spray of water. Under normal conditions, it is sufficient to spray Xypex-treated surfaces three times per day for two to three days. In hot or arid climates, spraying may be required more frequently. Wet burlap and some specialty curing blankets are also effective for curing. During the curing period, the coating must be protected from rainfall, frost, wind, the puddling of water and temperatures below 36°F (2°C) for a period of not less than 48 hours after application. If plastic sheeting is used as protection, it must be raised off the Xypex to allow the coating to breathe. Xypex Gamma Cure may be used in lieu of water curing for certain applications, consult with Xypex's Technical Services Department or your local Xypex Technical Services Representative.

NOTE:

- i. For concrete structures that hold liquids (e.g. reservoirs, swimming pools, tanks, etc.), Xypex should be cured for three days and allowed to set for 12 days (18 days for waste water or corrosive solutions) before filling the structure with liquid.
- ii. For Xypex coated slabs that will be a wearing surface, an application of Xypex Quickset after the coating has been cured and dried is recommended. Contact your local Xypex Technical Services Representative for assistance.
- iii. If any other cementitious system is applied over the Xypex coating, it should be after the coating has completely set but while it is still green (12 to 48 hours); the 12 to 24

hour window is considered ideal. For installations onto a Xypex coating older than 48 hours contact your local Xypex Technical Service Representative regarding surface preparation and application recommendations. Xypex Chemical Corporation makes no representations or warranties regarding the compatibility of Xypex products with plasters, stuccos, tiles and other surface-applied materials. Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond.

Technical Services

For more instructions, alternative application 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.

Certification

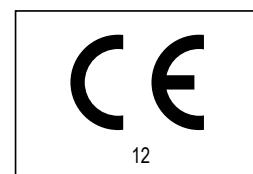
Xypex Concentrate satisfies the requirements of EN 1504-2; Initial Type Testing (ITT) according to EN 1504-2 was certified by BSI as the Notifying Body.

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. 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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