Fearn Clendaniel
Architects INC
6 Larch Avenue - Suite 398 - Wilmington, DE 19804 - (P) 302-998-7615 - (F) 302-998-7685

SMYRNA SCHOOL DISTRICT
Smyrna Elementary School Renovations and Addition
Bid Number SSD-15-001

ADDENDUM NO. 4 2 April 2015

Smyrna School District
Smyrna Elementary School
121 South School Lane
Smyrna, Delaware 19977

Fearn-Clendaniel Architects, Inc.
6 Larch Avenue Suite 398
Wilmington, Delaware, 19804
Phone: (302) 998-7615
Fax: ((302) 998-7685

BIDS DUE: **3:00 p.m. on April 13, 2015**

LOCATION: **Smyrna School District Administrative Offices**
82 Monrovia Ave, Smyrna, DE 19977

ARCHITECT'S PROJECT NO: 14107a

1.0 NOTICE TO ALL BIDDERS:

1.1. Bidders are hereby notified that this Addendum shall be and hereby becomes part of their Contract Documents, and shall be attached to the Project Manual for this project.

1.2. The following items are intended to revise and clarify the Contract Documents, and shall be included by the Bidder in their proposal.

1.3. Bidders shall verify that their sub-bidders are in full receipt of the information contained herein.

1.4. **Bid Due date is Monday, April 13, 2015 at 3:00 p.m.** Bid due date will not be extended further except at Owner's direction.

1.5. A revised Bid Form is attached to reflect Bid Due date as well as alternate A-2 revisions.

2.0 QUESTIONS:

2.1 **Q:** Will the Town of Smyrna permit be by Owner?

A: See Addendum No. 1; Pre-bid Minutes item 1.25.

2.2 **Q:** Will there be provisions issued for liquid asphalt escalation?

A: For pricing cost of Liquid Asphalt, the contractor shall use the DelDot price index for Liquid Asphalt for April 2015. This price will be adjusted to compensate difference of the actual Liquid Asphalt price index posted during construction. The contractor will

need to supply tickets for verifying construction quantities and dates. Price compensation is for Liquid Asphalt only.

2.3 **Q:** Who will pay for testing? If by the GC, what tests are required?

A: See Addendum No. 1; Pre-bid Minutes item 1.26 and 1.27. Owner will pay for 3rd party inspections described in Pre-bid Minutes item 1.27. Remaining costs by GC.

2.4 **Q:** Drawings C-03 and C-04 show relocated playground areas. Are we to remove and reinstall? Where will it be taken? Is this by the owner? If by the GC, please provide a scope of work.

A: The Owner will remove existing playground equipment (equipment only) and store on site. The contractor will need to coordinate schedule with the Owner. Following GC site work, the Owner will install playground equipment and playground area surfaces.

2.5 **Q:** Are there any landscape drawings?

A: Not beyond information currently indicated on civil documents. Landscaping for aesthetic and bio-retention areas will utilize Allowance No 1. Allowance No. 1 will be increased as part of this addendum from $4,000.00 to $20,000.00. (See changes to project manual section below).

2.6 **Q:** Is sod required?

A: All temporary and permanent stabilization shall be per DNREC standards and per contract documents. Sod is not specified on this project.

2.7 **Q:** The demo drawings show us removing sidewalk along south street. There are no drawings indicating what is to be placed back. Please clarify if it is the architects intent to replace the sidewalk with handicap ramps and if we are to use the sidewalk detail shown on the plans.

A: For The Alternate proposed walk replacement and new ADA Curb Ramps. Curb Ramps to be constructed per DelDOT and Town standards and shall have minimum 5', in length, of depressed curb, with maximum 12:1 curb taper and extend to tie-in with existing curbing as shown on plans. Any damaged paving extending into right-of-way shall be replaced per Town & DelDOT standards (as required for curb replacement)

2.8 **Q:** The tree where the new 8" water line is shown is called out to be saved. Can this tree be removed or should the water line be routed around the tree?

A: Water line has been adjusted to avoid conflict with existing tree. See attached C-04 and C-04 (ALT) drawings.

2.9 **Q:** Will a copy of the Geotechnical Report, which is referenced on drawing S10-01, be made available?

A: A copy of the Geotechnical Report has been attached to this Addendum.

2.10 **Q:** In reference to Alternate A-4: Bid documents show we need to provide casework at rooms 106 and 105 only in this area, they are not mentioned in the Alternate. Please clarify

A: Rooms 105 and 106 are part of the Base Bid.

2.11 **Q:** I do not see any plan sheets that show any details for the Reception/casework referred to in the Alternate Schedule. Please clarify.

A: Please refer to Sheet ALT-4.

2.12 **Q:** Toilet Rooms 183A and 184A are noted as having PVC – all other toilet rooms have ceramic tile, please advise.

A: Floor finish at Toilet Rooms 183A and 184A to be "C", ceramic tile and base to be ceramic cove base.

2.13 **Q:** Is there a manufacturer and style for the base to be matched in the hallways?

A: See Finish Specifications and Legend located on revised Sheet A80-02.

Base at Corridor 113: 4" Black

Base at remainder of Areas A, B, & C: 6" Beige

2.14 **Q:** In the Kitchen, please confirm the locker and storage area to receive PVC tile.

A: Storage Room 134 to be Quarry Tile, as noted. Locker Room 133A to be revised to type 'H' Quarry tile for floor and base. Toilet Room 133B to have type "C" ceramic tile as finish floor and "CT" at all wall finishes and base to be ceramic cove base.

2.15 **Q:** Solid surface countertops are noted to match architect's sample, are there colors selected?

A: See Finish Specifications and Legend located on revised Sheet A80-02.

2.16 **Q:** Resilient Tile Flooring spec page 2, item 2.1.A states "solid PVC floor tile according to the Finish Drawings and Schedule", however Finish Plans A80-01 & A80-02 do not list the product to be used. Please advise.

A: Existing PVC floor tile is Manufacturer: Toli ; Style Linotesta; Size 17.7", Gauge .120". See Finish Specifications and Legend located on revised Sheet A80-02.

2.17 **Q:** What is the specific product/mix level to be bid on color groups for ceramic tile? No specific colors or color groups are given in the documents

A: See Finish Specifications and Legend located on revised Sheet A80-02.

2.18 **Q:** What is the specification for carpet? There is no specification?

A: See Finish Specifications and Legend located on revised Sheet A80-02.

2.19 **Q:** Can structural engineer clarify the foundation elevations? There are 4 interior column footings showing TOF at -2-0", but those are all of the elevations that I see.

A: Refer to Foundation and First Floor Plan Notes on Sheet S11-02A. In addition, the bottom of footing needs to be coordinated with finish grades per the civil drawings. There is one section near the grease interceptor, this section has to coordinate with the grease interceptor elevation.

2.20 **Q:** Detail 12/S31-02: Per note on plan sheets S12-01A and S12-02A – "Where sprinkler is supported in Corridors, wall mount or provide W4x13's per Dtl 12/S31-02" Can you verify if these beams are needed?

A: Since we don't know if a fire pump is required until a sprinkler contractor has confirmed the flow test, assume Detail 12/S31-02 is required in corridors.

2.21 **Q:** Can you please clarify which continuous hinges are required? The hardware schedule calls for 651HD and 652HD. These are heavy duty and not sure they are required in an Elementary School.

A: See specification 087100 – Door Hardware; 2.3 Materials; B. Continuous Hinges for clarification. Provide hinge specified.

2.22 **Q:** Drawing A40-01 Door Schedule calls for door opening 176 to receive new aluminum doors. Hardware schedule calls for existing doors to remain. Please clarify.

A: Door 176 shall be existing, to remain.

2.23 **Q:** Should Hardware Set 46 be revised to reflect a single door and Sets 41, 44 to reflect pair of doors?

A: See attached revised door hardware specification 087100.

Hardware Set 46 to be revised to reflect a single door .
Hardware Set 44 to be deleted. Door 134 to move from HDWE set #44 to set #45.
Hardware Set 41 has been omitted. Door 131A to move from HDWE set #41 to set #44.

2.24 **Q:** Should Hardware Set 56 be self-latching to meet fire rating?

A: Yes, door will also include hold open. See attached revised door hardware specification 087100.

2.25 **Q:** Elevation 20/A60-01 shows casework at room 108. This elevation doesn't look like it printed correctly, and room 108 doesn't appear to receive any new casework. Please clarify.

A: Delete Elevation 20/A60-01. There is no casework in Room 108.

2.26 **Q:** Please confirm that refrigerators, washers, and dryers are all by the owner.

A: Yes, these will be provided by the Owner.

2.27 **Q:** Drawing A11-02, in room 170, shows "Patch floor as required – see MEP". I don't see any underground work in this room on the MEP drawings, please clarify.

A: Refer to Sheet P103. New domestic piping to be installed in crawlspace below Room 170.

2.28 **Q:** There is a spec section for Visual Display Surfaces (101100), though I don't see any shown on the drawings. Please confirm quantity and locations.

A: Omit section 101100 Visual Display Surfaces. No new display boards are added however, existing display boards in classroom areas requiring demolition for new construction shall be salvaged an reinstalled on new wall space.

2.29 **Q:** Item 2.36 in Addendum #3 refers to an allowance for cutting and patching existing floors, since existing underground drawings are not available. There has been no specific dollar figure nor area allowance stated for this work. I would like to suggest that one be added, so that all of the GC's are bidding the same scope of work.

A: See Plumbing drawing general and demolition notes. Scope of work to complete demolition and new installation shall be included in the base bid.

2.30 **Q:** Foundation Notes on drawing S10-01 states to retain the services of a geotechnical engineer. Will this be paid for by the owner or GC?

A: Per Pre-Bid Meeting minutes, the Owner will provide 3rd party testing of soils. The GC will be responsible for coordinating schedules with testing agency.

2.31 **Q:** The demolition drawings do not show any flooring to be removed. Please verify.

A: Refer to Note 8 on A10-01 and General Note 6 on PD101. Contractor is responsible for coordination of demolition between trades. As noted in Addendum 3, Item 2.8, Contractor shall be responsible for patching of disturbed or damaged flooring. Beyond patching of disturbed floor finishes, existing flooring finishes shall be demolished and floor prepared to receive new floor finish where flooring is indicated on finish plans.

2.32 **Q:** Behind the new lockers are existing walls that will receive in-wall blocking support, what type of wall construction are the existing walls?

A: GC to verify existing conditions at all locations. Contractor shall provide blocking as required by locker manufacturer.

2.33 **Q:** Can you identify the type of existing roof framing at shoring locations noted on structural drawings S12-01 A & B and at bracing locations for detail 9/S31-01?

A: Typical roof framing are steel joists, varying in size and spacing, per location. Refer to Sheet FP102 for Areas with wood framed construction.

2.34 **Q:** Note 10 on A10-01 is not indicated on the demo plans, can you confirm that this scope is necessary and where?

A: See item 4.2 on Addendum No. 3.

3.0 CHANGES TO THE PROJECT MANUAL:

3.1 Section 000007 Bidform: Has been modified to indicate the updated Bid Due Date and updated language for Alternate No. A-2.

3.2 Section 012100 Allowances; 3.3 schedule of Allowances; A. Allowance No. 1; revise allowance amount from $4,000.00 to $20,000.00.

3.3 In Section 012300, Alternate No. A-2 the numerated list (1 thru 5) shall be removed in its entirety and replaced with the following:

1. Integrate all the existing HVAC equipment into the new bas system. Integration includes all control, monitor, alarm and trending of all the existing components. Upon completion, the existing alerton control system shall be removed.

2. As part of this alternate, all existing temperature, humidity, CO2 sensors, shall be replaced with new. Existing communication trunk wiring, controller input and output wiring, controllers and end devices shall be reused/retained.

3. The drawings provided show the approximate location and type of equipment that will need to be controlled by the new bas in addition to the new equipment that is being installed as part of the base project.

4. The contractor shall be responsible to filed verify the exact location of this equipment as well as the location of all the existing control and monitoring devices such as thermostats, air flow sensors, duct detectors, etc.

5. These documents may not be inclusive of all existing systems and additional investigation will be required by the awarded contractor to determine all the existing parameters through examination of the existing BAS programming as well as examination of the existing equipment.

3.4 In Section 087100, Door Hardware: Replace section in its entirety. Highlighted items represent changes to the specification in reference questions in this, and previous, Addendum and also include hardware revisions to coordinate with security.

3.5 In Section 096519, Resilient Tile Flooring:

1.2 Summary, A: Add: 2. Solid VCT floor tile.

Part 2 Products, Add 2.2: Vinyl Composition Tile

A. Products: Subject to compliance with requirements, provide vinyl composition floor tile according to the Finish Drawings and Schedule.

4.0 CHANGES TO THE DRAWINGS:

4.1 Replace Sheet A11-03, A80-01 and A80-02 in their entirety.

4.2 Replace Sheets C-04 and C-04 (ALT) in the entirety.

4.3 On drawings MP001, M401 and M402:

The Base Bid Controls note and Alternate A-2 note shall be deleted in their entirety and replaced with the following:

Base bid controls:

Furnish and install new bas system including the building controller, communication lines, application controllers, unit controllers, control system servers, user interface laptop computer, programming and graphics required to accommodate all new hvac equipment and devices. This bas shall initially control all new equipment installed under the base contract. New user interface will be connected into the existing building automation system via the existing bacnet link to allow the new control system to interface with the existing system. A graphics review meeting with the owner's representative shall determine the style of graphics to be used for the new system.

Alternate A-2:

1. Integrate all the existing hvac equipment into the new bas system. Integration includes all control, monitor, alarm and trending of all the existing components. Upon completion, the existing Alerton control system shall be removed.

2. As part of this alternate, all existing temperature, humidity, co2 sensors, shall be replaced with new. Existing communication trunk wiring, controller input and output wiring, controllers and end devices shall be reused/retained.

3. The drawings provided show the approximate location and type of equipment that will need to be controlled by the new bas in addition to the new equipment that is being installed as part of the base project.

4. The contractor shall be responsible to filed verify the exact location of this equipment as well as the location of all the existing control and monitoring devices such as thermostats, air flow sensors, duct detectors, etc.

5. These documents may not be inclusive of all existing systems and additional investigation will be required by the awarded contractor to determine all the existing parameters through examination of the existing bas programming as well as examination of the existing equipment.

4.4 On drawings E12-01 and E12-02; move the Rescue Assistance Call Station currently indicated on drawing E12-01 at the lower landing of the wheelchair lift to the upper landing of the wheelchair lift Room 116A (room is shown but not labeled on E12-02).

END OF ADDENDUM NO. 4

SMYRNA ELEMENTARY SCHOOL – RENOVATIONS AND ADDITION
121 SOUTH SCHOOL LANE
SMYRNA, DE 19977
Bid No. SSD-15-001-SES Renovations

BID FORM

For Bids Due: April 13, 2014 @ 3:00 PM **To:** Smyrna School District
82 Monrovia Avenue
Smyrna, Delaware 19977

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____
"(A copy of a Bidders Delaware Business License must be attached to this form.)"

(Other License Nos.): _____

Phone No.: ( ) _____ - _____ **Fax No.: ( ) _____ - _____**

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____
($)

ALTERNATES

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

ALTERNATE No. A-1: Parking and Drive Expansion:
This Alternate includes Demolition of three existing parking areas adjacent to South Street that access the kitchen dock area to allow for increased parking and a drop-off lane. Relocate one of the parking entrance drives on South Street and relocate electrical pole. Relocate playground area and playground equipment to provide space for increased parking area. Combine two paved playground areas to reduce overall impervious coverage. New light poles will be included for new parking lot lighting.

Add/Deduct: _____
($)

ALTERNATE No. A-2: Integrate all HVAC equipment into the new BAS system: This Alternate includes all existing HVAC equipment beyond specified base bid scope of work as follows:

1. **Integrate all the existing HVAC equipment into the new bas system. Integration includes all control, monitor, alarm and trending of all the existing components. Upon completion, the existing alerton control system shall be removed.**

2. **As part of this alternate, all existing temperature, humidity, CO2 sensors, shall be replaced with new. Existing communication trunk wiring, controller input and output wiring, controllers and end devices shall be reused/retained.**

3. **The drawings provided show the approximate location and type of equipment that will need to be controlled by the new bas in addition to the new equipment that is being installed as part of the base project.**

4. **The contractor shall be responsible to filed verify the exact location of this equipment as well as the location of all the existing control and monitoring devices such as thermostats, air flow sensors, duct detectors, etc.**

5. **These documents may not be inclusive of all existing systems and additional investigation will be required by the awarded contractor to determine all the existing parameters through examination of the existing bas programming as well as examination of the existing equipment.**

Add/Deduct: _____
($)

ALTERNATE No. A-3: Extend piping mains into Building Area 'D': Disconnect, remove and replace the existing domestic cold water, hot water and hot water return in the classroom addition as indicated on the construction drawings. Installation shall include new isolation valves. Existing branch piping to the fixtures shall remain.

Add/Deduct: _____
($)

ALTERNATE No. A-4: Main Office Suite Renovations: Provide selective demolition of walls at the existing main office administrative suite and provide new construction to enlarge the Conference room, relocate the Assistant Principals office, add Storage rooms, reconfigure corridor wall access to office, and provide new Administrative reception counter/casework. Modify or revise existing mechanical and electrical work associated with the revised layout.

Add/Deduct: _____

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UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

		ADD	DEDUCT
A.	Unit Price No. 1 - Structural Fill (DelDot Type G):	$ _____	$ _____
	1. Description: Additional quantity required of less than cubic yards, with work performed according to Division 312000 Section "Earthwork."		
	2. Unit of Measurement: Cubic Yard (c.y.)		
B.	Unit Price No. 2 - Structural Fill (DelDot Type G):	$ _____	$ _____
	1. Description: Additional quantity required of more than 500 cubic yards, with work performed according to Division 312000 Section "Earthwork."		
	2. Unit of Measurement: Cubic Yard (c.y.)		
C.	Unit Price No. 3 - Cut:	$ _____	$ _____
	1. Description: Removal from site of less than 500 cubic yards according to Division 312000 Section "Earthwork."		
	2. Unit of Measurement: Cubic Yard (c.y.)		
D.	Unit Price No. 4 - Cut:	$ _____	$ _____
	1. Description: Removal from site of more than 500 cubic yards according to Division 312000 Section "Earthwork."		
	2. Unit of Measurement: Cubic Yard (c.y.)		
E.	Unit Price No. 5– Silt Fence:	$ _____	$ _____
	1. Description: Additional quantity of silt fence material and installation.		
	2. Unit of Measurement: Linear Foot (l.f.)		
F.	Unit Price No. 6 Geogrid Reinforcement	$ _____	$ _____
	1. Description: Placement of Tensar BX1100 geogrid reinforcement material and installation per section 2.03 of the Earthwork specification.		
	2. Unit of Measurement: Square Yard (s.y.)		

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SMYRNA, DE 19977
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BID FORM

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for _____ days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ **By:** _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS

Sub-Contractor List
Non-Collusion Statement
Bid Security
(Others as Required by Project Manuals)

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Bid No. SSD-15-001-SES Renovations

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the *Owner*, it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.

Subcontractor Category	Subcontractor Name	Address (City & State)	Subcontractors tax payer ID # or Delaware Business license #
1. Sitework			
2. Concrete			
3. Masonry			
4. Structural Steel			
5. Low Slope Roofing			
6. Doors/Frames/ Hardware Installer			
7. OH Door Installer			
8. Window Installer			
9. Metal Stud/Drywall			
10. Painting			
11. Resilient/Carpet Floors			
12. Ceramic Tile Installer			
13. Acoustical Ceilings			

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14.	**Institutional Casework Installer**			
15.	**Wheelchair Lift Systems**			
16.	**Kitchen Equipment**			
17.	**Fire Alarm Installer**			
18.	**Plumbing**			
19.	**Sprinklers**			
20.	**HVAC**			
21.	**DDC Controls**			
22.	**Electrical**			

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BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date to the Smyrna School District.

All the terms and conditions of the Smyrna School District, Smyrna Elementary School – Renovations and Addition, Bid No. SSD-15-001-SES Renovations, Architect Project No. 14107a have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Door and related hardware specified or indicated on drawings to complete project.
2. Accessories, tools and fasteners required for installation and maintenance.

B. Related Sections:

1. Steel Doors and Frames.
2. Aluminum Doors and Frames.
3. Hardwood Veneered Wood Doors.
4. Partition Blocking for Wall Mounted Hardware.
5. Division 16 Electrical.

C. Substitutions:

1. Approval of alternative or substitute products will be considered only under terms and conditions specified in Section 01600. This paragraph applies when specific manufacturers names follow a specified manufacturer's name in Part 2.3, or when no manufacturers names follow a specified manufacturer's name in Part 2.3.
2. Alternate or substitute products will be considered only when request includes documented proof product complies with UBC Std. 7-2 (1997) or UL10c.
3. Requests for substitution are to be in writing and received by the Architect at least ten days prior to the bid date. The acceptance of substitutions will be by addendum. Unauthorized substitutions will not be accepted.
4. The quality of all items of hardware has been clearly indicated by the manufacturer's name and product number. Certain products are specified without substitution and are to be furnished exactly as specified.

1.2 REFERENCES

A. Door & Hardware Institute (DHI):

1. Recommended Locations for Builders Hardware for Standard Steel Doors and Frames, 1990 Edition.
2. Scheduling Sequence and Scheduling Format.
3. Processing Hardware Schedules and Templates.

B. International Building Code, (IBC):

1. 2003 Edition.
2. Standard 7-2 (1997).

C. National Fire Protection Association (NFPA):

1. Standard No. 80 "Fire Doors & Windows", 2007 Edition.
2. Standard No. 101 "Life Safety Code", 2009 Edition.

D. American National Standards Institute (ANSI):

1. Standard A156.18 "Materials and Finishes".

2. Standard A156.23 “Electromagnetic Locks”.
3. Standard A117.1 “Accessible and Usable Buildings and Facilities”, 2003 Edition.

E. Governing Codes:

1. Where conflict occurs between above codes and standards the most stringent requirement governs.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Furnish hardware complying with NFPA 80, and certified for use on fire-rated openings complying with UBC 7-2 (1997) and UL10c.
2. Furnish hardware listed by Underwriters’ Laboratories or other approved testing agency.
3. Hardware for fire-rated openings: Comply with NFPA 80.
4. Hardware for non-fire-rated openings: Comply with ANSI A117.1.

1.4 SUBMITTALS

A. Submit in accordance with Section 01300:

B. Door Hardware Schedule & Format:

1. Submit quantities of schedule as required by Division 1 on 8 ½” by 11” sheets numbered consecutively.
2. Furnish cover sheet listing name of project as shown on Contract Documents, name of Owner, name of Architect, name of Contractor, name of Architectural Hardware Consultant (AHC) who prepared the hardware submittal and date of submittal or revision of submittal.
3. Furnish a vertical listing of hardware items used followed by manufacturer’s name on cover sheet or immediately following cover sheet. Horizontal schedule is not acceptable.
4. Schedule hardware items for each door separately in typed vertical form; list each door in numerical order under a separate heading using door number in sequence as shown in door Opening Schedule.

    a. The Finishing Hardware Schedule is to clearly indicate the swing, location, number, size, and thickness of each door, as well as type, number and finish of each article of hardware required for each opening.
    b. Group doors with like or similar hardware under a single heading. Doors with different size, material, or hardware are to be listed in different hardware sets.
    c. The Finishing Hardware Schedule is to follow the guidelines and format as set forth in the D.H.I. publication, *“Scheduling Sequence and Scheduling Format”*.
    d. Architect will not review hardware schedules unless first reviewed and approved by Contractor.
    e. Include with each submittal:
        1) Wiring diagrams: Elevation, riser, point to point.
        2) Written description of operation at all headings with electric hardware.
    f. Architect will review schedule and return 2 copies to Contractor with comments.
    g. Approval of schedule does not relieve Contractor of providing hardware specified for project.

h. Hardware schedules not complying with above will not be reviewed and will be returned for proper formatting.

C. Other Submittals:

1. Two complete sets of catalog cuts are to accompany the Finishing Hardware Schedule. The list of cuts is to include the item, manufacturer, and item number.

D. Samples:

1. Furnish samples on a timely basis upon request of Architect.
2. Send samples to Architect or Owner as directed.
3. All hardware samples remain the property of the hardware supplier, and are to be returned prior to completion of the project.

E. Templates:

1. Send hardware template information for pre-fitted wood doors, plastic faced doors, aluminum doors, metal doors and frames, together with a copy of approved hardware schedule to the respective door and frame manufacturers or fabricators not later than 7 days after approval of schedule. These related trades are also to supply the necessary shop drawings to the hardware supplier, upon request.
2. Coordinate templates between manufacturers of different hardware items to allow installation of various hardware items without interference between items. Special templates may be necessary, even though they may not be listed.
3. Clearly indicate on templates, under door clearances for exit devices, automatic flush bolts to ensure latching, and thresholds having built-in or applied stops.
4. The submission for templates and template list are to follow the procedure as set forth in the D.H.I. publication, *"For Processing Hardware Schedules and Templates"*.

F. Wiring Diagrams:

1. Furnish wiring diagrams for scheduled items requiring power.
2. Furnish elevation drawings for each door showing location of electric hardware; include point to point wiring and riser, diagrams and power requirements. See Part 3, "Doors with Electric Hardware", for operating and function requirements.

3. Submit wiring diagrams and door elevations with hardware submittal.

G. Keying Schedule:

1. Upon receipt of approved hardware schedule, arrange meeting between hardware supplier and Owner, through Architect, to obtain necessary keying information.
2. Submit 6 copies of keying schedule indicating door numbers in numerical sequence, and its particular keying. Obtain approval before proceeding.

H. Contract Closeout Submittals:

1. Comply with Section 01770.
2. Hardware Data and Maintenance Manuals: At time of acceptance of work, deliver two maintenance manuals. Include the following for each hardware item having operative parts:

a. Catalog data.

b. Isometric drawings, which identify and list part numbers.
c. Installation templates including special templates.
d. Installation instruction.
e. Manufacturer's maintenance instruction and maintenance schedule; include special lubricate and fluids information.
f. Assemble data in a clearly identified 3-ring binder.
g. Manufacturer bitting list.
h. Include in each manual one updated copy of hardware schedule, listing hardware installed, including changes and revisions approved by Architect during construction.

I. Certifications:

1. Arrange for hardware supplier to visit site, and certify the following:

a. Hardware is installed and operating in a satisfactory manner.
b. Hardware is installed as listed on approved door hardware submittal, including changes and revisions approved by Architect during construction.
c. Submit certifications in writing addressed to Owner in care of Architect.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Contractor is responsible for:

a. Proper application and fit of door and specialty hardware in locations as indicated on drawings or as specified.
b. Items not specifically mentioned, but necessary to complete work are to be furnished matching in quality and finish of specified items in similar locations.
c. Coordinate dimensions between hardware items.
d. Install only hardware items listed on approved Door Hardware Submittal.

2. Contractor's selection of hardware supplier:

a. Select recognized builders hardware supplier who has been furnishing hardware in area of project for period no less than five years.
b. Recognized supplier to have, full-time, on staff an Architectural Hardware Consultant

(AHC) certified by the Door and Hardware Institute. This consultant is to be registered in the Door and Hardware Institute Seal Program.
c. Hardware supplier's AHC to be available at all reasonable times during course of work to meet personally with Owner, Architect or Contractor for hardware consultation.
d. Supplier willing to agree in writing to maintain parts inventory of items supplied for future service to Owner.
e. Supplier to furnish all the hardware listed in this Section 08710 Finishing Hardware. All material is to be furnished totally including the hardware for Aluminum Doors, as listed in the sets. No items may be excluded.

B. Electric Hardware:

1. Unless noted otherwise in Division 16, furnish electric hardware items rated 24 VDC.
2. Coordinate electrical hardware requirements with Division 16 work for electrical distribution, fire alarm, and security systems.

C. Pre-Installation Conference:

1. Arrange for hardware supplier to meet with installer and discuss installation of hardware, templates and unique hardware applications.

D. Submittal Review Conference:

1. Hardware supplier to arrange a meeting with Contractor, Architect, and owner for the review of hardware, hollow metal, and wood door shop drawings.
2. The hardware supplier attendee is to be an AHC.
3. Representatives from the hollow metal and wood door manufacturers are also to attend. Representatives are to be factory employees, or factory sales agents. Wholesale warehouse employees are not acceptable.
4. Allow for one 8-hour working day.
5. Meeting location is to be determined by the Architect.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. All hardware is to be in its original package, properly wrapped. Package each item of hardware separately with necessary fasteners, screws, bolts, tampins, keys and installation templates.
2. Deliver packages clearly identified with heading number and door number as approved on hardware schedule.

B. Storage:

1. General Contractor or Construction Manager to provide storage area for hardware, which is dry, secure, and complete with shelving and tables for unpacking and sorting. A locked room is to be provided by the General Contractor or Construction Manager for storage of the finishing hardware.
2. All hardware to be delivered to the jobsite by employees of the finishing hardware supplier. No drop shipments are permitted.
3. Upon delivery, the General Contractor or Construction Manager and the hardware supplier to check in the hardware against the approved Finishing Hardware Schedule, and place the items on the shelves.
4. After delivery, the General Contractor or Construction Manager is responsible for the hardware against theft, misplacement, defacements, etc.

1.7 WARRANTY

A. Special Warranties:

1. Submit manufacturer's standard written product warranty signed by manufacturer's authorized official, guaranteeing to repair or replace defective products during the following warranty periods:

a. Hinges: Life of Building Guarantee. (Only for 3-knuckle hinges).
b. Continuous Hinges: 10-year warranty on total hinge (not just bearings).
c. Door Closers: 10-year warranty.
d. Door Closers with electric or pneumatic components: 2-year warranty.

e. Exit Devices: 3-year warranty.
f. Locksets: 3-year warranty.
g. Remainder of hardware: 1-year warranty.

B. Submit In Accordance With Section 01787.

1.8 MAINTENANCE

A. Instructions:

1. Arrange for hardware supplier to provide a training program for Owner's maintenance personnel for instruction in proper use, servicing, adjustment and maintenance of door hardware. Training is to occur on Owner's premise, unless otherwise agreed to by Owner.

a. Provide one 8-hour working day.

2. Prior to acceptance of work, submit to architect a confirmation letter between hardware supplier and Owner setting a date to commence training 30 days after acceptance of work.

B. Maintenance Service:

1. Approximately 6 months after acceptance of work, arrange to have installer of hardware in company with representatives of lock, exit device and closer manufacturers contact Owner and make arrangements for an inspection of hardware. Time and date of inspection at Owner's convenience.
2. Re-adjust each piece of operating hardware for proper and smooth operation; consult with Owner's personnel pertaining to additional maintenance procedures; clean and lubricate hardware as needed; replace and provide new hardware which has deteriorated due to faulty materials or improper installation.
3. Submit written report covering current and predictable problems of substantial nature in performance of hardware to Architect.

C. Tools:

1. After final adjustment of door hardware, turn over to Owner tools furnished during construction used for installation and adjustment.
2. Tag and identify each item as to its use and applicable piece of door hardware.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Products listed are items manufactured by the following:

1. Stanley
2. Stanley
3. Schlage
4. Von Duprin
5. LCN
6. ABH
7. Trimco
8. Corbin Russwin
9. National Guard
10. SDC
11. MMF

2.2 GENERAL

A. Door hardware items are specified from catalogs noted in this section. Only product, which have UL listings are acceptable on fire rated openings, and sets standard for project.

B. Items are specified by use of manufacturer's catalog numbers. Hardware by other named manufacturers are still required to meet the criteria listed for the product and will be reviewed for acceptance against specified items.

C. Except where scheduled otherwise, products within each hardware category are to be by one manufacturer; e.g., hinges, locks, closers, and exit devices.

2.3 MATERIALS

A. Hinges:

1. Unless otherwise noted, hinges are specified by catalog number of Hager. Hinges of equal size, weight and type manufactured by Bommer, or McKinney will be accepted per Part 2.2.
2. Quantity:

    a. For doors up to 60 inches in height, furnish 2 of scheduled hinges, and add 1 hinge for each additional 30 inches of door height.

3. Material:

    a. Hinges on exterior doors opening out are to be non-ferrous. All other hinges are to be steel unless otherwise noted in the specification sets. Exterior out-swing doors are to have non-removable pins/security stud.

4. Type:

    a. All hinges are 3 knuckle, antifriction bearing, and full mortise unless otherwise noted in the specification sets.

5. Size (1-3/4" Doors):

    a. Up to 3'-0" wide: 4 ½" by 4 ½". Unless otherwise noted in sets.
    b. Over 3'-0" to 3'-10" wide: 5" by 4 ½"
    c. Over 3'-10" wide: 6" by 4 ½"
    d. Width of hinge to be adjusted for thicker doors and as required to clear trim.

6. Size (1-3/8" Doors):

    a. Up to 3'-0" wide: 3 ½" by 3 ½". Unless otherwise noted.

7. Weight:

    a. Use heavy weight hinges as listed in sets.

B. Continuous Hinges:

1. Unless otherwise noted, continuous hinges are specified by catalog numbers of Markar. No

substitution will be accepted.
2. Furnish hinge 661 on all aluminum doors.
3. Furnish hinge 651 on hollow metal doors as listed in sets.
4. Furnish hinge 652 on all wood doors as listed in sets.
5. All continuous hinges are to have the same templated hole pattern.
6. All 652 continuous hinges are to be furnished with Adjusta-Stud fasteners to allow up to a 3/8" door edge adjustment.
7. Continuous hinges are to be warranted for complete hinge, not just replacement of bearings.
8. Electric Continuous Hinges:

    a. Furnish continuous hinge with power transfer prep where power transfer is required for electric exits.

9. Quantity:

    a. Furnish 1 continuous hinge per door leaf where scheduled.

10. Furnish hinge fillers for existing doors and existing frames.
11. Hinge height is 1/8" less than net door height on non-UL doors and full door height on fire rated doors as to meet NFPA 80, which requires a maximum 1/8" gap on doors.
12. Fire-rated doors and frames with continuous hinges are to have the metal labels installed at the frame head and top of the door.

C. Lock and Latchsets:

1. Unless otherwise noted, lock and latchsets are specified by catalog numbers of Schlage. Mortise locks are L9000 17A. Substitution as approved by Architect.
2. Include wrought box strikes or ANSI strikes with dust boxes, each with curved lips sufficient to protect door frame and trim. Do not notch astragals for strikes.
3. Furnish protective back strikes for pairs of doors if bored locks are specified.
4. Mortise locks and latchsets are to be fully field reversible without opening lock case.
5. Furnish minimum ¾" throw latch-bolt for mortise locks.
6. Comply with UL10c requirements for throw of latches on fire rated openings.
7. Quantity:

    a. Furnish 1 lock or latch per opening where scheduled.

D. Exit Devices:

1. Unless otherwise noted, exit devices are specified by catalog numbers of Von Duprin. Exit devices are 98. Substitution as approved by Architect.
2. Furnish fire exit hardware at labeled openings.
3. The exit device lever design is to match the lockset lever on devices with lever trim.
4. Furnish metal strikes and wrought boxes behind mortise lock strikes.
5. Furnish flush end cap on all exit devices.
6. Furnish cylinder dogging on all panic hardware, except fire exit hardware, exits with "BE" function, electric "EL" exit devices.
7. Center exit device cases and trim on door stiles unless required otherwise by manufacturer's templates. Size exit devices according to the width of the application.
8. Quantity:

    a. Furnish 1 exit device for each door leaf where scheduled unless otherwise noted in the

specification sets.

9. Furnish power supplies PS873K X2 as manufactured by Von Duprin for each opening having electric latch retraction. Electric exit devices with electric latch retraction are designated "EL" in the specification sets.

    a. Include Power Transfer for each door leaf having electric latch retraction scheduled.

11. Coordinate wiring for power transfers, electric hinges and electric continuous hinges.

E. Dummy Push Bars and Dummy Trim:

1. Unless otherwise noted, dummy push bars and trim are specified by catalog numbers of Von Duprin. Dummy push bars and trim are 350 by 990-DT. Substitution as approved by Architect.
2. Quantity:

    a. Furnish 1 dummy push bar and dummy trim for each door leaf where scheduled unless otherwise noted in the specification sets.

F. Removable Mullions:

1. Removable mullions are keyed removable steel. Fire rated mullions are required on fire rated labeled openings. Mullions are to be the same manufacture as the exit devices.
2. Quantity:

    a. Furnish 1 removable mullion for each opening where scheduled unless otherwise noted in the specification sets.

G. Automatic Flush Bolts:

1. Unless otherwise noted, automatic flush bolts are specified by catalog numbers of Trimco. Automatic flush bolts are 3810 on metal doors and 3815L on wood doors. Similar units of equivalent size, type and function as manufactured by Door Controls International, Ives, or Rockwood will be accepted per Part 2.2.
2. Quantity:

    a. Furnish both top and bottom bolts on inactive leaf where scheduled unless otherwise noted in the specification sets.

3. Include manufacturer's standard dustproof strike and floor plate.
4. All automatic flush bolts, flush bolts and coordinators must be by the same manufacturer.

H. Flush Bolts:

1. Unless otherwise noted, flush bolts are specified by catalog numbers of Tromco. Flush bolts are 3917 on metal doors and 3913 on wood doors. Similar units of equivalent size, type and function as manufactured by Door Controls International, Ives, or Rockwood will be accepted per Part 2.2.
2. Quantity:
    a. Furnish both top and bottom bolts on inactive leaf where scheduled unless otherwise noted in the specification sets.
3. Include manufacturer's standard dustproof strike and floor plate.
4. All automatic flush bolts, flush bolts and coordinators must be by the same manufacturer.

I. Coordinators:

1. Unless otherwise noted, coordinators are specified by catalog numbers of Trimco. Coordinators are 3094. Similar units of equivalent size, type and function as manufactured by Door Controls International, Ives, or Rockwood will be accepted per Part 2.2.
2. Furnish steel brackets for installation of soffit-mounted hardware.
3. Include manufacturer's standard filler bars.
4. Include carry bars where necessary for proper operation of hardware at pairs of doors.
5. Furnish manufacturers standard prime coat finish on coordinators, filler bars and brackets.
6. All automatic flush bolts, flush bolts and coordinators must be by the same manufacturer.

J. Closers:

1. Unless otherwise noted, closers are specified by catalog numbers of LCN. Closers are 4040 series. Substitution as approved by Architect.
2. Closers with pressure release valves will not be accepted.
3. Furnish surface mounted closers with minimum projection covers not exceeding 2 ¼".
4. Furnish sizes as recommended by manufacturer for conditions of installation to ensure doors are secure and latched. Closers are to be capable of adjustment to opening forces listed in Part 3.3-B.
5. Furnish closers with arms designed to permit opening of doors as far as job conditions permit; closers with arms restricting opening swing of doors will not be accepted, except for stop/holder arms.
6. Furnish EDA arms for parallel arm and Cush/Spring Cush series closers.
7. Furnish closers with separate key valves for speed, latching and back checking adjustments.
8. Fasteners:

    a. Fully threaded steel screws with 1-1/2" minimum penetration into rated and non-rated wood doors.
    b. Throughbolts in 45, 60 and 90 minute mineral core doors and on all closers with Cush/Spring Cush series closers.
    c. Steel screws in metal doors.

9. Furnish solid spacers for Cush/Spring Cush closers to permit fifth screw placement; finish to match closer color.
10 Furnish accessory items and attachments including special arms, soffit shoes, mounting plates, and special templates for coordinating closer installation with doors, frames and with overhead stops/holders and weather stripping. Do not use corner brackets for mounting.
11. Closers, covers, or mounting plates are not to extend below glass line of door. Hardware supplier is to notify Architect if there is a conflict.
12. Quantity:

    a. Furnish closers where scheduled, and furnish 2 closers for pairs of doors unless otherwise noted in the specification sets.
    b. Furnish closers on all fire rated openings, even if not listed in the specification sets. Closers are to be the same manufacturer and model as the specified closers.

13. Closer Location:

    a. Furnish correct arm so closer mounts on the interior of building.
    b. Furnish correct arms so closer is not mounted on the corridor side of door.
    c. Furnish correct arm where closer is required to swing 180 degrees.

K. Push and Pull Hardware:

1. Unless otherwise noted, push and pull hardware, including plates, are specified by catalog

numbers of Trimco. Push plates are 1001-9 and door pulls are 14015-3. Flush pulls installed on pull side of doors are 1115P. Similar units of equivalent size, weight, and type as manufactured by Rockwood or Ives will be accepted per Part 2.2.
2. Furnish plates with bevels on four sides and countersunk screw holes.
3. Push and pull plates: Furnish "Phillips" oval undercut head screws for plates .050" thick and oval head screws for 1/8" thick plates.
4. Push bars and push/pull sets: Include spanner caps and sized to be centered on door stiles unless noted otherwise on drawings.
5. Size of push and pulls are to be adjusted for door stiles.
6. Quantity:

    a. Furnish push and pull hardware for doors where scheduled, except furnish 2 of type scheduled for pairs of doors unless otherwise noted in the specification sets.
    b. Furnish 2 push plates at double acting doors.

L. Wall Bumpers and Floor Stops:

1. Unless otherwise noted, wall bumpers and floor stops are specified by catalog numbers of Trimco. Wall bumpers are 1270WV, floor stops are 1211. Similar items of equivalent size, weight, and type as manufactured by Rockwood or Ives will be accepted per Part 2.2.
2. Include manufacturer's standard risers for floor stops to furnish ½-inch minimum contact of door against stop.
3. Fasteners:

    a. Toggle bolts or machine screws and tampins.
    b. Wood screws, 1-1/2" minimum, where wood wall blocking is installed or where stop is to be mounted on wood doors.
    c. Machine screws where stop is mounted on metal doors.

4. Quantity:

    a. Furnish bumpers and stops for doors where scheduled, except furnish 2 of type scheduled for pairs of doors unless otherwise noted in the specification sets.
    b. Furnish 2 stops at double acting doors.

M. Overhead Stops and Holders:

1. Unless otherwise noted, overhead stops and holders are specified by catalog numbers of ABH. Overhead stops and holders are 1000 & 9000. Similar items of equivalent size, weight, type, and function as manufactured by Rockwood will be accepted per Part 2.2.
2. Furnish overhead stops and holders to permit maximum degree of door swing that job conditions permit, and sized as recommended by manufacturer.
3. Furnish accessory attachments for coordinating installation of overhead stops and holders with weatherstripping and for hinge side applications when scheduled.

4. Quantity:

    a. Furnish 1 overhead stop or holder per door leaf where scheduled unless otherwise noted in the specification sets.

N. Door Plates:

1. Unless otherwise noted, kickplates, mop plates, stretcher plates, armor plates and edge guards are specified by catalog numbers of Trimco. Similar items of equivalent size, weight, thickness, and color as manufactured by Rockwood or Ives will be accepted per Part 2.2.

2. Door plates are .050 thick.
3. Furnish door plates with bevels on 4 sides and countersunk screw holes.
4. Fasteners: "Phillips" oval undercut head screws for plates .050" thick and oval head screws for 1/8" thick plates.
5. Quantity:

    a. Furnish door plates for both sides of double acting doors and for one side for single acting doors.
    b. Furnish edge guards each vertical door's edge except omit on lock edge where astragals are noted.

6. Width:

    a. Plates mounted on push side of doors: size 2" less than door width for single doors, pairs with mullions; 1" less for pairs of doors and 6" less for doors with surface vertical rod exit devices.
    b. Plates mounted on pull side of doors: size 1" less than door width.

7. Height:

    a. Kickplates: 10"
    b. Mop Plates: 6"
    c. Armor Plates: 36"
    d. Adjust height per bottom rail conditions.

8. Furnish mop plates, armor plates, and stretcher plates where scheduled in the specification sets.
9. Exclude doorplates on aluminum doors and plastic faced doors.

O. Thresholds:

1. Unless otherwise noted, thresholds are specified by catalog numbers of NGP. Similar items of equivalent size, weight, type and function as manufactured by Pemko or Reese will be accepted per Part 2.2.
2. Include ¼-20 stainless steel screws and expansion anchors for aluminum thresholds.
3. Quantity: Furnish 1 at each opening where scheduled.

P. Weatherstripping and Seals:

1. Unless otherwise noted, weatherstripping, automatic door bottoms, astragals, and seals are specified by catalog numbers of NGP. Similar items of equivalent size, weight, type and operation as manufactured by Pemko or Reese will be accepted per Part 2.2.
2. Furnish end caps for automatic door bottoms. Include screws and fastenings for installation.
3. Quantity:

    a. Furnish weatherstripping and seals where scheduled.
    b. Furnish in lengths and widths to match door and frame.
    c. Furnish door top protection items; i.e., rain drips, full width of frame.
    d. Proved gaskets and seals all side on 4-sided frames.

Q. Wall Magnets:

1. Unless otherwise noted, wall magnets are specified by catalog numbers of ABH. Wall magnets are series 2100. Similar items of equivalent size, weight, type, and function as manufactured by Rixson will be accepted per Part 2.2.
2. Furnish concealed mounted wall magnets with properly sized armature.

3. Quantity:

    a. Furnish 1 wall magnet per door leaf where scheduled unless otherwise noted in the specification sets.

R. Electric Strikes:

1. Unless otherwise noted, electric strikes are specified by catalog numbers of Von Duprin. Electric strikes are 6211 on doors with mortise. Similar units of equivalent size, weight, type and function manufactured by HES will be accepted per Part 2.2, and furnished

devices will coordinate with other opening hardware, including automatic fire door operators.
2. Electric strikes which use strike pocket inserts to accommodate different manufacturers locations are not acceptable (except on existing frames).
3. Quantity:

    a. Furnish 1 per opening where scheduled.

S. Magnetic Power Locks:

1. Unless otherwise noted, magnetic power locks are specified by catalog numbers of Locknetics. Magnetic power locks are 390+ DSM MBS. Similar units of equivalent size, weight, type and function manufactured by Security Door Control will be accepted per Part 2.2, and furnished devices will coordinate with other opening hardware, including automatic door operators.
2. Quantity:

    a. Furnish 1 per door leaf where scheduled.

3. Furnish custom length housing.
4. Furnish power supply 510 by TDM by KLC for opening having magnetic power locks.

T. Door Position Switches:

1. Unless otherwise noted, door position switches are specified by catalog numbers of SDC. Door position switches are MC-4M. Similar units of equivalent size, weight, type and function manufactured by Detex will be accepted per Part 2.2.
2. Quantity:

    a. Furnish 1 per door leaf at all exterior doors.
    b. Door position switches are not listed in the specification sets.

2.4 MISCELLANEOUS HARDWARE AND SPECIALTIES

A. General: Unless otherwise noted, the following groups of miscellaneous items are not noted in the specification sets, but are required for completion of work:

B. Key Cabinet:

1. Furnish MMF key cabinet model 2018-460-03. Acceptable manufacturers are Telkee, per Part 2.2.
2. Include complete manufacturer's standard key control supplies and equipment.
3. Arrange for hardware supplier to:

a. Assist owner at end of project in setting up key cabinet.
b. Provide on-site instruction on operation and maintenance of key control system.

C. Cylinders:

1. Furnish cylinders keyed to project for all locks, exit devices and other scheduled items requiring cylinders for proper operation.
2. Furnish cylinders keyed to project to fit other manufacturer's locking mechanisms specified elsewhere, such as access doors.

D. Padlock:

1. Furnish padlocks compatible with masterkey system, coordinate shackle size with conditions. Furnish for all overhead doors, coiling shutters, etc., not in sets.
2. Padlocks are Model PL5070.

2.5 KEYING

A. Arrangement:

1. Furnish 6-pin interchangeable core cylinders.
2. Key to existing Corbin master keying system.
3. All cylinders to be Corbin.
4. Contact Clint Lasana at Smyrna School District for Keying (302-653-3132).

B. Construction Keying:

1. During construction, furnish temporary keying for locks keyed to a construction key, and maintain locks operative for access and exiting.
2. Furnish 10 construction keys, keyed alike.
3. At time of completion, convert construction keying to building keying system under supervision of Owner or Owner's authorized representative.

C. Keys:

1. Furnish 3 keys to each lock unless otherwise required by approved keying schedule.
2. Furnish 30 Master Keys unless otherwise required by approved keying schedule.
3. Furnish keys with visual key control with key code stamped on face of keys.
4. Furnish 100 additional factory original key blanks.
5. Furnish manufacturers bitting list.
6. After conversion to building keying system, adjust locks for proper key operation, file keys in individual envelops furnished by lock manufacturer and mark each with door number, key number, and master key set to facilitate their integration into a key control system.
7. Deliver change keys to Owner.
8. Send master keys by registered mail directly from manufacturer to Owner as later directed.

2.6 FINISHES

A. Furnish hardware, including exposed fasteners, attachments, and accessory items in following finished, except as noted otherwise in this Section:

Hardware Item	Finish
Hinges:	US32D
Continuous Hinges:	
661	ALUM
651	US32D
652	US32D
Locks, Latchsets & Deadlocks:	US32D, including faceplates
Electric Strikes:	US32D
Exit Devices:	US32D by US32D push pad
Flush Bolts & Surface Bolts	US26D
Push/Pulls & Plates	US32D
Closers:	ALUM
Floor Closers	US26D
Wall Bumpers	US32D
Floor Stops	US26D
Overhead Stops & Holders	US32D
Doorplates	US32D
Magnetic Power Locks	ALUM
Thresholds	Extruded Aluminum
Weatherstripping	Extruded Aluminum
Weatherstripping (Stick-On)	Black
Miscellaneous	US26D

B. Finishes: Hardware submittals using ANSI finish equivalents or US finish equivalents are acceptable.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General Contractor or Construction Manager to verify doors and frames are ready to receive work, and dimensions are as indicated on shop drawings or as instructed by manufacturers.

B. General Contractor or Construction Manager to verify power supply is available to electrically operated devices.

C. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

A. General:

1. Install each hardware item in accordance with each manufacturer's instructions and recommendations.

2. Install no hardware until substrate finishes are complete.
3. Wherever cutting and fitting is required to install hardware onto or into surface which are later to be painted or otherwise finished, install each item completely then remove and store during application of finishes; reinstall upon completion of finishing operations.
4. Set items level, plumb, and true to line and location.
5. Adjust and reinforce attachment substrate as necessary for a secure installation.
6. Drill and countersink items not factory prepared for fasteners.
7. Space fasteners and anchors per manufacturer's instructions and in accordance with industry standards.

8. Do not install hardware on doors, which have been improperly prepared.
9. Attach wall mounted hardware to concealed wall blocking. Do not install wall-mounted hardware where wall blocking has not been installed and arrange for blocking to be installed before proceeding.

B. Installation Clarification:

1. Direct questions regarding placement of hardware to Architect for clarification prior to installation.

C. Fire-Rated Openings:

1. In addition to previous requirements, conform to NFPA 80 and UL10c covering installations for fire door assemblies.
2. Refer to instructions from door and frame manufacturers regarding special hardware installation requirements, including function holes, undercutting and minimum clearances between hardware cutouts.

D. Installation Templates, Instruction Sheets, and Schedules:

1. Retain copies of templates, instruction sheets, schedules, installation details and similar data regarding hardware, maintenance and servicing.
2. See Part 1 under Contract Close-out Submittals for assembly and distribution of data.

E. Locations:

1. Unless otherwise indicated on drawings or listed below, locate hardware in accordance with DHI recommended locations. See Part 1.2-A.
2. Mount each hardware type at same location regardless of door material.

F. Hardware and Specialties: In addition to installation requirements specified above, install hardware as follows:

1. Hinges:

a. Hang doors within following tolerances: 1/8” maximum between door and frame, and 1/8” maximum between meeting edges of pairs of doors.
b. Provide under door clearance at fire-assemblies per NFPA 80.
c. Where shimming is necessary for proper door/frame installation, use only metal shims at exterior doors and fire rated doors per NFPA 80.
d. Drive hinge pin flush with top of hinge barrel after doors are hung plumb.

2. Exit Devices:

a. Center exit device cases on door stiles, and equally spaced from each door edge, unless required otherwise by manufacturers templates or instructions.
b. Locate power transfers in door and frame centered on exit devices.

3. Closers:

a. Install closers to permit maximum degree of door swing allowed by job conditions. Follow manufacturer’s instructions.
b. Fasteners:

Door Type	Fastener
Wood	Fully threaded steel screws with 1-1/2" minimum penetration into door.
Mineral Core Wood	Throughbolts in 45, 60 and 90 minute doors.
Metal	Steel machine screws.

c. Do not install parallel arm closers until after weatherstripping or seals have been installed on frame head.

d. Install parallel arm bracket onto the 700SA gasketing. Do not notch gasketing.

4. Door Stops:

a. Install stops to permit maximum degree of door swing allowed by job conditions.
b. Locate floor stops so as not to create a tripping hazard, and to catch door at a point no further than 6 inches in from latch edge.
c. Wall stops intended for knobs and levers are to be located centered on spindle.

5. Doorplates:

a. Armor and Kickplates: Install on push side of single acting doors and on both sides of double acting doors.
b. Mop Plates: Install on pull side of single acting doors.

6. Thresholds:

a. Scribe and cut to fit profiles of door jambs with mitered corners and precision made joints.
b. At exterior doors and elsewhere as indicated, set thresholds in bed of butyl rubber sealant; completely fill voids to exclude moisture, taking care not to plug drainage holes or block weeps; remove excess sealant.
c. At exterior doors, install bevel of threshold aligned with exterior face of door, unless indicated otherwise by detail or threshold manufacturer's instructions.
d. Install thresholds level.
e. Do not install thresholds over carpet. At fire rated doors do not install thresholds over any finish material, unless material in noncombustible; e.g., ceramic tile, terrazzo or concrete.
f. Remove existing floor covering materials to ensure threshold is installed directly against a noncombustible substrate.

7. Weatherstripping (Seals and Gaskets):

a. Install per manufacturer's instructions.
b. Do not cut or interrupt extrusions for weatherstripping, seals or gaskets for a door closer accessory, i.e., soffit shoe.
c. Contact hardware supplier when a conflict arises for alternate method of attachment, including templates, and obtain approval from Architect prior to installation.

G. Miscellaneous Hardware:

1. Magnetic Release Door Holders:

   a. Coordinate with electrical.
   b. Refer to manufacturer's graphic chart for mounting locations of both wall and door portions of holders.

2. Push/Pull Sets: Center push/pull sets on door stiles unless noted otherwise on plans. Mount push bar centered 42 inches above finished floor.

3. Pull Plates: Install through door mounted fasteners for pulls flush with face of door.

H. Doors with Electric Hardware:

1. Doors with Card Reader or Keypad and Electric Strikes:

   a. Wire card reader or keypad to operate electric strike.
   b. Electric strikes are fail secure and lock when power is off.

3.3 FIELD QUALITY CONTROL:

A. Tests:

1. Electric Closers: Test voltages at each door and note voltage at each. Arrange for and correct power supply where operating voltages are less than 23 volts or greater than 25 volts.

2. Magnetic Release Door Holders: Test each magnetic release after installation and note holding force. Magnetic holders, which do not have 25-pound minimum holding force, are to have voltage checked at each holder, and condition corrected.

B. Manufacturer's Field Service:

1. Closers: After air handling system has been balanced, arrange for closers to be finally adjusted by person trained by closer manufacturer or closer manufacturer's representative.

   a. Adjust closers so doors take 3 seconds minimum to swing from a 70 degree open position to a point 3" from latching.
   b. Adjust closers not to exceed following opening forces:

Door Location	Opening Force (Maximum)
Interior Doors	5 Pounds
Fire Doors	Doors must close and latch, but not exceed 30 lbs.

3.4 ADJUSTING

A. Adjustment and Cleaning:

1. Adjust and check each item of hardware and each door, to ensure proper operation and function of each unit.
2. Lubricate moving parts with graphite-type lubricant, unless otherwise recommended by manufacturer.
3. Replace and provide new hardware, which cannot be lubricated and adjusted, to operate freely and smoothly.

B. Final Adjustment:

1. Whenever hardware installation is made more than 1 month prior to acceptance of work, make final adjustment and check of hardware during week immediately prior to acceptance, unless otherwise directed by Architect.
2. Clean and relubricate operating items as necessary to restore proper functioning and finish of hardware and doors.
3. Make final adjustment of locksets and closers to compensate for operation of heading and ventilating systems under supervision of manufacturer's representative.

3.5 PROTECTION AND CLEANING

A. Installed Hardware:

1. Protect Builders Hardware against damage.
2. Remove protective coverings from hardware after surrounding surfaces have received final painting or refinishing and room or area is ready for final inspection.
3. Replace damaged hardware and provide new units and units which cannot be refinished to the Architect's satisfaction.

B. Installed Doors:

1. Do not prop doors open using an item wedged between hinge jamb and door.
2. Use only rubber stops, cardboard or rope.
3. Do not use unprotected wood wedges under wood doors.
4. Do not use bare wire or other unprotected means of securing doors in open position, which may damage or mar the finish of door or hardware.

C. Job Acceptance:

1. Prior to acceptance of job clean hardware surfaces on both interior and exterior doors or mortar, plaster, paint, caulking and other contaminants.
2. Replace and provide new hardware damaged after installation or where finish cannot be restored after cleaning.

3.6 DEMONSTRATION

A. Instructions:

1. Provide instruction in operation and maintenance of key control system.
2. See paragraph 2.4-B for requirements.

3.7 SINGLE SOURCE RESPONSBILITY

A. Specification sections Steel Doors and Frames, Flush Wood Doors, and Finishing Hardware is bid as one package. Furnished by one single source supplier. The use of more than one Supplier by the General Contractor or Construction Manager is absolutely prohibited.

3.8 EXISTING OPENING FIELD SURVEY

A. Existing Openings:

1. The finishing hardware supplier is responsible for surveying all existing doors and frames in order to verify the existing hardware preps and assure compatibility with specified hardware.
2. The survey is to be accomplished prior to submitting schedules and shop drawings.

3. Hardware supplier is to furnish a letter, certifying that the survey was completed prior to preparing the shop drawings and schedules. A copy of the survey list with door numbers and survey information is to be included with this letter.
4. Hardware schedules not complying with above will not be reviewed and will be returned for proper compliance.

3.9 HARDWARE SETS

Manufacturer List

Code	Name
AB	ABH Manufacturing Inc.
BO	By Others
CR	Corbin Russwin
DH	Door & Hardware Systems, Inc.
LC	LCN Closers
NA	National Guard
PR	Precision
SC	Schlage
SE	Security Door Controls
ST	Stanley
TR	Trimco
VO	Von Duprin

Option List

Code	Description
17	17 LEVER DESIGN
CD	CYLINDER DOGGING
EL	ELECTRIC LATCH RETRACTION
B4E	BEVELED 4 EDGES - ARMOR PLATES
B4E	BEVELED 4 EDGES - KICK PLATES
LBR	LESS BOTTOM ROD
CT6B	IC 6 PIN WITH TEMP. CORE (BLUE) -SGL
CT6D	IC 6 PIN DISPOSABLE TEMP CORE-SGL
900-KL	Key Lock Cover
900-2RS	2 Relay Board Output
EPT Prep	EPT Prep
EPT Prep	EPT Prep (full mortise)
L283-722	Vacant/Occupied Indicator(Outside of Dr)
C-SUNK HOLES	COUNTER SINKING
10-072 X 7/8"	STRIKE-7/8" LIP
1/4-20-2" COMBO	1/4-20 X COMBO MS/ANCHOR (SS)

Finish List

Code	Description
AL	Aluminum
26D	Satin Chrome
32D	Satin Stainless Steel

626	Satin Chromium Plated
628	Satin Aluminum, Clear Anodized
630	Satin Stainless Steel
GREY	Grey
SP28	Lacquer Sprayed Aluminum
US28	Aluminum - Clear Anodized
US26D	Chromium Plated, Dull
US32D	Stainless Steel, Dull
DARK BROWN	DARK BROWN

Hardware Sets

SET #1

Doors: 138A

2	Continuous Hinge	661HD EPT Prep	AL	ST
2	Power Transfer	EPT-12C	PR	
1	Mullion	KR4954 7'6"	SP28	VO
1	Exit Device	CD RX 98DT x 990DT	US32D	VO
1	Exit Device	QEL RX 98NL x 990NL-R&V	US32D	VO
1	Rim Cylinder Housing	3070 CT6	626	CR
		NOTE: Exit Trim		
2	Cylinder Housing	1070 CT6	626	CR
		NOTE: CD & Mullion		
3	Core	8000	626	CR
2	Closer	4040 XP SHCUSH	AL	LC
2	Adapter Plate	4040XP 18PA	AL	LC
2	Cush Shoe Support	4040XP-30	AL	LC
2	Spacer	4040XP-61	AL	LC
1	Mullion Seal	5100N		NA
1	Saddle Threshold	425 E 1/4-20-2" COMBO	AL	NA
2	Door Sweep	C627 A		NA
1	Power Supply	PS914 900-2RS 900-KL		VO

NOTE: Card reader by others. Balance of seals by door supplier.

SET #2

Doors: 138B

2	Continuous Hinge	651HD	US32D	ST
1	Mullion	KR4954 7'6"	SP28	VO
2	Exit Device	CD 98DT x 990DT	US32D	VO
3	Cylinder Housing	1070 CT6	626	CR
		NOTE: CD & Mullion		
3	Core	8000	626	CR
2	Closer	4040 XP SHCUSH	AL	LC
2	Adapter Plate	4040XP 18PA	AL	LC
2	Cush Shoe Support	4040XP-30	AL	LC
2	Spacer	4040XP-61	AL	LC
1	Mullion Seal	5100N		NA
1	Saddle Threshold	425 E 1/4-20-2" COMBO	AL	NA
2	Door Sweep	C627 A		NA

2	Concealed Magnetic Contact	MC-4M	628	SE

NOTE: Balance of seals by door supplier.

SET #3

Doors: 131D

1	Continuous Hinge	651HD EPT Prep	US32D	ST
1	Power Transfer	EPT-12C		PR
1	Electrified Lockset	By Security Vendor	630	BO
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP HEDA	AL	LC
1	Armor Plate	KA050-2 36" X 1"LDE B4E C-SUNK-AP	630	TR
1	Saddle Threshold	425 HD 1/4-20-2" COMBO	AL	NA
1	Weatherstrip	700 ES @ Head & Jambs		NA
1	Door Sweep	C627 A		NA

NOTE: Card reader by others.

SET #4

Doors: 144B, 152D

2	Continuous Hinge	652HD	US32D	ST
2	Flush Bolt	3917-12	626	TR
1	Dustproof Strike	3910	630	TR
1	Deadlock	L9460L	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
2	Set Flush Pulls	1115P	630	TR
1	Closer	4040 XP SHCUSH	AL	LC
2	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
1	Overhead Holder	9010 Series	US32D	AB
1	Door Sweep	C627 A		NA
1	Weatherstrip	700 ES @ Head & Jambs		NA
1	Saddle Threshold	425 HD 1/4-20-2" COMBO	AL	NA
1	Astragal	158 SA		NA
2	Concealed Magnetic Contact	MC-4M	628	SE

SET #5

Doors: 152B

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP REG	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Threshold	896 N 1/4-20-2" COMBO	AL	NA
1	Weatherstrip	700 ES @ Head & Jambs		NA
1	Door Sweep	C627 A		NA
1	Concealed Magnetic Contact	MC-4M	628	SE

SET #6 - Existing

Doors: 100A, 100B, 101B, 114A, 114B, 153A, 153C, 176, 177A, 177B

NOTE: Existing door and frame. Reuse all existing hardware.

SET #7

Doors: 137A

1	Continuous Hinge	661HD	AL	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP SCUSH	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Threshold	896 N 1/4-20-2" COMBO	AL	NA
1	Weatherstrip	700 ES @ Head & Jambs		NA
1	Door Sweep	C627 A		NA
1	Concealed Magnetic Contact	MC-4M	628	SE

SET #8

Doors: 101A, 105A, 101D.ALT, 101E.ALT, & 101F.ALT

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Overhead Holder	9010 Series	US32D	AB
3	Door Silencers	1229A	GREY	TR

SET #9

Doors: ~~101C~~, 151, 164

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #10 -

Doors: 103A, 103B, 104B, 101C.ALT & 103A.ALT

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Stop	1270WV / 1211 AS REQ'D	630	TR

3	Door Silencers	1229A	GREY	TR

SET #11

Doors: 102, 104A, 179B

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9050L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #12

Doors: 110A, 110B

1	Continuous Hinge	652HD	US32D	ST
1	Exit Device	CD 98L x 996L-NL-R&V 17	US32D	VO
1	Rim Cylinder Housing	3070 CT6	626	CR
1	Cylinder Housing	1070 CT6	626	CR
2	Core	8000	626	CR
1	Closer	4040 XP SCUSH	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
3	Door Silencers	1229A	GREY	TR

SET #13

Doors: 113

2	Continuous Hinge	652HD	US32D	ST
2	Exit Device	9827L x 996K-R&V-BE 17 LBR	US32D	VO
2	Closer	4040 XP EDA	AL	LC
2	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
2	Stop	1270WV / 1211 AS REQ'D	630	TR
2	Magnetic Holder	2100 24V x Extensions As REQ'D	US28	AB
1	Gasketing	5050 C @ Head & Jambs		NA
1	Astragal Set	9675 A @ FACE OF EACH LEAF		NA

SET #14

Doors: 119B, 120B, 121B, 147D, 158A, 159A, 171, 172B, 175B, 180C, 181D, 182D, 183D, 184D, 185C, 191D, 192D

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9071L 17A	630	SC
2	Cylinder Housing	1070 CT6	626	CR
2	Core	8000	626	CR
1	Closer	4040 XP HEDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	105-CNS-AM @ Head & Jambs	BROWN	DH

SET #15

Doors: 122, 123, 124, 125, 146C, 160, 161, 162, 163, 167B, 170

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9071L 17A	630	SC
2	Cylinder Housing	1070 CT6	626	CR
2	Core	8000	626	CR
1	Closer	4040 XP SHCUSH	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Gasketing	105-CNS-AM @ Head & Jambs	BROWN	DH

SET #16

Doors: 130C, 130D, 130E, 130F

2	Continuous Hinge	652HD	US32D	ST
1	Mullion	KR4954 7'6"	SP28	VO
1	Exit Device	CD 98DT x 990DT	US32D	VO
1	Exit Device	CD 98NL x 990NL-R&V	US32D	VO
3	Cylinder Housing	1070 CT6	626	CR
		NOTE: CD & Mullion		
1	Rim Cylinder Housing	3070 CT6	626	CR
		NOTE: Exit Trim		
4	Core	8000	626	CR
2	Closer	4040 XP EDA	AL	LC
2	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
2	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA
1	Mullion Seal	5100N		NA

SET #17

Doors: 138C, 138D

2	Continuous Hinge	652HD	US32D	ST
2	Dummy Push Bar	350	US32D	VO
2	Exit Device Trim	990DT	US26D	VO
2	Closer	4040 XP EDA	AL	LC
2	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
2	Stop	1270WV / 1211 AS REQ'D	630	TR
2	Door Silencers	1229A	GREY	TR

SET #18

Doors: 139, 149A

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP SCUSH	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
3	Door Silencers	1229A	GREY	TR

SET #19

Doors: 140

2	Continuous Hinge	652HD	US32D	ST
2	Flush Bolt	3917-12	626	TR
1	Dustproof Strike	3910	630	TR
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP REG	AL	LC
2	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
2	Overhead Stop	9020 Series	US32D	AB
2	Door Silencers	1229A	GREY	TR
1	Astragal	158 SA		NA

SET #20

Doors: 142A

2	Continuous Hinge	652HD	US32D	ST
2	Flush Bolt	3917-12	626	TR
1	Dustproof Strike	3910	630	TR
1	Lockset	L9080L 17A 10-072 X 7/8"	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
2	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
2	Stop	1270WV / 1211 AS REQ'D	630	TR
2	Door Silencers	1229A	GREY	TR
1	Astragal	158 SA		NA

SET #21

Doors: 143

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP REG	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #22

Doors: 144A

2	Continuous Hinge	652HD	US32D	ST
2	Flush Bolt	3917-12	626	TR
1	Dustproof Strike	3910	630	TR
1	Lockset	L9080L 17A 10-072 X 7/8"	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP SCUSH	AL	LC
2	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
2	Door Silencers	1229A	GREY	TR
1	Astragal	158 SA		NA

SET #23

Doors: 145

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP SCUSH	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
3	Door Silencers	1229A	GREY	TR

SET #24

Doors: 147C, 180B, 182C, 184C, 192C

2	Continuous Hinge	652HD	US32D	ST
2	Flush Bolt	3917-12	626	TR
1	Dustproof Strike	3910	630	TR
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Overhead Stop	9020 Series	US32D	AB
2	Door Silencers	1229A	GREY	TR

SET #25

Doors: 181C, 183C, 185B, 191C

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #26

Doors: 152A, 152C

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP REG	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #27

Doors: 178B

1	Continuous Hinge	652HD	US32D	ST

1	Lockset	L9050L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #28

Doors: 148

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #29

Doors: 190

1	Continuous Hinge	652HD	US32D	ST
1	Lockset	L9456L 17A L283-722	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #30

Doors: 105B

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #31

Doors: 106, 107, 132, 102.ALT

3	Hinges	CB1900R 4 1/2 x 4 1/2	26D	ST
1	Lockset	L9050L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Stop	1270WV / 1211 AS REQ'D	630	TR

3	Door Silencers	1229A	GREY	TR

SET #32

Doors: 108

3	Hinges	CB1960R 4 1/2 x 4 1/2	32D	ST
1	Privacy Set	L9040 17A	630	SC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #33

Doors: 109

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9456L 17A L283-722	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #34 -

Doors: 111, 187A, 187B

3	Hinges	CB1900R 4 1/2 x 4 1/2	26D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #35

Doors: 116A

3	Hinges	CB1900R 4 1/2 x 4 1/2	26D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP REG	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #36

Doors: 116B, 127, 142B

3	Hinges	CB1900R 4 1/2 x 4 1/2	26D	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR

1	Core	8000	626	CR
1	Closer	4040 XP REG	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #37 -

Doors: 119A, 120A, 121A, 146B, 147B, 158B, 159B, 178A, 179A, 181B, 182B, 183B, 191B

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #38

Doors: 126, 128, 154, 157

3	Hinges	CB1901R 4 1/2 x 4 1/2	26D	ST
1	Deadlock	L9463L	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Push Plate	1001-9	630	TR
1	Pull Plate	1015-3	630	TR
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Mop Plate	KM050 6" x 1"LDW B4E C-SUNK-KP	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #39

Doors: 130A

6	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
2	Flush Bolt	3917-12	626	TR
1	Dustproof Strike	3910	630	TR
1	Lockset	L9080L 17A 10-072 X 7/8"	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
2	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
2	Stop	1270WV / 1211 AS REQ'D	630	TR
2	Door Silencers	1229A	GREY	TR
1	Astragal	158 SA		NA

SET #40

Doors: 130B, 189

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR

1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #41 Omitted

~~Doors: 131A~~

~~3~~	~~Hinges~~	~~CB1901R 4 1/2 x 4 1/2~~	~~26D~~	~~ST~~
~~1~~	~~Deadlock~~	~~L9460L~~	~~630~~	~~SC~~
~~1~~	~~Cylinder Housing~~	~~1070 CT6~~	~~626~~	~~CR~~
~~1~~	~~Core~~	~~8000~~	~~626~~	~~CR~~
~~1~~	~~Push Plate~~	~~1001-9~~	~~630~~	~~TR~~
~~1~~	~~Pull Plate~~	~~1015-3~~	~~630~~	~~TR~~
~~1~~	~~Closer~~	~~4040 XP H~~	~~AL~~	~~LC~~
~~1~~	~~Kick Plate~~	~~KO050 10" X 2"LDW B4E C-Sunk~~	~~630~~	~~TR~~
~~1~~	~~Mop Plate~~	~~KM050 6" x 1"LDW B4E C-SUNK-KP~~	~~630~~	~~TR~~
~~1~~	~~Stop~~	~~1270WV / 1211 AS REQ'D~~	~~630~~	~~TR~~
~~1~~	~~Gasketing~~	~~5050 C @ Head & Jambs~~		~~NA~~

SET #42

Doors: 131B, 131C

1	Padlock	PL5070 CT6		CR
1	Cylinder Housing	1070 CT6	626	CR
2	Core	8000	626	CR

NOTE: Balance of hardware by door supplier. Confirm cylinder required before submittal.

SET #43

Doors: 133

3	Hinges	CB1900R 4 1/2 x 4 1/2	26D	ST
1	Privacy Set	L9040 17A	630	SC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Mop Plate	KM050 6" x 1"LDW B4E C-SUNK-KP	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #44

Doors: is moved to set 131A ~~134~~

3	Hinges	CB1900R 4 1/2 x 4 1/2	26D	ST
1	Passage Set	L9010 17A	630	SC
1	Closer	4040 XP REG	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #45

Doors: 134, 135

6	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
2	Flush Bolt	3917-12	626	TR
1	Dustproof Strike	3910	630	TR
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP SHCUSH	AL	LC
2	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
1	Overhead Stop	9020 Series	US32D	AB
2	Door Silencers	1229A	GREY	TR

SET #46

Doors: 136

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
2	Flush Bolt	3917-12	626	TR
1	Dustproof Strike	3910	630	TR
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Kick Plate	KO050 10" X 1"LDW B4E C-SUNK	630	TR
1	Overhead Holder	9010 Series	US32D	AB
2	Door Silencers	1229A	GREY	TR

SET #47

Doors: 137

3	Hinges	CB1901R 5 x 4 1/2	26D	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP H	AL	LC
1	Armor Plate	KA050-2 36" X 1"LDE B4E C-SUNK-AP	630	TR
1	Overhead Stop	9020 Series	US32D	AB
3	Door Silencers	1229A	GREY	TR

SET #48

Doors: 141

1	Continuous Hinge	651HD	US32D	ST
1	Exit Device	CD 98L x 996L-NL-R&V 17	US32D	VO
1	Cylinder Housing	1070 CT6	626	CR
		NOTE: CD		
1	Rim Cylinder Housing	3070 CT6	626	CR
		NOTE: Exit Trim		
2	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #49

Doors: 146A, 147A, 167A, 180A, 181A, 182A, 183A, 184A, 185A, 191A, 192A

3	Hinges	CB1900R 4 1/2 x 4 1/2	26D	ST
1	Passage Set	L9010 17A	630	SC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Mop Plate	KM050 6" x 1"LDW B4E C-SUNK-KP	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #50

Doors: 172A, 175A

3	Hinges	CB1900R 4 1/2 x 4 1/2	26D	ST
1	Passage Set	L9010 17A	630	SC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
3	Door Silencers	1229A	GREY	TR

SET #51

Doors: 150

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9071L 17A	630	SC
2	Cylinder Housing	1070 CT6	626	CR
2	Core	8000	626	CR
1	Closer	4040 XP HEDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	105-CNS-AM @ Head & Jambs	BROWN	DH

SET #52 -

Doors: 184B, 192B

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9070L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Overhead Stop	9020 Series	US32D	AB
3	Door Silencers	1229A	GREY	TR

SET #53

Doors: 187C

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9050L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP SCUSH	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
3	Door Silencers	1229A	GREY	TR

SET #54

Doors: 155, 188

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9456L 17A L283-722	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP SCUSH	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #55

Doors: 149B, 156

3	Hinges	CB1900R 4 1/2 x 4 1/2 NRP	26D	ST
1	Lockset	L9080L 17A	630	SC
1	Cylinder Housing	1070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP SCUSH	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
3	Door Silencers	1229A	GREY	TR

SET #56

Doors: 153B

3	Hinges	CB1901R 5 1/2 x 4 1/2 NRP	26D	ST
1	Fire Exit Device	99L-F X 996L–NL-R&V 17	US26D	VO
1	Rim Cylinder Housing	3070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Magnetic Hold Open		SCM	AL
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #57

Doors: 001A

3	Hinges	CB1901R 5 1/2 x 4 1/2 NRP	26D	ST
1	Fire Exit Device	99L-F X 996L–NL-R&V 17	US26D	VO
1	Rim Cylinder Housing	3070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

SET #58

Doors: 001B

3	Hinges	CB1901R 5 1/2 x 4 1/2 NRP	26D	ST
1	Fire Exit Device	99L-F X 996L–NL-R&V 17	US26D	VO

1	Rim Cylinder Housing	3070 CT6	626	CR
1	Core	8000	626	CR
1	Closer	4040 XP EDA	AL	LC
1	Kick Plate	KO050 10" X 2"LDW B4E C-Sunk	630	TR
1	Stop	1270WV / 1211 AS REQ'D	630	TR
1	Gasketing	5050 C @ Head & Jambs		NA

Opening List

Opening	Hdw Set
102	11
106	31
107	31
108	32
109	33
111	34
113	13
122	15
123	15
124	15
125	15
126	38
127	36
128	38
132	31
133	43
134	44
135	45
136	46
137	47
139	18
140	19
141	48
143	21
145	23
148	28
150	51
151	9
154	38
155	54
156	55
157	38
160	15
161	15
162	15
163	15
164	9
170	15
171	14
176	6
188	54
189	40
190	29
001A	57
001B	58
100A	6
100B	6
101A	8
101B	6

~~101C~~	~~9~~
103A	10
103B	10
104A	11
104B	10
105A	8
105B	30
110A	12
110B	12
114A	6
114B	6
116A	35
116B	36
119A	37
119B	14
120A	37
120B	14
121A	37
121B	14
130A	39
130B	40
130C	16
130D	16
130E	16
130F	16
131A	41
131B	42
131C	42
131D	3
137A	7
138A	1
138B	2
138C	17
138D	17
142A	20
142B	36
144A	22
144B	4
146A	49
146B	37
146C	15
147A	49
147B	37
147C	24
147D	14
149A	18
149B	55
152A	26
152B	5
152C	26
152D	4
153A	6
153B	56
153C	6
158A	14
158B	37

159A	14
159B	37
167A	49
167B	15
172A	50
172B	14
175A	50
175B	14
177A	6
177B	6
178A	37
178B	27
179A	37
179B	11
180A	49
180B	24
180C	14
181A	49
181B	37
181C	25
181D	14
182A	49
182B	37
182C	24
182D	14
183A	49
183B	37
183C	25
183D	14
184A	49
184B	52
184C	24
184D	14
185A	49
185B	25
185C	14
187A	34
187B	34
187C	53
191A	49
191B	37
191C	25
191D	14
192A	49
192B	52
192C	24
192D	14

DUFFIELD ASSOCIATES
Soil, Water & the Environment

Duffield Associates, Inc.
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February 9, 2015

Kenneth B. Fearn, AIA, LEED AP
Fearn-Clendaniel Architects, Inc.
6 Larch Avenue, Suite 398
Wilmington, DE 19804

RE: Project No. 6252.GC
Geotechnical Evaluation
Addition and Renovations
Smyrna Elementary School
Smyrna, Delaware

Dear Mr. Fearn:

Duffield Associates, Inc. (Duffield Associates) has completed our geotechnical evaluation for the proposed building addition and site improvements for the Smyrna Elementary School (Smyrna ES) located in Smyrna, Delaware. The evaluation is summarized in the following report, which includes the data obtained in our field and laboratory programs, the subsurface conditions encountered, as well as our recommendations for the design and construction of the addition foundations and slab-on-grade, as well at the stormwater management facilities and site pavements. This report also discusses design assumptions and limitations, which are important to understand in interpreting and using this report for designing, bidding, and constructing the building. These services were performed in general accordance with our agreement, dated July 2, 2014.

We appreciate this opportunity to be of service to you and will remain available to assist you and your team as design progresses and into the construction phase of the building. Should you have any questions concerning this evaluation, we encourage you to contact us.

Very truly yours,

DUFFIELD ASSOCIATES, INC.

Joseph Jakubowski, P.E., LEED AP
Geotechnical Section Manager

JJ/JFC:dam
6252GC 0215-SMYRNAES ADD.RPT

Enclosure: Report

Geotechnical Evaluation
Addition and Renovations
Smyrna Elementary School
Smyrna, Delaware

February 9, 2015

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EXECUTIVE SUMMARY

The following report summarizes Duffield Associates, Inc.'s Geotechnical Evaluation for the Smyrna Elementary School's building addition and site improvements at 82 Monrovia Ave in Smyrna, Delaware. This report includes information regarding the field and laboratory testing programs, the subsurface conditions encountered, as well as recommendations for the design and construction of the proposed building foundations and slab-on-grade, as well at the stormwater management facilities and site pavements. The report also discusses design assumptions and limitations, which are important to understand in interpreting and using this report for designing, bidding and constructing the building.

Based on the observed subsurface conditions and the design information provided by the project team, Duffield Associates makes these recommendations.

- The proposed construction could be supported on a conventional shallow foundation system and slab-on-grade.
- Foundations should be designed for a maximum allowable bearing pressure of 2,000 psf.
- Total foundation settlement is estimated to be on the order of 1 inch or less, which is within typical limits for construction in Delaware area.
- A bioretention area that uses infiltration of stormwater into the sand soils as the primary means of stormwater control is practical.
- A pavement section consisting of 4 inches of bituminous concrete overlying 8 inches of graded aggregate base course and a geotextile fabric is recommended for the pavements areas with primarily passenger car traffic.

The analysis and conclusions presented herein relate to Smyrna Elementary School constructing an approximately 3,600 square foot kitchen addition to the south of the existing gym and other site improvements. The existing kitchen is proposed to be demolished, and the new addition will increase the size of the kitchen area by 2,100 square feet. The addition will be a single-story steel framed structure constructed at grade with non-load bearing exterior masonry walls and a slab-on-grade. According to the project's structural engineer, Baker, Ingram & Associates, maximum column loads are anticipated to be 50 kips. The addition will have a finished floor elevation that will approximately match the existing grades. The project includes construction of a new parking lot and stormwater management (SWM) bioretention area. The parking lot is proposed in the location of the existing lots and will approximately match the existing grades. The SWM management area is proposed to cover a footprint of approximately 4,000 square feet and finished subgrade will be approximately 7 feet below the existing ground surface.

Four Standard Penetration Test borings and three borehole infiltration tests were performed at the project site on January 23 and 26, 2015, as the basis for this evaluation. Beneath a surficial layer of topsoil, the subsurface conditions observed can generally be described as layer of loose to medium dense sand containing varying amount of silt. Groundwater was not encountered during the test borings. Infiltration rates were observed to range from 1.4 to 3.4 inches per hour.

PROJECT SUMMARY

PROPOSED BUILDING CONSTRUCTION

- Demolition of the existing kitchen and construction of a new, larger kitchen to the south side of the existing gym.
- An additional footprint of approximately 3,600 square feet, increasing the size of the kitchen by 2,100 square feet.
- A single-story steel framed structure with non-load bearing exterior masonry walls and a slab-on-grade, constructed at-grade (i.e., no basement).
- Maximum column loads of 50 kips are anticipated by the project's structural engineer, Baker, Ingram & Associates.
- A finished floor elevation that will approximately match the existing grades (i.e., net cuts/fills of less than 2 feet).

PROPOSED PARKING LOT

- Located at the existing lots to the west of the school, with grades that will approximately match the existing grades.

PROPOSED STORMWATER MANAGEMENT AREA

- Bioretention area to cover a footprint of approximately 4,000 square feet, southwest of the new parking lot.
- Finished subgrade elevation of the bioretention area is 22 feet (project datum), and the facility will consist of two feet of biofiltration soil overlying two feet of clean, crushed stone.

REFERENCES UTILIZED

- A drawing titled "Smyrna Elementary School – Site Construction Plan," prepared by Fearn-Clendaniel Architects, Inc. (FCA), dated November 17, 2014.

EXISTING SITE CONDITIONS

- The area of the proposed addition adjacent to the existing kitchen is currently a relatively flat, bituminous concrete parking and landscaped area that slopes gradually to the south.

- Existing grade within the vicinity of the SWM area slopes gradually to the south with elevations ranging from 28 to 30 feet. The area is currently grass covered.

- Several existing utilities, including stormwater, gas, and communications were delineated within the new parking lot area. No utilities were delineated in the proposed building addition or stormwater management areas.

Existing site conditions at the location of the proposed parking lot and SWM area.

FIELD AND LABORATORY TESTING

STANDARD PENETRATION TEST BORINGS

- On January 23, 2015, four Standard Penetration Test (SPT) borings were performed in general accordance with ASTM D 1586 in the vicinity of the proposed addition, parking lot, and stormwater management facilities.

- The test borings were performed by CGC Geoservices, LLC, an affiliate company of Duffield Associates, utilizing a truck-mounted Diedrich D-50 drill rig with hollow-stem augers.

- The test borings were located in areas accessible to a truck-mounted drill rig in areas clear of existing structures and utilities, and the locations of the test borings were estimated in the field by Duffield Associates' representative, utilizing existing site features as a reference.

- At completion of the drilling, the boreholes were backfilled with soil cuttings. Additional settlement and softening of the soil replaced in the boreholes may occur, resulting in a depression or hole in the ground surface. Consequently, future maintenance and restoration of the site may be required.

- The approximate test boring locations are indicated on the enclosed Test Boring and Infiltration Test Location Sketch. Test boring logs, which describe the conditions observed during the field exploration program, are enclosed.

INFILTRATION TESTING

- Three augured boreholes were utilized for infiltration testing.

- Infiltration testing was performed by a Duffield Associates' representative at depths ranging from approximately 7.0 to 7.5 feet below the existing ground surface, corresponding to elevations ranging from approximately 21.7 to 22.5 feet.

- The infiltration tests were performed on January 26, 2015, in general accordance with the State of Delaware, Department of Natural Resources and Environmental Control (DNREC) 3.06.2.A-1 "Soil Investigation Procedures for Stormwater BMPs" and ASTM D 5126 "Standard Guide for Comparison of Field Methods for Determining Hydraulic Conductivity in Vadose Zone." A copy of the test procedure is included with this report.

LABORATORY TESTING

Following the test boring program, the samples were returned to Duffield Associates' office and laboratory testing was performed on the selected samples. The results of the laboratory testing are summarized below. No environmental testing or characterization was performed.

LOCATION	SAMPLE NO.	DEPTH (FT)	MOISTURE CONTENT (%) (ASTM D2216)	PERCENT PASSING NO. 200 SIEVE (%) (ASTM D1140)	PERCENT PASSING NO. 270 SIEVE (%)
TB-1	S-2	3.5 – 5.0	21.2	--	44.3
TB-2	S-2	3.5 – 5.0	12.9	20.4	--
TB-2	S-4	8.5 – 10.0	11.7	17.8	--
TB-3	S-2	1.0 – 3.0	13.0	22.2	--
IT-1	S-1	7.5	12.5	16.9	18.3
IT-2	S-1	7.0	11.5	--	23.0
IT-3	S-1	7.3	9.6	--	13.4

SUBSURFACE CONDITIONS

GENERALIZED SITE GEOLOGY

The site of the proposed addition is located within the Atlantic Coastal Plain Physiographic Province, which is a wedge-shaped accumulation of unconsolidated sediments deposited on a sloping shelf of Piedmont-type bedrock. Regional geologic mapping by DGS indicates that the stratigraphy of the Coastal Plain in the vicinity of the site consists of the upper Pleistocene Age Lynch Heights Formation. The Lynch Heights Formation is a heterogeneous unit of light-gray, brown, and light-yellowish brown medium to fine sand with discontinuous beds of coarse sand, gravel, silt, and organic-rich clayey silt to silty sand. The overall thickness of the unit ranges up to 50 feet.

STRATIGRAPHIC CONDITIONS

Beneath a surficial layer of topsoil, the subsurface conditions observed can generally be described as layer of loose to medium dense sand with varying amount of silt. For discussion purposes, the subsurface conditions can be further described as follows:

SUBSURFACE STRATUM	APPROXIMATE THICKNESS (FEET)	GENERALIZED DESCRIPTION[1]
A	0.3 – 1.0	TOPSOIL (approximately 3 to 12 inches)
B	6.0 – ---[2]	Brown, orange-brown, gray-brown fine SAND, some to "and" silt, little to trace medium sand, trace gravel (moist, loose to medium dense); USCS: SM
C	--- – ---[3]	Brown, orange-brown, light brown fine SAND, little medium sand, trace to little silt, trace gravel (moist, loose to medium dense); USCS: SM, SP-SM
Notes:	1. The soil descriptions utilized herein and on the test boring logs are defined in the attached General Notes. 2. Stratum B not fully penetrated in test borings TB-3 and TB-4. 3. Stratum C only observed in test borings TB-1 and TB-2 and not fully penetrated.	

GROUNDWATER

- Groundwater (not attributable to the infiltration testing) was not observed in the test borings performed during this evaluation, which were extended to depths of 20 feet below the existing ground surface.

- Groundwater mapping by the Delaware Geologic Survey and the current DNREC well permit database indicates average groundwater levels in "normal" and "dry" conditions may be approximately 9 to 16 feet or greater below the existing ground surface in the general area of proposed subsurface SWM facilities. In "wet" conditions, the published data indicates that groundwater levels may be approximately 6 to 9 feet or greater below the existing ground surface. The groundwater conditions observed in the test borings appeared to be deeper than the published groundwater data for the area.

- It is possible that localized perched groundwater conditions at shallower depths may be encountered during excavations. In addition, due to seasonal and annual variations in precipitation, groundwater fluctuations of several feet should be anticipated.

DISCUSSION OF ANALYSIS

SHALLOW FOUNDATION SYSTEM

It is Duffield Associates' opinion that the "natural" sands (Strata B or C), encountered beneath the topsoil (Stratum A) are generally suitable for supporting the proposed addition on a shallow foundation system and slab-on-grade. While generally suitable conditions were observed during the field program, localized areas of the sand were observed to be loose density. If yielding soils are encountered during site preparation, foundation construction, or pavement subgrade preparation, the loose soils could be removed from beneath the foundations, slabs-on-grade, and pavement areas. Alternatively, shallow yielding conditions could be stabilized through recompaction. Structural fill, placed and compacted as recommended herein is also considered suitable for shallow foundation construction and slab-on-grade systems.

EFFECT ON ADJACENT STRUCTURES AND UTILITIES

The burial depth of the foundations for the proposed construction should be selected such that additional loads will not be imparted to any existing footings. Assuming that the existing structures at the site are founded on a shallow foundation system, the proposed foundations immediately adjacent to the existing structures should be founded at an elevation equal to, or below, the existing foundations. Based on the understanding that the proposed slab will have a finished floor elevation approximately matching the existing ground surface, deep foundation burial depths are not anticipated.

Any connections between the proposed equipment and the existing equipment should be designed to tolerate up to 1 inch of total differential settlement. In addition, some additional settlement of the nearby existing equipment could occur due to the overlapping influence of the stress induced by the new foundations and foundations located adjacent to the existing equipment. However, this "additional settlement" should be relatively small based on the proposed foundation and slab loads.

INFILTRATION TEST RESULTS

Five infiltration tests were performed in the vicinity of the proposed stormwater management facilities. The following table summarizes the depths and results of the infiltration testing.

INFILTRATION TEST LOCATION	APPROX. TEST ELEVATION (FT., PROJECT DATUM)	USDA DESCRIPTION	USCS DESCRIPTION	AVERAGE FIELD INFILTRATION RATE (IN/HR)
IT-1	22.5 ± (7.5 feet ± b.e.g.s.)	Sandy Loam	Brown, light brown fine SAND, little silt, trace medium sand	2.1
IT-2	22.0 ± (7.0 feet ± b.e.g.s.)	Sandy Loam	Brown, light brown fine SAND, some silt, trace medium sand	1.4
IT-3	21.7 ± (7.3 feet ± b.e.g.s.)	Loamy Sand	Orange-brown, brown fine SAND, little medium sand, little silt	3.4

It should be noted that a factor of safety has not been applied to the field infiltration rates indicated above.

DESIGN RECOMMENDATIONS

1. ALLOWABLE FOUNDATION BEARING CAPACITY AND SETTLEMENT

- It is Duffield Associates' opinion that the natural soils encountered below the surficial topsoil are generally considered suitable for supporting the proposed building on a shallow spread footing foundation and slab-on-grade system following subgrade preparation and review, as discussed further herein. Structural fill, placed, compacted and reviewed, as recommended in this report, is also considered suitable for supporting shallow foundations.

- It is recommended that the proposed foundation be designed for a maximum net allowable bearing pressure of 2,000 pounds per square foot. Based on the results of the analysis performed as part of this evaluation, it is estimated that maximum total foundation settlement for the proposed structure should be on the order of 1 inch or less, with post-construction differential settlement on the order of ½ inch or less over a distance of 25 feet.

2. FOUNDATION BURIAL DEPTH AND SIZE

- The base of all footings in areas exposed to frost should be placed at least 32 inches below final exterior grade.

- Interior foundations in insulated areas should be placed at least 18 inches below the proposed finished floor elevation.

- All continuous wall footings should be at least 2 feet wide, and all isolated column footings should be at least 3 feet wide, regardless of bearing pressure.

- If a winter construction schedule is proposed for the foundations, provisions for the protection of shallow foundations from frost heave during construction should be included in the contract specifications.

3. SLAB-ON-GRADE

- Ground-supported floor slabs should be designed as free floating and should not be connected to the other structural elements (e.g., walls, framing, etc.) of the buildings. Isolation joints should be utilized at the interface of proposed ground-supported floor slabs and structural elements to accommodate potential differential settlement.

- A minimum 10 mil polyethylene vapor barrier and free-draining subbase, consisting of at least 4 inches of poorly graded crushed stone aggregate, such as AASHTO SP-57 stone, should be provided beneath all floor slabs.

- Subgrade conditions should be modeled for design utilizing a subgrade modulus, K_S of 150 pci, provided subgrade preparation is performed as recommended in this report.

4. SEISMIC DESIGN PARAMETERS

Based on the subsurface conditions encountered during the field exploration at the site and the review of regional geologic maps, a "D" site classification is recommended for the analysis of seismic conditions, as defined by 1613.3.2 of the 2012 International Building Code and Chapter 20 of the American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures (ASCE/SEI 7-10).

5. CONTROL JOINTS

Masonry walls should be provided with frequent control joints placed at architecturally convenient locations (e.g., windows and doorways) to provide a "preferred" location for differential settlement to occur to reduce the potential for cracking of the walls

6. GROUNDWATER

- Based on the proposed construction and the observed depth to groundwater, it is not anticipated that significant amounts of groundwater will be encountered during construction.

- It is possible that, due to varying amounts of fine-grained soil encountered at the site, localized perched water conditions may be encountered, or that stormwater could accumulate in open excavations or low areas during construction.

7. STORMWATER MANAGEMENT AREA DESIGN

- Due to the types and consistency of the soils encountered and observed infiltration rates in the area of the proposed infiltration structures, it is Duffield Associates' opinion that it is likely that a bioretention area that uses infiltration of stormwater into the sand soils as the primary means of stormwater control is practical. It is not recommended to utilize a system that infiltrates in the sand soils observed to contain significant amounts of silt.

- No indications of the seasonal high water table (SHWT) were observed during the performance of the test borings.

- It is recommended that the design of the SWM system utilize the most recent version of the "Delaware Sediment and Stormwater Regulations" and the "Delaware Sediment and Stormwater Program Technical Document Article 3.06, Sediment and Stormwater BMP Standards and Specifications," prepared by DNREC, dated March 2013. It is noted that the minimum infiltration rate for all runoff reduction and infiltration practices is 1.0 in/hr. The infiltration system shall be founded a minimum of 2 feet above the seasonal high water table (SHWT).

8. PAVEMENT DESIGN

- Based on an anticipated traffic loading consisting primarily of passenger vehicles (with limited access for delivery truck, trash collection vehicles and other truck traffic) in the parking areas, the pavement sections below are recommended.

Parking Area Pavements

1-1/2 inches	Bituminous Concrete Surface Course, DelDOT Type C
2-1/2 inches	Bituminous Concrete Base Course, DelDOT Type B
8 inches	Graded Aggregate Base Course, DelDOT Type B
	Geotextile Fabric, Geotex 601 or equivalent
12 inches	Total Depth

- All pavement materials and construction should be in accordance with the most recent version of Delaware Department of Transportation's "Standard Specifications for Construction and Materials, August 2001."

9. SITE GRADING

Site grading should be designed to provide positive drainage away from the proposed construction area. Positive site drainage should be maintained throughout the construction activities.

10. ASSUMPTIONS

The structural loading considered in this evaluation should be verified by the project team prior to the completion of their design. If the proposed loading conditions vary from those considered herein, Duffield Associates should be notified to possibly modify the recommendations provided herein as required.

CONSTRUCTION RECOMMENDATIONS

1. PROOFROLLING AND SUBGRADE PREPARATION

- At the start of construction, the site should be stripped of all topsoil and pavements, and the existing structures at the site should be demolished and removed in their entirety. Following rough grading and prior to footing excavation, placement of fill, or construction of the pavements or floor slabs, it is recommended that the exposed subgrade be proofrolled. The proofrolling should be performed using a minimum 10-ton static roller in the presence of a qualified soils technician working under the supervision of a geotechnical engineer. The purpose of the proofrolling is to identify yielding subgrade conditions. The proposed construction area should be proofrolled at least 10 feet beyond the construction perimeters.

- Yielding, or otherwise unsuitable subgrade conditions encountered within the proposed building area, should be undercut to firm subgrade conditions and backfilled with compacted structural fill in accordance with the recommendations of this report. Alternatively, shallow yielding conditions, as determined by a qualified soils technician working under the supervision of a geotechnical engineer, could be stabilized through moisture conditioning of the exposed subgrade and recompaction. A qualified soils technician working under the supervision of a geotechnical engineer should confirm the consistency and texture of the exposed soils with the conditions encountered by this evaluation.

2. FOUNDATION SUBGRADE REVIEW

- All shallow foundations should be placed on firm, dry, non-frozen subgrade consisting of the soils of Stata B or C, or on structural fill, placed and compacted as recommended herein. Foundation excavations should be reviewed by a qualified technician working under the supervision of a geotechnical engineer who is familiar with the recommendations of this report.

- Subgrade review should be performed prior to the placement of reinforcing steel or concrete, and should verify the presence of medium dense or denser sands. If these conditions are not encountered at the proposed foundation depth, additional excavation should be performed until they are uniformly encountered across the base of the foundation's excavation or, if acceptable to the project geotechnical engineer, the natural sand soils can be densified in place. Foundation undercut areas should be backfilled with structural fill as recommended herein.

3. RE-USE OF ON-SITE SOILS AS STRUCTURAL FILL

- On-site soils free of organic material, topsoil, miscellaneous fill, debris, and rock fragments in excess of 3 inches in their largest dimension may be suitable as structural fill.

- A majority of the on-site materials that will be available as fill from the excavations will consist of predominately coarse-grained (sand) soils of Stratum B and C. This material is

considered suitable for backfill as long as the moisture content of the soils are within the range in which the specified compaction requirements can be achieved.

- If sufficient quantities of suitable on-site soils are not available for structural fill, imported borrow consisting of predominately granular soils conforming to the requirements of Delaware Department of Transportation Standard Specifications Borrow Type C (Backfill) should be utilized. AASHTO SP-57 stone could also be utilized as structural fill at locations, as recommended by the project engineer, and should be considered for localized, relatively deep fills such as foundation undercuts.

4. COMPACTION REQUIREMENTS

- Structural fill should be placed in loose lifts with a maximum thickness of 8 inches.
- Each lift of fill placed within the proposed building construction area (defined as the area extending at least 5 feet beyond the foundation element perimeters) should be compacted to at least 95% of the maximum dry density as determined by the Modified Proctor test (ASTM D 1557).
- Structural fill for utility trenches located outside of the proposed construction areas and for site pavements, should be compacted to at least 90% of the Modified Proctor maximum dry density.
- The placement and compaction of structural fill should be monitored on a full-time basis by a qualified technician working under the supervision of a geotechnical engineer.

5. EXCAVATION SAFETY

All utility and foundation excavation should be performed in accordance with OSHA guidelines. Typically, the predominately granular soils can be characterized by OSHA CFR Part 1926 Excavation Standards as Type B soils. Should it be required, all temporary sheeting, shoring, benching, and sloping should be designed by a qualified engineer registered in the State of Delaware.

6. PROTECTION OF SUBGRADE SOILS

If foundation excavations are left open, precipitation may result in the collection of water within the excavation. Provisions for removal of water by drainage or sumping are recommended. Subgrade soils disturbed by precipitation and construction traffic should be either scarified and re-compacted or undercut and replaced with structural fill as previously discussed.

7. GROUNDWATER CONTROL

If “perched” groundwater is encountered, localized sumping may be required to control stormwater runoff into excavations during construction. It is recommended that wherever

groundwater is encountered during shallow foundation or utility excavations, the resulting excavation should be over excavated by at least 4 inches and replaced with AASHTO SP-57 stone to protect the exposed subgrade soils and to facilitate sumping.

8. SUBSURFACE DATA

All contractors interested in bidding on phases of this work, which involve subsurface conditions, should be given full access to this report so that they can develop their own interpretations of the available data.

9. CONSTRUCTION REVIEW

It is recommended that the project budget include provisions for the cost for independent construction monitoring of the earthwork and foundation construction by a qualified engineering firm retained by the Owner to review conformance of construction with the recommendations of the project geotechnical evaluation, as well as the project plans and specifications.

QUALIFICATIONS

The recommendations of this report have been prepared according to generally accepted soil and foundation engineering practice, and are based on the conditions encountered by the test borings performed at the site. Although soil quality has been inferred from the interpolation of the sampling data, you should explicitly note that subsurface conditions beyond the test boring are, in fact, unknown. Should any conditions encountered during construction differ from those described in this report, this office should be notified immediately in order to review, and possibly modify these recommendations. This report applies solely to the size, type, and location of the structure described herein. In the event that changes are proposed, this report will not be considered valid unless the changes have been reviewed and the recommendations of this report modified and re-approved in writing by Duffield Associates, Inc.

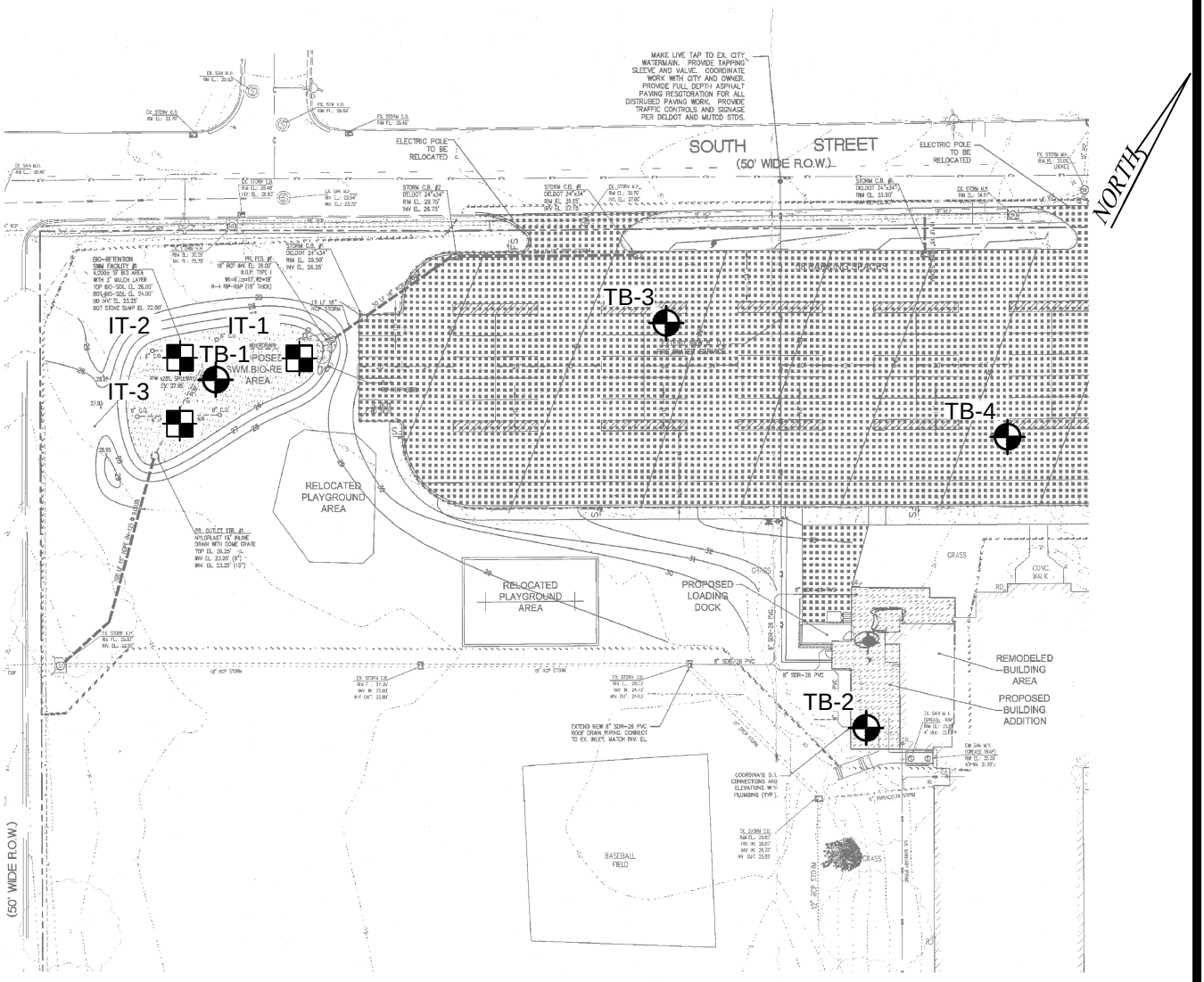
ENCLOSURES

TEST BORING AND INFILTRATION TEST LOCATION SKETCH

TEST BORING LOGS (4)

CONSTANT HEAD BOREHOLE INFILTRATION TEST PROCEDURE

GENERAL NOTES



KEY:

IT-1 - APPROXIMATE LOCATION OF INFILTRATION TEST

TB-3 - APPROXIMATE LOCATION OF TEST BORING

NOTE:

THIS SKETCH IS ADAPTED FROM A DRAWING TITLED "SMYRNA ELEMENTARY SCHOOL - SITE CONSTRUCTION PLAN," PREPARED BY FEARN-CLENDANIEL ARCHITECTS, INC., DATED NOVEMBER 17, 2014

DATE: 9 FEBRUARY 2015	TEST BORING AND INFILTRATION TEST LOCATION SKETCH	**DESIGNED BY: JJ**	DUFFIELD ASSOCIATES Soil, Water & the Environment
SCALE: 1" = 80'		**DRAWN BY: AP**	5400 LIMESTONE ROAD WILMINGTON, DE 19808-1232 TEL. (302)239-6634 FAX (302)239-8485
PROJECT. NO. 6252.GC	**ADDITION AND RENOVATIONS SMYRNA ELEMNTARY SCHOOL**	**CHECKED BY: JJ**	OFFICES IN DELAWARE, MARYLAND PENNSYLVANIA AND NEW JERSEY
SHEET: FIGURE 1	**SMYRNA - KENT COUNTY - DELAWARE**	**FILE: A-6252GC-01**	E-MAIL: DUFFIELD@DUFFNET.COM

DUFFIELD ASSOCIATES
Soil, Water & the Environment

TEST BORING TB-1

Geotechnical Evaluation
Addition and Renovations
Smyrna Elementary School
Smyrna, Delaware
Project No. 6252.GC

Date Started : January 23, 2015
Date Completed : January 23, 2015
Logged by : JJ
Weather : Sunny, 20's
Driller/Agency : D. Wilson/CGCG

Drilling Equipment : Truck Mounted Diedrich D-50
Drilling Methods : HSA (SPT, ASTM D 1586)

Sample Condition: ⊠ Remolded

Water Levels

Depth in feet	Layer Depth feet	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	0.3			TOPSOIL (3 inches ±)							
2			SM	Brown, fine SAND, some silt, little medium sand, trace gravel (moist)	⊠	S-1	3-5-6	1.0			
4				Dark brown, fine SAND and SILT, trace medium to coarse sand (moist); 44.3% passing No. 270 sieve	⊠	S-2	4-4-5	1.2	21.2		
6	6.0										
8				Brown, fine SAND, little silt, trace gravel (moist)	⊠	S-3	2-3-3	1.0			
10			SM	Brownish orange, fine SAND, trace to little silt (moist to dry)	⊠	S-4	3-3-3	1.4			
12											
14				Yellowish brown fine SAND, trace silt, trace gravel (moist to dry)	⊠	S-5	3-4-5	1.5			
15	15.0										
16											
18											
20											

NOTES:
1. Test boring terminated at ± 15.0 feet below existing ground surface (b.e.g.s.).
2. Wet-on-spoon conditions not encountered.
3. Upon removal of the augers, borehole dry and caved to 11.9 ft b.e.g.s.
4. Borehole backfilled with auger cuttings upon completion.
5. Soil descriptions performed in general accordance with ASTM D 2488, the Practice for Description and Identification of Soils (Visual-Manual Procedure).

DUFFIELD ASSOCIATES
Soil, Water & the Environment

TEST BORING TB-2

Geotechnical Evaluation
Addition and Renovations
Smyrna Elementary School
Smyrna, Delaware
Project No. 6252.GC

Date Started : January 23, 2015
Date Completed : January 23, 2015
Logged by : JJ
Weather : Sunny, 20's
Driller/Agency : D. Wilson/CGCG

Drilling Equipment : Truck Mounted Diedrich D-50
Drilling Methods : HSA (SPT, ASTM D 1586)

Sample Condition: ⊠ Remolded
Water Levels

Depth in feet	Layer Depth feet	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	0.3			TOPSOIL (3 inches ±)							
2			SM	Brown, orange, fine SAND, some silt (moist); possible fill	⊠	S-1	5-3-3	1.1			
	3.0										
4				Orange, tan fine SAND, little silt, trace medium sand (moist)	⊠	S-2	2-3-2	1.2	12.9	20.4	
6				Orange, tan fine to medium SAND, trace to little silt (moist)	⊠	S-3	3-2-2	1.0			
8				Orange, tan fine SAND, little silt, trace medium sand (moist)	⊠	S-4	2-2-2	0.9	11.7	17.8	
10			SM								
12											
14				Orange, tan fine to medium SAND, trace silt (moist)	⊠	S-5	5-6-5	1.3			
16											
18				Orange, gray fine to medium SAND, trace silt (moist)	⊠	S-6	5-6-7	1.0			
20	20.0										

NOTES:
1. Test boring terminated at ± 20.0 feet below existing ground surface (b.e.g.s.).
2. Wet-on-spoon conditions not encountered.
3. Upon removal of the augers, borehole dry and caved to 11.9 ft b.e.g.s.
4. Borehole backfilled with auger cuttings upon completion.
5. Soil descriptions performed in general accordance with ASTM D 2488, the Practice for Description and Identification of Soils (Visual-Manual Procedure).

DUFFIELD ASSOCIATES
Soil, Water & the Environment

TEST BORING TB-3

Geotechnical Evaluation
Addition and Renovations
Smyrna Elementary School
Smyrna, Delaware
Project No. 6252.GC

Date Started : January 23, 2015
Date Completed : January 23, 2015
Logged by : JJ
Weather : Sunny, 20's
Driller/Agency : D. Wilson/CGCG

Drilling Equipment : Truck Mounted Diedrich D-50
Drilling Methods : HSA (SPT, ASTM D 1586)

Sample Condition: ⊠ Remolded
Water Levels

Depth in feet	Layer Depth feet	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				TOPSOIL (12 inches ±)	⊠	S-1	2-3	0.6			
	1.0										
2			SM	Orange, brown, gray fine to coarse SAND, some silt, little gravel (moist)	⊠	S-2	2-2-3	1.6	13.0	22.2	
4				Orange, tan fine SAND, some silt (moist)	⊠	S-3	3-4-2	1.2			
	5.0										
6											
8											
10											
12											
14											
16											
18											
20											

NOTES:
1. Test boring terminated at ± 5.0 feet below existing ground surface (b.e.g.s.).
2. Wet-on-spoon conditions not encountered.
3. Borehole collapse did not occur.
4. Borehole backfilled with auger cuttings upon completion.
5. Soil descriptions performed in general accordance with ASTM D 2488, the Practice for Description and Identification of Soils (Visual-Manual Procedure).

DUFFIELD ASSOCIATES
Soil, Water & the Environment

TEST BORING TB-4

Geotechnical Evaluation
Addition and Renovations
Smyrna Elementary School
Smyrna, Delaware
Project No. 6252.GC

Date Started : January 23, 2015
Date Completed : January 23, 2015
Logged by : JJ
Weather : Sunny, 20's
Driller/Agency : D. Wilson/CGCG

Drilling Equipment : Truck Mounted Diedrich D-50
Drilling Methods : HSA (SPT, ASTM D 1586)

Sample Condition: ⊠ Remolded
Water Levels

Depth in feet	Layer Depth feet	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				TOPSOIL (12 inches ±)		S-1	2-3	0.8			
	1.0										
2				Brown, orange, fine SAND and SILT (moist)		S-2	4-5-4-3	1.1			
			SM								
4				Orange fine SAND, some silt (moist)		S-3	2-3-2-2	1.1			
	5.0										
6											
8											
10											
12											
14											
16											
18											
20											

NOTES:
1. Test boring terminated at ± 5.0 feet below existing ground surface (b.e.g.s.).
2. Wet-on-spoon conditions not encountered.
3. Borehole collapse did not occur.
4. Borehole backfilled with auger cuttings upon completion.
5. Soil descriptions performed in general accordance with ASTM D 2488, the Practice for Description and Identification of Soils (Visual-Manual Procedure).

DUFFIELD ASSOCIATES
Soil, Water & the Environment

CONSTANT HEAD
BOREHOLE INFILTRATION TEST

Field Procedure:

A. Excavate a test pit or perform a Standard Penetration Test boring (continuous SPT) to a depth of 4 feet below the proposed BMP bottom.
   a. Determine the depth to groundwater table upon initial drilling or digging if within 4 feet of the proposed facility bottom.
   b. Determine the depth to bedrock if within 4 feet of the proposed facility bottom.
   c. Determine the United States Department of Agriculture (USDA) and Unified Soil Classification System (USCS) textures at the proposed bottom of facility and 4 feet below the facility. The soil description should include all horizons encountered.

B. **Determine depth of infiltration test as the least permeable soil horizon within three feet of the bottom of the proposed facility**. Contact project manager to confirm test depth.

C. Offset at least five feet from the initial test boring, advance a second excavation or auger boring to within six inches of the infiltration test depth.

D. Set up the borehole infiltrometer.
   a. Install a solid 5-inch diameter casing by driving six inches into the base of the borehole in the soil horizon intended for infiltration testing.
   b. Using a hand-auger, excavate six inches of loose material from inside the casing to provide a natural soil interface into which water may infiltrate. **Do not compact the soil at the bottom of the casing.**
   c. A two-inch layer of coarse sand or fine gravel may be placed to protect the bottom from scouring and sediment.
   d. Fill the casing with clean water to a depth of 24” and **allow to pre-soak for 24 hours**.

E. Conduct infiltration testing
   a. After the 24-hour soak period, refill the casing to a depth of 24” with clean water.
   b. For 4 hours, take a water level reading a minimum of every 60 minutes and a maximum of every 15 minutes, refilling to 24 inches with each measurement.

F. The final field rate may either be measured as the average drop in water level or the final stabilized rate. **The final rate shall be recorded in inches per hour.**

Laboratory Procedure:

A. Determine the Natural Moisture Content and Percent Passing a No. 270 Sieve of the soil stratum in which infiltration testing is conducted. This data is used to evaluate the soil in accordance with the USDA textural classification and Hydraulic Soil Group.

References:

1. DNREC BMP Standards and Specifications: 3.06.2.A-1: Soil Investigation Procedures
2. ASTM-D5126 “Comparison of Field Methods for Determining Hydraulic Conductivity in the Vadose Zone.”
3. The Maryland Stormwater Design Manual, Appendix D.1: Testing Requirements for Infiltration, Bioretention and Sand Filter Subsoils

GENERAL NOTES

DUFFIELD ASSOCIATES uses the following definitions and terminology to classify and correlate the field and laboratory samples.

VISUAL UNIFIED CLASSIFICATIONS: The soil samples are described by color, major constituent, modifiers (by percentage), and density (or consistency). Coarse Grained or Granular Soils have more than 50% of their dry weight retained on a No. 200 sieve; they are described as: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a No. 200 sieve; they are described as: clays or clayey silts if they are cohesive and silts if they are noncohesive. In addition to gradation, granular soils are defined on the basis of their relative in-place density and fine grained soils on the basis of their strength or consistency and their plasticity.

The Unified Soil Classification symbols are:

COARSE GRAINED SOILS

GW - Well graded gravels
GP - Poorly graded gravels
GM - Silty gravels
GC - Clayey gravels
SW - Well graded sands
SP - Poorly graded sands
SM - Silty sands
SC - Clayey sands

FINE GRAINED SOILS

ML - Silts of low plasticity
CL - Clays of low to medium plasticity
OL - Organic silt clays of low plasticity
MH - Silts of high plasticity
CH - Clays of high plasticity
OH - Organic silt clays of high plasticity
PT - Peat and highly organic soils

SIZE DESCRIPTION

F - Fine
M - Medium
C - Coarse
G - Gravel

MODIFIERS (PERCENTAGE)

Tr -	Trace	1 - 10%
Ltl -	Little	11 - 20%
Some		21 - 35%
& -	And	36 - 50%

COLOR

Or - Orange
Yel - Yellow
Br - Brown
Blk - Black
Gr - Gray
R - Red
Vc - Varicolored
Dk - Dark
Lt - Light

DENSITY: COARSE GRAINED SOILS

Very loose	4 blows/ft or less
Loose	5 to 10 blows/ft
Medium	11 to 30 blows/ft
Dense	31 to 50 blows/ft
Very Dense	51 blows/ft or more

CONSISTENCY: FINE GRAINED SOILS

Very soft	2 blows/ft or less
Soft	3 to 4 blows/ft
Medium	5 to 8 blows/ft
Stiff	9 to 15 blows/ft
Very stiff	16 to 30 blows/ft
Hard	31 blows/ft or more

NOTE: The Standard Penetration Test "N" value is the number of blows per foot of a 140 pound hammer falling 30 inches on a 2 inch O.D. split spoon sampler, except where otherwise noted.

MAKE LIVE TAP TO EX. CITY WATERMAIN. PROVIDE TAPPING SLEEVE AND VALVE. COORDINATE WORK WITH CITY AND OWNER. PROVIDE FULL DEPTH ASPHALT PAVING RESGTORATION FOR ALL DISTRUBED PAVING WORK. PROVIDE TRAFFIC CONTROLS AND SIGNAGE PER DELDOT AND MUTCD STDS.

SOUTH STREET
(50' WIDE R.O.W.)

RANSOME LANE
(50' WIDE R.O.W.)

EX. SAN M.H.
RIM EL.: 29.83

EX. STORM C.B.
RIM EL.: 29.70'

EX. SAN M.H.
RIM EL.: 29.69'

EX. STORM C.B.
RIM EL.: 29.49'

EX. SAN M.H.
RIM EL.: 30.49'

EX. STORM C.B.
RIM EL.: 29.48'
INV. EL.: 26.63'

EX. SAN M.H.
RIM EL.: 29.64'
INV. EL.: 23.72'

EX. STORM M.H.
RIM EL.: 30.08'
INV. EL.: 25.78'

EX. STORM M.H.
RIM EL.: 30.70'
INV. EL.: 27.60'

EX. STORM M.H.
RIM EL.: 34.55'
INV. EL.: 30.11'

EX. STORM M.H.
RIM EL.: 35.01'
LOCKED

EX. STORM C.B.
RIM EL.: 35.03'
INV. EL.: 32.59'

EX. STORM C.B.
RIM EL.: 34.86'
INV. EL.: 32.03'

EX. STORM M.H.
RIM EL.: 37.04'

EX. STORM C.B.
RIM EL.: 36.05'
INV. EL.: 34.80'

EX. STORM C.B.
RIM EL.: 36.13'

EX. STORM C.B.
RIM EL.: 36.07'

EX. STORM M.H.
RIM EL.: 37.01'

EX. STORM C.B.
RIM EL.: 35.97'

EX. STORM M.H.
RIM EL.: 25.87'
INV. EL.: 22.87'

EX. STORM C.B.
RIM EL.: 27.35'
INV. IN: 23.90'
INV. OUT: 23.80'

EX. STORM C.B.
RIM EL.: 28.03'
INV. IN: 24.73'
INV. OUT: 24.63'

EX. STORM C.B.
RIM EL.: 28.87'

EX. STORM C.B.
RIM EL.: 33.25'
INV. EL.: 31.45'

EX. STORM C.B.
RIM EL.: 33.19'
INV. EL.: 31.79'

EX. STORM C.B.
RIM EL.: 29.80'
INV. IN: 26.80'
INV. IN: 26.70'
INV. OUT: 26.60'

EX. STORM C.B.
RIM EL.: 28.27'
INV. EL.: 25.72'

EX. STORM C.B.
RIM EL.: 36.53'
INV. EL.: 33.93' (12")
INV. EL.: 32.40' (12")
INV. EL.: 31.45'

EX. STORM C.B.
RIM EL.: 34.10'

RELOCATED PLAYGROUND AREA

RELOCATED PLAYGROUND AREA

BASEBALL FIELD

4" FIRE LANE STRIPING PER STATE FIRE REQUIREMENTS

EXTEND NEW 8" D.I. FIRE/WATER SERVICE.

PROTECT EX. PORTIONS OF WALK AND CURE TO REMAIN

SAW-CUT/BUTT JOINT

SAW-CUT EX. CONCRETE WALK. EXTEND NEW LAWN AREA UP TO EDGE OF WALK.

PROPOSED HYDRANT & VALVE

CONSTRUCT FULL-DEPTH ASPHALT PAVING SECTION FOR NEW PARKING LOT (SEE DETAIL).

EX. CONC. WALK TO REMAIN

REPLACE ALL DEMOLISHED AND DAMAGED CONCRETE WALKS WITH NEW P.C.C. WALK SECTIONS.

BIO-RETENTION SWM FACILITY #1
530± SF BIO AREA
WITH 3" MULCH LAYER
TOP BIO-SOIL EL. 28.00'
BOT BIO-SOIL EL. 26.00'
BOT STONE SUMP EL. 24.00'

PROPOSED SWM BIO-RET. AREA #1

PROPOSED LOADING DOCK CONCRETE SAD.

PR. OUTLET STR. #1
NYLOPLAST 8" INLINE DRAIN WITH DOME GRATE
TOP EL. 28.50'
INV EL. 25.25'

PROPOSED LOADING DOCK

12" SDR-26 PVC @ 0.0225

8" SDR-26 PVC

INSTALL BOLLARD SET 2' OFF BLDG. CORNER

APPROX. LIMITS OF BLDG. RENOVATIONS

PR. FIRE DEPARTMENT CONNECTION, TYP.

PROPOSED BUILDING ADDITION
F.F. EL. 35.55'±

EXISTING ELEMENTARY SCHOOL

F.F. 35.60'

20'x30' BLDG.
38.00

CONSTRUCT MIN. 2" ASPHALT OVERLAY. PROVIDE TACK COAT OVER MILLED PAVING (SEE DETAIL).

FULL-DEPTH ASPHALT EDGE MILL/OVERLAY

PROVIDE FULL-DEPTH ASPHALT PAVING IN LOCATION OF DEMOLISHED CONCRETE PAD.

TRANS

SHED

TANK

LOADING

EXTEND NEW 8" SDR-26 PVC ROOF DRAIN PIPING. CONNECT TO EX. INLET. MATCH INV. EL.

PROVIDE 8"x12" SDR-26 PVC INCREASER

COORDINATE D.S. CONNECTIONS AND ELEVATIONS WITH PLUMBING (TYP.).

PROPOSED CONCRETE STEPS AND LANDINGS (SEE ARCH. DWGS.)

(7) RISERS FOR TOP STEPS
(3) RISERS FOR BOT. STEPS
6" RISER HT.

NEW GREASE TRAP SEE MEP DWGS. STRUCTURE DETAILS AND FOR PIPING AND CLEANOUTS INTO BUILDING.

CONNECT NEW SANITARY TO EXISTING. PROVIDE CLEANOUT AND TEE-WYE CONNECTION. MATCH EX. INVERT ELEVATION.

NEW RAMP AND STEPS SEE ARCH. DWGS.

CONC. WALK

GRASS

LOD

EX. FENCE

CDA

1 C - 03 PLAN: SMYRNA ELEMENTARY SCHOOL - SITE CONSTRUCTION PLAN

SCALE: 1"=20'

20 10 0 20
1"=20'

CONSULTANTS:

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ISSUE DATES:

ISSUED FOR BID	03-11-2015
ADDENDUM 3	03-27-2015

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PROJECT

SMYRNA ELEMENTARY SCHOOL

ADDITION AND RENOVATIONS

121 South School Lane
Smyrna, DE 19977

DRAWING TITLE:
POST-CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN

DWN BY:	CHK BY:	PROJ. NUMBER:
EMT	CD	14107A

DATE: 03-11-2015

DRAWING NUMBER: C-04

SCALE:

MAKE LIVE TAP TO EX. CITY WATERMAIN. PROVIDE TAPPING SLEEVE AND VALVE. COORDINATE WORK WITH CITY AND OWNER. PROVIDE FULL DEPTH ASPHALT PAVING RESGTORATION FOR ALL DISTRUBED PAVING WORK. PROVIDE TRAFFIC CONTROLS AND SIGNAGE PER DELDOT AND MUTCD STDS.

SOUTH STREET (50' WIDE R.O.W.)

RANSOME LANE (50' WIDE R.O.W.)

58 PARKING SPACES

PROPOSED SWM BIO-RET. AREA

RELOCATED PLAYGROUND AREA

PROPOSED LOADING DOCK

BASEBALL FIELD

EXISTING ELEMENTARY SCHOOL

APPROX. LIMITS OF BLDG. RENOVATIONS

PROPOSED BUILDING ADDITION F.F. EL. 35.55'±

20'x30' BLDG 38.00

NEW RAMP AND STEPS SEE ARCH. DWGS.

CONSTRUCT FULL-DEPTH ASPHALT PAVING JOINT. TIE INTO SOUTH STREET PAVING. PROVIDE SAW-CUT AND BUTT-JOINT PER DELDOT STDS.

CONSTRUCT ADA CURB RAMP TYPE 1 PER TOWN & DELDOT STANDARDS.

CONSTRUCT ADA CURB RAMP TYPE 1 PER TOWN & DELDOT STANDARDS. FOR ALL CURB RAMPS PROVIDE MIN. 5' DEPRESSED CURB WITH MAX. 12:1 CURB TAPER. CONNECT NEW CURB TO EXITSING.

CONSTRUCT FULL-DEPTH ASPHALT PAVING SECTION FOR NEW PARKING LOT (SEE DETAIL).

ELECTRIC POLE TO BE RELOCATED PER TOWN STDS.

CONNECT NEW WALK AND CURB TO EXISTING (TYP.)

STORM C.B. #2 DELDOT 24"x34" RIM EL. 29.75' INV EL. 26.75'

STORM C.B. #1 DELDOT 24"x34" RIM EL. 31.05' INV EL. 27.15'

SITE LIGHTING, TYP. (SEE ELECTRIC DRAWINGS)

NEW 5' P.C.C. SIDEWALK

84 LF 18" RCP STORM

PR. FIRELANE SIGN, TYP.

BIO-RETENTION SWM FACILITY #1 4,100± SF BIO AREA WITH 3" MULCH LAYER TOP BIO-SOIL EL. 26.00' BOT.BIO-SOIL EL. 24.00 BOT STONE SUMP EL. 22.00'

PR. FES #1 18" RCP INV. EL. 26.00' R.O.P. TYPE 1 W1=6',Lo=12',W2=18' R-4 RIP-RAP (18" THICK)

STORM C.B. #1 DELDOT 24"x34" MODIFIED FOR SHALLOW DEPTH RIM EL. 29.35' INV. EL. 26.25'

15 LF 18" RCP STORM

50 LF 18" RCP STORM

R-4 RIP-RAP BERM

TC 30.35 BC 29.85

8'W x20'L SPILLWAY @ ELEV. 27.75'

27.75

EXTEND NEW 8" D.I. FIRE/WATER SERVICE.

4" FIRELANE STRIPING PER STATE FIRE REQ'TS

TRANSITION 8' P.C.C. SIDEWALK TO 5' WIDTH.

CONSTRUCT 30 LF DEPRESSED CURB WITH CONCRETE APRON SECTION.

STORM C.B. #1 DELDOT 24"x34" RIM EL. 33.05' INV EL. 28.05'

TRANSITION DEPRESSED CURB TO VERTICAL. PROVIDE 12:1 MAX TAPER.

4" FIRELANE STRIPING PER STATE FIRE REQ'TS

5' P.C.C. SIDEWALK

8' P.C.C. SIDEWALK

PROPOSED HYDRANT & VALVE

PR. 4" FIRELANE YELLOW STRIPING, TYP.

SITE LIGHTING, TYP. (SEE ELECTRIC DRAWINGS)

STORM C.B. #2 DELDOT 24"x34" RIM EL. 30.25' INV EL. 26.25'

INSTALL TRENCH DRAIN SILT FILTER ALONG LIMITS OF TRENCH DRAIN. FILTER SHALL BE AS MANUFACTURED BY BIO CLEAN ENVIRONMENTAL, MODEL #5-12, SIZED TO FIT 12" DRAIN OPENING (OR APPR'D EQUAL).

INSTALL BOLLARD SET 2' OFF BLDG. CORNER

22 LF 12" TRENCH DRAIN TOP EL. 35.10' INV. EL. 29.10'

CANOPY

8 LF DEPRESSED CURB. PROVIDE 12:1 CURB TAPER

ELECTRIC SERVICES, TYP. (SEE ELECTRIC DRAWINGS)

PR. FIRE DEPARTMENT CONNECTION, TYP.

PROPOSED LOADING DOCK CONCRETE PAD

PROVIDE 8"x12" SDR-26 PVC INCREASER

12" SDR-26 PVC @ 0.0225

PROPOSED CONCRETE STEPS AND LANDINGS (SEE ARCH. DWGS.)

(7) RISERS FOR TOP STEPS (3) RISERS FOR BOT. STEPS 6" RISER HT.

NEW GREASE TRAP SEE MEP DWGS. STRUCTURE DETAILS AND FOR PIPING AND CLEANOUTS INTO BUILDING.

CONNECT NEW SANITARY TO EXISTING. PROVIDE CLEANOUT AND TEE-WYE CONNECTION. MATCH EX. INVERT ELEVATION.

PROVIDE FULL-DEPTH ASPHALT PAVING IN LOCATION OF DEMOLISHED CONCRETE PAD.

BEGIN TRANSITION DEPRESSED CURB TO 6" VERTICAL.

CONSTRUCT 30 LF DEPRESSED CURB WITH CONCRETE APRON SECTION.

TRANSITION 8' P.C.C. SIDEWALK TO 5' WIDTH.

CONSTRUCT 8' P.C.C. SIDEWALK ALONG DROP-OFF DRIVE.

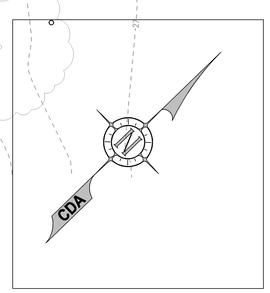
CONSTRUCT FULL-DEPTH ASPHALT PAVING SECTION FOR NEW PARKING LOT (SEE DETAIL).

CONSTRUCT 30 LF DEPRESSED CURB WITH CONCRETE APRON SECTION.

CONSTRUCT MIN. 2" ASPHALT OVERLAY. PROVIDE TACK COAT OVER MILLED PAVING (SEE DETAIL).

PR. OUTLET STR. #1 NYLOPLAST 8" INLINE DRAIN WITH DOME GRATE TOP EL. 26.50' INV. EL. 23.25'

106 LF 12" HDPE @ 0.025



1 C - 03 PLAN: SMYRNA ELEMENTARY SCHOOL - SITE CONSTRUCTION PLAN (ALTERNATE)

SCALE: 1"=20'

20 10 0 20

1"=20'

CONSULTANTS:

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ISSUE DATES:

ISSUED FOR BID	03-11-2015
ADDENDUM 3	03-27-2015

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PROJECT

SMYRNA ELEMENTARY SCHOOL

ADDITION AND RENOVATIONS

121 South School Lane
Smyrna, DE 19977

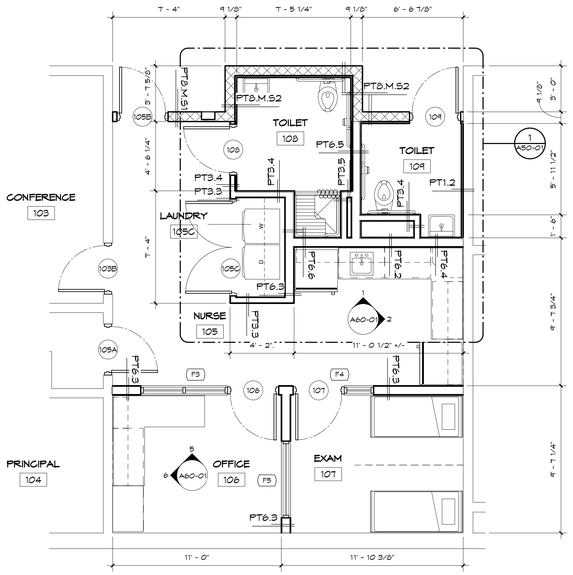
DRAWING TITLE:
POST-CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN

DWN BY:	CHK BY:	PROJ. NUMBER:
EMT	CD	14107A

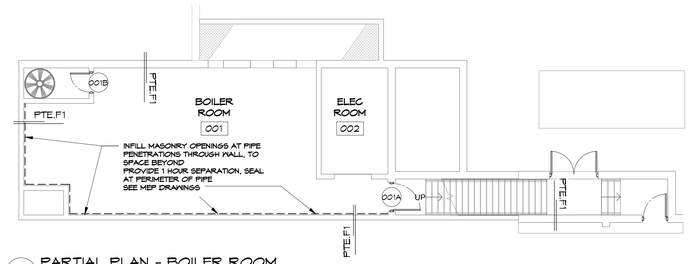
DATE: 03-11-2015

SCALE:

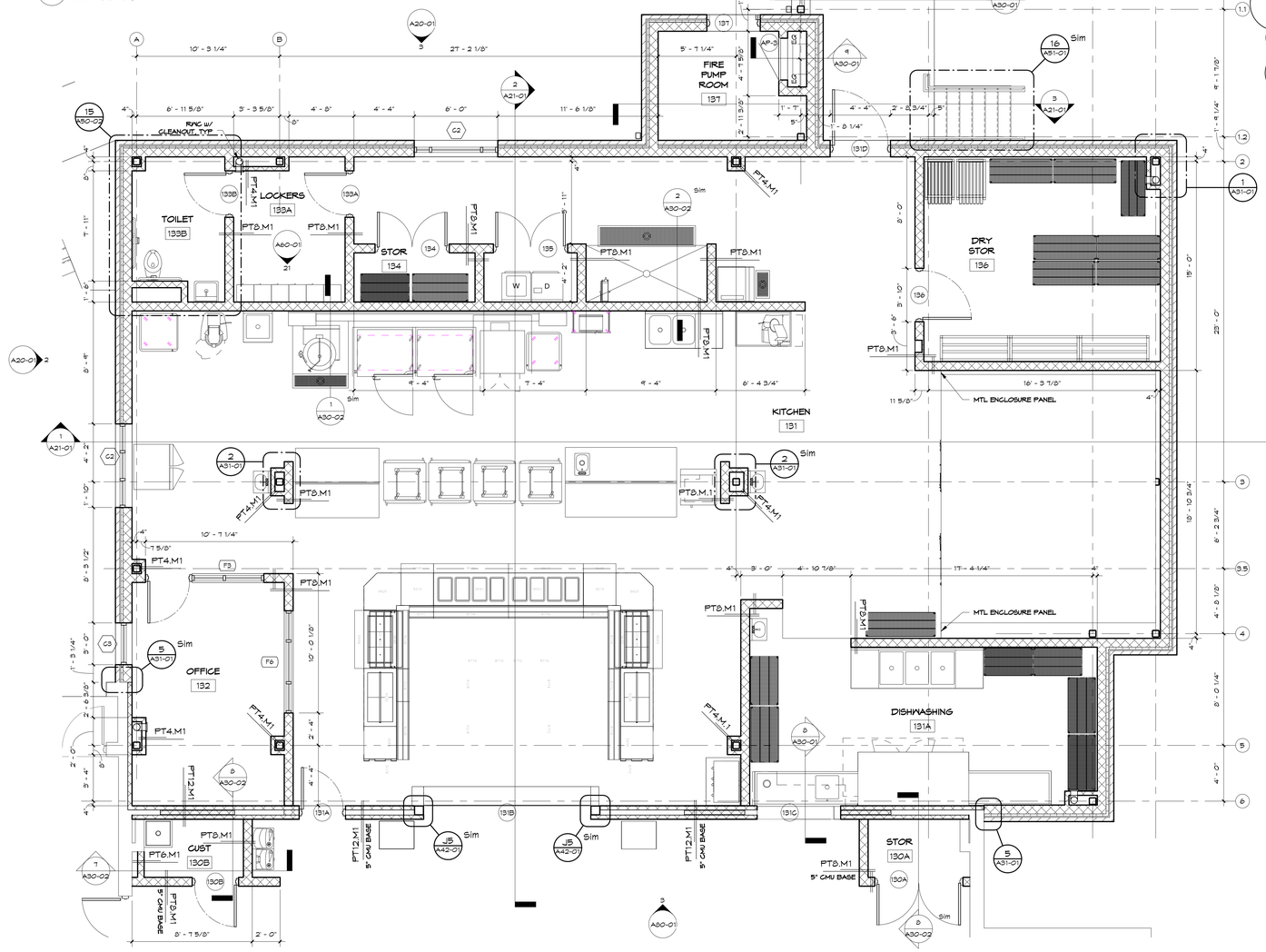
DRAWING NUMBER: C-04 (ALT)



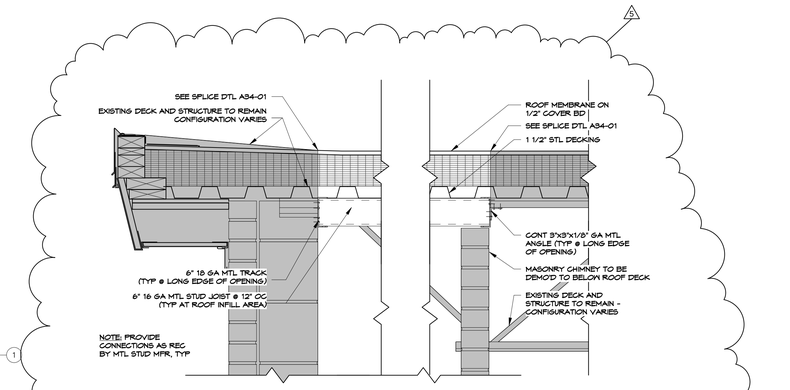
1 PARTIAL PLAN - NURSE SUITE
Scale: 1/4" = 1'-0"



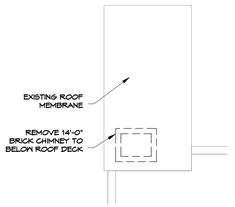
4 PARTIAL PLAN - BOILER ROOM
Scale: 1/8" = 1'-0"



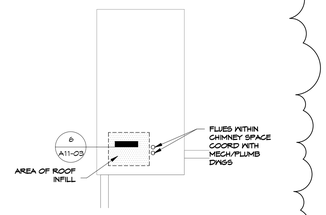
3 PARTIAL PLAN - KITCHEN
Scale: 1/4" = 1'-0"



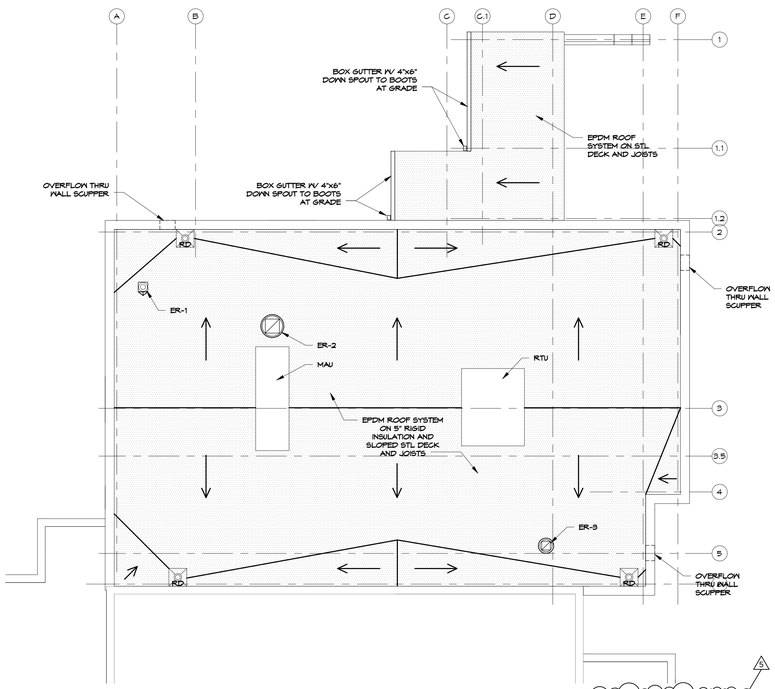
6 Roof Infill Dtl
Scale: 1 1/2" = 1'-0"



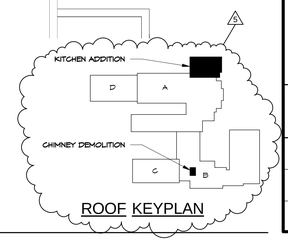
5 PARTIAL ROOF PLAN - CHIMNEY DEMO
Scale: 1/8" = 1'-0"



7 PARTIAL ROOF PLAN - ROOF INFILL
Scale: 1/8" = 1'-0"



2 PARTIAL ROOF PLAN - KITCHEN
Scale: 1/8" = 1'-0"



ROOF KEYPLAN

KENNETH B. HEARN
8238
STATE OF DELAWARE
REGISTERED ARCHITECT

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5	ADDENDUM 4	04-01-15

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PROJECT

SMYRNA ELEMENTARY SCHOOL

ADDITION AND RENOVATIONS

121 South School Lane
Smyrna, DE 19977

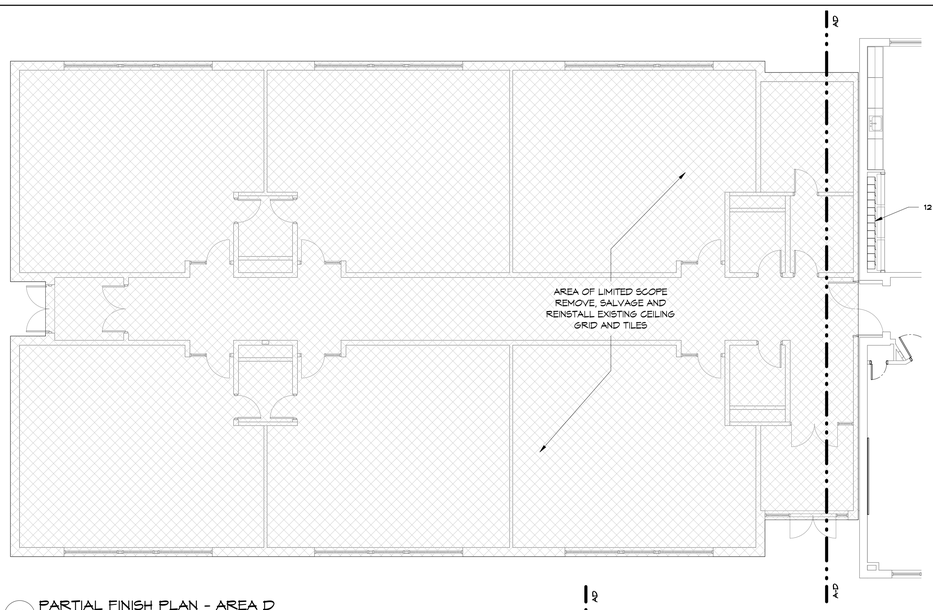
DRAWING TITLE:
PARTIAL FLOOR & ROOF PLANS

DWN BY:	CHK BY:	PROJ. NUMBER:
MAB	KBF	14107A

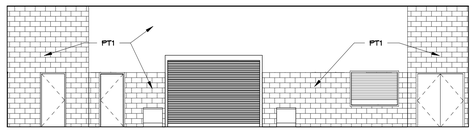
DATE: 04-02-15

DRAWING NUMBER: A11-03

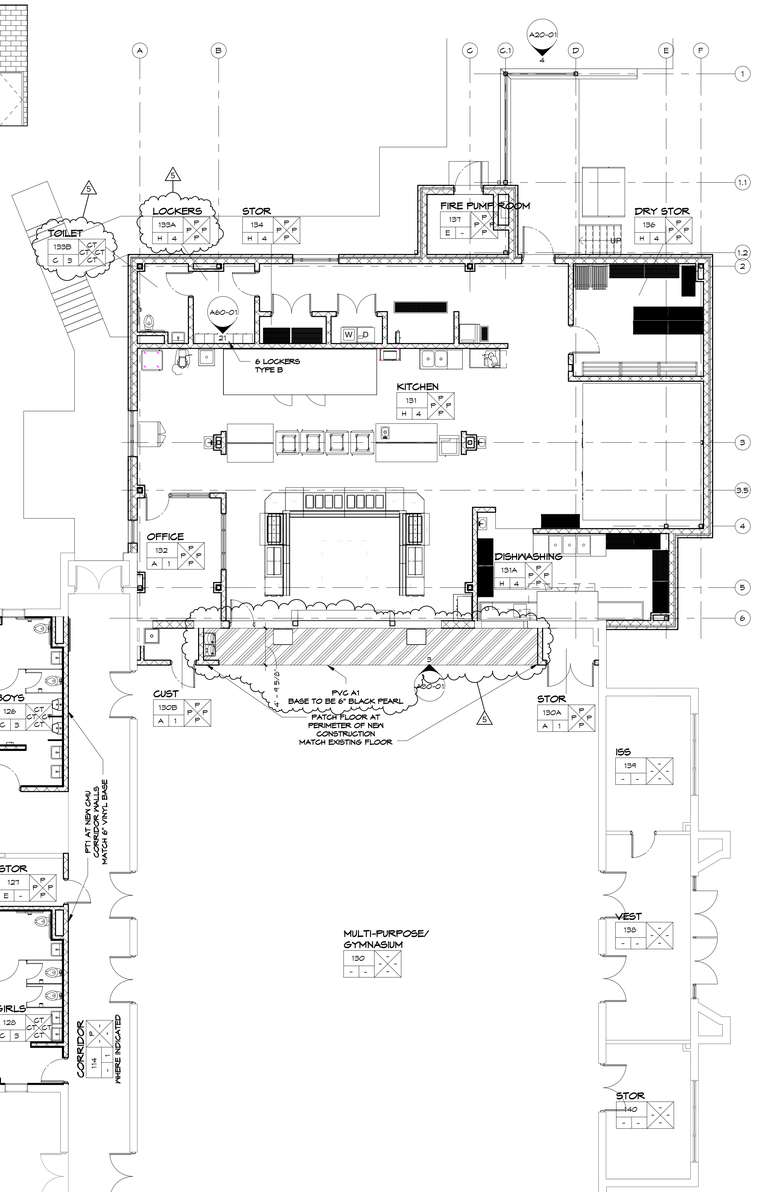
SCALE: As indicated

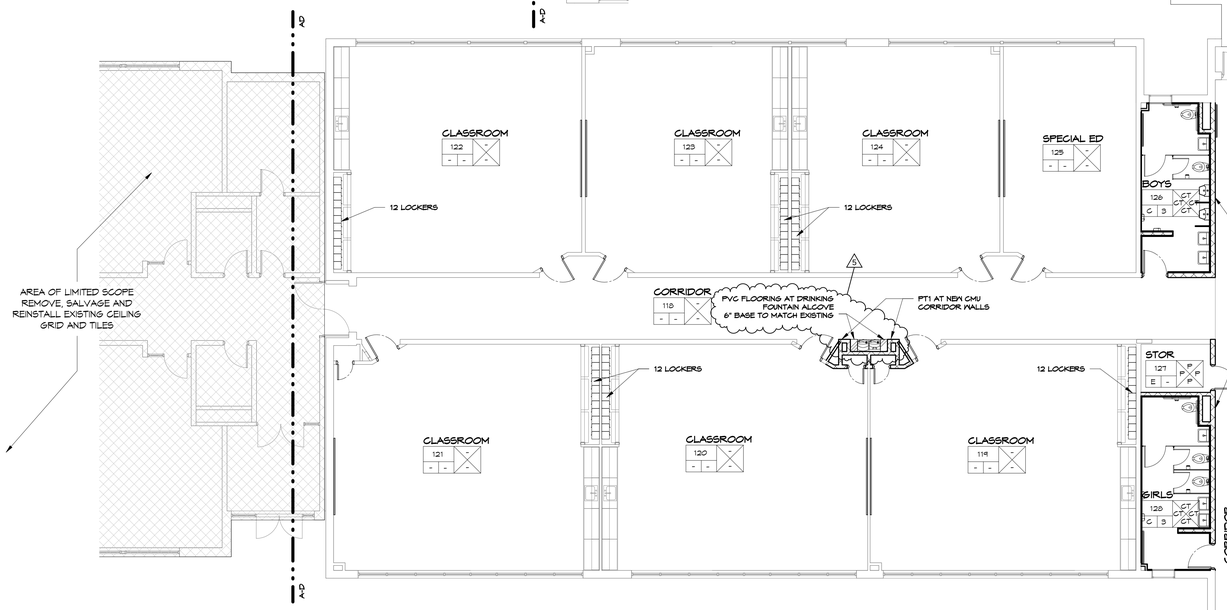


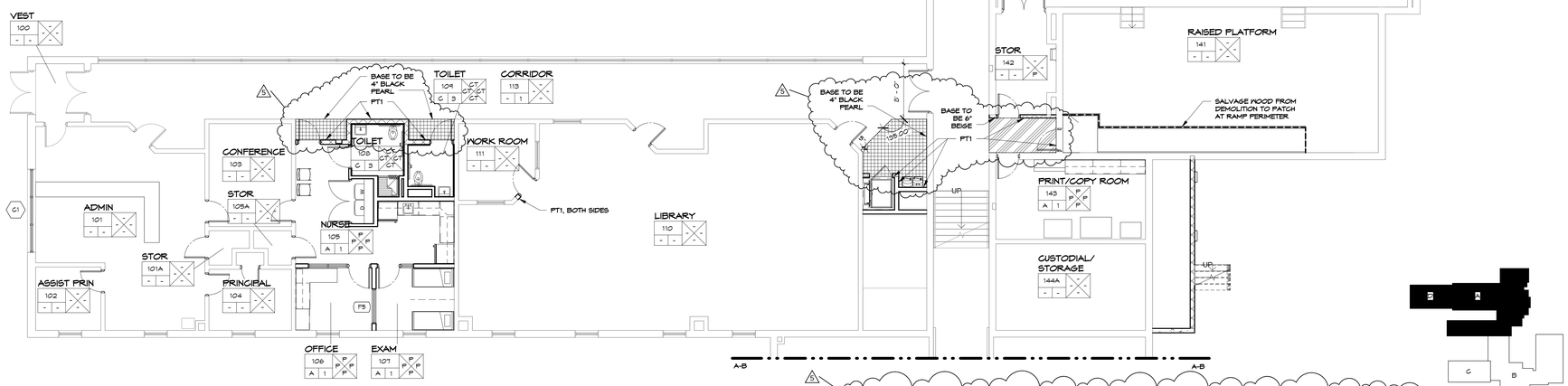
2 PARTIAL FINISH PLAN - AREA D
Scale: 1/8" = 1'-0"



3 INTERIOR ELEVATION - MULTIPURPOSE ROOM
Scale: 1/8" = 1'-0"







1 PARTIAL FINISH PLAN - AREA A & D
Scale: 1/8" = 1'-0"

FINISH LEGEND NOTES:

FINISH LEGEND NOTES:

1. ALL WALLS TO BE PT1 UNLESS NOTED OTHERWISE
2. ALL HOLLOW METAL DOOR FRAMES TO BE PT2
3. AT AREAS WHERE FLOOR IS TO BE INSTALLED, BASE IS TO BE INSTALLED TO MATCH EXISTING

ROOM FINISH LEGEND

ROOM NAME
ROOM # 102 — WALL FINISH (N-S-E-W)
FLOOR FINISH — A 2
BASE TYPE

FINISH NOTES

1. SEE REFLECTED CEILING PLANS FOR CEILING MATERIALS AND FINISHES. ALL AREAS OF EXPOSED DECK AND STRUCTURE TO BE PAINTED U. N. O.
2. SEE FINISH PLANS FOR DETAILED ROOM FINISH INFORMATION
3. SEE FINISH FLOOR PLANS FOR FLOOR PATTERNS
4. SEE ENLARGED TOILET ROOM PLANS FOR CERAMIC TILE FLOOR AND WALL PATTERNS

FLOOR FINISH MATERIALS

-	EXISTING FINISHES TO REMAIN
A	PVC TILE
B	VCT TILE
CP1	CARPET - COLOR 1
C	CERAMIC TILE
D	TACTILE RUBBER TREAD/ LANDING
E	SEALED CONCRETE
G	WOOD
H	QUARRY TILE
N	EPOXY PAINTED

BASE MATERIALS

-	EXISTING FINISHES TO REMAIN
1	VINYL
2	WOOD
3	CERAMIC COVE BASE
4	QUARRY TILE
5	NO BASE
6	STAINLESS STEEL - DIAMOND PLATE
7	RUBBER PROFILE

WALL FINISH MATERIALS

P	PAINTED	WC	WALLCOVERING
CT	CERAMIC TILE	WD	WOOD PANELING
X	UNFINISHED	AP	ACOUSTIC PANELING

FINISH LEGEND - PVC

A1 TO MATCH EXISTING
A2

FINISH LEGEND - VCT

B1 TO MATCH EXISTING
B2

NOTE: SEE SHEET A80-02 FOR FINISH SPECIFICATION AND LEGEND

KEYPLAN

KENNETH B. HEARN 8338 STATE OF DELAWARE REGISTERED ARCHITECT

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PROJECT

SMYRNA ELEMENTARY SCHOOL

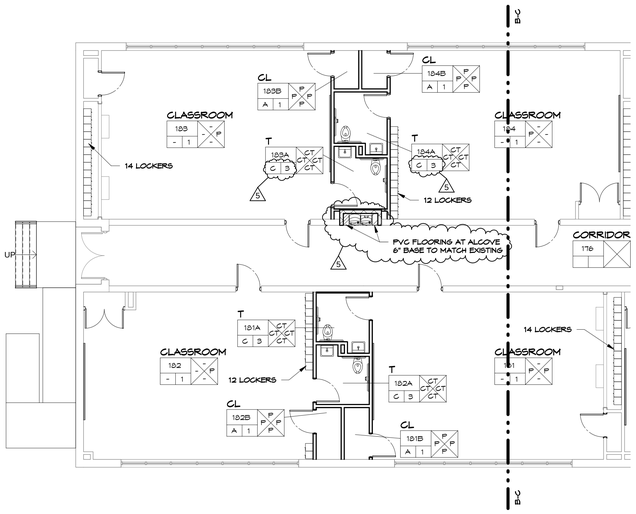
ADDITION AND RENOVATIONS

121 South School Lane
Smyrna, DE 19977

DRAWING TITLE:
FINISH PLAN - AREAS A & D

DWN BY:	CHK BY:	PROJ. NUMBER:
MAB	KBF	14107A

DATE: 04-02-15
SCALE: 1/8" = 1'-0"
DRAWING NUMBER: **A80-01**



2 PARTIAL FINISH PLAN - AREA C

Scale: 1/8" = 1'-0"

FINISH SPECIFICATIONS AND LEGEND

FLOORING

PVC TILE:

A1- CHECKERED PATTERN WITH 2 TILES:
MANUFACTURER: TOLI
STYLE: LINOTESTA
COLOR 1: DUSTY 522
COLOR 2: MUSHROOM 508
SIZE: 18" x 18", THK: .12"

A2- NOT USED

VCT TILE:

B1- MANUFACTURER: ARMSTRONG
STYLE: STANDARD EXCELON
COLOR: 52513 CIRQUE WHITE
SIZE: 12" x 12", THK: 1/8"

B2- MANUFACTURER: ARMSTRONG
STYLE: STANDARD EXCELON
COLOR: 51411 CLASSIC WHITE
SIZE: 12" x 12", THK: 1/8"

CARPET:

CP1- MANUFACTURER: MOHAWK INDUSTRIES
BRAND: BIGELOW
TYPE: BROADLOOM
STYLE: SKETCH PAD
COLOR: AUTUMN HARVEST 7866
WEIGHT: 20 OZ SQ/YD

QUARRY TILE:

H1- MANUFACTURER: AMERICAN OLEAN
STYLE: QUARRY TILE, UNGLAZED
COLOR: CANYON RED G01 (1)
SIZE: 6" x 6", THK: 1/2"

*ABOVE SHALL BE USED WITH THE FOLLOWING GROUT:
MANUFACTURER: MAPEI
STYLE: ULTRACOLOR
COLOR: 47 CHARCOAL

CERAMIC TILE:

C1- MANUFACTURER: AMERICAN OLEAN
STYLE: COMMERCIAL MOSAIC TILE
COLOR: PILLOW SPECKLED, A44 (1)
SIZE: 2" x 2"

C2- MANUFACTURER: AMERICAN OLEAN
STYLE: COMMERCIAL MOSAIC TILE
COLOR: MUSHROOM, A39 (2)
SIZE: 2" x 2"

C3- MANUFACTURER: AMERICAN OLEAN
STYLE: COMMERCIAL MOSAIC TILE
COLOR: RED, R26 (32)
SIZE: 2" x 2"

*ABOVE SHALL BE USED WITH THE FOLLOWING GROUT:
MANUFACTURER: MAPEI
STYLE: ULTRACOLOR
COLOR: 27 SILVER

BASE:

1- VINYL:
MANUFACTURER: JOHNSONITE
STYLE: 4" 4 6" (see plan) HIGH VINYL BASE
COLOR: #52 BLACK PEARL B
COLOR: #41 BEIGE WB

2- WOOD: 5/4" THK. SEE DRAWING DETAILS

3- CERAMIC TILE:
MANUFACTURER: AMERICAN OLEAN
STYLE: BRIGHT COVE BASE
COLOR: PILLOW SPECKLED A44 (1)

4- QUARRY TILE:
MANUFACTURER: AMERICAN OLEAN
STYLE: QUARRY TILE COVE BASE
COLOR: CANYON RED G01 (1)
SIZE: 6"

5- NO BASE REQUIRED

6- STAINLESS STEEL:
STYLE: DIAMOND PLATE COVE BASE
SIZE: 6" HIGH

WALLS

PAINT:

PT1- MANUFACTURER: GLIDDEN
COLOR: NATURAL WHITE, #A0050

PT2- MANUFACTURER: GLIDDEN
COLOR: TBD

CERAMIC TILE:

WT1- MANUFACTURER: AMERICAN OLEAN
STYLE: BRIGHT WALL TILE
COLOR: MATTE ALMOND (1) 0087
SIZE: 4 1/4" x 4 1/4"

WT2- MANUFACTURER: AMERICAN OLEAN
STYLE: BRIGHT WALL TILE
COLOR: MUSHROOM (2) 0038
SIZE: 4 1/4" x 4 1/4"

WT3- MANUFACTURER: AMERICAN OLEAN
STYLE: BRIGHT WALL TILE
COLOR: RUBY RED (5) 0121
SIZE: 4 1/4" x 4 1/4"

*ABOVE SHALL BE USED WITH THE FOLLOWING GROUT:
MANUFACTURER: MAPEI
STYLE: ULTRACOLOR
COLOR: 27 SILVER

MISCELLANEOUS

PLASTIC LAMINATE:

PL1- MANUFACTURER: NELSONART
COLOR: WALLABY, D439-60

PL2- MANUFACTURER: NELSONART
COLOR: NEUTRAL SLACE 4143-60

SOLID SURFACE MATERIAL

SS1- MANUFACTURER: DUPONT
STYLE: CORIAN SURFACES
COLOR: AURORA
THICKNESS: 1 1/8"

TOILET PARTITION MATERIAL

TP1- MANUFACTURER: SCRANTON PRODUCTS
COLOR: BLUEBERRY
THICKNESS: 1"

RUBBER STAIR TREADS

MANUFACTURER: JOHNSONITE
STYLE: VRTR ROUND TREAD/RISER
COLOR: #38 PEWTER
CONTRACTING INSERT
COLOR: #40 BLACK

RUBBER FLOOR TILE STAIR LANDINGS

MANUFACTURER: JOHNSONITE
STYLE: ROUNDEL-RT ROUND
COLOR: #38 PEWTER
SIZE: 2' x 2'

FINISH LEGEND NOTES:

FINISH LEGEND NOTES:

1. ALL WALLS TO BE PT1 UNLESS NOTED OTHERWISE
2. ALL HOLLOW METAL DOOR FRAMES TO BE PT2
3. AT AREAS WHERE FLOOR IS TO BE INSTALLED, BASE IS TO BE INSTALLED TO MATCH EXISTING

ROOM FINISH LEGEND

ROOM NAME
ROOM #
FLOOR FINISH
BASE TYPE
WALL FINISH (N-S-E-W)

FINISH NOTES

1. SEE REFLECTED CEILING PLANS FOR CEILING MATERIALS AND FINISHES. ALL AREAS OF EXPOSED DECK AND STRUCTURE TO BE PAINTED U. N. O.
2. SEE FINISH PLANS FOR DETAILED ROOM FINISH INFORMATION
3. SEE FINISH FLOOR PLANS FOR FLOOR PATTERNS
4. SEE ENLARGED TOILET ROOM PLANS FOR CERAMIC TILE FLOOR AND WALL PATTERNS

FLOOR FINISH MATERIALS

-	EXISTING FINISHES TO REMAIN
A	PVC TILE
B	VCT TILE
CP1	CARPET - COLOR 1
C	CERAMIC TILE
D	TACTILE RUBBER TREAD/ LANDING
E	SEALED CONCRETE
G	WOOD
H	QUARRY TILE
N	EPOXY PAINTED

BASE MATERIALS

-	EXISTING FINISHES TO REMAIN
1	VINYL
2	WOOD
3	CERAMIC COVE BASE
4	QUARRY TILE
5	NO BASE
6	STAINLESS STEEL - DIAMOND PLATE
7	RUBBER PROFILE

WALL FINISH MATERIALS

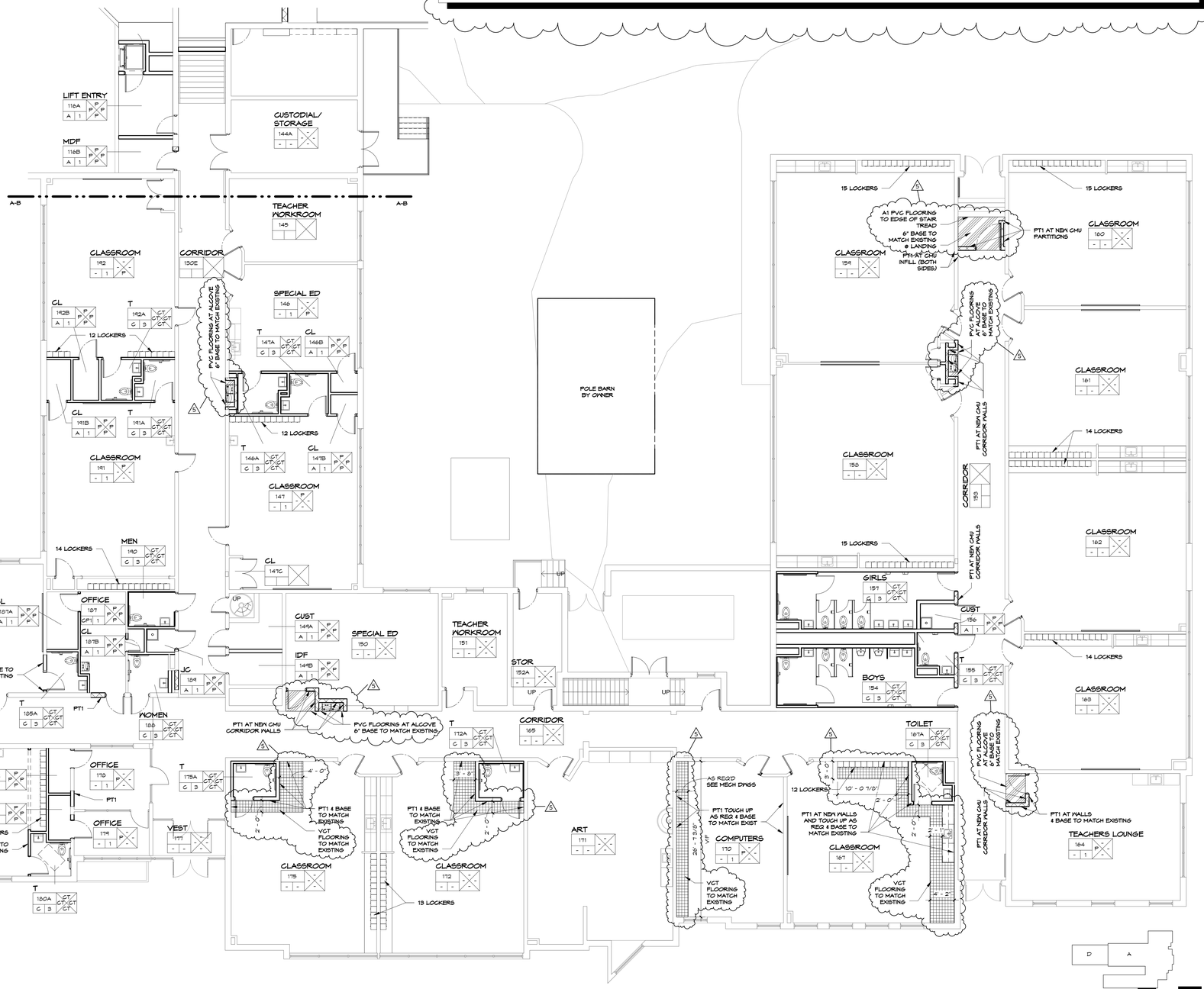
P	PAINTED	WC	WALLCOVERING
CT	CERAMIC TILE	WD	WOOD PANELING
X	UNFINISHED	AP	ACOUSTIC PANELING

FINISH LEGEND - PVC

A1 TO MATCH EXISTING
A2

FINISH LEGEND - VCT

B1 TO MATCH EXISTING
B2



1 PARTIAL FINISH PLAN - AREA B & C

Scale: 1/8" = 1'-0"

KEYPLAN

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ISSUE DATES:

1	ISSUED FOR BID	03-11-2015
5	ADDENDUM 4	04-01-15

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PROJECT

SMYRNA ELEMENTARY SCHOOL

ADDITION AND RENOVATIONS

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DRAWING TITLE:

FINISH PLAN - AREAS B & C

DWN BY:	CHK BY:	PROJ. NUMBER:	
MAB	KBF	14107A	
DATE:		DRAWING NUMBER:	
04-02-15		A80-02	
SCALE:			
1/8" = 1'-0"			