

**PROJECT MINUTES**

Project:	New W. Edward Balmer Elementary School	Project No.:	17020
Prepared by:	Joel Seeley	Meeting Date:	8/26/19
Re:	School Building Committee Meeting	Meeting No:	50
Location:	High School Media Center	Time:	7:00pm
Distribution:	School Building Committee Members, Attendees (MF)		

Attendees:

PRESENT	NAME	AFFILIATION	VOTING MEMBER
✓	Joseph Strazzulla	Chairman, School Building Committee	<b>Voting Member</b>
✓	Melissa Walker	School Business Manager	<b>Voting Member</b>
✓	Alicia Cannon	Representative of the Board of Selectmen	<b>Voting Member</b>
✓	Michael LeBrasseur	Chairman, School Committee	<b>Voting Member</b>
✓	Paul Bedigian	Representative of the Building, Planning, Construction Committee	<b>Voting Member</b>
✓	Steven Gogolinski	Representative of the Finance Committee	<b>Voting Member</b>
✓	Jeffrey Tubbs	Community Member with building design and/or construction experience	<b>Voting Member</b>
	Peter L'Hommedieu	Community Member with building design and/or construction experience	<b>Voting Member</b>
✓	Jeff Lundquist	Community Member with building design and/or construction experience	<b>Voting Member</b>
✓	Andrew Chagnon	Community Member with building design and/or construction experience	<b>Voting Member</b>
✓	Spencer Pollock	Parent Representative	<b>Voting Member</b>
	Adam Gaudette	Town Manager	Non-Voting Member
✓	Amy McKinstry	Interim Superintendent of Schools	Non-Voting Member
✓	Richard Maglione	Director of Facilities	Non-Voting Member
✓	Karlene Ross	Principal, W. Edward Balmer Elementary School	Non-Voting Member
✓	Theresa Gould	Principal, Northbridge Elementary School	Non-Voting Member
✓	Gregory Rosenthal	Director of Pupil Personnel Services	Non-Voting Member
	Lee Dore	D & W, Architect	
✓	Thomas Hengelsberg	D & W, Architect	
	David Fontaine	Fontaine Bros, CM	
✓	David Fontaine, Jr	Fontaine Bros, CM	
	David Barksdale	Fontaine Bros, CM	
✓	Jim Mauer	Fontaine Bros, CM	
✓	Joel Kent	Fontaine Bros, CM	
✓	Joel Seeley	SMMA, OPM	

Item #	Action	Discussion
50.1	Record	Call to Order, 7:14 PM, meeting opened.
50.2	Record	J. Strazzulla announced the meeting will be video and audio recorded with live broadcast and future re-broadcast.
50.3	Record	Public Comment - None
50.4	Record	A motion was made by P. Bedigian and seconded by M. LeBrasseur to approve the 8/6/19 School Building Committee meeting minutes. No Discussion, motion passed unanimous by those attending.
50.5	Record	Warrant No. 30 was reviewed.  A motion was made by A. Chagnon and seconded by M. LeBrasseur to approve Warrant No. 30. No discussion, motion passed unanimous.
50.6	Record	J. Seeley distributed and reviewed the updated Project Schedule, 90% Construction Documents Meetings and Agenda Schedule and updated 100% Construction Documents Meetings and Agenda Schedule, attached. The 9/4/19 SBC meeting is cancelled.
50.7	T. Hengelsberg J. Strazzulla J. Seeley	J. Strazzulla provided an overview of the Neighborhood Meeting held on 8/26/19, PowerPoint attached. The landscape planting design in front of each property along the East Property line was reviewed.  Some of property owners requested slight changes to some of the plantings, T. Hengelsberg will incorporate into the 100% Construction Documents.  J. Strazzulla indicated the property owners are to reach out to the J. Strazzulla or the Committee relative to requesting plantings to be planted on their private property in accordance with the 5/16/19 Planning Board conditions.  J. Seeley will post on the Project Website and email the neighbors when Saturday work is scheduled.
50.8	J. Strazzulla	J. Strazzulla will coordinate with Town Counsel on the Right of Entry and Release Agreement for the 282 Mason Road property owner, who has requested the Town remove three trees near the property line.
50.9	Record	J. Seeley distributed and reviewed the Town Manager's 8/9/19 letter to 192 Mason Road in response to their response to the Committee's proposal, attached. J. Strazzulla indicated the property owner responded via email to the Town Manager and indicated they will resolve in court.
50.10	T. Hengelsberg	J. Seeley distributed and reviewed the CDM Balmer School Flow Metering Study, attached, measuring the existing infiltration and inflow (I/I) from the existing Balmer School on-site sanitary sewer distribution system. Nitsch Engineering is reviewing the Study and will provide a response within the upcoming 2-3 weeks.  Committee Discussion:  1. J. Lundquist asked if the cost for off-site sanitary improvements is included in the budget? <i>J. Seeley indicated no, any off-site sanitary improvements would need to be funded out of the Owner's Change Order contingency budget.</i>



Item #	Action	Discussion
50.11	Committee	Committee will decide any action on the Electric Charging Stations after the 9/4/19 SBC meeting.
50.12	J. Strazzulla	J. Strazzulla to review the location of the relocated Vail Memorial with the Trustees of Soldiers Memorials Committee.
50.13	T. Hengelsberg	T. Hengelsberg to issue formal response to the design review meeting with the Disability Commission held on 7/10/19.
50.14	T. Hengelsberg	<p>T. Hengelsberg reviewed the Rooftop Mechanical Unit Noise Remediation options, 1) Free-Standing Screen, 2) Unit-Mounted Screen, and 3) Proprietary AAON Unit, attached. The Free-Standing Screen is the most advantageous option and the cost is included in the 90% Construction Documents cost estimate.</p> <p>Committee Discussion:</p> <ol style="list-style-type: none"> <li>1. J. Lundquist asked if the AAON Unit was measured at full fan speed or the anticipated fan speed on design degree days? <i>T. Hengelsberg will verify with the acoustical engineers and provide direction.</i></li> <li>2. J. Lundquist asked if diversity was taken into account on the AAON Unit operation? <i>T. Hengelsberg will verify with the HVAC engineers and provide direction.</i></li> </ol>
50.15		<p>J. Seeley distributed and reviewed the 90% Construction Documents Cost Estimates from PM&amp;C and FBI, and the 90% Construction Documents Cost Estimate Comparison Analysis, attached. Both estimates are below the Construction Budget of \$79,492,663.</p> <p>Committee Discussion:</p> <ol style="list-style-type: none"> <li>1. J. Tubbs asked how much design and estimating contingency is included in the estimate? <i>D. Fontaine indicated approximately \$700,000 is included for design and estimating contingency.</i></li> <li>2. J. Lundquist asked if the cost for the neighbors' fence, shed, trees and rock wall removals is included in the estimate? <i>J. Seeley indicated no, the neighbors' fence, shed, trees and rock wall removals will be funded out of the Owner's Change Order contingency budget.</i></li> <li>3. J. Lundquist asked if the Concrete and Steel Bids will be on budget? <i>D. Fontaine indicated a preliminary review shows them to be trending below budget.</i></li> <li>4. P. Bedigian asked when will the GMP be developed for the Concrete and Steel package? <i>J. Seeley indicated the Concrete and Steel package will be presented for approval at the 9/17/19 Committee meeting.</i></li> </ol>
50.16	Record	A Motion was made by A. Chagnon and seconded by A. Cannon to approve the 90% Construction Documents Submittal and authorize submission to the MSBA. No discussion, motion passed unanimous.
50.17	Record	J. Seeley distributed and reviewed the Trade Contractor Bid Results for the Early Concrete and Steel Package, attached. Five bids were received for the Waterproofing,

Item #	Action	Discussion
		<p>Dampproofing and Caulking Trade and one bid was received for the Elevator Trade, which was over budget. D. Fontaine indicated FBI contacted the Elevator Bidder in order to negotiate their bid to be within budget, the Bidder indicated they could not meet the budget.</p> <p>A Motion was made by A. Chagnon and seconded by M. LeBrasseur accept the Waterproofing, Dampproofing and Caulking Trade Bids and reject the Elevator Trade Bid and authorize FBI to obtain elevator bids as a non-Trade Contractor. No discussion, motion passed unanimous.</p>
50.18	Record	<p>J. Kent provided a Construction Update. The enabling work is complete, the 36" underground storm line tie-in to Crescent Street is complete, rough grading for the U10 playfield and the building footprint is underway.</p> <p>D. Fontaine indicated that the delay in removing the encroaching fence and shed at 192 Mason Road is impacting the U10 playfield rough grading and will impact the underdrain system installation. Further, when the fence and shed are relocated to the neighbor's side of the property line, all the work will need to be performed from the neighbor's-side of the property line, due to the current grade difference.</p>
50.19	Record	<p><b>Committee Questions</b></p> <ol style="list-style-type: none"> <li>J. Tubbs asked what open design-related items remain going into 100% Construction Documents? <i>T. Hengelsberg indicated three open design-related items remain, 1) full or partial under slab insulation, 2) final Rooftop Mechanical Unit Noise Remediation strategy and 3) alternate manufacturers to Nanowall.</i></li> <li>J. Tubbs asked if the 90% Pricing Construction Documents were reviewed? <i>J. Seeley indicated both FBI and SMMA reviewed the 90% Pricing Construction Documents and the documents were comprehensive and well done.</i></li> </ol>
50.20	Record	<b>Old or New Business</b> - none
50.21	Record	Next <b>SBC Meeting: 9/17/19 at TBD pm</b> at the High School Media Center. The anticipated agenda items are to review design refinements and vote to award the Early Concrete and Steel Package.
50.22	Record	A Motion was made by A. Chagnon and seconded by P. Bedigian to adjourn the meeting. No discussion, motion passed unanimous.

Attachments: Agenda, Budget Tracking Form, Warrant No. 30, Project Schedule, 90% Construction Documents Meetings and Agenda Schedule, 100% Construction Documents Meetings and Agenda Schedule, 8/26/19 Neighborhood Meeting PowerPoint, Town Manager's letter to 192 Mason Road, CDM Balmer School Flow Metering Study, 90% Construction Documents Cost Estimates from PM&C and FBI, and the 90% Construction Documents Cost Estimate Comparison Analysis, Trade Contractor Bid Results for the Early Concrete and Steel Package, PowerPoint

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes

## PROJECT MEETING SIGN-IN SHEET

Project: New W. Edward Balmer Elementary School  
 Prepared by: Joel Seeley  
 Re: School Building Committee Meeting  
 Location: High School Media Center  
 427 Linwood Avenue, Whitinsville, MA

Project No.: 17020  
 Meeting Date: 8/26/2019  
 Meeting No: 50  
 Time: ~~6:00pm~~  
 7:00

Distribution: Attendees, (MF)

SIGNATURE	ATTENDEES	EMAIL	AFFILIATION
	Joseph Strazzulla	<a href="mailto:jstrazzulla@nps.org">jstrazzulla@nps.org</a>	Chairman, School Building Committee
	Melissa Walker	<a href="mailto:mwalker@nps.org">mwalker@nps.org</a>	School Business Manager, MCPPO
	Alicia Cannon	<a href="mailto:cannonhome0927@gmail.com">cannonhome0927@gmail.com</a>	Member, Board of Selectmen, CEO
	Michael LeBrasseur	<a href="mailto:mlebrasseur@nps.org">mlebrasseur@nps.org</a>	Chairman, School Committee
	Paul Bedigian	<a href="mailto:bedigianps@cdmsmith.com">bedigianps@cdmsmith.com</a>	Representative of the Building, Planning, Construction Committee
	Steven Gogolinski	<a href="mailto:steve@gogolinskicpa.com">steve@gogolinskicpa.com</a>	Representative of the Finance Committee
	Jeffrey Tubbs	<a href="mailto:jtubbs@charter.net">jtubbs@charter.net</a>	Member of community with architecture, engineering and/or construction experience
	Peter L'Hommedieu	<a href="mailto:plhommedieu@shawmut.com">plhommedieu@shawmut.com</a>	Member of community with architecture, engineering and/or construction experience
	Jeff Lundquist	<a href="mailto:J.lundquist@charter.net">J.lundquist@charter.net</a>	Member of community with architecture, engineering and/or construction experience
	Andrew Chagnon	<a href="mailto:achagnon@vertexeng.com">achagnon@vertexeng.com</a>	Member of community with architecture, engineering and/or construction experience
	Spencer Pollock	<a href="mailto:spencerpollock22@gmail.com">spencerpollock22@gmail.com</a>	Parent Representative
	Adam Gaudette	<a href="mailto:agaudette@northbridgemass.org">agaudette@northbridgemass.org</a>	Town Manager
	Amy McKinstry	<a href="mailto:amckinstry@nps.org">amckinstry@nps.org</a>	Superintendent of Schools
	Richard Maglione	<a href="mailto:rmaglione@nps.org">rmaglione@nps.org</a>	Building Maintenance Local Official
	Theresa Gould	<a href="mailto:tgould@nps.org">tgould@nps.org</a>	Principal, W. Edward Balmer Elementary School
	Karlene Ross	<a href="mailto:kross@nps.org">kross@nps.org</a>	Principal, W. Edward Balmer Elementary School
	Jill Healy	<a href="mailto:jhealy@nps.org">jhealy@nps.org</a>	Director of Curriculum and Instruction
	Gregory Rosenthal	<a href="mailto:gresenthal@nps.org">gresenthal@nps.org</a>	Director of Pupil Personnel Services
	Lee P. Dore	<a href="mailto:lpdore@DoreandWhittier.com">lpdore@DoreandWhittier.com</a>	Dore & Whittier Architects
	Thomas Hengelsberg	<a href="mailto:thengelsberg@DoreandWhittier.com">thengelsberg@DoreandWhittier.com</a>	Dore & Whittier Architects
	David Fontaine, Jr.	<a href="mailto:djr@fontainebros.com">djf@fontainebros.com</a>	Fontaine Bros., Inc.
	David Barksdale	<a href="mailto:dbarksdale@fontainebros.com">dbarksdale@fontainebros.com</a>	Fontaine Bros., Inc.
	Jim Mauer	<a href="mailto:jmauer@fontainebros.com">jmauer@fontainebros.com</a>	Fontaine Bros., Inc.
	Joel Kent	<a href="mailto:jkent@fontainebros.com">jkent@fontainebros.com</a>	Fontaine Bros., Inc.
	Joel Seeley	<a href="mailto:jseeley@smma.com">jseeley@smma.com</a>	SMMA

## Agenda

Project:	New W. Edward Balmer Elementary School	Project No.:	17020
Re:	School Building Committee Meeting	Meeting Date:	8/26/2019
Meeting Location:	High School Media Center	Meeting Time:	7:00 PM
	427 Linwood Avenue, Whitinsville, MA	Meeting No.:	50
Prepared by:	Joel G. Seeley		
Distribution:	Committee Members (MF)		

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1. Call to Order
2. Public Comments
3. Approval of Minutes
4. Approval of Invoices and Commitments
5. Neighborhood Meeting Update
6. DPW Sanitary Systems Study Review
7. Review Reconciled 90% Construction Documents Cost Estimate
8. Vote to Submit 90% Construction Documents Package to MSBA
9. Trade Contractor Bids Review
10. Construction Update
  - Neighborhood Update
11. New or Old Business
12. Committee Questions
13. Next Meeting: ~~September 4, 2019~~ September 17, 2019
14. Adjourn

## Warrant No. 30

Project: New W. Edward Balmer Elementary School Project No.: 17020  
 Prepared by: Joel G. Seeley, AIA Date: 8/26/2019

School Building Committee for the W. Edward Balmer Elementary School hereby authorizes to draw against funds for the obligations incurred for value received in services and for materials shown below:

<u>Vendor</u>	<u>Invoice No.</u>	<u>Invoice Date</u>	<u>Invoice Amount</u>	<u>ProPay Code</u>	<u>Balance After Invoice</u>
Graves Engineering <i>Peer Review Consultant for Conservation Commission and Planning Board</i>	35101	08/07/2019	\$ 690.00	0104-0000	\$ 42,685.90
GateHouse New England	122033	08/04/2019	\$ 319.00	0103-0000	\$ 19,389.86

*Newspaper Advertisement for Early Foundation, Steel and Elevator Package Bidding*

**Total \$ 1,009.00**

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Joseph Strazzulla, Chair

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Melissa Walker

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Alicia Cannon

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Michael LeBrasseur

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Paul Bedigian

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Steven Gogolinski

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Jeffrey Tubbs

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Peter L'Hommedieu

\_\_\_\_\_  
Jeff Lundquist

\_\_\_\_\_  
Andrew Chagnon

\_\_\_\_\_  
Spencer Pollock

Approved on \_\_\_\_\_



# Graves Engineering, Inc.

100 Grove Street  
Worcester, MA 016052627  
Tel: (508) 856-0321 Fax: (508) 856-0357  
info@gravesengineering.com  
www.gravesengineering.com

## Invoice

Invoice Date: Aug 7, 2019

Invoice Num: 35101

Billing Through: Aug 3, 2019

R. Gary Bechtholdt, II  
Northbridge Planning Board  
7 Main Street  
Northbridge, MA 01588-

NorthbridgePB - Balmer School (19655BS:) - Managed by (JMW)

### Professional Services

Date	Employee	Description	Hours	Rate	Amount
6/26/2019	JMW	PEER REVIEW Second stormwater review.	0.25	\$148.00	\$37.00
7/10/2019	OAG	PEER REVIEW Second peer review	3.50	\$102.00	\$357.00
7/11/2019	JMW	PEER REVIEW Third site plan and stormwater review.	1.25	\$148.00	\$185.00
7/15/2019	JMW	PEER REVIEW Follow-up stormwater review and letter.	0.75	\$148.00	\$111.00

Total Service Amount:

Amount Due This Invoice:

*This invoice is due upon receipt*

### Account Summary

Services BTD	Expenses BTD	Last Inv Num	Last Inv Date	Last Inv Amt	Last Pay Amt	Prev Unpaid Amt
\$ 6,157.50	\$ 6.60	35020	6/7/2019	\$ 1,746.00	\$ 1,746.00	\$ 0.00

Total Amount Due Including This Invoice:

10	11	12	14	13	15	16	17	18	19
START	STOP	NEWSPAPER REFERENCE	DESCRIPTION	PRODUCT	SAU SIZE	BILLED UNITS	TIMES RUN	RATE	AMOUNT
Balance Forward									
07/08		P170231	Payment - FSC Lockbox 256016						(\$242.00)
07/24	07/24	I00408090-07242019	EARLY FOUNDATION, STEEL	WT&G	1.00 x 7.2500	7.25	1	\$44.00	\$319.00
Melissa Blodgett									
07/24	08/04	I00408090-07242019	EARLY FOUNDATION, STEEL	Telegram.com/Legals	1.00 x 7.2500	7.25	30		\$0.00
Melissa Blodgett									
PREVIOUS AMOUNT OWED:								\$242.00	
NEW CHARGES THIS PERIOD:								\$319.00	
CASH THIS PERIOD:								(\$242.00)	
DEBIT ADJUSTMENTS THIS PERIOD:								\$0.00	
CREDIT ADJUSTMENTS THIS PERIOD:								\$0.00	
<p><b>IMPORTANT ! PLEASE MAKE NOTE OF OUR NEW PAYMENT REMITTANCE ADDRESS.</b>  <b>TO ENSURE PROMPT POSTING OF YOUR PAYMENT, IT IS IMPORTANT THAT YOU USE THIS NEW ADDRESS.</b></p>									

**INVOICE AND STATEMENT OF ACCOUNT**

AGING OF PAST DUE ACCOUNTS

\* UNAPPLIED AMOUNTS ARE INCLUDED IN THE TOTAL AMOUNT DUE



21	CURRENT NET AMOUNT	22	30 DAYS	60 DAYS	Over 90 DAYS	* UNAPPLIED AMOUNT	23	TOTAL AMOUNT DUE	
	\$319.00		\$0.00	\$0.00	\$0.00	\$0.00		\$319.00	
24 SALES REP/PHONE #		25 ADVERTISER INFORMATION							
Kathleen Carr 508-793-9436		1	BILLING PERIOD	6	BILLED ACCOUNT NUMBER	7	ADVERTISER/CLIENT NUMBER	2	ADVERTISER/CLIENT NAME
			07/01/2019 - 08/04/2019		10008452		10008452		NORTHBRIDGE PUBLIC SCHOOLS

MAKE CHECKS PAYABLE TO

GateHouse New England  
PO Box 116653  
Atlanta, GA 30368-6653

PLEASE DETACH AND RETURN LOWER PORTION WITH YOUR REMITTANCE



Baystateparent  
Leominster Champion  
The Gardner News  
The Grafton News  
The Landmark  
The Millbury-Sutton Chronicle  
Worcester Magazine  
Worcester Telegram and Gazette

1	BILLING PERIOD	2	ADVERTISER/CLIENT NAME						
	07/01/2019 - 08/04/2019		NORTHBRIDGE PUBLIC SCHOOLS						
23	TOTAL AMOUNT DUE	* UNAPPLIED AMOUNT	3	TERMS OF PAYMENT					
	\$319.00	\$0.00		Due Upon Receipt					
21	CURRENT NET AMOUNT	22	30 DAYS	60 DAYS	Over 90 DAYS				
	\$319.00		\$0.00	\$0.00	\$0.00				
4	PAGE #	5	BILLING PERIOD	6	BILLED ACCOUNT NUMBER	7	ADVERTISER/CLIENT NUMBER	24	STATEMENT NUMBER
	1		08/04/2019		10008452		10008452		0000122033

**ADVERTISING INVOICE and STATEMENT**

8 BILLING ACCOUNT NAME AND ADDRESS

9 REMITTANCE ADDRESS

GateHouse New England  
PO Box 116653  
Atlanta, GA 30368-6653



3  
7 - 466

NORTHBRIDGE PUBLIC SCHOOLS  
87 LINWOOD AVE  
WHITINSVILLE MA 01588-2395



50000012203300100084520000319001

**SCHOOL BUILDING COMMITTEE  
W. EDWARD BALMER ELEMENTARY SCHOOL**

All meetings held at the  
**High School Media Center at 6:30 PM**  
unless otherwise noted

**MEETINGS SCHEDULE AND AGENDAS**  
May 6, 2019 *Updated August 22, 2019*

DATE	AGENDA
<b>90% Construction Documents Phase</b>	
July 2, 2019	BUILDING COMMITTEE MEETING Review Overall Construction Document Phase Schedule Review 90% Construction Document Schedule Review Design Refinements Approve Package 2 Trade Contractors
July 16, 2019	BUILDING COMMITTEE MEETING Review Design Refinements Review MSBA 60% Construction Documents Submission Comments
August 6, 2019	TRADE CONTRACTOR QUALIFICATION COMMITTEE MEETING Review RFQ
August 6, 2019	BUILDING COMMITTEE MEETING Review Design Refinements
August 26, 2019	BUILDING COMMITTEE MEETING (MONDAY) Review Reconciled 90% Construction Documents Cost Estimate Decide Value Engineering Items Vote to Submit 90% Construction Documents Package to MSBA
September 4, 2019	<b>SUBMIT 90% CONSTRUCTION DOCUMENTS PACKAGE TO MSBA</b>
	ADDITIONAL MEETINGS TO BE SCHEDULED



**SCHOOL BUILDING COMMITTEE  
W. EDWARD BALMER ELEMENTARY SCHOOL**

All meetings held at the  
**High School Media Center at 6:30 PM**  
unless otherwise noted

**MEETINGS SCHEDULE AND AGENDAS**

**July 2, 2019 Updated August 22, 2019**

DATE	AGENDA
<b>100% Construction Documents Phase</b>	
September 17, 2019	BUILDING COMMITTEE MEETING Review Overall Construction Document Phase Schedule Review 100% Construction Document Schedule Review Design Refinements Award Early Concrete and Steel
September 24, 2019	TRADE CONTRACTOR QUALIFICATION COMMITTEE MEETING Review of Trade Contractor Statements of Qualifications
October 1, 2019	BUILDING COMMITTEE MEETING Vote to Approve Trade Contractor Prequalifications Review MSBA 90% Construction Documents Submission Comments
November 19, 2019	BUILDING COMMITTEE MEETING Vote to Approve Trade Contractor Bids
	ADDITIONAL MEETINGS TO BE SCHEDULED

November 26, 2018  
Updated: August 26, 2019

New W. Edward Balmer Elementary School  
Project Schedule

PROJECT MANAGEMENT



ID	Task Name	Duration	Start	Finish	2014	2019
1	<b>MSBA PREREQUISITES</b>	431 days	3/9/2015	11/9/2016		
4	<b>RETAIN OPM</b>	45 days	1/30/2017	4/3/2017		
10	<b>RETAIN DESIGNER</b>	80 days	3/8/2017	6/27/2017		
20	<b>FEASIBILITY STUDY (FS)</b>	161 days	6/27/2017	2/14/2018		
35	<b>SCHEMATIC DESIGN (SD)</b>	86 days	2/14/2018	6/13/2018		
42	<b>PROJECT SCOPE AND BUDGET</b>	139 days	5/23/2018	12/6/2018		
50	<b>DESIGN DEVELOPMENT</b>	119 days	11/8/2018	4/26/2019		
59	<b>SITE PERMITTING</b>	170 days	11/7/2018	7/8/2019		
89	<b>BUILDING PERMITTING</b>	102 days	6/18/2019	11/8/2019		
94	<b>CONSTRUCTION DOCUMENTS</b>	160 days	3/8/2019	10/21/2019		
95	Incorporate MSBA DD Comments	11 days	4/29/2019	5/13/2019		
96	Develop 60% Contract Documents to Estimator	30 days	4/8/2019	5/17/2019		
97	<b>Early Site Enabling, and Preparation Package No. 1</b>	51 days	3/8/2019	5/17/2019		
98	OPM and Cx Review	13 days	5/17/2019	6/4/2019		
99	60% Construction Documents Cost Estimate	13 days	5/17/2019	6/4/2019		
100	<b>60% Construction Documents Submission to MSBA</b>	0 days	6/18/2019	6/18/2019	6/18/2019	60% Constru
101	MSBA Review of 60% CD Submission	16 days	6/19/2019	7/11/2019		
102	Incorporate MSBA 60% CD Comments	11 days	7/10/2019	7/24/2019		
103	Develop 90% Contract Documents to Estimator	30 days	6/18/2019	7/30/2019		
104	<b>Early Foundation and Structural Package No. 2</b>	30 days	6/18/2019	7/30/2019		
105	Structural Peer Review of Early Foundation and Structural Package	16 days	7/30/2019	8/20/2019		
106	90% Construction Documents Cost Estimate	16 days	7/30/2019	8/20/2019		
107	<b>90% Construction Documents Submission to MSBA</b>	0 days	9/4/2019	9/4/2019	9/4/2019	90% Constr
108	MSBA Review of 90% CD Submission	16 days	9/4/2019	9/25/2019		
109	Incorporate MSBA 90% CD Comments	11 days	9/25/2019	10/9/2019		
110	<b>Construction Documents Complete Package No. 3</b>	0 days	10/9/2019	10/9/2019	10/9/2019	Constructio
111	LEED-S Design Submission	9 days	10/9/2019	10/21/2019		
112	<b>PROCUREMENT</b>	514 days	12/6/2017	12/9/2019		
113	<b>CM Selection</b>	73 days	12/6/2017	3/21/2018		
120	<b>Prequalification - Package No. 2 Trade Contractors</b>	53 days	4/22/2019	7/3/2019		
128	<b>Prequalification - Package No. 3 Trade Contractors</b>	71 days	6/24/2019	10/2/2019		
129	Develop Draft RFQs	21 days	6/24/2019	7/23/2019		
130	Submit Advertisement to Central Register and Local Newspaper	0 days	7/23/2019	7/23/2019	7/23/2019	Submit Adve
131	Notice in Central Register	0 days	7/31/2019	7/31/2019	7/31/2019	Notice in Ce
132	Submit SOQs	0 days	8/21/2019	8/21/2019	8/21/2019	Submit SOC
133	Review SOQs	24 days	8/21/2019	9/24/2019		
134	Recommend Prequalified Trade Contractors to SBC	0 days	10/1/2019	10/1/2019	10/1/2019	Recommend
135	Issue Notification Letters to Prequalified Trade Contractors	0 days	10/2/2019	10/2/2019	10/2/2019	Issue Notifi
136	<b>100% Construction Documents Package No. 3</b>	48 days	10/1/2019	12/9/2019		
137	Submit Advertisement to Central Register and Newspaper	0 days	10/1/2019	10/1/2019		10/1/2019
138	Notice in Central Register	0 days	10/9/2019	10/9/2019	10/9/2019	Notice in Ce
139	Bid Package Issued	0 days	10/9/2019	10/9/2019	10/9/2019	10/9/2019
140	Pre-Bid Meeting	0 days	10/16/2019	10/16/2019	10/16/2019	Pre-Bid Mee
141	Trade Contractor Bids Due	0 days	11/6/2019	11/6/2019	11/6/2019	Trade Cont
142	CM Develop GMP	21 days	11/8/2019	12/9/2019		
143	GMP Approval	0 days	12/9/2019	12/9/2019	12/9/2019	GMP Appro
144	<b>EARLY PACKAGES PROCUREMENT</b>	85 days	5/17/2019	9/17/2019		
145	<b>Early Site Package No. 1</b>	18 days	5/17/2019	6/12/2019		
149	<b>Early Foundation, Steel and Elevator Structural Package No. 2</b>	44 days	7/16/2019	9/17/2019	9/17/2019	Early Found
150	Submit Advertisement to Central Register and Newspaper	0 days	7/16/2019	7/16/2019	7/16/2019	Submit Adve
151	Notice in Central Register and Newspaper	0 days	7/24/2019	7/24/2019	7/24/2019	Notice in Ce
152	Issue Early Concrete, Steel and Elevator Package Bid Documents	0 days	7/30/2019	7/30/2019	7/30/2019	Issue Early C
153	Pre-Bid Meeting	0 days	8/6/2019	8/6/2019	8/6/2019	Pre-Bid Mee
154	Trade Contractor Bids Due	0 days	8/20/2019	8/20/2019	8/20/2019	Trade Contr
155	Concrete and Steel Bids Due	0 days	8/20/2019	8/20/2019	8/20/2019	Concrete an
156	Descoping and Development of GMP Amendment	15 days	8/20/2019	9/10/2019		
157	Award Early Concrete, Steel and Elevator Package GMP	0 days	9/17/2019	9/17/2019	9/17/2019	Award Early
158	<b>CONSTRUCTION</b>	736 days	6/11/2019	4/21/2022		
159	Notice to Proceed	0 days	6/11/2019	6/11/2019	6/11/2019	Notice to Pro
160	Site Mobilization	0 days	6/18/2019	6/18/2019	6/18/2019	Site Mobiliza
161	<b>Substantial Completion - Phase 1 "Enabling Work"</b>	43 days	6/18/2019	8/16/2019		
162	50% DCAMM Evaluation	0 days	8/15/2020	8/15/2020	8/15/2020	50% DCA
163	Punch List Start	0 days	4/15/2021	4/15/2021	4/15/2021	Punch
164	Punch List Complete	0 days	6/15/2021	6/15/2021	6/15/2021	Punch
165	<b>Substantial Completion - Phase 2 "Building Construction"</b>	0 days	6/15/2021	6/15/2021	6/15/2021	Subst
166	Final Completion, Closeout and Commissioning	34 days	6/15/2021	7/30/2021		
167	FFE/Technology Installation	34 days	6/15/2021	7/30/2021		
168	Teacher/Staff Move-In	21 days	8/2/2021	8/30/2021		
169	<b>Occupancy</b>	0 days	8/30/2021	8/30/2021	8/30/2021	Occu
170	Demolish Existing School	66 days	7/3/2021	10/4/2021		
171	Parking Lot and Playfield Construction	55 days	10/4/2021	12/20/2021		
172	CM Request for Final Payment	0 days	12/20/2021	12/20/2021	12/20/2021	CM F
173	<b>Substantial Completion - Phase 3 "Demolition and Site Work"</b>	0 days	12/20/2021	12/20/2021	12/20/2021	Subs
174	Closeout	46 days	12/20/2021	2/21/2022		
175	Final Completion	46 days	12/20/2021	2/21/2022		
176	100% DCAMM Evaluation	0 days	2/21/2022	2/21/2022	2/21/2022	100%
177	LEED-S Construction Submission	46 days	12/20/2021	2/21/2022		
178	MSBA Final Payment Reimbursement Request	0 days	3/1/2022	3/1/2022	3/1/2022	MSB
179	Commissioning Agent 10-month Inspection	0 days	4/15/2022	4/15/2022	4/15/2022	Cor
180	Commissioning Agent Final Report Submission to MSBA	0 days	4/15/2022	4/15/2022	4/15/2022	Cor
181	Commissioning Agent Submission of Certification	0 days	4/15/2022	4/15/2022	4/15/2022	Cor
182	USGBC Issuance of Certification	0 days	4/21/2022	4/21/2022	4/21/2022	USC



**TOWN OF NORTHBRIDGE  
OFFICE OF THE TOWN MANAGER  
NORTHBRIDGE TOWN HALL  
7 MAIN STREET  
WHITINSVILLE, MASSACHUSETTS 01588  
Phone- (508) 234-2095 Fax- (508) 234-7640  
www.northbridgemass.org**

**Adam D. Gaudette  
Town Manager**

August 9, 2019

Mr. and Mrs. Kyle Bigness  
192 Mason Road  
Whitinsville, MA 01588

**RE: Town of Northbridge, Balmer School Construction Project**

Dear Mr. and Mrs. Bigness:

As you know, by letter dated June 12, 2019, I informed you that the wood fence and shed on the portion of your house lot property adjoining the Town's Balmer School site, were encroaching onto the Town-owned property and needed to be relocated. That letter requested that you relocate the encroaching portion of the fence and shed by June 28, 2019 in order to avoid impacting the required construction activities. (For reference, a copy of the letter is enclosed.)

As the deadline of June 28, 2019 passed, and without the relocation having taken place, I sent you a second letter on July 26, 2019, with a proposed resolution as recommended by the School Building Committee, including a Rights of Entry and Release agreement (For reference, a copy of the 2<sup>nd</sup> letter is enclosed).

The School Building Committee is in receipt of your response to the 2<sup>nd</sup> letter that included the Town's proposed resolution and has proposed the following to you, again, as a means of resolving the present impasse in a reasonable and cordial manner.

- 1. Abutter has requested Privacy Trees / 15 Green Giant Arborvitaes (18-20' feet high at time of planting) to be planted on their side of the property line before September 1, 2019.**

At this time, the Town cannot agree to the size and number of Arborvitaes as requested. There will be an opportunity to engage the School Building Committee on planting details as the project progresses. While the Committee has had communication with some of the school project site neighbors about plantings and/or trees to be planted on private property, your request is above and beyond the scope of what has been discussed so far.



- 2. Abutter has requested that Fontaine Brothers move the back property fence up 2' to be placed along the surveyed property line.**

The Town will agree to move the existing stockade wood fence, however, it will be placed on your property such that it would comply with Town Zoning Bylaws. After speaking with Building Inspector James Sheehan, the Town would plan for the fence to be placed parallel to, and one foot in, from the surveyed property line, on your property.

Please note that your existing stockade wood fence is not parallel to the property line and encroaches onto the Town's property for a distance of several feet, ranging from 4 feet to as much as 9 feet.

- 3. Abutter has requested Fontaine Brothers move the 10' x 20' shed to the right side of their property line and place between fencing (extending 4' beyond current fence line).**

The Town agrees to move the shed to the east, onto your property, to be located not less than 6 feet from the surveyed property line in accordance with the setback requirements of Town Zoning Bylaws.

- 4. Abutter has requested Fontaine Brothers repair/replace any broken fence panels or posts and install any additional needed to fully secure the back yard.**

The Town agrees with this request.

- 5. Abutter has requested that their swing set be moved up a few feet to allow for fence placement and privacy trees.**

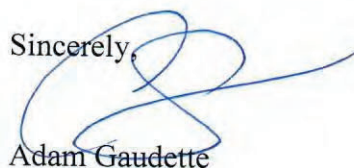
The Town agrees to move the swing set onto your property.

Kindly respond to this proposal by August 16, 2019. If an agreement is reached, we will forward a revised Rights of Entry and Release Agreement for signature.

Please note that if this matter cannot be resolved as proposed the Town will have to evaluate proceeding with other alternatives, including legal action if necessary. I sincerely hope that will not be the case, and that we can come to agreement as described above.

Thank you for your attention to this important matter.

Sincerely,



Adam Gaudette  
Town Manager



260 West Exchange Street, Suite 300  
Providence, Rhode Island 02903  
tel: 401-751-5360

August 7, 2019

Adam Gaudette, Town Manager  
7 Main Street  
Whitinsville, MA 01588

Subject: Balmer School Flow Monitoring Study

Dear Mr. Gaudette:

Please find enclosed the *Balmer School Flow Monitoring Study*, dated August 5, 2019. The purpose of the flow monitoring study was to field verify the total existing sewer flow, both sanitary flow and infiltration and inflow (I/I), from the existing Balmer School. From this, the increase in sewer flow from the existing school to the new school was determined.

During the flow monitoring period (May 14, 2019 to June 16, 2019), the average daily sewer flow from the Balmer School (while in-session) was 5,208 gallons per day (gpd). Of the 5,208 gpd, 4,458 gpd was estimated to be sanitary flow and 750 gpd was estimated to be infiltration. The school does not appear to be influenced by inflow. Using a maximum day peaking factor of 2.0, the maximum sanitary flow of the Balmer School is 8,916 gpd. When adding the measured infiltration rate of 750 gpd, the total maximum day sewer flow from the Balmer School is 9,666 gpd. Nitsch Engineering estimated the proposed Balmer School will have a maximum day sewer flow of 13,710 gpd, which represents an increase of approximately 4,044 gpd from the maximum day existing flows.

It is recommended this increase in sewer flow is mitigated through I/I removal in the wastewater collection system tributary to the over-capacity Lake Street sewer. Sub-area 7, which includes Swift Road, Mason Road, Shannon Drive, and Samuel Drive sewers, is located upstream of the Lake Street sewer and Balmer School and was found to have over 58,000 gpd of infiltration during the spring 2014 flow monitoring program. Sewer video inspections and manhole inspections can be completed to quantify and locate specific sources of infiltration. From this, sewer rehabilitation such as sewer and manhole lining can be completed to remove infiltration, and at a minimum, mitigate the 4,044 gpd increase in sewer flows from the proposed Balmer School.

Sincerely,

A handwritten signature in blue ink that reads 'Chad Kershaw'.

Chad Kershaw, P.E.  
CDM Smith Inc.

cc: Jim Shuris, Mark Kuras, Town of Northbridge  
Brendan Ennis, CDM Smith





## Memorandum

*To: Jim Shuris, Director of Public Works  
Mark Kuras, Sewer Superintendent*

*From: Chad J. Kershaw, P.E., CDM Smith*

*Date: August 5, 2019*

*Subject: Northbridge, MA  
Balmer School Flow Monitoring Study*

The Town of Northbridge, MA (Town) is proposing to discharge additional sewer flow to the Town's sewer collection system as part of the W. Edward Balmer Elementary School (Balmer School) building upgrade project. The proposed Balmer School will be replacing the existing Balmer School, located at 21 Crescent Street. Nitsch Engineering estimated that the existing Balmer School discharges 5,980 gallons per day (gpd) of sewer flow to the Town's sewer system, and the proposed Balmer School will discharge approximately 13,710 gpd of sewer flow, a 7,730 gpd increase (**Attachment A**).

The purpose of this evaluation is to field verify the total existing sewer flow, both sanitary flow and infiltration and inflow (I/I), from the existing Balmer School. From this, the increase in sewer flow from the existing school to the new school can be determined.

## Flow Monitoring Data and Analysis

### Field Program and Data Collection

In order to field verify the total sewer flow from the existing Balmer School, a flow monitoring program was conducted. The flow monitoring field program was conducted between May 14 and June 16, 2019 by Flow Assessment Service Inc. under the supervision of CDM Smith. The flow hydrographs, flow summary report, and site sketch are included in Flow Assessment's report titled, *Northbridge, MA, Flow Monitoring Report, May-June 2019* (**Attachment B**).

A level meter with a Palmer-Bowlus Flume was installed on the Balmer School's 6-inch diameter sewer service. The sewer service was accessed via the sewer manhole in Crescent Street at the school's driveway entrance. Also, a continuous recording rain gauge was installed on the roof of the Balmer School to correlate wastewater flows to rainfall. Both the flow meter and the rain gauge recorded data in 5-minute intervals. During the field program, there were two rainfall events which totaled at least 1.0 inch of rainfall. The two rainfall events occurred on May 28<sup>th</sup> to May 30<sup>th</sup> (1.23 inches of rain) and June 10<sup>th</sup> and June 11<sup>th</sup> (1.12 inches of rain). By capturing these significant

Jim Shuris, Mark Kuras  
August 5, 2019  
Page 2

rainfall events, the flow monitoring field program was able to be reduced from a planned eight weeks to five weeks.

## Dry Weather Analysis

Dry weather flow is obtained from metered flow data during a dry weather period and includes sanitary flow and base infiltration from groundwater. Dry weather is defined as a period with no rain or a period where the system is no longer under the influence of a prior rainfall event. For this analysis, this dry weather period was defined as three days following a rainfall event. It is important to avoid including storm related flow impacts in the dry weather flows as it would result in under- and over-estimating sanitary flow and I/I rates.

**Figure 1** shows the daily dry weather flow curves for the Balmer School during the flow monitoring period. The red curve represents the average daily dry weather flow during a weekday (school in session) and the blue curve represents the average daily dry weather flow during a weekend (school not in session). Note that holidays, early release days, and limited attendance days were not included in this analysis. During a typical weekday, peak flows occur around 9:30AM, with smaller peaks also occurring around 11:00AM and 1:00PM. As expected, during the weekend, virtually no sanitary flow was measured. These dry weather flow curves were used for the inflow and infiltration analyses.

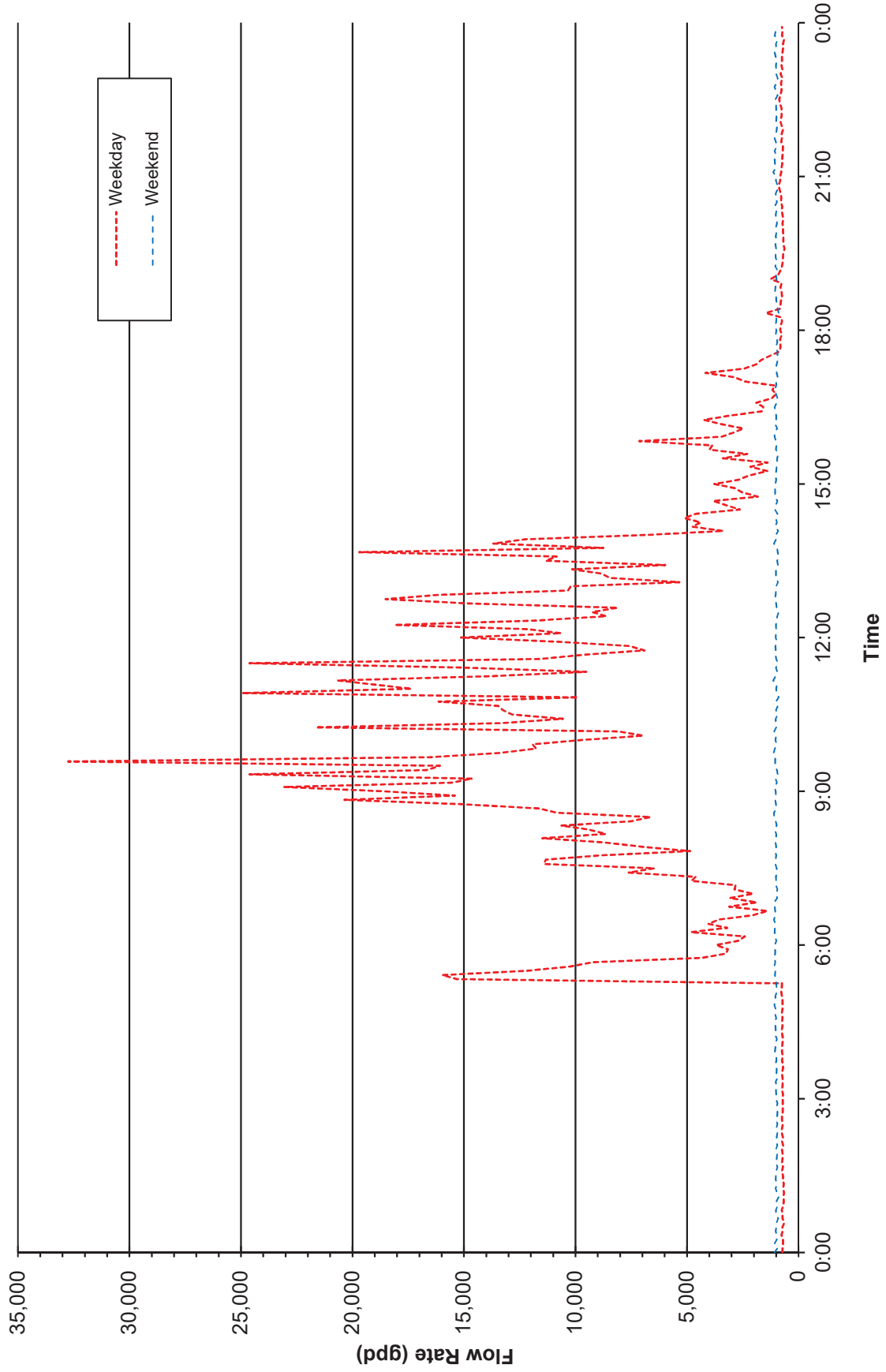
## Inflow Analysis

Inflow typically occurs during and immediately following a rainfall event. Inflow is clean water which enters a sewer system through direct connections such as roof leaders or catch basins (direct inflow) or other sources such as sump pumps or foundation drains (indirect inflow). In addition to the indirect sources, inflow can also occur as a result of temporary elevated groundwater elevations from rainfall influences. This impact is commonly referred to as rain derived infiltration and inflow (RDII).

The May 28<sup>th</sup> to May 30<sup>th</sup> (1.23 inches of rain) and June 10<sup>th</sup> and June 11<sup>th</sup> (1.12 inches of rain) rainfall events were used for the inflow analysis. **Figure 2** and **Figure 3** are hydrographs for the Balmer School sewer system during the May 28<sup>th</sup> to May 30<sup>th</sup> and June 10<sup>th</sup> and June 11<sup>th</sup> rainfall events, respectively. The storm hydrographs show the relationship between rainfall and peak wastewater flows. The data presented in the hydrographs are defined by the following:

- *Rainfall* (green curve) is captured in order to determine the variation in the size and intensity of storm events and to develop reasonable relationships between rainfall and peak wastewater flows.
- *Wet Weather Gross Flow* (blue curve) is the actual measured sewer flow from the Balmer School sewer system during and immediately after the rainfall event.

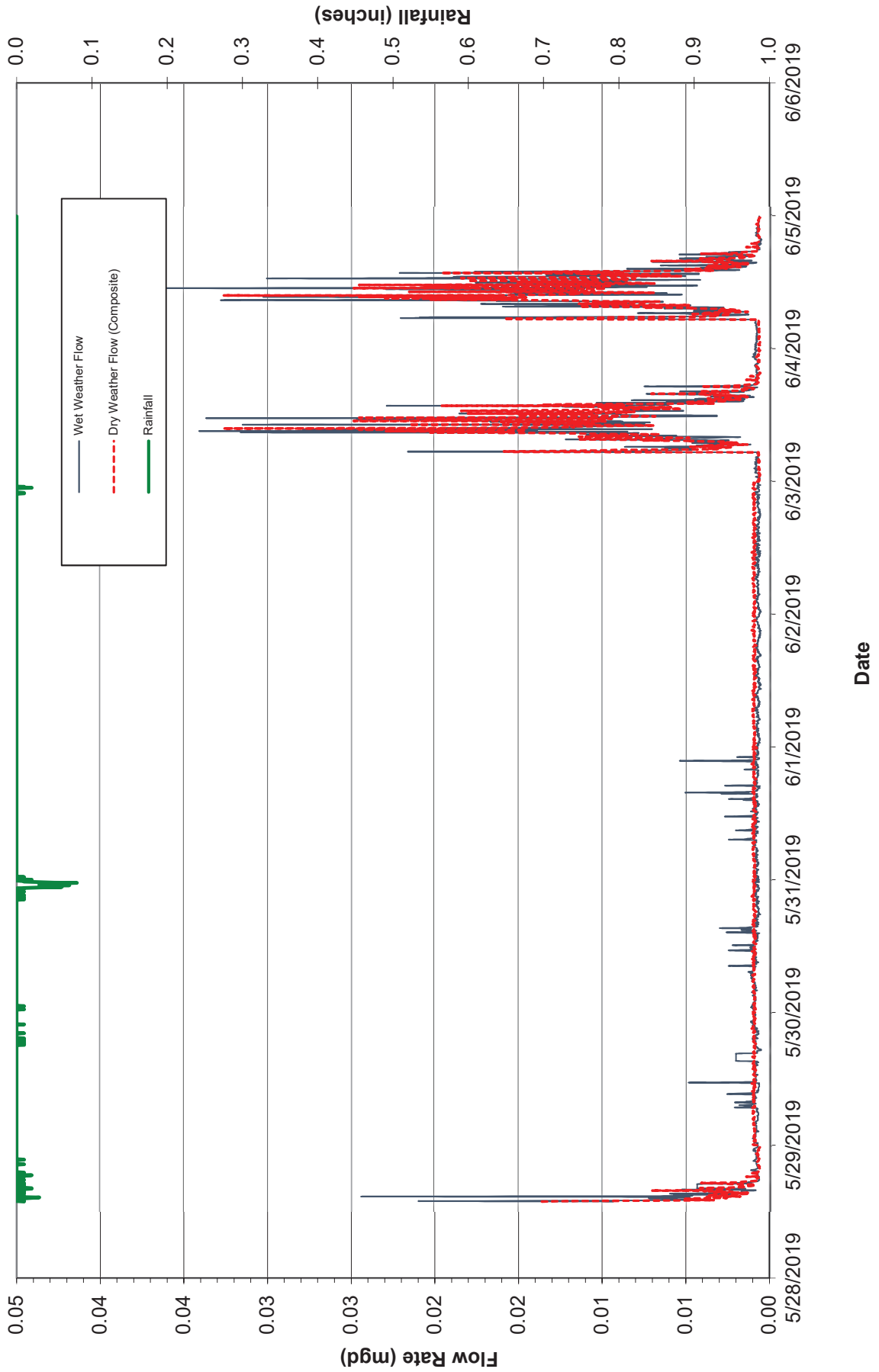
### Balmer School Dry Weather Flow Curves



DRY WEATHER FLOW CURVES  
BALMER SCHOOL FLOW MONITORING STUDY  
FIGURE 1

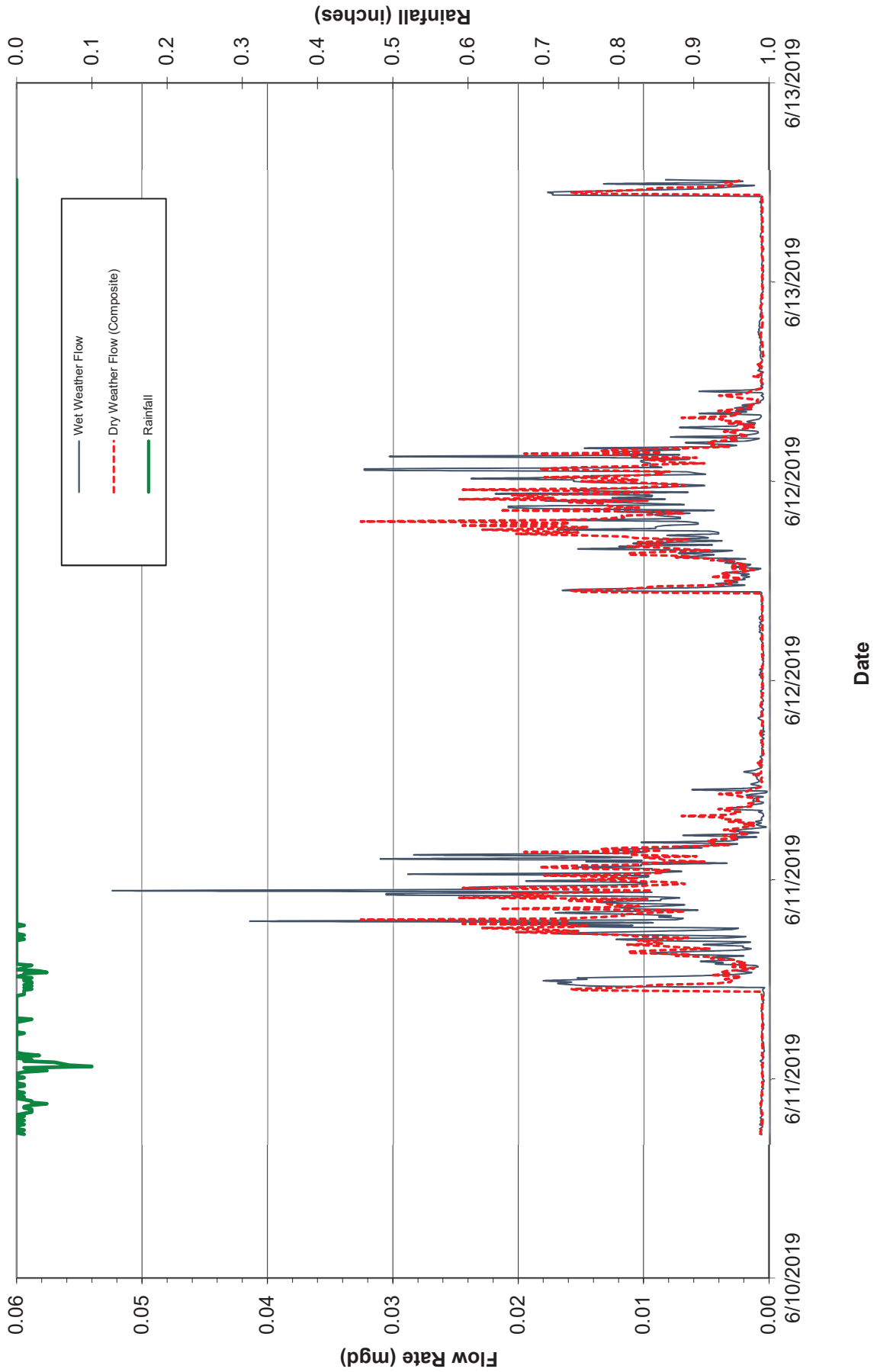


### May 28th to 30th Rainfall Event



MAY 28 TO 30, 2019 RAINFALL EVENT HYDROGRAPH  
BALMER SCHOOL FLOW MONITORING STUDY  
FIGURE 2

### June 10 & 11 Rainfall Event



JUNE 10 TO 11, 2019 RAINFALL EVENT HYDROGRAPH  
BALMER SCHOOL FLOW MONITORING STUDY  
FIGURE 3

Jim Shuris, Mark Kuras  
August 5, 2019  
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- *Dry Weather Flow* (red curve) are the average dry weather weekday and weekend curves, which are adjusted up or down to compensate for flow conditions immediately preceding the storm event.
- *Inflow* is the total clean water entering the system from direct and indirect connections. Direct inflow occurs during the rainfall event and indirect inflow occurs immediately after the rainfall event. The volume of direct and indirect inflow is estimated from the area between the blue curve and red curve from the beginning of the storm until the two curves converge or another rainfall event occurs.

For both rainfall events, the total inflow volume was less than 100 gallons, which is shown graphically in **Figure 2** and **Figure 3** as there is minimal variation between the red curve and blue curve. As a result, it was determined that the Balmer School sewer system is minimally influenced by inflow.

### Infiltration Analysis

Infiltration primarily consists of groundwater entering the sewer through cracks in the sewer pipe, offset pipe joints and defects in manholes. Infiltration can occur 24 hours a day throughout the year. The extent of infiltration will vary depending on the level of the local groundwater table and the severity of pipe and manhole defects.

Infiltration is calculated by determining all dry weather days during the flow monitoring period (occurs at least three days following a rain event). Next, the flow data for all dry weather days is averaged. Finally, the infiltration is calculated by finding the minimum average reading for all the dry weather days. Since the school is not occupied during the night time hours, it was assumed that 100 percent of the minimum flow reading is infiltration. Based on this analysis, it was determined that the Balmer School sewer system had an infiltration rate of 750 gpd, or approximately 0.5 gallons per minute (gpm), during the flow monitoring period.

### Total Sewer Flow Analysis

The flow monitoring data was also used to calculate the existing total sewer flows from the Balmer School. The total sewer flow was calculated by averaging all 5-minute interval flow data during the entire metering period (May 14 to June 16, 2019), except for days the school was vacant or partially vacant (weekends, holidays, early release days, limited attendance days). Using this data, the average total sewer flow for the Balmer School during the flow monitoring period was 5,208 gpd. Of the 5,208 gpd, 4,458 is estimated to be sanitary flow and 750 gpd is infiltration. The maximum day total sewer flow occurred on May 15<sup>th</sup> with a flow of 6,281 gpd and the minimum day sewer flow occurred on June 3<sup>rd</sup> with a flow of 4,522 gpd. See **Table 1** for a summary of daily sewer flows during the flow monitoring period.

Date	Day	Flow (gpd)	Notes	Removed from Analysis
5/14/2019	Tuesday	5,919		
5/15/2019	Wednesday	6,281		
5/16/2019	Thursday	5,486		
5/17/2019	Friday	5,755		
5/18/2019	Saturday	1,228	Weekend	X
5/19/2019	Sunday	1,263	Weekend	X
5/20/2019	Monday	5,436		
5/21/2019	Tuesday	4,919		
5/22/2019	Wednesday	5,503		
5/23/2019	Thursday	5,358		
5/24/2019	Friday	5,444		
5/25/2019	Saturday	754	Weekend	X
5/26/2019	Sunday	638	Weekend	X
5/27/2019	Monday	535	Holiday - Memorial Day	X
5/28/2019	Tuesday	4,553		
5/29/2019	Wednesday	925	Early Release	X
5/30/2019	Thursday	889	Limited Attendance	X
5/31/2019	Friday	884	Limited Attendance	X
6/1/2019	Saturday	673	Weekend	X
6/2/2019	Sunday	680	Weekend	X
6/3/2019	Monday	4,522		
6/4/2019	Tuesday	5,111		
6/5/2019	Wednesday	4,681		
6/6/2019	Thursday	4,556		
6/7/2019	Friday	4,602		
6/8/2019	Saturday	566	Weekend	X
6/9/2019	Sunday	519	Weekend	X
6/10/2019	Monday	4,331	Last Week - Limited Attendance	X
6/11/2019	Tuesday	4,435	Last Week - Limited Attendance	X
6/12/2019	Wednesday	3,893	Early Release	X
6/13/2019	Thursday	2,812	Last Week - Limited Attendance	X
6/14/2019	Friday	665	Last Week - Limited Attendance	X
6/15/2019	Saturday	652	Weekend	X
6/16/2019	Sunday	506	Weekend	X
	<b>Average</b>	<b>5,208</b>	<b>gpd</b>	
	<b>Minimum</b>	<b>4,522</b>	<b>gpd</b>	
	<b>Maximum</b>	<b>6,281</b>	<b>gpd</b>	

**AVERAGE DAILY FLOW SUMMARY  
BALMER SCHOOL FLOW MONITORING STUDY  
TABLE 1**

Jim Shuris, Mark Kuras  
August 5, 2019  
Page 8

## Conclusions and Recommendations

During the flow monitoring period, the average sewer flow from the Balmer School was 5,208 gpd. Of the 5,208 gpd of sewer flow, approximately 4,458 gpd is estimated to be sanitary flow and approximately 750 gpd was infiltration. The Balmer School sewer system does not appear to be influenced by inflow. In the document titled *Nitsch Engineering Sanitary Sewer Projections* dated February 12, 2019, it was estimated that the existing Balmer School has a sewer flow of 5,980 gpd, which was calculated using Title 5 flow rates (Massachusetts State Environmental Code 310 CMR 15.203). The Title 5 flow rates represent a maximum day sanitary flow, or a peaking factor of 2.0 from average daily sanitary flows. As a result, using the Title 5 flow rates, the average sanitary flow rate was calculated to be 2,990 gpd, which is 1,468 less the measured sanitary flow rate of 4,458 gpd.

Using the maximum day peaking factor of 2.0, the maximum sanitary flow rate of the Balmer School during the flow monitoring period was 8,916 gpd. When including the measured infiltration rate of 750 gpd, the total maximum day sewer flow from the Balmer School was 9,666 gpd. With an estimated maximum day flow rate of 13,710 gpd for the proposed Balmer School, the expected sewer flow increase is 4,044 gpd. This assumes that the proposed Balmer School sewer system will not be influenced by infiltration and inflow. Also, as Nitsch Engineering states in **Attachment A**, the Title 5 flow rates for the proposed Balmer School do not reflect low flow fixtures, which are planned to be implemented during construction. Once the new school is constructed, actual sewer flow can be measured, either through water use data or additional flow metering, to determine the exact increase in sewer flow from the existing Balmer School.

In the document titled *Balmer School Sewer Capacity Analysis (CDM Smith)*, dated May 7, 2019, multiple manholes along the 10- and 12-inch diameter sewer in Lake Street, Main Street, and Water Street were predicted to be surcharged under existing peak sewer flow. An increase in sewer flow from the proposed Balmer School will increase the surcharge height in these manholes. As a result, it is recommended that this increase in sewer flow is mitigated through I/I removal in the wastewater collection system tributary to the Lake Street sewer. Sub-area 7, which includes Swift Road, Mason Road, Shannon Drive, and Samuel Drive sewers, is located upstream of the Lake Street sewer and was found to have approximately 55,000 gpd of infiltration during the spring 2014 flow monitoring program. Closed-circuit television (CCTV) of these sewer mains and sewer manhole inspections can be completed to quantify and locate specific sources of infiltration. From this, sewer rehabilitation techniques such as cured-in-place pipe (CIPP) lining, manhole lining, and open-cut replacement can be recommended and implemented to mitigate the increase in sewer flows from the proposed Balmer School.

cc: Adam Gaudette, Town Manager, Northbridge  
Brendan Ennis, P.E., CDM Smith

Symmes Maini & McKee Associates, Inc.  
 New W. Edward Balmer Elementary School  
 Early Foundation & Steel Package - ERP #2  
 Trade Contractor Bid Tabulation Sheet

**Bid** Northbridge Town Hall, Selectmen's Conference Room  
**Opening:** Tuesday, August 20, 2019 at 3:00 PM

PROJECT MANAGEMENT



Company	Base Bid	Requirements				Addenda		
		Bid Bond	DCAM Certificate	Update Statement	Certificates	1	2	3
Folan Waterproofing & Construction Co., Inc.	\$ 81,900.00	✓	✓	✓	✓	✓	✓	✓
The Waterproofing Company LLC	\$ 189,000.00	✓	✓	✓	✓	✓	✓	✓
P.J. Spillane Company, Inc.	\$ 56,000.00	✓	✓	✓	✓	✓	✓	✓
Beacon Waterproofing & Restoration, Inc.	\$ 47,099.00	✓	✓	✓	✓	✓	✓	✓
Superior Caulking & Waterproofing, Inc.	\$ 43,000.00	✓	✓	✓	✓	✓	✓	✓
	\$							
	\$							

Symmes Maini & McKee Associates, Inc.  
 New W. Edward Balmer Elementary School  
 Early Foundation & Steel Package - ERP #2  
 Trade Contractor Bid Tabulation Sheet

**Bid** Northbridge Town Hall, Selectmen's Conference Room  
**Opening:** Tuesday, August 20, 2019 at 3:00 PM

PROJECT MANAGEMENT



Company	Base Bid	Requirements				Addenda		
		Bid Bond	DCAM Certificate	Update Statement	Certificates	1	2	3
Delta Beckwith Elevators	\$ 206,000.00	✓	✓	✓	✓	✓	✓	✓
	\$							
	\$							
	\$							
	\$							
	\$							
	\$							



260 West Exchange Street, Suite 300  
Providence, Rhode Island 02903  
tel: 401-751-5360

August 7, 2019

Adam Gaudette, Town Manager  
7 Main Street  
Whitinsville, MA 01588

Subject: Balmer School Flow Monitoring Study

Dear Mr. Gaudette:

Please find enclosed the *Balmer School Flow Monitoring Study*, dated August 5, 2019. The purpose of the flow monitoring study was to field verify the total existing sewer flow, both sanitary flow and infiltration and inflow (I/I), from the existing Balmer School. From this, the increase in sewer flow from the existing school to the new school was determined.

During the flow monitoring period (May 14, 2019 to June 16, 2019), the average daily sewer flow from the Balmer School (while in-session) was 5,208 gallons per day (gpd). Of the 5,208 gpd, 4,458 gpd was estimated to be sanitary flow and 750 gpd was estimated to be infiltration. The school does not appear to be influenced by inflow. Using a maximum day peaking factor of 2.0, the maximum sanitary flow of the Balmer School is 8,916 gpd. When adding the measured infiltration rate of 750 gpd, the total maximum day sewer flow from the Balmer School is 9,666 gpd. Nitsch Engineering estimated the proposed Balmer School will have a maximum day sewer flow of 13,710 gpd, which represents an increase of approximately 4,044 gpd from the maximum day existing flows.

It is recommended this increase in sewer flow is mitigated through I/I removal in the wastewater collection system tributary to the over-capacity Lake Street sewer. Sub-area 7, which includes Swift Road, Mason Road, Shannon Drive, and Samuel Drive sewers, is located upstream of the Lake Street sewer and Balmer School and was found to have over 58,000 gpd of infiltration during the spring 2014 flow monitoring program. Sewer video inspections and manhole inspections can be completed to quantify and locate specific sources of infiltration. From this, sewer rehabilitation such as sewer and manhole lining can be completed to remove infiltration, and at a minimum, mitigate the 4,044 gpd increase in sewer flows from the proposed Balmer School.

Sincerely,

Chad Kershaw, P.E.  
CDM Smith Inc.

cc: Jim Shuris, Mark Kuras, Town of Northbridge  
Brendan Ennis, CDM Smith







## Memorandum

*To: Jim Shuris, Director of Public Works  
Mark Kuras, Sewer Superintendent*

*From: Chad J. Kershaw, P.E., CDM Smith*

*Date: August 5, 2019*

*Subject: Northbridge, MA  
Balmer School Flow Monitoring Study*

The Town of Northbridge, MA (Town) is proposing to discharge additional sewer flow to the Town's sewer collection system as part of the W. Edward Balmer Elementary School (Balmer School) building upgrade project. The proposed Balmer School will be replacing the existing Balmer School, located at 21 Crescent Street. Nitsch Engineering estimated that the existing Balmer School discharges 5,980 gallons per day (gpd) of sewer flow to the Town's sewer system, and the proposed Balmer School will discharge approximately 13,710 gpd of sewer flow, a 7,730 gpd increase (**Attachment A**).

The purpose of this evaluation is to field verify the total existing sewer flow, both sanitary flow and infiltration and inflow (I/I), from the existing Balmer School. From this, the increase in sewer flow from the existing school to the new school can be determined.

## Flow Monitoring Data and Analysis

### Field Program and Data Collection

In order to field verify the total sewer flow from the existing Balmer School, a flow monitoring program was conducted. The flow monitoring field program was conducted between May 14 and June 16, 2019 by Flow Assessment Service Inc. under the supervision of CDM Smith. The flow hydrographs, flow summary report, and site sketch are included in Flow Assessment's report titled, *Northbridge, MA, Flow Monitoring Report, May-June 2019* (**Attachment B**).

A level meter with a Palmer-Bowlus Flume was installed on the Balmer School's 6-inch diameter sewer service. The sewer service was accessed via the sewer manhole in Crescent Street at the school's driveway entrance. Also, a continuous recording rain gauge was installed on the roof of the Balmer School to correlate wastewater flows to rainfall. Both the flow meter and the rain gauge recorded data in 5-minute intervals. During the field program, there were two rainfall events which totaled at least 1.0 inch of rainfall. The two rainfall events occurred on May 28<sup>th</sup> to May 30<sup>th</sup> (1.23 inches of rain) and June 10<sup>th</sup> and June 11<sup>th</sup> (1.12 inches of rain). By capturing these significant

rainfall events, the flow monitoring field program was able to be reduced from a planned eight weeks to five weeks.

## Dry Weather Analysis

Dry weather flow is obtained from metered flow data during a dry weather period and includes sanitary flow and base infiltration from groundwater. Dry weather is defined as a period with no rain or a period where the system is no longer under the influence of a prior rainfall event. For this analysis, this dry weather period was defined as three days following a rainfall event. It is important to avoid including storm related flow impacts in the dry weather flows as it would result in under- and over-estimating sanitary flow and I/I rates.

**Figure 1** shows the daily dry weather flow curves for the Balmer School during the flow monitoring period. The red curve represents the average daily dry weather flow during a weekday (school in session) and the blue curve represents the average daily dry weather flow during a weekend (school not in session). Note that holidays, early release days, and limited attendance days were not included in this analysis. During a typical weekday, peak flows occur around 9:30AM, with smaller peaks also occurring around 11:00AM and 1:00PM. As expected, during the weekend, virtually no sanitary flow was measured. These dry weather flow curves were used for the inflow and infiltration analyses.

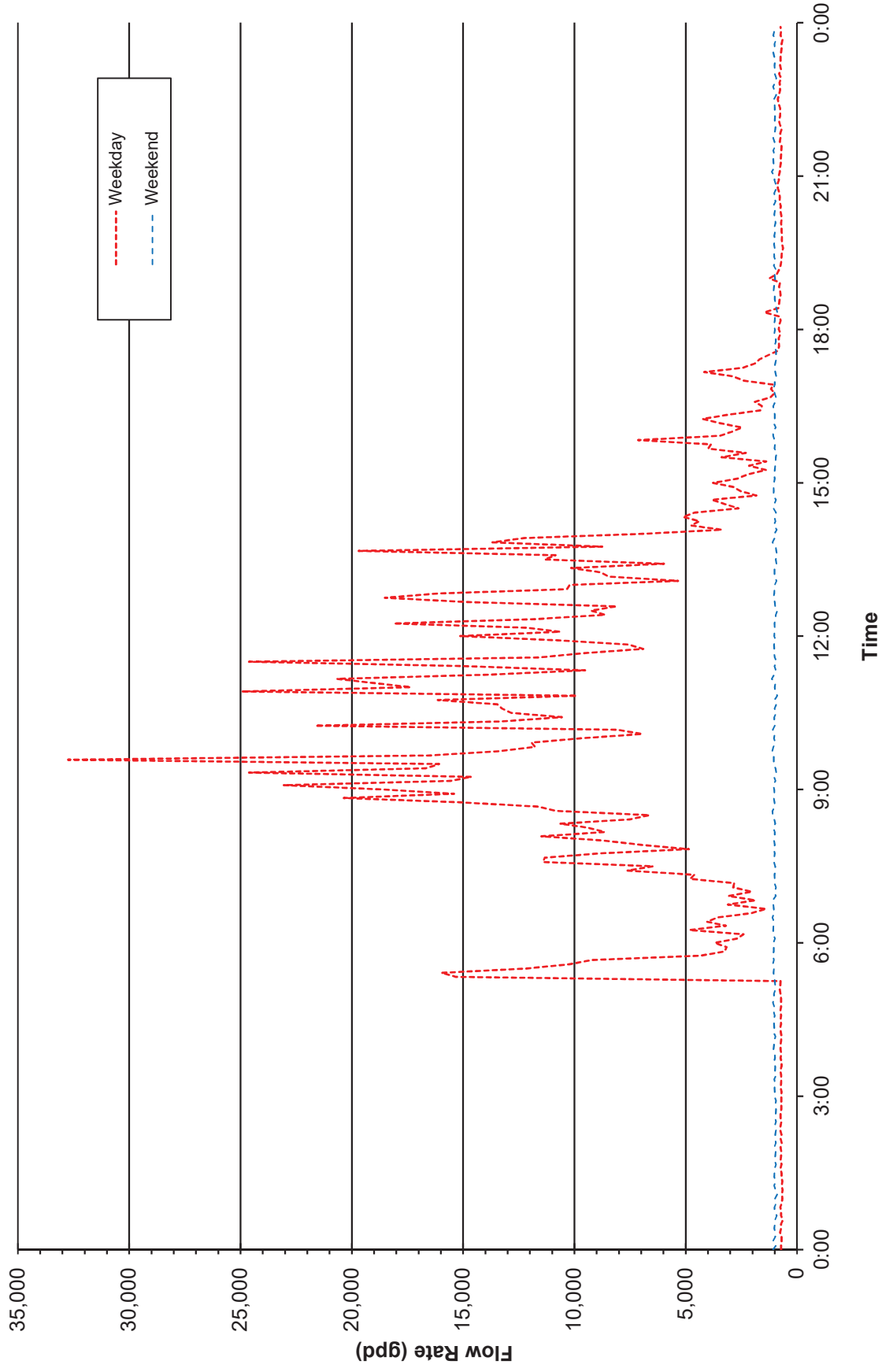
## Inflow Analysis

Inflow typically occurs during and immediately following a rainfall event. Inflow is clean water which enters a sewer system through direct connections such as roof leaders or catch basins (direct inflow) or other sources such as sump pumps or foundation drains (indirect inflow). In addition to the indirect sources, inflow can also occur as a result of temporary elevated groundwater elevations from rainfall influences. This impact is commonly referred to as rain derived infiltration and inflow (RDII).

The May 28<sup>th</sup> to May 30<sup>th</sup> (1.23 inches of rain) and June 10<sup>th</sup> and June 11<sup>th</sup> (1.12 inches of rain) rainfall events were used for the inflow analysis. **Figure 2** and **Figure 3** are hydrographs for the Balmer School sewer system during the May 28<sup>th</sup> to May 30<sup>th</sup> and June 10<sup>th</sup> and June 11<sup>th</sup> rainfall events, respectively. The storm hydrographs show the relationship between rainfall and peak wastewater flows. The data presented in the hydrographs are defined by the following:

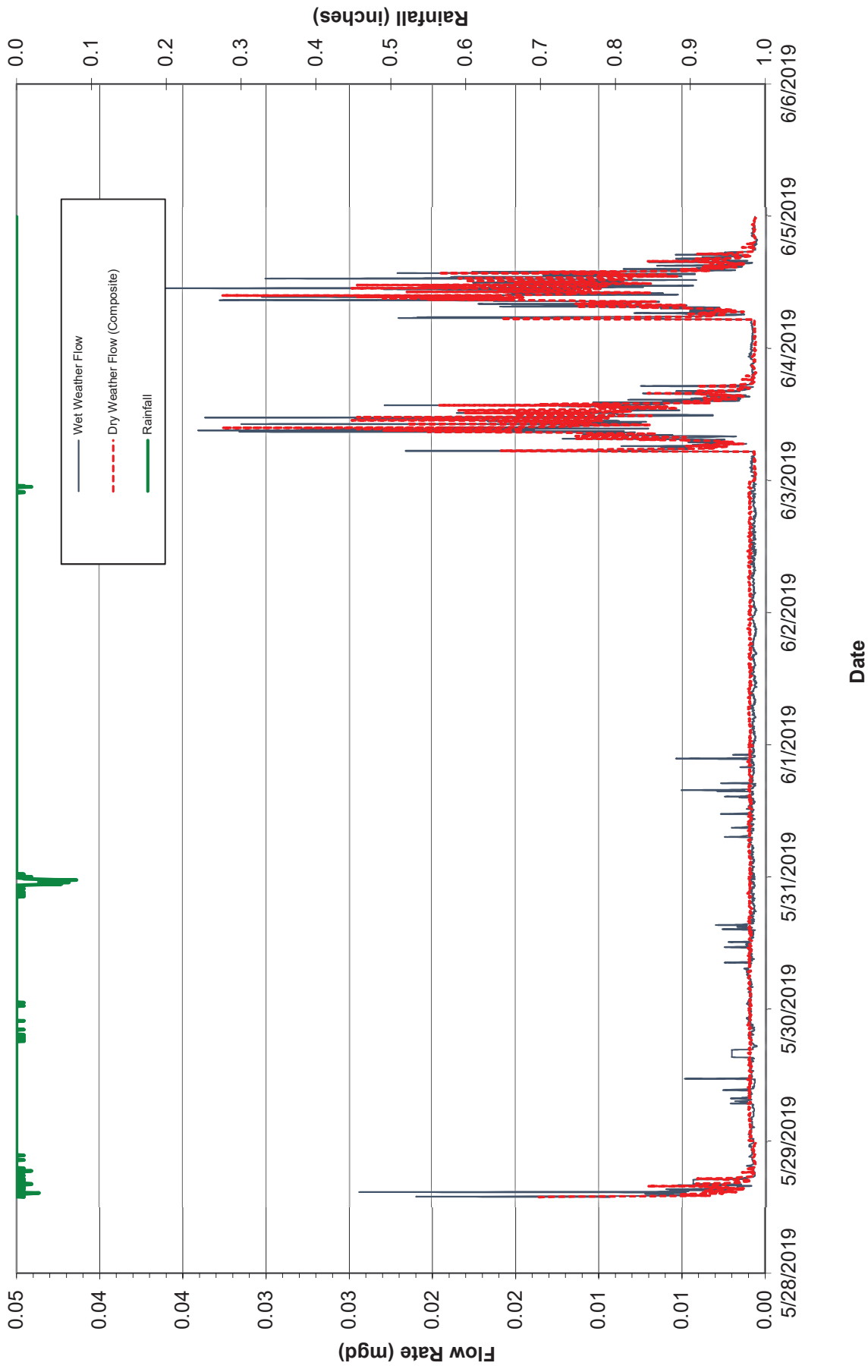
- *Rainfall* (green curve) is captured in order to determine the variation in the size and intensity of storm events and to develop reasonable relationships between rainfall and peak wastewater flows.
- *Wet Weather Gross Flow* (blue curve) is the actual measured sewer flow from the Balmer School sewer system during and immediately after the rainfall event.

# Balmer School Dry Weather Flow Curves



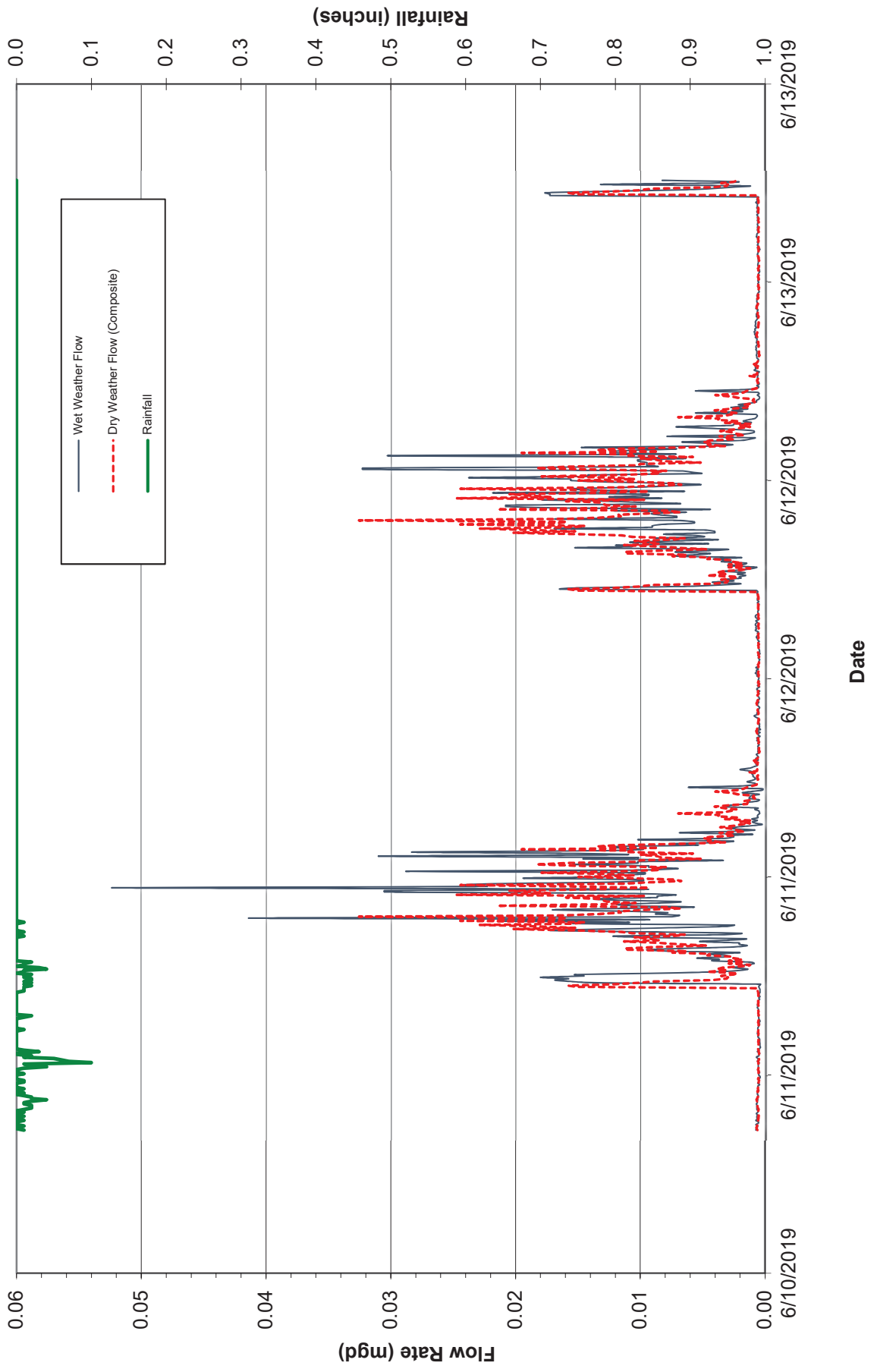
DRY WEATHER FLOW CURVES  
BALMER SCHOOL FLOW MONITORING STUDY  
FIGURE 1

# May 28th to 30th Rainfall Event



MAY 28 TO 30, 2019 RAINFALL EVENT HYDROGRAPH  
BALMER SCHOOL FLOW MONITORING STUDY  
FIGURE 2

# June 10 & 11 Rainfall Event



JUNE 10 TO 11, 2019 RAINFALL EVENT HYDROGRAPH  
BALMER SCHOOL FLOW MONITORING STUDY  
FIGURE 3

- *Dry Weather Flow* (red curve) are the average dry weather weekday and weekend curves, which are adjusted up or down to compensate for flow conditions immediately preceding the storm event.
- *Inflow* is the total clean water entering the system from direct and indirect connections. Direct inflow occurs during the rainfall event and indirect inflow occurs immediately after the rainfall event. The volume of direct and indirect inflow is estimated from the area between the blue curve and red curve from the beginning of the storm until the two curves converge or another rainfall event occurs.

For both rainfall events, the total inflow volume was less than 100 gallons, which is shown graphically in **Figure 2** and **Figure 3** as there is minimal variation between the red curve and blue curve. As a result, it was determined that the Balmer School sewer system is minimally influenced by inflow.

### **Infiltration Analysis**

Infiltration primarily consists of groundwater entering the sewer through cracks in the sewer pipe, offset pipe joints and defects in manholes. Infiltration can occur 24 hours a day throughout the year. The extent of infiltration will vary depending on the level of the local groundwater table and the severity of pipe and manhole defects.

Infiltration is calculated by determining all dry weather days during the flow monitoring period (occurs at least three days following a rain event). Next, the flow data for all dry weather days is averaged. Finally, the infiltration is calculated by finding the minimum average reading for all the dry weather days. Since the school is not occupied during the night time hours, it was assumed that 100 percent of the minimum flow reading is infiltration. Based on this analysis, it was determined that the Balmer School sewer system had an infiltration rate of 750 gpd, or approximately 0.5 gallons per minute (gpm), during the flow monitoring period.

### **Total Sewer Flow Analysis**

The flow monitoring data was also used to calculate the existing total sewer flows from the Balmer School. The total sewer flow was calculated by averaging all 5-minute interval flow data during the entire metering period (May 14 to June 16, 2019), except for days the school was vacant or partially vacant (weekends, holidays, early release days, limited attendance days). Using this data, the average total sewer flow for the Balmer School during the flow monitoring period was 5,208 gpd. Of the 5,208 gpd, 4,458 is estimated to be sanitary flow and 750 gpd is infiltration. The maximum day total sewer flow occurred on May 15<sup>th</sup> with a flow of 6,281 gpd and the minimum day sewer flow occurred on June 3<sup>rd</sup> with a flow of 4,522 gpd. See **Table 1** for a summary of daily sewer flows during the flow monitoring period.

Date	Day	Flow (gpd)	Notes	Removed from Analysis
5/14/2019	Tuesday	5,919		
5/15/2019	Wednesday	6,281		
5/16/2019	Thursday	5,486		
5/17/2019	Friday	5,755		
5/18/2019	Saturday	1,228	Weekend	X
5/19/2019	Sunday	1,263	Weekend	X
5/20/2019	Monday	5,436		
5/21/2019	Tuesday	4,919		
5/22/2019	Wednesday	5,503		
5/23/2019	Thursday	5,358		
5/24/2019	Friday	5,444		
5/25/2019	Saturday	754	Weekend	X
5/26/2019	Sunday	638	Weekend	X
5/27/2019	Monday	535	Holiday - Memorial Day	X
5/28/2019	Tuesday	4,553		
5/29/2019	Wednesday	925	Early Release	X
5/30/2019	Thursday	889	Limited Attendance	X
5/31/2019	Friday	884	Limited Attendance	X
6/1/2019	Saturday	673	Weekend	X
6/2/2019	Sunday	680	Weekend	X
6/3/2019	Monday	4,522		
6/4/2019	Tuesday	5,111		
6/5/2019	Wednesday	4,681		
6/6/2019	Thursday	4,556		
6/7/2019	Friday	4,602		
6/8/2019	Saturday	566	Weekend	X
6/9/2019	Sunday	519	Weekend	X
6/10/2019	Monday	4,331	Last Week - Limited Attendance	X
6/11/2019	Tuesday	4,435	Last Week - Limited Attendance	X
6/12/2019	Wednesday	3,893	Early Release	X
6/13/2019	Thursday	2,812	Last Week - Limited Attendance	X
6/14/2019	Friday	665	Last Week - Limited Attendance	X
6/15/2019	Saturday	652	Weekend	X
6/16/2019	Sunday	506	Weekend	X
<b>Average</b>		<b>5,208</b>	<b>gpd</b>	
<b>Minimum</b>		<b>4,522</b>	<b>gpd</b>	
<b>Maximum</b>		<b>6,281</b>	<b>gpd</b>	

**AVERAGE DAILY FLOW SUMMARY**  
**BALMER SCHOOL FLOW MONITORING STUDY**  
**TABLE 1**

## Conclusions and Recommendations

During the flow monitoring period, the average sewer flow from the Balmer School was 5,208 gpd. Of the 5,208 gpd of sewer flow, approximately 4,458 gpd is estimated to be sanitary flow and approximately 750 gpd was infiltration. The Balmer School sewer system does not appear to be influenced by inflow. In the document titled *Nitsch Engineering Sanitary Sewer Projections* dated February 12, 2019, it was estimated that the existing Balmer School has a sewer flow of 5,980 gpd, which was calculated using Title 5 flow rates (Massachusetts State Environmental Code 310 CMR 15.203). The Title 5 flow rates represent a maximum day sanitary flow, or a peaking factor of 2.0 from average daily sanitary flows. As a result, using the Title 5 flow rates, the average sanitary flow rate was calculated to be 2,990 gpd, which is 1,468 less the measured sanitary flow rate of 4,458 gpd.

Using the maximum day peaking factor of 2.0, the maximum sanitary flow rate of the Balmer School during the flow monitoring period was 8,916 gpd. When including the measured infiltration rate of 750 gpd, the total maximum day sewer flow from the Balmer School was 9,666 gpd. With an estimated maximum day flow rate of 13,710 gpd for the proposed Balmer School, the expected sewer flow increase is 4,044 gpd. This assumes that the proposed Balmer School sewer system will not be influenced by infiltration and inflow. Also, as Nitsch Engineering states in **Attachment A**, the Title 5 flow rates for the proposed Balmer School do not reflect low flow fixtures, which are planned to be implemented during construction. Once the new school is constructed, actual sewer flow can be measured, either through water use data or additional flow metering, to determine the exact increase in sewer flow from the existing Balmer School.

In the document titled *Balmer School Sewer Capacity Analysis (CDM Smith)*, dated May 7, 2019, multiple manholes along the 10- and 12-inch diameter sewer in Lake Street, Main Street, and Water Street were predicted to be surcharged under existing peak sewer flow. An increase in sewer flow from the proposed Balmer School will increase the surcharge height in these manholes. As a result, it is recommended that this increase in sewer flow is mitigated through I/I removal in the wastewater collection system tributary to the Lake Street sewer. Sub-area 7, which includes Swift Road, Mason Road, Shannon Drive, and Samuel Drive sewers, is located upstream of the Lake Street sewer and was found to have approximately 55,000 gpd of infiltration during the spring 2014 flow monitoring program. Closed-circuit television (CCTV) of these sewer mains and sewer manhole inspections can be completed to quantify and locate specific sources of infiltration. From this, sewer rehabilitation techniques such as cured-in-place pipe (CIPP) lining, manhole lining, and open-cut replacement can be recommended and implemented to mitigate the increase in sewer flows from the proposed Balmer School.

cc: Adam Gaudette, Town Manager, Northbridge  
Brendan Ennis, P.E., CDM Smith



**ATTACHMENT A**  
**NITSCH ENGINEERING SANITARY SEWER**  
**PROJECTIONS, DATED FEBRUARY 12, 2019**

February 13, 2019

Mr. Mark Kuras  
Superintendent, Department of Public Works  
644 Providence Road  
Whitinsville, MA 01588



**Project:** W. Edward Balmer Elementary School, 21 Crescent Street, Whitinsville

**Subject:** Sanitary Sewer Protections

Dear Mark,

On January 23, 2019 we discussed the proposed Balmer Elementary School project in a Technical Review meeting. This letter is to follow up on a few points where further clarification was desired on planned sewer protection devices designed as part of the plumbing system.

**Kitchen:** The kitchen will have two grease interceptors: a 35-gallon interior unit within the floor with a recommended weekly cleaning schedule; and a 5,000 gallon exterior unit with a more periodic cleaning schedule (O&M to be determined). According to school staff, the kitchen does not now, and does not plan do a lot of grease-intensive cooking in the new building; mostly what they are doing is re-heating prepared foods. It is our opinion that given these factors, the sanitary sewer will be well protected from undue grease pollution.

**Art Rooms:** Art room deep sinks are protected with a clay trap under each sink with a periodic cleaning schedule (O&M to be determined).

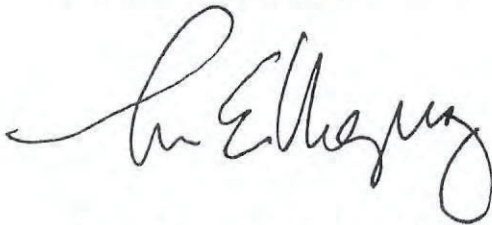
**Science Labs:** As this is an elementary school, there are no science labs, and thus no chemical discharges into the sewer are expected.

Please contact me if you should have any further questions.

Sincerely,

**DORE & WHITTIER ARCHITECTS, INC.**

Architects • Project Managers



Thomas E. Hengelsberg, AIA, NCARB, LEED-AP, MCPPO  
Project Manager

cc. Technical Review committee attendees  
Project Team distribution  
file

ARCHITECTS  
PROJECT MANAGERS

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[www.doreandwhittier.com](http://www.doreandwhittier.com)



Nitsch Engineering

120 Front Street, Suite 820  
Worcester, MA 01608-1425  
T: 508-365-1030

www.nitscheng.com

February 12, 2019

Mr. Thomas Hengelsberg, AIA, LEED AP, MCARB, MCPPO  
Project Manager  
Dore & Whittier  
212 Battery Street  
Burlington, VT 05401

RE: Nitsch Proposal #12260.3P  
Balmer Elementary School  
Civil Engineering Services  
Sanitary Flows  
Northbridge, MA

Dear Tom,

Nitsch Engineering has reviewed the existing and proposed occupancy for the Balmer School and has developed sanitary sewer design flows for the existing and proposed conditions as indicated in Table 1 based on Title 5 flow rates (Massachusetts State Environmental Code 310 CMR 15.203).

Table 1: Estimated Design Flows

Existing School	Occupants	Design Flows per Occupant Gallons per Day per Person	Total Flow (Gallons per Day)
Students	505	10	5050
Teachers/Admin/Staff	80	10	800
Volunteers – Visitors Allowance (FTE)	13	10	130
<i>Existing School Totals</i>			<b>5,980</b>
Proposed School	Occupants	Design Flows per Occupant	Total Flow
Students	1214	10	12,140
Teachers/Admin/Staff	133	10	1,330
Volunteers – Visitors Allowance (FTE)	3	10	240
<i>Proposed School Totals</i>			<b>13,710</b>
<b>Change</b>			<b><u>+7,730</u></b>

Source: Occupancy from Balmer Elementary School

The proposed sanitary sewer service is being designed based on the Title 5 flows rates. See Attachment A for additional design information.

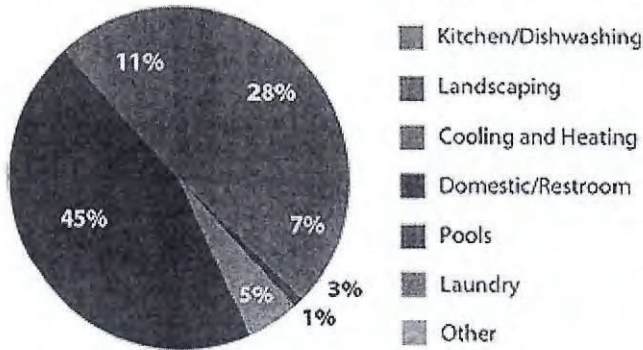
It should be noted that Title 5 flows are based on flows from the 1970s, the same time period that the school was constructed. Title 5 flow rates does not take into account the use of low flow fixtures.

The new Balmer Elementary School will be USGBC LEED certified and low flow fixtures will be used for toilets, faucets, kitchen fixtures and dishwashers, etc. Low flow fixtures are not reflected in Title 5 flow rates.



Toilets from the 1970s had flush volumes of 3.5 to 7.0 gallons per flush. Current low flow fixtures have flush volume of 1.28 gallons per flush (gpf) (EPA WaterSense Label). Reducing flush volume (3.5 to 1.28 gpf) by 63 percent for each flush.

### End Uses of Water in Schools



If toilet flushing is approximately 62 percent of sanitary flows at schools without landscape uses (irrigation), then a school with *just* low flow toilets will result in a 39% reduction of water usage over schools with fixture that are pre-1980s. The amount of water usage approximates the amount of sanitary sewer flows.

The estimated sanitary design flow of 13,710 gallons per day is a more realistically 7,730 gallons per day (or an increase of 2,330 over the existing design flow of 5,980 gallons per day) even with the occupancy more than doubling.

Source: EPA WaterSense

As previously stated, the sanitary infrastructure (pipes sizes, slopes, velocities, peaking factor, etc.) is being design based on the Title 5 flow rates, TR-16 and current engineering standards.

The analysis for the more realistic average daily flow prediction is based on the use of low flow toilets that is not included in the current Title 5 flow rates and provides a more realistic impact from the new school even with the increase in occupancy on the municipal sanitary sewer lines.

If you have any questions, please call.

Very truly yours,

**Nitsch Engineering, Inc.**

Sandra A. Brock, PE, CFM, LEED AP BD+C  
Vice President, Chief Engineer

SAB/mma

Balmer Elementary School  
 21 Crescent Street  
 Northbridge, MA

Balmer Elementary School  
 Project #12260

1/31/2018 (revised 2/11/2019)  
 Prepared by: SAB  
 Checked by:

(Estimated Maximum Daily Sewage Flows)



**MAXIMUM<sup>1</sup> DAILY SANITARY SEWER FLOWS SUMMARY TABLE**

Flow Calculations based on staffing received from School

Calculation based on MAXIMUM OCCUPANTS - GALLONS PER DAY (GPD)							
OCCUPANT	Existing Occupants	Design Flows	Totals	Proposed Occupants	DESIGN FLOW <sup>1</sup>	ESTIMATED SEWER FLOWS	CHANGE
Students	505	10 GPD/person <sup>1</sup>	5050	1214	10 GPD/person <sup>1</sup>	12,140	7,090
Teachers and Assistants (full time)	80	10 GPD/person <sup>1</sup>	800	133	10 GPD/person <sup>1</sup>	1,330	530
Volunteers (FTE) - Visitors Allowance	13	10 GPD/person <sup>2</sup>	130	24	5 GPD/person <sup>2</sup>	240	110
<b>TOTAL</b>		<b>EXISTING</b>	<b>5,980</b>		<b>PROPOSED</b>	<b>13,710</b>	<b>7,730</b>

USE 13,710

NOTES:

1. Project's sewage generation rates were estimated using the Massachusetts State Environmental Code ((Title 5) 310 CMR 15.203) and TR-16.
2. The School anticipates volunteers and visitors that will be on site from a short visit to the entire school day (this is an allowance for these occupants).
3. Peak Rates based on TR-16 and xxxx to determine peaking factor.

**MAXIMUM<sup>3</sup> DAILY PEAK RATE OF SANITARY SEWER FLOW**

Description	Gallons Per Day (GPD)	Cubic Feet Per Second (cfs)	Peaking Factor	Peak Flow	Pipe size and Slope (most restrictive run)	Capacity
Total Sanitary Sewer Flow	13,710	0.021	5	0.106		

**FLOW IN PIPE VARIABLES FOR SANITARY SEWER FLOW**

Description	Flow - Cubic Feet Per Second (cfs)	Pipe size and Slope (most restrictive run)	Mannings roughness	velocity	Note
Pipe Flowing Full - Main Line	1.55	8" PVC S=0.16	0.013	4.45	
Peak Rate of Flow - Main Line	0.11	8" PVC S=0.16	0.013	2.14	(min velocity 2 ft/s)

**ATTACHMENT B  
NORTHBRIDGE, MA, FLOW MONITORING  
REPORT, MAY-JUNE 2019**

CDM Smith  
260 West Exchange Street, Suite 300  
Providence, RI 02903  
Attn: Chad J. Kershaw

June 28, 2019

Re: Northbridge, MA  
Flow Monitoring  
May – June 2019

Dear Mr. Kershaw,

This letter is written to present the flow monitoring data collected in Northbridge, MA. The meter was installed on 05/13/19. This letter presents the data from 05/13/19 to 06/17/19. The meter was removed 06/17/19.

Site configuration information:

Site	Location	Meter
1	18 Crescent Street	Level Meter installed with a 4" Palmer- Bowlus Flume in an existing 6" diameter line.

The Level Meter senses depth. This depth information is stored in the meter's memory. The recorded data is uploaded from the flow meters with a laptop computer. During the installation, maintenance visits and removal, the depth and velocity information is confirmed and calibration measurements are noted.

**Appendix 1** contains a summary flow report and flow analysis graph for the meter site. The summary flow report presents minimum, peak and total daily flow based on the recorded 5-minute interval readings. The flow analysis graph data is presented averaged hourly to make it easier to visualize the overall flow pattern during the monitoring period. A PDF copy of the summary flow report and the flow analysis graph can be found on the data disk which accompanies this report.

**Appendix 2**, which is located on the data disk included with this report, contains daily flow reports summarized in 15-minute intervals in PDF format. The final data is also included in Excel format in its recorded 5-minute intervals on the data disk.

**Appendix 3** contains a meter site investigation sketch for the meter site. This is also included in PDF format on the included data disk.

The rainfall data presented in **Appendix 1 & 2** was collected by a tipping bucket type rain gauge installed at Balmer Elementary School on Crescent Street in Northbridge, MA on 05/13/19.

Page 2  
June 28, 2019  
Northbridge, MA

If you have any questions or require anything additional, please feel free to contact me via email or phone.

Sincerely,

Erich O'Dowd  
Data Analyst



# Summary Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Date	Minimum Flow (mgd)	Peak Flow (mgd)	Total Daily Flow (mg)	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
5/13/2019 (Mon)	0.001	0.041	0.004	0.49	0.16	0.02
5/14/2019 (Tue)	0.001	<b>0.059</b>	0.006	0.09	0.05	0.01
5/15/2019 (Wed)	0.001	0.046	<b>0.006</b>	0.01	0.01	0.01
5/16/2019 (Thu)	0.001	0.040	0.005	0.00	0.00	0.00
5/17/2019 (Fri)	0.001	0.036	0.006	0.06	0.02	0.01
5/18/2019 (Sat)	0.001	0.001	0.001	0.00	0.00	0.00
5/19/2019 (Sun)	0.001	0.002	0.001	0.00	0.00	0.00
5/20/2019 (Mon)	0.001	0.026	0.005	0.57	0.23	<b>0.11</b>
5/21/2019 (Tue)	0.001	0.034	0.005	0.00	0.00	0.00
5/22/2019 (Wed)	0.001	0.030	0.006	0.00	0.00	0.00
5/23/2019 (Thu)	0.001	0.046	0.005	0.35	0.26	0.08
5/24/2019 (Fri)	0.001	0.040	0.005	0.00	0.00	0.00
5/25/2019 (Sat)	0.000	0.001	0.001	0.09	0.09	0.04
5/26/2019 (Sun)	0.000	0.001	0.001	0.00	0.00	0.00
5/27/2019 (Mon)	0.000	0.001	0.001	0.00	0.00	0.00
5/28/2019 (Tue)	0.000	0.027	0.005	0.38	0.12	0.03
5/29/2019 (Wed)	0.001	0.005	0.001	0.12	0.08	0.01
5/30/2019 (Thu)	0.001	0.003	0.001	0.73	<b>0.60</b>	0.08
5/31/2019 (Fri)	0.001	0.005	0.001	0.03	0.03	0.02
6/1/2019 (Sat)	0.001	0.001	0.001	0.00	0.00	0.00
6/2/2019 (Sun)	0.001	0.001	0.001	0.05	0.03	0.02
6/3/2019 (Mon)	0.001	0.034	0.005	0.00	0.00	0.00
6/4/2019 (Tue)	0.000	0.042	0.005	0.00	0.00	0.00
6/5/2019 (Wed)	0.001	0.049	0.005	0.08	0.08	0.06
6/6/2019 (Thu)	0.001	0.034	0.005	0.01	0.01	0.01
6/7/2019 (Fri)	0.000	0.035	0.005	0.00	0.00	0.00
6/8/2019 (Sat)	0.000	0.005	0.001	0.00	0.00	0.00
6/9/2019 (Sun)	0.000	0.001	0.001	0.00	0.00	0.00
6/10/2019 (Mon)	0.000	0.030	0.004	0.29	0.20	0.04
6/11/2019 (Tue)	<b>0.000</b>	0.052	0.004	<b>0.83</b>	0.42	0.10
6/12/2019 (Wed)	0.000	0.032	0.004	0.00	0.00	0.00
6/13/2019 (Thu)	0.000	0.023	0.003	0.51	0.27	0.04
6/14/2019 (Fri)	0.000	0.005	0.001	0.00	0.00	0.00
6/15/2019 (Sat)	0.000	0.006	0.001	0.00	0.00	0.00
6/16/2019 (Sun)	0.000	0.001	0.001	0.16	0.04	0.01
6/17/2019 (Mon)	0.000	0.003	0.000	0.01	0.01	0.01
<b>Total for period</b>			0.109	4.86		
	<b>Min:</b>	0.000				
	<b>Avg:</b>	0.003				
	<b>Max:</b>	0.059				

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/13/2019</b>						12:30	0.98		0.010	0.003	
0:00						12:45	1.37		0.018	0.003	
0:15						13:00	0.95		0.009	0.003	
0:30						13:15	0.88		0.008	0.003	
0:45						13:30	1.24		0.015	0.003	
1:00						13:45	0.76		0.006	0.003	
1:15						14:00	0.88		0.008	0.003	
1:30						14:15	0.93		0.009	0.003	
1:45						14:30	0.45		0.002	0.003	
2:00						14:45	0.58		0.004	0.003	
2:15						15:00	0.34		0.001	0.003	
2:30						15:15	0.40		0.002	0.003	
2:45						15:30	0.34		0.001	0.004	
3:00						15:45	0.38		0.002	0.004	
3:15						16:00	0.54		0.003	0.004	
3:30						16:15	0.48		0.002	0.004	0.01
3:45						16:30	0.31		0.001	0.004	0.02
4:00						16:45	0.42		0.002	0.004	0.04
4:15						17:00	0.35		0.001	0.004	0.04
4:30						17:15	0.31		0.001	0.004	0.04
4:45						17:30	0.40		0.002	0.004	0.04
5:00						17:45	0.30		0.001	0.004	0.02
5:15						18:00	0.28		0.001	0.004	0.01
5:30						18:15	0.30		0.001	0.004	
5:45						18:30	0.30		0.001	0.004	
6:00						18:45	0.29		0.001	0.004	
6:15						19:00	0.31		0.001	0.004	0.01
6:30						19:15	0.30		0.001	0.004	0.01
6:45						19:30	0.30		0.001	0.004	0.03
7:00						19:45	0.30		0.001	0.004	0.03
7:15						20:00	0.53		0.003	0.004	0.02
7:30						20:15	0.63		0.004	0.004	0.02
7:45						20:30	0.59		0.004	0.004	0.04
8:00						20:45	0.30		0.001	0.004	0.03
8:15						21:00	0.29		0.001	0.004	
8:30						21:15	0.35		0.001	0.004	
8:45	0.43		0.005	0.000		21:30	0.30		0.001	0.004	0.01
9:00	1.33		0.017	0.000		21:45	0.37		0.001	0.004	0.02
9:15	1.57		0.023	0.000		22:00	0.45		0.002	0.004	0.02
9:30	1.51		0.021	0.001		22:15	0.31		0.001	0.004	0.01
9:45	1.45		0.020	0.001		22:30	0.29		0.001	0.004	0.01
10:00	1.63		0.025	0.001		22:45	0.29		0.001	0.004	
10:15	1.71		0.028	0.001		23:00	0.28		0.001	0.004	
10:30	1.20		0.014	0.002		23:15	0.29		0.001	0.004	
10:45	1.08		0.011	0.002		23:30	0.29		0.001	0.004	
11:00	1.22		0.014	0.002		23:45	0.28		0.001	0.004	0.01
11:15	1.49		0.022	0.002		<b>Daily Totals:</b>				<b>0.004</b>	<b>0.49</b>
11:30	1.36		0.017	0.002		<b>Data reported every:</b>	15 Minutes				
11:45	0.97		0.009	0.002							
12:00	1.14		0.012	0.002							
12:15	0.78		0.006	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/14/2019</b>						12:30	0.89		0.008	0.004	
0:00	0.28		0.001	0.000		12:45	1.34		0.017	0.005	
0:15	0.29		0.001	0.000		13:00	0.95		0.009	0.005	
0:30	0.29		0.001	0.000	0.01	13:15	1.35		0.018	0.005	
0:45	0.28		0.001	0.000	0.01	13:30	1.41		0.019	0.005	
1:00	0.28		0.001	0.000	0.02	13:45	0.94		0.009	0.005	
1:15	0.28		0.001	0.000		14:00	0.62		0.004	0.005	
1:30	0.28		0.001	0.000	0.01	14:15	0.98		0.010	0.005	
1:45	0.28		0.001	0.000		14:30	0.66		0.004	0.005	
2:00	0.28		0.001	0.000	0.01	14:45	0.40		0.002	0.005	
2:15	0.29		0.001	0.000		15:00	0.59		0.004	0.005	
2:30	0.29		0.001	0.000		15:15	0.44		0.002	0.005	
2:45	0.29		0.001	0.000	0.01	15:30	0.39		0.002	0.005	
3:00	0.29		0.001	0.000		15:45	0.63		0.004	0.005	
3:15	0.29		0.001	0.000		16:00	0.49		0.003	0.005	
3:30	0.29		0.001	0.000		16:15	0.36		0.001	0.005	
3:45	0.30		0.001	0.000		16:30	0.41		0.002	0.005	
4:00	0.30		0.001	0.000		16:45	0.52		0.003	0.006	
4:15	0.30		0.001	0.000		17:00	0.35		0.001	0.006	
4:30	0.29		0.001	0.000		17:15	0.33		0.001	0.006	
4:45	0.30		0.001	0.000		17:30	0.33		0.001	0.006	
5:00	0.30		0.001	0.000		17:45	0.33		0.001	0.006	
5:15	0.76		0.008	0.000		18:00	0.45		0.002	0.006	
5:30	1.39		0.018	0.000		18:15	0.34		0.001	0.006	
5:45	0.72		0.005	0.001		18:30	0.34		0.001	0.006	
6:00	0.62		0.004	0.001		18:45	0.34		0.001	0.006	
6:15	0.35		0.001	0.001		19:00	0.39		0.002	0.006	
6:30	0.60		0.004	0.001		19:15	0.36		0.001	0.006	
6:45	0.60		0.004	0.001		19:30	0.34		0.001	0.006	
7:00	0.59		0.004	0.001		19:45	0.34		0.001	0.006	
7:15	0.57		0.003	0.001		20:00	0.34		0.001	0.006	
7:30	1.87		0.033	0.001		20:15	0.40		0.002	0.006	
7:45	1.33		0.017	0.001		20:30	0.33		0.001	0.006	
8:00	0.71		0.005	0.001		20:45	0.42		0.002	0.006	0.01
8:15	0.80		0.006	0.001		21:00	0.39		0.002	0.006	
8:30	1.09		0.011	0.001		21:15	0.43		0.002	0.006	
8:45	1.40		0.019	0.002		21:30	0.39		0.002	0.006	
9:00	1.39		0.018	0.002		21:45	0.34		0.001	0.006	
9:15	1.14		0.012	0.002		22:00	0.38		0.002	0.006	
9:30	1.26		0.015	0.002		22:15	0.34		0.001	0.006	
9:45	1.47		0.020	0.002		22:30	0.33		0.001	0.006	
10:00	1.44		0.020	0.003		22:45	0.33		0.001	0.006	
10:15	1.15		0.013	0.003		23:00	0.33		0.001	0.006	
10:30	1.30		0.016	0.003		23:15	0.32		0.001	0.006	
10:45	1.03		0.010	0.003		23:30	0.32		0.001	0.006	0.01
11:00	1.28		0.016	0.003		23:45	0.32		0.001	0.006	
11:15	1.84		0.032	0.003		<b>Daily Totals:</b>				<b>0.006</b>	<b>0.09</b>
11:30	1.61		0.028	0.004		<b>Data reported every:</b>	15 Minutes				
11:45	1.31		0.018	0.004							
12:00	1.36		0.018	0.004							
12:15	1.08		0.011	0.004							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/15/2019</b>						12:30	1.05		0.011	0.005	
0:00	0.33		0.001	0.000		12:45	1.46		0.020	0.005	
0:15	0.33		0.001	0.000		13:00	1.26		0.015	0.005	
0:30	0.33		0.001	0.000		13:15	0.94		0.009	0.005	
0:45	0.33		0.001	0.000		13:30	1.64		0.025	0.005	
1:00	0.33		0.001	0.000		13:45	1.00		0.010	0.005	
1:15	0.33		0.001	0.000		14:00	0.70		0.005	0.005	
1:30	0.33		0.001	0.000		14:15	1.06		0.011	0.006	
1:45	0.33		0.001	0.000	0.01	14:30	0.67		0.004	0.006	
2:00	0.33		0.001	0.000		14:45	0.79		0.006	0.006	
2:15	0.33		0.001	0.000		15:00	0.47		0.002	0.006	
2:30	0.32		0.001	0.000		15:15	0.48		0.003	0.006	
2:45	0.33		0.001	0.000		15:30	0.38		0.002	0.006	
3:00	0.33		0.001	0.000		15:45	0.59		0.004	0.006	
3:15	0.33		0.001	0.000		16:00	0.54		0.003	0.006	
3:30	0.33		0.001	0.000		16:15	0.36		0.001	0.006	
3:45	0.33		0.001	0.000		16:30	0.59		0.004	0.006	
4:00	0.33		0.001	0.000		16:45	0.42		0.002	0.006	
4:15	0.33		0.001	0.000		17:00	0.37		0.001	0.006	
4:30	0.34		0.001	0.000		17:15	0.37		0.001	0.006	
4:45	0.33		0.001	0.000		17:30	0.35		0.001	0.006	
5:00	0.33		0.001	0.000		17:45	0.34		0.001	0.006	
5:15	0.48		0.003	0.000		18:00	0.34		0.001	0.006	
5:30	1.49		0.021	0.001		18:15	0.34		0.001	0.006	
5:45	1.22		0.015	0.001		18:30	0.37		0.001	0.006	
6:00	0.48		0.003	0.001		18:45	0.35		0.001	0.006	
6:15	0.46		0.002	0.001		19:00	0.50		0.003	0.006	
6:30	0.48		0.002	0.001		19:15	0.34		0.001	0.006	
6:45	0.39		0.002	0.001		19:30	0.34		0.001	0.006	
7:00	0.53		0.003	0.001		19:45	0.34		0.001	0.006	
7:15	0.76		0.006	0.001		20:00	0.35		0.001	0.006	
7:30	1.22		0.015	0.001		20:15	0.55		0.003	0.006	
7:45	1.60		0.024	0.001		20:30	0.37		0.001	0.006	
8:00	1.06		0.012	0.001		20:45	0.35		0.001	0.006	
8:15	1.02		0.011	0.001		21:00	0.35		0.001	0.006	
8:30	0.99		0.010	0.002		21:15	0.34		0.001	0.006	
8:45	1.40		0.018	0.002		21:30	0.34		0.001	0.006	
9:00	0.98		0.009	0.002		21:45	0.34		0.001	0.006	
9:15	0.59		0.004	0.002		22:00	0.37		0.001	0.006	
9:30	1.34		0.019	0.002		22:15	0.39		0.002	0.006	
9:45	1.30		0.016	0.002		22:30	0.33		0.001	0.006	
10:00	1.29		0.016	0.002		22:45	0.33		0.001	0.006	
10:15	1.14		0.013	0.003		23:00	0.33		0.001	0.006	
10:30	1.48		0.021	0.003		23:15	0.34		0.001	0.006	
10:45	1.86		0.033	0.003		23:30	0.34		0.001	0.006	
11:00	1.81		0.031	0.003		23:45	0.34		0.001	0.006	
11:15	1.47		0.021	0.004		<b>Daily Totals:</b>				<b>0.006</b>	<b>0.01</b>
11:30	1.75		0.028	0.004		<b>Data reported every:</b>	15 Minutes				
11:45	1.22		0.014	0.004							
12:00	1.33		0.017	0.004							
12:15	1.14		0.013	0.004							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/16/2019</b>						12:30	0.99		0.009	0.004	
0:00	0.33		0.001	0.000		12:45	1.52		0.022	0.004	
0:15	0.34		0.001	0.000		13:00	0.95		0.009	0.004	
0:30	0.32		0.001	0.000		13:15	1.16		0.013	0.004	
0:45	0.33		0.001	0.000		13:30	1.17		0.013	0.005	
1:00	0.33		0.001	0.000		13:45	1.09		0.011	0.005	
1:15	0.33		0.001	0.000		14:00	0.98		0.010	0.005	
1:30	0.33		0.001	0.000		14:15	0.66		0.004	0.005	
1:45	0.33		0.001	0.000		14:30	0.53		0.003	0.005	
2:00	0.33		0.001	0.000		14:45	0.48		0.002	0.005	
2:15	0.33		0.001	0.000		15:00	0.36		0.001	0.005	
2:30	0.34		0.001	0.000		15:15	0.52		0.003	0.005	
2:45	0.33		0.001	0.000		15:30	0.36		0.001	0.005	
3:00	0.34		0.001	0.000		15:45	0.50		0.003	0.005	
3:15	0.33		0.001	0.000		16:00	0.58		0.004	0.005	
3:30	0.34		0.001	0.000		16:15	0.37		0.001	0.005	
3:45	0.34		0.001	0.000		16:30	0.36		0.001	0.005	
4:00	0.34		0.001	0.000		16:45	0.51		0.003	0.005	
4:15	0.34		0.001	0.000		17:00	0.41		0.002	0.005	
4:30	0.34		0.001	0.000		17:15	0.35		0.001	0.005	
4:45	0.34		0.001	0.000		17:30	0.35		0.001	0.005	
5:00	0.34		0.001	0.000		17:45	0.37		0.001	0.005	
5:15	0.53		0.003	0.000		18:00	0.35		0.001	0.005	
5:30	1.29		0.016	0.000		18:15	0.34		0.001	0.005	
5:45	0.77		0.006	0.001		18:30	0.34		0.001	0.005	
6:00	0.43		0.002	0.001		18:45	0.42		0.002	0.005	
6:15	0.38		0.002	0.001		19:00	0.36		0.001	0.005	
6:30	0.46		0.002	0.001		19:15	0.37		0.001	0.005	
6:45	0.42		0.002	0.001		19:30	0.41		0.002	0.005	
7:00	0.87		0.008	0.001		19:45	0.42		0.002	0.005	
7:15	0.84		0.007	0.001		20:00	0.36		0.001	0.005	
7:30	1.08		0.011	0.001		20:15	0.34		0.001	0.005	
7:45	0.92		0.008	0.001		20:30	0.35		0.001	0.005	
8:00	1.89		0.033	0.001		20:45	0.45		0.002	0.005	
8:15	0.81		0.007	0.001		21:00	0.36		0.001	0.005	
8:30	0.90		0.008	0.001		21:15	0.35		0.001	0.005	
8:45	1.08		0.012	0.002		21:30	0.38		0.001	0.005	
9:00	1.33		0.017	0.002		21:45	0.35		0.001	0.005	
9:15	1.18		0.014	0.002		22:00	0.40		0.002	0.005	
9:30	1.18		0.013	0.002		22:15	0.46		0.002	0.005	
9:45	1.30		0.016	0.002		22:30	0.41		0.002	0.005	
10:00	1.25		0.015	0.002		22:45	0.35		0.001	0.005	
10:15	1.25		0.015	0.003		23:00	0.35		0.001	0.005	
10:30	1.43		0.019	0.003		23:15	0.35		0.001	0.005	
10:45	1.21		0.014	0.003		23:30	0.35		0.001	0.005	
11:00	1.27		0.016	0.003		23:45	0.36		0.001	0.005	
11:15	0.97		0.009	0.003		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.00</b>
11:30	1.40		0.019	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.43		0.020	0.004							
12:00	0.93		0.009	0.004							
12:15	1.52		0.021	0.004							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/17/2019</b>						12:30	1.17		0.014	0.003	0.01
0:00	0.35		0.001	0.000		12:45	1.15		0.015	0.004	
0:15	0.36		0.001	0.000		13:00	1.10		0.012	0.004	
0:30	0.35		0.001	0.000		13:15	1.20		0.014	0.004	
0:45	0.35		0.001	0.000		13:30	1.67		0.026	0.004	
1:00	0.35		0.001	0.000		13:45	0.99		0.010	0.004	
1:15	0.35		0.001	0.000		14:00	0.89		0.009	0.004	
1:30	0.35		0.001	0.000		14:15	0.87		0.008	0.004	
1:45	0.34		0.001	0.000		14:30	0.53		0.003	0.004	
2:00	0.35		0.001	0.000		14:45	0.46		0.002	0.004	
2:15	0.35		0.001	0.000		15:00	0.37		0.001	0.004	0.01
2:30	0.34		0.001	0.000		15:15	0.52		0.003	0.005	
2:45	0.35		0.001	0.000		15:30	0.43		0.002	0.005	
3:00	0.35		0.001	0.000		15:45	0.63		0.004	0.005	
3:15	0.35		0.001	0.000		16:00	0.50		0.003	0.005	
3:30	0.35		0.001	0.000		16:15	0.41		0.002	0.005	
3:45	0.35		0.001	0.000		16:30	0.52		0.003	0.005	
4:00	0.36		0.001	0.000		16:45	0.49		0.002	0.005	
4:15	0.35		0.001	0.000		17:00	0.47		0.002	0.005	
4:30	0.34		0.001	0.000		17:15	0.97		0.010	0.005	
4:45	0.35		0.001	0.000		17:30	0.79		0.006	0.005	
5:00	0.35		0.001	0.000		17:45	0.71		0.005	0.005	
5:15	0.34		0.001	0.000		18:00	1.49		0.021	0.005	
5:30	1.40		0.018	0.000		18:15	0.97		0.009	0.005	
5:45	0.60		0.004	0.001		18:30	0.70		0.005	0.005	
6:00	0.39		0.002	0.001		18:45	0.80		0.006	0.005	
6:15	0.48		0.003	0.001		19:00	0.64		0.004	0.005	
6:30	0.49		0.003	0.001		19:15	0.61		0.004	0.005	
6:45	0.47		0.002	0.001		19:30	0.46		0.002	0.005	
7:00	0.47		0.002	0.001		19:45	0.52		0.003	0.006	
7:15	0.39		0.002	0.001		20:00	0.39		0.002	0.006	
7:30	0.79		0.006	0.001		20:15	0.42		0.002	0.006	
7:45	0.79		0.006	0.001		20:30	0.38		0.002	0.006	
8:00	0.83		0.007	0.001		20:45	0.38		0.001	0.006	
8:15	1.02		0.010	0.001		21:00	0.39		0.002	0.006	
8:30	1.16		0.013	0.001		21:15	0.39		0.002	0.006	
8:45	1.29		0.016	0.001		21:30	0.43		0.002	0.006	
9:00	1.22		0.014	0.001	0.01	21:45	0.49		0.003	0.006	
9:15	0.92		0.008	0.002		22:00	0.36		0.001	0.006	
9:30	1.29		0.016	0.002	0.01	22:15	0.33		0.001	0.006	
9:45	1.07		0.011	0.002		22:30	0.34		0.001	0.006	
10:00	1.04		0.011	0.002		22:45	0.34		0.001	0.006	
10:15	1.16		0.013	0.002		23:00	0.34		0.001	0.006	
10:30	1.02		0.010	0.002	0.01	23:15	0.34		0.001	0.006	
10:45	1.30		0.016	0.002		23:30	0.33		0.001	0.006	
11:00	1.30		0.016	0.002		23:45	0.34		0.001	0.006	
11:15	1.10		0.012	0.003		<b>Daily Totals:</b>				<b>0.006</b>	<b>0.06</b>
11:30	1.24		0.015	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.00		0.010	0.003							
12:00	1.68		0.027	0.003							
12:15	1.25		0.015	0.003	0.01						

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/18/2019</b>						12:30	0.33		0.001	0.001	
0:00	0.34		0.001	0.000		12:45	0.35		0.001	0.001	
0:15	0.33		0.001	0.000		13:00	0.33		0.001	0.001	
0:30	0.33		0.001	0.000		13:15	0.33		0.001	0.001	
0:45	0.34		0.001	0.000		13:30	0.33		0.001	0.001	
1:00	0.33		0.001	0.000		13:45	0.34		0.001	0.001	
1:15	0.34		0.001	0.000		14:00	0.33		0.001	0.001	
1:30	0.33		0.001	0.000		14:15	0.34		0.001	0.001	
1:45	0.34		0.001	0.000		14:30	0.34		0.001	0.001	
2:00	0.34		0.001	0.000		14:45	0.35		0.001	0.001	
2:15	0.34		0.001	0.000		15:00	0.33		0.001	0.001	
2:30	0.34		0.001	0.000		15:15	0.33		0.001	0.001	
2:45	0.34		0.001	0.000		15:30	0.33		0.001	0.001	
3:00	0.33		0.001	0.000		15:45	0.33		0.001	0.001	
3:15	0.33		0.001	0.000		16:00	0.34		0.001	0.001	
3:30	0.33		0.001	0.000		16:15	0.34		0.001	0.001	
3:45	0.33		0.001	0.000		16:30	0.33		0.001	0.001	
4:00	0.34		0.001	0.000		16:45	0.34		0.001	0.001	
4:15	0.33		0.001	0.000		17:00	0.34		0.001	0.001	
4:30	0.34		0.001	0.000		17:15	0.34		0.001	0.001	
4:45	0.35		0.001	0.000		17:30	0.33		0.001	0.001	
5:00	0.33		0.001	0.000		17:45	0.33		0.001	0.001	
5:15	0.34		0.001	0.000		18:00	0.34		0.001	0.001	
5:30	0.35		0.001	0.000		18:15	0.32		0.001	0.001	
5:45	0.34		0.001	0.000		18:30	0.35		0.001	0.001	
6:00	0.34		0.001	0.000		18:45	0.34		0.001	0.001	
6:15	0.34		0.001	0.000		19:00	0.34		0.001	0.001	
6:30	0.34		0.001	0.000		19:15	0.35		0.001	0.001	
6:45	0.36		0.001	0.000		19:30	0.34		0.001	0.001	
7:00	0.33		0.001	0.000		19:45	0.34		0.001	0.001	
7:15	0.34		0.001	0.000		20:00	0.34		0.001	0.001	
7:30	0.35		0.001	0.000		20:15	0.34		0.001	0.001	
7:45	0.35		0.001	0.000		20:30	0.33		0.001	0.001	
8:00	0.35		0.001	0.000		20:45	0.33		0.001	0.001	
8:15	0.35		0.001	0.000		21:00	0.34		0.001	0.001	
8:30	0.34		0.001	0.000		21:15	0.35		0.001	0.001	
8:45	0.35		0.001	0.000		21:30	0.33		0.001	0.001	
9:00	0.35		0.001	0.000		21:45	0.34		0.001	0.001	
9:15	0.34		0.001	0.000		22:00	0.35		0.001	0.001	
9:30	0.35		0.001	0.001		22:15	0.35		0.001	0.001	
9:45	0.34		0.001	0.001		22:30	0.33		0.001	0.001	
10:00	0.35		0.001	0.001		22:45	0.34		0.001	0.001	
10:15	0.35		0.001	0.001		23:00	0.35		0.001	0.001	
10:30	0.33		0.001	0.001		23:15	0.34		0.001	0.001	
10:45	0.34		0.001	0.001		23:30	0.34		0.001	0.001	
11:00	0.35		0.001	0.001		23:45	0.35		0.001	0.001	
11:15	0.34		0.001	0.001		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.34		0.001	0.001		<b>Data reported every:</b>	15 Minutes				
11:45	0.34		0.001	0.001							
12:00	0.33		0.001	0.001							
12:15	0.34		0.001	0.001							



# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/19/2019</b>						12:30	0.35		0.001	0.001	
0:00	0.35		0.001	0.000		12:45	0.34		0.001	0.001	
0:15	0.34		0.001	0.000		13:00	0.34		0.001	0.001	
0:30	0.33		0.001	0.000		13:15	0.34		0.001	0.001	
0:45	0.34		0.001	0.000		13:30	0.32		0.001	0.001	
1:00	0.33		0.001	0.000		13:45	0.34		0.001	0.001	
1:15	0.35		0.001	0.000		14:00	0.34		0.001	0.001	
1:30	0.35		0.001	0.000		14:15	0.33		0.001	0.001	
1:45	0.34		0.001	0.000		14:30	0.34		0.001	0.001	
2:00	0.34		0.001	0.000		14:45	0.34		0.001	0.001	
2:15	0.34		0.001	0.000		15:00	0.35		0.001	0.001	
2:30	0.33		0.001	0.000		15:15	0.34		0.001	0.001	
2:45	0.33		0.001	0.000		15:30	0.35		0.001	0.001	
3:00	0.34		0.001	0.000		15:45	0.35		0.001	0.001	
3:15	0.34		0.001	0.000		16:00	0.35		0.001	0.001	
3:30	0.35		0.001	0.000		16:15	0.36		0.001	0.001	
3:45	0.35		0.001	0.000		16:30	0.36		0.001	0.001	
4:00	0.34		0.001	0.000		16:45	0.35		0.001	0.001	
4:15	0.35		0.001	0.000		17:00	0.33		0.001	0.001	
4:30	0.34		0.001	0.000		17:15	0.34		0.001	0.001	
4:45	0.34		0.001	0.000		17:30	0.35		0.001	0.001	
5:00	0.34		0.001	0.000		17:45	0.35		0.001	0.001	
5:15	0.35		0.001	0.000		18:00	0.35		0.001	0.001	
5:30	0.35		0.001	0.000		18:15	0.34		0.001	0.001	
5:45	0.35		0.001	0.000		18:30	0.34		0.001	0.001	
6:00	0.34		0.001	0.000		18:45	0.36		0.001	0.001	
6:15	0.34		0.001	0.000		19:00	0.35		0.001	0.001	
6:30	0.34		0.001	0.000		19:15	0.34		0.001	0.001	
6:45	0.34		0.001	0.000		19:30	0.35		0.001	0.001	
7:00	0.34		0.001	0.000		19:45	0.35		0.001	0.001	
7:15	0.35		0.001	0.000		20:00	0.34		0.001	0.001	
7:30	0.35		0.001	0.000		20:15	0.35		0.001	0.001	
7:45	0.35		0.001	0.000		20:30	0.34		0.001	0.001	
8:00	0.35		0.001	0.000		20:45	0.34		0.001	0.001	
8:15	0.35		0.001	0.000		21:00	0.36		0.001	0.001	
8:30	0.37		0.001	0.000		21:15	0.34		0.001	0.001	
8:45	0.35		0.001	0.000		21:30	0.35		0.001	0.001	
9:00	0.34		0.001	0.000		21:45	0.34		0.001	0.001	
9:15	0.34		0.001	0.000		22:00	0.33		0.001	0.001	
9:30	0.34		0.001	0.001		22:15	0.34		0.001	0.001	
9:45	0.34		0.001	0.001		22:30	0.34		0.001	0.001	
10:00	0.35		0.001	0.001		22:45	0.34		0.001	0.001	
10:15	0.34		0.001	0.001		23:00	0.34		0.001	0.001	
10:30	0.35		0.001	0.001		23:15	0.35		0.001	0.001	
10:45	0.34		0.001	0.001		23:30	0.34		0.001	0.001	
11:00	0.34		0.001	0.001		23:45	0.35		0.001	0.001	
11:15	0.35		0.001	0.001		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.34		0.001	0.001		<b>Data reported every:</b>	15 Minutes				
11:45	0.34		0.001	0.001							
12:00	0.35		0.001	0.001							
12:15	0.34		0.001	0.001							



# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	
<b>5/20/2019</b>						12:30	0.92		0.008	0.004		
0:00	0.34		0.001	0.000		12:45	0.95		0.009	0.004		
0:15	0.35		0.001	0.000		13:00	1.14		0.012	0.004		
0:30	0.34		0.001	0.000		13:15	0.71		0.006	0.004		
0:45	0.35		0.001	0.000	0.20	13:30	0.64		0.005	0.004		
1:00	0.33		0.001	0.000	0.01	13:45	1.07		0.011	0.004		
1:15	0.32		0.001	0.000		14:00	0.87		0.007	0.004		
1:30	0.30		0.001	0.000		14:15	0.55		0.003	0.004	0.07	
1:45	0.32		0.001	0.000	0.01	14:30	0.69		0.005	0.004	0.15	
2:00	0.32		0.001	0.000	0.01	14:45	0.57		0.003	0.004	0.01	
2:15	0.34		0.001	0.000		15:00	0.51		0.003	0.004		
2:30	0.37		0.001	0.000		15:15	0.64		0.004	0.004		
2:45	0.35		0.001	0.000		15:30	0.80		0.007	0.004		
3:00	0.35		0.001	0.000		15:45	0.58		0.003	0.004		
3:15	0.34		0.001	0.000		16:00	0.60		0.004	0.004		
3:30	0.32		0.001	0.000		16:15	0.79		0.006	0.004	0.01	
3:45	0.33		0.001	0.000		16:30	0.95		0.009	0.005	0.09	
4:00	0.30		0.001	0.000		16:45	0.99		0.010	0.005		
4:15	0.30		0.001	0.000		17:00	0.83		0.007	0.005	0.01	
4:30	0.31		0.001	0.000		17:15	0.51		0.003	0.005		
4:45	0.31		0.001	0.000		17:30	0.69		0.006	0.005		
5:00	0.31		0.001	0.000		17:45	0.63		0.004	0.005		
5:15	0.80		0.007	0.000		18:00	0.54		0.003	0.005		
5:30	1.28		0.016	0.000		18:15	0.48		0.002	0.005		
5:45	0.84		0.007	0.001		18:30	0.44		0.002	0.005		
6:00	0.35		0.001	0.001		18:45	0.43		0.002	0.005		
6:15	0.31		0.001	0.001		19:00	0.42		0.002	0.005		
6:30	0.57		0.003	0.001		19:15	0.46		0.002	0.005		
6:45	0.41		0.002	0.001		19:30	0.51		0.003	0.005		
7:00	0.61		0.004	0.001		19:45	0.81		0.007	0.005		
7:15	0.62		0.004	0.001		20:00	0.58		0.003	0.005		
7:30	0.89		0.008	0.001		20:15	0.53		0.003	0.005		
7:45	0.76		0.006	0.001		20:30	0.46		0.002	0.005		
8:00	0.68		0.005	0.001		20:45	0.39		0.002	0.005		
8:15	0.79		0.006	0.001		21:00	0.40		0.002	0.005		
8:30	1.03		0.010	0.001		21:15	0.39		0.002	0.005		
8:45	1.10		0.012	0.001		21:30	0.41		0.002	0.005		
9:00	1.49		0.021	0.001		21:45	0.41		0.002	0.005		
9:15	1.48		0.020	0.002		22:00	0.55		0.003	0.005		
9:30	1.41		0.018	0.002		22:15	0.47		0.002	0.005		
9:45	1.45		0.020	0.002		22:30	0.45		0.002	0.005		
10:00	1.37		0.017	0.002		22:45	0.45		0.002	0.005		
10:15	1.42		0.019	0.002		23:00	0.46		0.002	0.005		
10:30	1.16		0.013	0.003		23:15	0.44		0.002	0.005		
10:45	0.91		0.008	0.003		23:30	0.46		0.002	0.005		
11:00	1.08		0.012	0.003		23:45	0.48		0.002	0.005		
11:15	1.41		0.019	0.003		<b>Daily Totals:</b>					<b>0.005</b>	<b>0.57</b>
11:30	1.26		0.015	0.003		<b>Data reported every:</b> 15 Minutes						
11:45	1.11		0.012	0.003								
12:00	0.92		0.008	0.003								
12:15	0.92		0.009	0.003								

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/21/2019</b>						12:30	1.30		0.016	0.003	
0:00	0.51		0.003	0.000		12:45	1.45		0.020	0.003	
0:15	0.56		0.003	0.000		13:00	0.96		0.009	0.004	
0:30	0.57		0.003	0.000		13:15	1.03		0.010	0.004	
0:45	0.56		0.003	0.000		13:30	1.34		0.017	0.004	
1:00	0.53		0.003	0.000		13:45	1.18		0.014	0.004	
1:15	0.51		0.003	0.000		14:00	0.98		0.010	0.004	
1:30	0.45		0.002	0.000		14:15	0.65		0.004	0.004	
1:45	0.41		0.002	0.000		14:30	0.87		0.008	0.004	
2:00	0.40		0.002	0.000		14:45	0.80		0.008	0.004	
2:15	0.39		0.002	0.000		15:00	0.69		0.005	0.004	
2:30	0.39		0.002	0.000		15:15	0.58		0.003	0.004	
2:45	0.39		0.002	0.000		15:30	0.43		0.002	0.004	
3:00	0.43		0.002	0.000		15:45	0.55		0.003	0.004	
3:15	0.41		0.002	0.000		16:00	0.39		0.002	0.004	
3:30	0.41		0.002	0.000		16:15	0.37		0.001	0.004	
3:45	0.41		0.002	0.000		16:30	0.45		0.002	0.004	
4:00	0.44		0.002	0.000		16:45	0.65		0.004	0.004	
4:15	0.44		0.002	0.000		17:00	0.50		0.003	0.005	
4:30	0.44		0.002	0.000		17:15	0.43		0.002	0.005	
4:45	0.44		0.002	0.000		17:30	0.34		0.001	0.005	
5:00	0.45		0.002	0.000		17:45	0.39		0.002	0.005	
5:15	0.45		0.002	0.000		18:00	0.36		0.001	0.005	
5:30	0.64		0.005	0.001		18:15	0.35		0.001	0.005	
5:45	0.79		0.006	0.001		18:30	0.35		0.001	0.005	
6:00	0.54		0.003	0.001		18:45	0.41		0.002	0.005	
6:15	0.52		0.003	0.001		19:00	0.36		0.001	0.005	
6:30	0.53		0.003	0.001		19:15	0.35		0.001	0.005	
6:45	0.47		0.002	0.001		19:30	0.36		0.001	0.005	
7:00	0.56		0.003	0.001		19:45	0.35		0.001	0.005	
7:15	0.74		0.005	0.001		20:00	0.35		0.001	0.005	
7:30	0.74		0.005	0.001		20:15	0.36		0.001	0.005	
7:45	0.74		0.006	0.001		20:30	0.36		0.001	0.005	
8:00	0.85		0.008	0.001		20:45	0.34		0.001	0.005	
8:15	0.76		0.006	0.001		21:00	0.37		0.001	0.005	
8:30	0.84		0.007	0.001		21:15	0.35		0.001	0.005	
8:45	0.84		0.007	0.001		21:30	0.36		0.001	0.005	
9:00	0.84		0.007	0.001		21:45	0.46		0.002	0.005	
9:15	0.84		0.007	0.001		22:00	0.35		0.001	0.005	
9:30	0.84		0.007	0.001		22:15	0.42		0.002	0.005	
9:45	0.78		0.006	0.002		22:30	0.35		0.001	0.005	
10:00	0.81		0.006	0.002		22:45	0.35		0.001	0.005	
10:15	1.12		0.012	0.002		23:00	0.35		0.001	0.005	
10:30	1.31		0.016	0.002		23:15	0.35		0.001	0.005	
10:45	1.25		0.015	0.002		23:30	0.35		0.001	0.005	
11:00	1.28		0.015	0.002		23:45	0.35		0.001	0.005	
11:15	1.43		0.019	0.002		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.00</b>
11:30	1.29		0.016	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.29		0.017	0.003							
12:00	1.39		0.018	0.003							
12:15	1.07		0.011	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/22/2019</b>						12:30	1.34		0.017	0.004	
0:00	0.34		0.001	0.000		12:45	1.28		0.016	0.004	
0:15	0.34		0.001	0.000		13:00	0.98		0.009	0.004	
0:30	0.34		0.001	0.000		13:15	0.96		0.009	0.004	
0:45	0.34		0.001	0.000		13:30	1.41		0.019	0.004	
1:00	0.34		0.001	0.000		13:45	0.99		0.010	0.005	
1:15	0.35		0.001	0.000		14:00	0.95		0.009	0.005	
1:30	0.35		0.001	0.000		14:15	0.70		0.005	0.005	
1:45	0.35		0.001	0.000		14:30	0.41		0.002	0.005	
2:00	0.35		0.001	0.000		14:45	0.88		0.009	0.005	
2:15	0.35		0.001	0.000		15:00	0.53		0.003	0.005	
2:30	0.35		0.001	0.000		15:15	0.55		0.003	0.005	
2:45	0.35		0.001	0.000		15:30	0.46		0.002	0.005	
3:00	0.35		0.001	0.000		15:45	0.58		0.004	0.005	
3:15	0.34		0.001	0.000		16:00	0.40		0.002	0.005	
3:30	0.35		0.001	0.000		16:15	0.47		0.002	0.005	
3:45	0.34		0.001	0.000		16:30	0.38		0.002	0.005	
4:00	0.34		0.001	0.000		16:45	0.49		0.003	0.005	
4:15	0.35		0.001	0.000		17:00	0.34		0.001	0.005	
4:30	0.34		0.001	0.000		17:15	0.33		0.001	0.005	
4:45	0.34		0.001	0.000		17:30	0.46		0.002	0.005	
5:00	0.35		0.001	0.000		17:45	0.33		0.001	0.005	
5:15	0.53		0.003	0.000		18:00	0.33		0.001	0.005	
5:30	1.66		0.025	0.001		18:15	0.34		0.001	0.005	
5:45	0.96		0.009	0.001		18:30	0.36		0.001	0.005	
6:00	0.63		0.004	0.001		18:45	0.55		0.004	0.005	
6:15	0.50		0.003	0.001		19:00	0.64		0.004	0.005	
6:30	0.54		0.003	0.001		19:15	0.65		0.004	0.005	
6:45	0.40		0.002	0.001		19:30	0.59		0.004	0.005	
7:00	0.59		0.004	0.001		19:45	0.49		0.003	0.005	
7:15	0.74		0.006	0.001		20:00	0.39		0.002	0.005	
7:30	1.19		0.014	0.001		20:15	0.33		0.001	0.005	
7:45	0.90		0.008	0.001		20:30	0.32		0.001	0.005	
8:00	0.88		0.008	0.001		20:45	0.33		0.001	0.005	
8:15	0.84		0.007	0.001		21:00	0.34		0.001	0.005	
8:30	0.88		0.008	0.001		21:15	0.34		0.001	0.005	
8:45	1.24		0.015	0.002		21:30	0.41		0.002	0.005	
9:00	1.38		0.018	0.002		21:45	0.34		0.001	0.005	
9:15	1.11		0.012	0.002		22:00	0.34		0.001	0.005	
9:30	1.23		0.015	0.002		22:15	0.42		0.002	0.005	
9:45	1.06		0.011	0.002		22:30	0.34		0.001	0.005	
10:00	1.07		0.011	0.002		22:45	0.34		0.001	0.005	
10:15	1.42		0.019	0.002		23:00	0.34		0.001	0.005	
10:30	1.56		0.023	0.003		23:15	0.34		0.001	0.005	
10:45	1.51		0.021	0.003		23:30	0.33		0.001	0.005	
11:00	1.16		0.013	0.003		23:45	0.33		0.001	0.006	
11:15	1.44		0.019	0.003		<b>Daily Totals:</b>				<b>0.006</b>	<b>0.00</b>
11:30	0.83		0.007	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.07		0.011	0.003							
12:00	1.41		0.019	0.004							
12:15	1.03		0.010	0.004							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/23/2019</b>						12:30	1.44		0.020	0.004	
0:00	0.33		0.001	0.000		12:45	1.45		0.020	0.004	
0:15	0.32		0.001	0.000		13:00	1.16		0.013	0.004	
0:30	0.32		0.001	0.000		13:15	1.33		0.017	0.004	
0:45	0.33		0.001	0.000		13:30	1.22		0.014	0.004	
1:00	0.32		0.001	0.000		13:45	1.07		0.011	0.005	
1:15	0.33		0.001	0.000		14:00	0.78		0.006	0.005	
1:30	0.32		0.001	0.000		14:15	0.69		0.005	0.005	
1:45	0.32		0.001	0.000		14:30	0.93		0.009	0.005	
2:00	0.33		0.001	0.000		14:45	0.51		0.003	0.005	
2:15	0.32		0.001	0.000		15:00	0.42		0.002	0.005	
2:30	0.32		0.001	0.000		15:15	0.62		0.004	0.005	
2:45	0.32		0.001	0.000		15:30	0.47		0.002	0.005	
3:00	0.32		0.001	0.000		15:45	0.48		0.002	0.005	0.07
3:15	0.32		0.001	0.000		16:00	0.69		0.006	0.005	0.01
3:30	0.32		0.001	0.000		16:15	0.38		0.002	0.005	0.01
3:45	0.32		0.001	0.000		16:30	0.34		0.001	0.005	
4:00	0.32		0.001	0.000		16:45	0.34		0.001	0.005	
4:15	0.32		0.001	0.000		17:00	0.55		0.003	0.005	
4:30	0.32		0.001	0.000		17:15	0.39		0.002	0.005	
4:45	0.32		0.001	0.000		17:30	0.38		0.002	0.005	
5:00	0.32		0.001	0.000		17:45	0.36		0.001	0.005	
5:15	0.49		0.003	0.000		18:00	0.33		0.001	0.005	
5:30	1.18		0.014	0.000		18:15	0.32		0.001	0.005	
5:45	1.08		0.012	0.001		18:30	0.32		0.001	0.005	
6:00	0.59		0.004	0.001		18:45	0.32		0.001	0.005	
6:15	0.39		0.002	0.001		19:00	0.33		0.001	0.005	
6:30	0.55		0.003	0.001		19:15	0.32		0.001	0.005	
6:45	0.39		0.002	0.001		19:30	0.42		0.002	0.005	
7:00	0.55		0.003	0.001		19:45	0.39		0.002	0.005	
7:15	0.61		0.004	0.001		20:00	0.47		0.002	0.005	
7:30	0.78		0.006	0.001		20:15	0.35		0.001	0.005	
7:45	0.94		0.009	0.001		20:30	0.34		0.001	0.005	
8:00	0.75		0.006	0.001		20:45	0.42		0.002	0.005	
8:15	0.86		0.008	0.001		21:00	0.33		0.001	0.005	
8:30	0.78		0.006	0.001		21:15	0.32		0.001	0.005	
8:45	1.04		0.011	0.001		21:30	0.32		0.001	0.005	
9:00	1.00		0.010	0.001		21:45	0.39		0.002	0.005	
9:15	0.94		0.009	0.001		22:00	0.31		0.001	0.005	
9:30	1.38		0.019	0.002		22:15	0.32		0.001	0.005	
9:45	1.17		0.013	0.002		22:30	0.32		0.001	0.005	
10:00	1.40		0.019	0.002		22:45	0.28		0.001	0.005	0.09
10:15	1.11		0.012	0.002		23:00	0.33		0.001	0.005	0.11
10:30	1.13		0.012	0.002		23:15	0.32		0.001	0.005	0.04
10:45	1.50		0.022	0.002		23:30	0.31		0.001	0.005	0.02
11:00	1.27		0.016	0.003		23:45	0.31		0.001	0.005	
11:15	1.42		0.019	0.003		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.35</b>
11:30	1.27		0.015	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.11		0.012	0.003							
12:00	1.75		0.029	0.003							
12:15	1.29		0.017	0.004							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/24/2019</b>						12:30	1.43		0.019	0.004	
0:00	0.31		0.001	0.000		12:45	1.23		0.015	0.004	
0:15	0.28		0.001	0.000		13:00	1.23		0.014	0.004	
0:30	0.29		0.001	0.000		13:15	1.14		0.013	0.004	
0:45	0.29		0.001	0.000		13:30	1.42		0.019	0.004	
1:00	0.29		0.001	0.000		13:45	0.94		0.009	0.005	
1:15	0.29		0.001	0.000		14:00	0.96		0.009	0.005	
1:30	0.29		0.001	0.000		14:15	0.95		0.009	0.005	
1:45	0.29		0.001	0.000		14:30	0.86		0.007	0.005	
2:00	0.31		0.001	0.000		14:45	0.77		0.006	0.005	
2:15	0.31		0.001	0.000		15:00	0.74		0.005	0.005	
2:30	0.31		0.001	0.000		15:15	0.57		0.004	0.005	
2:45	0.30		0.001	0.000		15:30	0.48		0.002	0.005	
3:00	0.30		0.001	0.000		15:45	0.33		0.001	0.005	
3:15	0.30		0.001	0.000		16:00	0.68		0.005	0.005	
3:30	0.32		0.001	0.000		16:15	0.35		0.001	0.005	
3:45	0.32		0.001	0.000		16:30	0.28		0.001	0.005	
4:00	0.31		0.001	0.000		16:45	0.26		0.001	0.005	
4:15	0.32		0.001	0.000		17:00	0.45		0.002	0.005	
4:30	0.32		0.001	0.000		17:15	0.69		0.005	0.005	
4:45	0.32		0.001	0.000		17:30	0.65		0.005	0.005	
5:00	0.32		0.001	0.000		17:45	0.49		0.003	0.005	
5:15	0.31		0.001	0.000		18:00	0.42		0.002	0.005	
5:30	1.48		0.020	0.000		18:15	0.30		0.001	0.005	
5:45	0.87		0.008	0.001		18:30	0.28		0.001	0.005	
6:00	0.51		0.003	0.001		18:45	0.27		0.001	0.005	
6:15	0.40		0.002	0.001		19:00	0.29		0.001	0.005	
6:30	0.52		0.003	0.001		19:15	0.29		0.001	0.005	
6:45	0.55		0.003	0.001		19:30	0.28		0.001	0.005	
7:00	0.79		0.006	0.001		19:45	0.30		0.001	0.005	
7:15	0.60		0.004	0.001		20:00	0.28		0.001	0.005	
7:30	0.87		0.008	0.001		20:15	0.27		0.001	0.005	
7:45	0.79		0.007	0.001		20:30	0.27		0.001	0.005	
8:00	0.82		0.007	0.001		20:45	0.27		0.001	0.005	
8:15	1.17		0.013	0.001		21:00	0.26		0.001	0.005	
8:30	1.03		0.011	0.001		21:15	0.27		0.001	0.005	
8:45	1.36		0.018	0.001		21:30	0.30		0.001	0.005	
9:00	1.28		0.016	0.002		21:45	0.42		0.002	0.005	
9:15	0.98		0.010	0.002		22:00	0.32		0.001	0.005	
9:30	1.26		0.015	0.002		22:15	0.36		0.001	0.005	
9:45	1.23		0.015	0.002		22:30	0.30		0.001	0.005	
10:00	1.30		0.016	0.002		22:45	0.28		0.001	0.005	
10:15	1.33		0.017	0.002		23:00	0.28		0.001	0.005	
10:30	1.03		0.011	0.002		23:15	0.28		0.001	0.005	
10:45	1.29		0.016	0.003		23:30	0.28		0.001	0.005	
11:00	1.26		0.016	0.003		23:45	0.27		0.001	0.005	
11:15	1.43		0.021	0.003		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.00</b>
11:30	1.60		0.024	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.11		0.012	0.003							
12:00	1.04		0.011	0.003							
12:15	1.09		0.012	0.004							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/25/2019</b>						12:30	0.25		0.001	0.000	
0:00	0.27		0.001	0.000		12:45	0.26		0.001	0.000	
0:15	0.26		0.001	0.000		13:00	0.25		0.001	0.000	
0:30	0.26		0.001	0.000		13:15	0.23		0.001	0.000	
0:45	0.26		0.001	0.000		13:30	0.24		0.001	0.000	
1:00	0.27		0.001	0.000		13:45	0.23		0.001	0.000	
1:15	0.27		0.001	0.000		14:00	0.22		0.001	0.000	
1:30	0.27		0.001	0.000		14:15	0.24		0.001	0.000	
1:45	0.27		0.001	0.000		14:30	0.24		0.001	0.000	
2:00	0.27		0.001	0.000		14:45	0.24		0.001	0.000	
2:15	0.27		0.001	0.000		15:00	0.26		0.001	0.000	
2:30	0.28		0.001	0.000		15:15	0.25		0.001	0.000	
2:45	0.27		0.001	0.000		15:30	0.27		0.001	0.001	
3:00	0.27		0.001	0.000		15:45	0.26		0.001	0.001	
3:15	0.26		0.001	0.000		16:00	0.26		0.001	0.001	
3:30	0.27		0.001	0.000		16:15	0.27		0.001	0.001	
3:45	0.27		0.001	0.000		16:30	0.27		0.001	0.001	
4:00	0.27		0.001	0.000		16:45	0.27		0.001	0.001	
4:15	0.27		0.001	0.000		17:00	0.23		0.001	0.001	
4:30	0.27		0.001	0.000		17:15	0.23		0.001	0.001	
4:45	0.27		0.001	0.000		17:30	0.25		0.001	0.001	
5:00	0.27		0.001	0.000		17:45	0.25		0.001	0.001	
5:15	0.27		0.001	0.000		18:00	0.24		0.001	0.001	
5:30	0.27		0.001	0.000		18:15	0.26		0.001	0.001	
5:45	0.27		0.001	0.000		18:30	0.26		0.001	0.001	
6:00	0.28		0.001	0.000		18:45	0.26		0.001	0.001	
6:15	0.28		0.001	0.000		19:00	0.27		0.001	0.001	
6:30	0.27		0.001	0.000		19:15	0.26		0.001	0.001	
6:45	0.27		0.001	0.000		19:30	0.27		0.001	0.001	
7:00	0.27		0.001	0.000		19:45	0.28		0.001	0.001	
7:15	0.28		0.001	0.000		20:00	0.28		0.001	0.001	
7:30	0.29		0.001	0.000		20:15	0.26		0.001	0.001	
7:45	0.29		0.001	0.000		20:30	0.27		0.001	0.001	
8:00	0.27		0.001	0.000		20:45	0.27		0.001	0.001	
8:15	0.27		0.001	0.000		21:00	0.24		0.001	0.001	
8:30	0.27		0.001	0.000		21:15	0.24		0.001	0.001	
8:45	0.26		0.001	0.000		21:30	0.24		0.001	0.001	
9:00	0.27		0.001	0.000		21:45	0.25		0.001	0.001	
9:15	0.28		0.001	0.000		22:00	0.25		0.001	0.001	
9:30	0.26		0.001	0.000		22:15	0.26		0.001	0.001	
9:45	0.25		0.001	0.000		22:30	0.26		0.001	0.001	0.03
10:00	0.27		0.001	0.000		22:45	0.26		0.001	0.001	0.05
10:15	0.26		0.001	0.000		23:00	0.26		0.001	0.001	
10:30	0.27		0.001	0.000		23:15	0.27		0.001	0.001	
10:45	0.26		0.001	0.000		23:30	0.28		0.001	0.001	0.01
11:00	0.24		0.001	0.000		23:45	0.27		0.001	0.001	
11:15	0.24		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.09</b>
11:30	0.26		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.25		0.001	0.000							
12:00	0.27		0.001	0.000							
12:15	0.27		0.001	0.000							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/26/2019</b>						12:30	0.26		0.001	0.000	
0:00	0.26		0.001	0.000		12:45	0.26		0.001	0.000	
0:15	0.24		0.001	0.000		13:00	0.26		0.001	0.000	
0:30	0.23		0.001	0.000		13:15	0.25		0.001	0.000	
0:45	0.24		0.001	0.000		13:30	0.27		0.001	0.000	
1:00	0.25		0.001	0.000		13:45	0.26		0.001	0.000	
1:15	0.25		0.001	0.000		14:00	0.25		0.001	0.000	
1:30	0.26		0.001	0.000		14:15	0.23		0.001	0.000	
1:45	0.26		0.001	0.000		14:30	0.24		0.001	0.000	
2:00	0.26		0.001	0.000		14:45	0.26		0.001	0.000	
2:15	0.27		0.001	0.000		15:00	0.25		0.001	0.000	
2:30	0.28		0.001	0.000		15:15	0.26		0.001	0.000	
2:45	0.27		0.001	0.000		15:30	0.28		0.001	0.000	
3:00	0.28		0.001	0.000		15:45	0.27		0.001	0.000	
3:15	0.27		0.001	0.000		16:00	0.25		0.001	0.000	
3:30	0.24		0.001	0.000		16:15	0.26		0.001	0.000	
3:45	0.23		0.001	0.000		16:30	0.24		0.001	0.000	
4:00	0.23		0.001	0.000		16:45	0.20		0.000	0.000	
4:15	0.23		0.001	0.000		17:00	0.20		0.000	0.000	
4:30	0.24		0.001	0.000		17:15	0.20		0.000	0.000	
4:45	0.24		0.001	0.000		17:30	0.20		0.000	0.001	
5:00	0.25		0.001	0.000		17:45	0.20		0.000	0.001	
5:15	0.24		0.001	0.000		18:00	0.21		0.001	0.001	
5:30	0.24		0.001	0.000		18:15	0.23		0.001	0.001	
5:45	0.24		0.001	0.000		18:30	0.23		0.001	0.001	
6:00	0.26		0.001	0.000		18:45	0.24		0.001	0.001	
6:15	0.25		0.001	0.000		19:00	0.24		0.001	0.001	
6:30	0.25		0.001	0.000		19:15	0.23		0.001	0.001	
6:45	0.26		0.001	0.000		19:30	0.21		0.000	0.001	
7:00	0.27		0.001	0.000		19:45	0.20		0.000	0.001	
7:15	0.26		0.001	0.000		20:00	0.20		0.000	0.001	
7:30	0.24		0.001	0.000		20:15	0.20		0.000	0.001	
7:45	0.26		0.001	0.000		20:30	0.20		0.000	0.001	
8:00	0.23		0.001	0.000		20:45	0.20		0.000	0.001	
8:15	0.22		0.001	0.000		21:00	0.20		0.000	0.001	
8:30	0.22		0.001	0.000		21:15	0.20		0.000	0.001	
8:45	0.22		0.001	0.000		21:30	0.20		0.000	0.001	
9:00	0.23		0.001	0.000		21:45	0.20		0.000	0.001	
9:15	0.24		0.001	0.000		22:00	0.20		0.000	0.001	
9:30	0.26		0.001	0.000		22:15	0.20		0.000	0.001	
9:45	0.30		0.001	0.000		22:30	0.21		0.001	0.001	
10:00	0.29		0.001	0.000		22:45	0.24		0.001	0.001	
10:15	0.26		0.001	0.000		23:00	0.24		0.001	0.001	
10:30	0.25		0.001	0.000		23:15	0.23		0.001	0.001	
10:45	0.23		0.001	0.000		23:30	0.21		0.001	0.001	
11:00	0.24		0.001	0.000		23:45	0.21		0.001	0.001	
11:15	0.23		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.22		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.21		0.001	0.000							
12:00	0.25		0.001	0.000							
12:15	0.22		0.001	0.000							



# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/27/2019</b>						12:30	0.24		0.001	0.000	
0:00	0.21		0.001	0.000		12:45	0.25		0.001	0.000	
0:15	0.21		0.001	0.000		13:00	0.24		0.001	0.000	
0:30	0.21		0.001	0.000		13:15	0.20		0.000	0.000	
0:45	0.21		0.001	0.000		13:30	0.20		0.000	0.000	
1:00	0.21		0.001	0.000		13:45	0.20		0.000	0.000	
1:15	0.21		0.001	0.000		14:00	0.20		0.000	0.000	
1:30	0.21		0.001	0.000		14:15	0.20		0.000	0.000	
1:45	0.21		0.001	0.000		14:30	0.20		0.000	0.000	
2:00	0.21		0.001	0.000		14:45	0.20		0.000	0.000	
2:15	0.21		0.001	0.000		15:00	0.20		0.000	0.000	
2:30	0.21		0.001	0.000		15:15	0.20		0.000	0.000	
2:45	0.21		0.001	0.000		15:30	0.20		0.000	0.000	
3:00	0.23		0.001	0.000		15:45	0.21		0.000	0.000	
3:15	0.26		0.001	0.000		16:00	0.21		0.001	0.000	
3:30	0.24		0.001	0.000		16:15	0.24		0.001	0.000	
3:45	0.24		0.001	0.000		16:30	0.22		0.001	0.000	
4:00	0.23		0.001	0.000		16:45	0.23		0.001	0.000	
4:15	0.21		0.001	0.000		17:00	0.23		0.001	0.000	
4:30	0.20		0.000	0.000		17:15	0.22		0.001	0.000	
4:45	0.20		0.000	0.000		17:30	0.20		0.000	0.000	
5:00	0.20		0.000	0.000		17:45	0.20		0.000	0.000	
5:15	0.20		0.000	0.000		18:00	0.20		0.000	0.000	
5:30	0.20		0.000	0.000		18:15	0.20		0.000	0.000	
5:45	0.20		0.000	0.000		18:30	0.20		0.000	0.000	
6:00	0.20		0.000	0.000		18:45	0.19		0.000	0.000	
6:15	0.20		0.000	0.000		19:00	0.19		0.000	0.000	
6:30	0.20		0.000	0.000		19:15	0.19		0.000	0.000	
6:45	0.20		0.000	0.000		19:30	0.19		0.000	0.000	
7:00	0.20		0.000	0.000		19:45	0.20		0.000	0.000	
7:15	0.27		0.001	0.000		20:00	0.22		0.001	0.000	
7:30	0.27		0.001	0.000		20:15	0.23		0.001	0.000	
7:45	0.27		0.001	0.000		20:30	0.24		0.001	0.000	
8:00	0.27		0.001	0.000		20:45	0.24		0.001	0.000	
8:15	0.26		0.001	0.000		21:00	0.25		0.001	0.000	
8:30	0.26		0.001	0.000		21:15	0.24		0.001	0.000	
8:45	0.22		0.001	0.000		21:30	0.24		0.001	0.000	
9:00	0.20		0.000	0.000		21:45	0.24		0.001	0.000	
9:15	0.20		0.000	0.000		22:00	0.24		0.001	0.000	
9:30	0.20		0.000	0.000		22:15	0.24		0.001	0.000	
9:45	0.20		0.000	0.000		22:30	0.25		0.001	0.000	
10:00	0.20		0.000	0.000		22:45	0.25		0.001	0.001	
10:15	0.20		0.000	0.000		23:00	0.25		0.001	0.001	
10:30	0.19		0.000	0.000		23:15	0.25		0.001	0.001	
10:45	0.19		0.000	0.000		23:30	0.25		0.001	0.001	
11:00	0.18		0.000	0.000		23:45	0.25		0.001	0.001	
11:15	0.18		0.000	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.19		0.000	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.22		0.001	0.000							
12:00	0.23		0.001	0.000							
12:15	0.23		0.001	0.000							



# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/28/2019</b>						12:30	0.53		0.003	0.003	
0:00	0.23		0.001	0.000		12:45	1.60		0.024	0.003	
0:15	0.24		0.001	0.000		13:00	0.86		0.007	0.003	
0:30	0.25		0.001	0.000		13:15	0.82		0.007	0.003	
0:45	0.26		0.001	0.000		13:30	1.47		0.020	0.004	
1:00	0.25		0.001	0.000		13:45	1.28		0.016	0.004	0.01
1:15	0.23		0.001	0.000		14:00	0.83		0.007	0.004	0.01
1:30	0.22		0.001	0.000		14:15	0.80		0.006	0.004	0.03
1:45	0.22		0.001	0.000		14:30	0.78		0.006	0.004	0.05
2:00	0.22		0.001	0.000		14:45	1.05		0.012	0.004	0.01
2:15	0.22		0.001	0.000		15:00	0.59		0.004	0.004	
2:30	0.22		0.001	0.000		15:15	0.60		0.004	0.004	0.02
2:45	0.23		0.001	0.000		15:30	0.40		0.002	0.004	0.01
3:00	0.23		0.001	0.000		15:45	0.31		0.001	0.004	0.02
3:15	0.23		0.001	0.000		16:00	0.49		0.003	0.004	0.03
3:30	0.23		0.001	0.000		16:15	0.66		0.004	0.004	0.04
3:45	0.24		0.001	0.000		16:30	0.66		0.004	0.004	0.02
4:00	0.24		0.001	0.000		16:45	0.66		0.004	0.004	0.01
4:15	0.25		0.001	0.000		17:00	0.48		0.003	0.004	0.02
4:30	0.24		0.001	0.000		17:15	0.32		0.001	0.004	
4:45	0.24		0.001	0.000		17:30	0.24		0.001	0.004	
5:00	0.21		0.000	0.000		17:45	0.23		0.001	0.004	0.01
5:15	0.44		0.003	0.000		18:00	0.24		0.001	0.004	
5:30	1.36		0.018	0.000		18:15	0.24		0.001	0.004	0.02
5:45	1.25		0.016	0.001		18:30	0.25		0.001	0.004	0.03
6:00	0.37		0.001	0.001		18:45	0.25		0.001	0.004	0.01
6:15	0.34		0.001	0.001		19:00	0.25		0.001	0.004	0.01
6:30	0.38		0.002	0.001		19:15	0.26		0.001	0.004	
6:45	0.36		0.001	0.001		19:30	0.30		0.001	0.004	
7:00	0.36		0.001	0.001		19:45	0.26		0.001	0.004	
7:15	0.53		0.003	0.001		20:00	0.25		0.001	0.004	
7:30	0.76		0.006	0.001		20:15	0.26		0.001	0.004	
7:45	0.59		0.004	0.001		20:30	0.26		0.001	0.004	0.01
8:00	0.89		0.008	0.001		20:45	0.27		0.001	0.004	
8:15	1.04		0.011	0.001		21:00	0.28		0.001	0.004	
8:30	0.88		0.008	0.001		21:15	0.28		0.001	0.004	0.01
8:45	0.90		0.008	0.001		21:30	0.27		0.001	0.004	
9:00	0.87		0.008	0.001		21:45	0.27		0.001	0.004	
9:15	0.74		0.006	0.001		22:00	0.25		0.001	0.004	
9:30	1.07		0.011	0.001		22:15	0.27		0.001	0.005	
9:45	1.23		0.014	0.001		22:30	0.27		0.001	0.005	
10:00	1.01		0.010	0.002		22:45	0.27		0.001	0.005	
10:15	1.14		0.012	0.002		23:00	0.29		0.001	0.005	
10:30	1.14		0.012	0.002		23:15	0.29		0.001	0.005	
10:45	1.54		0.022	0.002		23:30	0.26		0.001	0.005	
11:00	1.46		0.020	0.002		23:45	0.25		0.001	0.005	
11:15	1.03		0.010	0.002		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.38</b>
11:30	1.03		0.010	0.002		<b>Data reported every:</b>	15 Minutes				
11:45	1.06		0.011	0.003							
12:00	1.41		0.018	0.003							
12:15	1.06		0.011	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/29/2019</b>						12:30	0.27		0.001	0.000	
0:00	0.25		0.001	0.000		12:45	0.28		0.001	0.000	
0:15	0.25		0.001	0.000		13:00	0.28		0.001	0.000	
0:30	0.29		0.001	0.000		13:15	0.29		0.001	0.000	
0:45	0.29		0.001	0.000		13:30	0.28		0.001	0.001	
1:00	0.29		0.001	0.000		13:45	0.28		0.001	0.001	
1:15	0.29		0.001	0.000		14:00	0.28		0.001	0.001	
1:30	0.28		0.001	0.000		14:15	0.28		0.001	0.001	
1:45	0.27		0.001	0.000		14:30	0.26		0.001	0.001	
2:00	0.27		0.001	0.000		14:45	0.27		0.001	0.001	
2:15	0.27		0.001	0.000		15:00	0.26		0.001	0.001	
2:30	0.25		0.001	0.000		15:15	0.44		0.002	0.001	
2:45	0.27		0.001	0.000		15:30	0.44		0.002	0.001	
3:00	0.27		0.001	0.000		15:45	0.44		0.002	0.001	
3:15	0.27		0.001	0.000		16:00	0.44		0.002	0.001	
3:30	0.27		0.001	0.000		16:15	0.44		0.002	0.001	
3:45	0.29		0.001	0.000		16:30	0.38		0.002	0.001	
4:00	0.27		0.001	0.000		16:45	0.26		0.001	0.001	
4:15	0.27		0.001	0.000		17:00	0.24		0.001	0.001	
4:30	0.25		0.001	0.000		17:15	0.22		0.001	0.001	
4:45	0.25		0.001	0.000		17:30	0.25		0.001	0.001	
5:00	0.25		0.001	0.000		17:45	0.27		0.001	0.001	
5:15	0.25		0.001	0.000		18:00	0.27		0.001	0.001	0.01
5:30	0.24		0.001	0.000		18:15	0.27		0.001	0.001	0.03
5:45	0.24		0.001	0.000		18:30	0.27		0.001	0.001	0.02
6:00	0.26		0.001	0.000		18:45	0.27		0.001	0.001	0.01
6:15	0.26		0.001	0.000		19:00	0.30		0.001	0.001	0.02
6:30	0.26		0.001	0.000		19:15	0.29		0.001	0.001	0.01
6:45	0.35		0.001	0.000		19:30	0.28		0.001	0.001	
7:00	0.31		0.001	0.000		19:45	0.28		0.001	0.001	
7:15	0.35		0.001	0.000		20:00	0.25		0.001	0.001	
7:30	0.28		0.001	0.000		20:15	0.25		0.001	0.001	0.01
7:45	0.39		0.002	0.000		20:30	0.26		0.001	0.001	
8:00	0.28		0.001	0.000		20:45	0.28		0.001	0.001	
8:15	0.28		0.001	0.000		21:00	0.27		0.001	0.001	
8:30	0.28		0.001	0.000		21:15	0.28		0.001	0.001	
8:45	0.28		0.001	0.000		21:30	0.29		0.001	0.001	
9:00	0.29		0.001	0.000		21:45	0.29		0.001	0.001	0.01
9:15	0.44		0.002	0.000		22:00	0.30		0.001	0.001	
9:30	0.26		0.001	0.000		22:15	0.32		0.001	0.001	
9:45	0.25		0.001	0.000		22:30	0.29		0.001	0.001	
10:00	0.24		0.001	0.000		22:45	0.29		0.001	0.001	
10:15	0.24		0.001	0.000		23:00	0.28		0.001	0.001	
10:30	0.24		0.001	0.000		23:15	0.28		0.001	0.001	
10:45	0.23		0.001	0.000		23:30	0.28		0.001	0.001	
11:00	0.24		0.001	0.000		23:45	0.28		0.001	0.001	
11:15	0.46		0.002	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.12</b>
11:30	0.28		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.27		0.001	0.000							
12:00	0.27		0.001	0.000							
12:15	0.27		0.001	0.000							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/30/2019</b>						12:30	0.28		0.001	0.001	
0:00	0.29		0.001	0.000		12:45	0.27		0.001	0.001	
0:15	0.29		0.001	0.000		13:00	0.26		0.001	0.001	
0:30	0.29		0.001	0.000	0.01	13:15	0.26		0.001	0.001	
0:45	0.30		0.001	0.000		13:30	0.26		0.001	0.001	
1:00	0.31		0.001	0.000	0.01	13:45	0.26		0.001	0.001	
1:15	0.30		0.001	0.000		14:00	0.26		0.001	0.001	
1:30	0.30		0.001	0.000		14:15	0.30		0.001	0.001	
1:45	0.29		0.001	0.000		14:30	0.39		0.002	0.001	
2:00	0.28		0.001	0.000		14:45	0.31		0.001	0.001	
2:15	0.28		0.001	0.000		15:00	0.34		0.001	0.001	
2:30	0.28		0.001	0.000		15:15	0.42		0.002	0.001	
2:45	0.28		0.001	0.000		15:30	0.26		0.001	0.001	
3:00	0.29		0.001	0.000		15:45	0.26		0.001	0.001	
3:15	0.29		0.001	0.000		16:00	0.26		0.001	0.001	
3:30	0.30		0.001	0.000		16:15	0.25		0.001	0.001	
3:45	0.29		0.001	0.000		16:30	0.27		0.001	0.001	
4:00	0.28		0.001	0.000		16:45	0.27		0.001	0.001	
4:15	0.28		0.001	0.000		17:00	0.27		0.001	0.001	
4:30	0.28		0.001	0.000		17:15	0.25		0.001	0.001	
4:45	0.28		0.001	0.000		17:30	0.25		0.001	0.001	
5:00	0.28		0.001	0.000		17:45	0.23		0.001	0.001	
5:15	0.28		0.001	0.000		18:00	0.24		0.001	0.001	
5:30	0.30		0.001	0.000		18:15	0.25		0.001	0.001	
5:45	0.30		0.001	0.000		18:30	0.24		0.001	0.001	
6:00	0.31		0.001	0.000		18:45	0.24		0.001	0.001	
6:15	0.31		0.001	0.000		19:00	0.25		0.001	0.001	
6:30	0.32		0.001	0.000		19:15	0.27		0.001	0.001	
6:45	0.31		0.001	0.000		19:30	0.26		0.001	0.001	
7:00	0.31		0.001	0.000		19:45	0.26		0.001	0.001	
7:15	0.32		0.001	0.000		20:00	0.26		0.001	0.001	
7:30	0.29		0.001	0.000		20:15	0.26		0.001	0.001	0.01
7:45	0.29		0.001	0.000		20:30	0.26		0.001	0.001	
8:00	0.29		0.001	0.000		20:45	0.26		0.001	0.001	0.01
8:15	0.35		0.001	0.000		21:00	0.28		0.001	0.001	
8:30	0.33		0.001	0.000		21:15	0.28		0.001	0.001	0.01
8:45	0.27		0.001	0.000		21:30	0.27		0.001	0.001	
9:00	0.27		0.001	0.000		21:45	0.26		0.001	0.001	0.01
9:15	0.28		0.001	0.000		22:00	0.26		0.001	0.001	
9:30	0.27		0.001	0.000		22:15	0.24		0.001	0.001	0.01
9:45	0.28		0.001	0.000		22:30	0.24		0.001	0.001	0.10
10:00	0.28		0.001	0.000		22:45	0.25		0.001	0.001	0.12
10:15	0.29		0.001	0.000		23:00	0.27		0.001	0.001	0.15
10:30	0.28		0.001	0.000		23:15	0.28		0.001	0.001	0.19
10:45	0.28		0.001	0.000		23:30	0.25		0.001	0.001	0.09
11:00	0.33		0.001	0.000		23:45	0.28		0.001	0.001	0.01
11:15	0.37		0.002	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.73</b>
11:30	0.30		0.001	0.000		<b>Data reported every:</b>		15 Minutes			
11:45	0.30		0.001	0.000							
12:00	0.35		0.001	0.000							
12:15	0.29		0.001	0.001							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>5/31/2019</b>						12:30	0.27		0.001	0.000	
0:00	0.26		0.001	0.000	0.02	12:45	0.28		0.001	0.000	
0:15	0.25		0.001	0.000		13:00	0.28		0.001	0.000	
0:30	0.25		0.001	0.000	0.01	13:15	0.26		0.001	0.000	
0:45	0.27		0.001	0.000		13:30	0.24		0.001	0.000	
1:00	0.27		0.001	0.000		13:45	0.25		0.001	0.000	
1:15	0.27		0.001	0.000		14:00	0.27		0.001	0.000	
1:30	0.26		0.001	0.000		14:15	0.31		0.001	0.001	
1:45	0.25		0.001	0.000		14:30	0.38		0.002	0.001	
2:00	0.28		0.001	0.000		14:45	0.28		0.001	0.001	
2:15	0.28		0.001	0.000		15:00	0.26		0.001	0.001	
2:30	0.26		0.001	0.000		15:15	0.26		0.001	0.001	
2:45	0.25		0.001	0.000		15:30	0.38		0.002	0.001	
3:00	0.24		0.001	0.000		15:45	0.49		0.003	0.001	
3:15	0.27		0.001	0.000		16:00	0.27		0.001	0.001	
3:30	0.26		0.001	0.000		16:15	0.25		0.001	0.001	
3:45	0.28		0.001	0.000		16:30	0.23		0.001	0.001	
4:00	0.27		0.001	0.000		16:45	0.24		0.001	0.001	
4:15	0.27		0.001	0.000		17:00	0.37		0.002	0.001	
4:30	0.26		0.001	0.000		17:15	0.26		0.001	0.001	
4:45	0.27		0.001	0.000		17:30	0.26		0.001	0.001	
5:00	0.26		0.001	0.000		17:45	0.27		0.001	0.001	
5:15	0.26		0.001	0.000		18:00	0.28		0.001	0.001	
5:30	0.26		0.001	0.000		18:15	0.27		0.001	0.001	
5:45	0.27		0.001	0.000		18:30	0.26		0.001	0.001	
6:00	0.29		0.001	0.000		18:45	0.25		0.001	0.001	
6:15	0.28		0.001	0.000		19:00	0.25		0.001	0.001	
6:30	0.28		0.001	0.000		19:15	0.25		0.001	0.001	
6:45	0.27		0.001	0.000		19:30	0.25		0.001	0.001	
7:00	0.27		0.001	0.000		19:45	0.29		0.001	0.001	
7:15	0.40		0.002	0.000		20:00	0.29		0.001	0.001	
7:30	0.29		0.001	0.000		20:15	0.25		0.001	0.001	
7:45	0.28		0.001	0.000		20:30	0.26		0.001	0.001	
8:00	0.28		0.001	0.000		20:45	0.26		0.001	0.001	
8:15	0.27		0.001	0.000		21:00	0.28		0.001	0.001	
8:30	0.26		0.001	0.000		21:15	0.36		0.002	0.001	
8:45	0.32		0.001	0.000		21:30	0.48		0.003	0.001	
9:00	0.32		0.001	0.000		21:45	0.24		0.001	0.001	
9:15	0.28		0.001	0.000		22:00	0.31		0.001	0.001	
9:30	0.26		0.001	0.000		22:15	0.29		0.001	0.001	
9:45	0.29		0.001	0.000		22:30	0.26		0.001	0.001	
10:00	0.28		0.001	0.000		22:45	0.24		0.001	0.001	
10:15	0.27		0.001	0.000		23:00	0.25		0.001	0.001	
10:30	0.26		0.001	0.000		23:15	0.25		0.001	0.001	
10:45	0.27		0.001	0.000		23:30	0.27		0.001	0.001	
11:00	0.27		0.001	0.000		23:45	0.26		0.001	0.001	
11:15	0.35		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.03</b>
11:30	0.33		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.27		0.001	0.000							
12:00	0.26		0.001	0.000							
12:15	0.29		0.001	0.000							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/1/2019</b>						12:30	0.24		0.001	0.000	
0:00	0.26		0.001	0.000		12:45	0.28		0.001	0.000	
0:15	0.25		0.001	0.000		13:00	0.26		0.001	0.000	
0:30	0.25		0.001	0.000		13:15	0.25		0.001	0.000	
0:45	0.23		0.001	0.000		13:30	0.25		0.001	0.000	
1:00	0.23		0.001	0.000		13:45	0.25		0.001	0.000	
1:15	0.23		0.001	0.000		14:00	0.26		0.001	0.000	
1:30	0.23		0.001	0.000		14:15	0.24		0.001	0.000	
1:45	0.24		0.001	0.000		14:30	0.23		0.001	0.000	
2:00	0.24		0.001	0.000		14:45	0.24		0.001	0.000	
2:15	0.24		0.001	0.000		15:00	0.24		0.001	0.000	
2:30	0.25		0.001	0.000		15:15	0.25		0.001	0.000	
2:45	0.25		0.001	0.000		15:30	0.25		0.001	0.000	
3:00	0.26		0.001	0.000		15:45	0.27		0.001	0.000	
3:15	0.25		0.001	0.000		16:00	0.25		0.001	0.000	
3:30	0.26		0.001	0.000		16:15	0.24		0.001	0.000	
3:45	0.26		0.001	0.000		16:30	0.22		0.001	0.000	
4:00	0.26		0.001	0.000		16:45	0.23		0.001	0.000	
4:15	0.25		0.001	0.000		17:00	0.24		0.001	0.000	
4:30	0.26		0.001	0.000		17:15	0.25		0.001	0.000	
4:45	0.24		0.001	0.000		17:30	0.25		0.001	0.000	
5:00	0.23		0.001	0.000		17:45	0.27		0.001	0.001	
5:15	0.25		0.001	0.000		18:00	0.26		0.001	0.001	
5:30	0.25		0.001	0.000		18:15	0.26		0.001	0.001	
5:45	0.25		0.001	0.000		18:30	0.26		0.001	0.001	
6:00	0.26		0.001	0.000		18:45	0.25		0.001	0.001	
6:15	0.25		0.001	0.000		19:00	0.25		0.001	0.001	
6:30	0.27		0.001	0.000		19:15	0.25		0.001	0.001	
6:45	0.26		0.001	0.000		19:30	0.24		0.001	0.001	
7:00	0.27		0.001	0.000		19:45	0.23		0.001	0.001	
7:15	0.24		0.001	0.000		20:00	0.23		0.001	0.001	
7:30	0.24		0.001	0.000		20:15	0.23		0.001	0.001	
7:45	0.24		0.001	0.000		20:30	0.22		0.001	0.001	
8:00	0.23		0.001	0.000		20:45	0.23		0.001	0.001	
8:15	0.24		0.001	0.000		21:00	0.22		0.001	0.001	
8:30	0.25		0.001	0.000		21:15	0.23		0.001	0.001	
8:45	0.24		0.001	0.000		21:30	0.24		0.001	0.001	
9:00	0.26		0.001	0.000		21:45	0.24		0.001	0.001	
9:15	0.27		0.001	0.000		22:00	0.24		0.001	0.001	
9:30	0.28		0.001	0.000		22:15	0.25		0.001	0.001	
9:45	0.25		0.001	0.000		22:30	0.26		0.001	0.001	
10:00	0.25		0.001	0.000		22:45	0.27		0.001	0.001	
10:15	0.24		0.001	0.000		23:00	0.27		0.001	0.001	
10:30	0.22		0.001	0.000		23:15	0.26		0.001	0.001	
10:45	0.24		0.001	0.000		23:30	0.24		0.001	0.001	
11:00	0.23		0.001	0.000		23:45	0.24		0.001	0.001	
11:15	0.22		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.24		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.25		0.001	0.000							
12:00	0.24		0.001	0.000							
12:15	0.24		0.001	0.000							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/2/2019</b>						12:30	0.26		0.001	0.000	
0:00	0.23		0.001	0.000		12:45	0.28		0.001	0.000	
0:15	0.22		0.001	0.000		13:00	0.28		0.001	0.000	
0:30	0.22		0.001	0.000		13:15	0.23		0.001	0.000	
0:45	0.23		0.001	0.000		13:30	0.24		0.001	0.000	
1:00	0.24		0.001	0.000		13:45	0.24		0.001	0.000	
1:15	0.25		0.001	0.000		14:00	0.24		0.001	0.000	
1:30	0.24		0.001	0.000		14:15	0.26		0.001	0.000	
1:45	0.24		0.001	0.000		14:30	0.23		0.001	0.000	
2:00	0.26		0.001	0.000		14:45	0.25		0.001	0.000	
2:15	0.27		0.001	0.000		15:00	0.24		0.001	0.000	
2:30	0.26		0.001	0.000		15:15	0.27		0.001	0.000	
2:45	0.26		0.001	0.000		15:30	0.24		0.001	0.000	
3:00	0.25		0.001	0.000		15:45	0.25		0.001	0.000	
3:15	0.25		0.001	0.000		16:00	0.27		0.001	0.000	
3:30	0.24		0.001	0.000		16:15	0.24		0.001	0.000	
3:45	0.24		0.001	0.000		16:30	0.23		0.001	0.000	
4:00	0.25		0.001	0.000		16:45	0.25		0.001	0.000	
4:15	0.24		0.001	0.000		17:00	0.24		0.001	0.000	
4:30	0.25		0.001	0.000		17:15	0.24		0.001	0.001	
4:45	0.25		0.001	0.000		17:30	0.24		0.001	0.001	
5:00	0.26		0.001	0.000		17:45	0.22		0.001	0.001	
5:15	0.24		0.001	0.000		18:00	0.22		0.001	0.001	
5:30	0.26		0.001	0.000		18:15	0.24		0.001	0.001	
5:45	0.25		0.001	0.000		18:30	0.23		0.001	0.001	
6:00	0.25		0.001	0.000		18:45	0.23		0.001	0.001	
6:15	0.27		0.001	0.000		19:00	0.24		0.001	0.001	
6:30	0.26		0.001	0.000		19:15	0.25		0.001	0.001	
6:45	0.26		0.001	0.000		19:30	0.25		0.001	0.001	
7:00	0.25		0.001	0.000		19:45	0.25		0.001	0.001	
7:15	0.24		0.001	0.000		20:00	0.25		0.001	0.001	
7:30	0.24		0.001	0.000		20:15	0.25		0.001	0.001	
7:45	0.24		0.001	0.000		20:30	0.25		0.001	0.001	
8:00	0.24		0.001	0.000		20:45	0.24		0.001	0.001	
8:15	0.24		0.001	0.000		21:00	0.24		0.001	0.001	
8:30	0.24		0.001	0.000		21:15	0.25		0.001	0.001	
8:45	0.27		0.001	0.000		21:30	0.25		0.001	0.001	
9:00	0.25		0.001	0.000		21:45	0.28		0.001	0.001	0.02
9:15	0.26		0.001	0.000		22:00	0.26		0.001	0.001	
9:30	0.24		0.001	0.000		22:15	0.23		0.001	0.001	
9:45	0.26		0.001	0.000		22:30	0.24		0.001	0.001	
10:00	0.27		0.001	0.000		22:45	0.25		0.001	0.001	0.02
10:15	0.25		0.001	0.000		23:00	0.25		0.001	0.001	0.01
10:30	0.23		0.001	0.000		23:15	0.23		0.001	0.001	
10:45	0.24		0.001	0.000		23:30	0.25		0.001	0.001	
11:00	0.24		0.001	0.000		23:45	0.25		0.001	0.001	
11:15	0.22		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.05</b>
11:30	0.27		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.26		0.001	0.000							
12:00	0.25		0.001	0.000							
12:15	0.26		0.001	0.000							



# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/3/2019</b>						12:30	0.97		0.009	0.003	
0:00	0.25		0.001	0.000		12:45	0.85		0.007	0.003	
0:15	0.24		0.001	0.000		13:00	0.88		0.008	0.004	
0:30	0.24		0.001	0.000		13:15	0.93		0.009	0.004	
0:45	0.26		0.001	0.000		13:30	1.22		0.015	0.004	
1:00	0.24		0.001	0.000		13:45	0.86		0.007	0.004	
1:15	0.24		0.001	0.000		14:00	0.84		0.007	0.004	
1:30	0.27		0.001	0.000		14:15	0.61		0.004	0.004	
1:45	0.27		0.001	0.000		14:30	0.64		0.005	0.004	
2:00	0.27		0.001	0.000		14:45	0.53		0.003	0.004	
2:15	0.27		0.001	0.000		15:00	0.43		0.002	0.004	
2:30	0.27		0.001	0.000		15:15	0.45		0.002	0.004	
2:45	0.27		0.001	0.000		15:30	0.48		0.002	0.004	
3:00	0.27		0.001	0.000		15:45	0.77		0.006	0.004	
3:15	0.27		0.001	0.000		16:00	0.54		0.003	0.004	
3:30	0.26		0.001	0.000		16:15	0.50		0.003	0.004	
3:45	0.27		0.001	0.000		16:30	0.32		0.001	0.004	
4:00	0.26		0.001	0.000		16:45	0.30		0.001	0.004	
4:15	0.27		0.001	0.000		17:00	0.60		0.004	0.004	
4:30	0.24		0.001	0.000		17:15	0.40		0.002	0.004	
4:45	0.24		0.001	0.000		17:30	0.28		0.001	0.004	
5:00	0.26		0.001	0.000		17:45	0.27		0.001	0.004	
5:15	1.10		0.015	0.000		18:00	0.26		0.001	0.004	
5:30	0.81		0.006	0.000		18:15	0.26		0.001	0.004	
5:45	0.68		0.005	0.000		18:30	0.26		0.001	0.004	
6:00	0.72		0.005	0.000		18:45	0.27		0.001	0.004	
6:15	0.71		0.005	0.001		19:00	0.26		0.001	0.004	
6:30	0.48		0.003	0.001		19:15	0.26		0.001	0.004	
6:45	0.57		0.003	0.001		19:30	0.26		0.001	0.004	
7:00	0.52		0.003	0.001		19:45	0.27		0.001	0.004	
7:15	0.58		0.003	0.001		20:00	0.26		0.001	0.004	
7:30	0.97		0.009	0.001		20:15	0.26		0.001	0.004	
7:45	0.64		0.004	0.001		20:30	0.27		0.001	0.004	
8:00	0.65		0.005	0.001		20:45	0.27		0.001	0.004	
8:15	0.95		0.009	0.001		21:00	0.28		0.001	0.004	
8:30	0.97		0.009	0.001		21:15	0.25		0.001	0.004	
8:45	1.37		0.019	0.001		21:30	0.25		0.001	0.004	
9:00	1.40		0.020	0.001		21:45	0.25		0.001	0.004	
9:15	1.28		0.016	0.002		22:00	0.28		0.001	0.004	
9:30	1.31		0.016	0.002		22:15	0.28		0.001	0.004	
9:45	1.11		0.012	0.002		22:30	0.29		0.001	0.004	
10:00	0.94		0.009	0.002		22:45	0.28		0.001	0.004	
10:15	1.24		0.016	0.002		23:00	0.28		0.001	0.004	
10:30	0.99		0.010	0.002		23:15	0.28		0.001	0.005	
10:45	1.22		0.014	0.002		23:30	0.26		0.001	0.005	
11:00	1.54		0.022	0.003		23:45	0.28		0.001	0.005	
11:15	1.44		0.020	0.003		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.00</b>
11:30	1.18		0.014	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	0.55		0.003	0.003							
12:00	0.96		0.009	0.003							
12:15	1.24		0.015	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/4/2019</b>						12:30	1.29		0.017	0.004	
0:00	0.27		0.001	0.000		12:45	1.41		0.019	0.004	
0:15	0.28		0.001	0.000		13:00	1.08		0.012	0.004	
0:30	0.27		0.001	0.000		13:15	0.89		0.008	0.004	
0:45	0.27		0.001	0.000		13:30	0.95		0.010	0.004	
1:00	0.27		0.001	0.000		13:45	1.28		0.015	0.004	
1:15	0.26		0.001	0.000		14:00	0.64		0.004	0.005	
1:30	0.26		0.001	0.000		14:15	0.67		0.005	0.005	
1:45	0.26		0.001	0.000		14:30	0.53		0.003	0.005	
2:00	0.26		0.001	0.000		14:45	0.36		0.001	0.005	
2:15	0.26		0.001	0.000		15:00	0.67		0.005	0.005	
2:30	0.26		0.001	0.000		15:15	0.37		0.001	0.005	
2:45	0.26		0.001	0.000		15:30	0.46		0.003	0.005	
3:00	0.26		0.001	0.000		15:45	0.43		0.002	0.005	
3:15	0.26		0.001	0.000		16:00	0.55		0.003	0.005	
3:30	0.26		0.001	0.000		16:15	0.65		0.004	0.005	
3:45	0.26		0.001	0.000		16:30	0.49		0.003	0.005	
4:00	0.27		0.001	0.000		16:45	0.31		0.001	0.005	
4:15	0.27		0.001	0.000		17:00	0.64		0.004	0.005	
4:30	0.28		0.001	0.000		17:15	0.47		0.002	0.005	
4:45	0.27		0.001	0.000		17:30	0.32		0.001	0.005	
5:00	0.28		0.001	0.000		17:45	0.24		0.001	0.005	
5:15	0.63		0.004	0.000		18:00	0.24		0.001	0.005	
5:30	1.50		0.021	0.000		18:15	0.24		0.001	0.005	
5:45	0.68		0.005	0.000		18:30	0.25		0.001	0.005	
6:00	0.39		0.002	0.000		18:45	0.23		0.001	0.005	
6:15	0.77		0.006	0.001		19:00	0.22		0.001	0.005	
6:30	0.46		0.002	0.001		19:15	0.22		0.001	0.005	
6:45	0.58		0.003	0.001		19:30	0.21		0.001	0.005	
7:00	0.56		0.003	0.001		19:45	0.21		0.001	0.005	
7:15	0.67		0.005	0.001		20:00	0.23		0.001	0.005	
7:30	0.90		0.009	0.001		20:15	0.25		0.001	0.005	
7:45	0.91		0.009	0.001		20:30	0.26		0.001	0.005	
8:00	1.18		0.014	0.001		20:45	0.26		0.001	0.005	
8:15	0.88		0.007	0.001		21:00	0.26		0.001	0.005	
8:30	1.15		0.013	0.001		21:15	0.25		0.001	0.005	
8:45	1.65		0.025	0.001		21:30	0.25		0.001	0.005	
9:00	1.45		0.020	0.002		21:45	0.25		0.001	0.005	
9:15	1.70		0.027	0.002		22:00	0.24		0.001	0.005	
9:30	1.61		0.025	0.002		22:15	0.24		0.001	0.005	
9:45	1.05		0.011	0.002		22:30	0.25		0.001	0.005	
10:00	0.89		0.008	0.002		22:45	0.24		0.001	0.005	
10:15	1.23		0.014	0.003		23:00	0.24		0.001	0.005	
10:30	1.21		0.014	0.003		23:15	0.23		0.001	0.005	
10:45	1.61		0.025	0.003		23:30	0.23		0.001	0.005	
11:00	1.05		0.011	0.003		23:45	0.23		0.001	0.005	
11:15	0.80		0.007	0.003		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.00</b>
11:30	1.10		0.012	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.04		0.011	0.003							
12:00	1.18		0.014	0.004							
12:15	0.92		0.009	0.004							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	
<b>6/5/2019</b>						12:30	0.81		0.006	0.003		
0:00	0.23		0.001	0.000		12:45	1.40		0.019	0.004		
0:15	0.23		0.001	0.000		13:00	0.67		0.005	0.004		
0:30	0.23		0.001	0.000		13:15	0.92		0.008	0.004		
0:45	0.23		0.001	0.000		13:30	1.35		0.017	0.004		
1:00	0.22		0.001	0.000		13:45	1.08		0.012	0.004		
1:15	0.24		0.001	0.000		14:00	0.57		0.003	0.004		
1:30	0.23		0.001	0.000		14:15	0.72		0.005	0.004		
1:45	0.23		0.001	0.000		14:30	0.44		0.002	0.004		
2:00	0.23		0.001	0.000		14:45	0.50		0.003	0.004		
2:15	0.23		0.001	0.000		15:00	0.44		0.002	0.004		
2:30	0.23		0.001	0.000		15:15	0.34		0.001	0.004		
2:45	0.23		0.001	0.000		15:30	0.63		0.004	0.004		
3:00	0.23		0.001	0.000		15:45	0.74		0.006	0.004		
3:15	0.24		0.001	0.000		16:00	0.48		0.002	0.004		
3:30	0.24		0.001	0.000		16:15	0.40		0.002	0.004		
3:45	0.24		0.001	0.000		16:30	0.29		0.001	0.004		
4:00	0.24		0.001	0.000		16:45	0.34		0.001	0.004		
4:15	0.24		0.001	0.000		16:55	0.31		0.001	0.004		
4:30	0.26		0.001	0.000		17:00	0.31		0.001	0.004		
4:45	0.26		0.001	0.000		17:15	0.41		0.002	0.004		
5:00	0.25		0.001	0.000		17:30	0.28		0.001	0.004		
5:15	1.04		0.013	0.000		17:45	0.29		0.001	0.004		
5:30	0.64		0.004	0.000		18:00	0.30		0.001	0.004		
5:45	0.35		0.001	0.000		18:15	0.38		0.002	0.004		
6:00	0.44		0.002	0.000		18:30	0.29		0.001	0.004		
6:15	0.30		0.001	0.000		18:45	0.30		0.001	0.005		
6:30	0.45		0.002	0.000		19:00	0.39		0.002	0.005		
6:45	0.34		0.001	0.000		19:15	0.28		0.001	0.005		
7:00	0.40		0.002	0.000		19:30	0.26		0.001	0.005		
7:15	0.92		0.009	0.001		19:45	0.26		0.001	0.005		
7:30	1.05		0.011	0.001		20:00	0.26		0.001	0.005		
7:45	0.85		0.008	0.001		20:15	0.26		0.001	0.005		
8:00	1.04		0.011	0.001		20:30	0.28		0.001	0.005		
8:15	1.06		0.011	0.001		20:45	0.30		0.001	0.005		
8:30	0.84		0.007	0.001		21:00	0.27		0.001	0.005		
8:45	0.85		0.007	0.001		21:15	0.27		0.001	0.005		
9:00	1.37		0.018	0.001		21:30	0.27		0.001	0.005		
9:15	1.16		0.013	0.001		21:45	0.27		0.001	0.005		
9:30	1.52		0.025	0.002		22:00	0.28		0.001	0.005		
9:45	1.21		0.014	0.002		22:15	0.27		0.001	0.005		
10:00	0.90		0.008	0.002		22:30	0.28		0.001	0.005	0.01	
10:15	1.26		0.015	0.002		22:45	0.27		0.001	0.005	0.07	
10:30	1.30		0.016	0.002		23:00	0.28		0.001	0.005		
10:45	1.08		0.011	0.002		23:15	0.29		0.001	0.005		
11:00	1.59		0.024	0.003		23:30	0.27		0.001	0.005		
11:15	1.07		0.011	0.003		23:45	0.27		0.001	0.005		
11:30	1.43		0.020	0.003		<b>Daily Totals:</b>					<b>0.005</b>	<b>0.08</b>
11:45	1.08		0.011	0.003		<b>Data reported every:</b> 15 Minutes						
12:00	1.28		0.015	0.003								
12:15	1.23		0.015	0.003								

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/6/2019</b>						12:30	0.84		0.007	0.003	
0:00	0.29		0.001	0.000		12:45	1.33		0.017	0.003	
0:15	0.28		0.001	0.000		13:00	1.06		0.011	0.003	
0:30	0.28		0.001	0.000		13:15	1.15		0.013	0.004	
0:45	0.27		0.001	0.000		13:30	1.23		0.014	0.004	
1:00	0.27		0.001	0.000		13:45	1.01		0.010	0.004	
1:15	0.28		0.001	0.000		14:00	0.86		0.007	0.004	
1:30	0.28		0.001	0.000		14:15	0.67		0.005	0.004	
1:45	0.28		0.001	0.000	0.01	14:30	0.57		0.004	0.004	
2:00	0.28		0.001	0.000		14:45	0.71		0.005	0.004	
2:15	0.28		0.001	0.000		15:00	0.36		0.001	0.004	
2:30	0.27		0.001	0.000		15:15	0.56		0.004	0.004	
2:45	0.27		0.001	0.000		15:30	0.53		0.004	0.004	
3:00	0.28		0.001	0.000		15:45	0.48		0.003	0.004	
3:15	0.27		0.001	0.000		16:00	0.45		0.002	0.004	
3:30	0.28		0.001	0.000		16:15	0.38		0.001	0.004	
3:45	0.28		0.001	0.000		16:30	0.42		0.002	0.004	
4:00	0.28		0.001	0.000		16:45	0.51		0.003	0.004	
4:15	0.28		0.001	0.000		17:00	0.62		0.004	0.004	
4:30	0.28		0.001	0.000		17:15	0.27		0.001	0.004	
4:45	0.28		0.001	0.000		17:30	0.25		0.001	0.004	
5:00	0.26		0.001	0.000		17:45	0.26		0.001	0.004	
5:15	0.85		0.008	0.000		18:00	0.26		0.001	0.004	
5:30	0.80		0.007	0.000		18:15	0.26		0.001	0.004	
5:45	0.49		0.003	0.000		18:30	0.32		0.001	0.004	
6:00	0.43		0.002	0.000		18:45	0.25		0.001	0.004	
6:15	0.39		0.002	0.000		19:00	0.26		0.001	0.004	
6:30	0.61		0.004	0.000		19:15	0.26		0.001	0.004	
6:45	0.40		0.002	0.000		19:30	0.26		0.001	0.004	
7:00	0.69		0.005	0.001		19:45	0.25		0.001	0.004	
7:15	0.91		0.008	0.001		20:00	0.25		0.001	0.004	
7:30	0.97		0.009	0.001		20:15	0.24		0.001	0.004	
7:45	0.83		0.007	0.001		20:30	0.26		0.001	0.004	
8:00	0.88		0.008	0.001		20:45	0.25		0.001	0.004	
8:15	0.78		0.006	0.001		21:00	0.25		0.001	0.004	
8:30	0.94		0.009	0.001		21:15	0.25		0.001	0.004	
8:45	1.21		0.014	0.001		21:30	0.24		0.001	0.004	
9:00	1.15		0.013	0.001		21:45	0.25		0.001	0.005	
9:15	1.06		0.011	0.001		22:00	0.24		0.001	0.005	
9:30	1.16		0.013	0.002		22:15	0.24		0.001	0.005	
9:45	1.10		0.012	0.002		22:30	0.24		0.001	0.005	
10:00	1.06		0.011	0.002		22:45	0.23		0.001	0.005	
10:15	1.04		0.011	0.002		23:00	0.23		0.001	0.005	
10:30	1.34		0.017	0.002		23:15	0.23		0.001	0.005	
10:45	1.29		0.017	0.002		23:30	0.23		0.001	0.005	
11:00	1.30		0.016	0.002		23:45	0.22		0.001	0.005	
11:15	1.62		0.024	0.003		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.01</b>
11:30	1.05		0.011	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.03		0.011	0.003							
12:00	0.87		0.008	0.003							
12:15	1.30		0.016	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/7/2019</b>						12:30	1.08		0.012	0.003	
0:00	0.23		0.001	0.000		12:45	1.21		0.015	0.004	
0:15	0.23		0.001	0.000		13:00	1.28		0.017	0.004	
0:30	0.23		0.001	0.000		13:15	1.45		0.020	0.004	
0:45	0.23		0.001	0.000		13:30	1.27		0.016	0.004	
1:00	0.24		0.001	0.000		13:45	0.79		0.006	0.004	
1:15	0.24		0.001	0.000		14:00	0.47		0.002	0.004	
1:30	0.24		0.001	0.000		14:15	0.56		0.004	0.004	
1:45	0.24		0.001	0.000		14:30	0.62		0.004	0.004	
2:00	0.24		0.001	0.000		14:45	0.51		0.003	0.004	
2:15	0.24		0.001	0.000		15:00	0.29		0.001	0.004	
2:30	0.24		0.001	0.000		15:15	0.24		0.001	0.004	
2:45	0.24		0.001	0.000		15:30	0.23		0.001	0.004	
3:00	0.24		0.001	0.000		15:45	0.31		0.001	0.004	
3:15	0.24		0.001	0.000		16:00	0.38		0.002	0.004	
3:30	0.24		0.001	0.000		16:15	0.36		0.001	0.004	
3:45	0.24		0.001	0.000		16:30	0.25		0.001	0.004	
4:00	0.24		0.001	0.000		16:45	0.43		0.002	0.004	
4:15	0.24		0.001	0.000		17:00	0.42		0.002	0.004	
4:30	0.23		0.001	0.000		17:15	0.27		0.001	0.004	
4:45	0.23		0.001	0.000		17:30	0.24		0.001	0.004	
5:00	0.22		0.001	0.000		17:45	0.24		0.001	0.004	
5:15	0.37		0.001	0.000		18:00	0.23		0.001	0.004	
5:30	1.10		0.015	0.000		18:15	0.23		0.001	0.004	
5:45	0.88		0.008	0.000		18:30	0.22		0.001	0.004	
6:00	0.32		0.001	0.000		18:45	0.33		0.001	0.004	
6:15	0.34		0.001	0.000		19:00	0.30		0.001	0.004	
6:30	0.39		0.002	0.000		19:15	0.24		0.001	0.005	
6:45	0.34		0.001	0.000		19:30	0.23		0.001	0.005	
7:00	0.33		0.001	0.000		19:45	0.21		0.001	0.005	
7:15	0.59		0.004	0.001		20:00	0.22		0.001	0.005	
7:30	0.83		0.007	0.001		20:15	0.22		0.001	0.005	
7:45	0.90		0.008	0.001		20:30	0.23		0.001	0.005	
8:00	1.41		0.019	0.001		20:45	0.22		0.001	0.005	
8:15	1.38		0.018	0.001		21:00	0.22		0.001	0.005	
8:30	0.95		0.009	0.001		21:15	0.22		0.001	0.005	
8:45	0.83		0.007	0.001		21:30	0.21		0.000	0.005	
9:00	0.91		0.008	0.001		21:45	0.22		0.001	0.005	
9:15	0.90		0.008	0.001		22:00	0.21		0.001	0.005	
9:30	1.18		0.013	0.002		22:15	0.21		0.001	0.005	
9:45	1.02		0.010	0.002		22:30	0.22		0.001	0.005	
10:00	1.21		0.014	0.002		22:45	0.21		0.001	0.005	
10:15	1.13		0.012	0.002		23:00	0.23		0.001	0.005	
10:30	0.97		0.011	0.002		23:15	0.22		0.001	0.005	
10:45	1.27		0.016	0.002		23:30	0.21		0.001	0.005	
11:00	1.25		0.015	0.002		23:45	0.21		0.001	0.005	
11:15	1.38		0.018	0.003		<b>Daily Totals:</b>				<b>0.005</b>	<b>0.00</b>
11:30	1.71		0.027	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	0.98		0.009	0.003							
12:00	1.43		0.020	0.003							
12:15	1.38		0.018	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/8/2019</b>						12:30	0.23		0.001	0.000	
0:00	0.20		0.000	0.000		12:45	0.21		0.000	0.000	
0:15	0.21		0.000	0.000		13:00	0.21		0.000	0.000	
0:30	0.21		0.001	0.000		13:15	0.20		0.000	0.000	
0:45	0.20		0.000	0.000		13:30	0.20		0.000	0.000	
1:00	0.19		0.000	0.000		13:45	0.21		0.000	0.000	
1:15	0.20		0.000	0.000		14:00	0.20		0.000	0.000	
1:30	0.21		0.000	0.000		14:15	0.19		0.000	0.000	
1:45	0.20		0.000	0.000		14:30	0.18		0.000	0.000	
2:00	0.20		0.000	0.000		14:45	0.20		0.000	0.000	
2:15	0.20		0.000	0.000		15:00	0.21		0.000	0.000	
2:30	0.20		0.000	0.000		15:15	0.23		0.001	0.000	
2:45	0.21		0.000	0.000		15:30	0.24		0.001	0.000	
3:00	0.21		0.000	0.000		15:45	0.21		0.001	0.000	
3:15	0.21		0.001	0.000		16:00	0.22		0.001	0.000	
3:30	0.22		0.001	0.000		16:15	0.21		0.000	0.000	
3:45	0.22		0.001	0.000		16:30	0.21		0.000	0.000	
4:00	0.22		0.001	0.000		16:45	0.22		0.001	0.000	
4:15	0.23		0.001	0.000		17:00	0.22		0.001	0.000	
4:30	0.22		0.001	0.000		17:15	0.22		0.001	0.000	
4:45	0.22		0.001	0.000		17:30	0.21		0.001	0.000	
5:00	0.23		0.001	0.000		17:45	0.20		0.000	0.000	
5:15	0.21		0.001	0.000		18:00	0.23		0.001	0.000	
5:30	0.23		0.001	0.000		18:15	0.24		0.001	0.000	
5:45	0.23		0.001	0.000		18:30	0.22		0.001	0.000	
6:00	0.23		0.001	0.000		18:45	0.19		0.000	0.000	
6:15	0.24		0.001	0.000		19:00	0.19		0.000	0.000	
6:30	0.22		0.001	0.000		19:15	0.20		0.000	0.000	
6:45	0.23		0.001	0.000		19:30	0.20		0.000	0.000	
7:00	0.25		0.001	0.000		19:45	0.21		0.000	0.000	
7:15	0.24		0.001	0.000		20:00	0.23		0.001	0.000	
7:30	0.23		0.001	0.000		20:15	0.21		0.001	0.000	
7:45	0.21		0.000	0.000		20:30	0.20		0.000	0.000	
8:00	0.21		0.000	0.000		20:45	0.21		0.001	0.000	
8:15	0.23		0.001	0.000		21:00	0.23		0.001	0.001	
8:30	0.18		0.000	0.000		21:15	0.21		0.001	0.001	
8:45	0.22		0.001	0.000		21:30	0.23		0.001	0.001	
9:00	0.52		0.003	0.000		21:45	0.22		0.001	0.001	
9:15	0.23		0.001	0.000		22:00	0.23		0.001	0.001	
9:30	0.20		0.000	0.000		22:15	0.21		0.001	0.001	
9:45	0.20		0.000	0.000		22:30	0.21		0.001	0.001	
10:00	0.35		0.001	0.000		22:45	0.22		0.001	0.001	
10:15	0.25		0.001	0.000		23:00	0.22		0.001	0.001	
10:30	0.24		0.001	0.000		23:15	0.23		0.001	0.001	
10:45	0.24		0.001	0.000		23:30	0.22		0.001	0.001	
11:00	0.22		0.001	0.000		23:45	0.23		0.001	0.001	
11:15	0.21		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.22		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.22		0.001	0.000							
12:00	0.30		0.001	0.000							
12:15	0.27		0.001	0.000							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/9/2019</b>						12:30	0.18		0.000	0.000	
0:00	0.22		0.001	0.000		12:45	0.22		0.001	0.000	
0:15	0.22		0.001	0.000		13:00	0.22		0.001	0.000	
0:30	0.21		0.001	0.000		13:15	0.22		0.001	0.000	
0:45	0.22		0.001	0.000		13:30	0.21		0.000	0.000	
1:00	0.21		0.000	0.000		13:45	0.23		0.001	0.000	
1:15	0.21		0.001	0.000		14:00	0.22		0.001	0.000	
1:30	0.21		0.000	0.000		14:15	0.22		0.001	0.000	
1:45	0.21		0.000	0.000		14:30	0.22		0.001	0.000	
2:00	0.22		0.001	0.000		14:45	0.23		0.001	0.000	
2:15	0.21		0.001	0.000		15:00	0.23		0.001	0.000	
2:30	0.21		0.000	0.000		15:15	0.23		0.001	0.000	
2:45	0.20		0.000	0.000		15:30	0.19		0.000	0.000	
3:00	0.23		0.001	0.000		15:45	0.23		0.001	0.000	
3:15	0.22		0.001	0.000		16:00	0.21		0.001	0.000	
3:30	0.22		0.001	0.000		16:15	0.21		0.000	0.000	
3:45	0.23		0.001	0.000		16:30	0.21		0.000	0.000	
4:00	0.23		0.001	0.000		16:45	0.22		0.001	0.000	
4:15	0.23		0.001	0.000		17:00	0.21		0.000	0.000	
4:30	0.23		0.001	0.000		17:15	0.20		0.000	0.000	
4:45	0.23		0.001	0.000		17:30	0.18		0.000	0.000	
5:00	0.22		0.001	0.000		17:45	0.19		0.000	0.000	
5:15	0.23		0.001	0.000		18:00	0.21		0.001	0.000	
5:30	0.23		0.001	0.000		18:15	0.19		0.000	0.000	
5:45	0.24		0.001	0.000		18:30	0.19		0.000	0.000	
6:00	0.24		0.001	0.000		18:45	0.20		0.000	0.000	
6:15	0.24		0.001	0.000		19:00	0.20		0.000	0.000	
6:30	0.24		0.001	0.000		19:15	0.21		0.000	0.000	
6:45	0.21		0.001	0.000		19:30	0.22		0.001	0.000	
7:00	0.21		0.001	0.000		19:45	0.21		0.000	0.000	
7:15	0.20		0.000	0.000		20:00	0.21		0.000	0.000	
7:30	0.20		0.000	0.000		20:15	0.22		0.001	0.000	
7:45	0.20		0.000	0.000		20:30	0.22		0.001	0.000	
8:00	0.19		0.000	0.000		20:45	0.21		0.000	0.000	
8:15	0.21		0.000	0.000		21:00	0.23		0.001	0.000	
8:30	0.22		0.001	0.000		21:15	0.24		0.001	0.000	
8:45	0.20		0.000	0.000		21:30	0.24		0.001	0.000	
9:00	0.21		0.000	0.000		21:45	0.23		0.001	0.000	
9:15	0.19		0.000	0.000		22:00	0.21		0.001	0.000	
9:30	0.23		0.001	0.000		22:15	0.21		0.001	0.000	
9:45	0.24		0.001	0.000		22:30	0.22		0.001	0.000	
10:00	0.22		0.001	0.000		22:45	0.21		0.001	0.000	
10:15	0.22		0.001	0.000		23:00	0.20		0.000	0.001	
10:30	0.18		0.000	0.000		23:15	0.21		0.000	0.001	
10:45	0.19		0.000	0.000		23:30	0.21		0.000	0.001	
11:00	0.21		0.001	0.000		23:45	0.21		0.001	0.001	
11:15	0.21		0.000	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.22		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.22		0.001	0.000							
12:00	0.22		0.001	0.000							
12:15	0.21		0.000	0.000							



# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/10/2019</b>						12:30	1.35		0.019	0.003	
0:00	0.20		0.000	0.000		12:45	1.34		0.017	0.003	
0:15	0.20		0.000	0.000		13:00	0.99		0.010	0.003	
0:30	0.20		0.000	0.000		13:15	1.27		0.016	0.004	
0:45	0.21		0.000	0.000		13:30	1.49		0.021	0.004	
1:00	0.20		0.000	0.000		13:45	0.76		0.006	0.004	
1:15	0.20		0.000	0.000		14:00	0.57		0.004	0.004	
1:30	0.21		0.000	0.000		14:15	0.71		0.006	0.004	
1:45	0.20		0.000	0.000		14:30	0.43		0.002	0.004	
2:00	0.20		0.000	0.000		14:45	0.36		0.001	0.004	
2:15	0.20		0.000	0.000		15:00	0.57		0.004	0.004	
2:30	0.21		0.000	0.000		15:15	0.47		0.002	0.004	
2:45	0.20		0.000	0.000		15:30	0.42		0.002	0.004	
3:00	0.20		0.000	0.000		15:45	0.43		0.002	0.004	
3:15	0.20		0.000	0.000		16:00	0.35		0.001	0.004	
3:30	0.21		0.000	0.000		16:15	0.36		0.001	0.004	
3:45	0.21		0.000	0.000		16:30	0.33		0.001	0.004	
4:00	0.21		0.000	0.000		16:45	0.53		0.003	0.004	
4:15	0.21		0.000	0.000		17:00	0.43		0.002	0.004	
4:30	0.21		0.000	0.000		17:15	0.39		0.002	0.004	
4:45	0.21		0.000	0.000		17:30	0.30		0.001	0.004	
5:00	0.21		0.000	0.000		17:45	0.27		0.001	0.004	
5:15	0.37		0.002	0.000		18:00	0.36		0.001	0.004	
5:30	1.28		0.016	0.000		18:15	0.28		0.001	0.004	
5:45	0.83		0.007	0.000		18:30	0.26		0.001	0.004	
6:00	0.68		0.005	0.000		18:45	0.24		0.001	0.004	
6:15	0.35		0.001	0.000		19:00	0.23		0.001	0.004	
6:30	0.56		0.003	0.000		19:15	0.25		0.001	0.004	
6:45	0.34		0.001	0.000		19:30	0.23		0.001	0.004	
7:00	0.41		0.002	0.000		19:45	0.24		0.001	0.004	
7:15	0.56		0.003	0.001		20:00	0.21		0.001	0.004	
7:30	0.97		0.009	0.001		20:15	0.21		0.001	0.004	
7:45	1.18		0.013	0.001		20:30	0.25		0.001	0.004	0.01
8:00	0.79		0.006	0.001		20:45	0.24		0.001	0.004	0.01
8:15	0.67		0.005	0.001		21:00	0.23		0.001	0.004	
8:30	0.92		0.008	0.001		21:15	0.24		0.001	0.004	0.01
8:45	0.88		0.008	0.001		21:30	0.24		0.001	0.004	0.01
9:00	1.07		0.012	0.001		21:45	0.23		0.001	0.004	0.02
9:15	1.48		0.020	0.001		22:00	0.24		0.001	0.004	0.06
9:30	0.98		0.010	0.001		22:15	0.24		0.001	0.004	0.04
9:45	1.14		0.012	0.002		22:30	0.23		0.001	0.004	0.08
10:00	1.10		0.012	0.002		22:45	0.23		0.001	0.004	0.02
10:15	1.14		0.013	0.002		23:00	0.23		0.001	0.004	0.01
10:30	0.97		0.009	0.002		23:15	0.22		0.001	0.004	
10:45	1.38		0.018	0.002		23:30	0.22		0.001	0.004	0.02
11:00	1.08		0.011	0.002		23:45	0.20		0.000	0.004	
11:15	1.09		0.012	0.002		<b>Daily Totals:</b>				<b>0.004</b>	<b>0.29</b>
11:30	1.13		0.013	0.003		<b>Data reported every:</b>		15 Minutes			
11:45	1.18		0.013	0.003							
12:00	1.00		0.010	0.003							
12:15	1.09		0.012	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/11/2019</b>						12:30	0.94		0.009	0.003	
0:00	0.21		0.000	0.000	0.01	12:45	1.11		0.012	0.003	
0:15	0.22		0.001	0.000	0.01	13:00	0.96		0.009	0.003	
0:30	0.22		0.001	0.000	0.08	13:15	1.41		0.019	0.004	
0:45	0.22		0.001	0.000	0.23	13:30	1.32		0.017	0.004	
1:00	0.23		0.001	0.000	0.08	13:45	0.99		0.010	0.004	
1:15	0.21		0.001	0.000	0.03	14:00	0.67		0.005	0.004	
1:30	0.20		0.000	0.000	0.01	14:15	0.70		0.005	0.004	
1:45	0.19		0.000	0.000		14:30	0.56		0.004	0.004	
2:00	0.20		0.000	0.000		14:45	0.44		0.002	0.004	
2:15	0.22		0.001	0.000		15:00	0.32		0.001	0.004	
2:30	0.23		0.001	0.000		15:15	0.27		0.001	0.004	
2:45	0.22		0.001	0.000	0.01	15:30	0.26		0.001	0.004	
3:00	0.20		0.000	0.000		15:45	0.21		0.000	0.004	
3:15	0.20		0.000	0.000		16:00	0.24		0.001	0.004	
3:30	0.22		0.001	0.000	0.03	16:15	0.49		0.003	0.004	
3:45	0.21		0.001	0.000		16:30	0.27		0.001	0.004	
4:00	0.23		0.001	0.000		16:45	0.33		0.001	0.004	
4:15	0.23		0.001	0.000		17:00	0.31		0.001	0.004	
4:30	0.21		0.000	0.000		17:15	0.35		0.002	0.004	
4:45	0.20		0.000	0.000		17:30	0.32		0.001	0.004	
5:00	0.19		0.000	0.000	0.02	17:45	0.32		0.001	0.004	
5:15	0.20		0.000	0.000	0.04	18:00	0.29		0.001	0.004	
5:30	0.89		0.010	0.000	0.04	18:15	0.32		0.001	0.004	
5:45	1.34		0.017	0.000	0.05	18:30	0.35		0.001	0.004	
6:00	1.15		0.013	0.001	0.03	18:45	0.25		0.001	0.004	
6:15	0.47		0.002	0.001	0.06	19:00	0.24		0.001	0.004	
6:30	0.44		0.002	0.001	0.04	19:15	0.23		0.001	0.004	
6:45	0.42		0.002	0.001	0.03	19:30	0.22		0.001	0.004	
7:00	0.62		0.004	0.001		19:45	0.22		0.001	0.004	
7:15	0.56		0.003	0.001		20:00	0.21		0.000	0.004	
7:30	0.90		0.008	0.001		20:15	0.24		0.001	0.004	
7:45	0.44		0.002	0.001		20:30	0.21		0.000	0.004	
8:00	0.57		0.003	0.001		20:45	0.21		0.001	0.004	
8:15	0.84		0.008	0.001	0.01	21:00	0.20		0.000	0.004	
8:30	0.66		0.005	0.001	0.01	21:15	0.21		0.000	0.004	
8:45	1.14		0.013	0.001		21:30	0.22		0.001	0.004	
9:00	0.77		0.007	0.001		21:45	0.25		0.001	0.004	
9:15	1.20		0.014	0.001	0.01	22:00	0.21		0.001	0.004	
9:30	1.29		0.019	0.001		22:15	0.22		0.001	0.004	
9:45	0.98		0.009	0.002		22:30	0.23		0.001	0.004	
10:00	1.08		0.012	0.002		22:45	0.21		0.000	0.004	
10:15	1.03		0.010	0.002		23:00	0.22		0.001	0.004	
10:30	1.05		0.011	0.002		23:15	0.22		0.001	0.004	
10:45	0.92		0.008	0.002		23:30	0.21		0.000	0.004	
11:00	1.59		0.024	0.002		23:45	0.22		0.001	0.004	
11:15	1.67		0.028	0.003		<b>Daily Totals:</b>				<b>0.004</b>	<b>0.83</b>
11:30	1.45		0.020	0.003		<b>Data reported every:</b>	15 Minutes				
11:45	1.15		0.013	0.003							
12:00	1.11		0.012	0.003							
12:15	1.26		0.016	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/12/2019</b>						12:30	1.17		0.015	0.003	
0:00	0.22		0.001	0.000		12:45	1.28		0.017	0.003	
0:15	0.25		0.001	0.000		13:00	1.01		0.010	0.003	
0:30	0.24		0.001	0.000		13:15	0.98		0.009	0.003	
0:45	0.21		0.001	0.000		13:30	1.28		0.017	0.003	
1:00	0.20		0.000	0.000		13:45	1.01		0.010	0.003	
1:15	0.22		0.001	0.000		14:00	0.80		0.007	0.003	
1:30	0.20		0.000	0.000		14:15	0.64		0.004	0.003	
1:45	0.21		0.000	0.000		14:30	0.50		0.003	0.004	
2:00	0.21		0.001	0.000		14:45	0.38		0.002	0.004	
2:15	0.22		0.001	0.000		15:00	0.48		0.003	0.004	
2:30	0.23		0.001	0.000		15:15	0.61		0.004	0.004	
2:45	0.24		0.001	0.000		15:30	0.36		0.001	0.004	
3:00	0.25		0.001	0.000		15:45	0.25		0.001	0.004	
3:15	0.25		0.001	0.000		16:00	0.48		0.003	0.004	
3:30	0.24		0.001	0.000		16:15	0.46		0.002	0.004	
3:45	0.25		0.001	0.000		16:30	0.39		0.002	0.004	
4:00	0.22		0.001	0.000		16:45	0.24		0.001	0.004	
4:15	0.22		0.001	0.000		17:00	0.21		0.001	0.004	
4:30	0.22		0.001	0.000		17:15	0.39		0.002	0.004	
4:45	0.23		0.001	0.000		17:30	0.28		0.001	0.004	
5:00	0.23		0.001	0.000		17:45	0.22		0.001	0.004	
5:15	0.60		0.006	0.000		18:00	0.23		0.001	0.004	
5:30	0.89		0.008	0.000		18:15	0.23		0.001	0.004	
5:45	0.52		0.003	0.000		18:30	0.24		0.001	0.004	
6:00	0.48		0.002	0.000		18:45	0.26		0.001	0.004	
6:15	0.41		0.002	0.000		19:00	0.24		0.001	0.004	
6:30	0.43		0.002	0.000		19:15	0.23		0.001	0.004	
6:45	0.40		0.002	0.000		19:30	0.24		0.001	0.004	
7:00	0.49		0.003	0.000		19:45	0.25		0.001	0.004	
7:15	0.64		0.004	0.000		20:00	0.25		0.001	0.004	
7:30	0.76		0.006	0.001		20:15	0.24		0.001	0.004	
7:45	0.82		0.007	0.001		20:30	0.25		0.001	0.004	
8:00	0.95		0.009	0.001		20:45	0.27		0.001	0.004	
8:15	0.85		0.007	0.001		21:00	0.27		0.001	0.004	
8:30	0.80		0.006	0.001		21:15	0.26		0.001	0.004	
8:45	0.73		0.005	0.001		21:30	0.26		0.001	0.004	
9:00	1.01		0.010	0.001		21:45	0.24		0.001	0.004	
9:15	0.89		0.008	0.001		22:00	0.24		0.001	0.004	
9:30	0.99		0.010	0.001		22:15	0.24		0.001	0.004	
9:45	0.88		0.008	0.001		22:30	0.24		0.001	0.004	
10:00	0.97		0.009	0.001		22:45	0.24		0.001	0.004	
10:15	1.16		0.014	0.002		23:00	0.24		0.001	0.004	
10:30	1.12		0.013	0.002		23:15	0.22		0.001	0.004	
10:45	1.16		0.013	0.002		23:30	0.21		0.001	0.004	
11:00	1.04		0.010	0.002		23:45	0.22		0.001	0.004	
11:15	1.19		0.014	0.002		<b>Daily Totals:</b>				<b>0.004</b>	<b>0.00</b>
11:30	1.08		0.011	0.002		<b>Data reported every:</b>	15 Minutes				
11:45	0.95		0.009	0.002							
12:00	1.40		0.018	0.002							
12:15	1.05		0.011	0.003							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/13/2019</b>						12:30	0.32		0.001	0.002	0.02
0:00	0.21		0.001	0.000		12:45	0.62		0.004	0.002	
0:15	0.22		0.001	0.000		13:00	0.49		0.003	0.002	0.01
0:30	0.21		0.000	0.000		13:15	0.33		0.001	0.002	0.02
0:45	0.21		0.000	0.000		13:30	0.49		0.003	0.002	
1:00	0.22		0.001	0.000		13:45	0.59		0.004	0.002	0.01
1:15	0.22		0.001	0.000		14:00	0.62		0.004	0.002	0.01
1:30	0.23		0.001	0.000		14:15	0.57		0.004	0.002	0.01
1:45	0.22		0.001	0.000		14:30	0.25		0.001	0.003	0.02
2:00	0.21		0.001	0.000		14:45	0.21		0.000	0.003	0.01
2:15	0.23		0.001	0.000		15:00	0.40		0.002	0.003	0.02
2:30	0.23		0.001	0.000		15:15	0.56		0.003	0.003	
2:45	0.24		0.001	0.000		15:30	0.51		0.003	0.003	
3:00	0.23		0.001	0.000		15:45	0.42		0.002	0.003	
3:15	0.23		0.001	0.000		16:00	0.36		0.001	0.003	
3:30	0.23		0.001	0.000		16:15	0.30		0.001	0.003	
3:45	0.23		0.001	0.000		16:30	0.26		0.001	0.003	
4:00	0.23		0.001	0.000		16:45	0.23		0.001	0.003	
4:15	0.23		0.001	0.000		17:00	0.24		0.001	0.003	
4:30	0.24		0.001	0.000		17:15	0.22		0.001	0.003	
4:45	0.24		0.001	0.000		17:30	0.22		0.001	0.003	0.01
5:00	0.23		0.001	0.000		17:45	0.23		0.001	0.003	
5:15	1.36		0.017	0.000		18:00	0.21		0.001	0.003	
5:30	0.90		0.008	0.000		18:15	0.21		0.000	0.003	
5:45	0.68		0.006	0.000		18:30	0.21		0.000	0.003	
6:00	0.68		0.005	0.001		18:45	0.21		0.000	0.003	
6:15	0.68		0.005	0.001	0.01	19:00	0.21		0.001	0.003	
6:30	0.58		0.003	0.001		19:15	0.21		0.000	0.003	
6:45	0.73		0.006	0.001		19:30	0.21		0.001	0.003	
7:00	0.65		0.004	0.001	0.01	19:45	0.21		0.001	0.003	
7:15	0.82		0.007	0.001		20:00	0.21		0.001	0.003	
7:30	0.79		0.006	0.001		20:15	0.22		0.001	0.003	
7:45	0.68		0.005	0.001		20:30	0.22		0.001	0.003	
8:00	0.69		0.005	0.001		20:45	0.22		0.001	0.003	
8:15	0.75		0.006	0.001		21:00	0.22		0.001	0.003	
8:30	0.81		0.007	0.001		21:15	0.22		0.001	0.003	
8:45	0.78		0.006	0.001		21:30	0.22		0.001	0.003	
9:00	1.32		0.018	0.001		21:45	0.22		0.001	0.003	
9:15	1.19		0.014	0.001	0.01	22:00	0.22		0.001	0.003	
9:30	0.90		0.008	0.002		22:15	0.22		0.001	0.003	
9:45	0.98		0.010	0.002	0.01	22:30	0.21		0.001	0.003	
10:00	1.30		0.016	0.002		22:45	0.22		0.001	0.003	
10:15	1.38		0.018	0.002	0.01	23:00	0.22		0.001	0.003	
10:30	0.81		0.007	0.002		23:15	0.23		0.001	0.003	
10:45	0.94		0.009	0.002	0.05	23:30	0.24		0.001	0.003	
11:00	0.52		0.003	0.002	0.09	23:45	0.24		0.001	0.003	
11:15	0.43		0.002	0.002	0.08	<b>Daily Totals:</b>					
11:30	0.27		0.001	0.002	0.05						
11:45	0.47		0.002	0.002	0.02	<b>Data reported every:</b> 15 Minutes					
12:00	0.33		0.001	0.002	0.02						
12:15	0.26		0.001	0.002	0.01						

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/14/2019</b>						12:30	0.23		0.001	0.000	
0:00	0.23		0.001	0.000		12:45	0.22		0.001	0.000	
0:15	0.23		0.001	0.000		13:00	0.22		0.001	0.000	
0:30	0.23		0.001	0.000		13:15	0.23		0.001	0.000	
0:45	0.23		0.001	0.000		13:30	0.27		0.001	0.000	
1:00	0.23		0.001	0.000		13:45	0.40		0.002	0.000	
1:15	0.23		0.001	0.000		14:00	0.26		0.001	0.000	
1:30	0.22		0.001	0.000		14:15	0.26		0.001	0.000	
1:45	0.22		0.001	0.000		14:30	0.21		0.001	0.000	
2:00	0.22		0.001	0.000		14:45	0.21		0.000	0.000	
2:15	0.21		0.001	0.000		15:00	0.21		0.000	0.000	
2:30	0.21		0.001	0.000		15:15	0.19		0.000	0.000	
2:45	0.20		0.000	0.000		15:30	0.21		0.000	0.000	
3:00	0.20		0.000	0.000		15:45	0.24		0.001	0.000	
3:15	0.19		0.000	0.000		16:00	0.23		0.001	0.000	
3:30	0.20		0.000	0.000		16:15	0.22		0.001	0.000	
3:45	0.19		0.000	0.000		16:30	0.19		0.000	0.000	
4:00	0.19		0.000	0.000		16:45	0.22		0.001	0.000	
4:15	0.19		0.000	0.000		17:00	0.22		0.001	0.000	
4:30	0.21		0.000	0.000		17:15	0.22		0.001	0.001	
4:45	0.21		0.000	0.000		17:30	0.21		0.001	0.001	
5:00	0.21		0.000	0.000		17:45	0.22		0.001	0.001	
5:15	0.21		0.001	0.000		18:00	0.22		0.001	0.001	
5:30	0.22		0.001	0.000		18:15	0.23		0.001	0.001	
5:45	0.22		0.001	0.000		18:30	0.24		0.001	0.001	
6:00	0.21		0.001	0.000		18:45	0.22		0.001	0.001	
6:15	0.23		0.001	0.000		19:00	0.24		0.001	0.001	
6:30	0.23		0.001	0.000		19:15	0.24		0.001	0.001	
6:45	0.35		0.002	0.000		19:30	0.24		0.001	0.001	
7:00	0.30		0.001	0.000		19:45	0.24		0.001	0.001	
7:15	0.25		0.001	0.000		20:00	0.24		0.001	0.001	
7:30	0.24		0.001	0.000		20:15	0.24		0.001	0.001	
7:45	0.22		0.001	0.000		20:30	0.24		0.001	0.001	
8:00	0.30		0.001	0.000		20:45	0.26		0.001	0.001	
8:15	0.30		0.001	0.000		21:00	0.24		0.001	0.001	
8:30	0.24		0.001	0.000		21:15	0.24		0.001	0.001	
8:45	0.23		0.001	0.000		21:30	0.24		0.001	0.001	
9:00	0.32		0.001	0.000		21:45	0.23		0.001	0.001	
9:15	0.30		0.001	0.000		22:00	0.23		0.001	0.001	
9:30	0.27		0.001	0.000		22:15	0.23		0.001	0.001	
9:45	0.24		0.001	0.000		22:30	0.22		0.001	0.001	
10:00	0.46		0.003	0.000		22:45	0.22		0.001	0.001	
10:15	0.32		0.001	0.000		23:00	0.21		0.001	0.001	
10:30	0.30		0.001	0.000		23:15	0.21		0.000	0.001	
10:45	0.42		0.002	0.000		23:30	0.21		0.001	0.001	
11:00	0.30		0.001	0.000		23:45	0.21		0.000	0.001	
11:15	0.32		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.24		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.22		0.001	0.000							
12:00	0.23		0.001	0.000							
12:15	0.21		0.001	0.000							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/15/2019</b>						12:30	0.20		0.000	0.000	
0:00	0.21		0.000	0.000		12:45	0.20		0.000	0.000	
0:15	0.21		0.001	0.000		13:00	0.20		0.000	0.000	
0:30	0.21		0.000	0.000		13:15	0.20		0.000	0.000	
0:45	0.21		0.000	0.000		13:30	0.20		0.000	0.000	
1:00	0.20		0.000	0.000		13:45	0.18		0.000	0.000	
1:15	0.20		0.000	0.000		14:00	0.20		0.000	0.000	
1:30	0.20		0.000	0.000		14:15	0.20		0.000	0.000	
1:45	0.20		0.000	0.000		14:30	0.20		0.000	0.000	
2:00	0.21		0.000	0.000		14:45	0.20		0.000	0.000	
2:15	0.18		0.000	0.000		15:00	0.20		0.000	0.000	
2:30	0.20		0.000	0.000		15:15	0.19		0.000	0.000	
2:45	0.20		0.000	0.000		15:30	0.20		0.000	0.000	
3:00	0.21		0.000	0.000		15:45	0.22		0.001	0.000	
3:15	0.20		0.000	0.000		16:00	0.21		0.001	0.000	
3:30	0.21		0.000	0.000		16:15	0.22		0.001	0.000	
3:45	0.21		0.000	0.000		16:30	0.21		0.000	0.000	
4:00	0.20		0.000	0.000		16:45	0.22		0.001	0.000	
4:15	0.22		0.001	0.000		17:00	0.22		0.001	0.000	
4:30	0.22		0.001	0.000		17:15	0.22		0.001	0.000	
4:45	0.22		0.001	0.000		17:30	0.23		0.001	0.000	
5:00	0.22		0.001	0.000		17:45	0.21		0.001	0.000	
5:15	0.22		0.001	0.000		18:00	0.23		0.001	0.000	
5:30	0.23		0.001	0.000		18:15	0.22		0.001	0.001	
5:45	0.23		0.001	0.000		18:30	0.23		0.001	0.001	
6:00	0.22		0.001	0.000		18:45	0.22		0.001	0.001	
6:15	0.23		0.001	0.000		19:00	0.23		0.001	0.001	
6:30	0.23		0.001	0.000		19:15	0.22		0.001	0.001	
6:45	0.23		0.001	0.000		19:30	0.23		0.001	0.001	
7:00	0.24		0.001	0.000		19:45	0.23		0.001	0.001	
7:15	0.23		0.001	0.000		20:00	0.27		0.001	0.001	
7:30	0.42		0.002	0.000		20:15	0.25		0.001	0.001	
7:45	0.45		0.002	0.000		20:30	0.26		0.001	0.001	
8:00	0.29		0.001	0.000		20:45	0.26		0.001	0.001	
8:15	0.27		0.001	0.000		21:00	0.24		0.001	0.001	
8:30	0.41		0.002	0.000		21:15	0.26		0.001	0.001	
8:45	0.54		0.003	0.000		21:30	0.24		0.001	0.001	
9:00	0.46		0.002	0.000		21:45	0.25		0.001	0.001	
9:15	0.28		0.001	0.000		22:00	0.26		0.001	0.001	
9:30	0.24		0.001	0.000		22:15	0.25		0.001	0.001	
9:45	0.24		0.001	0.000		22:30	0.24		0.001	0.001	
10:00	0.24		0.001	0.000		22:45	0.25		0.001	0.001	
10:15	0.23		0.001	0.000		23:00	0.23		0.001	0.001	
10:30	0.23		0.001	0.000		23:15	0.24		0.001	0.001	
10:45	0.23		0.001	0.000		23:30	0.25		0.001	0.001	
11:00	0.23		0.001	0.000		23:45	0.24		0.001	0.001	
11:15	0.23		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.00</b>
11:30	0.23		0.001	0.000		<b>Data reported every:</b>	15 Minutes				
11:45	0.20		0.000	0.000							
12:00	0.19		0.000	0.000							
12:15	0.21		0.000	0.000							

# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/16/2019</b>						12:30	0.24		0.001	0.000	
0:00	0.23		0.001	0.000		12:45	0.21		0.001	0.000	
0:15	0.24		0.001	0.000		13:00	0.20		0.000	0.000	
0:30	0.24		0.001	0.000		13:15	0.23		0.001	0.000	
0:45	0.23		0.001	0.000		13:30	0.23		0.001	0.000	
1:00	0.23		0.001	0.000		13:45	0.23		0.001	0.000	
1:15	0.23		0.001	0.000		14:00	0.23		0.001	0.000	
1:30	0.22		0.001	0.000		14:15	0.22		0.001	0.000	
1:45	0.23		0.001	0.000		14:30	0.21		0.001	0.000	
2:00	0.23		0.001	0.000		14:45	0.21		0.001	0.000	
2:15	0.24		0.001	0.000	0.01	15:00	0.22		0.001	0.000	
2:30	0.23		0.001	0.000	0.01	15:15	0.22		0.001	0.000	
2:45	0.23		0.001	0.000	0.01	15:30	0.23		0.001	0.000	0.01
3:00	0.24		0.001	0.000		15:45	0.22		0.001	0.000	0.01
3:15	0.22		0.001	0.000		16:00	0.21		0.000	0.000	0.01
3:30	0.23		0.001	0.000		16:15	0.20		0.000	0.000	
3:45	0.22		0.001	0.000		16:30	0.20		0.000	0.000	0.01
4:00	0.22		0.001	0.000		16:45	0.21		0.001	0.000	0.01
4:15	0.22		0.001	0.000		17:00	0.20		0.000	0.000	0.01
4:30	0.21		0.001	0.000		17:15	0.21		0.000	0.000	
4:45	0.20		0.000	0.000		17:30	0.20		0.000	0.000	
5:00	0.20		0.000	0.000		17:45	0.19		0.000	0.000	
5:15	0.20		0.000	0.000		18:00	0.19		0.000	0.000	0.01
5:30	0.21		0.001	0.000		18:15	0.18		0.000	0.000	
5:45	0.21		0.001	0.000		18:30	0.18		0.000	0.000	
6:00	0.20		0.000	0.000		18:45	0.17		0.000	0.000	
6:15	0.20		0.000	0.000		19:00	0.18		0.000	0.000	0.01
6:30	0.21		0.000	0.000	0.01	19:15	0.18		0.000	0.000	
6:45	0.19		0.000	0.000		19:30	0.18		0.000	0.000	
7:00	0.20		0.000	0.000		19:45	0.19		0.000	0.000	
7:15	0.20		0.000	0.000		20:00	0.19		0.000	0.000	0.02
7:30	0.19		0.000	0.000		20:15	0.20		0.000	0.000	0.01
7:45	0.20		0.000	0.000		20:30	0.20		0.000	0.000	
8:00	0.21		0.000	0.000		20:45	0.20		0.000	0.000	0.01
8:15	0.22		0.001	0.000		21:00	0.20		0.000	0.000	
8:30	0.21		0.001	0.000		21:15	0.20		0.000	0.000	
8:45	0.20		0.000	0.000		21:30	0.20		0.000	0.000	
9:00	0.22		0.001	0.000		21:45	0.20		0.000	0.000	
9:15	0.22		0.001	0.000		22:00	0.21		0.000	0.000	
9:30	0.22		0.001	0.000		22:15	0.20		0.000	0.000	
9:45	0.23		0.001	0.000		22:30	0.20		0.000	0.000	
10:00	0.21		0.000	0.000		22:45	0.20		0.000	0.000	
10:15	0.21		0.001	0.000		23:00	0.20		0.000	0.000	
10:30	0.23		0.001	0.000		23:15	0.21		0.000	0.000	
10:45	0.22		0.001	0.000		23:30	0.23		0.001	0.001	
11:00	0.21		0.000	0.000		23:45	0.22		0.001	0.001	
11:15	0.21		0.001	0.000		<b>Daily Totals:</b>				<b>0.001</b>	<b>0.16</b>
11:30	0.23		0.001	0.000		<b>Data reported every:</b>		15 Minutes			
11:45	0.23		0.001	0.000							
12:00	0.23		0.001	0.000							
12:15	0.22		0.001	0.000							



# Daily Flow Report



Site:

1  
18 Crescent Street

Northbridge, MA

4" Palmer-Bowlus flume in a 6" line

Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)	Time	Depth (in)	Velocity (fps)	Flow (mgd)	Cumm Flow (mg)	Rain (in)
<b>6/17/2019</b>						12:30				0.000	
0:00	0.23		0.001	0.000		12:45				0.000	
0:15	0.22		0.001	0.000		13:00				0.000	
0:30	0.22		0.001	0.000		13:15				0.000	
0:45	0.22		0.001	0.000		13:30				0.000	
1:00	0.22		0.001	0.000		13:45				0.000	
1:15	0.21		0.001	0.000		14:00				0.000	
1:30	0.21		0.000	0.000		14:15				0.000	
1:45	0.21		0.001	0.000		14:30				0.000	
2:00	0.21		0.000	0.000		14:45				0.000	
2:15	0.21		0.000	0.000		15:00				0.000	
2:30	0.20		0.000	0.000		15:15				0.000	
2:45	0.21		0.000	0.000		15:30				0.000	
3:00	0.19		0.000	0.000		15:45				0.000	
3:15	0.21		0.000	0.000		16:00				0.000	
3:30	0.19		0.000	0.000	0.01	16:15				0.000	
3:45	0.20		0.000	0.000		16:30				0.000	
4:00	0.18		0.000	0.000		16:45				0.000	
4:15	0.18		0.000	0.000		17:00				0.000	
4:30	0.18		0.000	0.000		17:15				0.000	
4:45	0.18		0.000	0.000		17:30				0.000	
5:00	0.17		0.000	0.000		17:45				0.000	
5:15	0.17		0.000	0.000		18:00				0.000	
5:30	0.19		0.000	0.000		18:15				0.000	
5:45	0.25		0.001	0.000		18:30				0.000	
6:00	0.21		0.000	0.000		18:45				0.000	
6:15	0.22		0.001	0.000		19:00				0.000	
6:30	0.21		0.001	0.000		19:15				0.000	
6:45	0.21		0.000	0.000		19:30				0.000	
7:00	0.27		0.001	0.000		19:45				0.000	
7:15	0.24		0.001	0.000		20:00				0.000	
7:30	0.30		0.001	0.000		20:15				0.000	
7:45	0.32		0.001	0.000		20:30				0.000	
8:00	0.27		0.001	0.000		20:45				0.000	
8:15	0.22		0.001	0.000		21:00				0.000	
8:30	0.28		0.001	0.000		21:15				0.000	
8:45	0.22		0.001	0.000		21:30				0.000	
9:00	0.14		0.000	0.000		21:45				0.000	
9:15				0.000		22:00				0.000	
9:30				0.000		22:15				0.000	
9:45				0.000		22:30				0.000	
10:00				0.000		22:45				0.000	
10:15				0.000		23:00				0.000	
10:30				0.000		23:15				0.000	
10:45				0.000		23:30				0.000	
11:00				0.000		23:45				0.000	
11:15				0.000		<b>Daily Totals:</b>				<b>0.000</b>	<b>0.01</b>
11:30				0.000		<b>Data reported every:</b>	15 Minutes				
11:45				0.000							
12:00				0.000							
12:15				0.000							

# Flow Analysis Graph

Site:  
1

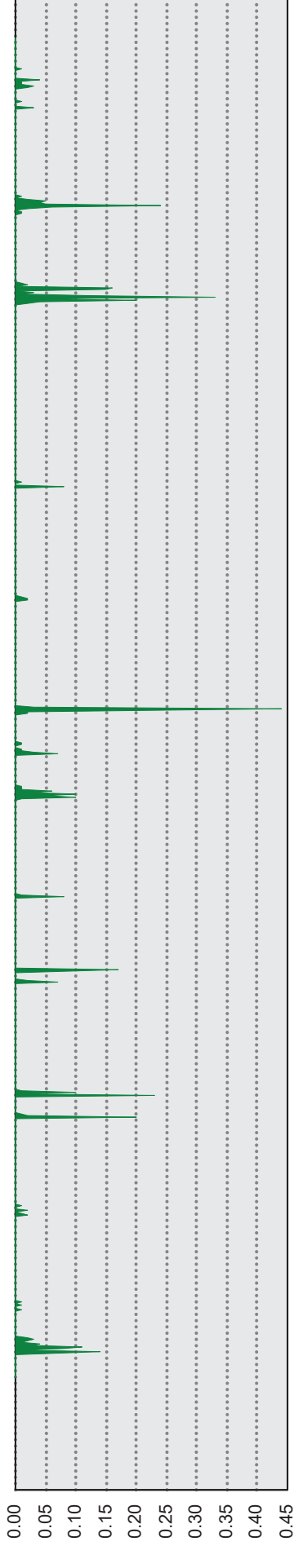
18 Crescent Street

Northbridge, MA

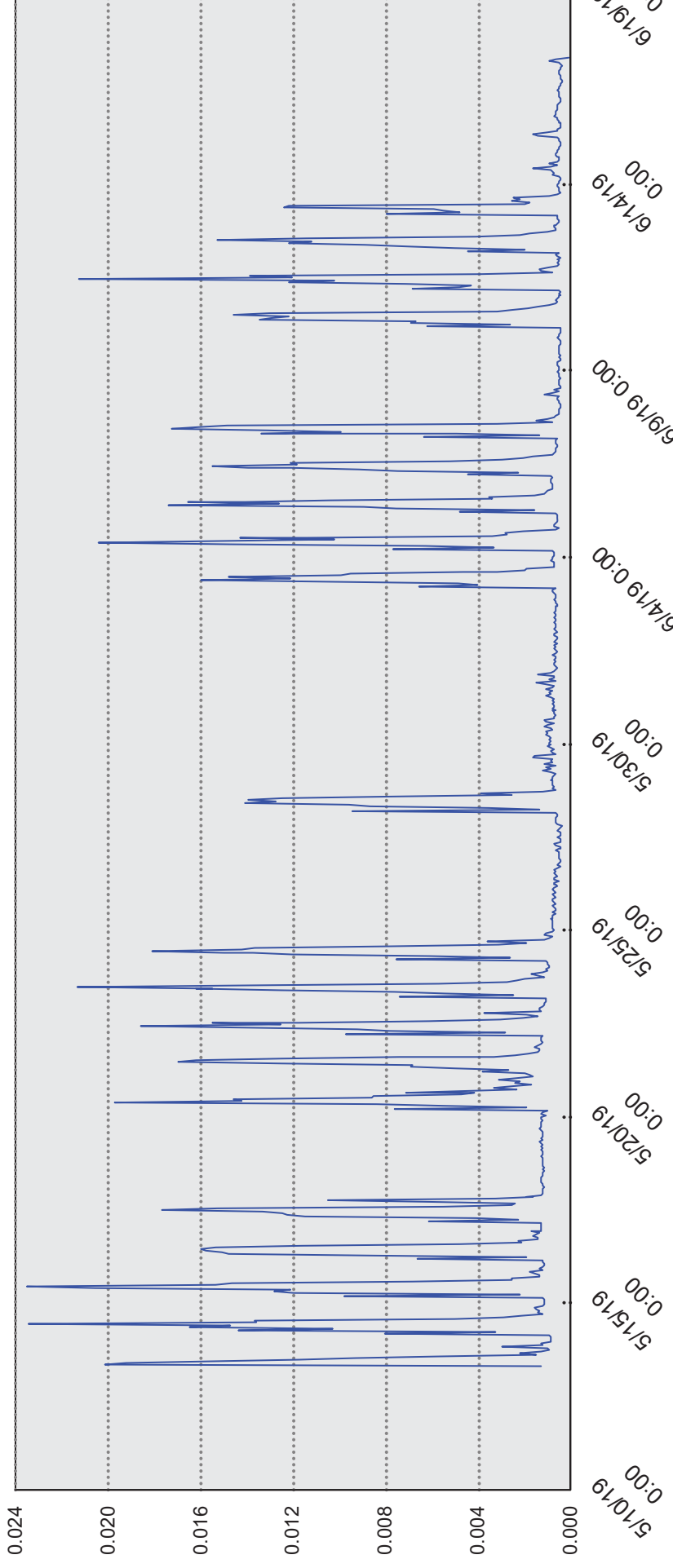
4" Palmer-Bowling flume in a 6" line

Printed on: 6/28/2019

Period Covered: 05/13/2019 - 06/18/2019 Every 1 Hour



Flow (mgd)



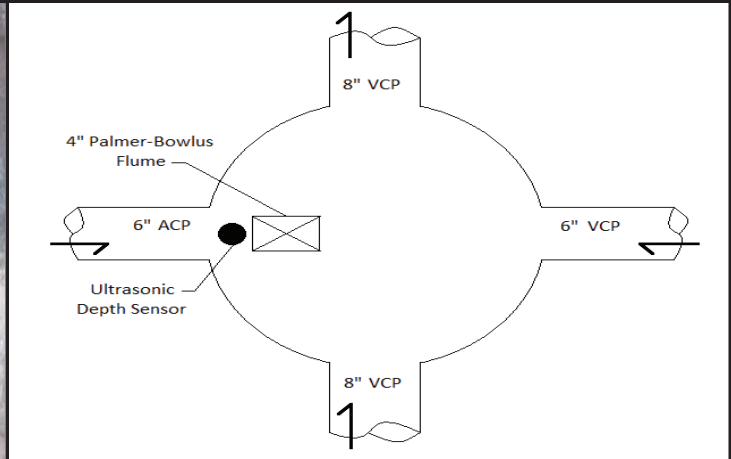


### METER SITE INFORMATION FIELD LOG

<b>PROJECT:</b> Northbridge, MA	<b>DATE:</b> May 13, 2019	<b>JOB#:</b> 19066
<b>LOCATION:</b> 18 Crescent Street	<b>MH#:</b>	<b>METER SITE:</b> 1
<b>GPS/COMMENTS:</b> 42.115393, -71.679840		

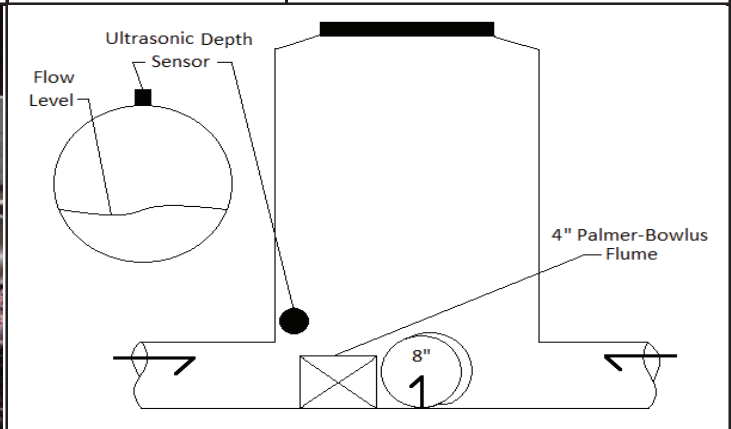


	Size (")	Material	Flow Depth (")	Debris (")	Shape	MH Depth
Incoming	6	ACP	1	0	Circular	06' 09"
Incoming	8	VCP	1.5	0	Circular	06' 11"
Incoming	6	VCP	1	0	Circular	06' 10"
Outgoing	8	VCP	2	0	Circular	07' 00"



<b>SURCHARGE INFORMATION</b>
<b>SURCHARGE NONE EVIDENT:</b> X
<b>SURCHARGED MARKS TO:</b>
<b>SURCHARGE CURRENTLY TO:</b>

<b>LENGTH:</b>	<b>HEIGHT ABOVE WEIR:</b>
<b>BREADTH:</b>	<b>OVERFLOW OCCURS AT:</b>
<b>LEVEL:</b>	



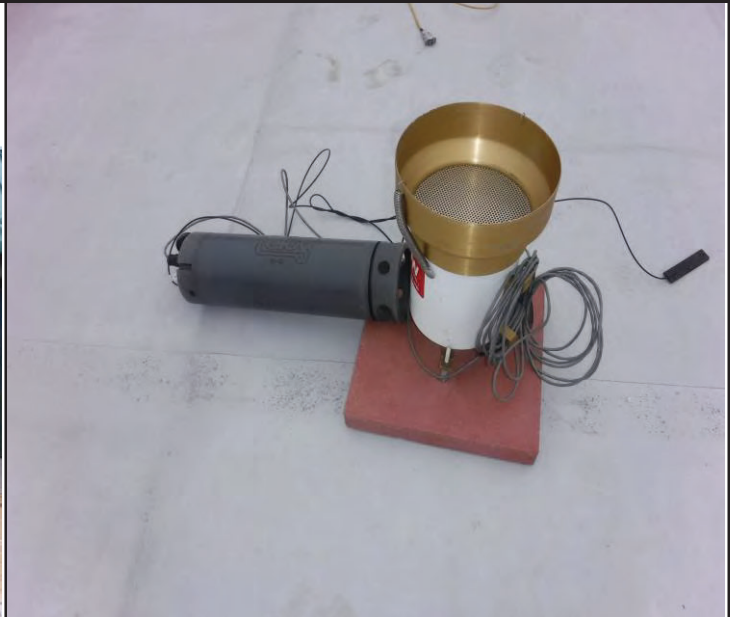




### RAIN GAUGE SITE INFORMATION FIELD LOG

<b>PROJECT:</b> Northbridge, MA	<b>DATE:</b> May 13, 2019	<b>JOB #:</b> 19066
<b>LOCATION:</b> Crescent Street at Balmer Elementary School		
<b>GPS/COMMENTS:</b> 42.116941, -71.681180		

#### LOCATION





## Memorandum

*To: Jim Shuris, Director of Public Works  
Mark Kuras, Sewer Superintendent*

*From: Chad J. Kershaw, P.E., CDM Smith*

*Date: May 7, 2019*

*Subject: Northbridge, MA  
Balmer School Sewer Capacity Analysis*

The Town of Northbridge, MA (Town) is proposing to discharge an additional 7,730 gallons per day (gpd) of sewer flow to the Town's sewer collection system as part of the W. Edward Balmer Elementary School (Balmer School) building upgrade project. The proposed Balmer School will be replacing the existing Balmer School, located at 21 Crescent Street. The existing Balmer School currently conveys all sewer flow to the existing sewer main in Crescent Street. The Balmer School sewer flow, along with other sewer flow from the Town, is then conveyed via existing 10- to 24-inch gravity sewer mains to the Town's wastewater treatment plant (WWTP) located at 644 Providence Road. The proposed Balmer School will discharge to the Town's sewer collection system at the same point as the current school.

The purpose of this evaluation was to determine how the Town's existing sewer infrastructure handles existing average day and peak sewer flows and average day and peak sewer flows after the new Balmer School is constructed and occupied. For the purpose of this study, the sewer mains downstream of the Balmer School from Crescent Street to Douglas Road were analyzed. These sewer mains are located in Lake Street, Main Street, Water Street and a cross-country easement behind the mills off Main Street. See **Figure 1** for a map highlighting the location of these sewer mains. Note that the sewer mains from Douglas Road to the WWTP were not analyzed, as they were sized and installed in the 2000s to convey future flow to the WWTP.

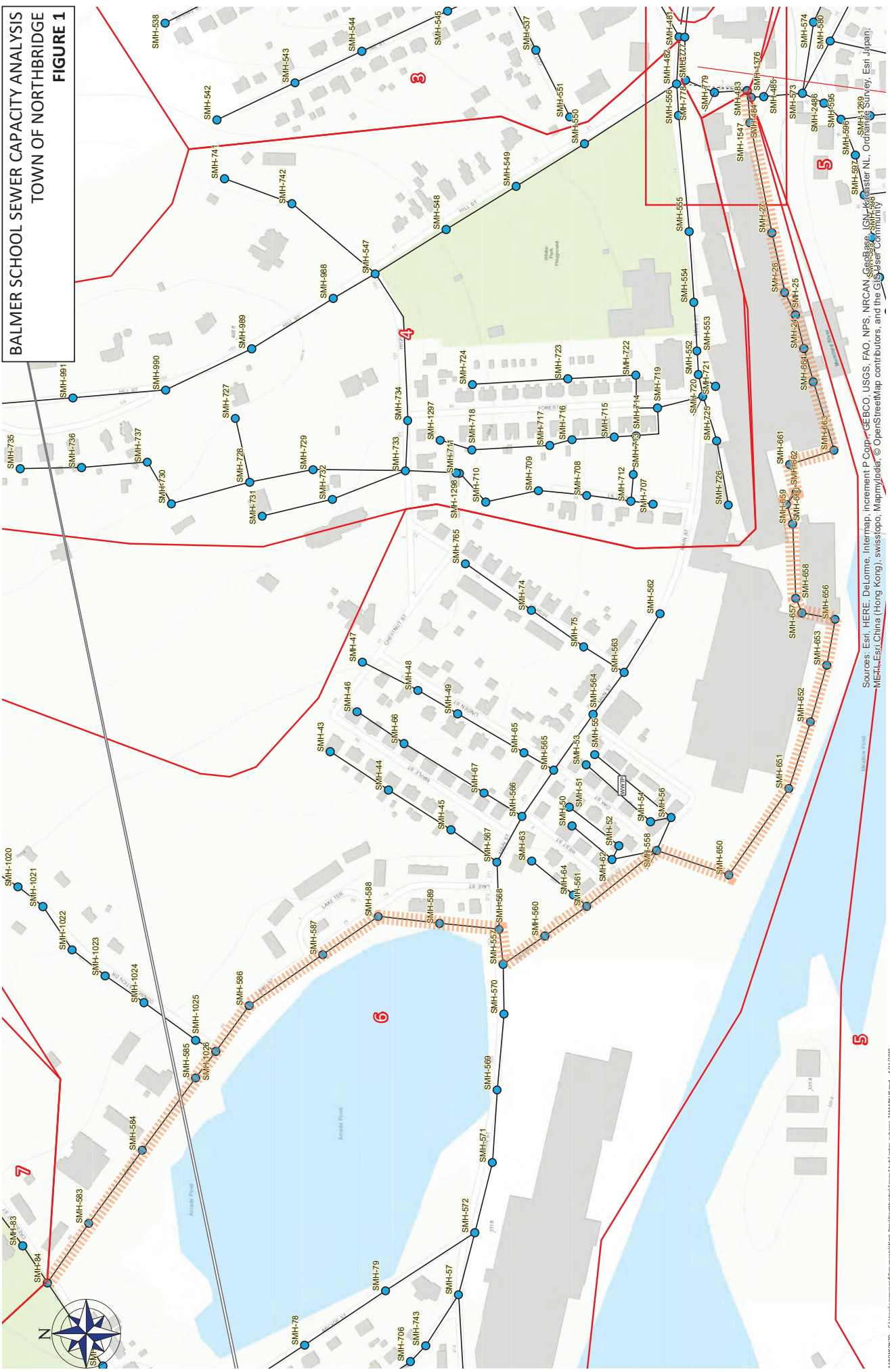
## Sewer Flow Analysis

### Existing Flows

Flow metering data from the spring 2014 flow metering program was used to determine existing average daily flows and peak flows during a high groundwater season. The flow metering program included installation of a flow meter in SMH-84 (most upstream manhole) and a flow meter in SMH-483 (most downstream manhole), which captured all sanitary flow (including sanitary flow from the existing Balmer School) and any infiltration and inflow (I/I) during the metering period (April 2 to May 28, 2014). The average daily flows were calculated by averaging all 15-minute interval flow



**BALMER SCHOOL SEWER CAPACITY ANALYSIS  
TOWN OF NORTHBRIIDGE  
FIGURE 1**



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeBCO, IGN, Esri, Swisstopo, Esri Japan, MEI, Esri, China (Hong Kong), swisstopo, Mapbox, © OpenStreetMap contributors, and the GIS User Community

data during the entire metering period. The resulting average daily flow was approximately 177,000 gpd for the most upstream sewer manhole (SMH-84) and approximately 306,000 gpd for the most downstream sewer manhole (SMH-483).

The Massachusetts Department of Environmental Protection (MassDEP) “Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys” was used for this analysis. The MassDEP guidelines state that a sewer system capacity evaluation shall be completed to assess the risk for sanitary sewer overflows for the 5-year, 24-hour storm event. During the spring 2014 flow metering program, the largest rainfall event occurred on March 29-31, 2014, producing 4.0 inches of rain, including a 24-hour peak rainfall intensity of 3.13 inches.

Using the National Oceanic and Atmospheric Administration (NOAA) Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS) ([https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html)), a 24-hour rainfall event with 3.13 inches equates to approximately a 2-year, 24-hour rainfall event for the Northbridge, Massachusetts region. However, multiple preceding rainfall events in late February/early March, coupled with snow melt, created a high groundwater condition. As a result, the flows captured during this rainfall event may be more representative of a 5-year, 24-hour rainfall event. The peak flow was calculated by taking the highest 15-minute flow reading during the peak 24-hour intensity of the March 29-31, 2014 rainfall event, which resulted in a peak flow of approximately 458,000 gpd for the most upstream sewer manhole (SMH-84) and approximately 728,000 gpd for the most downstream sewer manhole (SMH-483).

Also, the Town provided water use data for all buildings tributary to the analyzed sewer mains. Using this data, the existing average daily and peak flows could be allocated at key locations along the analyzed sewer mains based on system configuration (i.e. where other sideline sewers discharge to the analyzed sewer mains). See **Table 1** for a summary of existing average day and peak flows for the sewer mains from Crescent Street to Douglas Road.

**Table 1 – Summary of Existing Sewer Flows**

Upstream SMH	Downstream SMH	Location	Average Daily Flow (mgd)	Peak Flow (mgd)
SMH-84	SMH-583	Crescent Street at Lake Street	0.177	0.458
SMH-583	SMH-584	Lake Street	0.177	0.458
SMH-584	SMH-585	Lake Street	0.177	0.458
SMH-585	SMH-1026	Lake Street	0.177	0.458
SMH-1026	SMH-586	Lake Street	0.182	0.468
SMH-586	SMH-587	Lake Street	0.182	0.468
SMH-587	SMH-588	Lake Street	0.182	0.468
SMH-588	SMH-589	Easement off Lake Street	0.185	0.474
SMH-589	SMH-568	Easement off Lake Street	0.185	0.474



Upstream SMH	Downstream SMH	Location	Average Daily Flow (mgd)	Peak Flow (mgd)
SMH-568	SMH-557	Main Street	0.218	0.543
SMH-557	SMH-560	Water Street	0.296	0.707
SMH-560	SMH-561	Water Street	0.296	0.707
SMH-561	SMH-558	Water Street	0.298	0.711
SMH-558	SMH-650	Easement off Water Street	0.306	0.728
SMH-650	SMH-651	Easement Behind Mills	0.306	0.728
SMH-651	SMH-652	Easement Behind Mills	0.306	0.728
SMH-652	SMH-653	Easement Behind Mills	0.306	0.728
SMH-653	SMH-656	Easement Behind Mills	0.306	0.728
SMH-656	SMH-657	Easement Behind Mills	0.306	0.728
SMH-657	SMH-658	Easement Behind Mills	0.306	0.728
SMH-658	SMH-659	Easement Behind Mills	0.306	0.728
SMH-659	SMH-660	Easement Behind Mills	0.306	0.728
SMH-660	SMH-662	Easement Behind Mills	0.306	0.728
SMH-662	SMH-661	Easement Behind Mills	0.306	0.728
SMH-661	SMH-663	Easement Behind Mills	0.306	0.728
SMH-663	SMH-664	Easement Behind Mills	0.306	0.728
SMH-664	SMH-24	Easement Behind Mills	0.306	0.728
SMH-24	SMH-25	Easement Behind Mills	0.306	0.728
SMH-25	SMH-26	Easement Behind Mills	0.306	0.728
SMH-26	SMH-27	Easement Behind Mills	0.306	0.728
SMH-27	SMH-1547	Easement Behind Mills	0.306	0.728
SMH-1547	SMH-483	Easement Behind Mills at Douglas Road	0.306	0.728

## Proposed Flows

The sanitary sewer design flows for the proposed Balmer School were provided in a letter dated February 12, 2019 by Nitsch Engineering (see **Attachment A**). The letter states that the existing Balmer School has a sanitary flow of 5,980 gpd and the proposed Balmer School will have a sanitary flow of 13,710 gpd, resulting in an additional sanitary flow of 7,730 gpd. These sanitary sewer flows are based on Title 5 flow rates (Massachusetts State Environmental Code 310 CMR 15.203). The Title 5 flow rates represent a maximum day sanitary flow, or a peaking factor of 2.0 from average daily sanitary flows. As a result, the proposed additional average day sanitary flow is 3,865 gpd. Using the industry standard curve for average daily to peak flow ratios, a peaking factor of 5.5 is a conservative ratio. Therefore, the proposed additional peak flow from the new Balmer School is 21,257.5 gpd.

Also, infiltration for the new Balmer School sewer mains from the proposed building(s) to the existing Crescent Street sewer needs to be considered. Using the industry standard for infiltration rate for new sewer mains of 100 gpd per inch-mile and an assumed 0.5 miles of new 8-inch diameter sewer mains on the Balmer School property, the expected I/I from the new sewer mains would be approximately 400 gpd.

**Table 2** summarizes the proposed additional sewer flows from the new Balmer School. Also, **Table 3** provides a summary of existing average day flows plus Balmer School proposed peak flow and existing peak flows plus Balmer School proposed peak flow for the sewer mains from Crescent Street to Douglas Road. The existing average daily flow plus Balmer School proposed peak flow and existing peak flow plus Balmer School proposed peak flow for the most upstream sewer manhole (SMH-84) is 0.199 mgd and 0.480 mgd, respectively, and for the most downstream sewer manhole (SMH-483) is 0.328 mgd and 0.750 md, respectively.

**Table 2 – Proposed Additional Flows from New Balmer School**

Type	Average Daily Flow (gpd)	Maximum Daily Flow (gpd)	Peak Flow (gpd)
Sanitary Flow	3,865	7,730	21,257.5
Infiltration	400	400	400
Total Sewer Flow	4,265	8,130	21,657.5

Note: The proposed additional sanitary flows are based on Title 5 flow rates (310 CMR 15.203). The Merrimac curves were used to determine peaking factors (average daily flow = 1.0, maximum daily flow = 2.0, peak flow = 5.5)

**Table 3 – Summary of Existing and Proposed Sewer Flows**

Upstream SMH	Downstream SMH	Location	Existing Average Daily Flow + Proposed Peak Flow (mgd)	Existing Peak Flow + Proposed Peak Flow (mgd)
SMH-84	SMH-583	Lake Street	0.199	0.480
SMH-583	SMH-584	Lake Street	0.199	0.480
SMH-584	SMH-585	Lake Street	0.199	0.480
SMH-585	SMH-1026	Lake Street	0.199	0.480
SMH-1026	SMH-586	Lake Street	0.204	0.490
SMH-586	SMH-587	Lake Street	0.204	0.490
SMH-587	SMH-588	Lake Street	0.204	0.490
SMH-588	SMH-589	Easement off Lake Street	0.207	0.496
SMH-589	SMH-568	Easement off Lake Street	0.207	0.496
SMH-568	SMH-557	Main Street	0.239	0.564
SMH-557	SMH-560	Water Street	0.317	0.728
SMH-560	SMH-561	Water Street	0.317	0.728
SMH-561	SMH-558	Water Street	0.320	0.733
SMH-558	SMH-650	Easement off Water Street	0.328	0.750

Upstream SMH	Downstream SMH	Location	Existing Average Daily Flow + Proposed Peak Flow (mgd)	Existing Peak Flow + Proposed Peak Flow (mgd)
SMH-650	SMH-651	Easement Behind Mills	0.328	0.750
SMH-651	SMH-652	Easement Behind Mills	0.328	0.750
SMH-652	SMH-653	Easement Behind Mills	0.328	0.750
SMH-653	SMH-656	Easement Behind Mills	0.328	0.750
SMH-656	SMH-657	Easement Behind Mills	0.328	0.750
SMH-657	SMH-658	Easement Behind Mills	0.328	0.750
SMH-658	SMH-659	Easement Behind Mills	0.328	0.750
SMH-659	SMH-660	Easement Behind Mills	0.328	0.750
SMH-660	SMH-662	Easement Behind Mills	0.328	0.750
SMH-662	SMH-661	Easement Behind Mills	0.328	0.750
SMH-661	SMH-663	Easement Behind Mills	0.328	0.750
SMH-663	SMH-664	Easement Behind Mills	0.328	0.750
SMH-664	SMH-24	Easement Behind Mills	0.328	0.750
SMH-24	SMH-25	Easement Behind Mills	0.328	0.750
SMH-25	SMH-26	Easement Behind Mills	0.328	0.750
SMH-26	SMH-27	Easement Behind Mills	0.328	0.750
SMH-27	SMH-1547	Easement Behind Mills	0.328	0.750
SMH-1547	SMH-483	Easement Behind Mills	0.328	0.750

## Sewer Capacity Analysis

The design drawings for the majority of the analyzed sewer mains were available and used for this analysis. The design drawings, completed by McClintock & Woodfall Consulting and Civil Engineers, show that these sewer mains were installed in the late 1910's or early 1920's and consist of 10- to 12-inch diameter cast iron (CI) pipe. See **Figure 1** for a map showing the location of the analyzed sewer mains.

The ground cover (invert to ground surface) varies from approximately 2.8 feet at SMH-557 to 14.3 feet at SMH-661. SMH-557 is located in Main Street at Water Street and SMH-661 is located in the cross-country easement behind the mills. On average, the ground cover at all analyzed sewer mains is 5.7 feet. Note that design drawings for the sewer mains between SMH-664 to SMH-483 (six sewer reaches in the cross-country easement behind the mills) were not available. As a result, the known invert elevations at SMH-664 and SMH-483 were used and the six sewer reaches were assumed to have a common, constant slope. Also, on the record drawings there was a vertical elevation discrepancy at SMH-568 of 0.77 feet. This discrepancy was confirmed in the field not to represent actual conditions and was adjusted in the model accordingly. All information was compiled into a

spreadsheet model which calculated the capacity of each pipeline between each manhole using Manning's Equation.

## Capacity Analysis

Based on a Manning's roughness coefficient, "n", value of 0.014 for CI pipe, the theoretical pipe capacity of the analyzed sewer mains ranges from 0.41 MGD to 2.54 MGD. Using the flow scenarios calculated in **Table 1** and **Table 3**, a capacity analysis of the sewer mains was completed for each scenario. Based on the analysis, the sewer mains have adequate capacity to convey the existing average daily flow and existing average daily flow plus Balmer School proposed peak flow scenarios. However, the sewer mains do not have adequate capacity to convey the existing peak flow and existing peak flow plus Balmer School proposed peak flow scenarios. However, no sanitary sewer overflows (SSOs) are predicted under any scenario.

### Existing Average Daily Flow Scenario

As shown in **Table 4**, all sewer mains have sufficient capacity to convey the existing average daily flow. For sewer pipes 10 to 12 inches in diameter, the industry standard sewer design flow ratio (actual sewer flow/full pipe flow) is 0.5. Under this scenario, all sewer segments but two (SMH-557 to SMH-560 and SMH-561 to SMH-558) operate within the industry standard acceptable range for percent flow of up to 0.5. SMH-557 to SMH-560 and SMH-561 to SMH-558 have flow ratios of 0.56, and 0.60, respectively.

### Existing Peak Flow Scenario

As shown in **Table 5**, three sewer reaches do not have adequate capacity to convey the existing peak flow scenario. These three sewer reaches are SMH-557 to SMH-560, SMH-560 to SMH-561, and SMH-561 to SMH-558. These three reaches are all 10-inch diameter, are relatively flat, and convey additional flow from all sewers tributary to Main Street. Also, these three reaches are the most downstream 10-inch diameter sewer mains before the sewers upsize to 12-inch, starting at the Water Street easement.

As a result, eight sewer manholes (SMH-586, -587, -588, -589, -568, -557, -560, and -561) are predicted to experience surcharging conditions. The largest calculated surcharge height over the crown of the pipe is 0.68 feet at SMH-557, resulting in a freeboard (hydraulic grade line elevation to ground surface) of 2.11 feet. However, no SSOs are predicted.

### Existing Average Daily Flow + Balmer School Proposed Peak Flow

As shown in **Table 6**, all sewer mains can convey the existing average daily flow plus Balmer School proposed peak flow scenario. Under this scenario, all sewer segments but two (SMH-557 to SMH-560 and SMH-561 to SMH-558) operate within the industry standard acceptable range for percent flow of up to 0.50. SMH-557 to SMH-560 and SMH-561 to SMH-558 have flow ratios of 0.60, and 0.65, respectively.

**TABLE 4  
EXISTING AVERAGE DAILY FLOW SCENARIO**

Upstream MH Number	Upstream MH Location	Pipe Diameter (in)	Slope ft/ft	Surcharge Over Crown (ft.)	Upstream Freeboard (ft)	Pipe Capacity Q <sub>c</sub> (mgd)	Flow Demand Q <sub>p</sub> (mgd)	Delta Q <sub>c</sub> -Q <sub>p</sub>	Capacity Ratio Q <sub>p</sub> /Q <sub>c</sub>
SMH-84	Lake Street at Crescent Street	10	0.0018	N/A	3.54	0.46	0.15	0.31	0.32
SMH-583	Lake Street	10	0.0018	N/A	3.62	0.47	0.15	0.32	0.31
SMH-584	Lake Street	10	0.0018	N/A	3.81	0.47	0.15	0.32	0.32
SMH-585	Lake Street	10	0.0018	N/A	3.57	0.46	0.15	0.32	0.32
SMH-1026	Lake Street at Conservation Drive	10	0.0018	N/A	3.94	0.47	0.15	0.32	0.32
SMH-586	Lake Street	10	0.0018	N/A	4.53	0.46	0.15	0.31	0.33
SMH-587	Lake Street	10	0.0018	N/A	4.66	0.47	0.15	0.32	0.32
SMH-588	Easement off Lake Street	10	0.0020	N/A	4.53	0.49	0.15	0.33	0.32
SMH-589	Easement off Lake Street	10	0.0021	N/A	3.65	0.50	0.15	0.34	0.31
SMH-568	Main Street	10	0.0028	N/A	4.15	0.58	0.18	0.40	0.31
SMH-557	Main Street at Water Street	10	0.0016	N/A	2.97	0.44	0.25	0.20	0.56
SMH-560	Water Street	10	0.0026	N/A	4.00	0.56	0.25	0.31	0.44
SMH-561	Water Street	10	0.0014	N/A	4.77	0.41	0.25	0.16	0.60
SMH-558	Water Street	12	0.0021	N/A	6.39	0.81	0.25	0.55	0.31
SMH-650	Easement off Water Street	12	0.0020	N/A	5.59	0.79	0.25	0.54	0.32
SMH-651	Easement Behind Mills	12	0.0020	N/A	6.59	0.79	0.25	0.54	0.32
SMH-652	Easement Behind Mills	12	0.0020	N/A	7.02	0.80	0.25	0.55	0.32
SMH-653	Easement Behind Mills	12	0.0020	N/A	7.70	0.79	0.25	0.53	0.32
SMH-656	Easement Behind Mills	12	0.0012	N/A	7.51	0.62	0.25	0.37	0.41
SMH-657	Easement Behind Mills	12	0.0040	N/A	8.37	1.12	0.25	0.87	0.23
SMH-658	Easement Behind Mills	12	0.0020	N/A	9.03	0.80	0.25	0.55	0.32
SMH-659	Easement Behind Mills	12	0.0021	N/A	12.22	0.83	0.25	0.57	0.31
SMH-660	Easement Behind Mills	12	0.0018	N/A	12.28	0.75	0.25	0.50	0.34
SMH-662	Easement Behind Mills	12	0.0020	N/A	12.36	0.80	0.25	0.55	0.32
SMH-661	Easement Behind Mills	12	0.0203	N/A	17.25	2.54	0.25	2.28	0.10
SMH-663	Easement Behind Mills	12	0.0146	N/A	7.04	2.15	0.25	1.89	0.12
SMH-664	Easement Behind Mills	10	0.0045	N/A	5.12	0.74	0.25	0.48	0.35
SMH-24	Easement Behind Mills	10	0.0045	N/A	5.02	0.74	0.25	0.48	0.35
SMH-25	Easement Behind Mills	10	0.0045	N/A	4.79	0.74	0.25	0.48	0.35
SMH-26	Easement Behind Mills	10	0.0045	N/A	5.16	0.74	0.25	0.48	0.35
SMH-27	Easement Behind Mills	10	0.0045	N/A	5.62	0.74	0.25	0.48	0.35
SMH-1547	Easement Behind Mills	10	0.0045	N/A	4.27	0.74	0.25	0.48	0.35

**TABLE 5  
EXISTING PEAK FLOW SCENARIO**

Upstream MH Number	Upstream MH Location	Pipe Diameter (in)	Slope ft/ft	Surcharge Over Crown (ft.)	Upstream Freeboard (ft)	Pipe Capacity Q <sub>c</sub> (mgd)	Flow Demand Q <sub>b</sub> (mgd)	Delta Q <sub>c</sub> -Q <sub>b</sub>	Capacity Ratio Q <sub>b</sub> /Q <sub>c</sub>
SMH-84	Lake Street at Crescent Street	10	0.0018	N/A	3.31	0.46	0.38	0.08	0.83
SMH-583	Lake Street	10	0.0018	N/A	3.33	0.47	0.38	0.09	0.81
SMH-584	Lake Street	10	0.0018	N/A	3.52	0.47	0.38	0.09	0.82
SMH-585	Lake Street	10	0.0018	N/A	3.46	0.46	0.38	0.08	0.82
SMH-1026	Lake Street at Conservation Drive	10	0.0018	N/A	3.73	0.47	0.39	0.08	0.83
SMH-586	Lake Street	10	0.0018	0.02	4.06	0.46	0.39	0.07	0.85
SMH-587	Lake Street	10	0.0018	0.16	4.14	0.47	0.39	0.08	0.83
SMH-588	Easement off Lake Street	10	0.0020	0.28	3.89	0.49	0.39	0.09	0.81
SMH-589	Easement off Lake Street	10	0.0021	0.42	2.88	0.50	0.39	0.10	0.80
SMH-568	Main Street	10	0.0028	0.56	3.31	0.58	0.45	0.13	0.78
SMH-557	Main Street at Water Street	10	0.0016	0.68	2.11	0.44	0.59	-0.15	1.33
SMH-560	Water Street	10	0.0026	0.48	3.19	0.56	0.59	-0.03	1.06
SMH-561	Water Street	10	0.0014	0.43	4.08	0.41	0.59	-0.18	1.44
SMH-558	Water Street	12	0.0021	N/A	6.16	0.81	0.61	0.20	0.75
SMH-650	Easement off Water Street	12	0.0020	N/A	5.27	0.79	0.61	0.18	0.77
SMH-651	Easement Behind Mills	12	0.0020	N/A	6.38	0.79	0.61	0.19	0.76
SMH-652	Easement Behind Mills	12	0.0020	N/A	6.84	0.80	0.61	0.20	0.76
SMH-653	Easement Behind Mills	12	0.0020	N/A	7.56	0.79	0.61	0.18	0.77
SMH-656	Easement Behind Mills	12	0.0012	N/A	7.41	0.62	0.61	0.01	0.98
SMH-657	Easement Behind Mills	12	0.0040	N/A	8.32	1.12	0.61	0.51	0.54
SMH-658	Easement Behind Mills	12	0.0020	N/A	8.81	0.80	0.61	0.20	0.75
SMH-659	Easement Behind Mills	12	0.0021	N/A	12.15	0.83	0.61	0.22	0.74
SMH-660	Easement Behind Mills	12	0.0018	N/A	12.23	0.75	0.61	0.15	0.80
SMH-662	Easement Behind Mills	12	0.0020	N/A	12.28	0.80	0.61	0.20	0.76
SMH-661	Easement Behind Mills	12	0.0203	N/A	17.11	2.54	0.61	1.93	0.24
SMH-663	Easement Behind Mills	12	0.0146	N/A	6.83	2.15	0.61	1.54	0.28
SMH-664	Easement Behind Mills	10	0.0045	N/A	4.85	0.74	0.61	0.13	0.82
SMH-24	Easement Behind Mills	10	0.0045	N/A	4.74	0.74	0.61	0.13	0.82
SMH-25	Easement Behind Mills	10	0.0045	N/A	4.59	0.74	0.61	0.13	0.82
SMH-26	Easement Behind Mills	10	0.0045	N/A	4.67	0.74	0.61	0.13	0.82
SMH-27	Easement Behind Mills	10	0.0045	N/A	4.72	0.74	0.61	0.13	0.82
SMH-1547	Easement Behind Mills	10	0.0045	N/A	4.01	0.74	0.61	0.13	0.82



**TABLE 6  
EXISTING AVERAGE DAILY FLOW + BALMER SCHOOL PROPOSED PEAK FLOW SCENARIO**

Upstream MH Number	Upstream MH Location	Pipe Diameter (in)	Slope ft/ft	Surcharge Over Crown (ft.)	Upstream Freeboard (ft.)	Pipe Capacity Q <sub>c</sub> (mgd)	Flow Demand Q <sub>p</sub> (mgd)	Delta Q <sub>c</sub> -Q <sub>p</sub>	Capacity Ratio Q <sub>p</sub> /Q <sub>c</sub>
SMH-84	Lake Street at Crescent Street	10	0.0018	N/A	3.53	0.46	0.17	0.30	0.36
SMH-583	Lake Street	10	0.0018	N/A	3.61	0.47	0.17	0.30	0.35
SMH-584	Lake Street	10	0.0018	N/A	3.80	0.47	0.17	0.30	0.35
SMH-585	Lake Street	10	0.0018	N/A	3.56	0.46	0.17	0.30	0.36
SMH-1026	Lake Street at Conservation Drive	10	0.0018	N/A	3.93	0.47	0.17	0.30	0.36
SMH-586	Lake Street	10	0.0018	N/A	4.52	0.46	0.17	0.29	0.37
SMH-587	Lake Street	10	0.0018	N/A	4.65	0.47	0.17	0.30	0.36
SMH-588	Easement off Lake Street	10	0.0020	N/A	4.52	0.49	0.17	0.32	0.35
SMH-589	Easement off Lake Street	10	0.0021	N/A	3.64	0.50	0.17	0.32	0.35
SMH-568	Main Street	10	0.0028	N/A	4.14	0.58	0.20	0.38	0.34
SMH-557	Main Street at Water Street	10	0.0016	N/A	2.95	0.44	0.26	0.18	0.60
SMH-560	Water Street	10	0.0026	N/A	3.99	0.56	0.26	0.29	0.48
SMH-561	Water Street	10	0.0014	N/A	4.74	0.41	0.27	0.15	0.65
SMH-558	Water Street	12	0.0021	N/A	6.38	0.81	0.27	0.54	0.34
SMH-650	Easement off Water Street	12	0.0020	N/A	5.58	0.79	0.27	0.52	0.34
SMH-651	Easement Behind Mills	12	0.0020	N/A	6.59	0.79	0.27	0.52	0.34
SMH-652	Easement Behind Mills	12	0.0020	N/A	7.02	0.80	0.27	0.53	0.34
SMH-653	Easement Behind Mills	12	0.0020	N/A	7.70	0.79	0.27	0.52	0.35
SMH-656	Easement Behind Mills	12	0.0012	N/A	7.50	0.62	0.27	0.35	0.44
SMH-657	Easement Behind Mills	12	0.0040	N/A	8.37	1.12	0.27	0.85	0.24
SMH-658	Easement Behind Mills	12	0.0020	N/A	9.02	0.80	0.27	0.53	0.34
SMH-659	Easement Behind Mills	12	0.0021	N/A	12.21	0.83	0.27	0.55	0.33
SMH-660	Easement Behind Mills	12	0.0018	N/A	12.28	0.75	0.27	0.48	0.36
SMH-662	Easement Behind Mills	12	0.0020	N/A	12.36	0.80	0.27	0.53	0.34
SMH-661	Easement Behind Mills	12	0.0203	N/A	17.25	2.54	0.27	2.27	0.11
SMH-663	Easement Behind Mills	12	0.0146	N/A	7.04	2.15	0.27	1.87	0.13
SMH-664	Easement Behind Mills	10	0.0045	N/A	5.12	0.74	0.27	0.46	0.37
SMH-24	Easement Behind Mills	10	0.0045	N/A	5.01	0.74	0.27	0.46	0.37
SMH-25	Easement Behind Mills	10	0.0045	N/A	4.78	0.74	0.27	0.46	0.37
SMH-26	Easement Behind Mills	10	0.0045	N/A	5.15	0.74	0.27	0.46	0.37
SMH-27	Easement Behind Mills	10	0.0045	N/A	5.60	0.74	0.27	0.46	0.37
SMH-1547	Easement Behind Mills	10	0.0045	N/A	4.26	0.74	0.27	0.46	0.37

**TABLE 7  
EXISTING PEAK FLOW + BALMER SCHOOL PROPOSED PEAK FLOW SCENARIO**

Upstream MH Number	Upstream MH Location	Pipe Diameter (in)	Slope ft/ft	Surcharge Over Crown (ft.)	Upstream Freeboard (ft)	Pipe Capacity Q <sub>c</sub> (mgd)	Flow Demand Q <sub>b</sub> (mgd)	Delta Q <sub>c</sub> -Q <sub>b</sub>	Capacity Ratio Q <sub>b</sub> /Q <sub>c</sub>
SMH-84	Lake Street at Crescent Street	10	0.0018	N/A	3.28	0.46	0.40	0.06	0.87
SMH-583	Lake Street	10	0.0018	N/A	3.29	0.47	0.40	0.07	0.85
SMH-584	Lake Street	10	0.0018	N/A	3.36	0.47	0.40	0.07	0.85
SMH-585	Lake Street	10	0.0018	0.12	3.27	0.46	0.40	0.06	0.86
SMH-1026	Lake Street at Conservation Drive	10	0.0018	0.17	3.47	0.47	0.41	0.06	0.87
SMH-586	Lake Street	10	0.0018	0.25	3.83	0.46	0.41	0.05	0.89
SMH-587	Lake Street	10	0.0018	0.36	3.95	0.47	0.41	0.06	0.87
SMH-588	Easement off Lake Street	10	0.0020	0.45	3.72	0.49	0.41	0.08	0.85
SMH-589	Easement off Lake Street	10	0.0021	0.57	2.73	0.50	0.41	0.08	0.83
SMH-568	Main Street	10	0.0028	0.69	3.18	0.58	0.47	0.11	0.81
SMH-557	Main Street at Water Street	10	0.0016	0.79	2.00	0.44	0.61	-0.16	1.37
SMH-560	Water Street	10	0.0026	0.56	3.11	0.56	0.61	-0.05	1.09
SMH-561	Water Street	10	0.0014	0.48	4.03	0.41	0.61	-0.20	1.48
SMH-558	Water Street	12	0.0021	N/A	6.14	0.81	0.62	0.19	0.77
SMH-650	Easement off Water Street	12	0.0020	N/A	5.25	0.79	0.62	0.17	0.79
SMH-651	Easement Behind Mills	12	0.0020	N/A	6.37	0.79	0.62	0.17	0.79
SMH-652	Easement Behind Mills	12	0.0020	N/A	6.83	0.80	0.62	0.18	0.78
SMH-653	Easement Behind Mills	12	0.0020	N/A	7.55	0.79	0.62	0.16	0.79
SMH-656	Easement Behind Mills	12	0.0012	N/A	7.40	0.62	0.62	0.00	1.01
SMH-657	Easement Behind Mills	12	0.0040	N/A	8.32	1.12	0.62	0.50	0.56
SMH-658	Easement Behind Mills	12	0.0020	N/A	8.79	0.80	0.62	0.18	0.78
SMH-659	Easement Behind Mills	12	0.0021	N/A	12.15	0.83	0.62	0.20	0.76
SMH-660	Easement Behind Mills	12	0.0018	N/A	12.23	0.75	0.62	0.13	0.83
SMH-662	Easement Behind Mills	12	0.0020	N/A	12.27	0.80	0.62	0.18	0.78
SMH-661	Easement Behind Mills	12	0.0203	N/A	17.10	2.54	0.62	1.91	0.25
SMH-663	Easement Behind Mills	12	0.0146	N/A	6.81	2.15	0.62	1.52	0.29
SMH-664	Easement Behind Mills	10	0.0045	N/A	4.83	0.74	0.62	0.11	0.85
SMH-24	Easement Behind Mills	10	0.0045	N/A	4.72	0.74	0.62	0.11	0.85
SMH-25	Easement Behind Mills	10	0.0045	N/A	4.57	0.74	0.62	0.11	0.85
SMH-26	Easement Behind Mills	10	0.0045	N/A	4.64	0.74	0.62	0.11	0.85
SMH-27	Easement Behind Mills	10	0.0045	N/A	4.66	0.74	0.62	0.11	0.85
SMH-1547	Easement Behind Mills	10	0.0045	N/A	3.99	0.74	0.62	0.11	0.85

### **Existing Peak Flow + Balmer School Proposed Peak Flow**

As shown in **Table 7**, four sewer reaches do not have adequate capacity to convey the existing peak flow plus Balmer School proposed peak flow scenario. The additional sewer reach over capacity from the existing peak flow scenario is SMH-656 to SMH-657. This sewer reach is 12-inch diameter and is very flat (slope of 0.0012 ft/ft).

As a result, 10 sewer manholes are predicted to experience surcharging conditions. The two additional sewer manholes predicted to experience surcharging conditions from existing peak flow scenario are SMH-585, and SMH-1026. The largest calculated surcharge height over the crown of the pipe is 0.80 feet at SMH-557, resulting in a freeboard (hydraulic grade line elevation to ground surface) of 1.99 feet. However, no SSOs are predicted.

### **Additional Findings and Suggested Follow-Up Activities**

The desktop analysis identified potential capacity issues within the sewer mains downstream of the proposed Balmer School under the existing peak flow scenario and existing peak flow plus Balmer School proposed peak flow scenario. The desktop model is conservative in nature, as it assumes the starting hydraulic grade line is the crown of the pipe. Even with this conservative approach, under all existing and future flow scenarios, sanitary sewer overflows are not anticipated. If the Town wishes to address the minimal surcharging in the identified sewer mains, CDM Smith recommends the following additional investigations/alternatives:

#### **Manhole Inspections**

The Town should inspect the sewer manholes identified as surcharging under peak flow conditions and visually observe and document the flow level in the manhole during or immediately following a significant rainfall event (i.e., greater than 3-inches). Also, the Town should look for evidence of historical surcharging. Typically, in surcharged manholes, non-flushables, floatables, and trash are found on the manhole shelf or wrapped around manhole rungs. Visual observations of flow within these manholes under high flow conditions will provide additional confirmation of the predicted modeling results.

#### **I/I Remediation**

As part of the Town's ongoing I/I remediation program, certain sewer sub-areas were identified as having excessive infiltration and/or inflow and were recommended for follow-up investigations. Sub-areas 6 and 7 are the only two sub-areas tributary to the analyzed sewer mains. Of these two sub-areas, only sub-area 7 was found to have excessive inflow and neither were identified as having excessive infiltration.

As a result, the Town should consider smoke testing sub-area 7 to identify direct sources of inflow such as roof drains, driveway drains, and yard drains tied to the sewer collection system. Also, the Town could re-prioritize these two sub-areas and complete additional infiltration investigations such as flow isolation and closed-circuit television (CCTV) inspections in both sub-areas and inflow investigations (i.e. smoke testing and dye testing) in sub-area 6. From these investigations, sources

Jim Shuris, Mark Kuras  
May 7, 2019  
Page 13

of I/I can be located and quantified. Rehabilitation techniques to remove I/I include cured-in-place pipe (CIPP) lining, manhole lining, open-cut replacement, testing and sealing of pipe joints and private inflow removal via coordination with homeowners and business owners. The Town may consider requiring owners of proposed developments in this sub-area to either fund or perform a portion of this rehabilitation work to remove I/I and restore system capacity for sanitary flows. Identification and removal of sources of I/I through investigations/rehabilitation is likely a far more cost-effective approach to gaining sewer capacity than upsizing the existing sewer mains.

### **Flow Metering**

The Town would install a temporary flow meter on the existing Balmer School sanitary service line to determine the school's existing sanitary flow, infiltration and inflow. Using this flow data and the projected sanitary flows from the new Balmer School, it can be determined if there will be a sewer flow (sanitary, infiltration and inflow) increase or decrease by demolishing the existing school and installing a new school. If there is a sewer flow decrease, the sewer mains downstream of the school can be re-analyzed to determine if there is still manhole surcharging during peak flow conditions.

cc: Adam Gaudette, Town Manager, Northbridge  
Brendan Ennis, P.E., CDM Smith

**ATTACHMENT A**  
**NITSCH ENGINEERING SANITARY SEWER**  
**PROJECTIONS, DATED FEBRUARY 12, 2019**

February 13, 2019

Mr. Mark Kuras  
Superintendent, Department of Public Works  
644 Providence Road  
Whitinsville, MA 01588



**Project:** W. Edward Balmer Elementary School, 21 Crescent Street, Whitinsville

**Subject:** Sanitary Sewer Protections

Dear Mark,

On January 23, 2019 we discussed the proposed Balmer Elementary School project in a Technical Review meeting. This letter is to follow up on a few points where further clarification was desired on planned sewer protection devices designed as part of the plumbing system.

**Kitchen:** The kitchen will have two grease interceptors: a 35-gallon interior unit within the floor with a recommended weekly cleaning schedule; and a 5,000 gallon exterior unit with a more periodic cleaning schedule (O&M to be determined). According to school staff, the kitchen does not now, and does not plan do a lot of grease-intensive cooking in the new building; mostly what they are doing is re-heating prepared foods. It is our opinion that given these factors, the sanitary sewer will be well protected from undue grease pollution.

**Art Rooms:** Art room deep sinks are protected with a clay trap under each sink with a periodic cleaning schedule (O&M to be determined).

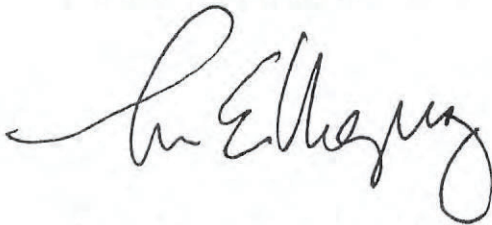
**Science Labs:** As this is an elementary school, there are no science labs, and thus no chemical discharges into the sewer are expected.

Please contact me if you should have any further questions.

Sincerely,

**DORE & WHITTIER ARCHITECTS, INC.**

Architects • Project Managers



Thomas E. Hengelsberg, AIA, NCARB, LEED-AP, MCPPO  
Project Manager

cc. Technical Review committee attendees  
Project Team distribution  
file

ARCHITECTS  
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Nitsch Engineering

120 Front Street, Suite 820  
Worcester, MA 01608-1425  
T: 508-365-1030

www.nitscheng.com

February 12, 2019

Mr. Thomas Hengelsberg, AIA, LEED AP, MCARB, MCPPO  
Project Manager  
Dore & Whittier  
212 Battery Street  
Burlington, VT 05401

RE: Nitsch Proposal #12260.3P  
Balmer Elementary School  
Civil Engineering Services  
Sanitary Flows  
Northbridge, MA

Dear Tom,

Nitsch Engineering has reviewed the existing and proposed occupancy for the Balmer School and has developed sanitary sewer design flows for the existing and proposed conditions as indicated in Table 1 based on Title 5 flow rates (Massachusetts State Environmental Code 310 CMR 15.203).

Table 1: Estimated Design Flows

Existing School	Occupants	Design Flows per Occupant Gallons per Day per Person	Total Flow (Gallons per Day)
Students	505	10	5050
Teachers/Admin/Staff	80	10	800
Volunteers – Visitors Allowance (FTE)	13	10	130
<i>Existing School Totals</i>			<b>5,980</b>
Proposed School	Occupants	Design Flows per Occupant	Total Flow
Students	1214	10	12,140
Teachers/Admin/Staff	133	10	1,330
Volunteers – Visitors Allowance (FTE)	3	10	240
<i>Proposed School Totals</i>			<b>13,710</b>
<b>Change</b>			<b>+7,730</b>

Source: Occupancy from Balmer Elementary School

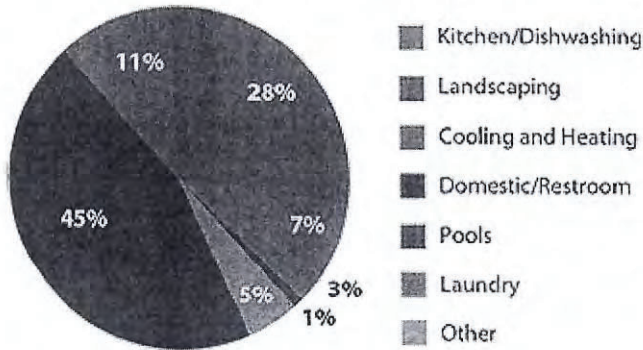
The proposed sanitary sewer service is being designed based on the Title 5 flows rates. See Attachment A for additional design information.

It should be noted that Title 5 flows are based on flows from the 1970s, the same time period that the school was constructed. Title 5 flow rates does not take into account the use of low flow fixtures.

The new Balmer Elementary School will be USGBC LEED certified and low flow fixtures will be used for toilets, faucets, kitchen fixtures and dishwashers, etc. Low flow fixtures are not reflected in Title 5 flow rates.

Toilets from the 1970s had flush volumes of 3.5 to 7.0 gallons per flush. Current low flow fixtures have flush volume of 1.28 gallons per flush (gpf) (EPA WaterSense Label). Reducing flush volume (3.5 to 1.28 gpf) by 63 percent for each flush.

### End Uses of Water in Schools



If toilet flushing is approximately 62 percent of sanitary flows at schools without landscape uses (irrigation), then a school with *just* low flow toilets will result in a 39% reduction of water usage over schools with fixture that are pre-1980s. The amount of water usage approximates the amount of sanitary sewer flows.

The estimated sanitary design flow of 13,710 gallons per day is a more realistically 7,730 gallons per day (or an increase of 2,330 over the existing design flow of 5,980 gallons per day) even with the occupancy more than doubling.

Source: EPA WaterSense

As previously stated, the sanitary infrastructure (pipes sizes, slopes, velocities, peaking factor, etc.) is being design based on the Title 5 flow rates, TR-16 and current engineering standards.

The analysis for the more realistic average daily flow prediction is based on the use of low flow toilets that is not included in the current Title 5 flow rates and provides a more realistic impact from the new school even with the increase in occupancy on the municipal sanitary sewer lines.

If you have any questions, please call.

Very truly yours,

**Nitsch Engineering, Inc.**

Sandra A. Brock, PE, CFM, LEED AP BD+C  
Vice President, Chief Engineer

SAB/mma



Balmer Elementary School  
 21 Crescent Street  
 Northbridge, MA

Balmer Elementary School  
 Project #12260

1/31/2018 (revised 2/11/2019)  
 Prepared by: SAB  
 Checked by:



**MAXIMUM<sup>1</sup> DAILY SANITARY SEWER FLOWS SUMMARY TABLE**

Flow Calculations based on staffing received from School

OCUPANT	Existing Occupants	Design Flows	Totals	Proposed Occupants	DESIGN FLOW <sup>1</sup>	ESTIMATED SEWER FLOWS	CHANGE
Students	505	10 GPD/person <sup>1</sup>	5050	1214	10 GPD/person <sup>1</sup>	12,140	7,090
Teachers and Assistants (full time)	80	10 GPD/person <sup>1</sup>	800	133	10 GPD/person <sup>1</sup>	1,330	530
Volunteers (FTE) - Visitors Allowance	13	10 GPD/person <sup>2</sup>	130	24	5 GPD/person <sup>2</sup>	240	110
<b>TOTAL</b>		<b>EXISTING</b>	<b>5,980</b>		<b>PROPOSED</b>	<b>13,710</b>	<b>7,730</b>

USE 13,710

**NOTES:**

1. Project's sewage generation rates were estimated using the Massachusetts State Environmental Code ((Title 5) 310 CMR 15.203) and TR-16.
2. The School anticipates volunteers and visitors that will be on site from a short visit to the entire school day (this is an allowance for these occupants).
3. Peak Rates based on TR-16 and xxxx to determine peaking factor.

**MAXIMUM<sup>3</sup> DAILY PEAK RATE OF SANITARY SEWER FLOW**

Description	Gallons Per Day (GPD)	Cubic Feet Per Second (cfs)	Peaking Factor	Peak Flow	Pipe size and Slope (most restrictive run)	Capacity
Total Sanitary Sewer Flow	13,710	0.021	5	0.106		

**FLOW IN PIPE VARIABLES FOR SANITARY SEWER FLOW**

Description	Flow - Cubic Feet Per Second (cfs)	Pipe size and Slope (most restrictive run)	Mannings roughness	velocity	Note
Pipe Flowing Full - Main Line	1.55	8" PVC S=0.16	0.013	4.45	
Peak Rate of Flow - Main Line	0.11	8" PVC S=0.16	0.013	2.14	(min velocity 2 ft/s)

	60% CD SUBMISSION 6/7/19		Final 90% CD			Final 90% CD			Delta Fontaine to PM&C
	Fontaine		Fontaine 8/26/19		Delta from 60% CD	PM&C 8/23/19		Delta from 60% CD	
	SF	167,352	167,352			167,352			
<b>Building</b>									
<b>Foundations</b>									
standard	\$ 1,455,051	\$9	\$ 1,736,038	\$10	\$280,987	\$ 1,775,401	\$11	\$320,350	\$ (39,363)
slab on grade	\$ 1,895,707	\$11	\$ 1,914,228	\$11	\$18,521	\$ 1,950,901	\$12	\$55,194	\$ (36,673)
<b>Superstructure</b>									
upper floor	\$ 4,277,072	\$26	\$ 4,105,657	\$25	-\$171,415	\$ 4,464,301	\$27	\$187,229	\$ (358,644)
roof structure	\$ 2,523,765	\$15	\$ 2,931,941	\$18	\$408,176	\$ 2,609,987	\$16	\$86,222	\$ 321,954
<b>Exterior Closure</b>									
exterior walls	\$ 7,716,946	\$46	\$ 7,712,192	\$46	-\$4,754	\$ 7,856,780	\$47	\$139,834	\$ (144,588)
windows	\$ 2,129,522	\$13	\$ 2,138,498	\$13	\$8,976	\$ 2,175,905	\$13	\$46,383	\$ (37,407)
doors	\$ 170,093	\$1	\$ 170,036	\$1	-\$57	\$ 175,667	\$1	\$5,574	\$ (5,631)
<b>Roofing</b>	\$ 2,214,823	\$13	\$ 2,314,361	\$14	\$99,538	\$ 2,268,079	\$14	\$53,256	\$ 46,282
<b>Interior Construction</b>									
partitions	\$ 3,876,103	\$23	\$ 4,034,109	\$24	\$158,006	\$ 3,923,433	\$23	\$47,330	\$ 110,676
doors	\$ 1,285,209	\$8	\$ 1,315,614	\$8	\$30,405	\$ 1,290,937	\$8	\$5,728	\$ 24,677
millwork	\$ 1,904,599	\$11	\$ 1,825,498	\$11	-\$79,101	\$ 1,917,227	\$11	\$12,628	\$ (91,729)
<b>Staircases</b>	\$ 622,676	\$4	\$ 622,676	\$4	\$0	\$ 533,762	\$3	-\$88,914	\$ 88,914
<b>Interior Finishes</b>									
wall finishes	\$ 959,644	\$6	\$ 1,048,335	\$6	\$88,691	\$ 977,530	\$6	\$17,886	\$ 70,805
floor finishes	\$ 1,496,250	\$9	\$ 1,492,412	\$9	-\$3,838	\$ 1,401,396	\$8	-\$94,854	\$ 91,016
ceiling finishes	\$ 1,342,001	\$8	\$ 1,317,620	\$8	-\$24,381	\$ 1,250,273	\$7	-\$91,728	\$ 67,347
<b>Conveying Systems</b>	\$ 159,153	\$1	\$ 183,153	\$1	\$24,000	\$ 176,950	\$1	\$17,797	\$ 6,203
<b>Plumbing</b>	\$ 2,243,688	\$13	\$ 2,219,205	\$13	-\$24,483	\$ 2,196,694	\$13	-\$46,994	\$ 22,511
<b>HVAC</b>	\$ 7,182,509	\$43	\$ 7,520,395	\$45	\$337,886	\$ 7,449,198	\$45	\$266,689	\$ 71,197
<b>Fire Protection</b>	\$ 922,977	\$6	\$ 895,389	\$5	-\$27,588	\$ 879,500	\$5	-\$43,477	\$ 15,889
<b>Electrical</b>	\$ 5,156,457	\$31	\$ 5,609,540	\$34	\$453,083	\$ 5,415,818	\$32	\$259,361	\$ 193,722
<b>Equipment</b>	\$ 753,435	\$5	\$ 747,235	\$4	-\$6,200	\$ 732,414	\$4	-\$21,021	\$ 14,821
<b>Furnishings</b>	\$ 2,263,471	\$14	\$ 2,366,165	\$14	\$102,694	\$ 2,377,844	\$14	\$114,373	\$ (11,679)
<b>Building HazMat</b>	\$ 1,088,926		\$ 1,088,926	\$7	\$0	\$ 1,088,926		\$0	\$ -
<b>Building Demolition</b>	\$ 539,033		\$ 549,813		\$10,780	\$ 539,033		\$0	\$ 10,780
<b>Building Trade Cost</b>	<b>\$ 54,179,110</b>	<b>\$324</b>	<b>\$ 55,859,036</b>	<b>\$334</b>	<b>\$1,679,926</b>	<b>\$ 55,427,956</b>	<b>\$331</b>	<b>\$1,248,846</b>	
<b>Sitework</b>									
Site Preparation	\$ 2,061,834		\$ 2,228,724		\$166,890	\$ 2,322,608		\$260,774	\$ (93,884)
Site Improvements	\$ 5,298,035		\$ 5,890,228		\$592,193	\$ 5,687,386		\$389,351	\$ 202,842
Mechanical Utilities	\$ 3,188,449		\$ 3,188,449		\$0	\$ 3,502,607		\$314,158	\$ (314,158)
Electrical Utilities	\$ 709,616		\$ 900,161		\$190,545	\$ 602,700		-\$106,916	\$ 297,461
<b>Site Trade Cost</b>	<b>\$ 11,257,934</b>		<b>\$ 12,207,562</b>		<b>\$949,628</b>	<b>\$ 12,115,301</b>		<b>\$857,367</b>	
<b>Total Trade Cost</b>	<b>\$ 65,437,044</b>		<b>\$ 68,066,598</b>			<b>\$ 67,543,257</b>			
<b>General Conditions</b>	\$ 5,364,384		\$ 5,364,384		\$0	\$ 5,364,384		\$0	\$ -
<b>General Requirements</b>	\$ 2,065,736		\$ 2,101,736		\$36,000	\$ 2,065,736		\$0	\$ 36,000
<b>Bonds</b>	\$ - w GCs		\$ - w GCs		\$0	\$ - w GCs		\$0	\$0
<b>Insurance</b>	\$ - w GCs		\$ - w GCs		\$0	\$ - w GCs		\$0	\$0
<b>Permit</b>	\$ -		\$ -		\$0	\$ -		\$0	\$0
<b>Fee</b>	\$ 1,625,000		\$ 1,625,000		\$0	\$ 1,625,000		\$0	\$0
<b>Design Contingency</b>	\$ 1,856,326		\$ 702,622		-\$1,153,704	\$ 700,754		-\$1,155,572	\$ 1,868
<b>GMP Contingency</b>	\$ 1,186,764		\$ 1,191,021		\$4,257	\$ 1,415,523		\$228,759	\$ (224,502)
<b>Escalation</b>	\$ 1,582,352		\$ 350,065		-\$1,232,287	\$ 466,380		-\$1,115,972	\$ (116,315)
<b>Total Construction Cost</b>	<b>\$ 79,117,606</b>	<b>\$473</b>	<b>\$ 79,401,426</b>	<b>\$474</b>	<b>\$283,820</b>	<b>\$ 79,181,034</b>	<b>\$473</b>	<b>\$63,428</b>	
<b>Accepted Post 60% CD VE</b>	<b>\$ (47,673)</b>								
<b>Adjusted 60% CD Total</b>	<b>\$ 79,069,933</b>	<b>\$472</b>	<b>\$ 79,401,426</b>	<b>\$474</b>		<b>\$ 79,181,034</b>	<b>\$473</b>		
<b>Construction Budget</b>	<b>\$ 79,492,663</b>		<b>\$ 79,492,663</b>			<b>\$ 79,492,663</b>			
<b>(Under Budget) /Over Budget</b>	<b>\$ (422,730)</b>		<b>\$ (91,237)</b>			<b>\$ (311,629)</b>			





Northbridge Elementary School  
90 % Construction Development Estimate  
Reconciled Uniformat

August 26, 2019

**UNI**



**Estimate Totals**

Description	Amount	Totals	Rate	Cost per Unit	
<b>Direct Cost</b>	<b>70,262,218</b>	<b>70,262,218</b>		<b>419.847 /sf</b>	<b>88.49%</b>
Design Contingency	702,622		1.000 %		
ERP1 Site Design Contingency	(93,884)				
Escalation	397,007		0.500 %		
ERP1 Site Escalation Contingency	(46,942)				
<b>Subtotal</b>	<b>958,803</b>	<b>71,221,021</b>			
Construction Contingency	1,191,021		1.500 %		
	<b>1,191,021</b>	<b>72,412,042</b>			
<b>General Conditions &amp; Requirements</b>					
Staff/ General Conditions	5,364,384				
<b>Subtotal</b>	<b>5,364,384</b>	<b>77,776,426</b>			
<b>Permits &amp; Insurance Requirements</b>					
General Liability Insurance					
Performance & Payment Bonds					
Builders Risk Insurance					
Permits - By Town					
<b>Subtotal</b>		<b>77,776,426</b>			
CM Fee (OH&P)	1,625,000				
<b>Subtotal</b>	<b>1,625,000</b>	<b>79,401,426</b>		<b>474.458 /sf</b>	<b>100.00%</b>
PROJECT GSF 167,352					
PFA 79,492,633 / 011000					
DD BUDGET 79,480,442					
60CD Budget 79,364,082					
6/10 - 60CD RECON 79,117,604					
8.20.19 90CD 79,361,422					
8.23.19 90CD Recon 79,401,426					
<b>Total</b>		<b>79,401,426</b>		<b>474.458 /sf</b>	

NEW BUILDING	167,352.00 sf	336.55 /sf	56,322,034
DEMOLISH EXISTING SCHOOL	167,352.00 sf	3.29 /sf	549,813
REMOVE HAZARDOUS MATERIALS	167,352.00 sf	6.51 /sf	1,088,926
SITWORK	167,352.00 sf	73.51 /sf	12,301,446
<b>SUB TOTAL</b>	<b>167,352.00</b>	<b>419.85 /sf</b>	<b>70,262,219</b>

Description	Quantity	Unit Cost	Total	
			Unit Cost	Amount
<b>SUBSTRUCTURE</b>				
<b>FOUNDATIONS</b>				
Standard Foundations	167,352.00 sf	10.374/sf		1,736,038
Slab on Grade	167,352.00 sf	11.438/sf		1,914,228
<b>A10 FOUNDATIONS</b>		<b>21.812/sf</b>		<b>3,650,266</b>
167,352.00 sf				
<b>A SUBSTRUCTURE</b>			<b>21.812/sf</b>	<b>3,650,266</b>
167,352.00 sf				
<b>SHELL</b>				
<b>SUPERSTRUCTURE</b>				
Floor Construction	167,352.00 sf	24.533/sf		4,105,657
Roof Construction	167,352.00 sf	17.52 /sf		2,931,941
<b>B10 SUPERSTRUCTURE</b>		<b>42.053/sf</b>		<b>7,037,598</b>
167,352.00 sf				
<b>EXTERIOR VERTICAL ENCLOSURES</b>				
Exterior Walls	167,352.00 sf	46.084/sf		7,712,192
Exterior Windows	167,352.00 sf	12.778/sf		2,138,498
Exterior Doors	167,352.00 sf	1.016/sf		170,036
<b>B20 EXTERIOR VERTICAL ENCLOSURES</b>		<b>59.878/sf</b>		<b>10,020,726</b>
167,352.00 sf				
<b>EXTERIOR HORIZONTAL ENCLOSURES</b>				
Roof Coverings	167,352.00 sf	13.056/sf		2,184,876
Roof Openings	167,352.00 sf	0.774/sf		129,485
<b>B30 EXTERIOR HORIZONTAL ENCLOSURES</b>		<b>13.829/sf</b>		<b>2,314,361</b>
167,352.00 sf				
<b>B SHELL</b>			<b>115.76 /sf</b>	<b>19,372,685</b>
167,352.00 sf				
<b>INTERIORS</b>				
<b>INTERIOR CONSTRUCTION</b>				
Interior Partitions	167,352.00 sf	24.106/sf		4,034,109
Interior Doors	167,352.00 sf	7.861/sf		1,315,614
Fittings	167,352.00 sf	10.908/sf		1,825,498

Description	Quantity	Unit Cost	Total	
			Unit Cost	Amount
<b>C10 INTERIOR CONSTRUCTION</b>				
			<b>42.875/sf</b>	<b>7,175,221</b>
167,352.00 sf				
<b>STAIRS</b>				
Stair Construction	167,352.00 sf	3.06 /sf		512,170
Stair Finishes	167,352.00 sf	0.66 /sf		110,506
<b>C20 STAIRS</b>				
			<b>3.721/sf</b>	<b>622,676</b>
167,352.00 sf				
<b>INTERIOR FINISHES</b>				
Wall Finishes	167,352.00 sf	6.264/sf		1,048,335
Floor Finishes	167,352.00 sf	8.918/sf		1,492,412
Ceiling Finishes	167,352.00 sf	7.873/sf		1,317,620
<b>C30 INTERIOR FINISHES</b>				
			<b>23.055/sf</b>	<b>3,858,367</b>
167,352.00 sf				
<b>C INTERIORS</b>			<b>69.651/sf</b>	<b>11,656,264</b>
167,352.00 sf				
<b>SERVICES</b>				
<b>CONVEYING</b>				
Vertical Conveying Systems	167,352.00 sf	1.094/sf		183,153
<b>D10 CONVEYING</b>				
			<b>1.094/sf</b>	<b>183,153</b>
167,352.00 sf				
<b>PLUMBING</b>				
Plumbing Fixtures	167,352.00 sf	3.242/sf		542,634
Domestic Water Distribution	167,352.00 sf	2.337/sf		391,135
Sanitary Waste	167,352.00 sf	1.946/sf		325,646
Rain Water Drainage	167,352.00 sf	3.095/sf		517,898
Other Plumbing Systems	167,352.00 sf	2.64 /sf		441,892
<b>D20 PLUMBING</b>				
			<b>13.261/sf</b>	<b>2,219,205</b>
167,352.00 sf				
<b>HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)</b>				
Heat Generating Systems	167,352.00 sf	0.654/sf		109,500
Cooling Generating Systems	167,352.00 sf	0.437/sf		73,200
Distribution Systems	167,352.00 sf	7.878/sf		1,318,350
Other HVAC Systems And Equipment	167,352.00 sf	35.968/sf		6,019,345
<b>D30 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)</b>				
			<b>44.938/sf</b>	<b>7,520,395</b>
167,352.00 sf				

Description	Quantity	Unit Cost	Total	
			Unit Cost	Amount
<b>FIRE PROTECTION</b>				
Sprinklers	167,352.00 sf	0.591/sf		98,850
Other Fire Protection Systems	167,352.00 sf	4.76 /sf		796,539
<b>D40 FIRE PROTECTION</b>		<b>5.35 /sf</b>		<b>895,389</b>
<b>167,352.00 sf</b>				
<b>ELECTRICAL</b>				
Electrical Service And Distribution	167,352.00 sf	7.048/sf		1,179,530
Lighting & Branch Wiring	167,352.00 sf	12.064/sf		2,018,930
PA Systems	167,352.00 sf	1.05 /sf		175,720
Fire Alarm Systems	167,352.00 sf	1.75 /sf		292,866
Electronic Safety & Alarm	167,352.00 sf	1.243/sf		208,038
Data Communications	167,352.00 sf	8.754/sf		1,465,000
Other Electrical System	167,352.00 sf	1.61 /sf		269,456
<b>D50 ELECTRICAL</b>		<b>33.519/sf</b>		<b>5,609,540</b>
<b>167,352.00 sf</b>				
<b>D SERVICES</b>		<b>98.162/sf</b>		<b>16,427,681</b>
<b>167,352.00 sf</b>				
<b>EQUIPMENT AND FURNISHINGS</b>				
<b>EQUIPMENT</b>				
Commercial Equipment	167,352.00 sf	3.211/sf		537,435
Institutional Equipment	167,352.00 sf	1.254/sf		209,800
<b>E10 EQUIPMENT</b>		<b>4.465/sf</b>		<b>747,235</b>
<b>167,352.00 sf</b>				
<b>FURNISHINGS</b>				
Fixed Furnishings	167,352.00 sf	13.796/sf		2,308,835
Movable Furnishings	167,352.00 sf	0.343/sf		57,330
<b>E20 FURNISHINGS</b>		<b>14.139/sf</b>		<b>2,366,165</b>
<b>167,352.00 sf</b>				
<b>E EQUIPMENT AND FURNISHINGS</b>		<b>18.604/sf</b>		<b>3,113,400</b>
<b>167,352.00 sf</b>				
<b>SPECIAL CONSTRUCTION AND DEMOLITION</b>				
<b>SELECTIVE BUILDING DEMOLITION</b>				
Building Elements Demolition	167,352.00 sf	3.285/sf		549,813
Hazardous Components Abatement	167,352.00 sf	6.507/sf		1,088,926

Description	Quantity	Total	
		Unit Cost	Amount
<b>F20 SELECTIVE BUILDING DEMOLITION</b>		<b>9.792/sf</b>	<b>1,638,739</b>
167,352.00 sf			
<b>F SPECIAL CONSTRUCTION AND DEMOLITION</b>		<b>9.792/sf</b>	<b>1,638,739</b>
167,352.00 sf			
<b>SITWORK</b>			
<b>SITE PREPARATION</b>			
Site Clearing	167,352.00 sf	7.34 /sf	1,228,394
Site Earthwork	167,352.00 sf	6.538/sf	1,094,214
<b>G10 SITE PREPARATION</b>		<b>13.879/sf</b>	<b>2,322,608</b>
167,352.00 sf			
<b>SITE IMPROVEMENTS</b>			
Pedestrian Paving	167,352.00 sf	3.248/sf	543,602
Site Development	167,352.00 sf	24.072/sf	4,028,488
Landscaping	167,352.00 sf	7.876/sf	1,318,138
<b>G20 SITE IMPROVEMENTS</b>		<b>35.197/sf</b>	<b>5,890,228</b>
167,352.00 sf			
<b>SITE MECHANICAL UTILITIES</b>			
Water Supply	167,352.00 sf	2.365/sf	395,750
Sanitary Sewer	167,352.00 sf	1.293/sf	216,305
Storm Sewer	167,352.00 sf	15.395/sf	2,576,394
<b>G30 SITE MECHANICAL UTILITIES</b>		<b>19.052/sf</b>	<b>3,188,449</b>
167,352.00 sf			
<b>SITE ELECTRICAL UTILITIES</b>			
Site Electrical Utilities	167,352.00 sf	5.379/sf	900,161
<b>G40 SITE ELECTRICAL UTILITIES</b>		<b>5.379/sf</b>	<b>900,161</b>
167,352.00 sf			
<b>G SITWORK</b>		<b>73.506/sf</b>	<b>12,301,446</b>
167,352.00 sf			
<b>GENERAL</b>			
<b>GENERAL REQUIREMENTS</b>			
Temporary Facilities and Controls	167,352.00 sf	12.559/sf	2,101,736



# Northbridge Elementary School

8/26/2019 7:20 AM

**FONTAINE BROS., INC.**

Whitinsville, MA

CONSTRUCTION MANAGERS  
GENERAL CONTRACTORS

## 90% CD Budget Estimate Uniformat

90CD Reconciled

Description	Quantity	Total	
		Unit Cost	Amount
Z10 GENERAL REQUIREMENTS		12.559/sf	2,101,736
167,352.00 sf			
Z GENERAL		12.559/sf	2,101,736
167,352.00 sf			



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
<b>A</b>	<b>SUBSTRUCTURE</b>			
<b>A10</b>	<b>FOUNDATIONS</b>			
A1010	Standard Foundations			
03-0000.000	CONCRETE			
03-1113.102	Forms, Place Footings			
10	Form And Place Strip Footings	3,335.00 sf	17.75 /sf	59,196
10	Form And Place Strip Footings At Loading Dock	95.00 sf	17.75 /sf	1,686
20	Form And Place BF Grade Beams	1,888.00 sf	17.75 /sf	33,512
22	Form And Place Interior Spread - F FTG'S	10,028.00 sf	17.75 /sf	177,997
	Forms, Place Footings		1.628/sf	272,392
	167,352.00 sf			
03-1113.110	Forms, Place Columns/Piers			
2	Form And Place Concrete Piers Square	278.00 sf	17.75 /sf	4,935
2	Form And Place Concrete Piers Square - Pipe	1,680.00 sf	17.75 /sf	29,820
2	Form And Place Concrete Piers Round NA	428.00 sf	17.75 /sf	7,597
2	Form And Place F FTGS CANOPY	1,220.00 sf	17.75 /sf	21,655
2	Form And Place Concrete Piers Square CANOPY	1,020.00 sf	17.75 /sf	18,105
	Forms, Place Columns/Piers		0.491/sf	82,112
	167,352.00 sf			
03-1113.180	Forms, Place Walls			
a 4	Form And Place Foundation Frost Walls/Low Walls	16,650.00 sf	17.75 /sf	295,538
a 4	Form And Place Foundation At Loading Dock	741.00 sf	17.75 /sf	13,153
	Forms, Place Walls		1.845/sf	308,690
	167,352.00 sf			
03-2100.110	Rebar			
202	Rebar At Building Wall Footings	12.79 ton	2,200.00 /ton	28,138
202	Rebar At Building F Grade Beams	6.00 ton	2,200.00 /ton	13,200
202	Rebar At Interior Spread - F FTG'S	59.00 ton	2,050.847 /ton	121,000
202	Rebar At Concrete Piers Square	0.45 ton	2,200.00 /ton	990
202	Rebar At Interior Spread - F FTG'S CANOPY	6.00 ton	2,200.00 /ton	13,200
202	Rebar At Concrete Piers Square CANOPY	3.00 ton	2,200.00 /ton	6,600
210	Rebar At Concrete Piers Square - Pipe	3.60 ton	2,200.00 /ton	7,920
210	Rebar At Concrete Piers Round	0.90 ton	2,200.00 /ton	1,980
210	Rebar At Foundation Frost Walls/Low Walls	43.35 ton	2,200.00 /ton	95,370
210	Rebar At Loading Dock Foundation	1.75 ton	2,200.00 /ton	3,850
	Rebar		1.746/sf	292,248
	167,352.00 sf			
03-3000.100	Concrete			
40	4500 PSI Concrete At Building Wall Footings	173.25 cy	120.00 /cy	20,790
40	4500 PSI Concrete At Building F Grade Beams	78.75 cy	120.00 /cy	9,450
40	4500 PSI Concrete At Interior Spread - F FTG'S	690.00 cy	120.00 /cy	82,800
40	4500 PSI Concrete At Concrete Piers Square	7.00 cy	120.00 /cy	840
40	4500 PSI Concrete At Concrete Piers Square Pipe D	41.00 cy	120.00 /cy	4,920
40	4500 PSI Concrete At Concrete Piers Round D	11.00 cy	120.00 /cy	1,320

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
03-3000.100	Concrete			
40	4500 PSI Concrete At Foundation Frost Walls/Low Walls D	510.00 cy	120.00 /cy	61,200
40	4500 PSI Concrete At Loading Dock Foundation D	20.00 cy	120.00 /cy	2,400
40	Miscellaneous Shelves And Box Outs	16,178.00 sf	0.70 /sf	11,325
40	Engineering and layout	10.00 cd	2,250.00 /cd	22,500
40	Footing Pier Adjust New Draw	15.00 cy	980.00 /cy	14,700
40	Logistics, safety, cleanup and protection	167,352.00 sf	0.785 /sf	131,371
40	4500 PSI Concrete At Spread - F FTG'S CANOPY	64.00 cy	120.00 /cy	7,680
40	4500 PSI Concrete At Concrete Piers CANOPY Concrete	24.00 cy	120.00 /cy	2,880
			2.236/sf	374,176
	167,352.00 sf			
	80.00 Labor hours			
	CONCRETE		7.945/sf	1,329,617
	167,352.00 sf			
07-0000.000	THERMAL & MOIST PROTECT			
07-1200.100	Waterproofing			
2	Damproofing & Waterpoofoing ERP2 Waterproofing	1.00 ls	33,069.00 /ls	33,069
			0.198/sf	33,069
	167,352.00 sf			
	THERMAL & MOIST PROTECT		0.198/sf	33,069
	167,352.00 sf			
31-0000.000	EARTHWORK			
31-2316.215	Footing Excavation			
105	Earthwork Foundations - Bid*****	1.00 Bid	325,052.00 /Bid	325,052
105	Earthwork Foundations - Bid***** S Drawing	1.00 Bid	39,000.00 /Bid	39,000
	Footing Elevations			
105	Earthwork at Additional Footings CANOPY Footing Excavation	124.00 cy	75.00 /cy	9,300
			2.231/sf	373,352
	167,352.00 sf			
	EARTHWORK		2.231/sf	373,352
	167,352.00 sf			
	A1010 Standard Foundations		10.374/sf	1,736,038
	167,352.00 sf			
A1030	Slab on Grade			
03-0000.000	CONCRETE			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
03-0010.165	Concrete - Equipment Pads			
125	Interior Equipment Pads by Area SF - Allowance	400.00 sf	28.00 /sf	11,200
	Concrete - Equipment Pads		0.067/sf	11,200
	167,352.00 sf			
03-1113.102	Forms, Place Footings			
20	Form And Place Elevator Spread Footing/Slab	60.00 sf	22.00 /sf	1,320
	Forms, Place Footings		0.008/sf	1,320
	167,352.00 sf			
03-1113.180	Forms, Place Walls			
a 4	Form And Place Elevator Walls	280.00 sf	25.00 /sf	7,000
a 4	Form And Place Platform Stairs	50.00 lf	175.00 /lf	8,750
a 4	Form And Place Loading Dock Stairs	35.00 lf	175.00 /lf	6,125
	Forms, Place Walls		0.131/sf	21,875
	167,352.00 sf			
03-1113.630	Vapor Barrier			
12	Vapor Barrier Wlth Lap (Not At Blind Side Waterproofing)	83,677.23 sf	1.00 /sf	83,677
12	Blind Side Waterproofing B Building Removed *****	17,771.00 sf		
	Vapor Barrier		0.50 /sf	83,677
	167,352.00 sf			
03-1113.635	Rigid Insulation			
120	Rigid Insulation under Slab 2.0"	71,519.00 sf	2.50 /sf	178,798
	Rigid Insulation		1.068/sf	178,798
	167,352.00 sf			
03-1513.110	Waterstop			
6	Waterstop At Elevator	40.00 lf	12.00 /lf	480
	Waterstop		0.003/sf	480
	167,352.00 sf			
03-2100.110	Rebar			
208	SOG Rebar	71,519.00 sf	0.30 /sf	21,456
210	Rebar Elevator Spread Footing	0.64 ton	2,200.00 /ton	1,408
210	Rebar Elevator Walls	0.40 ton	2,200.00 /ton	880
210	Rebar Loading Dock	1.13 ton	2,200.00 /ton	2,486
	Rebar		0.157/sf	26,230
	167,352.00 sf			
03-2200.110	Wire Mesh			
110	WWF Reinforcement with Lap SOG	83,677.23 sf	0.90 /sf	75,310
110	WWF Reinforcement with Lap SOG Platform	982.00 sf	0.90 /sf	884
110	WWF Reinforcement with Lap SOG Loading Dock	182.00 sf	0.90 /sf	164

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	Wire Mesh		0.456/sf	76,357
	167,352.00 sf			
03-3000.100	Concrete			
40	4500 PSI Concrete SOG And Haunch/Columns Infill D	1,390.20 cy	120.00 /cy	166,824
40	4500 PSI Concrete Platform SOG And Stairs/Ramp D	22.00 cy	120.00 /cy	2,640
40	4500 PSI Concrete Elevator D	16.00 cy	120.00 /cy	1,920
40	Concure Vapor Reducing Additive SOG D	1,670.55 cy	50.00 /cy	83,528
45	4500 PSI Concrete Loading Dock Foundation SOG And Stairs*****	22.00 cy	120.00 /cy	2,640
	Concrete		1.539/sf	257,552
	167,352.00 sf			
03-3500.110	Finish Flatwork			
10	Place And Finish SOG	71,519.00 sf	3.00 /sf	214,557
10	Place And Finish SOG At Platform	840.00 sf	9.00 /sf	7,560
10	Place And Finish SOG At Loading Dock	346.00 sf	9.50 /sf	3,287
	Finish Flatwork		1.347/sf	225,404
	167,352.00 sf			
	CONCRETE		5.276/sf	882,892
	167,352.00 sf			
07-0000.000	THERMAL & MOIST PROTECT			
07-1200.100	Waterproofing			
2	Damproofing & Waterpoofting ERP2	1.00 ls	20,331.00 /ls	20,331
	Waterproofing		0.121/sf	20,331
	167,352.00 sf			
	THERMAL & MOIST PROTECT		0.121/sf	20,331
	167,352.00 sf			
31-0000.000	EARTHWORK			
31-2213.110	Site Grading			
120	Earthwork Slab On Grade - Bid*****	1.00 Bid	709,505.00 /Bid	709,505
	Site Grading		4.24 /sf	709,505
	167,352.00 sf			
	EARTHWORK		4.24 /sf	709,505
	167,352.00 sf			
33-0000.000	UTILITIES			
33-0550.010	Pipe Trenching			
2	Sitework Underslab Utilities - Bid*****	1.00 Bid	226,500.00 /Bid	226,500

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
33-0550.010	Pipe Trenching				
2	Sitework Underslab Utilities - Updated Design	1.00 Bid	75,000.00 /Bid	75,000	
	Pipe Trenching		1.802/sf	301,500	
	167,352.00 sf				
	UTILITIES		1.802/sf	301,500	
	167,352.00 sf				
	A1030 Slab on Grade		11.438/sf	1,914,228	
	167,352.00 sf				
	<b>A10 FOUNDATIONS</b>		<b>21.812/sf</b>	<b>3,650,266</b>	
	167,352.00 sf				
	80.00 Labor hours				
	<b>A SUBSTRUCTURE</b>		<b>21.812/sf</b>	<b>3,650,266</b>	
	167,352.00 sf				
<b>B</b>	<b>SHELL</b>				
<b>B10</b>	<b>SUPERSTRUCTURE</b>				
B1010	Floor Construction				
03-0000.000	CONCRETE				
03-0010.165	Concrete - Equipment Pads				
125	Concrete - Equipment Pads	400.00 sf	28.00 /sf	11,200	
	Concrete - Equipment Pads		0.067/sf	11,200	
	167,352.00 sf				
03-0022.140	Concrete - Place & Finish SOD				
100	Place & Finish - SOMD 4.5" NW 2" 20 Ga W/6X6	91,230.00 sf	2.50 /sf	228,075	
	- W2.1 W 2.1 WWF				
	Concrete - Place & Finish SOD		1.363/sf	228,075	
	167,352.00 sf				
03-2100.110	Rebar				
210	Rebar At SOD	91,230.00 sf	0.596 /sf	54,403	
	Rebar		0.325/sf	54,403	
	167,352.00 sf				
03-2200.110	Wire Mesh				
110	WWF Reinforcement with Lap W/6X6 - W2.1 W 2.1	106,739.10 sf	1.00 /sf	106,739	

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	Wire Mesh		0.638/sf	106,739
	167,352.00 sf			
03-3000.100	Concrete			
40	4000 PSI Concrete SOMD NW D	1,420.00 cy	115.00 /cy	163,300
40	Concure Vapor Reducing Additive SOG D	1,420.00 cy	50.00 /cy	71,000
	Concrete		1.40 /sf	234,300
	167,352.00 sf			
	CONCRETE		3.793/sf	634,717
	167,352.00 sf			
05-0000.000	METALS			
05-1200.110	Structural Steel			
a 01	Structural Steel, Bracing, Angles, Studs, Connections And Joist	829.00 ton	3,750.00 /ton	3,108,750
	Structural Steel		18.576/sf	3,108,750
	167,352.00 sf			
05-3100.114	Steel Floor Decking			
618	Metal Floor Deck - 2" 20 Ga	91,230.00 sf	3.00 /sf	273,690
	Steel Floor Decking		1.635/sf	273,690
	167,352.00 sf			
05-5100.001	Metal			
001	Fero Clips	76.00 ea	750.00 /ea	57,000
	Metal		0.341/sf	57,000
	167,352.00 sf			
	METALS		20.552/sf	3,439,440
	167,352.00 sf			
07-7000.000	ROOF & WALL ACCESSORIES			
07-8100.100	Fireproofing			
2	Fireproofing - Cementitious D * Note Structural Coord	9,000.00 sf	3.50 /sf	31,500
	Fireproofing		0.188/sf	31,500
	167,352.00 sf			
	ROOF & WALL ACCESSORIES		0.188/sf	31,500
	167,352.00 sf			
	B1010 Floor Construction		24.533/sf	4,105,657
	167,352.00 sf			



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>B1010 Floor Construction</i>		24.533/sf	4,105,657
	167,352.00 sf			
<i>B1020</i>	<i>Roof Construction</i>			
03-0000.000	CONCRETE			
03-0022.140	Concrete - Place & Finish SOD			
100	Place & Finish - SOMD 7" LW W/6X6 - W2.1 W 2.1 WWF	4,520.00 sf	5.75 /sf	25,990
	Concrete - Place & Finish SOD		0.155/sf	25,990
	167,352.00 sf			
03-2100.110	Rebar			
212	Rebar At SOMD - Roof	4,520.00 sf	0.855 /sf	3,864
	Rebar		0.023/sf	3,864
	167,352.00 sf			
03-2200.110	Wire Mesh			
110	WWF Reinforcement with Lap Roof W/6X6 - W2.1 W 2.1	5,288.40 sf	1.00 /sf	5,288
	Wire Mesh		0.032/sf	5,288
	167,352.00 sf			
03-3000.100	Concrete			
140	4500 PSI LW Concrete SOMD Sound Atten D	135.00 cy	165.00 /cy	22,275
	Concrete		0.133/sf	22,275
	167,352.00 sf			
	CONCRETE		0.343/sf	57,417
	167,352.00 sf			
05-0000.000	METALS			
05-1200.110	Structural Steel			
a 01	Structural Steel, Bracing, Angles, Studs, Connections And Joist	437.00 ton	3,750.00 /ton	1,638,750
a 01	Structural Steel Misc Supports	55.00 ton	4,500.00 /ton	247,500
a 01	Structural Steel MEP Equipment Screen Galvanized D	85.00 ton	4,500.00 /ton	382,500
a 01	Structural Steel - Deduct For Canopy	-22.00 ton	3,750.00 /ton	(82,500)
a 01	Structural Steel - Galvanized steel tubes with base plates and anchor rods	4.50 ton	5,800.00 /ton	26,100
a 01	Structural Steel - Galvanized beams - gusset plates	5.50 ton	7,800.00 /ton	42,900
	Structural Steel		13.476/sf	2,255,250
	167,352.00 sf			
05-3100.110	Steel Roof Decking			
120	Metal Roof Deck 3" 20 ga.	72,970.00 sf	3.25 /sf	237,153

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
05-3100.110	<i>Steel Roof Decking</i>			
120	Metal Roof Deck 3" 20 ga. - Deduct For Canopy	-2,835.00 sf	3.25 /sf	(9,214)
320	Metal Deck 3" 20 ga. - Cellular Acoustical	6,776.00 sf	11.50 /sf	77,924
	<i>Steel Roof Decking</i>		1.828/sf	305,863
	167,352.00 sf			
05-5100.001	<i>Metal</i>			
002	Fero Clips	38.00 ea	750.00 /ea	28,500
	<i>Metal</i>		0.17 /sf	28,500
	167,352.00 sf			
	<b>METALS</b>		15.474/sf	2,589,613
	167,352.00 sf			
06-0000.000	<i>ROUGH CARPENTRY</i>			
06-1523.001	<i>Laminated Wood Decking</i>			
001	CLT Decking material	2,815.00 sf	13.00 /sf	36,595
001	CLT Decking misc hardware	2,815.00 sf	2.75 /sf	7,741
002	CLT Decking installation labor and equipment	2,815.00 sf	12.00 /sf	33,780
	<i>Laminated Wood Decking</i>		0.467/sf	78,116
	167,352.00 sf			
06-1813.001	<i>Glue-Laminated Beams</i>			
001	Glulam Main Beams - 54	780.00 cf	46.00 /cf	35,880
002	Glulam Infill Beams - 32	160.00 cf	44.00 /cf	7,040
003	Glulam Beams - Installation Labor And Equipment	88.00 ea	775.00 /ea	68,200
	<i>Glue-Laminated Beams</i>		0.664/sf	111,120
	167,352.00 sf			
06-1816.001	<i>Glue-Laminated Columns</i>			
001	Glulam Columns Material	43.00 ea	350.00 /ea	15,050
002	Glulam Columns - Custom Connection And Hardware Material	43.00 ea	1,100.00 /ea	47,300
002	Glulam Columns - Installation And Equipment	43.00 ea	775.00 /ea	33,325
	<i>Glue-Laminated Columns</i>		0.572/sf	95,675
	167,352.00 sf			
	<i>ROUGH CARPENTRY</i>		1.702/sf	284,911
	167,352.00 sf			
	<i>B1020 Roof Construction</i>		17.52 /sf	2,931,941
	167,352.00 sf			
	<b>B10 SUPERSTRUCTURE</b>		42.053/sf	7,037,598
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
<b>B10 SUPERSTRUCTURE</b>			<b>42.053/sf</b>	<b>7,037,598</b>
	167,352.00 sf			
<b>B20 EXTERIOR VERTICAL ENCLOSURES</b>				
B2010	Exterior Walls			
04-0000.000	MASONRY			
04-0000.110	Block 12" CMU Back - Up			
212	Backup Wall 8"CMU Stairs	5,450.00 sf	26.00 /sf	141,700
212	Backup Wall 12" At 26' Type X4 / 9 And L.4 Lines	3,711.00 sf	34.00 /sf	126,174
212	Backup Wall 12" At 12' Type X4 Roof Level / 12, J.5 And L.4 Lines	1,579.00 sf	34.00 /sf	53,686
212	Backup Wall 12" At 6' Type X4 Roof Level / J.5 Between 9.6 And 11.2 Lines	312.00 sf	34.00 /sf	10,608
212	Build-up 4" CMU At Roof To Support Brick A3.50	1,474.00 sf	24.00 /sf	35,376
	Block 12" CMU Back - Up		2.196/sf	367,544
	167,352.00 sf			
04-2113.140	Brick			
10	Brick Veneer - Wall Type X1.11,1.11a And X4.11 DAB	37,784.00 sf	34.50 /sf	1,303,548
	Brick		7.789/sf	1,303,548
	167,352.00 sf			
04-7200.120	Architectural Cast Stone			
020	Cast Unit Veneer Masonry	4,544.00 sf	60.00 /sf	272,640
020	Ground Face Veneer Masonry AT East Wall Gymnasium	420.00 sf	42.00 /sf	17,640
050	D Arch Precast Concrete Cap 5" w +- x 4" h +- At Brick Veneer A6.60	1,075.00 lf	60.00 /lf	64,500
050	D Arch Precast Concrete Stone Cap 10" w +- x 4" h +- At Brick Veneer A6.60	2,081.00 lf	64.00 /lf	133,184
	Architectural Cast Stone		2.916/sf	487,964
	167,352.00 sf			
04-9590.110	Staging			
5	Masonry Staging	46,873.00 sf	3.50 /sf	164,056
	Staging		0.98 /sf	164,056
	167,352.00 sf			
	MASONRY		13.882/sf	2,323,112
	167,352.00 sf			
05-0000.000	METALS			
05-4100.010	LGMF Framing			
080	LGMF At Masonry And Precast (43,748 - 5,602 Minus CMU Back - Up -Brick shelf 1200)	36,946.00 sf	11.00 /sf	406,406

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
05-4100.010	<i>LGMF Framing</i>				
080	LGMF At Metal Wall Panel	12,800.00 sf	11.00 /sf		140,800
080	LGMF At Prefinished Phenolic Panels	11,300.00 sf	11.00 /sf		124,300
080	LGMF At A6.70 Roof Edge Metal Soffit 1'-11-5/8"	3,870.00 sf	14.00 /sf		54,180
080	LGMF At A6.70 Prefinished Fascia At Overhang 3'-5" +-	6,490.00 sf	14.00 /sf		90,860
080	LGMF At Exterior Linear Metal Ceiling Lobby 1101 / Cafe Entry	1,892.00 sf	14.00 /sf		26,488
080	LGMF At Exterior Linear Metal Panel Ceiling Receiving 1158	36.00 sf	14.00 /sf		504
080	LGMF At Exterior Exterior Metal Panel Ceilings Entries/Stairs	200.00 sf	14.00 /sf		2,800
080	LGMF At Exterior Metal Panel Ceilings Corridor 1136 /Gym Entry	316.00 sf	14.00 /sf		4,424
080	LGMF At Masonry Stairs CMU	-5,450.00 sf	11.00 /sf		(59,950)
	<i>LGMF Framing</i>		<u>4.725/sf</u>		<u>790,812</u>
	167,352.00 sf				
05-5820.120	<i>Misc Steel</i>				
40	Column Covers At 8' +- Under Soffit 8" Exposed Con Col.	2.00 ea	5,800.00 /ea		11,600
140	Seismic Clips L5x5x5/16 x 1'6" Long At 4" OC Staggered / Expan Bolts	162.00 Ea	225.00 /Ea		36,450
140	Exterior Lintels	1,270.00 lf	28.00 /lf		35,560
140	Misc Exterior	167,352.00 lf	0.20 /lf		33,470
	<i>Misc Steel</i>		<u>0.70 /sf</u>		<u>117,080</u>
	167,352.00 sf				
	<b>METALS</b>		5.425/sf		907,892
	167,352.00 sf				
06-0000.000	<b>ROUGH CARPENTRY</b>				
06-1610.110	<i>Sheathing At Walls</i>				
62	Sheathing At Masonry And Precast 41,886 - 5,602 Minus CMU Back - Up)	36,946.00 sf	3.00 /sf		110,838
62	Sheathing At Metal Wall Panel	12,800.00 sf	3.00 /sf		38,400
62	Sheathing At Prefinished Phenolic Panels	11,300.00 sf	3.00 /sf		33,900
62	Sheathing At A6.70 Roof Edge Metal Soffit 1'-11-5/8"	3,870.00 sf	2.995 /sf		11,591
62	Sheathing At A6.70 Prefinished Fascia At Overhang 3'-5" +-	6,490.00 sf	2.995 /sf		19,438
62	Sheathing At Exterior Linear Metal Ceiling Entry Vestibule 1214 A2.11,A6.10	1,892.00 sf	2.995 /sf		5,667
62	Sheathing At Exterior Metal Panel Ceiling Receiving 1158	36.00 sf	2.995 /sf		108
62	Sheathing At Exterior Metal Panel Ceilings Entries/Stairs	200.00 sf	2.995 /sf		599
62	Sheathing At Masonry CMU Stairs	-5,450.00 sf	3.00 /sf		(16,350)
	<i>Sheathing At Walls</i>		<u>1.22 /sf</u>		<u>204,190</u>
	167,352.00 sf				
	<b>ROUGH CARPENTRY</b>		1.22 /sf		204,190
	167,352.00 sf				

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>ROUGH CARPENTRY</i>		1.22 /sf	204,190
	167,352.00 sf			
07-0000.000	<i>THERMAL &amp; MOIST PROTECT</i>			
07-2113.230	<i>Insulation Board</i>			
2	3" Rigid Insulation At Masonry And Precast - Brick Shelf	38,146.00 sf	3.00 /sf	114,438
2	4" Mineral Wool Insulation At Metal Wall Panel	12,800.00 sf	4.00 /sf	51,200
2	4" Mineral Wool Insulation At Prefinished Phenolic Panels	11,300.00 sf	4.00 /sf	45,200
2	4" Mineral Wool Insulation At A6.70 Roof Edge Metal Soffit 1'-11-5/8"	3,870.00 sf	4.00 /sf	15,480
2	4" Mineral Wool Insulation At A6.70 Prefinished Fascia At Overhang 3'-5" +-	6,490.00 sf	4.00 /sf	25,960
2	4" Mineral Wool Insulation At Exterior Linear Metal Ceiling Entry Vestibule 1214 A2.11,A6.10	1,892.00 sf	4.00 /sf	7,568
2	4" Mineral Wool Insulation At Exterior Metal Panel Ceiling Receiving 1158	36.00 sf	4.00 /sf	144
2	4" Mineral Wool Insulation At Exterior Metal Panel Ceilings Entries/Stairs	200.00 sf	4.00 /sf	800
	<i>Insulation Board</i>		1.558/sf	260,790
	167,352.00 sf			
07-2129.265	<i>Sprayed Insulation</i>			
201	3" Sprayed Foam Insulation (SF Inc Vert ) A6.10 Linear Metal Ceiling Entry Vestibule 1214	2,270.40 sf	4.00 /sf	9,082
201	3" Sprayed Foam Insulation (SF Inc Vert ) @ Cond Space Linear Metal Southwest Canopy	969.60 sf	4.00 /sf	3,878
	<i>Sprayed Insulation</i>		0.077/sf	12,960
	167,352.00 sf			
07-2700.100	<i>Air Barriers</i>			
10	Air Vapor Barrier At Masonry And Precast - Brick Shelf	38,146.00 sf	6.75 /sf	257,486
10	Air Vapor Barrier At Metal Wall Panel Basis - Basis ATAS International, Inc; Design Wall DWF	12,800.00 sf	6.75 /sf	86,400
10	Air Vapor Barrier At Prefinished Phenolic Panels	11,300.00 sf	6.75 /sf	76,275
10	Air Vapor Barrier At A6.70 Roof Edge Metal Soffit 1'-11-5/8" - Basis ATAS International, Inc; Design Wall DW	3,870.00 sf	6.75 /sf	26,123
10	Air Vapor Barrier At A6.70 Prefinished Fascia At Overhang 3'-5" +- Basis ATAS International, Inc; Design Wall DW	6,490.00 sf	6.75 /sf	43,808
10	Air Vapor Barrier At Exterior Linear Metal Ceiling Entry Vestibule 1214 A2.11,A6.10	1,892.00 sf	6.75 /sf	12,771
10	Air Vapor Barrier At Exterior Metal Panel Ceiling Receiving 1158	36.00 sf	6.75 /sf	243
10	Air Vapor Barrier At Exterior Metal Panel Ceilings Entries/Stairs	200.00 sf	6.75 /sf	1,350
10	Strip in AVB At Windows	9,304.00 sf	6.75 /sf	62,802
10	Strip in AVB At Doors	114.00 sf	6.75 /sf	770
	<i>Air Barriers</i>		3.394/sf	568,026
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
07-4616.100	<i>Composite Wall Panel</i>			
2	Metal Wall Panel	12,800.00 sf	67.00 /sf	857,600
2	Metal Panel A6.70 Roof Edge Metal Soffit 1'-11-5/8"	3,870.00 sf	67.00 /sf	259,290
2	Metal Panel A6.70 Prefinished Fascia At Overhang 3'-5"	6,490.00 sf	67.00 /sf	434,830
2	Linear Metal Ceiling Entry Vestibule 1214 A2.11,A6.10	1,892.00 sf	70.00 /sf	132,440
2	Metal Panel Ceilings Receiving 1158	36.00 sf	67.00 /sf	2,412
2	Metal Panel Ceilings Building Entry / Stairs A3.10	200.00 sf	67.00 /sf	13,400
2	Prefinished Phenolic Panels	11,300.00 sf	68.00 /sf	768,400
2	Prefinished Phenolic Panels (Adjusted RS \$sf, removed 1" Vert insulation added. Now nort required)	11,300.00 sf	11.75 /sf	132,775
	<i>Composite Wall Panel</i>		<u>15.543/sf</u>	<u>2,601,147</u>
	167,352.00 sf			
	<i>THERMAL &amp; MOIST PROTECT</i>		20.573/sf	3,442,923
	167,352.00 sf			
07-9000.000	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>			
07-9200.200	<i>Exterior Caulking</i>			
2	Exterior Joint/Control Joint sealants - Ext Wall & MP	77,746.00 Allo	1.00 /Allo	77,746
	<i>Exterior Caulking</i>		<u>0.465/sf</u>	<u>77,746</u>
	167,352.00 sf			
07-9513.100	<i>Expansion Covers</i>			
12	Exterior Expansion Joint Cover Assemblies	104.00 lf	225.00 /lf	23,400
	<i>Expansion Covers</i>		<u>0.14 /sf</u>	<u>23,400</u>
	167,352.00 sf			
	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>		0.604/sf	101,146
	167,352.00 sf			
08-0000.000	<i>OPENINGS</i>			
08-9200.100	<i>Louvered Equipment Enclosures</i>			
100	Solid, acoustically-rated equipment screens for concealing rooftop equipment.	9,300.00 sf	56.00 /sf	520,800
	<i>Louvered Equipment Enclosures</i>		<u>3.112/sf</u>	<u>520,800</u>
	167,352.00 sf			
	<i>OPENINGS</i>		3.112/sf	520,800
	167,352.00 sf			
09-0000.000	<i>FINISHES</i>			
09-2000.010	<i>Drywall Partitions</i>			



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
09-2000.010	Drywall Partitions			
100	Drywall At Interior LGMF	59,886.00 sf	3.50 /sf	209,601
100	CMU @ Stairs Drywall At Interior LGMF	-5,450.00 sf	3.50 /sf	(19,075)
	Drywall Partitions		1.138/sf	190,526
	167,352.00 sf			
09-9113.100	Painting- Exterior			
2	Painting Exterior Seal Timbers	1.00 ls	7,500.00 /ls	7,500
30	Paint Exterior Structural Steel	342.00 sf	12.00 /sf	4,104
30	Stained HDWD Incert 2" x 10" x 9'+-h ES Web SS Through Bolts A26/A6.51			
	Painting- Exterior		0.069/sf	11,604
	167,352.00 sf			
	FINISHES		1.208/sf	202,130
	167,352.00 sf			
10-0000.000	SPECIALTIES			
10-1400.110	Signs - Exterior			
100	Signs - Building ID Allowance	1.00 ALLO W	10,000.00 /ALLO W	10,000
	Signs - Exterior		0.06 /sf	10,000
	167,352.00 sf			
	SPECIALTIES		0.06 /sf	10,000
	167,352.00 sf			
	B2010 Exterior Walls		46.084/sf	7,712,192
	167,352.00 sf			
B2020	Exterior Windows			
06-0000.000	ROUGH CARPENTRY			
06-0000.010	Carpentry			
2	Exterior Blocking At Storefront, Curtainwall and Windows	9,304.00 lf	15.00 /lf	139,560
2	Exterior Blocking At Prefinished Aluminum Sun Shades D Had In Est	134.00 loc	125.00 /loc	16,750
	Carpentry		0.934/sf	156,310
	167,352.00 sf			
	ROUGH CARPENTRY		0.934/sf	156,310
	167,352.00 sf			
07-9000.000	JOINT SEALANTS AND EXPANTION CONTROL			
07-9200.200	Exterior Caulking			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
07-9200.200	<i>Exterior Caulking</i>			
20	Exterior Caulking At Storefront, Curtainwall and Windows	9,304.00 lf	6.50 /lf	60,476
	<i>Exterior Caulking</i>		<u>0.361/sf</u>	<u>60,476</u>
	167,352.00 sf			
	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>		0.361/sf	60,476
	167,352.00 sf			
08-0000.000	<i>OPENINGS</i>			
08-4100.100	<i>Storefronts - Aluminum</i>			
10	SF-1 Alum. Storefront 5-4w x 9-4h -- 69	3,435.00 sf	95.00 /sf	326,325
10	SF-2 Alum. Storefront 5-4w x 6-8h -- 64	2,276.00 sf	95.00 /sf	216,220
10	SF-3 Alum. Storefront 5-4w x 6-8h -- 31	2,170.00 sf	95.00 /sf	206,150
10	SF-4 Alum. Storefront 5-4w x 6-8h -- 30	2,100.00 sf	95.00 /sf	199,500
10	SF-5 Alum. Storefront 8-4w x 6-8h -- 4	222.00 sf	95.00 /sf	21,090
10	SF-7 (2)Pr. Drs. Alum Storefront 20 w x 10h -- 1	200.00 sf	95.00 /sf	19,000
10	SF-8 (1)Pr. Drs. Alum Storefront 12-2 w x 10h -- 1	120.00 sf	95.00 /sf	11,400
10	SF-10 Alum Storefront 20-6 w x 6-4h -- 1	130.00 sf	95.00 /sf	12,350
10	SF-11 Alum Storefront 17-4 w x 6-4h -- 1	110.00 sf	95.00 /sf	10,450
10	SF-12 Alum Storefront 23-4 w x 6-4h -- 1	148.00 sf	95.00 /sf	14,060
10	SF-13 Alum Storefront 23-4 w x 6-4h -- 2	296.00 sf	95.00 /sf	28,120
10	SF-14 Alum Storefront 23-4 w x 6-4h -- 1	148.00 sf	95.00 /sf	14,060
10	SF-15 Alum Storefront 23-4 w x 6-4h -- 1	148.00 sf	95.00 /sf	14,060
10	SF-16 Alum Storefront 36-6 w x 6-8h -- 1	243.00 sf	95.00 /sf	23,085
10	SF-17* Radius Alum Storefront 40 w x 7-4h -- 1	293.00 sf	95.00 /sf	27,835
10	SF-18* (1)Pr Drs Radius Alum Storefront 20 w x 7-2h -- 1	143.00 sf	95.00 /sf	13,585
10	SF-21 Alum Storefront Sng Dr 11-9 w x 10 -- 1	118.00 sf	95.00 /sf	11,210
10	SF-27 Alum Storefront 12-0 w x 7-4h -- 1	88.00 sf	95.00 /sf	8,360
10	SF-28 Alum Storefront 14-10 w x 4 h -- 1	59.00 sf	95.00 /sf	5,605
10	SF-29 Alum Storefront 27 w x 4 h -- 6	648.00 sf	95.00 /sf	61,560
10	SF-30 Alum Storefront 27 w x 4 h --3	324.00 sf	95.00 /sf	30,780
10	SF-31 Alum Storefront 13 w x 7-2 --1	93.00 sf	95.00 /sf	8,835
10	SF-32 (2) Pr Drs Alum Storefront 14-6 w x 9-4 h --1	135.00 sf	95.00 /sf	12,825
10	SF-33 (1)/(1)Sgl Pr Drs Alum Storefront 25-8 w x 9-4 h --1	240.00 sf	95.00 /sf	22,800
10	SF-34 (1)Sgl Dr Alum Storefront 10-11 w x 7-2 h	78.00 sf	95.00 /sf	7,410
10	SF-35 (1)Sgl Dr Alum Storefront 10-11 w x 7-2 h	78.00 sf	95.00 /sf	7,410
10	SF-36 Alum Storefront 10-10 w x 8 h -- 2	173.00 sf	95.00 /sf	16,435
10	SF-37 Alum Storefront 10-10 w x 8 h --2	173.00 sf	95.00 /sf	16,435
10	SF-38 (1)Pr Drs Alum Storefront 6-4 w x 9-4 h -- 5	296.00 sf	95.00 /sf	28,120
	<i>Storefronts - Aluminum</i>		<u>8.336/sf</u>	<u>1,395,075</u>
	167,352.00 sf			
08-4400.110	<i>Curtain Wall</i>			
1000	CW 1 10w x 42-8h [1ea]	427.00 sf	118.00 /sf	50,386
1000	CW 2 (1) Pr Drs 12hw x 42-8h [1ea]	512.00 sf	118.00 /sf	60,416
1000	CW 3 5w x 39-8h [2ea]	397.00 sf	118.00 /sf	46,846
1000	CW 4 19-06w x 20-08h [1ea]	403.00 sf	118.00 /sf	47,554
	<i>Curtain Wall</i>		<u>1.226/sf</u>	<u>205,202</u>
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
08-5113.100	Windows - Aluminum			
10	W1 2-0 x 2-0 -- 10	40.00 sf	95.00 /sf	3,800
10	W2 2-8 x 2-8 -- 14	100.00 sf	95.00 /sf	9,500
10	W3 4 x 4 -- 16	256.00 sf	95.00 /sf	24,320
10	W4 6 x 6 -- 12	432.00 sf	95.00 /sf	41,040
10	W5 8 x 8 -- 1	64.00 sf	95.00 /sf	6,080
10	W6 3-4 x 6-0 -- 7	140.00 sf	95.00 /sf	13,300
10	W7 3w x 5-2 -- 2	31.00 sf	95.00 /sf	2,945
10	W8 5w x 6-4 -- 6	190.00 sf	95.00 /sf	18,050
	Windows - Aluminum		0.711/sf	119,035
	167,352.00 sf			
	OPENINGS		10.274/sf	1,719,312
	167,352.00 sf			
10-7000.000	EXTERIOR SPECIALITIES			
10-7113.000	Sun Control Devices			
10	Prefinished Aluminum Sun Shades	736.00 lf	275.00 /lf	202,400
	Sun Control Devices		1.209/sf	202,400
	167,352.00 sf			
	EXTERIOR SPECIALITIES		1.209/sf	202,400
	167,352.00 sf			
	B2020 Exterior Windows		12.778/sf	2,138,498
	167,352.00 sf			
B2030	Exterior Doors			
05-0000.000	METALS			
05-5820.120	Misc Steel			
80	Channel Door Frame(s) - Ext. OH Door (8' W x 7' H+-)	1.00 ea	2,500.00 /ea	2,500
80	Overhead Support(s) - Ext. OH Door (8' W x 7' H+-)	1.00 ea	3,200.00 /ea	3,200
	Misc Steel		0.034/sf	5,700
	167,352.00 sf			
	METALS		0.034/sf	5,700
	167,352.00 sf			
06-0000.000	ROUGH CARPENTRY			
06-0000.010	Carpentry			
2	Exterior Door Blocking	92.00 lf	15.00 /lf	1,380
2	Exterior Door Blocking At Ext. at OH Door(s) (8' W x 7'H+-)	22.00 lf	15.00 /lf	330

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>Carpentry</i>		<i>0.01 /sf</i>	<i>1,710</i>
	<i>167,352.00 sf</i>			
	<i>ROUGH CARPENTRY</i>		<i>0.01 /sf</i>	<i>1,710</i>
	<i>167,352.00 sf</i>			
07-9000.000	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>			
07-9200.200	<i>Exterior Caulking</i>			
10	Caulking Exterior Doors	92.00 lf	6.50 /lf	598
10	Caulking Exterior Overhead Coiling Doors	22.00 lf	6.50 /lf	143
	<i>Exterior Caulking</i>		<i>0.004/sf</i>	<i>741</i>
	<i>167,352.00 sf</i>			
	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>		<i>0.004/sf</i>	<i>741</i>
	<i>167,352.00 sf</i>			
08-0000.000	<i>OPENINGS</i>			
08-1100.300	<i>Doors - Hollow Metal Doors And Frames</i>			
10	S2-1 (Roof Stair) HM Door,Frame, Hardware & Installation - Single	1.00 ea	2,500.00 /ea	2,500
10	1212 HM Door,Frame, Hardware & Installation - Single	1.00 ea	2,500.00 /ea	2,500
10	1131A HM Door,Frame, Hardware & Installation - Pair	1.00 pr	3,500.00 /pr	3,500
10	1158A HM Door,Frame, Hardware & Installation - Pair	1.00 pr	3,500.00 /pr	3,500
10	1158B HM Door,Frame, Hardware & Installation - Pair	1.00 pr	3,500.00 /pr	3,500
	<i>Doors - Hollow Metal Doors And Frames</i>		<i>0.093/sf</i>	<i>15,500</i>
	<i>167,352.00 sf</i>			
08-3300.100	<i>Doors- Overhead</i>			
110	1155A Exterior Overhead Door (8' W x 7' H +/-) - Overhead Door Corporation; Series 596	1.00 ea	9,800.00 /ea	9,800
	<i>Doors- Overhead</i>		<i>0.059/sf</i>	<i>9,800</i>
	<i>167,352.00 sf</i>			
08-4200.100	<i>Storefront Entrances</i>			
001	1141 SF Entrance,hardware & Insallation - Single	1.00 ea	4,400.00 /ea	4,400
001	1214 SF Entrance,hardware & Insallation - Single	1.00 ea	4,400.00 /ea	4,400
001	1214B SF Entrance,hardware & Insallation - Single	1.00 ea	4,400.00 /ea	4,400
001	1222 SF Entrance,hardware & Insallation - Single	1.00 ea	4,400.00 /ea	4,400
001	1231B SF Entrance,hardware & Insallation - Single	1.00 ea	4,400.00 /ea	4,400
010	1246 SF Entrance,hardware & Insallation - Single	1.00 ea	4,400.00 /ea	4,400
010	1100 SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	1100A SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
08-4200.100	<i>Storefront Entrances</i>			
010	1100B SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	1126B SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	1136 SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	1136A SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	1137A SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	1211 SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	1233B SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	S2-1B SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	S3-1B SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
010	S4-1B SF Entrance,hardware & Insallation - Pair	1.00 pr	8,800.00 /pr	8,800
	<i>Storefront Entrances</i>		<u>0.789/sf</u>	<u>132,000</u>
	167,352.00 sf			
	<i>OPENINGS</i>		0.94 /sf	157,300
	167,352.00 sf			
09-0000.000	<i>FINISHES</i>			
09-9113.100	<i>Painting- Exterior</i>			
30	Paint Exterior Door and Frame	2.00 ea	175.00 /ea	350
30	Paint Exterior Pair of Doors and Frame	3.00 pr	275.00 /pr	825
30	Paint Exterior OH Door Frame(s)	1.00 ea	275.00 /ea	275
	<i>Painting- Exterior</i>		<u>0.009/sf</u>	<u>1,450</u>
	167,352.00 sf			
	<i>FINISHES</i>		0.009/sf	1,450
	167,352.00 sf			
10-0000.000	<i>SPECIALTIES</i>			
10-1400.120	<i>Signs - Interior</i>			
110	Signage - GC1.1Provide 3" Vinyl #'s At Each Ext Door x2- Ext & Int Face(Where Dble or Bank Of Doors 1# Only)	19.00 ea	165.00 /ea	3,135
	<i>Signs - Interior</i>		<u>0.019/sf</u>	<u>3,135</u>
	167,352.00 sf			
	<i>SPECIALTIES</i>		0.019/sf	3,135
	167,352.00 sf			
	<i>B2030 Exterior Doors</i>		1.016/sf	170,036
	167,352.00 sf			
	<b>B20 EXTERIOR VERTICAL ENCLOSURES</b>		<b>59.878/sf</b>	<b>10,020,726</b>
	167,352.00 sf			
B30	<b>EXTERIOR HORIZONTAL ENCLOSURES</b>			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
B3010	Roof Coverings			
06-0000.000	ROUGH CARPENTRY			
06-0000.010	Carpentry			
2	Vertical Roof Sheathing DAB	916.00 sf	4.00 /sf	3,664
2	Roof Blocking	13,789.00 lf	15.00 /lf	206,835
2	Roof Blocking Canopy	272.00 lf	15.00 /lf	4,080
	Carpentry		<u>1.282/sf</u>	<u>214,579</u>
	167,352.00 sf			
	ROUGH CARPENTRY		1.282/sf	214,579
	167,352.00 sf			
07-0000.000	THERMAL & MOIST PROTECT			
07-5300.100	Roofing - Membrane			
2	Roof R-1/R3 And Flashing	85,682.00 sf	19.00 /sf	1,627,958
2	Roof Vertical	916.00 sf	18.00 /sf	16,488
2	Roof Expansion Joint	78.00 sf	225.00 /sf	17,550
2	Protection of completed roofing.	85,682.00 sf	0.20 /sf	17,136
2	Walkway Pads	2,526.00 sf	15.00 /sf	37,890
2	Protection of completed roofing.	85,682.00 sf	0.20 /sf	17,136
	Roofing - Membrane		<u>10.362/sf</u>	<u>1,734,159</u>
	167,352.00 sf			
07-6200.100	Flashing- Aluminum			
2	Roof Edge Metal	1,926.00 lf	22.00 /lf	42,372
2	1'-2" Fascia W/1'-6" Coping Flashing	1,926.00 lf	74.00 /lf	142,524
2	Roof Edge Metal Canopy	272.00 lf	22.00 /lf	5,984
2	1'-2" Fascia W/1'-6" Coping Flashing	272.00 lf	74.00 /lf	20,128
	Flashing- Aluminum		<u>1.261/sf</u>	<u>211,008</u>
	167,352.00 sf			
	THERMAL & MOIST PROTECT		11.623/sf	1,945,167
	167,352.00 sf			
07-7000.000	ROOF & WALL ACCESSORIES			
07-7123.100	Gutter Systems			
20	Gutters	266.00 lf	65.00 /lf	17,290
	Gutter Systems		<u>0.103/sf</u>	<u>17,290</u>
	167,352.00 sf			
07-7123.110	Downspouts			
20	Downspouts	98.00 lf	80.00 /lf	7,840
	Downspouts		<u>0.047/sf</u>	<u>7,840</u>
	167,352.00 sf			





# Northbridge Elementary School

8/26/2019 7:15 AM

**FONTAINE BROS., INC.**

Whitinsville, MA

CONSTRUCTION MANAGERS  
GENERAL CONTRACTORS

## 90% CD Budget Estimate Uniformat

90CD Reconciled

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>ROOF &amp; WALL ACCESSORIES</i>		0.15 /sf	25,130
	167,352.00 sf			
	<i>B3010 Roof Coverings</i>		13.056/sf	2,184,876
	167,352.00 sf			
B3020	<i>Roof Openings</i>			
05-0000.000	<i>METALS</i>			
05-5820.120	<i>Misc Steel</i>			
140	Metal Grating Roof Stair Access Form Stair 2 A6.17	26.00 sf	250.00 /sf	6,500
140	Metal Framing Roof Stair Access Form Stair 2	480.00 lbs	12.00 /lbs	5,760
140	Metal Railings Roof Stair Access Form Stair 2	12.00 lbs	175.00 /lbs	2,100
	<i>Misc Steel</i>		0.086/sf	14,360
	167,352.00 sf			
	<i>METALS</i>		0.086/sf	14,360
	167,352.00 sf			
07-7000.000	<i>ROOF &amp; WALL ACCESSORIES</i>			
07-7200.100	<i>Roof Accessories</i>			
12	Manufactured Curbs, Equipment Rails, and Pedestals.	1.00 Allow	25,000.00 /Allow	25,000
12	Roof Access Hatches	1.00 ea	2,500.00 /ea	2,500
12	1 Roof Access Ladders 9' +- J1.6 Line / A4.15	1.00 ea	3,600.00 /ea	3,600
12	2 Roof Access Ladders 9' +- W6.1 Line / A4.15	1.00 ea	3,600.00 /ea	3,600
12	3 Roof Access Ladders 14' +- Z2 Line / A4.15	1.00 ea	5,600.00 /ea	5,600
12	4 Roof Access Ladders 16' +- 10 Line / A4.15	1.00 ea	6,400.00 /ea	6,400
12	Elevator Hoistway Vent. [Basis-of-Design Manufacturer / Product: Greenheck, Model ESJ-401P Stationary Blade Louver Penthouse ]	1.00 ea	4,200.00 /ea	4,200
	<i>Roof Accessories</i>		0.304/sf	50,900
	167,352.00 sf			
	<i>ROOF &amp; WALL ACCESSORIES</i>		0.304/sf	50,900
	167,352.00 sf			
08-0000.000	<i>OPENINGS</i>			
08-6200.100	<i>Skylights</i>			
20	Skylight - Metal Framed	367.00 sf	175.00 /sf	64,225
	<i>Skylights</i>		0.384/sf	64,225
	167,352.00 sf			
	<i>OPENINGS</i>		0.384/sf	64,225
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<b>OPENINGS</b>		<i>0.384/sf</i>	<i>64,225</i>
	167,352.00 sf			
	<i>B3020 Roof Openings</i>		<i>0.774/sf</i>	<i>129,485</i>
	167,352.00 sf			
	<b>B30 EXTERIOR HORIZONTAL ENCLOSURES</b>		<b>13.829/sf</b>	<b>2,314,361</b>
	167,352.00 sf			
	<b>B SHELL</b>		<b>115.76 /sf</b>	<b>19,372,685</b>
	167,352.00 sf			
<b>C</b>	<b>INTERIORS</b>			
<b>C10</b>	<b>INTERIOR CONSTRUCTION</b>			
<i>C1010</i>	<i>Interior Partitions</i>			
<i>04-0000.000</i>	<i>MASONRY</i>			
<i>04-2200.080</i>	<i>Block- 8" CMU</i>			
102	E 8" CMU At Stairs	8,850.00 sf	26.00 /sf	230,100
102	E1 8" CMU 1 HR. Grouted Solid S0.02 [Includes Staging/Access]	1,450.00 sf	28.00 /sf	40,600
102	E1 8" CMU 1 HR. Elevator Machine Room	364.00 sf	28.00 /sf	10,192
102	G1 12" CMU 26' HT. - 1 HR Gym	2,130.00 sf	32.00 /sf	68,160
102	G1 6" CMU 25' HT.	452.00 sf	26.00 /sf	11,752
102	G1 4" CMU 25' HT.	156.00 sf	24.00 /sf	3,744
102	E2 8" CMU 43' HT. - 2 HR Sep Wall DAB	3,201.00 sf	28.00 /sf	89,628
	<i>Block- 8" CMU</i>		<i>2.714/sf</i>	<i>454,176</i>
	167,352.00 sf			
	<i>MASONRY</i>		<i>2.714/sf</i>	<i>454,176</i>
	167,352.00 sf			
<i>05-0000.000</i>	<i>METALS</i>			
<i>05-5820.120</i>	<i>Misc Steel</i>			
10	Seismic Clips	54.00 ea	250.00 /ea	13,500
140	Support for Operable Partition	55.00 lf	200.00 /lf	11,000
140	Interior Lintels	1.00 ls	5,500.00 /ls	5,500
140	Misc interior And Column Closures	167,352.00 ls	0.30 /ls	50,206
	<i>Misc Steel</i>		<i>0.479/sf</i>	<i>80,206</i>
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>METALS</i>		<i>0.479/sf</i>	<i>80,206</i>
	<i>167,352.00 sf</i>			
06-0000.000	<i>ROUGH CARPENTRY</i>			
06-0000.010	<i>Carpentry</i>			
2	In Wall And Misc. Blocking	167,352.00 sf	1.25 /sf	209,190
2	Backer Boards At Elec/Tel/Data	500.00 Sf	8.00 /Sf	4,000
	<i>Carpentry</i>		<i>1.274/sf</i>	<i>213,190</i>
	<i>167,352.00 sf</i>			
	<i>ROUGH CARPENTRY</i>		<i>1.274/sf</i>	<i>213,190</i>
	<i>167,352.00 sf</i>			
07-9000.000	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>			
07-9200.100	<i>Interior Caulking</i>			
40	Caulking Interior Window Openings	2,220.00 lf	6.50 /lf	14,430
	<i>Interior Caulking</i>		<i>0.086/sf</i>	<i>14,430</i>
	<i>167,352.00 sf</i>			
07-9513.100	<i>Expansion Covers</i>			
12	Interior Expansion Joints	167,352.00 lf	0.30 /lf	50,206
	<i>Expansion Covers</i>		<i>0.30 /sf</i>	<i>50,206</i>
	<i>167,352.00 sf</i>			
	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>		<i>0.386/sf</i>	<i>64,636</i>
	<i>167,352.00 sf</i>			
08-0000.000	<i>OPENINGS</i>			
08-1100.500	<i>HM Frames</i>			
100	BL1 5-4 w x 2-4 / HM Borrowed Lite Frames	5.00 ea	150.00 /ea	750
100	BL2 3 w x 4 / HM Borrowed Lite Frames	47.00 ea	180.00 /ea	8,460
100	BL3 4-8 w x 4 / HM Borrowed Lite Frames	9.00 ea	280.00 /ea	2,520
100	BL4 3w x 3 / HM Borrowed Lite Frames	4.00 ea	135.00 /ea	540
100	BL5 4 w x 4 / HM Borrowed Lite Frames	12.00 ea	200.00 /ea	2,400
	<i>HM Frames</i>		<i>0.088/sf</i>	<i>14,670</i>
	<i>167,352.00 sf</i>			
08-4100.100	<i>Storefronts - Aluminum</i>			
10	SF-06 Alum. Storefront And Glazing	64.00 sf	80.00 /sf	5,120
10	SF-09 Alum. Storefront Frames And Glazing	103.00 sf	80.00 /sf	8,240
10	SF-19 Alum. Storefront And Glazing	95.00 sf	80.00 /sf	7,600
10	SF-20 Alum. Storefront And Glazing 21 w x 10h	215.00 sf	80.00 /sf	17,200
10	SF-22 Alum. Storefront And Glazing 13-8 w x 10h	137.00 sf	80.00 /sf	10,960
10	SF-23 Alum. Storefront And Glazing 23-5 w x 10h	234.00 sf	80.00 /sf	18,720
10	SF-24 Alum. Storefront Frames And Glazing 9-0 w x 9-0h	81.00 sf	80.00 /sf	6,480

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
08-4100.100	<i>Storefronts - Aluminum</i>			
10	SF-25/26 Alum. Storefront Frames And Glazing 9-0 w x 6-0h	648.00 sf	80.00 /sf	51,840
	<i>Storefronts - Aluminum</i>		<u>0.754/sf</u>	<u>126,160</u>
	167,352.00 sf			
08-4400.110	<i>Curtain Wall</i>			
1000	CW 5 *FR 17-2 x 10 Frames And Glazing [STAIR 5]	172.00 sf	245.00 /sf	42,140
1000	CW 6 *FR 9-5 x 10 Frames And Glazing [STAIR 5]	188.00 sf	245.00 /sf	46,060
1000	CW 7 *FR 2-4 x 10h Frames And Glazing [STAIR 5]	47.00 sf	245.00 /sf	11,515
1000	CW 8 *FR 9-10 x 10 Frames And Glazing [STAIR 5]	98.00 sf	245.00 /sf	24,010
1000	CW 9 *FR 17-3 x 10 Frames And Glazing [STAIR 5]	173.00 sf	245.00 /sf	42,385
1000	CW 10 *FR 27-2 x 10 Frames And Glazing [STAIR 5]	543.00 sf	245.00 /sf	133,035
	<i>Curtain Wall</i>		<u>1.788/sf</u>	<u>299,145</u>
	167,352.00 sf			
08-8100.100	<i>Glazing- Glass</i>			
100	BL1 5-4 w x 2-4 / HM Borrowed Lite Glass & Glazing	55.00 sf	32.00 /sf	1,760
100	BL2 3 w x 4 / HM Borrowed Lite Glass & Glazing	564.00 sf	32.00 /sf	18,048
100	BL3 4-8 w x 4 / HM Borrowed Lite Glass & Glazing	112.00 sf	32.00 /sf	3,584
100	BL4 3w x 3 / HM Borrowed Lite Frames Glass & Glazing	36.00 sf	32.00 /sf	1,152
100	BL5 4w x 4 / HM Borrowed Lite Frames Glass & Glazing	192.00 sf	32.00 /sf	6,144
	<i>Glazing- Glass</i>		<u>0.183/sf</u>	<u>30,688</u>
	167,352.00 sf			
	<b>OPENINGS</b>		2.812/sf	470,663
	167,352.00 sf			
09-0000.000	<b>FINISHES</b>			
09-2000.010	<i>Drywall Partitions</i>			
100	A 14' HT- Non Rated w/ 6" Metal Studs 1 Layer of Gyp Each Side, Batt Insul.	102,801.00 sf	11.80 /sf	1,213,052
100	A 27'-6"HT- w/ 6" Metal Studs 1 Layer of Gyp Each Side, Batt Insul.	3,932.00 sf	12.50 /sf	49,150
100	A1 14' HT- 1 HR. w/ 6" Metal Studs 1 Layer of Gyp Each Side, Batt Insul.	1,992.00 sf	13.50 /sf	26,892
100	A2 14' HT- 2 HR. w/ 6" Metal Studs 2 Layers of Gyp Each Side, Batt Insul.	965.00 sf	16.00 /sf	15,440
100	A2A 14' HT- 2 HR. w/ 6" Metal Studs 2 Layers of Gyp Each Side, Batt Insul. w/Acoustic Sealant	2,700.00 sf	20.00 /sf	54,000
100	B 14' HT- w/ 3 5/8" Metal Studs 1 Layer of Gyp Each Side, Batt Insul.	141.00 sf	10.80 /sf	1,523
100	F 14' HT- Non Rated w/ 2 1/2" Metal Stud, 1 Layer of Gyp, Batt Insul.	20,290.00 sf	7.00 /sf	142,030

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
09-2000.010	<i>Drywall Partitions</i>			
100	F 27" HT- Non Rated w/ 2 1/2" Metal Stud, 1 Layer of Gyp, Batt Insul.	3,518.00 sf	7.50 /sf	26,385
100	F4 14' HT- 1 Layer Gyp. One Side w/ 3 5/8" Metal Studs, Batt Insul.	25,379.00 sf	8.75 /sf	222,066
100	F4 14' HT- 1 Layer Gyp. One Side w/ 3 5/8" Metal Studs, No Batt	3,378.00 sf	8.25 /sf	27,869
100	F6 14' HT- Non Rated Furring w/ 6" Metal Stud, 1 Layer of Gyp, Batt Insul.	22,559.00 sf	9.80 /sf	221,078
100	A1 Stair 1 1 HR RATED SEPARATION 6" 1 +1	5,608.00 sf	13.85 /sf	77,671
100	F4 Stair 1 2-1/2" 1+0	2,731.00 sf	7.00 /sf	19,117
100	F6 Stair 2 6" 1+0	513.00 sf	10.00 /sf	5,130
100	S1 Stair SHAFTWALL 2-1/2" STUD 1 HR RATED W/ (1) LAYER 5/8" GYP BD (UL U415 SYSTEM A)	7,867.00 sf	24.00 /sf	188,808
100	S7 1Hr {UL-U415} 6" metal stud w/Batt insulation 1 Layer of 1" type X & 1 Layer of 5/8"	410.00 sf	20.00 /sf	8,200
100	Scaffolding/Lifts/Logistics	167,352.00 sf	1.25 /sf	209,190
100	Install Hollow Metal Door Frames	308.00 sf	275.00 /sf	84,700
100	A1 Stair 1 1 HR RATED SEPARATION 6" 1 +1	-4,350.00 sf	13.85 /sf	(60,248)
100	S1 Stair SHAFTWALL 2-1/2" STUD 1 HR RATED W/ (1) LAYER 5/8" GYP BD (UL U415 SYSTEM A)	-4,500.00 sf	24.00 /sf	(108,000)
100	Cleanup	167,352.00 sf	1.75 /sf	292,866
	<i>Drywall Partitions</i>		16.235/sf	2,716,919
	167,352.00 sf			
	<i>FINISHES</i>		16.235/sf	2,716,919
	167,352.00 sf			
10-0000.000	<i>SPECIALTIES</i>			
10-2226.100	<i>Partitions Folding</i>			
2	D 1137 Operable Partition at Platform Motorized (26w +- x 12'h +-) A9.53 / A5.14 DAB 6/2/19 CONFIRM *****	312.00 sf	110.00 /sf	34,320
	<i>Partitions Folding</i>		0.205/sf	34,320
	167,352.00 sf			
	<i>SPECIALTIES</i>		0.205/sf	34,320
	167,352.00 sf			
	<i>C1010 Interior Partitions</i>		24.106/sf	4,034,109
	167,352.00 sf			
C1020	<i>Interior Doors</i>			
05-0000.000	<i>METALS</i>			
05-5820.120	<i>Misc Steel</i>			
80	Overhead Support(s) - OH Coiling Grille at Kitchen (17 'w x 10'h)	17.00 lf	275.00 /lf	4,675
80	Overhead Support(s) - OH Coiling Grille at Kitchen (17 w x 10'h)	17.00 lf	275.00 /lf	4,675

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
05-5820.120	Misc Steel				
80	Overhead Support(s) - 1102 HSD Folding 15'-4w" x 8'h x 11-1/2"thk 90 Min	18.00 lf	763.889 /lf		13,750
80	Overhead Support(s) - 1202C FD Media 12'w x 8'h	12.00 lf	275.00 /lf		3,300
80	Overhead Support(s) - 1222B FD Kinder 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 1224B FD Kinder 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 2215A FD Alum. 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 2216A FD Alum. 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 2227A FD Alum. 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 2228A FD Alum. 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 3214A Alum. FD 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 3215A Alum. FD 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 3226A Alum. FD 8'w x 8'h	8.00 lf	275.00 /lf		2,200
80	Overhead Support(s) - 3227A Alum. FD 8'w x 8'h	8.00 lf	275.00 /lf		2,200
	Misc Steel		0.289/sf		48,400
	167,352.00 sf				
	METALS		0.289/sf		48,400
	167,352.00 sf				
07-9000.000	JOINT SEALANTS AND EXPANTION CONTROL				
07-9200.100	Interior Caulking				
30	Caulking Interior Doors	13,288.00 lf	6.50 /lf		86,372
	Interior Caulking		0.516/sf		86,372
	167,352.00 sf				
	JOINT SEALANTS AND EXPANTION CONTROL		0.516/sf		86,372
	167,352.00 sf				
08-0000.000	OPENINGS				
08-1100.300	Doors - Hollow Metal Doors And Frames				
10	HM Doors	0.00	NAM		
			E		
10	Door F - 3' X 7' HM -Single	15.00	ea	244.999 /ea	3,675
10	Door F - 3' X 7' HM -Single (90 MIN)	1.00	ea	300.00 /ea	300
10	Door F - 6' X 7' HM - Pair	1.00	pr	600.00 /pr	600
10	Door F - 6' X 7' HM - Pair (60 MIN.)	1.00	pr	650.00 /pr	650
10	Door F - 6' X 7' HM - Pair (90 MIN.)	1.00	pr	800.00 /pr	800
220	FRAMES	0.00	NAM		
			E		
220	Frame 1 - HM 3'-4" x 7'-4"	7.00	ea	220.00 /ea	1,540
220	Frame 2 - HM 6'-4" x 7'-4"	4.00	ea	250.00 /ea	1,000
220	Frame 3 - HM 3' x 7' (90MIN)				250
220	Frame 3 - HM 3'-4" x 7'-2"	145.00	ea	220.00 /ea	31,900
220	Frame 3 - HM 3'-4" x 7'-2" (45 MIN)	1.00	ea	250.00 /ea	250
220	Frame 3 - HM 3'-4" x 7'-2" (90 Min)	1.00	ea	550.00 /ea	550
220	Frame 4 - HM 6'-4" x 7'-2"	15.00	ea	190.667 /ea	2,860
220	Frame 4 - HM 6'-4" x 7'-2" (60 Min)	13.00	ea	250.00 /ea	3,250
220	Frame 4 - HM 6'-4" x 7'-2" (90 Min)	1.00	ea	275.00 /ea	275
220	Frame 5 - HM 4'-8" x 7'-2" w/Side Light	19.00	ea	500.00 /ea	9,500
220	Frame 6 - HM 5' x 8'-10" w/Side Light & Transom	88.00	ea	550.00 /ea	48,400
220	Frame 7 - HM 3'-4" x 8'-10" w/Transom	1.00	ea	500.00 /ea	500
220	Frame 7 - HM 7'-4" x 8'-10" w/Transom	6.00	ea	550.00 /ea	3,300



Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
08-1100.300	Doors - Hollow Metal Doors And Frames				
220	Frame 7 - HM 7'-4" x 8'-10" w/ Glass (90 MIN)	3.00 ea	550.00 /ea		1,650
220	Frame 8 - HM 4'-10" X 7'-4" w/ Glass	1.00 ea	475.00 /ea		475
220	Frame 9 - HM 6'-4" x 9'-2" w/Transom	1.00 ea	475.00 /ea		475
	Doors - Hollow Metal Doors And Frames			0.67 /sf	112,200
	167,352.00 sf				
	5,646,723.00 Labor hours				
08-1400.200	Doors - Wood				
102	WOOD DOORS	0.00 ea			
102	Door F - 3' X 7' Wood -Single	118.00 ea	500.00 /ea		59,000
102	Door F - 3' X 7' Wood -Single (45 MIN.)	1.00 ea	575.00 /ea		575
102	Door F - 3' X 7' Wood -Single (60 MIN.)	2.00 ea	575.00 /ea		1,150
102	Door F - 3' X 7' Wood -Single (90 MIN.)	1.00 ea	575.00 /ea		575
102	Door F - 3' X 7' Wood - STC 52	4.00 ea	575.00 /ea		2,300
102	Door F - 6' X 7' Wood - Pair	17.00 ea	1,000.00 /ea		17,000
102	Door F - 6' X 7' Wood - Pair (60 MIN.)	12.00 pr	1,200.00 /pr		14,400
102	Door F - 6' X 7' Wood - Pair (90 MIN.)	4.00 pr	1,200.00 /pr		4,800
102	Door F - 7' X 7' Wood - Pair	4.00 pr	1,100.00 /pr		4,400
102	Door FG - 3 X 7' Wood - Single (GL-3.4sqft)	68.00 ea	500.00 /ea		34,000
102	Door FG - 3 X 7' Wood - Single (GL-3.4sqft) - STC 52	17.00 ea	525.00 /ea		8,925
102	Door FG - 6' X 7' Wood - Pair	1.00 pr	1,000.00 /pr		1,000
102	Door FG - 7' X 7' Wood - Pair	2.00 pr	1,100.00 /pr		2,200
102	Door N - 3' X 7' Wood - Single (GL 1sf)	36.00 ea	500.00 /ea		18,000
	Doors - Wood			1.006/sf	168,325
	167,352.00 sf				
08-3500.100	Doors- Coiling				
50	OH Coiling Grille 17' x 10'-6"	2.00 ea	21,250.00 /ea		42,500
	Doors- Coiling			0.254/sf	42,500
	167,352.00 sf				
08-3513.230	Acordian Folding Fire Door				
60	1125 HSD Folding WON 15'-4w" x8'h x 11-1/2"thk 90 Min	122.64 sf	275.00 /sf		33,726
	Acordian Folding Fire Door			0.202/sf	33,726
	167,352.00 sf				
08-4200.100	Storefront Entrances				
150	1101 SF-9 Entrance,hardware & Insallation - Single	1.00 ea	4,000.00 /ea		4,000
150	1101A SF-9 Entrance,hardware & Insallation - Pair	1.00 ea	8,200.00 /ea		8,200
150	1214A SF-31 Entrance,hardware & Insallation - Pair	1.00 ea	8,200.00 /ea		8,200
	Storefront Entrances			0.122/sf	20,400
	167,352.00 sf				
08-4450.100	Curtain Wall Entrances				
005	S5-1 *FR Stair 5 Pair Doors, Hardware 6w x 7h +-	1.00 pr	10,500.00 /pr		10,500
005	S5-1A *FR Stair 5 Pair Doors, Hardware 6w x 7h +-	1.00 pr	10,500.00 /pr		10,500

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
08-4450.100	<i>Curtain Wall Entrances</i>				
005	S5-2 *FR Stair 5 Pair Doors, Hardware 6w x 7h +-	1.00 pr	10,500.00 /pr		10,500
005	S5-3 *FR Stair 5 Pair Doors, Hardware 6w x 7h +-	1.00 pr	10,500.00 /pr		10,500
	<i>Curtain Wall Entrances</i>		<u>0.251/sf</u>		<u>42,000</u>
	167,352.00 sf				
08-7100.090	<i>Finish Hardware</i>				
10	FURNISH & INSTALL HARDWARE	0.00 NAM			
10	Hardware Material Install Single	272.00 ea	1,000.00 /ea		272,000
10	Hardware Material Install Pair	27.00 pr	2,000.00 /pr		54,000
10	Hardware Material Install Sound Assembly Single	17.00 ea	1,200.00 /ea		20,400
	<i>Finish Hardware</i>		<u>2.07/sf</u>		<u>346,400</u>
	167,352.00 sf				
08-8100.100	<i>Glazing- Glass</i>				
100	Door Frame 5 Glass	152.00 sf	28.00 /sf		4,256
100	Door Frame 6 Glass	1,408.00 sf	28.00 /sf		39,424
100	Door Frame 7 Glass	88.00 sf	28.00 /sf		2,464
100	Door Frame 8 Glass	12.00 sf	28.00 /sf		336
100	Door Frame 9 Glass	920.00 sf	28.00 /sf		25,760
100	Door N Glass	37.00 sf	28.00 /sf		1,036
100	Door G Glass	5.00 sf	28.00 /sf		140
100	Door FG Glass	920.00 sf	28.00 /sf		25,760
	<i>Glazing- Glass</i>		<u>0.593/sf</u>		<u>99,176</u>
	167,352.00 sf				
	OPENINGS		5.167/sf		864,727
	167,352.00 sf				
09-0000.000	<i>FINISHES</i>				
09-9123.200	<i>Painting- Interior</i>				
40	Paint Frame(s) - Single HM	272.00 ea	230.00 /ea		62,560
40	Paint Frame(s) - Double HM	27.00 ea	275.00 /ea		7,425
40	Paint Door(s) HM	21.00 ea	330.00 /ea		6,930
	<i>Painting- Interior</i>		<u>0.46/sf</u>		<u>76,915</u>
	167,352.00 sf				
	FINISHES		0.46/sf		76,915
	167,352.00 sf				
10-0000.000	<i>SPECIALTIES</i>				
10-2226.100	<i>Partitions Folding</i>				
2	1205A FD Alum. Media 12'w x 8'h	96.00 sf	325.00 /sf		31,200
2	1242B FD Alum. Kinder 8'w x 8'h	64.00 sf	325.00 /sf		20,800
2	1247A FD Alum. Kinder 8'w x 8'h	64.00 sf	325.00 /sf		20,800
2	2214A FD Alum. 8'w x 8'h	64.00 sf	325.00 /sf		20,800
2	3213A FD Alum. 8'w x 8'h	64.00 sf	325.00 /sf		20,800

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
10-2226.100	<i>Partitions Folding</i>				
2	3216A FD Alum. 8'w x 8'h	64.00 sf	325.00 /sf		20,800
2	2217A FD Alum. 8'w x 8'h	64.00 sf	325.00 /sf		20,800
2	2231A Alum. FD 8'w x 8'h	64.00 sf	325.00 /sf		20,800
2	2235A Alum. FD 8'w x 8'h	64.00 sf	325.00 /sf		20,800
2	3229A Alum. FD 8'w x 8'h	64.00 sf	325.00 /sf		20,800
2	3233A Alum. FD 8'w x 8'h	64.00 sf	325.00 /sf		20,800
	<i>Partitions Folding</i>			1.429/sf	239,200
	167,352.00 sf				
	<i>SPECIALTIES</i>			1.429/sf	239,200
	167,352.00 sf				
	<i>C1020 Interior Doors</i>			7.861/sf	1,315,614
	167,352.00 sf				
	5,646,723.00 Labor hours				
C1030	<i>Fittings</i>				
05-0000.000	<i>METALS</i>				
05-5820.120	<i>Misc Steel</i>				
10	Platform Rails (4 - 1 Upper One Lower Each Side) A7.12	80.00 lf	165.00 /lf		13,200
10	Ladder to Roof Hatch	1.00 ea	3,500.00 /ea		3,500
10	Ballet Bar	10.00 lf	125.00 /lf		1,250
10	1/8" Column Plate 1'-8"w x 32' A1.53 / Column Closures	1.00 ls	7,500.00 /ls		7,500
10	Bench Supports OT/PT Support	60.00 ea	175.00 /ea		10,500
10	Misc Metals Allowance	167,352.00 lf	1.10 /lf		184,087
	<i>Misc Steel</i>			1.315/sf	220,037
	167,352.00 sf				
	<i>METALS</i>			1.315/sf	220,037
	167,352.00 sf				
06-2000.000	<i>FINISH CARPENTRY</i>				
06-2000.010	<i>Finish Carpentry</i>				
2	Wood Veneer Wainscot Hall	450.00 ea	65.00 /ea		29,250
2	Wood Veneer Cafe/Hall At Benches	1,960.00 ea	85.00 /ea		166,600
2	Plam Lockers 15"	440.00 lf	60.00 /lf		26,400
2	Plam Lockers 30"	92.00 lf	90.00 /lf		8,280
2	Media 3Form Wall Features A9.72 J10	60.00 sf	175.00 /sf		10,500
2	Media 3Form Wall Features A9.72 J23	80.00 sf	175.00 /sf		14,000
2	WIndow Sills & Aprons HRWD Shop Finished 7" +- w x 2-1/4"	1,925.00 sf	48.00 /sf		92,400
2	Lego Wall	100.00 sf	55.00 /sf		5,500
	<i>Finish Carpentry</i>			2.109/sf	352,930
	167,352.00 sf				

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>FINISH CARPENTRY</i>		2.109/sf	352,930
	167,352.00 sf			
06-4100.000	<i>ARCHITECTURAL WOOD CASEWORK</i>			
06-4210.120	<i>Architectural Woodwork</i>			
c 10	Hall Benches	4.00 ea	3,200.00 /ea	12,800
c 10	6' +- Window Seats Inspiration A9.71	10.00 ea	3,000.00 /ea	30,000
c 10	10'-6" +- Window Seats Inspiration A9.71	4.00 ea	5,000.00 /ea	20,000
c 10	Media Center desk	44.00 lf	800.00 /lf	35,200
c 10	Libray/Media Center Book Bins	2.00 ea	650.00 /ea	1,300
c 10	Libray/Media Built In Wood Benches Wih Custom Removable Cushions	32.00 lf	750.00 /lf	24,000
c 10	Cafe Upolstered 9'+-	3.00 ea	7,800.00 /ea	23,400
c 10	Reception Desk = 20'Lf R1,2,3,4 (3 Form)	20.00 lf	1,200.00 /lf	24,000
c 10	Custodial Shop R27-9.72 - Solid wood Work Bench = 10'-6"	11.00 lf	550.00 /lf	6,050
c 10	Custodial Shop R27-9.72 - Wall Mounted Shelving	21.00 lf	225.00 /lf	4,725
	<i>Architectural Woodwork</i>		1.084/sf	181,475
	167,352.00 sf			
	<i>ARCHITECTURAL WOOD CASEWORK</i>		1.084/sf	181,475
	167,352.00 sf			
07-9000.000	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>			
07-9513.100	<i>Expansion Covers</i>			
10	Expansion At Fire Wall 5.4 5.8	75.00 lf	225.00 /lf	16,875
	<i>Expansion Covers</i>		0.101/sf	16,875
	167,352.00 sf			
	<i>JOINT SEALANTS AND EXPANTION CONTROL</i>		0.101/sf	16,875
	167,352.00 sf			
08-0000.000	<i>OPENINGS</i>			
08-8100.100	<i>Glazing- Glass</i>			
100	Mirror 7648	26.00 sf	44.00 /sf	1,144
	<i>Glazing- Glass</i>		0.007/sf	1,144
	167,352.00 sf			
	<i>OPENINGS</i>		0.007/sf	1,144
	167,352.00 sf			
10-0000.000	<i>SPECIALTIES</i>			
10-1113.100	<i>Chalkboards/Markerboards</i>			
2	MB 4' x 5'	3,340.00 sf	22.00 /sf	73,480
2	MB 6' x 5'	90.00 sf	22.00 /sf	1,980

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
10-1113.100	<i>Chalkboards/Markerboards</i>			
2	MB 8' x 5'	3,480.00 sf	22.00 /sf	76,560
2	TB 4' X 5'	1,920.00 sf	20.00 /sf	38,400
2	TB 6' X 5'	420.00 sf	20.00 /sf	8,400
2	TB 8' X 5'	480.00 sf	20.00 /sf	9,600
2	Tack Strip At 3" +-	9,000.00 lf	8.00 /lf	72,000
2	Wardrobe MB Surface	660.00 sf	22.00 /sf	14,520
	<i>Chalkboards/Markerboards</i>		<u>1.762/sf</u>	<u>294,940</u>
	167,352.00 sf			
10-1133.100	<i>Display Cases</i>			
10	Glass Display Cases 5'+- X 8'+-	10.00 ea	8,500.00 /ea	85,000
	<i>Display Cases</i>		<u>0.508/sf</u>	<u>85,000</u>
	167,352.00 sf			
10-1400.120	<i>Signs - Interior</i>			
110	Building Directory - Signage Allowance	167,352.00 sf	0.40 /sf	66,941
110	Commemorative Plaques	1.00 ls	3,800.00 /ls	3,800
110	LEED Plaques	1.00 ls	2,500.00 /ls	2,500
110	Signage for Concealed Spaces.	1.00 ls	1,200.00 /ls	1,200
	<i>Signs - Interior</i>		<u>0.445/sf</u>	<u>74,441</u>
	167,352.00 sf			
10-2113.110	<i>Toilet Partitions</i>			
2	ADA Toilet Compartment (Solid Polymer Resin, Radiused Edges, Solid Color)	9.00 ea	1,800.00 /ea	16,200
2	Standard Toilet Compartment (Solid Polymer Resin, Radiused Edges, Solid Color)	42.00 ea	1,500.00 /ea	63,000
2	Urinal Screen (Solid Polymer Resin, Radiused Edges, Solid Color)	9.00 ea	375.00 /ea	3,375
	<i>Toilet Partitions</i>		<u>0.493/sf</u>	<u>82,575</u>
	167,352.00 sf			
10-2123.200	<i>Curtains &amp; Track</i>			
2	Cubicle Curtains and Track	90.00 lf	75.00 /lf	6,750
	<i>Curtains &amp; Track</i>		<u>0.04 /sf</u>	<u>6,750</u>
	167,352.00 sf			
10-2601.001	<i>Wall &amp; Corner Guards</i>			
001	Wall Pads On Walls De-Esc Rooms	828.00 sf	20.00 /sf	16,560
	<i>Wall &amp; Corner Guards</i>		<u>0.099/sf</u>	<u>16,560</u>
	167,352.00 sf			
10-2613.100	<i>Corner Guards</i>			
2	CG Corner Guards	210.00 ea	175.00 /ea	36,750
	<i>Corner Guards</i>		<u>0.22 /sf</u>	<u>36,750</u>
	167,352.00 sf			
10-2813.100	<i>Toilet Accessories</i>			
2	Waste Receptacle (WR)(20 Gallons 11.5" x 20.6")	44.00 ea	200.00 /ea	8,800

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
10-2813.100	<i>Toilet Accessories</i>				
2	Mirrors, Framed (MIR, CLD-MIR, PK-MIR)	57.00 ea	450.00 /ea		25,650
2	Sanitary Napkin Disposal Unit (SND)	12.00 ea	95.00 /ea		1,140
2	Sanitary Napkin Double-Disposal Unit (SND)	24.00 ea	185.00 /ea		4,440
2	Shower Curtain Rod and Curtain (SC)	1.00 ea	386.00 /ea		386
2	Folding Shower Seat (FSS)	1.00 ea	575.00 /ea		575
2	Towel bar (TB)	1.00 ea	250.00 /ea		250
2	Robe Hook (RB HK)	1.00 ea	95.00 /ea		95
2	Hook Strip (HS)	1.00 ea	170.00 /ea		170
2	Baby Changing Table (CHGTB)	2.00 ea	785.00 /ea		1,570
2	Utility Shelf/Mop and Broom Holder (MH)	4.00 ea	225.00 /ea		900
2	Grab Bar 42"	79.00 ea	185.00 /ea		14,615
2	Grab Bar 36"	9.00 ea	155.00 /ea		1,395
2	D OFOI Toilet Paper Dispenser (TPD)	89.00 BY			
			OTH		
			ER		
2	D OFOI Paper Towel Dispenser (PTD)	44.00 BY			
			OTH		
			ER		
2	D OFOI Soap Dispenser (SD)	50.00 BY			
			OTH		
			ER		
	<i>Toilet Accessories</i>			0.358/sf	59,986
	167,352.00 sf				
10-4413.100	<i>Fire Cabinets</i>				
30	Fire Extinguisher and Cabinet	39.00 ea	550.00 /ea		21,450
30	Fire Extinguisher at Mechanical Area(s)	14.00 Allow	225.00 /Allow		3,150
30	D A.E.D. With Cabinet	2.00 ea	1,300.00 /ea		2,600
	<i>Fire Cabinets</i>			0.163/sf	27,200
	167,352.00 sf				
10-5100.100	<i>Lockers Metal</i>				
10	Double Tier HDPE Student Lockers 12" x 15" x 60"	303.00 ea	700.00 /ea		212,100
10	Single Tier HDPE Lockers Level 2	372.00 ea	420.00 /ea		156,240
10	Staff Metal Lockers	3.00 ea	165.00 /ea		495
	<i>Lockers Metal</i>			2.204/sf	368,835
	167,352.00 sf				
	<i>SPECIALTIES</i>			6.292/sf	1,053,037
	167,352.00 sf				
	<i>C1030 Fittings</i>			10.908/sf	1,825,498
	167,352.00 sf				
	<b>C10 INTERIOR CONSTRUCTION</b>			<b>42.875/sf</b>	<b>7,175,221</b>
	<b>167,352.00 sf</b>				
	5,646,723.00 Labor hours				
<b>C20</b>	<b>STAIRS</b>				



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
C2010	Stair Construction			
03-0000.000	CONCRETE			
03-0010.160	Concrete - Stairs And Landings			
105	Stair 1	2.00 Flt	2,200.00 /Flt	4,400
105	Stair 2 To Roof	3.00 Flt	2,200.00 /Flt	6,600
105	Stair 3	2.00 Flt	2,200.00 /Flt	4,400
105	Stair 4	2.00 Flt	2,200.00 /Flt	4,400
105	Stair 5	2.00 Flt	2,200.00 /Flt	4,400
	Concrete - Stairs And Landings		0.145/sf	24,200
	167,352.00 sf			
	CONCRETE		0.145/sf	24,200
	167,352.00 sf			
05-0000.000	METALS			
05-5113.100	Stairs & Ladders			
10	Stair 1	2.00 Flt	20,000.00 /Flt	40,000
10	Stair 2 To Roof	3.00 Flt	20,000.00 /Flt	60,000
10	Stair 3	2.00 Flt	20,000.00 /Flt	40,000
10	Stair 4	2.00 Flt	20,000.00 /Flt	40,000
10	Stair 5	2.00 Flt	20,000.00 /Flt	40,000
	Stairs & Ladders		1.315/sf	220,000
	167,352.00 sf			
05-5213.200	Handrails - Guardrails			
10	Stair 1 Wall Railings	108.00 lf	120.00 /lf	12,960
10	Stair 2 Wall Railings	152.00 lf	120.00 /lf	18,240
10	Stair 3 Wall Railings	108.00 lf	120.00 /lf	12,960
10	Stair 4 Wall Railings	108.00 lf	120.00 /lf	12,960
10	Stair 5 Wall Railings	100.00 lf	120.00 /lf	12,000
10	Stair 1 Wire Mesh Railings Type 2	80.00 lf	275.00 /lf	22,000
10	Stair 2 Wire Mesh Railings Type 2	102.00 lf	275.00 /lf	28,050
10	Stair 2 8' Wire Mesh With Mesh Door/Hardware	13.00 lf	750.00 /lf	9,750
10	Stair 4 Wire Mesh Railings Type 2	80.00 lf	275.00 /lf	22,000
10	Stair 5 Glass Railings Type 1	90.00 lf	500.00 /lf	45,000
10	Stair 2 Wire Mesh Railings Type 2	102.00 lf	275.00 /lf	28,050
10	Stair 3 Wire Mesh Railings Type 2	80.00 lf	275.00 /lf	22,000
10	Stair 4 Wire Mesh Railings Type 2	80.00 lf	275.00 /lf	22,000
	Handrails - Guardrails		1.601/sf	267,970
	167,352.00 sf			
	METALS		2.916/sf	487,970
	167,352.00 sf			
	C2010 Stair Construction		3.06 /sf	512,170
	167,352.00 sf			
C2020	Stair Finishes			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
09-0000.000	<i>FINISHES</i>			
09-6500.200	<i>Flooring- Resilient Stair</i>			
2	RFL Rubber Sheet Flooring At Stairs	3,050.00 sf	14.00 /sf	42,700
2	RRT Rubber Treads And Risers Stair 1	248.00 lf	22.00 /lf	5,456
2	RRT Rubber Treads And Risers Stair 2	378.00 lf	22.00 /lf	8,316
2	RRT Rubber Treads And Risers Stair 3	248.00 lf	22.00 /lf	5,456
2	RRT Rubber Treads And Risers Stair 4	248.00 lf	22.00 /lf	5,456
2	RRT Rubber Treads And Risers Stair 5	248.00 lf	22.00 /lf	5,456
2	RFL Rubber Sheet Flooring Minor Preparation	4,420.00 sf	0.75 /sf	3,315
2	RFL Rubber Sheet Flooring Initial Cleaning Per Manu. Require.	4,420.00 sf	0.80 /sf	3,536
2	RFL Rubber Sheet Flooring Protection Per Manu.Require.	4,420.00 sf	0.75 /sf	3,315
2	RFL Rubber Sheet Flooring In Place Mock-up	0.00 MOC K-UP		
	<i>Flooring- Resilient Stair</i>		<u>0.496/sf</u>	<u>83,006</u>
	167,352.00 sf			
09-9123.200	<i>Painting- Interior</i>			
30	Paint Stair Well 1	2.00 Flt	2,500.00 /Flt	5,000
30	Paint Stair Well 2	3.00 Flt	2,500.00 /Flt	7,500
30	Paint Stair Well 3	2.00 Flt	2,500.00 /Flt	5,000
30	Paint Stair Well 4	2.00 Flt	2,500.00 /Flt	5,000
30	Paint Stair Well 5	2.00 Flt	2,500.00 /Flt	5,000
	<i>Painting- Interior</i>		<u>0.164/sf</u>	<u>27,500</u>
	167,352.00 sf			
	<i>FINISHES</i>		<u>0.66 /sf</u>	<u>110,506</u>
	167,352.00 sf			
	<i>C2020 Stair Finishes</i>		<u>0.66 /sf</u>	<u>110,506</u>
	167,352.00 sf			
	<b>C20 STAIRS</b>		<b>3.721/sf</b>	<b>622,676</b>
	167,352.00 sf			
<b>C30</b>	<b>INTERIOR FINISHES</b>			
C3010	<i>Wall Finishes</i>			
06-2000.000	<i>FINISH CARPENTRY</i>			
06-2000.010	<i>Finish Carpentry</i>			
2	FRP 1 Janitors/Storage	1,100.00 sf	12.00 /sf	13,200
2	FRP 2 & 3 Kitchen Digital	980.00 sf	22.00 /sf	21,560
	<i>Finish Carpentry</i>		<u>0.208/sf</u>	<u>34,760</u>
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>FINISH CARPENTRY</i>		0.208/sf	34,760
	167,352.00 sf			
09-0000.000	<i>FINISHES</i>			
09-3116.100	<i>Tile- Quarry</i>			
2	T - Glazed Wall Tile 8" x 8"	3,780.00 sf	22.00 /sf	83,160
2	LVL 1 Tile Mix = T14-27% & T2-17% & T15-7% & T3-30% & T1-19%	9,202.00 sf	24.00 /sf	220,848
2	LVL 2 Tile Mix = T14-27% & T4-17% & T16-7% & T5-30% & T1-19%	4,056.00 sf	24.00 /sf	97,344
2	LVL 3 Tile Mix = T14-27% & T6-17% & T17-7% & T7-30% & T1-19%	4,074.00 sf	24.00 /sf	97,776
	<i>Tile- Quarry</i>		2.983/sf	499,128
	167,352.00 sf			
09-7216.110	<i>Wall Covering Vinyl</i>			
2	Wall Coverings	1,600.00 sf	38.00 /sf	60,800
	<i>Wall Covering Vinyl</i>		0.363/sf	60,800
	167,352.00 sf			
09-8400.100	<i>Acoustical Panels</i>			
2	AWP-1/Knauf: Ecosce @ Cafe	510.00 sf	40.00 /sf	20,400
2	AWP-2/Armstrong; ACGI Woodworks Microperforated Wall Panels @ Cafe	568.00 sf	65.00 /sf	36,920
2	AWP-2/Armstrong; ACGI Woodworks Microperforated Wall Panels @ Music Room	40.00 sf	65.00 /sf	2,600
2	AWP-4/Conwed Designscape-Wall Technology Respond IR108 Series Acoustic Panels @ Music Room	170.00 sf	40.00 /sf	6,800
2	AWP-3/Tectum @ GYM	2,100.00 sf	28.00 /sf	58,800
	<i>Acoustical Panels</i>		0.75 /sf	125,520
	167,352.00 sf			
09-9123.200	<i>Painting- Interior</i>			
10	Paint Walls	296,855.00 sf	0.80 /sf	237,484
10	Paint Walls CMU	8,400.00 sf	1.10 /sf	9,240
20	Paint Green Screen	150.00 sf	4.00 /sf	600
20	Paint Borrowed Lites HM	77.00 ea	175.00 /ea	13,475
	<i>Painting- Interior</i>		1.558/sf	260,799
	167,352.00 sf			
	<i>FINISHES</i>		5.654/sf	946,247
	167,352.00 sf			
10-0000.000	<i>SPECIALTIES</i>			
10-2606.001	<i>Digitally Printed Protective Wallcoverings</i>			
001	DPW-1 Digitall Wall Protection	140.00 sf	32.00 /sf	4,480
001	DPW-2 Digitall Wall Protection	444.00 sf	32.00 /sf	14,208
001	DPW-3 Digitall Wall Protection	570.00 sf	32.00 /sf	18,240
001	DPW-4 Digitall Wall Protection	540.00 sf	32.00 /sf	17,280

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
10-2606.001	<i>Digitally Printed Protective Wallcoverings</i>			
001	DPW-5 Digital Wall Protection	410.00 sf	32.00 /sf	13,120
	<i>Digitally Printed Protective Wallcoverings</i>		0.402/sf	67,328
	167,352.00 sf			
	<i>SPECIALTIES</i>		0.402/sf	67,328
	167,352.00 sf			
	<i>C3010 Wall Finishes</i>		6.264/sf	1,048,335
	167,352.00 sf			
C3020	<i>Floor Finishes</i>			
09-0000.000	<i>FINISHES</i>			
09-3116.100	<i>Tile- Quarry</i>			
2	Quarry Tile	2,243.00 sf	24.00 /sf	53,832
2	Quarry Tile Base	425.00 lf	22.00 /lf	9,350
2	Quarry Tile Minor Preparation	2,243.00 sf	0.75 /sf	1,682
2	Quarry Tile Initial Cleaning Per Manu.Require	2,243.00 sf	0.30 /sf	673
2	Quarry Tile Protection With Red-Rosin Paper (Part 3)	2,243.00 sf	0.75 /sf	1,682
2	Quarry Tile Owner Extra Materials at 5% (Package,Deliver)	112.00 sf	24.00 /sf	2,688
2	Quarry Base Owner Extra Materials at 5% (Package,Deliver)	21.00 lf	20.00 /lf	420
2	Quarry Tile Mock-up Minimum 25 sf In Place	25.00 sf	24.00 /sf	600
2	Quarry Base Mock-up Minimum 25 sf In Place	25.00 lf	20.00 /lf	500
	<i>Tile- Quarry</i>		0.427/sf	71,427
	167,352.00 sf			
09-6400.100	<i>Flooring- Wood</i>			
145	-- D Gymnasium Wood Athletic Floor , Robbins, Inc, Bio-Channel Star	6,000.00 sf	17.00 /sf	102,000
145	Gymnasium Wood Athletic Floor Vented Base	320.00 lf	7.25 /lf	2,320
145	Floor Minor Preparation	6,000.00 sf	0.75 /sf	4,500
145	Gymnasium Wood Athletic Flooring Polish and Clean Per Manufactures Requirements	6,000.00 sf	0.50 /sf	3,000
145	Gymnasium Wood Athletic Flooring Protection With Red-Rosin Paper (Part 3)	6,000.00 sf	0.75 /sf	4,500
145	Gymnasium Wood Athletic Floor Owner Extra Materials at 5% (Package,Deliver)	300.00 sf	18.75 /sf	5,625
145	-- D Platform Wood Strip and Plank Flooring - Sleeper System	874.00 sf	24.25 /sf	21,195
145	Platform Wood Strip and Plank Flooring Vented Base	140.00 lf	7.251 /lf	1,015
145	Floor Minor Preparation	874.00 sf	1.25 /sf	1,093
145	Platform Wood and Plank Flooring Polish and Clean Per Manufactures Requirements	874.00 sf	0.50 /sf	437
145	Platform Wood and Plank Flooring Protection With Red-Rosin Paper (Part 3)	874.00 sf	0.75 /sf	656
145	Platform Wood and Plank Flooring Owner Extra Materials at 5% (Package,Deliver)	44.00 sf	22.00 /sf	968
	<i>Flooring- Wood</i>		0.88 /sf	147,308
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>Flooring- Wood</i>		0.88 /sf	147,308
	167,352.00 sf			
09-6500.100	<i>Flooring- Resilient</i>			
2	Luxury Vinyl Tile			
2	Luxury Vinyl Tile	473.00 sf	6.50 /sf	3,075
2	Luxury Vinyl Tile - Flooring Flooring Minor Preparation	473.00 sf	1.25 /sf	591
2	Luxury Vinyl Tile - Intial Cleaning Per Manu. Require	473.00 sf	0.50 /sf	237
2	Luxuty Vinyl Tile - Protection per Manu. Require	473.00 sf	0.75 /sf	355
2	Owner Exta Materials At 5% (Package,Deliver)	24.00 sf	6.50 /sf	156
2	Resilient Athletic Flooring In Place Mock-up	25.00 sf	6.50 /sf	163
2	Resilient Athletic Flooring	874.00 sf	14.00 /sf	12,236
2	Resilient Athletic Flooring Minor Preparation	874.00 sf	1.25 /sf	1,093
2	Resilient Athletic Flooring Initial Cleaning Per Manu.Require	874.00 sf	0.50 /sf	437
2	Resilient Athletic Flooring Protection Per Manu.Require. Flooring	874.00 sf	0.75 /sf	656
2	Owner Exta Materials At 5% (Package,Deliver)	44.00 sf	14.00 /sf	616
2	Resilient Athletic Flooring In Place Mock-up	25.00 sf	14.00 /sf	350
2	SDT - 1 Flooting			
2	SDT -1 Flooring	546.00 sf	11.00 /sf	6,006
2	SDT -1 Flooring Flooring Minor Preparation	546.00 sf	1.25 /sf	683
2	SDT -1 Flooring Flooring Initial Cleaning Per Manu.Require	546.00 sf	0.50 /sf	273
2	SDT -1 Flooring Flooring Protection Per Manu.Require. Flooring	546.00 sf	0.75 /sf	410
2	Owner Exta Materials At 5% (Package,Deliver)	28.00 sf	110.00 /sf	3,080
2	SDT - 1 Flooring 25SqFt Mock-Up	25.00 sf	11.00 /sf	275
2	Linoleum Flooring			
2	Linoleum - 1	89,192.00 sf	6.85 /sf	610,965
2	Linoleum - 2	3,628.00 sf	6.85 /sf	24,852
2	Linoleum - 3	4,628.00 sf	6.85 /sf	31,702
2	Linoleum - 4	5,869.00 sf	6.85 /sf	40,203
2	Linoleum - 5	4,296.00 sf	6.85 /sf	29,428
2	Linoleum Floor Minor Preparation	107,548.00 sf	0.75 /sf	80,661
2	Linoleum Flooring Initial Cleaning Per Manu.Require	107,548.00 sf	0.30 /sf	32,264
2	Linoleum Flooring Protection Per Manu.Require. Flooring	107,548.00 sf	0.35 /sf	37,642
2	Linoleum Mock-up Minimum 25 sf In Place	25.00 sf	6.85 /sf	171
2	Rubber Flooring	2,037.00 sf	14.00 /sf	28,518
2	Rubber Flooring Minor Preparation	2,037.00 sf	1.25 /sf	2,546
2	Rubber Flooring Initial Cleaning Per Manu.Require	2,037.00 sf	0.50 /sf	1,019
2	Rubber Flooring Protection Per Manu.Require. Flooring	2,037.00 sf	0.75 /sf	1,528
2	Owner Exta Materials At 5% (Package,Deliver)	1,167.00 sf	14.00 /sf	16,338
2	Rubber Flooring In Place Mock-up	25.00 sf	14.00 /sf	350
	<i>Flooring- Resilient</i>		5.789/sf	968,875
	167,352.00 sf			
09-6500.110	<i>Flooring Base</i>			
2	Resilient Base - 1	17,601.00 lf	3.35 /lf	58,963
2	Resilient Base -1 - Owner Exta Materials at 5% (Package,Deliver)	880.00 lf	2.25 /lf	1,980
2	Resilient Base - 2	411.00 lf	3.35 /lf	1,377
2	Resilient Base - 2 Owner Exta Materials at 5% (Package,Deliver)	21.00 lf	2.25 /lf	47

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>Flooring Base</i>		<i>0.373/sf</i>	<i>62,367</i>
	<i>167,352.00 sf</i>			
09-6700.110	<i>Epoxy Flooring</i>			
10	Epoxy Applied Flooring	6,949.00 sf	11.00 /sf	76,439
10	Epoxy Applied Flooring Integral Base	2,096.00 lf	14.00 /lf	29,344
10	Epoxy Flooring Minor Preparation	6,949.00 sf	0.75 /sf	5,212
10	Epoxy Flooring Initial Cleaning Per Manu.Require	6,949.00 sf	0.30 /sf	2,085
10	Epoxy Flooring Protection Per Manu.Require. Flooring	6,949.00 sf	0.25 /sf	1,737
10	Owner Exta Materials At 5% (Package,Deliver)	382.00 sf	12.00 /sf	4,584
10	Epoxy Flooring In Place Mock-up	25.00 sf	14.00 /sf	350
	<i>Epoxy Flooring</i>		<i>0.716/sf</i>	<i>119,751</i>
	<i>167,352.00 sf</i>			
09-6800.100	<i>Flooring - Carpet</i>			
f 10	Carpet Tile	13,075.00 sf	5.70 /sf	74,528
f 10	Floor Minor Preparation	13,075.00 sf	0.75 /sf	9,806
f 10	Floor Protection / Cover with not less than 6-mil thick polyethylene covering with taped joints	13,075.00 sf	0.35 /sf	4,576
f 10	Clean and Vacuum Carpet Surfaces Upon Completion of The Installation.	13,075.00 sf	0.18 /sf	2,354
f 10	Carpet Tile Mock-up Minimum 25 sf In Place	654.00 sf	5.70 /sf	3,728
f 10	Carpet Tile Owner Exta Materials at 5% (Package,Deliver)	25.00 sf	5.70 /sf	143
	<i>Flooring - Carpet</i>		<i>0.568/sf</i>	<i>95,134</i>
	<i>167,352.00 sf</i>			
09-9101.100	<i>Painting - Sealing Floors</i>			
120	Paint - Epoxy Concrete Slabs	5,800.00 sf	3.50 /sf	20,300
120	Floor Minor Preparation	5,800.00 sf	0.50 /sf	2,900
120	Floor Protection (Part 3)	5,800.00 sf	0.75 /sf	4,350
	<i>Painting - Sealing Floors</i>		<i>0.165/sf</i>	<i>27,550</i>
	<i>167,352.00 sf</i>			
	<i>FINISHES</i>		<i>8.918/sf</i>	<i>1,492,412</i>
	<i>167,352.00 sf</i>			
	<i>C3020 Floor Finishes</i>		<i>8.918/sf</i>	<i>1,492,412</i>
	<i>167,352.00 sf</i>			
C3030	<i>Ceiling Finishes</i>			
09-0000.000	<i>FINISHES</i>			
09-2000.014	<i>Drywall Ceilings</i>			
2499	GWB Ceilings And Flat Soffits	8,414.00 sf	15.00 /sf	126,210
2499	GWB Vertical Soffits	5,331.00 sf	15.00 /sf	79,965
	<i>Drywall Ceilings</i>		<i>1.232/sf</i>	<i>206,175</i>
	<i>167,352.00 sf</i>			



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
09-5000.110	<i>Ceilings - ACT</i>			
2	ACP - 1	84,451.00 sf	5.00 /sf	422,255
2	ACP - 1A	34,499.00 sf	5.25 /sf	181,120
2	ACP - 1A Black Ceiling Tile Green Room	200.00 sf	5.25 /sf	1,050
2	ACP - 2A	332.00 sf	5.25 /sf	1,743
2	ACP - 4	2,656.00 sf	6.50 /sf	17,264
2	ACP - 6 Serpentina Waves / Cafe Curved	2,728.00 sf	60.00 /sf	163,680
2	ACP-7 - Wood Works Grille Ceiling	6,312.00 sf	40.00 /sf	252,480
2	Curved Metal Soffit At Platform	275.00 sf	70.00 /sf	19,250
	<i>Ceilings - ACT</i>		6.327/sf	1,058,842
	167,352.00 sf			
09-9123.200	<i>Painting- Interior</i>			
20	Paint GWB Ceilings/Soffits	13,745.00 sf	1.50 /sf	20,618
20	Paint Exposed Ceilings	10,662.00 sf	3.00 /sf	31,986
	<i>Painting- Interior</i>		0.314/sf	52,604
	167,352.00 sf			
	<b>FINISHES</b>		7.873/sf	1,317,620
	167,352.00 sf			
	<b>C3030 Ceiling Finishes</b>		7.873/sf	1,317,620
	167,352.00 sf			
	<b>C30 INTERIOR FINISHES</b>		23.055/sf	3,858,367
	167,352.00 sf			
	<b>C INTERIORS</b>		69.651/sf	11,656,264
	167,352.00 sf			
<b>D</b>	<b>SERVICES</b>			
<b>D10</b>	<b>CONVEYING</b>			
D1010	<i>Vertical Conveying Systems</i>			
03-0000.000	<b>CONCRETE</b>			
03-6110.100	<i>Hand Grout Equip</i>			
500	Grout Elevator Sill Angles	3.00 ea	250.00 /ea	750
	<i>Hand Grout Equip</i>		0.004/sf	750
	167,352.00 sf			
	<b>CONCRETE</b>		0.004/sf	750
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>CONCRETE</i>		<i>0.004/sf</i>	<i>750</i>
	<i>167,352.00 sf</i>			
05-0000.000	<i>METALS</i>			
05-5113.100	<i>Stairs &amp; Ladders</i>			
102	Elevator Pit Ladder	1.00 ea	2,800.00 /ea	2,800
	<i>Stairs &amp; Ladders</i>		<i>0.017/sf</i>	<i>2,800</i>
	<i>167,352.00 sf</i>			
05-5820.125	<i>Misc. Steel</i>			
22	Sill Angles	3.00 ea	583.333 /ea	1,750
22	Sump Pit Frame Grate	1.00 ea	950.00 /ea	950
22	Hoist Beam	1.00 ea	1,800.00 /ea	1,800
	<i>Misc. Steel</i>		<i>0.027/sf</i>	<i>4,500</i>
	<i>167,352.00 sf</i>			
	<i>METALS</i>		<i>0.044/sf</i>	<i>7,300</i>
	<i>167,352.00 sf</i>			
09-0000.000	<i>FINISHES</i>			
09-6500.100	<i>Flooring- Resilient</i>			
2	ELEVATOR RUBBER SHEET FLOORING	0.00 LOC		
2	RFL Rubber Sheet Flooring At Elevator	55.00 sf	18.00 /sf	990
2	RFL Rubber Sheet Flooring Minor Preparation At Elevator	55.00 sf	0.75 /sf	41
2	RFL Rubber Sheet Flooring Initial Cleaning Per Manu.Require At Elevator	55.00 sf	0.55 /sf	30
2	RFL Rubber Sheet Flooring Protection Per Manu.Require. At Elevator	55.00 sf	0.75 /sf	41
2	Owner Exta Materials At 5% (Package,Deliver)	0.00 sf		
2	RFL Sheet Flooring In Place Mock-up	0.00 MOC K-UP		
	<i>Flooring- Resilient</i>		<i>0.007/sf</i>	<i>1,103</i>
	<i>167,352.00 sf</i>			
	<i>FINISHES</i>		<i>0.007/sf</i>	<i>1,103</i>
	<i>167,352.00 sf</i>			
14-0000.000	<i>CONVEYING SYSTEMS</i>			
14-2000.100	<i>Elevator Hydraulic</i>			
2	Passenger Elevator(s) Holess Hydraulic, 3500 lbs, 100 fpm [Canton Elevator, Incorporated:]	3.00 stp	58,000.00 /stp	174,000
	<i>Elevator Hydraulic</i>		<i>1.04 /sf</i>	<i>174,000</i>
	<i>167,352.00 sf</i>			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>CONVEYING SYSTEMS</i>		1.04 /sf	174,000
	167,352.00 sf			
	<i>D1010 Vertical Conveying Systems</i>		1.094/sf	183,153
	167,352.00 sf			
	<b>D10 CONVEYING</b>		<b>1.094/sf</b>	<b>183,153</b>
	<b>167,352.00 sf</b>			
<b>D20</b>	<b>PLUMBING</b>			
D2010	Plumbing Fixtures			
22-0000.000	PLUMBING			
22-1000.000	Plumbing			
10	Fixtures	0.00	ITEM	
10	P-1, 1A, 1B (Water Closets)	87.00	ea	1,100.00 /ea 95,700
10	P-1A (Water Closet ADA)	0.00	Abovr	
10	P-1B (Small Lavatory)	0.00	Abovr	
10	P-2 (Lavatory)	15.00	ea	1,080.00 /ea 16,200
10	P-2A (Lavatory ADA)	28.00	ea	1,080.00 /ea 30,240
10	P-2B (Small Lavatory)	14.00	ea	980.00 /ea 13,720
10	P-3 (Urinal)	18.00	ea	700.00 /ea 12,600
10	P-3A (Urinal)	0.00	ea	
10	P-4 (Classroom Sink)	19.00	ea	1,250.00 /ea 23,750
10	P-4A (Hall Sink)	12.00	ea	1,250.00 /ea 15,000
10	P-4B (Dining Sink)	3.00	ea	1,250.00 /ea 3,750
10	P-4C (Sink)	16.00	ea	1,200.00 /ea 19,200
10	P-5 (Drinking Fountain)	12.00	ea	1,250.00 /ea 15,000
10	P-6 (Janitor Sink)	5.00	ea	1,200.00 /ea 6,000
10	P-7 (Art Sink)	4.00	ea	1,250.00 /ea 5,000
10	P-8 (Shower)	1.00	ea	3,000.00 /ea 3,000
10	FD-1, 2	23.00	ea	750.00 /ea 17,250
10	RD-1	28.00	ea	850.00 /ea 23,800
10	RD-2	12.00	ea	850.00 /ea 10,200
10	RD-3	5.00	ea	850.00 /ea 4,250
10	OD-1	15.00	ea	850.00 /ea 12,750
10	OD-2	16.00	ea	850.00 /ea 13,600
10	OD-3	3.00	ea	850.00 /ea 2,550
10	HB, WH	12.00	ea	550.00 /ea 6,600
10	Eco-Floor Cleanout	0.00	ea	
10	Storm	9.00	ea	800.00 /ea 7,200
10	Sanitary	14.00	ea	800.00 /ea 11,200
10	Electronic flush valves (WC's & Lav's)	162.00	ea	450.00 /ea 72,900
10	Kitchen Connections:	0.00	NAM	
			E	
10	Water	28.00	ea	200.00 /ea 5,600
10	Waste	26.00	ea	250.00 /ea 6,500
10	Gas	9.00	ea	350.00 /ea 3,150
10	Equipment	0.00	ea	
10	DWH-1	1.00	ea	28,624.00 /ea 28,624
10	DWH-2	1.00	ea	28,624.00 /ea 28,624
10	XT-1	1.00	ea	480.00 /ea 480
10	XT-2	1.00	ea	480.00 /ea 480
10	RCP-1: Hot water circulation pump	1.00	ea	1,600.00 /ea 1,600
10	SP-1: Elevator sump pump, 50 GPM	1.00	ea	1,250.00 /ea 1,250

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
22-1000.000	<i>Plumbing</i>				
10	GI-1: Grease Interceptor, 50 GPM, (Schier GB2)	1.00 ea	1,250.00 /ea		1,250
10	GI-2: Grease Interceptor, 35 GPM, (Schier GB2)	1.00 ea	1,250.00 /ea		1,250
10	SI-1: Striem HLT-1176	6.00 ea	800.00 /ea		4,800
10	Back Flow Preventer	0.00 ITEM			
10	- 6"	1.00 ea	4,816.00 /ea		4,816
10	- 1 1/2"	1.00 ea	1,000.00 /ea		1,000
10	Cold Water Meter	1.00 ea	3,500.00 /ea		3,500
10	Hot Water Meter	1.00 ea	3,500.00 /ea		3,500
10	Makeup water meter	1.00 ea	3,500.00 /ea		3,500
10	Thermostatic Mixing Valve at Hot Water Heater	1.00 ea	1,250.00 /ea		1,250
	Recirculation Line				
10		0.00 ea			
	<i>Plumbing</i>			3.242/sf	542,634
	167,352.00 sf				
	<b>PLUMBING</b>			3.242/sf	542,634
	167,352.00 sf				
	<i>D2010 Plumbing Fixtures</i>			3.242/sf	542,634
	167,352.00 sf				
D2020	<i>Domestic Water Distribution</i>				
22-0000.000	<b>PLUMBING</b>				
22-1000.000	<i>Plumbing</i>				
10	Domestic Water Distribution	0.00 ITEM			
10	Boiler intake flue	25.00 lf	250.00 /lf		6,250
10	Boiler exhaust breeching	25.00 ls	500.00 /ls		12,500
10	Exhaust and Combustion Intake Piping, 6"	50.00 lf	300.00 /lf		15,000
10	Incoming 6" water from 10' outside the building incl. sleeves	1.00 ls	5,000.00 /ls		5,000
10	Domestic Water Underslab - Type K pipe	0.00 ITEM			
10	Incoming 6" water from 10' outside the building incl. sleeves	1.00 ls	5,000.00 /ls		5,000
10	Domestic Water Above Slab - Copper type L	0.00 ITEM			
10	6" Domestic Water	44.00 lf	150.00 /lf		6,600
10	4" Domestic Water	564.00 lf	124.00 /lf		69,936
10	3" Domestic Water	25.00 lf	81.00 /lf		2,025
10	2 1/2" Domestic Water	719.00 lf	67.00 /lf		48,173
10	2" Domestic Water	138.00 lf	47.00 /lf		6,486
10	1 1/2" Domestic Water	156.00 lf	36.00 /lf		5,616
10	1" Domestic Water	975.00 lf	25.00 /lf		24,375
10	3/4" Domestic Water	577.00 lf	20.00 /lf		11,540
10	1/2" Domestic Water	577.00 lf	18.00 /lf		10,386
10	Branch connections to fixtures	2,088.00 lf	22.00 /lf		45,936
10	Insulation on Piping	5,864.00 lf	8.00 /lf		46,912
10	Final connections to fixtures	347.00 ea	200.00 /ea		69,400
10	Valves & Specialties	0.00 Abov e			
	<i>Plumbing</i>			2.337/sf	391,135
	167,352.00 sf				

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>PLUMBING</i>		2.337/sf	391,135
	167,352.00 sf			
	<i>D2020 Domestic Water Distribution</i>		2.337/sf	391,135
	167,352.00 sf			
D2030	<i>Sanitary Waste</i>			
22-0000.000	<i>PLUMBING</i>			
22-1000.000	<i>Plumbing</i>			
10	Sanitary Waste & Vent (Hubless Cast Iron)	0.00	ITEM	
10	5" Waste	356.00	lf	90.00 /lf 32,040
10	4" Waste	1,124.00	lf	83.00 /lf 93,292
10	2" Waste	341.00	lf	55.00 /lf 18,755
10	4" Kitchen Waste	72.00	lf	83.00 /lf 5,976
10	2" Kitchen Waste	11.00	lf	55.00 /lf 605
10	1 1/2" Waste	34.00	lf	45.00 /lf 1,530
10	Above Slab*****	0.00	ITEM	
10	4" Waste	576.00	lf	67.00 /lf 38,592
10	2" Waste	522.00	lf	33.00 /lf 17,226
10	branch distribution piping & drop connection to fixtures (1 1/2" assumed)	2,530.00	lf	26.00 /lf 65,780
10	VTR; Vent through roof - 4"	0.00	ITEM	
10	- 4"	3.00	ea	750.00 /ea 2,250
10	- 3"	2.00	ea	650.00 /ea 1,300
10	- 2"	1.00	ea	500.00 /ea 500
10	Final connections to fixtures	239.00	ea	200.00 /ea 47,800
	<i>Plumbing</i>		1.946/sf	325,646
	167,352.00 sf			
	<i>PLUMBING</i>		1.946/sf	325,646
	167,352.00 sf			
	<i>D2030 Sanitary Waste</i>		1.946/sf	325,646
	167,352.00 sf			
D2040	<i>Rain Water Drainage</i>			
22-0000.000	<i>PLUMBING</i>			
22-1000.000	<i>Plumbing</i>			
10	Unnderslab (trench/backfill excluded)	0.00	ITEM	
10	12" Storm	54.00	lf	150.00 /lf 8,100
10	10" Storm	308.00	lf	130.00 /lf 40,040
10	8" Storm	262.00	lf	120.00 /lf 31,440
10	6" Storm	707.00	lf	107.00 /lf 75,649
10	5" Storm	113.00	lf	90.00 /lf 10,170
10	4" Storm	453.00	lf	83.00 /lf 37,599
10	Above Slab	0.00	ITEM	
10	8" Storm	326.00	lf	140.00 /lf 45,640
10	6" Storm	652.00	lf	107.00 /lf 69,764
10	5" Storm	1,616.00	lf	80.00 /lf 129,280
10	4" Storm	1,048.00	lf	67.00 /lf 70,216

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>Plumbing</i>		3.095/sf	517,898
	167,352.00 sf			
	<b>PLUMBING</b>		3.095/sf	517,898
	167,352.00 sf			
	<i>D2040 Rain Water Drainage</i>		3.095/sf	517,898
	167,352.00 sf			
D2090	<i>Other Plumbing Systems</i>			
22-0000.000	<b>PLUMBING</b>			
22-1000.000	<i>Plumbing</i>			
2	Natural Gas System	0.00	ITEM	
2	Gas Meter - 6"	1.00	sf	3,500
2	Gas piping	0.00	ITEM	
2	- 6" (Underslab)	65.00	lf	9,750
2	- 4"	163.00	lf	22,005
2	- 3"	453.00	lf	54,360
2	- 2 1/2"	120.00	lf	12,960
2	- 2"	289.00	lf	28,900
2	- 1 1/4"	83.00	lf	7,055
2	- 1"	68.00	lf	5,440
10	Water Treatment / testing/ Sign off /shutdowns	1.00	ls	12,500
10	Sub-trade on costs	1.00	ls	193,378
10	Plumbing SF Cost Gap TBD	167,352.00	sf	92,044
	<i>Plumbing</i>		2.64 /sf	441,892
	167,352.00 sf			
	<b>PLUMBING</b>		2.64 /sf	441,892
	167,352.00 sf			
	<i>D2090 Other Plumbing Systems</i>		2.64 /sf	441,892
	167,352.00 sf			
	<b>D20 PLUMBING</b>		13.261/sf	2,219,205
	167,352.00 sf			
D30	<b>HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)</b>			
D3020	<i>Heat Generating Systems</i>			
23-0000.000	<b>HVAC</b>			
23-0100.110	<i>HVAC</i>			
2	Main Equipment			
2	Heating equipment			
2	Boilers - B-1,2,3, 1000 MBH each, Lochinvar (FBN-1001)	3,000.00	mbh	75,000





# Northbridge Elementary School

8/26/2019 7:15 AM

**FONTAINE BROS., INC.**

Whitinsville, MA

CONSTRUCTION MANAGERS  
GENERAL CONTRACTORS

## 90% CD Budget Estimate Uniformat

90CD Reconciled

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
23-0100.110	HVAC			
2	Boilers Pump - P-1,2, 290 GPM each, Bell & Gossett (1510-3BC)	580.00 ea	25.00 /ea	14,500
2	CF-1, Chemical Shot Feeder serving HHW, 5.0 GAL	1.00 ea	15,000.00 /ea	15,000
2	AS-1, Air Separator, 250 GPM, dosing	1.00 ea	2,000.00 /ea	2,000
2	ET-1, Expansion Tank, 80L Capacity	1.00 ea	3,000.00 /ea	3,000
	HVAC		0.654/sf	109,500
	167,352.00 sf			
	HVAC		0.654/sf	109,500
	167,352.00 sf			
	D3020 Heat Generating Systems		0.654/sf	109,500
	167,352.00 sf			
D3030	Cooling Generating Systems			
23-0000.000	HVAC			
23-0100.110	HVAC			
2	Condenser Units	0.00 ITEM		
2	Condenser units for VRF units - allow	19.00 ea	2,800.00 /ea	53,200
2	VRFc-1, VRF Outdoor Units	5.00 ton	2,000.00 /ton	10,000
2	VRFc-2, VRF Outdoor Units	5.00 ea	2,000.00 /ea	10,000
	HVAC		0.437/sf	73,200
	167,352.00 sf			
	HVAC		0.437/sf	73,200
	167,352.00 sf			
	D3030 Cooling Generating Systems		0.437/sf	73,200
	167,352.00 sf			
D3040	Distribution Systems			
23-0000.000	HVAC			
23-0100.110	HVAC			
2	Air distribution			
2	Roof-top units, w/ 1 supply and 1 return fan each, Energy Recovery Wheel, Natural Gas Heating Coil, DX Cooling Coil	0.00 ITEM		
2	RTU-1, 8,710 CFM, 480 MBH Heating Capacity, 355 Cooling Capacity, (1) Supply fan @ 5 hp, (1) Return fan @ 1 hp	8,710.00 cfm	15.00 /cfm	130,650
2	RTU-2, 13,380 CFM, 480 MBH heating capacity, 582 MBH cooling capacity, (1) supply fan @ 10 hp, (1) return fan @ 2 hp	13,380.00 cfm	15.00 /cfm	200,700
2	RTU-3, 3,740 CFM, 160 MBH heating capacity, 157 MBH cooling capacity, (1) supply fan @ 5 hp, (1) return fan @ 1 hp	3,740.00 cfm	15.00 /cfm	56,100

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
23-0100.110	HVAC			
2	RTU-4, 11,090 CFM, 480 MBH heating capacity, 556 MBH cooling capacity, (1) supply fan @ 7.5 hp, (1) return fan @ 3 hp	11,090.00 cfm	15.00 /cfm	166,350
2	RTU-5, 11,410 CFM, 480 MBH heating capacity, 561 MBH cooling capacity, (1) supply fan @ 7.5 hp, (1) return fan @ 2 hp	11,410.00 cfm	15.00 /cfm	171,150
2	RTU-6, 1,740 CFM, 120 MBH heating capacity, 80 MBH cooling capacity, (1) supply fan @ 2 hp, (1) return fan @ 1 hp	1,740.00 cfm	15.00 /cfm	26,100
2	RTU-7, 12,430 CFM, 480 MBH heating capacity, 573 MBH cooling capacity, (1) supply fan @ 10 hp, (1) return fan @ 2 hp	12,430.00 cfm	15.00 /cfm	186,450
2	RTU-8, 7,280 CFM, 320 MBH heating capacity, 300 MBH cooling capacity, (1) supply fan @ 10 hp, (1) return fan @ 2 hp	7,280.00 cfm	15.00 /cfm	109,200
2	RTU-9, 6,300 CFM, 320 MBH heating capacity, 300 MBH cooling capacity, (1) supply fan @ 10 hp, (1) return fan @ 3 hp	6,300.00 cfm	15.00 /cfm	94,500
2	HV-1, 1,960 CFM, 80 MBH heating capacity, 107 MBH cooling capacity, (1) supply fan @ 2 hp, (1) return fan @ 0.5 hp	1,960.00 cfm	10.00 /cfm	19,600
2	MAU-1, 4,500 CFM, 280 MBH heating capacity, 327 MBH cooling capacity, (1) supply fan @ 7.5 hp	4,500.00 cfm	6.80 /cfm	30,600
2	Sound Attenuators	19.00 ea	5,500.00 /ea	104,500
2	Extract fans	0.00 ITEM		
2	KEF-1	4,500.00 cfm	3.00 /cfm	13,500
2	EF-1, Greenheck (G-VG), 1/10 hp	510.00 cfm	1.25 /cfm	638
2	EF-2, Greenheck (G-VG), 2 hp	3,150.00 cfm	1.25 /cfm	3,938
2	EF-3, Greenheck (G-VG), 1/10 hp	500.00 cfm	1.25 /cfm	625
2	EF-4, Greenheck (G-VG), 1 hp	2,350.00 cfm	1.25 /cfm	2,938
2	EF-5, Greenheck (G-VG), 1/10 hp	150.00 cfm	1.25 /cfm	188
2	EF-6, Greenheck (SQ-VG), 1/6 hp	500.00 cfm	1.25 /cfm	625
	HVAC		7.878/sf	1,318,350
	167,352.00 sf			
	HVAC		7.878/sf	1,318,350
	167,352.00 sf			
	D3040 Distribution Systems		7.878/sf	1,318,350
	167,352.00 sf			
D3090	Other HVAC Systems And Equipment			
23-0000.000	HVAC			
23-0100.110	HVAC			
2	Energy Performance			
2	Variable Frequency Drives			
2	RTUs	18.00 ea	8,500.00 /ea	153,000
2	MAU	1.00 ea	8,500.00 /ea	8,500
2	HV	2.00 ea	6,500.00 /ea	13,000
2	EF	7.00 ea	2,500.00 /ea	17,500
2	Pumps	2.00 ea	4,500.00 /ea	9,000
2	Energy Metering Allowance	1.00 ea	15,000.00 /ea	15,000
2	Heating/ cooling terminal units			
2	WRU-1, Wall Run Units, 11 units	162.00 lf	110.00 /lf	17,820

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
23-0100.110	HVAC			
2	Radiant panels	0.00	ITEM	
2	Radiant ceiling panels - (283 panels)	3,513.00	lf	125.00 /lf 439,125
2	VRF System Indoor Ceiling-Mounted Evaporator Heating/Cooling Units			
2	VRFe indoor Units, PLFY INC --- INC ABOVE ---	0.00	ABO VE	
2	CP-1 Condensate pump for VRF Units --- INC ABOVE ---	0.00	ABO VE	
2	Branch Circuit Controllers for VRFs above			
2	BC-1 serving VRFe 1-6	1.00	ea	5,000.00 /ea 5,000
2	BC-1 serving VRFe 7-12	1.00	ea	5,000.00 /ea 5,000
2	BC-1 serving VRFe 13-19	1.00	ea	5,000.00 /ea 5,000
2	Split AC unit	0.00	ITEM	
2	DCUe - 1,3,7,11,12,15,16, 247 CFM, 0.8 ton	7.00	ea	5,000.00 /ea 35,000
2	DCUe - 13, 14, 477 CFM each, 2 ton	2.00	ea	10,000.00 /ea 20,000
2	DCUe - 2,8,9,10, 448 CFM, 1.5 ton	4.00	ea	7,500.00 /ea 30,000
2	DCUe - 4, 5, 512CFM, 2 ton	2.00	ea	10,000.00 /ea 20,000
2	DCUe - 6, 448 CFM, 1.5 ton	1.00	ea	7,500.00 /ea 7,500
2	Unit Heaters	0.00	ITEM	
2	UH, Unit Heaters	25.00	ea	700.00 /ea 17,500
2	Air terminals	0.00	ITEM	
2	VAV units	135.00	ea	1,200.00 /ea 162,000
2	Pipe, Valves & Connections			
2	Heating piping			
2	4"	204.00	lf	83.00 /lf 16,932
2	3"	61.00	lf	58.00 /lf 3,538
2	2-1/2"	1,208.00	lf	49.00 /lf 59,192
2	2"	483.00	lf	34.00 /lf 16,422
2	1-1/2"	868.00	lf	27.00 /lf 23,436
2	1-1/4"	912.00	lf	26.00 /lf 23,712
2	1"	1,326.00	lf	25.00 /lf 33,150
2	3/4"	9,703.00	lf	20.00 /lf 194,060
2	Branch piping to unit heaters	250.00	lf	19.00 /lf 4,750
2	Branch piping to VAVs	1,350.00	lf	34.00 /lf 45,900
2	Branch Connection to Terminals	2,940.00	lf	34.00 /lf 99,960
2	Refrigerant Piping - VRF	0.00	ITEM	
2	Refrigerant Piping, RL/RS (from VRFe to Branch Selectors)	2,067.00	lf	30.00 /lf 62,010
2	Branch Connection to Terminals	380.00	lf	30.00 /lf 11,400
2	Secondary valve sets for VRF heat pumps	69.00	ea	600.00 /ea 41,400
2	Dx piping for IT cooling (Allowance)	0.00	ITEM	
2	Dx piping	991.00	lf	27.00 /lf 26,757
2	Secondary valve sets; including isolation, commissioning & non return valves	16.00	ea	600.00 /ea 9,600
2	Secondary control valves	16.00	ea	300.00 /ea 4,800
2	DX condensate	3,000.00	lf	27.00 /lf 81,000
2	Sheetmetal & Accessories	0.00	ITEM	
2	D Ductwork - Galvanized	129,116.00	lbs	14.00 /lbs 1,807,624
2	Allowance for Stainless Steel Kitchen exhaust ductwork	4,050.00	lbs	14.00 /lbs 56,700
2	Accessories	0.00	ITEM	
2	Fire dampers for main supply extract risers (Assume)	2.00	ea	750.00 /ea 1,500
2	Volume Dampers, control dampers & access panels	1.00	ls	5,670.00 /ls 5,670
2	Motorized control dampers ---- NIC ---	0.00	ea	
2	Exhaust intake actuators for smoke ---- NIC ---	0.00	ls	
2	CVD	19.00	ea	800.00 /ea 15,200
2	General exhaust boxes ---- NIC ---	0.00	.	
2	Final Connections			
2	Dedicated plenum connections for VAVs, S/R Diffusers	550.00	ea	200.00 /ea 110,000

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
23-0100.110	HVAC				
2	Additional motorized dampers for demand control - allow ---NIC---				
2	Displacement Diffusers	0.00	ITEM		
2	DD-1, 24" x 72" x 13"	9.00	ea	700.00 /ea	6,300
2	DD-2, 24" x 60" x 13"	112.00	ea	700.00 /ea	78,400
2	DD-3, 24" x 90" x 16"	8.00	ea	700.00 /ea	5,600
2	DD-4, 36" x 96" x 16"	6.00	ea	700.00 /ea	4,200
2	DD-5, 48" x 120" x 16"	3.00	ea	700.00 /ea	2,100
2	DD-6, 48" x 120"	3.00	ea	700.00 /ea	2,100
2	DD-7, 15" x 24" x 3.5"	40.00	ea	700.00 /ea	28,000
2	DD-8, 15" x 30" x 3.5"	5.00	ea	700.00 /ea	3,500
2	DD-9, 15" x 36" x 3.5"	2.00	ea	700.00 /ea	1,400
2	DD-10, 24" x 48" x 3.5"	15.00	ea	700.00 /ea	10,500
2	DD-11, 24" x 60" x 3.5"	2.00	ea	700.00 /ea	1,400
2	DD-12, 24" x 24"	9.00	ea	700.00 /ea	6,300
2	DD-13, 24" x 24"	8.00	ea	700.00 /ea	5,600
2	DD-14, 24" x 24"	10.00	ea	700.00 /ea	7,000
2	DD-15, 24" x 72"	6.00	ea	700.00 /ea	4,200
2	DD-X	1.00	ea	700.00 /ea	700
2	Exhaust/Return Grilles	0.00	ITEM		
2	E-1, Exhaust Grilles, 8x8	46.00	ea	250.00 /ea	11,500
2	Registers (R-1)	0.00	ea		
2	24 x 24	1.00	ea	300.00 /ea	300
2	18 x 18	6.00	ea	250.00 /ea	1,500
2	16 x 16	60.00	ea	240.00 /ea	14,400
2	14 x 14	15.00	ea	220.00 /ea	3,300
2	10 x 10	9.00	ea	190.00 /ea	1,710
2	8 x 8	83.00	ea	175.00 /ea	14,525
2	R-2, Registers	0.00	ITEM		
2	36 x 12	8.00	ea	350.00 /ea	2,800
2	22 x 10	4.00	ea	320.00 /ea	1,280
2	14 x 4	1.00	ea	300.00 /ea	300
2	Supply Grilles (S-A)	0.00	ITEM		
2	12 x 12	3.00	ea	200.00 /ea	600
2	9 x 9	5.00	ea	180.00 /ea	900
2	6 x 6	21.00	ea	170.00 /ea	3,570
2	Supply/return Grilles (Unspecified)	47.00	ea	200.00 /ea	9,400
2	L-1 Intake Louver 36 x 36 (EHH-601)	2.00	ea	1,350.00 /ea	2,700
2	Flexible Duct Connections	218.00	ea	200.00 /ea	43,600
2	Insulation	0.00	ITEM		
2	Piping insulation	21,821.00	lf	8.00 /lf	174,568
2	Ductwork insulation	80,697.00	sf	4.00 /sf	322,788
2	Fire wrap on kitchen exhaust ductwork	3,115.20	sf	18.00 /sf	56,074
	HVAC			27,294/sf	4,567,773
	167,352.00 sf				

23-0900.100	Controls				
20	Building Management Systems	0.00	ITEM		
20	Primary BMS/ BAS Systems	0.00	ITEM		
20	RTU	135.00	pts	900.00 /pts	121,500
20	MAU/HV	30.00	pts	900.00 /pts	27,000
20	Extract Fans	14.00	pts	900.00 /pts	12,600
20	Condenser units	120.00	pts	900.00 /pts	108,000
20	Pumps	6.00	pts	900.00 /pts	5,400
20	New DDC head-end	36.00	pts	900.00 /pts	32,400
20	New DDC head-end	1.00	pts	35,000.00 /pts	35,000
20	Secondary BMS*****	0.00	ITEM		
20	VRF Heat pump units	36.00	ea	600.00 /ea	21,600
20	VAVs	540.00	ea	600.00 /ea	324,000
20	RCPs	566.00	ea	600.00 /ea	339,600
20	WRUs	22.00	ea	600.00 /ea	13,200

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
23-0900.100	<i>Controls</i>				
20	Testing & Commissioning	1.00	Is	150,142.00 /Is	150,142
20	Overtime & Phasing Considerations				
20	Sub-Trade Temp requirements & GC's	1.00	Is	261,130.00 /Is	261,130
20	Rigging	0.00	Is		
20	Cad/Shop Drawing	0.00	Is		
20	Co-Ordination	0.00	Is		
20	Permit	0.00	Is		
20	Main Equipment	0.00	Is		
20	Market Adjustment	167,352.00	Is		
	<i>Controls</i>			<u>8.674/sf</u>	<u>1,451,572</u>
	167,352.00 sf				
	<i>HVAC</i>			35.968/sf	6,019,345
	167,352.00 sf				
	<i>D3090 Other HVAC Systems And Equipment</i>			35.968/sf	6,019,345
	167,352.00 sf				
	<b>D30 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)</b>			<b>44.938/sf</b>	<b>7,520,395</b>
	167,352.00 sf				
<b>D40</b>	<b>FIRE PROTECTION</b>				
D4040	<i>Sprinklers</i>				
21-0000.000	<i>FIRE SUPRESSION</i>				
21-1300.120	<i>Sprinkler Systems</i>				
2	Incoming fire main from utility (10' from threshold of the building)	10.00	If	175.00 /If	1,750
2	MACV: Main wet alarm check valve	1.00	ea	2,500.00 /ea	2,500
2	SCV- Supervised Control valve	1.00	ea	1,850.00 /ea	1,850
2	6" Back Flow Preventer	1.00	ea	4,800.00 /ea	4,800
2	DCVA: Double check valve assembly w/h backflow preventer	1.00	ea	7,600.00 /ea	7,600
2	6" Control Valve	2.00	ea	7,600.00 /ea	15,200
2	4" Control Valve	3.00	ea	5,300.00 /ea	15,900
2	Riser shut off valve	3.00	ea	2,250.00 /ea	6,750
2	FDC- Fire department connection	3.00	ea	1,500.00 /ea	4,500
2	FDV - Fire department Valve 2 1/2"	16.00	ea	1,500.00 /ea	24,000
2	FDVC - Fire department valve cabinet - 18" x18" x 10" (CROKER 1710) - 2 1/2"	16.00	ea	750.00 /ea	12,000
2	Pressure gauge	6.00	ea	250.00 /ea	1,500
2	Tamper switch	1.00	ea	250.00 /ea	250
2	Low water supply pressure switch	1.00	ea	250.00 /ea	250
	<i>Sprinkler Systems</i>			<u>0.591/sf</u>	<u>98,850</u>
	167,352.00 sf				
	<i>FIRE SUPRESSION</i>			0.591/sf	98,850
	167,352.00 sf				

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>FIRE SUPPRESSION</i>		<i>0.591/sf</i>	<i>98,850</i>
	167,352.00 sf			
	<i>D4040 Sprinklers</i>		<i>0.591/sf</i>	<i>98,850</i>
	167,352.00 sf			
<i>D4090</i>	<i>Other Fire Protection Systems</i>			
<i>21-0000.000</i>	<i>FIRE SUPPRESSION</i>			
<i>21-1300.120</i>	<i>Sprinkler Systems</i>			
2	Capped connections	0.00	ITEM	
2	- 6"	2.00	ea	290.00 /ea
2	- 4"	3.00	ea	190.00 /ea
2	Fire standpipe - Risers	0.00	ITEM	
2	- 6" w/ 3" drain	5.00	ea	3,500.00 /ea
2	- 4" drain	7.00	ea	2,500.00 /ea
2	Fire standpipe - Horizontal	0.00	ITEM	
2	6" Pipe	52.00	lf	54.00 /lf
2	4" Pipe	731.00	lf	44.00 /lf
2	3" Pipe	7.00	lf	39.00 /lf
2	Sprinkler Piping Distribution	0.00	ITEM	
2	4" Piping	2,031.00	lf	48.00 /lf
2	3" Piping	222.00	lf	46.00 /lf
2	2-1/2" Piping	322.00	lf	43.00 /lf
2	2" Piping	4,593.00	lf	38.00 /lf
2	1-1/2" Piping	1,444.00	lf	28.50 /lf
2	1-1/4" Piping	6,010.00	lf	21.50 /lf
2	1' Piping	3,820.00	lf	19.50 /lf
2	Sprinkler Heads	0.00	ITEM	
2	- pendant (quick response)	1,430.00	ea	85.00 /ea
2	- pendant, high temp head (quick response)	1.00	ea	85.00 /ea
2	- dry pendant wrap with thermal mastic tape	4.00	ea	85.00 /ea
2	- upright (quick response)	85.00	ea	85.00 /ea
2	- sidewall	3.00	ea	85.00 /ea
2	Misc.	0.00	ITEM	
2	Hydraulic Calculations, Hydrant Flow Tests, As-builts	1.00	ls	5,000.00 /ls
2	Sub-trade temp requirements & GC's	1.00	ls	49,750.00 /ls
2	Rigging	0.00	ABO	
			VE	
2	CAD/ Shop drawings	0.00	ABO	
			VE	
2	Co-ordination	0.00	ABO	
			VE	
2	Permit	0.00	ABO	
			VE	
	<i>Sprinkler Systems</i>		<i>4.76 /sf</i>	<i>796,539</i>
	167,352.00 sf			
	<i>FIRE SUPPRESSION</i>		<i>4.76 /sf</i>	<i>796,539</i>
	167,352.00 sf			



Item	Description	Takeoff Qty	Total		
			Unit Cost	Amount	
	D4090 Other Fire Protection Systems		4.76 /sf	796,539	
	167,352.00 sf				
	<b>D40 FIRE PROTECTION</b>		<b>5.35 /sf</b>	<b>895,389</b>	
	167,352.00 sf				
<b>D50</b>	<b>ELECTRICAL</b>				
D5010	Electrical Service And Distribution				
26-0000.000	ELECTRICAL				
26-0000.100	Electrical				
10	Main Switchboard, 480V, 3P 4W, 100KAIC	1.00	Is	60,000.00 /ls	60,000
10	- Main breaker,3000A 65 KAIC w/ ground fault protection	0.00	ABO		
			VE		
10	- Ground bus	0.00	ABO		
			VE		
10	- Surge Protection Device	0.00	ABO		
			VE		
10	- Digital monitoring meter, Power Logic CM4000 Series	0.00	ABO		
			VE		
10	- 112.5 KVA	1.00	ea	12,320.00 /ea	12,320
10	- T-5, 45kVA	16.00	ea	4,950.00 /ea	79,200
10	- T-4, 30kVA	1.00	ea	3,300.00 /ea	3,300
10	Disconnect Switches, 100A	15.00	ea	350.00 /ea	5,250
10	Panelboards, 480V, 3P/4W, 65KAIC w/ surge protection devices	0.00	TITL		
			E		
10	- MHP2C, 225A, 84cts	1.00	ea	4,500.00 /ea	4,500
10	- MHP1A/1B/1B2/1C2/2B/3A/3B, 225A, 42cts	7.00	ea	4,500.00 /ea	31,500
10	- LP1A/1C2/2C/3A, 100A, 42cts	4.00	ea	2,000.00 /ea	8,000
10	- LP1B/1B2/2B/3B, 100A, 30cts	4.00	ea	2,000.00 /ea	8,000
10	Panelboards, 208V, 3P/4W, 10KAIC w/ surge protection devices	0.00	TITL		
			E		
10	- Double tub panelboards, PP1B/1B2/2B, 225A, 126cts	3.00	ea	4,500.00 /ea	13,500
10	- Double tub panelboards, PP1A/3A, MP2B/3B, MP1B/1B2/1C2, KP1C2, 225A, 84cts	6.00	ea	4,500.00 /ea	27,000
10	- Double tub panelboards, PP1C/1C2, MP1A/3A, 225A, 42cts	4.00	ea	4,500.00 /ea	18,000
10	- PP3B, 225A, 126cts	1.00	ea	4,500.00 /ea	4,500
10	- PP2C & MP2C, 125A assume	2.00	ea	2,500.00 /ea	5,000
10	FB-1, Field Box Panel, 100A @ Concession Bldg	1.00	ea	2,000.00 /ea	2,000
10	Feeders				
10	3000A; 7 Sets of 4#600Kcmil in (7) 4"C plus (1) 4"C spare w/ pull line	179.00	INCL		
			ABO		
10	600A; To ATS-OS	25.00	lf	150.00 /lf	3,750
10	225A; To MP2B	40.00	lf	56.25 /lf	2,250
10	225A; 4#3/0+#6G in 2-1/2" C	536.00	lf	56.25 /lf	30,150
10	225A; 4#3/0 + #6G in 2-1/2"C	267.00	lf	56.25 /lf	15,019
10	225A; 3#2+#3/0(N)+1#2(IG)+1#8(EG) in 2"C	55.00	lf	56.25 /lf	3,094
10	225A; 3#2+#3/0(N)+1#2(IG)+1#8(EG)	25.00	lf	56.25 /lf	1,406
10	225A; 3#1/0+2#1(N)+1#1(IG)+1#6(EG) in 3"C	50.00	lf	56.25 /lf	2,813
10	125A; 3#2+#3/0(N)+1#2(IG)+1#8(EG)	25.00	lf	31.25 /lf	781
10	125A; 3#1/0+2#1(N)+1#1(IG)+1#6(EG) in 3"C	300.00	lf	31.25 /lf	9,375
10	100A; Under ground feeder to Panel FB1 at concessional building	392.00	lf	25.00 /lf	9,800
10	100A; 3#2+#8EG in 1-1/4"C	1,940.00	lf	25.00 /lf	48,500
10	100A; 4#1+#6G in 1-1/2"C	827.00	lf	25.00 /lf	20,675

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
26-0000.100	<i>Electrical</i>				
10	100A; To ATS-LS	25.00	lf	25.00 /lf	625
10	100A; 3#6+#10EG in 3/4" C	190.00	lf	25.00 /lf	4,750
10	Connection/Wiring to MMU units	1.00	ls	1,000.00 /ls	1,000
10	Conduit for above ---INC ABOVE-----				
10	Mechanical / Equipment power				
10	HVAC				
10	Rooftop units, RTU-1 thru 9, 100A/3P	11.00	ea	5,000.00 /ea	55,000
10	Boilers, B-1/2/3, 20A/1P	3.00	ea	5,000.00 /ea	15,000
10	Branch controller, BC-1/2/3, 20A/1P	3.00	ea	1,500.00 /ea	4,500
10	KEF-1, 5520 CFM	1.00	ea	1,500.00 /ea	1,500
10	EF-1, roof above vestibule 3201, 825	1.00	ea	1,500.00 /ea	1,500
10	EF-2, roof above toilets 3247, 1125	1.00	ea	1,500.00 /ea	1,500
10	EF-3, roof above toilets 3248, 3150	1.00	ea	1,500.00 /ea	1,500
10	EF-4, roof above CR 3104, unsized	1.00	ea	1,500.00 /ea	1,500
10	EF-5, roof above toilet 3123, 2400	1.00	ea	1,500.00 /ea	1,500
10	EF-6, roof above corridor 1158, unsized	1.00	ea	1,500.00 /ea	1,500
10	Pumps	0.00	TITL		
			E		
10	- Condensate Pump, 20A/1P	1.00	ea	1,500.00 /ea	1,500
10	- Water pump, 7.5hp each	2.00	ea	3,500.00 /ea	7,000
10	Condensors	10.00	ea	1,500.00 /ea	15,000
10	Terminal Units				
10	Ductless Cooling Unit	16.00	ea	1,500.00 /ea	24,000
10	Indoor Condensor Unit	16.00	ea	1,500.00 /ea	24,000
10	Unit Heaters, 1/10hp each	25.00	ea	1,500.00 /ea	37,500
10	VRF outdoor unit	1.00	ea	1,500.00 /ea	1,500
10	VAV boxes	135.00	ea	350.00 /ea	47,250
10	Plumbing	0.00	TITL		
			E		
10	Main H/W heater	2.00	ea	1,500.00 /ea	3,000
10	Recirculation pump, 1/8hp each	1.00	ea	750.00 /ea	750
10	Thermal switch with pilot light ---INC ABOVE---	0.00	ea		
10	Elevator sump pump	1.00	ea	750.00 /ea	750
10	Electronic Flush Valves	162.00	ea	280.00 /ea	45,360
10	Miscellaneous	0.00	TITL		
			E		
10	Elevator motor connection	2.00	ea	1,500.00 /ea	3,000
10	Allowance for institutional equipment	10.00	ls	575.00 /ls	5,750
10	Emergency Service & Distribution	0.00	TITL		
			E		
10	Diesel generator 250kW/312.5kVA, 277Y/480V, 3-Phase, 4-Wire, 0.8pf	250.00	kw	350.00 /kw	87,500
10	Acoustic enclosure allowance	1.00	ea	50,000.00 /ea	50,000
10	Aux/batt ch/ crank	1.00	ea	7,500.00 /ea	7,500
10	ESL Storm switch 3042 series model #SFD4-2005-2005-480-311-S-C w/ interlocked switched & Cam-lock connectors	1.00	ea	15,000.00 /ea	15,000
10	Automatic Transfer Switches	0.00	TITL		
			E		
10	- ATS-OS, 600A	1.00	ea	60,000.00 /ea	60,000
10	- ATS-LS, 100A	1.00	ea	10,000.00 /ea	10,000
10	Uninterrupted Power Supply, 16kW, 20kVA	2.00	ea	23,200.00 /ea	46,400
10	Interior Distribution Transformers, 480V, K-13 rated	0.00	TITL		
			E		
10	- T-8, 150kVA	0.00	NA		
10	- T-5, 45kVA	6.00	ea	4,950.00 /ea	29,700
10	Distribution Panelboards, 480V, 3P/4W, 65KAIC w/ surge protection devices	0.00	TITL		
			E		
10	- EHP1A/1B/2B/3B, ELP1C2/2A/3B, 225A, 42cts	6.00	ea	4,500.00 /ea	27,000
10	Panelboards, 208V, 3P/4W, 10KAIC w/ surge protection devices	0.00	TITL		
			E		
10	- EP1A, 225A, 84cts	1.00	ea	4,500.00 /ea	4,500

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
26-0000.100	<i>Electrical</i>				
10	- EP1B/1C/1C1, 225A, 168cts	3.00 ea	4,500.00 /ea		13,500
10	- Double tub panelboards, TEP2A/2C, 225A, 84cts	2.00 ea	4,500.00 /ea		9,000
10	Feeders (MI Cable)	0.00 TITL			
				E	
10	600A; description unknown	222.00 lf	150.00 /lf		33,300
10	225A; 4#600kcmil + 1#3G in 4"C	25.00 lf	56.25 /lf		1,406
10	225A; 4#3/0+#6G in 2"C	25.00 lf	56.25 /lf		1,406
10	225A; 3#4+1/0 Neutral +1#8G in 2"C	50.00 lf	56.25 /lf		2,813
10	225A; 2 Sets 250kcmil + 2#250kcmil(N) +1#250kcmil(IG)+1#2(EG)	25.00 lf	56.25 /lf		1,406
10	225A; unknown	322.00 lf	56.25 /lf		18,113
10	150A; 3#350+#4EG in 3"C	25.00 lf	52.50 /lf		1,313
10	150A; unknown	36.00 lf	37.50 /lf		1,350
10	125A; 3#1/0+2#1(N)+1#1(IG)+1#6(EG) in 3"C	25.00 lf	31.25 /lf		781
10	100A; 4#3/0&6G in 3"C	25.00 lf	25.00 /lf		625
10	100A; 3#2+#8EG in 1-1/4"C	191.00 lf	25.00 /lf		4,775
10	100A; unknown	361.00 lf	25.00 /lf		9,025
10	3#3/0 & #6G in 2"C to Load Bank	25.00 lf	25.00 /lf		625
10	4#4+#8G in 1-1/2"C to UPS	203.00 lf	25.00 /lf		5,075
10	Convenience Power	0.00 TITL			
				E	
	<i>Electrical</i>			7.048/sf	1,179,530
	167,352.00 sf				
	<b>ELECTRICAL</b>			7.048/sf	1,179,530
	167,352.00 sf				
	<i>D5010 Electrical Service And Distribution</i>			7.048/sf	1,179,530
	167,352.00 sf				
D5020	<i>Lighting &amp; Branch Wiring</i>				
26-0000.000	<b>ELECTRICAL</b>				
26-0000.100	<i>Electrical</i>				
10	Lighting, inclusive of conduit, fitting and wiring (allowances included for fixture material prices)	0.00 NOT			
				E	
10	LG2; 24' Acrylic Globe Fixture & Cast Globe Guard, 0-10V Dimming Capable, G Lighting, GL-2801-42LED35	5.00 ea	300.00 /ea		1,500
10	LG3: 30" Acrylic Globe Fixture, 0-10V, Dimming Capable, G Lighting	32.00 ea	350.00 /ea		11,200
10	LK24; 2'X4' Fixture With Prismatic Acrylic Lens, Mct Series	26.00 ea	300.00 /ea		7,800
10	LP4; 4' Linear Direct / Indirect Fixture With Frosted Acrylic Diffuser. 0-10V Dimming Capable, Finelite, S16 Series	112.00 ea	440.00 /ea		49,280
10	LP8; 8' Linear Direct / Indirect Fixture With Frosted Acrylic Diffuser, 0-10V Dimming Capable, Finelite, S16 Series	380.00 ea	880.00 /ea		334,400
10	LPR4; LED Pendant Linear Fixture w/ Round Profile, 0-10V Dimming Capable, Lumium, O3-CSD-4'-35K	4.00 ea	350.00 /ea		1,400
10	LPG; Pendant Hi-Bay Fixture. 0-10V Dimming Capable, With Wire Guard, Meteor, WSSeries	24.00 ea	500.00 /ea		12,000

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
26-0000.100	<i>Electrical</i>			
10	LR10; 10' X 2"W Recessed Fixture. 0-10V Dimming Capable	17.00 ea	1,000.00 /ea	17,000
10	LR12; 10' x 2"W Recessed Fixture, 0-10V Dimming Capable, Finelite	4.00 ea	1,000.00 /ea	4,000
10	LR14; 10' x 2"W Recessed Fixture, 0-10V Dimming Capable, Finelite	13.00 ea	1,000.00 /ea	13,000
10	LR16; 10' x 2"W Recessed Fixture, 0-10V Dimming Capable, Finelite	3.00 ea	1,000.00 /ea	3,000
10	LR18; 10' x 2"W Recessed Fixture, 0-10V Dimming Capable, Finelite	10.00 ea	1,000.00 /ea	10,000
10	LR20; 10' x 2"W Recessed Fixture, 0-10V Dimming Capable, Finelite	6.00 ea	1,000.00 /ea	6,000
10	LR22; 10' x 2"W Recessed Fixture, 0-10V Dimming Capable, Finelite	31.00 ea	1,000.00 /ea	31,000
10	LR24; 2' X 4' Architectural LED Troffer, Diffuse Lens, -10V Dimming Capable	126.00 ea	300.00 /ea	37,800
10	LR2; 2' X 2"W Recessed Fixture. 0-10V Dimming Capable. Ceiling Type, Finelite, HP-2 Series	17.00 ea	200.00 /ea	3,400
10	LR4; 4' X 2"W Recessed Fixture. 0-10V Dimming Capable, Finelite, Hp-2 Series	82.00 ea	300.00 /ea	24,600
10	LR4A; 4' X 2"W Recessed Fixture. 0-10V Dimming Capable	17.00 ea	300.00 /ea	5,100
10	LR6; 6' X 2"W Recessed Fixture. 0-10V Dimming Capable	28.00 ea	400.00 /ea	11,200
10	LR8; 8' X 2"W Recessed Fixture. 0-10V Dimming	22.00 ea	500.00 /ea	11,000
10	LR8A; 8' X 2"W Recessed Fixture. 0-10V Dimming	1.00 ea	500.00 /ea	500
10	LRD2; 2' Diameter Round Recessed Fixture. 0-10V Dimming Capable	24.00 ea	660.00 /ea	15,840
10	LRD2H; 2' Diameter Round Recessed Fixture, 0-10V Dimming Capable, He Williams	13.00 ea	660.00 /ea	8,580
10	LRD3; 3' Diameter Round Recessed Fixture. 0-10V Dimming Capable	2.00 ea	990.00 /ea	1,980
10	LRD4; 4' Diameter Round Recessed Fixture. 0-10V Dimming Capable	3.00 ea	1,250.00 /ea	3,750
10	LS2; 2' Surface Mounted Fixture With Acrylic Lens. 0-10V Dimming Capable, Elite, 2-Oc1-Led Series	2.00 ea	350.00 /ea	700
10	LS4; 4' Surface Mounted Fixture With Acrylic Lens. 0-10V Dimming Capable, Elite, 4-Oc1-Led Series	34.00 ea	440.00 /ea	14,960
10	LS8; 8' Surface Mounted Fixture With Acrylic Lens. 0-10V Dimming Capable, Elite, 8-Oc1-Led Series	58.00 ea	750.00 /ea	43,500
10	LS8A; 8' Surface Mounted Fixture With Acrylic Lens. 0-10V Dimming Capable, He Williams, Lims Series	22.00 ea	750.00 /ea	16,500
10	LSV4; 4' Wet Location Fixture With Acrylic Lens. 0-10V Dimming Capable, Birchwood, Vanessa Series	7.00 ea	350.00 /ea	2,450
10	LV4; no description given	8.00 ea	350.00 /ea	2,800
10	LWS; Continuous Linear Wall Slot Fixture	931.00 lf	110.00 /lf	102,410
10	-wiring points	233.00 ea	100.00 /ea	23,300
10	LSD2; 2' Dia Round Surface Fixture w/ Frosted Acrylic Lens, 0-10V Dimming Capable, HE Williams	6.00 ea	750.00 /ea	4,500
10	LSD3; 3' Dia Round Surface Fixture w/ Frosted Acrylic Lens, 0-10V Dimming Capable, HE Williams	3.00 ea	850.00 /ea	2,550
10	LSR4; LED Surface Linear Fixture w/ Round Profile, 0-10V Dimming Capable, Lumium	4.00 ea	350.00 /ea	1,400

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
26-0000.100	<i>Electrical</i>				
10	LV2; 2' LED Wall Mounted Vanity Light w/ Up/Down Lighting, 0-10V Dimming Capable, Elite Lighting	6.00 ea	300.00 /ea		1,800
10	PC1; 4" Cylinder Fixture w/ semi-specular reflector, 0-10V Dimming Capable, Intense	12.00 ea	500.00 /ea		6,000
10	PC2; 6" Cylinder Fixture w/ semi specular reflector, 0-10V Dimming Capable, Intense	21.00 ea	600.00 /ea		12,600
10	RC1; 4" Round Downlight Fixture With Semi-Specular Reflector, Maxilume, Hh4 Series	155.00 ea	350.00 /ea		54,250
10	RC2; 4" Square Downlight Fixture With Semi-Specular Reflector, Maxilume, Hh4 Series	242.00 ea	250.00 /ea		60,500
10	RCW; 4" Round Wall Wash Fixture With Semi-Specular Reflector, Maxilume, Hh4 Series	9.00 ea	300.00 /ea		2,700
10	RSH :4" Round Wall Wash Fixture With Semi-Specular Reflector. 0-10V Dimming Capable, Maxilume	1.00 ea	250.00 /ea		250
10	SL4; Led Wall Pack. 0-10V Dimming Capable	11.00 ea	250.00 /ea		2,750
10	SL5; Led Wall Pack. 0-10V Dimming Capable	3.00 ea	250.00 /ea		750
10	Track for light TH1 & TH2	72.00 lf	150.00 /lf		10,800
10	- TH1 light on track	12.00 ea	500.00 /ea		6,000
10	- TH2 light on track	6.00 ea	500.00 /ea		3,000
10	Double Duplex Receptacle	549.00 ea	550.00 /ea		301,950
10	Duplex Receptacles	673.00 ea	280.00 /ea		188,440
10	Duplex Receptacles, weatherproof	13.00 ea	300.00 /ea		3,900
10	Duplex Receptacle, 20A, Unistrut grid mtd , Hubbell Model	8.00 ea	300.00 /ea		2,400
10	Duplex Receptacle, GFI	299.00 ea	300.00 /ea		89,700
10	Flush Mtd poke thru device w/ (2) duplex receptacles & (3) comm. outlets	3.00 ea	750.00 /ea		2,250
10	Special Receptacles	7.00 ea	350.00 /ea		2,450
10	Single Receptacle	3.00 ea	180.00 /ea		540
10	Three function push button switch	8.00 ea	350.00 /ea		2,800
10	EPO - Emergency Power Off	2.00 ea	2,000.00 /ea		4,000
10	Junction Boxes	117.00 ea	250.00 /ea		29,250
10	Handicap Door Activate Switches - F&I by System Supplier	28.00 ea	3,000.00 /ea		84,000
10	Uni Strut p1000 w/plain finish, to be painted	200.00 lf	60.00 /lf		12,000
10	Kitchen Connections	60.00 ea	300.00 /ea		18,000
10	Exit signs	65.00 ea	350.00 /ea		22,750
10	Floor proximity single faced exit signs diecast exit sign	1.00 ea	350.00 /ea		350
10	Labor to install fixtures/ supports - Included Above	2,926.00 ABO			
		VE			
10	Wiring and switches for fixtures - Included Above	2,926.00 ABO			
		VE			
10	Daylight dimming ballasts for fixtures - Included Above	293.00 ABO			
		VE			
10	Lighting controls	0.00 ea			
10	Occupancy Sensor	353.00 ea	500.00 /ea		176,500
10	Photocell Sensor	96.00 ea	500.00 /ea		48,000
10	Emergency Stop Switch	1.00 ea	350.00 /ea		350
10	Stage DMX Lighting Control	1.00 ea	25,000.00 /ea		25,000
10	NES; 24 Port Ethernet Switch	1.00 ea	2,500.00 /ea		2,500
10	L: ALCS multi zone local station	207.00 ABO			
		VE			
10	M: ALCS multi zone local station	1.00 ABO			
		VE			
10	MTS: ALCS Master Touch Screen	1.00 ABO			
		VE			
10	PC: ALCS Exterior Photocell	2.00 ABO			
		VE			
10	SSU; Encelium SSU-300 System Support Unit	1.00 ABO			
		VE			

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
26-0000.100	<i>Electrical</i>				
10	ECU; Encelium ECS-300 Energy Control Unit	4.00	ABO VE		
10	Office Station, RC-5TSB-OS2	21.00	ABO VE		
10	Teacher Station, RC-6TSB-TS1	21.00	ABO VE		
10	Entry Station, RC-2TLB-ES1	21.00	ABO VE		
10	Room Controller, RC3DE & RC3D	23.00	ABO VE		
	<i>Electrical</i>			12.064/sf	2,018,930
	167,352.00 sf				
	<i>ELECTRICAL</i>			12.064/sf	2,018,930
	167,352.00 sf				
	<i>D5020 Lighting &amp; Branch Wiring</i>			12.064/sf	2,018,930
	167,352.00 sf				
D5031	<i>PA Systems</i>				
27-0000.000	<i>COMMUNCIATIONS</i>				
27-5000.000	<i>Distributed Communications &amp; Monitoring</i>				
100	PA System - allow	167,352.00	ALLO W	1.05 /ALLO W	175,720
100	Wall secondary clock w/ single gang back box	145.00	ABO VE		
100	Horn speaker	3.00	ABO VE		
100	Speakers	349.00	ABO VE		
100	Call button w/ device plate and cabling	73.00	ABO VE		
100	Public address rack	1.00	ABO VE		
	<i>Distributed Communications &amp; Monitoring</i>			1.05 /sf	175,720
	167,352.00 sf				
	<i>COMMUNCIATIONS</i>			1.05 /sf	175,720
	167,352.00 sf				
	<i>D5031 PA Systems</i>			1.05 /sf	175,720
	167,352.00 sf				
D5037	<i>Fire Alarm Systems</i>				
28-0000.000	<i>ELECTRONIC SAFETY &amp; SECURITY</i>				
28-4000.000	<i>Life Saftey</i>				
100	Fire Alarm System Complete	167,352.00	sf	1.75 /sf	292,866



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
28-4000.000	Life Saftey			
100	FACP - Fire Alarm Control Panel - IN ABOVE	1.00	IN ABO VE	
100	FATC - Fire Alarm Terminal Cabinet - IN ABOVE	2.00	IN ABO VE	
100	ANN - Generator Remote Annunciator - IN ABOVE	2.00	IN ABO VE	
100	Flush mounted Sigcom Wireless 16 Zone Master box - IN ABOVE	1.00	IN ABO VE	
100	Elevator Recall Control Module - IN ABOVE	7.00	IN ABO VE	
100	Monitor Module - IN ABOVE	32.00	IN ABO VE	
100	Digital Dialer for trouble & supervisory - IN ABOVE	1.00	IN ABO VE	
100	Carbon Monoxide Detector - IN ABOVE	11.00	IN ABO VE	
100	Drill Key Switch	1.00	IN ABO VE	
100	Fire Alarm Graphic Map	115.00	IN ABO VE	
100	Photoelectric smoke detector	9.00	IN ABO VE	
100	Smoke Detector for elevator	3.00	IN ABO VE	
100	Heat Detector for Elevator	1.00	IN ABO VE	
100	Speaker/Visual ADA compliant Signal	66.00	IN ABO VE	
100	Speaker/Visual ADA compliant Signal, WG	38.00	IN ABO VE	
100	Isolation Module	2.00	IN ABO VE	
100	Knox box	1.00	IN ABO VE	
100	Manual Pull Station	27.00	IN ABO VE	
100	Pressure Switch	1.00	IN ABO VE	
100	Flow Switch	9.00	IN ABO VE	
100	Red fire alarm beacon, WP	1.00	IN ABO VE	

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
28-4000.000	<i>Life Saftey</i>				
100	Box Support Assembly	590.00	IN ABO VE		
100	EMT 3/4" w/ fittings	14,750.00	IN ABO VE		
100	FA Cable	44,250.00	IN ABO VE		
100	FA Device Testing	331.00	IN ABO VE		
	<i>Life Saftey</i>			1.75 /sf	292,866
	167,352.00 sf				
	<i>ELECTRONIC SAFETY &amp; SECURITY</i>			1.75 /sf	292,866
	167,352.00 sf				
	<i>D5037 Fire Alarm Systems</i>			1.75 /sf	292,866
	167,352.00 sf				
D5038	<i>Electronic Safety &amp; Alarm</i>				
28-0000.000	<i>ELECTRONIC SAFETY &amp; SECURITY</i>				
28-3000.000	<i>Electronic Detection &amp; Alarm</i>				
100	Security systems allowances				
100	Rough in (empty conduit)	167,352.00	sf	0.25 /sf	41,838
100	Access Control System, Manufacturer; Avigilon				
100	Access Control Panel	1.00	ea	5,000.00 /ea	5,000
100	Panel for intrusion detection system	1.00	ea	5,000.00 /ea	5,000
100	Network Video Recorder Panel	1.00	ea	20,000.00 /ea	20,000
100	Access Panel, allow	1.00	ea	350.00 /ea	350
100	Video intercom/door release station	4.00	ea	350.00 /ea	1,400
100	Card Reader, Proximity	38.00	ea	350.00 /ea	13,300
100	Door Contact	92.00	ea	350.00 /ea	32,200
100	PIR sensor	64.00	ea	350.00 /ea	22,400
100	Keypad	7.00	ea	350.00 /ea	2,450
100	Alarm panic button	1.00	ea	350.00 /ea	350
100	Camera 150Deg	1.00	ea	750.00 /ea	750
100	Camera 180Deg	15.00	ea	750.00 /ea	11,250
100	Camera 270Deg	12.00	ea	750.00 /ea	9,000
100	Wall speaker	2.00	ea	600.00 /ea	1,200
100	Ceiling Camera	17.00	ea	750.00 /ea	12,750
100	Ceiling Camera 180	20.00	ea	750.00 /ea	15,000
100	Ceiling Camera 270	1.00	ea	750.00 /ea	750
100	Ceiling Camera 360	11.00	ea	750.00 /ea	8,250
100	Junction Boxes	32.00	ea	150.00 /ea	4,800
	<i>Electronic Detection &amp; Alarm</i>			1.243/sf	208,038
	167,352.00 sf				
	<i>ELECTRONIC SAFETY &amp; SECURITY</i>			1.243/sf	208,038
	167,352.00 sf				

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>D5038 Electronic Safety &amp; Alarm</i>		<i>1.243/sf</i>	<i>208,038</i>
	<i>167,352.00 sf</i>			
<i>D5039</i>	<i>Data Communications</i>			
<i>27-0000.000</i>	<i>COMMUNICATIONS</i>			
<i>27-2000.000</i>	<i>Data Communications</i>			
100	Tel / Data			
100	Trunk & Network Protector/ Entrance Facility	1.00	BY OTH ER	
100	Wire Management (Backbone cabling)	0.00	TITL E	
100	Wire management; vertical wire manager, cabletray, conduit and sleeves	167,352.00	sf	0.50 /sf 83,676
100	1#1/0-1"C Backbone Cable	342.00	lf	20.00 /lf 6,840
100	- cable tray	118.00	ABO VE	
100	Grounding Busbar (#6AWG @ each IDF & MDF room)	4.00	ea	3,000.00 /ea 12,000
100	Tel/data outlets inc. conduit drop from cable tray			
100	D - WAP; Wireless access point (39,550)	104.00	ea	1,100.00 /ea 114,400
100	Data Outlets	0.00	- 1 por	
100	- 4 ports	2.00	ea	350.00 /ea 700
100	- 2 ports	312.00	ea	350.00 /ea 109,200
100	- 1 ports	25.00	ea	250.00 /ea 6,250
100	- Tel/data outlet, 2ports (1) voice & (1) data outlets	51.00	ea	350.00 /ea 17,850
100	- 2 port data outlet for projector	23.00	ea	350.00 /ea 8,050
100	Wall phone outlet	99.00	ea	350.00 /ea 34,650
100	Desk phone & Admin phone outlet	19.00	ea	350.00 /ea 6,650
100	Cabling & jacks (Category 6A, UTP, 8 conductor copper cable)	0.00	- 1 por	
100	- 4 port	2.00	ea	800.00 /ea 1,600
100	- 2 port	386.00	ea	400.00 /ea 154,400
100	- 1 port	256.00	ea	200.00 /ea 51,200
100		0.00	ea	
100	CATV System - allow	167,352.00	sf	0.50 /sf 83,676
100	CATV rough-in, empty raceway , Series 11 Quad Shielded Coax cable - IN ABOBE			
100	Allowance for CATV fit-out; equipment, devices, wiring & testing - IN ABOBE			
100	Speech Reinforcement system, Lightspeed Topcat System	74.00	ea	2,000.00 /ea 148,000
100		0.00	ls	
100	Digital Antenna System	167,352.00	sf	0.45 /sf 75,308
100	Network Controller - IN ABOBE	1.00	IN ABO VE	
100	Remote Device - IN ABOBE	3.00	IN ABO VE	
100	Bi-Directional Amplifiers (BDA) - IN ABOBE	2.00	IN ABO VE	
100	Allowance for antenna - IN ABOBE	2.00	IN ABO VE	

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
27-2000.000	<i>Data Communications</i>			
100	Wiring for DAS System - IN ABOBE	1.00	IN ABOVE	
			VE	
100	Digital signage system - allow	0.00	BY OWNER	
100	Audio visual allowances			
100	Audio junction box (Same \$)	73.00	ea	350.00 /ea
100	Rough-in allowance only (Approximate locations). (64,400)	450.00	ea	100.00 /ea
100	Power for AV (64,400)	450.00	ea	100.00 /ea
100	A/V Allowance - Café	1.00	ls	25,000.00 /ls
100	A/V Allowance - Gym	1.00	ls	15,000.00 /ls
100	A/V Allowance - Auditorium	1.00	ls	75,000.00 /ls
100	Digital signage system - allow (0)	1.00	ls	20,000.00 /ls
100	*Backbone & Equipment - allow (0)	1.00	ls	300,000.00 /ls
	<i>Data Communications</i>			<u>8.754/sf</u>
				<u>1,465,000</u>
	167,352.00 sf			
	<b>COMMUNICATIONS</b>			8.754/sf
				<u>1,465,000</u>
	167,352.00 sf			
	<i>D5039 Data Communications</i>			8.754/sf
				<u>1,465,000</u>
	167,352.00 sf			
D5090	<i>Other Electrical System</i>			
26-0000.000	<i>ELECTRICAL</i>			
26-0000.050	<i>Electrical - Other</i>			
20	Testing & bonding (84,782)	1.00	ls	30,407.00 /ls
20	Sub-trade temps/ gcs	1.00	ls	172,108.00 /ls
20	Lighting Protection/Grounding (\$108,779)	167,352.00	sf	0.40 /sf
	<i>Electrical - Other</i>			<u>1.61 /sf</u>
				<u>269,456</u>
	167,352.00 sf			
	<i>ELECTRICAL</i>			1.61 /sf
				<u>269,456</u>
	167,352.00 sf			
	<i>D5090 Other Electrical System</i>			1.61 /sf
				<u>269,456</u>
	167,352.00 sf			
	<b>D50 ELECTRICAL</b>			33.519/sf
				<u>5,609,540</u>
	167,352.00 sf			
	<b>D SERVICES</b>			98.162/sf
				<u>16,427,681</u>
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
<b>D SERVICES</b>			<b>98.162/sf</b>	<b>16,427,681</b>
<b>167,352.00 sf</b>				
<b>E EQUIPMENT AND FURNISHINGS</b>				
<b>E10 EQUIPMENT</b>				
<i>E1010 Commercial Equipment</i>				
<i>11-0000.000 EQUIPMENT</i>				
<i>11-3000.110 Residential Food Equip</i>				
10	Appliance Allowance	1.00 ALLO	30,000.00 /ALLO	30,000
			W	W
10	Loading Dock Equipment	1.00 ls	2,200.00 /ls	2,200
10	Kiln	1.00 ea	5,800.00 /ea	5,800
	<i>Residential Food Equip</i>		<u>0.227/sf</u>	<u>38,000</u>
<i>167,352.00 sf</i>				
<i>11-4000.110 Food Service</i>				
2	Food Service Budget - Crabtree McGrath	1.00 ls	499,435.00 /ls	499,435
	<i>Food Service</i>		<u>2.984/sf</u>	<u>499,435</u>
<i>167,352.00 sf</i>				
<i>EQUIPMENT</i>			<i>3.211/sf</i>	<i>537,435</i>
<i>167,352.00 sf</i>				
<i>E1010 Commercial Equipment</i>			<i>3.211/sf</i>	<i>537,435</i>
<i>167,352.00 sf</i>				
<i>E1020 Institutional Equipment</i>				
<i>11-0000.000 EQUIPMENT</i>				
<i>11-5200.100 Projection Screens - Projectors</i>				
10	One (1 at Platform 1137 Facing Gymnasium ) Ultimate Access XL V, Motorized 272" Diagonal Projection Screen by Draper, Inc.	1.00 ea	12,600.00 /ea	12,600
10	One (1 at Platform 1137 (Facing Cafeteria) Ultimate Access V, Motorized 226" Diagonal Projection Screen by Draper, Inc.	1.00 ea	11,600.00 /ea	11,600
	<i>Projection Screens - Projectors</i>		<u>0.145/sf</u>	<u>24,200</u>
<i>167,352.00 sf</i>				
<i>11-6050.000 Stage Curtains</i>				
010	Stage Curtain 32'-6"4 x 13' h	1.00 ea	28,000.00 /ea	28,000
	<i>Stage Curtains</i>		<u>0.167/sf</u>	<u>28,000</u>
<i>167,352.00 sf</i>				

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	Stage Curtains		0.167/sf	28,000
	167,352.00 sf			
11-6833.110	Athletic Equipment			
10	Divider Curtain	1,596.00 sf	20.00 /sf	31,920
10	Basketball Backboards and Hoop	6.00 ea	8,200.00 /ea	49,200
10	Floor Mounted Sleeves for Posts	1.00 ls	3,500.00 /ls	3,500
10	Scoreboards 35" x 144" by IPI Bison/Shot Clocks (SC450 by IPI Bison)	1.00 ea	14,000.00 /ea	14,000
10	Gym Wall Padding 24" x 72" (PEP Supp. #4)	939.00 sf	20.00 /sf	18,780
	Athletic Equipment		0.702/sf	117,400
	167,352.00 sf			
	EQUIPMENT		1.013/sf	169,600
	167,352.00 sf			
12-0000.000	FURNISHINGS			
12-6600.100	Stands & Bleachers			
10	Telescoping Bleachers 3 Rows Motorized	134.00 ea	300.00 /ea	40,200
	Stands & Bleachers		0.24 /sf	40,200
	167,352.00 sf			
	FURNISHINGS		0.24 /sf	40,200
	167,352.00 sf			
	E1020 Institutional Equipment		1.254/sf	209,800
	167,352.00 sf			
	E10 EQUIPMENT		4.465/sf	747,235
	167,352.00 sf			
E20	FURNISHINGS			
E2010	Fixed Furnishings			
12-0000.000	FURNISHINGS			
12-2113.100	Shades - Blinds			
2	Shade Type WS1: Manually operating, chain drive, light filtering / privacy shades.	5,210.00 sf	10.00 /sf	52,100
2	Shade Type WS2: Motorized light filtering roller shades, and related motor control systems.	1,770.00 sf	20.00 /sf	35,400
2	Shade Type WS3: Manually operating, chain drive, "double" light filtering and room darkening roller shades,	12,206.00 sf	10.00 /sf	122,060
	Shades - Blinds		1.252/sf	209,560
	167,352.00 sf			



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	Shades - Blinds		1.252/sf	209,560
	167,352.00 sf			
12-3000.130	Casework- Misc			
30	Pre-Kindergarden Class Rooms	0.00 LOC		
30	Pre-K - Base Cabinets w/P-Lam Countertops - H18 = 3 DBS2-30-Shallow & 4 DBB01-30 = 19'-6"Lf ea @ 5 Rooms	98.00 lf	325.00 /lf	31,850
30	Pre-K - Kitchenette Set up - Base Cabinets - H12/A28 = 1 AB-33, 1 AB-21, 1 AB-24, 1 ABA36, w/P-Lam Top = 14'-2"Lf ea @ 4 Rooms	57.00 lf	325.00 /lf	18,525
30	Pre-K - Kitchenette Set up - Upper Cabinets - H12/A28 = 3 W2-3332, 1 W2-3624 = 14'-2"Lf ea @ 4 Rooms	57.00 lf	250.00 /lf	14,250
30	Pre-K - Kitchenette Set up - Wardrobes - H12/A28 = 1 TW-3384, 1 TS-3684, Laptop Cart Cab. = 3ea @ 4 Rooms	12.00 ea	1,200.00 /ea	14,400
30	Pre-K - Wardrobes - A23 = 5 TSC-33 ea @ 2 Rooms	10.00 ea	1,100.00 /ea	11,000
30	Pre-K - Wardrobes - F23 = 4 TSC-33 @ 2 Rooms	8.00 ea	1,100.00 /ea	8,800
30	Pre-K - Wardrobes - T28 = 3 TSC-33 @ 1 Room	3.00 ea	1,100.00 /ea	3,300
30	Pre-K - Student Cubbies - J28 = 6 TLO2-3348 = 6 per room @ 4 Rooms	24.00 ea	650.00 /ea	15,600
30	Pre-K - Base Cabinets w/Plam Top - S9 - 2 AB30, 3 AB27, 1 ABA-36, 1 ABP5-30 @ 1 Room = 17'-9"	18.00 lf	325.00 /lf	5,850
30	Pre-K - Upper Cabinets - S9 - 3 W2-3032, 3 W2-2732, 1 W2-3624 @ 1 Room = 17'-9"	18.00 lf	250.00 /lf	4,500
30	Pre-K - Wardrobes - S9 - 3 TSC-33, 1 TS-3684, 1 TWD-3684, 1 Laptop Cart Cab. @ 1 Room	6.00 ea	1,200.00 /ea	7,200
30	Kindergarden Class Rooms	0.00 LOC		
30	Kindergarden - Kitchenette Set up - Base Cabinets - H12/A28 = 1 AB-33, 1 AB-21, 1 AB-24, 1 ABA36, w/P-Lam Top = 14'-2"Lf ea @ 5 Rooms	71.00 lf	325.00 /lf	23,075
30	Kindergarden - Kitchenette Set up - Upper Cabinets - H12/A28 = 3 W2-3332, 1 W2-3624, w/P-Lam Top = 14'-2"Lf ea @ 5 Rooms	71.00 lf	250.00 /lf	17,750
30	Kindergarden - Base Cabinets w/P-Lam Countertops - H18 = 3 DBS2-30-Shallow & 4 DBB01-30 = 19'-6"Lf ea @ 9 Rooms	176.00 lf	325.00 /lf	57,200
30	Kindergarden - Kitchenette Set up - Base Cabinets - P13 = 1 AB-12, 1 ABA-36, 2 AB36, w/P-Lam Top = 10'-7"Lf ea @ 4 Rooms	45.00 lf	325.00 /lf	14,625
30	Kindergarden - Kitchenette Set up - Upper Cabinets - P13 = 2 W@-3632, 1 W1-1532, 1 W2-2432, 1 W2-3624 = 10'-7"Lf ea @ 4 Rooms	45.00 lf	250.00 /lf	11,250
30	Kindergarden - Kitchenette Set up - Wardrobes - H12/A28 = 1 TW-3384, 1 TS-3684, Laptop Cart Cab. = 3ea @ 5 Rooms	15.00 ea	1,200.00 /ea	18,000
30	Kindergarden - Kitchenette Set up - Wardrobes - P13 = 1 TW-3384, 1 TS-3684 = 2ea @ 4 Rooms	8.00 ea	1,200.00 /ea	9,600
30	Kindergarden - Student Cubbies - K28 = 3 TLO2-3348 = 3ea @ 11 Locations	33.00 ea	650.00 /ea	21,450
30	Kindergarden - Student Cubbies - N22 = 4 TLO2-3348 = 4ea @ 2 Locations	8.00 ea	650.00 /ea	5,200
30	Kindergarden - Student Cubbies - S28 = 2 TLO2-3348 = 2ea @ 5 Locations	10.00 ea	650.00 /ea	6,500
30	Kindergarden - Wardrobe - S12 = 1 Laptop Cart Cab. = 1ea @ 3 Locations	3.00 ea	1,250.00 /ea	3,750
30	Kindergarden - Wardrobe - A23 = 5 TSC-33 ea @ 3 Rooms	15.00 ea	1,100.00 /ea	16,500

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
12-3000.130	Casework- Misc				
30	Kindergarden - Wardrobe - F23 = 4 TSC-33 = 4ea @ 3 Locations	12.00 ea	1,100.00 /ea		13,200
30	Kindergarden - Wardrobe - T28 = 3 TSC-33 = 3ea @ 1 Locations	3.00 ea	1,100.00 /ea		3,300
30	Class Rooms	0.00 LOC			
30	Classroom - Kitchenette - E4 - Base Cabinets w/Plam Top - 2 AB27, 1 AB-21, 1 AB-36 = 9'-9"Lf ea @ 4 Locations	39.00 lf	325.00 /lf		12,675
30	Classroom - Kitchenette - E4 - Upper Cabinets - 3 W2-3332, 1 W2-3032 = 9'-9"Lf ea @ 4 Locations	39.00 lf	250.00 /lf		9,750
30	Classroom - Kitchenette- E4 - Wardrobes - 1 TS-3684, 1 TW-3684, 1 Laptop Cart Cab. = 3ea @ 4 Locations	4.00 ea	1,200.00 /ea		4,800
30	Classroom - Kitchenette - P6 - Base Cabinets w/Plam Top - 2 AB-30, 1 AB-36, 1 AB-21 = 10'-6"Lf ea @ 32 Locations	336.00 lf	325.00 /lf		109,200
30	Classroom - Kitchenette - P6 - Upper Cabinets - 3 W2-3332, 1 W2-3632 = 10'-6"Lf ea @ 32 Locations	336.00 lf	250.00 /lf		84,000
30	Classroom - Kitchenette - P6 - Wardrobes - 1 TS-3684, 1 TW-3684, 1 Laptop Cart Cab = 3ea @ 32 Locations	96.00 ea	1,200.00 /ea		115,200
30	Classroom - Kitchenette - S13 - Base Cabinets w/Plam Top - 1 AB-36, 1 ABD4/2-33 = 5'-6"Lf ea @ 4 Locations	22.00 lf	325.00 /lf		7,150
30	Classroom - Kitchenette - S13 - Upper Cabinets - 1 W1-1532, 1 W2-2732, 1 W23032 = 5'-6"Lf ea @ 4 Locations	22.00 lf	250.00 /lf		5,500
30	Classroom - Kitchenette - S13 - Wardrobes - 1 TS-3684, 1 Laptop Cart Cab. = 2ea @ 4 Locations	8.00 ea	1,200.00 /ea		9,600
30	Classroom - Base Cabinets w/P-Lam Countertops - H18-1.50 = 3 DBS2-30-Shallow & 4 DBB01-30 = 19'-6"Lf ea @ 32 Locations	624.00 lf	325.00 /lf		202,800
30	Classroom - Base Cabinets w/P-Lam Countertop - S4 - 4 DBB01-33, 3 DBS2-33-Shallow = 19'-6"Lf ea @ 6 Locations	117.00 lf	325.00 /lf		38,025
30	Classroom - Base Cabinets w/P-lam Countertop - H13-1.56 - 2 Dbb01-30 = 8'Lf ea @ 1 Location	8.00 lf	325.00 /lf		2,600
30	Classroom - Wardrobe - H13-1.56 - 1 TW-3684 - 1ea @ 1 Location	1.00 ea	1,200.00 /ea		1,200
30	Classroom - Base Cabinets w/P-lam Top - H13-1.51 - 4 BB02-36 - 12'Lf ea @ 20 Locations	240.00 lf	325.00 /lf		78,000
30	Classroom - Base Cabinets w/P-lam Top - H6-1.51 - 5 BB02-33 - 14Lf ea @ 4 Locations	56.00 lf	325.00 /lf		18,200
30	Classroom - Base Cabinets w/P-Lam Top - H22-1.51 - 2 BB02-33 - 5'-6"Lf ea @ 6 Locations	33.00 lf	325.00 /lf		10,725
30	Classroom - Base Cabinet w/P-Lam Top - H18-1.51 - 1 BB02-33 - 3'Lf ea @ 2 Locations	6.00 lf	325.00 /lf		1,950
30	Classroom - Base Cabinets w/P-Lam Top - H23-1.56 - 4 DBB01-30 = 10'-6"Lf ea @ 1 Location	11.00 lf	325.00 /lf		3,575
30	Classroom - Base Cabinets w/P-Lam Top - L23-1.56 - 3 DBB01-30 = 7'-6"Lf ea @ 1 Location	8.00 lf	325.00 /lf		2,600
30	Classroom - Wardrobe - L23-1.56 - 1 TW-3684 = 1ea @ 1 Location	1.00 ea	1,200.00 /ea		1,200
30	Classroom - Base Cabinets w/P-Lam Top - B23-1.56 - 1 DB02-27, 1 DBB01-36, 1 DBS-33-Shallow = 9'Lf ea @ 1 Location	9.00 lf	325.00 /lf		2,925
30	Classroom - Base Cabinets w/P-Lam Top - B4-1.56 - 2 DBB01-36, 1 DBB02-21 = 8'-2"Lf ea @ 1 Location	8.50 lf	325.00 /lf		2,763

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
12-3000.130	Casework- Misc				
30	Classroom - Base Cabinets w/P-Lam Top - V13-1.56 - 2 DB02-27, 1 DBB01-30, 1 DBB01-33 = 10'Lf ea @ 1 Location	10.00	lf	325.00 /lf	3,250
30	Classroom - Wardrobe - V13-1.56 - 1 TW-3684 = 1ea @ 1 Location	1.00	ea	1,200.00 /ea	1,200
30	Classroom - Base Cabinets w/P-Lam Top - H4-1.56 - 2 DBB01-30, 1 DBB01-33 = 8'Lf ea @ 1 Location	8.00	lf	325.00 /lf	2,600
30	Classroom - Wardrobe - H4-1.56 - 1 TW-3684 = 1ea @ 1 Location	1.00	ea	1,200.00 /ea	1,200
30	Classroom - Base Cabinets w/P-Lam Top - V4-1.56 - 2 DBB01-33, 1 DBB01-36 = 8'-10"Lf ea @ 1 Location	9.00	lf	325.00 /lf	2,925
30	Classroom - Wardrobe - V4-1.56 - 1 TW-3684 = 1ea @ 1 Location	1.00	ea	1,200.00 /ea	1,200
30	Classroom - Base Cabinets w/P-Lam Top - B13-1.56 - 2 DBB01-36, 1 DBB01-33 = 8'-10"Lf ea @ 1 Location	9.00	lf	325.00 /lf	2,925
30	Specialty Rooms	0.00	LOC		
30	Maker Space 1231, 1238, 2221, 2228, 3220, 3225 - N18-1.50 - Base Cabinets w/P-Lam Top - 6 AB-36, 1 ABA-36 = 21'-6" @ 6 Location	132.00	lf	325.00 /lf	42,900
30	Maker Space 1231, 1238, 2221, 2228, 3220, 3225 - N18-1.50 - Upper Cabinets - 4 W2-2730, 2 W2-3630, 2 W2-3624 = 21'6" @ 6 Location	312.00	lf	250.00 /lf	78,000
30	Maker Space 1231, 1238, 2221, 2228, 3220, 3225 - R23-1.50 - Base Cabinets w/P-Lam Top & Supports - 2 ABS2-36, 2 Counter Supports = 13'-6" @ 6 Location	84.00	lf	325.00 /lf	27,300
30	Maker Space 1231, 1238, 2221, 2228, 3220, 3225 - F7-1.50 - Base Cabinets w/Open Upper Shelving - 4 TH4-3684 = 4ea @ 6 Location	24.00	ea	1,200.00 /ea	28,800
30	Maker Space 1231, 1238, 2221, 2228, 3220, 3225 - K7-1.50 - Wardrobes - 6 Ts-3384, 2 TS-3384P = 8ea @ 6 Location	48.00	ea	1,200.00 /ea	57,600
30	Collaboration 1228, 1238, 2221, 2228, 3220, 3225 A7-1.50 - Base Cabinets w/P-Lam Top - 1 AB-24, 1 ABA-33, 1 AS01-30, 1 ABD3-24 = 9'-6" @ 6 Location	60.00	lf	325.00 /lf	19,500
30	Collaboration 1228, 1238, 2221, 2228, 3220, 3225 A7-1.50 - Wardrobes - 3 TWD3384, 1 TS3084 = 4ea @ 6 Location	24.00	ea	1,200.00 /ea	28,800
30	Collaboration 1228, 1238, 2221, 2228, 3220, 3225 A7-1.50 - Wall mounted Shelving 87' @ 6 Location	522.00	lf	225.00 /lf	117,450
30	Collaboration 1228, 1238, 2221, 2228, 3220, 3225 A7-1.50 - Wall Mounted P-Lam Top w/Supports 42' @ 6 Location	252.00	lf	225.00 /lf	56,700
30	Exam Room 1122 - 1 Wardrobe	1.00	lf	1,200.00 /lf	1,200
30	Exam Room 1122 - P-Lam Counter Top w/Sink	4.50	lf	225.00 /lf	1,013
30	Exam Room 1122 - 1 Upper Cabinet	2.00	lf	250.00 /lf	500
30	Exam Room 1119 - Base Cabinets w/P-Lam Top - ABA-36 = 6'	6.00	lf	325.00 /lf	1,950
30	Exam Room 1119 Upper Cabenits - 1 W2-3624, 1 W2-3324 = 6'	6.00	ea	250.00 /ea	1,500
30	Exam Room 1119 Wardrobe - 1 TS-3384	1.00	ea	1,100.00 /ea	1,100
30	Copy/Mail Room 1111 - Base Cabinets w/P-Lam Top - 5 AB-36 = 14'-8"	15.00	lf	325.00 /lf	4,875
30	Copy/Mail Room 1111 - Mail Cubbies = 4 WM17-3642	12.00	lf	500.00 /lf	6,000
30	Copy/Mail Room 1111 - Upper Cabinets - W2-3024	3.00	lf	550.00 /lf	1,650
30	Copy/Mail Room 1111 - Room Desk = 8sf	1.00	ea	3,500.00 /ea	3,500

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
12-3000.130	Casework- Misc				
30	Copy/Mail Room 1111 - Base Cabinets w/P-lam Top - 8 ABC04-30 = 20lf	20.00 lf	375.00 /lf		7,500
30	Student Survices - 2203 - Wall Mounted P-Lam Top w/Supports	53.00 lf	225.00 /lf		11,925
30	Student Survices - 2203 - Wall mounted Shelving	110.00 lf	225.00 /lf		24,750
30	Connect - 2220, 3219 - S12-1.52 Kitchenette - Base Cabinets w/P-Lam Top - 3 AB-3-, 1 ABP5-30, 1 ABA-36 = 30'-10"Lf ea @ 2 Locations	62.00 lf	325.00 /lf		20,150
30	Connect - 2220, 3219 - S12-1.52 Kitchenette - Upper Cabinets - 4 W2-3032, 1 W2-2732, 1 W2-3624 = 30'-10" @ 2Locations	62.00 lf	25.00 /lf		1,550
30	Connect - 2220, 3219 - S12-1.52 Kitchenette - Wardrobes - 1 TS-3684, 1 TW-3684, 1 Laptop Cart Cab - 3 ea @ 2 Locations	2.00 ea	1,200.00 /ea		2,400
30	Connect - 2220, 3219 - S5-1.52 - Base Cabinets w/P-Lam Top - 3 DBB01-33, 3 DBS2-33-Shallow - 33'-6" @ 2 Locations	67.00 lf	325.00 /lf		21,775
30	Connect - 2220, 3219 - S18-1.52 - Wardrobes - 5 TSC-33, 1 TBO-2784 - 6ea @ 2Locations	12.00 ea	1,200.00 /ea		14,400
30	Rise 2227, 3226 - M12-1.52 - Kitchenette - Base Cabinets w/P-Lam Top - 3 AB-30, 1 ABA-36, 1 ABP-30, 1 AB-24 = 30'-6"Lf ea @ 2 Locations	61.00 lf	325.00 /lf		19,825
30	Rise 2227, 3226 - M12-1.52 - Kitchenette - Upper Cabinets - 4 W2-3032, 1 W2-3624, 1 W2-2432 = 30'-6"Lf ea @ 2 Locations	61.00 lf	250.00 /lf		15,250
30	Rise 2227, 3226 - M12-1.52 - Kitchenette - Wardrobes - 1 TSC-33, 1 TS-3684, 1 TW-3684, 1 Laptop Cart Cab. = 4ea @ 2Locations	8.00 ea	1,250.00 /ea		10,000
30	Rise 2227, 3226 - M5-1.52 Base Cabinets w/P-Lam Top - 3 DBB01-33, 3 DBS2-33-Shallow - 33'-6" @ 2 Locations	67.00 lf	325.00 /lf		21,775
30	Rise 2227, 3226 - M18-1.56 - Wardrobes - 5 TSC-33, 1 TBO-2784 - 6ea @ 2Locations	12.00 ea	1,200.00 /ea		14,400
30	Resource Rooms 2244, 3242 - W3-1.57 -Wall Mounted P-Lam Counter w/Supports = 6' @ 2 Locations	12.00 lf	225.00 /lf		2,700
30	Resource Rooms 2244, 3242 - W3-1.57 -Wall Mounted Shelving = 12'Lf @ 2 locations	24.00 lf	225.00 /lf		5,400
30	Resource Rooms 2244, 3242 - W10-1.57 - Base Cabinets w/P-Lam Top - 2 DBB01-30 - 5'Lf @ 2 Locations	10.00 lf	325.00 /lf		3,250
30	ART - 2109 P7-1.58 - V19 - Base Cabinets w/P-Lam Top - 4 AB-30 = 10'	10.00 lf	375.00 /lf		3,750
30	ART - 2109 P7-1.58 - V19 - Upper Cabinets = 4 W2-3-32 = 10'	10.00 lf	250.00 /lf		2,500
30	ART 2109 P7-1.58 - R2 - Base Cabinet w/P-Lam Top - 1 AB30 = 2'-6"	3.00 lf	325.00 /lf		975
30	ART 2109 P7-1.58 -V27 - Base Cabinets w/P-Lam Top - 3 B-30 = 7'-6"	8.00 lf	325.00 /lf		2,600
30	ART 2109 P7-1.58 - V27 - Upper Cabinets - 3 W2-3032 - 7'-6"	8.00 lf	250.00 /lf		2,000
30	ART 2106 - B7-1.57 - B22 - Base Cabinets w/P-Lam Top - 4 AB-30 = 10'	10.00 lf	375.00 /lf		3,750
30	ART 2106 - B7-1.57 - B22 - Upper Cabinets = 4 W2-3-32 = 10'	10.00 lf	250.00 /lf		2,500
30	ART 2106 - B7-1.57 - B13 - Base Cabinet w/P-Lam Top - 1 AB30 = 2'-6"	3.00 lf	325.00 /lf		975
30	ART 2106 - B7-1.57 - E22 - Base Cabinets w/P-Lam Top - 4 DB-36, 4 DB-33, 3 DB-39 = 33'-6"	34.00 lf	325.00 /lf		11,050
30	ART 2106 - B7-1.57 - E22 - Wardrobe 2 TS-2484	2.00 ea	1,100.00 /ea		2,200
30	Music 2105 - E16-1.53 - K-19 - Base Cabinets w/P-Lam Top - 4 AB-33, 1 AB-36 =14'	14.00 lf	325.00 /lf		4,550

Item	Description	Takeoff Qty	Unit Cost	Total	
				Unit Cost	Amount
12-3000.130	Casework- Misc				
30	Music 2105 - E16-1.53 - K-19 - Upper Cabinets - 4 W2-3332, 1 W2-3632 - 14'	14.00 lf	275.00 /lf		3,850
30	Music 2105 - E16-1.53 - K26 - Base Cabinets w/P-Lam Top - 9 DBB01-30, 2 DBB01-27 = 27'-6"	28.00 lf	325.00 /lf		9,100
30	Music 2102 -L23-1.57 - Base Cabinets w/P-Lam Top - 5 DBB01-39, 5 DBB01-36, 2 DBB01-33 = 34'-6"	34.00 lf	325.00 /lf		11,050
30	Music Room 2106 & 2102 Inst. Storage Cabinets = 12	12.00 ea	1,450.00 /ea		17,400
30	Ensemble 2101 - J27-1.55 - Base Cabinets w/P-Lam Top = 2 AB-36, 1 ABA-36, 1 AB-33 = 12'	12.00 lf	375.00 /lf		4,500
30	SS Copy 2nd & 3rd Floor - u-26 - 1.53 - Wall Mounted P-lam Counter w/Support = 14'-6" @ 2 Locations	29.00 lf	225.00 /lf		6,525
30	SS Copy 2nd & 3rd Floor U-26 - 1.53 - Wall Mounted Shelving - 43'-6" @ 2 Locations	87.00 lf	225.00 /lf		19,575
30	SS Copy 2nd & 3rd Floor - Wardrobes 5 TWD-3884 @ 2 Locations	10.00 ea	1,200.00 /ea		12,000
30	Student Services 3202 - A8-1.51 - Wall Mounted P-lam Counter w/Support = 55'Lf	55.00 lf	450.00 /lf		24,750
30	Student Services 3202 - A8-1.51 - Wall Mounted Shelving - 110'Lf	110.00 ea	225.00 /ea		24,750
30	Collaboration 3117 - J9-1.59 - Base Cabinets w/P-Lam Top - 1 AB-30, 1 ABD3-24, 1 ABS01-30, 1 ABA-33, AB-24 = 12'-10"Lf	13.00 lf	375.00 /lf		4,875
30	Collaboration 3117 - J9-1.59 - Wardrobes - 4 TWD-3684. 1 TS-3084 = 5ea	5.00 ea	1,200.00 /ea		6,000
30	Collaboration 3117 - J9-1.59 - Wall Mounted P-lam Counter w/Support = 28'Lf	28.00 lf	225.00 /lf		6,300
30	Collaboration 3117 - J9-1.59 - Wall Mounted Shelving = 40'Lf	40.00 lf	225.00 /lf		9,000
30	Title 1 Office - 3110 - *** NO DETAIL *** 8 wardrobes	8.00 ea	1,200.00 /ea		9,600
30	Title 1 Office - 3110 - *** NO DETAIL *** 25'Lf Wall Mounted P-Lam Counter w/Supports	25.00 lf	225.00 /lf		5,625
30	IT-Office 2119 - Base Cabinets w/P-Lam Top - 5 B-36 = 20'Lf	20.00 lf	325.00 /lf		6,500
30	IT-Office 2119 - Wall Mounted Shelving - 40'Lf	40.00 lf	225.00 /lf		9,000
30	HallWay "U" A19-1.54 - Shaped Desk = Base Cabinets w/P-Lam Top = 2 DB-24, 2 DB-27, 2 CBA-33, 1 DB-33 = 23'-6"Lf ea @ 6 Locations	141.00 ea	375.00 /ea		52,875
30	Staff Lunch - 1124 - Base Cabinets w/P-Lam Top = 2 AB-36, 1 ABA-36, 1 ABD4/2-36 = 12'-6"Lf	13.00 lf	325.00 /lf		4,225
30	Staff Lunch - 1124 - Upper Cabinets = 4 W2-2432, 1 W2-3624, 1 W1-1232 = 12'6"Lf	13.00 lf	250.00 /lf		3,250
30	Storage 1133 - Wall Mounted Shelving = 66'Lf	66.00 lf	225.00 /lf		14,850
30	PT - 1132 - Base Cabinets w/P-Lam Top = 4 DBB01-36, 2 DBB01-33, 1 ABA-48 = 22'Lf	22.00 lf	325.00 /lf		7,150
30	PT - 1132 - Upper Cabinets = 1 W2-3024, 1 W1-1832 = 4'Lf	4.00 lf	250.00 /lf		1,000
30	PT - 1132 - Wardrobes = 3 TS-4884	3.00 ea	1,400.00 /ea		4,200
30	PT - 1132 - Wall Mounted Shelving = 20'Lf	20.00 lf	225.00 /lf		4,500
30	HallWay Desk = Base Cabinets w/P-Lam Top = 2 ABA-33, 2 AB-27, 2 AB-36 = 19'Lf	19.00 lf	325.00 /lf		6,175
	Casework- Misc			12.544/sf	2,099,275
	167,352.00 sf				
	FURNISHINGS			13.796/sf	2,308,835
	167,352.00 sf				

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>FURNISHINGS</i>		13.796/sf	2,308,835
	167,352.00 sf			
	<i>E2010 Fixed Furnishings</i>		13.796/sf	2,308,835
	167,352.00 sf			
E2020	<i>Movable Furnishings</i>			
09-0000.000	<i>FINISHES</i>			
09-6800.100	<i>Flooring - Carpet</i>			
	2 Area Rugs 6x8/14ea 096813, 2.01C FF&E	672.00	FF&E	
	2 Area Rugs 9x12/14ea 096813, 2.01C FF&E	1,512.00	FF&E	
	<i>FINISHES</i>			0
	167,352.00 sf			
12-0000.000	<i>FURNISHINGS</i>			
12-4813.100	<i>Floor Mats</i>			
	10 Walk-Off Mats WOM1	340.00	sf 45.00 /sf	15,300
	10 Foot Grilles FGR1	934.00	sf 45.00 /sf	42,030
	<i>Floor Mats</i>		0.343/sf	57,330
	167,352.00 sf			
	<i>FURNISHINGS</i>		0.343/sf	57,330
	167,352.00 sf			
	<i>E2020 Movable Furnishings</i>		0.343/sf	57,330
	167,352.00 sf			
	<b>E20 FURNISHINGS</b>		14.139/sf	2,366,165
	167,352.00 sf			
	<b>E EQUIPMENT AND FURNISHINGS</b>		18.604/sf	3,113,400
	167,352.00 sf			

**F SPECIAL CONSTRUCTION AND DEMOLITION**

**F20 SELECTIVE BUILDING DEMOLITION**

F2010 *Building Elements Demolition*

02-0000.000 *EXISTING CONDITIONS & DEMO*

02-4116.100 *Building Demolition*



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
02-4116.100	<i>Building Demolition</i>			
110	Demolition of Existing Structure(s) 01 10 00-1	71,871.00 sf	7.65 /sf	549,813
	<i>Building Demolition</i>		3.285/sf	549,813
	167,352.00 sf			
	<i>EXISTING CONDITIONS &amp; DEMO</i>		3.285/sf	549,813
	167,352.00 sf			
	<i>F2010 Building Elements Demolition</i>		3.285/sf	549,813
	167,352.00 sf			
F2020	<i>Hazardous Components Abatement</i>			
02-0000.000	<i>EXISTING CONDITIONS &amp; DEMO</i>			
02-8200.110	<i>Asbestos Removal</i>			
30	Asbestos Removal - Allowance 00 31 00.40	1.00 Allow	1,025,442.00 /Allow	1,025,442
30	UST Tank Soils - Contaminated Soil Allow Carried in Bid Per Spec Site Bid***	300.00 Bid	150.00 /Bid	45,000
30	UST Tank Removal - Site Bid***	1.00 Bid	18,484.00 /Bid	18,484
	<i>Asbestos Removal</i>		6.507/sf	1,088,926
	167,352.00 sf			
	<i>EXISTING CONDITIONS &amp; DEMO</i>		6.507/sf	1,088,926
	167,352.00 sf			
	<i>F2020 Hazardous Components Abatement</i>		6.507/sf	1,088,926
	167,352.00 sf			
	<b>F20 SELECTIVE BUILDING DEMOLITION</b>		<b>9.792/sf</b>	<b>1,638,739</b>
	167,352.00 sf			
	<b>F SPECIAL CONSTRUCTION AND DEMOLITION</b>		<b>9.792/sf</b>	<b>1,638,739</b>
	167,352.00 sf			
<b>G</b>	<b>SITWORK</b>			
<b>G10</b>	<b>SITE PREPARATION</b>			
G1010	<i>Site Clearing</i>			
31-0000.000	<i>EARTHWORK</i>			
31-1100.100	<i>Site Preparation</i>			
10	Sitework Preparation Bid*****	1.00 Bid	1,228,394.00 /Bid	1,228,394

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	Site Preparation		7.34 /sf	1,228,394
	167,352.00 sf			
	<b>EARTHWORK</b>		7.34 /sf	1,228,394
	167,352.00 sf			
	G1010 Site Clearing		7.34 /sf	1,228,394
	167,352.00 sf			
G1070	Site Earthwork			
31-0000.000	<b>EARTHWORK</b>			
31-2213.110	Site Grading			
110	Sitework Earthwork Bid*****	1.00 Bid	1,094,214.00 /Bid	1,094,214
	Site Grading		6.538/sf	1,094,214
	167,352.00 sf			
	<b>EARTHWORK</b>		6.538/sf	1,094,214
	167,352.00 sf			
	G1070 Site Earthwork		6.538/sf	1,094,214
	167,352.00 sf			
	<b>G10 SITE PREPARATION</b>		<b>13.879/sf</b>	<b>2,322,608</b>
	167,352.00 sf			
<b>G20</b>	<b>SITE IMPROVEMENTS</b>			
G2030	Pedestrian Paving			
32-0000.000	<b>EXTERIOR IMPROVEMENTS</b>			
32-1313.100	Site Concrete			
6	4" Concrete Paving	42,100.00 sf	9.90 /sf	416,790
6	Concrete Paving At Loading Dock	1,290.00 sf	17.00 /sf	21,930
8	4" Concrete Base at Pavers 4500PSI	1,370.00 sf	7.00 /sf	9,590
8	Concrete Stairs	2.00 ea	15,000.00 /ea	30,000
	Site Concrete		2.858/sf	478,310
	167,352.00 sf			
32-1400.100	Site Pavers			
30	Unit Pavers w/ 1" setting bed	1,370.00 sf	24.00 /sf	32,880
	Site Pavers		0.196/sf	32,880
	167,352.00 sf			
32-1713.120	Paving			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
32-1713.120	<i>Paving</i>			
110	Tactile Warning Surfacing	250.00 sf	20.00 /sf	5,000
110	Now Concrete	610.00 sf		
110	Crushed Stone 1.5"/ 2"Compacted Stone Dust/ Steel Edging - Around Generator Pad	451.00 sf	12.00 /sf	5,412
110	Peastone Gravel Strip At Building	2,000.00 sf	11.00 /sf	22,000
	<i>Paving</i>		0.194/sf	32,412
	167,352.00 sf			
	<i>EXTERIOR IMPROVEMENTS</i>		3.248/sf	543,602
	167,352.00 sf			
	<i>G2030 Pedestrian Paving</i>		3.248/sf	543,602
	167,352.00 sf			
G2040	<i>Site Development</i>			
04-0000.000	<i>MASONRY</i>			
04-4000.010	<i>Masonry</i>			
2	Stone Masonry Seat Wall 2" Granite With SS Rail Skate Deter	192.00 sf	275.00 /sf	52,800
2	CMU Entry Walls & Piers	650.00 sf	24.00 /sf	15,600
2	Brick Masonry Entry Walls & Piers	2,550.00 sf	32.00 /sf	81,600
2	Precast At Entry Piers	31.00 ea	275.00 /ea	8,525
2	Precast At Entry Walls	84.00 lf	65.00 /lf	5,460
	<i>Masonry</i>		0.98 /sf	163,985
	167,352.00 sf			
	<i>MASONRY</i>		0.98 /sf	163,985
	167,352.00 sf			
05-0000.000	<i>METALS</i>			
05-5820.120	<i>Misc Steel</i>			
10	Loading Dock Rails A7.12 ( 2 Double Rails)	20.00 lf	225.00 /lf	4,500
10	Guardrail At CIP Wall Loading Area	56.00 lf	275.00 /lf	15,400
10	Site Stair Rails SS	28.00 lf	225.00 /lf	6,300
10	Bollards	12.00 ALLO W	1,200.00 /ALLO W	14,400
	<i>Misc Steel</i>		0.243/sf	40,600
	167,352.00 sf			
	<i>METALS</i>		0.243/sf	40,600
	167,352.00 sf			
10-7000.000	<i>EXTERIOR SPECIALITIES</i>			
10-7500.100	<i>Flagpoles</i>			
130	Flagpole	1.00 ea	10,500.00 /ea	10,500

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>Flagpoles</i>		<i>0.063/sf</i>	<i>10,500</i>
	<i>167,352.00 sf</i>			
	<i>EXTERIOR SPECIALITIES</i>		<i>0.063/sf</i>	<i>10,500</i>
	<i>167,352.00 sf</i>			
12-0000.000	<i>FURNISHINGS</i>			
12-9300.110	<i>Site Furnishings</i>			
120	Bike Rack w/ Expansion Bolts	16.00 ea	1,800.00 /ea	28,800
120	Cafe Table w/ 4 Attached seats	15.00 ea	3,900.00 /ea	58,500
120	Soccer Goals	12.00 ea	2,500.00 /ea	30,000
120	Bench w/ Stainless Steel Wedge Anchor Bolts*****	8.00 ea	3,400.00 /ea	27,200
120	Baseball/Softball Base	8.00 ea	450.00 /ea	3,600
120	Trash Receptacle	4.00 ea	1,800.00 /ea	7,200
120	Pitchers Rubber	2.00 ea	450.00 /ea	900
120	Basketball Goal	1.00 ea	8,800.00 /ea	8,800
120	KOPMAN # - Playground Equipment	1.00 ea	602,000.00 /ea	602,000
	3PK2/Playground Equipment 3-5 grades			
120	Shade Structure	1.00 ea	18,000.00 /ea	18,000
120	Backless Aluminum Players Bench (21' each)	6.00 ea	4,500.00 /ea	27,000
120	Aluminum Bleachers	2.00 ea	14,000.00 /ea	28,000
	<i>Site Furnishings</i>		<i>5.019/sf</i>	<i>840,000</i>
	<i>167,352.00 sf</i>			
	<i>FURNISHINGS</i>		<i>5.019/sf</i>	<i>840,000</i>
	<i>167,352.00 sf</i>			
31-0000.000	<i>EARTHWORK</i>			
31-2316.210	<i>Structure Excavation</i>			
105	Sitework Improvements Earthwork Bid*****	1.00 Bid	1,684,347.00 /Bid	1,684,347
	<i>Structure Excavation</i>		<i>10.065/sf</i>	<i>1,684,347</i>
	<i>167,352.00 sf</i>			
	<i>EARTHWORK</i>		<i>10.065/sf</i>	<i>1,684,347</i>
	<i>167,352.00 sf</i>			
32-0000.000	<i>EXTERIOR IMPROVEMENTS</i>			
32-1313.100	<i>Site Concrete</i>			
8	Concrete - Set For Bollards Supplied by Others	20.00 ea	500.00 /ea	10,000
8	Shade Structure - Footings	20.00 cy	1,200.00 /cy	24,000
8	Loading Area Separation & Radius Walls	60.00 cy	1,200.00 /cy	72,000
	Concrete - Footings - Walls			
8	Concrete Walls At Seating	44.00 cy	1,200.00 /cy	52,800
8	Concrete Footings & Walls Front Entry	55.00 cy	1,200.00 /cy	66,000
8	Concrete Footings At Site Improvements	36.00 cy	1,200.00 /cy	43,200
	<i>Site Concrete</i>		<i>1.601/sf</i>	<i>268,000</i>
	<i>167,352.00 sf</i>			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	Site Concrete		1.601/sf	268,000
	167,352.00 sf			
32-1613.110	Curbs- Concrete			
10	Flush Concrete Curb at Safety Play Surface	269.00 lf	60.00 /lf	16,140
	Curbs- Concrete		0.096/sf	16,140
	167,352.00 sf			
32-1823.110	Athletic Surfaces			
20	Rubber Safety Surfacing Lower Area	7,566.00 sf	22.00 /sf	166,452
20	Rubber Safety Surfacing Upper Area	6,785.00 sf	22.00 /sf	149,270
20	Coating & Lines Play Surface Acrylic Color Coating System With Line Paint Min Two Appl. Coats	5,500.00 sf	6.00 /sf	33,000
	Athletic Surfaces		2.084/sf	348,722
	167,352.00 sf			
32-3113.110	Ornamental Metal Fence			
102	6' HT. Ornamental Fence	414.00 lf	110.00 /lf	45,540
102	4' HT. Ornamental Fence	323.00 lf	90.00 /lf	29,070
102	Double Gate at Ornamental Fence 4'	2.00 ea	5,400.00 /ea	10,800
102	Single Gate at Ornamental Fence 4'	1.00 ea	2,850.00 /ea	2,850
102	Single Gate at Ornamental Fence 6'	1.00 ea	3,250.00 /ea	3,250
	Ornamental Metal Fence		0.547/sf	91,510
	167,352.00 sf			
32-3113.200	Fence Rails			
4	4' HT. Vinyl-Clad Chain Link Fence	3,752.00 lf	52.00 /lf	195,104
4	Single Gate at Vinyl-Clad Chain Link Fence 4'	14.00 ea	925.00 /ea	12,950
4	Double Gate at Vinyl-Clad Chain Link Fence 4'	2.00 ea	1,800.00 /ea	3,600
4	8' HT. **Repair Vinyl-Clad Chain Link Fence*****	652.00 lf	35.00 /lf	22,820
4	4' HT. **Repair Vinyl-Clad Chain Link Fence*****	114.00 lf	20.00 /lf	2,280
4	8' Wood Fence 'B' 8'	140.00 lf	125.00 /lf	17,500
4	8' Wood Fence 'B' Gates	1.00 ea	1,500.00 /ea	1,500
4	7' PVC Privacy Fence	112.00 lf	125.00 /lf	14,000
4	D 7' PVC Privacy Fence	1,218.00 lf	125.00 /lf	152,250
4	Single Gate 7' PVC Privacy Fence	1.00 ea	1,500.00 /ea	1,500
4	4'HT. Plastic Chain-Link Fence Topper at Baseball Field	432.00 lf	65.00 /lf	28,080
4	Vinyl-Clad Chain Link Main Backstop	76.50 lf	250.00 /lf	19,125
4	Vinyl-Clad Chain Link Backstop	73.50 lf	250.00 /lf	18,375
4	24' HT. Nylon Netting (PER Supp. #3)	410.00 lf	160.00 /lf	65,600
4	Foul Pole	4.00 ea	2,500.00 /ea	10,000
	Fence Rails		3.374/sf	564,684
	167,352.00 sf			
	EXTERIOR IMPROVEMENTS		7.703/sf	1,289,056
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>G2040 Site Development</i>		24.072/sf	4,028,488
	167,352.00 sf			
G2050	Landscaping			
32-0000.000	EXTERIOR IMPROVEMENTS			
32-9113.120	Soil Preparation			
10	Supply/Screen/Test/Ammend/Spread Loam	11,800.00 Bid	30.00 /Bid	354,000
10	Plant Soil	1,400.00 Bid	55.00 /Bid	77,000
	Soil Preparation		2.575/sf	431,000
	167,352.00 sf			
32-9219.110	Lawns & Grasses			
5	Lawn Restoration	1.00 ls	15,000.00 /ls	15,000
5	Native Low Mow Mix	66,000.00 sf	0.40 /sf	26,400
5	4" Skinned Infield at Baseball Field (85 cyds )	11,700.00 sf	5.00 /sf	58,500
5	Grass Lawn Mix	287,274.00 sf	0.45 /sf	129,273
5	6" Skinned Infield at Softball Field (150 cyds )	4,500.00 sf	8.00 /sf	36,000
5	Boulder Benches	3.00 ea	4,600.00 /ea	13,800
	Lawns & Grasses		1.667/sf	278,973
	167,352.00 sf			
32-9313.110	Groundcover Plants			
110	AB Compact Bluestar (Perennials, Groundcover, Vines)	68.00 ea	25.00 /ea	1,700
110	DP Hay-Scented Fern (Perennials, Groundcover, Vines)	18.00 ea	25.00 /ea	450
110	LS Native Trumpet Honeyuckle (Perennials, Groundcover, Vines)	4.00 ea	45.00 /ea	180
110	Bioretention Plants & Wetland Seed Mix	11,500.00 sf	2.00 /sf	23,000
	Groundcover Plants		0.151/sf	25,330
	167,352.00 sf			
32-9333.110	Shrubs & Hedges			
110	AX Compact belia (Deciduous Shrubs)	68.00 ea	175.00 /ea	11,900
110	FA Forsythia (Deciduous Shrubs)	50.00 ea	175.00 /ea	8,750
110	IV Dwarf Winterberry (Deciduous Shrubs)	6.00 ea	175.00 /ea	1,050
110	IV Male Winterberry (Deciduous Shrubs)	2.00 ea	175.00 /ea	350
110	LO California Privet (Deciduous Shrubs)	78.00 ea	375.00 /ea	29,250
110	RA Gr-Low Fragrance Sumac ( Deciduous Shrubs)	162.00 ea	120.00 /ea	19,440
110	SP Compact Lilac (Deciduous Shrub)	11.00 ea	325.00 /ea	3,575
110	VT Cranberrybush (Deciduous Shrubs)	22.00 ea	325.00 /ea	7,150
110	IG Inkberry (Evergreen Shrubs)	181.00 ea	350.00 /ea	63,350
110	JB Blue Pacific Shore Juniper (Evergreen Shrubs)	429.00 ea	210.00 /ea	90,090
110	JC Green Seargent Junioer	18.00 ea	210.00 /ea	3,780
	Shrubs & Hedges		1.426/sf	238,685
	167,352.00 sf			
32-9343.110	Trees			
120	JV Eastern Red Cedar (Evergreen Trees)	30.00 ea	1,000.00 /ea	30,000
120	PG White Spruce (Evergreen Trees)	71.00 ea	1,600.00 /ea	113,600



Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
32-9343.110	Trees			
120	TG Green Giant (Evergreen Trees)	13.00 ea	1,600.00 /ea	20,800
120	AR Red Maple (Deciduous Trees)	56.00 ea	1,000.00 /ea	56,000
120	GB Maidenhair Tree (Deciduous Trees)	3.00 ea	950.00 /ea	2,850
120	GT Thornless Honeylocust (Deciduous Trees)	76.00 ea	1,000.00 /ea	76,000
130	AL Allegheny Serviceberry (Ornamental Trees)	8.00 ea	1,000.00 /ea	8,000
130	AP Upright Green (Ornamental Trees)	2.00 ea	1,000.00 /ea	2,000
130	HM Seven Son Flower (Ornamental Trees)	1.00 ea	950.00 /ea	950
130	HX Witch Hazel (Ornamental Trees)	1.00 ea	1,000.00 /ea	1,000
130	MD Donald Crabapple (Ornamental Trees)	20.00 ea	1,600.00 /ea	32,000
130	MS Sugar Tyme Grabapple (Ornamental Trees)	1.00 ea	950.00 /ea	950
	Trees		2.056/sf	344,150
	167,352.00 sf			
	EXTERIOR IMPROVEMENTS		7.876/sf	1,318,138
	167,352.00 sf			
	G2050 Landscaping		7.876/sf	1,318,138
	167,352.00 sf			
	<b>G20 SITE IMPROVEMENTS</b>		<b>35.197/sf</b>	<b>5,890,228</b>
	167,352.00 sf			
<b>G30</b>	<b>SITE MECHANICAL UTILITIES</b>			
G3010	Water Supply			
33-0000.000	UTILITIES			
33-1002.101	DI Push On Pipe			
c 6	Sitework Bid	1.00 Bid	395,750.00 /Bid	395,750
	Water*****			
	DI Push On Pipe		2.365/sf	395,750
	167,352.00 sf			
	UTILITIES		2.365/sf	395,750
	167,352.00 sf			
	G3010 Water Supply		2.365/sf	395,750
	167,352.00 sf			
G3020	Sanitary Sewer			
33-0000.000	UTILITIES			
33-1004.901	SDR 35 Pipe			
8	Sitework Bid Sanitary	1.00 Bid	216,305.00 /Bid	216,305
	Sewer*****			



# Northbridge Elementary School

8/26/2019 7:15 AM

**FONTAINE BROS., INC.**

Whitinsville, MA

CONSTRUCTION MANAGERS  
GENERAL CONTRACTORS

## 90% CD Budget Estimate Uniformat

90CD Reconciled

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	SDR 35 Pipe		1.293/sf	216,305
	167,352.00 sf			
	UTILITIES		1.293/sf	216,305
	167,352.00 sf			
	G3020 Sanitary Sewer		1.293/sf	216,305
	167,352.00 sf			
G3030	Storm Sewer			
33-0000.000	UTILITIES			
33-1002.101 c 36	DI Push On Pipe Sitework Bid Storm Sewer***** DI Push On Pipe	1.00 Bid	2,576,394.00 /Bid	2,576,394
	167,352.00 sf		15.395/sf	2,576,394
	UTILITIES		15.395/sf	2,576,394
	167,352.00 sf			
	G3030 Storm Sewer		15.395/sf	2,576,394
	167,352.00 sf			
	<b>G30 SITE MECHANICAL UTILITIES</b>		<b>19.052/sf</b>	<b>3,188,449</b>
	<b>167,352.00 sf</b>			
<b>G40</b>	<b>SITE ELECTRICAL UTILITIES</b>			
G4010	Site Electrical Utilities			
26-0000.000	ELECTRICAL			
26-0000.100	Electrical			
10	SL1/3; Pole Mounted LED Fixture w/ Type III Distribution on 17.5' Pole, US Architectural	32.00 ea	3,000.00 /ea	96,000
10	SL2/3; Dual Pole Mounted LED Fixture w/ Type III Distribution on 17.5' Pole, US Architectural	16.00 ea	4,000.00 /ea	64,000
10	SL3/4; Post Top LED Fixture w/ Type V Distribution on 12.5' Pole, US Architectural	8.00 ea	2,500.00 /ea	20,000
10	SLV4: 4' In-Grade Flag Pole Lighting, 0-10V Dimming Capable, Birchwood	18.00 ea	750.00 /ea	13,500
10	SL6; Ingrade Accent Fixture w/ Internal Glare Louver & External Rock guard, Targetti	2.00 ea	750.00 /ea	1,500
10	SL7; On grade Sign Lighting, Eco Sense	3.00 ea	750.00 /ea	2,250

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
26-0000.100	<i>Electrical</i>			
10	Incoming secondary feeder to MSB from utility transformer in concrete encased *By Others ductbank w/ (6) 4" Schedule 40 PVC Conduit & (1) 4" spare Schedule 40 Conduit (BB) - Includes conduit and feeders	179.00 lf	450.00 /lf	80,550
10	2#8, 1#10G, 1"C - 24" below grade & 2-1/2" Shielded Cable (0-10V DC) 1"C - Includes conduit and feeders	4,203.00 lf	10.00 /lf	42,030
10	Incoming primary emergency feeder (EE) - Includes conduit and feeders	221.00 lf	320.00 /lf	70,720
10	Incoming primary electrical service feeder (AA) - empty conduit only	915.00 lf	50.00 /lf	45,750
10	Incoming Primary Telecom Feeder from Pvt property pole set (CC) - empty conduit only	449.00 lf	100.00 /lf	44,900
10	Incoming secondary Telecom Feeder from telcom handhole to MDF room (CC) - empty conduit only	614.00 lf	100.00 /lf	61,400
10	Electrical manhole	2.00 ea	3,500.00 /ea	7,000
10	Telcom manhole	3.00 ea	3,500.00 /ea	10,500
10	Pullbox, grnd mtd 24"x36"x24"DP Quazite #PG2436BC-24	52.00 ea	400.00 /ea	20,800
	<i>Electrical</i>		3.471/sf	580,900
	167,352.00 sf			
	<i>ELECTRICAL</i>		3.471/sf	580,900
	167,352.00 sf			
32-0000.000	<i>EXTERIOR IMPROVEMENTS</i>			
32-1313.100	<i>Site Concrete</i>			
110	Transformer Pad	63.00 sf	25.00 /sf	1,575
110	Generator Pad	126.00 sf	28.00 /sf	3,528
	<i>Site Concrete</i>		0.03 /sf	5,103
	167,352.00 sf			
	<i>EXTERIOR IMPROVEMENTS</i>		0.03 /sf	5,103
	167,352.00 sf			
33-0000.000	<i>UTILITIES</i>			
33-0550.010	<i>Pipe Trenching</i>			
8	Sitework Bid Utilities*****	1.00 Bid	314,158.00 /Bid	314,158
	<i>Pipe Trenching</i>		1.877/sf	314,158
	167,352.00 sf			
	<i>UTILITIES</i>		1.877/sf	314,158
	167,352.00 sf			
	<i>G4010 Site Electrical Utilities</i>		5.379/sf	900,161
	167,352.00 sf			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
	<i>G4010 Site Electrical Utilities</i>		<i>5.379/sf</i>	<i>900,161</i>
	<i>167,352.00 sf</i>			
	<b>G40 SITE ELECTRICAL UTILITIES</b>		<b>5.379/sf</b>	<b>900,161</b>
	<b>167,352.00 sf</b>			
	<b>G SITEWORK</b>		<b>73.506/sf</b>	<b>12,301,446</b>
	<b>167,352.00 sf</b>			
<b>Z</b>	<b>GENERAL</b>			
<b>Z10</b>	<b>GENERAL REQUIREMENTS</b>			
<i>Z1050</i>	<i>Temporary Facilities and Controls</i>			
<i>01-5000.000</i>	<i>TEMPORARY FACILITIES AND CONTROLS</i>			
<i>01-5000.010</i>	<i>Temp Requirements</i>			
200	Temporary Facilities and Controls			
200	Training video	1.00	1,200.00 /ls	1,200
200	Field Engineering/Building Layout (Survey and Control)	1.00	7,000.00 /ls	7,000
200	Temporary Toilets	27.00	1,500.00 /mos	40,500
200	Temporary Egress Stairs	1.00	8,000.00 /ls	8,000
200	Pest Control	1.00	1,500.00 /ls	1,500
200	Project Signs / Wayfinding	1.00	12,000.00 /ls	12,000
200	Field First Aid			
200	Safety / Temporary Protection	1.00	276,318.00 /ls	276,318
200	Fire Protection - Extinguishers (4 Re-Charges)	5.00	500.00 /ls	2,500
200	Site Security	1.00	15,000.00 /ls	15,000
200	Police details	1.00	25,000.00 /ls	25,000
200	Temporary Provisions			
200	Temporary Fire Protection	1.00	30,000.00 /ls	30,000
200	Temporary Light and Power			
200	Temporary Power - Trailers	1.00	25,000.00 /ls	25,000
200	Temporary Water	1.00	15,000.00 /ls	15,000
200	Water Consumption	1.00	5,000.00 /ls	5,000
200	Energy Consumption (fuel)	1.00	102,000.00 /ea	102,000
200	Energy Consumption (power)	1.00	150,000.00 /ea	150,000
200	Trash Chutes	2.00	15,000.00 /ea	30,000
200	Temporary Enclosures	1.00	167,352.00 /ls	167,352
200	Temporary Heat - Equipment/Distribution	6.00	7,500.00 /mos	45,000
200	Temporary Heat - Equipment - Electric Hookup	1.00	25,000.00 /ls	25,000
200	Winter Conditions (SITE)	1.00	55,000.00 /winter	55,000
200	Winter Conditions (CONCRETE)	1.50	55,000.00 /winter	82,500
200	Dumpsters	232.00	750.00 /pulls	174,000
200	Emergency Generator Fuel	1.00	10,000.00 /ls	10,000
200	Noise Control	1.00	10,000.00 /ls	10,000
200	Pest Control	1.00	2,500.00 /ls	2,500
200	Cleaning Progress / Final			
200	Progress Cleaning	1.00	495,219.65 /ls	495,220
200	Lull	26.00	4,000.00 /mos	104,000
200	Final Cleaning - 1st pass at turn over	167,352.00	0.70 /sf	117,146
200	Engineering & Control			

Item	Description	Takeoff Qty	Total	
			Unit Cost	Amount
01-5000.010	Temp Requirements			
200	Layout/Staking	1.00 ls	10,000.00 /ls	10,000
200	As-Built Survey	1.00 ls	12,000.00 /ls	12,000
200	Mobilization & Building Demo			
200	Mobilize / Coordination / Survey Existing Conditions	1.00 ea	10,000.00 /ea	10,000
200	Vibration Control	18.00 ea	2,000.00 /ea	36,000
	Temp Requirements		12.559/sf	2,101,736
	167,352.00 sf			
	TEMPORARY FACILITIES AND CONTROLS		12.559/sf	2,101,736
	167,352.00 sf			
	Z1050 Temporary Facilities and Controls		12.559/sf	2,101,736
	167,352.00 sf			
	Z10 GENERAL REQUIREMENTS		12.559/sf	2,101,736
	167,352.00 sf			
	Z GENERAL		12.559/sf	2,101,736
	167,352.00 sf			



## **90% Construction Documents Estimate**

### **W. Edward Balmer Elementary School**

Whitinsville, MA

**PM&C LLC**  
20 Downer Ave, Suite 5  
Hingham, MA 02043  
(T) 781-740-8007  
(F) 781-740-1012

Prepared for:

**Dore + Whittier Architects, Inc.**

August 23, 2019





W. Edward Balmer Elementary School  
Whitinsville, MA

23-Aug-19

90% Construction Documents Estimate

MAIN CONSTRUCTION COST SUMMARY

	Construction Start	Gross Floor Area	\$/sf	Estimated Construction Cost
	Sep-19			
NEW BUILDING		167,352	\$321.48	\$53,799,997
DEMOLISH EXISTING SCHOOL		71,871	\$7.50	\$539,033
REMOVE HAZARDOUS MATERIALS				\$1,088,926
GENERAL REQUIREMENTS				\$2,065,736
SITEWORK				\$12,115,301
<hr/>				
SUB-TOTAL		167,352	\$415.94	\$69,608,993
ESCALATION	0.67%			\$466,380
DESIGN AND PRICING CONTINGENCY	1.0%			\$700,754
<hr/>				
SUB-TOTAL		167,352	\$422.92	\$70,776,127
GENERAL CONDITIONS				\$5,364,384
BONDS				Included w/ GC's
INSURANCE				Included w/ GC's
PERMIT				Waived
CM CONTINGENCY	2%			\$1,415,523
CM FEE				\$1,625,000
<b>TOTAL OF ALL CONSTRUCTION</b>		167,352	\$473.14	<b>\$79,181,034</b>



**W. Edward Balmer Elementary School**  
Whitinsville, MA

23-Aug-19

**90% Construction Documents Estimate**

This 90% Construction Documents cost estimate was produced from drawings, specifications and other documentation prepared by Dore and Whittier Architects Inc. and their design team dated July 31, 2019. Design and engineering changes occurring subsequent to the issue of these documents have not been incorporated in this estimate.

This estimate includes all direct construction costs, Construction Managers overhead, fee and design contingency. Cost escalation assumes start dates indicated.

Bidding conditions are expected to be public bidding under Chapter 149a of the Massachusetts General Laws to pre-qualified construction managers, and pre-qualified sub-contractors, open specifications for materials and manufacturers.

The estimate is based on prevailing wage rates for construction in this market and represents a reasonable opinion of cost. It is not a prediction of the successful bid from a contractor as bids will vary due to fluctuating market conditions, errors and omissions, proprietary specifications, lack or surplus of bidders, perception of risk, etc. Consequently the estimate is expected to fall within the range of bids from a number of competitive contractors or subcontractors, however we do not warrant that bids or negotiated prices will not vary from the final construction cost estimate.

**ITEMS NOT CONSIDERED IN THIS ESTIMATE**

Items not included in this estimate are:

- Land acquisition, feasibility, and financing costs
- All professional fees and insurance
- Site or existing conditions surveys investigations costs, including to determine subsoil conditions
- All Furnishings, Fixtures and Equipment
- Items identified in the design as Not In Contract (NIC)
- Items identified in the design as by others
- Owner supplied and/or installed items as indicated in the estimate
- Utility company back charges, including work required off-site
- Work to City streets and sidewalks, (except as noted in this estimate)
- Construction contingency
- Contaminated soils removal



W. Edward Balmer Elementary School

23-Aug-19

Whitinsville, MA

GSF

167,352

90% Construction Documents Estimate

**CONSTRUCTION COST SUMMARY IN CSI FORMAT**

	NEW SCHOOL BUILDING	SITEWORK	TOTAL	Cost/SF
<b>DIV. 2 EXISTING CONDITIONS</b>				
024120 Demolition - Bulk	See Front Summary			
028200 HazMat Remediation	See Front Summary			
<b>DIV. 3 CONCRETE</b>				
033000 Cast-in-Place Concrete	\$2,698,290	\$278,660	\$2,976,950	\$18.66
033005 Water Vapor Reducing Admixture	\$145,868		\$145,868	
<b>DIV. 4 MASONRY</b>				
<b>040001 Masonry - FSB</b>	<b>\$2,726,927</b>	<b>\$2,726,927</b>	<b>\$2,726,927</b>	<b>\$16.29</b>
<b>DIV. 5 METALS</b>				
051000 Structural Steel	\$6,085,672	\$4,800	\$6,085,672	\$42.15
054000 Cold-Formed Metal Framing	\$210,946		\$210,946	
<b>055000 Metal Fabrications - FSB</b>	<b>\$748,064</b>	<b>\$4,800</b>	<b>\$752,864</b>	
055305 Metal Gratings and Floor Plates	\$3,900		\$3,900	
<b>DIV. 6 WOODS &amp; PLASTICS</b>				
061000 Rough Carpentry	\$474,303	\$1,216,596	\$1,690,899	\$7.27
061850 Glued-Laminated Timber Beams	\$234,274		\$234,274	
062000 Finish Carpentry	\$200,155		\$200,155	
064020 Interior Architectural Woodwork	\$189,734		\$189,734	
064216 Wood-Veneer Paneling	\$118,130		\$118,130	
<b>DIV. 7 THERMAL &amp; MOISTURE PROTECTION</b>				
<b>070001 Waterproofing, Dampproofing &amp; Caulking - FSB</b>	<b>\$1,087,795</b>		<b>\$1,087,795</b>	<b>\$38.27</b>
<b>070002 Roofing and Flashing - FSB</b>	<b>\$1,831,027</b>		<b>\$1,831,027</b>	
072100 Building Insulation	\$486,406		\$486,406	
076400 Cladding Panels	\$2,943,277		\$2,943,277	
077200 Roof Accessories	\$9,000		\$9,000	
078100 Fireproofing & Firestopping	\$47,649		\$47,649	
<b>DIV. 8 DOORS &amp; WINDOWS</b>				
<b>080001 Windows - FSB</b>	<b>\$474,455</b>	<b>\$4,171,932</b>	<b>\$4,646,387</b>	<b>\$24.93</b>
<b>080002 Glass and Glazing - FSB</b>	<b>\$166,692</b>		<b>\$166,692</b>	
081110 HM Doors and Frames	\$258,925		\$258,925	



**CONSTRUCTION COST SUMMARY IN CSI FORMAT**

	NEW SCHOOL BUILDING	SITEWORK	TOTAL	Cost/SF
082110 Wood Doors	\$171,675		\$171,675	
083100 Access Doors	\$10,000		\$10,000	
083513 Folding Doors (Nana)	\$244,208		\$244,208	
084113 Overhead Doors	\$27,720		\$27,720	
084313 Aluminum Framed-Storefronts	\$1,683,920		\$1,683,920	
084413 Glazed Aluminum Curtainwalls	\$211,920		\$211,920	
086300 Sky Lights	\$62,100		\$62,100	
087100 Door Hardware	\$323,500		\$323,500	
088300 Mirrors	\$1,000		\$1,000	
089100 Exterior Louvers	\$1,625		\$1,625	
089200 Louvered Equipment Enclosures	\$534,192		\$534,192	
<b>DIV. 9 FINISHES</b>	<b>\$7,494,063</b>		<b>\$7,494,063</b>	<b>\$44.78</b>
<b>090002 Tile - FSB</b>	<b>\$514,959</b>		<b>\$514,959</b>	
<b>090003 Acoustical Tile - FSB</b>	<b>\$644,009</b>		<b>\$644,009</b>	
<b>090005 Resilient Floors - FSB</b>	<b>\$1,028,194</b>		<b>\$1,028,194</b>	
<b>090007 Painting - FSB</b>	<b>\$417,344</b>		<b>\$417,344</b>	
092900 Gypsum Wallboard	\$4,072,802		\$4,072,802	
095000 Wood Ceiling	\$274,350		\$274,350	
096000 Wood Flooring	\$20,640		\$20,640	
096100 Wood Athletic Flooring	\$132,368		\$132,368	
096723 Fluid-Applied Flooring	\$117,640		\$117,640	
096820 Carpeting	\$94,011		\$94,011	
097200 Wall Coverings	\$6,770		\$6,770	
098400 Acoustic Room Components	\$170,976		\$170,976	
<b>DIV 10 SPECIALTIES</b>	<b>\$1,277,544</b>		<b>\$1,277,544</b>	<b>\$7.63</b>
101100 Visual Display Surfaces	\$250,904		\$250,904	
101400 Signage	\$79,280		\$79,280	
102100 Toilet Compartments and Cubicles	\$114,300		\$114,300	
102213 Wire Mesh Partitions	\$1,850		\$1,850	
102239 Folding Panel Partitions	\$35,100		\$35,100	
102400 Display cases	\$102,350		\$102,350	
102600 Wall And Corner Guards	\$23,900		\$23,900	
102606 Digitally Printed Protective Wallcovering	\$30,800		\$30,800	
102800 Toilet Accessories	\$61,310		\$61,310	
104400 Fire Protection Specialties	\$20,650		\$20,650	
104600 Privacy Curtains	\$3,000		\$3,000	
105100 Metal Lockers	\$368,100		\$368,100	



W. Edward Balmer Elementary School

23-Aug-19

Whitinsville, MA

GSF 167,352

90% Construction Documents Estimate

**CONSTRUCTION COST SUMMARY IN CSI FORMAT**

	NEW SCHOOL BUILDING	SITEWORK	TOTAL	Cost/SF
107113 Fixed Sun Screens	\$186,000		\$186,000	



W. Edward Balmer Elementary School

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**CONSTRUCTION COST SUMMARY IN CSI FORMAT**

	NEW SCHOOL BUILDING	SITEWORK	TOTAL	Cost/SF
<b>DIV. 11 EQUIPMENT</b>				
111313 Loading Dock Bumpers	\$750		\$750	
113013 Appliances	\$37,616		\$37,616	
114000 Food Service Equipment	\$499,435		\$499,435	
115213 Projection Screens	\$10,101		\$10,101	
116050 Theatrical Drapery and Rigging	\$28,000		\$28,000	
116623 Gymnasium Equipment	\$117,728		\$117,728	
118827 Waste Compactors				
119513 Kilns	\$5,000		\$5,000	
	<b>\$698,630</b>		<b>\$698,630</b>	<b>\$4.17</b>
<b>DIV. 12 FURNISHINGS</b>				
122410 Window Treatments	\$172,659		\$172,659	
123200 Manufactured Wood Casework	\$2,149,285		\$2,149,285	
124810 Entrance Floor Mats and Frames	\$55,900		\$55,900	
126613 Telescoping Bleachers	\$39,000		\$39,000	
	<b>\$2,416,844</b>		<b>\$2,416,844</b>	<b>\$14.44</b>
<b>DIV. 13 SPECIAL CONSTRUCTION</b>				
No work assumed				
<b>DIV. 14 CONVEYING SYSTEMS</b>				
142400 Hydraulic Elevators - FSB	\$174,000		\$174,000	
	<b>\$174,000</b>		<b>\$174,000</b>	<b>\$1.04</b>
<b>DIV. 21 FIRE SUPPRESSION</b>				
210000 Fire Protection - FSB	\$879,500		\$879,500	
	<b>\$879,500</b>		<b>\$879,500</b>	<b>\$5.26</b>
<b>DIV. 22 PLUMBING</b>				
220000 Plumbing - FSB	\$2,196,694		\$2,196,694	
	<b>\$2,196,694</b>		<b>\$2,196,694</b>	<b>\$13.13</b>
<b>DIV. 23 HVAC</b>				
230000 HVAC - FSB	\$7,568,698		\$7,568,698	
	<b>\$7,568,698</b>		<b>\$7,568,698</b>	<b>\$45.23</b>
<b>DIV. 26 ELECTRICAL</b>				
260000 Electrical - FSB	\$5,296,318	\$558,600	\$5,854,918	
	<b>\$5,296,318</b>	<b>\$558,600</b>	<b>\$5,854,918</b>	<b>\$34.99</b>
<b>DIV. 31 EARTHWORK</b>				
311000 Site Preparation				
312000 Earthwork				
312500 Erosion and Sedimentation Control				
316600 Shoring/SOE				
	<b>\$1,384,357</b>	<b>\$2,322,608</b>	<b>\$3,706,965</b>	<b>\$22.15</b>



W. Edward Balmer Elementary School  
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**CONSTRUCTION COST SUMMARY IN CSI FORMAT**

	NEW SCHOOL BUILDING	SITEWORK	TOTAL	Cost/SF





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**CONSTRUCTION COST SUMMARY IN CSI FORMAT**

	NEW SCHOOL BUILDING	SITEWORK	TOTAL	Cost/SF
<b>DIV. 32 EXTERIOR IMPROVEMENTS</b>				
320000 Paving	\$2,618,904		\$2,618,904	
323000 Site Improvements	\$1,613,505		\$1,613,505	
329200 Landscaping	\$1,215,617		\$1,215,617	
<b>DIV. 33 UTILITIES</b>				
330000 Civil Utilities	\$3,502,607		\$3,502,607	
<b>SUBTOTAL DIRECT (TRADE) COST</b>	<b>\$53,799,997</b>	<b>\$12,115,301</b>	<b>\$65,915,298</b>	<b>\$393.87</b>



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**CONSTRUCTION COST SUMMARY**

BUILDING SYSTEM	SUB-TOTAL	TOTAL	\$/SF	%
<b>NEW BUILDING</b>				
<b>A10 FOUNDATIONS</b>				
A1010 Standard Foundations	\$1,775,401			
A1020 Special Foundations	\$0			
A1030 Lowest Floor Construction	\$1,950,901	<b>\$3,726,302</b>	\$22.27	6.9%
<b>A20 BASEMENT CONSTRUCTION</b>				
A2010 Basement Excavation	\$0			
A2020 Basement Walls	\$0	<b>\$0</b>	\$0.00	0.0%
<b>B10 SUPERSTRUCTURE</b>				
B1010 Upper Floor Construction	\$4,464,301			
B1020 Roof Construction	\$2,609,987	<b>\$7,074,288</b>	\$42.27	13.1%
<b>B20 EXTERIOR CLOSURE</b>				
B2010 Exterior Walls	\$7,856,780			
B2020 Windows	\$2,175,905			
B2030 Exterior Doors	\$175,667	<b>\$10,208,352</b>	\$61.00	19.0%
<b>B30 ROOFING</b>				
B3010 Roof Coverings	\$2,268,079			
B3020 Roof Openings		<b>\$2,268,079</b>	\$13.55	4.2%
<b>C10 INTERIOR CONSTRUCTION</b>				
C1010 Partitions	\$3,923,433			
C1020 Interior Doors	\$1,290,937			
C1030 Specialties/Millwork	\$1,917,227	<b>\$7,131,597</b>	\$42.61	13.3%
<b>C20 STAIRCASES</b>				
C2010 Stair Construction	\$428,950			
C2020 Stair Finishes	\$104,812	<b>\$533,762</b>	\$3.19	1.0%
<b>C30 INTERIOR FINISHES</b>				
C3010 Wall Finishes	\$977,530			
C3020 Floor Finishes	\$1,401,396			
C3030 Ceiling Finishes	\$1,250,273	<b>\$3,629,199</b>	\$21.69	6.7%
<b>D10 CONVEYING SYSTEMS</b>				
D1010 Elevator	\$176,950	<b>\$176,950</b>	\$1.06	0.3%
<b>D20 PLUMBING</b>				
D20 Plumbing	\$2,196,694	<b>\$2,196,694</b>	\$13.13	4.1%
<b>D30 HVAC</b>				
D30 HVAC	\$7,449,198	<b>\$7,449,198</b>	\$44.51	13.8%
<b>D40 FIRE PROTECTION</b>				
D40 Fire Protection	\$879,500	<b>\$879,500</b>	\$5.26	1.6%



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<b>CONSTRUCTION COST SUMMARY</b>					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
<b>NEW BUILDING</b>					
<b>D50 ELECTRICAL</b>					
D5010 Complete System		\$5,415,818	<b>\$5,415,818</b>	\$32.36	10.1%
<b>E10 EQUIPMENT</b>					
E10 Equipment		\$732,414	<b>\$732,414</b>	\$4.38	1.4%
<b>E20 FURNISHINGS</b>					
E2010 Fixed Furnishings		\$2,377,844			
E2020 Movable Furnishings		NIC	<b>\$2,377,844</b>	\$14.21	4.4%
<b>F10 SPECIAL CONSTRUCTION</b>					
F10 Special Construction		\$0	<b>\$0</b>	\$0.00	0.0%
<b>F20 HAZMAT REMOVALS</b>					
F2010 Building Elements Demolition		\$0			
F2020 Hazardous Components Abatement		\$0	<b>\$0</b>	\$0.00	0.0%
<b>TOTAL DIRECT COST (Trade Costs)</b>			<b>\$53,799,997</b>	\$321.48	100.0%



90% Construction Documents Estimate

GFA 167,352

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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NEW BUILDING

**GROSS FLOOR AREA CALCULATION**

First Floor	72,910
Second Floor	45,825
Third Floor	48,617

<b>TOTAL GROSS FLOOR AREA (GFA)</b>	<b>167,352 sf</b>
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**A10 FOUNDATIONS**

**A1010 STANDARD FOUNDATIONS**

033000 CONCRETE

Strip Footings	196	CY
Foundation Walls	455	CY
Spread Footings	772	CY
Additional concrete at stepped footings	73	CY
Piers	121	CY
<b>Total Foundation Concrete</b>	<b>1,617</b>	<b>CY</b>

Strip footings

Formwork	4,324	sf	16.00	69,184
Re-bar	6,643	lbs.	1.20	7,972
Concrete material; 4,500 psi	196	cy	125.00	24,500
Placing concrete	196	cy	130.00	25,480

Foundation walls

Formwork	16,860	sf	20.00	337,200
Re-bar	33,720	lbs.	1.20	40,464
Concrete material; 4,500 psi	455	cy	125.00	56,875
Placing concrete	455	cy	130.00	59,150
Form shelf	1,920	lf	10.00	19,200

Spread Footings

Formwork	11,118	sf	17.00	189,006
Re-bar	78,400	lbs.	1.20	94,080
Concrete material; 4,500 psi	772	cy	125.00	96,500
Placing concrete	772	cy	140.00	108,080
Set anchor bolts grout plates	228	ea	150.00	34,200

Piers/Pilasters

Formwork	3,108	sf	20.00	62,160
Re-bar	9,075	lbs	1.15	10,436
Concrete material; 4,500 psi	121	cy	125.00	15,125
Placing concrete	121	cy	200.00	24,200
Additional concrete at footings along path of underground drain pipe	73	cy	750.00	54,750

Strip footings

Formwork	100	sf	16.00	1,600
Re-bar	77	lbs.	1.20	92
Concrete material; 4,500 psi	11	cy	125.00	1,375
Placing concrete	11	cy	130.00	1,430

Foundation walls

Formwork	64	sf	18.00	1,152
Re-bar	128	lbs.	1.20	154
Concrete material; 4,500 psi	4	cy	125.00	500
Placing concrete	4	cy	130.00	520
Form shelf		lf	10.00	

070001 WATERPROOFING, DAMPPROOFING AND CAULKING

Foundation waterproofing - ERP#2 bid	1	ls	43,000.00	43,000
Damp proofing at brick shelf at gym	801	sf	3.00	Early bid



90% Construction Documents Estimate

GFA 167,352

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
59	Fluid applied waterproofing at retaining wall	1,110	sf	7.50	Early bid		
60							
61	072100 THERMAL INSULATION						
62	Insulation	7,888	sf	3.00	23,664		
63							
64	312000 EARTHWORK						
65	Earthwork foundations -ERP#1 bid	1	ls	373,352.00	373,352		
66	<u>Strip footings</u>						
67	Excavation	1,435	cy	18.00	Early Bid		
68	Store on site	1,435	cy	15.00	Early Bid		
69	Backfill with onsite material	784	cy	18.00	Early Bid		
70	<u>Spread footings</u>						
71	Excavation	2,316	cy	20.00	Early Bid		
72	Additional excavation at lower footings along path of underground drain pipe	3,911	cy	18.00	Early Bid		
73	Store on site	6,227	cy	15.00	Early Bid		
74	Backfill with onsite material	5,382	cy	18.00	Early Bid		
75	<u>Miscellaneous</u>						
76	Temporary support/protection at 36" diameter pipe - 410 lf	1	ls	150,000.00	Early Bid		
77	Premium for rock blasting -10% of total excavation	766	cy	60.00	Early Bid		
78	Gravel fill beneath footings, 12"	545	cy	40.00	Early Bid		
79	Perimeter drain	1,920	lf	20.00	Early Bid		
80	Dewatering for foundation work (per Geotech report)	1	ls	25,000.00	Early Bid		
81	SUBTOTAL					1,775,401	
82							
83	<b>A1020 SPECIAL FOUNDATIONS</b>						
84	No work in this section						
85	SUBTOTAL						
86							
87	<b>A1030 LOWEST FLOOR CONSTRUCTION</b>						
88							
89	033000 CONCRETE						
90	<u>Slab on grade, 5" thick</u>						
91	Vapor barrier	74,336	sf	1.00	74,336		
92	Mesh reinforcing 15% lap	85,486	sf	1.10	94,035		
93	Concrete - 5" thick; 4,500 psi	1,214	cy	125.00	151,750		
94	Premium for blind side waterproofing	17,771	sf	7.50	NR		
95	Placing concrete	1,214	cy	45.00	54,630		
96	Finishing and curing concrete	74,336	sf	3.50	260,176		
97	Control joints - saw cut	74,336	sf	0.10	7,434		
98	<u>Elevator Pit</u>						
99	<u>Wall</u>						
100	Formwork	240	sf	20.00	4,800		
101	Re-bar	480	lbs.	1.20	576		
102	Concrete material; 4,500 psi	9	cy	125.00	1,125		
103	Placing concrete	9	cy	200.00	1,800		
104	20" Mat slab w/ sump pit	175	sf	35.00	6,125		
105	Thickened slab at CMU walls	341	lf	25.00	8,525		
106	Slab depression premium	800	lf	25.00	20,000		
108	Underslab drainage at B & C wings per supplement #4	55,472	sf	4.00	Early Bid		
109	Ramp to gym	75	sf	20.00	1,500		
110	Equipment pads	1	ls	15,000.00	15,000		
111	Concrete to stair treads at loading dock	35	lfr	220.00	7,700		
112							
113	033005 WATER VAPOR REDUCING ADMIXTURE						
114	Water vapor reducer admixture	1,214	cy	52.00	63,128		
115							



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST	
<b>NEW BUILDING</b>								
116	070001 WATERPROOFING, DAMPPROOFING AND CAULKING							
117	Waterproofing at elevator pit footings and walls; 1/A0.11	1	ls	8,000.00	Early Bid			
118								
119	072100 THERMAL INSULATION							
120	Rigid insulation	74,336	sf	2.25	167,256			
121								
122	312000 EARTHWORK							
107	Sitework underslab utilities -ERP#1 bid	1	ls	226,500.00	226,500			
123	Earthwork Slab on Grade -ERP#1 Bid	1	ls	709,505.00	709,505			
124	Adjustment to bid for underslab drainage- ERP#1	1	ls	75,000.00	75,000			
125	Removal of unsuitables under the building included in site							
126	Slab on grade							
127	E+B for UG plumbing	1	ls	40,000.00	Early Bid			
128	Structural fill under the building	13,254	cy	30.00	Early Bid			
129	12" Structural fill	2,753	cy	30.00	Early Bid			
130	Compact sub-grade	74,336	sf	0.50	Early Bid			
131	SUBTOTAL					1,950,901		
132								
133	<b>TOTAL - FOUNDATIONS</b>							<b>\$3,726,302</b>
134								
135								
136	<b>A20 BASEMENT CONSTRUCTION</b>							
137								
138	<b>A2010 BASEMENT EXCAVATION</b>							
139	No Work in this section							
140	SUBTOTAL							
141								
142	<b>A2020 BASEMENT WALLS</b>							
143	No Work in this section							
144	SUBTOTAL							
145								
146	<b>TOTAL - BASEMENT CONSTRUCTION</b>							
147								
148								
149	<b>B10 SUPERSTRUCTURE</b>							
150								
151	<b>B1010 FLOOR CONSTRUCTION</b>	1,274	tns	15.2 lbs/sf	Excluding roof screen steel			
152								
153	033000 CONCRETE							
154	Concrete on Metal Deck							
155	WWF reinforcement	108,753	sf	1.10	119,628			
156	Concrete fill to metal deck; 4-1/2" normal weight	1,379	cy	130.00	179,270			
157	Place and finish concrete	94,568	sf	2.50	236,420			
158	Rebar to decks	28,370	lbs	1.20	34,044			
159	Ferro clips at CMU fire wall; S1.33	30	lf	50.00	1,500			
160								
161	033005 WATER VAPOR REDUCING ADMIXTURE							
162	Water vapor reducer admixture	1,379	cy	60.00	82,740			
163								
164	051000 STRUCTURAL STEEL FRAMING							
165	Steel beams and bracing	555	tns	3,800.00	2,109,000			
166	Steel columns	164	tns	3,800.00	623,200			
167	Premium for HSS	256	tns	350.00	89,600			
168	Misc. angles, plates, lintels etc - 15%	108	tns	3,800.00	410,400			
169	Shear studs	18,914	ea	2.50	47,285			
170	2", 20ga Metal floor deck	94,568	sf	3.90	368,815			
171	Moment connections	21	ea	750.00	15,750			
172	Full welds	95	ea	900.00	85,500			
173	Expansion joints	150	lf	90.00	13,500			



90% Construction Documents Estimate

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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**NEW BUILDING**

174							
175	078100	<i>FIREPROOFING/FIRESTOPPING</i>					
176		<i>Fireproofing locations per Ao.XX partial horizontal control plans addendum #2</i>					
177		1-hour rated spray applied fireproofing to steel framing including columns and underside of deck above	8,065	sf	3.50	28,228	
178		1-hour rated spray applied fireproofing to columns only	2	loc	168.00	336	
179		2-hour rated spray applied fireproofing to steel framing including columns and underside of deck above	1,625	sf	5.00	8,125	
180		2-hour rated spray applied fireproofing to steel columns only	4	loc	240.00	960	
181		Fire stopping floors	1	ls	10,000.00	10,000	
182		SUBTOTAL					4,464,301
183							

**B1020 ROOF CONSTRUCTION**

184							
185							
186	033000	<i>CONCRETE</i>					
187		<i>Concrete on metal deck at rooftop equipment &amp; select low roof locations</i>					
188		WWF reinforcement	7,070	sf	1.10	7,777	
189		Concrete fill to metal deck; 7" light weight	139	cy	175.00	24,325	
190		Place and finish concrete	6,148	sf	3.00	18,444	
191		Rebar to decks	2,121	lbs	1.20	2,545	
192							
193	051000	<i>STRUCTURAL STEEL FRAMING</i>					
194		Steel beams/columns	366	tns	3,800.00	1,390,800	
195		Joists at gym roof - DLH series	23	tns	3,500.00	80,500	
196		Premium for HSS	19	tns	350.00	6,650	
197		Misc. angles, plates, lintels etc - 15%	58	tns	3,800.00	220,400	
198		Galv steel at roof screen framing	37	tns	4,900.00	181,300	
199		Premium for AESS steel - exterior columns only				NR	
200		Acoustic deck at gym	6,400	sf	9.00	57,600	
201		3" type N galvanized metal roof deck, typical	81,529	sf	3.50	285,352	
202		Uplift bridging at gym roof	188	lf	50.00	9,400	
203		X-bridging at gym roof	3,235	lbs	2.00	6,470	
204		Expansion joints	75	lf	120.00	9,000	
205		Moment connections	6	ea	500.00	3,000	
206							
207	061850	<i>GLUEWD-LAMINATED TIMBER BEAMS</i>					
208		Galv steel knife plate base pedestal connection into spread footing at wood column	39	loc	550.00	21,450	
209		Galv steel gusset plate connection each side of wood column to beam	78	loc	650.00	50,700	
210		Douglas Fir wood canopy decking and glu lam structure material, per Smartlam quote dated 6/3/19	1	ls	108,041.81	108,042	
211		Canopy decking and columns at gym rear entrance, material only	1	ls	22,282.26	22,282	
212		Installation of CLT decking	2,815	sf	30.00	84,450	
213		Glulam columns install; 9'-4" high	39	loc	500.00	19,500	
214							
215	078100	<i>FIREPROOFING/FIRESTOPPING</i>					
216		<i>Fireproofing locations per Ao.XX partial horizontal control plans</i>					
217		1-hour rated spray applied fireproofing to steel framing including columns and underside of deck above per addendum #2		sf	3.50	none shown	
218		SUBTOTAL					2,609,987

<b>TOTAL - SUPERSTRUCTURE</b>	<b>\$7,074,288</b>
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<b>B20 EXTERIOR CLOSURE</b>
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<b>B2010 EXTERIOR WALLS</b>	68,615	sf
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90% Construction Documents Estimate

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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
227	040001 MASONRY						
228	Brick veneer	36,859	sf	38.00	1,400,642		
229	Ground face CMU veneer at gym A24/A4.14	400	sf	32.00	12,800		
230	Premium for brick pier construction type X1.11A	8,909	sf	3.00	26,727		
231	Premium for brick 8" soldier course	378	lf	5.00	1,890		
232	Brick to columns at entry vestibule #1214	682	sf	40.00	27,280		
233	Cast stone base	4,454	sf	62.00	276,148		
234	Architectural precast concrete cap at base; 9"	1,100	lf	60.00	66,000		
235	Architectural precast concrete cap above brick; profile A 6" deep	1,596	lf	52.00	82,992		
236	Architectural precast concrete cap above brick piers at upper level; profile B 9" deep	215	lf	60.00	12,900		
237	4" CMU at roof to wall flashing below brick veneer; R11/A3.50	301	sf	20.00	6,020		
238	8" CMU backup at stairwells	3,758	sf	24.00	90,192		
239	12" CMU backup, reinforced @ Gym	5,651	sf	32.00	180,832		
240	Staging to exterior wall	42,395	sf	4.00	169,580		
241	<u>Mockup AGO.03</u>						
242	Brick veneer	160	sf	38.00	6,080		
243	Cast stone base	105	sf	62.00	6,510		
244	Architectural precast concrete cap at base	33	lf	60.00	1,980		
245	Architectural precast concrete cap above brick	19	lf	60.00	1,140		
214							
215	101400 SIGNAGE						
216	Exterior signage	1	ls	10,000.00	10,000		
217							
218	070001 WATERPROOFING, DAMPPROOFING AND CAULKING						
219	Air barrier; spray barrier	68,615	sf	6.50	445,998		
220	Air barrier; spray barrier at soffit and cornice	17,878	sf	6.50	116,207		
221	Air barrier/flashing at windows	9,042	lf	6.75	61,034		
222	Miscellaneous sealants & flashings at closure	68,615	sf	1.00	68,615		
223	<u>Mockup AGO.03</u>						
224	Air barrier; spray barrier	197	sf	6.50	1,281		
225	Air barrier/flashing at windows	81	lf	6.75	547		
226	Miscellaneous sealants & flashings at closure	197	sf	1.00	197		
227							
228	072100 THERMAL INSULATION						
229	Insulation; 3" rigid at masonry	42,696	sf	3.00	128,088		
230	Insulation; 4" mineral wool at metal & phenolic panel	25,919	sf	4.15	107,564		
231	Insulation; 4" mineral wool at metal soffits	6,148	sf	4.15	25,514		
232							
233	075200 CLADDING						
234	Metal composite material panel rain screen system with back ventilation @ roof level; LYMO architectural systems	13,147	sf	70.00	920,290		
235	Pre-finished phenolic panel rainscreen system (3 colors); Trespa "Meteon"; 10 mm panel	12,772	sf	68.00	868,496		
236	Prefinished MCM metal cornice; A6.70	1,955	lf	280.16	547,713		
237	Metal soffit panel at overhang and canopy soffits, including framing, sheathing, insulation (ATAS)	6,148	sf	65.00	399,620		
238	Insulated metal column covers at exterior 9'-2" high; A27/A6.60	4	loc	5,135.20	20,541		
239	<u>Mockup AGO.03</u>						
240	Metal composite material panel rain screen system with back ventilation @ roof level; LYMO architectural systems	150	sf	70.00	10,500		
241	Pre-finished phenolic panel rainscreen system (3 colors); Trespa "Meteon"	47	sf	68.00	3,196		
242	Prefinished MCM metal cornice; A6.70	35	lf	280.16	9,806		
243							
244	089200 LOUVERED EQUIPMENT ENCLOSURES						



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
245	Solid acoustically rated equipment screen; Bass associates	9,279	sf	57.57	534,192		
246							
247	092900 GYPSUM BOARD ASSEMBLIES						
248	12 GA. CFMF angle at roof cornice	1,955	lf	35.00	68,425		
249	2-1/2" CFMF between struct. Channels at cornice	3,095	sf	9.00	27,855		
250	3-1/2" CFMF horizontal z-girt at cornice	3,578	sf	6.00	21,468		
251	6" CFMF vertical z-girt behind cornice and fascia	5,963	sf	9.50	56,649		
252	Vertical z-girt at cornice roof edge and fascia; 4"	5,630	sf	6.00	33,780		
253	Framing system @ overhangs and canopies	6,148	sf	14.00	86,072		
254	6" metal stud backup	59,206	sf	9.50	562,457		
255	Gypsum Sheathing	59,206	sf	2.75	162,817		
256	Drywall lining to interior face of stud backup (furred partitions at inside of exterior walls taken below)	55,246	sf	3.30	182,312		
257	<u>Mockup AGO.03</u>						
258	12 GA. CFMF angle at roof cornice	35	lf	35.00	1,225		
259	2-1/2" CFMF between struct. Channels at cornice	55	sf	9.00	495		
260	3-1/2" CFMF horizontal z-girt at cornice	64	sf	6.00	384		
261	6" CFMF vertical z-girt behind cornice and fascia	70	sf	9.50	665		
262	6" metal stud backup	197	sf	9.50	1,872		
263	Gypsum Sheathing	197	sf	2.75	542		
264	Drywall lining to interior face of stud backup	197	sf	3.30	650		
265	SUBTOTAL					7,856,780	
266							
267	<b>B2020 WINDOWS</b>	16,831	sf				
268							
269	061000 ROUGH CARPENTRY						
270	Wood blocking at openings	9,042	lf	12.00	108,504		
271	<u>Mockup AGO.03</u>						
272	Wood blocking at openings	81	lf	12.00	972		
273							
274	070001 WATERPROOFING, DAMPPROOFING AND CAULKING						
275	Backer rod & double sealant	9,042	lf	10.00	90,420		
276	<u>Mockup AGO.03</u>						
277	Backer rod & double sealant	81	lf	9.00	729		
278							
279	080001 METAL WINDOWS						
280	Aluminum framed windows	1,177	sf	95.00	111,815		
281							
282	084313 ALUMINUM-FRAMED STOREFRONTS						
283	Storefront	13,929	sf	95.00	1,323,255		
284	Premium for operable hopper panels in storefront	155	loc	300.00	46,500		
285	Premium for 1" school guard coating at storefront SGS-1	2,324	sf	35.00	81,340		
286	<u>Mockup AGO.03</u>						
287	Storefront	135	sf	95.00	12,825		
288							
289	084413 GLAZED ALUMINUM CURTAINWALLS						
290	Curtainwall, double glazed (EFCO 5600 or equal) 7-1/2" system	1,700	sf	120.00	204,000		
291	Premium for spandrel glass; IG-6	792	sf	10.00	7,920		
292							
293	089100 LOUVERS						
294	Louvers	25	sf	65.00	1,625		
295							
296	107113 FIXED SUN SCREENS						
297	Pre-finished aluminum sunshades	744	lf	250.00	186,000		
298	SUBTOTAL					2,175,905	
299							
300	<b>B2030 EXTERIOR DOORS</b>						
301							
302	061000 ROUGH CARPENTRY						



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST	
<b>NEW BUILDING</b>								
303	Wood blocking at openings	461	lf	11.00	5,071			
304								
305	072100 THERMAL INSULATION							
306	Fill frames with batt insulation; details page A8.50	461	lf	6.00	2,766			
307								
308	079200 JOINT SEALANTS							
309	Backer rod & double sealant	461	lf	10.00	4,610			
310								
311	081110 HOLLOW METAL							
312	Frames, single	2	ea	450.00	900			
313	Frames, double	4	ea	600.00	2,400			
314	Type F - Single leaf hollow metal door	2	ea	500.00	1,000			
315	Type F - Double leaf hollow metal door	4	pr	1,000.00	4,000			
316								
317	084113 OVERHEAD DOORS							
318	Overhead door; 8' x 7'	1	ea	3,920.00	3,920			
319								
320	089000 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS							
321	Glazed aluminum entrance door and hardware in CW frame; 3'x7'	5	ea	4,000.00	20,000			
322	Glazed aluminum entrance door and hardware in CW frame; 6'x7'	12	pr	8,500.00	102,000			
323	Auto openers - allow	3	ea	5,000.00	15,000			
324								
325	087100 DOOR HARDWARE							
326	Hardware	10	leaf	1,200.00	12,000			
327								
328	090007 PAINTING							
329	Finish doors and frames	10	ea	200.00	2,000			
330	SUBTOTAL					175,667		
331								
332	<b>TOTAL - EXTERIOR CLOSURE</b>						<b>\$10,208,352</b>	

**B30 ROOFING**

336							
337	<b>B3010 ROOF COVERINGS</b>						
338							
339	055000 MISC. METALS						
340	Roof ladder	4	ea	5,000.00	20,000		
341							
342	061000 ROUGH CARPENTRY						
343	Rough blocking	9,515	lf	8.00	76,120		
344	Rough blocking at mechanical penetrations	1	ls	5,000.00	5,000		
345							
346	070002 ROOFING AND FLASHING						
347	TPO roofing, 60mil, complete; with 6" insulation	86,951	sf	18.25	1,586,856		
348	Extend roof membrane over top and back of parapet	978	sf	11.00	10,758		
349	Self adhered base sheet at cornice backup	3,265	sf	6.00	19,590		
350	Stone ballast roofing, R1B & R3B, complete		sf	22.00	removed		
351	Premium for tapered insulation	34,612	sf	2.00	69,224		
352	2 layers 3/4" PPT plywood at fascia backup	3,495	sf	9.00	31,455		
353	1/2" exterior grade plywood at cornice and fascia backup	6,119	sf	4.00	24,476		
354	1/2" exterior grade plywood at roof to wall flashing	1,429	sf	2.75	3,930		
355	Walkway pads	2,478	sf	12.00	29,736		
356	Roof to wall through wall flashing	1,429	lf	20.00	28,580		
357	Roof scupper; R27/A3.50	24	loc	350.00	8,400		
358	Gutter	290	lf	35.00	10,150		
359	Downspout	84	lf	30.00	2,520		
360	Miscellaneous roof flashings & sealants	86,951	sf	0.75	65,213		
361							



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**NEW BUILDING**

362	072100	THERMAL INSULATION						
363		3"	rigid insulation at cornice and fascia	9,540	sf	3.00	28,620	
364		3"	rigid insulation at over top and back of parapet	978	sf	3.00	2,934	
365								
366	075200	CLADDING PANELS						
367		Preformed fascia/gravel stop edge detail at canopy/ ballast roofs/ parapet 18" high; T6/A6.71		1,908	lf	85.00	162,180	
368		<u>Mockup AGO.03</u>						
369		Preformed fascia/gravel stop edge detail at canopy/ ballast roofs/ parapet 18" high; T6/A6.71		11	lf	85.00	935	
370		SUBTOTAL					2,186,677	
371								
372	077200	ROOF ACCESSORIES						
373		Roof hatch including access ladder		1	ea	4,000.00	4,000	
374		Elevator penthouse		1	ls	5,000.00	5,000	
375								
376	086300	METAL FRAMED SKYLIGHTS						
377		Sloped skylights		414	sf	150.00	62,100	
378								
379	092900	GYPSUM BOARD ASSEMBLIES						
380		Gypsum Sheathing at roof edge		3,746	sf	2.75	10,302	
381		SUBTOTAL					81,402	
382								
383		<b>TOTAL - ROOFING</b>						<b>\$2,268,079</b>
384								
385								
386		<b>C10 INTERIOR CONSTRUCTION</b>						
387								
388		<b>C1010 PARTITIONS</b>						
389								
390	042000	MASONRY						
391		D; 4"	CMU	147	sf	20.00	2,940	
392		E1; 8"	CMU, reinforced, 1 hr @ elevator shaft and stairs 1-4	10,528	sf	24.00	252,672	
393		E2; 8"	CMU, 2hr rated	2,770	sf	25.00	changed to G2	
394		G1; 12"	CMU shear wall, reinforced, 1 hr @ gym	2,134	sf	32.00	68,288	
395		G2; 8"	CMU shear wall, reinforced, 2 hr fire wall 12' high;A28/A6.19	840	sf	29.00	24,360	
395		H; 6"	CMU	407	sf	22.00	8,954	
396								
397	055000	MISCELLANEOUS METALS						
398		Seismic clips		86	ea	150.00	12,900	
399		Misc. metals to CMU		15,986	sf	1.00	15,986	
400		Painted steel plate column covers at CMU wall locations; per J series details/A1.50		1	ls	5,000.00	5,000	
401		Support at fire door & overhead doors		185	lf	130.00	24,050	
402								
403	061000	ROUGH CARPENTRY						
404		Wood blocking at interiors		167,352	gsf	0.50	83,676	
405		Rough blocking at partitions		36,061	lf	3.00	108,183	
406								
407	070001	WATERPROOFING, DAMPPROOFING AND CAULKING						
408		Miscellaneous sealants at partitions		202,505	sf	0.30	60,752	
409								
410	080001	METAL WINDOWS						
411		Interior storefront		1,208	sf	80.00	96,640	
412		Interior curtainwall at stair 5, 1hr fire rated 7-1/2" frame		1,050	sf	250.00	262,500	
413		Premium for 5/16" school guard coating at SF-9, SF-31 & door 1102		100	sf	35.00	3,500	
414								
415	080002	GLASS AND GLAZING						
416		Glazing to borrowed lite HM frames		1,010	sf	35.00	35,350	
417		Premium for 1 hr glass at library open to above		98	sf	35.00	3,430	



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
418							
419	081110 HOLLOW METAL DOOR FRAMES						
420	Glazed HM borrowed lite frames	1,010	sf	40.00	40,400		
421							
422	088300 MIRRORS						
423	Wall mirror at PT	25	sf	40.00	1,000		
424							
425	092900 GYPSUM BOARD ASSEMBLIES						
426	A; 6" Metal stud, 1 layer 5/8" e.s., insulation	105,761	sf	15.00	1,586,415		
427	A1; 6" Metal stud, 1 layer 5/8" e.s., insulation, 1 hr	3,999	sf	17.00	67,983		
428	A2; 6" Metal stud, 2 layers 5/8" e.s., insulation	834	sf	19.00	15,846		
429	A2A; 6" Metal stud, 2 layers 5/8" e.s. w/ acoustic sealant, insulation	2,173	sf	19.00	41,287		
430	B; 3-5/8" Metal stud, 1 layer 5/8" e.s., insulation	1,636	sf	13.00	21,268		
431	B1; 3-5/8" Metal stud, 1 layer 5/8" e.s., insulation (1 hr)	499	sf	15.00	7,485		
432	F - 2 1/2" Metal stud, 1 layer 5/8" o.s., insulation	19,589	sf	7.50	146,918		
433	F4; 3 5/8" Metal stud, 1 layer 5/8" o.s., insulation	40,403	sf	9.50	383,829		
434	F4B; 3 5/8" Metal stud, 2 layers 5/8" o.s., insulation	1,930	sf	13.00	25,090		
434	F6; 6" Metal stud, 1 layer 5/8" o.s., insulation	24,396	sf	11.50	280,554		
435	F8; 8" Metal stud, 1 layer 5/8" o.s., insulation	282	sf	13.50	3,807		
436	F10; 1-5/8" Metal stud, 1 layer 5/8" o.s., insulation	350	sf	6.00	2,100		
437	S3 - 2 1/2" CH stud, 1 layer 1" GWB coreboard o/s, 1 layers 5/8" GWB o/s, insulation	653	sf	13.70	8,946		
438	Premium for abuse resistant GWB at all walls up to 10' per AGO.02	180,305	sf	0.50	90,153		
439	Premium for water-resistant GWB	3,696	sf	1.00	3,696		
440	Additional layer of GWB on FRT blocking at shower	99	sf	5.30	525		
441	Cleanup for drywall/logistics	1	ls	90,000.00	90,000		
442							
443	102213 WIRE MESH PARTITIONS						
444	Wire mesh partition at stair 2 level 3; 8' high	9	lf	150.00	1,350		
445	Wire mesh door; single	1	ea	500.00	500		
446							
447	102239 FOLDING PANEL PARTITIONS						
448	Modernfold partition btwn Platform & Gym	26	lf	1,350.00	35,100		
449	SUBTOTAL					3,923,433	
450							
451	<b>C1020 INTERIOR DOORS</b>						
452							
453	061000 ROUGH CARPENTRY						
454	Wood blocking at openings	5,941	lf	4.00	23,764		
455							
456	070001 WATERPROOFING, DAMPPROOFING AND CAULKING						
457	Backer rod & double sealant	5,941	lf	2.50	14,853		
458							
459	080002 GLASS AND GLAZING						
460	Glass in door, transoms & sidelights 5/16" S3 safety glazing	2,779	sf	38.00	105,602		
461	S-2 fire resistant safety glazing in glass openings in fire rated partitions	1	ls	20,000.00	20,000		
462	Premium for 5/16" school guard glazing at interior doors and frames at pre-k entrance and main entrance	66	sf	35.00	2,310		
463							
464	081110 HOLLOW METAL DOORS AND FRAMES						
465	Type F door, sgl leaf	2	ea	500.00	1,000		
466	Type F door, dbl leaf	3	pr	1,000.00	3,000		
467	Type F door, sgle mesh door	1	ea	750.00	750		
468	Frame type 1, single	7	ea	450.00	3,150		
469	Frame type 2, double	4	ea	600.00	2,400		
470	Frame type 3, single	148	ea	450.00	66,600		
471	Frame type 4, double	29	ea	600.00	17,400		



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
472	Frame type 5, single w/ sidelight	19	ea	750.00	14,250		
473	Frame type 6, single w/ transom & sidelight	88	ea	1,050.00	92,400		
474	Frame type 7, double w/ transom	10	ea	850.00	8,500		
475	Frame type 8, single w/ sidelight	1	ea	775.00	775		
476							
477	081400 WOOD DOORS						
478	Type F, sgl leaf	144	ea	450.00	64,800		
479	Type F, dbl leaf	37	pr	900.00	33,300		
480	Type FG, sgl leaf, glazed upper & lower	84	ea	600.00	50,400		
481	Type FG, dbl leaf, glazed upper & lower	2	pr	1,200.00	2,400		
482	Type N, sgl leaf w/ vision panel	36	ea	500.00	18,000		
483	Premium for 45 min fire rated doors	1	ea	75.00	75		
484	Premium for 60 min fire rated doors	15	ea	100.00	1,500		
485	Premium for 90 min fire rated doors	8	ea	150.00	1,200		
486							
487	083000 OVERHEAD DOORS						
488	Overhead door; 17' x 10' at Servery	2	ea	11,900.00	23,800		
489							
490	083110 ACCESS DOORS AND FRAMES						
491	Access doors	1	ls	10,000.00	10,000		
492							
493	083513 FOLDING DOORS, GLAZED						
494	FD; Nana wall, 8' x 8' at Classrooms w/ sandblasted glazing	10	ea	19,200.00	192,000		
495	FD; Nana wall, 12' x 8' at Media Center	1	ea	28,800.00	28,800		
496	FD; Nana wall, 15'-4" x 8' at Corridor	1	ea	30,660.00	NR		
497	HSD - mislabeled as FD - Folding wall doors; 15'-4" x 8', 90 min at fire wall level 1, WON or equal	1	ea	23,408.00	23,408		
498							
499	089000 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS						
500	Glazed aluminum entrance door, frame and hardware, type FG, single leaf	3	ea	4,000.00	12,000		
501	Glazed aluminum entrance door, frame and hardware, type FG, double leaf	7	pr	8,000.00	56,000		
502	Auto openers - allow	3	ea	5,000.00	15,000		
503							
504	087100 DOOR HARDWARE						
505	Hardware	350	leaf	850.00	297,500		
506	Premium for STC 52 rated doors at Music rooms	7	ea	2,000.00	14,000		
507							
508	090007 PAINTING						
509	Finish doors and frames	350	ea	200.00	70,000		
510	SUBTOTAL					1,290,937	
511							
512	<b>C1030 SPECIALTIES / MILLWORK</b>						
513							
514	055000 MISCELLANEOUS METALS						
515	Miscellaneous metals throughout building	167,352	gsf	1.50	251,028		
516	Double handrail at platform ramp	35	lf	150.00	5,250		
517	Double ballet bar at PT	5	lf	150.00	750		
518	PT swing misc. steel beam	2	loc	2,000.00	4,000		
519							
520	061000 ROUGH CARPENTRY						
521	Backer panels in electrical closets	1	ls	2,500.00	2,500		
522	3/4" millwork grade plywood backup at lego wall	163	sf	4.00	652		
523							
524	062000 FINISH CARPENTRY						
525	Stage nosing - 1x hardwood trim with bullnose; K20/A9.60	25	lf	50.00	1,250		
526	Library light well decorative acrylic sculptural elements; 3-form	2	ea	9,100.00	18,200		



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<b>NEW BUILDING</b>							
527	Library decorative acrylic sculptural element above shelving; 3-form	2	ea	7,000.00	14,000		
528	3-1/2" maple trim at lego wall	143	lf	35.00	5,005		
529	Hardwood window sill and apron	1,779	lf	50.00	88,950		
530	Plam cap at lockers; 15" deep	751	lf	50.00	37,550		
531	Plam sides at lockers; 15" deep	570	lf	50.00	28,500		
532	Plam cap at locker islands level 2; 30" wide	67	lf	100.00	6,700		
533							
534	064020 INTERIOR ARCHITECTURAL WOODWORK						
535	Alcove seating at Corridor 1101; F24/A9.71	36	lf	350.00	12,600		
536	Built in benches with book drop at library; T20/A9.71	40	lf	800.00	32,000		
537	Built in upholstered benches at cafeteria; F6/A9.71	27	lf	800.00	21,600		
538	Book shelving joined to desks at media center 3 tier	19	lf	300.00	5,700		
539	Freestanding book shelving at library		lf		F,F & E		
540	Counter at general office/waiting	14	lf	900.00	12,600		
541	Desk at media center/Reading room including shelving at front	18	lf	1,200.00	21,600		
542	Vanity at gang bathroom corridor sinks				NIC		
543	Window seat at corridor	113	lf	350.00	39,550		
544	Countertop at corridor 3109	11	lf	250.00	2,750		
545	Lego plate wall; A23/A9.71	163	sf	32.00	5,216		
546							
547	064216 WOOD-VENEER PANELING						
548	Hardwood veneer plywood panel at Proscenium	444	sf	75.00	33,300		
549	1/2" solid surface wall panel with MDF substrate and laser cut letters at entry to gang toilet rooms	98	sf	70.00	6,860		
550	Hardwood veneer plywood wainscoting at corridor; A9.55		sf	75.00	see below		
551	Chair rail above wainscoting at corridor; A9.55	389	lf	30.00	11,670		
552	3/4" maple veneer plywood at lobby 1101 and corridor 1135 per details on A9.72	441	sf	75.00	33,075		
553	3/4" maple veneer plywood at cafeteria per details on A9.72	443	sf	75.00	33,225		
554							
555	070001 WATERPROOFING, DAMPPROOFING AND CAULKING						
556	Miscellaneous sealants throughout building	167,352	gsf	1.00	167,352		
557							
558	101100 VISUAL DISPLAY SURFACES						
559	Marker boards	6,852	sf	22.00	150,744		
560	Tack board	3,432	sf	20.00	68,640		
561	Tack strips at teaching walls and corridors	3,940	lf	8.00	31,520		
562							
563	102400 DISPLAY CASES						
564	Glass display case with bi-parting sliding glass doors on BB rail hardware, jewelry case lock at bottom	4	loc	6,000.00	24,000		
565	Glass display case at media center (shown dashed)	4	loc	10,000.00	40,000		
566	Recessed display cases with lockable sliding glass doors; Q19/A9.72	4	loc	9,587.50	38,350		
567							
568	101400 SIGNAGE						
569	Building directory	1	loc	3,000.00	3,000		
570	Room Signs	324	loc	120.00	38,880		
571	Acrylic back painted circle with grade symbol at corridor door transom	8	loc	100.00	800		
572	Acrylic cutout letters, back painted white	8	loc	200.00	1,600		
573	Other signage/graphics	1	ls	25,000.00	25,000		
574							
575	102110 TOILET COMPARTMENTS						
576	ADA, solid part-recycled plastic	12	ea	2,000.00	24,000		
577	Standard, solid part-recycled plastic	48	ea	1,800.00	86,400		
578	Urinal screen, solid part-recycled plastic	6	ea	650.00	3,900		
579							





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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**NEW BUILDING**

580	102800	<b>TOILET ACCESSORIES</b>					
581		Combo paper towel dispenser & waste units	12	ea	380.00	4,560	
582		Trash receptacle units at pre-k	4	ea	250.00	1,000	
583		Framed mirrors	60	ea	200.00	12,000	
584		Grab bars	57	sets	200.00	11,400	
585		Sanitary napkin disposal units	84	ea	100.00	8,400	
586		Electric hand dryers at gang bathrooms	24	ea	750.00	18,000	
587		Folding shower seat	1	ea	350.00	350	
588		Shower curtain and rod	1	ea	200.00	200	
589		Shower grab bars	1	set	300.00	300	
590		Soap dispenser	51	ea	70.00	By owner	
591		Toilet paper dispensers	93	ea	150.00	By owner	
592		Paper towel dispensers	48	ea	150.00	By owner	
593		Paper towel dispensers at pre-k	4	ea	150.00	By owner	
594		Bench with changing table at SPED toilet 6' wide	1	ea	1,700.00	1,700	
595		Changing table	2	ea	800.00	1,600	
596		Janitors Closet Accessories	6	rms	300.00	1,800	
597							
598	104600	<b>PRIVACY CURTAINS</b>					
599		Curtain track in exam rooms	60	lf	50.00	3,000	
600							
601	104400	<b>FIRE PROTECTION SPECIALTIES</b>					
602		Fire extinguisher cabinets	56	ea	350.00	19,600	
603		AED cabinets	3	ea	350.00	1,050	
604							
605	105100	<b>LOCKERS</b>					
606		<u>All lockers on fixed bases</u>					
607		Double tier HDPE student lockers, 12"x15"x60"	606	ope	360.00	218,160	
608		Single tier HDPE lockers on level 2	372	ea	400.00	148,800	
609		Staff metal lockers	6	ope	190.00	1,140	
610							
611	102800	<b>WALL PROTECTION</b>					
612		Stainless steel corner guards at corridor 1158 and kitchen	9	ea	200.00	1,800	
613		Vinyl faced corner guards throughout	221	loc	100.00	22,100	
614		SUBTOTAL					1,917,227
615							
616		<b>TOTAL - INTERIOR CONSTRUCTION</b>					<b>\$7,131,597</b>

**C20 STAIRCASES**

**C2010 STAIR CONSTRUCTION**

623	033000	<b>CONCRETE</b>					
624		Concrete to stairs	9	flt	2,100.00	18,900	
625							
626	055000	<b>MISCELLANEOUS METALS</b>					
627		Egress stairs 1,2,3,4 w/ mesh rails	9	flt	34,000.00	306,000	
628		Egress stairs 5 w/ glass infill panel rails	2	flt	50,000.00	100,000	
629		Steps at stair 2 roof penthouse	5	lf	30.00	150	
630							
631	055305	<b>METAL GRATINGS AND FLOOR PLATES</b>					
632		Metal grate at stair 2 roof penthouse	20	sf	75.00	1,500	
633		Handrail at stair 2 roof penthouse steps	12	lf	200.00	2,400	
634		SUBTOTAL					428,950
635							
636	C2020	<b>STAIR FINISHES</b>					
637							
638	090005	<b>RESILIENT FLOORS</b>					
639		Rubber tile at stairs - landings	3,500	sf	15.00	52,500	



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST	
<b>NEW BUILDING</b>								
640	Rubber tile at stairs - treads	1,328	lft	19.06	25,312			
641								
642	090007 PAINTING							
643	Paint to staircases including underside	9	flt	3,000.00	27,000			
644	SUBTOTAL					104,812		
645								
646	<b>TOTAL - STAIRCASES</b>						<b>\$533,762</b>	
647								
648								
649	<b>C30 INTERIOR FINISHES</b>							
650								
651	<b>C3010 WALL FINISHES</b>							
652								
653	064020 INTERIOR ARCHITECTURAL WOODWORK							
654	FRP wall panels in janitor's closet	967	sf	14.00	13,538			
655	FRP at kitchen & storage per A9.13	1,914	sf	14.00	26,796			
656	Premium for digital images at kitchen FRP per D&W email 8/21/19	1	ls	1,000.00	1,000			
657								
658	090002 TILE							
659	Wall tile at gang toilet rooms; 8' high	9,312	sf	24.00	223,488			
660	Wall tile at single toilet rooms; 7' high (per D&W email 8/21/19)	6,531	sf	24.00	156,744			
661	Porcelain wall tile at Servery/Cafeteria area, full height	363	sf	24.00	8,712			
662	Porcelain wall tile at front of kitchen area, full height	2,600	sf	24.00	62,400			
663	Wall tile at corridor drinking fountains	196	sf	22.00	deleted			
664								
665	090007 PAINTING							
666	Paint to GWB	309,665	sf	0.80	247,732			
667	Paint to CMU	22,099	sf	1.25	27,624			
668	Paint to columns in media center	3	loc	75.00	225			
669	Green screen wall paint	145	sf	5.00	725			
670								
671	102601 WALL AND CORNER GUARDS							
672	Wall protection at corridor 1158	677	sf	10.00	6,770			
673								
674	098413 SOUND ABSORBING PANELS							
675	AWP-1; 1" acoustic fabric wrapped panel	232	sf	28.00	6,496			
676	AWP-2-5; 1" perforated wood acoustic panels	660	sf	190.00	125,400			
677	AWP-3; Gymnasium -tectum acoustic panel	2,080	sf	16.50	34,320			
678	AWP-4; 1" fabric wrapped panels	170	sf	28.00	4,760			
679								
680	102606 DIGITALLY PRINTED WALL COVERINGS							
681	DPW; Digitally printed protective wall coverings; Koroseal	880	sf	35.00	30,800			
682	SUBTOTAL					977,530		
683								
684	<b>C3020 FLOOR FINISHES</b>							
685								
686	033000 CONCRETE							
687	Epoxy painted concrete (changed from sealed concrete per D&W email 8/22)	5,270	sf	2.00	10,540			
688								
689	070001 WATERPROOFING, DAMPPROOFING AND CAULKING							
690	Waterproofing membrane throughout all toilet rooms at elevated slab on deck; note 20/A1.71	3,050	sf	4.00	12,200			
691								
692	096000 INTERIOR ARCHITECTURAL WOODWORK							
693	Wood flooring at Platform	860	sf	24.00	20,640			
694								
695	090002 TILE							
696	Floor patching or self leveling compound allowance where necessary, per floor finish general note 15	2,230	sf	0.50	1,115			
697	Quarry tile 6x6	1,850	sf	26.00	48,100			
698	Compressed Quartz tile	380	sf	20.00	7,600			
699	Quarry tile base	340	lf	20.00	6,800			



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
700							
701	090005 RESILIENT FLOORS						
702	Floor patching or self leveling compound allowance where necessary, per floor finish general note 15	114,717	sf	0.75	86,038		
703	Sheet linoleum (including premium for patterns)	112,067	sf	7.00	784,469		
704	Luxury vinyl tile	110	sf	5.50	605		
705	Luxury vinyl tile - checkerboard pattern at staff dining per finish schedule	360	sf	6.50	2,340		
706	Rubber flooring at art rooms	2,010	sf	12.00	24,120		
707	Static dissipative tile 12x12	170	sf	12.00	2,040		
708	Resilient base	20,308	lf	2.50	50,770		
709							
710	096100 ATHLETIC FLOORING						
711	Floor patching or self leveling compound allowance where necessary, per floor finish general note 15	6,865	sf	0.75	5,149		
712	Wood athletic flooring	5,995	sf	19.00	113,905		
713	Wood athletic flooring vented base	360	lf	7.50	2,700		
714	Resilient athletic floor; Taraflex sports M plus	870	sf	12.20	10,614		
715							
716	096700 FLUID APPLIED FLOORING						
717	Epoxy floor at toilet rooms with 4" integral base	5,640	sf	17.00	95,880		
718	Epoxy floors elsewhere (no integral base)	1,360	sf	16.00	21,760		
719							
720	096810 TILE CARPETING						
721	Floor patching or self leveling compound allowance where necessary, per floor finish general note 15	13,675	sf	0.75	10,256		
722	Carpet	9,405	sf	5.00	47,025		
723	Carpet at media center - including premium for patterning per A9.63	4,270	sf	7.00	29,890		
724	Carpet, waste	1,368	sf	5.00	6,840		
725	Area rugs	10,049	sf		NIC		
726	Moisture mitigation -admixture included w/ concrete slabs						
727	SUBTOTAL					1,401,396	
728							
729	<b>C3030 CEILING FINISHES</b>						
730							
731	095000 INTERIOR ARCHITECTURAL WOODWORK						
732	ACP-7; linear wood slats w/ black felt scrim above; Armstrong woodworks grille	6,320	sf	40.00	252,800		
733	6" wood trim at wood ceiling to ACT transition; P12/A2.50	502	lf	30.00	15,060		
734	Wood veneer trim on mdf with 2-1/2" mtl studs at proscenium opening; detail 3/A2.50	118	sf	55.00	6,490		
735							
736	090003 ACOUSTICAL TILE						
737	ACP-1, 2x4 Armstrong Calla	82,131	sf	5.00	410,655		
738	ACP-1A, 2x2 Armstrong Calla	34,670	sf	5.80	201,086		
739	ACP-1B, 2x2 Armstrong Calla black	378	sf	5.80	2,192		
740	ACP-2A; 2x2 Armstrong Calla at Quiet room	318	sf	5.80	1,844		
741	ACP-4; 2x4 Armstrong optima healthzone	2,308	sf	6.50	15,002		
742	Pyramidal diffusers at platform per finish schedule; 50% of area	378	sf	35.00	13,230		
743							
744	090007 PAINTING						
745	Paint to GWB ceilings	13,150	sf	1.50	19,725		
746	Paint ceiling tile and grid black in Green screen & video room	200	sf	2.00	NR		
747	Paint to exposed ceilings including at gym	8,925	sf	2.50	22,313		
748							
749	092900 GYPSUM BOARD ASSEMBLIES						
750	GWB ceiling	1,444	sf	15.00	21,660		
751	GWB ceiling to underside of stair runs/landings	2,322	sf	18.00	41,796		



90% Construction Documents Estimate

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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**NEW BUILDING**

752	GWB cap above cafeteria bumpouts and deep window sills	243	sf	15.00	3,645			
753	Premium for sound isolation ceiling type B at general office/waiting	615	sf	22.00	13,530			
754	GWB soffits - horizontal	4,975	sf	15.00	74,625			
755	GWB soffits - vertical	6,731	sf	20.00	134,620			
756								
757	098400 SOUND ABSORBING PANELS							
758	Direct attached tectum panels between structure at gym per note on A2.23 (60% of ceiling)	3,597	sf	18.00	Removed from contract			
759	SUBTOTAL					1,250,273		
760								
761	<b>TOTAL - INTERIOR FINISHES</b>						<b>\$3,629,199</b>	

**D10 CONVEYING SYSTEMS**

764	055000 MISCELLANEOUS METALS							
765								
766								
767	Pit ladder	1	ea	2,500.00	2,500			
768	Sill angle	18	lf	25.00	450			
769								
770	142000 ELEVATOR							
771	Hydraulic elevator; 3 stop; 3,500 lbs - ERP#2 bid	1	ea	174,000.00	174,000			
772	SUBTOTAL					176,950		
773								
774	<b>TOTAL - CONVEYING SYSTEMS</b>						<b>\$176,950</b>	

**D20 PLUMBING**

779	<b>D20 PLUMBING, GENERALLY</b>						
780	<u>Equipment</u>						
781	Gas fired domestic HW heater 500 MBH with storage	2	ea	28,000.00	56,000		
782	Hot water circulation pump	1	ea	1,200.00	1,200		
783	Water meter assembly	1	ea	3,500.00	3,500		
784	Hot water submeter	1	ea	900.00	900		
785	Reduced pressure backflow preventer	1	ea	3,000.00	3,000		
786	Connection to gas meter	1	ea	1,200.00	1,200		
787	DHW Mixing valve	1	ea	4,500.00	4,500		
788	Expansion tank	2	ea	2,000.00	4,000		
789	Grease trap, interior	2	ea	3,500.00	7,000		
790	Floor drains	24	ea	650.00	15,600		
791	Roof drains	81	ea	750.00	60,750		
792	Wall hydrant	6	ea	395.00	2,370		
793	Hose bibb	6	ea	325.00	1,950		
794	Elevator sump pump	1	ea	3,500.00	3,500		
795	Gas solenoid control panel	1	ea	2,500.00	2,500		
796	DHW heater and boiler flue/intake	5	ea	2,500.00	12,500		
797	Exterior grease trap system	5	ls	10,000.00	50,000		
798	<u>Plumbing Fixtures &amp; Specialties</u>						
799	Water closet	44	ea	1,525.00	67,100		
800	Water closet ADA	28	ea	1,550.00	43,400		
801	Water closet ADA Child	14	ea	1,425.00	19,950		
802	Lavatory	15	ea	1,250.00	18,750		
803	Lavatory ADA	28	ea	1,275.00	35,700		
804	Lavatory ADA Child	14	ea	1,250.00	17,500		
805	Urinal	18	ea	1,575.00	28,350		
806	Classroom sink	17	ea	1,125.00	19,125		
807	Classroom sink ADA	12	ea	1,150.00	13,800		
808	Kitchen double sink with solids interceptor	3	ea	1,450.00	4,350		



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST	
<b>NEW BUILDING</b>								
809	Kitchen sink	15	ea	1,150.00	17,250			
810	Art room sink with interceptor	4	ea	1,875.00	7,500			
811	Drinking fountain	10	ea	3,500.00	35,000			
812	Janitor sink	5	ea	1,150.00	5,750			
813	Shower ADA	1	ea	3,120.00	3,120			
814	<u>Domestic Water Type L Copper Pipe</u>							
815	Domestic water pipe with fittings & hangers	8,495	lf	40.00	339,800			
816	Domestic water pipe insulation	8,495	lf	10.00	84,950			
817	<u>Sanitary Waste And Vent Pipe w/ Hangers</u>							
818	UG Sanitary waste pipe with fittings	2,425	lf	35.00	84,875			
819	AG Sanitary waste pipe with fittings & hangers	4,240	lf	45.00	190,800			
820	<u>Storm Drainage, Hubless Cast Iron Pipe</u>							
821	UG Storm water pipe with fittings	1,525	lf	48.00	73,200			
822	AG Storm water pipe with fittings & hangers	4,980	lf	55.00	273,900			
823	Pipe insulation on horizontal runs	1,800	lf	12.00	21,600			
824	<u>UD Underground Drainage Pipe</u>							
825	UG PVC drainage pipe with fittings	5,210	lf	33.00	Included with Site			
826	<u>Gas And Fuel Distribution Pipe</u>							
827	Gas pipe with fittings & hangers	1,350	lf	62.00	83,700			
828	Equipment gas valves, connections, & accs	15	ea	1,150.00	17,250			
829	Kitchen gas valves, connections, & accessories	6	ea	800.00	4,800			
830	<u>Miscellaneous</u>							
831	Coordination & BIM	1	ls	62,000.00	62,000			
832	Coring, sleeves & firestopping	1	ls	15,000.00	15,000			
833	Commissioning support	1	ls	12,000.00	12,000			
834	Testing and sterilization	1	ls	10,000.00	10,000			
835	Market adjustment	167,352	sf	2.00	334,704			
836	Fees & permits	1	ls	21,000.00	21,000			
837	SUBTOTAL					2,196,694		
838								
839	<b>TOTAL - PLUMBING</b>						<b>\$2,196,694</b>	
840								
841								
842	<b>D30 HVAC</b>							
843								
844	<b>D30 HVAC, GENERALLY</b>							
845	<u>HVAC Equipment</u>							
846	Gas fired HW boiler 1000 MBH	3	ea	25,000.00	75,000			
847	Chemical treatment system	1	ls	12,000.00	12,000			
848	Expansion tank	1	ea	3,000.00	3,000			
849	Air separator	1	ea	2,000.00	2,000			
850	Wall radiation unit	162	lf	90.00	14,580			
851	Radiant ceiling panel	3,410	lf	130.00	443,300			
852	Unit heater HW	25	ea	850.00	21,250			
853	Ductless split AC unit with ACCU, 1 tons	7	ea	5,500.00	38,500			
854	Ductless split AC unit with ACCU, 1.5 tons	5	ea	6,500.00	32,500			
855	Ductless split AC unit with ACCU, 2 tons	4	ea	7,250.00	29,000			
856	<u>Pumps</u>							
857	Hot water pump 290 gpm, 15 hp	2	ea	12,500.00	25,000			
858	<u>Air distribution</u>							
859	RTU's gas fired heating with DX cooling & ERW	76,080	cfm	15.00	1,141,200			
860	Kitchen make-up air unit	4,500	cfm	6.00	27,000			
861	Kitchen heating & ventilation unit	1,960	cfm	10.00	19,600			
862	VRF outdoor unit	10	ton	2,000.00	20,000			
863	VRF indoor unit	18	ea	2,800.00	50,400			
864	Branch controller	2	ea	4,000.00	8,000			



90% Construction Documents Estimate

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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**NEW BUILDING**

865	<u>Exhaust fans</u>							
866	Kitchen exhaust fan 4500 cfm	1	ea	6,700.00	6,700			
867	Exhaust fans (2350-3150 cfm)	2	ea	4,200.00	8,400			
868	Exhaust fans <510 cfm	4	ea	1,000.00	4,000			
869	<u>Sheet metal &amp; Accessories</u>							
870	Supply & return galvanized ductwork distribution system	130,000	lbs	14.00	1,820,000			
871	Duct insulation	97,000	sf	4.00	388,000			
872	Black steel welded ductwork with hangers	800	lbs	16.50	13,200			
873	Duct insulation, fire wrap	500	sf	18.00	9,000			
874	VAV unit	142	ea	1,200.00	170,400			
875	CVD constant volume damper	19	ea	800.00	15,200			
876	Sound attenuators	151,630	cfm	0.60	90,978			
877	Registers, grilles & diffusers	274	ea	125.00	34,250			
878	Displacement ventilation system	246	ea	1,200.00	295,200			
879	Sheet metal accessories	1	ls	50,000.00	50,000			
880	Mechanical louver	1	ls	5,000.00	5,000			
881	<u>Piping</u>							
882	<u>Hot Water Piping</u>							
883	Hot water piping with fittings & hangers	16,465	lf	40.00	658,600			
884	<u>Refrigerant Piping</u>							
885	Refrigerant piping with fittings & hangers	4,295	lf	26.00	111,670			
886	<u>Condensate Drain Piping</u>							
887	Condensate drain piping with fittings & hangers	1,440	lf	20.00	28,800			
888	<u>Piping Insulation</u>							
889	Piping insulation	22,200	lf	9.00	199,800			
890	<u>Automatic Temperature Controls</u>							
891	Automatic temperature controls DDC	167,352	sf	6.50	1,087,788			
892	<u>Balancing</u>							
893	System testing & balancing	167,352	sf	0.80	133,882			
894	<u>Miscellaneous</u>							
895	Coordination & BIM	1	ls	175,000.00	175,000			
896	Commissioning support	1	ls	37,500.00	37,500			
897	Coring, sleeves & fire stopping	1	ls	15,000.00	15,000			
898	Equipment start-up and inspection	1	ls	3,500.00	3,500			
899	Rigging & equipment rental	1	ls	90,000.00	90,000			
900	Vibration & seismic restraints	1	ls	35,000.00	35,000			
901	SUBTOTAL					7,449,198		
902								
903	<b>TOTAL - HVAC</b>						<b>\$7,449,198</b>	
904								
905								
906	<b>D40 FIRE PROTECTION</b>							
907								
908	<b>D40 FIRE PROTECTION, GENERALLY</b>							
909	<u>Equipment &amp; valves</u>							
910	Double check valve assembly	1	ea	9,500.00	9,500			
911	Wet alarm check valve assembly	1	ea	4,000.00	4,000			
912	Fire department connection	2	ea	1,650.00	3,300			
913	Zone control valve & TS	6	ea	2,200.00	13,200			
914	Standpipe control valve	5	ea	2,800.00	14,000			
915	Fire hose valve	16	ea	700.00	11,200			
916	Sprinkler heads	1,541	ea	105.00	161,805			
917	<u>Sprinkler Piping</u>							
918	Main sprinkler piping with fittings & hangers	3,050	lf	46.00	140,300			
919	Branch sprinkler piping with fittings & hangers	20,495	lf	21.00	430,395			
920	Fire standpipes with fittings & hangers	5	ea	3,600.00	18,000			



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**NEW BUILDING**

921	Drain piping with fittings & hangers	2	ea	2,400.00	4,800			
922	<u>Miscellaneous</u>							
923	Coordination & BIM	1	ls	20,000.00	20,000			
924	Hydraulic calculations	1	ls	8,000.00	8,000			
925	Coring, sleeves & firestopping	1	ls	15,000.00	15,000			
926	Shop drawings	1	ls	5,000.00	5,000			
927	Commissioning of system	1	ls	12,000.00	12,000			
928	Fees & permits	1	ls	9,000.00	9,000			
929	SUBTOTAL					879,500		
930								
931	<b>TOTAL - FIRE PROTECTION</b>							<b>\$879,500</b>

**D50 ELECTRICAL**

**D5010 ELECTRICAL SYSTEMS**

Gear & Distribution

Normal Power

939	Meter Sockets	1	ea	400.00	400		
940	CT/PT cabinet	1	ea	3,500.00	3,500		
941	3000A 277/480V main switchboard	1	ea	75,000.00	75,000		
942	225A 277/480V panelboard	8	ea	2,400.00	19,200		
943	100A 277/480V panelboard	8	ea	1,400.00	11,200		
944	45KVA K-13 type transformer	16	ea	8,000.00	128,000		
945	225A 208/120V triple tub panelboard	5	ea	7,200.00	36,000		
946	225A 208/120V double tub panelboard	9	ea	4,800.00	43,200		
947	225A 208/120V panelboard	1	ea	2,400.00	2,400		
948	100A 208/120V panelboard	2	ea	1,400.00	2,800		
949	100A fused disconnect switch	15	ea	1,000.00	15,000		
950	SPD	43	ea	750.00	32,250		
951	225A feed	1,130	lf	45.00	50,850		
952	100A feed	2,200	lf	20.00	44,000		
953	90A feed	1,800	lf	18.00	32,400		
954	Grounding	1	ls	10,000.00	10,000		
955	<u>Emergency power</u>						
956	250kW diesel generator w/125kW resistive load bank including fuel for testing	1	ea	100,000.00	100,000		
957	600A 277/480V ATS	1	ea	12,000.00	12,000		
958	100A 277/480V ATS	1	ea	3,800.00	3,800		
959	225A 277/480V panelboard	7	ea	2,400.00	16,800		
960	100A 277/480V panelboard	1	ea	1,400.00	1,400		
961	112.5 KVA K-13 type transformer	3	ea	15,400.00	46,200		
962	45KVA dry type transformer	2	ea	5,200.00	10,400		
963	400A 208/120V quadruple panelboard	4	ea	11,850.00	47,400		
964	225A 208/120V double tub panelboard	2	ea	4,800.00	9,600		
965	SPD	7	ea	750.00	5,250		
966	600A feed	60	lf	120.00	7,200		
967	400A feed	60	lf	80.00	4,800		
968	225A feed	100	lf	45.00	4,500		
969	200A feed	1,200	lf	40.00	48,000		
970	150A feed	60	lf	24.00	1,440		
971	100A feed	450	lf	20.00	9,000		
972	<u>UPS System</u>						
973	16kW UPS	2	ea	15,000.00	30,000		
974	225A 208/120V double tub panelboard	2	ea	4,800.00	9,600		
975	100A fused disconnect switch	2	ea	996.00	1,992		
976	70A feed	400	lf	20.00	8,000		





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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
977	<u>Photovoltaic system</u>						
978	PV equipment & installation						
979	Future PV system rough in including 1" & 2" conduit to roof	2	loc	5,000.00	10,000		
980	<u>Equipment Wiring</u>						
981	Elevator 125A feed, connection & 200A FSS	1	ea	3,500.00	3,500		
982	Elevator cab 20A feed, connection & 30A FSS	1	ea	1,500.00	1,500		
983	BC 20A feed, connection & 30A NFSS	2	ea	935.00	1,870		
984	Boiler 20A feed, connection & TS	3	ea	1,200.00	3,600		
985	CP 20A feed, connection & TS	1	ea	1,095.00	1,095		
986	DWH 20A feed, connection & TS	2	ea	650.00	1,300		
987	EF 20A feed, connection & TS	6	ea	850.00	5,100		
988	UH 20A feed, connection & TS	25	ea	850.00	21,250		
989	VRF outdoor unit feed and connection	8	ton	1,500.00	12,000		
990	KEF 20A feed, connection & 30A NFSS	1	ea	1,500.00	1,500		
991	MAU 20A feed, connection & 30A NFSS	1	ea	2,500.00	2,500		
992	Hot water pump 500 gpm feed and connection	2	ea	1,200.00	2,400		
993	Hot water pump 1.5 GPM feed and connection	1	ea	1,200.00	1,200		
994	Split unit feed and connection	16	ea	2,500.00	40,000		
995	RTU 100A feed, connection & 100A FSS WP	9	ea	3,500.00	31,500		
996	SV 20A feed, connection & TS	1	ea	905.00	905		
997	VRF indoor unit feed and connection	20	ea	940.00	18,800		
998	Chemical treatment system feed and connection	1	ls	650.00	650		
998	VAV unit	142	ea	250.00	35,500		
999	HC door openers to interior and exterior doors	28	ea	3,000.00	84,000		
1000	Kitchen:						
1001	20A feed & connection	47	ea	500.00	23,500		
1002	30A feed, connection & 30A FSS	4	ea	650.00	2,600		
1003	60A feed, connection & 60A FSS	1	ea	1,300.00	1,300		
1004	70A feed, connection & 100A FSS	1	ea	1,400.00	1,400		
1005	SUBTOTAL					1,192,552	
1006							
1007	<b>D5020 LIGHTING &amp; POWER</b>						
1008	<u>Lighting &amp; Branch Power</u>						
1009	Exit sign	67	ea	220.00	14,740		
1010	EL	1	ea	200.00	200		
1011	J	11	ea	250.00	2,750		
1012	LCL	20	lf	120.00	2,400		
1013	LG3	32	ea	500.00	16,000		
1014	LK24	26	ea	320.00	8,320		
1015	LP1B	1	ea	300.00	300		
1016	LP4	119	ea	320.00	38,080		
1017	LPR4	8	ea	480.00	3,840		
1018	LP8	388	ea	650.00	252,200		
1019	LPD2H	12	ea	400.00	4,800		
1020	LPD3	1	ea	500.00	500		
1021	LPG	24	ea	1,000.00	24,000		
1022	LR (Linear)	4,352	lf	80.00	348,160		
1023	LRD2	45	ea	400.00	18,000		
1024	LRD3	5	ea	500.00	2,500		
1025	LRD4	2	ea	600.00	1,200		
1026	LS2	1	ea	280.00	280		
1027	LS4	34	ea	350.00	11,900		
1028	LS4A	2	ea	350.00	700		
1029	LS8	52	ea	500.00	26,000		
1030	LS8A	20	ea	550.00	11,000		



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
1031	LSV4	5	ea	300.00	1,500		
1032	LV2	6	ea	150.00	900		
1033	LV4	8	ea	300.00	2,400		
1034	LWS	466	lf	120.00	55,920		
1035	PC1	24	ea	750.00	18,000		
1036	PC2	21	ea	750.00	15,750		
1037	RC1	288	ea	320.00	92,160		
1038	RC2	126	ea	320.00	40,320		
1039	RCW	6	ea	350.00	2,100		
1040	SL4	13	ea	450.00	5,850		
1041	SLV4	3	ea	500.00	1,500		
1042	SL5	7	ea	650.00	4,550		
1043	Track lighting	40	lf	35.00	1,400		
1044	TH1 (Track head)	14	ea	150.00	2,100		
1045	<u>Lighting controls</u>						
1046	Networked lighting control system	1	ls	165,000.00	165,000		
1047	Single pole switch	7	ea	22.00	154		
1048	MTS	1	ea	650.00	650		
1049	Single pole low voltage switch	214	ea	25.00	5,350		
1050	Single pole switch wp	11	ea	32.00	352		
1051	Sk	8	ea	45.00	360		
1052	Occupancy sensor	294	ea	220.00	64,680		
1053	Photo sensor	88	ea	150.00	13,200		
1054	ALC	1	ea	1,500.00	1,500		
1055	<u>Branch devices</u>						
1056	Duplex receptacle	810	ea	23.00	18,630		
1057	Double duplex receptacle	430	ea	46.00	19,780		
1058	Double duplex receptacle in floor box	6	ea	46.00	276		
1059	GFI duplex receptacle	316	ea	38.00	12,008		
1060	Special purpose receptacle	37	ea	75.00	2,775		
1061	Cord reel	8	ea	600.00	4,800		
1062	2 gang floor box	6	ea	300.00	1,800		
1063	<u>Lighting and branch circuitry</u>						
1064	WP device plate	23	ea	16.00	368		
1065	Device plate	1,750	ea	4.00	7,000		
1066	Device box	3,334	ea	20.00	66,680		
1067	3/4" EMT	30,000	lf	6.50	195,000		
1068	#12 THHN	135,000	lf	0.75	101,250		
1069	Cat cabling	11,000	lf	2.00	22,000		
1070	12-2 MC cable	30,000	lf	3.85	115,500		
1071	12-3 MC cable	12,000	lf	4.60	55,200		
1072	1" conduit in slab	200	lf	9.00	1,800		
1073	Low voltage lighting control circuitry	15,000	lf	2.00	30,000		
1074	SUBTOTAL					1,938,433	
1075							
1076	<b>D5030 COMMUNICATION &amp; SECURITY SYSTEMS</b>						
1077	<u>Fire Alarm</u>						
1078	Fire alarm control panel	1	ea	30,000.00	30,000		
1079	Fire alarm remote annunciator	2	ea	1,200.00	2,400		
1080	Fire alarm terminal cabinet	2	ea	1,200.00	2,400		
1081	Knox box	2	ea	600.00	1,200		
1082	Exterior beacon	2	ea	300.00	600		
1083	Master box	1	ea	1,600.00	1,600		
1084	Bell	2	ea	320.00	640		
1085	Manual pull station	24	ea	100.00	2,400		



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
1086	Smoke/heat detector	129	ea	135.00	17,415		
1087	CO detector	21	ea	135.00	2,835		
1088	Duct smoke detector, allow	21	ea	400.00	8,400		
1089	Audio/visual device	35	ea	135.00	4,725		
1090	Audio/visual device with A, not scheduled, allow amber mass notification device	75	ea	150.00	11,250		
1091	Speaker light	81	ea	140.00	11,340		
1092	A ceiling, not scheduled, allow amber mass notification device	81	ea	135.00	10,935		
1093	Visual device	66	ea	120.00	7,920		
1094	FP equipment connection	17	ea	150.00	2,550		
1095	Kitchen connection	1	ea	150.00	150		
1096	Elevator recall connection	2	ea	150.00	300		
1097	Gas detection monitor	9	ea	150.00	1,350		
1098	Wireguard	4	ea	35.00	140		
1099	Control/monitor module	61	ea	150.00	9,150		
1100	Device box	640	ea	20.00	12,800		
1101	3/4" EMT	6,500	lf	6.50	42,250		
1102	#14 THHN	19,000	lf	0.61	11,590		
1103	FA cable	3,200	lf	0.65	2,080		
1104	MC cable	22,000	lf	3.85	84,700		
1105	Testing and programming	1	ls	11,000.00	11,000		
1106	<u>Bi-Directional Amplification System</u>						
1107	BDA	1	ls	75,000.00	75,000		
1108	<u>Security System</u>						
1109	Head-end and mics. increases per engineer	1	ls	80,000.00	80,000		
1110	AI, video intercom/door release station	4	ea	750.00	3,000		
1111	CCTV camera	78	ea	750.00	58,500		
1112	CCTV camera WP	17	ea	950.00	16,150		
1113	Card reader	32	ea	350.00	11,200		
1114	Keypad	5	ea	350.00	1,750		
1115	Panic button	1	ea	120.00	120		
1116	Motion button	55	ea	120.00	6,600		
1117	Device box with conduit stub	192	ea	85.00	16,320		
1118	Security cabling	11,000	lf	1.25	13,750		
1119	<u>Telephone/Data/CATV</u>						
1120	Telecommunications rough in:						
1121	Wireless budget number per engineers comments	1	ls	115,000.00	115,000		
1122	MDF fit out	1	ls	2,500.00	2,500		
1123	IDF fit out	3	ea	2,500.00	7,500		
1124	System rack	12	ea	2,000.00	24,000		
1125	Backboard	4	ea	500.00	2,000		
1126	Closet grounding	4	ea	350.00	1,400		
1127	4" conduit sleeves, allow	12	ea	150.00	1,800		
1128	4" conduit, allow 2-4" from MDF to each IDF	1,000	lf	22.00	22,000		
1129	Cable tray, allow	325	lf	35.00	11,375		
1130	1 gang box with 1" conduit	70	ea	95.00	6,650		
1131	1 gang box with 2-1" conduit	455	ea	160.00	72,800		
1132	1 gang box with 1" & 1.25" conduit	216	ea	200.00	43,200		
1133	WAP back box	104	ea	55.00	5,720		
1134	Telecommunications devices & cabling:						
1135	Telephone port	87	ea	18.00	1,566		
1136	1 port device	2	ea	18.00	36		
1137	2 port device	316	ea	36.00	11,376		
1138	3 port device	50	ea	54.00	2,700		
1139	AV, blank cover plate	216	ea	5.00	1,080		



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
1140	Call button	70	ea	18.00	1,260		
1141	WAP 2 port device	104	ea	300.00	31,200		
1142	Cat cabling	175,000	lf	1.25	218,750		
1143	School wide local area network switches, allow per engineers budget	1	ls	300,000.00	300,000		
1144	Digital signage system per engineers budget	1	ls	20,000.00	20,000		
1145	Computer network equipment					FF&E	
1146	Mobile computer carts and lockers					FF&E	
1147	Network printer equipment					FF&E	
1148	Cafeteria point of sale equipment					FF&E	
1149	Visitor management system					FF&E	
1150	Wireless					See above	
1151	<u>PA/Clock System</u>						
1152	Head-end	1	ls	20,000.00	20,000		
1153	Clock	132	ea	120.00	15,840		
1154	Speaker ceiling mount	265	ea	120.00	31,800		
1155	Speaker with volume control	113	ea	160.00	18,080		
1156	Speaker wall mount	4	ea	150.00	600		
1157	Speaker back box	378	ea	65.00	24,570		
1158	Device box with conduit stub	136	ea	95.00	12,920		
1159	MC cable	8,000	lf	3.85	30,800		
1160	Speaker cabling	19,000	lf	1.10	20,900		
1161	<u>Audio/Visual systems</u>						
1162	AV equipment					By Owner	
1163	Instructional video presentation equipment					FF&E	
1164	Portable video presentation system equipment					FF&E	
1165	Rack, gym/café	1	ea			FF&E	
1166	HS, horn speaker	3	ea			Included	
1167	M, microphone	5	ea			Included	
1168	M2, microphone	1	ea			FF&E	
1169	PC, AV interface outlet	2	ea			FF&E	
1170	Projector	1	ea			FF&E	
1171	S4 Gym interface outlet	8	ea			FF&E	
1172	S4 Ceiling speaker	8	ea			Included	
1173	W, assisted listening and microphone antenna	1	ea			Included	
1174	WA, assisted listening and microphone antenna	2	ea			Included	
1175	Rough-In conduit and backboxes only	32	ea	350.00	11,200		
1176	Classroom audio system	66	rooms	2,200.00	145,200		
1177	Cafeteria sound system per engineers budget	1	ls	25,000.00	25,000		
1178	<u>Gymnasium</u>						
1179	Scoreboard with feed and connection	2	ea	15,000.00	30,000		
1180	Backstop feed and connections	2	ea	1,500.00	3,000		
1181	Equipment feed and connections	3	ea	1,500.00	4,500		
1182	Sound system	1	ls	20,000.00	20,000		
1183	<u>Auditorium</u>						
1184	Dimmer system/ stage lighting	1	ls	35,000.00	35,000		
1185	Performance lighting rough-in & power	1	ls	15,000.00	15,000		
1186	TH1	12	ea			Included	
1187	TH2	6	ea			Included	
1188	Audio visual system equipment	1	ls	75,000.00	75,000		
1189	Audio/visual rough-in & power	1	ls	30,000.00	30,000		
1190	SUBTOTAL						2,049,833
1191							
1192	<b>D5040 OTHER ELECTRICAL SYSTEMS</b>						
1193	<u>Miscellaneous</u>						
1194	Temp power and lights	1	ls	80,000.00	80,000		



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST	
<b>NEW BUILDING</b>								
1195	Commissioning support	1	ls	15,000.00	15,000			
1196	Coordination and studies	1	ls	10,000.00	10,000			
1197	Seismic restraints	1	ls	10,000.00	10,000			
1198	UL Master Label Lightning Protection System	1	sf	65,000.00	65,000			
1199	Fees & Permits	1	ls	55,000.00	55,000			
1200	SUBTOTAL					235,000		
1201								
1202	<b>TOTAL - ELECTRICAL</b>							<b>\$5,415,818</b>
1203								
1204								
1205	<b>E10 EQUIPMENT</b>							
1206								
1207	<b>E10 EQUIPMENT, GENERALLY</b>							
1208								
1209	<b>113013 APPLIANCES</b>							
1210	Microwave	8	loc	800.00	6,400			
1211	Refrigerator - side by side	5	loc	2,000.00	10,000			
1212	Washer/dryer pair, locate in Recycling Room #1164	1	pr	5,000.00	5,000			
1213	Washer/dryer pair, locate in Custodial Storage #2115	1	pr	5,000.00	5,000			
1214	Defibrillator units	4	ea	1,500.00	6,000			
1215								
1216	<u>FF&amp;E Items</u>							
1217	Ride-on floor scrubber machines ; (220 volt power)	2	ea			FF&E		
1218	Backpack vacuums	2	ea			FF&E		
1219	Man-lift/ scissor lift – max 32” wide x 6’-8” tall (Door opening sized)	1	ea			FF&E		
1220	Pallet jack – max 32” wide	1	ea			FF&E		
1221	Desk lifter/ jack/ mover	1	ea			FF&E		
1222	Floor buffer machines	2	ea			FF&E		
1223	Carpet Extractors	2	ea			FF&E		
1224	Rolling metal ladder-stairs - 6’ standing height (re. Lowes)	2	ea			FF&E		
1225	Type IA Ladders – (1) 24’ extension; (1) 18’ extension; (1) 10’ scissor type	3	ea			FF&E		
1226	Pottery wheel	2	ea			FF&E		
1227	Hoyer lift at rise toilet	1	ea			FF&E		
1228								
1229	<b>111313 LOADING DOCK BUMPERS</b>							
1230	Loading dock bumpers	1	ls	750.00	750			
1231								
1232	<b>114000 FOOD SEVERVICE EQUIPMENT</b>							
1233	Food Service equipment (dated 5/14/19)	1	ls	499,435.00	499,435			
1234								
1235	<b>115213 PROJECTION SCREENS</b>							
1236	Projection screen at platform room facing Café 227” diagonal per specifications	1	ls	4,490.10	4,490			
1237	Projection screen at platform room facing Gym 272” diagonal per specifications	1	ls	5,610.60	5,611			
1238	Projection screen at media/library					none shown		
1239								
1240	<b>116050 THEATRICAL EQUIPMENT</b>							
1241	Stage curtain and rigging	1	ls	28,000.00	28,000			
1242								
1243	<b>116623 GYM EQUIPMENT</b>							
1244	Basketball backstops; swing up; electric operated	6	ea	10,000.00	60,000			
1245	Gym wall pads	828	sf	18.00	14,904			
1246	Wall pads at de-esc rooms	588	sf	18.00	10,584			
1247	Gymnasium roll-up fabric divider; electrically operated	1	loc	30,240.00	30,240			
1248	Telescoping bleachers motorized; 300 person capacity	1	ls	39,000.00	39,000			



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**NEW BUILDING**

1249	Miscellaneous equipment; climbing wall, volley ball stanchions etc.	1	ls	2,000.00	2,000			
1250								
1251	118227 WASTE COMPACTORS							
1252	Waste compactor; per specifications	1	loc		leased by owner			
1253								
1254	119513 KILN							
1255	Kiln	1	ea	5,000.00	5,000			
1256	SUBTOTAL					732,414		
1257								
1258	<b>TOTAL - EQUIPMENT</b>							<b>\$732,414</b>

**E20 FURNISHINGS**

**E2010 FIXED FURNISHINGS**

1264	123200 CASEWORK						
1265	Art						
1266	Base cabinet with epoxy resin counter; per note 13/AQ1.23	82	lf	500.00	41,000		
1267							
1268	TS 24	4	ea	1,000.00	4,000		
1269	Upper cabinets - 32" high	46	lf	285.00	13,110		
1270	Cafeteria						
1271	Recycling counter at cafeteria 7'-0" wide	3	ea	600.00	1,800		
1272	Collaboration						
1273	2 tier wall shelving	137	lf	120.00	16,440		
1274	3 tier wall shelving	69	lf	160.00	11,040		
1275	Base cabinet with 4 drawers and counter	10	lf	420.00	4,200		
1276	Base cabinet with plam counter	68	lf	400.00	27,200		
1277	Open base shelving with counter 2 tier	11	lf	360.00	3,960		
1278	TS 30 with markerboard surface on face of door	12	ea	1,400.00	16,800		
1279	TS 33 with markerboard surface on face of door	3	ea	1,600.00	4,800		
1280	TS 33 with peg board on inside of door and markerboard surface on face of door	1	ea	1,800.00	1,800		
1281	TW 36	1	ea	1,800.00	1,800		
1282	TW 36 marker board fronts, lockable	14	ea	2,000.00	28,000		
1283	TW 39	2	ea	2,000.00	4,000		
1284	Wall hung counter	126	lf	250.00	31,500		
1285	Copy / Mail room						
1286	Base cabinet with plam counter	15	lf	400.00	6,000		
1287	Island counter with base cabinet 4'-0" wide	10	lf	750.00	7,500		
1288	Upper cabinets - 30" high	3	lf	285.00	855		
1289	Upper mail slots at copy mail room	12	lf	700.00	8,400		
1290	Connect 2220						
1291	Base cabinet with 5 drawers and counter	2	lf	440.00	880		
1292	Base cabinet with plam counter	16	lf	400.00	6,400		
1293	Laptop cart cabinet 36	1	ea	1,700.00	1,700		
1294	Open base shelving with counter 2 tier	19	lf	5,000.00	95,000		
1295	TS 36	2	ea	1,500.00	3,000		
1296	Upper cabinets - 24" high	3	lf	250.00	750		
1297	Upper cabinets - 32" high	15	lf	285.00	4,275		
1298	Connect 3219						
1299	Base cabinet with 4 drawers and counter	2	lf	420.00	840		
1300	Base cabinet with plam counter	19	lf	400.00	7,600		
1301	Laptop cart cabinet 36	1	ea	1,700.00	1,700		
1302	Open base shelving with counter 2 tier	9	lf	360.00	3,240		
1303	Shallow base cabinet with plam counter	8	lf	300.00	2,400		
1304	TS 33	1	ea	1,400.00	1,400		



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
1305	TS 36	2	ea	1,600.00	3,200		
1306	TS 42	2	ea	2,000.00	4,000		
1307	TW 36	1	ea	1,800.00	1,800		
1308	Upper cabinets - 24" high	3	lf	250.00	750		
1309	Upper cabinets - 32" high	18	lf	285.00	5,130		
1310	<i>Custodial shop</i>						
1311	Work bench	10	lf	600.00	6,000		
1312	2 tier shelving	10	lf	100.00	1,000		
1313	<i>ELA</i>						
1314	Island - base cabinet with solid surface countertop	159	lf	550.00	87,450		
1315	<i>Ensemble</i>						
1316	Base cabinet with plam counter	12	lf	400.00	4,800		
1317	<i>Exam</i>						
1318	Base cabinet with plam counter	6	lf	400.00	2,400		
1319	TS 30	1	ea	1,200.00	1,200		
1320	TS 33	1	ea	1,400.00	1,400		
1321	Upper cabinets - 24" high	6	lf	250.00	1,500		
1322	Wall hung counter	4	lf	250.00	1,000		
1323	<i>IT office/repair</i>						
1324	2 tier wall shelving	19	lf	120.00	2,280		
1325	Base cabinet with plam counter	19	lf	400.00	7,600		
1326	<i>Kindergarten ; typical</i>	9	rms				
1327	2'-9"x56" Double cubbie		lf	750.00	taken below		
1328	Base cabinet with plam counter	99	lf	400.00	39,600		
1329	Laptop cart cabinet 36	9	ea	1,700.00	15,300		
1330	Open base shelving with counter 2 tier	99	lf	360.00	35,640		
1331	Open base shelving, 3 tier	27	lf	265.00	7,155		
1332	Shallow base cabinet with plam counter	72	lf	300.00	21,600		
1333	TS 36	9	ea	1,600.00	14,400		
1334	TW 36	9	ea	1,800.00	16,200		
1335	Upper cabinets - 24" high	27	lf	250.00	6,750		
1336	Upper cabinets - 32" high	90	lf	285.00	25,650		
1337	Upper cabinets above cubbies 32"		lf	230.00	taken below		
1338	<i>Maker space</i>						
1339	Base cabinet with 4 tier open shelving above	12	lf	700.00	8,400		
1340	Base cabinet with plam counter	28	lf	400.00	11,200		
1341	TS 33 with markerboard surface on face of door	6	ea	1,600.00	9,600		
1342	TS 33 with peg board on inside of door and markerboard surface on face of door	2	ea	1,800.00	3,600		
1343	Upper cabinets - 24" high	6	lf	250.00	1,500		
1344	Upper cabinets - 30" high	15	lf	285.00	4,275		
1345	Wall hung counter	7	lf	250.00	1,750		
1346	<i>Music</i>	2	rms				
1347	Base cabinet with plam counter	14	lf	400.00	5,600		
1348	Music instrument storage	48	lf	800.00	38,400		
1349	Open base shelving with counter 2 tier	68	lf	360.00	24,480		
1350	Upper cabinets - 32" high	14	lf	285.00	3,990		
1351	<i>OT 1134</i>						
1352	TW 48	2	ea	2,400.00	4,800		
1353	<i>Music practice</i>						
1354	TS 36	2	ea	1,600.00	3,200		
1355	<i>Pre-K ; typical</i>	4	rms				
1356	2'-9"x56" Double cubbie		lf	750.00	taken below		
1357	Base cabinet with plam counter	40	lf	400.00	16,000		
1358	Laptop cart cabinet 36	4	ea	1,700.00	6,800		
1359	Open base shelving with counter 2 tier	40	lf	360.00	14,400		





90% Construction Documents Estimate

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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>NEW BUILDING</b>							
1360	Shallow base cabinet with plam counter	52	lf	300.00	15,600		
1361	TS 36	4	ea	1,600.00	6,400		
1362	TW 33	4	ea	1,650.00	6,600		
1363	Upper cabinets - 24" high	12	lf	250.00	3,000		
1364	Upper cabinets - 32" high	32	lf	285.00	9,120		
1365	Upper cabinets above cubbies 32"		lf	230.00	taken below		
1366	<i>Pre-K rise</i>						
1367	2'-9"x56" Double cubbie		lf	750.00	taken below		
1368	Base cabinet with 6 drawers and counter	3	lf	460.00	1,380		
1369	Base cabinet with plam counter	18	lf	400.00	7,200		
1370	TS 36	1	ea	1,600.00	1,600		
1371	TW 36	1	ea	1,800.00	1,800		
1372	Upper cabinets - 24" high	6	lf	250.00	1,500		
1373	Upper cabinets - 32" high	14	lf	285.00	3,990		
1374	Upper cabinets above cubbies 32"		lf	230.00	taken below		
1375	<i>PT 1132</i>						
1376	3 tier wall shelving	10	lf	160.00	1,600		
1377	Open base shelving with counter 2 tier	18	lf	360.00	6,480		
1378	TS 48	3	ea	2,200.00	6,600		
1379	Upper cabinets - 24" high	2	lf	250.00	500		
1380	Upper cabinets - 32" high	2	lf	285.00	570		
1381	<i>Resource room</i>						
1382	2 tier wall shelving	11	lf	120.00	1,320		
1383	Base cabinet with plam counter	5	lf	400.00	2,000		
1384	Wall hung counter	11	lf	250.00	2,750		
1385	<i>Rise 2227</i>						
1386	Base cabinet with plam counter	29	lf	400.00	11,600		
1387	Open base shelving with counter 2 tier	8	lf	360.00	2,880		
1388	TS 36	2	ea	1,600.00	3,200		
1389	Upper cabinets - 24" high	3	lf	250.00	750		
1390	Upper cabinets - 32" high	18	lf	285.00	5,130		
1391	<i>Rise 3221</i>						
1392	Base cabinet with plam counter	18	lf	400.00	7,200		
1393	Laptop cart cabinet 36	1	ea	1,700.00	1,700		
1394	Open base shelving with counter 2 tier	17	lf	360.00	6,120		
1395	TS 36	2	ea	1,600.00	3,200		
1396	TS 39	1	ea	1,800.00	1,800		
1397	Upper cabinets - 24" high	15	lf	250.00	3,750		
1398	Upper cabinets - 32" high	14	lf	285.00	3,990		
1399	<i>Staff dining</i>						
1400	Base cabinet with 6 drawers and counter	3	lf	460.00	1,380		
1401	Base cabinet with plam counter	9	lf	400.00	3,600		
1402	Upper cabinets - 24" high	3	lf	250.00	750		
1403	Upper cabinets - 32" high	9	lf	285.00	2,565		
1404	<i>Storage</i>						
1405	5 tier wall shelving	13	lf	250.00	3,250		
1406	<i>Storage/copy</i>						
1407	5 tier wall shelving	10	lf	250.00	2,500		
1408	Base cabinet with plam counter	10	lf	400.00	4,000		
1409	<i>Student services vestibule/copy</i>						
1410	3 tier wall shelving	15	lf	160.00	2,400		
1411	Base cabinet with plam counter	18	lf	400.00	7,200		
1412	TS 33	2	ea	1,400.00	2,800		
1413	TS 36	5	ea	1,600.00	8,000		
1414	TW 36	3	ea	1,800.00	5,400		
1415	Upper cabinets - 32" high	18	lf	285.00	5,130		



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST	
<b>NEW BUILDING</b>								
1416	Wall hung counter	14	lf	250.00	3,500			
1417	Student services							
1418	2 tier wall shelving	106	lf	120.00	12,720			
1419	Wall hung counter	106	lf	250.00	26,500			
1420	Title 1 office							
1421	3 tier wall shelving	25	lf	160.00	4,000			
1422	TS 36	6	ea	1,600.00	9,600			
1423	TW 36	2	ea	1,800.00	3,600			
1424	Wall hung counter	25	lf	250.00	6,250			
1425	Typical 2nd floor classroom ; AQ1.55	16	rms					
1426	Base cabinet with plam counter	288	lf	400.00	115,200			
1427	Laptop cart cabinet 36	16	ea	1,700.00	27,200			
1428	Open base shelving with counter 2 tier	176	lf	360.00	63,360			
1429	Open base shelving with counter, 3 tier	80	lf	385.00	30,800			
1430	TS 36	16	ea	1,600.00	25,600			
1431	TW 36	16	ea	1,800.00	28,800			
1432	Upper cabinets - 32" high	176	lf	285.00	50,160			
1433	Typical 3rd floor classroom ; AQ1.55	24	rms					
1434	Base cabinet with plam counter	432	lf	400.00	172,800			
1435	Laptop cart cabinet 36	24	ea	1,700.00	40,800			
1436	Open base shelving with counter 2 tier	264	lf	360.00	95,040			
1437	Open base shelving with counter, 3 tier	120	lf	385.00	46,200			
1438	TS 36	24	ea	1,600.00	38,400			
1439	TW 36	24	ea	1,800.00	43,200			
1440	Upper cabinets - 32" high	264	lf	285.00	75,240			
1441	Mobile units						assume FF+E	
1442	Closet shelving	1	ls	10,000.00	10,000			
1443	2'-9"x56" Double cubbie at pre-k and kindergarten	209	lf	750.00	156,750			
1444	Upper cabinets above cubbies 32"	209	lf	230.00	48,070			
1445								
1446	012410 WINDOW TREATMENT							
1447	Window shades at interior doors, sidelights, storefront and borrowed light openings; light filtering	4,997	sf	7.00	34,979			
1448	Window shades at exterior glazing; light filtering and room darkening	10,454	sf	10.00	104,540			
1449	Premium for motorized shades; WS-2	1,657	sf	20.00	33,140			
1450								
1451	124810 ENTRANCE FLOOR MAT AND FRAMES							
1452	Foot grilles	940	sf	55.00	51,700			
1453	Walk off mat	350	sf	12.00	4,200			
1454	SUBTOTAL					2,377,844		
1455								
1456	E2020 MOVABLE FURNISHINGS							
1457	All movable furnishings to be provided and installed by owner							
1458	SUBTOTAL						NIC	
1459								
1460	<b>TOTAL - FURNISHINGS</b>						<b>\$2,377,844</b>	
1461								
1462								
1463	<b>F10 SPECIAL CONSTRUCTION</b>							
1464								
1465	F10 SPECIAL CONSTRUCTION							
1466	No items in this section							
1467	SUBTOTAL							
1468								
1469	<b>TOTAL - SPECIAL CONSTRUCTION</b>							
1470								
1471								
1472	<b>F20 SELECTIVE BUILDING DEMOLITION</b>							
1473								
1474	F2010 BUILDING ELEMENTS DEMOLITION							



W. Edward Balmer Elementary School  
Whitinsville, MA

23-Aug-19

90% Construction Documents Estimate

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<i>CSI CODE</i>	<i>DESCRIPTION</i>	<i>QTY</i>	<i>UNIT</i>	<i>UNIT COST</i>	<i>EST'D COST</i>	<i>SUB TOTAL</i>	<i>TOTAL COST</i>
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**NEW BUILDING**

1475 No items in this section

1476 SUBTOTAL

1477

1478 **F2020 HAZARDOUS COMPONENTS ABATEMENT**

1479 See main summary for HazMat allowance

See Summary

1480 SUBTOTAL

1481

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<b>TOTAL - SELECTIVE BUILDING DEMOLITION</b>
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90% Construction Documents Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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<b>G SITEWORK</b>
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**G10 SITE PREPARATION & DEMOLITION**

Sitework preparation bid - ERP#1	1	ls	1,228,394.00	1,228,394		
Sitework earthwork bid - ERP#1	1	ls	1,094,214.00	1,094,214		
<u>Site Demolitions and Relocations</u>						
Site construction fence/barricades allowance	5,500	lf	25.00	Early Bid		
Site construction fence/barricades allowance phase allowance	2,640	lf	25.00	Early Bid		
Jersey barriers	1	ls	29,600.00	Early Bid		
Allowance for clearing & grubbing at North wood area	5	acres	6,500.00	Early Bid		
Clearing existing shrubs	500	sf	3.00	Early Bid		
Demolition of existing concrete sidewalks / pads / etc.	17,363	sf	1.25	Early Bid		
Demolition of existing bituminous concrete / crush and re use for base	107,450	sf	1.25	Early Bid		
Demolition of existing wooded fiber mulch	12,920	sf	1.00	Early Bid		
Sawcut existing pavement	70	lf	8.00	Early Bid		
Demolition of existing overhead electric and pole	525	lf	12.00	Early Bid		
Demolition of existing hydrant	2	ea	400.00	Early Bid		
Demolition of existing sewer line	815	lf	10.00	Early Bid		
Demolition of existing water line	1,400	lf	10.00	Early Bid		
Demolition of existing drainage lateral	52	lf	10.00	Early Bid		
Demolition of existing gas service line	300	lf	10.00	Early Bid		
Cut and cap gas service	1	loc	1,500.00	Early Bid		
Cut and cap water service	2	loc	1,500.00	Early Bid		
Cut and cap sewer service	1	loc	1,500.00	Early Bid		
Demolition of existing 2" metal guardrail	130	lf	10.00	Early Bid		
Demolition of existing backstop	1	loc	1,000.00	Early Bid		
Demolition of existing dugouts and footings	2	loc	1,200.00	Early Bid		
Demolition of existing gazebo and footings	1	loc	1,200.00	Early Bid		
Demolition of existing concessions stand and steps	1	loc	1,500.00	Early Bid		
Demolition of existing infield mix	19,550	sf	1.00	Early Bid		
Demolition of existing concrete feature	1	loc	500.00	Early Bid		
Demolition of existing trees	3	ea	1,000.00	Early Bid		
Demolition of existing benches	10	ea	150.00	Early Bid		
Demolition of existing sign	1	ea	500.00	Early Bid		
Demolition of existing bleachers	1	loc	750.00	Early Bid		
Demolition of existing bollards	3	ea	75.00	Early Bid		
Demolition of existing boulder	1	ea	200.00	Early Bid		
Demolition of existing concrete walls	90	lf	15.00	Early Bid		
Demolition of existing steps	80	lf	10.00	Early Bid		
Demolition of existing segmental retaining walls	225	lf	15.00	Early Bid		
Demolition of existing drain manhole	1	ea	250.00	Early Bid		
Demolition of existing catch basin	3	ea	200.00	Early Bid		
Demolition of existing flagpole	1	ea	500.00	Early Bid		
Demolition of existing 36" RCP drainage line	1,018	lf	20.00	Early Bid		
Demolition of existing fence	1,465	lf	10.00	Early Bid		
Remove existing rocks	15	ea	75.00	Early Bid		
Demolition of existing railings	110	lf	10.00	Early Bid		
Demolition of existing landscape timber wall	505	lf	10.00	Early Bid		
Demolition of existing play equipment	1	ls	3,500.00	Early Bid		
Misc. site demo - fencing, retaining walls, etc.	1	ls	25,000.00	Early Bid		
Salvage corporal jeffrey l vail monuments and return to owner	1	ls	5,000.00	Early Bid		
R&D stone wall, return stones to owner	85	lf	100.00	Early Bid		
<u>Site Earthwork</u>				Early Bid		
Strip topsoil	11,448	cy	7.00	Early Bid		
Cut unsuitables under building	4,849	cy	10.00	Early Bid		
Cut	25,829	cy	10.00	Early Bid		



90% Construction Documents Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>SITEWORK</b>							
56	Fill w/ existing material; general; geotechnical report indicates existing material may be suitable for general fill	18,205	cy	14.00	Early Bid		
57	Remove excess material off site; assumed clean material	12,473	cy	16.00	Early Bid		
58	Reconciled cost for ledge removal	1	ls	150,000.00	Early Bid		
59	Sheeting along retaining wall	1	ls	200,000.00	Early Bid		
60	Allowance for boulder removal	1	ls	50,000.00	Early Bid		
61	Fine grading	72,498	sy	1.25	Early Bid		
62	Silt fence/erosion control	4,094	lf	12.00	Early Bid		
63	Silt fence/erosion control	2,600	lf	12.00	Early Bid		
64	Construction entrances	1,250	sf	6.00	Early Bid		
65	Inlet protection	110	ea	325.00	Early Bid		
66	Erosion control maintenance	1	ls	30,000.00	Early Bid		
67	<u>Hazardous Waste Remediation</u>						
68	UST tank soils - ERP#1	1	ls	45,000.00	see summary		
69	UST Tank Removal - ERP#1	1	ls	18,484.00	see summary		
69	SUBTOTAL						2,322,608
70							
71	<b>G20 SITE IMPROVEMENTS</b>						
72	Sitework improvements earthwork bid - ERP#1	1	ls	1,684,647.00	1,684,647		
73	<u>Roadways and Parking Lots</u>	181,166	sf				
74	gravel base; 8" thick	4,496	cy	40.00	Early Bid		
75	gravel base; 4" thick	2,214	cy	40.00	Early Bid		
76	Asphalt paving; 4" thick	20,130	sy	28.00	Early Bid		
77	VGC	9,215	lf	39.00	Early Bid		
78	Flush VGC	66	lf	38.00	Early Bid		
79	Concrete curb	290	lf	22.00	Early Bid		
80	Cape Cod Berm - 2"	1,580	lf	14.00	removed		
81	Single solid lines, 4" thick	234	spc	20.00	Early bid		
82	Single solid lines, 4" thick	8	spc	75.00	Early bid		
83	Other road markings	1	ls	7,500.00	Early bid		
84	Crosswalk	9	ea	1,200.00	Early bid		
85	Tactile warning surface	4	ea	350.00	1,400		
86	ADA compliant curb cut	20	ea	350.00	Early Bid		
87	Signage	58	ea	350.00	Early Bid		
88	<u>Basketball court paving</u>						
89	Bituminous concrete paving - play area / basketball court	5,900	sf	12.00	Early Bid		
90	Bituminous concrete paving - color seal coat and line striping; 2 surface colors & markings	5,900	sf	6.00	35,400		
91	gravel base; 12" thick	219	cy	40.00	Early Bid		
92	<u>Precast Pavers</u>						
93	Bituminous base material for precast pavers - 3"	1,370	sf	3.00	Early Bid		
94	Precast unit pavers	1,370	sf	20.00	27,400		
95	Paving band	225	lf	60.00	13,500		
96	Stone dust paths	810	sf	7.50	6,075		
97	Mulch paths	1,675	sf	4.00	NIC		
98	Concrete paving						
99	concrete sidewalk gravel base - 6"	954	cy	40.00	Early Bid		
100	concrete; 4" thick	51,526	sf	10.00	515,260		
101	concrete; 5" thick at loading dock approach	1,000	sf	10.00	10,000		
101	Bit concrete walkway						
102	gravel base - 6"	31	cy	40.00	Early Bid		
103	bit concrete; 3" thick	1,700	sf	8.00	Early Bid		
104	HD Concrete paving						
105	HD concrete gravel base - 12"	23	cy	40.00	Early Bid		
106	HD concrete pads; 6" thick	630	sf	15.00	9,450		
107	Generator crushed stone bed	400	sf	6.00	Early Bid		
108	Playground - poured rubber play surface (adjusted per Kompan budget dated 8/16/19)	1	ls	315,772.00	315,772		



90% Construction Documents Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>SITEWORK</b>							
	<u>Site Masonry</u>						
109	Masonry seat walls; with granite	60	lf	650.00	39,000		
110	Masonry seat walls; skate deterrents	1	ls	10,000.00	10,000		
111	Masonry piers at ornamental fence along Crescent street	7	ea	4,000.00	28,000		
112	Masonry veneer at entry signs / features	4	ea	20,000.00	80,000		
113	Segmental retaining wall	1	ls	156,040.00	Early Bid		
114	Guardrail at top of retaining wall	190	lf	65.00	12,350		
115	<u>Stairs, Retaining walls and Ramps</u>						
115	Concrete walls at loading dock	1	ls	48,000.00	48,000		
116	Concrete to stair treads	74	lfr	240.00	17,760		
117	Cheek walls	16	lf	200.00	3,200		
118	Concrete footings to seat walls	37	cy	1,200.00	44,400		
119	Concrete footings to columns/gateways	55	cy	1,200.00	66,000		
119	Concrete footings for other site improvement items	36	cy	1,200.00	43,200		
120	Concrete footings for shade structures	10	cy	1,200.00	12,000		
118	Ornamental metal hand railings w/ light - galv at stairs	30	lf	160.00	4,800		
119	<u>Fencing</u>						
120	Vinyl clad CLF - 4' high @ baseball	432	lf	40.00	17,280		
121	Vinyl clad CLF - 4' high	3,749	lf	40.00	149,960		
122	Vinyl clad CLF - 4' high gates, single	12	ea	800.00	9,600		
123	Vinyl clad CLF - 4' high gates, double	2	ea	1,600.00	3,200		
124	Ornamental Fencing - 4' high	312	lf	90.00	28,080		
125	Ornamental Fencing - 4' high gates	2	ea	2,500.00	5,000		
126	Ornamental Fencing - 6' high	582	lf	100.00	58,200		
127	Ornamental Fencing - 6' high gates	2	ea	8,000.00	16,000		
128	Vinyl clad CLF at basketball - 6'	190	lf	50.00	9,500		
129	Vinyl clad CLF - 6' high gates, single	1	ea	1,000.00	1,000		
130	Vinyl clad CLF - 6'	642	lf	50.00	32,100		
131	Repair existing vinyl clad CLF at perimeter - 8'	850	lf	20.00	17,000		
132	Repair existing vinyl clad CLF at perimeter - 4'	125	lf	15.00	1,875		
131	Wood privacy fence (L2.20 adjacent to picnic tables)	30	lf	150.00	4,500		
132	PVC privacy fence 7' high- stockade	709	lf	90.00	63,810		
133	Wood and wire fence	172	lf	55.00	NIC		
134	Wood and wire fence gates, single	1	ea	800.00	NIC		
135	Wood and wire fence gates, double	1	ea	1,600.00	NIC		
149	Baseball backstop, bleachers & benches	1	loc	40,000.00	40,000		
150	Softball backstop, bleachers & benches	1	loc	25,000.00	25,000		
152	Poles with nylon sports net adjacent to baseball backstops; 24' high	410	lf	160.00	65,600		
136	Wood fence allowance	1,000	lf	75.00	75,000		
137	<u>Site Improvements</u>						
138	50' high flagpole	1	ea	10,000.00	10,000		
139	36" Pipe rail @ loading dock North wall	55	lf	150.00	8,250		
140	Utility Bollards	12	ea	800.00	9,600		
141	Trash receptacles	4	ea	1,750.00	7,000		
142	Bike Racks	20	ea	1,500.00	30,000		
143	Wood round seats	20	ea	600.00	NIC		
144	Benches	8	ea	3,200.00	25,600		
145	Café tables and chairs	16	ea	3,500.00	56,000		
146	Garden raised beds - field built	12	ea	1,200.00	NIC		
147	Garden ADA beds - field built	3	ea	1,200.00	NIC		
148	Utility Shed	360	sf	25.00	NIC		
151	21' backless aluminum players bench at natural turf soccer field	2	loc	10,000.00	20,000		
151	Basketball hoop, swing up	1	ea	5,000.00	5,000		
159	Foul poles / pitcher mound / bases	2	loc	10,000.00	20,000		



90% Construction Documents Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>SITEWORK</b>							
153	Shade structure	1	ls	18,000.00	18,000		
137	Soccer Goals	12	ea	2,500.00	30,000		
154	Playground equipment	1	ls	602,000.00	602,000		
155	<u>Landscaping + Sports Fields</u>						
156	gravel base; assume 12" thick	5,416	cy	35.00	Early Bid		
157	Baseball/softball fields; seed	68,000	sf	0.35	23,800		
158	Infield mix	16,200	sf	5.50	89,100		
160	Soccer fields; seed	62,042	sf	0.35	21,715		
161	Soil amend existing stockpiled soil; assumed amend (spec calls for new topsoil) - bid ERP#1	1	ls	354,000.00	354,000		
162	Planter beds topsoil - 18" - ERP#1	1	ls	77,000.00	77,000		
163	Upland Seed Mix	229,610	sf	0.25	57,403		
164	Wetland Seed Mix	34,828	sf	0.25	8,707		
165	Swale	1,100	lf	6.00	6,600		
166	<u>Evergreen Trees</u>						
167	Eastern Red Cedar 7' - 8' ht	30	ea	1,000.00	30,000		
168	White Spruce 10' - 12' ht	71	ea	1,500.00	106,500		
169	Green Giant' Arborvitae 10' - 12' ht	13	ea	1,500.00	19,500		
170	<u>Deciduous Trees</u>						
171	October Glory' Red Maple 3 - 3.5" cal	56	ea	1,000.00	56,000		
172	Autumn Gold' Maidenhair Tree 2.5 - 3.0" cal	3	ea	937.50	2,813		
173	Shademaster' Thornless Honeylocust 3 - 3.5" cal	76	ea	1,000.00	76,000		
174	<u>Ornamental Trees</u>						
175	Allegheny Serviceberry 7' - 8'	8	ea	1,000.00	8,000		
176	Japanese Maple - Upright Green 2 - 2.5" cal	2	ea	750.00	1,500		
177	Seven Son Flower 7' - 8'	1	ea	1,000.00	1,000		
178	Arnold Promise' Witch Hazel 25gal	1	ea	1,000.00	1,000		
179	Donald Wyman' Crabapple 1.5 - 2" cal	20	ea	625.00	12,500		
180	Sugar Tyme' Crabapple 1.5 - 2" cal	1	ea	625.00	625		
181	<u>Deciduous Trees</u>						
182	Rose Creek' Compact Abelia 3gal	68	ea	187.50	12,750		
183	Arnold Dwarf' Forsythia 3gal	50	ea	187.50	9,375		
184	Berry Poppins' Dwarf Winterberry 3gal	6	ea	187.50	1,125		
185	Mr Poppins' Dwarf Male Winterberry 3gal	2	ea	187.50	375		
186	California Privet 7gal	78	ea	375.00	29,250		
187	Gro-low Fragrant Sumac 2gal	162	ea	125.00	20,250		
188	Miss-Kim' Compact Lilac 5gal	11	ea	300.00	3,300		
189	Bailey Compact' Cranberrybush Viburnum 5gal	22	ea	300.00	6,600		
190	<u>Evergreen Shrubs</u>						
191	Shamrock' Compact Inkberry 5gal	181	ea	300.00	54,300		
192	Blue Pacific' Shore Juniper 3gal	429	ea	187.50	80,438		
193	Green Sargent' Shore Juniper 3gal	18	ea	187.50	3,375		
194	<u>Perennials, Groundcover &amp; Vines</u>						
195	Blue Ice' Compact Bluestar 1gal	68	ea	15.00	1,020		
196	Hay-Scented Fern 1gal	18	ea	15.00	270		
197	Native Trumpet Honeysuckle 2gal	4	ea	30.00	120		
198	Total planting for bioretention #1 & #2	1	ls	19,306.00	19,306		
199	Irrigation				not required		
200	SUBTOTAL						5,687,386
201	<b>G30 CIVIL MECHANICAL UTILITIES</b>						
202	Pipe trenching bid - - ERP#1	1	ls	314,158.00	314,158		
203	<u>Water supply</u>						
204	Sitework Water Supply Bid - ERP#1	1	ls	395,750.00	395,750		
205	Connect to existing water	2	ea	6,000.00	Early Bid		
206	Corporation stop	3	ea	800.00	Early Bid		
207	Gate valves	15	ea	1,200.00	Early Bid		
208	Hose bib	1	ea	600.00	Early Bid		





90% Construction Documents Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>SITEWORK</b>							
209	Hydrant	2	ea	5,000.00	Early Bid		
210	2" copper	870	lf	45.00	Early Bid		
211	Yard hydrant in 2 x 2 concrete box	4	ea	3,000.00	Early Bid		
212	DI Water line - 6"	230	lf	80.00	Early Bid		
213	DI Water line - 10"	2,630	lf	130.00	Early Bid		
214	<u>Storm Sewer</u>						
215	Sitework Bid Storm Sewer - ERP#1	1	ls	2,576,394.00	2,576,394		
216	Bio retention basins	12,545	sf	10.00	Early Bid		
217	Drain Manholes 4' dia	51	ea	4,500.00	Early Bid		
218	Drain Manholes 5' dia	4	ea	5,000.00	Early Bid		
219	Drain Manholes 5' dia bypass	2	ea	5,500.00	Early Bid		
220	Drain Manholes 6' dia	2	ea	5,800.00	Early Bid		
221	Drain Manholes - 6' Doghouse	1	ea	6,000.00	Early Bid		
222	Drain Manholes 8' dia	1	ea	7,500.00	Early Bid		
223	Catch Basins	60	ea	4,200.00	Early Bid		
224	Double Catch Basins	1	sf	7,500.00	Early Bid		
225	DCO	10	sf	2,600.00	Early Bid		
226	Area Basin	3	ea	1,750.00	Early Bid		
227	Area Drains	42	ea	1,750.00	Early Bid		
228	Swale inlet	7	ea	1,600.00	Early Bid		
229	Roof Drain connections	8	ea	600.00	Early Bid		
230	Reducer	1	ea	600.00	Early Bid		
231	WYE	8	ea	600.00	Early Bid		
232	FES - Flared End Sections	4	ea	1,250.00	Early Bid		
233	WQI - Water Quality Inlet	2	ea	4,500.00	Early Bid		
234	WQS - Water Quality Structures	4	ea	15,000.00	Early Bid		
235	OCS - Outlet Control Structures	3	ea	10,000.00	Early Bid		
236	Connect to existing drain	1	ea	3,500.00	Early Bid		
237	Connect to existing headwall	1	ea	2,500.00	Early Bid		
238	UD	2,561	lf	50.00	Early Bid		
239	Perf CPP - 6"	2,975	lf	48.00	Early Bid		
240	CPP - 6"	72	lf	48.00	Early Bid		
241	CPP - 8"	185	lf	52.00	Early Bid		
242	CPP - 12"	4,300	lf	55.00	Early Bid		
243	CPP - 15"	70	lf	60.00	Early Bid		
244	CPP - 18"	1,775	lf	65.00	Early Bid		
245	CPP - 24"	535	lf	80.00	Early Bid		
246	CPP - 30"	240	lf	90.00	Early Bid		
247	CPP - 36"	740	lf	115.00	Early Bid		
248	DI - 36"	325	lf	160.00	Early Bid		
249	Trench drain	15	lf	120.00	Early Bid		
250	<u>Underground Detention #2</u>				Early Bid		
251	Excavate and dispose on site for detention systems	3,087	cy	12.00	Early Bid		
252	Back-fill infiltration bed with 3/4" crushed stone wrapped in filter fabric	1,852	cy	50.00	Early Bid		
253	SC - 740 chambers	374	ea	650.00	Early Bid		
254	<u>Underground Detention #3</u>				Early Bid		
255	Excavate and dispose on site for detention systems	1,025	cy	12.00	Early Bid		
256	Back-fill infiltration bed with 3/4" crushed stone wrapped in filter fabric	615	cy	50.00	Early Bid		
257	SC - 740 chambers	150	ea	650.00	Early Bid		
258	<u>Underground Detention #4</u>				Early Bid		
259	Excavate and dispose on site for detention systems	826	cy	12.00	Early Bid		
260	Back-fill infiltration bed with 3/4" crushed stone wrapped in filter fabric	496	cy	50.00	Early Bid		
261	SC - 740 chambers	96	ea	650.00	Early Bid		
262	<u>Underground Detention #5</u>				Early Bid		
263	Excavate and dispose on site for detention systems	251	cy	12.00	Early Bid		
264	Back-fill infiltration bed with 3/4" crushed stone wrapped in filter fabric	151	cy	40.00	Early Bid		
265	SC - 740 chambers	36	ea	650.00	Early Bid		



90% Construction Documents Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST	
<b>SITEWORK</b>								
266	<u>Sanitary Sewer</u>							
267	Sitework Bid Sanitary Sewer	1	ls	216,305.00	216,305			
268	Connect to existing sewer	1	ea	7,500.00	Early Bid			
269	Sanitary Sewer Manholes	10	sf	3,800.00	Early Bid			
270	E&B Grease tank	1	ea	4,000.00	Early Bid			
271	Sanitary Sewer line - 4"	10	lf	40.00	Early Bid			
272	Sanitary Sewer line - 6"	130	lf	45.00	Early Bid			
273	Sanitary Sewer line - 8"	1,340	lf	60.00	Early Bid			
274	<u>Gas and Telecom service</u>							
275	E&B trench for new lines, pipe and install by utilities							
276	New gas service from Crescent street	1,000	lf	22.00	Early Bid			
277	New telecom service from Crescent Street	590	lf	22.00	Early Bid			
278	SUBTOTAL					3,502,607		
279								
280	<b>G40 ELECTRICAL UTILITIES</b>							
281	Power riser	1	ea	2,000.00	2,000			
282	Primary ductbank AA 2-5" empty conduit	920	lf	45.00	41,400			
283	Pad mount transformer	1	ea		Utility co			
284	Secondary ductbank BB 4-4" with 2500A feed	240	lf	410.00	98,400			
285	Generator ductbank EE with feeders	230	lf	320.00	73,600			
286	Communication riser	1	ea	2,500.00	2,500			
287	Communication ductbank CC 4-4" empty conduit	790	lf	80.00	63,200			
288	Communication handhole	3	ea	1,200.00	3,600			
289	Site lighting circuitry: 2#8 & #10 in 1" c	6,000	lf	9.00	54,000			
290	Fixture SL1/3	32	ea	2,800.00	89,600			
291	Fixture SL2/3	16	ea	3,800.00	60,800			
292	Fixture SL3/4	15	ea	2,500.00	37,500			
293	Flag pole lighting and sign lighting	1	ls	20,000.00	20,000			
293	Pole base grounding and bonding	47	ea	150.00	7,050			
294	Pull box	1	ls	450.00	450			
295	1" conduit from PB	500	lf	9.00	4,500			
296	Civil:							
297	Excavation, DB AA, BB, EE, CC	2,180	lf	20.00	Included in ERP#1			
298	Concrete, DB AA, BB, EE, CC	2,180	lf	25.00	Included in ERP#1			
299	Excavation, site lighting & PB circuitry	6,500	lf	5.00	Included in ERP#1			
300	Pad mount transformer pad	1	ea	2,200.00	2,200			
301	Power manhole	2	ea	4,500.00	9,000			
302	Pole base	47	ea	700.00	32,900			
303	SUBTOTAL					602,700		
304	<b>TOTAL - SITE DEVELOPMENT</b>						<b>\$12,115,301</b>	
305								

# THE NEW W. EDWARD BALMER SCHOOL

## WHITINSVILLE, MASSACHUSETTS



## NEIGHBORS INFORMATION MEETING

AUGUST 26, 2019



Massachusetts School Building Authority  
Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities



# AGENDA

- Project Construction Schedule Update
- Landscaping Discussion
- General Question and Answer





# CONSTRUCTION SCHEDULE UPDATE

## June 2019

- o Mobilize
- o Install erosion controls, site fence
- o Begin clearing and grubbing

\*\* Please relocate any items beyond property line by June 28, 2019

## July 2019

- o Continue earthwork, logistics work around existing school

## August 2019

- o Complete logistical reconfiguration, continue earth moving

## September 2019 – December

- o Earthwork, foundations

## December 2019 – March 2020

- o Foundations, steel erection

## March 2020 – April 2021

- o Complete Phase 1 Construction / New Building

## June 2021 – December 2021

- o Abate / demolish Balmer, complete Vail Restoration

## Spring 2022

- o Plant final fields

# EVERGREEN



JV – Juniper Virginianus  
'Emerald Sentinel'  
Eastern Red Cedar  
7'-8' tall when planted

# TREES



PG – Picea Glauca  
White Spruce  
10'-12' tall when planted



TG – Thuja 'Green Giant'  
Arborvitae  
10'-12' tall when planted





# DECIDUOUS TREES



AR – Acer  
Rubrum  
Red Maple



‘October Glory’  
3” - 3.5” Caliper  
when planted



GB – Ginkgo  
Biloba  
‘Autumn Gold’  
Maidenhair



2.5” – 3” Caliper  
when planted



GT – Gleditsia  
Tr. Inermis  
‘Shademaster’  
Honey Locust



3” – 3.5” Caliper  
when planted

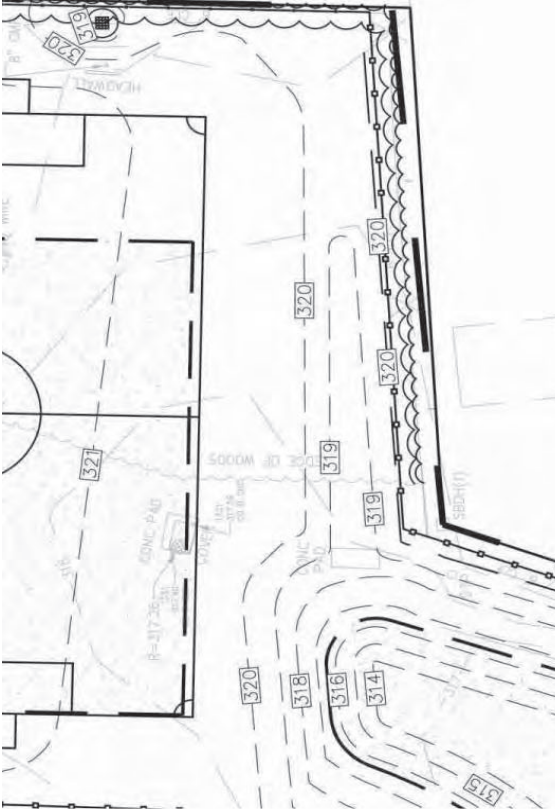












292 MASON RD  
N/F COLLINS RUSSELL D  
BK 6581 PG 254  
MAP PARCEL 7-388

# GRADING PLAN 292 MASON ROAD





TG – Thuja  
'Green Giant'  
Arborvitae



AR – Acer Rubrum



PG – Pinea Glauca



# PROPOSED LANDSCAPING 282 MASON ROAD



AR – Acer Rubrum



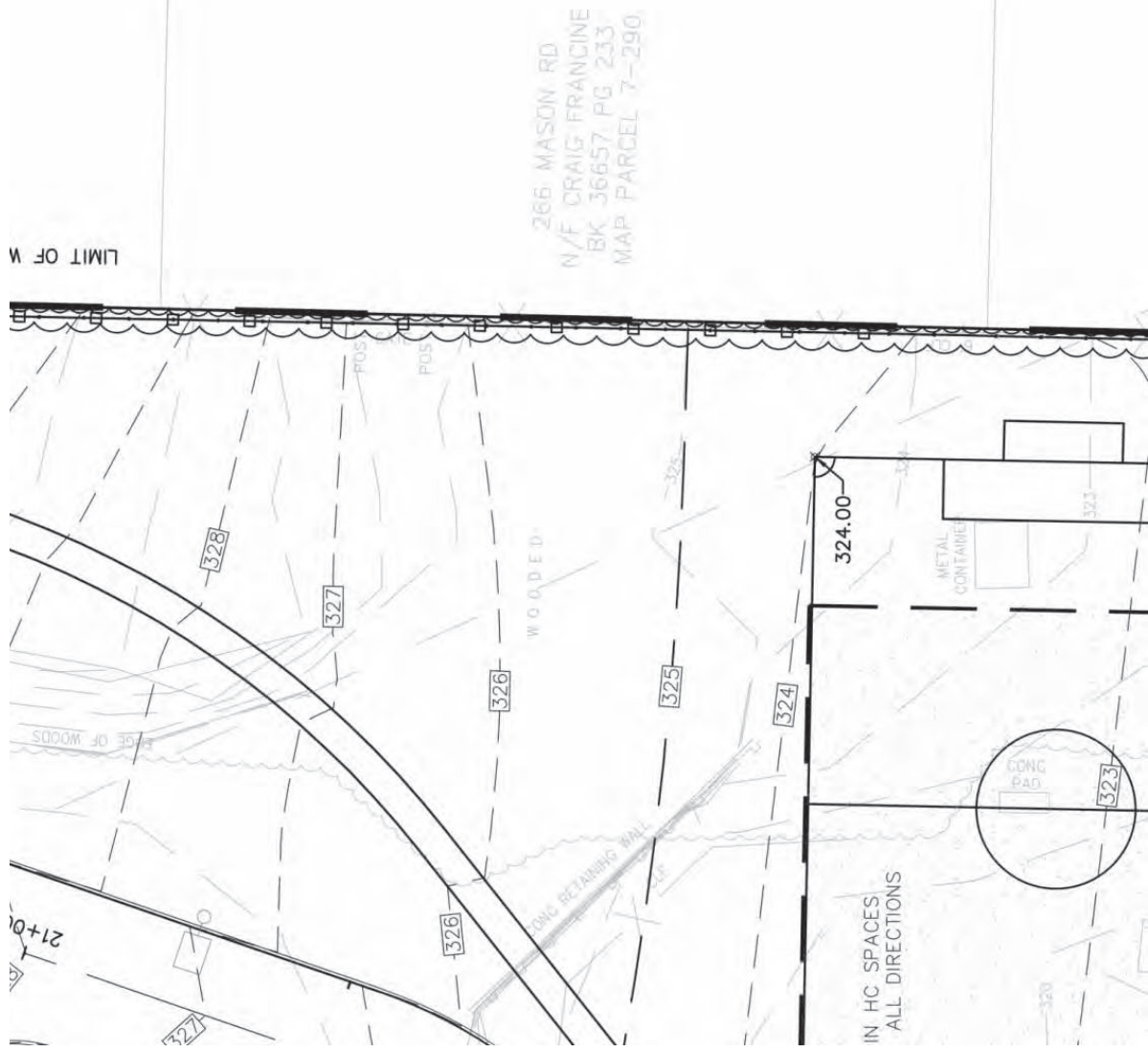
TG – Thuja  
'Green Giant'  
Arborvitae





# GRADING PLAN

## 266 MASON ROAD



IN HC SPACES  
ALL DIRECTIONS

266 MASON RD  
N/F CRAIG FRANCINE  
BK 36657 PG 233  
MAP PARCEL 7-290

LIMIT OF W



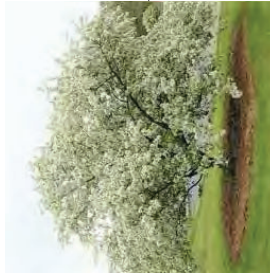
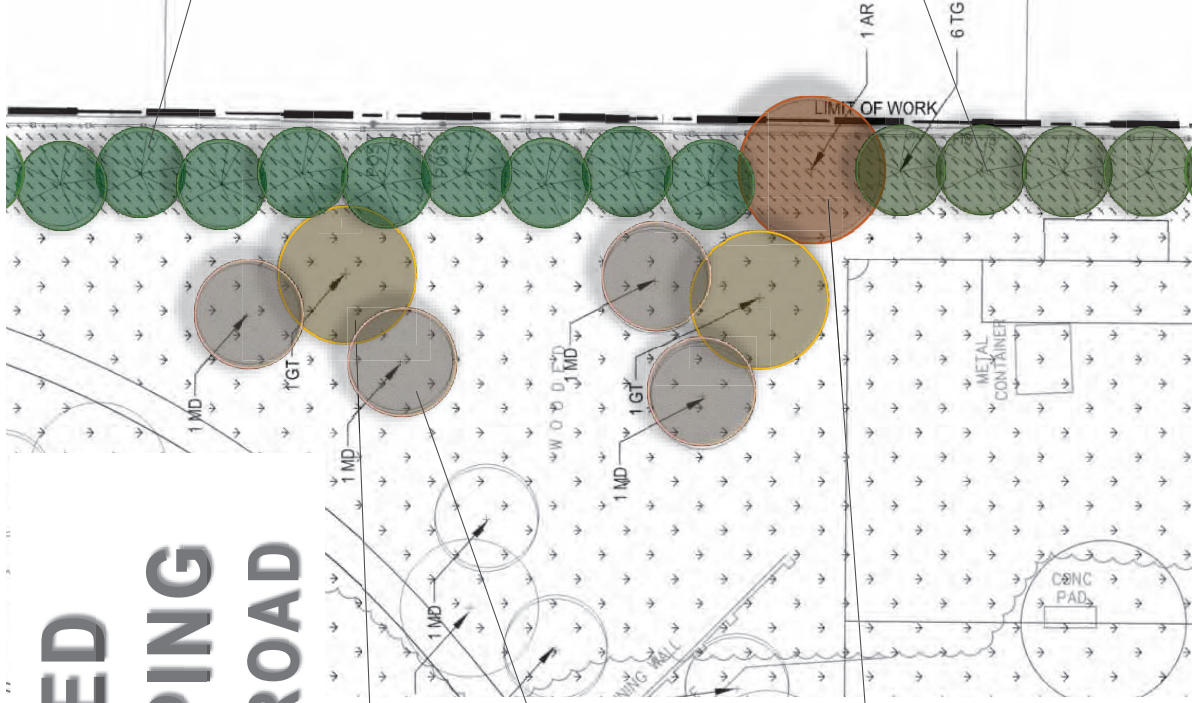
# PROPOSED LANDSCAPING 266 MASON ROAD



PG – White Pine



TG – Thuja 'Green  
Giant' Arborvitae



MD – Wyman  
Crabapple



GT – 'Shademaster'  
Honey Locust

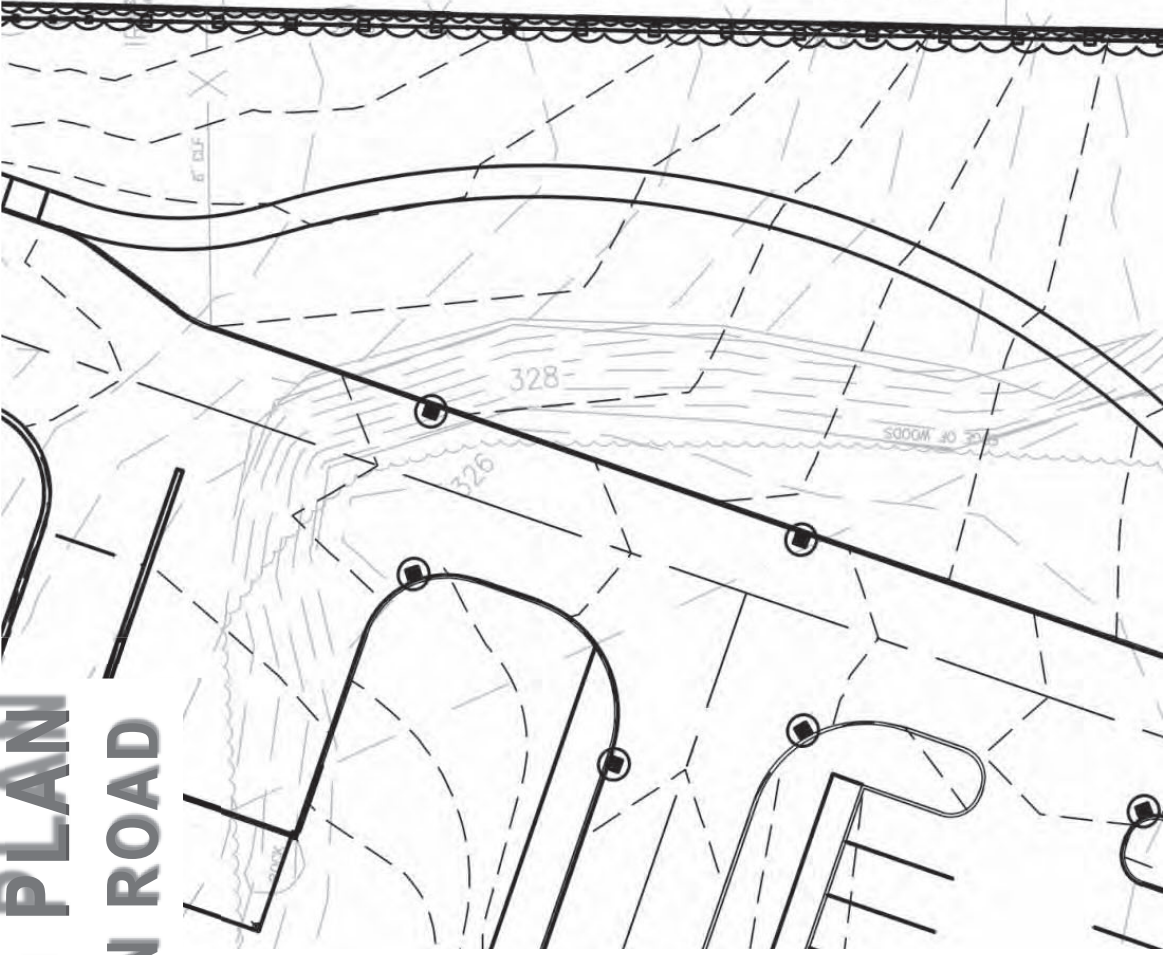


AR – Acer Rubrum

MASON RD  
266 MASON RD  
2657 PG 233  
ARCEL 7-3

# GRADING PLAN

## 254 MASON ROAD



MATCHLINE

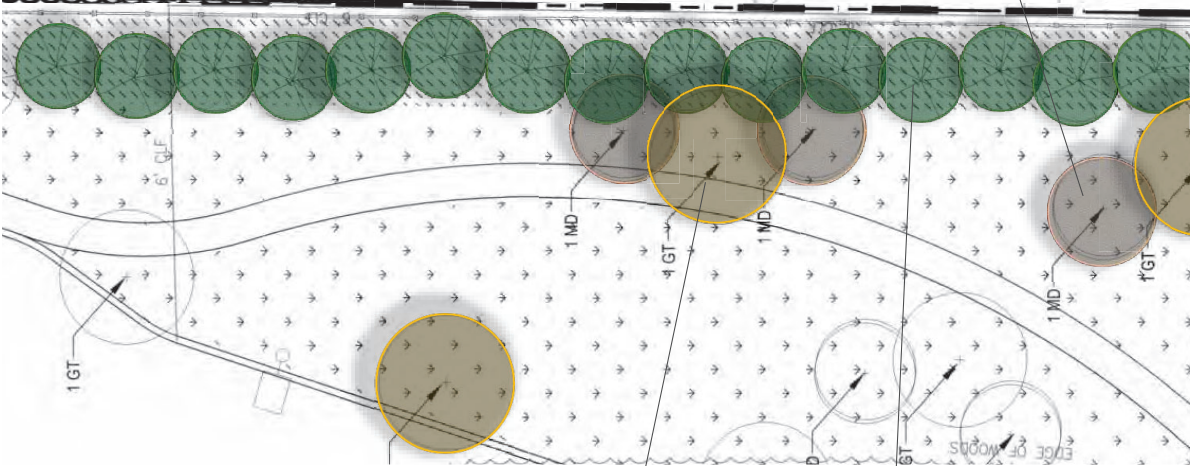
254 MASON RD  
N/F ZANELLA PATRICK T  
BK 22450 PG 181  
MAP PARCEL 7-291

LIMIT OF WORK



# PROPOSED LANDSCAPING 254 MASON ROAD

254 MASON RD  
N/F ZANELLA PATRICK T  
BK 22450 PG 181  
MAP PARCEL 7-291



GT – 'Shademaster  
Honey Locust



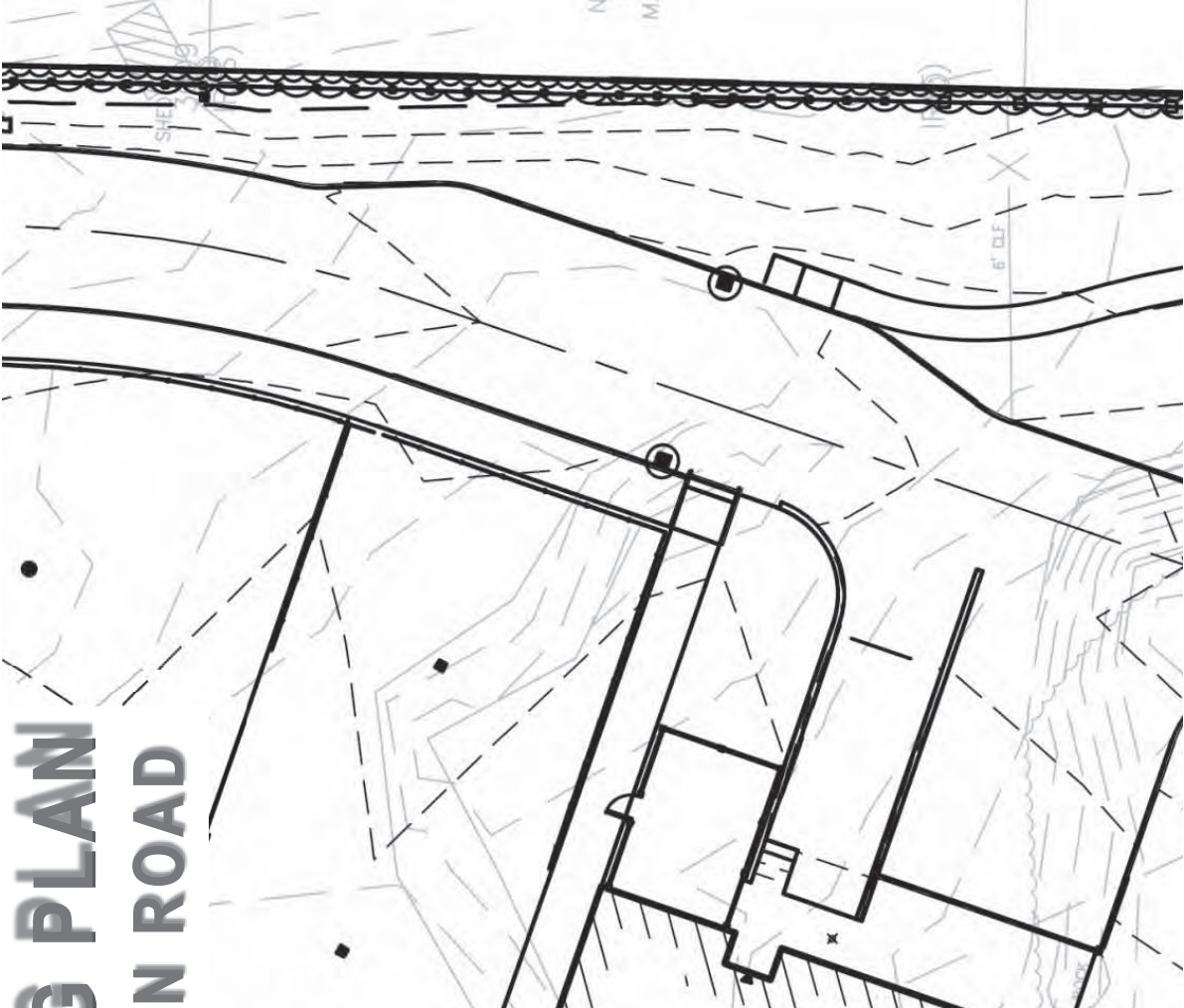
MD – Wyman  
Crabapple



PG – White Pine

# GRADING PLAN

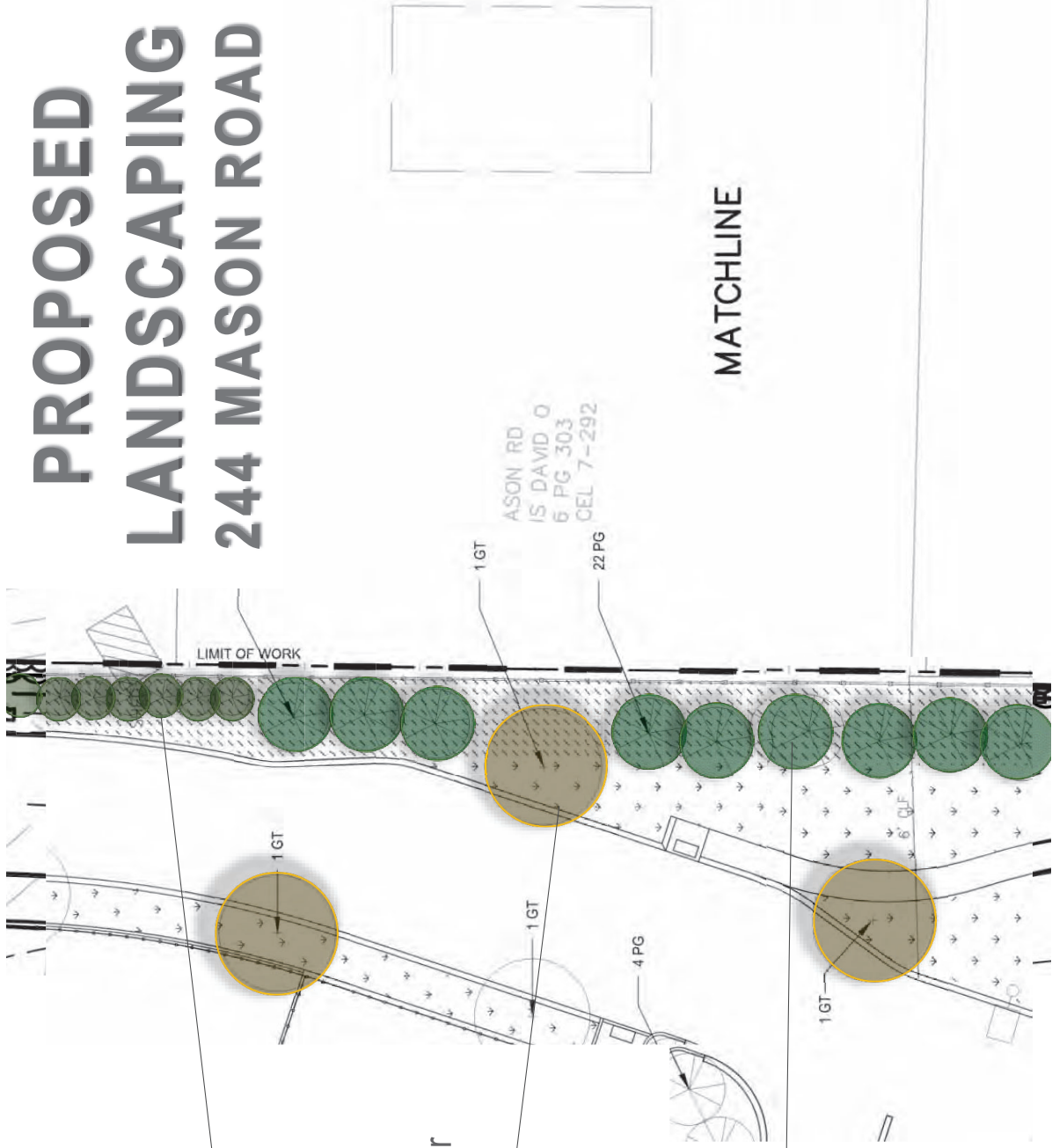
## 244 MASON ROAD



244 MASON RD  
N/F VALIS DAVID O  
BK 6936 PG 303  
MAP PARCEL 7-292

MATCHLINE

# PROPOSED LANDSCAPING 244 MASON ROAD



JV – Eastern Red Cedar



PG – White Pine

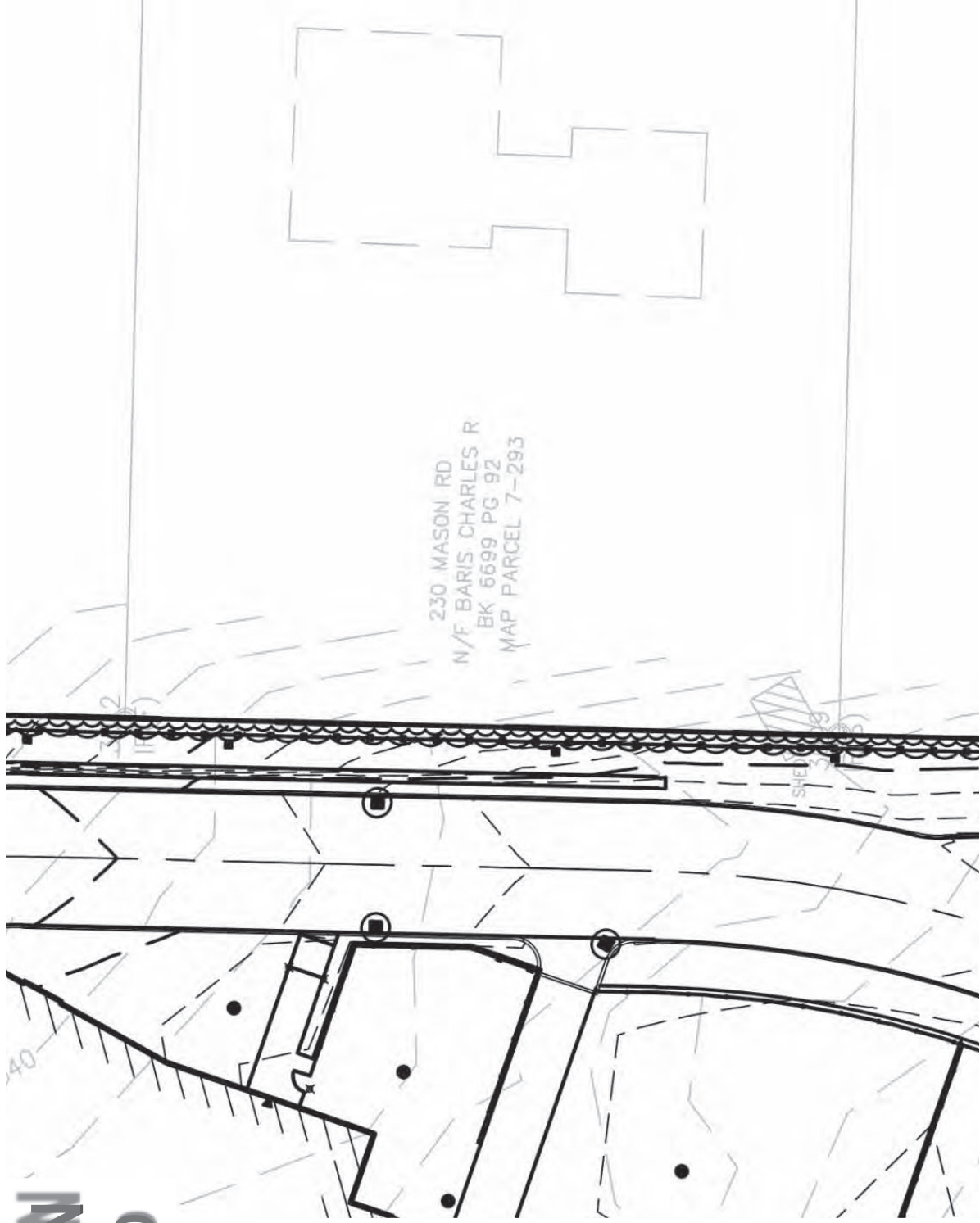


GT – 'Shademaster  
Honey Locust



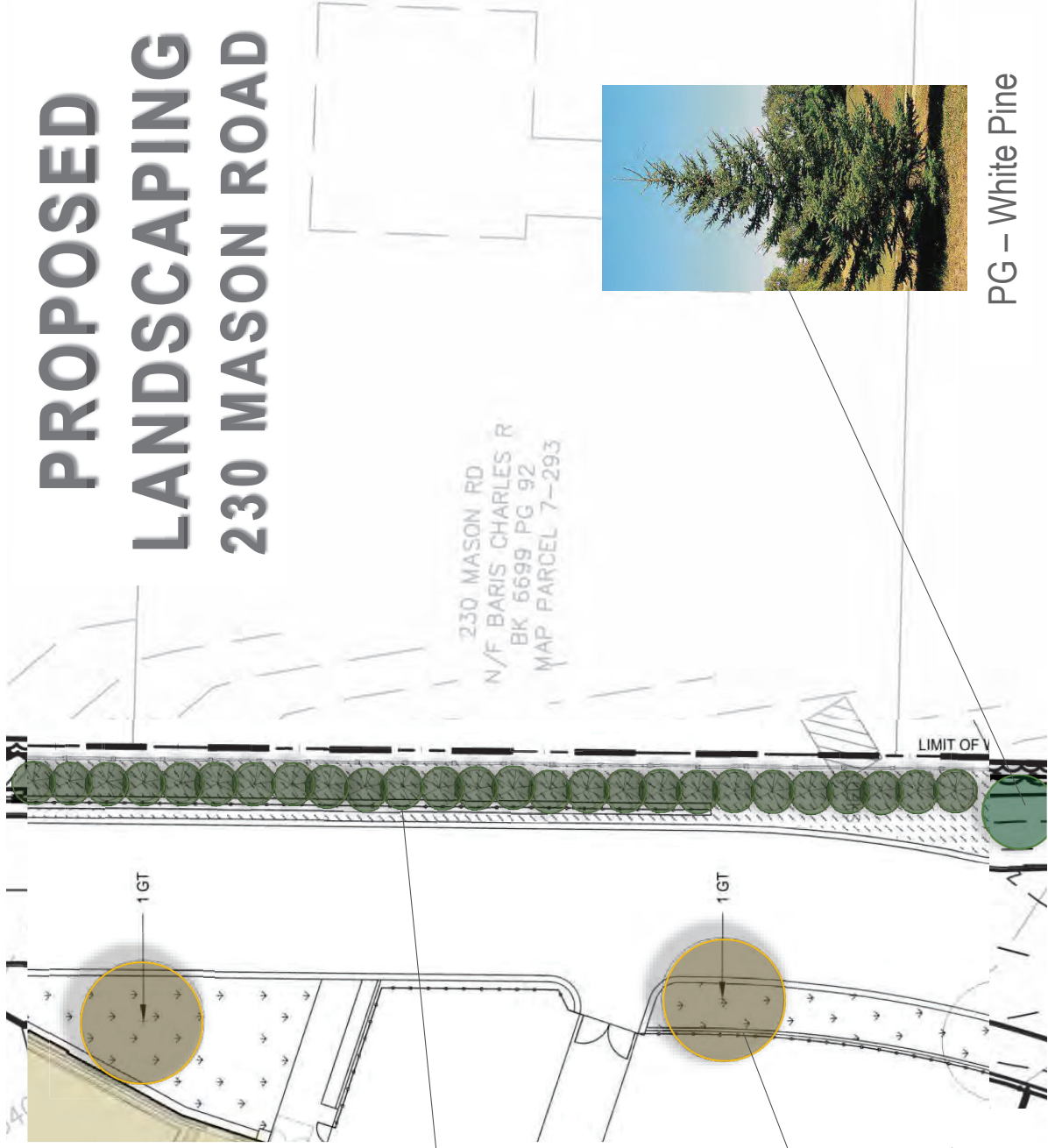
# GRADING PLAN

## 230 MASON ROAD





# PROPOSED LANDSCAPING 230 MASON ROAD



JV – Eastern Red Cedar



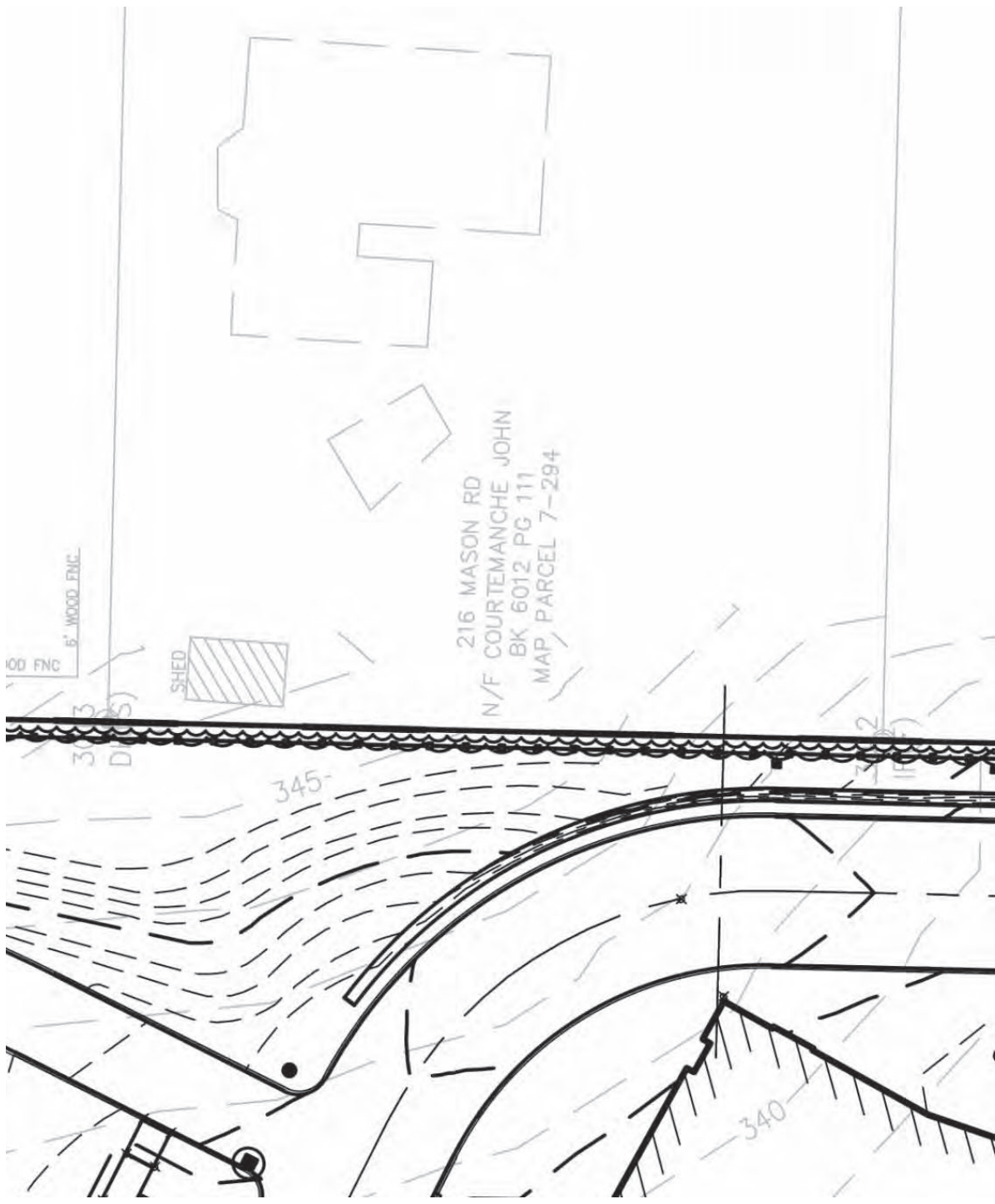
PG – White Pine



GT – 'Shademaster  
Honey Locust

# GRADING PLAN

## 216 MASON ROAD



# PROPOSED LANDSCAPING 216 MASON ROAD



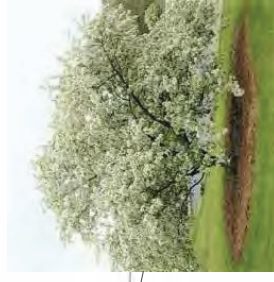
GT – 'Shademaster  
Honey Locust



JV – Eastern Red  
Cedar



PG – White Pine

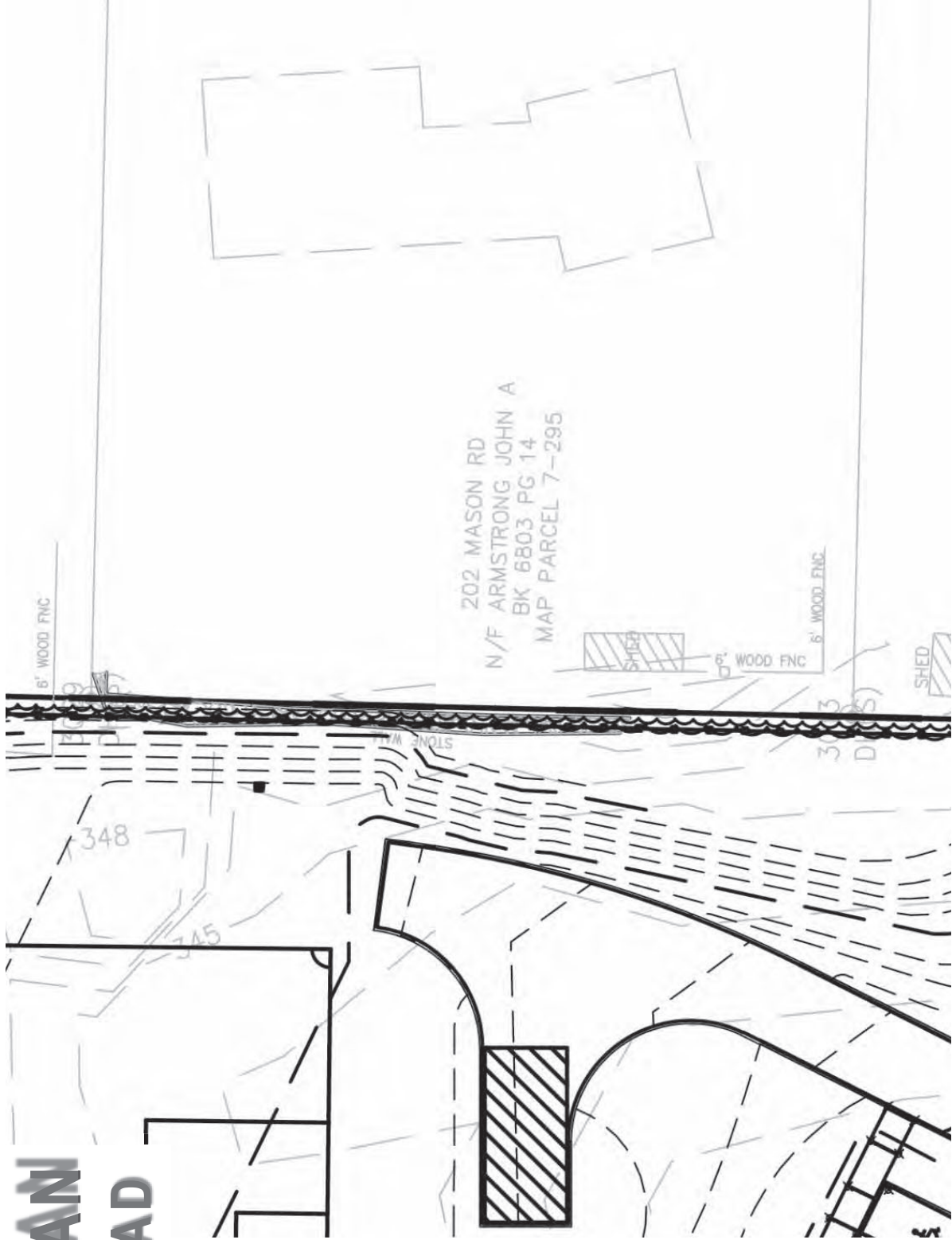


MD – Wyman  
Crabapple



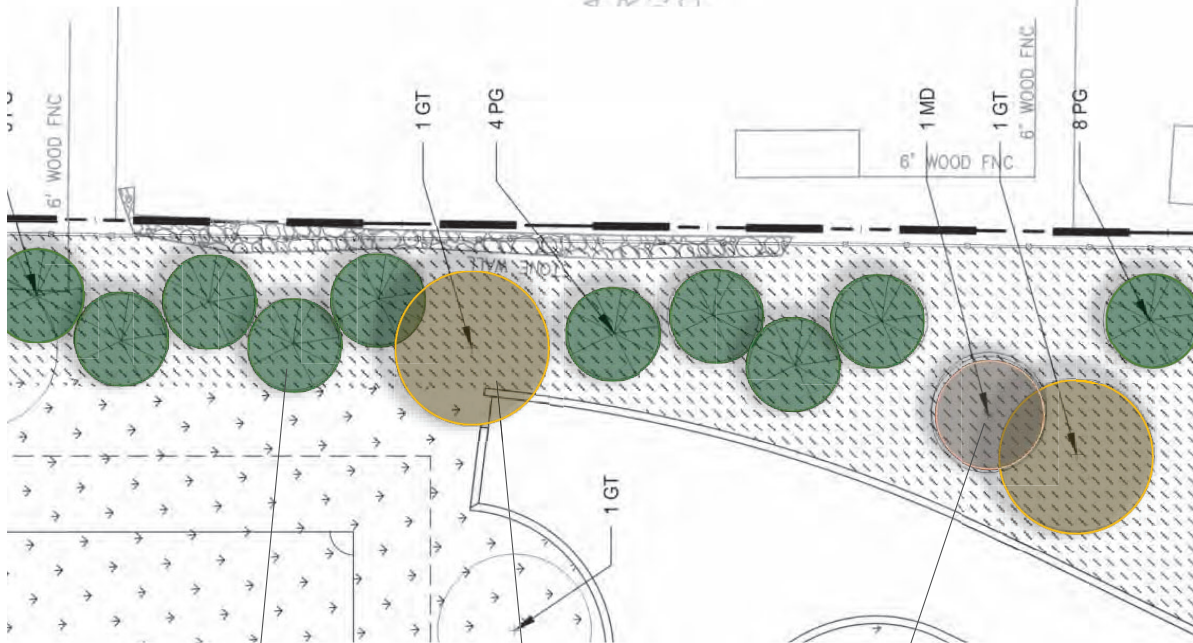
# GRADING PLAN

## 202 MASON ROAD



# PROPOSED LANDSCAPING 202 MASON ROAD

MASON RD  
RONG JOHN A  
13 PG 14  
CEL 7-295



PG – White Pine

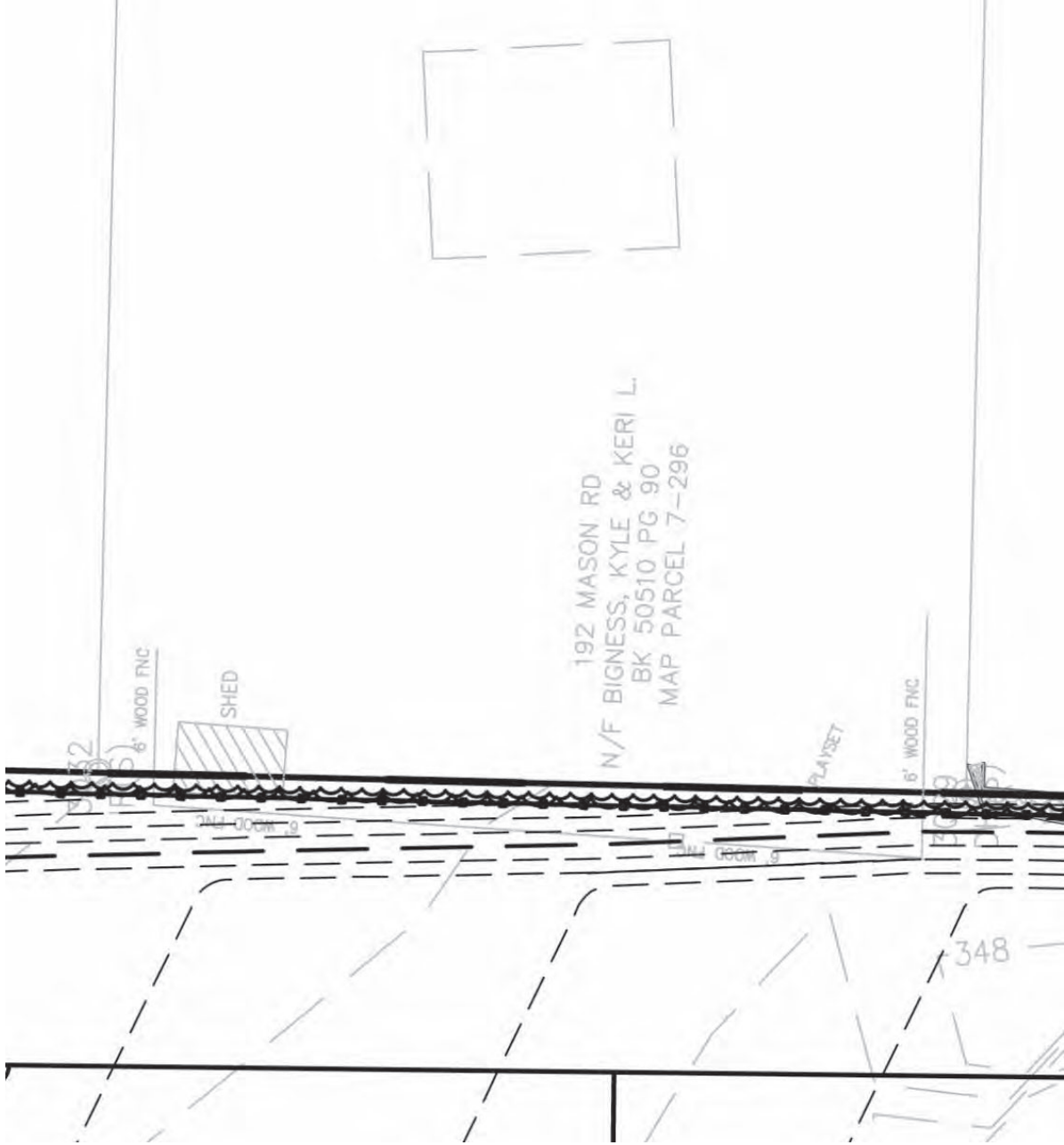


MD – Wyman  
Crabapple



GT – 'Shademaster  
Honey Locust

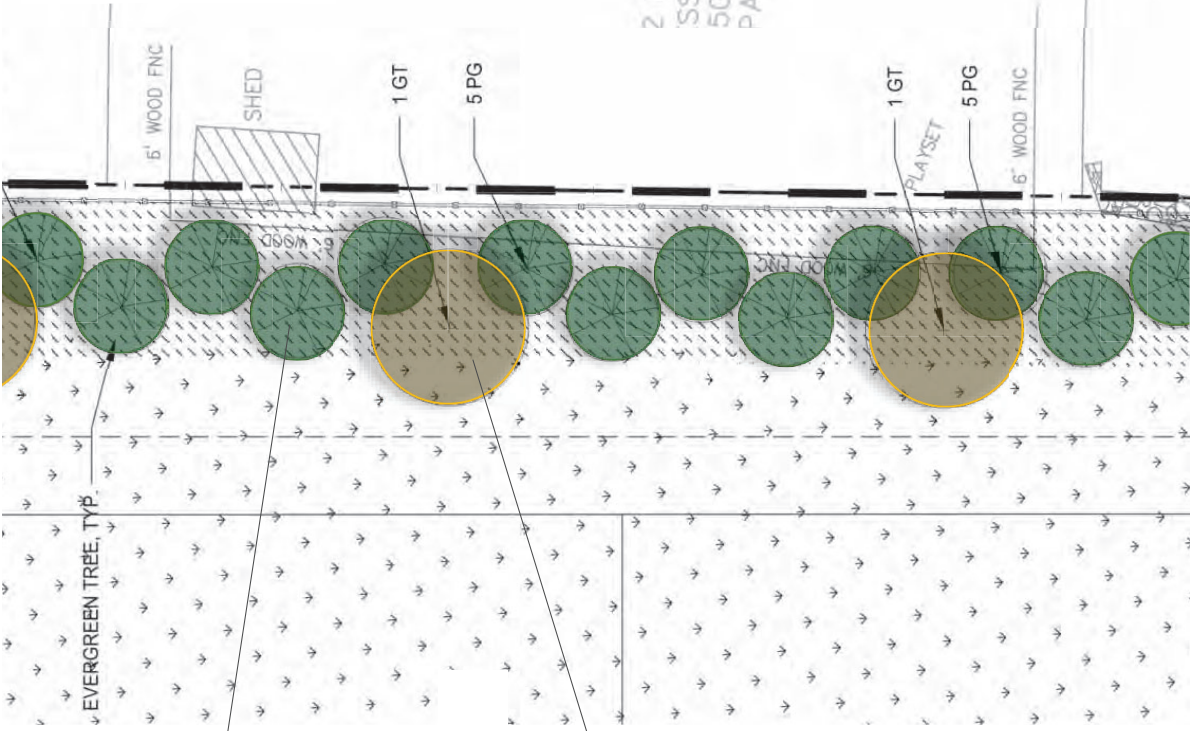
# GRADING PLAN 192 MASON ROAD





# PROPOSED LANDSCAPING 192 MASON ROAD

2 MASON RD  
SS, KYLE & KERI L.  
50510 PG 90  
PARCEL 7-296



PG – White Pine



GT – 'Shademaster  
Honey Locust

# GRADING PLAN

## 178 MASON ROAD



# PROPOSED LANDSCAPING 178 MASON ROAD



GT – 'Shademaster  
Honey Locust

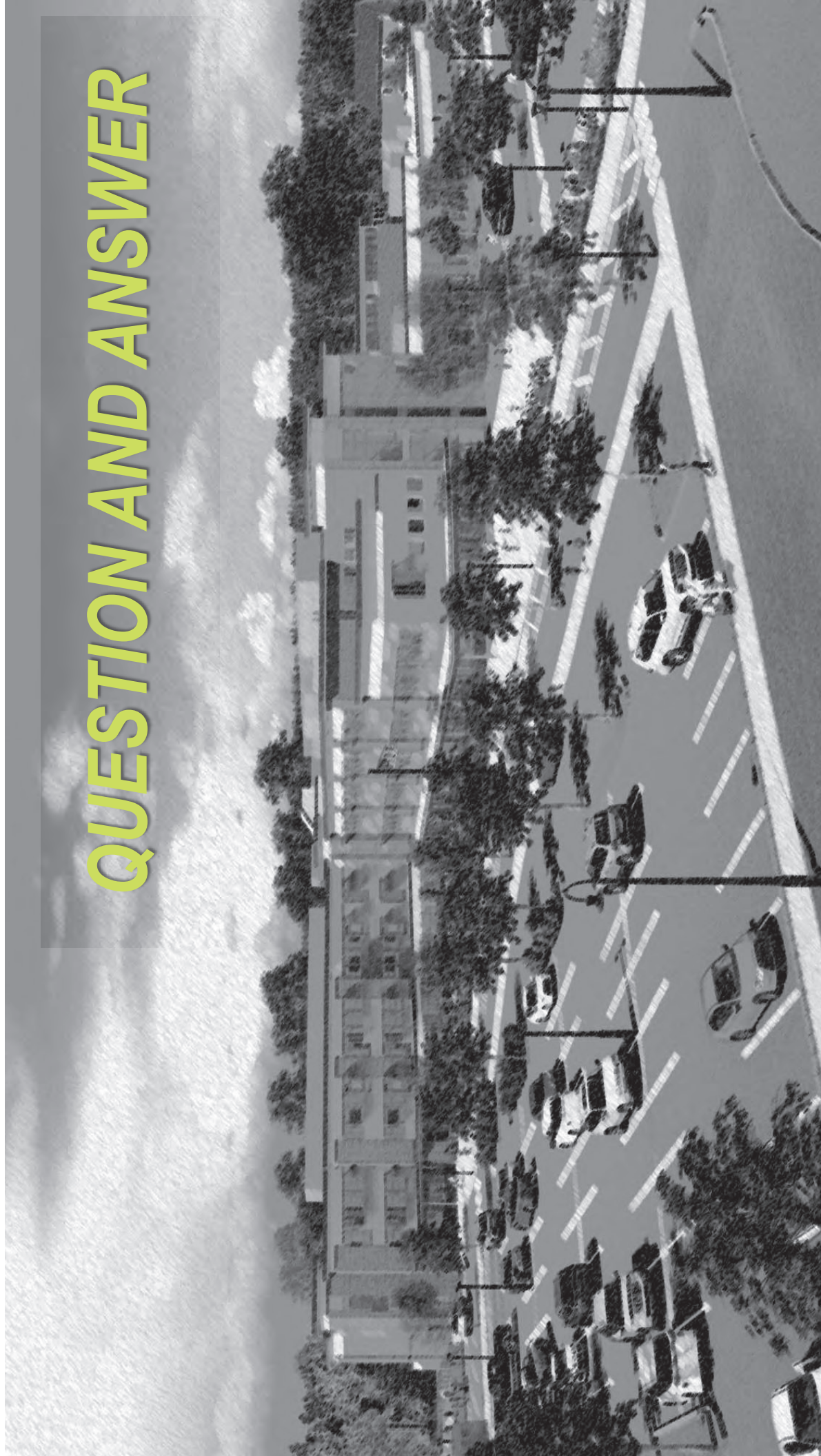


PG – White Pine



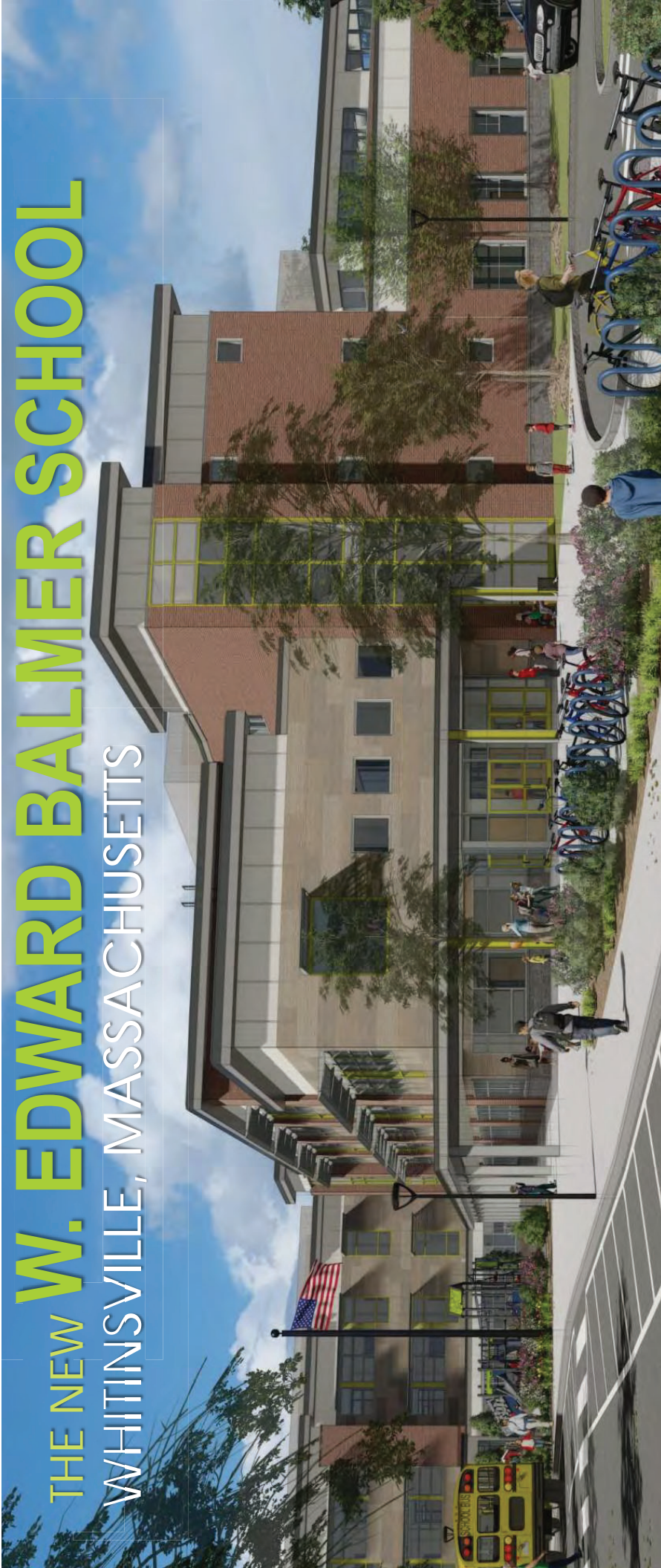


# QUESTION AND ANSWER





# THE NEW W. EDWARD BALMER SCHOOL WHITINSVILLE, MASSACHUSETTS



## SCHOOL BUILDING COMMITTEE MEETING

AUGUST 26, 2019



Massachusetts School Building Authority  
Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities



**FONTAINE BROS., INC.**  
CONSTRUCTION MANAGERS  
GENERAL CONTRACTORS



DORE & WHITTIER  
ARCHITECTS, INC.

# AGENDA

- Neighborhood Meeting Update
- CD Progress Report
- 60% CD Cost Estimate Update
- Construction Progress Update





# EVERGREEN



JV – Juniper Virginianus  
'Emerald Sentinel'  
Eastern Red Cedar  
7'-8' tall when planted

# TREES



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White Spruce  
10'-12' tall when planted



TG – Thuja 'Green Giant'  
Arborvitae  
10'-12' tall when planted





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AR – Acer  
Rubrum

Red Maple

‘October Glory’

3” - 3.5” Caliper  
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GB – Ginkgo  
Biloba

‘Autumn Gold’

Maidenhair

2.5” – 3” Caliper  
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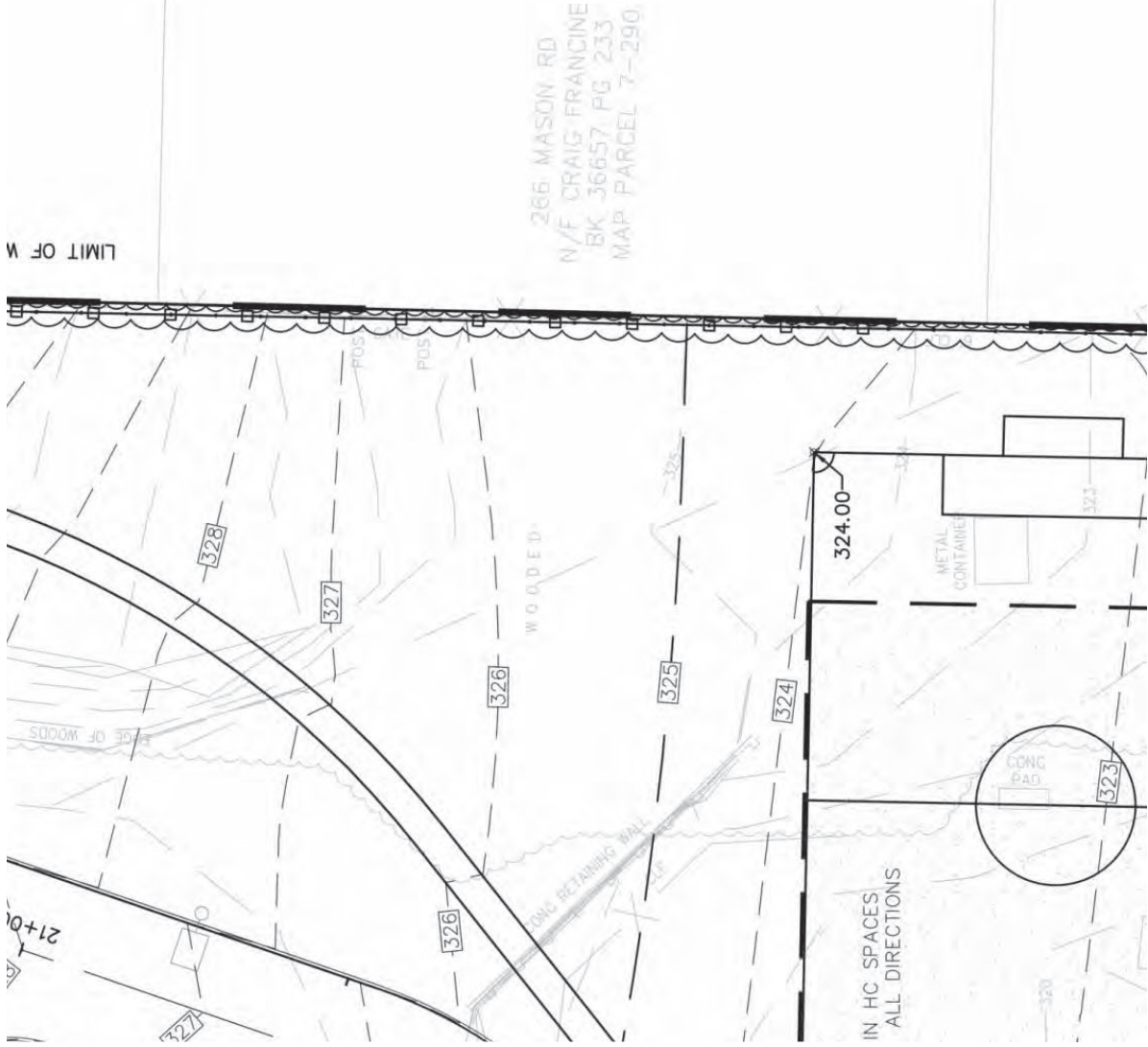


GT – Gleditsia  
Tr. Inermis  
‘Shademaster’  
Honey Locust

3” – 3.5” Caliper  
when planted



# GRADING PLAN 266 MASON ROAD



**TYPICAL  
EXAMPLE SLIDE**



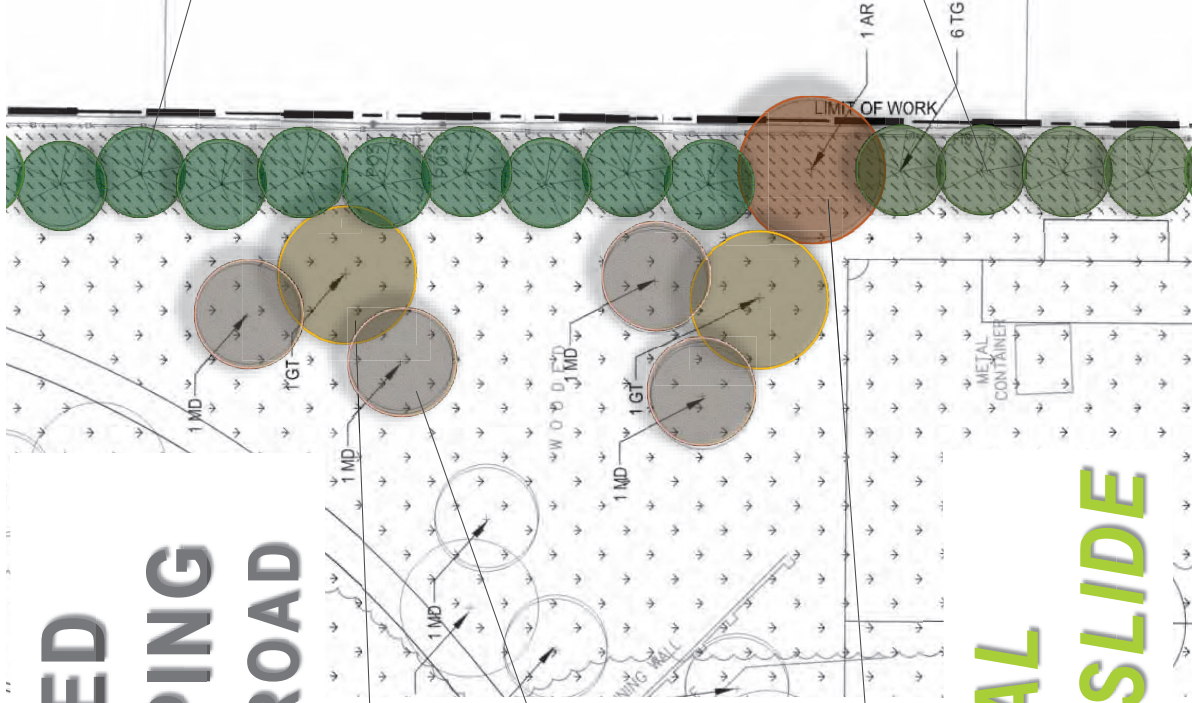
# PROPOSED LANDSCAPING 266 MASON ROAD



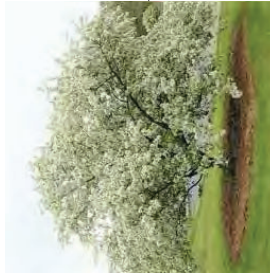
PG – White Pine



TG – Thuja 'Green  
Giant' Arborvitae



MASON RD  
RAIG FRANCINE  
3657 PG 233  
ARCEL 7-3



MD – Wyman  
Crabapple

# TYPICAL EXAMPLE SLIDE



GT – 'Shademaster'  
Honey Locust



AR – Acer Rubrum

# DESIGNER PROGRESS REPORT

7/31	90% CD Pricing Documents issued
8/6	Attended MSBA Collaborative Furniture Procurement meeting
8/6	Working Group Meeting – Final Interiors Presentation
8/14	Board of Health permit approval received

## Ongoing:

- Construction Document Detailing and Production, Specifications coordination and editing, Consultant Drawing and Spec Coordination, QA/QC redlining
- PM coordination with internal team, CM, Consultants, OPM, Owner
- On-site Construction Administration services: weekly meetings, field reports, submittals, requests for information/interpretation (RFI's), payment application review

## Next Deadlines:

- 9/4/19 90% CD package submitted to MSBA
- 10/9/19 100% CDs posted for Trade & Non-Trade Bidding



# ESTIMATED CONSTRUCTION COST COMPARISON – 90%CD

	60% CD PHASE FONTAINEBROS. INC. (CM)	90% CD PHASE PM&C INC. (Designer's Estimator)	90% CD PHASE FONTAINEBROS. INC. (CM)
AREA (GSF)	167,352	167,352	167,352
BUILDING	\$54,179,110	\$55,427,956	\$55,859,036
SITE WORK	\$11,257,934	\$12,115,301	\$12,207,562
MARK-UPS	\$13,680,562	\$11,637,777	\$11,334,828
Post-Estimate VE	(\$47,673)	--	--
<b>TOTAL</b>	<b>\$79,069,933</b>	<b>\$79,181,034</b>	<b>\$79,401,426</b>
Unit Cost (\$/SF)	\$472	\$473	\$474

**CONSTRUCTION BUDGET: \$79,492,663**





# ESTIMATED CONSTRUCTION COST PROGRESSION – DD / 60%CD/ 90% CD

	DD PHASE FONTAINEBROS. INC. (CM)	60% CD PHASE FONTAINEBROS. INC. (CM)	90% CD PHASE FONTAINEBROS. INC. (CM)
AREA (GSF)	167,352	167,352	167,352
BUILDING	\$50,767,822	\$54,179,110	\$55,859,036
SITE WORK & DEMO	\$12,554,970	\$11,257,934	\$12,207,562
MARK-UPS	\$16,157,650	\$13,680,562	\$11,334,828
Post-Estimate VE	(\$629,476)	(\$47,673)	--
<b>TOTAL</b>	<b>\$78,850,968</b>	<b>\$79,069,933</b>	<b>\$79,401,426</b>
Unit Cost (\$/SF)	\$471	\$472	\$474

**CONSTRUCTION BUDGET: \$79,492,663**



# MECHANICAL RTU ACOUSTICAL UPDATE

## COMPARING COST OPTIONS:

1. Conventional mech units and BRD sound treatment, plus the solid absorptive acoustical roof screens on structural steel support structure:  
ADD approx. **\$338,000 – in CD90 estimate**

## VERSUS

2. Conventional mech units, plus BRD curb-supported solid acoustical roof screens with integral support and BRD sound treatment, with NO structural steel support structure. **Costs less, but durability and warranty questions.**

## VERSUS

3. AAOON proprietary mech units (+ ~15%), plus corrugated sheet metal roof screens on structural steel support structure. **Found that sound data on unit was not correctly reported; when evaluated was not that much quieter than specified units.**







# CONSTRUCTION PROGRESS UPDATE





**CONSTRUCTION PROGRESS UPDATE**





# CONSTRUCTION PROGRESS UPDATE







# CONSTRUCTION PROGRESS UPDATE







CONSTRUCTION PROGRESS UPDATE

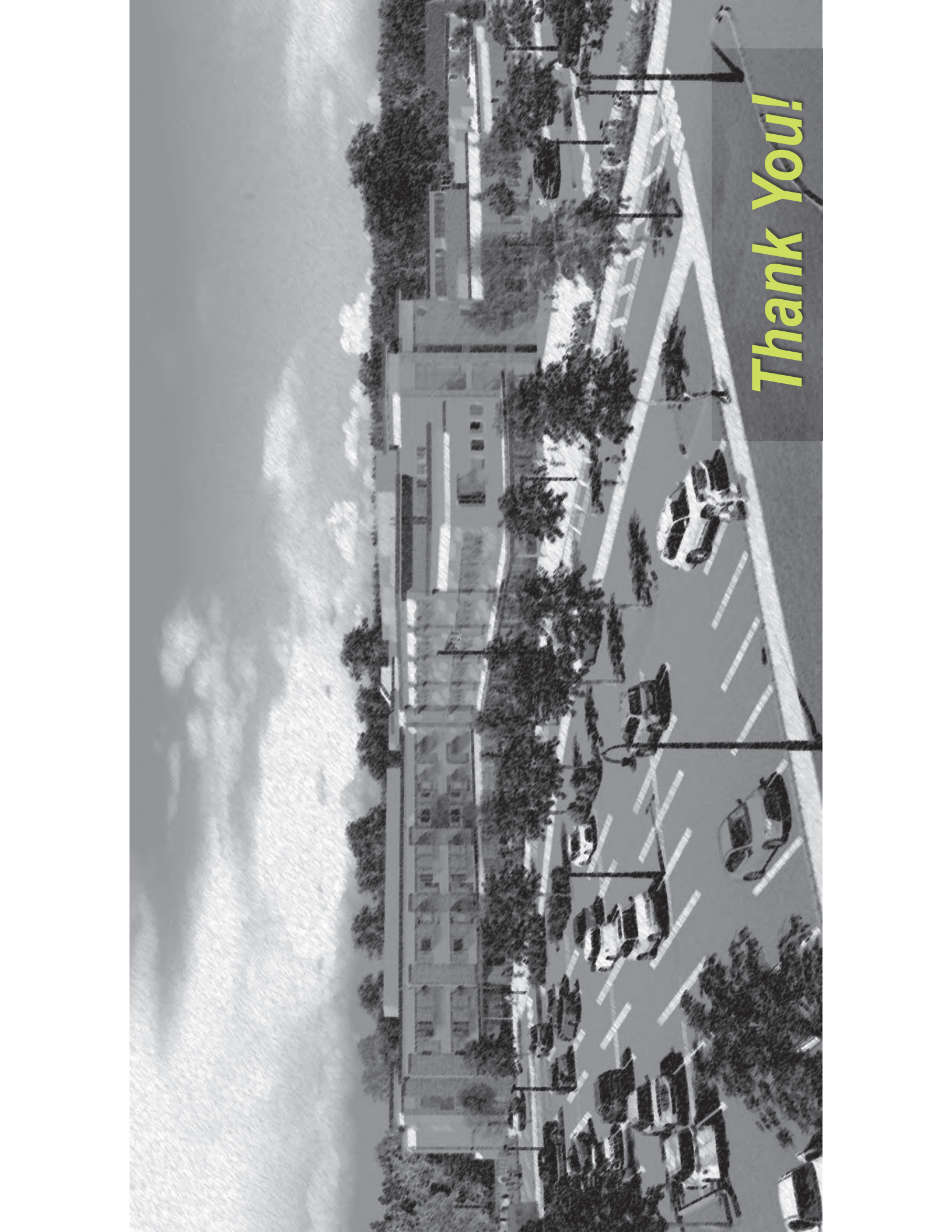




**CONSTRUCTION PROGRESS UPDATE**  
**RE. 192 MASON ROAD**







**Thank You!**