Massachusetts School Building Authority

Deborah B. Goldberg, State Treasurer and Receiver-General

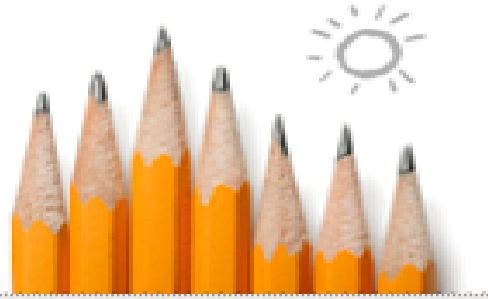
Chairperson

James MacDonald

Chief Executive Officer

John K. McCarthy

Executive Director



MSBA Contractor Roundtable

Occupied School Construction

www.MassSchoolBuildings.org

MSBA Roundtable Discussion

Occupied School Construction

W.T. Rich Company, Inc.

Clark Avenue Middle School
Chelsea, MA

Pine Grove Elementary School
Rowley, MA

Manchester Memorial Elementary School
Manchester, MA

Projects of Focus

W.T. Rich Company, Inc.

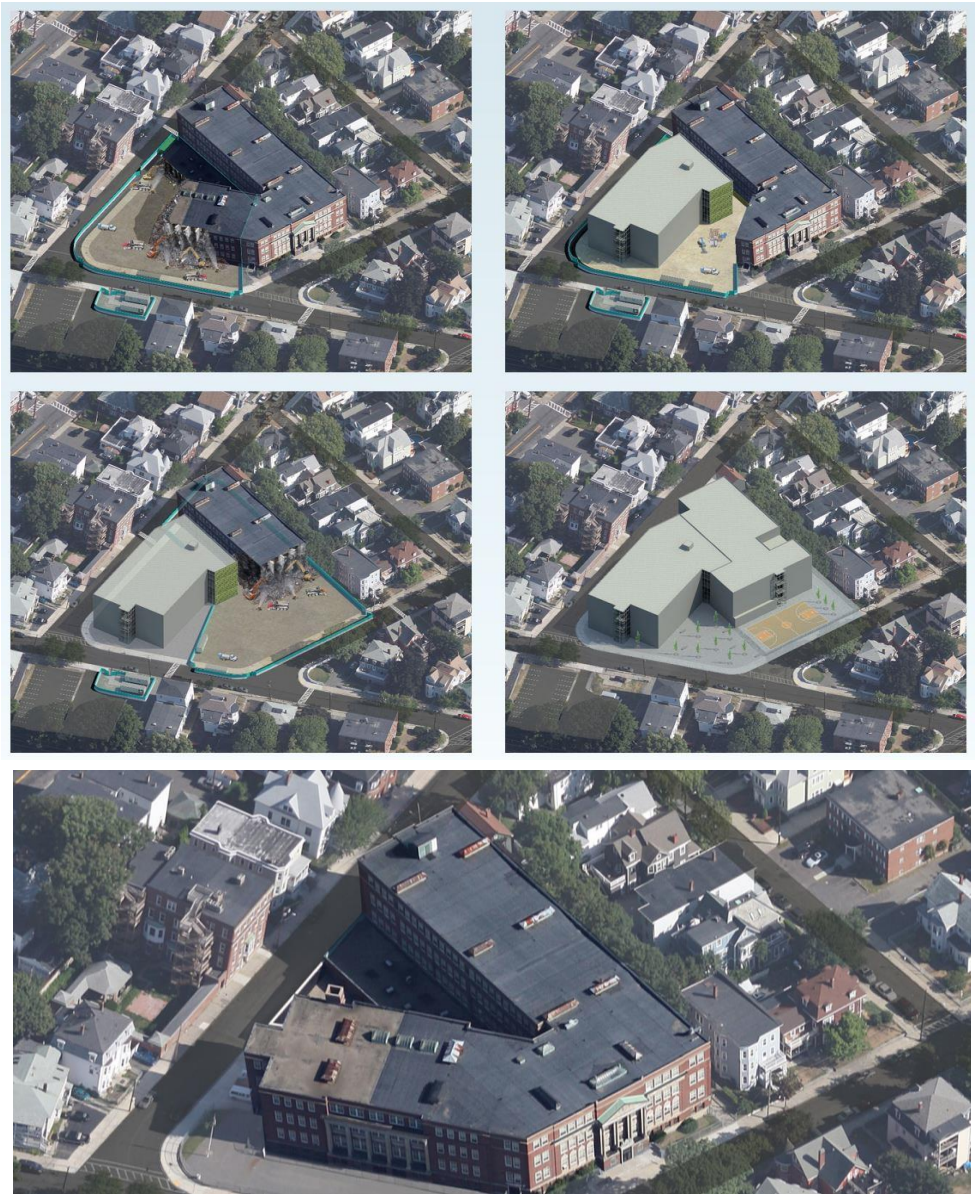
Clark Avenue Middle School

- New construction on existing/occupied site
- Total SF: 115,236
  - *Phase 1: 77,021 / Phase 2: 38,215*
- Budget: $46,046,367
- *MSBA Funded*

W.T. Rich Company, Inc.

Overall Challenges
Clark Avenue Middle School

- New 115,236 SF School – Located on Existing School Building Site
- Two Existing Buildings Occupied 90% of Site
  - 1908 Building = Vacant (52,000 SF)
  - 1926 Building = Clark Middle School (103,500 SF)



W.T. Rich Company, Inc.

The Prep Work

- The "Big 3"
  - Maintain an existing campus and keep it safe
  - Manage the schedule and phases
  - Manage the schedule towards the client's budget

W.T. Rich Company, Inc.

Key Strategies

Constant and consistent communication

Managing the budget to the schedule

Utilization of February and April vacation

- Open gym floor
- Investigate existing conditions
- Develop scopes
  - Temp boiler
  - Excavation
  - Concrete
  - Shoring

Managing the design to the schedule

Phase 1 Challenges

- Maintain daily safe operation of existing 1926 school building
- Phase 1 demo of existing 1908 building
- Abate 1908 building during the summer
- Relocate and/or cut/cap street utilities and Interior infrastructure
- Setup and maintain temp boiler on the exterior
- Evaluation of exterior egress and supports
- Converting interior walls to exterior weather resistant wall systems
- Phase 1 life safety systems required updating
- Construction of Phase 1 was within 10' of the existing building
- 18 month construction period for 77,021 SF of Phase 1

W.T. Rich Company, Inc.

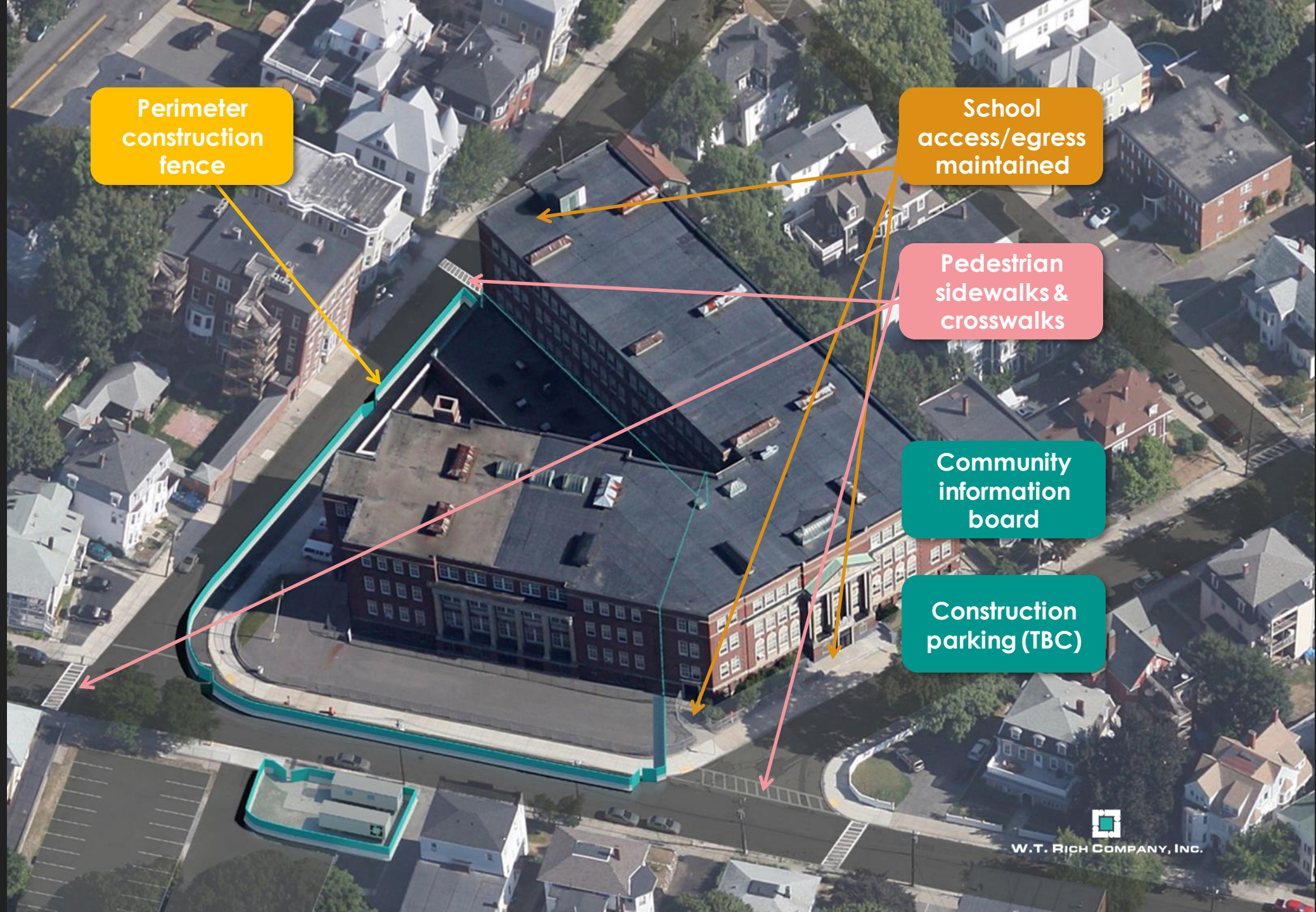
Existing Conditions
May 23, 2015

W.T. Rich Company, Inc.

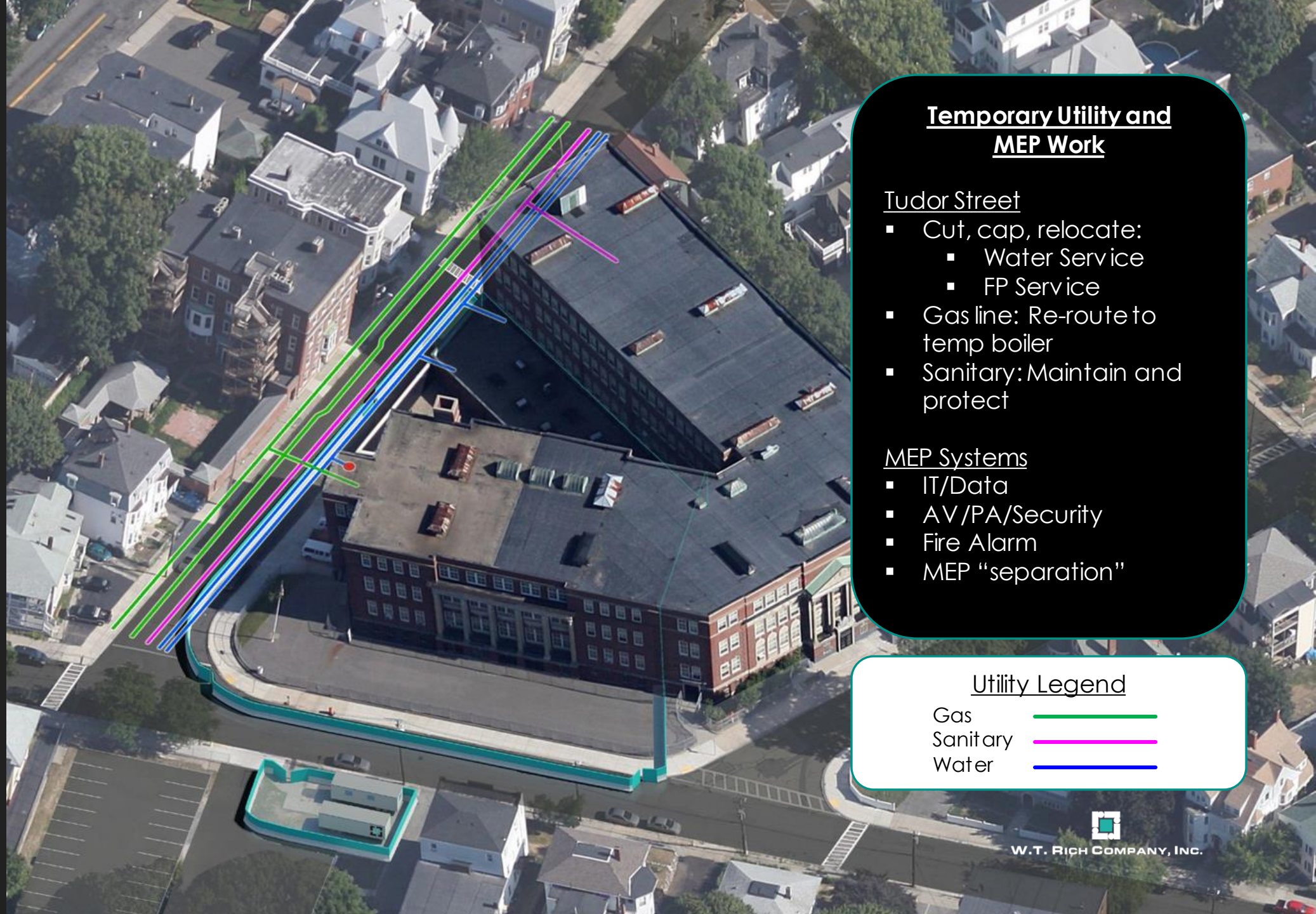
Initial Site Setup
May 2015

W.T. Rich Company, Inc.

Initial Site Setup
May 2015



Temp/Relocated Services June 2015



Temporary Utility and MEP Work

Tudor Street

- Cut, cap, relocate:
  - Water Service
  - FP Service
- Gas line: Re-route to temp boiler
- Sanitary: Maintain and protect

MEP Systems

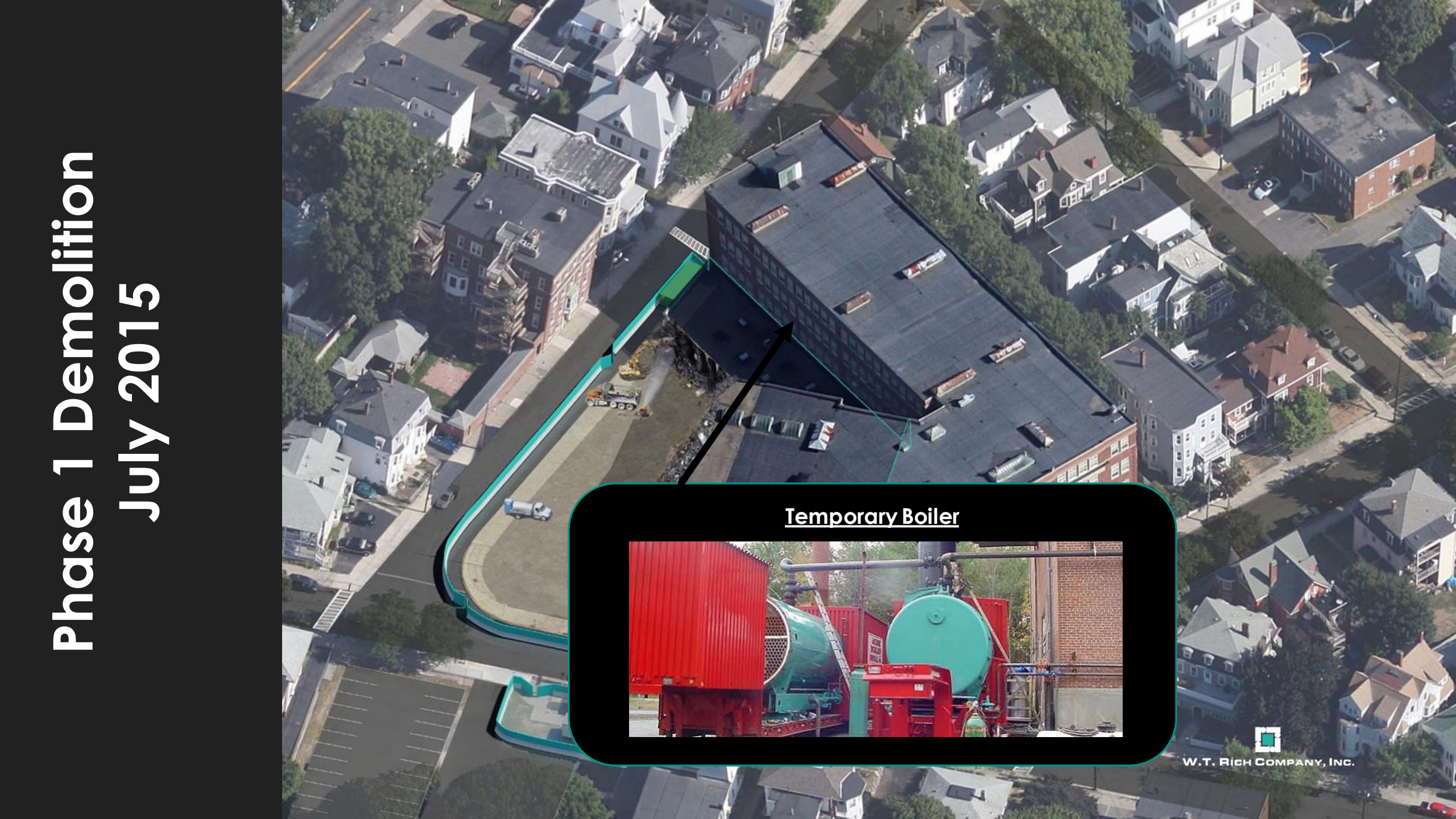
- IT/Data
- AV/PA/Security
- Fire Alarm
- MEP "separation"

Utility Legend

Gas
Sanitary
Water

W.T. Rich Company, Inc.

Phase 1 Demolition
July 2015



W.T. Rich Company, Inc.

Phase 1 Foundations
November 2015

W.T. Rich Company, Inc.

Foundations

W.T. Rich Company, Inc.

Phase 1 Steel
February 2016

Construction of Phase 1 within 10 Feet of the Existing Building

W.T. Rich Company, Inc.

Phase 1 Shell
May 2016

W.T. Rich Company, Inc.

Construction Phase 1

W.T. Rich Company, Inc.

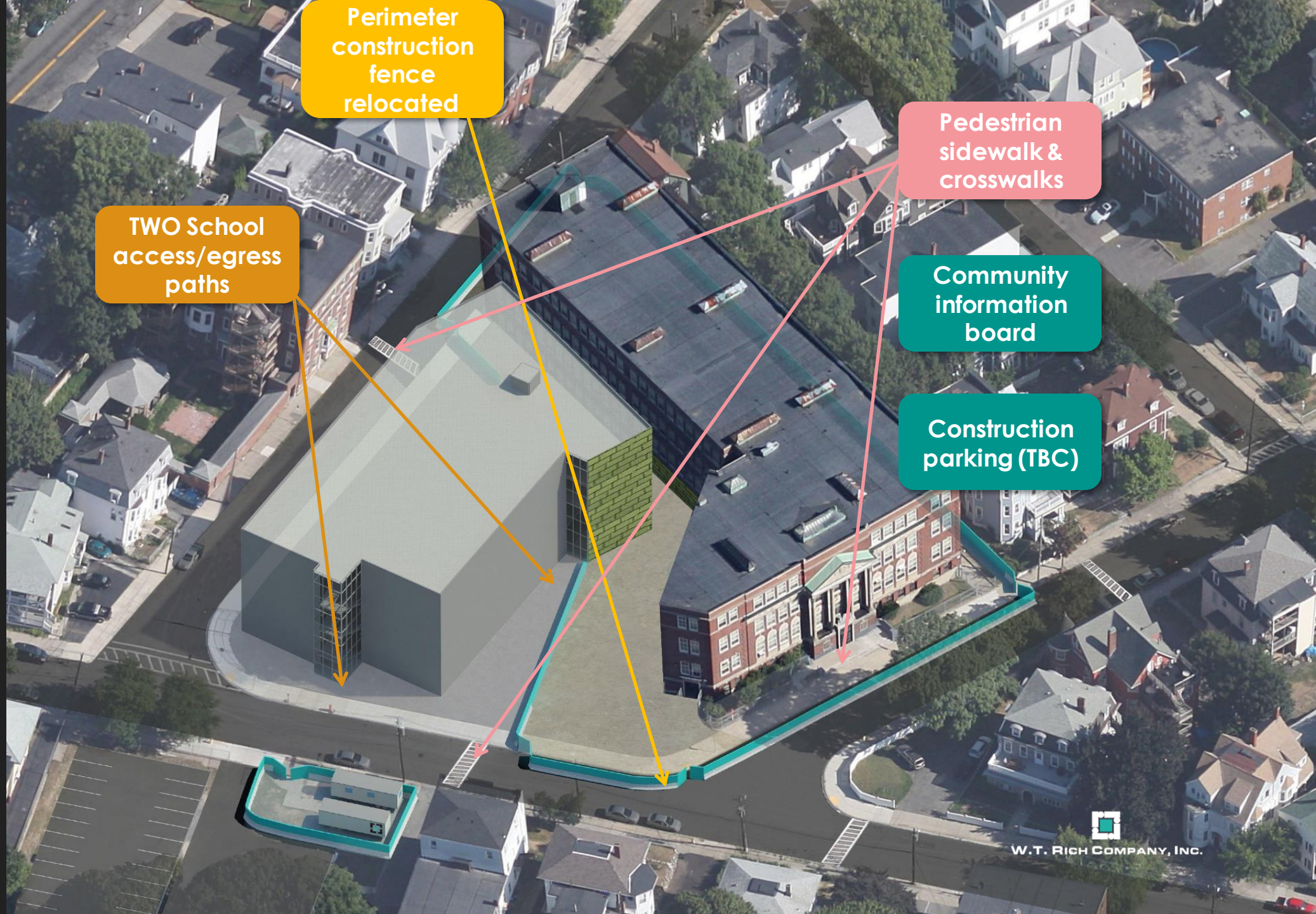
Phase 2 Challenges

- Maintain daily operation of new school
- Proximity of residents required earth shoring systems and specialty "blind waterproofing" systems at foundations at gymnasium
- Deep excavations for gym required strategic thinking and planning
- Phase 2 to Phase 1 "Tie-Ins" from steel to MEP systems were challenging and complex
- Phase 2 landscaping and site logistics during "summer only" was a logistical challenge

W.T. Rich Company, Inc.

Phase 2 Initial Setup
February 2017

Phase 2 Initial Setup
February 2017



Phase 2 Demolition
April 2017


CAT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Phase 2 Foundations
July 2017

Phase 2 Steel
September 2017

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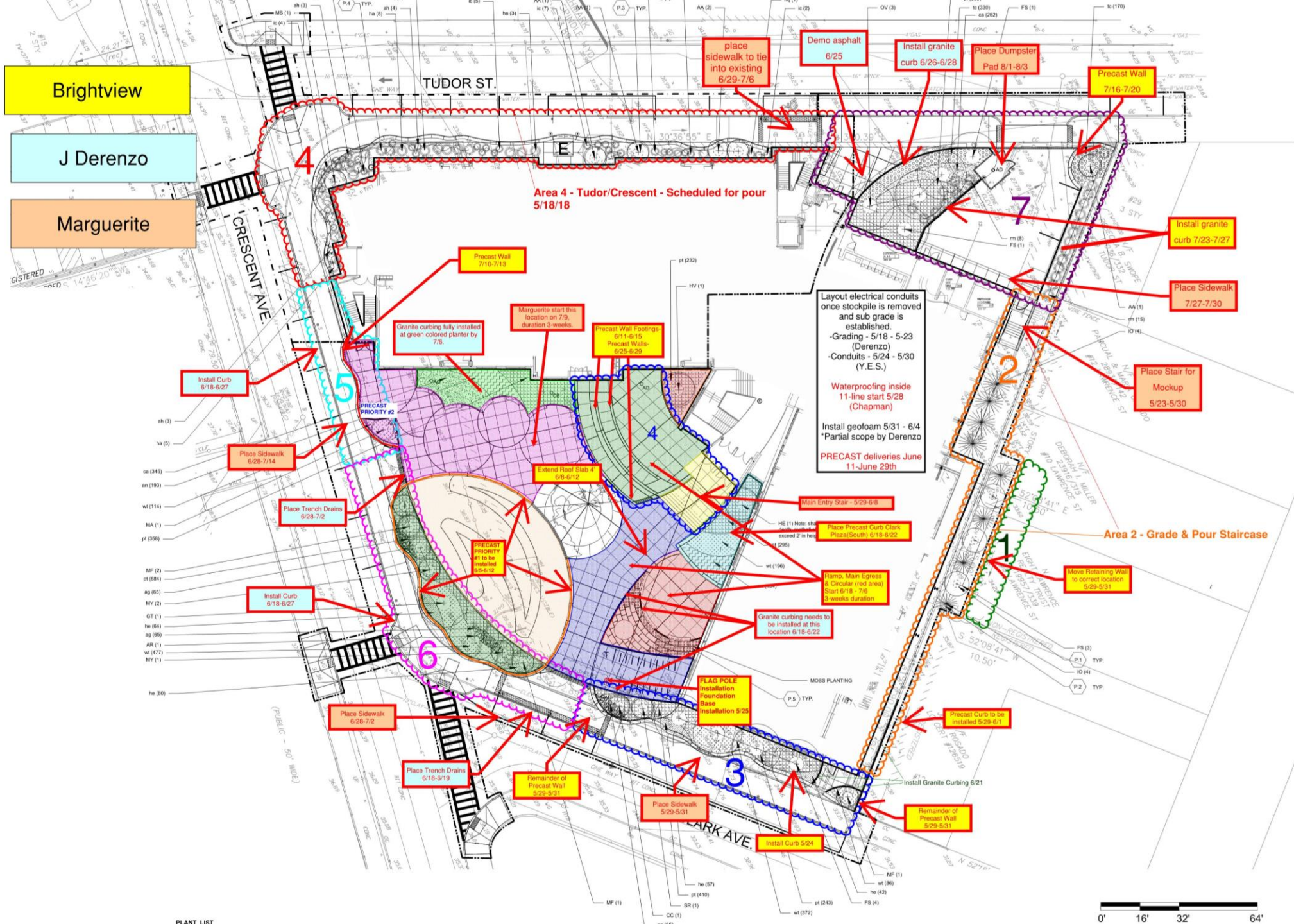
W.T. Rich Company, Inc.



PLANTING			
P.1		DECIDUOUS TREES	1/L5.1
P.2		EVERGREEN TREES EVERGREEN SHRUBS	7/ L5.1
P.3		ORNAMENTAL TREES	1/ L5.1
P.4		SHRUBS	3 / L5.1
P.5		"MOSS" AT RECLAIMED STONE PAVING	7 / L5.1
A.5		GROUNDCOVER	4 / L5.1

NOTES
PLANTING PLAN

1. FOR SITE LAYOUT SEE DRAWING L-3.1 FOR EXISTING AND PROPOSED GRADE INFORMATION SEE DRAWING L-2.1.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETING WORK CALLED FOR ON THE DRAWINGS AND IN THE SPECIFICATIONS WHETHER OR NOT EACH WORK ELEMENT IS NOTED IN THE LEGEND.
3. STORAGE AREAS FOR CONTRACTORS EQUIPMENT AND MATERIALS SHALL BE ON AND WITHIN LIMITS OF WORK AS SHOWN ON THE PLANS AND AS APPROVED BY THE LANDSCAPE ARCHITECT.
4. CONTRACTOR SHALL VERIFY CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES THAT WILL AFFECT THE INSTALLATION OF PLANTING OR SITE IMPROVEMENTS TO THE LANDSCAPE ARCHITECT.
5. ALL PLANT MATERIAL SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
6. ALL PLANTS TO BE BALLED AND BURLAPPED UNLESS OTHERWISE NOTED ON PLANT LIST.
7. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN ON THE DRAWING.
8. ALL PLANTS SHALL BE TAGGED AND APPROVED BY THE LANDSCAPE ARCHITECT AT THE NURSERY PRIOR TO DIGGING OR DELIVERY TO THE SITE UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT.
9. CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LINES PRIOR TO PLANTING AND SHALL REPORT ANY CONFLICTS TO THE LANDSCAPE ARCHITECT.
10. STAKE LOCATION OF ALL PROPOSED PLANTING FOR APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO THE COMMENCEMENT OF PLANTING.
11. NO TREES SHALL BE PLANTED BEFORE ACCEPTANCE OF ROUGH GRADING. TREES SHALL BEAR SAME RELATIONSHIP TO FINISH GRADE AS THEY BORE TO PREVIOUS GRADE.
12. ALL LANDSCAPED AREAS DISTURBED BY CONSTRUCTION OPERATIONS INSIDE AND OUTSIDE THE LIMIT OF WORK SHALL BE REPAIRED AS SPECIFIED AND AT NO EXTRA COST TO THE OWNER.
13. ONE OR TWO DAYS BEFORE THE ARRIVAL OF THE PLANT MATERIAL, CONTRACTOR SHALL HARROW OR LOOSEN THE PLANTING SOIL MIX THOROUGHLY.

KEYPLAN

HMFH Architects, Inc.
CISIS Landscape Architecture | Planning | Urban Design

BID SET
07.21.2015

W.T. Rich Company, Inc.

W.T. Rich Company, Inc.


CLARK
AVENUE
SCHOOL
W.T. Rich Company, Inc.

Pine Grove Elementary School

- Gut/Renovation
- *Total SF: 87,600*
- *Budget: $30,000,000*
- *MSBA Funded*

W.T. Rich Company, Inc.

Phase 1 Challenges

To be completed over **summer of 2018**

- Complete administration area
- Replace existing switch gear, transformer, primary and secondary power lines
- Phase in new FA and SMS
- Have new AHU's and boilers on line for beginning of school year
- Maintain existing school MEP/FP systems in other phases
- Latent site conditions

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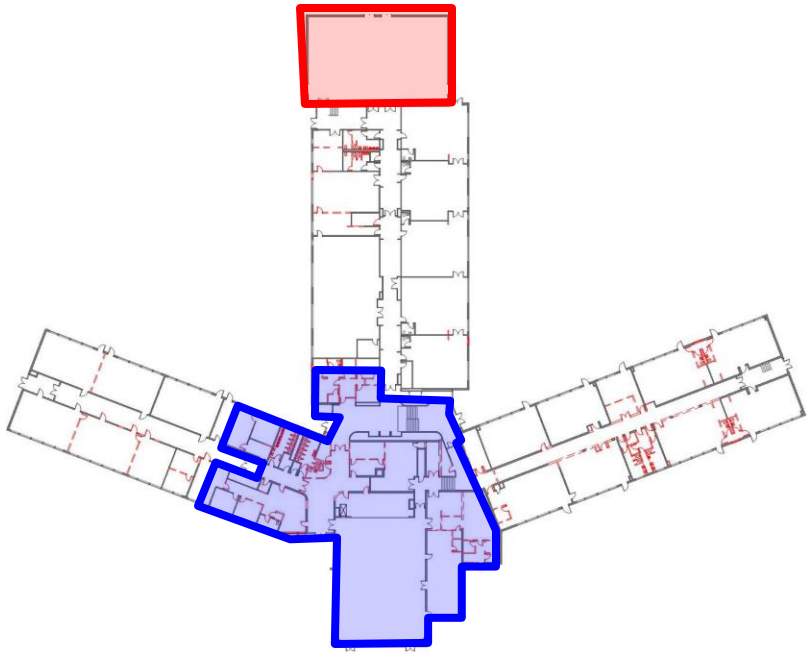


First Floor

Second Floor

Admin Offices, Multi-purpose, Lobby, Nurse
Duration: 10 weeks
Area: 18,820 SF

Full renovation

Install temporary cafeteria

- New mechanical room and main electrical room
- MEP infrastructure in corridors
- Summer "must" areas (Admin, Multi-purpose, Lobby, Kitchen)
- Temporary classrooms in gymnasium
- Double shift throughout

Key Strategy

- Preconstruction survey to include structural and electrical systems

Phase 1 Summer 2018

W.T. Rich Company, Inc.

Entrance / Lobby

Key Strategy

- ERP for storefront/curtainwall/window trade bids

Glulam Remediation

Key Strategy

- Quick and decisive remediation process
- Coordination with the school to adjust for impacts to food services and assemblies
- Managing expectations

Boiler Room / HVAC Equipment

Key Strategy

- Pre-purchase all equipment through ERP

Electrical Infrastructure

Key Strategies

- Accelerate primary and secondary work through coordination with school and town
- Pre-purchase switch gear through ERP

Phase 2 thru 4 Challenges

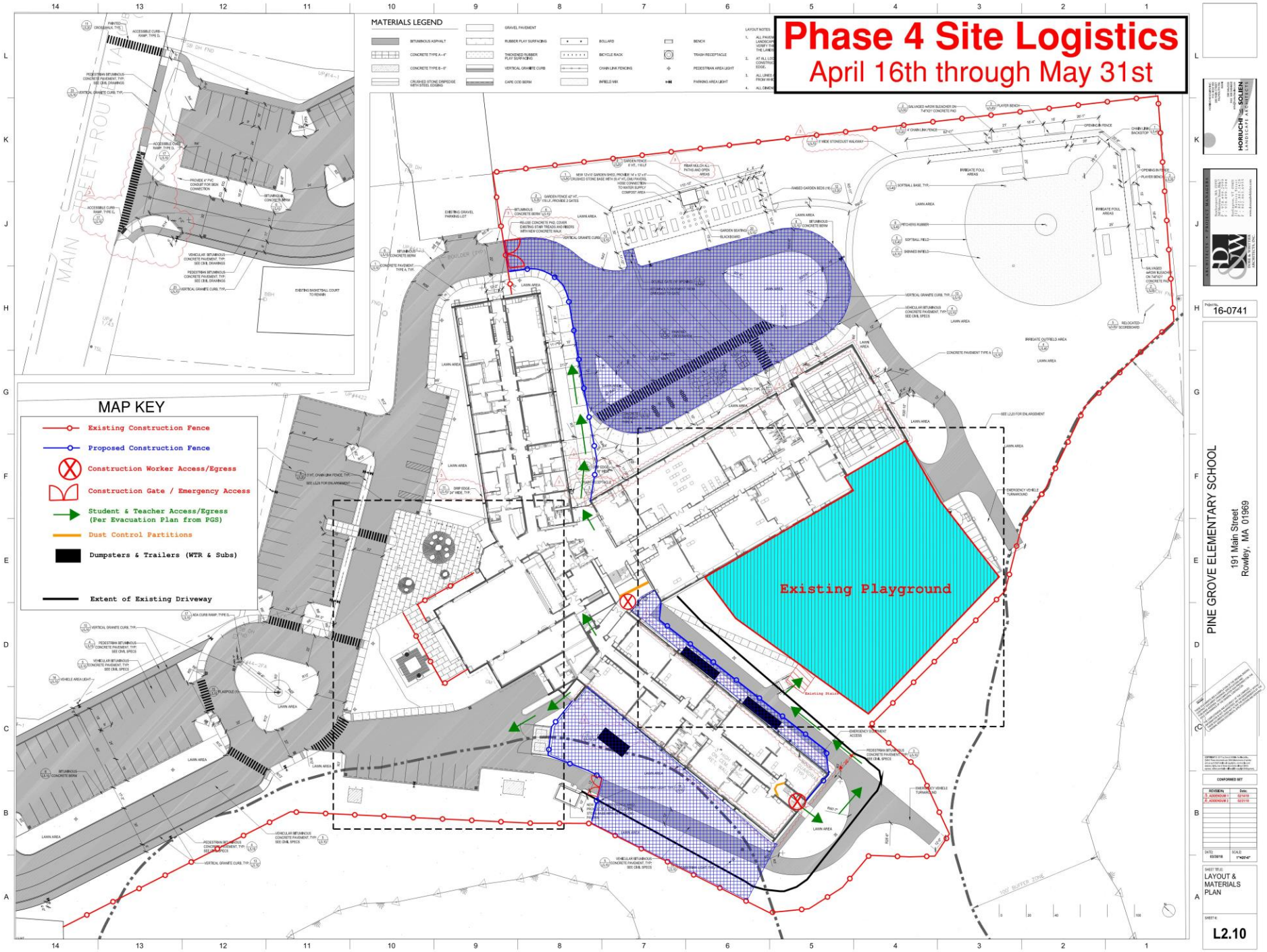
All work to be completed while school was occupied

Proposed work was required to be tied into existing work (e.g.- plumbing)

Install and function of AHU's required

Key Strategy

- Close coordination in consultation with school staff and AHJ to develop the plan



W.T. Rich Company, Inc.

Integrating MEP/FP Systems onto Multiple Floors

Key Strategies

- Key Strategies – tying in new services into existing infrastructure
- Working shifts strategically to limit impact to school and its services
- Maintaining existing services until new services are online

W.T. Rich Company, Inc.

Phase 5 Challenges – Most Challenging Phase

- Per phase, greatest SF requiring renovation
- Bulk of site work and landscaping
- Additional site work imposed by the AHJ pressed schedule further
- Additional AHU install / full building mechanical balancing
- Mold

Mold Remediation

Key Strategies

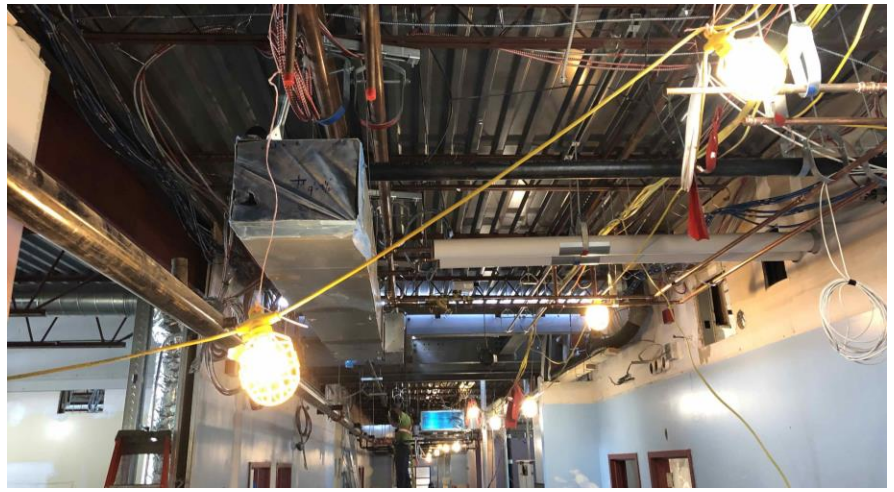
- Work out of sequence and coordinate with subs accordingly to take advantage of open spaces
- Work closely with design team to expedite remediation and reconstruction methods

W.T. Rich Company, Inc.

Work Volume

Key Strategies

- Required multiple shifts and extended work weeks for all trades
- Requirement incorporated into contract specifications



Last Minute Work by AHJ's

Key Strategy

- Managing expectations with the owner regarding completion and sequencing and prioritizing

W.T. Rich Company, Inc.

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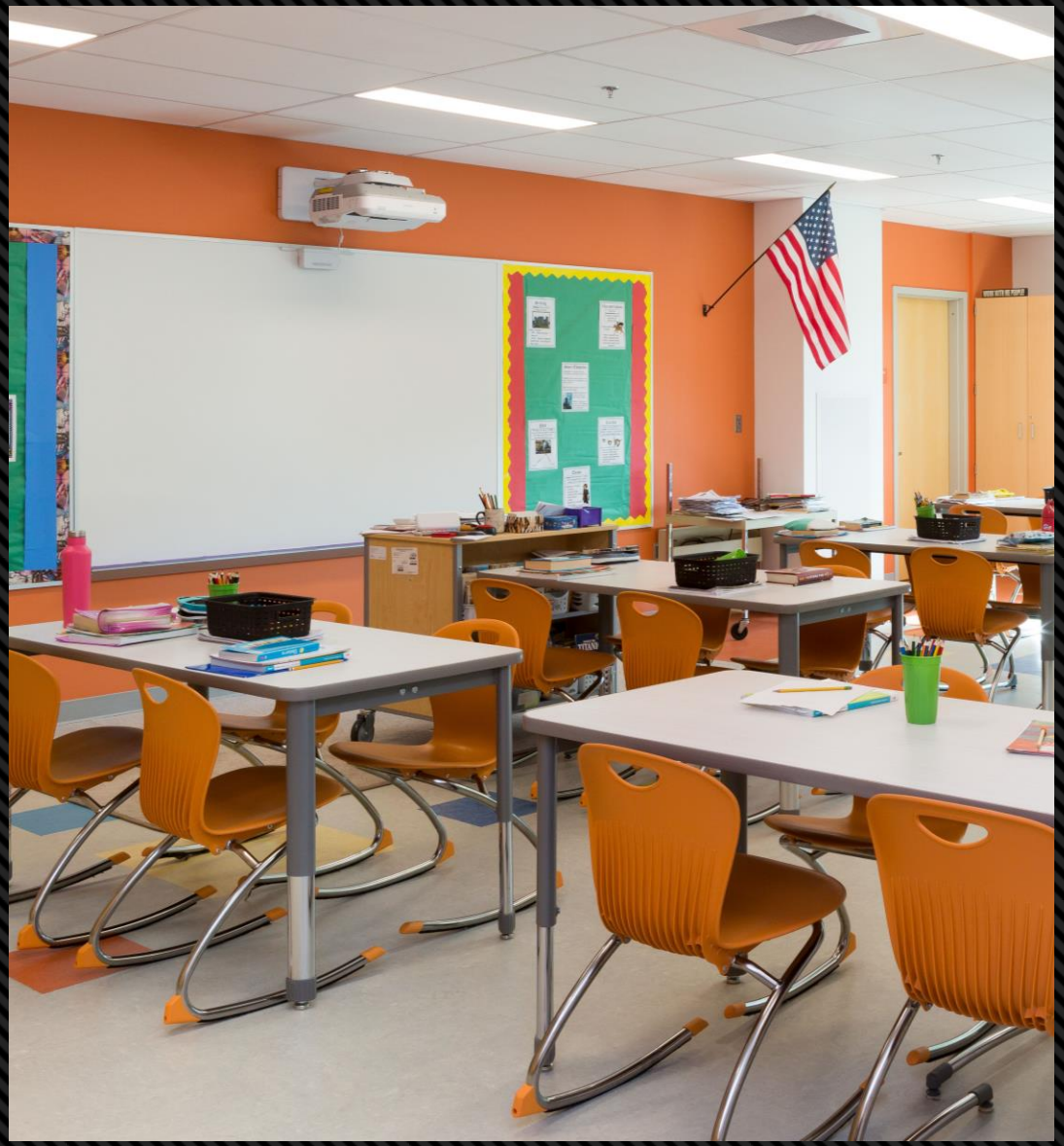


W.T. Rich Company, Inc.

Manchester Memorial Elementary School

- New Construction on Existing Occupied Site
- *Total SF: 77,000*
- *Budget: $41,000,000*
- *MSBA Funded*
- *Budget Pressure (District override required)*

W.T. Rich Company, Inc.

Challenges

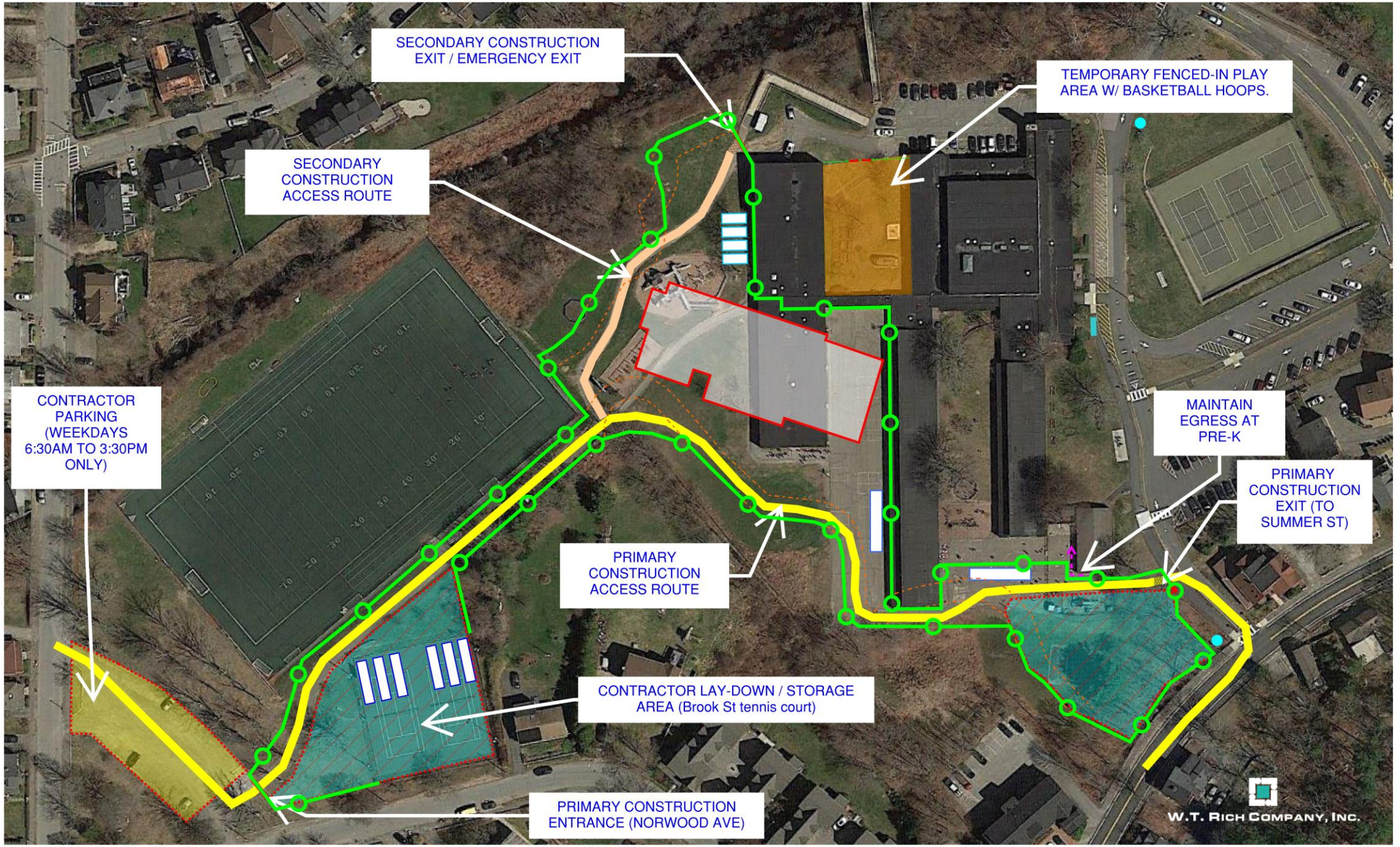
- Extremely tight site
- Phased construction
- Challenging topography
- Wetlands / flood plain
- Access constraints
- Very close proximity to new school
- Neighborhood constraints
- Poor soil conditions / unsuitable soft clay
- Very aggressive schedule
  - Phase 1 – 39,000 SF classroom addition (11 mos)
  - Phase 2 – 38,000 SF new east wing (10 mos)
- Budget – tight every step of the way

W.T. Rich Company, Inc.

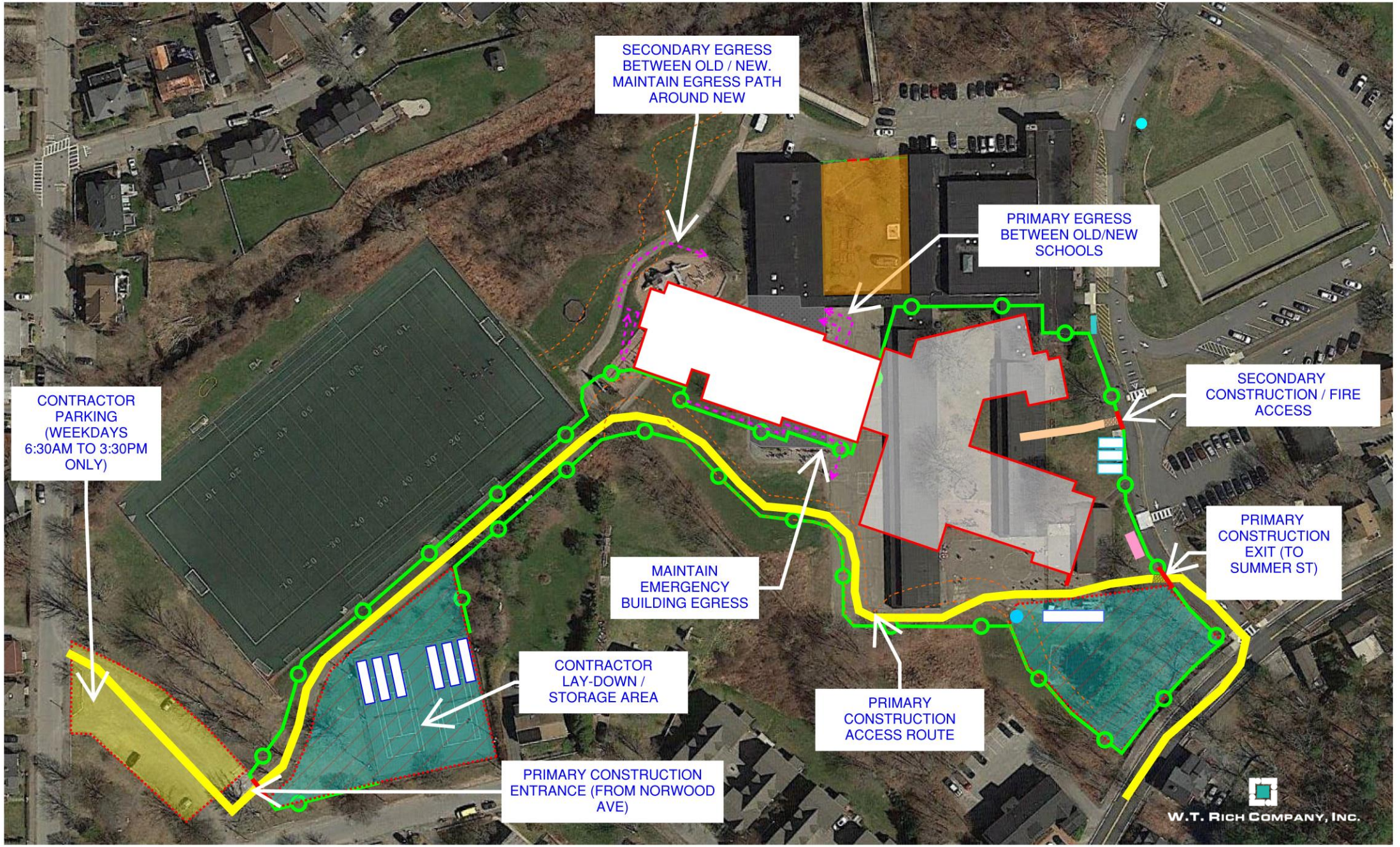
MANCHESTER MEMORIAL ELEMENTARY SCHOOL - EXISTING CONDITIONS

MANCHESTER MEMORIAL ELEMENTARY SCHOOL PROJECT - OVERVIEW

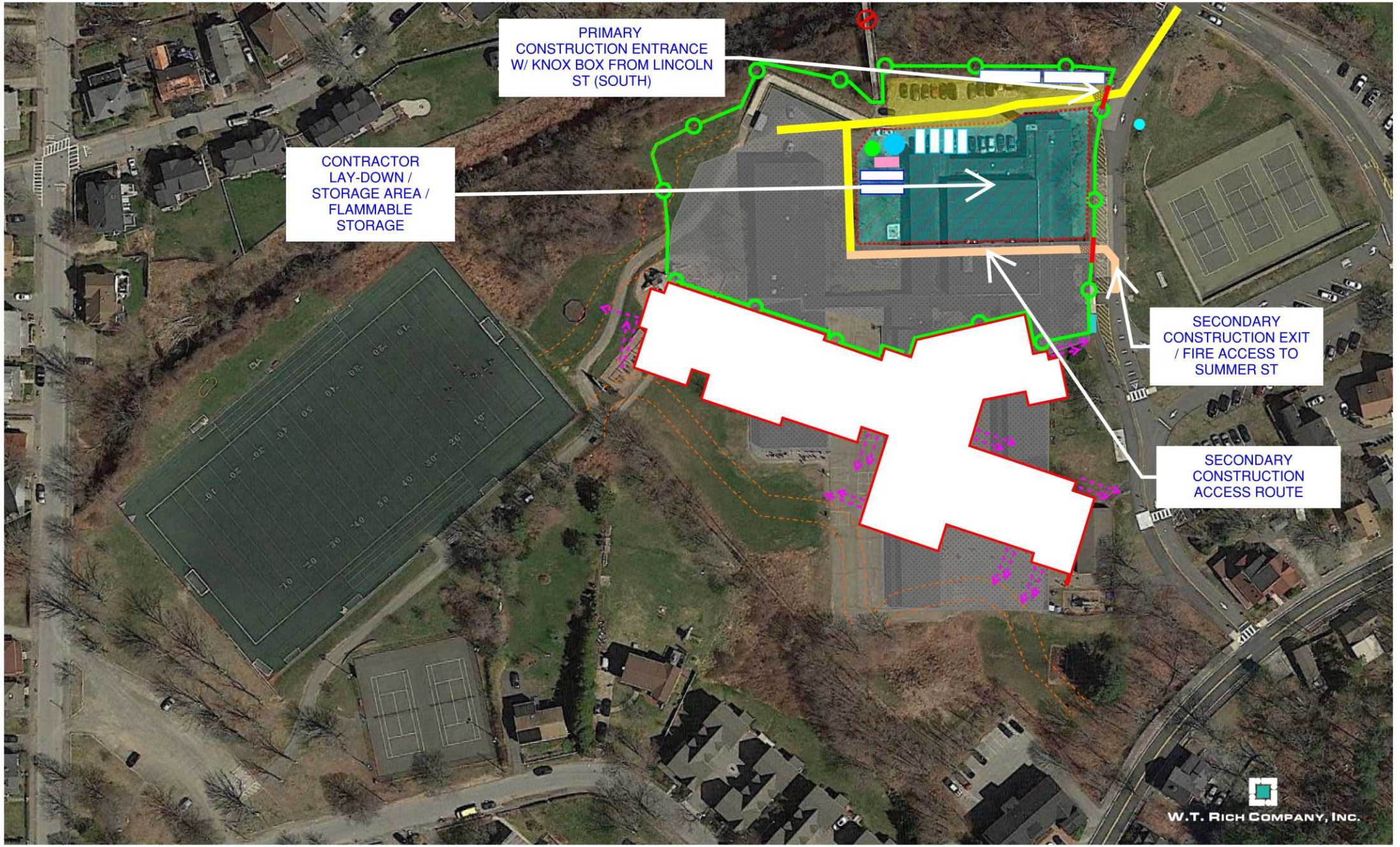
MANCHESTER MEMORIAL ELEMENTARY SCHOOL PROJECT SITE UTILIZATION PLAN - PHASE I



MANCHESTER MEMORIAL ELEMENTARY SCHOOL PROJECT SITE UTILIZATION PLAN - PHASE II



MANCHESTER MEMORIAL ELEMENTARY SCHOOL PROJECT SITE UTILIZATION PLAN - PHASE III



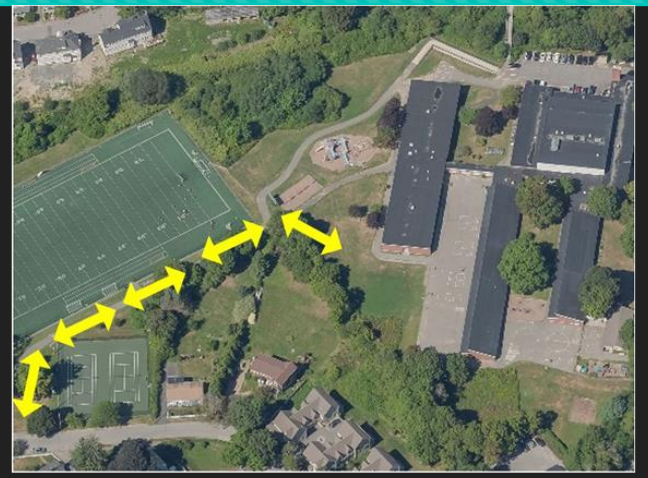
Site Logistics

- Access
- Laydown / storage

Site Access

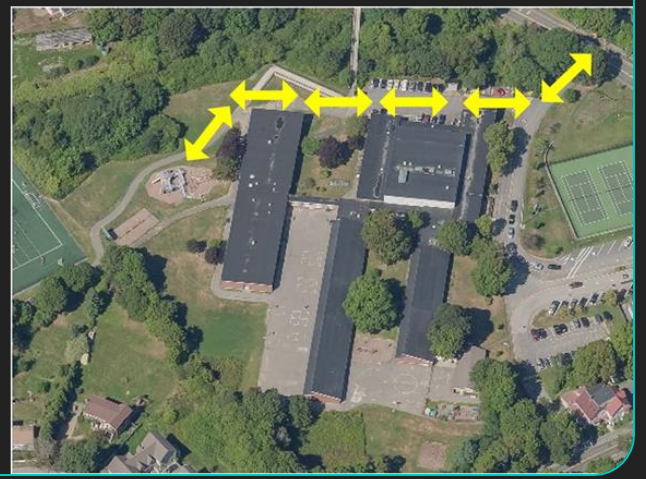
1. South via Brooke Street
2. Southeast near Summer Street
3. North Side of the Existing Building

1



2

3



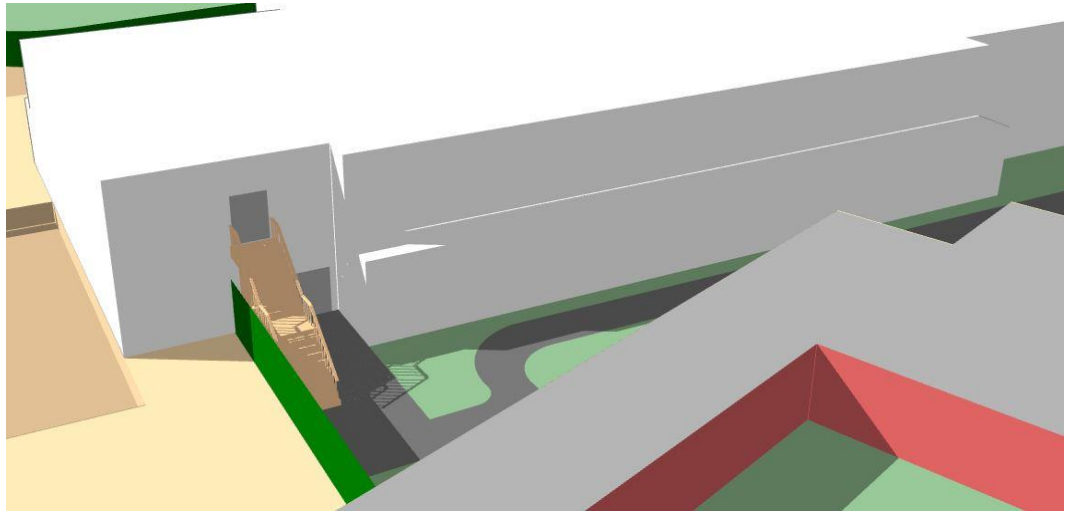
W.T. Rich Company, Inc.

Laydown / Storage

- Restrictive policies for on-site storage
- Utilize tennis court
- Access to fields
- Include restoration costs

Occupancy and Phasing

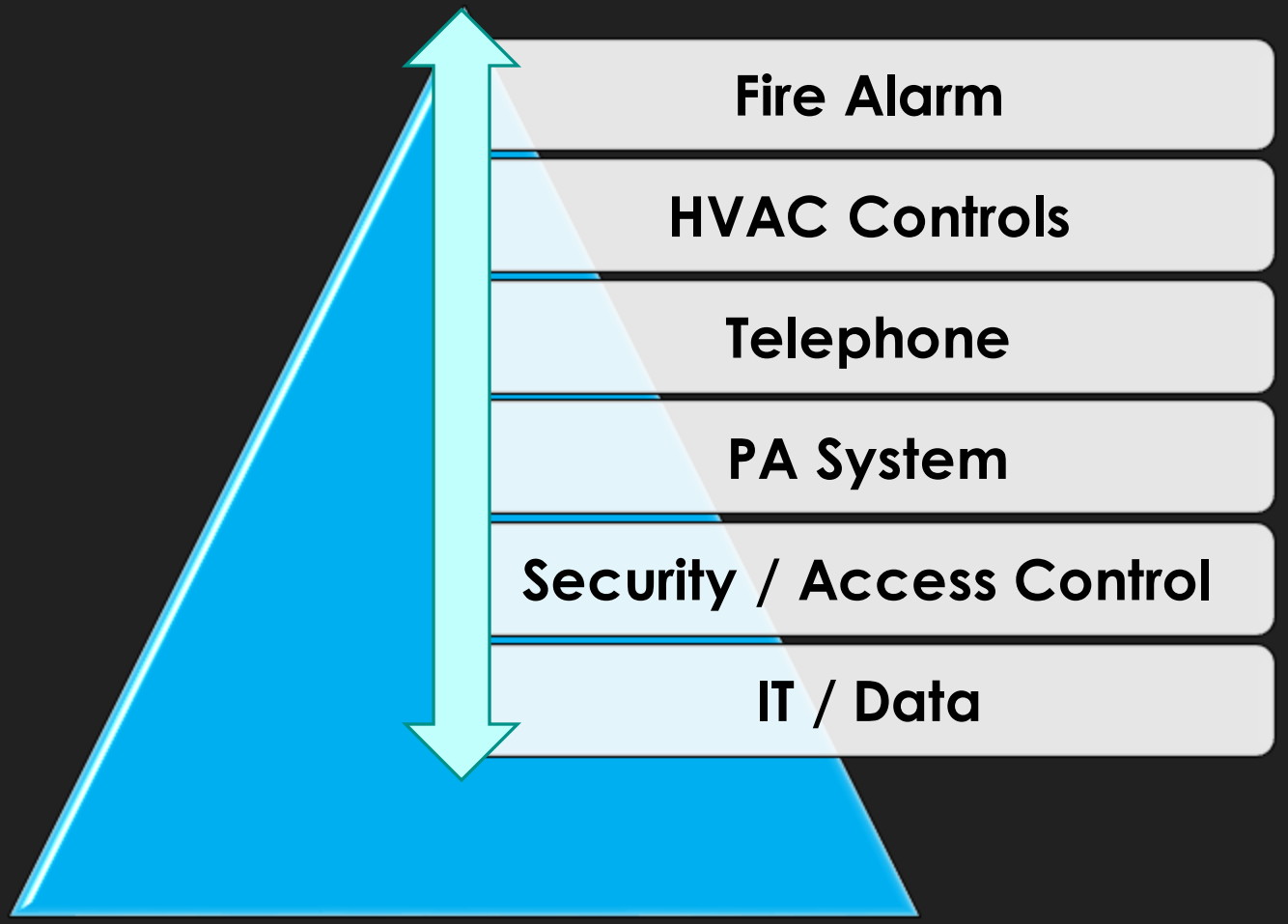
- Looking and planning ahead
- Specific examples
  - Safe, code-compliant egress
  - Construction mitigation
  - Continuity of services



Temporary Provisions at West Wing North Elevation

W.T. Rich Company, Inc.

Continuity of Services
Between New Classroom Wing and Existing Building

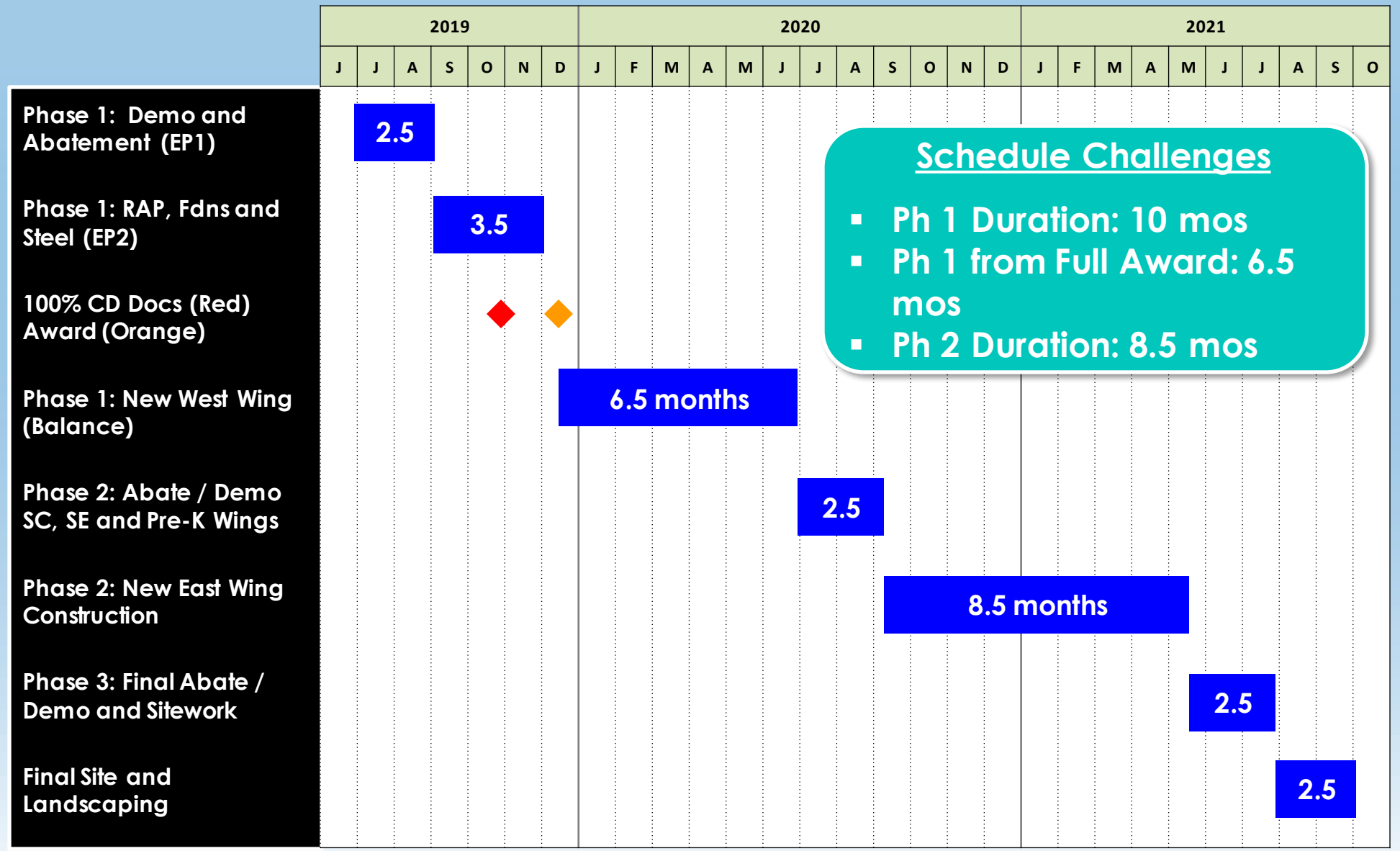


W.T. Rich Company, Inc.

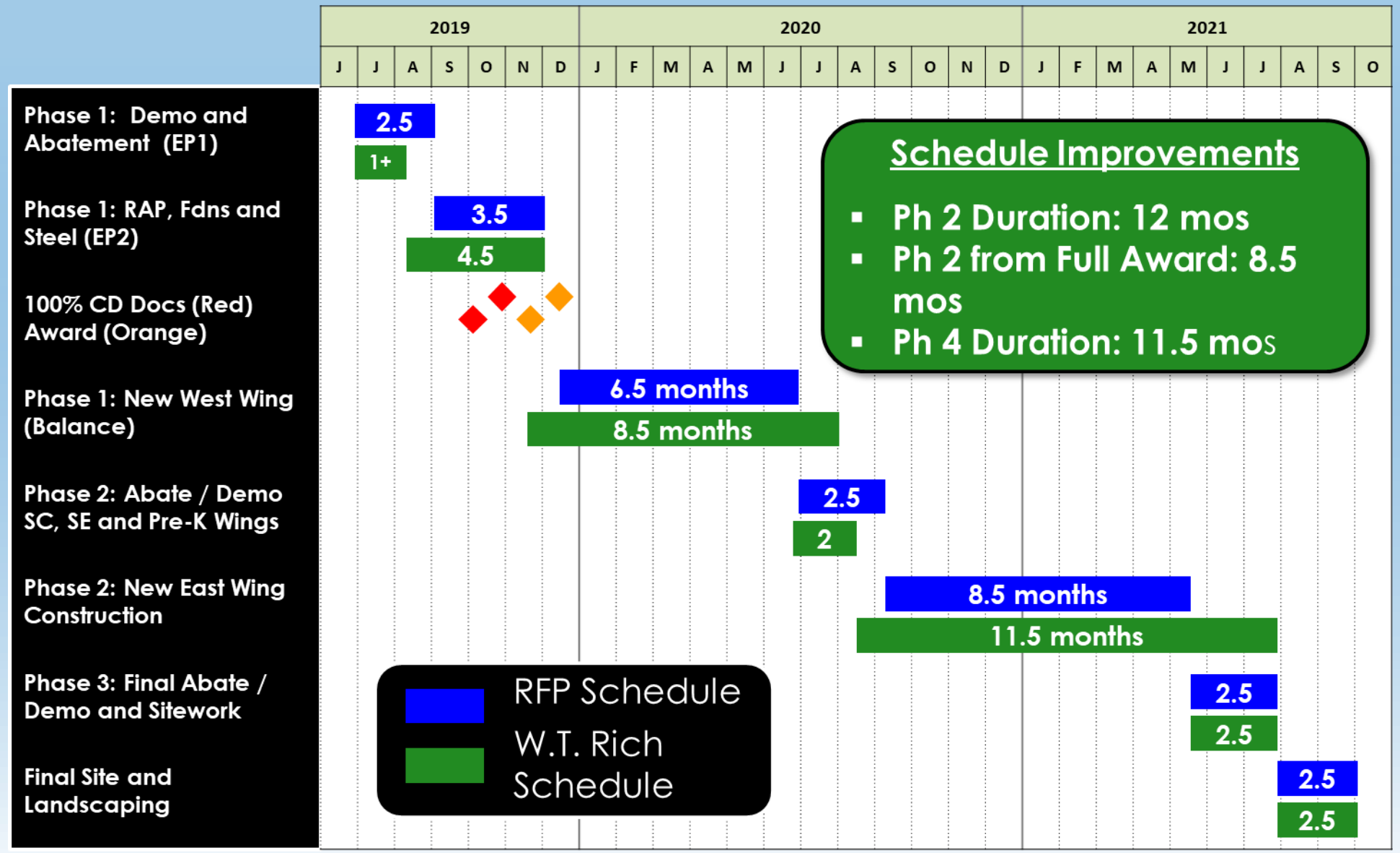
Schedule Management

- RFP schedule was very tight (not viable). Proposed a revised approach
- Creative early construction packages
- Procurement / material management urgency
- Orchestration and execution in the field (Lean)

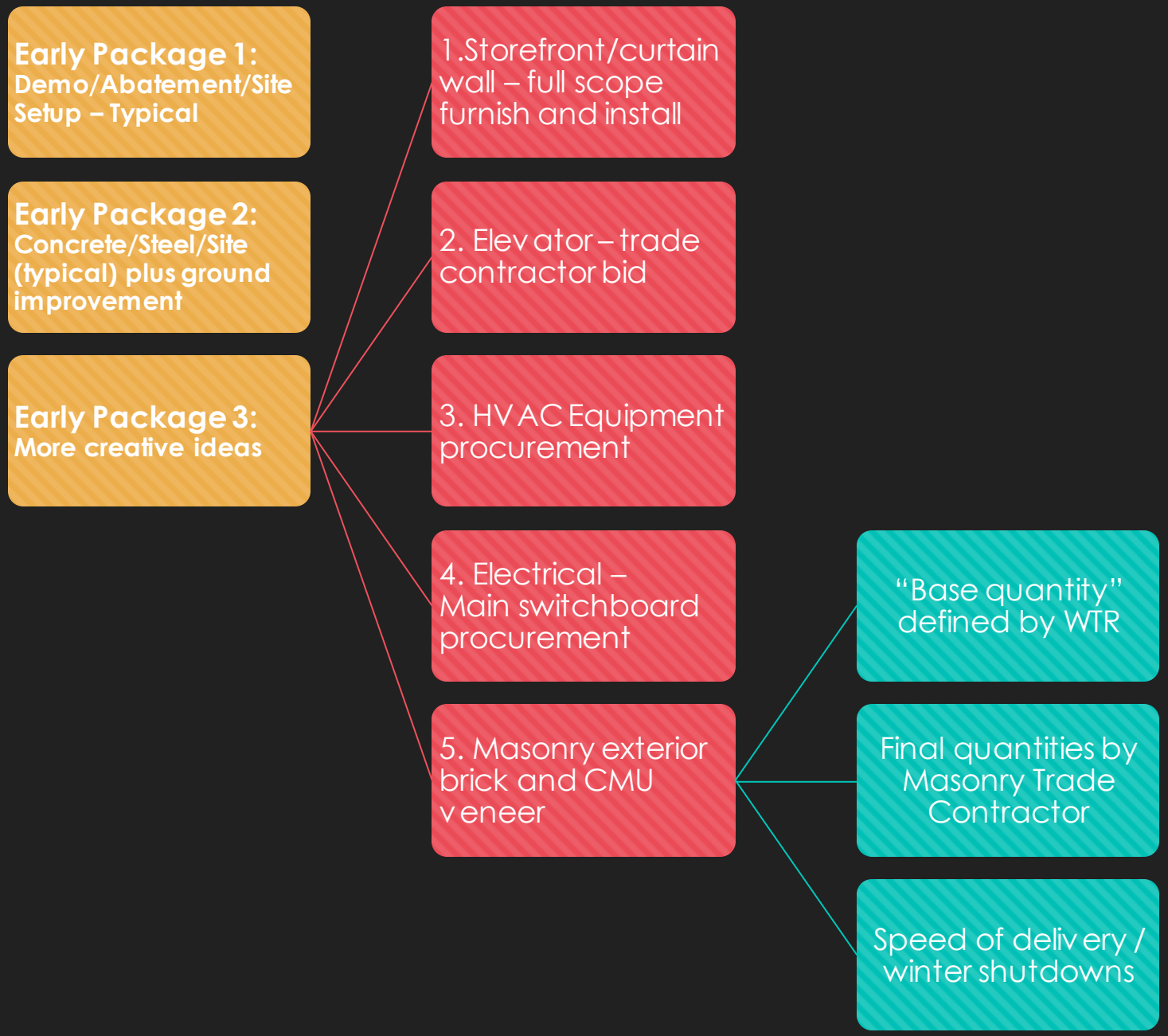
RFP Schedule



W.T. Rich Proposed Schedule (Green)



Creative Early Construction Packages



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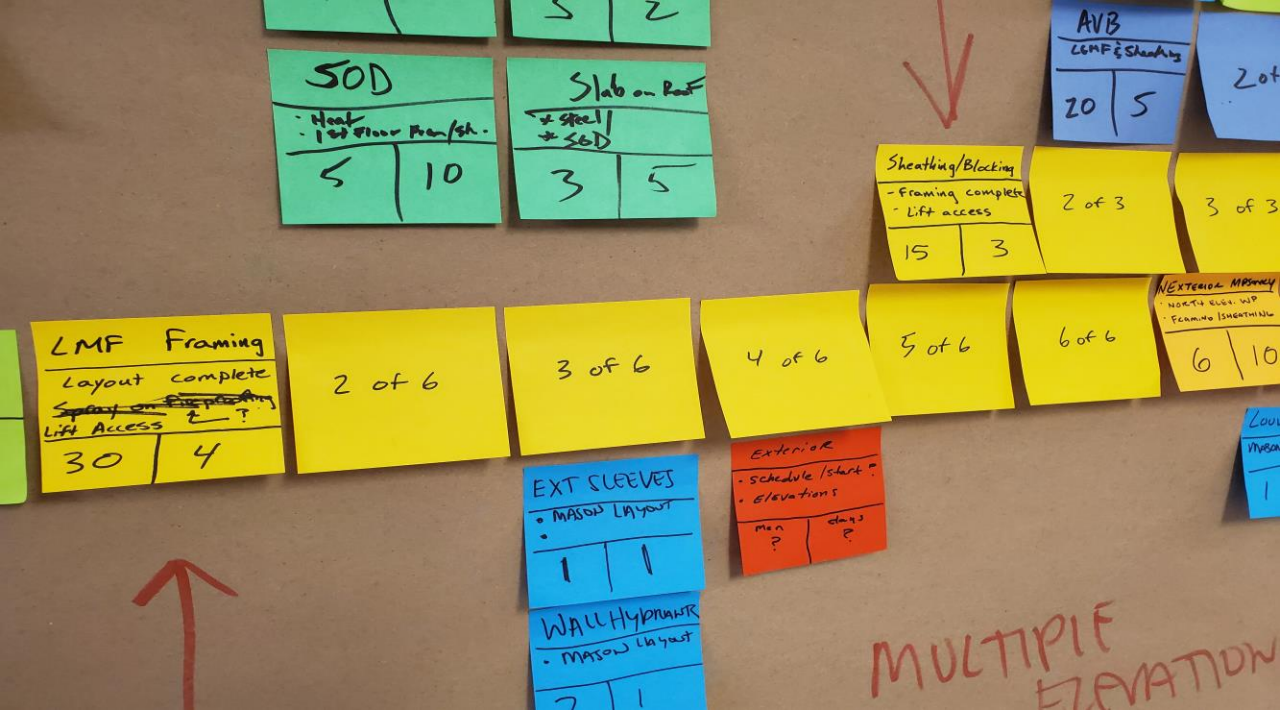
SOD
5 | 10
Slab on Roof
3 | 5
AVB
20 | 5
Sheathing/Blocking
- Framing complete
- Lift access
15 | 3
2 of 3
3 of 3
LMF Framing
Layout complete
Lift Access
30 | 4
2 of 6
3 of 6
4 of 6
5 of 6
6 of 6
6 | 10
EXT SLEEVES
• MASON LAYOUT
1 | 1
WALL HYDRANTS
• MASON LAYOUT
Exterior
• schedule / start
• Elevations
MULTIPLE ELEVATIONS


MP
WT RICH
EXT PULL
10/30/M
SLAB DEPENDENT MANPOWER ACCELERATION
MULTIPLE ELEVATIONS
W.T. RICH COMPANY, INC.


Orchestration &
Execution in the Field
manganaro
building best, together

Benefits of Revised Schedule Approach

MEET ALL SCHOOL OPENING REQUIREMENTS

PRESERVE ALL DESIGN DURATIONS

ALLEVIATE PHASE 1 LEAD TIME CHALLENGE

INCREASE PHASE 1 DURATION TO 12 MONTHS

INCREASE PHASE 2 DURATION TO 11.5 MONTHS

PERFORM ABATEMENT/DEMO SUMMERS ONLY

MORE ATTRACTIVE TO BIDDERS => COST SAVINGS!

CONS:

- Some premium time (abatement/demo)
- Expedited owner move-in (but achievable)

W.T. Rich Company, Inc.

Questions and Discussion