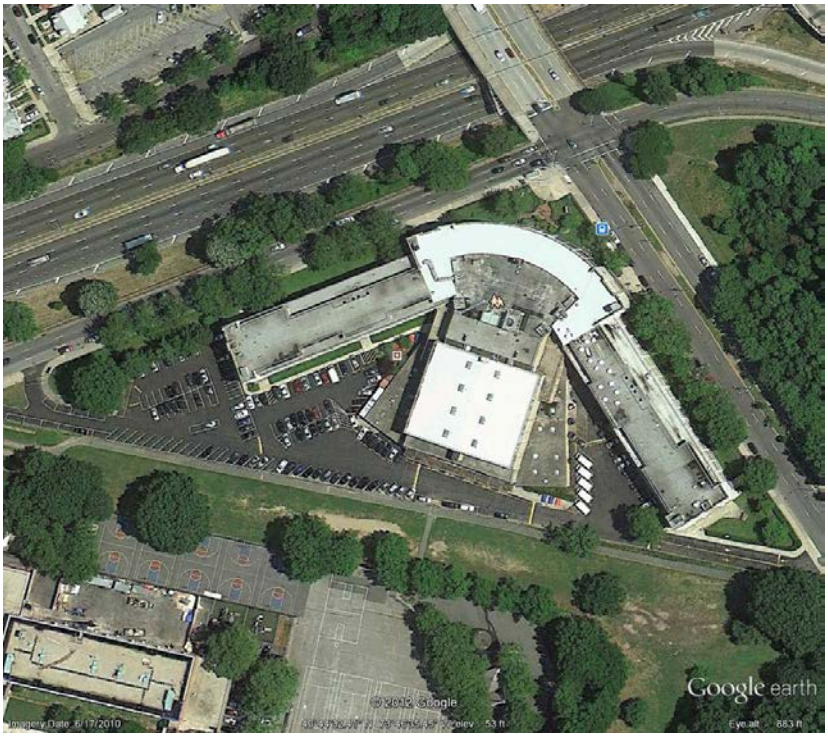
Sustainable Management LLC

Environmental Analysis
Transportation
Planning
Development Consulting
Real Estate Analysis
and
HazMat Investigation

Environmental Assessment Statement
Parts I and II



St. Francis Preparatory School

61-00 Francis Lewis Boulevard
Fresh Meadows, NY 11365

March 15, 2012

Sustainable Management LLC
1370 Broadway
5th Floor
New York, NY 10018
(646) 380-1940
Fax: (646) 380-1220

City Environmental Quality Review
ENVIRONMENTAL ASSESSMENT STATEMENT FULL FORM

Please fill out, print and submit to the appropriate agency (see instructions)

PART I: GENERAL INFORMATION

PROJECT NAME St. Francis Preparatory School

1. *Reference Numbers*

CEQR REFERENCE NUMBER (To Be Assigned by Lead Agency)	BSA REFERENCE NUMBER (If Applicable)
13DCP081Q	
ULURP REFERENCE NUMBER (If Applicable))	**OTHER REFERENCE NUMBER(S)** (If Applicable) (e.g. Legislative Intro, CAPA, etc)

2a. *Lead Agency Information*

NAME OF LEAD AGENCY: NYC Department of City Planning

NAME OF LEAD AGENCY CONTACT PERSON: Robert Dobruskin, Director of Environmental Assessment and Review

ADDRESS: 22 Reade Street, Room 4E

CITY: New York | STATE: NY | ZIP: 10022

TELEPHONE: 212-320-3423 | FAX: 212-320-3495

EMAIL ADDRESS: rdobrus@planning.nyc.gov

2b. *Applicant Information*

NAME OF APPLICANT: St. Francis Preparatory School

NAME OF APPLICANT'S REPRESENTATIVE OR CONTACT PERSON: Sustainable Management LLC, Chunyuan Li

ADDRESS: 1370 Broadway, 5th Floor

CITY: New York | STATE: NY | ZIP: 10018

TELEPHONE: 646-380-1939 | FAX: 646-380-1220

EMAIL ADDRESS: eceali@aol.com

3. *Action Classification and Type*

SEQRA Classification

☐ UNLISTED ☑ TYPE I; SPECIFY CATEGORY *(see 6 NYCRR 617.4 and NYC Executive Order 91 of 1977, as amended):* Type I under 6 NYCRR 617.6(b) (10)

Action Type *(refer to Chapter 2, "Establishing the Analysis Framework" for guidance)*

☐ LOCALIZED ACTION, SITE SPECIFIC ☑ LOCALIZED ACTION, SMALL AREA ☐ GENERIC ACTION

4. *Project Description:*

The proposed action involves a zoning change from R3-2 to R4 affecting a portion of a block (Block 7128, Lot 2, 10, p/o 100) located in the Fresh Meadows neighborhood of Queens, Community District 8. The proposed action would facilitate a proposal by the applicant to enlarge an existing, 247,979 gsf community facility building - the St. Francis Preparatory School (Block 7128, Lot 2). The proposed development would facilitate a proposal by the applicant to expand the school building by approximately 58,893 gsf.

4a. *Project Location: Single Site* *(for a project at a single site, complete all the information below)*

ADDRESS: 16-00 Francis Lewis Boulevard | NEIGHBORHOOD NAME: Fresh Meadow

TAX BLOCK AND LOT: Block 7128, Lot 2*, 10, p/o 100 (*Applicant owned) | BOROUGH: Queens | COMMUNITY DISTRICT: CD 8

DESCRIPTION OF PROPERTY BY BOUNDING OR CROSS STREETS: The project site is bound by LIE Eastbound Service Road, Peck Avenue and Francis Lewis Boulevard.

EXISTING ZONING DISTRICT, INCLUDING SPECIAL ZONING DISTRICT DESIGNATION IF ANY: R3-2 | ZONING SECTIONAL MAP NO: 11b

4b. *Project Location: Multiple Sites* *(Provide a description of the size of the project area in both City Blocks and Lots. If the project would apply to the entire city or to areas that are so extensive that a site-specific description is not appropriate or practicable, describe the area of the project, including bounding streets, etc.)*

5. *REQUIRED ACTIONS OR APPROVALS* *(check all that apply)*

City Planning Commission: YES ☑ NO ☐

- ☐ CITY MAP AMENDMENT
- ☑ ZONING MAP AMENDMENT
- ☐ ZONING TEXT AMENDMENT
- ☑ UNIFORM LAND USE REVIEW PROCEDURE (ULURP)
- ☐ CONCESSION
- ☐ UDAAP
- ☐ REVOCABLE CONSENT
- ☐ ZONING CERTIFICATION
- ☐ ZONING AUTHORIZATION
- ☐ HOUSING PLAN & PROJECT
- ☐ SITE SELECTION — PUBLIC FACILITY
- ☐ FRANCHISE
- ☐ DISPOSITION — REAL PROPERTY

ZONING SPECIAL PERMIT, SPECIFY TYPE:

- ☐ MODIFICATION OF
- ☐ RENEWAL OF
- ☐ OTHER

Board of Standards and Appeals: YES ☐ NO ☑

- ☐ SPECIAL PERMIT

EXPIRATION DATE MONTH DAY YEAR

- ☐ VARIANCE (USE)
- ☐ VARIANCE (BULK)

SPECIFY AFFECTED SECTION(S) OF THE ZONING RESOLUTION

Department of Environmental Protection: YES ☐ NO ☑

Other City Approvals: YES ☑ NO ☐

- ☐ LEGISLATION
- ☐ FUNDING OF CONSTRUCTION; SPECIFY
- ☐ POLICY OR PLAN; SPECIFY
- ☐ LANDMARKS PRESERVATION COMMISSION APPROVAL *(not subject to CEQR)*
- ☐ 384(b)(4) APPROVAL
- ☐ PERMITS FROM DOT'S OFFICE OF CONSTRUCTION MITIGATION AND COORDINATION (OCMC) *(not subject to CEQR)*
- ☐ RULEMAKING
- ☐ CONSTRUCTION OF PUBLIC FACILITIES
- ☐ FUNDING OF PROGRAMS; SPECIFY
- ☐ PERMITS; SPECIFY:
- ☑ OTHER; EXPLAIN — Building Department for a permit to construct

6. *State or Federal Actions/Approvals/Funding:* YES ☐ NO ☑ IF "YES," IDENTIFY

7. *Site Description:* *Except where otherwise indicated, provide the following information with regard to the directly affected area. The directly affected area consists of the project site and the area subject to any change in regulatory controls.*

GRAPHICS *The following graphics must be attached and each box must be checked off before the EAS is complete.* ***Each map must clearly depict*** *the boundaries of the directly affected area or areas and indicate a 400-foot radius drawn from the outer boundaries of the project site. Maps may not exceed 11×17 inches in size and must be folded to 8.5 ×11 inches for submission.*

☑ Site location map ☑ Zoning map ☑ Photographs of the project site taken within 6 months of EAS submission and keyed to the site location map

☑ Sanborn or other land use map ☑ Tax map ☐ For large areas or multiple sites, a GIS shape file that defines the project sites

PHYSICAL SETTING *(both developed and undeveloped areas)*

Total directly affected area (sq. ft.):	Type of waterbody and surface area (sq. ft.):	Roads, building and other paved surfaces (sq. ft.)
802,846 sq. ft. (216,215 sf. project site)	0	336,200 sq. ft.

Other, describe (sq. ft.): 466,646 sq. ft. for landscaping and park. Attachments 1, 2, 3 and 4 provide the maps. Attachment 7 provide photographs.

8. *Physical Dimensions and Scale of Project* *(if the project affects multiple sites, provide the total development below facilitated by the action)*

Size of project to be developed: 58,893 sq.ft. (gross sq. ft.)

Does the proposed project involve changes in zoning on one or more sites? YES ☑ NO ☐

If 'Yes,' identify the total square feet owned or controlled by the applicant : 216,215 Total square feet of non-applicant owned development: 586,631 school park

Does the proposed project involve in-ground excavation or subsurface disturbance, including but not limited to foundation work, pilings, utility lines, or grading? YES ☑ NO ☐

If 'Yes,' indicate the estimated area and volume dimensions of subsurface disturbance (if known):

Area: 16,622 sq. ft. (width × length) Volume: 66,000 cubic feet (width × length × depth)

Does the proposed project increase the population of residents and/or on-site workers? YES ☐ NO ☑ Number of additional residents? Number of additional workers?

Provide a brief explanation of how these numbers were determined:

Does the project create new open space? YES ☐ NO ☑ If Yes: (sq. ft)

Using Table 14-1, estimate the project's projected operational solid waste generation, if applicable: n/a (pounds per week)

Using energy modeling or Table 15-1, estimate the project's projected energy use: n/a (annual BTUs)

9. *Analysis Year* *CEQR Technical Manual Chapter 2*

ANTICIPATED BUILD YEAR (DATE THE PROJECT WOULD BE COMPLETED AND OPERATIONAL):	ANTICIPATED PERIOD OF CONSTRUCTION IN MONTHS:
2014	18

WOULD THE PROJECT BE IMPLEMENTED IN A SINGLE PHASE? YES ☑ NO ☐ IF MULTIPLE PHASES, HOW MANY PHASES:

BRIEFLY DESCRIBE PHASES AND CONSTRUCTION SCHEDULE: Project is 18-month single phase construction ending in 2014

10. *What is the Predominant Land Use in Vicinity of Project?* *(Check all that apply)*

☑ RESIDENTIAL ☐ MANUFACTURING ☑ COMMERCIAL ☑ PARK/FOREST/OPEN SPACE ☑ OTHER, Describe: Schools

DESCRIPTION OF EXISTING AND PROPOSED CONDITIONS

The information requested in this table applies to the directly affected area. The directly affected area consists of the project site and the area subject to any change in regulatory control. The increment is the difference between the No-Action and the With-Action conditions.

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
Land Use				
Residential	YES ☐ NO ☑	YES ☐ NO ☑	YES ☐ NO ☑	
If yes, specify the following				
No. of dwelling units				
No. of low- to moderate income units				
No. of stories				
Gross Floor Area (sq.ft.)				
Describe Type of Residential Structures				
Commercial	YES ☐ NO ☑	YES ☐ NO ☑	YES ☐ NO ☑	
If yes, specify the following:				
Describe type (retail, office, other)				
No. of bldgs				
GFA of each bldg (sq.ft.)				
Manufacturing/Industrial	YES ☐ NO ☑	YES ☐ NO ☑	YES ☐ NO ☑	
If yes, specify the following:				
Type of use				
No. of bldgs				
GFA of each bldg (sq.ft.)				
No. of stories of each bldg				
Height of each bldg				
Open storage area (sq.ft.)				
If any unenclosed activities, specify				
Community Facility	YES ☑ NO ☐	YES ☑ NO ☐	YES ☑ NO ☐	
If yes, specify the following:				
Type	School	School	School	School
No. of bldgs	2	2	2	0
GFA of each bldg (sq.ft.)	247,979 / 115,000	247,979 / 115,000	313,672 / 115,000	65,693
No. of stories of each bldg	3 / 2	3 / 2	3 / 2	0
Height of each bldg	40 ft. / 20 ft.	40 ft. / 20 ft.	40 ft. / 20 ft.	0
Vacant Land	YES ☐ NO ☑	YES ☐ NO ☑	YES ☐ NO ☑	
If yes, describe:				
Publicly Accessible Open Space	YES ☑ NO ☐	YES ☐ NO ☐	YES ☑ NO ☐	
If yes, specify type (mapped City, State, or Federal Parkland, wetland—mapped or otherwise known, other)	499,131 gsf (mapped City Park)	499,131 gsf (mapped City Park)	499,131 gsf (mapped City Park)	0
Other Land Use	YES ☐ NO ☑	YES ☐ NO ☑	YES ☐ NO ☑	
If yes, describe				
Parking				
Garages	YES ☐ NO ☑	YES ☐ NO ☑	YES ☐ NO ☑	
If yes, specify the following:				
No. of public spaces				
No. of accessory spaces				
Operating hours				
Attended or non-attended				

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
Parking *(continued)*				
Lots	YES ☑ NO ☐	YES ☑ NO ☐	YES ☑ NO ☐	
If yes, specify the following:				
No. of public spaces	0	0	0	0
No. of accessory spaces	152	152	167	15
Operating hours	24	24	24	0
Other (includes street parking)	YES ☑ NO ☐	YES ☑ NO ☐	YES ☑ NO ☐	
If yes, describe	There are on street parking spaces reserved for St. Francis Preparatory School along Francis Lewis Blvd.			
Storage Tanks				
Storage Tanks	YES ☑ NO ☐	YES ☑ NO ☐	YES ☑ NO ☐	
If yes, specify the following:				
Gas/Service stations	YES ☐ NO ☐	YES ☐ NO ☐	YES ☐ NO ☐	
Oil storage facility	YES ☐ NO ☐	YES ☐ NO ☐	YES ☐ NO ☐	
Other, identify:	YES ☑ NO ☐	YES ☑ NO ☐	YES ☑ NO ☐	
If yes to any of the above, describe:				
Number of tanks	1	1	1	0
Size of tanks	10,000 gallons	10,000 gallons	10,000 gallons	0
Location of tanks	Ground floor	Ground floor	Ground floor	-
Depth of tanks	Aboveground	Aboveground	Aboveground	-
Most recent FDNY inspection date	02/29/2012	-	-	-
Population				
Residents	YES ☑ NO ☐	YES ☑ NO ☐	YES ☑ NO ☐	
If any, specify number	10	10	10	0
Briefly explain how the number of residents was calculated:				
Businesses	YES ☐ NO ☑	YES ☐ NO ☑	YES ☐ NO ☑	
If any, specify the following:				
No. and type	1 hgh. schl. /1 pub. schl	11 hgh. schl/1 pub. schl	1 hgh. schl./1 pub. schl	0
No. and type of workers by business	235 empl./131 empl.	235 empl/131 empl.	235 empl./131 empl.	0 employees
No. and type of non-residents who are not workers	2,639 stu/400 stu.	2,655 stu./400 stu.	2,655 stu./400 stu.	0 stu / 0 stu.
Briefly explain how the number of businesses was calculated:	The number of students and employees are proportional to the building floor area.			
Zoning*				
Zoning classification	R3-2	R3-2	R4	R4
Maximum amount of floor area that can be developed (in terms of bulk)	802,846 SF	802,846 SF	868,539 SF	65,693 SF
Predominant land use and zoning classifications within a 0.25 mile radius of proposed project	Residential & commercial	Residential & commercial	Residential & commercial	Residential & commercial
Attach any additional information as may be needed to describe the project. If your project involves changes in regulatory controls that affect one or more sites not associated with a specific development, it is generally appropriate to include the total development projections in the above table and attach separate tables outlining the reasonable development scenarios for each site.				

**This section should be completed for all projects, except for such projects that would apply to the entire city or to areas that are so extensive that site-specific zoning information is not appropriate or practicable.*

PART II: TECHNICAL ANALYSES

INSTRUCTIONS: For each of the analysis categories listed in this section, assess the proposed project's impacts based on the thresholds and criteria presented in the CEQR Technical Manual. Check each box that applies.

- If the proposed project can be demonstrated not to meet or exceed the threshold, check the '**NO**' box.
- If the proposed project will meet or exceed the threshold, or if this cannot be determined, check the '**YES**' box.
- For each 'Yes' response, answer the subsequent questions for that technical area and consult the relevant chapter of the CEQR Technical Manual for guidance on providing additional analyses (and attach supporting information, if needed) to determine whether the potential for significant impacts exists. Please note that a 'Yes' answer does not mean that an EIS must be prepared—it often only means that more information is required for the lead agency to make a determination of significance.
- The lead agency, upon reviewing Part II, may require an applicant to either provide additional information to support the Full EAS Form. For example, if a question is answered 'No,' an agency may request a short explanation for this response.

	YES	NO
1. *LAND USE, ZONING AND PUBLIC POLICY*: *CEQR Technical Manual Chapter 4*		
(a) Would the proposed project result in a change in land use or zoning that is different from surrounding land uses and/or zoning? Is there the potential to affect an applicable public policy? If "Yes", complete a preliminary assessment and attach.	✔	
(b) Is the project a large, publicly sponsored project? If "Yes", complete a PlaNYC assessment and attach.		✔
(c) Is any part of the directly affected area within the City's Waterfront Revitalization Program boundaries? If "Yes", complete the Consistency Assessment Form.		✔
2. *SOCIOECONOMIC CONDITIONS*: *CEQR Technical Manual Chapter 5*		
(a) Would the proposed project:		
• Generate a net increase of 200 or more residential units?		✔
• Generate a net increase of 200,000 or more square feet of commercial space?		✔
• Directly displace more than 500 residents?		✔
• Directly displace more than 100 employees?		✔
• Affect conditions in a specific industry?		✔
(b) If 'Yes' to any of the above, attach supporting information to answer the following questions, as appropriate. If 'No' was checked for each category above, the remaining questions in this technical area do not need to be answered.		✔
(1) ***Direct Residential Displacement***		
• If more than 500 residents would be displaced, would these displaced residents represent more than 5% of the primary study area population?		✔
• If 'Yes,' is the average income of the directly displaced population markedly lower than the average income of the rest of the study area population?		✔
(2) ***Indirect Residential Displacement***		
• Would the expected average incomes of the new population exceed the average incomes of the study area populations?		✔
• If 'Yes,' would the population increase represent more than 5% of the primary study area population or otherwise potentially affect real estate market conditions?		✔
• If 'Yes,' would the study area have a significant number of unprotected rental units?		✔
Would more than 10 percent of all the housing units be renter-occupied and unprotected?		✔
Or, would more than 5 percent of all the housing units be renter-occupied and unprotected where no readily observable trend toward increasing rents and new market rate development exists within the study area?		✔

	YES	NO
(3) *Direct Business Displacement*		
• Do any of the displaced businesses provide goods or services that otherwise could not be found within the trade area, either under existing conditions or in the future with the proposed project?		✔
• Do any of the displaced businesses provide goods or services that otherwise could not be found within the trade area, either under existing conditions or in the future with the proposed project?		✔
• Or, is any category of business to be displaced the subject of other regulations or publicly adopted plans to preserve, enhance, or otherwise protect it?		✔
(4) *Indirect Business Displacement*		
• Would the project potentially introduce trends that make it difficult for businesses to remain in the area?		✔
• Would the project capture the retail sales in a particular category of goods to the extent that the market for such goods would become saturated as a result, potentially resulting in vacancies and disinvestment on neighborhood commercial streets?		✔
(5) *Affects on Industry*		✔
• Would the project significantly affect business conditions in any industry or any category of businesses within or outside the study area?		✔
• Would the project indirectly substantially reduce employment or impair the economic viability in the industry or category of businesses?		✔
3. *COMMUNITY FACILITIES*: *CEQR Technical Manual Chapter 6*		
(a) Would the project directly eliminate, displace, or alter public or publicly funded community facilities such as educational facilities, libraries, hospitals and other health care facilities, day care centers, police stations, or fire stations?		✔
(b) Would the project exceed any of the thresholds outlined in Table 6-1 in Chapter 6?		✔
(c) If 'No' was checked above, the remaining questions in this technical area do not need to be answered. If 'Yes' was checked, attach supporting information to answer the following, if applicable.		✔
(1) *Child Care Centers*		
• Would the project result in a collective utilization rate of the group child care/Head Start centers in the study area that is greater than 100 percent?		✔
• If Yes, would the project increase the collective utilization rate by 5 percent from the No-Action scenario?		✔
(2) *Libraries*		
• Would the project increase the study area population by 5 percent from the No-Action levels?		✔
• If Yes, would the additional population impair the delivery of library services in the study area?		✔
(3) *Public Schools*		
• Would the project result in a collective utilization rate of the elementary and/or intermediate schools in the study area that is equal to or greater than 105 percent?		✔
• If Yes, would the project increase this collective utilization rate by 5 percent from the No-Action scenario?		✔
(4) *Health Care Facilities*		
• Would the project affect the operation of health care facilities in the area?		✔
(5) *Fire and Police Protection*		
• Would the project affect the operation of fire or police protection in the area?		✔
4. *OPEN SPACE*: *CEQR Technical Manual Chapter 7*		
(a) Would the project change or eliminate existing open space?		✔
(b) Is the project located within an underserved area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?		✔
(c) If 'Yes,' would the proposed project generate more than 50 additional residents or 125 additional employees?		
(d) Is the project located within a well-served area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?	✔	
(e) If 'Yes,' would the project generate more than 350 additional residents or 750 additional employees?		✔
(f) If the project is not located within an underserved or well-served area, would it generate more than 200 additional residents or 500 additional employees?		✔
(g) If 'Yes' to any of the above questions, attach supporting information to answer the following: • Does the project result in a decrease in the open space ratio of more then 5%?		✔
• If the project is within an underserved area, is the decrease in open space between 1% and 5%?		✔
• If 'Yes," are there qualitative considerations, such as the quality of open space, that need to be considered?		✔

	YES	NO
5. *SHADOWS:* CEQR Technical Manual Chapter 8		
(a) Would the proposed project result in a net height increase of any structure of 50 feet or more?		✔
(b) Would the proposed project result in any increase in structure height and be located adjacent to or across the street from a sunlight-sensitive resource?	✔	
(c) If 'Yes' to either of the above questions, attach supporting information explaining whether the project's shadow reach any sunlight-sensitive resource at any time of the year.		✔
6. *HISTORIC AND CULTURAL RESOURCES*: CEQR Technical Manual Chapter 9		
(a) Does the proposed project site or an adjacent site contain any architectural and/or archaeological resource that is eligible for, or has been designated (or is calendared for consideration) as a New York City Landmark, Interior Landmark or Scenic Landmark; is listed or eligible for listing on the New York State or National Register of Historic Places; or is within a designated or eligible New York City, New York State, or National Register Historic District? If "Yes," list the resources and attach supporting information on whether the proposed project would affect any of these resources.		✔
7. *URBAN DESIGN AND VISUAL RESOURCES*: CEQR Technical Manual Chapter 10		
(a) Would the proposed project introduce a new building, a new building height, or result in any substantial physical alteration to the streetscape or public space in the vicinity of the proposed project that is not currently allowed by existing zoning?	✔	
(b) Would the proposed project result in obstruction of publicly accessible views to visual resources that is not currently allowed by existing zoning?		✔
(c) If "Yes" to either of the above, please provide the information requested in Chapter 10.	✔	
8. *NATURAL RESOURCES:* CEQR Technical Manual Chapter 11		
(a) Is any part of the directly affected area within the Jamaica Bay Watershed? If "Yes", complete the Jamaica Bay Watershed Form.		✔
(b) Does the proposed project site or a site adjacent to the project contain natural resources as defined in Section 100 of Chapter 11? If "Yes," list the resources: Attach supporting information on whether the proposed project would affect any of these resources.		✔
9. *HAZARDOUS MATERIALS:* CEQR Technical Manual Chapter 12		
(a) Would the proposed project allow commercial or residential use in an area that is currently, or was historically, a manufacturing area that involved hazardous materials?		✔
(b) Does the proposed project site have existing institutional controls (e.g. (E) designations or a Restrictive Declaration) relating to hazardous materials that preclude the potential for significant adverse impacts?		✔
(c) Does the project require soil disturbance in a manufacturing zone or any development on or near a manufacturing zone or existing/historic facilities listed in Appendix 1 (including nonconforming uses)?		✔
(d) Does the project result in the development of a site where there is reason to suspect the presence of hazardous materials, contamination, illegal dumping or fill, or fill material of unknown origin?		✔
(e) Does the project result in development where underground and/or aboveground storage tanks (e.g. gas stations) are or were on or near the site?	✔	
(f) Does the project result in renovation of interior existing space on a site with potential compromised air quality, vapor intrusion from on-site or off-site sources, asbestos, PCBs or lead-based paint?		✔
(g) Does the project result in development on or near a government-listed voluntary cleanup/brownfield site, current or former power generation/transmission facilities, municipal incinerators, coal gasification or gas storage sites, or railroad tracks and rights-of-way?		✔
(h) Has a Phase I Environmental Site Assessment been performed for the site? If 'Yes," were RECs identified? Briefly identify: One 10,000-gal oil AST in service and one closed 15,000-gallon UST.	✔	
(i) Based on a Phase I Assessment, is a Phase II Assessment needed?		✔
10. *WATER AND SEWER INFRASTRUCTURE:* CEQR Technical Manual Chapter 13		
(a) Would the project result in water demand of more than one million gallons per day?		✔
(b) Is the proposed project located in a combined sewer area and result in at least 1,000 residential units or 250,000 SF or more of commercial space in Manhattan or at least 400 residential units or 150,000 SF or more of commercial space in the Bronx, Brooklyn, Staten Island or Queens?		✔
(c) Is the proposed project located in a separately sewered area and result in the same or greater development than that listed in Table 13-1 in Chapter 13?		✔
(d) Does the proposed project involve development on a site five acres or larger where the amount of impervious surface would increase?		✔
(e) Would the proposed project involve development on a site one acre or larger where the amount of impervious surface would increase and is located within the Jamaica Bay Watershed or in certain specific drainage areas including: Bronx River, Coney Island Creek, Flushing Bay and Creek, Gowanus Canal, Hutchinson River, Newtown Creek, or Westchester Creek?		✔
(f) Would the proposed project be located in an area that is partially sewered or currently unsewered?		✔
(g) Is the project proposing an industrial facility or activity that would contribute industrial discharges to a WWTP and/or generate contaminated stormwater in a separate storm sewer system?		✔
(h) Would the project involve construction of a new stormwater outfall that requires federal and/or state permits?		✔
(i) If "Yes" to any of the above, conduct the appopriate preliminary analyses and attach supporting documentation.		✔
11. *SOLID WASTE AND SANITATION SERVICES:* CEQR Technical Manual Chapter 14		
(a) Would the proposed project have the potential to generate 1000,000 pounds (50 tons) or more of solid waste per week?		✔
(b) Would the proposed project involve a reduction in capacity at a solid waste management facility used for refuse or recyclables generated within the City?		✔

	YES	NO
12. *ENERGY*: *CEQR Technical Manual Chapter 15*		
(a) Would the proposed project affect the transmission or generation of energy?		✔
13. *TRANSPORTATION*: *CEQR Technical Manual Chapter 16*		
(a) Would the proposed project exceed any threshold identified in Table 16-1 in Chapter 16?		✔
(b) If "Yes," conduct the screening analyses, attach appropriate back up data as needed for each stage, and answer the following questions:		✔
(1) Would the proposed project result in 50 or more Passenger Car Equivalents (PCEs) per project peak hour? If "Yes," would the proposed project result in 50 or more vehicle trips per project peak hour at any given intersection? ***It should be noted that the lead agency may require further analysis of intersections of concern even when a project generates fewer than 50 vehicles in the peakhour. See Subsection 313 in Chapter 16 for more information.*		✔
(2) Would the proposed project result in more than 200 subway/rail or bus trips per project peak hour? If "Yes," would the proposed project result, per project peak hour, in 50 or more bus trips on a single line (in one direction) or 200 subway trips per station or line?		✔
(3) Would the proposed project result in more than 200 pedestrian trips per project peak hour? If "Yes," would the proposed project result in more than 200 pedestrian trips per project peak hour to any given pedestrian or transit element, crosswalk, subway stair, or bus stop?		✔
14. *AIR QUALITY*: *CEQR Technical Manual Chapter 17*		
(a) *Mobile Sources:* Would the proposed project result in the conditions outlined in Section 210 in Chapter 17?		✔
(b) *Stationary Sources:* Would the proposed project result in the conditions outlined in Section 220 in Chapter 17? If 'Yes,' would the proposed project exceed the thresholds in the Figure 17-3, Stationary Source Screen Graph? (attach graph as needed)		✔
(c) Does the proposed project involve multiple buildings on the project site?		✔
(d) Does the proposed project require Federal approvals, support, licensing, or permits subject to conformity requirements?		✔
(e) Does the proposed project site have existing institutional controls (*e.g.* E) designations or a Restrictive Declaration) relating to air quality that preclude the potential for significant adverse impacts?		✔
(f) If "Yes," conduct the appropriate analyses and attach any supporting documentation.		✔
15. *GREENHOUSE GAS EMISSIONS*: *CEQR Technical Manual Chapter 18*		
(a) Is the proposed project a city capital project, a power plant, or would fundamentally change the City's solid waste management system?		✔
(b) If "Yes," would the proposed project require a GHG emissions assessment based on the guidance in Chapter 18?		✔
(c) If "Yes," attach supporting documentation to answer the following; Would the project be consistent with the City's GHG reduction goal?		✔
16. *NOISE*: *CEQR Technical Manual Chapter 19*		
(a) Would the proposed project generate or reroute vehicular traffic?		✔
(b) Would the proposed project introduce new or additional receptors (see Section 124 in Chapter 19) near heavily trafficked roadways, within one horizontal mile of an existing or proposed flight path, or within 1,500 feet of an existing or proposed rail line with a direct line of site to that rail line?	✔	
(c) Would the proposed project cause a stationary noise source to operate within 1,500 feet of a receptor with a direct line of sight to that receptor or introduce receptors into an area with high ambient stationary noise?		✔
(d) Does the proposed project site have existing institutional controls (*e.g.* E-designations or a Restrictive Declaration) relating to noise that preclude the potential for significant adverse impacts?		✔
(e) If "Yes," conduct the appropriate analyses and attach any supporting documentation.		
17. *PUBLIC HEALTH*: *CEQR Technical Manual Chapter 20*		✔
(a) Would the proposed project warrant a public health assessment based upon the guidance in Chapter 20?		
18. *NEIGHBORHOOD CHARACTER*: *CEQR Technical Manual Chapter 21*		
(a) Based upon the analyses conducted for the following technical areas, check Yes if any of the following technical areas required a detailed analysis: Land Use, Zoning, and Public Policy, Socioeconomic Conditions, Open Space, Historic and Cultural Resources, Urban Design and Visual Resources, Shadows, Transportation, Noise.	✔	
(b) If "Yes," explain here why or why not an assessment of neighborhood character is warranted based on the guidance in Chapter 21, "Neighborhood Character." Attach a preliminary analysis, if necessary.		✔
The proposed action warrants detailed Land Use, Zoning and Public Policy analyses, a detailed Shadows analysis and a detailed Urban Design and Visual Resources analysis. Therefore, a Neighborhood Character analysis has been provided.		

		YES	NO
19.	***CONSTRUCTION IMPACTS***: CEQR Technical Manual Chapter 22 Would the project's construction activities involve (check all that apply):		
	• Construction activities lasting longer than two years;		✔
	• Construction activities within a Central Business District or along an arterial or major thoroughfare;		✔
	• Require closing, narrowing, or otherwise impeding traffic, transit or pedestrian elements (roadways, parking spaces, bicycle routes, sidewalks, crosswalks, corners, etc);	✔	
	• Construction of multiple buildings where there is a potential for on-site receptors on buildings completed before the final build-out;		✔
	• The operation of several pieces of diesel equipment in a single location at peak construction;		✔
	• Closure of community facilities or disruption in its service;		✔
	• Activities within 400 feet of a historic or cultural resource; or		✔
	• Disturbance of a site containing natural resources.		✔

If any boxes are checked, explain why or why not a preliminary construction assessment is warranted based on the guidance of in Chapter 22, "Construction." It should be noted that the nature and extent of any commitment to use the Best Available Technology for construction equipment or Best Management Practices for construction activities should be considered when making this determination.

Although the proposed action may require closing or narrowing the sidewalk along LIE Expressway Eastbound Service Road and Francis Lewis Boulevard, such pedestrian impediments would be temporary and would be implemented in accordance with New York City requirement and regulations.

20. *APPLICANT'S CERTIFICATION*

I swear or affirm under oath and subject to the penalties for perjury that the information provided in this Environmental Assessment Statement (EAS) is true and accurate to the best of my knowledge and belief, based upon my personal knowledge and familiarity with the information described herein and after examination of pertinent books and records and/or after inquiry of persons who have personal knowledge of such information or who have examined pertinent books and records.

Still under oath, I further swear or affirm that I make this statement in my capacity as the

Technical Director (APPLICANT/SPONSOR) of Sustainable Management LLC (NAME THE ENTITY OR OWNER)

the entity which seeks the permits, approvals, funding or other governmental action described in this EAS.

Check if prepared by: ☑ APPLICANT/REPRESENTATIVE or ☐ LEAD AGENCY REPRESENTATIVE (FOR CITY-SPONSORED PROJECTS)

Chunyuan Li
APPLICANT/SPONSOR NAME:

LEAD AGENCY REPRESENTATIVE NAME:

Li Chunyuan
SIGNATURE:

3-15-2013
DATE:

PLEASE NOTE THAT APPLICANTS MAY BE REQUIRED TO SUBSTANTIATE RESPONSES IN THIS FORM AT THE DISCRETION OF THE LEAD AGENCY SO THAT IT MAY SUPPORT ITS DETERMINATION OF SIGNIFICANCE.

PART III: DETERMINATION OF SIGNIFICANCE (To Be Completed By Lead Agency)

INSTRUCTIONS:
In completing Part III, the lead agency should consult 6 NYCRR 617.7 and 43 RCNY §6-06 (Executive Order 91 of 1977, as amended) which contain the State and City criteria for determining significance.

1. For each of the impact categories listed below, consider whether the project may have a significant effect on the environment. For each of the impact categories listed below, consider whether the project may have a significant adverse effect on the environment, taking into account its (a) location; (b) probability of occurring; (c) duration; (d) irreversibility; (e) geographic scope; and (f) magnitude.

	Potential Significant Adverse Impact	
IMPACT CATEGORY	**YES**	**NO**
Land Use, Zoning, and Public Policy		✓
Socioeconomic Conditions		✓
Community Facilities and Services		✓
Open Space		✓
Shadows		✓
Historic and Cultural Resources		✓
Urban Design/Visual Resources		✓
Natural Resources		✓
Hazardous Materials		✓
Water and Sewer Infrastructure		✓
Solid Waste and Sanitation Services		✓
Energy		✓
Transportation		✓
Air Quality		✓
Greenhouse Gas Emissions		✓
Noise		✓
Public Health		✓
Neighborhood Character		✓
Construction Impacts		✓

2. Are there any aspects of the project relevant to the determination whether the project may have a significant impact on the environment, such as combined or cumulative impacts, that were not fully covered by other responses and supporting materials? If there are such impacts, explain them and state where, as a result of them, the project may have a significant impact on the environment.

No.

3. ***LEAD AGENCY CERTIFICATION***

Deputy Director, Environmental Assessment and Review Division	New York City Department of City Planning
TITLE	LEAD AGENCY
Celeste Evans	March 15, 2013
NAME	SIGNATURE

Proposed Action

The Applicant, St. Francis Preparatory School, is seeking a zoning change from R3-2 to R4, on a portion of a block (Block 7128, Lots 2, 10, and p/100) located in the Fresh Meadows neighborhood of Queens, Community District 8. The affected area, which is irregularly shaped, is generally bounded by the Long Island Expressway Eastbound Service Road to the north, Peck Avenue to the west and Francis Lewis Boulevard to the east. The proposed action would facilitate a proposal by the applicant to expand the existing St. Francis Preparatory School ("St. Francis Prep"), a 247, 979 gross square foot (gsf), 3-story private high school institution located on Block 7128, Lot 2 (the "projected development site"), by approximately 58, 893 gsf.

The projected development site, owned by the applicant, is currently zoned R3-2, which allows residential uses at a floor area ratio (FAR) of .60 and community facility uses at an FAR of 1.0. The proposed rezoning would establish an R4 zone over the subject site, permitting residential uses with an FAR of .75 and community facility uses with an FAR of 2.0.

The two remaining sites located within the affected area, not under the applicant's control, and also currently zoned R3-2, are improved with an approximately 115,000 gsf community facility building, the Special Education Public School 4Q (Lot 10), and an approximately 500,000 gsf public park (p/o Lot 100).

Purpose and Need for the Proposed Action

St. Francis Preparatory School is a private, independent Catholic college preparatory school considered to be the largest non-diocesan Catholic high school in the United States. St. Francis Prep is administered by the Franciscan Brothers, who maintain a residence on 10 dwelling units located on the top floor of the school. In addition, the school has a student body of approximately 2,700 students and employs 235 staff.

The purpose of the proposed rezoning is to increase the permitted community facility floor area on the projected development site from 1.0 FAR to 2.0 FAR, thus permitting the proposed expansion of St. Francis Prep by 58,893 gsf. The school intends to increase its classroom, science laboratory, art and musical performance spaces to support students interested in the arts. It is the applicant's position that it is necessary to increase the number of classrooms to reduce the school's extraordinarily high classroom size (40 students per classroom) to a more acceptable average in keeping with modern educational standards. In addition, the school also lacks adequate musical rehearsal and performance space and updated science laboratory facilities. The proposed action would help expand the educational space within the school's existing campus.

Project Description

As described above, the applicant intends on expanding the existing, 247, 979 gsf St. Francis School located on the projected development site (Lot 2) by approximately 58,893 gsf. The school's sole facility occupies the projected development site. The school is composed of four wings: the North (facing the intersection of the Horace Harding Expressway and Francis Lewis Boulevard), South, East and West Wings, as well as partial basements and cellars to each wing. A 152 parking space lot provides accessory parking for the school population.

The proposed expansion to St. Francis Prep would expand along the North, West and South Wings of the school facility. More specifically, the proposed expansion would comprise three components: (1) demolition of portions of the existing South Wing; (2) addition of square footage adjacent to the South Wing and (3) addition to the front of the North Wing, described in more detail below.

Existing portions of the South Wing, measuring approximately 7,000 zoning square feet (zsf) will be demolished.

An addition will be constructed in the triangularly shaped lot area generally bounded by the school's South and West Wings, (partially on the site of the cleared wing and partially on the existing parking lot). The first floor of the additions will total approximately 17,782 zsf; the second floor will total approximately 19,891 SF (2,109 zsf of the first floor was built in a previous phase). The floors will be approximately 10 feet in height and thus the addition will be lower in height than the high-rise portion of the remaining portions of the existing South Wing. An additional 4,598 zsf of expansion will contain a stair bulkhead located on the roof.

Additionally, the North Wing, will comprise a small three-story addition, which will contain a new entry to the school on the first floor and locate a chapel on the second and third floors.

Although the result of the proposal will be the reduction in the overall size of the parking area on the site, it is expected that through reorganization of the parking lot the total number of parking spaces will increase by 15 spaces.

Vehicular access to the site and existing curb cuts will remain the same as current conditions.

Analysis Framework

According to the 2012 CEQR Technical Manual, Chapter 2-320, "[d]iscretionary actions sometimes permit a range of project characteristics, or development scenarios to occur, even though the action may be sought in order to facilitate a specific development. From the range of possible scenarios that are considered reasonable and likely, the scenario with the worst environmental consequences is chosen for analysis. This is considered to be the RWCDS, the use of which ensures that, regardless of which scenario actually occurs, its impacts would be no worse than those considered in the environmental review." A range of possible reasonable, likely development scenarios were considered. The analysis framework, including the existing conditions, future without and future with the proposed action scenarios, is presented below.

EXISTING CONDITIONS.

Projected Development Site

The projected development site, (Block 7128, Lot 2), measures approximately 215, 215 gross square feet (gsf). The St. Francis Preparatory facility and its accessory parking occupy the projected development site. As described above, the school is housed by a 3-story, multi-structure building measuring 247,979 gsf (see Attachment 4/Tax Map and Attachment 5/Site Plan). The school facility is composed of four wings: the North (facing the intersection of the

Horace Harding Expressway and Francis Lewis Boulevard), South, East and West Wings, as well as partial basements and cellars below each wing. A 152 parking space lot provides accessory parking for the school population.

Remaining Sites in the Rezoning Area

The remainder of the rezoning area consists of two lots. Lot 10, which measures 87,500 gsf, is developed with an approximately 115,000 gsf special education public school (Public School 4Q). Public School 4Q is a special education school with approximately 400 students, 96 teachers and 35 employees. The school is housed in a two-story building located southwest of St, Francis Preparatory School between the pedestrian way and Peck Avenue.

The 499,131 gsf portion of Lot 100 affected by the proposal contains Kissena Corridor Park ("Kissena Park"), an approximately 500,000 gsf City-mapped publicly accessible open space. Kissena Park is a part of a regional park system. The portion of the park that is within the affected area is part of the eastern portion of the corridor.

Kissena Park forms part of a regional park system. The portion of the park that is within the affected area is part of the eastern portion of the corridor. In the affected area, it extends from the Horace Harding Expressway, past Public School 4 and along the prolongation of 67th Avenue. At the Horace Harding Expressway, a pedestrian bridge that spans the Expressway connects the portion of the park to the parts of the corridor located north and west of the Expressway. To the south the park continues past 67th Avenue and reaches Cunningham Park. The portion of the park located within the affected area contains athletic courts (located between the school building and the pedestrian way) as well as playing courts to the east of the school (Holy Cow Playground).

Attachment 3/Zoning Map and Attachment 4/Tax Map illustrate the entire affected area.

FUTURE NO-ACTION SCENARIO.

Projected Development Site

In the future without the proposed action ("No Action Scenario"), the affected area would remain R3-2. The St. Francis Preparatory School would continue to operate its facility as in existing conditions.

Remaining Sites in the Rezoning Area

In the future without the proposed action, the remainder of the proposed rezoning area (approximately 115,000 gsf public school and approximately 500,000 gsf publicly accessible open space) would remain unchanged.

The Department of Education has neither made any announcement nor revealed any plan to alter P.S. 4Q. There are no known development plans to alter Kissena Park on the adjacent site.

Therefore, the proposed rezoned area will remain the same absent the proposed action.

FUTURE WITH-ACTION SCENARIO.

Projected Development Site

In the future with the proposed action ("With-Action Scenario"), the entire affected area would be rezoned from R3-2 to R4. As described in more detailed in the Land Use, Zoning and Public Policy section of this document, the proposed rezoning would increase the permitted community facility floor area ratio (FAR) from 1.0 to 2.0 and residential FAR from 0.6 to 0.75. While a range of development scenarios could take place on the projected development site, operational, legal and construction-related constraints described below, conclude that a school expansion totaling 65,693 gsf would be developed on the projected development site. In addition to the applicant's proposed development of 42,271 zoning (58,893 gsf) on the site, there is the potential to add approximately 6,800 gsf based on the zoning lot dimensions and allowable land use. The existing, 152-space parking lot would be improved with 15 additional parking spaces.

Legal Constraints

St. Francis Prep will remain a school indefinitely into the foreseeable future due to a specific deed restriction and an August 9, 1974 agreement between the School and the Roman Catholic Diocese of Brooklyn, New York. Per the agreement, the school would lose both the site and its improvements if school use were discontinued.

Operational Constraints

The school is one of the nation's largest and most prestigious parochial high schools. The School's sole facility occupies the subject site. Thus it would be highly infeasible, if not impossible to demolish the existing building in order to construct a substantially larger building while maintaining an uninterrupted School use and without discontinuing for years School activities for the years it would take to erect an even larger School buildings. The school's architect, Perkins Eastman, has determined after thorough analysis that a maximum addition of 65,693 square feet could possibly be added to the existing School while maintaining necessary parking.

Construction-Related Constraints

It is necessary to maintain existing on-site parking for facility, visitors and drop-offs as the school is insufficiently served by mass transit. Therefore, on-grade additions to the school beyond the previously described proposed additions would be extremely difficult to construct. Also the design of the existing school building makes it impracticable to vertically increase building size. The proposed wing along Horace Harding Expressway could be extended to the permitted setback line with a one-story 6,800 square foot addition, thereby enabling parking to be maintained below. Thus a potential 6,800 square feet of floor area could be added in addition to the proposed 42,271 zoning square feet (58,893 GSF), making for a Reasonable Worst Case Development Scenario of a maximum 65,693 square feet.

Therefore, per the proposed R4 zoning district, the With-Action scenario would comprise a 65,693 gsf addition to St. Francis Prep, totaling 313,672 gsf on the projected development site and a parking lot containing 167 spaces.

Remaining Sites in the Rezoning Area

Under the With-Action Scenario, the remaining rezoning area would be the same as in existing conditions. The 115,000 gsf public school (Lot 10) and Kissena Park (p/o Lot 100) would remain unchanged notwithstanding the proposed R4 zoning district.

INCREMENTAL DIFFERENCE BETWEEN THE FUTURE NO-ACTION AND WITH-ACTION SCENARIOS.

In accordance with 2012 CEQR Technical Manual Chapter 2-320, the analyses to follow will be made for the area to be rezoned by comparing a the future No-Action Scenario with the future With-Action condition. Potential impacts will be determined based on the incremental differences between the two scenarios.

As described above, the projected development site is the only property within the rezoning area that is expected to be redeveloped as result of the proposed action. The other properties within the proposed rezoning area (including Lots 10 and 100) are expected to remain in their current state. Thus, the incremental difference between the No-Action and With-Action Scenarios would is 65,693 gsf of community facility expansion and 15 accessory parking spaces.

The following analyses are based on this incremental difference between the No-Action and With-Action Scenarios.

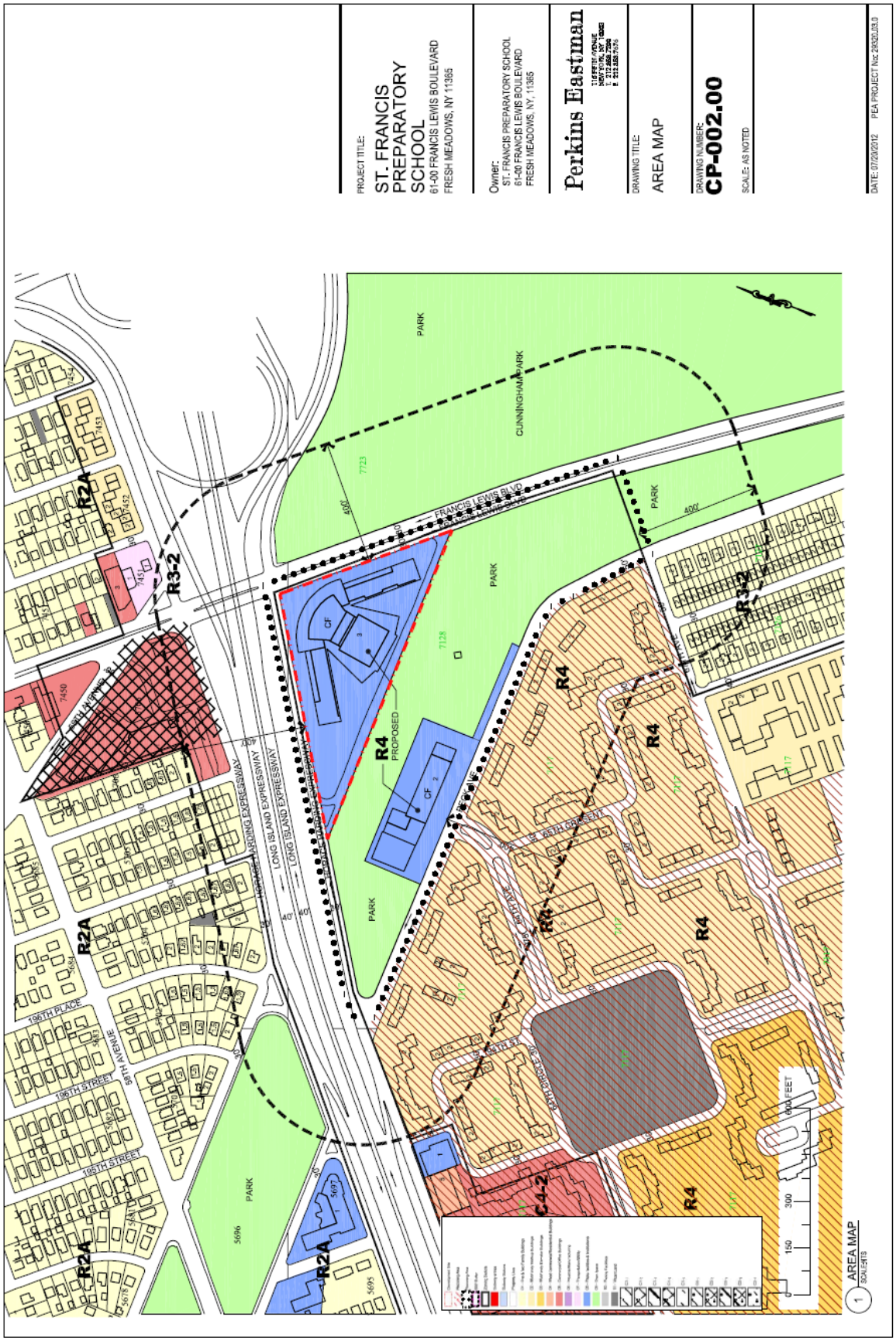
Technical Analyses

Land Use, Zoning and Public Policy

INTRODUCTION.

According to the 2012 CEQR technical Manual guidelines, a land use analysis should evaluate the uses and development trends in the area that may be affected by a proposed project, and determine whether the proposed project is compatible with, or may affect, those conditions. The analysis should consider the project compliance with, and effect on, the area zoning and other applicable public policies.

As previously noted, this application is for a Zoning Map Amendment to change portions of one block 7128 in Queens from an R3-2 to an R4 zoning district. The purpose of the requested action is to increase the permitted community facilities FAR of the projected development site from 1 FAR to 2 FAR. As determined in the "Analysis Framework" section of this document, the proposed action would facilitate the development of a 2-story 65, 693 gsf addition to the existing school and 15 additional parking spaces on the projected development site.


PROJECT TITLE:
ST. FRANCIS PREPARATORY SCHOOL
61-00 FRANCIS LEWIS BOULEVARD
FRESH MEADOWS, NY 11365
Owner:
ST. FRANCIS PREPARATORY SCHOOL
61-00 FRANCIS LEWIS BOULEVARD
FRESH MEADOWS, NY, 11365
Perkins Eastman
DRAWING TITLE:
AREA MAP
DRAWING NUMBER:
CP-002.00
SCALE: AS NOTED
DATE: 07/20/2012
PEA PROJECT No: 28920.03.0
PARK
CUNNINGHAM PARK
FRANCIS LEWIS BLVD
R2A
R3-2
R4
PROPOSED
CF
C4-2
LONG ISLAND EXPRESSWAY
HORACE HARDING EXPRESSWAY
196TH PLACE
196TH STREET
195TH STREET
59TH AVENUE
59TH DRIVE
59TH ROAD
60TH AVENUE
60TH ROAD
61ST AVENUE
61ST ROAD
61ST DRIVE
400'
40'
0
150
300
600 FEET
1 AREA MAP
SCALE: 1" = 300'

EXISTING CONDITIONS.

Land Use

Affected Area

The area of the proposed zoning map change includes:

- The applicant's property (Block 7128, Lot 2);
- A public school – P.S. 4Q (Block 7128, Lot 10) and;
- Parkland – Kissena Park (Block 7128, p/o Lot 100)

Saint Francis Preparatory School is a private high school accommodating children in grades 9-12. Public School 4 is a special education school with approximately 400 students, 96 teachers and 35 employees. The school is housed in a two-story building located southwest of St, Francis Preparatory School between the pedestrian way and Peck Avenue.

P.S.4Q is located south of the park between Francis Lewis Boulevard and Peck Avenue. The school building contains two stories. There is a school parking lot located on the east side of the property. The south side of the P.S. 4Q property is characterized by lawn and trees and a public sidewalk along Peck Avenue and the adjacent park, and two-family homes are homogeneously located southeast of the subject school.

As previously noted Kissena Park, located directly south of St. Francis Preparatory School, forms part of a regional park system. Kissena Corridor Park is characterized by grass and trees and athletic courts. A paved walkway located along the park's boundary with Saint Francis Prep extends from Francis Lewis Boulevard to Peck Avenue.

The portion of the park that is located within the affected area is part of the eastern portion of the corridor. In the affected area, it extends from the Horace Harding Expressway, past Public School 4 and along the prolongation of 67th Avenue. At the Horace Harding Expressway, a pedestrian bridge that spans the Expressway connects the portion of the park to the parts of the corridor located north and west of the Expressway. To the south the park continues past 67th Avenue and reaches Cunningham Park. The portion of the park located within the affected area contains athletic courts (located between the school building and the pedestrian way) as well as playing courts to the east of the school (Holy Cow Playground).

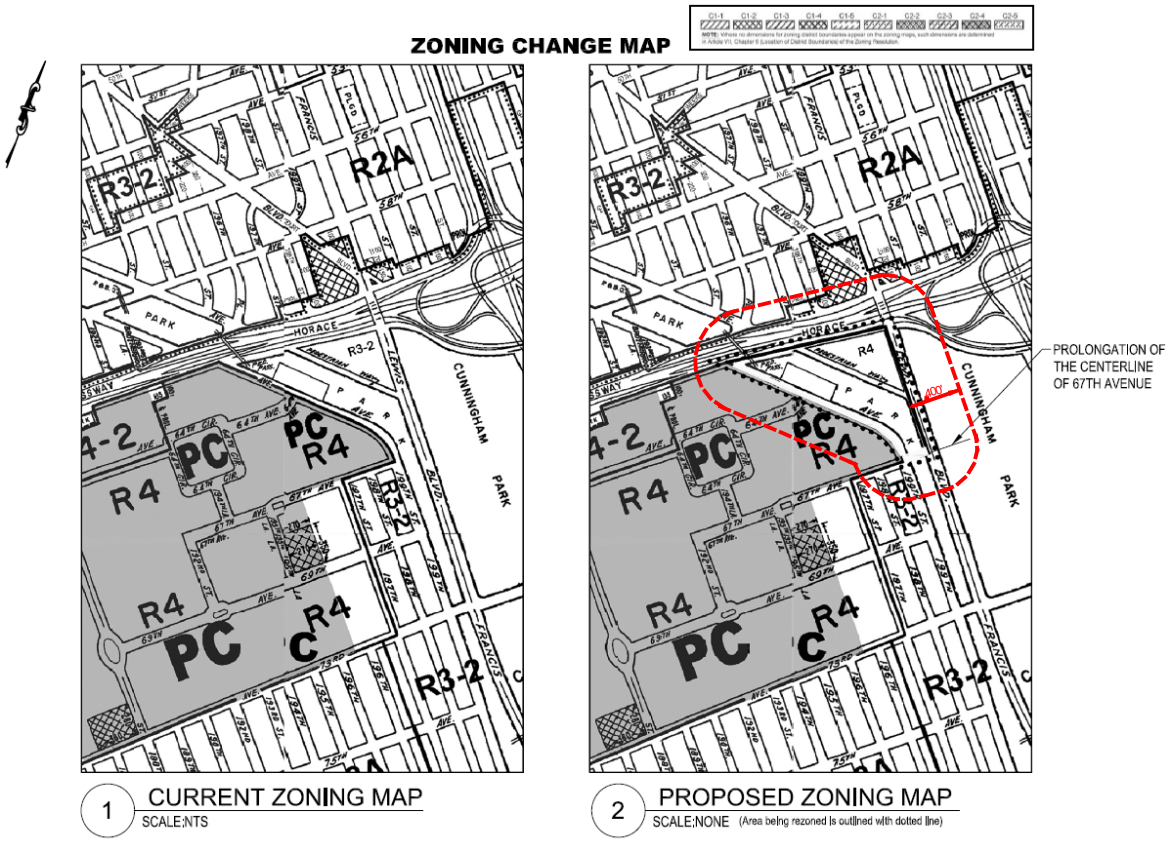
On the opposite side of Francis Lewis Boulevard, a strip of Cunningham Park extends north to the corner of the Horace Harding Expressway Service Road. This portion of Cunningham Park is thick with trees and is undeveloped, fenced and inaccessible.

400-foot Study Area

Land uses in the 400 foot radius study area are predominately two-story single and multi-family homes with lawns, as well as tree-lined sidewalks. There is a concentration of commercial retail stores in a shopping center and a diner located at the corner northwest of the Horace Harding Expressway at the intersection of Francis Lewis Boulevard. The single family homes are concentrated in the area to the northwest on the opposite side of the Horace Harding Expressway.

The two-story multi-family homes in the area are concentrated to the areas geographically south of Saint Francis Preparatory School. These homes are characterized with front lawns and sidewalks lined by trees.

The surrounding area is also characterized by commercial uses is improved with retail (e.g. a diner, a shopping center and a supermarket as well as other retail shops) and parking.



Zoning

The existing R3-2 zoning district permits residential uses in Use Groups 1 & 2 and most community facility uses in Use Groups 3 & 4.

In the R3-2 district (a Low Density General Residence District) detached houses must have a maximum FAR of 0.60 and be on lots with a 40-foot minimum width and a lot area of at least 3,800 SF. All residential buildings must have a 15 ft. front yard and maximum coverage is 35%. Maximum building height is limited to 35 ft. and perimeter wall height is a maximum of 21 ft. One off-street parking space is permitted per dwelling unit.

Community facility uses in the R3-2 Zoning District generally have an FAR maximum of 1.0 and are permitted 60% coverage on corner lots and 55% on other lots. In terms of coverage the portion of any building containing a community facility use not exceeding 23 feet in height is not

counted towards the coverage limit. A front yard with a minimum depth of 15 ft. is required. Side yards are based upon the aggregate with of streetwall(s). All buildings that contain community facilities must provide a 30 ft. deep rear yard. However, unlike for residential buildings, a community facility building or portion of a building containing community facility use is a permitted obstruction in a rear yard as long as it doesn't exceed one-story nor 23 ft. in height. Height and setback for community facility buildings is controlled through minimum setback and sky exposure plane regulations.

Public Policy

There are no special zoning districts within the study area. However, the project area is immediately northeast of the Fresh Meadows housing development and Special Planned Community Preservation District, with its clustering of housing allowing substantial areas of open space.

FUTURE NO-ACTION SCENARIO.

Land Use

Affected Area

In the absence of the proposed zoning changes, no change in the allowable FAR would occur, and no new uses that are not currently permitted would be allowed. The existing R3-2 zoning would remain.

As noted in the Analysis Framework, in the future without the proposed action, Saint Francis Prep would be unable to make the addition necessary to provide state-of-the –art educational programs with laboratories, music and art facilities remaining outdated and classroom space would continue to be inadequate for modern class size standards.

400-foot Study Area

It is expected that no change in land use would occur in the study area. The study area would continue to exhibit a mix of predominately institutional school uses, a portion of Kissena Corridor Park and predominately single and multi-family residential uses. There are no known plans for developments in the study area.

Zoning

No changes in zoning would occur in the rezoning area. The existing R3-2 zoning would remain**.**

Public Policy

No changes related to public policy are expected to occur in the affected area.

FUTURE WITH-ACTION SCENARIO.

Land Use

Affected Area

The proposed change in zoning to R4 would result in a maximum of 65,693 square feet added to the Saint Francis School building on Lot 2. The development would not introduce new or incompatible land use to the rezoning area. In addition, the proposed action would not adversely any of the existing buildings in the rezoning area.

The proposed zoning map changes and proposed development would not result in a significant change of land use in the rezoning area as the uses allowed under the proposed zoning district would be identical to those currently allowed. Therefore, the land uses resulting from the proposed zoning would be consistent with existing land use patterns and trends in the rezoning area and surrounding area.

Accordingly, the proposed action would not result in significant adverse land use impacts.

Zoning

Affected Area

The proposed R4 zoning district would allow all types of housing (Use Groups 1 & 2) at a slightly higher density than permitted in the existing R3-2 district. The FAR is 0.75 but with the "Attic Rule" it is 0.90. The required lot widths and minimum lot sizes are the same as in the R3-2 and R4 districts. The R4 lot coverage is increased to 45% and the required front yard reduced by 5 ft. to 10 ft. The side yard requirements and rear yard requirements are the same in both districts. One parking space per dwelling unit is required.

Zoning Comparison Table

	Permitted/Required			
	Existing Zoning - R3-2		**Proposed Zoning - R4**	
	ZR Section #	**R3-2**	**ZR Section #**	**R4**
USE GROUPS	22-00	1 ,2, 3, 4	22-00	1 ,2, 3, 4
Maximum FAR (Total)				
Residential				
Community Facility	24-11	1.0	24-11	2.0
Commercial	Not Permitted	0.0	Not Permitted	0.0
Manufacturing	Not Permitted	0.0	Not Permitted	0.0

YARDS				
Front Yard	24-34	15ft	24-34	15ft
Side Yard	24-35	8ft	24-35	8ft
Rear Yard	24-36	30ft	24-36	30ft
Open Space	24-163		24-163	
Lot Coverage	24-11	60%	24-11	60%
HEIGHT AND SETBACKS				
Maximum Height of Front Wall	24-521	25ft	24-521	35ft
Maximum Building Height	24-521	skyplane	24-521	skyplane
Sky Exposure Plane	24-521	1:1	24-521	1.1
Setbacks from Narrow Streets	24-521	N/A	24-521	N/A
Stebacks from Wide Streets	24-521	N/A	24-521	N/A
DENSITY	24-20	N/A	24-20	N/A
PARKING AND LOADING				
Parking	25-31	None	25-31	None
Loading	25-70	None	25-70	None

Community facility uses in R4 districts generally have a permitted FAR of 2.00. The lot coverage is the same as in R3-2 districts – 60% on corner lots and 55% on other lots. A 15 ft. front yard is required, as it is for community facility uses in R3-2 districts. The side yard regulations are the same in both districts. All buildings that contain community facilities must provide a 30 ft. deep rear yard. As in the R3-2 district, a community facility building or portion of a building containing community facility use is a permitted obstruction in a rear yard as long as it doesn't exceed one-story nor 23 ft. in height. The difference is the height at which the sky exposure plane begins above the front yard line.

The proposed zoning is very similar in characteristics to the existing district. The only significant differences are the slightly greater height the proposed district allows and the increase in FAR from 1 to 2. The increase in maximum FAR is necessary to facilitate the proposed enlargement of the School. The proposed district is appropriate because it is already the predominate district in the area and this will make development throughout the area consistent. Equally important this enlarged R4 district will abut two major arterials that provide both physical and visual separation from lower density districts further away.

The development site as proposed would be almost entirely consistent with the new zoning district. Currently, two portions of the front of the building protrude into the required front yard, where the North Wing adjoins the West and East Wings and are non-complying. This non-compliance would still exist in the proposed zoning district. The additions to the building will

not increase the degree of non-compliance or cause any new compliance. Other than the front yard the building would be entirely complying and conforming.

Therefore, the proposed rezoning would facilitate an addition to the existing school and would not alter any uses within the study area and the proposed action is not expected to result in any significant adverse impacts related to zoning.

Public Policy

The proposed action is not expected to result in any significant adverse impacts related to public policy. It is the applicant's opinion the proposed rezoning would allow for the modernization of an important educational resource for the Borough of Queens and the City of New York and would be consistent with the predominate zoning in the area.

Conclusion

The proposed action would not result in significant adverse impacts related to land use, zoning or public policy, and no further analysis is warranted.

Shadows

INTRODUCTION.

The proposed action would result in a building expansion reaching approximately 53 feet in height. The shadow study examines whether the With-Action building expansion would cast new shadows on any publicly accessible sunlight-sensitive resources.

Sunlight-sensitive resources can include parks, playgrounds, gardens, and other publicly accessible open spaces; sunlight dependent architectural features of historic resources; and important natural features such as water bodies. As described under "Project Description", this analysis has been prepared using the With-Action Scenario. The analysis provides a conceptual analysis of the potential impacts of the proposed With-Action Scenario for analytic purposes. The detailed analysis presented in this attachment concluded that the proposed project would not result in any new shadows on sunlight-sensitive resources, at any time of year.

DEFINITIONS.

Incremental shadow is the additional, or new, shadow that a structure resulting from a proposed action would cast on a sunlight-sensitive resource.

Sunlight-sensitive resources are those resources that depend on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity. Such resources generally include:

- *Public open space* (e.g., parks, beaches, playgrounds, plazas, schoolyards, greenways, landscaped medians with seating). Planted areas within unused portions of roadbeds that are part of the Greenstreets program are also considered sunlight-sensitive resources.
- *Features of architectural resources that depend on sunlight for their enjoyment by the public.* Only the sunlight-sensitive features need be considered, as opposed to the entire resource. Such sunlight-sensitive features might include: design elements that depend on the contrast between light and dark (e.g., recessed balconies, arcades, deep window reveals); elaborate, highly carved ornamentation; stained glass windows; historic landscapes and scenic landmarks; and features for which the effect of direct sunlight is described as playing a significant role in the structure's importance as a historic landmark.
- *Natural resources* where the introduction of shadows could alter the resource's condition or microclimate. Such resources could include surface water bodies, wetlands, or designated resources such as coastal fish and wildlife habitats.

Non-sunlight-sensitive resources include, for the purposes of CEQR:

- *City streets and sidewalks* (except Greenstreets);
- *Private open space* (e.g., front and back yards, stoops, vacant lots, and any private, non-publicly accessible open space);
- *Project-generated open space* cannot experience a significant adverse shadow impact from the project, according to CEQR, because without the project the open space would not exist. However, a qualitative discussion of shadows on the project-generated open space should be included in the analysis.

A significant adverse shadow impact occurs when the incremental shadow added by a proposed project falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources. Each case must be considered on its own merits based on the extent and duration of new shadow and an analysis of the resource's sensitivity to reduced sunlight.

METHODOLOGY.

First, a preliminary screening assessment must be conducted to ascertain whether a project's shadow could reach any sunlight-sensitive resources at any time of year. The preliminary screening assessment consists of three tiers of analysis. The first tier determines a simple radius around the proposed building representing the longest shadow that could be cast. If there are sunlight-sensitive resources within this radius, the analysis proceeds to the second tier, which reduces the area that could be affected by project shadow by accounting for the fact that shadows can never be cast between a certain range of angles south of the project site due to the path of the sun through the sky at the latitude of New York City. If the second tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a third tier of screening analysis further refines the area that could be reached by project shadow by looking at specific representative days of the year and determining the maximum extent of shadow over the course of each representative day. If the third tier of analysis does not eliminate the possibility of new shadows on sunlight sensitive resources, a detailed shadow analysis is required to determine the

extent and duration of the incremental shadow resulting from the project. The detailed analysis provides the data needed to assess the shadow impacts. The effects of the new shadows on the sunlight-sensitive resources are described, and their degree of significance is considered. The results of the analysis and assessment are documented with graphics, a table of incremental shadow durations, and narrative text.

PRELIMINARY SCREENING ASSESSMENT.

A base map was developed (see Figure 1) showing the location of the proposed project and the surrounding street layout. In coordination with the land use, open space, and historic resources sections of this EAS, potentially sunlight-sensitive resources were identified and shown on the map.

St. Francis Preparatory School - Building Shadow Assessment
FIGURE 1 - BASE MAP

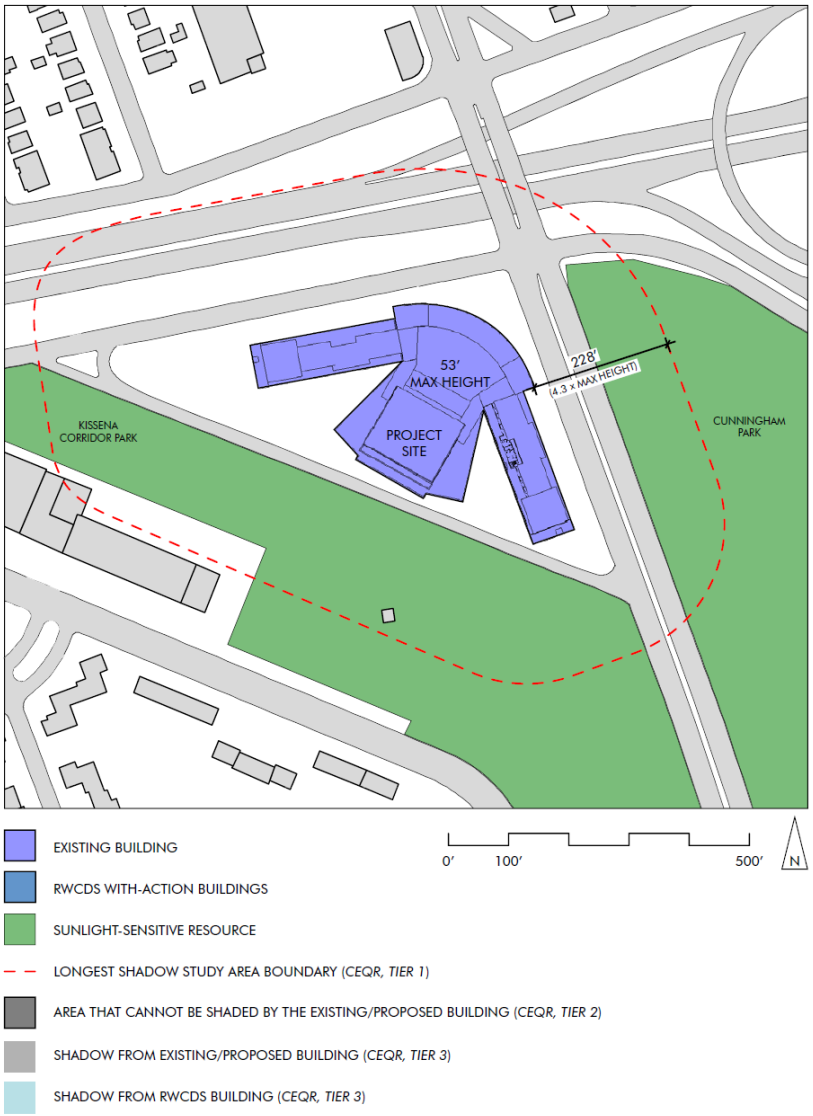


TIER 1 SCREENING ASSESSMENT.

For the Tier 1 assessment, the longest shadow that the proposed structure could cast is calculated, and, using this length as the radius, a perimeter is drawn around the project site. Anything outside this perimeter representing the longest possible shadow could never be affected by project generated shadow, while anything inside the perimeter needs additional assessment. According to the *CEQR Technical Manual*, the longest shadow that a structure can cast at the

latitude of New York City occurs on December 21, the winter solstice, at the start of the analysis day at 8:51 AM, and is equal to 4.3 times the height of the structure. Therefore, at a maximum height of 53 feet above curb level, the proposed building could cast a shadow up to 228 feet in length (53 x 4.3). Using this length as the radius, a perimeter was drawn around the project site (see Figure 2). Since a number of sun-sensitive resources lay within the perimeter or longest shadow study area, the next tier of screening assessment was conducted.

St. Francis Preparatory School - Building Shadow Assessment
FIGURE 2 - LONGEST POTENTIAL SHADOW

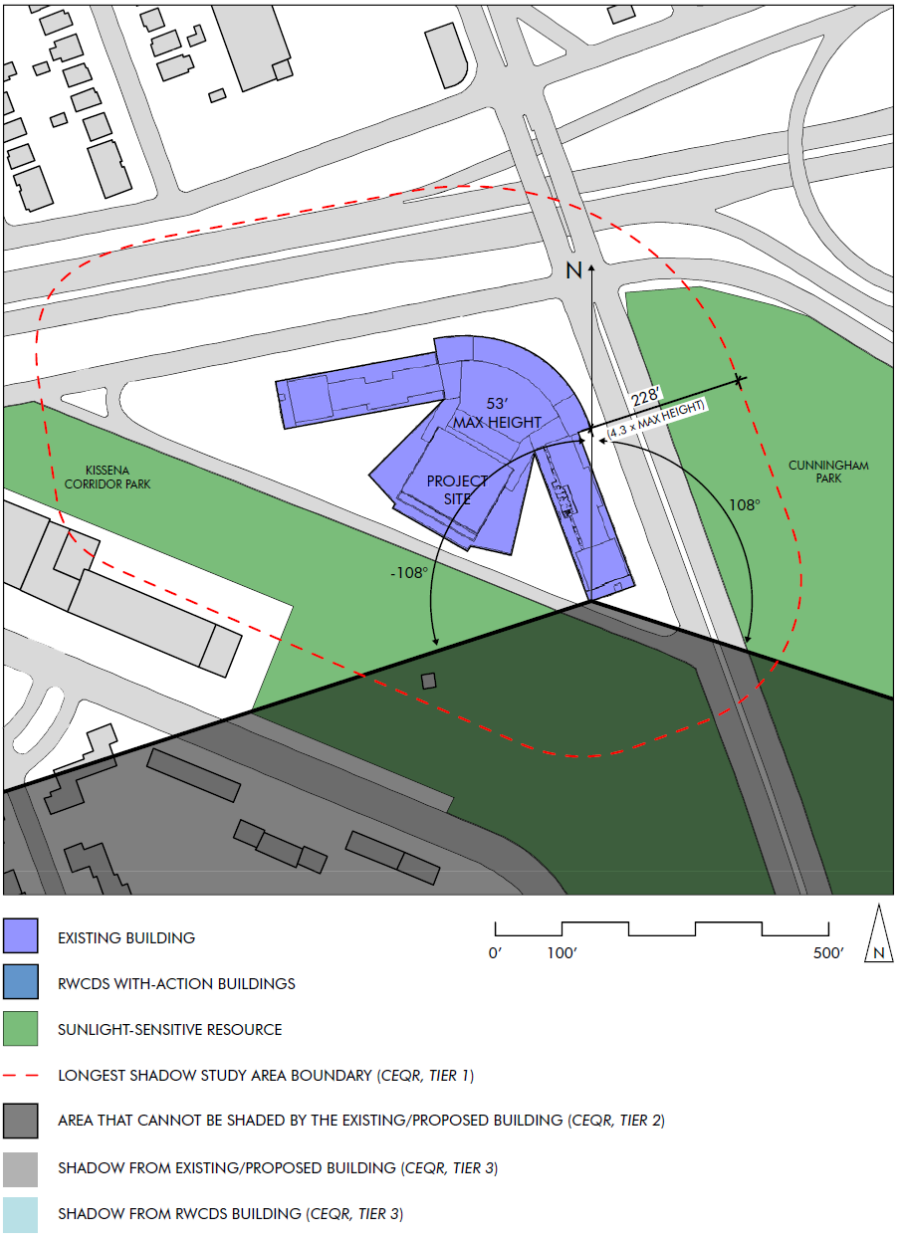


TIER 2 SCREENING ASSESSMENT.

Because of the path that the sun travels across the sky in the northern hemisphere, no shadow can be cast in a triangular area south of any given project site. In New York City this area lies between -108 and +108 degrees from true north. Figure 3 illustrates this triangular area south of the project site. The complementing area to the north within the longest shadow study area

represents the remaining area that could potentially experience new project generated shadow. A number of sun-sensitive resources are located in the remaining shadow study area, and therefore the next tier of screening assessment was performed.

St. Francis Preparatory School - Building Shadow Assessment
FIGURE 3 - AREA THAT CANNOT BE SHADED BY THE PROPOSED ACTION



TIER 3 SCREENING ASSESSMENT.

The third tier of assessment uses three-dimensional computer modeling software to more accurately refine the area that could be reached by project shadow by looking at specific representative days of the year and determining the maximum extent of shadow over the course of each representative day. The direction and length of shadows vary throughout the course of

the day and also differ depending on the season. In order to determine whether project generated shadow could fall on a sunlight-sensitive resource, three-dimensional computer mapping software is used in the Tier 3 assessment to calculate and display the proposed action's shadows on individual representative days of the year. A three-dimensional representation of the proposed building was developed based on plans and elevations provided by the applicant.

REPRESENTATIVE DAYS FOR ANALYSIS
Shadows on the summer solstice (June 21), winter solstice (December 21) and spring and fall equinoxes (March 21 and September 21), which are approximately the same in terms of shadow patterns) are modeled, to represent the range of shadows over the course of the year. An additional representative day during the growing season is also modeled, generally the day halfway between the summer solstice and the equinoxes, i.e. May 6 or August 6, which have approximately the same shadow patterns.

TIMEFRAME WINDOW OF ANALYSIS
The shadow assessment considers shadows occurring between one and a half hours after sunrise and one and a half hours before sunset. At times earlier or later than this timeframe window of analysis, the sun is down near the horizon and the sun's rays reach the Earth at very tangential angles, diminishing the amount of solar energy and producing shadows that are very long, move fast, and generally blend with shadows from existing structures until the sun reaches the horizon and sets. Consequently, shadows occurring outside the timeframe window of analysis are not considered significant under *CEQR*, and their assessment is not required.

TIER 3 SCREENING ASSESSMENT RESULTS
Figure 2 illustrates the range of shadows that would occur, in the absence of intervening buildings, from the proposed building on the four representative days for analysis. For informational purposes the boundaries of the analysis area are shown on Figure 2. As they move east and clockwise over the landscape, the shadows are shown occurring approximately every two hours from the start of the analysis day (one and a half hours after sunrise) to the end of the analysis day (one and a half hours before sunset). On the March 21/September 21, May 6 and June 21 analysis days, the RWCDS With-Action's shadow would be long enough to reach Cunningham Park. The shadow study is presented in Attachment 9. Project-generated shadow would not reach any sun-sensitive resources on the December 21 analysis day. The Tier 3 screening assessment concluded that shadows from the RWCDS With-action buildings would reach the Cunningham Park on the March 21/September 21, May 6 and June 21 analysis days. Therefore, a detailed analysis was conducted for those analysis days.

DETAILED SHADOW ANALYSIS.

For the detailed analysis, the computer model used in the Tier 3 assessment was further developed with three-dimensional representations of existing buildings in the study area. The future condition with the RWCDS With-Action buildings and its shadows was then compared to the baseline shadows, or shadows without the proposed action, to determine the incremental shadows that would result with the proposed action. Shadow analyses were performed for each of the representative days and analysis periods indicated in the Tier 3 assessment. Shadows are in constant movement. The computer simulation software produces an animation showing the

movement of shadows over the course of each analysis period. The analysis compares the animation of the RWCDS No Action condition (the same as the Existing condition) with the animation of the RWCDS With-Action condition to determine the time when incremental shadow would enter a sun-sensitive resource, and the time it would exit. The detailed analysis showed that shadow from the RWCDS With-Action buildings would reach a small area of Cunningham Park on the March 21/September 21, May 6 and June 21 analysis days.

- On 21 March the With-Action Scenario would cast a shadow on Cunningham Park (across Francis Lewis Boulevard) from 4:00 PM to 4:29 PM. The shadow duration is 29 minutes (see Attachment 9/Figure 7A).
- On 6 May the With-Action Scenario would cast a shadow on Kissena Corridor Park on the south of the project site from 6:27 AM to 7:18 AM which is 51 minutes and a shadow on Cunningham Park across Francis Lewis Boulevard from 5:09 PM to 5:18 PM which is 9 minutes(see Attachment 9/Figure 9A).
- On 21 June the With-Action Scenario would cast a shadow on Kissena Corridor Park on the south of the project site from 5:57 AM to 7:27 AM which is 1 hour 30 minutes and a shadow on Cunningham Park across Francis Lewis Boulevard from 5:47 PM to 6:01 PM which is 14 minutes (see Attachment 9/Figure 11A).

Project-generated shadow would not reach the Cunningham Park on December 21 analysis day (see Attachment 9/Figure 5A).

CONCLUSIONS.

No new shadow would fall on the Cunningham Park during the winter time. The incremental shadows would fall on a portion of Kissena Corridor Park or Cunningham Park on the March 21/September 21, May 6 and June 21 but would be very small in extent. The longest shadow would only last for one hour thirty minutes (1.5 hours) on Kissena Corridor Park which is located on the south of the project site. This incremental shadow would not significantly affect the health of the vegetation during the growing months according to the CEQR Technical Manual standard “four to six hours a day of sunlight is often a minimum requirement”. Kissena Corridor Park is an active park with moderate utilization for playground but the incremental shadows would not cast any shadows on the playground area. The Cunningham park is inactive. Therefore, given all these factors, the vegetation in that Cunningham Park would not be significantly impacted by the new project-generated shadow.



View of Cunningham Park from the project site

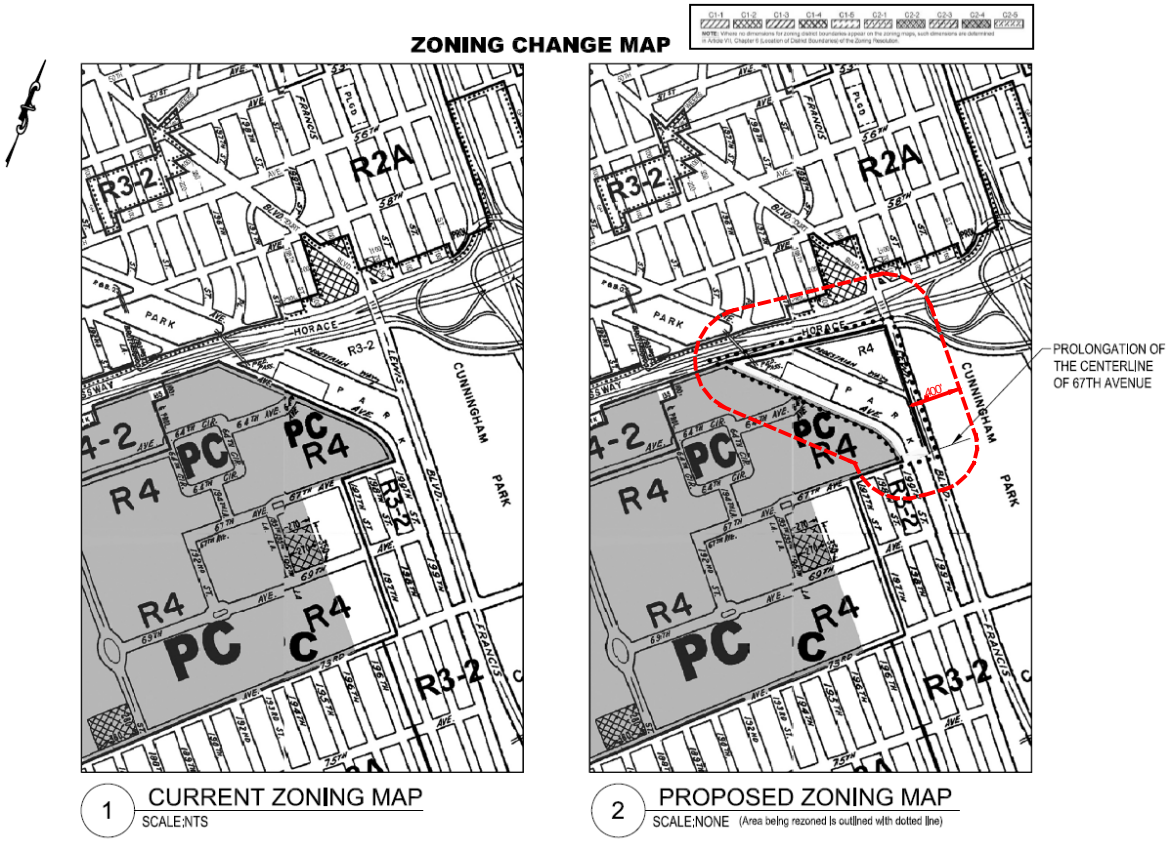


View of Kissena Corridor Park near the project site form Francis Lewis Blvd.

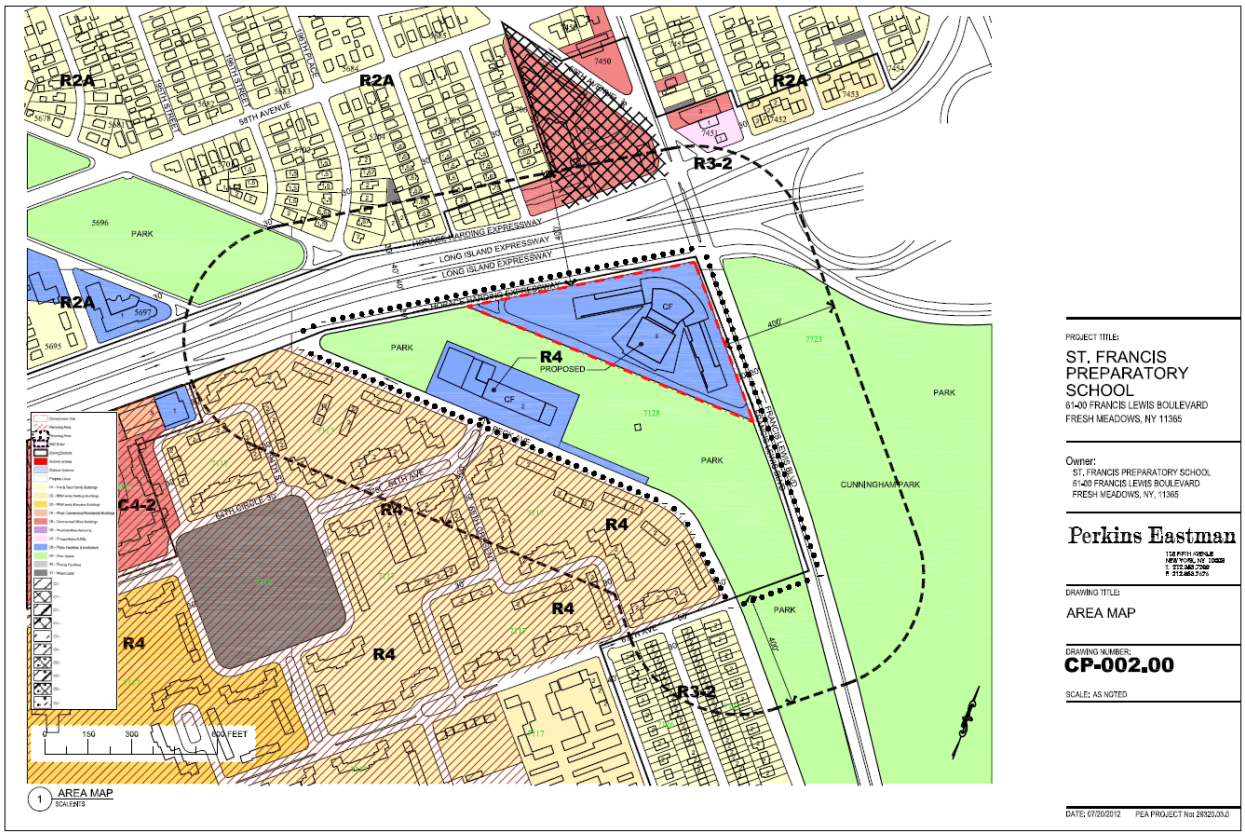
Urban Design and Visual Resources

The rezoning area is generally bounded by the LIE Southbound Service Road to the north, Francis Lewis Boulevard to the east, Peck Avenue to the west and 67th Avenue to the south. The study area is defined as being within a 400-foot radius of the rezoning area and is presented in the following figures. The projected development site and study area are located in a typically residential, commercial and community facility neighborhood in Queens, with a mix of building types, styles, and uses. Within the 400-foot radius area the predominant land uses include community facility (e.g. the schools located on the projected development site and PS 4Q in the rezoning area), residential and commercial. The purpose of the proposed rezoning is to increase the permitted community facility floor area of the development site from 1.0 FAR to 2.0 FAR permitting the proposed expansion of the St. Francis Preparatory School by Approximately 65, 497 gsf.

As described below, the community facility expansion resulting from the proposed action would be consistent with the predominant uses in the study area, and not result in significant adverse impacts related to Urban Design and Visual Resources.



Zoning Change Map



400-foot Radius Study Area

EXISTING CONDITIONS.

The existing condition in the rezoning area consists a 802,846 gsf area comprising three lots, including the projected development site, developed with the 3-story, 247,979 gsf private high school, St. Francis Preparatory School (Lot 2); a 115,000 gsf public school, PS 4Q (Lot 10), and a public park (Lot 100).

The area extending 400-feet from the rezoning area boundary includes residential uses to the south, park land to the southeast and northeast, and residential and commercial uses to the northwest. Other land uses in the area include residential housing, generally found to the north of the Long Island Expressway and to the west and south west of the project area. As detailed in the Land Use, Zoning and Public Policy section of this document, the housing found north of the Expressway is largely composed of detached 2-story single-family homes and attached and semi-detached 2-family homes.

No visual corridors have been identified for the study area.

FUTURE NO-ACTION SCENARIO.

Under the future No-Action Scenario, the affected area would remain zoned R3-2, and St. Francis Preparatory School as well as the remainder of the affected area would remain unchanged.

Visual corridors would be the same as the existing condition.

FUTURE WITH-ACTION SCENARIO.

The With-Action Scenario for the rezoning area would propose the rezoning of the existing R3-2 to R4. If the proposed rezoning is approved, an additional 65,693 gsf of community facility gross floor area will be attributed to the school's zoning lot. Therefore, the With-Action Scenario would permit up to 313,672 gsf of community facility gross floor on the projected development site under the proposed zoning district of R4.

Under the With-Action Scenario, for the remaining sites located within the rezoning area would be remain unchanged, notwithstanding the proposed R4 zoning district.

An aerial photograph of the rezoning area is presented below.



Aerial photo of the rezoning area



Looking due south on Francis Lewis Blvd from LIE Eastbound Service Rd



Looking due west on LIE Eastbound Service Rd from Francis Lewis Blvd



Looking at the projected development site from west side



Looking at the projected development site on Pedestrian Way from Francis Lewis Blvd

The existing condition and the With-Action Scenario expansion are presented below:



Existing Site Condition



With-Action Scenario

The proposed zoning change would not result in significant changes in the bulk of above-ground developments in the area. Buildings in a R4 zoning district allow a maximum allowable FAR of 2.0 for a typical height of two stories. As described in the "Analysis Framework" section of this document, while the total allowable zoning floor area permitted on the projected development site would amount to 431,430 zsf (216,215 zsf x 2.0 allowable FAR), operational, legal and construction related limitations on the projected development site would constrain the proposed development to approximately 263,685 zsf or 313,672 gsf. Therefore the expansion would be relatively small in comparison to the overall building structure.

Further, the proposed expansion, which is contextual with buildings in the surrounding area, would not negatively impact the built environment. The expansion would not change block form, nor conflict with building heights in the area. The proposed action would not de-map an active street or map a new street. The action would result in no effect on street hierarchy. The action would not have a significant effect on view corridors or visual resources because the proposed expansion would not block any existing view corridors or visual resources, as shown in the above two photo views. There would be no effect on natural features that are enjoyed by the community or are designated as special resources in the Zoning Resolution. No significant effect on public open space, landmarks or landmark districts, or distinct buildings or groups of buildings would result from the action. The proposal would not have a significant effect on wind pressure or down-washed wind pressure or on sunlight. The pedestrian experience at street level would be similar to that on nearby streets as to street wall, building heights, regularity of street grid, site planning and configuration, parking and streets cape.

The proposed action would therefore not result in a significant impact related to Urban Design and Visual Resources and no further analysis is warranted.

Hazardous Materials

A review of the Phase I Environmental Site Assessment Report prepared by Sustainable Management LLC on behalf of St. Francis Preparatory School dated December 19, 2012 revealed the following findings:

Recognized Environmental Conditions:

> *During the site reconnaissance Sustainable Management LLC found one (1) above-ground oil tank with a capacity of 10,000 gallons in the basement. The database shows a closed 15,000 gallon underground oil storage tank.*

De Minimus Environmental Conditions:

> *During the site visit Sustainable Management LLC observed suspect ACM floor tiles (9" x 9") in most classrooms, laboratories and offices.*

Sustainable Management LLC recommended testing of the suspect ACM or removal of these materials in accordance with all local, State, and Federal rules and regulations when the buildings are renovated or demolished. It should be noted that the suspect ACM floor tiles were found to be in good condition.

The Phase I Environmental Site Assessment was submitted for review by the Department of Environmental Protection (DEP). Pursuant to a DEP letter dated February 1, 2013, (refer to Attachment 8), a Construction Health and Safety Plan (CHASP) prepared on March 5, 2013. In a letter dated March 6, 2013 DEP reviewed the document and finds the CHASP acceptable (refer to Attachment 8).

Therefore, no significant adverse impacts related to hazardous materials would result from the proposed action, and no further analysis is warranted.

Transportation

TRAFFIC, MASS TRANSIT AND PEDESTRIANS

The proposed action will change the projected development site's zoning district from R3-2 to R4. The projected development site's existing gross floor area is 247,979 sf. The No-Action Scenario would be the same as the existing condition with a gross floor area of 247,979 sf under the existing zoning R3-2. The With-Action Scenario would increase the projected development site's floor area by 65,693 sf to a total gross floor area of 313,672 sf under the proposed R4 zoning.

The proposed rezoning will result in an increase in the number of classrooms on the projected development site. This will reduce the extraordinarily high class size under existing conditions to

levels that are more acceptable by modern educational standards. Similarly, the current modern science/laboratory space will be substantially increased in size. St. Francis also lacks adequate musical rehearsal and performance space, which can be provided by the additional space in the proposed building expansion. However, the proposed rezoning would not generate any additional students or employees and would not result in additional person trips traveling to or from the projected development site. As a result, no significant traffic, mass transit or pedestrian impacts are anticipated.

Air Quality

STATIONARY SOURCES

According to information provided by the project engineer (refer to Attachment 10), under the With-Action Scenario, the proposed expansion to St. Francis Preparatory School would utilize its existing boilers, which have sufficient capacity and thus would not result in any significant air quality impacts.

Therefore, in accordance with the 2012 CEQR Technical Manual, the proposed rezoning action would not result in significant air quality impacts.

Noise

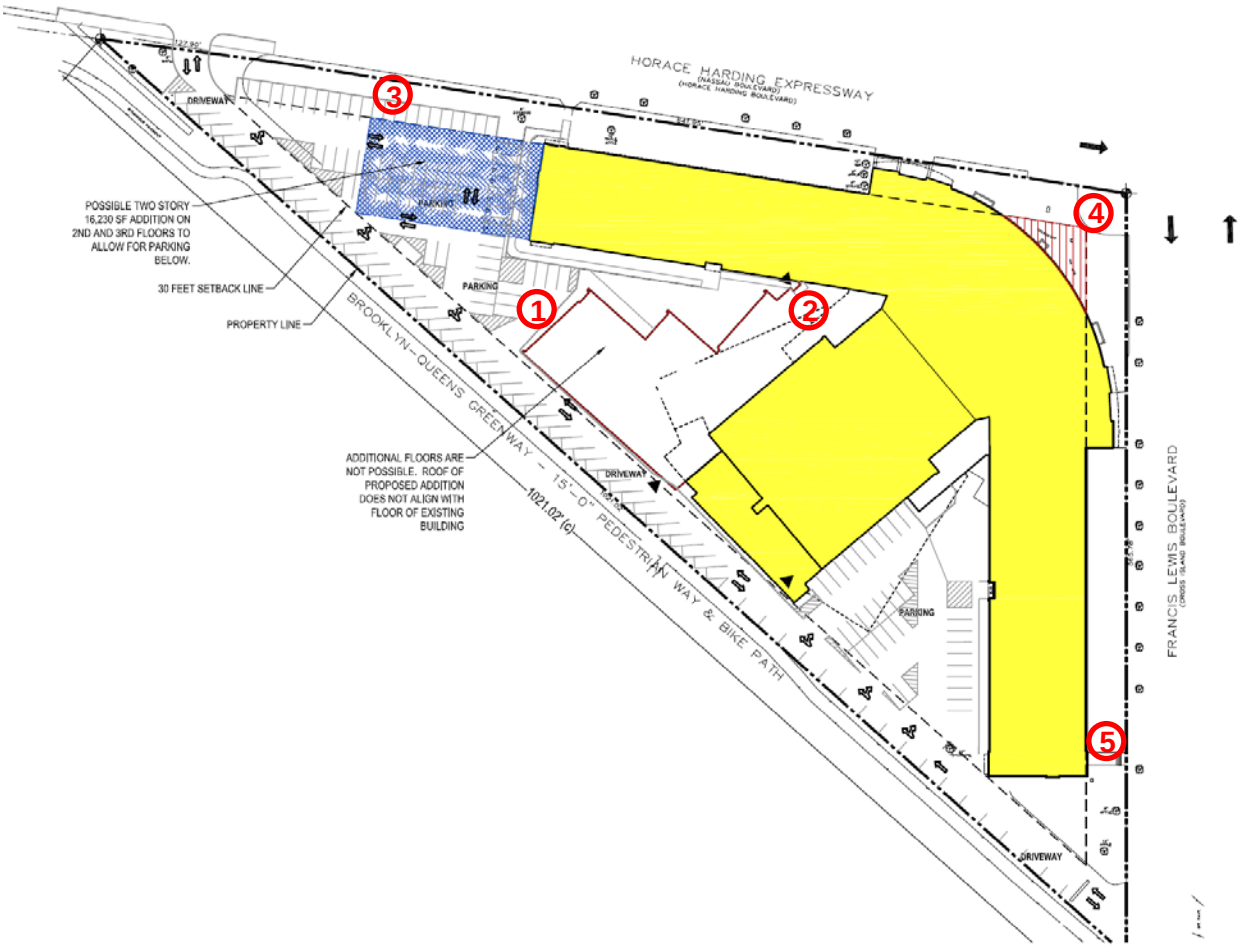
MOBILE SOURCES

According to the 2012 CEQR Technical Manual, if the existing passenger car equivalent (PCE) values are increased by 100% for a proposed project a detailed analysis of traffic noise is required. The With-Action Scenario would not increase any vehicle trips compared to the Existing condition. The existing PCE's would not be increased by 100% for the With-Action Scenario. Therefore, no further analysis is required in accordance with the 2012 CEQR Technical Manual.

AMBIENT SURVEY

The CEQR Technical Manual requires that indoor noise levels for school buildings not exceed 45 dBA. An ambient noise level survey was conducted in front of the proposed building expansion and along the projected development site boundary on the LIE Eastbound Service Road and Francis Lewis Boulevard by Sustainable Management LLC[1] to determine if potential significant impacts related to noise would result from the proposed action. The noise receptor locations are presented in the following diagram.

[1] November 8, 2011 (Tuesday) and July 25, 2012 (Wednesday). Both days were sunny.



A noise meter, Metrosonics db-3080 (manufacturer: Metrosonics, Inc.;model:db 3080), was utilized to take noise readings. Before noise readings were taken, the noise meter was calibrated using a QC-10M Calibrator (also manufactured by Metrosonics, Inc). The microphone of the noise meter was placed 4 feet above the ground and greater than 6.5 feet away from any structures. The readings were taken during the peak noise periods in the morning (7-9 AM), midday (12-2 PM) and evening (4-6 PM). The duration of the noise survey was approximately 20 minutes for each reading. The ambient noise levels at the sidewalk receptors are presented below:

Receptor Location	Morning Peak Hour (dBA, L_{10})	Midday Peak Hour (dBA, L_{10})	Evening Peak Hour (dBA, L_{10})
1. West of the Proposed Building	61	65	63
2. North of the Proposed Building	58	62	64
3. LIE E/B Service Rd	69	69	67
4. LIE E/B Service Rd/Francis Lewis Blvd	71	69	70
5. Francis Lewis Blvd	71	69	74

The noise readings at the proposed 2-story building (Receptors 1 and 2) which would be associated with the South Wing expansion, were below 65 dBA, which is in the "Acceptable" category as per the CEPO-CEQR Noise Exposure Standards.

The highest noise reading identified came fromthe corner of the LIE Eastbound Service Road and Francis Lewis Boulevard (Receptor 4); the reading was 71 dBA which is in the "Marginally Unacceptable" category. Therefore, according to the CEQR Technical Manual, noise attenuation of 28 dBA is required for the proposed expansion attached to the North Wing of the existing building.

The noise readings at the LIE Eastbound Service Road in front of the Receptor 3 were below 70 dBA which is in the "Marginally Acceptable" category. According to the CEQR Technical Manual, no noise attenuation is required for this location of the building expansion.

Additionally, the highest noise reading at the southern end of the East Wing/Francis Lewis Boulevard (Receptor 5) was 74 dBA which is in the "Marginally Unacceptable" category.

Based on the noise readings, to preclude the potential for significant adverse noise impacts related to noise, an (E) designation would be incorporated into the rezoning proposal for Queens Block 7128, Lot 2. The text of the (E) designation is as follows:

Block 7128, Lot 2

In order to ensure an acceptable interior noise environment, future institutional expansions must provide a closed window condition with minimum attenuation of 28 dB(A) window/wall attenuation on facades facing the Francis Lewis Boulevard and the Long Island Expressway Service Road in order to maintain an interior noise level of 45 dB(A). In order to maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning.

With this (E) designation in place, no significant adverse noise impacts related to noise are expected to result from the proposed action, and no further analysis is warranted.

Neighborhood Character

Neighborhood character is an amalgam of various elements that give a neighborhood its distinctive personality.

When a proposed project has the potential to result in significant adverse impacts in any subject area presented below, or when the project may have moderate effects on several of the elements that define a neighborhood's character an assessment is required.

The elements that define the neighborhood character include:

1- Land Use, Zoning and Public Policy;
2- Socioeconomic conditions;
3- Open Space
4- Historic and Cultural Resources;
5- Urban Design and Visual Resources;
6- Shadows;
7- Transportation; or
8- Noise

EXISTING CONDITIONS.

As described in the Land Use, Zoning and Public Policy section of this document, the character of the neighborhood within the 400-foot study radius is primarily residential, institutional and public parkland. Local commercial activity is concentrated north of the Horace Harding Expressway at the intersection with Francis Lewis Boulevard.

FUTURE NO-ACTION SCENARIO.

In the future no action scenario, the current R3-2 zoning district would remain and development on the subject site, PS 4Q and the public park would remain unchanged.

FUTURE WITH-ACTION SCENARIO.

The proposed rezoning would not result in any significant changes to the primary elements defining a neighborhood's character. The proposed zoning would not introduce a land use that would be in conflict with the current uses in the study area or permit any significant change in urban design criteria such that the project would be in conflict with existing urban design characteristics in the area. Additionally, the proposed zoning would not result in any significant alterations to surrounding block forms or to historic resources or views of those resources.

The proposed zoning change would not result in any significant socioeconomic conditions changes. The existing Saint Francis Preparatory School would remain on the site and be expanded resulting in improved educational service to the community. No direct or indirect displacement would occur as a result of the proposed action and the action would not have an

effect on the local real estate market. PS 4Q and the public parkland would continue to be available to the community. Also, no significant growth in housing development is anticipated as a result of the change in zoning.

Other than the Special Planned Community Preservation District (described in the Land Use, Zoning and Public Policy section of this document), there are no special zoning districts or areas of special zoning policy (e.g. any Urban Renewal areas) in or adjacent to the affected area.

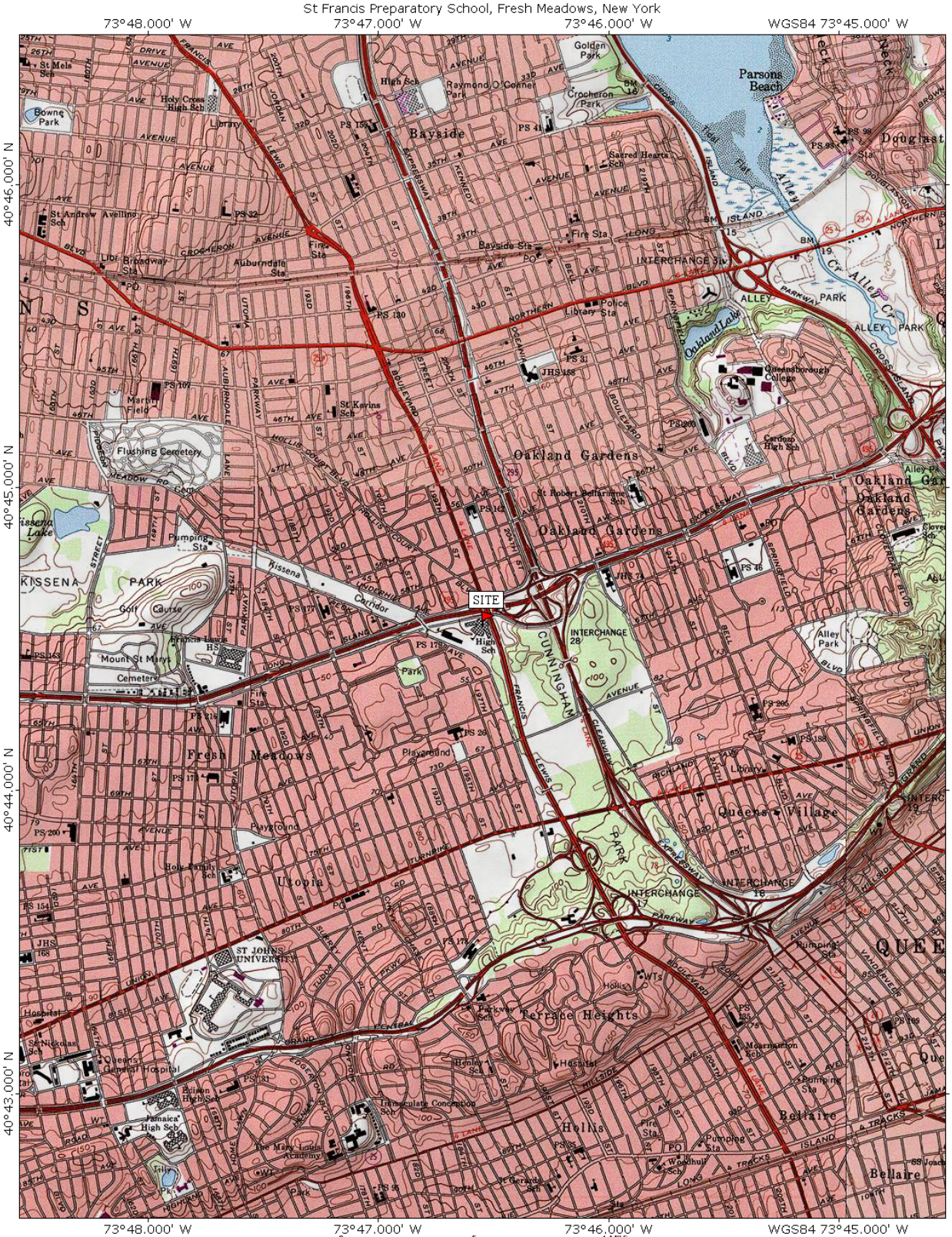
Therefore, as previously stated, the proposed action would not result in significant impact on the sections of Land Use, Zoning and Public Policy, Socioeconomic Conditions, Open Space, Historic and Cultural Resources, Urban Design and Visual Resources, Shadows, Transportation or Noise. Further, there would be no moderate impacts resulting from a combination of any these various study elements.

In accordance with the 2012 CEQR Technical Manual, no significant adverse impact related to neighborhood character impact is anticipated as a result from the proposed action and no further analysis is required.

Attachment 1

Site Location Map

St Francis Preparatory School, Fresh Meadows, New York



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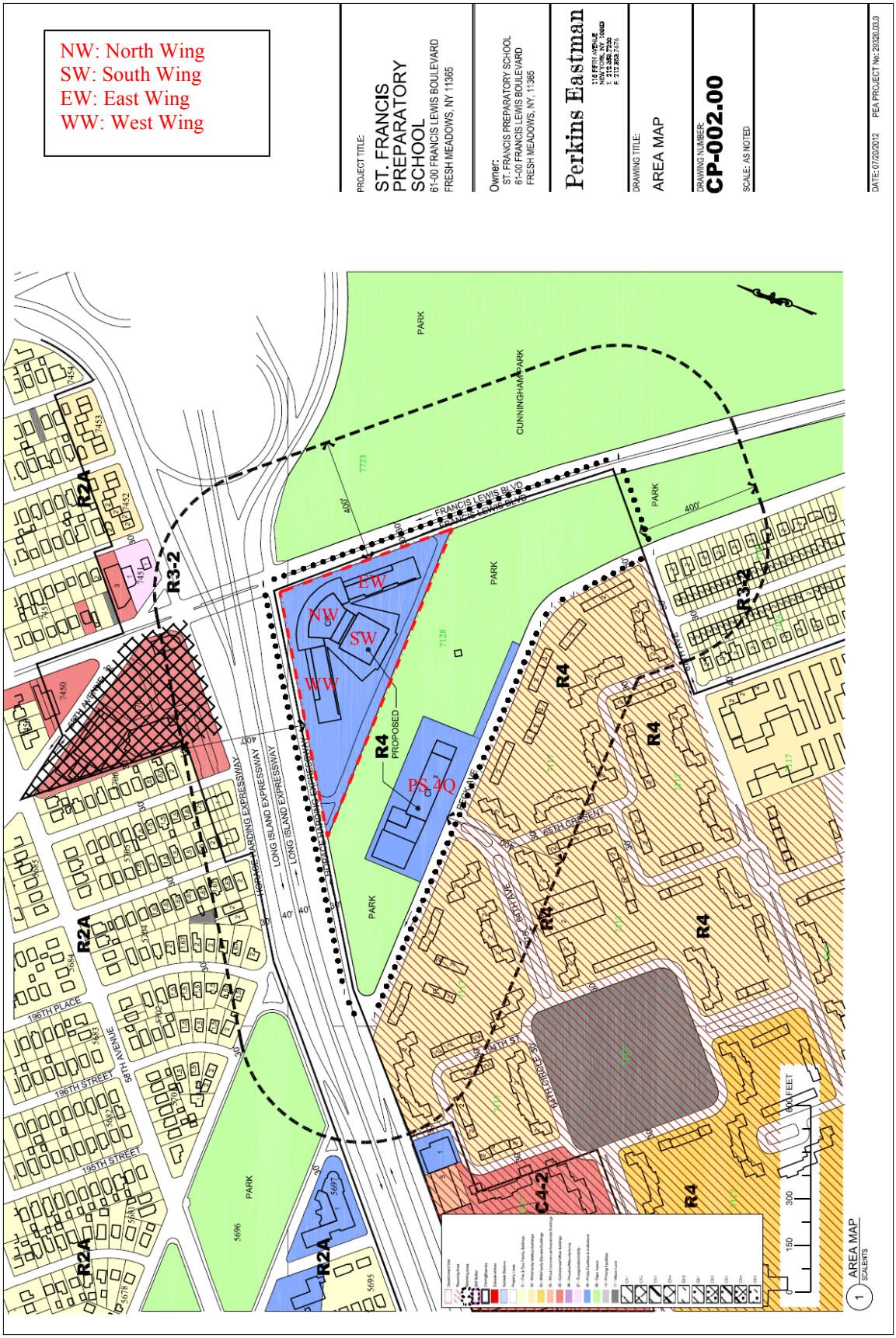
Attachment 2

Land Use Map

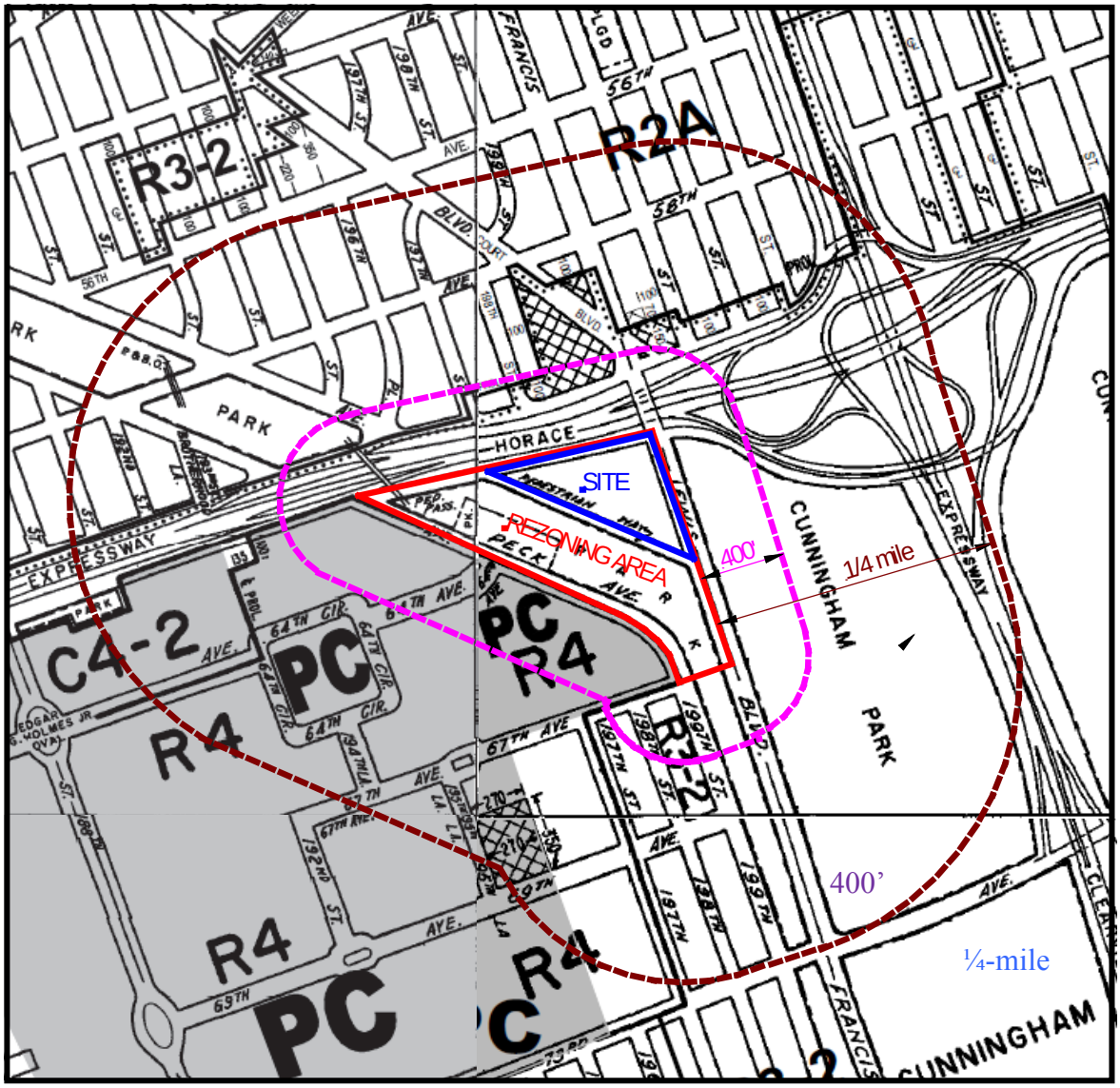
Land Use Map


NW: North Wing
SW: South Wing
EW: East Wing
WW: West Wing
PROJECT TITLE:
ST. FRANCIS PREPARATORY SCHOOL
61-00 FRANCIS LEWIS BOULEVARD
FRESH MEADOWS, NY 11365
Owner:
ST. FRANCIS PREPARATORY SCHOOL
61-00 FRANCIS LEWIS BOULEVARD
FRESH MEADOWS, NY, 11365
Perkins Eastman
DRAWING TITLE:
AREA MAP
DRAWING NUMBER:
CP-002.00
SCALE: AS NOTED
DATE: 07/20/2012
PEA PROJECT No: 29320.03.0
PARK
CUNNINGHAM PARK
FRANCIS LEWIS BLVD
R2A
R3-2
R4
R4 PROPOSED
PS 4Q
EW
NW
SW
WW
LONG ISLAND EXPRESSWAY
HORACE HARDING EXPRESSWAY
196TH PLACE
196TH STREET
195TH STREET
58TH AVENUE
85TH GOLF CLUB
C4-2
AREA MAP
SCALE: 1" = 300'-0"
0
150
300
600 FEET

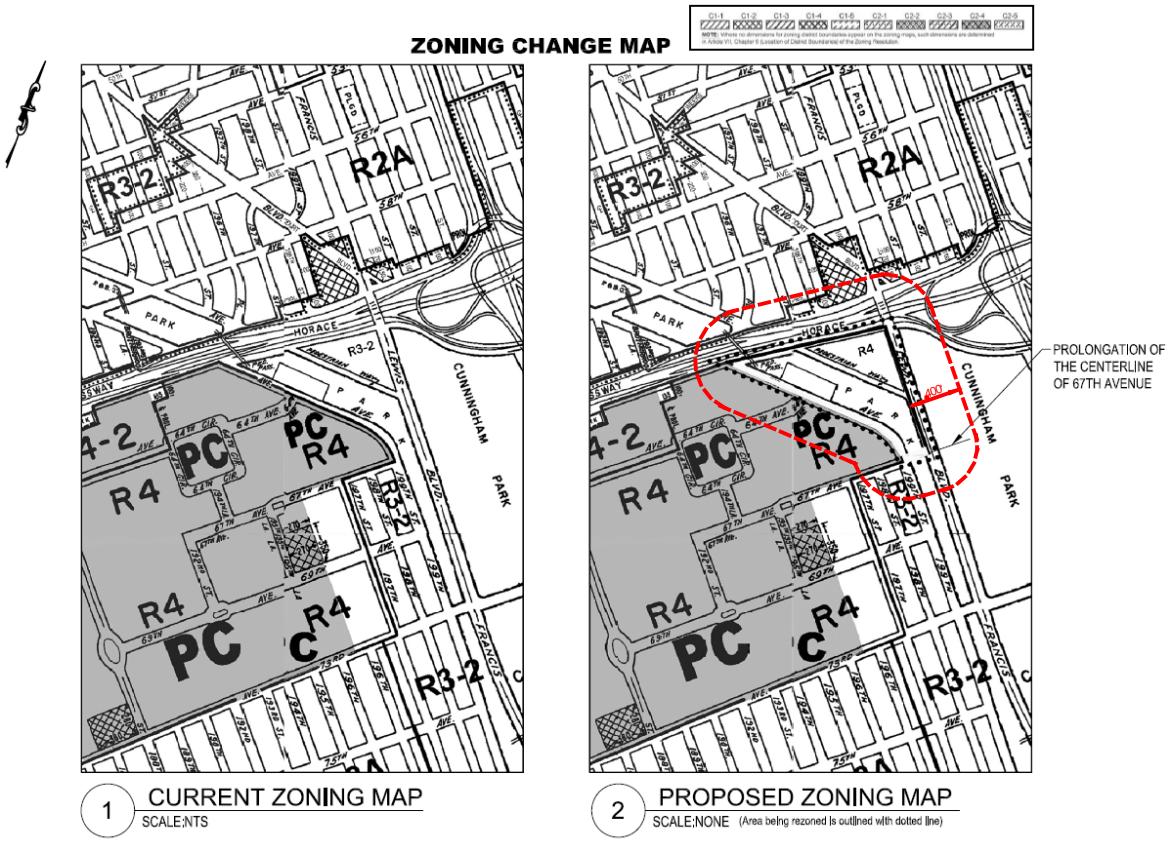
Attachment 3

Zoning Map

Zoning Map


R3-2
R2A
HORACE
SITE
REZONING AREA
400'
1/4 mile
CUNNINGHAM
PARK
EXPRESSWAY
C4-2
PC
R4
400'
¼-mile
NORTH
C1-1
C1-2
C1-3
C1-4
C1-5
C2-1
C2-2
C2-3
C2-4
C2-5

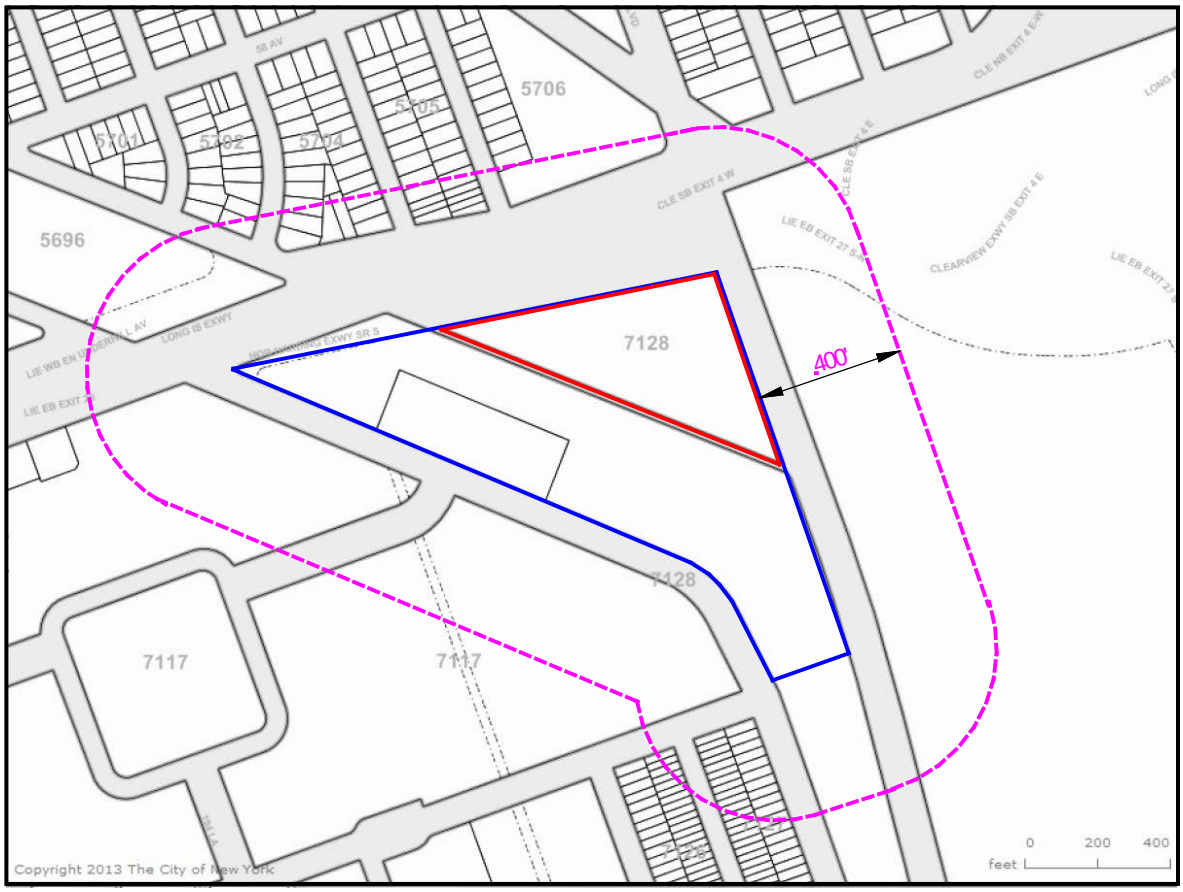
Zoning Map


ZONING CHANGE MAP
R3-2
R2A
R4
PC
C
PARK
HORACE
CUNNINGHAM
PROLONGATION OF
THE CENTERLINE
OF 67TH AVENUE
400'
1 CURRENT ZONING MAP
SCALE:NTS
2 PROPOSED ZONING MAP
SCALE:NONE (Area being rezoned is outlined with dotted line)

Attachment 4

Tax Map

Tax Map



Rezoning area

Project site

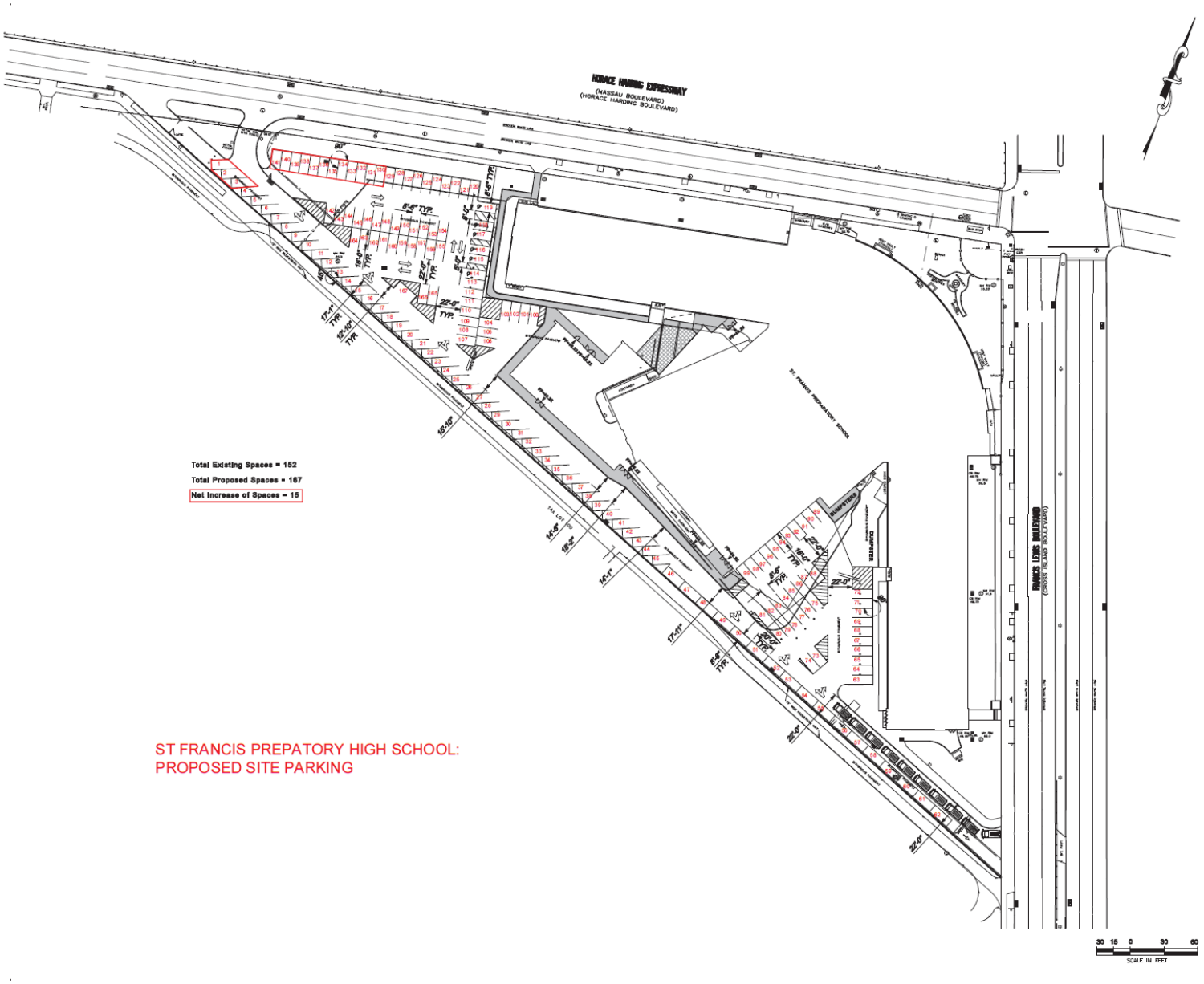
NORTH

Attachment 5

Site Plan

Existing Condition

The proposed project Plan



Perkins Eastman

PROJECT TITLE:
ST. FRANCIS PREP
PHASE: THREE
ADDITIONS &
RENOVATIONS

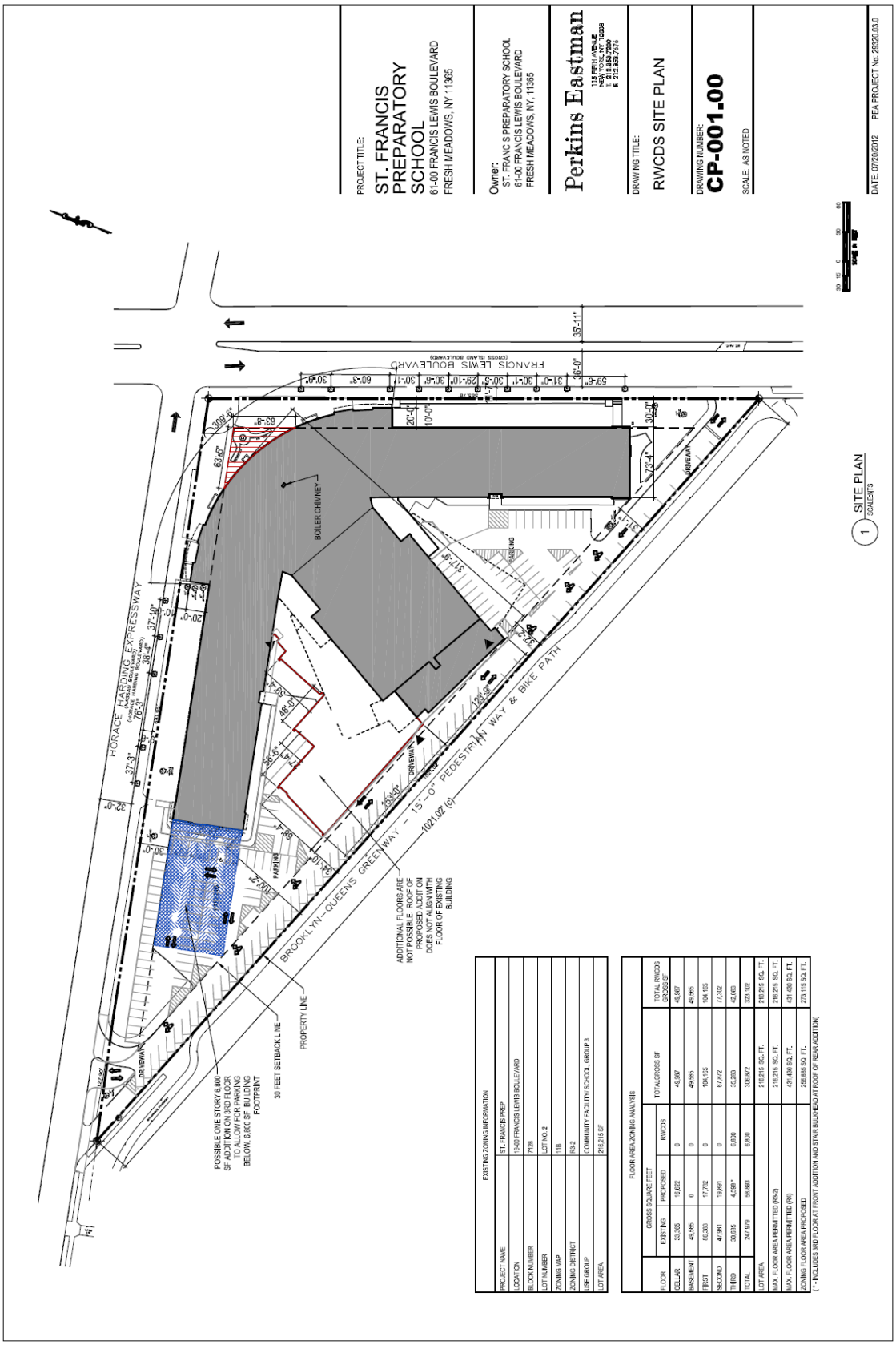
61-00 FRANCIS LEWIS BOULEVARD
FRESH MEADOWS, NY 11365

DRAWING TITLE:
PAVEMENT
MARKING
PLAN

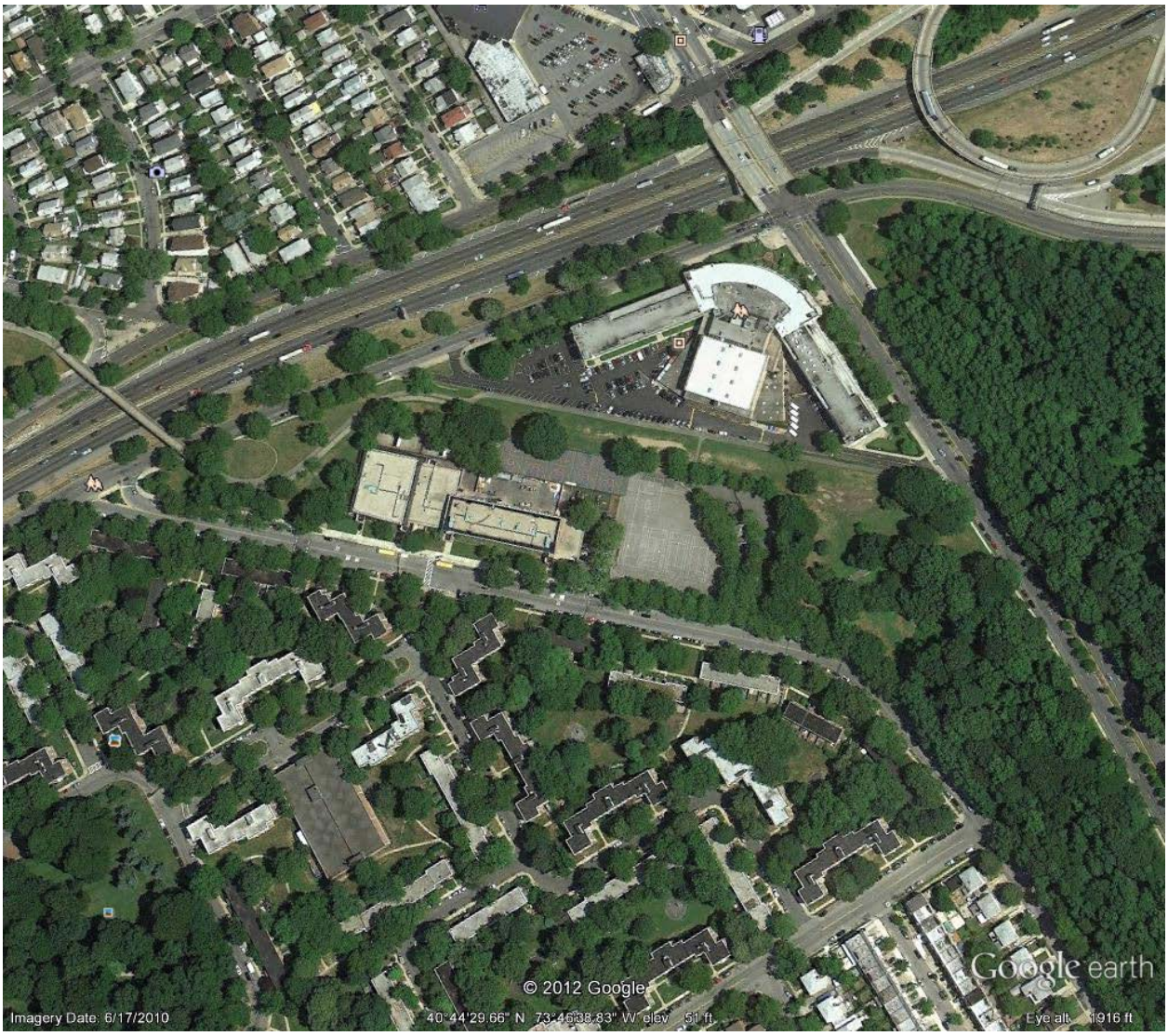
SCALE: 1"=30'-0" PAGE: OF XXXX

C-002.00

BLDG DEPT SUBMISSION
04/15/2009



The RWCDS With-Action Scenario Plan



Aerial Photo

Attachment 6

LPC Correspondence

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: NO LEAD AGENCY / NL-CEQR-Q
Project: ST. FRANCIS PREP
Address: 61-00 FRANCIS LEWIS BLVD, **BBL:** 4071280002
Date Received: 11/9/2011

[X] No architectural significance

[X] No archaeological significance

[ ] Designated New York City Landmark or Within Designated Historic District

[ ] Listed on National Register of Historic Places

[ ] Appears to be eligible for National Register Listing and/or New York City Landmark Designation

[ ] May be archaeologically significant; requesting additional materials

Comments:

Gina Santucci 11/10/2011

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 27829_FSO_DNP_11102011.doc

NYC Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: DEPARTMENT OF CITY PLANNING / 13DCP081Q
Project: ST. FRANCIS PREP
Date received: 2/6/2013

Properties with no Architectural or Archaeological significance:

1) ADDRESS: 61-00 FRANCIS LEWIS BLVD, BBL: 4071280002
2) ADDRESS: 195-61 PECK AVENUE, BBL: 4071280010
3) ADDRESS: PECK AVENUE, BBL: 4071280100

Gina Santucci 2/17/2013

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 27829_FSO_GS_02072013.doc

Attachment 7

Photographs

Photographs

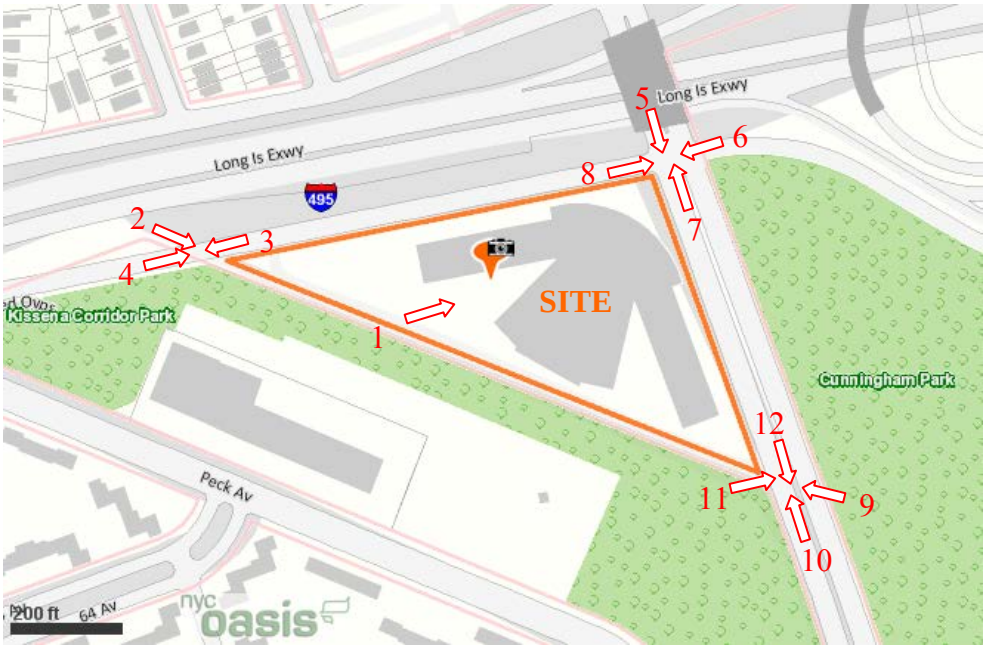




Photo Index

Photographs



1. Looking at the project site



2. Looking at the project site from LIE Eastbound Service Rd at Ped Way

Photographs



3. Looking due west on LIE Eastbound Service Rd from Ped Way



4. Looking due east on LIE Eastbound Service Rd from Ped Way

Photographs



5. Looking due south on Francis Lewis Blvd from LIE Eastbound Service Rd



6. Looking due west on LIE Eastbound Service Rd from Francis Lewis Blvd

Photographs



7. Looking due south on Francis Lewis Blvd from LIE Eastbound Service Rd


8. Looking due east on LIE Eastbound Service Rd from Francis Lewis Blvd

Photographs



9. Looking at the project site on Ped Way from Francis Lewis Blvd



10. Looking due north on Francis Lewis Blvd from Ped Way

Photographs



11. Looking due east on Ped Way from Francis Lewis Blvd



12. Looking due south on Francis Lewis Blvd from Ped Way

Attachment 8

DEP Correspondents

NYC Environmental Protection

Carter H. Strickland, Jr.
Commissioner

Angela Licata
Deputy Commissioner
of Sustainability
alicata@dep.nyc.gov

59-17 Junction Boulevard
Flushing, NY 11373
T: (718) 595-4398
F: (718) 595-4479

February 21st, 2013

Mr. Robert Dobruskin
Director, Environmental Assessment and Review Division
New York City Department of City Planning
22 Reade Street, Room 4E
New York, New York 10007-1216

Re: Francis Lewis Blvd Rezoning
61-00 Francis Lewis Blvd.
Block 7128, Lots 2, 10, p/o Lot 100
DEP # 13DEPTECH040Q / CEQR # 13DCP081Q
Queens, New York.

Dear Mr. Dobruskin:

The New York City Department of Environmental Protection, Bureau of Environmental Planning and Analysis (DEP) has reviewed the January 2013 Environmental Assessment Statement (EAS) and the January 2013 Phase I Environmental Site Assessment Report (Phase 1), prepared by Sustainable Management LLC. on behalf of St. Francis Preparatory School (applicant) for the above referenced project. It is our understanding that the applicant is seeking a zoning map amendment from the New York City Department of City Planning (DCP) to rezone Block 7128, Lots 2, 10 & p/o 100 from R3-2 to R4. The proposed action would facilitate a proposal by the applicant to enlarge an existing community facility building, the St. Francis Preparatory School, by adding approximately 58,893 gross square feet of floor area to the existing school building (Block 7128 Lot 2). The development site is bounded by the LIE Eastbound Service Road, Peck Avenue and Francis Lewis Blvd, in the Fresh Meadow neighborhood of Queens, Community District 8. It should be noted that Lot 2 is under the control or ownership of the applicant, while lots 10 & p/o Lot 100 are not under the control or ownership of the applicant.

The January 2013 Phase I report revealed that on-site and surrounding area land uses consists of school, residential, commercial and park/open space. An active 10,000-gallon aboveground oil storage tank was observed in the basement of the existing building, as well as a 15,000-gallon underground oil storage tank on site which has been previously closed. Suspected Asbestos Containing Material (ACM) in floor tiles (9" x 9") were noted in the class rooms, laboratories and offices of the existing building. The New York State Department of Environmental Conservation (NYSDEC) SPILLS database revealed 2 spills sites within a 1/8-mile radius of the project site, both of these spills have a closed status.

Based upon our review of the submitted documentation, we have the following comments and recommendations to DCP:

Block 7128 Lot 2 (Applicant controlled site)

- DCP should inform the applicant to submit a site-specific Construction Health and Safety Plan (CHASP) for the proposed renovation/construction project. The CHASP should be submitted to DEP for review and approval. Soil disturbance should not occur without DEP written approval of the CHASP.

- DCP should inform the applicant that suspected ACM may be present in the on-site structure. This material should be properly removed and/or managed prior to the start of the renovation/construction activities and disposed of in accordance with all federal, state, and local regulations.

Block 7128, 10 and p/o Lot 100 (Sites not owned or under the control of the applicant)

Please note that the above comments pertain to Lot 2, the applicant development site. The January 2013 ESA does not clarify whether Lots 10 and p/o Lot 100 are likely to be developed as a result of the subject action. However, in the event that other lots are identified as potential development sites, the potential for hazardous materials impacts and the need for (E) designations should be considered at that time."

Future correspondence related to this project should include the following tracking number **13DEPTECH040Q**. If you have any questions, you may contact Ms. Cassandra Scantlebury at (718) 595-6756.

Sincerely,

Maurice S. Winter
Deputy Director, Site Assessment

c: E. Mahoney
M. Winter
C. Scantlebury
W. Yu
T. Estesen
M. Wimbish
C. Evans- DCP
File

NYC Environmental Protection

Carter H. Strickland, Jr.
Commissioner

Angela Licata
Deputy Commissioner
of Sustainability
alicata@dep.nyc.gov

59-17 Junction Boulevard
Flushing, NY 11373
T: (718) 595-4398
F: (718) 595-4479

March 6th, 2013

Mr. Robert Dobruskin
Director, Environmental Assessment and Review Division
New York City Department of City Planning
22 Reade Street, Room 4E
New York, New York 10007-1216

Re: Francis Lewis Blvd Rezoning
61-00 Francis Lewis Blvd.
Block 7128, Lots 2, 10, p/o 100
DEP # 13DEPTECH040Q / CEQR # 13DCP081Q
Queens, New York.

Dear Mr. Dobruskin:

The New York City Department of Environmental Protection, Bureau of Environmental Planning and Analysis (DEP) has reviewed the March 2013 Construction Health and Safety Plan (CHASP), prepared by Sustainable Management LLC. on behalf of St. Francis Preparatory School (applicant) for the above referenced project. It is our understanding that the applicant is seeking a zoning map amendment from the New York City Department of City Planning (DCP) to rezone Block 7128, Lots 2, 10 & p/o 100 from R3-2 to R4. The proposed action would facilitate a proposal by the applicant to enlarge an existing community facility building, the St. Francis Preparatory School, by adding approximately 58,893 gross square feet of floor area to the existing school building (Block 7128 Lot 2). The development site is bounded by the LIE Eastbound Service Road, Peck Avenue and Francis Lewis Blvd, in the Fresh Meadow neighborhood of Queens, Community District 8.

Based upon our review of the submitted documentation, we have the following comments and recommendations to DCP:

Construction Health and Safety Plan (CHASP)

- DCP should instruct the applicant to include the names and phone numbers of the Project Manager, Site Health and Safety Officer and Alternate in the CHASP.

DEP finds the March 2013 CHASP for the proposed project acceptable as long as the aforementioned information is incorporated into the CHASP.

Future correspondence related to this project should include the following tracking number **13DEPTECH040Q**. If you have any questions, you may contact Ms. Cassandra Scantlebury at (718) 595-6756.

Sincerely,

Maurice S. Winter
Deputy Director, Site Assessment

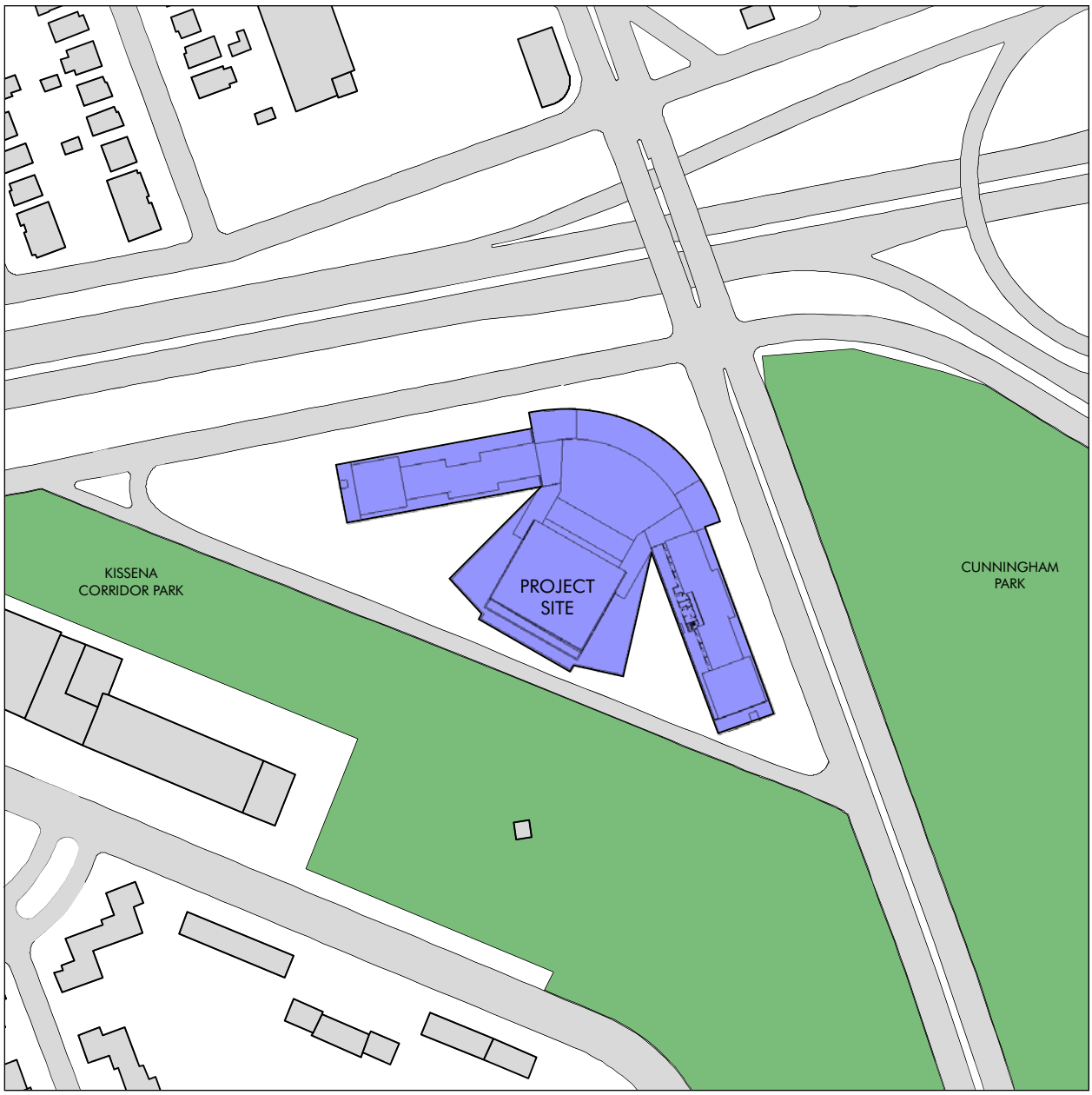
c: E. Mahoney
M. Winter
C. Scantlebury
W. Yu
T. Estesen
M. Wimbish
C. Evans- DCP
O. Abinader-DCP
File

Attachment 9

Shadow Study

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 1 - BASE MAP



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

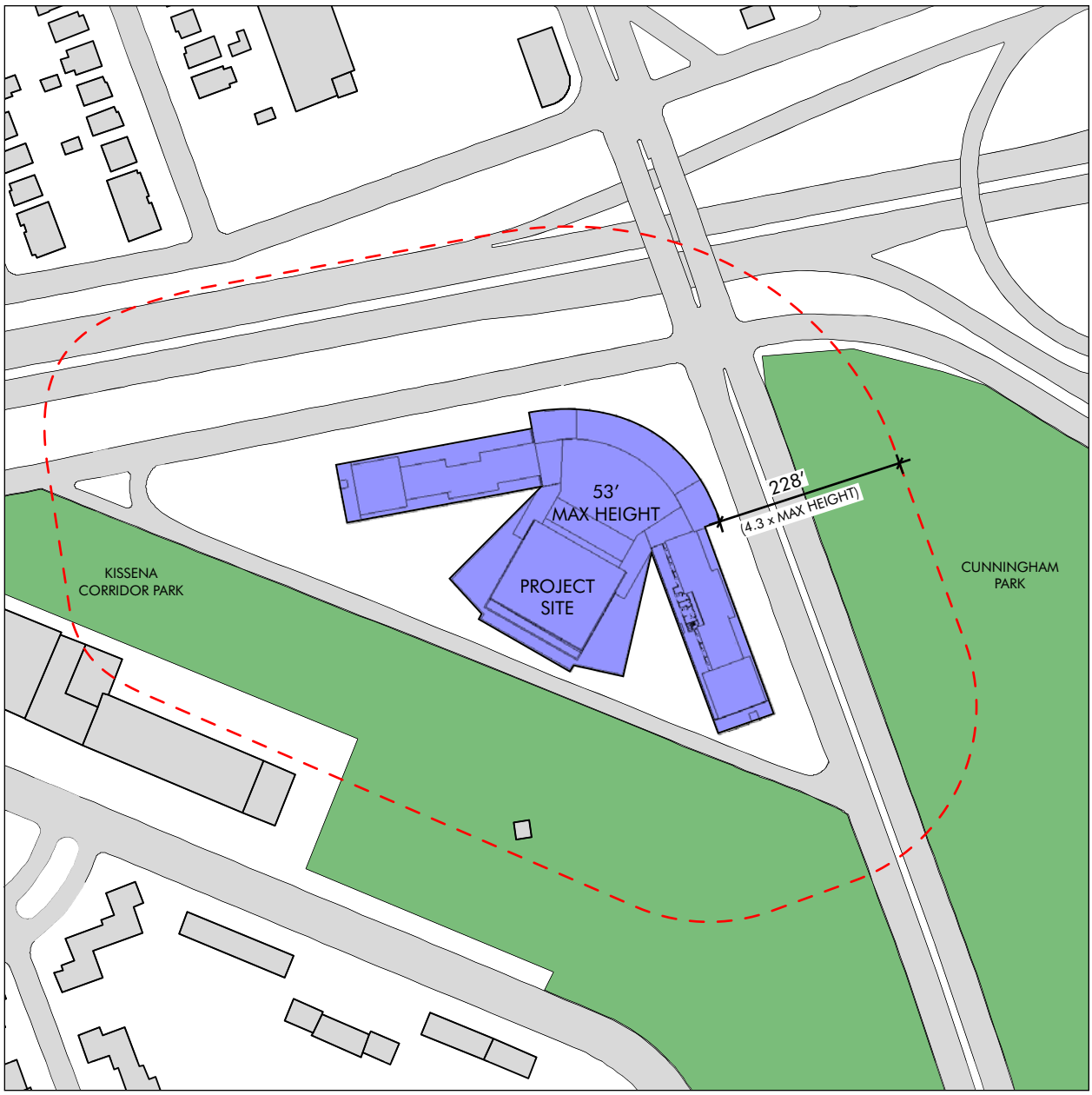
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 2 - LONGEST POTENTIAL SHADOW



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

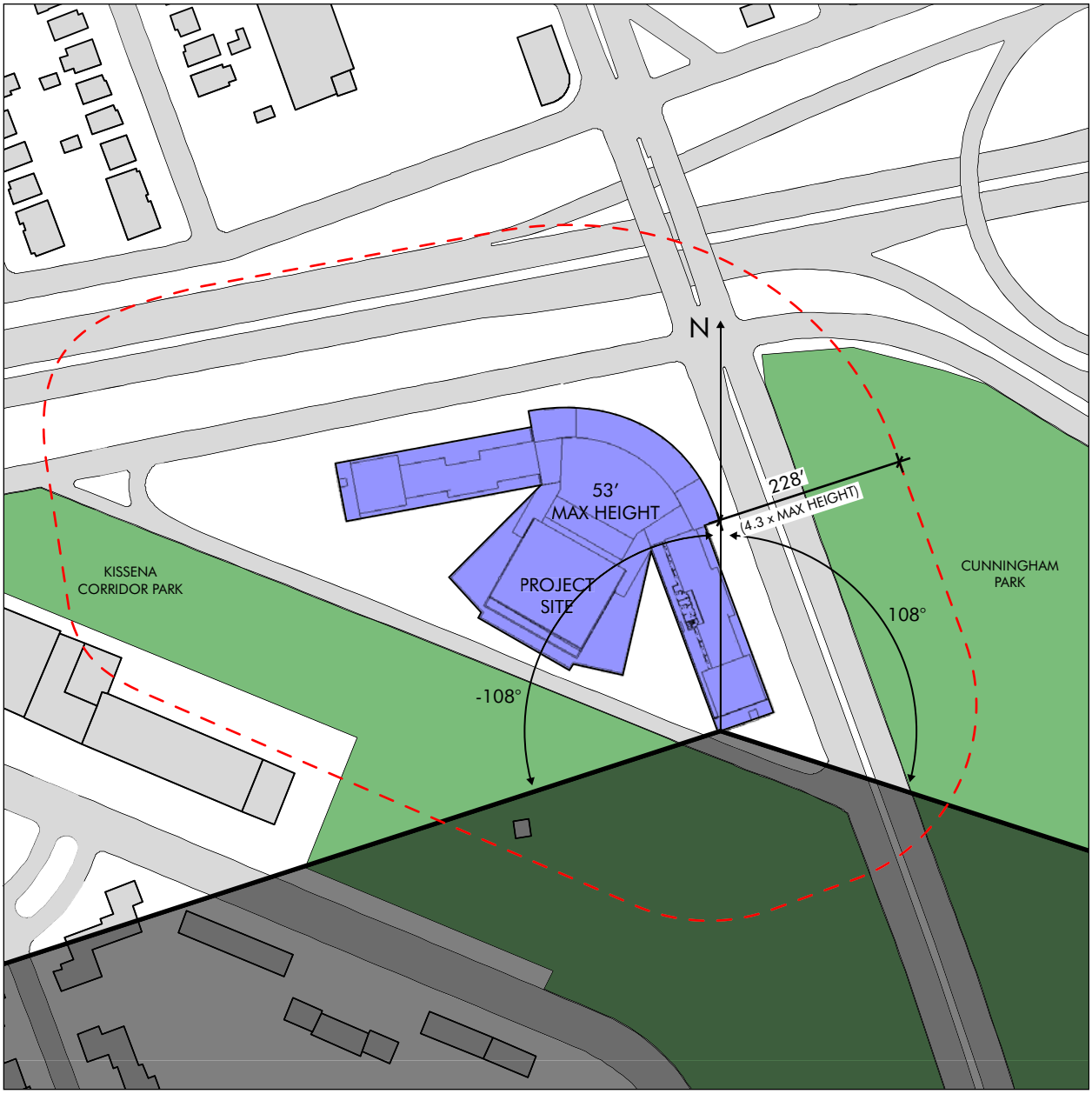
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0' 100' 500'

N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 3 - AREA THAT CANNOT BE SHADED BY THE PROPOSED ACTION



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

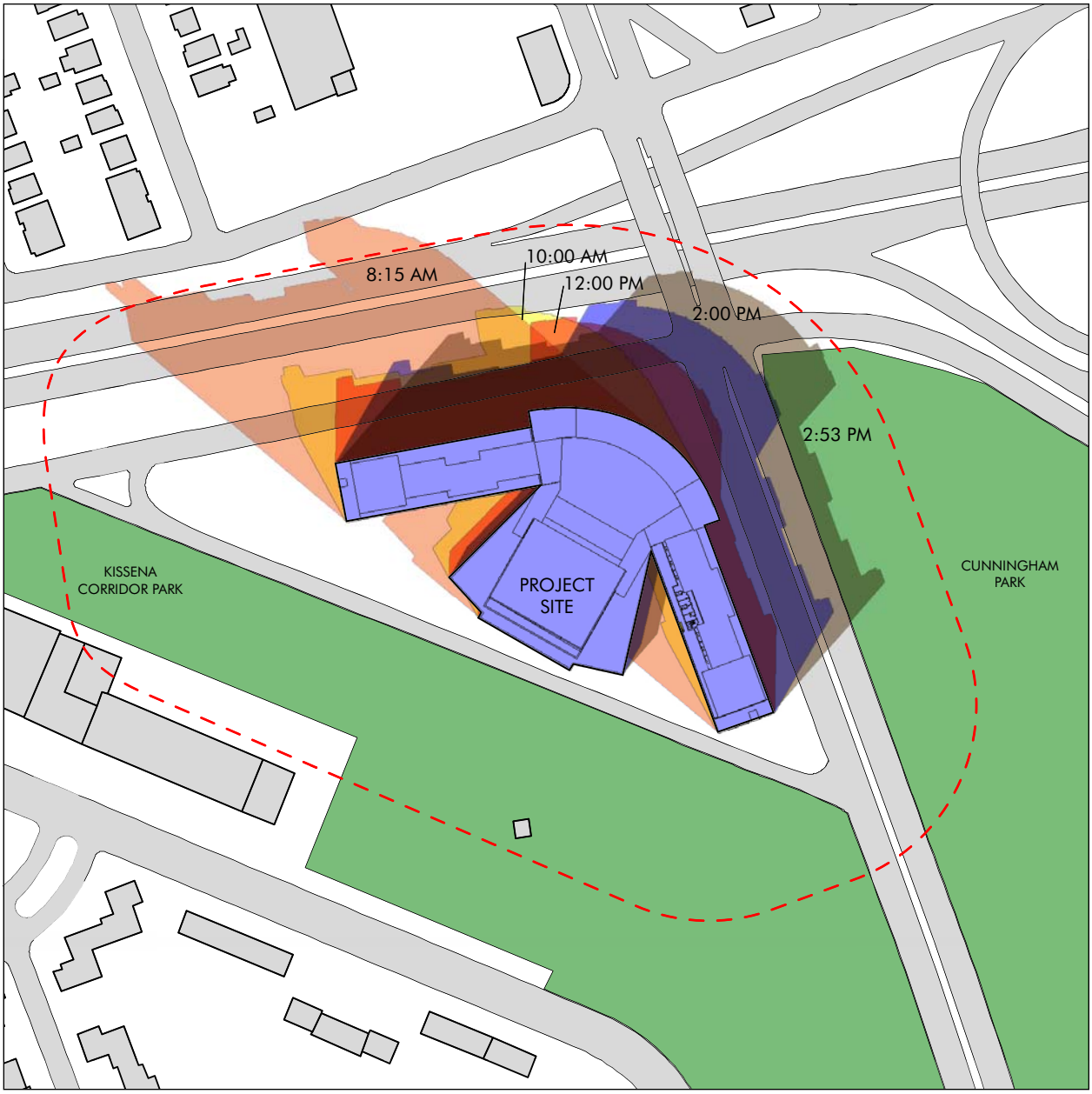
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 4 - TIER 3 SHADOW ASSESSMENT, EXISTING, DEC 21ST



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

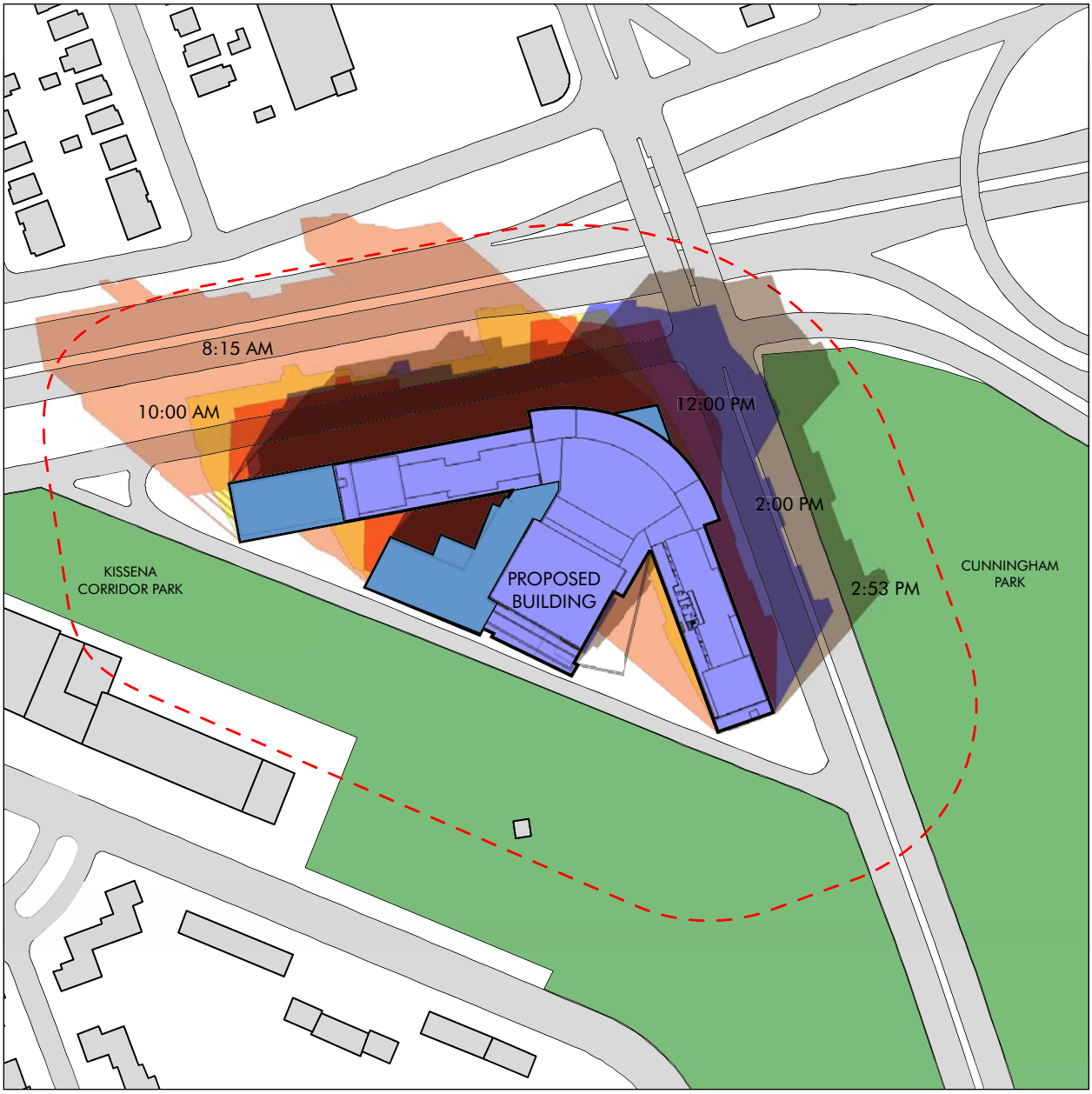
LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

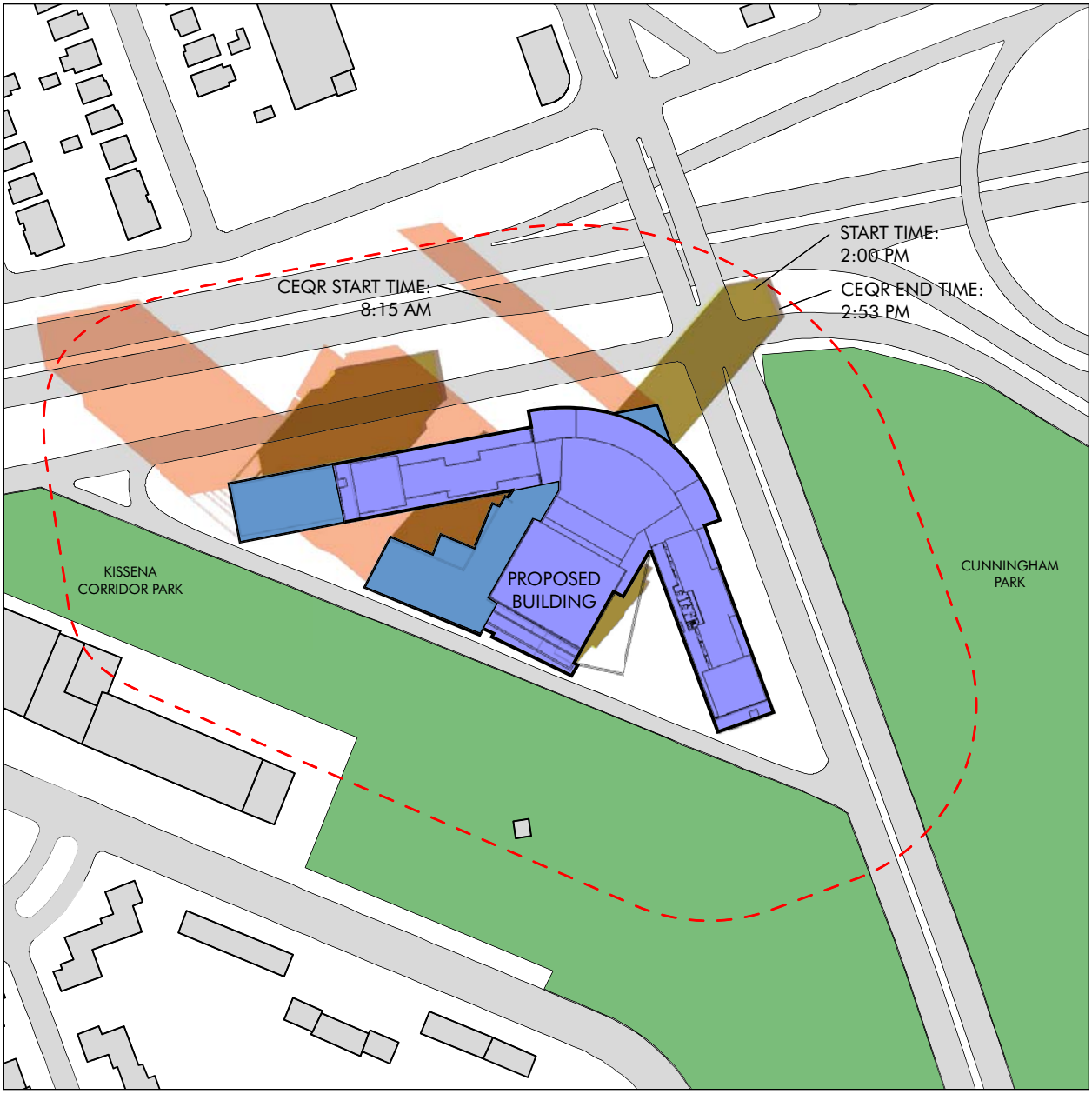
AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 5A - TIER 3 SHADOW ASSESSMENT, PROPOSED, DEC 21ST - START/END TIMES



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

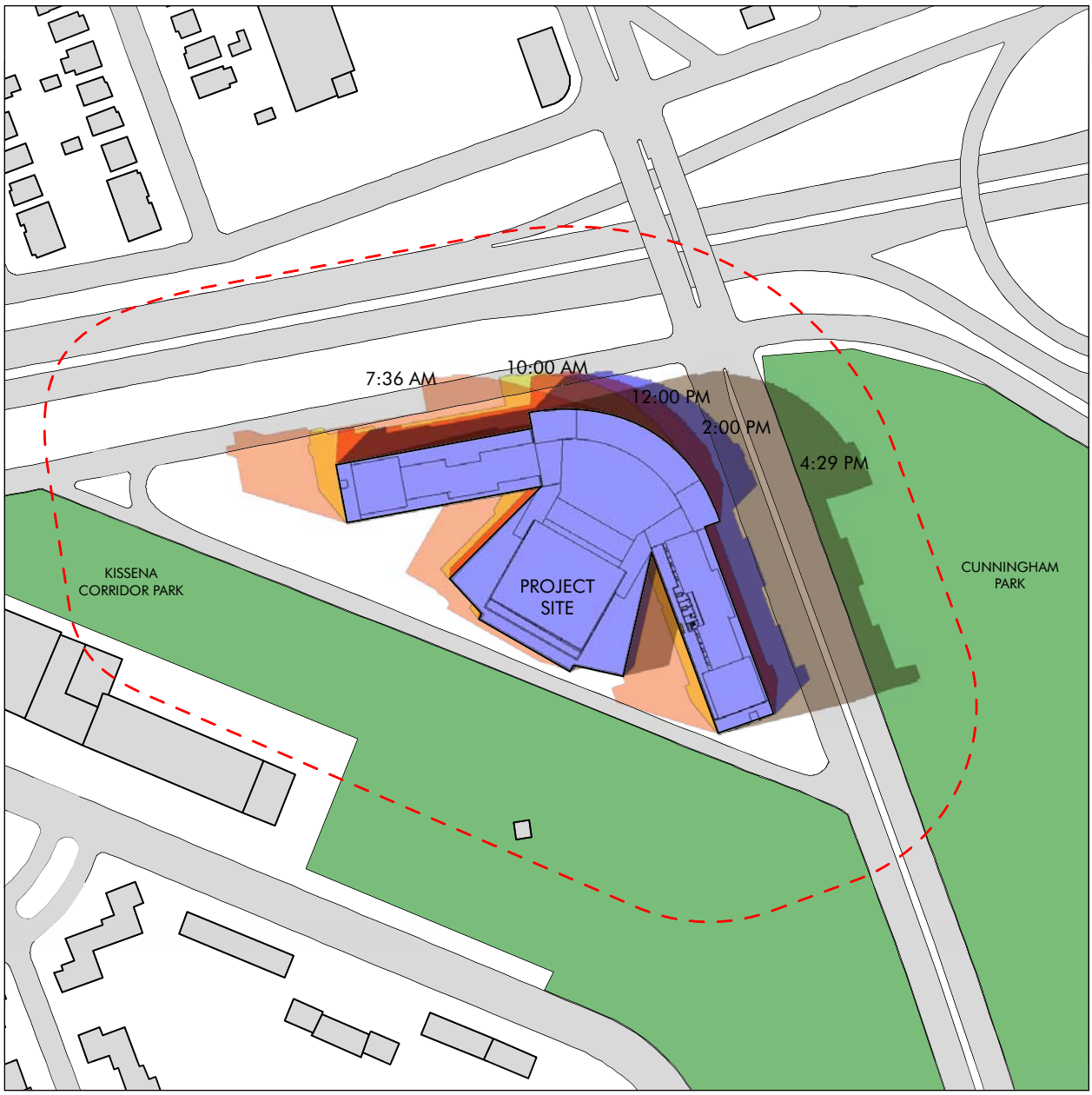
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 6 - TIER 3 SHADOW ASSESSMENT, EXISTING, MAR/SEPT 21ST



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

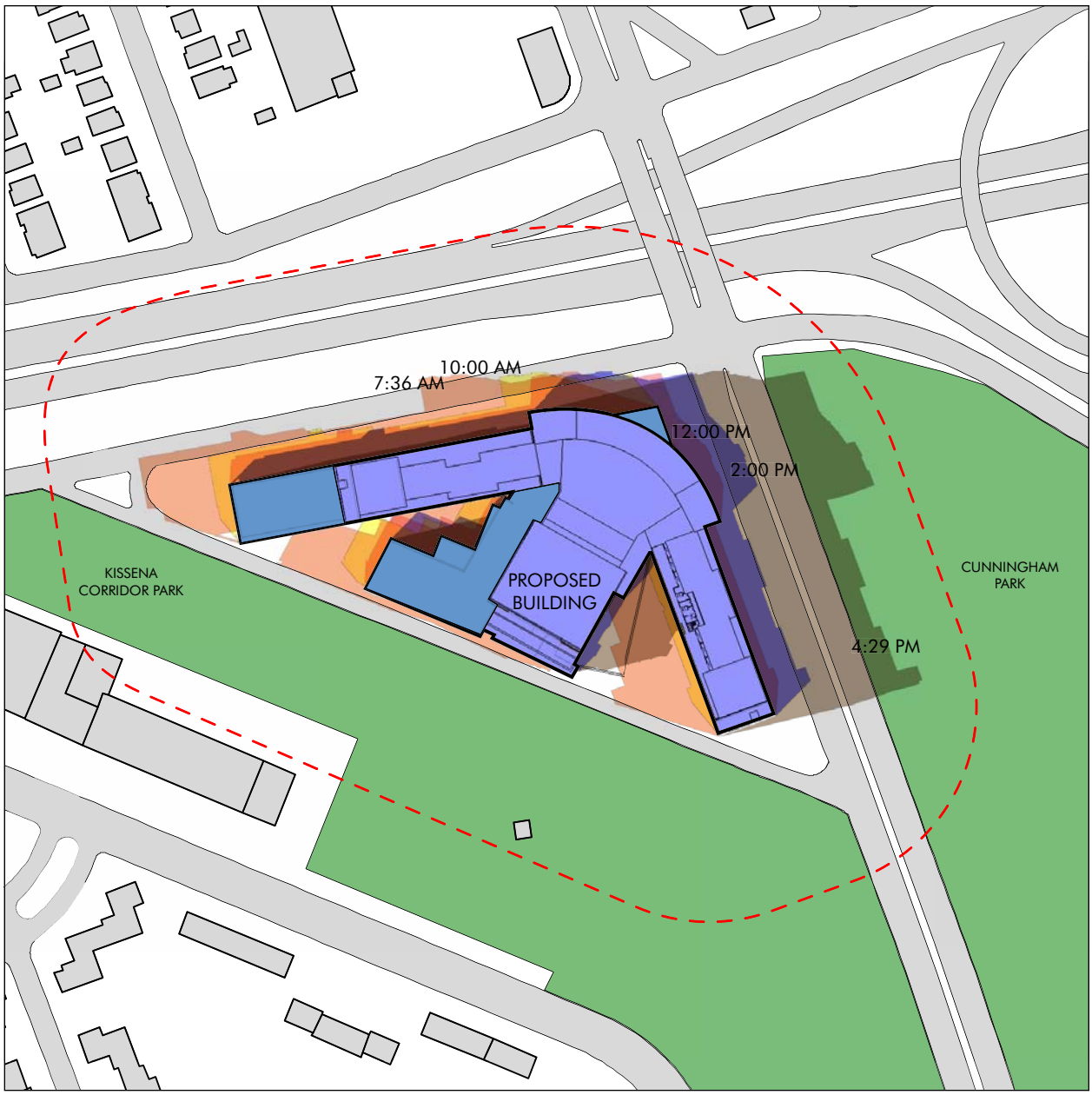
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

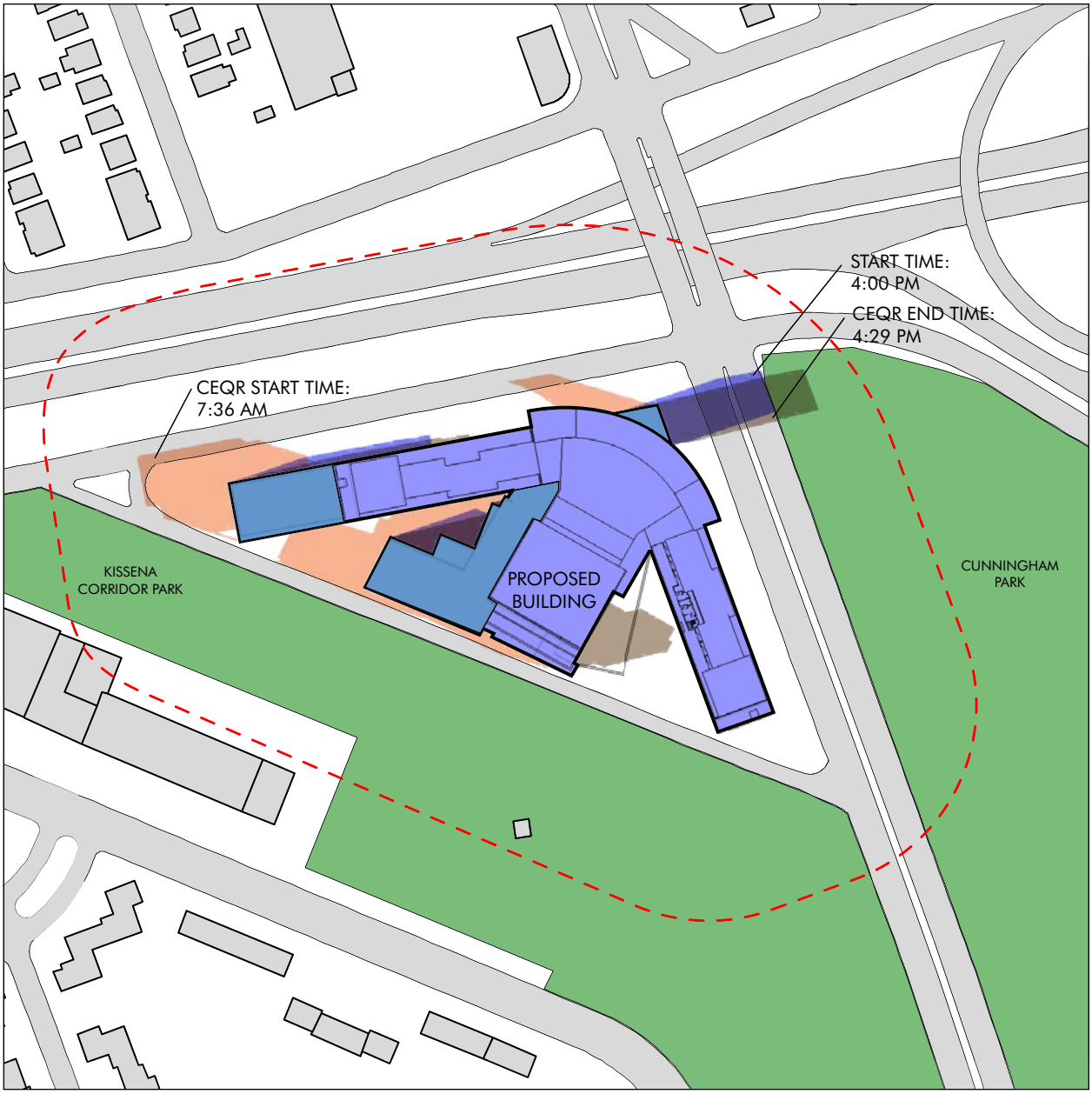
St. Francis Preparatory School - Building Shadow Assessment

FIGURE 7 - TIER 3 SHADOW ASSESSMENT, PROPOSED, MAR/SEPT 21ST



St. Francis Preparatory School - Building Shadow Assessment

FIGURE 7A - TIER 3 SHADOW ASSESSMENT, PROPOSED, MAR/SEPT 21ST - START/END TIMES



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

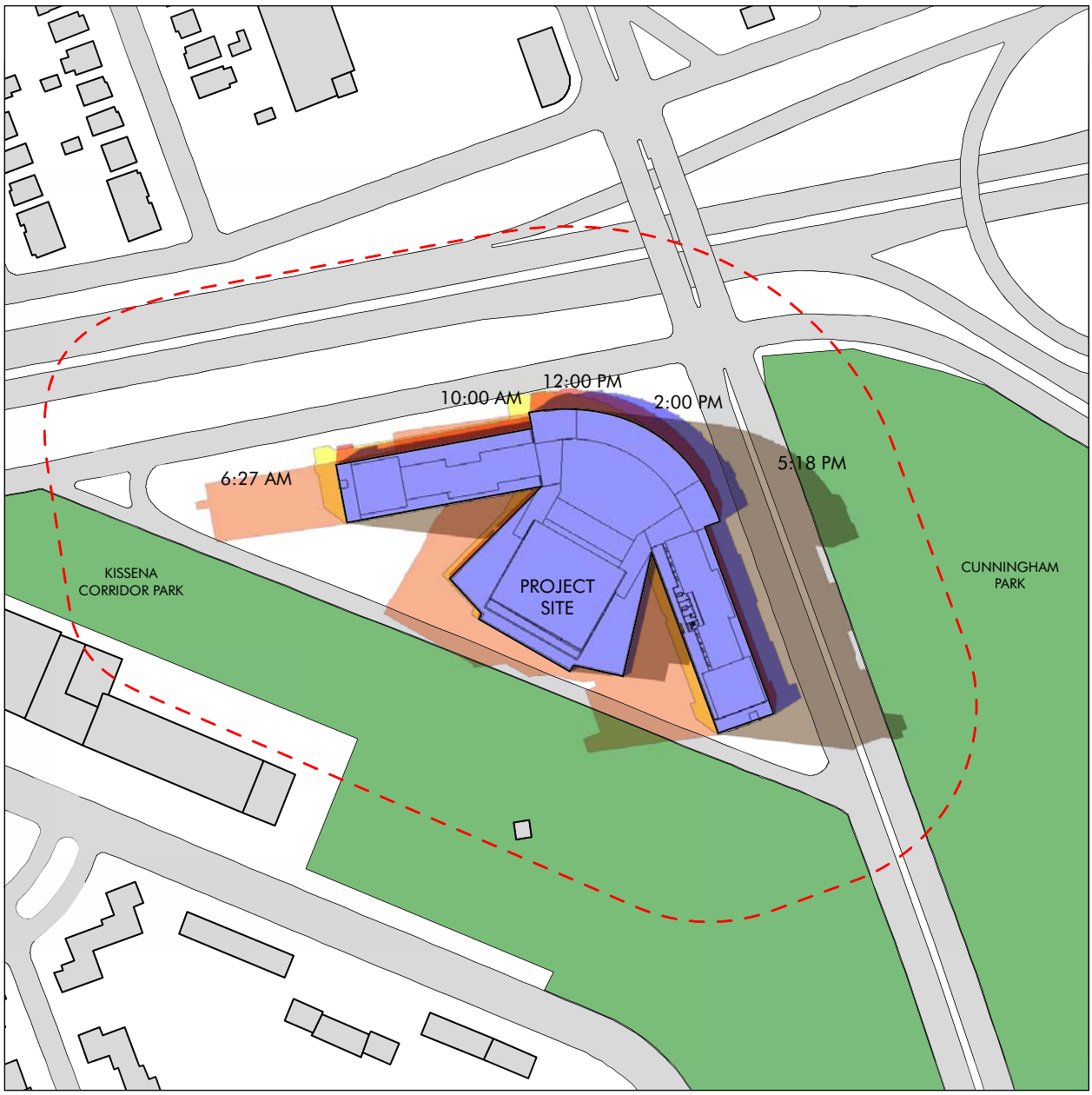
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 8 - TIER 3 SHADOW ASSESSMENT, EXISTING, MAY/AUG 6TH



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

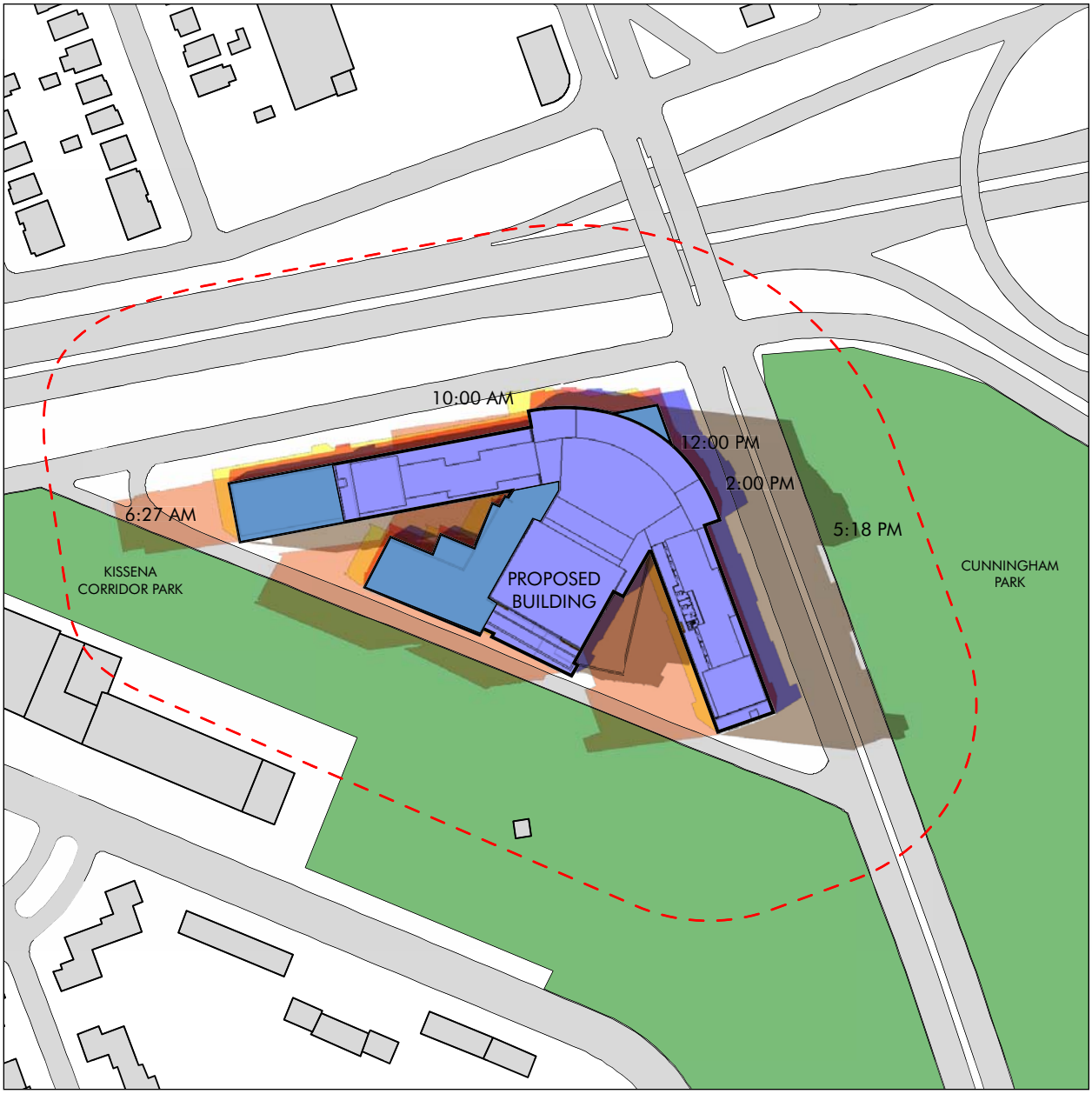
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 9 - TIER 3 SHADOW ASSESSMENT, PROPOSED, MAY/AUG 6TH



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

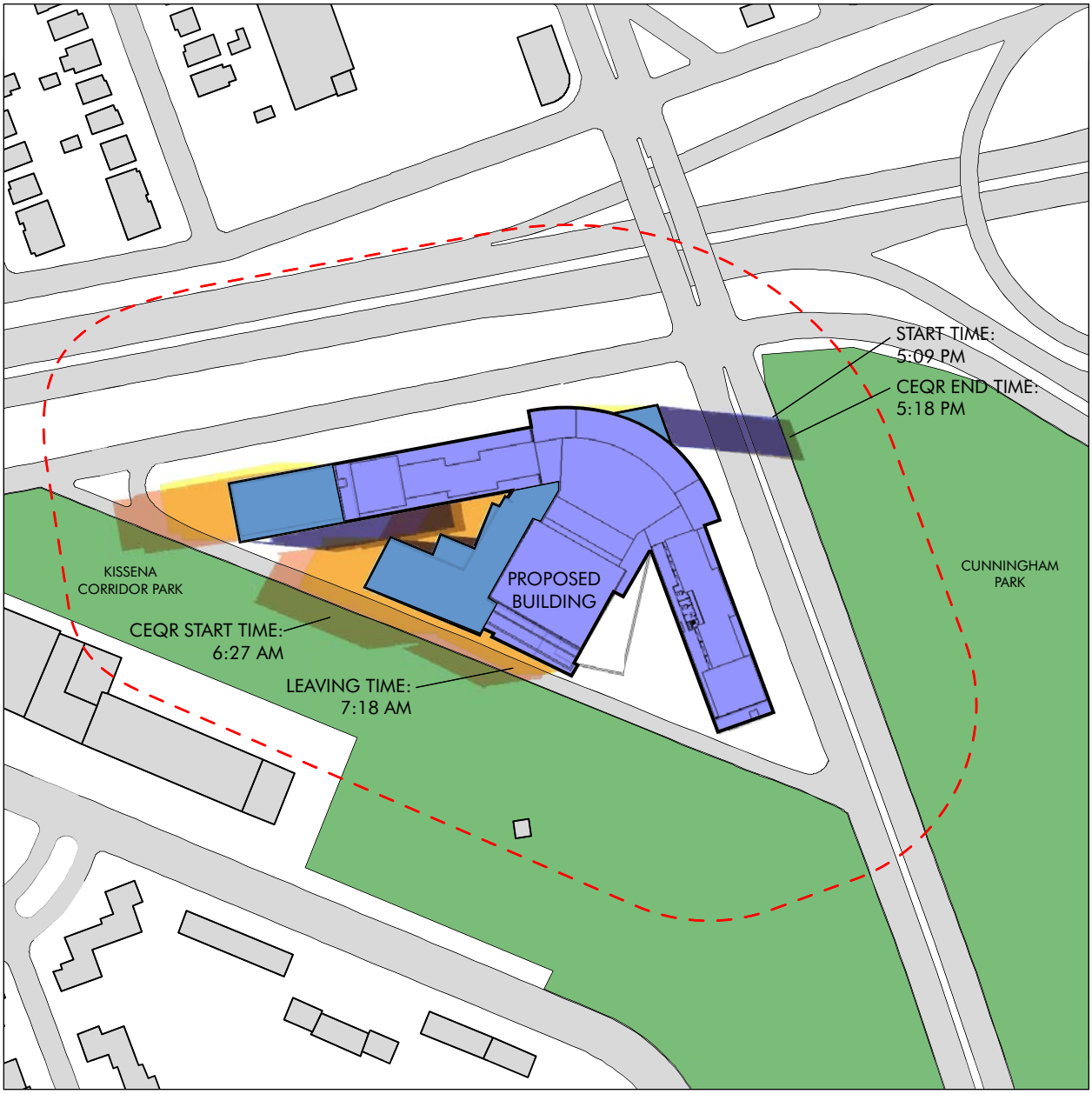
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 9A - TIER 3 SHADOW ASSESSMENT, PROPOSED, MAY/AUG 6TH - START/END TIMES



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 10 - TIER 3 SHADOW ASSESSMENT, EXISTING, JUNE 21ST



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 11 - TIER 3 SHADOW ASSESSMENT, PROPOSED, JUNE 21ST



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

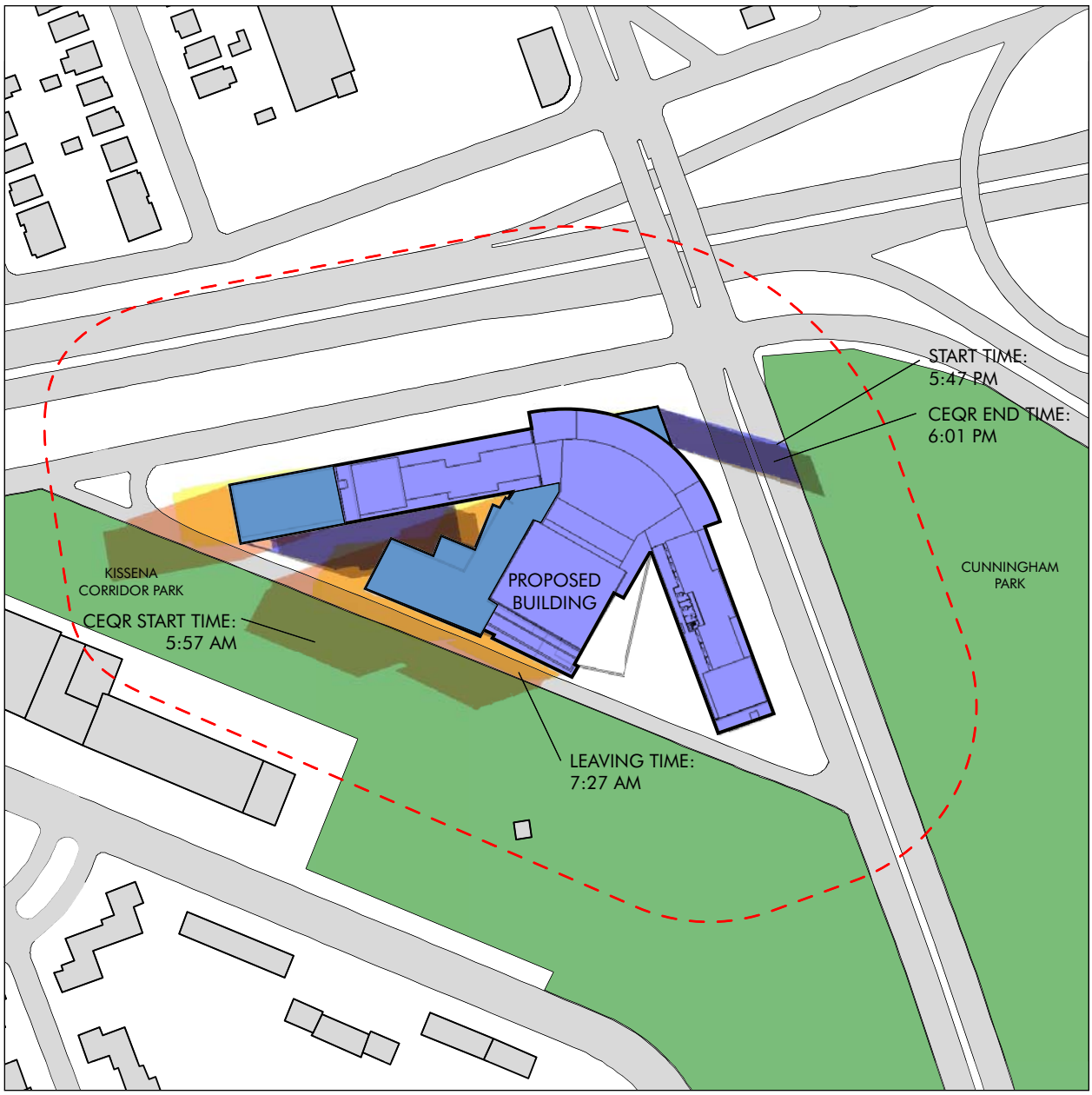
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 11A - TIER 3 SHADOW ASSESSMENT, PROPOSED, JUNE 21ST - START/END TIMES



EXISTING BUILDING

RWCDS WITH-ACTION BUILDINGS

SUNLIGHT-SENSITIVE RESOURCE

LONGEST SHADOW STUDY AREA BOUNDARY (*CEQR, TIER 1*)

AREA THAT CANNOT BE SHADED BY THE EXISTING/PROPOSED BUILDING (*CEQR, TIER 2*)

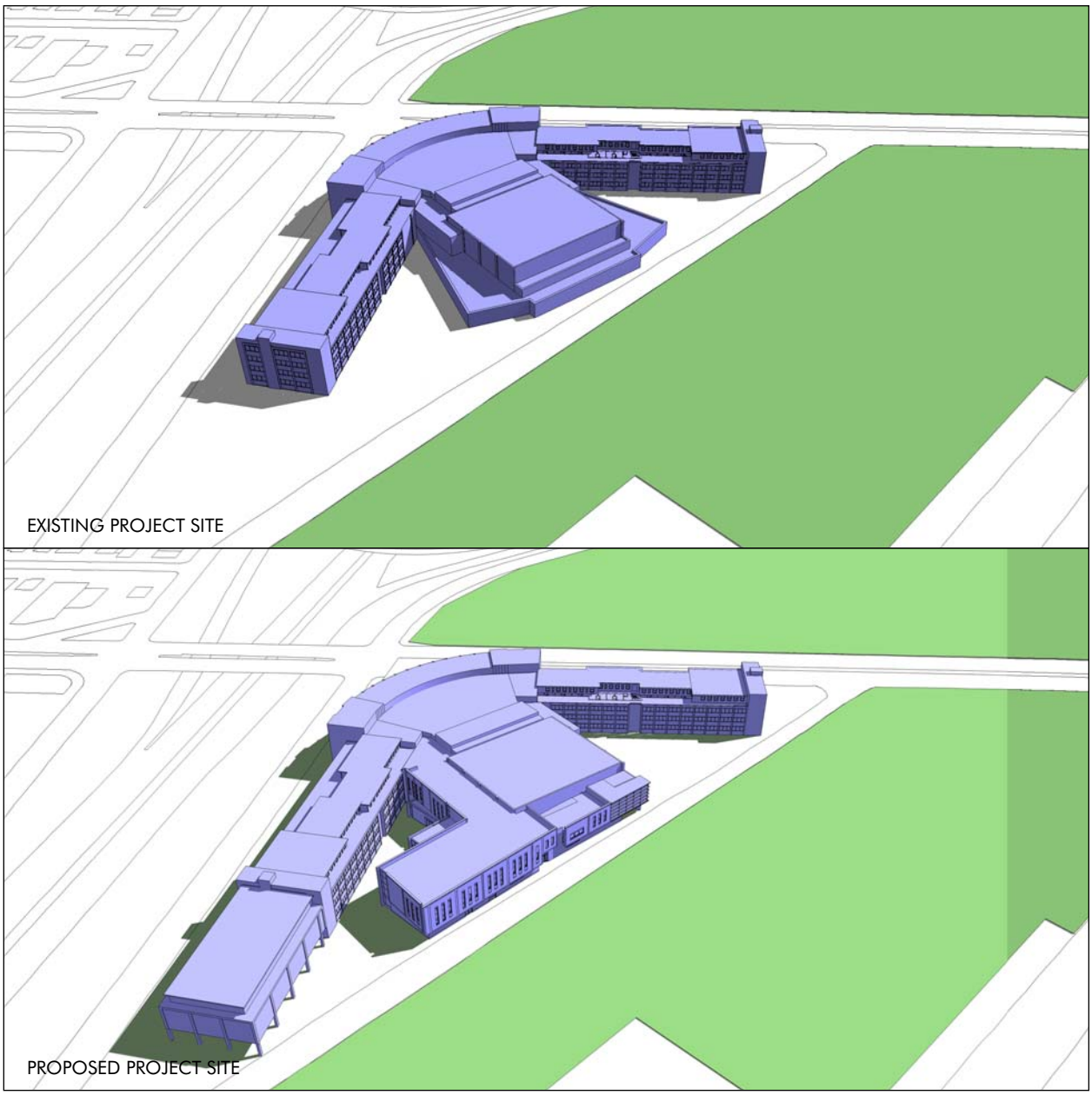
SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

SHADOW FROM RWCDS BUILDING (*CEQR, TIER 3*)

0′ 100′ 500′ N

St. Francis Preparatory School - Building Shadow Assessment

FIGURE 12 - THREE-DIMENSIONAL MODELS USED FOR SHADOW ASSESSMENT



PROJECT SITE

SUNLIGHT-SENSITIVE RESOURCE

SHADOW FROM EXISTING/PROPOSED BUILDING (*CEQR, TIER 3*)

Attachment 10

AQ-Boiler Information

amaconsulting
engineers, p.c.

March 8, 2013

Christine Schlendorf, AIA
Perkins Eastman
115 Fifth Avenue
New York, NY 10003

Re: St. Francis Preparatory School
6100 Francis Lewis Blvd.
Fresh Meadows, NY
AMA Project No. S072-01-002

Dear Ms. Schlendorf:

The original boiler plant, installed in 1961, consisted of three (3), scotch marine, combination natural gas/#2 fuel oil boilers. One boiler was used as standby. Each boiler had a capacity of 4700 MBH, for a total building heating load of 9400 MBH.

As part of the building infrastructure upgrade, the boiler plant was replaced with eleven (11), cast iron modular boilers manufactured by HB Smith (Series 19A) capable of operating on natural gas or #2 fuel oil. Please refer to the attached equipment submittals for additional information. Each boiler has a net heat output of 1207 MBH, resulting in a boiler plant with a total heating capacity of 13,277 MBH (11 x 1207 MBH). The design was based on a maximum of 8 boiler modules operating during peak winter periods to heat the original building (8 x 1207 MBH = 9656 MBH) with 3 modules available as stand-by and to accommodate the future expansion. To date, no more than 5 boiler modules have been required to heat the building during peak winter periods.

Since the majority of the heating for the recent and proposed expansion phases is via gas fire rooftop air handling units, the impact of the building expansion on the existing boiler plant capacity is minimal. The net increase in boiler demand anticipated for the building expansion is approximately 700 MBH, which is well within the present boiler plant capacity.

Based on the above, neither the boilers nor the existing stack location are expected to change to address the needs of the proposed expansion. Refer to the attached site plan indicating the approximate locations of the existing boiler room and stack. Therefore, a stationary source air quality analysis is not warranted, and the proposed action would not result in significant adverse impacts related to air quality.

Please do not hesitate to contact our office with any questions or concerns.

Very truly yours,

Anthony M. Cottone, PE
Associate Principal

L:\Projects\S\S072-01-002 - St. Francis Prep - Infrastructure Upgrades\Outgoing\Letters\20130308-S07201002-BoilerCapacitySummary.doc

Manhasset, NY

Los Angeles, CA

Madison, NJ

New York, NY

47 Hillside Avenue
Manhasset, NY 11030
516 365 6966 phone
516 365 2683 fax
www.amapc.com

(NASSAU BOULEVARD)
(HORACE HARDING BOULEVARD)
HORACE HARDING EXPRESSWAY

LOCATION OF EXISTING
36" CHIMNEY ON ROOF.

APPROX. LOCATION
OF BOILER PLANT
IN CELLAR.

ST. FRANCIS PREPARATORY SCHOOL

FRANCIS LEWIS BOULEVARD
(CROSS ISLAND BOULEVARD)

amaconsulting
engineers, p.c.

SHOP DRAWING COMMENTS

AMA Project Name: St. Francis Prep – Infrastructure Upgrade	**Control No:** H-08
Project Number: S072-01-002	**Page:** 1 **of** 1
☐ **NO EXCEPTIONS TAKEN** No further review of submittal required.	☐ **REVISE AND RESUBMIT** Revise as noted and resubmit for further review.
☒ **MAKE CORRECTIONS AS NOTED** Incorporate corrections in work; resubmission is not required. Where corrections can not be complied with, revise the exceptions and resubmit.	☐ **EXAMINED** Submittal received, formal review by others and/or formal review by this office not required. Submittal has been examined for information only.

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

Date: June 30, 2008	**Engineer:** A. Cottone

SUBMITTAL DESCRIPTION: Boilers **(Resubmit missing/requested information prior to release)**

COMMENTS:

1. The boiler manufacturer is a substitution to the specified item which was not identified during the bid period. As per Article 1, paragraph E. of the mechanical specifications, the contractor will assume all responsibility for the installation, operation and performance of the substituted equipment, including but not limited to dimensional changes, service access requirements, electrical requirements, service connection locations, etc.
2. Verify that submitted boilers can be installed in parallel and sequenced. Submit a piping detail for review.
3. Ref: water piping (Installation instructions page 6) – The boiler plant is based on a 40 degree temperature drop (220 degree to 180 degree F.). Revise water flow requirements to reflect the actual operation of the boiler plant. Also, verify that the submitted equipment can operate under these conditions.
4. Ref: Installation instructions page 10 – The specified boiler utilizes a top flue outlet, while the specified unit uses a side outlet. The mechanical contractor is to be responsible for coordination of flue routing with other work in the area.
5. Ref: Burner (cover sheet) – The number of boiler sections (11) does not match the number in the boiler submittal (10).
6. Ref: Burner (cover sheet) – The firing rate does not match the boiler specifications or the submitted boiler.
7. Ref: Burner (cover sheet) – The fan voltage does not match the equipment schedule (3- phase vs. single phase). In addition, no control voltage requirements have been included.
8. Ref: Burner (control sheet) – The specifications require a modulating burner, but on-off, high-low controls have been submitted.
9. Ref: Honeywell Controls – Confirm that controls are compatible with the BMS. Coordinate with BMS/ATC contractor.
10. Ref: Honeywell Controls – Controls for sequencing multiple boilers have not been included (See Article IX, paragraph K.7 of the mechanical specifications).

Manhasset, NY

New York, NY

Parsippany, NJ

47 Hillside Avenue
Manhasset, NY 11030
516 365 6966 phone
516 365 2683 fax
www.amapc.com

TO: Heating & Burner
479 Walton Ave.
Bronx, NY. 10451

JOB: St. Francis Prep.

BOILERS: Eleven (11) B19A-W-10 Boiler units
with associated equipment being furnished by the
Smith Company.

We transmit for approval purposes,

Submittal Record No. HBS-14571

ST. FRANCIS PREP

Eleven (11) B19A-W-10 Pressurized Wet Base Boilers only. A.S.M.E. certified, I=B=R approved, 80 PSI Maximum water working pressure.

I=B=R RATINGS:

Gross Output: 1,338,000 BTU/Hr.
Net Output: 1,207,000 BTU/Hr.
Burner Capacity: 12.2 GPH of No. 2 Fuel Oil @ 140,000 BTU/Gallon.
1754 MBH Natural Gas.
Furnace Volume: 11.81 Cu. Ft.
Heating Surface: 107.4 Sq. Ft.
Dia. Vent Conn: 10" inch.

BOILER APPURTENANCES: (EACH UNIT)

*Insulated Metal Jacket.
*Cast Iron smokehood with 14 gauge aluminized steel damper.
*Burner mounting plate complete with insulation block .
*Front and rear flame observation ports.
*Steel angle floor rails.
*Ceramic fiber rope seal between sections.
*"Hy-Temp" hydronic port seals.
*Flue brush.

TRIM AND INSTRUMENTS: (EACH UNIT)

* (1) ASME Relief Valve set 40 PSI.
* (1) Theraltimeter.

NOTES:

1. Boilers are to be furnished knocked down for field assembly. (?)
2. Specified Burners and Controls being supplied by other than the Smith Company, are not included as part of this submittal packet.

HBS-14571
JG/jg

16 June, 2008

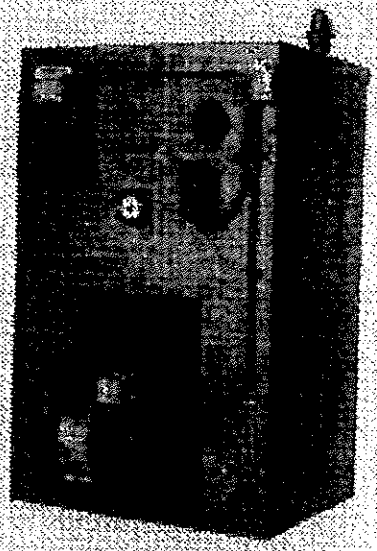
PRODUCT DATA

PD19-1

19A Series
Pressurized Wet Base
Boiler/Burner Unit

Smith
CAST IRON BOILERS

Smith 19A Series cast iron, pressurized, wet base boiler/burner units are ideal for light commercial water or steam heating systems utilizing No. 2 fuel oil, natural gas, or combination gas/oil. Ten different sizes are available, ranging from three-section, 297 MBH I=B=R gross output units to twelve-section, 1713 MBH I=B=R gross output units.



STANDARD FEATURES
- Cast iron wet base sections tested for 80 psi water working pressure, 15 psi steam working pressure
- Insulated metal jacket
- Burner mounting plate with insulation blocks
- Front and rear flame observation ports
- Steel angle floor rails
- Ceramic fiber rope seal between sections
- Hi-temp hydronic port seals
- Flue brush
- Target wells (3-6 sections)
- Manual, reset, hi-limit control
- Operating control

ADDITIONAL FEATURES FOR WATER BOILER/BURNER UNITS
- A.S.M.E. relief valve, 40 psi
- Thermometer

ADDITIONAL FEATURES FOR STEAM BOILER/BURNER UNITS
- A.S.M.E. side outlet safety valve, 15 psi
- Gauge glass with gauge cocks and guards

I=B=R Ratings, Burner Capacities

Designed and tested to the A.S.M.E. boiler and pressure vessel code, section IV for maximum allowable working pressure, steam 15 PSIG, water 30 PSIG.

Boiler Number	Boiler Horsepower	Heating Surface (Sq. Ft.)	Furnace Volume (Cu. Ft.)	I=B=R Gross Output	Net I=B=R Rating (1) Steam (Sq. Ft.)	Net I=B=R Rating (1) Steam MBH	Net I=B=R Rating (1) Water MBH	I=B=R Burner Capacity Oil (GPH)* (2)	I=B=R Burner Capacity Gas Mbh** (3)	Draft Loss (In W.C.)	Overfire Pressure (In W.C.)	Water Content (Gals.) Steam	Water Content (Gals.) Water	Water Working Weight (Lbs.) Steam	Water Working Weight (Lbs.) Water
†19A-*-3	9	78.0	6.12	297	829	223	258	2.40	276	0.18	0.28	33.2	38.6	1672.8	1716.8
†19A-*-4	12	35.6	3.56	413	1292	310	358	2.96	620	0.18	0.28	41.1	49.2	1967.8	2122.8
†19A-*-5	17	47.7	4.59	578	1795	431	500	4.00	725	0.20	0.29	49.8	59.8	2442.8	2528.4
†19A-*-6	22	59.7	5.27	736	2308	554	642	5.50	931	0.23	0.33	58.8	70.3	2825.4	2933.4
†19A-*-7	27	71.5	7.46	901	2817	676	783	7.00	1137	0.28	0.36	64.7	80.9	3209.8	3339.2
†19A-*-8	32	83.5	9.04	1063	3321	797	924	9.00	1342	0.29	0.39	72.8	91.5	3593.8	3745.0
†19A-*-9	37	95.4	10.42	1226	3833	920	1066	10.80	1548	0.33	0.42	80.5	102.9	3978.8	4150.0
†19A-*-10	42	107.4	11.81	1388	4343	1042	1207	12.00	1754	0.35	0.45	88.3	112.8	4361.4	4556.8
†19A-*-11	46	118.5	13.20	1551	4846	1187	1349	13.80	1969	0.38	0.48	96.2	123.1	4745.8	4960.6
†19A-*-12	51	131.2	14.58	1713	5358	1322	1490	15.00	2185	0.41	0.51	104.0	133.7	5129.8	5356.6

† Insert prefix "G" for gas, "GO" for combination gas/oil or "LO" for light oil.

* Insert "S" for steam, "W" for water. Example: GO19A-S-10 is a 10-section 19A Series Boiler for steam using combination gas/oil burner.

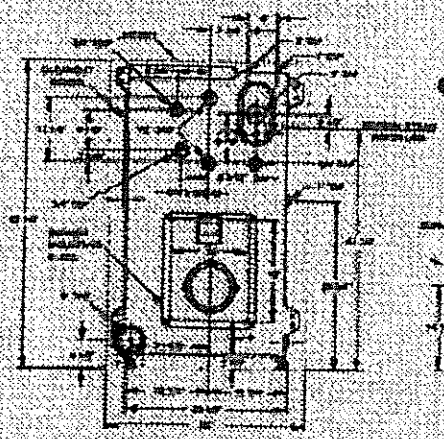
(1) The net I=B=R Steam Ratings shown are based on a piping and pickup allowance of 1.333. The I=B=R Water Ratings shown are based on an allowance of 1.15.

(2) Based on light oil having a heat content of 140,000 BTU per gallon.

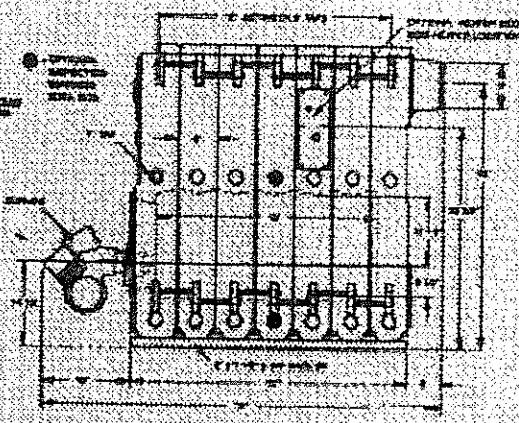
(3) Gas having a heat content of 1,000 BTU/cu. ft. at 0.6 specific gravity.

(4) Includes 0.10" W.C. pressure on upstream side of exit damper.

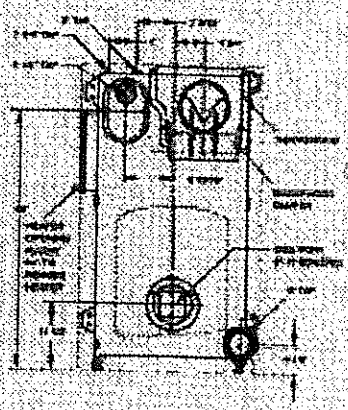
19A Series



FRONT VIEW



SIDE VIEW



REAR VIEW

Dimensions (inches)

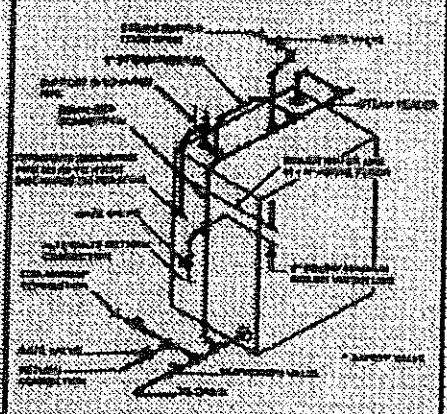
Boiler Number	Overall Length "A"				"B"	"C"	Burner Length "D"				"E" Distance Between Supply Tappings	"F" Flue Pipe Diameter
	Carlin	R/FJ	R/FE	Beckett			Carlin	R/FJ	R/FE	Beckett		
119A-*-3	35	44	–	31	9	18	16	21	–	13	12	7
119A-*-4	43	50	39	37	15	24	18	21	30	17	18	7
119A-*-5	51	56	45	43	21	30	16	21	30	13	24	8
119A-*-6	59	62	71	49	27	36	25	21	30	19	30	8
119A-*-7	67	68	62	55	33	42	28	21	35	22	36	8
119A-*-8	73	74	68	73	39	48	28	21	35	23	42	10
119A-*-9	79	80	84	77	45	54	28	21	35	25	48	10
119A-*-10	87	86	100	83	51	60	22	21	35	22	54	10
119A-*-11	93	–	106	89	57	66	22	N/A	35	23	60	10*
119A-*-12	99	–	112	99	63	72	22	N/A	35	27	66	10*

The manufacturer should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping, etc.

For forced hot water heating systems where the boiler and all the piping are within the area to be heated, the boiler may be selected on the basis of its Gross Output.

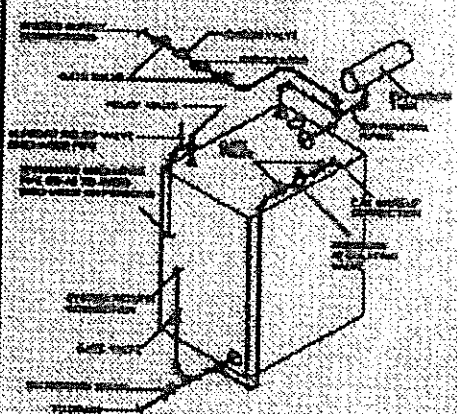
* Eleven and twelve section requires 12" diameter vent pipe. Transition collar provided by Smith.

Typical Steam Piping Diagram



Boiler Size	No. of 2" Risers	Header	Equalizer
3 thru 5 Section	1	3"	1-1/2"
5 thru 12 Section	2	4"	2"

Typical Water Piping Diagram



Boiler Size	GPM	Return Connection	Supply Connection
3	30	2"	2"
4	41	2"	2"
5	58	2-1/2"	2-1/2"
6	74	3"	3"
7	90	3"	3"
8	106	3"	3"
9	123	3"	3"
10	139	3"	3"
11	155	3"	4"
12	171	3"	4"

Based on 20°F temperature rise.

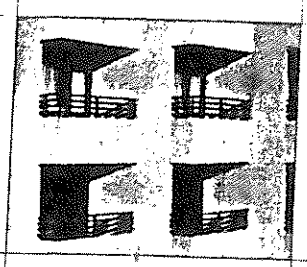
Smith
EAST IRON WORKS
WESTCAST, INC.
260 NORTH ELM STREET WESTFIELD, MA 01085
TEL. (413) 562-9613 FAX (413) 562-3799



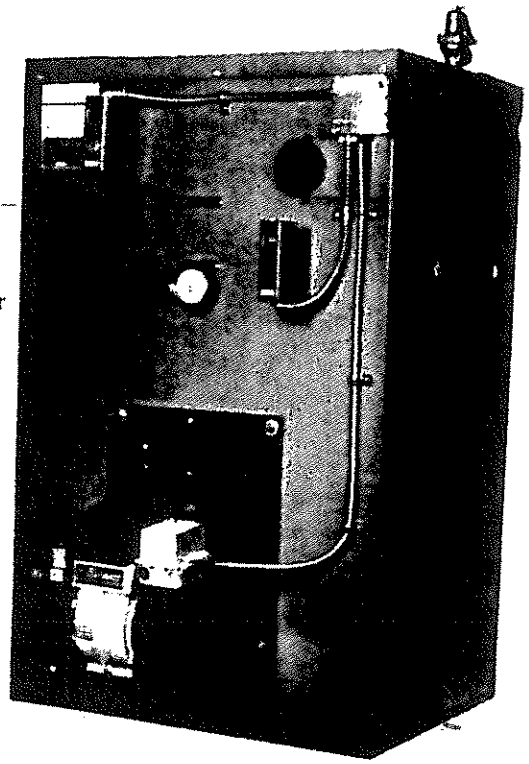
series 19A

PRESSURIZED WET BASE
BOILER/BURNER UNIT

HEATING



series 19A



Smith 19A Series cast iron, pressurized, wet-base boiler/burner units are ideal for light commercial water or steam heating systems utilizing No. 2 fuel oil, natural gas, or combination gas/oil. Ten different sizes are available, ranging from three-section, 297 MBH I=B=R gross output units to twelve-section, 1713 MBH I=B=R gross output units. Series 19A boilers are available in three ways — knocked down, assembled sections, or completely packaged units. All sections are tested and approved for 80 psi working pressure as standard equipment.

All sizes exceed the Ashrae 90.1 efficiency requirements

STANDARD EQUIPMENT

All Boilers

- Cast iron wet-base sections tested for 80psi.
- Insulated metal jacket
- Cast iron smokehood with integral damper
- Burner mounting plate with insulation block
- Front and rear flame observation ports
- Steel angle floor rails
- Hi-Temp hydronic port seals
- Flue brush
- Target Wall (3-6 sections)

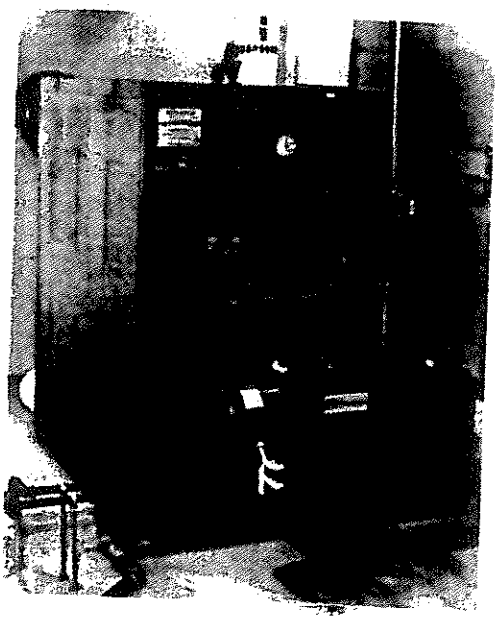
Water Boiler/Burner Units

- ASME relief valve, 40 psi
- Theraltimeter
- Manual reset, Hi-Limit control
- Lo-Limit operating control

Steam Boiler/Burner Units

- ASME side outlet safety valve, 15 psi
- Steam gauge (0-30 psig)
- Gauge glass with gauge cocks and guards
- Manual reset, Hi-Limit control
- Lo-Limit operating control

Designed and Constructed for Easy Service and Long Life.



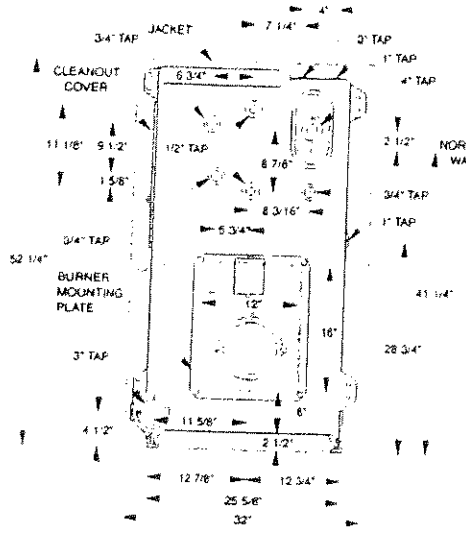
19A Series boiler/burner units are designed and constructed for easy service. A front observation port allows the serviceman to visually check the flame and combustion area. Easy-to-remove, side-mounted cover plates make boiler clean-out quick and easy. Side-mounted tankless 9 GPM coils allow for easy visual inspection and/or replacement. Heavy-duty, hydrocarbon-resistant Viton port seal gaskets are exceptionally easy to install. The integral, cast-iron, fail-safe breeching damper may be easily adjusted and securely locked in position. Individual section draw rods simplify assembly while reducing stress.

Reliable, Fuel-Efficient Heat

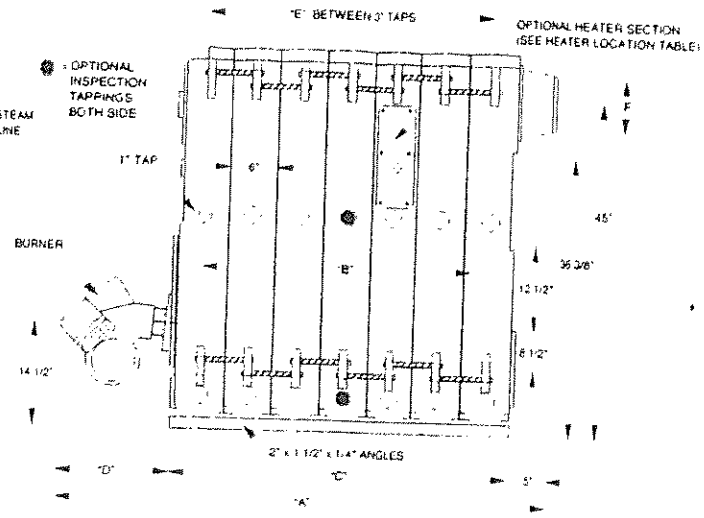
Smith 19A Series boiler/burner units are designed and constructed for high efficiency and top performance. High-quality cast iron sections, cast-in heat extraction pins, completely insulated metal jacket, ceramic fiber rope section seals, obround-shaped upper ports, and carefully selected, high-efficiency burner add up to a boiler/burner unit that will provide reliable, fuel-efficient heat for years to come.

Compare Smith 19A Series units with other brands with similar capacities — you'll discover that Smith is your smartest choice.

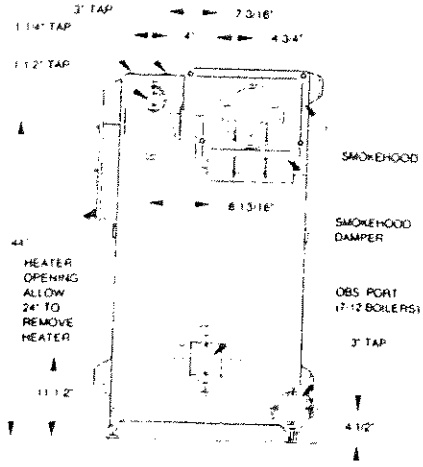
PRESSURIZED WET-BASE BOILER BURNER UNITS



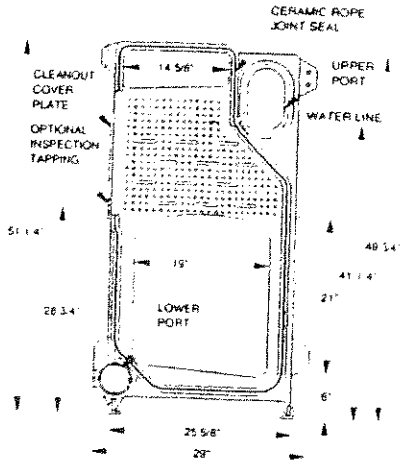
FRONT VIEW



SIDE VIEW



REAR VIEW



INTERMEDIATE SECTION

Dimensions (inches)

Boiler Number	Overall Length "A"						"B"	"C"	Burner Length "D"						"E" Distance Between Supply Tappings	"F" Flue Pipe Diameter
	Carlin	PF/J	PF/C	Beckett	GP/V	GP/R			Carlin	PF/J	PF/C	Beckett	GP/V	GP/R		
†19A-*-3	39	44	–	31	–	–	9	18	16	21	–	13	–	–	12	7
†19A-*-4	45	50	59	37	–	–	15	24	16	21	30	13	–	–	18	7
†19A-*-5	51	56	65	43	53	–	21	30	16	21	30	13	18	–	24	8
†19A-*-6	61	62	71	49	59	67	27	36	20	21	30	13	18	26	30	8
†19A-*-7	67	68	82	64	65	75 1/2	33	42	20	21	35	22	18	28 1/2	36	9
†19A-*-8	73	74	88	71	71	81 1/2	39	48	20	21	35	23	18	28 1/2	42	10
†19A-*-9	79	80	94	77	77	87 1/2	45	54	20	21	35	23	18	28 1/2	48	10
†19A-*-10	87	86	100	83	83	93 1/2	51	60	22	21	35	23	18	28 1/2	54	10
†19A-*-11	93	–	106	89	–	99 1/2	57	66	22	–	35	23	–	28 1/2	60	10+
†19A-*-12	99	–	112	99	–	105 1/2	63	72	22	–	35	27	–	28 1/2	66	10+

The manufacturer should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping, etc.

For forced hot water heating systems where the boiler and all the piping are within the area to be heated, the boiler may be selected on the basis of its Gross Output.

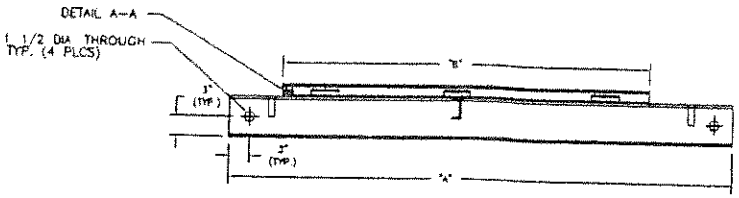
+ 11 and 12 section requires 12" diameter vent pipe. Transition collar provided by Smith.

NOTE: Dimensions are approximate. Should not be used to "rough-in" equipment.

TECHNICAL INFORMATION

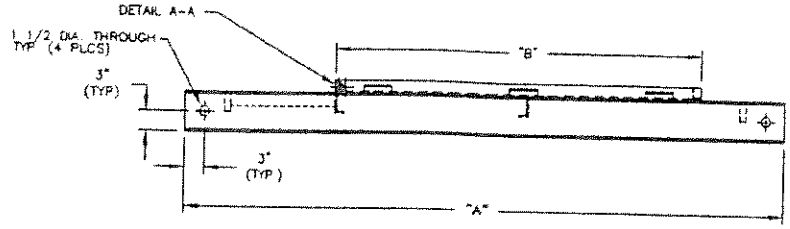
Assembled Block or Packaged Boiler without Burner

NO. OF SECTIONS	CHANNEL LENGTH DIM. "A"	ANGLE LENGTH DIM. "B"
3	39	18
4	45	24
5	51	30
6	57	36
7	63	42
8	69	48
9	75	54
10	81	60
11	87	66
12	93	72



Packaged Boiler with Burner

NO. OF SECTIONS	CHANNEL LENGTH DIM. "A"			ANGLE LENGTH DIM. "B"
	CARLIN/ BECKETT	POWERFLAME J-SERIES	POWERFLAME C-SERIES	
3	49	59	———	18
4	55	65	74	24
5	61	71	80	30
6	67	77	86	36
7	78	83	92	42
8	84	89	98	48
9	90	95	104	54
10	98	101	110	60
11	105	107	116	66
12	111	113	122	72



I B R Ratings, Burner Capacities

Designed and tested to the A.S.M.E. boiler and pressure vessel code, section IV for maximum allowable working pressure, steam 15 psig, water 80 psig.

Boiler Number	Boiler Horse-power	Heating Surface (Sq. Ft.)	Furnace Volume (Cu. Ft.)	I=B=R Gross Output	Net I=B=R Rating (1)			I=B=R Burner Capacity		Draft Loss (in W.C.)	Overfire(4) Pressure (in W.C.)	Water Content (Gals.)		Water Working Weight (Lbs.)	
					Steam		Water								
					(Sq. Ft.)	MBH	MBH	OilGPH(2)	GasMBH(3)			Steam	Water	Steam	Water
†19A-*-3	9	23.9	2.12	297	929	223	258	2.60	375	0.18	0.28	33.2	38.6	1673.6	1716.8
†19A-*-4	12	35.8	3.50	413	1292	310	359	3.60	520	0.18	0.28	41.1	49.2	2057.8	2122.6
†19A-*-5	17	47.7	4.88	575	1796	431	500	5.00	725	0.20	0.30	49.0	59.8	2442.0	2528.4
†19A-*-6	22	59.7	6.27	738	2308	554	642	6.50	931	0.23	0.33	56.8	70.3	2825.4	2933.4
†19A-*-7	27	71.6	7.65	901	2817	676	783	7.90	1137	0.26	0.36	64.7	80.9	3209.6	3339.2
†19A-*-8	32	83.5	9.04	1063	3321	797	924	9.30	1342	0.29	0.39	72.6	91.5	3593.8	3745.0
†19A-*-9	37	95.4	10.42	1226	3833	920	1066	10.80	1548	0.32	0.42	80.5	102.0	3978.0	4150.0
†19A-*-10	42	107.4	11.81	1388	4383	1052	1207	12.20	1754	0.35	0.45	88.3	112.6	4361.4	4555.8
†19A-*-11	46	119.3	13.20	1551	4946	1187	1349	13.60	1989	0.38	0.48	96.2	123.1	4745.6	4960.8
†19A-*-12	51	131.2	14.58	1713	5508	1322	1490	15.00	2165	0.41	0.51	104.0	133.7	5129.0	5366.6

† No insert for oil. Insert prefix "G" for gas or "GO" for combination gas/oil.

* Insert "S" for steam, "W" for water. Example: GO19A-S-10 is a 10-section 19A Series Boiler for steam using combination gas/oil burner.

(1) The net I=B=R Steam Ratings shown are based on a piping and pickup allowance of 1.333. The I=B=R Water Ratings shown are based on an allowance of 1.15.

(2) Based on light oil having a heat content of 140,000 BTU per gallon.

(3) Gas having a heat content of 1,000 BTU/cu. ft. at 0.6 specific gravity.

(4) Includes 0.10" W.C. pressure on upstream side of exit damper.

Side-Mounted Tankless Heater Capacities

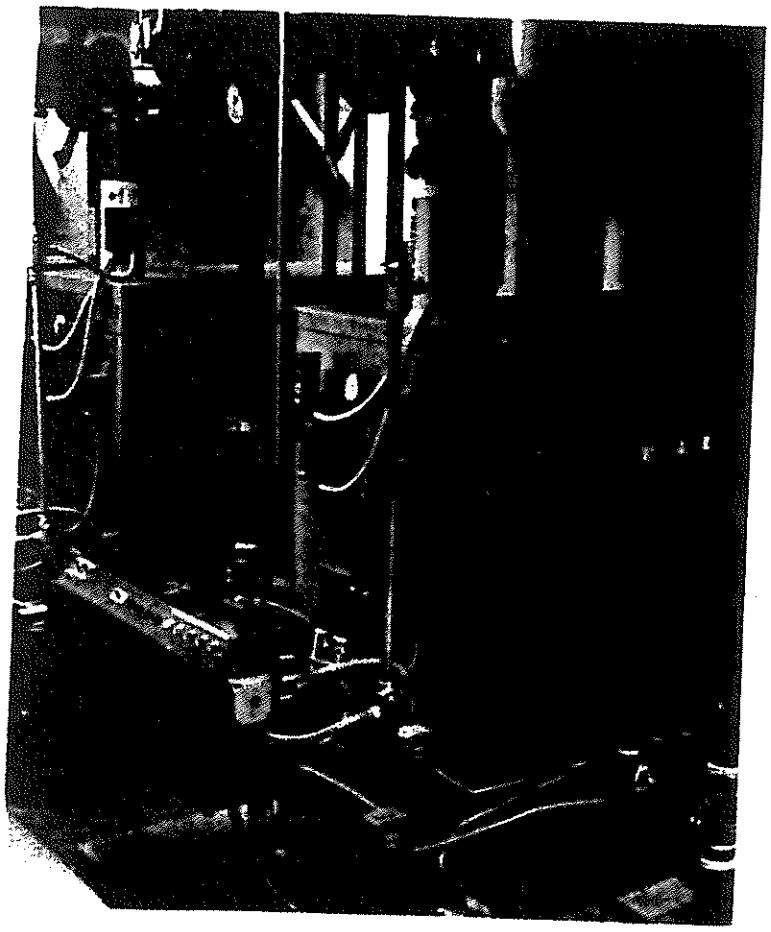
No. of Sections	I=B=R Gross Output MBH	Cont. Draw (GPM)		
		One Heater	Two Heaters	Three Heaters
3	297	8.5	N/A	N/A
4	413	8.5	N/A	N/A
5	575	9.0	10.6	N/A
6	738	9.0	12.9	N/A
7	901	9.0	15.3	N/A
8	1063	9.0	17.6	N/A
9	1226	9.0	18.0	19.9
10	1388	9.0	18.0	22.2
11	1551	9.0	18.0	24.6
12	1713	9.0	18.0	26.9

Heater ratings based on 100° F. temperature rise, 200° F. boiler water, 9 GPM at 9.5 psi Δ P. For 180° boiler water ratings, consult factory.

Heater Section Location

Boiler Number	Max. No. of heaters	Location by boiler section (Heaters install from right side)
19A-3	1	F - **H** - B
19A-4	1	F - P - **H** - B
19A-5	2	F - **H** - P - **H** - B
19A-6	2	F - P - **H** - P - **H** - B
19A-7	3	F - **H** - P - **H** - P - **H** - B
19A-8	3	F - P - **H** - P - **H** - P - **H** - B
19A-9	3	F - P - **H** - P - **H** - P - **H** - P - B
19A-10	3	F - P - P - **H** - P - **H** - P - **H** - P - B
19A-11	3	F - P - P - P - **H** - P - **H** - P - **H** - P - B
19A-12	3	F - P - P - P - P - **H** - P - **H** - P - **H** - P - B

F = Front, P = Intermediate Plain, **H** = Intermediate Heater, B = Back



Burners:

Carlin Light Oil Burner

- High performance, forced draft, UL listed, flame retention oil burner:
  - — On-off firing, (4 thru 5 sections), with cadmium cell primary control, oil valve, delay timer. Lo-hi firing (6 thru 12 sections)
  - — Single stage fuel unit (3 thru 5 sections)
  - — Two stage fuel unit (6 thru 12 sections)

Beckett Light Oil Burner

- High performance, forced draft, UL listed, flame retention oil burner:
  - — On-off firing, (3 thru 5 sections) with cadmium cell primary control, oil valve. Lo-hi off firing (6 thru 12 sections)
  - — Single stage fuel unit (3 and 4 sections)
  - — Two stage fuel unit (5 thru 12 sections)

Gordon Piatt Light Oil Burner

- High performance, forced draft, UL listed, flame retention oil burner:
  - — On-off firing (6 thru 12 sections), with cadmium cell primary control, oil valve
  - — Two stage fuel unit

Power Flame Gas Burner

- High performance, forced draft, UL listed, power gas burner for natural gas firing:
  - — On-off firing, (3 thru 12 sections), fixed air shutter combustion control, 115 volt diaphragm gas shut-off valve, 115 volt solenoid auxiliary gas valve, spark ignited intermittent gas pilot (gas train not assembled), pilot gas train with solenoid valve, pressure regulator and manual shut-off cock, pilot tubing and fittings

Gordon Piatt Gas/Oil Burner

- Both fuels, spark ignited gas pilot, intermittent UV flame detection, prepurge.
  - — On-off firing, (6 thru 12 sections), fixed air louver control, two stage fuel pump, oil valve, slow opening diaphragm gas valve for gas, auxiliary solenoid gas valve. Gas train not assembled

Power Flame Gas/Oil Burner

- Both fuels — Spark ignited gas pilot, intermittent UV flame detection, prepurge.
  - — On-off firing (4 thru 12 sections), with fixed air shutter, two stage fuel pump for oil, oil valve, slow opening diaphragm gas valve for gas, auxiliary solenoid gas valve. Gas train not assembled
  - — Pilot gas train with solenoid valve, pressure regulator and manual shut-off cock, pilot tubing and fittings

Gordon Piatt Gas Burner

- High performance, forced draft, UL listed, power gas burner for natural gas firing.
  - — On-off firing, (5 thru 12 sections), fixed air inlet louver control, 115 volt gas diaphragm shut-off valve, 115 volt solenoid auxiliary gas valve, spark ignited intermittent gas pilot. Gas train not assembled
  - — Pilot gas train with solenoid valve, pressure regulator and manual shut-off cock, pilot tubing and fittings

series 19A

OPTIONAL EQUIPMENT

All Boilers

- Tankless water heaters
- Heater cover plates
- Sections assembled
- Packaged
- Burner start-up and one-year service
- Low water cutoffs
- Feeder and pump controllers
- Inspection taps and brass plugs (up to four per section)
- Water boilers—80 psi pressure relief valve

Beckett & Carlin Oil Burners

- Electronic controls
- Two stage fuel unit (4 thru 6 sections)
- N.Y.C.— D.E.P. (formerly B.A.R.) approval
- Burner mounted, factory wired control panel
- Lo-hi-lo firing (7 thru 12 sections)

Power Flame Gas and Oil Burners

- Two stage firing with fuel-air control
- Lo-hi-lo firing
- Modulating firing
- I.R.I., FM, MASS approval
- Other motor current characteristics
- Increased gas train sizes for low pressure drops
- Flame safeguard options

Gordon Piatt Gas and Oil Burners

- Two stage firing with fuel-air control
- Lo-hi-lo firing
- Modulating firing
- I.R.I., FM, MASS approval
- Other motor current characteristics
- Flame safeguard options
- Increased gas train sizes for low pressure drops

Burner Models

No. of Boiler Sections	Carlin Oil	HP	Beckett Oil	HP	Power Flame						Gordon Piatt					
					Oil	HP	Gas	HP	Gas/Oil	HP	Oil	HP	Gas	HP	Gas/Oil	HP
3	201CRD	–	CF500	1/3	–	–	JR15A	1/4	–	–	–	–	–	–	–	–
4	301CRD	1/4	CF500	1/3	CR1-0	1/3	JR15A	1/4	CR1-GO	1/3	–	–	–	–	–	–
5	301CRD	1/4	CF800	1/3	CR1-0	1/3	JR30A	1/4	CR1-GO	1/3	–	–	–	–	–	–
6	702CRD	1/2	CF1400	1/2	CR1-0	1/2	JR30A	1/3	CR1-GO	1/3	–	–	–	–	–	–
7	702CRD	1/2	CF1400	1/2	CR2-0	3/4	JR30A	1/3	CR2-GO	3/4	R6.3	1/2	R6.3	1/2	R6.3	1/2
8	702CRD	1/2	N/A	N/A	CR2-0	3/4	JR50A	1/3	CR2-GO	3/4	R8.1	3/4	R8.1	3/4	R8.1	3/4
9	702CRD	1/2	CF2300	3/4	CR2-0	3/4	JR50A	1/3	CR2-GO	3/4	R8.1	3/4	R8.1	3/4	R8.1	3/4
10	801CRD	3/4	CF2300	3/4	CR2-0	3/4	JR50A	1/3	CR2-GO	3/4	R8.1	3/4	R8.1	3/4	R8.1	3/4
11	801CRD	3/4	CF2500	2	CR2-0	1	CR2G	1/2	CR2-GO	3/4	R8.1	3/4	R8.1	3/4	R8.1	3/4
12	801CRD	3/4	CF2500	2	CR2-0	1 1/2	CR2G	1/2	CR2-GO	3/4	R8.3	1 1/2	R8.3	1 1/2	R8.3	1 1/2

MEA #416-99-M

In the interest of product development, we reserve the right to make changes without notice.

Smith
CAST IRON BOILERS
Westcast, Inc., 260 North Elm Street, Westfield, MA 01085
(413) 562-9631 • FAX: (413) 562-3799
www.smithboiler.com

A MESTEK COMPANY



Log on to www.smithboiler.com and get connected to the Smith Heating Pros SPECifier. Fast, browser-based, easy-to-use program provides dynamically generated specifications, Auto-Cad drawings and more for Smith commercial boilers.

INSTALLER
READ THESE INSTRUCTIONS CAREFULLY. THEY WILL SAVE TIME IN ASSEMBLING BOILER

19A SERIES BOILER INSTALLATION INSTRUCTIONS

STEAM OR WATER HEATING PRESSURIZED FOR FIRING OIL, GAS OR COMBINATION GAS/OIL

DESIGNED AND TESTED ACCORDING TO THE A.S.M.E. BOILER AND PRESSURE VESSEL CODE, SECTION IV FOR MAXIMUM ALLOWABLE WORKING PRESSURE.
STEAM - 15 PSIG, WATER - 80 PSIG
CANADA: STEAM - 15 PSIG, WATER - 50 PSIG

CAUTION

Do not use automotive anti-freeze in boiler waterways. If necessary to use anti-freeze, be sure to employ a preparation designed for hydronic heating systems such as ethylene or propylene glycol.

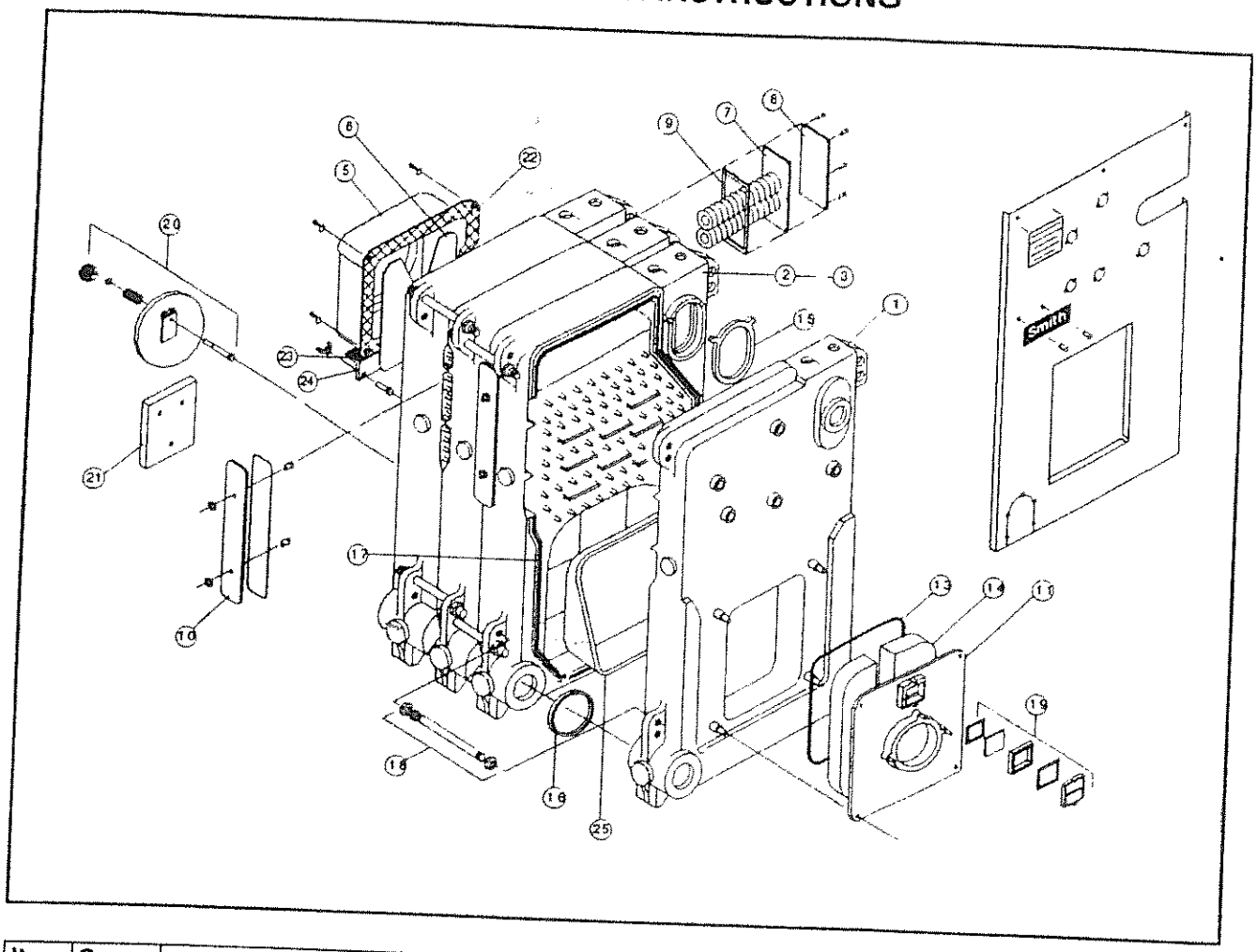
Water treatment is not recommended. This boiler uses gaskets to seal the ports of adjoining sections. These gaskets are made of a fluorocarbon elastomer (designation FKM) marketed under the brand name Viton. Consult a water treatment professional before adding any chemical to the boiler water. Any water treatment or anti-freeze added to the system must be compatible with the Viton gaskets.

THE SECTIONS OF THIS BOILER MUST BE ASSEMBLED TO THE PROPER TORQUE. READ INSTRUCTIONS

THESE INSTRUCTIONS TO BE LEFT WITH THE BOILER FOR REFERENCE PURPOSES

Smith CAST IRON BOILERS
WESTCAST, INC.
260 NORTH ELM STREET WESTFIELD, MA 01085
TEL. (413) 562-9631 FAX (413) 562-3799

19A SERIES BOILER
INSTALLATION INSTRUCTIONS



Item No.	Comp. No.	Description
1	3638	Front Section
2	3637	Intermediate Section, Plain
3	3641	Intermediate Section, Heater (Optional)
4	3639	Back Section
5	70338	Smokehood 7"
	70339	Smokehood 8"
	70340	Smokehood 9"
	70341	Smokehood 10"
		Includes: Smokehood, Slide Damper, Angle Bracket Hardware
6	69370	Slide Damper
7	50634	Tankless Coil w/Gasket & Hardware (For Intermediate Heater Sections Only)
8	3572	Heater Cover Plate, Blank
9	60312	Heater Cover Plate Gasket
10	3611	Cleanout Cover Plate
11		Burner Mounting Plate,
	70465	6 1/8" Opening
	70466	7 3/4" Opening
	70491	9 1/8" Opening
		Includes: Mounting Plate w/Observation Glass and Cover

Item No.	Comp. No.	Description
13	78105	Burner Mounting Plate Rope, 1/4" x 4.75'
14	60434	Burner Mounting Plate Insulating Block
14	60430	Burner Mounting Plate Insulating Block (Beckett Burner 3-6 Section)
15		Upper Port Hydronic Seal
16		Lower Port Hydronic Seal
17	60025	Insulating Ceramic Rope
18	—	Tie Rod & Hardware
19	—	Front Observation Port
20	70614	Rear Observation Port Assembly
21	3679	Rear Observation Port Cover Plate - 3, 4, 5, 6 Section Boilers
22	74300	Insulating Bolt Hole Tape 3' 6"
23	74302	Insulating Tape 11"
24	69150	Angle Bracket
25	69761	Target Wall - 3, 4, 5, 6 Section Boilers

19A SERIES BOILER
INSTALLATION INSTRUCTIONS

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1. GENERAL

19A Series boilers are wet-base, extended surface, vertical flue design with integral cast flue gas collector for pressurized firing with oil, gas or combination power burners. Upper and lower port hydronic seals are of a special material resistant to petroleum products and compatible with ethylene and propylene based anti-freeze (non automotive type) which does not contain corrosion inhibitors to protect aluminum. The flue gas joints between sections, etc. are sealed using high temperature (2300°F) ceramic fiber rope. Access to the heating surface for cleaning is provided from the left hand side of the boiler through large cast iron cover plates. A slide damper is provided in the flue gas outlet for back pressure adjustment.

The boilers are supplied completely knocked down for field assembly, as factory assembled blocks of sections or completely assembled boiler-burner units. All items should be inspected for damage upon receipt, and any damage reported to the wholesaler and trucker. All components should be stored in a clean, dry area.

The boilers are conservatively rated for high efficiency performance with capability for down-firing to match connected load. The large OBROUND upper port provides transfer area above the water surface for dry steaming at full load.

2. BOILER LOCATION

The boiler must be installed on a smooth, level, non-combustible floor or pad as close to the chimney or vent location as possible to minimize breeching length. Allow clearance around the boiler for piping, service, maintenance, cleaning and tankless coil removal. Approximately 30 inches on the sides is a minimum (Check local code requirements). Do not install electrical conductors in floor or pad under boilers.

See FIGURE 1 for boiler floor pad requirements, and TABLE 1 for minimum required pad length.

TABLE 1

Boiler No.	Min. Recommended Pad Length
19-*-3	30"
19-*-4	36"
19-*-5	42"
19-*-6	48"
19-*-7	54"
19-*-8	60"
19-*-9	66"
19-*-10	72"
19-*-11	78"
19-*-12	84"

3. CODES AND REGULATIONS

All work in connection with the boiler, burner and controls must be performed in strict accordance with requirements of state and local authorities having jurisdiction over boiler installations.

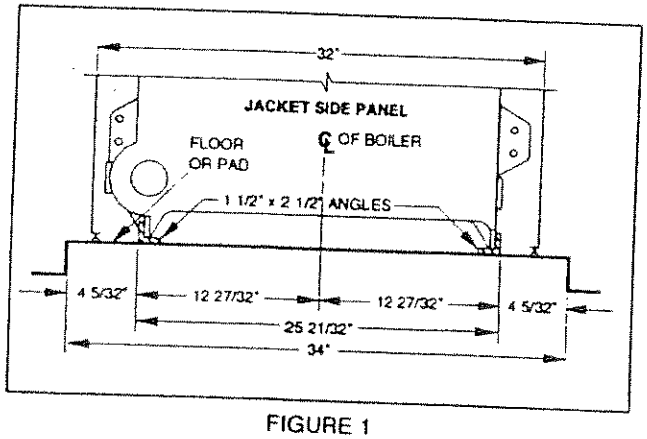


FIGURE 1

In the absence of such local requirements, the following should govern:

A.S.M.E. Section IV - "Heating Boilers"
A.S.M.E. Section VI - "Care and Operation of Boilers"
ANSI/NFPA 31 - "Installation of Oil Burning Equipment"
ANSI/Z223.1 - "National Fuel Gas Code"
ANSI/NFPA 70 - "National Electrical Code"

4. CHIMNEY AND BREECHING

The breeching connection between boiler and chimney should be as direct as possible with the minimum number of elbows or bends. It should pitch upwards to the chimney at a rate of 1/4 inch per foot of horizontal run. Generally, the breeching and chimney should be the same diameter as the boiler outlet connection.

NOTE
11 and 12 section uses adapter collar for connection to 12" diameter vent system.

For fuel conservation and stable burner performance, the vent connection from the boiler should not include a barometric draft control or other opening unless the venting system can develop an excessive draft, or is required by code.

19A SERIES BOILER
INSTALLATION INSTRUCTIONS

5. COMBUSTION AND VENTILATION AIR

An adequate supply of air for the boiler room must be provided to allow complete combustion of fuel and ventilation of the room to avoid excessively high ambient temperature. Air inlet by natural ventilation directly from the outside shall have total free area of not less than one sq. in. per 14,000 BTU per hour of input of all fuel burning appliances in the boiler room.

Where combustion air must be obtained through ducts, see ANSI/NFPA 31 or ANSI Z223.1 for requirements.

If mechanical combustion air supply is required, the system must be approved by the local authorities, and should provide at least 30 CFM per gallon of oil and 0.25 CFM per MBH of gas input to the boilers.

Ventilation air, if required, must be in addition to the combustion air quantities called for above.

6. ASSEMBLY OF SECTIONS

When boilers are delivered to the job site, each item should be inspected closely for possible shipping damage. Scars or nicks in the port sealing surfaces may allow leakage. **Do not attempt to use any section that has been damaged in the port seal area.**

When ready to commence assembly, recommended on a level pad, place the angle rails in position parallel with each other with the 2" legs on the floor and measuring 25-21/32 inches outside dimension. Be sure to align the center of the boiler with the center line of the pad. If no pad is provided, shim and grout under the angles to make them level and provide support along the full length. See FIGURE 1. Clean hydronic gasket recesses and rope groove with a wire brush, taking care not to damage machine surface.

See TABLE 2 for proper location of sections.

TABLE 2

3 SECT	F	H	B								
4 SECT	F	P	H	B							
5 SECT	F	H	P	H	B						
6 SECT	F	P	H	P	H	B					
7 SECT	F	H	P	H	P	H	B				
8 SECT	F	P	H	P	H	P	H	B			
9 SECT	F	P	H	P	H	P	H	P	B		
10 SECT	F	P	P	H	P	H	P	H	P	B	
11 SECT	F	P	P	P	H	P	H	P	H	P	B
12 SECT	F	P	P	P	P	H	P	H	P	H	P	B

F = Front Section
P = Plain intermediate section
H = Heater intermediate section-Optional, must be ordered.
B = Back Section

CAUTION
Due to the fact that the sections are top heavy, it is absolutely necessary that the back section be supported in such a manner as to prevent its falling and causing potential serious bodily injury while preparing to add the next section. One such way would be to insert a piece of 3" x 36" piping in the lower port.

NOTE
Some sections may need shims under support feet to align with other sections.

Stand the back section in place with the feet on and in the angle iron rails. Support the section as required to prevent it from falling forward or rearward. Clean hydronic gasket recesses and rope groove with a stiff wire brush. Apply spray-on adhesive (supplied with the boiler) to rope groove to hold wicking in place during assembly.

CAUTION
Do not spray adhesive into the hydronic seal ports.

Apply a length of wicking avoiding bends and twists. Be sure ends extend past the cleanout cover opening. (See FIGURE 2) Place the upper and lower hydronic seals in the recessed section taking care not to dislodge the rope or the hydronic seals. Inspect the alignment of the sections through the open ports and, if properly aligned, install the draw rods with nuts drawn hand-tight. (See FIGURE 3.) Plumb the sections before applying torque to the upper right and lower left draw rods. Maintain finger-tight torque on upper left and lower right draw rods.

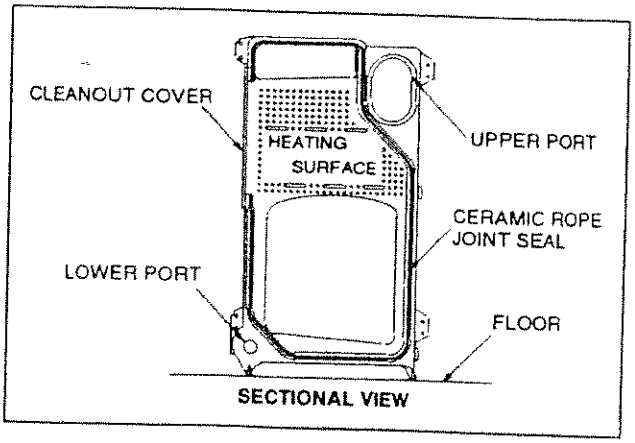


FIGURE 2

IMPORTANT
The upper and lower ports should be drawn up metal to metal around the outside of the hydronic seal. Metal to metal conditions will not occur at any other location. Avoid excessive torque on upper left and lower right draw rods, which may warp the section. See FIGURE 3 for correct alignment of the seal.

Assemble additional sections as described above.

After draw rods are hand tight, torque as shown in TABLE 3.

19A SERIES BOILER
INSTALLATION INSTRUCTIONS

TABLE 3		
STEP 1	UPPER RIGHT	5 FT. LBS.
STEP 2	LOWER LEFT	5 FT. LBS.
STEP 3	UPPER LEFT	5 FT. LBS.
STEP 4	LOWER RIGHT	5 FT. LBS.
STEP 5	UPPER RIGHT	25 FT. LBS.
STEP 6	LOWER LEFT	25 FT. LBS.
STEP 7	UPPER RIGHT	50 FT. LBS.
STEP 8	LOWER LEFT	50 FT. LBS.
STEP 9	UPPER LEFT	10 FT. LBS.
STEP 10	LOWER RIGHT	10 FT. LBS.

Prepare additional intermediate sections and install in the same manner described above. Be sure each section is properly sealed against water leakage and flue gas exfiltration. Be certain the angle rails remain level and provide support for each section as it is assembled. Check each section for vertical position.

When all sections, including the front section or back are in place, check all draw rods to insure iron-to-iron contact at ports. ***DO NOT APPLY EXCESSIVE TORQUE***. See TABLE 3 for recommended torques.

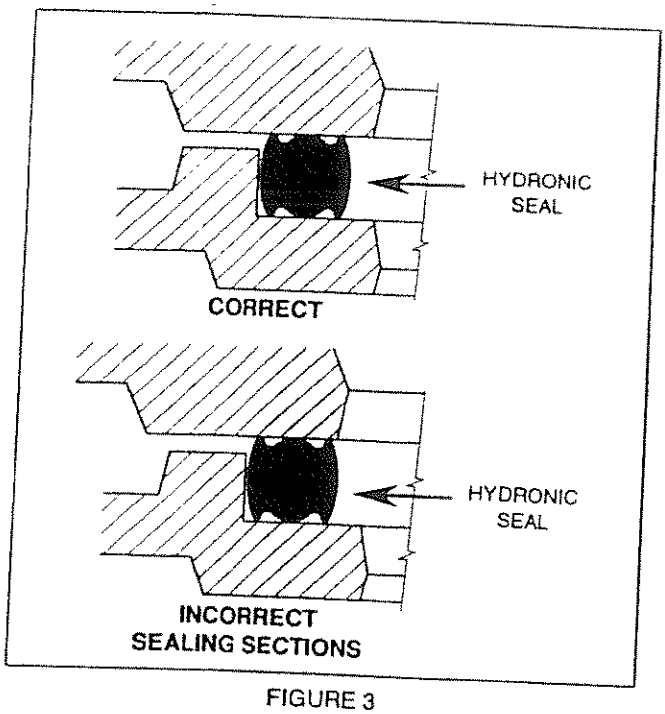


FIGURE 3

7. HYDROSTATIC TEST

Plug tappings, fill boiler with water and vent air from top of boiler. Check for leaks. Leakage at seals may be due to misalignment of hydronic seals. Loosen draw rods, reposition seals and retest as above.

All completed boilers shall satisfactorily pass the hydrostatic tests as prescribed by A.S.M.E., Code Section IV.

1. Steam Boilers – The assembled boiler shall be subjected to a hydrostatic test of not less than 45 PSIG.
2. Water Boilers – The assembled boiler shall be subjected to a hydrostatic test pressure not less than 1-1/2 times the maximum allowable working pressure.
3. The required test shall not exceed the test pressure by more than 10 PSI.

Excessive torque on draw rods may damage castings. Do not exceed the torque shown in TABLE 3.

In a cold environment, hydronic seals may not quickly conform to sealing surfaces when properly compressed. Under such conditions, hydrostatic testing with cold water might show weeping or leaking at the seals. To avoid this possibility, delay filling the boiler with cold water for a few hours after assembly, or use warm water, if available, for the tests.

If there is seepage about chaplets or minor leakage, consult the Smith Company representative for advice regarding A.S.M.E. Code approved repairs by peening or plugging.

8. STEAM PIPING

A steam piping schedule is shown in TABLE 4. Pitch piping to allow condensate to flow in the same direction as steam. Makeup water connections must be made to the return piping, not directly to the boiler. Install blow-down valves as required.

See FIGURE 4 for recommended acceptable steam piping arrangement.

TABLE 4			
BOILER SIZE	NO. OF 3" RISERS	HEADER	EQUALIZER
3 THRU 5 SECTION	1	3"	1-1/2"
6 THRU 10 SECTION	2	4"	2"
11 AND 12 SECTION	2	5"	2-1/2"

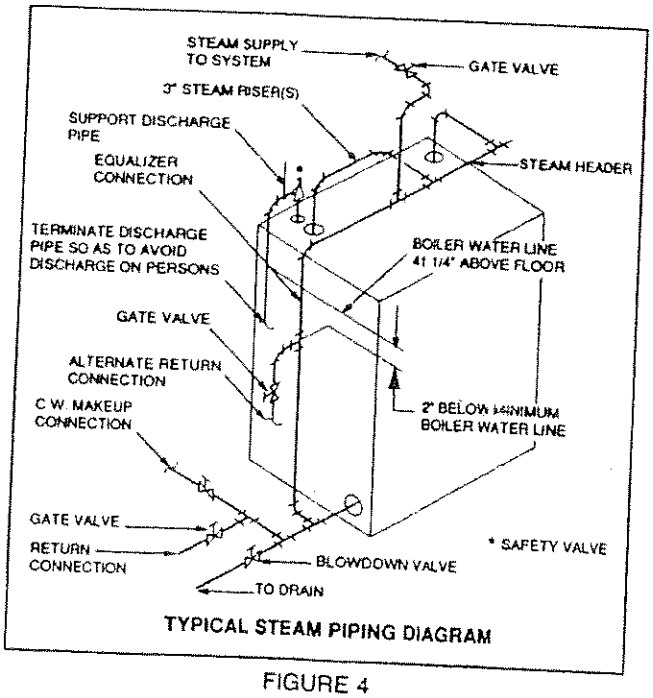


FIGURE 4

19A SERIES BOILER
INSTALLATION INSTRUCTIONS

TABLE 5				
NUMBER OF SECTIONS	EVAPOR. RATE GPM	WATER 1" BELOW WATER LEVEL GAL.	MIN. FEED WATER PUMP RATE-GPM	CONDENSATE RECEIVER CAP.-GAL.
3	.61	1.4	1.22	12
4	.85	1.9	1.70	16
5	1.19	2.4	2.37	22
6	1.52	2.9	3.04	29
7	1.86	3.3	3.71	35
8	2.19	3.8	4.38	41
9	2.53	4.3	5.05	47
10	2.86	4.8	5.72	54
11	3.20	5.2	6.39	60
12	3.53	5.7	7.06	66

Feed water makeup requirements.

NOTE
These recommendations are considered normal for compact buildings on the basis of 80% receiver use. Where buildings are spread out, additional receiver capacity may be necessary because of the extended time required for condensation to return to the receiver.

9. WATER PIPING

See FIGURE 5 for acceptable water piping diagram. TABLE 6 gives pumping rate and supply & return sizing for standard installations.

TABLE 6			
BOILER SIZE	GPM	RETURN CONN.	SUPPLY CONN.
3	30	2"	2"
4	41	2"	2"
5	58	2-1/2"	2-1/2"
6	74	3"	3"
7	90	3"	3"
8	106	3"	3"
9	123	3"	3"
10	139	3"	3"
11	155	3"	4"
12	171	3"	4"

Based on 20°F system temperature drop.

NOTE
Boiler supplied with 4" water supply tapping and 3" return tapping.

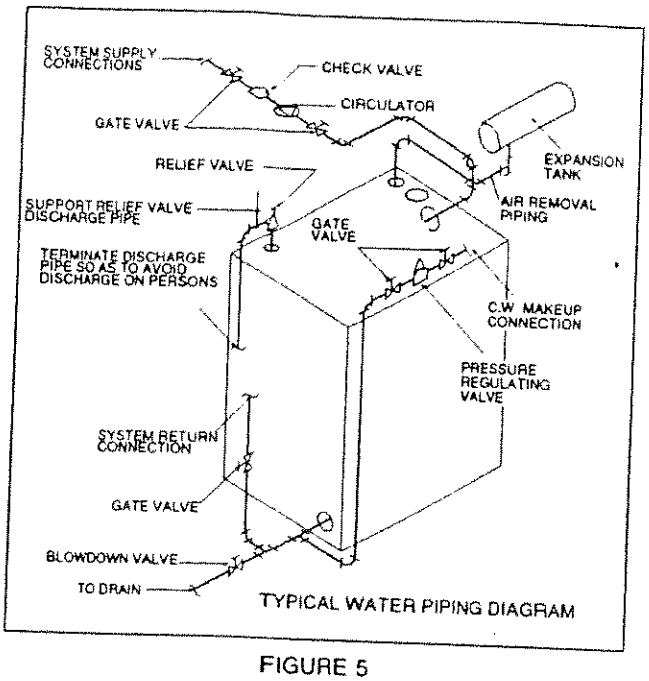


FIGURE 5

10. TANKLESS HEATERS

Heater openings are provided for below-the-water-line tankless heater coils in all special intermediate sections when ordered. See TABLE 2 for the conr·ct placement of these heater sections. Install the low limit temperature control in the 3/4" tap located in the center of the coil.

If the heater sections are installed in an order other than in TABLE 2 the jacket panels will not match.

11. SMOKE HOOD

Install smoke hood with the correct size smoke pipe connecting collar using the 5/16" x 1-1/2" studs and hex nuts furnished in screw seats in the back section. Apply self-adhesive insulating tape (Items 21 and 22 in Parts detail drawing on Page 2) to smoke hood flange and damper angle Item 23. Fasten the slide damper in the open position for starting the burner adjustment process.

See FIGURE 6 for recommended "L" coil piping and FIGURE 7 for SM9-18 single and/or dual piping arrangements.

19A SERIES BOILER
INSTALLATION INSTRUCTIONS

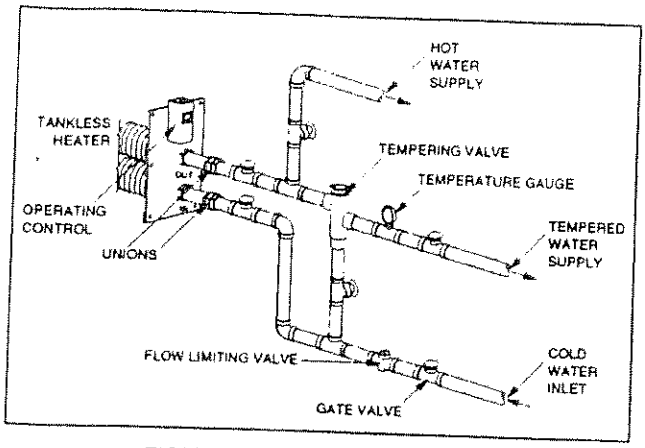


FIGURE 6 – TANKLESS PIPING

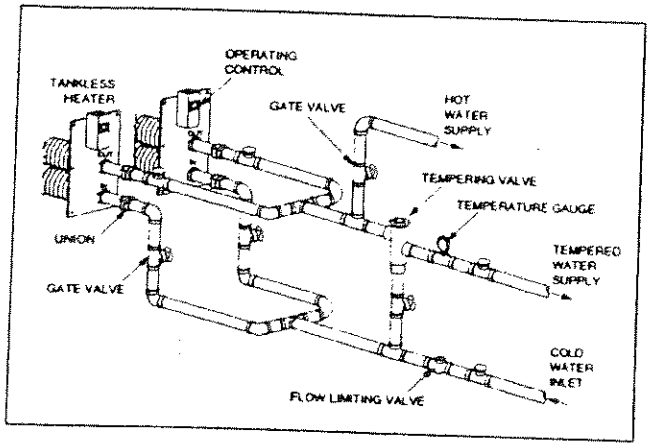


FIGURE 7 – DUAL TANKLESS PIPING

12. BURNER MOUNTING PLATE & TARGET WALL

The new **target wall** used on 3-6 section boilers must be positioned with the flat side tight against the **rear casting** and with the bottom side resting on the **floor** of the combustion chamber. No glues or fasteners are used to secure the target wall.

Each boiler is provided with a cast iron burner mounting plate with an appropriate burner opening and tapped holes for studs to accommodate burner flange. The mounting plate is furnished with 1/4" diameter sealing rope and an insulation block which should be installed on the plate before placing the plate on the boiler. (See exploded view on page 2, Items 11-13 & FIGURE 8.)

The sealing rope should be placed in the groove on the boiler side of the plate using adhesive to hold it in place. The insulation block has a burner opening and a cutout for the observation opening. Locate the block with the high temperature facing on the fire side in the opening in the front section. The burner mounting plate **insulating block** for Beckett burners is installed with the dished side facing **towards** the combustion chamber.

Attach the block to the plate with the four 1/4" x 5" machine screws and 1-1/2" O.D. washers, the washers on the insulation block side. At the time of burner installation, the hole in the insulation block may have to be enlarged. See separate burner installation booklet for further assistance and dimensions.

NOTE
Tighten burner mounting plate screws evenly to slightly compress rope gasket. Overtightening will cause plate cracking at corners.

NOTE
Most large burners require support to the floor. See burner manufacturer's manual for such specifications if needed.

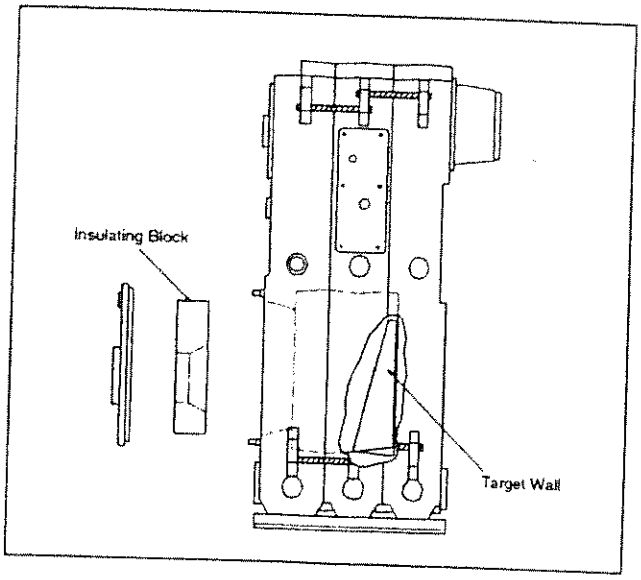


FIGURE 8

19A SERIES BOILER
INSTALLATION INSTRUCTIONS

13. CLEANOUT COVERS

Be sure the rope seals are in place around the groove in the cleanout cover plate. Install the plates on the boiler sections carefully to insure proper sealing all around, using the 5/16" x 2" special anchor bolt and 5/16" hex head nuts. After periodic flue cleaning, replace nuts at 10 lbs. torque. Use Hi-Temp silicone caulk to seal covers air-tight.

14. REAR OBSERVATION PORTS 7-12 SECTIONS

INSTRUCTIONS FOR ASSEMBLY:

1. Locate steel "flapper door" (Item 6) as shown in FIGURE 9 below. Drive Item 7, "expansion pin", into hole in Item 1 to secure 6 in position.

2. Lift Item 6 up and install Item 2, "hex bolt".

3. Slide Item 3, "compression spring" over the hex bolt and screw Item 4 "hex nut" to hex bolt.

4. Screw Item 5, "ball knob" into position and lock location using Item 4 as a "jam" nut.

5. Adhere 24-1/2" insulating tape as shown to Item 1.6. Mount assembly to back section of boiler.

7. 3-6 section boilers use a solid cover which is installed the same way.

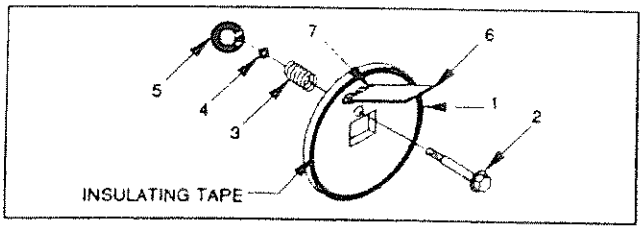


FIGURE 9

IMPORTANT
Item 6 must always be part of the assembly. Check condition twice a year and replace as needed.

15. CONTROL LOCATIONS

NOTE
Jacket front panel should be in place before controls on front of front section are installed.

Refer to FIGURE 11 showing locations recommended for steam and water boiler limit and operating controls. Note the requirement for an operating temperature control whenever a tankless heater is called for. This is in addition to pressure limit controls and other operating controls on steam boilers.

NOTE
On steam boilers the 1" close nipple and 1" x 1/4" reducing coupling for operating control should be installed prior to jacket top panels.

16. JACKET

Jacket assembly details are contained in a separate instruction booklet.

17. SAFETY AND RELIEF VALVES

Safety and relief valves sized on the output rating of each boiler size are furnished along with the necessary pipe and fittings for installation in the back section. The valve discharge connections should be piped to a location where people will not be exposed to hot vapor or liquid. Any discharge piping should be supported so as to prevent exerting any strain on the valve body by the weight of the piping. See FIGURE 10.

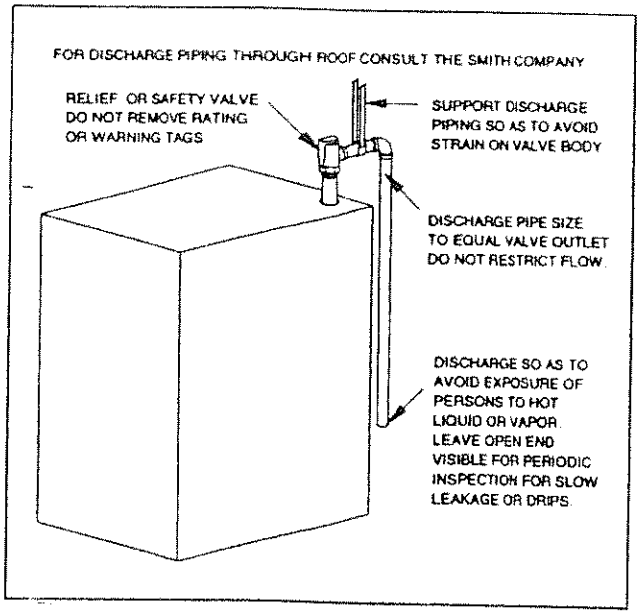


FIGURE 10

Some state and local codes require steam safety valves be piped to the atmosphere outside the building.

19A SERIES BOILER
INSTALLATION INSTRUCTIONS

18. CLEANING BOILER WATERWAYS

A. STEAM BOILERS

> **NOTE**
> The boiler should be cleaned before connecting system piping and installing steam trim.

1. Plug unused openings all around the boiler leaving a valved overflow pipe connected to the safety valve tapping. Also provide a valved blow-down connection to one of the bottom tappings.

2. The fuel burning equipment should be installed and made ready to operate in accordance with the burner instructions.

3. Fill the boiler with water to the middle of the upper port, adding a boiler cleaning compound, as recommended in A.S.M.E. Section VI.

4. Fire the boiler for at least one hour at a low rate to circulated the cleaning compound through the boiler.

5. Blow off surface of boiler water through skimmer connection or through safety valve opening by feeding clean water into the boiler through a bottom fill connection.

6. When the water coming off the surface runs clear, shut off the burner, close the top valve and open the bottom blow-down valve. If there is a slight steam pressure in the boiler, it will assist the blow-down.

7. When the sections have cooled after blow-down, flush the interior of the boiler from the top by introducing water from a hose through the top port. When the water runs clear, complete the system piping, install the steam trim and controls. Fill the boiler with clean water. Heat the boiler water to at least 180°F to release corrosive gases.

B. WATER BOILERS

> **NOTE**
> The system piping should be completed before cleaning the boiler.

1. Add an approved boiler compound. Follow the compound manufacturer's instructions for best results. Fill the system and vent air wherever necessary.

2. Heat the water to at least 180°F and circulate through all the piping system. After about one hour, drain the system thoroughly. Wash the interior of the boiler with a hose inserted through the top tapping. When blow-down water runs clean, allow boiler to cool, then fill the system with clean water.

3. Heat the water up to about 180°F and vent air as necessary to purge the system. The boiler is now ready to operate.

19. OWNERS INSTRUCTIONS

A. For best performance of the boiler, the following suggestions should be performed by a qualified boiler room technician, through a regular program of maintenance and adjustment to obtain the following.

1. Oil burner combustion: 12 to 12 1/2 + % CO_2, zero smoke, smooth lightoff and operation.

   Gas burner combustion: 10 to 10 1/2% CO_2, 0.02% CO, smooth lightoff and operation.

2. Keep boiler fireside surface clean. Flue gas temperature reading above 450°F over boiler room temperature signals the start of soot accumulation. Inspect at least twice each year.

3. Steam boiler water condition should be observed. Unstable water line, system steam hammer indicate dirty water. Blow-down is recommended. However, the introduction of excess raw water to a steam boiler can result in the deposit of scale and inefficient operation of physical damage to the boiler.

4. Float operated and probe type low water cutoff devices should be maintained according to the instructions of the manufacturer.

5. Limit control function should be checked on a regular basis.

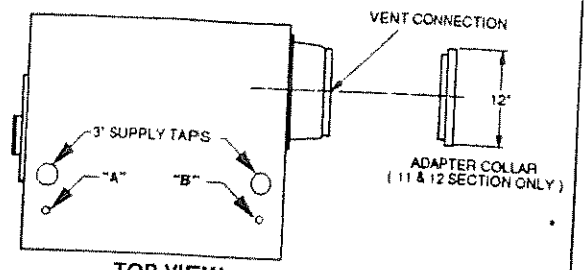
6. Flame safeguard controls should be checked regularly.

B. The products of combustion must be conducted to the outdoors by means of a metal connector of at least the same size as the boiler smokehood outlet and a chimney or stub-stack. The boiler is constructed for pressurized operation and the burners are selected for operation against a back pressure of 0.10 ins. w.c. at the boiler outlet. If the actual conditions cause a back pressure in excess of 0.10 ins. w.c. at the boiler outlet, consult the Smith Co. for verification of burner size. If the chimney has the ability to develop excess draft, a barometric draft control should be installed in the chimney. Check with the Smith representative for assistance.

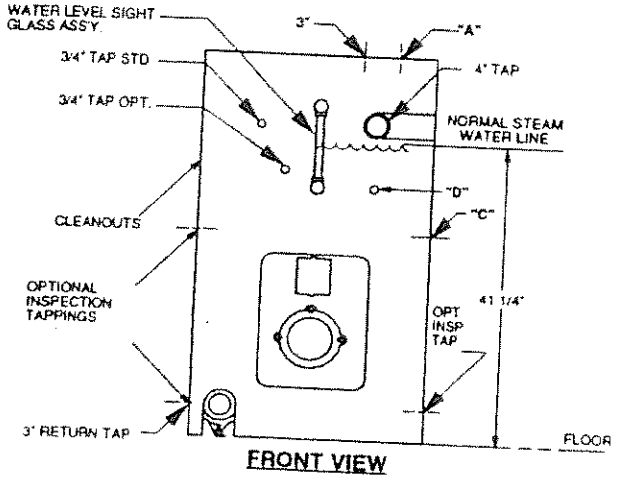
19A SERIES BOILER
INSTALLATION INSTRUCTIONS

SERIES 19A BOILER (STEAM)
TAPPING AND CONTROL LOCATIONS

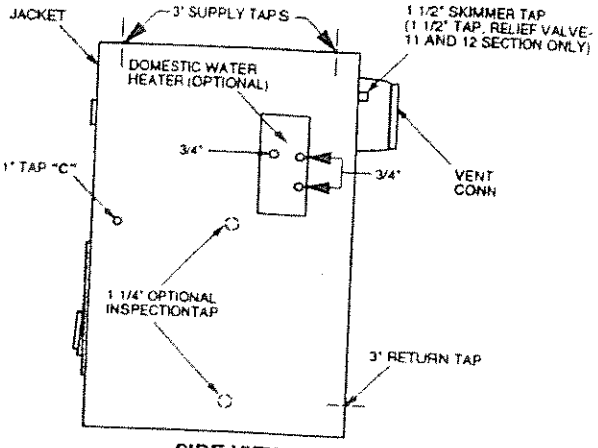
"A" - 1" TAP, PRESSURE CONTROLS
"B" - 1 1/4" TAP, STEAM SAFETY VALVE
"C" - 1" TAP, OPTIONAL LWCO
"D" - 3/4" TAP



TOP VIEW



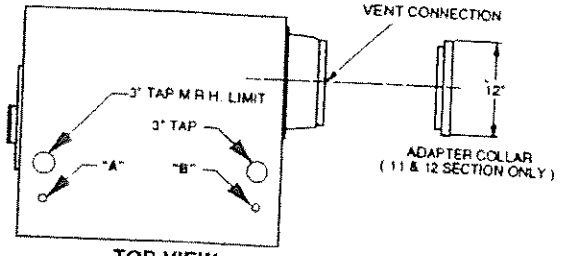
FRONT VIEW



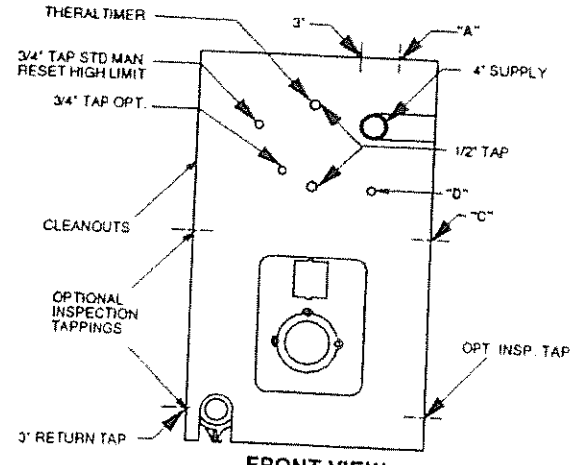
SIDE VIEW

SERIES 19A BOILER (WATER)
TAPPING AND CONTROL LOCATIONS

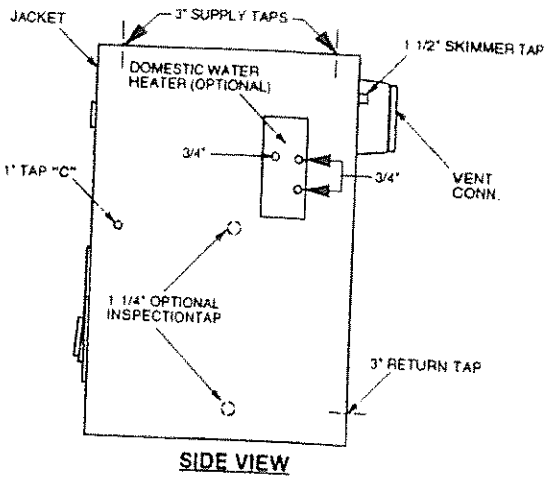
"A" - 1" TAP, AIR REMOVAL CONN., OPT LWCO
"B" - 1 1/4" TAP, SAFETY VALVE
"C" - 1" TAP, OPTIONAL LWCO
"D" - 3/4" TAP, OPER. TEMP. CONN.



TOP VIEW



FRONT VIEW



SIDE VIEW

FIGURE 11

19A SERIES BOILER
INSTALLATION INSTRUCTIONS

WARNING

Any appliance that burns natural gas, propane gas, fuel oil, wood or coal is capable of producing carbon monoxide (CO).

Carbon Monoxide (CO) is a gas which is odorless, colorless and tasteless but is very toxic.

If your Smith boiler is not working properly, or is not vented properly, dangerous levels of CO may accumulate. CO is lighter than air and thus may travel throughout the building. **BRIEF EXPOSURE TO HIGH CONCENTRATIONS OF CO, OR PROLONGED EXPOSURE TO LESSER AMOUNTS OF CO MAY RESULT IN CARBON MONOXIDE POISONING.**

EXPOSURE CAN BE FATAL AND EXPOSURE TO HIGH CONCENTRATIONS MAY RESULT IN THE SUDDEN ONSET OF SYMPTOMS INCLUDING UNCONSCIOUSNESS.

Symptoms of CO poisoning include the following:

dizziness	vision problems	shortness of breath
headaches	loss of muscle control	unclear thinking
nausea	weakness	unconsciousness

The symptoms of CO poisoning are often confused with those of influenza, and the highest incidence of poisoning occurs at the onset of cold weather or during flu season. A victim may not experience any symptoms, only one symptom, or a few symptoms. Suspect the presence of carbon monoxide if symptoms tend to disappear when you leave your home.

The following signs may indicate the presence of carbon monoxide:

- Hot gases from appliance, venting system, pipes or chimney, escaping into the living space.
- Flames coming out around the appliance.
- Yellow colored flames in the appliance.
- Stale or smelly air.
- The presence of soot or carbon in or around the appliance.
- Very high unexplained humidity inside the building.

If any of the symptoms of CO poisoning occur, or if any of the signs of carbon monoxide are present, **VACATE THE PREMISES IMMEDIATELY AND CONTACT A QUALIFIED HEATING SERVICE COMPANY OR THE GAS COMPANY OR THE FIRE DEPARTMENT.**

To reduce the risk of CO poisoning, have your heating system "tuned up" by a licensed heating contractor or the gas company -- preferably before each heating season. Also have the service company check your chimney or vent pipes for blockage.
Your home should also be adequately ventilated, particularly if you have insulated your home.

ONLY QUALIFIED, LICENSED SERVICE CONTRACTORS SHOULD PERFORM WORK ON YOUR SMITH BOILER.

WARNING

Install, operate and maintain unit in accordance with manufacturer's instructions to avoid exposure to fuel substances or substances from incomplete combustion which can cause death or serious illness. The State of California has determined that these substances may cause cancer, birth defects, or other reproductive harm. Also, install and service this product to avoid exposure to airborne particles of glasswool fibers and/or ceramic fibers known to the State of California to cause cancer through inhalation.

Smith
CAST IRON BOILERS
WESTCAST, INC.
260 NORTH ELM STREET WESTFIELD, MA 01085
TEL. (413) 562-9631 FAX (413) 562-3799

Heating & Burner Supply, Inc.

INDUSTRIAL, COMMERCIAL & RESIDENTIAL

HEATING, BURNER & BOILER SUPPLIES

479 WALTON AVENUE BRONX, NY 10451

TEL: (718) 665-0006 FAX: (718) 402-0757

Burner Specification Data Sheet

St Francis Prep

Burner:	Gordon Piatt Model R8.1-GO-07 RM7800L H.20-F4S
Boiler:	H B Smith 19A 11 Section Hot Water
BHP:	46
Firing Rate:	1754 MBH Input Natural Gas / 13.6 GPH # 2 Fuel Oil
Combustion Control:	Low / High / Off – Pressure Atomizing, Linkage
Flame Safeguard:	Honeywell RM7800L
Voltage:	208 / 3 / 60
Mode of Operation:	Pressure Atomizing, with Burner Mounted Fuel Pump
Gas Train:	1 1/2 " Honeywell Motorized Gas Train (7" w.c. req'd at inlet)
Burner Control Panel:	• NEMA1 (Burner mounted panel) • Single point wiring • Alarms – low water, main flame failure • Lights – power on, call for heat, ignition on, fuel on, low water, pilot flame failure, main flame failure • Locking key with handle • Auto fuel changeover • Circuit breakers
Code Compliance:	UL & FM

JOHN ZINK
JOHN ZINK COMPANY LLC

Intelligent design, smart operation

GORDON-PIATT® brand burners are the premier choice for die-hard performance and exceptional reliability in commercial and industrial applications.

The Model R series of forced draft burners fires gas, oil or combination dual fuels with pressure atomizing oil systems. The Model R burner is most commonly used with cast iron and firebox boilers, and other applications with firebox pressures not exceeding 1.50 inches water column.

Like all GORDON-PIATT **brand** burners, the Model R series is equipped with a patented stainless steel combustion head for pulsation-free operation with high heat release in confined combustion chambers.

GORDON-PIATT burners – for the long run

As an exclusive **brand** of John Zink Company, LLC, GORDON-PIATT products are developed, tested and manufactured with precision engineering and sophisticated controls. Our engineers design burner products that work for retrofit as well as replacement applications, and offer customers superior reliability and safety.

Ask about our legendary service and support team, world-class manufacturing, and dedicated research and development – all of which keep GORDON-PIATT products built for the long run.

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John Zink Company, LLC
11920 East Apache, Tulsa, OK 74116
Fax: 918-234-1833
e-mail: gpinfo@johnzink.com

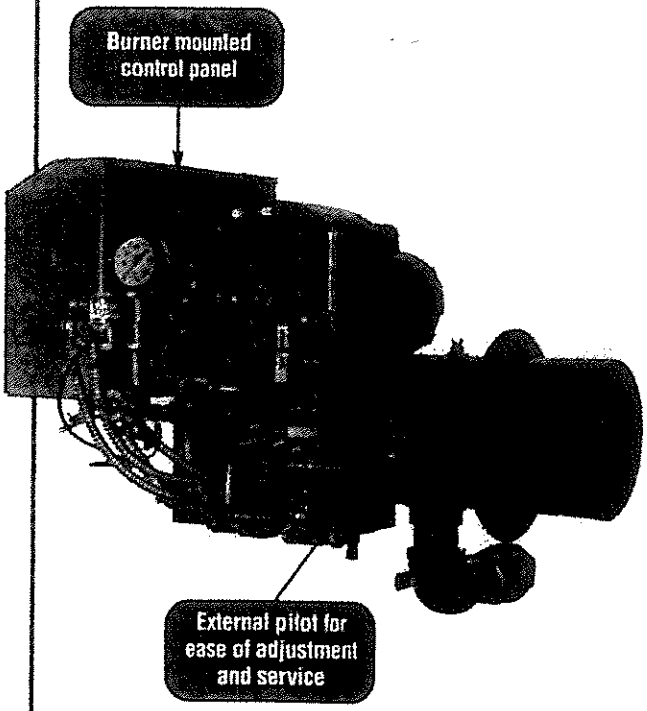
Toll Free: 1-800-638-6940

Model R

Patented*
Forced Draft Gas, Oil or Combination Dual-Fuel Burners

Features

- A variety of control systems available, including on-off, low-fire start, low-high-low and modulation.
- Patented stainless steel head combines a ring of recessed gas ports with controlled primary air for maximum flame retention.



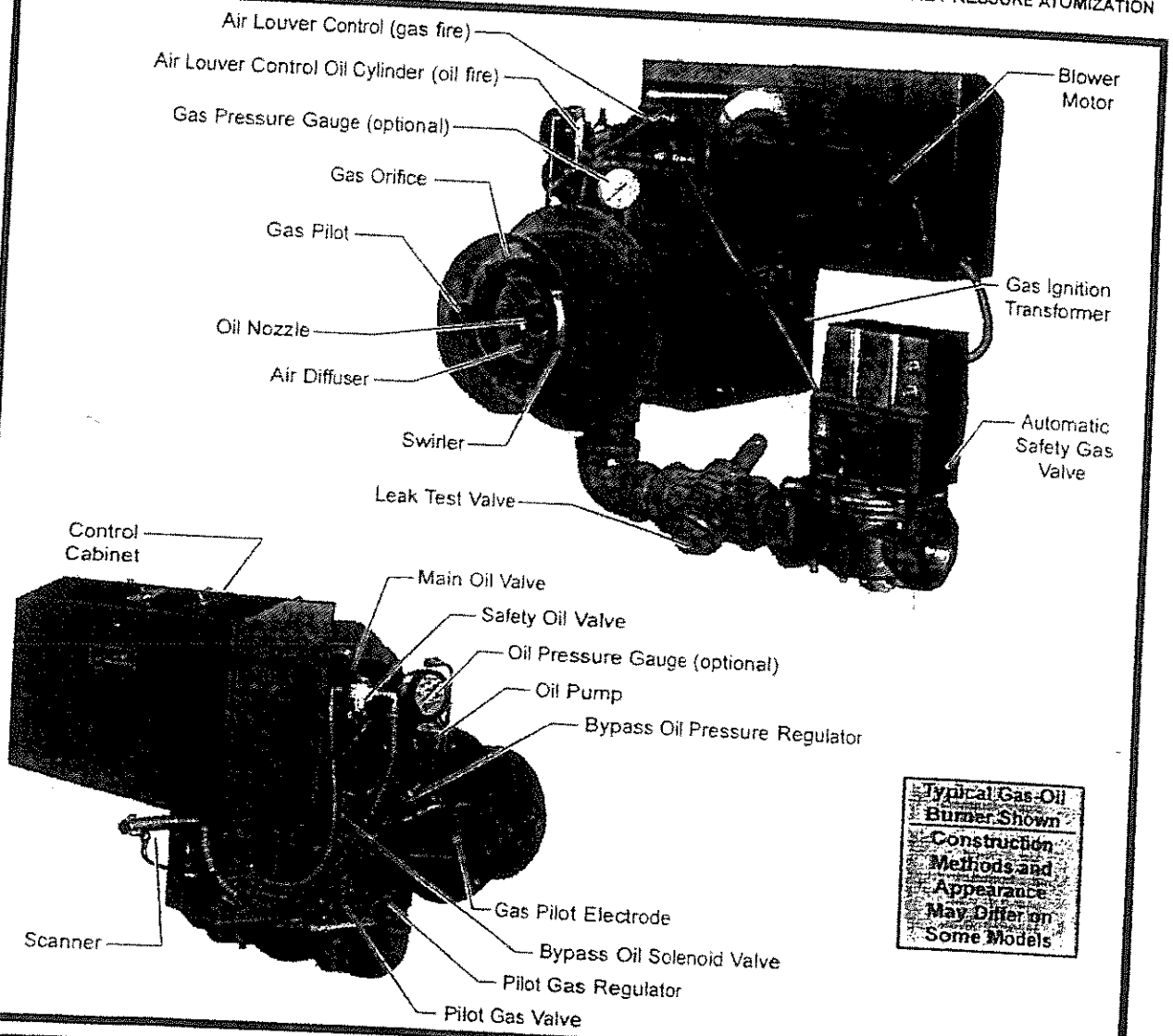
*Covered by one or more of the following U.S. Patent Numbers, 4785680, 4932274, 5441404, 5722821, 5957682. Canadian Patent Number 1279632 and Canadian Patents Pending.

JOHN ZINK
JOHN ZINK COMPANY LLC
Gordon-Piatt

1	R	15.1	Rev. 23
8-04	Replaces	1-03	

Specification Data

USING GAS AND LIGHT OIL-MECHANICAL PRESSURE ATOMIZATION



Typical Gas-Oil Burner Shown
Construction Methods and Appearance May Differ on Some Models

Burner Numbering System

R8.1-GO-07-RM7800L-H20-F4S

R - 8 - GO - 10 - XXXX - H. 20 - F4S

- Burner Type
- Burner Size
- Fuel (Gas - Oil)
- Blower Motor HP (1.0 HP)
- Flame Safeguard Control
- Gas Control System
- Gas Train Size
- Oil Control System

1 See Catalog Sheet 1-gen-10.1 for burner numbering.

2 Use Order Entry and Equipment Pricing Form 1196 when placing order.

An exclusive brand of John Zink Company

*Covered by one or more of the following patents: U.S. Patent Numbers 4785680; 4932274; 5441404; 5722821; 5944506; 5957682. Canadian Patent 1278632 and Canadian patents pending.

Specifications and Capacities

BASIC BURNER MODEL NO.		MAXIMUM FIRING RATE — COMBUSTION CHAMBER PRESSURE — DRAFT-.05" W.C. — NATURAL GAS BTU/HR 1000s	NO. 2 OIL GPH	LOW PRESSURE — PRESS. INCHES W.C.	NATURAL GAS BTU/HR 1000s	NO. 2 OIL GPH	HIGH PRESSURE — PRESS. INCHES W.C.	NATURAL GAS BTU/HR 1000s	NO. 2 OIL GPH	BURNER BLOWER MOTOR 3450 RPM VOLTAGE	HP
R6.9	03	630	4.5	0.2	560	4.0	—	—	—	120/60/1	1/3
R6	03	910	6.5		840	6.0					
R6.1	03	1120	8.0		990	7.0					
R6.2	03	1190	8.5	0.3	1120	8.0					
R6.3	05	—	—	0.4	1190	8.5					
R8	05	2100	15.0	0.2	1960	14.0					1/2
R8.1	07	2250	16.0		2100	15.0					3/4
R6.2	10	2380	17.0	0.3	2100	15.0	—			240/60/1	1
R8.3	15	2800	20.0		2520	18.0	1.0	2030	14.5	240/60/3	1½
R8.4	20	—	—		2800	20.0		2520	18.0		2
R10.9	10	2800	20.0	—	—	—	—	—	—	240/60/1	1
R10	15	3650	26.0		3200	22.8		2800	20.0		1½
R10	20	4200	30.0	0.2	3800	27.1	1.0	3080	22.0		2
R10.1	30	4500	32.0		4200	30.0		3920	28.0		3
R10.2	50	6300	45.0	0.6	5700	41.0		5600	40.0	240/60/3	5
R12.9	30	6000	43.0		5700	41.0		5450	39.0		3
R12.9	50	6000	43.0		5700	41.0		5450	39.0		5
R12	30	6400	46.0		6300	45.0	.75	6000	43.0		3
R12	50	7100	51.0	0.3	6900	49.0		6700	48.0		5
R12.1	50	8100	58.0		7800	55.7		7550	54.0		5
		[1] [2]			[1] [2]			[1] [2]			

Fuel

Gas	= G
Oil	= O
Gas/Oil	= GO

[1] Capacity based on an elevation of 2,000 feet. Capacity will be reduced 4% for each additional 1,000 feet of elevation.

[2] Oil burners - No. 2 oil, GPH based upon 140,000 BTU/U.S. gallon. Maximum viscosity 38 SSU at 100°F average 31 Redwood seconds. Mechanical pressure atomization.

[3] Oil burners supplied with burner mounted oil pump as standard except for R12-50 and R12.1-50. Modulating burners with burner mounted pumps limited to 35.0 GPH with 3.0 HP blower motor and 45.0 GPH with 5.0 HP blower motor. See catalog Sheet 6-10-2.2 for further data on burner high pressure pump sets.

Dimensions

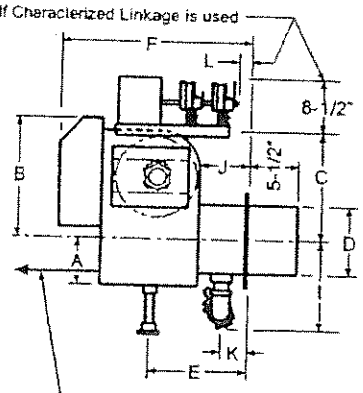
BASIC BURNER MODEL NO	SHIPPING WEIGHT LBS. APPROX.	OVERALL BURNER DIMENSIONS (INCHES) A	B	C	D	E	F	G	H	I	J	K	L
R6.9 03	160	6	19	12-1/8	6	14-1/4	26	11-5/8	11-7/8	9	8-1/8	6	
R6 03													
R6.1 03													
R6.2 03													
R6.3 05	165												
R8 05	200												
R8.1 07	230												
R8.2 10	250									12		6-5/16	
R8.3 15	270	6-1/2	19-3/4	13-3/4	8	13-7/16	28-1/2	13-1/2	14-1/2				
R8.4 20	280												
R10.9 10	300												
R10 15	320												
R10 20	360				10					14			3
R10.1 30	410												
R10.2 50	430					14-9/16	30-1/4		16	16			4-1/4
R12.9 30													
R12.9 50	650	6-1/2	21-1/8	15-3/8	12	15-3/16	30-1/4				8-11/16	6-1/2	5-1/4
R12 30													
R12 50	700							16	SEE NOTE				
R12.1 50													

4 5

Fuel

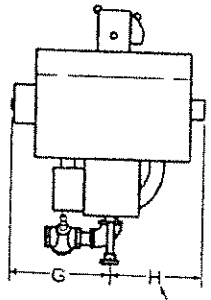
Gas	= G
Oil	= O
Gas/Oil	= GO

If Cheracterized Linkage is used



NOTE

Dimension E plus burner nose length (5-1/2" standard) is required behind the burner to remove the drawer assembly.



NOTE

If remote oil pump set is used, dimension will be 1/2 width of control cabinet.

4 Weight will vary by burner depending on size and type of gas train, type of fuel control system, etc. The figures shown represent a burner with standard controls including gas train and burner oil pump set where applicable.

5 The dimensions shown are typical and subject to change without notice.

Standard Equipment

	SINGLE OR COMBINATION FUEL BURNERS	[1] FUEL CONTROL SYSTEMS											
		ON - OFF FIXED AIR & FUEL			ON-OFF OR HI-LOW LOW FIRE START			MODULATING PROVEN LOW FIRE START			MODULATING PROVEN LOW FIRE START		
	DESCRIPTION	GAS	OIL	GAS-OIL	GAS	OIL	GAS-OIL	GAS	OIL	GAS-OIL	GAS	OIL	GAS-OIL
		F1	F1	F1-F1	F4	F4	F4-F4	F2	F5-R2	F2-F5R2	F2	F7-Z	F2-F7-Z
GENERAL	Blower Motor and Fan Air Inlet Register and Air Inlet Guard Flame Detector (UV Scanner)	X	X	X	X	X	X	X	X	X	X	X	X
GENERAL	Air Flow Safety Switch (also on Oil Burners when required)	X		X	X		X	X		X	X		X
CONTROL CABINET	Combustion Flame Safeguard Control On - Off Switch Motor Contactor or Starter (½ HP and larger)	X	X	X	X	X	X	X	X	X	X	X	X
CONTROL CABINET	Fuel Transfer Switch			X			X			X			X
CONTROL CABINET	Modulating Sub-Panel with Manual-Auto Switch and Manual Potentiometer							X	X	X	X	X	X
CONTROL CABINET	Two Indicator Lights	X	X	X	X	X	X						
CONTROL CABINET	Four Indicator Lights							X	X	X	X	X	X
AIR-FUEL CONTROL	Fixed Air and Fuel	X	X	X									
AIR-FUEL CONTROL	Low Fire Start, Motorized Gas Valve Air-Fuel Control				X		X						
AIR-FUEL CONTROL	Low Fire Start, Oil Valving and Oil Cylinder Air-Fuel Control					X	X						
AIR-FUEL CONTROL	Proven Low Fire Start, Modulating Motor Air-Fuel Control							X	X	X	X	X	X
GAS CONTROL	Safety Pilot Burner Ignition Transformer, 6000 Volt Pilot Solenoid Valve Pilot Shut-Off Cock Safety Test Cock Gas Orifices	X		X	X		X	X		X	X		X
OIL CONTROL	Oil Drawer Assembly with Air Diffuser Main Oil Solenoid Valve Safety Oil Solenoid Valve Low Oil Pressure Switch (When Required) Ignition Transformer, 10,000 Volts [2] Gas Pilot Ignition [3] Oil Pump		X	X		X	X		X	X		X	X
OIL CONTROL	Simplex Oil Nozzle(s)		X	X		X	X		X	X			
OIL CONTROL	By-Passing Oil Nozzle(s) Strainer Spring Loaded Check Valve											X	X
OIL CONTROL	By-Pass Oil Solenoid Valve By-Pass and 3-Way Solenoid Valve By-Pass Pressure Regulating Valve Oil Cylinder Assembly					X	X						
OIL CONTROL	Oil Metering Valve								X	X		X	X

[1] Natural gas and/or No. 2 oil

[2] Spark ignition of oil standard on STRAIGHT OIL burners under 34 GPH.

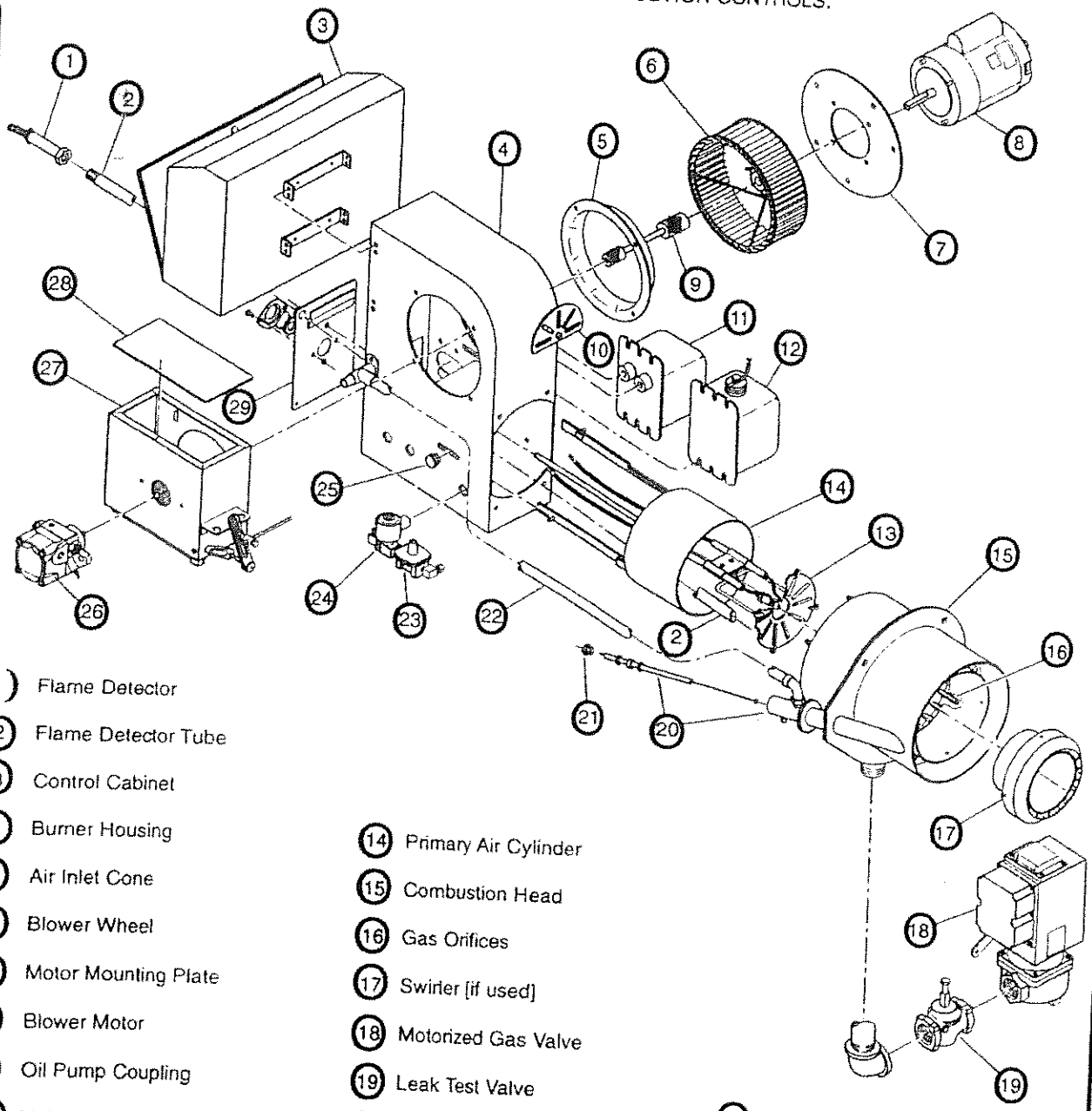
[3] Proven gas pilot ignition is standard on all GAS and COMBINATION GAS/OIL burners and also for all sizes 12 OIL Burners.

Optional Equipment

■ Characterized Linkage available on sizes 10 and 12 Burners with Modulating Systems.

TYPICAL R6 or R8 GAS-OIL BURNER

NOTE SEE PART IV FOR GAS SYSTEM COMPONENTS, PART V FOR OIL SYSTEM COMPONENTS AND PART VI FOR COMBUSTION CONTROLS.



) Flame Detector

2 Flame Detector Tube

3 Control Cabinet

4 Burner Housing

5 Air Inlet Cone

6 Blower Wheel

7 Motor Mounting Plate

8 Blower Motor

9 Oil Pump Coupling

10 Linkage Control Quadrant

11 Oil Ignition Transformer [if used]

12 Gas Pilot Ignition Transformer

13 Oil Drawer Assembly
- Air Diffuser
- Oil Nozzle
- Oil Nozzle Adapter
- Oil Ignition Electrodes [if used]
- Main Fuel Tube
- Ignition Cables [if used]

14 Primary Air Cylinder

15 Combustion Head

16 Gas Orifices

17 Swirler [if used]

18 Motorized Gas Valve

19 Leak Test Valve

20 216C Gas Pilot Electrode Assembly

21 216C Pilot Packing Nut

22 Pilot Air Tube

23 Pilot Gas Pressure Regulator

24 Pilot Solenoid Valve

25 Primary Air Positioning Control Knob

26 Oil Pump

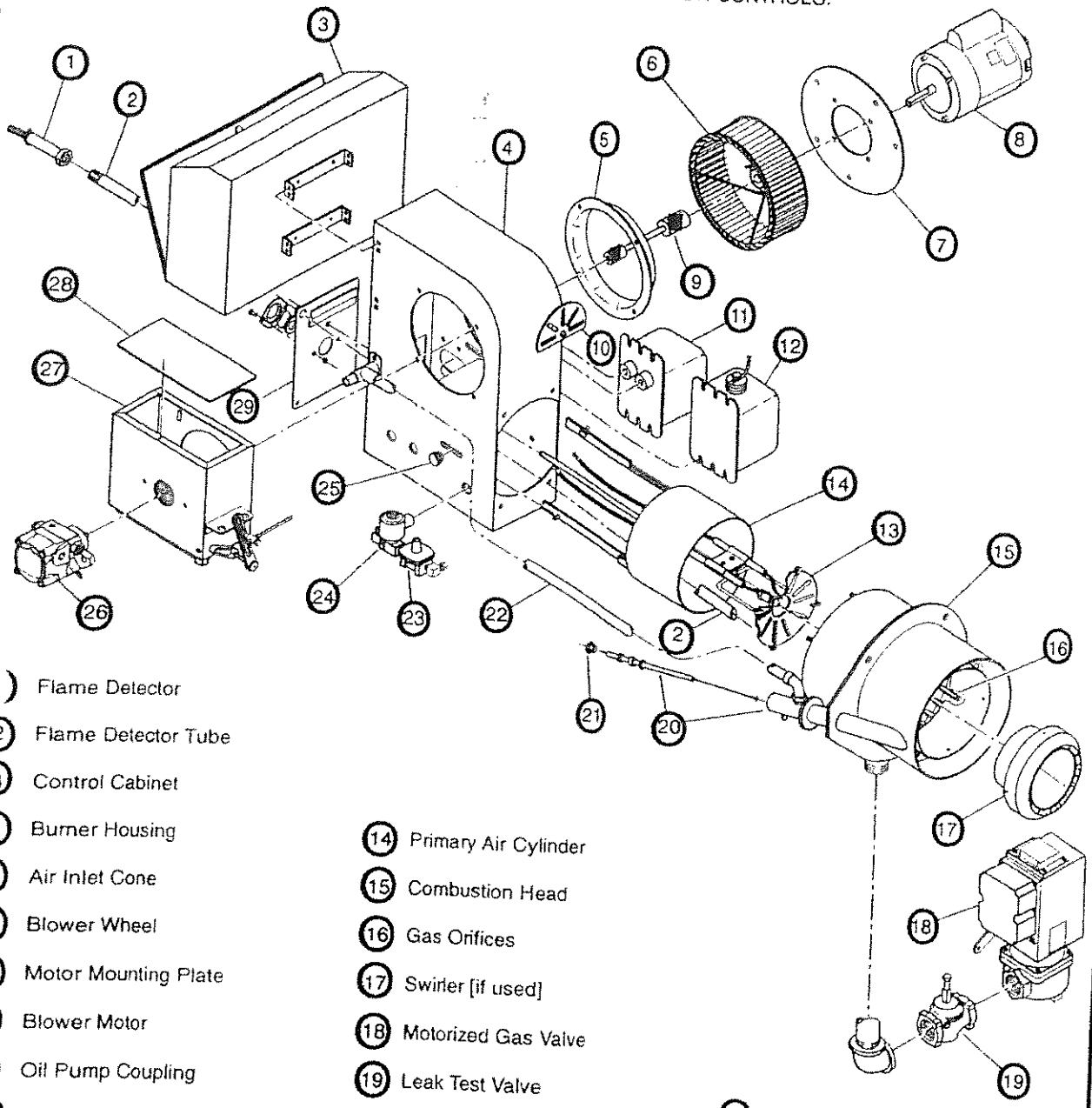
27 Air Inlet Assembly
- Air Louver
- Air Louver Spring
- Oil Cylinder Mounting Bracket
- Louver Actuator Arm
- Air Inlet Guard

28 Air Inlet Box Cover

29 Back Plate Assembly

TYPICAL R6 or R8 GAS-OIL BURNER

NOTE SEE PART IV FOR GAS SYSTEM COMPONENTS, PART V FOR OIL SYSTEM COMPONENTS AND PART VI FOR COMBUSTION CONTROLS.



1. Flame Detector
2. Flame Detector Tube
3. Control Cabinet
4. Burner Housing
5. Air Inlet Cone
6. Blower Wheel
7. Motor Mounting Plate
8. Blower Motor
9. Oil Pump Coupling
10. Linkage Control Quadrant
11. Oil Ignition Transformer [if used]
12. Gas Pilot Ignition Transformer
13. Oil Drawer Assembly
    - Air Diffuser
    - Oil Nozzle
    - Oil Nozzle Adapter
    - Oil Ignition Electrodes [if used]
    - Main Fuel Tube
    - Ignition Cables [if used]
14. Primary Air Cylinder
15. Combustion Head
16. Gas Orifices
17. Swirler [if used]
18. Motorized Gas Valve
19. Leak Test Valve
20. 216C Gas Pilot Electrode Assembly
21. 216C Pilot Packing Nut
22. Pilot Air Tube
23. Pilot Gas Pressure Regulator
24. Pilot Solenoid Valve
25. Primary Air Positioning Control Knob
26. Oil Pump
27. Air Inlet Assembly
    - Air Louver
    - Air Louver Spring
    - Oil Cylinder Mounting Bracket
    - Louver Actuator Arm
    - Air Inlet Guard
28. Air Inlet Box Cover
29. Back Plate Assembly

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1	R	30.11	Rev. 12
1	S	30.22	
5-04	Replaces	1-03	

MODEL R & S BURNER
INSTALLATION INSTRUCTIONS
FOR FIREBOX, HRT & CAST IRON BOILERS

GENERAL INSTRUCTIONS

These instructions provide illustrations of typical R & S burner installations in various kinds of boilers. They should be carefully read and the example selected that most nearly fits the job before attempting the installation.

The furnace or boiler should be thoroughly cleaned if not already done. The heating surfaces should have all scale, soot and ashes removed.

The combustion chamber illustrations are general in nature and show approximate chamber dimensions and recommended types and thickness of insulating materials.

CAUTION

It is the installing contractors responsibility to include and provide expansion joints, refractory supports, wall ties, etc., as may be required for a proper installation. Consult your refractory supplier for construction details and requirements for these items.

Fig. 1 provides minimum chamber dimensions and pertinent burner dimensions necessary for a correct installation for the various size burners. Compare those dimensions given for your burner firing rate to be certain that adequate clearances and base heights exist.

FIRING FIREBOX BOILER THROUGH THE BASE

Fig. 2 illustrates a type "R" burner installed in a firebox boiler with a conventional base and combustion chamber. This is also applicable to the "S" burner where the boiler base height is sufficient to allow clearance for the blower housing illustrated in Fig. 5.

When installing a burner that will be firing on oil, the opening centerline height (nozzle height "Hc" in Fig. 2) above the combustion chamber floor should be maintained as stated or higher. The nozzle height is based on recommended practice for efficient oil combustion. Lower nozzle height may be used, but at reduced efficiency with tendency toward smoke and flame impingement on floor which may cause carbon buildup.

When the burner will be firing only on gas, the "Hc" nozzle height dimension may be reduced to one-half of the burner head diameter plus one inch. In cases of an extremely low boiler base, the burner head may be located up against the boiler water leg.

The burner opening should be made in accordance with the proper illustration in Fig. 3.

The burner head must be packed with high temperature insulating rope before the plastic refractory is put in place. Seal between the burner mounting flange and boiler frontplate with high temperature insulating rope gasket.

Fig. 2 illustrates a combustion chamber floor thickness of 1" block insulation, 2-1/2" insulating firebrick and 2-1/2" of standard No. 1 (high duty) firebrick for installations at firing rates of 2,800,000 Btu/Hr or 20 GPH and above. For firing with low to medium furnace temperatures at inputs below 20 GPH, the center layer 2-1/2" of insulating firebrick is not required.

The insulation fill material, used between the refractory walls and the steel boiler base, should be block insulation or other insulating material that will not settle.

Firebrick should be laid with high temperature bonding mortar, such as Hiloset, Sairset, or as recommended by the refractory manufacturer.

Expansion joints should be 3/32" wide per linear foot in any direction. If more than 1" is required, two joints should be installed.

Burner Size	Oil GPH	Recommended Minimum Dimensions for Combustion Chamber (inches)			
		Width W	Length L	Nozzle Height H_c	Base H_b
R6 S6	3 to 4	11	22	6	14
	4½ to 5½	13	26	7	15
	6 to 7	15	30	8	16
R8 S8	8 to 9	17	34	9	17
	10 to 11	19	38	9	18
	12 to 13	21	42	10	19
	14 to 16	23	46	11	20
	17 to 19	25	50	12	21
	20 to 22	27	54	12	21
R10 S10	15 to 16	23	46	10	25
	17 to 18	25	50	11	26
	19 to 20	26	52	11	27
	21 to 22	27	54	12	28
	23 to 24	28	56	12	29
	25 to 26	30	60	13	30
	27 to 28	31	62	13	31
	29 to 30	32	64	14	32
	31 to 32	33	66	14	33
R12 S12	33 to 36	35	70	15	34
	37 to 40	37	74	15	35
	41 to 44	39	78	16	36
	45 to 48	41	82	17	38
	49 to 52	43	86	18	39
	53 to 55	45	90	19	40
S14	60	50	86	23	46
	65	52	90	24	46
	70	54	94	25	46
	75	56	96	26	46
S16	80	58	98	27	47
	90	60	103	28	47
	100	62	108	29	47
	110	65	115	30	51

L - Minimum length of combustion chamber (normally made full length of boiler firebox).
H_c - Dimension applies to oil firing only. (For gas firing, dimension is one-half of burner head diameter plus one inch).
H_b - Minimum base height without pitting combustion chamber.

FIGURE 1 - Combustion Chamber Dimensions

Combustion chamber width and length dimensions may vary from Dimension Table (Fig. 1) to fit job conditions. The floor area may be reduced to a minimum of 70 sq. inches per GPH of oil or 50 sq. inches per 100 MBh input, at some sacrifice of refractory life. Floor area increases are permissable, but reduce combustion chamber temperatures. Combustion chamber length should be no less than 1-1/3times the width. Combustion chamber height should be approximately twice the nozzle height of the burner from the floor.

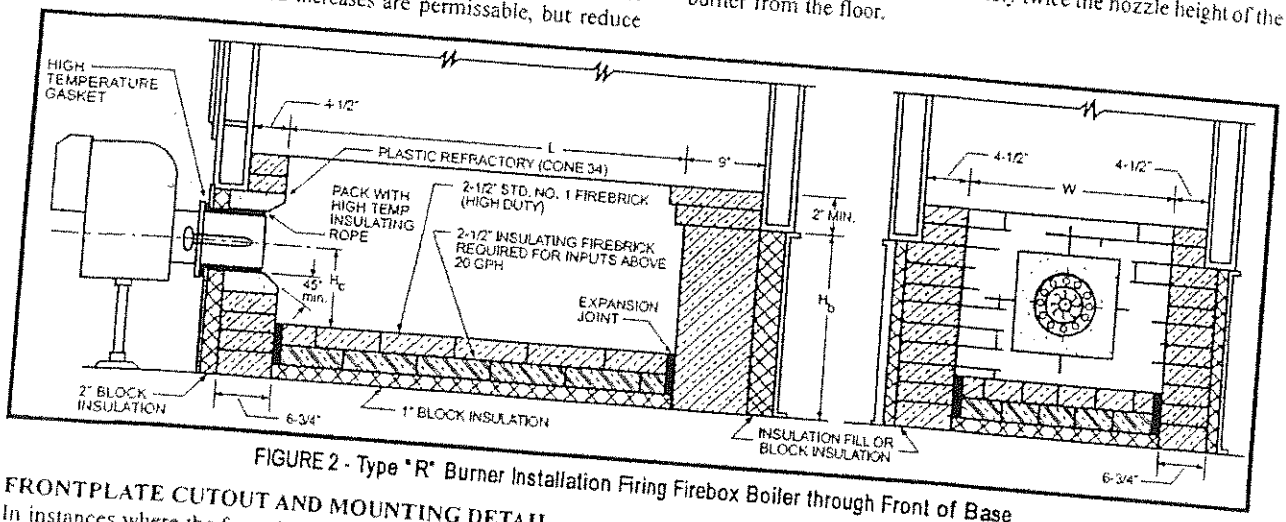
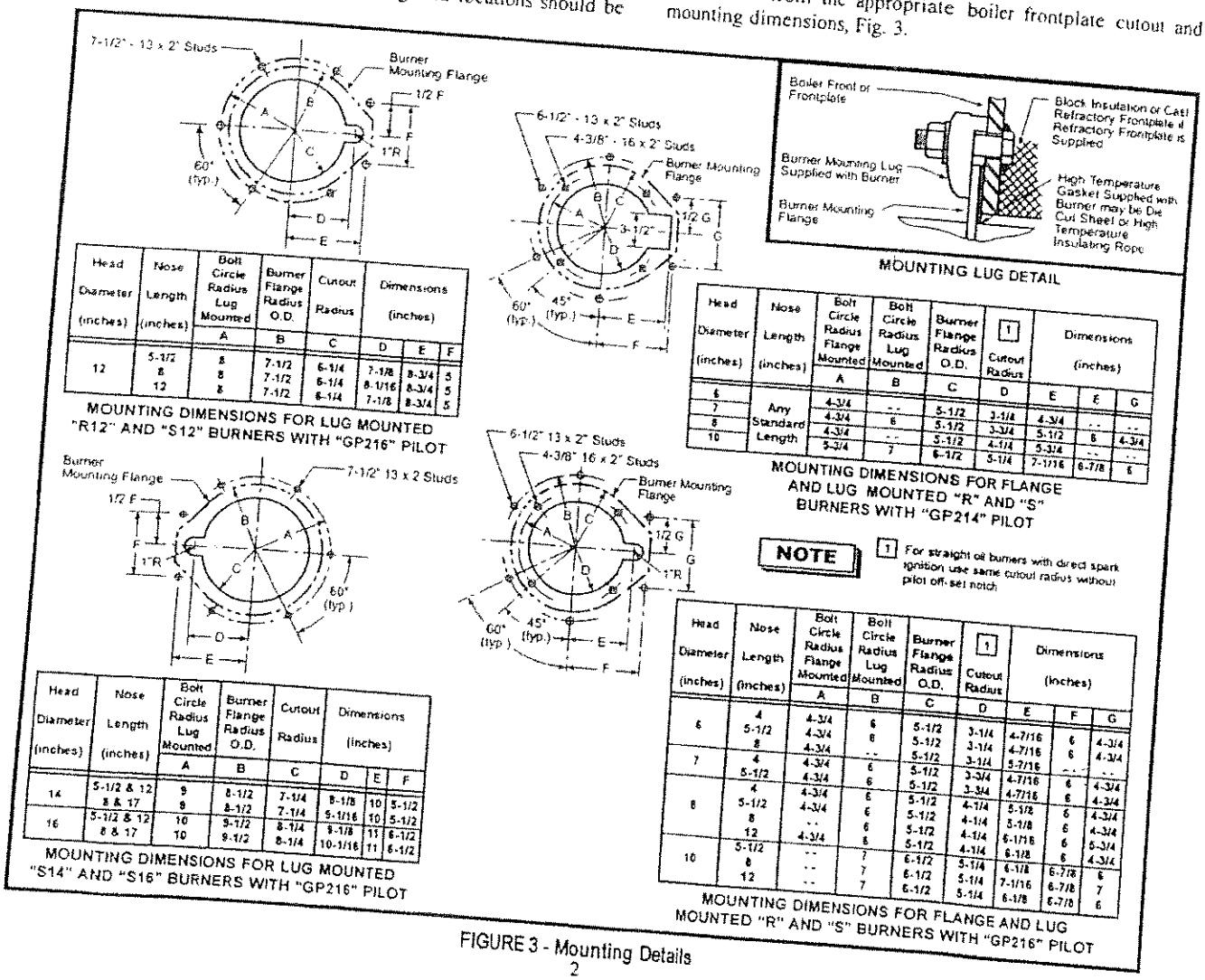


FIGURE 2 - Type "R" Burner Installation Firing Firebox Boiler through Front of Base

FRONTPLATE CUTOUT AND MOUNTING DETAIL

In instances where the frontplate is not supplied with the burner, the burner opening size and mounting stud locations should be determined from the appropriate boiler frontplate cutout and mounting dimensions, Fig. 3.



Head Diameter (inches)	Nose Length (inches)	Bolt Circle Radius Lug Mounted A	Burner Flange Radius O.D. B	Cutout Radius C	Dimensions (inches) D	E	F
12	5-1/2	8	7-1/2	6-1/4	7-1/8	8-3/4	5
	8	8	7-1/2	6-1/4	8-1/16	8-3/4	5
	12	8	7-1/2	6-1/4	7-1/8	8-3/4	5

MOUNTING DIMENSIONS FOR LUG MOUNTED "R12" AND "S12" BURNERS WITH "GP216" PILOT

Head Diameter (inches)	Nose Length (inches)	Bolt Circle Radius Flange Mounted A	Bolt Circle Radius Lug Mounted B	Burner Flange Radius O.D. C	[1] Cutout Radius D	Dimensions (inches) E	F	G
6	Any Standard Length	4-3/4	--	5-1/2	3-1/8	4-3/4	--	--
7		4-3/4	6	5-1/2	3-3/4	5-1/2	6	4-3/4
8		4-3/4	--	5-1/2	3-3/4	5-1/2	6	4-3/4
10		5-3/4	7	6-1/2	5-1/4	7-1/16	6-7/8	6

MOUNTING DIMENSIONS FOR FLANGE AND LUG MOUNTED "R" AND "S" BURNERS WITH "GP214" PILOT

NOTE [1] For straight oil burners with direct spark ignition use same cutout radius without pilot off-set notch

Head Diameter (inches)	Nose Length (inches)	Bolt Circle Radius Lug Mounted A	Burner Flange Radius O.D. B	Cutout Radius C	Dimensions (inches) D	E	F
14	5-1/2 & 12	9	8-1/2	7-1/4	8-1/8	10	5-1/2
	8 & 17	9	8-1/2	7-1/4	9-1/16	10	5-1/2
16	5-1/2 & 12	10	9-1/2	8-1/4	8-1/8	11	6-1/2
	8 & 17	10	9-1/2	8-1/4	10-1/16	11	6-1/2

MOUNTING DIMENSIONS FOR LUG MOUNTED "S14" AND "S16" BURNERS WITH "GP216" PILOT

Head Diameter (inches)	Nose Length (inches)	Bolt Circle Radius Flange Mounted A	Bolt Circle Radius Lug Mounted B	Burner Flange Radius O.D. C	[1] Cutout Radius D	Dimensions (inches) E	F	G
6	4	4-3/4	6	5-1/2	3-1/4	4-7/16	6	4-3/4
	5-1/2	4-3/4	6	5-1/2	3-1/4	4-7/16	6	4-3/4
	8	4-3/4	--	5-1/2	3-1/4	5-7/16	--	--
7	4	4-3/4	6	5-1/2	3-3/4	4-7/16	6	4-3/4
	5-1/2	4-3/4	6	5-1/2	3-3/4	4-7/16	6	4-3/4
8	4	4-3/4	6	5-1/2	4-1/4	5-1/8	6	4-3/4
	5-1/2	4-3/4	6	5-1/2	4-1/4	5-1/8	6	4-3/4
	8	--	6	5-1/2	4-1/4	6-1/16	6	4-3/4
	12	4-3/4	6	5-1/2	4-1/4	6-1/8	6	5-3/4
10	5-1/2	--	7	6-1/2	5-1/4	6-1/8	6-7/8	6
	8	--	7	6-1/2	5-1/4	7-1/16	6-7/8	7
	12	--	7	6-1/2	5-1/4	6-1/8	6-7/8	6

MOUNTING DIMENSIONS FOR FLANGE AND LUG MOUNTED "R" AND "S" BURNERS WITH "GP216" PILOT

FIGURE 3 - Mounting Details

FIRING FIREBOX BOILER THROUGH THE FIRING DOOR

"Through the Firedoor" installations are recommended where conditions allow. This method will prevent the need for expensive pitting when insufficient base height is available to permit the installation of a standard combustion chamber, or when it is desired to fire over a stoker which is used as the standby fuel burner. See Fig. 4.

In some cases, it may be desirable to provide a new access opening in the side or rear of the boiler firebox to avoid having to remove the burner to get into the firebox, particularly if there is only one firedoor for the boiler.

When the boiler has two firing doors the burner may be installed in one door but angled to fire towards the opposite corner of the chamber. See Fig. 7. Note that "angled" installations require an extra long head length and in some cases may require as much as 12" head length. **HEAD MUST EXTEND THROUGH TO INSIDE EDGE OF WATER LEG.**

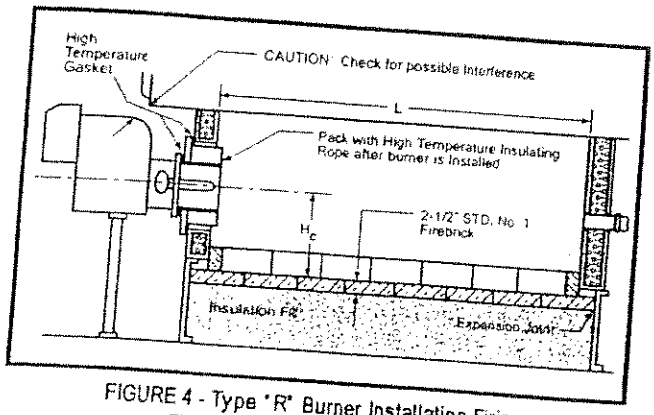


FIGURE 4 - Type "R" Burner Installation Firing Firebox Boiler through the Door

Fig. 5 shows an "S" burner which is designed for use where clearance for boiler smokebox doors would not be sufficient to permit installation of a standard type "R" burner.

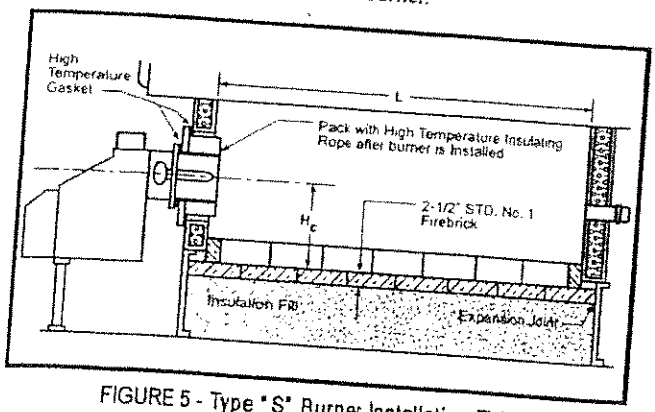


FIGURE 5 - Type "S" Burner Installation Firing Firebox Boiler through the Door

In instances where the burner head is too large to allow proper refractory between its head and the boiler firing door opening, or where a special frontplate is desired, a reflector frontplate may be supplied. See Fig. 6. For installation procedure of reflector frontplate, see Fig. 7 and 8.

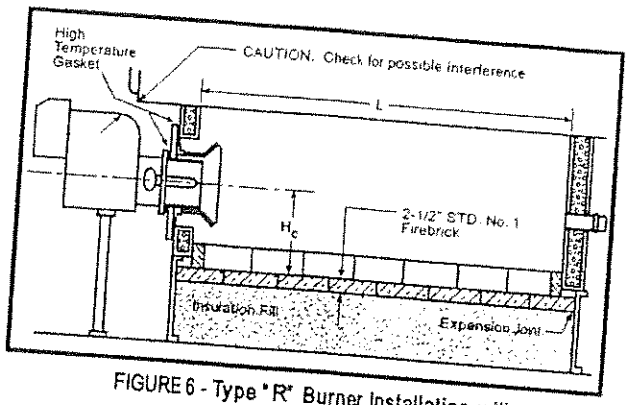


FIGURE 6 - Type "R" Burner Installation with Reflector Frontplate

REFLECTOR FRONTPLATE INSTALLATION

Before installation of the reflector frontplate can be made, the existing boiler firing door and frame must be removed. The reflector frontplate and cone are shipped as an assembled unit and may be installed as a unit. In instances where the reflector cone diameter is larger than the opening, the reflector cone must be detached from the frontplate, with the removal of the 10-32 flat head machine screws, Fig. 7 and 8. A cord is attached to the reflector cone for use in retrieving the cone for mounting. The cone is then placed through the opening and inside the boiler.

Mounting holes are then drilled in the frontplate mounting flange, as required to fit the existing door frame mounting studs. With the Fiberfrax insulating paper in position, bolt the frontplate to the mounting studs. The reflector cone, if detached, is repositioned on the frontplate and mounted with the 10-32 flat head machine screws. A high temperature gasket is placed between the burner mounting flange and the reflector frontplate, and the burner mounted in place.

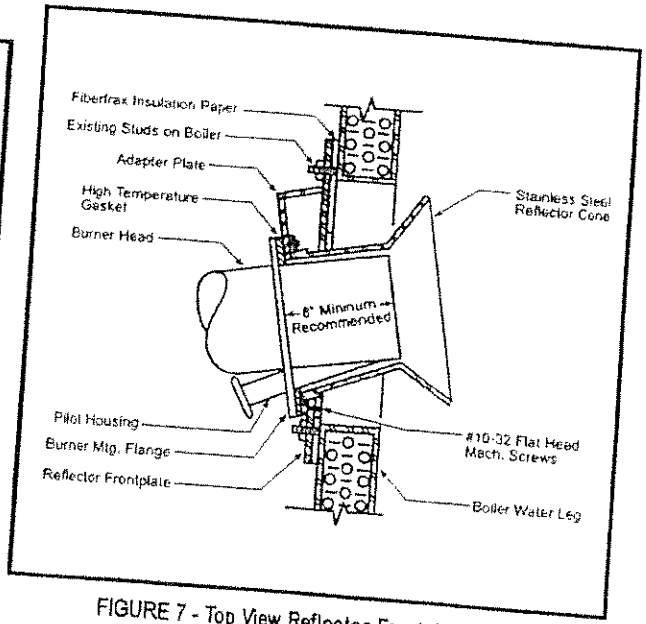


FIGURE 7 - Top View Reflector Frontplate through Right Hand Firing Door

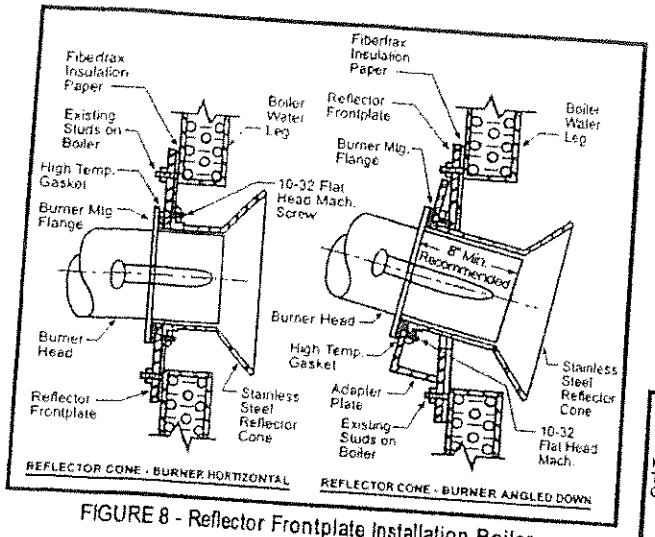


FIGURE 8 - Reflector Frontplate Installation Boiler with Single Firing Door

FIRING A BOILER WITH BLANKET INSULATION

When firing a boiler with blanket insulation, a frontplate with refractory of a minimum of 3000° F must be installed as shown in figure 9.

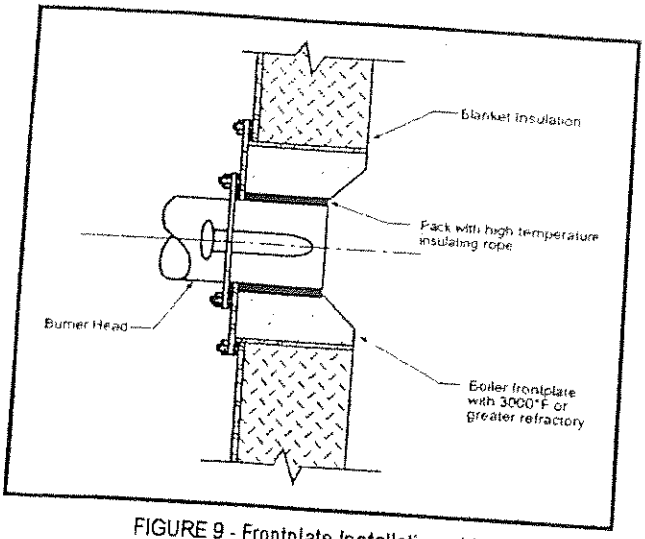


FIGURE 9 - Frontplate Installation with Blanket Insulated Boiler

FIRING FORCED DRAFT BOILER

The burner installation in a firebox type boiler designed for forced draft firing requires no refractory other than in the floor of the firebox and the boiler frontplate. Fig. 10. The refractory floor is normally furnished with the boiler and the refractory frontplate may or may not be with the burner. The burner centerline height ("Hc"dimension) above the refractory floor should be approximately the same as those shown in Fig. 1.

All pressurized or forced draft fired boilers require a high temperature insulating gasket seal between the boiler and the refractory-lined frontplate and between the refractory-lined frontplate and the burner mounting flange to prevent leakage of high temperature combustion gases at this point. In the absence of high temperature gasket, high temperature insulating rope may be used for sealing.

CAUTION

When used, high temperature insulating rope must be wrapped around the burner head, inside the mounting studs, to provide a complete gas tight seal. Wrapping the rope around the outside diameter of the mounting studs will allow leakage around the stud openings in the frontplate. Damage to the burner, due to high temperature gas leakage, will not be covered by the warranty.

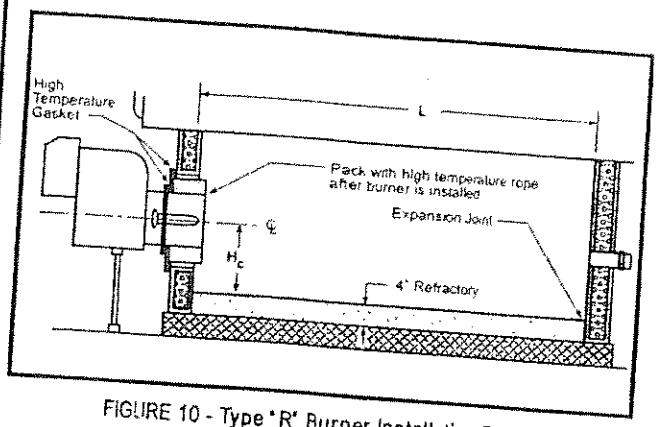


FIGURE 10 - Type "R" Burner Installation Firing Forced Draft Boiler

FIRING CAST IRON BOILERS SINGLE DOOR

Cast iron boilers having low crowns may require burner installations as shown in Fig. 11 or 12. When the distance from the burner horizontal centerline to the crown sheet is less than 1.5 x Hc then the burner must be installed at an angle that will prevent the flame from impinging on the cast iron boiler sections. Significant impingement on cast iron sections can cause damage to the sections.

CAUTION

Standard nose length is 5-1/2 inches. Angled installations require that the burner nose reach to the inside edge of the water leg and usually requires 8 or more inches nose length.

The refractory chamber floor is to be A. P. Green greencast -97-L (3300°F) or equal castable refractory on top of high temperature block insulation. Super duty fire clay brick P. C. E. cone 33-34 A. P. Green "Clipper" or equal may be used in lieu of castable refractory. Use A. P. Green "Sairset" or equal high temperature mortar with firebrick. All exposed brick surfaces must be scrubbed with thin wash before setting. Loose insulating fill is not a requirement, but is recommended for minimum heat loss through the boiler base. The burner head must be wrapped with high temperature insulating rope before installing plastic refractory.

FIRING CAST IRON BOILER WITH DOUBLE DOORS

When firing a cast iron boiler with double doors, the burner may be installed through either door at an angle as to allow the centerline of the burner to point at the opposite rear corner of the combustion chamber as shown in the top section view of Fig. 12. If the cast iron boiler has a low crown the burner must also be installed at a downward angle (Fig. 12 Side View), to prevent the flame from impinging on the cast iron sections. Installation of Firebrick in unused firedoor is necessary to prevent heat loss through the door opening. Installation is otherwise identical to installing burner in a cast iron boiler with a single firedoor, Fig. 11.

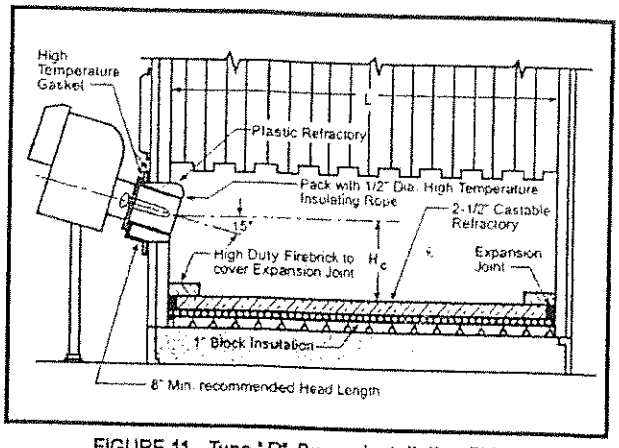


FIGURE 11 - Type "R" Burner Installation Firing Cast Iron Boiler with Single Door

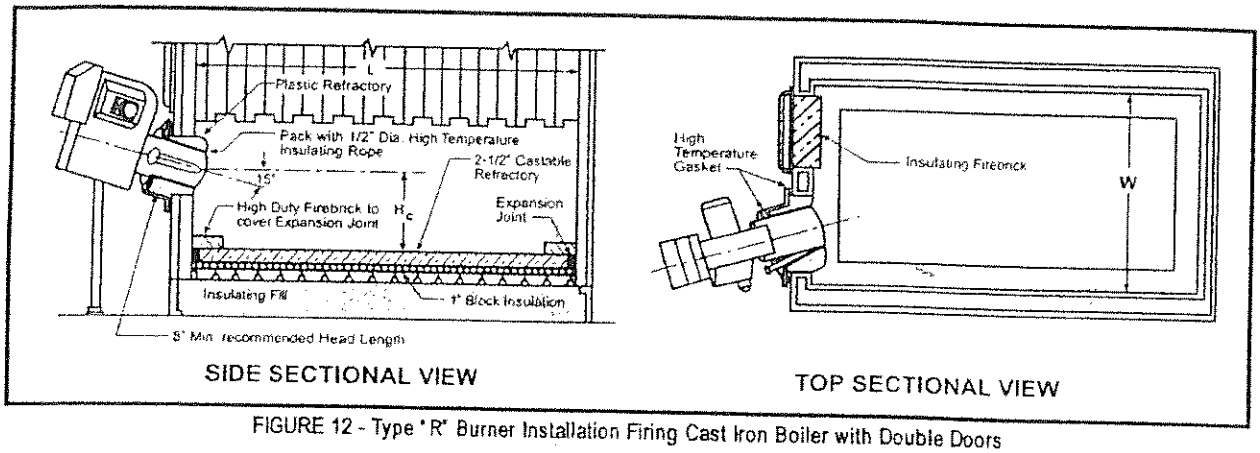


FIGURE 12 - Type "R" Burner Installation Firing Cast Iron Boiler with Double Doors

FIRING HRT BOILER

When installing an R burner in an HRT boiler. Fig. 13. the minimum combustion chamber dimensions Hc, L and W must be maintained as given in Fig 1. The existing side and rear walls may be reused if in good condition and equal to 18 inches of standard No. 1 high duty firebrick. All expansion joints are to be filled with a compressible insulating material and must be kept free of material that will not compress.

It is recommended that the combustion chamber floor be raised to obtain the minimum Hc dimension and the area below filled with insulating fill material, reducing heat loss to a minimum. It is possible, that when replacing a stoker, the combustion chamber floor may be laid on top of the existing grates, if the minimum Hc dimension may be obtained.

The proper burner opening cutout and burner mounting stud location must be determined from the appropriate chart. Fig. 3. The burner head must be packed with high temperature insulating rope before the plastic refractory is put in place.

CAUTION

The bridgewall must not be directly under a girth seam or girth seam leakage may result. The girth seams located within the combustion zone must be protected by an inverted refractory arch.

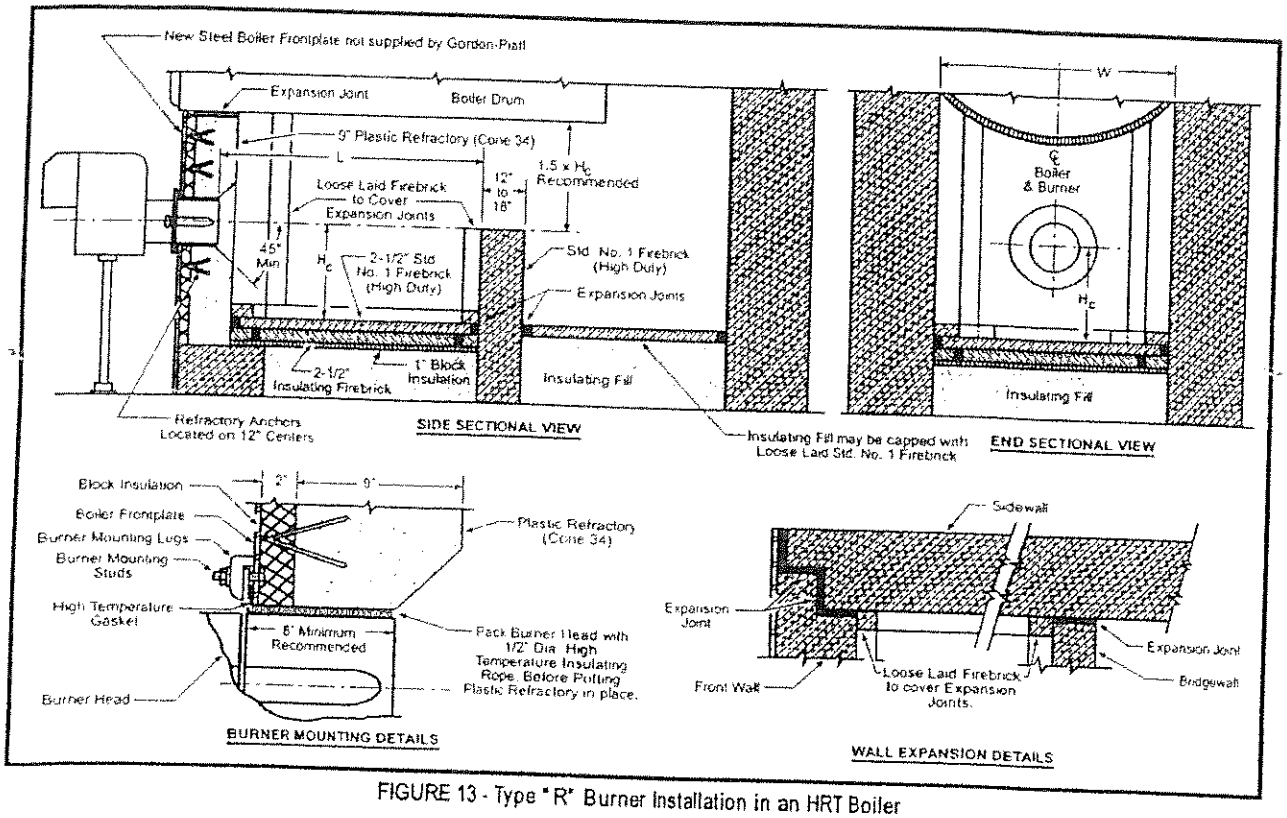


FIGURE 13 - Type "R" Burner Installation in an HRT Boiler

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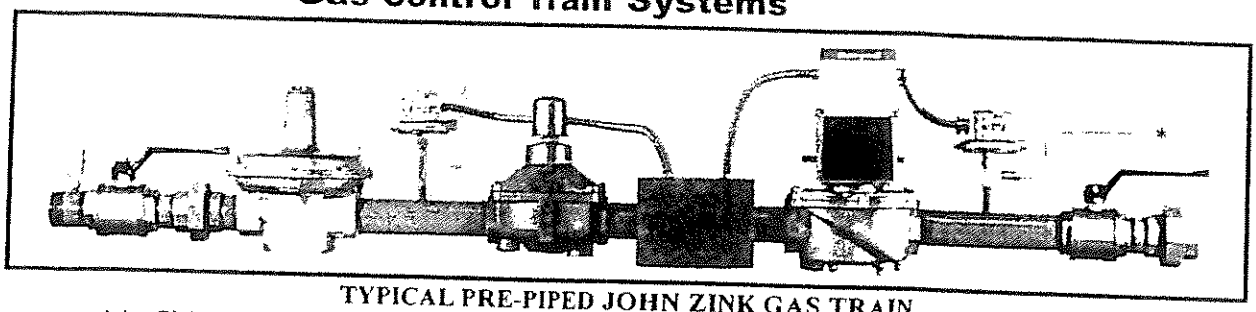
		Replaces	1-gen-10.5
			1-gen-10.52
5-04	Replaces	1-03	

UL, CSD-1, FM and IRI
Gas Control Train Systems



TYPICAL PRE-PIPED JOHN ZINK GAS TRAIN

(John Zink DOES NOT furnish the piping unless a pre-piped gas train is ordered with an additional charge.)

* Gas pressure to the high pressure switch comes from the burner head. A plugged half coupling welded to the gas train is used for mounting the high gas pressure switch.

NOTE

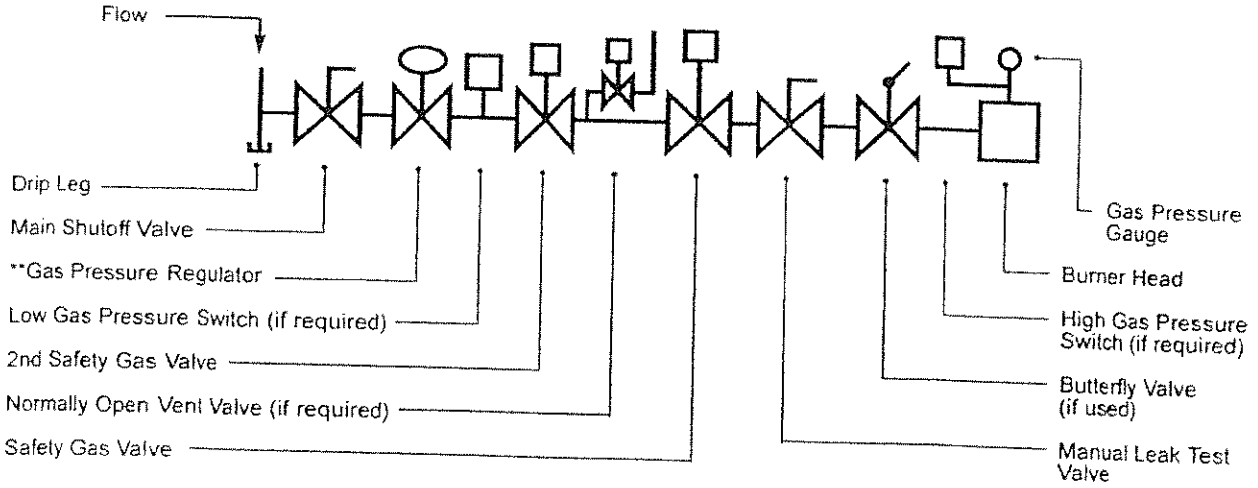
Installation requirements and instructions should always be covered in appropriate engineering drawings and specifications which detail the applicable building codes, etc. Information contained herein is to be used as a guide ONLY and not as the final authority.

GENERAL

Proper operation of a gas or gas-oil fired forced draft burner is very dependent on a properly selected and assembled gas train.

The data contained in this bulletin has been compiled to assist in the selection of a UL, CSD-1, FM or IRI gas control train and the individual gas controls used in conjunction with these approval agencies. For other agency gas control trains, consult factory.

The schematic below gives the location of the various components in a typical gas train. In the interest of SAFETY, John Zink's standard policy is to supply TWO safety gas valves.



NOTE

Underwriters Laboratories (UL) regulations require that all gas or gas-oil burners bearing the UL label must be furnished with a gas train which meets UL requirements matching the input rating of the burner.

** Gas Pressure regulators with internal control require a length of five (5) pipe diameters of straight uninterupted pipe on the outlet side. Consult manufacturer's instructions for all other regulators.

Additional information on gas trains can be found in the John Zink catalog sheet 1-gen-10.53.

* 1½" - HONEYWELL GAS TRAIN 7" W.C. @ INLET

GAS SYSTEM SCHEMATICS

UL & FM Systems

Figure I - 400 MBh - 2500 MBh

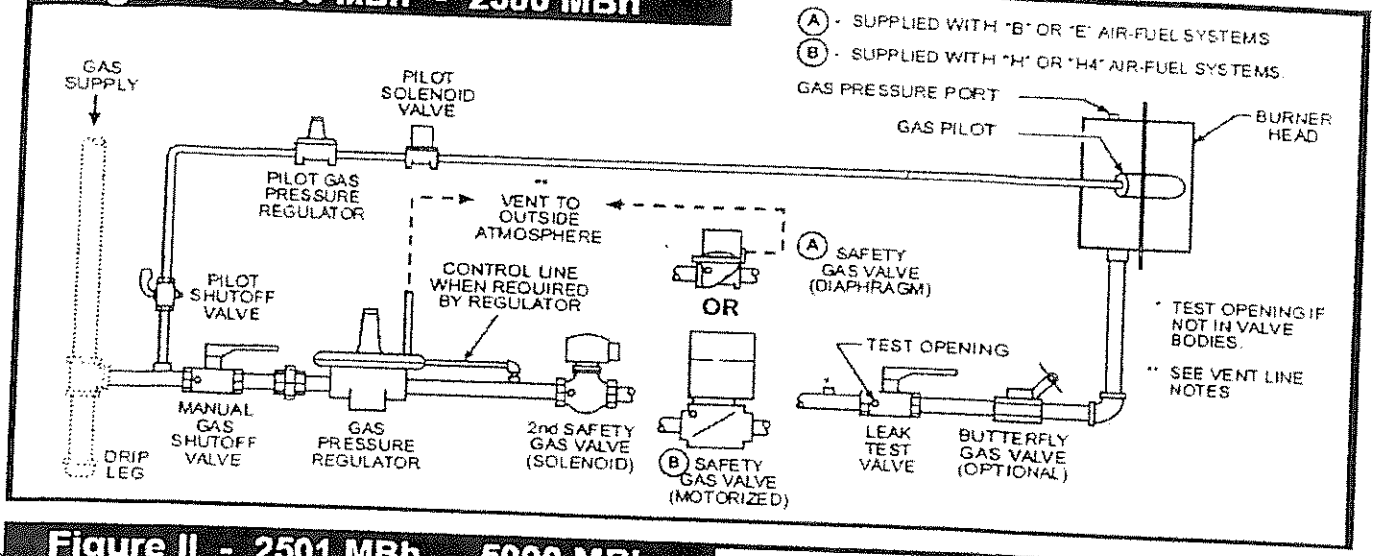


Figure II - 2501 MBh - 5000 MBh

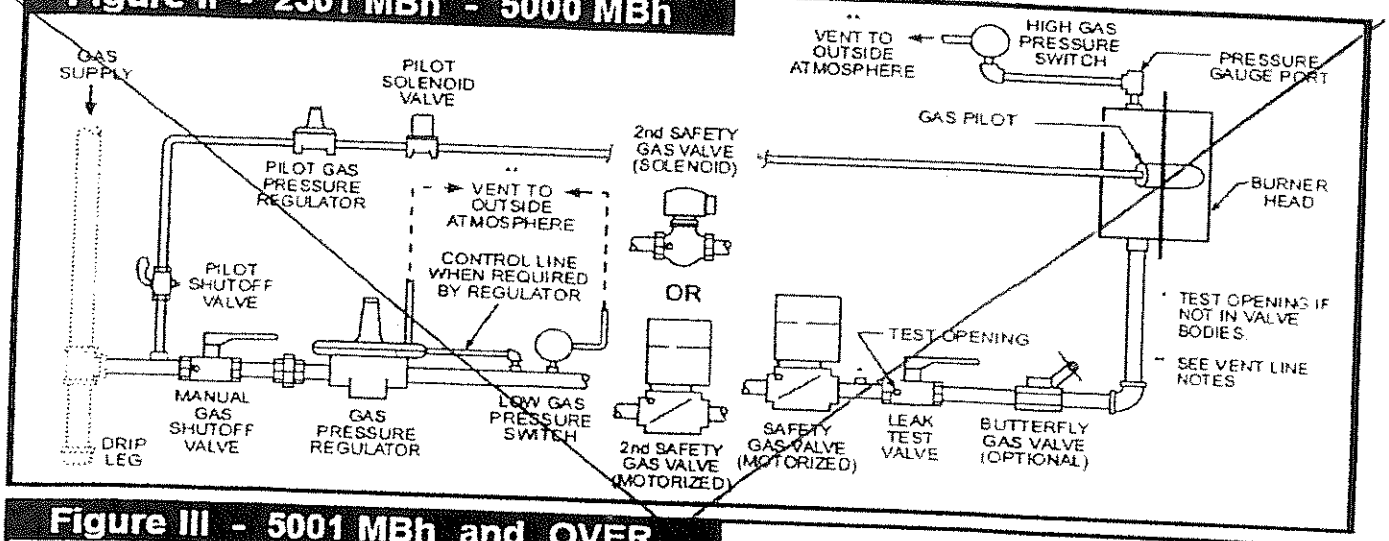
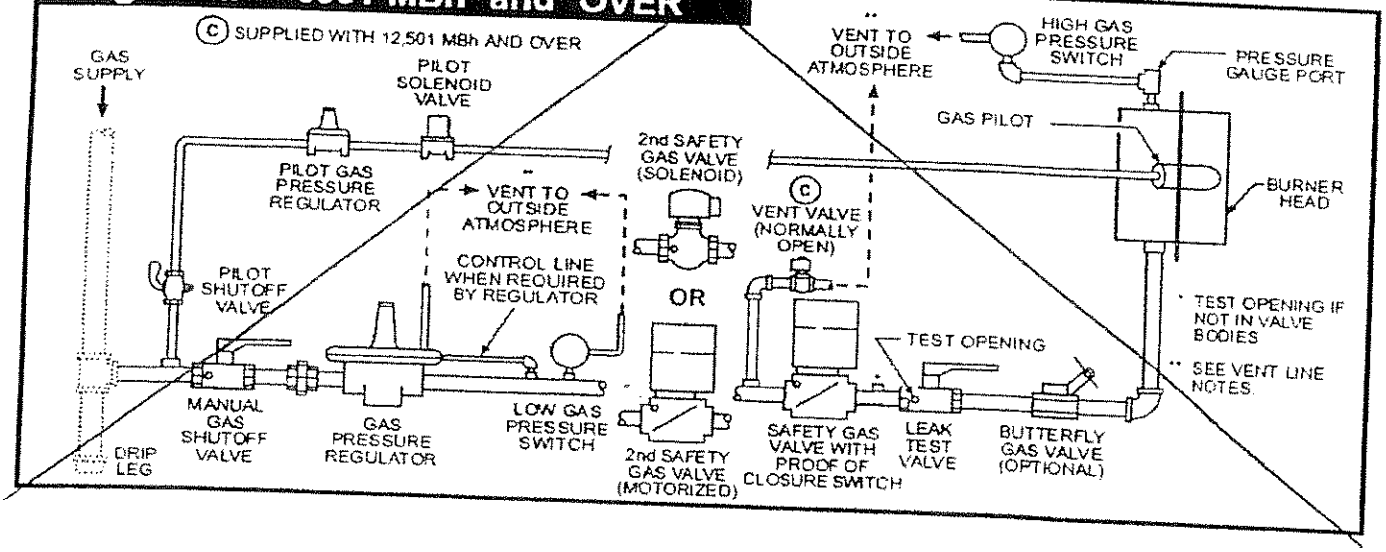


Figure III - 5001 MBh and OVER



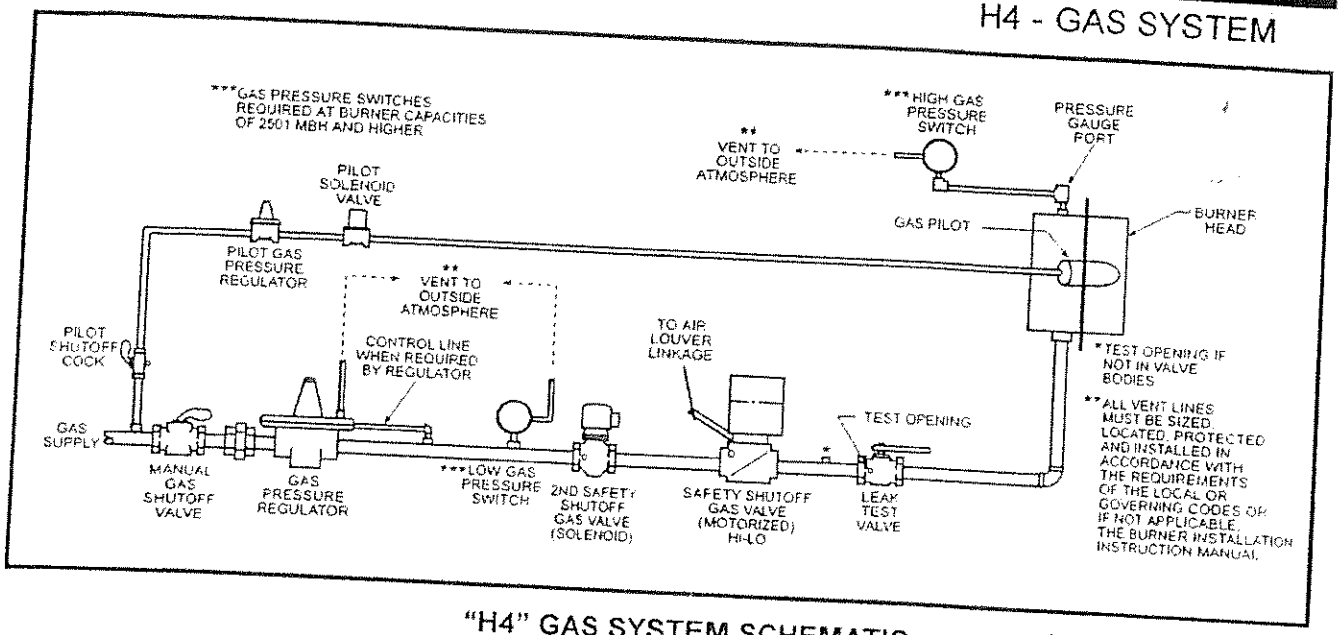
JOHN ZINK
JOHN ZINK COMPANY LLC
Gordon-Piatt

HIGH-LOW

■ LOW FIRE START

1	gen	10.56	Rev. 2
6-04	Replaces	1-03	

H4 - GAS SYSTEM



"H4" GAS SYSTEM SCHEMATIC
(As shown meets U. L. requirements)

APPLICATION

The "H4" gas system is used for high-low, low fire start control in firing. It is commonly used on burners with 2.500 MBh to 5.000 MBh capacity and is used in conjuction with the "F4H", "F4V" or "F4VT" oil systems for combination gas-oil models.

DESCRIPTION

The "H4" system uses a motorized hi-lo gas valve and a quick opening solenoid gas valve arrangement to control gas flow. Gas pressure is adjusted and maintained by a pressure regulator.

Combustion air available to the burner is controlled by connection of the air inlet louver to the motorized gas valve through a linkage arrangement.

OPERATING SEQUENCE

The burner motor starts on a call for heat by the operating control and the pre-purge cycle begins. The motorized valve is in the closed position, allowing low fire combustion air through the louver.

At the end of pre-purge, the ignition transformer is energized and the pilot valve opens, igniting the gas pilot.

The flame detector proves the flame and the safety shutoff gas valves open, slowly supplying gas to the orifices at the low fire rate, and the burner ignites in the low fire position.

The ignition transformer and pilot valve are de-energized.

The motorized gas-valve continues to open, allowing the linkage to drive the air louver to the full open position and the burner goes to high fire.

HIGH-LOW OPERATION

The high fire controller, when satisified, drives the motorized valve to the low fire position, allowing less gas flow through the burner. Simultaneously, the air louver is closed to the low fire position. If low fire cannot maintain pressure or temperature in the boiler, the high fire controller will re-energize the motorized valve and the air louver and the burner will sequentially return to high fire.

When the operating control is satisified, the gas valves close and the burner motor is switched off, causing the burner to shut down and await the next call for heat.

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JOHN ZINK COMPANY LLC
Gordon-Piatt

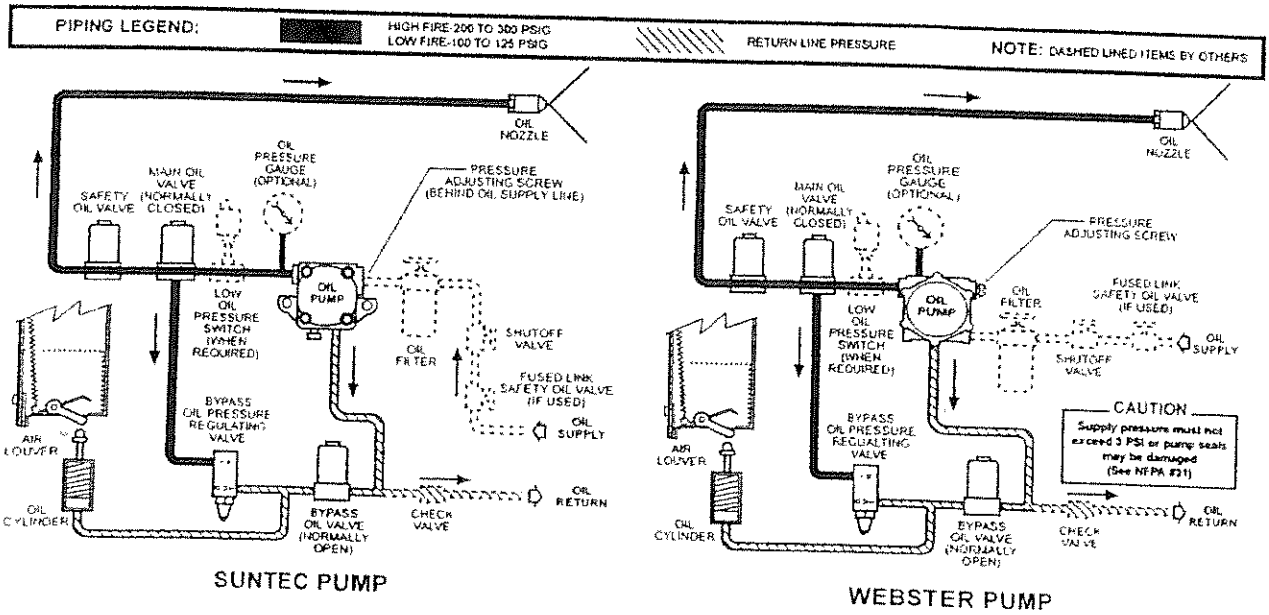
1	gen 80.421	Rev. 5
5-04	Replaces	1-03

ON-OFF OR HIGH-LOW

F4S OIL SYSTEM

- NO. 2 OIL
- LOW FIRE START

MECHANICAL PRESSURE ATOMIZING SIMPLEX TYPE OIL NOZZLE



SUNTEC PUMP

WEBSTER PUMP

"F4S" OIL SYSTEM SCHEMATIC
(Shown In Low Fire Position)

APPLICATION

The F4S Oil System is used for On-Off or High-Low, Low Fire Start Control in firing No. 2 fuel oil. It is commonly used on burners with 4 to 34 GPH capacity and is used in conjunction with the "H" or "H4" gas systems for combination Gas-Oil models.

DESCRIPTION

The F4S system uses a simplex type nozzle and an oil valving arrangement to provide a low fire and a high fire oil pressure to the nozzle and simultaneously control the combustion air available to the burner through the action of an oil cylinder assembly. The burner air inlet louver is spring loaded in the closed (low fire) position. Pressure is generated by an oil pump connected to the burner motor through a flexible coupling. Pump pressure is adjusted and maintained by the pump's integral pressure regulating valve. Low fire oil pressure is adjusted and maintained by the bypass oil pressure regulating valve.

OPERATING SEQUENCES

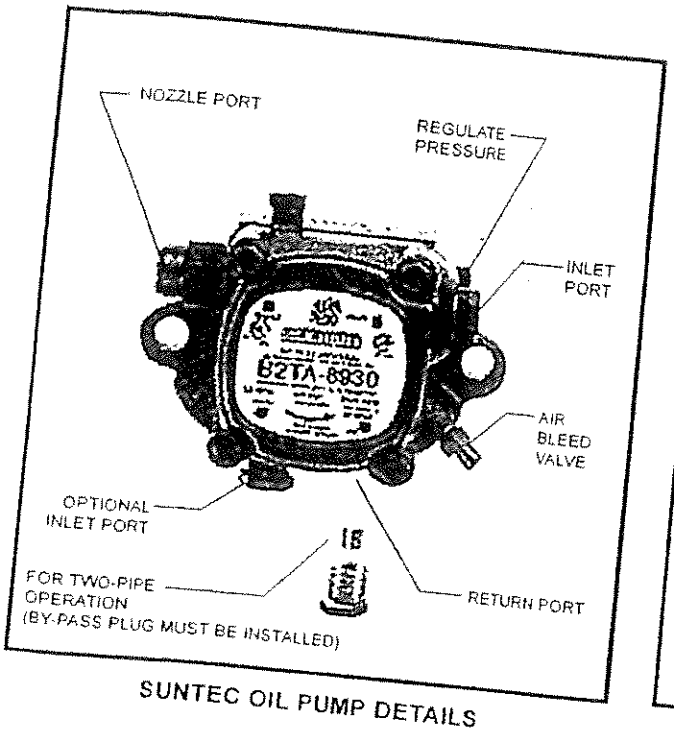
The burner motor and pump start on a call for heat by the operating control and the pre-purge cycle begins. The Normally Open bypass oil solenoid valve is open allowing oil to flow through the bypass pressure regulating valve and return to the tank. The oil cylinder piston remains in the retracted position allowing low fire combustion air through the louver.

At the end of pre-purge, the ignition transformer is energized. The main oil solenoid valve opens supplying oil to the nozzle at the low fire pressure setting of the bypass pressure regulating valve. The air inlet louver remains at the low fire position and the burner ignites at low fire rate.

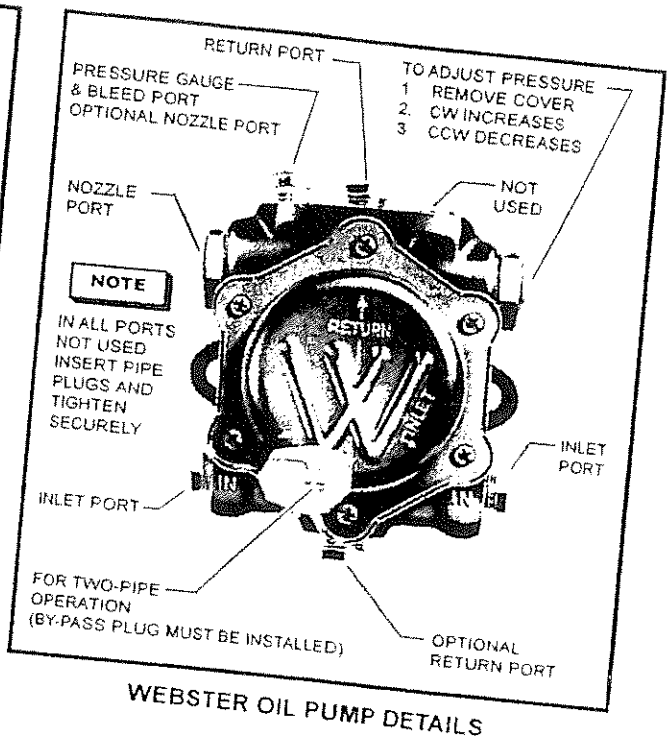
The flame detector proves the flame and the ignition transformer is de-energized. After the flame is proven, the bypass oil solenoid valve closes stopping the flow through the bypass pressure regulating valve thus raising the nozzle pressure to the high fire setting of the pump's integral pressure regulating valve. Simultaneously, this causes the oil cylinder piston to extend and drive the air louver to the high fire position and the burner goes to high fire.

HIGH-LOW OPERATION

On High-Low Control Systems, the High Fire Controller, when satisfied, opens the bypass oil solenoid valve allowing flow through the bypass pressure regulating valve causing the nozzle pressure to drop to the low fire setting. Simultaneously, this allows the oil cylinder piston to retract and the air louver spring pulls the louver to the low fire position. If low fire cannot maintain pressure or temperature in the boiler, the high fire controller will re-energize the bypass oil solenoid valve and the burner will sequentially return to high fire.



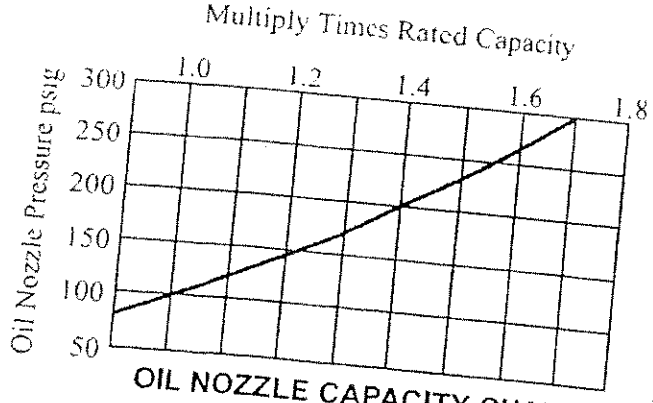
SUNTEC OIL PUMP DETAILS



WEBSTER OIL PUMP DETAILS

NOTE

Simplex nozzles are rated at 100 PSIG. Use following chart to determine GPH flow at higher pressures.



OIL NOZZLE CAPACITY CHART

REPLACEMENT PARTS

The material list which accompanies the burner is the master record of parts used to assemble your unit. When ordering replacement parts, always include:

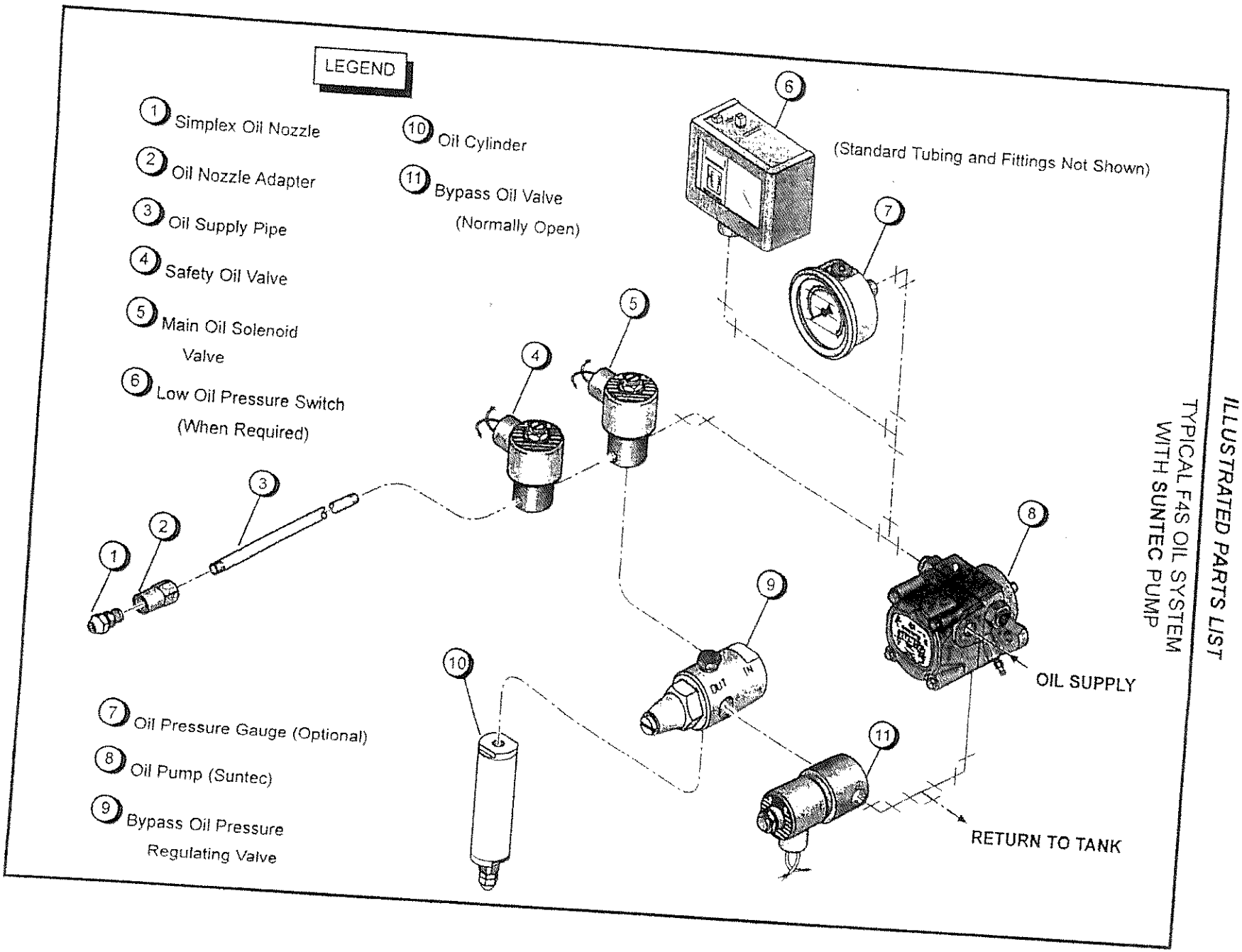
1. Burner model and UL serial numbers.
2. Name of part desired.
3. Part and/or model number.
4. All data shown in stampings or on nameplates.
5. Quantity and mode of shipment desired.

SERVICE HINTS

Low or erratic oil supply pressure could be due to an air leak in the oil suction line, a change in the oil pump's integral pressure regulating valve setting, wear or other failure of the oil pump, or an empty oil tank.

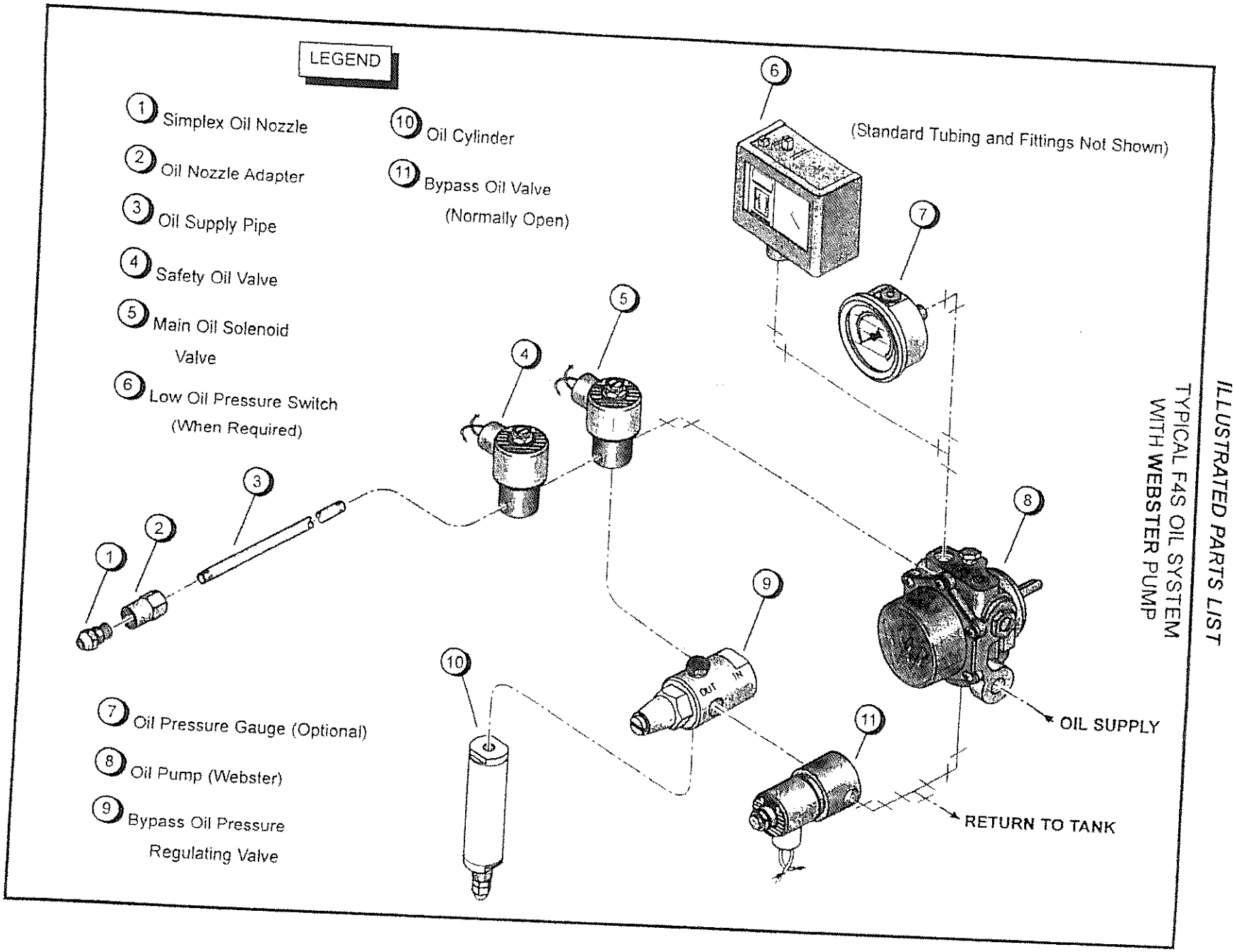
Oil nozzle inspection may reveal a build-up of gum, varnish or carbon on the nozzle orifice or distributor head. As this is difficult to clean properly, and since nozzles do wear, it is good practice to change nozzles after one or two years of operation.

The nozzle adapter must be in good condition to insure the nozzle will function properly. Damage to the sealing surface can be caused by cross-threading, frequent nozzle removal or rough handling. A leak at the adapter seat can be detected by a drop of oil forming at the tip of the nozzle which dislodges and falls off into the flame.



ILLUSTRATED PARTS LIST

TYPICAL F4S OIL SYSTEM WITH SUNTEC PUMP



ILLUSTRATED PARTS LIST

TYPICAL F4S OIL SYSTEM WITH WEBSTER PUMP

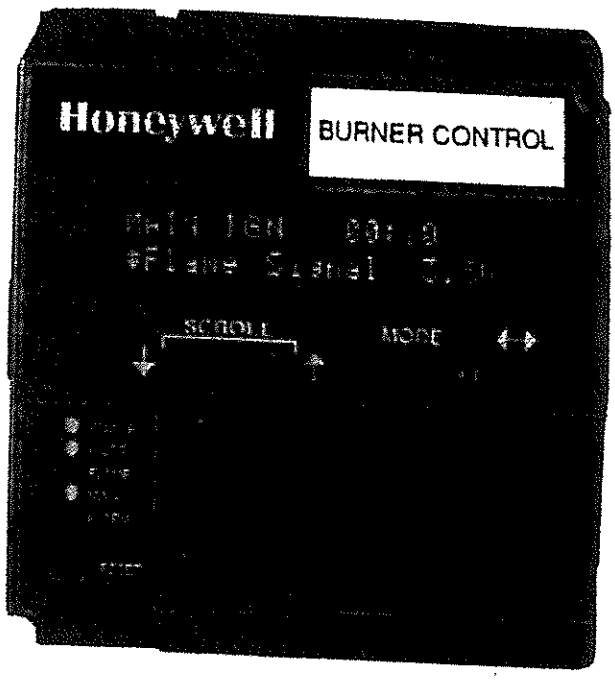
Comfort, Energy & Health Solutions

www.honeywell.com

7800 SERIES
Burner Control

Customize Your 7800 SERIES Burner Control with the following optional components:

- **Keyboard Display Module**
- **Communications Interface**
- **First-Out Expanded Annunciator**
- **Combustion System Manager Software**



The Honeywell 7800 SERIES combines enhanced safety, comprehensive diagnostics, communication and networking capabilities into one compact and affordable microcomputer burner control. It can do just about anything and everything you would like it to do.

The 7800 SERIES offers you intelligent control any way you want it: with or without communications, with or without expanded annunciator, with or without a keyboard display module.

And the 7800 can work on a wide range of commercial and industrial applications: burners, boilers, furnaces, packaged rooftop units, ovens, kilns, hot water heaters and more. In fact, the 7800 SERIES replaces more than 400 Honeywell and competitive control types. So, whatever features you want from a burner control just ask! With the 7800, the answer is ... yes, it can.

Customized To Your Operation

Keyboard Display Module

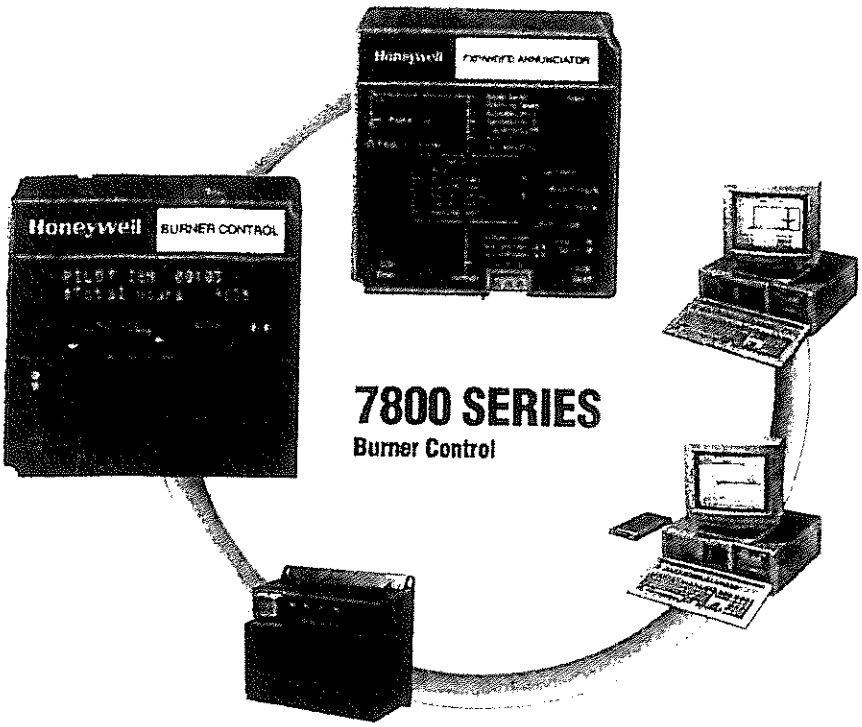
You can place an easy-to-use Keyboard Display Module on the 7800 or in any remote location where you want convenient access to information. The optional keyboard display module is easy to install and you can add it at anytime. Models are available in English, French, German, Italian, Spanish, Porteguese, Japanese (Katakana), and Chinese.

Communications Capability

You can add the optional Communications Interface to provide you with local or remote monitoring, centralized reporting, data logging and troubleshooting. This compact, modular unit interfaces with an IBM equivalent personal computer running Microsoft® Windows™.

What's more, the Microsoft Windows based Combustion System Manager Software makes it the easiest to use system of its kind. This software gives you dynamic, real-time information in a simplified graphic format. You can configure the communications interface to auto-dial to a personal computer or beeper. You can monitor 72 points for each burner control. Up to 1000 faults can be stored, with the time and date of occurrence, to facilitate troubleshooting. With all this information stored on your personal computer, you can create reports and graphs quickly and easily. If you have multiple 7800 burner controls you can communicate with each of them through a multidrop bus connection. You can connect hundreds of 7800 controls to a single communication interface.

You can integrate 7800 SERIES programmer and primary controls into building automation and industrial control systems through a general purpose interface card or through the CSM software.



THE 7800 SERIES Puts Critical Information At Your Fingertips

Operational Information



The 7800 provides a wealth of control information at the touch of a button. The English text readout on the keyboard display provides sequence status, hold status, lockout/alarm status, flame signal strength, as well as total hours and cycles of operation.

Easy Troubleshooting

The Keyboard Display Module (KDM) instantly identifies complete information for servicing including interlock, limit and fuel circuit status. It also enables you to check terminal voltage status and read flame signal strength in dc volts, eliminating the need to use a meter. In addition, you can directly access the subbase terminals without removing the control, making quick diagnosis easy.

Fault History



Through the keyboard display module the 7800 SERIES identifies 127 different faults with easy-to-read messages and codes, helping you to correct a costly lockout quickly and easily.

What's more, the 7800 provides readout of the six most recent faults. With the push of a button you will see the cause of a shutdown and at what point in the burner cycle the shutdown occurred—all using the KDM as a service tool.

The 7800 SERIES is equipped with nonvolatile memory. In the event of a power failure, critical information will not be lost.

Check our website www.honeywell.com/bbc for the name of your nearest Authorized 7800 SERIES Distributor.

Enhanced Safety With Dynamic Self Checks

7800's self-diagnostic capabilities give you maximum assurance of reliability. The 7800 continually tests itself and all related hardware. If the 7800 safety hardware or software fails, a safety shutdown will occur and all critical loads will be de-energized.

Trouble Free Retrofit

The 7800 SERIES uses existing Honeywell flame detectors and sensors, making upgrade economical. In addition, plug-in adapter bases are available so that you can easily replace most Honeywell and competitive controls.

First-Out Expanded Annunciator

You can add the optional expanded annunciator at anytime to provide first-out annunciation. What's more, it allows you to monitor 20 additional points to identify the specific limit or interlock causing a hold or lockout—at a glance! A series of 24 LEDs represents operation and critical limit or interlock status.

Green Lights Partner

BUILDINGS

Honeywell

Automation and Control Solutions
In the US: Honeywell, 1985 Douglas Drive North, Golden Valley, MN 55422-3992
In Canada: Honeywell Limited, 35 Dynamic Drive, Toronto, Ontario M1V 4Z9

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www.honeywell.com

Honeywell

RM7800E,G,L,M; RM7840E,G,L,M 7800 SERIES Relay Modules

INSTALLATION INSTRUCTIONS

APPLICATION

The Honeywell RM7800/RM7840 Relay Modules are microprocessor-based integrated burner controls for automatically fired gas, oil, or combination fuel single burner applications. The RM7800/RM7840 Relay Modules are used for UL/CSA On/Off, UL/CSA Modulating, and FM/IRI Modulating burner applications. The RM7800/RM7840 system consists of a Relay Module, Keyboard Display Modules (standard with RM7800), Dust Cover (standard with RM7840), Subbase, Amplifier, and Purge Card. Options include Personal Computer Interface, DATA CONTROLBUS MODULE™, Remote Display Mounting, First-Out Expanded Annunciator and Combustion System Manager™ Software.

Functions provided by the RM7800/RM7840 include automatic burner sequencing, flame supervision, system status indication, system or self-diagnostics and troubleshooting. The RM7800/RM7840 is a solid state replacement for the electromechanical R4140 Automatic Programming Control.

This document provides installation and static checkout instructions. Other applicable publications are:

- 65-0084:Q7800A,B 22-Terminal Wiring Subbase Product Data.
- 65-0089:ST7800A Plug-In Purge Timer Installation Instructions.
- 65-0090:S7800A Keyboard Display Module Product Data
- 65-0091:S7810A Data ControlBus Module™ Product Data.
- 65-0095:S7820 Remote Reset Module Product Data.
- 65-0097:221729C Dust Cover Packing Sheet.
- 65-0101:S7830 Expanded Annunciator Product Data.
- 65-0109:R7824, R7847, R7848, R7849, R7851, R7861, R7886 Flame Amplifiers for the 7800 SERIES Product Data.
- 65-0131:221818A Extension Cable Assembly Product Data.
- 65-0228:7800 SERIES Multi-Drop Switch Module Product Data.
- 65-0229:7800 SERIES RELAY MODULES Checkout and Troubleshooting Product Data.
- 65-0249:S7810M ModBus™ Module Product Data.

SPECIFICATIONS

Electrical Ratings, see Table 3:
Voltage and Frequency: 120 Vac (+10/-15%), 50 or 60 Hz (±10%).
Power Dissipation: RM7800/RM7840: 10W maximum.

Maximum Total Connected Load: 2000 VA.

Fusing: 15A maximum, Type SC or equivalent Fast Blow.

Environmental Ratings:
Ambient Temperature:
Operating: -40°F to +140°F (-40°C to +60°C).
Storage: -40°F to +150°F (-40°C to +66°C).
Humidity: 85% relative humidity continuous, noncondensing
Vibration: 0.5G environment.

Approvals:
Underwriters Laboratories Inc. Listed: File No. MP268, Guide No. MCCZ.
Canadian Standards Association Certified: LR9S329-3
Factory Mutual Approved: Report No. J.I.1V9A0.AF
IRI Acceptable.
Federal Communications Commission, Part 15, Class B—Emissions

INSTALLATION

When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and marked on the product to make sure the product is suitable for the application.
3. Installer must be a trained, experienced, flame safeguard service technician.
4. After installation is complete, check out the product operation as provided in these instructions.

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⚠ WARNING

Fire or Explosion Hazard.
Can cause property damage, severe injury, or death.
To prevent possible hazardous burner operation, verify safety requirements each time a control is installed on a burner.

⚠ WARNING

Electrical Shock Hazard.
Can cause serious injury or death.
Disconnect the power supply before beginning installation. More than one power supply disconnect may be required.

IMPORTANT

1. *Wiring connections for the relay modules are unique; therefore, refer to Fig. 2, 3, 4, or the correct Specifications for proper subbase wiring, and sequence charts.*
2. *Wiring must comply with all applicable codes, ordinances and regulations.*
3. *Wiring must comply with NEC Class 1 (Line Voltage) wiring.*
4. *Loads connected to the RM7800/RM7840 must not exceed those listed on the RM7800/RM7840 label or the Specifications, see Table 1*
5. *Limits and interlocks must be rated to simultaneously carry and break current to the ignition transformer, pilot valve, and main fuel valve(s).*
6. *All external timers must be listed or component recognized by authorities who have jurisdiction for the specific purpose for which they are used.*
7. *For on-off gas-fired systems, some authorities who have jurisdiction prohibit the wiring of any limit or operating contacts in series between the flame safeguard control and the main fuel valve(s).*
8. *Two Flame Detectors can be connected in parallel with the exception of Infrared Flame Detectors (C7015).*
9. *This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class B computing device of Part 15 of FCC rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference; in which case, the users at their own expense may be required to take whatever measures are required to correct this interference.*
10. *This digital apparatus does not exceed the Class B limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.*

Location

Humidity

Install the relay module where the relative humidity never reaches the saturation point. The relay module is designed to operate in a maximum 85 percent relative humidity continuous, noncondensing, moisture environment. Condensing moisture may cause a safety shutdown.

Vibration

Do not install the relay module where it could be subjected to vibration in excess of 0.5G continuous maximum vibration.

Weather

The relay module is not designed to be weather tight. When installed outdoors, protect the relay module using an approved weather-tight enclosure.

Mounting Wiring Subbase

1. Mount the subbase in any position except horizontally with the bifurcated contacts pointing down. The standard vertical position is recommended. Any other position decreases the maximum ambient temperature rating.
2. Select a location on a wall, burner or electrical panel The Q7800 can be mounted directly in the control cabinet. Be sure to allow adequate clearance for servicing, installation, access or removal of the RM7800/RM7840, Expanded Annunciator, Keyboard Display Module, flame amplifier, flame amplifier signal voltage probes, Run/Test Switch, electrical signal voltage probes and electrical field connections.
3. For surface mounting, use the back of the subbase as a template to mark the four screw locations. Drill the pilot holes.
4. Securely mount the subbase using four no. 6 screws.

Wiring Subbase

⚠ WARNING

Electrical Shock Hazard.
Can cause serious injury, death or equipment damage.
Disconnect the power supply before beginning installation to prevent electrical shock, equipment and control damage. More than one power supply disconnect may be required.

1. For proper subbase wiring, refer to Figs. 2, 3, 4 or 5.
2. For proper remote wiring of the Keyboard Display Module, through a 203541 5-wire Connector, refer to the Specifications for the Keyboard Display Module (65-0090), Network Interface Unit (63-2278), Data ControlBus Module™ (65-0091) or Extension Cable Assembly (65-0131).
3. Disconnect the power supply from the main disconnect before beginning installation to prevent electrical shock and equipment damage. More than one disconnect may be required.

4. All wiring must comply with all applicable electrical codes, ordinances and regulations. Wiring, where required, must comply with NEC, Class 1 (Line Voltage) wiring.
5. Recommended wire size and type: see Table 1.
6. Recommended grounding practices: see Table 2.

The Keyboard Display Module, Data ControlBus Module™ (for remote mounting or communications), through a 203541 5-wire Connector, or Communication Interface ControlBus Module must be wired in a daisy chain configuration, (1(a)-1(a), 2(b)-2(b), 3(c)-3(c)). The order of interconnection of all the devices listed above is not important. Be aware that modules on the closest and farthest end of the daisy chain configuration string require a 120 ohm (1/4 watt minimum) resistor termination across terminals 1 and 2 of the electrical connectors, for connections over 100 feet.

7. Recommended wire routing of leadwires:
   a. Do not run high voltage ignition transformer wires in the same conduit with the flame detector, Data Controlbus Module™, or Remote Reset Module wiring.
   b. Do not route flame detector, Data Controlbus Module™, or Remote Reset Module leadwires in conduit with line voltage circuits.
   c. Enclose flame detector leadwires without armor cable in metal cable or conduit.
   d. Follow directions in flame detector, Data Controlbus Module™, or Remote Reset Module Instructions.
8. Keyboard Display Module (KDM): Because the KDM is powered from a low voltage, energy limited source, it can be mounted outside of a control panel if it is protected from mechanical damage.

NOTE: A 13 Vdc power supply must be used any time more than one Keyboard Display Module is used.

9. Maximum wire lengths follow:
   a. RM7800/RM7840 leadwires—The maximum length of leadwire is 300 feet to terminal inputs (Control, Preignition Interlock, Running/Lockout Interlock, High Fire Switch and Low Fire Switch).
   b. Flame Detector leadwires—The maximum flame sensor leadwire length is limited by the flame signal strength.
   c. Remote Reset leadwires—The maximum length of wire is 1000 feet to a Remote Reset pushbutton.
   d. Data Controlbus Module™—The maximum Data Controlbus Module™ cable length depends on the number of system modules connected, the noise conditions and the cable used. The maximum length of all Data Controlbus Module™ interconnecting wire is 1000 feet.
10. Make sure loads do not exceed the terminal ratings Refer to the label on the RM7800/RM7840 or to the ratings in Tables 3, 4 and 5

Final Wiring Check

1. Check the power supply circuit. The voltage and frequency tolerance must match those of the RM7800/RM7840. A separate power supply circuit may be required for the RM7800/RM7840. Add the required disconnect means and overload protection.
2. Check all wiring circuits and complete the Static Checkout, see Table 8, before installing the RM7800/RM7840 on the subbase
3. Install all electrical connectors.
4. Restore power to the panel.

Table 1. Recommended Wire Sizes and Part Numbers.

Application	Recommended Wire Size	Recommended Part Number(s)
Line voltage terminals	14, 16 or 18 AWG copper conductor, 600 volt insulation, moisture-resistant wire.	TTW60C, THW75C, THHN90C
Keyboard Display Module (KDM)	22 AWG two-wire twisted pair with ground, or five wire.	Belden 8723 shielded cable or equivalent.
Data ControlBus Module™	22 AWG two-wire twisted pair with ground, or five wire.	Belden 8723 shielded cable or equivalent.
Remote Reset Module	22 AWG two-wire twisted pair, insulated for low voltage.	—
Communications Interface ControlBus™ Module	22 AWG two-wire twisted pair with ground.	Belden 8723 shielded cable or equivalent.
13 Vdc full-wave rectified transformer power input.	18 AWG wire insulated for voltages and temperatures for given application.	TTW60C, THW75C, THHN90C.

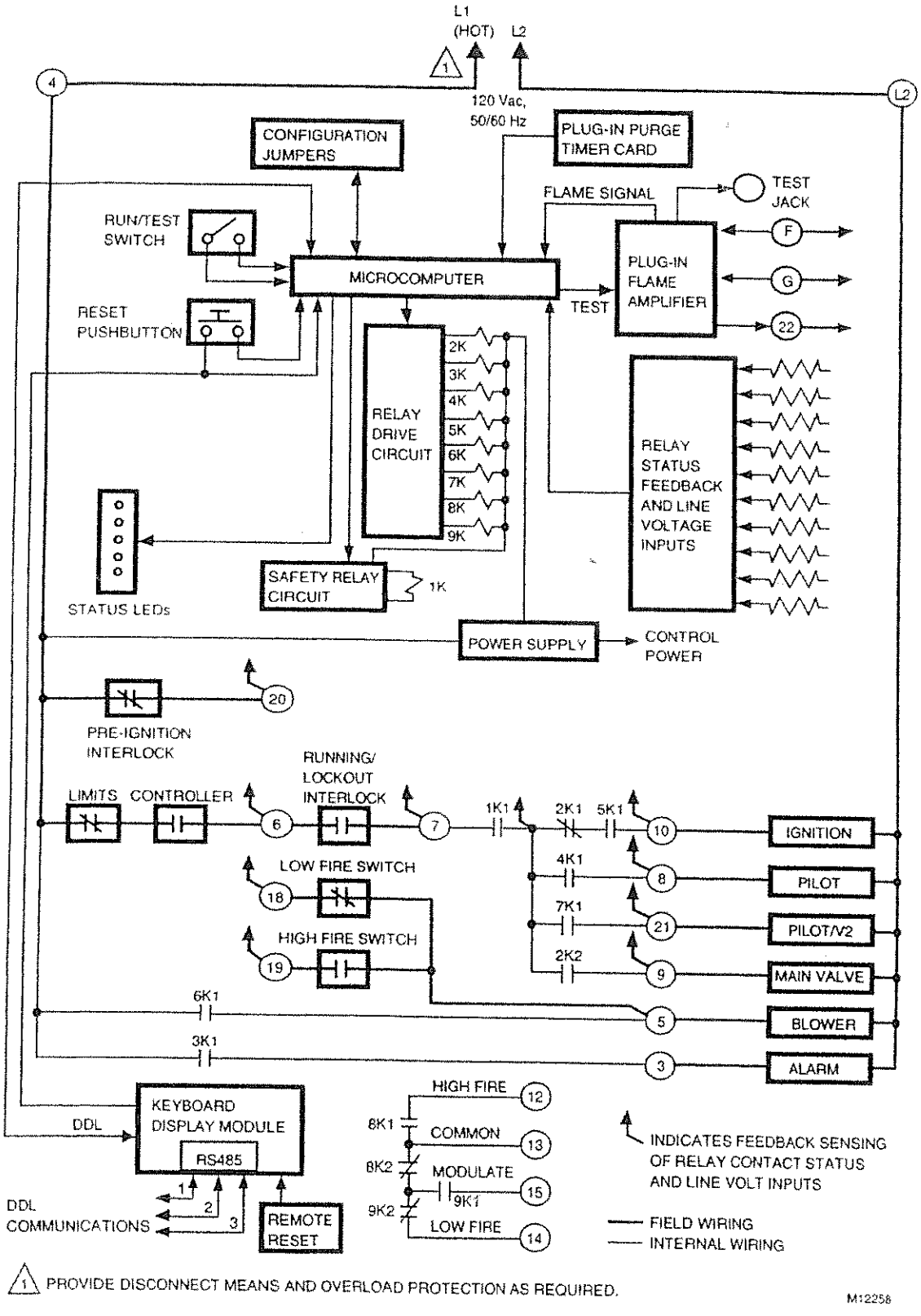


Fig. 1. Internal block diagram of the RM7800L/RM7840L (See Fig. 2, 3, 4 or 5 for individual detailed wiring instructions).

Table 2. Recommended Grounding Practices.

Ground Type	Recommended Practice
Earth ground (subbase and relay module).	1. Use to provide a connection between the subbase and the control panel of the equipment. Earth ground must be capable of conducting enough current to blow the 20A fuse (or breaker) in the event of an internal short circuit. 2. Use wide straps or brackets to provide minimum length, maximum surface area ground conductors. If a leadwire must be used, use 14 AWG copper wire. 3. Make sure that mechanically tightened joints along the ground path are free of nonconductive coatings and protected against corrosion on mating surfaces.
Signal ground (KDM, Data ControlBus Module™, Communications Interface ControlBus™ Module).	Use the shield of the signal wire to ground the device to the signal ground terminals [3(c)] of each device. Connect the shield at both ends of the chain to earth ground.

Table 3. Terminal Ratings.

Terminal No.	Description	Ratings
G	Flame Sensor Ground[a]	—
Earth G	Earth Ground[a]	—
L2(N)	Line Voltage Common	—
3	Alarm	120 Vac, 1A pilot duty
4	Line Voltage Supply (L1)	120 Vac (+10%/-15%), 50 or 60 Hz (±10%)[b,d]
5	Burner Motor	120 Vac, 9.8 AFL, 58.8 ALR (inrush)
6	Burner Controller and Limits	120 Vac, 1 mA.
7	Lockout/Running Interlock	120 Vac, 8A run, 43A inrush
8	Pilot Valve/Ignition	120 Vac[c]
9	Main Fuel Valve	120 Vac[c]
10	Ignition	120 Vac[c]
F(11)	Flame Sensor	60 to 220 Vac, current limited
12	Firing Rate High Fire	120 Vac, 75 VA pilot duty
13	Firing Rate Common	120 Vac, 75 VA pilot duty
14	Firing Rate Low Fire	120 Vac, 75 VA pilot duty
15	Firing Rate Modulate	120 Vac, 75 VA pilot duty
16	Unused	—
17	Unused	—
18	Low Fire Switch Input	120 Vac, 1 mA.
19	High Fire Switch Input	120 Vac, 1 mA.
20	Preignition Interlock Input	120 Vac, 1 mA.
21	Interrupted/Intermittent Pilot Valve/First Stage Oil Valve	120 Vac[c]
22	Shutter	120 Vac, 0.5A.

[a] The relay module must have an earth ground providing a connection between the subbase and the control panel or the equipment. The earth ground wire must be capable of conducting the current to blow the 15A fuse (or breaker) in event of an internal short circuit. The relay module requires a low impedance ground connection to the equipment frame, which, in turn, requires a low impedance connection to earth ground.

[b] 2000 VA maximum connected load to relay module assembly.

[c] See tables 4 and 5.

[d] RM7800G,M/RM7840G,M operating frequency determined by relay module selection.

Table 4. Combinations for Terminals 8, 9, 10 and 21.

Combination No.	Pilot Fuel 8	Main 9	Ignition 10	Intermittent Pilot Valve 21
1	C	F	No Load	No Load
2	B	F	No Load	No Load
3	No Load	F	No Load	B
4	F	F	A	No Load
5	No Load	F	A	F
6	D	F	A	No Load
7	No Load	D	A	D
8	D	D	A	No Load
9	No Load	D	A	D

Table 5. Explanation of Each Combination.

A	B	C	D	F
4.5A ignition.	50 VA Pilot Duty plus 4.5A ignition.	180 VA ignition plus motor valve with: 660 VA inrush, 360 VA open, 260 VA hold.	2A Pilot Duty.	64 VA Pilot Duty plus motor valves with: 3850 VA inrush, 700 VA open, 250 VA hold.

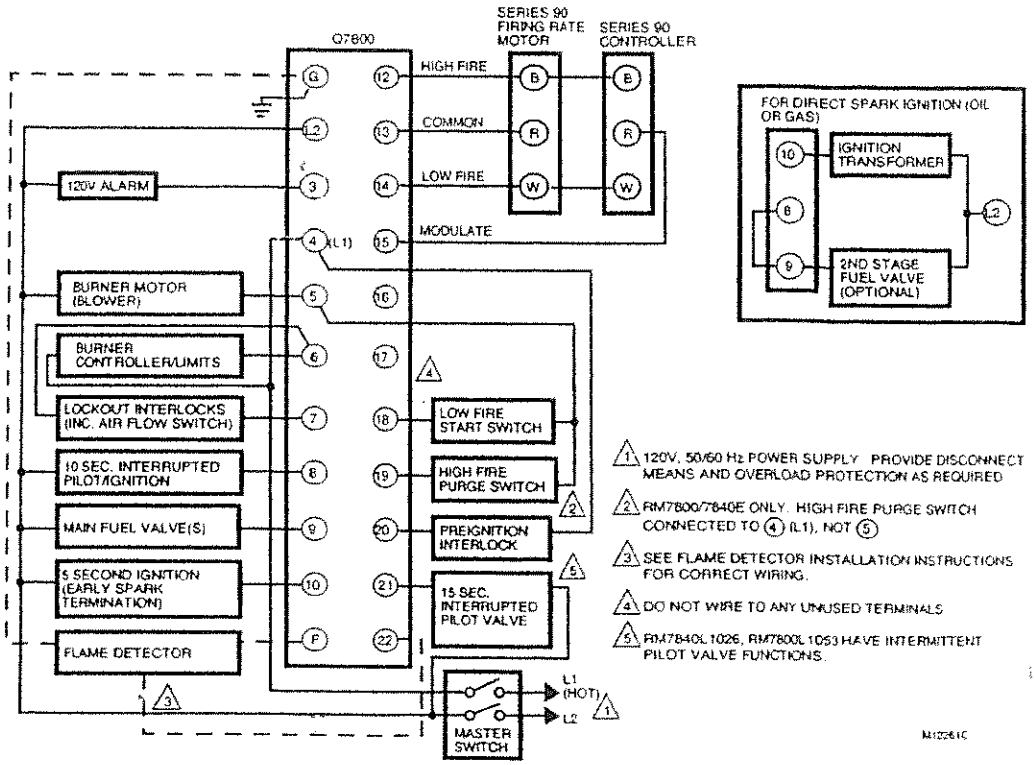
Mounting RM7800/RM7840 Relay Module (Fig. 5)

1. Mount the RM7800/RM7840 vertically on the Q7800 Subbase, or mount horizontally with the knife blade terminals pointing downward. When mounted on the Q7800A, the RM7800/RM7840 must be in an electrical enclosure.
2. When mounting in an electrical enclosure, provide adequate clearance for servicing, installation and removal of the RM7800/RM7840, Keyboard Display Module, flame amplifier, flame amplifier signal voltage probes, electrical signal voltage probes, and electrical connections.
   a. Allow an additional two inches below the RM7800/RM7840 for the flame amplifier mounting.
   b. Allow an optional three-inch minimum to both sides of the RM7800/RM7840 for electrical signal voltage probes.
3. Make sure no subbase wiring is projecting beyond the terminal blocks. Tuck in wiring against the back of the subbase so it does not interfere with the knife blade terminals or bifurcated contacts.

IMPORTANT

The RM7800/RM7840 must be installed with a plug-in motion rather than a hinge action.

4. Mount the RM7800/RM7840 by aligning the four L-shaped corner guides and knife blade terminals with the bifurcated contacts on the wiring subbase and securely tighten the two screws without deforming the plastic.



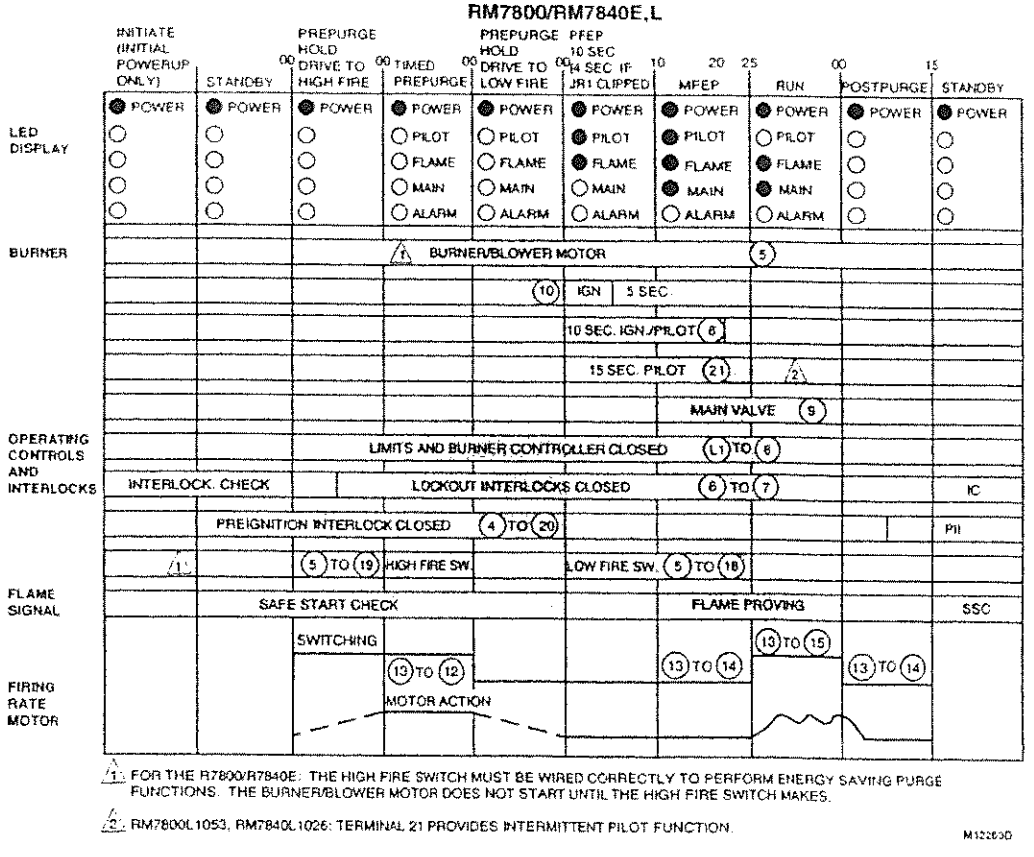
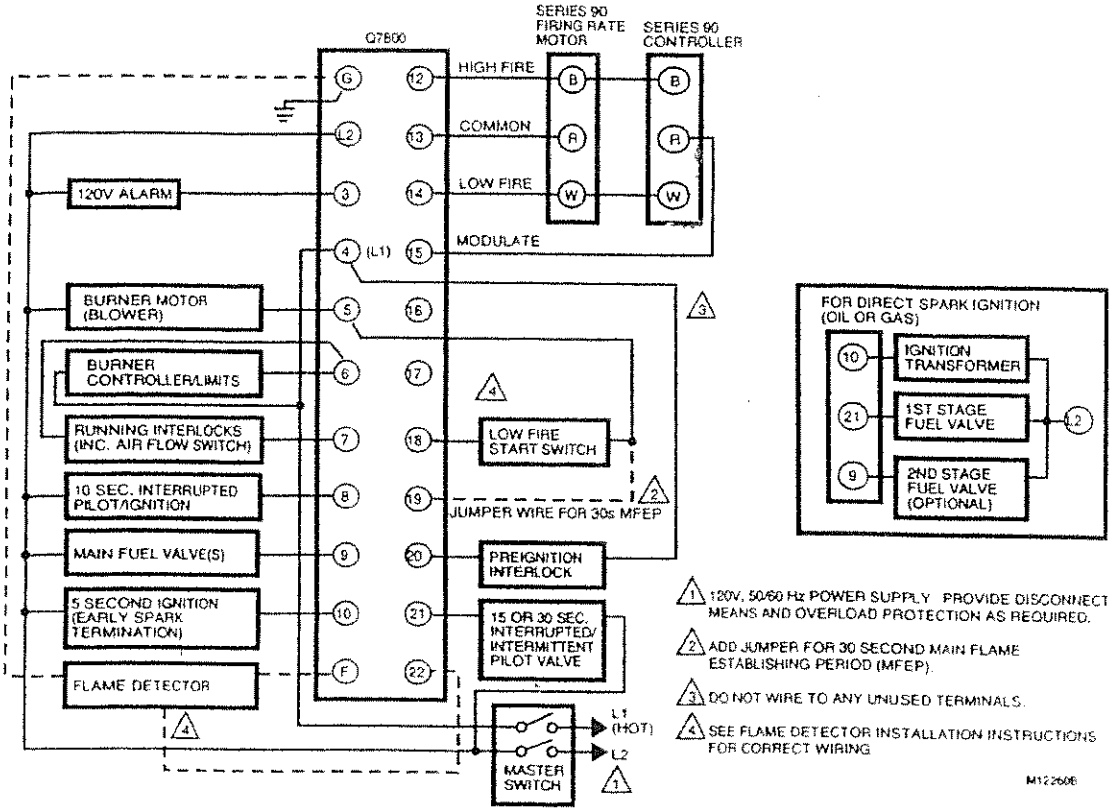


Fig. 2. Wiring subbase and sequence for RM7800E,L/RM7840E,L.



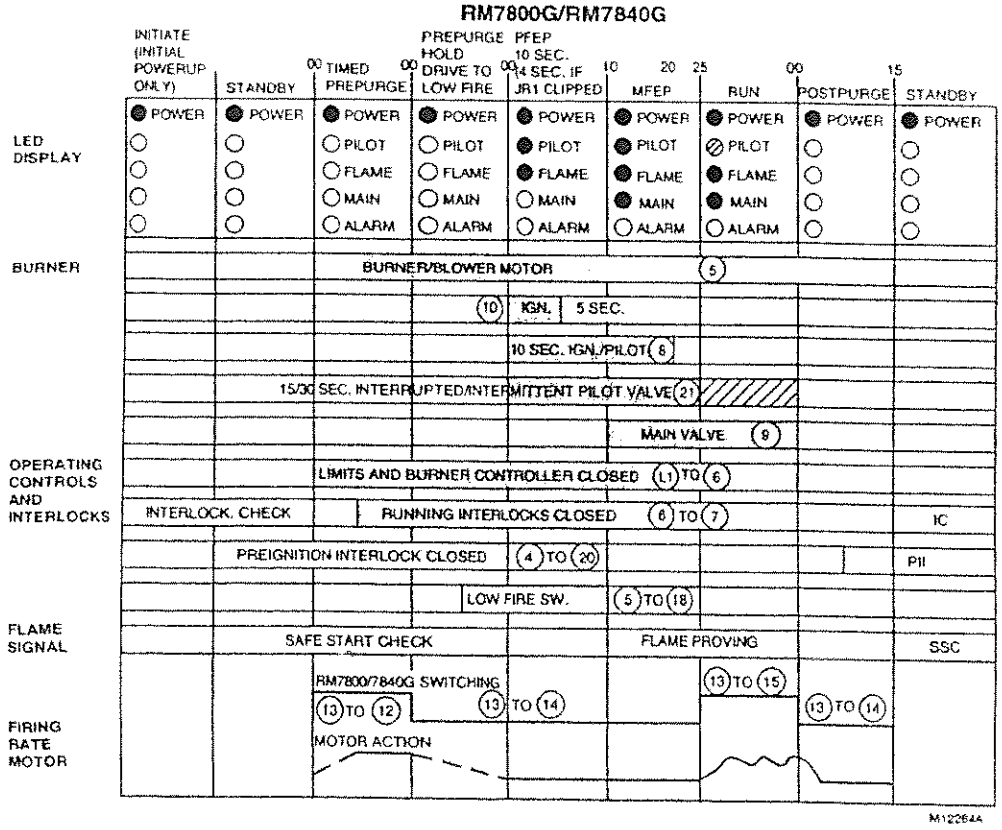
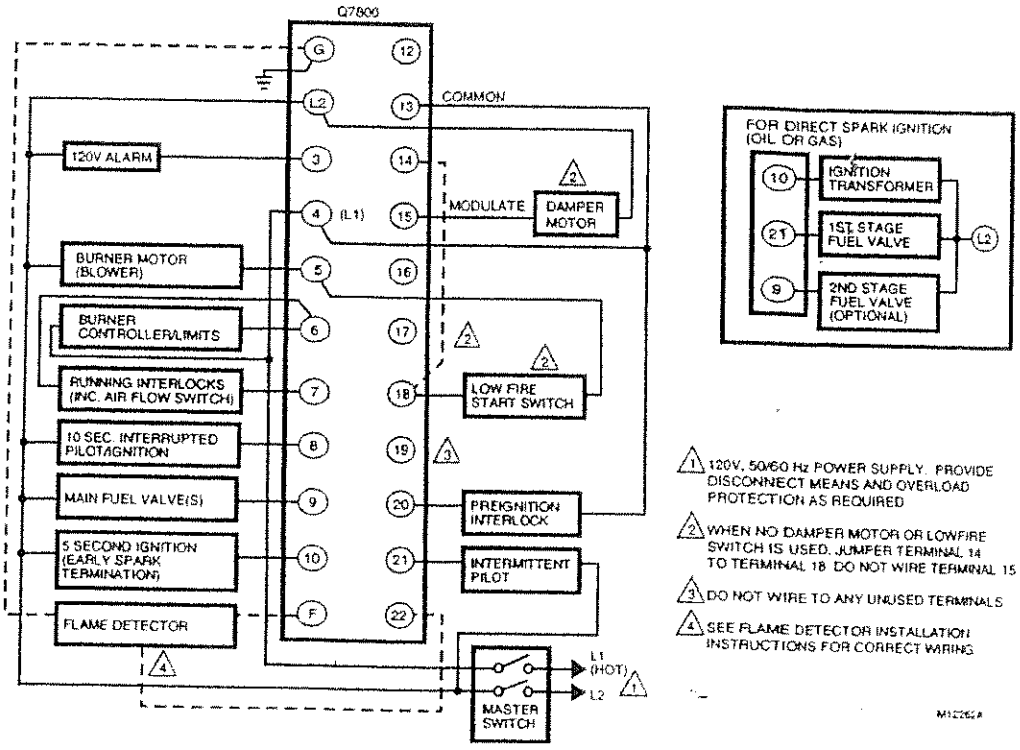


Fig. 3. Wiring subbase and sequence for RM7800G/RM7840G.



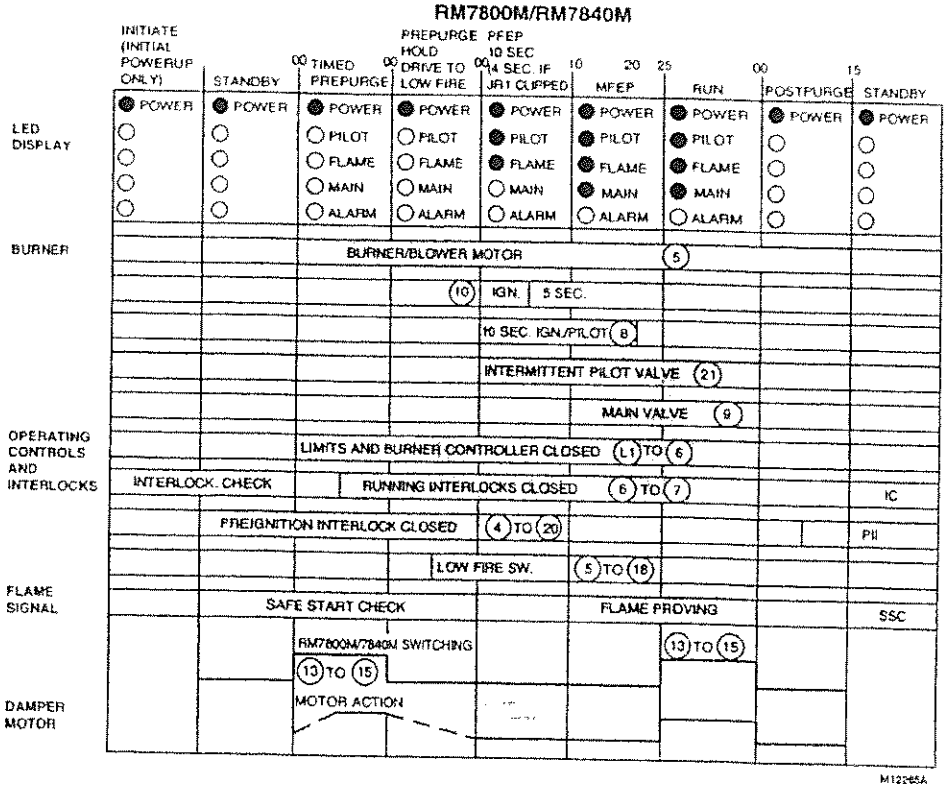


Fig. 4. Wiring subbase and sequence for RM7800M/RM7840M.

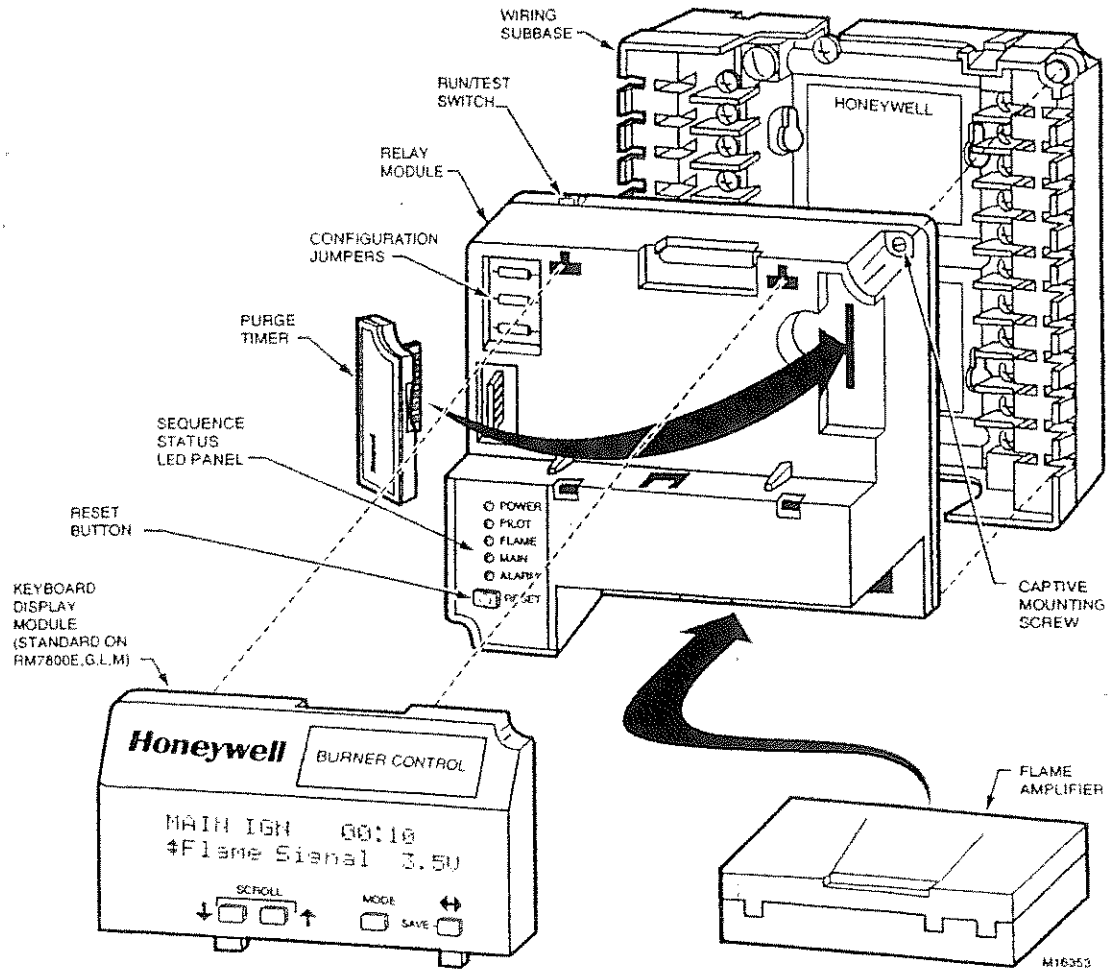


Fig. 5. RM7800/RM7840 Relay Module exploded view.

SAFETY SHUTDOWN

Safety Shutdown (Lockout) occurs if any of the following occur during the indicated period:

1. INITIATE Period:
   a. Purge card is not installed or is removed.
   b. Purge card is bad.
   c. Configuration jumpers are changed (after 200 hours of operation).
   d. Ac line power errors occurred, see Operation section.
   e. Four minute INITIATE period has been exceeded.
2. STANDBY Period:
   a. Flame signal is present after 40 seconds.
   b. Preignition Interlock is open an accumulative time of 30 seconds.
   c. Interlock check feature is enabled and the Interlock String (including airflow switch) is closed for 120 seconds with controller closed.
   d. Ignition/pilot valve/intermittent pilot valve terminal is energized.
   e. Main valve terminal is energized.
   f. Internal system fault occurred.
   g. Purge card is not installed or is removed.
   h. Purge card is bad.
3. PREPURGE Period:
   a. Preignition Interlock opens anytime during PREPURGE period (RM7840E,L).
   b. Flame signal is detected after first ten seconds during PREPURGE (RM7840E,L).
   c. High Fire Switch fails to close within four minutes and fifteen seconds after the firing rate motor is commanded to drive to the high fire position at the start of PREPURGE (RM7840E,L).
   d. Low Fire Switch fails to close within four minutes and fifteen seconds after the firing rate motor is commanded to drive to the low fire position at the end of PREPURGE.
   e. Running Interlock does not close within 30 seconds (RM7840G,M).
   f. Lockout Interlock does not close within 10 seconds (RM7840E,L).

g. Lockout Interlock opens during PREPURGE (RM7840E,L).
h. Ignition/pilot valve/intermittent pilot valve terminal is energized.
i. Main valve terminal is energized.
j. Internal system fault occurred.
k. Purge card is removed.
l. Purge card is bad.

4. PILOT FLAME ESTABLISHING Period (PFEP):
   a. Low Fire Switch opens.
   b. Lockout Interlock opens (RM7840E,L).
   c. Ignition/pilot valve/intermittent pilot valve terminal is not energized.
   d. Early spark termination terminal is energized after five seconds.
   e. No flame is present at the end of PFEP.
   f. Main valve terminal is energized (RM7800G,M).
   g. Internal system fault occurred.
   h. Purge card is removed.
   i. Purge card is bad.
5. MAIN FLAME ESTABLISHING Period (MFEP):
   a. Low Fire Switch Opens.
   b. Lockout Interlock opens (RM7840E,L).
   c. Ignition/pilot valve/intermittent pilot valve terminal is not energized.
   d. Main valve terminal is not energized.
   e. No flame is present at the end of MFEP.
   f. Internal system fault occurred.
   g. Purge card is removed.
   h. Purge card is bad.
6. RUN Period:
   a. No flame is present.
   b. Lockout Interlock opens (RM7840E,L).
   c. Interrupted pilot valve terminal is energized (RM7840G,M).
   d. Main valve terminal is not energized.
   e. Internal system fault occurred.
   f. Purge card is removed.
   g. Purge card is bad.
7. POSTPURGE Period:
   a. Preignition Interlock does not close in five seconds and opens after five-second time period.
   b. Ignition/pilot valve/intermittent pilot valve terminal is energized.
   c. Main valve terminal is energized.
   d. Internal system fault occurred.
   e. Purge card is removed.
   f. Purge card is bad.

OPERATION

Sequence of Operation

The RM7800/RM7840 has the following operating sequences, see Fig. 2, 3, 4, and Table 6. The RM7800/RM7840 LED provide positive visual indication of the program sequence: POWER, PILOT, FLAME, MAIN and ALARM.

Initiate

The RM7800/RM7840 enters the INITIATE sequence when the Relay Module is powered. The RM7800/RM7840 can also enter the INITIATE sequence if the Relay Module verifies voltage fluctuations of +10/-15 percent or frequency fluctuations of +/-10 percent during any part of the operating sequence. The INITIATE sequence lasts for ten seconds unless the voltage or frequency tolerances are not met. When the tolerances are not met, a hold condition is initiated and displayed on the VFD for at least five seconds. When the tolerances are met, the INITIATE sequence restarts. If the condition is not corrected and the hold condition exists for four minutes, the RM7800/RM7840 locks out. Causes for hold conditions in the INITIATE sequence:

a. AC line dropout is detected.
b. AC line frequency error occurs caused by using a 60 Hz device on a 50 Hz line, or vice versa.
c. AC line noise prevents a sufficient reading of the line voltage inputs.
d. Low line voltage brownouts occur.

The INITIATE sequence also delays the burner motor starter from being energized and de-energized from an intermittent AC line input or control input.

Standby

The RM7800/RM7840 is ready to start an operating sequence when the operating control determines a call for heat is present. The burner switch, limits, operating control and all microcomputer monitored circuits must be in the correct state for the RM7800/RM7840 to continue into the PREPURGE sequence.

Normal Start-Up Prepurge

The RM7800/RM7840 provides a prepurge timing selectable from two seconds to 30 minutes with power applied and the RM7800 operating control indicating a call for heat.

a. Running Interlocks, Preignition Interlocks, Burner Switch, Run/Test Switch, Lockout Interlocks and all microcomputer monitored circuits must be in the correct operating state.
b. The blower motor output, terminal 5, is powered to start the PREPURGE sequence, except for the RM7800E/RM7840. The firing rate motor is driven to the high fire position. The PREPURGE timing for the RM7800/RM7840E,L does not begin until the Lockout Interlock String and High Fire Switch are both closed. The blower motor output for the RM7800E is not energized until the High Fire Switch is closed.
c. The Preignition Interlock input must remain closed throughout PREPURGE; otherwise, control returns to the STANDBY state and holds (30 seconds) for the RM7800/RM7840G,M or safety shutdown for the RM7800/RM7840E,L occurs.
d. The Lockout Interlock or Running Interlock inputs (interlock circuit including Airflow Switch) must close by ten seconds into PREPURGE; otherwise, a recycle to the beginning of PREPURGE for the RM7800/RM7840G,M will happen or a safety shutdown for the RM7800/RM7840E,L occurs.
e. When PREPURGE timing is complete, the firing rate motor drives to the low fire position, RM7800/RM7840E,G,L.
f. When the firing rate motor reaches low fire position, the Low Fire Switch, terminal 18, input must be energized before entering the Ignition Trial state.

Ignition Trials

Pilot Flame Establishing Period (PFEP):

a. With the firing rate motor at the low fire position:
   (1) The pilot valve and ignition transformer, terminals 8, 10 and 21, are energized. The RM7800M has an intermittent pilot valve, terminal 21. The RM7800/RM7840G has an interrupted or intermittent pilot valve, terminal 21, depending on the selection of configuration jumper 2. The RM7800/RM7840E,L has a fifteen-second interrupted pilot valve, terminal 21. All of the RM7800/RM7840s have a ten-second interrupted pilot valve/ignition, terminal 8.
   (2) During PFEP, the Low Fire Switch must remain closed. If it opens, a safety shutdown occurs.
   (3) The Preignition Interlock input is ignored throughout the Ignition Trial state.

b. Flame must be proven by the end of the ten-second PFEP (four if JR1 is clipped) to allow the sequence to continue. If flame is not proven by the end of PFEP, a safety shutdown occurs.

c. After five seconds, the ignition, terminal 10, is de-energized for early spark termination

2. Main Flame Establishing Period (MFEP):

a. Terminal 9 is energized when the presence of flame is verified at the end of a 10-second Pilot Flame Establishing Period (PFEP) (four seconds if JR1 is clipped).

b. Terminal 8 is turned off 10 seconds after Terminal 9 is energized.

c. Terminal 21 action:
   (1) RM7800E,L/RM7840E,L: De-energized 15 seconds after Terminal 9 is energized.
   (2) RM7840G:
      (a) Not turned off, or
      (b) 15 seconds after Terminal 9 is energized and JR2 is clipped, or
      (c) 30 seconds after Terminal 9 is energized and Terminals 5 and 19 are jumpered and jumper JR2 is clipped.
   (3) RM7800L1053, RM7840L1026, RM7800M/RM7840M: Remain energized as long as call for heat is present.

Run

1. A ten-second stabilization period occurs at the beginning of the RUN period.
2. The firing rate motor releases to modulation (RM7800/RM7840E,G,L). Damper motor is energized (RM7800/RM7840M).
3. The RM7800/RM7840 is now in RUN and remains in RUN until the controller input, terminal 6, opens, indicating that the demand is satisfied or a limit opened.

Postpurge

The RM7800/RM7840 provides a fifteen-second POSTPURGE following the completion of the RUN period. The blower motor output is powered to drive all products of combustion and any unburned fuel from the combustion chamber. It also supplies combustion air to burn fuel being purged from the fuel line downstream of the fuel shutoff valve.

1. The main fuel valve and intermittent pilot valve, Terminals 9 and 21, are de-energized and the firing rate motor is commanded to the low fire position to begin the POSTPURGE period.
2. The Preignition Interlock closes within the first five seconds of POSTPURGE.

Table 6. Sequence Timing for Normal Operation.

Device	Initiate	Standby	Purge	Flame Establishing Period		Run	Post-Purge Timing	Interlock Circuits	Firing Rate Circuit	Energy Saving Prepurge	Approval Code Bodies
				Pilot	Main[a]						
RM7800E/ RM7840E	10 sec.	*	**	4 or 10 sec.	10 or 15 sec.	*	15 sec.	Preignition, Lockout, High and Low Fire	4-wire modulating	Yes	FM/IRI Modulating
RM7800G/ RM7840G					10, 15 sec or intermittent			Preignition, Running, Low Fire		No	UL/CSA Modulating
RM7800L/ RM7840L					10 or 15 sec.[b]			Preignition, Lockout, High and Low Fire			FM/IRI Modulating
RM7800M/ RM7840M					10 sec. or intermittent			Preignition, Running, Low Fire	2-wire isolated On-Off-On contacts		UL/CSA On-Off

* STANDBY and RUN can be an infinite time period.

**PURGE determined by which ST7800A purge card is selected.

[a] The MFEP is determined by which terminal is used, configuration jumper selected or jumper wire added. See Fig. 2, 3, 4, 5 and 6.

[b] M7800L1053, RM7840L1026: 10 second or intermittent.

Keyboard Display Module (VFD)

The Keyboard Display Module (see Fig. 5) is provided with the RM7800 Relay Module (but is not required for operation) and is an option for the RM7840 Relay Module. The first line of the Vacuum Fluorescent Display (VFD) provides:

- Current status of the burner sequence (STANDBY, PURGE, PILOT IGN, MAIN IGN, RUN and POSTPURGE).
- Timing information (PURGE, PILOT IGN, MAIN IGN and POSTPURGE) in minutes and seconds.
- Hold information (PURGE HOLD: T19).
- Lockout information (Lockout, Fault Code, Message and Sequence).

The extreme right side of the first line is either blank or shows a small arrow pointing to the second line followed by a two-letter code (DI-Diagnostic Information, Hn-Fault History Information, and EA-Expanded Annunciator). When the arrow and two-letter code are displayed, it indicates the second line is showing a selectable message submenu. The second line displays selectable or preemptive messages.

A selectable message supplies information for flame strength, system status indication, system or self-diagnostics and troubleshooting.

A preemptive message has parentheses around the message and supplies a detailed message to support the sequence status information. A preemptive message can also be a lockout message. A preemptive message replaces a selectable message to support the sequence status information. It also replaces a selectable message after 60 seconds if it or a lockout message is available.

Run/Test Switch

⚠ WARNING

Explosion Hazard.
Can cause serious injury or death.
Do not use the Run/Test switch during the Pilot Flame Establishing Period for the RM7800/RM7840G,M when using Direct Spark Function, because it turns on the main gas valve, causing an accumulation of fuel in the burner.

The Run/Test Switch is located on the top side of the RM7800/RM7840, see Fig. 6. The Run/Test Switch allows the burner sequence to be altered as follows:

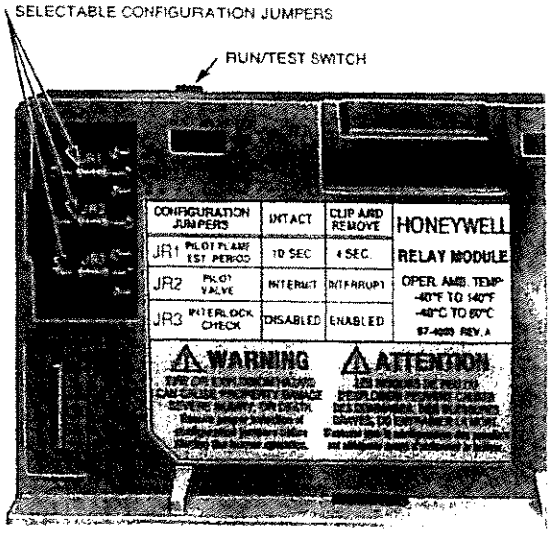
1. In Prepurge Drive To High Fire Position, the Run/Test Switch, when placed in the TEST position, holds in PREPURGE with the firing rate motor in the High Fire position.
2. In the measured PREPURGE sequence, the Run/Test Switch, when placed in the TEST position, causes the PREPURGE timing to stop. The firing rate motor is in the High Fire position.
3. In Prepurge Drive to Low Fire position, the Run/Test Switch, when placed in the TEST position, holds the burner sequence in PREPURGE with the firing rate motor in the Low Fire position.
4. In PFEP, the Run/Test Switch, when placed in the TEST position, stops the timer during the first eight seconds when a ten second PFEP is selected or during the first three seconds when a four second PFEP is selected, allowing pilot-turn-down test and other burner adjustments to be made. This activates a fifteen second flameout timer that permits pilot flame adjustment without nuisance safety shutdowns. The Run/Test Switch is ignored during PFEP for the RM7800/RM7840E,L if Terminals 8 and 9 or 9 and 21 are jumpered.
5. During Run, the Run/Test Switch, when placed in the TEST position, drives the firing rate motor to the Low Fire position.

NOTE: When RM7800/RM7840 is switched to the Test mode, it stops and holds at the next Run/Test Switch point in the operating sequence. Make sure that the Run/Test Switch is in the RUN position before leaving the installation.

SETTINGS AND ADJUSTMENTS

Selectable Site-Configurable Jumpers

The RM7800/RM7840 has three site-configurable jumper options, see Fig. 6 and Table 7. If necessary, clip the site-configurable jumpers with side cutters and remove the resistors from the Relay Module.



NOTE: CONFIGURATION JUMPERS SHOWN FOR RM7800G/RM7840G.

M12301

Fig. 6. Selectable site-configurable jumpers.

Table 7. Site Configurable Jumper Options.

Jumper Number	Description	Intact	Clipped	RM7800/RM7840 Type
JR1	Pilot Flame Establishing Period (PFEP)	10 seconds	4 seconds	All
JR2	Pilot Valve[a]/Main Flame Establishing Period (MFEP)	10 seconds Intermittent	15 or 30 seconds Interrupted[b]	RM7800G/RM7840G
JR3	Start-up Interlock Check	Disabled	Enabled	All

[a] Pilot Valve /First Stage Oil Valve (Valve/Start) Terminal 21.

[b] A 30 second MFEP can be accomplished by adding a jumper wire between Terminals 19 and 5.
SERVICE NOTE: Clipping and removing a site-configurable jumper enhances the level of safety. Removal after 200 hours of main valve operation will result in a hard lockout, Code 110.

STATIC CHECKOUT

After checking all wiring, perform this checkout before installing the RM7800/RM7840 on the subbase. These tests verify the Q7800 Wiring Subbase is wired correctly, and the external controllers, limits, interlocks, actuators, valves, transformers, motors and other devices are operating properly.

⚠ WARNING

Explosion and Electrical Shock Hazard.
Can cause serious injury, death or equipment damage.

1. Close all manual fuel shutoff valve(s) before starting these tests.
2. Use extreme care while testing the system. Line voltage is present on most terminal connections when power is on.
3. Open the master switch before installing or removing a jumper on the subbase.
4. Before continuing to the next test, be sure to remove test jumper(s) used in the previous test.
5. Replace all limits and interlocks that are not operating properly. Do not bypass limits and interlocks.

⚠ CAUTION

Equipment Damage Hazard.
Improper testing can damage equipment.
Internal surge protectors can break down and conduct a current, causing the RM7800/RM7840 to fail the dielectric test or possibly destroy the internal lightning and high current protection. Do not perform a dielectric test with the RM7800/RM7840 installed.

Equipment Recommended

1. Voltmeter (1M ohm/volt minimum sensitivity) set on the 0-300 Vac scale.
2. Two jumper wires; no. 14 wire, insulated, 12 inches (304.8 mm) long with insulated alligator clips at both ends.

General Instructions

1. Perform all applicable tests listed in Static Checkout, Table 8, in the order listed.
2. Make sure all manual fuel shutoff valve(s) are closed.
3. Perform only those tests designated for the specific RM7800/RM7840 model being tested.
4. Raise the setpoint of the operating controller to simulate a call for heat.
5. For each test, open the master switch and install the jumper wire(s) between the subbase wiring terminals listed in the Test Jumpers column.
6. Close the master switch before observing operation.
7. Read the voltage between the subbase wiring terminals listed in the Voltmeter column.
8. If there is no voltage or the operation is abnormal, check the circuits and external devices as described in the last column.
9. Check all wiring for correct connections, tight terminal screws, correct wire, and proper wiring techniques. Replace all damaged or incorrectly sized wires.
10. Replace faulty controllers, limits, interlocks, actuators, valves, transformers, motors and other devices as required.
11. Make sure normal operation is obtained for each required test before continuing the checkout.
12. After completing each test, be sure to remove the test jumper(s).

⚠ WARNING

Explosion Hazard.
Can cause serious injury or death.
Make sure all manual fuel shutoff valves are closed before performing static checkout.

Table 8. Static Checkout.

Test No.	RM7800/ RM7840 Models	Test Jumpers	Voltmeter	Normal Operation	If Operation is Abnormal, Check the Items Listed Below
1	All	None	4-L2	Line voltage at Terminal 4.	1. Master Switch. 2. Power connected to the Master Switch. 3. Overload protection (fuse, circuit breaker, etc.) has not opened the power line.
2			6-L2	Line voltage at Terminal 6.	1. Limits. 2. Burner Controller.
3			20-L2	Line voltage at Terminal 20.	1. Preignition interlocks.
4		4-5	7-L2	1. Burner motor (fan or blower) starts. 2. Line voltage at Terminal 7 within 10 seconds.	1. Burner motor circuit. a. Manual switch of burner motor. b. Burner motor power supply, overload protection, and starter. c. Burner motor. 2. Running or Lockout Interlocks (including Airflow Switch)
5		4-10	—	Ignition spark (if ignition transformer is connected to Terminal 10)	1. Watch for spark or listen for buzz. a. Ignition electrodes are clean. b. Ignition transformer is okay.
6	All	4-8	—	1. Ignition spark (if ignition transformer is connected to Terminal 8). 2. Automatic pilot valve opens (if connected to Terminal 8) NOTE: Refer to wiring diagram of system being tested.	1. Watch for spark or listen for buzz. a. Ignition electrodes are clean b. Ignition transformer is okay. 2. Listen for click or feel head of valve for activation. a Actuator if used. b. Pilot valve.
7		4-21	—	Same as test no. 6 for connections to Terminal 8. If using direct spark ignition, check the first stage fuel valve(s) instead of the pilot valve.	Same as test no. 6 If using direct spark ignition, check the first stage fuel valve(s) instead of the pilot valve.
8		4-9	—	Automatic main fuel valve(s) open. If using direct spark ignition on a model with intermittent pilot on Terminal 21, check the optional second stage fuel valve, if used	1. Listen for and observe operation of the main fuel valve(s) and actuator(s). 2. Valve(s) and actuator(s).
9		4-3	—	Alarm (if used) turns on.	1. Alarm.
10	RM7800E,G,L; RM7840E,G,L	4-5 and 12-13	18-L2	Firing rate motor drives open; zero volts at Terminal 18 after motor starts driving open.	1. Low Fire Start Switch. 2. Firing rate motor and transformer.
11	RM7800E,G,L; RM7840E,G,L	4-5 and 14-13	18-L2	Firing rate motor drives closed; line voltage at Terminal 18 after motor is in Low Fire position.	1. Low Fire Start Switch. 2. Firing rate motor and transformer.
12	RM7800E,L; RM7840E,L	4-5 and 12-13	19-L2	Firing rate motor drives open; line voltage at Terminal 19 after motor is in High Fire position.	1. High Fire Purge Switch. 2. Firing rate motor and transformer.
13	RM7800E,L; RM7840E,L	4-5 and 14-13	19-L2	Firing rate motor drives closed; zero volts at Terminal 19 after motor starts driving closed.	1. Low Fire Start Switch. 2. Firing rate motor and transformer.
14	RM7800E,G,L; RM7840E,G,L	15-13	—	1. Raise setpoint of Series 90 controller—firing rate motor should drive toward open. 2. Lower setpoint of Series 90 controller—firing rate motor should drive toward closed.	1. Series 90 Controller. 2. Firing rate motor and transformer.

Table 8. Static Checkout. (Continued)

Test No.	RM7800/ RM7840 Models	Test Jumpers	Voltmeter	Normal Operation	If Operation is Abnormal, Check the Items Listed Below
15	RM7800M; RM7840M with open damper contacts..	14-13	—	If damper motor is used, motor drives damper open.	Damper motor.
16	RM7800M; RM7840M with open damper contacts..	4-5	18-L2	If damper motor is used, motor drives open; line voltage at Terminal 18 after motor is in Low Fire position.	1. Low Fire Start Switch. 2. Damper motor.
17	RM7800M; RM7840M with open damper contacts..	4-5 and 4-13	18-L2	If damper motor is used, motor drives open; zero volts at Terminal 18.	1. Low Fire Start Switch. 2. Damper motor.
Final	All	**⚠ CAUTION** **Equipment Damage Hazard.** **Improper wiring can damage equipment.** On completing these tests, open the master switch and remove all test jumpers from the subbase terminal. Also remove bypass jumpers from the low fuel pressure limits (if used) to prevent equipment damage.			