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March 5, 2009

Mr. Neil Golden - Trustee
Thatchmont Condominium Association
14-26 Edgmont Street
Brookline, MA 02446

RE: 14-26 EGMONT STREET AND 15-25 THATCHER STREET, BROOKLINE, MASSACHUSETTS

Subject: Masonry Facade Condition Survey

Dear Mr. Golden:

On Monday, February 23, 2009 and again on February 25, 2009, Thomas G. Heger P.E. of DM Berg Consultants, P.C. visited the above-referenced addresses to perform an inspection of the masonry façade of both buildings. The purposes of our inspection were to perform an inspection and condition survey of the façade masonry elements and the steel window and door lintels. We chose to select representative areas on each façade elevation to make observations from a wheeled high-lift.

Scope of Work

We performed the following scope of work:

- Visual inspection of the exterior masonry façade elements of all elevations.
- Visual inspection of the window head steel lintels.
- Remove brick from above three window heads to observe the condition of the steel lintels.
- Visual inspection of the concrete window sills.
- Develop CAD elevations including extent and type of damaged/deteriorated areas.
- Prepare a report with our survey results and recommended repairs for the exterior façade.
- Prepare an opinion of probable cost for the recommend repairs.

Description of Structure

Thatchmont Condominium complex is made up of two identical, three story brick masonry buildings, one set on Egmont Street and the other on Thatcher Street. Each building contains 18 condominium units.

The buildings were built approximately 85 years ago and are likely constructed of wood floor and roof framing supported by exterior brick masonry bearing walls and interior wood bearing walls.

The facades are bearing and are constructed of two wythes of common red brick with a lower grade brick used in the rear and side elevations as typical done to save construction costs. Windows are single double hung units on the rear and side elevations and double and triple combination double hung units on the front elevations. All windows have a steel window head lintels and reinforced precast concrete sills. On the front elevation there is two piece decorative precast concrete cornice band above the third floor windows at approximately the roof line and another precast concrete band above the basement window. The lower band acts as lintels across the basement windows. On each building and at each of the three main entrances there is a low roof at the entry supported by a total four reinforced concrete columns.

Observations

During our site visits we made the following observations (Note our observations and quantities of damaged areas are noted on drawings EC-1 through EC - 4 attached with this report):

- The exterior walls are multi-wythe brick masonry bearing walls with a better quality brick on the front façade.

- On the front façades of both buildings we observed the mortar joints on the parapet above the cornice concrete band to be poor condition. We observed loose powdery mortar (Photos 1 and 2). We observed on both buildings that mortar joints in this area of the parapet had been repointed in the past. The repointing was poorly done as the joints were not cut deep enough and the mortar was of high cement content. The repointing mortar is falling out and exposing the soft original mortar (Photos 3 and 4). This condition is typical across the entire length of both buildings.

- We observed several precast concrete sills to be cracked, split and delaminated (Photos 5 and 6). At one location we removed the delaminated concrete to expose the embedded reinforcement bar. The reinforcement bar was corroded (Photo 7).

- We observed several precast concrete lintels at the bands above the basement windows to be cracked, split and delaminated (Photos 8 and 9).

- We observed many of the concrete columns at the front main entryways at both buildings to be cracked, split and delaminated (Photos 10 through 13). At these entryways we also observed that all concrete surfaces had been previously coated. The coating has cracked and failed and debonded (Photos 14 and 15).

- The condition of the steel window head lintels at all elevations at both buildings, we observed to be slightly corroded to severely corroded. The most severely rusted lintels where the lintels above the top floor windows on the rear of both buildings with the most of this type observed on the rear of the Thatcher Street building. We observed the brick to be bowing outward and lifted upward as well as the lintel bowed downward caused by the rust expansion (Photos 16 through 19). We removed the brick header course above three top floor windows on the Thatcher Street

building to observe the lintel and the as built construction. The lintels at the three locations were corroded and at one location the steel was completely gone and a finger could be pushed through the lintel creating a hole (Photos 20 and 21).

- The front façade steel lintels across the double and triple windows varied in condition. We observed most with slight rust but observed some with evidence of more corrosion by observance of cracked mortar joint and lifted brick at the lintel head corners (Photos 22 and 23). The front façade Thatcher Street building lintels were in better condition than the Egmont Street building.

- We observed the condition of the mortar joints on all elevations of both buildings. On the rear and side elevations of both buildings we observed the majority of the joints to be weathered but sound. We did observe areas of severely weather washed out and soft joints that we would consider in need of repointing. These areas are primarily near the top of the walls above the third floor windows and at the base of the walls near the splash zone (Photo 24 and 25). All areas that we consider in need of repointing are identified on the attached drawings.

- The joint between the top front precast concrete cornice band and the precast concrete decorative bracket has missing and loose mortar (Photo 26). This condition is typical across the front of both buildings.

- We observed many locations where the horizontal joint between the steel lintel and brick contains sealant (Photo 27) or mortar. No weep holes were observed.

- On the rear of the Egmont building we observed areas with ivy growth.

Conclusions:

Based on our observations we present the following conclusions:

1. On the rear of both building the mortar joints are weathered for over 80 years of service, however, the mortar is sound for the majority of the surface area. We observe areas of spot repointing done in the past. We did observe areas of soft and washed out mortar in need of repointing. These areas are primarily along the top floor window to roof line and in the splash zones at the base of the walls. The areas in need of repointing represent approximately 25 percent of the rear and side wall areas.

2. On the front elevation of both buildings, the mortar in the repointed mortar joints at the parapet appears to be hard and contains high cement content and was not cut in deep enough. When the brick expands during heat and moisture gain the surface repointing mortar cracked, loosened and in some case has fallen out. When the repointing mortar falls out, the old soft mortar is exposed and soaks up moisture. The moisture freezes and thaws damaging the mortar joint even further.

3. Some of the precast and cast concrete elements (window sills, decorative bands, cornice bands, entryway columns and window head medallions) we observe to be cracked and delaminated.

The cracks and delaminations are the cause of the embedded steel reinforcement corroding. When steel corrodes it will expand up to nine times the original thickness. This expansion of the corrosion product creates internal tension forces within the concrete and will generate enough force to split, delaminate and spall the concrete.

4. The damage to the brick around the window head and the bowing of the steel lintels are caused by moisture penetrating through the exterior brick and corroding the steel lintel. The moisture is also trapped by the sealant or mortar placed in the joint between the steel lintel toe and the header brick. When steel corrodes it will expand up to nine times the original thickness. This expansion of the corrosion product creates enough force to lift up and bulge the brick and push down the lintel. At one location we observed up to an inch and a half of rust product.

5. The coating placed on the cast concrete columns and concrete surface at the entryways, as well as the cast concrete medallions above the first floor triple window is brittle, cracked and peeling at most locations. It appears the wrong concrete coating product may have been specified.

6. On the rear elevation there is ivy growth. Overtime ivy growth will damage and weaken mortar joints as well as wood trim around windows as the ivy tendrils grow into cracks and crevices.

Recommendations

Based on our conclusions we would make the following recommendations for both buildings:

We have presented the recommendations in two phases. The first phase we recommend to be done within the year to control further deterioration to the structural elements and to keep moisture out of the building. The second phase are recommendations that will prevent similar type of structural and moisture damage to occur again.

Under Phase 1 recommendation number 8, we recommend applying a clear penetrating masonry sealer to all masonry and concrete surfaces. There has been conflict presented from various experts indicating that masonry sealers may do harm to older masonry structures. The conflict comes from the many types of sealers used, some good for brick others that could do harm. The key is to specify a sealer that is breathable and does not trap water vapor behind the outside face of brick. If moisture gets trapped this could cause more harm because the brick will not dry out and will be subject to freeze thaw issues. We would specify a siloxane based sealer with the required water vapor permeability of 0.98 or greater (as recommended by the Brick Industry Association). This type of sealer is called a penetrant as it penetrates into the brick. Other types of sealers are film forming as they waterproof by forming a film over the brick surface (these sealers are not recommended for brick and concrete).

We must understand a sealer will not entirely waterproof the building. The sealer only helps reduce the moisture absorbed into the brick and mortar joints. Sealers will not bridge cracks or solve other leak causes such as poor sealant, poor or nonexistent flashing at window head lintels and cracks in mortar joints or brick.

There are two masonry wall systems, cavity wall systems and barrier wall systems. In a cavity wall system there is the outside brick veneer then a 2 inch air cavity. In this system any water that passes through the brick veneer will fall into the cavity and be directed back outside by flashings at windows and at wall bases. In a barrier wall system (Thatchmont Condominium buildings have a barrier wall system) there is no cavity and the multi-wythe brick wall acts as a barrier. Any water that gets through the barrier could enter into the building. For this reason I tend to recommend a breathable sealer on barrier walls to help (not completely) stop moisture penetration. If the Board and owners agree that moisture penetration through the walls has not been a big issue we could eliminate this recommendation and remove the cost from estimates. The sealer is generally reapplied every 10 years.

Phase One

Within 0 to 1 years

1. Replace all rusted lintels identified as **RL** on the attached Existing Condition plans (78 single for Thatcher Street and 26 single, 13 double and 5 triple for Egmont Street). To replace the lintel the header brick course will be removed, the inside wythe of brick will be parged, a new galvanized lintel installed, through wall head flashing installed and the brick header replaced.

2. Replace all Delaminated cast concrete sills identified as **DS** on the attached Existing Condition plans (3 single, 1 double and 2 triple for Thatcher Street and 24 single, 1 double and 1 triple for Egmont Street).

3. Replace the delaminated and cracked precast concrete lintels over the front elevation basement windows (3 at Thatcher Street and 5 at Egmont Street).

4. Repair the delaminated and cracked concrete columns and decorative elements at the front entryways (40 square feet at Thatcher Street and 175 square feet at Egmont Street). After the repairs are made mechanically removed the existing coating on the entryway concrete elements and recoat with an elastomeric concrete coating.

5. Remove all ivy from the Egmont building. Ivy areas are shown on the attached Existing Condition plans.

6. Repoint deteriorated mortar joint areas identified on the attached Existing Condition plans (4,600 square feet each building).

7. To allow moisture to drain out from the window lintel, remove the existing mortar and/or sealant from the joint between the brick header course and the window steel lintel toe at all windows on both buildings.

8. To help shed water and waterproof the brick and other concrete elements, apply a clear penetrating masonry sealer to all exterior surfaces of the brick and concrete elements.

9. Scrape and paint the exposed surfaces of the remaining existing steel lintels. Use a rust converter base coat and a zinc rich paint as a top coat.

Phase Two

Within 4 to 5 years

1. Scrape and paint the wood trim around all windows on both buildings (Some owners may choose to replace the original windows during this phase).

2. Replace the sealant in the joints between the wood window trim and the brick at the windows on all elevations at both buildings.

3. Repoint 50 percent of the area (6000 square feet) of the rear and side walls of the remaining masonry joints not repointed in Phase One.

4. Inspect all window steel lintels not replaced in Phase One. A quantity of 25 single, 5 double and 5 triple steel lintels should be assumed to need to be replaced under this phase.

5. Inspect the original precast concrete window sill not replaced in Phase 1 and replace any delaminated or spalled sills. A quantity of 10 single, 2 double and 2 triple concrete sills should be assumed to need to be replaced under this phase.

Attached to this report are two spread sheets presenting our opinion of probable costs for each of the two construction phases as described above.

If you have and questions or need additional assistance please call.

Sincerely,

DM Berg Consultants, P.C.

Thomas G. Heger P.E., LEED AP
President

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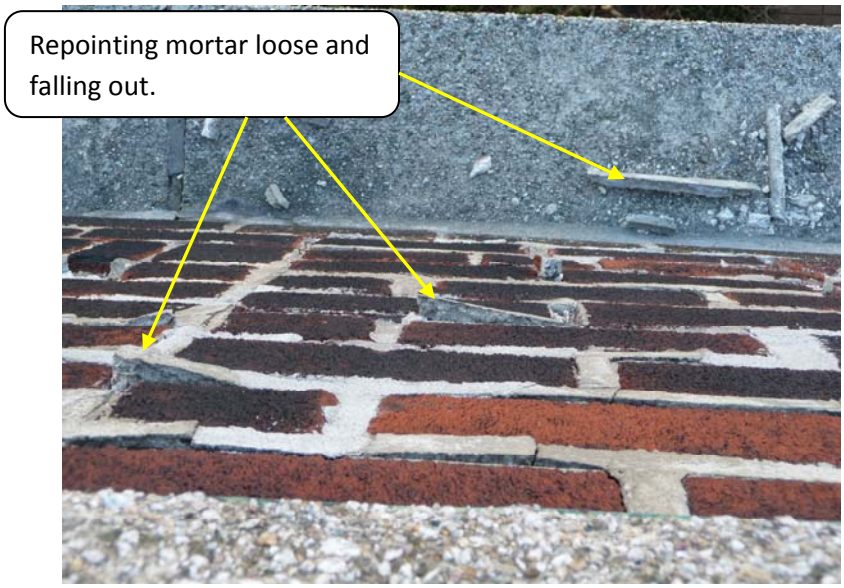
Photograph 1

Photograph 2



Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

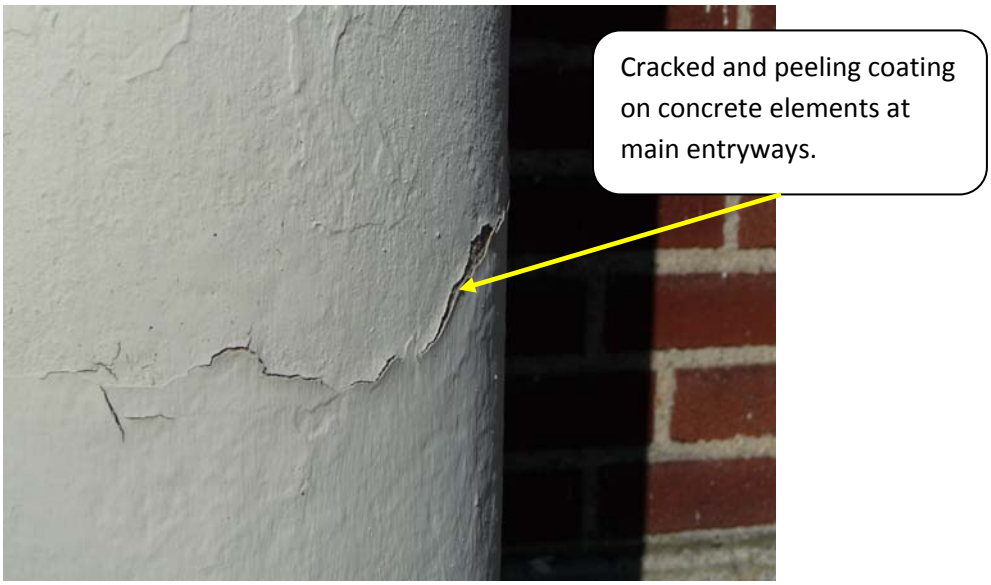
Photograph 10

Cracked and split concrete column capitals at main entryways.

Photograph 11

Photograph 12

Photograph 13



Photograph 14

Photograph 15

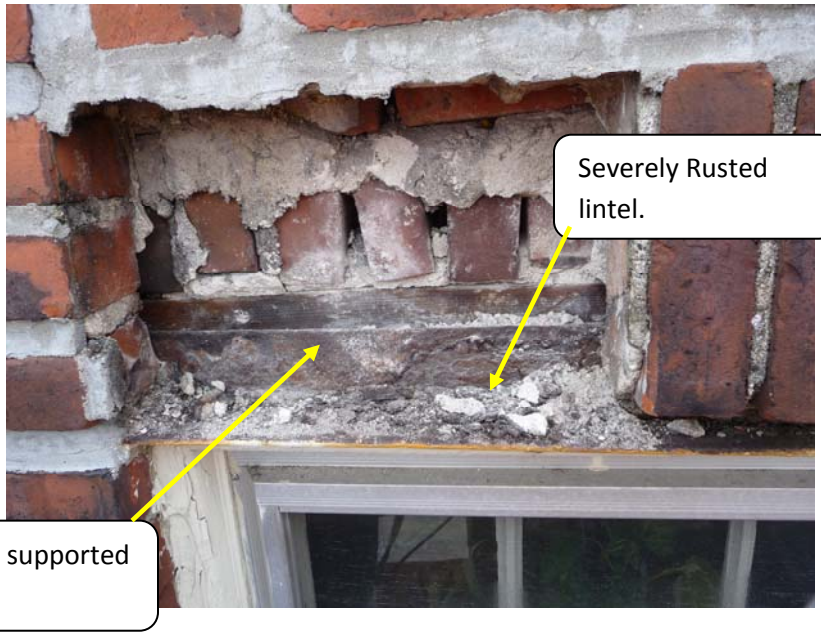
Photograph 16

Photograph 17

Photograph 18

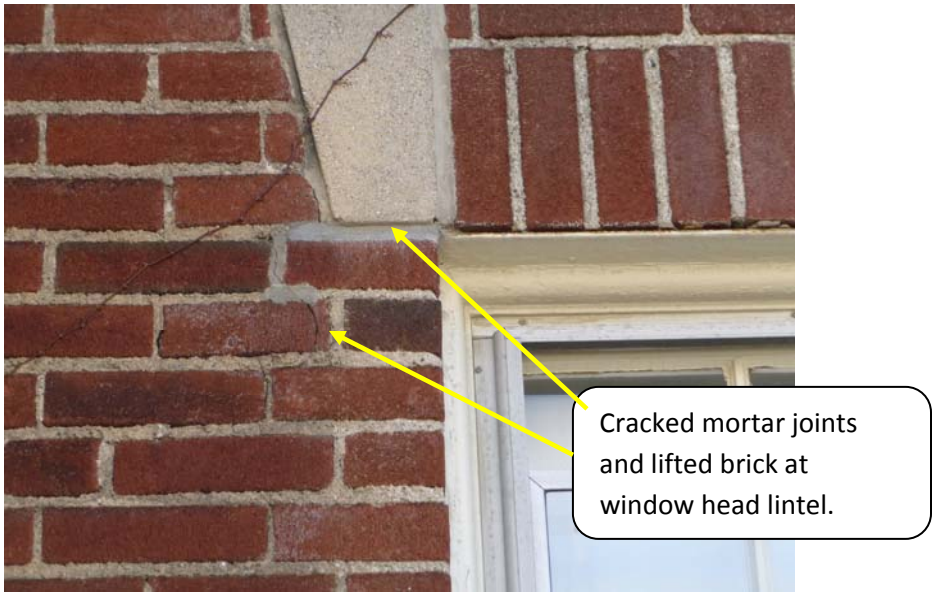
Photograph 19

Photograph 20



Photograph 21

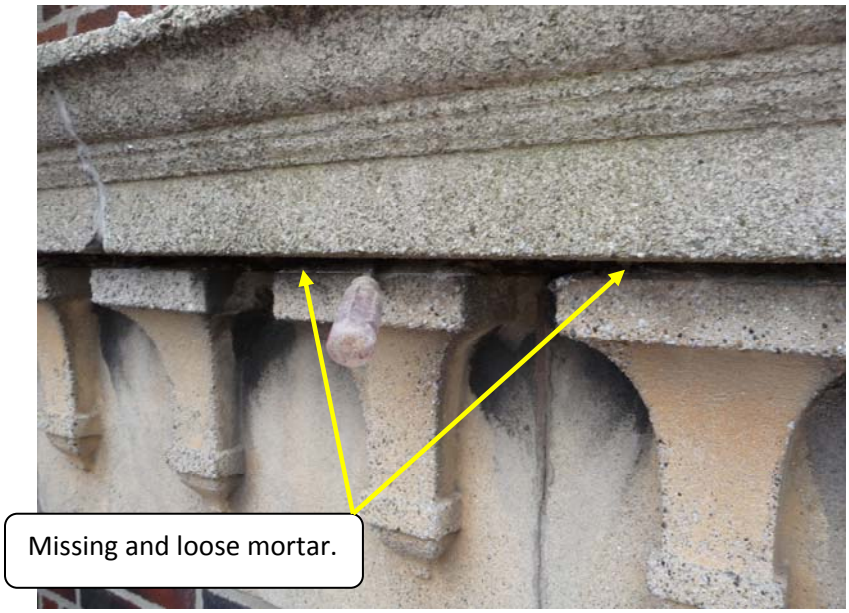
Photograph 22



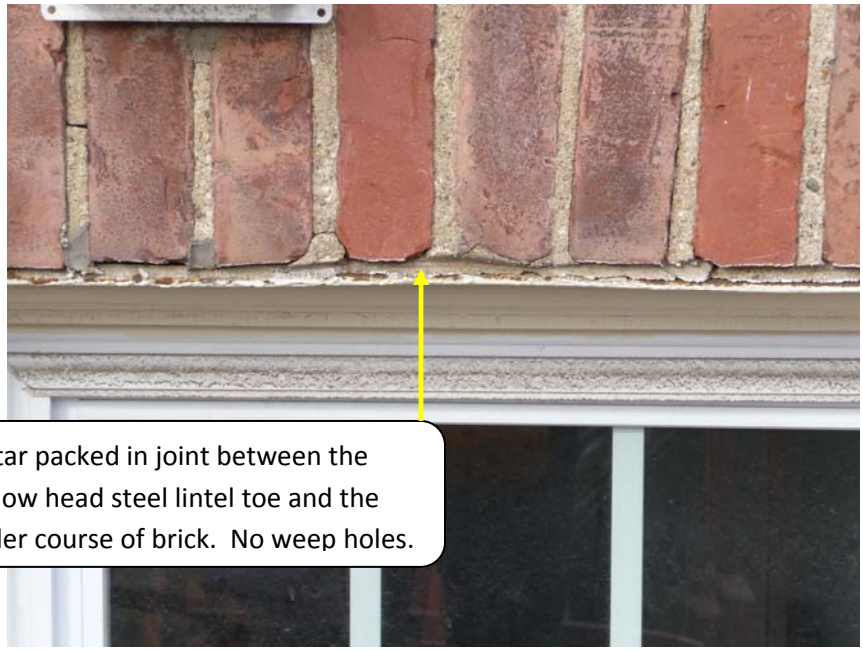
Photograph 23

Photograph 24

Photograph 25



Photograph 26



Photograph 27

PHASE 1 - FACADE REPAIRS TO THATCHMONT CONDOMINIUM COMPLEX, BROOKLINE, MA

OPINION OF PROBABLE COST BASED ON FAÇADE CONDITION SURVEY DATED 02/23/2009

FAÇADE REPAIR - PHASE 1			
ITEM(SUPPLIED AND INSTALLED)	**QUANTITY**	**UNIT COST**	**TOTAL**
Replace rusted lintels on single windows (Rpt Rec # 1)	104 each	$ 1,200 each	$124,800
Replace rusted lintels on double windows (Rpt Rec # 1)	13	$ 2,400 each	$31,200
Replace rusted lintels on triple windows (Rpt Rec # 1)	5 each	$ 3,600 each	$18,000
Replace cast concrete window sills at single windows (Rpt Rec # 2)	27 each	$ 480 each	$12,960
Replace cast concrete window sills at double windows (Rpt Rec # 2)	2 each	$ 960 each	$1,920
Replace cast concrete window sills at triple windows (Rpt Rec # 2)	2 each	$ 1,440 each	$2,880
Replace Damaged PC Concrete Lintels at Bsmt windows (Rpt Rec #3)	8 each	$ 1,800 each	$14,400
Concrete repair to Entry way concrete elements (Rpt Rec # 4)	215 S.F.	$ 240 per S.F.	$51,600
Remove Ivy for rear of Egmont Street (Rpt Rec # 5)	1 Lump Sum	$ 3,000 Lump Sum	$3,000
Repoint deteriorated Mortar Joints (Rpt Rec # 6)	9,200 S.F.	$ 26 per S.F.	$242,880
Remove sealant and mortar from lintel/brick joint (Rpt Rec # 7)	1 Lump Sum	$ 12,000 Lump Sun	$12,000
Apply clear penetrating masonry sealer (Rpt Rec # 8)	37,800 S.F.	$ 2.40 per S.F.	$90,720
Remove coating from entryway concrete elements and recoat with elastomeric coating (Rpt Rec # 9)	1 Lump Sum	$ 28,800 Lump Sun	$28,800
		Sub Total	**$ 635,160**
ENGINEERING FEES	@ 3.5 %		$22,000
CONSTRUCTION CONTINGENCY	@ 15 %		$95,274
ADMINISTRATIVE COSTS	@ 3 %		$19,055
		TOTAL =	**$771,489**

This OPCC does not include a phasing premium or any extraordinary contingency.

Any estimates or opinions of project or construction costs provided by D M Berg Consultants, P.C. are on the basis of D M Berg Consultants, P.C experience and qualifications as an engineer and represents its best judgment as an experienced and qualified engineer familiar with the construction industry. Since D M Berg Consultants, P.C has no control over the cost of labor, materials, equipment or services furnished by others or over competitive bidding or market conditions, it cannot guarantee that proposals, bids or actual project costs or constructions costs will not vary from any estimates or opinions of costs prepared by D M Berg Consultants, P.C.

PHASE 2 - FACADE REPAIRS TO THATCHMONT CONDOMINIUM COMPLEX, BROOKLINE, MA

SHEET # 1 of 1

OPINION OF PROBABLE COST BASED ON FAÇADE CONDITION SURVEY DATED 02/23/2009

FAÇADE REPAIR - PHASE 2			
ITEM(SUPPLIED AND INSTALLED)	**QUANTITY**	**UNIT COST**	**TOTAL**
Replace rusted lintels on single windows (Rpt Rec # 4)	25 each	$ 1,200 each	$30,000
Replace rusted lintels on double windows (Rpt Rec # 4)	5 each	$ 2,400 each	$12,000
Replace rusted lintels on triple windows (Rpt Rec # 4)	5 each	$ 3,600 each	$18,000
Replace cast concrete window sills at single windows (Rpt Rec # 5)	10 each	$ 480 each	$4,800
Replace cast concrete window sills at double windows (Rpt Rec # 5)	2 each	$ 960 each	$1,920
Replace cast concrete window sills at triple windows (Rpt Rec # 5)	2 each	$ 1,440 each	$2,880
Repoint Mortar Joints 50 % area of rear and sides not done under phase 1 work (Rpt Rec # 3)	6,000 S.F.	$ 26 per S.F.	$158,400
Scrape and paint wood trim around windows both bldgs (Rpt Rec # 1)	1 Lump Sum	$ 40,000 Lump Sun	$40,000
Replace sealant at window wood trim and brick joint at both bldgs (Rpt Rec # 2)	1 Lump Sum	$ 20,000 Lump Sun	$20,000
		Sub Total	**$ 288,000**
ENGINEERING FEES	@ 3.5 %		$10,080
CONSTRUCTION CONTINGENCY	@ 15 %		$43,200
ADMINISTRATIVE COSTS	@ 3 %		$8,640
		TOTAL =	**$349,920**

This OPCC does not include a phasing premium or any extraordinary contingency.

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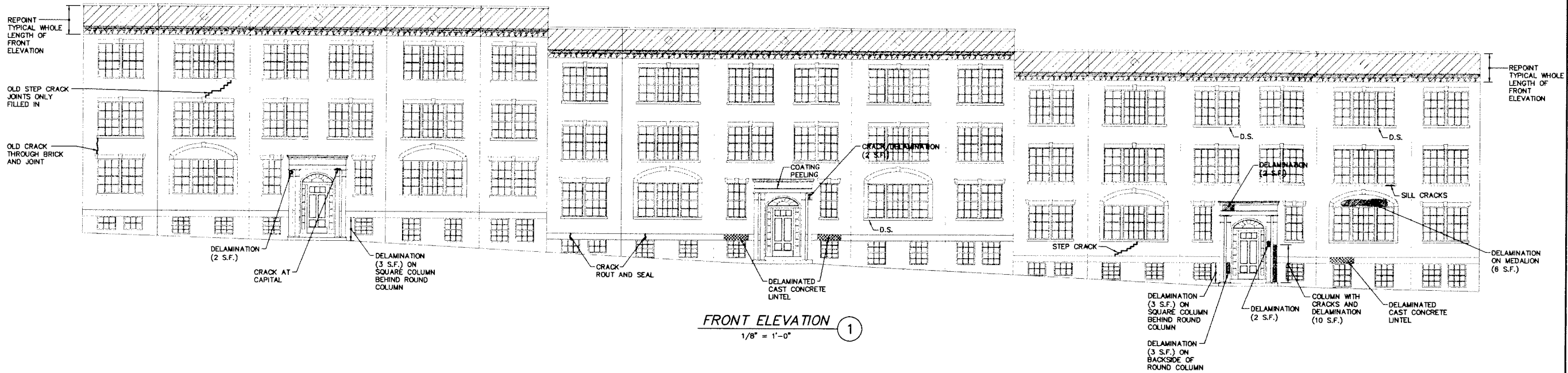
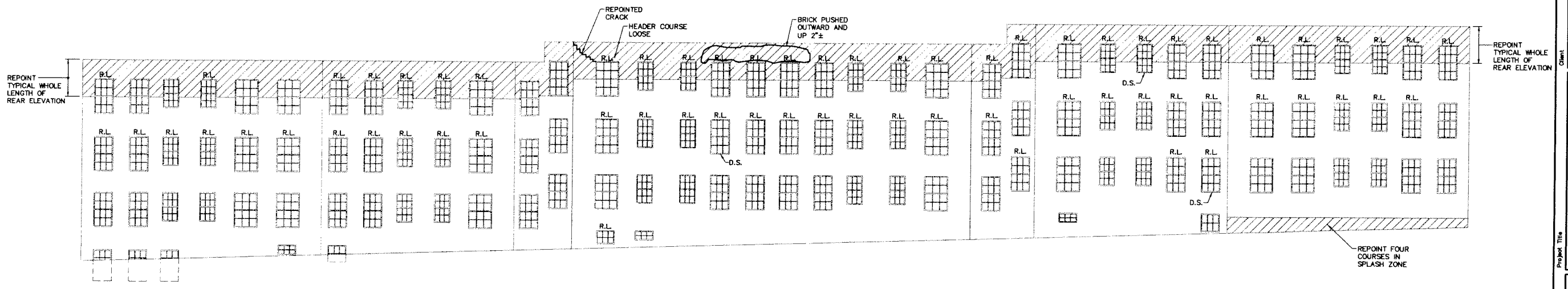


FRONT ELEVATION (1)

1/8" = 1'-0"

NOTES:

1. D.S. INDICATES DELAMINATED/CRACKED SILL.
2. R.L. INDICATES RUSTED LINTEL TO BE REPLACED.

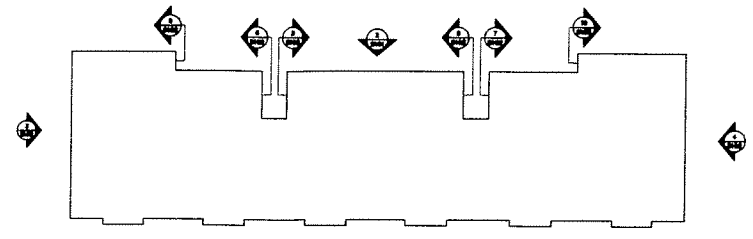


REAR ELEVATION (2)

1/8" = 1'-0"

NOTES:

1. D.S. INDICATES DELAMINATED/CRACKED SILL.
2. R.L. INDICATES RUSTED LINTEL TO BE REPLACED.



THATCHER STREET KEY PLAN

DMBC
BUILDING CONSULTANTS
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Drawing Issue History

	Issue :	Date
Revision #	Issue :	
Revision #	Issue :	
Revision #	Issue :	
Construction Set Issue :		
Owner/Bid Revision Issue :		
Bid Set Issue :		
Building Permit Issue :		03/09/09
Report Issue :		

Client: THATCHMONT CONDOMINIUMS

Project Title: 15-25 THATCHER ST. BROOKLINE, MA

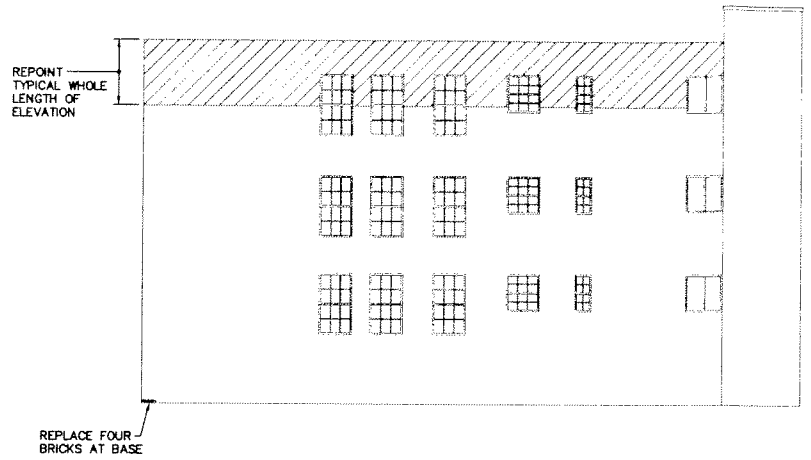
Drawing Title: EXTERIOR WALL ELEVATIONS

Preparation

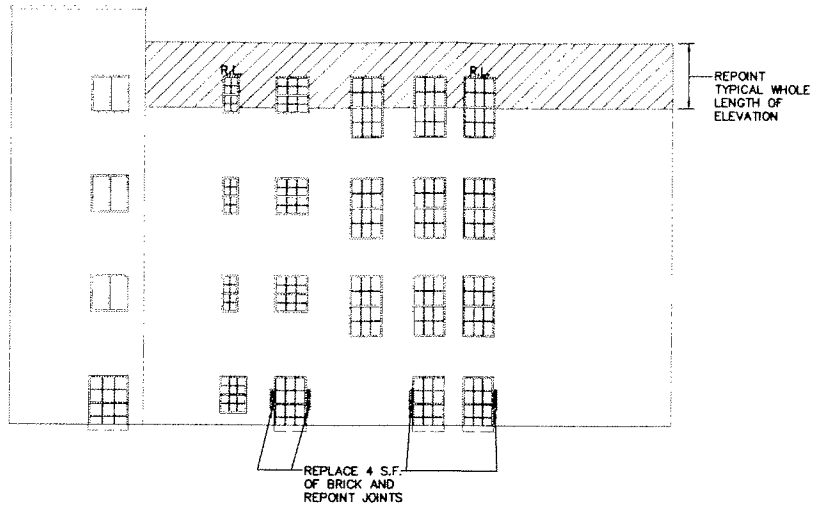
Approved By:	
Checked By:	
Drawn By:	
Scale:	1/8" = 1'-0"

Sheet No.: EC-1

DMBC JOB NO.: 09010



LEFT SIDE ELEVATION (3)
1/8" = 1'-0"



RIGHT SIDE ELEVATION (4)
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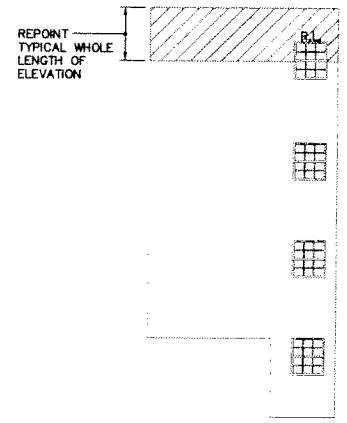
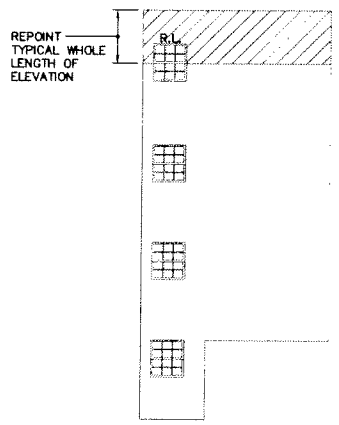
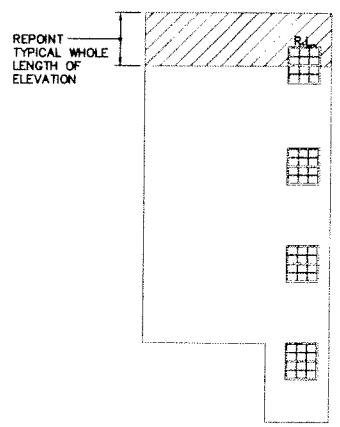


REAR ENTRY ELEVATION (5)
1/8" = 1'-0"



REAR ENTRY ELEVATION (6)
1/8" = 1'-0"



REAR ENTRY ELEVATION (7)
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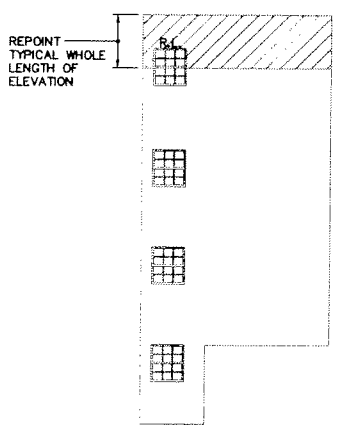


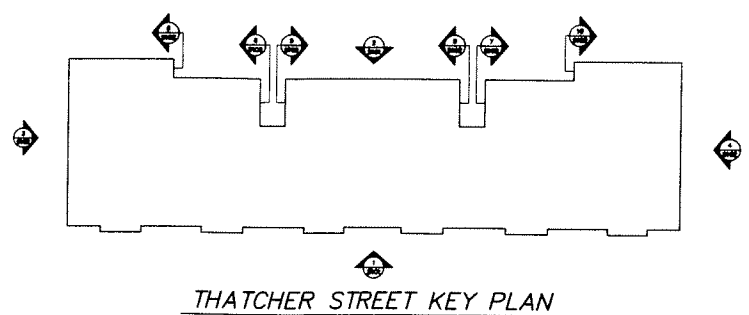
REAR ENTRY ELEVATION (8)
1/8" = 1'-0"

ELEVATION (9)
1/8" = 1'-0"

ELEVATION (10)
1/8" = 1'-0"

NOTES:

1. D.S. INDICATES DELAMINATED/CRACKED SILL.
2. R.L. INDICATES RUSTED LINTEL TO BE REPLACED.



THATCHER STREET KEY PLAN

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Drawing Issue History — Date

Revision #	Issue :	
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Construction Set Issue :		
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Bid Set Issue :		
Building Permit Issue :		03/06/09
Report Issue :		

Client

Project Title

THATCHMONT CONDOMINIUMS

15-25 THATCHER ST. BROOKLINE, MA

Drawing Title

EXTERIOR WALL ELEVATIONS

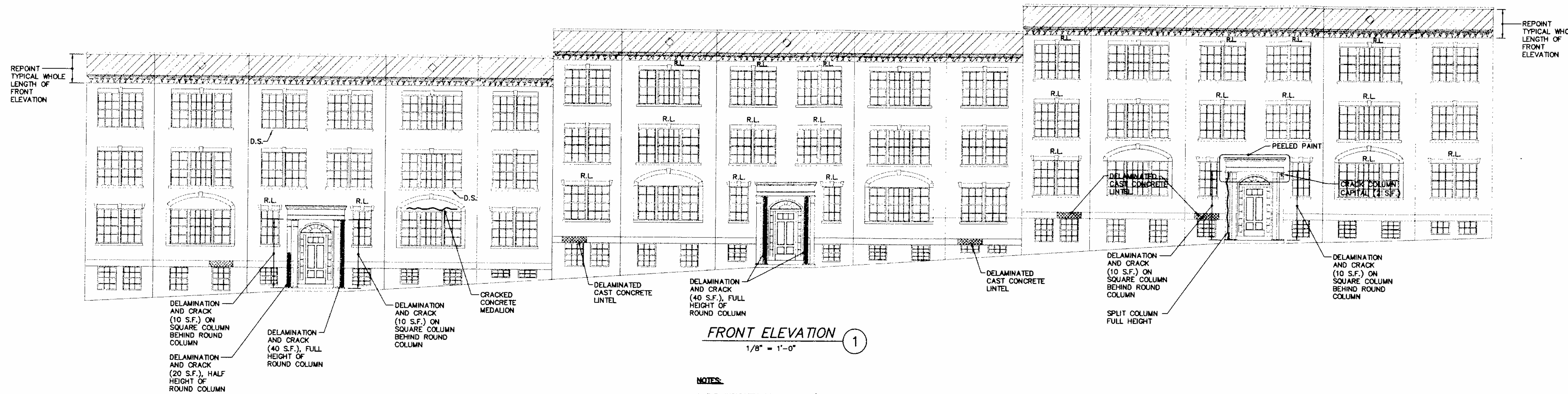
Preparation

Approved By:	
Checked By:	
Drawn By:	
Scale:	1/8" = 1'-0"

Sheet No.

EC-2

DMBC JOB NO.: 09010

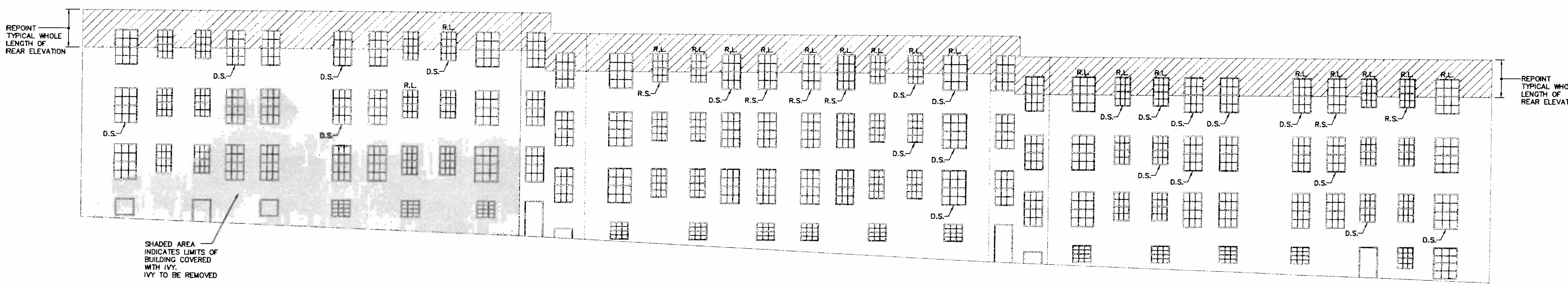


FRONT ELEVATION (1)

1/8" = 1'-0"

NOTES:

1. D.S. INDICATES DELAMINATED/CRACKED SILL.
2. R.L. INDICATES RUSTED LINTEL TO BE REPLACED.
3. R.S. INDICATES PREVIOUSLY REPLACED SILL.



REAR ELEVATION (2)

1/8" = 1'-0"

NOTES:

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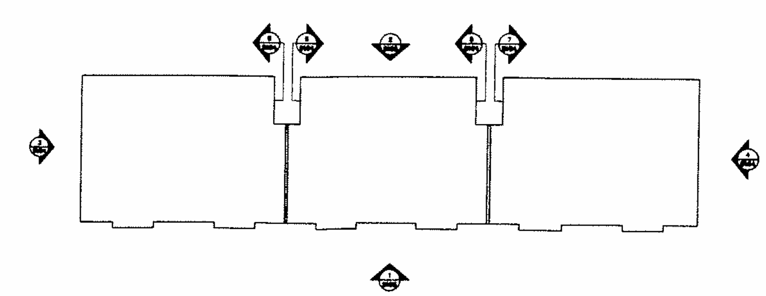

EGMONT STREET KEY PLAN

DMBC STRUCTURAL ENGINEERS
DM BERG CONSULTANTS, P.C.
SERVING THE INDUSTRY SINCE 1963
570 HILLSIDE AVENUE
NEEDHAM, MASSACHUSETTS 02494-1297
P 781.444.5156 F 781.444.3157
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Professional Seal

Drawing Issue History	Dates
Revision # Issue :	
Revision # Issue :	
Revision # Issue :	
Revision # Issue :	
Construction Set Issue :	
Owner/Bid Revision Issue :	
Bid Set Issue :	
Building Permit Issue :	
Report Issue :	03/05/09

Client: THATCHMONT CONDOMINIUMS

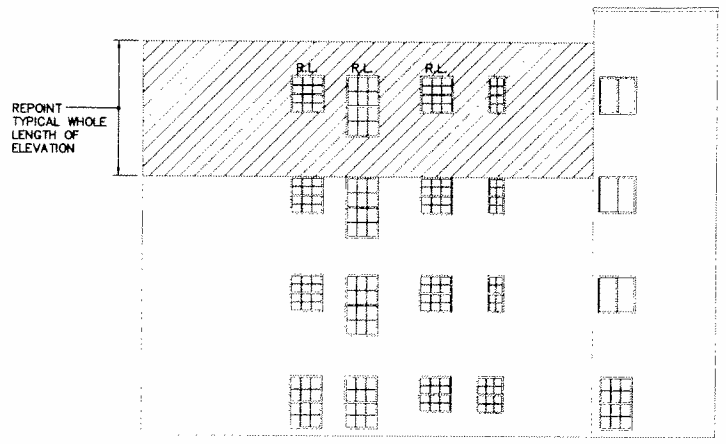
Project Title: 14-26 EGMONT ST. BROOKLINE, MA

Drawing Title: EXTERIOR WALL ELEVATIONS

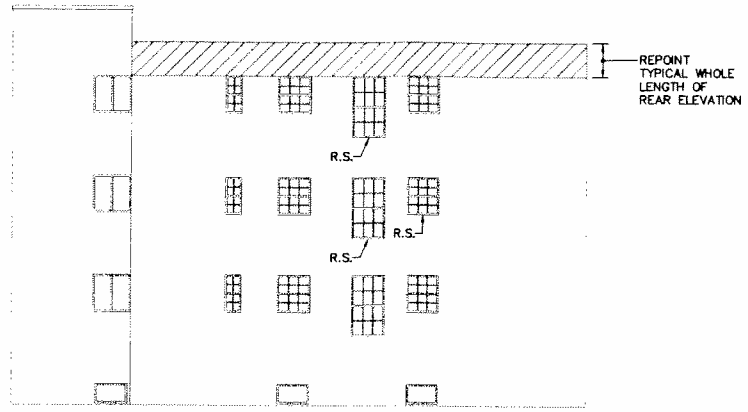
Preparation	
Approved By:	
Checked By:	
Drawn By:	
Scale:	1/8" = 1'-0"

Sheet No. EC-3

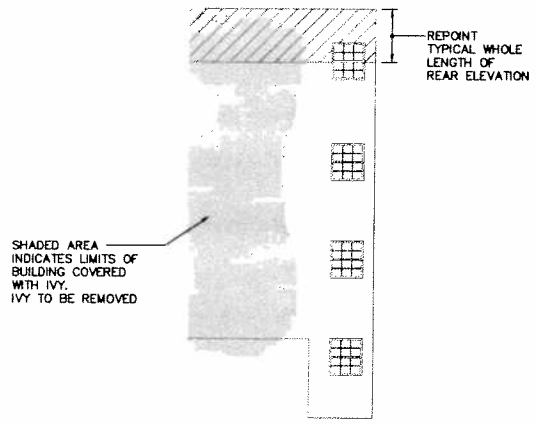
DMBC JOB NO.: 09010



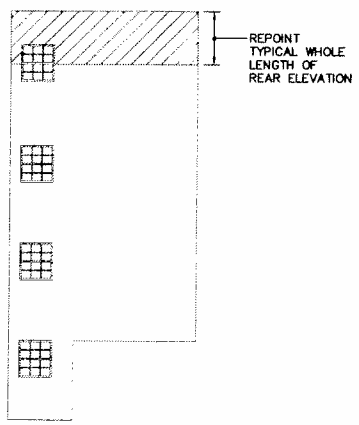
LEFT SIDE ELEVATION (3)
1/8" = 1'-0"



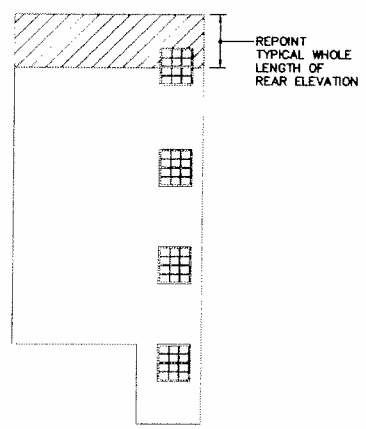
RIGHT SIDE ELEVATION (4)
1/8" = 1'-0"



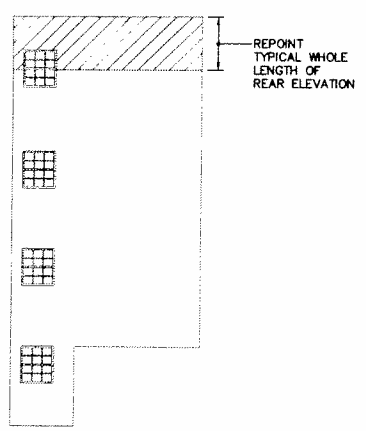
REAR ENTRY ELEVATION (5)
1/8" = 1'-0"



REAR ENTRY ELEVATION (6)
1/8" = 1'-0"



REAR ENTRY ELEVATION (7)
1/8" = 1'-0"



REAR ENTRY ELEVATION (8)
1/8" = 1'-0"

NOTES:

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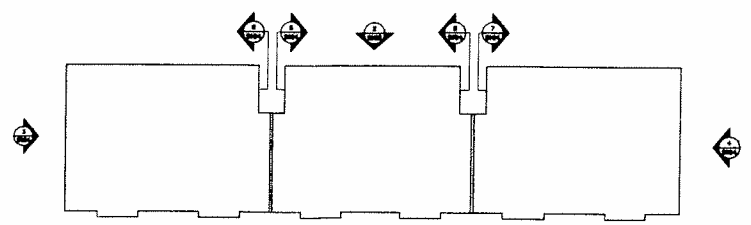

EGMONT STREET KEY PLAN

DMBC
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Drawing Issue History

Revision # Issue :	
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Bid Set Issue :	
Building Permit Issue :	03/05/09
Report Issue :	

Client

Project Title

14-26 EGMONT ST.
BROOKLINE, MA

Drawing Title

EXTERIOR WALL
ELEVATIONS

Preparation

Approved By:	
Checked By:	
Drawn By:	
Scale:	1/8" = 1'-0"

Sheet No.

EC-4

DMBC JOB NO.: 09010