



April 3, 2013

New York City Office of Environmental Remediation  
City Brownfield Cleanup Program  
c/o Shaminder Chawla  
100 Gold Street, 2<sup>nd</sup> Floor  
New York, NY 10038

**Re: 13CVCP111Q  
30-40 21<sup>st</sup> Street  
Remedial Action Work Plan (RAWP) Stipulation List**

Dear Mr. Chawla:

Athenica Environmental Services, Inc. hereby submits a Remedial Action Work Plan (RAWP) Stipulation List for the subject site to the New York City Office of Environmental Remediation (NYCOER) on behalf of 87-87, LLC. This letter serves as an addendum to the RAWP to stipulate additional content, requirements and procedures that will be followed during the site remediation. The contents of this list are added to the RAWP and will supersede the content in said document where there is a conflict in purpose or intent. The additional requirements/procedures include the following:

### **Stipulation List**

1. The criterion attached in Addendum 1 will be utilized if petroleum containing tank or vessel is identified during the remedial action or subsequent redevelopment excavation activities. All petroleum spills will be reported to the NYSDEC hotline as required by applicable laws and regulations. This contingency plan is designed for heating oil tanks and other small or moderately sized storage vessels. If larger tanks, such as gasoline storage tanks are identified, OER will be notified before this criterion is utilized.
2. In the event that hazardous waste is identified during the remedial action or subsequent redevelopment excavation activities at this NYC VCP project, and removal and transportation of hazardous waste becomes necessary, the project may be subject to the New York State Department

of Environmental Conservation's Special Assessment Tax (ECL 27-0923) and Hazardous Waste Regulatory Fees (ECL 72-00402). See DEC's website for more information:

<http://www.dec.ny.gov/chemical/9099.html>.

3. Collection and analysis of end-point samples will be conducted to evaluate the performance of the remedy with respect to attainment of Track 1 SCOs. To evaluate attainment of Track 1 SCOs throughout the site, 5 base samples will be collected. Each sample will be analyzed for SVOCs and TAL Metals. A map indicating post-remedial End-Point Sampling Locations is attached as Addendum 2.
4. The proposed vapor barrier systems will consist of the following, all manufactured by W. R. Grace & Co.:

*Where foundation wall is against adjacent foundation wall/underpinning (blind pour)*

Preprufe® 300R 46-mil Membrane will be installed beneath the building floor, which serves as the building footing, and Preprufe® 160R 32-mil Membrane will be installed along the exterior foundation walls to prevent infiltration of vapor into the structure. The vapor barrier will be installed over a 3-inch mud slab. Preprufe® Tape (a self-adhesive 4-inch-wide strip) will be used to cover all penetrations. Vertical and horizontal overlaps in succeeding sheets will be 3 inches. All roll ends and cut edges will overlap a minimum of 3 inches and Preprufe® Tape will be applied centered over the lap edges. Overlaps of horizontal and vertical membranes at corners and construction joints, mechanical fastening of overlaps and ancillary products will be in accordance with the manufacturer installation diagrams and specifications.

*Where foundation wall is formed on both sides*

Preprufe® 300R 46-mil Membrane will be installed beneath the building floor, which serves as the building footing, and Bituthene® 3000 62-mil Membrane will be installed along the exterior foundation walls to prevent infiltration of vapor into the structure. The vapor barrier will be installed over a 3-inch mud slab. Bituthene Liquid Membrane® 0.1-inch-thick will be applied around all penetrations. Horizontal overlaps in succeeding Preprufe® 300R sheets will be 3 inches. All Preprufe® 300R roll ends and cut edges will overlap a minimum of 3 inches and Preprufe® Tape will be applied centered over the lap edges. Vertical overlaps in Bituthene® 3000 will be 2 inches minimum. Overlaps of horizontal and vertical membranes at corners and construction joints, mechanical fastening of overlaps and ancillary products will be in accordance with the manufacturer installation diagrams and specifications.

- The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. Installation locations and details of the vapor barrier beneath the floor slab and along the exterior foundation walls, manufacturer's specifications and installation diagrams and site-specific compatibility letter for the proposed vapor barrier products are attached as Addendum 3.
5. A pre-approval letter from all disposal facilities will be provided to OER prior to any soil/fill material removal from the site. Documentation specified in the RAWP - Appendix 4 - Section 1.6 "Materials Disposal Off-Site" will be provided to OER. If a different disposal facility for the soil/fill material is selected, OER will be notified immediately.
  6. Approval for the import of material for backfilling purposes must be received from OER prior to the commencement of such activities. Documentation illustrating that the requisitioned import material has been properly segregated, stockpiled, and tested (when needed) prior to its release from the generating site, and by extension prior to its arrival to the import site, will be required. Blended recycled concrete aggregate (bRCA) is not an acceptable material for import.
  7. A CD containing the final RAWP including this approved Stipulation List will be placed in the library that constitutes the primary public repository for project documents.
  8. Signage for the project will include a sturdy placard mounted in a publically accessible right of way to building and other permits signage will consist of the NYC VCP Information Sheet (attached Addendum 4) announcing the remedial action. The Information sheet will be laminated and permanently affixed to the placard.

Sincerely,



Nahum Kedem, PG  
Athenica Environmental Services, Inc.

cc: J.Pati – jpati@dep.nyc.gov, S. Chawla – ShaminderC@dep.nyc.gov

**Addendum 1**  
**Generic Procedures for Management of Underground Storage Tanks**  
**Identified under the NYC VCP**

Prior to Tank removal, the following procedures should be followed:

- Remove all fluid to its lowest draw-off point.
- Drain and flush piping into the tank.
- Vacuum out the “tank bottom” consisting of water product and sludge.
- Dig down to the top of the tank and expose the upper half.
- Remove the fill tube and disconnect the fill, gauge, product, vent lines and pumps. Cap and plug open ends of lines.
- Temporarily plug all tank openings, complete the excavation, remove the tank and place it in a secure location.
- Render the tank safe and check the tank atmosphere to ensure that petroleum vapors have been satisfactorily purged from the tank.
- Clean tank or remove to storage yard for cleaning.
- If the tank is to be moved, it must be transported by licensed waste transporter. Plug and cap all holes prior to transport leaving a 1/8 inch vent hole located at the top of the tank during transport.
- After cleaning, the tank must be made acceptable for disposal at a scrap yard, cleaning the tanks interior with a high pressure rinse and cutting the tank in several pieces.

During the tank and pipe line removal, the following field observations should be made and recorded:

- A description and photographic documentation of the tank and pipe line condition (pitting, holes, staining, leak points, evidence of repairs, etc.).
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with a calibrated photoionization detector (PID).

Impacted Soil Excavation Methods

The excavation of the impacted soil will be performed following the removal of the existing tanks. Soil excavation will be performed in accordance with the procedures described under Section 5.5 of Draft DER-10 as follows:

- A description and photographic documentation of the excavation.
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with calibrated photoionization detector (PID).

Final excavation depth, length, and width will be determined in the field, and will depend on the horizontal and vertical extent of contaminated soils as indentified through physical examination (PID response, odor, staining, etc.). Collection of

verification samples will be performed to evaluate the success of the removal action as specified in this document.

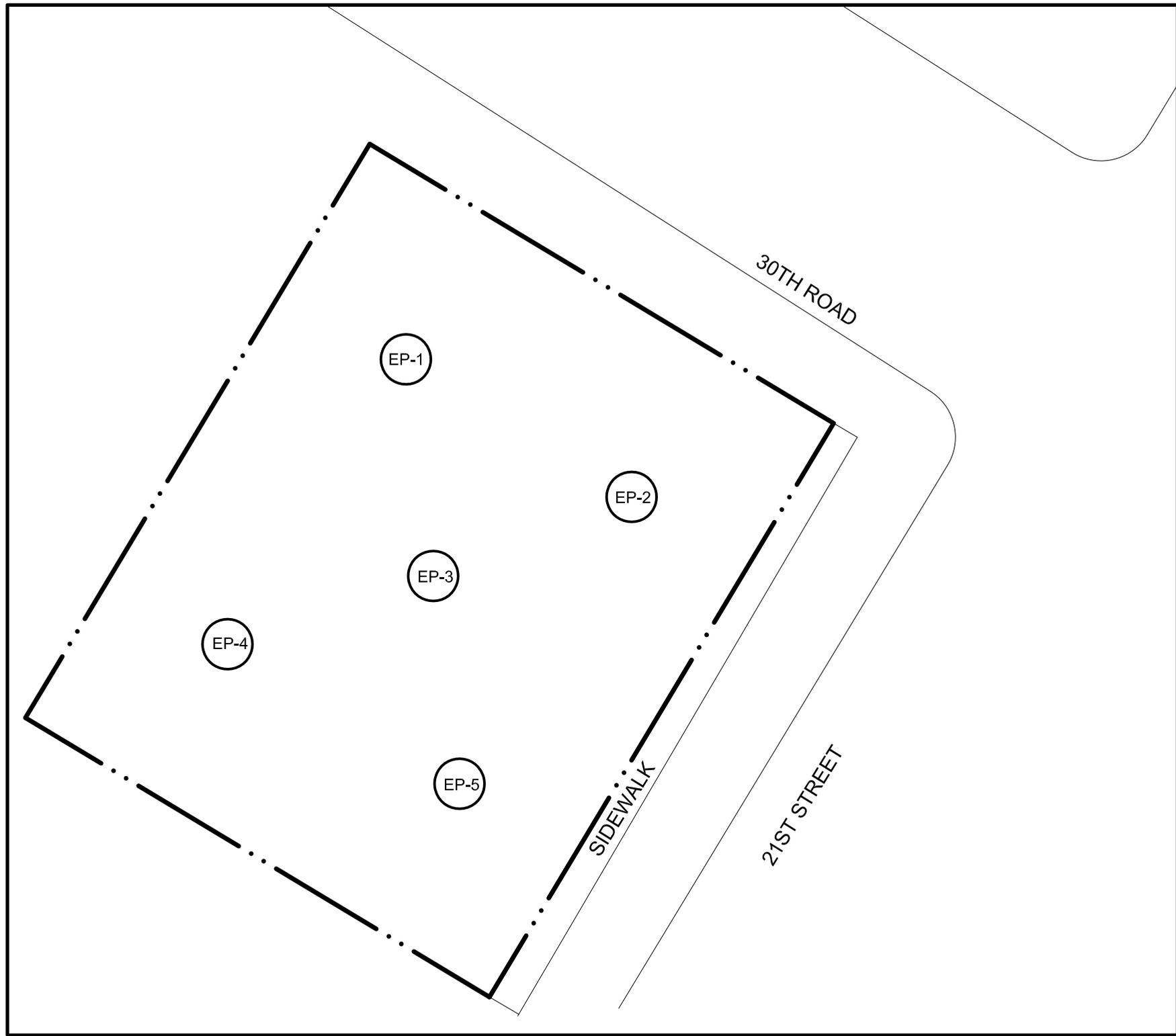
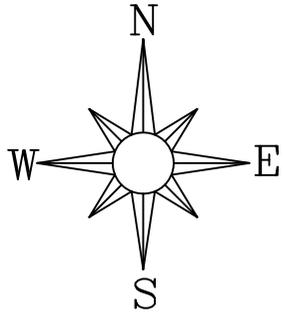
The following procedure will be used for the excavation of impacted soil (as necessary and appropriate):

- Wear appropriate health and safety equipment as outlined in the Health and Safety Plan.
- Prior to excavation, ensure that the area is clear of utility lines or other obstructions. Lay plastic sheeting on the ground next to the area to be excavated.
- Using a rubber-tired backhoe or track mounted excavator, remove overburden soils and stockpile, or dispose of, separate from the impacted soil.
- If additional UST's are discovered, the NYSDEC will be notified and the best course of action to remove the structure should be determined in the field. This may involve the continued trenching around the perimeter to minimize its disturbance.
- If physically contaminated soil is present (e.g., staining, odors, sheen, PID response, etc.) an attempt will be made to remove it, to the extent not limited by the site boundaries or the bedrock surface. If possible, physically impacted soil will be removed using the backhoe or excavator, segregated from clean soils and overburden, and staged on separated dedicated plastic sheeting or live loaded into trucks from the disposal facility. Removal of the impacted soils will continue until visibly clean material is encountered and monitoring instruments indicate that no contaminants are present.
- Excavated soils which are temporarily stockpiled on-site will be covered with tarp material while disposal options are determined. Tarp will be checked on a daily basis and replaced, repaired or adjusted as needed to provide full coverage. The sheeting will be shaped and secured in such a manner as to drain runoff and direct it toward the interior of the property.

Once the site representative and regulatory personnel are satisfied with the removal effort, verification of confirmatory samples will be collected from the excavation in accordance with DER-10.

**Addendum 2**

Revised End-Point Sampling Locations Plan (See attached)



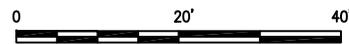
**Legend:**

 PROPERTY BOUNDARY



REVISED END-POINT SAMPLING LOCATION AND DESIGNATION NUMBER

**Scale:**



**ATHENICA  
ENVIRONMENTAL  
SERVICES, INC.**  
Environmental Consultants

Drawn by: SHANA HOLBERTON

Checked by: NAHUM KEDEM

Drawing Scale: AS NOTED

Project No: 12-0656

Date: MARCH 8, 2013

Sheet in contract: 1

**Site Plan:** REMEDIAL ACTION WORK PLAN  
30-40 21ST STREET  
QUEENS, NEW YORK

**Figure:** FIGURE 6  
**Title:** REVISED END-POINT SAMPLING  
LOCATIONS-STIPULATION ADDENDUM

### **Addendum 3**

Vapor Barrier Details, Manufacturer's Specifications, Installation Diagrams and  
Compatibility Letter (See attached)

## PREPRUFE® 300R & 160R

Pre-applied waterproofing membranes that bond integrally to poured concrete for use below slabs or behind basement walls on confined sites

### Description

Preprufe® 300R & 160R membranes are unique composite sheets comprising a thick HDPE film, an aggressive pressure sensitive adhesive and a weather resistant protective coating.

Unlike conventional non-adhering membranes, which are vulnerable to water ingress tracking between the unbonded membrane and structure, the unique Preprufe bond to concrete prevents ingress or migration of water around the structure.

The Preprufe R System includes:

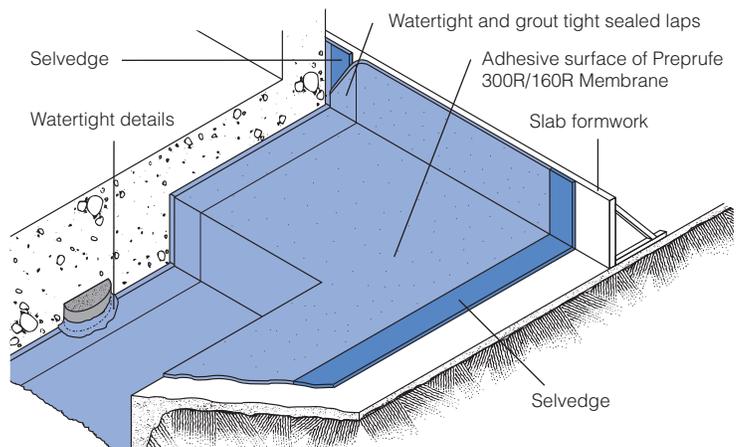
- **Preprufe 300R**—heavy-duty grade for use below slabs and on rafts (i.e. mud slabs). Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe 160R**—thinner grade for blindside, zero property line applications against soil retention systems.
- **Preprufe Tape LT**—for covering cut edges, roll ends, penetrations and detailing (temperatures between 25°F (-4°C) and 86°F (+30°C)).
- **Preprufe Tape HC**—as above for use in Hot Climates (minimum 50°F (10°C)).
- **Bituthene® Liquid Membrane**—for sealing around penetrations, etc.
- **Adcor™ ES**—waterstop for joints in concrete walls and floors
- **Preprufe Tieback Covers**—preformed cover for soil retention wall tieback heads
- **Preprufe Preformed Corners**—preformed inside and outside corners

Preprufe 300R & 160R membranes are applied either horizontally to smooth prepared concrete, carton forms or well rolled and compacted earth or crushed stone substrate; or vertically to permanent formwork or adjoining structures. Concrete is then cast directly against the adhesive side of the membranes. The specially developed Preprufe adhesive layers work together to form a continuous and integral seal to the structure.

Preprufe can be returned up the inside face of slab formwork but is not recommended for conventional twin-sided formwork on walls, etc. Use Bituthene self-adhesive membrane or Procor® fluid applied membrane to walls after removal of formwork for a fully bonded system to all structural surfaces.

### Advantages

- **Forms a unique continuous adhesive bond to concrete poured against it**—prevents water migration and makes it unaffected by ground settlement beneath slabs
- **Fully-adhered watertight laps** and detailing
- **Provides a barrier to water, moisture and gas**—physically isolates the structure from the surrounding ground
- **BBA Certified** for basement Grades 2, 3, & 4 to BS 8102:1990
- **Zero permeance** to moisture
- **Solar reflective**—reduced temperature gain
- **Simple and quick to install**—requiring no priming or fillets
- **Can be applied to permanent formwork**—allows maximum use of confined sites
- **Self protecting**—can be trafficked immediately after application and ready for immediate placing of reinforcement
- **Unaffected by wet conditions**—cannot activate prematurely
- **Inherently waterproof, non-reactive system:**
  - not reliant on confining pressures or hydration
  - unaffected by freeze/thaw, wet/dry cycling
- **Chemical resistant**—effective in most types of soils and waters, protects structure from salt or sulphate attack



Drawings are for illustration purposes only. Please refer to [graceconstruction.com](http://graceconstruction.com) for specific application details.

## Installation

The most current application instructions, detail drawings and technical letters can be viewed at [graceconstruction.com](http://graceconstruction.com). For other technical information contact your local Grace representative.

Preprufe 300R & 160R membranes are supplied in rolls 4 ft (1.2 m) wide, with a selvedge on one side to provide self-adhered laps for continuity between rolls. The rolls of Preprufe Membrane and Preprufe Tape are interwound with a disposable plastic release liner which must be removed before placing reinforcement and concrete.

### Substrate Preparation

**All surfaces**—It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability (see Figure 1).

**Horizontal**—The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.

**Vertical**—Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment.

### Membrane Installation

Preprufe can be applied at temperatures of 25°F (-4°C) or above. When installing Preprufe in cold or marginal weather conditions 55°F (<13°C) the use of Preprufe Tape LT is recommended at all laps and detailing. Preprufe Tape LT should be applied to clean, dry surfaces and the release liner must be removed immediately after application. Alternatively, Preprufe Low Temperature (LT) is available for low temperature condition applications. Refer to Preprufe LT data sheet for more information.

**Horizontal substrates**—Place the membrane HDPE film side to the substrate with the clear plastic release liner facing towards the concrete pour. End laps should be staggered to avoid a build up of layers. Leave plastic release liner in position until overlap procedure is completed (see Figure 2).

Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear.

Refer to Grace Tech Letter 15 for information on suitable rebar chairs for Preprufe.

**Vertical substrates**—Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the clear plastic release liner facing towards the concrete pour. The membrane may be installed in any convenient length. Fastening can be made through the selvedge using a small and low profile head fastener so that the membrane lays flat and allows firmly rolled overlaps. Immediately remove the plastic release liner.

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to

overlap. Roll firmly to ensure a watertight seal.

**Roll ends and cut edges**—Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. Allow to dry and apply Preprufe Tape LT (or HC in hot climates) centered over the lap edges and roll firmly (see Figure 3). Immediately remove printed plastic release liner from the tape.

### Details

Refer to Preprufe Field Application Manual, Section V Application Instructions or visit [graceconstruction.com](http://graceconstruction.com). This manual gives comprehensive guidance and standard details.

### Membrane Repair

Inspect the membrane before installation of reinforcement steel, formwork and final placement of concrete. The membrane can be easily cleaned by power washing if required. Repair damage by wiping the area with a damp cloth to ensure the area is clean and free from dust, and allow to dry. Repair small punctures (0.5 in. (12 mm) or less) and slices by applying Preprufe Tape centered over the damaged area and roll firmly. Remove the release liner from the tape. Repair holes and large punctures by applying a patch of Preprufe membrane, which extends 6 in. (150 mm) beyond the damaged area. Seal all edges of the patch with Preprufe Tape, remove the release liner from the tape and roll firmly. Any areas of damaged adhesive should be covered with Preprufe Tape. Remove printed plastic release liner from tape. Where exposed selvedge has lost adhesion or laps have not been sealed, ensure the area is clean and dry and cover with fresh Preprufe Tape, rolling firmly. Alternatively, use a hot air gun or similar to activate adhesive and firmly roll lap to achieve continuity.

### Pouring of Concrete

Ensure the plastic release liner is removed from all areas of Preprufe membrane and tape.

It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane. Following proper ACI guidelines, concrete must be placed carefully and consolidated properly to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

### Removal of Formwork

Preprufe membranes can be applied to removable formwork, such as slab perimeters, elevator and lift pits, etc. Once the concrete is poured the formwork must remain in place until the concrete has gained sufficient compressive strength to develop the surface bond. Preprufe membranes are not recommended for conventional twin-sided wall forming systems.

A minimum concrete compressive strength of 1500 psi (10 N/mm<sup>2</sup>) is recommended prior to stripping formwork supporting Preprufe membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete.

Refer to Grace Tech Letter 17 for information on removal of formwork for Preprufe.

Figure 1

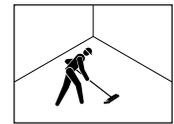


Figure 2

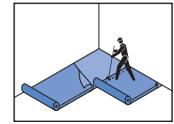
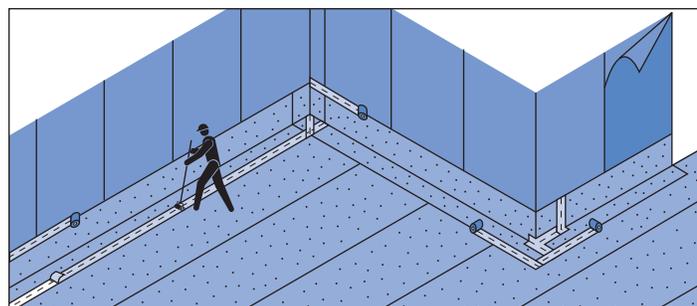
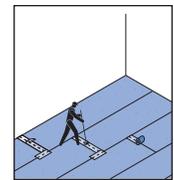


Figure 3

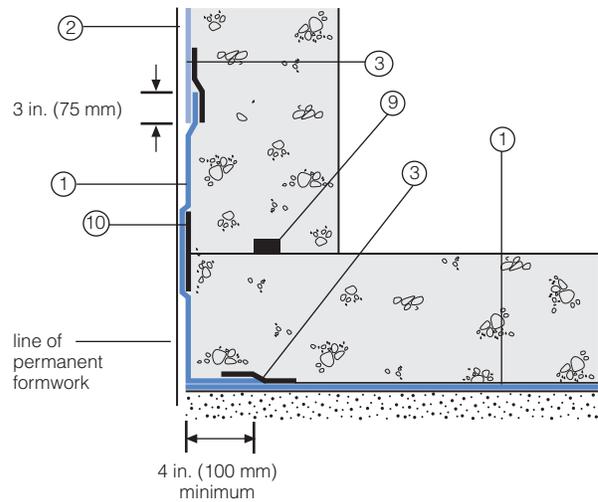


## Detail Drawings

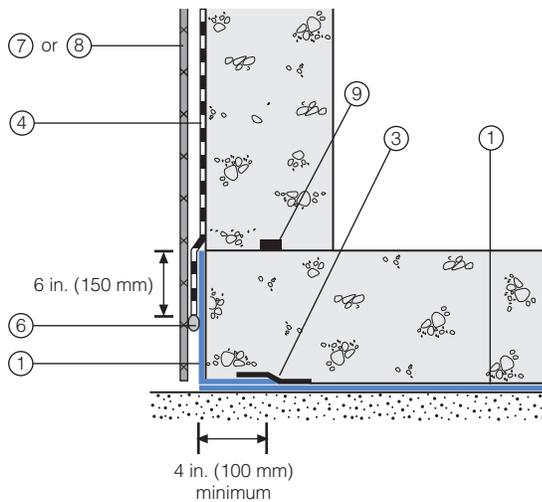
Details shown are typical illustrations and not working details. For a list of the most current details, visit us at [graceconstruction.com](http://graceconstruction.com).

For technical assistance with detailing and problem solving please call toll free at 866-333-3SBM (3726).

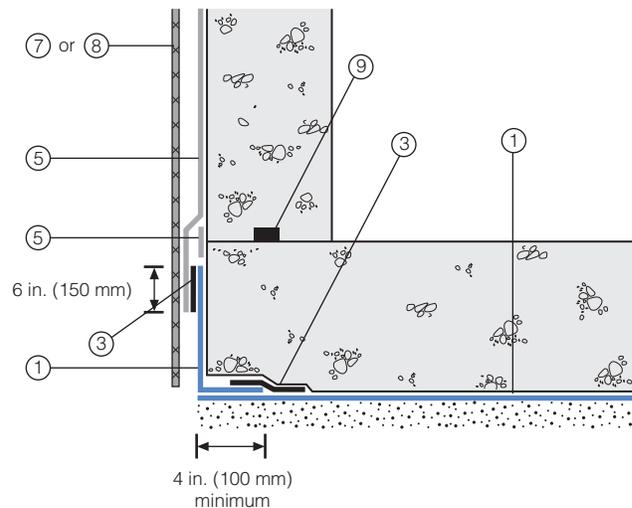
### Wall base detail against permanent shutter



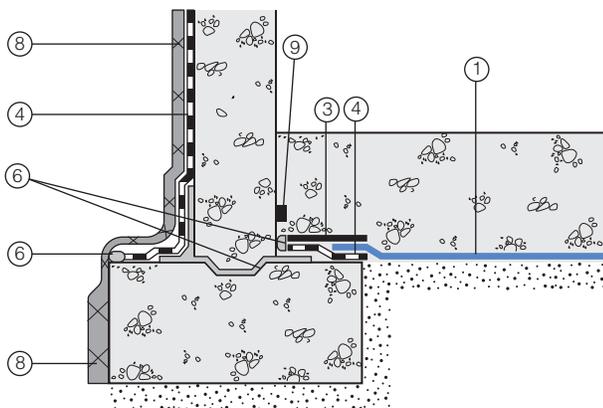
### Bituthene wall base detail (Option 1)



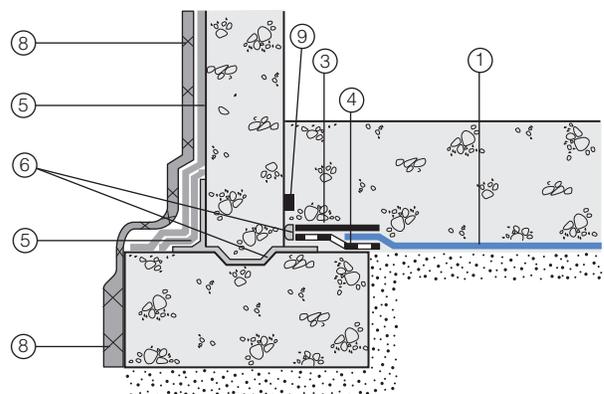
### Procor wall base detail (Option 1)



### Bituthene wall base detail (Option 2)



### Procor wall base detail (Option 2)



- 1 Preprufe 300R
- 2 Preprufe 160R
- 3 Preprufe Tape
- 4 Bituthene

- 5 Procor
- 6 Bituthene Liquid Membrane
- 7 Protection

- 8 Hydroduct®
- 9 Adcor ES
- 10 Preprufe CJ Tape

## Supply

Dimensions (Nominal)	Preprufe 300R Membrane	Preprufe 160R Membrane	Preprufe Tape (LT or HC*)
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	
Roll size	4 ft x 98 ft (1.2 m x 30 m)	4 ft x 115 ft (1.2 m x 35 m)	4 in. x 49 ft (100 mm x 15 m)
Roll area	392 ft <sup>2</sup> (36 m <sup>2</sup> )	460 ft <sup>2</sup> (42 m <sup>2</sup> )	
Roll weight	108 lbs (50 kg)	92 lbs (42 kg)	4.3 lbs (2 kg)
Minimum side/end laps	3 in. (75 mm)	3 in. (75 mm)	3 in. (75 mm)
* LT denotes Low Temperature (between 25°F (-4°C) and 86°F (+30°C)) HC denotes Hot Climate (50°F (>+10°C))			
<b>Ancillary Products</b>			
Bituthene Liquid Membrane—1.5 US gal (5.7 liter) or 4 US gal (15.1 liter)			

## Physical Properties

Property	Typical Value 300R	Typical Value 160R	Test Method
Color	white	white	
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	ASTM D3767
Lateral Water Migration Resistance	Pass at 231 ft (71 m) of hydrostatic head pressure	Pass at 231 ft (71 m) of hydrostatic head pressure	ASTM D5385, modified <sup>1</sup>
Low temperature flexibility	Unaffected at -20°F (-29°C)	Unaffected at -20°F (-29°C)	ASTM D1970
Resistance to hydrostatic head	231 ft (71 m)	231 ft (71 m)	ASTM D5385, modified <sup>2</sup>
Elongation	500%	500%	ASTM D412, modified <sup>3</sup>
Tensile strength, film	4000 psi (27.6 MPa)	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -9.4°F (-23°C), 100 cycles	Unaffected, Pass	Unaffected, Pass	ASTM C836
Puncture resistance	221 lbs (990 N)	100 lbs (445 N)	ASTM E154
Peel adhesion to concrete	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D903, modified <sup>4</sup>
Lap peel adhesion	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D1876, modified <sup>5</sup>
Permeance to water vapor transmission	0.01 perms (0.6 ng/(Pa × s × m <sup>2</sup> ))	0.01 perms (0.6 ng/(Pa × s × m <sup>2</sup> ))	ASTM E96, method B
Water absorption	0.5%	0.5%	ASTM D570

### Footnotes:

- Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the membrane.
- Hydrostatic head tests of Preprufe Membranes are performed by casting concrete against the membrane with a lap. Before the concrete cures, a 0.125 in. (3 mm) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to the head indicated.
- Elongation of membrane is run at a rate of 2 in. (50 mm) per minute.
- Concrete is cast against the protective coating surface of the membrane and allowed to properly dry (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 2 in. (50 mm) per minute at room temperature.
- The test is conducted 15 minutes after the lap is formed (per Grace published recommendations) and run at a rate of 2 in. (50 mm) per minute.

### Specification Clauses

Preprufe 300R or 160R shall be applied with its adhesive face presented to receive fresh concrete to which it will integrally bond. Only Grace Construction Products approved membranes shall be bonded to Preprufe 300R/160R. All Preprufe 300R/160R system materials shall be supplied by Grace Construction Products, and applied strictly in accordance with their instructions. Specimen performance and formatted clauses are also available.

NOTE: Use Preprufe Tape to tie-in Procor with Preprufe.

### Health and Safety

Refer to relevant Material Safety data sheet. Complete rolls should be handled by a minimum of two persons.

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

For technical assistance call toll free at 866-333-3SBM (3726)

Adcor is a trademark and Preprufe, Bituthene and Hydroduct are registered trademarks of W. R. Grace & Co.—Conn. Procor is a U.S. registered trademark of W. R. Grace & Co.—Conn., and is used in Canada under license from PROCOR LIMITED.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate and is offered for the users' consideration, investigation and verification, but we do not warrant the results to be obtained. Please read all statements, recommendations or suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use which would infringe any patent or copyright. W. R. Grace & Co.—Conn., 62 Whittemore Avenue, Cambridge, MA 02140. In Canada, Grace Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This product may be covered by patents or patents pending.  
PF-111H Printed in U.S.A. 07/12

Copyright 2012. W. R. Grace & Co.—Conn.  
FA/PDF

**GRACE**

## BITUTHENE® 3000 AND BITUTHENE LOW TEMPERATURE

Self-adhesive, rubberized asphalt/polyethylene waterproofing membranes for basements and sub-structures

### Description

Bituthene® 3000 and Bituthene Low Temperature are self-adhesive, rubberized asphalt/polyethylene waterproofing membranes used in basements and sub-structures.

### Advantages

- **Waterproof**—high hydrostatic head resistance
- **Cross laminated film**—provides dimensional stability, high tear strength, puncture and impact resistance
- **Cold applied**—no flame hazard; self-adhesive overlaps ensure continuity
- **Chemically resistant**—provides effective external protection against aggressive soils and ground water
- **Flexible**—accommodates minor settlement and shrinkage movement
- **Controlled thickness**—factory made sheet ensures constant, non-variable site application
- **Wide application window**—
  - **Bituthene Low Temperature** surface and ambient temperatures between 25°F (-4°C) and 60°F (16°C)
  - **Bituthene 3000** surface and ambient temperatures at 40°F (5°C) or above

- **Ripcord® split release on demand**—faster application in the straight-aways, ease of membrane positioning in detailed areas

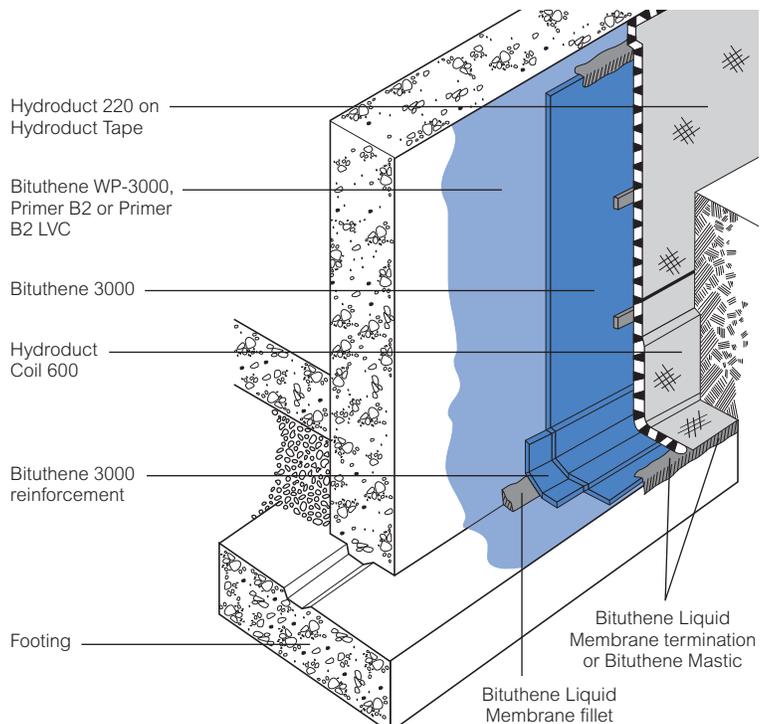
### Use

Bituthene is ideal for waterproofing concrete, masonry and wood surfaces where in-service temperatures will not exceed 130°F (54°C). It can be applied to foundation walls, tunnels, earth sheltered structures and split slab construction, both above and below grade. (For above grade applications, see *Above Grade Waterproofing Bituthene 3000 and Bituthene Low Temperature.*)

Bituthene is 1/16 in. (1.5 mm) thick, 3 ft (0.9 m) wide and 66.7 ft (20 m) long and is supplied in rolls. It is unrolled sticky side down onto concrete slabs or applied onto vertical concrete faces primed with Bituthene Primer WP-3000, Primer B2 or Primer B2 LVC. Continuity is achieved by overlapping a minimum 2 in. (50 mm) and firmly rolling the joint.

### Product Advantages

- Waterproof
- Cross laminated film
- Cold applied
- Chemically resistant
- Flexible
- Controlled thickness
- Wide application window
- Ripcord split release on demand



Drawings are for illustration purposes only. Please refer to [graceconstruction.com](http://graceconstruction.com) for specific application details.

Bituthene is extremely flexible. It is capable of bridging shrinkage cracks in the concrete and will accommodate minor differential movement throughout the service life of the structure.

## Application Procedures

### Safety, Storage and Handling Information

Bituthene products must be handled properly. Vapors from solvent-based primers and mastic are harmful and flammable. For these products, the best available information on safe handling, storage, personal protection, health and environmental considerations has been gathered. Material Safety Data Sheets (MSDS) are available at [graceconstruction.com](http://graceconstruction.com) and users should acquaint themselves with this information. Carefully read detailed precaution statements on product labels and the MSDS before use.

### Surface Preparation

Surfaces should be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Concrete must be properly dried (minimum 7 days for normal structural concrete and 14 days for lightweight structural concrete).

**If time is critical, Bituthene Primer B2 or Bituthene Primer B2 LVC may be used to allow priming and installation of membrane on damp surfaces or green concrete. Priming may begin in this case as soon as the concrete will maintain structural integrity.** Use form release agents which will not transfer to the concrete. Remove forms as soon as possible from below horizontal slabs to prevent entrapment of excess moisture. Excess moisture may lead to blistering of the membrane. Cure concrete with clear, resin-based curing compounds which do not contain oil, wax or pigment. Except with Primer B2 or Primer B2 LVC, allow concrete to thoroughly dry following rain. Do not apply any products to frozen concrete.

Repair defects such as spalled or poorly consolidated areas. Remove sharp protrusions and form match lines. On masonry surfaces, apply a parge coat to rough concrete block and brick walls or trowel cut mortar joints flush to the face of the concrete blocks.

### Temperature

- Apply Bituthene 3000 Membrane only in dry weather and at air and surface temperatures of 40°F (5°C) and above.
- Apply Bituthene Low Temperature Membrane only in dry weather and when air and surface temperatures are between 25°F (-4°C) and 60°F (16°C).
- Apply Bituthene Primer WP-3000 in dry weather above 40°F (5°C).

- Apply Bituthene Primer B2 in dry weather above 25°F (-4°C). (See separate product information sheet.)

### Priming

- Apply Bituthene Primer WP-3000 by spray or roller at a coverage rate of 500–600 ft<sup>2</sup>/gal (12–15 m<sup>2</sup>/L). Allow to dry one hour or until concrete returns to original color.
- Apply Bituthene Primer B2 by a lamb's wool roller at a coverage rate of 250–350 ft<sup>2</sup>/gal (6–8 m<sup>2</sup>/L). Allow primer to dry one hour or until tack-free.
- Apply Bituthene Primer B2 LVC by a lamb's wool roller at a coverage rate of 325–425 ft<sup>2</sup>/gal (7.5–10 m<sup>2</sup>/L). Allow primer to dry one hour or until tack free.
- Dry time may be longer in cold temperatures. Reprime areas if contaminated by dust. If the work area is dusty, apply membrane as soon as the primer is dry.
- **Do not apply any primer to Bituthene membrane.**

### Corner Details

The treatment of corners varies depending on the location of the corner. For detailed information on Bituthene Liquid Membrane, see separate product information sheet.

- At wall to footing inside corners—
  - Option 1:** Apply membrane to within 1 in. (25 mm) of base of wall. Treat the inside corner by installing a ¾ in. (20 mm) fillet of Bituthene Liquid Membrane. Extend Bituthene Liquid Membrane at least 2½ in. (65 mm) onto footing, and 2½ in. (65 mm) onto wall membrane.
  - Option 2:** Treat the inside corner by installing a ¾ in. (20 mm) fillet of Bituthene Liquid Membrane. Apply 12 in. (300 mm) wide strip of sheet membrane centered over fillet. Apply wall membrane over inside corner and extend 6 in. (150 mm) onto footing. Apply 1 in. (25 mm) wide troweling of Bituthene Liquid Membrane over all terminations and seams within 12 in. (300 mm) of corner.
- At footings where the elevation of the floor slab is 6 in. (150 mm) or more above the footing, treat the inside corner either by the above two methods or terminate the membrane at the base of the wall. Seal the termination with Bituthene Liquid Membrane.

### Joints

Properly seal all joints with waterstop, joint filler and sealant as required. Bituthene membranes are not intended to function as the primary joint seal. Allow sealants to fully cure. Pre-strip all slab and wall cracks over ¼ in. (1.5 mm) wide and all construction and control joints with 9 in. (230 mm) wide sheet membrane strip.

## Application on Horizontal Surfaces

(Note: Preprufe® pre-applied membranes are strongly recommended for below slab or for any application where the membrane is applied before concreting. See Preprufe product information sheets.)

Apply membrane from the low point to the high point so that laps shed water. Overlap all seams at least 2 in. (50 mm). Stagger all end laps. Roll the entire membrane firmly and completely as soon as possible. Use a linoleum roller or standard water-filled garden roller less than 30 in. (760 mm) wide, weighing a minimum of 75 lbs (34 kg) when filled. Cover the face of the roller with a resilient material such as a ½ in. (13 mm) plastic foam or two wraps of indoor-outdoor carpet to allow the membrane to fully contact the primed substrate. Seal all T-joints and membrane terminations with Bituthene Liquid Membrane at the end of the day.

## Protrusions and Drains

Apply membrane to within 1 in. (25 mm) of the base of the protrusion. Apply Bituthene Liquid Membrane 0.1 in. (2.5 mm) thick around protrusion. Bituthene Liquid Membrane should extend over the membrane a minimum of 2½ in. (65 mm) and up the penetration to just below the finished height of the wearing course.

## Vertical Surfaces

Apply membrane in lengths up to 8 ft (2.5 m). Overlap all seams at least 2 in. (50 mm). On higher walls apply membrane in two or more sections with the upper overlapping the lower by at least 2 in. (50 mm). Roll all membrane with a hand roller.

Terminate the membrane at grade level. Press the membrane firmly to the wall with the butt end of a hardwood tool such as a hammer handle or secure into a reglet. Failure to use heavy pressure at terminations can result in a poor seal. A termination bar may be used to ensure a tight seal.

Terminate the membrane at the base of the wall if the bottom of the interior floor slab is at least 6 in. (150 mm) above the footing. Otherwise, use appropriate inside corner detail where the wall and footing meet.

## Membrane Repairs

Patch tears and inadequately lapped seams with membrane. Clean membrane with a damp cloth and dry. Slit fishmouths and repair with a patch extending 6 in. (150 mm) in all directions from the slit and seal edges of the patch with Bituthene Liquid Membrane. Inspect the membrane thoroughly before covering and make any repairs.

## Drainage

Hydroduct® drainage composites are recommended for both active drainage and protection of the membrane. See Hydroduct product information sheets.

## Protection of Membrane

Protect Bituthene membranes to avoid damage from other trades, construction materials or backfill. Place protection immediately in temperatures above 77°F (25°C) to avoid potential for blisters.

- On vertical applications, use Hydroduct 220 Drainage Composite. Adhere Hydroduct 220 Drainage Composite to membrane with Hydroduct Tape. Alternative methods of protection are to use ¼ in. (6 mm) asphalt impregnated board or 1 in. (25 mm) extruded polystyrene. Such alternatives do not provide positive drainage to the system. Adhere protection board with an adhesive or Hydroduct Tape.
- In mud slab waterproofing, or other applications where positive drainage is not desired and where reinforced concrete slabs are placed over the membrane, the use of ¼ in. (6 mm) hardboard or 2 layers of ⅛ in. (3 mm) hardboard is recommended.

## Insulation

Always apply Bituthene membrane directly to primed or conditioned structural substrates. Insulation, if used, must be applied over the membrane. Do not apply Bituthene membranes over lightweight insulating concrete.

## Backfill

Place backfill as soon as possible. Use care during backfill operation to avoid damage to the waterproofing system. Follow generally accepted practices for backfilling and compaction. Backfill should be added and compacted in 6 in. (150 mm) to 12 in. (300 mm) lifts.

For areas which cannot be fully compacted, a termination bar is recommended across the top termination of the membrane.

## Placing Steel

When placing steel over properly protected membrane, use concrete bar supports (dobies) or chairs with plastic tips or rolled feet to prevent damage from sharp edges. Use special care when using wire mesh, especially if the mesh is curled.

## Approvals

- City of Los Angeles Research Report RR 24386
- U.S. Department of Housing and Urban Development (HUD) HUD Materials Release 628E

## Warranty

Five year material warranties covering Bituthene and Hydroduct products are available upon request. Contact your Grace sales representative for details.

## Technical Services

Support is provided by full time, technically trained Grace representatives and technical service personnel, backed by a central research and development staff.

## Supply

<b>Bituthene 3000 or Bituthene Low Temperature</b>	3 ft x 66.7 ft roll (200 ft <sup>2</sup> ) [0.9 m x 20 m (18.6 m <sup>2</sup> )]
Roll weight	83 lbs (38 kg) gross
Palletization	25 rolls per pallet
Storage	Store upright in dry conditions below 95°F (+35°C).
<b>Ancillary Products</b>	
Bituthene WP-3000	5 gal (18.9 L) pail/24 pails per pallet
Bituthene Primer B2	5 gal (18.9 L) pail/48 pails per pallet
Bituthene Primer B2 LVC	5 gal (18.9 L) pail/48 pails per pallet
Bituthene Liquid Membrane	1.5 gal (5.7 L) pail/100 pails per pallet or 4 gal (15.1 L) pail/24 pails per pallet
Hydroduct Tape	1 in. x 200 ft (2.5 cm x 61.0 m) roll/6 rolls per carton
Bituthene Mastic	Twelve 30 oz (0.9 L) tubes/carton or 5 gal (18.9 L) pail/36 pails per pallet

**Equipment by others:** Soft broom, utility knife, brush or roller for priming

## Physical Properties for Bituthene Membrane

Property	Typical Value	Test Method
Color	Dark gray-black	
Thickness	1/16 in. (1.5 mm) nominal	ASTM D3767—method A
Flexibility, 180° bend over 1 in. (25 mm) mandrel at -25°F (-32°C)	Unaffected	ASTM D1970
Tensile strength, membrane, die C	325 lbs/in. <sup>2</sup> (2240 kPa) minimum	ASTM D412 modified <sup>1</sup>
Tensile strength, film	5,000 lbs/in. <sup>2</sup> (34.5 MPa) minimum	ASTM D882 modified <sup>1</sup>
Elongation, ultimate failure of rubberized asphalt	300% minimum	ASTM D412 modified <sup>1</sup>
Crack cycling at -25°F (-32°C), 100 cycles	Unaffected	ASTM C836
Lap adhesion at minimum application temperature	3000: 4 lbs/in. (700 N/m) Low Temp: 5 lbs/in. (880 N/m)	ASTM D1876 modified <sup>2</sup>
Peel strength	9 lbs/in. (1576 N/m)	ASTM D903 modified <sup>3</sup>
Puncture resistance, membrane	50 lbs (222 N) minimum	ASTM E154
Resistance to hydrostatic head	200 ft (60 m) of water	ASTM D5385
Permeance	0.05 perms (2.9 ng/m <sup>2</sup> sPa) maximum	ASTM E96, section 12—water method
Water absorption	0.1% maximum	ASTM D570

### Footnotes:

1. The test is run at a rate of 2 in. (50 mm) per minute.
2. The test is conducted 15 minutes after the lap is formed and run at a rate of 2 in. (50 mm) per minute at 40°F (5°C).
3. The 180° peel strength is run at a rate of 12 in. (300 mm) per minute.

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

**For technical assistance call toll free at 866-333-3SBM (3726)**

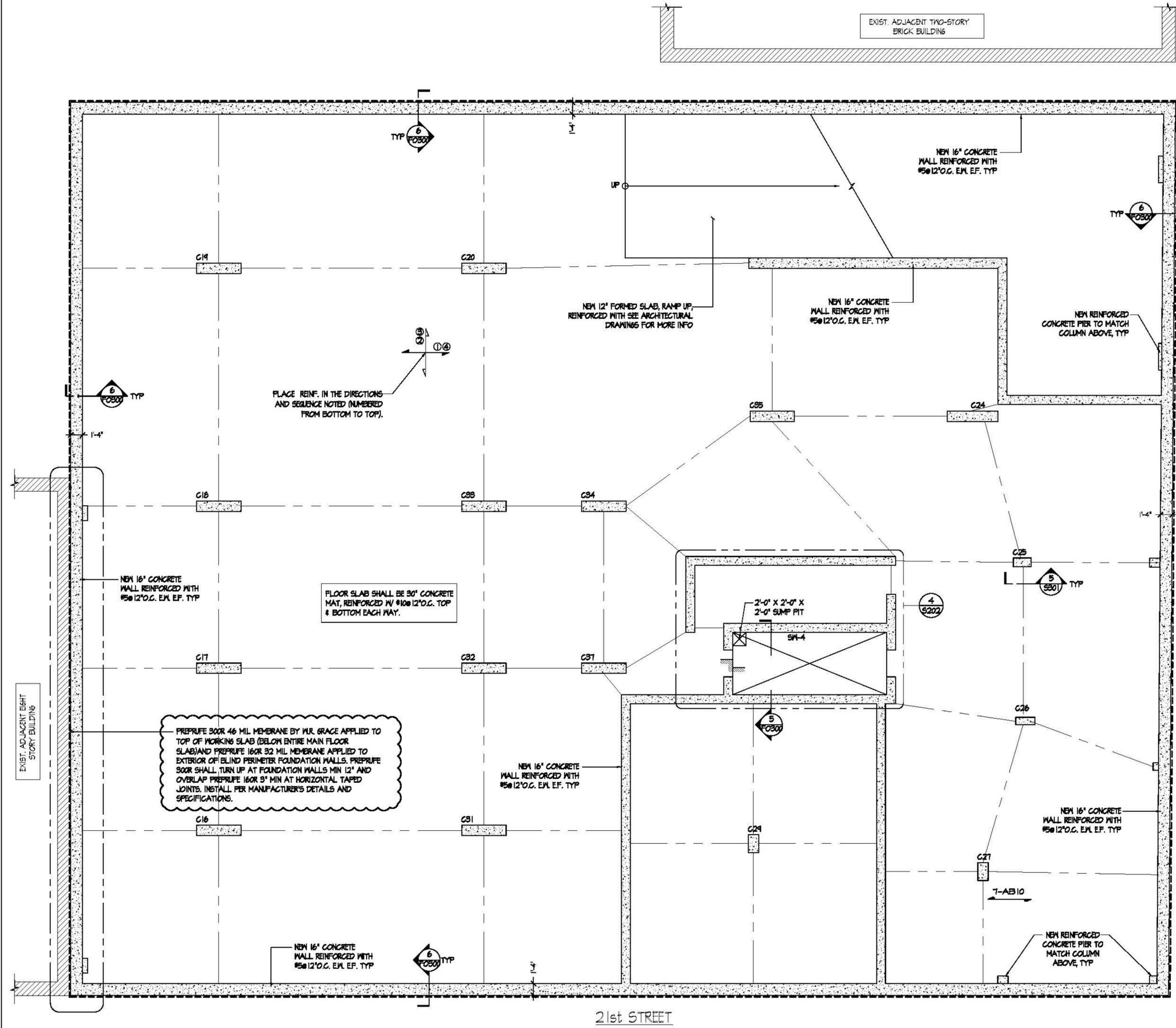
Bituthene, Preprufe, Ripcord and Hydroduct are registered trademarks of W. R. Grace & Co.—Conn.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate and is offered for the users' consideration, investigation and verification, but we do not warrant the results to be obtained. Please read all statements, recommendations or suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use which would infringe any patent or copyright. W. R. Grace & Co.—Conn., 62 Whittemore Avenue, Cambridge, MA 02140. In Canada, Grace Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This product may be covered by patents or patents pending.  
BIT-210F Printed in U.S.A. 9/08

Copyright 2007. W. R. Grace & Co.—Conn.  
FA/LVI/1M

**GRACE**



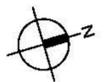
EXIST. ADJACENT TWO-STORY BRICK BUILDING

PREPRUFE 300R 46 MIL MEMBRANE BY M.R. GRACE APPLIED TO TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND BITUTHENE 3000 82 MIL MEMBRANE BY M.R. GRACE APPLIED TO EXTERIOR OF FORMED PERIMETER FOUNDATION WALLS. PREPRUFE 300R SHALL TURN UP AT EDGE OF MAIN FLOOR SLAB TO TOP SLAB. BITUTHENE 3000 SHALL OVERLAP OVER PREPRUFE 300R 6" MIN AT EDGE OF MAIN FLOOR SLAB. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.

PREPRUFE 300R 46 MIL MEMBRANE BY M.R. GRACE APPLIED TO TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND PREPRUFE 160R 32 MIL MEMBRANE APPLIED TO EXTERIOR OF BLIND PERIMETER FOUNDATION WALLS. PREPRUFE 300R SHALL TURN UP AT FOUNDATION WALLS MIN 12" AND OVERLAP PREPRUFE 160R 9" MIN AT HORIZONTAL TAPED JOINTS. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.

FLOOR SLAB SHALL BE 30" CONCRETE MAT, REINFORCED W/ #10 @ 12" O.C. TOP & BOTTOM EACH MAT.

PLACE REINF. IN THE DIRECTIONS AND SEQUENCE NOTED (NUMBERED FROM BOTTOM TO TOP).



NOTES

- FLOOR SLAB SHALL BE 30" CONCRETE MAT, REINFORCED W/ #10 @ 12" O.C. TOP & BOTTOM EACH MAT. ADDITIONAL BARS MAY BE REQUIRED, SEE PLAN.
- SEE ARCH. DWG'S FOR TOP OF SLAB ELEVATIONS.
- SEE "STRUCTURAL CONCRETE NOTES" FOR CONCRETE STRENGTH REQUIREMENTS, ETC.
- 6-ABS INDICATES ADDITIONAL 6BOTT #5 BARS AT COLUMN STRIP, SPACE ADDL BOTT BARS MIDWAY BETWEEN BOTT. GRID SAME SPACING AS BOTT. GRID
- 4ATS12 INDICATES ADDITIONAL 4TOP #5 BARS @ 12 O.C. ADDITIONAL TOP BARS SHALL BE CENTERED AT SUPPORT AND FALL IN BETWEEN THE CONTINUOUS TOP BARS

LEGEND

- CAST-IN-PLACE REINFORCED WALL
- CAST-IN-PLACE REINFORCED COLUMN
- SLAB EDGE
- SLAB OPENING
- CAST-IN-PLACE REINFORCED COLUMN / WALL BELOW
- SLAB DROP, SEE PLAN
- ADDITIONAL TOP BARS, SEE NOTE 5 ABOVE
- ADDITIONAL BOTTOM BARS, SEE NOTE 4 ABOVE

STRUCTURAL ENGINEER:  
**STRATFORD ENGINEERING**  
 57 West 30th Street, 10th floor  
 New York, NY 10018  
 Tel: 848.723.1890 Fax: 812.401.4792

MEP ENGINEER:  
**MANOUVELOIS ENGINEERING, P.C.**  
 3033 Crosswicks Street  
 Long Island City, NY 11102  
 Tel: 718.721.2842 Fax: (718) 721.2842

FIRE ALARM:  
**MANOUVELOIS ENGINEERING, P.C.**  
 3033 Crosswicks Street  
 Long Island City, NY 11102  
 Tel: 718.721.2842 Fax: (718) 721.2842

CODE CONSULTANT/EXPECITER:  
**BMB BUILDING CONSULTING INC.**  
 407 Broadway, Suite# 2115  
 New York, NY 10013  
 Tel: 812.968.0370 Fax: 917.961.8990

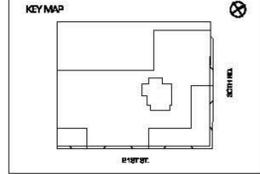
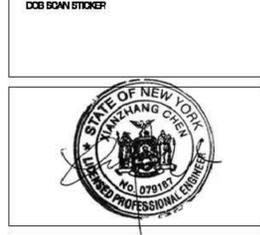
REVISION:

25	.....
24	.....
23	.....
22	.....
21	.....
20	.....
19	.....
18	.....
17	.....
16	.....
15	.....
14	.....
13	.....
12	.....
11	.....
10	.....
09	.....
08	.....
07	.....
06	.....
05	.....
04	.....
03	03.09.2013 - MEMBRANE REVISIONS
02	03.12.2013 - MEMBRANE REVISIONS
01	02.12.2013 - ISSUE FOR DOB

ISSUE: 02.12.2013 ISSUE FOR DOB

DOB APPROVAL

DOB SIGN STICKER



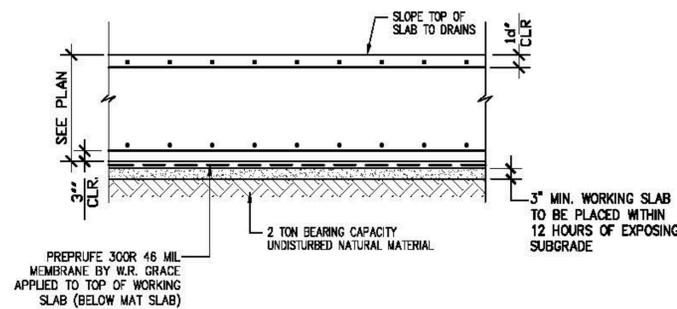
**Q 21**  
 30-40 21TH STREET  
 QUEENS, NY 11102  
 owner:  
**XX, LLC**  
 30-40 21TH STREET, QUEENS, NY 11102

**FO-101.00**  
 CELLAR FOUNDATION PLAN  
 rev # 02.12.2013 page 1 of 16

**TKA STUDIO**  
 TOM KOWALSKI ARCHITECT STUDIO PC  
 10 JAY STREET SUITE 908 BROOKLYN, NY 11201  
 Tel: 718 282 8268  
 Fax: 718 282 8268  
 email: info@tkastudio.com  
 web: http://www.tkastudio.com

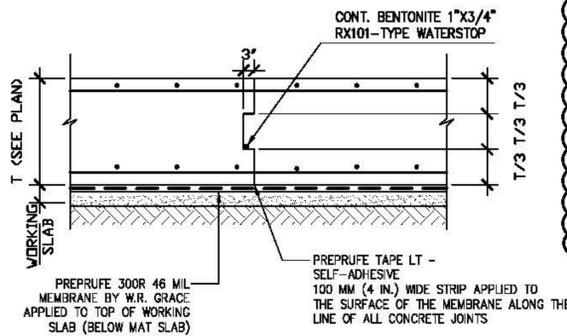
Confidential information: this material, specifications, and all information therein are the property of TKA Studio. No part of this documentation may be revealed, reproduced, or made public without express written authorization and shall be returned on request.  
 ©COPYRIGHT TKA STUDIO INC 12.05.2005

1 CELLAR FLOOR FRAMING PLAN  
 SCALE 3/16"=1'-0"



1 TYPICAL "MAT" DETAIL

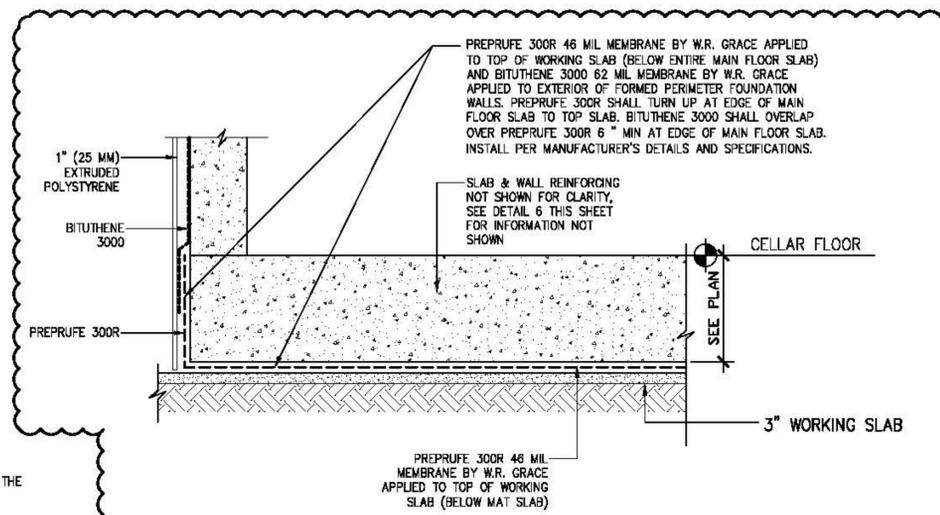
SCALE: 1/2" = 1'-0"



2 TYPICAL CONSTRUCTION JT. DETAIL

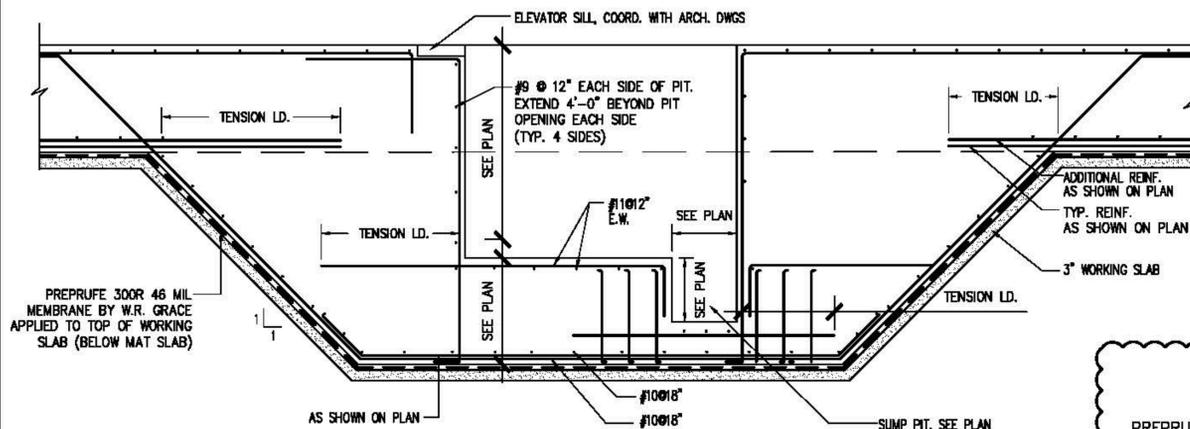
SCALE: 1/2" = 1'-0"

CONTRACTOR TO SUPPLY LOCATION OF JTS. TO ARCH. & ENGINEER FOR APPROVAL PRIOR TO POUR.



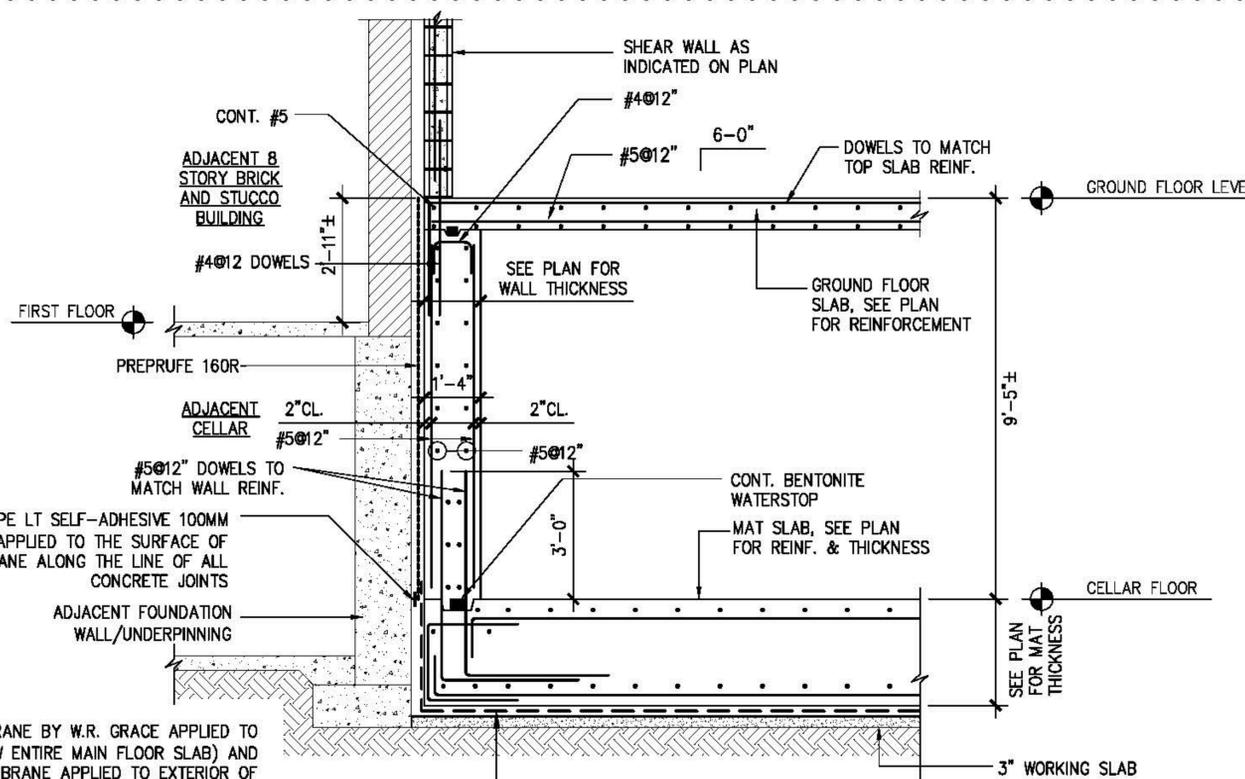
3 TYPICAL FOUNDATION WALL DETAIL - FORMED WALL

SCALE: 1/2" = 1'-0"



5 TYPICAL PIT DETAIL IN MAT SLAB

SCALE: 1/2" = 1'-0"



6 TYPICAL FOUNDATION WALL DETAIL  
© WALLS AGAINST ADJACENT FOUNDATION/UNDERPINNING (BLIND)

SCALE: 1/2" = 1'-0"

PREPRUFE 300R 46 MIL MEMBRANE BY W.R. GRACE APPLIED TO TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND PREPRUFE 160R 32 MIL MEMBRANE APPLIED TO EXTERIOR OF PERIMETER FOUNDATION WALLS. PREPRUFE 300R SHALL TURN UP AT FOUNDATION WALLS MIN 12" AND OVERLAP PREPRUFE 160R 3" MIN AT HORIZONTAL TAPED JOINTS. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS

STRUCTURAL ENGINEER  
**STRATFORD ENGINEERING**  
 57 West 35th Street, 10th floor  
 New York, NY 10018  
 Tel: 848.723.1280 Fax: 212.401.4722

MEP ENGINEER  
**MANUVELOIS ENGINEERING, P.C.**  
 30-33 Crossways Street  
 Long Island City, NY 11102  
 Tel: 718.721.2842 Fax: 718.721.2842

FIRE ALARM  
**MANUVELOIS ENGINEERING, P.C.**  
 30-33 Crossways Street  
 Long Island City, NY 11102  
 Tel: 718.721.2842 Fax: 718.721.2842

CODE CONSULTANT/EXPIEDITER  
**BMB BUILDING CONSULTING INC.**  
 401 Broadway, Suite 2115  
 New York, NY 10013  
 Tel: 212.906.0370 Fax: 917.891.6960

REVISION:

25	.....
24	.....
23	.....
22	.....
21	.....
20	.....
19	.....
18	.....
17	.....
16	.....
15	.....
14	.....
13	.....
12	.....
11	.....
10	.....
09	.....
08	.....
07	.....
06	.....
05	.....
04	.....
03	03.09.2013 - MEMBRANE REVISIONS
02	03.12.2013 - MEMBRANE REVISIONS
01	02.12.2013 - ISSUE FOR DOB

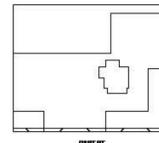
ISSUE: 02.12.2013 ISSUE FOR DOB

DOB APPROVAL

DOB SCAN STICKER



KEY MAP



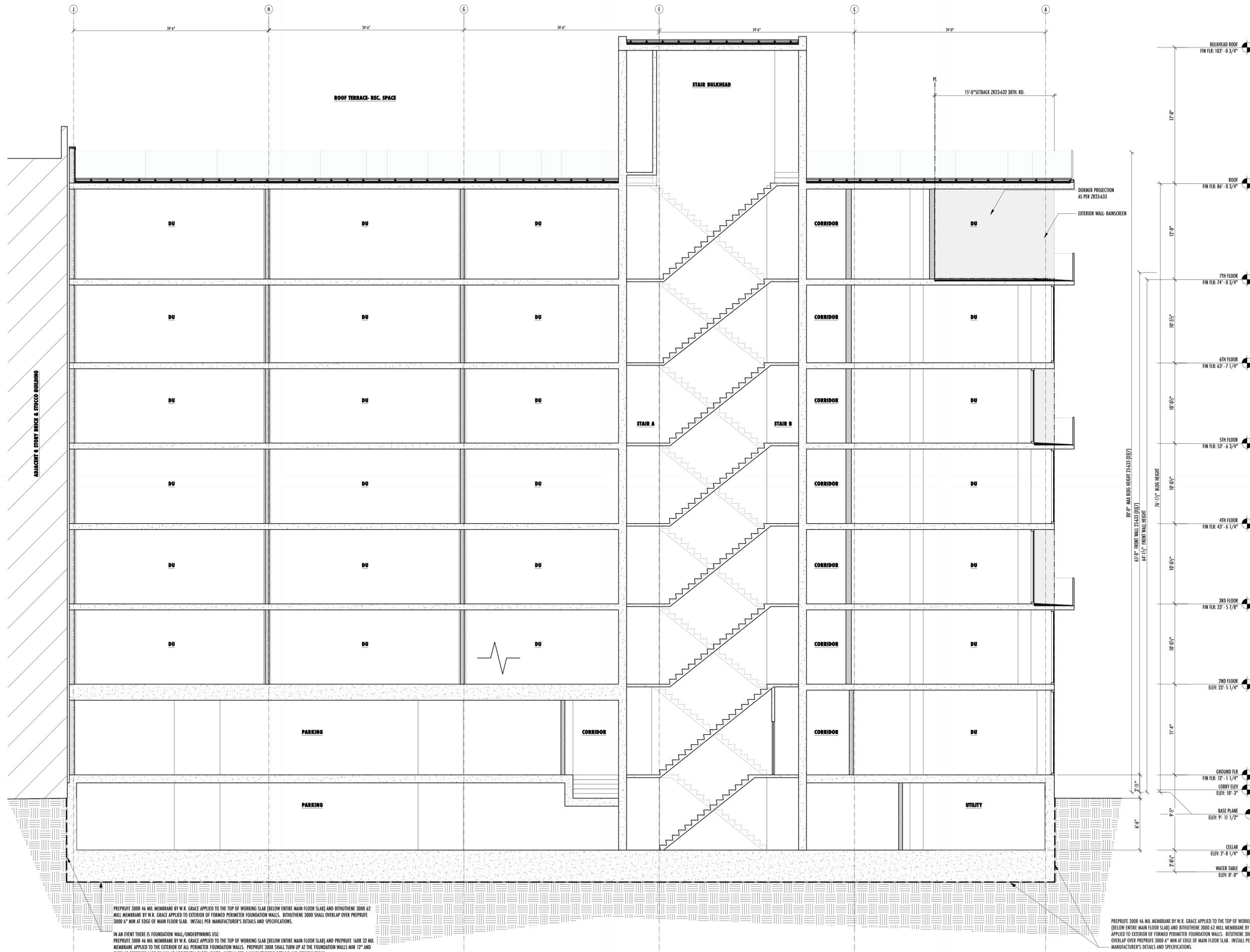
021  
 30-40 21TH STREET  
 QUEENS, NY 11102  
 owner:  
**XXL LLC**  
 30-40 21TH STREET, QUEENS, NY 11102

**FO-300.00**  
 TYP. FOUNDATION DETAILS

02.12.2013 PAGE 2 of 15

**TKA STUDIO**  
 TOM KOWALSKI ARCHITECT STUDIO P.C.  
 10 JAY STREET SUITE 808 BROOKLYN, NY 11201  
 Tel: 718.292.8258  
 Fax: 718.292.8294  
 email: info@tkastudio.com  
 web: http://www.tkastudio.com

Confidential material. This material, specifications, and all information therein are the property of TKA Studio. No part of this documentation may be reprinted, reproduced, or made public without express written authorization and shall be returned on request.  
 COPYRIGHT TKA STUDIO INC 12.05.2008



PREPRUFE 300R 46 MIL MEMBRANE BY W.R. GRACE APPLIED TO THE TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND BITUTHENE 3000 62 MIL MEMBRANE BY W.R. GRACE APPLIED TO EXTERIOR OF FORMED PERIMETER FOUNDATION WALLS. BITUTHENE 3000 SHALL OVERLAP OVER PREPRUFE 3000 6" MIN AT EDGE OF MAIN FLOOR SLAB. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.

IN AN EVENT THERE IS FOUNDATION WALL/UNDERPINNING USE:  
 PREPRUFE 300R 46 MIL MEMBRANE BY W.R. GRACE APPLIED TO THE TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND PREPRUFE 160R 32 MIL MEMBRANE APPLIED TO THE EXTERIOR OF ALL PERIMETER FOUNDATION WALLS. PREPRUFE 300R SHALL TURN UP AT THE FOUNDATION WALLS MIN 12" AND OVERLAP PREPRUFE 160R 3" MIN AT HORIZONTAL TAPED JOINTS. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.

PREPRUFE 300R 46 MIL MEMBRANE BY W.R. GRACE APPLIED TO THE TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND BITUTHENE 3000 62 MIL MEMBRANE BY W.R. GRACE APPLIED TO EXTERIOR OF FORMED PERIMETER FOUNDATION WALLS. BITUTHENE 3000 SHALL OVERLAP OVER PREPRUFE 3000 6" MIN AT EDGE OF MAIN FLOOR SLAB. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.

STRUCTURAL ENGINEER:  
**STRATFORD ENGINEERING**  
 57 West 38th Street, 10th floor  
 New York, NY 10018  
 Tel: 646.723.1280 Fax: 212.401.4722

MEP ENGINEER:  
**MANOUELOS ENGINEERING, P.C.**  
 30-53 Crescent Street  
 Long Island City, NY 11102  
 Tel: 718.721.2542 Fax: (718) 721.2642

FIRE ALARM:  
**MANOUELOS ENGINEERING, P.C.**  
 30-53 Crescent Street  
 Long Island City, NY 11102  
 Tel: 718.721.2542 Fax: (718) 721.2642

CODE CONSULTANT/EXPEDITER:  
**BMB BUILDING CONSULTING INC.**  
 401 Broadway, Suite# 2115  
 New York, NY 10013  
 Tel: 212.956.0370 Fax: 917.591.6950

REVISION:

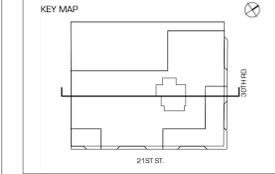
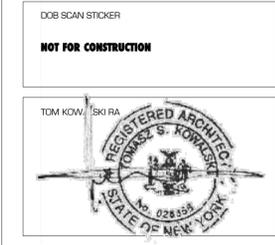
25	.....
24	.....
23	.....
22	.....
21	.....
20	.....
19	.....
18	.....
17	.....
16	.....
15	.....
14	.....
13	.....
12	.....
11	.....
10	.....
09	.....
08	.....
07	.....
06	.....
05	.....
04	.....
03	.....
02	03.12.2013 MEMBRANE REVISION
01	12.28.2012 BACKGROUNDS

ISSUE: 03.12.2013 MEMBRANE REVISION

DOB APPROVAL

DOB SCAN STICKER

**NOT FOR CONSTRUCTION**



**Q 21**  
 30-40 21TH STREET  
 QUEENS, NY 11102  
 owner:  
**XX, LLC**  
 30-40 21TH STREET, QUEENS, NY 11102

**A-300.0**  
 SECTIONS

proj. # **4.12.00** page: **7** of **24**

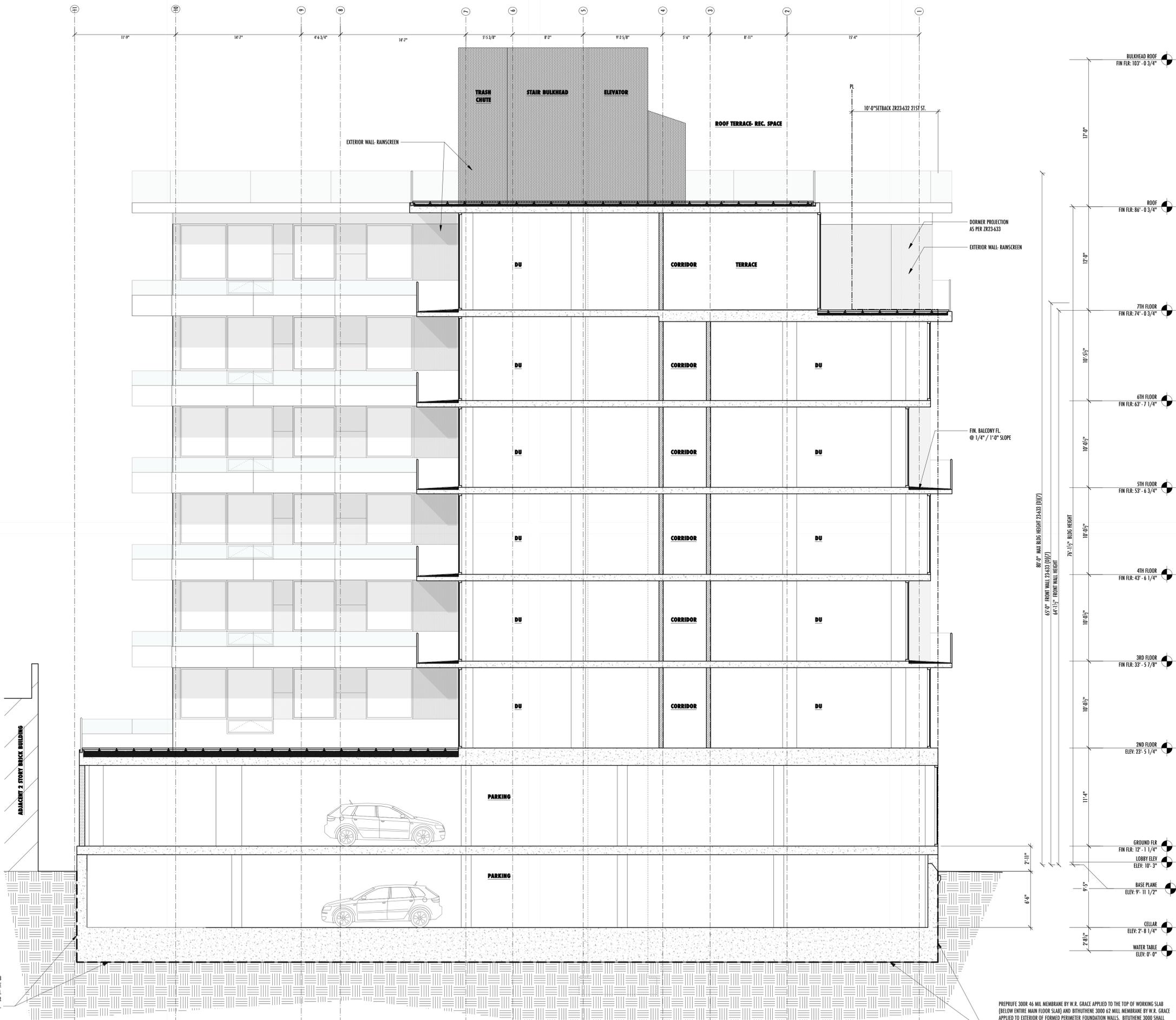
**TKA STUDIO**  
 TOM KOWALSKI ARCHITECT STUDIO PC  
 10 JAY STREET SUITE 906 BROOKLYN, NY 11201  
 Tel: 718.260.8036 Fax: 718.260.8034  
 email: info@tkastudio.com  
 web: http://www.tkastudio.com

Confidential material: this material, specifications, and all information therein are the property of TKA Studio. No part of this documentation may be revealed, reproduced, or made public without express written authorization and shall be returned on request.  
 ©COPYRIGHT TKA STUDIO INC 18.05.2006

4/3/13 2:23:07 PM  
 C:\1\street sections elevations.vwx

EAST - WEST SECTION

3/16" = 1'-0"



NORTH - SOUTH SECTION

3/16" = 1'-0"

STRUCTURAL ENGINEER:  
**STRATFORD ENGINEERING**  
 57 West 38th Street, 10th floor  
 New York, NY 10018  
 Tel: 646.723.1280 Fax: 212.401.4722

MEP ENGINEER:  
**MANOUELOS ENGINEERING, P.C.**  
 30-53 Crescent Street  
 Long Island City, NY 11102  
 Tel: 718.721.2642 Fax: (718) 721.2642

FIRE ALARM:  
**MANOUELOS ENGINEERING, P.C.**  
 30-53 Crescent Street  
 Long Island City, NY 11102  
 Tel: 718.721.2642 Fax: (718) 721.2642

CODE CONSULTANT/EXPEDITER:  
**BMB BUILDING CONSULTING INC.**  
 401 Broadway, Suite# 2115  
 New York, NY 10013  
 Tel: 212.966.0370 Fax: 917.591.6950

REVISION:

25	.....
24	.....
23	.....
22	.....
21	.....
20	.....
19	.....
18	.....
17	.....
16	.....
15	.....
14	.....
13	.....
12	.....
11	.....
10	.....
09	.....
08	.....
07	.....
06	.....
05	.....
04	.....
03	.....
02	03.12.2013 MEMBRANE REVISION
01	12.28.2012 BACKGROUNDS

ISSUE: 03.12.2013 MEMBRANE REVISION

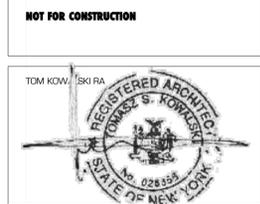
DOB APPROVAL

DOB SCAN STICKER

**NOT FOR CONSTRUCTION**

DOB SCAN STICKER

**NOT FOR CONSTRUCTION**



**Q 21**  
 30-40 21TH STREET  
 QUEENS, NY 11102  
 owner:  
**XX, LLC**  
 30-40 21TH STREET, QUEENS, NY 11102

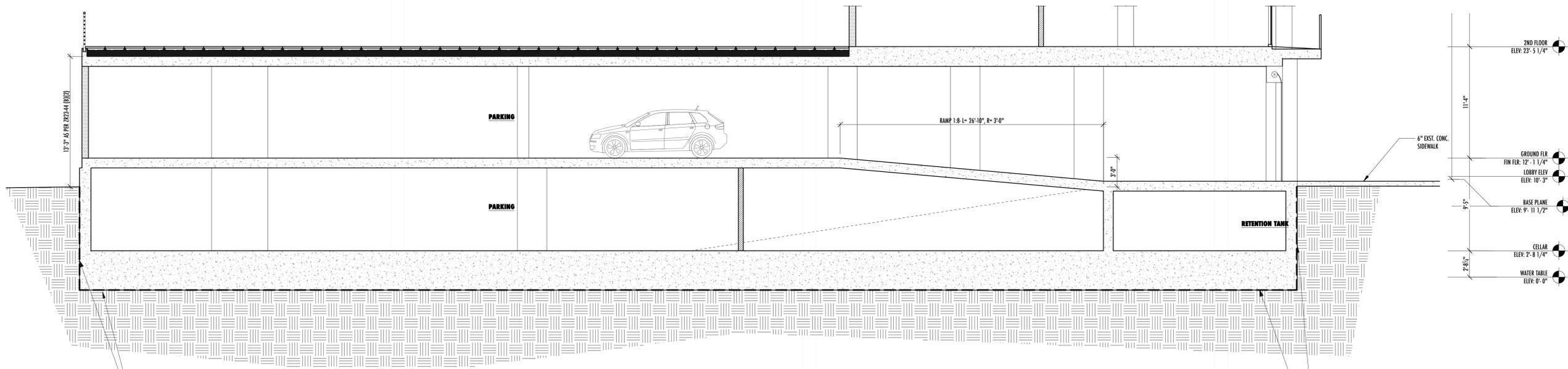
**A-301.0**  
 SECTIONS

proj. # **4.12.00** page: **7** of **24**

**TKA STUDIO**  
 TOM KOWALSKI ARCHITECT STUDIO PC  
 10 JAY STREET SUITE 906 BROOKLYN, NY 11201  
 Tel: 718.260.8036  
 Fax: 718.260.8034  
 email: info@tkastudio.com  
 web: http://www.tkastudio.com

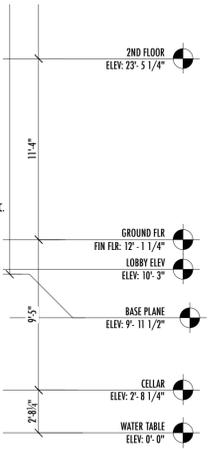
Confidential material: this material, specifications, and all information therein are the property of TKA Studio. No part of this documentation may be revealed, reproduced, or made public without express written authorization and shall be returned on request.  
 ©COPYRIGHT TKA STUDIO INC 12.05.2006

4/13/13 1:57 PM  
 G:\21 street sections elevations.vwx



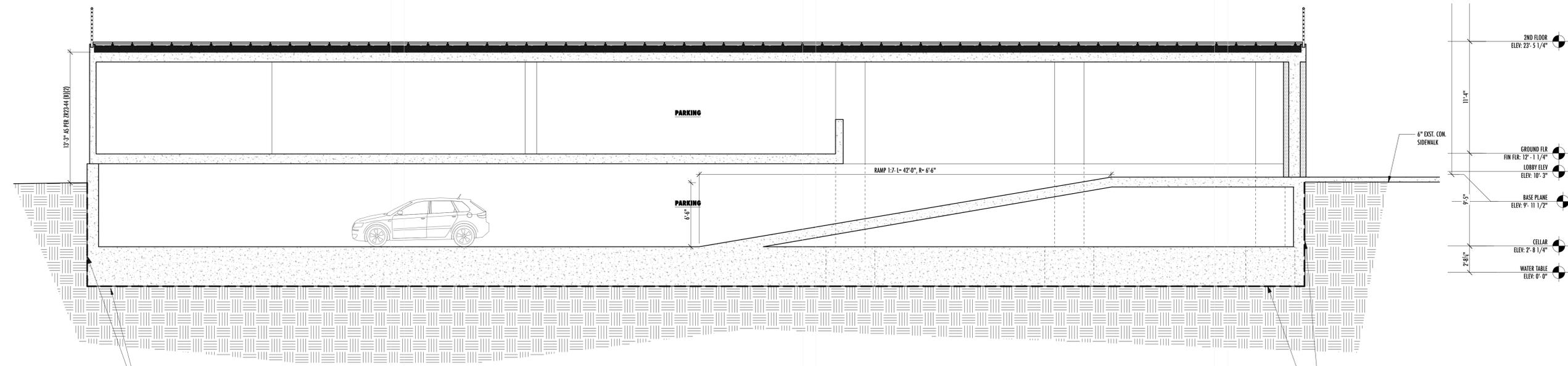
PREPUNE 300R 46 MIL MEMBRANE BY W.R. GRACE APPLIED TO THE TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND BITUTHENE 3000 62 MIL MEMBRANE BY W.R. GRACE APPLIED TO EXTERIOR OF FORMED PERIMETER FOUNDATION WALLS. BITUTHENE 3000 SHALL OVERLAP OVER PREPUNE 3000 6" MIN AT EDGE OF MAIN FLOOR SLAB. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.

PREPUNE 300R 46 MIL MEMBRANE BY W.R. GRACE APPLIED TO THE TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND BITUTHENE 3000 62 MIL MEMBRANE BY W.R. GRACE APPLIED TO EXTERIOR OF FORMED PERIMETER FOUNDATION WALLS. BITUTHENE 3000 SHALL OVERLAP OVER PREPUNE 3000 6" MIN AT EDGE OF MAIN FLOOR SLAB. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.



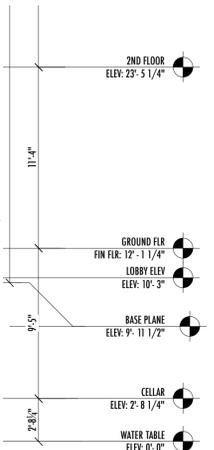
EAST - WEST SECTION

3/16" = 1'-0"



PREPUNE 300R 46 MIL MEMBRANE BY W.R. GRACE APPLIED TO THE TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND BITUTHENE 3000 62 MIL MEMBRANE BY W.R. GRACE APPLIED TO EXTERIOR OF FORMED PERIMETER FOUNDATION WALLS. BITUTHENE 3000 SHALL OVERLAP OVER PREPUNE 3000 6" MIN AT EDGE OF MAIN FLOOR SLAB. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.

PREPUNE 300R 46 MIL MEMBRANE BY W.R. GRACE APPLIED TO THE TOP OF WORKING SLAB (BELOW ENTIRE MAIN FLOOR SLAB) AND BITUTHENE 3000 62 MIL MEMBRANE BY W.R. GRACE APPLIED TO EXTERIOR OF FORMED PERIMETER FOUNDATION WALLS. BITUTHENE 3000 SHALL OVERLAP OVER PREPUNE 3000 6" MIN AT EDGE OF MAIN FLOOR SLAB. INSTALL PER MANUFACTURER'S DETAILS AND SPECIFICATIONS.



EAST - WEST SECTION

3/16" = 1'-0"

STRUCTURAL ENGINEER:  
**STRATFORD ENGINEERING**  
 57 West 38th Street, 10th floor  
 New York, NY 10018  
 Tel: 646.723.1290 Fax: 212.401.4722

MEP ENGINEER:  
**MANUVELOS ENGINEERING, P.C.**  
 3053 Crescent Street  
 Long Island City, NY 11102  
 Tel: 718.721.2642 Fax: (718) 721.2642

FIRE ALARM:  
**MANUVELOS ENGINEERING, P.C.**  
 3053 Crescent Street  
 Long Island City, NY 11102  
 Tel: 718.721.2642 Fax: (718) 721.2642

CODE CONSULTANT/EXPEDITER:  
**BMB BUILDING CONSULTING INC.**  
 401 Broadway, Suite# 2115  
 New York, NY 10013  
 Tel: 212.966.0370 Fax: 917.591.6950

REVISION:

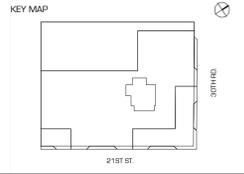
25	.....
24	.....
23	.....
22	.....
21	.....
20	.....
19	.....
18	.....
17	.....
16	.....
15	.....
14	.....
13	.....
12	.....
11	.....
10	.....
09	.....
08	.....
07	.....
06	.....
05	.....
04	.....
03	.....

02, 03, 12, 2013 MEMBRANE REVISION  
 01, 12, 28, 2012 BACKGROUNDS

ISSUE: 03.12.2013 MEMBRANE REVISION

DOB APPROVAL

DOB SCAN STICKER  
**NOT FOR CONSTRUCTION**



**Q 21**  
 30-40 21TH STREET  
 QUEENS, NY 11102  
 owner:  
**XX, LLC**  
 30-40 21TH STREET, QUEENS, NY 11102

**A-302.0**  
 SECTIONS  
 pro. # 4.12.00 page 8 of 24

**TKA STUDIO**  
 TOM KOWALSKI ARCHITECT STUDIO PC  
 10 JAY STREET SUITE 908 BROOKLYN, NY 11201  
 Tel: 718.260.8036  
 Fax: 718.260.8034  
 email: info@tkastudio.com  
 web: http://www.tkastudio.com

Confidential material:  
 this material, specifications, and all information therein are  
 the property of TKA studio. No part of this documentation  
 may be revealed, reproduced, or made public without  
 express written authorization and shall be returned on  
 request.  
 ©COPYRIGHT TKA STUDIO INC 12.05.2006

# GRACE

## Construction Products

**Mark A. Franciosi**  
Technical Service Engineer - Americas

T 617-498-4303

mark.a.franciosi@grace.com

**W. R. Grace & Co.-Conn.**  
62 Whittemore Avenue  
Cambridge, MA 02140

March 27<sup>th</sup>, 2013

Nahum Kedem, PG  
Athenica Environmental Services, Inc.  
45-09 Greenpoint Avenue  
Long Island City, NY 11104

Project: 30-40 21<sup>st</sup> Street Astoria, NY Block 535, Lot 46, OER# 13CVCP111QDOB

Mr. Kedem,

I have reviewed the following documents for the above referenced project:

- Table 3 - Summary of Soil Sampling Results SB-1 – SB-8 (Pages 1-8)
- Table 4 - Summary of Groundwater Sampling Results (Pages 1-4)
- Table 5 - Summary of Soil Vapor Sampling Results (Pages 1)

The identified contaminants at the levels reported will not have an adverse effect on the waterproofing or vapor barrier properties of Preprufe<sup>®</sup> 300R, Preprufe<sup>®</sup> 160R, Bituthene<sup>®</sup> 3000/4000 or Procor<sup>®</sup> 75 systems along with all system accessories, provided standard design and application procedures are followed.

Standard installation instructions and details can be found on our website at [www.graceconstruction.com](http://www.graceconstruction.com).

This letter supersedes the previous letter dated march 21<sup>st</sup>, 2013.

If you have any questions, please feel free to call me at the number above.

Sincerely,



Mark Franciosi

Technical Services Engineer

cc: K. Burke, J. Ridgeway

## Addendum 4

### Signage



## NYC Brownfield Cleanup Program

This property is enrolled in the New York City Brownfield Cleanup Program for environmental remediation. This is a voluntary program administered by the NYC Office of Environmental Remediation.

For more information, log on to:

[www.nyc.gov/oer](http://www.nyc.gov/oer)



If you have questions or would like more information, please contact:

Jennifer Pati at (212) 341-2034  
or email us at [brownfields@cityhall.nyc.gov](mailto:brownfields@cityhall.nyc.gov)

30-40 21st Street  
Site #: 13CVCP111Q