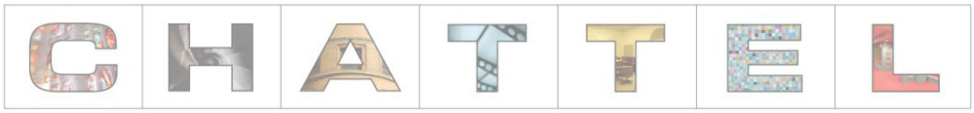
Appendix FEIR-5

Preservation Plan

PRESERVATION PLAN

Sunkist Growers, Inc.
14130 Riverside Drive
Sherman Oaks, CA 91423



Prepared for:
Armbruster Goldsmith & Delvac LLP
12100 Wilshire Blvd, Suite 1600
Los Angeles, CA 90025

Prepared by:
Chattel, Inc. | Historic Preservation Consultants
13417 Ventura Blvd
Sherman Oaks, CA 91423

October 25, 2018

THIS PAGE INENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I. Introduction 3

II Methodology and Evaluation 4

III. Qualifications 5

IV. *Secretary's Standards* 6

V. Historic Resource Description 7
Building description 7
Alterations 8
Character-defining features 8

VI. Proposed Project 10
Views of the Sunkist Building 10
Primary approach from north 11
Landscaping at berm 12
Plinth, podium terrace, and colonnade of trapezoidal piers 12
Inverted pyramidal massing 13
Regular and repetitive geometric pattern of solids and voids 13
Triangular sidewalls shading inset second and third floor windows 13
Hazardous materials 14
Paint removal and repainting 16
Signage 16
New entrance canopy 17
New courtyard trellis 17
First floor existing doors and windows 18
New courtyard terrace boxes 18
Brick paving at interior courtyard 19
Repetitive floor plans with single-loaded corridors encircling the courtyard 19
Concrete shear walls 19
Antennae/Cell sites 20

VII. Maintenance Recommendations 21
Precast concrete panels 21

VIII. Tenant Guidelines 22

IX. Provision for Future Changes to Scope of Work 23

X. Attachments
Attachment A: Figures and photographs
Attachment B: Updated Drawings and Renderings
Attachment C: *Preservation Brief 1: Cleaning and Water-Repellent Treatments for Historic Masonry Buildings*
Attachment D: *Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings*
Attachment E: *Preservation Brief 15: Preservation of Historic Concrete*
Attachment F: Detailed Design Drawing Set (abridged)

I. INTRODUCTION

The purpose of this Preservation Plan is to ensure, to the greatest extent possible, the preservation of character-defining features that convey the architectural and associative significance of the historic Sunkist Building. The character-defining features described in this report were identified in the Historic Resource Assessment Chattel prepared dated April 1, 2015.[1] The current proposed project, described in a Detailed Design drawing set dated October 14, 2015, and a Design Update drawing set dated June 13, 2018, both prepared by Johnson Fain. The Design Update drawing set includes minor changes to the subject property to provide increased usability and to meet contemporary needs. This Preservation Plan reviews the rehabilitation plans, and design changes associated with the subject property and its character-defining features, details the existing conditions and proposed work, and provides treatment recommendations to more fully conform with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

[1] Chattel, Inc., "Sunkist Growers, Inc.: Historical Resource Assessment and CEQA Impacts Analysis," April 1, 2015.

II. METHODOLOGY & EVALUATION

This Preservation Plan evaluates detailed design plans by Johnson Fain, dated October 14, 2015, May 17, 2018 and June 13, 2018 for conformance with the *Secretary of the Interior's Standards for Rehabilitation* (*Secretary's Standards*). The existing conditions were assessed during multiple site visits conducted between March 2015 and September 2018 by professionals meeting the *Secretary of the Interior's Professional Qualification Standards* for historic architecture, architecture, and architectural history.

Recommended maintenance and treatments draw from the *Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties,* and from multiple National Park Service *Preservation Briefs* related to the appropriate methods and approaches for the repair and treatment of historic materials.[2]

[2] *Preservation Briefs* are published by the Technical Preservation Services agency of the National Park Service, and provide guidance on the preservation, treatment, and maintenance of historic materials to appropriately retain features that contribute to historic character.

III. QUALIFICATIONS

Chattel is a full service historic preservation consulting firm with practice throughout the western United States. The firm represents governmental agencies and private ventures, successfully balancing project goals with a myriad of historic preservation regulations without sacrificing principles on either side. Comprised of professionals meeting the *Secretary of the Interior's Professional Qualifications Standards* in history, architecture, architectural history, and historic architecture, the firm offers professional services including historic resources evaluation and project impacts analysis, in addition to consultation on federal, state, and local historic preservation statutes and regulations.

Staff engage in a collaborative process and work together as a team on individual projects. This Preservation Plan was prepared by President Robert Chattel, preservation architect, Associate III Brian Matuk, architectural historian, and Associate II Olivia White, architectural historian, professionals meeting the *Secretary of the Interior's Professional Qualification Standards* for historic architecture, architecture, and architectural history.

IV. *SECRETARY'S STANDARDS*

Under CEQA, effects on historical resources resulting from a project found in conformance with the *Secretary's Standards* are generally considered mitigated to a less than significant level or exempt, as provided in CEQA Guidelines §15064.5(b)(3). The *Secretary's Standards* contain four treatments; the appropriate treatment for this project is rehabilitation. The rehabilitation standards are:

1. A property would be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
2. The historic character of a property would be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property would be avoided.
3. Each property would be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right would be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property would be preserved.
6. Deteriorated historic features would be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features would be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, would be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources would be protected and preserved in place. If such resources must be disturbed, mitigation measures would be undertaken.
9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work would be differentiated from the old and would be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction would be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

The *Secretary's Standards* are not intended to be prescriptive, but instead provide general guidance. They are intended to be flexible and adaptable to specific project conditions to balance continuity and change while retaining historic fabric to the greatest extent possible. Their interpretation requires exercise of professional judgment and balance of the various opportunities and constraints of any given project based on use, materials retention and treatment, and compatibility of new construction. Not every standard necessarily applies to every aspect of a project, nor is it necessary to comply with every standard to achieve conformance.

V. HISTORIC RESOURCE DESCRIPTION

The Sunkist Building, which was completed in 1970, is not designated as an individual resource or as a contributor to a historic district, but is eligible for individual listing in the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), and as an Historical-Cultural Monument (HCM) under the contexts of "Industrial Development," for its association with Sunkist Growers, Inc., and "Architecture and Engineering, 1850-1980" for its design by master architect A.C. Martin and Associates and as an excellent example of Brutalist architecture. In addition, the subject property was identified as an historic resource by SurveyLA in a 2015 Historic Resources Survey Report Draft of the Van Nuys-North Sherman Oaks Community Plan Area.[3]

Building Description

Setting

The Sunkist Building is located at the southwest corner of Hazeltine Avenue (Hazeltine) and Riverside Drive (Riverside), adjacent to the Los Angeles River and Interstate 101 freeway to the south. Westfield Fashion Square shopping mall is located to the east across Hazeltine. To the west, Calhoun Avenue (Calhoun) is a residential street lined with single family homes. The Sunkist Building is located on a large, low density site, which slopes down to the south (the property). The Sunkist Building is substantially set back from Riverside at the center of the southern half of the property. The Sunkist Building is surrounded by a surface parking lot lining the north, east, and west elevations (Attachment A, Fig. 1). The main entry drive, on axis with the north entrance on Riverside, is lined with eucalyptus trees. Monument signs are located on either side of the north entrance on Riverside. The property boundary is landscaped with grass and low shrubs with pine trees planted along Hazeltine. A pole sign is located at the corner of Hazeltine and Riverside.

Prior to the construction of the Sunkist Building, which began in 1969, the property was the Eunice Knight Saunders School and contained several buildings and a swimming pool at the time of redevelopment. The north approach to the subject property, particularly the eucalyptus trees, are remnants of this earlier site plan.

Exterior

The Sunkist Building is a horizontal mass in form and is square in plan, with four nearly identical elevations and a flat roof. It is comprised of a series of solids and voids with four compositional sections or levels (Attachment A, Fig. 2). Designed in the Brutalist style, the Sunkist Building is constructed of a steel frame clad with smooth, precast concrete panels. The concrete is covered in a textured coating and painted a Navajo White color. It sits on an elevated basement, which appears as a monumental concrete plinth and a landscaped berm from the exterior, covered with plantings except for driveways to interior parking and service areas at the west and south elevations. A pedestrian exit from the parking is at the east elevation. The podium level (first floor) entrances are accessed through wide staircases which bisect the plinth and berm up to the podium terrace at the first floor, and are centered at north, east and west elevations. A single narrow staircase is located on the south elevation along a driveway.

The first floor is located above the elevated basement. Fenestration consists of a continuous glass wall with aluminum brake-metal, using bronze tinted glazing and dark bronze metal, typical of all levels and elevations. The podium terrace is clad in brick paving with a colonnade of massive concrete piers supporting upper levels. The top of the plinth has a continuous concrete bench which

[3] Architectural Resources Group, "SurveyLA: Historic Resources Survey Report Draft, Van Nuys-North Sherman Oaks Community Plan Area," July 31, 2015.

surrounds the building on all four elevations. The piers are trapezoidal in shape and abut at the corners.

Second and third levels cantilever over the podium level and are subdivided into smaller square bays with triangular sidewalls that extend to the bottom of the floor plates below. The triangular sidewalls shade deeply inset fenestration of fixed sash windows with bronze tinted glazing. Unlike the piers, which form a solid element on the podium level, glass at the second and third levels butt together at the corners, generating a void.

Interior
The interior is defined by a large open air, central courtyard with a small fountain. The elevated basement contains parking and offices. The podium level lobby (lobby) at the north elevation features brown brick flooring that continues through to the central courtyard. The first through third floors are characterized by repetitive floor plans consisting of single-loaded corridors encircling the courtyard, providing access to offices and other ancillary spaces, including kitchen, board, conference, and dining rooms.

Alterations
Alterations to the Sunkist Building are minor. The setting, including the layout of the surface parking deck, and exterior are largely intact. Though a texture coat finish was not specified on the original plans, the exterior walls are described as "stucco" on a signage application from 1971, shortly after the completion of initial construction.[4] The main entry drive, lined by eucalyptus trees, pre-dates the subject property. Driveways to underground parking and interior loading docks at the south and west elevations were most recently reconfigured in 1996. Handicap ramps and ADA compliance work began in 1988.

The central courtyard was modified in 1994 when the fountain was resized from a large square to a smaller square, and new paving was used for infill.[5] In the majority of the tenant spaces, interior finishes have been replaced repeatedly; a continual process that began shortly after the subject property was first occupied in 1971.[6] The repetitive floor plan with a single-loaded corridor encircling the central courtyard is generally intact.

Character-defining features
As defined by the National Park Service, the character-defining features of a building encompass "the overall shape of the building, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment."[7] The following are character-defining features of the subject property:

- Four symmetrical elevations
- Inverted pyramidal massing
- Regular and repetitive geometrical pattern of solids and voids across all elevations
- Triangular sidewalls (canopies) shading inset upper level windows
- Plinth and landscaped berm with colonnade of trapezoidal piers

[4] Los Angeles Department of Building and Safety, "Application for Inspection of Signs," Permit #27445, 23 April 1971.
[5] Los Angeles Department of Building and Safety, "Application for Inspection," Permit #28842, 14 December 1994.
[6] Los Angeles Department of Building and Safety, "Application to Alter, Repair, or Demolish," Permit #65477, February 3, 1971.
[7] Lee H. Nelson, FAIA, *Preservation Brief 17: Architectural Character Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character*, National Park Service, Technical Preservation Services.

- Primary approach from north and view from Riverside Drive, including main entry drive with flanking landscaped medians
- View of south elevation from Interstate 101 freeway
- Wall of central courtyard mirror cantilever of exterior elevations
- Repetitive floor plans generally consisting of single-loaded corridors encircling the courtyard

VI. PROPOSED PROJECT

In July 2016, a Draft Environmental Impact Report (DEIR) was issued for the originally proposed project.[8] Five alternatives to the original proposed project were presented in the DEIR, and the City of Los Angeles (City) identified Alternative 5 as the preferred alternative. In late 2017, and early 2018, the project team collaborated with the Sherman Oaks Neighborhood Council (SONC) to modify Alternative 5 with respect to the sizes and locations of the proposed new construction, based on community concerns. The modified Alternative 5 is described herein as the proposed project and this Preservation Plan is based on both the Detailed Design drawing set dated October 14, 2015 and the Design Update drawing set dated June 13, 2018 (Attachment F: Proposed project plans and renderings (abridged), Attachment B: Updated Drawings and Renderings).

The Design Update contains plans, elevations, site sections, landscape plan, and renderings.

The proposed project includes a historic rehabilitation component that would focus on the rehabilitation of the main entrance, courtyard, and lobby of the Sunkist Building. The upper floors would continue to function as office space, with changes subject to individual tenant needs. Tenant improvement guidelines would be developed which would ensure future changes are compatible with the character of the Sunkist Building, and do not alter character-defining features, and views of the Sunkist Building from the exterior.

The proposed project includes construction of two mixed-use buildings, one parking structure, and one parking deck adjacent to the Sunkist Building. The primary elevations of the two new buildings would face Riverside and each would have five stories above grade and two stories of below grade parking. Both buildings abut the sidewalk along Riverside and are approximately 220 (east building) and 230 (west building) feet long and extend approximately 194 feet deep along Hazeltine and Calhoun respectively (Attachment A, Fig. 4). Both buildings are rectangular in plan, have asymmetrical primary elevations, and tall first floors which echo the podium level of the Sunkist Building (Attachment B, Rendering 1). Mature trees along the main entry drive would be removed and replaced with Date Palms.

The parking structure is located along Calhoun and is proposed to have three stories above grade and two stories below grade. The 2-story parking deck is located along Hazeltine and consists of a one story at grade and one story below grade and landscaping (Attachment A, Figs. 3-7).[9]

Landscaping plans for the property include creation of a new linear park along Hazeltine that would be public open space (Attachment A, Fig. 6). New public open space is also proposed at the southern end of the property adjacent to the Los Angeles River as part of the Los Angeles River Master Plan (Riverfront Park). Some existing mature trees would be removed to create the Riverfront Park. Additional new landscaping would be installed on the interior of the property, as well as around the perimeter.

Views of the Sunkist Building

Existing Conditions

The subject property is visible from the streets that surround the parcel at three sides, Calhoun at the west, Riverside at the north, and Hazeltine at the east, with mature trees partially obscuring the view from nearly all vantage points on these surrounding streets.

[8] Eyestone Environmental, LLC, "Draft Environmental Impact Report: ICON Sherman Oaks Project," July 2016.

[9] While project plans have changed, and the 2-story parking deck is now proposed to be a surface parking lot at grade with landscaping, drawings that reflect this change were not available when this report was issued.

The south elevation of the subject property is visible from the Interstate 101 freeway, although the view from this vantage point is partially obscured by mature trees.

Scope of Work
The proposed project includes construction of two mixed-use buildings, one parking deck (east parking deck), and one parking structure (west parking structure) adjacent to the Sunkist Building. These buildings and structures would be constructed at the existing paved parking areas and would largely obscure the existing views of the west and north elevations of the Sunkist Building. The proposed project also includes viewsheds between proposed new buildings to provide views of the Sunkist Building from all three surrounding streets. This includes an approximately 47-foot viewshed at Private Drive A, between the two five-story buildings along Riverside, creating south-facing viewshed of the Sunkist Building.

The parking structure is proposed to be approximately 26 feet tall, a height which allows for a view of the upper floors of the Sunkist Building from the west. Looking east from Calhoun, there is proposed to be an approximately 43-foot wide viewshed through the parcel at Private Drive B (Attachment A, Fig. 4).

The 2-story parking deck is at grade with one below-grade level, creating largely unobstructed views of the Sunkist Building from Hazeltine (Attachment B, Rendering 2). The linear park proposed along Hazeltine supports public engagement with this view.

Some existing mature trees at the southern end of the property would be removed for the Riverfront Park proposed for the area between the Sunkist Building and the adjacent Los Angeles River (Attachment A, Fig.7). Aside from some proposed landscape changes, the south elevation view from the Interstate 101 freeway would remain.

Treatment
The new buildings and structures allow for views of the Sunkist Building at all elevations. The linear park allows for greater engagement with views of the Sunkist Building along Hazeltine. Generally, the new landscaping plan supports improved views of the Sunkist Building. Typically, we would recommend exploring using planting material that would have been planted at the time the Sunkist Building was constructed. However, the proposed project, located adjacent to the Los Angeles River, is required to comply with the City of Los Angeles River Improvement Overlay District Ordinance, which includes specifications on the types of plantings that may be used.[10]

The proposed new views of the Sunkist Building are acceptable.

Primary approach from north
Existing Conditions
The vehicular entry from Riverside provides the primary approach to the Sunkist Building (main entry drive). This approach is defined by a central driveway that aligns with the Sunkist Building main entry stairs and doors. The main entry drive is flanked on both sides by a landscaped strip that consists of grass, shrubs, and mature eucalyptus trees (Attachment A, Fig. 8). The eucalyptus trees were planted as part of landscaping related to the Eunice Knight Saunders School that occupied the subject property before the Sunkist Building was constructed.

Scope of Work
The proposed project would retain the existing view corridor from the north to the main entry of the

[10] "Zoning Information (Z.I) No. 2358 River Improvement Overlay District," Ordinance Nos. 183144 and 183144," City of Los Angeles, revised January 12, 2015, http://zimas.lacity.org/documents/zoneinfo/zi2358.pdf.

Sunkist Building between the two new buildings. The new plaza design would incorporate the symmetrical elements of the existing main primary approach into the new design to visually reinforce the axis. This would be accomplished with the planting of new palm trees on either side of the new driveway, providing similar symmetry to the existing eucalyptus trees, which would be removed for the new design.

Treatment
The existing view corridor would remain and would be improved with new plantings. The proposed new primary approach from the north is acceptable.

Landscaping at berm
Existing Conditions
While historic photographs from 1970 show the berm consisting of a continuous slope on the east, south, and west elevations (Attachment A, Figs. 9-10), other historic photographs from the same era show a less defined slope with young trees and small shrubs planted in these areas (Attachment A, Fig. 41). The landscaping at the berm has since matured and, today, exhibits mature trees and shrubs at all elevations, with few areas which still reveal a continuous slope. Despite the mature landscaping, the berm continues to contribute to the monumentality of the Sunkist Building.

At the north elevation, the berm contributes to the symmetry of the inverted pyramidal design, tapering toward the main entry steps and adjacent ADA access ramps (Attachment A, Fig. 16). However, this berm is not as pronounced or steep as the other three elevations.

Scope of Work
The landscaped berm would be altered for a new, compatible design that accommodates new exterior seating and improves pedestrian circulation. To meet these needs, the proposed project includes the berm taking on a stepped form at the east, south, and west elevations. This stepped design would retain the general character of the berm feature by providing shrub and tree plantings at various levels, maintaining a modified form of the existing slopes. This would allow the new stepped berm to contribute to the monumentality of the Sunkist Building, while providing a welcoming access to all four elevations of the podium terrace.

The berm at the north elevation would be minimally altered to retain the symmetry that correlates with the inverted pyramidal design.

Treatment
Due to the height and prominence of the berm at the south elevation, we recommend preserving the slope, height, and character of the berm at this elevation to the greatest extent possible. In addition, we recommend that the southwest and southeast corners of the berm transition to the stepped planters, serving as sloped returns to better incorporate the monumentality of the south elevation with the proposed berm design changes at the west and east elevations.

It is also our recommendation to retain the current width of the stairs at the north elevation.

Plinth, podium terrace, and colonnade of trapezoidal piers
Existing Conditions
The mature berm landscaping obscures nearly all views of the plinth, with the exception of areas directly above the driveways to interior parking and service areas at south and west elevations (Attachment A, Fig. 11). The colonnade of trapezoidal piers contributes to the visual prominence of the podium level of the exterior of the Sunkist Building (Attachment A, Fig. 14). The podium level currently has brick pavers around the exterior of the building. It features a continuous concrete bench that continues around the building on all four elevations.

Scope of Work
The colonnade of trapezoidal piers would remain unaltered. The concrete plinth would be retained and remain visible in some locations on the south, west, and east elevations. In other locations on the east, south, and west elevations, the plinth would not be as tall as it currently is but would remain partially visible. The podium terrace is proposed to be altered through the removal of portions of the concrete bench on the north elevation.

Treatment
We recommend retaining the plinth height and visibility to the greatest extent possible.

Inverted pyramidal massing
Existing Conditions
The Sunkist Building features an inverted pyramidal design, which occurs on all perimeter exterior elevations as well as interior courtyard elevations. (Attachment A, Figs. 18-20).

Scope of Work
The inverted pyramidal massing would be unaltered on the exterior elevations and would be minimally affected by changes to the courtyard elevations (Attachment B, A3.01, A4-01).

Treatment
We recommend no changes to the exterior, and minimal changes to the courtyard elevations to incorporate the proposed courtyard terrace boxes.

Regular and repetitive geometric pattern of solids and voids
Existing Conditions
The Sunkist Building features a regular and repetitive geometric pattern of solids and voids across all exterior and courtyard elevations.

Scope of Work
The regular and repetitive geometric pattern of solids and voids would be retained across all exterior elevations, as the exterior design is proposed to be unaltered. The courtyard elevations, however, would experience minimal loss of this regular and repetitive geometric pattern of solids and voids with the additions of various courtyard terrace boxes (Attachment F, L1.0).

Treatment
We recommend minimal changes to the courtyard elevations that incorporate the proposed courtyard terrace boxes.

Triangular sidewalls shading inset second and third floor windows
Existing Conditions
At the exterior and courtyard elevations of the second and third floors, there are triangular sidewalls that shade the inset windows at each bay. These sidewalls contribute to the inverted pyramid design of the subject property, serving as components of the regular and repetitive geometrical pattern of solids and voids.

Scope of Work
Since the proposed projects does not include alterations to the exterior design, the regular and repetitive geometric pattern of solids and voids would be retained across all elevations. The courtyard elevations, however, would experience minimal loss of these triangular canopies shading inset second and third floor windows with the additions of courtyard terrace boxes (Attachment F, A10.1.03).

Treatment
For recommendations related to the courtyard elevations, see section on courtyard terrace boxes.

Hazardous materials
Existing Conditions
An asbestos and lead inspection report completed by CF Environmental, Inc. dated April 2, 2015 shows several areas with asbestos containing materials. It identifies materials and locations as follows:

- Sprayed fireproofing: 20% Chrysotile asbestos (historical sampling) on metal deck, structural steel, support columns with overspray and debris above ceilings, within wall cavities, air shafts, perimeter soffits, support columns and elevator shafts and cement decking. Estimated quantity is 137,974 SF of nominal surface area coated with fireproofing on the first, second, and third Floors;
- 12" black (dark brown) floor tile: >1% Chrysotile in tile, 3-4% in mastic. Located in stairwells, landings, under carpet in the cafeteria, projection room, various storage rooms, under linoleum and plywood in third floor storage room and kitchenette. Estimated quantity is 5,932 SF;
- 12" off white/tan floor tile: >1% Chrysotile in the Tile, 3-4% in the mastic. Located in basement hallway, offices, shop, storage rooms, housekeeping rooms, maintenance rooms, service elevator lobbies, and electrical rooms; some areas under carpet. Estimated quantity is 5,500 SF;
- 12" gray/white floor tile: 0% in tile, 3-4% Chrysotile asbestos in mastic. Located in IBE com room and kitchen. Estimated quantity is 256 SF;
- Exposed floor tile mastic: 3-4% in kitchen storage room and bank vault. Estimated quantity is 120 SF;
- Joint compound: 1-2% Chrysotile asbestos. Applied to drywall sheeting in basement storage rooms, walls in parking areas, trash Room, and auto shop areas. Estimated to be applied to 450 LF of wall (double sided) and 600 SF of ceiling;
- Joint compound applied to original modular walls remaining on the second and third floors: 0.25% Chrysotile following Point Count Analysis. Estimated quantity is 500 LF (double sided);
- Fitting insulation on domestic hot water lines in boiler room, air handler rooms, and above hallway ceilings. Estimated quantity is 45 each;
- Insulation mud at tee's: 20% Amosite asbestos on domestic hot water lines in parking and storage areas. Estimated quantity is 18 each;
- Insulation mud at valves, tees and hard fittings: 15% Chrysotile asbestos on chilled and hot water lines. Estimated quantity is 120 each;
- Hanger insulation: 20% Chrysotile asbestos. The insulation is used with metal saddles at support hangers on hot water heating lines. Estimated quantity is 48 each;
- Boiler insulation: 10% Chrysotile asbestos. Located on interior of boiler in basement boiler boom. Estimated quantity is 140 SF;
- Overflow tank: 10% Amosite asbestos, 10% Chrysotile. Located above boiler in basement boiler room. Approximate quantity is 18" x 6';
- Black mastic: 10% Chrysotile asbestos inside air handling equipment at heating and cooling coils. Estimated quantity is 280 SF;
- Fire door insulation (original doors/transoms): 30% Amosite, 10% Chrysotile. Located at stairwells, storage rooms, and hallway doors throughout the basement and select locations on upper floors. Estimated quantity is 54 each;
- Textured coating on interior concrete window treatments: 1-2% Chrysotile asbestos. Estimated quantity is 7,800 SF;

- Exterior textured coating: 1-2% Chrysotile asbestos. Applied to exterior concrete structure, overhangs, window treatments, columns, walkway walls, and retaining walls. Estimated quantity is 94,500 SF;
- Base flashing: 7-13% Chrysotile asbestos. Flashings are applied at equipment curbs installed as part of the original roof system and interior and exterior perimeter wall including mastics. Estimated quantity is 1,464 LF;
- Roof mastics: Mastics are applied to all penetrations and breaks in the roof system including anchor points, vent pipes, inside and outside corners, and repair locations. Historically, this material contains 5-15% Chrysotile asbestos and was not sampled as part of this inspection. Estimated quantity is 600 SF; and,
- Transite Cement Board: 15% Chrysotile asbestos. Installed as backer board beneath stucco enclosures at mechanical equipment. Estimated quantity is 1,040 SF. Newer stucco enclosures surrounding cell service equipment were not included in this survey.[11]

Scope of Work
Asbestos-containing materials are proposed to be removed from all accessible areas, which appears to include all materials and locations listed in the asbestos and lead inspection report.

Of the identified asbestos containing materials, two have the potential to affect character-defining features during removal:

- Textured coating on interior concrete window treatments: 1-2% Chrysotile asbestos;
- Exterior textured coating: 1-2% Chrysotile asbestos. Applied to exterior concrete structure, overhangs, window treatments, columns, walkway walls, and retaining walls.

Treatment
We recommend removing the asbestos-containing texture coating on the interior concrete window treatments and the exterior textured coating using the gentlest means possible and under supervision of a qualified conservator[12] or the historic preservation consultant. The method for removing the exterior and interior asbestos-containing texture coating should follow guidelines presented in *Preservation Brief 1: Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings*,[13] *Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings*,[14] and *Preservation Brief 15: Preservation of Historic Concrete*,[15] taking precautions to avoid damaging the underlying concrete and adjacent windows.

In removing the exterior texture coating, no abrasive methods, including sand or other abrasive blasting, and pressure washing greater than 400 psi, may be used. Chemical methods, such as solvent-based or caustic strippers, including products by PROSOCO, Inc. and Dumond Chemicals, are recommended. Products must be applied according to manufacturer specifications, including neutralization.

Means and methods for removal of paint and texture coating shall be approved by the historic preservation consultant and tested on a 6" x 6" portion of the concrete in an unobtrusive location

[11] CF Environmental, Inc., "Asbestos and Lead Inspection Report," 2 April 2015.
[12] A qualified conservator is an individual member of the American Institute for Conservation of Historic and Artistic Works (AIC), and has attained Professional Associate or Fellow designation in the organization.
[13] Robert C. Mack, FAIA, and Anne E. Grimmer, *Preservation Brief 1: Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings*, National Park Service, Technical Preservation Services.
[14] Anne E. Grimmer, *Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings*, National Park Service, Technical Preservation Services.
[15] Paul Gaudette and Deborah Slaton, *Preservation Brief 15: Preservation of Historic Concrete*, National Park Service, Technical Preservation Services.

(test panel) under the supervision of a qualified conservator or the historic preservation consultant. If pressure washing is selected as a method for testing, the pressure should start at a very-low pressure (40-100 psi) and increase incrementally only until the coating can be removed or until the concrete exhibits damage from the pressure washing. At no time should pressure washing exceed medium pressure (400 psi). If the concrete exhibits damage from pressure washing during testing, this method should be abandoned and other methods, including chemical methods, should be explored. After testing, the historic preservation consultant should approve means and methods for paint removal on the remaining exterior. As work is implemented, measures for proper disposal of paint and texture coating residue and containment of dust and debris shall be followed to protect workers and maintain a safe environment.

In removing the texture coating of the interior window treatments, chemical methods, such as solvent-based or caustic strippers, including products by PROSOCO, Inc. and Dumond Chemicals, are recommended. The process for which the appropriate method is selected should conform to the previous recommendation related to removing the exterior texture coating.

We recommend removing asbestos-containing materials from accessible areas only. If future testing identifies asbestos-containing materials in areas not easily accessible or in areas that require significant invasive action to access (such as around the steel framing within precast concrete panels), abatement should be avoided.

Paint removal and repainting

Existing Conditions

All exterior and courtyard elevations of the subject property are painted over a textured coating (Attachment A, Fig. 17). All available historic photographs show the exterior concrete painted. In 2016, the maintenance manager of the property noted that the paint has been Navajo White since the beginning of his employment at the subject property in the 1970s. Precast concrete panels that frame the interior windows at the second and third floors are painted with the same Navajo White color over a textured coating, but display a smooth finish, rather than the sand-like finish at the exterior (Attachment A, Figs. 36-37).

Scope of Work

As stated in the hazardous materials section, the existing textured coating is proposed to be removed from all exterior elevations, as it contains asbestos. Once the textured coating and paint is removed from these areas, the exterior would then be coated with a paint product to closely match the existing Navajo White color.

Treatment

Recommendations for removing the textured coating and paint should follow the recommendations presented in the Hazardous Materials section. We recommend repainting the precast concrete panels at the exterior with a Navajo White color. Although replicating the existing textured coating is an acceptable treatment, considering that the sand-like finish is not original, a smooth paint finish is also acceptable. The paint color for the interior of the Sunkist Building is flexible.

Signage

Existing Conditions

Until some point in 2012-2014, there were two signs that read “Sunkist” near the roofline at the western and eastern ends of the south elevation. These signs remained from the Sunkist Growers, Inc. occupation of the subject property, and date to the original construction of the Sunkist Building, as evidenced by historic photographs. At close range, these signs were primarily visible from the Interstate 101 freeway (Attachment A, Fig. 39). The sign on the western end was removed between

2012-2014 and replaced with a new sign that reads “imt RESIDENTIAL”, reflecting the current owner of the building (Attachment A, Fig. 13).

In March 2017, the sign on the eastern end was removed in conformance with an oral agreement executed between the current owner of the Sunkist Building and the prior owner. Upon removal, the sign was carefully crated, and stored on-site at the Sunkist Building. A new sign has since been installed at this eastern corner of the south elevation, which appears identical to the current sign on the western corner and reads “imt RESIDENTIAL”.

Scope of Work
The sign that reads “Sunkist,” now removed from the eastern corner of the south elevation, is proposed to remain crated on-site for possible future display.

Treatment
Given both “Sunkist” signs have been removed from the south elevation, we recommend installing the stored sign in the main lobby, for display. If displaying this sign is not feasible, a less preferable alternative to lobby installation would be to continue storing the sign on-site.

New entrance canopy
Existing Conditions
There is currently no distinctive feature that identifies the main entry to the Sunkist Building on Riverside. With proposed new construction adjacent to the subject property, the property owner requested the creation of a wayfinding point for the main entry.

Scope of Work
A new freestanding entry canopy is proposed to be constructed at the main entry to the Sunkist Building to fulfill the need for a wayfinding point. This feature would be a minor addition to the view toward the north elevation and is currently proposed to be painted in Dunn Edwards DEA108 Red Power. The canopy is proposed to be constructed of steel with a solid roof and align symmetrically to its respective elevation. The proposed structural support bracing is designed to be parallel to the existing column face (approximately 77 degrees), incorporating the angles of the trapezoidal piers into the new feature to increase compatibility. This feature is proposed to be attached to both grade and the floor of the podium terrace and is proposed to avoid contact with exterior elevations (Attachment F, A4.1.11, A4.1.21, A.9.1.02, A10.1.01, A10.1.02).

Treatment
We recommend the new canopy design utilize a paint color that is more consistent with the historic character of the Sunkist Building during its period of significance. We recommend studying the orange color that is found in the exit signs located at the basement floor (Fig. 38), which are likely original to the 1970 construction.

New courtyard trellis
Existing Conditions
The courtyard is currently open to the sky. To promote usability and to create a more hospitable environment in the courtyard, the property owner requested the installation of a new courtyard trellis to serve as a partial-shade structure over the courtyard.

Scope of Work
A new courtyard trellis would be constructed of steel and designed in a modified grid pattern with a large square-shaped void at the center. The proposed new courtyard trellis would be painted in a bright yellow color (Dunn Edwards DEA119, Electric Glow), and is designed in a contemporary manner that is differentiated from, yet compatible with, the Sunkist Building.

Due to the height of the Sunkist Building, and the position of the new courtyard trellis at the center of the building's square plan, the new courtyard trellis is not expected to be seen from any immediate street level, nor from the Interstate 101 freeway. The new courtyard trellis is proposed to be attached to the roof to avoid contact with exterior elevations (Attachment F, A9.1.05, A9.1.06, A9.1.07, A10.1.03, A10.1.04, S2.1.14, A5.01, A5.02).

Treatment
The proposed scope of work for the new courtyard trellis is acceptable.

First floor lobby doors, windows, and flooring
Existing Conditions
As with all fenestration at the subject property, the exterior doors and windows on the first-floor lobby have bronze tinted glazing in bronze aluminum storefront frames (Fig. 15). The bronze tinted glazing limits the amount of light that penetrates the interior. The first-floor interior lobby features brown del piso tile flooring.

Scope of Work
The glazing on the windows and doors at the entry to the lobby would be removed and replaced with new transparent low-iron glass, connected with spider clips to minimize visibility of new components. This area would be limited to the existing center span of windows and doors that are visible between the concrete trapezoidal piers. This corresponding span of doors and windows reflected at the courtyard elevation is also proposed to be replaced similarly.

Treatment
We recommend retaining the bronze aluminum storefront frames, avoiding use of spider clips, and replacing the existing bronze glazing with new transparent glass. Retaining the bronze aluminum storefront frames would provide more flexibility for changes to the main entry doors, with respect to height and operation. Nontraditional doors, such as particularly tall and/or pivot doors, would be acceptable for visual effect. If such a door is chosen, the removal of the existing header would be acceptable, so long that the width of the opening remains the same, the door uses compatible materials, and the original frames that surround the opening are retained or replaced in-kind.

New interior courtyard terrace boxes
Existing Conditions
The interior courtyard is defined by a large open-air space with a small fountain in the center (Figs. 18-20). The courtyard elevations of the subject property exhibit a similar inverted pyramid design as the exterior elevations, with each subsequent level cantilevering out over the previous level, and triangular sidewalls that shade deeply inset fenestration. These elevations are made up of a series of precast concrete panels that each consist of two triangular sidewalls—one on either side of the window—connected to a center panel situated below the window.

Scope of Work
The proposed project shows the addition of courtyard terrace boxes in various areas at the second and third floor of all four courtyard elevations (Attachment F, A4.1.12, A4.1.20, A9.1.01, A10.1.03, A10.1.04). These terrace boxes are designed as modules, and act as balconies, providing tenant outdoor space. These modules would be installed in the location of existing bays, in either a single or double module for a total of twelve boxes. For installation, the existing precast concrete panels (including existing windows) would be carefully removed and retained on-site for possible future reinstallation.

The new terrace boxes are proposed to be painted white (Sherwin Williams SW7006 Extra White) at the outside perimeter, with natural finish vertical ipe wood siding at the inside perimeter, and transparent guardrail panels.

Treatment
We recommend the design use no more than the proposed twelve terrace boxes. For the proposed terrace boxes to be installed, the affected precast concrete panels must be removed from the underlying steel frame. In these cases, we recommend removing, crating, and storing the entire concrete panel intact and on-site for possible future reinstallation.

Brick paving at courtyard
Existing Conditions
There are currently two types of brick paving used at the interior courtyard. One type of brick paving encircles the existing fountain, which was laid in the footprint of the original fountain upon its removal and is not original to the subject property. The other type of brick paving is the same brick as exists in the lobby, which is laid on the outside perimeter of the courtyard and original to the building (Figs. 18-20).

Scope of Work
The proposed project retains the existing brick paving directly outside the courtyard entrances, which are centered on each of the four courtyard elevations. The rest of the brick pavers would be removed and replaced with new paving, planter beds, benches, and a new water feature.

Treatment
We recommend retaining as much brick paving original to the 1970 construction as possible, and carefully removing, crating, and storing on-site those brick pavers that must be removed for the proposed planter beds, benches, or new water feature. We recommend concentrating any changes to the courtyard to the area that has already been altered, to the greatest extent possible.

Repetitive floor plans with single-loaded corridors encircling the courtyard
Existing Conditions
Except for the ground (basement) floor, the subject property exhibits single-loaded corridors at each floor, which encircle the courtyard.

Scope of Work
The first floor corridor is proposed to be altered at the areas to the east and west of the courtyard, allowing for tenant improvements in this area. The first floor areas to the north and south of the courtyard are proposed to be retained. The corridors on the second and third floors are proposed to be retained, with only minimal changes to existing rooms at the corridor areas to the north and south of the corridor.

Treatment
We recommend the first floor corridor and the associated brick flooring be retained to the greatest extent possible, and continue to encircle the courtyard. See tenant guidelines section for guidelines on first floor layouts. We determined that the second and third floor corridors have more flexibility for changes, due to a less-established relationship between the corridor and the courtyard, as compared to the first floor.

Concrete shear walls
Existing conditions
The Sunkist Building is steel-framed and clad in precast concrete panels. To date, there has not been any seismic retrofit work performed on the subject property. According to a seismic

performance evaluation report by John Labib + Associates Structural Engineers (JLA) dated July 27, 2015, the only previous seismic-related work occurred in December 1994, which consisted of minor repairs after the 1994 Northridge Earthquake.[16]

Scope of Work
The seismic performance evaluation report identifies structural deficiencies that, although limited, are recommended to be resolved by construction of concrete shear walls. The report shows the locations for these new concrete shear walls at the ground (basement) floor and first floor.[17]

The proposed scope of work considers these recommendations and incorporates construction of new concrete shear walls into the design. The locations of these new shear walls generally run between columns perpendicular to building elevations, do not affect the significant spatial arrangement of the single-loaded corridor on the first floor, and would be minimally visible from both the exterior and courtyard.

Treatment
The proposed scope of work is acceptable.

Antennae/Cell Sites
Existing Conditions
There are currently three locations of existing base camp equipment on the roof of the subject property—one at the northwest corner, one at the northeast corner, and one to the southeast of the courtyard.

There are three antenna sites at the roofline of two elevations of the Sunkist Building. On the south elevation, there is one antenna site at the western end and one in the middle of the elevation. On the east elevation, there is one antenna site in the middle of the elevation.

Scope of Work
There is no work proposed for the base camp equipment.

For the antennas, the scope of work proposes construction of new sleds on the roof to relocate the antennas from the east and south elevations. Each sled is proposed to be approximately six feet in height and located five feet from their current location towards the center of the subject property. This proposed work aims to remove the antennas from the east and south elevations, in an attempt to reduce their visibility. The expected visibility of these new sleds has not yet been determined.

Treatment
We recommend the sleds be as small and as short as possible and screened. We also recommend collocating the antennas to no more than two new enclosures to minimize visibility of the sleds from the adjacent streets, and from the Interstate 101 freeway. Collocation of wireless antennas is mandated by a Programmatic Agreement between the Federal Communication Commission (FCC), the National Conference of State Historic Preservation Officers (NCSHPO), and the Advisory Council on Historic Preservation (ACHP).[18]

[16] John Labib + Associates Structural Engineers, "Seismic Performance Evaluation Report, 14130 Riverside Drive, Sherman Oaks, California," July 27, 2015, 8.

[17] Ibid, 9-10.

[18] The Federal Communications Commission, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation, *Nationwide Programmatic Agreement for the Collocation of Wireless Antennas*, 2001.

VII. MAINTENANCE RECOMMENDATIONS

Precast concrete panels

Existing conditions

The painted precast concrete panels at the exterior and courtyard elevations of the subject property are texture-coated, painted, and appear to be well-maintained. Visual observations have not detected any spalling, and it appears that the textured coating on the surface of the precast concrete panels has protected the concrete over the years and has been appropriately patched when paint has chipped or flaked.

Due to the detection of hazardous materials, the existing texture coating is proposed to be removed from the concrete. The precast concrete panels are proposed to be repainted with a similar sand-texture finish, which would provide a layer of protection against moisture infiltration. A smooth finish paint would also be acceptable.

Maintenance recommendations

We recommend performing inspections of the precast concrete panels on a regular basis to detect any potential paint chipping or flaking, and any potential signs of concrete damage. All repairs and maintenance should follow *Preservation Brief 15: Preservation of Historic Concrete*,[19] and should avoid all abrasive cleaning methods, including sand-blasting, pressure washing above 400 psi, and grinding. We also recommend the precast concrete panels remain painted.

[19] Paul Gaudette and Deborah Slaton, *Preservation Brief 15: Preservation of Historic Concrete*, National Park Service, Technical Preservation Services.

VIII. TENANT GUIDELINES

The following tenant guidelines are necessary for this Preservation Plan to remain effective through occupation by future tenants. Each tenant lease agreement would include these guidelines, to be enforced by the property owner.

Exterior Doors and Windows

In areas that are subject to tenant improvements, exterior doors and windows must retain the bronze aluminum frames and bronze glazing to avoid creating visual contrast with historic character. New partition walls should align with exterior doors and windows and should not bisect windows.

First Floor Interior Layouts

In areas that are subject to tenant improvements, the historic single-loaded corridor on the first floor that encircles the courtyard should be retained to the greatest extent possible. If any area of the corridor must be altered, the brick paving should remain in place, to retain the defining boundaries of the original corridor. Although it is preferable to have the brick remain visible, tenant improvements could include the installation of carpet over the brick in a reversible manner that would not cause damage to the brick during installation, normal use, or removal.

Signage

Signage attached to the exterior fascia should be focused at the western and eastern ends of the south elevation, immediately below the roofline. Any additional tenant signage should be developed into an integrated signage program. The signage program should be developed to not alter any character-defining features of the Sunkist Building, should not overwhelm or compete with the Sunkist Building, and should be removable without causing harm to building materials. All additional signage must be limited to the interior lobby space, or on up to two tenant monument signs—one for a single tenant and another as a collocated sign for multiple tenants.

IX. PROVISION FOR FUTURE CHANGES TO SCOPE OF WORK

Any future changes to the planned scope of work must be disclosed to the historic preservation consultant before implementation. Upon notification, the historic preservation consultant would evaluate the potential for the new or changed item to affect historic materials and/or character-defining features, and would provide recommendations accordingly, effectively amending the Preservation Plan.

ATTACHMENT A: FIGURES AND PHOTOGRAPHS

SUNKIST GROWERS INC.
14130 RIVERSIDE DRIVE, SHERMAN OAKS, CA

THIS PAGE INTENTIONALLY LEFT BLANK

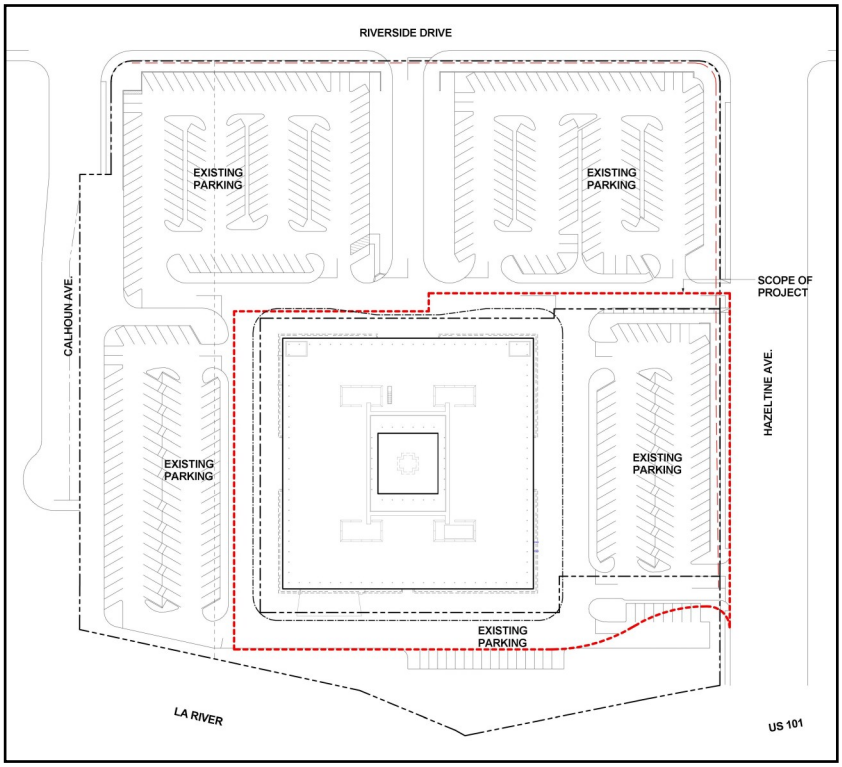


Fig. 1: Existing site plan (Johnson Fain, 2015).

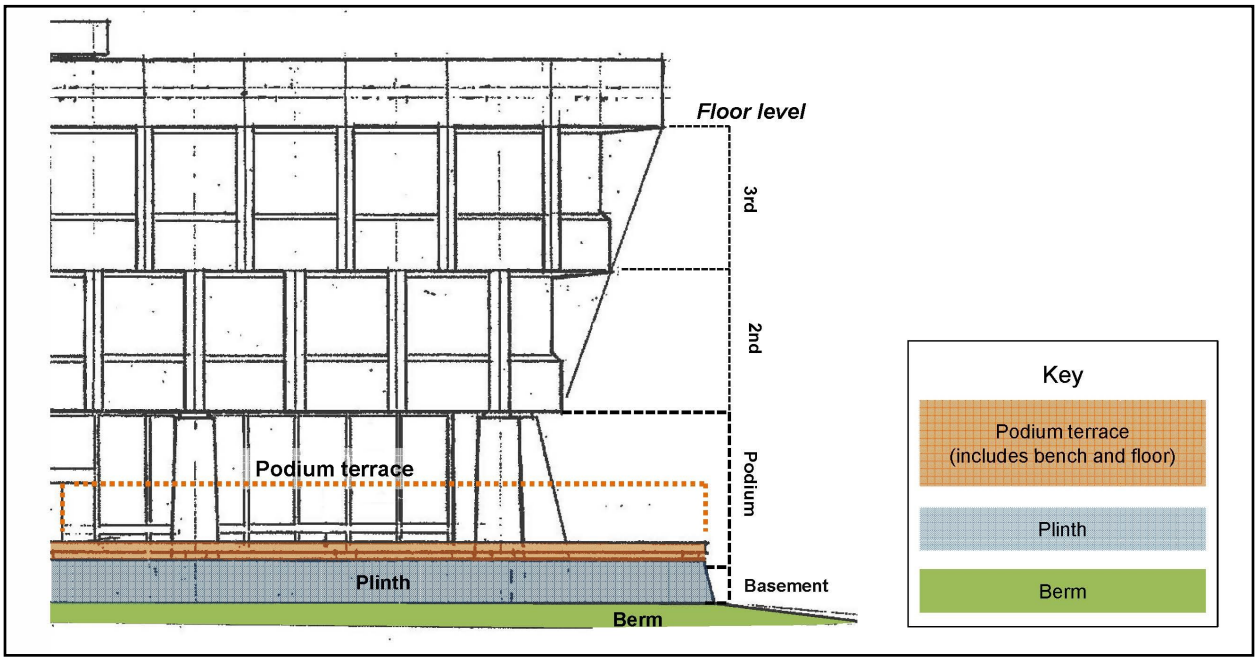


Fig. 2: Detail of four levels (basement, podium, second, and third), showing relationship to podium terrace, plinth, and berm (Chattel 2014).

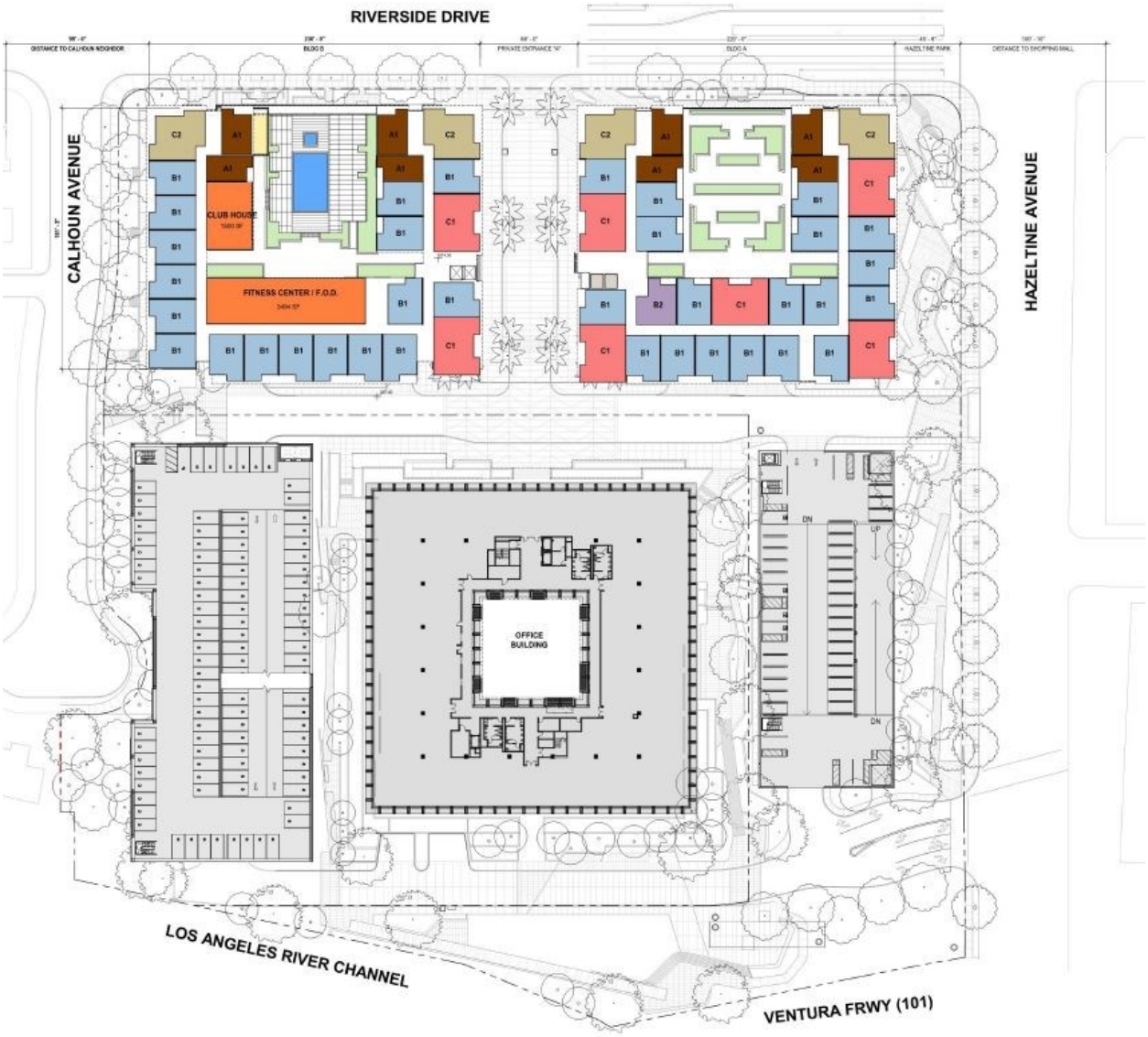


Fig. 3: Proposed site plan (Johnson Fain, 2018).

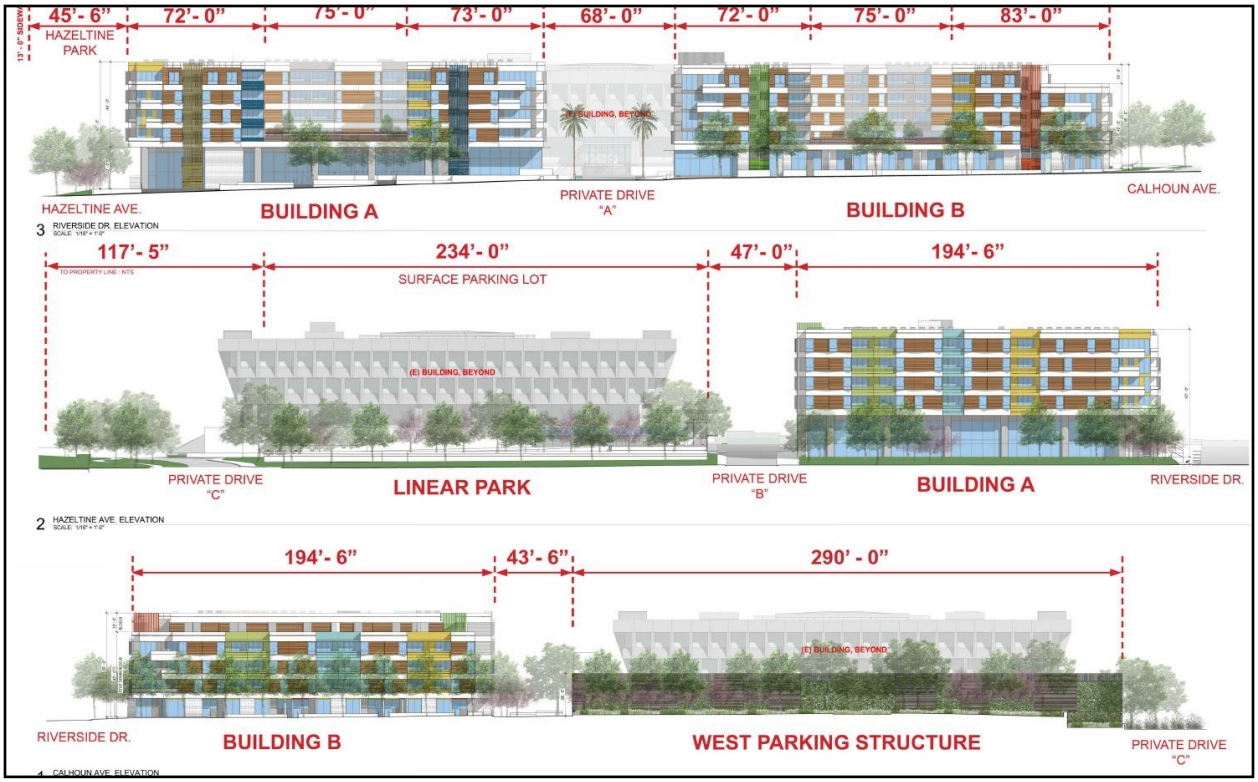


Fig. 4: Proposed elevations (Johnson Fain, 2018)

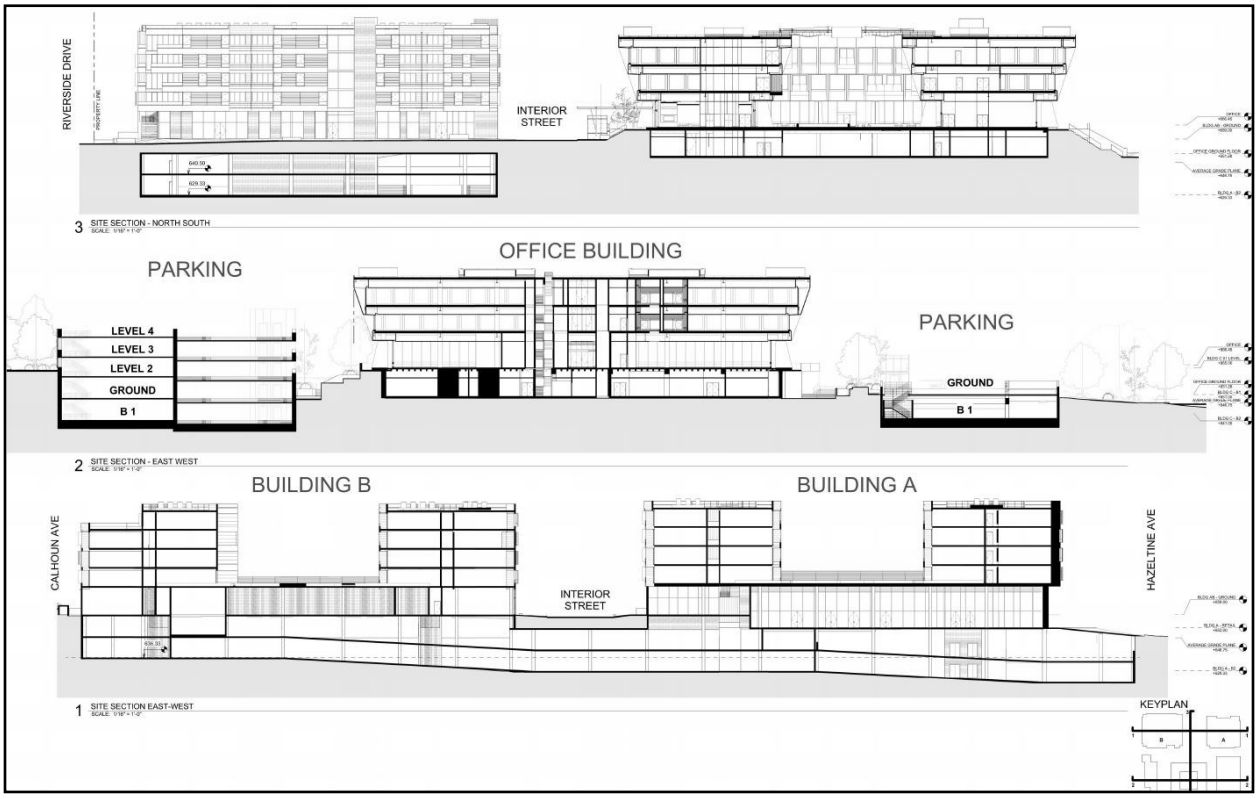


Fig. 5: Proposed sections (Johnson Fain, 2018)

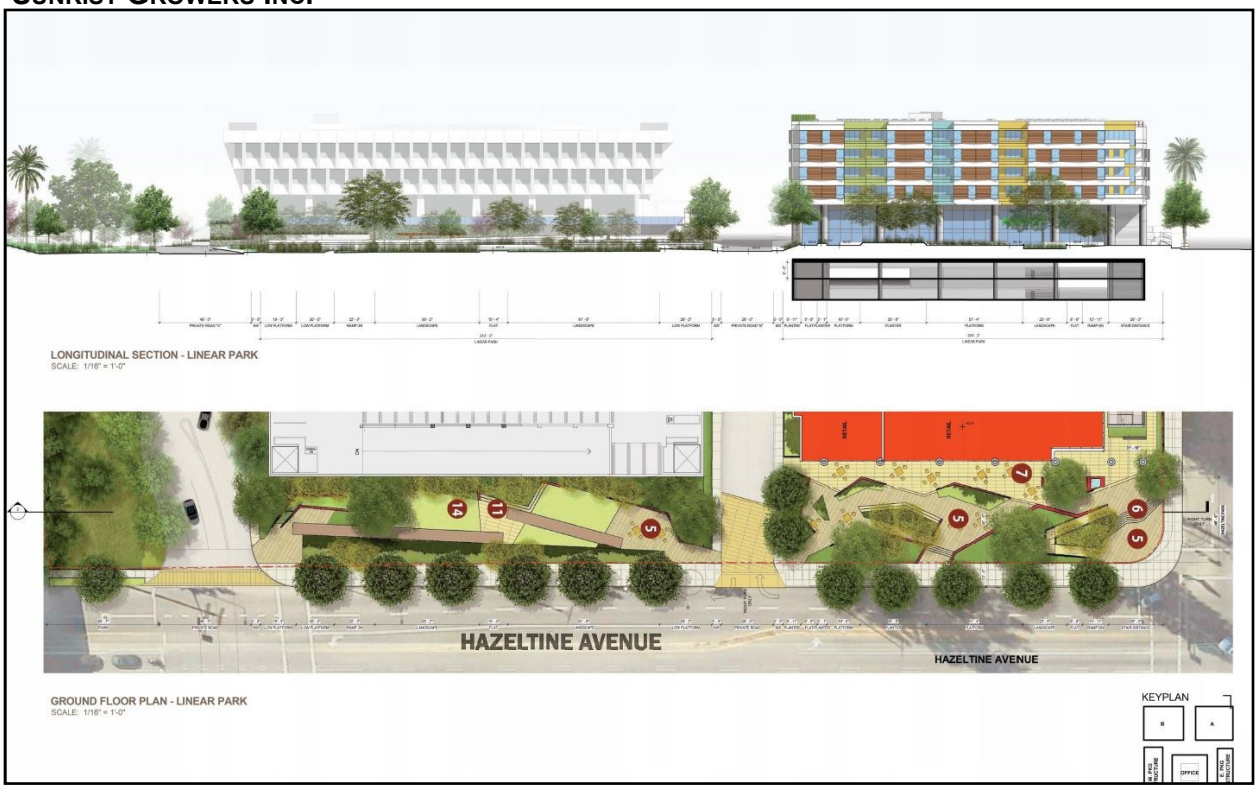


Fig. 6: Proposed linear park (Johnson Fain, 2018).



Fig. 7: Proposed landscape plan (Johnson Fain, 2018).



Fig. 8: Sunkist building, north elevation, view south (Chattel, 2012).



Fig. 9: Sunkist building, east elevation, view southwest (Chattel, 2012).



Fig. 10: Corner of west (left) elevation and south elevation with underground parking entrance (right), view northeast (Chattel, 2012).



Fig. 11: East elevation berm and underground entrance, view west (Chattel, 2012).



Fig. 12: Second and third levels of north elevation, view south (Chattel, 2012).



Fig. 13: Third level of south elevation showing contemporary signage of current property owner, view northwest (Chattel, 2012).



Fig. 14: North elevation with main entry stairs, view southeast (Chattel, 2012).



Fig. 15: North elevation main entry stairs, view south (Chattel, 2012).



Fig. 16: North elevation ADA access ramp, view southwest (Chattel, 2012).



Fig. 17: Exterior paint chipping on trapezoidal pier at south elevation. (Chattel, 2012).



Fig. 18: Courtyard elevations, showing square perimeter of original fountain (now removed), in dark bricks. (Chattel, 2015).



Fig. 19: Courtyard elevations, showing square perimeter of original fountain (now removed), in dark bricks. (Chattel, 2015).



Fig. 20: View of courtyard from roof, view southwest (Chattel, 2012).



Fig. 21: Rooftop, view east (Chattel, 2012).



Fig. 22: Base camp site on roof near north elevation parapet, view northeast (Chattel, 2012).



Fig. 23: Cell antennae on south elevation parapet, view southwest from roof (Chattel, 2012).



Fig. 24: Parking garage at ground (basement) level (Chattel, 2012).



Fig. 25: Parking garage at ground (basement) level (Chattel, 2012).



Fig. 26: Typical non-partitioned interior space at basement floor (Chattel, 2012).



Fig. 27: Typical corridor in basement floor (Chattel, 2012).



Fig. 28: Elevator lobby at first floor (Chattel, 2012).



Fig. 29: Lobby on first floor toward elevator lobby, view from main entry (Chattel, 2012).



Fig. 30: Lobby and main entry on first floor, view from elevator lobby (Chattel, 2012).



Fig. 31: Entrance to interior corridor on first floor, view from lobby (Chattel, 2015).



Fig. 32: View down interior corridor on first floor (Chattel, 2012).



Fig. 33: Employee cafeteria on first floor. The podium terrace at the west elevation is visible through the windows at the left (Chattel, 2012).



Fig. 34: Elevator lobby on second floor (Chattel, 2012).



Fig. 35: View down interior corridor on second floor (Chattel, 2012).



Fig. 36: Second floor windows from interior corridor, showing triangular shade canopies at the exterior (Chattel, 2012).



Fig. 37: Third floor interior corridor (Chattel, 2015).



Fig. 38: Exit sign at basement level interior (Chattel, 2016).



Fig. 39: View of Sunkist signage on south elevation from westbound Interstate 101 freeway. Google Streetview photograph taken July 2016.(Google, 2016)



Fig. 40: Sunkist building, rendering from display inside building, source unknown.

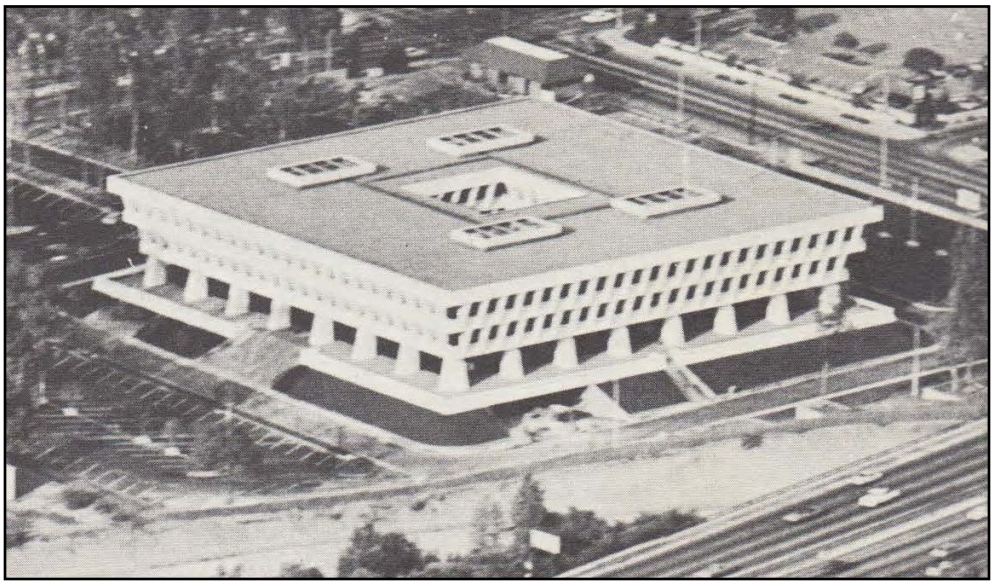


Fig. 41: Sunkist building circa 1970, from Sunkist Grower's, Inc. promotional brochure. The small building at northeast corner of parcel was likely temporary and does not appear on historic aerials before 1967 or after 1972.

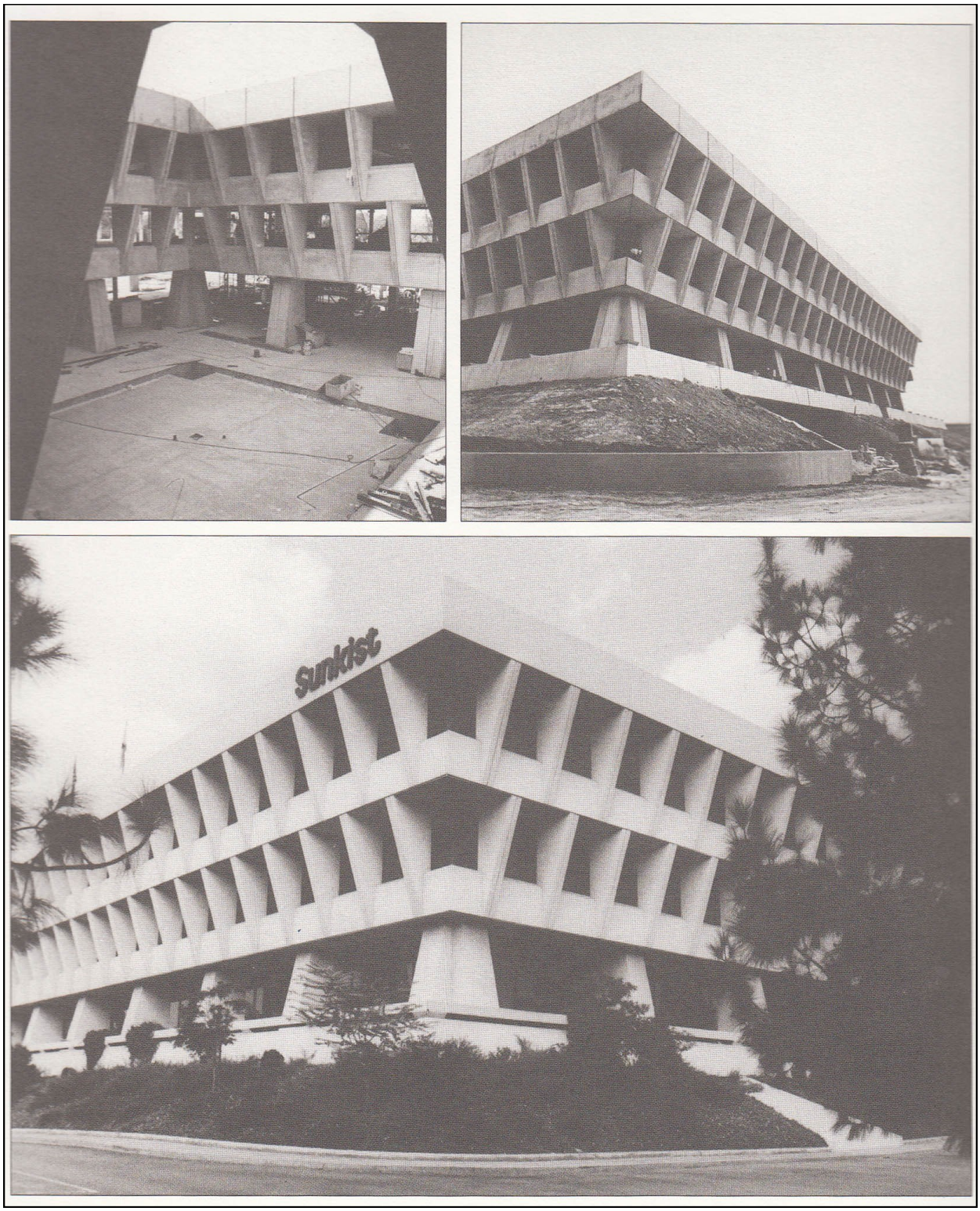


Fig. 42: Sunkist building circa 1970, from *Heritage of Gold.*

ATTACHMENT B: UPDATED DRAWINGS AND RENDERINGS

SUNKIST GROWERS INC.
14130 RIVERSIDE DRIVE, SHERMAN OAKS, CA

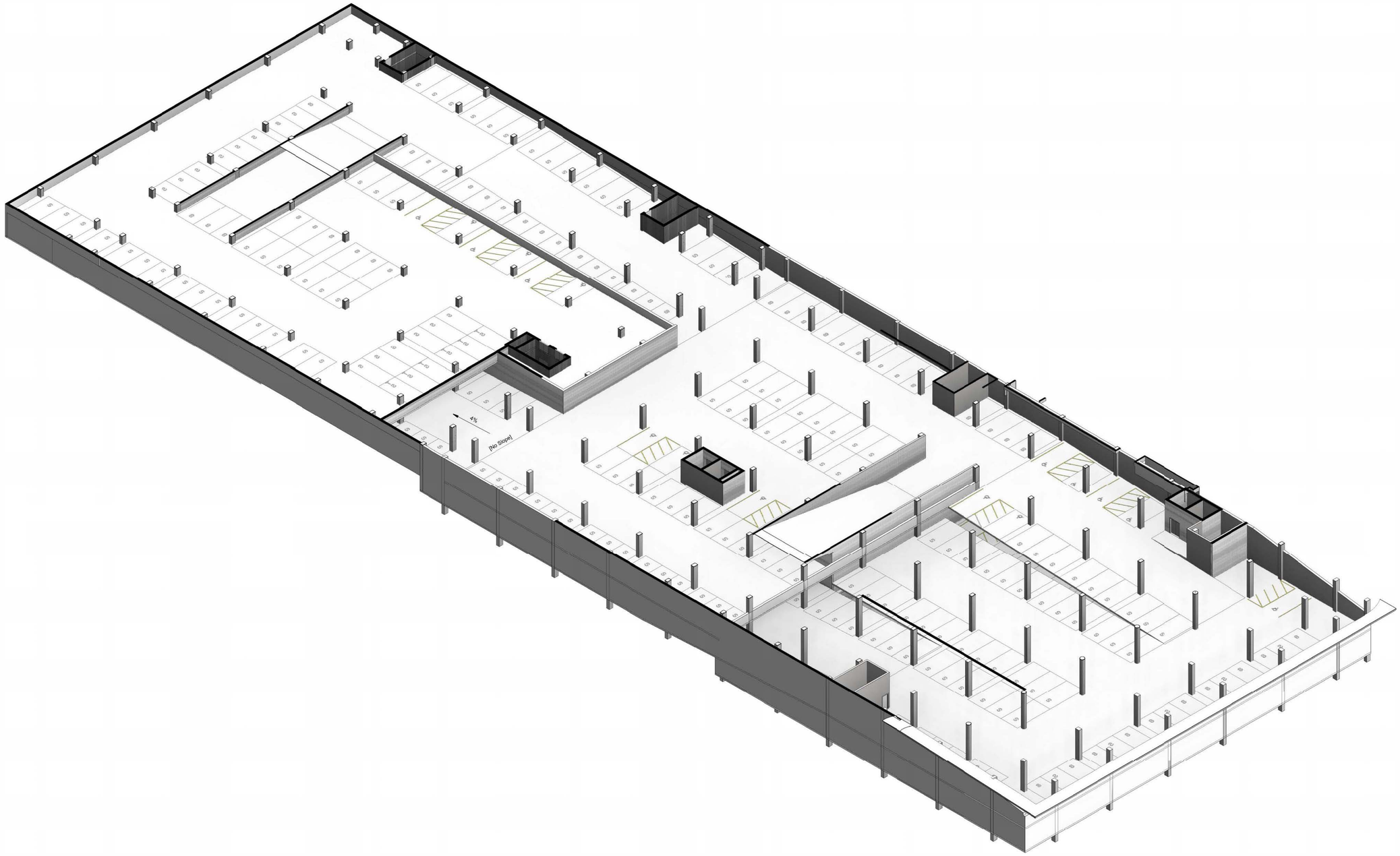
THIS PAGE INTENTIONALLY LEFT BLANK

DESIGN UPDATE

06-13-2018

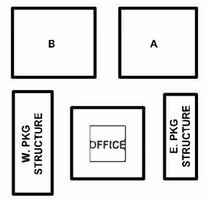


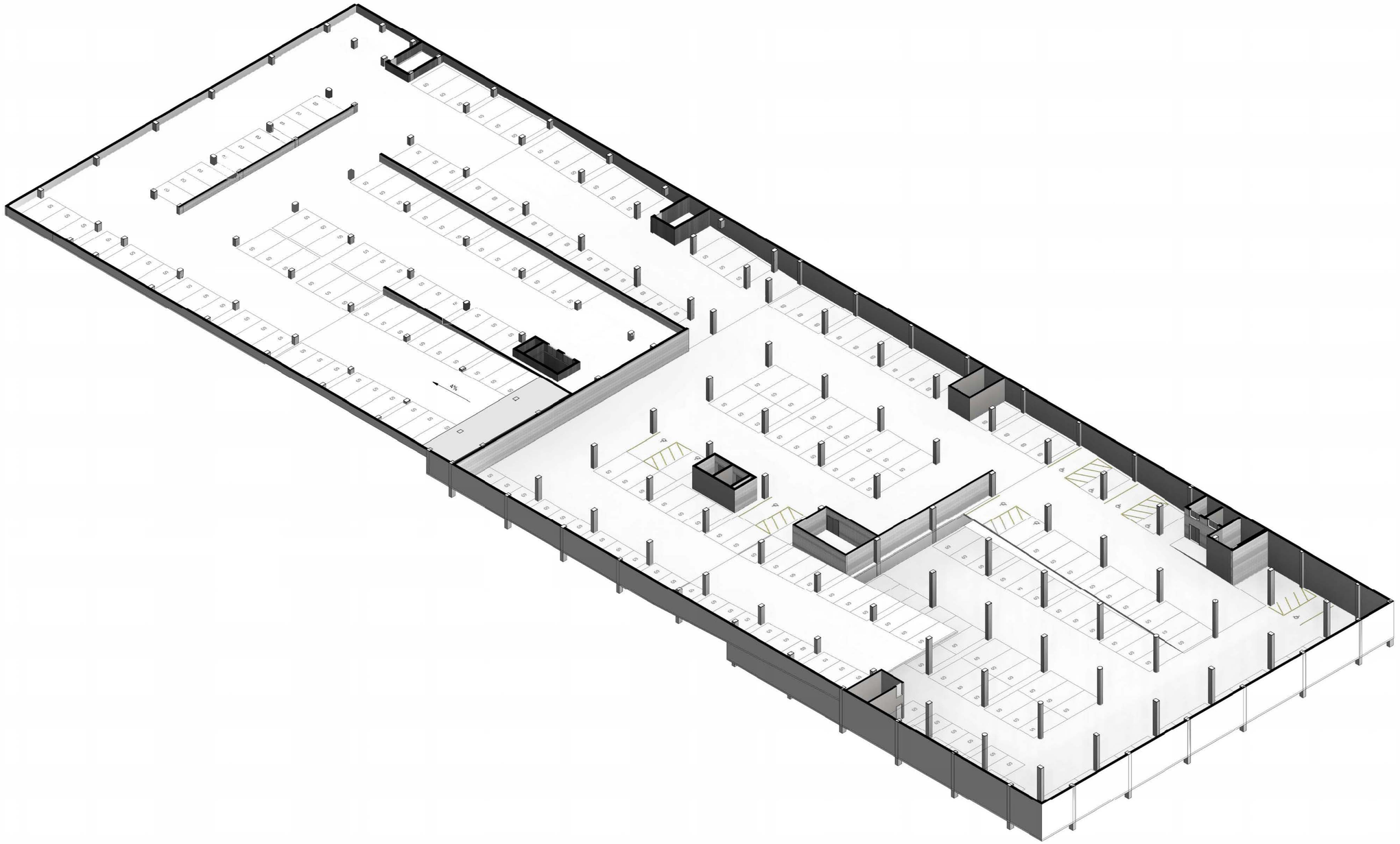
IMT - RESIDENTIAL



AXONOMETRIC - B1 PARKING
SCALE:

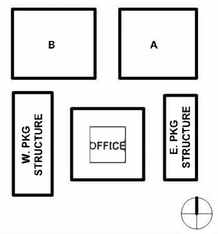
KEYPLAN



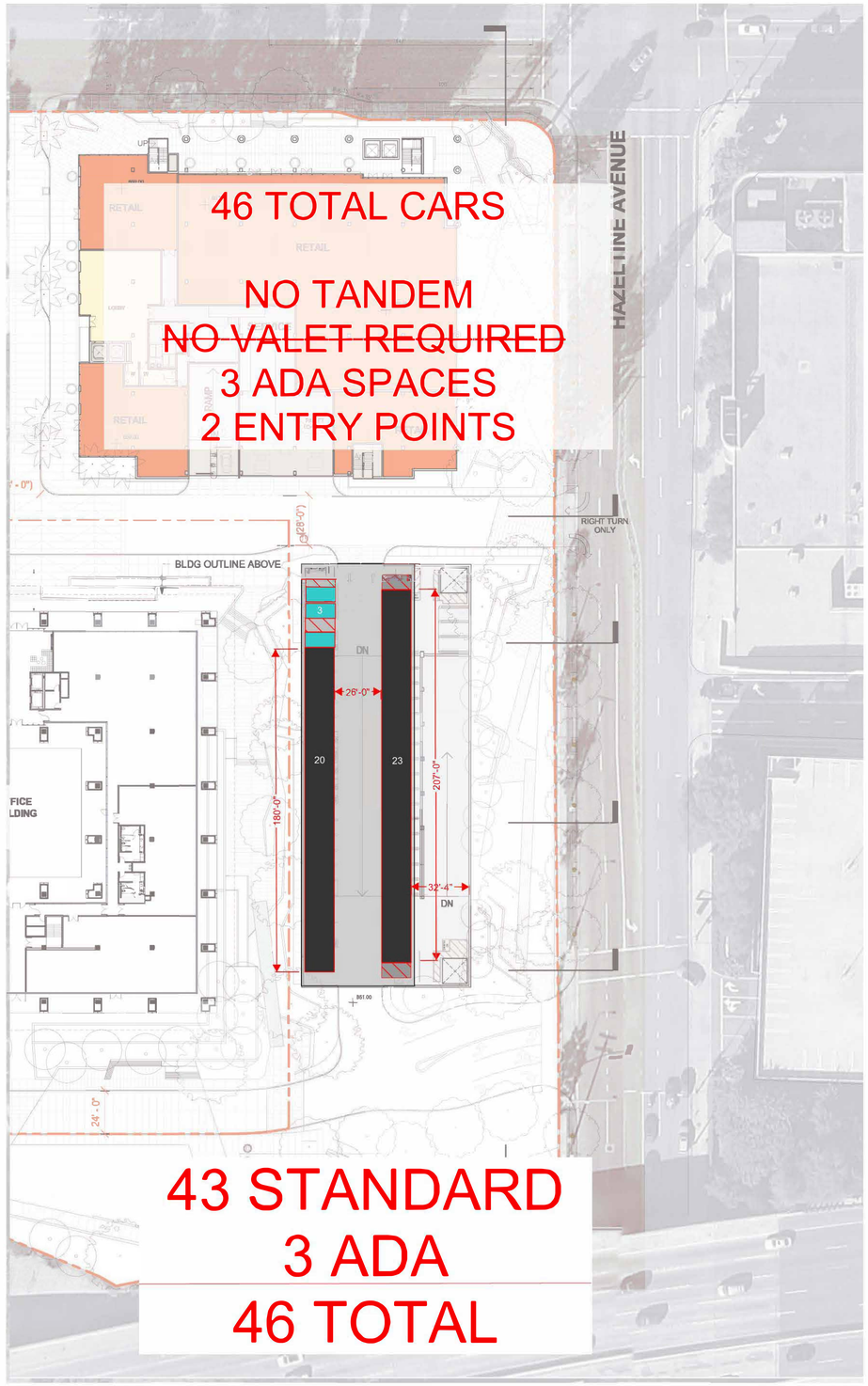


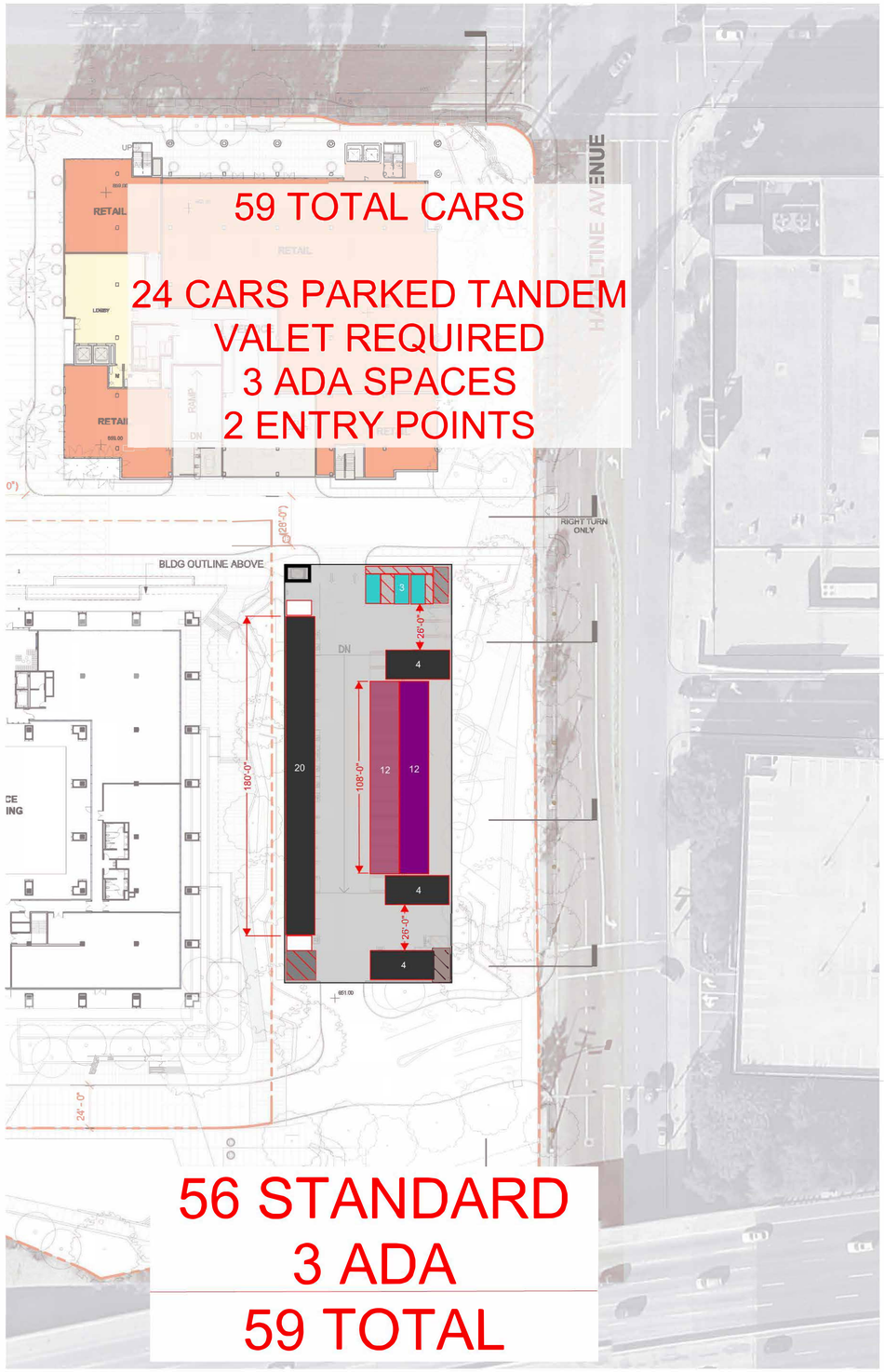
AXONOMETRIC - B2 PARKING
SCALE:

KEYPLAN



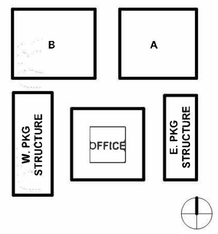
STUDY #2 SURFACE PARKING LOT





1 GROUND FLOOR PLAN
SCALE: 1/32" = 1'-0"

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

IMT RESIDENTIAL

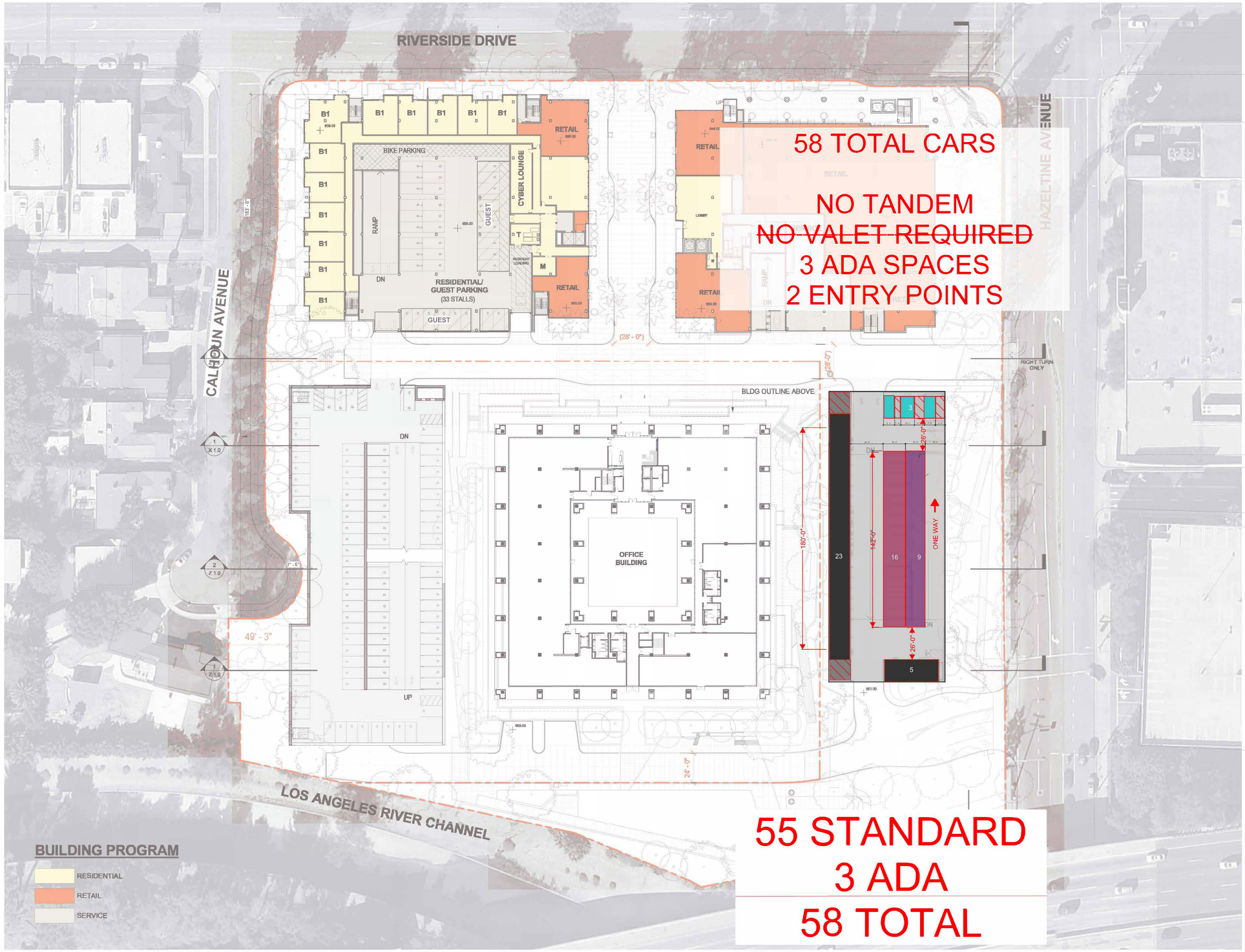
14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

GROUND FLOOR PLAN

06/13/2018

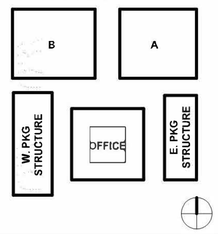
A2.01

STUDY #2 SURFACE PARKING LOT



1 GROUND FLOOR PLAN
SCALE: 1/32" = 1'-0"

KEYPLAN



OPTION 1 - 120 RETAIL

STUDY #3
Option #1

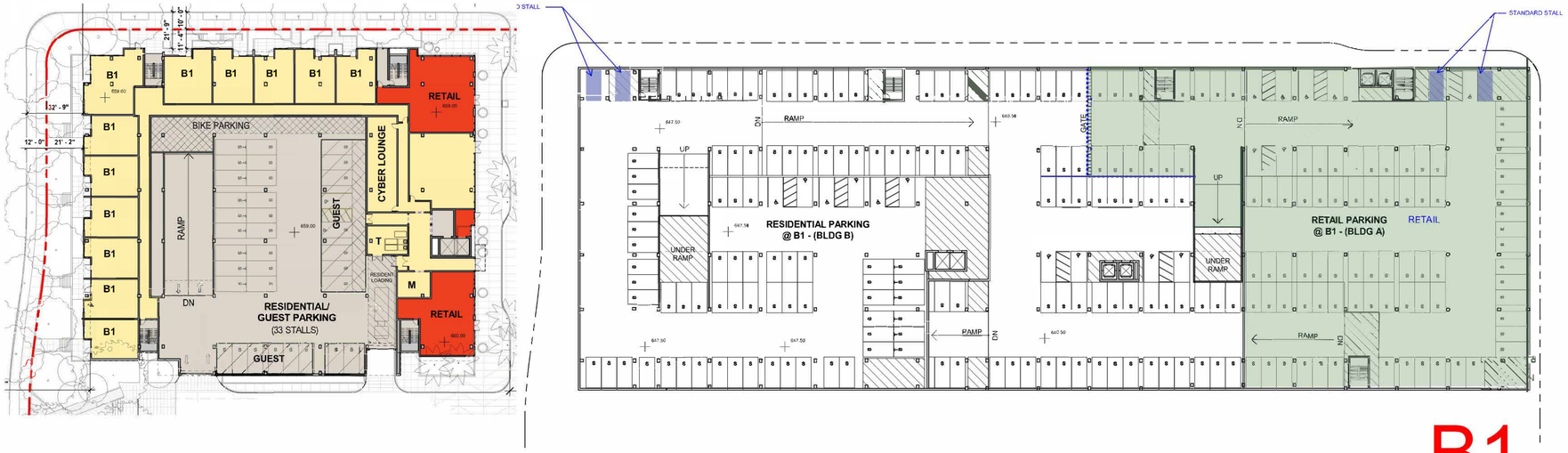
OPTION #1 - 120 RETAILS

TOTAL RESIDENTIAL PARKING = 388 STALLS
TOTAL RETAIL PARKING = 120 STALL
NOTE: 6 STALLS SHORT OF 514 (120+394=514)

+6 STALLS (IF ALTERNATE)
= 514 TOTAL (IF ALT)

GROUND LEVEL

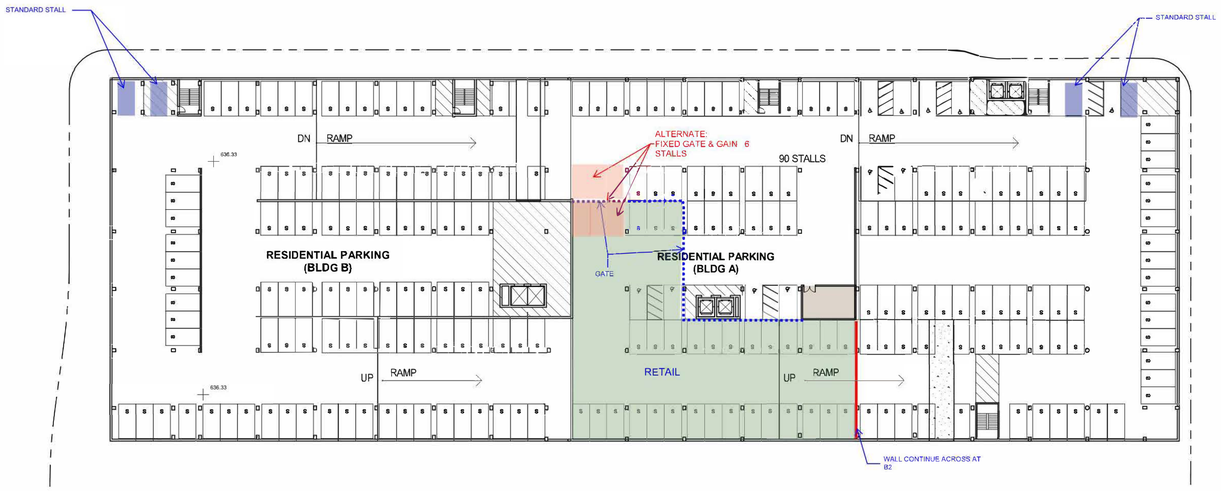
RESIDENTIAL PARKING = 34 STALLS
RETAIL PARKING = 0 STALL



B1

LEVEL B1

RESIDENTIAL PARKING = 141 STALLS
RETAIL PARKING = 88 STALLS



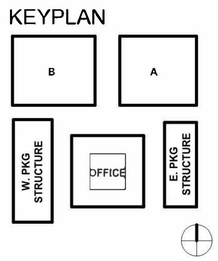
B2

LEVEL B2

RESIDENTIAL PARKING = 213 STALLS +6 (IF ALTERNATE)
RETAIL PARKING = 32 STALLS

388 RESIDENTIAL + 120 RETAIL = 508 TOTAL

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

PARKING PLAN- B1

5/17/2018

A2.08

OPTION 2 - 136 RETAIL

STUDY #3
Option #2

OPTION #2 - 136 RETAILS

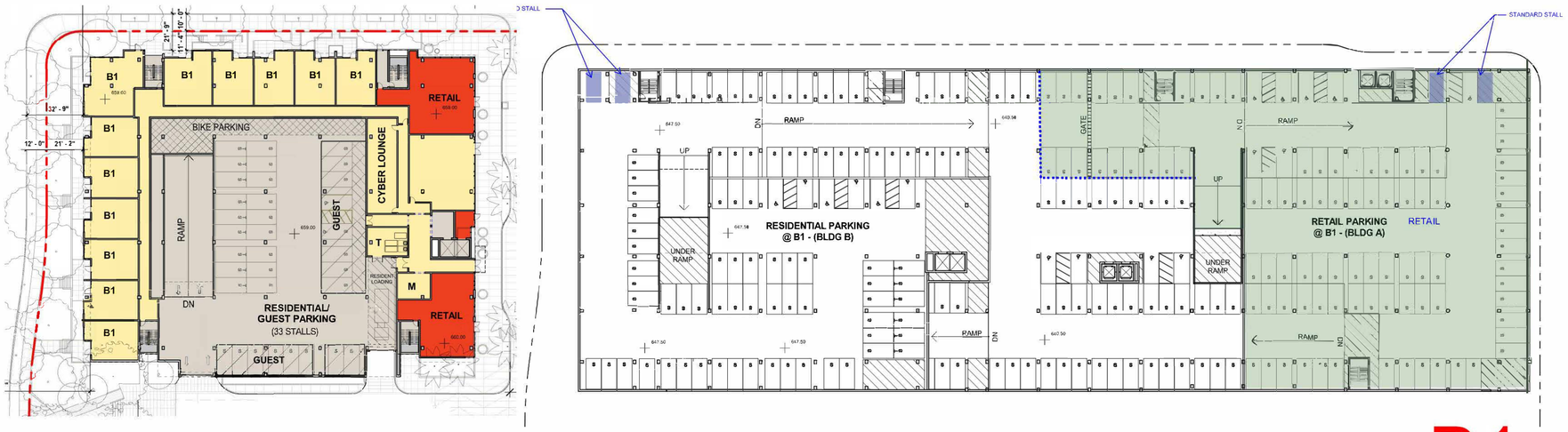
TOTAL RESIDENTIAL PARKING = 376 STALLS
TOTAL RETAIL PARKING = 136 STALL
NOTE: 2 STALLS SHORT OF 514 (120+394=514)

GROUND LEVEL

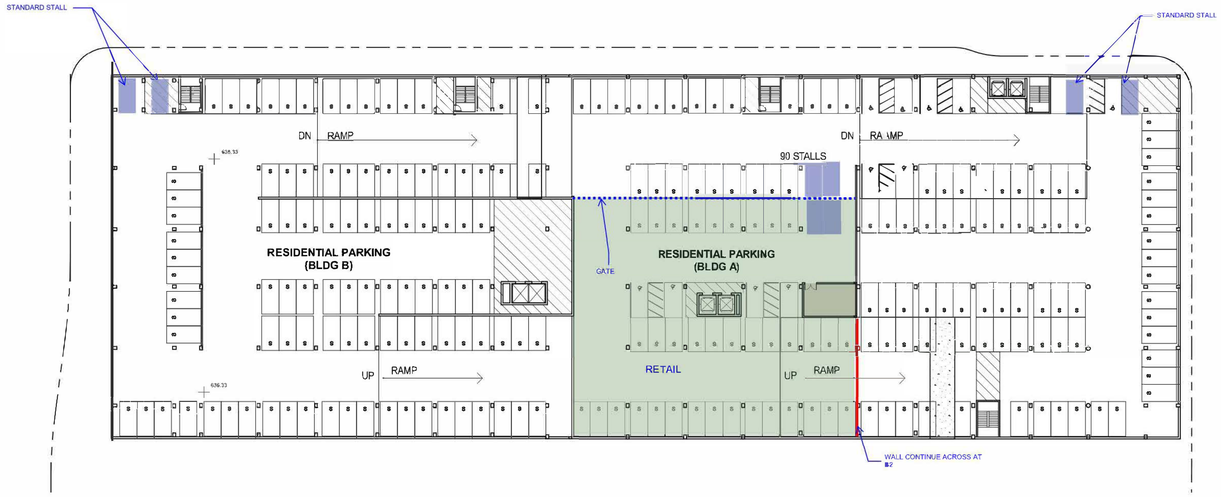
RESIDENTIAL PARKING = 34 STALLS
RETAIL PARKING = 0 STALL

LEVEL B1

RESIDENTIAL PARKING = 135 STALLS
RETAIL PARKING = 94 STALLS



B1



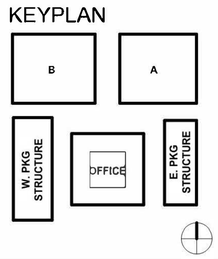
B2

LEVEL B2

RESIDENTIAL PARKING = 207 STALLS
RETAIL PARKING = 42 STALLS

376 RESIDENTIAL + 136 RETAIL = 512 TOTAL

KEYPLAN



OPTION 3 - 136 RETAIL WITH COMPACT

STUDY #3
Option #3

OPTION #3 - 136 RETAILS WITH COMPACTS

TOTAL RESIDENTIAL PARKING = 385 STALLS
TOTAL RETAIL PARKING = 136 STALL
NOTE: 7 STALLS OVER OF 514 (120+394=514)

GROUND LEVEL

RESIDENTIAL PARKING = 34 STALLS
RETAIL PARKING = 0 STALL

LEVEL B1

RESIDENTIAL PARKING = 139 STALLS
RETAIL PARKING = 94 STALLS



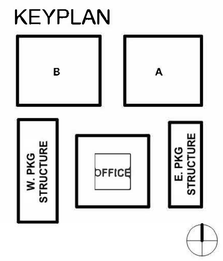


LEVEL B2

RESIDENTIAL PARKING = 212 STALLS
RETAIL PARKING = 42 STALLS

385 RESIDENTIAL + 136 RETAIL = 521 TOTAL

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

PARKING PLAN- B1

5/17/2018

A2.08

OPTION 4 - 136 RETAIL + BLDG EXTENSION

STUDY #4
Option #1

OPTION #4 - 136 RETAILS W/BUILDING EXTENSION

TOTAL RESIDENTIAL PARKING = 398 STALLS
TOTAL RETAIL PARKING = 136 STALL
NOTE: 4 STALLS OVER OF 530 (136+394=530)

GROUND LEVEL

RESIDENTIAL PARKING = 34 STALLS
RETAIL PARKING = 0 STALL

LEVEL B1

RESIDENTIAL PARKING = 135 STALLS
RETAIL PARKING = 101 STALLS

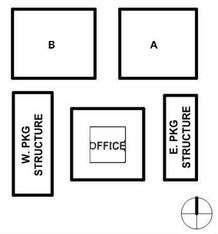




LEVEL B2

RESIDENTIAL PARKING = 229 STALLS
RETAIL PARKING = 35 STALLS

KEYPLAN



398 RESIDENTIAL + 136 RETAIL = 534 TOTAL

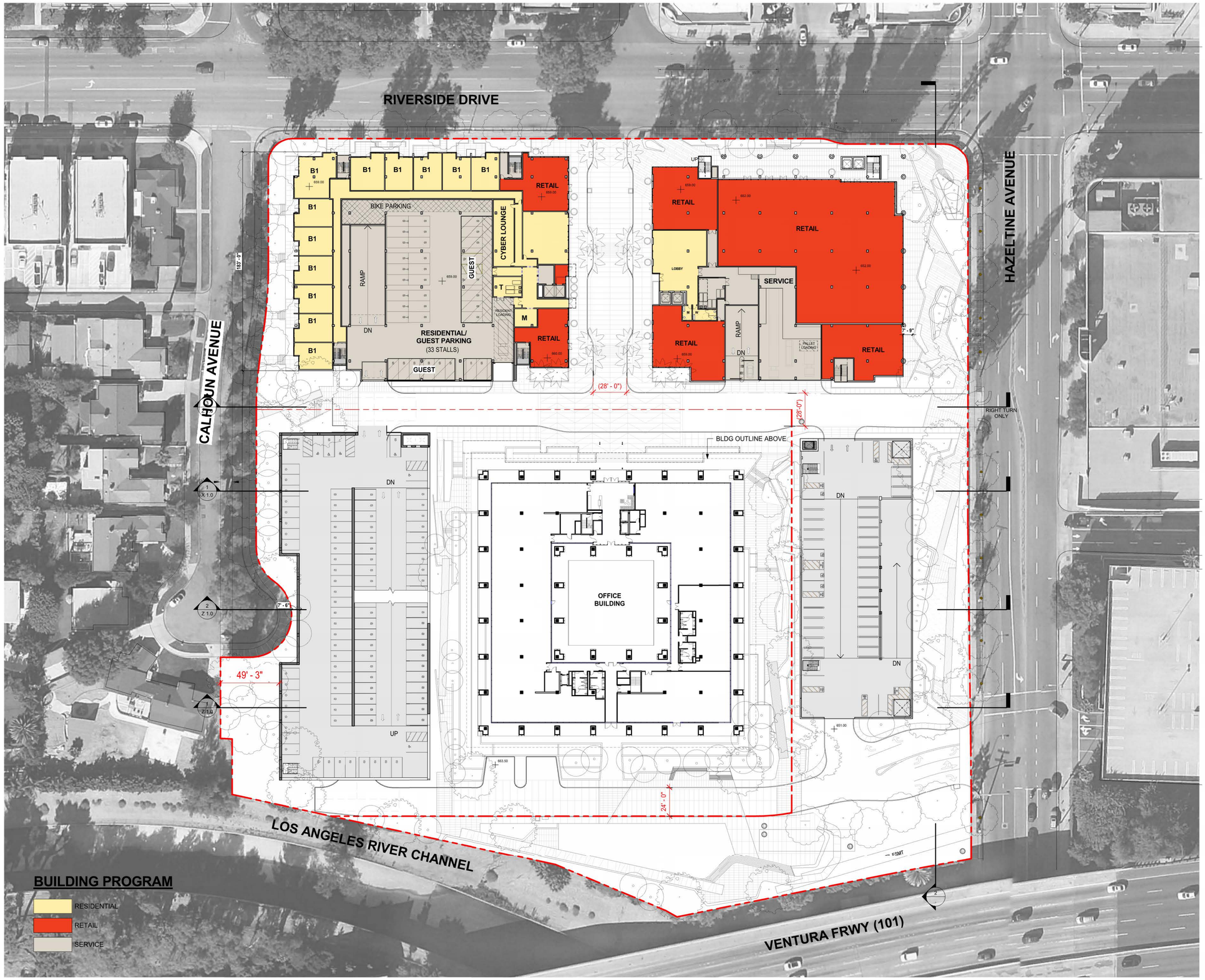
PROJECT PROGRAM COMPARISON

6/13/2015		ORIG ENTITLEMENT		ALT 5 : PLAZA		ALT 7 : LINEAR PARK	
Building A							
	Studio	0	0%	12	13%	16	13%
	One Bedroom	80	67%	56	58%	76	63%
	Two Bedroom	40	33%	28	29%	28	23%
		120		**96**		**120**	
Building B							
	Studio	0	0%	15	12%	25	19%
	One Bedroom	80	67%	79	65%	88	68%
	Two Bedroom	40	33%	28	23%	16	12%
		120		**122**		**129**	
Building C							
	Studio	0	0%	0	0%	0	#DIV/0!
	One Bedroom	48	83%	44	73%	0	#DIV/0!
	Two Bedroom	10	17%	16	27%	0	#DIV/0!
		58		**60**		**0**	
TOTAL		**298**		**278**		**249**	
	Studio	**0**	**0%**	**27**	**10%**	**41**	**16%**
	One Bedroom	**208**	**70%**	**179**	**64%**	**164**	**66%**
	Two Bedroom	**90**	**30%**	**72**	**26%**	**44**	**18%**

PROJECT SUMMARY

USE	BUILDING	LEVEL(S)	YIELD	PARKING REQUIRED TOTAL		PARKING PROVIDED
RETAIL	BUILDING A	GROUND	15,035 SF	15,035 SF @ 1/250 SF = 60		
	BUILDING B	GROUND	1,895 SF	1,895 SF @ 1/500 SF = 4	**64 STALLS**	**120 STALLS**
	BUILDING A/B	GROUND	10,540 SF	10,540 SF @ 1/100 SF = 106 ** RESTAURANT LOCATION TBD.*	**106 STALLS**	
	EAST PARKING STRUCTURE	GROUND B1				**90 STALLS** * GROUND - 38 STALLS * B1 - 52 STALLS
RESIDENTIAL	BUILDING A	B1 & B2	120 UNITS: 16 X STUDIO 76 X 1 BR UNITS 28 X 2 BR UNITS	16 X 1 = 16 SPACES 76 X 1.5 = 114 SPACES 28 X 2 = 56 SPACES	**186 STALLS**	18 STALLS RESIDENTIAL @ G - LEVEL 110 STALLS RESIDENTIAL @ B1 - LEVEL 250 STALLS RESIDENTIAL @ B2 - LEVEL
	BUILDING B	B1 & B2	127 UNITS: 25 X STUDIO 88 X 1 BR UNITS 16 X 2 BR UNITS	15 X 1 = 15 SPACES 88 X 1.5 = 132 SPACES 16 X 2 = 32 SPACES	**179 STALLS**	
RESIDENTIAL TOTAL			**249 UNITS**		**365 STALLS**	**393 STALLS** 15 OF THE 393 STALLS ARE SHORT TERM VISITOR AT BLDG B GROUND
OFFICE BUILDING (EXISTING)		1THROUGH 3	126,674 SF		**253 STALLS**	**490 STANDARD STALLS @ WEST PARKING STRUCTURE** **39 STALLS BELOW SUNKIST**
TOTAL PARKING REQUIRED (PARCEL 1 & 2 COMBINED)					**788 STALLS**	**1,132 STALLS PROVIDED**

PROJECT SUMMARY
SCALE: 12" = 1'-0"

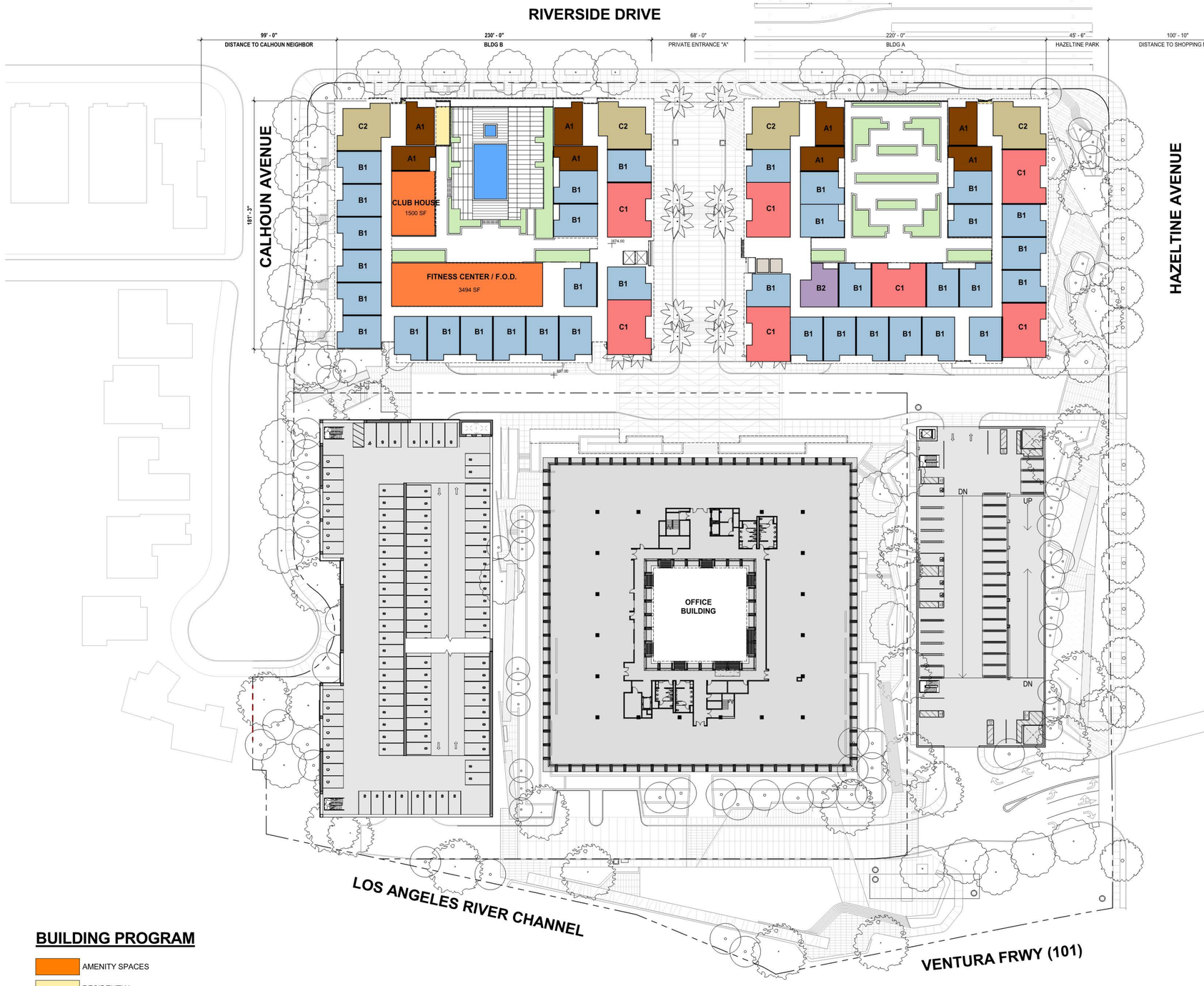


KEYPLAN

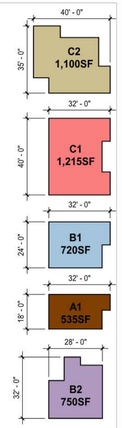
B | A | W. PKG STRUCTURE | OFFICE | E. PKG STRUCTURE

GROUND FLOOR PLAN

SCALE: 1/32" = 1'-0"



UNIT COUNT LEGEND



TOTAL UNIT COUNT - 249 UNITS TOTAL
16% - STUDIO
66% - 1BDRM
18% - 2BDRM

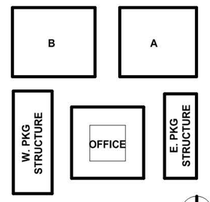
BUILDING PROGRAM

- AMENITY SPACES
- RESIDENTIAL
- SERVICE

PODIUM PLAN

SCALE: 1/32" = 1'-0"

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

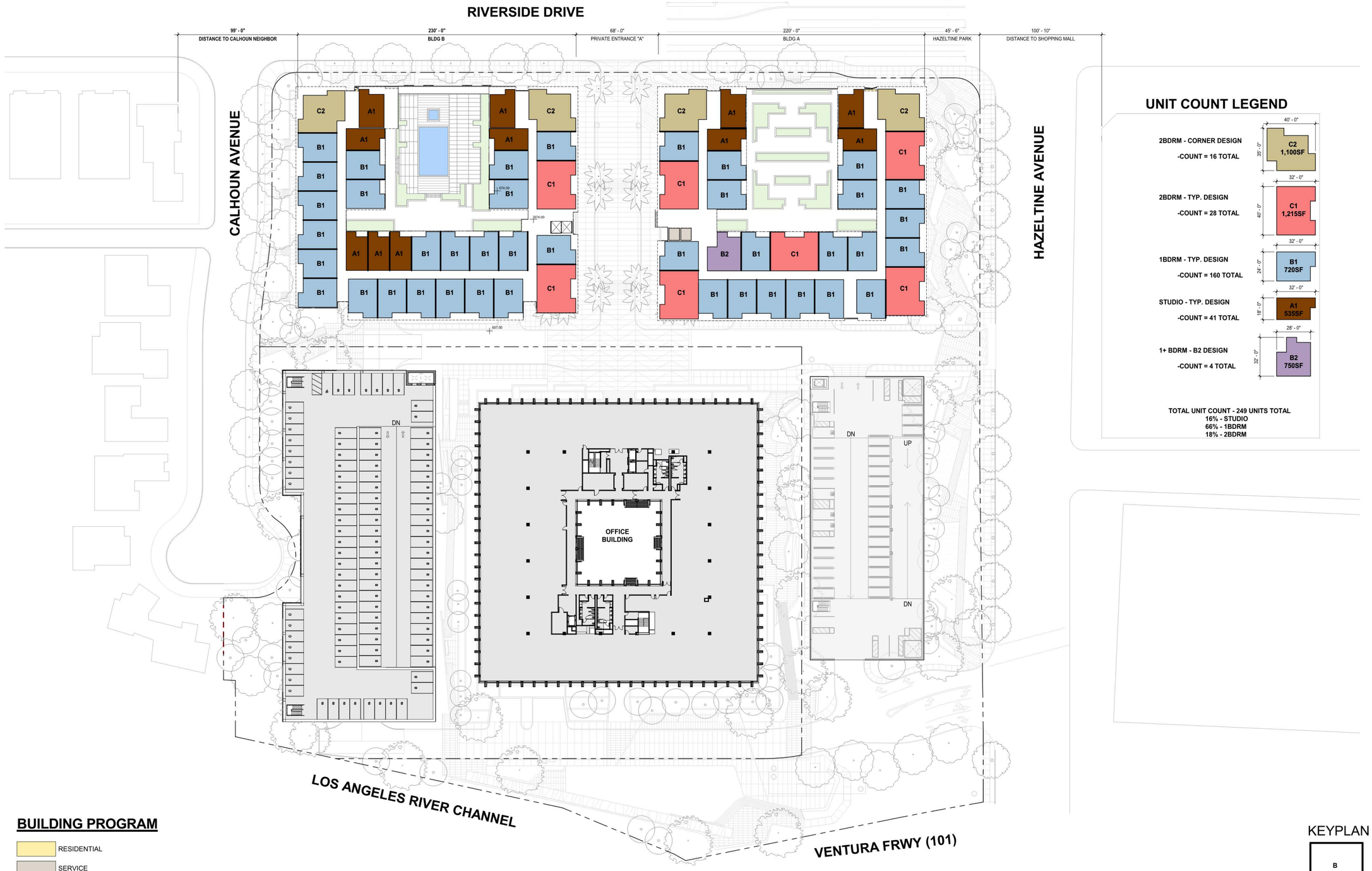
IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

PODIUM PLAN

06/13/2018

A2.02



UNIT COUNT LEGEND

TOTAL UNIT COUNT - 249 UNITS TOTAL
16% - STUDIO
66% - 1BDRM
18% - 2BDRM

BUILDING PROGRAM

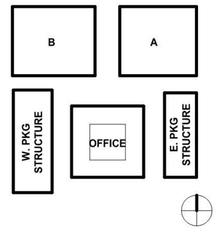
RESIDENTIAL

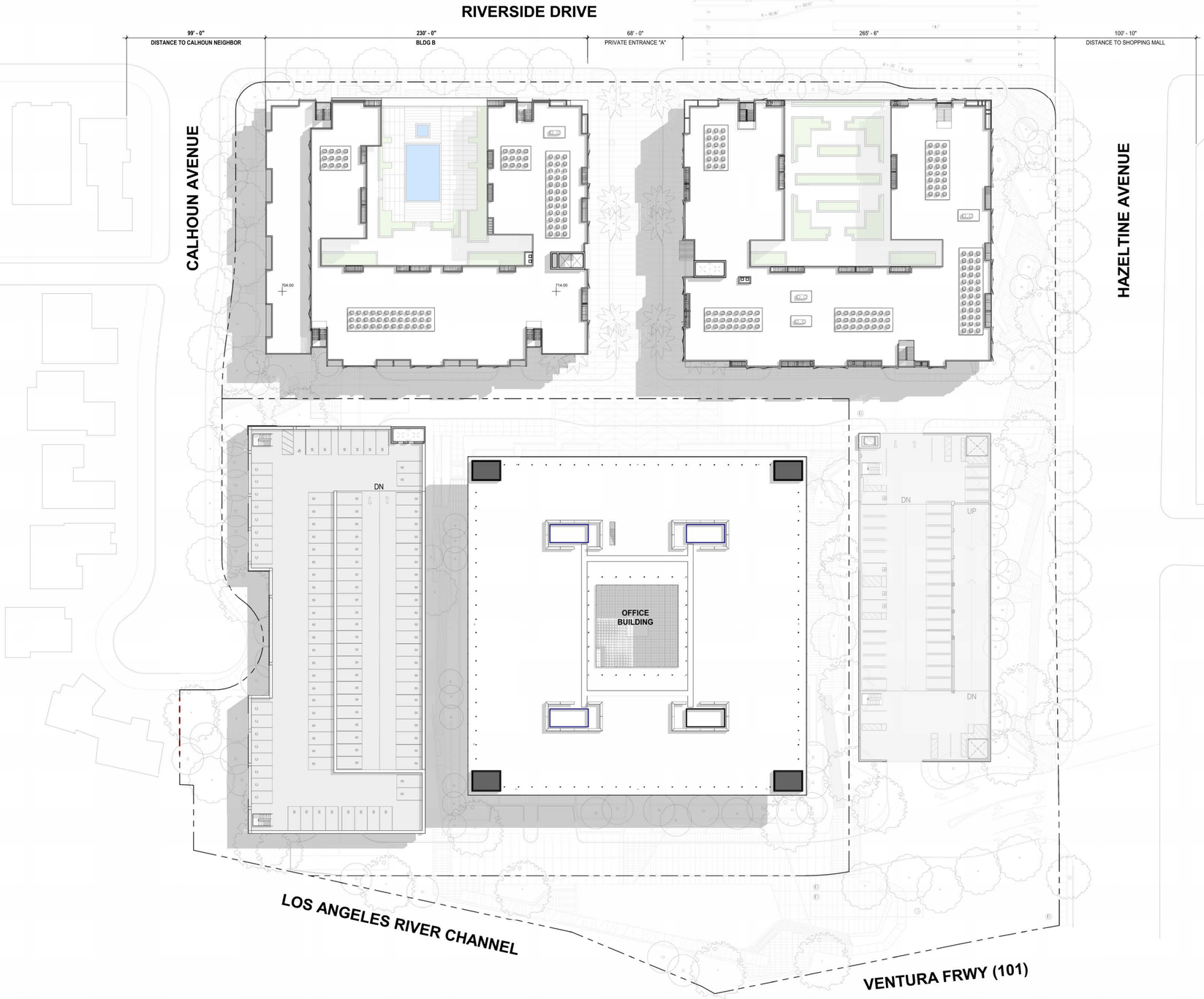
SERVICE

4TH FLOOR PLAN

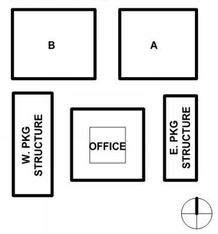
SCALE: 1/32" = 1'-0"

KEYPLAN





KEYPLAN



ROOF PLAN
SCALE: 1/32" = 1'-0"

JOHNSON FAIN

imt RESIDENTIAL

IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

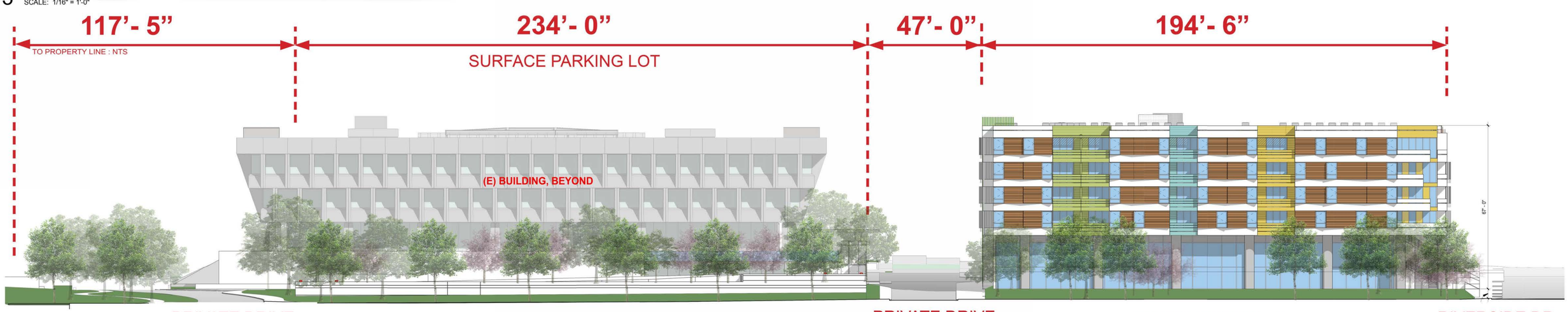
ROOF PLAN

06/13/2018

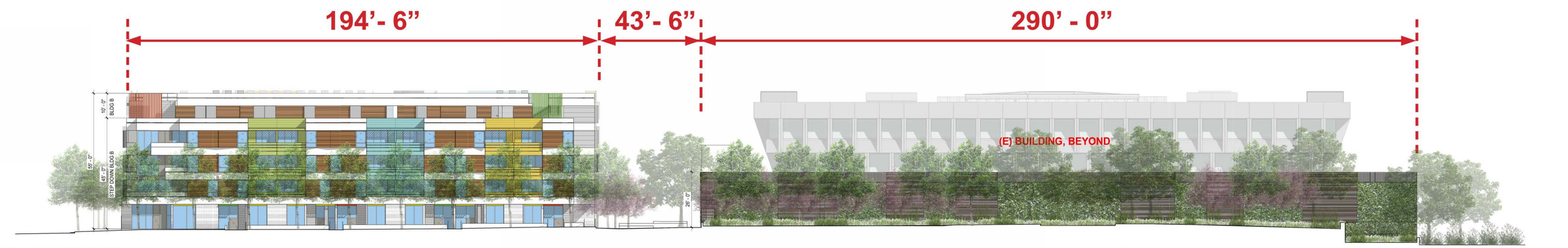
A2.06



3 RIVERSIDE DR. ELEVATION
SCALE: 1/16" = 1'-0"



2 HAZELTINE AVE. ELEVATION
SCALE: 1/16" = 1'-0"



1 CALHOUN AVE. ELEVATION
SCALE: 1/16" = 1'-0"

JOHNSON FAIN

imt RESIDENTIAL

IMT RESIDENTIAL

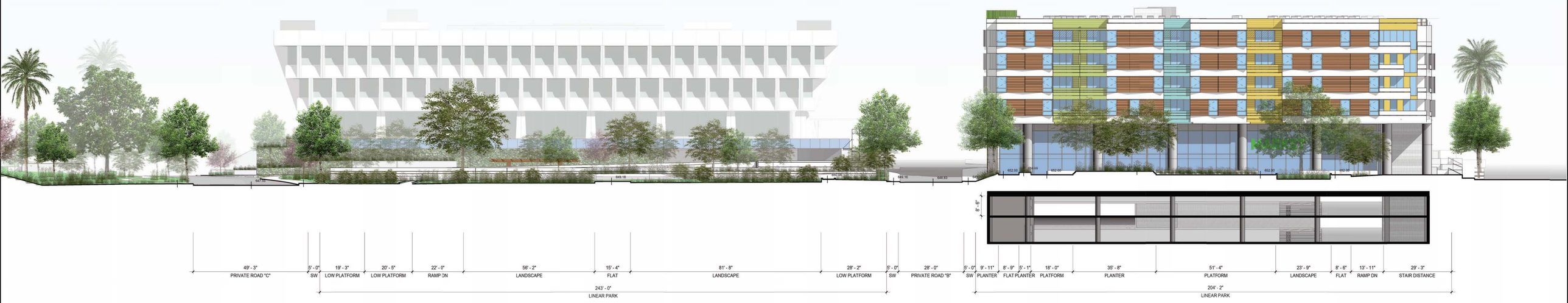
14130 & 1415 W Riverside Drive Sherman Oaks, CA 91423

SITE ELEVATION

5/17/2018

Public Process

- **SONC (PLUM)**
- **SONC (Full Council)**
- **Advisory Agency Hearing Office Public Hearing**
- **City Planning Commission Hearing**
- **Planning and Land Use Management Hearing**
- **City Council Public Hearing**



LONGITUDINAL SECTION - LINEAR PARK

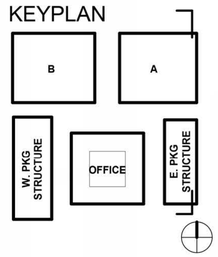
SCALE: 1/16" = 1'-0"



GROUND FLOOR PLAN - LINEAR PARK

SCALE: 1/16" = 1'-0"

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

SECTION AT LINEAR PARK

06/13/2018

APPENDIX



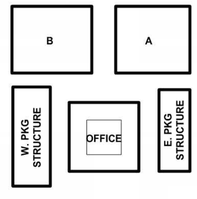
1 GROUND FLOOR PLAN
SCALE: 1" = 30'-0"

0' 15' 30' 60' 90'
SCALE : 1" = 30'-0"

LEGEND

1 Arrival Plaza and Monument Signage
2 Entry Drive w/ Date Palms
3 Retail Streetscape
4 Entry Garden w/ Ramp
5 Pedestrian Plaza
6 Arrival Steps
7 Retail Plaza
8 Townhome Gardens
9 Residential Entry Plaza
10 Landscape Buffer
11 Seating Garden
12 Garden Plaza w/ Water Feature
13 Sunset Courtyard
14 Hazeltine Parkway
15 Terraced Gardens
16 Rain Garden
17 Riverfront Park / Open Space

KEYPLAN



JOHNSON FAIN
DUANE BORDER DESIGN
LANDSCAPE ARCHITECTURE
imt RESIDENTIAL

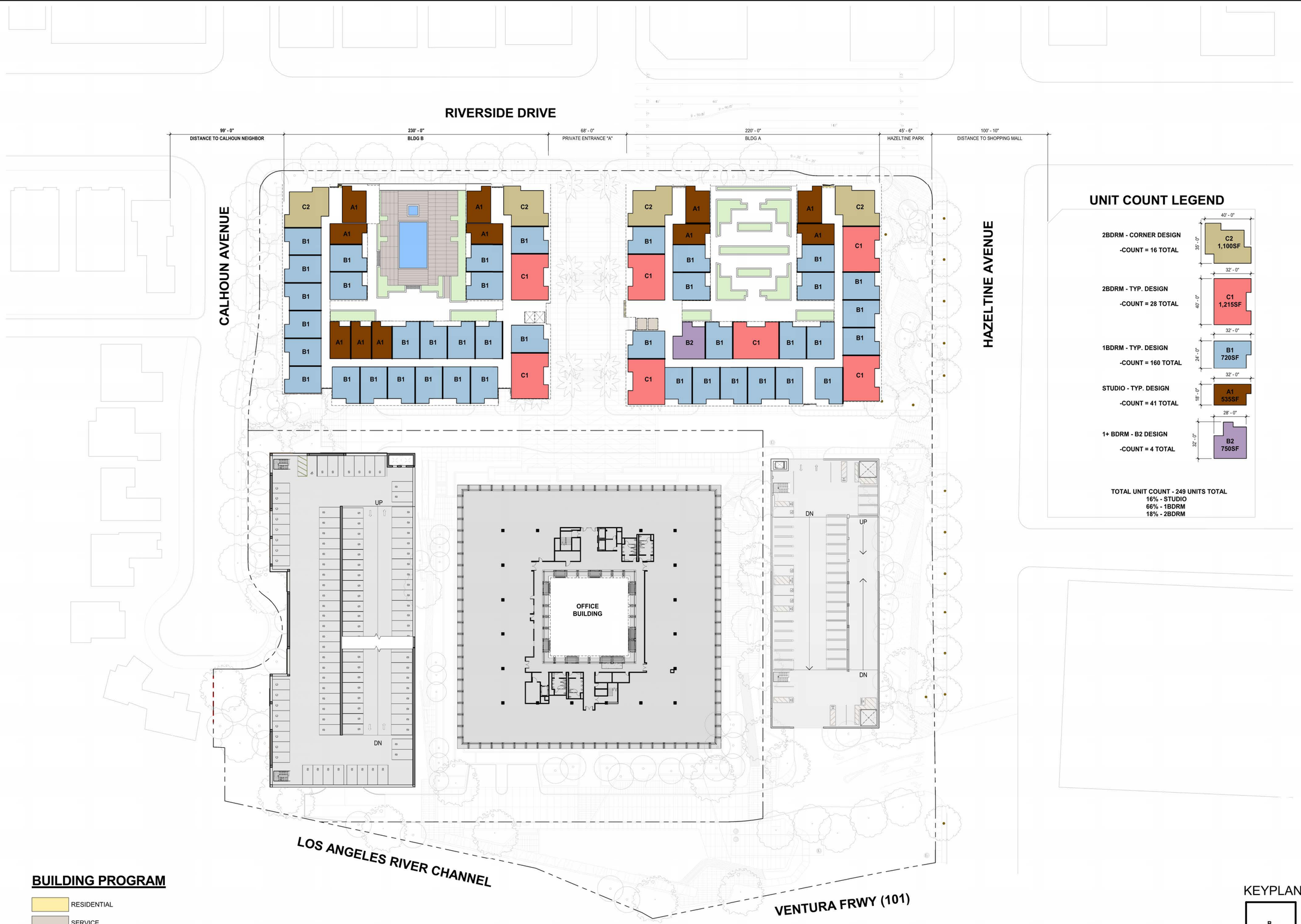
IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

LANDSCAPE PLAN

5/15/2018

L 1.0



BUILDING PROGRAM

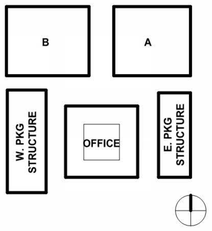
RESIDENTIAL

SERVICE

3RD FLOOR PLAN

SCALE: 1/32" = 1'-0"

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

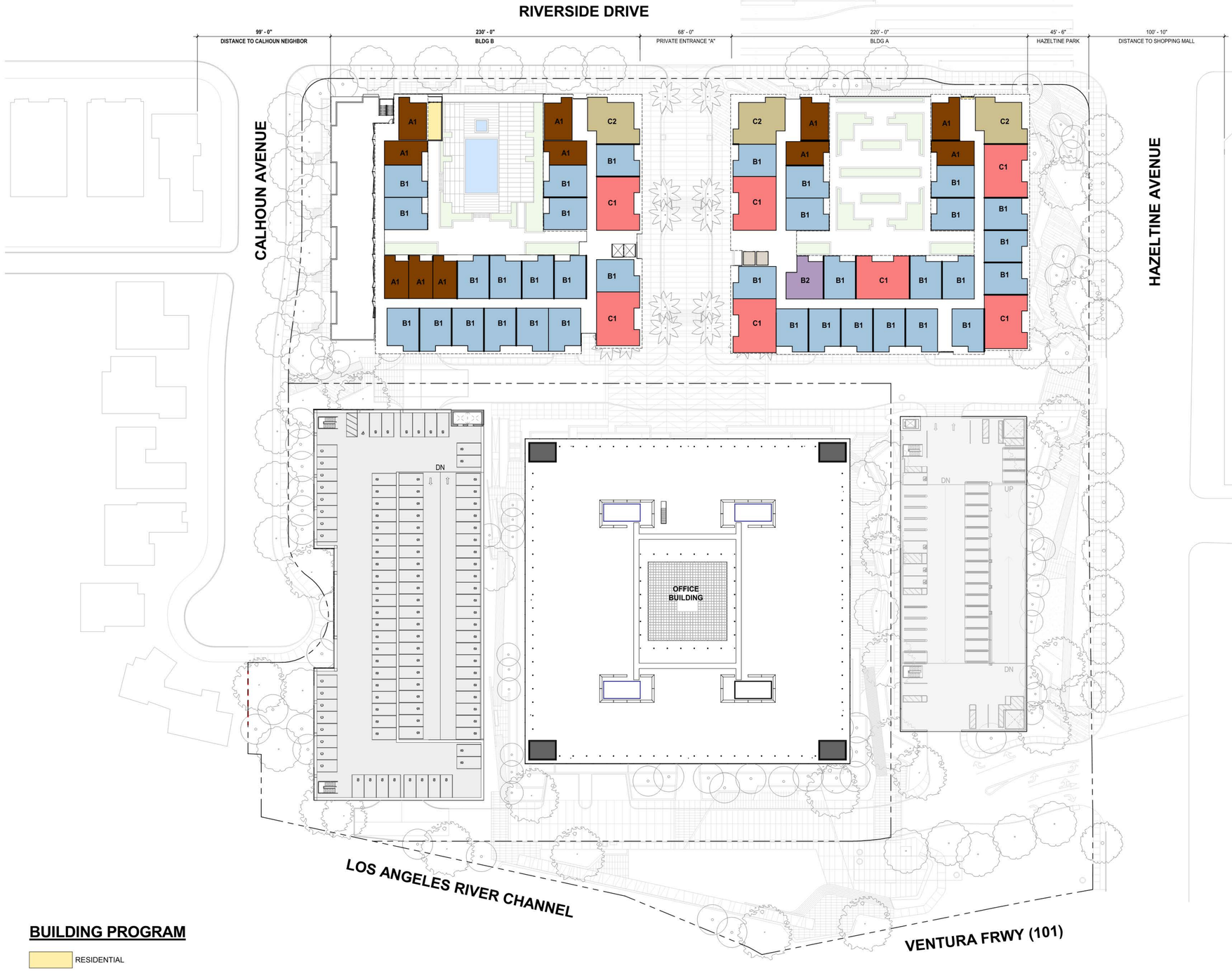
IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

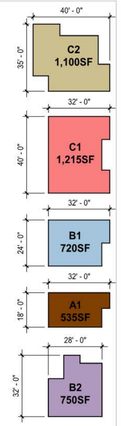
3RD & 4TH FLOOR PLAN

06/13/2018

A2.03



UNIT COUNT LEGEND



TOTAL UNIT COUNT - 249 UNITS TOTAL
16% - STUDIO
66% - 1BDRM
18% - 2BDRM

BUILDING PROGRAM

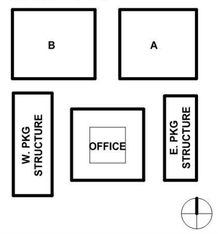
RESIDENTIAL

SERVICE

FIFTH FLOOR PLAN

SCALE: 1/32" = 1'-0"

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

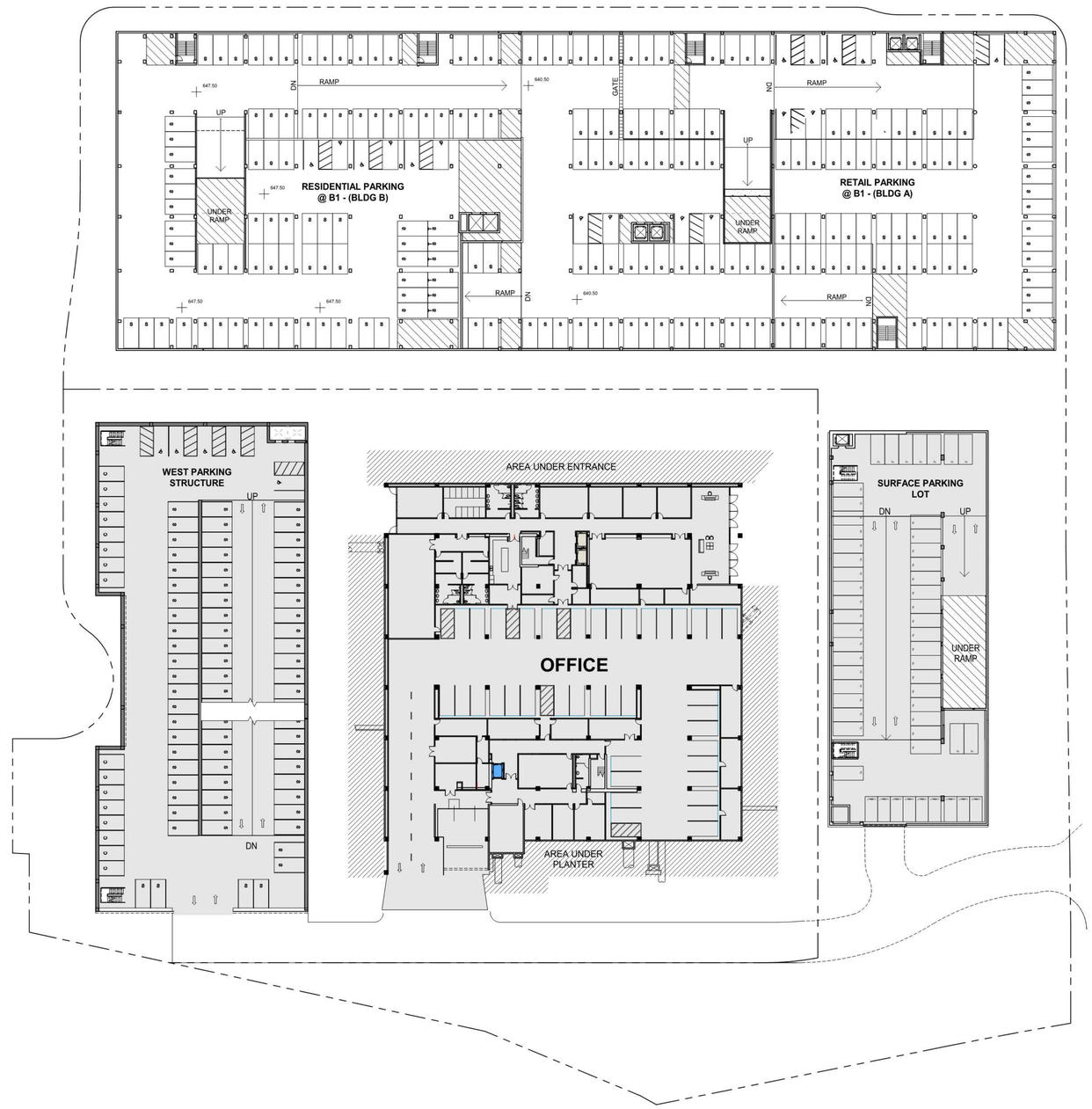
IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

5TH FLOOR PLAN

06/13/2018

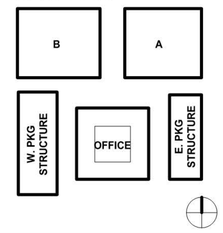
A2.05



PARKING PLAN - B1

SCALE: 1/32" = 1'-0"

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

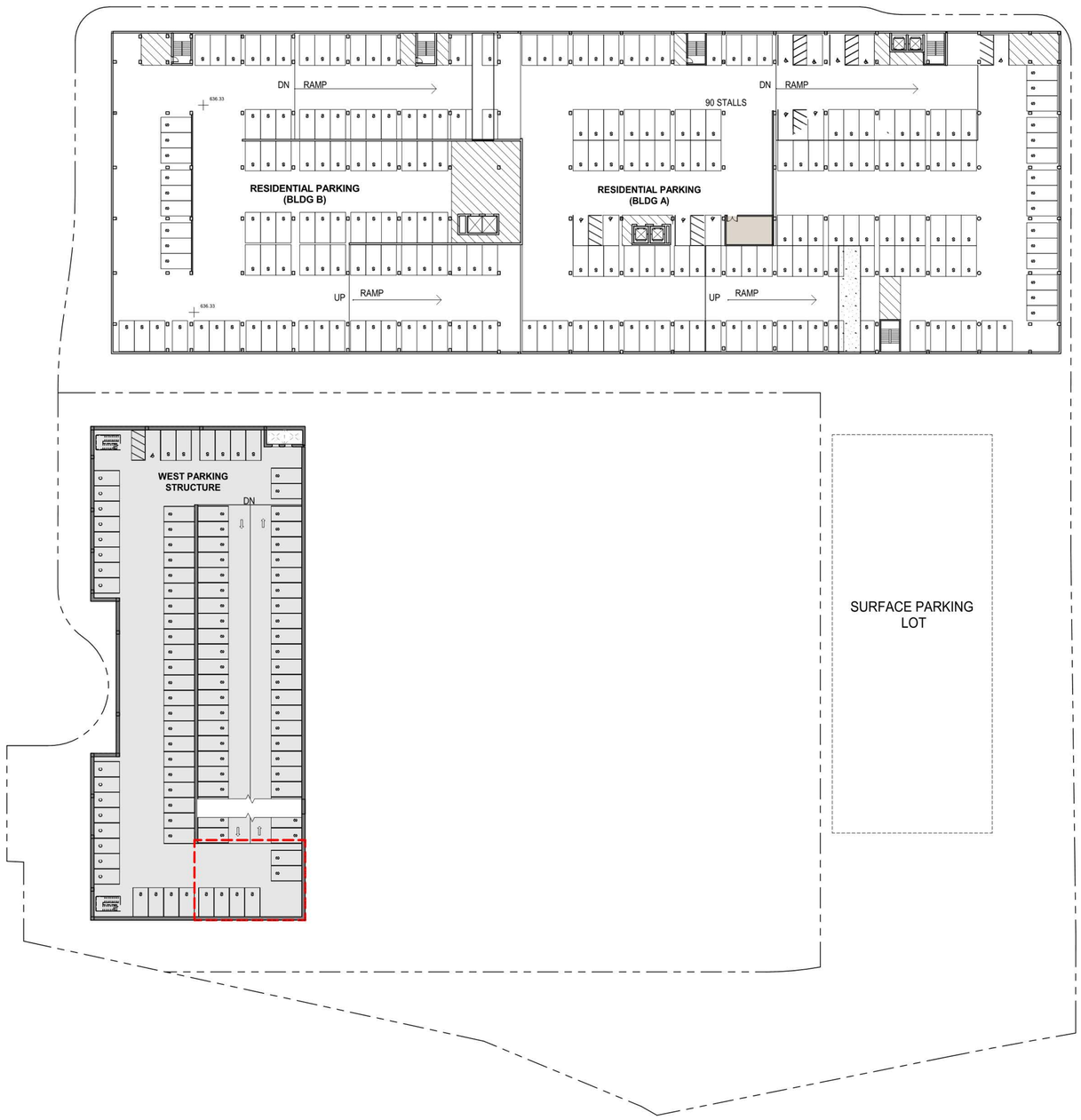
IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

PARKING PLAN- B1

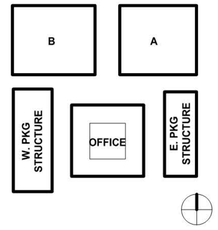
06/13/2018

A2.08



1 PARKING PLAN - B2
SCALE: 1/32" = 1'-0"

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

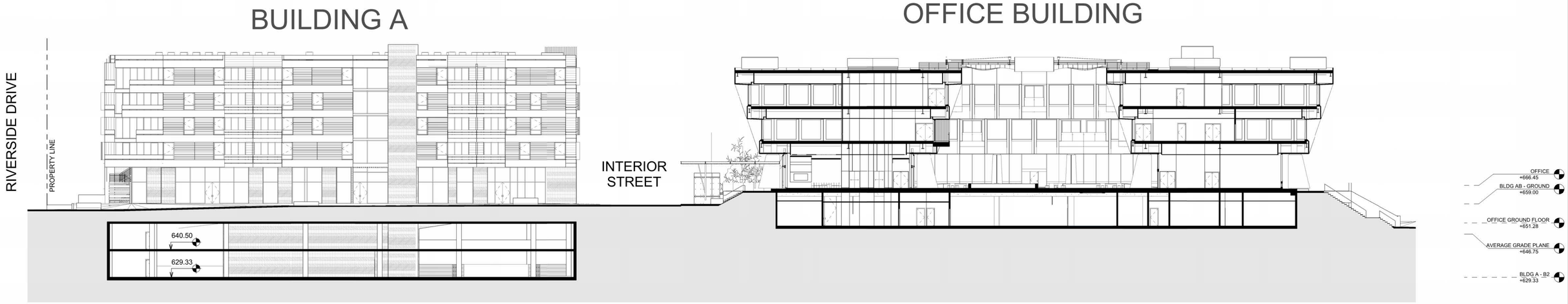
IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

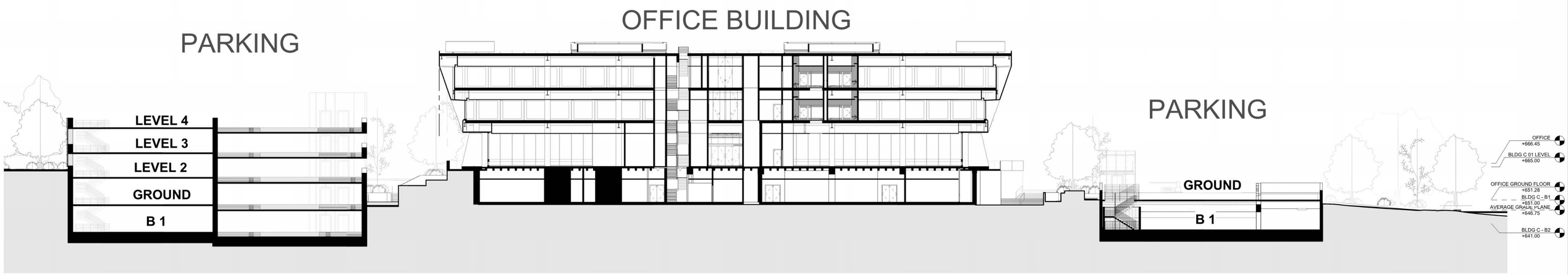
PARKING PLAN - B2

06/13/2018

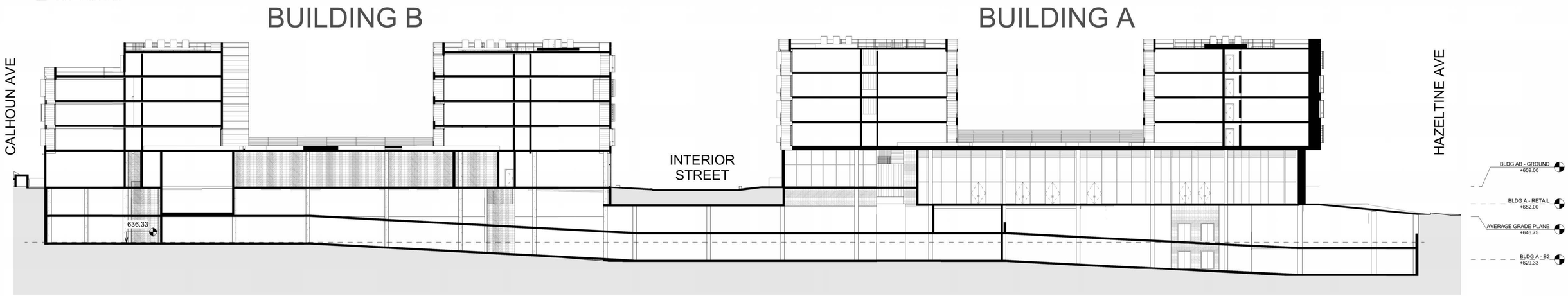
A2.09



3 SITE SECTION - NORTH SOUTH
SCALE: 1/16" = 1'-0"

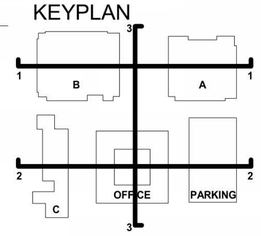


2 SITE SECTION - EAST WEST
SCALE: 1/16" = 1'-0"



1 SITE SECTION EAST-WEST
SCALE: 1/16" = 1'-0"

KEYPLAN



JOHNSON FAIN

imt RESIDENTIAL

IMT RESIDENTIAL

14130 & 14154 W Riverside Drive Sherman Oaks, CA 91423

SITE SECTIONS

5/17/2018

A3.01



Rendering 1: View southwest from Riverside Drive (Johnson Fain, 2018)



Rendering 2: View west from Hazeltine Avenue (Johnson Fain, 2018)

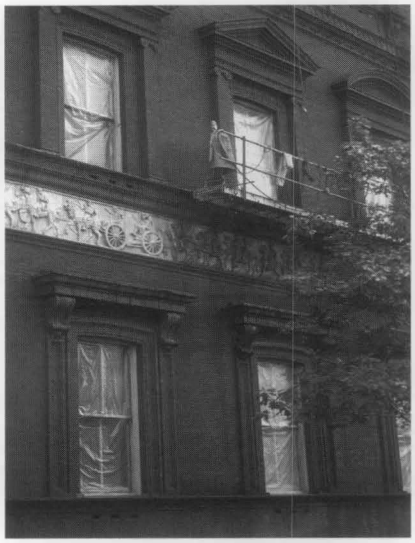
THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT C: *PRESERVATION BRIEF 1: CLEANING AND WATER-REPELLENT TREATMENTS FOR HISTORIC MASONRY BUILDINGS*

SUNKIST GROWERS INC.
14130 RIVERSIDE DRIVE, SHERMAN OAKS, CA

THIS PAGE INTENTIONALLY LEFT BLANK

1 PRESERVATION BRIEFS



Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings

Robert C. Mack, AIA
Anne Grimmer

U.S. Department of the Interior
National Park Service
Cultural Resources

Heritage Preservation Services

Inappropriate cleaning and coating treatments are a major cause of damage to historic masonry buildings. While either or both treatments may be appropriate in some cases, they can be very destructive to historic masonry if they are not selected carefully. Historic masonry, as considered here, includes stone, brick, architectural terra cotta, cast stone, concrete and concrete block. It is frequently cleaned because cleaning is equated with improvement. Cleaning may sometimes be followed by the application of a water-repellent coating. However, unless these procedures are carried out under the guidance and supervision of an architectural conservator, they may result in irrevocable damage to the historic resource.

The purpose of this Brief is to provide information on the variety of cleaning methods and materials that are available for use on the *exterior* of historic masonry buildings, and to provide guidance in selecting the most appropriate method or combination of methods. The difference between water-repellent coatings and waterproof coatings is explained, and the purpose of each, the suitability of their application to historic masonry buildings, and the possible consequences of their inappropriate use are discussed.

The Brief is intended to help develop sensitivity to the qualities of historic masonry that makes it so special, and to assist historic building owners and property managers in working cooperatively with architects, architectural conservators and contractors (Fig. 1). Although specifically intended for historic buildings, the information is applicable to all masonry buildings. This publication updates and expands *Preservation Brief 1: The Cleaning and Waterproof Coating of Masonry Buildings.* The Brief is not meant to be a cleaning manual or a guide for preparing specifications. Rather, it provides general information to raise awareness of the many factors involved in selecting cleaning and water-repellent treatments for historic masonry buildings.

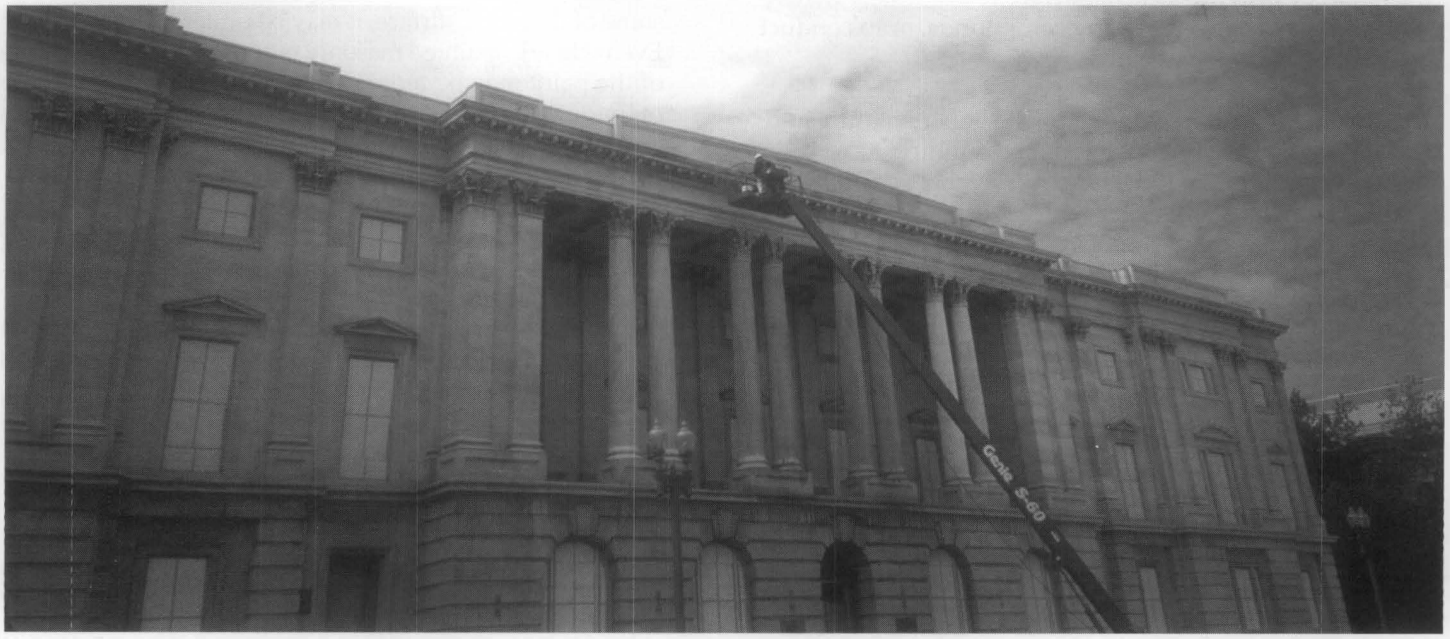


Figure 1. Low-to medium-pressure steam (hot-pressurized water washing), is being used to clean the exterior of the U.S. Tariff Commission Building, the first marble building constructed in Washington, D.C., in 1839. This method was selected by an architecural conservator as the "gentlest means possible" to clean the marble. Steam can soften heavy soiling deposits such as those on the cornice and column capitals, and facilitate easy removal. Note how these deposits have been removed from the right side of the cornice which has already been cleaned.

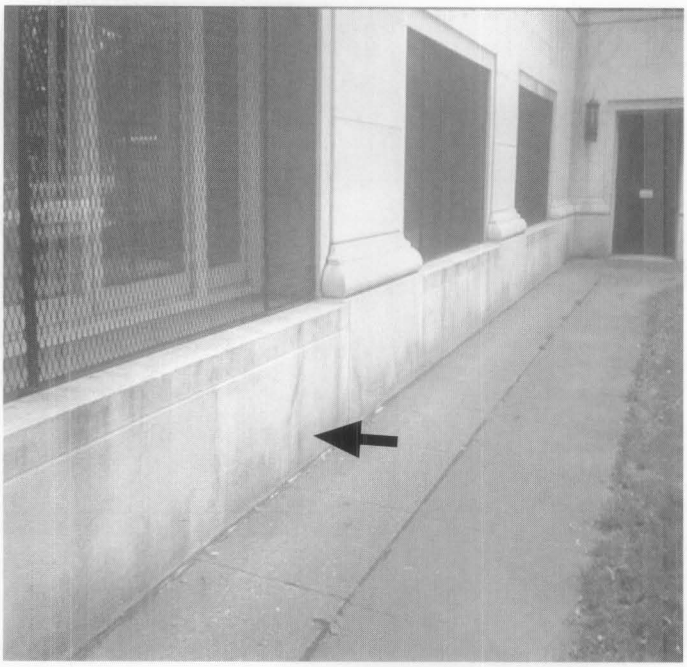


Figure 2. Biological growth as shown on this marble foundation can usually be removed using a low-pressure water wash, possibly with a non-ionic detergent added to it, and scrubbing with a natural or synthetic bristle brush.

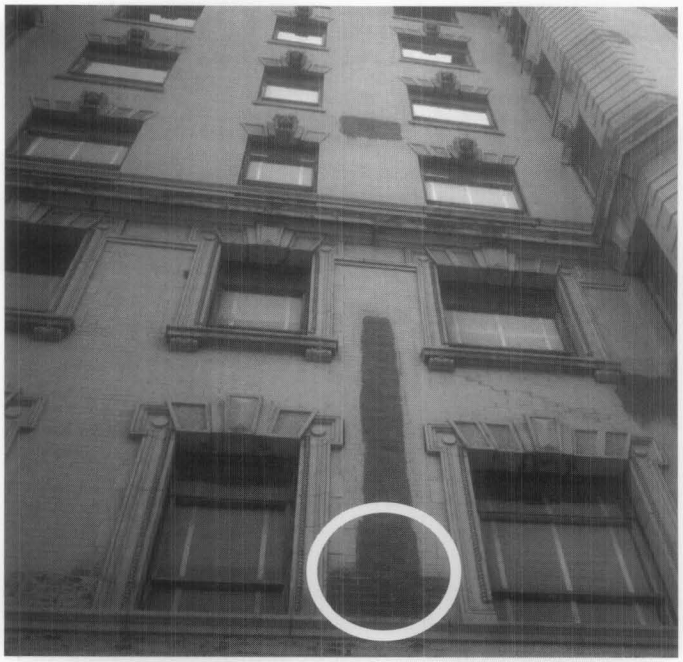


Figure 3. This small test area has revealed a red brick patch that does not match the original beige brick. This may explain why the building was painted, and may suggest to the owner that it may be preferable to keep it painted.

Preparing for a Cleaning Project

Reasons for cleaning. First, it is important to determine whether it is appropriate to clean the masonry. The objective of cleaning a historic masonry building must be considered carefully before arriving at a decision to clean. There are several major reasons for cleaning a historic masonry building: **improve the appearance of the building** by removing unattractive dirt or soiling materials, or non-historic paint from the masonry; **retard deterioration** by removing soiling materials that may be damaging the masonry; or **provide a clean surface** to accurately match repointing mortars or patching compounds, or to conduct a condition survey of the masonry.

Identify what is to be removed. The general nature and source of dirt or soiling material on a building must be identified to remove it in the *gentlest means possible* — that is, in the most effective, yet least harmful, manner. Soot and smoke, for example, require a different cleaning agent to remove than oil stains or metallic stains. Other common cleaning problems include biological growth such as mold or mildew, and organic matter such as the tendrils left on masonry after removal of ivy (Fig. 2).

Consider the historic appearance of the building. If the proposed cleaning is to remove paint, it is important in each case to learn whether or not unpainted masonry is historically appropriate. And, it is necessary to consider why the building was painted (Fig. 3). Was it to cover bad repointing or unmatched repairs? Was the building painted to protect soft brick or to conceal deteriorating stone? Or, was painted masonry simply a fashionable treatment in a particular historic period? Many buildings were painted at the time of construction or shortly thereafter; retention of the paint, therefore, may be more appropriate historically than removing it. And, if the building appears to have been painted for a long time, it is also important to think about whether the paint is part of the character of the historic building and if it has acquired significance over time.

Consider the practicalities of cleaning or paint removal. Some gypsum or sulfate crusts may have become integral with the stone and, if cleaning could result in removing some of the stone surface, it may be preferable not to clean. Even where unpainted masonry is appropriate, the retention of the paint may be more practical than removal in terms of long range preservation of the masonry. In some cases, however, removal of the paint may be desirable. For example, the old paint layers may have built up to such an extent that removal is necessary to ensure a sound surface to which the new paint will adhere.

Study the masonry. Although not always necessary, in some instances it can be beneficial to have the coating or paint type, color, and layering on the masonry researched before attempting its removal. Analysis of the nature of the soiling or of the paint to be removed from the masonry, as well as guidance on the appropriate cleaning method, may be provided by professional consultants, including architectural conservators, conservation scientists and preservation architects. The State Historic Preservation Office (SHPO), local historic district commissions, architectural review boards and preservation-oriented websites may also be able to supply useful information on masonry cleaning techniques.

Understanding the Building Materials

The construction of the building must be considered when developing a cleaning program because inappropriate cleaning can have a deleterious effect on the masonry as well as on other building materials. The masonry material or materials must be correctly identified. It is sometimes difficult to distinguish one type of stone from another; for example, certain sandstones can be easily confused with limestones. Or, what appears to be natural stone may not be stone at all, but cast stone or concrete. Historically, cast stone and architectural terra cotta were frequently used in combination with natural stone, especially for trim elements or on upper stories of a building where, from a distance, these substitute materials looked like real stone (Fig. 4). Other features on historic buildings that appear to be stone, such as decorative cornices, entablatures and window hoods, may not even be masonry, but metal.

Identify prior treatments. Previous treatments of the building and its surroundings should be researched and building maintenance records should be obtained, if available. Sometimes if streaked or spotty areas do not seem to get cleaner following an initial cleaning, closer inspection and analysis may be warranted. The discoloration may turn out not to be dirt but the remnant of a water-repellent coating applied long ago which has darkened the surface of the masonry over time (Fig. 5). Successful removal may require testing several cleaning agents to find something that will dissolve and remove the coating. Complete removal may not always be possible. Repairs may have been stained to match a dirty building, and cleaning may make these differences apparent. De-icing salts used near the building that have dissolved can migrate into the masonry. Cleaning may draw the salts to the surface, where they will appear as efflorescence (a powdery, white substance), which may require a second treatment to be removed. Allowances for dealing with such unknown factors, any of which can be a potential problem, should be included when investigating cleaning methods and materials. Just as more than one kind of masonry on a historic building may necessitate multiple cleaning approaches, unknown conditions that are encountered may also require additional cleaning treatments.

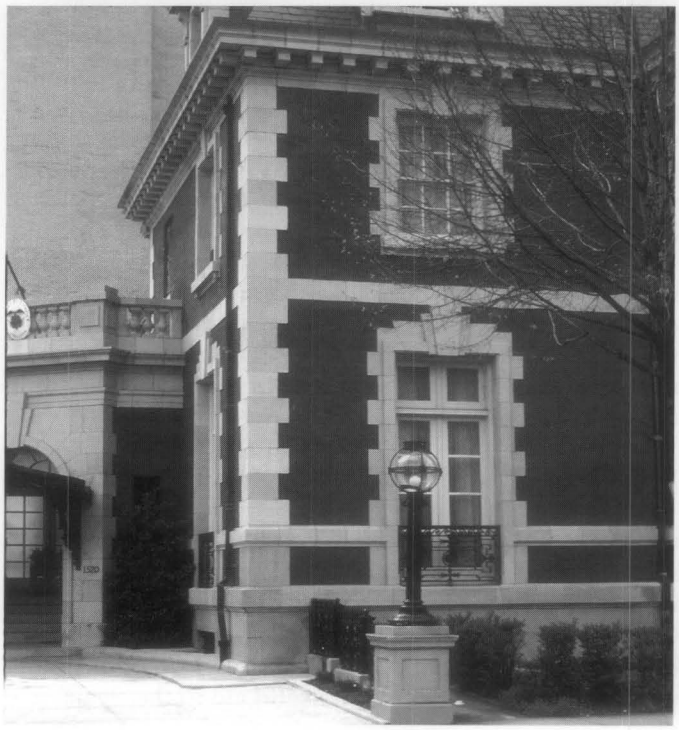


Figure 4. The foundation of this brick building is limestone, but the decorative trim above is architectural terra cotta intended to simulate stone.



Figure 5. Repeated water washing did not remove the staining inside this limestone porte cochere. Upon closer examination, it was determined to be a water-repellent coating that had been applied many years earlier. An alkaline cleaner may be effective in removing it.

Choose the appropriate cleaner. The importance of testing cleaning methods and materials cannot be over emphasized. Applying the wrong cleaning agents to historic masonry can have disastrous results. Acidic cleaners can be extremely damaging to acid-sensitive stones, such as marble and limestone, resulting in etching and dissolution of these stones. Other kinds of masonry can also be damaged by incompatible cleaning agents, or even by cleaning agents that are usually compatible. There are also numerous kinds of sandstone, each with a considerably different geological composition. While an acid-based cleaner may be safely used on some sandstones, others are acid-sensitive and can be severely etched or dissolved by an acid cleaner. Some sandstones contain water-soluble minerals and can be eroded by water cleaning. And, even if the stone type is correctly identified, stones, as well as some bricks, may contain unexpected impurities, such as iron particles, that may react negatively with a particular cleaning agent and result in staining. Thorough understanding of the physical and chemical properties of the masonry will help avoid the inadvertent selection of damaging cleaning agents.

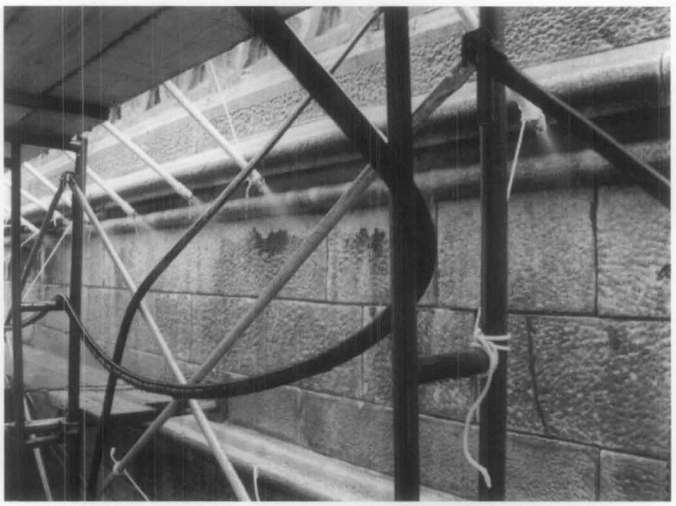


Figure 6. Timed water soaking can be very effective for cleaning limestone and marble as shown here at the Marble Collegiate Church in New York City. In this case, a twelve-hour water soak using a multi-nozzle manifold was followed by a final water rinse. Photo: Diane S. Kaese, Wiss, Janney, Elstner Associates, Inc., N.Y., N.Y.

Other building materials also may be affected by the cleaning process. Some chemicals, for example, may have a corrosive effect on paint or glass. The portions of building elements most vulnerable to deterioration may not be visible, such as embedded ends of iron window bars. Other totally unseen items, such as iron cramps or ties which hold the masonry to the structural frame, also may be subject to corrosion from the use of chemicals or even from plain water. The only way to prevent problems in these cases is to study the building construction in detail and evaluate proposed cleaning methods with this information in mind. However, due to the very likely possibility of encountering unknown factors, any cleaning project involving historic masonry should be viewed as unique to that particular building.

Cleaning Methods and Materials

Masonry cleaning methods generally are divided into three major groups: water, chemical, and abrasive. *Water methods* soften the dirt or soiling material and rinse the deposits from the masonry surface. *Chemical cleaners* react with dirt, soiling material or paint to effect their removal, after which the cleaning effluent is rinsed off the masonry surface with water. *Abrasive methods* include blasting with grit, and the use of grinders and sanding discs, all of which mechanically remove the dirt, soiling material or paint (and, usually, some of the masonry surface). Abrasive cleaning is also often followed with a water rinse. *Laser cleaning*, although not discussed here in detail, is another technique that is used sometimes by conservators to clean small areas of historic masonry. It can be quite effective for cleaning limited areas, but it is expensive and generally not practical for most historic masonry cleaning projects.

Although it may seem contrary to common sense, masonry cleaning projects should be carried out starting at the bottom and proceeding to the top of the building always keeping all surfaces wet below the area being cleaned. The rationale for this approach is based on the principle that dirty water or cleaning effluent dripping from cleaning in progress above will leave streaks on a dirty surface but will not streak a clean surface as long as it is kept wet and rinsed frequently.

Water Cleaning

Water cleaning methods are generally the *gentlest means possible*, and they can be used safely to remove dirt from all types of historic masonry.* There are essentially four kinds of water-based methods: soaking; pressure water washing; water washing supplemented with non-ionic detergent; and steam, or hot-pressurized water cleaning. Once water cleaning has been completed, it is often necessary to follow up with a water rinse to wash off the loosened soiling material from the masonry.

Soaking. Prolonged spraying or misting with water is particularly effective for cleaning limestone and marble. It is also a good method for removing heavy accumulations of soot, sulfate crusts or gypsum crusts that tend to form in protected areas of a building not regularly washed by rain. Water is distributed to lengths of punctured hose or pipe with non-ferrous fittings hung from moveable scaffolding or a swing stage that continuously mists the surface of the masonry with a very fine spray (Fig. 6). A timed on-off spray is another approach to using this cleaning technique. After one area has been cleaned, the apparatus is moved on to another. Soaking is often used in combination with water washing and is also followed by a final water rinse. Soaking is a very slow method — it may take several days or a week—but it is a very gentle method to use on historic masonry.

Water Washing. Washing with low-pressure or medium-pressure water is probably one of the most commonly used methods for removing dirt or other pollutant soiling from historic masonry buildings (Fig. 7). Starting with a very low pressure (100 psi or below), even using a garden hose, and progressing as needed to slightly higher pressure —generally no higher than 300-400 psi—is always the recommended way to begin. Scrubbing with natural bristle or synthetic bristle brushes—never metal which can abrade the surface and leave metal particles that can stain the masonry—can help in cleaning areas of the masonry that are especially dirty.

Water Washing with Detergents. Non-ionic detergents –which are not the same as soaps –are synthetic organic compounds that are especially effective in removing oily soil. (Examples of some of the numerous proprietary non-ionic detergents include Igepal by GAF, Tergitol by Union Carbide and Triton by Rohm & Haas.) Thus, the addition of a non-ionic detergent, or surfactant, to a low- or medium-pressure water wash can be a useful aid in the cleaning

*Water cleaning methods may not be appropriate to use on some badly deteriorated masonry because water may exacerbate the deterioration, or on gypsum or alabaster which are very soluble in water.

process. (A non-ionic detergent, unlike most household detergents, does not leave a solid, visible residue on the masonry.) Adding a non-ionic detergent and scrubbing with a natural bristle or synthetic bristle brush can facilitate cleaning textured or intricately carved masonry. This should be followed with a final water rinse.

Steam/Hot-Pressurized Water Cleaning. Steam cleaning is actually low-pressure hot water washing because the steam condenses almost immediately upon leaving the hose. This is a gentle and effective method for cleaning stone and particularly for acid-sensitive stones. Steam can be especially useful in removing built-up soiling deposits and dried-up plant materials, such as ivy disks and tendrils. It can also be an efficient means of cleaning carved stone details and, because it does not generate a lot of liquid water, it can sometimes be appropriate to use for cleaning interior masonry (Figs. 8-9).

Potential hazards of water cleaning. Despite the fact that water-based methods are generally the most gentle, even they can be damaging to historic masonry. Before beginning a water cleaning project, it is important to make sure that all mortar joints are sound and that the building is watertight. Otherwise water can seep through the walls to the interior, resulting in rusting metal anchors and stained and ruined plaster.

Some water supplies may contain traces of iron and copper which may cause masonry to discolor. Adding a chelating or complexing agent to the water, such as EDTA (ethylene diamine tetra-acetic acid), which inactivates other metallic ions, as well as softens minerals and water hardness, will help prevent staining on light-colored masonry.

Any cleaning method involving water should never be done in cold weather or if there is any likelihood of frost or freezing because water within the masonry can freeze, causing spalling and cracking. Since a masonry wall may take over a week to dry after cleaning, no water cleaning should be permitted for several days prior to the first average frost date, or even earlier if local forecasts predict cold weather.

Most essential of all, it is important to be aware that using water at too high a pressure, a practice common to "power washing" and "water blasting", is very abrasive and can easily etch marble and other soft stones, as well as some types of brick (Figs. 10-11). In addition, the distance of the nozzle from the masonry surface and the type of nozzle, as well as gallons per minute (gpm), are also important variables in a water cleaning process that can have a significant impact on the outcome of the project. This is why it is imperative that the cleaning be closely monitored to ensure that the cleaning operators do not raise the pressure or bring the nozzle too close to the masonry in an effort to "speed up" the process. The appearance of grains of stone or sand in the cleaning effluent on the ground is an indication that the water pressure may be too high.



Figure 7. Glazed architectural terra cotta often may be cleaned successfully with a low-pressure water wash and hand scrubbing supplemented, if necessary, with a non-ionic detergent. Photo: National Park Service Files.

Chemical Cleaning

Chemical cleaners, generally in the form of proprietary products, are another material frequently used to clean historic masonry. They can remove dirt, as well as paint and other coatings, metallic and plant stains, and graffiti. Chemical cleaners used to remove dirt and soiling include **acids**, **alkalies** and **organic compounds.** Acidic cleaners, of course, should not be used on masonry that is acid sensitive. Paint removers are **alkaline**, based on **organic solvents** or other chemicals.

Chemical Cleaners to Remove Dirt

Both alkaline and acidic cleaning treatments include the use of water. Both cleaners are also likely to contain surfactants (wetting agents), that facilitate the chemical reaction that removes the dirt. Generally, the masonry is wet first for both types of cleaners, then the chemical cleaner is sprayed on at very low pressure or brushed onto the surface. The cleaner is left to dwell on the masonry for an amount of time recommended by the product manufacturer or, preferably, determined by testing, and rinsed off with a low- or moderate-pressure cold, or sometimes hot, water wash. More than one application of the cleaner may be necessary, and it is always a good practice to test the product manufacturer's recommendations concerning dilution rates and dwell times. Because each cleaning situation is unique, dilution rates and dwell times can vary considerably. The masonry surface may be scrubbed lightly with natural or synthetic bristle brushes prior to rinsing. After rinsing, pH strips should be applied to the surface to ensure that the masonry has been neutralized completely.

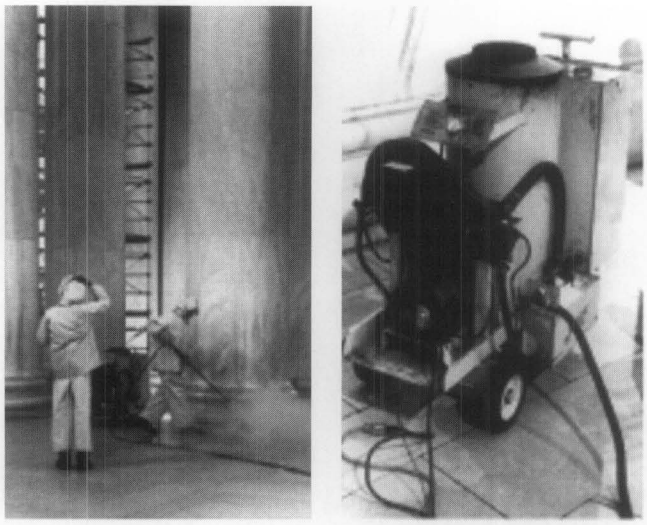


Figure 8. (Left) Low-pressure (under 100 psi) steam cleaning (hot-pressurized water washing), is part of the regular maintenance program at the Jefferson Memorial, Washington, D.C. The white marble interior of this open structure is subject to constant soiling by birds, insects and visitors. (Right) This portable steam cleaner enables prompt cleanup when necessary. Photos: National Park Service Files.

Acidic Cleaners. Acid-based cleaning products may be used on **non-acid sensitive** masonry, which generally includes: granite, most sandstones, slate, unglazed brick and unglazed architectural terra cotta, cast stone and concrete (Fig. 12). Most commercial acidic cleaners are composed primarily of hydrofluoric acid, and often include some phosphoric acid to prevent rust-like stains from developing on the masonry after the cleaning. Acid cleaners are applied to the pre-wet masonry which should be kept wet while the acid is allowed to "work", and then removed with a water wash.

Alkaline Cleaners. Alkaline cleaners should be used on **acid-sensitive** masonry, including: limestone, polished and unpolished marble, calcareous sandstone, glazed brick and glazed architectural terra cotta, and polished granite. (Alkaline cleaners may also be used sometimes on masonry materials that are not acid sensitive—after testing, of course—but they may not be as effective as they are on acid-sensitive masonry.) Alkaline cleaning products consist primarily of two ingredients: a non-ionic detergent or surfactant; and an alkali, such as potassium hydroxide or ammonium hydroxide. Like acidic cleaners, alkaline products are usually applied to pre-wet masonry, allowed to dwell, and then rinsed off with water. (Longer dwell times may be necessary with alkaline cleaners than with acidic cleaners.) Two additional steps are required to remove alkaline cleaners after the initial rinse. First the masonry is given a slightly acidic wash—often with acetic acid–to neutralize it, and then it is rinsed again with water.

Chemical Cleaners to Remove Paint and Other Coatings, Stains and Graffiti

Removing paint and some other coatings, stains and graffiti can best be accomplished with alkaline paint removers, organic solvent paint removers, or other cleaning compounds. The removal of layers of paint from a masonry surface usually involves applying the remover either by brush, roller or spraying, followed by a thorough water wash. As with any chemical cleaning, the manufacturer's recommendations regarding application procedures should always be tested before beginning work.

Alkaline Paint Removers. These are usually of much the same composition as other alkaline cleaners, containing potassium or ammonium hydroxide, or trisodium phosphate. They are used to remove oil, latex and acrylic paints, and are effective for removing multiple layers of paint. Alkaline cleaners may also remove some acrylic, water-repellent coatings. As with other alkaline cleaners, both an acidic neutralizing wash and a final water rinse are generally required following the use of alkaline paint removers.

Organic Solvent Paint Removers. The formulation of organic solvent paint removers varies and may include a combination of solvents, including methylene chloride, methanol, acetone, xylene and toluene.

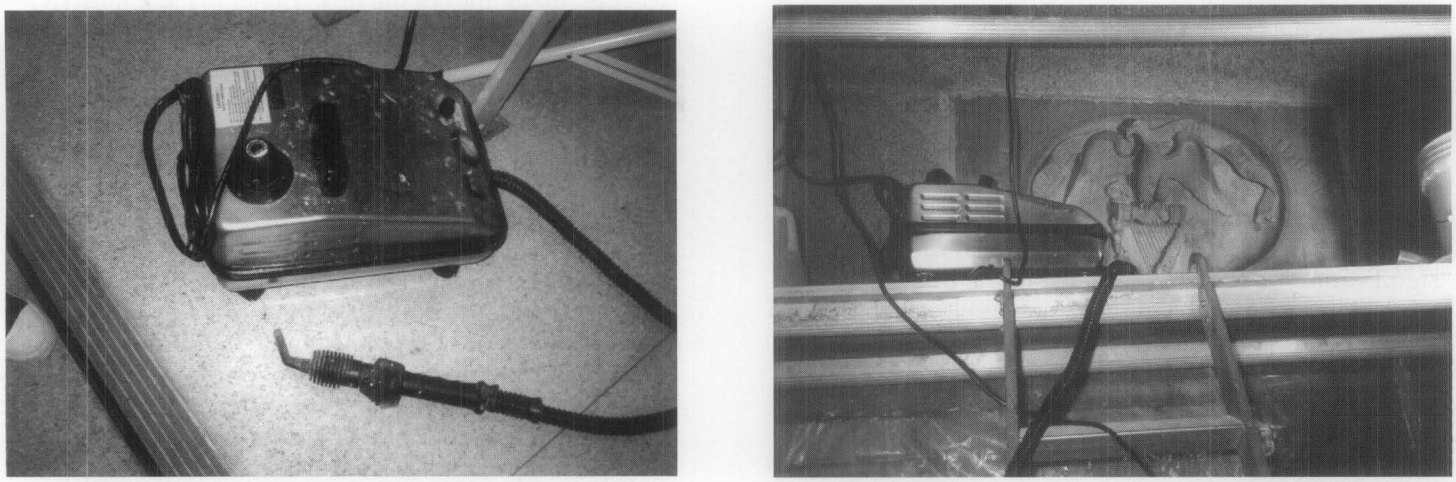


Figure 9. (Left) This small steam cleaner—the size of a vacuum cleaner—offers a very controlled and gentle means of cleaning limited, or hard-to-reach areas or carved stone details. (Right) It is particularly useful for interiors where it is important to keep moisture to a minumum, such as inside the Washington Monument, Washington, D.C., where it was used to clean the commemorative stones. Photos: Audrey T. Tepper.



Figure 10. High-pressure water washing too close to the surface has abraded and, consequently, marred the limestone on this early-20th century building.

Other Paint Removers and Cleaners. Other cleaning compounds that can be used to remove paint and some painted graffiti from historic masonry include paint removers based on N-methyl-2-pyrrolidone (NMP), or on petroleum-based compounds. Removing stains, whether they are industrial (smoke, soot, grease or tar), metallic (iron or copper), or biological (plant and fungal) in origin, depends on carefully matching the type of remover to the type of stain (Fig. 13). Successful removal of stains from historic masonry often requires the application of a number of different removers before the right one is found. The removal of layers of paint from a masonry surface is usually accomplished by applying the remover either by brush, roller or spraying, followed by a thorough water wash (Fig. 14).

Potential hazards of chemical cleaning. Since most chemical cleaning methods involve water, they have many of the potential problems of plain water cleaning. Like water methods, they should not be used in cold weather because of the possibility of freezing. Chemical cleaning should never be undertaken in temperatures below 40 degrees F (4 degrees C), and generally not below 50 degrees F. In addition, many chemical cleaners simply do not work in cold temperatures. Both acidic and alkaline cleaners can be dangerous to cleaning operators and, clearly, there are environmental concerns associated with the use of chemical cleaners.

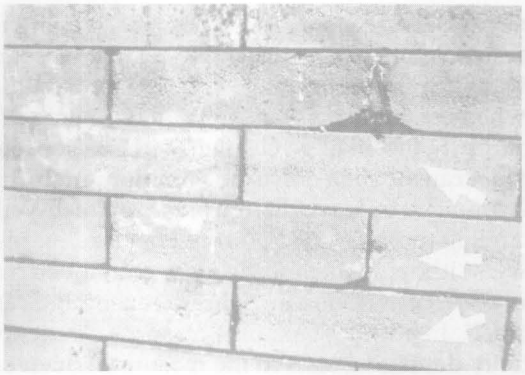


Figure 11. Rinsing with high-pressure water following chemical cleaning has left a horizontal line of abrasion across the bricks on this late-19th century row house.

If not carefully chosen, chemical cleaners can react adversely with many types of masonry. Obviously, acidic cleaners should not be used on acid-sensitive materials; however, it is not always clear exactly what the composition is of any stone or other masonry material. For, this reason, testing the cleaner on an inconspicuous spot on the building is always necessary. While certain acid-based cleaners may be appropriate if used as directed on a particular type of masonry, if left too long or if not adequately rinsed from the masonry they can have a negative effect. For example, hydrofluoric acid can etch masonry leaving a hazy residue (whitish deposits of silica or calcium fluoride salts) on the surface. While this efflorescence may usually be removed by a second cleaning—although it is likely to be expensive and time-consuming—**hydrofluoric acid** can also leave calcium fluoride salts or a colloidal silica deposit on masonry which may be impossible to remove (Fig. 15). Other acids, particularly **hydrochloric (muriatic) acid**, which is very powerful, should not be used on historic masonry, because it can dissolve lime-based mortar, damage brick and some stones, and leave chloride deposits on the masonry.

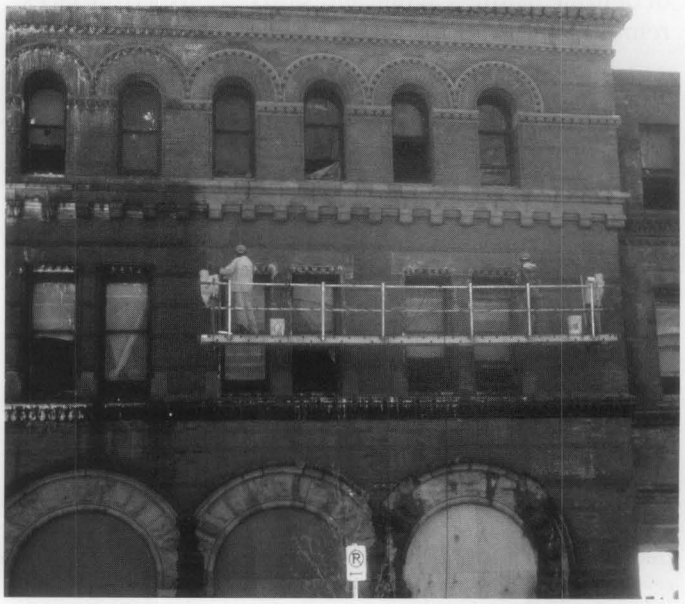


Figure 12. A mild acidic cleaning agent is being used to clean this heavily soiled brick and granite building. Additional applications of the cleaner and hand-scrubbing, and even poulticing, may be necessary to remove the dark stains on the granite arches below. Photo: Sharon C. Park, FAIA.

Alkaline cleaners can stain sandstones that contain a ferrous compound. Before using an alkaline cleaner on sandstone it is always important to test it, since it may be difficult to know whether a particular sandstone may contain a ferrous compound. Some alkaline cleaners, such as **sodium hydroxide (caustic soda or lye)** and **ammonium bifluoride**, can also damage or leave disfiguring brownish-yellow stains and, in most cases, should not be used on historic masonry. Although alkaline cleaners will not etch a masonry surface as acids can, they are caustic and can burn the surface. In addition, alkaline cleaners can deposit potentially damaging salts in the masonry which can be difficult to rinse thoroughly.

Abrasive and Mechanical Cleaning

Generally, abrasive cleaning methods are not appropriate for use on historic masonry buildings. Abrasive cleaning methods are just that—abrasive. Grit blasters, grinders, and sanding discs all operate by *abrading* the dirt or paint off the surface of the masonry, rather than *reacting* with the dirt and the masonry which is how water and chemical methods work. Since the abrasives do not differentiate between the dirt and the masonry, they can also remove the outer surface of the masonry at the same time, and result in permanently damaging the masonry. Brick, architectural terra cotta, soft stone, detailed carvings, and polished surfaces are especially susceptible to physical and aesthetic damage by abrasive methods. Brick and architectural terra cotta are fired products which have a smooth, glazed surface which can be removed by abrasive blasting or grinding (Figs. 18-19). Abrasively-cleaned masonry is damaged aesthetically as well as physically, and it has a rough surface which tends to hold dirt and the roughness will make future cleaning more difficult. Abrasive cleaning processes can also increase the likelihood of subsurface cracking of the masonry. Abrasion of carved details causes a rounding of sharp corners and other loss of delicate features, while abrasion of polished surfaces removes the polished finish of stone.

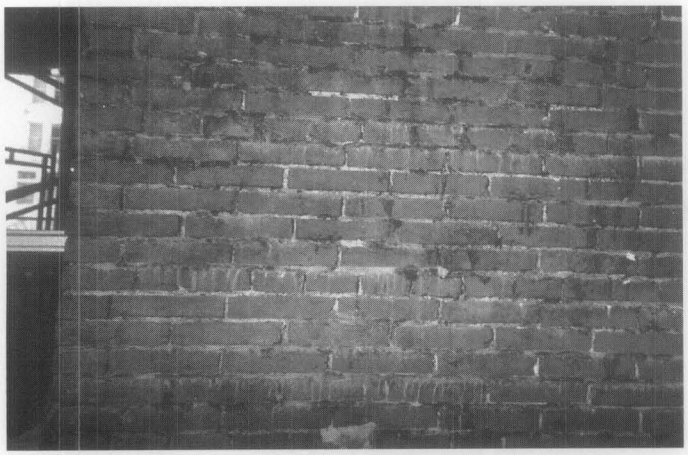


Figure 13. Sometimes it may be preferable to paint over a thick asphaltic coating rather than try to remove it, because it can be difficult to remove completely. However, in this case, many layers of asphaltic coating were removed through multiple applications of a heavy duty chemical cleaner. Each application of the cleaner was left to dwell following the manufacturer's reccommendations, and then rinsed thoroughly. (As much as possible of the asphalt was first removed with wooden scrapers.) Although not all the asphalt was removed, this was determined to be an acceptable level of cleanliness for the project.



Figure 14. Chemical removal of paint from this brick building has revealed that the cornice and window hoods are metal rather than masonry.

Mortar joints, especially those with lime mortar, also can be eroded by abrasive or mechanical cleaning. In some cases, the damage may be visual, such as loss of joint detail or increased joint shadows. As mortar joints constitute a significant portion of the masonry surface (up to 20 per cent in a brick wall), this can result in the loss of a considerable amount of the historic fabric. Erosion of the mortar joints may also permit increased water penetration, which will likely necessitate repointing.

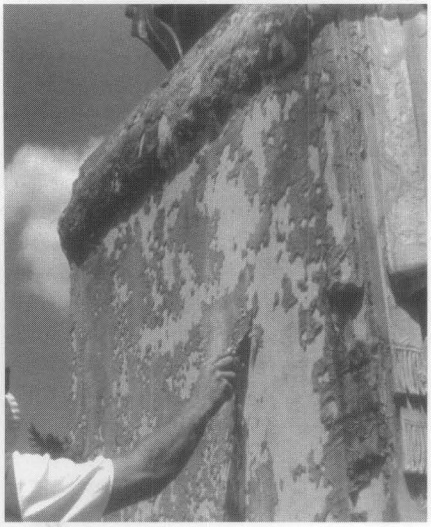


Figure 15. The whitish deposits left on the brick by a chemical paint remover may have resulted from inadequate rinsing or from the chemical being left on the surface too long and may be impossible to remove.

Poulticing to Remove Stains and Graffiti



a



c



d

Figure 16. (a) The limestone base was heavily stained by runoff from the bronze statue above. (b) A poultice consisting of copper stain remover and ammonia mixed with fuller's earth was applied to the stone base and covered with plastic sheeting to keep it from drying out too quickly. (c) As the poultice dried, it pulled the stain out of the stone. (d) The poultice residue was removed carefully from the stone surface with wooden scrapers and the stone was rinsed with water. Photos: John Dugger.



b

Graffiti and stains, which have penetrated into the masonry, often are best removed by using a poultice. A poultice consists of an absorbent material or clay powder (such as kaolin or fuller's earth, or even shredded paper or paper towels), mixed with a liquid (solvent or other remover) to form a paste which is applied to the stain (Figs. 16-17). As it dries, the paste absorbs the staining material so that it is not redeposited on the masonry surface. Some commercial cleaning products and paint removers are specially formulated as a paste or gel that will cling to a vertical surface and remain moist for a longer period of time in order to prolong the action of the chemical on the stain. Pre-mixed poultices are also available as a paste or in powder form needing only the addition of the appropriate liquid. The masonry must be pre-wet before applying an alkaline cleaning agent, but not when using a solvent. Once the stain has been removed, the masonry must be rinsed thoroughly.

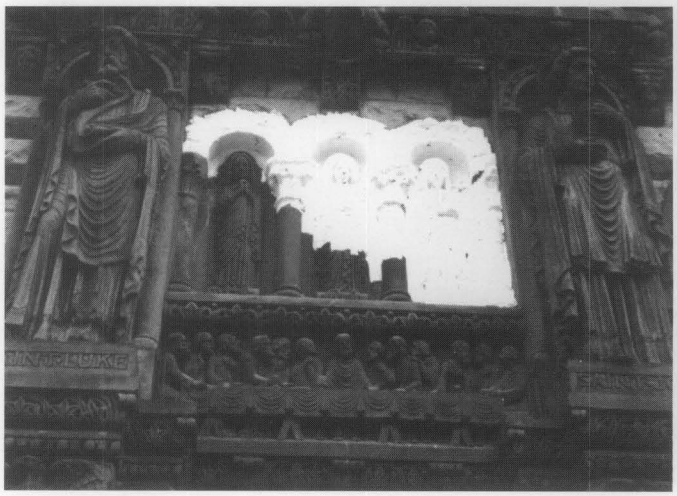


Figure 17. A poultice is being used to remove salts from the brownstone statuary on the facade of this late-19th century stone church. Photo: National Park Service Files.



Figure 18. The glazed bricks in the center of the pier were covered by a signboard that protected them being damaged by the sandblasting which removed the glaze from the surrounding bricks.



Figure 19. A comparison of undamaged bricks surroundng the electrical conduit with the rest of the brick facade emphasizes the severity of the erosion caused by sandblasting.

Abrasive Blasting. Blasting with abrasive grit or another abrasive material is the most frequently used abrasive method. *Sandblasting* is most commonly associated with abrasive cleaning. Finely ground silica or glass powder, glass beads, ground garnet, powdered walnut and other ground nut shells, grain hulls, aluminum oxide, plastic particles and even tiny pieces of sponge, are just a few of the other materials that have also been used for abrasive cleaning. Although abrasive blasting is not an appropriate method of cleaning historic masonry, it can be safely used to clean some materials. Finely-powdered walnut shells are commonly used for cleaning monumental bronze sculpture, and skilled conservators clean delicate museum objects and finely detailed, carved stone features with very small, micro-abrasive units using aluminum oxide.

A number of current approaches to abrasive blasting rely on materials that are not usually thought of as abrasive, and not as commonly associated with traditional abrasive grit cleaning. Some patented abrasive cleaning processes—one dry, one wet —use finely-ground glass powder intended to "erase" or remove dirt and surface soiling only, but not paint or stains (Fig. 20). Cleaning with baking soda (sodium bicarbonate) is another patented process. Baking soda blasting is being used in some communities as a means of quick graffiti removal. However, it should not be used on historic masonry which it can easily abrade and can permanently "etch" the graffiti into the stone; it can also leave potentially damaging salts in the stone which cannot be removed. Most of these abrasive grits may be used either dry or wet, although dry grit tends to be used more frequently.

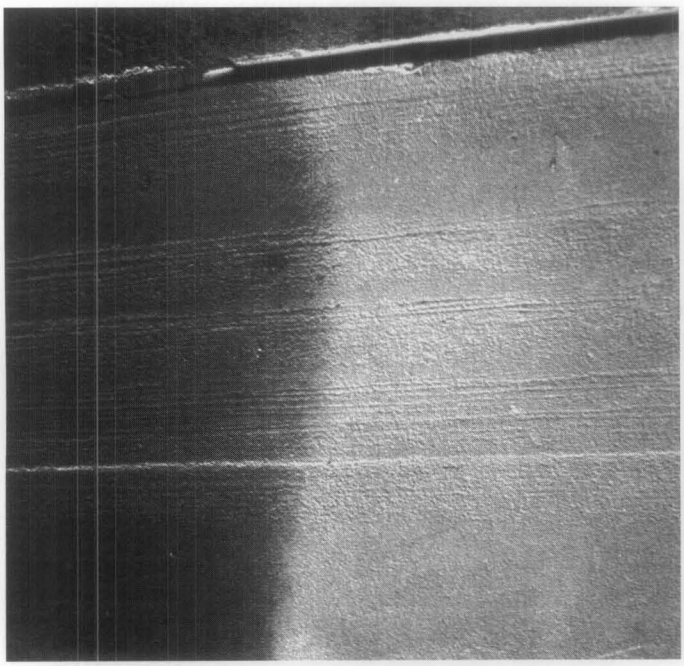




Figure 20. (Left) A comparison of the limestone surface of a 1920s office building before and after "cleaning" with a proprietary abrasive process using fine glass powder clearly shows the effectiveness of this method. But this is an abrasive technique and it has "cleaned" by removing part of the masonry surface with the dirt. Because it is abrasive, it is generally not recommended for large-scale cleaning of historic masonry, although it may be suitable to use in certain, very limited cases under controlled circumstances. (Right) A vacum chamber where the used glass powder is collected for environmentally safe disposal is a unique feature of this particular process. The specially-trained operators in the chamber wear protective clothing, masks and breathing equipment. Photos: Tom Keohan.

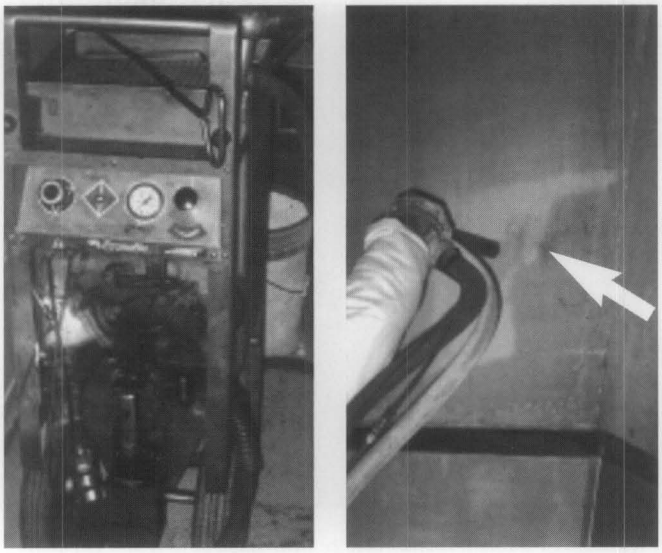


Figure 21. Low-pressure blasting with ice pellets or ice crystals (left) is an abrasive cleaning method that is sometimes recommended for use on interior masonry because it does not involve large amounts of water. However, like other abrasive materials, ice crystals "clean" by removing a portion of the masonry surface with the dirt, and may not remove some stains that have penetrated into the masonry without causing further abrasion (right). Photos: Audrey T. Tepper.

Ice particles, or pelletized dry ice (carbon dioxide or CO_2), are another medium used as an abrasive cleaner (Fig. 21). This is also too abrasive to be used on most historic masonry, but it may have practical application for removing mastics or asphaltic coatings from some substrates.

Some of these processes are promoted as being more environmentally safe and not damaging to historic masonry buildings. However, it must be remembered that they are abrasive and that they "clean" by removing a small portion of the masonry surface, even though it may be only a minuscule portion. The fact that they are essentially abrasive treatments must always be taken into consideration when planning a masonry cleaning project. *In general, abrasive methods should not be used to clean historic masonry buildings.* In some, very limited instances, highly-controlled, gentle abrasive cleaning may be appropriate on selected, hard-to-clean areas of a historic masonry building if carried out under the watchful supervision of a professional conservator. But, abrasive cleaning should never be used on an entire building.

Grinders and Sanding Disks. Grinding the masonry surface with mechanical grinders and sanding disks is another means of abrasive cleaning that should not be used on historic masonry. Like abrasive blasting, grinders and disks do not really clean masonry but instead grind away and abrasively remove and, thus, damage the masonry surface itself rather than remove just the soiling material.

Planning A Cleaning Project

Once the masonry and soiling material or paint have been identified, and the condition of the masonry has been evaluated, planning for the cleaning project can begin.

Testing cleaning methods. In order to determine the *gentlest means possible*, several cleaning methods or materials may have to be tested prior to selecting the best one to use on the building. Testing should always begin with the gentlest and least invasive method proceeding gradually, if necessary, to more complicated methods, or a combination of methods. All too often simple methods, such as low-pressure water wash, are not even considered, yet they frequently are effective, safe, and not expensive. Water of slightly higher pressure or with a non-ionic detergent additive also may be effective. It is worth repeating that these methods should always be tested prior to considering harsher methods; they are safer for the building and the environment, often safer for the applicator, and relatively inexpensive.

The level of cleanliness desired also should be determined prior to selection of a cleaning method. Obviously, the intent of cleaning is to remove most of the dirt, soiling material, stains, paint or other coating. A "brand new" appearance, however, may be inappropriate for an older building, and may require an overly harsh cleaning method to be achieved. When undertaking a cleaning project, it is important to be aware that some stains simply may not be removable. It may be wise, therefore, to agree upon a slightly lower level of cleanliness that will serve as the standard for the cleaning project. The precise amount of residual dirt considered acceptable may depend on the type of masonry, the type of soiling and difficulty of total removal, and local environmental conditions.

Cleaning tests should be carried out in an area of sufficient size to give a true indication of their effectiveness. It is preferable to conduct the test in an inconspicuous location on the building so that it will not be obvious if the test is not successful. A test area may be quite small to begin, sometimes as small as six square inches, and gradually may be increased in size as the most appropriate methods and cleaning agents are determined. Eventually the test area may be expanded to a square yard or more, and it should include several masonry units and mortar joints (Fig. 22). It should be remembered that a single building may have several types of masonry and that even similar materials may have different surface finishes. Each material and different finish should be tested separately. Cleaning tests should be evaluated only after the masonry has dried completely. *The results of the tests may indicate that several methods of cleaning should be used on a single building.*

When feasible, test areas should be allowed to weather for an extended period of time prior to final evaluation. A waiting period of a full year would be ideal in order to expose the test patch to a full range of seasons. If this is not possible, the test patch should weather for at least a month or two. For any building which is considered historically important, the delay is insignificant compared to the potential damage and disfigurement which may result from using an incompletely tested method. *The successfully cleaned test patch should be protected as it will serve as a standard against which the entire cleaning project will be measured.*

Environmental considerations. The potential effect of any method proposed for cleaning historic masonry should be evaluated carefully. Chemical cleaners and paint removers may damage trees, shrubs, grass, and plants. A plan must be provided for environmentally safe removal and disposal of the cleaning materials and the rinsing effluent before beginning the cleaning project. Authorities from the local regulatory agency—usually under the jurisdiction of the federal or state Environmental Protection Agency (EPA) should be consulted prior to beginning a cleaning project, especially if it involves anything more than plain water washing. This advance planning will ensure that the cleaning effluent or run-off, which is the combination of the cleaning agent and the substance removed from the masonry, is handled and disposed of in an environmentally sound and legal manner. Some alkaline and acidic cleaners can be neutralized so that they can be safely discharged into storm sewers. However, most solvent-based cleaners cannot be neutralized and are categorized as pollutants, and must be disposed of by a licensed transport, storage and disposal facility. Thus, it is always advisable to consult with the appropriate agencies before starting to clean to ensure that the project progresses smoothly and is not interrupted by a stop-work order because a required permit was not obtained in advance.

Vinyl guttering or polyethylene-lined troughs placed around the perimeter of the base of the building can serve to catch chemical cleaning waste as it is rinsed off the building. This will reduce the amount of chemicals entering and polluting the soil, and also will keep the cleaning waste contained until it can be removed safely. Some patented cleaning systems have developed special equipment to facilitate the containment and later disposal of cleaning waste.

Concern over the release of volatile organic compounds (VOCs) into the air has resulted in the manufacture of new, more environmentally responsible cleaners and paint removers, while some materials traditionally used in cleaning may no longer be available for these same reasons. Other health and safety concerns have created additional cleaning challenges, such as lead paint removal, which is likely to require special removal and disposal techniques.

Cleaning can also cause damage to non-masonry materials on a building, including glass, metal and wood. Thus, it is usually necessary to cover windows and doors, and other features that may be vulnerable to chemical cleaners. They should be covered with plastic or polyethylene, or a masking agent that is applied as a liquid which dries to form a thin protective film on glass, and is easily peeled off after the cleaning is finished. Wind drift, for example, can also damage other property by carrying cleaning chemicals onto nearby automobiles, resulting in etching of the glass or spotting of the paint finish. Similarly, airborne dust can enter surrounding buildings, and excess water can collect in nearby yards and basements.

Safety considerations. Possible health dangers of each method selected for the cleaning project must be considered before selecting a cleaning method to avoid harm to the

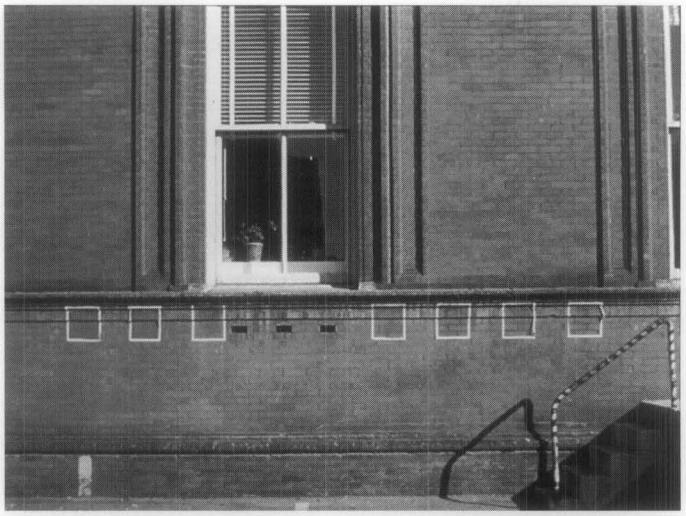


Figure 22. Cleaning test areas may be quite small at first and gradually increase in size as testing determines the "gentlest means possible". Photo: Frances Gale.

cleaning applicators, and the necessary precautions must be taken. The precautions listed in Material Safety Data Sheets (MSDS) that are provided with chemical products should always be followed. Protective clothing, respirators, hearing and face shields, and gloves must be provided to workers to be worn at all times. Acidic and alkaline chemical cleaners in both liquid and vapor forms can also cause serious injury to passers-by (Fig. 23). It may be necessary to schedule cleaning at night or weekends if the building is located in a busy urban area to reduce the potential danger of chemical overspray to pedestrians. Cleaning during non-business hours will allow HVAC systems to be turned off and vents to be covered to prevent dangerous chemical fumes from entering the building which will also ensure the safety of the building's occupants. Abrasive and mechanical methods produce dust which can pose a serious health hazard, particularly if the abrasive or the masonry contains silica.

Water-Repellent Coatings and Waterproof Coatings

To begin with, it is important to understand that waterproof coatings and water-repellent coatings are not the same. Although these terms are frequently interchanged and commonly confused with one another, they are completely different materials. **Water-repellent coatings** —often referred to incorrectly as "sealers", but which do not or should not seal— are intended to keep liquid water from penetrating the surface but to allow water vapor to enter and leave, or pass through, the surface of the masonry (Fig. 24). Water-repellent coatings are generally *transparent*, or clear, although once applied some may darken or discolor certain types of masonry while others may give it a glossy or shiny appearance. **Waterproof coatings** seal the surface from liquid water and from water vapor. They are usually *opaque*, or pigmented, and include bituminous coatings and some elastomeric paints and coatings.

Water-Repellent Coatings

Water-repellent coatings are formulated to be vapor permeable, or "breathable". They do not seal the surface completely to water vapor so it can enter the masonry wall as well as leave the wall. While the first water-repellent coatings to be developed were primarily acrylic or silicone resins in organic solvents, now most water-repellent coatings are water-based and formulated from modified siloxanes, silanes and other alkoxysilanes, or metallic stearates. While some of these products are shipped from the factory ready to use, other waterborne water repellents must be diluted at the job site. Unlike earlier water-repellent coatings which tended to form a "film" on the masonry surface, modern water-repellent coatings actually penetrate into the masonry substrate slightly and, generally, are almost invisible if properly applied to the masonry. They are also more vapor permeable than the old coatings, yet they still reduce the vapor permeability of the masonry. Once inside the wall, water vapor can condense at cold spots producing liquid water which, unlike water vapor, cannot escape through a water-repellent coating. The liquid water within the wall, whether from condensation, leaking gutters, or other sources, can cause considerable damage.

Water-repellent coatings are not consolidants. Although modern water repellents may penetrate slightly beneath the masonry surface, instead of just "sitting" on top of it, they do not perform the same function as a consolidant which is to "consolidate" and replace lost binder to strengthen deteriorating masonry. Even after many years of laboratory study and testing few consolidants have proven very effective. The composition of fired products such as brick and architectural terra cotta, as well as many types of building stone, does not lend itself to consolidation.

Some modern water-repellent coatings which contain a binder intended to replace the natural binders in stone that have been lost through weathering and natural erosion are described in product literature as both a water repellent and a consolidant. The fact that newer water-repellent coatings penetrate beneath the masonry surface instead of just forming a layer on top of the surface may indeed convey at least some consolidating properties to certain stones. However, a water-repellent coating cannot be considered a consolidant. In some instances, a water-repellent or "preservative" coating, if applied to already damaged or spalling stone, may form a surface crust which, if it fails, may exacerbate the deterioration by pulling off even more of the stone (Fig. 25).

Is a Water-Repellent Treatment Necessary?

Water-repellent coatings are frequently applied to historic masonry buildings for the wrong reason. They also are often applied without an understanding of what they are and what they are intended to do. And these coatings can be very difficult, if not impossible, to remove from the masonry if they fail or become discolored. Most importantly, the application of water-repellent coatings to historic masonry is usually unnecessary.



Figure 23. A tarpaulin protects and shields pedestrians from potentially harmful spray while chemical cleaning is underway on the granite exterior of the U.S. Treasury Building, Washington, D.C.

Most historic masonry buildings, unless they are painted, have survived for decades without a water-repellent coating and, thus, probably do not need one now. Water penetration to the interior of a masonry building is seldom due to porous masonry, but results from poor or deferred maintenance. Leaking roofs, clogged or deteriorated gutters and downspouts, missing mortar, or cracks and open joints around door and window openings are almost always the cause of moisture-related problems in a historic masonry building. **If historic masonry buildings are kept watertight and in good repair, water-repellent coatings should not be necessary.**

Rising damp (capillary moisture pulled up from the ground), or condensation can also be a source of excess moisture in masonry buildings. A water-repellent coating will not solve this problem either and, in fact, may be likely to exacerbate it. Furthermore, a water-repellent coating should never be applied to a damp wall. Moisture in the wall would reduce the ability of a coating to adhere to the masonry and to penetrate below the surface. But, if it did adhere, it would hold the moisture inside the masonry because, although a water-repellent coating is permeable to water vapor, liquid water cannot pass through it. In the case of rising damp, a coating may force the moisture to go even higher in the wall because it can slow down evaporation, and thereby retain the moisture in the wall.

Excessive moisture in masonry walls may carry waterborne soluble salts from the masonry units themselves or from the mortar through the walls. If the water is permitted to come to the surface, the salts may appear on the masonry surface as efflorescence (a whitish powder) upon evaporation. However, the salts can be potentially dangerous if they remain in the masonry and crystallize



Figure 24. Although the application of a water-repellent coating was probably not needed on either of these buildings, the coating on the brick building (above), is not visible and has not changed the character of the brick. But the coating on the brick column (below), has a high gloss that is incompatible with the historic character of the masonry.



beneath the surface as subflorescence. Subflorescence eventually may cause the surface of the masonry to spall, particularly if a water-repellent coating has been applied which tends to reduce the flow of moisture out from the subsurface of the masonry. Although many of the newer water-repellent products are more breathable than their predecessors, they can be especially damaging if applied to masonry that contains salts, because they limit the flow of moisture through masonry.

When a Water-Repellent Coating May be Appropriate

There are some instances when a water-repellent coating may be considered appropriate to use on a historic masonry building. Soft, incompletely fired brick from the 18th- and early-19th centuries may have become so porous that paint or some type of coating is needed to protect it from further deterioration or dissolution. When a masonry building has been neglected for a long period of time, necessary repairs may be required in order to make it watertight. If, following a reasonable period of time after the building has been made watertight and has dried out completely, moisture appears actually to be penetrating through the repointed and repaired masonry walls, then the application of a water-repellent coating may be considered *in selected areas only*. This decision should be made in consultation with an architectural conservator. And, if such a treatment is undertaken, it should not be applied to the entire exterior of the building.

Anti-graffiti or barrier coatings are another type of clear coating—although barrier coatings can also be pigmented—that may be applied to exterior masonry, but they are not formulated primarily as water repellents. The purpose of these coatings is to make it harder for graffiti to stick to a masonry surface and, thus, easier to clean. But, like water-repellent coatings, in most cases the application of anti-graffiti coatings is generally not recommended for historic masonry buildings. These coatings are often quite shiny which can greatly alter the appearance of a historic masonry surface, and they are not always effective (Fig. 26). Generally, other ways of discouraging graffiti, such as improved lighting, can be more effective than a coating. However, the application of anti-graffiti coatings may be appropriate in some instances on vulnerable areas of historic masonry buildings which are frequent targets of graffiti that are located in out-of-the-way places where constant surveillance is not possible.

Some water-repellent coatings are recommended by product manufacturers as a means of keeping dirt and pollutants or biological growth from collecting on the surface of masonry buildings and, thus, reducing the need for frequent cleaning. While this at times may be true, in some cases a coating may actually retain dirt more than uncoated masonry. Generally, the application of a water-repellent coating is not recommended on a historic masonry building as a means of preventing biological growth. Some water-repellent coatings may actually encourage biological growth on a masonry wall. Biological growth on masonry buildings has traditionally been kept at bay through regularly-scheduled cleaning as part of a maintenance plan. Simple cleaning of the masonry with low-pressure water using a natural- or synthetic-bristled scrub brush can be very effective if done on a regular basis. Commercial products are also available which can be sprayed on masonry to remove biological growth.

In most instances, a water-repellent coating is not necessary if a building is watertight. The application of a water-repellent coating is not a recommended treatment for historic masonry buildings unless there is a specific



Figure 25. The clear coating applied to this limestone molding has failed and is taking off some of the stone surface as it peels. Photo: Frances Gale.

problem which it may help solve. If the problem occurs on only part of the building, it is best to treat only that area rather than an entire building. Extreme exposures such as parapets, for example, or portions of the building subject to driving rain can be treated more effectively and less expensively than the entire building. Water-repellent coatings are not permanent and must be reapplied periodically although, if they are truly invisible, it can be difficult to know when they are no longer providing the intended protection.

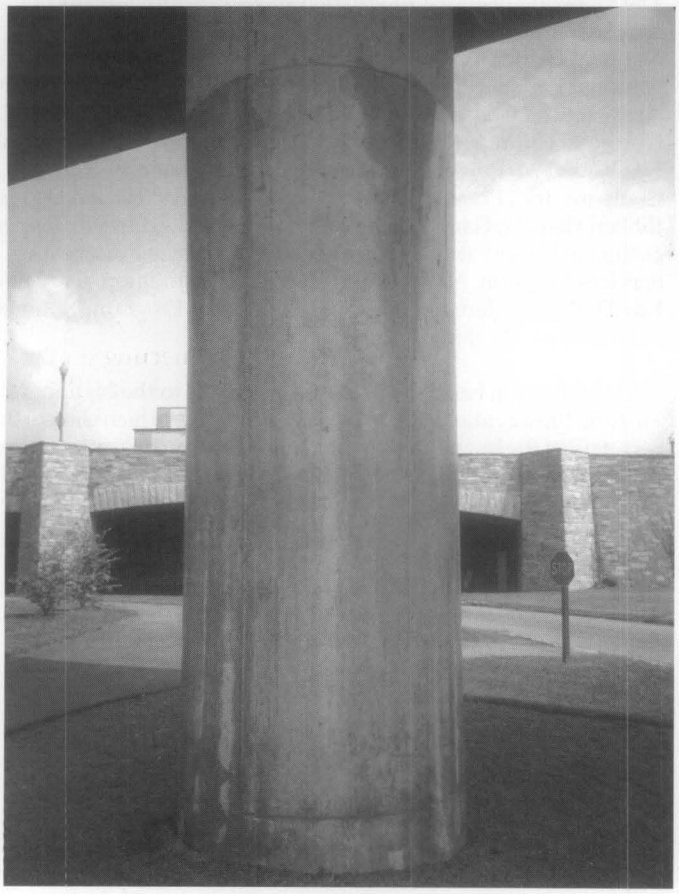


Figure 26. The anti-graffiti or barrier coating on this column is very shiny and would not be appropriate to use on a historic masonry building. The coating has discolored as it has aged and whitish streaks reveal areas of bare concrete where the coating was incompletely applied.

Testing a water-repellent coating by applying it in one small area may not be helpful in determining its suitability for the building because a limited test area does not allow an adequate evaluation of such a treatment. Since water may enter and leave through the surrounding untreated areas, there is no way to tell if the coated test area is "breathable." But trying a coating in a small area may help to determine whether the coating is visible on the surface or if it will otherwise change the appearance of the masonry.

Waterproof Coatings

In theory, waterproof coatings usually do not cause problems as long as they exclude all water from the masonry. If water does enter the wall from the ground or from the inside of a building, the coating can intensify the damage because the water will not be able to escape. During cold weather this water in the wall can freeze causing serious mechanical disruption, such as spalling.

In addition, the water eventually will get out by the path of least resistance. If this path is toward the interior, damage to interior finishes can result; if it is toward the exterior, it can lead to damage to the masonry caused by built-up water pressure (Fig. 27).

In most instances, waterproof coatings should not be applied to historic masonry. The possible exception to this might be the application of a waterproof coating to below-grade exterior foundation walls as a last resort to stop water infiltration on interior basement walls. **Generally, however, waterproof coatings, which include *elastomeric paints*, should almost never be applied above grade to historic masonry buildings.**

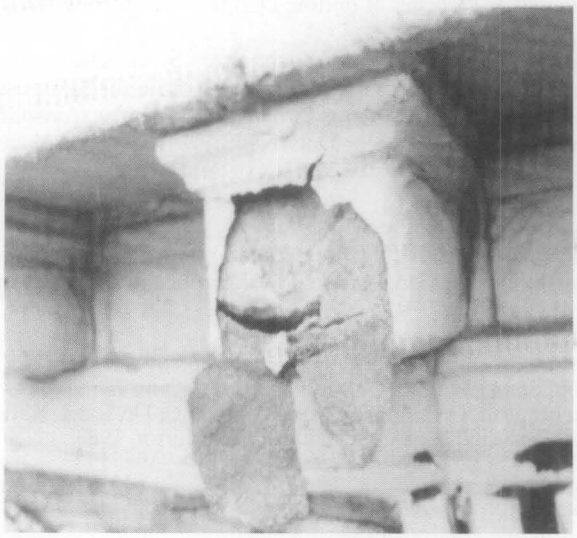


Figure 27. Instead of correcting the roof drainage problems, an elastomeric coating was applied to the already saturated limestone cornice. An elastomeric coating holds moisture in the masonry because it does not "breathe" and does not allow liquid moisture to escape. If the water pressure builds up sufficiently it can cause the coating to break and pop off as shown in this example, often pulling pieces of the masonry with it. Photo: National Park Service Files.

Summary

A well-planned cleaning project is an essential step in preserving, rehabilitating or restoring a historic masonry building. Proper cleaning methods and coating treatments, when determined necessary for the preservation of the masonry, can enhance the aesthetic character as well as the structural stability of a historic building. Removing years of accumulated dirt, pollutant crusts, stains, graffiti or paint, if done with appropriate caution, can extend the life and longevity of the historic resource. Cleaning that is carelessly or insensitively prescribed or carried out by inexperienced workers can have the opposite of the intended effect. It may scar the masonry permanently, and may actually result in hastening deterioration by introducing harmful residual chemicals and salts into the masonry or causing surface loss. Using the wrong cleaning method or using the right method incorrectly, applying the wrong kind of coating or applying a coating that is not needed can result in serious damage, both physically and aesthetically, to a historic masonry building. Cleaning a historic masonry building should always be done using the *gentlest means possible* that will clean, but not damage the building. It should always be taken into consideration before applying a water-repellent coating or a waterproof coating to a historic masonry building whether it is really necessary and whether it is in the best interest of preserving the building.

Selected Reading

Architectural Ceramics: Their History, Manufacture and Conservation. A Joint Symposium of English Heritage and the United Kingdom Institute for Conservation, September 22-25, 1994. London: English Heritage, 1996.

Ashurst, Nicola. *Cleaning Historic Buildings. Volume One: Substrates, Soiling & Investigation. Volume Two: Cleaning Materials & Processes.* London: Donhead Publishing Ltd., 1994.

Association for Preservation Technology. *Special Issue: Preservation of Historic Masonry.* Papers from the Symposium on Preservation Treatments for Historic Masonry: Consolidants, Coatings, and Water Repellents, New York, New York, November 11-12, 1994. *APT Bulletin.* Vol. XXVI, No. 4 (1995).

Grimmer, Anne E. *Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings.* Washington, D.C.: Preservation Assistance Division, National Park Service, U.S. Department of the Interior, 1979.

Grimmer, Anne E. *Keeping it Clean: Removing Exterior Dirt, Paint, Stains and Graffiti from Historic Masonry Buildings.* Washington, D.C.: Preservation Assistance Division, National Park Service, U.S. Department of the Interior, 1988.

Park, Sharon C., AIA. *Preservation Brief 39: Holding the Line: Controlling Unwanted Moisture in Historic Buildings.* Washington, D.C.: Heritage Preservation Services, National Park Service, U.S. Department of the Interior, 1996.

Powers, Robert M. *Preservation Tech Note, Masonry No. 3, "Water Soak Cleaning of Limestone".* Washington, D.C.: Preservation Assistance Division, National Park Service, U.S. Department of the Interior, 1992.

Sinvinski, Valerie. *"Gentle Blasting." Old-House Journal.* Vol. XXIV, No. 4 (July-August 1996), pp. 46-49.

Weaver, Martin E. *Conserving Buildings: A Guide to Techniques and Materials.* New York: John Wiley & Sons, Inc., 1993.

Weaver, Martin E. *Preservation Brief 38: Removing Graffiti from Historic Masonry.* Washington, D.C.: Preservation Assistance Division, National Park Service, U.S. Department of the Interior, 1995.

Winkler, E.M. *Stone in Architecture: Properties, Durability.* Third, completely revised and extended edition. Berlin, Germany: Springer-Verlag, 1997.

Acknowledgments

Robert C. Mack, FAIA, is a principal in the firm of MacDonald & Mack Architects, Ltd., an architectural firm that specializes in historic buildings in Minneapolis, Minnesota.
Anne Grimmer is a Senior Architectural Historian in the Technical Preservation Services Branch, Heritage Preservation Services Program, National Park Service, Washington, D.C.

The original version of *Preservation Brief 1: The Cleaning and Waterproof Coating of Masonry Buildings* was written by Robert C. Mack, AIA. It inaugurated the *Preservation Briefs* series when it was published in 1975.

The following historic preservation specialists provided technical review of this publication: Frances Gale, Training Director, National Center for Preservation Technology and Training, National Park Service, Natchitoches, LA; Judith M. Jacob, Architectural Conservator, Building Conservation Branch, Northeast Cultural Resources Center, National Park Service, N.Y., NY; Robert M. Powers, Architectural Conservator, Powers and Company, Inc., Philadelphia, PA; Antonio Aguilar, Kaaren Dodge, JoEllen Hensley, Gary Sachau, John Sandor and Audrey T. Tepper, Technical Preservation Services Branch, Heritage Preservation Services Program, National Park Service, Washington, D.C.; and Kay D. Weeks, Heritage Preservation Services Program, National Park Service, Washington, D.C.

This publication has been prepared pursuant to the National Historic Preservation Act of 1966, as amended, which directs the Secretary of the Interior to develop and make available information concerning historic properties. Comments on the usefulness of this publication may be directed to: Sharon C. Park, FAIA, Chief, Technical Preservation Services Branch, Heritage Preservation Services Program, National Park Service, 1849 C Street, N.W., Suite NC200, Washington, D.C. 20240 (www2.cr.nps.gov/tps).
This publication is not copyrighted and can be reproduced without penalty. Normal procedures for credit to the authors and the National Park Service are appreciated.

Front Cover: Chemical cleaning of the brick and architectural terra cotta frieze on the 1880s Pension Building, Washington, D.C. (now the National Building Museum), is shown here in progress. Photo: Christina Henry.

Photographs used to illustrate this Brief were taken by Anne Grimmer unless otherwise credited.

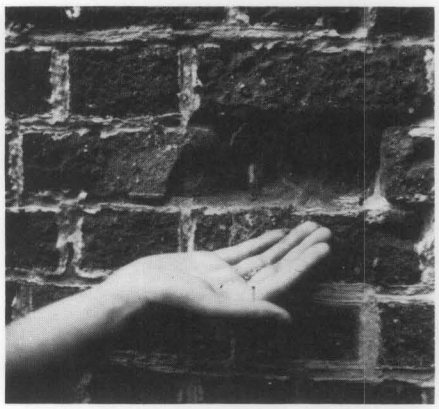
ISSN:0885-7016 *November 2000*

ATTACHMENT D: *PRESERVATION BRIEF 6: DANGERS OF ABRASIVE CLEANING TO HISTORIC BUILDINGS*

SUNKIST GROWERS INC.
14130 RIVERSIDE DRIVE, SHERMAN OAKS, CA

THIS PAGE INTENTIONALLY LEFT BLANK

6 PRESERVATION BRIEFS



Dangers of Abrasive Cleaning to Historic Buildings

Anne E. Grimmer

U.S. Department of the Interior
National Park Service
Cultural Resources

Heritage Preservation Services

"The surface cleaning of structures shall be undertaken with the gentlest means possible. Sandblasting and other cleaning methods that will damage the historic building materials shall not be undertaken."—The Secretary of the Interior's "Standards for Historic Preservation Projects."

Abrasive cleaning methods are responsible for causing a great deal of damage to historic building materials. To prevent indiscriminate use of these potentially harmful techniques, this brief has been prepared to explain abrasive cleaning methods, how they can be physically and aesthetically destructive to historic building materials, and why they generally are not acceptable preservation treatments for historic structures. There are alternative, less harsh means of cleaning and removing paint and stains from historic buildings. However, careful testing should preceed general cleaning to assure that the method selected will not have an adverse effect on the building materials. A historic building is irreplaceable, and should be cleaned using only the "gentlest means possible" to best preserve it.

What is Abrasive Cleaning?

Abrasive cleaning methods include all techniques that physically abrade the building surface to remove soils, discolorations or coatings. Such techniques involve the use of certain *materials* which impact or abrade the surface under pressure, or abrasive *tools and equipment.* Sand, because it is readily available, is probably the most commonly used type of grit material. However, any of the following materials may be substituted for sand, and all can be classified as abrasive substances: ground slag or volcanic ash, crushed (pulverized) walnut or almond shells, rice husks, ground corncobs, ground coconut shells, crushed eggshells, silica flour, synthetic particles, glass beads and micro-balloons. Even *water* under pressure can be an abrasive substance. Tools and equipment that are abrasive to historic building materials include wire brushes, rotary wheels, power sanding disks and belt sanders.

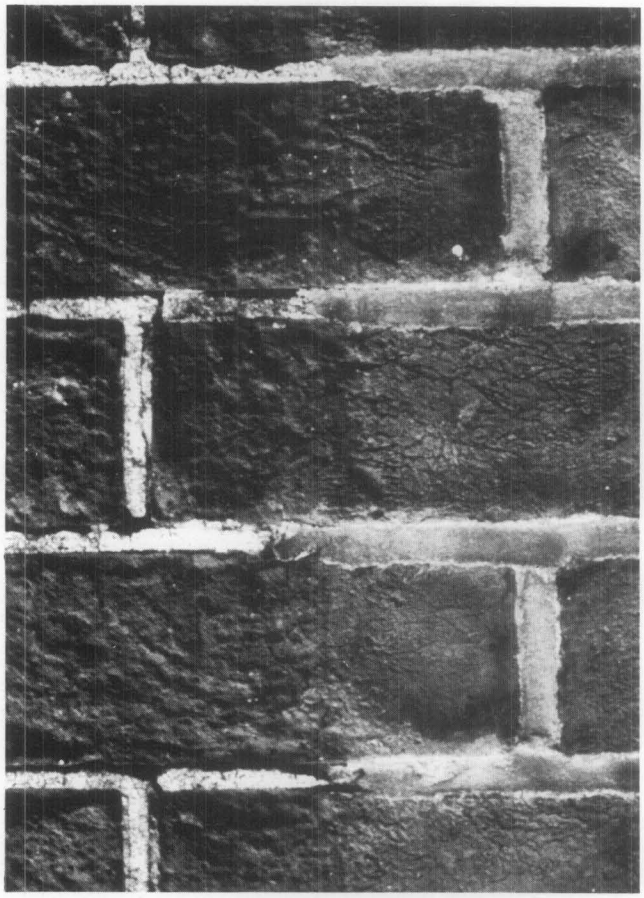
The use of water in combination with grit may also be classified as an abrasive cleaning method. Depending on the manner in which it is applied, water *may* soften the impact of the grit, but water that is too highly pressurized can be very abrasive. There are basically two different methods which can be referred to as "wet grit," and it is important to differentiate between the two. One technique involves the addition of a stream of water to a regular sandblasting nozzle. This is done primarily to cut down dust, and has very little, if any, effect on reducing the aggressiveness, or cutting action of the grit particles. With the second technique, a very small amount of grit is added to a pressurized water stream. This method may be controlled by regulating the amount of grit fed into the water stream, as well as the pressure of the water.

Why Are Abrasive Cleaning Methods Used?

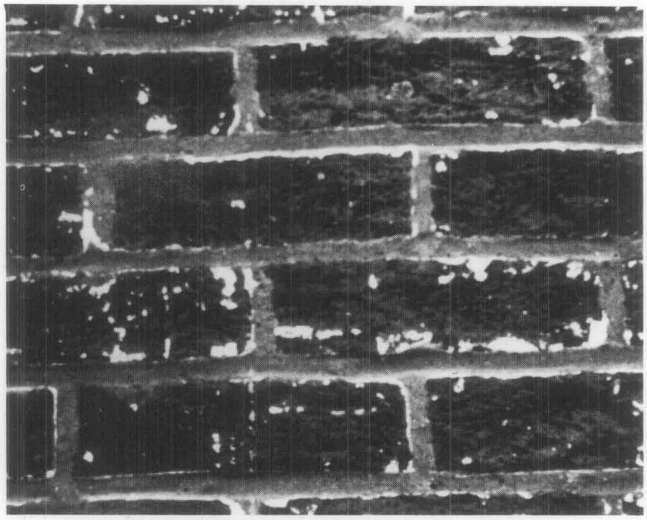
Usually, an abrasive cleaning method is selected as an expeditious means of quickly removing years of dirt accumulation, unsightly stains, or deteriorating building fabric or finishes, such as stucco or paint. The fact that sandblasting is one of the best known and most readily available building cleaning treatments is probably the major reason for its frequent use.

Many mid-19th century brick buildings were painted immediately or soon after completion to protect poor quality brick or to imitate another material, such as stone. Sometimes brick buildings were painted in an effort to produce what was considered a more harmonious relationship between a building and its natural surroundings. By the 1870s, brick buildings

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402



Abrasively Cleaned vs. Untouched Brick. *Two brick rowhouses with a common façade provide an excellent point of comparison when only one of the houses has been sandblasted. It is clear that abrasive blasting, by removing the outer surface, has left the brickwork on the left rough and pitted, while that on the right still exhibits an undamaged and relatively smooth surface. Note that the abrasive cleaning has also removed a considerable portion of the mortar from the joints of the brick on the left side, which will require repointing.*



Abrading the Surface without Removing the Paint. *Even though the entire outer surface layer of the brick has been sandblasted off, spots of paint still cling to the masonry. Sandblasting or other similarly abrasive methods are not always a successful means of removing paint.*

were often left unpainted as mechanization in the brick industry brought a cheaper pressed brick and fashion decreed a sudden preference for dark colors. However, it was still customary to paint brick of poorer quality for the additional protection the paint afforded.

It is a common 20th-century misconception that all historic masonry buildings were initially unpainted. If the intent of a modern restoration is to return a building to its original appearance, removal of the paint not only may be historically inaccurate, but also harmful. Many older buildings were painted or stuccoed at some point to correct recurring maintenance problems caused by faulty construction techniques, to hide alterations, or in an attempt to solve moisture problems. If this is the case, removal of paint or stucco may cause these problems to reoccur.

Another reason for paint removal, particularly in rehabilitation projects, is to give the building a "new image" in response to contemporary design trends and to attract investors or tenants. Thus, it is necessary to consider the purpose of the intended cleaning. While it is clearly important to remove unsightly stains, heavy encrustations of dirt, peeling paint or other surface coatings, it may not be equally desirable to remove paint from a building which originally was painted. Many historic buildings which show only a slight amount of soil or discoloration are much better left as they are. A thin layer of soil is more often protective of the building fabric than it is harmful, and seldom detracts from the building's architectural and/or historic character. Too thorough cleaning of a historic building may not only sacrifice some of the building's character, but also, misguided cleaning efforts can cause a great deal of damage to historic building fabric. Unless there are stains, graffiti or dirt and pollution deposits which are destroying the building fabric, it is generally preferable to do as little cleaning as possible, or to repaint where necessary. It is important to remember that a historic building does not have to look as if it were newly constructed to be an attractive or successful restoration or rehabilitation project. For a more thorough explanation of the philosophy of cleaning historic buildings see Preservation Briefs: No. 1 "The Cleaning and Waterproof Coating of Masonry Buildings," by Robert C. Mack, AIA.

Problems of Abrasive Cleaning

The crux of the problem is that abrasive cleaning is just that—abrasive. An abrasively cleaned historic structure may be physically as well as aesthetically damaged. Abrasive methods "clean" by eroding dirt or paint, but at the same time they also tend to erode the surface of the building material. In this way, abrasive cleaning is destructive and causes irreversible harm to the historic building fabric. If the fabric is brick, abrasive methods remove the hard, outer protective surface, and therefore make the brick more susceptible to rapid weathering and deterioration. Grit blasting may also increase the water permeability of a brick wall. The impact of the grit particles tends to erode the bond between the mortar and the brick, leaving cracks or enlarging existing cracks where water can enter. Some types of stone develop a protective patina or "quarry crust" parallel to the worked surface (created by the movement of moisture towards the outer edge), which also may be damaged by abrasive cleaning. The rate at which the material subsequently weathers depends on the quality of the inner surface that is exposed.

Abrasive cleaning can destroy, or substantially diminish, decorative detailing on buildings such as a molded brickwork or architectural terra-cotta, ornamental carving on wood or stone, and evidence of historic craft techniques, such as tool marks and other surface textures. In addition, perfectly sound and/or "tooled" mortar joints can be worn away by abrasive techniques. This not only results in the loss of historic craft detailing but also requires repointing, a step involving con-

siderable time, skill and expense, and which might not have been necessary had a gentler method been chosen. Erosion and pitting of the building material by abrasive cleaning creates a greater surface area on which dirt and pollutants collect. In this sense, the building fabric "attracts" more dirt, and will require more frequent cleaning in the future.

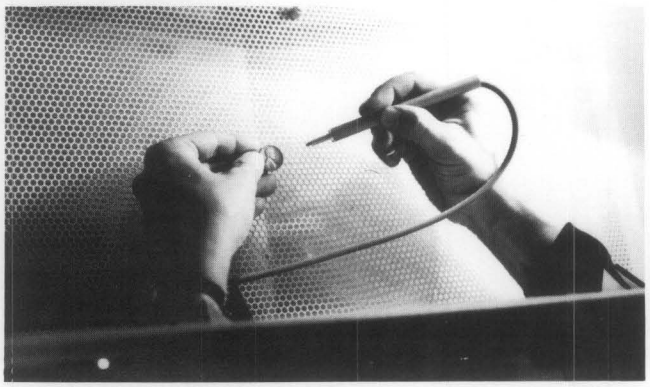
In addition to causing physical and aesthetic harm to the historic fabric, there are several adverse environmental effects of dry abrasive cleaning methods. Because of the friction caused by the abrasive medium hitting the building fabric, these techniques usually create a considerable amount of dust, which is unhealthy, particularly to the operators of the abrasive equipment. It further pollutes the environment around the job site, and deposits dust on neighboring buildings, parked vehicles and nearby trees and shrubbery. Some adjacent materials not intended for abrasive treatment such as wood or glass, may also be damaged because the equipment may be difficult to regulate.

Wet grit methods, while eliminating dust, deposit a messy slurry on the ground or other objects surrounding the base of the building. In colder climates where there is the threat of frost, any wet cleaning process applied to historic masonry structures must be done in warm weather, allowing ample time for the wall to dry out thoroughly before cold weather sets in. Water which remains and freezes in cracks and openings of the masonry surface eventually may lead to spalling. High-pressure wet cleaning may force an inordinate amount of water into the walls, affecting interior materials such as plaster or joist ends, as well as metal building components within the walls.

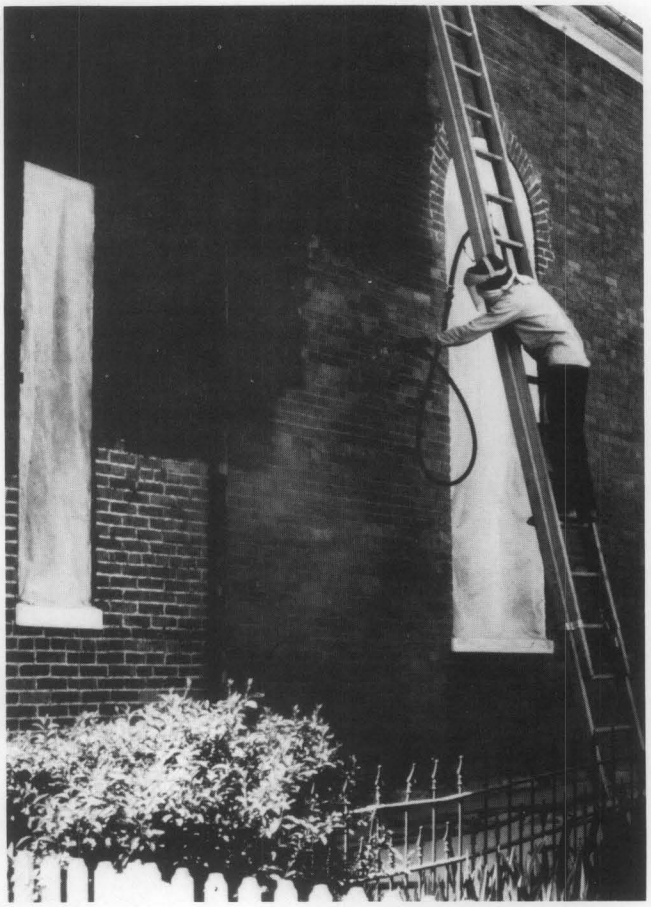
Variable Factors

The greatest problem in developing practical guidelines for cleaning any historic building is the large number of variable and unpredictable factors involved. Because these variables make each cleaning project unique, it is difficult to establish specific standards at this time. This is particularly true of abrasive cleaning methods because their inherent potential for causing damage is multiplied by the following factors:

— the type and condition of the material being cleaned;
— the size and sharpness of the grit particles or the mechanical equipment;
— the pressure with which the abrasive grit or equipment is applied to the building surface;
— the skill and care of the operator; and
— the constancy of the pressure on all surfaces during the cleaning process.



Micro-Abrasive Cleaning. *This small, pencil-sized micro-abrasive unit is used by some museum conservators to clean small objects. This particular micro-abrasive unit is operated within the confines of a box (approximately 2 cubic feet of space), but a similar and slightly larger unit may be used for cleaning larger pieces of sculpture, or areas of architectural detailing on a building. Even a pressure cleaning unit this small is capable of eroding a surface, and must be carefully controlled.*



"Line Drop." *Even though the operator of the sandblasting equipment is standing on a ladder to reach the higher sections of the wall, it is still almost impossible to have total control over the pressure. The pressure of the sand hitting the lower portion of the wall will still be greater than that above, because of the "line drop" in the distance from the pressure source to the nozzle. (Hugh Miller)*

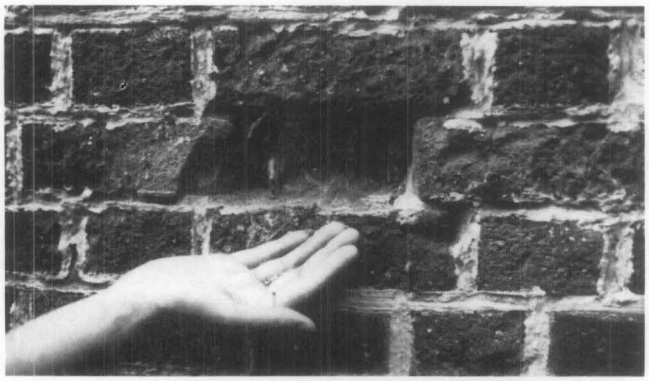
Pressure: The damaging effects of most of the variable factors involved in abrasive cleaning are self evident. However, the matter of pressure requires further explanation. In cleaning specifications, pressure is generally abbreviated as "psi" (pounds per square inch), which technically refers to the "tip" pressure, or the amount of pressure at the nozzle of the blasting apparatus. Sometimes "psig," or pressure at the gauge (which may be many feet away, at the other end of the hose), is used in place of "psi." These terms are often incorrectly used interchangeably.

Despite the apparent care taken by most architects and building cleaning contractors to prepare specifications for pressure cleaning which will not cause harm to the delicate fabric of a historic building, it is very difficult to ensure that the same amount of pressure is applied to all parts of the building. For example, if the operator of the pressure equipment stands on the ground while cleaning a two-story structure, the amount of force reaching the first story will be greater than that hitting the second story, even if the operator stands on scaffolding or in a cherry picker, because of the "line drop" in the distance from the pressure source to the nozzle. Although technically it may be possible to prepare cleaning specifications with tight controls that would eliminate all but a small margin of error, it may not be easy to find professional cleaning firms willing to work under such restrictive conditions. The fact is that many professional building cleaning firms do not really understand the extreme delicacy of historic building fabric, and how it differs from modern construction materials. Consequently, they may ac-

cept building cleaning projects for which they have no experience.

The amount of pressure used in any kind of cleaning treatment which involves pressure, whether it is dry or wet grit, chemicals or just plain water, is crucial to the outcome of the cleaning project. Unfortunately, no standards have been established for determining the correct pressure for cleaning each of the many historic building materials which would not cause harm. The considerable discrepancy between the way the building cleaning industry and architectural conservators define "high" and "low" pressure cleaning plays a significant role in the difficulty of creating standards.

Nonhistoric/Industrial: A representative of the building cleaning industry might consider "high" pressure *water* cleaning to be anything over 5,000 psi, or even as high as 10,000 to 15,000 psi! Water under this much pressure may be necessary to clean industrial structures or machinery, but would destroy most historic building materials. Industrial *chemical* cleaning commonly utilizes pressures between 1,000 and 2,500 psi.



Spalling Brick. *This soft, early 19th-century brick was sandblasted in the 1960s; consequently, severe spalling has resulted. Some bricks have almost totally disintegrated, and will eventually have to be replaced. (Robert S. Gamble)*

Historic: By contrast, conscientious dry or wet abrasive cleaning of a historic structure would be conducted within the range of 20 to 100 psi at a range of 3 to 12 inches. Cleaning at this low pressure requires the use of a very fine 00 or 0 mesh grit forced through a nozzle with a ¼ inch opening. A similar, even more delicate method being adopted by architectural conservators uses a micro-abrasive grit on small, hard-to-clean areas of carved, cut or molded ornament on a building façade. Originally developed by museum conservators for cleaning sculpture, this technique may employ glass beads, micro-balloons, or another type of micro-abrasive gently powered at approximately 40 psi by a very small, almost pencil-like pressure instrument. Although a slightly larger pressure instrument may be used on historic buildings, this technique still has limited practical applicability on a large scale building cleaning project because of the cost and the relatively few technicians competent to handle the task. In general, architectural conservators have determined that only through very controlled conditions can most historic building material be abrasively cleaned of soil or paint without measurable damage to the surface or profile of the substrate.

Yet some professional cleaning companies which sepcialize in cleaning historic masonry buildings use chemicals and water at a pressure of approximately 1,500 psi, while other cleaning firms recommend lower pressures ranging from 200 to 800 psi for a similar project. An architectural conservator might decide, *after testing*, that some historic structures could be cleaned properly using a moderate pressure (200–600 psi), or even a high pressure (600–1800 psi) water rinse. However, cleaning historic buildings under such high pressure should be considered an exception rather than the rule, and would require *very careful* testing and supervision to assure that the historic surface materials could withstand the pressure without gouging, pitting or loosening.

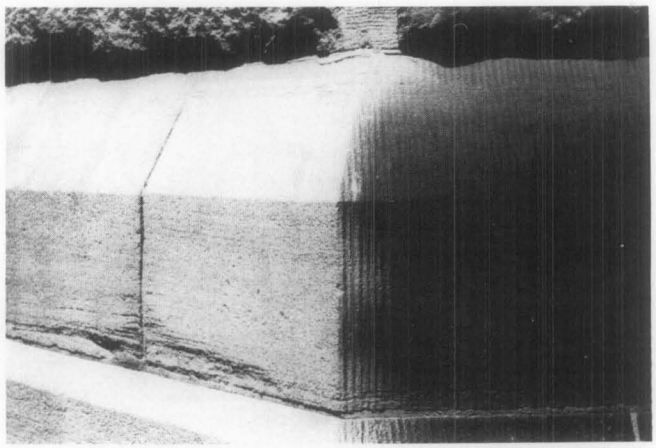
These differences in the amount of pressure used by commercial or industrial building cleaners and architectural conservators point to one of the main problems in using abrasive means to clean historic buildings: misunderstanding of the potentially fragile nature of historic building materials. There is no one cleaning formula or pressure suitable for all situations. Decisions regarding the proper cleaning process for historic structures can be made only after careful analysis of the building fabric, and testing.

How Building Materials React to Abrasive Cleaning Methods

Brick and Architectural Terra-Cotta: Abrasive blasting does not affect all building materials to the same degree. Such techniques quite logically cause greater damage to softer and more porous materials, such as brick or architectural terra-cotta. When these materials are cleaned abrasively, the hard, outer layer (closest to the heat of the kiln) is eroded, leaving the soft, inner core exposed and susceptible to accelerated weathering. Glazed architectural terra-cotta and ceramic veneer have a baked-on glaze which is also easily damaged by abrasive cleaning. Glazed architectual terra-cotta was designed for easy maintenance, and generally can be cleaned using detergent and water; but chemicals or steam may be needed to remove more persistent stains. Large areas of brick or architectural terra-cotta which have been painted are best left painted, or repainted if necessary.

Plaster and Stucco: Plaster and stucco are types of masonry finish materials that are softer than brick or terra-cotta; if treated abrasively these materials will simply disintegrate. Indeed, when plaster or stucco is treated abrasively it is usually with the intention of removing the plaster or stucco from whatever base material or substrate it is covering. Obviously, such abrasive techniques should not be applied to clean sound plaster or stuccoed walls, or decorative plaster wall surfaces.

Building Stones: Building stones are cut from the three main categories of natural rock: dense, igneous rock such as granite; sandy, sedimentary rock such as limestone or sandstone; and crystalline, metamorphic rock such as marble. As op-

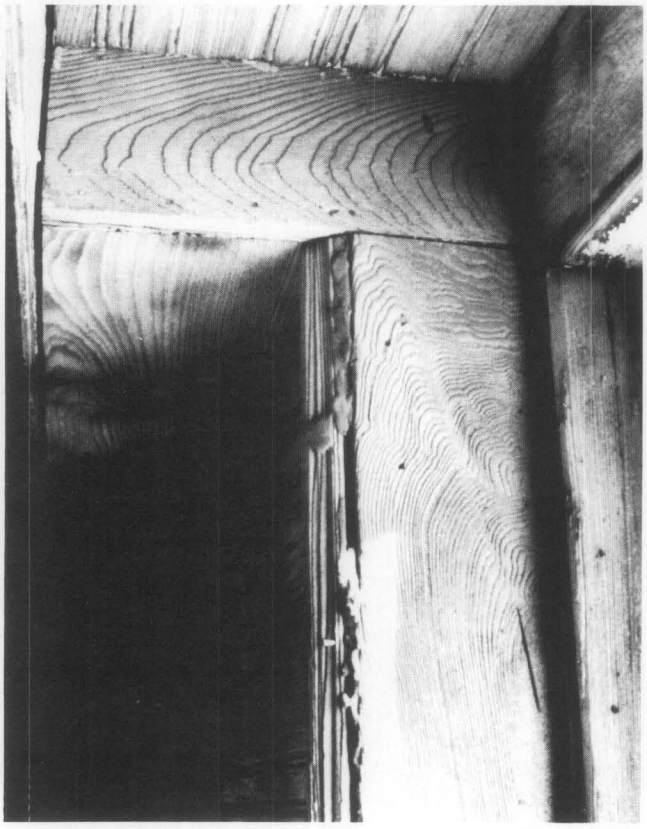


Abrasive Cleaning of Tooled Granite. *Even this carefully controlled "wet grit" blasting has erased vertical tooling marks in the cut granite blocks on the left. Not only has the tooling been destroyed, but the damaged stone surface is now more susceptible to accelerated weathering.*

posed to kiln-dried masonry materials such as brick and architectural terra-cotta, building stones are generally homogeneous in character at the time of a building's construction. However, as the stone is exposed to weathering and environmental pollutants, the surface may become friable, or may develop a protective skin or patina. These outer surfaces are very susceptible to damage by abrasive or improper chemical cleaning.

Building stones are frequently cut into ashlar blocks or "dressed" with tool marks that give the building surface a specific texture and contribute to its historic character as much as ornately carved decorative stonework. Such detailing is easily damaged by abrasive cleaning techniques; the pattern of tooling or cutting is erased, and the crisp lines of moldings or carving are worn or pitted.

Occasionally, it may be possible to clean small areas of rough-cut granite, limestone or sandstone having a heavy dirt encrustation by using the "wet grit" method, whereby a small amount of abrasive material is injected into a controlled, pressurized water stream. However, this technique requires very careful supervision in order to prevent damage to the stone. Polished or honed marble or granite should *never* be treated abrasively, as the abrasion would remove the finish in much the way glass would be etched or "frosted" by such a process. It is generally preferable to underclean, as too strong a cleaning procedure will erode the stone, exposing a new and increased surface area to collect atmospheric moisture and dirt. Removing paint, stains or graffiti from most types of stone may be accomplished by a chemical treatment carefully selected to best handle the removal of the particular type of paint or stain without damaging the stone. (See section on the "Gentlest Means Possible")



Abrasive Cleaning of Wood. *This wooden windowsill, molding and paneling have been sandblasted to remove layers of paint in the rehabilitation of this commercial building. Not only is some paint still embedded in cracks and crevices of the woodwork, but more importantly, grit blasting has actually eroded the summer wood, in effect raising the grain, and resulting in a rough surface.*

Wood: Most types of wood used for buildings are soft, fibrous and porous, and are particularly susceptible to damage by abrasive cleaning. Because the summer wood between the lines of the grain is softer than the grain itself, it will be worn away by abrasive blasting or power tools, leaving an uneven surface with the grain raised and often frayed or "fuzzy." Once this has occurred, it is almost impossible to achieve a smooth surface again except by extensive hand sanding, which is expensive and will quickly negate any costs saved earlier by sandblasting. Such harsh cleaning treatment also obliterates historic tool marks, fine carving and detailing, which precludes its use on any interior or exterior woodwork which has been hand planed, milled or carved.

Metals: Like stone, metals are another group of building materials which vary considerably in hardness and durability. Softer metals which are used architecturally, such as tin, zinc, lead, copper or aluminum, generally should not be cleaned abrasively as the process deforms and destroys the original surface texture and appearance, as well as the acquired patina. Much applied architectural metal work used on historic buildings—tin, zinc, lead and copper—is often quite thin and soft, and therefore susceptible to denting and pitting. Galvanized sheet metal is especially vulnerable, as abrasive treatment would wear away the protective galvanized layer.

In the late 19th and early 20th centuries, these metals were often cut, pressed or otherwise shaped from sheets of metal into a wide variety of practical uses such as roofs, gutters and flashing, and façade ornamentation such as cornices, friezes, dormers, panels, cupolas, oriel windows, etc. The architecture of the 1920s and 1930s made use of metals such as chrome, nickel alloys, aluminum and stainless steel in decorative exterior panels, window frames, and doorways. Harsh abrasive blasting would destroy the original surface finish of most of these metals, and would increase the possiblity of corrosion.

However, conservation specialists are now employing a sensitive technique of glass bead peening to clean some of the harder metals, in particular large bronze outdoor sculpture. Very fine (75–125 micron) glass beads are used at a low pressure of 60 to 80 psi. Because these glass beads are completely spherical, ther are no sharp edges to cut the surface of the metal. After cleaning, these statues undergo a lengthy process of polishing. Coatings are applied which protect the surface from corrosion, but they must be renewed every 3 to 5 years. A similarly delicate cleaning technique employing glass beads has been used in Europe to clean historic masonry structures without causing damage. But at this time the process has not been tested sufficiently in the United States to recommend it as a building conservation measure.

Sometimes a very fine *smooth* sand is used at a low pressure to clean or remove paint and corrosion from copper flashing and other metal building components. Restoration architects recently found that a mixture of crushed walnut shells and copper slag at a pressure of approximately 200 psi was the only way to remove corrosion successfully from a mid-19th century terne-coated iron roof. Metal cleaned in this manner must be painted immediately to prevent rapid recurrence of corrosion. It is thought that these methods "work harden" the surface by compressing the outer layer, and actually may be good for the surface of the metal. But the extremely complex nature and the time required by such processes make it very expensive and impractical for large-scale use at this time.

Cast and wrought iron architectural elements may be gently sandblasted or abrasively cleaned using a wire brush to remove layers of paint, rust and corrosion. Sandblasting was, in fact, developed originally as an efficient maintenance procedure for engineering and industrial structures and heavy machinery—iron and steel bridges, machine tool frames, engine frames, and railroad rolling stock—in order to clean and prepare them for repainting. Because iron is hard, its surface,

which is naturally somewhat uneven, will not be noticeably damaged by controlled abrasion. Such treatment will, however, result in a small amount of pitting. But this slight abrasion creates a good surface for paint, since the iron must be repainted immediately to prevent corrosion. Any abrasive cleaning of metal building components will also remove the caulking from joints and around other openings. Such areas must be recaulked quickly to prevent moisture from entering and rusting the metal, or causing deterioration of other building fabric inside the structure.

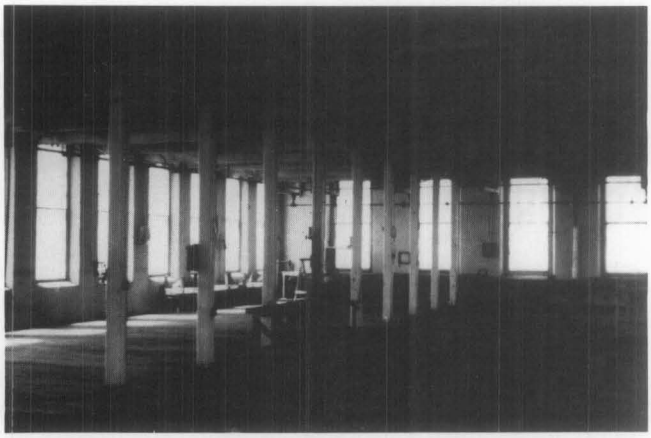
When is Abrasive Cleaning Permissible?

For the most part, abrasive cleaning is destructive to historic building materials. A limited number of special cases have been explained when it may be appropriate, if supervised by a skilled conservator, to use a delicate abrasive technique on some historic building materials. The type of "wet grit" cleaning which involves a small amount of grit injected into a stream of low pressure water may be used on small areas of stone masonry (i.e., rough cut limestone, sandstone or unpolished granite), where milder cleaning methods have not been totally successful in removing harmful deposits of dirt and pollutants. Such areas may include stone window sills, the tops of cornices or column capitals, or other detailed areas of the façade.

This is still an abrasive technique, and without proper caution in handling, it can be *just as harmful to the building surface as any other abrasive cleaning method.* Thus, the decision to use this type of "wet grit" process should be made only after consultation with an experienced building conservator. Remember that *it is very time consuming and expensive to use any abrasive technique on a historic building in such a manner that it does not cause harm to the often fragile and friable building materials.*

At this time, and only under certain circumstances, abrasive cleaning methods may be used in the rehabilitation of interior spaces of warehouse or industrial buildings for contemporary uses.

Interior spaces of factories or warehouse structures in which the masonry or plaster surfaces do not have significant design, detailing, tooling or finish, and in which wooden architectural features are not finished, molded, beaded or worked by hand, may be cleaned abrasively in order to remove layers of paint and industrial discolorations such as smoke, soot, etc. It is expected after such treatment that brick surfaces will be rough and pitted, and wood will be somewhat frayed or "fuzzy" with raised wood grain. These nonsignificant surfaces will be damaged and have a roughened texture, but because they are interior elements, they will not be subject to further deterioration caused by weathering.



Permissible Abrasive Cleaning. *In accordance with the Secretary of the Interior's* Guidelines for Rehabilitation Projects, *it may be acceptable to use abrasive techniques to clean an industrial interior space such as that illustrated here, because the masonry surfaces* do not *have significant design, detailing, tooling or finish, and the wooden architectural features are not finished, molded, beaded or worked by hand.*

Historic Interiors that Should Not Be Cleaned Abrasively

Those instances (generally industrial and some commercial properties), when it may be acceptable to use an abrasive treatment on the interior of historic structures have been described. But for the majority of historic buildings, the Secretary of the Interior's *Guidelines for Rehabilitation* do not recommend "changing the texture of exposed wooden architectural features (including structural members) and masonry surfaces through sandblasting or use of other abrasive techniques to remove paint, discolorations and plaster. . . ."

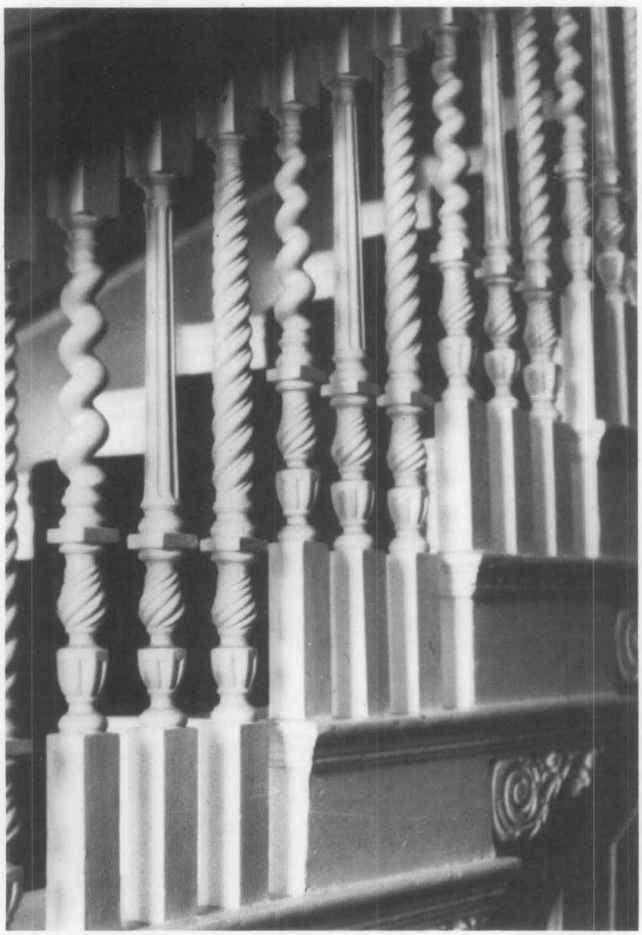
Thus, it is not acceptable to clean abrasively interiors of historic residential and commercial properties which have *finished* interior spaces featuring milled woodwork such as doors, window and door moldings, wainscoting, stair balustrades and mantelpieces. Even the most modest historic *house* interior, although it may not feature elaborate detailing, contains plaster and woodwork that is architecturally significant to the original design and function of the house. Abrasive cleaning of such an interior would be destructive to the historic integrity of the building.

Abrasive cleaning is also impractical. Rough surfaces of abrasively cleaned wooden elements are hard to keep clean. It is also difficult to seal, paint or maintain these surfaces which can be splintery and a problem to the building's occupants. The force of abrasive blasting may cause grit particles to lodge in cracks of wooden elements, which will be a nuisance as the grit is loosened by vibrations and gradually sifts out. Removal of plaster will reduce the thermal and insulating value of the walls. Interior brick is usually softer than exterior brick, and generally of a poorer quality. Removing surface plaster from such brick by abrasive means often exposes gaping mortar joints and mismatched or repaired brickwork which was never intended to show. The resulting bare brick wall may require repointing, often difficult to match. It also may be necessary to apply a transparent surface coating (or sealer) in order to prevent the mortar and brick from "dusting." However, a sealer may not only change the color of the brick, but may also compound any existing moisture problems by restricting the normal evaporation of water vapor from the masonry surface.

"Gentlest Means Possible"

There are alternative means of removing dirt, stains and paint from historic building surfaces that can be recommended as more efficient and less destructive than abrasive techniques. The "gentlest means possible" of removing dirt from a building surface can be achieved by using a low-pressure water wash, scrubbing areas of more persistent grime with a natural bristle (never metal) brush. Steam cleaning can also be used effectively to clean some historic building fabric. Low-pressure water or steam will soften the dirt and cause the deposits to rise to the surface, where they can be washed away.

A third cleaning technique which may be recommended to remove dirt, as well as stains, graffiti or paint, involves the use of commerically available chemical cleaners or paint removers, which, when applied to masonry, loosen or dissolve the dirt or stains. These cleaning agents may be used in combination with water or steam, followed by a clear water wash to remove the residue of dirt and the chemical cleaners from the masonry. A natural bristle brush may also facilitate this type of chemically assisted cleaning, particularly in areas of heavy dirt deposits or stains, and a wooden scraper can be



Do not Abrasively Clean these Interiors. *Most historic residential and some commercial interior spaces contain finished plaster and wooden elements such as this stair balustrade and paneling which contribute to the historic and architectural character of the structure. Such interiors should not be subjected to abrasive techniques for the purpose of removing paint, dirt, discoloration or plaster.*

useful in removing thick encrustations of soot. A limewash or absorbent talc, whiting or clay poultice with a solvent can be used effectively to draw out salts or stains from the surface of the selected areas of a building façade. It is almost impossible to remove paint from masonry surfaces without causing some damage to the masonry, and it is best to leave the surfaces as they are or repaint them if necessary.

Some physicists are experimenting with the use of pulsed laser beams and xenon flash lamps for cleaning historic masonry surfaces. At this time it is a slow, expensive cleaning method, but its initial success indicates that it may have an increasingly important role in the future.

There are many chemical paint removers which, when applied to painted wood, soften and dissolve the paint so that it can be scraped off by hand. Peeling paint can be removed from wood by hand scraping and sanding. Particularly thick layers of paint may be softened with a heat gun or heat plate, providing appropriate precautions are taken, and the paint film scraped off by hand. Too much heat applied to the same spot can burn the wood, and the fumes caused by burning paint are dangerous to inhale, and can be explosive. Furthermore, the hot air from heat guns can start fires in the building cavity. Thus, adequate ventilation is important when using a heat gun or heat plate, as well as when using a chemical stripper. A torch or open flame should never be used.

Preparations for Cleaning: It cannot be overemphasized that all of these cleaning methods must be approached with caution. When using any of these procedures which involve water or other liquid cleaning agents on masonry, it is imperative that *all* openings be tightly covered, and all cracks or joints be well pointed in order to avoid the danger of water penetrating the building's facade, a circumstance which might result in serious moisture related problems such as efflorescence and/or subflorescence. Any time water is used on masonry as a cleaning agent, either in its pure state or in combination with chemical cleaners, it is very important that the work be done in warm weather when there is no danger of frost for several months. Otherwise water which has penetrated the masonry may freeze, eventually causing the surface of the building to crack and spall, which may create another conservation problem more serious to the health of the building than dirt.

Each kind of masonry has a unique composition and reacts differently with various chemical cleaning substances. Water and/or chemicals may interact with minerals in stone and cause new types of stains to leach out to the surface immediately, or more gradually in a delayed reaction. What may be a safe and effective cleaner for certain stain on one type of stone, may leave unattractive discolorations on another stone, or totally dissolve a third type.

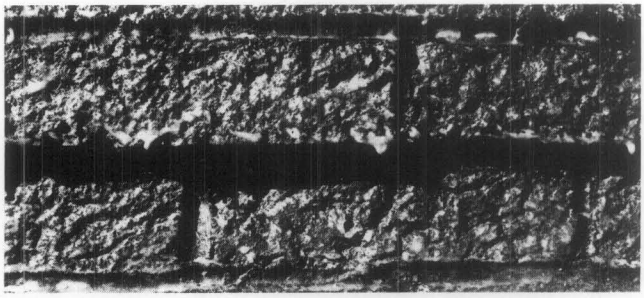
Testing: Cleaning historic building materials, particularly masonry, is a technically complex subject, and thus, should never be done without expert consultation and testing. No cleaning project should be undertaken without first applying the intended cleaning agent to a representative test patch area in an inconspicuous location on the building surface. The test patch or patches should be allowed to weather for a period of time, preferably through a complete seasonal cycle, in order to determine that the cleaned area will not be adversely affected by wet or freezing weather or any by-products of the cleaning process.

Mitigating the Effects of Abrasive Cleaning

There are certain restoration measures which can be adopted to help preserve a historic building exterior which has been damaged by abrasive methods. Wood that has been sandblasted will exhibit a frayed or "fuzzed" surface, or a harder wood will have an exaggerated raised grain. The only way to remove this rough surface or to smooth the grain is by laborious sanding. Sandblasted wood, unless it has been extensively sanded, serves as a dustcatcher, will weather faster, and will present a continuing and ever worsening maintenance problem. Such wood, after sanding, should be painted or given a clear surface coating to protect the wood, and allow for somewhat easier maintenance.

There are few successful preservative treatments that may be applied to grit-blasted exterior masonry. Harder, denser stone may have suffered only a loss of crisp edges or tool marks, or other indications of craft technique. If the stone has a compact and uniform composition, it should continue to weather with little additional deterioration. But some types of sandstone, marble and limestone will weather at an accelerated rate once their protective "quarry crust" or patina has been removed.

Softer types of masonry, particularly brick and architectural terra-cotta, are the most likely to require some remedial treatment if they have been abrasively cleaned. Old brick, being essentially a soft, baked clay product, is greatly susceptible to increased deterioration when its hard, outer skin is removed through abrasive techniques. This problem can be minimized by painting the brick. An alternative is to treat it with a clear sealer or surface coating but this will give the masonry a glossy or shiny look. It is usually preferable to paint the brick rather than to apply a transparent sealer since



Hazards of Sandblasting and Surface Coating. *In order to "protect" this heavily sandblasted brick, a clear surface coating or sealer was applied. Because the air temperature was too cold at the time of application, the sealer failed to dry properly, dripping in places, and giving the brick surface a cloudy appearance.*

sealers reduce the transpiration of moisture, allowing salts to crystallize as subflorescence that eventually spalls the brick. If a brick surface has been so extensively damaged by abrasive cleaning and weathering that spalling has already begun, it may be necessary to cover the walls with stucco, if it will adhere.

Of course, the application of paint, a clear surface coating (sealer), or stucco to deteriorating masonry means that the historical appearance will be sacrificed in an attempt to conserve the historic building materials. However, the original color and texture will have been changed already by the abrasive treatment. At this point it is more important to try to preserve the brick, and there is little choice but to protect it from "dusting" or spalling too rapidly. As a last resort, in the case of severely spalling brick, there may be no option but to replace the brick—a difficult, expensive (particularly if custom-made reproduction brick is used), and lengthy process. As described earlier, sandblasted interior brick work, while not subject to change of weather, may require the application of a transparent surface coating or painting as a maintenance procedure to contain loose mortar and brick dust. (See Preservation Briefs: No. 1 for a more thorough discussion of coatings.)

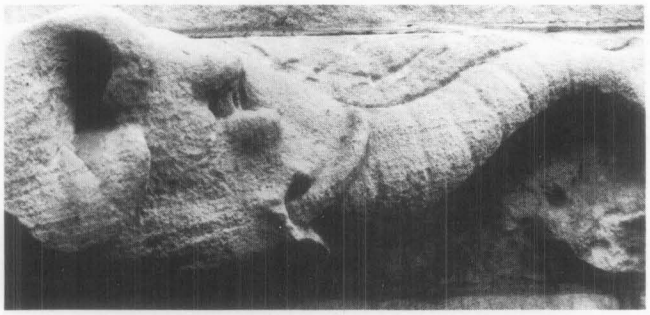
Metals, other than cast or wrought iron, that have been pitted and dented by harsh abrasive blasting usually cannot be smoothed out. Although fillers may be satisfactory for smoothing a painted surface, exposed metal that has been damaged usually will have to be replaced.

Summary

Sandblasting or other abrasive methods of cleaning or paint removal are by their nature destructive to historic building materials and should not be used on historic buildings except in a few well-monitored instances. There are exceptions when certain types of abrasive cleaning may be permissible, but only if conducted by a trained conservator, and if cleaning is necessary for the preservation of the historic structure.

There is no one formula that will be suitable for cleaning all historic building surfaces. Although there are many commerical cleaning products and methods available, it is impossible to state definitively which of these will be the most effective without causing harm to the building fabric. It is often difficult to identify ingredients or their proportions contained in cleaning products; consequently it is hard to predict how a product will react to the building materials to be cleaned. Similar uncertainties affect the outcome of other cleaning methods as they are applied to historic building materials. Further advances in understanding the complex nature of the many variables of the cleaning techniques may someday provide a better and simpler solution to the problems. But until that time, the process of cleaning historic buildings must be approached with caution through trial and error.

It is important to remember that historic building materials are neither indestructible, nor are they renewable. They must be treated in a responsible manner, which may mean little or no cleaning at all if they are to be preserved for future generations to enjoy. If it is in the best interest of the building to clean it, then it should be done "using the gentlest means possible."



Selected Reading List

Ashurst, John. *Cleaning Stone and Brick*. Technical Pamphlet 4. London: Society for the Protection of Ancient Buildings, 1977.

Asmus, John F. "Light Cleaning: Laser Technology for Surface Preparation in the Arts." *Technology and Conservation*, 3: 3 (Fall 1978), pp. 14–18.

"The Bare-Brick Mistake." *The Old House Journal*, I: 2 (November 1973), p. 2

Brick Institute of America. *Colorless Coatings for Brick Masonry*. Technical Notes on Brick Construction, Number 7E (September/ October 1976).

Gilder, Cornelia Brooke. *Property Owner's Guide to the Maintenance and Repair of Stone Buildings*. Technical Series/ No. 5. Albany, New York: The Preservation League of New York State, 1977.

Prudon, Theodore H.M. "The Case Against Removing Paint from Brick Masonry." *The Old House Journal*, III: 2 (February 1975), pp. 6–7

——— "Removing Stains from Masonry." *The Old House Journal*, V: 5 (May 1977), pp. 58–59.

Stambolov, T., and J.R.J. Van Asperen de Boer. *The Deterioration and Conservation of Porous Building Materials in Monuments: A Review of the Literature*. Second enlarged edition. Rome: International Centre for Conservation, 1976.

Weiss, Norman R. "Cleaning of Building Exteriors: Problems and Procedures of Dirt Removal." *Technology and Conservation*, 2/76 (Fall 1976), pp. 8–13.

——— *Exterior Cleaning of Historic Masonry Buildings*. Draft. Washington, D.C.: Office of Archeology and Historic Preservation, Heritage Conservation and Recreation Service, U.S. Department of the Interior, 1976.

This Preservation Brief was written by Anne E. Grimmer, Architectural Historian, Technical Preservation Services Division. Valuable suggestions and comments were made by Hugh C. Miller, AIA, Washington, D.C.; Martin E. Weaver, Ottawa, Ontario, Canada; Terry Bryant, Downers Grove, Illinois; Daniel C. Cammer, McLean, Virginia; and the professional staff of Technical Preservation Services Division. Deborah Cooney edited the final manuscript.

The illustrations for this brief not specifically credited are from the files of the Technical Preservation Services Division.

This publication was prepared pursuant to Executive Order 11593, "Protection and Enhancement of the Cultural Environment," which directs the Secretary of the Interior to "develop and make available to Federal agencies and State and local governments information concerning professional methods and techniques for preserving, improving, restoring and maintaining historic properties." The Brief has been developed under the technical editorship of Lee H. Nelson, AIA, Chief, Preservation Assistance Division, National Park Service, U.S. Department of the Interior, Washington, D.C. 20240. Comments on the usefulness of this information are welcome and can be sent to Mr. Nelson at the above address. This publication is not copyrighted and can be reproduced without penalty. Normal procedures for credit to the author and the National Park Service are appreciated. **June 1979.**

ATTACHMENT E: *PRESERVATION BRIEF 15: PRESERVATION OF HISTORIC CONCRETE*

SUNKIST GROWERS INC.
14130 RIVERSIDE DRIVE, SHERMAN OAKS, CA

THIS PAGE INTENTIONALLY LEFT BLANK

15 PRESERVATION BRIEFS



Preservation of Historic Concrete

Paul Gaudette and Deborah Slaton

National Park Service
U.S. Department of the Interior
Heritage Preservation Services

Introduction to Historic Concrete

Concrete is an extraordinarily versatile building material used for utilitarian, ornamental, and monumental structures since ancient times. Composed of a mixture of sand, gravel, crushed stone, or other coarse material, bound together with lime or cement, concrete undergoes a chemical reaction and hardens when water is added. Inserting reinforcement adds tensile strength to structural concrete elements. The use of reinforcement contributes significantly to the range and size of building and structure types that can be constructed with concrete.

While early twentieth century proponents of modern concrete often considered it to be permanent, it is, like all materials, subject to deterioration. This Brief provides an overview of the history of concrete and its popularization in the United States, surveys the principal causes and modes of concrete deterioration, and outlines approaches to repair and protection that are appropriate to historic concrete. In the context of this Brief, historic concrete is considered to be concrete used in construction of structures of historical, architectural, or engineering interest, whether those structures are old or relatively new.

Brief History of Use and Manufacture

The ancient Romans found that a mixture of lime putty and pozzolana, a fine volcanic ash, would harden under water. The resulting hydraulic cement became a major feature of Roman building practice, and was used in many buildings and engineering projects such as bridges and aqueducts. Concrete technology was kept alive during the Middle Ages in Spain and Africa. The Spanish introduced a form of concrete to the New World in the first decades of the sixteenth century, referred to as "tapia" or "tabby." This material, a mixture of lime, sand, and shell or stone aggregate mixed with water, was placed between wooden forms, tamped, and allowed to dry in successive layers. Tabby was later used by the English settlers in the coastal southeastern United States.

The early history of concrete was fragmented, with developments in materials and construction techniques occurring on different continents and in various countries. In the United States, concrete was slow in achieving widespread acceptance in building construction and did not begin to gain popularity until the late nineteenth century. It was more readily accepted for use in transportation and infrastructure systems.

The Erie Canal in New York is an example of the early use of concrete in transportation in the United States. The natural hydraulic cement used in the canal construction was processed from a deposit of limestone found in 1818 near Chittenango, southeast of Syracuse. The use of concrete in residential construction was



Figure 1. The Sebastopol House in Seguin, Texas, is an 1856 Greek Revival-style house constructed of lime concrete. Lime concrete or "limecrete" was a popular construction material, as it could be made inexpensively from local materials. By 1900, the town had approximately ninety limecrete structures, twenty of which remain. Photo: Texas Parks and Wildlife Department.



Figure 2. Chatterton House was the home of the post trader at Fort Fred Steel in Wyoming, one of several forts established in the 1860s to protect the Union Pacific Railroad. The walls of the post trader's house were built using stone aggregate and lime, without cement. The use of this material presents special preservation challenges.

publicized in the second edition of Orson S. Fowler's *A Home for All* (1853) which described the advantages of "gravel wall" construction to a wide audience. The town of Seguin, Texas, thirty-five miles east of San Antonio, already had a number of concrete buildings by the 1850s and came to be called "The Mother of Concrete Cities," with approximately ninety concrete buildings made from local "lime water" and gravel (Fig. 1).

Impressed by the economic advantages of poured gravel wall or "lime-grout" construction, the Quartermaster General's Office of the War Department embarked on a campaign to improve the quality of building for frontier military posts. As a result, lime-grout structures were constructed at several western posts soon after the Civil War, including Fort Fred Steele and Fort Laramie, both in Wyoming (Fig. 2). By the 1880s, sufficient experience had been gained with unreinforced concrete to permit construction of much larger buildings. A notable example from this period is the Ponce de Leon Hotel in St. Augustine, Florida.

Extensive construction in concrete also occurred through the system of coastal fortifications commissioned by the federal government in the 1890s for the Atlantic, Pacific, and Gulf coasts. Unlike most concrete construction to that time, the special requirements of coastal fortifications called for concrete walls as much as 20 feet thick, often at sites that were difficult to access. Major structures in the coastal defenses of the 1890s were built of mass concrete with no internal reinforcing, a practice that was replaced by the use of reinforcing bars in fortifications constructed after about 1905.

The use of reinforced concrete in the United States dates from 1860, when S.T. Fowler obtained a patent for a reinforced concrete wall. In the early 1870s, William E. Ward built his own house in Port Chester, New York, using concrete reinforced with iron rods for all structural elements. Despite these developments, such construction remained a novelty until after 1880, when innovations introduced by Ernest L. Ransome made the use of reinforced concrete more practicable. Ransome made many contributions to the development of concrete construction technology, including the use of twisted reinforcing bars to improve bond between the concrete and the steel, which he patented in 1884. Two years later, Ransome introduced the rotary kiln to United States cement production. The new kiln had greater capacity and burned more thoroughly and uniformly, allowing development of a less expensive, more uniform, and more reliable manufactured cement. Improvements in concrete production initiated by Ransom led to a much greater acceptance of concrete after 1900.

The Lincoln Highway Association, incorporated in 1913, promoted the use of concrete in construction of a coast-to-coast roadway system. The goal of the Lincoln Highway Association and highway advocate Henry B. Joy was to educate the country in the need for good roads made of concrete, with an improved Lincoln



Figure 3. The Lincoln Highway Association promoted construction of a high quality continuous hard surface roadway across the country. The Boys Scouts of America installed concrete road markers along the Lincoln Highway in 1928.

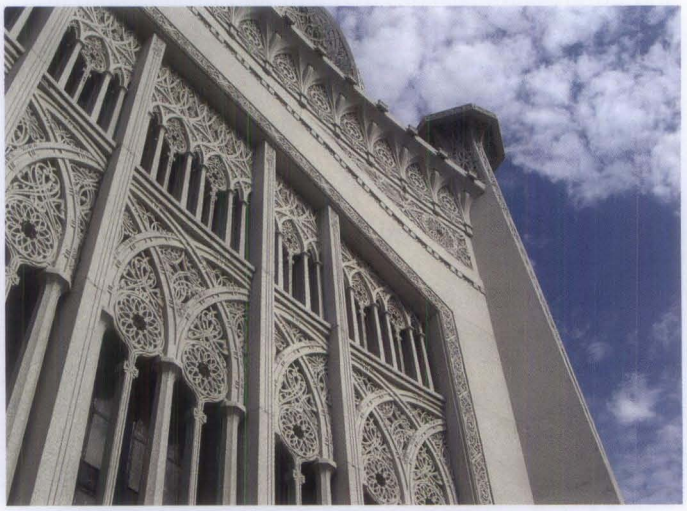


Figure 4. The highly ornamental concrete panels on the exterior facade of the Baha'i House of Worship in Wilmette, Illinois, illustrate the work of fabricator John J. Earley, known as "the man who made concrete beautiful."

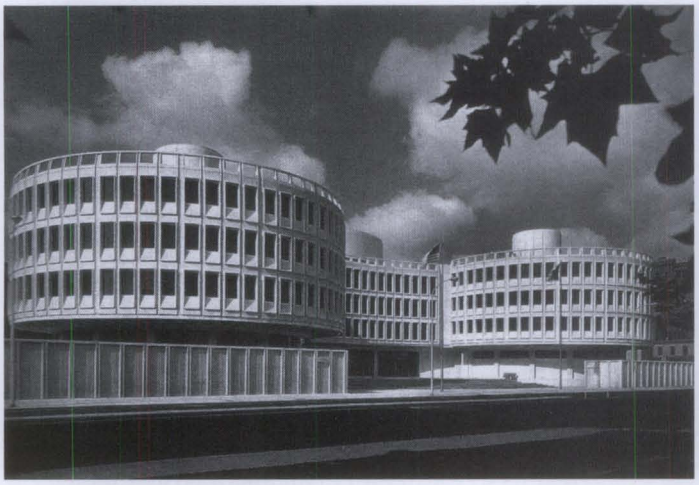


Figure 5. Following World War II, architects and engineers took advantage of improvements in concrete production, quality control, and advances in precast concrete to design structures such as the Police Headquarters building in Philadelphia, Pennsylvania, constructed in 1961. Photo: Courtesy of the Philadelphia Police Department.



Figure 6. The Bailey Magnet School in Jackson, Mississippi, was designed as the Jackson Junior High School by the firm of N.W. Overstreet & Town in 1936. The streamlined building exemplifies the applicability of concrete to creating a modern architectural aesthetic. Photo: Bill Burris, Burris/Wagnon Architects, P.A.

Highway as an example. Concrete "seedling miles" were constructed in remote areas to emphasize the superiority of concrete over unimproved dirt. The Association believed that as people learned about concrete, they would press the government to construct good roads throughout their states. Americans' enthusiasm for good roads led to the involvement of the federal government in road-building and the creation of numbered U.S. routes in the 1920s (Fig. 3).

During the early twentieth century, Ernest Ransome in Beverly, Massachusetts, Albert Kahn in Detroit, and Richard E. Schmidt in Chicago, promoted concrete for use in "Factory Style" utilitarian buildings with an exposed concrete frame infilled with expanses of glass. Thomas Edison's cast-in-place reinforced concrete homes in Union Township, New Jersey (1908), proclaimed a similarly functional emphasis in residential construction. From the 1920s onward, concrete began to be used with spectacular design results: examples include John J. Earley's Meridian Hill Park in Washington, D.C.; Louis Bourgeois' exuberant, graceful Baha'i Temple in Wilmette, Illinois (1920–1953), for which Earley fabricated the concrete (Fig. 4); and Frank Lloyd Wright's Fallingwater near Bear Run, Pennsylvania (1934). Continuing improvements in quality control and development of innovative fabrication processes, such as the Shockbeton method for precast concrete, provided increasing opportunities for architects and engineers. Wright's Guggenheim Museum in New York City (1959); Geddes Brecher Qualls & Cunningham's Police Headquarters building in Philadelphia, Pennsylvania (1961); and Eero Saarinen's soaring terminal building at Dulles International Airport outside Washington, D.C., and the TWA terminal at Kennedy Airport in New York (1962), exemplify the masterful use of concrete achieved in the modern era (Fig. 5).



Figure 7. Detailed bas reliefs as well as sculptures, such as this lion at the Bailey Magnet School, could be used as ornamentation on concrete buildings. Sculptural concrete elements were typically cast in molds.

Throughout the twentieth century, a wide range of architectural and engineering structures were built using concrete as a practical and cost-effective choice—and concrete also became valued for its aesthetic qualities. Cast in place and precast concrete were readily adapted to the Streamlined Moderne style, as exemplified by the Bailey Magnet School in Jackson, Mississippi, designed as the Jackson Junior High School by N.W. Overstreet & Town in 1936 (Figs. 6 and 7). The school is one of many concrete buildings designed and constructed under the auspices of the Public Works Administration. Recreational structures and landscape features also utilized the structural range and unique character of exposed concrete to advantage, as seen in Chicago's Lincoln Park Chess Pavilion, designed by Morris Webster in 1956 (Fig. 8), and the Ira C. Keller Fountain in Portland Oregon, designed by Lawrence Halprin in 1969 (Fig. 9). Concrete was also popular for building interiors, with ornamental features and exposed structural elements recognized as part of the design aesthetic (See Figs. 10 and 11 in sidebar).

Historic Interiors

The expanded use of concrete provided new opportunities to create dramatic spaces and ornate architectural detail on the interiors of buildings, at a significant cost savings over traditional construction practices. The architectural design of the Berkeley City Club in Berkeley, California, expressed Moorish and Gothic elements in concrete on the interior of the building (Fig. 10). Used as a woman's social club, the building was designed by noted California architect Julia Morgan and constructed in 1929. The vaulted ceilings, columns, and ornamental capitals of the lobby and the ornamental arches and beamed ceiling of the "plunge" are all constructed of concrete.



Figure 10. The Berkeley City Club has significant interior spaces and features of concrete construction, including the lobby and pool. Photos: Una Gilmartin (left) and Brian Kehoe (right), Wiss, Janney, Elstner Associates, Inc.

The historic character of a building's interior can also be conveyed in a more utilitarian manner in terms of concrete features and finishes (Fig. 11). The exposed concrete structure—columns, capitals, and drop panels—is an integral part of the character of this old commercial building in Minneapolis. In concrete warehouse and factory buildings of the early twentieth century, exposed concrete columns and formboard finish concrete slab ceilings are common features as seen in this warehouse, now converted for use as a parking garage and shops.



Figure 11. Whether in a circa 1925 office (left) or in a parking garage and retail facility (right), exposed concrete structures help characterize these building interiors. Photo: Minnesota Historical Society (left).

Concrete Characteristics

Concrete is composed of fine (sand) and coarse (crushed stone or gravel) aggregates and paste made of portland cement and water. The predominant material in terms of bulk is the aggregate. Portland cement is the binder most commonly used in modern concrete. It is commercially manufactured by blending limestone or chalk with clays that contain alumina, silica, lime, iron oxide and magnesia, and heating the compounds together to high temperatures. The hydration process that occurs between the portland cement and water results in formation of an alkali paste that surrounds and binds the aggregate together as a solid mass.

The quality of the concrete is dependent on the ratio of water to the binder; binder content; sound, durable, and well-graded aggregates; compaction during placement; and proper curing. The amount of water used in the mix affects the concrete permeability and strength. The use of excess water beyond that required in the hydration process results in more permeable concrete, which is more susceptible to weathering and deterioration. Admixtures are commonly added to concrete to adjust concrete properties such as setting or hardening time, requirements for water, workability, and other characteristics. For example, the advent of air entraining agents in the 1930s provided enhanced durability for concrete.

During the twentieth century, there was a steady rise in the strength of ordinary concrete as chemical processes became better understood and quality control measures improved. In addition, the need to protect embedded reinforcement against corrosion was acknowledged. Requirements for concrete cover over reinforcing steel, increased cement content, decreased water-cement ratio, and air entrainment all contributed to greater concrete strength and improved durability.

Mechanisms and Modes of Deterioration

Causes of Deterioration

Concrete deterioration occurs primarily because of corrosion of the embedded steel, degradation of the concrete itself, use of improper techniques or materials in construction, or structural problems. The causes of concrete deterioration must be understood in order to select an appropriate repair and protection system.

While reinforcing steel has played a pivotal role in expanding the applications of concrete in twentieth century architecture, corrosion of this steel has also caused deterioration in many historic structures. Reinforcing steel embedded in the concrete is normally surrounded by a passivating oxide layer that, when present, protects the steel from corrosion and aids in bonding the steel and concrete. When the concrete's normal alkaline environment (above a pH of 10) is compromised and the steel is exposed to water, water vapor, or high relative humidity, corrosion of the steel reinforcing takes place. A reduction in alkalinity results from carbonation, a process that occurs when the carbon dioxide in the atmosphere reacts with calcium hydroxide and moisture in the concrete. Carbonation starts at the concrete's exposed surface but may extend to the reinforcing steel over time. When carbonation reaches the metal reinforcement, the concrete no longer protects the steel from corrosion.



Figure 8. The Chess Pavilion in Chicago's Lincoln Park was designed by architect Morris Webster and constructed in 1956. The pavilion is a distinctive landscape feature, with its reinforced concrete cantilevered slab that provides cover for chess players.



Figure 9. The Ira C. Keller Fountain in Portland, Oregon, was designed by Lawrence Halprin and constructed in 1969. The fountain is constructed primarily of concrete pillars with formboard textures and surrounding elements, patterned with geometric lines, which facilitate the path of water. Photo: Anita Washko, Wiss, Janney, Elstner Associates, Inc.

Corrosion of embedded reinforcing steel may be initiated and accelerated if calcium chloride was added to the concrete as a set accelerator during original construction to promote more rapid curing. It may also take place if the concrete is later exposed to deicing salts, as may occur during the winter in northern climates. Seawater or other marine environments can also provide large amounts of chloride, either from inadequately washed original aggregate or from exposure of the concrete to seawater.

Corrosion-related damage to reinforced concrete is the result of rust, a product of the corrosion process of steel, which expands and thus requires more space in the concrete than the steel did at the time of installation. This change in volume of the steel results in expansive forces, which cause cracking and spalling of the adjacent concrete (Fig. 12). Other signs of corrosion of embedded steel include delamination of the concrete (planar separations parallel to the surface) and rust staining (often a precursor to spalling) on the concrete near the steel.

Lack of proper maintenance of building elements such as roofs and drainage systems can contribute to water-related deterioration of the adjacent concrete, particularly when concrete is saturated with water and then exposed to freezing temperatures. As water within the concrete freezes, it expands and exerts forces on the adjacent concrete. Repeated freezing and thawing can result in the concrete cracking and delaminating. Such damage appears as surface degradation, including severe scaling and micro-cracking that extends into the concrete. The condition is most often observed near the surface of the concrete but can also eventually occur deep within the concrete. This type of deterioration is usually most severe at joints, architectural details, and other areas with more surface exposure to weather. In the second half of the twentieth century, concrete has utilized entrained air (the incorporation of microscopic air bubbles) to provide enhanced protection against damage due to cyclic freezing of saturated concrete.

The use of certain aggregates can also result in deterioration of the concrete. Alkali-aggregate reactions—in some cases alkali-silica reaction (ASR)—occur when alkalis normally present in cement react with certain aggregates, leading to the development of an expansive crystalline gel. When this gel is exposed to moisture, it expands and causes cracking of the aggregate and concrete matrix. Deleterious aggregates are typically found only in certain areas of the country and can be detected through analysis by an experienced petrographer. Low-alkali cements as well as fly ash are used today in new construction to prevent such reactions where this problem may occur.

Problems Specifically Encountered with Historic Concrete

Materials and workmanship used in the construction of historic concrete structures, particularly those built before the First World War, sometimes present potential sources of problems. For example, where the aggregate consisted of cinder from burned coal or crushed brick,

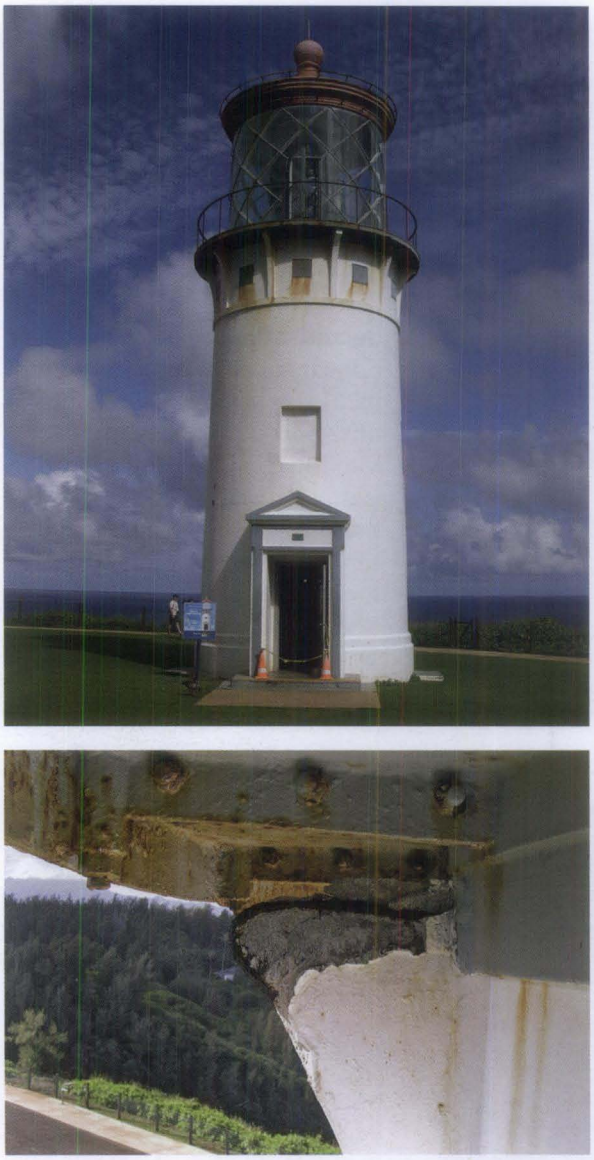


Figure 12. The concrete lighthouse at the Kilauea Point Light Station, Kilauea, Kauai, Hawaii, was constructed circa 1913. The concrete, which was a good quality, high strength mix for its day, is in good condition after almost one hundred years in service. Deterioration in the form of spalling related to corrosion of embedded reinforcing steel has occurred primarily in areas of higher ornamentation such as projecting bands and brackets (see close-up photo).

the concrete tends to be weak and porous because these aggregates absorb water. Some of these aggregates can be extremely susceptible to deterioration when exposed to moisture and cyclic freezing and thawing. Concrete was sometimes compromised by inclusion of seawater or beach sand that was not thoroughly washed with fresh water, a condition more common with coastal fortifications built prior to 1900. The sodium chloride present in seawater and beach sand accelerates the rate of corrosion of the reinforced concrete.

Another problem encountered with historic concrete is related to poor consolidation of the concrete during its placement in forms, or in molds in the case of precasting. This problem is especially prevalent in highly ornamental units. Early twentieth century concrete was often tamped or rodded into place, similar to techniques used in forming cast stone. Poorly consolidated concrete often contains voids ("bugholes" or "honeycombs"), which can reduce the protective concrete cover over the embedded reinforcing bars, entrap water, and, if sufficiently large and strategically numerous, reduce localized concrete strength. Vibration technology has improved over time and flowability agents are also used today to address this problem.

A common type of deterioration observed in concrete is the effect of weathering from exposure to wind, rain, snow, and salt water or spray. Weathering appears as erosion of the cement paste, a condition more prevalent in northern regions where precipitation can be highly acidic. This results in the exposure of the aggregate particles on the exposed concrete surface. Variations may occur in the aggregate exposure due to differential erosion or dissolution of exposed cement paste. Erosion can also be caused by the mechanical action of water channeled over concrete, such as by the lack of drip grooves in belt courses and sills, and by inadequate drainage. In addition, high-pressure water when used for cleaning can also erode the concrete surface.

In concrete structures built prior to the First World War, concrete was often placed into forms in relatively short vertical lifts due to limitations in lifting and pouring techniques available at the time. Joints between different concrete placements (often termed cold joints or lift lines) may sometimes be considered an important part of the character of a concrete element (Fig. 13). However, wide joints may permit water to infiltrate the concrete, resulting in more rapid paste erosion or freeze-thaw deterioration of adjacent concrete in cold climates.

In the early twentieth century, concrete was sometimes placed in several layers parallel to the exterior surface. A base concrete was first created with formwork and then a more cement rich mortar layer was applied to the exposed vertical face of the

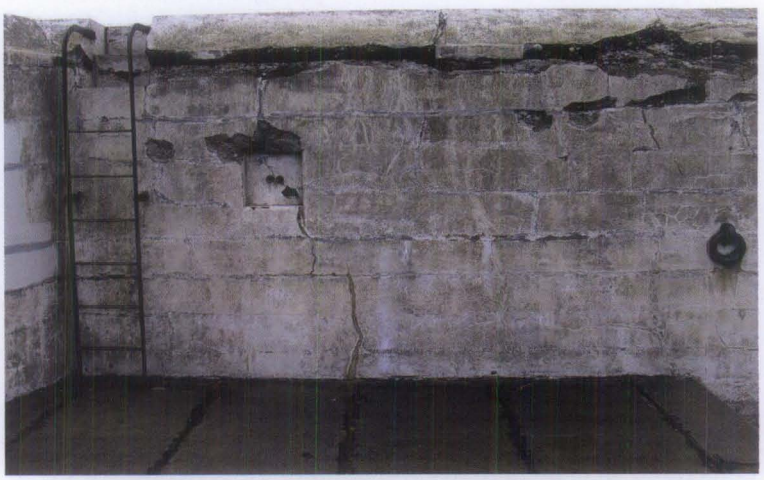


Figure 13. Fort Casey on Admiralty Head, Fort Casey, Washington, was constructed in 1898. The lift lines from placement of concrete are clearly visible on the exterior walls and characterize the finished appearance.

base concrete. The higher cement content in the facing concrete provided a more water-resistant outer layer and finished surface. The application of a cement-rich top layer, referred to in some early concrete publications as "waterproofing," was also used on top surfaces of concrete walls, or as the top layer in sidewalks. With this type of concrete construction, deterioration can occur over time as a result of debonding between layers, and can proceed very rapidly once the protective cement-rich layer begins to break down.

It is common for historic concrete to have a highly variable appearance, including color and finish texture. Different levels of aggregate exposure due to paste erosion are often found in exposed aggregate concrete. This variability in the appearance of historic concrete increases the level of difficulty in assessing and repairing weathered concrete.

Signs of Distress and Deterioration

Characteristic signs of failure in concrete include cracking, spalling, staining, and deflection. Cracking occurs in most concrete but will vary in depth, width, direction, pattern, and location, and can be either active or dormant (inactive). Active cracks can widen, deepen, or migrate through the concrete, while dormant cracks remain relatively unchanged in size. Some dormant cracks, such as those caused by early age shrinkage of the concrete during curing, are not a structural concern but when left unrepaired, can provide convenient channels for moisture penetration and subsequent damage. Random surface cracks, also called map cracks due to their resemblance to lines on a map, are usually related to early-age shrinkage but may also indicate other types of deterioration such as alkali-silica reaction.

Structural cracks can be caused by temporary or continued overloads, uneven foundation settling, seismic forces, or original design inadequacies. Structural cracks are active if excessive loads are applied to a structure, if the overload is continuing, or if settlement is ongoing. These cracks are dormant if the temporary overloads have been removed or if differential settlement has stabilized. Thermally-induced cracks result from stresses produced by the expansion and contraction of the concrete during temperature changes. These cracks frequently occur at the ends or re-entrant corners of older concrete structures that were built without expansion joints to relieve such stress.

Spalling (the loss of surface material) is often associated with freezing and thawing as well as cracking and delamination of the concrete cover over embedded reinforcing steel. Spalling occurs when reinforcing bars corrode and the corrosion by-products expand, creating high stresses on the adjacent concrete, which cracks and is displaced. Spalling can also occur when water absorbed by the concrete freezes and thaws (Fig. 14). In addition, surface spalling or scaling may result from the improper finishing, forming, or other surface



Figures 14. Layers of architectural concrete that have debonded (spalled) from the surface were removed from a historic water tank during the investigation performed to assess existing conditions. Photos: Anita Washko, Wiss, Janney, Elstner Associates, Inc.

phenomena when water-rich cement paste (laitance) rises to the surface. The resulting weak material is vulnerable to spalling of thin layers, or scaling. In some cases, spalling of the concrete can diminish the load-carrying capacity of the structure.

Deflection is the bending or sagging of structural beams, joists, or slabs, and can be an indication of deficiencies in the strength and structural soundness of concrete. This condition can be produced by overloading, corrosion of embedded reinforcing, or inadequate design or construction, such as use of low-strength concrete or undersized reinforcing bars.

Staining of the concrete surface can be related to soiling from atmospheric pollutants or other contaminants, dirt accumulation, and the presence of organic growth. However, stains can also indicate more serious underlying problems, such as corrosion of embedded reinforcing steel, improper previous surface treatments, alkali-aggregate reaction, or efflorescence, the deposition of soluble salts on the surface of the concrete as a result of water migration (Fig. 15).

Planning for Concrete Preservation

The significance of a historic concrete building or structure—including whether it is important for its architectural or engineering design, for its materials and construction techniques, or both—guides decision making about repair and, if needed, replacement methods. Determining the causes of deterioration is also central to the development of a conservation and repair plan. With historic concrete buildings, one of the more difficult challenges is allowing for sufficient time during the planning phase to analyze the concrete, develop mixes, and provide time for adequate aging of mock-ups for matching to the original concrete.

An understanding of the original construction techniques (cement characteristics, mix design, original intent of assembly, type of placement, precast versus cast in place, etc.) and previous repair work performed on the concrete is important in determining causes of existing deterioration and the susceptibility of the structure to potential other types of deterioration. For example, concrete placed in short lifts (individual concrete placements) or constructed in precast segments will have numerous joints that can provide entry points for water infiltration. Inappropriate prior repairs, such as installation of patches using an incompatible material, can affect the future performance of the concrete. Such prior repairs may require corrective work.

As with other preservation projects, three primary approaches are usually considered for historic concrete structures: ***maintenance***, ***repair***, or ***replacement***. Maintenance and repair best achieve the preservation goal of minimal intervention and the greatest retention of existing historic fabric. However, where elements of the building are severely deteriorated or where inherent problems with the material lead to ongoing failures, replacement may be necessary.

During planning, information is gathered through research, visual survey, inspection openings, and laboratory studies. The material should then be reviewed by professionals experienced in concrete deterioration to help evaluate the nature and causes of the concrete problems, to assess both the short-term and long-term effects of the deterioration, and to formulate proper repair approaches.

Condition Assessment

A condition assessment of a concrete building or structure should begin with a review of all available documents related to original construction and prior repairs. While plans and specifications for older concrete buildings are not always available, they can be an invaluable resource and every attempt should be made to find them. They may provide information on the composition of the concrete mix or on the type and location of reinforcing bars. If available, documents related to past repairs should also be reviewed to understand how the repairs were made and to help evaluate their anticipated performance and service life. Archival photographs can also provide a valuable source of information about original construction.



Figure 15. Evidence of moisture movement through concrete is apparent in the form of mineral deposits on the concrete surface. Cyclic freezing and thawing of entrapped moisture, and corrosion of embedded reinforcement, have also contributed to deterioration of the concrete column on this fence at Crocker Field in Fitchburg, Massachusetts, designed by the Olmsted Brothers.

A visual condition survey will help identify and evaluate the extent, types, and patterns of distress and deterioration. The American Concrete Institute offers several useful guides on how to perform a visual condition survey of concrete. Generally, the condition assessment begins with an overall visual survey, followed by a close-up investigation of representative areas to obtain more detailed information about modes of deterioration.

A number of nondestructive testing methods can be used in the field to evaluate concealed conditions. Basic techniques include sounding with a hand-held hammer (or for horizontal surfaces, a chain) to help identify areas of delamination. More sophisticated techniques include impact-echo testing (Fig. 16), ground penetrating radar, pulse velocity, and other methods that characterize concrete thickness and locate voids or delaminations. Magnetic detection instruments are used to locate embedded reinforcing steel and can be calibrated to identify the size and depth of reinforcement. Corrosion measurements can be taken using copper-copper sulfate half-cell tests or linear polarization techniques to determine the probability or rate of active corrosion of the reinforcing steel.

To further evaluate the condition of the concrete, samples may be removed for laboratory study to determine material components and composition, and causes of deterioration. Samples need to be representative of existing conditions but should be taken from unobtrusive locations. Laboratory studies of the concrete may include petrographic evaluation following ASTM C856, *Practice for Petrographic Examination of Hardened Concrete.* Petrographic examination, consisting of microscopical studies performed by a geologist specializing in the evaluation of construction materials, is performed to determine air content, water-cement ratio, cement content, and general aggregate characteristics. Laboratory studies can also include

chemical analyses to determine chloride content, sulfate content, and alkali levels of the concrete; identification of deleterious aggregates; and determination of depth of carbonation. Compressive strength studies can be conducted to evaluate the strength of the existing concrete and provide information for repair work. The laboratory studies provide a general identification of the original concrete's components and aggregates, and evidence of damage due to various mechanisms including cyclic freezing and thawing, alkali-aggregate reactivity, or sulfate attack. Information gathered through laboratory studies can also be used to help develop a mix design for the repair concrete.

Cleaning

As with other historic structures, concrete structures are cleaned for several reasons: to improve the appearance of the concrete, as a cyclical maintenance measure, or in preparation for repairs. Consideration should first be given to whether the historic concrete structure needs to be cleaned at all. If cleaning is required, then the gentlest system that will be effective should be selected.

Three primary methods are used for cleaning concrete: water methods, abrasive surface treatments, and chemical surface treatments. Low-pressure water (less than 200 psi) or steam cleaning can effectively remove surface soiling from sound concrete; however, care is required on fragile or deteriorated surfaces. In addition, water and steam methods are typically not effective in removing staining or severe soiling. Power washing with high-pressure water is sometimes used to clean or remove coatings from sound, high-strength concrete, but high-pressure water washing is generally damaging to and not appropriate for concrete on historic structures.

When used with proper controls and at very low pressures (typically 35 to 75 psi), microabrasive surface treatments using very fine particulates, such as dolomitic limestone powder, can sometimes clean effectively. However, microabrasive cleaning may alter the texture and surface reflectivity of concrete. Some concrete can be damaged even by fine particulates applied at very low pressures.



Figure 16. Impact echo testing is performed on a concrete structural slab to help determine depth of deterioration. In this method, a short pulse of energy is introduced into the structure and a transducer mounted on the impacted surface of the structure receives the reflected input waves or echoes. These waves are analyzed to help identify flaws and deterioration within the concrete.

Chemical surface treatments can clean effectively but may also alter the appearance of the concrete by bleaching the concrete, removing the paste, etching the aggregate, or otherwise altering the surface. Detergent cleaners or mild, diluted acid cleaners may be appropriate for removal of staining or severe soiling. Cleaning products that contain strong acids such as hydrochloric (muriatic) or hydrofluoric acid, which will damage concrete and are harmful to persons, animals, site features, and the environment, should not be used.

For any cleaning process, trial samples should be performed prior to full-scale implementation. The intent of the cleaning program should not be to return the structure to a like new appearance. Concrete can age gracefully, and as long as soiling is not severe or deleterious, many structures can still be appreciated without extensive cleaning.

Methods of Maintenance and Repair

The maintenance of historic concrete often is thought of in terms of appropriate cleaning to remove unattractive dirt or soiling materials. However, the implementation of an overall maintenance plan for a historic structure is the most effective way to help protect historic concrete. For examples, the lack of maintenance to roofs and drainage systems can promote water related damage to adjacent concrete features. The repeated use of deicing salts in winter climates can pit the surface of old concrete and also may promote decay in embedded steel reinforcements. Inadequate protection of concrete walls adjacent to driveways and parking areas can result in the need for repair work later on.

The maintenance of historic concrete involves the regular inspection of concrete to establish baseline conditions and identify needed repairs. Inspection tasks involve monitoring protection systems, including sealant joints, expansion joints, and protective coatings; reviewing existing conditions for development of distress such as cracking and delaminations; documenting conditions observed; and developing and implementing a cyclical repair program.

Sealants are an important part of maintenance of historic concrete structures. Elastomeric sealants, which have replaced traditional oil-resin based caulks for many applications, are used to seal cracks and joints to keep out moisture and reduce air infiltration. Sealants are commonly used at windows and door perimeters, at interfaces between concrete and other materials, and at attachments to or through walls or roofs, such as with lamps, signs, or exterior plumbing fixtures.

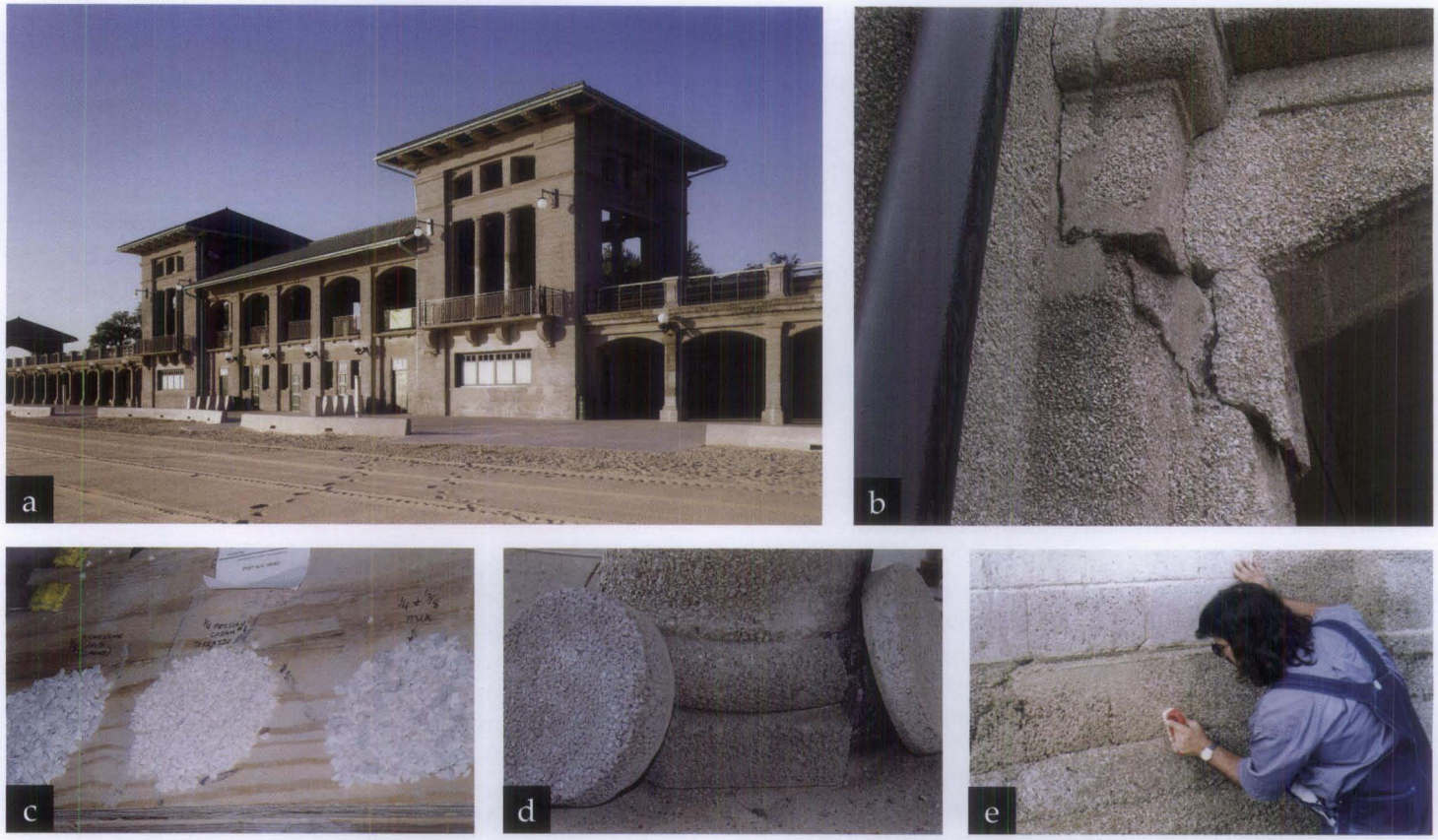


Figure 17. (a) The 63rd Street Beach House was constructed on the shoreline of Chicago in 1919. The highly exposed aggregate concrete of the exterior walls of the beach house was used for many buildings in the Chicago parks as an alternative to more expensive stone construction. Photo: Leslie Schwartz Photography. (b) Concrete deterioration included cracking, spalling, and delamination caused by corrosion of embedded reinforcing steel and concrete damage due to cyclic freezing and thawing. (c) Various sizes and types of aggregates were reviewed for matching to the original concrete materials. (d) Mock-ups of the concrete repair mix were prepared for comparison to the original concrete. Considerations included aggregate type and size, cement color, proportions, aggregate exposure, and surface finish. (e) The craftsman finished the surface to replicate the original appearance in a mock-up on the structure. Here, he used a nylon bristle brush to remove loose paste and expose the aggregate, creating a variable surface to match the adjacent original concrete.

Where used for crack repairs on historic facades, the finished appearance of the sealant application must be considered, as it may be visually intrusive. In some cases, sand can be broadcast onto the surface of the sealant to help conceal the repair.

Urethane and polyurethane sealants are often used to seal joints and cracks in concrete structures, paving, and walkways; these sealants provide a service life of up to ten years. High-performance silicone sealants also are often used with concrete, as they provide a range of movement capabilities and a service life of twenty years or more. Some silicone sealants may stain adjacent materials, which may be a problem with more porous concrete, and may also tend to accumulate dust and dirt. The effectiveness of sealants for sealing joints and cracks depends on numerous factors including proper surface preparation and application. Sealants should be examined as part of routine maintenance inspections, as these materials deteriorate faster than their substrates and must be replaced periodically as a part of cyclical maintenance.

Repair of historic concrete may be required to address deterioration because the original design and construction did not provide for long-term durability, or to facilitate a change in use of the structure. Examples include increasing concrete cover to protect reinforcing steel and reducing water infiltration into the structure by repair of joints. Any such improvements must be thoroughly evaluated for compatibility with the original design and appearance. Care is required in all aspects of historic concrete repair, including surface preparation; installation of formwork; development of the concrete mix design; and concrete placement, consolidation, and curing.

An appropriate repair program addresses existing distress and reduces the rate of future deterioration, which in many cases involves moisture-related issues. The repair program should incorporate materials and methods that are sympathetic to the existing materials in character and appearance, and which provide good long-term performance. In addition, repair materials should age and weather similarly to the original materials. In order to best achieve these goals, concrete repair projects should be divided into three phases: development of trial repair procedures, trial repairs and evaluation, and production repair work.

For any concrete repair project, the process of investigation, laboratory analysis, trial samples, mock-ups, and full-scale repairs allows ongoing refinement of the repair work as well as implementation of quality-control measures. The trial repair process provides an opportunity for the owner, architect, engineer, and contractor to evaluate the concrete mix design and the installation and finishing techniques for the repairs from both technical and aesthetic standpoints. The final repair materials and procedures should match the original concrete in appearance while meeting the established criteria for durability. Information gathered through trial repairs and mock-ups is invaluable in refining the construction documents prior to the start of the overall repair project (Fig. 17).

Surface Preparation

In undertaking surface preparation for historic concrete repair, care must be taken to limit removal of existing material while still providing an appropriate substrate for repairs. This is particularly important where ornamentation and fine details are involved. Preparation for localized repairs usually begins with removal of the loose concrete to determine the general extent of the repair, followed by saw-cutting the perimeter of the repair area. The repair area should extend beyond the area of concrete deterioration to a sufficient extent to provide a sound substrate. When repairing concrete with an exposed aggregate or other special surface texture, a sawcut edge may be too visually evident. To hide the repair edge, techniques such as lightly hand-chipping the edge of the patch may be used to conceal the joint between the original concrete and the new repair material. The depth to which the concrete needs to be removed may be difficult to determine without invasive probing in the repair area. Removal of concrete should typically extend beyond the level of the reinforcing steel, if present, so that the patch encapsulates the reinforcing steel, which provides mechanical attachment for the repair.

If the concrete was originally of lower strength and quality, the assessment of present soundness is more difficult. Deteriorated and unsound concrete is typically removed using pneumatic chipping hammers. Removal of concrete in historic structures is better controlled by using smaller chipping hammers or hand tools. The area of the concrete to be repaired and the exposed reinforcing steel are then cleaned, usually by careful sandblast and air blast procedures applied only within the repair area. Adjacent original concrete surfaces should be protected during this work. In some cases, project constraints such as dust control may limit the ability to thoroughly clean the concrete and steel. For example, it may be necessary to use needle scaling (a small pneumatic impact device) and wire brushing instead of sandblasting.

Supplemental steel may be needed when existing reinforcing steel is severely deteriorated, or if reinforcing steel is not present in repair areas. Exposed existing reinforcing and other embedded steel elements can be cleaned, primed, and painted with a corrosion-inhibiting coating. The patching material should be reinforced and mechanically attached to the existing concrete. Reinforcement materials used in repairs most often include mild steel, epoxy-coated steel, or stainless steel, depending on existing conditions.

Formwork and Molds

Special formwork is needed to recreate ornamental concrete features—which may be complex, in high relief, or architecturally detailed—and to provide special surface finishes such as wood form board textures. Construction of the formwork itself requires particular skill and craftsmanship. Reusable forms can be used for concrete ornamentation that is repeated across a building facade, or precast concrete elements may be used to replace missing or unrepairable architectural features. Formwork for ornamental concrete is often created using a four-step process: a casting of the original concrete is taken; a plaster replica of the unit is prepared; a mold or form is made from the plaster replica; and a new concrete unit is cast. Custom formwork and molds are often the work of specialty companies, such as precasters and cast stone fabricators.

The process of forming architectural features or special surface textures is particularly challenging if early age stripping (removal of formwork early in the concrete curing process) is needed to perform surface treatment on the concrete. Timing for formwork removal is related to strength gain, which in turn is partly dependent on temperature and weather conditions. Early age removal of formwork in highly detailed concrete can lead to damage of the new concrete that has not yet gained sufficient strength through curing.

Selection of Repair Materials and Mix Design

Selection and design of proper repair materials is a critical component of the repair project. This process requires evaluation of the performance, characteristics, and limitations of the repair materials, and may involve laboratory testing of proposed materials and trial repairs. The materials should be selected to address the specific type of repair required and to be compatible with special characteristics of the original concrete. Some modern repair materials are designed to have a high compressive strength and to be impermeable. Even though inherently durable, these newer materials may not be appropriate for use in repairing a low strength historic concrete.

The concrete's durability, or resistance to deterioration, and the materials and methods selected for repair depend on its composition, design, and quality of workmanship. In most cases, a mix design for durable replacement concrete should use materials similar to those of the original concrete mix. Prepackaged materials are often not appropriate for repair of historic concrete. The concrete patching material can be air entrained or polymer-modified if subject to exterior exposure, and should incorporate an appropriate selection of aggregate and cement type, and proper water content and water

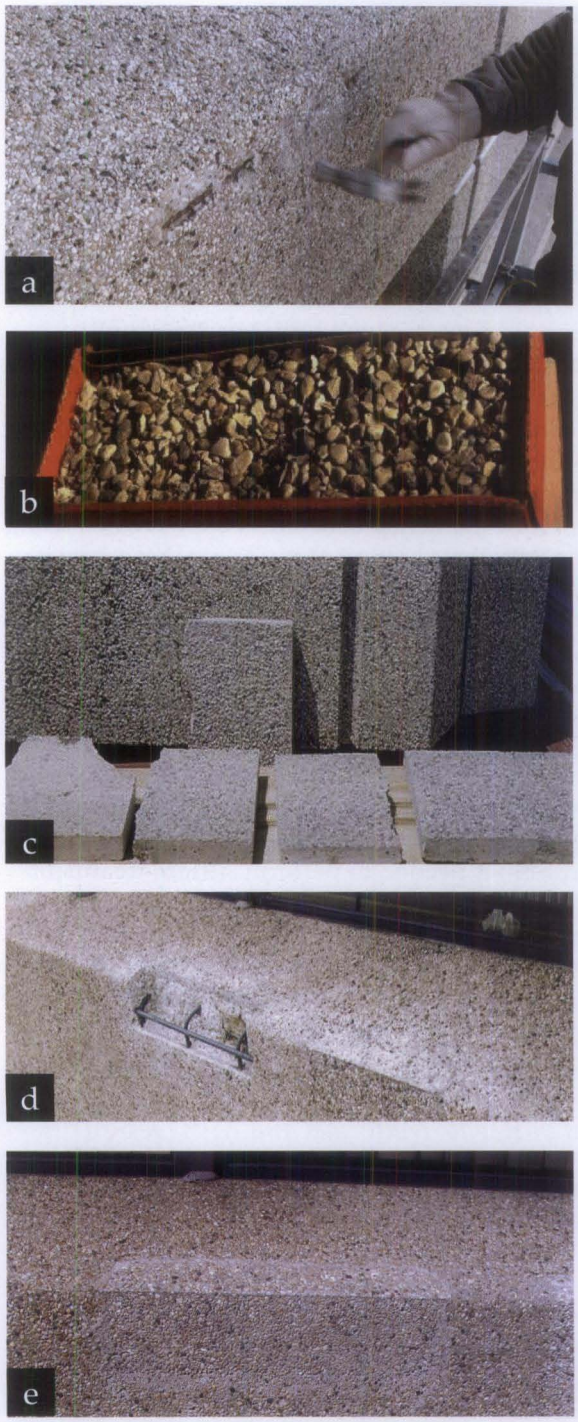


Figure 18. (a) Exposed aggregate precast concrete is sounded with a hammer to detect areas of deterioration. Corrosion of the exposed reinforcing steel bar has led to spalling of the adjacent concrete. (b) Samples of aggregate considered for use in repair concrete are compared to the original concrete materials in terms of size, color, texture, and reflectance. (c) Various sample panels are made using the selected concrete repair mix design for comparison to the original concrete on the building, and the mix design is adjusted based on review of the samples. (d) After removal of the spall, the concrete surface is prepared for installation of a formed patch. (e) Prior to placement of the concrete, a retarding agent is brush-applied to the inside face of the formwork to slow curing at the surface. After the concrete is partially cured, the forms are removed and the surface of the concrete is rubbed to remove some of the paste and expose the aggregate to match the original concrete.

to cement ratio. Some admixtures, including polymer modifiers, may change the appearance of the concrete mix. Design of the concrete patching material should address characteristics required for durability, workability, strength gain, compressive strength, and other performance attributes. During installation of the repair, skilled workmanship is required to ensure proper mixing procedures, placement, consolidation, and curing.

Matching and Repair Techniques for Historic Concrete

Repair measures should be selected that retain as much of the original material as possible, while providing for removal of an adequate amount of deteriorated concrete to provide a sound substrate for a durable repair. The installed repair must visually match the existing concrete as closely as possible and should be similar in other aspects such as compressive strength, permeability, and other characteristics important in the mix design of the concrete (Fig. 18).

Understanding the original construction techniques often provides opportunities in the design of repairs. For example, joints between the new and old concrete can be hidden in changes in surface profile and cold joints. The required patching mix for the concrete to be used in the repair will likely need to be specially designed to replicate the appearance of the adjacent historic concrete. A high level of craftsmanship is required for finishing of historic concrete, in particular to create the sometimes inconsistent finish and variation in the original concrete in contrast to the more even appearance required for most non-historic repairs.

To match the various characteristics of the original concrete, trial mixes should be developed. These mixes need to take into account the types and colors of aggregates and paste present in the original concrete. Different mixes may be needed because of variations in the appearance and composition of the historic concrete. The trials should utilize different forming and finishing techniques to achieve the best possible match to the original concrete. Initial trials should first take place on site but off the structure. The mix designs providing the best match are then installed as trial repairs on the structure, and assessed after they have cured.

Achieving compatibility between repair work and original concrete may be difficult, especially given the variability often present in historic concrete materials and finishes. Formed rather than trowel-applied patch repairs are recommended for durability, as forming permits better ranges of mix ingredients (such as coarse aggregates) and improved consolidation as compared to trowel-applied repairs. Parge coatings usually are not recommended as they do not provide as durable repair as formed concrete. However, in some cases parge coatings may be appropriate to match an original parged surface treatment. Proper placement and finishing of the repair are important to obtain a match with the original concrete. To minimize problems associated with rapid curing of concrete, such as surface cracking, it is important to use proper curing methods and to allow for sufficient time.

Hairline cracks that show no sign of increasing in size may often be left unrepaired. The width of the crack and the amount of movement usually limits the selection of crack repair techniques that are available. Although it is difficult to determine whether cracks are moving or non-moving, and therefore most cracks

should be assumed to be moving, it is possible to repair non-moving cracks by installation of a cementitious repair mortar matching the adjacent concrete. It is generally desirable not to widen cracks prior to the mortar application. Repair mortar containing sand in the mix may be used for wider cracks; unsanded repair mortar may be used for narrower cracks.

When it is desirable to re-establish the structural integrity of a concrete structure involving dormant cracks, epoxy injection repair has proven to be an effective procedure. Such a repair is made by first sealing the crack on both sides of a wall or structural member with epoxy, polyester, wax, tape, or cement slurry, and then injecting epoxy through small holes or ports drilled in the concrete. Once the epoxy in the crack has hardened, the surface sealing material may be removed; however, this type of repair is usually quite apparent. Although it may be possible to inject epoxy without leaving noticeable residue, this process is difficult and, in general, the use of epoxy repairs in visible areas of concrete on historic structures is not recommended.

Active structural cracks (which move as loads are added or removed) and thermal cracks (which move as temperatures fluctuate) must be repaired in a manner that will accommodate the anticipated movement. In some more extreme cases, expansion joints may have to be introduced before crack repairs are undertaken. Active cracks may be filled with sealants that will adhere to the sides of the cracks and will compress or expand during crack movement. The design, detailing, and execution of sealant repairs require considerable attention, or they will detract from the appearance of the historic building. The routing and cleaning of a crack, and installation of an elastomeric sealant to prevent water penetration, is used to address cracks where movement is anticipated. However, unless located in a concealed area of the concrete, this technique is often not acceptable for historic structures because the repair will be visually intrusive (Fig. 19). Other approaches, such as installation of a cementitious crack repair, may need to be considered even though this type of repair may be less effective or have a shorter service life than a sealant repair.

Replacement

If specific components of historic concrete structures are beyond repair, replacement components can be cast to match historic ones. Replacement of original concrete should be carefully considered and viewed as a method of last resort. In some cases, such as for repeated ornamental units, it may be more cost-effective to fabricate precast concrete units to replace missing elements. The forms created for precast or cast-in-place units can then be used again during future repair projects.

Careful mix formulation, placement, and finishing are required to ensure that replacement concrete units will match the historic concrete. There is often a tendency to make replacement concrete more consistent in appearance than the original concrete. The consistency can be in stark contrast with the variability of the original concrete



Figure 19. A high-speed grinder ia used to widen a crack in preparation for installation of a sealant. This process is called "routing." After the crack is prepared, the sealant is installed to prevent moisture infiltration through the crack. Although sealant repairs can provide a durable, watertight repair for moving cracks, they tend to be very visible.

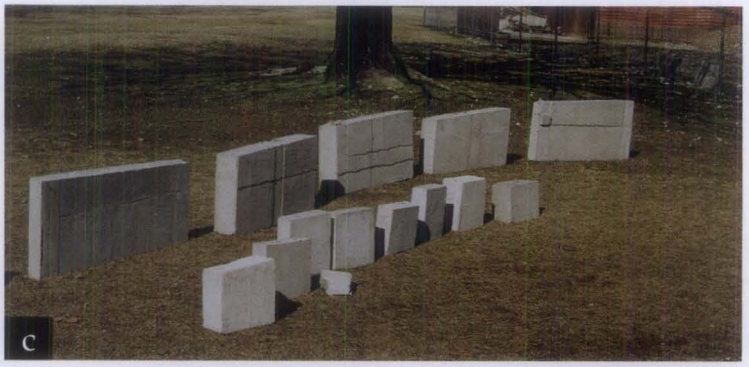
due to original construction techniques, architectural design, or differential exposure to weather. Trial repairs and mock-ups are used to evaluate the proposed replacement concrete work and to refine construction techniques (Fig 20).

Protection Systems

Coatings and Penetrating Sealers. Protection systems such as a penetrating sealers or film forming coating are often used with non-historic structures to protect the concrete and increase the length of the service life of concrete repairs. However, film-forming coatings are often inappropriate for use on a historic structure, unless the structure was coated historically. Film-forming coatings will often change the color and appearance of a surface, and higher build coatings can also mask architectural finishes and ornamental details. For example, the application of a coating on concrete having a formboard finish may hide the wood texture of the surface. Pigmented film-forming coatings are also typically not appropriate for use over exposed aggregate concrete, where the uncoated exposed surface contributes significantly to the historic character of









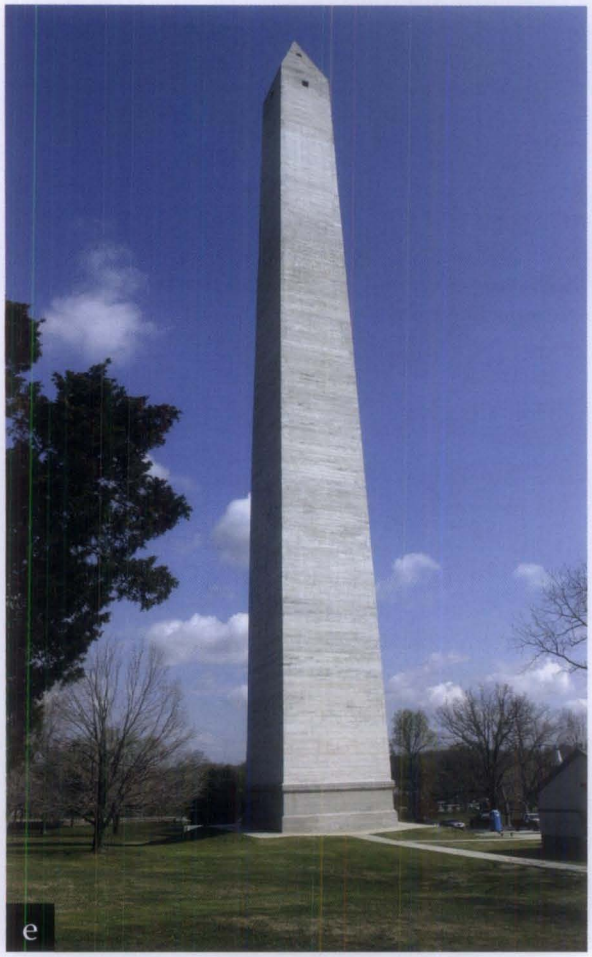


Figure 20. (a) The Jefferson Davis Memorial in Fairview, Kentucky, constructed from 1917–1924, is 351 feet tall and constructed of unreinforced concrete. The walls of the memorial are 8 feet thick at the base and 2 feet thick at the top of the wall. Access to the monument for investigation was provided by rappelling techniques, while ground supported and suspended scaffolding was used to access the exterior during repairs. (b) The concrete was severely deteriorated at isolated locations, with spalling and damage from cyclic freezing and thawing of entrapped water. In addition, previous repairs were at the end of their service life and removal of deteriorated concrete and failed previous repairs was required. Light duty chipping hammers were used to avoid damage to adjacent material when removing deteriorated concrete to the level of sound concrete. (c) Field samples were performed to match the color, finish, and texture of the original concrete. A challenge in matching of historic concrete is achieving variability of appearance. (d) The completed surface after repairs exhibits intentional variability of the concrete surface to match the appearance of the original concrete. Some formwork imperfections that would normally be removed by finishing were intentionally left in place, to replicate the highly variable finish of the original concrete. (e) The Jefferson Davis Memorial after completion of repairs in 2004. Photo e: Joseph Lenzi, Senler, Campbell & Associates, Inc.

concrete. In cases where the color of a substrate needs to be changed, such as to modify the appearance of existing repairs, an alternative to pigmented film-forming coatings is the use of pigmented stains.

Many proprietary clear, penetrating sealers are currently available to protect concrete substrates. These products render fine cracks and pores within the concrete hydrophobic; however, they do not bridge or fill cracks. Clear sealers may change the appearance of the concrete in that treated areas become more visible after rain in contrast to the more absorptive areas of original concrete. Once applied, penetrating sealers cannot be effectively removed and are therefore considered irreversible. They should not be used on historic concrete without thorough prior consideration. However, clear penetrating sealers provide an important means of protection for historic concrete that is not of good quality and can help to avoid more extensive future repairs or replacement. Thus they are sometimes appropriate for use on historic concrete. Once applied, these sealers will require periodic re-application.

Waterproofing membranes are systems used to protect concrete surfaces such as roofs, terraces, plazas, or balconies, as well as surfaces below grade. Systems range from coal tar pitch membranes used on older buildings, to asphalt or urethane-based systems. On historic buildings, membrane systems are typically used only on surfaces that were originally protected by a similar system and surfaces that are not visible from grade. Waterproofing membranes may be covered by roofing, paving, or other architectural finishes.

Laboratory and field testing is recommended prior to application of a protection system or treatment on any concrete structure; testing is even more critical for historic structures because many such treatments are not reversible. As with other repairs, trial samples are important to evaluate the effectiveness of the treatment and to determine whether it will harm the concrete or affect its appearance.

Cathodic Protection. Corrosion is an electrochemical process in which electrons flow between cathodic (positively charged) and anodic (negatively charged) areas on a metal surface; corrosion occurs at the anodes. Cathodic protection is a technique used to control the corrosion of metal by making the whole metal surface the cathode of an electrochemical cell. This technique is used to protect metal structures from corrosion and is also sometimes used to protect steel reinforcement embedded in concrete. For reinforced concrete, cathodic protection is typically accomplished by connecting an auxiliary anode to the reinforcing so that the entire reinforcing bar becomes a cathode. In sacrificial anode (passive) systems, current flows naturally by galvanic action between the less noble anode (such as zinc) and the cathode. In impressed-current (active) systems, current is impressed between an inert anode (such as titanium) and the cathode. Cathodic protection is intended to reduce the rate of corrosion of embedded steel in concrete, which in turn reduces overall deterioration. Protecting embedded steel from corrosion helps to prevent concrete cracking and spalling.

Impressed-current cathodic protection is the most effective means of mitigating steel corrosion and has been used in practical structural applications since the 1970s. However, impressed-current cathodic protection systems are typically the most costly to install and require substantial ongoing monitoring, adjustment, and maintenance to ensure a proper voltage output (protection current) over time. Sacrificial anode cathodic protection dates back to the 1800s, when the hulls of ships were protected using this technology. Today many industries utilize the concept of sacrificial anode cathodic protection for the protection of steel exposed to corrosive environments. It is less costly than an impressed-current system, but is somewhat less effective and requires reapplication of the anode when it becomes depleted.

Re-alkalization. Another technique currently available to protect concrete is realkalization, which is a process to restore the alkalinity of carbonated concrete. The treatment involves soaking the concrete with an alkaline solution, in some cases forcing it into the concrete to the level of the reinforcing steel by passage of direct current. These actions increase the alkalinity of the concrete around the reinforcement, thus restoring the protective alkaline environment for the reinforcement. Like impressed-current cathodic protection methods, it is costly. Other corrosion methods are also available but have a somewhat shorter history of use.

Careful evaluation of existing conditions, the causes and nature of distress, and environmental factors is essential before a protection method is selected and implemented. Not every protection system will be effective on each structure. In addition, the level of intrusion caused by the protection system must be carefully evaluated before it is used on a historic concrete structure.

Summary

In the United States, concrete has been a popular construction material since the late nineteenth century and recently has gained greater recognition as a historic material. Preservation of historic concrete requires a thorough understanding of the causes and types of deterioration, as well as of repair and replacement materials and methods. It is important that adequate time is allotted during the planning phase of a project to provide for trial repairs and mock-ups in order to evaluate the effectiveness and aesthetics of the repairs. Careful design is essential and, as with other preservation efforts, the skill of those performing the work is critical to the success of the repairs. The successful repair of many historic concrete structures in recent years demonstrates that the techniques and materials now available can extend the life of such structures and help ensure their preservation.

Selected Reading

American Concrete Institute. *Guide for Making a Condition Survey of Concrete in Service*. ACI Committee 201, ACI 201.1R-92.

American Concrete Institute. *Guide to Evaluation of Concrete Structures before Rehabilitation*. ACI Committee 364, ACI 364.1R-07.

American Concrete Institute. *Concrete Repair Guide*. ACI Committee 546, ACI 546R-04.

American Concrete Institute. *Guide for Evaluation of Existing Concrete Buildings*. ACI Committee 437, ACI 437R-03.

Childe, H.L. *Manufacture and Uses of Concrete Products and Cast Stone*. London: Concrete Publications Limited, 1930.

Collins, Peter. *Concrete: The Vision of a New Architecture*. New York, New York: Faber and Faber, 1959.

Cowden, Adrienne B., comp. *Historic Concrete: An Annotated Bibliography*. Washington, D.C.: National Park Service, 1993.

Komandant, August E. *Contemporary Concrete Structures*. New York, New York: McGraw Hill, 1972.

Erlemann, Gustav G. "Steel Reinforcing Bar Specification in Old Structures." *Concrete International*, April 1999, 49–50.

Federal Highway Administration. *Guide to Nondestructive Testing of Concrete*. FHWA Publication Number FHWA-SA-97-105.

Gaudette, Paul E. "Special Considerations in Repair of Historic Concrete." *Concrete Repair Bulletin*, January/February 2000, 12–13.

Jester, Thomas C., ed. *Twentieth Century Building Materials*. New York, New York: McGraw-Hill, 1995.

Johnson, Arne P., and Seung Kyoung Lee. "Protection Methods for Historic Concrete at Soldier Field." *Preserve and Play: Preserving Historic Recreation and Entertainment Sites*. Washington, D.C.: Historic Preservation Education Foundation, National Council for Preservation Education, and National Park Service, 2006.

Macdonald, Susan, ed. *Concrete: Building Pathology*. Osney Mead, Oxford, U.K.: Blackwell Science, 2003.

McGovern, Martin S. "A Clear View of Sealers." *Concrete Construction*, January 2000, 53–58.

Morton, W. Brown III, Gary L. Hume, Kay D. Weeks, H. Ward Jandl, and Anne E. Grimmer. *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings*. Washington, D.C.: National Park Service, 1983, reprinted 1997.

"Repairing Cracks." *Concrete Repair Digest*, August/September 1992, 160–164. Condensed from ACI document 224.1R-93.

Slaton, Deborah. "Cleaning Historic Concrete." *Concrete Repair Bulletin*, January/February 2000, 14–15.

Acknowledgements

Paul Gaudette is an engineer with Wiss, Janney, Elstner Associates, Inc., in Chicago, Illinois. Deborah Slaton is an architectural conservator with Wiss, Janney, Elstner Associates, Inc., in Northbrook, Illinois. All photographs by Paul Gaudette unless otherwise stated. Front cover image: Kyle Normandin, Wiss, Janney, Elstner Associates, Inc.

The authors wish to thank William Bing Coney, author of the first edition of this preservation brief, who served as a peer reviewer for the current edition. In addition, the authors gratefully acknowledge the assistance of the following individuals as peer reviewers of this brief: Arne Johnson and Una Gilmartin, Wiss, Janney, Elstner Associates, Inc.; Robert Joyce, Quality Restorations, Inc.; Susan Macdonald, New South Wales Heritage Office; Miles T. Murray, Restruction Corporation; and Jack Pyburn, OJP/Architect, Inc. Anne E. Grimmer, Chad Randl, and former staff Sharon C. Park, FAIA, of the Technical Preservation Services, National Park Service, offered valuable comments during development of the brief. Charles E. Fisher of the National Park Service was the technical editor for this publication project.

This publication has been prepared pursuant to the National Historic Preservation Act of 1966, as amended, which directs the Secretary of the Interior to develop and make available information concerning historic properties. Comments about this publication should be addressed to: Charles E. Fisher, Technical Preservation Publications Program Manager, Technical Preservation Services—2255, National Park Service, 1849 C Street, NW, Washington, DC 20240. This publication is not copyrighted and can be reproduced without penalty. Normal procedures for credit to the authors and the National Park Service should be provided. The photographs used in this publication may not be used to illustrate other publications without permission of the owners. For more information about the programs of the National Park Service's Technical Preservation Services see our website at http://www.nps.gov/history/hps/tps.htm

ISBN: 978-0-16-078946-5
U.S. Government Printing Office Stock Number: 024-005-01253-2 2007

ATTACHMENT F: DETAILED DESIGN DRAWING SET (ABRIDGED)

SUNKIST GROWERS INC.
14130 RIVERSIDE DRIVE, SHERMAN OAKS, CA

THIS PAGE INTENTIONALLY LEFT BLANK

DETAILED DESIGN

OCTOBER 14, 2015

PREPARED FOR

imt RESIDENTIAL

PREPARED BY

JOHNSON FAIN

MATERIALS LEGEND

MATERIAL	TYPE	MANUFACTURER	DESCRIPTION	STYLE/MODEL	COLOR	REMARKS	REPRESENTATIVE CONTACT INFORMATION
RUBBER BASE	RB-1	TBD				TYPICAL	
	RB-2	TBD				@FITNESS AREA	
	RB-3	TBD				@OFFICE	
STONE / SYNTHETIC STONE	ST-1	TRISTONE	THICKNESS: 1 1/4"	HONED	BARDIGLIO	RECEPTION DESK COUNTERTOP	
	ST-2	TRISTONE	THICKNESS: 1 1/4"	HONED	ATHENS GREY	RECEPTION DESK COUNTERTOP (OPTION 2)	
	ST-3	TBD				RESTROOM COUNTERTOP	
	ST-4	TBD				KITCHEN COUNTERTOP	
METAL	MTL-1	RIGIDIZED METALS	THICKNESS: .075"	LINEN			
	MTL-2	RIGIDIZED METALS	THICKNESS: .024"	SATIN			
	MTL-3	TIGER		GLOSSY GL/SM	049/11340		
	MTL-4	TBD				RECEPTION DESK	
TILE	T-1	STONE SOURCE	PORCELAIN TILE - I COLOR	4" X 12"	BIANCO MATTE	4" X 8" COVE BASE. FLOOR FIELD @RESTROOM	
	T-2	STONE SOURCE	PORCELAIN TILE - I COLOR	2" X 8"	BIANCO MATTE	1" X 8" CANALETTA INTERNA/ ESTERNA AT CORNERS. WALL FIELD @RESTROOM	
	T-3	STONE SOURCE	PORCELAIN TILE - I COLOR	2" X 8"	AZZURRO MATTE	ACCENT @RESTROOM (MEN). RANDOM PATTERN, SEE ELEVATIONS	
	T-4	STONE SOURCE	PORCELAIN TILE - I COLOR	2" X 8"	MELA MATTE	ACCENT @RESTROOM (WOMEN). RANDOM PATTERN, SEE ELEVATIONS	
WOOD	WD-1	RULON	TBD (BIRCH, WALNUT, ANIGRE)			WALL PANEL @LEVEL1 LOBBYMATCH ARCHITECT'S SAMPLE	
	WD-2	SEELEY BROTHERS	IPE			MATCH ARCHITECT'S SAMPLE	
	WD-3	TBD				PAINTED WOOD BASE @CONF RMS AND CORRIDOR	
CARPET	CPT-1	SHAW CONTRACT		CLOTH TILE 5T096	BAYON	@ELEVATOR	
	CPT-2	TBD					
	CPT-3	TBD				@CONFERENCE ROOMS	
	CPT-4	TBD				@CORRIDORS	
	CPT-5	TBD				@FITNESS AND CARDIO AREA	
	CPT-6	TBD				@OFFICE	
PAINT	PT-1	SHERMAN WILLIAMS		SW 7757	HIGH REFLECTIVE WHITE	SHEEN: PROMAR 200 EGGSHELL. TYPICAL WALLS	
	PT-2	SHERMAN WILLIAMS		SW 7006	EXTRA WHITE	SHEEN: PROMAR 200 EGGSHELL. GRG FORMS	
	PT-3	COLOR LIFE		CL3257N	ECLIPSE	SHEEN: EGGSHELL. LOBBY RCP	
	PT-4	DUNN EDWARDS		DEA119	ELECTRIC GLOW (YELLOW)		
	PT-5	DUNN EDWARDS		DEA136	BEAUTIFUL BLUE (BLUE)		
	PT-6	DUNN EDWARDS		DE5552	CLIPPED GRASS (GREEN)		
	PT-7	DUNN EDWARDS		DEA108	RED POWER (RED)		
	PT-8	TBD				@KITCHEN AND RR RCP	
	PT-9	TBD				@KITCHEN AND RR WALLS	
UPHOLSTERY/ TEXTILES	FB-1	LUNA TEXTILES		STACKING CHAIRS #STK-5311	COASTAL		
	FB-1A	KNOLL		HIGHLINE CR #HC1064/8	PEWTER	OPTION A	
	FB-1B	KNOLL		EARTHWORK #K1238/5	BISMUTH	OPTION B	
	FB-1C	MAYER FABRICS		MOTIF	CHARCOAL #411-006	OPTION C	
	FB-1D	MAYER FABRICS		TURNABOUT	GRANITE #LC380-016-R	OPTION D	

MATERIALS LEGEND

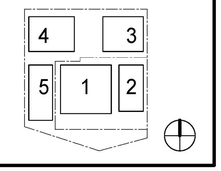
MATERIAL	TYPE	MANUFACTURER	DESCRIPTION	STYLE/MODEL	COLOR	REMARKS	REPRESENTATIVE CONTACT INFORMATION
ACOUSTICAL CEILING TILE	ACT-1	CEILINGS PLUS		TBD	BLANCO MAT (WHITE)	SIZE: 2'X2' CUSTOM PERFORATION	
	ACT-2	ARMSTRONG		TBD	WHITE	SIZE: 2'X2'	
GLASS	GL-1	MCGRORY GLASS	BACK-PAINTED	#JFA-070	ORANGE	ACCENT GLASS AT ELEVATOR #1	
	GL-2	MCGRORY GLASS	BACK-PAINTED	#JFA-055	GREEN	ACCENT GLASS AT ELEVATOR #2	
	GL-3	PPG		STARPHIRE GLASS	CLEAR	EXTERIOR GLAZING AT ENTRY	
	GL-4	TBD				EXTERIOR GLAZING AT GROUND LEVEL	
GFRG	GRG-1	FORMGLAS		MATCH PT-1/PT-2		CUSTOM	
FILM	FLM-1	3M		DUSTED CRYSTAL #7725SE-314		CUSTOM PATTERN	
						ELECTRICAL RMS.	
VINYL/ VINYL COMPOSITE TILE	VCT-1	TBD					
	VT-1	TBD					
						SEALED CONCRETE	
CONCRETE	CONC-1	TBD					
PLASTIC LAMINATE	PL-1	TBD				TYPICAL AT RESTROOM TOILET PARTITIONS	

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
MATERIALS LEGEND

ARCHITECT
JOHNSON FAIN

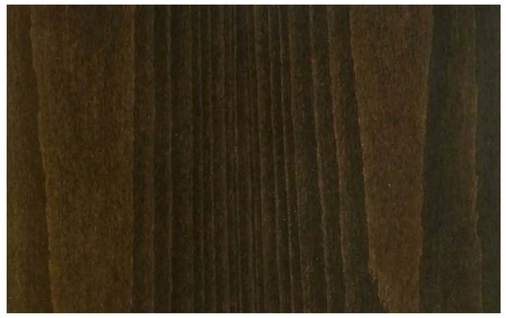
PLOT STAMP
10/14/2015 7:31:52 PM

PROJECT NUMBER
13032

SHEET NUMBER
A0.1.30

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



WD-1; RULON; WALNUT



PT-1; SHERWIN WILLIAMS;
SW7757 HIGH REFLECTIVE



PT-2; SHERWIN WILLIAMS;
SW7006 EXTRA WHITE



PT-3; FRAZEE; CL3257N
ECLIPSE



ACT-1; CEILINGS PLUS; WHITE



FB-1; LUNA TEXTILES; COASTAL



GRG-1; FORMGLAS; TO MATCH PT-1/PT-2



ST-1; TRISTONE; BARDIGLIO



MTL-1; RIGIDIZED
METALS; LINEN



MTL-2; RIGIDIZED
METALS; SATIN



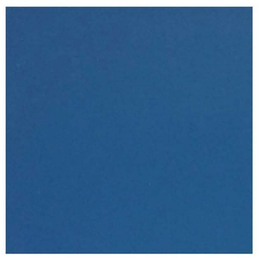
GL-1; MCGRORY GLASS;
ORANGE



GL-2; MCGRORY GLASS;
GREEN



PT-4; DUNN EDWARDS; DEA119
ELECTRIC GLOW



PT-5; DUNN EDWARDS; DEA136
BEAUTIFUL BLUE



PT-6; DUNN EDWARDS; DE5552
CLIPPED GRASS



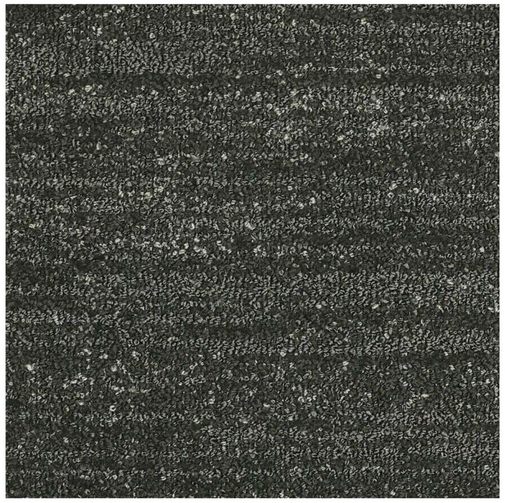
PT-7; DUNN EDWARDS; DEA108
RED POWER



MTL-3; TIGER; 049/11340



WD-2; SEELEY BROTHERS; IPE



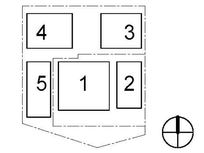
CPT-1; SHAW CONTRACT; BAYON

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

MATERIAL FINISH PALETTE

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:32:01 PM

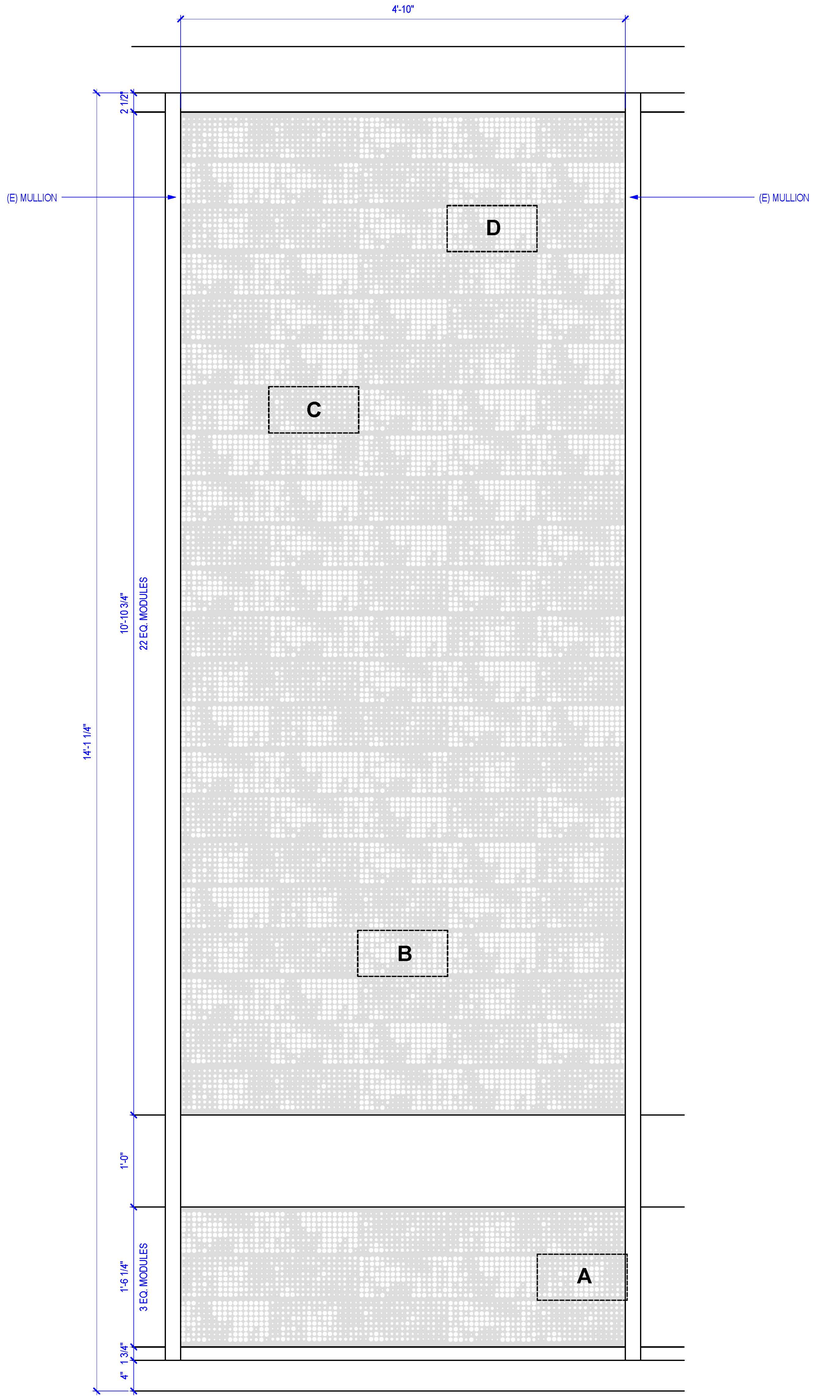
PROJECT NUMBER
13032

SHEET NUMBER

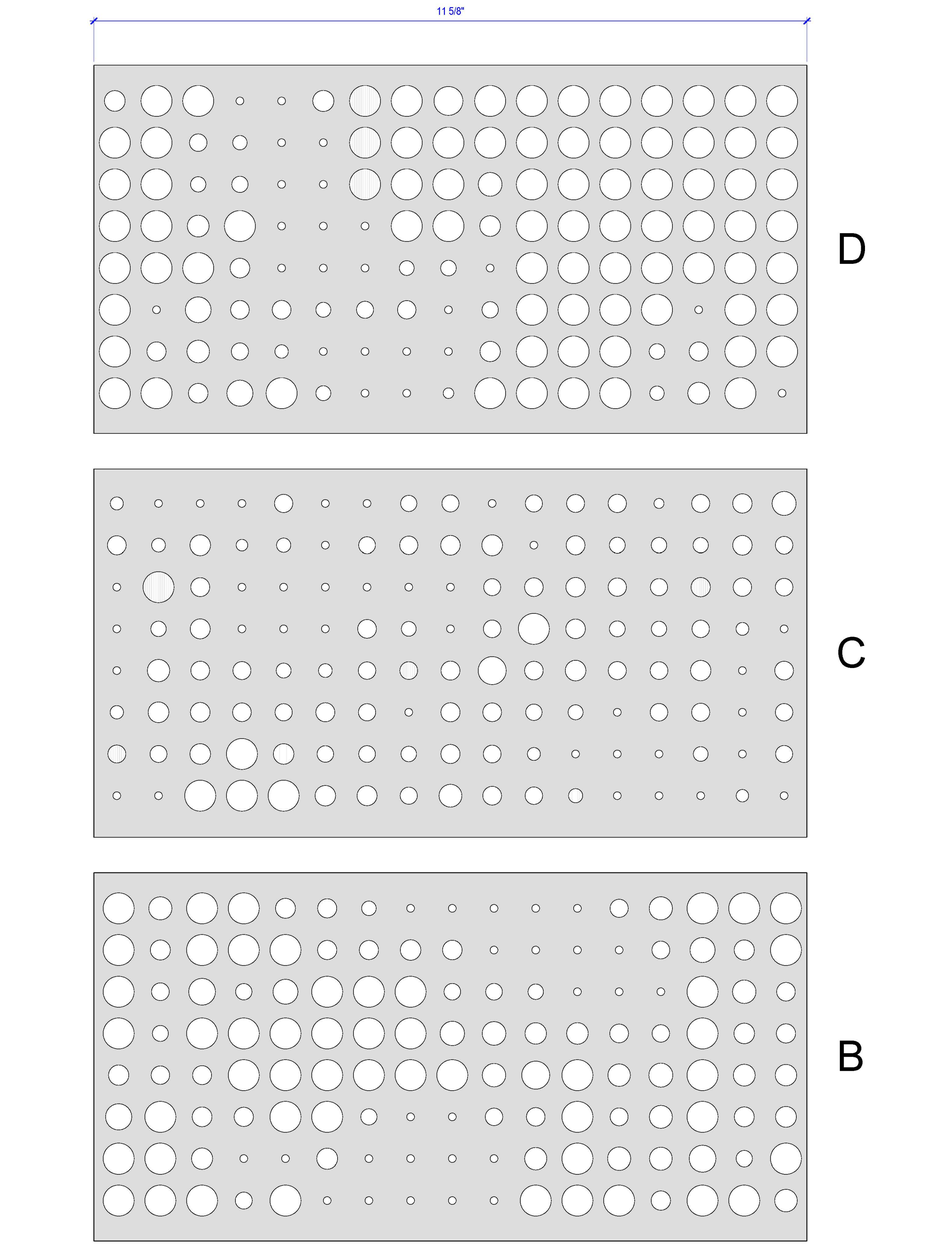
A0.1.31

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 ENLARGED ELEVATION - DOT SCREEN GLAZING MODULE
SCALE: 1 1/2" = 1'-0"



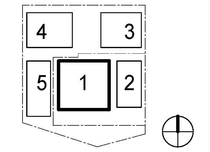
1 DETAIL - DOT SCREEN MODULES
SCALE: 12" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
METAL PANEL DOT PATTERN

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:32:31 PM

PROJECT NUMBER
13032

SHEET NUMBER
A0.1.32

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

A B C D E F G H J K L M N P R

52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

BASE

PATTERN START POINT

10'-0"

8"

2"

4"

2'-0" 10% ACCENT

1'-8" 20% ACCENT

T-2

T-3, ACCENTAT MEN'S
T-4, ACCENT AT WOMEN'S

1'-8" 30% ACCENT

1'-8" 40% ACCENT

1'-8" 50% ACCENT

9'-0"

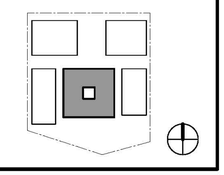
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

TILE PATTERN

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:32:39 PM

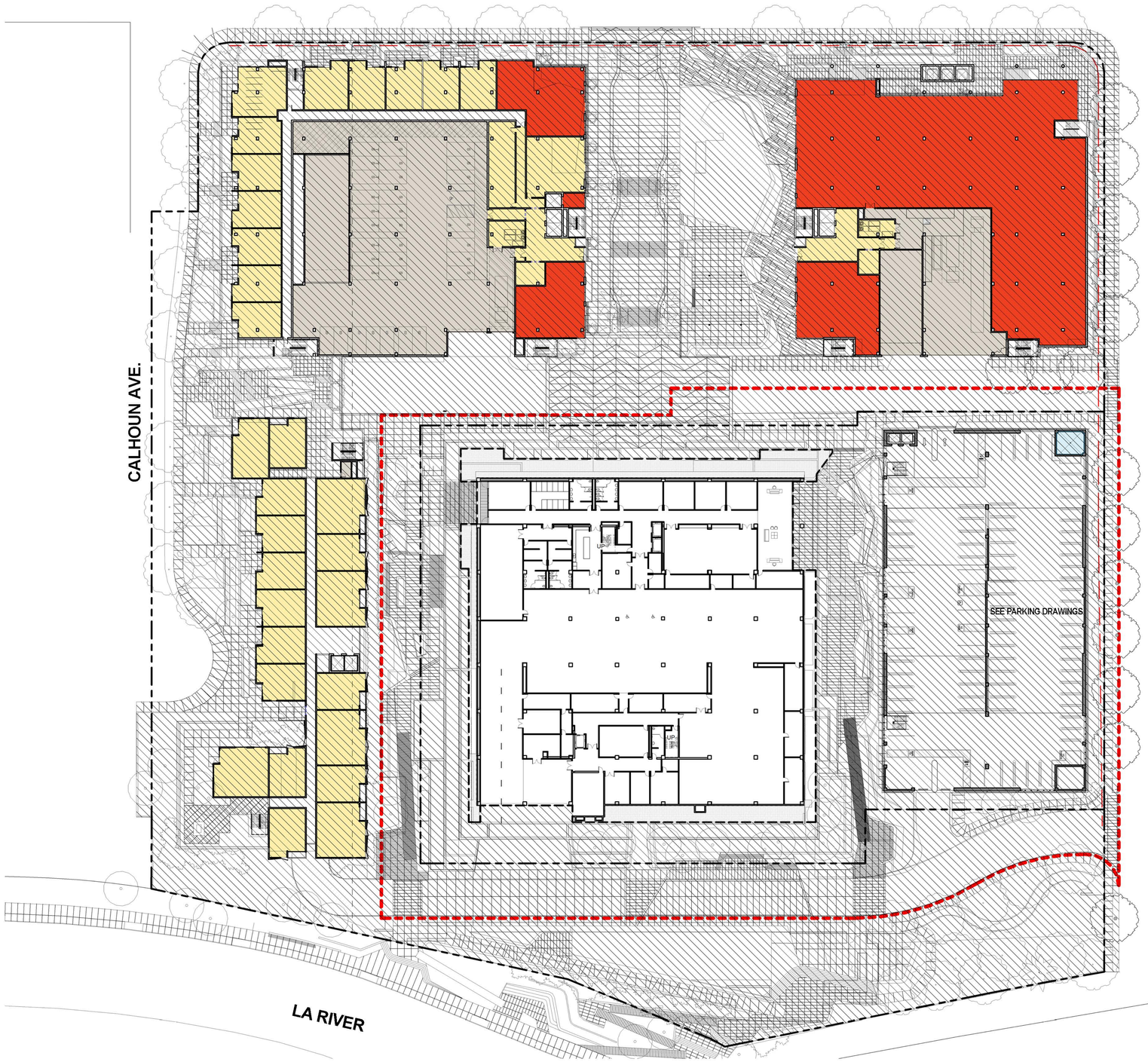
PROJECT NUMBER
13032

SHEET NUMBER

A0.1.33

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 SITE PLAN
SCALE: 1" = 30'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN

4 3
5 1 2

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

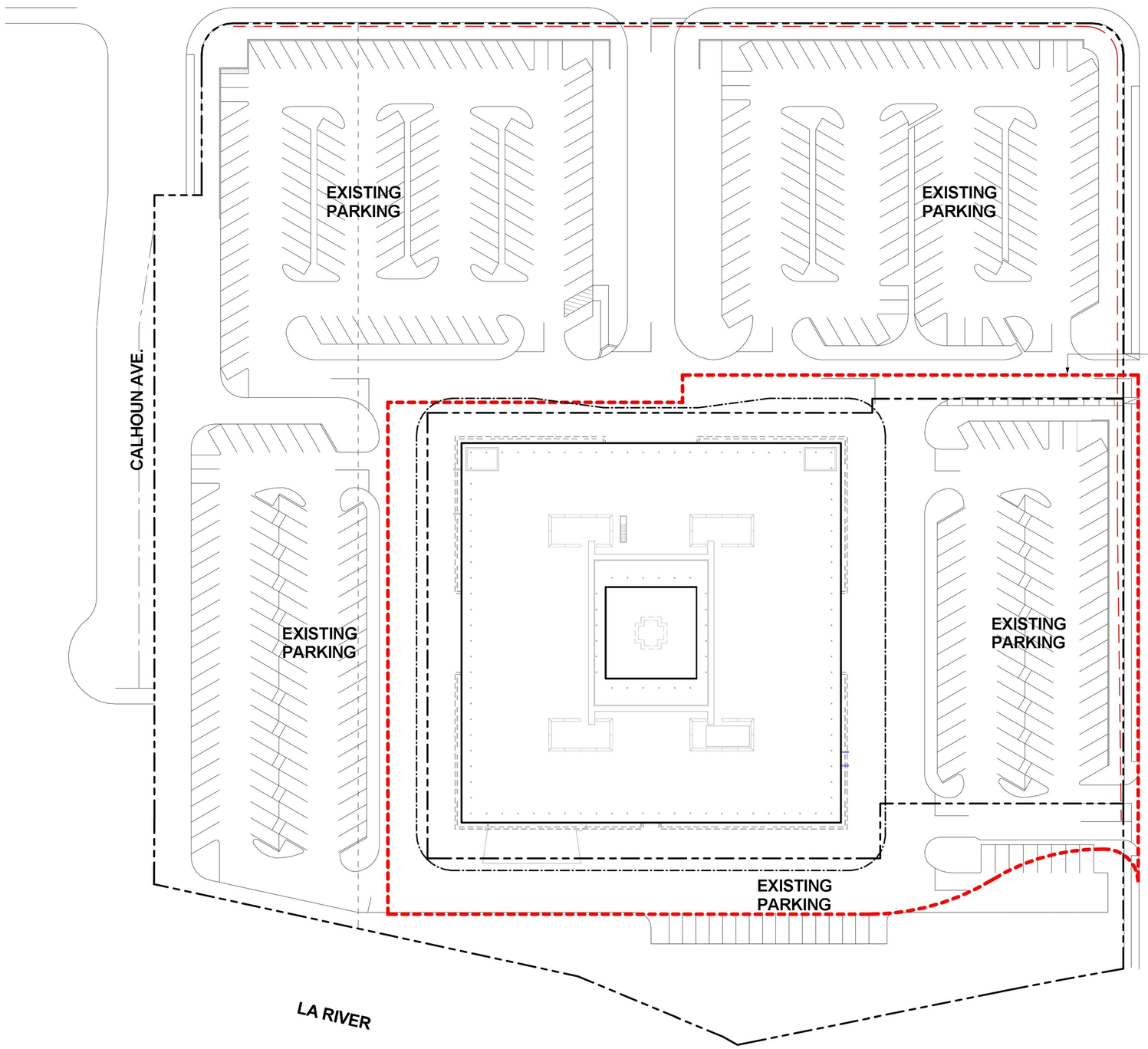
14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
SITE PLAN

ARCHITECT
JOHNSON FAIN
PLOT STAMP
10/15/2015 4:42:15 PM
PROJECT NUMBER
13032
SHEET NUMBER
A1.1.01

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



LEGEND

EXISTING CONSTRUCTION TO REMAIN

EXISTING CONSTRUCTION TO BE REMOVED

1 EXISTING/ DEMOLITION SITE PLAN
SCALE: 1" = 30'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

DEMOLITION PLAN - SITE

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/15/2015 5:01:56 PM

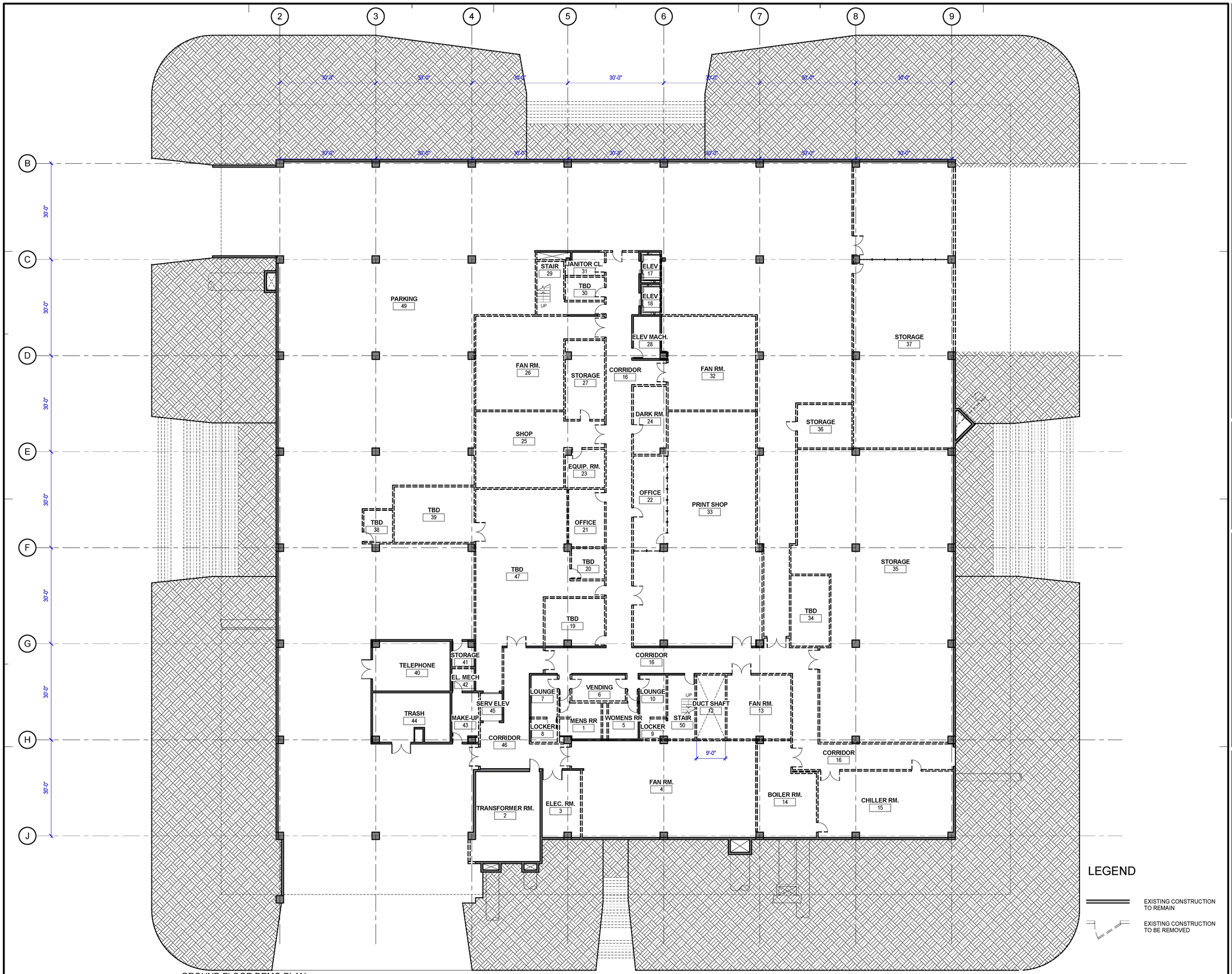
PROJECT NUMBER
13032

SHEET NUMBER

A1.1.02

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 GROUND FLOOR DEMO PLAN
SCALE: 3/32" = 1'-0"

LEGEND

EXISTING CONSTRUCTION TO REMAIN

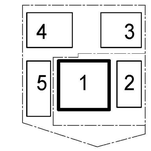
EXISTING CONSTRUCTION TO BE REMOVED

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
DEMOLITION PLAN - GROUND FLOOR

ARCHITECT
JOHNSON FAIN

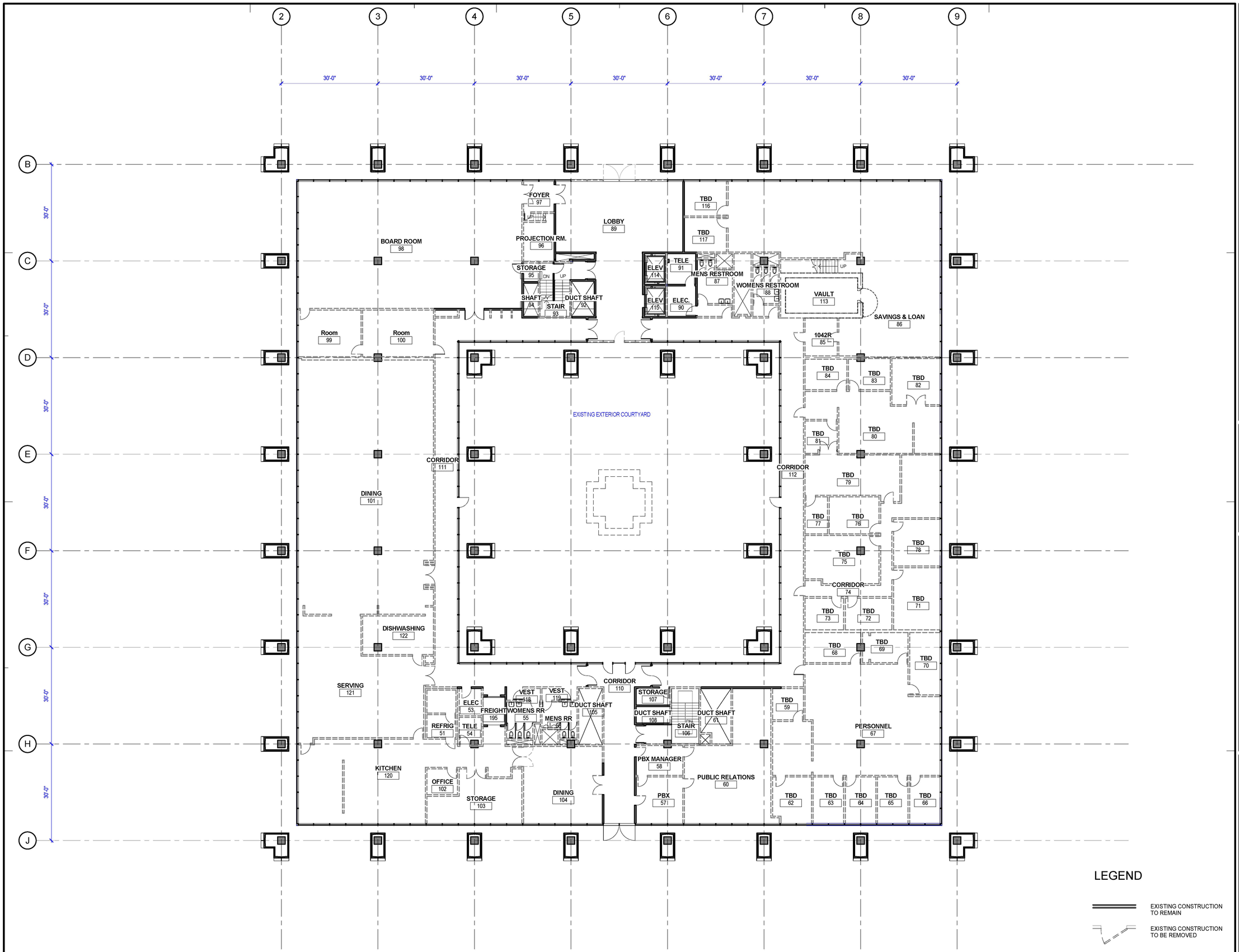
PLOT STAMP
10/14/2015 7:33:38 PM

PROJECT NUMBER
13032

SHEET NUMBER
A1.1.10

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 FIRST FLOOR DEMO PLAN
SCALE: 3/32" = 1'-0"

LEGEND

EXISTING CONSTRUCTION TO REMAIN

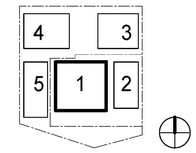
EXISTING CONSTRUCTION TO BE REMOVED

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
DEMOLITION PLAN- FIRST FLOOR

ARCHITECT
JOHNSON FAIN

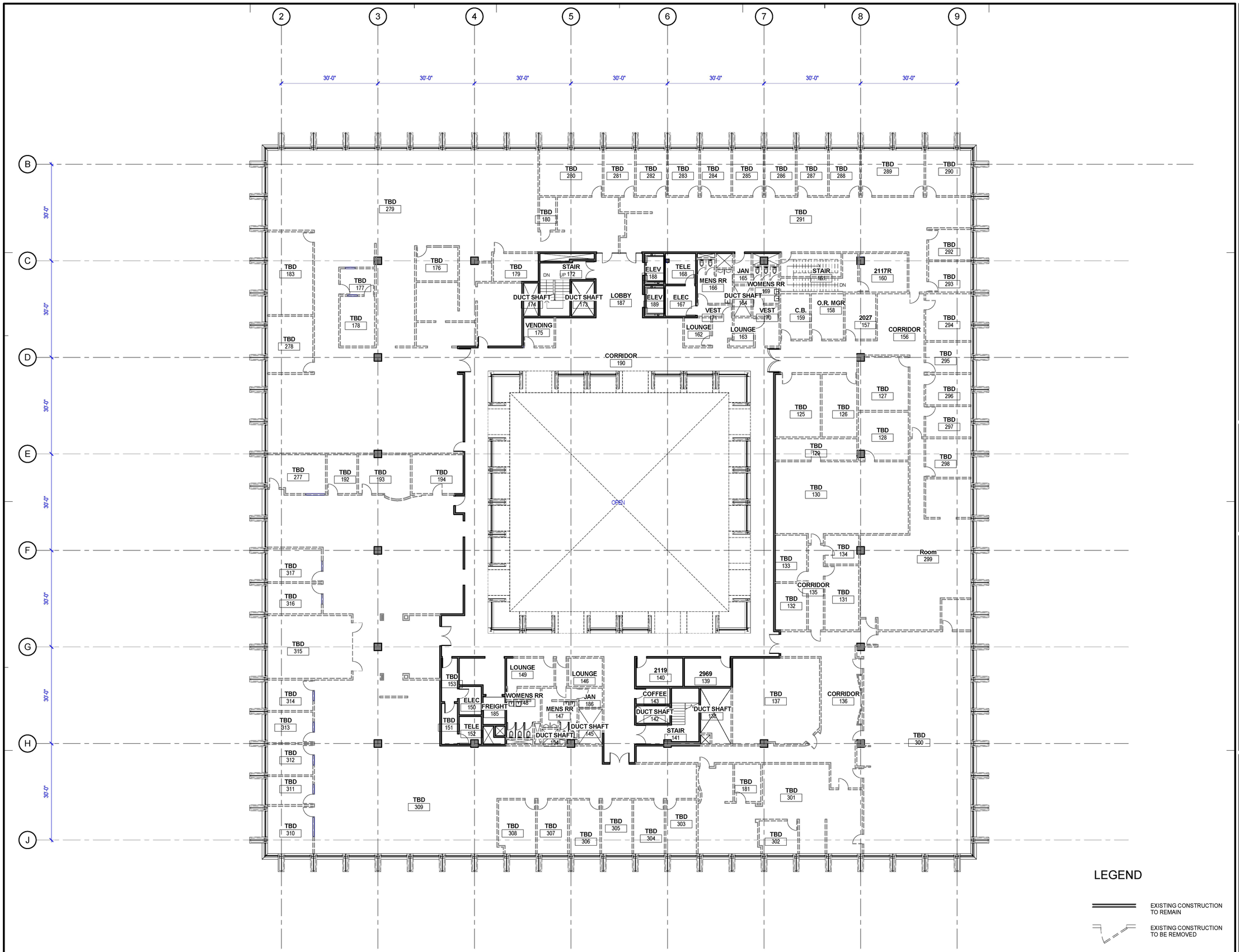
PLOT STAMP
10/14/2015 7:33:42 PM

PROJECT NUMBER
13032

SHEET NUMBER
A1.1.11

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 SECOND FLOOR DEMO PLAN
SCALE: 3/32" = 1'-0"

LEGEND

EXISTING CONSTRUCTION TO REMAIN

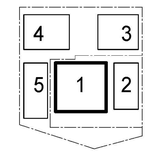
EXISTING CONSTRUCTION TO BE REMOVED

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
DEMOLITION PLAN- SECOND FLOOR

ARCHITECT
JOHNSON FAIN

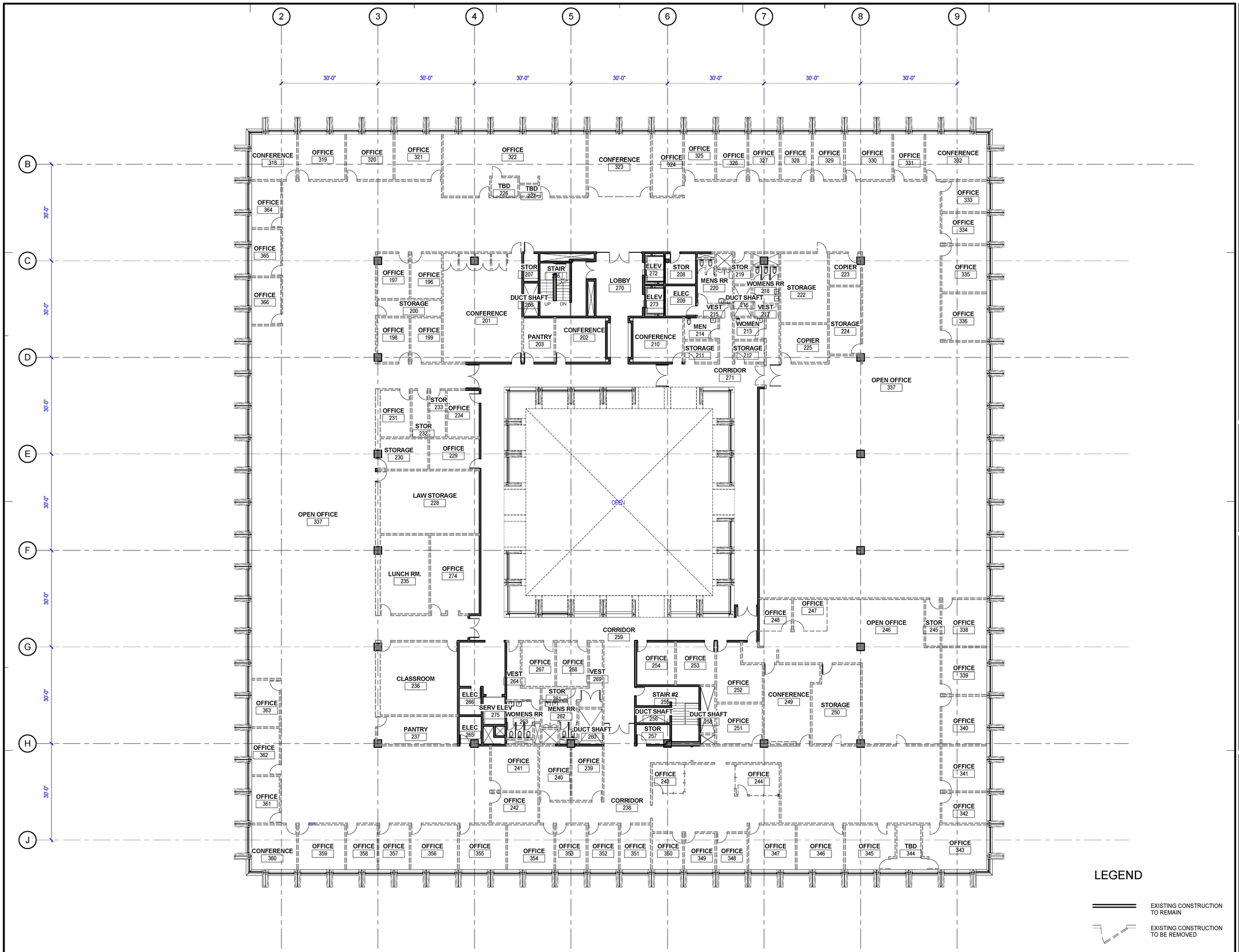
PLOT STAMP
10/14/2015 7:33:46 PM

PROJECT NUMBER
13032

SHEET NUMBER
A1.1.12

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 THIRD FLOOR DEMO PLAN
SCALE: 3/32" = 1'-0"

LEGEND

EXISTING CONSTRUCTION TO REMAIN

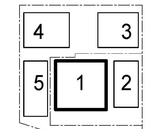
EXISTING CONSTRUCTION TO BE REMOVED

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
DEMOLITION PLAN- THIRD FLOOR

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:33:50 PM

PROJECT NUMBER
13032

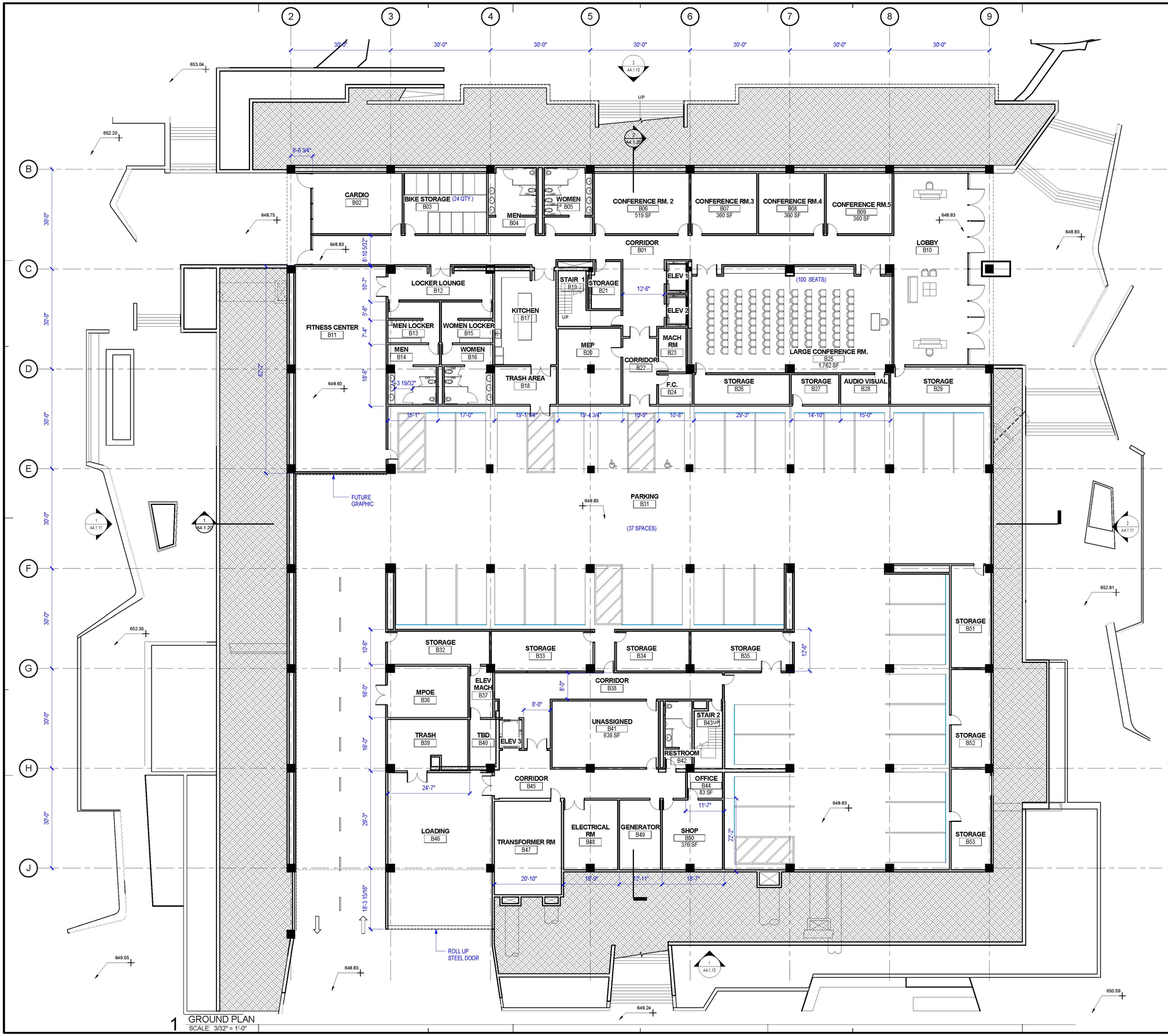
SHEET NUMBER
A1.1.13

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

SHEET NOTES:

SHEAR WALL



1 GROUND PLAN
SCALE: 3/32" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

GROUND FLOOR

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:33:55 PM

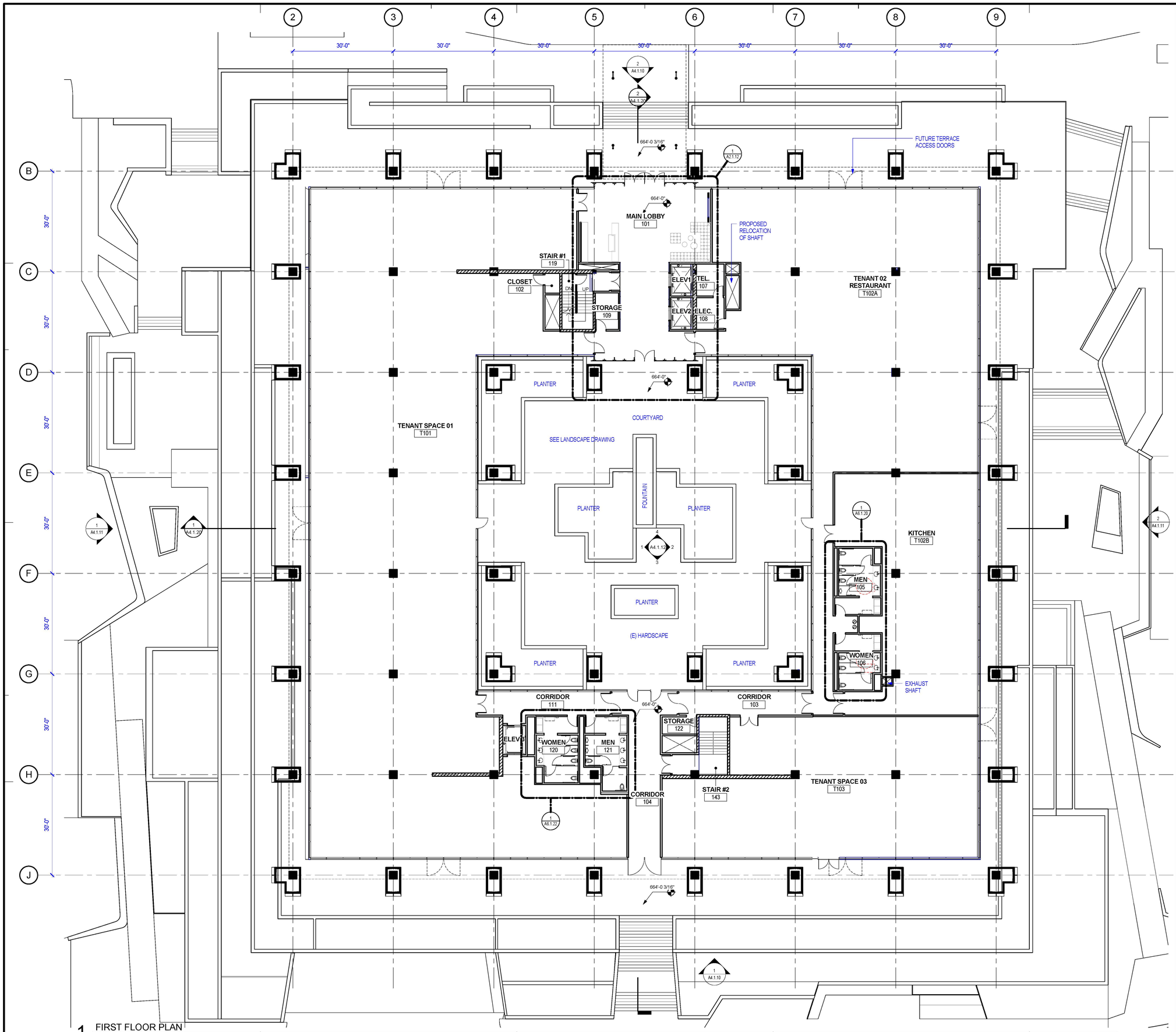
PROJECT NUMBER
13032

SHEET NUMBER

A2.1.00

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 FIRST FLOOR PLAN
SCALE: 3/32" = 1'-0"

SHEET NOTES:

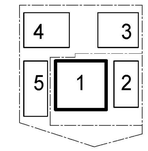
SHEAR WALL

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
FIRST FLOOR

ARCHITECT
JOHNSON FAIN

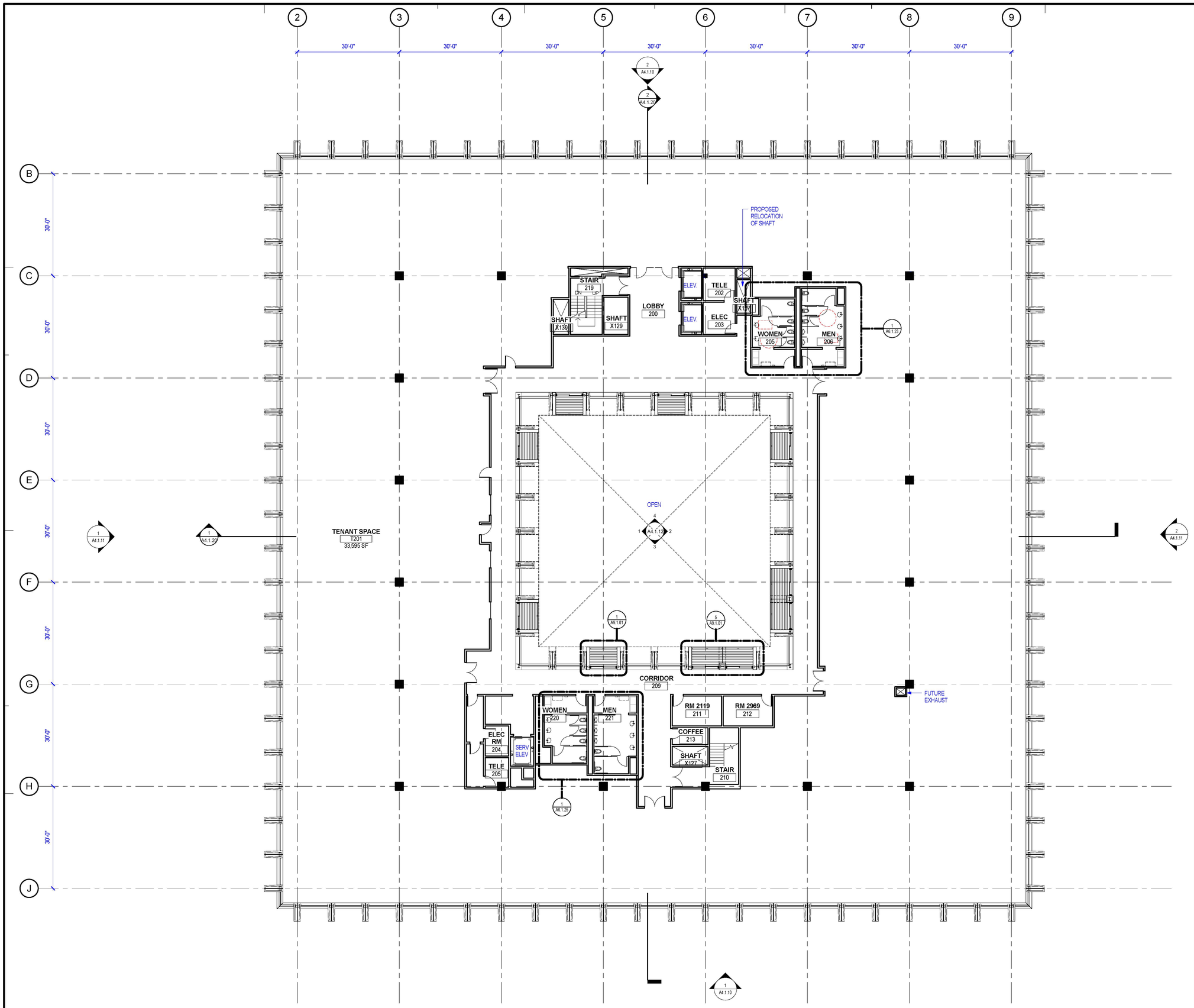
PLOT STAMP
10/14/2015 7:34:01 PM

PROJECT NUMBER
13032

SHEET NUMBER
A2.1.01

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



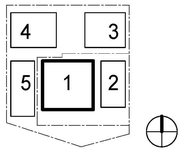
1 SECOND FLOOR PLAN
SCALE: 3/32" = 1'-0"

SHEET NOTES:

SHEAR WALL

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
SECOND FLOOR

ARCHITECT
JOHNSON FAIN

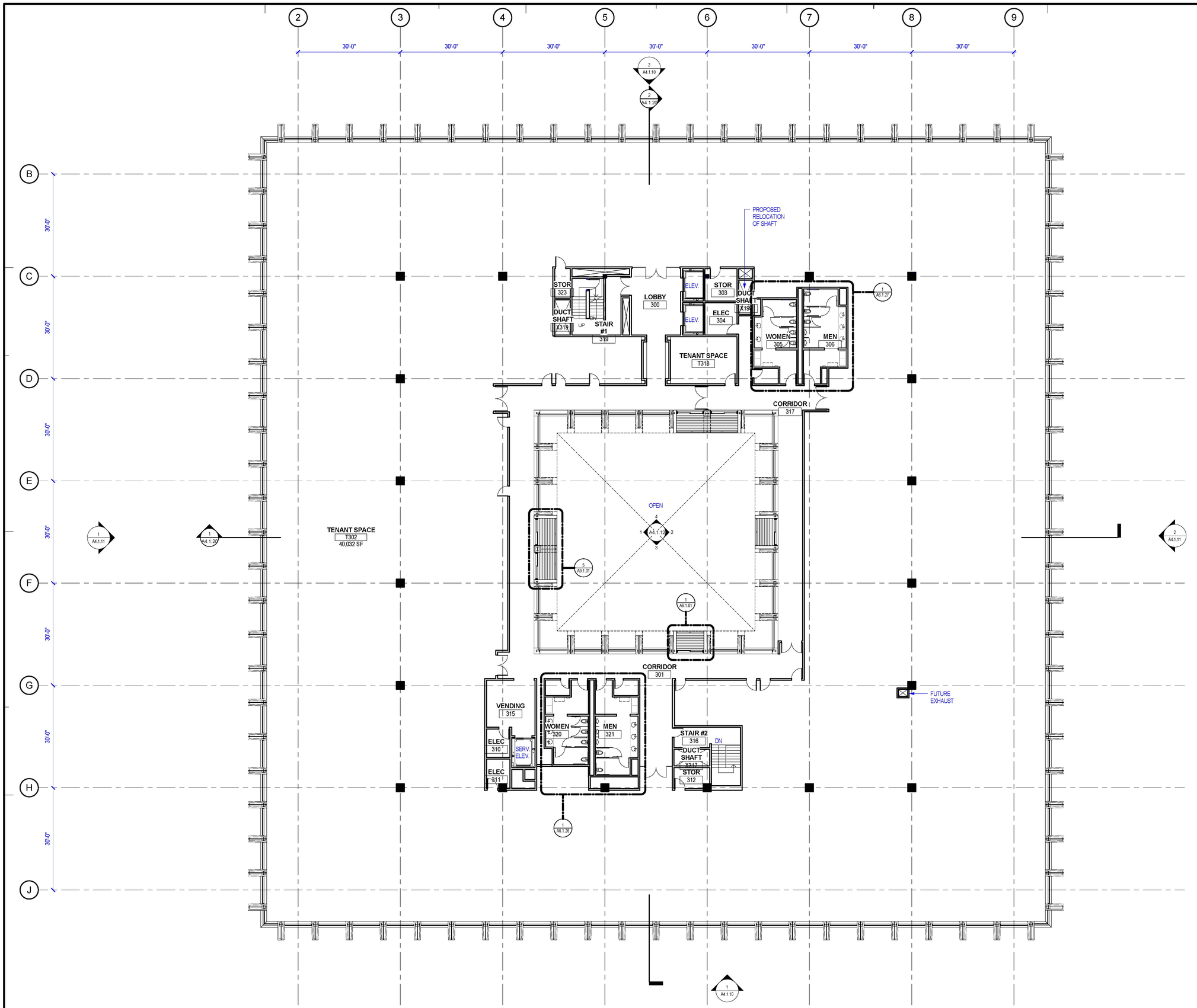
PLOT STAMP
10/14/2015 7:34:06 PM

PROJECT NUMBER
13032

SHEET NUMBER
A2.1.02

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 THIRD FLOOR PLAN
SCALE: 3/32" = 1'-0"

SHEET NOTES:

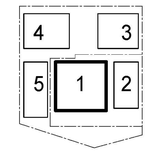
SHEAR WALL

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
THIRD FLOOR

ARCHITECT
JOHNSON FAIN

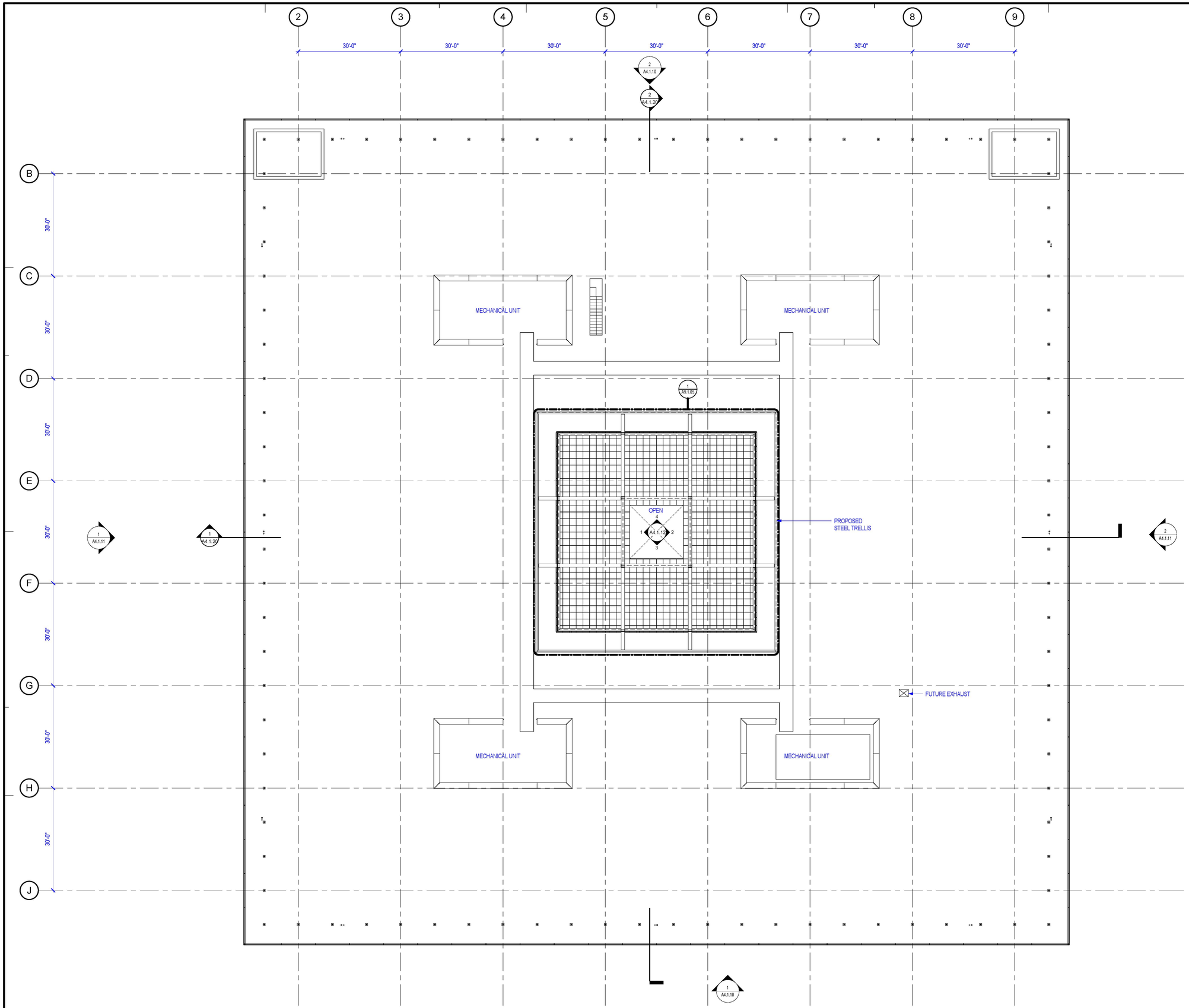
PLOT STAMP
10/14/2015 7:34:10 PM

PROJECT NUMBER
13032

SHEET NUMBER
A2.1.03

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 ROOF PLAN
SCALE: 3/32" = 1'-0"

SHEET NOTES:

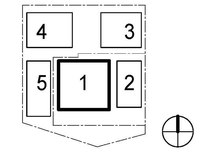
SHEAR WALL

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ROOF PLAN

ARCHITECT
JOHNSON FAIN

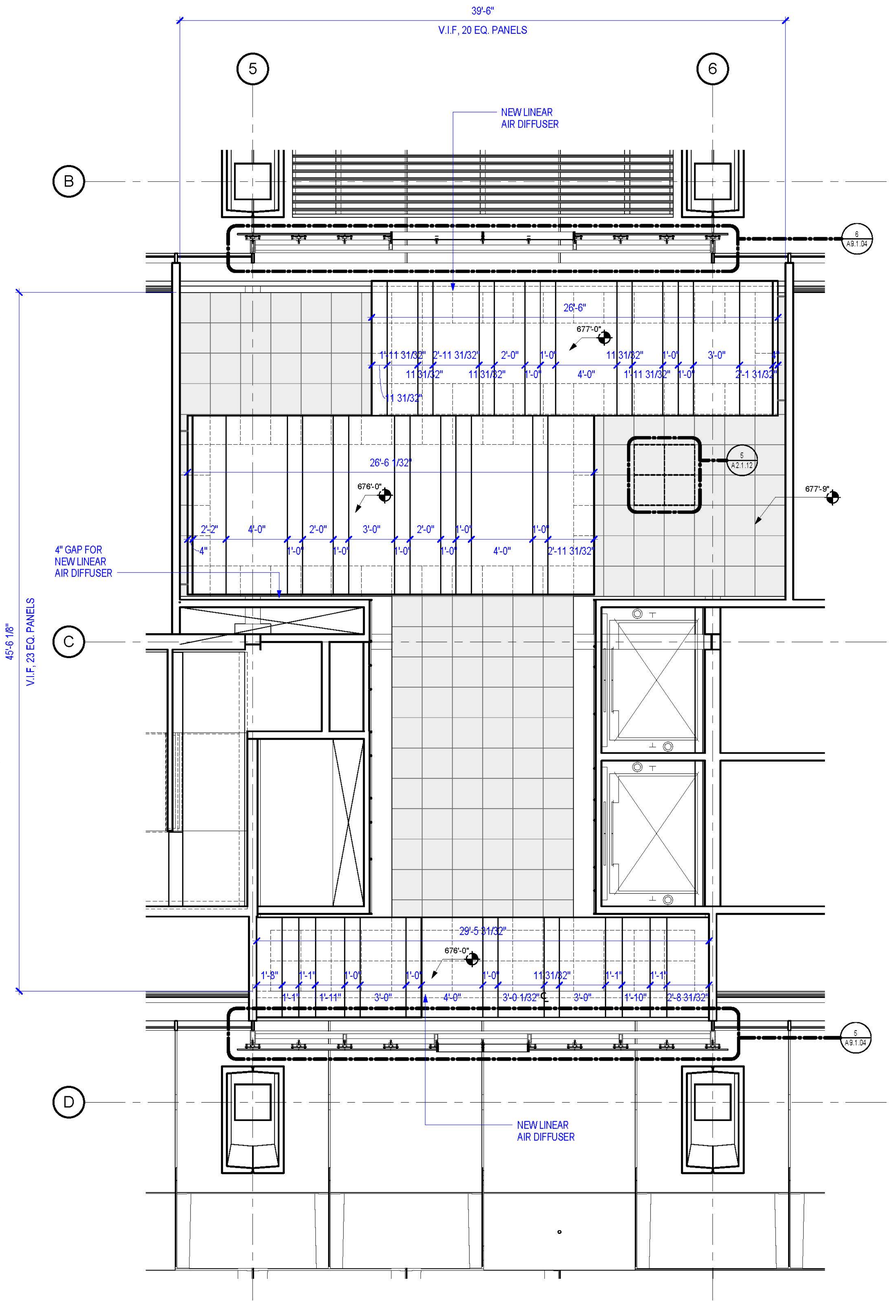
PLOT STAMP
10/14/2015 7:34:13 PM

PROJECT NUMBER
13032

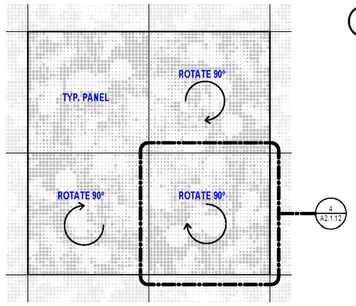
SHEET NUMBER
A2.1.04

COPYRIGHT © 2013 JOHNSON FAIN

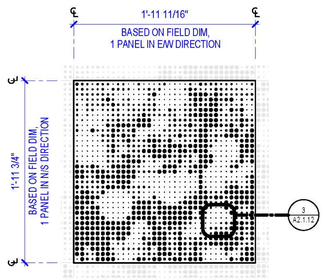
NOTE: NOT FOR CONSTRUCTION



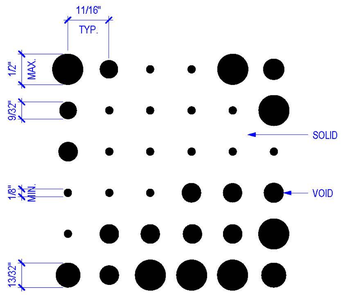
2 ENLARGED RCP - ENTRY LOBBY
SCALE: 1/4" = 1'-0"



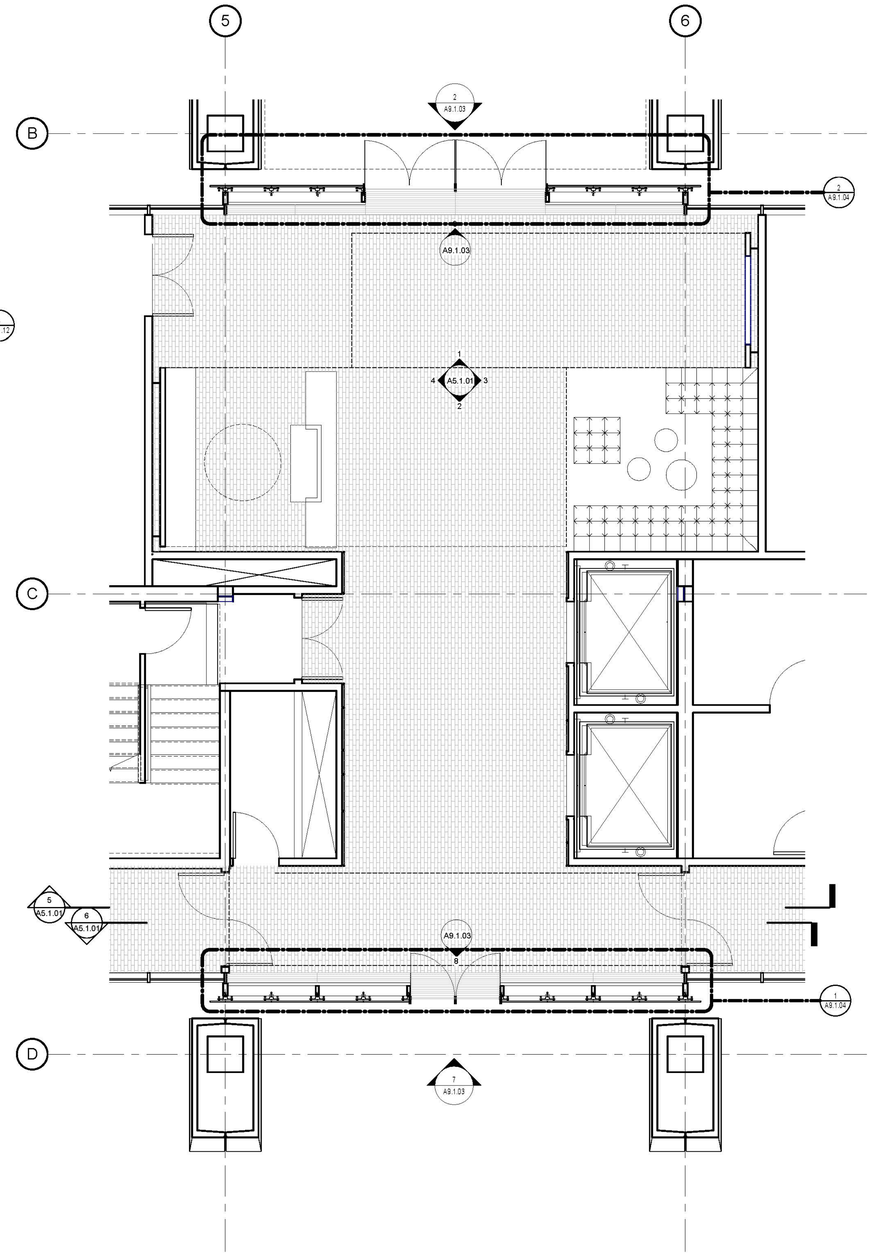
5 TYP. CEILING PANEL LAYOUT
SCALE: 1" = 1'-0"



4 TYP. CEILING PANEL
SCALE: 1 1/2" = 1'-0"



3 DETAIL
SCALE: 12" = 1'-0"



1 ENLARGED PLAN - ENTRY LOBBY
SCALE: 1/4" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ENLARGED DRAWINGS - ENTRY LOBBY

ARCHITECT
JOHNSON FAIN

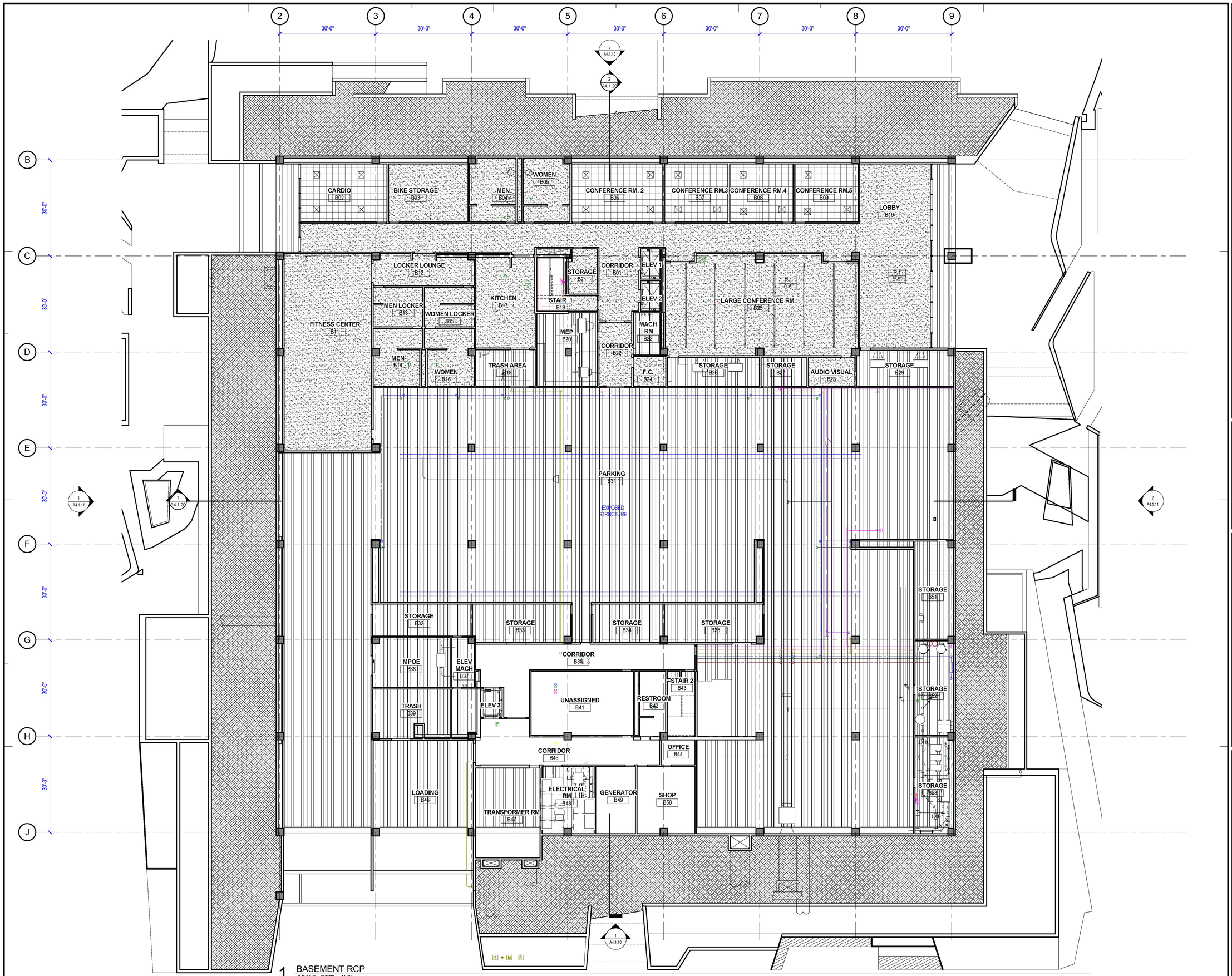
PLOT STAMP
10/14/2015 7:34:27 PM

PROJECT NUMBER
13032

SHEET NUMBER
A2.1.12

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



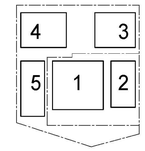
1 BASEMENT RCP
SCALE: 3/32" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

REFLECTED CEILING PLAN - GROUND FLOOR

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:34:41 PM

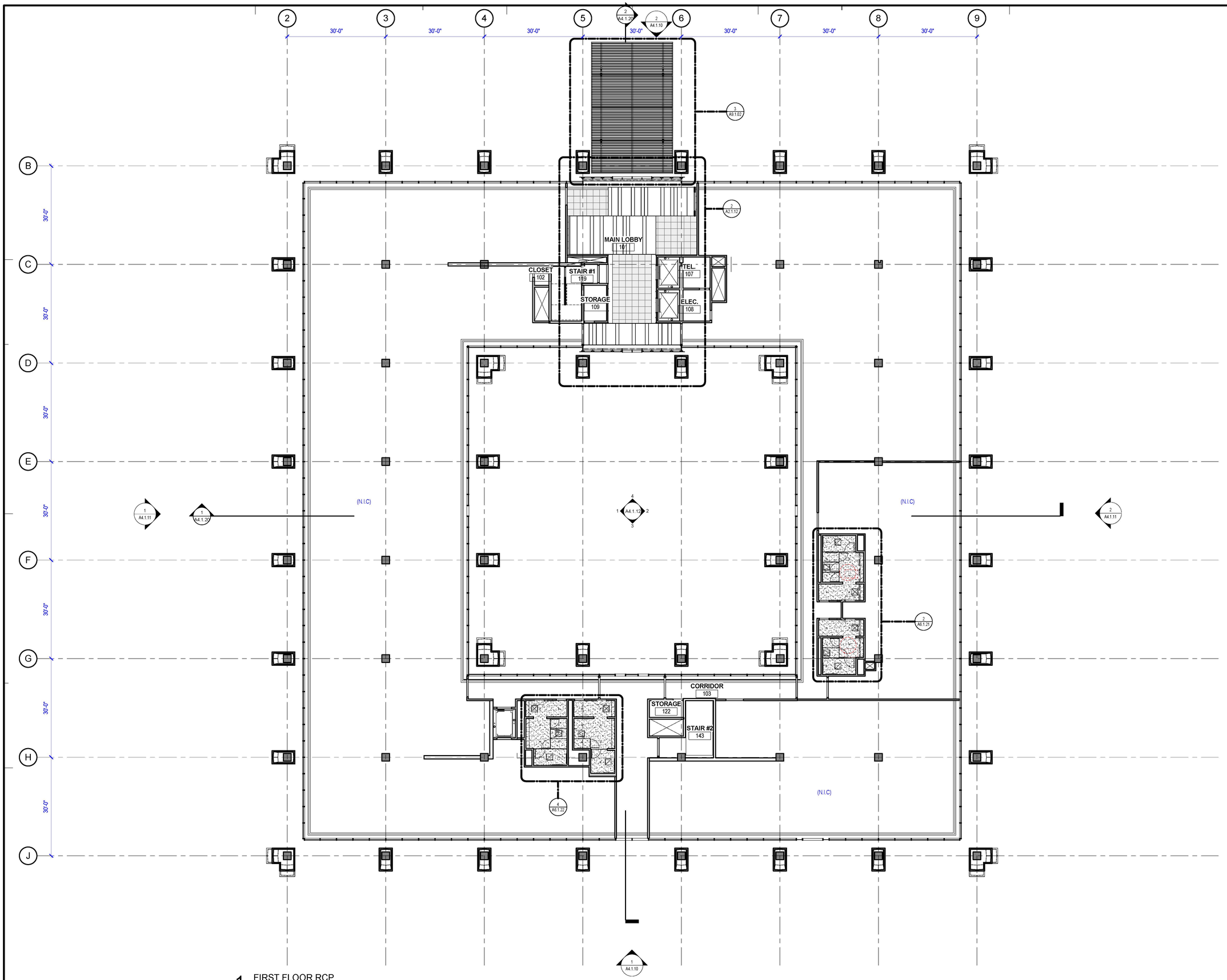
PROJECT NUMBER
13032

SHEET NUMBER

A3.1.00

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



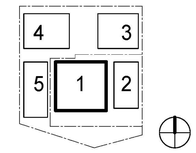
1 FIRST FLOOR RCP
SCALE: 3/32" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
REFLECTED CEILING PLAN - FIRST FLOOR

ARCHITECT
JOHNSON FAIN

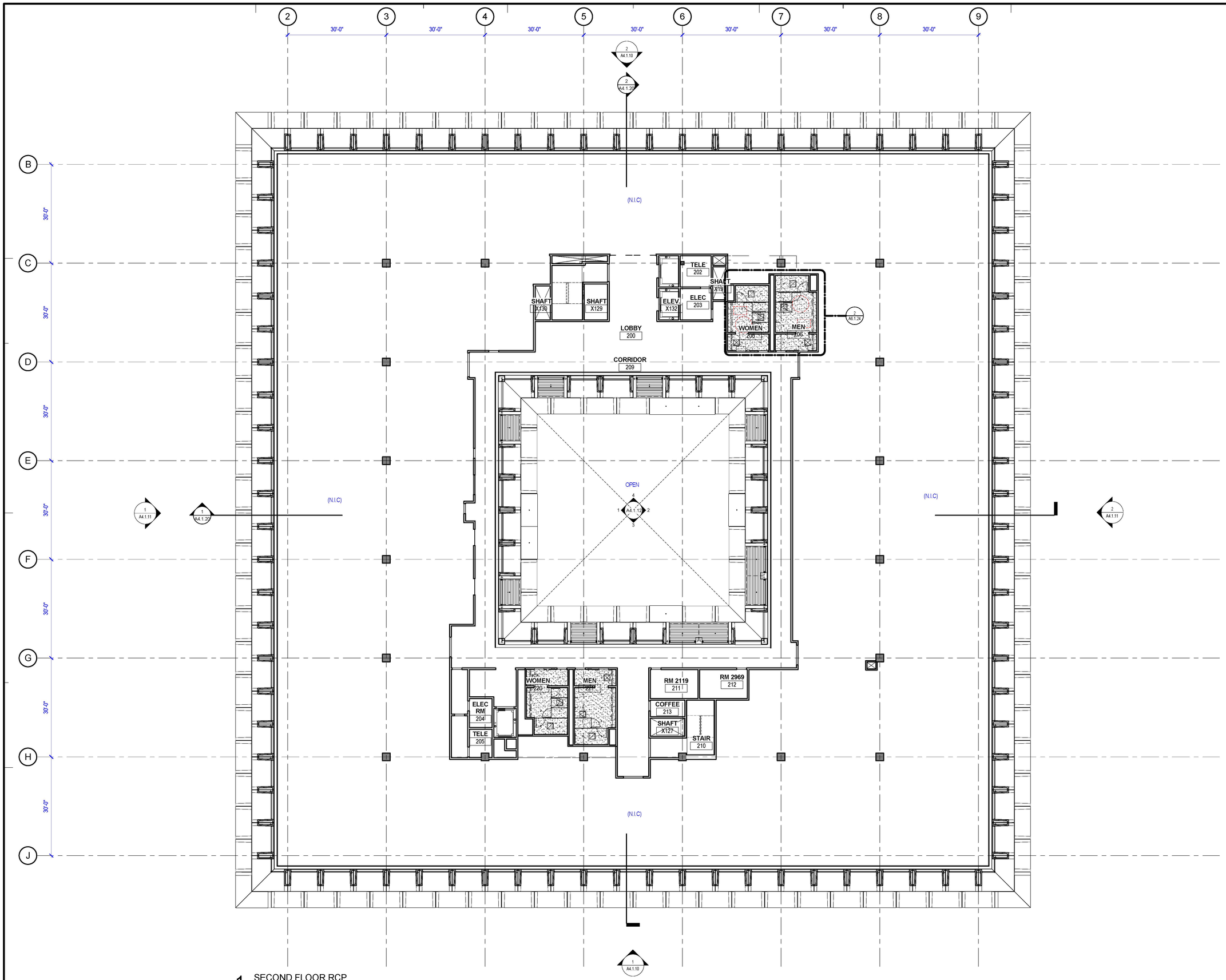
PLOT STAMP
10/14/2015 7:34:47 PM

PROJECT NUMBER
13032

SHEET NUMBER
A3.1.01

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 SECOND FLOOR RCP
SCALE: 3/32" = 1'-0"

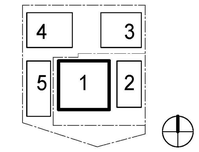
NOTE:
1. LIGHTING DESIGN PENDING
2. SEE FINISH SCHEDULE FOR CORRIDOR FINISHES

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
REFLECTED CEILING PLAN - SECOND FLOOR

ARCHITECT
JOHNSON FAIN

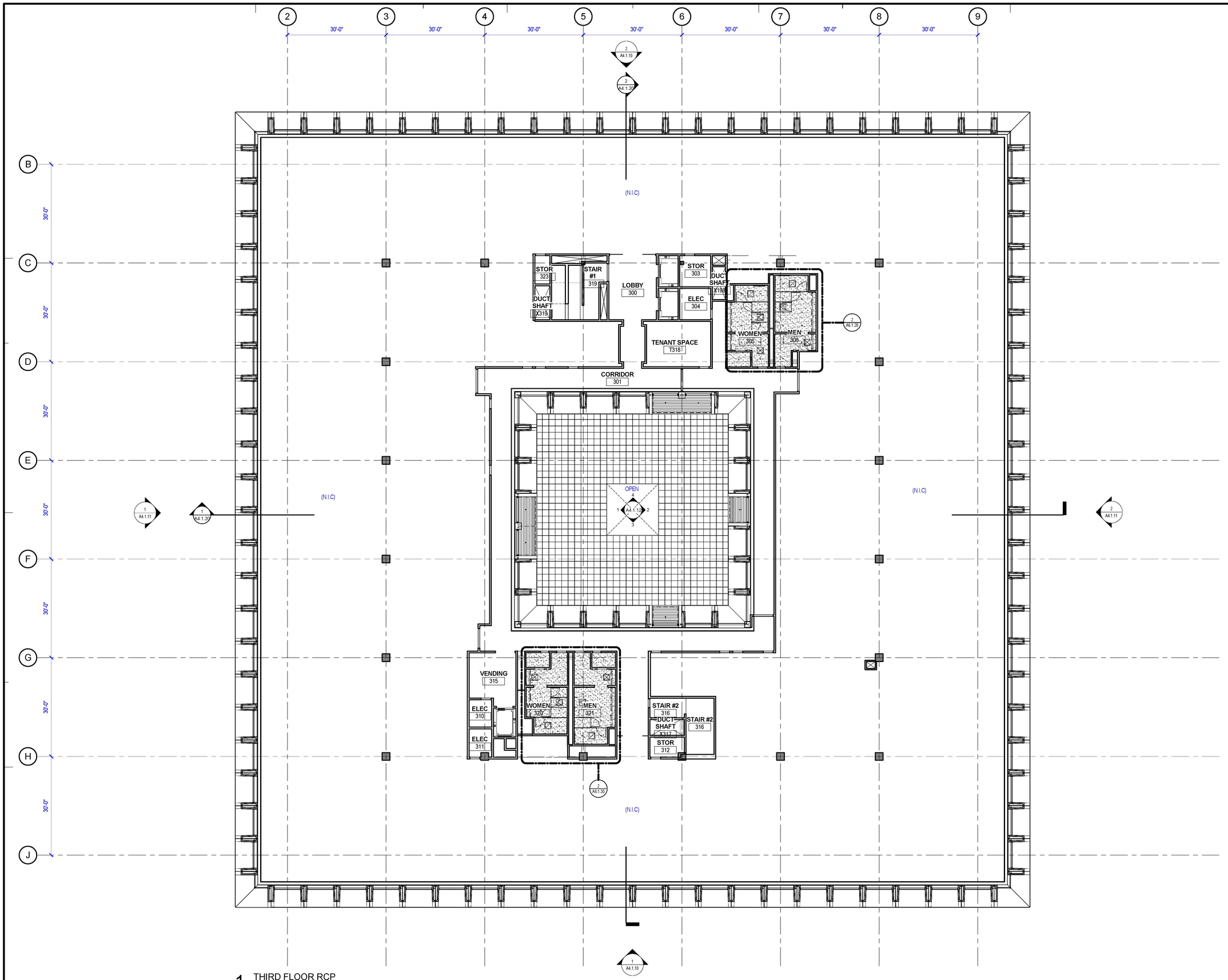
PLOT STAMP
10/14/2015 7:34:50 PM

PROJECT NUMBER
13032

SHEET NUMBER
A3.1.02

COPYRIGHT © 2013 JOHNSON FAIN

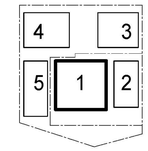
NOTE: NOT FOR CONSTRUCTION



1 THIRD FLOOR RCP
SCALE: 3/32" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
REFLECTED CEILING PLAN - THIRD FLOOR

ARCHITECT
JOHNSON FAIN

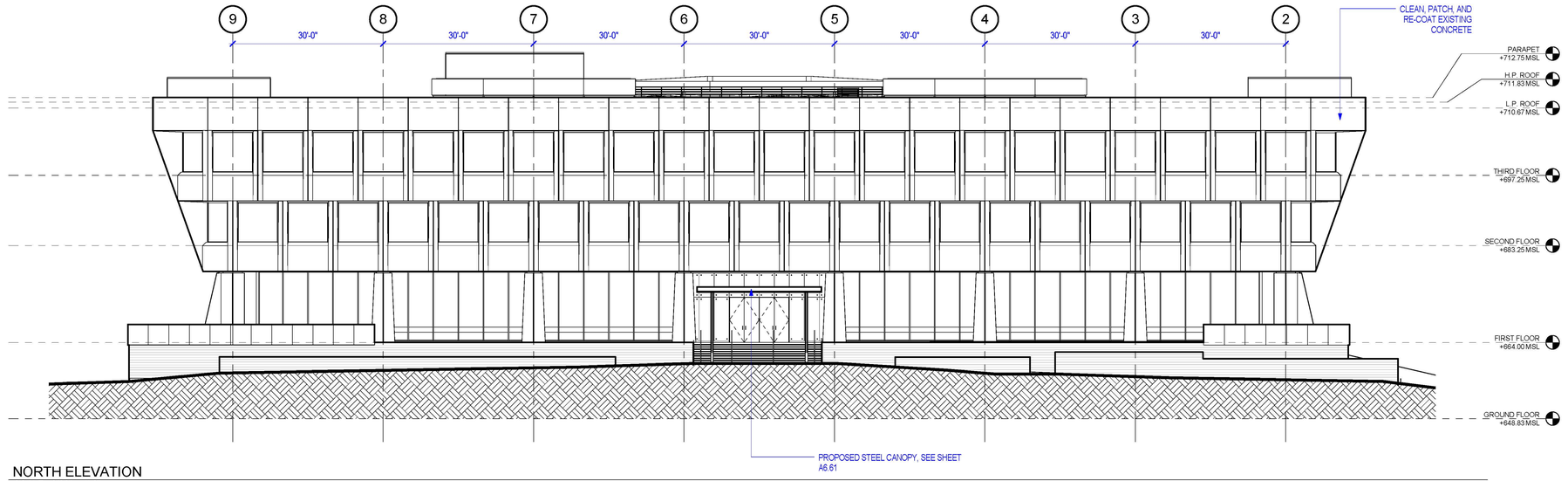
PLOT STAMP
10/14/2015 7:34:54 PM

PROJECT NUMBER
13032

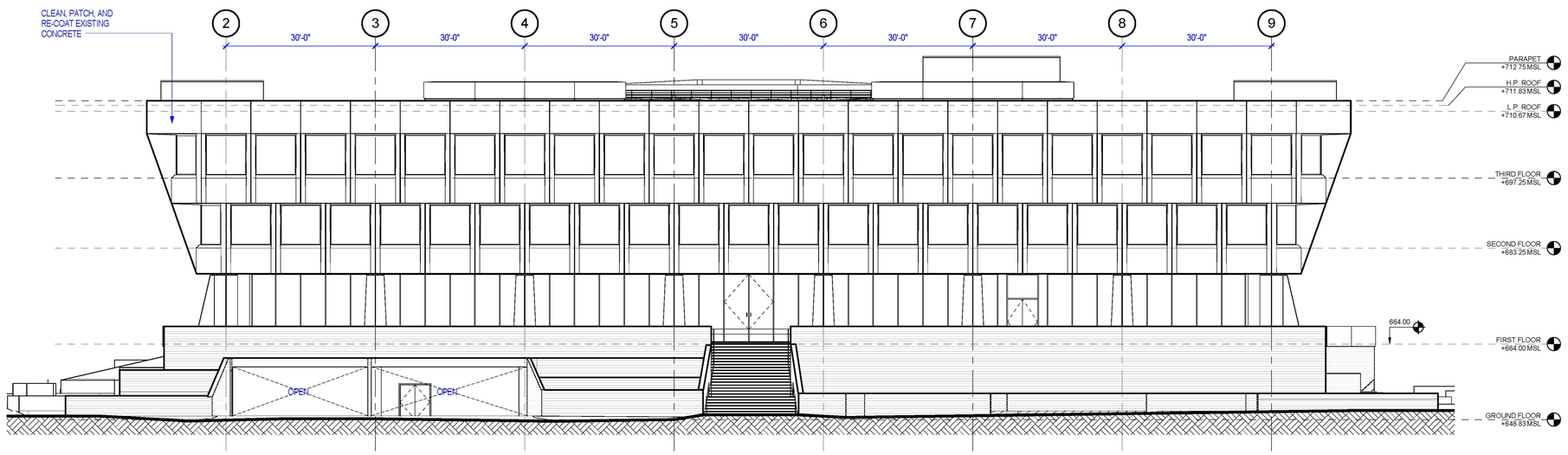
SHEET NUMBER
A3.1.03

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 NORTH ELEVATION
SCALE: 3/32" = 1'-0"



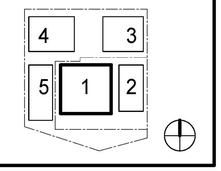
1 SOUTH ELEVATION
SCALE: 3/32" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ELEVATIONS

ARCHITECT
JOHNSON FAIN

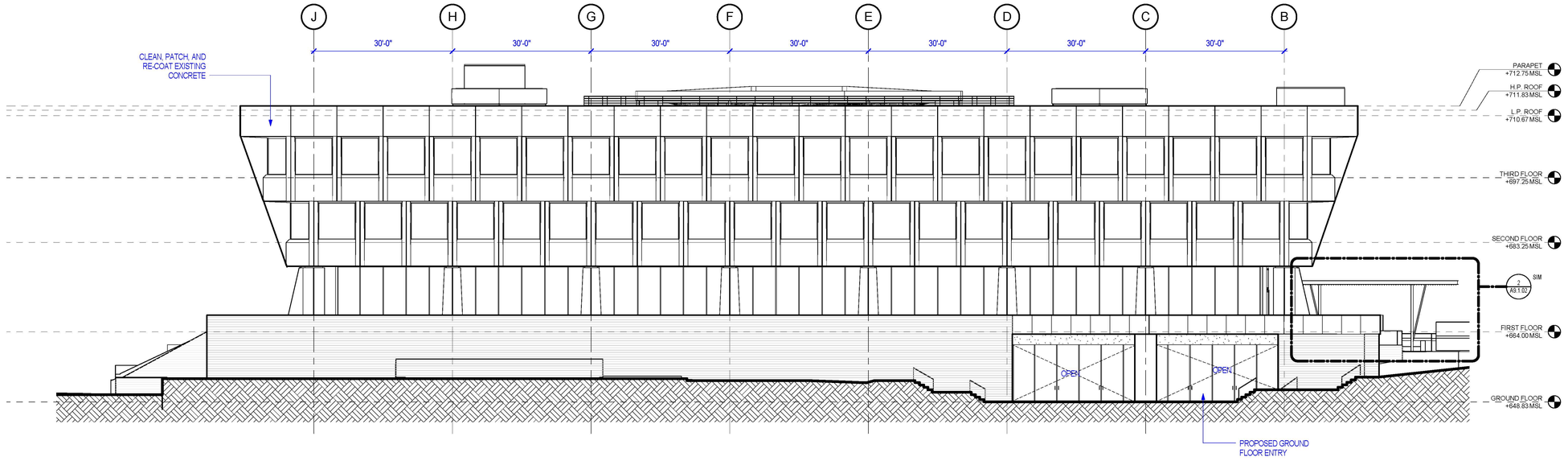
PLOT STAMP
10/14/2015 7:35:03 PM

PROJECT NUMBER
13032

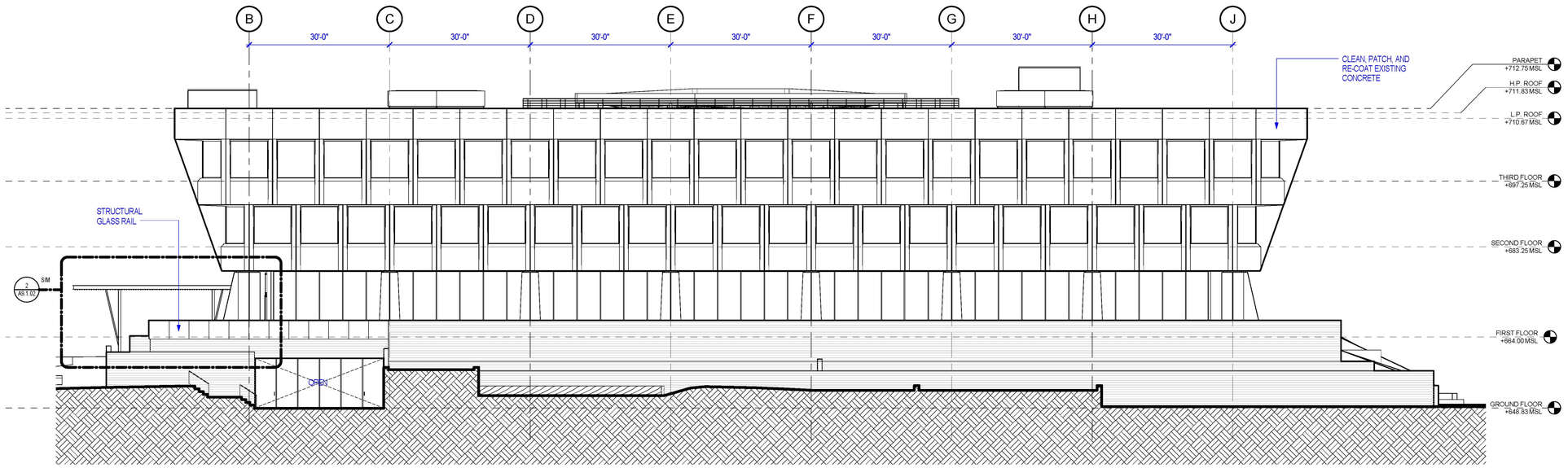
SHEET NUMBER
A4.1.10

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 EAST ELEVATION
SCALE: 3/32" = 1'-0"



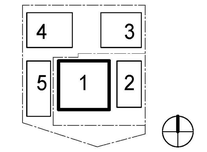
1 WEST ELEVATION
SCALE: 3/32" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ELEVATIONS

ARCHITECT
JOHNSON FAIN

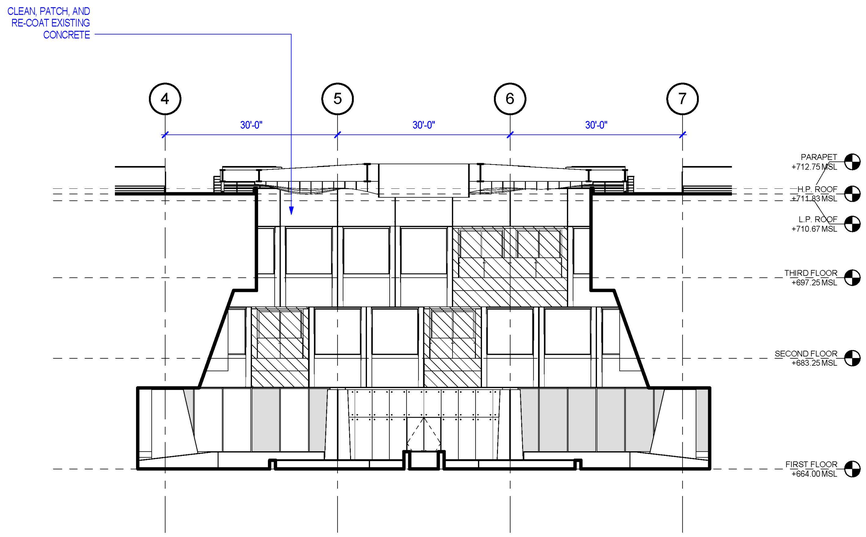
PLOT STAMP
10/14/2015 7:35:14 PM

PROJECT NUMBER
13032

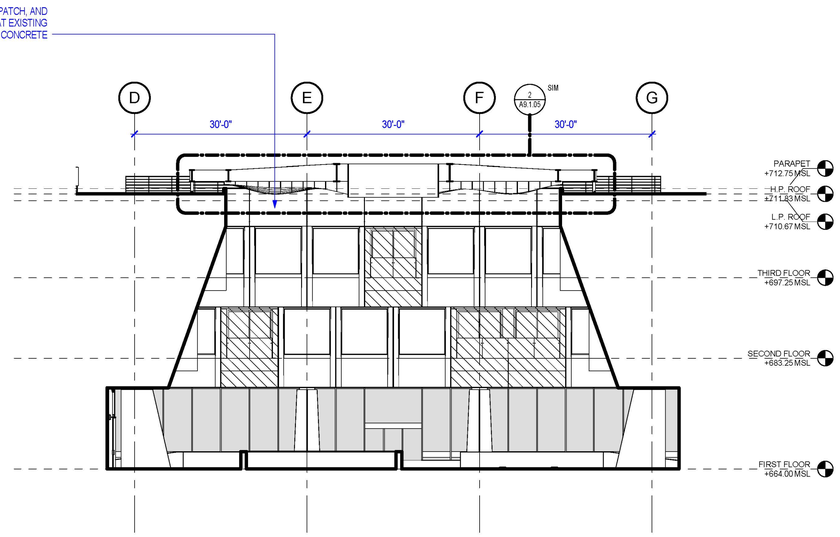
SHEET NUMBER
A4.1.11

COPYRIGHT © 2013 JOHNSON FAIN

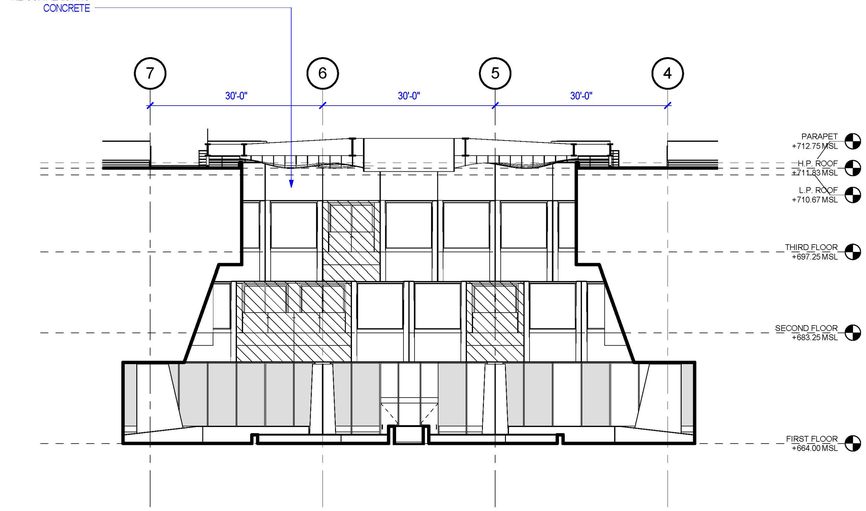
NOTE: NOT FOR CONSTRUCTION



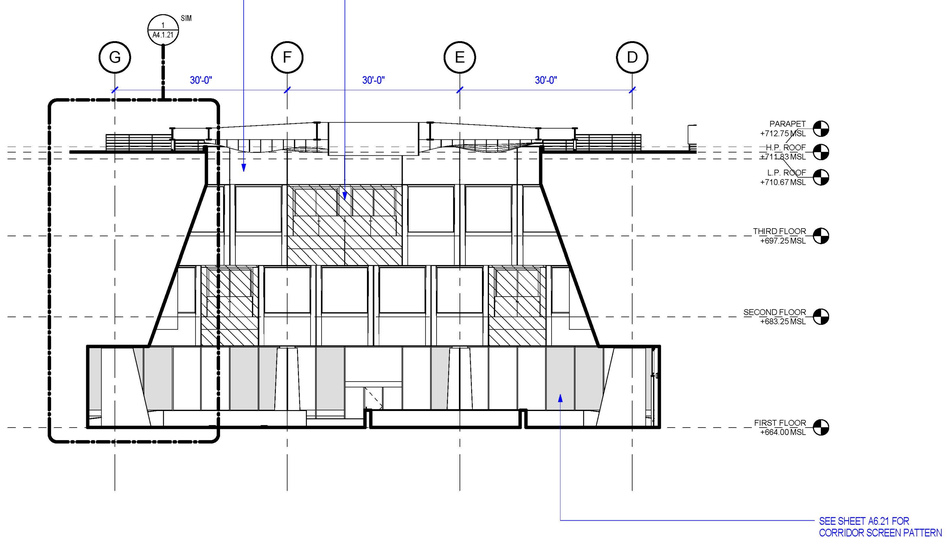
4 COURTYARD ELEVATION- NORTH
SCALE: 3/32" = 1'-0"



2 COURTYARD ELEVATION- EAST
SCALE: 3/32" = 1'-0"



3 COURTYARD ELEVATION- SOUTH
SCALE: 3/32" = 1'-0"



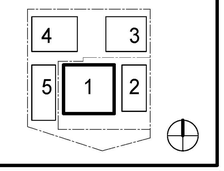
1 COURTYARD ELEVATION- WEST
SCALE: 3/32" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ELEVATIONS

ARCHITECT
JOHNSON FAIN

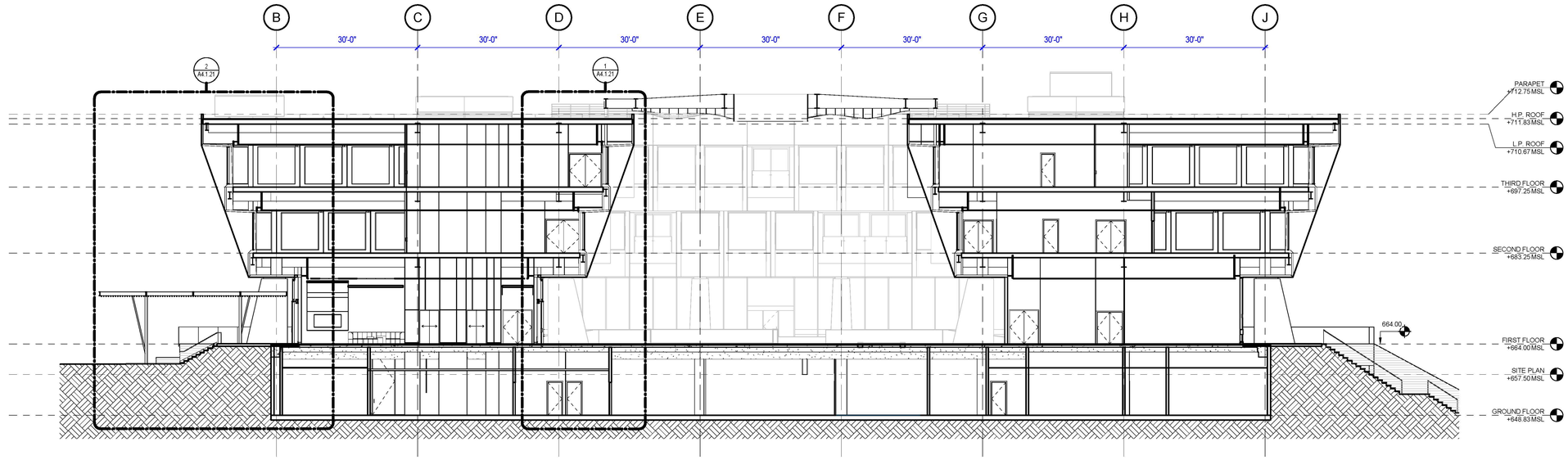
PLOT STAMP
10/14/2015 7:35:27 PM

PROJECT NUMBER
13032

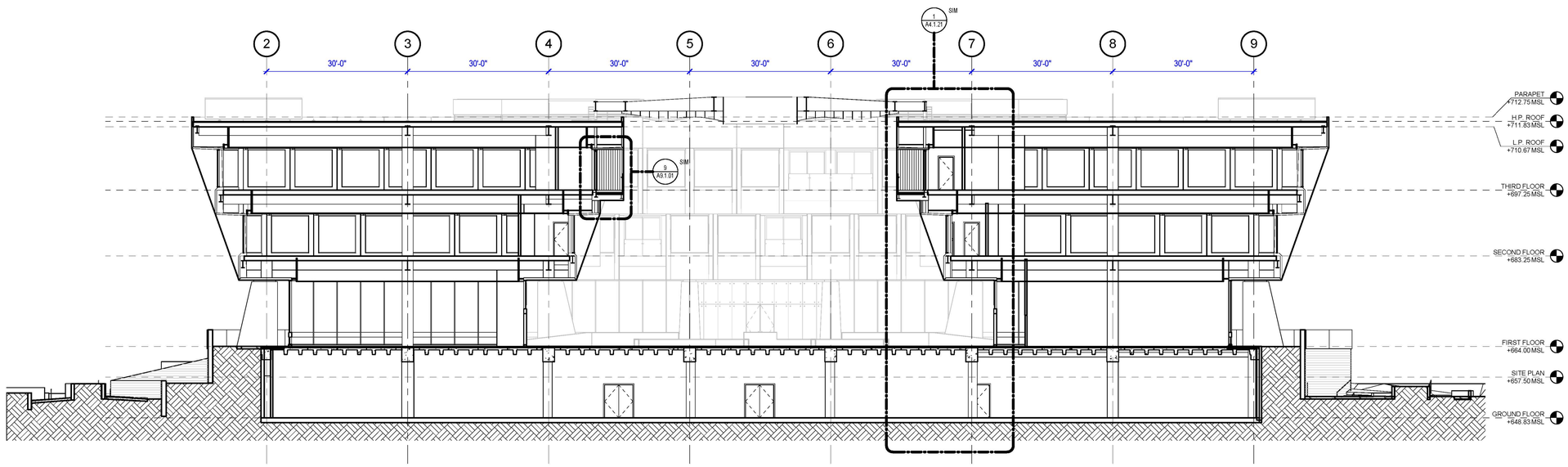
SHEET NUMBER
A4.1.12

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BUILDING SECTION- NORTH/SOUTH
SCALE: 3/32" = 1'-0"



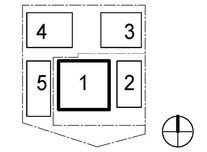
1 BUILDING SECTION- EAST/WEST
SCALE: 3/32" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
BUILDING SECTIONS

ARCHITECT
JOHNSON FAIN

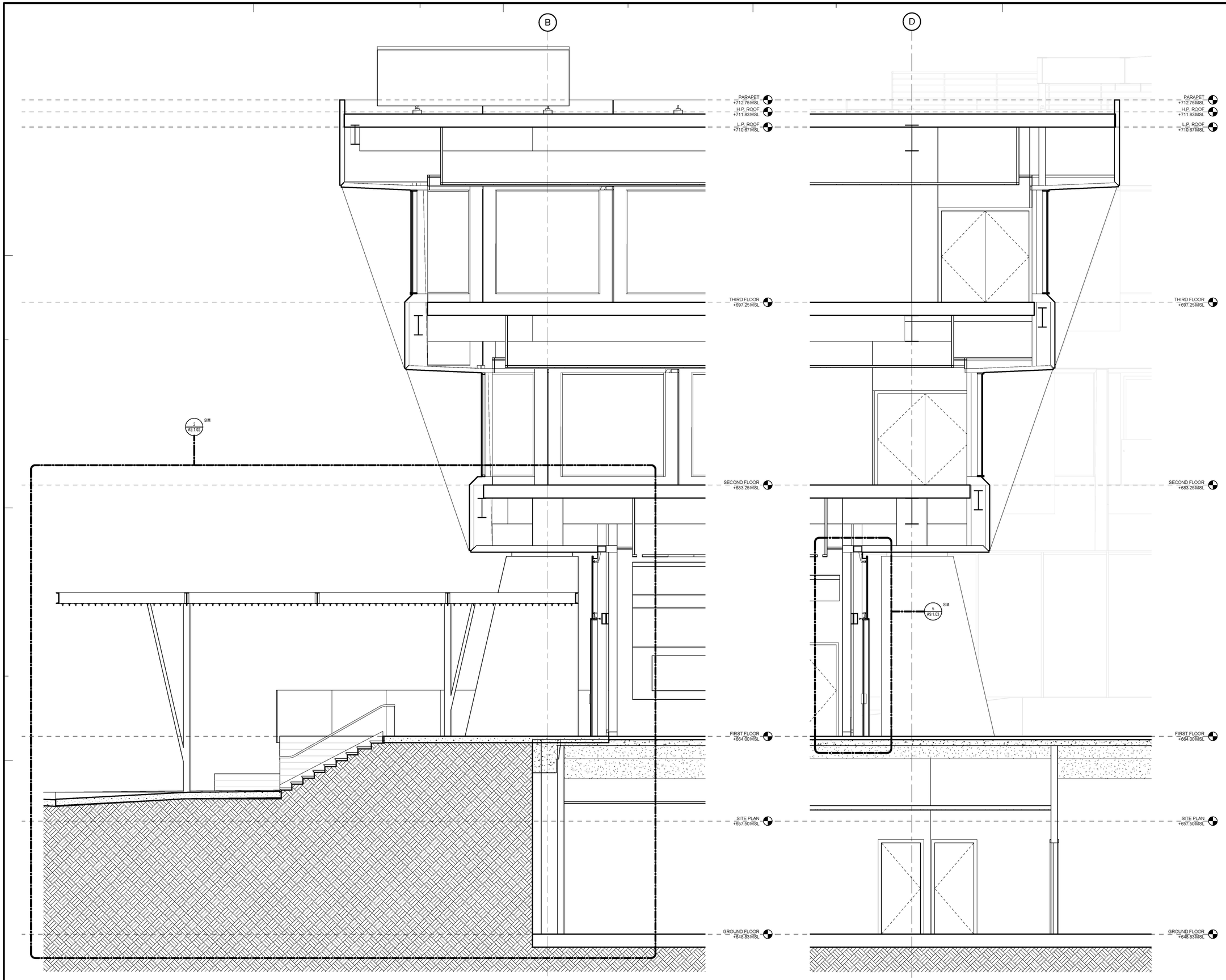
PLOT STAMP
10/14/2015 7:35:46 PM

PROJECT NUMBER
13032

SHEET NUMBER
A4.1.20

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 ENLARGED WALL SECTION - LOBBY ENTRY
SCALE: 3/8" = 1'-0"

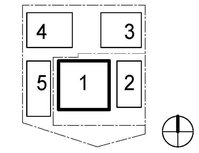
1 ENLARGED WALL SECTION - COURTYARD
SCALE: 3/8" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
WALL SECTIONS

ARCHITECT
JOHNSON FAIN

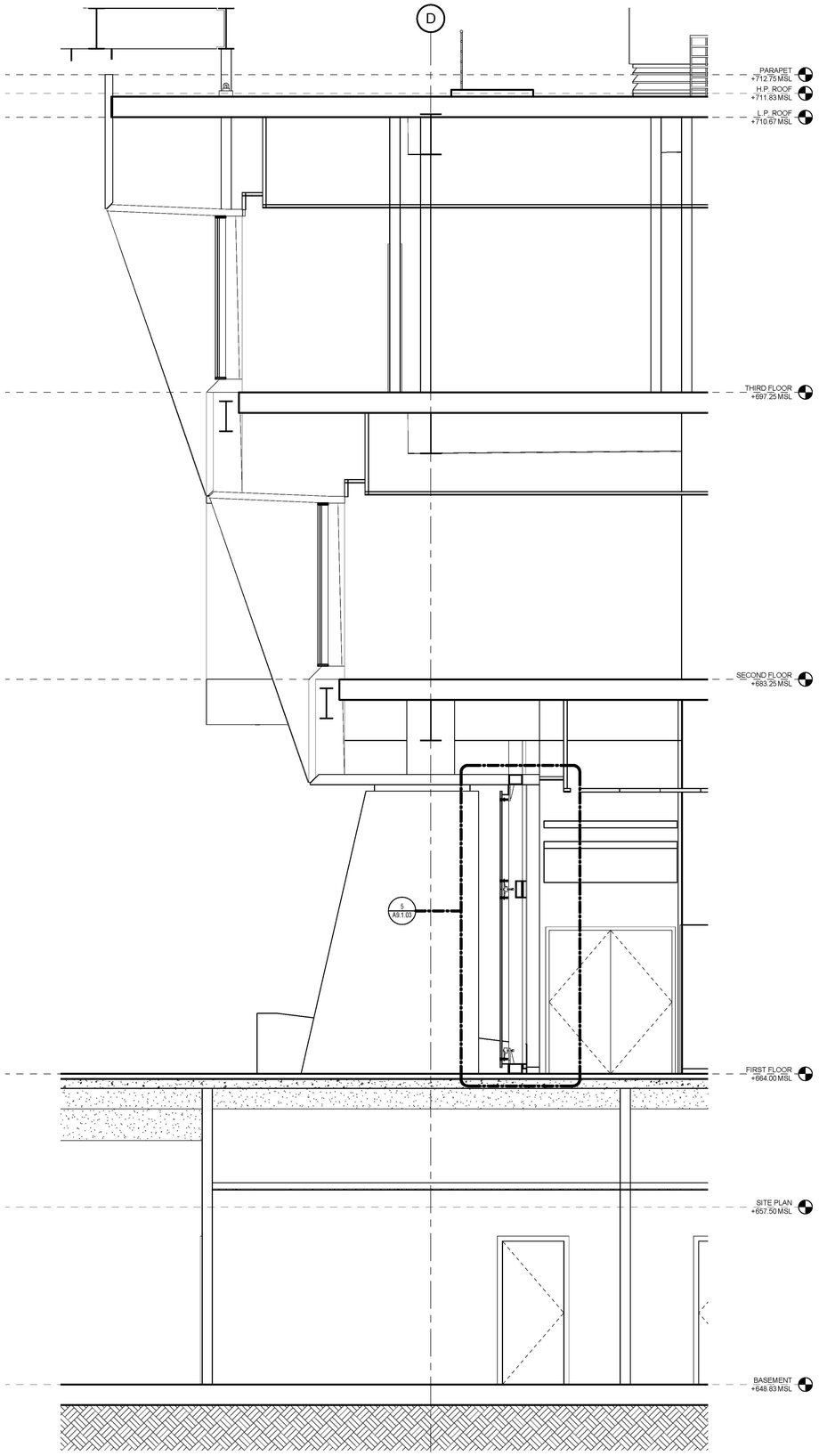
PLOT STAMP
10/14/2015 7:35:50 PM

PROJECT NUMBER
13032

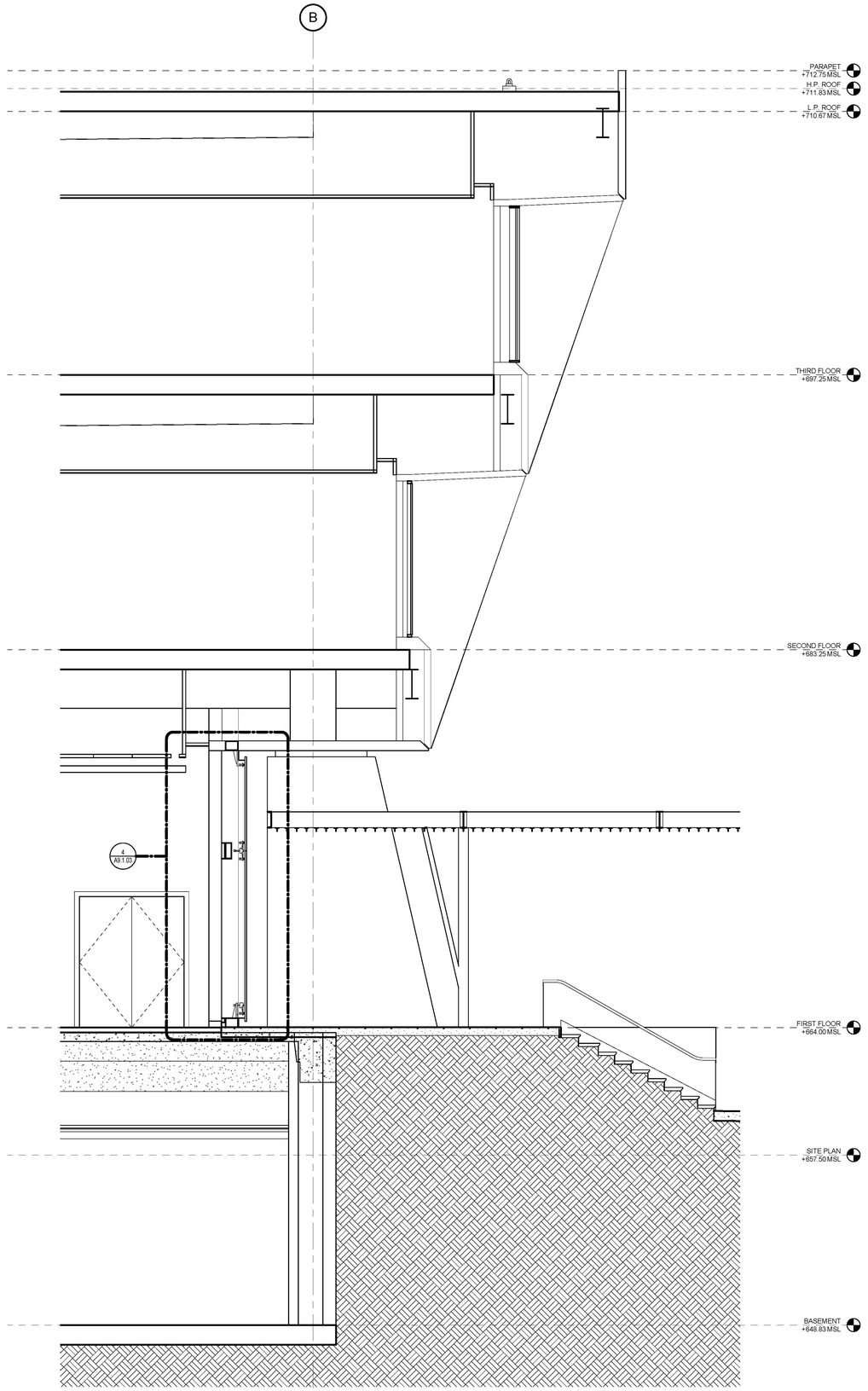
SHEET NUMBER
A4.1.21

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 TYP WALL SECTION (COURTYARD)
SCALE: 3/8" = 1'-0"



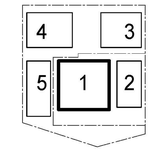
1 TYP WALL SECTION (NORTH ENTRY)
SCALE: 3/8" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
WALL SECTIONS

ARCHITECT
JOHNSON FAIN

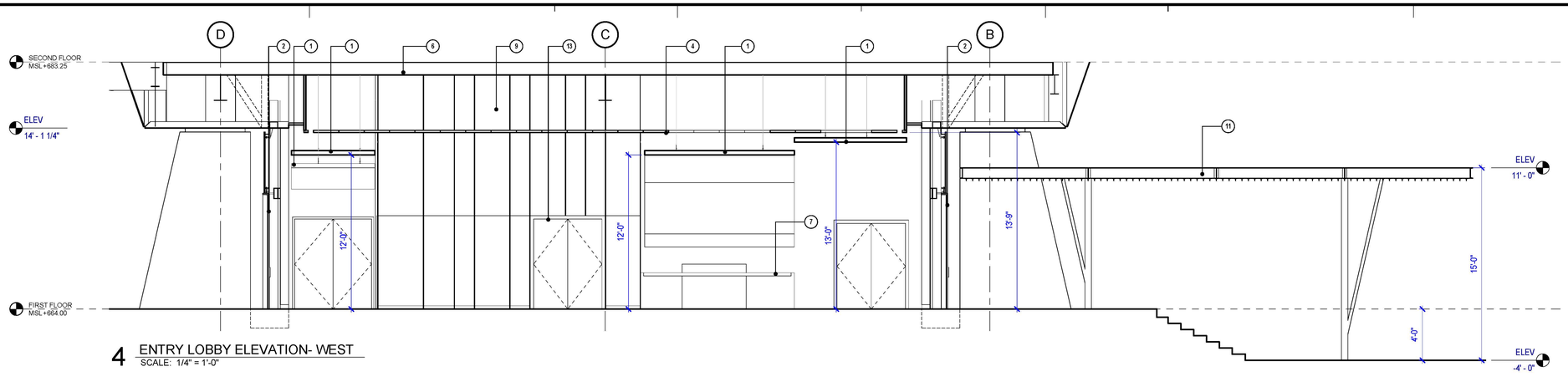
PLOT STAMP
10/15/2015 2:50:21 PM

PROJECT NUMBER
13032

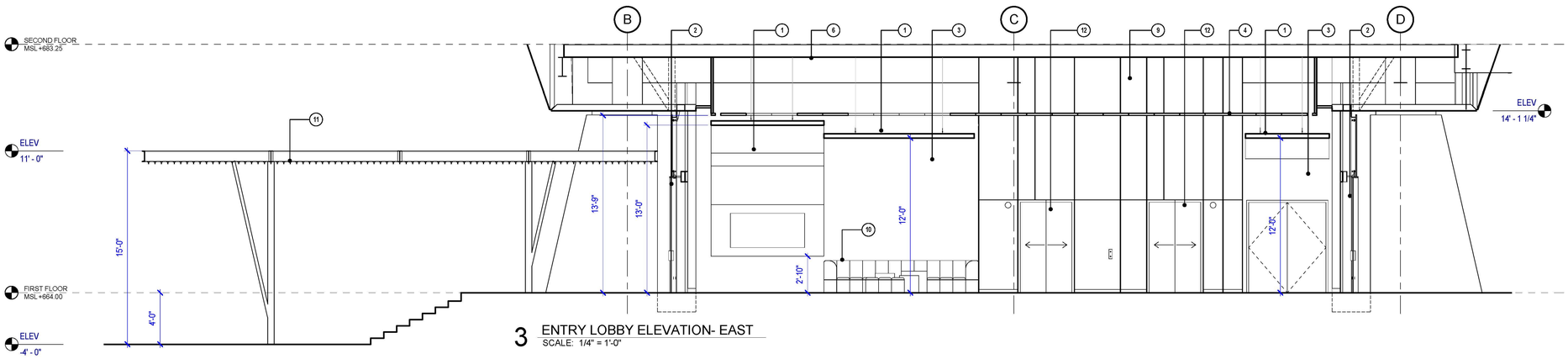
SHEET NUMBER
A4.1.22

COPYRIGHT © 2013 JOHNSON FAIN

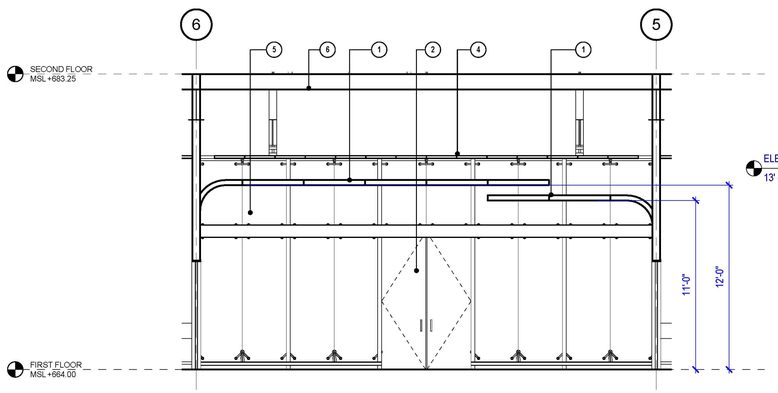
NOTE: NOT FOR CONSTRUCTION



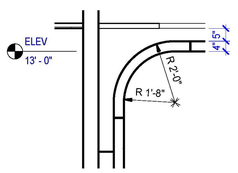
4 ENTRY LOBBY ELEVATION- WEST
SCALE: 1/4" = 1'-0"



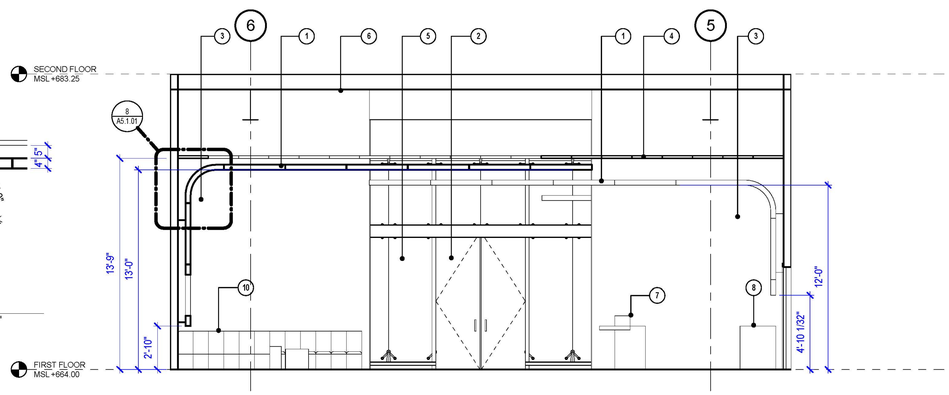
3 ENTRY LOBBY ELEVATION- EAST
SCALE: 1/4" = 1'-0"



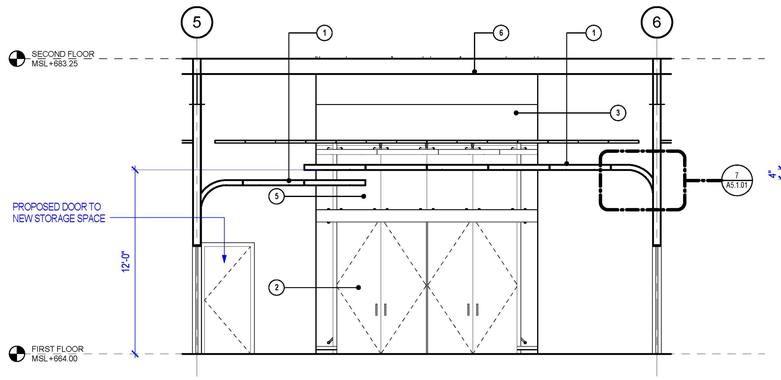
6 LOBBY CORRIDOR ELEVATION - SOUTH
SCALE: 1/4" = 1'-0"



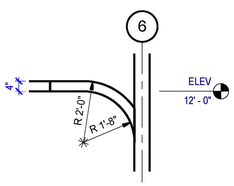
8 DETAIL
SCALE: 1/2" = 1'-0"



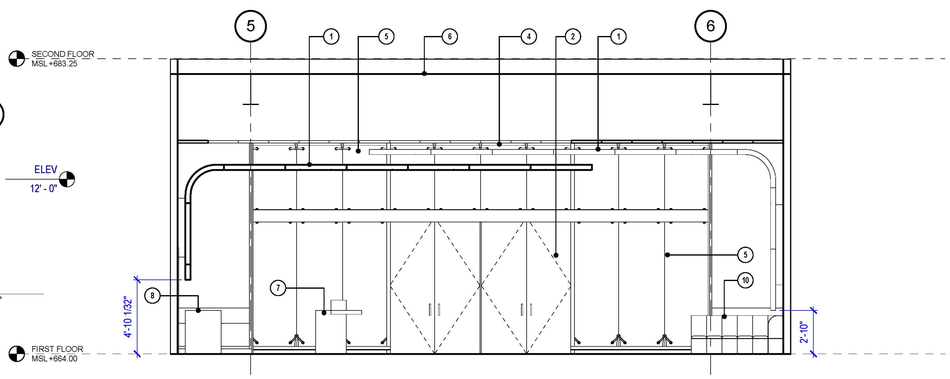
2 ENTRY LOBBY ELEVATION- SOUTH
SCALE: 1/4" = 1'-0"



5 LOBBY CORRIDOR ELEVATION - NORTH
SCALE: 1/4" = 1'-0"



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



1 ENTRY LOBBY ELEVATION- NORTH
SCALE: 1/4" = 1'-0"

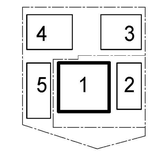
KEYNOTE LEGEND	
Key Value	Keynote Text
1	GRG-1
2	GL-3
3	PT-1
4	ACT-1
5	GL-3
6	PT-3
7	ST-1
8	WD-1
9	WD-1
10	FB-1
11	MTL-5
12	MTL-2
13	PT-7

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION	
DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION		
REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ENLARGED DRAWINGS - ENTRY LOBBY

ARCHITECT
JOHNSON FAIN

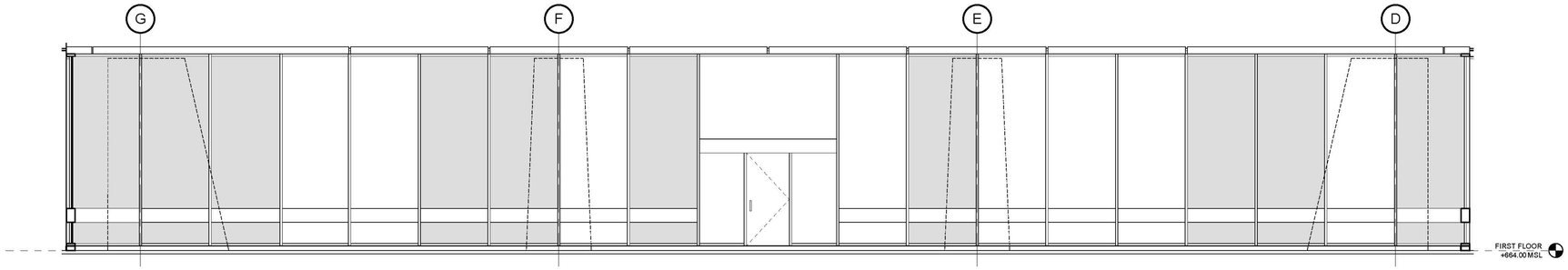
PLOT STAMP
10/14/2015 7:36:00 PM

PROJECT NUMBER
13032

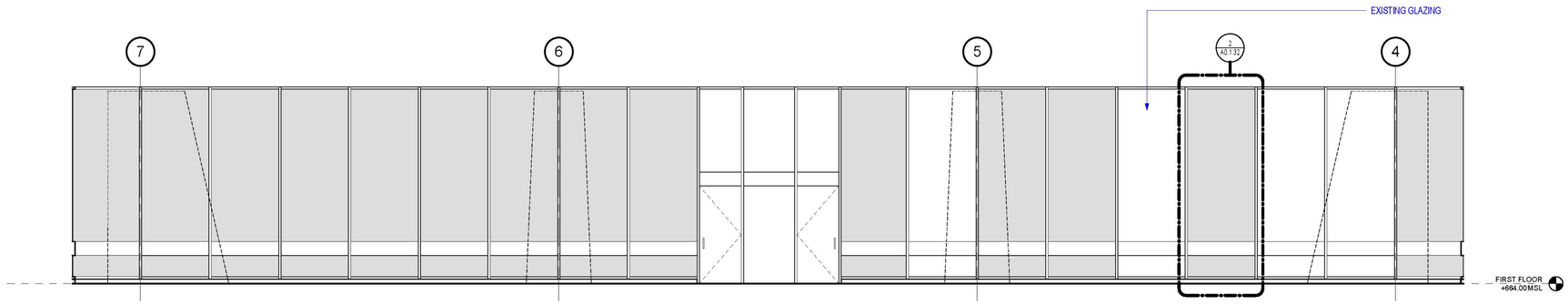
SHEET NUMBER
A5.1.01

COPYRIGHT © 2013 JOHNSON FAIN

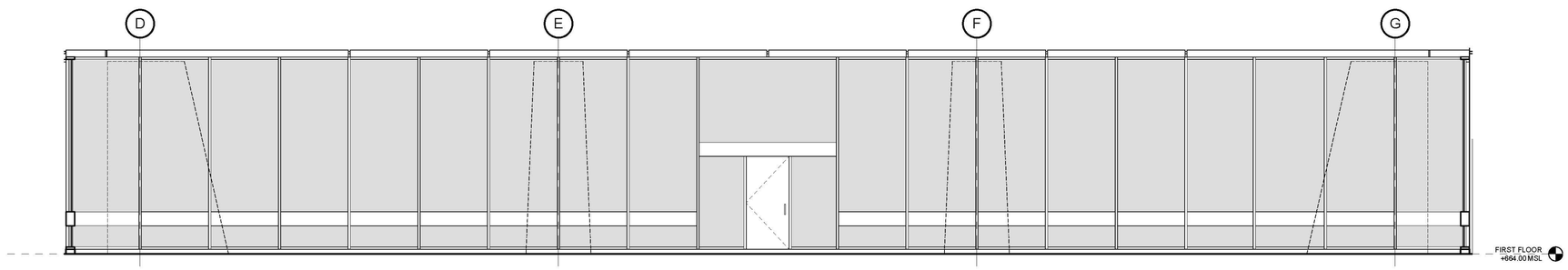
NOTE: NOT FOR CONSTRUCTION



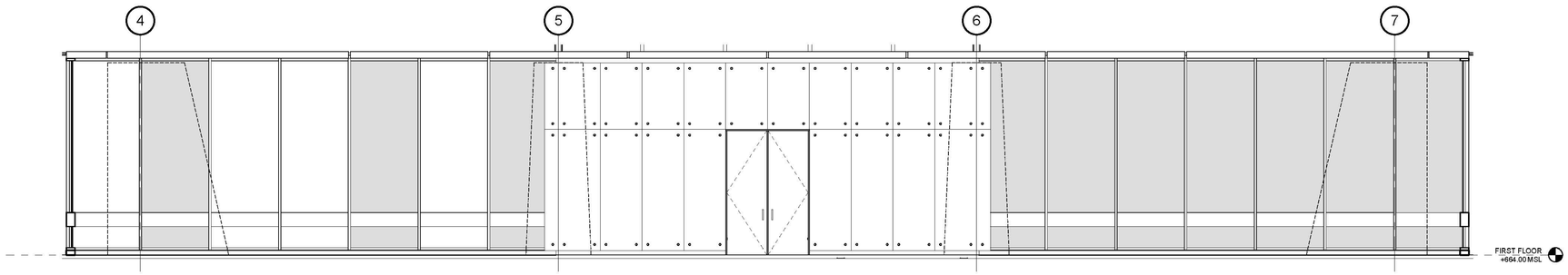
4 COURTYARD ELEVATION - WEST
SCALE: 1/4" = 1'-0"



3 COURTYARD ELEVATION - SOUTH
SCALE: 1/4" = 1'-0"



2 COURTYARD ELEVATION - EAST
SCALE: 1/4" = 1'-0"



1 COURTYARD ELEVATION - NORTH
SCALE: 1/4" = 1'-0"

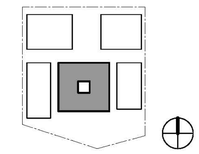
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

ENLARGED DRAWINGS - CORRIDORS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:36:02 PM

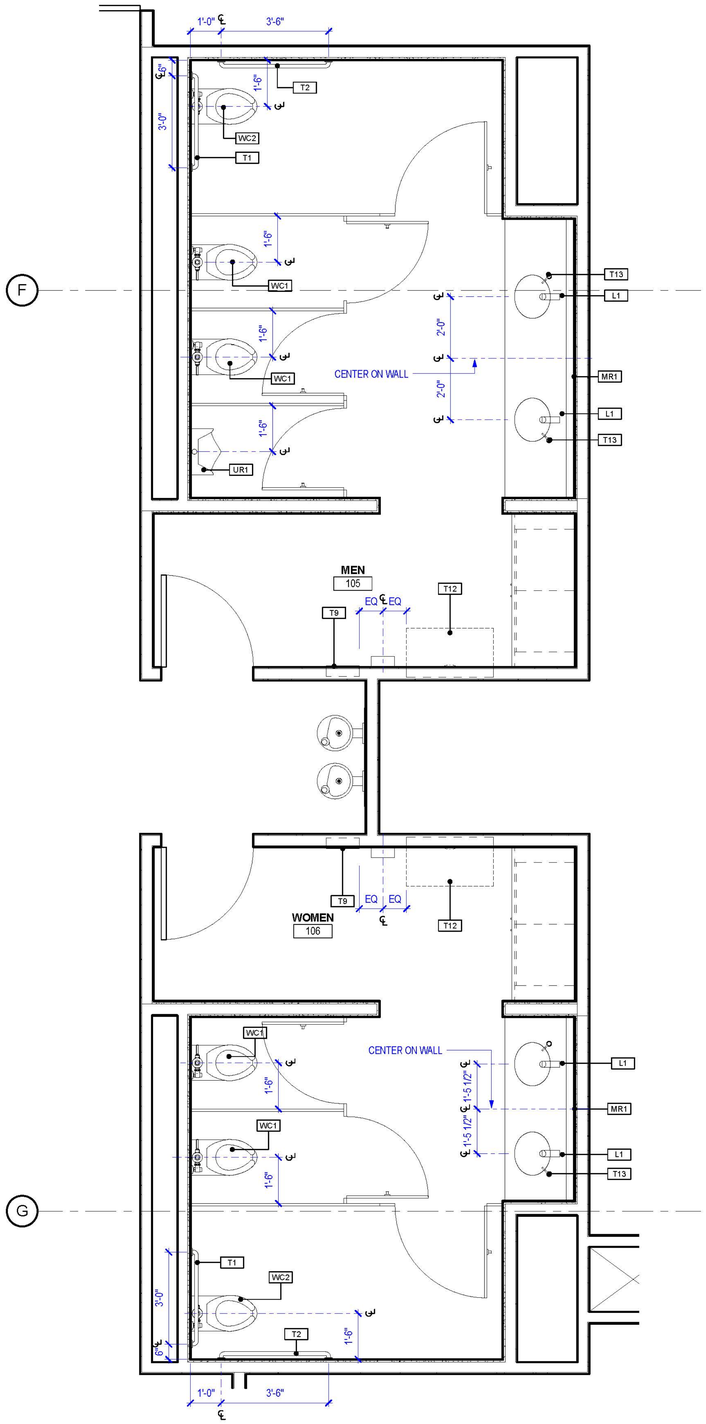
PROJECT NUMBER
13032

SHEET NUMBER

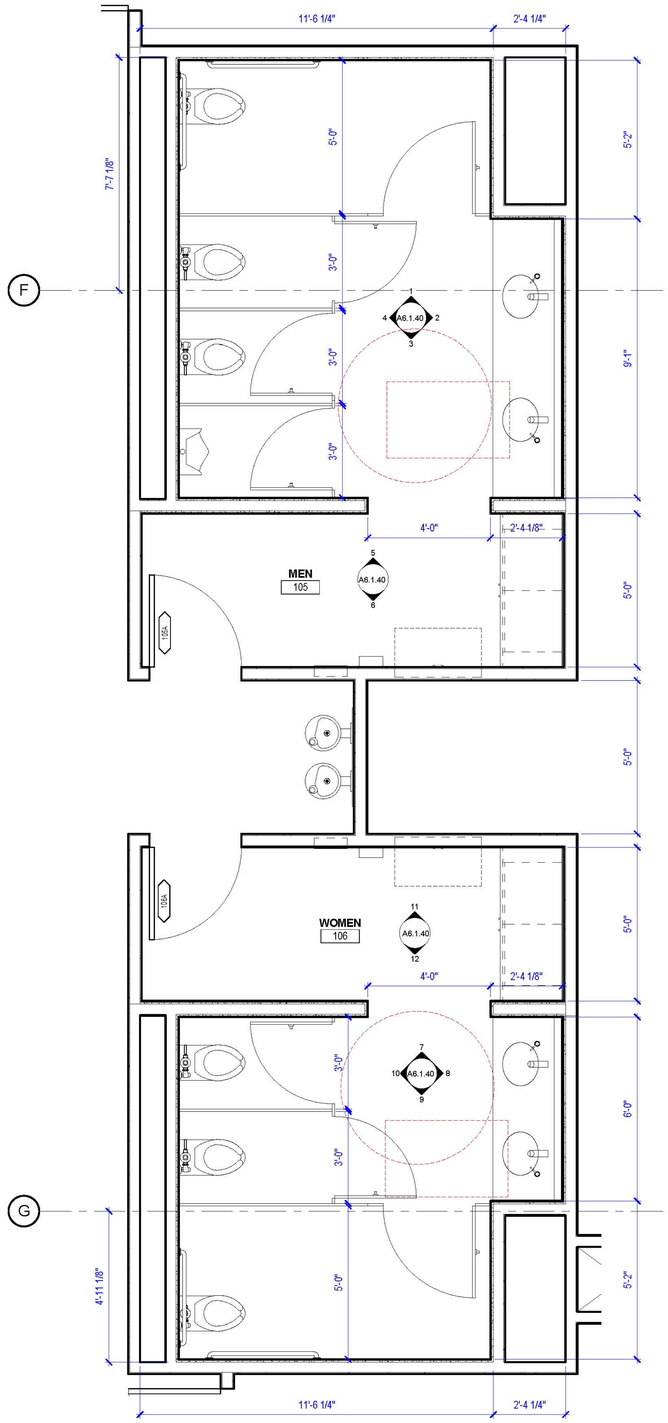
A5.1.05

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM PLAN 105 AND 106 FIXTURE PLAN
SCALE: 1/2" = 1'-0"



1 BATHROOM PLAN 105 AND 106 CONSTRUCTION PLAN
SCALE: 1/2" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

BATHROOM 105 AND 106 PLANS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:36:06 PM

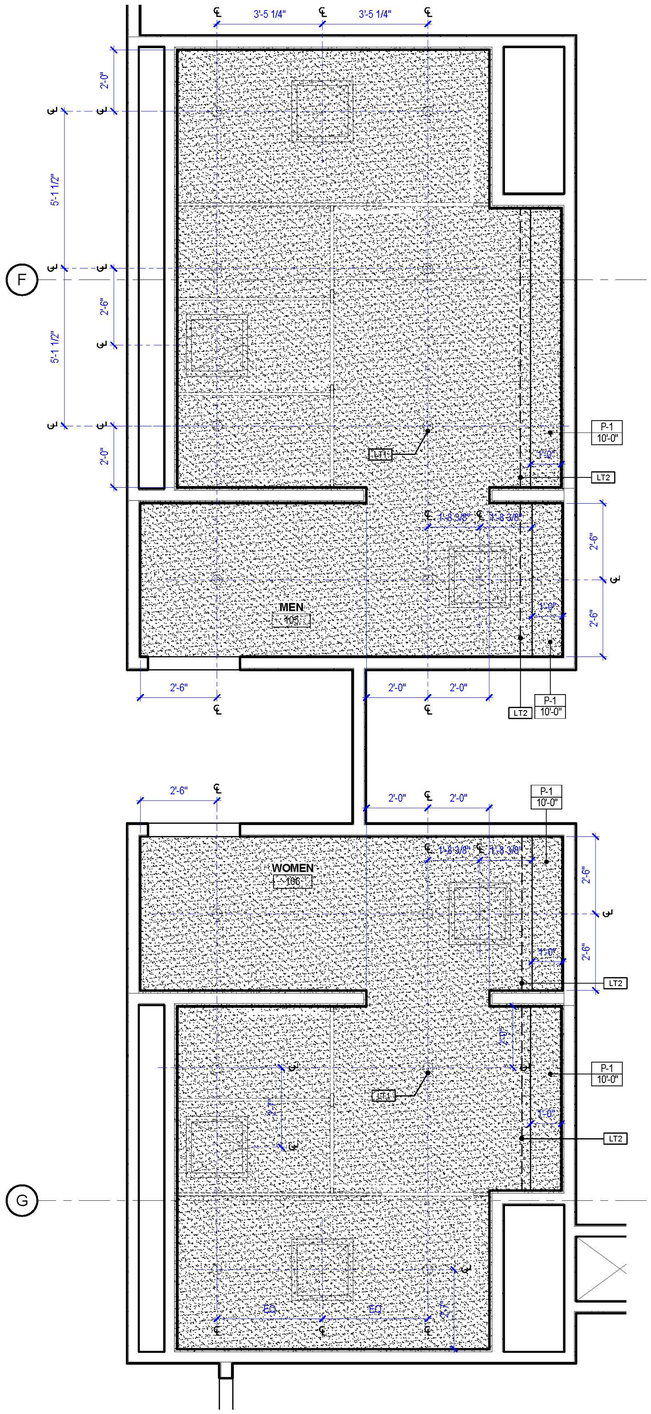
PROJECT NUMBER
13032

SHEET NUMBER

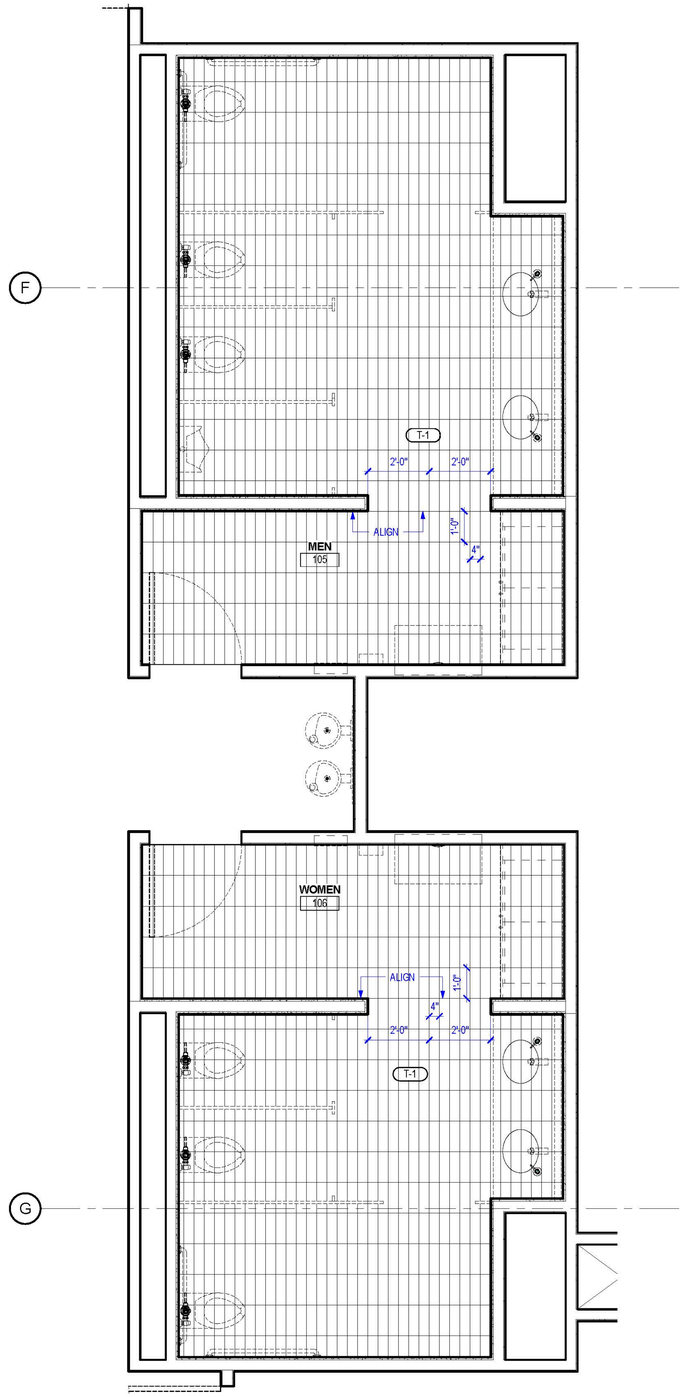
A6.1.20

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM PLAN 105 AND 106 RCP
SCALE: 1/2" = 1'-0"



1 BATHROOM PLAN 105 AND 106 FINISH PLAN
SCALE: 1/2" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

BATHROOM 105 AND 106 PLANS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:36:26 PM

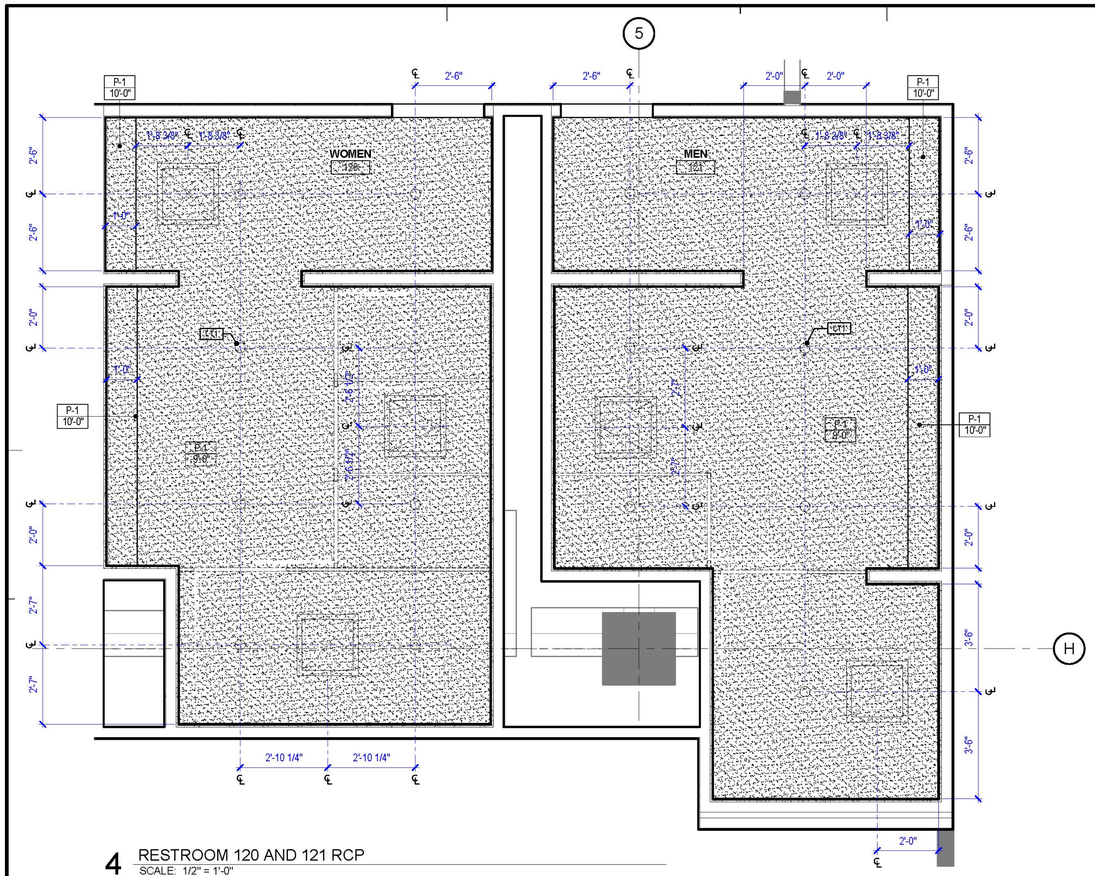
PROJECT NUMBER
13032

SHEET NUMBER

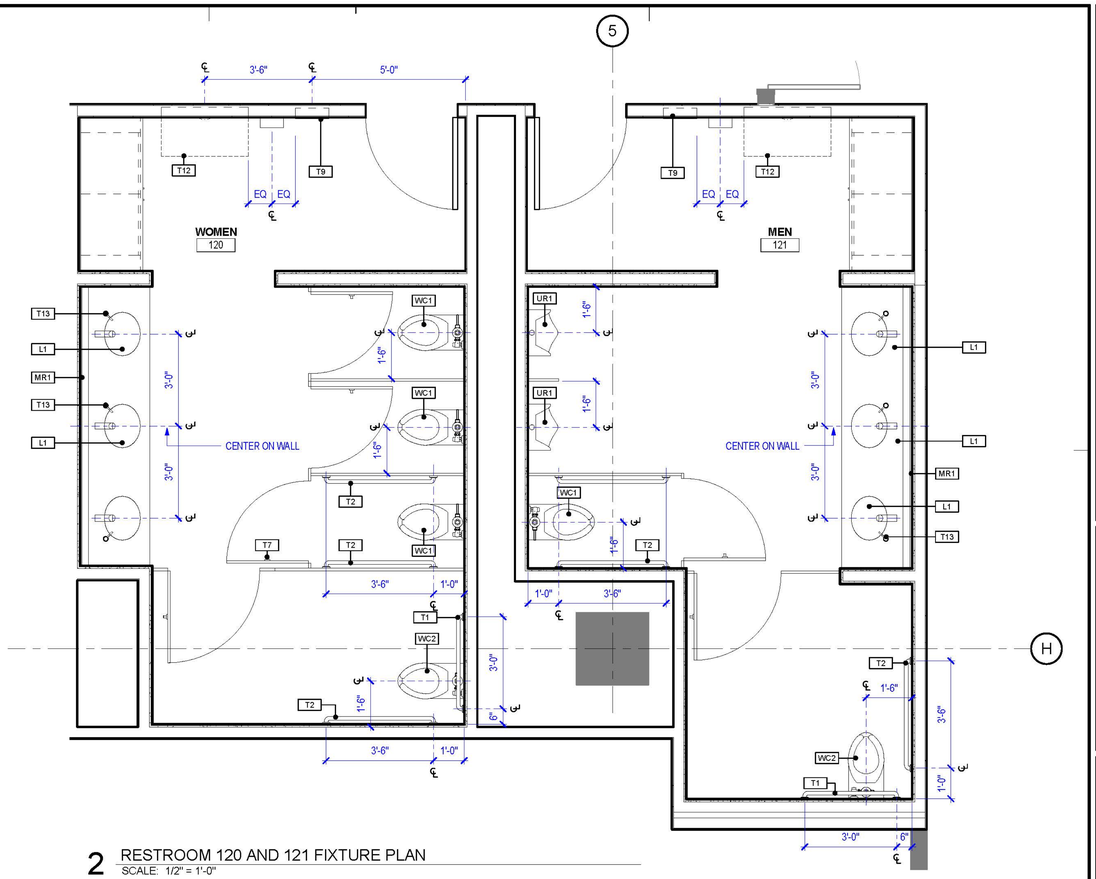
A6.1.21

COPYRIGHT © 2013 JOHNSON FAIN

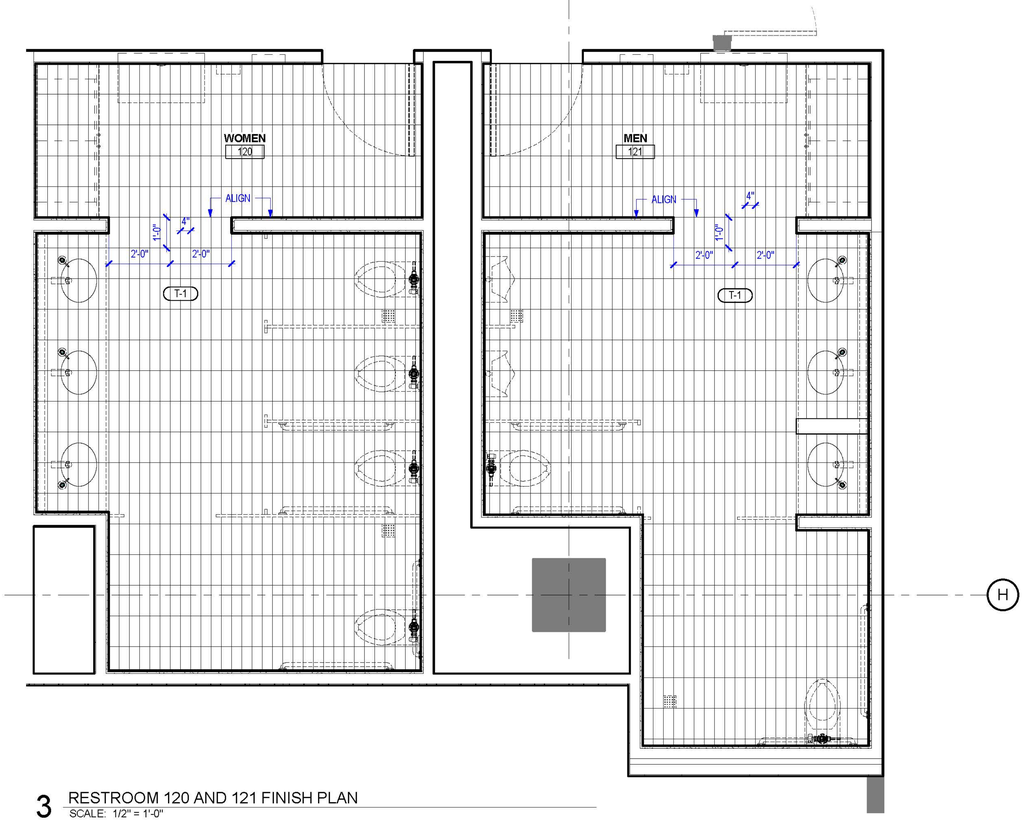
NOTE: NOT FOR CONSTRUCTION



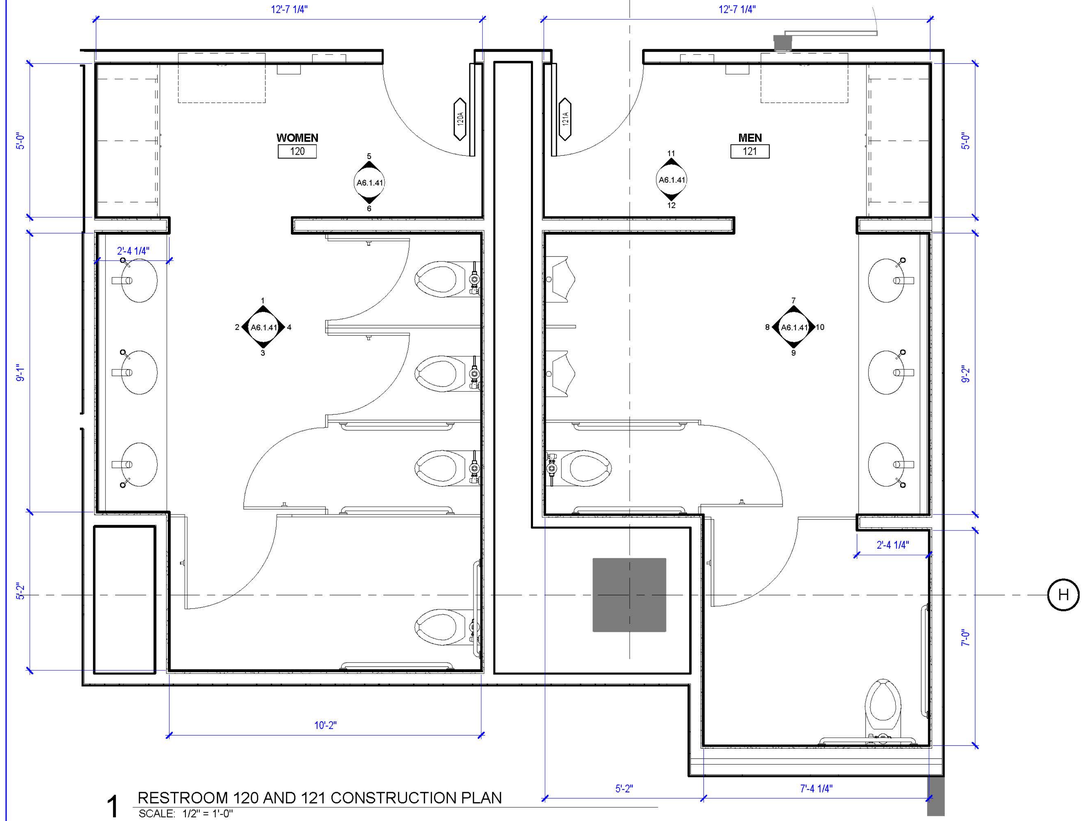
4 RESTROOM 120 AND 121 RCP
SCALE: 1/2" = 1'-0"



2 RESTROOM 120 AND 121 FIXTURE PLAN
SCALE: 1/2" = 1'-0"



3 RESTROOM 120 AND 121 FINISH PLAN
SCALE: 1/2" = 1'-0"



1 RESTROOM 120 AND 121 CONSTRUCTION PLAN
SCALE: 1/2" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

BATHROOM 120 AND 121 PLANS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:36:56 PM

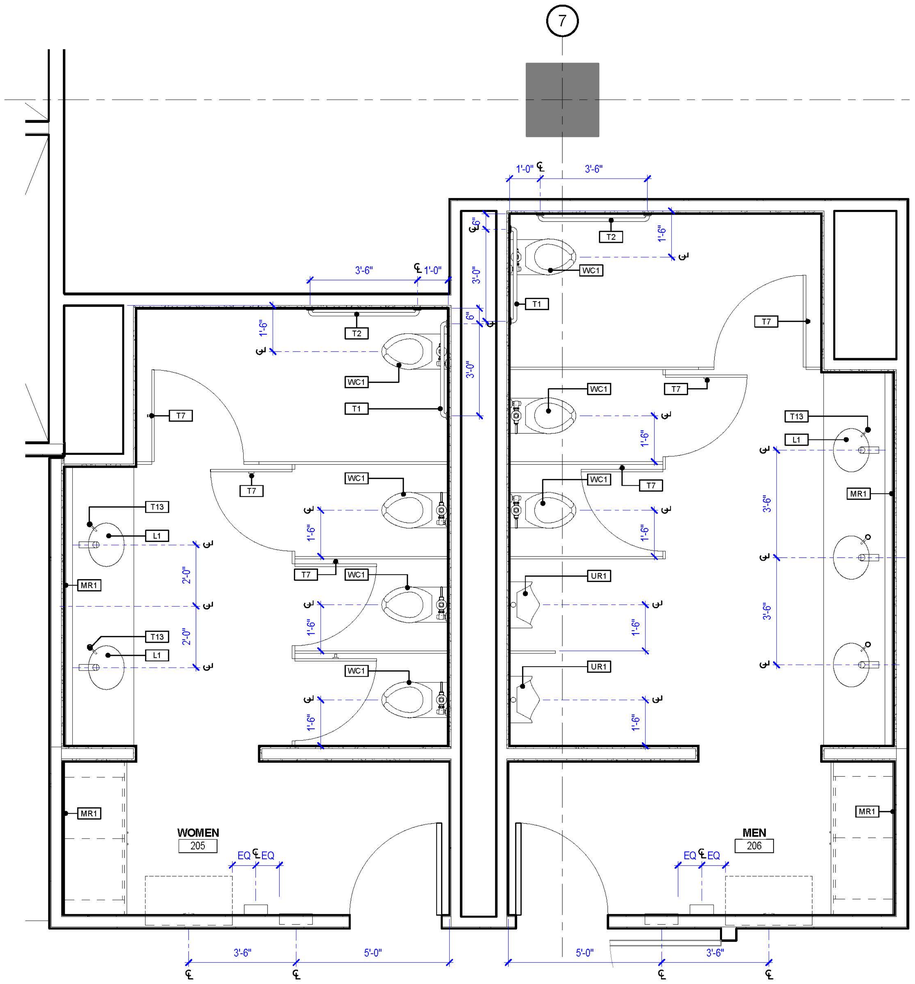
PROJECT NUMBER
13032

SHEET NUMBER

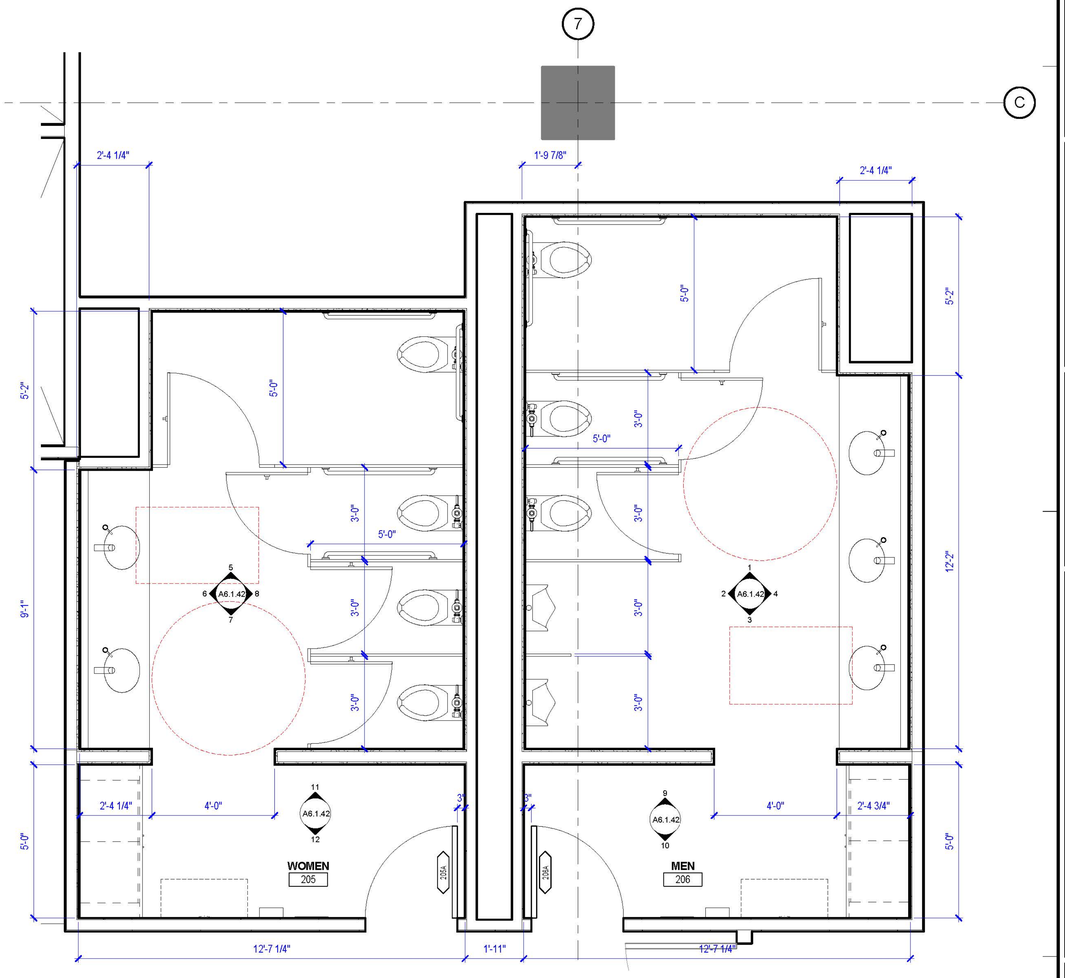
A6.1.22

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM 205 AND 206 FIXTURE PLAN
SCALE: 1/2" = 1'-0"



1 BATHROOM 205 and 206 CONSTRUCTION PLAN
SCALE: 1/2" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

BATHROOM 205 AND 206 PLANS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:36:59 PM

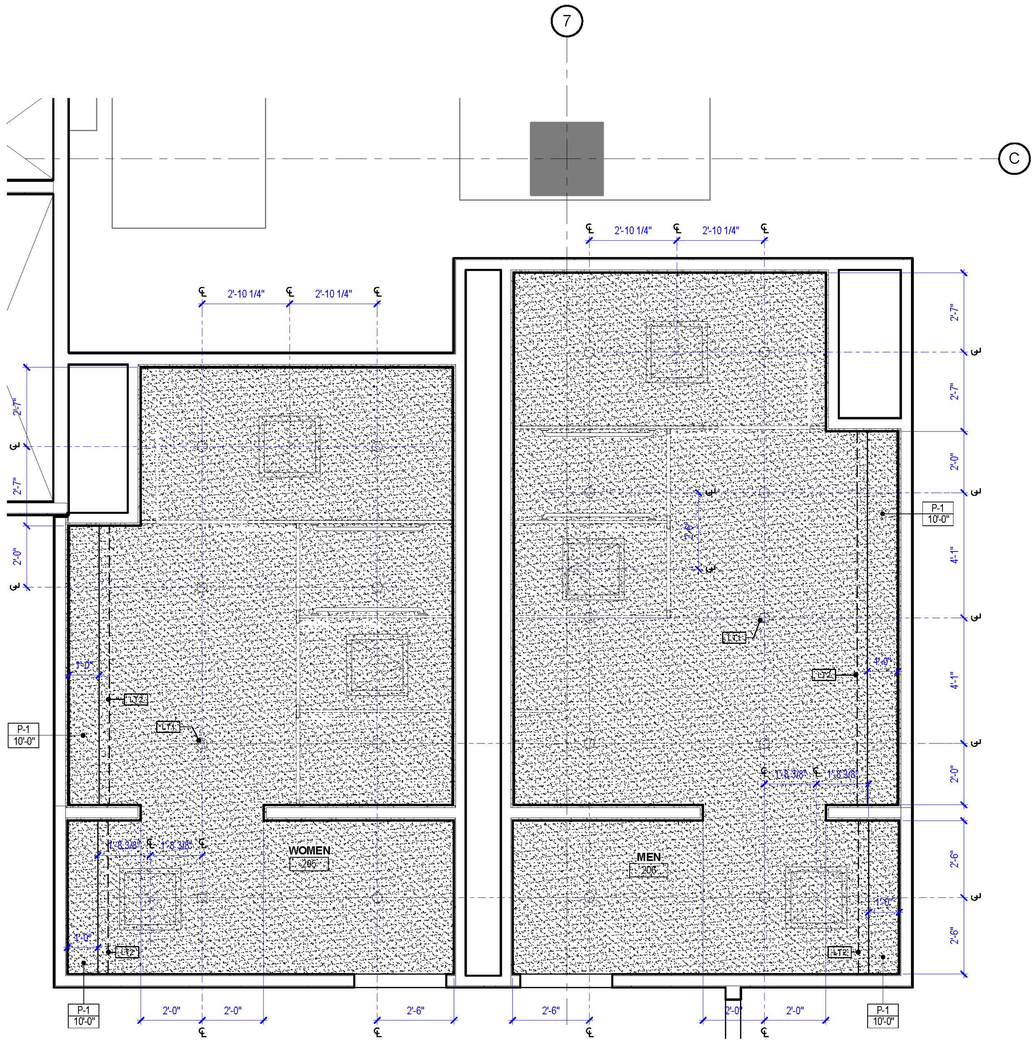
PROJECT NUMBER
13032

SHEET NUMBER

A6.1.23

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM 205 AND 206 RCP
SCALE: 1/2" = 1'-0"



1 BATHROOM 205 AND 206 FINISH PLAN
SCALE: 1/2" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
BATHROOM 205 AND 206 PLANS

ARCHITECT
JOHNSON FAIN

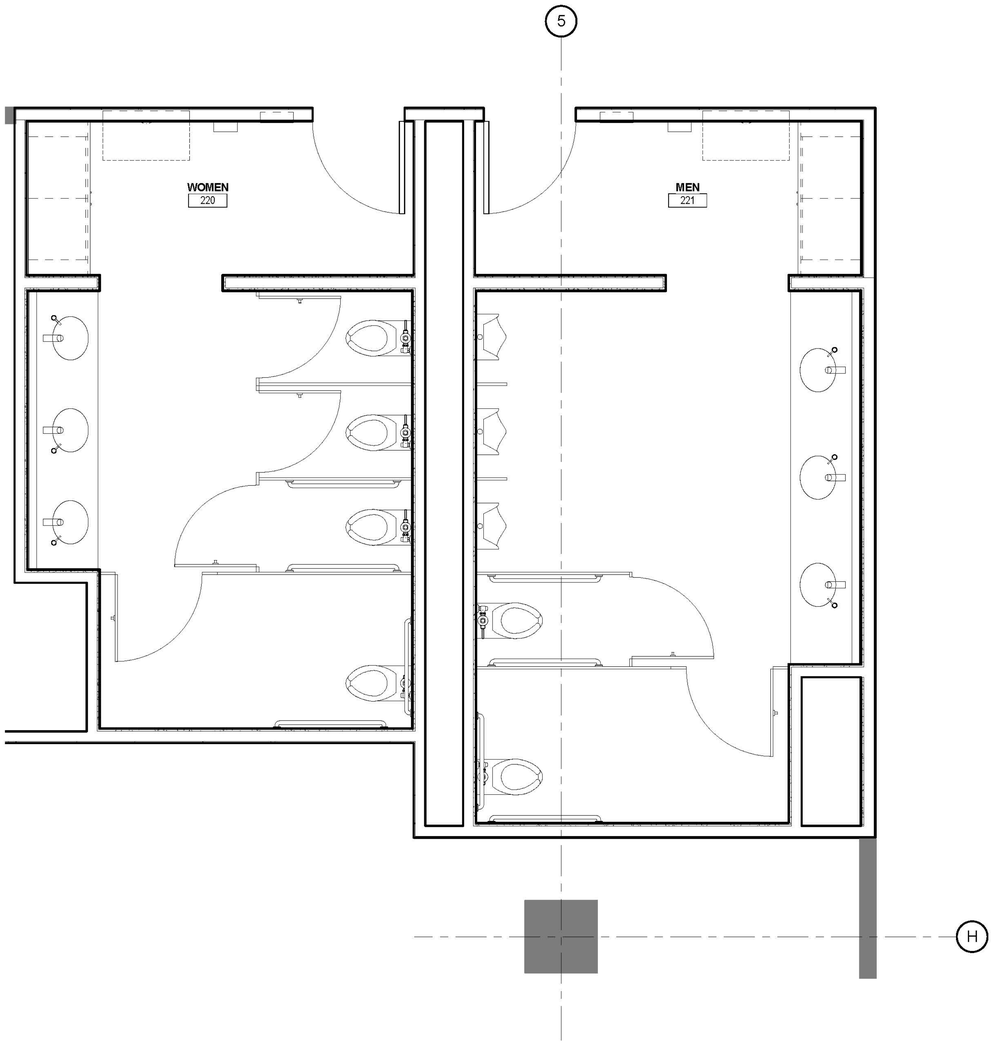
PLOT STAMP
10/14/2015 7:37:23 PM

PROJECT NUMBER
13032

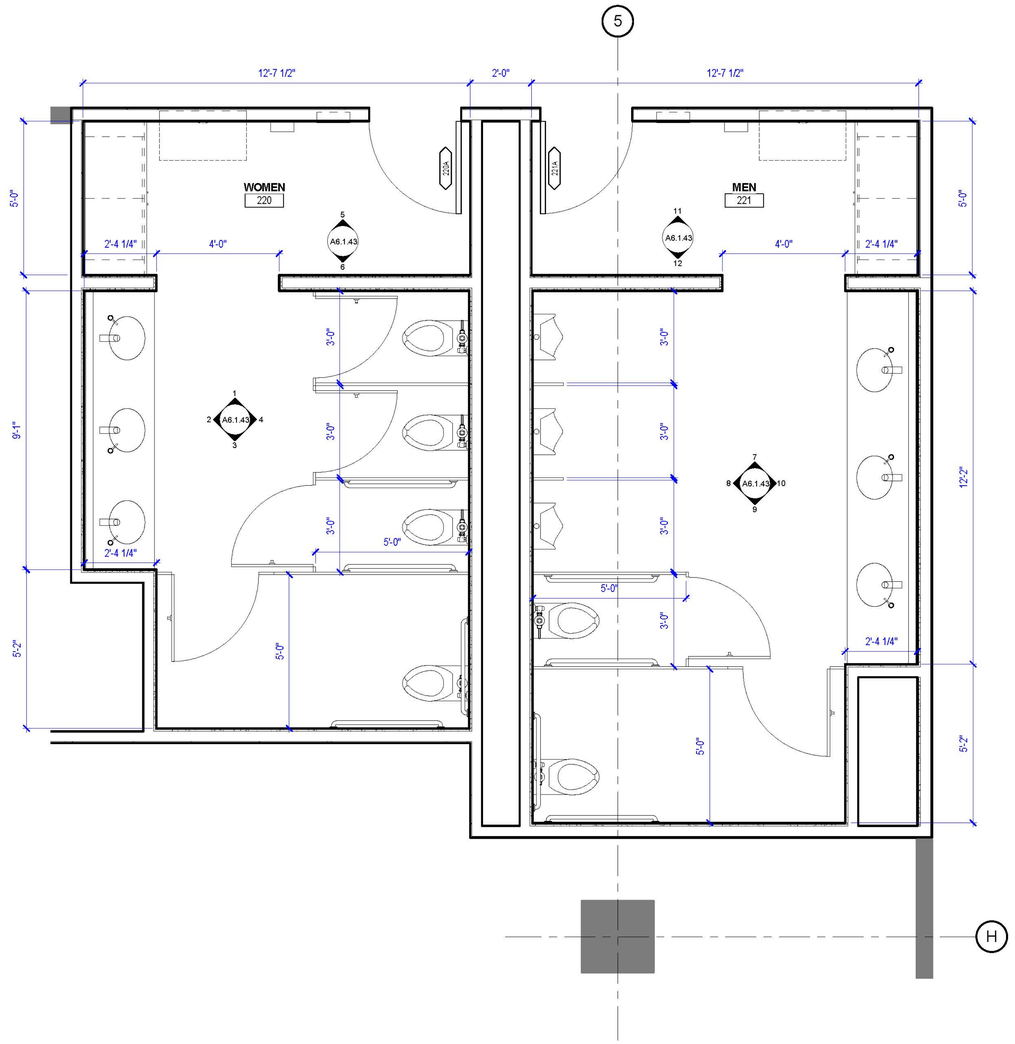
SHEET NUMBER
A6.1.24

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM 220 AND 221 FIXTURE PLAN
SCALE: 1/2" = 1'-0"



1 BATHROOM 220 AND 221 CONSTRUCTION PLAN
SCALE: 1/2" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

BATHROOM 220 AND 221 PLANS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:37:26 PM

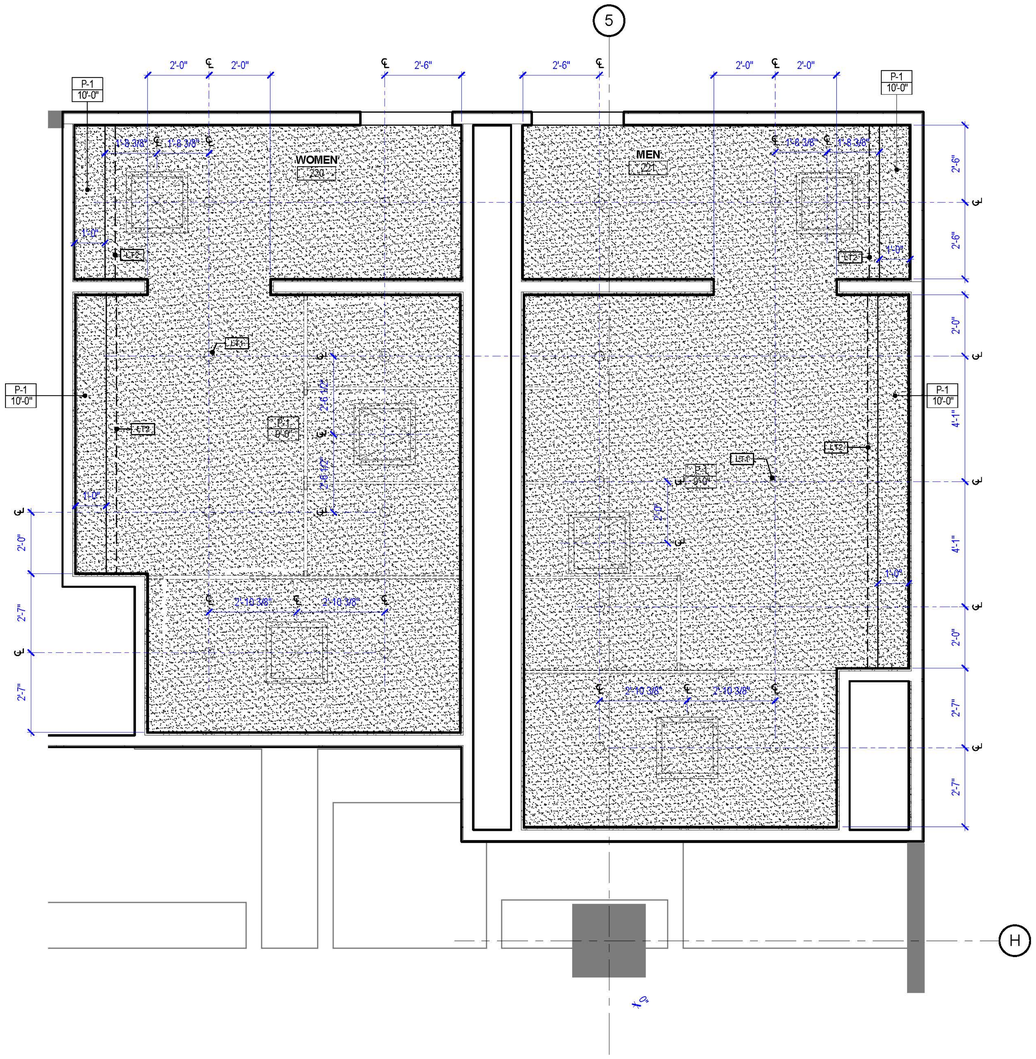
PROJECT NUMBER
13032

SHEET NUMBER

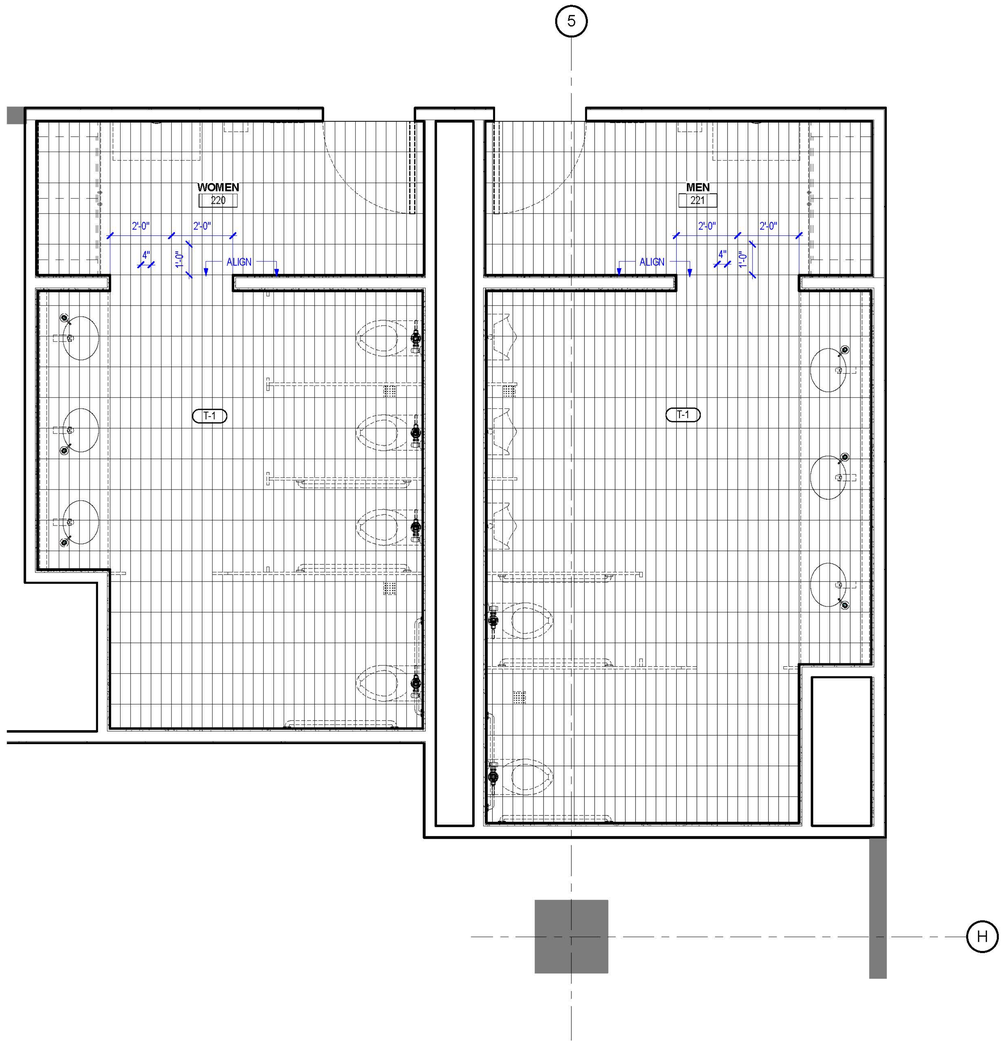
A6.1.25

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM 220 AND 221 RCP
SCALE: 1/2" = 1'-0"



1 BATHROOM 220 AND 221 FINISH PLAN
SCALE: 1/2" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
BATHROOM 220 AND 221 PLANS

ARCHITECT
JOHNSON FAIN

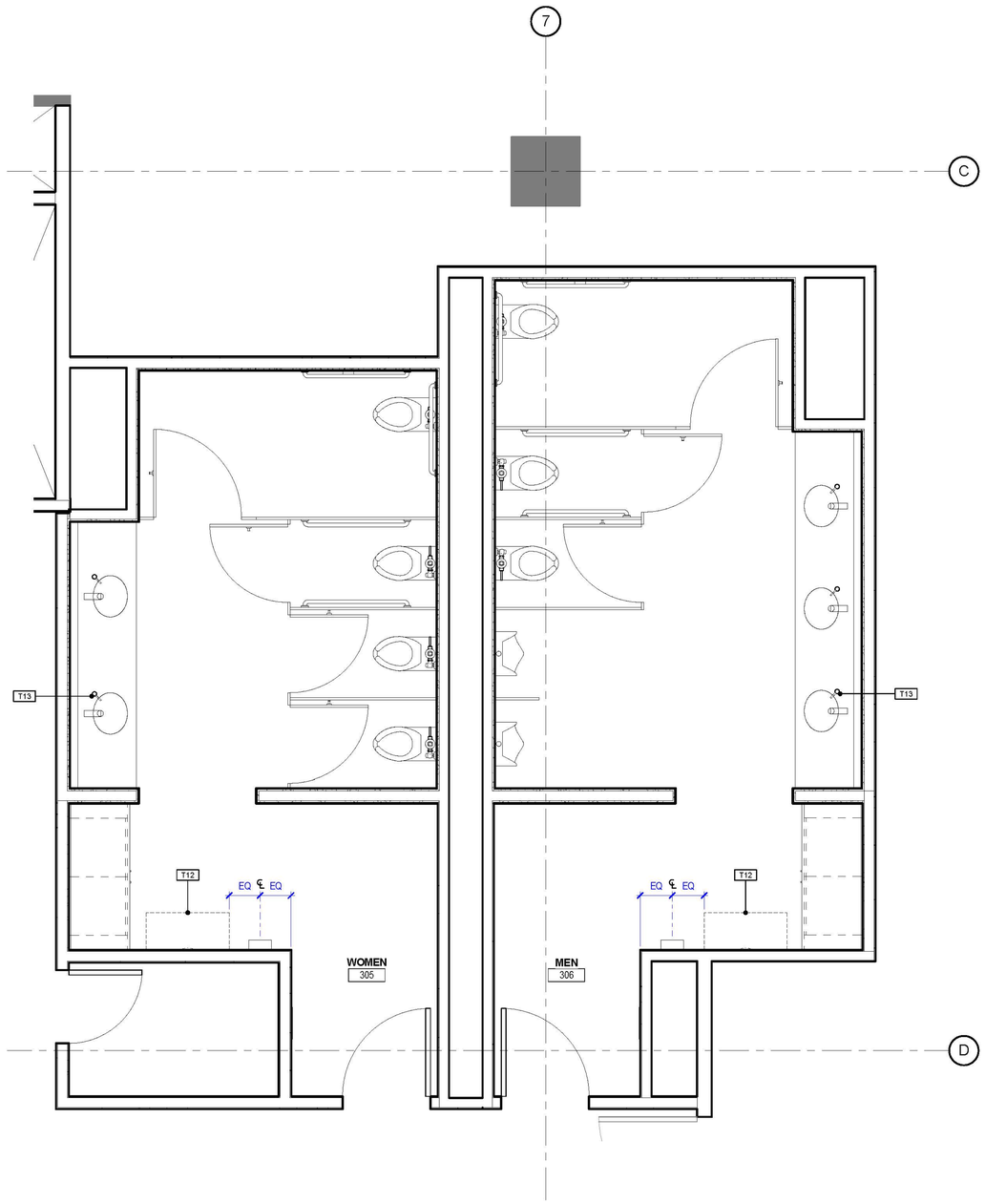
PLOT STAMP
10/14/2015 7:37:48 PM

PROJECT NUMBER
13032

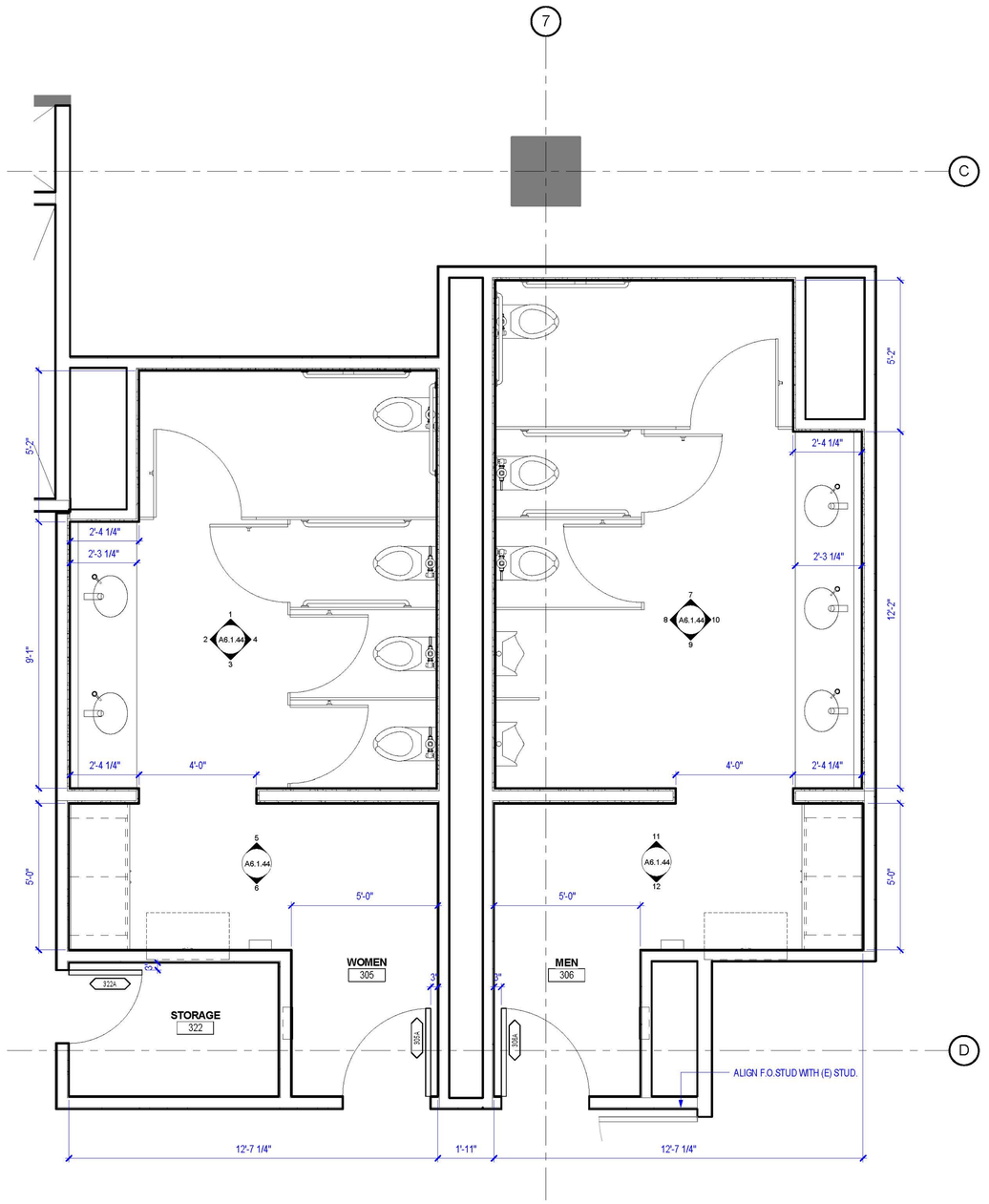
SHEET NUMBER
A6.1.26

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM 306 AND 307 FIXTURE PLANS
SCALE: 1/2" = 1'-0"



1 BATHROOM 306 AND 307 CONSTRUCTION PLANS
SCALE: 1/2" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

BATHROOM 306 AND 307 PLANS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:37:50 PM

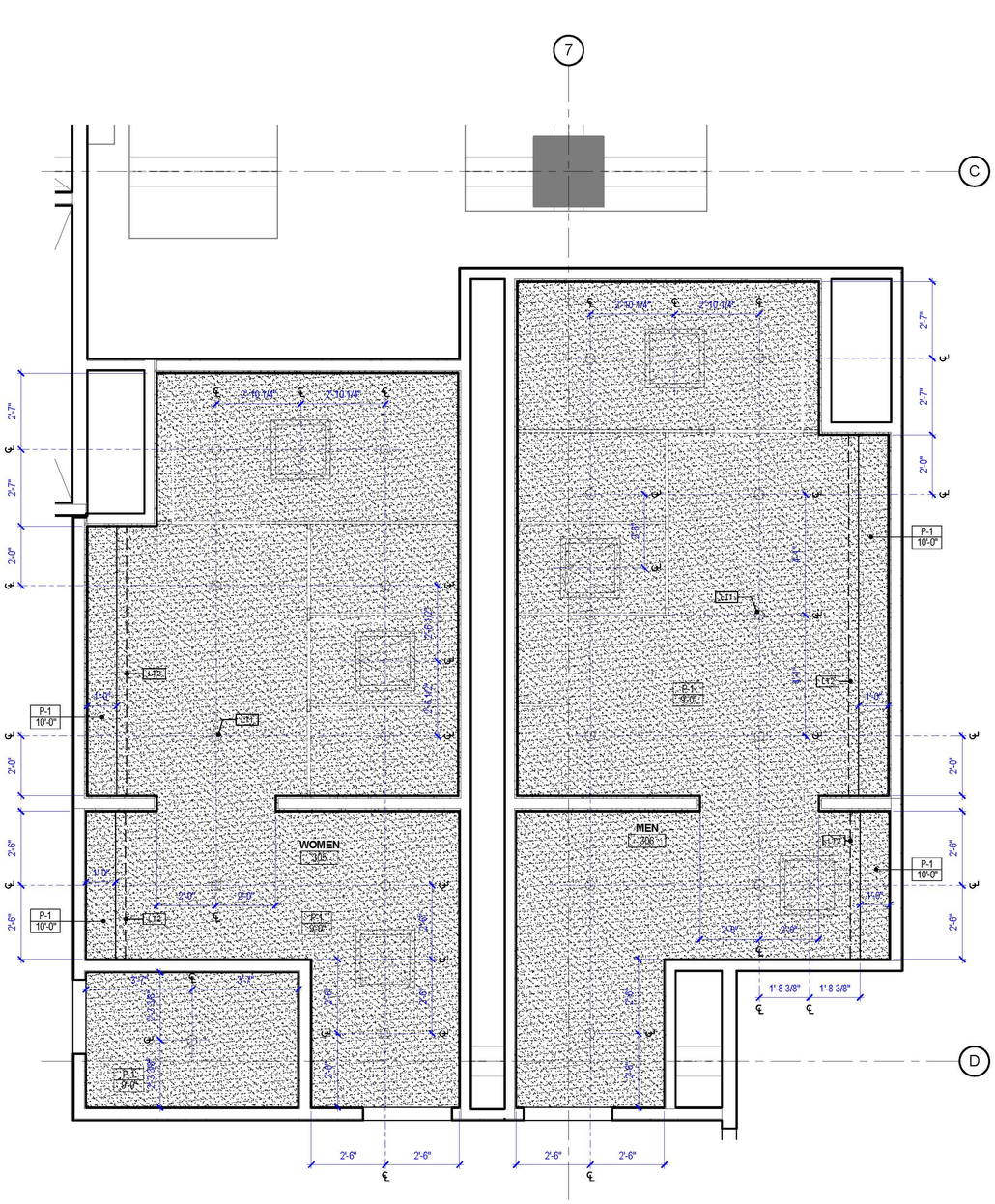
PROJECT NUMBER
13032

SHEET NUMBER

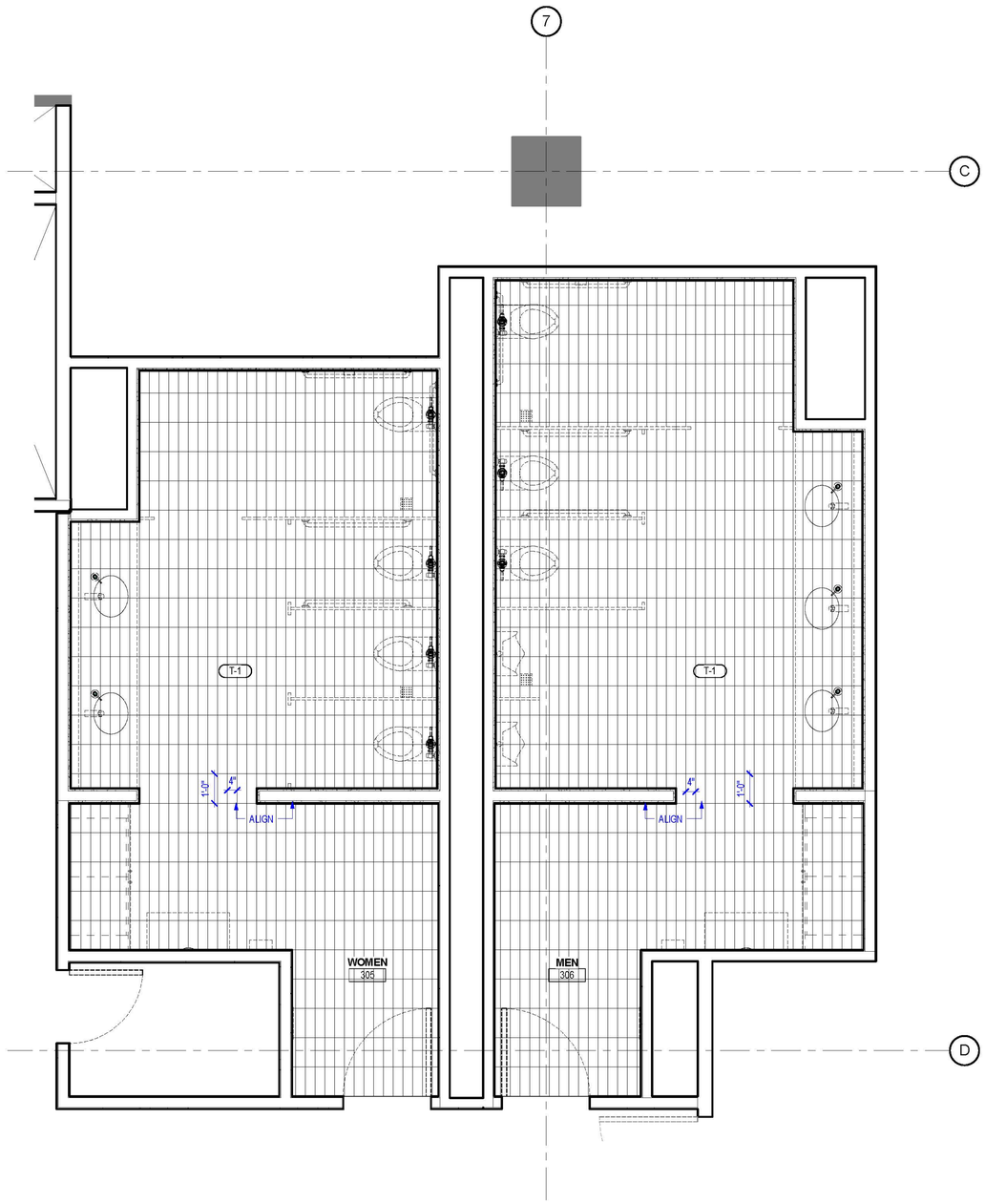
A6.1.27

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM 306 AND 307 RCP
SCALE: 1/2" = 1'-0"



1 BATHROOM 306 AND 307 FINISH PLANS
SCALE: 1/2" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

BATHROOM 306 AND 307 PLANS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:38:16 PM

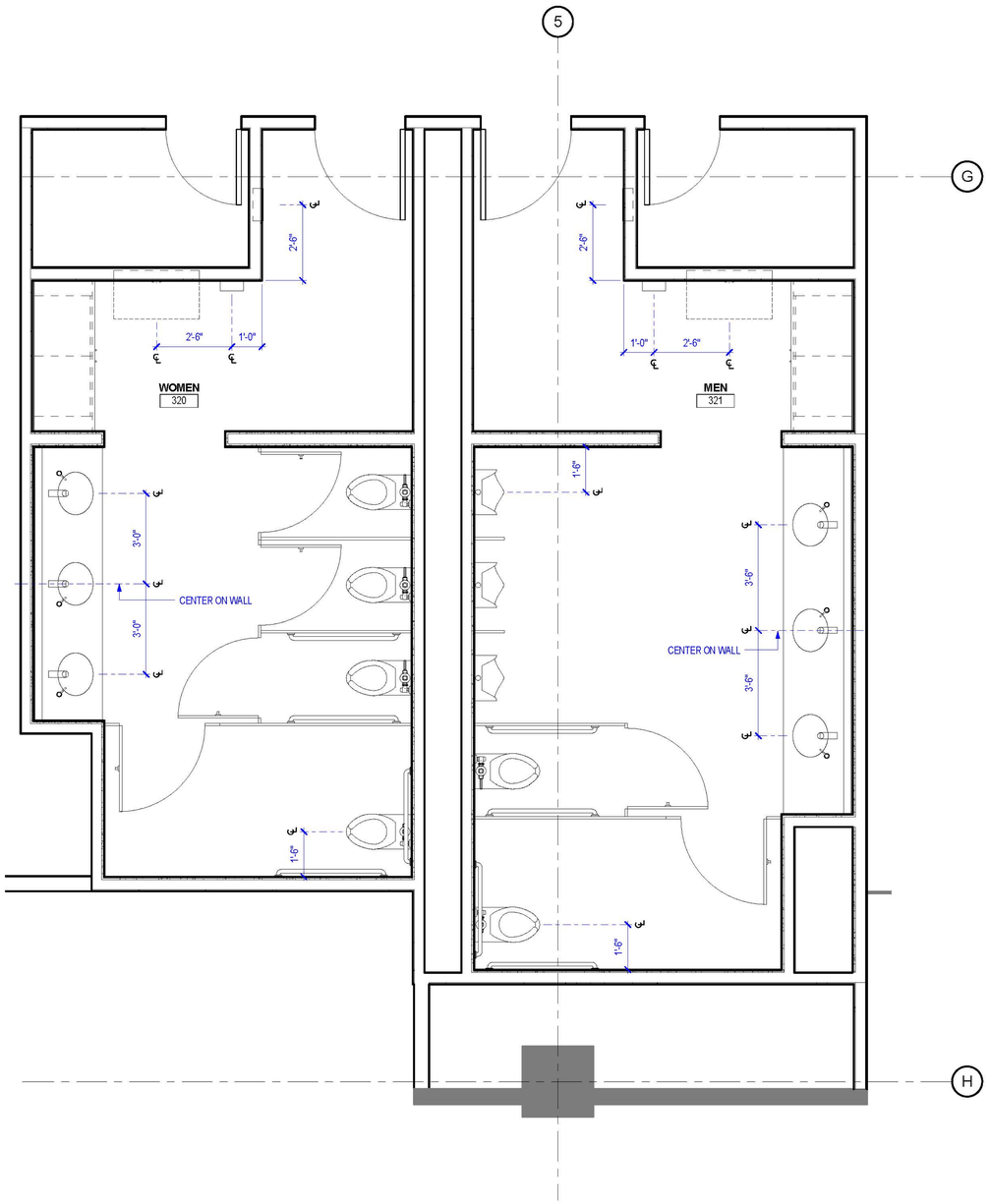
PROJECT NUMBER
13032

SHEET NUMBER

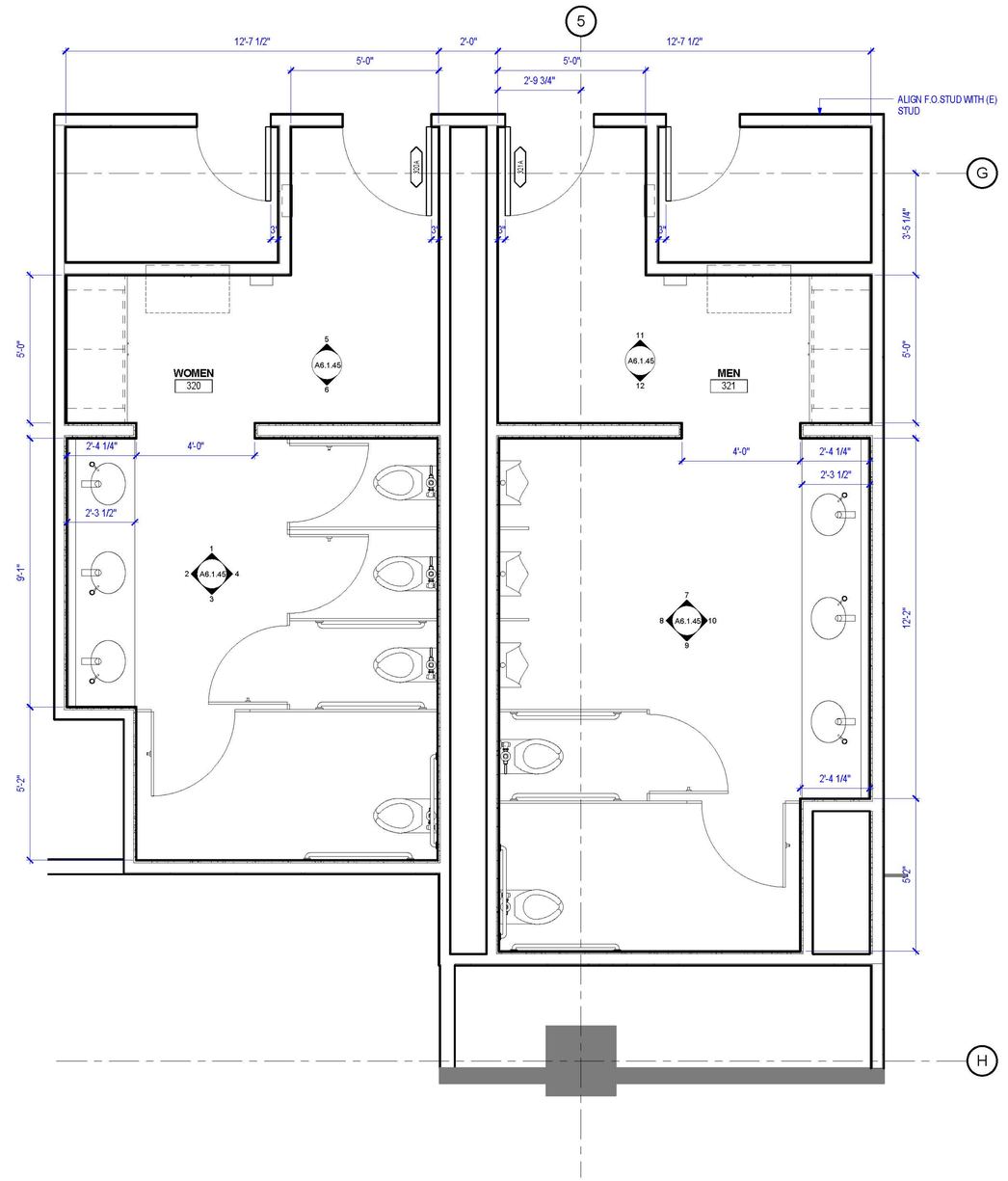
A6.1.28

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM 320 AND 321 FIXTURE PLANS
SCALE: 1/2" = 1'-0"



1 BATHROOM 320 AND 321 CONSTRUCTION PLANS
SCALE: 1/2" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
BATHROOM 320 AND 321 PLANS

ARCHITECT
JOHNSON FAIN

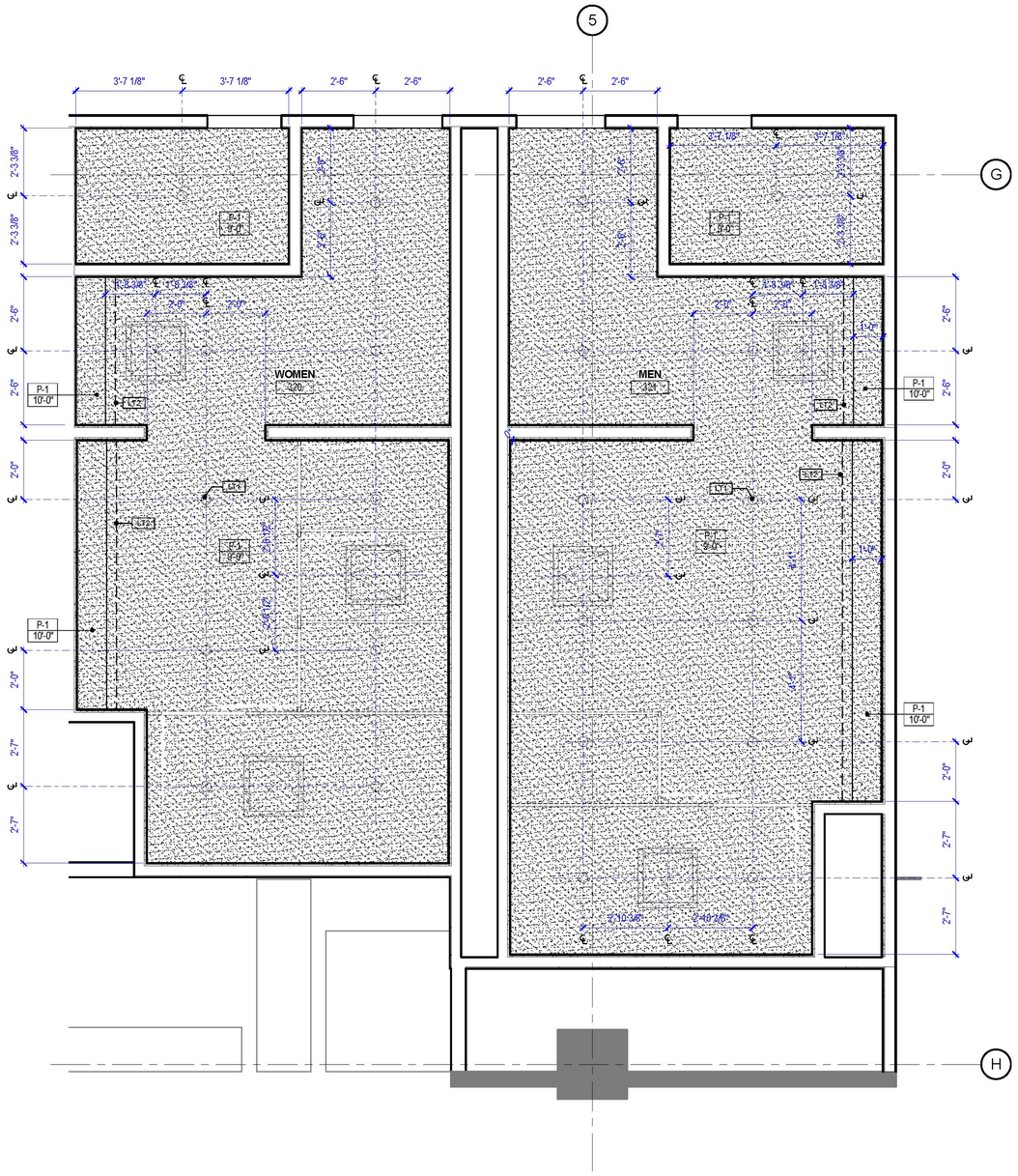
PLOT STAMP
10/14/2015 7:38:19 PM

PROJECT NUMBER
13032

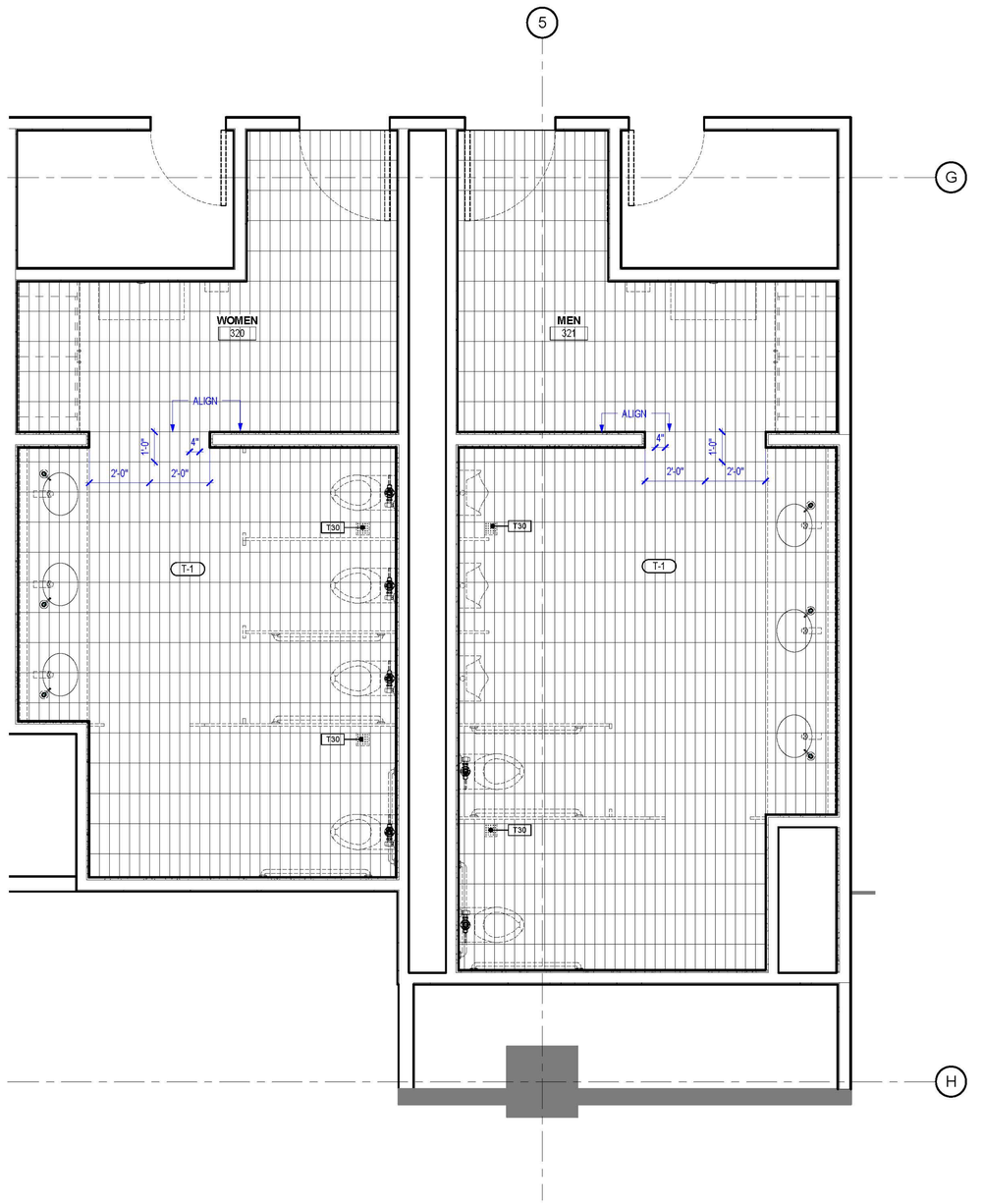
SHEET NUMBER
A6.1.29

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 BATHROOM 320 AND 321 RCP
SCALE: 1/2" = 1'-0"



1 BATHROOM 320 AND 321 FINISH PLANS
SCALE: 1/2" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

BATHROOM 320 AND 321 PLANS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:38:46 PM

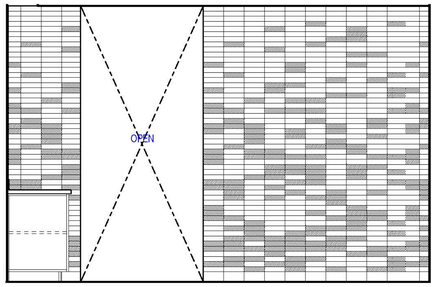
PROJECT NUMBER
13032

SHEET NUMBER

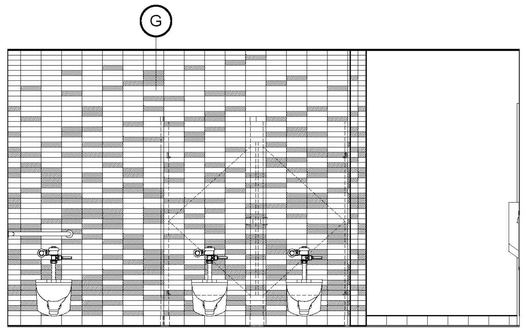
A6.1.30

COPYRIGHT © 2013 JOHNSON FAIN

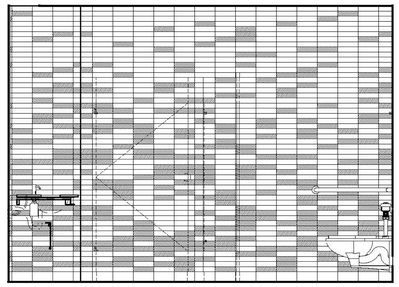
NOTE: NOT FOR CONSTRUCTION



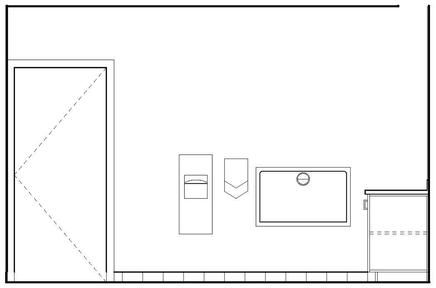
12 ELEVATION 106F
SCALE: 1/2" = 1'-0"



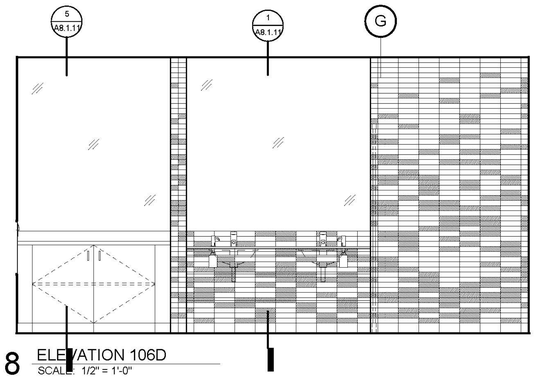
10 ELEVATION 106B
SCALE: 1/2" = 1'-0"



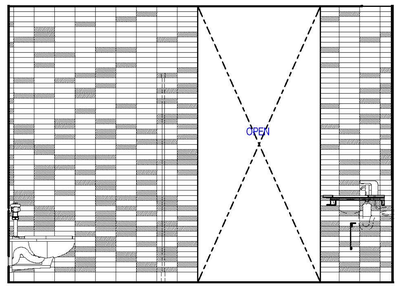
9 ELEVATION 106C
SCALE: 1/2" = 1'-0"



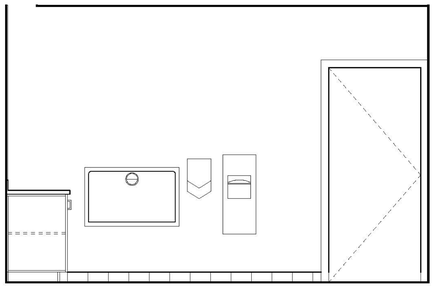
11 ELEVATION 106E
SCALE: 1/2" = 1'-0"



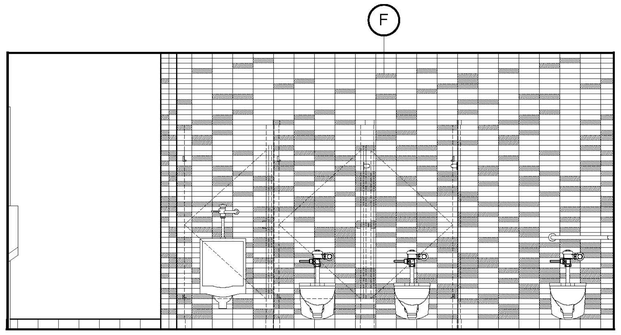
8 ELEVATION 106D
SCALE: 1/2" = 1'-0"



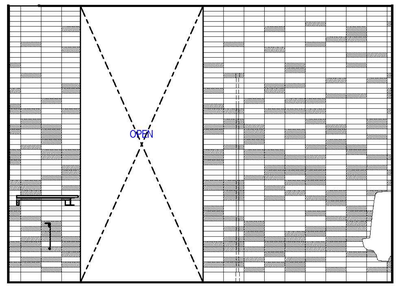
7 ELEVATION 106A
SCALE: 1/2" = 1'-0"



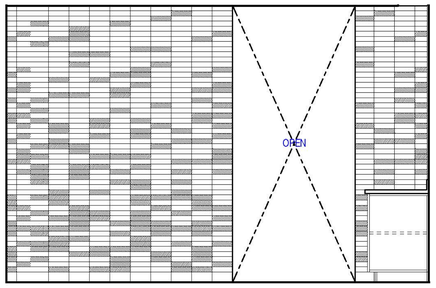
6 ELEVATION 105F
SCALE: 1/2" = 1'-0"



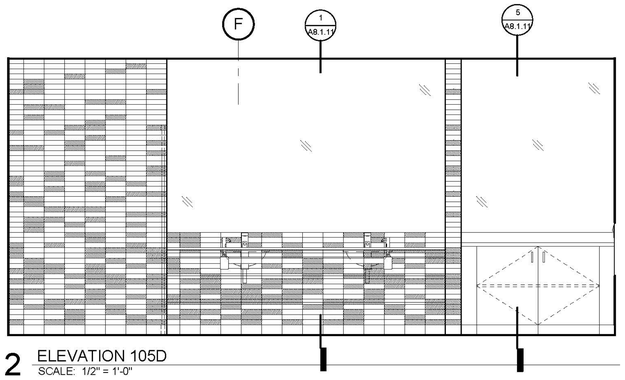
4 ELEVATION 105B
SCALE: 1/2" = 1'-0"



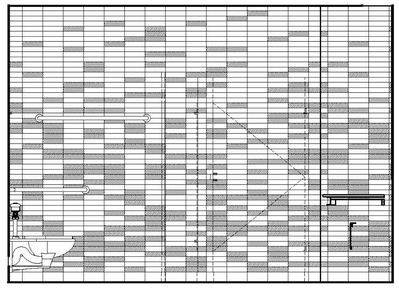
3 ELEVATION 105C
SCALE: 1/2" = 1'-0"



5 ELEVATION 105E
SCALE: 1/2" = 1'-0"



2 ELEVATION 105D
SCALE: 1/2" = 1'-0"



1 ELEVATION 105A
SCALE: 1/2" = 1'-0"

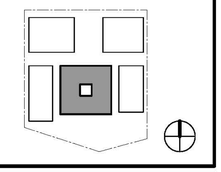
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

INTERIOR ELEVATIONS BATHROOM 105 AND 106

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:38:56 PM

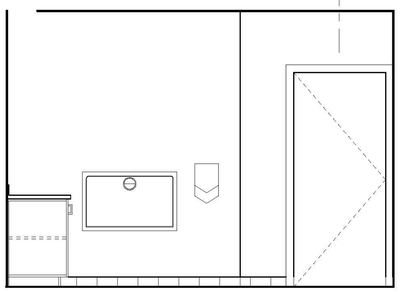
PROJECT NUMBER
13032

SHEET NUMBER

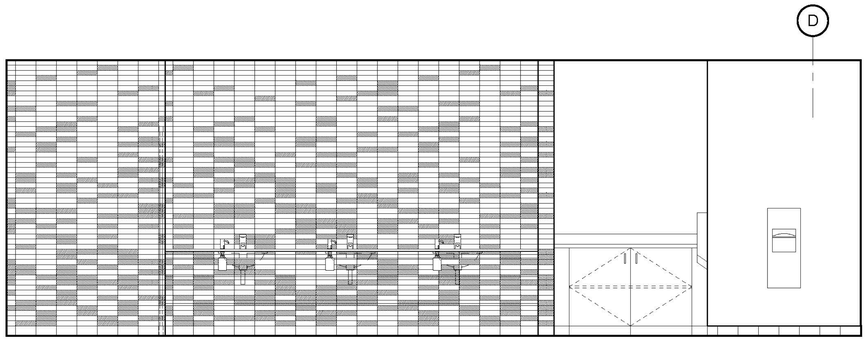
A6.1.40

COPYRIGHT © 2013 JOHNSON FAIN

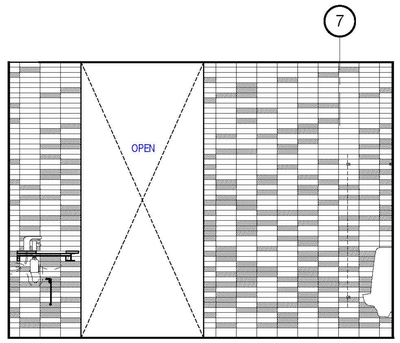
NOTE: NOT FOR CONSTRUCTION



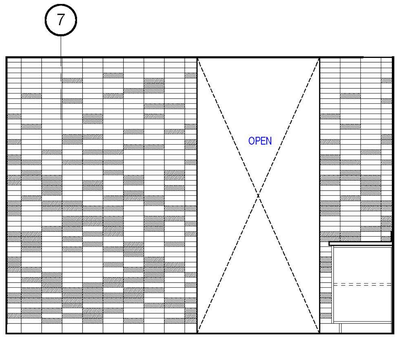
12 ELEVATION 307F
SCALE: 1/2" = 1'-0"



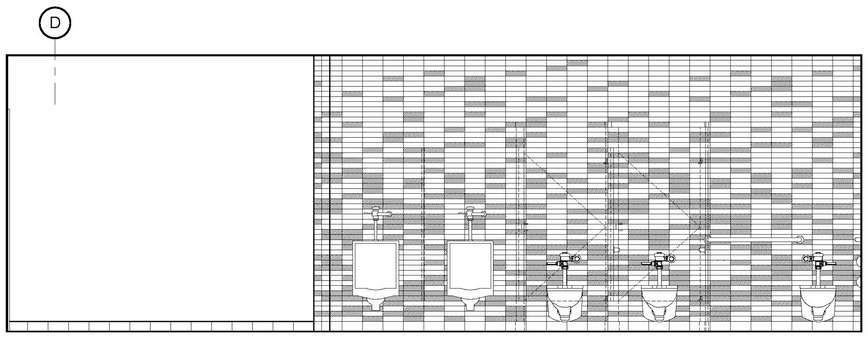
10 ELEVATION 307D
SCALE: 1/2" = 1'-0"



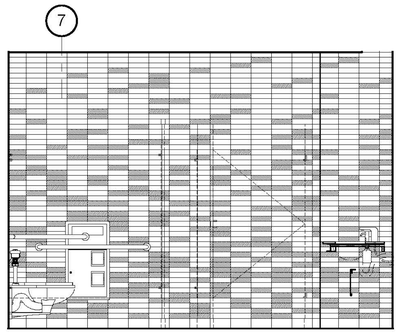
9 ELEVATION 307C
SCALE: 1/2" = 1'-0"



11 ELEVATION 307E
SCALE: 1/2" = 1'-0"



8 ELEVATION 307B
SCALE: 1/2" = 1'-0"

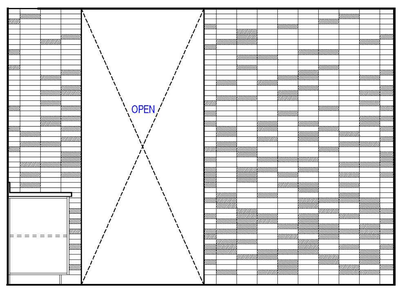


7 ELEVATION 307A
SCALE: 1/2" = 1'-0"

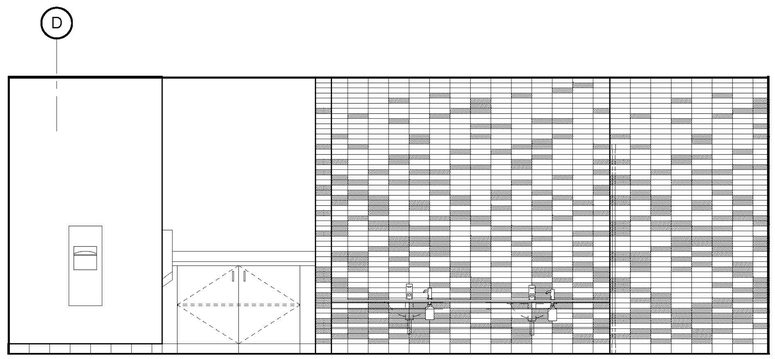
6 ELEVATION 306F
SCALE: 1/2" = 1'-0"

4 ELEVATION 306D
SCALE: 1/2" = 1'-0"

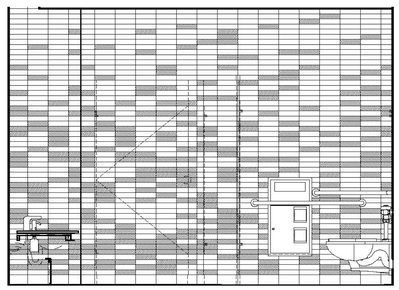
3 ELEVATION 306C
SCALE: 1/2" = 1'-0"



5 ELEVATION 306E
SCALE: 1/2" = 1'-0"



2 ELEVATION 306B
SCALE: 1/2" = 1'-0"



1 ELEVATION 306A
SCALE: 1/2" = 1'-0"

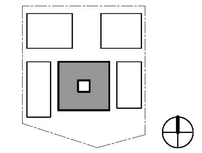
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

INTERIOR ELEVATIONS BATHROOM 306 AND 307

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:39:31 PM

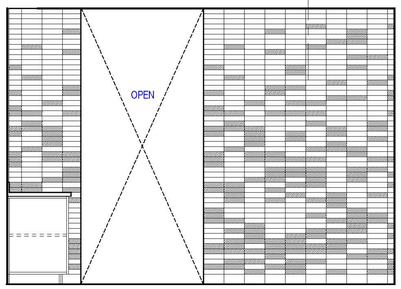
PROJECT NUMBER
13032

SHEET NUMBER

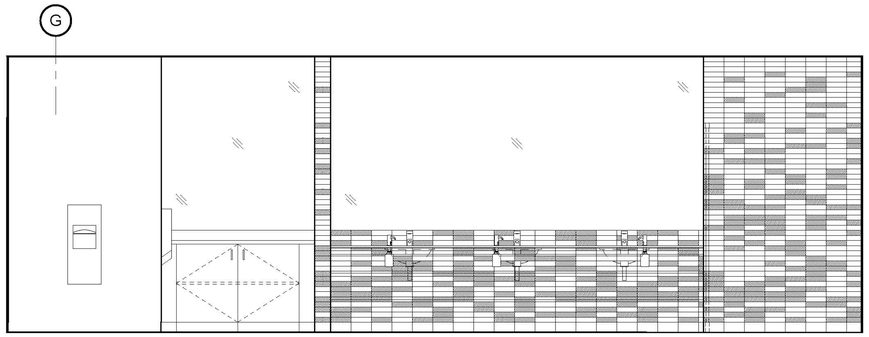
A6.1.44

COPYRIGHT © 2013 JOHNSON FAIN

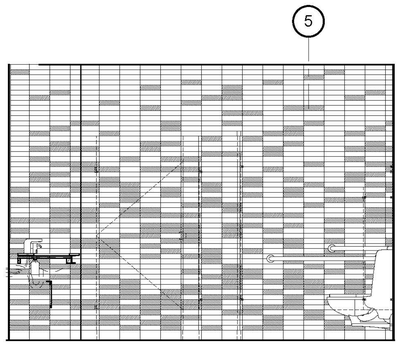
NOTE: NOT FOR CONSTRUCTION



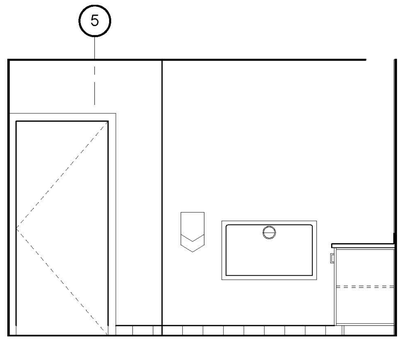
12 ELEVATION 321F
SCALE: 1/2" = 1'-0"



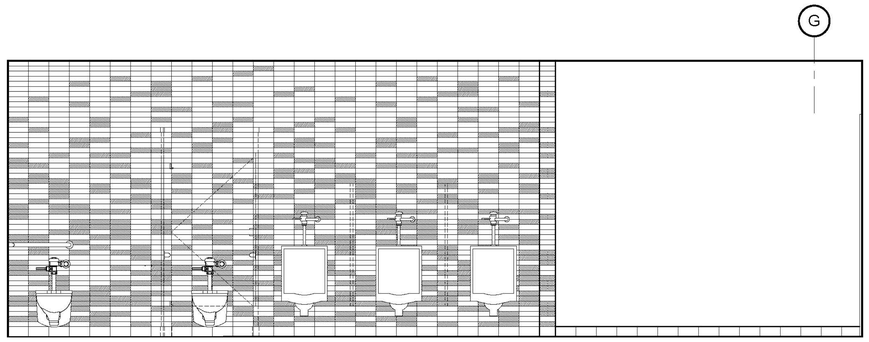
10 ELEVATION 321D
SCALE: 1/2" = 1'-0"



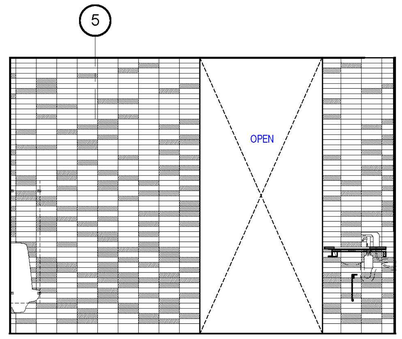
9 ELEVATION 321C
SCALE: 1/2" = 1'-0"



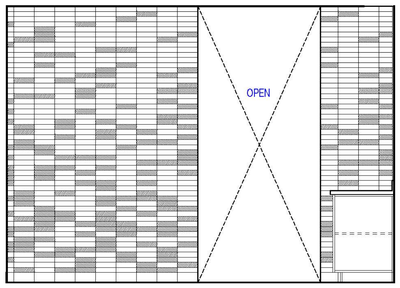
11 ELEVATION 321E
SCALE: 1/2" = 1'-0"



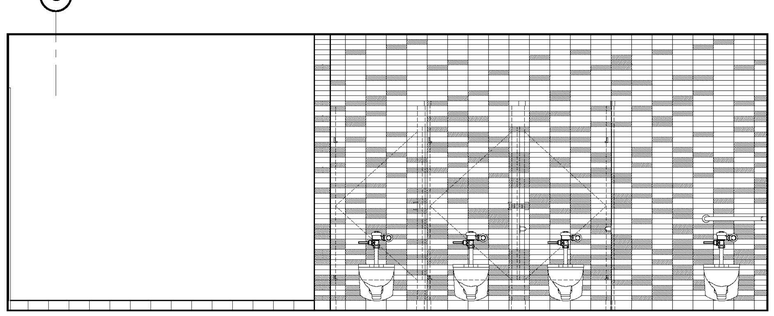
8 ELEVATION 321B
SCALE: 1/2" = 1'-0"



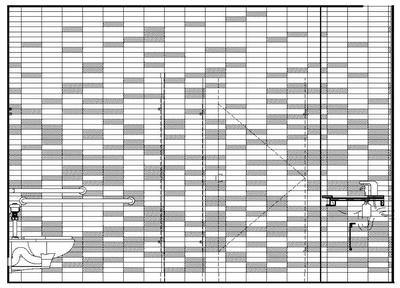
7 ELEVATION 321A
SCALE: 1/2" = 1'-0"



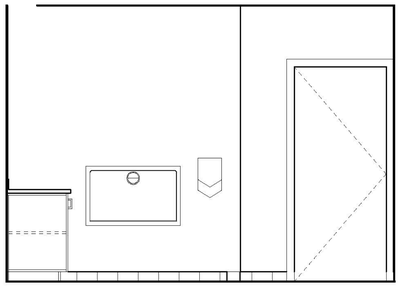
6 ELEVATION 320F
SCALE: 1/2" = 1'-0"



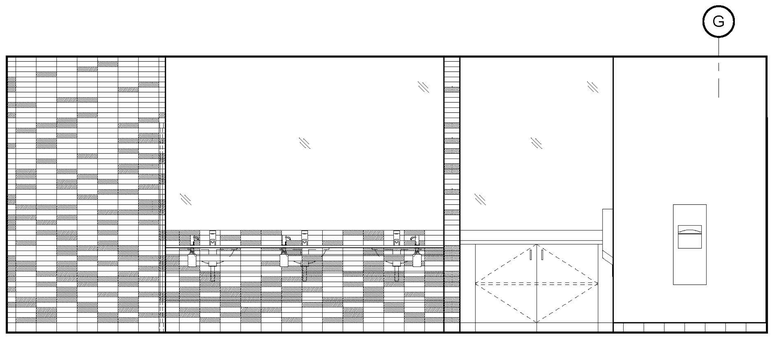
4 ELEVATION 320D
SCALE: 1/2" = 1'-0"



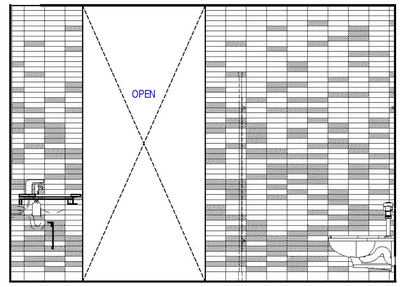
3 ELEVATION 320C
SCALE: 1/2" = 1'-0"



5 ELEVATION 320E
SCALE: 1/2" = 1'-0"



2 ELEVATION 320B
SCALE: 1/2" = 1'-0"



1 ELEVATION 320A
SCALE: 1/2" = 1'-0"

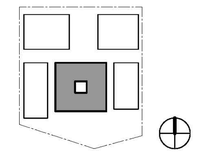
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

INTERIOR ELEVATIONS BATHROOM 320 AND 321

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:39:40 PM

PROJECT NUMBER
13032

SHEET NUMBER

A6.1.45

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

DOOR SCHEDULE

DOOR NO.	ROOM NUMBER	ROOM NAME	TYPE	DOOR WIDTH	DOOR HEIGHT	DOOR THK	DOOR MTR'L	FRAME DETAIL HEAD	FRAME DETAIL JAMB	FRAME DETAIL SILL	FRAME DETAIL MAT'L	FRAME DETAIL FINISH	RATING REQ'D	HDWE GRP	REMARKS
GROUND FLOOR															
B01A	B01	CORRIDOR		6'-0"	7'-0"	2"									
B01B	B25	LARGE CONFERENCE RM.		6'-0"	7'-0"	2"									
B01C				4'-3 11/32"	14'-1 1/2"										
B01D	B01	CORRIDOR		6'-0"	7'-0"	2"									
B02A	B01	CORRIDOR		3'-0"	7'-0"	2"									
B02B				4'-3 11/32"	14'-1 1/2"										
B03A	B09	CONFERENCE RM.5		3'-0"	7'-0"	2"									
B03A	B03	BIKE STORAGE		3'-0"	7'-0"	2"									
B04A	B04	MEN		3'-0"	7'-0"	2"									
B05A	B05	WOMEN		3'-0"	7'-0"	2"									
B06A	B06	CONFERENCE RM. 2		3'-0"	7'-0"	2"									
B06B	B06	CONFERENCE RM. 2		3'-0"	7'-0"	2"									
B07A	B07	CONFERENCE RM.3		3'-0"	7'-0"	2"									
B08A	B08	CONFERENCE RM.4		3'-0"	7'-0"	2"									
B10A	B10	LOBBY		4'-7 21/32"	14'-1 1/2"										
B10A	B10	LOBBY		4'-7 21/32"	14'-1 1/2"										
B10B	B10	LOBBY		4'-7 21/32"	14'-1 1/2"										
B10B	B10	LOBBY		4'-7 21/32"	14'-1 1/2"										
B10C	B10	LOBBY		4'-7 21/32"	14'-1 1/2"										
B10C	B10	LOBBY		4'-7 21/32"	14'-1 1/2"										
B10D	B10	LOBBY		4'-7 21/32"	14'-1 1/2"										
B10D	B10	LOBBY		4'-7 21/32"	14'-1 1/2"										
B11A	B11	FITNESS CENTER		6'-0"	8'-0"	2"									
B11B	B11	FITNESS CENTER		3'-0"	7'-0"	2"									
B12A				6'-0"	7'-0"	2"									
B13A	B13	MEN LOCKER		3'-0"	7'-0"	2"									
B14A	B14	MEN		3'-0"	7'-0"	2"									
B15A	B15	WOMEN LOCKER		3'-0"	7'-0"	2"									
B16A	B16	WOMEN		3'-0"	7'-0"	2"									
B17A	B17	KITCHEN		6'-0"	7'-0"	2"									
B18A	B17	KITCHEN		6'-0"	7'-0"	2"									
B18B	B18	TRASH AREA		6'-0"	7'-0"	2"									
B19A	B19	STAIR 1		3'-0"	7'-0"	2"									
B20A	B20	MEP		3'-0"	7'-0"	2"									
B21A	B21	STORAGE		3'-0"	7'-0"	2"									
B23A (E)	B23	MACH RM		3'-0"	7'-0"	2"									
B24A	B24	F.C.		3'-0"	7'-0"	2"									
B26A	B25	LARGE CONFERENCE RM.		3'-0"	7'-0"	2"									
B27A	B27	STORAGE		3'-0"	7'-0"	2"									
B28A	B28	AUDIO VISUAL		3'-0"	7'-0"	2"									
B29A	B29	STORAGE		3'-0"	7'-0"	2"									
B32A	B32	STORAGE		3'-0"	7'-0"	2"									
B33A	B33	STORAGE		3'-0"	7'-0"	2"									
B34A	B34	STORAGE		3'-0"	7'-0"	2"									
B35A	B35	STORAGE		3'-0"	7'-0"	2"									
B35B (E)	B35	STORAGE		6'-0"	7'-0"	2"									
B36A (E)	B31	PARKING		6'-0"	7'-0"	2"									
B37A (E)	B37	ELEV MACH		3'-0"	7'-0"	2"									
B37B	B37	ELEV MACH		3'-0"	7'-0"	2"									
B38A	B31	PARKING		3'-0"	7'-0"	2"									
B38B				3'-0"	7'-0"	2"									
B38C	X001	ELEV 3		6'-0"	7'-0"	2"									
B39A (E)	B46	LOADING		6'-0"	7'-0"	2"									
B41A	B41	UNASSIGNED		3'-0"	7'-0"	2"									
B41B	B41	UNASSIGNED		3'-0"	7'-0"	2"									
B42A	B42	RESTROOM		3'-0"	7'-0"	2"									
B43A (E)	B43	STAIR 2		3'-0"	7'-0"	2"									
B44A	B44	OFFICE		3'-0"	7'-0"	2"									
B46A	B46	LOADING		6'-0"	7'-0"	2"									
B47A (E)	B45	CORRIDOR		3'-0"	7'-0"	2"									
B48A (E)	B48	ELECTRICAL RM		6'-0"	7'-0"	2"									
B49A	B49	GENERATOR		3'-0"	7'-0"	2"									
B50A	B50	SHOP		3'-0"	7'-0"	2"									
B51A	B51	STORAGE		3'-0"	7'-0"	2"									
B52A	B52	STORAGE		3'-0"	7'-0"	2"									
B53A	B53	STORAGE		3'-0"	7'-0"	2"									
B221	B31	PARKING		6'-0"	7'-0"	2"									
FIRST FLOOR															
101A				2'-11"	8'-11"										
101A				2'-11 1/2"	8'-11"										
101B				2'-11 1/2"	8'-11"										
101B				2'-11"	8'-11"										
101C	101	MAIN LOBBY		5'-4"	6'-8"	2"									
101D (E)	101	MAIN LOBBY		5'-4"	7'-0"	2"									
101E	101	MAIN LOBBY		6'-0"	7'-0"	1 3/4"									
101F	101	MAIN LOBBY		6'-0"	7'-0"	1 3/4"									
101G	110	COURTYARD		2'-10 1/2"	8'-11"										
101G	110	COURTYARD		2'-10 1/2"	8'-11"										
102A (E)	T101	TENANT SPACE 01		3'-0"	7'-0"	2"									
103A	103	CORRIDOR		6'-0"	8'-0"	2"									
104A	104	CORRIDOR		6'-0"	7'-0"	1 3/4"									
104B	110	COURTYARD		3'-0"	7'-0"										
104C	110	COURTYARD		3'-0"	7'-0"										
104D	104	CORRIDOR		6'-0"	7'-0"	1 3/4"									
104E				4'-10"	10'-11 1/4"										
104E				4'-10"	10'-11 1/4"										
104F (E)	104	CORRIDOR		5'-4"	6'-8"	2"									
105A	105	MEN		3'-0"	7'-0"	2"									

DOOR SCHEDULE

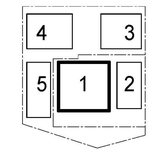
DOOR NO.	ROOM NUMBER	ROOM NAME	TYPE	DOOR WIDTH	DOOR HEIGHT	DOOR THK	DOOR MTR'L	FRAME DETAIL HEAD	FRAME DETAIL JAMB	FRAME DETAIL SILL	FRAME DETAIL MAT'L	FRAME DETAIL FINISH	RATING REQ'D	HDWE GRP	REMARKS
106A	T102A	TENANT 02 RESTAURANT		3'-0"	7'-0"	2"									
107A (E)	107	TEL.		3'-0"	7'-0"	2"									
108A (E)	108	ELEC.		3'-0"	7'-0"	2"									
109A	109	STORAGE		3'-0"	7'-0"	2"									
111A	T101	TENANT SPACE 01		5'-4"	6'-8"	2"									
119A (E)	119	STAIR #1		3'-0"	7'-0"	2"									
120A	120	WOMEN		3'-0"	7'-0"	2"									
121A	121	MEN		3'-0"	7'-0"	2"									
122A (E)	122	STORAGE		3'-0"	7'-0"	2"									
590	111	CORRIDOR		4'-0"	7'-0"										
591	T101	TENANT SPACE 01		4'-0"	7'-0"										
T101A	110	COURTYARD		3'-1"	6'-8"										
T102AB	T102A	TENANT 02 RESTAURANT		5'-4"	6'-8"	2"									
T102AC	T102A	TENANT 02 RESTAURANT		3'-1"	6'-8"										
T102AD	T102A	TENANT 02 RESTAURANT		6'-0"	8'-0"	2"									
T103A	T103	TENANT SPACE 03		5'-4"	6'-8"	2"									
T103B	T103	TENANT SPACE 03		6'-0"	9'-0"										
SECOND FLOOR															
200A	200	LOBBY		3'-0 1/32"	14'-0"										
200B	200	LOBBY		3'-0"	14'-0"										
202A (E)	202	TELE		3'-0"	7'-0"	2"									
203A (E)	203	ELEC		3'-0"	7'-0"	2"									
204A (E)	204	ELEC RM		3'-0"	7'-0"	2"									
205A	205	WOMEN		3'-0"	7'-0"	2"									
205A (E)	205	TELE		3'-0"	7'-0"	2"									
206A	206	MEN		3'-0"	7'-0"	2"									
209A (E)	209	CORRIDOR		7'-3"	7'-0"	2"									
209B (E)	209	CORRIDOR		6'-0"	6'-10"	2"									
209C (E)	209	CORRIDOR		6'-0"	6'-10"	2"									
209D (E)	209	CORRIDOR		6'-0"	6'-10"	2"									
209E (E)	209	CORRIDOR		7'-3"	7'-0"	2"									
210A (E)	210	STAIR		6'-0"	6'-10"	2"									
211A (E)	211	RM 2119		3'-0"	7'-0"	2"									
212A (E)	212	RM 2969		3'-0"	7'-0"	2"									
213A	213	COFFEE		3'-0"	7'-0"	2"									
219A (E)	219	STAIR		5'-4"	7'-0"	2"									
220A	220	WOMEN		3'-0"	7'-0"	2"									
221A	221	MEN		3'-0"	7'-0"	2"									
222A (E)	222	CORRIDOR		3'-0"	7'-0"	2"									
223A (E)	222	CORRIDOR		3'-0"	7'-0"	2"									
415				7'-6"	8'-4 1/4"	2"									
418				7'-6"	8'-4 1/4"	2"									
424				7'-6"	8'-4 1/4"	2"									
428				7'-6"	8'-4 1/4"	2"									
430				7'-6"	8'-4 1/4"	2"									
431	209	CORRIDOR		7'-6"	8'-4 1/4"	2"									
452				7'-6"	8'-4 1/4"	2"									
456				7'-6"	8'-4 1/4"	2"									
457	209	CORRIDOR		7'-6"	8'-4 1/4"	2"									
458				7'-6"	8'-4 1/4"	2"									
592				5'-0"	7'-0"										
T201A (E)	T201	TENANT SPACE		3'-0"	7'-0"	2"									
T201C (E)	T201	TENANT SPACE		3'-0"	7'-0"	2"									
T201D (E)	209	CORRIDOR		3'-0"	7'-0"	2"									
THIRD FLOOR															
300A (E)	T302	TENANT SPACE		6'-0 1/32"	13'-5"										
301D (E)	301	CORRIDOR		3'-0"	7'-0"	2"									
303A (E)	303	STOR		3'-0"	7'-0"	2"									
304A (E)	304	ELEC		3'-0"	7'-0"	2"									
305A	305	WOMEN		3'-0"	7'-0"	2"									
306A	306	MEN		3'-0"	7'-0"	2"									
310A (E)	310	ELEC		3'-0"	7'-0"	2"									
311A (E)	311	ELEC		3'-0"	7'-0"	2"									
311A (E)	301	CORRIDOR		6'-8 1/2"	7'-0"	2"									
311B (E)	301	CORRIDOR		7'-3"	7'-0"	2"									
311B (E)				6'-8 1/2"	7'-0"	2"									
311C (E)	301	CORRIDOR		6'-0"	7'-0"	2"									
311E (E)	301	CORRIDOR		6'-0"	7'-0"	2"									
312A (E)	312	STOR		3'-0"	7'-0"	2"									
316A (E)	316	STAIR #2		2'-8"	7'-0"	2"									
318A	318	STORAGE		2'-6"	7'-0"	2"									
319A (E)	319	STAIR #1		5'-4"	7'-0"	2"									
319B (E)	319	STAIR #1		3'-0"	7'-0"	2"									
320A	320	WOMEN		3'-0"	7'-0"	2"									
321A	321	MEN		3'-0"	7'-0"	2"									
322A	322	STORAGE		2'-6"	7'-0"	2"									
323A (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
324A	324	STORAGE		2'-6"	7'-0"	2"									
416				7'-6"	8'-4 1/4"	2"									
417	317	CORRIDOR		7'-6"	8'-4 1/4"	2"									
437				7'-6"	8'-4 1/4"	2"									
438	301	CORRIDOR		7'-6"	8'-4 1/4"	2"									
439				7'-6"	8'-4 1/4"	2"									
455				7'-6"	8'-4 1/4"	2"									
T302A (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
T302B (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
T302C (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
T302D (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
T302E (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
T302F (E)	301	CORRIDOR		6'-0"	13'-5"										
T302G (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
T302H (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
T302J (E)	T302	TENANT SPACE		3'-0"	7'-0"	2"									
T318A	T318	TENANT SPACE		3'-0"	7'-0"	2"									

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

DOOR SCHEDULE

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:39:42 PM

PROJECT NUMBER
13032

SHEET NUMBER

A7.1.00

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	FLOOR FIN./ MAT'L	WALLS				BASE				CEILING FIN./ MAT'L	REMARKS
			WALL NORTH	WALL EAST	WALL SOUTH	WALL WEST	BASE NORTH	BASE EAST	BASE SOUTH	BASE WEST		
GROUND FLOOR												
B01	CORRIDOR	CPT-4	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	PT-2	PAINTED GYP CEILING
B02	CARDIO	CPT-5	PT-1	PT-1	PT-1	GL-4	RB-2	RB-2	RB-2	RB-2	ACT-2	
B03	BIKE STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
B04	MEN	T-1	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
B05	WOMEN	T-1	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
B06	CONFERENCE RM. 2	CPT-3	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	ACT-2	
B07	CONFERENCE RM.3	CPT-3	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	ACT-2	
B08	CONFERENCE RM.4	CPT-3	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	ACT-2	
B09	CONFERENCE RM.5	CPT-3	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	ACT-2	
B10	LOBBY	CPT-4	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	PT-2	PAINTED GYP CEILING
B11	FITNESS CENTER	CPT-5	PT-1	PT-1	PT-1	PT-1	RB-2	RB-2	RB-2	RB-2	ACT-2	
B12	LOCKER LOUNGE	CPT-5	PT-1	PT-1	PT-1	PT-1	RB-2	RB-2	RB-2	RB-2	ACT-2	
B13	MEN LOCKER	CPT-5	PT-1	PT-1	PT-1	PT-1	RB-2	RB-2	RB-2	RB-2	ACT-2	
B14	MEN	T-1	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
B15	WOMEN LOCKER	CPT-5	PT-1	PT-1	PT-1	PT-1	RB-2	RB-2	RB-2	RB-2	ACT-2	
B16	WOMEN	T-1	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
B17	KITCHEN	T-3	PT-9	PT-9	PT-9	PT-9	T-4	T-4	T-4	T-4	PT-9	PAINTED GYP CEILING
B18	TRASH AREA	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B19	STAIR 1											EXISTING TO REMAIN
B20	MEP	VCT-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B21	STORAGE	VT-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
B22	CORRIDOR	CPT-4	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	ACT-2	
B23	MACH RM											EXISTING TO REMAIN
B24	F.C.	VT-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B25	LARGE CONFERENCE RM.	CPT-3	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	ACT-2	
B26	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B27	STORAGE	VT-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
B28	AUDIO VISUAL	VT-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
B29	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B31	PARKING	CONC-1	PT-1	PT-1	PT-1	PT-1	CONC-1	CONC-1	CONC-1	CONC-1	EXPOSED	
B32	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B33	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B34	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B35	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B36	MPOE											EXISTING TO REMAIN
B37	ELEV MACH											EXISTING TO REMAIN
B38	CORRIDOR	CPT-4	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
B39	TRASH											EXISTING TO REMAIN
B40	TBD	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B41	UNASSIGNED	CPT-2	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
B42	RESTROOM	T-1	PT-9; T-2	PT-9; T-2	PT-9; T-2	PT-9; T-2	T-2	T-2	T-2	T-2	PT-8	PAINTED GYP CEILING
B43	STAIR 2											EXISTING TO REMAIN
B44	OFFICE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
B45	CORRIDOR	CPT-4	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
B46	LOADING	CONC-1	PT-1	PT-1	PT-1	PT-1	CONC-1	CONC-1	N/A	RB-1	EXPOSED	
B47	TRANSFORMER RM											EXISTING TO REMAIN
B48	ELECTRICAL RM											EXISTING TO REMAIN
B49	GENERATOR	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B50	SHOP	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B51	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B52	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
B53	STORAGE	CONC-1	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	EXPOSED	
FIRST FLOOR												
101	MAIN LOBBY	EXISTING	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	ACT-1	
102	CLOSET	CPT-3	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	ACT-2	
103	CORRIDOR	CPT-4	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	PT-2	PAINTED GYP CEILING
104	CORRIDOR											
105	MEN	T-1	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
106	WOMEN	T-1	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
107	TEL.											EXISTING TO REMAIN
108	ELEC.											EXISTING TO REMAIN
109	STORAGE											
110	COURTYARD											REFER TO LANDSCAPE DRWINGS
111	CORRIDOR											
119	STAIR #1											EXISTING TO REMAIN
120	WOMEN	T-1	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
121	MEN	T-1	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
122	STORAGE											EXISTING TO REMAIN
143	STAIR #2											EXISTING TO REMAIN
T101	TENANT SPACE 01											NIC BY TENANT
T102A	TENANT 02 RESTAURANT											NIC BY TENANT
T102B	KITCHEN											NIC BY TENANT
T103	TENANT SPACE 03											
SECOND FLOOR												
200	LOBBY	CPT-4	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	PT-2	PAINTED GYP CEILING
202	TELE											EXISTING TO REMAIN
203	ELEC											EXISTING TO REMAIN
204	ELEC RM											EXISTING TO REMAIN
205	TELE											EXISTING TO REMAIN
205	WOMEN	T-1	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
206	MEN	T-1	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
209	CORRIDOR	CPT-4	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	PT-2	PAINTED GYP CEILING
210	STAIR											EXISTING TO REMAIN
211	RM 2119											EXISTING TO REMAIN
212	RM 2969											EXISTING TO REMAIN
213	COFFEE											EXISTING TO REMAIN
219	STAIR											
220	WOMEN	T-1	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
221	MEN	T-1	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
222	CORRIDOR											
223	CORRIDOR											
T201	TENANT SPACE											NIC BY TENANT
THIRD FLOOR												
300	LOBBY	CPT-4	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	PT-2	PAINTED GYP CEILING
301	CORRIDOR	CPT-4	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	PT-2	PAINTED GYP CEILING
303	STOR											EXISTING TO REMAIN
304	ELEC											EXISTING TO REMAIN
305	WOMEN	T-1	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
306	MEN	T-1	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
310	ELEC											EXISTING TO REMAIN
311	ELEC											EXISTING TO REMAIN
312	STOR											EXISTING TO REMAIN
315	VENDING											EXISTING TO REMAIN
316	STAIR #2											EXISTING TO REMAIN
317	CORRIDOR											
318	STORAGE											
319	STAIR #1											EXISTING TO REMAIN
320	WOMEN	T-1	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	PT-9; T-2,T-4	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
321	MEN	T-1	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	PT-9; T-2,T-3	T-1	T-1	T-1	T-1	PT-8	PAINTED GYP CEILING
322	STORAGE											
323	STOR											EXISTING TO REMAIN
324	STORAGE											
T302	TENANT SPACE											NIC BY TENANT
T318	TENANT SPACE	CPT-3	PT-1	PT-1	PT-1	PT-1	WD-3	WD-3	WD-3	WD-3	ACT-2	NIC BY TENANT

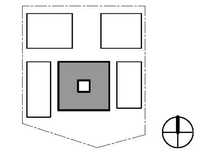
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
(323) 224 6000 • (323) 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

ROOM FINISH SCHEDULE

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:39:44 PM

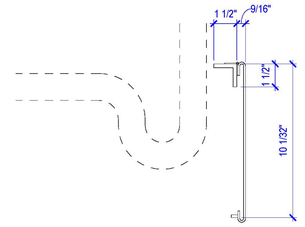
PROJECT NUMBER
13032

SHEET NUMBER

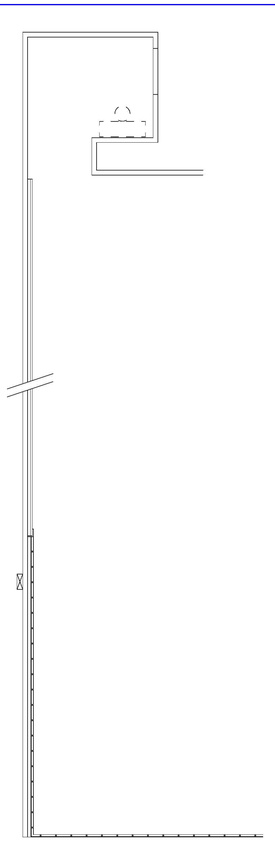
A7.1.10

COPYRIGHT © 2013 JOHNSON FAIN

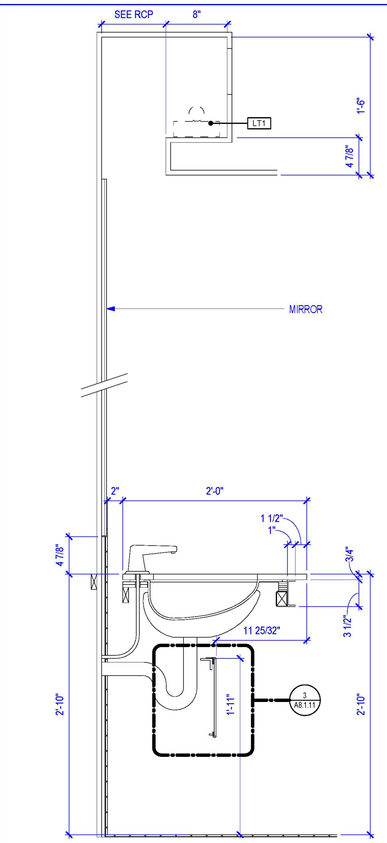
NOTE: NOT FOR CONSTRUCTION



SINK KICK DETAIL
SCALE: 3" = 1'-0" 3



SECTION AT CABINET
SCALE: 1 1/2" = 1'-0" 5



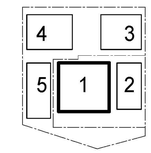
SECTION AT SINK
SCALE: 1 1/2" = 1'-0" 1

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
DETAILS- INTERIOR

ARCHITECT
JOHNSON FAIN

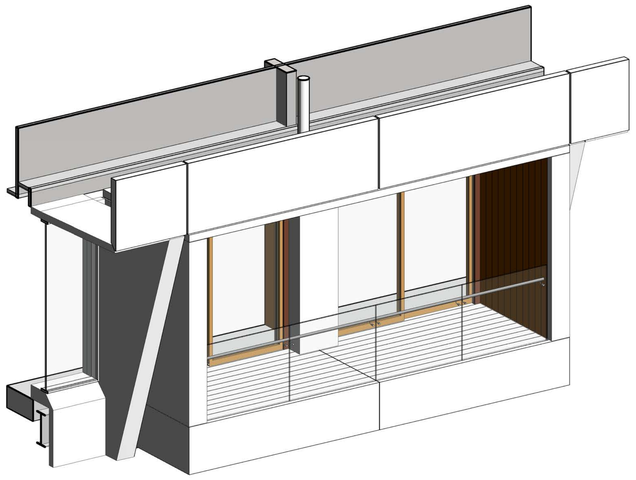
PLOT STAMP
10/14/2015 7:39:46 PM

PROJECT NUMBER
13032

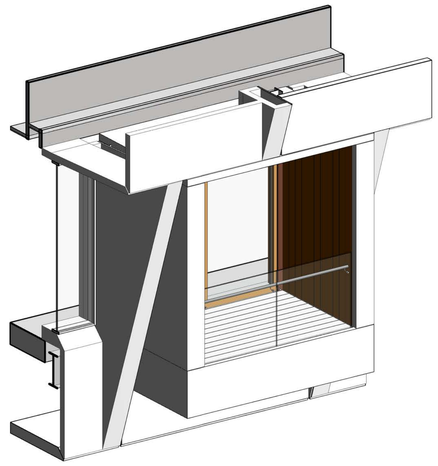
SHEET NUMBER
A8.1.11

COPYRIGHT © 2013 JOHNSON FAIN

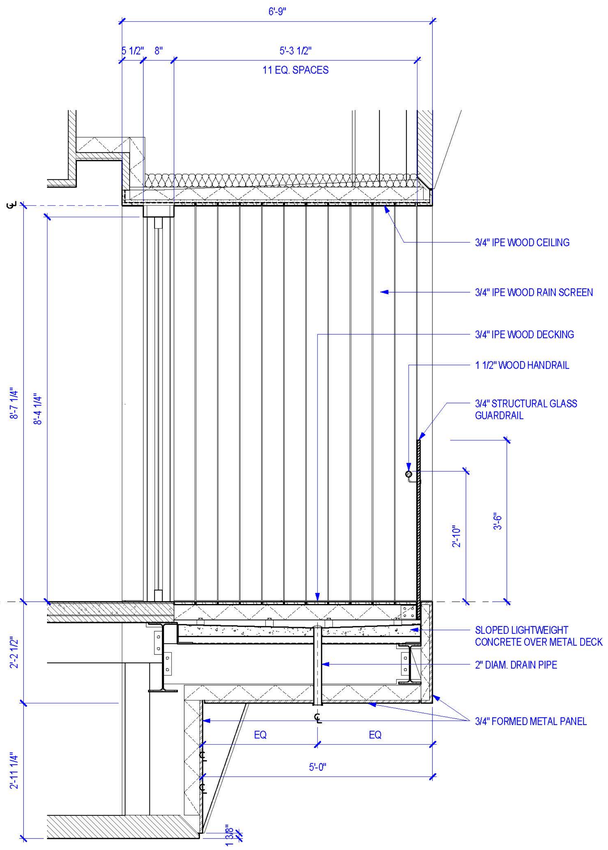
NOTE: NOT FOR CONSTRUCTION



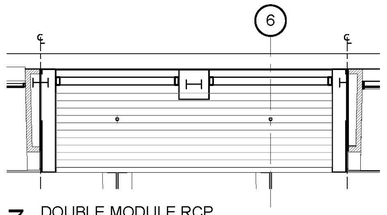
8 3D VIEW - DOUBLE MODULE
SCALE:



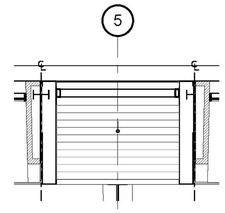
4 3D VIEW - SINGLE MODULE
SCALE:



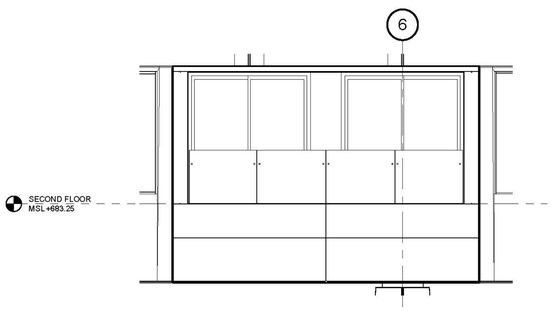
9 SECTION - SINGLE/DOUBLE MODULE
SCALE: 3/4" = 1'-0"



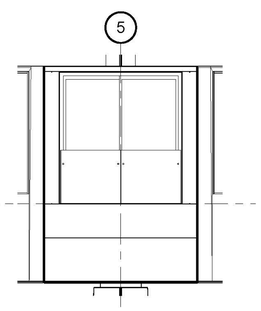
7 DOUBLE MODULE RCP
SCALE: 1/4" = 1'-0"



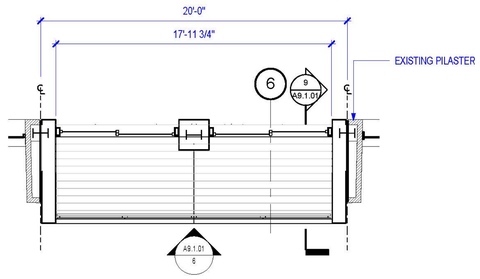
3 SINGLE MODULE RCP
SCALE: 1/4" = 1'-0"



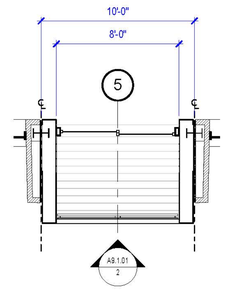
6 DOUBLE MODULE ELEVATION
SCALE: 1/4" = 1'-0"



2 SINGLE MODULE ELEVATION
SCALE: 1/4" = 1'-0"



5 DOUBLE MODULE PLAN
SCALE: 1/4" = 1'-0"



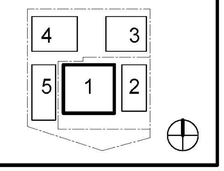
1 SINGLE MODULE PLAN
SCALE: 1/4" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ENLARGED DRAWINGS - COURTYARD TERRACE BOXES

ARCHITECT
JOHNSON FAIN

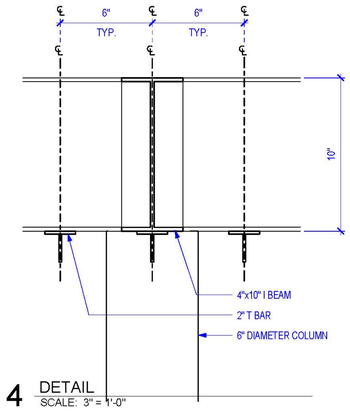
PLOT STAMP
10/14/2015 7:39:55 PM

PROJECT NUMBER
13032

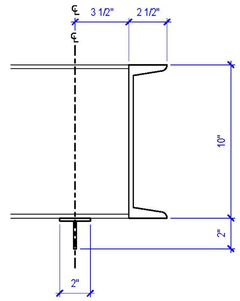
SHEET NUMBER
A9.1.01

COPYRIGHT © 2013 JOHNSON FAIN

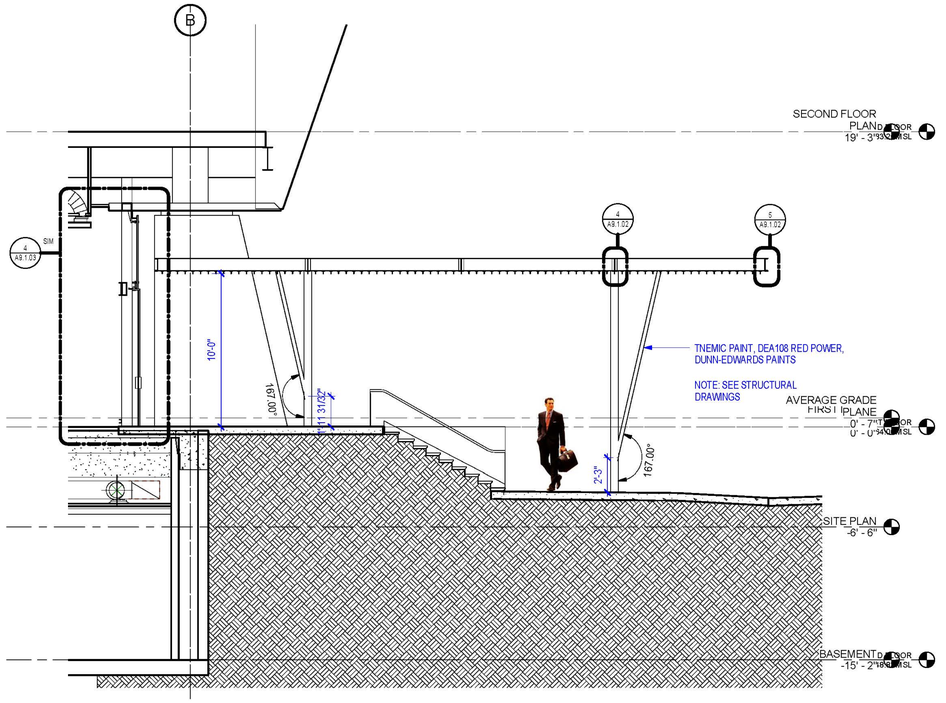
NOTE: NOT FOR CONSTRUCTION



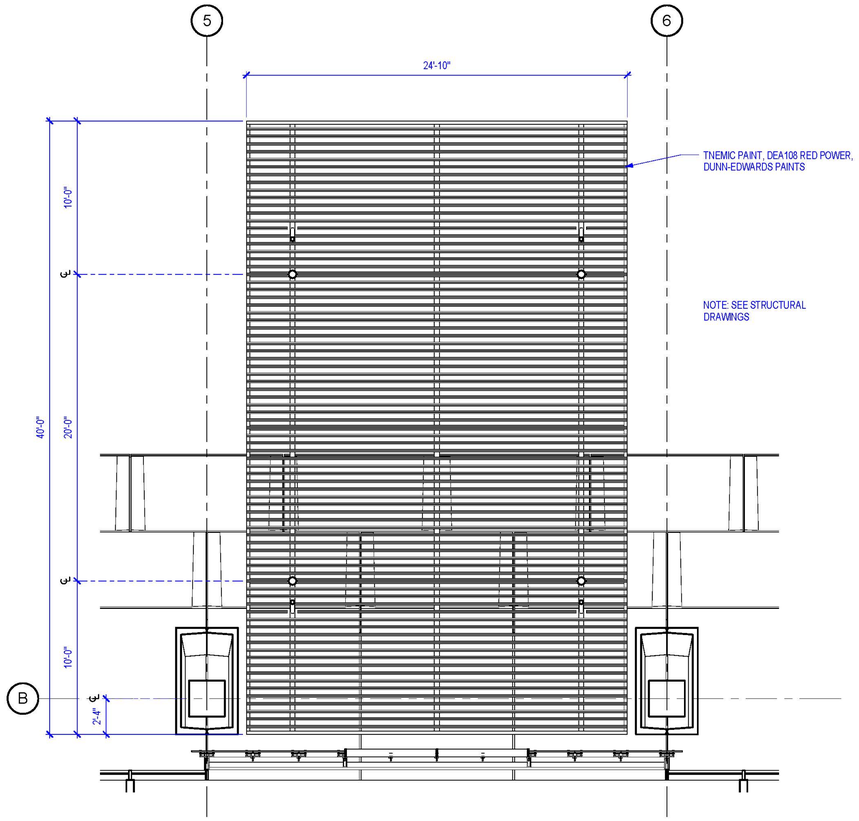
4 DETAIL
SCALE: 3" = 1'-0"



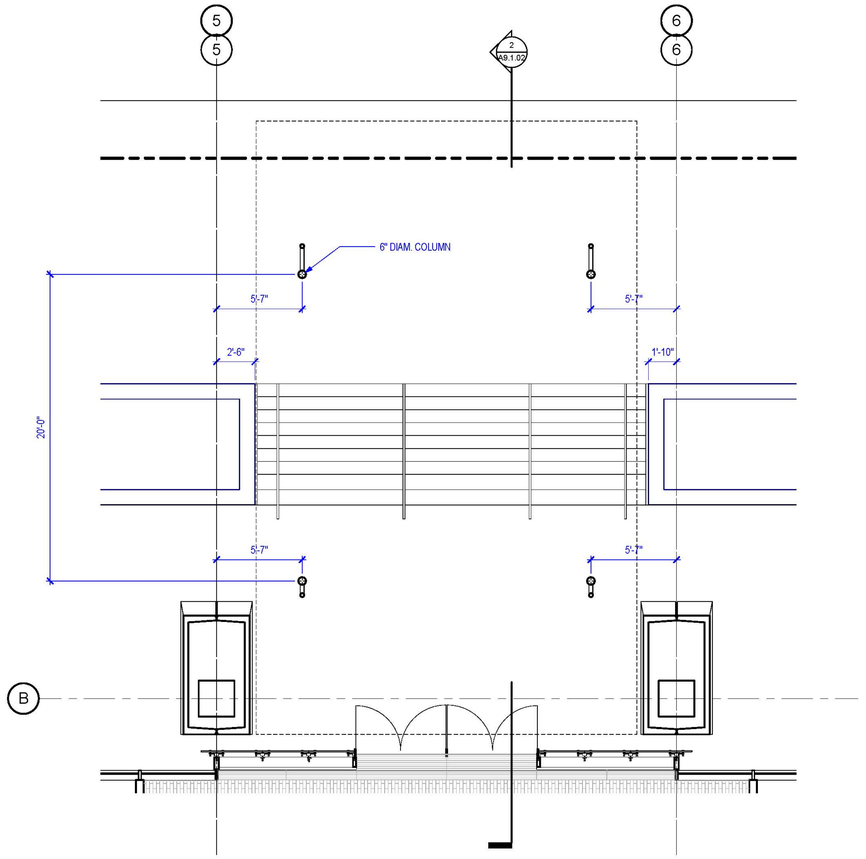
5 DETAIL
SCALE: 3" = 1'-0"



2 SECTION - ENTRANCE CANOPY
SCALE: 1/4" = 1'-0"



3 ENLARGED RCP - ENTRANCE CANOPY
SCALE: 1/4" = 1'-0"

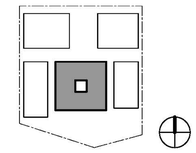


1 ENLARGED PLAN - ENTRANCE CANOPY
SCALE: 1/4" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
(323) 224 6000 • (323) 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ENLARGED DRAWINGS - ENTRANCE CANOPY

ARCHITECT
JOHNSON FAIN

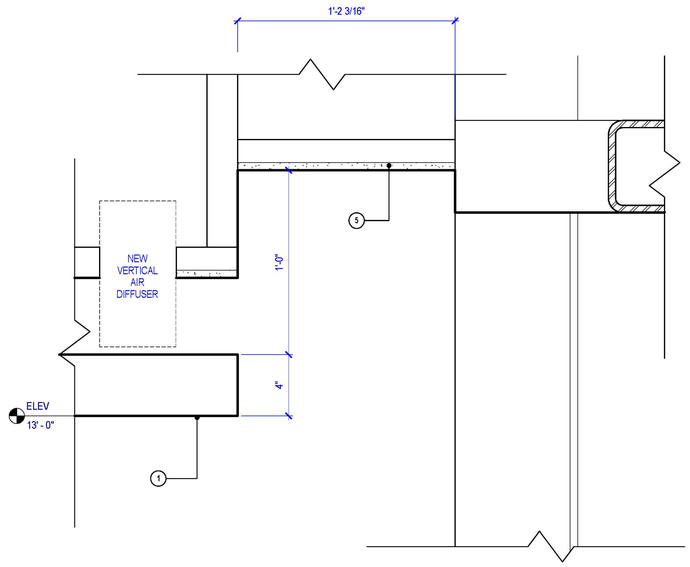
PLOT STAMP
10/14/2015 7:40:01 PM

PROJECT NUMBER
13032

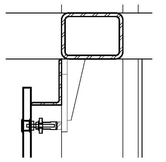
SHEET NUMBER
A9.1.02

COPYRIGHT © 2013 JOHNSON FAIN

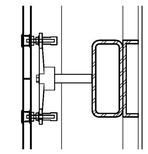
NOTE: NOT FOR CONSTRUCTION



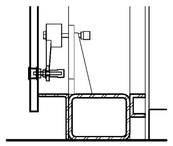
9 SOFFIT DETAIL
SCALE: 3" = 1'-0"



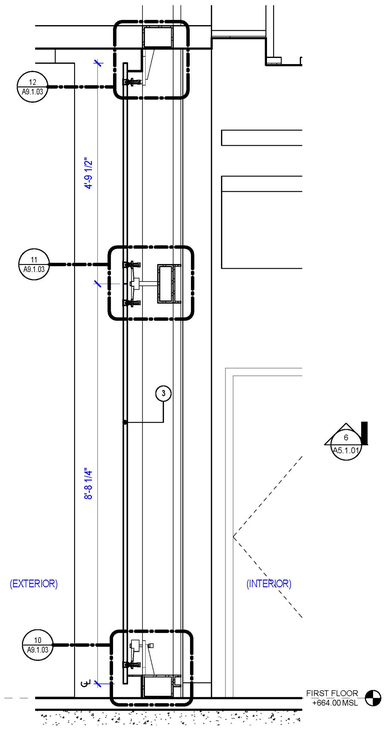
12 DETAIL
SCALE: 1 1/2" = 1'-0"



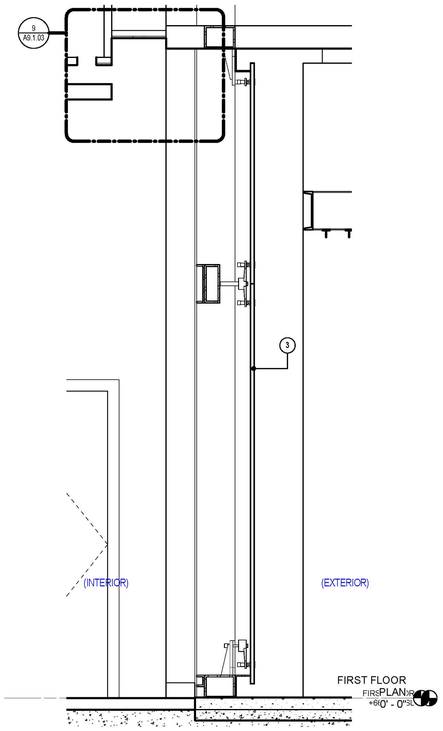
11 DETAIL
SCALE: 1 1/2" = 1'-0"



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

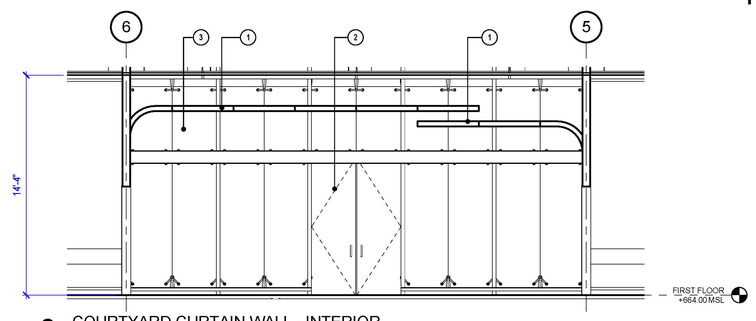


5 COURTYARD ENTRY CURTAIN WALL - WALL SECTION
SCALE: 3/4" = 1'-0"

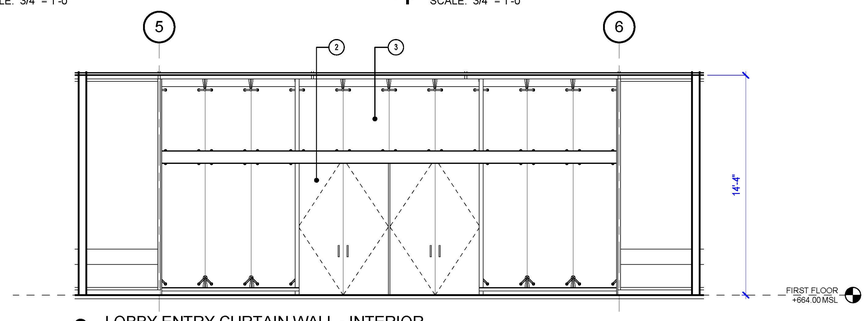


4 LOBBY ENTRY CURTAIN WALL - WALL SECTION
SCALE: 3/4" = 1'-0"

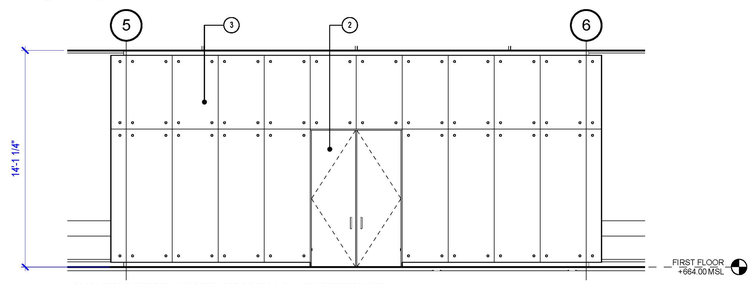
KEYNOTE LEGEND	
Key Value	Keynote Text
1	GRG-1
2	GL-3
3	GL-3
4	MTL-5
5	PT-3



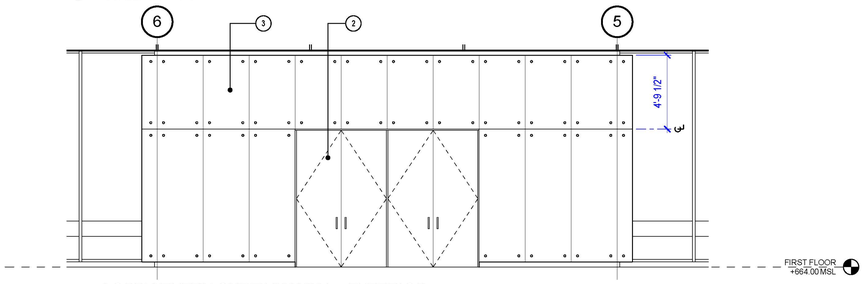
8 COURTYARD CURTAIN WALL - INTERIOR
SCALE: 1/4" = 1'-0"



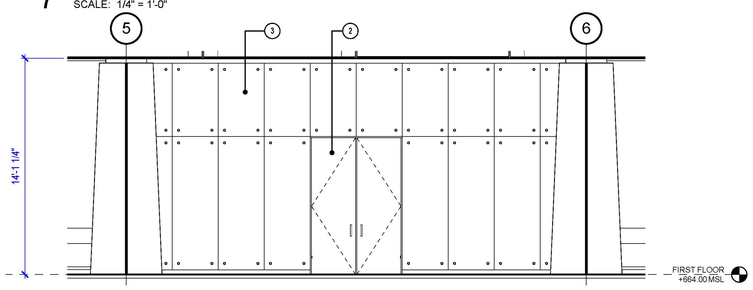
3 LOBBY ENTRY CURTAIN WALL - INTERIOR
SCALE: 1/4" = 1'-0"



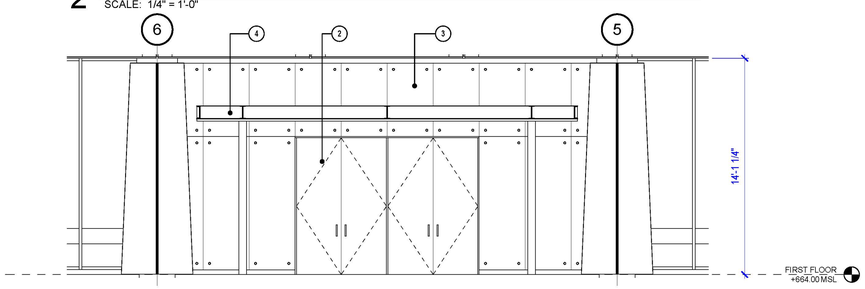
7 COURTYARD CURTAIN WALL - EXTERIOR
SCALE: 1/4" = 1'-0"



2 LOBBY ENTRY CURTAIN WALL - EXTERIOR
SCALE: 1/4" = 1'-0"



6 COURTYARD CURTAIN WALL - EXTERIOR B
SCALE: 1/4" = 1'-0"



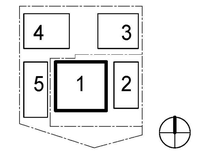
1 LOBBY ENTRY CURTAIN WALL - EXTERIOR B
SCALE: 1/4" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ENLARGED DRAWINGS - ENTRY LOBBY/ ENTRY CURTAIN WALLS

ARCHITECT
JOHNSON FAIN

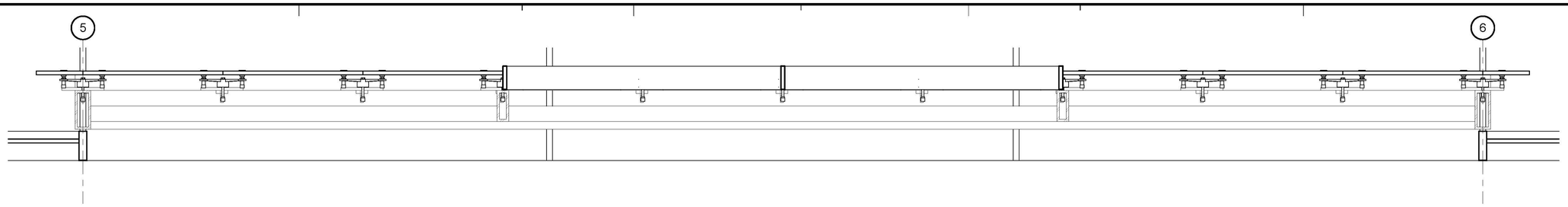
PLOT STAMP
10/14/2015 7:40:07 PM

PROJECT NUMBER
13032

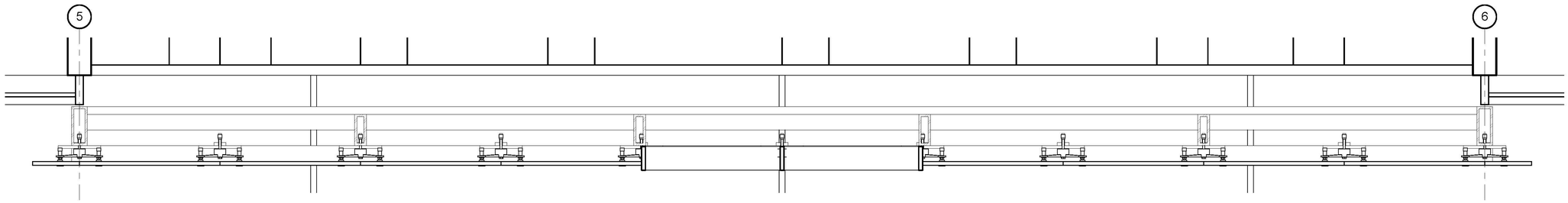
SHEET NUMBER
A9.1.03

COPYRIGHT © 2013 JOHNSON FAIN

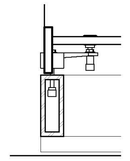
NOTE: NOT FOR CONSTRUCTION



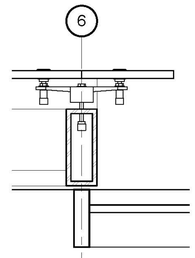
6 ENLARGED RCP - LOBBY ENTRY GLAZING
SCALE: 1" = 1'-0"



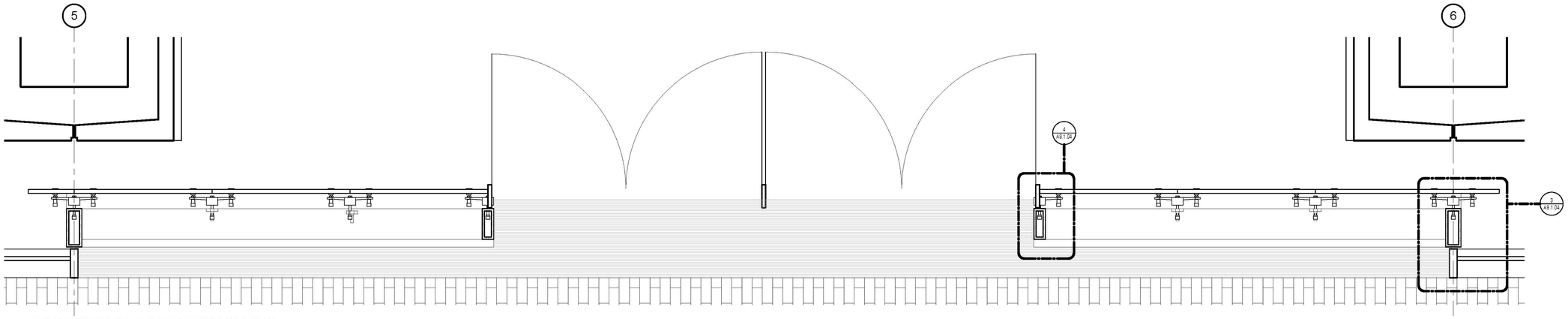
5 ENLARGED RCP - COURTYARD ENTRY GLAZING
SCALE: 1" = 1'-0"



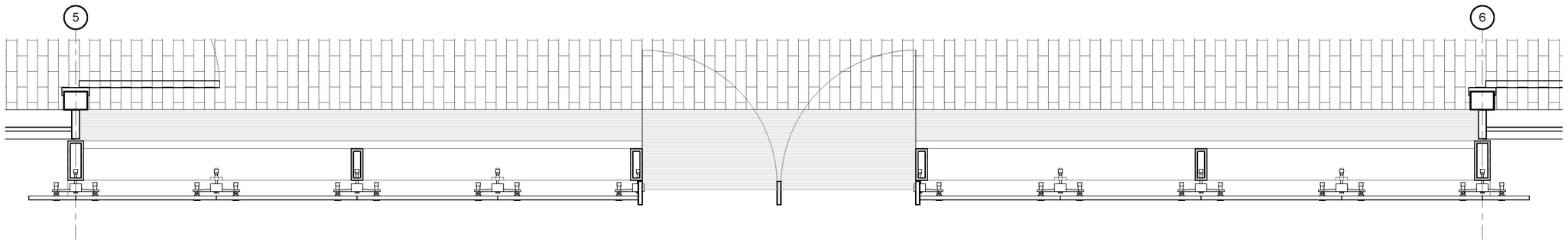
4 DETAIL
SCALE: 1 1/2" = 1'-0"



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



2 ENLARGED PLAN - LOBBY ENTRY GLAZING
SCALE: 1" = 1'-0"



1 ENLARGED PLAN - COURTYARD ENTRY GLAZING
SCALE: 1" = 1'-0"

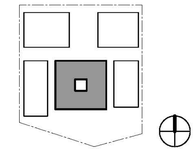
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
(323) 224 6000 • (323) 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

ENTRY LOBBY CURTAIN WALLS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 7:40:12 PM

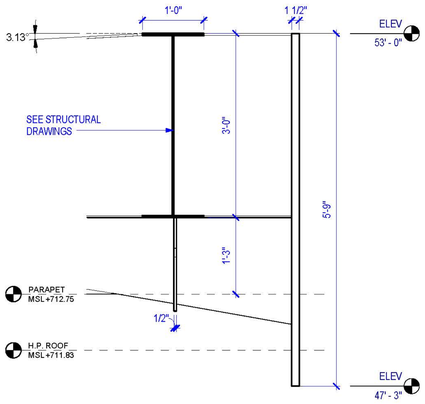
PROJECT NUMBER
13032

SHEET NUMBER

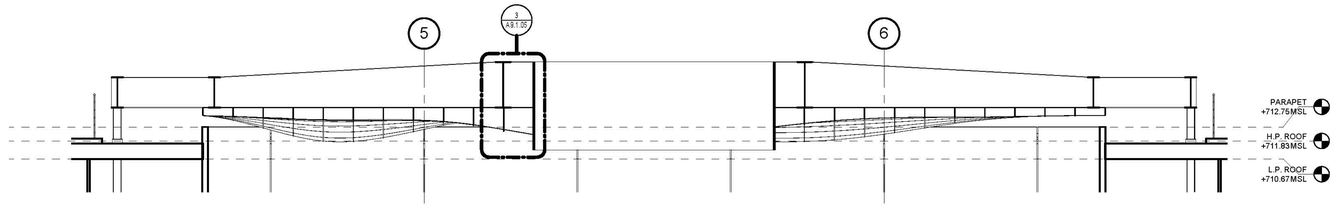
A9.1.04

COPYRIGHT © 2013 JOHNSON FAIN

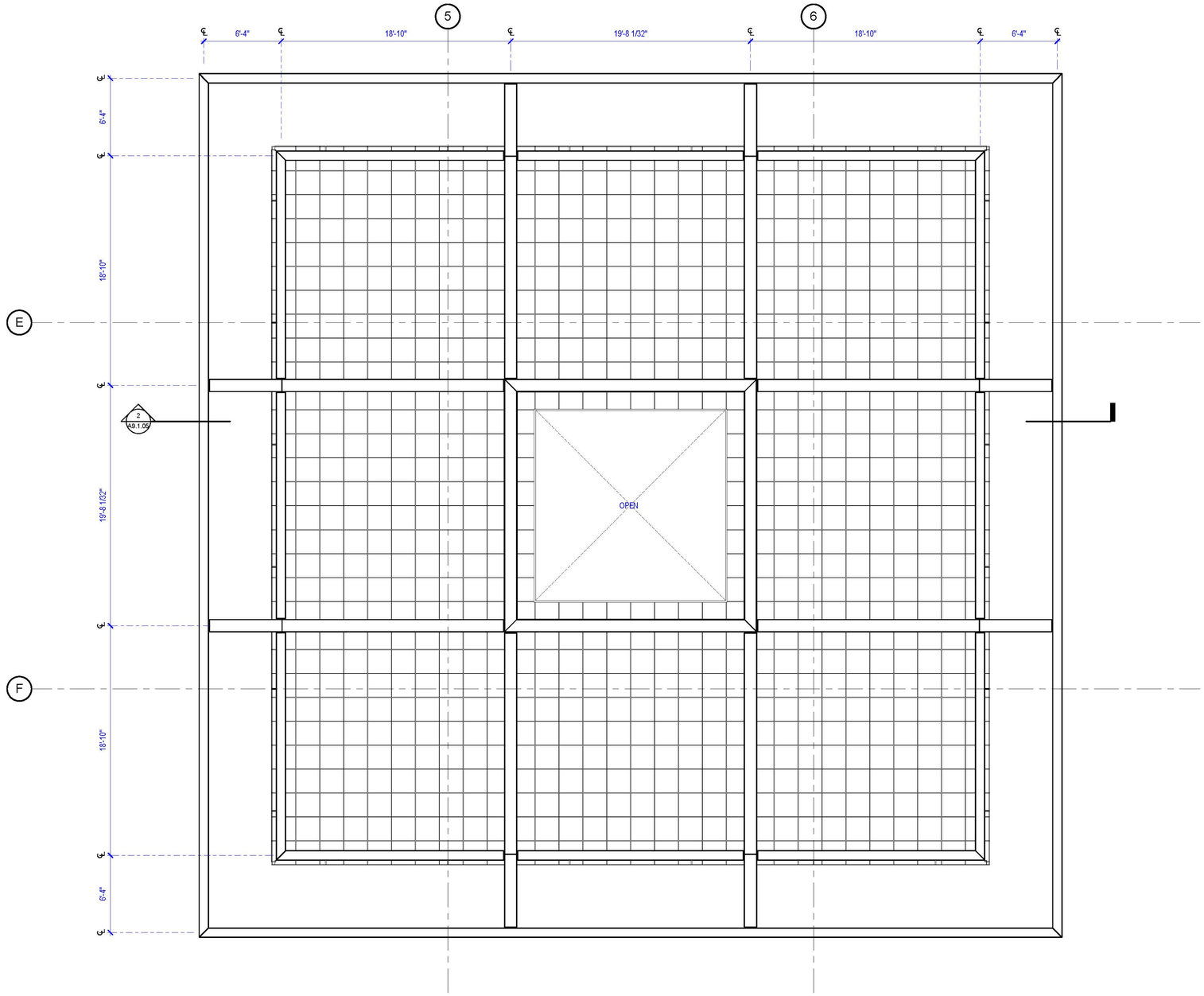
NOTE: NOT FOR CONSTRUCTION



3 ENLARGED SECTION
SCALE: 1" = 1'-0"



2 ENLARGED SECTION - COURTYARD TRELLIS
SCALE: 1/4" = 1'-0"

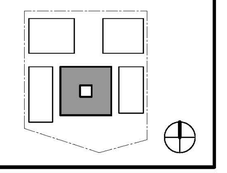


1 ENLARGED PLAN - COURTYARD TRELLIS
SCALE: 1/4" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ENLARGED DRAWINGS - COURTYARD TRELLIS

ARCHITECT
JOHNSON FAIN

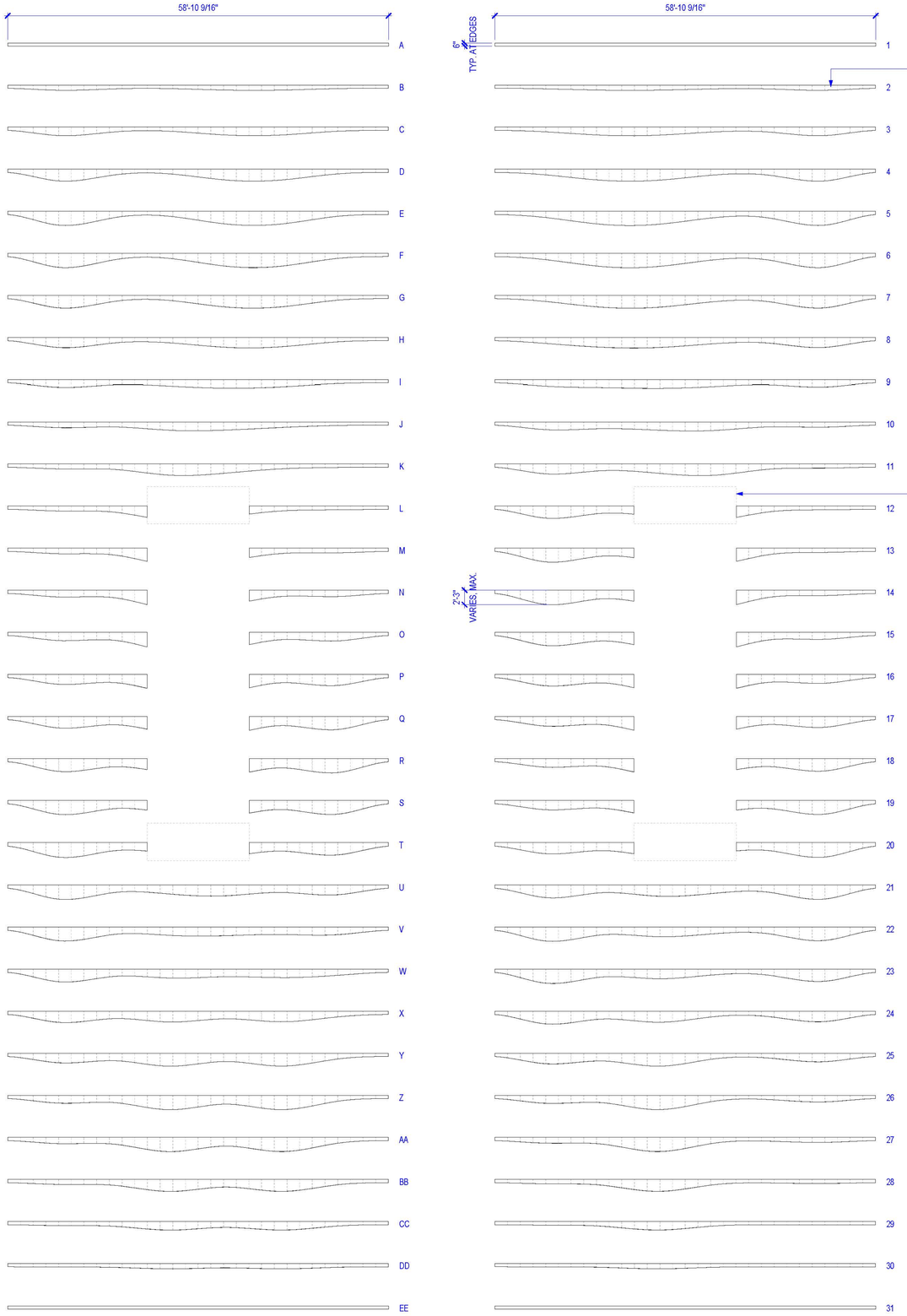
PLOT STAMP
10/14/2015 7:40:20 PM

PROJECT NUMBER
13032

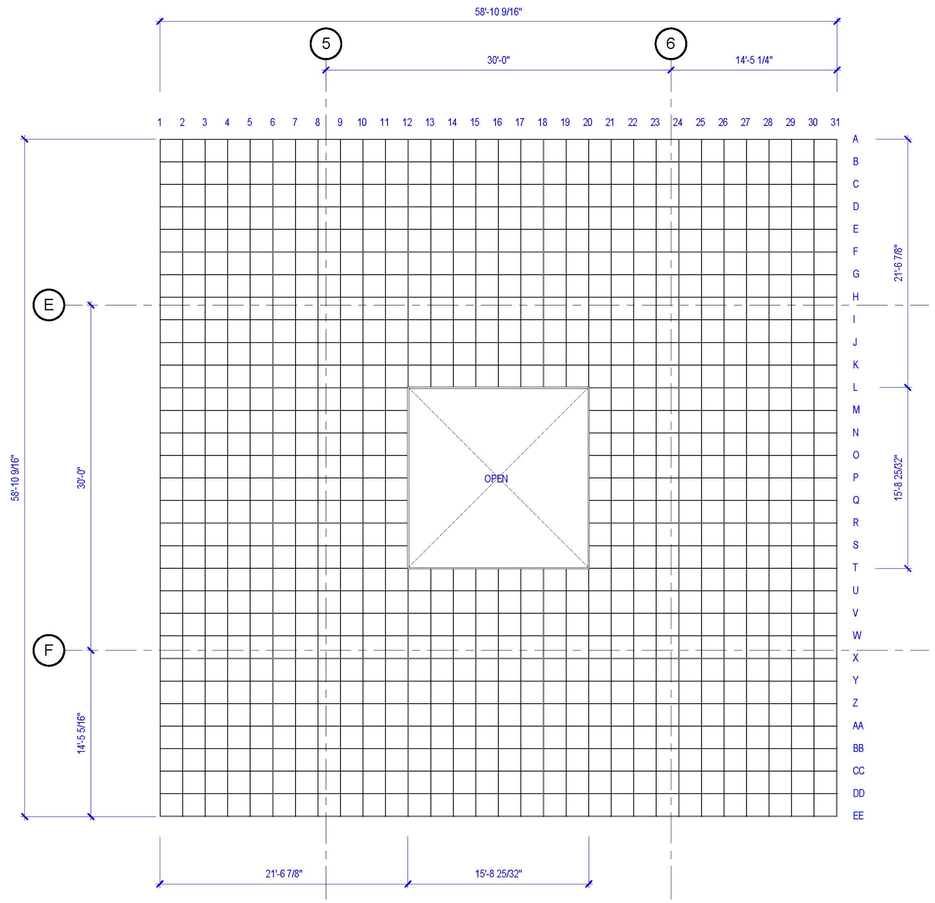
SHEET NUMBER
A9.1.05

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



2 COURTYARD TRELLIS - RIBS
SCALE: 1/8" = 1'-0"

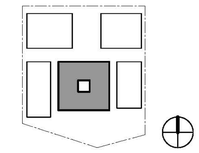


1 COURTYARD TRELLIS - RIB KEY PLAN
SCALE: 3/16" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ENLARGED DRAWINGS - COURTYARD TRELLIS

ARCHITECT
JOHNSON FAIN

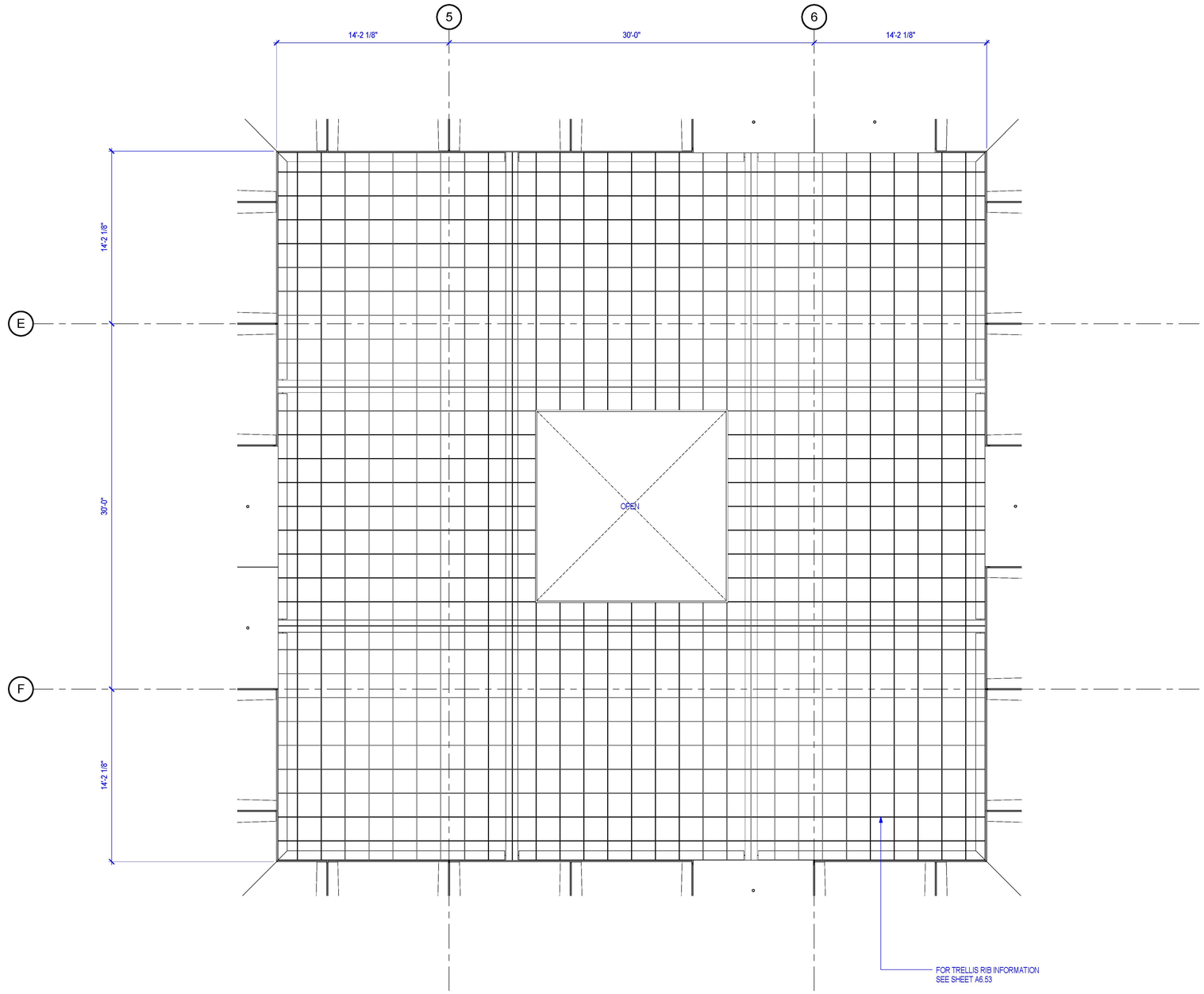
PLOT STAMP
10/14/2015 7:40:24 PM

PROJECT NUMBER
13032

SHEET NUMBER
A9.1.06

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



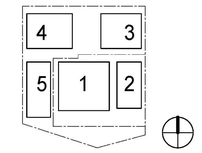
1 ENLARGED RCP - COURTYARD TRELLIS
SCALE: 1/4" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
ENLARGED DRAWINGS - COURTYARD TRELLIS

ARCHITECT
JOHNSON FAIN

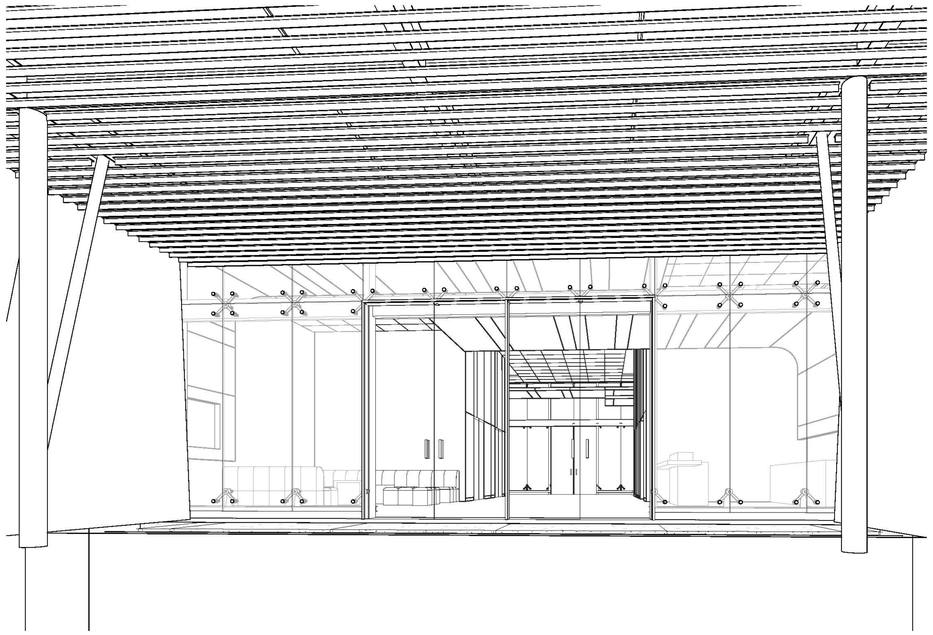
PLOT STAMP
10/14/2015 7:40:27 PM

PROJECT NUMBER
13032

SHEET NUMBER
A9.1.07

COPYRIGHT © 2013 JOHNSON FAIN

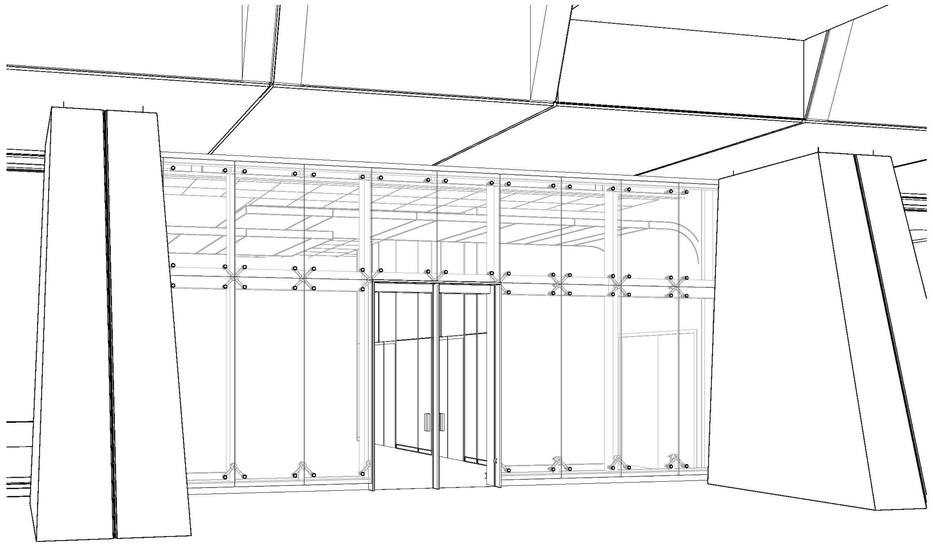
NOTE: NOT FOR CONSTRUCTION



LOBBY ENTRY VIEW - PROPOSED



LOBBY ENTRY VIEW - EXISTING



COURTYARD VIEW TOWARDS LOBBY - PROPOSED



COURTYARD VIEW TOWARDS LOBBY - EXISTING

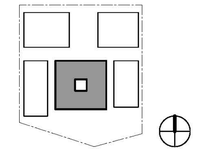
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
(323) 224 6000 • (323) 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

3D VIEWS - ENTRY LOBBY

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/15/2015 2:49:35 PM

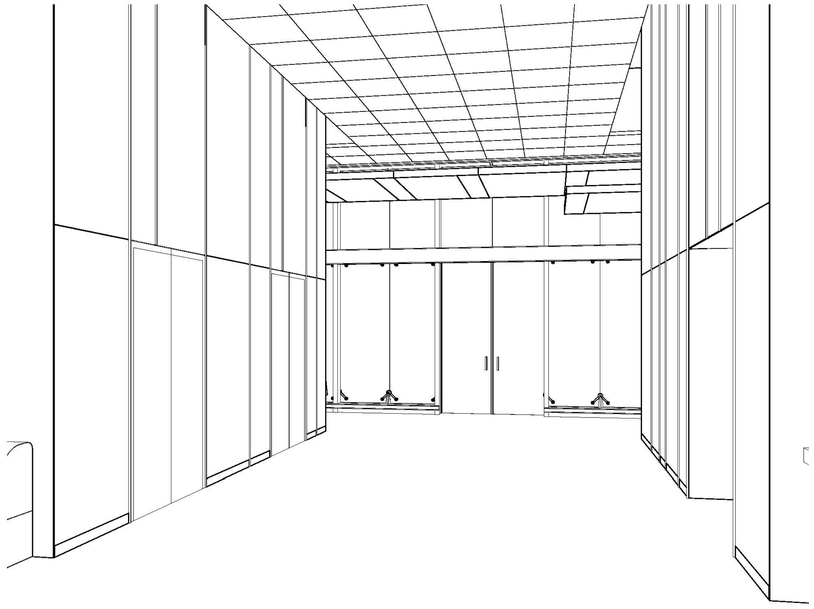
PROJECT NUMBER
13032

SHEET NUMBER

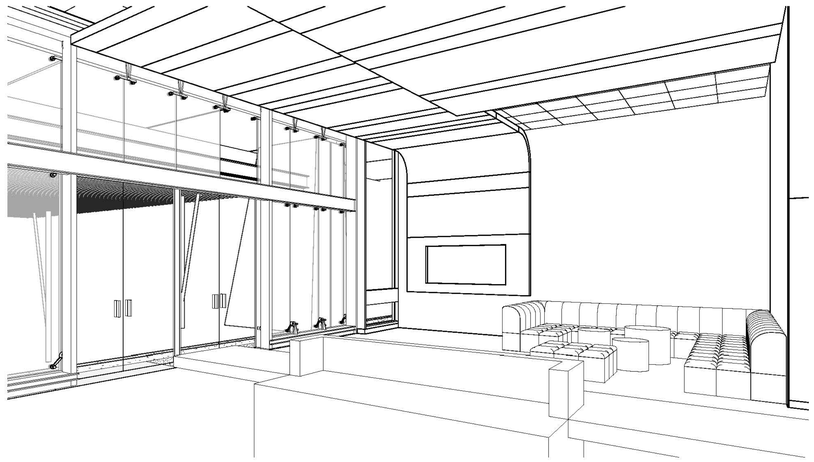
A10.1.01

COPYRIGHT © 2013 JOHNSON FAIN

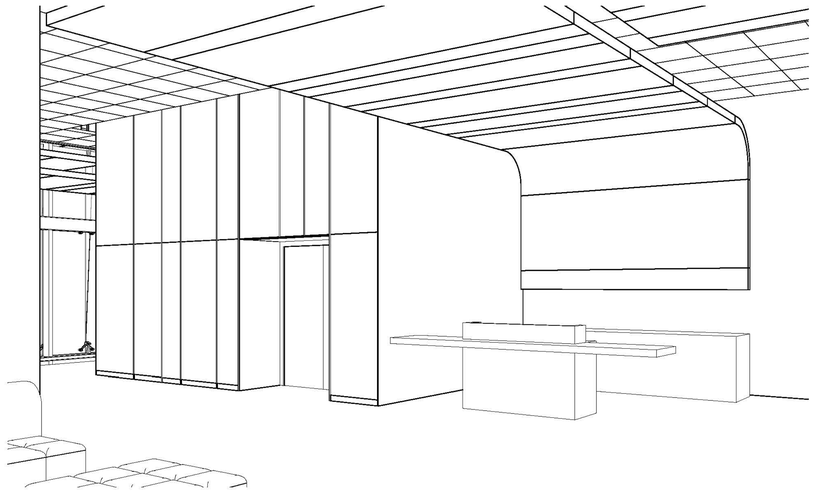
NOTE: NOT FOR CONSTRUCTION



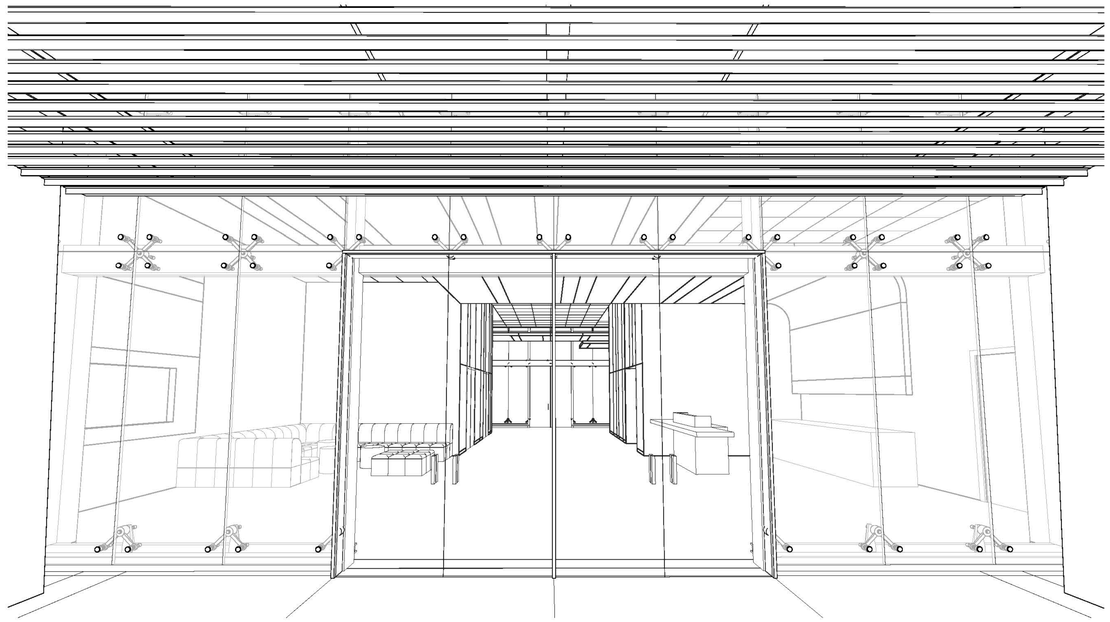
5 ELEVATOR LOBBY
SCALE:



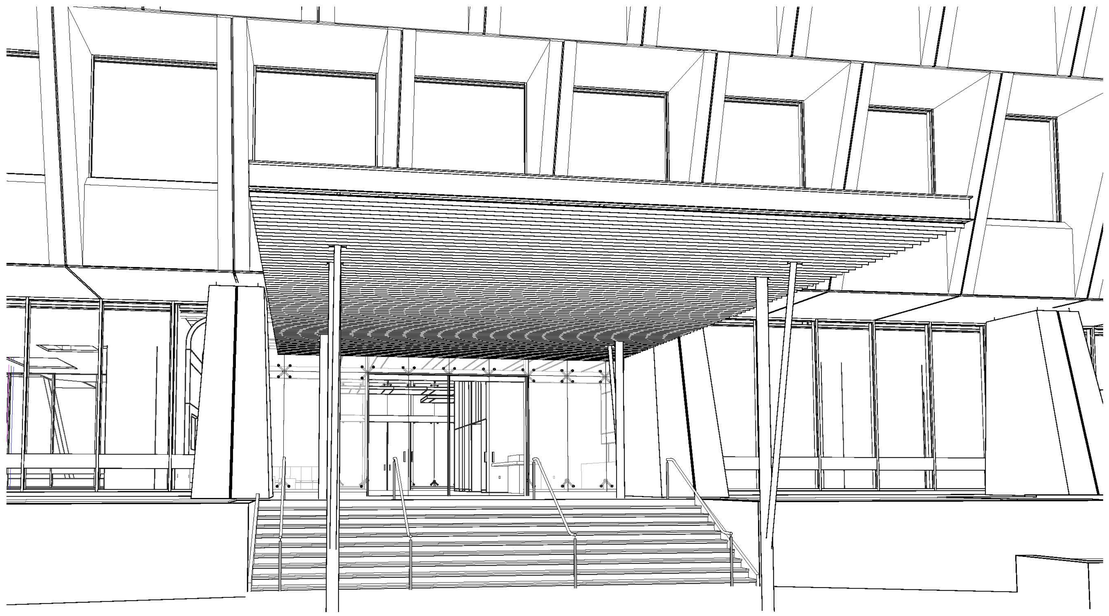
4 SEATING AREA
SCALE:



3 SECURITY DESK
SCALE:



2 ENTRY GLAZING
SCALE:



1 ENTRANCE CANOPY
SCALE:

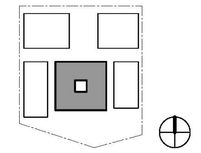
JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
(323) 224 6000 • (323) 224 6030 fax
www.johnsonfain.com

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

3D VIEWS - ENTRY CANOPY & LOBBY

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/15/2015 2:49:50 PM

PROJECT NUMBER
13032

SHEET NUMBER

A10.1.02

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

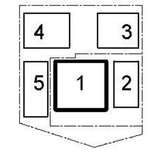


JOHNSON FAIN

ARCHITECTURE - URBAN DESIGN - PLANNING - INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 - [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

COURTYARD TERRACE BOXES-RENDER

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/15/2015 2:49:52 PM

PROJECT NUMBER
13032

SHEET NUMBER

A10.1.03

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

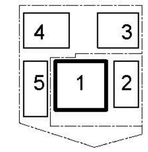


JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DETAILED DESIGN	4/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

COURTYARD TERRACE BOXES-RENDER

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/15/2015 2:49:55 PM

PROJECT NUMBER
13032

SHEET NUMBER

A10.1.04

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

METAL DECK

1. STEEL DECK SHALL HAVE MINIMUM PROPERTIES AND BE THE TYPE AS INDICATED ON DRAWINGS.
2. "S" AND "I" VALUES SHALL BE DETERMINED ACCORDING TO THE "LIGHT GAUGE STEEL INSTITUTE".
3. ALL FLOOR AND ROOF DECK TO BE GALVANIZED IN ACCORDANCE WITH ASTM A653 COATING CLASS G90. REPAIR DAMAGED COATING.
4. UNLESS OTHERWISE NOTED ON THE STRUCTURAL DRAWINGS, MINIMUM DECK ATTACHMENT IS AS FOLLOWS: 1/2" EFFECTIVE DIAMETER PUDDLE WELDS AT 12" O.C. AT TRANSVERSE AND PERIMETER SUPPORTS. 1/2" EFFECTIVE DIAMETER PUDDLE WELDS AT 16" O.C. AT LONGITUDINAL SUPPORTS. 3/16" BUTTON PUNCH OR 1-1/2" TOP SEAM WELD AT 36" O.C. AT SIDE LAP CONNECTIONS.
5. ALL STEEL DECK SHALL BE CONTINUOUS OVER AT LEAST TWO SPANS EXCEPT ON SINGLE SPANS WHICH ARE SPECIFICALLY NOTED.
6. ALL WELDING OF STEEL DECK SHALL BE PERFORMED BY LIGHT GAUGE WELDERS CERTIFIED BY CITY.
7. STEEL DECK SHALL BE MANUFACTURED BY "VERCO" (ICC-ESR 1735P, LA RR #23789).
8. PROVIDE WELDS WASHERS IN ACCORDANCE WITH AWSD1.3 FOR ALL STEEL DECKS LIGHTER THAN 22 GAUGE.

MECHANICAL AND ADHESIVE ANCHORS

1. ADHESIVE ANCHORS AND DOWELS INSTALLED INTO CONCRETE:
   A. "SET-XP" BY SIMPSON STRONG TIE (COLA RR#25744, ESR#2508)
   B. "HIT-RE 500-SD" BY HILTI, INC. (COLA RR#25700, ESR#2322)
2. ADHESIVE ANCHORS AND DOWELS INSTALLED INTO GROUT-FILLED MASONRY UNITS:
   A. "SET-XP" BY SIMPSON STRONG TIE (COLA RR#25965, IAPMO#265)
3. ADHESIVE ANCHORS AND DOWELS INSTALLED INTO UNREINFORCED BRICK MASONRY (URM):
   A. "EPOXY-TIE ET-22" BY SIMPSON STRONG TIE, IN CITY OF LOS ANGELES ONLY (COLA RR#25120)
   B. "EPOXY-TIE SET" BY SIMPSON STRONG TIE, NOT IN CITY OF LOS ANGELES (ESR#1772)
4. MECHANICAL ANCHORS INSTALLED INTO CONCRETE:
   A. "STRONG BOLT2" BY SIMPSON STRONG-TIE (COLA RR#25891, ESR#3037)
   B. "KWIK BOLT 3" BY HILTI, INC. NOT IN CITY OF LOS ANGELES (ESR#2302)
   C. "KWIK BOLT TZ" BY HILTI, INC. (COLA RR#25701, ESR#1917)
5. MECHANICAL ANCHORS INSTALLED INTO GROUT-FILLED MASONRY UNITS:
   A. "STRONG BOLT 2" BY SIMPSON STRONG-TIE (COLA RR#25936, IAPMO#240)
6. ADHESIVE ANCHORS: ASTM A36 THREADED RODS WITH ASTM A 563 GRADE A NUTS AND ANSI B18.22.1 TYPE A WASHERS, UNLESS OTHERWISE NOTED. ANCHORS DESIGNATED AS ASTM A193 GRADE B7 THREADED RODS TO USE ASTM A 563 GRADE DH HEAVY HEX NUTS AND ASTM F 436 WASHERS.
7. ADHESIVE DOWELS: ASTM A615 GRADE 60 REINFORCING STEEL.
8. ALL ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH ICC-ES REPORT AND COLA REPORT AND MANUFACTURER'S RECOMMENDATIONS.
9. UNLESS OTHERWISE NOTED, PROVIDE MINIMUM EMBEDMENT OF ANCHORS PER ICC-ES REPORT, COLA REPORTS & MANUFACTURERS RECOMMENDATIONS.
10. CONFIRM FINAL ANCHOR LOCATIONS PRIOR TO FABRICATING PLATES, MEMBERS, OR OTHER STEEL ASSEMBLIES ATTACHED WITH MECHANICAL OR ADHESIVE ANCHORS. AT CONTRACTOR OPTION, OVERSIZED HOLES AND WELDED PLATE WASHERS CAN BE USED IN LIEU OF STANDARD DIAMETER HOLES. SIZE & WELD
11. PRIOR TO ALL DRILLING OR CORING, THE CONTRACTOR SHALL: (1) VERIFY THE EXISTING CONCRETE OR MASONRY THICKNESS TO PREVENT DAMAGE TO THE OPPOSITE FACE OF CONCRETE AND MAINTAIN 1-1/2" CLEAR COVER U.N.O., AND (2) IDENTIFY EXISTING REINFORCING LOCATIONS BY PACHHOMETER, PROBING, CHIPPING, ETC. TO AVOID DAMAGE EXISTING REINFORCING.
12. IF REINFORCEMENT IS ENCOUNTERED DURING DRILLING, ABANDON AND SHIFT THE HOLE LOCATION TO AVOID THE REINFORCEMENT. PROVIDE A MINIMUM OF 2 ANCHOR DIAMETERS OR 1 INCH, WHICHEVER IS LARGER, OF SOUND CONCRETE BETWEEN THE DOWEL AND THE ABANDONED HOLE. FILL THE ABANDONED HOLE WITH NON-SHRINK GROUT. IF THE ANCHOR OR DOWEL MAY NOT BE SHIFTED AS NOTED ABOVE, THE ENGINEER WILL DETERMINE A NEW LOCATION.
13. ANCHORS SHALL BE PROOF-TESTED BY OWNER'S TESTING AND INSPECTION AGENCY. TEST 20% OF ALL ANCHORS.
14. TEST ANCHORS NO SOONER THAN 24 HOURS AFTER INSTALLATION.
15. APPLY TEST LOAD BY ANY METHOD THAT WILL EFFECTIVELY MEASURE THE TENSION ON THE ANCHOR SUCH AS DIRECT PULL WITH A HYDRAULIC JACK, TORQUE WRENCH, OR CALIBRATED SPRING-LOADING DEVICES, ETC.
16. ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE OR GROUT HAVING A MINIMUM AGE OF 21 DAYS AT THE TIME OF ANCHOR INSTALLATION.
17. FOR EXTERIOR AND FOR EXPOSED APPLICATIONS PROVIDE HOT DIP GALVANIZED OR STAINLESS STEEL ANCHORS.

STRUCTURAL STEEL WELDING

1. ALL WELDING SHALL BE IN STRICT CONFORMANCE WITH THE LATEST EDITION OF AWS D1.1 AND THE 2013 CALIFORNIA BUILDING CODE.
2. ALL WELDING ELECTRODES (FILLER METAL) SHALL BE E7XXX (70 KSI), U.N.O., AND SHALL BE LOW HYDROGEN TYPES. FIELD WELDING OF FULL AND PARTIAL PENETRATION WELDS OF THE STEEL MOMENT FRAME CONNECTIONS BETWEEN MOMENT FRAME BEAMS AND MOMENT FRAME COLUMNS SHALL BE BY SHIELDED METAL ARC PROCESS USING LOW HYDROGEN ELECTRODES
3. ALL WELDS SHALL HAVE A FILLER METAL WITH CHARPY V-NOTCH TOUGHNESS OF 20 FT/LBS AVERAGE AT -20 DEGREES FAHRENHEIT AND 40 FT/LBS @ 70 DEGREES FAHRENHEIT. CERTIFY CONFORMANCE TO CHARPY V-NOTCH TOUGHNESS REQUIREMENTS WITH TESTS BY AN INDEPENDENT TESTING LABORATORY.
4. LENGTHS OF WELDS ARE EFFECTIVE LENGTHS AS SPECIFIED IN THE APPLICABLE CODE. WHERE LENGTH OF WELD IS NOT SHOWN IT SHALL BE FULL LENGTH OF JOINT. ALL BUTT WELDS SHALL BE FULL PENETRATION, UNLESS NOTED OTHERWISE.
5. CONTRACTOR SHALL PROVIDE FIELD WELDING AS REQUIRED FOR CONSTRUCTION. WHERE FIELD WELDING IS NOTED, THE DESIGNATION IS GIVEN AS A SUGGESTED CONSTRUCTION PROCEDURE ONLY.
6. ALL SHOP WELDS SHALL BE PERFORMED BY A LOS ANGELES CITY LICENSED FABRICATOR.
7. ALL WELDERS SHALL BE QUALIFIED FOR THE WORK THEY WILL BE DOING & SHALL HAVE CURRENT CERTIFICATIONS BY AWS & THE CITY OF LOS ANGELES.
8. FACES OF FILLET WELDS EXPOSED TO VIEW SHALL HAVE AS-WELDED SURFACES THAT ARE REASONABLY SMOOTH AND UNIFORM. NO FINISHING OR GRINDING SHALL BE REQUIRED, EXCEPT WHERE CLEARANCES OR FIT OF OTHER ITEMS MAY SO NECESSITATE.
9. ALL PARTIAL AND FULL PENETRATION WELDS WHICH ARE EXPOSED TO VIEW SHALL BE GROUND SMOOTH AND FLUSH WITH FINISH SURFACE OF STEEL. HOLES SHALL BE FILLED WITH WELD METAL OR BODY SOLDER AND SMOOTHED BY GRINDING OR FILING.
10. CLEAN GROOVE PREPARATION THERMAL CUTS BY GRINDING.
11. WELDS SHALL BE TERMINATED AT THE END OF A JOINT IN A MANNER THAT WILL ENSURE SOUND WELDS. WHENEVER NECESSARY THIS SHALL BE DONE BY USE OF EXTENSION BARS AND RUN OFF TABS.
12. ALL WELDED JOINTS SHALL BE PRE-QUALIFIED PER THE LATEST EDITION OF AWS D1.1. NON PRE- QUALIFIED WELDED JOINTS SHALL BE QUALIFIED BY TEST & PROCEDURE QUALIFICATION TEST RECORD INCLUDED PER THE LATEST EDITION OF AWS D1.1.
13. THE CONTRACTOR SHALL SUBMIT ALL WELDING PROCEDURE SPECIFICATIONS (WPS) TO BE USED ON THE PROJECT PER THE LATEST EDITION OF AWS D1.1. THE WPS SHALL INCLUDE ALL MANUFACTURER'S DATA SHEETS FOR ALL WELDING MATERIALS TO BE USED. THE DATA SHEETS SHALL DESCRIBE THE PRODUCTS, LIMITATIONS OF USE, RECOMMENDED WELDING PARAMETERS, AND STORAGE AND EXPOSURE REQUIREMENTS.
14. ELECTRODES SHALL BE RECEIVED AND STORED IN THE ORIGINAL, UNDAMAGED MANUFACTURER PACKAGING, UNTIL READY FOR USE. WHEN WELDING IS TO BE SUSPENDED FOR MORE THAN 8 HOURS, ELECTRODES SHALL BE REMOVED FROM THE MACHINES AND STORED IN AN ELECTRODE WIRE OVEN MAINTAINED AT A TEMPERATURE BETWEEN 250 DEGREES AND 550 DEGREES OR AS RECOMMENDED BY THE MANUFACTURER. ELECTRODES NOT CONSUMED WITHIN 24 HOURS OF ACCUMULATED EXPOSURE OUTSIDE CLOSED OR HEATED STORAGE SHALL NOT BE USED.
15. ALL BOTTOM FLANGE BACKING BARS SHALL BE REMOVED. FOLLOWING REMOVAL OF BACKING, THE ROOT PASS SHALL BE BACKGOUGED TO SOUND WELD METAL AND BACKWELDED UNTIL FLUSH OR WITH SLIGHT REINFORCEMENT. THE SURFACE SHALL BE GROUND SMOOTH TO A SURFACE ROUGHNESS NOT TO EXCEED 500 MICROINCHES.

ADDITIONAL STRUCTURAL STEEL WELDING NOTES AT MOMENT FRAME CONNECTIONS

1. THE FOLLOWING PROVISIONS APPLY TO ALL WELDING AT BEAM-COLUMN MOMENT FRAME CONNECTIONS:
   A. MINIMUM INITIAL PREHEAT TO BE 226 DEGREES F MEASURED +- 3 INCHES FROM THE WELD JOINT. FOR JUMBO SECTIONS, MINIMUM PREHEAT TO BE 350 DEGREES F. MAXIMUM INTERPASS TEMPERATURE 600 DEGREES F SHALL BE MONITORED ON COLUMN FLANGE. MAINTAIN PREHEAT TEMPERATURE WHEN WELDING IS INTERRUPTED.
   B. EACH FLANGE OF A MOMENT FRAME BEAM TO COLUMN CONNECTION SHALL BE WELDED IN ONE CONTINUOUS PROCESS WITHOUT COOLING BELOW THE PRE-HEAT TEMPERATURE.
   C. USE STRINGER PASSES ONLY, NO WEAVING. LAY PASSES IN HORIZONTAL LAYERS. EACH PASS SHALL BE THOROUGHLY DESLAGGED AND CLEANED BY WIRE BRUSHING.
   D. PEEN EACH PASS, EXCEPT FIRST AND LAST, IMMEDIATELY AFTER DESLAGGING AND CLEAN USING A POWER SLAGGING GUN WITH A BLUNT TOOL. KEEP GUN AT RIGHT ANGLES TO WELD AND MAKE 4-5 PASSES THE LENGTH OF THE WELD WITH NO NICKS, CUTS OR DEEP INDENTATIONS BEING EVIDENT.
   E. BOTH BEAM FLANGES SHOULD BE WELDED PRIOR TO ANY SUPPLEMENTAL WELDING TO THE SHEAR TAB. WELD RUN OFF TABS SHALL BE REMOVED AND GROUND FLUSH TO THE BEAM FLANGE WITH MINIMAL DISTURBANCE.
   F. RUN OFF TABS USED AT BEAM FLANGE CONNECTION SHALL BE REMOVED AND THE ENDS OF THE WELDS SHALL BE MADE SMOOTH & FLUSH WITH THE EDGE OF ABUTTING PARTS PER 3.12.3 OF AWS D1.1-96. NO WELD DAMS ARE ALLOWED.
   G. AFTER FULL PENETRATION WELDING, THE BOTTOM BACKING BAR IS TO BE REMOVED, THE WELD ROOT T&B SHALL BE INSPECTED AND TESTED FOR IMPERFECTIONS, WHICH IF FOUND, ARE TO BE REMOVED BY BACKGOUGING TO SOUND MATERIAL & CLEANED BY GRINDING IF BACKGOUGED BY AIR ARC. THE BACKGOUGED AREA IS TO BE WELDED. A FILLET WELD SHALL BE APPLIED TO REINFORCE THE JOINT. THE SIZE OF THE REINFORCING FILLET WELD SHALL BE EQUAL TO 1/4 THE PLATE THICKNESS, BUT NOT LESS THAN $\frac{5}{16}$", NOR MORE THAN 3/8" PER NOTE J OF FIGURE 2.4 OF AWS D1.1-96.
2. THE FOLLOWING PROVISIONS APPLY TO WELDING BEAM-COLUMN MOMENT FRAME BOTTOM FLANGE CONNECTIONS:
   A. THE ROOT PASS SHALL BEGIN IN THE CENTER OF THE JOINT, IN THE AREA OF THE WELD ACCESS HOLE, REACHING PAST THE BEAM WEB THROUGH THE COPE HOLE WHEN NEAR END OF WELDING. AFTER THE ARC IS INITIATED, TRAVEL SHALL PROGRESS TOWARD THE EDGE OF BEAM BOTH FLANGES, AND THE WELD SHALL BE TERMINATED ON THE WELD RUN OFF TAB.
   B. THE HALF LENGTH ROOT PASS SHALL BE THOROUGHLY CLEANED.
   C. THE START OF THE WELD IN THE WELD ACCESS HOLE AREA SHALL BE VISUALLY INSPECTED TO ENSURE FUSION, SOUNDNESS, FREE FROM SLAG INCLUSIONS AND EXCESSIVE POROSITY. THE RESULTING BEAD PROFILE SHALL BE SUITABLE FOR OBTAINING GOOD FUSION BY THE SUBSEQUENT PASS TO BE INITIATED ON THE OPPOSITE SIDE OF THE BEAM WEB. IF THE PROFILE IS NOT CONDUCIVE TO GOOD FUSION, THE START OF THE FIRST ROOT PASS SHALL BE GROUND, GOUGED, CHIPPED, OR OTHERWISE PREPARED TO ENSURE ADEQUATE FUSION.
   D. THE SECOND HALF OF THE WELD JOINT SHALL HAVE THE ROOT PASS APPLIED BEFORE ANY OTHER WELD PASSES ARE PERFORMED. THE ARC SHALL BE INITIATED IN THE AREA OF THE START OF THE FIRST ROOT PASS, AND TRAVEL SHALL PROGRESS TO THE END OF THE JOINT, TERMINATING ON THE WELD TAB.
   E. EACH WELD LAYER SHALL BE COMPLETED ON BOTH SIDES OF THE JOINT BEFORE A NEW LAYER IS DEPOSITED.

CONCRETE

1. CONCRETE IS REINFORCED AND CAST-IN-PLACE UNLESS OTHERWISE NOTED. WHERE REINFORCING IS NOT SPECIFICALLY SHOWN OR WHERE DETAILS ARE NOT GIVEN, PROVIDE REINFORCING SIMILAR TO THAT SHOWN FOR SIMILAR CONDITIONS, SUBJECT TO REVIEW BY THE OWNER'S REPRESENTATIVE.
2. ALL PHASES OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF ACI318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", AND THE LATEST EDITION OF ACI117 "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS"
3. ALL STRUCTURAL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS AND A MAX WATER CEMENT RATIO W/C AS FOLLOWS:

LOCATION	STRENGTH	W/C	TYPE OF CONCRETE
ALL LOCATIONS U.N.O.	4,000 PSI	0.50	NORMAL WEIGHT
SLAB ON GRADE	4,500 PSI	0.45	NORMAL WEIGHT
FILL ON METAL DECK	3,000 PSI	0.55	LIGHT WEIGHT

4. NO MORE THAN ONE GRADE OF CONCRETE SHALL BE ON THE JOB SITE AT ANY ONE TIME.
5. ALL STRUCTURAL CONCRETE MIXES SHALL DESIGNED BY AN APPROVED LABORATORY AND SHALL BE STAMPED AND SIGNED BY A CIVIL ENGINEER LICENSED IN CALIFORNIA.
6. CONCRETE MIXES SHALL BE PREPARED WITH TYPE II/V PORTLAND CEMENT CONFORMING TO ASTM C150.
7. CONCRETE MIX DESIGNS CONTAINING FLY ASH MAY BE USED WHERE CONCRETE IS NOT VISUALLY EXPOSED. FLY ASH SHALL CONFORM WITH ASTM C618 AND MAY REPLACE UP TO 20% PORTLAND CEMENT BY VOLUME.
8. NORMAL WEIGHT CONCRETE AGGREGATES SHALL CONFORM TO ASTM C33. LIGHT WEIGHT CONCRETE AGGREGATES SHALL CONFORM TO ASTM C330.
9. WATER USED IN MIXING CONCRETE SHALL CONFORM WITH ASTM C1602.
10. THOROUGHLY CLEAN AND ROUGHEN ALL HARDENED CONCRETE AND MASONRY SURFACES TO RECEIVE NEW CONCRETE. INTERFACE SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" UNLESS NOTED OTHERWISE.
11. KEY AND DOWEL POUR JOINTS AS SHOWN ON THE PLANS. ANY DEVIATION FROM POUR JOINTS SHOWN ON THE PLANS MUST BE APPROVED BY THE OWNER'S REPRESENTATIVE.
12. NON-SHRINK CEMENT GROUT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 7000 PSI. USE "QUIKRETE" (LARR #25451) OR "RAPID SET" (LARR #24654).
13. DEFECTIVE CONCRETE (VOIDS, ROCK POCKETS, HONEYCOMBS, CRACKING, ETC.) SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

REINFORCEMENT

1. ALL REINFORCING BARS SHALL CONFORM TO ASTM A-615, GRADE 60, UNLESS NOTED OTHERWISE ON THE DRAWINGS AND BELOW:
   A. SPIRALS SHALL BE COLD DRAWN BARS CONFORMING TO ASTM A-82. REINFORCING FOR DIAPHRAGMS AND FOUNDATIONS MAY BE GRADE 75 IN LIEU OF GRADE 60, AT THE CONTRACTOR'S OPTION. MAINTAIN OVERALL CAPACITY OF ELEMENTS WHERE GRADE 75 REINFORCING IS PROPOSED FOR USE. IN GENERAL, REDUCE REQUIRED STEEL AREA IN PROPORTION TO RATIO OF YIELD STRENGTH. MAINTAIN BAR SPACING SHOWN ON PLANS, DETAILS, AND SCHEDULES.
   B. MOMENT FRAME LONGITUDINAL REBAR, COLUMN LONGITUDINAL REBAR, SHEAR WALL VERTICAL REBAR, AND COUPLING BEAM LONGITUDINAL REBAR SHALL BE EITHER ASTM A-706 [Fy=60 KSI] OR ASTM A-615, GRADE 60, WITH ACTUAL YIELD STRENGTH BASED ON MILL TESTS NOT GREATER THAN 78 KSI.
   C. SMOOTH DOWELS IN SLAB ON GRADE: ASTM A36, 36 KSI
2. WELDING OF REINFORCEMENT (INCLUDING TACK WELDING) SHALL BE NOT BE DONE UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS. WHERE SHOWN ON THE DRAWINGS, THE FOLLOWING SHALL APPLY:
   A. WELDED REBAR SHALL COMPLY WITH ASTM A-706 [Fy=60 KSI]
   B. WELDING SHALL CONFORM TO AWS D1.4
   C. WELDING OF REINFORCING STEEL SHALL BE PERFORMED BY WELDERS CERTIFIED BY THE CITY OF LA
   D. USE E90XX ELECTRODES
3. WELDED WIRE FABRIC SHALL BE MADE OF COLD DRAWN WIRE AND SHALL CONFORM TO ASTM A-185 [Fy=65 KSI]. MINIMUM LAP AT SPLICES OF 12 INCHES. PROVIDE MESH IN FLAT SHEETS ONLY. ROLLED MESH IS NOT ACCEPTABLE. OFFSET END-LAPS IN ADJACENT SHEETS TO PREVENT CONTINUOUS LAPS.
4. REINFORCING STEEL SHALL HAVE THE FOLLOWING CONCRETE COVER. SEE ACI FOR TOLERANCES:
   A. CONCRETE POURED AGAINST EARTH 3"
   B. FORMED CONCRETE IN CONTACT WITH EARTH 2"
   C. CONCRETE EXPOSED TO WEATHER (#6 AND LARGER) 2"
   D. CONCRETE EXPOSED TO WEATHER (#5 AND SMALLER) 1-1/2"
   E. SLABS (INCLUDING SLAB SUPPORTING EARTH), WALLS, AND JOISTS NOT EXPOSED TO WEATHER (#11 AND SMALLER) 1"
   F. OTHER CONCRETE NOT EXPOSED TO WEATHER 1-1/2"
5. #5 AND LARGER REINFORCING BARS SHALL NOT BE SPLICED EXCEPT AS LOCATED AND DETAILED ON THE DRAWINGS. #4 AND SMALLER BARS WITH LENGTHS NOT SHOWN SHALL BE CONTINUOUS. PROVIDE CLASS 'B' SPLICE UNLESS NOTED OTHERWISE. ALL BARS IN MASONRY SHALL BE CONTINUOUS, LAPPING 48 BAR DIAMETERS, 2'-0" MINIMUM. HORIZONTAL WALL SPLICES SHALL BE STAGGERED. VERTICAL BARS SHALL NOT BE SPLICED EXCEPT AT HORIZONTAL SUPPORTS, SUCH AS FLOOR OR ROOF, UNLESS DETAILED OTHERWISE. ALL BARS ENDING AT THE FACE OF A WALL, COLUMN, OR BEAM SHALL EXTEND TO WITHIN 2" OF THE FAR FACE AND HAVE A 90 DEGREE HOOK, UNLESS OTHERWISE SHOWN.
6. BARS SHALL BE FIRMLY SUPPORTED AND ACCURATELY PLACED AS REQUIRED BY THE ACI STANDARDS, USING TIE AND SUPPORT BARS IN ADDITION TO REINFORCEMENT SHOWN WHERE NECESSARY FOR FIRM AND ACCURATE PLACING. PROVIDE DOWELS TO MATCH ALL REINFORCEMENT AT POUR JOINTS, UNLESS SHOWN OR NOTED OTHERWISE. ALL DOWELS AND BOLTS SHALL BE ACCURATELY SET IN PLACE BEFORE PLACING CONCRETE. NO WELDING OF REINFORCEMENT (INCLUDING TACK WELDING) SHALL BE DONE UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER. ALL SLAB AND BEAM REINFORCEMENT SHALL BE CHAIRED UP.
7. IN WALL REINFORCING, CURTAINS CONTAINING VERTICAL AND HORIZONTAL BARS OF THE SAME SIZE, VERTICAL BARS SHALL BE PLACED CLOSEST TO THE WALL SURFACE. IN CURTAINS WHICH VERTICAL AND HORIZONTAL BARS ARE OF DIFFERENT SIZES OR SPACING, THE LAYER WITH THE MOST STEEL SHALL BE PLACED CLOSEST TO THE NEAR SURFACE.
8. ALL BARS INTERRUPTED BY STRUCTURAL STEEL SHALL EXTEND TO WITHIN 1" OF STRUCTURAL STEEL FLANGE OR WEB AND HAVE A 90 DEGREE HOOK, UNLESS OTHERWISE SHOWN.
9. DRAWINGS SHOW TYPICAL REINFORCING CONDITIONS. CONTRACTOR SHALL PREPARE DETAILED PLACEMENT DRAWINGS OF ALL CONDITIONS SHOWING QUANTITY, SPACING, SIZES, CLEARANCES, LAPS, INTERSECTIONS, AND COVERAGE REQUIRED BY THE STRUCTURAL DETAILS, APPLICABLE CODE, AND TRADE STANDARDS. CONTRACTOR SHALL NOTIFY REINFORCING INSPECTOR OF ANY ADJUSTMENTS FROM TYPICAL CONDITIONS WHICH ARE PROPOSED IN PLACEMENT DRAWINGS TO FACILITATE FIELD PLACEMENT OF REINFORCING STEEL AND CONCRETE.
10. ALL PRINCIPAL REBAR SHALL TERMINATE WITH A STANDARD HOOK MINIMUM UNLESS SPECIFICALLY DETAILED OTHERWISE. REBAR BENDS SHALL BE MADE COLD. REBAR SHALL NOT BE BENT AFTER ANY PORTION OF THE BAR IS ENCASED IN CONCRETE.
11. ALL LAP SPLICES ARE CLASS 'B' LAP SPLICES UNLESS NOTED OTHERWISE.
12. ALL WALL FOOTING REINFORCEMENT SHALL BEND AROUND ALL CORNERS AND EXTEND 36 BAR DIAMETERS OR 18 INCHES WHICHEVER IS LARGER. UNLESS NOTED OTHERWISE.
13. ALL SLABS ON GRADE LESS THAN 6" IN THICKNESS SHALL BE REINFORCED WITH #4 REBARS AT 16 INCHES ON CENTERS EACH WAY, UNLESS NOTED OTHERWISE. PROVIDE ONE (1) LAYER OF 6X6/W2.9XW2.9 WELDED WIRE FABRIC CONTINUOUS FOR EVERY 3" ARCHITECTURAL CONCRETE FILLS ABOVE THE STRUCTURAL SLAB.
14. ALL MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT PADS LESS THAN 4" THICK SHALL BE REINFORCED WITH AT LEAST ONE (1) LAYER OF 6X6/W2.9XW2.9 WELDED WIRE FABRIC AND HAVE HOOKED DOWELS (#3 AT 12' ON CENTERS) INTO THE STRUCTURAL SLAB. UNLESS NOTED OTHERWISE. FOR PADS GREATER THAN 4 INCHES THICK, USE REINFORCING AS SHOWN IN THE TYPICAL DETAILS.
15. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AROUND ALL SLAB AND WALL OPENINGS INCLUDING DIAGONAL BARS WITHOUT EXCEPTION.
16. ALL STRUCTURAL CONCRETE ELEMENTS REQUIRE REINFORCEMENT SINCE NO PLAIN CONCRETE ELEMENTS ARE USED. ALL CONCRETE SLABS SHALL HAVE A MINIMUM REINFORCEMENT PERCENTAGE OF 0.18 EACH WAY CONTINUOUS.

FOUNDATIONS

1. THE DESIGN OF THE FOUNDATION SYSTEM IS BASED UPON THE CRITERIA AND RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL INVESTIGATION REPORT TITLED "GEOTECHNICAL ENGINEERING INVESTIGATION PROPOSED MIXED USE DEVELOPMENT, 14130 RIVERSIDE DRIVE, SHERMAN OAKS, CALIFORNIA", BY GEOTECHNILOGIES, INC., DATED JANUARY 21,2010, FILE NO. 20594.
2. THE GEOTECHNICAL INVESTIGATION REPORT AND ITS RECOMMENDATIONS SHALL BE FOLLOWED AND SHALL BE CONSIDERED MINIMUM REQUIREMENTS UNLESS MORE STRINGENT REQUIREMENTS ARE PRESENTED IN THE SPECIFICATIONS OR ON THE DRAWINGS.
3. PER GEOTECHNICAL INVESTIGATION REPORT, THE ALLOWABLE SOIL BEARING PRESSURES ARE AS FOLLOWS:
   A. CONTINUOUS FOOTING: 4,000 PSI
   B. ISOLATED SPREAD FOUNDATIONS: 5,000 PSI
4. REMOVE LOOSE SOIL AND STANDING WATER FROM FOUNDATION EXCAVATIONS PRIOR TO PLACING CONCRETE. THE GEOTECHNICAL ENGINEER SHALL INSPECT AND APPROVE ALL EXCAVATIONS, SOIL COMPACTION WORK PRIOR TO PLACEMENT OF ANY REBAR OR CONCRETE, SHORING INSTALLATIONS, BACKFILL MATERIALS AND BACK FILLING PROCEDURES.
5. LOCATE AND PROTECT EXISTING UTILITIES TO REMAIN DURING AND/OR AFTER CONSTRUCTION.
6. REMOVE ABANDONED FOOTINGS, UTILITIES, ETC. WHICH INTERFERE WITH NEW CONSTRUCTION, UNLESS OTHERWISE INDICATED.
7. NOTIFY THE OWNER'S REPRESENTATIVE IF ANY BURIED STRUCTURES NOT INDICATED, SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, ETC., ARE FOUND.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, UNDERPINNING AND PROTECTION OF EXISTING CONSTRUCTION.
9. PLACE BACKFILL BEHIND RETAINING WALLS AFTER CONCRETE OR MASONRY HAS ATTAINED FULL DESIGN STRENGTH. BRACE BUILDING AND PIT WALLS BELOW GRADE FROM LATERAL LOADS UNTIL ATTACHED FLOORS AND SLABS ON GRADE ARE COMPLETE AND HAVE ATTAINED FULL DESIGN STRENGTH.
10. THE CONTRACTOR SHALL PROVIDE CARE IN DRILLING, PLACEMENT OF STEEL REINFORCEMENT, AND POURING OF CONCRETE TO AVOID DISTURBANCE OF PILE BORING WALLS. THE STEEL REINFORCEMENT CAGE SHALL BE INSTALLED AND CONCRETE SHALL BE PLACED INTO THE PILE HOLE IMMEDIATELY AFTER THE HOLE IS DRILLED. PILE HOLES SHALL NOT BE LEFT OPEN OVERNIGHT. WHERE PILE SPACING IS LESS THAN THREE DIAMETERS, DRILLING SHALL NOT BE CARRIED OUT BEFORE THE PREVIOUSLY POURED PILE CONCRETE HAS SET FOR AT LEAST TWENTY FOUR HOURS.
11. IN THE EVENT OF SOIL OR WATER SEEPAGE INTO THE PILE EXCAVATION, CASING AND/OR THE USE OF "POLYMER-SLURRY" DRILLING FLUID MAY BE REQUIRED IF CAVING IS ENCOUNTERED BELOW THE WATER SEEPAGE LEVEL, IN ORDER TO ACHIEVE THE REQUIRED DEPTH, AND MAINTAIN AN OPEN EXCAVATION TO ALLOW FOR THE PLACEMENT OF REINFORCING STEEL AND CONCRETE. CASING SHALL BE PULLED AS THE PILE EXCAVATION IS FILLED WITH CONCRETE, MAINTAINING AT LEAST FIVE FEET OF CONCRETE HEAD INSIDE THE CASING. CONCRETE SHALL BE PLACED AND VIBRATED THROUGHOUT THE FULL LENGTH OF THE PILE SO THAT VOIDS DO NOT EXIST IN EITHER THE PILE BASE OR THE SHAFT. PLACEMENT PROCEDURES SHALL BE USED TO ENSURE THAT AGGREGATE SEGREGATION DOES NOT OCCUR.

STRUCTURAL STEEL

1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF AISC SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, AND THE LATEST EDITION OF AISC SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS. WHERE THE STRUCTURAL STEEL IS EXPOSED, FABRICATION AND ERECTION SHALL ALSO BE IN ACCORDANCE WITH AISC CODE OF STANDARD PRACTICE FOR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL.
2. STRUCTURAL STEEL SHALL CONFORM TO ASTM DESIGNATION AS INDICATED BELOW (U.N.O.):

A. ALL WIDE FLANGE SHAPES	A992, GRADE 50
B. STEEL ANGLES	A36
C. ALL PLATES	A572, GRADE 50
D. HSS (RECTANGULAR AND SQUARE)	A500, GRADE B
E. HSS (ROUND)	A500, GRADE B
F. PIPE COLUMNS	A53, GRADE B
G. CHANNELS (C AND MC SECTIONS)	A36
H. ALL OTHER STRUCTURAL SECTIONS	A572, GRADE 50
I. BOLTS	A325X
J. ANCHOR BOLTS AT LOCATIONS OTHER THAN MOMENT FRAME COLUMN BASE PLATE	F1554, GR55
K. ANCHOR BOLTS AT MOMENT FRAME COLUMN BASE PLATE	F1554, GR105
L. THREADED RODS AND HANGER RODS	A36
M. NUTS FOR BOLTS AND MACHINE BOLTS	A563
N. HARDENED WASHERS	F436
O. UNHARDENED WASHERS	F844
P. PLAIN WASHERS	ANSI B18.22.1
Q. BEVELED WASHERS	ANSI B18.23.1

3. ALL STEEL SHALL BE PROVIDED BY A CITY OF LOS ANGELES LICENSED FABRICATOR.
4. WHEN FABRICATING BEAMS PLACE NATURAL CAMBER UP.
5. SPLICE MEMBERS ONLY WHERE INDICATED.
6. HIGH STRENGTH BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF AISC SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS. HIGH STRENGTH BOLTS SHALL BE BEARING TYPE WITH THREADS EXCLUDED FROM THE FROM THE SHEAR PLANES (I.E. A325-X) UNLESS NOTED OTHERWISE.
7. ALL BOLTED CONNECTIONS SHALL HAVE A MINIMUM OF TWO BOLTS UNLESS SHOWN OTHERWISE. MINIMUM SIZE OF BOLTS FOR STRUCTURAL STEEL CONNECTIONS SHALL BE 3/4" DIA. EXCEPT WHEN OTHERWISE SHOWN OR NOTED.
8. ALL HOLES SHALL BE STANDARD DIAMETER U.N.O.
9. ALL FLANGE STIFFENER PLATES SHALL BE ORIENTED SO THAT ROLLING DIRECTION OF PLATE IS PARALLEL WITH DIRECTION OF PRINCIPAL STRESS.
10. AFTER FABRICATION, ALL STEEL SHALL BE CLEANED FREE OF RUST, LOOSE MILL SCALE AND OIL.
11. PROVIDE FILLS AT SPLICES OF PARTS HAVING MORE THAN 1/8" DIFFERENCE IN THICKNESS.
12. PROVIDE BEVELED WASHERS ON ALL CONNEC

STRUCTURAL OBSERVATION

1. PERIODIC STRUCTURAL OBSERVATION SHALL BE PROVIDED BY JOHN LABIB & ASSOCIATES, STRUCTURAL ENGINEERS, PER THE ATTACHED L.A. CITY P/BC 2002-024. CONTRACTOR SHALL NOTIFY ENGINEER 72 HOURS BEFORE REQUIRED OBSERVATIONS. DELINQUENT NOTIFICATION MAY REQUIRE DEMOLITION OF COVERING MATERIAL TO FACILITATE OBSERVATION.

2. STRUCTURAL OBSERVATION IS REQUIRED FOR THE STRUCTURAL SYSTEM IN ACCORDANCE WITH THE INFORMATION BULLETIN NO. P/BC 2002-024 STRUCTURAL OBSERVATION IS THE VISUAL OBSERVATION AT THE CONSTRUCTION SITE OF THE ELEMENTS AND CONNECTIONS OF THE STRUCTURAL SYSTEM AT SIGNIFICANT CONSTRUCTION STAGES AND THE COMPLETE STRUCTURE FOR GENERAL CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS. STRUCTURAL OBSERVATION DOES NOT WAIVE THE RESPONSIBILITY FOR THE INSPECTIONS REQUIRED OF THE BUILDING INSPECTOR OR THE DEPUTY INSPECTOR.

3. THE OWNER SHALL EMPLOY A STATE OF CALIFORNIA REGISTERED CIVIL OR STRUCTURAL ENGINEER OR LICENSED ARCHITECT TO PERFORM THE STRUCTURAL OBSERVATION. THE DEPARTMENT OF BUILDING AND SAFETY (LADBS) RECOMMENDS THE USE OF THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN WHO ARE INDEPENDENT OF THE CONTRACTOR.

4. THE STRUCTURAL OBSERVER SHALL PROVIDE EVIDENCE OF EMPLOYMENT BY THE OWNER OR THE OWNER'S REPRESENTATIVE. A LETTER FROM THE OWNER, THE OWNER'S REPRESENTATIVE, OR A COPY OF THE AGREEMENT FOR SERVICES SHALL BE SENT TO THE BUILDING INSPECTOR BEFORE THE FIRST SITE VISIT.

5. THE OWNER OR OWNER'S REPRESENTATIVE SHALL COORDINATE AND CALL FOR A MEETING BETWEEN THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN, STRUCTURAL OBSERVER, CONTRACTOR, AFFECTED SUBCONTRACTORS AND DEPUTY INSPECTORS. THE PURPOSE OF THE MEETING SHALL BE TO IDENTIFY THE MAJOR STRUCTURAL ELEMENTS AND CONNECTIONS THAT AFFECT THE VERTICAL AND LATERAL LOAD SYSTEMS OF THE STRUCTURE AND TO REVIEW SCHEDULING OF THE REQUIRED OBSERVATIONS. A RECORD OF THE MEETING SHALL BE INCLUDED IN THE FIRST OBSERVATION REPORT SUBMITTED TO THE BUILDING INSPECTOR.

6. THE STRUCTURAL OBSERVER SHALL PERFORM SITE VISITS AT THOSE STEPS IN THE PROGRESS OF THE WORK THAT ALLOW FOR CORRECTION OF DEFICIENCIES WITHOUT SUBSTANTIAL EFFORT OR UNCOVERING OF THE WORK INVOLVED. AT A MINIMUM, THE LISTED SIGNIFICANT CONSTRUCTION STAGES ON THE FOLLOWING STRUCTURAL OBSERVATION/SIGNIFICANT CONSTRUCTION STAGES TABLE REQUIRE A SITE VISIT AND AN OBSERVATION REPORT FROM THE STRUCTURAL OBSERVER.

7. THE STRUCTURAL OBSERVER SHALL PREPARE A REPORT OF THE STRUCTURAL OBSERVATION REPORT FORM IN/FORM.08 (PART 1) FOR EACH SIGNIFICANT STAGE OF CONSTRUCTION OBSERVED. THE ORIGINAL OF THE STRUCTURAL OBSERVATION REPORT SHALL BE SENT TO THE BUILDING INSPECTOR'S OFFICE AND SHALL BE SIGNED AND SEALED (WET STAMP) BY THE RESPONSIBLE STRUCTURAL OBSERVER. ONE COPY OF THE OBSERVATION REPORT SHALL BE ATTACHED TO THE APPROVED PLANS. THE COPY ATTACHED TO THE PLANS SHALL BE SIGNED AND SEALED (WET STAMP) BY THE RESPONSIBLE STRUCTURAL OBSERVER OR THEIR DESIGNEE. COPIES OF THE REPORT SHALL ALSO BE GIVEN TO THE OWNER, CONTRACTOR, AND DEPUTY INSPECTOR. ANY DEFICIENCY NOTED ON THE OBSERVATION REPORT WILL BECOME THE RESPONSIBILITY OF THE STRUCTURAL ENGINEER OF RECORD TO VERIFY ITS COMPLETION BY HIM (HER), OR BY A REGISTERED DEPUTY INSPECTOR AT THE DISCRETION OF THE STRUCTURAL OBSERVER.

8. A FINAL OBSERVATION REPORT AND THAT OF THE REGISTERED DEPUTY INSPECTOR MUST BE SUBMITTED WHICH SHOWS THAT ALL OBSERVED DEFICIENCIES WERE RESOLVED AND STRUCTURAL SYSTEM GENERALLY CONFORMS WITH THE APPROVED PLANS AND SPECIFICATIONS. THE DEPARTMENT OF BUILDING AND SAFETY (LADBS) WILL NOT ACCEPT THE STRUCTURAL WORK WITHOUT THIS FINAL OBSERVATION REPORT AND THAT OF THE REGISTERED DEPUTY INSPECTOR (WHEN PROVIDED) AND THE CORRECTION OF SPECIFIC DEFICIENCIES NOTED DURING NORMAL BUILDING INSPECTION.

9. THE STRUCTURAL OBSERVER SHALL PROVIDE THE ORIGINAL STAMPED AND SIGNED STRUCTURAL OBSERVATION REPORT TO THE CITY OF LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY BUILDING INSPECTOR.

10. WHEN THE OWNER ELECTS TO CHANGE THE STRUCTURAL OBSERVER OF RECORD, THE OWNER SHALL:

    A. NOTIFY THE BUILDING INSPECTOR IN WRITING BEFORE THE NEXT INSPECTION BY SUBMITTING COMPLETED "STRUCTURAL OBSERVATION PROGRAM AND DESIGNATION OF THE STRUCTURAL OBSERVER" FORM IN/FORM.08 (PART 2)

    B. CALL AN ADDITIONAL PRECONSTRUCTION MEETING, AND

    C. FURNISH THE REPLACEMENT STRUCTURAL OBSERVER WITH A COPY OF ALL PREVIOUS OBSERVATION REPORTS. THE REPLACEMENT STRUCTURAL OBSERVER SHALL APPROVE THE CORRECTION OF THE ORIGINAL OBSERVED DEFICIENCIES. UNLESS OTHERWISE APPROVED BY PLAN CHECK SUPERVISION. THE POLICY OF THE DEPARTMENT SHALL BE TO CORRECT ANY PROPERTY NOTED DEFICIENCIES WITHOUT CONSIDERATION OF THEIR SOURCE.

11. THE ENGINEER OR ARCHITECT OF RECORD SHALL DEVELOP ALL CHANGES RELATING TO THE STRUCTURAL SYSTEMS. THE BUILDING DEPARTMENT SHALL REVIEW AND APPROVE ALL CHANGES TO THE APPROVED PLANS AND SPECIFICATIONS.

12. STRUCTURAL OBSERVATIONS PERFORMED BY ENGINEER DURING CONSTRUCTION ARE NOT THE CONTINUOUS AND SPECIAL INSPECTION SERVICES AND DO NOT WAIVE THE RESPONSIBILITY FOR THE INSPECTIONS REQUIRED OF THE BUILDING INSPECTOR OR THE DEPUTY INSPECTOR. OBSERVATIONS ALSO DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSIDERED AS SUPERVISION OF CONSTRUCTION.

STRUCTURAL OBSERVATION

PERIODIC STRUCTURAL OBSERVATION SHALL BE PROVIDED BY JOHN LABIB & ASSOCIATES, STRUCTURAL ENGINEERS, PER THE ATTACHED L.A. CITY P/BC 2001-24. CONTRACTOR SHALL NOTIFY ENGINEER 72 HOURS BEFORE REQUIRED OBSERVATIONS. DELINQUENT NOTIFICATION MAY REQUIRE DEMOLITION OF COVERING MATERIAL TO FACILITATE OBSERVATION.

LOS ANGELES REGIONAL UNIFORM
CODE PROGRAM
COMMITTEE 1-3: STRUCTURAL
OBSERVATION

STRUCTURAL OBSERVATION PROGRAM
AND DESIGNATION OF THE
STRUCTURAL OBSERVER

PROJECT ADDRESS: 14130 RIVERSIDE DRIVE, SHERMAN OAKS, CA
OWNER: IMT
ARCHITECT: JOHNSON FAIN
ENGINEER: JOHN LABIB AND ASSOCIATES

STRUCTURAL OBSERVATION
(ONLY CHECKED ITEMS ARE REQUIRED)

FIRM OR INDIVIDUAL TO BE RESPONSIBLE FOR THE STRUCTURAL OBSERVATION:
NAME: JOHN LABIB & ASSOC. PHONE: (213) 239.9600 CALIF. REGISTRATION: S4549

FOUNDATION		WALL		FRAME		DIAPHRAGM	
FOOTINGS, STEM WALLS, PIERS	☐	CONCRETE	☐	STEEL MOMENT FRAME	☐	CONCRETE	☐
MAT FOUNDATION	☐	MASONRY	☐	STEEL BRACED FRAME	☐	STEEL DECK	☐
CAISSONS, PILES, GRADE BEAMS	☒	WOOD	☐	CONCRETE MOMENT FRAME	☐	WOOD	☐
STEPP'G/RET'G FOUND. -- HILLSIDE SPECIAL ANCHORS	☐	HARDY FRAMES STRONG WALLS	☐	MASONRY FRAME	☐		☐
OTHERS	☐	OTHERS	☐	OTHERS	☐	OTHERS	☐

DECLARATION BY OWNER

I, THE OWNER OF THE PROJECT, DECLARE THAT THE ABOVE LISTED FIRM OR INDIVIDUAL IS HIRED BY ME TO BE THE STRUCTURAL OBSERVER.

SIGNATURE DATE

STATEMENT OF SPECIAL INSPECTION

1. CONTINUOUS AND PERIODIC SPECIAL INSPECTION IS REQUIRED FOR THE WORK AS DESCRIBED IN CBC 2013 CHAPTER 17. SEE INSPECTION SCHEDULE BELOW. ONLY CHECKED ITEMS ARE REQUIRED.

2. APPROVAL BY THE INSPECTOR DOES NOT MEAN APPROVAL OF FAILURE TO COMPLY WITH THE PLANS OR SPECIFICATIONS. ANY DETAIL THAT FAILS TO BE CLEAR OR IS AMBIGUOUS MUST BE REFERRED TO THE STRUCTURAL ENGINEER FOR INTERPRETATION OR CLARIFICATION.

3. FOR VERIFICATION AND INSPECTION OF SOILS SEE SOILS REPORT.

4. CONTINUOUS SPECIAL INSPECTION PER AWS D1.1 IS REQUIRED FOR ALL STRUCTURAL STEEL WELDING, EXCEPT FOR SINGLE PASS FILLET WELDS NOT EXCEEDING $5/16$" IN SIZE. WELDING INSPECTORS SHALL BE AWS Q.C.-1 CERTIFIED.

5. STRUCTURAL WOOD. PERIODIC SPECIAL INSPECTION IS REQUIRED FOR WOOD SHEAR WALLS, SHEAR PANELS, AND DIAPHRAGMS, INCLUDING NAILING, BOLTING, ANCHORING, AND OTHER FASTENING OF COMPONENTS OF THE SEISMIC FORCE RESISTING SYSTEM, INCLUDING WOOD SHEAR WALLS, WOOD DIAPHRAGMS, DRAG STRUTS, BRACES, SHEAR PANELS, AND HOLDOWNS. EXCEPTION: SPECIAL INSPECTION IS NOT REQUIRED FOR WOOD SHEAR WALLS, SHEAR PANELS AND DIAPHRAGMS, INCLUDING NAILING, BOLTING, ANCHORING AND OTHER FASTENING TO OTHER COMPONENTS OF THE SEISMIC-FORCE-RESISTING SYSTEM, WHERE THE FASTENER SPACING OF THE SHEATHING IS MORE THAN 4 INCHES ON CENTER (O.C.). INSPECTIONS SHALL BE PERFORMED BEFORE COVERING.

6. CONTRACTORS RESPONSIBLE FOR CONSTRUCTION OF A WIND OR SEISMIC FORCE RESISTING SYSTEM/COMPONENT LISTED IN THIS STATEMENT OF SPECIAL INSPECTION SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE LADBS INSPECTORS AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON SUCH A SYSTEM OR COMPONENT PER SEC 1704.4.

7. WHERE FABRICATION OF MEMBERS AND ASSEMBLIES IS PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTION OF THE FABRICATED ITEMS SHALL BE REQUIRED BY THIS SECTION, UNLESS THE FABRICATOR IS REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVAL SHALL BE BASED UPON REVIEW OF THE FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND PERIODIC AUDITING OF FABRICATION PRACTICES BY AN APPROVED SPECIAL INSPECTION AGENCY. AT COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE BUILDING OFFICIAL STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL BE RESPONSIBLE OF VERIFYING APPROVAL OF FABRICATOR.

INSPECTION SCHEDULE

TYPE OF WORK	CODE REFERENCE	REMARKS	
CONCRETE WORK	CBC TABLE 1705.3		☐
SHOTCRETE WORK	CBC TABLE 1705.3		☐
REINFORCING STEEL	CBC TBL 1705.2.2 1705.3		☐
POST INSTALLED ANCHORS	CBC TABLE 1705.3	SEE ALSO ICC APPROVAL	☐
STRUCTURAL STEEL	CBC 1705.2		☐
STRUCTURAL STEEL WELDING	CBC 1705.2		☐
HIGH STRENGTH BOLTING	CBC 1705.2		☐
MASONRY WORK	CBC 1705.4		☐
HIGH LOAD DIAPHRAGMS	CBC 1705.5.1		☐
STRUCTURAL WOOD	CBC 1705.10.1 & 1705.11.2	SEE NOTE ABOVE	☐
COLD FORMED STEEL	CBC 1705.10.2 & 1705.11.3		☐
DRIVEN DEEP FOUND. ELEMENT	CBC TABLE 1705.7		☐
CAST IN PLACE DEEP FOUND.	CBC TABLE 1705.8		☐
SOIL CONDITION	CBC TABLE 1705.6	SEE SOILS REPORT FOR COMPLIANCE	☐

COLD-FORMED STEEL

1. FOR NON-LOAD BEARING METAL STUDS AND CEILINGS SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS. FOLLOWING NOTES APPLY TO METAL STUDS INDICATED ON STRUCTURAL DRAWINGS.

2. ALL COLD-FORMED STEEL FRAMING CONSTRUCTION SHALL BE IN ACCORDANCE WITH AISI "SPECIFICATIONS FOR DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS" 2007 EDITION.

3. ALL COLD-FORMED STEEL FRAMING SHALL BE AS NOTED BELOW:
   INTERIOR AND EXTERIOR STUDS: GALVANIZED CONFORMING TO ASTM A123 COATING CLASS G60.

4. ALL COLD-FORMED STEEL FRAMING SHALL CONFORM WITH THE FOLLOWING:

- GALVANIZED STUDS, JOISTS, TRACKS, END CLOSURES, BRIDGING, ACCESSORIES AND STRAPS (12 (97), 14 (68) AND 16 (54) GAUGE):
ASTM A653, GRADE 50, (Fy_min.= 50,000 psi, Fu_min.=65,000 psi)

- GALVANIZED STUDS, JOISTS, TRACKS, END CLOSURES, BRIDGING, ACCESSORIES AND STRAPS (18 (43) AND 20 (33) GAUGE):
ASTM A653, GRADE 33, (Fy_min.= 33,000 psi, Fu_min.=45,000 psi)

- GALVANIZED BACKING PLATES:
ASTM A653, GRADE 50, (Fy_min.= 50,000 psi, Fu_min.=65,000 psi)

5. DOUBLE VERTICAL STUDS SHALL BE STITCH WELDED TOGETHER ON BOTH FLANGES WITH 1/16" GROOVE WELDS X 1" LONG AT 12" ON CENTER, UNO ON DRAWINGS.

6. TOP AND BOTTOM STUD TRACKS FOR INTERIOR PARTITIONS SHALL BE 16 GA. MATERIAL WITH 1.5" FLANGES, UNO ON DRAWINGS.

7. TOP STUDS TRACKS FOR EXTERIOR WALLS SHALL BE 16 GA MATERIAL WITH 1.5" FLANGES: BOTTOM STUD TRACKS FOR EXTERIOR WALLS SHALL BE 16 GA MATERIAL WITH 1.5" FLANGES, UNO ON DRAWINGS.

8. DEEP LEG TRACK FOR EXTERIOR WALLS SHALL BE 16GA MATERIAL WITH 2" FLANGES, UNO ON DRAWINGS.

9. DOUBLE JOIST ARE BACK TO BACK U.N.O.

10. ALL LIGHT GAUGE FRAMING MEMBERS SHALL BE CLARKDIETRICH PER LA CITY RR 25889.

11. SUBMIT SHOP DRAWINGS FOR REVIEW.

12. ALL METAL STUDS AND JOISTS SHALL HAVE STIFFENED FLANGES. SEE DRAWINGS FOR DETAILS ON CONNECTIONS, BRACING, BRIDGING, ETC.

13. CUT FRAMING COMPONENTS, SUCH AS BRACING, SQUARELY OR AT AN ANGLE TO FIT TIGHT AGAINST ABUTTING MEMBERS. HOLD MEMBERS FIRMLY IN POSITION UNTIL PROPERLY FASTENED.

14. ALL BEARING STUDS MUST BE FULLY ATTACHED TO THE WALL LEDGER. ALL STUDS SHALL BE SPACED AT SAME SPACING AS JOIST (IN LINE FRAMING). ALL BEARING STUDS, COLUMNS AND BUILT UP STUDS SHALL HAVE CONTINUOUS BEARING DOWN TO FOUNDATION U.N.O. SOLID BLOCKING AT FLOORS SHALL BE PROVIDED.

15. CUTTING FLANGES AND STIFFENER LIPS OF LOAD BEARING STUDS IS PROHIBITED, NO STUD NOTCHING IS PERMITTED IN BEARING WALLS U.N.O.

16. OPENING IN STUD/JOIST WEBS OTHER THAN THE STANDARD PUNCHOUTS BY MANUFACTURER ARE PROHIBITED UNLESS SPECIFICALLY DESIGNED AND DETAILED BY ENGINEER. NO PUNCHOUT SHALL BE ALLOWED WITHIN 24" OF THE SUPPORT OR POINT LOAD.

17. BRIDGING SHALL BE PROVIDED FOR ALL JOISTS @ 8'-0" O.C.MAX.

18. ATTACH STUDS USING PLUG, BUTT OR SEAM WELDS, UNLESS NOTED OTHERWISE. WHERE STUDS ARE BURNED THROUGH BY WELDING, PROVIDE SUITABLE STITCH PLATE OF SAME GAUGE. SPLICES IN AXIAL LOADED STUDS OR BRACES ARE NOT PERMITTED. PROVIDE BUTT WELDS OR SPLICES AT JOINTS IN TRACK. WIRE TYING OF FRAMING COMPONENTS IS NOT PERMITTED.

19. PREFABRICATED PANELS SHALL BE SQUARED AND BRACED TO AVOID RACKING. LIFT PREFABRICATED PANELS IN A MANNER SO AS NOT TO CAUSE LOCAL DISTORTION OF ANY MEMBER.

20. ALL SHEET METAL SCREWS SHALL EXTEND THROUGH METAL FRAMING AND STRUCT. STEEL A MINIMUM OF 1/4" OR 3 EXPOSED THREADS WHICHEVER IS GREATER.

21. ALL LIGHT METAL GAUGE TO METAL FASTENERS INDICATED ON THESE DRAWINGS ARE QUICK DRIVE COLD FORMED SELF-DRILLING/SELF-TAPPING STEEL SCREWS AS MANUFACTURED BY SIMPSON STRONG-TIE (LARR 25670). SCREWS SHALL HAVE A MINIMUM EDGE DISTANCE OF 1/2" FASTENERS SHALL BE AS FOLLOWS:

APPLICATION	FASTENER
LIGHT GAUGE	18 GA. OR 20 GA.-#8 MODIFIED TRUSS HEAD
TRACK TO STUD	16 GA.-#10 PANCAKE HEAD
ALL OTHER COLD-FORMED STEEL	18 GA. OR 20 GA.-#8 WASHER HEAD
TO COLD-FORMED STEEL CONNECTION	16 GA.-#10 HEX WASHER HEAD

22. ALL COLD-FORMED STEEL TO STRUCTURAL STEEL FASTENERS SHALL BE HILTI X-AL-H POWER DRIVEN FASTENER (LARR 25646, ICC ESR-1663)

APPLICATION	FASTENER SHANK DIA
STRUCTURAL STEEL THICKNESS <= 1/8"	0.145"
1/8" < STRUCTURAL STEEL THICKNESS < 3/8"	0.158"
3/8" <=STRUCTURAL STEEL THICKNESS	0.177"

23. THE CONTRACTOR IS PROHIBITED FROM USING TORCHES TO BURN HOLES IN TRACKS OR STUDS

LIGHT GAUGE WELDING

1. ALL WELDING SHALL BE IN STRICT CONFORMANCE WITH THE LATEST EDITION OF ANSI/AWS D1.3 AND CBC.

2. THE CONTRACTOR SHALL PROVIDE WELDING PROCEDURE SPECIFICATION (WPS) FOR REVIEW AND APPROVAL PRIOR TO STARTING OF FABRICATION. THE SEQUENCE OF WELDING SHALL BE PLANNED TO MINIMIZE LOCKED IN STRESSES AND DISTORTION.

3. ALL WELDERS AND INSPECTORS SHALL BE INFORMED OF AND MUST ADHERE TO THE WPS AND SHALL RETAIN A COPY.

4. WELDING OF LIGHT GAUGE STEEL SHALL BE BY MANUAL SHIELD METAL ARC WELDING USING E-6012, E-6013 OR E-7014 RODS.

5. LENGTHS OF WELDS ARE EFFECTIVE LENGTHS AS SPECIFIED IN THE CBC CODE. WHERE LENGTH OF WELD IS NOT SHOWN IT SHALL BE FULL LENGTH OF JOINT. ALL BUTT WELDS SHALL BE FULL PENETRATION UNLESS NOTES OTHERWISE.

6. ALL SHOP WELDS SHALL BE PERFORMED BY A FABRICATOR LICENSED BY THE CITY.

7. WELDERS SHALL BE QUALIFIED FOR THE WORK THEY WILL BE DOING AND SHALL HAVE CERTIFICATIONS CURRENT.

8. FACES OF FILLET WELDS EXPOSED TO VIEW SHALL HAVE AS-WELDED SURFACES THAT ARE REASONABLY SMOOTH AND UNIFORM. NO FINISHING OR GRINDING SHALL BE REQUIRED, EXCEPT WHERE CLEARANCES OR FIT OF OTHER ITEMS MAY SO NECESSITATE.

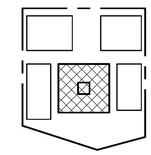
JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

JLA
John Labib + Associates
Structural Engineers
319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
GENERAL NOTES

ARCHITECT
JOHNSON FAIN

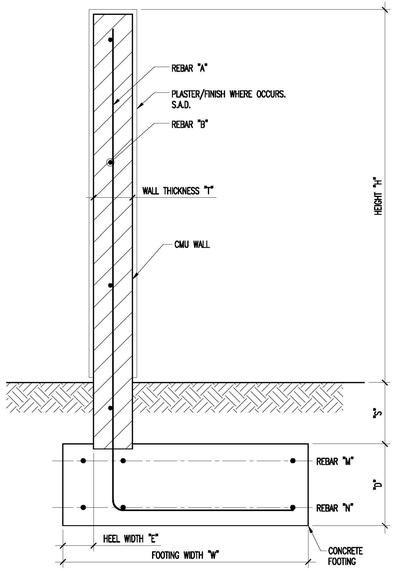
PLOT STAMP
10/14/2015 4:36:22 PM

PROJECT NUMBER
13032

SHEET NUMBER
S0.1.02

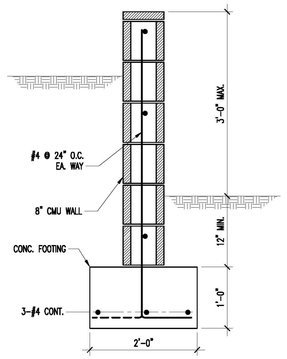
COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

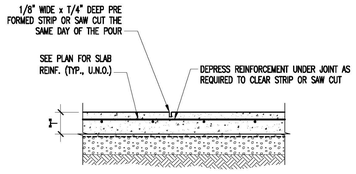


FREESTANDING WALL SCHEDULE									
MAX WALL HEIGHT "H"	STEM			FOOTING					
	"T"	"A"	"B"	"W"	"D"	"S"	"E"	"M"	"N"
8'-0"	8"	#5 @ 16"O.C.	#4 @ 24"O.C.	3'-6"	18"	18"	0"	(2) #6	(2) #6

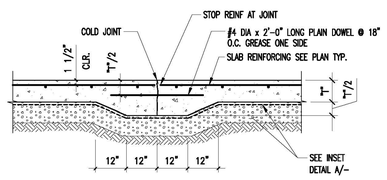
FREESTANDING SITE WALL (12)
SCALE: N.T.S.



TYP. SITE PLANTER DETAIL (9)
SCALE: N.T.S.



CONTROL JOINT (WHERE CONTINOUS POUR IS USED) (A)



TYPICAL CONSTRUCTION JOINT (B)

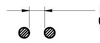
NOTES:

1. CONTROL JOINTS TO BE LOCATED AT COLUMN CENTER LINES AND AT 20'-0" O.C. MAX. AND EVERY 400 SQUARE FEET.
2. IF SAW-CUT CONTROL JOINT TO BE USED, SAW-CUT WITHIN 24 HOURS OF POUR.
3. SEE PLAN FOR "T".

JOINTS AT SLAB ON GRADE (7)
SCALE: N.T.S.

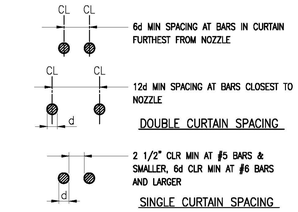


BAR SPACING FOR NON-SPLICED BARS (A)

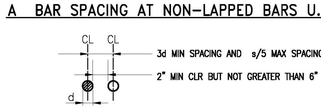


BAR SPACING FOR BARS SPLICED W/ NON-CONTACT LAP (B)

BAR SPACING (3)
SCALE: N.T.S.



A BAR SPACING AT NON-LAPPED BARS U.N.O.



B LAPPED BAR SPACING

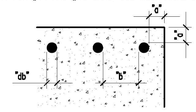
WHERE d = DIAMETER OF LARGER BAR

BAR SPACING IN SHOTCRETE (4)
SCALE: N.T.S.

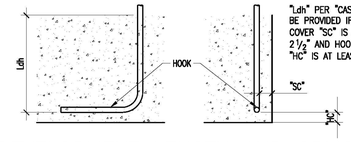
CONC f'c	TENSION LAP SPLICE LENGTH (IN) (CLASS B)						DEVELOPMENT LENGTH "Ld" (IN) (CLASS A)						DEVELOPMENT LENGTH "Ldh" STANDARD HOOK					
	N.W. 3000 PSI		N.W. 4000 PSI		N.W. 5000 PSI		N.W. 3000 PSI		N.W. 4000 PSI		N.W. 5000 PSI		N.W. 3000 PSI		N.W. 4000 PSI		N.W. 5000 PSI	
BAR SIZE	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2
#3	29	22	28	20	28	20	23	17	21	15	21	15	9	6	8	6	7	6
#4	39	29	34	25	30	23	30	22	26	19	23	17	11	8	10	7	9	6
#5	48	36	42	31	38	28	37	28	32	24	29	22	14	10	12	9	11	8
#6	58	43	50	37	45	34	45	33	39	29	35	26	17	12	15	10	13	9
#7	81	63	71	54	63	49	63	48	54	42	49	38	20	14	17	12	15	11
#8	93	72	81	62	72	56	72	55	62	48	56	43	22	16	19	14	17	12
#9	105	81	91	70	81	63	81	62	70	54	63	48	25	18	22	15	20	14
#10	118	91	102	79	92	70	91	70	79	61	70	54	28	20	24	17	22	15
#11	131	101	113	87	102	78	101	78	87	67	78	60	31	22	27	19	24	17

NOTES:

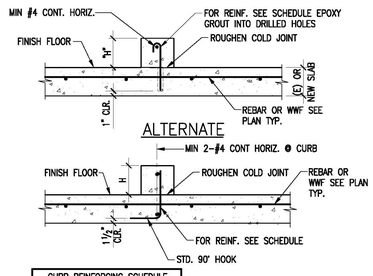
1. ALL SPLICES SHALL BE TENSION LAP SPLICES U.N.O.
2. ALL DEVELOPMENT LENGTH WITH STANDARD HOOKS "Ldh" SHALL BE TYPE 1 UNLESS TYPE 2 CAN BE USED AS SHOWN IN ILLUSTRATION BELOW
3. LENGTHS SHOWN ARE FOR GRADE 60 UNCOATED BARS
4. LENGTHS SHOWN ARE FOR NORMAL WEIGHT CONCRETE (N.W.). INCREASE LENGTHS 30% FOR LIGHT WEIGHT CONCRETE AND AT FOUR BAR BUNDLES (WHERE 2 BARS LAP WITH 2 OTHER BARS) INDIVIDUAL BARS WITHIN A BUNDLE SHALL NOT OVERLAP
5. TOP BARS – HORIZONTAL BARS PLACED WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW THEM
6. INCREASE LENGTHS 50% WHERE a < db OR WHERE b < db FOR BEAMS AND COLUMNS OR WHERE b < 2db FOR OTHER ELEMENTS
7. FOR #14 AND #18 BARS, USE MECHANICAL SPLICE IN ACCORDANCE WITH IBC REQUIREMENTS.



WHERE:
"c" IS THE CLEAR COVER
"b" IS THE CLEAR SPACING
"db" IS THE BAR DIA



DEVELOPMENT LENGTH AND SPLICE (1)
SCALE: N.T.S.

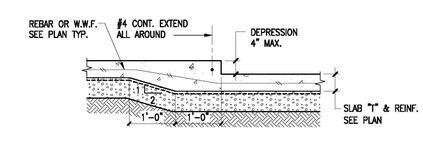


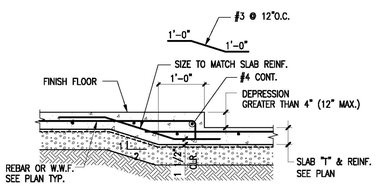
CURB REINFORCING SCHEDULE		
MAX. "H"	VERTICAL	HORIZ.
8"	#3 @ 18"	
18"	#4 @ 18"	
4'-0"	#4 @ 12"	#4 @ 12"

REINF. TO BE PLACED IN CURB WALL ℄

NOTE:
1. SEE ARCH'L DWGS FOR CURB LOCATION & SIZE

CONCRETE CURB DETAIL (10)
SCALE: N.T.S.

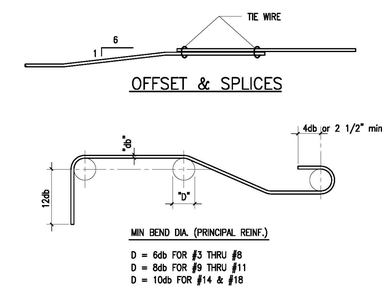




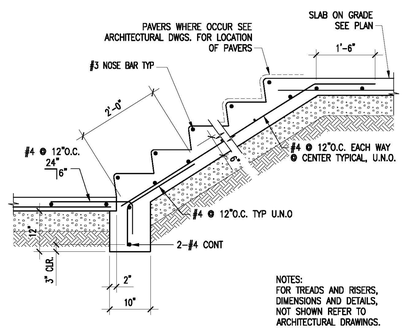
SLAB ON GRADE DEPRESSION (8)
SCALE: N.T.S.

NOTES:
1. SEE SOILS REPORT FOR ADDITIONAL SUBGRADE PREPARATION REQUIREMENTS
2. VAPOR BARRIERS SPECS NOT PER JLA

TYPICAL SLAB ON GRADE (5)
SCALE: N.T.S.

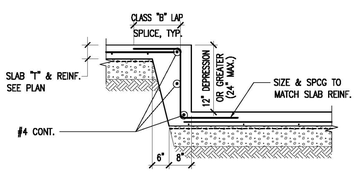


STANDARD HOOK DETAILS FOR PRINCIPAL REINF.

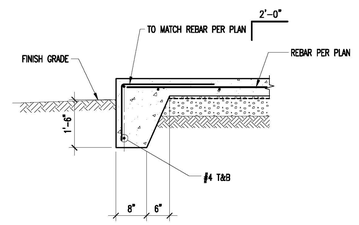


NOTES:
FOR TREADS AND RISERS, DIMENSIONS AND DETAILS, NOT SHOWN REFER TO ARCHITECTURAL DRAWINGS.

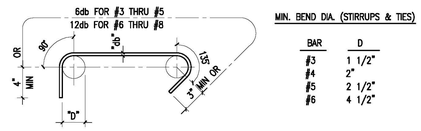
STAIR ON GRADE DETAIL (11)
SCALE: N.T.S.



SLAB ON GRADE DEPRESSION (8)
SCALE: N.T.S.



SLAB ON GRADE EDGE DETAIL (6)
SCALE: N.T.S.



MIN. BEND DIA. (STIRRUPS & TIES)

BAR	D
#3	1 1/2"
#4	2"
#5	2 1/2"
#6	4 1/2"

STANDARD HOOK DETAILS FOR STIRRUPS & TIES

TYPICAL REINFORCEMENT DETAILS (2)
SCALE: N.T.S.

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

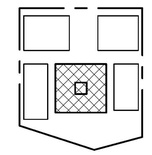
JLA
John Labib + Associates
Structural Engineers

319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION	
DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION		
REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
TYPICAL DETAILS

ARCHITECT
JOHNSON FAIN

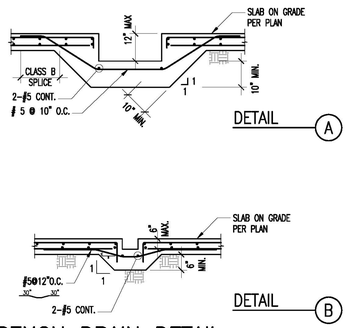
PLOT STAMP
10/14/2015 4:36:23 PM

PROJECT NUMBER
13032

SHEET NUMBER
S1.1.01

COPYRIGHT © 2013 JOHNSON FAIN

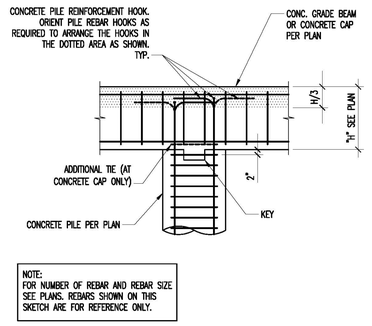
NOTE: NOT FOR CONSTRUCTION



TRENCH DRAIN DETAIL

SCALE: N.T.S.

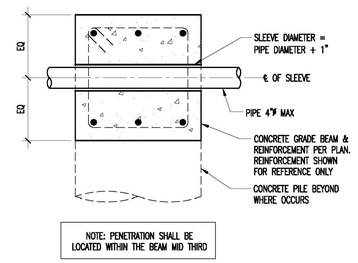
12



TOP OF CONCRETE PILE DETAIL

SCALE: N.T.S.

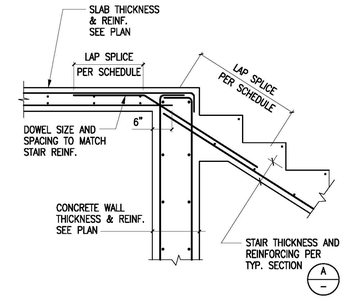
8



TYP. PIPE THRU GRADE BEAM

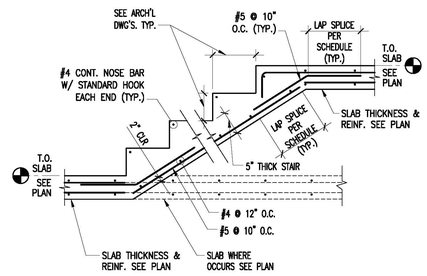
SCALE: N.T.S.

5



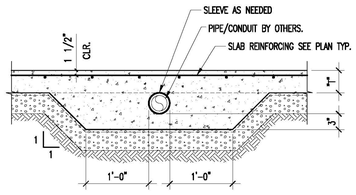
TYP. TOP OF STAIR TO WALL SECTION

C



TYP. STAIR/LANDING SECTION

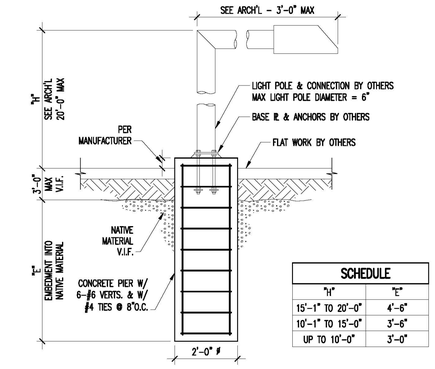
A



TYP. PIPE THRU SLAB ON GRADE

SCALE: N.T.S.

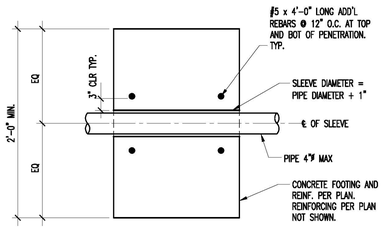
13



LIGHT POLE FOOTING

SCALE: N.T.S.

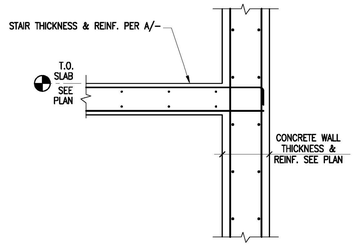
9



TYP. PIPE THRU FOOTING

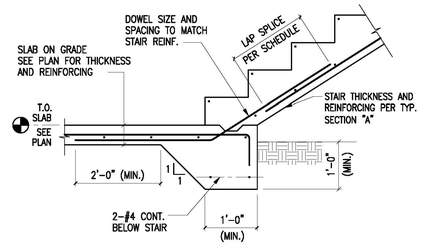
SCALE: N.T.S.

6



TYP. STAIR/LANDING TO WALL SECTION

D



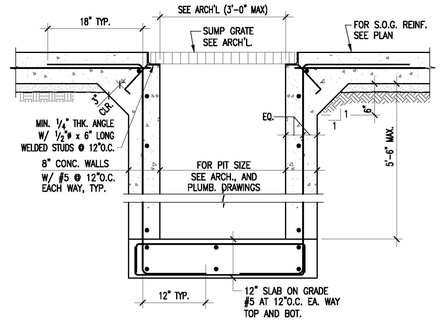
TYP. STAIR TO SLAB ON–GRADE SECTION

B

TYP. CONCRETE STAIR DETAILS

SCALE: N.T.S.

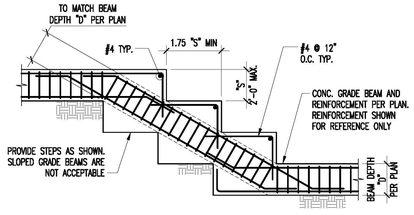
1



TYP. SUMP PUMP PIT

SCALE: N.T.S.

10



STEPPED GRADE BEAM DETAIL

SCALE: N.T.S.

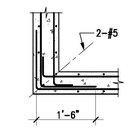
7

NOTES:
WHERE REINFORCING IS NOT SHOWN OTHERWISE ON SECTIONS, DETAILS OR WALL ELEVATIONS.

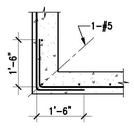
MINIMUM REINFORCEMENT IN CONCRETE WALLS

WALL THICKNESS "T"	REINFORCING EACH WAY	OPENING REINF.
6"	#4 @ 12" @ C.L.	1–#5
8"	#4 @ 10" @ C.L.	2–#5
10"	#4 @ 16" E.F.	2–#6
12"	#4 @ 12" E.F.	2–#6
14"	#4 @ 12" E.F.	2–#7
16"	#5 @ 15" E.F.	2–#7
18"	#5 @ 14" E.F.	2–#8
20"	#5 @ 12" E.F.	2–#8

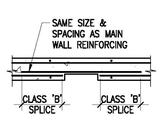
NOTES:
1. FOR PLACEMENT OF VERTICAL BARS RELATIVE TO HORIZONTAL BARS, SEE REINFORCING NOTES IN GENERAL NOTES.
2. MAXIMUM OPENING 8'–0".



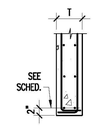
CORNER DOUBLE REINF.



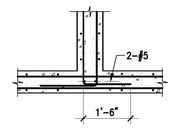
CORNER SINGLE REINF.



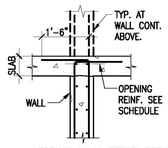
SECTION AT WALL CHASES

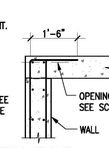


TOP, BOTTOM AND SIDES OF OPENINGS AND ENDS OF WALL

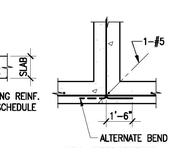


WALL INTERSECTION DOUBLE REINFORCEMENT





VERTICAL WALL REINF. DETAILS AT SLAB WHERE WALL IS DISCONTINUOUS

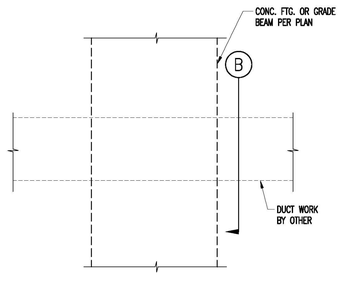


WALL INTERSECTION SINGLE REINF.

TYPICAL CONCRETE WALL DETAILS

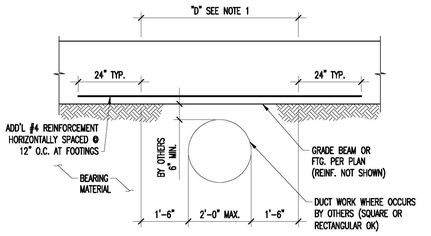
SCALE: N.T.S.

2



PARTIAL PLAN

A



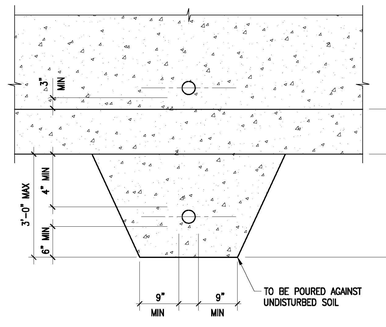
SECTION

B

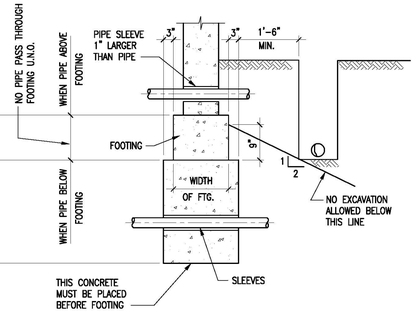
TYP. DUCT BELOW FOOTING OR GRADE BEAM

SCALE: N.T.S.

11



ELEVATION

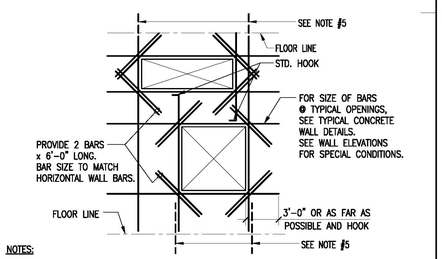


SECTION

TYP. PIPE THRU FOUNDATION DETAIL

SCALE: N.T.S.

4



NOTES:
1. WHERE ONE OPENING OCCURS ABOVE ANOTHER, EXTEND ALL SILL AND LINTEL REINF. 3'–0" BEYOND FURTHEST OPENING IN EACH DIRECTION.
2. WHERE OPENINGS IN A HORIZONTAL LINE ARE SPACED LESS THAN THE WIDTH OF THE MAX. ADJACENT OPENING APART, RUN LINTEL AND SILL REINF. CONTINUOUS BETWEEN OPENINGS.
3. EXTEND VERTICAL BARS FROM FLOOR TO FLOOR OR (WHERE OPENING INTERSECTS BAR) FROM FLOOR TO OPENING.
4. TYPICAL WALL REINF. AT TYPICAL SPACING BETWEEN SPECIAL BARS IS TO BE USED. SEE TYPICAL WALL REINF. DETAILS AND WALL SECTIONS.
5. EXTEND VERTICAL BARS 3'–0" PAST FLOOR JOINT OR PROVIDE EQUIVALENT DOWELS.

REINF. @ CONC. WALL OPENING

SCALE: N.T.S.

3

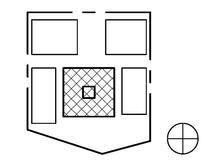
JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

JLA
John Labib + Associates Structural Engineers
319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

GENERAL NOTES

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:23 PM

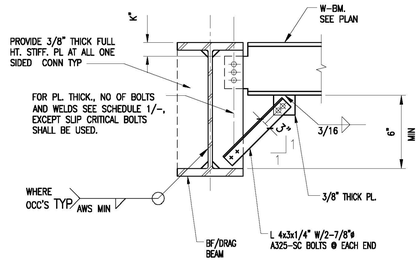
PROJECT NUMBER
13032

SHEET NUMBER

S1.1.02

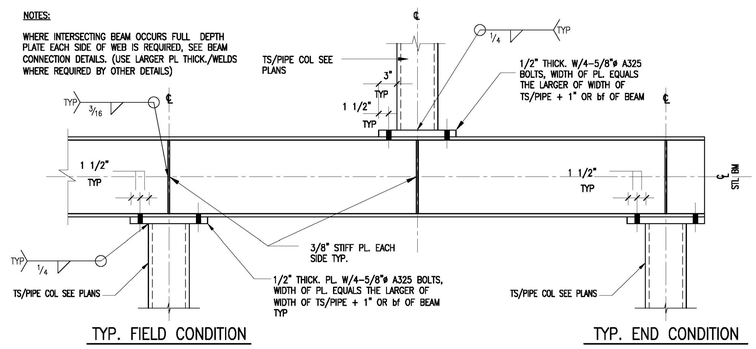
COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



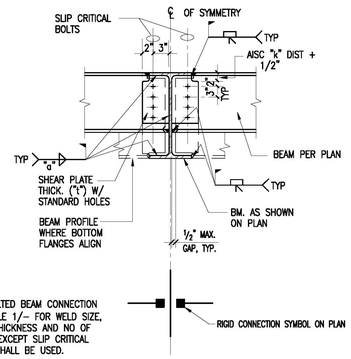
BEAM TO BRACED BEAM CONN. (17)

SCALE: N.T.S.



TYP. HSS – PIPE COLUMN TO Wx BEAM CONNECTIONS (9)

SCALE: N.T.S.



NOTES:
SEE BOLTED BEAM CONNECTION SCHEDULE 1/– FOR WELD SIZE, PLATE THICKNESS AND NO OF BOLTS, EXCEPT SLIP CRITICAL BOLTS SHALL BE USED.

BEAM TO BEAM RIGID CONN. (5)

SCALE: N.T.S.

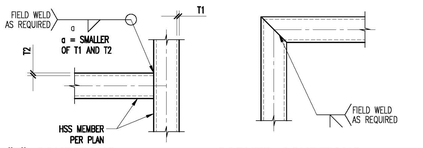
BEAM CONNECTION SCHEDULE

BEAM/ GIRDER	CONNECTION BOLT – A325X			
	NO. OF BOLTS	SIZE OF BOLTS	PLATE THICK. "t"	WELD SIZE "a", "b"
W6	2 [2]	5/8"ø	3/8"	5/16"
W8, W10	2	7/8"ø	3/8"	5/16"
W12, W14	3	7/8"ø	3/8"	3/8"
W16, W18	4	7/8"ø	1/2"	3/8"
W21	5	7/8"ø	1/2"	3/8"
W24	6	7/8"ø	1/2"	3/8"
W27	7	7/8"ø	1/2"	3/8"
W30	8	7/8"ø	5/8"	3/8"
W33	9	7/8"ø	5/8"	3/8"
W36	10	7/8"ø	5/8"	3/8"

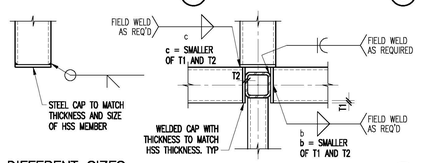
NOTES:
1. ALL FILLET WELD SIZES SHOWN ARE MINIMUM WELD SIZE. WHERE WELD SIZE SHOWN ARE SMALLER THAN AWS MINIMUM WELD SIZE, AWS MINIMUM WELD SIZE SHALL BE USED.
2. FIELD WELD CONNECTION PLATES WHERE (N) MEMBERS CONNECT TO (E) MEMBERS.
3. AT W6 BEAMS PROVIDE 1 7/8" SPACING BETWEEN BOLTS
4. ALL HOLES SHALL BE STANDARD HOLES

BEAM CONNECTION SCHEDULE (1)

SCALE: N.T.S.



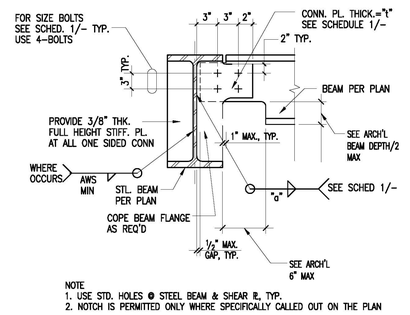
"T" CONDITIONS (A) CORNER CONDITIONS (C)



DIFFERENT SIZES (B)

HSS MEMBERS CONNECTION (18)

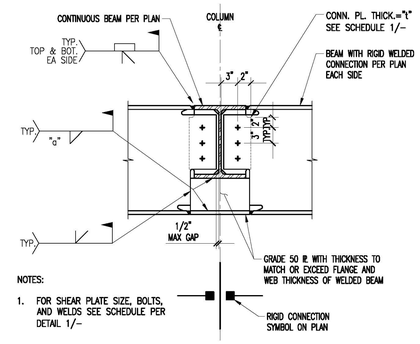
SCALE: N.T.S.



NOTE
1. USE STD. HOLES ø STEEL BEAM & SHEAR PL, TYP.
2. NOTCH IS PERMITTED ONLY WHERE SPECIFICALLY CALLED OUT ON THE PLAN

TYP. NOTCHED BEAM CONNECTION (14)

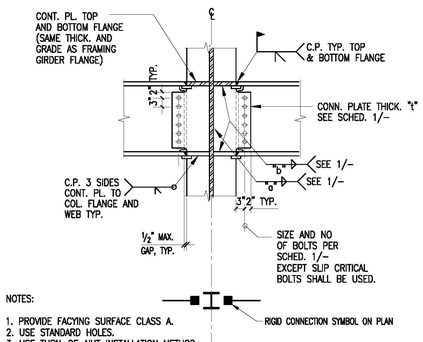
SCALE: N.T.S.



NOTES:
1. FOR SHEAR PLATE SIZE, BOLTS, AND WELDS SEE SCHEDULE PER DETAIL 1/–

DEEP BEAM TO BEAM RIGID CONN. (10)

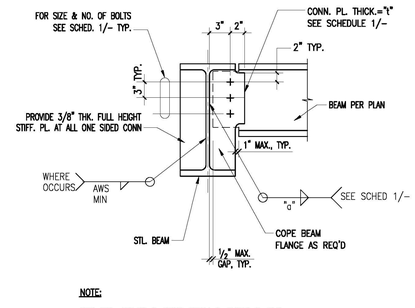
SCALE: N.T.S.



NOTES:
1. PROVIDE FACYING SURFACE CLASS A.
2. USE STANDARD HOLES.
3. USE TURN-OF-NUT INSTALLATION METHOD.

BEAM TO COL. WEB RIGID CONN. (6)

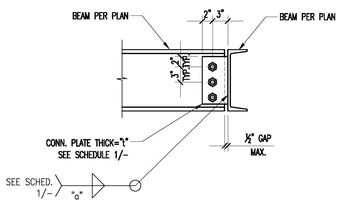
SCALE: N.T.S.



NOTE:
USE STD. HOLES ø STEEL BEAM & SHEAR PL, TYP.

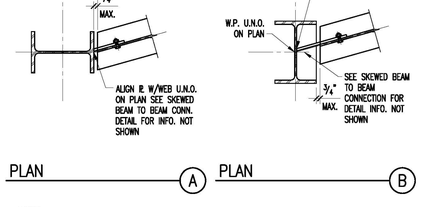
TYP. BEAM TO BEAM CONNECTION (2)

SCALE: N.T.S.



DETAIL (19)

SCALE: N.T.S.

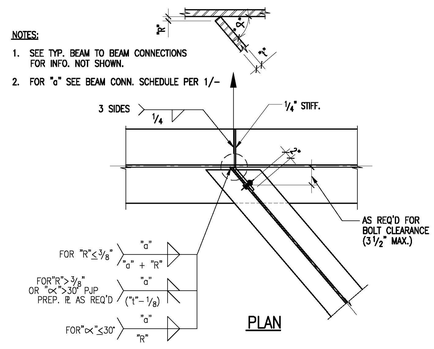


PLAN (A) PLAN (B)

NOTES:
1. SIMILAR CONDITIONS APPLY FOR BEAMS ON BOTH SIDE OF COL.

SKEWED BEAM TO COLUMN CONN. (15)

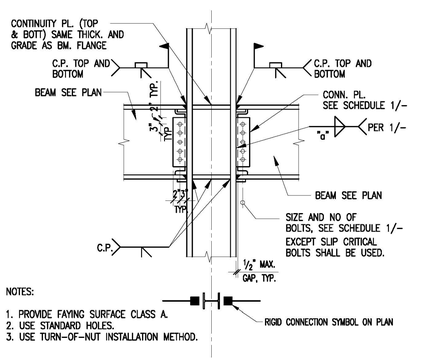
SCALE: N.T.S.



PLAN

SKEWED BEAM TO BEAM CONN. (11)

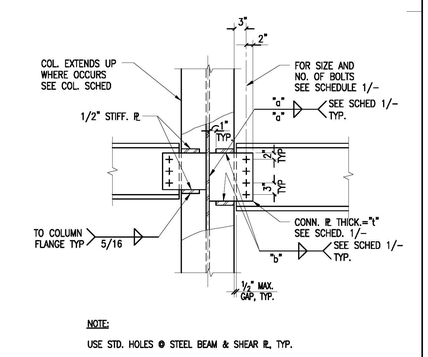
SCALE: N.T.S.



NOTES:
1. PROVIDE FAYING SURFACE CLASS A.
2. USE STANDARD HOLES.
3. USE TURN-OF-NUT INSTALLATION METHOD.

BEAM TO COL. FLANGE RIGID CON. (7)

SCALE: N.T.S.



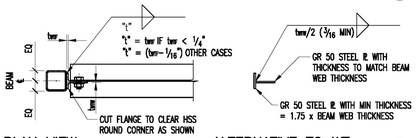
NOTE:
USE STD. HOLES ø STEEL BEAM & SHEAR PL, TYP.

TYP. BEAM TO COL. WEB CONN. (3)

SCALE: N.T.S.

NOTES:
1. PROVIDE FIELD WELD AS NEEDED AT EXISTING/ALREADY INSTALLED COLUMNS

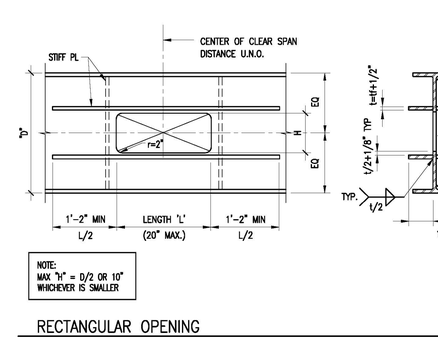
ELEVATION (B)



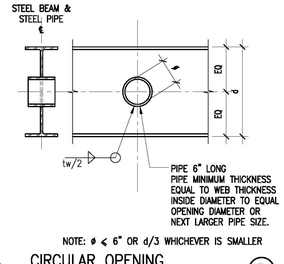
PLAN VIEW (A) ALTERNATIVE TO WT (C)

SKEWED BEAM TO HSS–TS COLUMN (16)

SCALE: N.T.S.



RECTANGULAR OPENING (A)

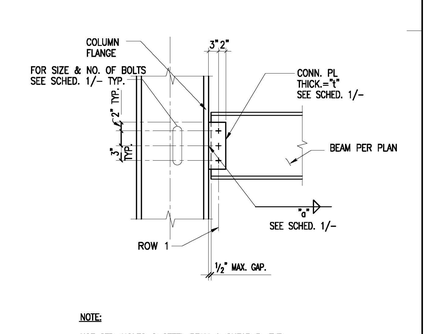


NOTE: ø ≤ 6" OR d/3 WHICHEVER IS SMALLER

CIRCULAR OPENING (B)

OPENING IN STEEL BEAM (8)

SCALE: N.T.S.



NOTE:
USE STD. HOLES ø STEEL BEAM & SHEAR PL, TYP.

TYP. BEAM TO COL. FLANGE CON. (4)

SCALE: N.T.S.

20

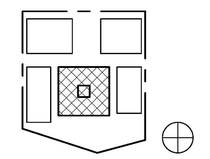
JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

JLA Structural Engineers
319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
TYPICAL DETAILS

ARCHITECT
JOHNSON FAIN

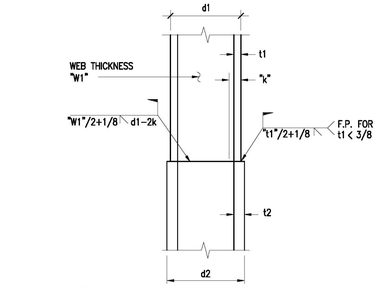
PLOT STAMP
10/14/2015 4:36:24 PM

PROJECT NUMBER
13032

SHEET NUMBER
S1.1.03

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

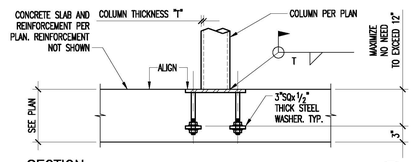


NOTES:

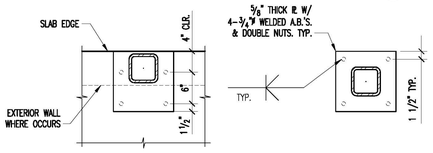
1. STEEL FABRICATOR TO DESIGN AND PROVIDE ALL REQUIRED ERECTION PLATES
2. FOR FINISH SURFACES AT COLUMN ENDS-- SEE AISC "CODE OF STANDARD PRACTICE"

TYP. COL. SPLICE 17

SCALE: N.T.S.



SECTION C

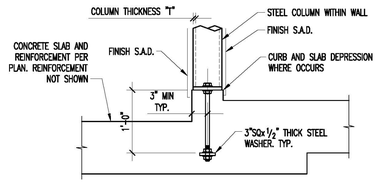


PLAN VIEW EDGE (B)

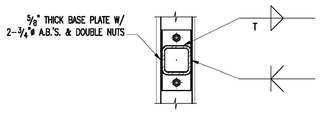
PLAN VIEW FIELD (A)

BASE PL ON PODIUM SLAB 18

SCALE: N.T.S.



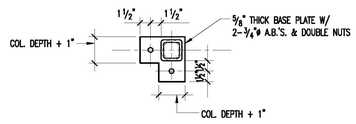
SECTION B



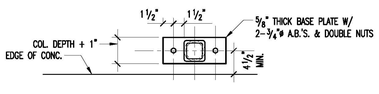
PLAN VIEW A

B. PL ON PODIUM SLAB DEPRESSION 19

SCALE: N.T.S.



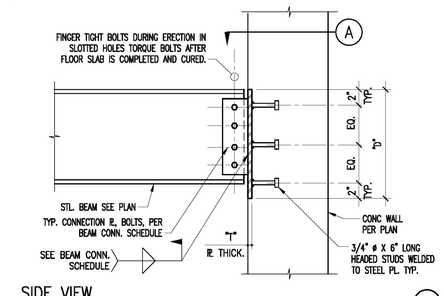
PLAN AT CORNER WALL CONDITIONS D



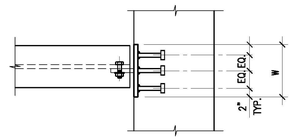
PLAN AT EXTERIOR WALL CONDITIONS C

ISOLATED HSS-PIPE COL. BASE PL 16

SCALE: N.T.S.



SIDE VIEW A



PLAN VIEW B

EMBEDDED STEEL PL SCHEDULE

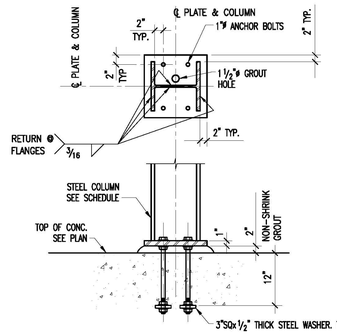
SECTION	NO. OF STUDS		SIZE OF STEEL PLATE			
	NO. OF ROW	STUDS PER ROW	"W"	"D"	"T"	"o"
C6, W8	4	2	1'-4"	1'-2"	3/4"	3"
W10, W12	4	3	1'-4"	1'-6"	3/4"	4"
W14	4	3	1'-4"	1'-6"	3/4"	4"
W16	4	3	1'-4"	1'-10"	1"	6"
W18	4	3	1'-4"	1'-10"	1"	6"
W24	4	3	1'-4"	2'-0"	1"	6"

NOTE:
1. FOR STEEL BEAM TO CONCRETE WALL CONNECTION USE DETAIL WITH STEEL BEAM SEATED INTO POCKET. USE THIS DETAIL ONLY WHERE SPECIFICALLY SPECIFIED ON THE PLANS, OR OBTAIN APPROVAL FROM ENGINEER PRIOR TO USING THIS DETAIL.
2. SEE EMBEDDED STEEL PLATE SCHEDULE FOR NO. OF STUDS AND PLATE SIZE.
3. W8x BEAMS MAY USE 3/4" Ø SIMPSON TITEN HD SCREWS
4. REINF. NOT SHOWN FOR CLARITY.

SCHEDULE AND NOTES C

TYP. STEEL BEAM TO CONC. WALL CONN. DETAIL 14

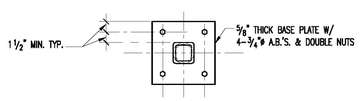
SCALE: N.T.S.



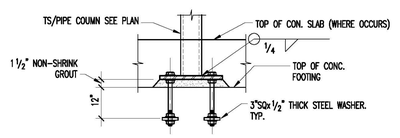
NOTES:
1. BASE PLATE SHALL BE FINISHED PER AISC SPECS
2. COLUMN SHALL BE FINISHED PER AISC "CODE OF STANDARD PRACTICES"

TYP. Wx BASE PLATE DETAIL 15

SCALE: N.T.S.



PLAN AT INTERIOR WALL CONDITIONS B



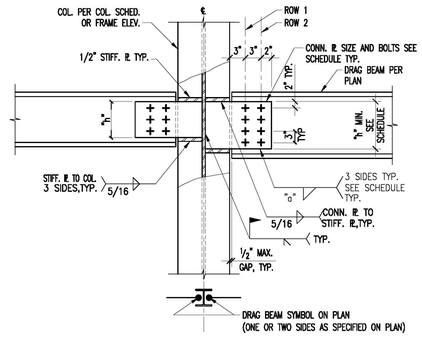
ELEVATION A

DRAG BEAM SIZE	NUMBER OF 1"Ø A490-SC BOLTS		CONNECTION PLATE		
	ROW 1	ROW 2	PLATE THICKNESS "t"	PLATE HEIGHT "h"	WELD "a"
W12x	2	2	5/8"	9"	5/16"
W14x	3	2	5/8"	11"	5/16"
W16	4	2	5/8"	13"	3/8"
W18x	4	4	3/4"	13"	3/8"
W21x	5	4	3/4"	16"	3/8"
W24x55 W24x62	6	4	3/4"	19"	3/8"
W24x68 W24x76	6	4	1 1/4"	19"	3/8"
W24x84	6	6	1 1/2"	19"	3/8"
W24x94	6	6	1 5/8"	19"	1/2"
W27x	7	5	1 5/8"	22"	1/2"

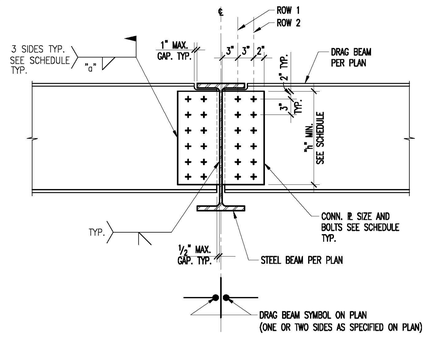
DRAG BEAM CONNECTION SCHEDULE E

NOTES:
1. ALL FILLET WELD SIZES SHOWN ARE MINIMUM WELD SIZE. WHERE WELD SIZE SHOWN ARE SMALLER THAN AWS MINIMUM WELD SIZE, AWS MINIMUM WELD SIZE SHALL BE USED.
2. ALL CONN PL. SHALL BE A572, GRADE 50
3. FIELD WELD CONNECTION PLATES WHERE (N) MEMBERS CONNECT TO (E) MEMBERS.
4. USE STD. HOLES Ø STEEL BEAM & SHEAR PL, TYP.

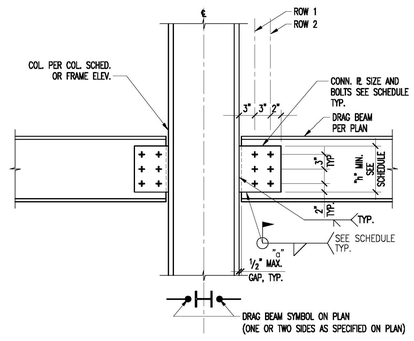
DRAG BEAM CONNECTION NOTES F



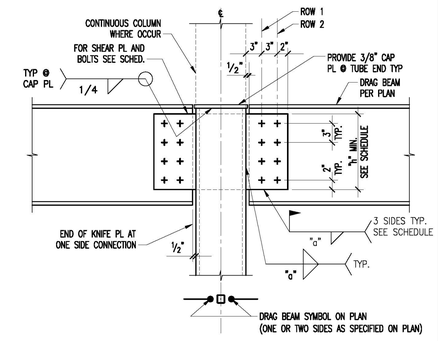
DRAG BEAM TO COL. WEB CONN. C



DRAG BEAM TO BEAM CONNECTION A



DRAG BEAM TO COL. FLANGE CONN. D



DRAG BEAM TO TS COLUMN B

TYPICAL DRAG BEAM CONNECTIONS 2

SCALE: N.T.S.

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN • PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

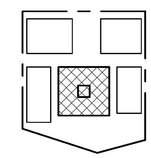
JLA
John Labib + Associates
Structural Engineers

319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

GENERAL NOTES

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:24 PM

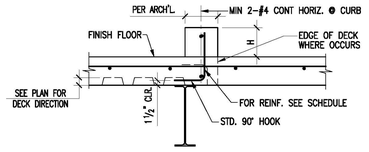
PROJECT NUMBER
13032

SHEET NUMBER

S1.1.04

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



CURB REINFORCING SCHEDULE		
MAX. "H"	VERTICAL	HORIZ.
12"	#4 @ 18"	
24"	#4 @ 12"	#4 @ 12"

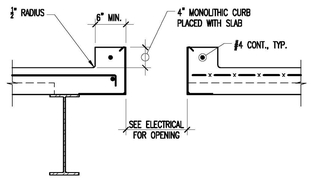
REINF. TO BE PLACED IN CURB WALL ℄

NOTE:
1. SEE ARCH'L DWGS FOR CURB LOCATION & SIZE
2. PROVIDE 2 CURTAIN REINF. FOR CURBS 12" WIDE.

TYP. CURB DETAIL

13 / -

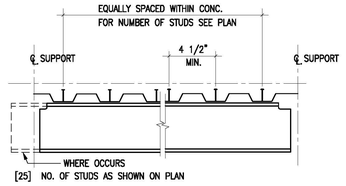
SCALE: NTS



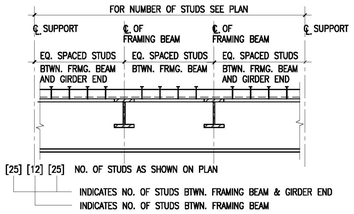
CURB AT ELECTRICAL OPENING

10 / -

SCALE: NTS

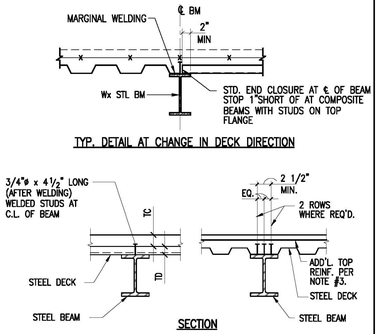


BEAM ELEVATION



GIRDER ELEVATION

NOTE:
1. ALL DECKS SHALL BE REINFORCED WITH MINIMUM OF 1 LAYER WWF 6x6-W2.9xW2.9
2. SEE PLAN FOR DECKS WITH SPECIAL LOADING.



TYP. DETAIL AT CHANGE IN DECK DIRECTION

SECTION

NOTES:
1. WELDED STUD SHALL BE HEADED STUDS OF A TYPE IN CONFORMANCE WITH THE DESIGN CODES AND THE SPECIFICATIONS.
2. WHERE STUDS ARE NOT INDICATED ON FRAMING PLANS PROVIDE WELDED STUD SHEAR CONNECTORS @ 12" O.C. MAX. SPACING.

TYPICAL METAL DECK DETAILS

1 / -

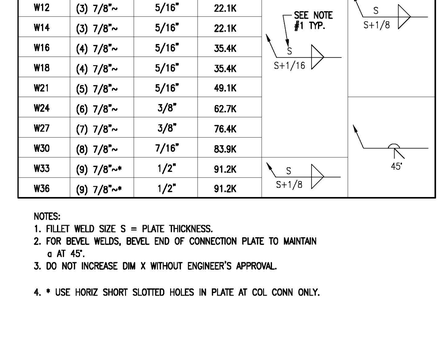
SCALE: NTS

NOTES:
1. SCHEDULE APPLIES TO REINFORCING BARS TERMINATING IN STRUCTURAL CONCRETE.
2. EPOXY DOWELS/ANCHORS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
3. DIAMETER OF HOLES AND EMBEDMENT FOR EPOXY-SET DOWELS SHALL BE PER EPOXY MANUFACTURER'S RECOMMENDATIONS (UNO).
4. ENSURE END OF DRILLED HOLE FOR EPOXY-SET DOWELS IS MIN. 1 1/2" CLEAR OF FAR SIDE OF CONCRETE WALL OR SLAB
5. FOR EMBEDMENT "E" SEE ICBO TABLES FOR SPECIFIED EPOXY PRODUCT.

DOWEL SCHEDULE U.N.O

14 / -

SCALE: NTS

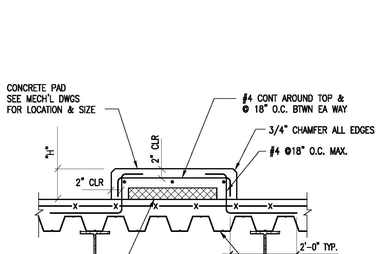


NOTE:
PRECAST ELEMENTS MUST BE ATTACHED TO EMBEDDED ANCHORS

EXTENDED SLAB EDGE DETAIL

11 / -

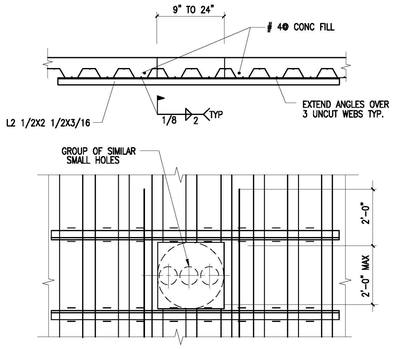
SCALE: NTS



TYP. MECH'L PAD ON DECK

7 / -

SCALE: NTS

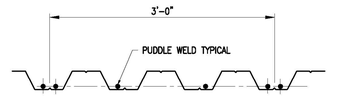


NOTE: USE OF TWO L2x2x¼ TACK WELDED PERPENDICULAR TO DECK ON TOP IS ACCEPTABLE AS A SUBSTITUTE

TYP. OPENING IN FLOOR & ROOF DECK

5 / -

SCALE: NTS

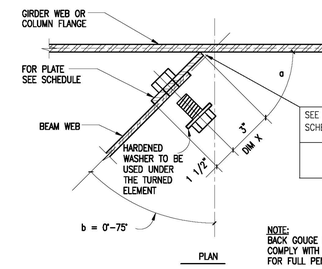


NOTES:
1. WHERE DECK RIBS ARE PARALLEL TO SUPPORTS, USE 1/2" DIA EFFECTIVE PUDDLE WELDS @ 12" O.C.
2. BUTTON PUNCH SIDE LAPS @ 30"o.c.
3. DECK TO BE WELDED TO SUPPORTS BY 3/4" DIA EFFECTIVE PUDDLE WELDS @ EACH FLUTE
4. WHERE NELSON STUDS AND PUDDLE WELDS COINCIDE THE PUDDLE WELD MAY BE REPLACED BY THE STUDS ICBO EVALUATION REPORT NO. 2078

TYP. METAL DECK SECTION

2 / -

SCALE: NTS



PLAN

NOTE:
BACK GOUGE FOR C.P. WELD & COMPLY WITH AWS D1.1 SECT. 10.13 FOR FULL PEN WELDING

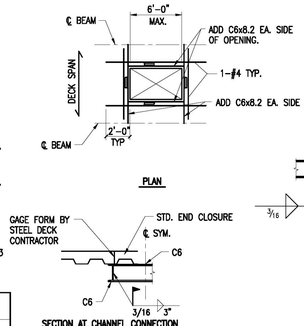
SKEWED BEAM CONNECTION SCHEDULE					
BEAM SIZE	NO.& SIZE OF BOLTS REQUIRED	PLATE THICKNESS	CONN CAPACITY (SING.SHEAR)	WELD FOR 0°<b<10°	WELD FOR 10°<b<30°
W8	(2) 7/8"~	5/16"	11.1K	SEE NOTE #1 TYP. S S+1/16	S S+1/8
W10	(2) 7/8"~ W/ 4"GA	5/16"	13.7K		
W12	(3) 7/8"~	5/16"	22.1K		
W14	(3) 7/8"~	5/16"	22.1K		
W16	(4) 7/8"~	5/16"	35.4K		
W18	(4) 7/8"~	5/16"	35.4K		
W21	(5) 7/8"~	5/16"	49.1K		
W24	(6) 7/8"~	3/8"	62.7K		
W27	(7) 7/8"~	3/8"	76.4K		
W30	(8) 7/8"~	7/16"	83.9K		
W33	(9) 7/8"~*	1/2"	91.2K	S S+1/8	45°
W36	(9) 7/8"~*	1/2"	91.2K		

NOTES:
1. FILLET WELD SIZE S = PLATE THICKNESS.
2. FOR BEVEL WELDS, BEVEL END OF CONNECTION PLATE TO MAINTAIN α AT 45°.
3. DO NOT INCREASE DIM X WITHOUT ENGINEER'S APPROVAL.
4. * USE HORIZ SHORT SLOTTED HOLES IN PLATE AT COL CONN ONLY.

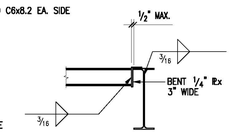
TYPICAL SKEWED BEAM CONNECTION

12 / -

NOT TO SCALE



PLAN



SECTION AT BEAM CONNECTION

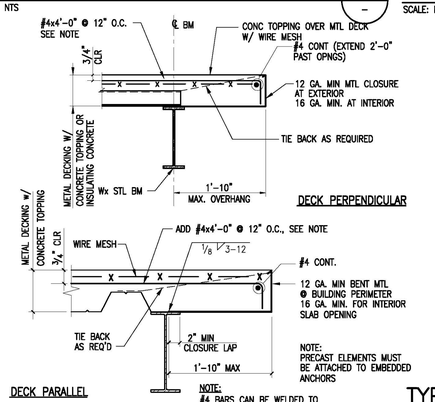
SECTION AT CHANNEL CONNECTION

WHERE MORE THAN TWO FLUTES ARE CUT

TYP. LARGE DECK OPENING

8 / -

SCALE: NTS



NOTE:
PRECAST ELEMENTS MUST BE ATTACHED TO EMBEDDED ANCHORS

NOTE:
#4 BARS CAN BE WELDED TO CLOSURE ℞ IN LIEU OF HOOKING.

TYPICAL SLAB EDGE

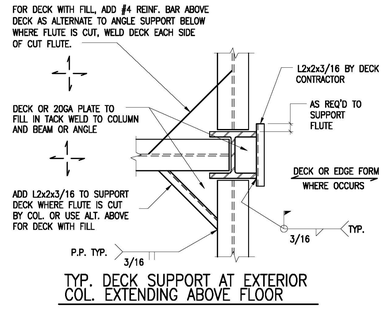
9 / -

SCALE: NTS

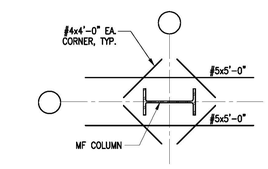
TYPICAL SLAB DETAIL

6 / -

SCALE: NTS



TYP. DECK SUPPORT AT EXTERIOR COL. EXTENDING ABOVE FLOOR



TYP. REINF. SLAB METAL DECK AT INTERIOR STEEL COL. DETAIL

4 / -

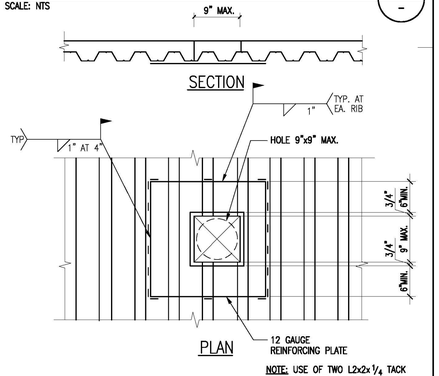
SCALE: NTS

TYP. OPENING IN FLOOR & ROOF DECK

3 / -

SCALE: NTS

(MAX. OPENING SIZE 9"x9")



NOTE: USE OF TWO L2x2x¼ TACK WELDED PERPENDICULAR TO DECK ON TOP IS ACCEPTABLE AS A SUBSTITUTE

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

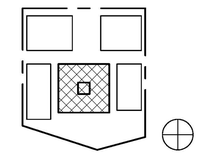
JLA
John Labib + Associates Structural Engineers

319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

TYPICAL DETAILS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:25 PM

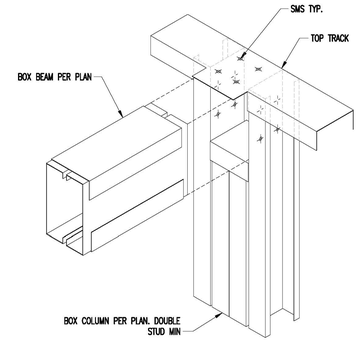
PROJECT NUMBER
13032

SHEET NUMBER

S1.1.05

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



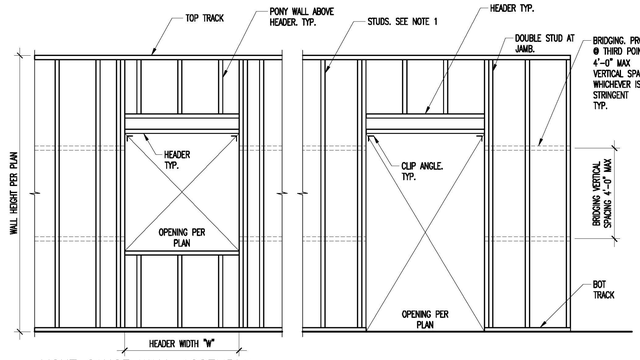
BOX BEAM PERP. TO WALL (5)

SCALE: N.T.S.

STUD SIZE U.N.O. ON PLANS		
MAX WALL HEIGHT	NON SUPPORTING CEILING FRAMING	SUPPORTING CEILING FRAMING
UP TO 8'-0"	362S125-18 @ 16"O.C.	362S125-27 @ 16"O.C.
UP TO 10'-0"	362S125-27 @ 16"O.C.	362S125-30 @ 16"O.C.
UP TO 12'-0"	362S125-30 @ 16"O.C.	362S162-33 @ 16"O.C.
UP TO 14'-0"	400S125-33 @ 16"O.C.	400S162-33 @ 16"O.C.
UP TO 16'-0"	600S125-30 @ 16"O.C.	400S162-33 @ 16"O.C.

LIGHT GAUGE WALL SCHEDULE U.N.O. ON PLAN (C)

HEADER SCHEDULE U.N.O. ON PLAN (D)



LIGHT GAUGE WALL ASSEMBLY (B)

NOTES

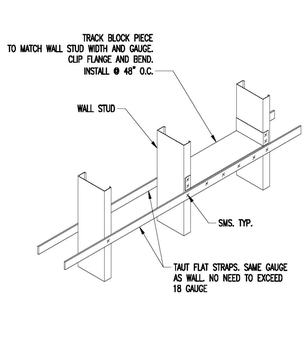
1. FOR STUD SIZE, SPACING AND GAUGE SEE PLANS. IF NOT NOTED ON PLAN, PROVIDE SIZES PER SCHEDULE THIS DETAIL.
2. UNLESS OTHERWISE NOTED ALL THE FRAMING MEMBERS SHALL HAVE THE SAME DEPT AND GAUGE OF THE STUDS.
3. FASTENERS CONNECTING LIGHT GAUGE MEMBERS TO LIGHT GAUGE OR STRUCTURAL STEEL MEMBERS SHALL SELF DRILLING AND SELF TAPPING SIMPSON "QUIK DRIVE" SHEET METAL SCREWS (SMS). (LA RR 25670).

   PROVIDE SMS SCREWS ACCORDING TO THE THICKNESS OF THE CONNECTING MEMBERS AS FOLLOWS:

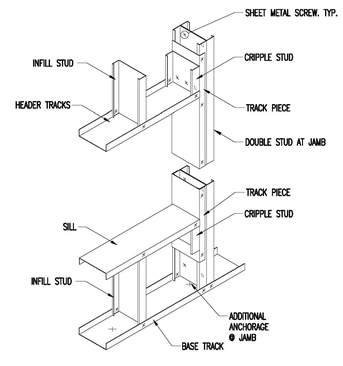
   A. #8 SMS FOR THICKN. UP TO 18 GAUGE
   B. #10 SMS FOR THICKN. UP TO 16 GAUGE
   C. #12 SMS FOR THICKN. EXCEEDING 16 GAUGE
   D. #12 X SCREWS FOR CONNECTION TO STRUCTURAL STEEL

   PROVIDE A MIN ½" EDGE DISTANCE FOR ALL THE FASTENERS
3. UNLESS OTHERWISE NOTED ON PLANS PROVIDED HEADERS WITH SIZES PER SCHEDULE THIS DETAIL.

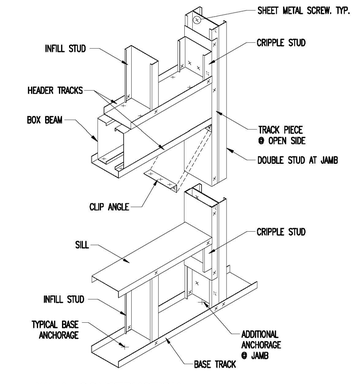
LIGHT GAUGE WALL NOTES (A)



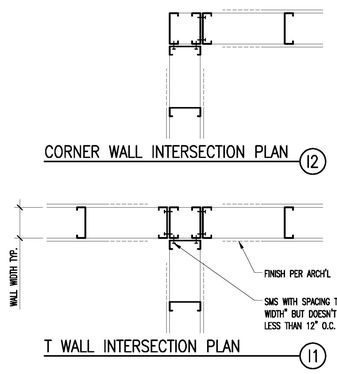
BRIDGING (G)



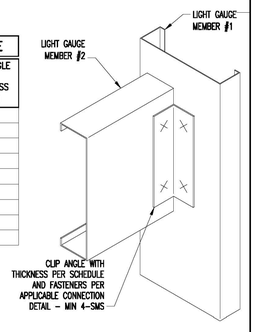
WALL CONSTRUCTION (F)



WALL CONSTRUCTION (E)



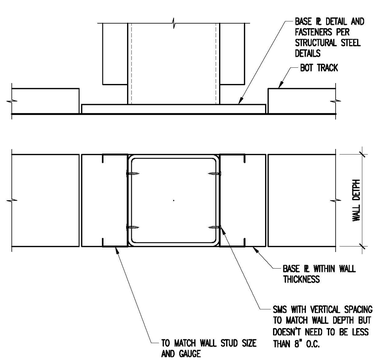
CLIP ANGLE THICKN. SCHEDULE	
DESIGNATION THICKNESS OF THICKER MEMBER BEING CONNECTED (MILS)	CLIP ANGLE MIN THICKNESS (MILS)
18	33
27	33
30	43
33	54
43	68
54	97
68	118
97	118
118	118



TYPICAL CLIP ANGLE (H)

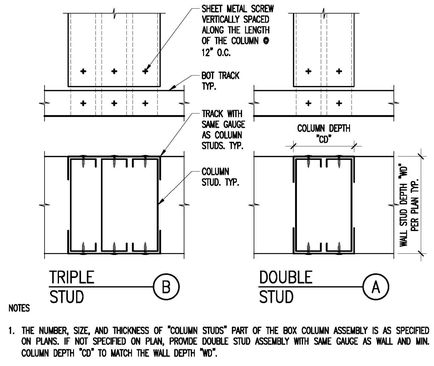
TYPICAL WALL CONSTRUCTION (1)

SCALE: N.T.S.



STEEL POST WITHIN WALL CONN. (4)

SCALE: N.T.S.

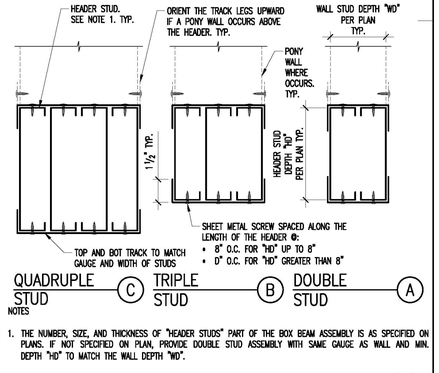


NOTES

1. THE NUMBER, SIZE, AND THICKNESS OF "COLUMN STUDS" PART OF THE BOX COLUMN ASSEMBLY IS AS SPECIFIED ON PLANS. IF NOT SPECIFIED ON PLAN, PROVIDE DOUBLE STUD ASSEMBLY WITH SAME GAUGE AS WALL AND MIN. COLUMN DEPTH "CD" TO MATCH THE WALL DEPTH "WD".

LG BOX COLUMN ASSEMBLIES (3)

SCALE: N.T.S.



NOTES

1. THE NUMBER, SIZE, AND THICKNESS OF "HEADER STUDS" PART OF THE BOX BEAM ASSEMBLY IS AS SPECIFIED ON PLANS. IF NOT SPECIFIED ON PLAN, PROVIDE DOUBLE STUD ASSEMBLY WITH SAME GAUGE AS WALL AND MIN. DEPTH "HD" TO MATCH THE WALL DEPTH "WD".

LG BOX BEAM ASSEMBLIES (2)

SCALE: N.T.S.

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

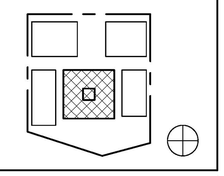
JLA — John Labib + Associates Structural Engineers

319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

TYPICAL DETAILS

ARCHITECT
JOHNSON FAIN

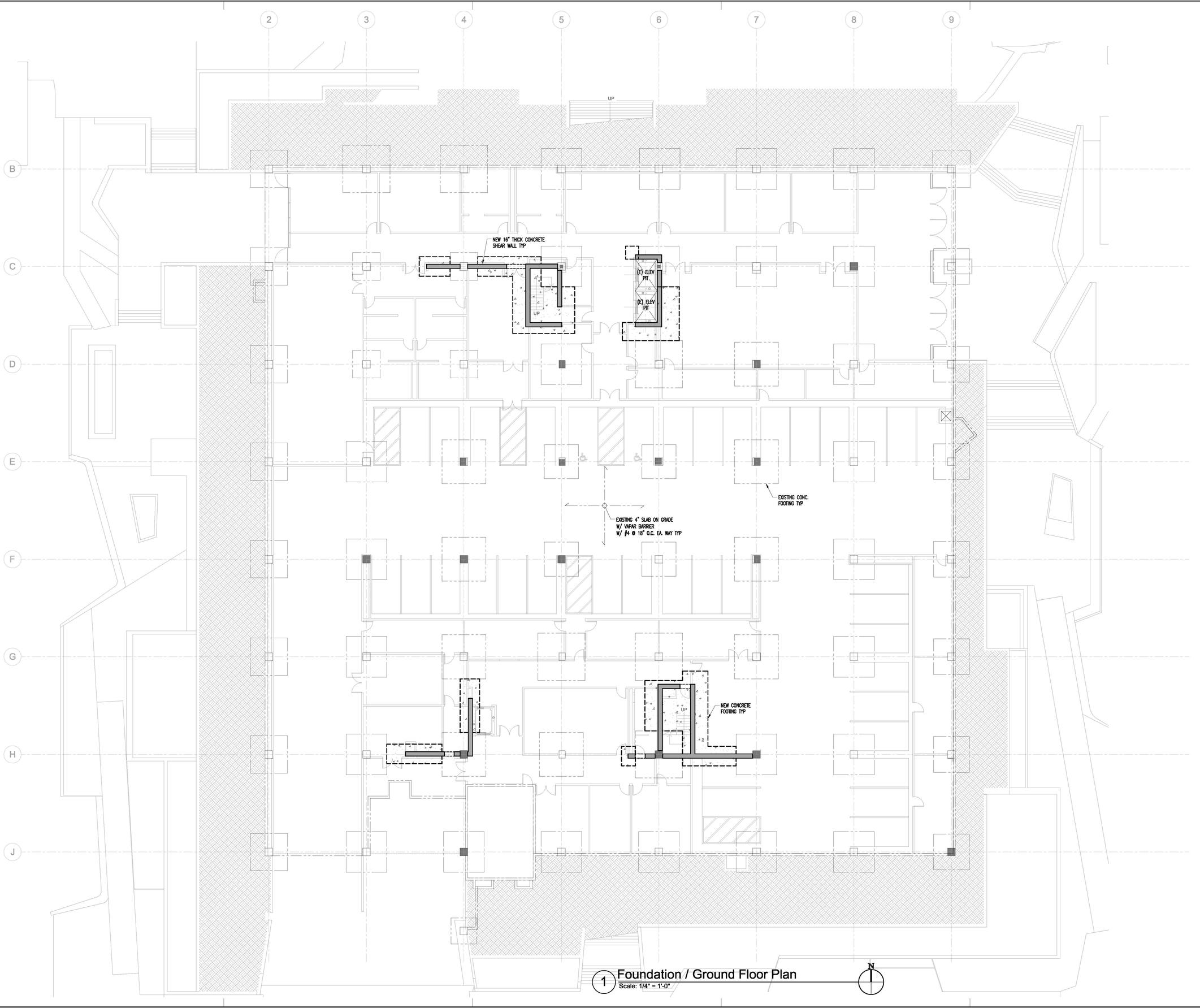
PLOT STAMP
10/14/2015 4:36:26 PM

PROJECT NUMBER
13032

SHEET NUMBER
S1.1.06

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 Foundation / Ground Floor Plan
Scale: 1/4" = 1'-0"

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 8000 • [323] 224 8030 fax
www.johnsonfain.com

JLA
John Labib + Associates
Structural Engineers

319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

FOUNDATION / GROUND FLOOR PLAN

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:27 PM

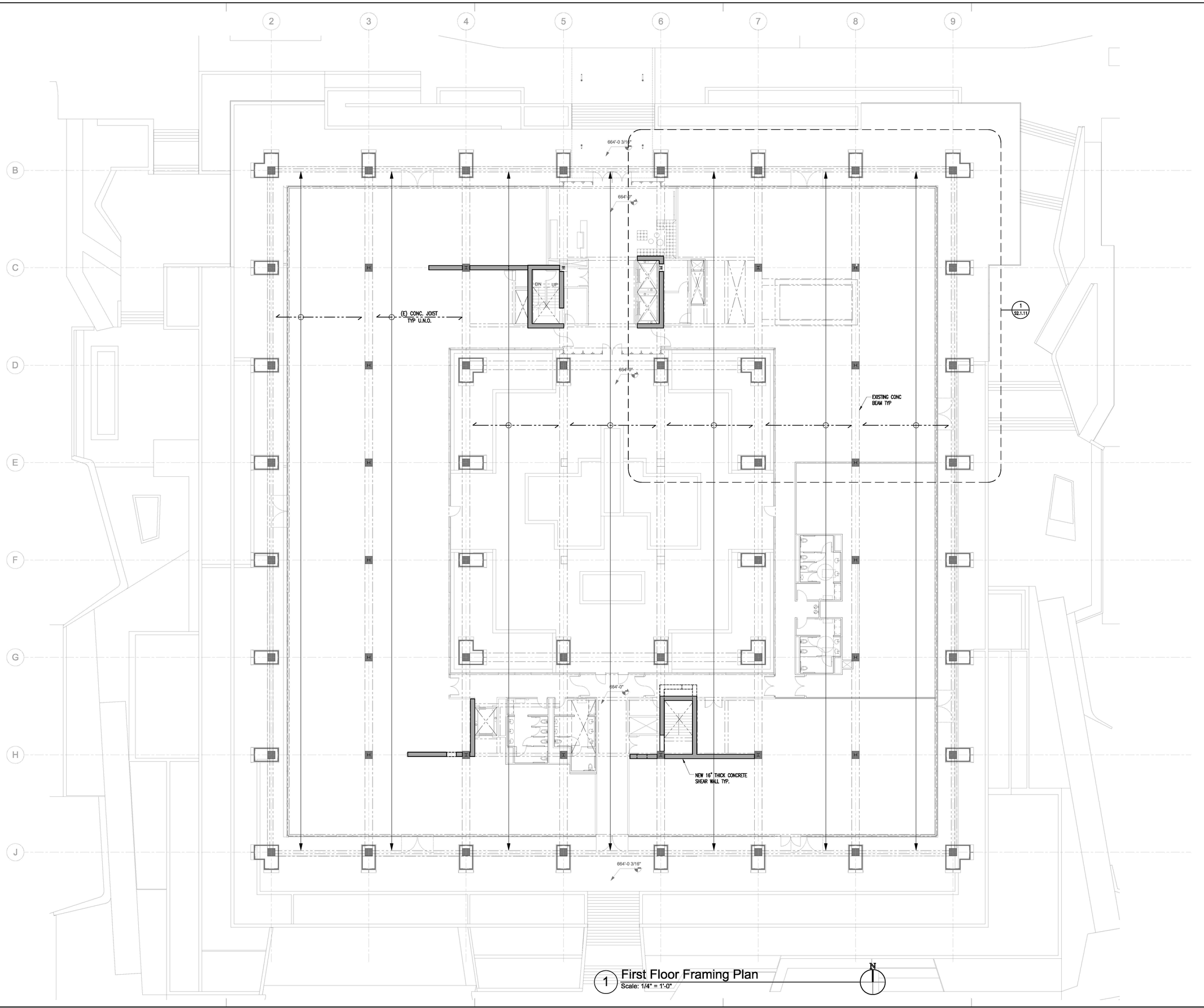
PROJECT NUMBER
13032

SHEET NUMBER

S2.1.00

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 First Floor Framing Plan
Scale: 1/4" = 1'-0"

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 8000 • [323] 224 6030 fax
www.johnsonfain.com

JLA John Labib + Associates Structural Engineers
319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

FIRST FLOOR FRAMING PLAN

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:28 PM

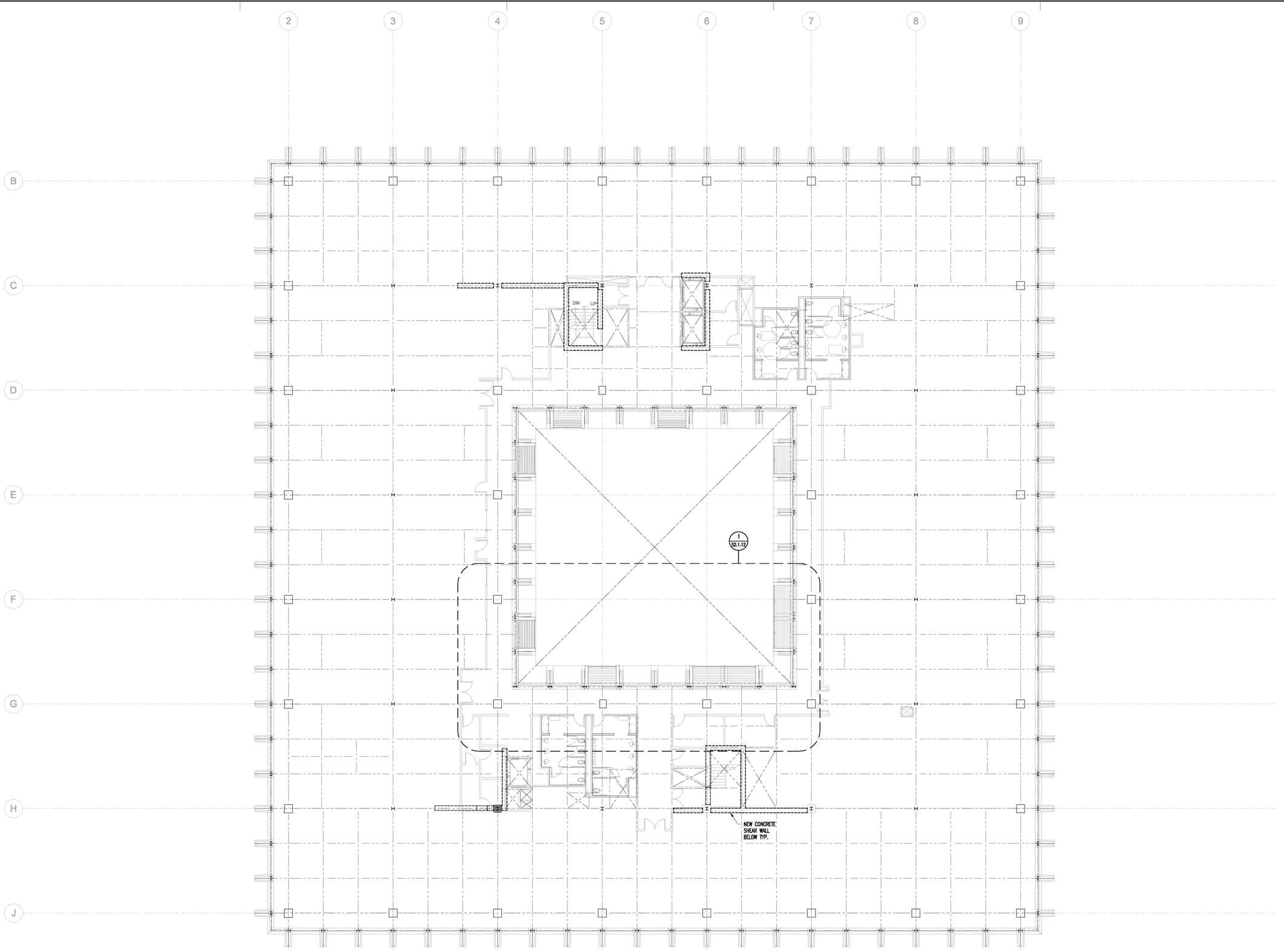
PROJECT NUMBER
13032

SHEET NUMBER

S2.1.01

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



1 Second Floor Framing Plan
Scale: 1/4" = 1'-0"

N

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

JLA
John Labib + Associates
Structural Engineers

319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

SECOND FLOOR FRAMING PLAN

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:29 PM

PROJECT NUMBER
13032

SHEET NUMBER

S2.1.02

COPYRIGHT © 2013 JOHNSON FAIN

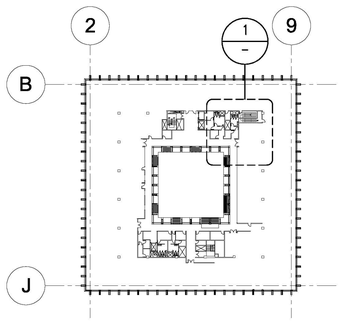
NOTE: NOT FOR CONSTRUCTION

FRAMING PLAN NOTES:

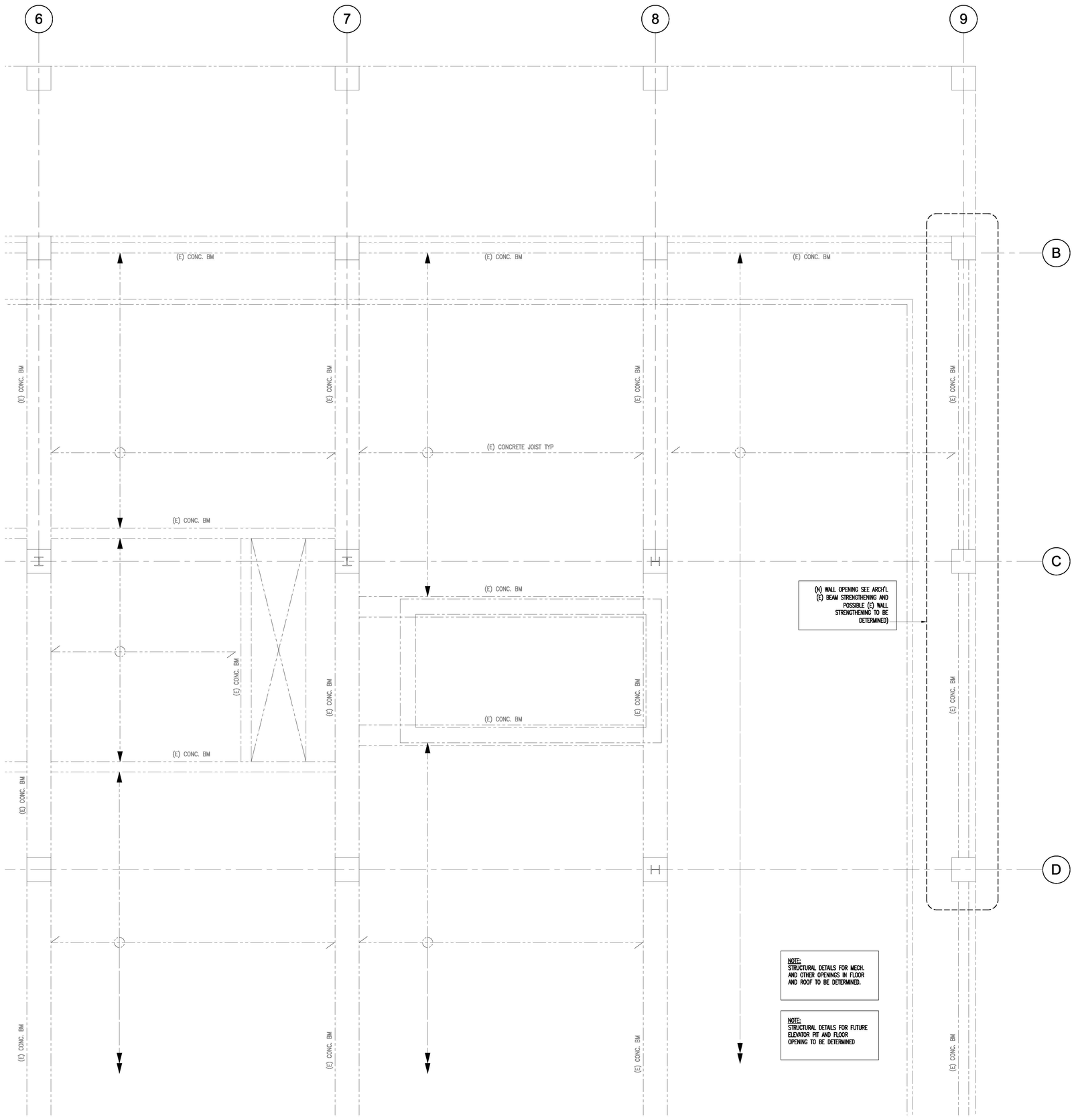
1. FOR GENERAL NOTES AND TYPICAL DETAILS SEE S0.1.01 THRU S1.1.06 SHEETS. GENERAL NOTES & TYPICAL DETAILS APPLY TO ALL PARTS OF THE WORK EXCEPT WHERE SPECIFICALLY DETAILED OR U.N.O.
2. VERIFY ALL DIMENSIONS, ELEVATIONS, SLAB EDGES, SLAB DEPRESSIONS, SLAB OPENINGS, CURBS, FOOTING, PENETRATIONS, WALL OPENINGS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL & CIVIL DRAWINGS.
3. FOR ALL DIMENSIONS & ROOF SLOPES SEE ARCHITECTURAL DRAWINGS.
4. WALL FRAMING:
   - EXTERIOR WALL FRAMING S.A.D.: 6" STUDS AT 16" O.C., U.N.O., MIN.
   - INTERIOR WALL FRAMING S.A.D.: 4" STUDS @ 16" O.C., U.N.O. MIN.

SYMBOLS:

- INDICATES RIGID CONNECTION PER S1.1.03
- INDICATES OPENING IN DIAPHRAGM
- (C="X") INDICATES CAMBER



Key Plan
Scale: NTS



1 Partial First Floor Framing Plan
Scale: 1/4" = 1'-0"

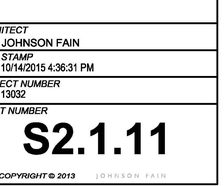
JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

John Labib + Associates Structural Engineers
319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
PARTIAL FIRST FLOOR FRAMING PLAN

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:31 PM

PROJECT NUMBER
13032

SHEET NUMBER
S2.1.11

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

FRAMING PLAN NOTES:

1. FOR GENERAL NOTES AND TYPICAL DETAILS SEE S0.1.01 THRU S1.1.06 SHEETS. GENERAL NOTES & TYPICAL DETAILS APPLY TO ALL PARTS OF THE WORK EXCEPT WHERE SPECIFICALLY DETAILED OR U.N.O.

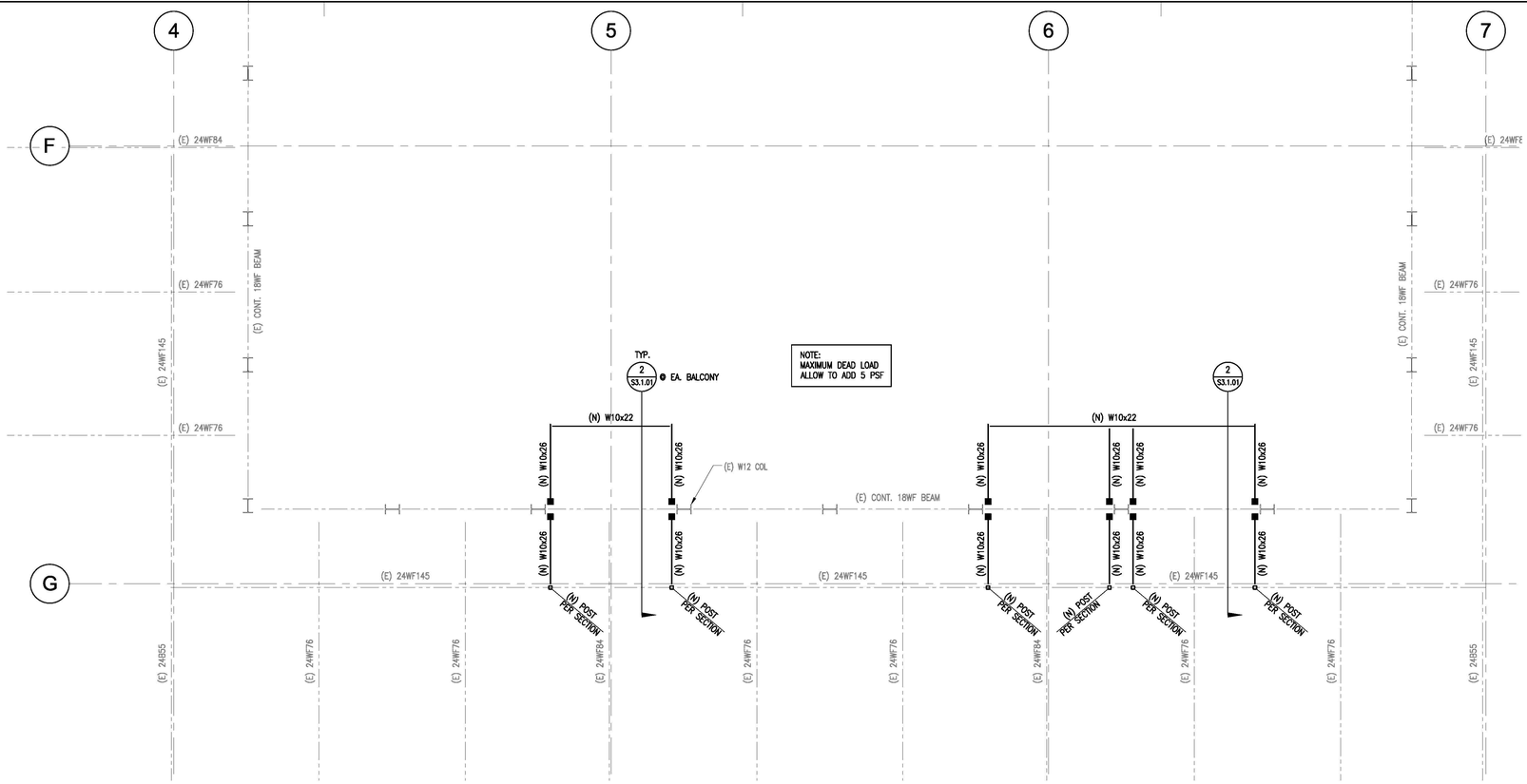
2. VERIFY ALL DIMENSIONS, ELEVATIONS, SLAB EDGES, SLAB DEPRESSIONS, SLAB OPENINGS, CURBS, FOOTING, PENETRATIONS, WALL OPENINGS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL & CIVIL DRAWINGS.

3. FOR ALL DIMENSIONS & ROOF SLOPES SEE ARCHITECTURAL DRAWINGS.

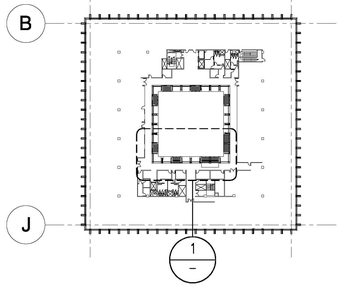
4. WALL FRAMING:
   - EXTERIOR WALL FRAMING S.A.D.: 6" STUDS AT 16" O.C., U.N.O., MIN.
   - INTERIOR WALL FRAMING S.A.D.: 4" STUDS @ 16" O.C., U.N.O. MIN.

SYMBOLS:

- INDICATES RIGID CONNECTION PER S1.1.03
- INDICATES OPENING IN DIAPHRAGM
- (C="X") INDICATES CAMBER



1 **Partial Second Floor Framing Plan**
Scale: 1/4" = 1'-0"



N **Key Plan**
Scale: NTS

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 8000 • [323] 224 8030 fax
www.johnsonfain.com

JLA John Labib + Associates Structural Engineers
319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
PARTIAL SECOND FLOOR FRAMING PLAN

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:33 PM

PROJECT NUMBER
13032

SHEET NUMBER
S2.1.12

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION

FRAMING PLAN NOTES:

1. FOR GENERAL NOTES AND TYPICAL DETAILS SEE S0.1.01 THRU S1.1.06 SHEETS. GENERAL NOTES & TYPICAL DETAILS APPLY TO ALL PARTS OF THE WORK EXCEPT WHERE SPECIFICALLY DETAILED OR U.N.O.

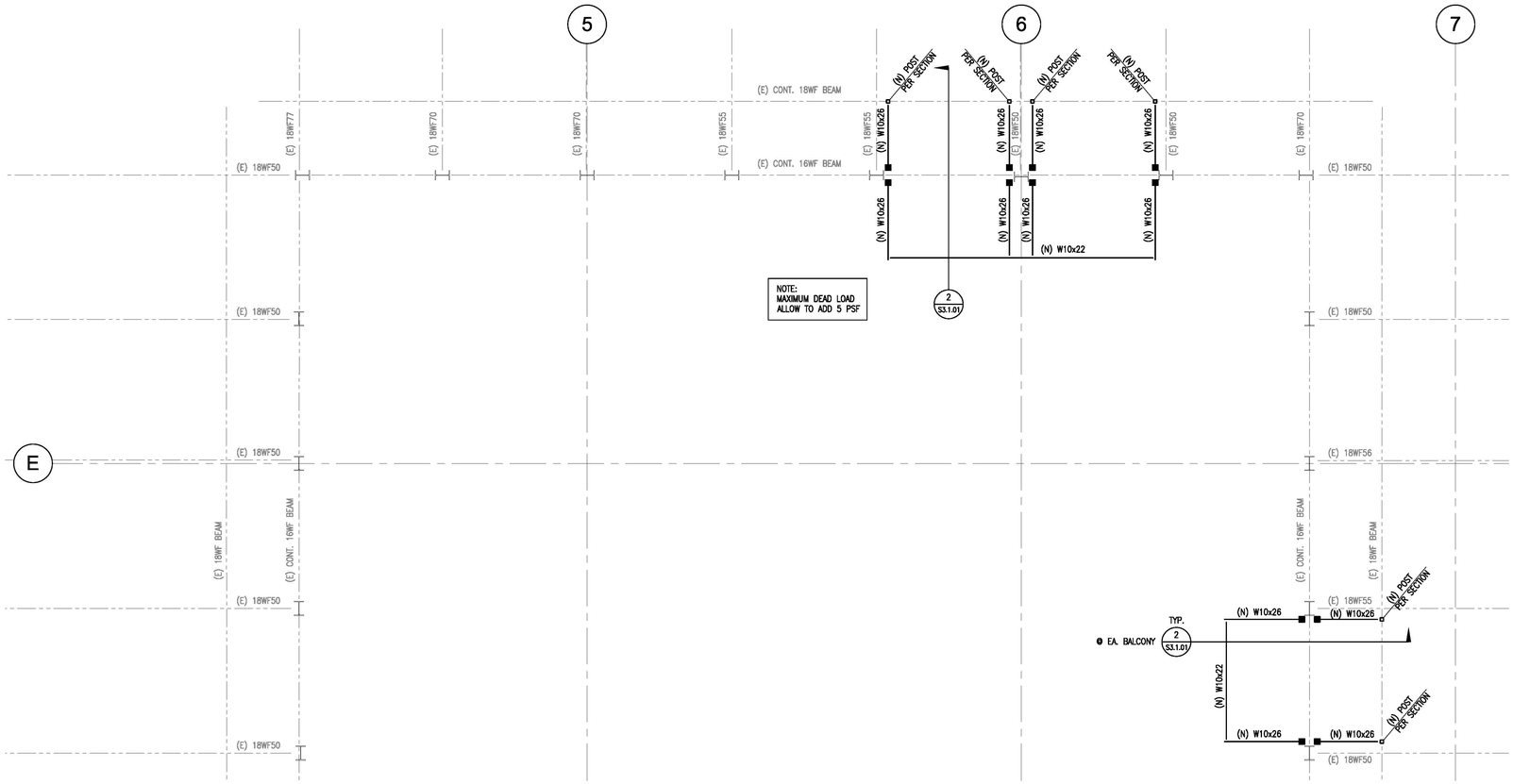
2. VERIFY ALL DIMENSIONS, ELEVATIONS, SLAB EDGES, SLAB DEPRESSIONS, SLAB OPENINGS, CURBS, FOOTING, PENETRATIONS, WALL OPENINGS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL & CIVIL DRAWINGS.

3. FOR ALL DIMENSIONS & ROOF SLOPES SEE ARCHITECTURAL DRAWINGS.

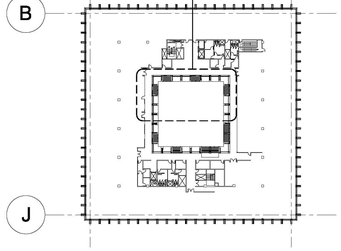
4. WALL FRAMING:
   - EXTERIOR WALL FRAMING S.A.D.: 6" STUDS AT 16" O.C., U.N.O., MIN.
   - INTERIOR WALL FRAMING S.A.D.: 4" STUDS @ 16" O.C., U.N.O. MIN.

SYMBOLS:

- ■—— INDICATES RIGID CONNECTION PER S1.1.03
- ⊠ INDICATES OPENING IN DIAPHRAGM
- (C="X") INDICATES CAMBER



1 Partial Third Floor Framing Plan
Scale: 1/4" = 1'-0"



N Key Plan
Scale: NTS

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS
1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

JLA John Labib + Associates Structural Engineers
319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN

ISSUE DESCRIPTION	
DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION		
REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE
PARTIAL THIRD FLOOR FRAMING PLAN

ARCHITECT
JOHNSON FAIN

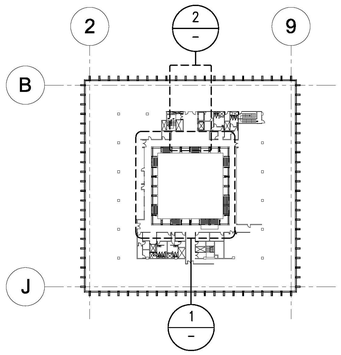
PLOT STAMP
10/14/2015 4:36:35 PM

PROJECT NUMBER
13032

SHEET NUMBER
S2.1.13

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



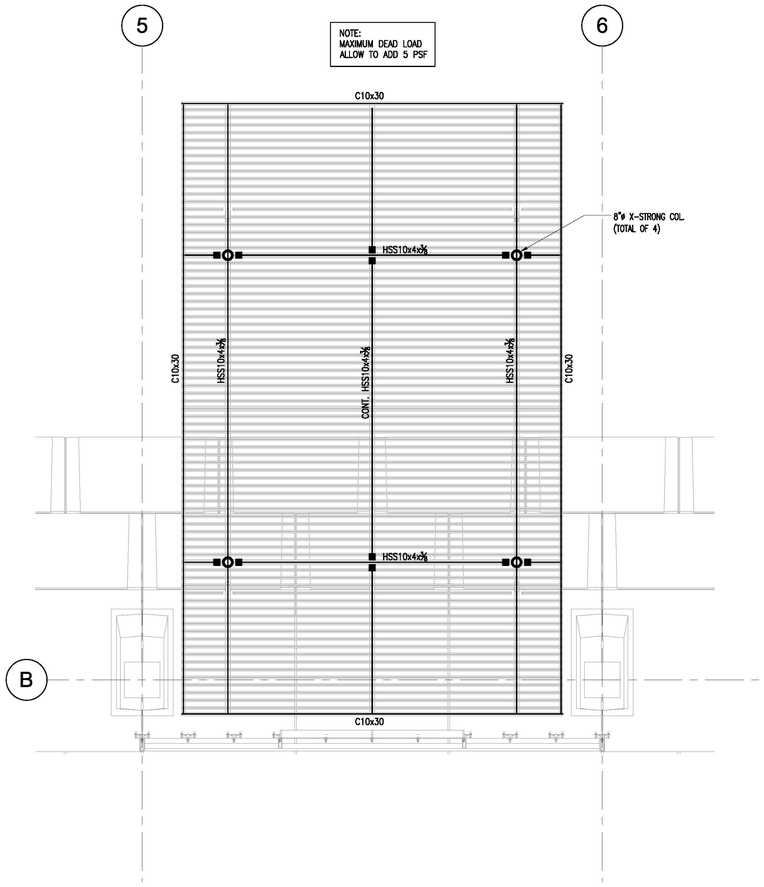
Key Plan
Scale: NTS

FRAMING PLAN NOTES:

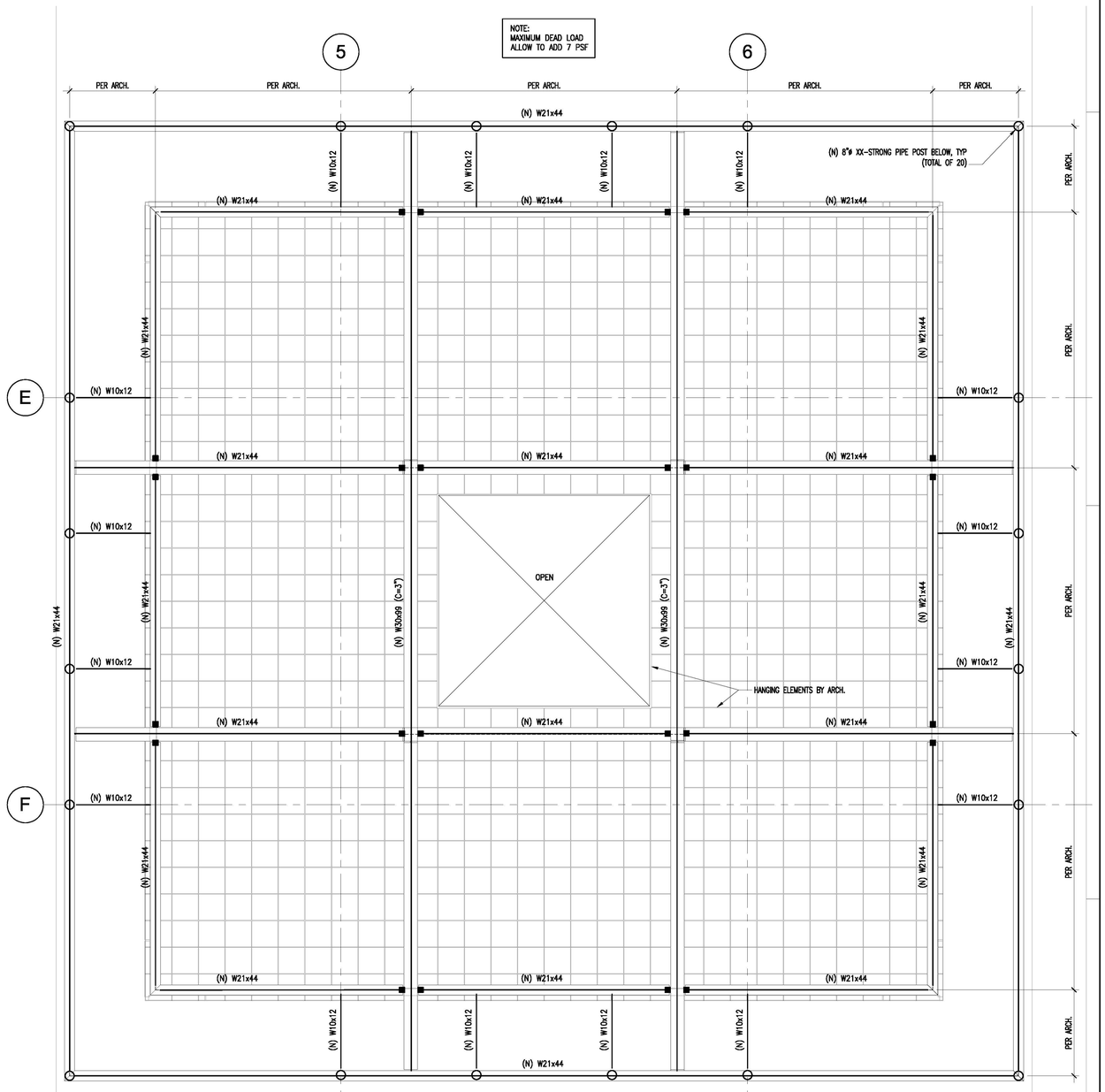
1. FOR GENERAL NOTES AND TYPICAL DETAILS SEE S0.1.01 THRU S1.1.06 SHEETS. GENERAL NOTES & TYPICAL DETAILS APPLY TO ALL PARTS OF THE WORK EXCEPT WHERE SPECIFICALLY DETAILED OR U.N.O.
2. VERIFY ALL DIMENSIONS, ELEVATIONS, SLAB EDGES, SLAB DEPRESSIONS, SLAB OPENINGS, CURBS, FOOTING, PENETRATIONS, WALL OPENINGS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL & CIVIL DRAWINGS.
3. FOR ALL DIMENSIONS & ROOF SLOPES SEE ARCHITECTURAL DRAWINGS.
4. WALL FRAMING:
   - EXTERIOR WALL FRAMING S.A.D.: 6" STUDS AT 16" O.C., U.N.O., MIN.
   - INTERIOR WALL FRAMING S.A.D.: 4" STUDS @ 16" O.C., U.N.O. MIN.

SYMBOLS:

- INDICATES RIGID CONNECTION PER S1.1.03
- INDICATES OPENING IN DIAPHRAGM
- (C="X") INDICATES CAMBER



2 ENTRANCE CANOPY FRAMING PLAN
Scale: 1/4" = 1'-0"



1 ROOF TRELLIS FRAMING PLAN
Scale: 1/4" = 1'-0"

NOTE:
STRUCTURAL DETAILS AND REVIEW OF MECH. EQUIPMENTS LOADS TO BE DETERMINED.

JOHNSON FAIN
ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 8000 • [323] 224 6030 fax
www.johnsonfain.com

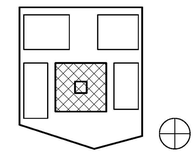
JLA John Labib + Associates Structural Engineers

319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

PARTIAL ROOF & CANOPY FRAMING PLANS

ARCHITECT
JOHNSON FAIN

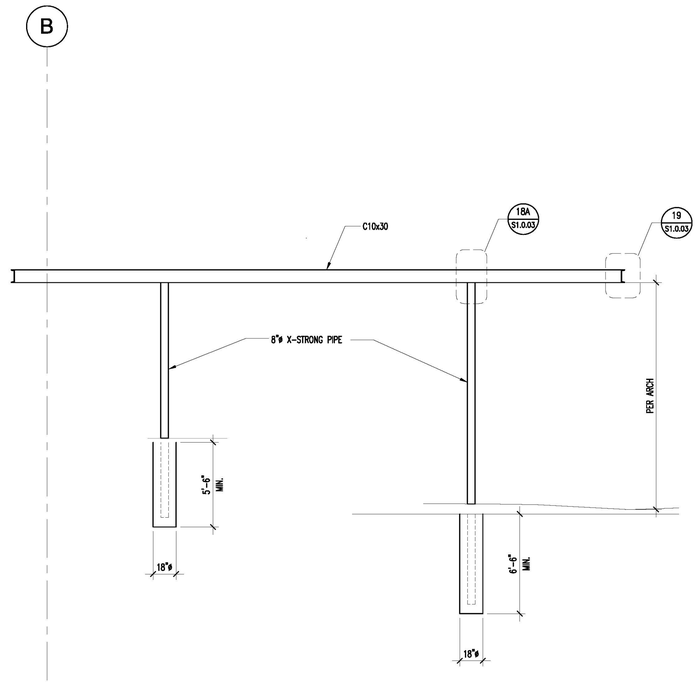
PLOT STAMP
10/14/2015 4:36:38 PM

PROJECT NUMBER
13032

SHEET NUMBER
S2.1.14

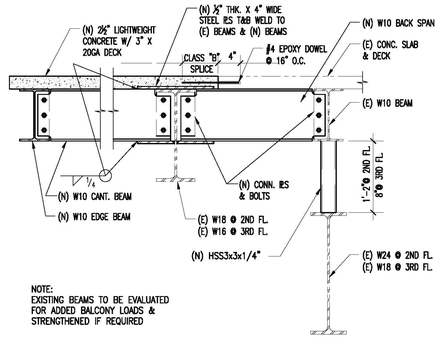
COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION



SECTION
SCALE: 1/4"=1'-0"

1
–



NOTE:
EXISTING BEAMS TO BE EVALUATED FOR ADDED BALCONY LOADS & STRENGTHENED IF REQUIRED

SECTION AT 2ND FLOOR
(SIMILAR AT 3RD FLOOR)
SCALE: NTS

2
–

JOHNSON FAIN

ARCHITECTURE • URBAN DESIGN + PLANNING • INTERIORS

1201 North Broadway, Los Angeles, CA 90012
[323] 224 6000 • [323] 224 6030 fax
www.johnsonfain.com

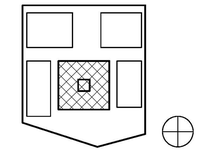
JLA
John Labib + Associates
Structural Engineers

319 Main Street
El Segundo, CA 90245
t: 213/239-9700 f: 213/239-9699
www.labibse.com

JLA Job No. 15805

PROFESSIONAL SEAL

KEYPLAN



ISSUE DESCRIPTION

DESCRIPTION	DATE
DD SET	04/29/15
100% DETAILED DESIGN	10/14/15

REVISION DESCRIPTION

REV	DESCRIPTION	DATE

OWNER: IMT RESIDENTIAL

ICON OFFICE BUILDING

14130 Riverside Drive
Sherman Oaks, CA 91423

SHEET TITLE

SECTIONS AND DETAILS

ARCHITECT
JOHNSON FAIN

PLOT STAMP
10/14/2015 4:36:39 PM

PROJECT NUMBER
13032

SHEET NUMBER

S3.1.01

COPYRIGHT © 2013 JOHNSON FAIN

NOTE: NOT FOR CONSTRUCTION