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6. With regards to Miscellaneous Construction Contracts (MCC) 7040 Plan Request for Price Quotations:
    a. Only bidders included on the Project’s Bidders List, provided by the Internal Service Department, Procurement Management Division to the DTPW, can submit a bid.
    b. Only timely bids received from bidders included in the Project’s Bidders List will be considered.

7. These documents shall not be altered in any manner. Utilization or viewing of these electronic documents shall constitute implicit acknowledgement and acceptance of these provisions. Failure to comply with these provisions may result in rejection of your bid.

CONTRACT SPECIFICATIONS

DEPARTMENT OF TRANSPORTATION
& PUBLIC WORKS
DESIGN AND ENGINEERING DIVISION

APPENDICES TO SPECIAL PROVISIONS

METRORAIL MARTIN LUTHER KING
(MLK) PARKING GARAGE
EMERGENCY DEMOLITION

CICC 7360 PLAN

CONTRACT NO. CIP271-DTPW23-CT

VOLUME II OF II

MARCH 2023

RPQ No.: CIP271-DTPW23-CT

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For a Better Image Quality Documents Please Visit:

CIP271-DTPW23-CT SOLICITATION DOCUMENTS

All documents inside this link can be downloaded.

APPENDIX “A” TO SPECIAL PROVISIONS

FDOT FENCING SECTION 550

SECTION 550
FENCING

550-1 Description.

Furnish, erect and reset metal fence of the type and at the locations shown in the Plans.

550-2 Types of Fence.

The types of fence are designated as follows:

Type A (Farm Fence).
Type B (Chain-Link Fence).
Type R (Chain-Link Fence for Pedestrian Overpass).

550-3 Materials.

550-3.1 Type A Fence (Farm Fence): Meet the requirements of Section 954 for timber posts and braces. For metal posts and braces, and for recycled plastic fence posts, meet the requirements of the Design Standards.

For the fabric and all other accessories, meet the requirements of the Design Standards.

550-3.2 Type B Fence (Chain-Link): For the posts, braces, fabric and all accessories other than the concrete for bases, meet the requirements of the Design Standards.

Use concrete as specified in Section 347, or a premix approved by the Engineer for bases. The requirements contained in 347-2.2, and 347-3 will not apply.

550-3.3 Type R Fence (Chain-Link for Pedestrian Overpass): Use the fabric and accessories specified in the Plans.

550-3.4 Resetting Fence: Use material from the existing fence. For any additional materials required, provide the same type of material as in the existing fence and as specified herein, including gates when applicable.

550-3.5 Optional Use of Materials: For Type A Fence, a combination of steel, aluminum, timber, recycled plastic or concrete posts may be used. Unless otherwise called for in the Plans, line posts of one material may be used with corner, pull and end post assemblies of a different material. The Engineer will permit the use of line posts of only one optional material and pull posts assemblies of only one optional material between corner and end post assemblies. Within individual corner and end post assemblies, the Engineer will allow the use of only one optional material.

For Type B Fence, a combination of zinc-coated steel fence members, aluminum coated fence members and aluminum alloy fence members may be used. Unless otherwise indicated in the Plans, the Engineer will allow the use of only one type of fabric material, one type of line post material and one type of pull assembly material between corner and end post assemblies.

550-3.6 Certification: Provide the Engineer with certified test reports from the manufacturer confirming that all materials (posts, braces, fabric and all other accessories) conform to the requirements of this Section, Section 6 and the Design Standards. Provide the Engineer a copy of the certification at least ten days prior to fence construction.

Also furnish the Engineer a Certificate of Compliance certifying that the fencing system, materials and construction practices comply with the applicable Design Standards and Specifications.

Acceptance of furnished material will be based on the Certificate of Compliance, accompanying test reports and visual inspection by the Engineer.

550-4 Construction Methods.

550-4.1 General: Install the fence in accordance with the specific requirements of this Article and with the details shown on the Design Standards for the particular type of fence called for, except for Type R Fence which shall be detailed in the Plans. Construct the fence in close proximity to the right of way line except as otherwise detailed in the Plans. Assume responsibility for obtaining satisfactory permits or permission from property owners for any encroachments required to perform the work, and for proper scheduling of the fence installation with the removal of existing fence where it is necessary to provide continuous security to adjacent areas already fenced. In order to meet this requirement, where necessary for maintaining security of livestock on adjacent property during construction of the new fence, the Engineer may require the erection and subsequent removal of temporary fencing.

550-4.2 Spacing of Posts: Space posts as shown in the Design Standards, within a tolerance of 12 inches, except where definite spotting of corner posts is required. Ensure that in any line of fence, the over-spacings and the under-spacings shall approximately compensate. Set additional line posts at abrupt changes in grade.

550-4.3 Clearing: Where the clearing and grubbing for the project includes the area occupied by the fence, clear the area to the limits shown in the Plans. If the limits are not shown in the Plans, clear the area at least 2 feet wide on each side of the fence line. The Engineer may direct that desirable trees be left in place and may restrict clearing where permission from the property owners cannot be obtained.

550-4.4 Construction Over Irregular Terrain and Other Obstructions:

550-4.4.1 Clearance of Bottom of Fence: Install the fence such that the bottom of the fence, in general, follows the contour of the ground. The fence is detailed in the Plans at approximately 3 inches above ground line. Over irregular ground, however, the Engineer will permit a minimum clearance of 1 inch and a maximum of 6 inches for a length not to exceed 8 feet, and, for Type A fence, with the barbed wire spaced midway between ground and bottom of fabric.

550-4.4.2 Grading: Where necessary to secure proper vertical alignment and to meet the clearance requirements, fill depressions (except where filling would obstruct proper drainage) and cut down knolls and ridges. Provide a substantial and permanent foundation for the fence.

550-4.4.3 Use of Extra-Length Posts. At locations where it is impracticable to adjust the ground level, the Engineer may require that posts of additional length be set and that the opening at the bottom be closed by additional barbed wire, stretched taut between poles, with no vertical distance between wires greater than 3 inches. For all such posts requiring a concrete base, extend the concrete downward to the bottom of the extra-length post.

550-4.5 Setting Posts: If rock occurs within the required depth of the post hole, or pavement which is to remain in place exists at the location of a post, drill a hole of a diameter slightly larger than the greatest dimension of the post or footing and grout in the post or footing. Set timber posts either by digging or by driving. Set recycled plastic fence posts in accordance with the Design Standards.

550-4.6 Placing Fabric: Do not place fabric and barbed wire until the posts have been permanently positioned and concrete foundations have attained adequate strength. Place the

fabric by securing one end and applying sufficient tension to remove all slack before making permanent attachments at intermediate points. Fasten the fabric to all end, corner and pull posts by approved means. Fasten the fabric using tools designed for the purpose, in accordance with the manufacturer's recommendations. Apply the tension for stretching by mechanical fence stretchers or with single-wire stretchers designed for the purpose.

550-4.7 Electrical Grounds: Wherever a power line passes over the fence, install a ground directly below the point of crossing. Install a ground rod consisting of a galvanized rod with connection of similar metal if required, or of other appropriate material, 8 feet in length and at least 5/8 inch in diameter. Drive the rod vertically until the top of the rod is approximately 6 inches below the ground surface. Use a No. 6 conductor to connect the rod and all fence elements. Connect the conductor to each fence element and the ground rod by means of non-corrosive electrical-type clamps.

550-5 Method of Measurement.

550-5.1 General: The quantities to be paid for will be plan quantity for the number of gates and the length of each type of fence constructed and accepted. In addition, extra payment will be made, in accordance with 550-6.2, for additional lengths of post approved by the Engineer for the crossing of depressions in accordance with 550-4.4.3, muck areas, or other areas of inadequate support for a post of standard length.

550-5.2 Measurement of Fence Length, and Payment: The length of fence to be paid for will be plan quantity completed and accepted. Measurement for resetting fence will be the actual length of existing fence reset, including gates when applicable.

550-6 Basis of Payment.

550-6.1 Basic Items of Fencing: The Contract unit price per foot for the item of fencing, will be full compensation for all work and materials necessary for the complete installation, including line posts, corner, end, and pull posts. Such price and payment will include, but not be limited to, the following specific incidental work.

1. Any work required to level and prepare the terrain along the line of the fence.
2. Any additional clearing incidental to construction of the fence.
3. All preparation for post holes, in whatever type of material, as specified herein.
4. Any furnishing and installing of electrical grounds.
5. Any additional work or materials required for special construction over irregular terrain, or terrain of inadequate support for the posts, including the additional barbed wire, but not including the extra lengths of posts ordered by the Engineer.
6. Any cost of erection and removal of any temporary fencing, which may be necessary for maintaining security of livestock, etc., on adjacent property during construction of the new fence.

550-6.2 Payment Rates for Extra-Length Posts: Any extra length posts added to complete installation of the fence will require an invoice. The Contractor will be compensated for invoice price plus 10% as payment for any extra length posts.

The standard length of steel, recycled plastic and aluminum posts will be the required length as indicated in the Plans or Design Standards for each type and case.

The payment for additional length of post will include the cost of additional concrete to extend concrete bases, as applicable.

550-6.3 Gate Payment: The quantities to be paid for will be full compensation for all labor, materials, posts, and associated hardware for the complete installation of the type gate specified in the Plans, and accepted by the Engineer.

550-6.4 Payment Items: Payment shall be made under:

Item No. 550- 10- Fencing - per foot.

Item No. 550- 60- Gates - each.

FDOT section 550, Type "B" fence drawings can be found on the following link:

CIP271-DTPW23-CT SOLICITATION DOCUMENTS

All documents inside this link can be downloaded.

APPENDIX “B” TO SPECIAL PROVISIONS

ASBESTOS SURVEY

REPORT OF PRE-DEMOLITION SURVEY, INVASIVE SAMPLING AND ANALYSIS FOR ASBESTOS-CONTAINING MATERIALS

PARKING GARAGE STRUCTURES
2600 NW 64 STREET
MIAMI, FLORIDA 33147
EBS PROJECT NO. 820-2202157.01
July 10, 2022

PREPARED FOR

MIAMI-DADE COUNTY INTERNAL SERVICES DEPARTMENT
111 NW 1ST STREET, SUITE 2420
MIAMI, FLORIDA 33128

PREPARED BY

EBS ENGINEERING, INC.
4715 NW 157 ST. STE. 202
MIAMI, FLORIDA 33014
Tel. 305-625-5252 • Fax 305-625-7110

EBS *ENGINEERING, INC.*

ENGINEERING AND ENVIRONMENTAL SERVICES

EBS ENGINEERING, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES

July 10, 2022

Mr. Barry Kent
Miami-Dade County Internal Services Department
111 NW 1st Street, Suite 2420
Miami, Florida 33128

Subject: Report of Pre-Demolition Survey, Invasive Sampling and Analysis for Asbestos-Containing Materials
Parking Garage Structures
2600 NW 64th Street
Miami, Florida 33147
EBS Engineering Project No. 820-2202157.01

Dear Mr. Kent:

EBS Engineering, Inc. (EBS) has completed the pre-demolition survey, invasive sampling and analysis of suspect asbestos-containing materials (ACMs) in the Parking Garage Structures located at 2600 NW 64th Street in Miami, Florida. The field sampling was performed on July 6, 2022 by Mr. Ronquavis Fulton of EBS. Authorization for our services was provided by Deborah Dorsett on July 6, 2022. This report presents the project information, bulk sampling procedures, the analytical results with recommendations for the handling of the ACMs identified, if any.

EBS appreciates the opportunity to be of service to you and looks forward to our continued association. If you should have any questions concerning this report, please contact us at your convenience.

Sincerely,

EBS ENGINEERING, INC.
Business License # ZA -0000069

Francisco E. Gomez
Senior Environmental Scientist

Benjamin S. Essien, P.E.
Florida Asbestos Consultant
License Number EA0000079

EBS\820-2202157.01.REPORT

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I. BACKGROUND INFORMATION

EBS Engineering, Inc. was contacted by Mr. Barry Kent with Miami-Dade County Internal Services Department concerning the pre-demolition survey, invasive sampling and analysis of suspect asbestos-containing building materials in the Parking Garage Structures located at 2600 NW 64th Street in Miami, Florida. It is our understanding that this sampling is necessary prior to the planned demolition of the structures and for permitting purposes.

The purpose of the sampling was to locate and identify asbestos-containing building materials in the Parking Garage Structures prior to any demolition activities which may disturb the materials. The sampling of the roof, interior and exterior areas of the parking structures was included in the scope of this survey.

II. FACILITY DESCRIPTION

The subject facility consists of two (2) three-story Parking Garage Structures located at 2600 NW 64th Street in Miami, Florida with approximately 95,000 square feet. The finishes of the Parking Garage Structures include; concrete slab, vinyl floor tile/mastic on the floor, drywall board, joint compound and vinyl baseboard/mastic on the interior partition walls, suspended acoustic panels and concrete on the ceiling, brick and concrete on the exterior walls and emergency generator exhaust insulation.

III. SURVEY PROCEDURES

General

The invasive survey was performed by observing accessible building materials in the parking structures. The primary purpose of the survey was to locate, identify and assess building materials which were suspected to contain asbestiform minerals. Friable and non-friable asbestos-containing materials (ACMs) encountered during the survey are addressed in this report. Friable materials, when dry, will crumble and release fibers under normal hand pressure, whereas non-friable materials will not.

The sampling protocol used in this asbestos survey is in general accordance with Title 40, Code of Federal Regulations (CFR), Part 763.86 and State of Florida Statutes.

Bulk Sampling Procedures

The bulk sampling procedures used for the collection of suspect materials first required the establishment of homogenous sampling areas, which are defined as areas of materials of the same type and applied during the same general time period. The homogenous sampling areas were then examined and representative samples of suspect materials were obtained from these areas.

The U.S. Environmental Protection Agency (EPA) has published guidelines and recommendations for obtaining samples of asbestos-containing materials. These

guidelines were followed during our survey, where appropriate. Additionally, samples of these materials were obtained at the discretion of our personnel based on past experience.

Bulk samples collected during the site survey were analyzed by Polarized Light Microscopy (PLM) coupled with dispersion staining. PLM is an analytical method for asbestos identification which depends on the unique optical properties of mineral forms in the samples and specifically identifies the various asbestos types. The optical properties are a result of the mineral's chemical composition, physical atomic structure, and visual morphology. This is the recommended method of analysis by EPA for asbestos identification in bulk samples. EMSL Analytical, Inc., the laboratory that analyzed the samples, has attained National Institute of Standards and Technology (NIST) accreditation through participation in the National Voluntary Laboratory Accreditation Program (NVLAP). Percentages of the identified types of asbestos are determined by visual estimation. Any material containing more than one percent (1%) of asbestos is considered by EPA and Occupational Safety and Health Administration (OSHA) to be ACM.

The following suspect materials were sampled in the Parking Garage Structures during our survey:

1. Gray Concrete Slab
2. Red Brick Wall
3. Gray Concrete Exterior Wall
4. White Drywall Board
5. White Joint Compound
6. Gray 12"x12" Floor tile/Mastic
7. Gray 4" Baseboard/Mastic
8. White 12"x12"' Ceiling Panel
9. White Generator Exhaust Insulation

IV. RESULTS OF LABORATORY ANALYSIS

Laboratory results of the invasive sampling revealed that **no asbestos was detected in the 43 building materials samples obtained from the Parking Garage Structures during our survey.** Asbestos concentrations expressed within the laboratory results are based on visual estimation. The point counting method of quantification is recommended for asbestos concentration below ten percent. The results of the 43 samples are summarized in Table 1. The PLM results of each sample obtained during the survey is included in Appendix A.

TABLE 1 - SUMMARY OF ANALYTICAL RESULTS
Parking Garage Structures
2600 NW 64 Street
Miami, Florida 33147

SEQUENTIAL NUMBER	SAMPLE NUMBER	HOMOGENOUS AREA	SAMPLE DESCRIPTION	SAMPLE LOCATION	RESULTS OF PLM ANALYSIS
01	01	HA-1	Gray Concrete Slab	Garage Floor, Northwest	No Asbestos Detected
02	02	HA-1	Gray Concrete Slab	Garage Floor, Southwest	No Asbestos Detected
03	03	HA-1	Gray Concrete Slab	Bus Station Floor, Center	No Asbestos Detected
04	04	HA-2	Red Brick Wall	Exterior Wall, Northwest	No Asbestos Detected
05	05	HA-2	Red Brick Wall	Exterior Wall, Southwest	No Asbestos Detected
06	06	HA-2	Red Brick Wall	Exterior Wall, Bus Station	No Asbestos Detected
07	07	HA-3	Gray Concrete Wall	Exterior Wall, Northwest	No Asbestos Detected
08	08	HA-3	Gray Concrete Wall	Exterior Wall, Southwest	No Asbestos Detected
09	09	HA-3	Gray Concrete Wall	Exterior Wall, East	No Asbestos Detected
10	10	HA-4	White Drywall Board	Office, North Wall	No Asbestos Detected
11	11	HA-4	White Drywall Board	Office, South Wall	No Asbestos Detected
12	12	HA-4	White Drywall Board	Office, West Wall	No Asbestos Detected
13	13	HA-5	White Joint Compound	Office, North Wall	No Asbestos Detected
14	14	HA-5	White Joint Compound	Office, South Wall	No Asbestos Detected
15	15	HA-5	White Joint Compound	Office, West Wall	No Asbestos Detected
16	16	HA-6	Gray 12"x12" Floor Tile	Office, North Wall	No Asbestos Detected
17	17	HA-7	Yellow Floor Mastic	Office, North Wall	No Asbestos Detected
18	17	HA-6	Gray 12"x12" Floor Tile	Office, South Wall	No Asbestos Detected
19	18	HA-6	Gray 12"x12" Floor Tile	Office, West Wall	No Asbestos Detected
20	19	HA-8	Gray 4" Baseboard	Office, North Wall	No Asbestos Detected
21	19	HA-9	Pink Baseboard Glue	Office, North Wall	No Asbestos Detected
22	20	HA-8	Gray 4" Baseboard	Office, South Wall	No Asbestos Detected
23	20	HA-9	Pink Baseboard Glue	Office, South Wall	No Asbestos Detected
24	21	HA-8	Gray 4" Baseboard	Office, West Wall	No Asbestos Detected

TABLE 1 - SUMMARY OF ANALYTICAL RESULTS
Parking Garage Structures
2600 NW 64 Street
Miami, Florida 33147

SEQUENTIAL NUMBER	SAMPLE NUMBER	HOMOGENOUS AREA	SAMPLE DESCRIPTION	SAMPLE LOCATION	RESULTS OF PLM ANALYSIS
25	21	HA-10	White Baseboard Glue	Office, West Wall	No Asbestos Detected
26	22	HA-11	White 12" Ceiling Panel	Office Ceiling, North	No Asbestos Detected
27	23	HA-11	White 12" Ceiling Panel	Office Ceiling, South	No Asbestos Detected
28	24	HA-11	White 12" Ceiling Panel	Office Ceiling, West	No Asbestos Detected
29	25	HA-12	Slim Exhaust Insulation	Electrical Room, North	No Asbestos Detected
30	26	HA-12	Slim Exhaust Insulation	Electrical Room, South	No Asbestos Detected
31	27	HA-12	Slim Exhaust Insulation	Electrical Room, West	No Asbestos Detected
32	28	HA-13	Wide Exhaust Insulation	Electrical Room, North	No Asbestos Detected
33	29	HA-13	Wide Exhaust Insulation	Electrical Room, South	No Asbestos Detected
34	30	HA-13	Wide Exhaust Insulation	Electrical Room, West	No Asbestos Detected
35	31	HA-14	Exhaust Flange Insulation	Electrical Room, North	No Asbestos Detected
36	32	HA-14	Exhaust Flange Insulation	Electrical Room, South	No Asbestos Detected
37	33	HA-14	Exhaust Flange Insulation	Electrical Room, West	No Asbestos Detected
38	34	HA-15	Exhaust Fitting Insulation	Electrical Room, North	No Asbestos Detected
39	35	HA-15	Exhaust Fitting Insulation	Electrical Room, South	No Asbestos Detected
40	36	HA-15	Exhaust Fitting Insulation	Electrical Room, West	No Asbestos Detected
41	37	HA-16	Black Exhaust Dampener	Electrical Room, North	No Asbestos Detected
42	38	HA-16	Black Exhaust Dampener	Electrical Room, South	No Asbestos Detected
43	39	HA-16	Black Exhaust Dampener	Electrical Room, West	No Asbestos Detected

V. FINDINGS AND RECOMMENDATIONS

Laboratory results of the invasive sampling revealed that **no asbestos was detected in the 43 materials samples obtained from the Parking Garage Structures during our survey.** The PLM results of each sample obtained during the survey is included in Appendix A.

VI. QUALIFICATIONS

EBS observed the existing conditions in the Parking Garage Structures located at 2600 NW 64th Street in Miami, Florida using generally accepted procedures. However, there is always the possibility that some areas containing asbestos were not observed, inaccessible, or different from those at specific sample locations. Therefore, conditions at every location may not be as anticipated and as summarized in this report. In addition, renovation or demolition may uncover altered or differing conditions. We recommend that you notify EBS if any changed conditions are encountered so that we can assess the situation and its impact on this report.

APPENDIX A

LABORATORY ANALYTICAL RESULTS

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A N. Miami Beach, FL 33179
Tel/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com / miamilab@emsl.com

EMSL Order: 172203482
Customer ID: EBSE50
Customer PO:
Project ID:

Attention: Francisco Gomez
EBS Engineering, Inc.
4715 NW 157th St. Ste 202
Miami, FL 33014

Project: 2600 NW 64th St

Phone: (305) 625-5252
Fax: (305) 625-7110
Received Date: 07/06/2022 3:20 PM
Analysis Date: 07/06/2022 - 07/07/2022
Collected Date:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
01 *172203482-0001*	Concrete Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02 *172203482-0002*	Concrete Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
03 *172203482-0003*	Concrete Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
04 *172203482-0004* *Unable to Layer*	Concrete Wall	Gray/Red Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
05 *172203482-0005* *Unable to Layer*	Concrete Wall	Gray/Red Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
06 *172203482-0006*	Concrete Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07 *172203482-0007*	Concrete Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08 *172203482-0008*	Concrete Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09 *172203482-0009*	Concrete Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10 *172203482-0010*	Drywall	Brown/White Fibrous Heterogeneous	3% Cellulose <1% Glass	97% Non-fibrous (Other)	None Detected
11 *172203482-0011*	Drywall	Brown/White Fibrous Heterogeneous	3% Cellulose <1% Glass	97% Non-fibrous (Other)	None Detected
12 *172203482-0012*	Drywall	Brown/White Fibrous Heterogeneous	3% Cellulose <1% Glass	97% Non-fibrous (Other)	None Detected
13 *172203482-0013*	Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14 *172203482-0014*	Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15 *172203482-0015*	Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 07/07/2022 14:32:13

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A N. Miami Beach, FL 33179
Tel/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com / miamilab@emsl.com

EMSL Order: 172203482
Customer ID: EBSE50
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
16 *172203482-0016* *No Mastic*	FT	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17-Floor Tile *172203482-0017*	FT	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17-Mastic *172203482-0017A*	FT	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
18 *172203482-0018*	FT	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19-Baseboard *172203482-0019*	Base Board	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19-Glue *172203482-0019A*	Base Board	Pink Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20-Baseboard *172203482-0020*	Base Board	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20-Glue *172203482-0020A*	Base Board	Pink Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21-Baseboard *172203482-0021*	Base Board	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21-Glue *172203482-0021A*	Base Board	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
22 *172203482-0022*	CT	Tan/White Fibrous Heterogeneous	30% Cellulose 30% Glass	40% Non-fibrous (Other)	None Detected
23 *172203482-0023*	CT	Tan/White Fibrous Heterogeneous	30% Cellulose 30% Glass	40% Non-fibrous (Other)	None Detected
24 *172203482-0024*	CT	Tan/White Fibrous Heterogeneous	30% Cellulose 30% Glass	40% Non-fibrous (Other)	None Detected
25 *172203482-0025*	Pipe Insulation (Slim)	White Non-Fibrous Heterogeneous	75% Glass 3% Wollastonite	22% Non-fibrous (Other)	None Detected
26 *172203482-0026*	Pipe Insulation (Slim)	White Fibrous Heterogeneous	75% Glass 3% Wollastonite	22% Non-fibrous (Other)	None Detected
27 *172203482-0027*	Pipe Insulation (Slim)	White Fibrous Homogeneous	10% Cellulose 75% Glass	15% Non-fibrous (Other)	None Detected
28 *172203482-0028*	Pipe Insulation (Wide)	White Fibrous Heterogeneous	75% Glass 3% Wollastonite	22% Non-fibrous (Other)	None Detected
29 *172203482-0029*	Pipe Insulation (Wide)	White Fibrous Heterogeneous	75% Glass 3% Wollastonite	22% Non-fibrous (Other)	None Detected

Initial report from: 07/07/2022 14:32:13

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A N. Miami Beach, FL 33179
Tel/Fax: (305) 650-0577 / (305) 650-0578
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EMSL Order: 172203482
Customer ID: EBSE50
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
30 *172203482-0030*	Pipe Insulation (Wide)	White Fibrous Heterogeneous	10% Cellulose 75% Glass	15% Non-fibrous (Other)	None Detected
31 *172203482-0031*	Pipe Insulation	White Fibrous Heterogeneous	75% Glass 3% Wollastonite	22% Non-fibrous (Other)	None Detected
32 *172203482-0032*	Pipe Insulation	White Fibrous Heterogeneous	75% Glass 3% Wollastonite	22% Non-fibrous (Other)	None Detected
33 *172203482-0033*	Pipe Insulation	White Fibrous Heterogeneous	75% Glass 5% Wollastonite	20% Non-fibrous (Other)	None Detected
34 *172203482-0034*	Pipe Insulation (Fitting)	White Fibrous Heterogeneous	75% Glass 5% Wollastonite	20% Non-fibrous (Other)	None Detected
35 *172203482-0035*	Pipe Insulation (Fitting)	White Fibrous Heterogeneous	75% Glass 5% Wollastonite	20% Non-fibrous (Other)	None Detected
36 *172203482-0036*	Pipe Insulation (Fitting)	White Fibrous Heterogeneous	10% Cellulose 75% Glass	15% Non-fibrous (Other)	None Detected
37 *172203482-0037*	Exhaust Dampener	Black Fibrous Heterogeneous	15% Synthetic <1% Glass	85% Non-fibrous (Other)	None Detected
38 *172203482-0038*	Exhaust Dampener	Black Fibrous Heterogeneous	15% Synthetic <1% Glass	85% Non-fibrous (Other)	None Detected
39 *172203482-0039*	Exhaust Dampener	Black Fibrous Heterogeneous	15% Synthetic <1% Glass	85% Non-fibrous (Other)	None Detected

Analyst(s)
Aubrenee Barlow (33)
Ryan Mulhearn (10)

Kimberly A Wallace
Kimberly Wallace, Laboratory Manager
or Other Approved Signatory

Initial report from: 07/07/2022 14:32:13

APPENDIX B

CERTIFICATIONS

Ron DeSantis, Governor

Julie I. Brown, Secretary

Florida dbpr

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

ASBESTOS LICENSING UNIT

THE ASBESTOS BUSINESS ORGANIZATION HEREIN IS LICENSED UNDER THE PROVISIONS OF CHAPTER 469, FLORIDA STATUTES

EBS ENGINEERING INC

BENJAMIN S. ESSIEN
4715 NW 157 ST STE 202
MIAMI FL 33014

LICENSE NUMBER: ZA0000069

EXPIRATION DATE: NOVEMBER 30, 2023

Always verify licenses online at MyFloridaLicense.com

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Asbestos Consulting & Training Systems

2835 N.W. 12TH Avenue, Fort Lauderdale, Florida 333

This is to Certify that

Ronquavis Fulton

XXX-XX-2070

12921 nw 17th ct, Miami, FL 33167

Processed By:

Seagull

To Authenticate Certificate:
www.seagulltraining.com
1-800-966-9933

has successfully completed an English

Asbestos Building Inspection Refresher

27-Aug-21 TO 27-Aug-21

and has completed the requisite training for TSCA

Meets state requirements of FL49-0001020/CN-0006273 and UT (6.0 core).

NDAAC Provider #451 Trainer(s): James F. Stump

Training Address: 900 NW 5th Ave, Fort Lauderdale, FL 33311

Successful course completion based on exam score on: 27-Aug-21

This Certificate Expires:

27-Aug-22 08/27/22

James F. Stump, Course Sponsor

Certificate Number: 187167

Course Number: SE2135

APPENDIX “C” TO SPECIAL PROVISIONS

METRORAIL MLK PARKING GARAGE STRUCTURE ANALYSIS

Metrorail MLK Parking Garage Structure Analysis

Miami-Dade County
Contract No. CIP142-TR15-PE1
Work Order: WO-A-048.R0

Submitted to

Department of Transportation and Public Works
Miami, Florida

Submitted by

WSP USA

March 2022

188724-48

March 23, 2022

Mr. German A. Arenes
Chief of Construction, Structural Inspection and Analysis
Miami Dade Department of Transportation and Public Works
701 N.W. 1st Court, Suite 1500
Miami, FL 33136

Subject: Metrorail MLK Parking Garage Structure Analysis
Contract No.: CIP142-TR15-PE1
Work Order: WO-A-048.R0
Structural Analysis Report

Dear Mr. Arenes:

The attached report is provided as your record of the engineer's structural analysis performed for the Metrorail MLK Parking Garage Structure.

I hereby certify that the following engineering documents were prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Florida.

Please do not hesitate to contact me or one of the project engineers to discuss any questions regarding the information presented here.

Sincerely,

Ryan W Bell

Ryan W. Bell, PE
Senior Project Engineer
FL PE #66425
My license renewal date is February 28, 2023.

Attachments: Structural Analysis Report (March 2022)

WSP USA
7650 Corporate Center Drive
Suite 300
Miami, FL 33126
+1 305-514-3100
wsp.com

Metrorail MLK Parking Garage Structure Analysis

Miami-Dade County
Contract No. CIP142-TR15-PE1
Work Order: WO-A-048.R0

Submitted to

Department of Transportation and Public Works
Miami, Florida

March 2022

Submitted by

WSP USA
7650 Corporate Center Drive, Suite 300
Miami, Florida 33126

WSP Job No. 188724-48

METRORAIL MLK PARKING GARAGE STRUCTURE ANALYSIS
MIAMI-DADE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

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EXECUTIVE SUMMARY

The Miami-Dade Department of Transportation and Public Works has contracted WSP USA Inc. to provide structural engineering analysis for the Metrorail MLK Parking Garage Structure (Structure) located at 6350 Northwest 25th Avenue, Miami, Florida. The Structure is currently closed to occupancy.

The scope of this project is to examine the Structure's capacity to resist the latest code-prescribed environmental load combinations with varying occupancy scenarios for vehicular live loads. Three scenarios will be investigated: 1) vehicles on all levels, 2) vehicles on ground floor and level 2 only, and 3) vehicles on ground floor only.

Structural analysis that includes additional load combinations for partial and full vehicle occupancy on the elevated levels is also included in this report.

BACKGROUND

The Structure is a three-level parking garage that encompasses approximately 300,000 square feet of total space and provides parking space for government employees working in the adjacent government office building and Metrorail passengers. The Structure was constructed in the mid-1980s and had major renovations completed in the early 2000s. Renovations included removal of two parking bays and framing member repairs. The Structure is a concrete framed building that uses precast prestressed composite beams with integral cast-in-place concrete deck.

Under a previous task, the existing record construction documents for the Structure were collected and reviewed by WSP's engineers. These records were subsequently reviewed under further examination during this project.

Key information required to evaluate the Structure's load carrying capacity is missing from the record documents. Therefore, to assess the existing Structure's framing capacity, non-destructive testing (NDT) procedures were performed on representative beams and columns to verify and/or estimate the size and quantity of mild reinforcing steel and prestressing steel strands.

The NDT examination and structural engineering analysis focused on the primary structural framing members (beams and columns).

The NDT inspections were performed January 23 to January 25, 2022 by Joshua Fisher (NDT team leader) and Freddie Silva (engineer/inspector). Isolated portions of the Structure's façade were removed to provide access for the NDT examinations. The NDT examinations included multiple tests to determine reinforcing layout and size. Ground penetrating radar (GPR) was used to scan each member in multiple directions to verify reinforcing spacing and obtain locations of reinforcing not shown in the record drawings. When GPR was unable to obtain clear results, a tomographer was used. This provided a clearer definition of steel in areas with multiple layers of reinforcing. A profometer was used to determine the size of the reinforcing steel.

STRUCTURAL ANALYSIS AND DESIGN VERIFICATION

Analysis and design verification for the Structure was performed at global and component performance levels following provisions of the Florida Existing Building Code 2020 and Florida Building Code 2020.

Global Performance Evaluation

Global finite element models were developed for both South and North parts of the structure for evaluation of dynamic properties, overall building deformations and associated second-order effects (P-Delta amplification of structural demand). The following observations were made based on the global analysis results:

1. Overall building deformations under wind loads (serviceability considerations) follow typical limitations adopted in the industry for new buildings of similar type (maximum interstory drift under 25-year return period wind was 1/588 versus limit of 1/400).

2. Global second-order effects for both the South and North buildings are within acceptable code limits. However, it was observed that the second-order effects for the South building are significantly higher in comparison with the North building. Moment magnification factors for individual components of lateral force-resisting system in the South building range from 1.21 to 1.33 while the North building ranges between 1.06 and 1.11. The code limitation is 1.4. When combined with gravity loads, the result increases the total demand in the range of 1.07 to 1.2 times. High second-order effects in the South building could be attributed to its lower global stiffness, which could be due to partial demolition of the structure and removal of ramps (ramps typically provide noticeable lateral stiffness to the building).

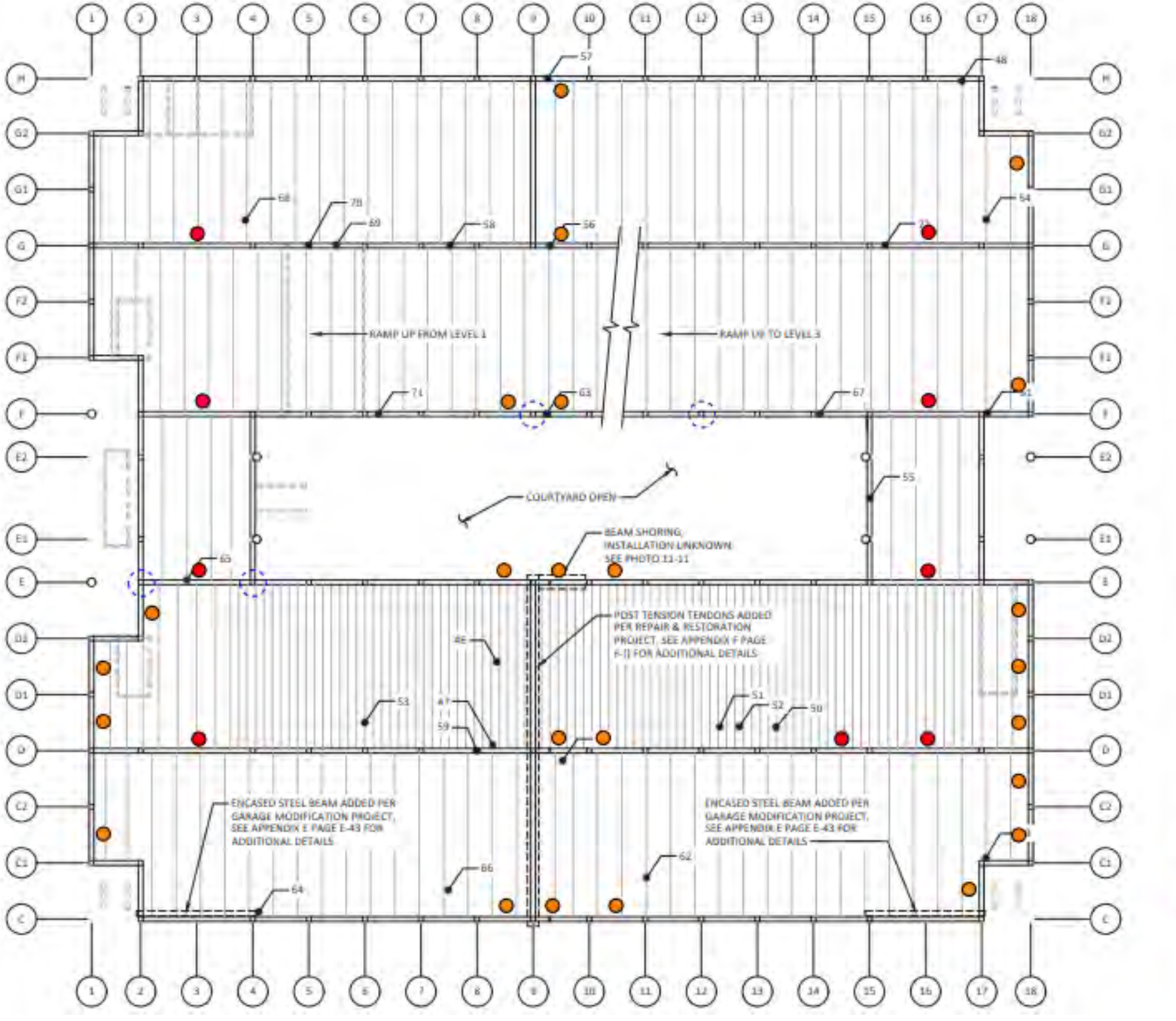
3. Dynamic properties (natural periods of vibration) are longer in comparison with expectations for new structures that are designed in accordance with the modern generations of building codes. Dynamic properties could be used as an indirect measure of building performance and longer natural periods are indicative of overall softer structural system that can result in amplification of structural demand due to P-Delta effects. It was observed that periods of vibration for the South building are significantly longer in comparison with the North building (2.0 seconds versus 1.2 seconds), which could be seen as a consequence of partial demolition of the South building in the early 2000s and removal of ramps.

Component Performance Evaluation

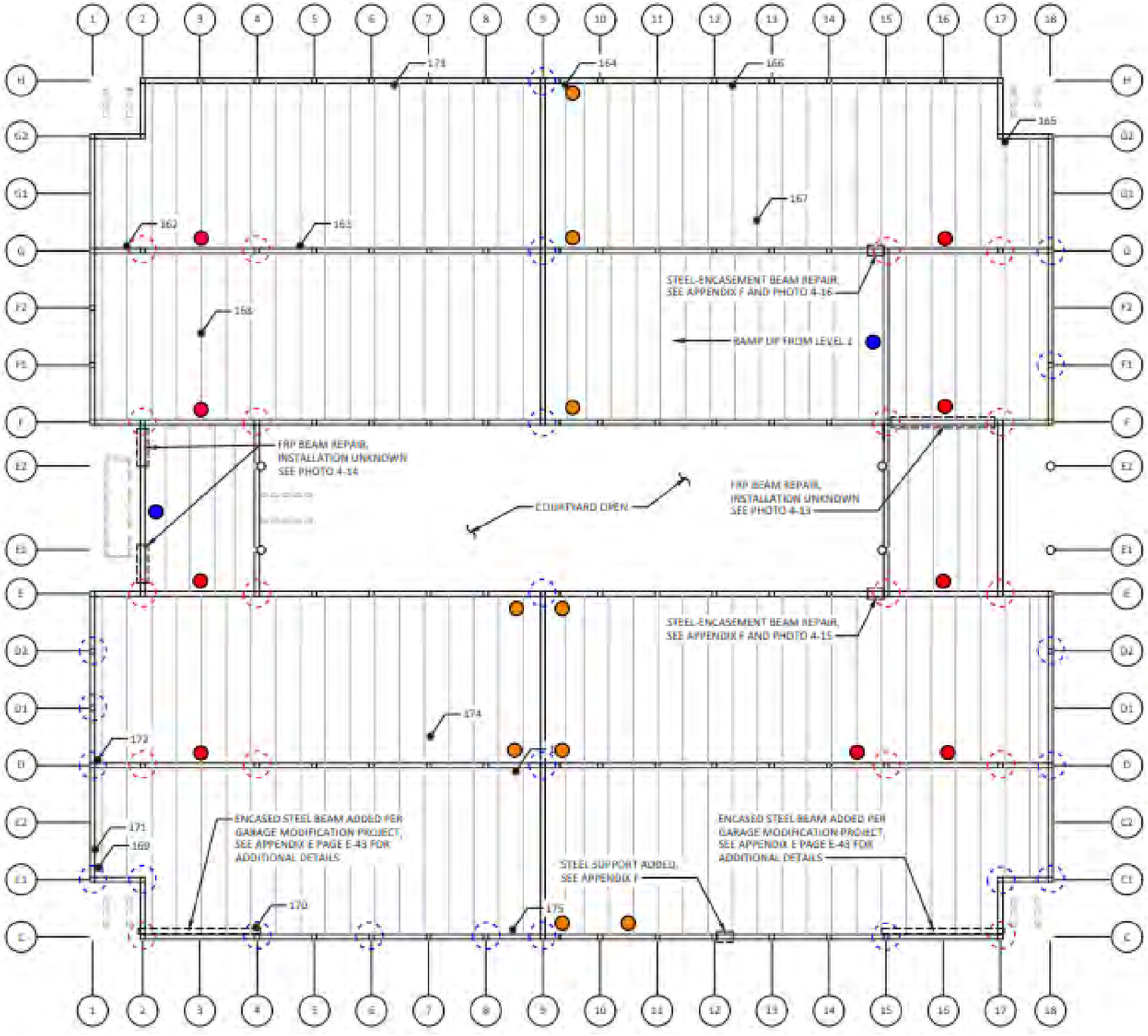
Component performance evaluation for Ground Floor only occupancy revealed a number of overstress conditions in primary components of gravity and lateral force-resisting systems for both the South and North buildings. See Table 1 and following framing plan views.

Table 1 - Member Performance Summary

Building	Structural Element	Structural Action	Overstressed Elements (% of total)
South	Beams	Flexure (negative moment)	25 out of 121 (21%)
		Shear	10 out of 121 (8%)
	Columns	Combined axial and flexure	3 out 110 (3%)
		Shear	10 out of 110 (9%)
North	Beams	Flexure (positive moment)	2 out of 156 (1%)
		Flexure (negative moment)	10 out of 156 (6%)
		Shear	9 out of 156 (6%)
	Columns	Shear	8 out of 122 (7%)



Framing Plan Level 2
Showing Level 2 beams and ground floor columns



Framing Plan Level 3
Showing Level 3 beams and Level 2 columns

- BEAM M(+) O/S
- BEAM M(-) O/S
- BEAM SHEAR O/S
- COLUMN SHEAR O/S
- COLUMN REINF SPACING

In addition to the Ground Floor only occupancy scenario, two more scenarios were studied and summarized in this report: full occupancy (Ground Floor, Level 2, and Level 3) and partial occupancy (Ground Floor and Level 2). Results of the additional scenarios indicated higher degrees of overstress and higher percentage of overstressed components. Detailed results of the additional studies are provided in the report.

The following are comments related to the general findings of the study:

- The Demand-to-Demand comparison (calculated versus original drawings) showed good correlation when floor joists were not modeled, and slabs transferred loads to supporting beams as uniformly distributed. However, inclusion of the joists significantly changed the load distribution between different bays. Joist loads are concentrated loads instead of evenly distributed loads. Short bay beams had either two or three joists loaded onto each beam, which results in possible variation of loads by as much as 50 percent. This specific aspect could be one of the potential reasons for certain overstress conditions.
- The demolition of two bays of parking structure in the South building reduced the number of moment frames resisting lateral loads while building exposure remained essentially the same in the N-S direction. This condition results in a higher lateral demand on the remaining structural components.
- In addition to the reduced number of moment frame resisting lateral loads, the demolition resulted in softening of the structure as ramps were also removed. As it was shown in the global analysis evaluation section of this report, P-Delta effects noticeably magnify flexural moments in the South building versus the North building.

Overall Condition Evaluation

Overall, verification analysis and design revealed overstress conditions that are consistent with observed deficiencies and deterioration of the structure. Significant percentage of primary structural elements does not satisfy the code strength provisions even for partial occupancy (Ground Floor only), and therefore mitigation measures are necessary.

RECOMMENDED MITIGATION MEASURES

Considering current level of overstress and deficiency of the Structure, it is recommended to consider the following mitigation measures to improve structural safety of the building:

1. Shoring of overstressed components to provide secondary load path as a temporary measure before permanent retrofit/strengthening solution is developed and implemented.

2. Development and implementation of strengthening solutions for overstressed components can include, but not limited to, the following:

    a. Enhancement of cross section (jacketing, additional concrete and reinforcement, engagement of concrete toping in composite action where possible, including local replacement of nonstructural toping with structural toping)

    b. Exterior steel reinforcement

c. Use of carbon fiber reinforced polymers

d. Introduction of exterior post-tensioning

3. Supplementary measures to improve efficiency of the mitigation solutions:

a. Material testing (concrete, reinforcement)

b. Confirmation of geometric properties for primary structural components (member sizes, reinforcement quantities, and locations)

These supplementary measures can potentially reduce degree of uncertainty associated with structural properties (when verified in the field) and allow the use of less conservative strength reduction factors as allowed by the code for existing building structures.

1.0 NON-DESTRUCTIVE TESTING INVESTIGATION

1.1 APPROACH

Non-destructive testing (NDT) was performed on 12 columns and 18 beams. Josh Fisher and Freddie Silva, PE, completed the work between January 23 and January 25, 2022. Multiple tests were completed at each location to determine reinforcement layout and size.

- Ground penetrating radar (GPR) (Proceq GP8000) was used to scan each member in multiple directions to verify reinforcement spacing and obtain locations of reinforcement missing from the plans.
- Where GPR was unable to obtain clear results, a tomographer (A1040 MIRA) was used. This provided information in areas with multiple layers of reinforcement.
- A profometer (Proceq Profometer 650 AI) was used to determine the size of the reinforcement where achievable.

The reinforcement layout was obtained by scanning the beam from multiple angles. The number of longitudinal reinforcement mats was determined by scanning the side of the beam in a vertical orientation. The amount of longitudinal reinforcement in each mat was determined by scanning transversely across the bottom of the beam. The shear reinforcement spacing was determined by scanning along the length of the beam.

See Appendix A – Non-Destructive Testing Location Plan for locations of members that received NDT examinations.

1.2 AREA 1 (BEAM D:9 TO E:9)

Location: Beam D:9 to E:9, Level 2
Beam ID: 2SB-34
Size/Length: 16” x 28” x 60-foot span
Precast Section: 16” x 10” x 58’

Precast longitudinal reinforcement appeared to be five lines; however, the MIRA scans could not determine how many mats were present. A similar beam shape with a 40-foot span showed two mats of five lines. Shear reinforcement was spaced 6 inches for the first foot from the column then measured 12 inches average. The 12-inch average spacing was also verified at midspan. The “A-Bar” appeared to be present at Column E:9. Due to the exterior post-tensioning and façade framing, access for scanning was limited at this beam.

The similar third floor beam (D:9 to E:9, 3SB-34, 16” x 28” x 60’) was also scanned and demonstrated similar reinforcement to the second-floor observations.

1.3 AREA 2 (BEAM C2:18 TO D1:18)

Location: Beam D:18 to D1:18, Level 2
Beam ID: 2SB-2
Size/Length: 16” x 28” x 20-foot span
Precast Section: 16” x 10” x 18’

Precast longitudinal reinforcement appeared to be two mats of two lines. Shear reinforcement was spaced 12 inches on average throughout the entire beam and was measured to be #3 bars. B-Bar appeared to be present at Column D:18.

Beam C2:18 to D:18 (2SB-2), 16” x 28” x 20’ span was tested as well. Both beams showed similar reinforcement.

1.4 AREA 3 (BEAM E:2 TO E:5)

Location: Beam E:4 to E:5, Level 2
Beam ID: 2SB-29
Size/Length: 24” x 28” x 20-foot span
Precast Section: 24” x 6.5” x 18’

Precast longitudinal reinforcement observed was one mat of four lines. Shear reinforcement was spaced at a 5-inch average throughout. The “B-Bar” appeared to be present along with two top mats at Column E:4.

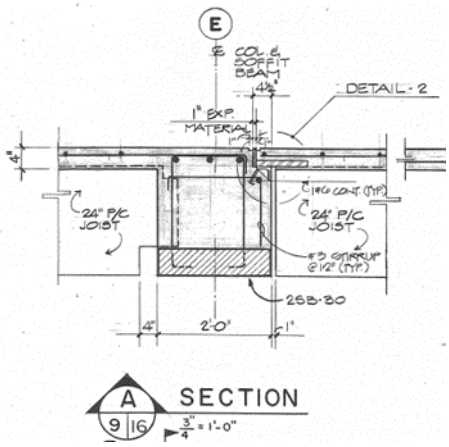


Figure 1 - Beam Section (A)

Location: Beam E:2 to E:4, Level 2
Beam ID: 2SB-40
Size/Length: 24” x 30” x 40-foot span
Precast Section: 24” x 6.5” x 38’

The longitudinal reinforcement was not measured at this location. See Beam E:15 to E:17 for similar reinforcement measured. Shear reinforcement was spaced at a 5-inch average spacing throughout. Additional secondary shear reinforcement was observed and spaced at 12-inch average throughout the beam for the bearing support. See Figure 1, Beam Section A. The “B-Bar” appeared to be present and one top mat was verified at Column E:4; however, the second top mat observed in the adjacent beam was not verified in this location due to access limitations.

1.5 AREA 4 (BEAM E:14 TO E:17)

Location: Beam E:15 to E:17, Level 2
Beam ID: 2SB-29
Size/Length: 24” x 30” x 40-foot span
Precast Section: 24” x 6.5” x 38’

Precast longitudinal reinforcement observed was one mat of 10 lines. Shear reinforcement was spaced at a 4-inch average spacing full length of the beam. Additional secondary shear reinforcement was observed and spaced at 12-inch average throughout the beam along the bearing line. See Figure 1, Beam Section A. The “B-Bar” appeared to be present at Column E:15.

The similar third floor beam (E:15 to E:17, 3SB-25, 24” x 30” x 40’) was also scanned at Column E:15. The reinforcement observed was similar to the second-floor beam observations.

Location: Beam E:14 to E:15, Level 2
Beam ID: 2SB-26
Size/Length: 24” x 28” x 20-foot span
Precast Section: 24” x 6.5” x 18’

Precast longitudinal reinforcement observed was one mat of four strands. Shear reinforcement was spaced at a 5-inch average spacing throughout. The “B-Bar” appeared to be present at Column E:15.

1.6 AREA 5 (BEAM D:6 TO D:8)

Location: Beam D:6 to D:7, Level 2
Beam ID: 2SB-16
Size/Length: 24” x 28” x 20-foot span
Precast Section: 24” by 65” x 18’

Precast longitudinal reinforcement observed was one mat of four strands. Shear reinforcement was spaced at a 5-inch average spacing throughout. See Figure 2, Beam Section D. The “B-Bar” appeared to be present at Column D:7. Beam D:7 to D:8 was observed to have similar reinforcement.

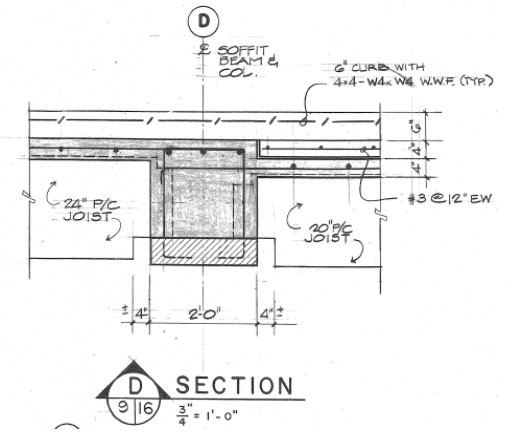


Figure 2 - Beam Section (D)

The third-floor beam (D:7 to D:8, 3SB-16, 24” x 28” x 20’) was also scanned. The reinforcement images were similar to those observed in the second-floor beams; however, additional secondary shear reinforcement was observed and spaced 12 inches on average throughout the beam. See Figure 3, Beam Section J.

1.7 AREA 6 (BEAM D:14 TO D:15)

Location: Beam D:14 to D:15, Level 2
Beam ID: 2SB-15
Size/Length: 24” x 28” x 20-foot span
Precast Section: 24” by 6.5” x 18’

Precast longitudinal reinforcement observed was one mat of four strands. Prestressed strands were measured to have a 0.5-inch diameter. Additional information for this location could not be observed due to limited access on the side of the beam.

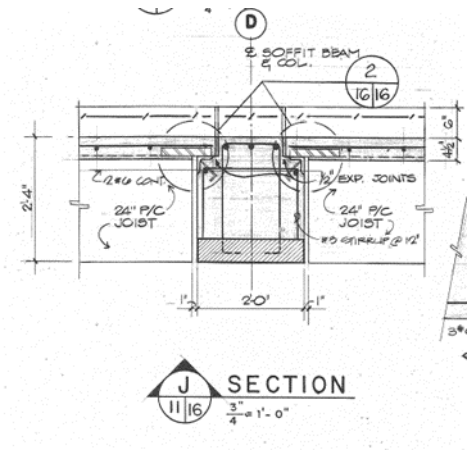


Figure 3 - Beam Section (J)

1.8 AREA 7 (BEAM D:17 TO D:18)

Location: Beam D:17 to D:18, Level 2
Beam ID: 2SB-39
Size/Length: 24” x 28” x 20-foot span
Precast Section: 24” by 6.5” x 18’

Precast longitudinal reinforcement observed was one mat of four strands. Shear reinforcement was spaced at a 5-inch average spacing throughout. The "A-Bar" appeared to be present at Column D:18.

The similar third-floor beam (D:17 to D:18, 3SB-13, 24" x 28" x 20') was also scanned. The reinforcement patterns observed were similar to the patterns observed in the second-floor beams; however, additional secondary shear reinforcing was noted with spacing at 12 inches on average throughout the beam. See Figure 3, Beam Section J.

1.9 AREA 8 (BEAM C:4 TO C:5)

Location: Beam C:4 to C:5, Level 2
Beam ID: VSB-9
Size/Length: 24" x 28" at column C:4; 24" x 39.7" at column C:5; 20-foot span each
Precast Section: Varies

There appeared to be one mat of longitudinal reinforcement at Column C:4. There appeared to be two mats of longitudinal reinforcement at Column C:5. The bottom of the beam could not be accessed to scan for the number of strands per mat. Shear reinforcement was spaced at a 4-inch average spacing throughout. The "B-Bar" appeared to be present at Column C:5 and the "A-Bar" appeared at Column C:4.

1.10 PRECAST MEMBERS

- 24" x 6.5" x 18' members had 4 longitudinal reinforcement strands measuring 0.5-inch diameter.
- 24" x 6.5" x 38' members had 10 longitudinal reinforcement strands. Unable to measure reinforcement size due to the high quantity of reinforcement present and depth.
- 16" x 10" x 18' members had 4 longitudinal (2 mats of 2) reinforcement strands measuring 0.5-inch diameter.
- 16" x 10" x 38' members had 10 longitudinal (2 mats of 5) reinforcement strands. Unable to measure size due to high quantity of reinforcement present and depth.
- 16" x 10" x 58' members had 5 longitudinal reinforcement strands. Inconclusive data on how many mats of reinforcement were present, however the similar beam shape at 38-foot span showed 2 mats of 5 lines.
- Multiple precast members of each size were scanned and showed similar results.

1.11 COLUMNS

Multiple columns were tested on both the first and second floors. First and second floor columns closely matched the column schedule in the plans. NDT observations and measurements recorded for the columns are provided in Table 2.

Table 2 - Column Reinforcement

Ground Floor					
Column	**Longitudinal Bars**	**Measured Bar Size**	**Shear Reinforcement Avg. Spacing**	**Measured Bar Size**	**Plans**
D:2	12	#13	20"	#7	Detail C
D:4	12	#13	20"	#7	Detail C
D:14	4	#7	14"	#4	Detail A
D:15	12	#10	18"	#6	Detail C
D:17	12	#8	16"	#8	Detail C
C:14	4	-	14"	-	Detail A
G:9	8	#13	12"	#6	Detail B
H:9	8	#8	18"	#6	Detail B
E1:17	4	#5	16"	#3	Detail A
E2:17	4	#5	16"	#3	Detail A
E2:15	8	#6	16	#3	Detail F

Second Level					
Column	**Longitudinal Bars**	**Measured Bar Size**	**Shear Reinforcement Avg. Spacing**	**Measured Bar Size**	**Plans**
D:2	12		18"		Detail C
D:4	12		18"		Detail C
D:14	4		18"		Detail A
D:15	12		18		Detail C
D:17	12		17"		Detail C
C:14	4		18"		Detail A
G:9	8		18"		Detail B
H:9	8		18"		Detail B

2.0 ANALYSIS AND DESIGN VERIFICATION

The assessment was conducted in accordance with the following codes and standards.

2.1 VERIFICATION CRITERIA

2.1.1 Codes and standards

2.1.1.1 General

- Florida Existing Building Code 2020
- Florida Building Code 2020
- ASCE 11-99 Guideline for Structural Condition Assessment of Existing Buildings

2.1.1.2 Loads and Actions

- ASCE 7-16 – Minimum Design Loads for Buildings and Other Structures

2.1.1.3 Material Specific

- ACI 318-14 – Building Code Requirements for Structural Concrete
- PCI Design Handbook: Precast and Prestressed Concrete, 6th Edition

2.1.1.4 Supplemental

- ACI 318-77 – Building Code Requirements for Reinforced Concrete (listed in original drawings)
- ACI 318-83 – Building Code Requirements for Reinforced Concrete (listed in original drawings)

2.1.2 Approach and Methodology for Existing Building Evaluation

Analysis and design evaluation of structural performance for the Metrorail MLK Parking Garage Structure (Structure) is conducted in accordance with requirements and procedures of the Florida Existing Building Code 2020 (FEBC 2020). In accordance with FEBC 2020, the evaluation of structural performance, in general case, is triggered for buildings with substantial structural damage to vertical elements of gravity and lateral force-resisting systems (unless other reasons such as alteration, expansion or change of occupancy require structural evaluation).

FEBC 2020 defines Substantial Structural Damage as a condition where one or both of the following apply:

- The vertical elements of the lateral force-resisting system have suffered damage such that the lateral load carrying capacity of any story in any horizontal direction has been reduced by more than 33 percent from its predamage condition.
- The capacity of any vertical component carrying gravity load, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its predamage condition and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by the Florida Building Code for new buildings of similar structure, purpose and location.

Previously conducted base line assessment (WSP report, dated November 4, 2020) indicated that vertical elements of lateral force-resisting system (columns) were generally in satisfactory condition. Nevertheless, based on the request from the Department of Transportation and Public Works (Miami, Florida) and considering that multiple floor beams had advanced deterioration and cracking, we have proceeded with the evaluation following the procedures and recommendations of the FEBC 2020 as detailed in Appendix C.

Summarizing the FEBC 2020 provisions cited in Appendix C, the evaluation of the Structure will be performed in accordance with the following three steps:

- Step 1. Assessment of the building performance based on the wind and gravity loads for new buildings in accordance with the Florida Existing Building Code 2020.
- Step 2. In case if the assessment from Step 1 above indicates noncompliance with the building code requirements for new buildings, then evaluation will be repeated for wind loads from the original design.
- Step 3. Discussion of results, findings, and observations.

The Structure will be evaluated for three different scenarios:

- Scenario 1 – Full occupancy (Ground floor, Level 2, and Level 3);
- Scenario 2 – Partial occupancy (Ground floor and Level 2); and
- Scenario 3 – Partial occupancy (Ground floor).

2.1.3 Risk Category

The Structure is classified as Risk Category II in accordance with ASCE 7-16.

2.1.4 Loads and Load Combinations

2.1.4.1 Gravity Loads

Self-weight of structural components is calculated based on the geometry and material properties in analysis/design software. Superimposed Dead Loads (SDL) and Live Loads (LL) are based on the existing structural drawings and summarized in Table 3.

Table 3 - Superimposed Dead and Live Loads

Level	Occupancy	SDL	LL	Comments
Level 3 (Roof)	Parking	-	40*	Reference: S-3 (07-10-2000)
Level 2	Parking	-	40*	Reference: SE-1A-1 (04-16-1984)
Level 1 (Ground Floor)	Parking	-	40*	Reference: SE-1A-1 (04-16-1984)
	Mechanical	-	100	Reference: SE-1A-1 (04-16-1984)

*Note: * LL=40 psf for parking garages in accordance with the current building code requirements (original drawings indicate parking LL = 50 psf).*

2.1.4.2 Wind

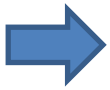
Two sets of loads are considered for the evaluation:

- Current code wind loads (FBC 2020)
- Basic wind speed
  - 175 mph (ultimate level wind, 700-year return period (YRP)
  - 112 mph (service level wind, 25 YRP)
- Exposure: C
- Original design wind loads (original design drawings)
  - Basic wind speed (fastest mile): 120 mph

Conversion of the original design wind speed from the fastest mile service wind (ASCE 7-93 and prior editions) to ASCE 7-16 design wind speed at ultimate wind speed is based on Table C26.5-7 of ASCE 7-16 as shown in Table 4. The converted value is practically equal to the current code wind speed (172.6 mph versus 175 mph).

Table 4 - Wind Speed Conversion (Original Design Code and Current Design Code)

ASCE 7-95 through ASCE 7-05 Basic Wind Speed (3-s gust in mi/h)	ASCE 7-10 and ASCE 7-16 Basic Wind Speed (3-s gust, mi/h)	ASCE 7-93 and Prior Editions Basic Wind Speed (fastest mile, mi/h)
85	108[a]	71
90	114[a]	76
100	126	85
105	133	90
110	139	95
120	152	104
130	164	114
140	177	123
145	183	128
150	190	133
170	215	152



$V_{converted}$ = 172.6 mph

2.1.4.3 Seismic

Seismic loads from ASCE 7-16 (ASCE 7 Online Hazard Tool) are presented in Figure 4 – Seismic Design Category – A (no seismic load consideration in design verification in accordance with ASCE 7-16).

Figure 4 - Seismic Load (ASCE 7-16, ASCE 7 Online Hazard Tool)

2.1.4.4 Design Combinations

Ultimate limit state analysis and design combinations (LRFD, ASCE 7-16):

- 1.4D
- 1.2D + 1.6L
- 1.2D + 1.6L_r + (L or 0.5W)
- 1.2D + 1.0W + L + 0.5L_r
- 0.9D + 1.0W

2.1.5 Global Performance

- Building Deformations: Wind deformations: Interstory Drift Index ≤ 1/400 (Service, 25 YRP).
- P-Delta Effect: Ratio of overturning moments with and without second order effects £ 1.4.

2.1.6 Materials

Materials used in the Structure as indicated in the original set of structural drawings are summarized in Table 5.

Table 5 - Materials

Structural Components	Materials
Floors	Cast-in-place concrete deck - Concrete: f'c = 4 ksi - Reinforcement: ASTM A615 Gr. 60 Precast prestressed joists: - Concrete: f'c = 6 ksi - PT strands ASTM A416
Beams	Composite beams (precast + cast-in-place) Concrete: - Precast: f'c = 6 ksi - Cast-in-place: f'c = 4 ksi Reinforcement: - ASTM A615 Grade 60 (fy = 60 ksi) - ASTM A416
Columns	Cast-in-place concrete columns: - Concrete: f'c = 5 ksi, 6 ksi - ASTM A615 Grade 60 (fy = 60 ksi)
Foundation	Pile caps - Concrete: f'c = 3 ksi - Reinforcement: ASTM A615 Grade 60 (fy = 60 ksi) Piles (auger grout injected piles): - Grout: f'c = 4 ksi - Reinforcement: ASTM A615 Grade 60 (fy = 60 ksi)

2.2 STRUCTURAL SYSTEM DESCRIPTION

The Structure is a concrete structure comprised of precast and cast-in-place components. Gravity Force-Resisting System is represented by two-component floor system (cast-in-place concrete deck on precast, prestressed joists) supported on composite beams (precast, prestressed soffit element + cast-in-place concrete) as shown in Figure 5. Floor framing is supported by cast-in-place concrete columns. Foundation system uses pile caps and piles.

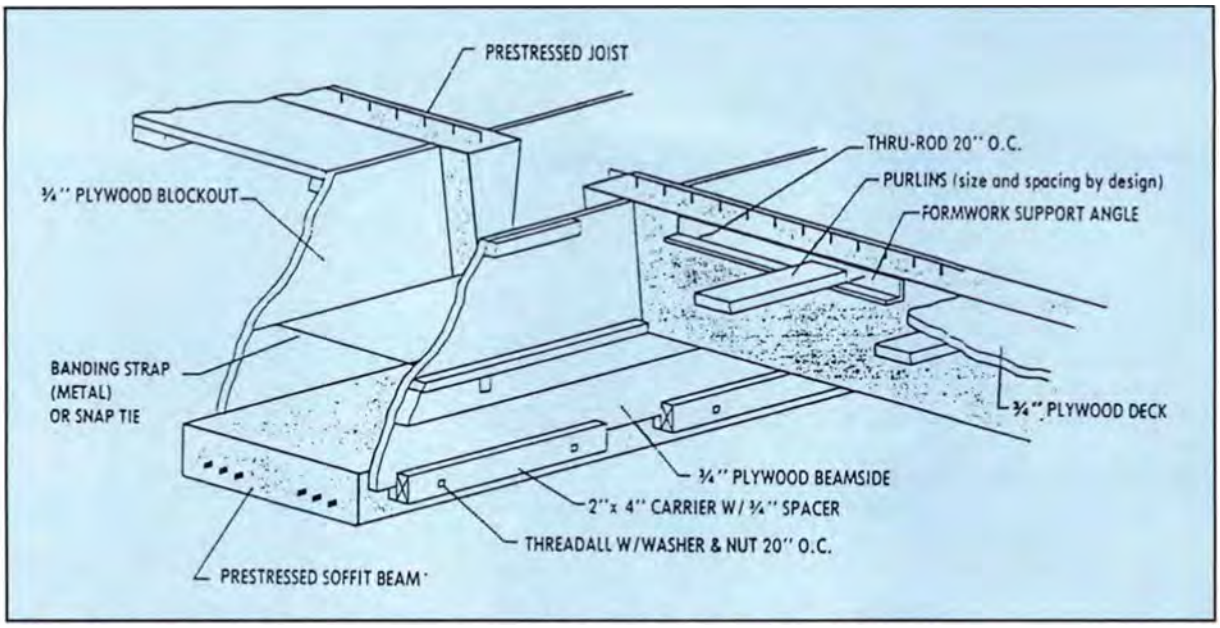


Figure 5 - Floor Framing System (Prestressed joist system)

This system represents one of the typical solutions for parking garages. Based on the information from technical publications and system description, precast, prestressed floor joists serve as tensile components and the cast-in-place floor slab serves as the compressive component. The joists are supported by a soffit beam that is designed as a shored composite member. Longitudinal reinforcement is tied to shear reinforcement, which protrudes from the joists and soffit beams to provide continuity.

The structure has overall dimensions of approximately 340 by 305 feet and separated by E-W and N-S expansion joints as shown in Figure 6. E-W expansion joints allow movement of the North and South buildings along and across the joints. N-S expansion joints allow movement across the joints but restrict relative movements along the joints.

Typical building elevations, sections, foundation plans, floor framing plans, soffit beam schedule, and column schedule are provided in Appendix B. This information is based on the original set of construction documents from 1985. It is important to note that two bays south from Grid Line C were demolished to allow construction of an office tower (modification drawings from 2001) and the Structure in its current condition is bounded within Grid Lines C to H and 1 to 18.

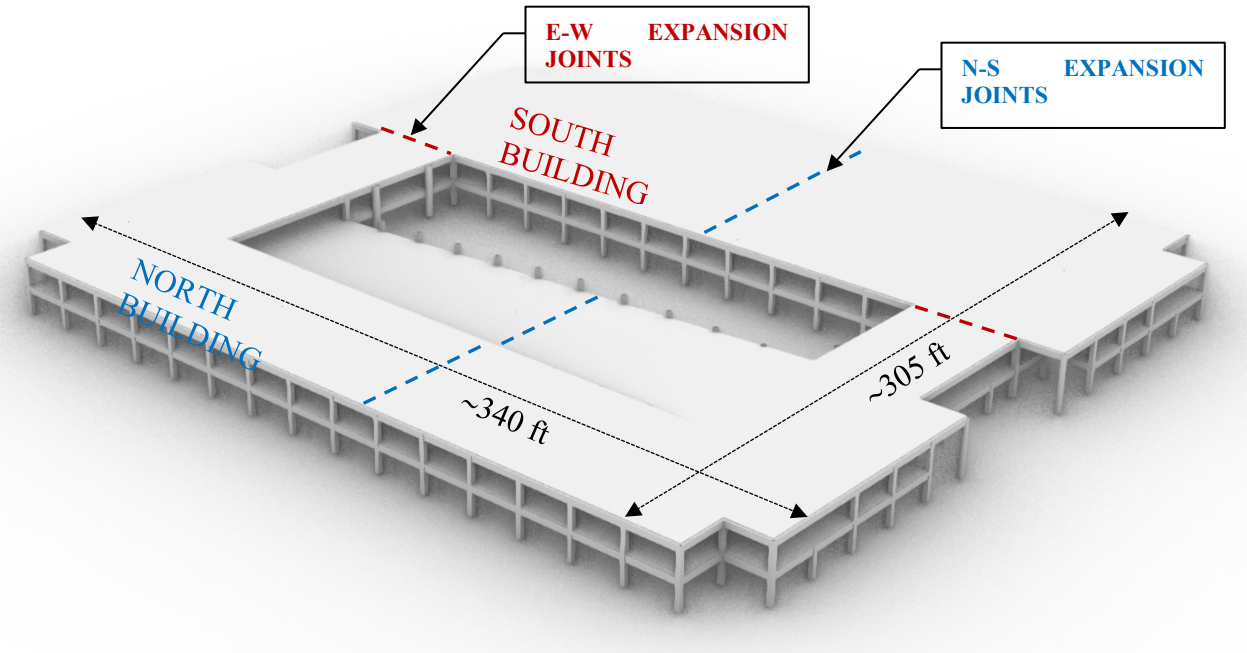


Figure 6 - General View of Structural System

Based on the available information from record drawings (structural plans, sections, details) and description of this type of structural system in engineering publications from the time of construction, we can categorize structural components as part of gravity and/or lateral force-resisting systems (GFRS and LFRS) as presented in Table 6.

Table 6 - Gravity and Lateral Force-Resisting Structural Elements

Structural Component	GFRS	LFRS	Comments
Floor system (cast-in-place deck and precast PT joists)	V	V	Slab consideration in LFRS is for diaphragm action only, no moment frame action is considered
Composite beams (precast PT + cast-in-place)	V	V	Beams and columns represent primary component of LFRS
Columns (cast-in-place)	V	V	
Foundation (cast-in-place)	V	V	

2.3 ANALYSIS AND GLOBAL PERFORMANCE

2.3.1 Analysis Model

Analysis and evaluation of the Structure was performed in ETABS Version 18. Two separate models were used for the evaluation of the South and North buildings as they are separated by E-W expansion joint (see Figure 6). N-S expansion joints are included in analysis models of the South and North buildings (allowing movement across the joint and coupling movement along the joint). General views of the South and North buildings analysis models are presented in Figures 7 and 8. Finite element description of structural components in the global FEM is summarized in Table 7.

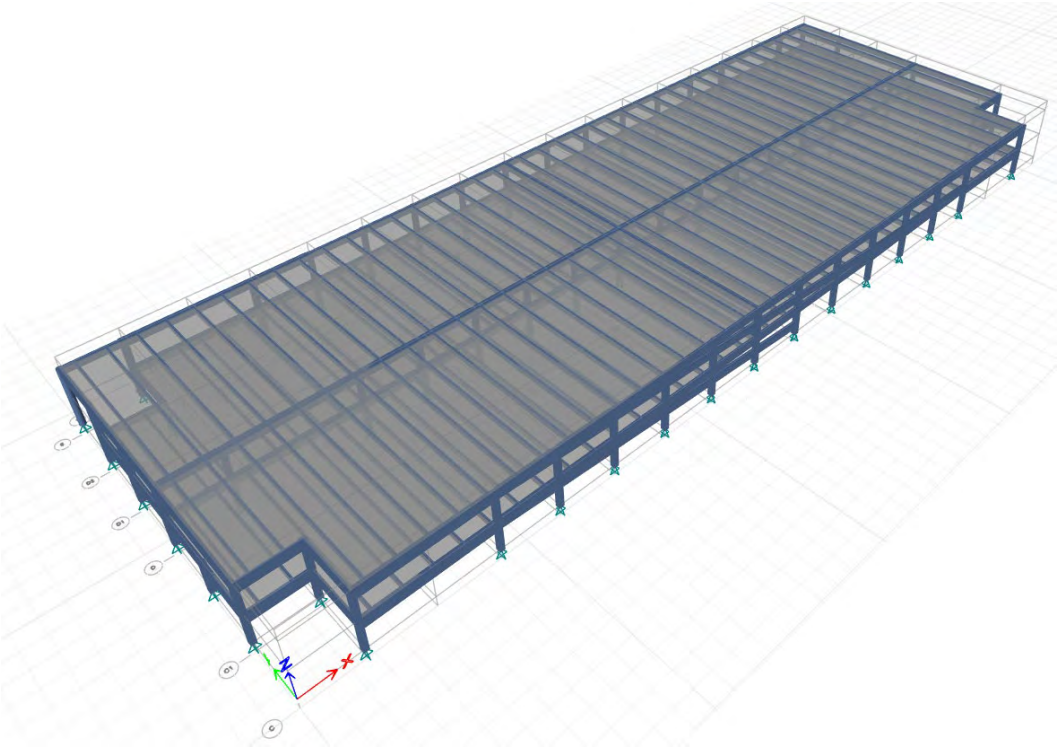


Figure 7 - General View of Global Finite Element Model (South building)

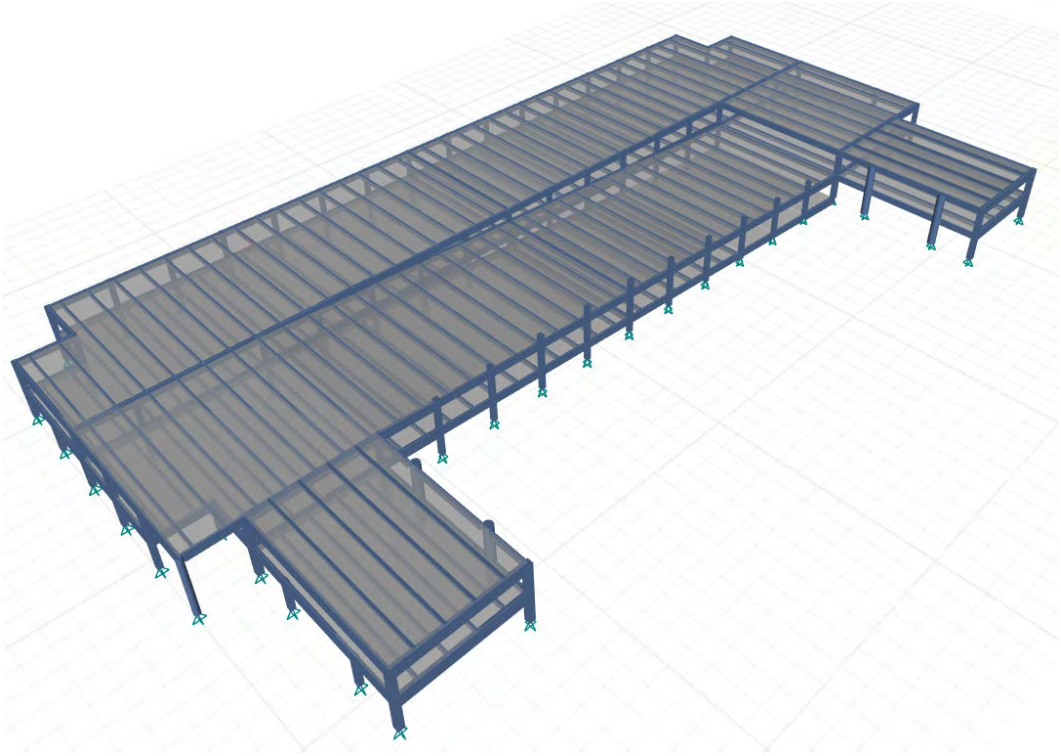


Figure 8 - General View of Global Finite Element Model (North building)

Table 7 - Finite Element Description of Structural Components in FEM

Structural component	FEM description
Floor slabs	Shell (membrane formulation)
Floor beams	Frame element
Columns	Frame element

Two variations of models were used for evaluation of the building performance:

- Ultimate level model (strength and stability evaluation);
- Service level model (serviceability evaluation).

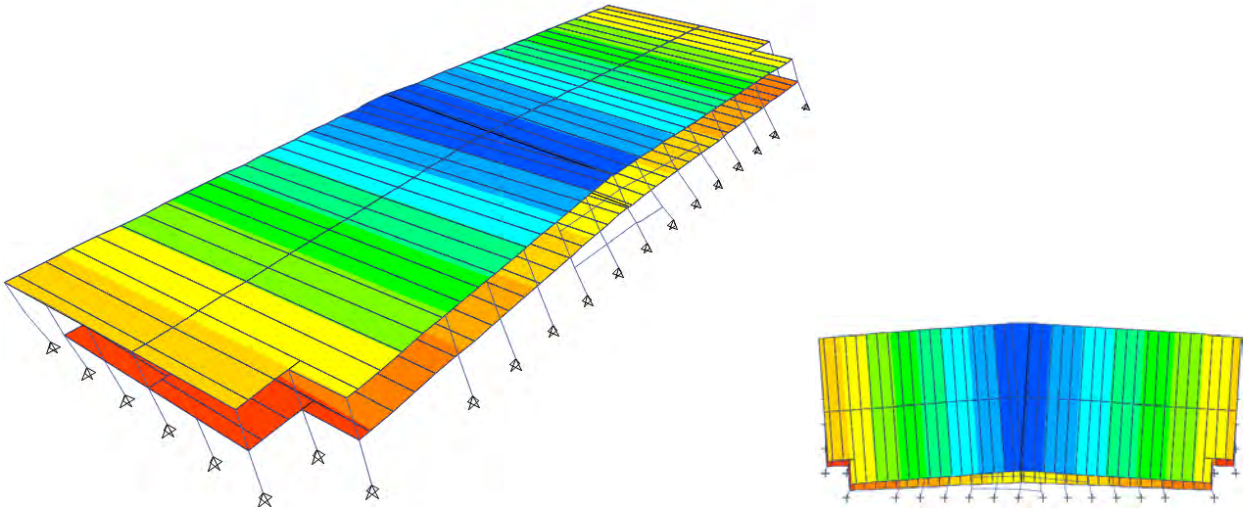
Stiffness modifiers that were used in the ultimate and service level models are summarized in Table 8.

Table 8 - Stiffness Modifiers for Ultimate and Service Level Models (ACI 318-14)

Structural Component	Ultimate Model	Service Model
Beams	$I_{eff} = 0.35I_g$	$I_{eff} = 0.5I_g$
Columns	$I_{eff} = 0.7I_g$	$I_{eff} = 1.0I_g$

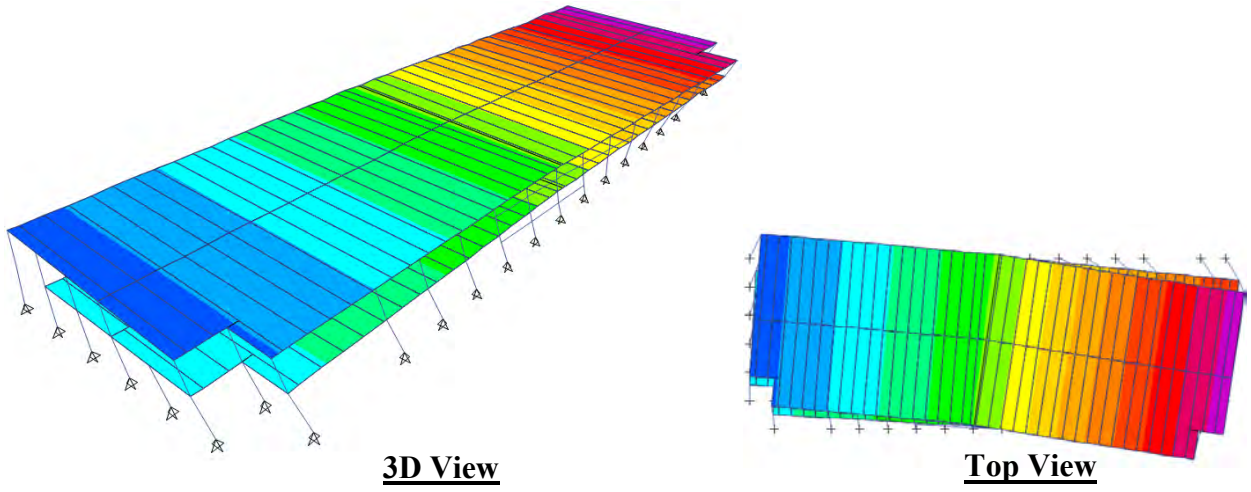
2.3.2 Dynamic Properties

Dynamic properties of the building were evaluated for ultimate and service level models. First three mode shapes with corresponding periods of vibration are presented in Figures 9 to 14.



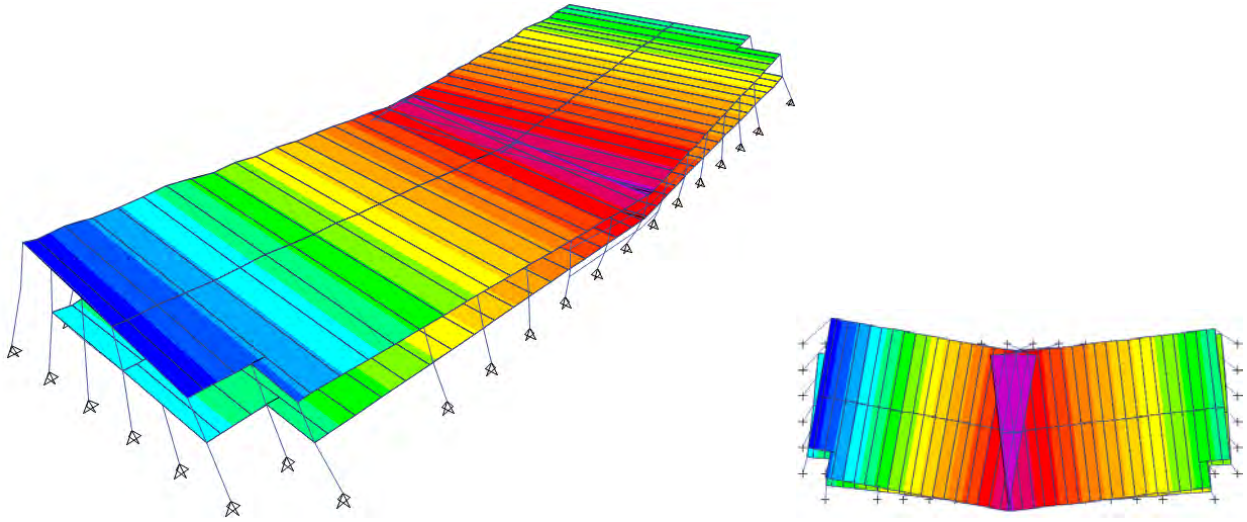
3D View **Top View**

Figure 9 - 1st Mode Shape – South Building ($T_{1.ULT}$ = 2.0 sec, $T_{1.SERV}$ = 1.4 sec)



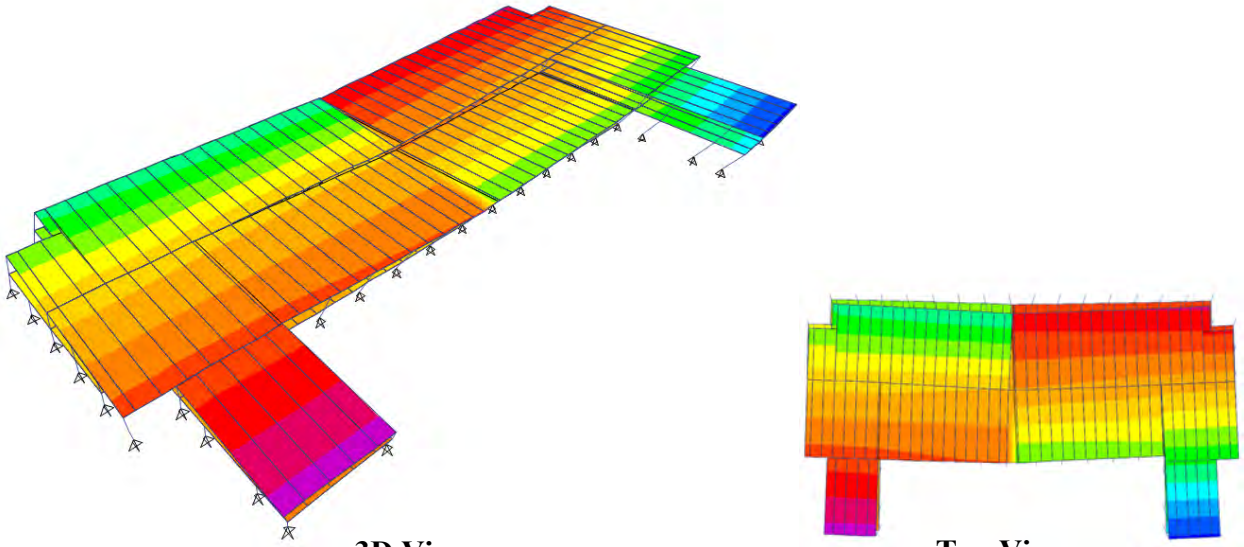
3D View **Top View**

Figure 10 - 2nd Mode Shape – South Building ($T_{2.ULT}$ = 1.0 sec, $T_{2.SERV}$ = 0.7 sec)



3D View **Top View**

Figure 11 - 3rd Mode Shape – South Building *($T_{3.ULT}$ = 0.9 sec, $T_{3.SERV}$ = 0.6 sec)*



3D View **Top View**

Figure 12 - 1st Mode Shape – North Building *($T_{1.ULT}$ = 1.2 sec, $T_{1.SERV}$ = 0.9 sec)*

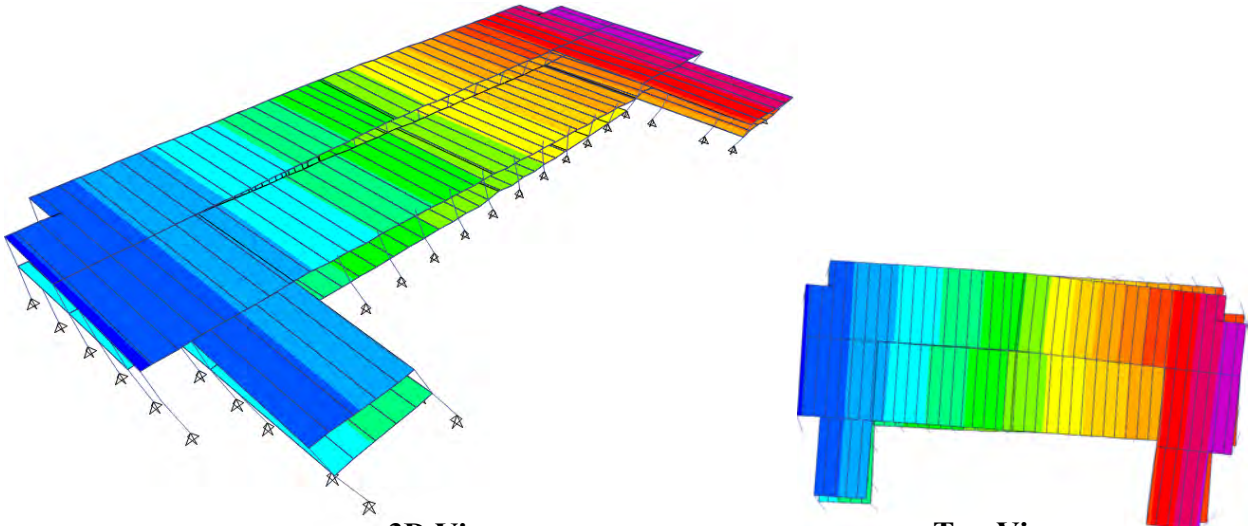


Figure 13 - 2nd Mode Shape – North Building *($T_{2.ULT}$ = 0.9 sec, $T_{2.SERV}$ = 0.7 sec)*

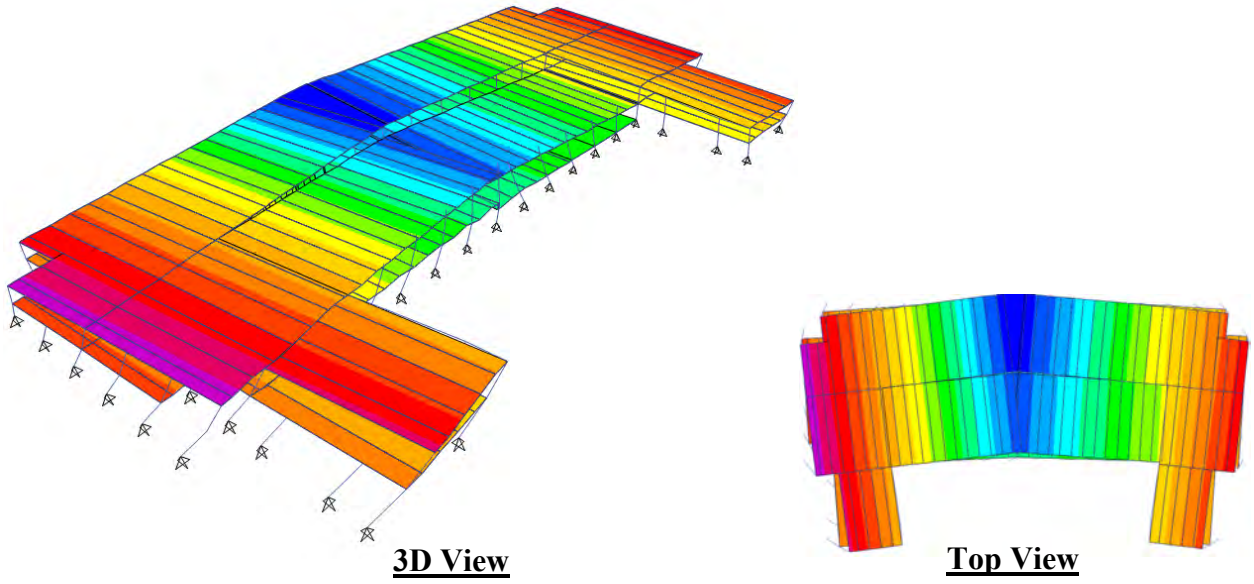


Figure 14 - 3rd Mode Shape – North Building *($T_{3.ULT}$ = 0.8 sec, $T_{3.SERV}$ = 0.6 sec)*

Long natural periods of vibration are indicative of overall softer structural system in comparison with expectations for new structures that are designed in accordance with the modern generation of building codes. Periods of vibration for the South building are significantly longer in comparison with the North building (2.0 versus 1.2 seconds), which could be indicative of a consequence of partial demolition of the South building in early 2000 and removal of ramps. This added flexibility of the structure can result in a higher lateral demand due to increased P-Delta effects.

2.3.2.1 Building Deformations

Global building deformations were assessed for service level wind loads (25 YRP). Results of the assessment are presented in Figures 15 and 16 for the South and North buildings, respectively.

Deformation of the South and North buildings under service level wind loads (serviceability consideration) are in compliance with typical limitations adopted in the industry for new buildings of similar type.

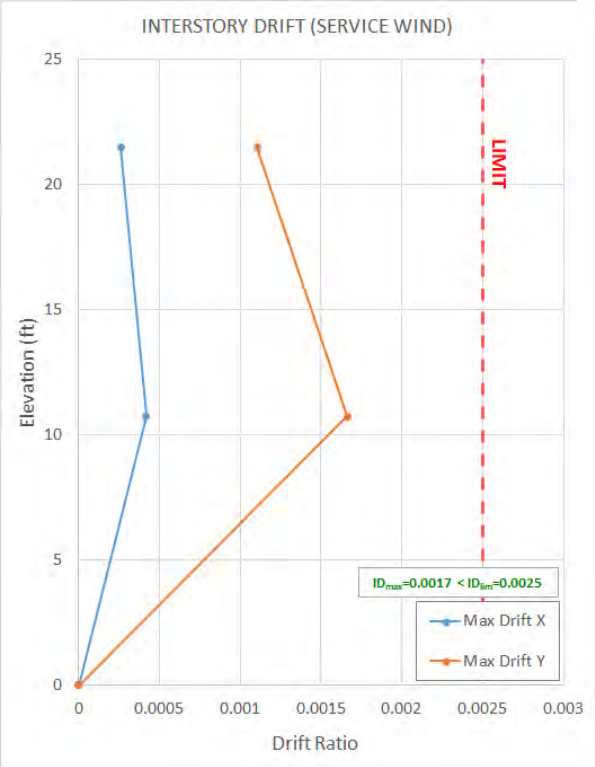


Figure 15 - South Garage Wind Deformations – Drift Index

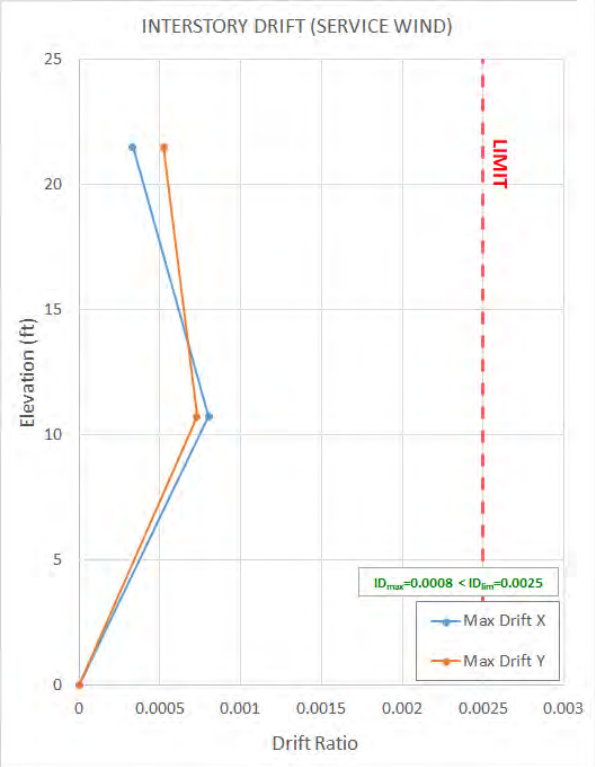


Figure 16 - North Garage Wind Deformations – Drift Index

2.3.2.2 P-Delta Effects

Global P-Delta effects were evaluated for both the South and North buildings at global (overturning demand) and component levels (flexural moments in columns) under ultimate loading condition. Overturning and flexural moments were calculated and compared in finite element model with and without consideration of P-Delta effects. Limitation on P-Delta moment magnification was taken as 1.4 in accordance with ACI 318-14. Summary of moment magnification due to P-Delta effects is presented in Tables 9 through 11.

Table 9 - Global P-Delta Effect Evaluation

Load	P-Delta Magnification			
	Mx	My	Limit	Status
Wind (South Garage)	1.28	1.08	1.4	OK
Wind (North Garage)	1.11	1.05	1.4	OK

Table 10 - P-Delta Effect Evaluation for Perimeter Columns (South Garage)

Column Location			P-Delta Magnification			Column Location			P-Delta Magnification		
Level	Grid-X	Grid-Y	Magnifier	Limit	Status	Level	Grid-X	Grid-Y	Magnifier	Limit	Status
2	1	E	1.28	1.4	OK	2	12	C	1.26	1.4	OK
2	2	E	1.21	1.4	OK	2	13	C	1.26	1.4	OK
2	4	E	1.29	1.4	OK	2	14	C	1.25	1.4	OK
2	5	E	1.33	1.4	OK	2	15	C	1.25	1.4	OK
2	6	E	1.32	1.4	OK	2	17	C	1.22	1.4	OK
2	7	E	1.32	1.4	OK	3	2	C	1.29	1.4	OK
2	8	E	1.33	1.4	OK	3	4	C	1.3	1.4	OK
2	9	E	1.32	1.4	OK	3	5	C	1.3	1.4	OK
2	10	E	1.32	1.4	OK	3	6	C	1.3	1.4	OK
2	11	E	1.3	1.4	OK	3	7	C	1.3	1.4	OK
2	12	E	1.27	1.4	OK	3	8	C	1.29	1.4	OK
2	13	E	1.27	1.4	OK	3	9	C	1.3	1.4	OK
2	14	E	1.27	1.4	OK	3	10	C	1.29	1.4	OK
2	15	E	1.28	1.4	OK	3	11	C	1.3	1.4	OK
2	17	E	1.28	1.4	OK	3	12	C	1.3	1.4	OK
2	18	E	1.2	1.4	OK	3	13	C	1.3	1.4	OK
3	1	E	1.27	1.4	OK	3	14	C	1.3	1.4	OK
3	2	E	1.32	1.4	OK	3	15	C	1.3	1.4	OK
3	4	E	1.22	1.4	OK	3	17	C	1.3	1.4	OK
3	5	E	1.31	1.4	OK	2	1	C1	1.21	1.4	OK
3	6	E	1.29	1.4	OK	2	1	C2	1.27	1.4	OK
3	7	E	1.3	1.4	OK	2	1	D	1.21	1.4	OK
3	8	E	1.31	1.4	OK	2	1	D1	1.22	1.4	OK
3	9	E	1.3	1.4	OK	2	1	D2	1.21	1.4	OK
3	10	E	1.31	1.4	OK	3	1	C1	1.29	1.4	OK
3	11	E	1.31	1.4	OK	3	1	D	1.28	1.4	OK
3	12	E	1.3	1.4	OK	3	1	D1	1.28	1.4	OK
3	13	E	1.29	1.4	OK	3	1	D2	1.28	1.4	OK
3	14	E	1.31	1.4	OK	2	2	C1	1.26	1.4	OK
3	15	E	1.22	1.4	OK	3	2	C1	1.29	1.4	OK
3	17	E	1.18	1.4	OK	2	17	C1	1.24	1.4	OK
3	18	E	1.29	1.4	OK	3	17	C1	1.29	1.4	OK
2	2	C	1.22	1.4	OK	2	18	C1	1.21	1.4	OK
2	4	C	1.24	1.4	OK	2	18	C2	1.27	1.4	OK

Table 10 (continued) - P-Delta Effect Evaluation for Perimeter Columns (South Garage)

Column Location			P-Delta Magnification			Column Location			P-Delta Magnification		
Level	Grid-X	Grid-Y	Magnifier	Limit	Status	Level	Grid-X	Grid-Y	Magnifier	Limit	Status
2	5	C	1.28	1.4	OK	2	18	D	1.21	1.4	OK
2	6	C	1.3	1.4	OK	2	18	D1	1.27	1.4	OK
2	7	C	1.27	1.4	OK	2	18	D2	1.21	1.4	OK
2	8	C	1.29	1.4	OK	3	18	C1	1.29	1.4	OK
2	9	C	1.23	1.4	OK	3	18	D	1.29	1.4	OK
2	10	C	1.31	1.4	OK	3	18	D2	1.29	1.4	OK
2	11	C	1.3	1.4	OK						

Table 11 - P-Delta Effect Evaluation for Perimeter Columns (North Garage)

Column Location			P-Delta Magnification			Column Location			P-Delta Magnification		
Level	Grid-X	Grid-Y	Magnifier	Limit	Status	Level	Grid-X	Grid-Y	Magnifier	Limit	Status
2	1	F	1.09	1.4	OK	3	2	H	1.1	1.4	OK
2	2	F	1.08	1.4	OK	3	3	H	1.11	1.4	OK
2	4	F	1.06	1.4	OK	3	4	H	1.11	1.4	OK
2	5	F	1.06	1.4	OK	3	5	H	1.11	1.4	OK
2	6	F	1.06	1.4	OK	3	6	H	1.11	1.4	OK
2	7	F	1.06	1.4	OK	3	7	H	1.11	1.4	OK
2	8	F	1.06	1.4	OK	3	8	H	1.11	1.4	OK
2	9	F	1.06	1.4	OK	3	9	H	1.1	1.4	OK
2	10	F	1.11	1.4	OK	3	10	H	1.11	1.4	OK
2	11	F	1.11	1.4	OK	3	11	H	1.1	1.4	OK
2	12	F	1.11	1.4	OK	3	12	H	1.11	1.4	OK
2	13	F	1.11	1.4	OK	3	13	H	1.11	1.4	OK
2	14	F	1.11	1.4	OK	3	14	H	1.11	1.4	OK
2	15	F	1.11	1.4	OK	3	15	H	1.11	1.4	OK
2	17	F	1.1	1.4	OK	3	16	H	1.1	1.4	OK
2	18	F	1.08	1.4	OK	3	17	H	1.09	1.4	OK
3	1	F	1.08	1.4	OK	2	1	F1	1.08	1.4	OK
3	2	F	1.11	1.4	OK	2	1	F2	1.08	1.4	OK
3	4	F	1.11	1.4	OK	2	1	G	1.08	1.4	OK
3	5	F	1.11	1.4	OK	2	1	G1	1.08	1.4	OK
3	6	F	1.11	1.4	OK	2	1	G2	1.08	1.4	OK

Table 11 (continued) - P-Delta Effect Evaluation for Perimeter Columns (North Garage)

Column Location			P-Delta Magnification			Column Location			P-Delta Magnification		
Level	Grid-X	Grid-Y	Magnifier	Limit	Status	Level	Grid-X	Grid-Y	Magnifier	Limit	Status
3	7	F	1.11	1.4	OK	3	1	F1	1.09	1.4	OK
3	8	F	1.11	1.4	OK	3	1	F2	1.1	1.4	OK
3	9	F	1.09	1.4	OK	3	1	G	1.1	1.4	OK
3	10	F	1.05	1.4	OK	3	1	G2	1.1	1.4	OK
3	11	F	1.05	1.4	OK	2	2	E1	1.09	1.4	OK
3	12	F	1.05	1.4	OK	2	2	E2	1.09	1.4	OK
3	13	F	1.05	1.4	OK	2	2	F1	1.09	1.4	OK
3	14	F	1.04	1.4	OK	2	2	G2	1.08	1.4	OK
3	15	F	1.11	1.4	OK	3	2	G2	1.1	1.4	OK
3	17	F	1.09	1.4	OK	2	4	E1	1.08	1.4	OK
3	18	F	1.09	1.4	OK	2	4	E2	1.09	1.4	OK
2	2	H	1.08	1.4	OK	3	4	E1	1.1	1.4	OK
2	3	H	1.05	1.4	OK	3	4	E2	1.11	1.4	OK
2	4	H	1.05	1.4	OK	2	15	E1	1.1	1.4	OK
2	5	H	1.05	1.4	OK	2	15	E2	1.11	1.4	OK
2	6	H	1.05	1.4	OK	3	15	E1	1.08	1.4	OK
2	7	H	1.06	1.4	OK	3	15	E2	1.11	1.4	OK
2	8	H	1.06	1.4	OK	2	17	G2	1.1	1.4	OK
2	9	H	1.11	1.4	OK	3	17	G2	1.09	1.4	OK
2	10	H	1.1	1.4	OK	2	18	F1	1.09	1.4	OK
2	11	H	1.1	1.4	OK	2	18	F2	1.09	1.4	OK
2	12	H	1.1	1.4	OK	2	18	G	1.09	1.4	OK
2	13	H	1.1	1.4	OK	2	18	G1	1.09	1.4	OK
2	14	H	1.1	1.4	OK	2	18	G2	1.1	1.4	OK
2	15	H	1.1	1.4	OK	3	18	F1	1.09	1.4	OK
2	16	H	1.11	1.4	OK	3	18	G	1.09	1.4	OK
2	17	H	1.1	1.4	OK	3	18	G2	1.09	1.4	OK

Global P-Delta effects are within acceptable limits for both the South and North buildings. However, both global and component levels, P-Delta effects are significantly higher for the South building (magnification factor of 1.21 to 1.33) in comparison to the North building (magnification factor of 1.06 to 1.11). High level of moment magnification for the South building can be attributed to its lower global stiffness, which can be due to the partial demolition of the structure and removal of ramps (ramps typically provide noticeable lateral stiffness to the structural system). High level of moment magnification at component

level results in proportionally higher lateral demand (1.21 to 1.31 times higher) and when combined with gravity loads it increases total demand in the range of 1.07 to 1.2 times.

2.4 COMPONENT PERFORMANCE

Component performance evaluation was based on the analysis results from the global finite element analysis models of the South and North buildings. The evaluation was conducted for three different scenarios:

Scenario 1: Full Occupancy
(Ground floor, Level 2, and Level 3)

Scenario 2: Partial Occupancy
(Ground floor and Level 2)

Scenario 3: Partial Occupancy
(Ground floor)

Component performance evaluation was focused on the primary elements of gravity and lateral force-resisting systems with observed deficiencies and deteriorated condition (composite floor framing beams with precast prestressed soffit panels and cast-in-place body, cast-in-place columns).

2.4.1 Beams

Design verification for beams was conducted for the following structural actions:

- Flexure (positive moment – bottom beam fibers in tension)
- Flexure (negative moment – top beam fibers in tension)
- Shear

The verification was conducted based on the following comparisons:

- Comparison of the calculated demand versus demand, which was reported in the original construction drawings (Demand to Demand Ratio – DDR, where original demand is available)
- Comparison of the calculated demand versus capacity (Demand to Capacity Ratio – DCR)

Beam flexural and shear capacities were calculated based on the reinforcement information from the original drawings (top rebars) and field scanning and measurements (bottom PT tendons, shear reinforcement). Field verified reinforcement was available for representative members in different geometric groups (span, location) and was extrapolated within those groups to other members where there is no information in the original drawings.

2.4.1.1 South Building

Observed overstressed conditions in the South building are related to positive/negative flexural demands (M+/M-) and shear demands (V):

- M+: positive moment overstress condition was observed for full (GF, L2, L3) and partial (GF, L2) occupancies. Some degree of moment redistribution could be considered to reduce/eliminate overstress condition where additional reserve capacity is available for negative moments within the same beams. Partial occupancy (GF only) does not show overstress condition.
- M-: negative moment overstress condition was observed for all 3 scenarios of occupancies (full and partial). Redistribution of moments is limited due to two major considerations:
  - Overstressed condition was observed in cantilevers (no opportunity to redistribute excessive moments to the span)
  - Redistribution of negative moments to the span will result in reduction of lateral capacity of the structure as it would require some degree of inelasticity in the negative moment regions
- V: shear overstress condition was observed for all 3 scenarios of occupancies (full and partial).

Table 12 - Evaluation Summary for Beams – South Building

Building	Scenario	Structural Action	Reference Diagram	Demand/Capacity (DCR)	Status
South	1	Flexure (M+)	3.4.1.1	DCR range: 0 - 1.2 DCR >1: 7% of beams	NG
		Flexure (M-)	3.4.1.2	DCR range: 0.2 - 2.1 DCR >1: 31% of beams	NG
		Shear	3.4.1.3	DCR range: 0.35 - 2.0 DCR >1: 18% of beams	NG
	2	Flexure (M+)	3.4.1.4	DCR range: 0 - 1.2 DCR >1: 3% of beams	NG
		Flexure (M-)	3.4.1.5	DCR range: 0.2 - 2.0 DCR >1: 25% of beams	NG
		Shear	3.4.1.6	DCR range: 0.3 - 2.0 DCR >1: 12% of beams	NG
	3	Flexure (M+)	3.4.1.7	DCR range: 0 – 0.9 DCR >1: 0% of beams	OK
		Flexure (M-)	3.4.1.8	DCR range: 0.2 – 1.9 DCR >1: 21% of beams	NG
		Shear	3.4.1.9	DCR range: 0.3 - 1.5 DCR >1: 8% of beams	NG

2.4.1.2 North Building

Observed overstressed conditions in the North building are related to positive/negative flexural demands (M+/M-) and shear demands (V):

- M+: positive moment overstress condition was observed for all 3 scenarios of occupancy (full and partial). Some degree of moment redistribution could be considered to reduce/eliminate overstress condition where additional reserve capacity is available for negative moments within the same beams. There are several instances where beams are simply supported and redistribution of the moments is not possible.
- M-: negative moment overstress condition was observed for all 3 scenarios of occupancies (full and partial). Redistribution of moments is limited due to two major considerations:
  - Overstressed condition was observed in cantilevers (no opportunity to redistribute excessive moments to the span)
  - Redistribution of negative moments to the span will result in reduction of lateral capacity of the structure as it would require some degree of inelasticity in the negative moment regions
- V: shear overstress condition was observed for all 3 scenarios of occupancies (full and partial).

Table 13 - Evaluation Summary for Beams – North Building

Building	Scenario	Structural Action	Reference Diagram	Demand/Capacity (DCR)	Status
North	1	Flexure (M+)	3.4.1.10	DCR range: 0 - 1.5 DCR >1: 5% of beams	NG
		Flexure (M-)	3.4.1.11	DCR range: 0 - 1.4 DCR >1: 22% of beams	NG
		Shear	3.4.1.12	DCR range: 0.3 - 1.8 DCR >1: 10% of beams	NG
	2	Flexure (M+)	3.4.1.13	DCR range: 0 - 1.5 DCR >1: 2% of beams	NG
		Flexure (M-)	3.4.1.14	DCR range: 0 - 1.4 DCR >1: 15% of beams	NG
		Shear	3.4.1.15	DCR range: 0.3 - 1.8 DCR >1: 7% of beams	NG
	3	Flexure (M+)	3.4.1.16	DCR range: 0 - 1.5 DCR >1: 1% of beams	NG
		Flexure (M-)	3.4.1.17	DCR range: 0 - 1.1 DCR >1: 6% of beams	NG
		Shear	3.4.1.18	DCR range: 0.3 - 1.37 DCR >1: 6% of beams	NG

Additional observations within the evaluation:

- Demand to Demand comparison (calculated versus original drawings) showed good correlation when floor joists were not modeled, and slabs transferred loads to supporting beams as uniformly distributed. However, inclusion of the joists significantly changed the load distribution between different bays. With joist system

load transfer from slabs to beams occurs as concentrated loads. In short bays, we observed conditions with two or three joists, which results in possible variation of loads at approximately 50 percent. This specific aspect could be one of the potential reasons for certain overstress conditions;

- Demolition of two bays of parking structure in the South building reduced number of moment frames resisting lateral loads while building exposure remained essentially the same in the N-S direction. This condition results in higher lateral demand on the remaining structural components.
- In addition to the reduced number of moment frame resisting lateral loads, demolition resulted in softening of the Structure as ramps were removed. As it was shown in the global analysis evaluation section of this report, P-Delta effects noticeably magnify flexural moments in the South building versus the North building.

Scenario 1: Full Occupancy (Ground Floor (GF), Level 2, and Level 3 Occupied)
South Building

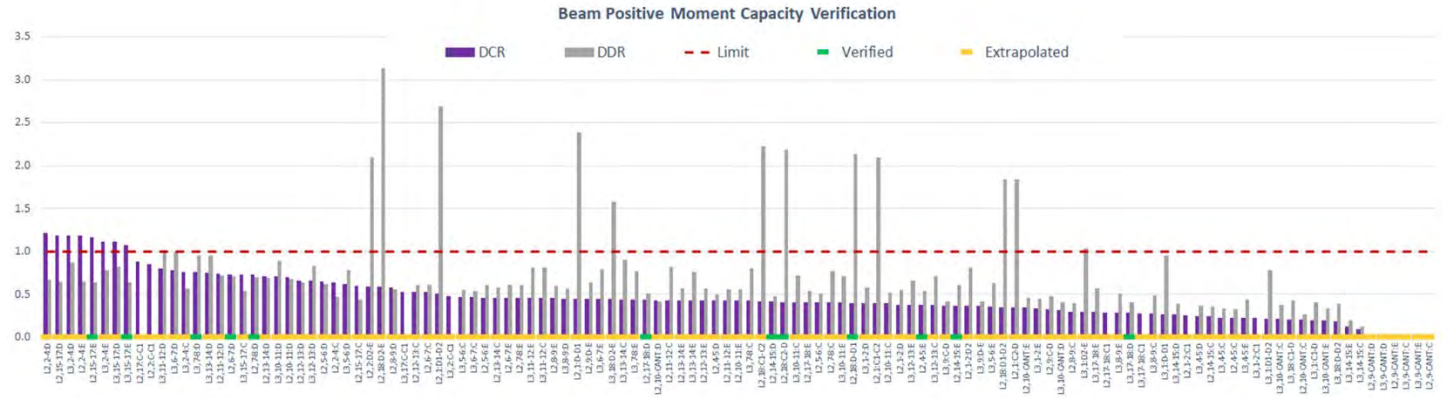


Figure 17 – Beam Positive Moment – South Building (Full Occupancy)

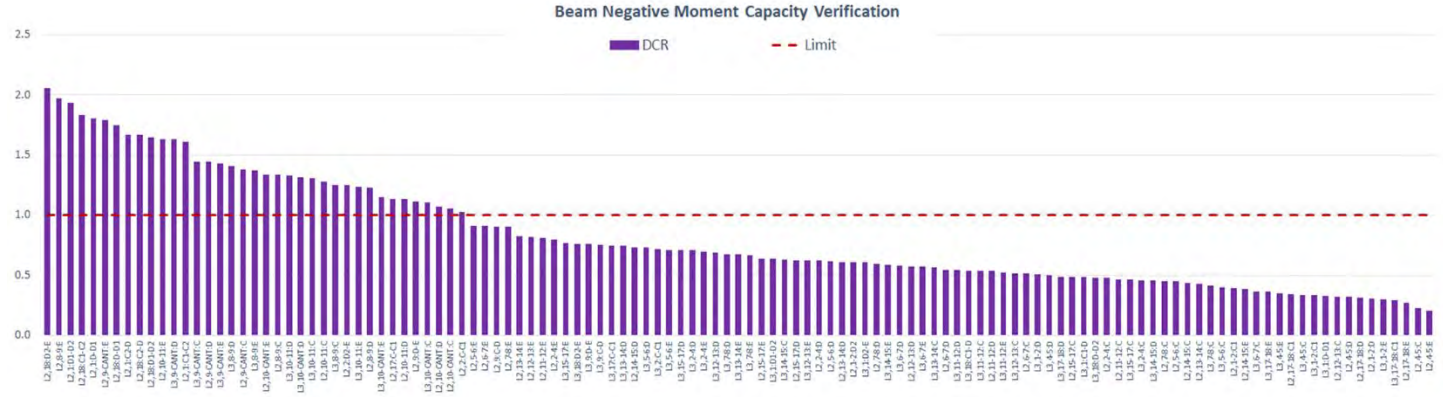


Figure 18 – Beam Negative Moment – South Building (Full Occupancy)

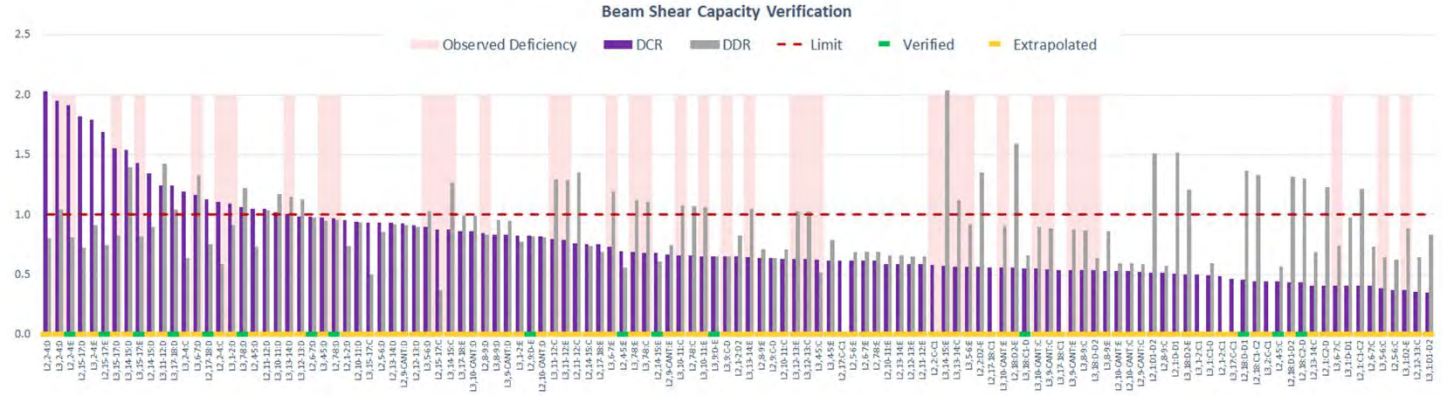


Figure 19 – Beam Shear – South Building (Full Occupancy)

Scenario 2: Partial Occupancy (Ground Floor (GF) and Level 2 Occupied)
South Building

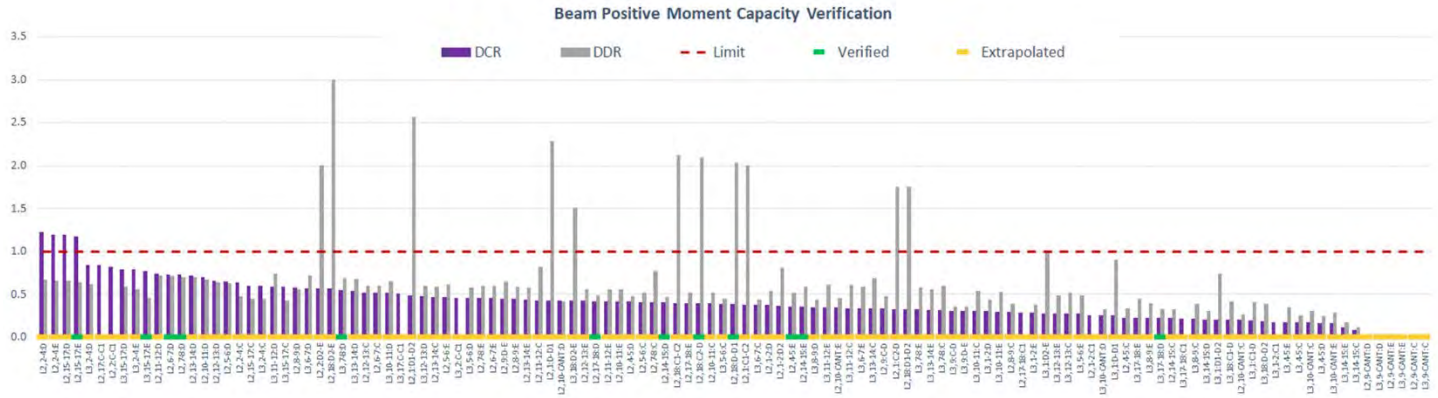


Figure 20 – Beam Positive Moment – South Building (GF & L2 Occupied)

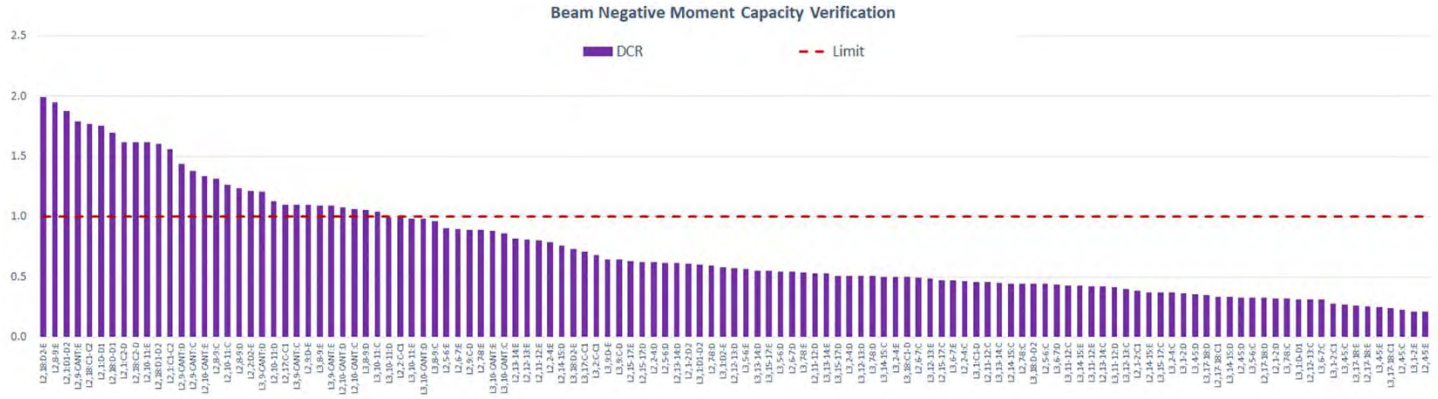


Figure 21 – Beam Negative Moment – South Building (GF & L2 Occupied)

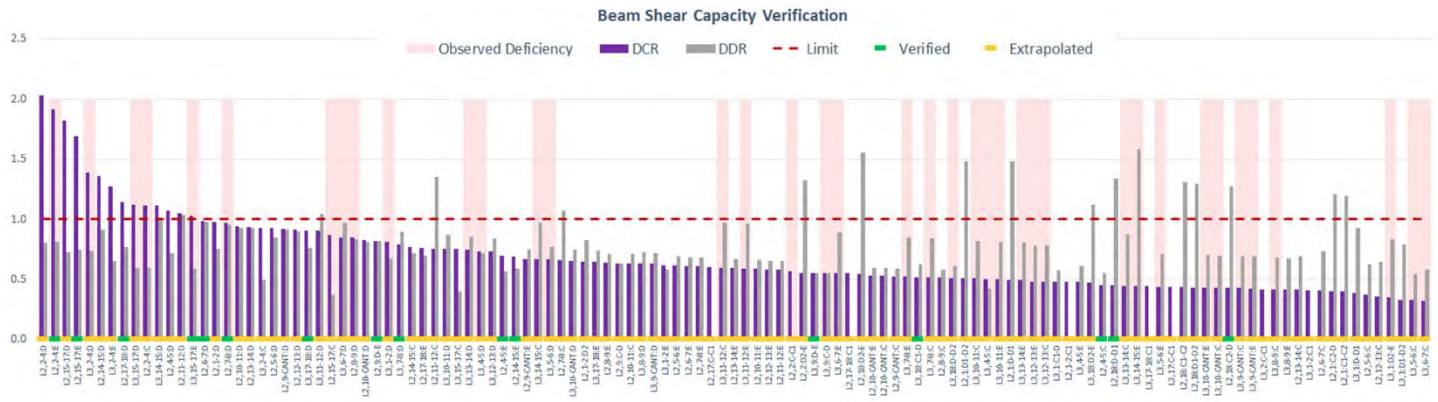


Figure 22 – Beam Shear – South Building (GF & L2 Occupied)

Scenario 3: Partial Occupancy (Ground Floor (GF) only Occupied)
South Building

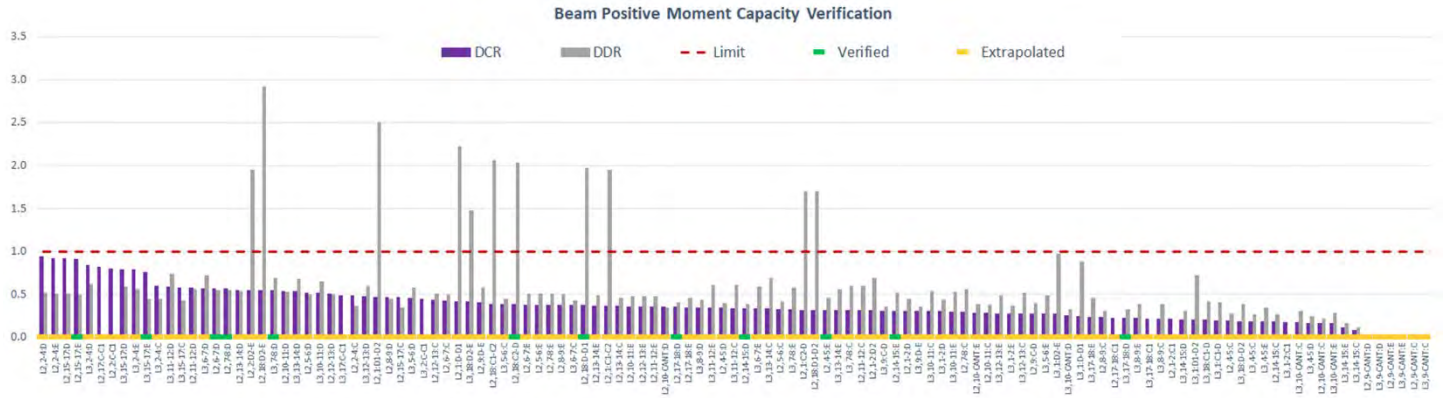


Figure 23 – Beam Positive Moment – South Building (GF only Occupied)

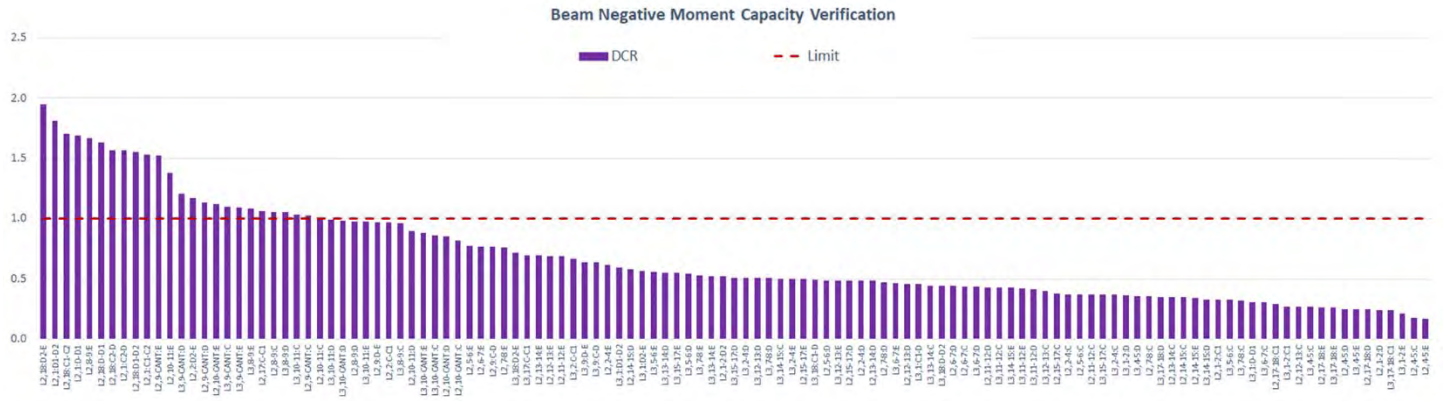


Figure 24 – Beam Negative Moment – South Building (GF only Occupied)

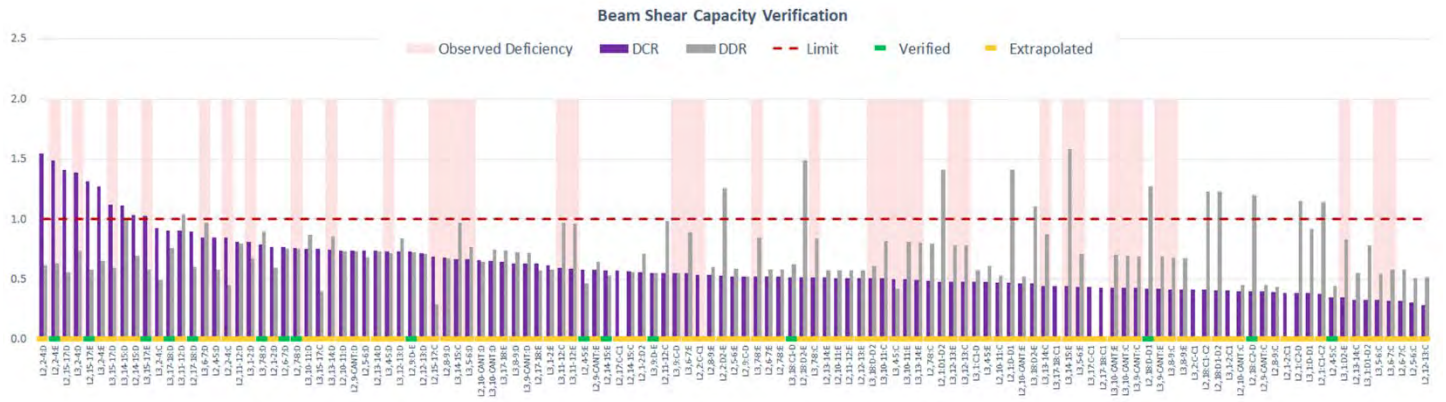


Figure 25 – Beam Shear – South Building (GF only Occupied)

Scenario 1: Full Occupancy (Ground Floor (GF), Level 2, and Level 3 Occupied)
North Building

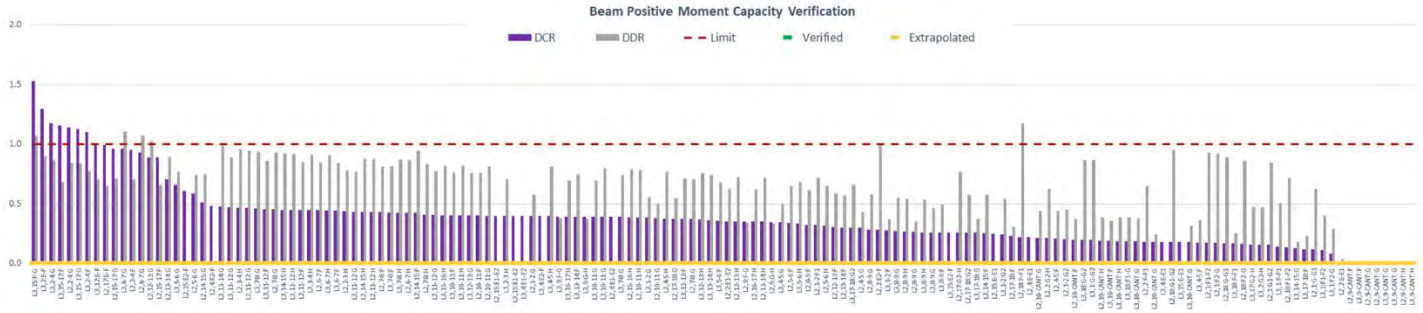


Figure 26 – Beam Positive Moment – North Building (Full Occupancy)

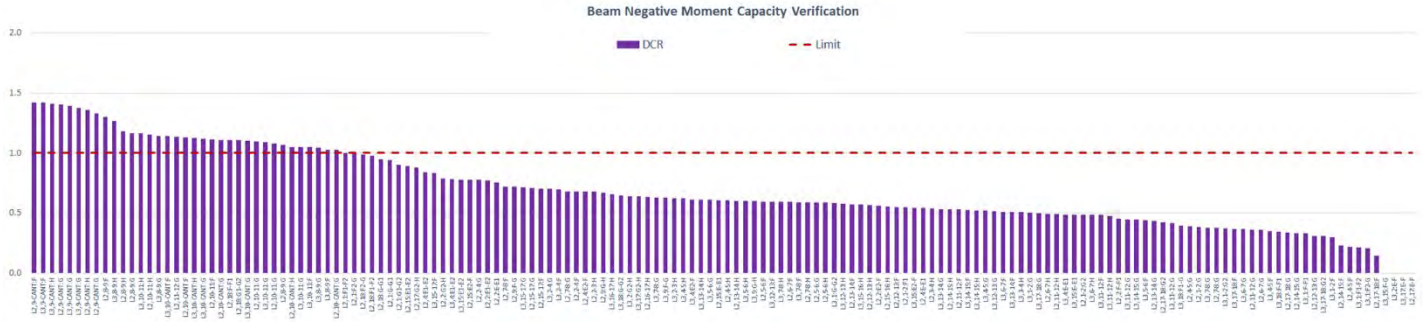


Figure 27 – Beam Negative Moment – North Building (Full Occupancy)

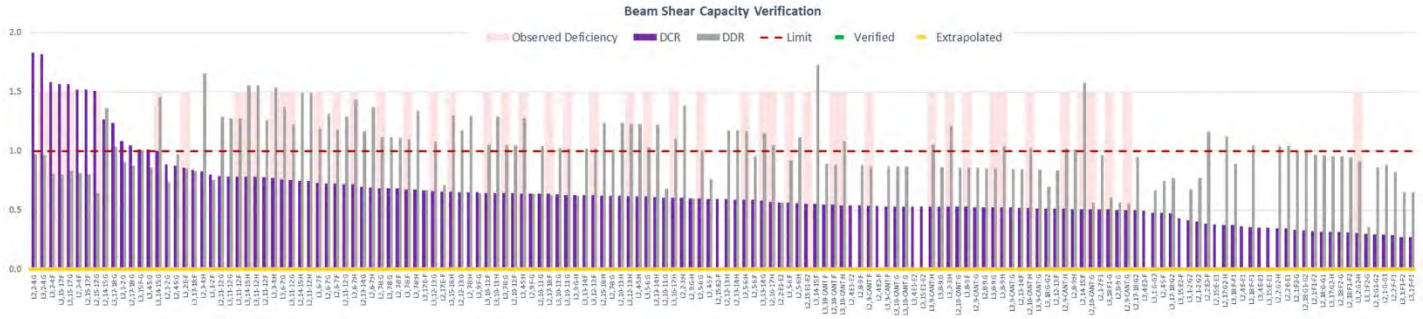


Figure 28 – Beam Shear – North Building (Full Occupancy)

Scenario 2: Partial Occupancy (Ground Floor (GF) and Level 2 Occupied)
North Building

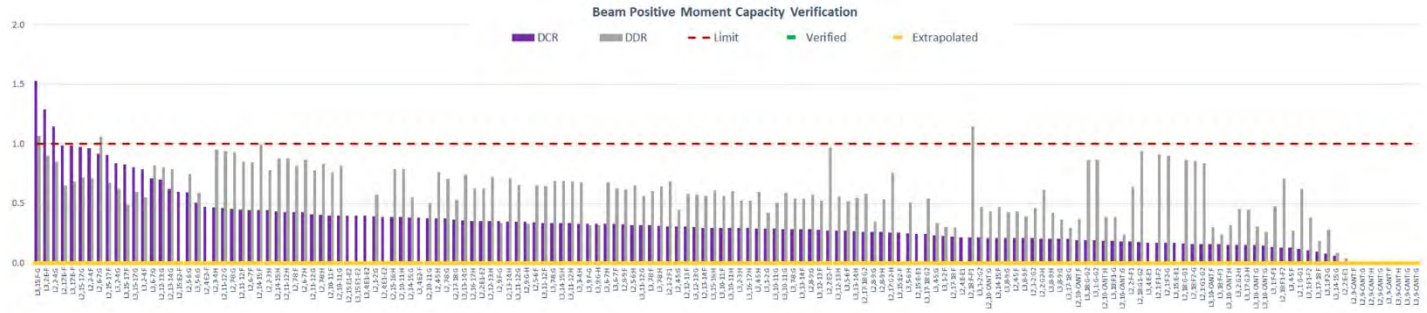


Figure 29 – Beam Positive Moment – North Building (GF & L2 Occupied)

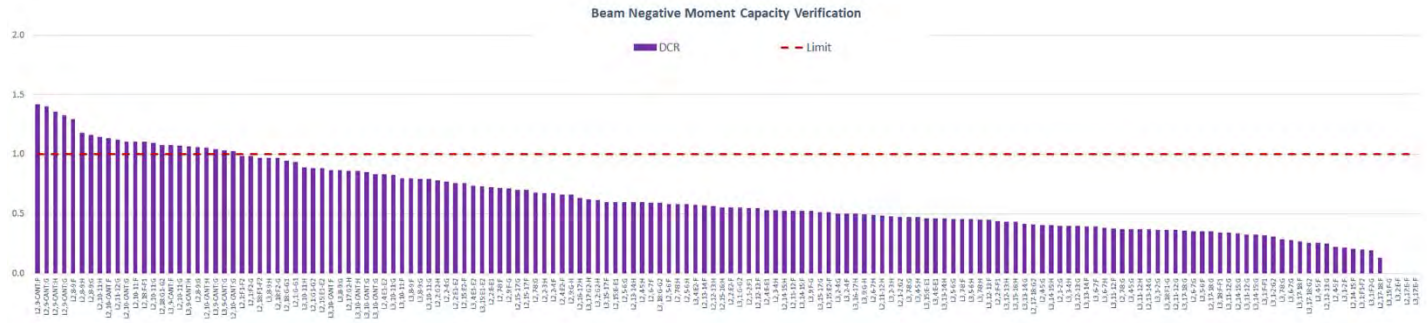


Figure 30 – Beam Negative Moment – North Building (GF & L2 Occupied)

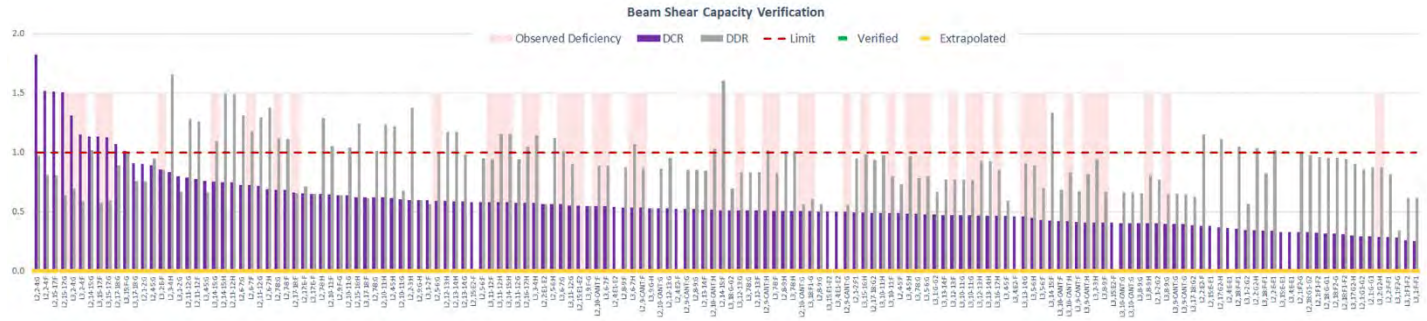


Figure 31 – Beam Shear – North Building (GF & L2 Occupied)

Scenario 3: Partial Occupancy (Ground Floor (GF) only Occupied)
North Building

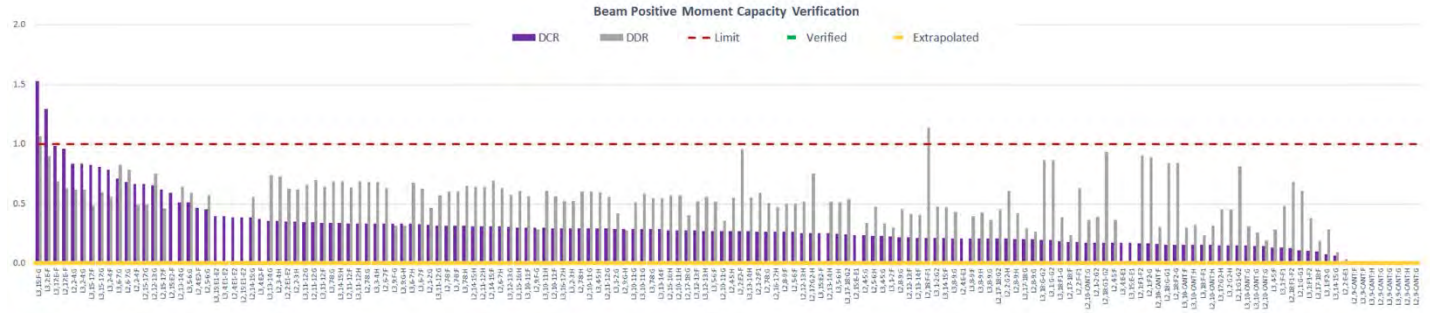


Figure 32 - Beam Positive Moment – North Building (GF only Occupied)

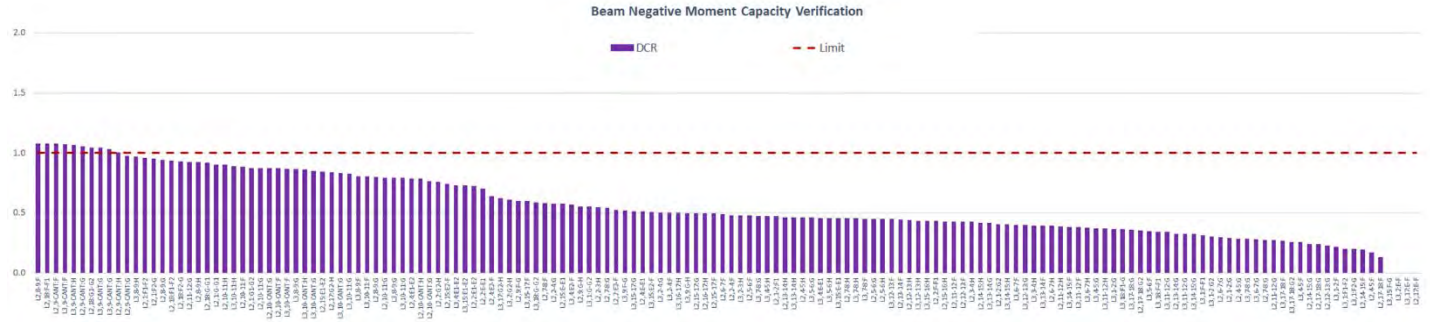


Figure 33 - Beam Negative Moment – North Building (GF only Occupied)

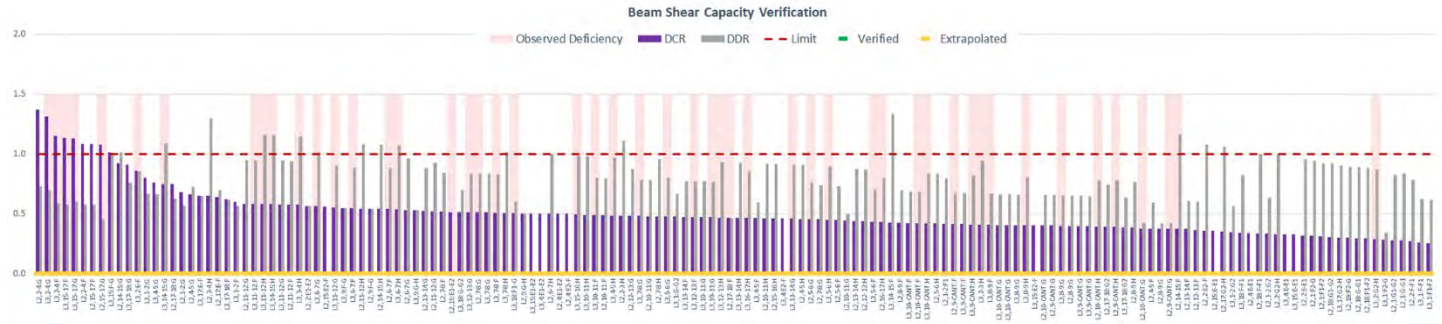


Figure 34 - Beam Shear – North Building (GF only Occupied)

2.4.2 Columns

Design verification for columns was performed for the following structural actions:

- Axial strength design verification
- Shear strength design verification
- Combined axial + flexural action design verification

The verification was conducted based on the comparison of the calculated demand versus capacity (Demand to Capacity Ratio – DCR).

Column axial, flexural and shear capacities were calculated based on the reinforcement information from the original drawings. Field scanning and measurement data (longitudinal and transverse reinforcements) were used to verify the information in the original drawing for the selected representative columns.

Summary of the column design verification is presented in Table 14 and Figures 35 to 50.

2.4.2.1 South Building

Observed overstressed conditions in the South building are related to shear (V) and combined axial + flexural demands (P-M-M):

- V: shear overstress condition was observed for all three scenarios and primarily attributed to gravity load combinations. It is important to note that there is a number of columns with DCR values between 0.5 and 1.0 that do not meet the detailing requirements/provisions of ACI 318-14. Where shear demand exceeds 50 percent of concrete section capacity, minimum shear reinforcement with spacing limitation of $s \leq d/2$ needs to be provided. Current tie spacing for the columns typically exceeds the code limit (existing tie spacing $s > d$ versus code required spacing $s \leq d/2$). Properly sized and spaced shear reinforcement restrains the growth of inclined cracking so that ductility of the member is improved and a warning of failure is provided. In an unreinforced member (or member with excessive tie spacing), the formation of the inclined cracking might lead directly to failure without warning. Such reinforcement is of great value if a member is subjected to an unexpected overload.
- P-M-M: Three columns indicated marginal overstress of 4 to 5 percent primarily attributed to high flexural demand from load combinations with wind. As it was previously discussed in this report, there are two conditions that potentially resulted in the increased lateral demand on lateral force-resisting system of the South building: demolition of two bays, including ramps that resulted in overall weakening of the system and increased P-Delta effects.

2.4.2.2 North Building

Observed overstressed conditions in the North building are related to shear demand (V):

- V: shear overstress condition was observed for all three scenarios and primarily attributed to gravity load combinations. Similar to the South building, there is a number of columns with DCR values between 0.5 and 1.0 that do not meet the detailing

requirements/provisions of ACI 318-14 (see the South building column verification comments).

Table 14 - Evaluation Summary for Columns

Building	Scenario	Structural Action	Reference Diagram	Demand/Capacity (DCR)	Status
South	1	Axial	3.4.2.1	DCR range: 0.03 - 0.46 DCR >1: 0% of columns	OK
		Shear	3.4.2.2	DCR range: 0.06 - 1.9 DCR >1: 15% of columns	NG
		P-Mx-My	3.4.2.3	DCR range: 0.1 - 1.05 DCR >1: 3% of columns	NG
	2	Axial	3.4.2.4	DCR range: 0.03 - 0.39 DCR >1: 0% of columns	OK
		Shear	3.4.2.5	DCR range: 0.07 - 1.6 DCR >1: 9% of columns	NG
		P-Mx-My	3.4.2.6	DCR range: 0.1 - 1.04 DCR >1: 3% of columns	NG
	3	Axial	3.4.2.7	DCR range: 0.03 - 0.37 DCR >1: 0% of columns	OK
		Shear	3.4.2.8	DCR range: 0.07 - 1.48 DCR >1: 9% of columns	NG
		P-Mx-My	3.4.2.9	DCR range: 0.1 - 1.04 DCR >1: 3% of columns	NG
North	1	Axial	3.4.2.10	DCR range: 0.03 - 0.43 DCR >1: 0% of columns	OK
		Shear	3.4.2.11	DCR range: 0.04 - 2.2 DCR >1: 7% of columns	NG
		P-Mx-My	3.4.2.12	DCR range: 0.1 - 0.95 DCR >1: 0% of columns	OK
	2	Axial	3.4.2.13	DCR range: 0.03 - 0.35 DCR >1: 0% of columns	OK
		Shear	3.4.2.14	DCR range: 0.04 - 1.6 DCR >1: 7% of columns	NG
		P-Mx-My	-	DCR range: 0.1 - 0.94 DCR >1: 0% of columns	OK
	3	Axial	3.4.2.15	DCR range: 0.03 - 0.32 DCR >1: 0% of columns	OK
		Shear	3.4.2.16	DCR range: 0.04 - 1.6 DCR >1: 7% of columns	NG
		P-Mx-My	-	DCR range: 0.1 - 0.94 DCR >1: 0% of columns	OK

Scenario 1: Full Occupancy (Ground Floor (GF), Level 2, and Level 3 Occupied)
South Building

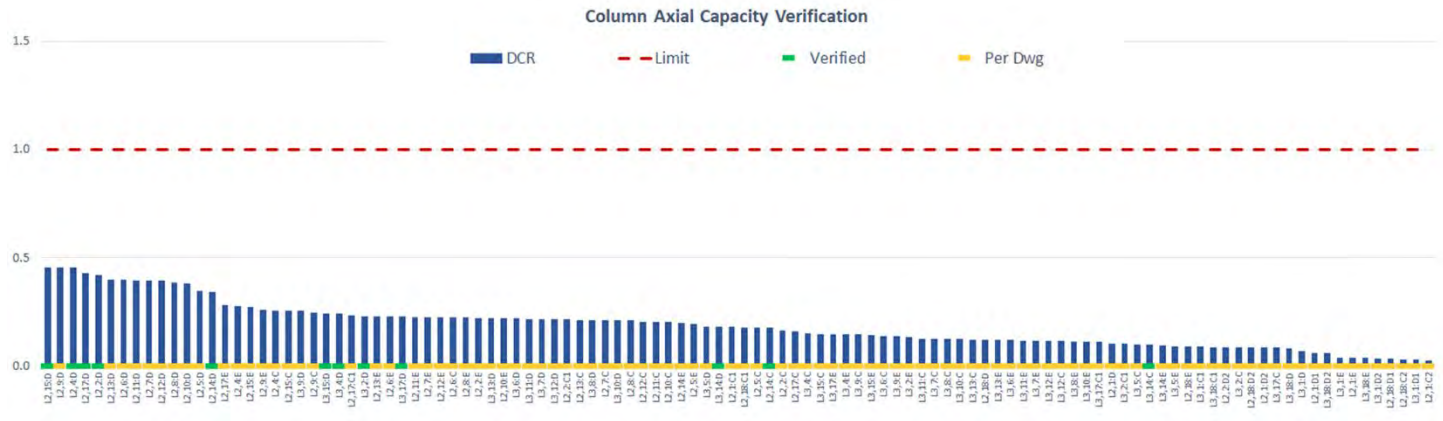


Figure 35 – Column Axial – South Building (Full Occupancy)

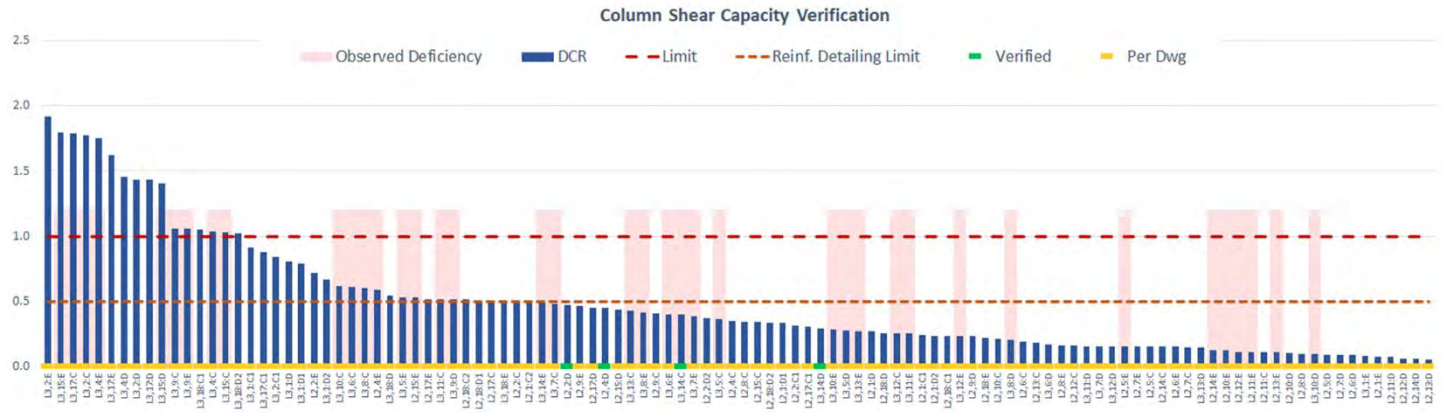


Figure 36 – Column Shear – South Building (Full Occupancy)

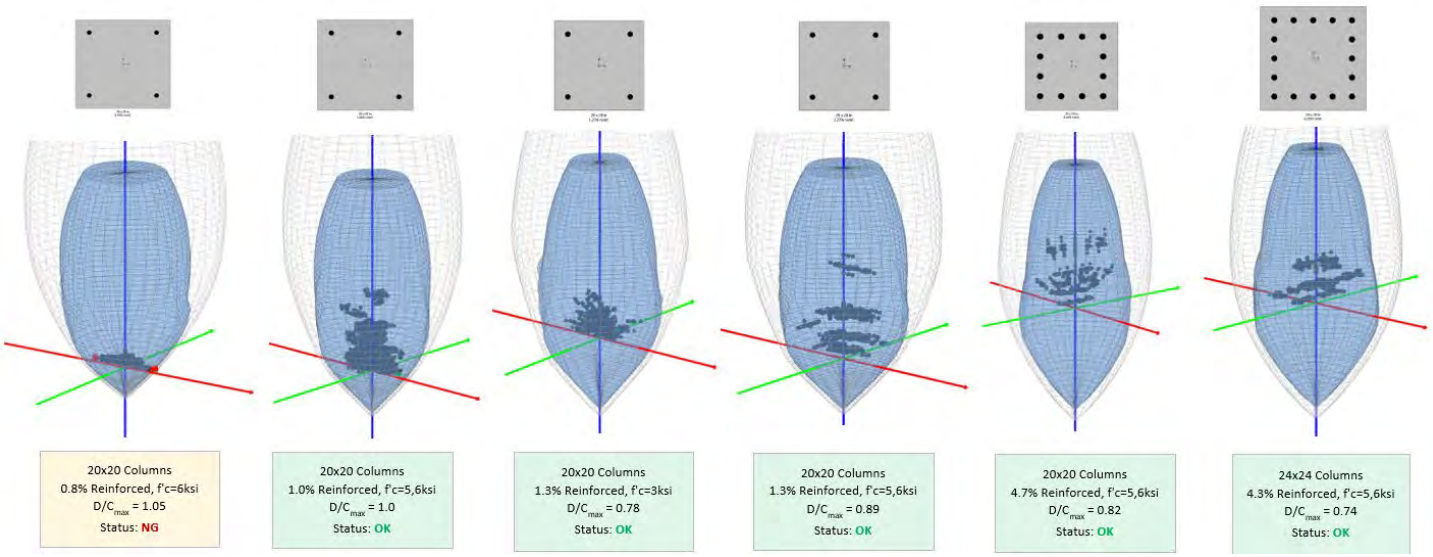


Figure 37 – Column Combined Axial + Flexure – South Building (Full Occupancy)

Scenario 2: Partial Occupancy (Ground Floor (GF) and Level 2 Occupied)
South Building

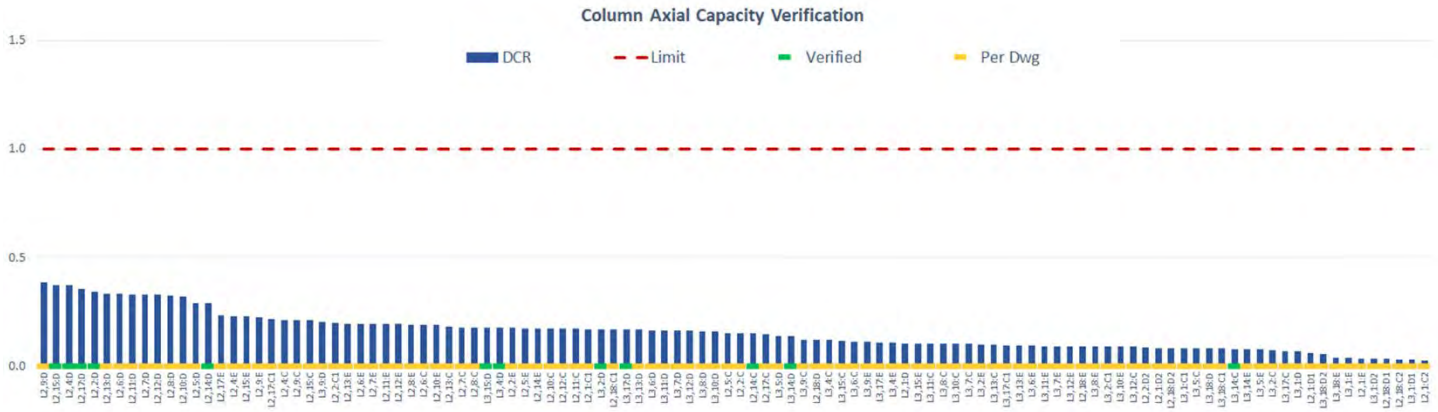


Figure 38 - Column Axial – South Building (GF & L2 Occupied)

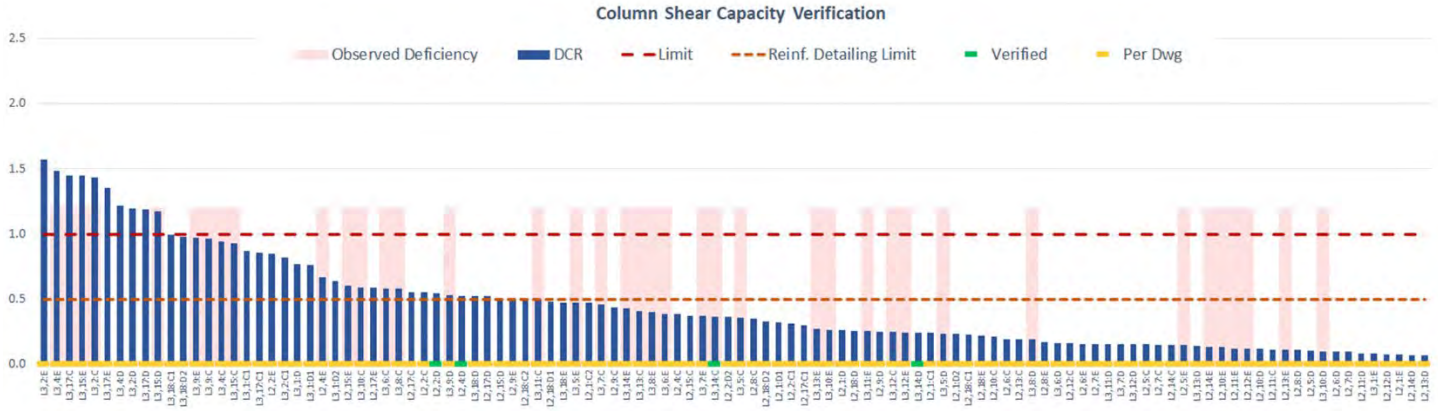


Figure 39 - Column Shear – South Building (GF & L2 Occupied)

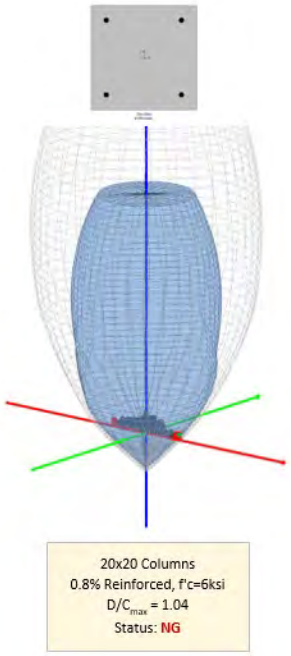


Figure 40 - Column Combined Axial + Flexure – South Garage (GF & L2 Occupied)

Scenario 3: Partial Occupancy (Ground Floor (GF) only Occupied)
South Building

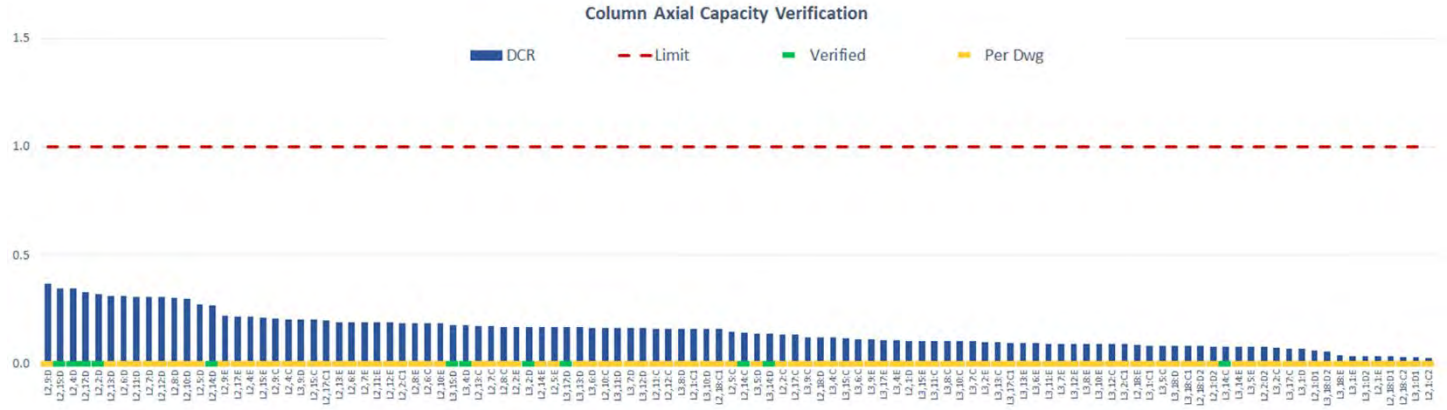


Figure 41 - Column Axial – South Building (GF only Occupied)

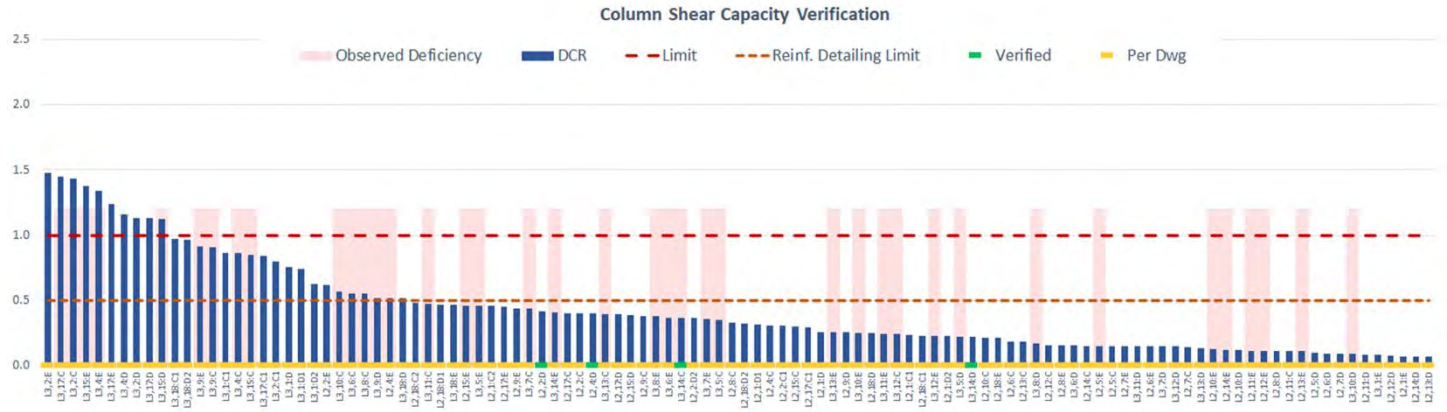


Figure 42 - Column Shear – South Building (GF only Occupied)

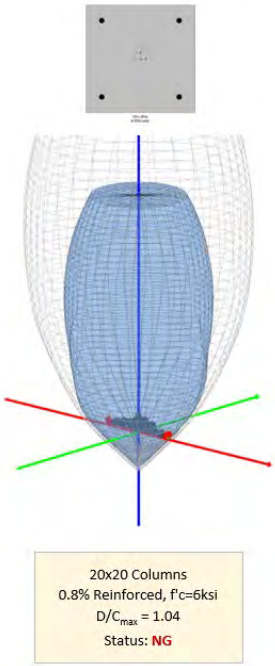


Figure 43 - Column Combined Axial + Flexure – South Garage (GF only Occupied)

Scenario 1: Full Occupancy (Ground Floor (GF), Level 2, and Level 3 Occupied)
North Building

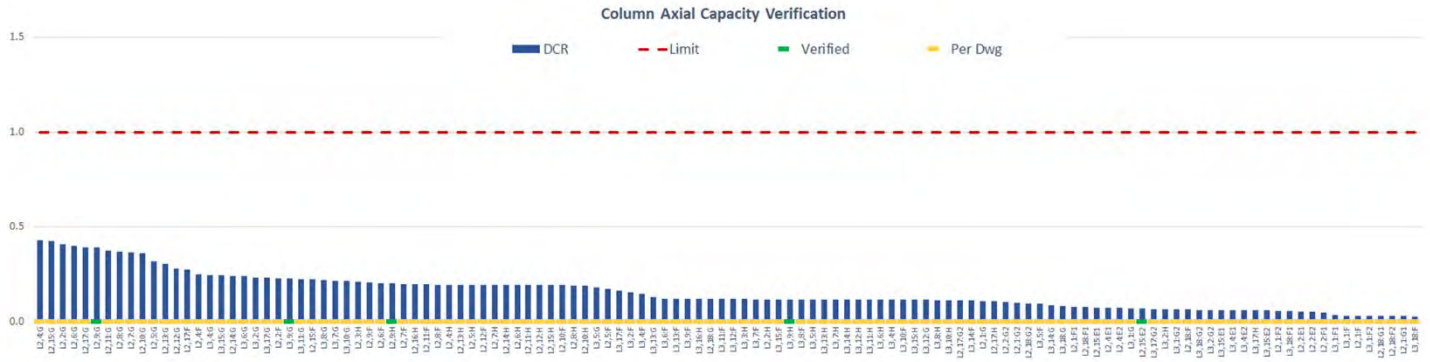


Figure 44 - Column Axial – North Building (Full Occupancy)

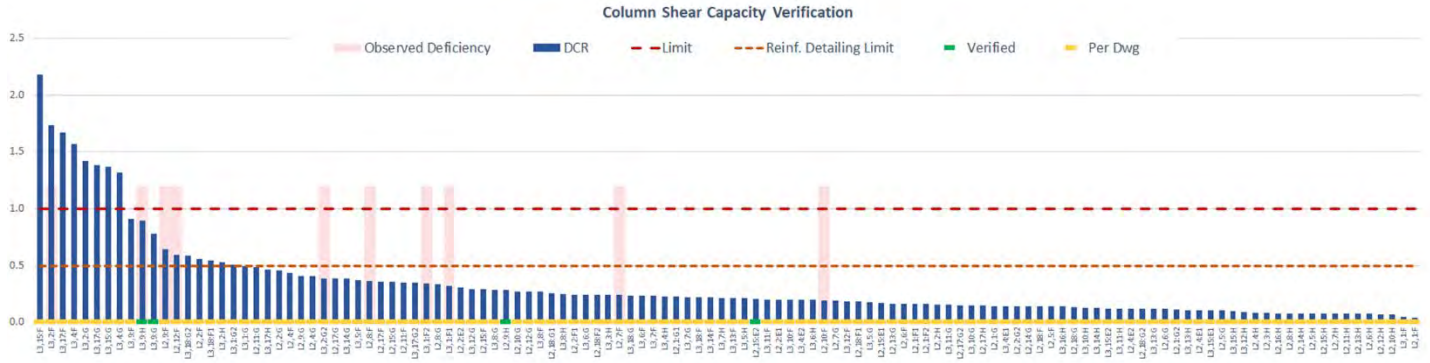


Figure 45 - Column Shear – North Building (Full Occupancy)

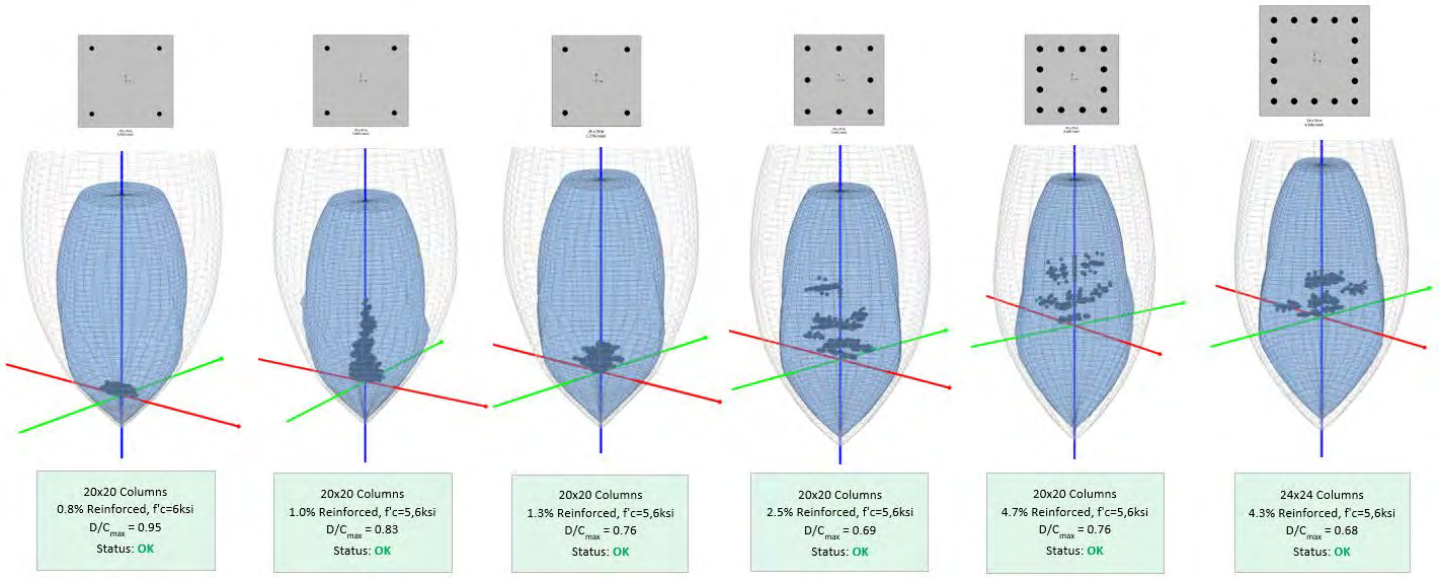


Figure 46 - Column Combined Axial + Flexure – North Garage (Full Occupancy)

Scenario 2: Partial Occupancy (Ground Floor (GF) and Level 2 Occupied)
North Building

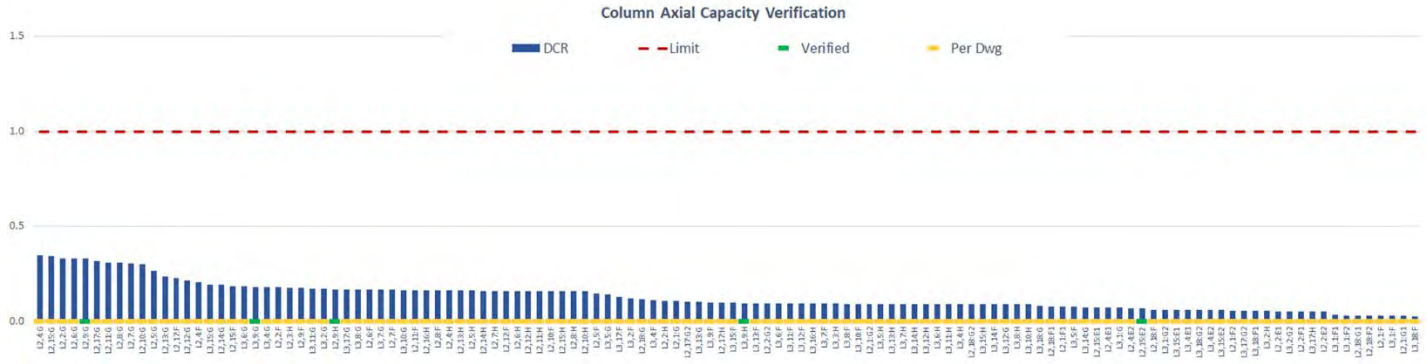


Figure 47 – Column Axial – North Building (GF & L2 Occupied)

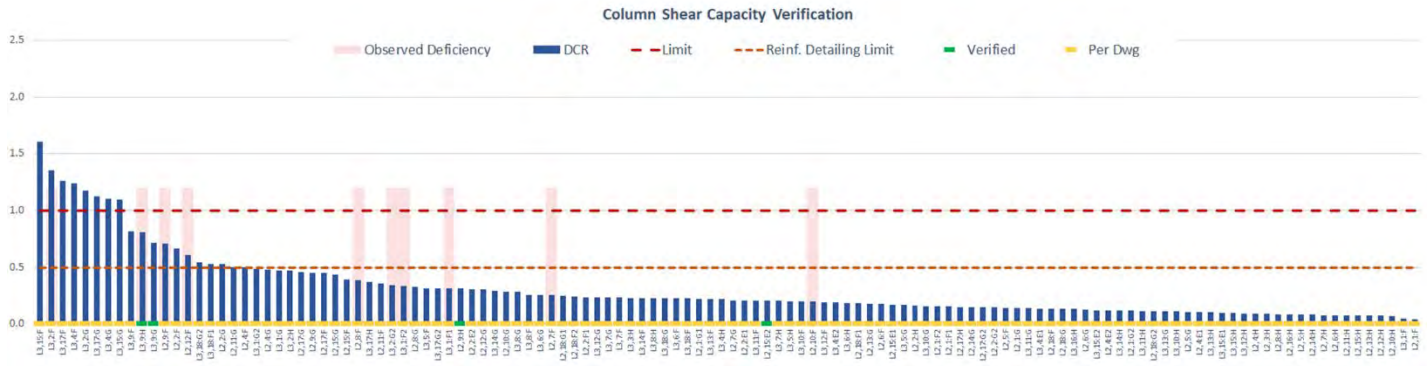


Figure 48 – Column Shear – North Building (GF & L2 Occupied)

Scenario 3: Partial Occupancy (Ground Floor (GF) only Occupied)
North Building

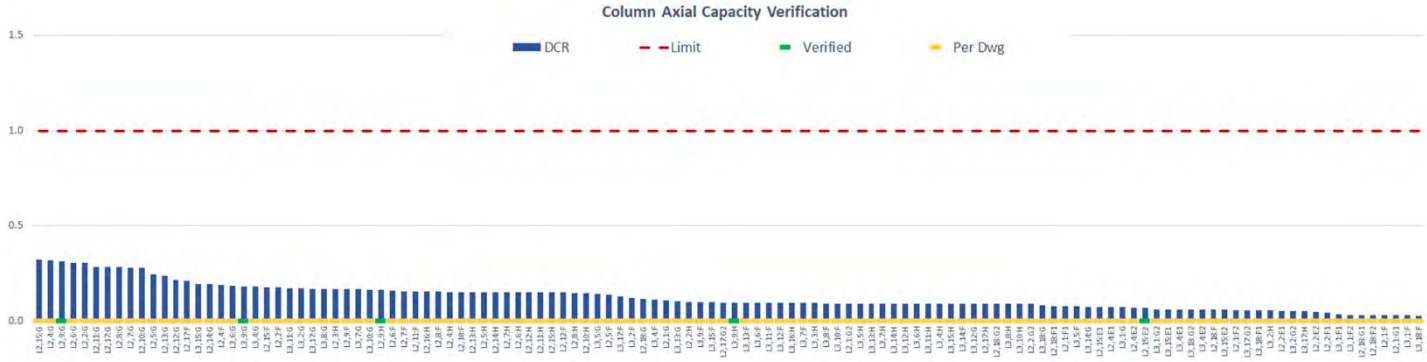


Figure 49 - Column Axial – North Building (GF only Occupied)

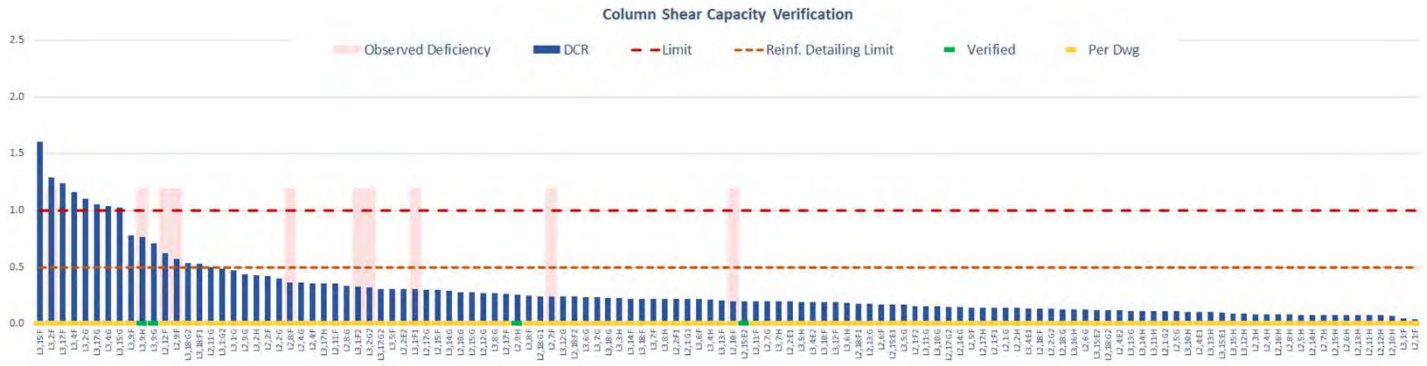
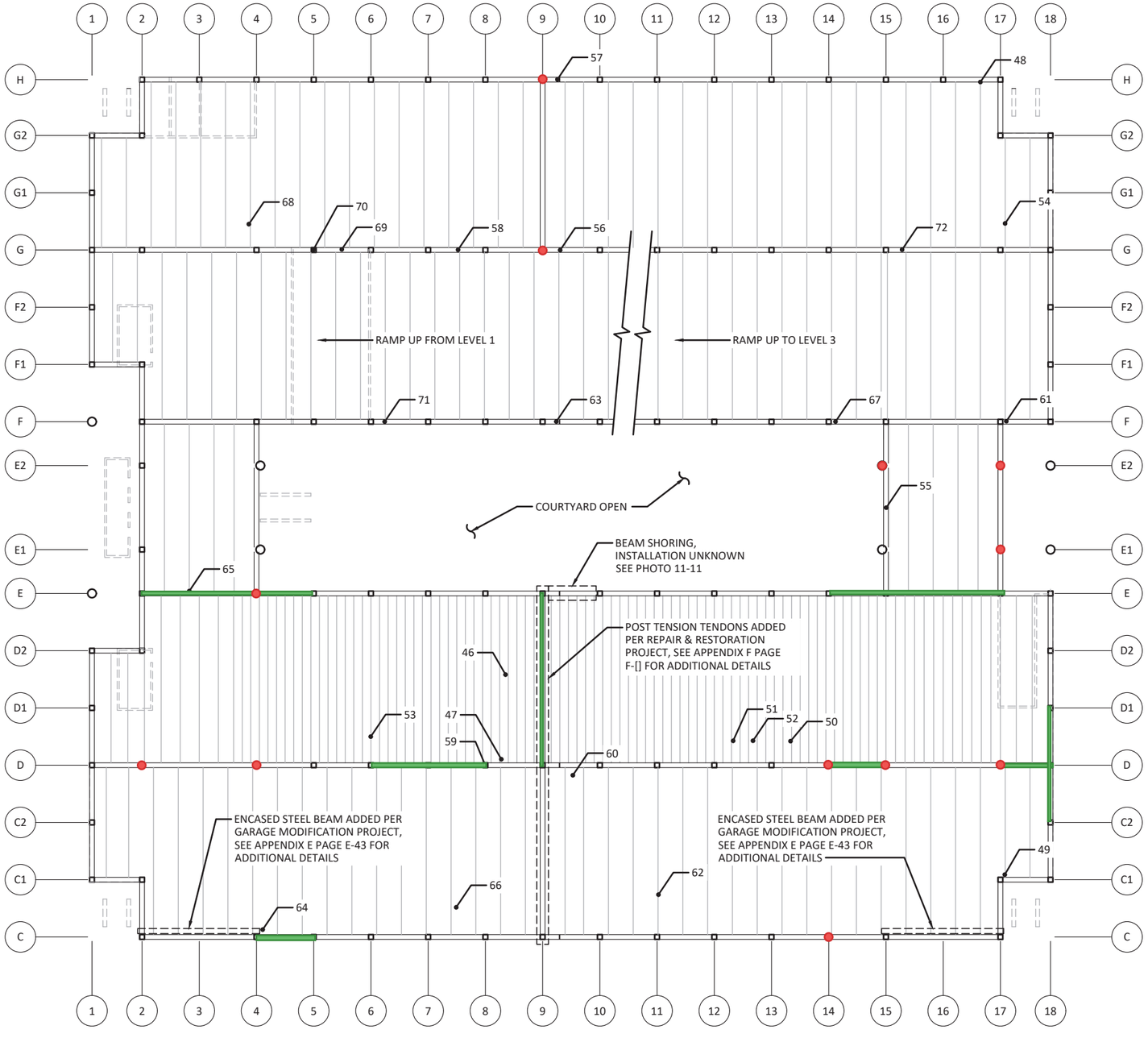


Figure 50 - Column Shear – North Building (GF only Occupied)

APPENDIX A

NON-DESTRUCTIVE TESTING LOCATION PLAN



ASSETS
C = Column
B = Beam
FJ = Floor Joist
GEN = General
CMU = CMU Wall
SWP = Steel Wall Panel
PCP = Precast Concrete Panel
TRUSS
DECK
SOFFIT
CURB
EXP JT = Expansion Joint

REPAIR PRIORITY
1-YR = REPAIR IN 1-YR
5-YR = REPAIR IN 5-YRS
MON = MONITOR

CONCRETE DEFECTS

Code	Description
ABR	Abrasion
BLD	Bleeding
CHD	Chemical Deterioration
CHL	Chloride Attack
HCR	Horizontal Crack
VCR	Vertical Crack
DCR	Diagonal crack
DEL	Delamination
DET	Deterioration
DIS	Discoloration
DST	Distortion
EFF	Efflorescence
ERO	Erosion
FTD	Freeze-thaw Damage
HNC	Honeycomb
LCH	Leaching
POP	Popouts
SCA	Scaling
OCS	Open corrosion spall
CCS	Closed corrosion spall
STR	Stratification
STP	Structural Performance
SUL	Sulphate Attack
UNF	Uniformity of concrete
UNS	Unsound Concrete

REBAR, TENDONS

Code	Description
ANC	Anchorage
COR	Corrosion
EXP	Exposure

STRUCTURAL STEEL

Code	Description
DEF	Deformations
COR	Corrosion
FRP	Fire Protection
CRA	Fracture Cracking
LTR	Laminar Tearing
LBU	Local Buckling
TIG	Tightness
WEL	Weld deficiency

DAMAGE RATING

NI	Not Inspected
ND	No Damage / No Defects
MN	Minor
MD	Moderate
MJ	Major
SV	Severe

DEFECT TABLE

DEFECT ID	ASSET	DEFECT TYPE	GRID-X	GRID-Y	RATING	COMMENT	Repair
46	FJ	DCR	8 to 9	D to E	MN	DCR at both ends of 5 Beams	MON
47	FJ	DCR	8.2	D.1	MN	Typical floor joist crack repair, epoxy injected	MON
48	FJ	DCR	16.6	H	MN	≤ 0.006"	MON
49	FJ	POP	17.1	C1.1	MN	soffit corner, 9" x 4" x 0.5", no exposed rebar	MON
50	FJ	POP	13.2	D1.5	MN	Several floor beams repaired, QTY. 3, up to 3" x 3" x 0.5"	MON
51	FJ	POP	12.5	D1.5	MN	QTY. 3: 13" x 2" x 1"; 8" x 2" x 1"; 8" x 1" x 1"	5-YR
52	FJ	POP	12.6	D1.5	MN	QTY. 1, 4" x 4" x 1"	5-YR
53	FJ	POP	6.1	D1.6	MN	9" x 3" x 0.5"	5-YR
54	FJ	POP	17.1	G1.5	MN	QTY. 3: 14" x 5" x 2"; 9" x 3" x 1"; 3" x 5" x 0.5"	5-YR
55	B	DCR	15	E1 to	MN	Typical beam crack repair, epoxy injected	MON
56	B	DCR	9.25	G	MD	DCR at channel steel	1-YR
57	B	HCR	9.25	H	SV	HCR ≤ 0.5", no rust staining, located at end of cantilever beam	1-YR
58	B	POP	7.5	G	MN	POP 6" x 2" x 0.25" at ramp beam	MON
59	B	VCR	8	D	MN	Crack in negative moment region	MON
60	SOFFIT	DCR	9.5	C2.9	MD	DCR ≤ 0.016" x 8' long, Efflorescence present 3' long	5-YR
61	B	DCR	17	F	MN	Previously repaired, no new damage	MON
62	SOFFIT	DCR	11	C2.9	MN	DCR (2) ≤ 0.016"x 6' and 5' long	MON
63	B	DCR	9.2	F	MN	DCR at expansion joint bearing, previously repaired (epoxy injected), no new damage observed	MON
64	SOFFIT	HCR	4 to 5	C.1	MD	HCR (2) ≤ 0.016" x 20' long, previously repaired	MON
65	B	POP	2.8	E	MD	Top of beam, up to 8" x 24" x 3", no exposed rebar	MON
66	SOFFIT	HCR	7 to 8	C1.5	MN	HCR ≤ 0.016"	MON
67	B	REP	14.1	F	N/A	Previous repair, 3-sided steel plate assembly added to reinforce beam at floor joist bearing	MON
68	SOFFIT	POP	4	G1.5	MD	POP in three areas; 9" x 6" x 0.75", 5" x 5" x 0.75"	MON
69	B	REP	5.5	G	N/A	Previous repair, 3-sided steel plate assembly added to reinforce beam at floor joist bearing. Efflorescence observed coming out of repaired section.	MON
70	SOFFIT	VOID	5	G	MD	Void 3" x 3" x 1.5" deep	MON
71	B	VCR	6.2	F	MN	Tangent soffit crack and VCR on face.	5-YR
72	B	VCR/DCR	15.1	G	MN	VCR/DCR from soffit to slab. Regularly spaced VCR through the midspan region (several cracks) previously repaired, no new damage observed	MON

● Column NDT location
▬ Beam NDT location

3/64" = 1'-0"

20 0 20 40
scale feet

MARK	REVISION DESCRIPTION	BY	APP.	DATE

WSP USA Inc.
7650 Corporate Center Drive
Suite 300
Miami, FL 33126
TEL: (305) 261-4785
wsp.com

DRAWN BY WC
DESIGN BY
CHECK BY RW
PROJ MGR RWB

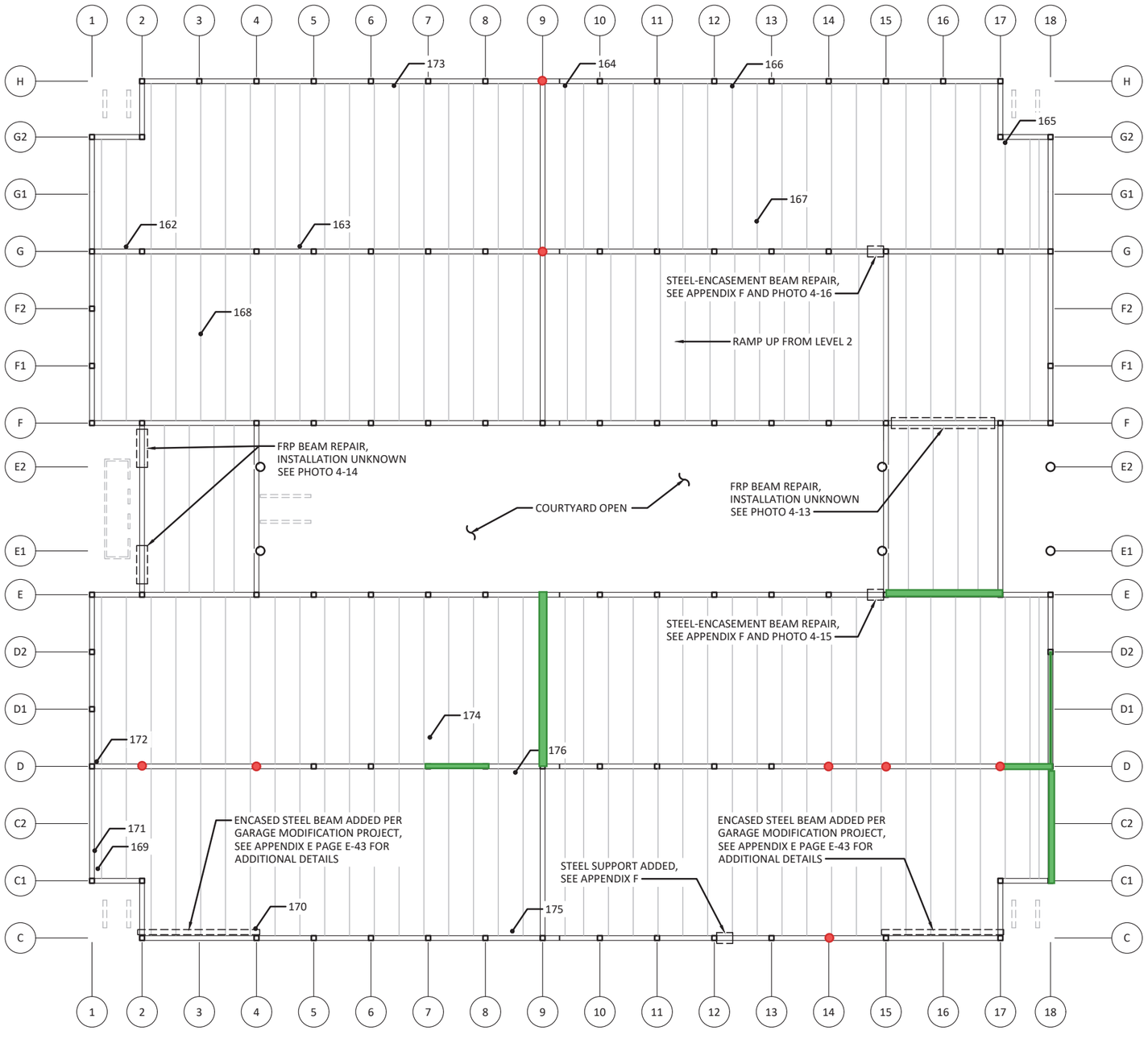
MIAMI-DADE COUNTY
MARTIN LUTHER KING JR. METRORAIL STATION PARKING GARAGE ASSESSMENT

FRAMING PLAN - LEVEL 2

NDT INSPECTION PLAN

DRAWING NO. G-4
PROJECT NO. 188724-23
DATE: 5/29/20
SHEET NO. 4 OF 9

Last Saved by: USRB675347 on: May 22, 2020 3:27 PM File: D:\Projects\188724.23 MLK Parking Structure CA\7.0 CADD\Dwgs\01_G04.dwg



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NI	Not Inspected
ND	No Damage / No Defects
MN	Minor
MD	Moderate
MJ	Major
SV	Severe

DEFECT TABLE

DEFECT ID	ASSET	DEFECT TYPE	GRID-X	GRID-Y	RATING	COMMENT	REPAIR
162	FJ	DCR	1.9	G	MN	Up to hairline width	MON
163	FJ	DCR/HCR	4.8	G	MD	Crack at bottom corner, hanging portion below bearing	MON
164	FJ	EXP	9.3	H	MD	Exposed bars at end of floor joist	1-YR
165	FJ	OCS	17 to 18	G2	MD	3 exposed strands at ends of floor joists	1-YR
166	FJ	OCS	12.5	H	MD	6" x 4" x 0.5" with exposed strands	1-YR
167	FJ	POP	12.9	G1.5	MN	9" x 5" x 0.5"	1-YR
168	FJ	POP	3.3	F1.5	MN	Previous repair has fallen away	1-YR
169	SOFFIT	HCR/LCH	1	C1.3	MD	HCR/LCH ≤ 0.060" x 4' long	MON
170	SOFFIT	HCR/LCH	4	C.9	MD	HCR/LCH ≤ 0.060" x 3' long	MON
171	SOFFIT	ORG	1	C1.5	MN	Plant growth u/side of deck at edge	1-YR
172	SOFFIT	ORG	1	D	MN	Plant growth u/side of deck at edge	1-YR
173	SOFFIT	ORG	6.5	H	MD	Plant growth at edge of slab and edge beam	1-YR
174	SOFFIT	POP	7	D1.5	MD	POP (2) 6" x 6" x 0.75"	MON
175	SOFFIT	N/A	1 to 18	C	N/A	Previously repaired joints	MON
176	SOFFIT	N/A	1 to 18	D	N/A	Previously repaired joints	MON

Column NDT location
Beam NDT location

3/64" = 1'-0" scale 20 0 20 40 feet

MARK	REVISION DESCRIPTION	BY	APP.	DATE

WSP USA Inc.
7650 Corporate Center Drive
Suite 300
Miami, FL 33126
TEL: (305) 261-4785
wsp.com

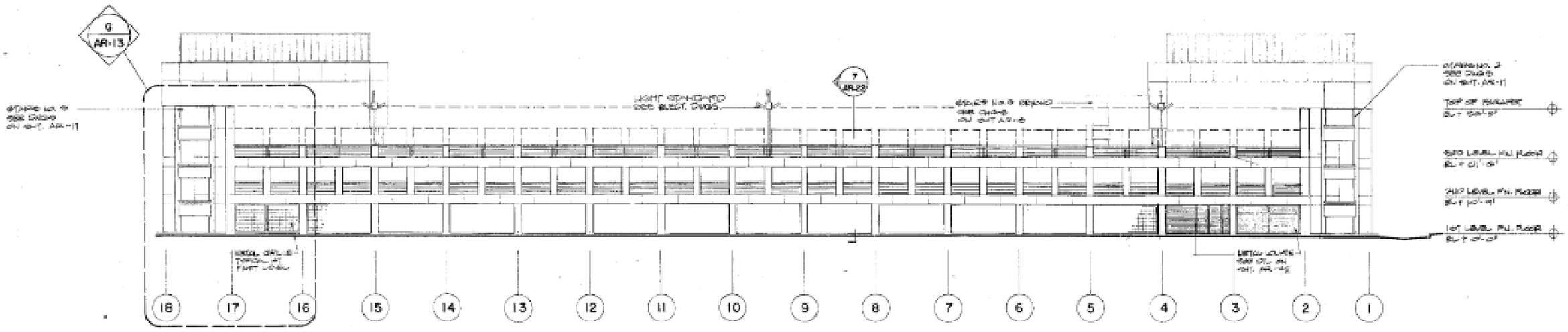
DRAWN BY WC
DESIGN BY
CHECK BY RW
PROJ MGR RWB

MIAMI-DADE COUNTY
MARTIN LUTHER KING JR. METRORAIL STATION PARKING GARAGE ASSESSMENT
FRAMING PLAN - LEVEL 3
NDT INSPECTION PLAN

DRAWING NO. G-7
PROJECT NO. 188724-23
DATE: 5/29/20
SHEET NO. 7 OF 9

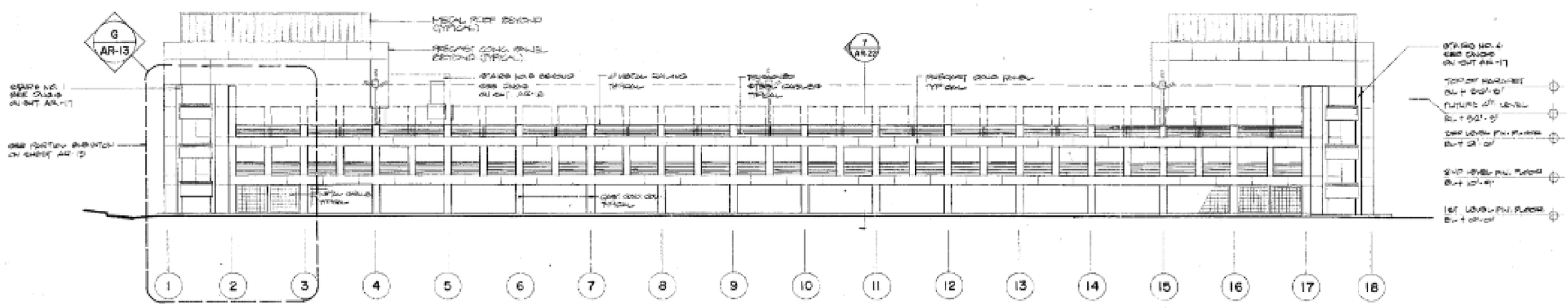
APPENDIX B

RECORD DRAWING FIGURES



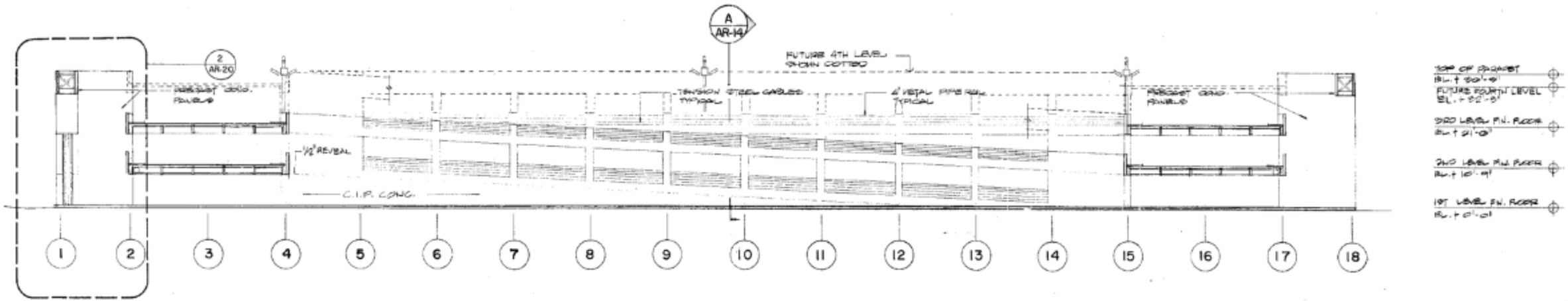
NORTH ELEVATION

1/16" = 1'-0"



SOUTH ELEVATION

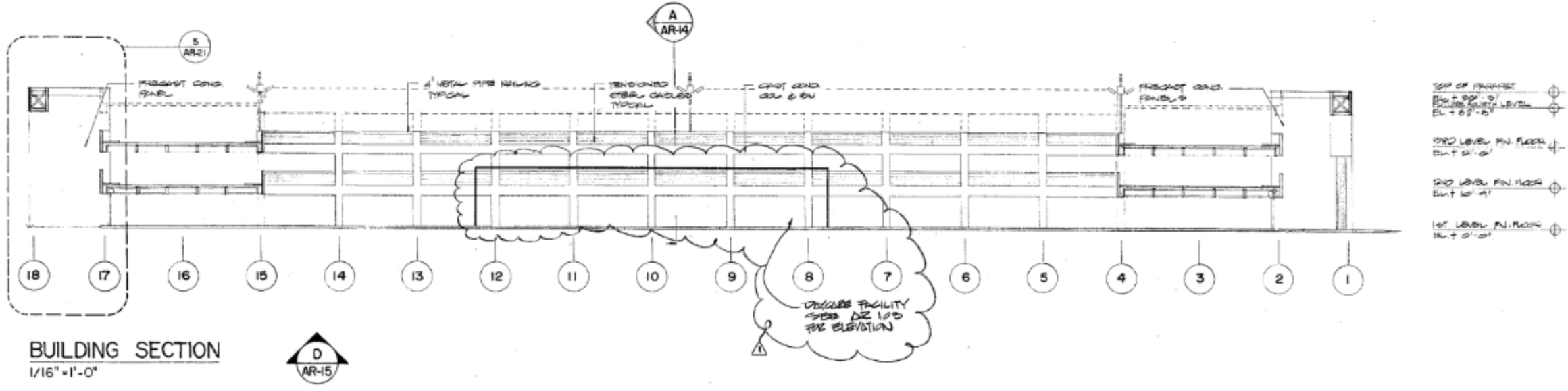
1/16" = 1'-0"



BUILDING SECTION

1/16" = 1'-0"

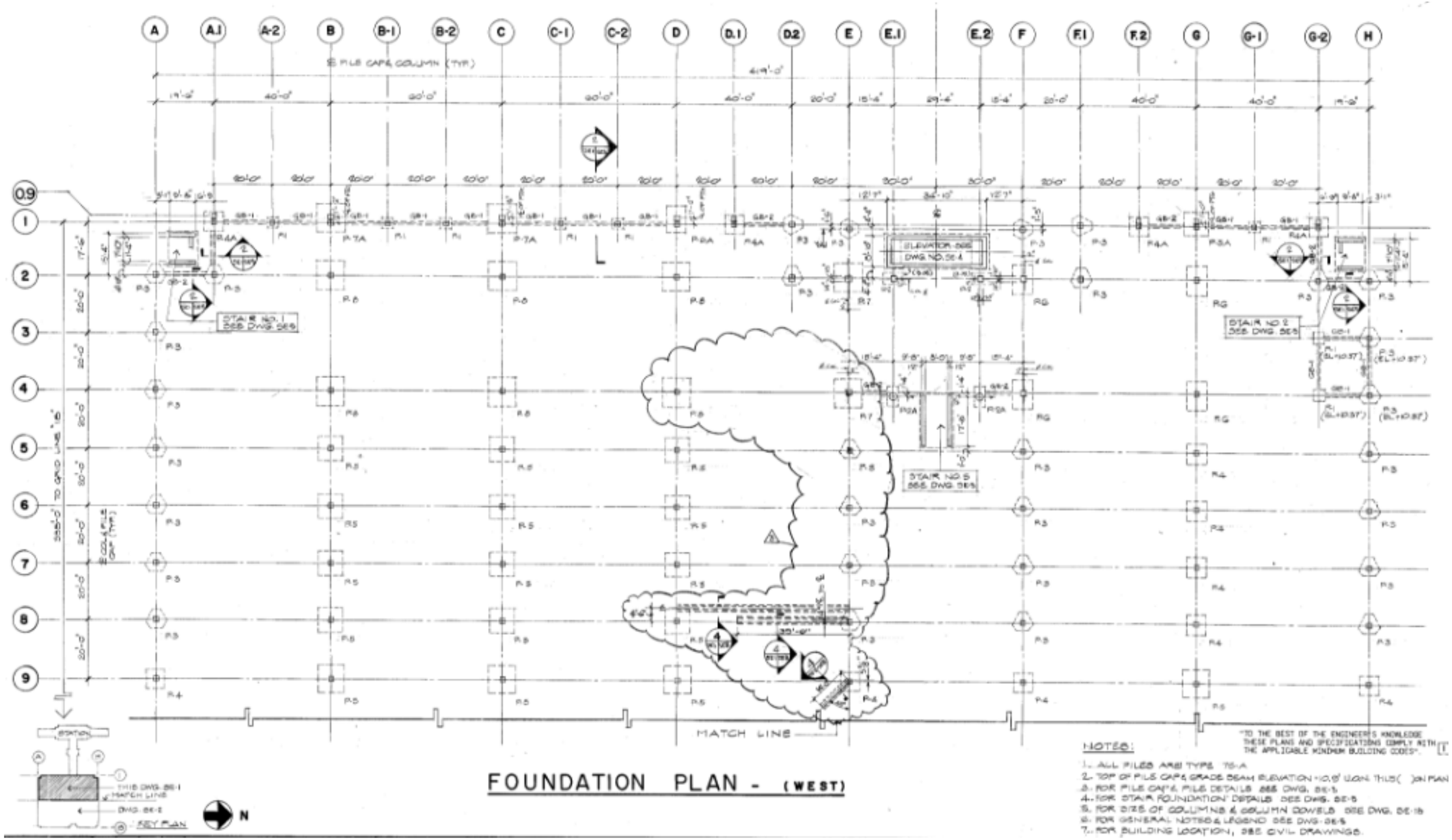
C
AR-15



BUILDING SECTION

1/16" = 1'-0"

D
AR-15

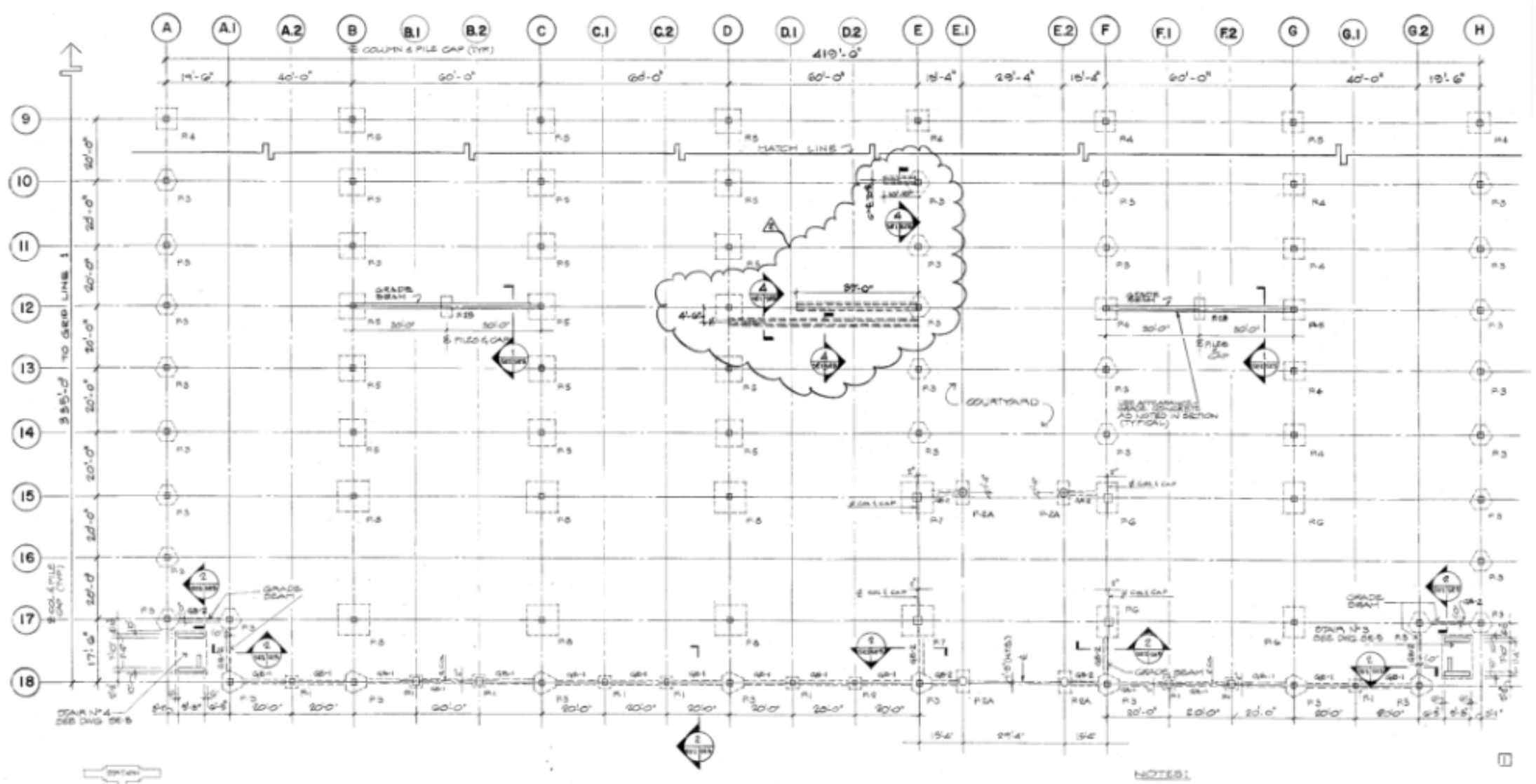


FOUNDATION PLAN - (WEST)

NOTES:

1. ALL PILES ARE TYPE TS-A
2. TOP OF PILE CAPS, GRADE BEAM ELEVATION +10.0' U.O.N. THUS ( )ON PLAN
3. FOR PILE CAPS, PILE DETAILS SEE DWG. SE-5
4. FOR STAIR FOUNDATION DETAILS SEE DWG. SE-5
5. FOR SIZE OF COLUMNS & COLUMN DOWELS SEE DWG. SE-15
6. FOR GENERAL NOTES & LEGEND SEE DWG. SE-5
7. FOR BUILDING LOCATION, SEE CIVIL DRAWINGS.

"TO THE BEST OF THE ENGINEER'S KNOWLEDGE THESE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES".



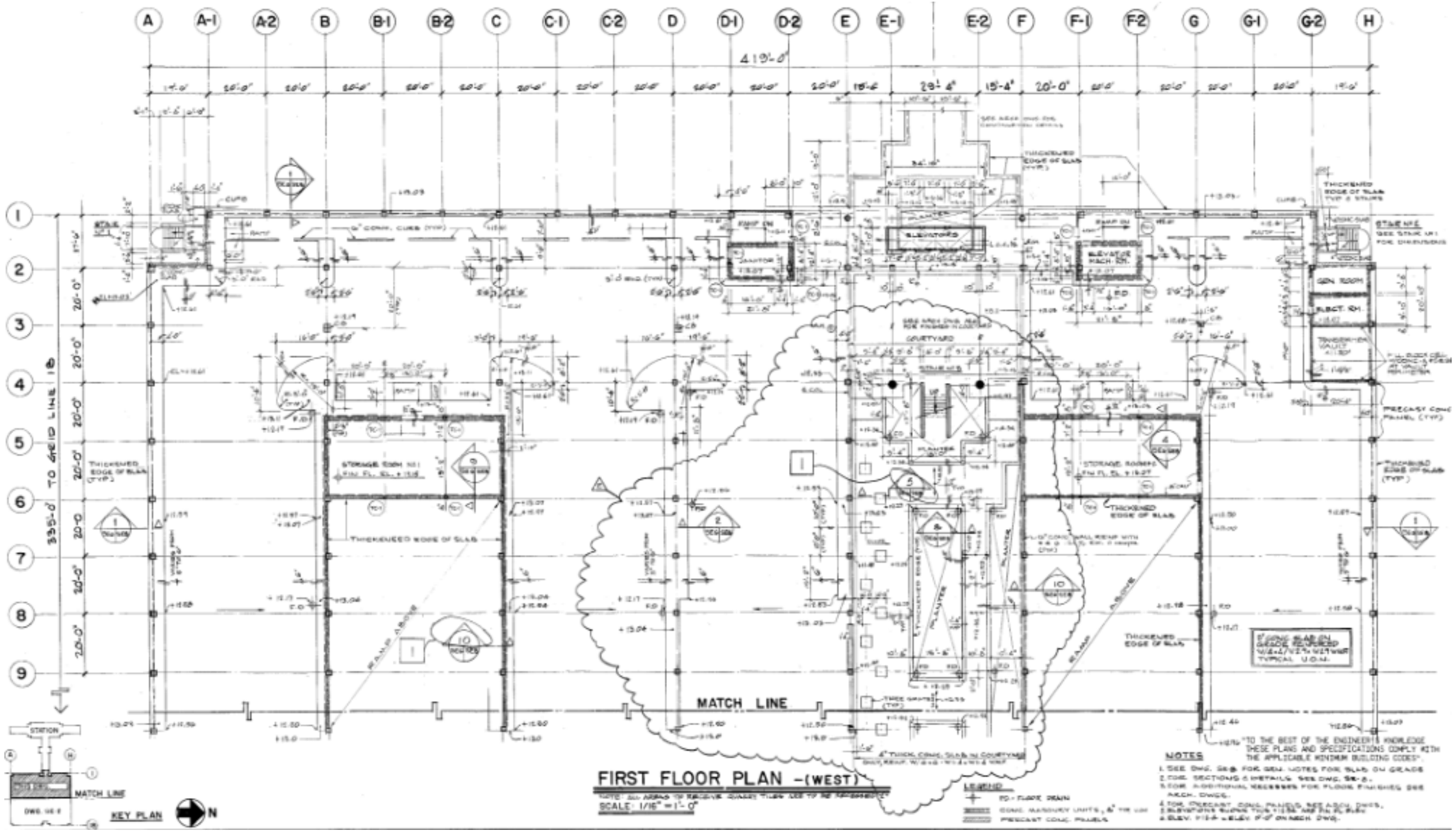
FOUNDATION PLAN - (EAST)

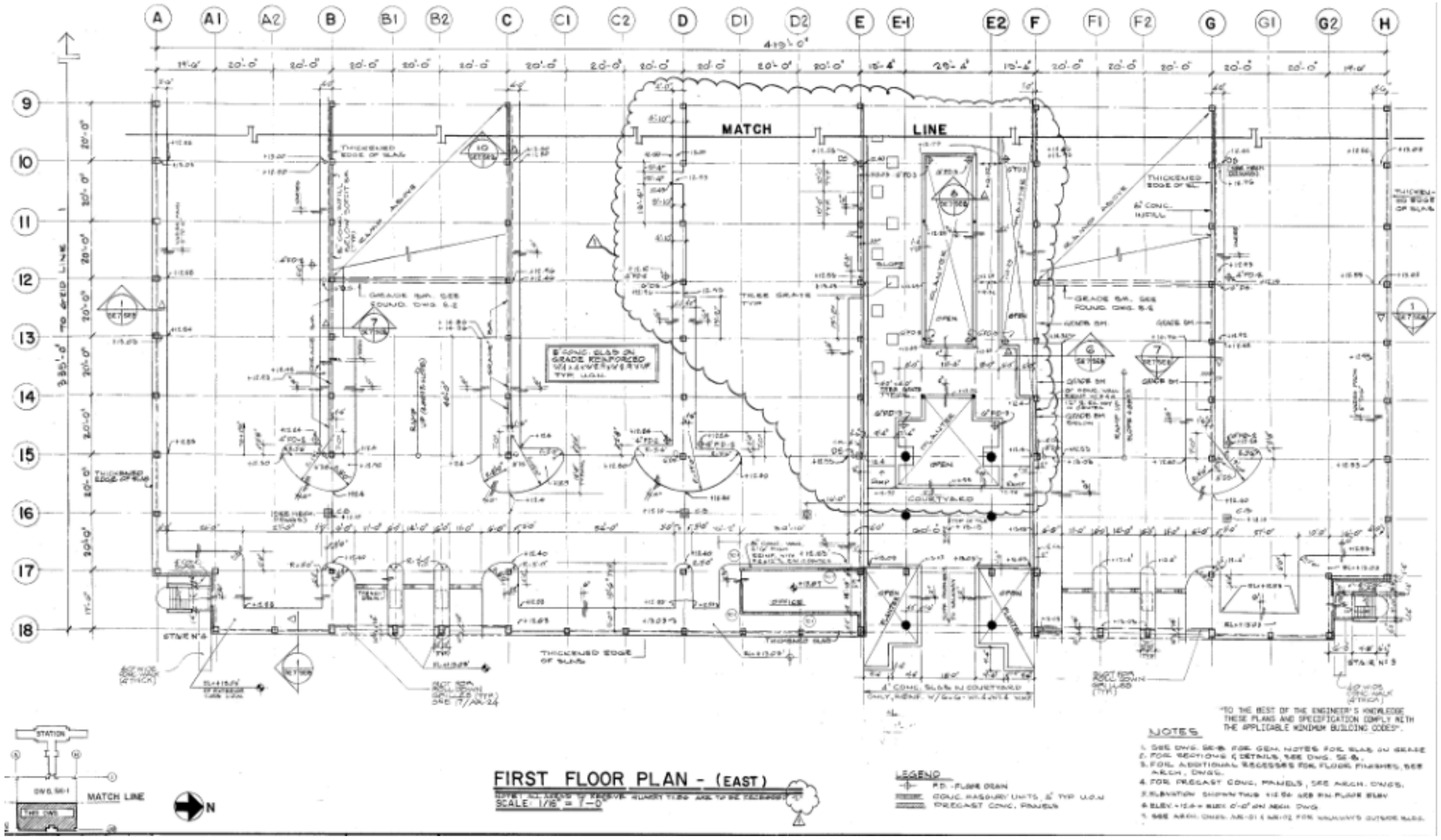
SCALE: 1/16" = 1'-0"

NOTES:

1. ALL PILES ARE TYPE TS-A.
2. TOP OF PILECAPS & GRADE BEAM ELEV. = 10'0" U.O.N. THUS ( ) ON PLAN
3. FOR PILE CAP & PILE DETAILS SEE DWG. S6-5
4. FOR STAIR FOUNDATION DETAILS SEE DWG. S6-5
5. FOR SIZE OF COLUMNS & COLUMN DOWELS SEE DWG S6-16
6. FOR GENERAL NOTES & LEGEND SEE DWG. S6-5
7. FOR BUILDING LOCATION, SEE CIVIL DRAWINGS

"TO THE BEST OF THE ENGINEER'S KNOWLEDGE THESE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES".


A
A-1
A-2
B
B-1
B-2
C
C-1
C-2
D
D-1
D-2
E
E-1
E-2
F
F-1
F-2
G
G-1
G-2
H
419'-0"
1
2
3
4
5
6
7
8
9
395'-0" TO GRID LINE 10
MATCH LINE
FIRST FLOOR PLAN -(WEST)
SCALE: 1/16" = 1'-0"
KEY PLAN
N
NOTES
LEGEND



FIRST FLOOR PLAN - (EAST)

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

LEGEND

F.D. - FLOOR DRAIN

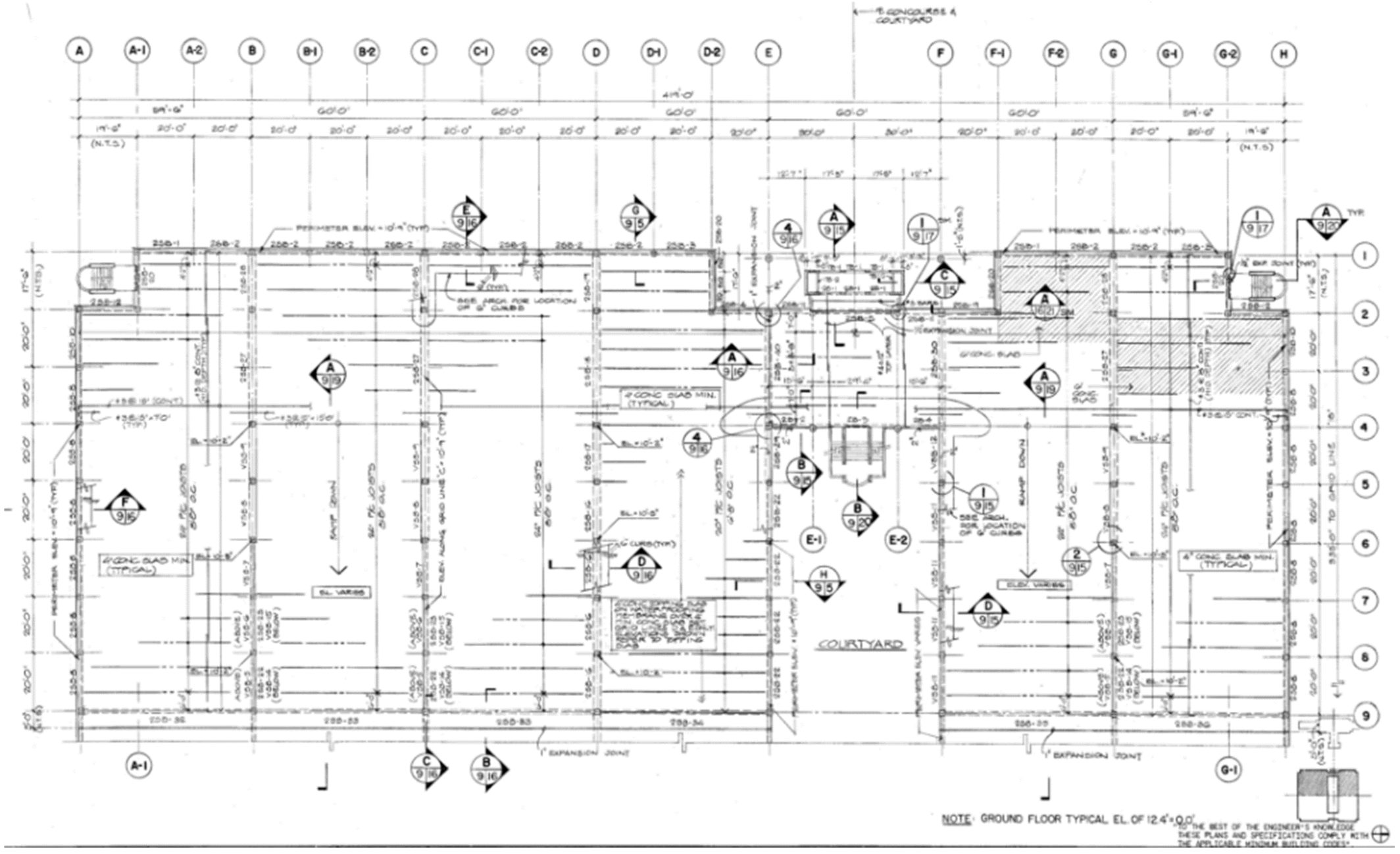
CONC. RAISED UNITS, 6" TYP. U.O.N.

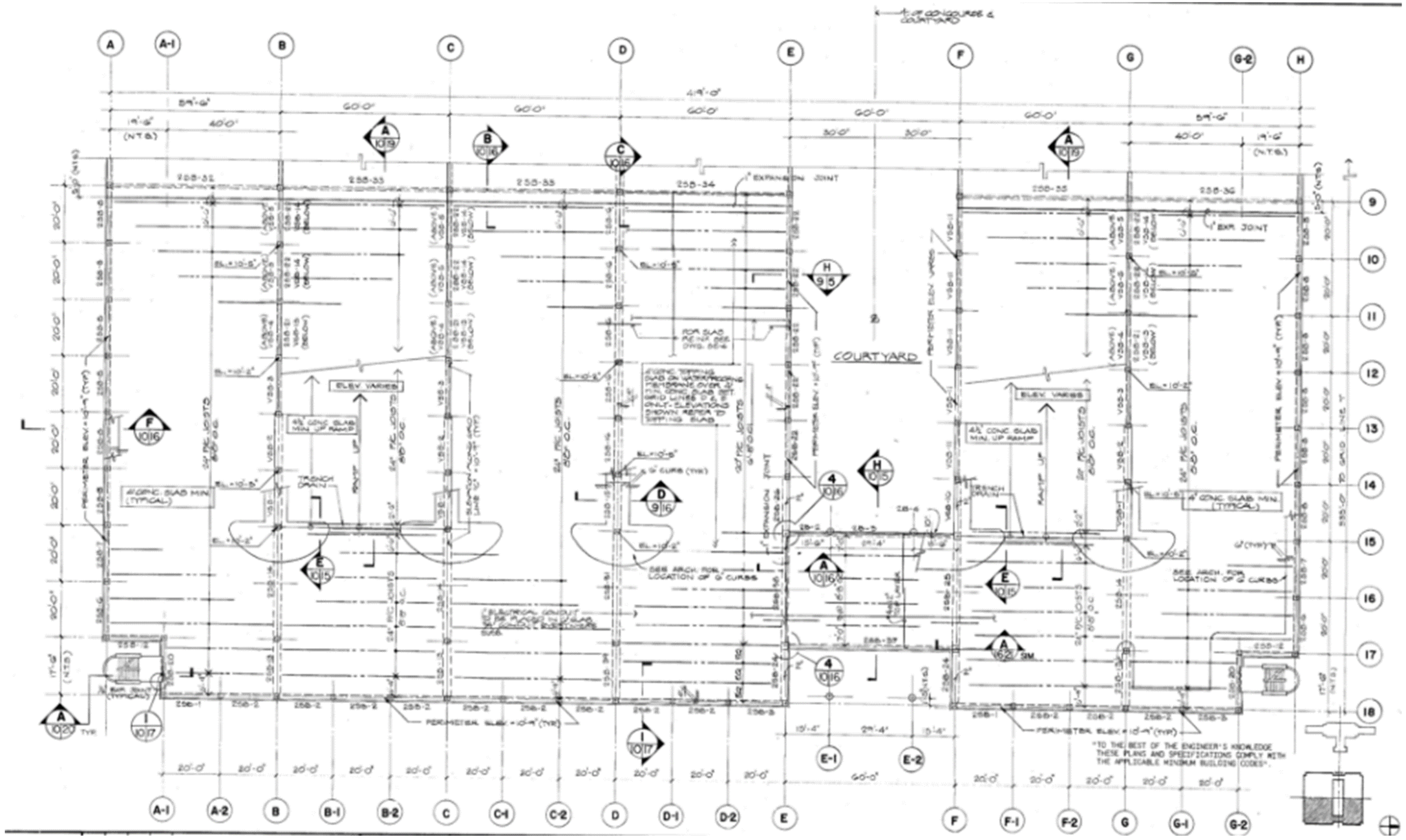
PRECAST CONC. PANELS

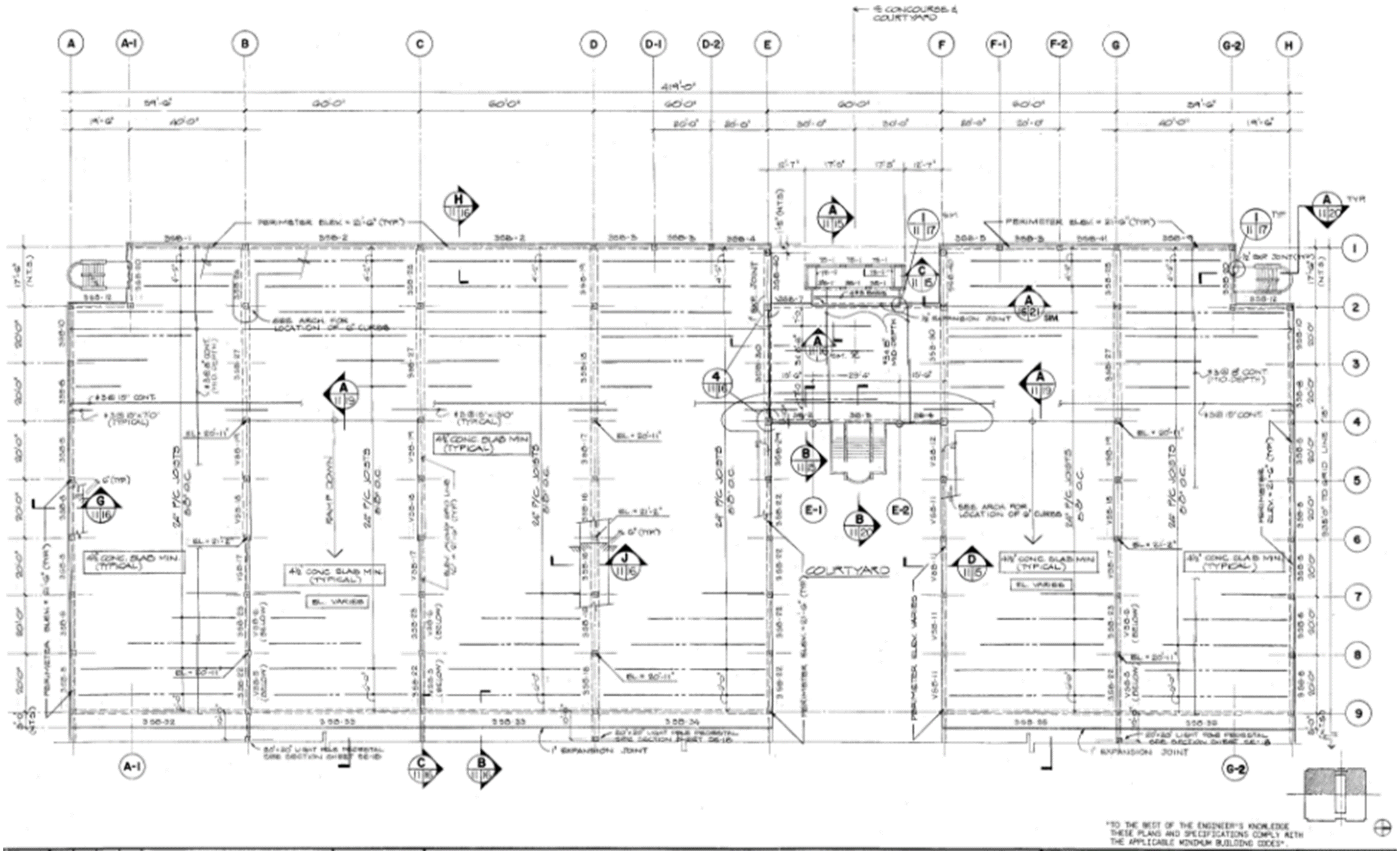
"TO THE BEST OF THE ENGINEER'S KNOWLEDGE THESE PLANS AND SPECIFICATION COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES".

NOTES

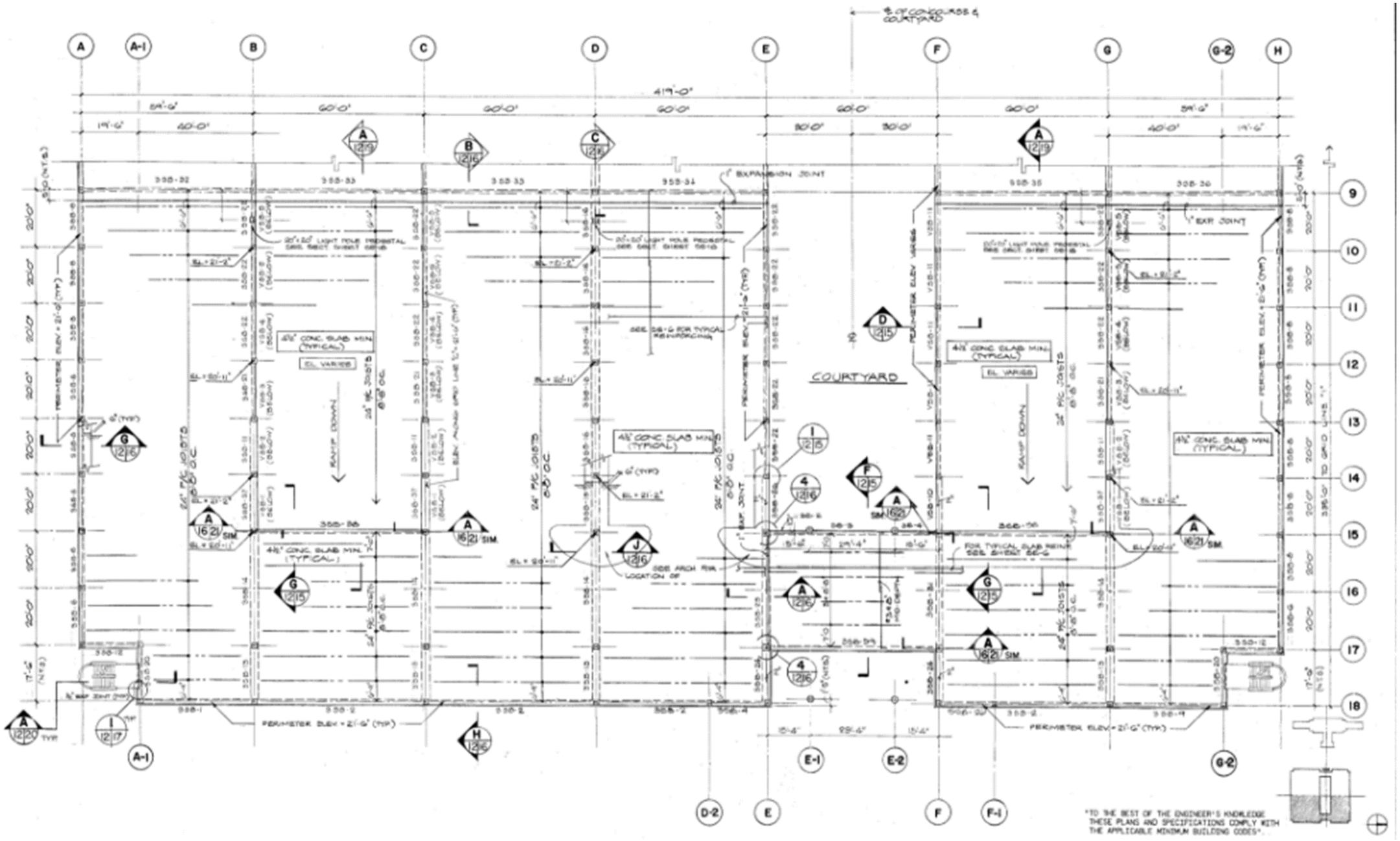
1. SEE DWG. S6-B FOR GEN. NOTES FOR SLAB ON GRADE
2. FOR SECTIONS & DETAILS, SEE DWG. S6-B.
3. FOR ADDITIONAL RECESSES FOR FLOOR FINISHES, SEE ARCH. DWGS.
4. FOR PRECAST CONC. PANELS, SEE ARCH. DWGS.
5. ELEVATION SHOWN THUS +12.54 ARE TOP OF FLOOR SLAB
6. ELEV. +12.4 = ELEV. 0'-0" ON ARCH. DWG.
7. SEE ARCH. DWGS. A6-01 & A6-02 FOR WALKWAYS OUTSIDE BLDG.


A
A-1
A-2
B
B-1
B-2
C
C-1
C-2
D
D-1
D-2
E
F
F-1
F-2
G
G-1
G-2
H
TO CONCOURSE & COURTYARD
411'-0"
(N.T.S.)
PERIMETER BLEV. = 10'-9" (TYP.)
4" CONC. SLAB MIN. (TYPICAL)
EXPANSION JOINT
SEE AREA FOR LOCATION OF 6" CURBS
RAMP DOWN
EL. VARIES
COURTYARD
NOTE: GROUND FLOOR TYPICAL EL. OF 12.4' = 0.0'
TO THE BEST OF THE ENGINEER'S KNOWLEDGE THESE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES.


A
A-1
B
C
D
E
F
G
G-2
H
COURTYARD
EXPANSION JOINT
EXP. JOINT
ELEV VARIES
4" CONC. SLAB MIN. (TYPICAL)
4½" CONC. SLAB MIN. UP RAMP
TRENCH DRAIN
6" CURB (TYP.)
SEE ARCH. FOR LOCATION OF 6" CURBS
PERIMETER ELEV. = 10'-4" (TYP.)
"TO THE BEST OF THE ENGINEER'S KNOWLEDGE THESE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES".



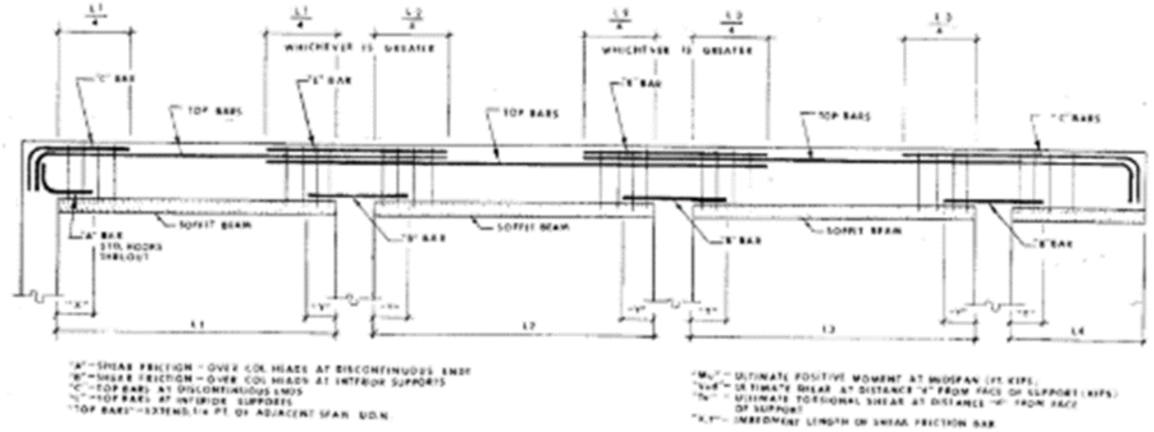
"TO THE BEST OF THE ENGINEER'S KNOWLEDGE THESE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES".


A
A-1
B
C
D
E
F
G
G-2
H
419'-0"
60'-0"
40'-0"
50'-0"
30'-0"
19'-6"
1" EXPANSION JOINT
1" EXP. JOINT
4½" CONC. SLAB MIN. (TYPICAL)
EL. VARIES
COURTYARD
PERIMETER ELEV. VARIES
PERIMETER ELEV. = 21'-9" (TYP.)
PERIMETER ELEV. = 21'-6" (TYP.)
RAMP DOWN
24" PRC JOISTS @ 6'-8" O.C.
SEE S6.1-G FOR TYPICAL REINFORCING
SEE ARCH DWG. FOR LOCATION OF
FOR TYPICAL SLAB REINF. SEE SHEET S6.1-G
20'-0" LIGHT POLE PEDESTAL SEE ELECT. SHEET E0.1-G
9
10
11
12
13
14
15
16
17
18
D-2
E
E-1
E-2
F
F-1
G-2
"TO THE BEST OF THE ENGINEER'S KNOWLEDGE THESE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES".

SOFFIT BEAM SCHEDULE

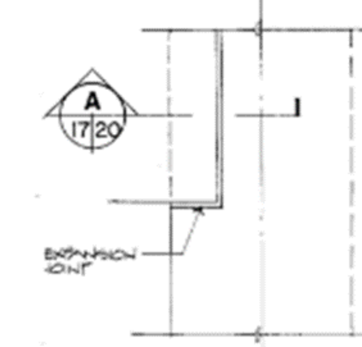
BEAM NO.	ELEV. TOP OF BEAM	SIZE	Mu	REINFORCING A	X	B	Y	TOP	C	E	STIRRUPS LEFT Vu	RIGHT Vu	Tu	REMARKS
2SB-1	10'-9"	16"x28"	50	2#6	2'-6"	2#6	2'-6"	2#6*			20	25	-	* CONTINUOUS
2SB-2		16"x28"	50			2#6	2'-6"	2#6*			20	20	-	* CONTINUOUS
2SB-3		16"x28"	50	2#6	2'-6"			2#6*			25	20	-	* CONTINUOUS
2SB-4			75	2#6	2'-6"	2#7	2'-6"	2#8			20	25	10	
2SB-5			150	2#7	2'-6"	2#7	2'-6"	2#7**			60	60	15	* SEE SECT. A SHT. SE-20
2SB-6			150	2#7	2'-6"	2#7	2'-6"	2#7	1#7		39	49	32	
2SB-7			130			2#7	2'-6"	2#7			45	45	32	
2SB-8			130			2#7	2'-6"	2#7			45	45	32	
2SB-9			75	2#6	2'-6"			2#8			25	20	10	
2SB-10		16"x28"	150	2#7	2'-6"			2#7	1#7		49	39	32	
2SB-11		16"x28"	75					*			20	20	10	2#7 FROM 2SB-5
2SB-12	10'-9"	16"x28"	90	2#6 1/2	2'-6"			2#7			20	20	-	
2SB-13	VARIES SEE PLAN	24"x28"	200	3#8	2'-9"	4#10	4'-0"	2#11		5#11	90	130	-	
2SB-14		24"x30"	1000			4#10	4'-0"	2#11		5#11	275	275	-	
2SB-15		24"x28"	250			3#9	3'-6"	2#11		2#9	150	110	-	
2SB-16			300			3#8	2'-9"	2#10			110	110	-	
2SB-17		24"x28"	250			4#10	4'-0"	2#11		9#11*	110	150	-	*USE 5#11 BARS IN SEC. LAYER
2SB-18		24"x30"	1350			4#10	4'-0"	2#11		9#11*	275	275	-	*USE 5#11 BARS IN SEC. LAYER
2SB-19	VARIES SEE PLAN	24"x28"	200	3#8	2'-9"			2#11			130	85	-	
2SB-20	10'-9"	16"x28"	120	2#7 1/2	2'-6"			2#9			47	47	-	* SEE SECT. 'A' SHEET SE-20
2SB-21	VARIES SEE PLAN	16"x28"	140	2#7	2'-6"	2#7	2'-6"	2#8	2#7*		50	50	32	* EXTEND 5'-0" INTO VSB-5
2SB-22	VARIES SEE PLAN	16"x28"	200			3#7	2'-6"	2#7			80	80	47	
2SB-23	VARIES SEE PLAN	16"x28"	140	2#7	2'-6"	2#7	2'-6"	2#7		2#7*	55	55	32	* EXTEND 5'-0" INTO VSB-7
2SB-24	10'-9"	24"x28"	220	2#7	2'-6"	4#10	4'-0"	2#11		5#11	75	110	85	
2SB-25	10'-9"	24"x30"	1000			4#10	4'-0"	2#11		5#11	220	220	-	
2SB-26	10'-9"	24"x28"	175			3#7	2'-6"	2#11			120	75	32	
2SB-27	VARIES SEE PLAN	24"x30"	1000			4#10	4'-0"	2#11		5#11	220	220	-	
2SB-28	VARIES SEE PLAN	24"x28"	200	3#8	2'-9"			2#11			130	80	-	
2SB-29	10'-9"	24"x28"	200			4#10	4'-0"	2#11		10#11*	95	125	-	*USE 5#11 BARS IN SEC. LAYER
2SB-30	10'-9"	24"x30"	1000			4#10	4'-0"	2#11	7#11		220	220	-	
2SB-31	10'-9"	24"x30"	1350			4#10	4'-0"	2#11		9#11*	275	275	-	*USE 5#11 BARS IN SEC. LAYER
2SB-32	10'-9"	16"x28"	400	2#7	2'-6"	2#7	2'-6"	2#9	2#10	2#10	60	60	-	
2SB-33	VARIES SEE PLAN		400			2#7	2'-6"	2#9		2#10	60	60	-	
2SB-34	10'-9"		400	2#7	2'-6"			2#9	2#10		60	90	-	
2SB-35	VARIES SEE PLAN		600	2#7	2'-6"	2#7	2'-6"	2#9	2#11	3#11	60	60	-	
2SB-36	10'-9"		600	2#7	2'-6"			2#9	2#11		60	60	-	
2SB-37	10'-9"	16"x28"	575	2#7 1/2	2'-6"			2#9			55	55	45	* USE CAZALY HANGERS AT BOTH ENDS
2SB-38	10'-9"	24"x30"	1350			4#10	4'-0"	2#11		9#11*	275	275	-	*USE 5#11 BARS IN 2ND LAYER
2SB-39	10'-9"	24"x28"	250	3#8	2'-9"	4#10	4'-0"	2#11		9#11*	110	150	-	*USE 5#11 BARS IN 2ND LAYER
2SB-40	10'-9"	24"x30"	1350	4#10	4'-0"			2#11	7#11		275	250	-	
VSB-1	VARIES SEE PLAN	24"x[illegible]	200			3#7	2'-6"	2#11			125	80	-	
VSB-2		24"x[illegible]	250			3#7	2'-6"	2#9			95	95	-	
VSB-3		16"x[illegible]	230			3#7	2'-6"	2#8		2#7	95	95	-	TOP OF BEAM INTERSECTS W/ TOP OF VSB-4
VSB-4		16"x28"	140	2#7	2'-6"	2#7	2'-6"	2#7			55	50	-	TOP OF BEAM INTERSECTS W/ TOP OF VSB-5
VSB-5		16"x28"	130			2#7	2'-6"	2#7			55	55	-	
VSB-6	VARIES SEE PLAN	16"x28"	130			2#7	2'-6"	2#7		2#7*	55	55	-	*EXTEND 5'-0" INTO VSB-7 BOT. OF BM. INTERSECTS W/ BOTT. OF VSB-7
VSB-7	10'-9"	16"x[illegible]	250			3#7	2'-6"	2#8			95	95	-	BOT. OF BEAM INTERSECTS W/ BOTT. OF VSB-7
VSB-8	10'-9"	24"x[illegible]	230			3#7	2'-6"	2#9			95	95	-	
VSB-9	10'-9"	24"x[illegible]	200			4#10	4'-0"	2#11		5#11	90	150	-	
VSB-10	VARIES SEE PLAN	24x28	130			2#7	2'-6"	2#11			80	35	32	
VSB-11		16x28	140			2#7	2'-6"	2#7			55	55	32	
VSB-12		24x28	140			4#10	4'-0"	2#11		5#11	65	85	60	
VSB-13		16"x28"	130	2#7	2'-6"	2#7	2'-6"	2#7			55	55	-	
VSB-14		16"x28"	130			2#7	2'-6"	2#7			65	65	-	
VSB-15		16"x28"	130			3#7	2'-6"	2#7		2#7*	55	55	-	*EXTEND 5'-0" INTO VSB-7 BOTT. OF BM. INTERSECTS W/ BOTT. OF VSB-7
VSB-16	VARIES SEE PLAN													
VSB-17	21'-6"	16"x[illegible]	250			3#7	2'-6"	2#8			95	95	-	*TOP OF BEAM INTERSECTS W/ TOP OF 3SB-25
VSB-18	21'-6"	24"x[illegible]	250			3#7	2'-6"	2#9			75	70	-	*BOTT. OF BEAM INTERSECTS W/ BOTT. OF VSB-6
VSB-19	21'-6"	24"x[illegible]	200			4#10	4'-0"	2#11		5#11	70	150	-	

TYPICAL SOFFIT BEAM DIAGRAM

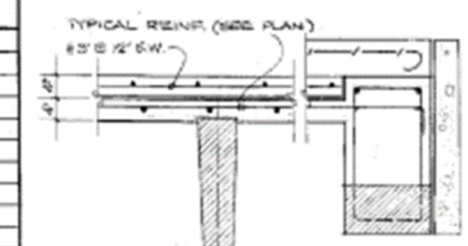


SOFFIT BEAM SCHEDULE (CONTINUATION)

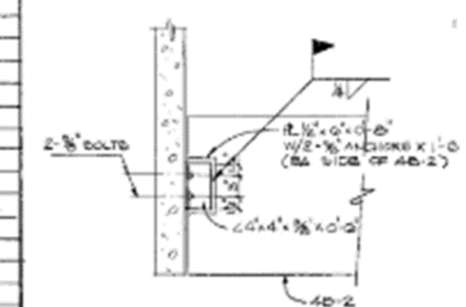
BEAM NO.	ELEV. TOP OF BEAM	SIZE	Mu	REINFORCING A	X	B	Y	TOP	C	E	STIRRUPS LEFT Vu	RIGHT Vu	Tu	REMARKS
3SB-1	21'-6"	16"x28"	130	2#7	2'-6"	2#7	2'-6"	2#8	1#8	2#9	40	45	25	
3SB-2			280			2#7	2'-6"	2#8		2#9	50	50	30	
3SB-3			75			2#6	2'-6"	2#8			25	25	10	
3SB-4			75	2#6	2'-6"			2#8			25	25	10	
3SB-5			75	2#6	2'-6"	2#7	2'-6"	2#8			25	25	10	
3SB-6			150	2#7	2'-6"	2#7	2'-6"	2#7	1#7		39	49	32	
3SB-7			525	2#7 1/2	2'-6"			2#9			60	60	45	USE CAZALY HANGERS AT BOTH ENDS
3SB-8			130			2#7	2'-6"	2#7			45	45	32	
3SB-9			130	2#7	2'-6"			2#8	1#8		45	40	25	
3SB-10	21'-6"	16"x28"	150	2#7	2'-6"			2#7	1#7		49	39	32	
3SB-11	VARIES SEE PLAN	24"x28"	140			2#7	2'-6"	2#8			55	55	32	
3SB-12	21'-6"	16"x28"	90	2#6 1/2	2'-6"			2#7			20	20	-	
3SB-13	VARIES SEE PLAN	24"x28"	200	3#8	2'-9"	4#10	4'-0"	2#11		5#11	90	130	-	
3SB-14		24"x30"	1000			4#10	4'-0"	2#11		5#11	220	220	-	
3SB-15		24"x28"	200			3#8	2'-9"	2#11			120	85	-	
3SB-16		24"x28"	250			3#8	2'-9"	2#9			95	95	50	
3SB-17		24"x28"	200			4#10	4'-0"	2#11		5#11	85	120	-	
3SB-18		24"x30"	1000			4#10	4'-0"	2#11		5#11	220	220	-	
3SB-19	VARIES SEE PLAN	24"x28"	200	3#8	2'-9"			2#11			130	85	-	
3SB-20	21'-6"	16"x28"	120	2#7 1/2	2'-6"			2#9			55	55	-	SEE SECT. 'A' ON SE-20
3SB-21	VARIES SEE PLAN	16"x28"	140			2#7	2'-6"	2#8			50	55	32	
3SB-22	VARIES SEE PLAN	16"x28"	150			2#7	2'-6"	2#7			55	50	85	
3SB-23	VARIES SEE PLAN	16"x28"	140	2#7	2'-6"	2#7	2'-6"	2#7		2#7	55	60	32	
3SB-24	21'-6"	24"x28"	150	2#7	2'-6"	4#10	4'-0"	2#11		5#11	45	95	60	
3SB-25	21'-6"	24"x30"	1250			4#10	4'-0"	2#11		5#11	230	220	-	SEE SECT. 'A' ON SE-10
3SB-26	21'-6"	16"x28"	175	2#6	2'-6"	2#7	2'-6"	2#8		2#8	25	25	10	
3SB-27	VARIES SEE PLAN	24"x30"	1000			4#10	4'-0"	2#11		5#11	220	220	-	
3SB-28	VARIES SEE PLAN	24"x28"	200	3#8	2'-9"			2#11			130	85	-	
3SB-29	21'-6"	26"x28"	150			4#10	4'-0"	2#11		5#11	95	85	60	
3SB-30	21'-6"	26"x30"	1050			4#10	4'-0"	2#11		5#11	230	230	-	
3SB-31	21'-6"	24"x30"	1250	4#9	3'-2"			2#11	4#11		230	230	-	
3SB-32	21'-6"	16"x28"	550	2#7	2'-6"	2#7	2'-6"	2#9	2#10	2#10	60	60	-	
3SB-33	VARIES SEE PLAN	16"x28"	500			2#7	2'-6"	2#9		2#10	60	60	-	
3SB-34	21'-6"	16"x28"	550	2#7	2'-6"			2#9	2#10		60	60	-	
3SB-35	VARIES SEE PLAN	16"x28"	600	2#7	2'-6"	2#7	2'-6"	2#9	2#11	3#11	60	60	-	
3SB-36	21'-6"	16"x28"	600	2#7	2'-6"			2#9	2#11		60	60	-	
3SB-37	VARIES SEE PLAN	24"x28"	210			2#7	2'-6"	2#11			75	40	60	
3SB-38	VARIES SEE PLAN	16"x28"	525	2#7 1/2	2'-6"			2#9			60	60	45	USE CAZALY HANGERS AT BOTH ENDS
3SB-39	21'-6"	16"x28"	525	2#7 1/2	2'-6"			2#9			60	60	45	USE CAZALY HANGERS AT BOTH ENDS
3SB-40	21'-6"	16"x28"	200	2#7	2'-6"			2#11			75	50	50	
3SB-41	21'-6"	16"x28"	75			2#7	2'-6"	2#8		2#8	55	50	30	



1 DETAIL 9|17 1/2" = 1'-0"



1 SECTION 10|17 3/4" = 1'-0"



NOTE: ABOVE DETAIL TO BE PLACED ON EACH SIDE OF BEAM 4B-2

2 SECTION 10|17 3/4" = 1'-0"

"TO THE BEST OF THE ENGINEER'S KNOWLEDGE THESE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES".

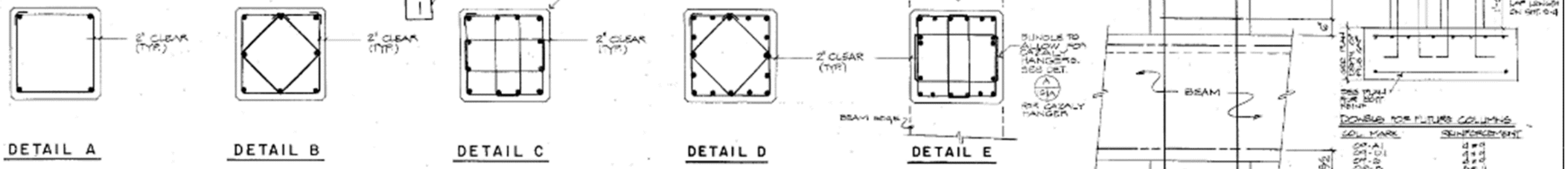
COLUMN SCHEDULE

COLUMN MARK / ELEVATION	G2-1 G2-16 A-2 F-2 A2-1 A1-16	A-9 B-1 C-1 E1-16 E1-9	E-17 F-17	B-16 C-16 D-16	A1-2 G2-2 A-12 G2-17 A-17 F-17	A-3 A-4 A-5 A-6 A-7 A-8	A-10 A-11 A-12 A-13 A-14 A-15 A-16	H-5 H-6 H-7 H-8	H-10 H-11 H-12 H-13 H-14 H-15	B-4 F-16 B-15	H-9	D-9	G-9	B-2 D-2 G-2 B-4 D-4 G-4	B-13 D-13 G-13 D-17 G-17	D-1 E2-1 E1-1 E2-16 E1-16 F-16	B-5 C-5 G-5 C-6 G-6 C-7	B-6 D-6 G-6	B-10 D-10 G-10 D-11 G-11 D-12 G-12	B-11 C-11 G-11	B-12 C-12 G-12	E1-15 E1-16 E2-15 E2-16 E1-4 E2-4 (C-1)	E-1 F-1	F-9	B-3 C-3	G-2 A-2 G-15 A-17	B-8 C-8 G-8	B-9 C-9 G-9	B-14 C-14 G-14	F-5	F-6	F-7	F-8	F-10	F-11	F-12	F-13	F-14	B-2 F-2	A2-1 B1-1 B2-1 C1-1 C2-1 G2-1 D2-2 E1-2 F1-2 E2-2	A2-16 B1-16 B2-16 C1-16 C2-16 D1-16 F2-16 G1-16	F-15
	+56'-0"		+56'-0"		+56'-0"											+56'-0"	+56'-0"				+45'-6"	+56'-0"																+56'-0"		
THIRD LEVEL	20"x20" 4#10 DET. A	+25'-0"	24"x24" 16#11 DET. G	+25'-0"	20"x20" 4#10 DET. A	+25'-0" (TYP.)							+25'-0" (TYP.)			30"x30" 4#9 DET. A						22"x22" 4#10 DET. A			+25'-0" (TYP.)												24"x24" 16#11 DET. B	+25'-0" (TYP.)	
SECOND LEVEL	20"x20" 4#10 DET. A	20"x20" 4#9 DET. A	24"x24" 16#11 DET. G	20"x20" 4#9 DET. A	20"x20" 4#10 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	24"x24" 16#11 DET. G	22"x22" 6#10 DET. B	22"x22" 4#10 DET. A	SAME AS ABOVE 24"x30" 4#10 DET. B	20"x20" 12#11 DET. C	20"x20" 12#11 DET. C	20"x20" 4#9 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	24"x30" 6#9 DET. F	24"x30" 6#7 DET. F	+25'-0"	30"x30" 4#10 DET. B	SAME AS BELOW 24"x30" 4#10 DET. A	32"x32" 12#11 DET. C	SAME AS BELOW 24"x30" 4#9 DET. A	SAME AS BELOW 24"x30" 4#9 DET. A	SAME AS BELOW 24"x30" 4#9 DET. A	SAME AS BELOW 24"x30" 4#9 DET. A	+25'-0" (TYP.) SAME AS BELOW 24"x30" 4#9 DET. A	SAME AS BELOW 30"x30" 4#9 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	24"x24" 16#11 DET. B	24"x24" 16#11 DET. B	24"x24" 16#11 DET. B
GROUND LEVEL	20"x20" 4#10 DET. A	20"x20" 4#9 DET. A	24"x24" 16#11 DET. G	20"x20" 4#9 DET. A	20"x20" 4#10 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	24"x24" 12#11 DET. G	22"x22" 6#10 DET. B	22"x22" 4#10 DET. A	SAME AS ABOVE 24"x30" 4#10 DET. B	20"x20" 12#11 DET. C	20"x20" 12#11 DET. C	20"x20" 4#9 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	24"x30" 6#8 DET. F	24"x30" 6#7 DET. F	30"x30" 4#10 DET. B	30"x30" 4#10 DET. B	SAME AS BELOW 24"x30" 4#10 DET. A	32"x32" 12#11 DET. C	SAME AS BELOW 24"x30" 4#9 DET. A	SAME AS BELOW 24"x30" 4#9 DET. A	SAME AS BELOW 24"x30" 4#9 DET. A	SAME AS BELOW 24"x30" 4#9 DET. A	SAME AS ABOVE 30"x30" 4#9 DET. A	SAME AS ABOVE 30"x30" 4#9 DET. A	22"x22" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	20"x20" 4#9 DET. A	24"x24" 16#11 DET. B	24"x24" 16#11 DET. B	24"x24" 16#11 DET. B
DOWELS	4#10"	4#9"	16#11**	4#9"	4#10"	4#9"	4#9	4#9	4#9	6#11**	8#10"	4#10"	8#10"	12#11"	12#11"	4#9"	4#9"	4#9	4#9	4#9"	4#9"	6#8"	6#7	6#10"	6#10"	4#10"	12#11"	4#9"	4#9"	4#9"	4#9"	4#9"	4#9"	4#9"	4#9"	4#9"	4#9"	4#9"	4#9"	4#9"	16#11"	4#8	4#8	16#11"
	SEE REINF. DETAIL	<																																								>		

*NOTE: USE TENSION SPLICE AS SHOWN IN REINFORCING DETAIL

**NOTE: SEE SPECIFICATIONS FOR MECHANICAL CONNECTORS

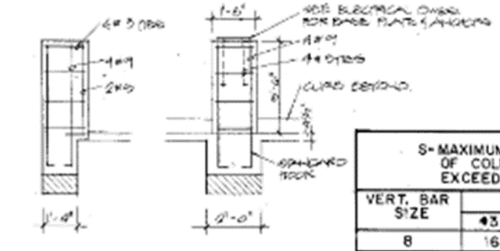
TOP AND TOE SHALL BE 6x12 W/4-#5 VERT. & DOWELS @3 @6" TIES



NOTE: SEE SOFFIT BEAM DIAGRAM (SB-1) FOR PLACEMENT OF REINF.

BEAM SCHEDULE**

MARK	ELEV.	SIZE	REINF. BOT.	REINF. TOP	STIRRUPS	REMARKS
2B-1	11'-8"	8x48	2#5	2#5	#3@12"	2#4 CONT. @ ½ PTS. SEE SECT A-16
2B-2*	10'-9"	12x28	2#8	2#8	#3@12"	* SEE CASALT HANGER AT EXP. JOINT
2B-3	10'-9"	12x28	2#8	2#8	#3@12"	
2B-4	10'-9"	12x28	2#8	2#8	#3@12"	
2B-5	*	8x18	2#6	2#7	#3@	* SEE SECT. B 9/20
3B-1	22'-0"	8x48	2#5	2#5	#3@ 12"	2#4 CONT. @ ½ PTS. SEE SECT. A-16
3B-2*	21'-6"	12x28	2#8	2#8	#3@12"	* SEE CASALT HANGER AT EXP. JOINT
3B-3	21'-6"	12x28	2#8	2#8	#3@12"	
3B-4	21'-6"	12x28	2#8	2#8	#3@12"	
4B-1	32'-9"	8x48	2#5	2#5		2#4 CONT. @ ½ PTS. SEE SECT. A-16
4B-2	32'-3"	8x28	2#8	2#7	#3@12" MAX.	EXT. B-D INTO SUBSTRUCTURE HOOK
4B-3	45'-0"	8x61	2#9	2#9	#3@12"	2#4 @ ¼ PTS. SEE SECT. A-19
5B-2	46'-0"	8x24	2#9	2#9	#3@12"	
7B-1	*	8x17½	2#9	2#6	#3@	SEE SECT. A-16 FOR SLOPE
7B-2	* SLOPE	8x12	2#9	2#6	#3@	
7B-3	45'-0"	8x12	2#8	2#5	#3@	SEE SECT. D-14

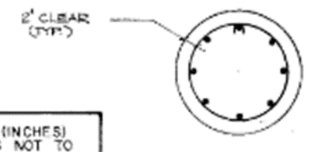


LIGHT POLE PEDESTAL DETAIL
3/8"=1'-0"

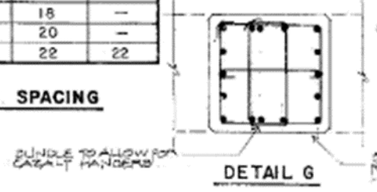
S= MAXIMUM SPACING (INCHES) OF COLUMN TIES NOT TO EXCEED LEAST COL. DIM.

VERT. BAR SIZE	SIZE OF TIES #3	#4	#5
8	16	16	—
9	18	18	—
10	18	20	—
11	N.A.	22	22

COL. TIE SPACING



DETAIL F



DETAIL G

TYPICAL COLUMN REINFORCING DETAIL

APPENDIX C

FLORIDA EXISTING BUILDING CODE REFERENCES

[BS] 406.2.2 Substantial Structural Damage to Vertical Elements of the Lateral Force-Resisting System

A building that has sustained substantial structural damage to the vertical elements of its lateral force-resisting system shall be evaluated in accordance with Section 406.2.2.1, and either repaired in accordance with Section 406.2.2.2 or repaired and rehabilitated in accordance with Section 406.2.2.3, depending on the results of the evaluation.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.

2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

[BS] 406.2.2.1 Evaluation

The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the code official. The evaluation shall establish whether the damaged building, if repaired to its predamage state, would comply with the provisions of the Florida Building Code, Building for load combinations that include wind or earthquake effects, except that the seismic forces shall be the reduced level seismic forces.

[BS] 406.2.2.2 Extent of Repair for Compliant Buildings

If the evaluation establishes that the building in its predamage condition complies with the provisions of Section 406.2.2.1, then the damaged elements shall be permitted to be restored to their predamage condition.

[BS] 406.2.2.3 Extent of Repair for Noncompliant Buildings

If the evaluation does not establish that the building in its predamage condition complies with the provisions of Section 406.2.2.1, then the building shall be rehabilitated to comply with the provisions of this section. The wind loads for the repair and rehabilitation shall be those required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be in accordance with the Florida Building Code, Building. The seismic forces for this rehabilitation design shall be those required by the building code in effect at the time of original construction, but not less than the reduced seismic forces.

[BS] 406.2.3 Substantial Structural Damage to Gravity Load-Carrying Components

Gravity load-carrying components that have sustained substantial structural damage shall be rehabilitated to comply with the applicable provisions for dead and live loads in the Florida Building Code, Building. Snow loads shall be considered if the substantial structural damage was caused by or related to snow load effects. Undamaged gravity load-carrying components that receive dead, live or snow loads from rehabilitated components shall also be rehabilitated if required to comply with the design loads of the rehabilitation design.

[BS] 406.2.3.1 Lateral Force-Resisting Elements

Regardless of the level of damage to gravity elements of the lateral force-resisting system, if substantial structural damage to gravity load-carrying components was caused primarily by wind or seismic effects, then the building shall be evaluated in accordance with Section 406.2.2.1 and, if noncompliant, rehabilitated in accordance with Section 406.2.2.3.

Exceptions:

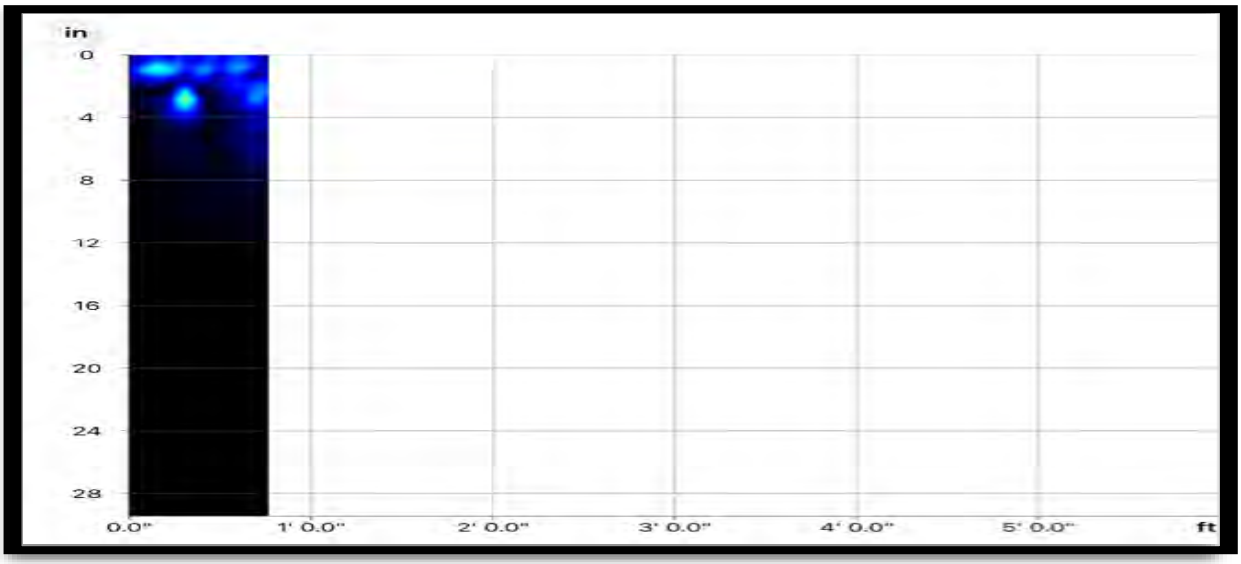
1. Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.

2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

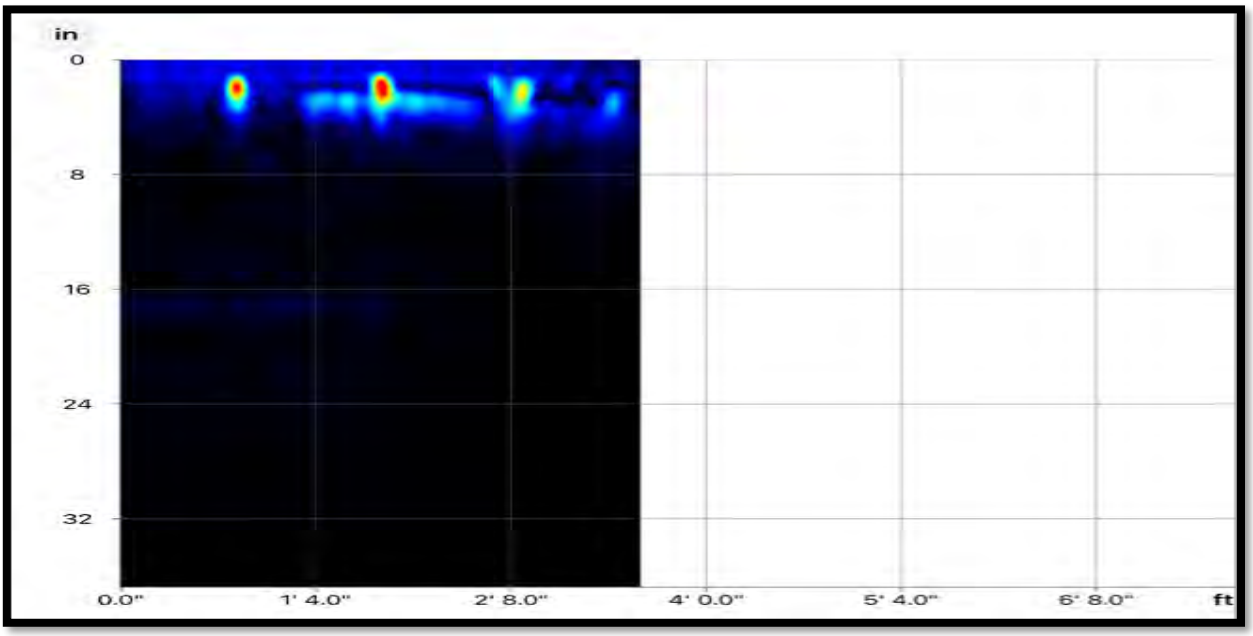
APPENDIX D

NON-DESTRUCTIVE TESTING IMAGERY

Beam Area of Concern 1

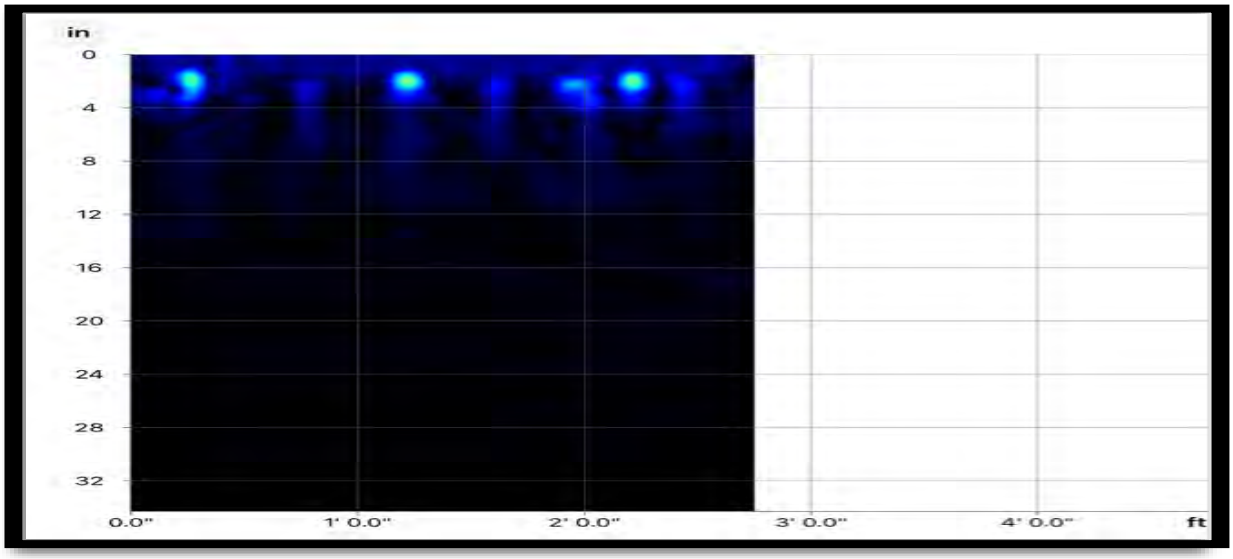


Beam D:9 to E:9 side scan with the Proceq GP8000 from the bottom of the beam going up. In this image, B-Bar is clearly visible just above the precast concrete section.

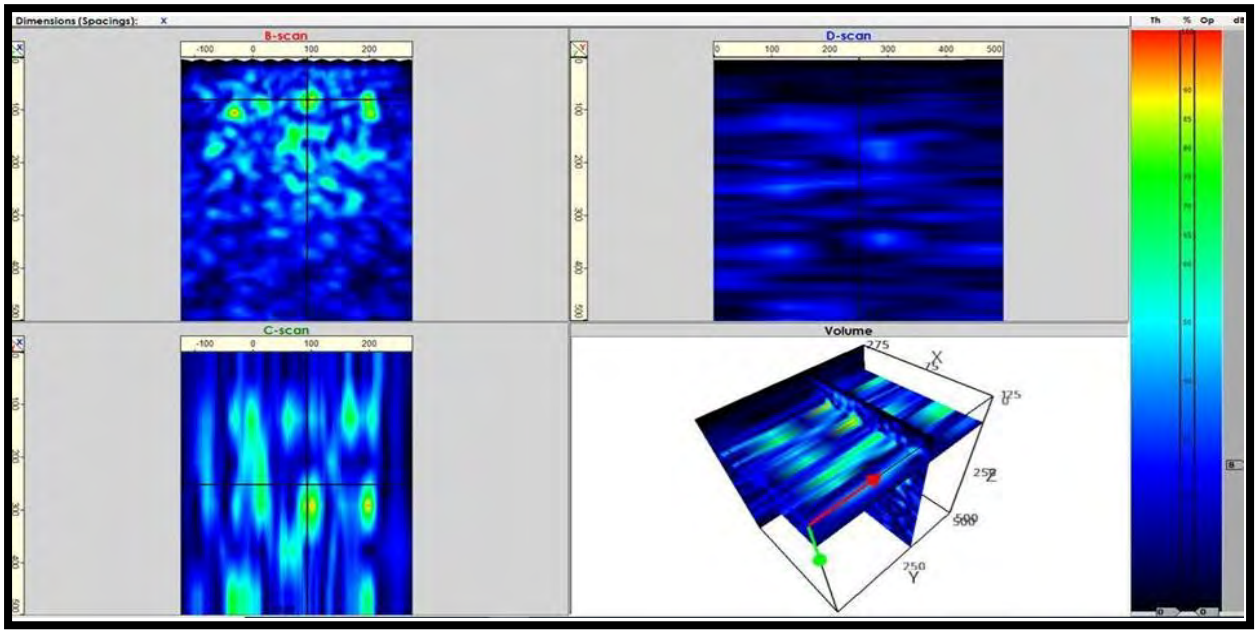


Beam D:9 to E:9 Shear spacing scan with the Proceq GP8000 at Column E:9.

Here you can see the shear stirrups spaced at an average spacing of 6 inches.

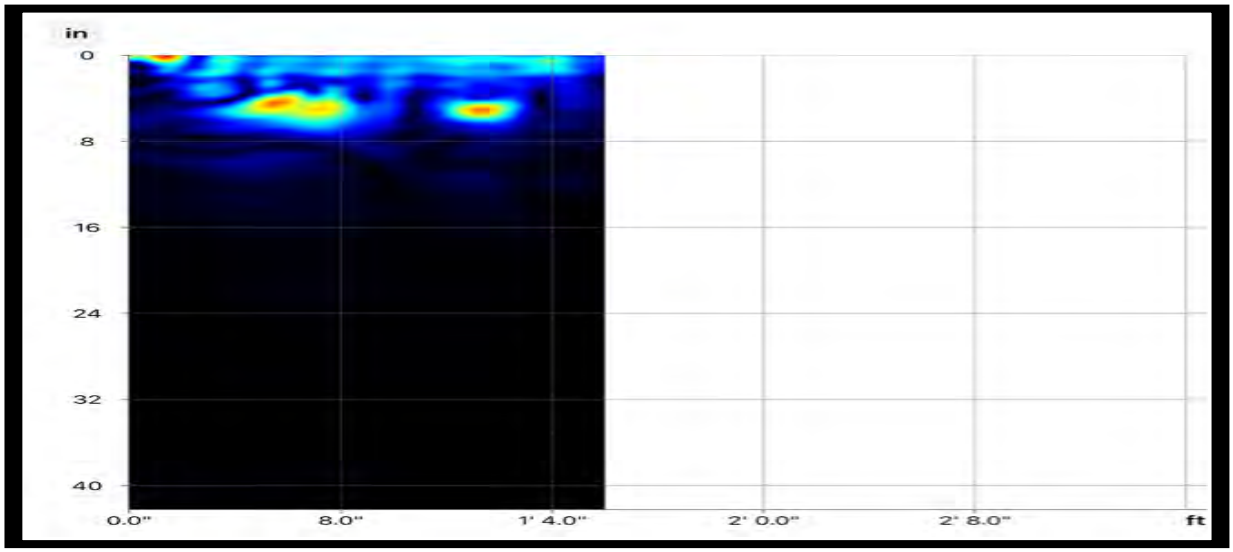


Beam D:9 to E:9 Shear spacing scan with the Proceq GP8000 at Midspan. Visible in this scan are the shear stirrups with an average spacing of 12 inches.

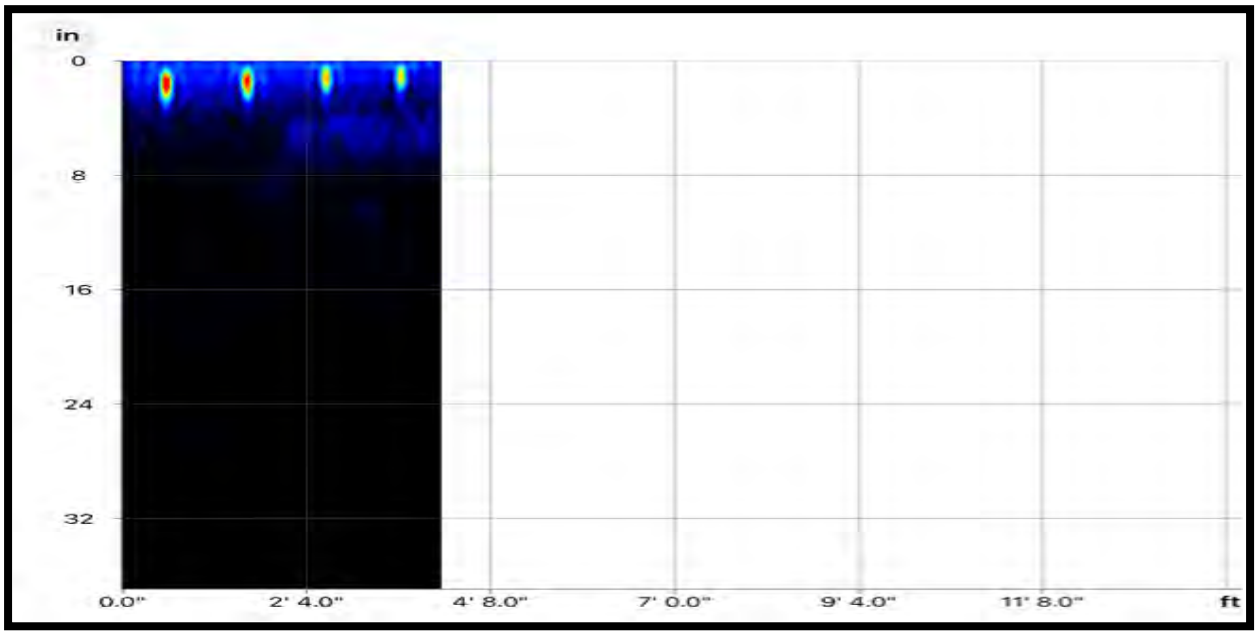


Beam D:9 to E:9 bottom scan with A1040 MIRA for longitudinal reinforcement 1st mat of bars (1st floor). This scan is too blurry to determine longitudinal reinforcement in this beam.

Beam Area of Concern 2

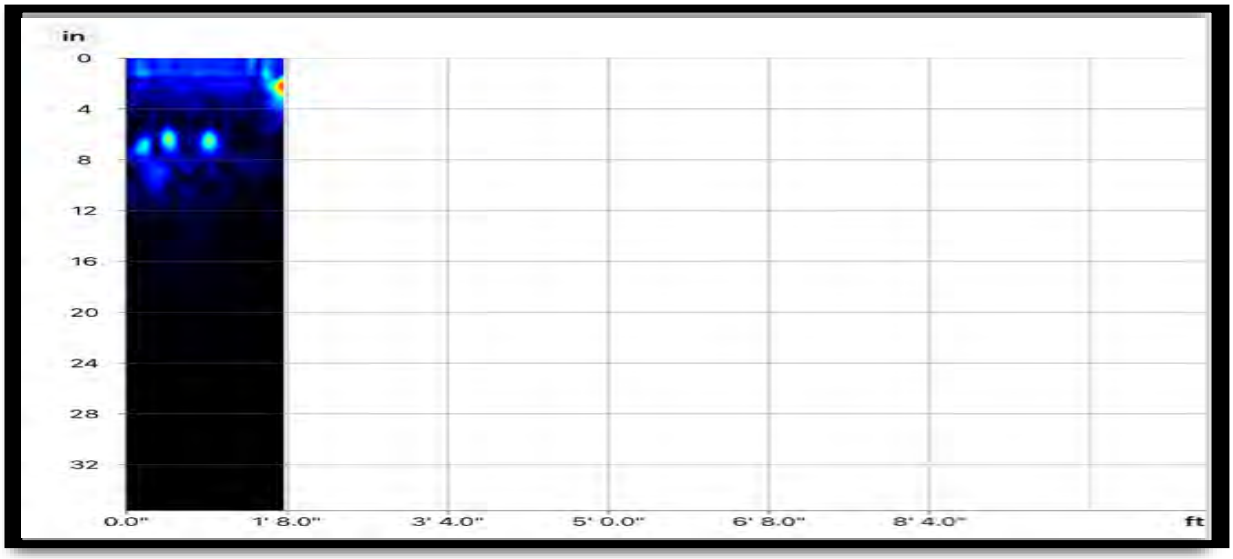


Beam D1:18 to D:18 side scan with Proceq GP800 from the bottom of the beam going up. Two mats of longitudinal reinforcement are visible as well as a B-Bar. (Beams C2:18 through D1:18 similar)

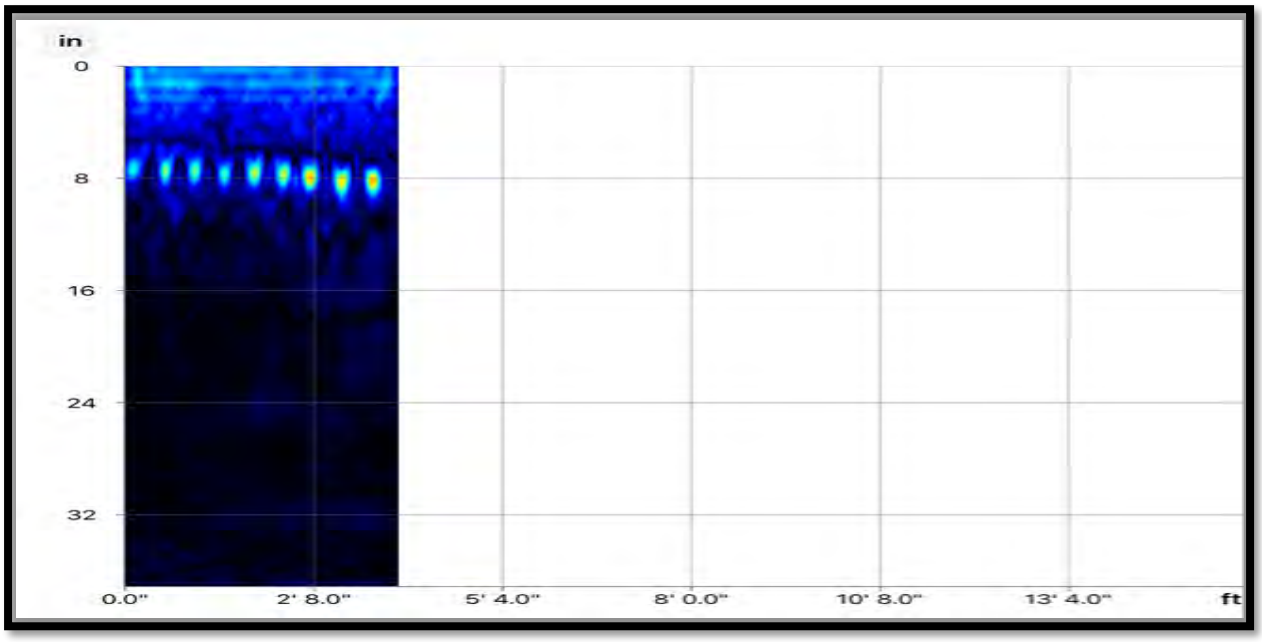


Beam D1:18 to D:18 Shear scan with the Proceq GP8000 at Column D:18. Shear stirrups are visible with an average spacing of 12 inches. (Beams C2:18 through D1:18 similar)

Beam Area of Concern 3

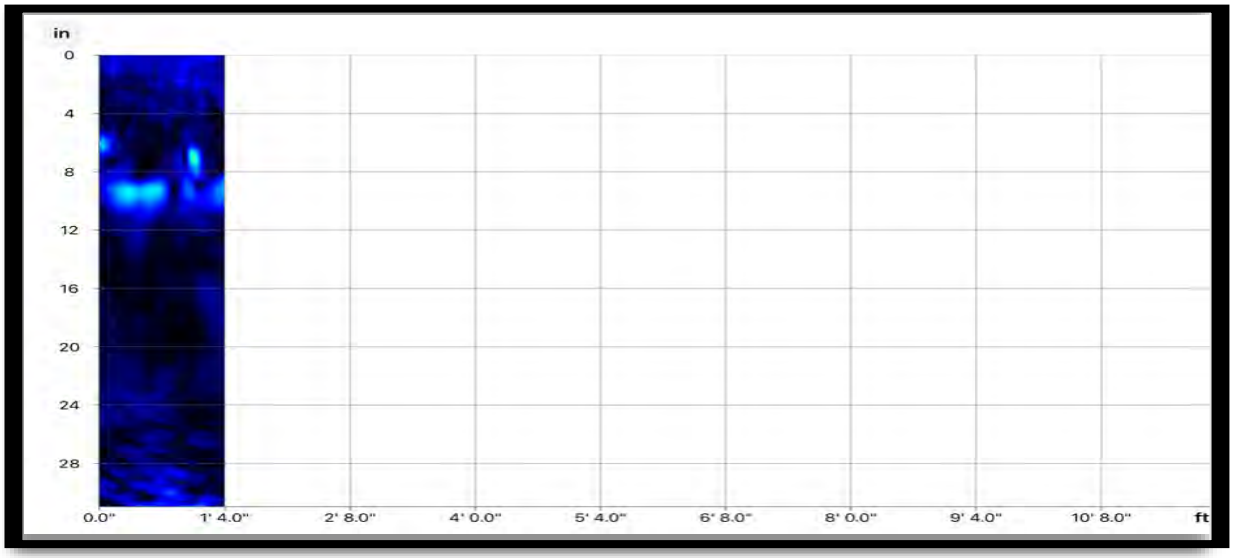


Beam E:4 to E:5 side scan with Proceq GP8000 from the top of the beam going down. From this scan, you can see the two mats of top bars and the B-Bar.

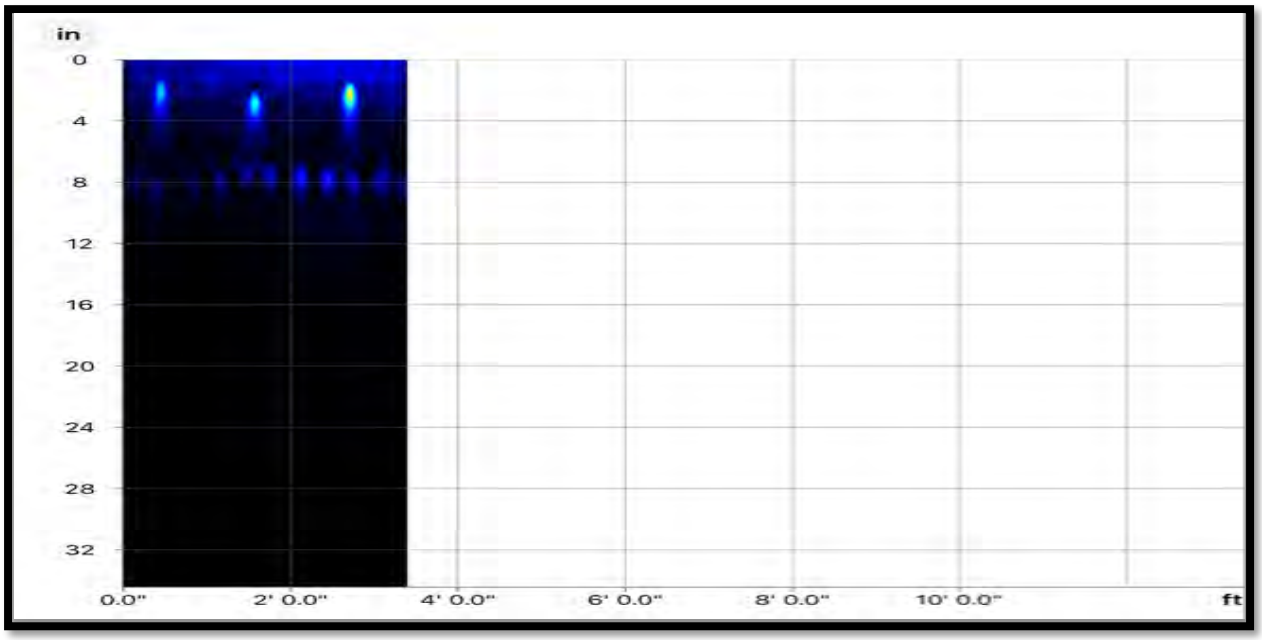


Beam E:4-E:5 Shear scan with the Proceq GP8000 at column E:4. Shear stirrups are visible with an average spacing of 5 inches.

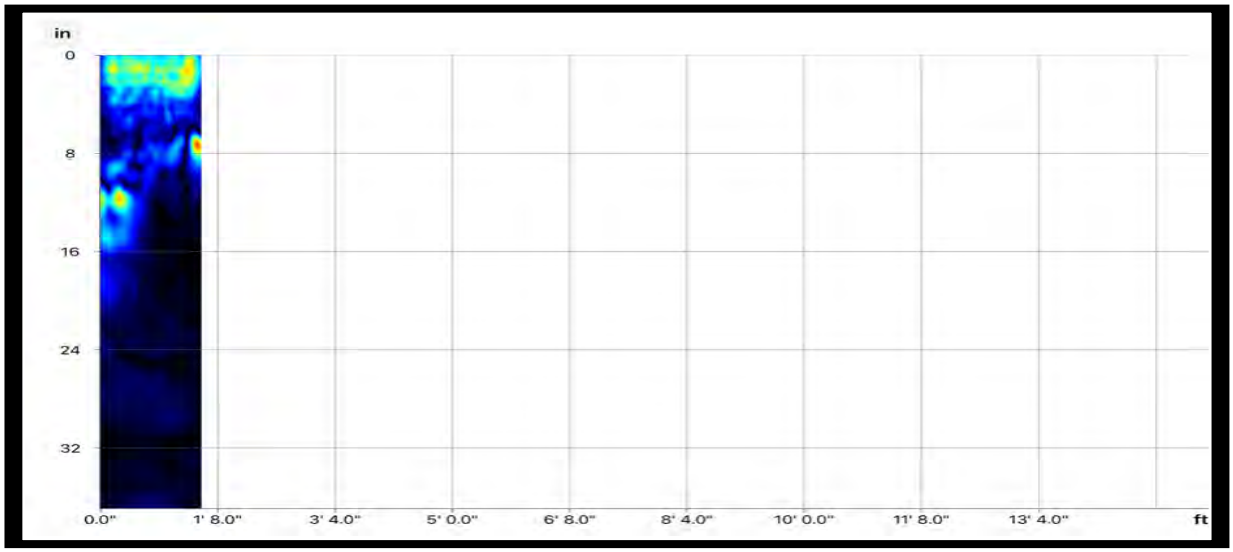
Beam Area of Concern 4



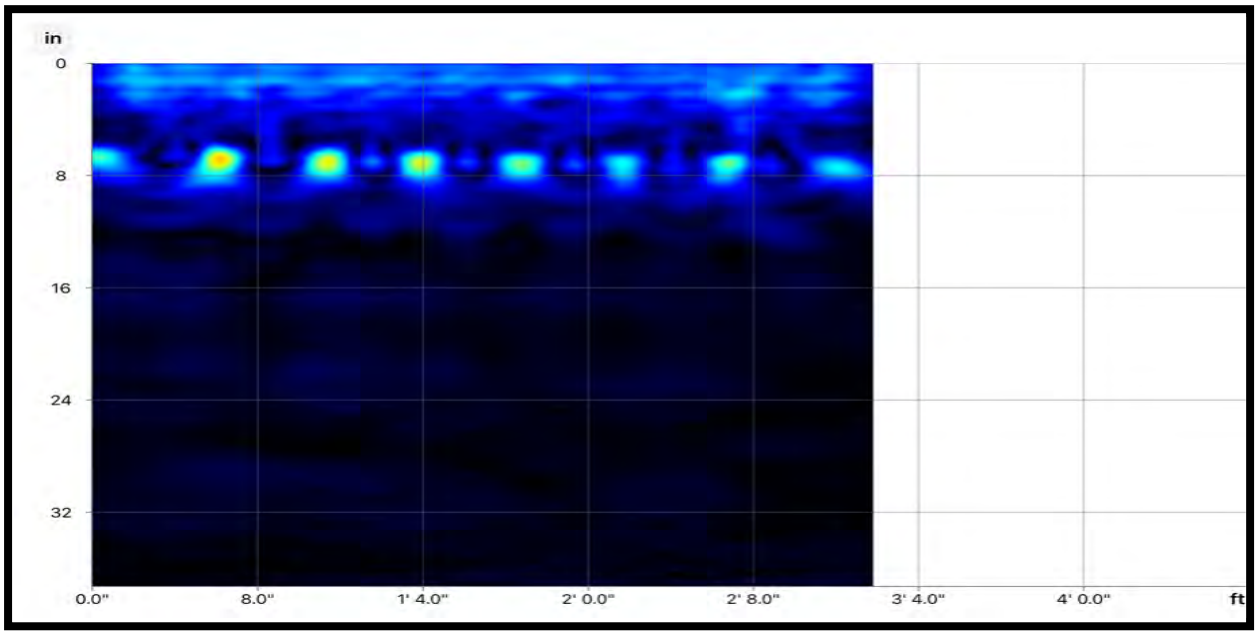
Beam E:15 to E:17 side scan with Proceq GP8000 from the bottom of the beam going up. Visible in this scan is the single mat of longitudinal reinforcement as well as the B-Bar



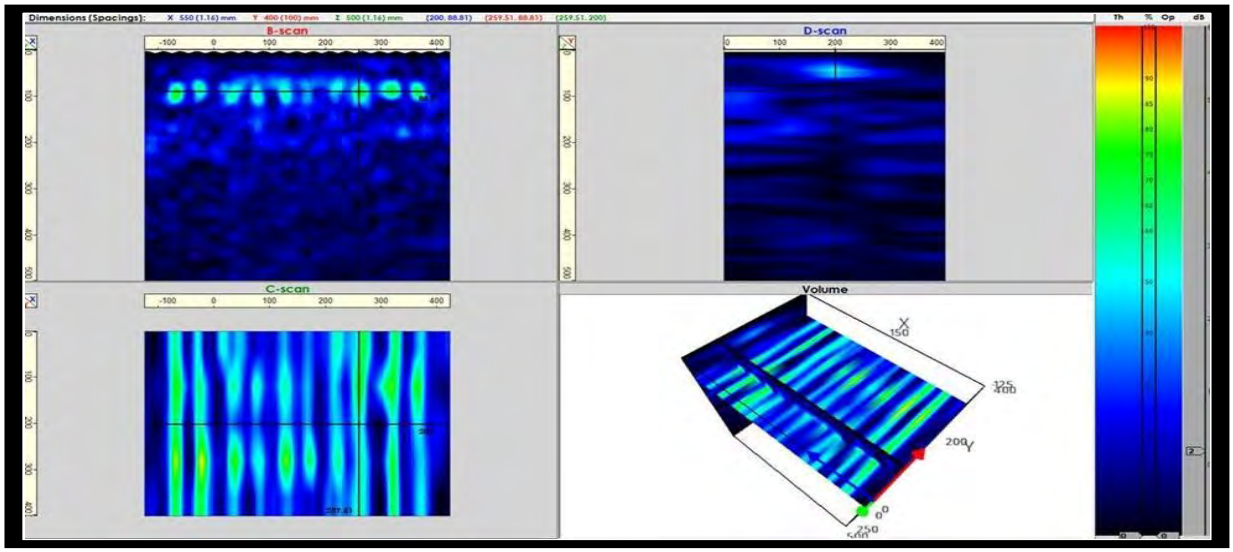
Beam E:15 to E:17 Shear scan with Proceq GP8000 at midspan. Both sets of shear reinforcement are visible in this scan. The bottom line is the regular shear reinforcement spaced at a 4 inch average and the top line is the secondary shear reinforcement spaced at a 12 inch average.



Beam E:14 to E:15 side scan with the Proceq GP8000 from the top of the beam going down. Visible in this scan is the B-Bar as well as the singular mat of longitudinal reinforcement.

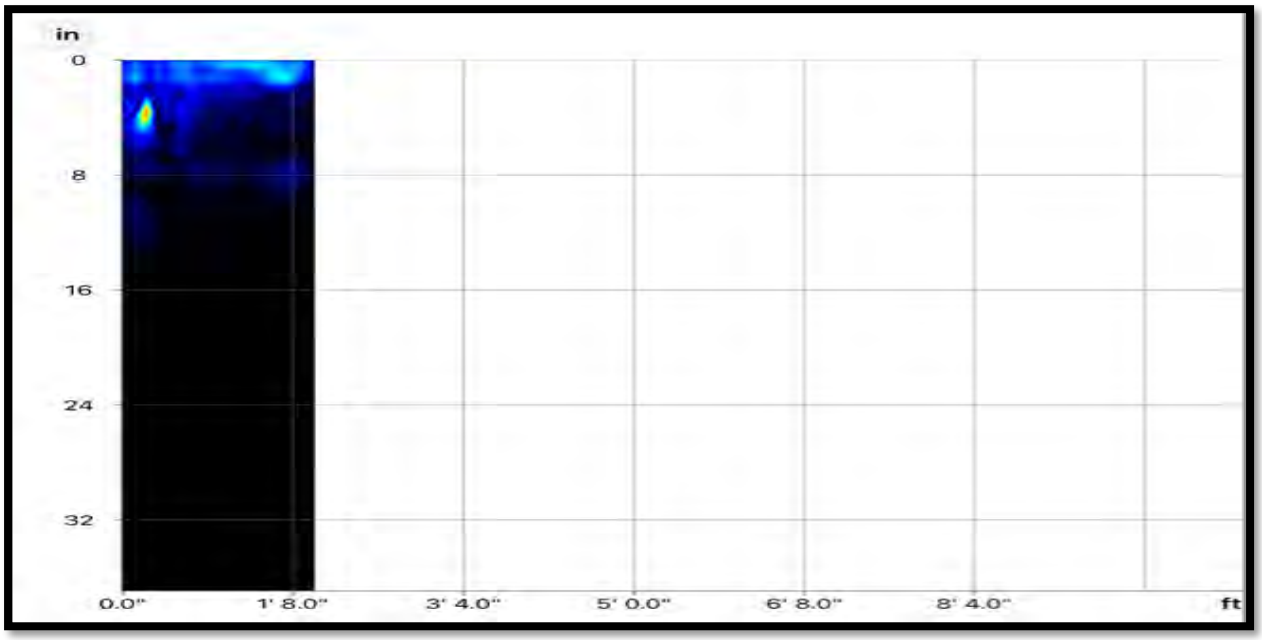


Beam E:14 to E:15 Shear scan with Proceq GP8000 at column E:15. Shear reinforcement is visible in this scan with an average spacing of 5 inches.

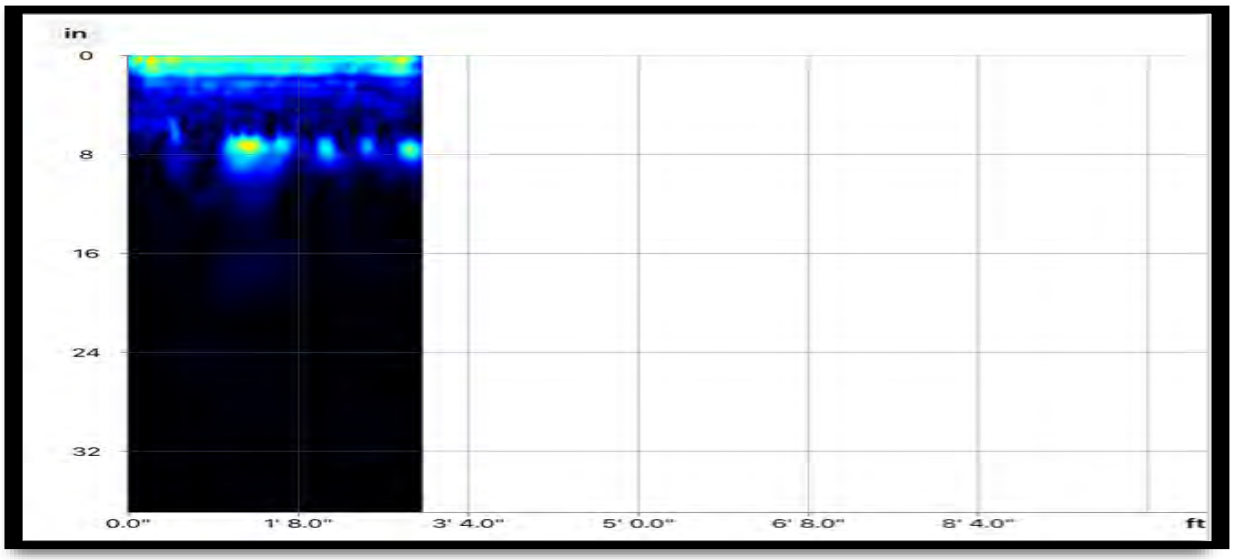


Beam E:15 to E:17 bottom scan with A1040 MIRA for longitudinal reinforcement 1st mat. Visible in this image are the 10 strands running longitudinally in this beam.

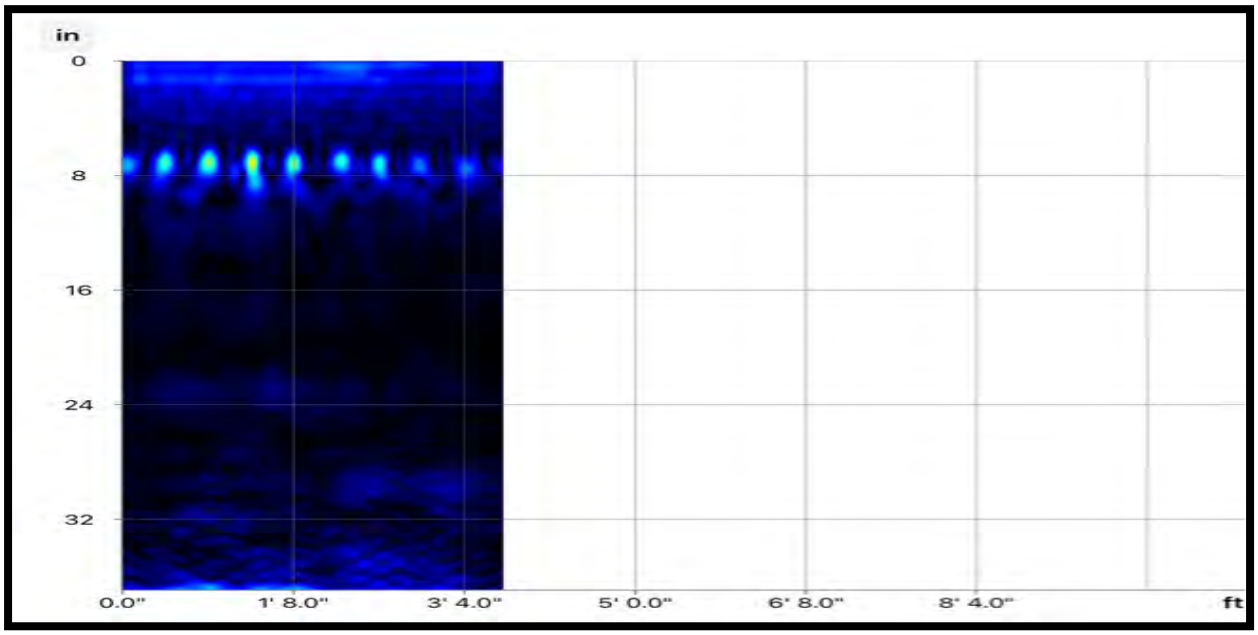
Beam Area of Concern 5



Beam D:6 to D:7 side scan with Proceq 8000 from the bottom of the beam going up. Visible in this image is the single mat of longitudinal reinforcement. (Beams D:7 to D:8 similar)

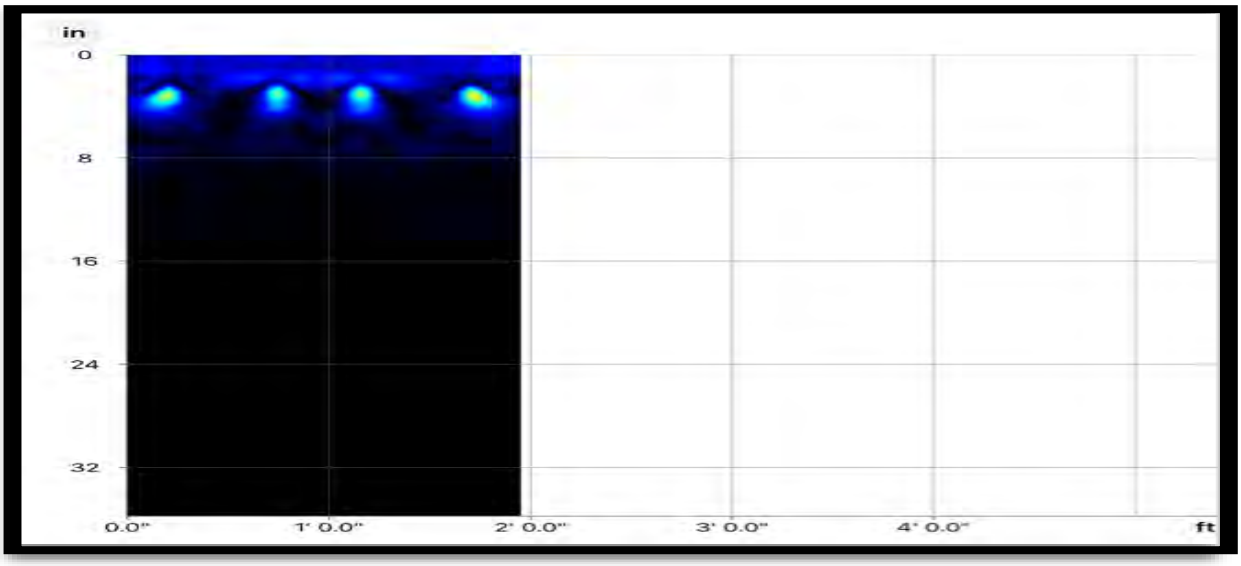


Beam D:6 to D:7 Shear scan with Proceq GP8000 at column D:7. Shear reinforcement is present in this image with an average spacing of 5 inches. (Beams D:7 to D:8 similar)



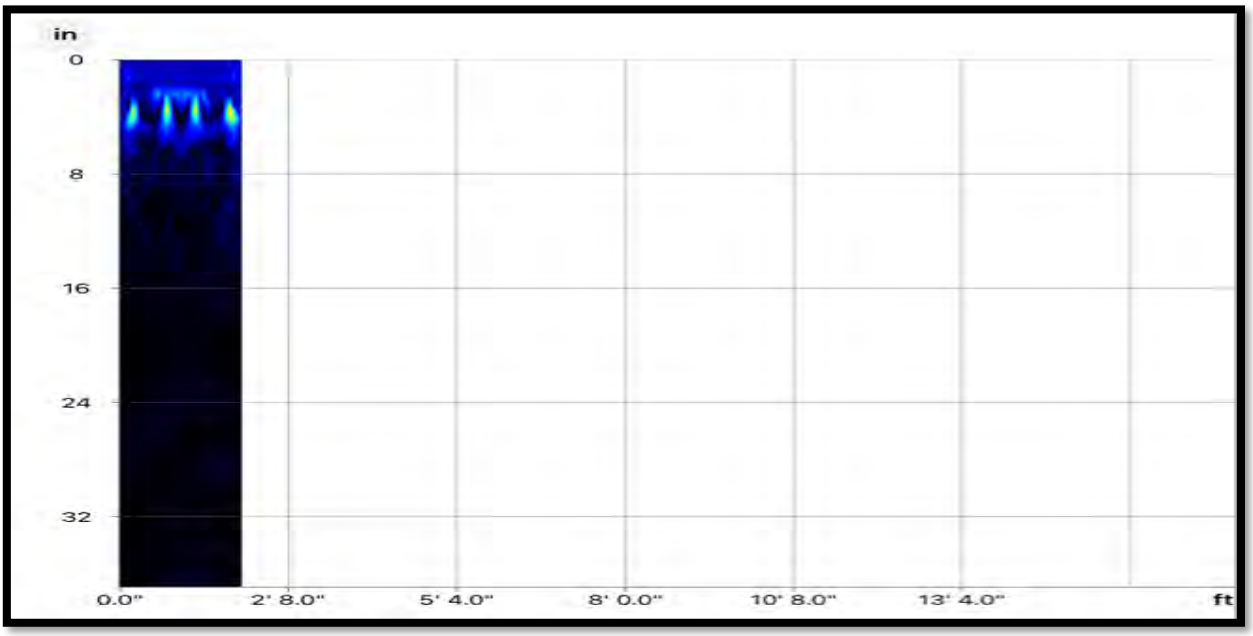
Beam D:6 to D:7 Shear scan with Proceq GP8000 at midspan. Shear reinforcement in this image shows an average spacing of 5 inches. (Beams D:7 to D:8 similar)

Beam Area of Concern 6

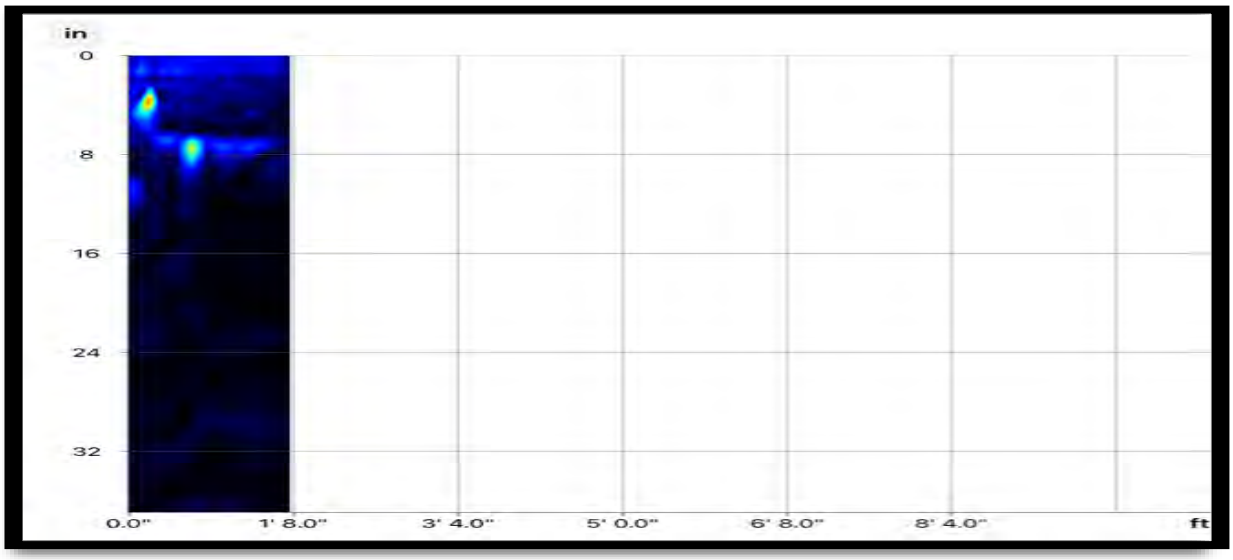


Beam D:14 to D:15 bottom scan with Proceq GP8000 for longitudinal reinforcement. This scan shows the 4 longitudinal strands in the singular mat for this beam.

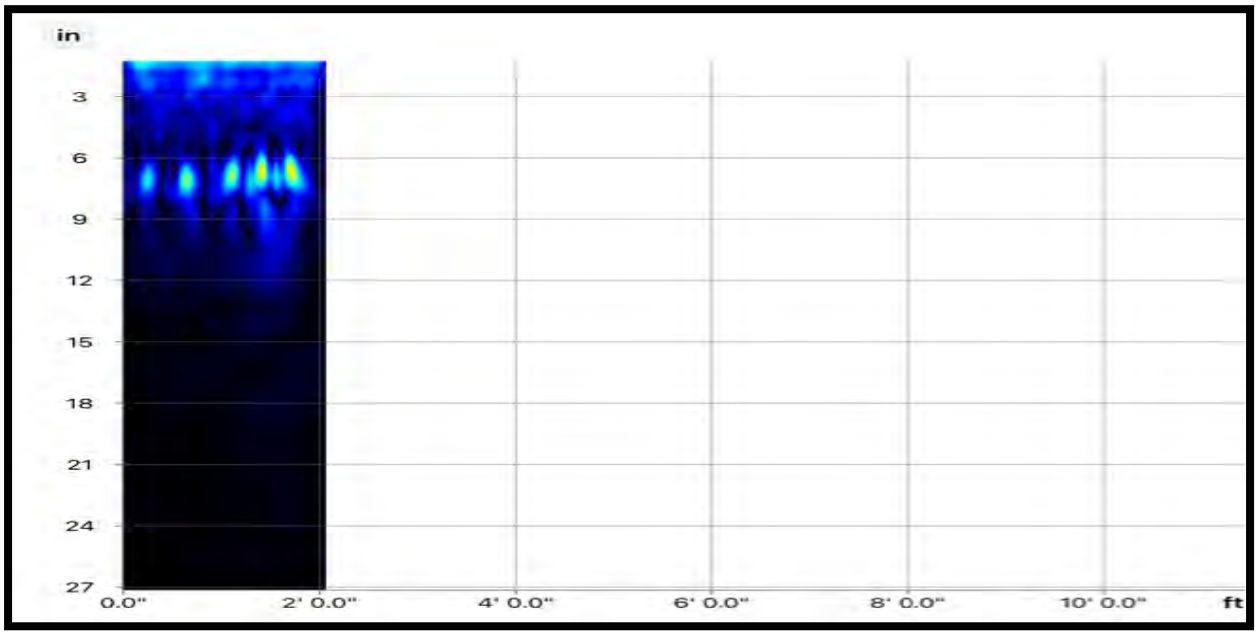
Beam Area of Concern 7



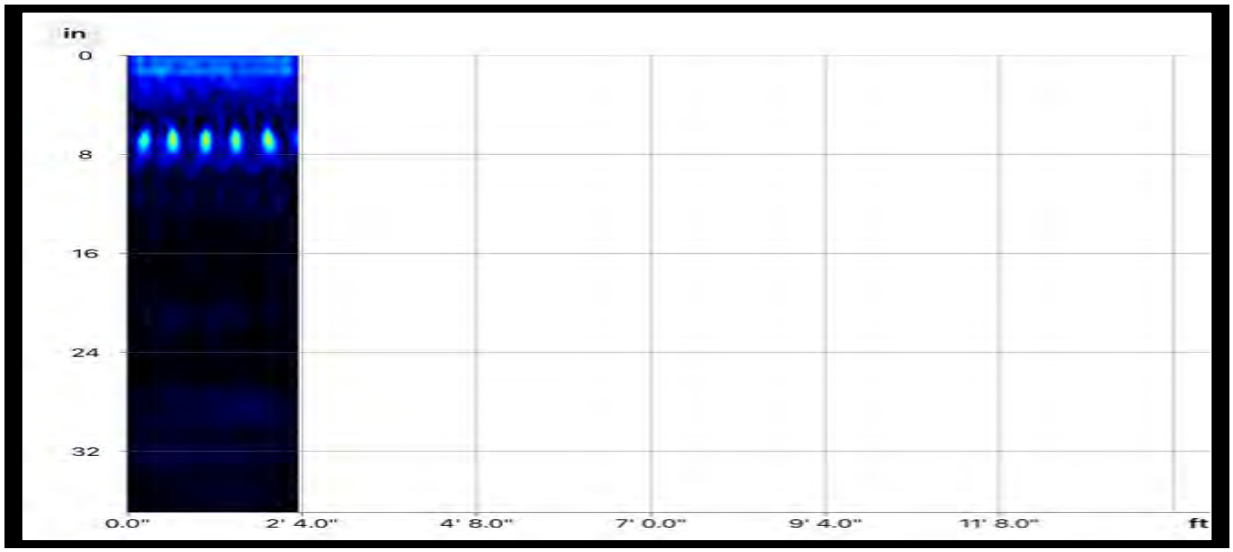
Beam D:17 to D:18 bottom scan with Proceq GP8000 for longitudinal reinforcement. Visible in this scan is the single mat of 4 strands.



Beam D:17 to D:18 side scan with Proceq GP8000 from the bottom of the beam going up. Visible in this scan is the single mat of longitudinal reinforcement and the A-Bar.

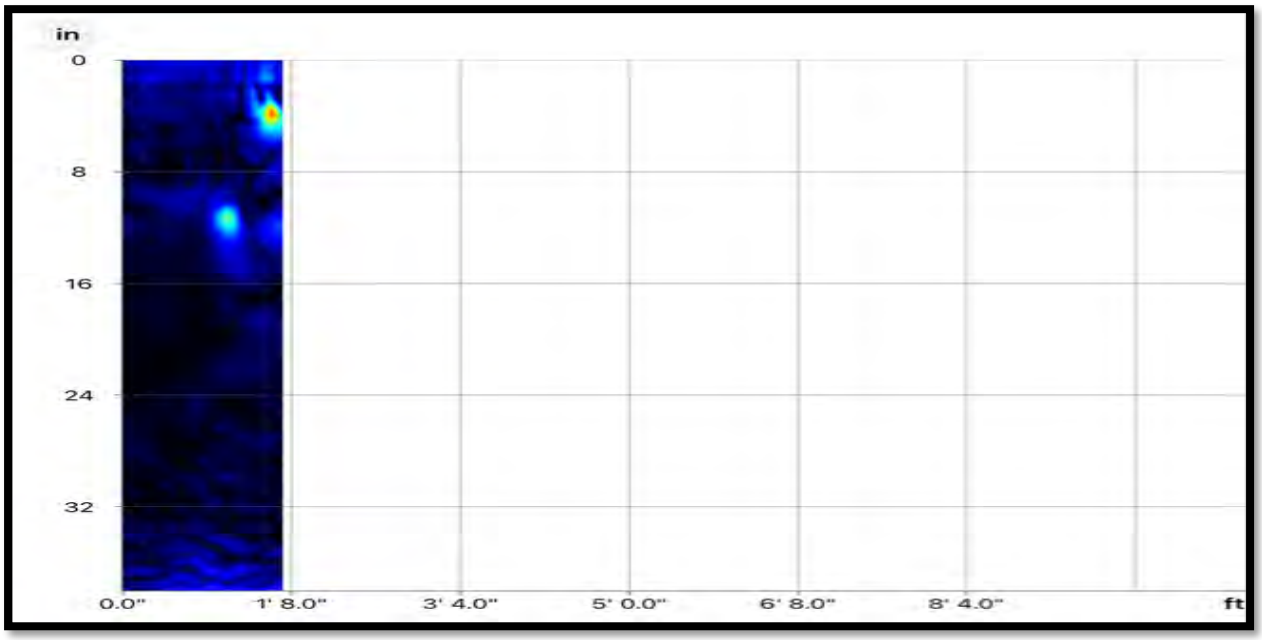


Beam D:17 to D:18 Shear scan with Proceq GP8000 at column D:18. Shear reinforcement is visible in this scan with an average spacing of 5 inches.

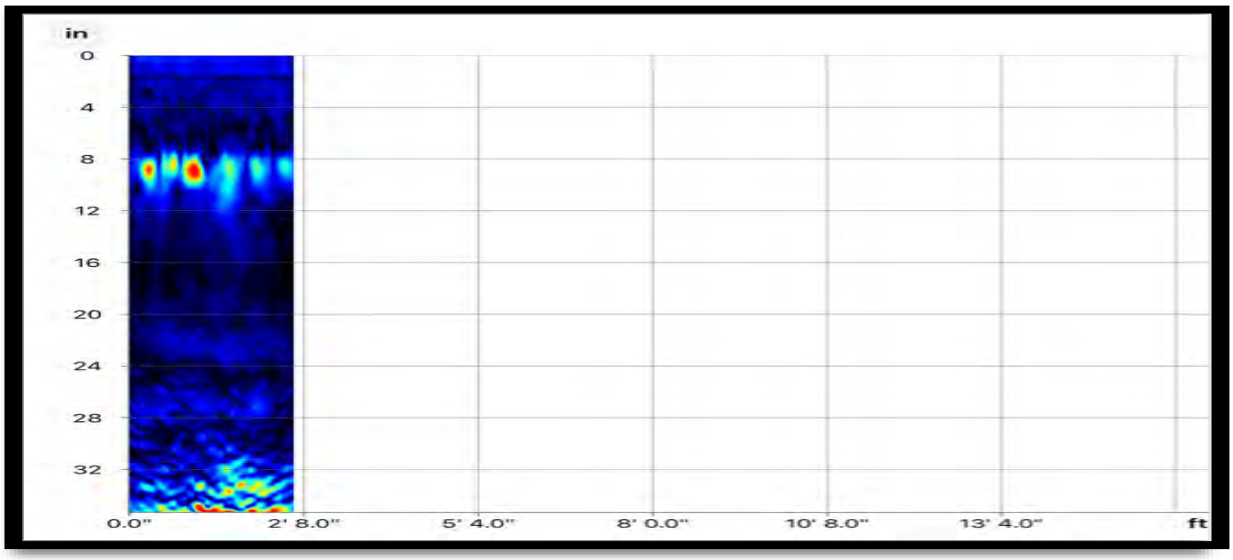


Beam D:17 to D:18 Shear scan with Proceq GP8000 at midspan. Visible in this scan is the shear reinforcement spaced at an average of 5 inches.

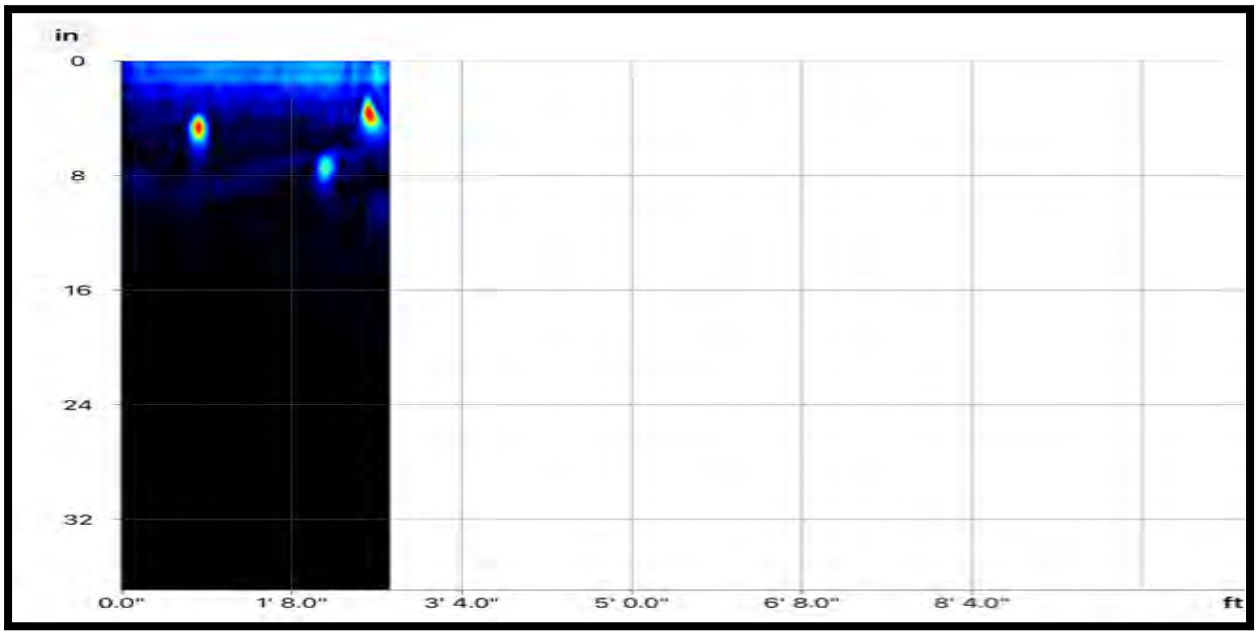
Beam Area of Concern 8



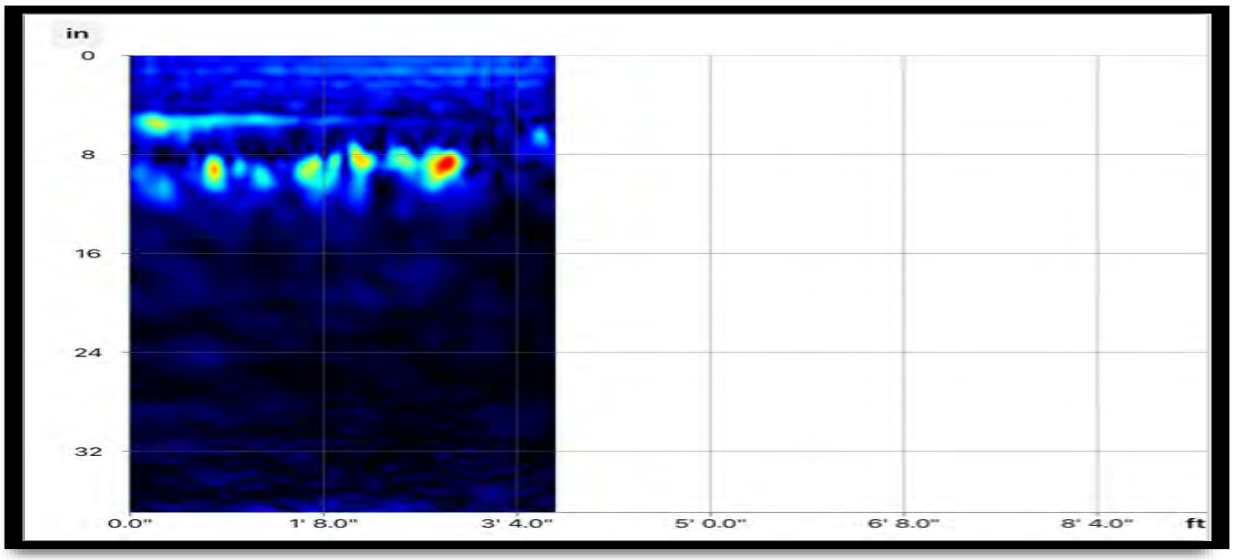
Beam C:4 to C:5 side scan with Proceq GP8000 from the top of the beam going down at column C:4. Visible in this scan is the single mat of longitudinal reinforcement and the A-Bar.



Beam C:4 to C:5 Shear scan with Proceq GP8000 at column C:4. Shear reinforcement is visible in this scan with an average spacing of 4 inches.

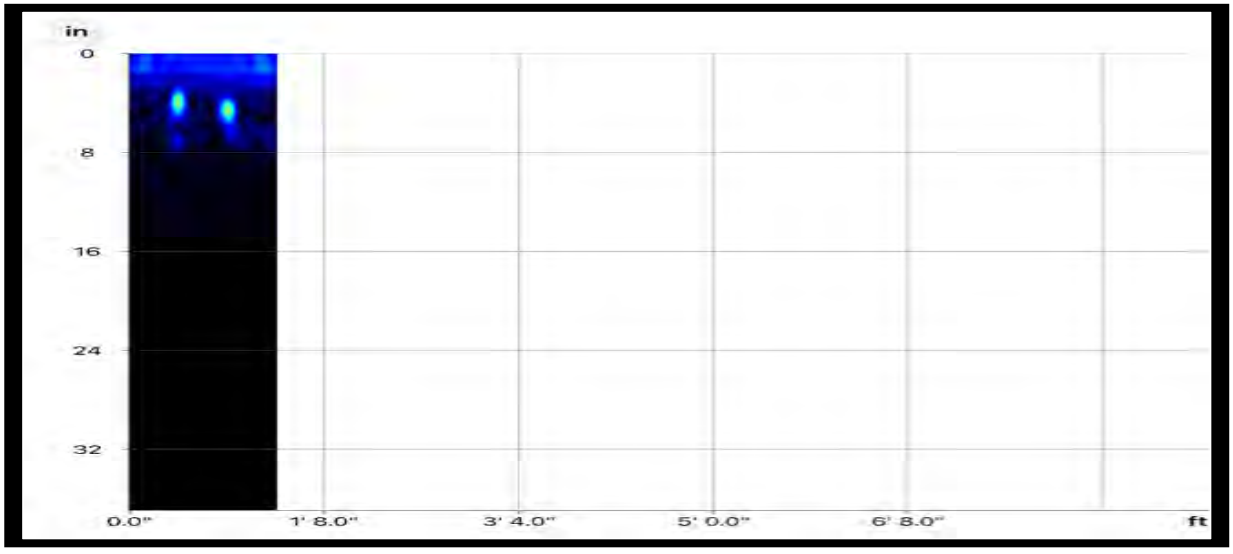


Beam C:4 to C:5 side scan with Proceq GP8000 from the top of the beam going down at column C:5. In this scan, there appears to be B-Bars and two mats of longitudinal reinforcement.



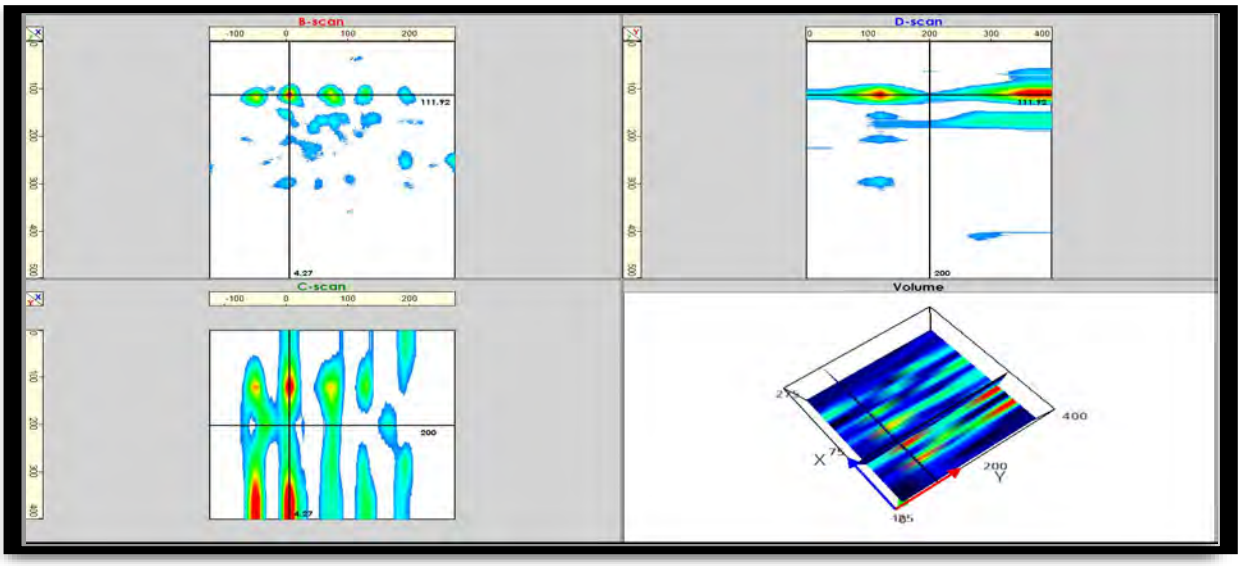
Beam C:4 to C:5 Shear scan with Proceq GP8000 at column C:5. Shear reinforcement is visible in this scan with an average spacing of 4 inches.

Other

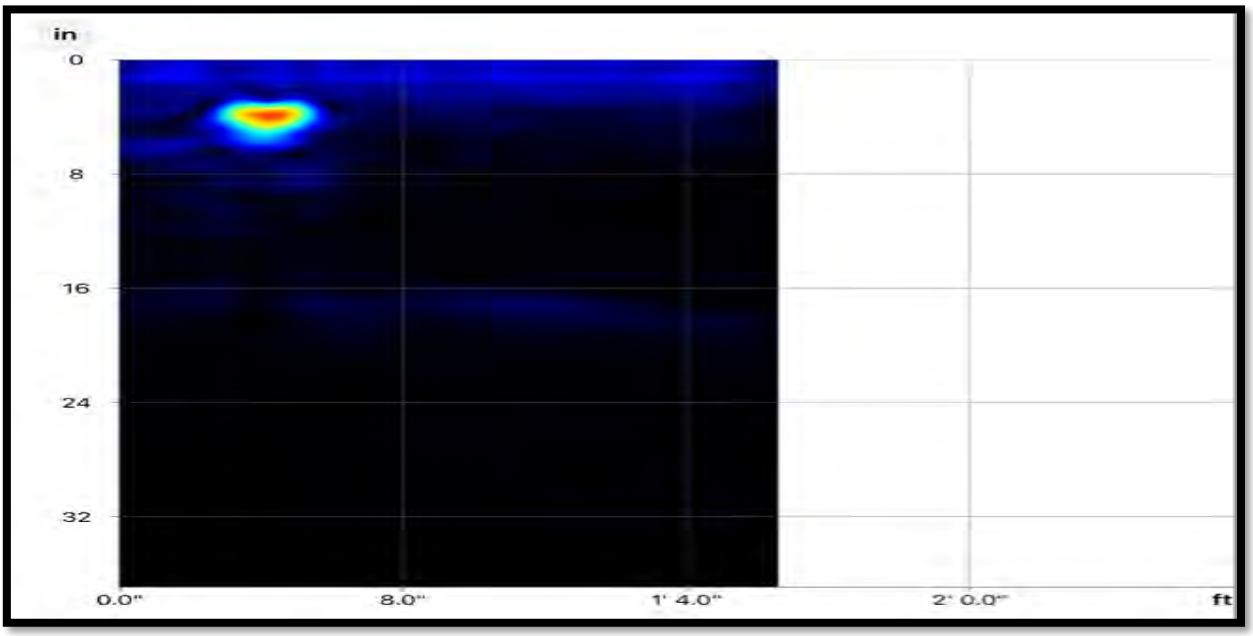


Beam E:8 to E:9 bottom scan with Proceq GP8000 for longitudinal reinforcement. Visible in this scan is a bottom mat of 2 strands. (All 16" x 28" 20-foot spans similar)

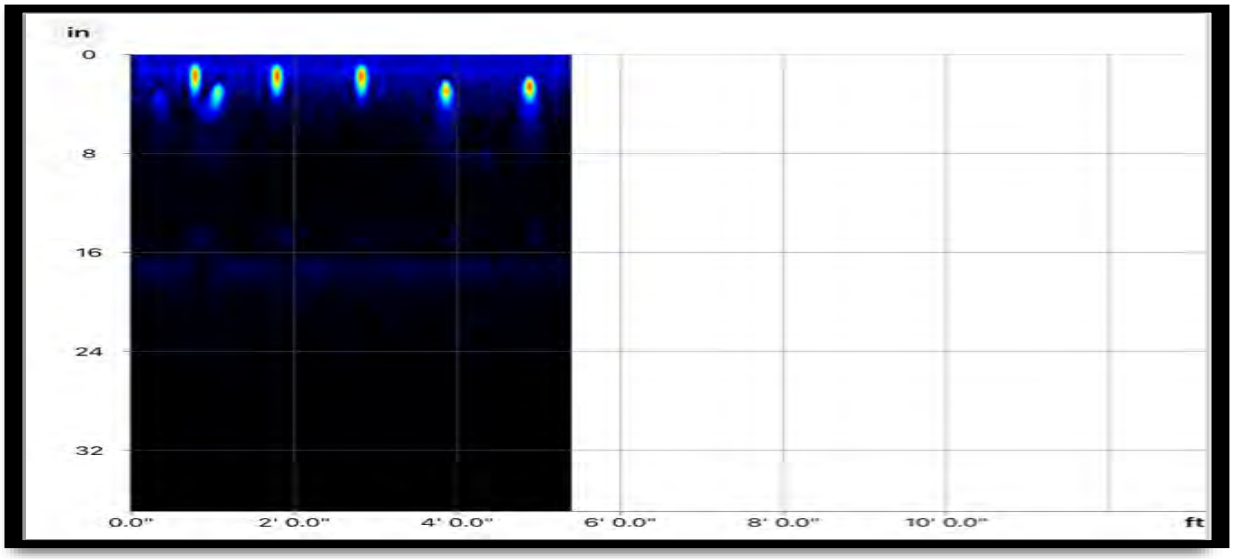
Beam Area of Concern 1 3rd Floor



Beam D:9 to E:9 bottom scan with A1040 MIRA for longitudinal reinforcement 1st mat of bars (3rd floor). In this scan, there is 1 mat of 5 strands visible.

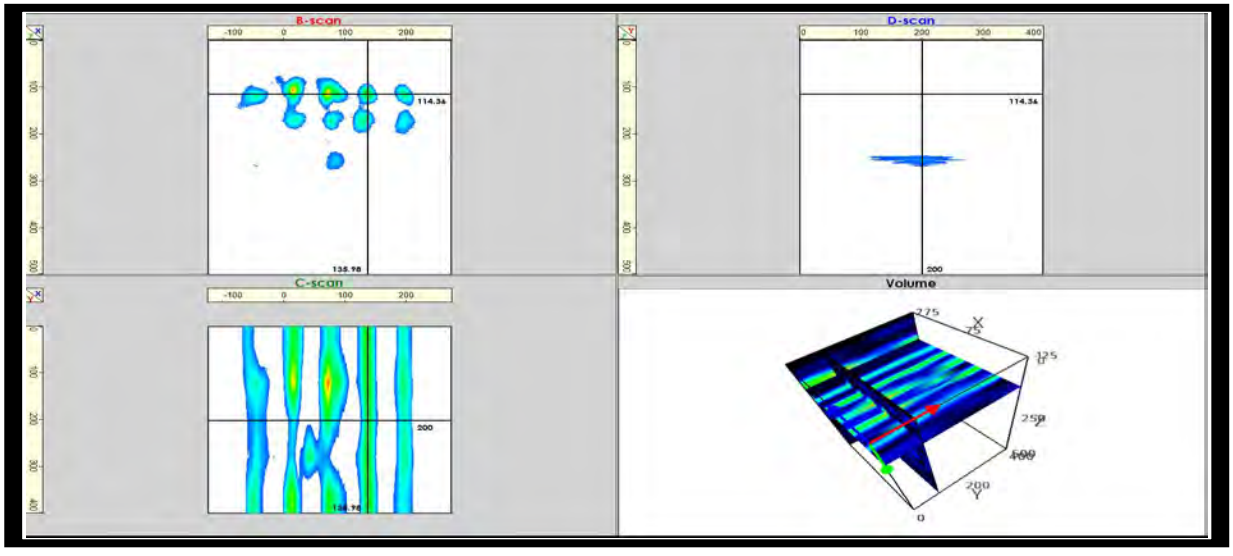


Beam D:9 to E:9 side scan with Proceq GP8000 from the bottom of the beam to the top 3rd floor. There appears to be 2 mats of longitudinal reinforcement present in this beam.

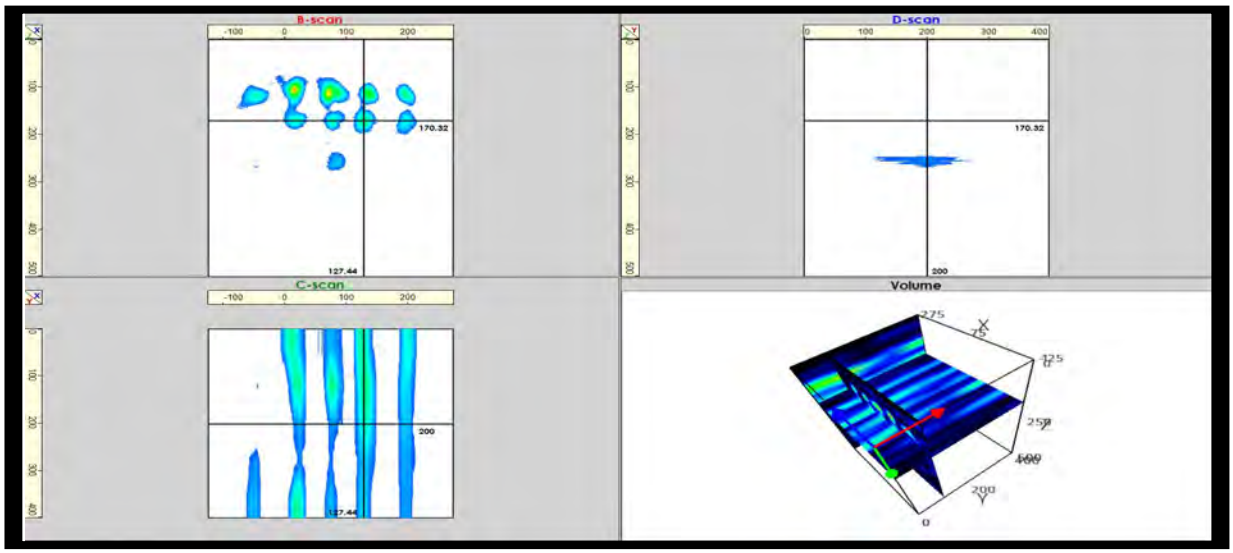


Beam D:9 to E:9 Shear scan with Proceq GP8000 at midspan 3rd floor. Visible in this scan is shear reinforcement spaced at an average of 12 inches.

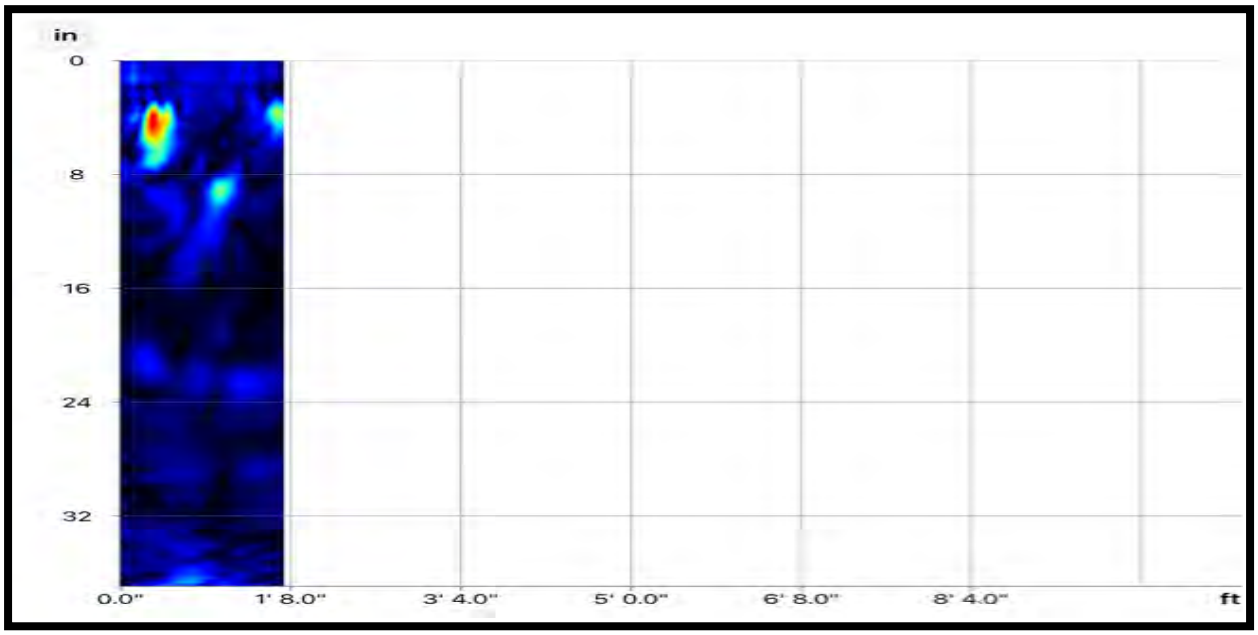
Beam Area of Concern 2 3rd Floor



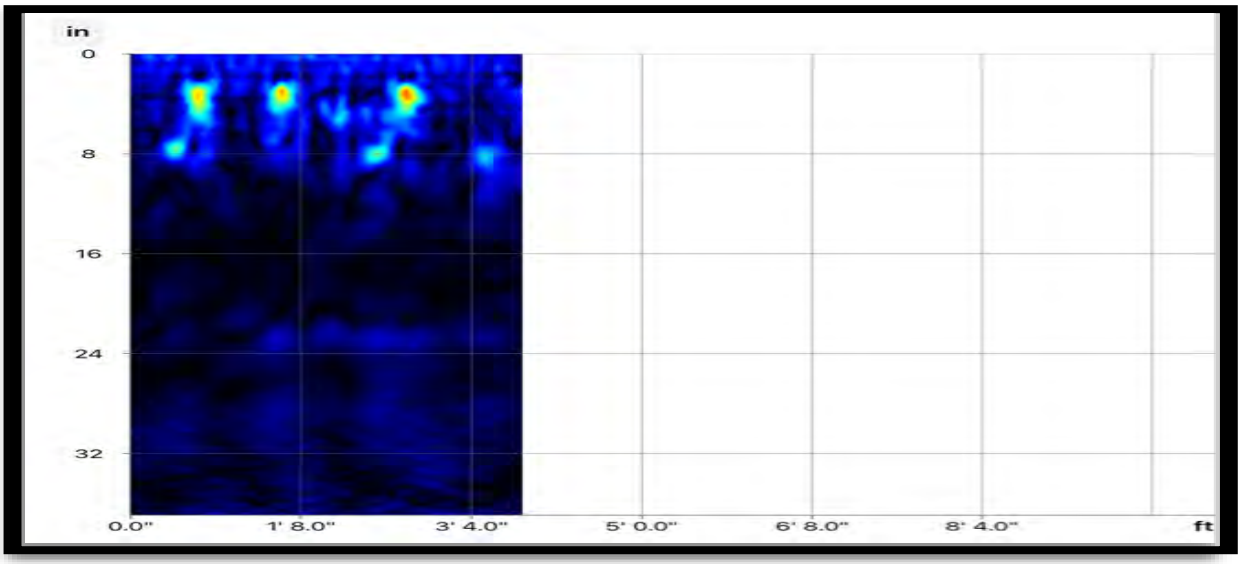
D2:18 to D:18 bottom scan with A1040 MIRA for longitudinal reinforcement 1st mat of bars. In this scan, there is the bottom mat of 5 strands clearly visible.



D2:18 to D:18 bottom scan with A1040 MIRA for longitudinal reinforcement 2nd mat of bars. There appears to be a second mat of 5 strands also visible in this scan.

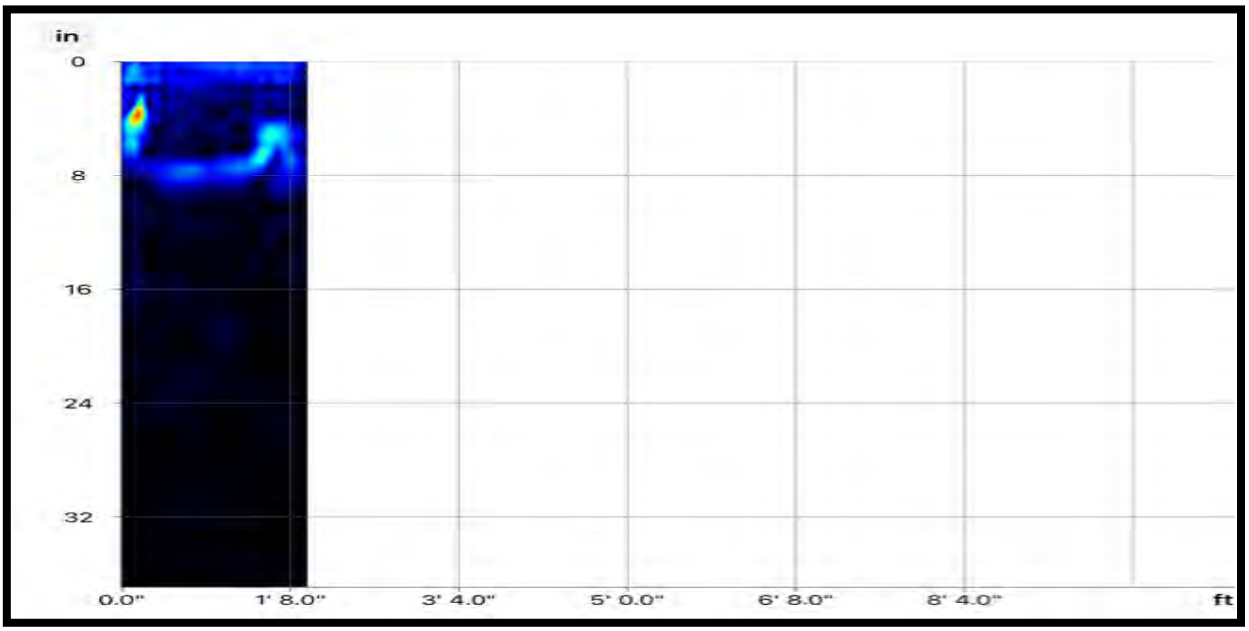


Beam C1:18 to D:18 side scan with Proceq GP8000 from the bottom to the top of the beam 3rd floor. Visible in this scan are two mats of longitudinal reinforcement as well as B-Bars.

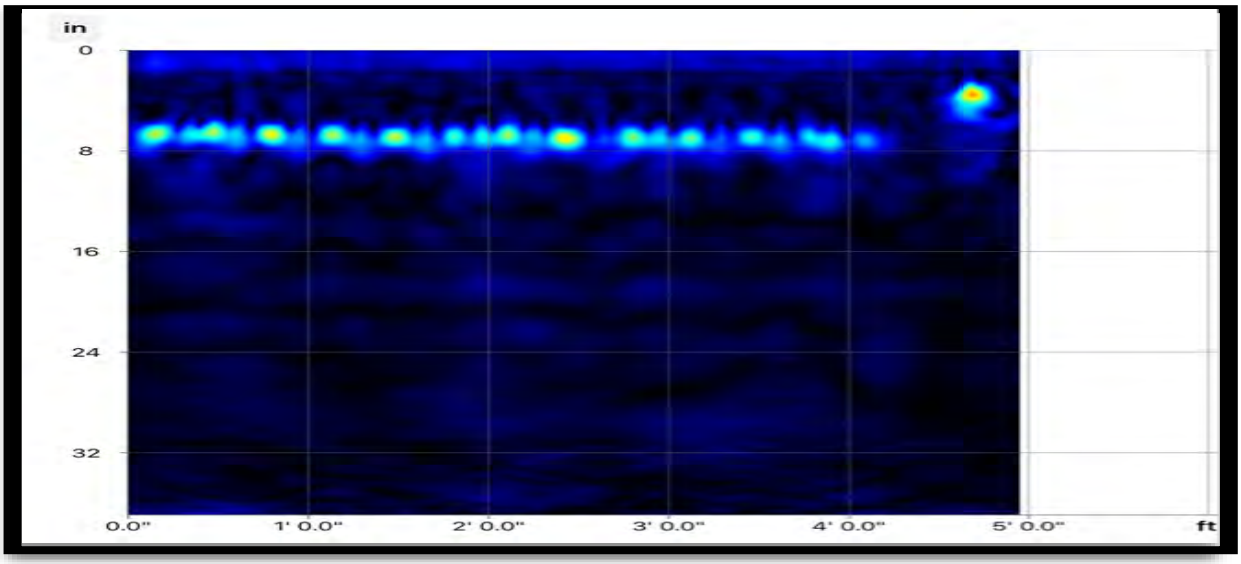


Beam C1:18 to D:18 Shear scan with Proceq GP8000 at column D:18 3rd floor. Shear reinforcement is visible in this scan with an average spacing of 12 inches.

Beam Area of Concern 4 2nd Floor



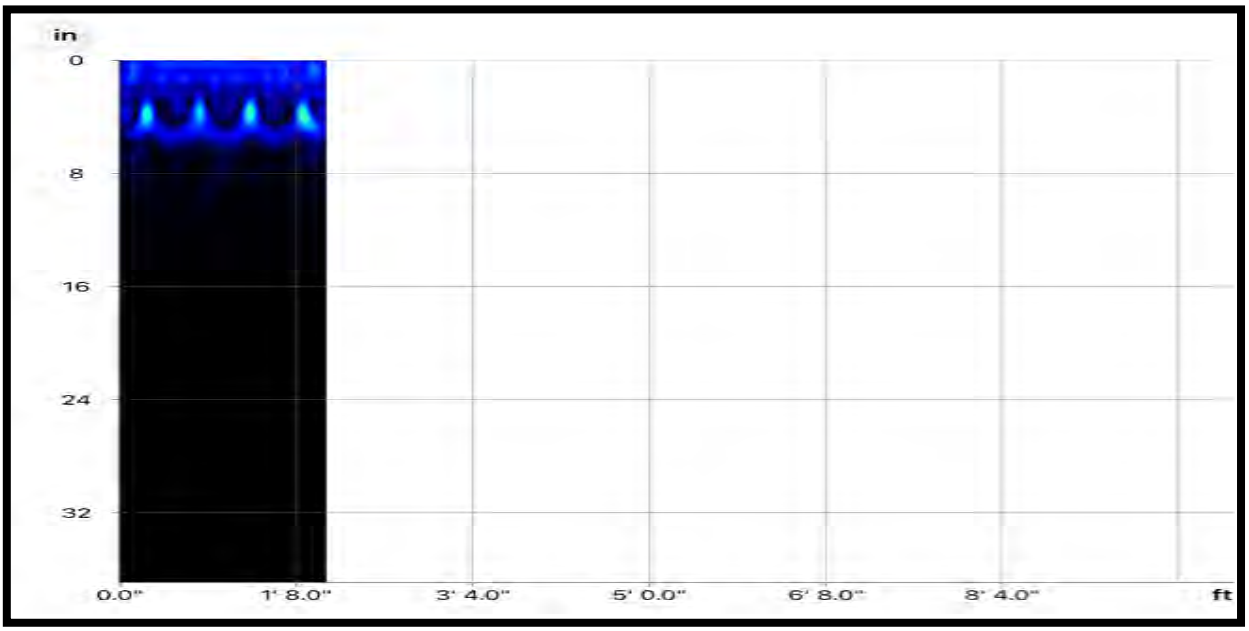
Beam E:15 to E:17 side scan with Proceq GP8000 from the bottom of the beam to the top 3rd floor. Visible in this picture is the one mat of longitudinal reinforcement and the B-Bar.



Beam E:15 to E:17 Shear scan with Proceq GP8000 at column E:15 3rd floor.

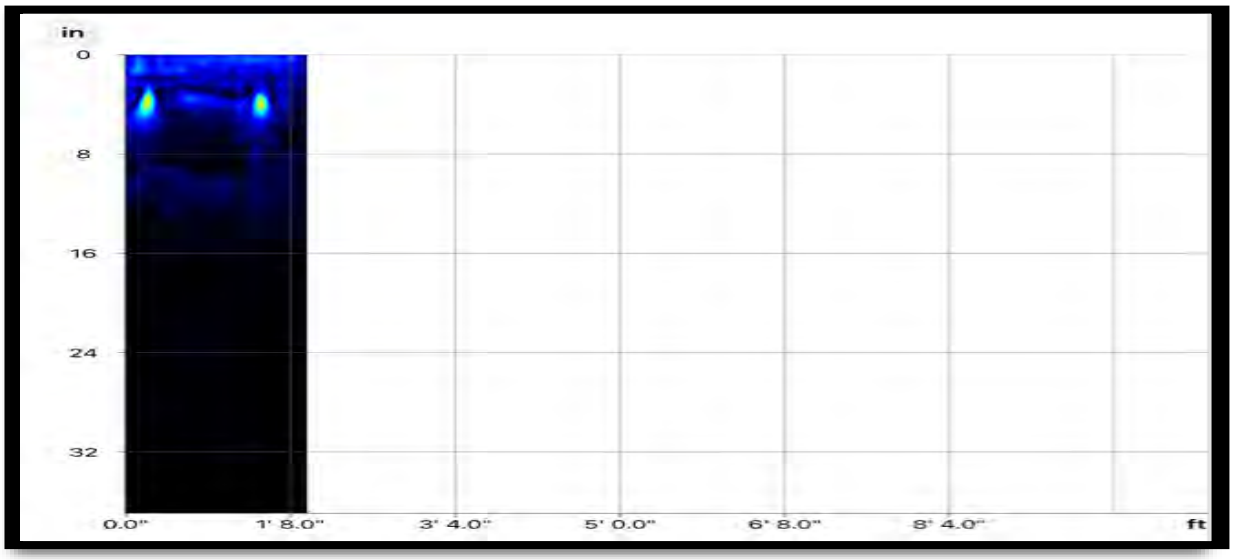
Shear reinforcement is visible with an average spacing of 4 inches.

Beam Area **o**f C**oncern** 5 **2nd** F**loor**

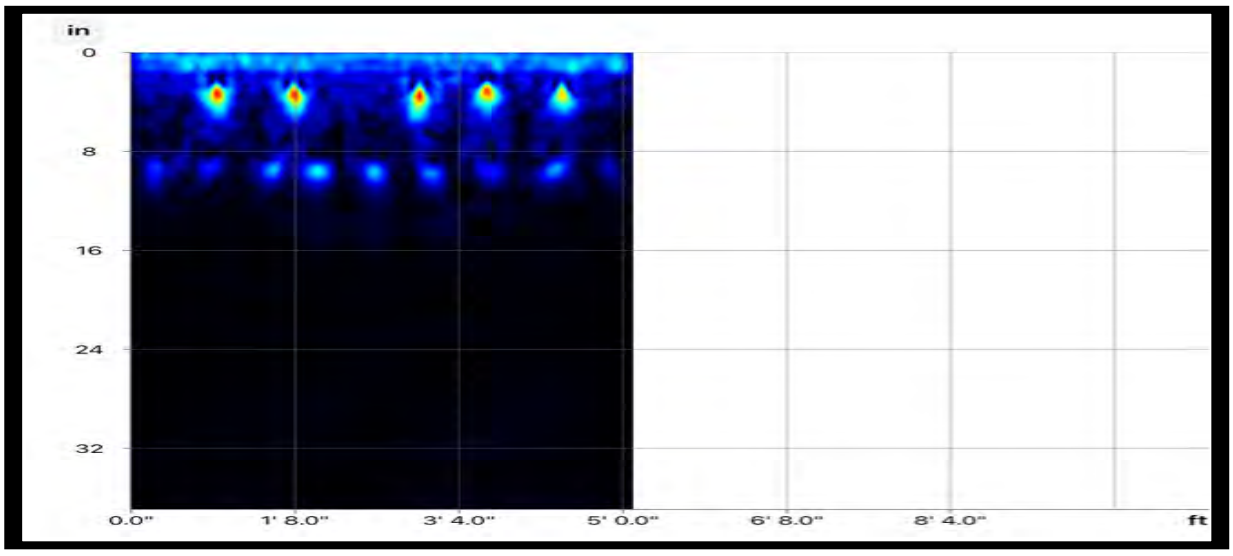


Beam D:7 to D:8 bottom scan with Proceq GP8000 for longitudinal reinforcement

3rd floor. Visible in this scan is one mat of 4 longitudinal strands.

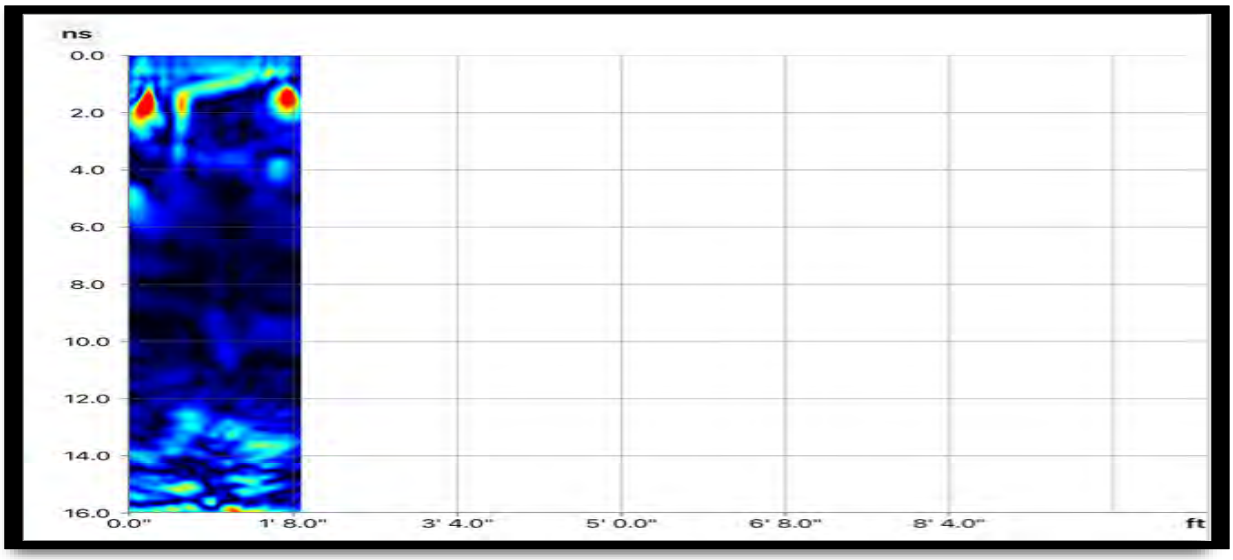


Beam D:7 to D:8 side scan with Proceq GP8000 from the bottom of the beam to the top 3rd floor. Visible in this scan is one mat of longitudinal reinforcement and B-Bars.

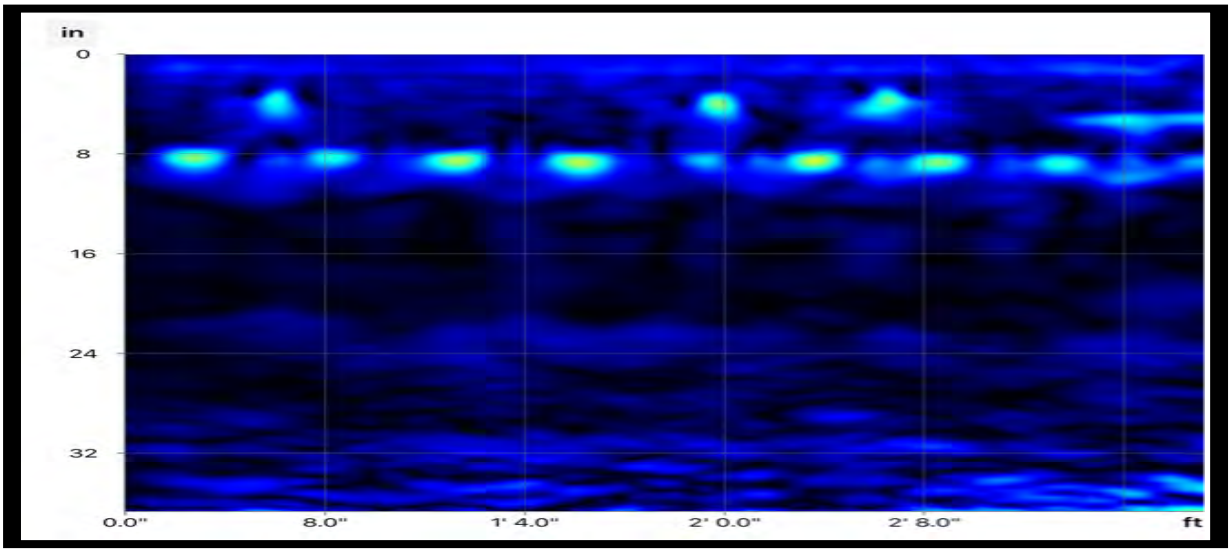


Beam D:7 to D:8 Shear scan with Proceq GP8000 at midspan 3rd floor. Two different shear reinforcements are visible in this scan. The normal shear reinforcement is present with an average spacing of 5 inches. There is also an additional shear reinforcement present with a 12 inch average spacing.

Beam Area of Concern 7 2nd Floor

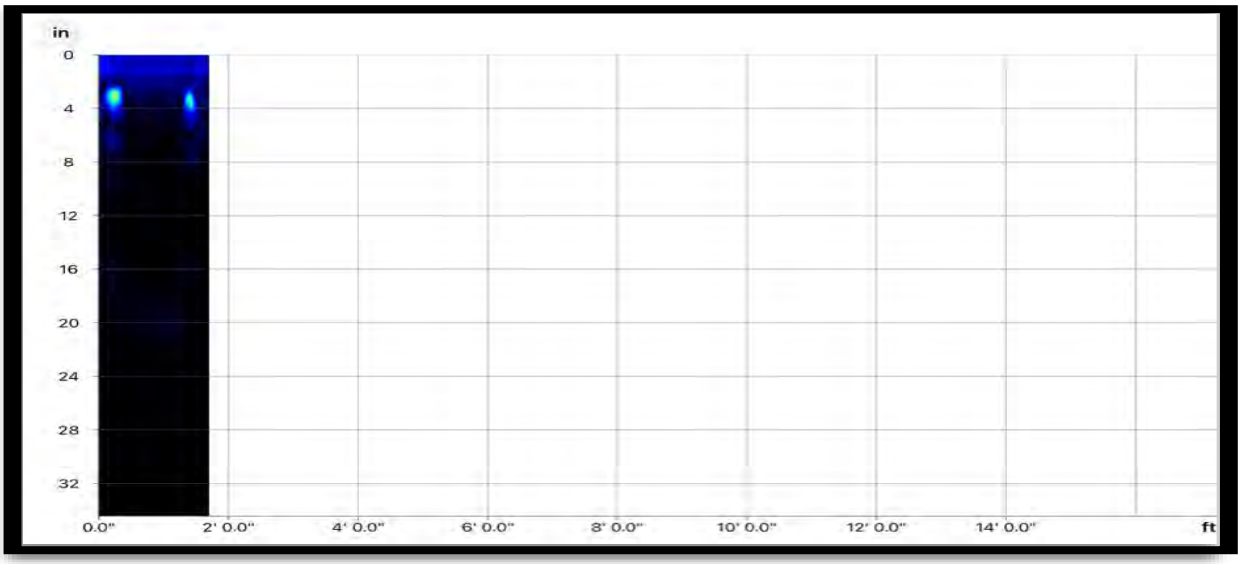


Beam D:17 to D:18 side scan with Proceq GP8000 from the bottom of the beam to the top 3rd floor. Visible in this scan is the single mat of longitudinal reinforcement as well as the B-Bars.

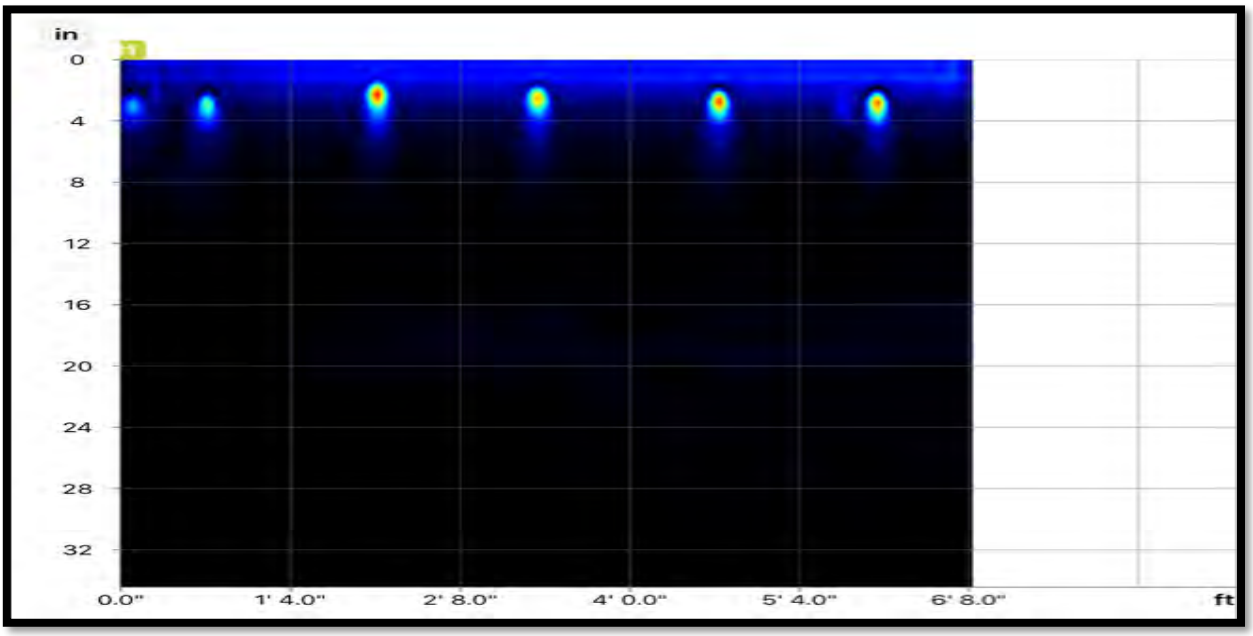


Beam D:7 to D:8 Shear scan with Proceq GP8000 at midspan 3rd floor. Two different shear reinforcements are visible in this scan. The normal shear reinforcement is present with an average spacing of 5 inches. There is also an additional shear reinforcement present with a 12 inch average spacing.

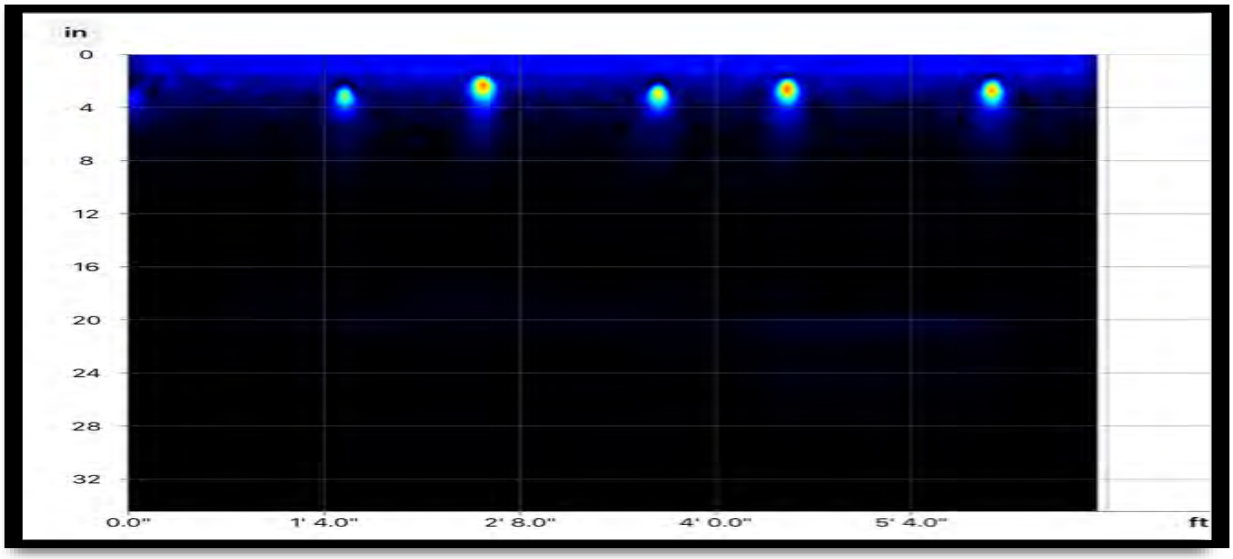
Column Type A



Column E1:17 Longitudinal scan with Proceq GP8000. Visible are two longitudinal bars. (E2:17, D:14, C:14 similar)

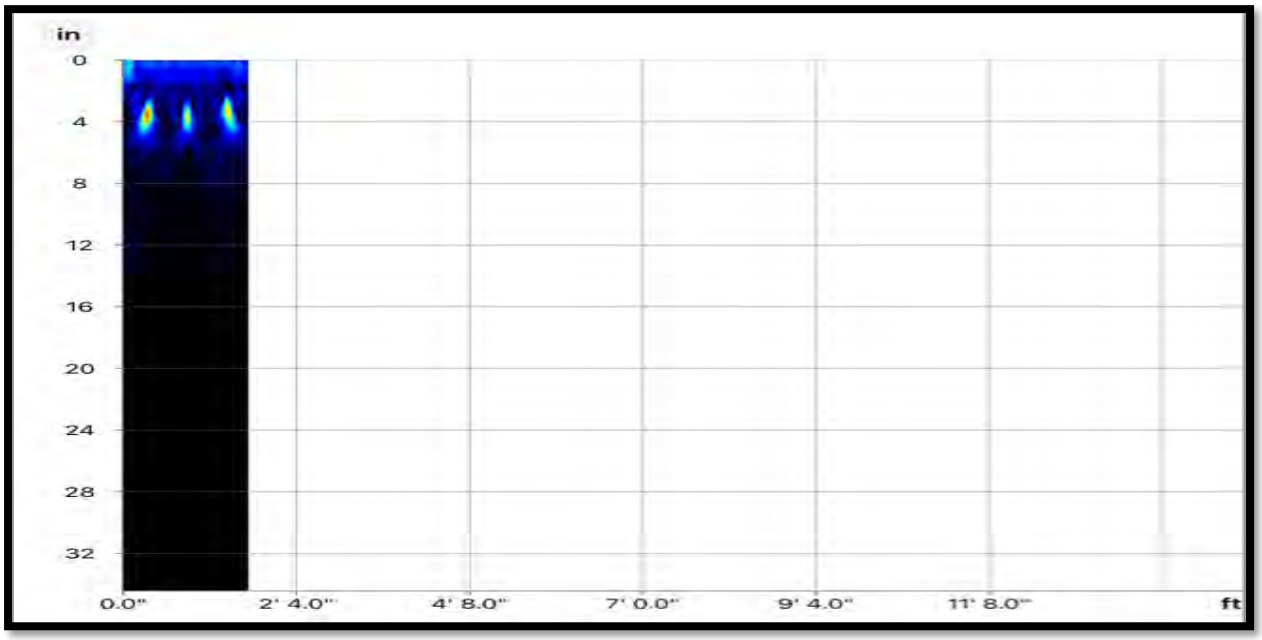


Column E1:17 Shear scan with Proceq GP8000 from bottom to top. Visible are shear bars with an average spacing of 16 inches. (E2:17 similar)

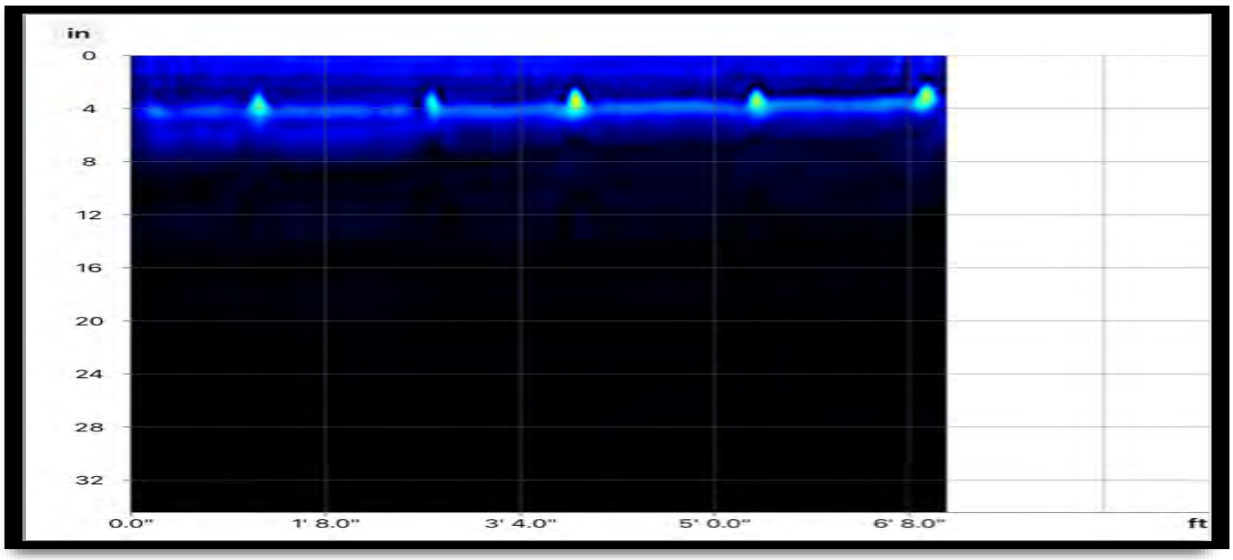


Column D:**14 Shear scan** with **Proceq** GP8000 **from bottom to top**. Shear reinforcement is present with an average spacing of 14 inches. (C:**14 similar**)

Column Type **B**

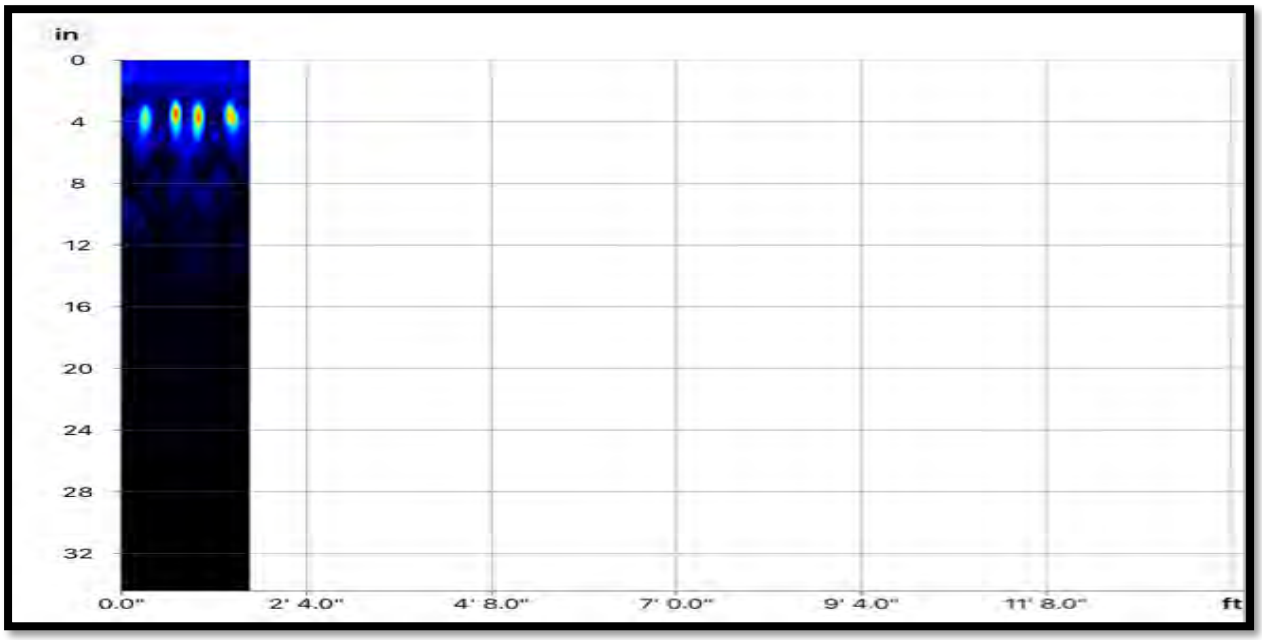


Column G:9 **Longitudinal** scan with Proceq GP8000. Present are three longitudinal bars. (H:9 **similar**)

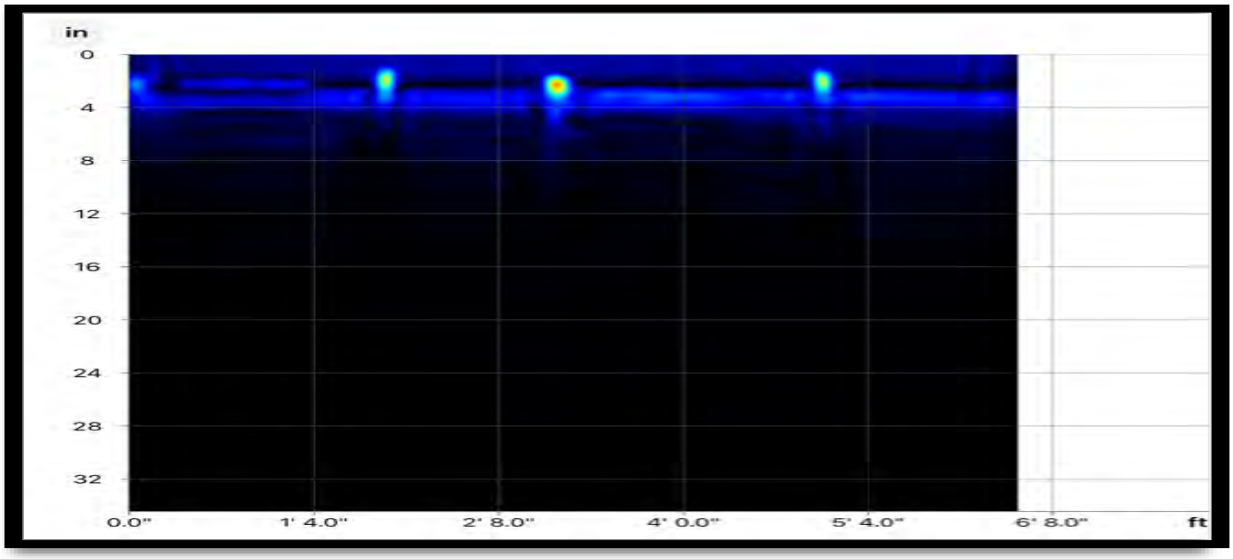


Column G:9 Shear scan with Proceq GP8000 from bottom to top. Shear reinforcement is present with an average spacing of 12 inches. (H:9 similar)

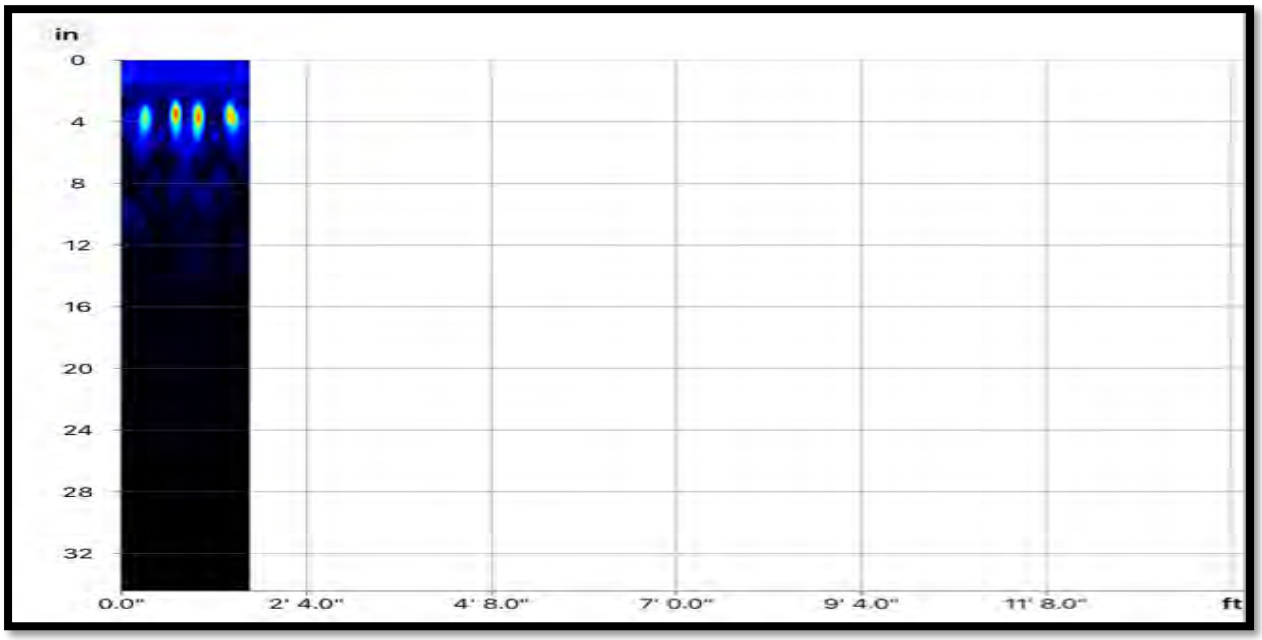
Column Type C



Column D:2 **Longitudinal** scan with Proceq GP8000. Present are 4 longitudinal bars. (D:**4**, D:**1**5, D:**1**7 **similar**)

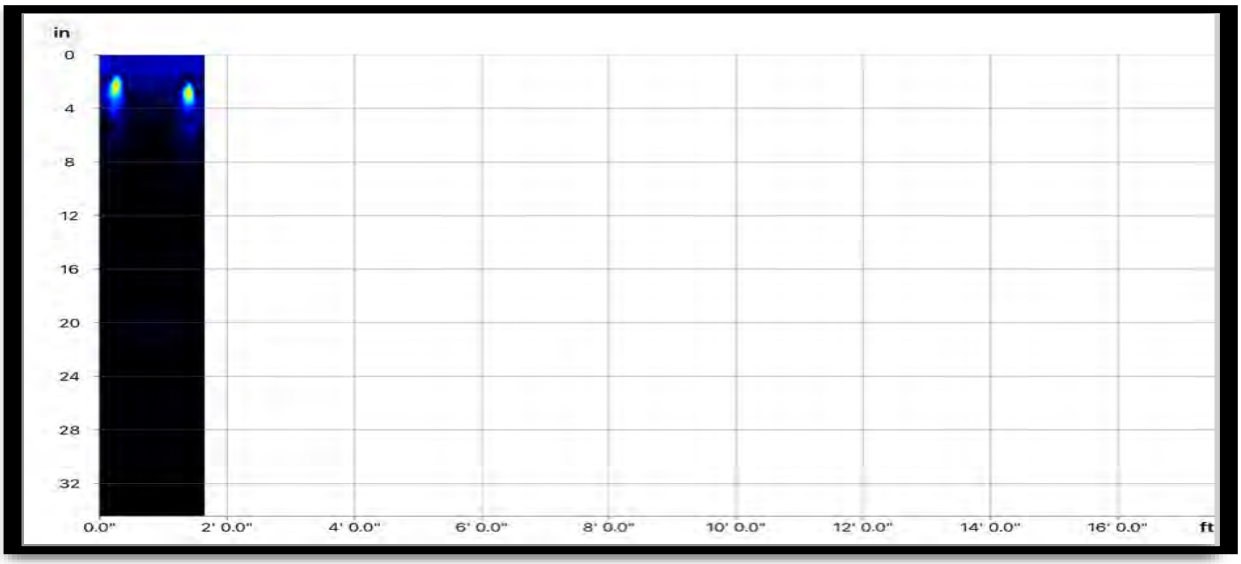


Column D:2 Shear scan with Proceq GP8000 from bottom to top. Shear reinforcement are present with an average spacing of 20 inches. (D:4 similar)

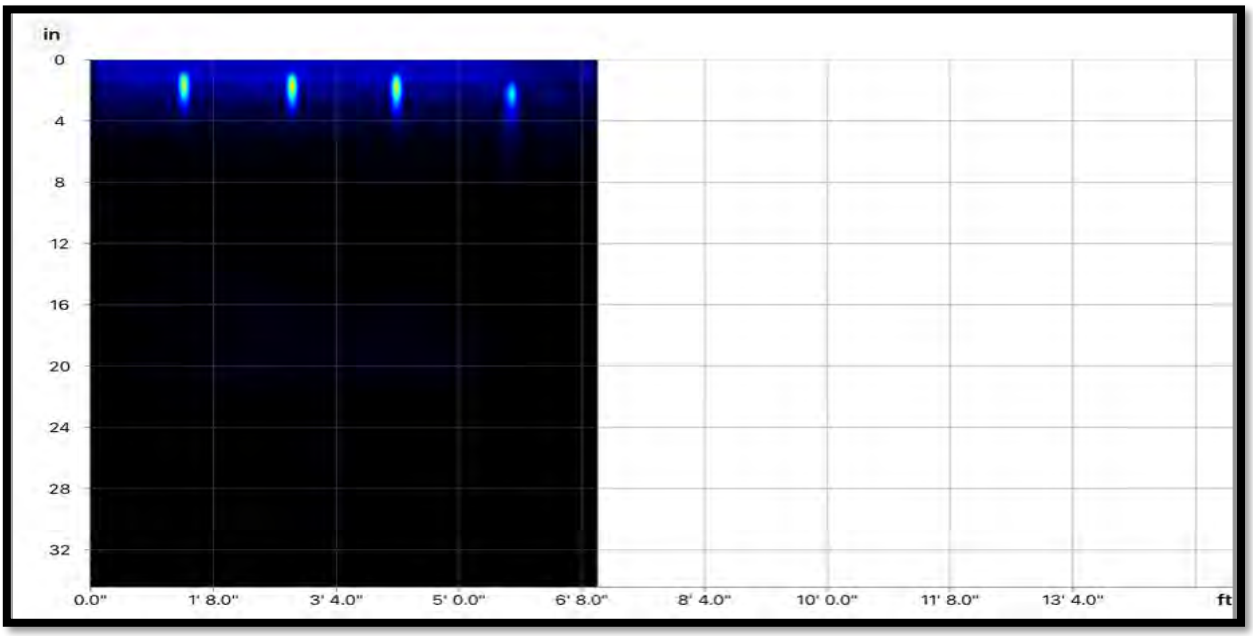


Column D:15 Shear scan with Proceq GP8000 from bottom to top. Four longitudinal bars are present. (D:17 similar)

2nd Floor Column Type A

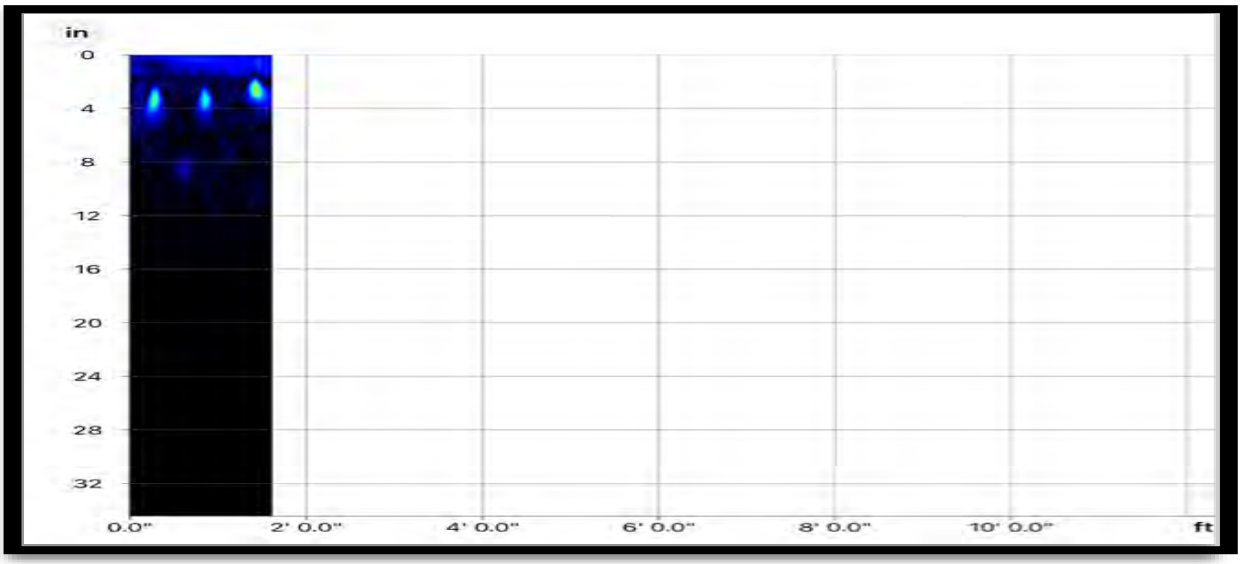


Column D:**14 Longitudinal** scan with Proceq GP8000 **2nd Floor**. Two **longitudinal bars are present**. (C:14 **similar**)

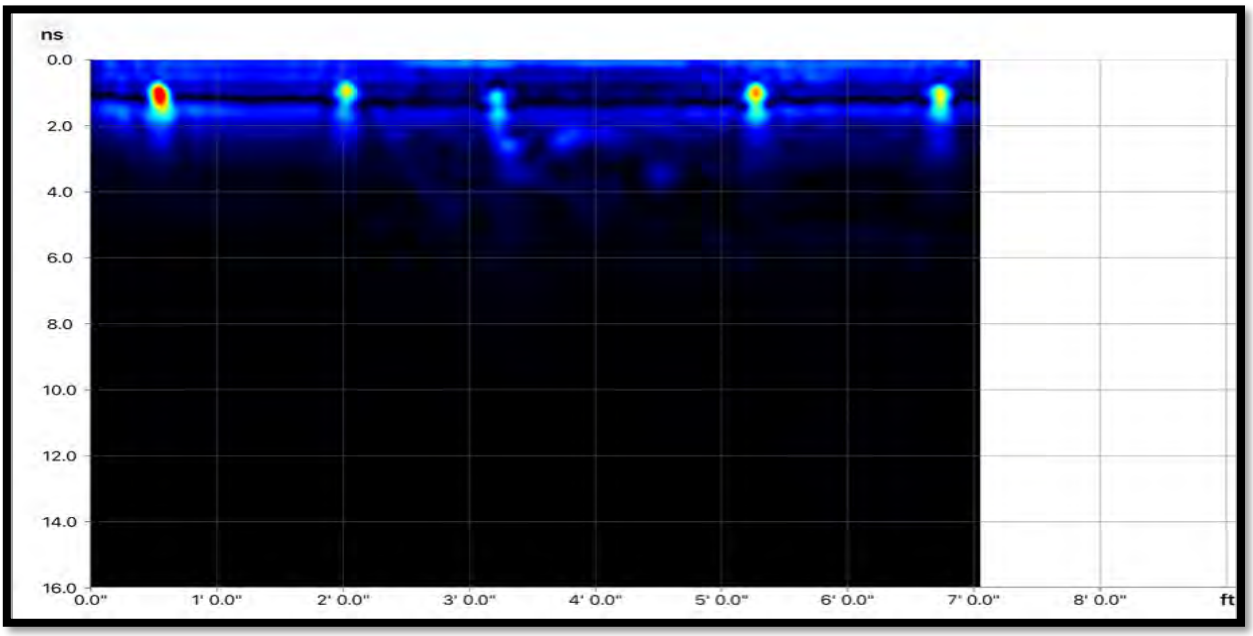


Column D:**14 Shear scan** with GP8000 **from bottom to top 2nd Floor**. **Shear reinforcement is present with an average spacing of 18 inches**. (C:**14 similar**)

2nd Floor C**olumn** Type B

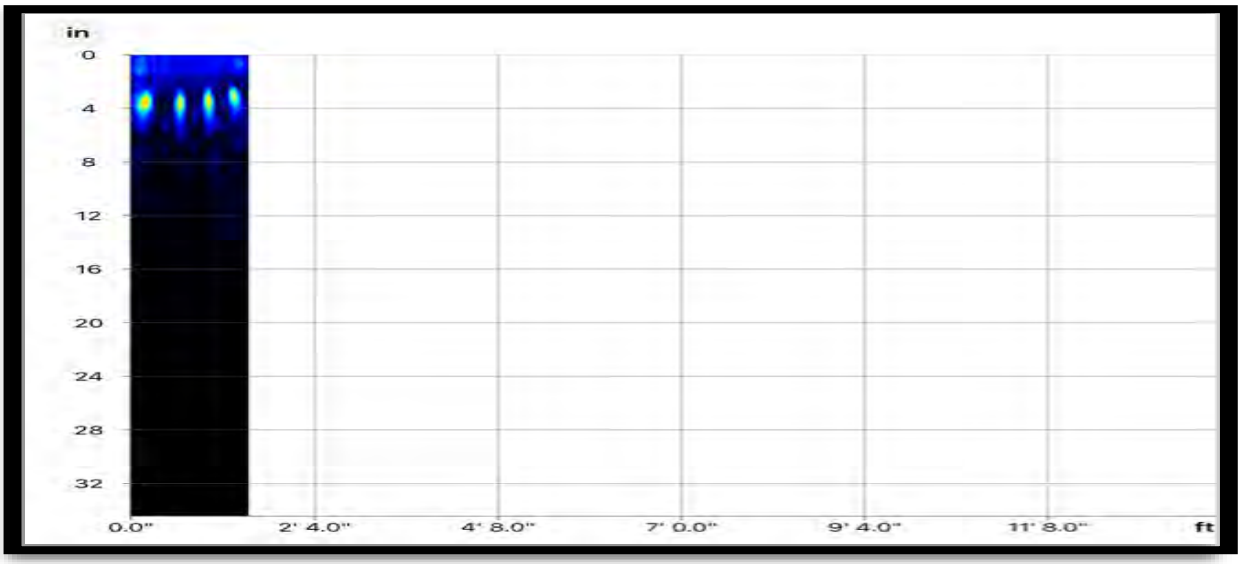


C**olumn** G:9 **Longitudinal** scan with Proceq GP8000 **2nd** F**loor**. Th**ree longitudinal bars are present**. (H:9 **similar**)

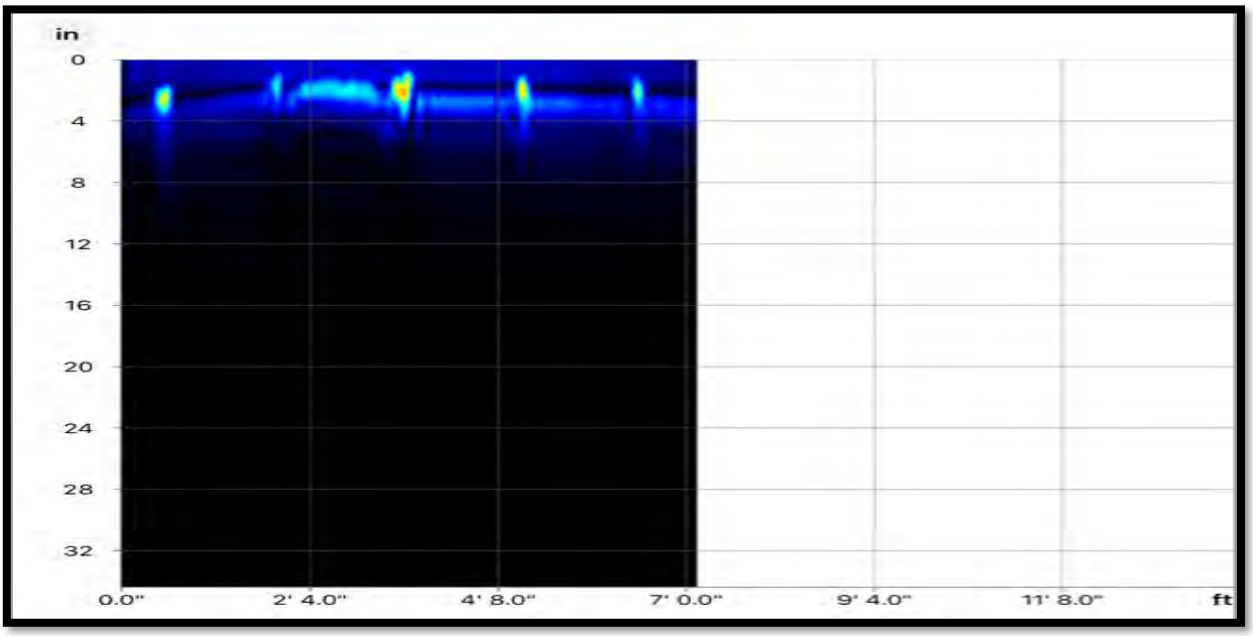


C**olumn** G:9 **Shear scan** with P**roceq** GP8000 f**rom bottom to top 2nd Floor. Shear reinforcement is present** with **an average spacing of 18 inches**. (H:9 **similar**)

2nd Floor Column Type C



Column D:2 **Longitudinal** scan with Proceq GP8000 **2nd Floor**. **Four longitudinal bars are present with an average spacing of 18 inches**. (D:**4**, D:**1**5, D:**1**7 **similar**)



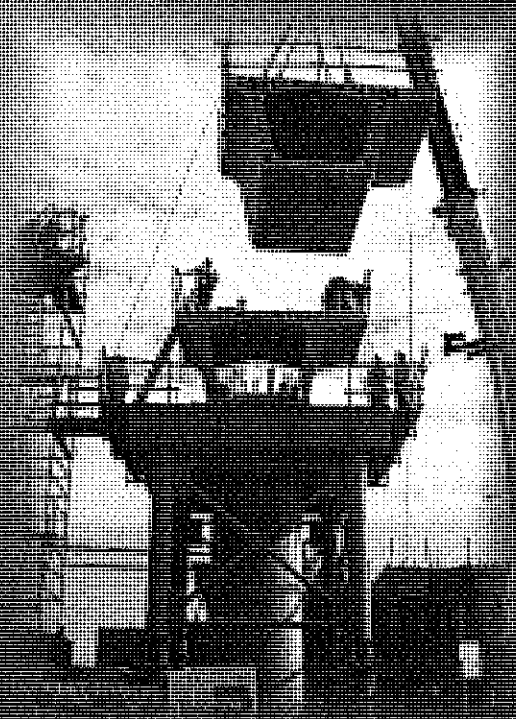
Column D:2 **Shear scan** with **Proceq** GP8000 **from bottom to top 2nd Floor**. **Shear reinforcement is present with an average spacing of 18 inches**. (D:4, D:15, D:17 **similar**)

APPENDIX “D” TO SPECIAL PROVISIONS

MD TRANSIT CONSTRUCTION SAFETY MANUAL

Miami-Dade Transit

Construction Safety Manual



MIAMI-DADE TRANSIT

MIAMI, FLORIDA

CONSTRUCTION SAFETY MANUAL

Revision No. 6

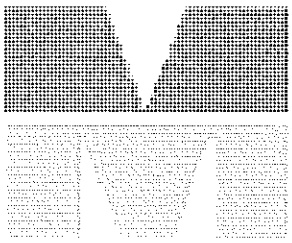
May 2012

6/4/2012
Date

Approved By:
James A. Sumoski
Construction Manager 3
MDT Construction

6/7/12
Date

Approved By:
Eric Muntan
Chief, MDT
Office of Safety and Security



MIAMI–DADE
TRANSIT

111 Northwest 1st Street, Suite 910, Miami, Florida 33128-1999

Policy Statement

It is the policy of the Miami-Dade Transit (MDT) and Miami-Dade County (MDC) to maintain a safe working environment for all employees and the public. The Construction Safety Program has been designed in accordance with the William-Steiger Occupational Safety and Health Act of 1970. The success of the safety program requires the full support of every employee and contractor working on the MDT system.

Regardless of the urgency or monetary cost of a job; all safety precautions must be observed. Prevention of personal injury or damage to property and equipment must always remain paramount in the minds of every employee and contractor.

PREFACE

THE CONSTRUCTION SAFETY MANUAL (CSM) is one of the Miami-Dade County (MDC) Contract Documents. Contractors are required to assure that all employees, subcontractors, and their suppliers / vendors, while on the work site and in the conduct of MDC contractors, comply with the provisions of the CSM and the minimum standards set forth under the William-Steiger Occupational Safety and Health Act of 1970 and as amended, the Construction and General Industry Standards (29CFR1926/1910), and all other applicable Federal, State and Local laws. The Contractors are expected to be familiar with the contents applicable to their operations. The provisions set forth in this CSM will be strictly enforced. Non-compliance with the CSM will be treated the same as non-compliance with any contract provision. Willful or repeated noncompliance shall result in the suspension of part or all work.

Safety at the work site shall be the sole responsibility of the Contractor. The CSM shall be used as a guide in developing the Contractor's Accident Prevention Program. The Contractor shall assume full responsibility for compliance with all applicable Federal, State and Local safety related regulations and for complying with this Construction Safety Manual during the performance of all activities.

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Appendices

A. DEFINITIONS

The following definitions apply for the purpose of this Construction Safety Manual.

ACCIDENT – An unforeseen event or occurrence which causes death, injury or damage to property.

ACCIDENT PREVENTION PROGRAM (APP) - A program designed to provide for the protection to life and health of employees and other persons; and for the prevention of damage to property, materials, supplies and equipment. The Contractor's APP shall be developed by the Contractor using the Contractor's Safety Manual as a guide. Once approved by MDC, the Contractor's APP shall be used by the Contractor and his subcontractors to insure the safe prosecution of the work.

ALARM CONDITION - Any abnormal condition that requires the attention or intervention of responsible personnel or an individual monitoring the transit system operations.

ANOMALY - Deviation from nominal performance, which does not cause a significant, effect on system performance but does warrant investigation and/ or repair.

AUDIT - Formal or official examination and verification.

AUTOMATIC - A term applied to a system, subsystem, or device which has the inherent capability to function without direct manual participation.

CENTRAL CONTROL - That place where train control or train supervision is accomplished for the entire Metrorail and Metromover system, the train command center.

CENTRAL DISPATCH - That place where bus, rail or mover supervision or dispatcher is accomplished for the entire transit system.

COMPETENT PERSON – A person who is capable of identifying existing or predicting hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.

CONSTRUCTION SAFETY - The optimum degree of safety within the constraints of construction effectiveness, time and cost through specific application of safety management throughout all phases of the construction.

CONSTRUCTION SAFETY MANUAL (CSM) - This manual, issued as a contract document by the Miami-Dade Transit (MDT), to be used as a guide by the Contractors in developing the Accident Prevention Program.

CONTRACTOR'S AUTHORIZED SAFETY REPRESENTATIVE - The person designated as authorized safety representative who will be responsible for work site safety and for reporting all insurance claims. On contracts of over $5 million in award amount this person shall have full-time safety responsibility, unless deemed by the Office of Safety and Security that due to the nature of the work, part-time oversight is adequate. On contracts of under $5 million award amount, the person may have part time safety responsibility, unless deemed by the Office of Safety and Security that the nature of the work necessitates full-time safety oversight. Whether part-time or full-time, this person shall NOT report to the Contractor's superintendent.

CONTRACT DRAWINGS - The plans, profiles, typical cross-sections, general cross-section, elevations, schedules and details which show locations, character and dimensions of the work.

CONTRACTING OFFICER - The Director, Miami-Dade Transit.

CONTRACTOR - The individual, firm, partnership, corporation, or combination thereof, private, municipal, or public, including joint ventures which, as an independent contractor, has entered into a contract with MDC, who is referred to throughout the Contract Documents by singular in number and masculine in gender.

DEGRADATION - Falling from an initial level to a lower level in quality or performance.

EMERGENCY - A situation which is life threatening or which can cause serious damage on or in the immediate vicinity of any transit facility, structure, bus or train.

EMPLOYEE - A person employed by the Contractor or Subcontractor.

ENGINEER - MDC or its authorized representatives, including but not limited to the Resident Engineer; the Contracting Officer's Representatives and the Engineer of Record.

EQUIPMENT FAILURE - The state in which equipment no longer meets the minimum acceptable specified performance and cannot be restored through operator adjustment or control.

FTA - Federal Transit Administration, formerly UMTA.

FAILURE - An inability to perform an intended function.

HAZARD - Any real or potential condition that can cause injury or death; or damage to or loss of equipment or property.

HAZARD MANAGEMENT (LOSS CONTROL) - An element of the system safety management function that evaluates the safety effects of potential hazards considering acceptance, control, or elimination of such hazards with respect to expenditure or

resources. (The feasibility of hazard elimination must be considered in light of financial, legal, and human considerations).

HAZARD SEVERITY - A qualitative measure or the worst potential consequences that could be caused by a specific hazard.

Category I - Catastrophic. May cause death, serious injury/illness or major system loss.

Category II - Critical. May cause injury/illness, or major system damage.

Category III - Marginal. May cause minor injury/illness, or minor system damage.

Category IV - Negligible. Will not result in injury/illness, or system damage.

HAZARD INDEX - A quantitative measure, combining the numerical probability of occurrence with a hazard severity.

HAZARD RESOLUTION - The analysis and subsequent actions taken to reduce, to the lowest level practical, the risk associated with an identified hazard.

HAZARD PROBABILITY - The probability that a hazard will occur during the planned life of the system. Hazard probability may be expressed in quantitative or qualitative terms. An example of a hazard probability ranking system is:

A	Frequent
B	Probable
C	Occasional
D	Remote
E	Improbable

IMMINENT DANGER - Refers to any condition or practice where there is reasonable certainty that a danger exists that can be expected to cause death or serious physical harm and/or serious property damage immediately or before the danger can be eliminated through normal enforcement procedures.

INCIDENT - An unforeseen event or occurrence which does not necessarily result in injury or property damage.

MAINTENANCE - All actions necessary for retaining an item in or restoring it to an operable condition.

MALFUNCTION - Any anomaly or failure wherein the system, subsystem, or component fails to function as intended.

MDC - Miami-Dade County - the Board of County Commissioners of Dade County, Florida, a political subdivision of the State of Florida, and MDT, and office under the

County Manager of Miami-Dade County, Created March 1, 1974, by Administrative Order No. 3-8, under the authority of Sections 4.01 and 4.02 of the Miami-Dade County Charter – and any authority, board, body, commission, official or officials to which or to whom the powers now belonging to MDT in respect to the location, construction, equipment, maintenance and operation of transit facilities shall, by virtue of any act or acts, hereinafter pass or appertain.

MDT - Miami-Dade Transit, Miami-Dade County, located at 111 NW 1st Street, Suite 910, Miami, Florida 33128.

MISHAP - An unplanned event or series of events that result in death, injury, occupational illness, or damage to or loss of equipment or property. (See also ACCIDENT).

OFFICE OF SAFETY AND SECURITY (OSS) - Miami-Dade Transit, Miami-Dade County, located at 111 NW 1st Street, 4th Floor, Miami, Florida 33128.

OPERATOR - That person having direct and immediate control of the movement of a vehicle or machinery.

OPERATING TIME - The time period between turn-on and turn-off of a system, subsystem, component or part during which time operation is as specified. Total operating time is the summation of all operating time periods.

OSHA - The Occupational Safety and Health Administration. An agency of the U.S. Government which sets standards to provide for the safety of employees in the workplace. The area office is located in Ft. Lauderdale, Florida, phone (305) 424-0242.

PERSONAL PROTECTIVE EQUIPMENT (PPE) - Equipment designed and worn to provide protection against hazard to some part of an employee's body. Example of PPE are safety glasses, respirators, hard hats, gloves etc. All PPE used at MDT work sites must comply with applicable OSHA standards.

POWER RAIL - A rail mounted on insulators alongside the running surfaces, which provides Metromover traction power for train propulsion.

PROCEDURES - Established methods to perform a series of tasks.

RELIABILITY - The probability that the system or subsystem will perform satisfactorily for a given period of time when used under stated conditions.

REPAIR - The maintenance activity, which restores a failed item to operable state.

RISK - An expression of possible loss over a specific period of time or number of operational cycles. It may by indicated in terms of hazard severity and probability.

RISK MANAGEMENT - The Risk Management Division, Miami-Dade County, General Services Administration, located at 111 NW 1st Street, Suite 2340, Miami, Florida 33128; phone 305-375-4280.

RULE - A law or order authoritatively governing conduct or action.

SAFE - Secure from danger or loss.

SAFETY - A reasonable degree of freedom from those conditions that can cause injury or death to personnel; damage to or loss of equipment or property; and freedom from danger.

SAFETY CHECKLIST - A list for examining the safety aspect of equipment, procedures and personnel.

SAFETY DEVICES - Protective devices, which do not alter the fundamental nature of a hazard but which, do control the extent of the hazard in some manner.

SAFETY CRITICAL - A designation placed on a system, subsystem, element component device, or function denoting that satisfactory operation of such is mandatory to assurance of patron, personnel, equipment, or facility safety. Such a designation dictates incorporation of special safety design features.

SAFETY MANAGEMENT - An element of management that establishes safety programs requirements and ensures the planning, implementation and accomplishment of task and activities to achieve work place safety.

SAFETY PROGRAM - The combined task and activities of safety management and safety engineering that enhance operational effectiveness by satisfying the safety requirements in a timely, cost-effective manner throughout all phases of the work.

SAFETY SUBCONTRACTOR - A subcontractor who satisfies the Florida Department of Labor and Employment Security Industrial Safety and Health Program, Chapter 38F-44, and is duly approved by MDC.

SECURITY PROGRAM PLAN (SPP) - A program designed to provide guidelines to implement security procedures and describe the contractors' commitments and specific actions proposed to provide a secure project site. The Contractor's SPP shall be developed by the Contractor using the Contractor's Safety Manual as a guide. Once approved by MDC, the Contractor's SPP shall be used by the Contractor and his subcontractors to insure the safe prosecution of the work.

SERVICE CONTRACTS/CONTRACTOR - Those operations that are providing any services, or repair, replacement or maintenance functions that are indigenous to the construction process on the work site.

STATE - The State of Florida.

SUBCONTRACTOR - Any person, firm or corporation, other than the employees of the Contractor, who contracts with the Contractor to furnish labor and/or materials under this Contract. The contractor shall be responsible for ensuring that their subcontractors comply with this manual.

SUPPLIER/VENDOR - Those entities whose sole responsibility to the project is the delivery of goods or materials, exclusive of direct labor.

SYSTEM – A composite of people, procedures and equipment operating in a specific environment to accomplished a specific mission or task.

THIRD RAIL - A rail mounted on insulators alongside the running rail which provides Metrorail traction power for train propulsion.

TRANSIT SYSTEM – A transportation system comprised of fleets of motor buses and electrically propelled transit vehicles and all of their operational/support personnel and systems (e.g. maintenance facilities, tracks, structures, etc.) utilized for the mass movement of passengers within a metropolitan area.

UNUSUAL OCCURRENCE – An unforeseen event or incident which does not necessarily result in injury or property damage.

UNSAFE CONDITIONS – Any condition which if not corrected will endanger human life or property.

WARNING DEVICES – Sensors that monitor or detect conditions and provide visible and/or audible alerting signals as desired for selected events.

WORK SITE - The area enclosed by the limit of work indicated in the Contract Documents and boundaries of local streets and public easements in which the Contractor is to perform the work under the Contract. It shall also include areas obtained by the Contractor for use in connection with the Contractor, when contiguous to the limit of work.

B. CONTRACTOR'S ACCIDENT PREVENTION PROGRAM (APP) & SECURITY PROGRAM (SPP) PLANS

1) OBJECTIVES OF THE ACCIDENT PREVENTION PROGRAM

- to achieve an injury-free experience for the Project.
- to achieve maximum property conservation.
- to reduce direct and indirect costs.

Accomplishing the above objectives will provide for:

a) A greater efficiency as a result of a safer working environment.

b) A reduction of the construction work interruptions which develop when unsafe environments are created and when accidents occur.

2) METHODS OF ATTAINING OBJECTIVES:

Effectiveness of the Accident Prevention Program depends on the comprehensive participation and cooperation extended by all participants in support of the basic requirements listed below.

The Contractor's Authorized Safety Representative shall be informed immediately of any recognized hazards or potential hazards, related to health & safety, which may impact on the effectiveness of the Project's Accident Prevention Program that cannot be handled promptly as set forth herein, and report such to the Engineer.

The major accident prevention requirements are:

a) Initiation and maintenance of programs, plans, training, etc. as necessary to comply with the requirements of this manual, and applicable Federal, State and Local standards.

b) Allocating manpower, as required, for professional safety personnel assistance.

c) Planning and coordinating all work to avoid personnel injury, property damage and loss of productive time.

d) Establishing and maintaining a system for prompt detection, reporting, and correction or control of unsafe practices and unsafe conditions.

e) Assuring the availability, and enforcing the use of appropriate personal protective equipment.

f) Establishing and maintaining an effective and comprehensive system of tools and equipment inspection and maintenance including records required by applicable regulations or internal directives. The tool and equipment inspection and maintenance program shall include all employee-owned items brought onto the work site.

g) Establishing and supporting an educational and job skill-training program designed to foster and maintain accident prevention knowledge and cooperation at all levels of employment by:

1. providing for new employee's orientations.

2. conducting targeted subject safety meetings.

3. posting adequate safety and health requirements for all operations.

4. maintaining a list of adequately trained and licensed employees authorized to operate specific equipment.

5. maintaining a list of the trained and certified crane operators.

6. maintain a list of employees who have been certified in accordance with Florida Department of Transportation to perform flagging operations and placement of traffic signs or devices (cones, barricades, warning signs, etc.).

7. maintain a list of "Competent Person" employees who satisfy OSHA standard requirements to perform specific functions under the OSHA standards. A partial list of standards that require a competent person is included in appendix G of this CSM.

8. investigating all accidents to determine causes (s) and taking prompt, reasonable and prudent necessary action to eliminate or control responsible factors.

h) Providing visitor control and hazard protection.

i) Providing work site security.

j) Establishment and maintenance of a first aid and/or medical facility.

k) Controlling the safe placement of materials or equipment received, or used, consistent with the traffic control pattern established and progression of construction on the work site.

l) Providing maintenance of traffic control plans and procedures consistent with the work to be performed in accordance with the Contract Documents.

m) Providing work site fire prevention/protection in coordination with local authorities and applicable standards.

n) Establishment and maintenance of an effective program in accordance with Federal, State and Local regulations for the storage, use, and disposal of hazardous substances.

o) Conducting accident/incident investigations.

3) **MDC AND THE ENGINEER:**

a) The Engineer will:

1. Receive from the Contractor an Accident Prevention Program and Security Program Plan no later than 25 days after approval of Award Recommendation by the Board of County Commissioners and no less that 15 days before the projected date for notice to proceed of the Contract. The Contractor shall assume full responsibility for compliance with all applicable Federal, State and Local safety related regulations and for complying with this Construction Safety Manual during the performance of all work performed prior to the approval of the Contractor's Accident Prevention Program and Security Program Plan. (See definition of Accident Prevention and Security Program).

2. verify that Contractor plans and executes the work in compliance with the stated objectives of the Accident Prevention Program, Security Program Plan and applicable regulations.

3. authorize work site inspections by MDC representatives to monitor Contractor compliance with this manual.

4. require prompt remedial action to correct substandard or illegal safety and/or health conditions reported or observed by MDC representatives.

5. verify that the Contractor has adequate fire prevention/ protection equipment; contained in ready-operating status at all times.

6. verify that the Contractor has temporary lighting and power systems during the construction phase set up and utilized in such a manner as to reduce hazards to a minimum.

7. ascertain that trained first aid personnel are available and certified for their work.

8. verify that good housekeeping procedures are maintained at all times by the Contractor and subcontractors.

9. establish procedures for the reporting of all fire incidents or damages as stated herein.

10. instruct the Contractor to establish an identification program for all employees at the work site.

11. verify that the Contractor reports all accidents immediately, as required by this manual and State and Federal regulations.

12. instruct the Contractor that employee access to unauthorized or restricted areas on Metromover or Metrorail property requires that the Contractor provide prior notification to, and receive authorization from Central Control.

13. establish procedures for timely reporting/notification to OSS for accidents and injuries.

4) **CONTRACTOR: The Contractor Shall:**

a) Submit in writing to the Engineer an Accident Prevention Program and Security Program Plan for approval no later than 25 days after approval of Award Recommendation by the Board of County Commissioners and no less than 15 days before the projected date for notice to proceed of the contract. Provide the name, qualifications, and a "24 hour" phone number of the Contractor's Authorized Safety Representative who shall devote his time to the work site as defined by the definitions section of this Construction Safety Manual. No work on the work site shall begin until MDC approves the Contractor's authorized safety representative. The Contractor shall assume full responsibility for compliance with all applicable Federal, State and local safety related regulations and for complying with this Construction Safety Manual during the performance of all work performed prior to the approval of the Contractor's Accident Prevention Program. (See definition of Accident Prevention and Security Program). For furnish and install equipment contracts (non-construction), the stated approval period will commence ten (10) days prior to the beginning of work on the work site.

b) Substantiate in writing to the Engineer that the Contractor's Authorized Safety Representative possesses at least two years of construction safety experience, is a managerial supervisory capacity, related to the work contemplated under this Contract.

c) Maintain responsibility for project safety on the work site for his own or subcontractor's employees at any time, under any circumstances.

d) After approval of the Contractor's Authorized Safety Representative, the Contractor, his Authorized Safety Representative and the Engineer will be required to attend a meeting with the MDT staff. At that time, a formal presentation and discussion of the Accident Prevention Program will be conducted.

e) Follow all of the requirements and procedures of the Accident Prevention Program.

f) Promptly provide the Engineer with a detailed written submission of the safety and/or health hazards not consistent to his work at the work site and a detailed program to control all such hazards. Such program must be consistent with the Accident Prevention Program and conform in all respects to all legal and safety requirements, including those of OSHA and Federal, State, and Local regulations. All such programs must be approved by the Engineer prior to the commencement of this work.

g) Require each new employee, before he starts work, to be oriented by his supervisor on the safety and health rules, procedures, and requirements established for the work task (s) to be performed and procedures to be adhered to. Tool-box safety meetings are not an acceptable substitute for new employee orientation. The name of the employee and orientation date shall be on record at the work site.

h) Provide an overall traffic control plan for pedestrians, vehicular traffic and construction operations; and establish a general visitor control program.

i) Set up and implement a program to protect persons and property in the event of emergencies.

j) Complete supervisory investigation reports of all injuries.

k) Require supervisory employees and subcontractors to attend monthly supervisor's safety meetings.

l) Schedule weekly "tool-box" safety sessions to be held by the job foremen for all employees. A record including date, employee attendance, and subject covered shall be kept of these meetings for the duration of the Construction

Project. The Engineer shall be advised of the time and location of the scheduled meetings. (See Appendix B for suggested format). The meeting should be used to review safety and health rules and procedures, applicable Federal, State or Local standards, and to discuss any problems related to safety at the work site. This would include information as to storage, use and disposal of hazardous materials at the work site.

m) Schedule and preside at safety meetings to be held monthly at which appropriate supervisory staff of the Contractor and subcontractors will be required to attend. The Engineer shall be advised of the time and location of the scheduled meetings.

n) Take immediate action to correct unsafe practices and unsafe conditions.

o) Report to the Engineer and observed conditions or violations of job safety regardless of weather they are within the observer's power or responsibility to correct.

p) Assure that supervisory employees at all levels have a good working knowledge of applicable safety and health standards as they pertain to their areas of supervisory control and encourage all supervisory personnel and employees to improve their accident prevention awareness.

q) Provide the establishment of first aid facilities for treatment of employees.

r) Obtain a personal copy of the OSHA Construction Industry Standards 29CFR1926 and OSHA General Industry Standards 29CFR1910 to be available for the Contractor's reference as required by this manual. (The OSHA standards may be obtained free, or at a minimal cost, by contacting the OSHA area office, phone (305) 424-0242, in Ft. Lauderdale).

s) Ensure that prior to accessing restricted areas on Metrorail or Metromover property; he has provided proper notifications to and received proper authorization from Central Control through the Engineer.

t) Ensure that during all times that employees are at the work site, an acceptable and reliable means of communication with local emergency response personnel is available.

u) In addition to complying with this manual, comply with all applicable safety & health governmental standards including the OSHA Construction Industry Standards 29CFR1926/1910, the Florida Right to Know Law, the Federal Hazard Communication Act, Florida Worker's Compensation Laws, etc. Maintain the necessary documentation, program, and/or training required by such standards.

v) Ensure all of his subcontractors, and subcontractor's employees, comply with the requirements of this Manual and applicable Federal, State and Local regulations.

w) Comply with the current edition of the Florida Building codes unless specifically exempt, in writing by the Engineer.

5) EMERGENCIES

For the purposes of the Accident Prevention Program, emergencies are classified as follows:

a) A fire, or major hazardous material leak or spill, requiring the response of the local fire or environmental protection department.

b) Unplanned collapse of equipment used in the course of construction.

c) Unplanned collapse of a substantial part of any structure at the work site.

d) Any serious accident involving an employee.

e) Any serious accident involving a member of the public.

f) Any other occurrence which would require immediate protection of life or property.

6) HOW TO REPORT AN ACCIDENT TO THE MDT ENGINEER:

a) The Contractor and all other participants in the Program shall instruct their employees and all other concerned personnel in how to report an accident which must include, at a minimum, the following procedures:

1. Report the matter immediately to the supervisor who shall arrange for first aid or other required emergency medical treatment.

2. In the event of serious injury or a death, in the absence of emergency first aid facilities on the work site, the supervisor of the injured employee is to arrange for necessary treatment. There shall be full compliance with all requirements of the Contractor's insurance carrier(s) with regard to accident reporting.

3. The emergency phone number is: **911**

4. In case of a death, or if five or more employees are seriously injured in the same accident, the Contractor's Authorized Safety Representative shall, not later than 24 hours after the occurrence report the same to:

    a. Office of the Area OSHA Director (305) 424-0242.

    b. State of Florida, Bureau of Industrial Safety and Health (305) 377-5373.

5. The employer of any injured employee shall be required to complete the Notice of Injury Form, as required by State of Florida Worker's Compensation Division. (See appendix A).

6. The employer of any injured employee shall be required to record all work related injuries on Form 301 (or equivalent), Form 300 and complete/post the summary (Form 300A) at the beginning of the calendar year as required by OSHA 29CFR1904. (See appendix A).

7. The supervisor of the injured employee shall be responsible to immediately report the injury to the Engineer, to fill out the Supervisor's Report of Accident (Appendix A), and make it and the notice of Injury report available to the Engineer.

8. All participants in this Accident Prevention Program shall cooperate fully in the investigation of any accident and/or occurrence.

    b) The contractors and other participants in the Accident Prevention Program shall instruct employees and all other concerned personnel of the following procedures if there is loss or damage to property of others, including damage to equipment or tools being used at he work site.

        1. Promptly report the loss or damage to the office of the Contractor's Authorized Safety Representative.

        2. In the event of a substantial loss or damage to the property of others, the Contractor is to immediately notify the Contractor's Authorized Safety Representative and the Engineer.

        3. There shall be full compliance with all requirements of the Contractor's insurance carrier (s) with regard to property loss and damages.

MDT SECURITY REQUIREMENTS

All Contractors are required to submit for review and approval a Security Program Plan (SPP), as defined in this Manual. This SPP shall provide guidelines to implement security procedures and describe the contractors' commitments and specific actions proposed to provide a secure project site. The Security Program Plan shall include, at a minimum:

- ✓ Procedures for inspecting perimeter security;
- ✓ Procedures for restricting who may visit the project site;
- ✓ Procedure for performing background checks;
- ✓ Procedure for overseeing security with respect to deliveries and other short-term visitors;
- ✓ Procedure for identification badges;
- ✓ Procedure for conducting periodic security meetings;
- ✓ Procedures for monitoring world-wide security threats and national security warnings and alerts;
- ✓ Emergency security procedures;
- ✓ Procedures for preparing, issuing and reporting security incidents.

MDT Contractor Identification Badges

All MDT contractors are to present identification along with documentation showing reason for visit. Following are the identification badge requirements for contractors.

1. Contractor's must be in possession of a photo identification card issued by MDT noting them as contractor's OR must be provided a VISITOR's BADGE upon the surrender of an approved government-issued photo identification.

2. All contractors under permanent, full-time assignment to MDT are required to display their MDT photo contractor identification. The identification is issued by the MDT Office of Safety and Security. A supervisory employee must be present with the contract employee for them to be issued identification.

3. All MDT employees who are involved in any way with contractor employees are to ensure that these security requirements are provided to those employees. MDT employees are to also assist contractors in meeting those requirements.

4. Contractor's requiring access to critical areas MUST BE ACCOMPANIED BY AN MDT EMPLOYEE WITH AUTHORIZED ACCESS TO THAT AREA AT ALL TIMES. AT NO TIME MAY A CONTRACTOR BE LEFT UNSUPERVISED IN ANY CRITICAL OR SENSITIVE AREA. These areas include, but are not limited to: bus and mover central control, bus dispatch, William Lehman Yard Tower,

traction power substations, switchgear rooms, train control rooms, electrical rooms, telephone rooms, computer server rooms, video monitoring areas, and communications rooms.

Visitor's to MDT Facilities

1. All visitors will be logged in before entering the premises.

2. Employees shall not allow any unauthorized persons to enter any MDT facility, including yard gates, buildings and other secure entrances. As necessary, MDT employees may direct visitor's to the security desk or, as necessary, request intervention by security personnel.

3. The employee entering the area is to ensure that each secured door is closed behind them and that no one else enters.

4. Any visitor who comes to our facilities for food delivery or any other personal type delivery will be met at the facility entrance by the employee who ordered the delivery. The delivery person shall not be allowed into the facility under any circumstances.

5. In instances where remote entry buttons are used at secure facilities, the entry button is not be used unless there is direct observation of the person entering. Direct observation includes visual observation and observation of closed circuit television monitors only.

   All appropriate MDT field staff will be familiar with each contractor's approved Security Program and will comply with specific requirements of the plan when carrying out their assigned tasks. The contractors have the primary responsibility for developing and implementing the program; however, the Engineer will monitor the contractors' compliance with each contractor's security program.

C. GENERAL SAFETY AND HEALTH PROVISIONS

1) The Contractor shall ensure employees do not work under conditions, which are unsanitary, hazardous, or dangerous to their health or safety.

2) The Contractor shall initiate and maintain such programs as may be necessary to comply with this manual, and all applicable government regulations.

3) Such programs shall provide for the frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the Contractors; and shall include a program for the

performance of work, to promote its orderly and expeditious progress and ensure its safe completion within the prescribed time.

4) The use of any machinery, tool, material or equipment not in good working order, or which has had a safety feature removed or tampered with, is prohibited. Such machine, tool, material or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from the work site.

5) The Contractors shall permit only those employees qualified by training or experience to operate equipment and machinery Applicable laws requiring employee to have a current license or certification (i.e., Class A Commercial Drivers License, etc.) to operate equipment are to be complied with.

6) The Contractor shall be solely responsible for the performance of the work in a manner, which will not create safety hazards, objectionable noise or other nuisance to the public.

7) Employees of the Contractor or subcontractors who are found to be intoxicated or appear to be under the influence of alcohol or drugs (other than as prescribed by a doctor) while on the work site shall be removed from the work site by the Contractor for the duration of the Contract. Employees who are found to be in possession of alcohol or drugs (other than as prescribed by a doctor) at the work site shall be removed from the work site by the Contractor for the duration of the Contract. An employee who is under a doctor's care and taking prescription drugs should inform his supervisor of same to determine if restrictions should be imposed.

8) Prior to the start of, and during the course of, any work, above or below ground level, the Contractor shall make a through survey of the entire work site to determine the type and locations of all utilities or other lines on the work site. The Contractors must verify this information by notifying the Underground Utilities Notification Center at 1-800-432-4770, other utilities not members of the Underground Utilities Notification Center, and notify the Engineer.

9) The Contractor shall instruct employees as to any precautions and procedures to be followed while working in the proximity of any utility or power line.

10) The Contractor shall develop and have readily available at the work site an emergency plan with the locations of any utility or line shut-offs or disconnects so that if any emergency arises, immediate action may be taken.

11) The Contractor will be required to identify and provide a notification procedure for all contingencies where cutting off a utility could adversely

affect any operation or render inoperative any protective apparatus in the surrounding area.

12) All structural repairs, alterations or reconstruction of any equipment used on the work site shall be certified in accordance with all applicable laws and regulations.
13) Portable toilets shall be chemical type or equal and shall be located convenient to work crews and maintained in proper sanitary conditions at all times.

14) Construction operations will normally be confined to those hours between dawn and dusk. Any work done other than during daylight hours must be approved by the Engineer. In requesting approval during other than daylight hours, the Contractor must present a written statement outlining the special precautions to be taken to control the extraordinary hazards presented by night work. This program shall include, but not limited to such items as supplementary lighting of work areas, illuminated barricades, proper supervision, availability of medical facilities, and security precautions.

15) Emergency lighting facilities, (i.e. battery operated or equivalent) shall be required in all construction areas where normal light failures would cause employees to be subjected to hazardous conditions. Such systems shall be maintained monthly.

16) Employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the precautions to take, and the use of protective and emergency equipment. The Contractor shall comply with all regulations applicable for working in dangerous or potentially dangerous areas.

17) The use of torpedo or salamander type heaters are prohibited.

18) No open burning of any kind shall be permitted without permits from appropriate local authorities and the Engineer.

19) Flammable storage cabinets shall be labeled in conspicuous lettering "Flammable – Keep Fire Away" and "No Smoking".

D. MEDICAL SERVICES AND FIRST AID

1) At least one person who has valid certificates in first-aid training from either the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, shall be available at the work site to render first-aid. Further, a minimum ratio of one such qualified person to 50 employees shall be maintained throughout the course of the

construction. A suitable emblem shall be affixed to the qualified person's hard hat, or other suitable means of identification shall be used.

2) First-aid supplies, approved by a physician licensed to practice in the State of Florida, shall be accessible for immediate use. One 16-unit first-aid kit (or equivalent) shall be provided for each 50 persons or fraction thereof.

3) First-aid kit (s) shall be provided in a weatherproof container with individual sealed packages for each type item. The kits shall be checked by the Contractor before being sent out on each job and at least weekly on each job to ensure that the expanded items are replaced.

4) A telephone shall be made available at the site before construction begins. Telephone numbers and locations of emergency facilities including emergency hospitals, physicians, ambulance service, police and fire department, as well as the complete street address of the work site, shall be posted in conspicuous locations at the work site, and at all telephone locations. The communication system for contacting necessary ambulance service or other emergency response personnel shall be operable at all times personnel are on the work site.

5) The location and number of approved stretchers provided for each contract shall be submitted to MDC for approval immediately after work commences on site. They will be maintained, properly protected and easily accessible at all times.

6) The Contractors, his supervisors and foreman, shall assure that any of his employees who suffers a job-related injury shall receive first aid and medical attention consistent with and as required by law.

7) The Contractor's first aid facility shall maintain a daily log of all injuries, both first aid and doctor cases. The log shall contain information to reflect the date, name of employee, employer, craft, supervisor, type of injury, how accident happened, time, disposition of patient and name of attendant.

8) The Contractor shall ensure that all OSHA and State of Florida record-keeping and reporting requirements are met.

E. DRINKING WATER

1) An adequate supply of potable water shall be provided in all places of employment.

2) Portable water containers shall be capable of being tightly closed and be equipped with a tap.

3) A common drinking cup is prohibited. Disposable cups shall be furnished.

4) Unused disposable cups shall be kept in a sanitary container, and a receptacle shall be provided for used cups.

5) All containers utilized for potable water shall be labeled as "Potable/Drinking Water Only".

F. PERSONAL PROTECTIVE AND LIFE SAVING EQUIPMENT

1) GENERAL

a) The Contractor is responsible for requiring and enforcing the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions.

b) The Contractors is to comply with all OSHA regulations (29CFR1926 Subpart E) regarding personal protection devices and life saving equipment.

c) All persons on the Work Site shall utilize the proper foot protection which meets ANSI Z41 (toe), Z41.2 (metatarsal) and Z41.4 (electrical) standards.

d) All persons on the Work Site shall utilize hand and body protection which meets ANSI/ISEA 105 and ASTM F23 standards.

2) HEAD PROTECTION

a) All persons on the Work Site shall be protected by NON-METALLIC protective helmets, which meet ANSI Z89.2 standards. Helmets for the protection of employees against impact and penetration of falling and flying objects shall meet the specifications contained in ANSI Z89.1 Safety Requirements for Industrial Head Protection. Bump caps are not acceptable.

b) All Work Sites shall have posted approved signs alerting all persons that hard hats are required on the site. The use of hard hats at the Work Site will be strictly enforced.

3) RESPIRATORY PROTECTION

a) Whenever feasible administrative and/or engineering controls fail or are inadequate to prevent harmful exposures to employees; the Contractor shall

provide and require the use of appropriate respiratory protective devices in accordance with OSHA, 29 CFR 1910.134.

b) Respiratory protective devices must be approved by the U.S. Bureau of Mines or acceptable to the U.S. Department of Labor for the specific contaminant to which the employee is exposed.

c) Employers must have a written respiratory protection program as defined in 29 CFR 1910.134.

d) Employees required to use respiratory protective equipment must be trained in the use and limitations of such equipment, fit tested annually and medically approved to wear respiratory protection as required by 29 CFR 1910.134.

e) Respiratory protective equipment shall be inspected regularly and maintained in good condition. Defective or worn parts shall be replaced.

4) HEARING PROTECTION

a) Feasible engineering or administrative controls shall be utilized to protect employees against sound levels in excess of those shown in the table below.

b) When engineering or administrative controls fail to reduce sound levels within the limits of the Table below, protective hearing devices in accordance with OSHA (29CFR1926.101) shall be provided and us.

c) Exposure to impulsive or impact noise should not exceed 140-db peak sound pressure level.

d) In all cases, where the sound levels exceed the values shown in the Table below, a continuing, effective hearing conservation program shall be administered.

e) PERMISSIBLE NOISE EXPOSURE TABLE (Source: OSHA, 29CFR1926.52)

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 –1/2	102

Duration per day, hours	Sound level dBA slow response
1	105
1 / 2	110
1 / 4 or less	115

f) Plain cotton is not an acceptable protective device. Hearing protection shall be used only when it meets OSHA requirements and is suitable to correct the exposure.

5. EYE AND FACE PROTECTION

a) Eye and face protection shall be provided and worn when machines or operations present potential eye or face injury.

b) Eye and face protective equipment shall meet the requirements of ANSI Z87. 1 – 2003, "Occupational and Educational Eye and Face Protection".

c) Employees involved in welding operations shall be furnished with a welding helmet with minimum grade 10 shade filter lens for shielded arc welding or cutting. Welding goggles with a minimum grade 4 shade filter lens may be worn only for oxyacetylene gas welding or burning.

d) Employees exposed to laser beams must be furnished suitable laser safety goggles, which will protect for the specific wavelength of the laser and be of optical density (0.0) adequate for the energy involved.

6. SAFETY NETS

a) Safety nets shall be provided when workplace are over roads, guideways, or more than 25 feet above other surfaces where the use of ladders, scaffold catch platforms, temporary floors, safety lines, or safety belts is impractical. Safety net systems shall conform to OSHA 29 CFR 1926 502.

b) Where nets are required, operations shall not be undertaken until the net is in place and has been tested & inspected by the Resident Engineer.

7. SAFETY BELTS, LIFELINES AND OTHER PERSONAL FALL ARREST SYSTEMS

a) Approved personal fall arrest systems (in accordance with OSHA; 29 CFR 1926.104 and 29 CFR 1926.502) shall be worn by those employees whose

work exposes them to falling from the perimeter of a structure or through shaftways and openings. Protection must also be provided for employees who are exposed to the hazard of falling into/onto dangerous equipment,

b) Employers must provide a training program for employees who might be exposed to fall hazards. The training shall include how to recognize such hazards and how the employees can minimize their exposure to such hazards. The training shall, at a minimum, comply with 29 CFR 1926.503. Re-training or refresher training must also be provided when necessary. Records of such training must be available for inspection by MDT.

8. WORKING OVER OR NEAR WATER

a) Employees shall be provided with a U.S Coast Guard approved life jacket or buoyant work vest.

b) Prior to and after each use, the buoyant work vest or life jacket shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used and be removed from the job site.

c) Ring buoys with at least 90 feet of line shall be provided and available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

d) At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water.

G. SIGNS, SIGNALS, BARRICADES AND TRAFFIC CONTROL

1) All traffic signs or devices used for protection of construction workmen or the public shall conform to the State of Florida Department of Transportation's "Roadway and Traffic Design Standards" and applicable permit(s) conditions. All work areas on or around highways, roads and streets shall follow approved maintenance of traffic plans.

2) Barricades, cones and/or similar protective devices shall be used whenever men or equipment are exposed to traffic or similar hazards.

3) When traffic lanes are closed due to work activity, advance warning signals and high level warning devices shall be used as described in the State of Florida Department of Transportation's "Roadway and Traffic Design Standards" and applicable permit(s) conditions. All work areas on or around highways, roads and streets shall follow approved maintenance of traffic plans.

4) Flagmen and signalmen will be properly trained, certified, wear high-visability clothing (as required by F-DOT FTDS600) and use appropriate procedures following the current F-DOT manual. Where flaggers are used, a flagger symbol or legend sign must als o be used.

5) All employees within 15 feet of the edge of the travelway and/or where employees are exposed to roadway traffic shall be required to wear a high visability vest vest/garment, per F-DOT manual.

6) Whenever and wherever possible and necessary, line voltage (12 volt) protected lights shall be used to mark fences and barricades and other such encroachments onto public streets or sidewalks. Warning lights shall be in accordance with F-DOT RTDS 600.

7) Where covered sidewalks are required they shall be provided with permanent lights to provide sufficient illumination for safe use by the public day or night. All bulbs shall be cage-protected.

8) Public walkways shall be kept clean and free of hazards at all times. When an existing pedestrian way or bicycle way is located within a traffic control work zone, accommodations must be maintained and include provisions for the disabled. Only approved temporary traffic control devices may be used to delineate a temporary traffic control zone for pedestrian and bicycle ways. Advanced notification af sidewalk closures and detours shall be provided by appropriate signs.

9) Where the Contractor is required to provide public walkway, they shall have abrasive, non-slip surface.

10) Where access to bus stop is disturbed or obstructed by the Contractors operations, safe access will be maintained or the bus stop relocated as directed by the Engineer. Coordination for maintaining or relocating bus stops with the appropriate agencies is the sole responsibility of the Contractors.

11) When steel plates or similar covers are used on public ways to cover excavations they shall be substantially secured to prevent movement imposed by traffic. Covers shall have non-slip surface, conforming to OSHA Specifications.

12) When such covers are located where there is pedestrian exposure, they shall be tapered at all sides with cut-back cold mix or similar material to eliminate tripping hazards. Covers shall have non-slip surface.

13) Free access shall be maintained to every fire extinguisher, fire hydrant, fire alarm box, fire escape and standpipe connection, street and traffic light control box. When required, hydrants shall be extended by suitable tube or piping to an

accessible point as approved by the Engineer. No obstructions shall be allowed at any time within 15 feet of a fire hydrant. Where materials are placed in the vicinity of a fire hydrant or a fire alarm box or fire extinguisher, and to such a height as to prevent the same from being readily seen, the position of such hydrant or fire alarm box or fire extinguisher shall be indicated by suitable signals, both day and night.

14) The Contractor shall erect and maintain fences and barricades to enclose the Contractor's work area, and provide watchmen where required to prevent unauthorized access.

15) No work shall be allowed above or below an active traffic lane. Contractor shall establish a work zone including appropriate lane closures following F-DOT RTDS 600 series.

H. MATERIAL HANDLING – (STORAGE, USE AND DISPOSAL)

1) All materials stored in tiers shall be secured to prevent sliding, falling or collapse.

2) Reinforcing steel shall not be used as a lifting ("Pick") point on any load nor as a guy line anchor.

3) Hooks, except special sliding choker hooks shall be securely moused when in use, or shall be provided with a functioning safety latch.

4) Scrap material of any kind, type or nature shall be placed daily into appropriate containers specifically supplied for this purpose. Containers shall be removed from the Work Site when full.

5) Loose material on open decks or other exposed locations shall be removed or secured at the end of each day to eliminate dislodgment by wind or other causes.

6) Compatibility of stored materials and storage methods will comply with all applicable OSHA, Fire Department and environmental agency standards.

7) Employees required to handle, use or dispose of hazardous materials shall be instructed regarding the safe handling, proper procedures, potential hazards, personal hygiene, and personal protective equipment required.

8) Disposal of materials shall be in accordance with all applicable Federal, State and Local regulations. All applicable recordkeeping and reporting requirements will be met by the Contractors.

I. TOOLS – HAND AND POWER

1) General

a) Keep the work area clear of clutter
b) Keep the work area well lighted
c) Maintain and keep tools sharpened, oiled and stored in a safe place
d) Supervisors instruct employees on using equipment and safe work practices before using equipment
e) Inspect tools, cords and accessories prior to use
f) Repair or replace problem equipment immediately
g) Use 3-prong electrical plugs, double insulated tools and safety switches
h) Machine guards must be in place and not removed
i) Do not wear loose clothing or jewelry when operating equipment
j) Install and repair equipment only if you are qualified to do so
k) Use the right tool for the job (i.e. do not use a pipe wrench as a hammer)
l) Carry a sharp tool pointed downward or place it in a tool belt/box
m) Protect sharp blades with a shield/sheath
n) Store tools in draws or chests with cutting edge down
o) Proper personal protective equipment shall be worn
p) All power hand tools shall be equipped with a "dead man" control where the power is shut down when the operator releases the tool
q) Never leave a running tool unattended
r) Tools of a non-sparking material and/or intrinsically safe tools must be used if fire or explosion hazards exist
s) All fuel operated tools shall be stoped and allowed to cool prior to being refueled, serviced, or maintained and proper ventiliating used when used in enclosed spaces
t) Power grinding machines shall have proper grounding. Work rests must be kept at a distance not to exceed 1/8" from the wheel surface
u) Avoid repetitive motion, hold tools in a neutral position

2) "Lock on" buttons on all hand held power drills are prohibited.

3) Powder Actuated Tools

a) High velocity tools are prohibited. Only low velocity piston drive tools are permitted.

b) Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a power actuated tool. ANSI STANDARD A10.3-1970.

c) Firing of the tools shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into firing position. The tool shall be so

designed so as not to be operable other than when being held against a work surface with a force of at least five pounds greater than the total tool weight. Caution must be exercised to ascertain that the proper color coded charge, for the materials involved, is utilized.

d) In case of misfire, the operator shall hold the tool in the operating position for at least 30 seconds. He shall then try to operate the tool a second time. He shall wait again 30 seconds, holding the tool in the operating position. Then he shall proceed to remove the explosive load in strict accordance with the manufacturer's instructions. Misfired cartridges shall be placed carefully in a metal container filled with water and returned to the supervisor for disposal.

4) Grinding wheels shall not be operated at speeds in excess of the manufacturer's RPM rating as labeled on the wheel.

5) Face and eye protection or safety goggles shall be worn by all employees using grinding wheels, jackhammering, slag chipping, powder actuated tools or similar operations.

6) Radial Saws

a) The upper hood shall completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The slides of the lower exposed portion of the blade shall be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock.

b) Radial saw for ripping shall be provided with non-kickback finger or dogs approved by the manufacturer.

c) The saw and table shall be designed to prevent the blade from traveling beyond front of table.

d) Installation shall be in such a manner so that the front end of the unit be slightly higher than the rear, so as to cause the cutting head to return gently to the starting position when released by the operator.

7) Table saws shall be equipped with a functioning hood, guard, anti-kickback device and splitter.

8) Only power saws specifically designed by the manufacturer for cutting concrete block, or similar materials, shall be used for this purpose.

9) Cutting shall be done with water spray and the operator shall wear a face shield.

10) All hose couplings or any pneumatic or hydraulic equipment or tools shall be equipped with appropriate safety clips or retainers and shall be properly installed and maintained.

11) All appropriate machine and tool guarding devices shall be provided, shall be operational, and shall be use when the equipment is in operation.

J. WELDING AND CUTTING

1) Contractors shall instruct employees in the safe and proper use of cutting and welding equipment prior to using that equipment.

2) Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use. Each regulator shall be provided with an anti-flashback device for protection against excessive oxygen back pressure in the fuel gas supply.

3) A minimum of one 10-pound all-purpose (ABC) dry chemical fire extinguisher shall be kept within 10 feet of any cutting or welding operation. The extinguisher shall be kept in a conspicuous place, free of any obstructions.

4) Proper personal protective equipment shall be worn while welding and cutting.

5) Welding screens shall be used in areas where prefabrication work is to be performed.

6) Oxygen and fuel gas regulators and hoses shall be maintained and in proper working order while in use.

7) All oxygen cylinders and fittings shall be kept free of grease and oil.

8) Do not weld without the approved goggles, hood and jacket/apron.

9) Always use approved gloves when welding.

10) Do not weld or burn in an area where fellow employees are working, without protective barriers, non-combustible flameproof screens/shields (blankets, covers, curtains etc.).

11) Do not weld where flammable or combustible material, such as waste, rags, paper, etc. can be ignited by the sparks or molten metal.

12) Do not weld in any location where open flame is not permitted.

13) Do not weld on a wooden bench or other structure that can burn.

14) Do not use leaky regulators, hose or other defective gas welding tools.

15) Do not use leaky gas cylinders.

16) Do not operate gas welding or cutting torches at pressure in excess of prescribed maximum.

17) Do not change or adjust pressure on regulators with torch valve closed.

18) Do not leave valves of gas cylinders open when not in use.

19) Do not leave valve key on gas cylinders when not in use.

20) Always remove all scale, rust, grease, protective surface coatings, oil and other foreign matter from metals before welding.

21) Always keep welding bench clear of dirt.

22) Always locate electric welding machine where it is protected from dirt, dust and harmful fumes.

23) Always see that the material being electrically welded is well grounded, and the ground connection from machine is tight.

24) Avoid fires on personal clothing from sparks or hot metal.

25) Always use protective clothing (welders legging, aprons, sleeves, jacket, etc.) when welding or burning.

26) Oxygen must not be used near flammable or combustible materials, such as grease, oil, etc., or any substance likely to cause fire.

27) Do not weld or cut in confined spaces without adequate ventilation.

28) Protect welding hose from being burned, trampled on or run over. Do not leave hose where it may be tripped over.

29) Valves on acetylene and oxygen tanks must be tightly closed when work is completed.

30) Carrying a lighted torch while climbing is forbidden.

31) Put rod stubs in a container. Stubs thrown on the floor become a slipping hazard.

32) Do not direct the flow of oxygen, from the torch, at clothing to remove dust, etc. This is a fire hazard.

33) Always have good ventilation when welding and gas cutting.

34) In the open air, when welding, cutting or heating metals having toxic substance(s), such as zinc, lead, cadmium, or chromebearing metals, approved respirator shall be used

35) When required have a certified fireguard while burning or welding. Fireguard must have a functional fire extinguisher present.

36) Use caution when removing eye protection. Hot slag may pop during cooling.

37) Remove manifold and replace protective caps on cylinders before storing welding unit (overnight, etc.).

38) Manifold hoses must be equipped with flash arrestors.

K. COMPRESSED GAS CYLINDERS

1) Valve protection caps shall be in place when compressed gas cylinders are transported, moved, or stored.

2) Cylinder valves shall be closed when work is finished and when cylinders are empty or are moved.

3) Compressed gas cylinders shall be secured in an upright position at all times, except when cylinders are actually being hoisted or carried.

4) Cylinders shall be kept at a safe distance or shielded from welding or cutting operations. Cylinders shall not be placed where they can contact an electrical circuit.

5) You are forbidden to lift or transport gas cylinders with hoisting equipment. Rough handling of loaded or empty gas cylinders is dangerous. Install protective caps onto cylinders before moving same. Transport cylinders on handcarts equipped with chains and secure the cylinder during movement. Do not accept cylinders, which do not have a protective cap.

6) Grease or oil on acetylene cylinders or oxygen cylinders is forbidden. It is extremely dangerous.

7) Avoid freezing acetylene cylinders.

8) Always remove leaky gas cylinders to open air, place them clear of flammable material or anything that might ignite them.

9) Always secure cylinders in an upright position. When a cylinder is empty, it must be marked "empty" and stored separately from full cylinders.

10) Protect cylinders from excessive heat. Do not store near steam pipes, furnaces, etc.

11) Oxygen cylinders should not be stored with acetylene or other highly combustible materials, including welding units. A minimum of 20 feet must be maintained from combustible and flammable gases.

12) All cylinders must be transported and stored with the protective cap securely in place. Never store cylinders with regulators/manifolds attached.

13) All cylinders must be clearly labeled as to content.

L. ELECTRICAL

1) Extension cords and temporary lighting electrical cords shall conform to the current edition of the National Electrical Code table 400.11. "Hard Usage" or "Extra Hard Usage", and shall be protected against all types of abrasion and damage.

2) All male plugs and female receptacle connections shall have cords physically interlocked to prevent accidental or unintentional separation and provide complete and positive continuity and grounding.

3) All power cords connected to panels of breaker boxes shall be connected using plugs. No direct wiring is permitted.

4) Temporary (extension) cords used to supply tools shall be limited to a maximum length of 200 feet, except that additional length may be used if supplemental positive equipment grounding is maintained within 200 feet of the tool or power use.

5) All portable power generators shall be grounded.

6) Ground-Fault Circuit Protection:

   a) Ground-Fault Circuit interrupters will be installed on all 120 volts, single-phase, 15 and 20 ampere receptacles, on the Work Site.

   b) An assured equipment grounding conductor program may be substituted for ground-fault circuit protectors, only after the following has been provided.

c) Submit a written program, developed by a licensed electrician, including specific procedures adopted by the Contractor to the Engineer and MDC Risk Management.

7) All Work Site conditions will comply with requirements in OSHA 1926 Subpart K.

8) Before starting work on electrical equipment and lines, inspections and tests must be made to determine if they are alive or dead.

9) Use only tools or devices provided and see that they are in good condition.

10) Never touch two parts at different potentials or a single exposed live part at a dangerous potential to ground unless employee is insulated from other conducting surfaces, including ground.

11) Standing with hands behind back, with back toward generator or switchboard, is prohibited.

12) Employees working near live equipment and lines must protect themselves from tripping, slipping or falling, or from touching equipment or lines with body, tools or material.

13) Work on or about electrical circuit, apparatus or equipment only if qualified and with a thorough knowledge of its operating voltage and service, and then only when authorized by the immediate supervisor.

14) Do not use appliance, device, tool, flashlight, material or equipment that is not designed and approved for the maintenance and operation of the circuit on which it is to be used.

15) Insulation, weather proofing or covering on electrical wire, apparatus or equipment must not be depended upon for protection against shock.

16) Do not use bolt, rivet, cotter key or other object as a jumper in place of fuse.

17) Do not place clothing, lunch, tools, clothes hanger, or other unauthorized items in or about the power or control cabinet, switch box, battery box or on top of electrical apparatus.

18) Place "DO NOT OPERATE" warning tag on switch, set to de-energize line, apparatus or equipment. "Lock Out" procedures are preferred where feasible. At all times, when working on equipment that has the potential to cause harm or create a hazard, "Lockout/Tagout projection Televisions" procedure shall be followed. Lockout/Tagout procedure requires each employee to place a lock (if possible) or a safety tag on the energy source of any equipment that has the

potential to cause harm if the equipment is activated while it is being worked on. Refer to OSHA Standard 1910.147, "Control of Hazardous Energy".

19) Consider every circuit to be alive.

20) Use extreme care when using "snakes" in preparation of installing wire or cable. The coiled "snake" may fly loose and strike a person or electrified equipment.

21) Do not allow wet clothing, raincoats, etc., to come in contact with electrified equipment.

22) Do not lubricate electrical apparatus with power on.

23) Do not use water to put out electrical fires.

24) Do not change any wire or connections with power on.

25) Do not shift brushes in electrical motors with power on.

26) Do not leave the secondary of a current transformer open-circuited, or open up the secondary with power on.

27) Never wear ring(s) or jewelry on fingers on person when working near or handling electrical equipment.

28) Inspect all temporary cords and plug equipment for damage prior to use. Cords with damaged insulation, covers, plugs or missing grounding pins are not to be used.

29) Do not pass temporary cords through door openings or other areas where they are likely to be cut.

30) When temporary cords are used, care must be taken to ensure a trip hazard is not created.

31) Portable extension lights shall be visually inspected by employees using them. Lamp guards must be in place on all extension lamps.

32) Electrical plugs of portable extension cords, or cords attached to any electrical apparatus, shall be disconnected by grasping the plug and not by pulling the cord.

LADDERS AND SCAFFOLDS

1) Ladders:

   a) The use of ladders with broken or missing rungs or steps, broken or split side rails, or with other faulty or defective construction is prohibited. When ladders with such defects are discovered, they shall immediately be withdrawn from service.

   b) Portable ladders shall be placed on a substantial base at a 4-1 pitch, have cleat access at top and bottom, extend a minimum of 36 inches above the landing, and be secured against movement while in use.

   c) Portable metal ladders shall not be used for electrical work or where they may contact electrical conductors.

   d) Job-made ladders shall be constructed for this intended use. Cleats shall be inset into side rails ½ inch, or filler blocks used. Cleats shall be uniformly spaced, 12 inches, top-to-top.

   e) Wooden ladders must not be painted. Split or rotted conditions would not be easily seen and constitute a hazard.

   f) The foot of a ladder shall be placed 1/4 of its length away from vertical plane of its support and must be secured to prevent all possibility of slipping.

   g) Before climbing ladders, see that your shoes are free and clean of slippery substances. Watch out for broken rungs.

   h) Face the ladder while climbing either up or down.

   i) Never place a ladder in front of an unlocked door.

   j) Employees must not reach out from a ladder more than an arm's length.

   k) Ladders must be inspected by employees using them daily. Defective ladders are to be marked and kept separate from serviceable equipment and must be repaired before using.

   l) Do not "walk" a ladder while on it.

   m) Do not jump from or slide down any portion of any kind of ladder.

n) When getting off a ladder, make certain of secure footing and avoid stepping on loose stones, debris or into a depression before releasing handhold on the ladder.

o) A stepladder must be fully opened and spread properly before being used. Never stand on the top step of a stepladder.

p) When carrying tools or other objects up a ladder presents a hazard, they should be raised with a rope and bucket.

q) Two or more persons should raise, extend, shorten or move extension ladders. Never use the top section of an extension ladder as a single ladder, since it has no safety feet.

r) Always rope off the area directly beneath ladders.

s) Never leave extended ladders unattended. Remove ladders when there is a temporary stoppage of work.

2) Scaffolds:

a) Platforms shall be tightly planked for the FULL width of the scaffold except for any necessary entrance opening. Platforms shall be secured in place, with proper guardrail and toe boards.

b) Workmen shall not be allowed to climb or stand in cross bracing, or scaffold bucks.

c) Adjustment screws on scaffold legs shall not be extended beyond the manufacturer's recommendations, or two-thirds of the threaded length, whichever is shorter.

d) Casters shall be properly designed for strength and dimensions to support four times the maximum intended load. All casters shall be provided with a positive locking device to hold the scaffold in position. Casters shall be provided with a positive means of attachment to the scaffold legs.

e) Scaffold support bearing shall not be comprised of concrete block or similar materials and footed securely or a solid, stable base.

f) Materials shall not be stored on scaffolds in excess of the suppliers needed for the immediate operation.

g) The edges of scaffolds shall be protected with railings and toe boards.

h) When using rollers for moveable scaffolds, lock or secure wheels.

i) Do not use bent or twisted members on scaffolds.

k) Always remove a scaffold as soon as there is no more need for it. A scaffold is a constant hazard.

l) Always rope off the area directly beneath scaffolds.

m) Use extreme caution and use approved fall protection equipment on elevated surfaces lacking side rail and/or approved guard.

FLOORS, WALL, OPENINGS AND STAIRWAYS

1) One-half inch mild plow steel cables or equivalent, or ¼ inch alloy steel chains may be used on bridge or guideway decks, open floor edges, and similar applications, in lieu of standard wooden top midrails. Such cables or chains shall be firmly anchored and kept taut. All connections or cables shall be looped and clamped. Standard toeboards shall be used in such instances.

2) Floor openings shall be guarded by a standard railing and toeboards or cover. In general, the railing shall be provided on all exposed sides, except at entrances to stairways. Temporary floor openings shall have standard railings.

3) Every open-sided floor or platform, six feet or more above adjacent floor or ground level, shall be guarded by a standard railing, or the equivalent, on all open sides except where there is entrance to a ramp, stairway, or fixed ladder.

4) Runways four feet or higher shall have standard railings on all open sides except runways more than 18 inches wide used exclusively for special purposes may have the railing on one side omitted where operating conditions necessitate.

RAILING

1) A standard railing shall consist of top rail, intermediate rail and posts, and have a vertical height of approximately 42 inches from upper surface of top rail to the floor, platform, etc.

2) The top rail of a railing shall be smooth-surfaced, with a strength to withstand at least 200 pounds. The intermediate rail shall be approximately halfway between the top rail and floor.

3) A stair railing shall be of construction similar to a standard railing, but the vertical height shall be not more that 34 inches nor less than 30 inches from upper surface of top rail of tread, in line with face of riser at forward edge of tread.

4) A standard toeboard shall be at least four inches in height, and may be of any substantial material either solid or open, with openings not to exceed one inch in greatest dimension.

CRANES, DERRICKS, HOISTS, ELEVATORS, PILE DRIVERS, & CONVEYORS

1) Prior to commencement of any work using any hoisting equipment on the Work Site, the Contractor will provide the Engineer with a valid certification of compliance for shore-based, or water borne equipment meeting all the provisions of OSHA 29CFR 1919.

2) Record Keeping Requirements:

   a) Supervision of all testing, examinations, inspections, heat treatments and record keeping procedures shall be carried out by such persons as are so designated in OSHA 29CFR 1919.

   b) Certificates issued by an accredited person (agency) shall be signed and all register entries made only by persons authorized by such accredited person (agency).

   c) Certification shall not be issued until all conditions cited for correction on the semi-annual certification report form have been corrected in a manner satisfactory to the certifying agency.

   d) In the event deficiencies remain uncorrected, no certification shall be issued.

   e) An accredited person (agency) shall maintain records of all work performed including reports of work or tests performed by others (nondestructive testing, heat treating, etc.), in relation to each certification. Such records shall be available for examination upon request by MDC Risk Management, the Engineer or their authorized representatives.

   f) A copy of each certificate relating to semi-annual examination and/or unit proof load test shall be available with each crane or derrick.

3) A checklist will be prepared and submitted to the Engineer by the Contractor for any lift where the load exceeds 80% of the load chart capacity for the crane or derrick, or, where the lift involves the use of two or more cranes. (See Appendix C).

a) No lifts meeting the above criteria will be made without prior submission of a Critical Lift Checklist.

b) Where erection drawings are prepared for submittal to the Engineer, Appendix C, will not be required if all the information contained therein is shown on the drawing submitted.

c) Prior to making the lift, the conditions shown on the drawing submitted will be verified by the Contractor's representative at the Work site. Any deviations from the erection drawing submitted will be reviewed and verified as safe by the Contractor's representative.

4) Operation of boom equipment, or other equipment such as forklifts, backhoes, and the handling of any load in the proximity of electrical transmission lines is forbidden within a minimum of 10 feet. Further, if such equipment is positioned so that it is possible by rotation or any other movement, whether anticipated or not, to possibly contact high voltage, de-energizing of the lines, restraints, "hold-backs", or other positive physical means will be required. (Note: "High Voltage" is defined as voltage in excess of 400 volts).

5) All cranes shall be equipped with spirit level, or equivalent, to indicate the level of the crane fore and aft, and across the width. As nearly as possible, the crane shall be operated in level position.

6) After normal working hours and during other extended periods of non-usage, crane booms shall be lowered to a horizontal position to minimize the chance of movement due to wind. If this cannot be accomplished, load lines shall be securely fastened to a substantial anchoring point.

7) Except for floor-controlled overhead track cranes, a bell or other effective audible warning signal shall be provided for each crane equipped with power traveling mechanism, which shall be automatically engage and immediately audible when the crane begins to travel.

8) All pinch points drive mechanisms, and other hazardous moving parts shall be effectively guarded. (See Appendix C for suggested checklist).

9) Conveyor Systems

a) Conveyor systems shall be equipped with an automatic audible warning signal sounded immediately **BEFORE** starting up the conveyor.

b) Whenever a conveyor is equipped with a catwalk, a safety cable shall be installed on the conveyor to stop it instantly in an emergency, so as it cannot be started until the actuating switch has been reset to the "On" position. The

cable shall not be less than 12 inches nor more than 18 inches above the conveyor belt and shall extend the entire length of the conveyor.

10) Catwalks shall be kept clean and free of tripping hazards.

11) Any anticipated use of helicopters for lifting operations shall require advance notice and approval by the Engineer and MDC Risk Management.

12) No person will be allowed to ride on a suspended load or hook for any reason.

13) No person shall be allowed to stand or pass under the elevated portion of any equipment whether loaded or empty.

14) Pile driving loftsmen shall use safety belts when working at elevations outside loft platforms. When the leads are to be rotated or moved, the loftsman shall descent from the leads.

15) Exhaust pipes, steam lines, and other hot surfaces, located where employees could contact them, shall be effectively guarded or insulated.

16) Do not operate cranes or hoisting machines unless qualified to do so.

17) Do not stand under load being moved by crane.

18) Always test crane brakes and limit switches before operating on your tour of duty.

19) Always be sure that path of crane travel is clear of people or alerted by signal alarm in advance of moving load and while crane is in motion.

20) Always be sure that hooks, chains or cables are secure and properly placed before raising load.

21) Always be sure that loose parts are removed from load before raising it.

22) Only the operator is permitted to be in the operators cab while crane is in operation, except when authorized maintenance is being performed or a new operator is being trained.

23) Hoisting hooks, chains or cables are to be visually inspected daily for flaws, cracks, etc., by employees using them and defects reported to their immediate supervisor. A monthly inspection with a certification record which includes the inspection date and signature of individual inspector must also be done.

24) Do not lift load with twists or kinks in the chain, rope or sling.

25) Operators of cranes that are moving loads in close proximity of exposed current carrying devices, are required to maintain a safe operating distance at least 10 feet from such devices to avoid contact with hoisting cables, blocks, hooks, etc.

26) Know the load rating of equipment when starting to raise an unusual or heavier than normal load (Load should not exceed limits of crane). Test brakes when load is a few inches from floor or ground.

27) When hoisting unusual material or machinery, attach a chain or cable well above the center of gravity to prevent the load from tilting or falling over when lift is made

28) When hoisting long shaped objects, a red tag line or other method of control is required to prevent load from turning end on end.

29) No employee shall ride or hang onto tongs, slings, hooks or load of hoisting equipment.

30) Before removing sling or chain from load, observe arrangement of load to be sure it has settled securely.

31) Keep from positioning yourself between the load being handled and a fixed object, (wall, stanchion or car) to avoid being pinned.

32) Leaving any hoisting equipment with a suspended load unattended, is forbidden.

33) Before hoisting a load, one (1) person must be designated to give signals, and all persons involved in the hoisting operation shall be notified who has been designated.

34) Before pulling a hoisting rope, wire, cable, chain or other such tackle, secure a firm footing, assume a braced position, and move clear in the event of adverse action.

35) Use both hands, when climbing into or leaving the crane cab. Lift tools and materials to the cab with a hand line.

36) If repairs to crane cause it to be laid up for a long period of time, lock the main switch in the open position to prevent use.

37) Make sure the controllers are in the "Off" position before opening or closing the main switch.

38) If power should go off, move the controllers to the "Off" position at once. Wait until power is restored before operating controllers again.

39)Never depend upon a limit switch to stop hoisting motor. Use your controls. Do not attempt to use two controls at the same time when approaching limits.

40)Whenever leaving the crane, place all controllers in the "Off" position, open the main switch and set the brakes.

41)When hoist operator's view is obstructed in the direction of movement, assign an employee to precede the hoist and warn others of its approach.

42)Do not shorten, repair or splice hoisting chain with wire, nails, bolts or other objects.

43)Use standard hoisting hand signals.

44)Do not make side pulls with a hoist, which will misalign the rope. It may cause the load to swing sideways or damage the rope itself.

45)Do not operate crane (move load) while the load is being raised or lowered.

46)Approved fire extinguishers are required in overhead cabs.

47)Any construction activity, including crane movement, occurring within 30' of the drip line of a Metromover or Metrorail guideway will also be subject to compliance with Miami-Dade Transit Adjacent Construction Manual requirements and OSS approval.

Q. WIRE ROPES, CHAINS, AND ROPES

1) Wire ropes, chains, ropes, and other rigging equipment shall be inspected prior to use and as necessary to assure their safety. Defective gear shall be tagged and removed from service.

2) Job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, shall not be used.

5) The proper type of chain is to be used for the particular application (overhead lifting, transport, cargo securement, etc)

6) Any attachment, such as hooks or links, are to have a rated "working load limit" at least equal to the chain/rope with which it is used.

3) When U-bolts are use for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

4) When U-bolt wire rope clips are used to form eyes, the following table shall be used to determine the number and spacing of clips.

NUMBER AND SPACING OF U-BOLT WIRE ROPE CLIPS

Improved plow steel, rope diameter inches	Number of clips Drop forged	Other material	Minimum Spacing (inches)
1/2.....	3	4	3
5/8	3	4	3-3/4
3/4.....	4	5	4-1/2
7/8.....	4	5	5-1/4
1.....	5	6	6
1-1/8.....	6	6	6-3/4
1-1/4.....	6	7	7-1/2
1-3/8.....	7	7	8-1/4
1-1/2.....	7	8	9

7) Slings are to be tagged for simple inclusion of sling type, working load limit, reach, serial number, chain size and grade.

8) State and federal regulations regarding size and number of chain systems required for securing loads on trucks are to be adhered too.

R. MOTOR VEHICLES AND MECHANIZED EQUIPMENT

1) All equipment that is left unattended adjacent to a roadway in normal use shall have appropriate lighted barricades placed around the location of the equipment

2) Loaders, backhoes, bulldozer and other similar equipment shall have their blades or buckets fully lowered and engines shut-off when left unattended.

3) All vehicles and equipment shall be checked at the beginning of each shift to ensure that the equipment is in proper operating condition and that accessories that affect safe operations are free from defects.

4) Heavy equipment, machinery, or parts thereof, shall be blocked to prevent falling or shifting before employees are permitted to work under or between them.

5) All equipment and vehicles with cabs shall have safety glass or equivalent windshields that are free of cracks and defects. Broken or cracked glass shall be replaced.

6) No person shall be allowed to ride in or on any equipment or vehicle except in seats, which are provided by the manufacturer.

7) Only trained, qualified and/or licensed persons are to operate equipment/vehicles.

8) All vehicles are required to have visual and audio back-up alarms.

S. EXCAVATION, TRENCHING AND SHORING

1) The Contractor shall call the Engineer who will call the Underground Utilities Notification Center at 1-800-432-4770 prior to any excavation regarding utilities. All initial excavation, which is done to expose all subsurface utilities, shall be done by hand to prevent damage. When exposed, they shall be protected at all times by suitable bridging, boxing, hangers or other supports during the prosecution of the work.

   a) To provide access in emergencies, and for routine inspections of valves on water, gas or other mains, and to electrical power, communications, signal alarm and other service boxes, junction boxes and manhole that are decked over; trap door of a suitable size with suitable identifying steel plates securely attached thereto, shall be provided at all times in the decking.

   b) The Contractors shall have a copy of the water main and gas drawings, clearly marked, to show the valves that control flow in the area and at the construction site. At least two valves in all directions outside the net lines shall be shown. The Contractor's superintendent shall mark and keep clear the location of valves for ready identification, should trouble develop.

2) Walkways shall be kept clean and free of all hazards at all times.

3) Internal combustion engines used in confined areas, such as in excavations or utility vaults where natural ventilation is limited, shall have exhaust fumes dispelled with forced ventilation or equivalent means.

4) All excavations and similar work areas where an exposure to the public or work personnel exists shall be promptly and completely fenced or barricaded, as shown in the Contact Drawings, except in those areas temporarily required to be open for the conduct of the work, then these openings shall be guarded to prevent access.

5) Adjustment screws on cross braces or trench jacks shall not be extended beyond the manufacturer's recommendations or 2/3 of the threaded length, whichever is more restrictive.

6) No one shall be permitted to climb or work from cross bracing.

7) Supervision – Excavation work shall at all times be under the immediate supervision of someone with authority to modify the shoring system or work methods, as necessary, to provide greater safety. He shall frequently examine the material under excavation and improve the shoring or methods beyond the minimum requirements, as necessary, to insure protection of workmen from moving material.

8) Removal of Shoring – No part of the shoring system of any excavation shall be removed until proper steps have been taken to avoid hazard to workmen from moving material. If a newly installed masonry or concrete wall is to be depended upon for this protection, it must have attained adequate strength to sustain resulting pressures.

9) Access and Egress – Convenient and safe means shall be provided for workmen to enter and leave the excavated area. This shall consist of a standard stairway, ladder, or ramp securely fastened in place at suitably guarded or protected locations where men are working and shall not require movement farther than 25 feet to reach such egress.

10) Blasting will not be permitted on the Work Site without prior approval of the Engineer and MDC Risk Management.

11) If any excavation (s) are required or requested to be left open by a utility company (s), municipality (s), or governmental agency, the excavations (s) will remain the sole responsibility of the Contractor for proper barricading and protection.

T. LASERS

1) Only qualified and trained employees shall be assigned to install, adjust, and operate laser equipment.

2) Employees shall wear proper eye protection where there is potential exposure to laser light greater than 0.005 watts (5 milliwatts).

3) Beams shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, over-night, or at change of shifts, the laser shall be turned off and shall be secured in a manner, which will preclude indiscriminate or unauthorized activation.

4) Employees shall not be exposed to light intensities above: direct staring – 1 microwatt per square centimeter; incidental observing – 1 milliwatt per square

centimeter: diffused reflected light – 21/2 watts per square centimeter. Employees shall not be exposed to microwave power densities in excess of 10 milliwatts per square centimeter.

5) The Engineer shall be notified of the location, time and qualifications of person or persons operating the laser.

U. ROLLOVER PROTECTIVE STRUCTURES, OVERHEAD PROTECTION AND REVERSE WARNING ALARMS

1) On ALL rubber-tried or crawler scrapers, bulldozers, front-end loaders, backhoes, motor graders, industrial tractors and forklift trucks, Rollover Protective Structures (ROPS) and Falling Object Protective Structures (FOPS) are required. (Note: See OSHA for structural performance standards).

2) On equipment where ROPS are required (above), seat belts shall be installed and worn by operators.

3) In lieu of a signalman, all bi-directional earthmoving, haulage or compacting equipment, and all trucks with a body capacity of 1-1/2 yards or more used to haul dirt, rock, concrete or other material shall be equipped with an automatically operated reverse signal alarm (such as buzzer, horn or bell) which is audible from a distance of 100 feet from the rear of the vehicle in operation. It shall be the duty of the contractor to inform his suppliers of these requirements.

V. CONCRETE

1) All equipment and materials used in concrete construction and masonry work shall meet the applicable requirements for design, construction, inspection, testing, maintenance and operations as provided in OSHA.

2) Employees working more than six feet above adjacent working surfaces, placing and typing reinforcing steels in walls, piers, columns, etc., shall be provided with a personal fall arrest system (29CFR 1926.502), or equivalent device.

3) Employees shall not be permitted to work above vertically protruding reinforcing steel unless it has been protected to eliminate the hazard of implement.

4) Guying – Reinforcing steel for walls, piers, column and similar vertical structures shall be guyed and supported to prevent collapse.

5) Wire mesh rolls – Wire mesh rolls shall be secured at each end to prevent dangerous recoiling action.

6) Pumpcrete systems – Pumpcrete or similar systems using discharge pipes shall be provided with pipe supports designed for 100 percent overload. Compressed air hose in such systems shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized. Safety chains shall be provided on all line two inches in diameter or larger.

7) Concrete buckets equipped with hydraulic or pneumatically operated gates shall have positive safety latches or similar safety devices installed to prevent aggregate and loose material from accumulating on the top and sides of the bucket.

8) Riding of concrete buckets for any purpose shall be prohibited, and vibrator crews shall be kept out from under concrete buckets suspended from cranes or cableways.

9) When discharging on a slope, the wheels of ready-mix trucks shall be locked and the brakes set to prevent movement. The use of chocks is also required.

10) Nozzlemen applying a cement, sand, and water mixture through a pneumatic hose shall be required to wear protective head and face equipment.

11) When temporary storage of reinforcing rods, materials, or equipment on top of formwork becomes necessary, these areas shall be strengthened to meet the intended loads.

12) The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load.

13) All shoring equipment shall be inspected prior to erection to determine that it is as specified in the shoring layout. Any equipment found to be damaged should not be used for shoring.

14) Erected shoring equipment shall be inspected immediately prior to, during, and immediately after the placement of concrete. Any shoring equipment that is found to be damaged or weakened shall be immediately reinforced or reshored.

15) Reshoring shall be provided when necessary to safety support slabs and beams after stripping or where such members are subjected to superimposed loads due to construction work done.

16) Metal tubular frames used for shoring shall not be loaded beyond the safe working load recommended by the manufacturer.

17) All locking devices on frames and braces shall be in good working order; coupling pins shall align the frame or panel legs; pivoted cross braces shall have

their center pivot in place; and all components shall be in a condition similar to that of original manufacture.

18) When checking the erected shoring frames with the shoring layout, the spacing between towers and cross brace spacing shall not exceed that shown on the layout, and all locking devices shall be in the closed position.

19) Devices for attaching the external lateral stability bracing shall be securely fastened to the legs of the shoring frames.

20) Formwork and shoring shall be designed, erected, supported, braced, and maintained so that it will safely support all vertical and lateral loads that may be imposed upon it during placement of concrete.

21) Working drawing showing the jack layout, formwork, shoring, working decks, and scaffolding, shall be available at the Work Site for review by the Engineer.

22) Stripped forms and shoring shall be removed and stockpiled promptly after stripping. In all areas which persons are required to work or pass, protruding nails, wire ties, and other form accessories not necessary to subsequent work shall be pulled, cut, or other means taken to eliminate the hazard.

23) Imposition of any construction loads on the partially completed structure shall not be permitted unless such loading has been considered in the design and approved by the Engineer.

24) Jacks and vertical supports shall be positioned in such a manner that the vertical loads are distributed equally and do not exceed the capacity of the jacks.

25) When checking the erected shoring towers with the shoring layout, the spacing between posts shall not exceed that shown on the layout, and all interlocking of tubular members and tightness of couples shall be checked.

26) All baseplates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material and shall be snug against the posts.

27) For stability, single post shores shall be horizontally braced in both the longitudinal and transverse directions, and diagonal bracing shall also be installed. Such bracing shall be installed as the shores are being erected.

28) All baseplates or shore heads of single post shores shall be in firm contact with the footing sill and the form materials.

29) Whenever single post shores are used in more than one tier, the layout shall be approved by the Engineer.

30) When formwork is at an angle, or sloping, or when the surface shored is sloping, the shoring shall be designed for such loading.

31) Adjustment of single post shores to raise formwork shall not be made after concrete is in place.

32) Fabricated single post shores shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects.

33) Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

34) Nails used to secure bracing or adjustable timber single post shores shall be driven home and the point of the nail bent over if possible. Double head nails will be permitted.

W. DEMOLITION

1) All sidewalks and walkways open to the public shall have abrasive non-skid surface and shall be kept clean and free of tripping hazards at all times.

2) "NO PARKING" zones with appropriate signs and barricades shall be displayed adjacent to buildings being demolished.

3) Water or other means of dust control shall be used where dust presents a health or environmental hazard, property damage potential, or nuisance.

4) See this Manual's section for Rollover and Falling Object Protection Structures, which also applies to demolition equipment.
5) Provide adequate protection to prevent damage to pipes, conduits, wires, cables, or structures above or below ground, which are not designated for removal.

6) Overhead protection shall be erected over sidewalks and shall extend at least ten feet beyond the building lines along direction of the sidewalks. Overhead planking shall be a minimum of three-inch full dimension lumber placed on adequately designed, metal or timber frames.

7) Substantial catch platforms shall be erected around all sides of the building prior to any demolition. Design must be approved by the Engineer.

8) Solid barriers of ¾ inch exterior fire rated B/D Plywood at least eight feet high shall be erected around the structure at ground or sidewalk level to protect the public. The barriers shall be framed with, at a minimum, 2"x3" fire rated studs 16" on center.

9) Full time flagman shall be provided to assist truck egress and ingress.

10) All mechanical, electrical, air conditioning, ducting, skylights, windows, and any other equipment, material or objects on roofs or walls of adjoining or adjacent structures to buildings under demolishment shall be adequately protected from falling material and activity of wrecking crews and equipment.

11) No mechanical equipment (i.e. headache ball, impact equipment other than hand held) shall be used within six feet of any adjoining structure.

12) Employees engage in the demolition or removal of any pipes, structures or machinery covered or insulated with asbestos shall conform with all federal, state and local codes, rules, regulations and requirements including but not limited to:

a) 29CFR 1926.1101

b) 40CFR 61, Subpart M

c) Florida Statue 469.001-469.099

d) Miami-Dade Department of Environmental Resource Management

13) Employees engage in the demolition, removal or disturbance of any listed hazardous substance shall conform with all applicable federal, state and local codes, rules, regulations and requirements.

X. ADVERSE WEATHER CONDITIONS

1) Disassemble all scaffolds, loose formwork, radio antennas and secure properly.

2) All items that cannot be secured shall be stored inside secured storage areas or buildings.

3) All crane booms shall be lowered to ground level and secured to prevent movement.

4) All office trailers shall be tied down in compliance with MDC Tie Down Ordinance No. 77-1 upon original installation. All tie down straps, ground anchors, piers, etc., shall be checked for condition and operation.

5) All exposed glass on the Work Site shall be protected by a solid, rigid covering.

6) All free standing walls shall be shored from both sides.

7) Before employees are dismissed from the Work Site, the Contractors shall make a thorough inspection to verify all necessary precautions have been taken, and report to the engineer for any further instructions.

8) All precautions for construction sites during hurricane conditions, as required by the Florida Building Codes (Appendix D) shall be met.

9) All contractors shall develop a project specific hurricane plan. This plan will include a detailed description of all hurricane preparation activities for each MDT phase of hurricane readiness including:

   a) Phase A – Pre-Season Preparedness

   b) Phase B – Hurricane Advisory (48 hours prior to landfall)

   c) Phase C – Hurricane Watch (24-48 hours prior to landfall)

   d) Phase D – Hurricane Warning (24 hours prior to landfall)

   e) Phase E – Landfall

   f) Phase F – Recovery/Post Hurricane

10) Progression through the MDT phases of hurricane readiness will be declared by the MDT Hurricane Disaster Preparedness Coordinator (Coordinator). The Coordinator may accelerate preparedness levels based on prevailing conditions and expectations. The time of day the storm is expected to arrive, along with the Miami-Dade Emergency Operations Center levels of activation, are some of the factors that are considered. The MDT readiness phase will be communicated through the Resident Engineer or other MDT contract representative.

Y. HOUSEKEEPING

1) All refuse piles shall be removed from the Work Site immediately.

2) Stored and stacked materials shall be kept orderly, properly stacked, choked, and secured.

3) Any protruding nails, etc., shall be bent, removed or clinched immediately.

4) Oil, grease, and water spills shall be cleaned up immediately.

5) Loose materials, tools, or equipment shall be kept off stairs, out of walkways, ramps, platforms at all times when not in use.

6) Depressions and pot-holes in vehicle or walkway surfaces on the Work Site shall be properly filled and graded immediately.

7) Walkways, vehicle travel ways, ramps, railings, and stairways, shall be kept free from debris, properly installed and maintained.

8) Smoking or the use of open flames within 25 feet of flammable storage areas or fueling areas shall not be permitted.

9) Flammable storage areas shall be properly posted **"NO SMOKING"**, provided with adequate fire extinguishers and free of combustible materials.

10) All sanitary facilities used on the Work Site shall be maintained on a daily basis.

11) All structures shall have a minimum of a 5-foot perimeter clearance that is to be free from any combustible debris or materials.

Z. HAZARDOUS SUBSTANCES

1) The Contractor shall develop, implement and maintain a written Hazard Communication/Right-to-Know Program and comply with all applicable requirements of OSHA Hazard Communication Standard 29CFR1910.1200.

2) The Contractor shall ensure that each container of hazardous substances in the workplace is labeled, tagged, or marked with the following information:

   a) identify of the hazardous substance (s) contained therein
   b) appropriate hazard warnings

3) The Contractor's written hazard communication program shall describe how the criteria for labeling; Material Safety Data Sheets (MSDS); employee information and training will be met and also include:

   a) A list of the hazardous chemicals known to be present and their locations at the Work Site.
   b) The methods the employer will use to inform employees of the hazards of non-routine tasks & the hazards associated with hazardous substances contained in unlabeled pipes in their work areas.

4) The Contractor shall maintain copies of the required Material Safety Data Sheet (MSDS) for each hazardous substance in the workplace, and shall ensure that they are readily accessible during each work shift to employees. (The Contractor may obtain the MSDS for a product by requesting it from the product's manufacturer, distributor, or importer.

5) Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the MSDS may be kept at a central location at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

6) MSDS shall also be made readily available to fire & emergency response personnel, the Engineer and MDC Rick Management.

7) Contractors shall provide their employees with the following:

   a) Information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.
   b) Any operations in there work area where hazardous chemicals are present.
   c) The location and availability of the written hazard communication program, including the required list (s) of hazardous chemicals and material safety data sheets.
   d) Information as to the employees' rights under the Florida Right-to-Know Law:

      1. The right to know of the listed toxic substances present in the workplace.
      2. The right to obtain a copy of the Material Safety Data Sheet for each listed toxic substance present.
      3. The right to refuse to work, under specified circumstances, with a listed substance, if not provided a copy of the Material Safety Data Sheet for that substance within 5 of the requesting employee's working days after submitting a written request to the employee's employer.
      4. The right to instruction, within 30 days of employment, and at least annually thereafter, on the adverse health effects of each listed toxic substance with which they work in the workplace, how to use each substance safety, and what to do in case of any emergency.
      5. The right to obtain further information on the properties and hazards of listed toxic substances from the Toxic Substance Information Center (1-800-367-4378).
      6. The right to protection against discharge, discipline, or discrimination for having exercised any of these rights.

8) The Contractor shall post the State of Florida Right-to-Know Poster at the Work Site. The poster and information/assistance in complying with the Right-to-Know Law is available from the Toxic Substance Information Center (1-800-367-4378). As soon as any environmental item is discovered, the Contractor shall immediately inform the Resident Engineer and the MDT Senior Professional Engineer (Environmental).

APPENDICES

Appendix A - State of Florida, First Report of Injury or Illness; Supervisor's Report; OSHA 300 & 300A

Appendix B - Tool Box Safety Meeting Document, Suggested Format

Appendix C - Safety Inspection Checklist For Crane Inspection & Critical Lifts

Appendix D - Special Hurricane Precautions

Appendix E - OSHA General Industry and Construction Standards Requiring a Competent Person

APPENDIX A

INSTRUCTION - FIRST REPORT OF INJURY OR ILLNESS
LES FORM DWC – 1

EMPLOYER -You are required by law to report all industrial accidents to the Division of Workers' Compensation within seven days of your first knowledge of the accident. A civil penalty of up to $500 is provided for failure. Fully complete this form, using the employee's description of the accident, signs it, have the employees sign it and mail the original to the Division. Copies marked for the employee and your carrier (insurance company) must be sent to them.

If, for any reason, the employee cannot or will not sign the notice, **do not delay your report.**

EMPLOYEE -You are required by law to report your accident to the Worker's Compensation Division. Enter your description of the accident on this form, have your employer complete the form, then both of you should sign. If your employer refuses to sign or complete the report you should complete it. Send the original to the division, a copy to your employer.

For assistance, or for answers to questions on Workers' Compensation, call the toll free number shown on the form.

DISTRIBUTION: Part 1 - Division Copy
Part 2 - Carrier Copy
Part 3 - Employer Copy
Part 4 - Employer Copy

FIRST REPORT OF INJURY OR ILLNESS

FLORIDA DEPARTMENT OF FINANCIAL SERVICES
DIVISION OF WORKERS' COMPENSATION

For assistance call 1-800-342-1741
or contact your local EAO Office
Report all deaths within 24 hours 1-800-319-5913 or (850) 922-3613

RECEIVED BY CLAIMS-HANDLING ENTITY	SENT TO DIVISION DATE	DIVISION RECEIVED DATE

PLEASE PRINT OR TYPE

EMPLOYEE INFORMATION

NAME (First, Middle, Last) | Social Security Number | Date of Accident (Month-Day-Year) | Time of Accident ☐ AM ☐ PM

HOME ADDRESS
Street/Apt #: _____
City: _____ State: _____ Zip: _____
TELEPHONE Area Code Number

EMPLOYEE'S DESCRIPTION OF ACCIDENT (Include Cause of Injury)

OCCUPATION | NATURE/ILLNESS THAT OCCURRED | PART OF BODY AFFECTED

DATE OF BIRTH ____/____/____ | SEX ☐ M ☐ F

EMPLOYER INFORMATION

COMPANY NAME: _____
D.B.A.: _____
Street: _____
City: _____ State: _____ Zip: _____
TELEPHONE Area Code Number

FEDERAL I.D. NUMBER (FEIN) | DATE FIRST REPORTED (Month/Day/Year)

NATURE OF BUSINESS | POLICY/MEMBER NUMBER

DATE EMPLOYED ____/____/____ | PAID FOR DATE OF INJURY ☐ YES ☐ NO

EMPLOYER'S LOCATION ADDRESS (If different)
Street: _____
City: _____ State: _____ Zip: _____
LOCATION # (If applicable): _____

LAST DATE EMPLOYEE WORKED ____/____/____
RETURNED TO WORK ☐ YES ☐ NO
IF YES, GIVE DATE ____/____/____

WILL YOU CONTINUE TO PAY WAGES INSTEAD OF WORKERS' COMP? ☐ YES
LAST DAY WAGES WILL BE PAID INSTEAD OF WORKERS' COMP ____/____/____

PLACE OF ACCIDENT (Street, City, State, Zip)
Street: _____
City: _____ State: _____ Zip: _____
COUNTY OF ACCIDENT: _____

DATE OF DEATH (If applicable) ____/____/____
AGREE WITH DESCRIPTION OF ACCIDENT ☐ YES ☐ NO

RATE OF PAY ☐ HR ☐ WK
$ _____ PER ☐ DAY ☐ MO
Number of hours per day _____
Number of hours per week _____
Number of days per week _____

Any person who knowingly and with intent to injure, defraud, or deceive any employer or employee, insurance company, or self-insured program, files a statement of claim containing any false or misleading information commits a felony of the third degree as provided in s. 817.234, Florida Statutes, or s. 440.105(5), F.S.
I have reviewed, understand and acknowledge the above statement.

EMPLOYEE SIGNATURE (Required to sign) _____ DATE _____
EMPLOYER SIGNATURE _____ DATE _____

NAME, ADDRESS AND TELEPHONE OF PHYSICIAN OR HOSPITAL

AUTHORIZED BY EMPLOYER ☐ YES ☐ NO

CLAIMS-HANDLING ENTITY INFORMATION

☐ 1(a) Denied Case - DWC-12, Notice of Denial Attached
☐ 1(b) Indemnity Only Denied Case - DWC-12, Notice of Denial Attached
☐ 2. Medical Only which became Lost Time Case (Complete all required information in #3)
Employee's 8th Day of Disability ____/____/____
Entity's Knowledge of 8th Day of Disability ____/____/____
☐ 3. Lost Time Case - 1st day of disability ____/____/____ Full Salary in lieu of comp? ☐ YES Full Salary End Date ____/____/____
Date First Payment Mailed ____/____/____ AWW _____ Comp Rate _____
☐ T.T. ☐ T.T. - 60% ☐ T.P. ☐ I.B. ☐ P.T. ☐ DEATH ☐ SETTLEMENT ONLY
Penalty Amount Paid in 1st Payment $_____ Interest Amount Paid in 1st Payment $_____

REMARKS:

INSURER NAME
CLAIMS-HANDLING ENTITY NAME, ADDRESS & TELEPHONE

INSURER CCEE #	EMPLOYER'S CLASS CODE	EMPLOYER'S NAICS CODE
SERVICE CENTER CODE #	CLAIMS-HANDLING ENTITY FILE #	

Form DFS-F1-DWC-1 (05/11)

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20___

U.S. Department of Labor
Occupational Safety and Health Administration
Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name ______________________

City ______________ State ________

Identify the person			Describe the case			Classify the case: CHECK ONLY ONE box for each case based on the most serious outcome for that case				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness: (M)					
(A) Case no.	(B) Employee's name	(C) Job title (e.g., Welder)	(D) Date of injury or onset of illness	(E) Where the event occurred (e.g., Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g., Second degree burns on right forearm from acetylene torch)	(G) Death	(H) Days away from work	(I) Remained at Work: Job transfer or restriction	(J) Remained at Work: Other recordable cases	(K) Away from work	(L) On job transfer or restriction	(1) Injury	(2) Skin disorder	(3) Respiratory condition	(4) Poisoning	(5) Hearing loss	(6) All other illnesses
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
					Page totals	___	___	___	___	___	___	___	___	___	___	___	___

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Injury (1) Skin disorder (2) Respiratory condition (3) Poisoning (4) Hearing loss (5) All other illnesses (6)

Page ___ of ___

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 20___

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

(G) Total number of deaths	(H) Total number of cases with days away from work	(I) Total number of cases with job transfer or restriction	(J) Total number of other recordable cases

Number of Days

(K) Total number of days away from work	(L) Total number of days of job transfer or restriction

Injury and Illness Types

Total number of . . . (M)			
(1) Injuries		(4) Poisonings	
		(5) Hearing loss	
(2) Skin disorders		(6) All other illnesses	
(3) Respiratory conditions			

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA, Office of Statistical Analysis, Room N 3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment Information

Your establishment name _____

Street _____

City _____ State ____ ZIP ____

Industry description (e.g., Manufacture of motor truck trailers)

_____

Standard Industrial Classification (SIC), if known (e.g., 3715)

____ ____ ____ ____

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

____ ____ ____ ____ ____ ____

Employment Information (If you don't have these figures, see the Worksheet on the back of this page to estimate.)

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

_____ _____
Phone Date

OSHA's Form 301

Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This Injury and Illness Incident Report is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the Log of Work-Related Injuries and Illnesses and the accompanying Summary, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone ( ) _____ Date ____/____/____

Information about the employee

1) Full name _____

2) Street _____

City _____ State ____ ZIP ____

3) Date of birth ____/____/____

4) Date hired ____/____/____

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State ____ ZIP ____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an inpatient?
☐ Yes
☐ No

Information about the case

10) Case number from the Log _____ (Transfer the case number from the Log after you record the case.)

11) Date of injury or illness ____/____/____

12) Time employee began work _____ AM / PM

13) Time of event _____ AM / PM ☐ Check if time cannot be determined

14) What was the employee doing just before the incident occurred? Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorinated solvent from a 5-gallon bucket"; "daily computer key-entry."

15) What happened? Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell from ladder"; "Worker was exposed to solvent when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) What was the injury or illness? Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) What object or substance directly harmed the employee? Examples: "concrete floor"; "chlorine"; "radial saw." If this question does not apply to the incident, leave it blank.

18) If the employee died, when did death occur? Date of death ____/____/____

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspect of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed form to this office.

APPENDIX B
TOOL BOX SAFETY MEETING

FOREMAN/SUPERVISOR – PRINT NAME _____ Date and Shift _____

FOREMAN/SUPERVISOR – SIGNATURE _____ Section _____

TOPICS COVERED AT MEETING:

_____

_____

_____

Name(s) of Personnel Present for Meeting _____

Name (print)	Signature	Job Title

MDC AUDIT: _____
(name) (signature) (date)

Original must be filed for length of construction project.

APPENDIX C: SAFETY INSPECTION CHECKLIST
Page 1 of 3

TITLE: JOB SITE ERECTION – Crane Inspection

AREA INSPECTED: _____

INSPECTED BY: _____ DATE: _____

INSPECTOR SUGNATURE: _____

PCI SAFETY MANUAL REFERENCE SECTIONS: _____

* Check items to be inspected in your area – disregard others not applicable

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		The Crane Crew: Is the operator and crew properly trained and medically fit to perform their job?		
		Operating is a full time job – does the operator pay strict attention to his duties?		
		Do crane personnel wear hard hats when away from the crane?		
		Is the operator aware of the regulations involving working close to high voltage lines and electrical equipment?		
		High Voltage, even from a distance source, can be induced in metal parts of the crane. Is the operator aware of these situations?		
		Does the operator know the weight of each piece before he picks it?		
		Does the crane crew know the manufacturer's proper recommendations for making short moves on the job site?		
		Does the crew get help when lifting heavy items?		
		Does the crew periodically check for level?		
		Do they check outriggers for stability?		
		Do they check the boom angel indicator and other electronic load equipment for accuracy?		
		Does the operator allow anyone to ride the load or the hooks?		
		The Ground Crew (hooking up product) Does the ground crew have, maintain and use proper safety equipment?		
		Are they familiar with the product erection sequence?		

TITLE: JOB SITE ERECTION – Crane Inspection (continued)

AREA INSPECTED: _____

INSPECTED BY: _____ DATE: _____

INSPECTOR SIGNATURE: _____

PCI SAFETY MANUAL REFERENCE SECTIONS: _____

* Check items to be inspected in your area – disregard others not applicable

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		(Continue) Are they familiar with the crane signals and general operation of the crane?		
		Do they know how to properly hook pieces and provide aerial stability?		
		Do they know how to properly use tag lines?		
		Are tag lines in good condition, strong enough?		
		Long Enough?		
		Two-way communication between the operator and erection foreman are becoming more common to provide safety on the job. Does the crew know how to operator and maintain the system? Are spare parts available for quick repair?		
		Is the crane swing radius roped off to prohibit the crane (during swing) from causing damage or hurting someone? Is entire swing checked? Including counterweights?		
		The Machine: Is the crane operated within all capacities?		
		Is the machine inspected daily?		
		Are the required crane inspections recorded?		
		Are all controls properly identified?		
		Are warning devices operative?		
		Is an operator's manual available to the crew for easy reference?		
		Are load charts, operating signals and other important information posted and/or readily available?		

APPENDIX C: SAFETY INSPECTION CHECKLIST
Page 3 of 3

TITLE: JOB SITE ERECTION – Crane Inspection (continued)

AREA INSPECTED: _____

INSPECTED BY: _____ DATE: _____

INSPECTOR SIGNATURE: _____

PCI SAFETY MANUAL REFERENCE SECTIONS: _____

* Check items to be inspected in your area – disregard others not applicable

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		(continued) Are brakes within operating limits?		
		Are clutch and brakes surfaces dry?		
		Are all protective panels and guards in place?		
		Are electrical systems in good condition?		
		Are all of the sheaves properly aligned so as to reduce rope wear during work?		
		Is cable in good condition?		
		Are hooks in good condition?		
		Have hooks been inspected by magnetic particle inspection?		
		Are there safety latches on hooks?		
		Are fuel tanks in good condition and without leaks?		
		Are fire extinguishers available and routinely inspected?		
		Slings Are slings in good conditions? Is safety factor of 5 maintained?		
		Are slings stored properly?		
		Are sling inspected reports maintained?		
		Are "U" bolt wire rope clips correctly placed?		
		Are all other lifting devices in good condition?		

APPENDIX C (continued)
Page 1 of 2

CHECK LIST FOR CRITICAL LIFTS

NOTE: THIS FORM IS TO BE COMPLETED WHEN THE LOAD EXCEEDS 80% OF THE LOAD CHART FOR THE CRANE OR DERRICK OR WHERE THE PICK INVOLVES THE USE OF TWO OR MORE CRANES.

DATE:_____

(1) SUPERVISOR RESPONSIBLE FOR LIFT:_____

(2) DESCRIPTION OF ITEM TO BE LIFTED AND ESTIMATED WEIGHT:

_____

_____

(3) EQUIPMENT AND LIFT RELATIONSHIP:

(A) OPERATING RADIUS.....

(B) BOOM LENGTH.....

(C) ALLOWABLE LOAD (FROM LOAD CHART).....

(D) RATIO OF LIFT TO ALLOWABLE LOAD.....

(E) CLEARANCE TO SURROUNDING FACILITIES.....

(F) SLING ANGLE.....

(4) CONDITION OF HOISTING EQUIPMENT AND RIGGING:

(A) HAS ALL EQUIPMENT BEEN REINSPECTED FOR THIS LIFT? o YES o NO

(5) STABILITY OF GROUND AREA:

(A) CHECK SOIL BEARING ALLOWABLE LOAD (COMMENTS):

_____

_____

_____

(B) WILL MATS BE NEEDED? o YES o NO

CHECK LIST FOR CRITICAL LIFTS (cont.)

(B) ANY UNDERGROUND INSTALLATIONS NEEDING SPECIAL ATTENTION?

o YES o NO

(C) WILL IT BE NECESSARY FOR THE CRANE TO WALK WITH THE LOAD?

o YES o NO

IF THE ANSWER IS "YES", ANSWER QUESTIONS E, F, & G.

(E) IS AREA SURFACE LEVEL AND STABLE WHERE THE CRANE WILL BE WALKING

o YES o NO

(F) HAVE FACILITIES BEEN PROVIDED TO KEEP THE LOAD RADIUS FROM CHANGING?

o YES o NO

(G) HAVE ALL OVERHEAD FACILITIES BEEN CHECKED FOR CLEARANCE IN THE AREA WHERE THE CRANE WILL BE MOVING?

(6) DOES THE OPERATOR HAVE THE NECESSARY EXPERIENCE ON THE CRANE AND ON THIS TYPE OF LIFT?

o YES o NO

(7) IF LIFT INVOLVES USE OF TWO CRANES ANSWER THE FOLLOWING:

A) HAVE OPERATORS WORKED TOGETHER BEFORE? o YES o NO

B) WHO WILL COORDINATE INSTRUCTIONS TO OPERATORS?_____

_____

_____

BY: _____
CONTRACTOR'S SUPERINTENDENT

APPENDIX D

SPECIAL HURRICANE PRECAUTIONS

During such periods of time as are designated by the United States Weather Bureau as being a hurricane warning or alert, all construction materials or equipment shall be secured against displacement by wind forces; provided that where a full complement of personnel is employed or otherwise in attendance, or engaged for such protection purposes, normal construction procedures or uses of materials or equipment may continue allowing such reasonable time as may be necessary to secure such materials or equipment before winds of hurricane force are anticipated. Construction materials and equipment shall be secured by guying and shoring, by tying down loose materials equipment and construction sheds.

APPENDIX E

OSHA General Industry and Construction Standards Requiring a Competent Person

The following OSHA standards require a competent person to perform specific functions under the standard. Standards are arranged numerically within the categories of General Industry and Construction. This list of standards requiring a competent person is to be used as a reference tool and does not supercede OSHA requirements.

General Industry (1910)

- 1910.66, Powered platforms for building maintenance.
- 1910.66 App C, Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms, Personal Fall Arrest System (Section I - Mandatory; Sections II and III - Non-Mandatory).
- 1910.109, Explosives and blasting agents.
- 1910.139, Respiratory protection for M. tuberculosis.
- 1910.183, Helicopters.
- 1910.184, Slings.
- 1910.268, Telecommunications.

Construction (1926)

- 1926.20, General safety and health provisions.
- 1926.53, Ionizing radiation.
- 1926.62, Lead.
- 1926.101, Hearing Protection.
- 1926.251, Rigging equipment for material handling.
- 1926.354, Welding, cutting, and heating in way of preservative coatings.
- 1926.404, Wiring design and protection.
- 1926.451, Scaffolds.
- 1926.454, Scaffolds, Training requirements.
- 1926.500, Fall Protections, Scope, application, and definitions applicable to this subpart.
- 1926.502, Fall protection systems criteria and practices.
  1926 Subpart M App C, Personal Fall Arrest Systems - Non-Mandatory Guidelines for Complying with 1926.502(d).
- 1926 Subpart M App E, Sample Fall Protection Plan - Non-Mandatory Guidelines for Complying with 1926.502(k).
- 1926.503, Fall Protection, Training Requirements.
- 1926.550, Cranes and derricks.
- 1926.552, Material hoists, personnel hoists, and elevators.
- 1926 Subpart P App A, Excavations, Soil Classification.
- 1926 Subpart P App B, Excavations, Sloping and Benching.
- 1926.651, Specific Excavation Requirements.
- 1926.652, Excavations, Requirements for protective systems.
-

- 1926.705, Concrete and Masonry Construction, Requirements for lift-slab operations.
- 1926.752, Steel Erection, Bolting, riveting, fitting-up, and plumbing-up.
- 1926.800, Underground Construction.
- 1926.803, Underground Construction, Caissons, Cofferdams, and Compressed Air, Compressed air.
- 1926.850, Demolition, Preparatory operations.
- 1926.859, Mechanical demolition.
- 1926.900, Blasting and the Use of Explosives.
- 1926.1053, Ladders.
- 1926.1060, Stairways and Ladders, Training requirements.
- 1926.1101, Asbestos.
- 1926.1101 App F, Work practices and engineering controls for Class I Asbestos Operations - non-mandatory.
- 1926.1127, Cadmium.

APPENDIX “E” TO SPECIAL PROVISIONS
ADJACENT CONSTRUCTION MANUAL

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS ADJACENT CONSTRUCTION MANUAL

July 2017

Published by the DTPW Office of Safety and Security

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

OFFICE OF SAFETY AND SECURITY

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Date

Approved By:
Eric Muntan
Chief, DTPW
Office of Safety and Security

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1.0 Introduction

This manual was prepared in the interest and for the guidance of those who may want to construct a non-Department of Transportation and Public Works (DTPW) physical structure (incl. any excavation, demolition or use of DTPW real property) on, adjacent to, or over, an existing DTPW facility and/or property. The purpose of this Manual is to provide uniform minimum standards and criteria for the construction, development and maintenance of all properties that have or may enter the **Safety Zone** (defined in Appendix A and C) that has been established for all DTPW property and extending on either side of the Metrorail and/or Metromover systems. This includes any equipment, regardless of distance from the guideway, which static or operational failure could directly or indirectly affect DTPW operations or structures.

These standards are intended to provide the basic guidance for the construction, development and maintenance of property adjacent to the operating guideway systems so as to:

1. Protect the safety of the general public and DTPW Employees.
2. Protect the guideway system and the DTPW property from physical damage.
3. Preserve the level of service and operational schedules so as to cause the least disruption for the ridership and use of the DTPW system.

This manual outlines the design guidelines and criteria to follow for the design and submittal of construction plans and specifications to DTPW for review prior to construction of the project. It is the general policy of DTPW to review designs for construction projects adjacent to or on DTPW property on a case-by-case basis to ensure that DTPW facilities are not damaged by the proposed construction, and that DTPW operations are not impacted during or after the adjacent construction.

DTPW maintains half-size "as-built" drawings in its Engineering, Planning & Development (EP&D) Library. Half-size copies of any of the drawings on file are available at printing costs. The full-size drawings on file are available at printing costs. The full-size drawings are normally in archival storage. Full size drawings may be obtained by special request. The Manager, DTPW Document Control, may be contacted (telephone: (786) 469-5268) for an appointment to review the drawings and to order prepaid copies as required.

The criteria provided herein are general in nature and for the sole purpose of providing a selective overview of the design requirements. Specific designs performed in the past by DTPW's consultants may not necessarily be in total conformance with this manual. It is considered to be the Developer's responsibility to obtain the original design computations, where available, from DTPW to completely understand the original design intent in order to accurately assess the impact of their proposed construction on the DTPW structures and facilities. A map of the DTPW Metrorail and Metromover system is provided in Section 2.0 (below) for use in locating "as-built" drawings.

2.0 System Maps (Rail & Mover)

2.1 Metrorail System

2.2 Metromover System

3.0 General Procedures for Adjacent and Transit Right-of-Way Construction Activity

Developers or agencies contemplating any construction activity adjacent to or on Department of Transportation and Public Works (DTPW) facility, structure or property, including any excavation, maintenance, restoration, demolition or use of DTPW real property, should provide, for review, three (3) copies of their drawings and three (3) copies of their calculations, showing the relationship between their project and the DTPW facilities.

Sufficient drawings and details should be submitted to facilitate DTPW's review of the effects that the proposed project may or may not have on the DTPW facilities. A DTPW review requires internal circulation of the construction drawings to concerned departments. Drawings normally required for review are:

- Site Plan
- Drainage Area Maps and Drainage Calculations
- Architectural drawings (basement plans through top floor)
- Sections showing foundations and DTPW Structures
- Structural drawings (provide relative sections showing DTPW)
- Column load tables
- Pertinent drawings detailing an impact on DTPW facilities
- A copy of the geotechnical report

If uncertainty exits on the possible impacts a project may have on the DTPW facilities, and before making a formal application for a review of a construction project adjacent to the DTPW System, the developer or his agent may contact the **Chief, Right-of-Way and Utilities Division should be contacted at (786) 469-5244.**

Sheeting and shoring drawings should be accompanied by calculations. The drawings and calculations should contain comments, details, notes, and instructions describing the proposed sequence of construction.

When the design of foundations and site work of the project has progressed to the point considered complete and ready for review, the drawings and calculations, as applicable, should be sent to:

Chief
Right-of-Way and Utilities
Department of Transportation and Public Works
701 N.W. 1st Court, Suite 1500
Miami, FL 33136

A period of 15 working days should be allowed for review of the drawings and calculations. Fifteen (15) days should be allowed for each successive review as required. Additional review time may be required for complex projects.

Reimbursement is required for the cost of providing support services for adjacent construction and joint development projects where access is required into the operating Metrorail/Metromover system; or the system is impacted. As part of the review procedure, and before any work may proceed, the developer will be required to sign a letter accepting this obligation.

The applicant must receive written approval for the design of a given project by the DTPW Chief, Right-of-Way & Utilities or DTPW Fire/Life Safety Technical Committee Chairperson (as applicable), prior to the start of construction.

Project Documents shall be reviewed and accepted by the appropriate DTPW Divisions for possible impact on DTPW facilities and operations, including all elements associated with the construction of the project and any temporary protection system needed to preserve the system safety.

Each "Part" of the project's design shall be reviewed and approved by the DTPW Design and Engineering Division (DED). A few of the more common "Parts" of a project are considered to be sheeting and shoring, overhead protection, dust protection, dewatering, temporary use of public space for construction activities.

The DTPW review process is outlined in Figure 1 below

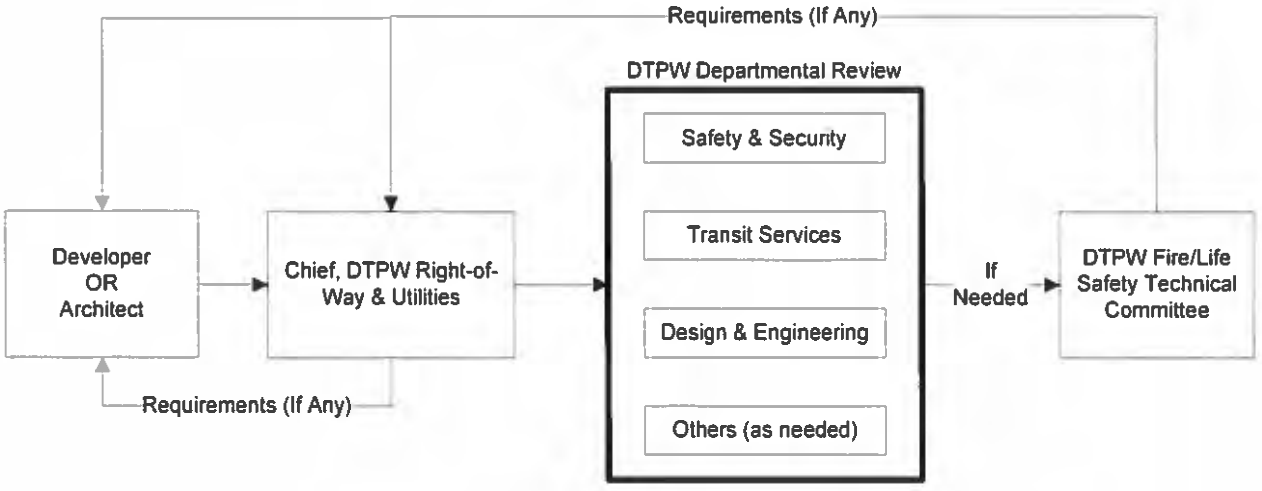


Figure 1

3.1 Fire/Life Safety

DTPW Office of Safety and Security is charged with the responsibility to chair the DTPW Fire/Life Safety Technical Committee which was formed in 1978 to guide Department of Transportation and Public Works (DTPW), rapid transit operations, in developing and following emergency procedures and operational procedures to ensure all fire/life safety related equipment is in proper order and all associated personnel are appropriately trained; to prescribe testing and inspection procedures for fire/life safety equipment in accordance with appropriate codes; to assist the DTPW in developing and implementing a comprehensive joint training program for fire/rescue personnel and DTPW employees; and, to interpret and apply fire/life safety codes, criteria and standards to the design of the fixed guideway systems.

The DTPW Fire/Life Safety Technical Committee acts on behalf of the DTPW Director in accordance with the above to interpret and apply fire/life-safety requirements incorporated in the Florida Building code; National Fire Protection Association Codes and Standards; State Statutes and Fire Marshal's Office; South Florida Fire Protection Code; DTPW Criteria and Standards; other applicable codes, standards and criteria; and, as required, to develop, and verify implementation of, design standards for the DTPW to protect life and property. The Committee works closely with Transit Engineering for design of fire/life safety features and test and maintenance of alarm systems. For test and maintenance of fire suppression systems, the Committee works with facilities maintenance organizations.

As required by the current System Safety Program Plan, the Fire/Life Safety Technical Committee addresses fire/life safety concerns, as described above, for all phases of DTPW Metrorail, Metromover, Metrobus and Special Transportation Services Operations. The Committee also serves as liaison with all Miami-Dade County jurisdictions for development and coordination of emergency response procedures and annual emergency response drills.

4.0 DTPW Review Policy

All design work will be reviewed based upon the assumption that the design will meet the applicable code adopted in the jurisdiction as well as the DTPW Design Criteria and DTPW Standard Specifications. The DTPW design concepts, as set forth herein, generally represent the design approach used by DTPW in the design of its facilities. The effect of adjacent construction upon DTPW structures should be examined based upon the same approach.

Permits, where required by the local jurisdiction, shall be the responsibility of the developer.

Monitoring of the temporary support of excavation structures for adjacent construction shall be required in all cases for excavations within the influence line of DTPW structures (Appendix B). The extent of the monitoring will vary from case to case. Structural design computations maybe required for the adjacent construction. When requested by DTPW, the calculations submitted for review shall include the following:

- A concise statement of the problem and the purpose of the calculation.
- Input data, applicable criteria, clearly stated assumptions and justifying rationale.
- References to articles, manuals and source material should be furnished with the calculations.
- References to pertinent codes and standards.
- Sufficient sketches or drawing references for the work to be easily understood by an independent reviewer. Diagrams indicating data (such as loads and dimensions) shall be included along with adequate sketches of all details not considered standard by DTPW.
- The source or derivation of all equations shall be shown where they are introduced into the calculations.
- Numerical calculations shall clearly show all English units.
- Identify results and conclusions.
- Calculations shall be neat, orderly, and legible.

Drawings should be drawn, to scale, showing the location and relationship of the proposed adjacent construction to existing DTPW structures at various stages of new construction along the entire adjacent alignment. The stresses and deflections induced in the existing DTPW structures should be provided.

The short-term and long-term effects of the new loading due to the adjacent construction on the DTPW structures should be provided. The soil parameters and other pertinent geo-technical criteria contained herein should be used to analyze the existing DTPW structures.

DTPW structures shall be analyzed for differential pressure loadings caused by dewatering the adjacent construction site.

A system of earth retaining structures is required for new excavations adjacent to DTPW structures. Design calculations and drawings stamped and prepared by a Registered Professional Engineer experienced in this type of work, and registered in the state where the work will be performed, are required.

All DTPW underground concrete structures are designed using the ACI Alternate Design Method (working stress design) to curtail excessive deflections and cracking. DTPW underground structures shall be fully reevaluated, for the effects caused by the adjacent construction, using working stress techniques.

4.1 REVIEW SUBMITTALS - DRAWING CRITERIA

General
All designs for the protection, support (sheeting and shoring) and underpinning of existing DTPW structures shall be reviewed by DTPW's Design and Engineering Division (DED). The investigation of the feasibility of various underpinning and dewatering schemes for structures constructed adjacent to DTPW facilities shall be investigated by the developer. The developer's engineer should make recommendations concerning the best underpinning design for a particular structure.

The developer's contract drawings and specifications shall require his construction contractor to maintain, protect and be responsible for the safety, stability and integrity of all adjacent DTPW structures which may be affected by his work.

Drawing Details
The following information shall be included in the drawings submitted for review of an adjacent construction project:

- Dimensioned clearances, both horizontal and vertical, between the adjacent developer's construction and DTPW structures, track, roadways, parking areas and utilities.
- Details of the proposed modifications to DTPW's roadways, parking areas, and busways. Include sections and details showing the relationship of existing facilities and proposed facilities.
- Cross sections with the existing and proposed contours and limits of grading work shown in relation to the property lines and the impact or lack thereof on DTPW facilities. Where grading changes are required in DTPW property, provide the dimensions and square footage of the area required for construction easements.
- Hydrologic and hydraulic calculations showing the impacts on the DTPW drainage system are required if storm drainage from the proposed development is to be discharged into the existing DTPW drainage system. Appropriate sedimentation

and erosion control measures should be included upstream of the discharge point onto DTPW property.

- Where modifications to DTPW utilities are required by adjacent construction, submit for review cross sections, plan and profiles, specifications and design calculations concerning the utility modifications. Details for maintaining electrical and water service to DTPW Stations should be shown when required.
- Where construction will impact a DTPW station entrance and the public, include in the submittal plans for temporary pedestrian and vehicular traffic circulation for the area around the station entrance. Where construction will be adjacent to or above a Metrorail/Metromover station entrance, protection will be required over the escalators in accordance with Section "Overhead Protection" of this Manual. Provide the construction plans, the shop drawings or the working drawings showing the phasing of adjacent construction as well as the construction details for overhead protection, pedestrian barricades, and sidewalk protection. Requests for relocation of bus stops and bus shelters shall be clearly shown on the plans. Barricades and signing necessary to direct the public through the construction zone will be required. Lighting will be required as part of all overhead protection structures.
- Provide construction protection details to preclude impacts on DTPW landscaping, street furniture, pylons, bus shelters and light fixtures.

5.0 DTPW Operational Requirements

DTPW shall have the right to stop any work or construction activities that effects the safety of the DTPW patrons and or facilities or normal DTPW operations. DTPW will exercise reasonable advance notice, except for any matters related to immediate system concerns which will require no advance notice.

Construction work which may have any impact on the Metrorail/Metromover Systems may be scheduled during the Non-Peak Operating Hours or Non-Passenger Hours. Non- Peak Operating Hours are defined as weekdays prior to 6:30 A.M. or after 7:00 P.M. and between 10 A.M. and 3 P.M.; and all day Saturday and Sunday. Non-Passenger hours are defined as Monday through Sunday 12:30 A.M. to 4:30 A.M. Passenger hours may change without notice.

Construction work that may impact weekend or special operational conditions will be limited. Schedule requirements will be addressed on a project by project basis where the individual scheduling need of the project can be evaluated with respect to the operations of the DTPW system.

5.1 General Conditions for Construction Adjacent to the Metrorail or Metromover Guideway/Facilities

A. Clear access is required on a 24 hour basis for ingress and egress for transit patrons, fire and rescue personnel, and maintenance personnel.

B. A contact person will be named by the Contractor to act as liaison with the DTPW Office of Safety and Security for all matters related to safety of the DTPW System. A contact person shall also be named (may be the same person) to act as liaison with the DTPW Metrorail/Metromover Operations Division for all matters related to operation of the Transit System.

C. DTPW shall have the right to review all plans and any construction with reasonable advance notice, except for any matters related to immediate system safety concerns which will require no advance notice.

D. No construction elevators or cranes will be erected on the Metrorail/Metromover guideway side of the building/structure being constructed or demolished.

E. The Metrorail/Metromover guideway shall not be used to support and/or brace construction scaffolding or equipment.

F. For any activity within the **Safety Zone**, the following requirements may apply pending DTPW review.

G. At least forty-eight hours notice describing the nature of the work shall be provided to the DTPW prior to commencement of work.

H. The contractor will provide special protection, such as netting, barricades, walks, screens, scaffolds, etc., acceptable to DTPW, to help ensure the safety

of DTPW property, patrons and employees. No work shall be permitted unless such protection is provided as determined necessary by DTPW.

I. Best efforts will be used to schedule all construction work which may have any impact on the Metrorail/Metromover System during the Non-Peak Operating Hours or Non-Passenger Hours. Non-Peak Operating Hours are defined as weekdays prior to 6:30 A.M.; after 7:00 P.M. and between 10 A.M. and 3 P.M.; and all Saturdays and Sundays. Non-Passenger Hours are defined as Monday through Sunday 12:30 A.M. to 5:00 A.M. or such other hours as may be designated by the County as Non-Passenger hours. Passenger hours will change as required by DTPW.

J. No crane lifts, other crane operations or any other operation shall be performed within the **Safety Zone** (Appendix A and C) without prior approval (in writing) from DTPW. This paragraph shall apply where any part of the load or crane (incl. counter weight), construction equipment or operation that is above the surface of the guideway running pad/rail.

K. For any construction activity within the **Safety Zone** (Appendix A and C) or that may encroach into the Safety Zone, DTPW may deem, as necessary, at the contractor's expense, a DTPW employee or DTPW authorized contractor or consultant (Monitor), to coordinate the contractor's activities with Central Control. This employee will be responsible for monitoring construction activities and communicating with DTPW Central Control. DTPW will determine, in the reasonable exercise of its discretion, the number of hours the above-mentioned employee is needed. The construction contractor will reimburse DTPW for costs arising from the provision of the above-mentioned employee which will be charged at the current rate.

L. DTPW may, at its discretion, modify any of the above conditions or impose additional conditions, to help ensure the safety of the public, and its patrons, employees or property.

5.2 DTPW Monitor and Contractor Coordination

A. Start-up

There will be continued meetings between representatives from DTPW, and Contractor/Developer's project manager, DTPW crane Monitors, the Contractor's crane operators and the form-work Contractor prior to the commencement of the phase work by the tower cranes and any other equipment or operation, adjacent to the DTPW Metromover/Metrorail Guideway System. In addition, DTPW Monitors and the contractor equipment/crane operators will continue to meet daily, at the beginning of the work day, of the project to establish a working relationship of the daily routines in and around the DTPW safety zone.

No construction work requiring a DTPW Monitor will commence until the Contractor provides the DTPW Monitor a functional Contractor radio, and sign off for same as per contractor procedures. Upon arrival at the project site, the DTPW Monitor will

immediately contact the DTPW Central Control Facility, to advise of his/her presence at the project site.

If, at any time during the construction project, a new crane operator is brought on-site to operate any crane, he/she must be apprised of all of the rules and regulations outlined in this Plan by the Contractor's/Developer's Project Manager.

B. Special Provisions – Pre-Task Plan

At the discretion of DTPW, based on construction project proximity to DTPW system and scope of work, DTPW may assign a DTPW manager to log in arrival of DTPW Monitor(s), at the construction site. The assigned DTPW manager will contact the Contractor Senior Superintendent to request and receive a Contractor radio and meet with the Contractor Senior Superintendent and Contractor trade partner /Superintendent or Foreman to go over planned work. The Contractor Senior Superintendent, Contractor Trade Superintendent/Foreman, the DTPW Monitor and the assigned DTPW manager will complete and sign the Contractor Pre-Task Plan (PTP) Form, as specified in the DTPW Adjacent Construction Manual. Until this revised PTP form is accurately and completely filled out, scheduled work warranting a DTPW Monitor shall not proceed. After the PTP form is completed, if PTP is deemed by DTPW, the assigned DTPW manager and the DTPW Monitor shall walk to the selected area to commence monitoring duties, performing a radio check with the operator or crew on the other end of the Contractor radio. If the radio check is successful, the DTPW Monitor will use the DTPW radio to communicate to the Rail Central Control Facility to advise that the Contractor will commence with construction work.

C. Commencement of Work

Once receiving authorization from the appropriate Rail Traffic Controller, the DTPW Monitor will use the Contractor radio to communicate to the work crew that it is now permissible to begin work. The Contractor representative and the DTPW Monitor will sign the provided Central Control log form (as specified in the DTPW Adjacent Construction Manual), with the corresponding approval code, to confirm hearing the verbal approval from the Rail Central Control Facility over the DTPW radio before commencing with work. This log records the code, date, time, location, equipment being used, person giving code and DTPW Monitor receiving code.

6.0 Construction Activity Considerations

The Contractor shall comply with the following requirements:

- The Contractor shall assume full responsibility for the compliance with all applicable Federal, State and local regulations and for complying with this Manual for construction adjacent to the right-of-way during the performance of all work.
- Provide an overall maintenance of traffic (MOT) control plan for pedestrians, vehicular traffic and construction operations. Establish a general visitor control program if required.
- Maintain responsibility for project safety on the work site for the company employees as well as its' subcontractor employees.
- Require each of the Contractor's personnel that may need access on the guideway, to attend the DTPW Orientation and Guideway Safety Class. The Contractor shall reimburse costs of these classes to the DTPW.

6.1 DTPW Personnel/Public/Property Safety & Security

6.1.1 Mechanical Criteria

Existing services to DTPW facilities, including chilled water and condenser water piping, potable and fire water, fire standpipes and storm and sanitary sewers, are not be interrupted nor disturbed without written approval of DTPW.

Clear access for the fire department to the DTPW fire standpipe system and guideways shall be maintained at all times. Construction signs shall be provided to identify the location of DTPW fire standpipes. Call **DTPW Office of Safety and Security (305-375-4240)** 48 hours in advance of any approved interruption to fire standpipe water service.

Modifications to existing DTPW mechanical systems and equipment, required by new connections into the DTPW System, will only be permitted with prior review and approval by DTPW.

The adjacent construction developer will be required to submit the design calculations, drawings, specifications, catalog cuts and any other information necessary to fully describe the proposed modification.

At the option of DTPW, the adjacent construction developer will be requested to perform the field tests necessary to verify the adequacy of the modified system and the equipment performance. Where a modification is approved, the developer shall be held responsible to maintain original operating capacity of the equipment and the system impacted by the modification.

6.1.2 Corrosion & Stray Current Protection

The developer should be aware that, since Metrorail/Metromover transit cars are powered by direct current (DC) electricity, direct current can enter the earth through

unintentional leakage from the DTPW negative ground return system. The leakage or stray current may flow to the discharge from underground metallic elements (i.e. steel reinforcing, pipelines, grounding systems, etc.) which are in contact with any electrolyte, including earth, in the vicinity of the DTPW System. Because stray current may be corrosive to metal at locations where it flows into an electrolyte, the developer is cautioned to investigate the site for stray current and to provide the means for stray current mitigation when warranted.

Further information concerning stray current mitigation can be obtained by contacting The National Association of Corrosion Engineers (NACE), P.O. BOX 218340, Houston, Texas 77812, telephone (713) 492-0535.

6.1.3 Electrical System Interference

No interference to existing DTPW duct banks for the following electrical services shall be allowed:

- 13.8 K.V. service from Florida Power & Light
- 480 V. Florida Power & Light or from DTPW substations
- 480 V service to lighting in Parking Lots, Kiss and Ride areas, and 120 V service to Bus Shelters.

If any of the listed duct banks are affected by the adjacent construction, all information shall be submitted to the DTPW and utility company for review and approval.

No interference to existing DTPW duct banks for the following services shall be allowed:

- Telephone cables from Bell South
- DTPW train control and communications cables

Redesign of Facilities

The design for relocation or modification to existing DTPW parking lots, or Kiss & Ride areas and bus shelters shall be done in accordance with DTPW Design Criteria, Directive Drawings and Standard Specifications. To minimize interruption of DTPW operations, a phasing plan shall be developed and submitted for approval.

Proposed relocation of light fixtures, if any, shall be submitted for DTPW approval.

Existing ground-grids and ground conductors from ground-grids to DTPW facilities shall not be disturbed. No digging or cutting into existing DTPW facilities (ductbanks, wall, floor or ceiling) shall be permitted.

Access to personnel and equipment hatches for underground facilities shall not be blocked. In case any structure is built over an equipment access hatch, adequate passageway for entry of a heavy truck and clearance for the use of a crane to lower equipment from the truck into the hatch shall be provided.

In case any structure is built adjacent to DTPW at-grade facilities (traction power substations, tiebreaker stations, train control or communications rooms), passageways for heavy trucks and adequate clearance for the use of cranes to move equipment from trucks into and out of the equipment hatches shall be provided.

Emergency access gates for at-grade or aerial sections of DTPW rail shall not be blocked. Adequate passage from the gates to public streets shall be provided.

6.1.4 Modifications/Direct Connections to a DTPW Station

Connections to Metrorail/Metromover Facilities shall be designed, built and paid for by the person requesting the connection in accordance with DTPW Design Criteria or through a Direct Connection Agreement. Below are the items that shall be considered in the design of the connections.

The connection shall have a bronze flexible gate installed between the two passageways. The gate or grate shall be keyed on both sides with separate locks. To open the gate both locks will have to be open. Where the connection has 24-hour manned security on the non-DTPW side of the connection, glass doors may be used in lieu of a gate. If doors are used, each door shall be locked from both sides.

When required, a Closed-Circuit Television (CCTV) will be installed at the developer's expense and connected to the DTPW Kiosk. Power for the cameras shall be run from the CCTV to the station power room. The existing conduit runs and spare breaker locations can be found in the DTPW "As Built" drawings. It is the developer's responsibility to have this research performed by a competent professional. Intrusion alarms shall be installed on the gate or door and control wires installed between the gate or door and the communications room by the developer's contractor. Final connection will be made by DTPW to the DTPW security system.

Finishes on the interior of the DTPW side of the connection shall be to DTPW standards and specifications.

Lights in the new passageway shall be run to the developer's power room and included in the development's emergency power panel.

In the event that a Direct Connection is to be maintained by DTPW then the design will be in accordance with DTPW Design Criteria and construction would be required to meet DTPW's standard construction specifications. Normally the Direct Connection passageway is designed to be compatible with the building of which they are constructed as a part.

Before removing the knock-out panel the contractor shall have an approved dust protection system in place and fully functional. Typically, a dust protection system shall consist of a stationary partition that isolates the knock-out panel from the station. The dust partition shall be constructed using only fire rated materials. All joints shall be sealed with tape. Construction of the partition shall be during non-passenger hours.

Adjacent construction with a connecting passageway(s) to DTPW facilities will require special features to isolate one facility from the other for fire-safety, and may include automatic fire doors and dampers, sprinkler systems, smoke removal and ventilation systems and detection and alarm systems as required by the local fire code.

6.1.5 Signs, Signals, Barricades and Traffic Control General Requirements

1. All traffic signs or devices used for protection of construction workmen or the public shall conform to the State of Florida Manual on Traffic Control and Safe Practices on Street and Highway Construction.

2. Barricades, cones and/or similar protective devices shall be used whenever men or equipment are exposed to traffic or similar hazards.

3. When traffic lanes are closed due to work activity, advance warning signals and high level warning devices shall be used as described in the State of Florida Manual on Traffic Control and Safe Practices on Street and Highway Construction.

4. Flagmen and signalmen will be properly trained and use appropriate procedures, using the current FDOT manual.

5. All employees working adjacent to traffic shall be required to wear reflective vest, per FDOT manual.

6. Whenever and wherever possible and necessary, line voltage (12 volt) protected lights shall be used to mark fences and barricades and other such encroachments onto public streets or sidewalks.

7. Where covered sidewalks are required they shall be provided with permanent lights to provide sufficient illumination for safe use by the public day or night. All bulbs shall be cage-protected.

8. Public walkways shall be kept clean and free of hazards at all times.

9. Where the Contractors are required to provide public walkway, they shall have abrasive non-slip surface.

10. Where access to bus stop is disturbed or obstructed by the Contractors operations, safe access will be maintained or the bus stop relocated as directed by DTPW. Coordination for maintaining or relocating bus stops with the appropriate agencies is the sole responsibility of the Contractors.

11. When steel plates or similar covers are used on public ways to cover excavations they shall be substantially secured to prevent movement imposed by traffic. Covers shall have non-slip surface, conforming to OSHA Specifications.

12. When such covers are located where there is pedestrian exposure, they shall be tapered at all sides with cut back cold mix or similar material to eliminate tripping hazards. Covers shall have non-slip surface.

13. Free access shall be maintained to every fire extinguisher, fire hydrant, fire alarm box, fire escape and standpipe connection, street and traffic light control box. When required, hydrants shall be extended by suitable tube or piping to an accessible point as approved by DTPW. No obstructions shall be allowed at any time within 15 feet of a fire hydrant. Where materials are placed in the vicinity of a fire hydrant or a fire alarm box or fire extinguisher, and to such a height as to prevent the same from being readily seen, the position of such hydrant or fire alarm box or fire extinguisher shall be indicated by suitable signals, both day and night.

14. The Contractor shall erect and maintain fences and barricades to enclose the Contractor's work area, and provide watchmen where required to prevent unauthorized access.

6.1.6 Material Handling (Storage, Use and Disposal) General Requirements

1. All materials stored in tiers shall be secured to prevent sliding, falling or collapse.

2. Reinforcing steel shall not be used as a lifting ("Pick") point on any load or as a guy line anchor.

3. Hooks, except special sliding choker hooks shall be securely moused when in use, or shall be provided with a functioning safety latch.

4. Scrap material of any kind, type or nature shall be placed daily into appropriate containers specifically supplied for this purpose. Containers shall be removed from the work site when full.

5. Loose material on open decks or other exposed locations shall be removed or secured at the end of each day to eliminate dislodgment by wind or other causes.

6. Compatibility of stored materials and storage methods will comply with all applicable OSHA, Fire Department and environmental agency standards.

7. Employees required to handle, use or dispose of hazardous materials shall be instructed regarding the safe handling, proper procedures, potential hazards, personal hygiene, and personal protective equipment required.

8. No explosive or flammable materials shall be stored under the guideways.

9. Disposal of materials shall be in accordance with all applicable Federal, State and Local regulations. All applicable recordkeeping and reporting requirements shall be met by the Contractors.

6.1.7 Adverse Weather Conditions General Requirements

1. Disassemble all scaffolds, loose formwork, radio antennas and secure properly.

2. All items that cannot be secure shall be stored inside secured storage areas or buildings.

3. All crane booms shall be lowered to ground level and secured to prevent movement.

4. All office trailers shall be tied down in compliance with MDC Tie-Down Ordinance No. 77-1 upon original installation. All tie down straps, ground anchors, piers, etc., shall be checked for condition and operation.

5. All exposed glass on the Work Site shall be protected by a solid, rigid covering.

6. All free standing walls shall be stored from both sides.

7. Before employees are dismissed from the Work Site, the Contractors shall make a through inspection to verify all necessary precautions have been taken.

8. All precautions for construction sites during hurricane conditions, as required by the Florida Building Code shall be met.

6.1.8 Housekeeping General Requirements

1. All refuse piles shall be removed from the Work Site immediately.

2. Stored and stacked materials shall be kept orderly, properly stacked, choked, and secured.

3. Any protruding nails, etc., shall be bent, removed or clinched immediately.

4. Oil, grease, and water spills shall be cleaned up immediately.

5. Loose materials, tools, or equipment shall be kept off stairs, out of walkways, ramps, platforms at all times when not in use.

6. Depressions and pot-holes in vehicle or walkway surfaces on the Work Site shall be properly filled and graded immediately.

7. Walkways, vehicle travel ways, ramps, railings, and stairways, shall be kept free from debris, properly installed and maintained.

8. Smoking or the use of open flames within 25 feet of flammable storage areas or fueling areas shall not be permitted.

9. Flammable storage areas shall be properly posted **"NO SMOKING"**, provided with adequate fire extinguishers and free of combustible materials.

10. All sanitary facilities used on the Work Site shall be maintained on a daily basis.

11. All structures shall have a minimum of a 5-foot perimeter clearance that is to be free from any combustible debris or materials.

6.1.9 Overhead Protection

Overhead protection from falling objects shall be provided over DTPW facilities whenever there is a possibility, due to the nature of a construction operation, that objects could fall in or around DTPW guideway, at- grade sections, DTPW facilities, DTPW station entrances and areas designated for public access to DTPW facilities. Erection of the overhead protection for these areas shall be done in strict accordance with the requirements of this Manual and applicable standards cited herein.

The design live load for all overhead protection shall be in compliance with the minimum required by the current Florida Building Code and/or other(s) enforceable code. Overhead protection design shall include provision for impact loading when located adjacent to demolition projects or construction / maintenance projects where it is foreseeable that construction debris could fall on or near DTPW Facilities. Overhead protection for impact loading must be designed for a minimum of 300 pounds per square foot and to resist the force of impact of the largest foreseeable member or building element as taken from the elevation of that element. All overhead protection shall be designed by a licensed professional engineer. The design wind load on the temporary structures shall be in accordance with the calculated loads for components and claddings per the latest edition of the ASCE 7 Code.

Overhead protection over sidewalks and pedestrian areas shall be constructed of fire resistant materials. The vertical clearance between walking surface and the lowest projection of the overhead protection shall be 6'- 8". Construction materials and equipment shall not be stored on the completed walkway and pedestrian areas of the overhead protection roofs. A clear path from any DTPW emergency exit to the public street shall be maintained at all times.

The contractor will provide special protection, such as netting, barricades, walks, screens, scaffolds, etc., acceptable to DTPW, to help ensure the safety of DTPW property, patrons and employees. No work shall be permitted unless such protection is provided as determined necessary by DTPW. Erection of protective structures shall not be done during normal passenger hours unless by written authorization through DTPW.

Lighting of overhead protection at sidewalks and pedestrian areas is required and shall be provided under the overhead protective to maintain a minimum level of ten (10) foot candles at the walking surface. The temporary lighting will be maintained by the contractor.

With written DTPW authorization, the Overhead or Fall Protection structure may be constructed over the right of way and the guideway, if designed for the use for which it is intended, as well as in accordance with the above minimum design load requirements. The shield shall be constructed or installed during non-passenger hours. Once installed, limited work may proceed above the overhead protection during non-passenger hours.

6.1.10 Cranes and Swing Stage Scaffolding

General Requirements

The erection or staging of cranes, construction elevators and man lifts, swing stage or scaffolding, debris chutes or gantries shall not be performed within the 30 feet of the guideway drip line during passenger hours, without an authorized DTPW "Monitor" under radio communication with Central Control, on site.

Crane lifts located within 30 feet of the DTPW guideway drip line are permitted during non-peak passenger operating hours only when coordinated by an authorized DTPW crane Monitor or DTPW authorized employee under radio communication with Central Control on site. Under no conditions will loads be permitted to be swung over or within 5 feet of the guideway.

Crane lifts and exterior building operation conducted from swing stage that are located within the DTPW Right of Way or within 30 feet of the guideway drip line are permitted only during non-peak operating hours and only when coordinated by an authorized DTPW Monitor under radio contact with Central Control.

No construction elevators or cranes will be erected on the Metrorail / Metromover guideway side of the building /structure.

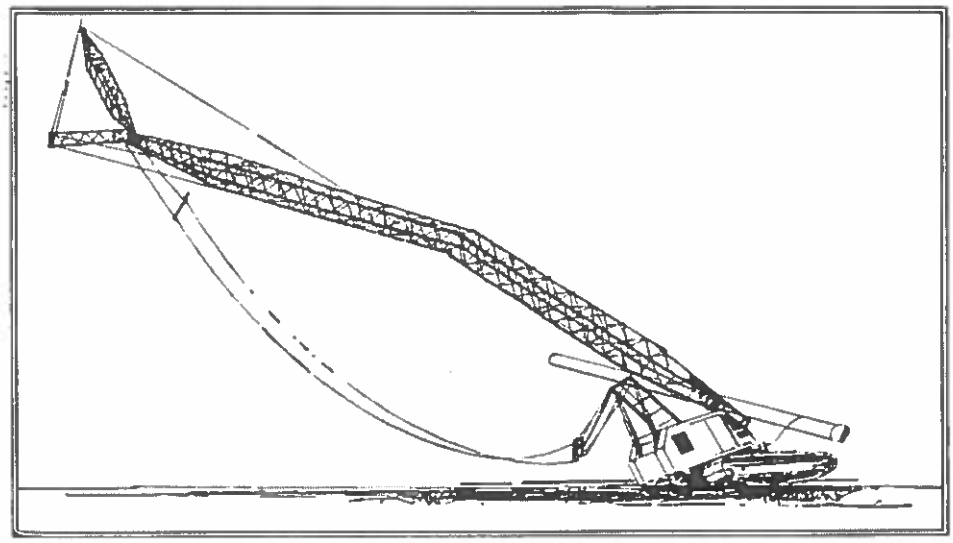
The contractor must ensure that all cranes are operated only by trained, experienced and competent operators who hold either an Operating Engineers, Local Union, Verification of Competence and Experience or equivalent licensure.

The contractor must also ensure that the men who direct, rig and handle loads are adequately trained, able to establish load weights, judge distance, heights and clearance and capable of selecting tackle and lifting gear suitable for the loads lifted.

All crane/scaffolding operations within the DTPW Right of Way and 30 feet of the guideway drip line are subject to inspection by the DTPW Design and Engineering Division, Metromover Maintenance Division and DTPW Office of Safety and Security. Cranes operated within DTPW Right of Way and Safety zones shall have complete maintenance, repair and inspection logs present on the machine and available for review. DTPW reserves the right to refuse the operation of any machine that the structural condition or stability of the machine is questioned regarding the task attempted by the contractor.

MOBILE CRANES

Over 50% of all Crane Accidents are "caused" when the machine is improperly set up.



The size, boom length and capacity of all cranes operated on projects within the DTPW Right of Way and Protective Safety Zones must be clearly shown on a site plan as part of an DTPW Access Permit application. The swing radius of the machine must be shown on the site plan with respect to the location of DTPW facilities.

Adequate care must be demonstrated by the contractor to DTPW representatives when setting up cranes and booms. Cranes shall be erected in strict conformance with the manufacturer's specifications and standard of good construction practice. Outriggers and support shall be adequately cribbed and blocked so as to properly brace the crane frame.

Adequate swing clearance shall be provided at the counterweight of the crane cab. At no time shall the counterweight swing clearance be less than 5 feet from the DTPW guideway drip line, without an authorized DTPW crane Monitor or employee under radio communication with Central Control on site. Overturning boom stops are required on all cranes when the boom angle exceeds 50 degrees from horizontal.

Mechanical swing limit switches and stops may be required to limit crane swing over and adjacent to the DTPW guideway and DTPW facilities. At no time will loads be allowed to be swung over the DTPW guideway, DTPW Stations or DTPW facilities.

Sheet pile and driven pile crane operations should be erected so that the crane and boom are situated perpendicular to the DTPW guideway. Staging and erection of piling should be adequately restrained or stayed such that the piling cannot topple into DTPW facilities during setup operations.

Tower Cranes

Tower cranes may be employed on projects that are adjacent to the DTPW facilities and guideway systems and that are tall enough, have sufficient jib length to reach a distance of 30 feet from the guideway drip line or that loads could be swung over DTPW facilities, are regulated by this manual. In general all tower cranes with base of tower located at a distance from the DTPW guideway drip line less than the height of the tower crane are subject to the restrictions in operation of this chapter.

Tower cranes are subject to wind movement and must be able to weather-vane during periods of high wind. Weather-vaning tower cranes, when cranes are not in use, are allowed to swing over DTPW guideway or facilities during passenger hours.

Tower cranes are subject to fatigue cracking and failure at the tower and jib connections. A certified structural inspection log of the Crane tower, jib, cables and haulage assemblies must be provided to DTPW on all tower cranes located in areas that they could affect DTPW facilities.

6.1.11 Excavations, Foundations and Sheet Piling

Until provisions for permanent support have been made, all excavations shall be properly guarded and protected so as to prevent the same from becoming dangerous to life and property and shall be sheet piled, braced and/or shored, where necessary, to prevent the adjoining earth from caving in; such protection to be provided by the person causing the excavation to be made. No excavation, for any purpose, shall extend within five (5) feet of the angle of repose of any soil bearing footing or foundation unless such footing or foundation is first properly underpinned or protected against settlement.

The design of all soils excavations, stabilization, modifications, underpinning or laterally protected with sheet piling shall be designed by a licensed professional engineer known to the Building Official to be qualified to evaluate the bearing capacity of soils. This design shall include a Geotechnical Soils investigation such that the registered Professional Engineer shall submit to the Building Official a letter attesting that the site has been observed and the foundation conditions are similar to those upon which the designed is based. The letter shall be signed and bear the impress seal of the engineer or architect, as applicable. Geotechnical soils sampling shall be conducted at sufficient frequency to ensure that the soils conditions on the project site are representative of the design conditions.

Angle of Repose

The angle of repose of all support soils within the DTPW Right of Way and safety zones shall be considered as 1:1 ratio. No excavation, for any purpose, shall extend within five (5) feet of the angle of repose of any DTPW soil bearing footing or foundation unless the design capacity of that footing is evaluated by the design Engineer of Record and his recommendations are approved by DTPW with respect to the design engineers modifications. Refer to Appendix B for clarification.

Pilings
Sheet pilings, driven pilings, auger cast pilings or other operations that create significant soils vibration shall be closely monitored with seismic accelerometers to verify the energy transmitted into the DTPW structures is less than 0.22 inches per second. Additional detailed survey analysis may be required to verify that no settlement has occurred in the course of the work.

Excavators
Excavation equipment operated within the DTPW Right of Way and Safety Zones must take extra care to avoid causing damage to DTPW facilities. Track excavators have similar swing geometry problems as mobile cranes and are capable of causing significant damage if improperly operated. Similarly, improper operation of wheel loaders, excavators, dump trucks and vibratory rollers can cause impact and vibration damage to structures.

The contractor must ensure that all heavy excavation equipment is operated only by trained, experienced and competent operators who hold either an Operating Engineers, Local Union, Verification of Competence and Experience or equivalent licensure.

Excavations may be conducted within the DTPW Right of Way and Safety Zones only during non-passenger hours. Excavation operations within the DTPW Right of Way and Safety Zones require a trained DTPW Monitor, in radio communication with DTPW Central Control, during all excavation operations.

Protection of underground site utilities is the responsibility of the contractor. All utilities must be located by an approved utilities locator service prior to the start of any excavation or piling activities.

DTPW may, at its discretion, modify any of the above conditions or impose additional conditions, to help ensure the safety of the public, and its patrons, employees or property.

6.1.12 Demolition
No Demolition of structures adjacent to DTPW facilities by blasting shall be permitted. During piece-by-piece demolition, it is essential that the DTPW escalators, and/or other DTPW equipment be protected from dust generated by the demolition. The DTPW equipment must be covered with polyethylene sheets during demolition to prevent dust from entering the equipment. Guideway protection diagrams and location plans shall be submitted by the contractor when appropriate or requested by DTPW. Such plans shall clearly show the alignment of the DTPW right-of-way together with the setback dimensions of the portions of the building to be demolished.

Application

This section is intended to apply to all activity on the exterior of buildings located within the Safety Zone including maintenance, inspections, probing, demolition operations and shall comply with the American National Standard (ANSI) A 10.6 standard for demolition

operations. In cases of practical difficulty and unnecessary hardship, or where other extenuating circumstances exist, DTPW may grant exceptions to the requirements stated herein, or may permit alternative methods, but only when it is clearly evident that equivalent protection is thereby secured.

Demolition Plan
The contractor must submit a detailed demolition plan to DTPW Engineering for review as part of the permit application package. This Demolition plan must include the scope of proposed demolition, location plan and building elevation of the proposed demolition work detailing the setback distance to DTPW facilities. Additionally the anticipated contractor means and methods, anticipated protective methods, equipment list including sizing of all demolition equipment should be supplied in the demolition submittal plan. The plan shall describe the type of construction (concrete, steel frame, masonry, etc.) and the overall construction configuration.

Guideway protection diagrams and location plans shall be submitted by the contractor when appropriate and requested by DTPW. Such plans shall clearly show the alignment of the DTPW right-of-way together with the setback dimensions of the portions of the building to be demolished.

Protection
During demolition, it is essential that the DTPW facilities be protected from dust generated by the demolition. The DTPW stations, escalators, train control and traction power rooms/buildings must be covered with polyethylene lined sheets during demolition to prevent dust from entering the DTPW switch gear and equipment.

Structural Condition and Analysis Survey
Prior to starting any demolition operation within the safety zone, an engineering survey of the structure shall be made to determine the condition at all locations of the exterior walls adjacent to the DTPW system. The purpose of the survey is to determine the condition of the framing, floors, and walls so that actions can be taken, if needed to prevent premature collapse of any portion of the structure. Such survey shall be made on the outside utilizing swing stages with full rail protection. The survey shall consist of documenting all locations displaying loose, cracked, and/or deteriorated stucco, tile, or other building facade materials in which such condition could result in falling debris.

An exterior crack survey may be required as part of the engineering survey of building to be demolished. A crack survey should be prepared locating all significant cracks including a location sketch, description, width, estimated recent activity, and the existence of previous repairs. Cracks of any significance shall be physically marked so that future observation may be made with telescopic equipment at the ground level. A stucco condition survey locating all significant irregularities in the stucco facade including bulges, micro/map cracking, hollow and de-bonded areas, discoloration due to water absorbance effervesce scaling, or other abnormalities should be included in the crack / engineering survey.

Guideway Protection Diagrams and Location Plans shall be submitted by the contractor when appropriate and requested by DTPW. Such plans shall clearly show the alignment of the DTPW right-of-way together with the setback dimensions of the portions of the building to be demolished.

Similarly a window / wall opening survey of the condition of window vents, plywood covers, sill stability, and other characteristics from which conclusions can be made as to the security of such openings. Where a hazard exists from fragmentation of glass or instability of the window frame/vent, all glazed openings shall be removed or protected.

Scheduling
Exterior building element demolition activities located within the safety zone are permitted only during non-passenger operating hours and only when coordinated by an authorized DTPW "Monitor" under radio communication with Central Control on site.

Protective Measures
Remove all loose materials by hand which are in imminent danger of falling. The removal of such loose materials must also include a temporary repair or stabilization at any location where the removal results in an opening or area, which can allow water to penetrate resulting in further or future deterioration.

Pedestrian Site Security and Safeguards
Prior to the engineering survey of the building exterior and other invasive activities, it is necessary to fully protect the public and in particular, DTPW facilities. Every sidewalk, train guideway, station platform, stairs, escalator, or public thoroughfare adjacent to or near enough to be affected by the operations on the building shall be closed, relocated or protected as specified in overhead protection above.

Demolition Observer
Provide a full time observer who is classified as a qualified person and who is capable of recognizing changes in the building facade and appearance. The purpose of this person is to provide warnings to the DTPW operators in the event of a sudden change in the building's outward appearance or stability so that service on a rail section may be discontinued. The observer and shall remain at the site at all times DTPW is in operation and providing service to the public

Periodic Demolition Reports
A certification shall be provided by a licensed engineer after each periodic inspection stating that the building components are secure and that it is safe to operate the DTPW system in that location.

Demolition Means and Methods
No wall sections shall be permitted to stand alone without lateral bracing. Additionally, all walls shall be left in a stable condition at the end of each shift. Masonry walls or other sections of masonry shall not be permitted to fall upon the floors of the building unless qualified persons have determined the impact of such masses will not exceed the safe carrying capacities of the floors.

Chutes
Materials shall be dropped only through chutes to any point lying outside the exterior walls of the building and chutes at any angle exceeding 45 degrees from the horizontal shall be entirely enclosed. Also, chutes shall be designed and constructed to eliminate hazards of impact of materials or debris

Particle Velocity and Seismograph Reports
When required, the contractor shall measure and furnish reports of particle velocity caused by impacts in accordance with provisions in Appendix E of this document.

Additional Requirements
DTPW may, at its discretion, modify any of the above conditions or impose additional conditions, to help ensure the safety of the public, and its patrons, employees or property.

6.1.13 Exterior Building Maintenance

Pressure Washing	Painting
Window Washing	Sandblasting
Stucco Damage Repair	Other Maintenance Operations
Structural/ Non-Structural Inspections	

General
In general, some routine maintenance activities associated with the exterior building envelope of buildings may not require a building permit. However, to adequately ensure the safety of the DTPW system, provisions are made in this manual detailing specific requirements and limitations of allowed building maintenance activities within the DTPW Safety Zone. A DTPW Access Permit is required on all exterior building maintenance activities for buildings located within the Safety Zone.

Access to exterior building components located within the Safety Zone including window cleaning operations and roofing operations is prohibited during DTPW passenger hours without a DTPW Monitor. The simple DTPW policy is that "there shall not be any exterior building maintenance activity at or above the elevation of the DTPW guideway during normal passenger operations without a DTPW Monitor".

Maintenance
This section is intended to apply to all activity on the exterior of buildings located within the Safety Zone including maintenance, inspections, probing, stucco repair, painting and waterproofing operations. In cases of practical difficulty and unnecessary hardship, or where other extenuating circumstances exist, DTPW may grant exceptions to the requirements stated herein, or may permit alternative methods, but only when it is clearly evident that equivalent protection is thereby secured.

Small Particle Protection
Routine exterior building cleaning is required to some extent on most structures. Much of this work is commonly accomplished by access to the building exterior via either swing stage or boson chair. Access on building exteriors located within the safety zones is prohibited during passenger hours without a DTPW Monitor.

Pressure cleaning and sandblasting activities produce over spray, dirt and particle fallout below the work area. DTPW guideway, stations and facilities must be adequately protected from the fallout of the dirt, particles, sand, loose paint, etc. prior to the start of any exterior building cleaning activity. Such protection may be in the form of polyurethane lines, canvas tarps or other catchment devices. Design of required protection must be approved by DTPW.

Stucco probing and repair, painting and waterproofing activities produce falling debris. DTPW guideway and DTPW Facilities must be adequately protected with overhead protection as described in this manual as part of the DTPW Work Order for stucco repair and painting activities.

DTPW may, at its discretion, modify any of the above conditions or impose additional conditions, to help ensure the safety of the public, and its patrons, employees or property.

DTPW Operations and Scheduling
DTPW shall have the right to stop any work or construction activity that affects the safety of DTPW patrons and or facilities or normal DTPW operations. DTPW will exercise reasonable advance notice, except for any matters related to immediate system safety concerns which will require no advance notice.

Construction work which may have any impact on the Metrorail/Metromover System may be scheduled during the Non-Peak Operating Hours or Non-Passenger Hours. Non- Peak Operating Hours are defined as weekdays prior to 6:30 A.M. or after 7:00 P.M. and between 10 A.M. and 3 P.M.; and all day Saturday and Sunday. Non-Passenger hours are defined as Monday through Sunday 12:30 A.M. to 4:30 A.M. or such other hours as may be designated by the County as Non-Passenger Hours. Passenger hours may change without notice as needed by DTPW.

Weekends / Holidays & Special Events
Construction work that may impact weekend or special operational conditions will be limited. Schedule requirements will be addressed on a project to project basis where the individual scheduling needs of the project can be evaluated with respect to the operations of the DTPW systems.

APPENDIX A: GLOSSARY

The following terms shall, for the purpose of this Manual, have the meanings respectively ascribed to them:

ACCIDENT - An unforeseen event or occurrence that causes death, injury or damage to property. Any abnormal condition that requires the attention or intervention of responsible personnel or an individual monitoring the transit system operation.

ALARM CONDITION - Deviation from nominal performance, which does not cause a significant, effect on system performance but does warrant investigation and/or repair. Sanctioned or accepted by the building official and Department of Transportation and Public Works.

AUTOMATIC - A term applied to a system, subsystem, or device, which has the inherent capability to function without direct manual participation.

CATCH PLATFORM - A temporary structure erected around or attached to, and abutting a building for the purpose of safeguarding the employees, and the public, by catching and retaining falling objects or debris.

CENTRAL CONTROL - That place where train control or train supervision is accomplished for the entire Metro-rail and Metro-mover system; the train command center.

CONSTRUCTION SAFETY - The optimum degree of safety within the constraints of construction effectiveness, time and cost through specific application of safety management throughout all phases of the construction.

CONSTRUCTION SAFETY MANUAL - Issued as a contract document by Department of Transportation and Public Works (DTPW), to be used as a guide by the Contractor in developing his Accident Prevention Program.

DTPW ACCESS PERMIT - Issued written authorization from DTPW for work in the DTPW Right of Way and DTPW Safety Zones. Construction Work Orders are specific with regard to the scope, extent, additional requirements or limitations, and allowable

schedule of approved work to be completed in the DTPW Right of Way and Safety Zones.

CONTRACT DRAWINGS - The plans, profiles, typical cross-sections, general cross-sections, elevations, schedules and details which show locations, character and dimensions of the work.

CONTRACTOR'S AUTHORIZED SAFETY REPRESENTATIVE - The person designated as authorized safety representative who will be responsible for work site safety and for reporting all insurance claims.

CONTRACTOR- The individual, firm, partnership, corporation, or combination thereof, private, municipal, or public, including joint ventures, which, as an independent contractor, has entered into a contract with MDC, who is referred to throughout the Contract Documents by singular in number and masculine in gender.

CHUTE- A trough or tube used to guide and transport sliding objects, materials, or debris from a higher to a lower level.

DEGRADATION - Falling from an initial level to a lower level in quality or performance.

DEMOLITION - Dismantling, razing, destroying, or wrecking any fixed building or structure or any part thereof.

EMERGENCY - A situation which is life threatening or which can cause serious damage on or in the immediate vicinity of any transit facility, structure, bus or train.

EMPLOYEE - A person employed by the Contractor or Subcontractor.

EQUIPMENT FAILURE - The state in which equipment no longer meets the minimum acceptable specified performance and cannot be restored through operator adjustment or control.

FTA - Federal Transit Administration, formerly UMTA.

FAILURE - An inability to perform an intended function within specified tolerances.

HAZARD - Any real or potential condition that can cause injury or death; or damage to or loss of equipment or property.

HAZARD MANAGEMENT (LOSS CONTROL) - An element of the system safety management function that evaluates the safety effects of potential hazards considering acceptance, control, or elimination of such hazards with respect to expenditure or resources. (The feasibility of hazard elimination must be considered in light of financial, legal, and human considerations).

HAZARD SEVERITY – A qualitative measure or the worst potential consequences that could be caused by a specific hazard.

Category I Catastrophic	May cause death, serious injury/illness or major system loss.
Category II Critical	May cause injury/illness, or major system damage.
Category III Marginal	May cause minor injury/illness, or minor system damage.
Category IV Negligible	Will not result in injury/illness, or system damage.

HAZARD RESOLUTION - The analysis and subsequent actions taken to reduce, to the lowest level practical, the risk associated with an identified hazard.

IMMINENT DANGER - Refers to any condition or practice where there is reasonable certainty that a danger exists that can be expected to cause death or serious physical harm and/or serious property damage immediately or before the danger can be eliminated through normal enforcement procedures

INCIDENT - An unforeseen event or occurrence that does not necessarily result in injury or property damage.

MAINTENANCE - All actions necessary for retaining an item in or restoring it to an operable condition.

MALFUNCTION - Any anomaly or failure wherein the system, subsystem, or component fails to function as intended.

MAY - A permissive condition. Where the work "may" is used, it is considered to denote permissive usage

MIAMI DADE COUNTY (MDC) - The Board of County Commissioners of Dade County, Florida, political subdivision of the State of Florida, and the DTPW, an office under the County manager of Miami Dade County, Created March 1, 1974, by Administrative

Order No. 3-8, under the authority of Sections 4.01 and 4.02 of the Miami Dade County Charter - and any authority, board, body, commission, official or officials to which or to whom the powers now belonging to DTPW in respect to the location, construction, equipment, maintenance and operation of transit facilities shall, by virtue of any act or acts, hereinafter pass or appertain.

DTPW - Department of Transportation and Public Works, Miami-Dade County, located at 701 N.W. 1st Court, Suite 1700, Miami, Florida 33136

DTPW RIGHT OF WAY- As defined by the legal description of the properties that the DTPW facilities occupy or are situated above and supportive easements. For the purpose of this manual the Right of Way shall be defined as those properties located within the drip lines of the DTPW rails, stations and facilities and include those properties used for access and egress to the DTPW facilities by the general public and normal DTPW operations.

MISHAP - An unplanned event or series of events that result in death, injury, occupational illness, or damage to or loss of equipment or property. (See also ACCIDENT).

MONITOR - An authorized DTPW employee, DTPW contractor or DTPW consultant monitoring the movement of construction equipment or materials that may infringe upon the 30' "Safety Zone" (that area of the Department of Transportation and Public Works Guideway (Metrorail and/or Metromover) that lies within 30' of the outermost edge of the superstructure) which has the potential to interfere with Department of Transportation and Public Works operations and/or maintenance. This person(s) shall ensure the safety of Department of Transportation and Public Works patrons, employees, property and the public. DTPW contractors and DTPW consultants shall be trained per DTPW Rail Services Metromover and Metrorail training packages before they perform duties as Monitors.

OPERATOR - That person having direct and immediate control of the movement of a vehicle or machinery.

OPERATING TIME - The time period between turn-on and turn-off of a system, subsystem, component or part during which time operation is as specified. Total operating time is the summation of all operating time periods

OSHA - The Occupational Safety and Health Administration. An agency of the U.S. Government which sets standards to provide for the safety of employees in the workplace. The local area office is located in Ft. Lauderdale, Florida, phone (305) 527-7292

PERSONAL PROTECTIVE EQUIPMENT (PPE) - Equipment designed and worn to provide protection against hazard to some part of an employee's body. Examples of PPE are safety glasses, respirators, hart hats, gloves etc. All PPE used at DTPW work sites must comply with applicable OSHA standards

POWER RAIL - Three separate rails center mounted on insulators on the guidebeam which provides traction power for vehicle propulsion. (Metromover)

PROCEDURES - Established methods to perform a series of tasks.

QUALIFIED PERSONS - Those who by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training, and experience in the demolition industry have successfully demonstrated their ability to solve or resolve problems relating to the subject matter of demolition.

QUALIFYING BUILDINGS - Buildings located within 30 feet of DTPW Right of Way corridor, and greater than 35 feet, in height, that have a building
footprint located adjacent to a Safety Zone where the elevation of the building encroaches into the Vertical Safety Zone extensions as defined in Safety Zone above and at the rate of 1 foot horizontal offset per 4 feet of building height above DTPW facility. See the definition of Safety Zone above and attached drawing CZ-1 (Appendix C).

QUALIFYING STRUCTURES - Cranes whose boom swing infringes within the 30 feet Safety Zone or DTPW Right-of-Way corridor. Signs located within the safety zone. Temporary scaffolding or construction towers within the Safety Zone or DTPW Right of Way corridor with heights greater than 30 feet.

QUALIFYING WORK- Any construction, demolition, equipment operations or building maintenance activity performed on or in a building or structure which may be hazardous to persons or property within the DTPW Right of Way or protective safety zones.

RELIABILITY - The probability that the system or sub-system will perform satisfactorily for a given period of time when used under stated conditions.

REPAIR - The maintenance activity which restores a failed item to operable state.

RISK - An expression of possible loss over a specific period of time or number of operational cycles. It may be indicated in terms of hazard severity and probability.

RISK MANAGEMENT - The Risk Management Division, Miami Dade County, General Services Administration, located at III N.W. I" Street, Suite 2340, Miami, Florida 33128; phone 375-4280.

RULE - A law or order authoritatively governing conduct or action.

SAFE - Secure from danger of loss.

SAFETY - A reasonable degree of freedom from those conditions that can cause injury or death to personnel; damage to or loss of equipment or property; and freedom from danger.

SAFETY CHECKLIST - A list for examining the safety aspects of equipment, procedures and personnel.

SAFETY CRITICAL - A designation placed on a system, sub-system, element, component, device, or function denoting that satisfactory operation of such is mandatory to assurance of patron, personnel, equipment, or facility safety. Such a designation dictates incorporation of special safety design features.

SAFETY DEVICES - Protective devices which do not alter the fundamental nature of a hazard but which do control the extent of the hazard in some manner.

SAFETY MANAGEMENT - An element of management that establishes safety program requirements and ensures the planning, implementation and accomplishment of task and activities to achieve work place safety.

SAFETY PROGRAM - The combined task and activities of safety management and safety engineering that enhance operational effectiveness by satisfying the safety requirements in a timely, cost-effective manner throughout all phases of the work.

SAFETY SUBCONTRACTOR - A subcontractor who satisfies the Florida Department of Labor and Employment Security Industrial Safety and Health Programs, Chapter 38F-44, and is duly approved by MDC

SAFETY ZONE - Safety Zones are defined as a protective safety buffer zone adjacent to the DTPW Right of Way. Safety Zones include all lands public or private within 30 feet (horizontally) of the DTPW Right of Way measured from the drip line of the facility/guideway. No work is allowed at the exterior of any building located within the protective safety zone without an approved DTPW Access Permit.

SERVICE CONTRACTS/ CONTRACTOR - Those operations that are providing any services, or repair, replacement or maintenance functions that are indigenous to the construction process on the Work Site.

SHALL - A mandatory condition. Where certain requirement are described with the "shall" stipulation, it is mandatory that these requirements be met.

SHOULD - An advisory condition. Where the " should" is used, it is considered to be advisable usage, recommended but not mandatory.

STATE - The State of Florida.

SUBCONTRACTOR - Any person, firm or corporation, other than the employees of the Contractor, who contracts with the Contractor to furnish labor and/or materials under this Contract.

SUPPLIER/VENDOR - Those entities whose. sole responsibility to the project is the delivery of goods or materials, exclusive of direct labor.

SYSTEM - A composite of people, procedures and equipment operating in a specific environment to accomplish a specific mission or task

THIRD RAIL - A rail mounted on insulators adjacent to running rails which provides traction power for train propulsion. (Metrorail).

TRANSIT SYSTEM - A transportation system comprised of fleets of motor buses and electrically propelled transit vehicles and all of their operational / support personnel and systems (e.g. maintenance facilities, tracks, structures, etc.) utilized for the mass movement of passengers within a metropolitan area.

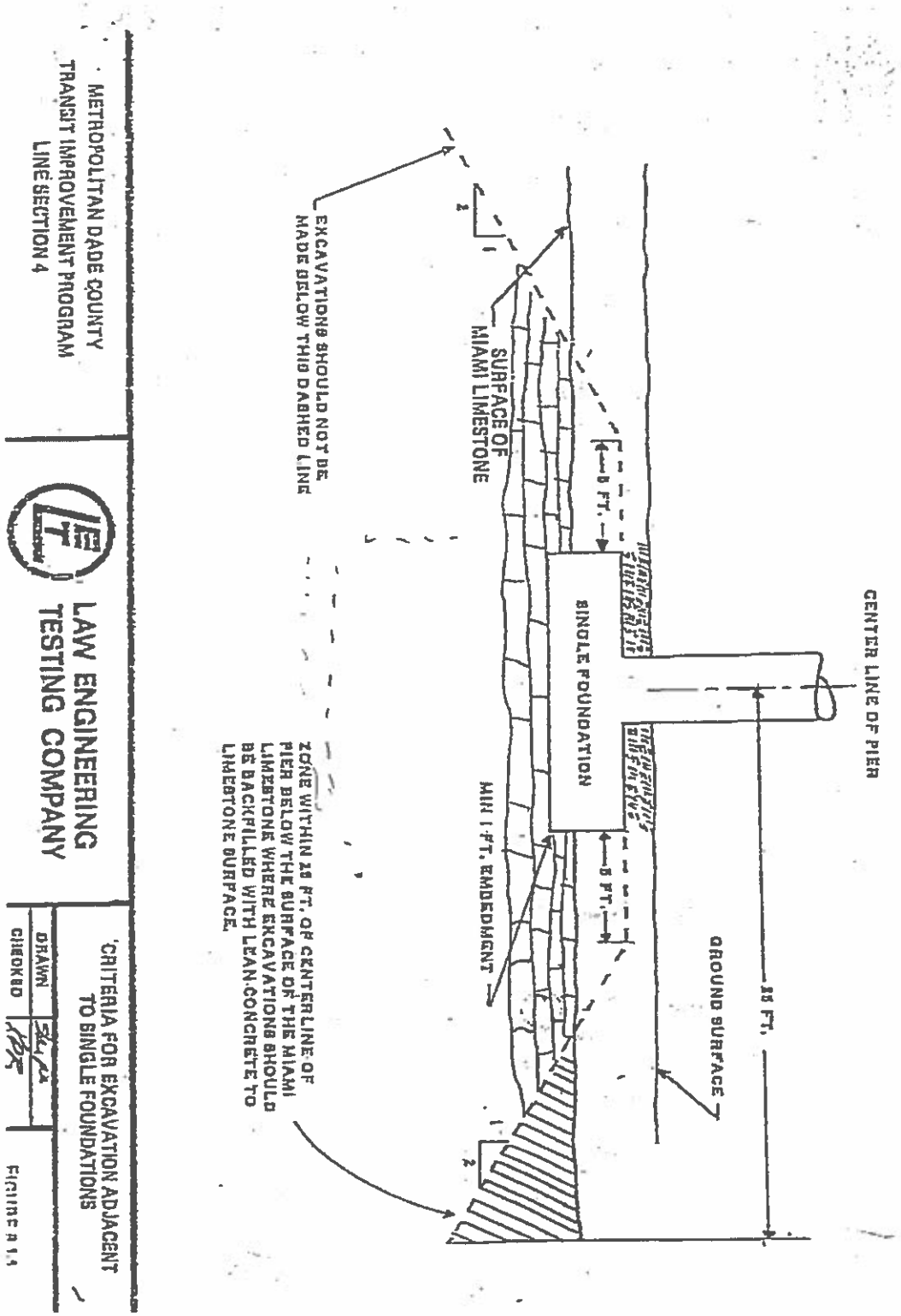
UNUSUAL OCCURRENCE - An unforeseen event or incident which does not necessarily result in injury or property damage.

UNSAFE CONDITION - Any condition which if not corrected, will endanger human life or property.

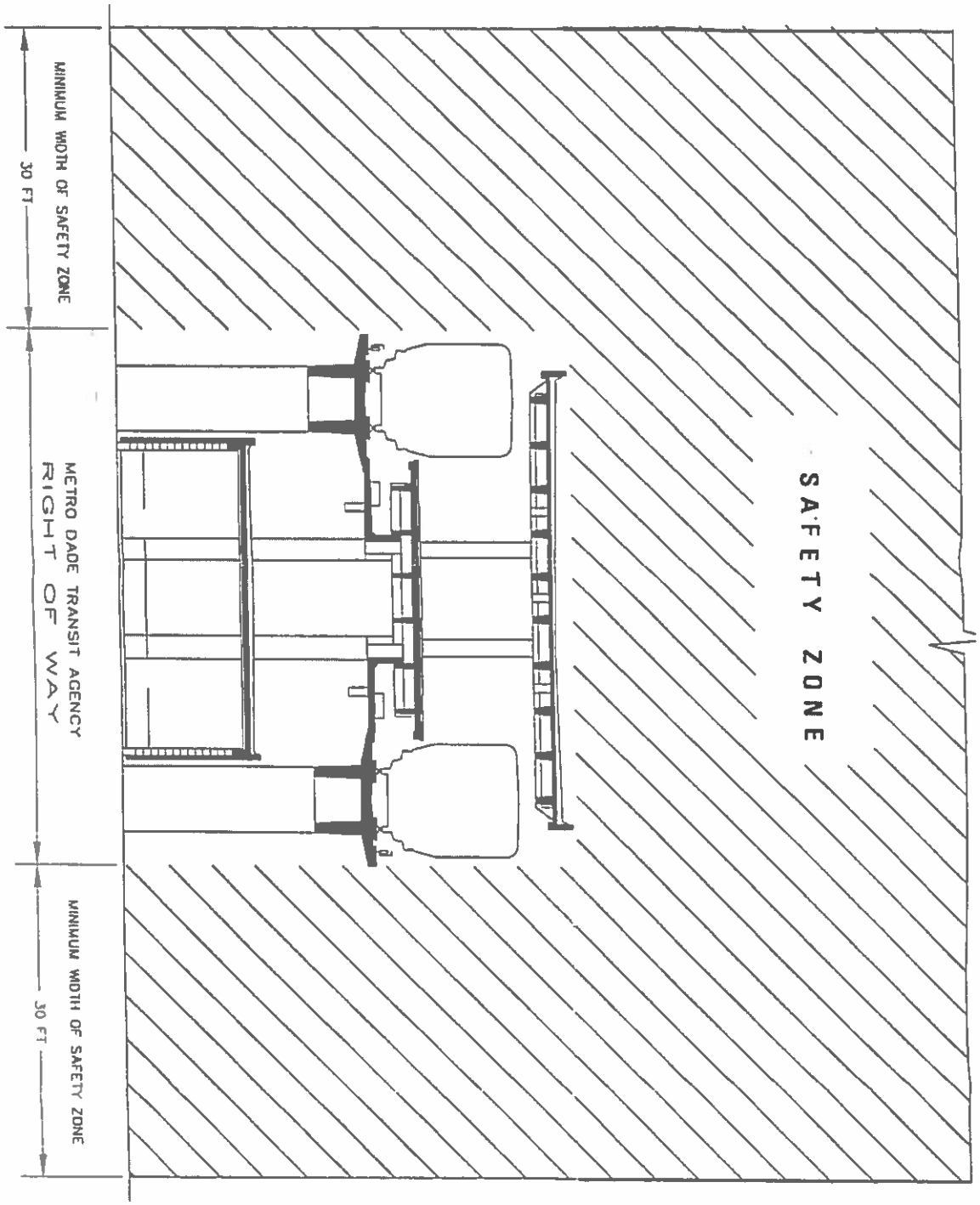
WARNING DEVICES - Sensors that monitor or detect conditions and provide visible and/or audible alerting signals as desired for selected events.

WORK SITE - The area enclosed by the limit of Work indicated in the Project Drawings and boundaries of local streets and public easements in which the Contractor is to perform the work under the Contract. It shall also include areas obtained by the Contractor for use in connection with the Contract, when contiguous to the Limit of Work.

APPENDIX B: CRITERIA FOR EXCAVATION ADJACENT TO SINGLE FOUNDATIONS



APPENDIX C: SAFETY ZONE CRITERIA



APPENDIX D: SAMPLE CRANE SAFETY INSPECTION CHECKLIST

CRANE SAFETY INSPECTION CHECKLIST

Location:

Area Inspected:

Inspected By: Date:

* Check Items to be inspected in your area - Disregard others as not applicable

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		THE CRANE CREW		
		Is the operator and crew properly trained?		
		Operating is a full time job—does the operator pay strict attention to his duties?		
		Do crane personnel wear hard hats when away from the crane?		
		Is the operator aware of the regulations involving working close to high voltage lines and electrical equipment?		
		High voltage, even from a distant source, can be introduced in metal parts of the crane. Is the operator aware of these situations?		
		Does the operator know the weight of each piece before he picks it?		
		Does the crane crew know the manufacturer's proper recommendations for making short moves on the job site?		
		Does the crew get help when lifting heavy objects?		
		Does the crew periodically check for level?		
		Do they check the outriggers for stability?		
		Do they check the boom angle indicator and other electronic load equipment for accuracy?		
		Does the operator allow anyone to ride the load or to the hooks?		
		THE GROUND CREW (HOOKING UP THE LOAD)		
		Does the ground crew have, maintain and use proper safety equipment?		
		Are they familiar with the product erection sequence?		
		Are they familiar with the crane signals and general operation of the crane?		
		Do they know how to properly hook pieces and provide aerial stability?		
		Do they know how to properly use tag lines?		
		Are the tag lines in good condition, strong enough and long enough?		

APPENDIX D: SAMPLE CRANE SAFETY INSPECTION CHECKLIST (CONT)

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		Is two way communication between the operator and the erection foreman being used? Does the crew know how to use and maintain the equipment? Are spare parts available for quick repair?		
		Is the crane swing radius roped off to prohibit the crane (during swing) from causing damage or hurting someone? Is entire swing checked including the counterweights?		
		THE MACHINE		
		Is the crane operated within all capacities?		
		Is the machine inspected daily?		
		Are the required crane inspections recorded?		
		Are all controls properly identified?		
		Are warning devices operative?		
		Is the manufacturer's rating plate visible?		
		Is the operator's manual available to the crew for easy reference?		
		Are load charts, operating signals and other important information posted and/or readily available?		
		Are brakes within operating limits?		
		Are clutch and brake surfaces dry?		
		Are all protective panels and guards in place?		
		Are electrical systems in good condition?		
		Are all of the sheaves properly aligned so as to reduce rope wear during work?		
		Is cable in good conditions?		
		Are hooks in good condition?		
		Have hooks been inspected by magnetic particle inspection?		
		Are there safety latches on the hooks?		
		Are fuel tanks in good condition and without leaks?		
		Are fire extinguishers available and routinely inspected?		
		SLINGS		
		Are slings in good condition/ Is safety factor of 5 maintained?		
		Are slings stored properly?		
		Are sling inspection reports maintained?		
		Are "U" bolt wire rope clips correctly placed?		
		Are all other lifting devices in good condition?		

APPENDIX D: CHECKLIST FOR CRITICAL LIFTS

CHECKLIST FOR CRITICAL LIFTS

This form is to be completed when the load exceeds 80% of the load chart for the crane or derrick or where the pick involves two or more cranes.

LIFT DATE: _____

1) Supervisor responsible for the lift: _____
2) Description of item to be lifted and estimated weight: _____

_____

_____

_____

3) Equipment and Lift Relationship:
   a. Operating Radius _____
   b. Boom Length _____
   c. Allowable Load (From Load Chart) _____
   d. Ratio of Lift to Allowable Load _____
   e. Clearance to Surrounding Facilities _____
   f. Sling Angle _____
4) Condition of Hoisting Equipment and Rigging
   a. Has all equipment been reinspected for this lift: ____Yes ____No
5) Stability of Ground Area:
   a. Check Soil/Ground Bearing Allowable Load (List Conditions) _____

_____

_____

   b. Will mats be needed? ____Yes ____No
   c. Any underground installations needing special attention? ____Yes ____No
   d. Will it be necessary for the crane to walk with the load? ____Yes ____No
   e. Is the surface level and stable where the crane will be walking?

____Yes ____No

APPENDIX D: CHECKLIST FOR CRITICAL LIFTS (CONT)

f. Have facilities been provided to keep the load radius from changing?

_____Yes _____No

g. Have all overhead facilities been checked for clearance in the area where the crane will be moving/operating? _____Yes _____No

6) Does the operator have the necessary experience on the crane and this type of lift?

_____Yes _____No

7) If the lift involves the use of two cranes answer the following:

a. Have operators worked together before? _____Yes _____No

b. Who will coordinate instructions to operators? _____

_____

_____

By: _____

Contractor's Superintendent

APPENDIX E: RECOMMENDED VIBRATION LIMITS

Seismological research by the U.S. Bureau of Mines, foreign investigative groups, and individual seismologists has established criteria relating the occurrence of structural damage to certain frequencies and levels of ground motion.

USBM Report of Investigations 8507[1] states that residential structures are most prone to damage as a result of vibration energy within the frequency range of 4-12 hertz. Within this range, a 0.5-inch per second maximum particle velocity is recommended to preclude 'threshold' damage to the plaster-on-wood-lath interior portions of older structures.

Threshold damage is defined by the USBM as the loosening of paint, small plaster cracks at joints between construction elements or the lengthening of old plaster cracks. A maximum of 0.75 inch per second is recommended for the protection of modern drywall interior construction. The damage threshold is normally considerably higher for load bearing or other structural portions of a house.

Above 12 hertz, the allowable vibration increases as the frequency increases, up to 40 hertz, above 40 hertz, a constant 2.0 inches per second level is recommended to protect the interior walls and ceilings of structures, regardless of construction material. A graphic representation of the USBM recommended criteria is shown In the velocity versus frequency curve on the following page, and the vibration analysis of the recordings are plotted on graphic representations at the end of this report.

It should be noted[2], however, that it is almost impossible in actual practice to visually determine if the recorded peak vibration on a typical seismogram is actually within the Bureau's 4-12 hertz range. This is because ground vibration is usually a complex mixture of many frequencies that cannot be accurately separated by visual analysis of a seismogram.

Proper implementation of the Bureau's limit can only be accomplished by a computerized technique that analyzes the seismographic data in terms of both peak particle velocity and frequency. Therefore, in order to best determine the potential effects of ground vibrations recorded in this study, a computerized response versus frequency technique known as RSVP was used in the preparation of this report.

RSVP TECHNIQUE

The Response Spectrum Velocity Profile (RSVP) technique used in this study was developed by Dr. Kenneth Medearis. It is a powerful vibration analysis tool which not only conforms to USSM recommendations, but also provides insight into the responses of various types of residences to a given vibration episode.

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[2] Siskind, David *et al*, *Structural Response and Damaie Produced by Ground Vibration From Blasting. U.S. Bureau of* Mines, RI, 1980.

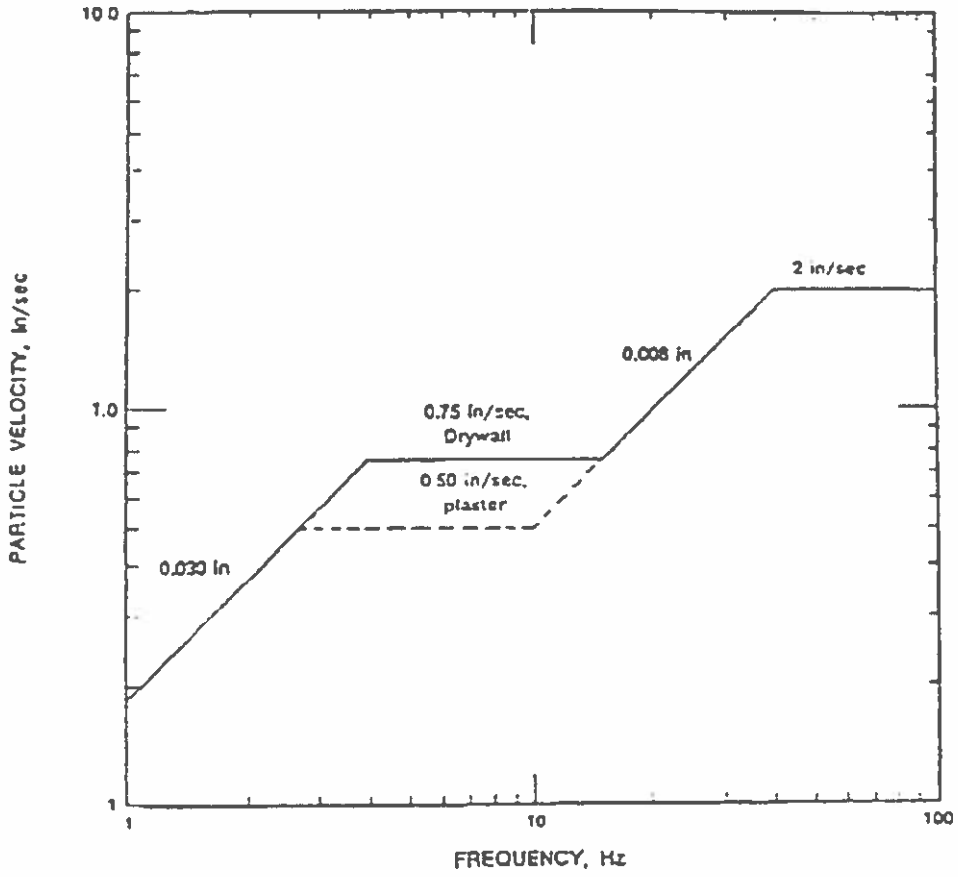
APPENDIX E: RECOMMENDED VIBRATION LIMITS (cont)

All buildings are characterized by a single natural fundamental frequency. This means that, as with a pendulum or a tuning fork, there is one dominant frequency at which a particular building will vibrate when excited. The fundamental natural frequency of a building depends primarily upon its height. Tall buildings are more flexible and vibrate at low frequencies. Low-rise structures, being stiffer, vibrate at higher frequencies.

When the frequency of a ground vibration wave matches the structure's natural frequency, the ground motion will be amplified within the structure. According to the USSM, the natural frequency of typical residential structures ranges between 4 and 12 hertz. Thus, it is within this range that the vibration limits recommended by the USBM are most stringent.

By applying the computerized RSVP Technique to the data obtained in this survey, both the ground particle velocity and response characteristics of residential structures are considered over a wide range of frequencies. The results are then related to the USSM velocity versus frequency curve discussed previously, and are plotted on the analysis sheets at the end of this report.

When particle velocities exceed the limits of the USBM Curve, non-damage probability calculations are performed, based on the research of Medearis. These probabilities are given under the graphs on the analysis sheet for 1, 1-1/2, and 2story houses. When no figures are given, probability of non-damage is essentially 100 percent.



APPENDIX “F” TO SPECIAL PROVISIONS
QUALITY ASSURANCE PLAN

PROJECT QUALITY ASSURANCE PLAN

PROJECT TITLE

_____

PROJECT/CONTRACT NUMBER

_____

COMPANY NAME

_____

REVISION DATE

_____

PROJECT QUALITY ASSURANCE PLAN

SIGNATURE SHEET

This Quality Assurance Plan dated (*input revision date identified on page 1*): _____ was prepared or revised in accordance with the project/contract requirements.

Prepared by (Quality Representative Signature):_____ Date: _____

Approved by (Project Manager Signature): _____ Date: _____

PROJECT QUALITY ASSURANCE PLAN

REVISION LOG

Any changes to this document will be re-submitted for review and approval by Miami-Dade County (MDC).

REVISION DATE	AFFECTED PAGES	REASON FOR CHANGE
SAME DATE AS IDENTIFIED ON PAGE 1:	*ALL PAGES*	*INITIAL ISSUE*

PROJECT QUALITY ASSURANCE PLAN

TABLE OF CONTENTS

PROJECT QUALITY ASSURANCE PLAN

1. MANAGEMENT RESPONSIBILITY

The successful implementation of this Quality Assurance Plan (QAP) for this project rests on the level of commitment by top management that ensures that the quality elements are understood, implemented, maintained, and continually being evaluated and improved to sustain quality throughout all phases of the project. The QAP shall include project-specific quality objectives and document how the quality requirements for the project will be achieved and implemented.

Contractor input:

STATEMENT OF COMMITMENT to QUALITY:

(Input quality statement)

_____ (Approved by highest level of management) DATE: _____

In this section, identify management's commitment to quality, and ensure that the commitment is understood, implemented, and maintained. Personnel assigned to this project shall be identified in an organizational chart format. Those personnel responsible for assuring quality must be independent of those having direct responsibility for the work being performed:

ORGANIZATIONAL CHART

(Insert the company's organizational chart)

PROJECT QUALITY ASSURANCE PLAN

Roles & Responsibilities: Include in this section assigned personnel duties and responsibilities within this project that are identified in the organizational chart.

Contractor input:

In this section, document the roles and responsibilities of key personnel (by functional position only) assigned to the project:

Example Positions:

Project Manager:

Quality Assurance Representative:

Inspection Personnel:

2. Documented Quality Management System (QMS)

The Quality Assurance Plan (QAP) applies to all quality activities performed under the contract. In order to ensure continued adherence to the standard practices, procedures and policies established for the project, periodic reviews, revisions, and redistribution of this QAP shall be performed.

Documentation records testifying to the satisfactory execution of the required activities for the project (i.e. construction, inspections, & testing) are readily available and delivered to authorized personnel as directed. An integral part of this project is the list of instructions, procedures, drawings, specifications, inspection test reports, and quality assurance reports to be prepared, submitted, or made available for review or approval, in accordance with contract requirements.

Contractor input:

In this section, document the method of enusring that all key documents (i.e. quality plans, procedures, and instructions) are developed, reviewed and updated. Also, any plan or procedure should include a statement of purpose, scope, and should contain any references to applicable codes, standards, or specifications to ensure compliance to contract requirements.

3. Design Control: (if applicable)

Note: If the design process does not apply, you may put "N/A" in this section.

The Contractor shall establish and maintain QA/QC procedures to control and verify the design in order to ensure that the design criteria, technical and relevant regulatory requirements are in compliance with Contract Documents and FTA guidelines for this project. Design control includes associated quality control and assurance procedures to demonstrate and ensure that the design requirements are understood, planned, verified, executed and that changes are reviewed and approved throughout the design process and project completion as applicable. The Final Design establishes criteria for the inspection and testing on items that affect safety, reliability, service life, and ADA requirements.

Contractor input:

In this section, document the design process, including quality control reviews for assuring design integrity is established throughout all phases of development, and what methods will be used to control the design within the key elements identified below:

Note: Key elements of the design process include, but not limited to:

- ***Design Planning:***
- ***Design Input:***
- ***Design Output:***
- ***Design Verification:***
- ***Design Validation:***
- ***Design Changes:***

4. Document Control

Procedures shall be established and maintained for the control of project documents and data. Quality procedures shall describe methods for review and approval of project documents by authorized personnel, distribution, storage and retrieval of documents, correction and deletion of documents, and control of changes to these documents. These controls are required to be implemented in order to provide project participants and organizations with access to the latest version of each document.

Contractor input:

In this section, identify which documents will be controlled and the process to ensure that they are maintained and current throughout the project:

Example of Documents:

- ***Contractors Project Quality Assurance Plan (QAP)***
- ***Contractors Inspection Procedures.***
- ***Contract Documents.***
- ***Drawings***

5. Purchasing (If applicable)

Note: If the purchasing process does not apply, you may put "N/A" in this section

The purpose of this element is to ensure that purchasing requirements are clearly understood by the contractor, consultant, or supplier, and that that proper quality elements are made part of the contract.

Procedures shall be established and maintained to ensure that purchased services or products conform to specified technical requirements. Purchasing requirements apply to all Contractors and Suppliers.

Receiving Inspection

A procedures for on-site inspection, handling and receiving of all materials shall be established and included in the Contractor's QA Plan. The receiving inspection of all materials shall include the Contractor's QA/QC staff at their facility, and any nonconforming materials shall be identified and documented.

Approved Supplier List

The Contractor shall develop and maintain an approved Supplier list and make it available for review and approval by the Project Sponsor. The Contractor shall have a process in place to review the supplier's ability to meet requirements prior to awarding a purchase order.

Contractor input:

In this section, document the purchasing process and how all products are received, inspected, accepted, stored and maintained.

Important Note: The Contractor must comply to all Buy America requirements if the Project is Federally Funded. This section shall also identify the verfication and control of purchased materials to ensure that these requirements are met.

6. Product Identification and Traceability (If applicable)

Note: If the product identification and traceability process does not apply, you may put "N/A" in this section.

The purpose of product identification and traceability is to ensure the control of materials, parts, components, equipment, and products, and the identification and traceability of these materials to prevent the use of incorrect or defective items. They also ensure that only correct and acceptable items are used or installed. These requirements apply to all materials, parts, components, equipment, and products, including partially fabricated or assembled components, produced for incorporation into the project.

Identification

All materials, supplies, and components that are intended for use in this Project shall be identified from the time of initial fabrication, or receipt, up to and including installation or end use. Items shall be identified by positive markings and/or certifications. They shall be segregated and/or stored with identification data to ensure control and proper identification as applicable.

Item identification methods include use of physical markings. If physical markings are either impractical or insufficient, other appropriate means of identification such as physical separation, container labels, barcodes or tags shall be employed.

Traceability

Item identification methods ensure that traceability is established and maintained in a manner that allows an item to be traced to applicable drawings, specifications, specific test report, purchase order, or other documents during all stages of production, delivery, and installation or end use.

Contractor input:

In this section, document how materials, components, equipment, and products will be identified:

Important Note: The Contractor must comply to all Buy America requirements if the Project is Federally Funded. This section shall also identify the verfication and control of purchased materials to ensure that these requirements are met.

7. Process Control

To achieve accuracy and consistency, the Contractor shall identify and plan the installation and/or construction, and testing processes that directly affect quality and ensure these processes are performed under controlled conditions. Controlled conditions shall include the following:

- Personnel qualifications and certifications requirements.
- Documented work instructions, including acceptance criteria, where such are needed to ensure quality.
- Implementing documents defining the manner of design and/or construction process.
- Use of suitable products for design; installation and testing ~~and/or construction~~ equipment, and a suitable working environment.
- Compliance with referenced standards/codes, quality plans, and/or documented procedures.
- Monitoring and controlling of processes parameters and documenting product characteristics during installation, and testing.
- When required, changes to processes must be controlled

A major issue in process control is to ensure that work is performed in the proper sequence.

Contractor input:

In this section, document how the process will be controlled to ensure accuracy and consistency.

8. Inspection and Testing

Activities affecting quality shall be inspected and documented by experienced personnel who are independent of those performing the work. Inspections and tests shall be performed in accordance with approved documents to determine that contract activities meet the established requirements of the specifications.

Contractor input:

In this section, identify the types of inspections and/or testing to be performed and the procedures/forms to be used to perform the inspections and/or testing:

9 Inspection, Measuring, and Test Equipment

All equipment used in the inspection, measuring, and ~~or~~ testing shall be identified, calibrated, and maintained under controlled conditions. Provisions shall be established for re-calibration of such equipment in a timely manner. The equipment to be used shall meet the National Institute of Standards and Technology (NIST) standards of accuracy for the measurements and tests required.

Contractor input:

In this section, document which inspection, measuring, and test equipment will be identified, calibrated and maintained to ensure its suitability for use. Also, identify the calibration intervals or frequency for each equipment that is subject to calibration:

10 Inspection and Test Status

A means should be provided for identifying the inspection and test status of the work during the installation and/or construction process. The purpose of this is to ensure that only work that has passed the required inspections and tests is accepted.

The test and inspection status should be identified by means of markings, stamps, tags, labels, routing cards, inspection records, test software, physical location, or other suitable means.

Contractor input:

In this section, document the method to be used to identify the inspection and testing status on the work to be performed:

11 Nonconformance

At a minimum, nonconformances should be controlled through immediate identification and segregation/containment. When segregation is not possible, nonconforming items should be clearly identified as such. Nonconforming work should be identified, documented, and evaluated to determine appropriate disposition.

The document should identify the authority responsible to make decisions and act with respect to the nonconformance, and should be traceable to any corrective action to prevent recurrence. Those activities affected by the nonconforming work should be immediately notified.

Contractor input:

In this section, document the method to be used to identify, document, evaluate and address nonconforming conditions. It is highly recommended that a "log of nonconformances" is kept and that it includes the corrective actions to address the nonconformances:

12 Corrective Action

The corrective action plans should include the investigation of the root cause of any nonconforming work and the preventive action needed to prevent recurrence.

Contractor input:

In this section, document the method to be used to implement a corrective action plan to address all nonconformances. It's highly recommended that a log be kept to track all nonconformances and the proposed corrective action plans as necessary:

13 Quality Records

Procedures should be established and maintained for all quality records. These procedures should identify which records should be kept, responsibility for production and collection, and responsibility for indexing, filing, storage, maintenance, and disposition of all quality records.

Additionally, any electronic data should be regularly backed up, and backups should be stored offsite in a manner to ensure their safety from deterioration and/or damage.

Contractor input:

In this section, identify which quality records will be controlled , the authority responsible for the records, and the process to ensure that records are maintained, stored and dispositions appropriately:

Example of Quality Records:

- ***Approved quality plans and procedures***
- ***Inspection Reports***
- ***Test Data***
- ***Calibration Records***
- ***Nonconformance Reports***
- ***Corrective Action Reports***
- ***Audit Reports***
- ***Training Records***
- ***Design review records and submittals***
- ***Product Certification***

14 Quality Audits (if applicable)

Note: If quality audits does not apply, you may put "N/A" in this section

Quality audits are not the same as financial audits. A quality audit program should be established to ensure that the elements of the contractor's quality program are functioning as intended.

Quality audits should be performed by the Contractor's qualified quality personnel, and should be independent, scheduled, and performed to standards and/or checklists. A final report that identifies the audit results should be generated, distributed, and a log developed to track both the findings and corrective action plans.

Contractor input:

In this section, document the quality audit program that should include an audit schedule, the activites to be audited and how the contractor will address the audit findings:

15 TRAINING

The contractor should establish and maintain procedures for identifying the training needs and provide for the training of all personnel performing the activities affecting quality.

Records of the training, and evaluations, qualifications, and quality related certifications should be maintained. A training matrix can be used as an effective tool for determining which personnel require what type of training. It is also important that effectiveness of training be evaluated to ensure that it has achieved or failed its objectives.

Contractor input:

In this section, document the training program, personnel qualification and any certification needed as necessary:

APPENDICES

Contractor input:

In this section, the Contractor may include any references, procedures, process flow charts, forms and acronyms/definitions that apply to this project:

APPENDIX “G” TO SPECIAL PROVISIONS

Existing Drawings for Informational Purposes

Martin Luther King Parking Garage Existing Plans are for informational purposes only and can be found on the following link:

CIP271-DTPW23-CT SOLICITATION DOCUMENTS

All documents inside this link can be downloaded.