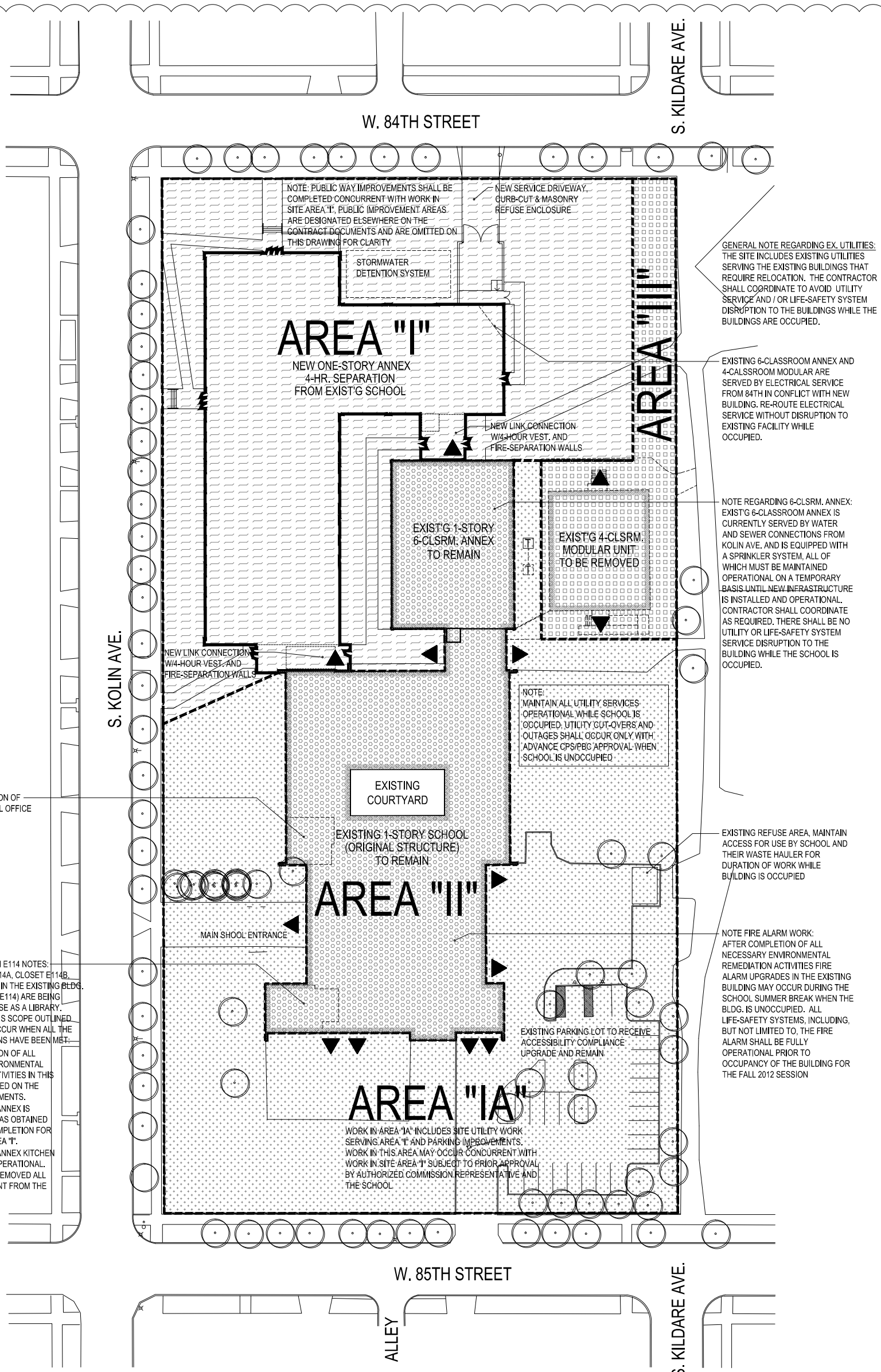


GRAPHIC SYMBOLS

- EXISTING EXIT EGRESS, MAINTAIN ROUTE FROM BUILDING(S) TO PUBLIC WAY FOR THE DURATION OF WORK WHILE BUILDING IS OCCUPIED AS REQUIRED BY AUTHORITIES HAVING JURISDICTION
- AREA OF WORK, ALSO REF. SPEC. SECTION 0113 "CONSTRUCTION OPERATIONS AND SITE UTILIZATION"
- PROPERTY LINE
- AREA "I"
- AREA "1A"
- AREA "II"
- AREA "III"
- EXISTING BUILDING
- PROPOSED ANNEX

GRAPHIC SCALE

0' 50' 100' 150'

SITE UTILIZATION NOTES:

1. THIS DRAWING IS DIAGRAMMATIC AND NOT INTENDED TO ILLUSTRATE ALL ASPECTS OF THE WORK IN DETAIL, REFER TO OTHER DRAWINGS FOR ADDITIONAL INFORMATION.
2. WORK AREAS DESIGNATED ON THIS DRAWING SHALL BE USED IN CONJUNCTION W/ SPECIFICATION SECTION 01113 "CONSTRUCTION OPERATIONS AND SITE UTILIZATION PLAN", SEE SPECIFICATION FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL MEANS, METHODS, TECHNIQUES, AND SEQUENCES FOR IMPLEMENTATION OF THE WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY FACILITIES, SITE FENCING, GATES, ETC. NECESSARY FOR IMPLEMENTATION OF THE WORK.

N

SITE LOGISTIC DIAGRAM

1 / ASK-5 — SCALE: 1/64" = 1'-0"

2

SMNG-A Architects, Ltd.
Schroeder Murchie
Niemiec Gazda-Auskalnis

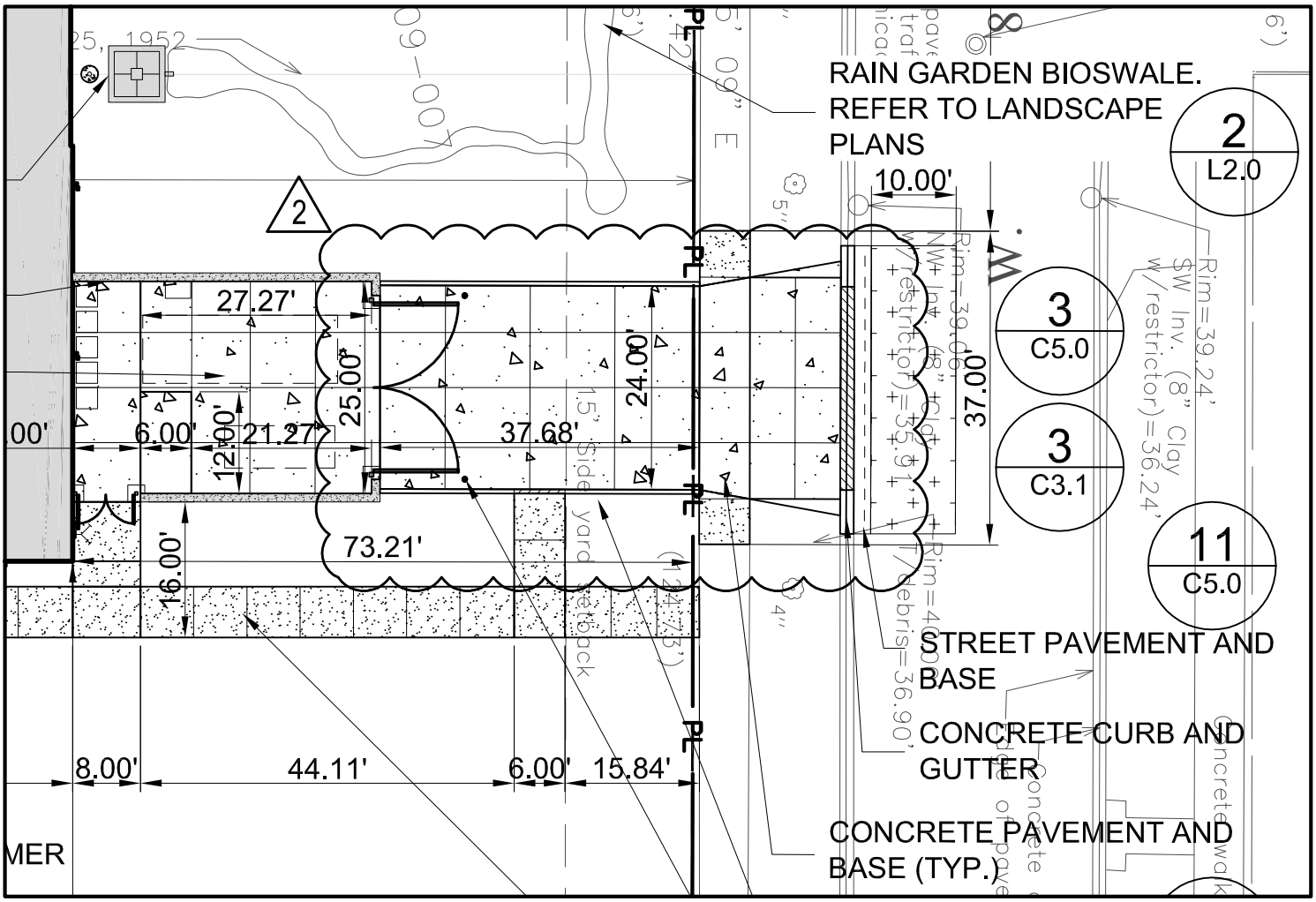
Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

PROJECT: DURKIN PARK ELEMENTARY SCHOOL ANNEX
SMNG-A NO.: 1110
PBC NO.: 05540
CONTRACT NO.:
ISSUE: ISSUE FOR ADDENDUM NO. 2
TITLE: SITE LOGISTIC DIAGRAM
COMMENTS: REFER TO SHEET SL.1

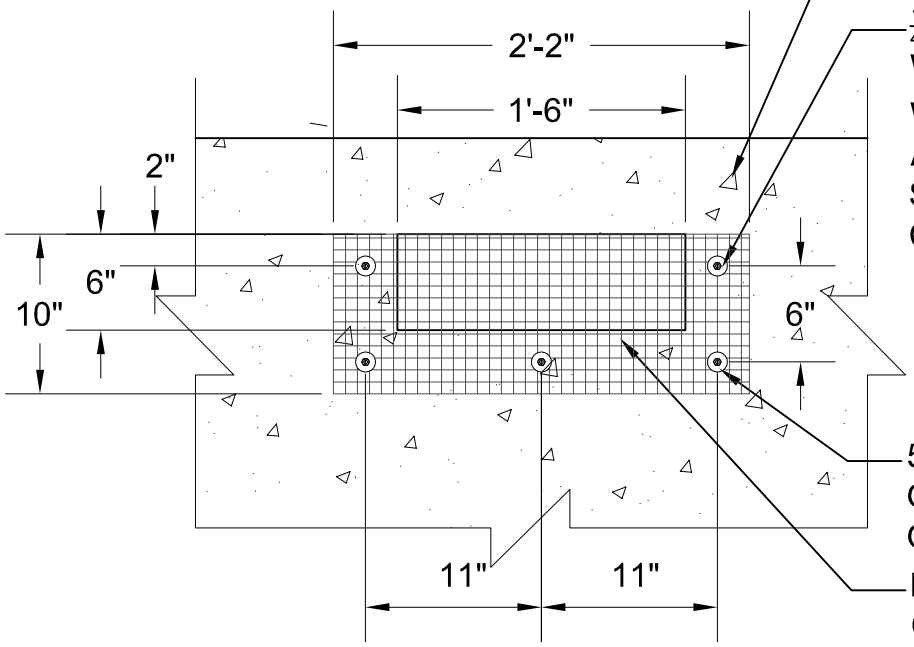
ISSUE DATE: 01.17.12

ASK-5



SMNG-A Architects, Ltd. Schroeder Murchie Niemiec Gazda-Auskalnis Architecture Planning Interior Architecture 936 West Huron Street Chicago, Illinois 60642 312.829.3355 voice 312.829.8187 fax	PROJECT: DURKIN PARK ELEMENTARY SCHOOL ANNEX SMNG-A NO.: 1110 PBC NO.: 05540 CONTRACT NO.: ISSUE: ISSUE FOR ADDENDUM NO. 2 TITLE: UPDATED DRIVEWAY DIMENSIONS COMMENTS: REFERENCE DRIVEWAY, SHEET C2.0	ISSUE DATE: 01.17.12 **CSK-04** PAGE 1 OF 1

2



OVERFLOW OPENING

INTERIOR FACE OF CONCRETE CISTERN

$\frac{1}{4}$"Ø - 1$\frac{3}{4}$" LONG SLOTTED HEX WASHER HEAD CONCRETE SCREW, WITH 1 $\frac{1}{4}$" O.D. FENDER WASHER AND SLEEVE ANCHOR. CONCRETE SCREW SHALL BE STEEL BLUE COATED FINISH.

5 SCREWS SHALL BE OFFSET 2" FROM OVERFLOW OPENING

MCNICHOLS CLOSE MESH GALVANIZED STEEL INSECT SCREEN (2'-2" x 10") SUBMIT 12" x 12" SAMPLE FOR ENGINEER'S APPROVAL

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Schroeder Murchie
Niemiec Gazda-Auskalnis

Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

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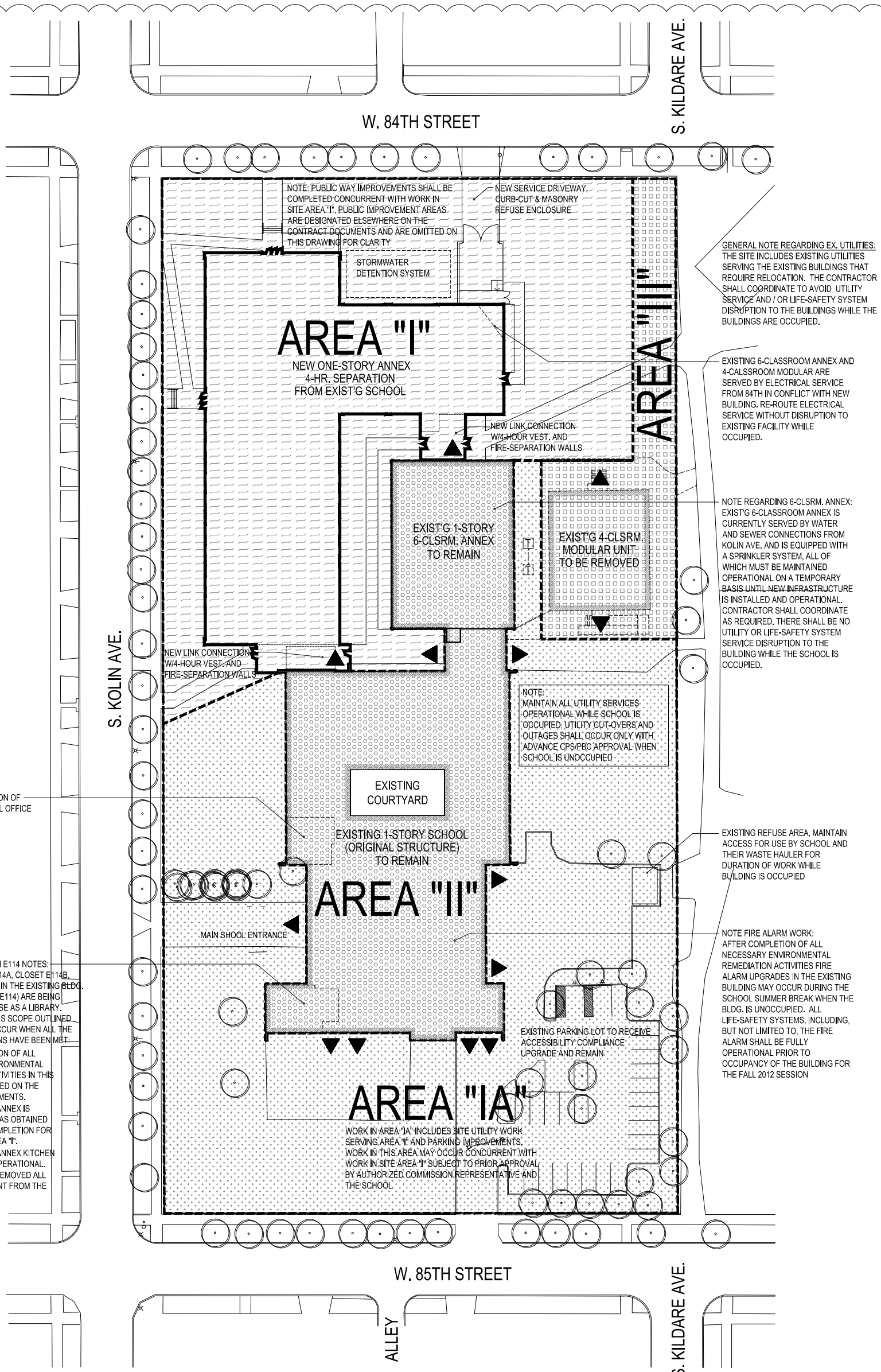
SMNG-A NO.: 1110
PBC NO.: 05540
CONTRACT NO.:
ISSUE: ISSUE FOR ADDENDUM NO. 2
TITLE: UPDATED OVERFLOW OPENING
COMMENTS: REFERENCE DETAIL 4 OF C5.3

ISSUE DATE: 01.17.12

CSK-05



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GRAPHIC SCALE

0' 50' 100' 150'

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N

SITE LOGISTIC DIAGRAM

1 / ASK-5 — SCALE: 1/64" = 1'-0"

2

SMNG-A Architects, Ltd.
Schroeder Murchie
Niemiec Gazda-Auskalnis

Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

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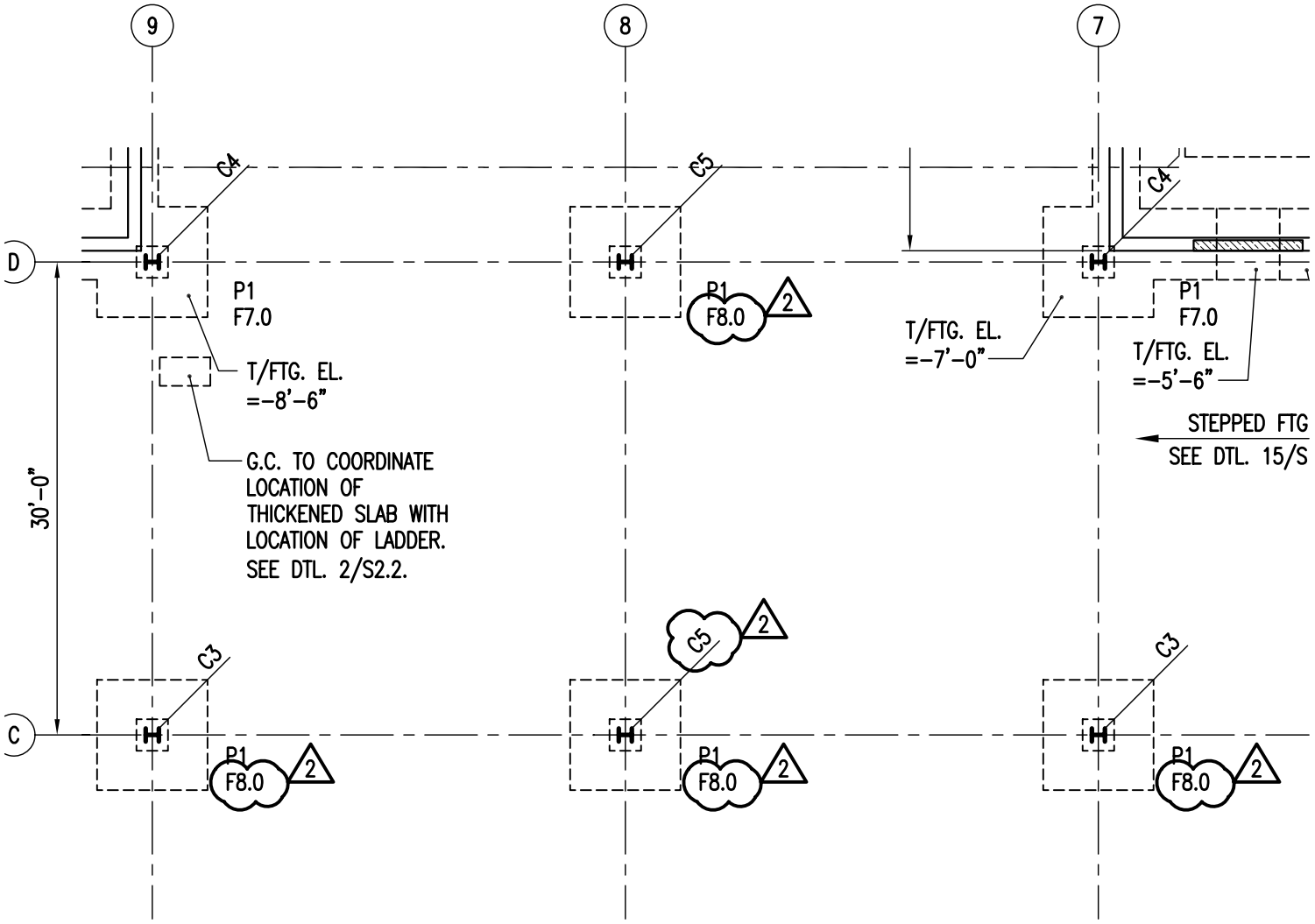
COMMENTS: REFER TO SHEET SL.1

ISSUE DATE: 01.17.12

ASK-5



PARTIAL FOUNDATION PLAN

1/8"=1'-0"

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Schroeder Murchie
Niemiec Gazda-Auskalnis

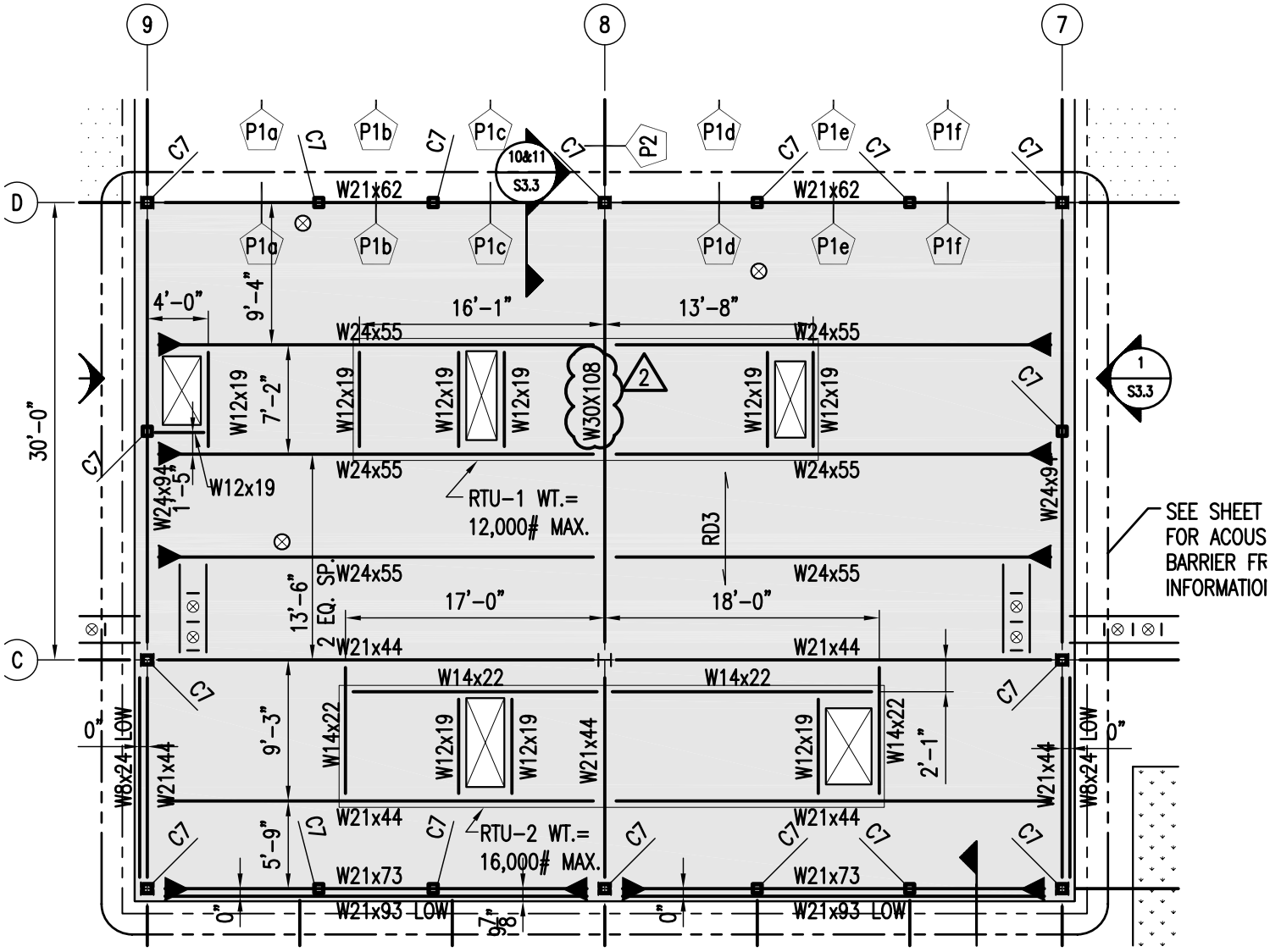
Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

PROJECT:	DURKIN PARK ELEMENTARY SCHOOL ANNEX
SMNG-A NO.:	1110 MEC# 11021
PBC NO.:	05540
CONTRACT NO.:	
ISSUE:	ISSUE FOR ADDENDUM NO. 2
TITLE:	PARTIAL FOUNDATION PLAN
REFERENCE:	S1.1
COMMENTS:	N.T.S.

ISSUE DATE: 01.17.12

SSK-08



PARTIAL ROOF FRAMING PLAN

1/8"=1'-0"

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Schroeder Murchie
Niemiec Gazda-Auskalnis

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Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

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SMNG-A NO.:	1110 MEC# 11021
PBC NO.:	05540
CONTRACT NO.:	
ISSUE:	ISSUE FOR ADDENDUM NO. 2
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REFERENCE:	S1.2
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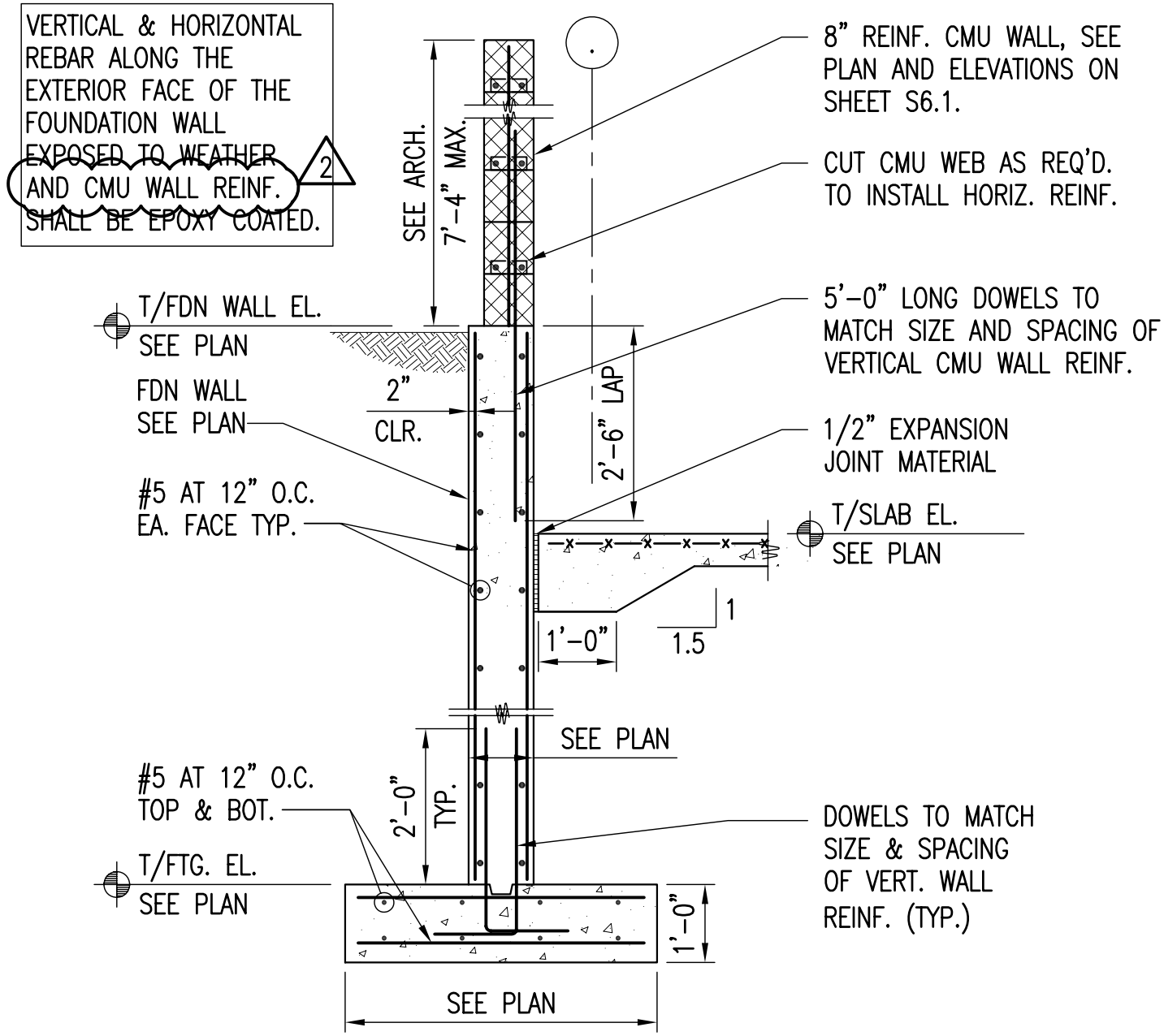
ISSUE DATE: 01.17.12

SSK-09



11
S2.2

TYPICAL SECTION AT CANTILEVERED CMU WALL

1/2"=1'-0"

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Schroeder Murchie
Niemiec Gazda-Auskalnis

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Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

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SMNG-A NO.:	1110 MEC# 11021
PBC NO.:	05540
CONTRACT NO.:	
ISSUE:	ISSUE FOR ADDENDUM NO. 2
TITLE:	TYPICAL SECTION AT CANTILEVERED CMU WALL
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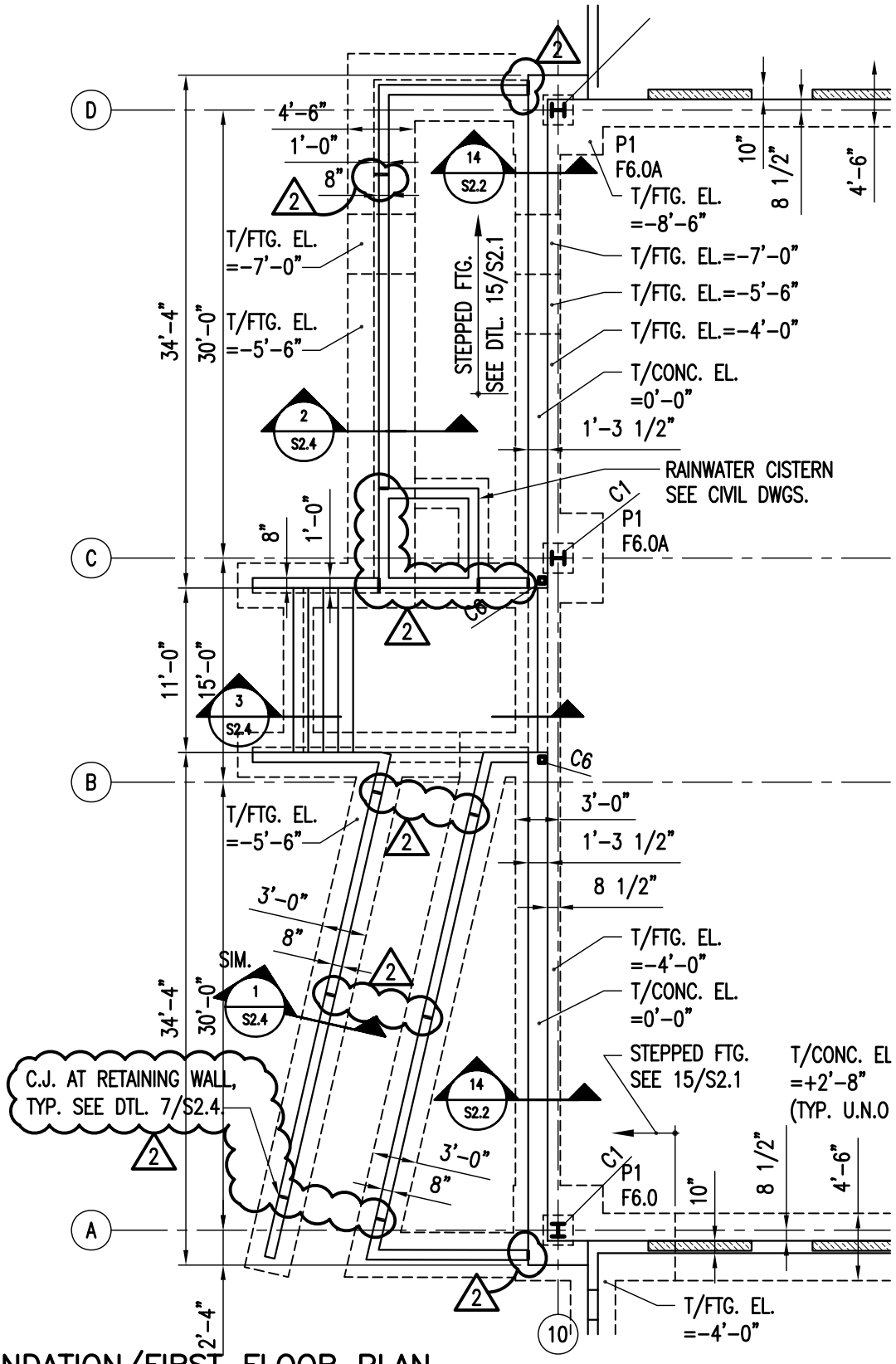
COMMENTS:	N.T.S.

ISSUE DATE: 01.17.12

SSK-10



PARTIAL FOUNDATION/FIRST FLOOR PLAN

1/8"=1'-0"

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Schroeder Murchie
Niemiec Gazda-Auskalnis

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Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

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ISSUE:	ISSUE FOR ADDENDUM NO. 2
TITLE:	PARTIAL FOUNDATION /FIRST FLOOR PLAN
REFERENCE:	S1.1
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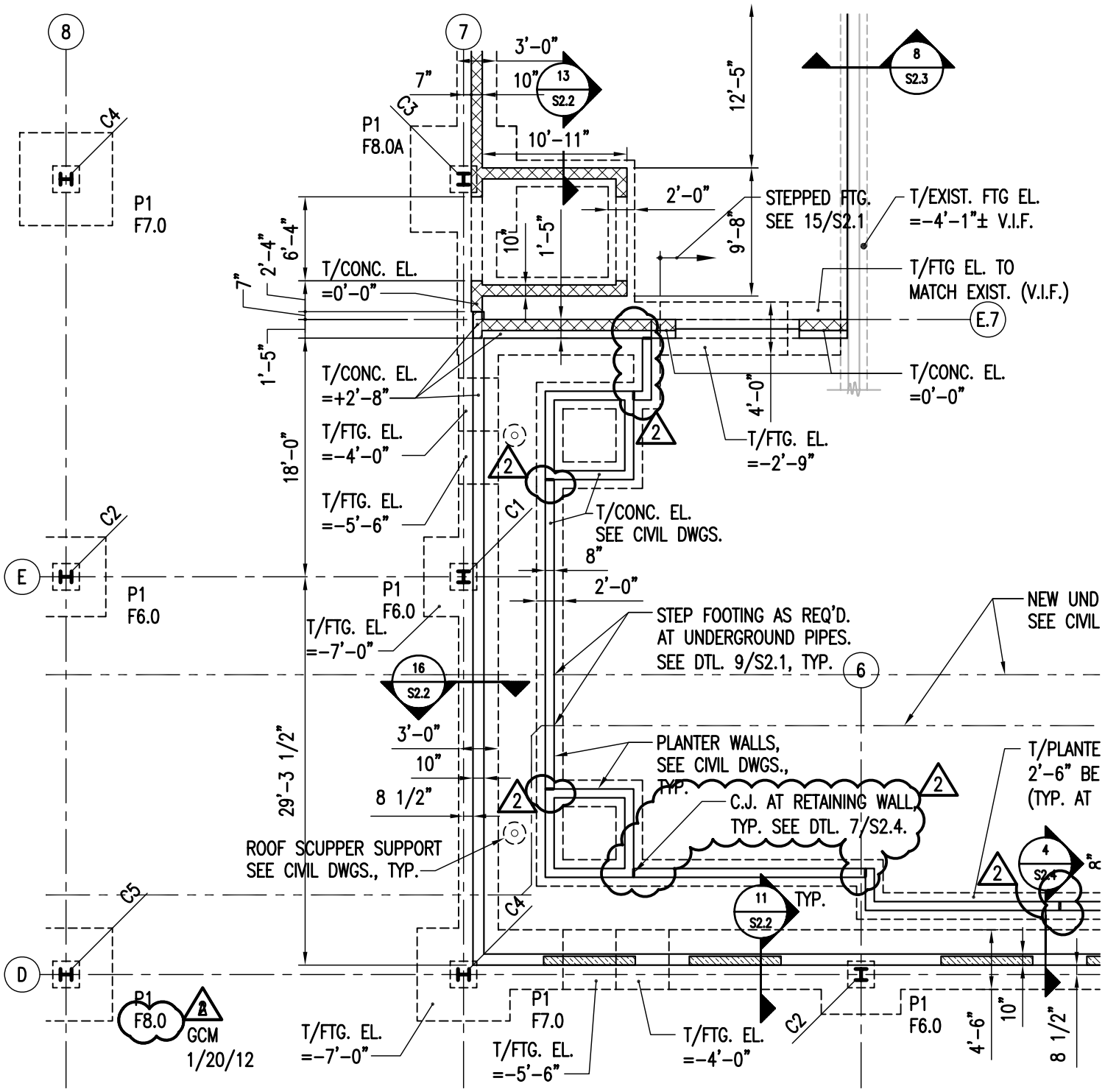
ISSUE DATE: 01.17.12

SSK-11



PARTIAL FOUNDATION/FIRST FLOOR PLAN

1/8"=1'-0"

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Schroeder Murchie
Niemiec Gazda-Auskalnis

Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

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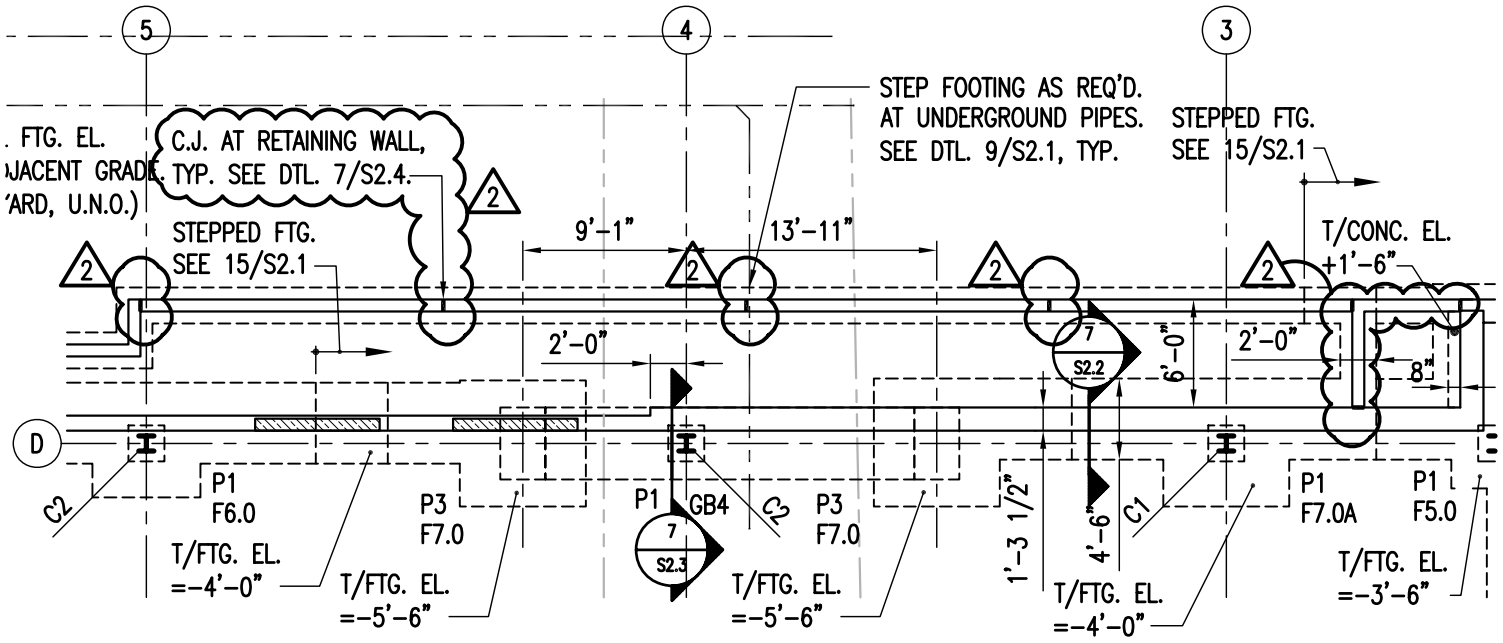
TITLE:	PARTIAL FOUNDATION /FIRST FLOOR PLAN
REFERENCE:	S1.1
COMMENTS:	N.T.S.

ISSUE DATE: 01.17.12

SSK-12

)ND PIPES.



PARTIAL FOUNDATION/FIRST FLOOR PLAN

1/8"=1'-0"

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Schroeder Murchie
Niemiec Gazda-Auskalnis

Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
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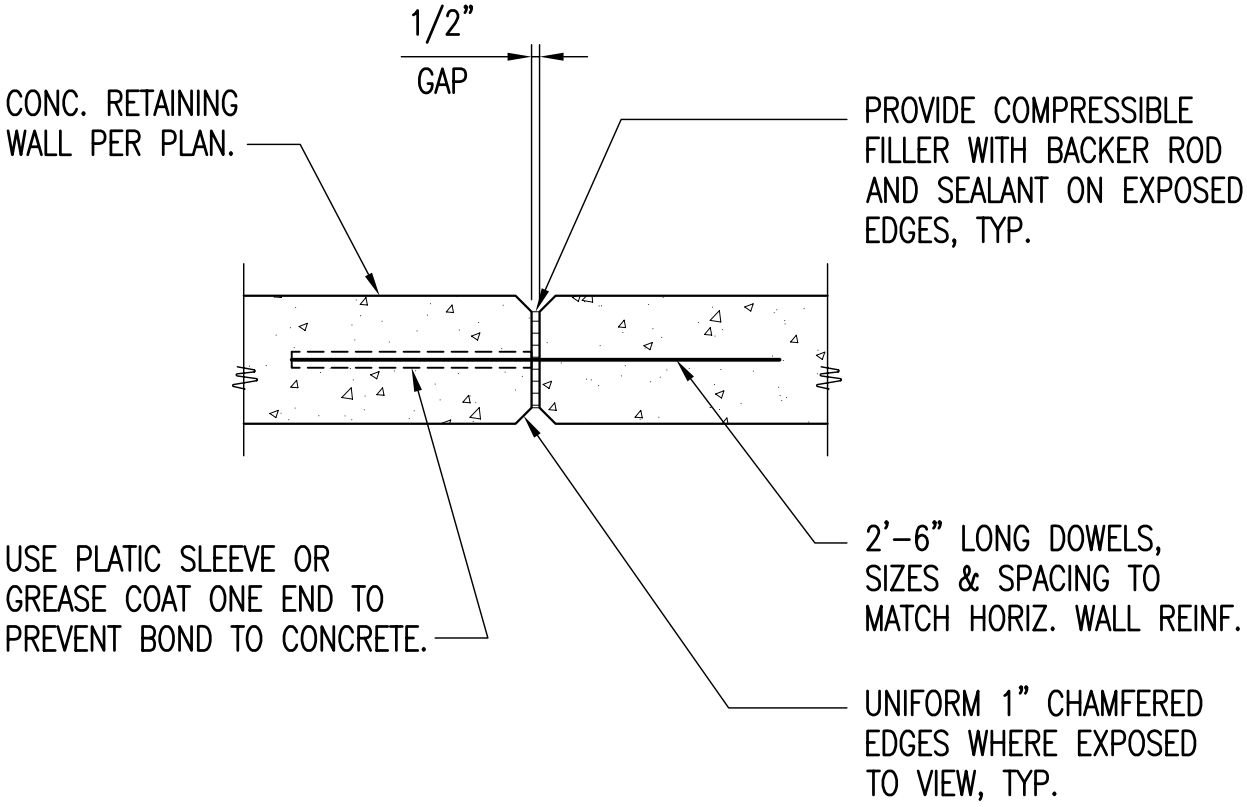
ISSUE DATE: 01.17.12

SSK-13



2
7
S2.4

PLAN DETAIL AT EXT. RETAINING WALL CONTROL JOINT

1"=1'-0"

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Schroeder Murchie
Niemiec Gazda-Auskalnis

Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

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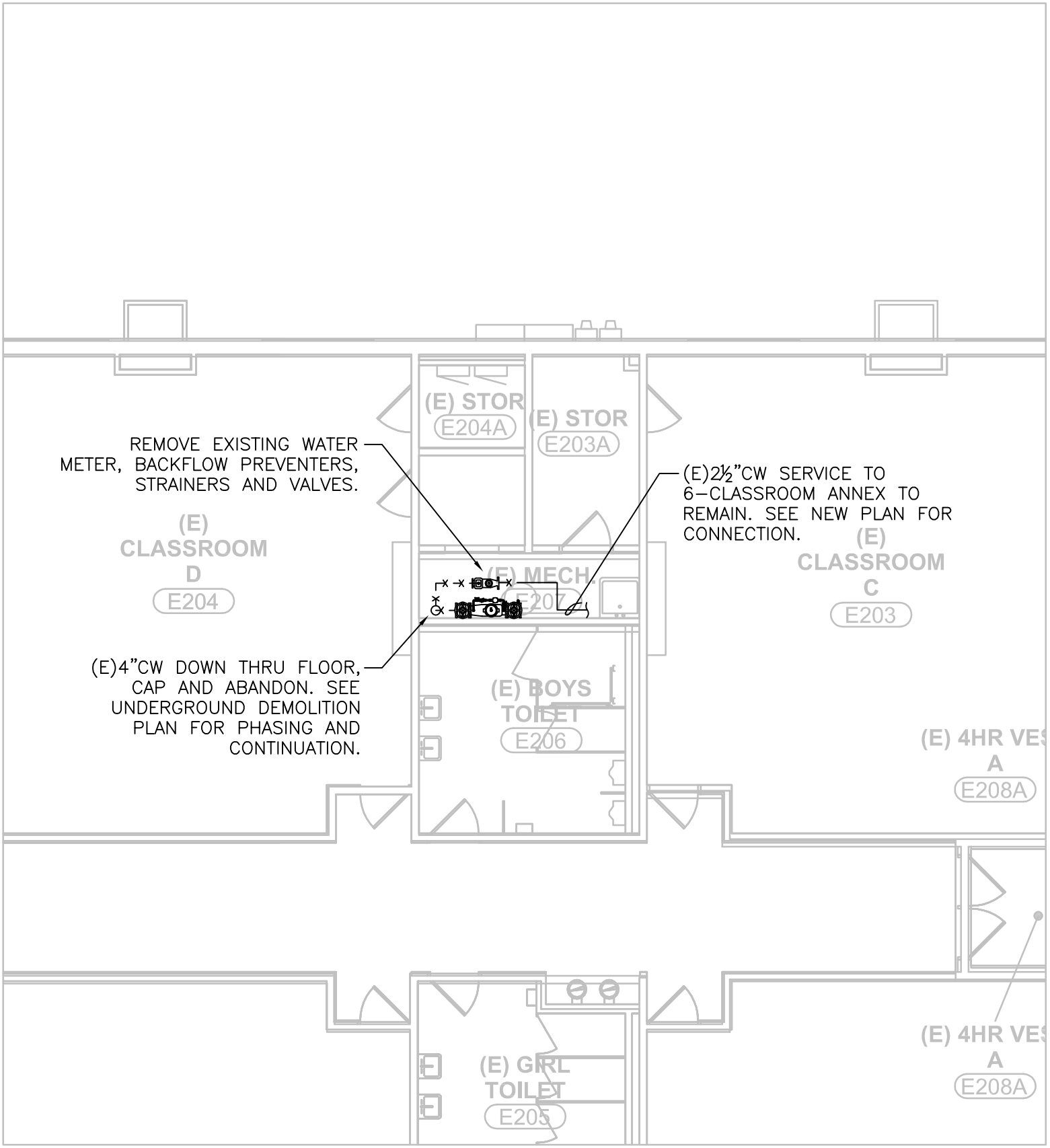
SMNG-A NO.:	1110 MEC# 11021
PBC NO.:	05540
CONTRACT NO.:	
ISSUE:	ISSUE FOR ADDENDUM NO. 2
TITLE:	PLAN DETAIL AT EXT. RETAINING WALL CONTROL JOINT
REFERENCE:	7/S2.4
COMMENTS:	N.T.S.

ISSUE DATE: 01.17.12

SSK-14



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Schroeder Murchie
Niemiec Gazda-Auskalnis

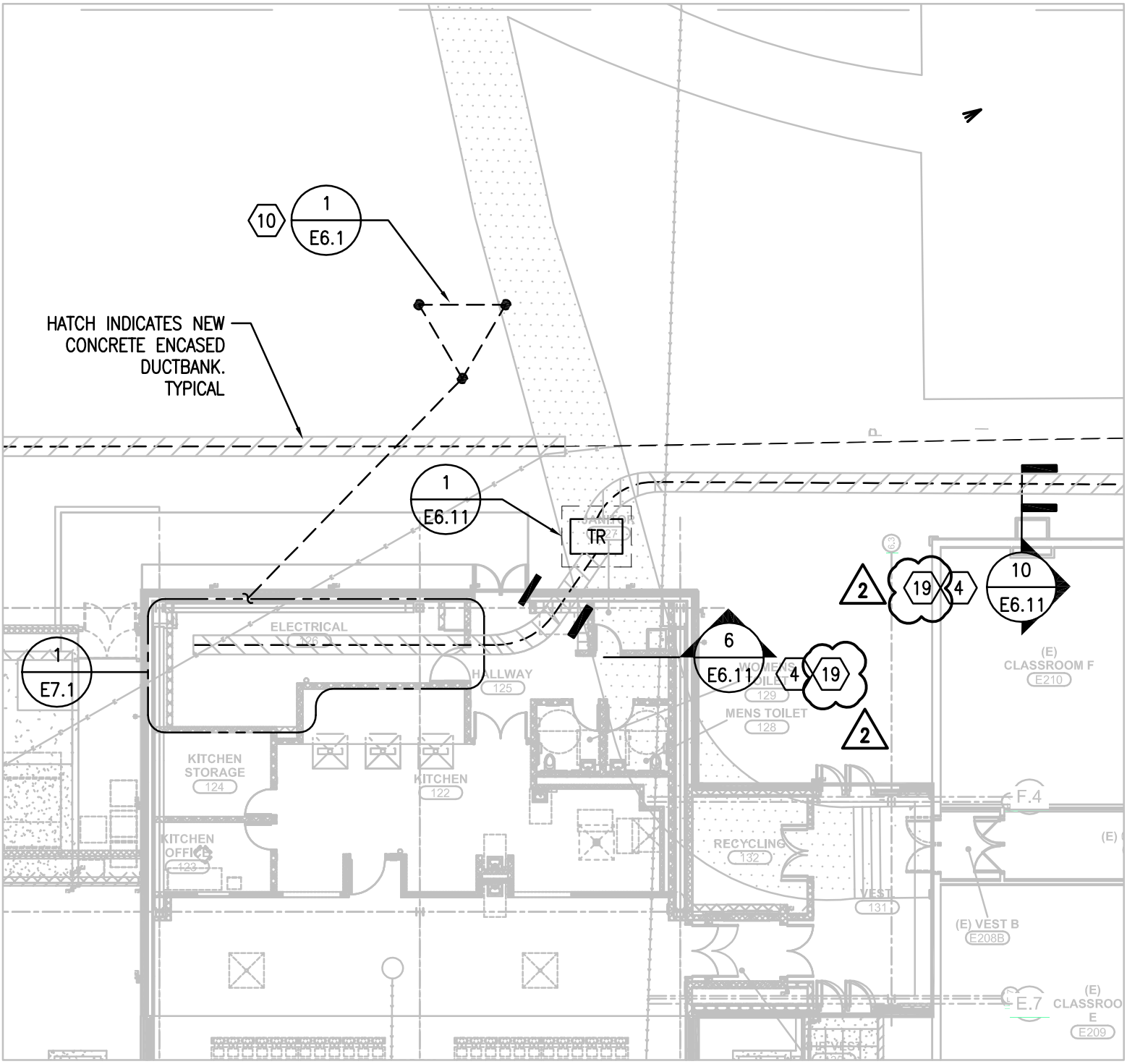
Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

PROJECT: DURKIN PARK ELEMENTARY SCHOOL ANNEX
SMNG-A NO.: 1110
PBC NO.: 05540
CONTRACT NO.:
ISSUE: ISSUE FOR ADDENDUM NO. 2
TITLE: PLUMBING DEMO FIRST FLOOR ANNEX PLAN
COMMENTS: -

ISSUE DATE: 01.17.12

PSK-1



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936 West Huron Street
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312.829.3355 voice
312.829.8187 fax

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SMNG-A NO.:	1110
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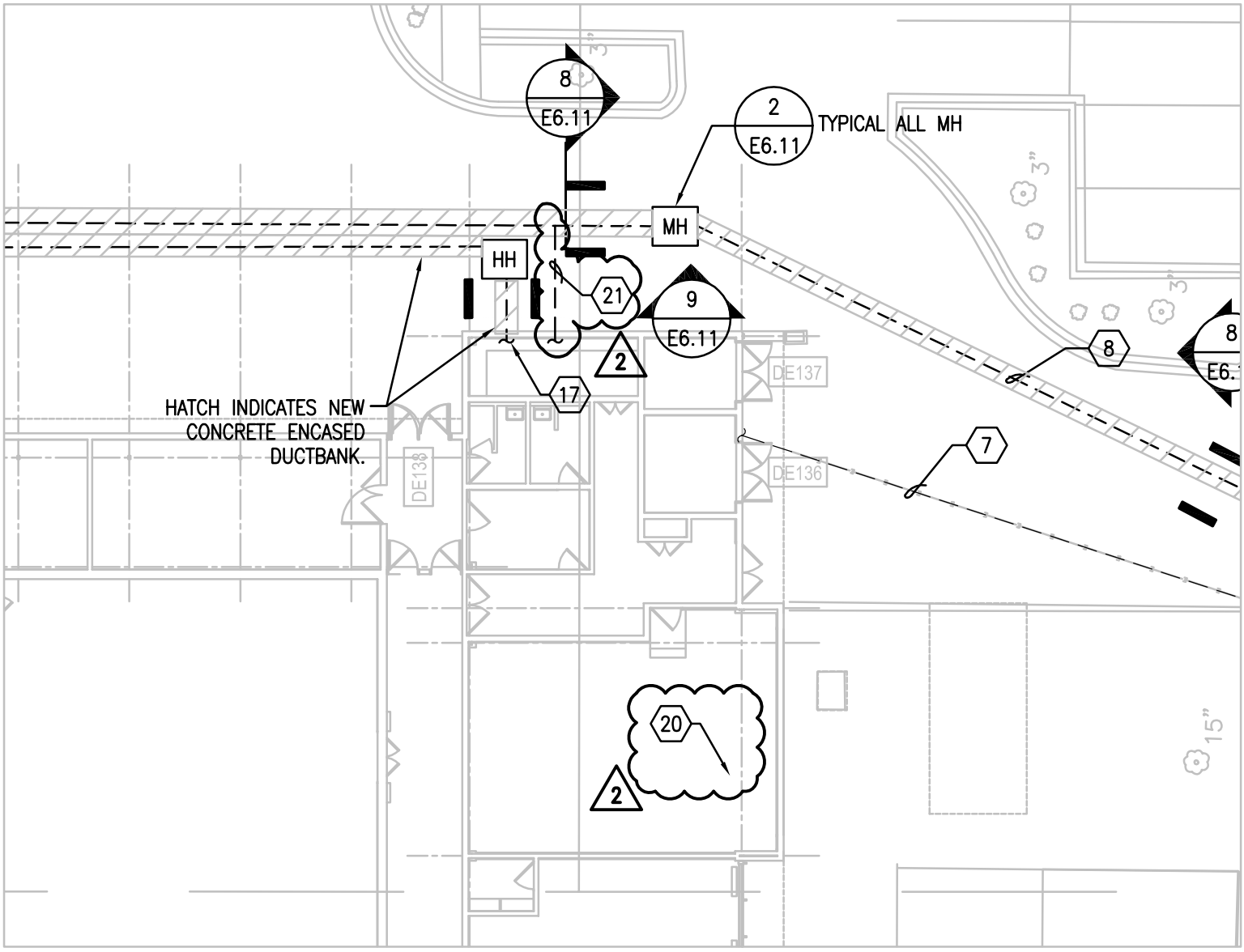
CONTRACT NO.:	
ISSUE:	ISSUE FOR ADDENDUM NO. 2
TITLE:	ELECTRICAL SITE PLAN
COMMENTS:	ES1.1

ISSUE DATE: 01.16.12

ESK-5



2 (18) EXISTING TRANSFORMER SERVING 6 CLASSROOM MODULAR BUILDING TO REMAIN.

(19) RUN COPPER CONDUCTOR IN 1 1/4" CONDUIT WITHIN CONCRETE DUCTBANK FROM NEW BUILDING GROUND BUS BAR TO THE EXISTING BUILDING MAIN SERVICE GROUND ON WATER PIPE. SEE GROUNDING DETAIL ON SHEET E6.1 FOR MORE INFORMATION.

(20) APPROXIMATE LOCATION OF WATER PIPE IN EXISTING BOILER ROOM.

(21) ROUTE CONDUIT ABOVE CEILING TO WATER PIPE IN BOILER ROOM.

SMNG-A Architects, Ltd.
Schroeder Murchie
Niemiec Gazda-Auskalnis

Architecture
Planning
Interior Architecture

936 West Huron Street
Chicago, Illinois 60642
312.829.3355 voice
312.829.8187 fax

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COMMENTS: ES1.1

ISSUE DATE: 01.16.12

ESK-6

SECTION 17780

DISTRIBUTED AUDIO-VIDEO COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Coaxial and Category 6 UTP wiring for media-management television distribution.
2. Cable connecting hardware, termination panels, and cross-connects.
3. Signal transmission active and passive components.
4. Signal transmission of a Locally Originated Video Channel.

B. The MMTV cabling system will be a star topology two-way coaxial video cabling system capable of passing reverse channels from 5 MHz to 36 MHz and forward channels for 54 MHz to 860 MHz. The MMTV cabling system is comprised of, but not limited to coaxial, splitters, faceplates, and connectors. Each MMTV outlet will have a dedicated coaxial cable and a 4-pair, UTP Category 6 cable run from the outlet to the MDF.

1.2 DEFINITIONS

A. Broadband: For the purposes of this Section, wide bandwidth equipment or systems that can carry signals occupying in the frequency range of 5 to 1000 MHz.

B. Carrier: An RF signal that is modulated to carry information. In the process of modulation, it is spread out over a wider band.

C. CATV: Community antenna television; a communication system that simultaneously distributes several different channels of broadcast programs and other information to customers via a coaxial cable.

D. dBmV: Decibels relative to 1 mV across 75 ohms. Zero dBmV is defined as 1 mV across 75 ohms. dBmV = 20 log $10(V_1/V_2)$ where V_1 is the measurement of voltage at a point having identical impedance to V_2 (0.001 V across 75 ohms).

E. Headend: The control center of the master antenna television system, where incoming signals are amplified, converted, processed, and combined into a common cable along with any locally originated television signals, for transmission to user-interface points.

F. IDF: Intermediate Distribution Facility

G. MDF: Main Distribution Facility

H. MMTV: Media Management Television

I. Modulator: An active device that modulates a baseband audio and video source onto an NTSC 6 MHz wide channel. This device shall employ a custom SAW filter to provide true vestigial sideband selectivity with built-in FCC group delay pre-distortion. This will allow for adjacent channel operation without any interference. This device shall also comply with FCC Docket 21006.

J. RF: Radio frequency.

K. User Interface: End point of Contractor's responsibility for Work of this Section. User interfaces are the 75-ohm terminals on device plates.

L. UTP: Unshielded Twisted Pair

1.3 SUBMITTALS

A. Product Data: For each component specified, including detailed manufacturer's specifications. Include data on features, ratings, and performance.

B. Shop drawings: Show fabrication and installation details, including:

1. Floor plans prepared at 1/8” scale indicating the following:

a. Location of all MMTV outlets with identification numbers.
b. Location of termination racks and backboards.
c. Point-to-point raceway routing, identifying number and type of cables in each raceway. Include pullbox locations and sizes.
d. Conduit fill calculations, indicating cross-section area percent fill for each raceway.

2. Detailed layout drawings of MDF racks, including front-view details identifying all components, cabling connections, and cable identification numbers.
3. For coaxial cable, include the following installation data for each type used:

a. Nominal OD.
b. Minimum bending radius.
c. Maximum pulling tension.

4. Functional Block Diagram: Show single-line interconnections between components for headend and distribution system to user-interface points. Show cable types and sizes.
5. Design Calculations: Calculate signal attenuation budget and show calculated line and equipment losses for the system based on the functional block diagram, to show that proposed system layout can be expected to perform up to specification. Contact Blonder Tongue Laboratories, Inc. for a survey form and recommended design considerations.

C. Source quality-control test reports on coaxial cable sweep tests.

D. Field quality-control test reports, as indicated in Part 3 Article “Contractor Startup and Reporting.”

E. Maintenance data for products to include in the operation and maintenance manual specified in Division 01. Include the following:

1. Lists of spare parts and replacement components recommended to be stored at the site for ready access.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Engage firms experienced in manufacturing systems and equipment similar to those indicated for this Project and that have a record of successful in-service performance.

B. Comply with City of Chicago Building Code (CCBC).

C. Comply with all parts of the FCC part 76 rules and regulations for CATV systems.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in City of Chicago Electrical Code, by a qualified testing agency, and marked for intended location and application.

1.5 DELIVERY, STORAGE AND HANDLING

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Receive, handle, and store MMTV system items and materials at the project site. Materials and items shall be placed so that they are protected from damage and deterioration.

C. Stage materials in a secure area of the project site until installation.

1.6 SYSTEM DESCRIPTION

A. System shall consist of a coaxial and UTP cable distribution system for delivery of two-way video channels and control signals.

B. Headend equipment shall consist of signal amplification devices. Coordinate with Owner to obtain signal levels, and noise and distortion characteristics from service provider as the point of departure for system layout and final equipment selection.

C. Cable distribution system consisting of Category 6 UTP cables, UTP termination hardware, coaxial cables, user interfaces, signal taps and splitters, RF amplifiers, signal equalizers, power supplies, and required hardware complying with IEEE 802.7 and resulting in performance parameters specified in this Section.

D. Hardware Requirements: Use modular, plug-in, solid-state electronic components. Mount amplifiers and other powered equipment in standard 19-inch cabinet complying with EIA 310.

1.7 PERFORMANCE REQUIREMENTS

A. Minimum acceptable distribution system performance at all user-interface points shall be as follows:

1. RF Video Carrier Level: 8 dBmV nominally, with -5/+7 dB tolerance range.
2. Relative Video Carrier Level: Within 3 dB to adjacent channel.
3. Slope: No more than 1 dB between 54- and 860-Mhz.
4. Tilt: + 8 dBmV maximum over the 54- to 860-Mhz frequency range.
5. Carrier Level Stability, Short Term: Level shall not change more than 0.5 dB during a 60-minute period.
6. Carrier Level Stability, Long Term: Level shall not change more than 2 dB during a 24-hour period.
7. Channel Frequency Response: Across any 6-MHz channel in 54- to 860-MHz frequency range, referenced to video, signal amplitude shall be plus or minus 1 dB, maximum.
8. Carrier-to-Noise Ratio: 45 dB or more.
9. RF Visual Signal-to-Noise Ratio: 43 dB or more.

1.8 WARRANTY

A. The Contractor shall unconditionally warrant all equipment and systems provided under this Section to be free from defects in materials and workmanship for a period of at least thirty-six (36) months from the date of final acceptance of all work of this Section.

PART 2 - PRODUCTS

2.1 MMTV CATEGORY 6 UTP CABLE AND CONNECTING HARDWARE

A. MMTV UTP Cable: 100-ohm, 4-pair Category 6 UTP.

1. Comply with requirements of Division 17 Section “Data Communications Horizontal Cabling” for Category 6 UTP cable.
2. Jacket Color: Grey.

B. MMTV UTP Patch Panel: Category-6 rated modular rack-mounted panel, 24 or 48 ports per patch panel.

1. Comply with requirements of Division 17 Section “Data Communications Horizontal Cabling” for Category 6 UTP patch panel.

C. MMTV UTP Jacks and Jack Assemblies: Category 6-rated modular, color-coded, non-keyed eight-position RJ45 modular receptacle units with integral IDC-type terminals.

1. Comply with requirements of Division 17 Section “Data Communications Horizontal Cabling” for Category 6 UTP jacks and jack assemblies.
2. Jack Color: Grey.

2.2 MMTV COAXIAL CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:

1. Belden CDT, Electronics Division.
2. CommScope Properties, LLC.

3. West Penn Wire/CDT; a division of Cable Design Technologies, Inc.

B. Cable Characteristics: Broadband type, recommended by cable manufacturer specifically for broadband CATV applications. Coaxial cable and accessories shall have 75-ohm nominal impedance. Listed to comply with City of Chicago Electrical Code.

C. Source Quality Control: Cable products shall be 100 percent sweep tested at the factory before shipping at frequencies from 5 MHz to 1 GHz. Sweep test shall test the frequency response, or attenuation over frequency, of a cable by generating a voltage whose frequency is varied through the specified frequency range and graphing the results.

D. RG-11/U, Indoor Trunk Cable: No. 14 AWG, solid, bare-copper conductor; cellular polyethylene dielectric insulation. Bare-copper braid shield with 95 percent minimum shielding factor. Jacketed with black PVC. Suitable for indoor installations; City of Chicago Electrical Code, Type CATVR.

1. Utilized for all runs of 135 feet and over in length.

E. RG-6/U, Indoor Branch Cable: No. 18 AWG, solid, copper-covered steel conductor; cellular polyethylene dielectric insulation. Double shielded with 100 percent aluminum-foil shield, 60 percent aluminum braid. Jacketed with black PVC. Suitable for indoor installations; City of Chicago Electrical Code, Type CATVR.

1. Utilized for branch drops up to 135 feet in length.

2.3 MMTV COAXIAL CABLE CONNECTORS AND TERMINATION HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:

1. Amphenol Corporation.
2. B&L Coaxial Connections, Ltd.
3. Connect-Tech Products.
4. Hubbell Inc., Hubbell Premise Wiring.
5. Leviton Manufacturing Co., Inc., Leviton Voice & Data Division.
6. Ortronics Inc.
7. Panduit Corporation.
8. Siemon Company.
9. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
10. Blonder Tongue Laboratories, Inc., CATV/MATV Hardware, active and passive

B. Coaxial Cable Connectors: Type F, 75 ohms. Connectors shall be properly sized for the cable outside diameter. Connectors shall be axial press-terminated to create a radial interference fit with the cable. Connector shall not pull-off by an axial pull force of 70 pounds. Other connector types, such as screw-on and hex crimp connectors are not acceptable.

C. Coax Patch Panels: Modular rack-mounted panel housing multiple, numbered coax bulkheads and Type F connectors for splicing and patching coaxial cable.

D. Coax Jacks: Female-type modular bulkhead connector, housing Type F mating adapter. Metallic parts of anodized brass, beryllium copper or phosphor bronze.

1. Attenuation: Less than 0.1 dB.
2. Voltage Standing-Wave Ratio: Less than 1.15 to 1.

2.4 MMTV FACEPLATE

A. Workstation Outlets: Three port-connector assemblies mounted in single-gang faceplate. Coordinate with Contract Drawings.

1. Plastic Faceplate: High-impact plastic. Coordinate color with Division 16 Section "Wiring Devices."
2. Metal Faceplate: Stainless steel, complying with requirements in Division 16 Section "Wiring Devices."
3. Coordinate manufacturer to match communications horizontal wiring.
4. Coordinate color and finish selection with Architect.
5. For use with snap-in jacks accommodating UTP and coaxial work area cords. Jacks shall snap firmly into faceplate frame and be flush with outer plate surface.

a. Provide with one MMTV coax jack and one MMTV Category 6 UTP RJ45 jack.
b. Provide with one data Category 6 UTP RJ45 jack for future wireless device.

6. Legend: Snap-in, clear-label covers and machine-printed paper inserts.

2.5 SIGNAL TRANSMISSION ACTIVE AND PASSIVE COMPONENTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:

1. Blonder Tongue Laboratories, Inc.
2. Or equal.

B. Bi-Directional Amplifiers (Blonder Tongue, RMDA-86A-30P stk#5200P83) Rack Mounted Broadband Amplifier): Furnish and install broadband amplifiers as necessary by design. Quantities as required to maintain specified signal strength at all outlets. Provide all proper internal attenuators and equalizers, (Blonder Tongue BIDA-FA. Stk#5411a and BIDA-CE8, stk#5478.)

1. Splitters (Blonder –Tongue SCVS Series, DFCS-24 (stk#5798), and DFCS-32 (stk#5799): Furnish and install splitters with solder back, 120 dB radiation RFI shielding or better, ports as required. Bandwidth of 5-1000 MHz. Quantities as required by design.

C. Directional Taps (Blonder Tongue SCW, SRT Series): Furnish and install directional taps with solder back, 120 dB RFI shielding or better. Bandwidth of 5-1000 MHz. Quantities as required by design.

D. Terminators (Blonder -Tongue BTF-TP Series): Terminators shall be 75 ohm F-type. Provide terminators on all unused ports including test ports located on amplifiers and MMTV coax outlets. Quantities as required by design.

E. Channel Elimination Filter: (Blonder Tongue CEF series, stk# 4446) This filter is designed to remove one 6 MHz wide television channel. Attenuation shall be a minimum of 52 db. Its insertion loss shall not be greater than 3.1db. Channel to be deleted shall be in the 54-312 MHz range. (Channel 99 may be considered as a standard)

F. Sub Band Diplexer (Blonder Tongue DSV-42, stk# 4376) The sub-band diplexers shall be manufactured in a die-cast housing with a soldered back plate to ensure high RFI shielding. Sub-band diplexers shall be employed for isolating and separating VHF/UHF/CATV signals (50 to 1000 MHz) from sub-channel signals (DC to 42 MHz). They shall permit two-way transmission of RF signals on a single coaxial cable. The sub-band diplexers shall be equal to Blonder Tongue DSV-42 and shall meet or exceed the following specifications:

1. Impedance: 75 Ohms
2. Passband:

    a. Combined: DC-42 and 50-1000 MHz
    b. High: 50-1000 MHz
    c. Low: DC-42 MHz

3. Insertion Loss: 0.5 dB
4. Return Loss: 14 dB Minimum
5. Isolation:
6. DC-42 MHz:
7. 50-860 MHz: 55 dB Minimum
8. 860-1000 MHz: 45 dB Minimum
9. 50-1000 MHz:
10. DC-42 MHz: 45 dB Minimum
11. Power Passing Capability: 500 mA

G. Single Channel Modulator, (Blonder Tongue MAVM-861 series, stk#7992)

H. The modulator shall be channelized agile channel, solid state heterodyne audio/video modulator. The modulator shall modulate a 0.7-2.8 volt peak to peak sync negative video source and a 140 mV RMS audio source to output CATV channels 2 to 135 by changing field changeable output filter modules. The modulator shall have front panel controls for video and audio modulation levels, aural to visual ratio and RF output level. The modulator shall be BTSC compatible via field-defeatable audio pre-emphasis. The modulator shall be equal to Blonder Tongue MAVM-861-** and shall meet or exceed the following specifications:

1. Frequency Range: 54-860 MHz
2. Output Level: 40 dBmV Minimum
3. Output Level Control: 15 dB
4. Spurious Outputs: -66 dBc
5. C/N In Channel: 65 dB
6. Output Return Loss: 15 dB Minimum
7. Broadband Noise: -95 dBc

2.6 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Ladder Rack Runway: Comply with requirements of Division 17 Section “Communications Cabinets, Racks, and Enclosures.”

1. Used for routing of MMTV UTP and coaxial cabling within MDF and IDFs.

C. Conduit, Surface Raceway and Boxes: Comply with requirements in Division 16 Section "Raceways and Boxes for Electrical Systems." Flexible metal conduit shall not be used.

1. Outlet boxes shall be no smaller than 4 inch square by 2-1/2 inches deep, fitted with single-gang trim plate to accommodate single-gang MMTV faceplate.
2. Provide all necessary fittings and adapters for installing MMTV outlet in surface raceway, where indicated in Contract Drawings.

PART 3 - EXECUTION

3.1 COMMUNICATIONS DEMOLITION

A. Comply with requirements of Division 17 Section “General Requirements for Communications” for demolition of communications systems.

3.2 WIRING METHODS AND INSTALLATION OF PATHWAYS

A. Wiring Method: Install cables in raceways. Conceal raceway except in unfinished spaces.

1. Comply with requirements for raceways and boxes and their installation specified in Division 16 Section "Raceways and Boxes for Electrical Systems."
2. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

a. Utilize wide radius bends and elbows.

B. Wiring within Enclosures: Bundle, lace, and train cables to terminal points without exceeding manufacturer's limitations on bending radii. Provide service loop per requirements of this Section.

C. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

D. Wiring within MDF and IDFs: Bundle, lace, and train cables to terminal points without exceeding manufacturer's limitations on bending radii. Provide service loop per requirements of this Section. Utilize overhead ladder rack runway for cable routing within room(s).

E. Comply with requirements for ladder rack runway, cabinets, and racks specified in Division 17 Section "Communications Cabinets, Racks, and Enclosures." Drawings indicate general arrangement of pathways and fittings.

3.3 INSTALLATION

A. Comply with NECA 1.

B. Examination: Examine pathway elements intended for MMTV UTP and coaxial cable installation. Check raceways, ladder rack, and other elements for compliance with accessibility for installation and maintenance, and other conditions affecting installation.

C. Install all equipment and components in accordance with manufacturer's written instructions, in compliance with City of Chicago Electrical Code and with recognized industry practices, to ensure that all items comply with specifications and service intended purposes.

D. For UTP cabling: Comply with requirements of Division 17 Section "Data Communications Horizontal Cabling" for installation of horizontal UTP cables.

1. Terminate MMTV UTP outlets on dedicated Category 6 patch panel mounted to floor-standing rack in MDF and IDFs. Terminate to Category 6 modular jack at user interface faceplate.

E. For MMTV coaxial cabling:

1. Terminations: Terminate coaxial cables on dedicated coax patch panel mounted to floor-standing rack in MDF and IDFs. Terminate to female Type F mating connector at user interface faceplate.
2. Pulling Cable: Do not exceed manufacturer's recommended pulling tensions. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between indicated termination, tap, or junction points. Remove and discard cable where damaged during installation and replace it with new cable.
3. Do not exceed manufacturer's recommended minimum bending radiuses
4. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps may not be used for heating.
5. Cable may not be installed in same raceway with power cable.
6. Coaxial cable shall not be spliced except on plywood backboards in wire closets, or in cabinets designated for the purpose.
7. Do not use water-based cable pulling lubricants with PVC-jacketed cable.
8. Install passive circuit devices, such as splitters and attenuators, in wire closets or cabinets. Do not install attenuators as part of user-interface device outlets.

F. Service Loops: Provide the following minimum extra length of cable, dressed and routed neatly:

1. At MDF/IDF frames: 60 inches, neatly installed in vertical wire manager or accommodated by additional routing around overhead ladder rack runway.
2. At Concentrator Enclosures – Pass-through Cabling: 24 inches, neatly installed inside housing for MMTV UTP and coaxial cables that pass through enclosure.

G. All items must be complete as specified prior to final acceptance. It will be the responsibility of the Contractor to ensure all cabling meets all specifications and standards defined herein.

3.4 IDENTIFICATION

A. Comply with requirements of Division 17 Section "Identification for Communications Systems" for identification of MMTV system cabling.

B. Identify system components, wiring, cabling, and terminals:

1. System: Use a unique 3-syllable alphanumeric designation for each cable, and label the cable and the jacks, connectors, and terminals to which it connects with the same designations. Use logical and systematic designations related to the architectural arrangements of the facility.

    a. First syllable is to identify and locate the wiring closet or equipment room where the cable originates.
    b. Second syllable is to identify and locate the cross-connect or patch panel field in which the cable terminates.
    c. Third syllable is to designate the type of medial (copper or fiber) and the position occupied by the cable pairs or fibers in the field.

2. Outlets: Label cables within outlet boxes.
3. Distribution Racks and Frames: Label each unit and field within that unit.
4. Within Connectors Fields, in MDF and IDF Rooms: Label each connector and each discrete unit of cable-terminating and connecting hardware.
5. Cables, Generally: Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
6. Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.

C. Cable Schedule: Post at a prominent location in each wiring closet and equipment room. List incoming and outgoing cables and their designations, origins, and destinations. Provide a diskette copy of final comprehensive schedules for the project in the software and format selected by the Owner.

D. Record serial numbers of all items furnished that are serialized. Serial numbers to be included in warranty manual.

3.5 CLEANING

A. On completion of installation inspect exposed finishes. Remove burrs, dirt, paint spots, and construction debris. Repair damaged finish(es), including chips, scratches, and abrasions.

B. All equipment, hardware and finishes shall be cleaned prior to final acceptance. Unless otherwise indicated, clean shall mean free of dust, dirt, mud, debris, oil, grease, residues, and contamination.

C. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion. Protect conduit and wireway openings against the entrance of foreign matter by means of plugs or caps. Cover fixtures, materials, equipment and devices furnished or installed under this Section or otherwise protect against damage, both before and after installation. Hardware, materials, equipment, or

devices damaged prior to final acceptance of the work shall be restored to their original condition or replaced.

D. During the course of MMTV installation work, provide for on-going proper disposal of all debris, including but not limited to: equipment packaging and shipping materials, shipping pallets, empty cable reels/boxes, cable cuttings, etc. The Contractor shall, at all times, keep the site free from accumulations of waste material or rubbish caused by its employees or work. Remove all crates, cartons, and other waste materials or trash from the working areas at the end of each working day. Flammable waste material must be removed from the working areas at the time of generation. All rubbish and debris, combustible or not, shall be discarded in covered metal containers daily and removed from the premises at least weekly and legally disposed of.

3.6 CONTRACTOR STARTUP AND REPORTING

A. MMTV Coax – Adjusting / Testing:

1. Field-Strength Instrument: Rated for minus 40-dBmV measuring sensitivity and a frequency range of 54 to 860 MHz, minimum. Provide documentation of recent calibration against recognized standards.
2. Adjust Amplifier(s) and Cabling System to meet the following:

    a. Measure the input signal to each amplifier to determine the correct value(s) of plug-in attenuators and equalizers for amplifier. Use amplifier plug-ins to equalize the input signal to obtain a flat input with no more than 1dB of slope between 54 MHz and 860 MHz. In cases where the input slope is positive, which may occur if IDF's are a short cable distance from the MDF's launch amplifier, no input equalization will be necessary.
    b. Measure signal levels at all MMTV faceplate jacks at 54 MHz and at 860 MHz. After all adjustments are made, record measured signal levels at these two frequencies.
    c. Acceptance Criteria: The Signal level range at any outlet shall be between +3 to +15 dBmV (54-860 MHz).

3. After all adjustments are made, measure and record signal level at input to amplifier and available to measure????
4. Results from testing described above shall be submitted to Architect/Engineer for review and approval prior to Final Acceptance.

B. MMTV UTP Cable Testing Procedure:

1. Comply with requirements in Division 17 Section "Commissioning of Communications" for Category 6 UTP performance tests, inspections, correction of deficiencies, and preparation of test and inspection reports.
2. Inspect for physical damage.
3. Test all permanent links in accordance with TIA/EIA-568-B.2-1. Correct malfunctioning links and retest to demonstrate compliance. Test report must indicate circuit ID as indicated on cable schedule.

END OF SECTION