

VEL O
CIVIL
DTES BION F BION F BION F BION F BION F BION F
5 5 5 5 5 5 5 5

C1009

C1010

C1011

C1050

# LE'S SUMMIT MIDDLE SCHOOL #4 PACKAGE 3 - BUILDING & SITE

# **1001 SE BAILEY ROAD** LEE'S SUMMIT, MO 64081 **ISSUE FOR PERMIT - VOLUME 1 OF 2 INDEX OF DRAWINGS**

10/08/20

A3.1F

A3.1G

A3.2A

A3.2B

A3.2C

A3.2E

A3.3

A3.4

A3.5

A3.6

A4 1

A4.2

A4.3

A5.1

A5.2

A5.3

A5.4

A5.5

A5.6

A6.1

A6.2

A7.1

A7.2

A7.3

A7.4

A7.5

A7.6

A8.1

A8.2

A8.3

A8.4

A8.5

A8.6

A8.7

A8.8

A9.1

A9.2

A9.3

A9.4

A9.5

A9.6

A9.7

A9.8

A10.1

A10.2

A10.3

A10.4

A10.5

A10.6

A10.7

A10.8

A11.1

A11.2

A11.3

A11.4

A12.1

A12.2

A12.3

A12.4

A12.5

A12.6 A13.0 A13.1A A13.1B A13.1C A13.1D A13.1E A13.1F A13.1G A13.1S A13.2A A13.2B A13.2C A13.2E

A13.3 A13.4

.GENERAL.

SYMBOLS AND ABBREVIATIONS
COVER SHEET - VOLUME 1
CODE ANALYSIS - SITE PLAN
CODE PLAN - LEVEL 01
CODE PLAN - LEVEL 02
UL DESIGNS
UL DESIGNS
FIRST LEVEL ORIENTATION PLAN
SECOND LEVEL ORIENTATION PLAN

L1.0

L1.1

L1.1A

L1.2

L1.2A

L1.3

L1.3A

L1.4

L1.4A

L1.5

L1.6

L1.7

L2.0

L2.1

L2.1A

L2.2A

L2.3

L2.3A

L2.4A

L2.5

L2.6

L2.7

L2.8

L3.0

L3.1

L3.2

L3.3

L3.4

L3.5

L3.6

L3.7

L3.8

L4.0

L4.1

L4.2

L4.3

L4.4

L4.5

L2.4

L2.2

.CIVIL.

# LANDSCAPE

OVERALL LAYOUT PLAN
ENLARGED LAYOUT PLAN
ALTERNATE ENLARGED LAYOUT PLAN
ENLARGED LAYOUT PLAN
ALTERNATE ENLARGED LAYOUT PLAN
ENLARGED LAYOUT PLAN
ALTERNATE ENLARGED LAYOUT PLAN
ENLARGED LAYOUT PLAN
ALTERNATE ENLARGED LAYOUT PLAN
ENLARGED LAYOUT PLAN
ENLARGED LAYOUT PLAN
ENLARGED LAYOUT PLAN
OVERALL LANDSCAPE PLAN
ENLARGED LANDSCAPE PLAN
ALTERNATE ENLARGED LANDSCAPE PL/
ENLARGED LANDSCAPE PLAN
ALTERNATE ENLARGED LANDSCAPE PL/
ENLARGED LANDSCAPE PLAN
ALTERNATE ENLARGED LANDSCAPE PL/
ENLARGED LANDSCAPE PLAN
ALTERNATE ENLARGED LANDSCAPE PL/
ENLARGED LANDSCAPE PLAN
OVERALL IRRIGATION PLAN
ENLARGED IRRIGATION PLAN
ENLARGED IRRIGATION PLAN
ENLARGED IRRIGATION PLAN
ENLARGED IRRIGATION PLAN
ENLARGED IRRIGATION PLAN
ENLARGED IRRIGATION PLAN
ENLARGED IRRIGATION PLAN
ENLARGED IRRIGATION PLAN
LANDSCAPE DETAILS
LANDSCAPE DETAILS
LANDSCAPE DETAILS
LANDSCAPE DETAILS

# .ARCHITECTURAL.

LANDSCAPE DETAILS

.0.1	INTERIOR WALL TYPES
.0.2	EXTERIOR WALL & ROOF TYPES
.0.3	ENLARGED SITE PLANS
1.1A	FIRST LEVEL FLOOR PLAN - AREA A
1.1B	FIRST LEVEL FLOOR PLAN - AREA B
1.1C	FIRST LEVEL FLOOR PLAN - AREA C
1.1D	FIRST LEVEL FLOOR PLAN - AREA D
1.1E	FIRST LEVEL FLOOR PLAN - AREA E
1.1F	FIRST LEVEL FLOOR PLAN - AREA F
1.1G	FIRST LEVEL FLOOR PLAN - AREA G
1.1SA	FIRST LEVEL FLOOR PLAN - AREA S
1.1SB	FIRST FLOOR PLAN - AREA S - DUGOUTS
1.1T	FIRST LEVEL FLOOR PLAN - AREA T
1.2A	SECOND LEVEL FLOOR PLAN - AREA A
1.2B	SECOND LEVEL FLOOR PLAN - AREA B
1.2C	SECOND LEVEL FLOOR PLAN - AREA C & D
1.2F	MEZZANINE / LEVEL 02 FLOOR PLAN - AREA E-F-G
1.3A	CLERESTORY PLAN - AREAS A-C
2.1	LARGE SCALE PLANS
2.2	LARGE SCALE PLANS
2.3	LARGE SCALE PLANS
2.4	LARGE SCALE PLANS
3.1A	FIRST LEVEL REFLECTED CEILING PLAN - AREA A
.3.1B	FIRST LEVEL REFLECTED CEILING PLAN - AREA B
.3.1C	FIRST LEVEL REFLECTED CEILING PLAN - AREA C
.3.1D	FIRST LEVEL REFLECTED CEILING PLAN - AREA D
3.1E	FIRST LEVEL REFLECTED CEILING PLAN - AREA E

# .ARCHITECTURAL.

FIRST LEVEL REFLECTED CEILING PLAN - AREA F
FIRST LEVEL REFLECTED CEILING PLAN - AREA G
SECOND LEVEL REFLECTED CEILING PLAN - AREA A
SECOND LEVEL REFLECTED CEILING PLAN - AREA B
SECOND LEVEL REFLECTED CEILING PLAN - AREA C
SECOND LEVEL REFLECTED CEILING PLAN - AREA E-F-G
ENLARGED CEILING PLANS
ENLARGED CEILING PLANS
CEILING DETAILS
CEILING DETAILS
OVERALL ROOF PLAN
ROOF PLAN - AREAS A, B, & C
ROOF PLAN - AREAS D, E, F, G
EXTERIOR ELEVATIONS EXTERIOR ELEVATIONS
EXTERIOR ELEVATIONS EXTERIOR ELEVATIONS
ENLARGED FACADE PATTERNS
EXTERIOR ELEVATIONS
MOCK UP WALL DETAILS
BUILDING SECTIONS
BUILDING SECTIONS
WALL SECTIONS
WALL SECTIONS
WALL SECTIONS
WALL SECTIONS
WALL SECTIONS
WALL SECTIONS
STAIR PLANS AND SECTIONS AREAS A & B
STAIR PLANS AND SECTIONS AREA C & D
STAIR PLANS AND SECTIONS E & G
STAIR PLANS AND SECTIONS F & G
PLATFORM PLANS AND DETAILS
ELEVATOR, RAMP & EXTERIOR STAIRS PLANS & SECTIONS
STAIR AND RAILING DETAILS
STAIR AND RAILING DETAILS
DOOR AND FRAME SCHEDULE
DOOR AND FRAME SCHEDULE
EXTERIOR ALUMINUM FRAME ELEVATIONS
EXTERIOR ALUMINUM FRAME ELEVATIONS - CLERESTORY
INTERIOR FRAME ELEVATIONS
DOOR AND WINDOW DETAILS
DOOR AND WINDOW DETAILS
DOOR AND WINDOW DETAILS
PLAN DETAILS
PLAN DETAILS
SECTION DETAILS
SECTION DETAILS
SECTION DETAILS
SECTION DETAILS
SECTION DETAILS
GENERAL DETAILS
CASEWORK ELEVATIONS
CASEWORK ELEVATIONS
CASEWORK ELEVATIONS
CASEWORK ELEVATIONS
INTERIOR ELEVATIONS INTERIOR ELEVATIONS
INTERIOR ELEVATIONS INTERIOR ELEVATIONS
INTERIOR ELEVATIONS/ DETAILS
INTERIOR DETAILS
INTERIOR DETAILS
FIRST LEVEL FINISH FLOOR PLAN - AREA A
FIRST LEVEL FINISH FLOOR PLAN - AREA B
FIRST LEVEL FINISH FLOOR PLAN - AREA C
FIRST LEVEL FINISH FLOOR PLAN - AREA D
FIRST LEVEL FINISH FLOOR PLAN - AREA E
FIRST LEVEL FINISH FLOOR PLAN - AREA F
FIRST LEVEL FINISH FLOOR PLAN - AREA G
FIRST LEVEL FINISH FLOOR PLAN - AREA S
SECOND LEVEL FINISH FLOOR PLAN - AREA A
SECOND LEVEL FINISH FLOOR PLAN - AREA B
SECOND LEVEL FINISH FLOOR PLAN - AREA C, D
SECOND LEVEL FINISH FLOOR PLAN - AREA E,F, G
SIGNAGE SCHEDULE AND DETAILS
SIGNAGE TYPES

.FOOD SERVICE.

FS100

FS101

FS102

FS102.1

FS102.2

FS103

FS104

FS104.1

FS104.2

FS104.3

FS104.4

FS104.5

FS105

FS105.1

FS106

FS106.1

FS107

FS108

S0.1

S0.2

S0.3

S0.4

S0.5

S1.1D

S1.1E

S1.1F

S1.1G

S1.1S

S2.1D

S2.1E

S2.1F

S2.1G

S2.2D

S2.2E

S2.2F

S2.2G

S2.2S

S3.1

S3.2

S3.7

S3.8

S4.2

S4.5

S4 7

S4 8

S4.9

S5.1

S5.5

S5.7

S5.8

S6.3

S6 1

S4.1

S3.5

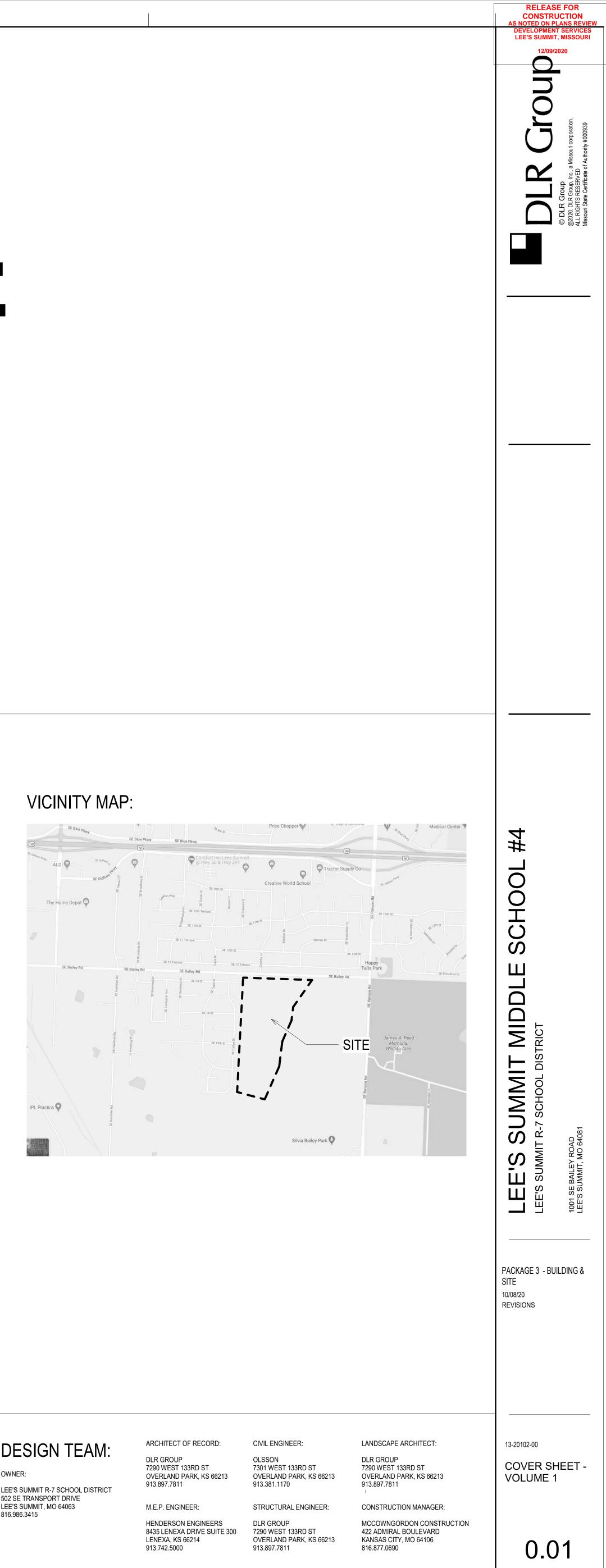
S2.3D

FS107.1

FOOD SERVICE EQUIPMENT PLAN FOOD SERVICE SPECIAL CONDITIONS PLAN FOOD SERVICE ELEVATIONS FOOD SERVICE ELEVATIONS FOOD SERVICE ELEVATIONS FOOD SERVICE DETAILS FOOD SERVICE EXHAUST HOOD FOOD SERVICE WALK-IN FOOD SERVICE WALK-IN FOOD SERVICE PLUMBING ROUGH-IN PLAN FOOD SERVICE PLUMBING SCHEDULE FOOD SERVICE ELECTRICAL ROUGH-IN PLAN FOOD SERVICE ELECTRICAL SCHEDULE FOOD SERVICE MECHANICAL ROUGH-IN PLAN

.STRUCTURAL.

STRUCTURAL NOTES STRUCTURAL NOTES SNOW DRIFT PLAN STORM SHELTER STRUCTURAL CRITERIAL GRID GEOMETRY PLAN FOUNDATION PLAN - AREA D FOUNDATION PLAN - AREA E FOUNDATION PLAN - AREA F FOUNDATION PLAN - AREA G FOUNDATION PLAN AREAS S & T LOW ROOF FRAMING PLAN - AREA D FLOOR AND LOW ROOF FRAMING PLAN - AREA E FLOOR AND LOW ROOF FRAMING PLAN - AREA F FLOOR AND LOW ROOF FRAMING PLAN - AREA G ROOF FRAMING PLAN - AREA D ROOF FRAMING PLAN - AREA E ROOF FRAMING PLAN - AREA F ROOF FRAMING PLAN - AREA G ROOF FRAMING PLAN - AREAS S & T HIGH ROOF FRAMING PLAN - AREA D FOUNDATION TYPICAL DETAILS FOUNDATION TYPICAL DETAILS FOUNDATION SECTIONS FOUNDATION SECTIONS FOUNDATION SECTIONS STEEL TYPICAL DETAILS FLOOR FRAMING TYPICAL DETAILS FLOOR FRAMING SECTIONS FLOOR FRAMING SECTIONS MASONRY TYPICAL DETAILS PRECAST TYPICAL DETAILS ROOF FRAMING TYPICAL DETAILS ROOF FRAMING SECTIONS ROOF FRAMING SECTIONS ROOF FRAMING SECTIONS BRACED FRAME TYPICAL DETAILS BRACED FRAME ELEVATIONS



# **DESIGN TEAM:**

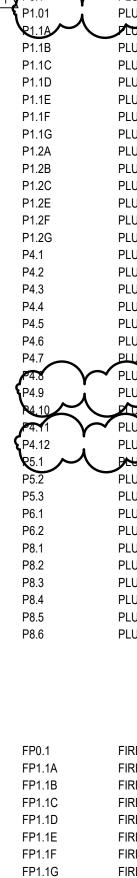
LEE'S SUMMIT R-7 SCHOOL DISTRICT 502 SE TRANSPORT DRIVE LEE'S SUMMIT, MO 64063 816.986.3415

.GENERAL. VOLUME 2

0.02 **COVER SHEET - VOLUME 2** 

.MECHANICAL.

	.MECHANICAL.
M0.1	MECHANICAL GENERAL NOTES AND LEGEND
M1.1A	HVAC FIRST LEVEL PLAN - AREA A
M1.1B	HVAC FIRST LEVEL PLAN - AREA B
M1.1C	HVAC FIRST LEVEL PLAN - AREA C
M1.1D	HVAC FIRST LEVEL PLAN - AREA D
M1.1E	HVAC FIRST LEVEL PLAN - AREA E
M1.1E	HVAC FIRST LEVEL PLAN - AREA E
M1.1G	
<b>K</b> M1.1S	HVAC FIRST LEVEL PLAN - AREA S
M1.2	AHONC SECONDLEVELAPLAN - ARDAA
M1.2B	HVAC SECOND LEVEL PLAN - AREA B
M1.2C	HVAC SECOND LEVEL PLAN - AREA C
M1.2E	HVAC SECOND LEVEL PLAN - AREA E
M1.2F	HVAC SECOND LEVEL PLAN - AREA F
M1.2G	HVAC SECOND LEVEL PLAN - AREA G
M2.1A	PIPING FIRST LEVEL PLAN - AREA A
M2.1B	PIPING FIRST LEVEL PLAN - AREA B
M2.1C	PIPING FIRST LEVEL PLAN - AREA C
M2.1D	PIPING FIRST LEVEL PLAN - AREA D
M2.1E	PIPING FIRST LEVEL PLAN - AREA E
M2.1G	PIPING FIRST LEVEL PLAN - AREA G
M2.2A	PIPING SECOND LEVEL PLAN - AREA A
M2.2B	PIPING SECOND LEVEL PLAN - AREA B
M2.2C	PIPING SECOND LEVEL PLAN - AREA C
M2.2D	PIPING SECOND LEVEL PLAN - AREA D
M2.2E	PIPING SECOND LEVEL PLAN - AREA E
M2.2F	PIPING SECOND LEVEL PLAN - AREA F
M2.2G	PIPING SECOND LEVEL PLAN - AREA G
M5.1	MECHANICAL DETAILS
M5.2	MECHANICAL DETAILS
M5.3	MECHANICAL DETAILS
M6.1	MECHANICAL SCHEDULES
M6.2	MECHANICAL SCHEDULES
M6.3	MECHANICAL SCHEDULES
M8.1	MECHANICAL CONTROLS
M8.2	MECHANICAL CONTROLS
M8.3	MECHANICAL CONTROLS
M8.4	MECHANICAL CONTROLS
M8.5	MECHANICAL CONTROLS
M8.6	MECHANICAL CONTROLS
M8.7	MECHANICAL CONTROLS
MP1.3A	MECHANICAL AND PLUMBING ROOF PLAN - AREA A
MP1.3B	MECHANICAL AND PLUMBING ROOF PLAN - AREA B
MP1.3C	MECHANICAL AND PLUMBING ROOF PLAN - AREA C
MP1.3D	MECHANICAL AND PLUMBING ROOF PLAN - AREA D
MP1.3E	MECHANICAL AND PLUMBING ROOF PLAN - AREA E
MP1.3G	MECHANICAL AND PLUMBING ROOF PLAN - AREA G



FP1.2A

FP1.2B

FP1.2C

FP1.2D

FP1.2E

FP1.2F

FP1.2G

FP5.1

# LE'S SUMMIT MIDDLE SCHOOL #4 PACKAGE 3 - BUILDING & SITE

# **1001 SE BAILEY ROAD** LEE'S SUMMIT, MO 64081 **ISSUE FOR PERMIT - VOLUME 2 OF 2 INDEX OF DRAWINGS** 10/08/20

E6.3

E6.4

E6.5

E6.6

E6.7

E6.8

E6.9

E6.10

E6.11

E6.12

E6.13

E7.1

E7.2

E7.3

E8.1

E8.2

E8.1C

.PLUMBING. E0.1 E1.0 E1.01 PLUMBING FIRST LEVEL PLAN - AREA B E1.1A PLUMBING FIRST LEVEL PLAN - AREA C E1.1B E1.1C PLUMBING FIRST LEVEL PLAN - AREA D E1.1D PLUMBING FIRST LEVEL PLAN - AREA E E1.1E PLUMBING FIRST LEVEL PLAN - AREA F E1.1F PLUMBING FIRST LEVEL PLAN - AREA G E1.1G PLUMBING SECOND LEVEL PLAN - AREA A E1.1ST PLUMBING SECOND LEVEL PLAN - AREA B E1.02 PLUMBING SECOND LEVEL PLAN - AREA C E1.2A PLUMBING SECOND LEVEL PLAN - AREA E PLUMBING SECOND LEVEL PLAN - AREA F E1.2B E1.2C PLUMBING SECOND LEVEL PLAN - AREA G PLUMBING ENLARGED PLANS E1.2D E1.2E PLUMBING ENLARGED PLANS E1.2F PLUMBING ENLARGED PLANS E1.2G PLUMBING ENLARGED PLANS E1.03 PLUMBING ENLARGED PLANS E2.1A PLUMBING ENLARGED PLANS E2.1B E2.1C E2.1D E2.1E E2.1F E2.1G E2.2A E2.2B E2.2C PLUMBING DETAILS E2.2D PLUMBING SCHEDULES E2.2E PLUMBING SCHEDULES E2.2F PLUMBING RISER DIAGRAMS E2.2G PLUMBING RISER DIAGRAMS E3.1A PLUMBING RISER DIAGRAMS PLUMBING RISER DIAGRAMS E3.1B E3.1C PLUMBING RISER DIAGRAMS E3.1D PLUMBING RISER DIAGRAMS E3.1E E3.1F E3.1G E3.2A .FIRE PROTECTION. E3.2B E3.2C FIRE PROTECTION GENERAL NOTES AND LEGEND E3.2D FIRE PROTECTION FIRST LEVEL RCP - AREA A E3.2E FIRE PROTECTION FIRST LEVEL RCP - AREA B E3.2G FIRE PROTECTION FIRST LEVEL RCP - AREA C E3.3A FIRE PROTECTION FIRST LEVEL RCP - AREA D E3.3B FIRE PROTECTION FIRST LEVEL RCP - AREA E E3.3C FIRE PROTECTION FIRST LEVEL RCP - AREA F E3.3D FIRE PROTECTION FIRST LEVEL RCP - AREA G E3.3E FIRE PROTECTION SECOND LEVEL RCP - AREA A E3.3G FIRE PROTECTION SECOND LEVEL RCP - AREA B E4.0 FIRE PROTECTION SECOND LEVEL RCP - AREA C E4.1 FIRE PROTECTION SECOND LEVEL RCP - AREA D FIRE PROTECTION SECOND LEVEL RCP - AREA E **E**4.3 FIRE PROTECTION SECOND LEVEL RCP - AREA F E5.1 FIRE PROTECTION SECOND LEVEL RCP - AREA G E5.2 FIRE PROTECTION DETAILS E6.1

E6.2

.ELECTRICAL

	ELECTRICAL GENERAL NOTES AND LEGEND
	ELECTRICAL SITE PLAN - OVERALL
	ELECTRICAL SITE PLAN - AREA 1
	LIGHTING FIRST LEVEL RCP - AREA A
	LIGHTING FIRST LEVEL RCP - AREA B
	LIGHTING FIRST LEVEL RCP - AREA C
	LIGHTING FIRST LEVEL RCP - AREA D
	LIGHTING FIRST LEVEL RCP - AREA E
	LIGHTING FIRST LEVEL RCP - AREA F
	LIGHTING FIRST LEVEL RCP - AREA G
	ELECTRICAL FIRST LEVEL PLANS - AREAS S,T
	ELECTRICAL SITE PLAN - AREA 2
	LIGHTING SECOND LEVEL RCP - AREA A
	LIGHTING SECOND LEVEL RCP - AREA B
	LIGHTING SECOND LEVEL RCP - AREA C
	LIGHTING SECOND LEVEL RCP - AREA D
	LIGHTING SECOND LEVEL RCP - AREA E
	LIGHTING SECOND LEVEL RCP - AREA F
	LIGHTING SECOND LEVEL RCP - AREA G
	ELECTRICAL SITE PLAN - AREA 3
	POWER FIRST LEVEL PLAN - AREA A
	POWER FIRST LEVEL PLAN - AREA B
	POWER FIRST LEVEL PLAN - AREA C
	POWER FIRST LEVEL PLAN - AREA D POWER FIRST LEVEL PLAN - AREA E
	POWER FIRST LEVEL PLAN - AREA E
	POWER FIRST LEVEL PLAN - AREA G
	POWER SECOND LEVEL PLAN - AREA A
	POWER SECOND LEVEL PLAN - AREA B
	POWER SECOND LEVEL PLAN - AREA C
	POWER SECOND LEVEL PLAN - AREA D
	POWER SECOND LEVEL PLAN - AREA E
	POWER SECOND LEVEL PLAN - AREA F
	POWER SECOND LEVEL PLAN - AREA G
	EQUIPMENT CONNECTION FIRST LEVEL PLAN - AREA A
	EQUIPMENT CONNECTION FIRST LEVEL PLAN - AREA B
	EQUIPMENT CONNECTION FIRST LEVEL PLAN - AREA C
	EQUIPMENT CONNECTION FIRST LEVEL PLAN - AREA D
	EQUIPMENT CONNECTION FIRST LEVEL PLAN - AREA E
	EQUIPMENT CONNECTION FIRST LEVEL PLAN - AREA F
	EQUIPMENT CONNECTION FIRST LEVEL PLAN - AREA G
	EQUIPMENT CONNECTION SECOND LEVEL PLAN - AREA A
	EQUIPMENT CONNECTION SECOND LEVEL PLAN - AREA B
	EQUIPMENT CONNECTION SECOND LEVEL PLAN - AREA C EQUIPMENT CONNECTION SECOND LEVEL PLAN - AREA D
	EQUIPMENT CONNECTION SECOND LEVEL PLAN - AREA D
	EQUIPMENT CONNECTION SECOND LEVEL PLAN - AREA G
	EQUIPMENT CONNECTION ROOF PLAN - AREA A
	EQUIPMENT CONNECTION ROOF PLAN - AREA B
	EQUIPMENT CONNECTION ROOF PLAN - AREA C
	EQUIPMENT CONNECTION ROOF PLAN - AREA D
	EQUIPMENT CONNECTION ROOF PLAN - AREA E
	EQUIPMENT CONNECTION ROOF PLAN - AREA G
	ENLARGED PLANS - ELECTRICAL ROOMS
$\checkmark$	ELECTRICAL DUCOUT PLANS
J	ENLARGED PLAN - STAGE THEATRICAL LIGHTING
$\sim$	electrical de tails
	ELECTRICAL DETAILS
	ELECTRICAL SCHEDULES
	ELECTRICAL SCHEDULES

### .ELECTRICAL

ELECTRICAL SCHEDULES
ELECTRICAL SCHEDULES
LIGHT FIXTURE SCHEDULES
LIGHT FIXTURE SCHEDULES
LIGHTING CONTROL SCHEDULES
ELECTRICAL ONE-LINE DIAGRAM
ELECTRICAL ONE-LINE DIAGRAM
ELECTRICAL ONE-LINE DIAGRAM

.SPECIAL SYSTEMS.

TA0.1

TA0.2

TA1.1A

TA1.1B

TA1.1C

TA1.1D

TA1.1E

TA1.1F

TA1.2A

TA1.2B

TA1.2C

TA2.1D

TA2.2D

TA2.2F

TA5.1

TA6.1

TA7.1

TA7.2

TA7.3

TN0.1

TN1.1A

TN1.1B

TN1.1C

TN1.1D

TN1.1E

TN1.1F

TN1.1G

TN1.1S

TN1.2A

TN1.2B

TN1.2C

TN1.2E

TN1.2F

TN1.2G

TN2.1A

TN2.1B

TN2.1C

TN2.1D

TN2.1E

TN2.1F

TN2.1G

TN2.2A

TN2.2B

TN2.2C

TN2.2D

TN2.2E

TN2.2G

TN4.1

TN4.2

TN5.1

TN5.2

TN6.1

TY0.1

TY1.1A

.SPECIAL SYSTEMS.
AUDIO-VIDEO GENERAL NOTES AND LEGEND AUDIO VIDEO GENERAL DETAILS - PLATES AUDIO-VIDEO FIRST LEVEL PLAN - AREA A AUDIO-VIDEO FIRST LEVEL PLAN - AREA B AUDIO-VIDEO FIRST LEVEL PLAN - AREA C
AUDIO-VIDEO FIRST LEVEL PLAN - AREA D AUDIO-VIDEO FIRST LEVEL PLAN - AREA E
AUDIO-VIDEO FIRST LEVEL PLAN - AREA F AUDIO-VIDEO SECOND LEVEL PLAN - AREA A
AUDIO-VIDEO SECOND LEVEL PLAN - AREA B
AUDIO-VIDEO SECOND LEVEL PLAN - AREA C AUDIO-VIDEO FIRST LEVEL RCP - AREA D
AUDIO-VIDEO SECOND LEVEL RCP - AREA D AUDIO-VIDEO SECOND LEVEL RCP - AREA F
AUDIO-VIDEO SECOND LEVEL RCP - AREA P AUDIO-VIDEO DETAILS
AUDIO-VIDEO SCHEDULES AUDIO-VIDEO SIGNAL FLOWS
AUDIO-VIDEO SIGNAL FLOWS
AUDIO-VIDEO SIGNAL FLOWS TECHNOLOGY GENERAL NOTES AND LEGEND
TECHNOLOGY FIRST LEVEL PLAN - AREA A TECHNOLOGY FIRST LEVEL PLAN - AREA B
TECHNOLOGY FIRST LEVEL PLAN - AREA C
TECHNOLOGY FIRST LEVEL PLAN - AREA D TECHNOLOGY FIRST LEVEL PLAN - AREA E
TECHNOLOGY FIRST LEVEL PLAN - AREA F
TECHNOLOGY FIRST LEVEL PLAN - AREA G TECHNOLOGY FIRST LEVEL PLAN - AREA S
TECHNOLOGY SECOND LEVEL PLAN - AREA A TECHNOLOGY SECOND LEVEL PLAN - AREA B
TECHNOLOGY SECOND LEVEL PLAN - AREA C
TECHNOLOGY SECOND LEVEL PLAN - AREA E TECHNOLOGY SECOND LEVEL PLAN - AREA F
TECHNOLOGY SECOND LEVEL PLAN - AREA G TECHNOLOGY FIRST LEVEL RCP - AREA A
TECHNOLOGY FIRST LEVEL RCP - AREA B
TECHNOLOGY FIRST LEVEL RCP - AREA C TECHNOLOGY FIRST LEVEL RCP - AREA D
TECHNOLOGY FIRST LEVEL RCP - AREA E TECHNOLOGY FIRST LEVEL RCP - AREA F
TECHNOLOGY FIRST LEVEL RCP - AREA F
TECHNOLOGY SECOND LEVEL RCP - AREA A TECHNOLOGY SECOND LEVEL RCP - AREA B
TECHNOLOGY SECOND LEVEL RCP - AREA C
TECHNOLOGY SECOND LEVEL RCP - AREA D TECHNOLOGY SECOND LEVEL RCP - AREA E
TECHNOLOGY SECOND LEVEL RCP - AREA G TECHNOLOGY ENLARGED PLANS
TECHNOLOGY ENLARGED PLANS
TECHNOLOGY DETAILS TECHNOLOGY DETAILS
TECHNOLOGY RISER DIAGRAMS
SECURITY GENERAL NOTES AND LEGEND SECURITY FIRST LEVEL PLAN - AREA A
SECURITY FIRST LEVEL PLAN - AREA B

TY1.1B SECURITY FIRST LEVEL PLAN - AREA B TY1.1C SECURITY FIRST LEVEL PLAN - AREA C SECURITY FIRST LEVEL PLAN - AREA D TY1.1D

# .SPECIAL SYSTEMS.

SECURITY FIRST LEVEL PLAN - AREA E
SECURITY FIRST LEVEL PLAN - AREA F
SECURITY FIRST LEVEL PLAN - AREA G
SECURITY FIRST LEVEL PLAN - AREA S
SECURITY SECOND LEVEL PLAN - AREA A
SECURITY SECOND LEVEL PLAN - AREA B
SECURITY SECOND LEVEL PLAN - AREA C
SECURITY DETAILS
SECURITY DETAILS

TY1.1E

TY1.1F

TY1.1G

TY1.1S

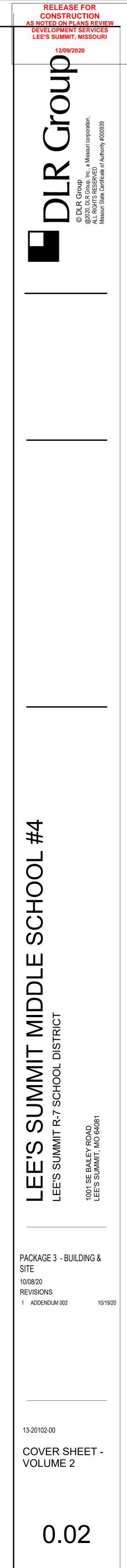
TY1.2A

TY1.2B

TY1.2C

TY5.1

TY5.2



# ABBREVIATIONS

EXP EXP

EXT

F.O.

F.V.

FAB

FDN

FIN

FLASH

FLEX

FLG

FLM

FLUOR

FO

FOC

FOF

FOM

FOS

FOW

FR

FRP

FRT

FS

FSS

FTG

FUT

FVC

FWC

GA GAL GALV

GB

GC GD

GEN

GFA

GMP

GR

GR

GRS GWB

GYP

HC

HD

HDBD

HDR HDWD HDWR

HM

HR

HR

HS HSS

IAW

IJS

INC

INT

JAN

JCT

JFB

IST

KCJ

KD

KH

KIT

LAB

LAM

LB(S)

LAV

LBR LDG

LG

LIN LINO

LKR

LOC

LONG

LSC

LTG

LV

LVT

LWC

MAG

MAINT

MAN

MAS

MATL

MAX

MB

MB⊢

MC MECH

MEMB

MEZZ

MFR

MH

MIN

MISC

MR/S MTD

MTG

MUL

NA

NC

NFPA

NIC

NOM

NTS

INSUL

HVAC

HORIZ

GOVT

FIX

BRKE	VIATIONS
ð	NUMBER AND AT
В	ANCHOR BOLT
.B	AIR BARRIER
.BS	ASBESTOS
.CC	ADA ACCESSIBLE
.CR	ACRYLIC
.D	ACCESS DOOR
.DA	AMERICANS WITH DISABILITY ACT
.DDN	ADDITION OR ADDITIONAL
.DJ	ADJUSTABLE
.DJT	ADJACENT
.DMIN	ADMINISTRATION
EC	AUTOMATED EXTERNAL DEFIBRILLATIORS
FF	ABOVE FINISHED FLOOR
.FG	ABOVE FINISHED GRADE
.HJ	AUTHORITY HAVING JURISDICTION
.L	ALUMINUM
LT LUM	ALUMINUM ALTERNATE ALUMINUM
NCH	ANCHOR
NSI	AMERICAN NATIONAL STANDARDS INSTITUTE
.P	ACCESS PANEL
.PC	ACOUSTIC PANEL CEILING
.PPROX	APPROXIMATE
	ARCHITECTURAL ASPHALT
.UTO	AUTOMATIC
.VG	AVERAGE
.WP	ACOUSTIC WALL PANEL
.0.	BOTTOM OF
ICS	BABY CHANGING STATION
ID	BOARD
ILDG	BUILDING
ILK	BLOCK
ILKG	BLOCKING
EKHD	BULKHEAD
M(S)	BEAM(S)
OT	BOTTOM
RDG	BRIDGING
RG	BEARING
RKT	BRACKET
ISMT	BASEMENT
T	BATHTUB
TWN	BETWEEN
;	CHANNEL
AB	CABINET
ad	CADINE T
Ant	CANTILEVER
Ap	CAPACITY
BD	CHALKBOARD
ER	CERAMIC
:F	CUBIC FEET
:FCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
:FSF	COLD-FORMED STEEL FRAMING
G	CLEAR FLOAT GLASS
G	CAST IRON
CIG	CLEAR INSULATING GLASS
CIP	CAST IN PLACE
:J	CONTROL JOINT
:JA	CONTROL JOINT ABOVE
:L	CENTER LINE
CLG	CEILING
CLOS	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COM	COMMON
COMB	COMBINATION
COMM	COMMUNICATIONS
COMPR	COMPRESSIBLE
CONC	CONCRETE
CONF	CONFERENCE
CONFIG	CONFIGURATION
CONN(S)	CONNECTION(S)
CONST	CONSTRUCTION
CONT	CONTINUOUS CONTRACT(OR)
;orr	CORRIDOR
;p	COVER PLATE
;pt	CARPET
R	CHAIR RAIL
S	COUNTERSINK
STJ	CONSTRUCTION JOINT
SWK	CASEWORK
CTG CTIG	CERAMIC TILE CLEAR TEMPERED FLOAT GLASS CLEAR TEMPERED INSULATING GLASS
CTR	CENTER
CU	COPPER
:U	CUBIC
:U	COMBINATION UNIT
:V	CONDOM VENDOR
SY	CUBIC YARD
SYL	CYLINDER
)	DEPTH
)B	DECIBEL
)BL	DOUBLE
)C	DUST COLLECTOR
DEG	DEGREE
DEMO	DEMOLISH OR DEMOLITION
)EPR	DEPRESS(ION)(ED)
)EPT	DEPARTMENT
)ET	DETAIL
)ET	DETENTION
)F	DRINKING FOUNTAIN
DG	DOOR GRILLE
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIV	SPECIFICATION DIVISION
N	DOWN
PFG	DAMPROFFING
)R	DOOR
)SN	DOWNSPOUT NOZZLE
)W	DISHWASHER
WG(S)	DRAWING(S)
WL(S)	DOWEL(S)
WR	DRAWER
A	EACH
A	EACH FACE
B	EXPANSION BOLT ELECTRICAL CONTRACTOR
E	EACH END
EW	EMERGENCY EYE WASH
EWS	EMERGENCY EYE WASH SHOWER
FF	EFFICIENCY
J	EXPANSION JOINT
L	ELEVATION
LAS	ELASTOMERIC
LEC	ELECTRICAL
ILEV	ELEVATOR
MER	EMERGENCY
NCL NG	ENCLOSURE ENGINEER ENTRANCE
:NTR	ENTRANCE
:Q	EQUAL
:QUIP	EQUIPMENT
QUIV	EQUIVALENT
RF	EPOXY RESIN FLOORING
UI	ENERGY USE INTENSITY

EXPANSION EXPOSED EXTERIOR
FABRIC FACE OF FIELD VERIFY FABRICATE(D) FACE BRICK FLOOR DRAIN FOUNDATION
FIRE EXTINGUISHER FIRE EXTINGUISHER CABINET FINISH FLOOR FIRE HYDRANT FIRE HOSE CABINET FIGURE FINISHED FIXTURE
FLATURE FLOOR FLASHING FLEXIBLE FLOORING FULL LENGTH MIRROR FLUORESCENT FINISH OPENING
FACE OF CONCRETE FACE OF FINISH FACE OF MASONRY FACE OF STUD FACE OF WALL FIREPROOFING FIRE RESISTANT
FIBERGLASS REINFORCED PANEL FIRE RESISTANCE TREATED FLOOR SINK FOLDING SHOWER SEAT FEET FOOTING FUTURE FIRE VALVE CABINET
FABRIC WALL COVERING GROUT GAUGE GALLON
GALVANIZED GRAB BAR GENERAL CONTRACTOR GARBAGE DISPOSAL GENERAL GROSS FLOOR AREA GLUE LAMINATED
GLASS GUARANTTED MAXIMUM PRICE GOVERNMENT GUARD RAIL GRADE GALVANIZED RIGID STEEL GYPSUM WALL BOARD
GYPSUM HEIGHT HOLLOW CORE HAND DRYER HARDBOARD
HEADER HARDWOOD HARDWARE HOLLOW METAL HORIZONTAL HOUR HANDRAIL
HARDWARE SET HOLLOW STRUCTURAL SHAPE HEATING VENTILATING AND AIR CONDITIONING THAT IS
IN ACCORDANCE WITH INTERNATIONAL BUILDING CODE INSIDE DIAMETER INSIDE FACE ISOLATION JOINT IN JOIST SPACE INCH INCLUDE(ING) INSULATION INTERIOR
JANITOR JUNCTION JOINT FILLER BOARD JOIST JOINT
KEYED CONSTRUCTION JOINT KNOCKDOWN KITCHEN HOOD KITCHEN
ANGLE LABORATORY LAMINATED LAVATORY POUND(S) LUMBER
LOADING LINEAR FOOT LENGTH (LONG) LAMINATED GLASS LINEAR LINOLEUM LOCKER
LOCATION LONGITUDINAL LIFE SAFETY CODE LIGHTING LOUVER LUXURY VINYL TILE LIGHT WEIGHT CONCRETE
THOUSAND MAGNETIC MAINTENANCE MANUAL MASONRY MATERIAL
MAXIMUM MOP BASIN MARKER BOARD MOP/BROOM HOLDER MEDICINE CABINET MECHANICAL MEMBRANE
MEZZANINE MANUFACTURER MANHOLE MINIMUM MISCELLANEOUS MIRROR WITH SHELF
MOUNTED MOUNTING MULLION NORTH NOT APPLICABLE
NOISE CRITERIA NATIONAL FIRE PROTECTION ASSOCIATION NOT IN CONTRACT NOMINAL NOT TO SCALE

NWC O to O OA OC OFCI OFF OFOI OPG(S) OPP OSHA OTB OVFL OVHD PAN B PAR PR PCD PCT PENT PERF PERP PG PIC PIG ΡL PLAM PLBG PLYWD PR PREFAB PROJ PS PT PTD PTD/R PTN PVC PWL QT QTR RND QTY RAD RB RC RCP RD REF REFL REM REQ(D) RESIL REV RF RFM RH RI&C RM RND S SAT SAW SB SC SC SCD SCH SCHED SCR SCT SD SECT SECY SG SGL SH SHM SHT SIM SLNT SM SND SNV SPEC SPL SPL SQ SS SS SSA SSS ST ST STAG'D STC STD STGR STL STOR STRUCT SUBFL SURF SUSP SV SYM Т T&G T.O. TAN ΤB TBD TCP TEMP TERR TG ΤH ΤI TIG TMR TOP TRANS TT TTD TTG TTIG TW TYP UL UNEX UNFIN UNO UR US UTIL VB VB VCB

EUI

EW EWC

EXIST

ELECTRIC WATER COOLER

EACH WAY

EXISTING

NORMAL WEIGHT CONCRETE	VERT
	VEST
OUT TO OUT	VF
OVERALL	VOC
ON CENTER	VOL
OWNER FURNISHED CONTRACTOR INSTALLED	VP
OFFICE	VT
OWNER FURNISHED OWNER INSTALLED	VWC
OPENING(S)	
OPPOSITE	W
OPERATIONAL SAFETY AND HEALTH ADMINISTRATION	W
OPEN TO BELOW	W/
OVERFLOW	W/O
OVERHEAD	WB
	WC
PAINT	WC
PANIC BOLT	WCL
PARALLEL	WD
PARTICLE BOARD	WDF
PRECAST CONCRETE	WDW
PAPER CUP DISPENSER	WG
PORCELAIN CERAMIC TILE	WI
PANIC DEVICE	WOM
PENTHOUSE	WR
PERFORATED	WRB
PERPENDICULAR	WW
PATTERN GLASS	WWF
PORTABLE INSTRUMENT CONNECTION	

YD

VERTICAL VESTIBULE VINYL FLOOR VOLITILE ORGANIC COMPOUND VOLUME VENEER PLASTER VINYL TILE VINYL WALL COVERING WEST WIDE WITH WITHOUT WALL BASE WATER CLOSET WALL COVERING WATER CLOSET/LAVATORY COMBINATION WOOD WOOD FLOORING WINDOW POLISHED WIRE GLASS WROUGHT IRON WALK OFF MAT WASTE RECEPTACLE WEATHER RESISTANT BARRIER WARM WHITE WELDED WIRE FABRIC YARD

### PLATE PROPERTY LINE PLASTIC LAMINATE

PATTERN INSULATING GLASS

PLASTIC LAMINATE PLUMBING PLYWOOD

PAIR PREFABRICATED PROJECT(OR) (ION)

### PROJECTION SCREEN POINT

PAPER TOWEL DISPENSER COMBINATION TOWEL DISPENSER/RECEPTACLE

### PARTITION POLYVINYL CHLORIDE

SOUND POWER LEVEL

### QUARRY TILE QUARTER ROUND

QUANTITY

### RADIUS

RUBBER BASE REMOTE CONTROL

### REFLECTED CEILING PLAN ROOF DRAIN

REFERENCE REFLECTED

# REMOVABLE

REQUIRE(D) RESILIENT

### REVISION(S) **RESILIENT FLOORING**

RUBBER FLOOR RECESSED FLOOR MAT

### ROBE HOOK

ROUGH IN AND CONNECT ROOM

# ROUND

SOUTH SINK

### SPRAYED ACOUSTIC TREATMENT

SOUND ABSORBING WALL UNITS SPLASH BLOCK

### SOLID CORE SHOWER CURTAIN

SEAT COVER DISPENSER SHOWER CURTAIN HOOK

### SCHEDULE SHOWER CURTAIN ROD

STRUCTURAL CLAY TILE

### SECTION SECRETARY

SOAP DISPENSER

SPANDREL GLASS

### SINGLE SHOWER

SECURITY HOLLOW METAL SHEET

### SIMILAR SEALANT

SHEET METAL

### SANITARY NAPKIN DISPOSAL SANITARY NAPKIN VENDOR

SPECIFICATION(S) SOUND PRESSURE LEVEL

### SPECIAL SQUARE

STAINLESS STEEL SOLID SURFACE

### STORM SHELTER AREA STAINLESS STEEL SHELF

STONE STAIR

# STAGGERED

SOUND TRANSMISSION CLASS STANDARD STRINGER

STEEL STORAGE

### STRUCTURAL SUBFLOOR

SURFACE SUSPENDED

### SYMETRICAL

SHEET VINYL

TREAD

# TONGUE AND GROOVE

TOP OF TANGENT

### TOWEL BAR TACK BOARD

TOILET COMPARTMENT PARTITION TEMPORARY

### TERRAZZO TINTED FLOAT GLASS

THRESHOLD TENANT IMPROVEMENT

### TINTED INSULATING GLASS TILT MIRROR UNIT

TOP OF PAVING TRANSVERSE

### TERRAZZO TILE TOILET TISSUE DISPENSER

TINTED TEMPERED FLOAT GLASS TINTED TEMPERED INSULATING GLASS

### TACK WALL TYPICAL

UNDERWRITERS LABORATORIES

### UNEXCAVATED UNFINISHED UNLESS NOTED OTHERWISE

URINAL UTILITY SHELF

## UTILITY VAPOR BARRIER

VINYL BASE VENTED COVE BASE

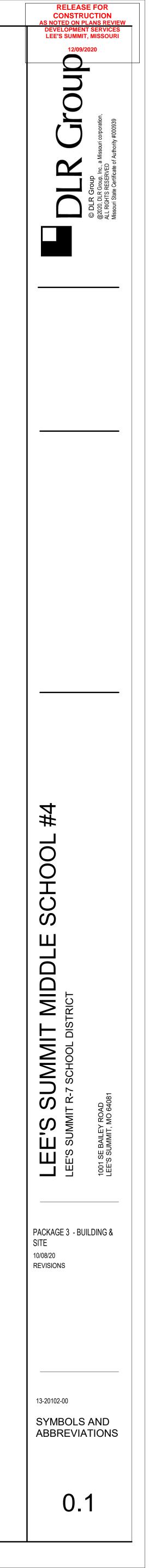
# GENERAL SYMBOLS

?	DETAIL NUMBER CROSS REFERENCE		EARTH
	SHEET NUMBER     SIMILAR OR TYPICAL		GRAVEL
? SIM	REFERENCE WALL SECTION		SAND
(1)		8 A	CONCRET
(?)	DETAIL REFERENCE		PRECAST
			STEEL
? ?			GYM FLOO
111 111	BUILDING SECTION		WOOD (CONTINU
? ? ? East	BUILDING ELEVATION INTERIOR ELEVATION		WOOD (NON-CON BLOCKING WOOD (TF
XX/ A11.X	CASEWORK ELEVATION		GLASS
			STONE
(1)	KEYNOTE		SHINGLES
$\sim$			CONCRET
(?)	COLUMN GRID LINE		BRICK VEI
ROOM NAME			STEEL (LA
<u>???</u>	ROOM NUMBER/NAME		PLYWOOD
(	DOOR NUMBER /		GYPSUM \
	INTERIOR WINDOW		BATT INSU
	EXTERIOR WINDOW NUMBER		RIGID INSI
	WALL TYPE		SPRAY FO
			FIRE SAFI
	REVISION NUMBER		PROTECT
			CARPET (I
			ACOUSTIC
			TILE (LAR

	EARTH
ို္ပ္ငံ ဂုိ္ပ္ငံ	GRAVEL
	SAND
▶ ►	CONCRETE
	PRECAST CONCRETE
	STEEL
$\square$	GYM FLOOR
$\overline{\langle}$	WOOD (CONTINUOUS BLOCKING)
	WOOD (NON-CONTINUOUS
	BLOCKING) WOOD (TRIM/FINISH)
, III	GLASS
	STONE
	SHINGLES
$\overline{\Box}$	CONCRETE MASONRY UNIT
	BRICK VENEER
	STEEL (LARGE SCALE)
	PLYWOOD (LARGE SCALE)
-	GYPSUM WALL BOARD
	BATT INSULATION
	RIGID INSULATION
	SPRAY FOAM INSULATION
	FIRE SAFING INSULATION
	PROTECTION BOARD
	CARPET (LARGE SCALE)
	ACOUSTIC TILE (LARGE SCALE)
	TILE (LARGE SCALE)

# SITE SYMBOLS

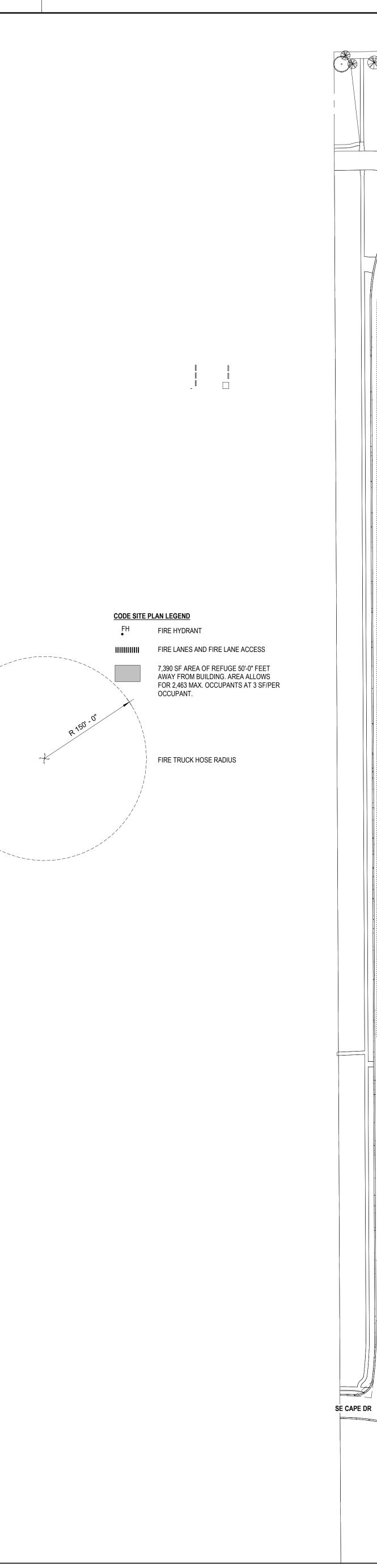
	PROPERTY LINE		AREA INLET
	LOT LINE	0	CURB INLET
	EASMENT LINE	•	MANHOLE
	BUILDING LINE, EXISTING	▲ <sup>OR</sup>	OBSERVATION RISER
	BUILDING LINE, NEW W/DOOR OPENING AND STRUCTURAL STOOP	(	HEAD WALL
	PRIMARY CONTOUR, EXISTING	•	FLARED END
100	PRIMARY CONTOUR, NEW	• <sup>CO</sup>	CLEAN OUT
99	SECONDARY CONTOUR, EXISTING	C	CAP
99	SECONDARY CONTOUR, NEW		THRUST BLOCK
1% SLOPE	SLOPE, PAVEMENT		VALVE
DOWN	DRAINAGE DITCH OR SWALE	PIV ▶◀	POST INDICATOR VALVE
·- <u> </u>	STREET CENTERLINE	$\square$	REDUCER
	CURB, THICKENED EDGE	Ą	MAGNESIUM ANODE
	CURB, EXISTING	ılı	DIELECTRIC COUPLING
	CURB, NEW	$\otimes$	CATHODIC TEST STATION
	PAVING CONTRACTION JOINT	<b>FH</b>	FIRE HYDRANT
KCJ	PAVING KEYED CONSTRUCTION JOINT	×	POWER POLE
<u> KC</u> T <sub>I</sub> I	PAVING TIED CONSTRUCTION JOINT	□●	LIGHT POLE
—   —   —   — – –   — – – – – EJ	PAVING EXPANSION JOINT		TELEPHONE MANHOLE
	FENCE, SECURITY		TELEPHONE BOX
<del>- XX   XX   XX   XX   XX   XX   XX   XX</del>	FENCE, BARBED WIRE	•	SPRINKLER HEAD, 360°
- <del>X X X X</del>	FENCE, CHAIN LINK	•	SPRINKLER HEAD, 270°
	FENCE, WOOD	0	SPRINKLER HEAD, 180°
* * * *	SEED LIMIT	O	SPRINKLER HEAD, 90°
000	SOD LIMIT	<sup>⊗</sup> QC	QUICK COUPLING
	STORM DRAIN	Ø <sup>X</sup> "	TREE, EXISTING DECIDUOUS
SD	SUBDRAIN	$\oslash^{X}$	TREE, EXISTING CONIFER
	SUBDRAIN, PERFORATED	for the for	SHADE TREE
$\rightarrow \rightarrow \rightarrow \rightarrow$	SANITARY SEWER	( · · · ·	
S	FORCE MAIN	NUMBER OF STREET	ORNAMENTAL TREE
FM	WATER	- Alver	DECIDUOUS TREE
W	FIRE	$\ast$	
———— F ———	GAS	$\langle \gamma \rangle$	SHRUB
G	HIGH PRESSURE STEAM	[]	CLIPPED SHRUB
HPS	MEDIUM PRESSURE STEAM		
MPS	LOW PRESSURE STEAM		
LPS	UNDERGROUND ELEC/TELEPHONE		
UGE/UGT	OVERHEAD POWER		
— - — OHP— - —	LAWN SPRINKLER HOT LINE		
——— НОТ ———	LAWN SPRINKLER LATERAL		
LAT			

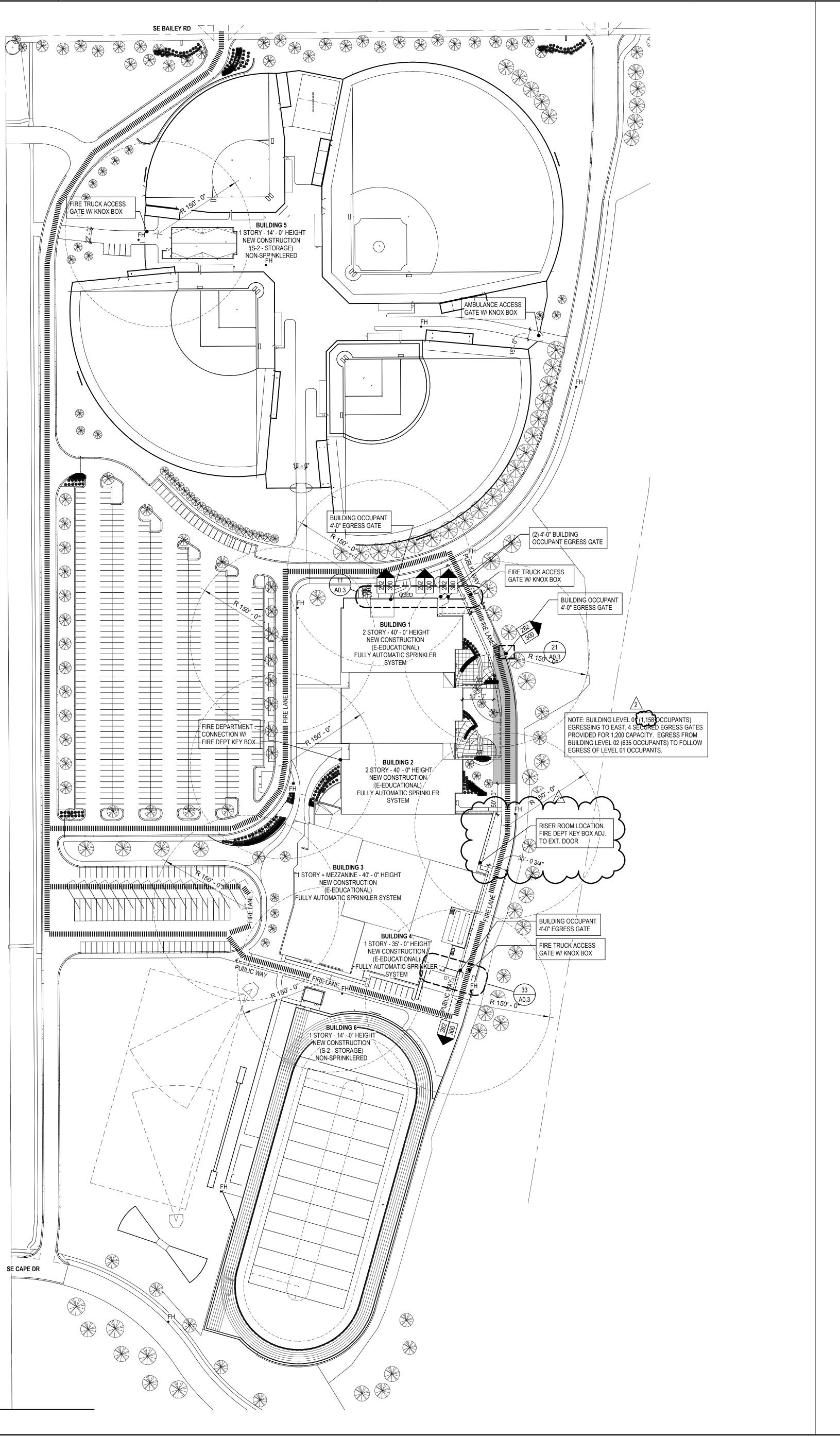


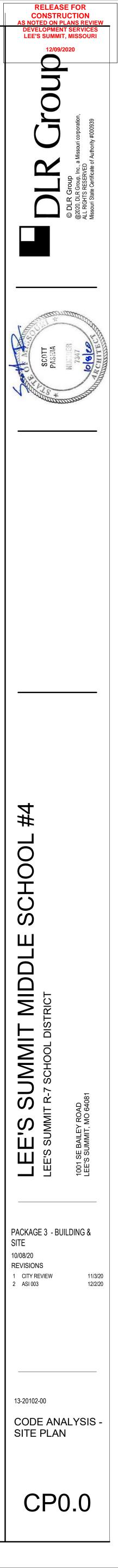
1

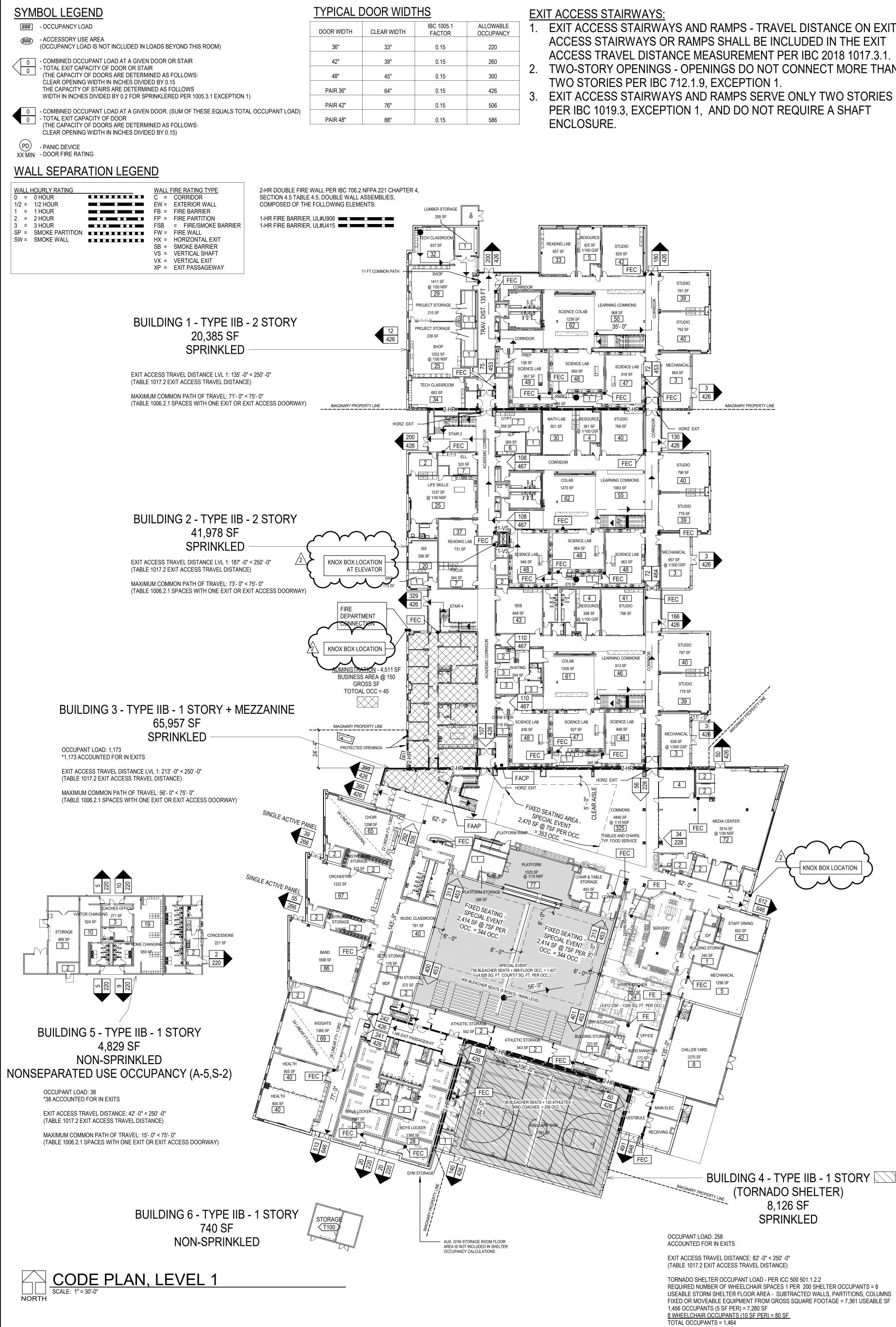


NORTH CODE SITE PLAN









- EXIT ACCESS STAIRWAYS AND RAMPS TRAVEL DISTANCE ON EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE INCLUDED IN THE EXIT
- TWO-STORY OPENINGS OPENINGS DO NOT CONNECT MORE THAN
- PER IBC 1019.3, EXCEPTION 1, AND DO NOT REQUIRE A SHAFT

REQUIRED NUMBER OF WHEELCHAIR SPACES 1 PER 200 SHELTER OCCUPANTS = 8 USEABLE STORM SHELTER FLOOR AREA - SUBTRACTED WALLS, PARTITIONS, COLUMNS FIXED OR MOVEABLE EQUIPMENT FROM GROSS SQUARE FOOTAGE = 7.361 USEABLE SF

# **BUILDING I:**

OCCUPANCY GROUP: E CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 43, ALLOWABLE AREA INCREASE FOR FROM (IBC 506.2.3 SINGLE OCCUPANCY, MULTI **IBC 506.3 FRONTAGE INCREASE):** 

IF= .6 Aa=[At + (NS \* If)] \* Sa Aa=[43,500+(14,500\*.6)]

# TOTAL ALLOWABLE AREA PER FLOOR: ACTUAL AREA PER FLOOR:

LEVEL 01: 20,385 SF LEVEL 02: 20,385 SF

MAXIMUM ALLOWABLE BUILDING HEIGHT ACTUAL BUILDING HEIGHT: 42' - 3"

# **BUILDING 2:**

OCCUPANCY GROUP: E CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 43, ALLOWABLE AREA INCREASE FOR FROM

IF= .26 Aa=[At + (NS \* If)] \* Sa Aa=[43,500 + (14,500 \* .26)]

# TOTAL ALLOWABLE AREA PER FLOOR: ACTUAL AREA PER FLOOR:

LEVEL 01: 41,978 SF LEVEL 02: 41,842 SF

MAXIMUM ALLOWABLE BUILDING HEIGHT ACTUAL BUILDING HEIGHT: 42' - 3"

# **BUILDING 3:**

OCCUPANCY GROUP: E CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 58, ALLOWABLE AREA INCREASE FOR FRON

IF= .67 Aa=[At + (NS \* If)] \* Sa Aa=[58,000 + (14,500 \* .67)]

# TOTAL ALLOWABLE AREA PER FLOOR: 6 ACTUAL AREA PER FLOOR: LEVEL 01: 61,768 SF MEZZANINE AND EQUIPMENT PLATFORM

MAXIMUM ALLOWABLE BUILDING HEIGHT ACTUAL BUILDING HEIGHT: 32'-0" **BUILDING 4:** 

**OCCUPANCY GROUP: E** CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 58,0 ALLOWABLE AREA INCREASE FOR FROM

IF= .46 Aa=[At + (NS \* lf)] \* Sa Aa=[58,000 + (14,500 \* .46)]

# TOTAL ALLOWABLE AREA PER FLOOR: ( ACTUAL AREA PER FLOOR: LEVEL 01: 8,

MAXIMUM ALLOWABLE BUILDING HEIGHT ACTUAL BUILDING HEIGHT: 32'-0"

# **BUILDING 5**: OCCUPANCY GROUP: S-2

CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 26, ALLOWABLE AREA INCREASE FOR FROM \*NONSEPARATED USE OCCUPANCY - AL **BUILDING BASED ON MOST RESTRICTIVE** 

IF=.4 Aa=[At + (NS \* If)] \* Sa Aa=[26, 000 + (26,000 \* .4)]

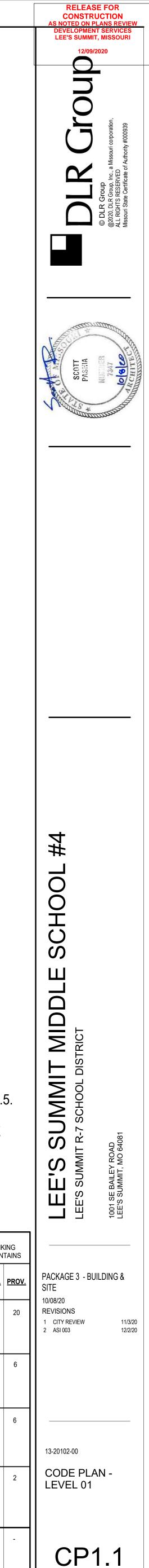
# TOTAL ALLOWABLE AREA PER FLOOR: 3 ACTUAL AREA PER FLOOR: 4,829 SF MAXIMUM ALLOWABLE BUILDING HEIGHT

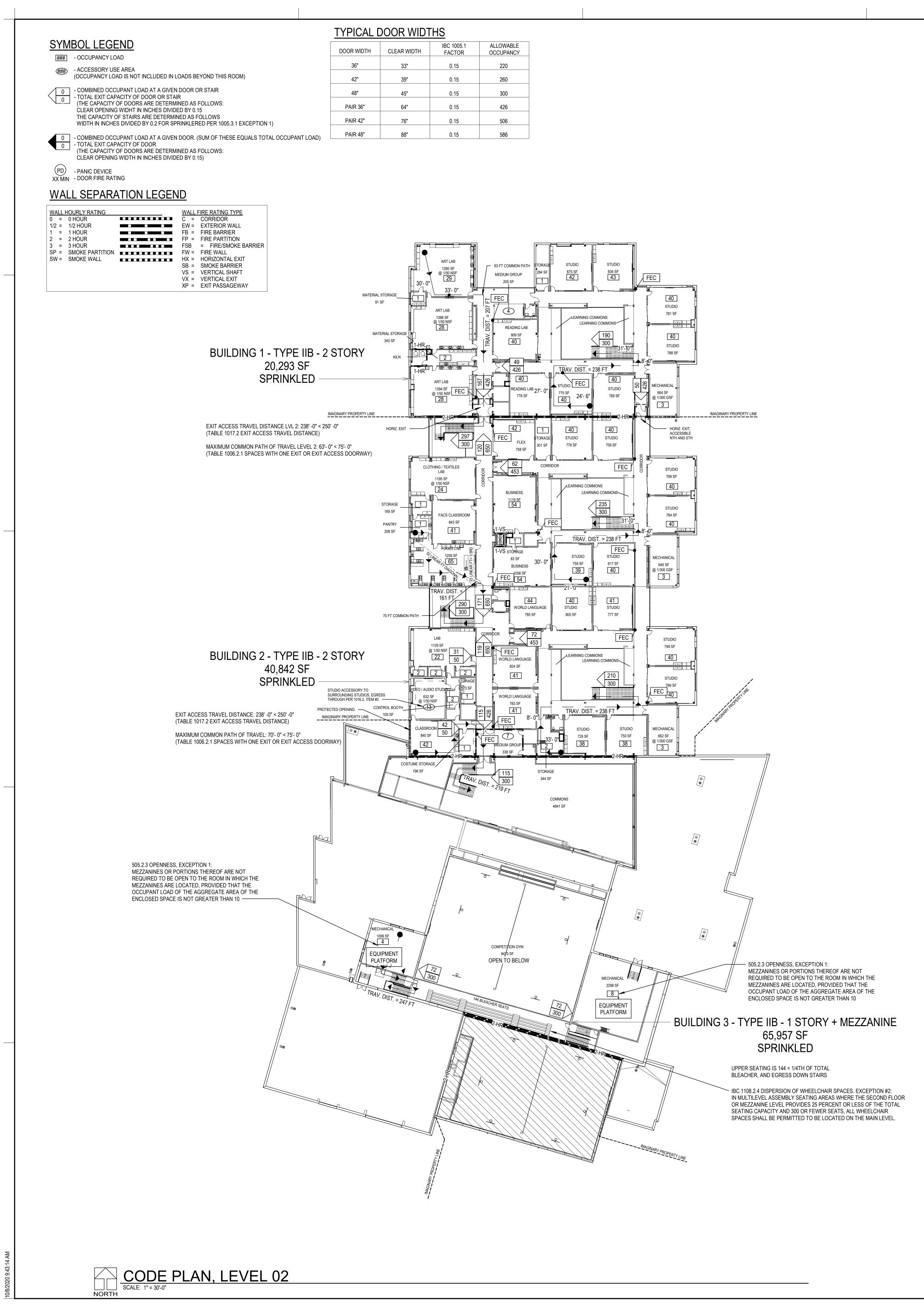
ACTUAL BUILDING HEIGHT: 14'-0" BUILDING 6:

OCCUPANCY GROUP: S-2 CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 26,0 ALLOWABLE AREA INCREASE FOR FROM IF=.4 Aa=[At + (NS \* lf)] \* Sa Aa=[26, 000 + (26,000 \* .4)]

**TOTAL ALLOWABLE AREA PER FLOOR: 3** ACTUAL AREA PER FLOOR: 740 SF MAXIMUM ALLOWABLE BUILDING HEIGHT ACTUAL BUILDING HEIGHT: 14'-0"

3,500 SF	<u>PROJECT LOCATION:</u> 1001 SE BAILEY ROAD LEE'S SUMMIT, MO 64081												
NTAGE FI STORY BUILDING	<u>OWNER NAME:</u> LEE'S SUMMIT R-7 SCHOOL DISTRICT												
	<u>OWNER CONTACT:</u> KYLE GORRELL, DIRECTOR LSR7 FACILITY SERVICES												
: 52, 200	<u>OWNER ADDRESS:</u> DEPARTMENT OF LEE'S SUMMI FACILITY SERVICES 502 SE TRANSPORT DRIVE LEE'S SUMMIT, MO 64081	DEPARTMENT OF LEE'S SUMMIT SCHOOL DISTRICT FACILITY SERVICES 502 SE TRANSPORT DRIVE LEE'S SUMMIT, MO 64081											
HT (PER TABLE 504.3): 75' - 0"	<u>COUNTY:</u> JACKSON COUNTY												
	<u>FIRE DEPARTMENT:</u> LEE'S SUMMIT FIRE DEPARTMENT												
3,500 SF NTAGE (IBC 506.3):	<u>WATER SUPPLY:</u> LEE'S SUMMIT WATER UTILITIE	S											
	AUTHORITY HAVING JURISDICT CITY OF LEE'S SUMMIT	<u>-ION:</u>											
: 47, 270	<u>ARCHITECT OF RECORD:</u> DLR GROUP 7290 WEST 133RD STREET, OV	ERLAN	ND PAI	RK, KS	6621	3							
HT (PER TABLE 504.3): 75' - 0"	CODES/REGULATIONS: BUILDING: 2018 IBC FIRE: 2018 INTERNATIONAL FIR MECHANICAL: 2018 INTERNATION PLUMBING: 2018 INTERNATION ELECTRICAL: 2017 NATIONAL E ACCESSIBLE STANDARD: ICC/A	DNAL I AL PLU LECTF	MECH, JMBIN RICAL	G COI CODE	DE	DE							
8, 000 SF NTAGE (IBC 506.3):	NEW CONSTRUCTION: OCCUPANCY: EDUCATIONAL GROUP CONSTRUCTION TYPE (SECTIO ALLOWABLE HEIGHT (PER IBC ALLOWABLE NUMBER OF STOF	N 602 TABLE	): TYP 504.3	E IIB 5): 75' -	0"		DNAL .	AREA	S				
: <b>67, 715</b> MS: 5,718 SF	ALLOWABLE NUMBER OF STORIES (PER TABLE 504.4): 3 <u>SEPARATION REQUIREMENTS:</u> BUILDING SEPARATION PER TABLE 706.4: 2-HOUR FIRE WALL *a. IN TYPE II CONSTRUCTION, WALLS SHALL BE PERMITTED TO HAVE A 2-HOUR FIRE- RESISTANCE RATING												
HT: 75'-0'	<u>LIFE SAFETY</u> AUTOMATIC FIRE SUPPRESSIO FIRE ALARMS THROUGHOUT FIRE EXTINGUISHERS THROUG			THROU	JGHO	UT							
8,000 SF NTAGE (IBC 506.2.2, 506.3):	EMERGENCY LIGHTING FIRE DEPARTMENT CONNECTIONS -SEE CIVIL AND PLUMBING PLANS FIRE ALARM ANNUNCIATOR PANEL (FAAP) - AT RECEPTION D100A FIRE ALARM CONTROL PANEL (FACP) - AT ELECTRICAL C116 SMOKE CONTROL SYSTEM: NOT APPLICABLE MANUAL ALARMS COMMUNICATIONS AND ELECTRICAL ROOMS: NO UPS PROVIDED, NO RACK OF BATTERIES												
<b>: 64,670</b> 8,126 SF HT: 75'-0'	PROVIDED. PENETRATIONS THROUGH FLC PENETRATING ITEMS TO BE FIL PASSAGE OF FLAME AND THE F DUCT PENETRATIONS THROUG TO BE FILLED WITH AN APPRO PASSAGE OF FLAME AND THE F 718.2.5	LED V PRODU GH FLC VED N	WITH A UCTS DORS: NON-C	APPRO OF CO ANNI OMBU	)VED )MBU )JLAR  STIBL	MATER STION SPACE E MAT	ŔIALS , PER E ARC FERIA	TO R 2018 )UND L THA	ESIST IBC 71 PENE <sup>-</sup> T RES	THE F 4.6.2 / TRATII SISTS	REE AND 7 NG DI THE F	18.2.5 JCT REE	5.
6,000 SF NTAGE (IBC 506.2.2, 506.3): LLOWABLE AREA AND HEIGHT OF	PLUMBING FIXTURES												
VE ALLOWANCES PER 508.3.2.		# OCCL	JPANTS	WC F	REQ'D	WC PRC	VIDED	LAV F	REQ'D	LAV PRC	VIDED	DRINKI FOUNT	
	STUDENTS/ FACULTY	M	<u>w</u>	M	<u>w</u>	M	<u>w</u>	M	<u>w</u>	M	<u>w</u>	<u>REQ'D.</u>	
: 36,400	NOTES: CALCULATIONS BASED ON IPC 4.1 REQT'S. OCCUPANT LOAD BASED ON PROJECTED 1,200 STUDENT/ 260 FACULTY COUNT	730	730	15	15	17	17	15	15	17	17	15	20
HT: 55'-0'	MAIN GYMNASIUM - PERFORMANCE SPECIAL EVENT NOTES: COMPETITION & AUXILLARY GYMS ARE NON- SIMULTANEOUS USE FROM STUDENT OCCUPANCY. BASED ON 1,369 OCCUPANTS SEATED ON BLEACHERS AND FLOOR W/ 63 STAGE OCCUPANTS	714	714	6	12	12	12	4	4	7	7	3	6
6,000 SF NTAGE (IBC 506.2.2, 506.3):	MAIN GYMNASIUM - ATHLETIC COMPETITION (ASSEMBLY) NOTES: COMPETITION & AUXILLARY GYMS ARE NON-SIMULTANEOUS USE FROM STUDENT OCCUPANCY. BASED ON 615 OCCUPANTS SEATED ON BLEACHERS AND 125 ATHLETES AND OFFICIALS	370	370	3	6	12	12	2	2	7	7	2	6
	BASEBALL/SOFTBALL COMPLEX (ASSEMBLY) NOTES: CALCULATIONS BASED ON IPC 4.1 REQT'S. OCCUPANT LOAD BASED ON PROJECTED MAXIMUM 600 ATHLETIC EVENT OCCUPANTS. FAMILY TOILET INCLUDED WITH FEMALE COUNTS PER 2902.1.2.	300	300	4	8	4	8	2	2	2	4	1	2
<b>: 36,400</b> HT: 55'-0'	TORNADO SHELTER NOTES: PER ICC 500 TABLE 702.2. OCCUPANT LOAD BASED ON PROJECTED 1,200 STUDENT/ 260 FACULTY COUNT. TO BE USED AS DESIGNATED STORM SHELTER FOR STUDENT/FACULTY POPULATION. CALCULATIONS BASED ON ICC-500 REQUIREMENT FOR PLUMBING FIXTURES	730	730	3	3	3	3	1	1	1	1	-	-
			I										





# **BUILDING I:**

OCCUPANCY GROUP: E CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 43,500 SF ALLOWABLE AREA INCREASE FOR FRONTAGE (IBC 506.2.3 SINGLE OCCUPANCY, MULTI STORY BUILDING IBC 506.3 FRONTAGE INCREASE):

IF= .6 Aa=[At + (NS \* If)] \* Sa Aa=[43,500+(14,500\*.6)]

TOTAL ALLOWABLE AREA PER FLOOR: 52, 200 ACTUAL AREA PER FLOOR: LEVEL 01: 20,385 SF LEVEL 02: 20,385 SF

MAXIMUM ALLOWABLE BUILDING HEIGHT (PER TABLE 504.3): 75' - 0" ACTUAL BUILDING HEIGHT: 42' - 3"

# **BUILDING 2:**

OCCUPANCY GROUP: E CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 43,500 SF ALLOWABLE AREA INCREASE FOR FRONTAGE (IBC 506.3):

# IF= .26

Aa=[At + (NS \* If)] \* Sa Aa=[43,500 + (14,500 \* .26)]

# TOTAL ALLOWABLE AREA PER FLOOR: 47, 270 ACTUAL AREA PER FLOOR: LEVEL 01: 41,978 SF LEVEL 02: 41,842 SF

MAXIMUM ALLOWABLE BUILDING HEIGHT (PER TABLE 504.3): 75' - 0" ACTUAL BUILDING HEIGHT: 42' - 3" \_\_\_\_\_

# **BUILDING 3:**

OCCUPANCY GROUP: E CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 58, 000 SF ALLOWABLE AREA INCREASE FOR FRONTAGE (IBC 506.3):

# IF= .67

Aa=[At + (NS \* If)] \* Sa Aa=[58,000 + (14,500 \* .67)]

# TOTAL ALLOWABLE AREA PER FLOOR: 67, 715 ACTUAL AREA PER FLOOR: LEVEL 01: 61,768 SF

MAXIMUM ALLOWABLE BUILDING HEIGHT: 75'-0' ACTUAL BUILDING HEIGHT: 32'-0"

# **BUILDING 4:**

OCCUPANCY GROUP: E CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 58,000 SF ALLOWABLE AREA INCREASE FOR FRONTAGE (IBC 506.2.2, 506.3):

# IF= .46 Aa=[At + (NS \* If)] \* Sa Aa=[58,000 + (14,500 \* .46)]

# **TOTAL ALLOWABLE AREA PER FLOOR: 64,670**

# MAXIMUM ALLOWABLE BUILDING HEIGHT: 75'-0' ACTUAL BUILDING HEIGHT: 32'-0"

# **BUILDING 5**: OCCUPANCY GROUP: S-2

CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 26,000 SF ALLOWABLE AREA INCREASE FOR FRONTAGE (IBC 506.2.2, 506.3): **\*NONSEPARATED USE OCCUPANCY - ALLOWABLE AREA AND HEIGHT OF BUILDING BASED ON MOST RESTRICTIVE ALLOWANCES PER 508.3.2.** IF=.4

# Aa=[At + (NS \* If)] \* Sa Aa=[26, 000 + (26,000 \* .4)]

# **TOTAL ALLOWABLE AREA PER FLOOR: 36,400** ACTUAL AREA PER FLOOR: 4,829 SF ACTUAL BUILDING HEIGHT: 14'-0"

# **BUILDING 6:**

OCCUPANCY GROUP: S-2 CONSTRUCTION TYPE: IIB ALLOWABLE AREA (IBC TABLE 506.2): 26,000 SF ALLOWABLE AREA INCREASE FOR FRONTAGE (IBC 506.2.2, 506.3): IF=.4

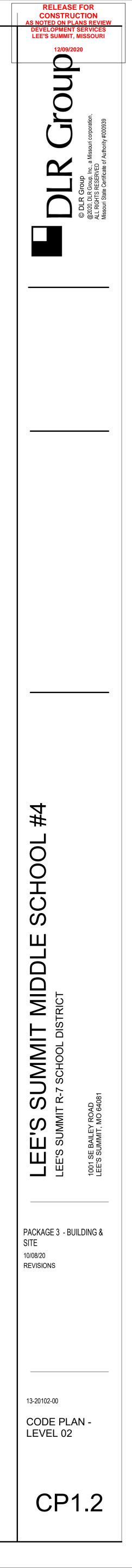
Aa=[At + (NS \* If)] \* Sa Aa=[26, 000 + (26,000 \* .4)]

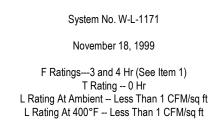
TOTAL ALLOWABLE AREA PER FLOOR: 36,400 ACTUAL AREA PER FLOOR: 740 SF MAXIMUM ALLOWABLE BUILDING HEIGHT: 55'-0' ACTUAL BUILDING HEIGHT: 14'-0"

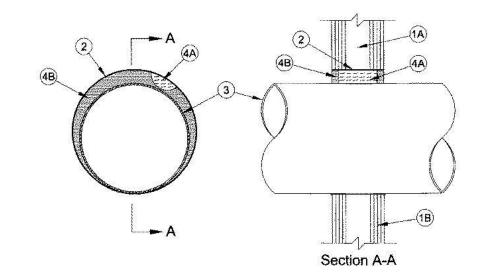
**MEZZANINE AND EQUIPMENT PLATFORMS: 5,718 SF** 

ACTUAL AREA PER FLOOR: LEVEL 01: 8,126 SF

MAXIMUM ALLOWABLE BUILDING HEIGHT: 55'-0' \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_



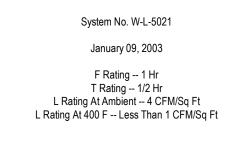


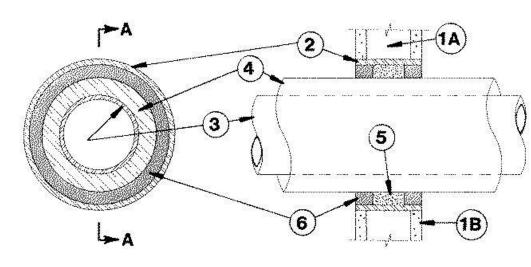


1. Wall Assembly The 3 or 4 hr fire-rated gypsum wallboard/steel stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features: A. Studs Wall framing shall consist of steel channel studs. Steel studs to be min 3-5/8 in. wide and spaced max 24 in. OC. B. Gypsum Board\* Multiple layers of min 1/2 in. thick gypsum wallboard. The gypsum wallboard type, thickness, number of layers and orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening is 22 in. 2. Steel Sleeve Cylindrical sleeve fabricated from min 0.031 in. thick (No. 22 MSG) galv sheet steel and having a min 2 in. lap along the longitudinal seam. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the openings and releasing the coil to let it uncoil against the circular cutouts in the gypsum wallboard layers. The ends of the steel sleeve shall be installed flush with each face of the wall or extend a max 1/4 in. beyond each surface of 3. Through Penetrants One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tubing and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used. A. Steel Pipe Nom 20 in. diam (or smaller) Schedule 10 (or heavier) steel pipe. B. Iron Pipe Nom 20 in. diam (or smaller) cast or ductile iron pipe. C. Conduit Nom 6 in. diam (or smaller) rigid steel conduit, nom 4 in. diam (or smaller) electrical metallic tubing or nom 1 in. diam (or smaller) flexible steel conduit. D. Copper Tubing Nom 6 in. diam (or smaller) Type M (or heavier) copper tubing. E. Copper Pipe Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe. 4. Firestop System The firestop system shall consist of the following: A. Packing Material In 4 hr fire-rated assemblies, min 5-5/8 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. In 3 hr fire-rated assemblies, min 4-5/8 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material.

B. Fill, Void or Cavity Material\* - Caulk Min 1 in. thickness of fill material applied within the annulus, flush with both ends of steel sleeve. A min 1/4 in. thick bead of fill material shall be applied at the point contact location on both surfaces of walll. When sleeve projects beyond surface of wall, a min 1/4 in. thick bead of caulk shall be applied to outer perimeter of sleeve at interface with wall surfaces. SPECIFIED TECHNOLOGIES INC -- SpecSeal 100, 101, 102, 129, 105 Sealant \*Bearing the UL Classification Marking

# UL DESIGN W-L-1171





SECTION A-A

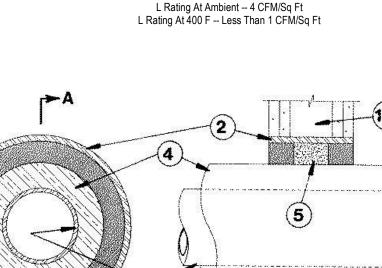
1 Wall Assembly -- The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. OC. B. Gypsum Board\* -- One layer of 5/8 in. thick gypsum wallboard, as specified in the individual Wall and Partition Design. Max liam of opening is 8 in. 2. Metallic Sleeve -- Nom 8 in. diam (or smaller) Schedule 40 (or thinner) steel pipe cast into wall assembly with joint compound and installed flush with wall surfaces. B. Through Penetrants -- One metallic pipe or tubing to be centered within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used: A. Steel Pipe -- Nom 4 in. diam (or smaller) Schedule 40 (or heavier) steel pipe. B. Copper Tubing -- Nom 4 in. diam (or smaller) Type L (or heavier) copper tubing. C. Copper Pipe -- Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.

4. Pipe Covering\* -- Nom 1 in. thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. An annular space of 3/4 in. is required within the firestop system See Pipe and Equipment Covering -- Materials -- (BRGU) category in the Building Material Directory for the names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a

Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used. 5. Packing Material -- Min 2-3/4 in. thickness of min 4.0 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material. 6. Fill, Void or Cavity Material\* -- Sealant -- Min 1 in. thickness of fill material applied within the annulus, flush with both surfaces of wall. HILTI CONSTRUCTION CHEMICALS, DIV OF

HILTI INC -- FS-ONE Sealant \*Bearing the UL Classification Mark

L DESIGN W-L-5021

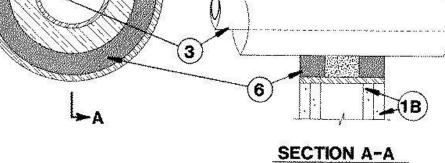


System No. W-L-5024

January 09, 2003

F Rating -- 2 Hr

T Rating -- 1 Hr



1. Wall Assembly -- The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features: A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC. B. Gypsum Board\* -- Two layers of 5/8 in. thick gypsum wallboard, as specified in the individual Wall and Partition Design. Max diam of opening is 10 in. 2. Metallic Sleeve -- Nom 10 in. diam (or smaller) Schedule 40 (or thinner) steel pipe cast into wall assembly with joint compound and installed flush with wall surfaces. 3. Through Penetrants -- One metallic pipe or tubing to be centered within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used: A. Steel Pipe -- Nom 4 in. diam (or smaller) Schedule 40 (or heavier) steel pipe.

B. Copper Tubing -- Nom 4 in. diam (or smaller) Type L (or heavier) copper tubing. C. Copper Pipe -- Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe. 4. Pipe Covering\* -- Nom 1-1/2 in. thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. A nom annular space of 1-7/16 in, is required within the firestop system See Pipe and Equipment Covering -- Materials -- (BRGU) category in the Building Material Directory for the names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a

Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

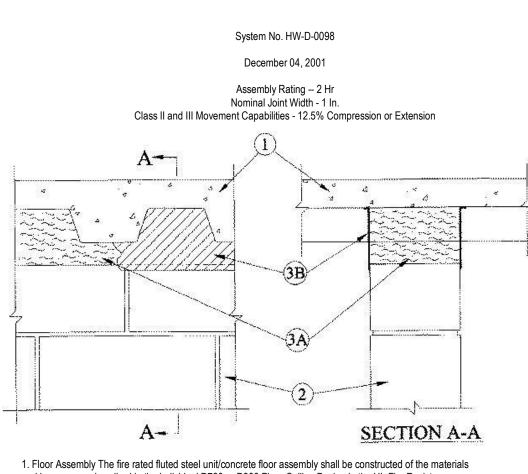
5. Packing Material -- Min 2 in. thickness of min 4.0 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill 6. Fill, Void or Cavity Material\* -- Sealant -- Min 1-1/2 in. thickness of fill material applied within the annulus, flush with both surfaces of wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-ONE Sealant

\*Bearing the UL Classification Mark

# UL DESIGN W-L-5024

# Design No. U415 June 10, 2003





and in a manner described in the individual D700 or D900 Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

A. Steel Floor and Form Units\* Max 2 in. deep galv steel fluted floor units. B. Concrete Min 2-1/2 in thick reinforced concrete as measured from top plane of the floor units. C. Spray-Applied Fire Resistive Materials\* (Optional)--(Not Shown)--Prior to the installation of the forming material and fill, void or cavity material (Items 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. to max 1-3/4 in. thickness of fire resistive material.

CONSTRUCTION PRODUCTS DIV -- Type MK-6-HY

W R GRACE & CO - CONN

1A. Roof Assembly (Not Shown) -- As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features: A. Steel Roof Deck Max 2 in. deep galv steel fluted roof deck. B. Roof Insulation Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the floor

1B. Roof Assembly As an alternate to Items 1 and 1A. a fire rated protected fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction featur A. Steel Roof Deck Max 2 in. deep galv steel fluted roof deck. B. Spray--Applied Fire Resistive Materials\* (Not Shown)--Prior to the installation of the steel ceiling runners,

Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B), the roof assembly shall be sprayed with the type and thickness of fire resistive material indicated in the individual P700 Series design. 2. Wall Assembly Min 6 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete.

Wall may also be constructed of any UL Classified Concrete Blocks\*. See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers. 3. Joint System Max separation between bottom of floor or roof and top of wall at time of installation of joint system is 1 in. The joint system is designed to accommodate a max 12.5 percent compression or extension

from its installed width. The joint system shall consist of the following: A. Forming Material Nom 4.0 pcf mineral wool batt insulation compressed and firmly packed to completely fill the flutes and the gap between the top of the wall and bottom of the floor or roof as a permanent form. Batt insulation cut to the shape of the fluted steel deck, approx 33 percent larger than the flutes. Pieces compressed and installed vertically into the flutes above the top of the wall. Additional pieces of batt insulation, min 6 in. wide, installed edge-first into joint opening between bottom of fluted steel deck and top of wall, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness. Compressed batt sections are flush with both surfaces of wall. Adjoining lengths of batt to be tightly butted with butted seams spaced min 48 in. apart along the length of the joint. ROCK WOOL MANUFACTURING CO -- Delta Board

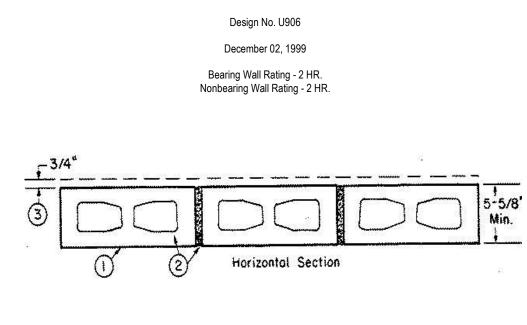
A1. Forming Material\*--Plugs (Optional-Not Shown) Performed mineral wool plugs, formed to the shape of the fluted floor units, friction fit to completely fill the flutes above the ceiling runner. The plugs shall be flush with both wall surfaces. Additional forming material, described in Item 3A, to be used in conjunction with the plugs to fill the gap between the top of the wall and the bottom of the steel floor units. HILTI CONSTRUCTION CHEMICALS, DIV OF

HILTI INC -- CP777 Speed Plugs

B. Fill, Void or Cavity Material\* Min 1/8 in. wet thickness of fill material sprayed or troweled on each side of the wall to completely cover mineral wool forming material and to overlap a min of 1/2 in. onto wall and steel deck on both sides of wall. When spray-applied fire resistive material\* is applied to the steel steel deck, the fill material is to overlap the wall a min of 1/2 in. and the spray-applied fire resistive material a min of 2 in. on both sides of wall. HILTI CONSTRUCTION CHEMICALS, DIV OF

HILTI INC -- CP672 Firestop Spray \*Bearing the UL Classification Mark

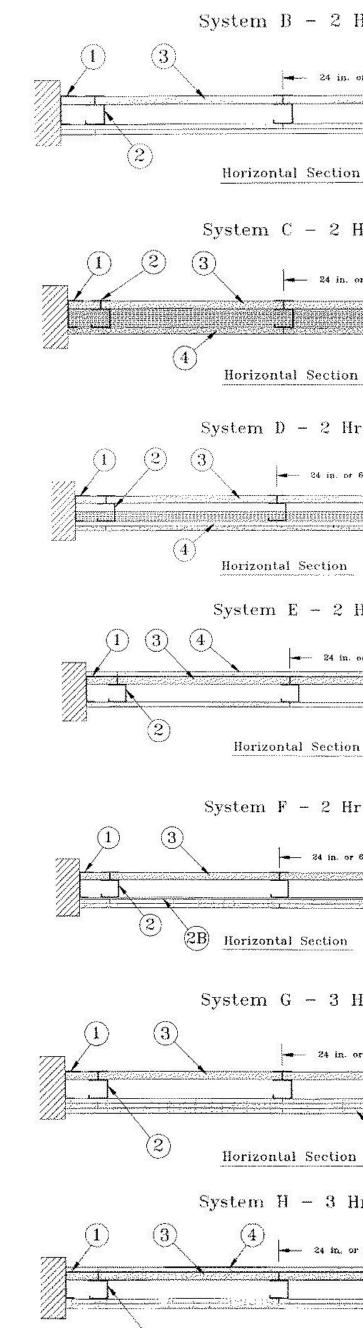
# **UL DESIGN HW-D-0098**



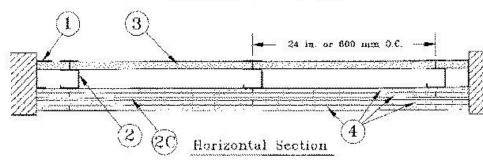
1. Concrete Blocks\* — Nominal 6 by 8 by 16 in, hollow or solid. Classification D-2 (2 hr). ANCHOR CONCRETE PRODUCTS INC GAGNE & SON CONCRETE BLOCK INC Allowable compressive stress of 57% of max allowable compressive stress in accordance with the empirical design method. BETCO BLOCK & PRODUCTS INC, DBA ARTHUR WHITCOMB WESTBROOK CONCRETE BLOCK CO INC Allowable compressive stress of 75.6% of max allowable compressive stress in accordance with the empirical design method. 2. Mortar — Blocks laid in full bed of mortar, nom. 3/8 in. thick, of not less than 2-1/4 and not more than 3-1/2 parts of clean sharp

sand to 1 part Portland cement (proportioned by volume) and not more than 50 percent hydrated lime (by cement volume). Vertical ioints staggered 3. Portland Cement Stucco or Gypsum Plaster — Add 1/2 hr to Classification if used. Attached to concrete blocks (Item 1). 4. Foamed Plastic\* - (Optional-Not Shown) - 1-1/2 in. thick max, 4 ft wide sheathing attached to concrete blocks (Item 1). THE DOW CHEMICAL CO — Type Thermax

\*Bearing the UL Classification Mark



**Horizontal Section** System I - 4 Hr.



1. Floor, Side and Ceiling Runners -- "J" - shaped runner, min 2-1/2 in. deep (min 4 in. deep when System C is used). with unequal legs of 1 in. and 2 in., fabricated from min 24 MSG (min 20 MSG when Item 4A or 7 are used) galv steel. Runners positioned with short leg toward finished side of wall. Runners attached to structural supports with steel fasteners located not greater than 2 in. from ends and not greater than 24 in. OC. "E" - shaped studs (Item 2A) may be used as side runners in place of "J" - shaped runners.

2. Steel Studs -- "C-H" - shaped studs, min 2-1/2 in. deep (min 4 in. deep when System C is used), fabricated from min 25 MSG (min 20 MSG when Item 7 is used) galv steel. Cut to lengths 3/8 to 1/2 in. less than floor-to-ceiling height and spaced 24 in. or 600 mm OC.

2A. Steel Studs -- (Not Shown) -- "E" - shaped studs installed back to back in place of "C-H" - shaped studs (Item 2) "E" shaped studs secured together with steel screws spaced a maximum 12 in. OC. Fabricated from min 25 MSG (min 20 MSG when Item 7 is used) galv steel, min 2-1/2 in, deep (min 4 in, deep when System C is used), with one leg 1 in, long and two legs 3/4 in. long. Shorter legs 1 in. apart to engage gypsum liner panels. Cut to lengths 3/8 to 1/2 in. less than floor to ceiling

2B. Furring Channels -- (Optional, not shown) -- For use with single or double layer systems. Resilient furring channels fabricated from min 25MSG corrosion protected steel, installed horizontally, and spaced vertically a max 24 in. OC. Flange portion of channel attached to each intersecting "C-H" or "E" stud on side of stud opposite the 1 in. liner panels with 1/2 in. long Type S or S-12 pan-head steel screws. When furring channels are used, wallboard to be installed vertically only. Not to be used with Type FRX or FRX-G gypsum wallboard (Item 4A) or cementitious backer units (Item 7).

2C. Furring Channels -- For use with System I - "Hat" - shaped, 25 MSG galv steel furring channels attached directly over the inner layers of wallboard to each stud with 2 in. long Type S pan head steel screws. Screws alternate from top flange to bottom flange at each stud intersection. Furring channels spaced vertically max 24 in. OC.

3. Gypsum Board\* -- Gypsum liner panels, nom 1 in. thick, 24 in. or 600 mm (for metric spacing) wide. Panels cut 1 in. less in length than floor to ceiling height. Vertical edges inserted in "H" portion of "C-H" studs or the gap between the two 3/4 in. legs of the "E" studs. Free edge of end panels attached to long leg of vertical "J" - runners with 1-5/8 in. long Type S steel screws spaced not greater than 12 in. OC. When wall height exceeds liner panel length, liner panel may be butted to extend to the full height of the wall. Horizontal joints need not be backed by steel framing. In System I, butt joints in liner panels are staggered min 36 in. Butt joints backed with 6 in. by 22 in. strips of 3/4 in. thick gypsum wallboard (Item 4). Wallboard strips centered over butt joints and secured to liner panels with six 1-1/2 in. long Type G steel screws, three screws along the 22

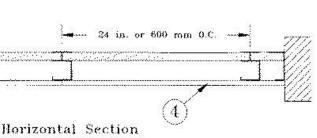
CANADIAN GYPSUM COMPANY -- Type SLX UNITED STATES GYPSUM CO -- Type SLX USG MEXICO S A DE C V -- Type SLX

in. dimension at the top and bottom of the strips.

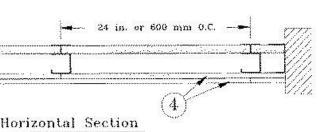
# UL DESIGN U415

# UL DESIGN U906

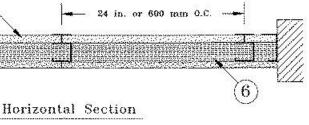
System A = 1 Hr.



System B - 2 Hr.



System C - 2 Hr.



24 in. or 600 mm 0.C.

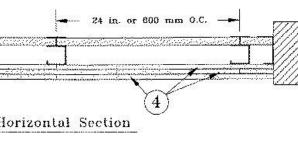
System E = 2 Hr.

24 in. or 600 mm 0.C. ----Horizontal Section

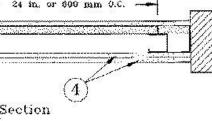
System F - 2 Hr.

- 24 in. or 600 mm 0.C.

System G - 3 Hr.



System H - 3 Hr.



### System A - 1 Hr Gypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally, attached to studs with 1 in. long Type S steel screws spaced 12 in. when installed vertically or 8 in OC when installed horizontally. Horizontal joints need not be backed by steel framing CANADIAN GYPSUM COMPANY -- Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, RC, WRX UNITED STATES GYPSUM CO -- Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX

USG MEXICO S A DE C V -- Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX

4. Gypsum Board\* --

Svstem D - 2 Hr

System B - 2 Hr Gypsum panels, with beveled, square or tapered edges, nom 1/2 in. or 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally in two layers. Inner or base layer attached to studs with 1 in. long Type S steel screws spaced 24 in. OC when installed vertically or 16 in. OC when installed horizontally. Outer or face layer attached to studs with 1-5/8 in, long Type S steel screws spaced 12 in, OC when installed vertically and staggered 12 in, from base laver screws or 8 in. OC when installed horizontally and staggered 8 in. from base layer screws. Horizontal joints between inner and outer layers staggered a min of 12 in. Horizontal joints need not be backed by steel framing. Vertical joints centered over studs and staggered 24 in. CANADIAN GYPSUM COMPANY -- 1/2 in. Type C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX UNITED STATES GYPSUM CO -- 1/2 in. Types C, IP-X2, IPC-AR, or WRC; 5/8 in. Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2. IPC-AR. SCX. SHX. WRC. WRX USG MEXICO S A DE C V -- 1/2 in. Types C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX

Svstem C - 2 Hr Gypsum panels, with beveled, square or tapered edges, nom 3/4 in. thick, 48 in. or 1200 mm wide, applied vertically or orizontally, secured with 1-1/4 in. long Type S steel screws spaced 8 in. OC along vertical edges and 12 in. OC in the field when installed vertically or 8 in. OC along the vertical edges and in the field when installed horizontally. Horizontal joints need not be backed by steel framing. Screws along side joints offset 4 in. Requires min 4 in. deep framing per Items 1, 2 and 3. Requires min 3 in. thick mineral wool batts per Item 6. CANADIAN GYPSUM COMPANY -- Types IP-X3, ULTRACODE, ULTRACODE SHC, LTRACODE WRC. UNITED STATES GYPSUM CO -- Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC. USG MEXICO S A DE C V -- Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC.

Gypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or orizontally, attached directly to studs with 1 in. long Type S steel screws spaced 24 in. when installed vertically or 16 in. OC when installed horizontally. . Horizontal joints need not be backed by steel framing. Requires face layer of 1/2 or 5/8 in, thick cementitious backer units per Item 7 and min 1-1/2 in, thick mineral wool batts per Item 6. CANADIAN GYPSUM COMPANY -- Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX UNITED STATES GYPSUM CO -- Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX USG MEXICO S A DE C V -- Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX

Svstem E - 2 Hr Gypsum panels, with beveled, square or tapered edges, nom 1/2 in. or 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally, attached to studs with 1 in. long Type S steel screws spaced 12 in. OC when installed vertically or 8 in. when installed horizontally. Horizontal joints need not be backed by steel framing CANADIAN GYPSUM COMPANY -- 1/2 in. Types C, IP-X2, IPC-AR; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR SCX. SHX. WRC. WRX UNITED STATES GYPSUM CO -- 1/2 in. Types C, IP-X2, IPC-AR; 5/8 in. Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX USG MEXICO S A DE C V -- 1/2 in. Types C, IP-X2, IPC-AR; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX

System F - 2 Hr Gypsum panels, with beveled, square or tapered edges, nom 1/2 in. or 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically in two layers. Inner or base layer attached to resilient furring channels (Item 2B) with 1 in. long Type S steel screws spaced 24 in. Outer or face layer attached to resilient furring channels (Item 2B) with 1-5/8 in. long Type S steel screws spaced 12 in. OC and staggered 12 in. from base layer screws. Joints between inner and outer layers staggered CANADIAN GYPSUM COMPANY -- 1/2 in. Type C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX UNITED STATES GYPSUM CO -- 1/2 in. Type C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2. IPC-AR. SCX. SHX. WRC. WRX USG MEXICO S A DE C V -- 1/2 in. Type C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX

Svstem G - 3 Hr Sypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically o horizontally in three layers. Inner or base layer attached to studs with 1 in. long Type S steel screws spaced 24 in. OC when installed vertically or 16 in OC when installed horizontally. Middle layer attached to studs with 1-5/8 in. long Type S steel screws spaced 24 in. when installed vertically or 16 in. OC when installed horizontally. Outer or face layer attached to studs with 2-1/4 in. long Type S steel screws spaced 16 in. when installed vertically or 12 in. OC when installed horizontally. Screws offset 6 in. from layer below. Horizontal joints on adjacent layers staggered a min of 12 in. Horizontal joints need not be backed by steel framing. Vertical joints centered over studs and staggered 24 in. on adjacent layers. CANADIAN GYPSUM COMPANY -- Types C, IP-X2, IPC-AR, WRC UNITED STATES GYPSUM CO -- Types C, IP-X2, IPC-AR, WRC USG MEXICO S A DE C V -- Types C, IP-X2, IPC-AR, WRC

System H - 3 Hr Gypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally, two layers over the flange of the "C" section of the studs, one layer over the flange of the "H" section of the studs. Inner or base layer attached to studs with 1 in. long Type S steel screws spaced 24 in. OC when installed vertically or 16 in. OC when installed horizontally. Face layer attached to studs with 1-5/8 in. long Type S steel screws spaced 16 in. when installed vertically or 12 in. OC when installed horizontally. Screws offset 6 in. from layer below. Horizontal joints on adjacent layers staggered a min of 12 in. Horizontal joints need not be backed by steel framing. Vertical joints centered over studs and staggered 24 in. on adjacent layers. CANADIAN GYPSUM COMPANY -- Types C, IP-X2, IPC-AR, WRC UNITED STATES GYPSUM CO -- Types C, IP-X2, IPC-AR, WRC USG MEXICO S A DE C V -- Types C, IP-X2, IPC-AR, WRC

Svstem I - 4 Hr Gypsum panels, with beveled, square or tapered edges, nom 3/4 in. thick, 4 ft wide (or 1200 mm for metric spacing) wallboard with square or tapered edges. Total of four layers to be used. First and second (inner) layers applied vertically or horizontally over the steel studs. Horizontal joints need not be backed by steel framing. When applied vertically, joints centered over studs and staggered min 24 in., otherwise all joints staggered min 12 in. First layer secured to studs with 1-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 24 in. OC. Second layer secured to studs with 2-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 12 in. OC. Third layer applied vertically over the furring channels (Item 2C) with a 1-1/4 in. long Type S self-drilling, self-tappling bugle-head steel screws spaced 12 in. OC. Fourth layer applied vertically or horizontally with 2-1/4 in. long Type S self-drilling, self-tapping

bugle-head steel screws spaced 12 in. OC. When applied vertically, joints to be staggered min 24 in. from third layer, otherwise all joints staggered min 12 in. CANADIAN GYPSUM COMPANY -- Types IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC UNITED STATES GYPSUM CO -- Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC.

USG MEXICO S A DE C V -- Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC.

5. Joint Tape and Compound -- (Not Shown) Systems A, B, C, E, F, G, H, I Joints on outer layers of gypsum boards (Item 4 and 4A) covered with paper tape and joint compound. Paper tape and

with joint compound. 6. Batts and Blankets\*

Systems A, B, E, F, G, H, I (Optional) -- Mineral wool or glass fiber batts partially or completely filling stud cavity. Any mineral wool or glass fiber batt mineral bearing the UL Classification Marking as to Fire Resistance.

joint compound may be omitted when gypsum boards are supplied with square edges. Exposed screw heads covered

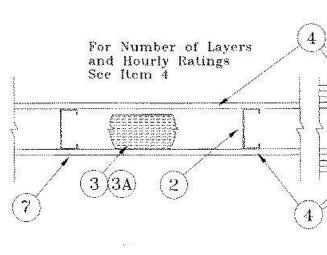
Systems C & D Min 3 in. (System C) and min 1-1/2 in. (System D) thick mineral wool batts, friction fitted between the studs and floor and ceiling runners. THERMAFIBER INC -- Type SAFB

7. Cementitious Backer Units\* -- (System D) -- Nom 1/2 or 5/8 in. thick panels, square edge, attached to studs over ypsum wallboard with 1-5/8 in. long, Type S-12, corrossion resistant steel screws spaced 8 in. OC and staggered 8 in. from gypsum wall board screws. Joints covered with glass fiber mesh tape. Vertical joints staggered one stud cavity from gypsum wallboard joints. Horizontal joints staggered a min of 12 in. from the gypsum wallboard joints. JNITED STATES GYPSUM CO -- DUROCK Exterior Cement Board or DUROCK Brand Cement Board

8. Laminating Adhesive\* -- (Optional, Not Shown) -- Used to bond outer layer of Cementitious Backer Units (Item 7) to inner layers of Gypsum Board (Item 4) in System D. ANSI A136.1 Type 1 organic adhesive applied with 1/4 in. square notched trowel. See Adhesives (BYWR) in the Fire Resistance Directory or Adhesives (BJLZ) in the Building Materials Directory for names of Classified companies. \*Bearing the UL Classification Mark

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Design No. U419 October 09, 2003 Nonbearing Wall Ratings -- 1, 2, 3 or 4 Hr (See Items 3 & 4)



1. Floor and Ceiling Runners -- (Not shown) -- Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min width to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max. 2. Steel Studs -- Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min width as indicated under Item 4, min 1-1/4 in. flanges and 1/4 in. return, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly

3. Batts and Blankets\* -- (Required as indicated under Item 4) -- Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 4. See Batts and Blankets (BKNV or BZJZ) Categories for names of Classified companies.

3A. Batts and Blankets\* -- (Optional) -- Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. See Batts and Blankets (BKNV or BZJZ) Categories for names of Classified companies.

4. Gypsum Board\* -- Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Wallboard Protection on Each Side of						
Rating	Min Stud Depth	No. of Layers & Thkns of Panel	Min Thkns of Insulation (item 3)			
1	3-1/2	1 layer, 5/8 in. thick	Optional			
1	2-1/2	1 layer, 1/2 in. thick	1-1/2 in.			
1	1-5/8	1 layer, 3/4 in. thick	Optional			
2	1-5/8	2 layers, 1/2 in. thick	Optional			
2	1-5/8	2 layers, 5/8 in. thick	Optional			
2	3-1/2	1 layer, 3/4 in. thick	3 in.			
3	1-5/8	3 layers, 1/2 in. thick	Optional			
3	1-5/8	2 layers, 3/4 in. thick	Optional			
3	1-5/8	3 layers, 5/8 in. thick	Optional			
4	1-5/8	4 layers, 5/8 in. thick	Optional			
4	1-5/8	4 layers, 1/2 in. thick	Optional			
4	2-1/2	2 layers, 3/4 in. thick	2 in.			

CANADIAN GYPSUM COMPANY -- 1/2 in. thick Type C, IP-X2 or IPC-AR; WRC, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX or WRC; 3/4 in. thick Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE

UNITED STATES GYPSUM CO -- 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type SCX, SHX, WRX, IP-X1, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR ; 3/4 in. thick Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE

JSG MEXICO S A DE C V -- 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX, WRC or; 3/4 in. thick Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC. 4A. Gypsum Board\* -- (As an alternate to Item 4) -- 5/8 in. thick, 2 ft. wide, tongue and groove edge, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 5. Joint covering (Item 7) not required.

CANADIAN GYPSUM COMPANY -- Type SHX. UNITED STATES GYPSUM CO -- Type SHX.

USG MEXICO S A DE C V -- Type SHX.

6). Single layer systems: 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. Two layer systems: First layer-1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer-1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer. Three-layer systems: First layer-1 in. long for 1/2 in., 5/8 in thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in thick panels, spaced 24 in. OC. Third layer-2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. Four-layer systems: First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

6. Furring Channels -- (Optional, not shown, for single or double layer systems) -- Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. Not for use with Item 4A. 6A. Steel Framing Members (Not Shown)\* -- (Optional on one or both sides, not shown, for single or double layer

a. Furring Channels -- Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 5. Not for use with Item 4A. b. Steel Framing Members\* -- Used to attach furring channels (Item 6a) to studs (Item 2). Clips spaced max. 48 in. OC.,

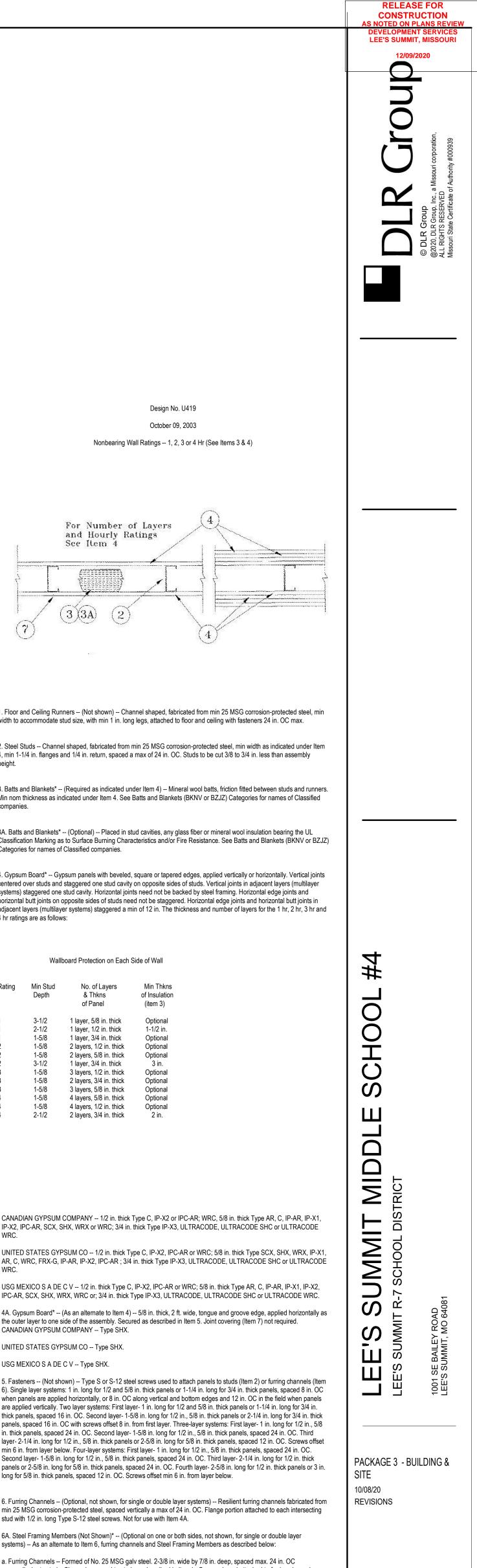
and secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips. PAC INTERNATIONAL INC -- Type RSIC-1.

heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and joint compound may be omitted when gypsum panels are supplied with a square edge.

8. Siding, Brick or Stucco -- (Optional, not shown) -- Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick

9. Caulking and Sealants\* -- (Optional, not shown) -- A bead of acoustical sealant applied around the partition perimeter for sound control. UNITED STATES GYPSUM CO -- Type AS \*Bearing the UL Classification Mark

# UL DESIGN U419

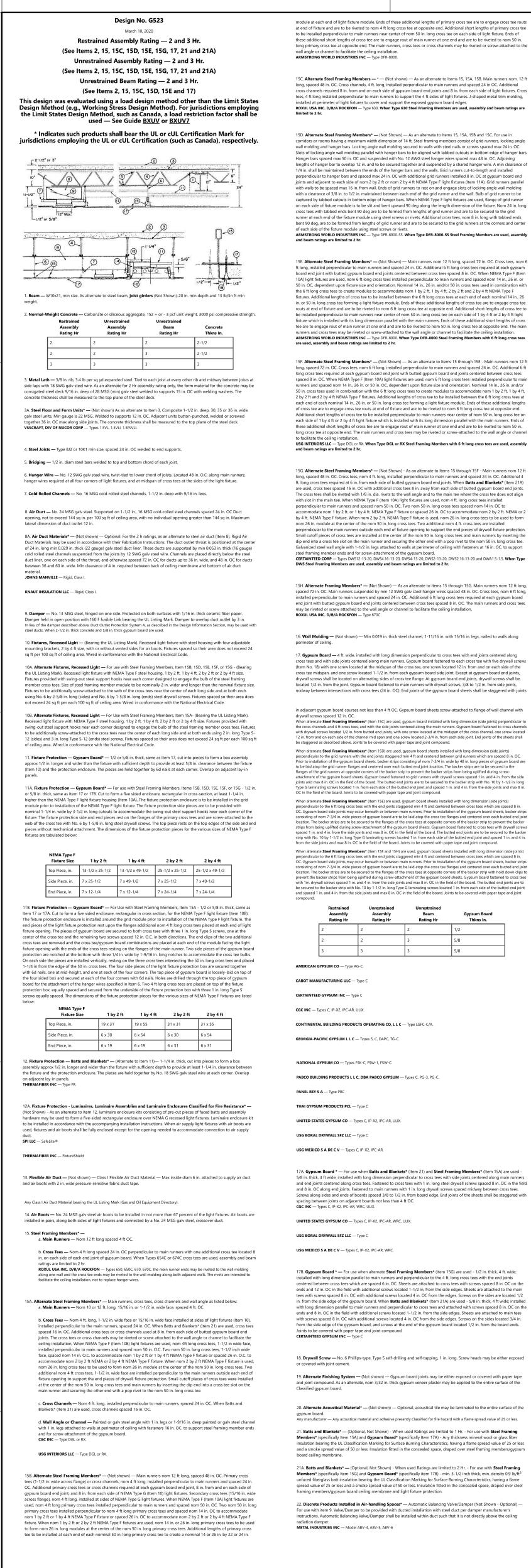


7. Joint Tape and Compound -- Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw

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UL DESIGNS

**CP1.3** 



strip with No. 10 by 1-1/2 in. long Type G laminating screws located 1 in. from each side of the butted end joint and spaced 1 in. and 4 in from the side joints and max 8 in. OC in the field of the board. Joints to be covered with paper tape and joint compound. When alternate **Steel Framing Members**<sup>4</sup> (Item 15F and 15H) are used, gypsum board sheets installed with long dimension (side joints) perpendicular to the 6 ft long cross tees with the end joints staggered min 4 ft and centered between cross tees which are spaced 8 in. OC. Sypsum board side joints may occur beneath or between main runners. Prior to installation of the gypsum board sheets, backer strips consisting of nom 7-3/4 in. wide pieces of gypsum board are to be laid atop the cross tee flanges and centered over each butted end joint location. The backer strips are to be secured to the flanges of the cross tees at opposite corners of the backer strip with hold down clips to prevent the backer strips from being uplifted during screw-attachment of the gypsum board sheets. Gypsum board fastened to cross tees with 1in. drywall screws spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board. The butted end joints are to be secured to the backer strip with No.10 bu 1-12/k in. Ion Twe G lamingting screws located 1 in. from each side of the putted end joints are to prevent the backer strip with No.10 bu 1-12/k in. Ion Twe G lamingting screws located 1 in. from each side of the putted end joints are to be secured to the backer strip with No.10 bu 1-12/k in. Detected 1 in. pe secured to the backer strip with No. 10 by 1-1/2 in. long Type G laminating screws located 1 in. from each side of the butted end joint and spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board. Joints to be covered with paper tape and joint Unrestrained Beam Rating Hr Assembly Rating Hr CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C — Type LGFC-C/A.

GEORGIA-PACIFIC GYPSUM L L C — Types 5, C, DAPC, TG-C. NATIONAL GYPSUM CO — Types FSK-C, FSW-1, FSW-C. PABCO BUILDING PRODUCTS L L C. DBA PABCO GYPSUM — Types C. PG-3. PG-C.

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR, ULIX

17A. Gypsum Board \* — For use when Batts and Blankets\* (Item 21) and Steel Framing Members\* (Item 15A) are used -5/8 in. thick, 4 ft wide; installed with long dimension perpendicular to cross tees with side joints centered along main runner.

Gypsum Board

Thkns In.

and 8 in. OC along end joints. Fastened to main runners with 1 in. long drywall screws spaced midway between cross tees Screws along sides and ends of boards spaced 3/8 to 1/2 in. from board edge. End joints of the sheets shall be staggered with spacing between joints on adjacent boards not less than 4 ft OC. **CGC INC** — Types C, IP-X2, IPC-AR, WRC, ULIX.

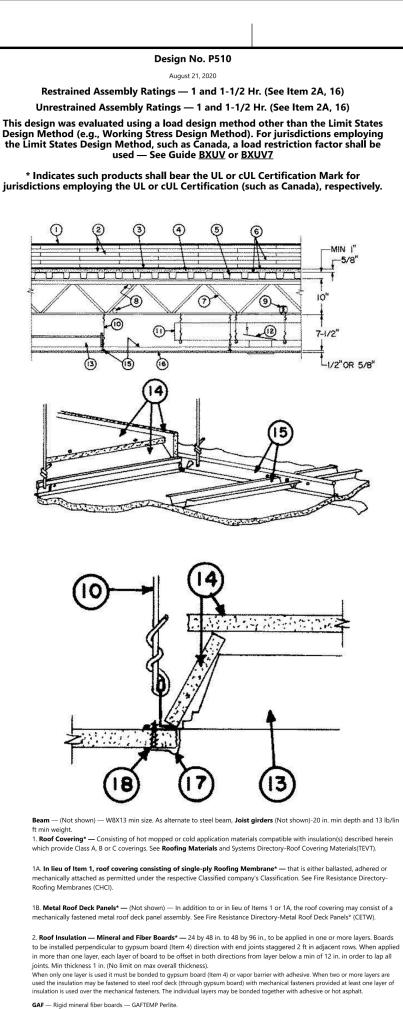
17B. Gypsum Board \* — For use when alternate Steel Framing Members\* (Item 15G) are used - 1/2 in. thick, 4 ft. wide; installed with long dimension parallel to main runners and perpendicular to the 4 ft. long cross tees with the end joints ntered between cross tees which are spaced 6 in. OC. Sheets are attached to cross tees with screws spaced 8 in. OC on the ends and 12 in. OC in the field with additional screws located 1-1/2 in, from the side edges. Sheets are attached to the main tees with screws spaced 8 in. OC with additional screws located 4 in. OC from the edges. Screws on the sides are located 1/2 . from the side edge of the gypsum board. When Batts and Blankets\* (Item 21A) are used - 5/8 in. thick, 4 ft wide; install with long dimension parallel to main runners and perpendicular to cross tees and attached with screws spaced 8 in. OC on th ends and 8 in. OC in the field with additional screws located 1-1/2 in. from the side edges. Sheets are attached to main tees ends and only Oc in the field with additional screws located 1-1/2 in from the side edges. Strews on the side located 3/4 in with screws spaced 8 in. Oc with additional screws located 4 in. OC from the side edges. Screws on the side located 3/4 in from the side edge of the gypsum board, and screws at the end of the gypsum board located 1/2 in. from the board ends. s to be covered with paper tape and joint compound.

18. Drywall Screw — No. 6 Phillips-type, Type S self-drilling and self-tapping, 1 in. long. Screw heads may be either exposed 19. Alternate Finishing System — (Not shown) — Gypsum board joints may be either exposed or covered with paper tape and joint compound. As an alternate, nom 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of the 20. Alternate Acoustical Material\* — (Not shown) — Optional, acoustical tile may be laminated to the entire surface of the

nanufacturer — Any acoustical material and adhesive presently Classified for fire hazard with a flame spread value of 25 or less 21. Batts and Blankets\* — (Optional, Not Shown) - When used Ratings are limited to 1 Hr. - For use with Steel Framing Members\* (specifically Item 15A) and Gypsum Board\* (specifically Item 17A) - Any thickness mineral wool or glass fiber insulation bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less nd a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over steel framing members/gypsur

21A. Batts and Blankets\* — (Optional, Not Shown) - When used Ratings are limited to 2 Hr. - For use with Steel Framing Members\* (specifically Item 15G) and Gypsum Board\* (specifically item 17B) - min. 3-1/2 inch thick, min. density 0.9 lb/ nfaced fiberglass batt insulation bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over steel framing members/gypsum board ceiling membrane and light fixture protection 22. Discrete Products Installed in Air-handling Spaces\* — Automatic Balancing Valve/Damper (Not Shown - Optional) For use with item 9. Valve/Damper to be provided with ducted installation with steel duct per damper manufacture instructions. Automatic Balancing Valve/Damper shall be installed within duct such that it is not directly above the ceiling

L DESIGN G523



### JOHNS MANVILLE — Rigid mineral fiber boards. ROCKWOOL — MonoBoard™, MonoBoard™ Plus, "MonoBoard Plus S", TopRock®DD, TopRock® DD Plus or TopRock DD Plus S. SOPREMA INC — SopraRock ® DD and SopraRock ® DD Plus. 2A. Foamed Plastic\* — As an alternate to Item 2, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in e applied in one or more layers. Min thickers is 1.2 in. for the 1 h ratings and 2.0 in. for the 1-1/2 h ratings. No limit on coverall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. When applied in more nan one layer, each layer to be offset in both directions from layer below a min of 6 in. in order to lap all joints. ATLAS ROOFING CORP — ACFoam II, Tapered ACFoam II, ACFoam II, NH, Tapered ACFoam II, NH, ACFoam III, ACFoam III, NH, Tapered

MULE-HIDE PRODUCTS CO INC - POLY ISO 2 CARLISLE SYNTEC SYSTEMS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — Types HP, HP-H, HP-N, HP-W. DOW ROOFING SYSTEMS L L C — "Dow Termico Polyisocyanurate Insulation", "Dow Termico ISO 3000 Insulation", "Dow Termico ISO IRESTONE BUILDING PRODUCTS COLLC --- "ISO 95+ GL", "ISO 95+ FK", "ISO 95+ CAN", "ISO 95+ GL NH", "ISOGARD HD Composite Board", "RESISTA", "ISOGARD GL", "ISOGARD CG".  $\textbf{GAF} - \textbf{EnergyGuard}^{\text{\tiny M}}, \textbf{EnergyGuard}^{\text{\tiny M}} \text{ RA, EnergyGuard}^{\text{\tiny M}} \text{ NH}.$ When EnergyGuard™ or EnergyGuard™ NH are used, all ratings are reduced by 1/2 hr. When the ground a thr are equilable and an energy of the second and the second of the second and the second MULE-HIDE PRODUCTS CO INC — Poly ISO 1, Tapered Poly ISO 1, Poly ISO 1-DWD, Tapered Poly ISO 1-DWD, Poly ISO 1-HD, Poly ISO 1-

Spi AGF, Tapered ENRGY 3 25 EIRKGY 3, Tapered ENRGY 3, Tapered ENRGY 3 CB, ENRGY 3 CGF, Tapered ENRGY 3 AGF, ENRGY 3 CGF, Tapered ENRGY 3 CGF, Tapered ENRGY 3 CGF, Tapered ENRGY 3 CGF, Tapered SPI AGF, ENRGY 3 CGF, Tapered ValuTherm, ValuTherm 25 psi, Tapered ValuTherm 25 psi, ValuTherm AGF, Tapered ValuTherm AGF, Tapered ValuTherm 25 psi AGF, ValuTherm 25 psi AGF, ValuTherm 25 psi AGF, Tapered ValuTherm 25 psi AGF, ValuTherm 25 psi LOADMASTER SYSTEMS INC — Loadmaster Polyisocyanurate Insulation. MARTIN FIREPROOFING CORP — "Perform-A-Deck I" RMAX, A BUSINESS UNIT OF SIKA CORPORATION — Multi-Max-3, Multi-Max FA-3, Ultra-Max, Ultra-Max Plus, Tapered Ultra-Max Plus, IKA SARNAFIL INC — Sarnatherm-R Insulation, Sarnatherm-R CG Insulation, Sarnatherm-R Tapered Insulation, Sarnatherm-R CG SOPREMA INC — Sopra-ISO s, Sopra-ISO s Tapered, Sopra-ISO+ s, Sopra-ISO+ s Tapered, Sopra-ISO H+ s, Sopra-ISO H+ s Tapered. TREMCO INC — Trisotech G, Trisotech CGF 2B. Roof Insulation-Foamed Plastic\* — Alternate to Items 2 through 2A. Any thickness polystyrene foamed plastic insulation

earing the UL Classification Marking, having a density of 2.5 pcf max, installed on top of min 1 in. thick Mineral an

iber Boards (Item 2) and covered with either the Built-Up Roof Covering (Item 1) or single-ply roofing membrane (Item 1A)

JOHNS MANVILLE — Nailboard.

SOPREMA INC — Sopra-ISO CV s.

JOHNS MANVILLE — Fesco-Foam

oetween layers offset min 6 ir

THE DOW CHEMICAL CO

IRESTONE BUILDING PRODUCTS CO L L C — ISO 95+ Wood Fiberboard Composite

THE DOW CHEMICAL CO

OPREMA INC

OHNS MANVILLE — ENRGY 3 25, ENRGY 3, Tapered ENRGY 3, Tapered ENRGY 3 25 psi, ENRGY 3 AGF, Tapered ENRGY 3 AGF, ENRGY 3

See Foamed Plastic\* (BRYX) category in the Building Materials Directory or Foamed Plastic\* (CCVW) category in the Fire ctory for list of Classified companies. 2C. Building Units — As an alternate to Items 2 through 2B, polyisocyanurate foamed plastic insulation boards, nom. 48 by 4 or 96 in., faced on the top surface with oriented strand board or plywood. Min. thickness of the polyisocyanurate core is 1.2 in for the 1 hr. ratings and 2.0 for the 1-1/2 hr. ratings. No limit on max overall thickness. Boards to be installed with end joints staggered a min. of 6 in. in adjacent rows. ATLAS ROOFING CORP — ACFoam NailBase Insulation, ACFoam Nail Base Insulation NH, Vented-R, ACFoam CrossVent, ACFoam Nail Base Insulation, ACFoam III Nail Base Insulation NH, ACFoam III CrossVent, ACFoam III CrossVent NH HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — H-Shield-NB, H-Shield-NB NH FIRESTONE BUILDING PRODUCTS CO L L C — Hailgard, "ISOGARD HG

2D. Building Units\* — As an alternate to Items 2 through 2C, polyisocyanurate foamed plastic insulation boards, min hickness of 1.2 in. for 1 hr ratings and 2.0 in. for the 1-1/2 hr ratings, nom 48 by 48 or 96 in. faced on both sides with mineral ards to be installed with end joints. Staggered a min of 6 in. in adjacent rows 2E. Building Units\* — As an alternate to Items 2 through 2D, polyisocyanurate foamed plastic insulation boards faced on the underside (or both sides) with mineral fiber board. Min thickness of the polyisocyanurate core is 1.2 in. for the 1 hr ratings and 2.0 in. for the 1-1/2 hr ratings. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. Adhesive (Item 3) may be applied between the building units and the vapor retarder (or gypsum board (Item ) if vapor retarder is not used). ATLAS ROOFING CORP — AC Foam II Composite/Perlite, ACFoam Tapered Composite/Perlite

FIRESTONE BUILDING PRODUCTS CO L L C — "ISO 95+ Composite" F. Building Units\* — As an alternate to Items 2 through 2E, polyisocyanurate foamed plastic insulation boards faced on the inderside with wood fiber board. Min thickness of the polyisocyanurate core is 1.2 in. for the 1 hr ratings and 2.0 in. for the 1 1/2 hr ratings. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacen ATLAS ROOFING CORP — AC Foam II Composite/Wood Fibe

JOHNS MANVILLE — ENRGY-2 Plus. 2G. Foamed Plastic\* — As an alternate to Items 2 through 2F, extruded polystyrene foamed plastic insulation boards to be placed on top of Roofing Membrane\* (Item 1A). Min thickness is 2 in. Max thickness is 8 in. Foamed plastic boards to be covered with crushed stone on concrete pavers at a rate of 10 psf, min. 2H. Foamed Plastic\* — As an alternate to Items 2 through 2G (for 1 hr. ratings only). Extruded polystyrene foamed plasti poards to be installed in one or more layers over gypsum board (Item 4). Joints of gypsum board to be covered with 4 in. wide foil tape. Min thickness is 1 in. when a min 1/2 in. thick layer of mineral and fiber board (Item 2) is installed on top of the plastic. Min thickness is 3 in. when the mineral and fiber board (Item 2) is omitted. No limit on max thickness. All joints 21. Building Units\* — Not Shown — As an alternate to Items 2 through 2H, composite polyisocyanurate foamed plasti insulation board with an adhered nailing surface, nom 48 by 48 or 96 in. may be used the following limitations. These composite building units have ventilation slots internal to the panels. The thickness of the panel depends upon the thinnest portion of the polyisocyanurate insulation. The following dimensions apply to the polyisocyanurate insulation; min. thickness i in. for the 1 hr ratings and 2.0 in. for the 1-1/2 in. ratings. There is no limit on the maximum insulation thickness.

JOHNS MANVILLE — Type ISO-VENT. 2J. Building Units\* — As an alternate to Items 2 through 2I, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 aced on the top surface with gypsum board. Min thickness of the polyisocyanurate core is 1.2 in for 1 hr ratings a 2.0 in. for the 1-1/2 hr ratings. No limit on overall thickness. Boards to be installed with end joints staggered a min of 6 in. in JOHNS MANVILLE - ENRGY 2 Gypsum Composite 2K. Foamed Plastic\* — Optional - Used in addition to the foam insulation required to achieve fire rating:

2Ka. Foamed Plastic\* — Optional - (Not Shown) - Maximum 1 in. thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofi system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both FIRESTONE BUILDING PRODUCTS CO L L C — "ISOGARD HD" or "ISOGARD HD Composite Board" 2Kb. Foamed Plastic\* — Optional — (Not Shown) — Maximum 5/8 inch thick polyisocyanurate foamed plastic insulatio boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any oofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — "Ultra-Max HD" SIKA SARNAFIL INC — "Sarnatherm Roof Board-I 2Kc. Foamed Plastic\* — Optional — (Not Shown) — Maximum 1/2 inch thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of an roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset

2Kd. Building Units\* — Optional — (Not Shown) — Maximum 1 inch thick polyisocyanurate foamed plastic insulation boar nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing m described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both ATLAS ROOFING CORP — ACFoam HD CoverBoard and ACFoam CoverBoard FR

2L. Building Units\* — As an alternate to Item 2, polyisocyanurate foamed plastic insulation boards, nom. 48 by 48 or 96 in. faced on the top surface with wood fiber board. Min. thickness of the polyisocyanurate core is 1.2 in. for the 1 hr. ratings and 2.0 for the 1-1/2 hr. ratings. No limit on max overall thickness. Boards to be installed with end joints staggered a min. of 6 in. in CARLISLE SYNTEC SYSTEMS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC - Polyiso HP-H Composite NH HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — H-Shield-WF, H-Shield-WF NH

2M. Building Units\* — As an alternate to Item 2, polyisocyanurate foamed plastic insulation boards, nom. 48 by 48 or 96 in., and 2.0 for the 1-1/2 hr. ratings. No limit on max overall thickness. Boards to be installed with end joints staggered a min. of 6 R PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — H-Shield-P, H-Shield-RP, H-Shield-P NH, H-Shield-

2N. Building Units\* — As an alternate to Item 2, polyisocyanurate foamed plastic insulation boards, nom, 48 by 48 or 96 in., the top surface with glass mat faced gypsum panel. . Min. thickness of the polyise ratings and 2.0 for the 1-1/2 hr. ratings. No limit on max overall thickness. Boards to be installed with end joints staggered a min. of 6 in. in adjacent rows CARLISLE SYNTEC SYSTEMS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC - Polyiso HP-HDD, Polyiso HP-HDD NH HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — H-Shield-DD, H-Shield-DD NH VERSICO INC - MP-HDD, MP-HDD NH

Roof Insulation — Foamed Plastic\* — As an alternate to Items 2 — Polyurethane foamed plastic roof insulation ormed by the simultaneous spraying of two liquid components applied over gypsum wallboard (item 4) in accordance with the manufacturer's instructions. Min thickness is 1.2 in. for the 1 h ratings and 2.0 in. for the 1-1/2 h ratings. No limit on max BASF CORP — Types FE348-2.5, FE348-2.8, FE348-3.0, ELASTOSPRAY 81255, ELASTOSPRAY 81285, ELASTOSPRAY 81305, SKYTITE C

BASF CORP — Elastospray 5100-2.0, Elastospray 5100-2.5, Elastospray 81302, Elastospray 81272, Elastospray Alpha System, Elastospray 3. Sheathing Material\* — (Optional) — Vinyl-film vapor barrier, applied with adhesive to gypsum board (Item 4). Adjacent 8A. Sheathing Material\*— (Optional)— In lieu of Item 3, a self-adhered rubberized asphalt roofing underlayment membr which may be placed on top of the gypsum board (Item 4) or on the roof insulation (Item 2 or any non-polystyrene foamed plastic insulation covered as an alternate to Item 2). SCP APPLIED TECHNOLOGIES INC — Grace Ice and Water Shield, Grace Ice and Water Shield-HT®, Grace Select, Grace Ultra, and Grace

4. Gypsum Board — (Classified or unclassified) — Supplied in sheets nom 2 by 4 ft to 4 by 12 ft, by nom 5/8 in. thick. Min .0 psf. Applied perpendicular to steel roof deck direction with adhesive. End joints to occur over crests of steel roof deck with end joints staggered 2 ft in adjacent rows. See Gypsum Board (CKNX) category for names of manufacturers. 5. Steel Roof Deck — Min 1 in, deep, 25 in, wide, fluted galv steel deck. Min 0.023 in, thick (24 gauge). Flutes approx 4 in. OC, sts approx 2-3/4 in, wide, Welded to supports with welding washers 12 in. OC. Side laps of adjacent units welded or secure ether with No. 12 by 1/2 in. self-drilling, self-tapping steel screws midway between steel joists; or, Classified Steel Floor

and Form Units\* min. 1-1/2 in. deep, 24 or 36 in. wide, galv steel units. Min gauge is 22 MSG. Welded to supports with

welding washers 12 in. OC. Side laps of adjacent units welded or secured together with No. 12 by 1/2 in. self-drilling, self-CANAM STEEL CORP — Type P-3606 or P-3615 GOODER HENRICHSEN CO. — Type B.

MARLYN STEEL DECKS INC - Types B, EF, F, HF.

VERSICO INC — MP-HWF NH, WeatherBond XP-WF NH

NEW MILLENNIUM BUILDING SYSTEMS L L C — Types B, BI, F, 1.0RD, N, NW32, and NW32I. Units may be phos/painted or galvanized. VALLEY JOIST+DECK — Types F, B, Bl. VULCRAFT, DIV OF NUCOR CORP — Types 1.0E, 1.5A, 1.5B, 1.5BI, 1.5PLB, 1.5F, 3.0N, 3.0NI, 3.0PLN, 3NL-32, 3NL-32, 3PLN-32; Types BW, B High Strength, BW High Strength, N, TF-75, TF-150, TV-75, TF S3, TV S3.

6. Adhesive\* — Applied between crests of steel roof deck and gypsum board (Item 4) in 1/2 in. wide ribbons 8 in. OC at 0.4 gal per 100 sq ft. Applied in 1/2 in. wide ribbons 6 in. OC, at 0.4 gal per 100 sq ft, between gypsum board and vapor barrier and between vapor barrier and mineral and fiber boards, or directly between gypsum boards and roof insulation when vapor tted. May also be applied at the same rate between layers of roof insulation 6A. Mechanical Fasteners - (Not shown) - Any steel nail or steel clip type fastener with metal or plastic washer designed for the purpose, may be used to attach one or more layers of insulation to steel roof deck (through gypsum board). 6B. Hot Asphalt or Coal Tar Pitch — (Not shown) — May be used as an alternate to adhesive between layers of roof at a rate not to exceed 35 lb per 100 sq ft. 7. Steel Joists — Type 10J4 or 12K3 min size. As an alternate, LH-Series steel joists spanning no greater than 60 ft. may be used. For spans greater than 60 ft. LH-Series joists may be used provided that their vertical deflection under published total load shall not be greater than 1/244 of the joist span. Joists may be spaced a max 72 in. OC and welded to end supports 8. Bridging — Steel angles or bars, min 1/2 in. diam, welded to top and bottom chords of each joist. 9. Cold Rolled Channels — For joist spacings max 48 in, OC, min 0.053 in, thick (16 gauge) painted cold-rolled steel channel 2 in. deep with 9/16 in. flanges. For joist spacings greater than 48 in. O.C. but not more than 72 in., min 0.0 gauge) painted cold rolled steel channels, 2 in, deep with 1-1/8 in, flanges. Two channels tied back to back with 18 SWG gal steel wire 48 in. OC and wire-tied to top of joist bottom chord. Channels spaced as required to provide attachment provision for ceiling hanger wires. 10. Hanger Wire — No. 12 SWG galv steel wire tied to lower chord of joists or cold-rolled channels tied face to face with 18 SWG galv wire. Hanger wires spaced not over 48 in. OC, along main runners and located at ends of main runners at walls and at corners and midspan along 4 ft sides of light fixture

ceiling area. Area of ind duct opening not to exceed 113 sq in. Max dimension of opening 12 in. Duct supported by cold-rolled channels, spaced approx 24 in. OC. 12. Damper — Min. 0.056 in. thick (16 gauge) galv steel, 16 by 16 in. protected on both surfaces with 1/16 in. thick ceramic fiber paper and held open with a Fusible Link. (Bearing the UL Listing Mark.) Damper to overlap duct outlet 1 in. min. 13. Fixtures, Recessed Light — (Bearing the UL Listing Mark) — Recessed light fixture with steel housing, 2 by 4 ft size. Fixtures spaced so their area does not exceed 24 sq ft per 100 sq ft of ceiling area. Wired in conformance with the National Electrical Code. Fixtures and ballasts must be considered for these ambient temperature conditions before installation 3A. Alternate Fixtures, Recessed Light — For Use with Steel Framing Members, Item 15B, 15D, 15E, 15F, or 15G - (Bearing the UL Listing Mark). Recessed light fixture with NEMA Type F steel housing, 1 by 2 ft, 1 by 4 ft, 2 by 2 ft or 2 by 4 ft s Fixtures provided with swing-out steel support hooks near each corner designed to engage the bulb of the steel framin Produces provided with swing-out steer support nooks hear each come designed to engage the object of the steer naming member cross tees. Size of steel framing member module to be nominally 2 in, wider and longer than the nominal fixture s Fixtures to be additionally screw-attached to the web of the cross tees near the center of each long side and at both ends using No. 6 by 2-5/8 in long (sides) and No. 6 by 1-5/8 in long (ends) steel drywall screws. Fixtures spaced so their area does not exceed 24 sq ft per each 100 sq ft of ceiling area. Wired in conformance with the National Electrical Code. 13B. Alternate Fixtures, Recessed Light — For Use with Steel Framing Members, Item 15- (Bearing the UL Listing Marl Recessed light fixture with NEMA Type F steel housing, 1 by 2 ft, 1 by 4 ft, 2 by 2 ft or 2 by 4 ft size. Fixtures provided with

1. Air Duct — Min 0.034 in. thick (20 gauge) galv steel. Total area of duct openings not to exceed 57 sq in. per 100 sq ft o

swing-out steel support hooks near each corner designed to engage the bulb of the steel framing member cross tees. Fixtures to be additionally screw-attached to the cross tees near the center of each long side and at both ends using 2 in. long Type S-12 (sides) and 3 in. long Type S-12 (ends) steel screws. Fixtures spaced so their area does not exceed 24 sq ft per each 100 sq ft of ceiling area. Wired in conformance with the National Electrical Code. 14. Fixture Protection-Gypsum Board\* — 1/2 or 5/8 in. thick, same as Item 16, 16A or 16B. Cut into pieces to form a five enclosure for the fixture (Item 13), trapezoidal in cross section, approx 1/2 in. longer and wider than the fixture with sufficient depth to provide at least 1/2 in. clearance between the fixture and enclosure. 14A. Fixture Protection — Gypsum Board\* — For Use with Steel Framing Members, Item 15B, 15D, 15E, 15F, or 15G - 5/8 in. thick, same as Item 16, 16A, 16B, or 16C. Cut to form a five sided enclosure, rectangular in cross-section, at least 1-1/4 in. higher than the NEMA Type F light fixture housing (Item 15A). The fixture protection enclosure is to be installed in the grid nodule prior to installation of the NEMA Type F light fixture. The fixture protection side pieces are to be provided with nominal 1-1/4 in. wide by 3-1/2 in. long actouts to accommodate the swing-out steel support hooks near each corner of the fixture. The fixture protection side and end pieces rest on the flanges of the primary cross tees and are screw-attached to the web of the cross tee with No. 6 by 1-5/8 in, long steel drywall screws. The top piece rests on the top edges of the side and end protection pieces for the various sizes of NEMA Type fixtures are tabulated below:

 
 Fixture Size
 1 by 2 ft
 1 by 4 ft
 2 by 2 ft
 2 by 4 ft

 Top Piece, in.
 13-1/2 x 25-1/2
 13-1/2 x 49-1/2
 25-1/2 x 25-1/2
 25-1/2 x 49-1/2
 Side Piece, in. 7 x 25-1/2 7 x 49-1/2 7 x 25-1/2 7 x 49-1/2 
 End Piece, in.
 7 x 12-1/4
 7 x 12-1/4
 7 x 24-1/4
 7 x 24-1/4

14B. Fixture Protection — Gypsum Board\* — For Use with Steel Framing Members, Item 15 - 1/2 or 5/8 in. thick, sam Item 16 or 16B. Cut to form a five sided enclosure, rectangular in cross section, for the NEMA Type F light fixture (Item 13E The fixture protection enclosure is installed around the grid module prior to installation of the NEMA Type F light fixture. The end pieces of the light fixture protection rest upon the flanges additional nom 4 ft long cross tees placed at each end of light fixture opening. The pieces of gypsum board are secured to both cross tees with three 1 in. long Type S screws, one at the enter of the cross tee and the remaining two screws spaced 12 in. O.C. in both directions. The end clips of the two additiona oss tees are removed and the cross tee/gypsum board combinations are placed at each end of the module facing the ligh fixture opening with the ends of the cross tees resting on the flanges of the main runner. Two side pieces of the gypsum board protection are notched at the bottom with three 1/4 in. wide by 1-9/16 in. long notches to accommodate the cross tee bulbs. On each side the pieces are installed vertically, resting on the three cross tees intersecting the 50 in. long cross tees and placed I/4 in from the edge of the 50 in. cross tees. The four side pieces of the light fixture protection box are secured togethe with 6d nails, one at mid-height, and one at each of the four corners. The top piece of gypsum board is loosely-laid on top the four sided box and secured at each of the four corners with 6d nails. Holes are drilled through the top piece of gypsum board for the attachment of the hanger wires specified in Item 9. Two 4 ft long cross tees are placed on top of the fixtur protection box, equally spaced and secured from the underside of the fixture protection box with three 1 in. long Type S screws equally spaced. The dimensions of the fixture protection pieces for the various sizes of NEMA Type F fixtures are listed 
 1 by 2 ft
 1 by 4 ft
 2 by 2 ft
 2 by 4 ft

 19 x 31
 19 x 55
 31 x 31
 31 x 55

 6 x 30
 6 x 54
 6 x 30
 6 x 54

 6 x 19
 6 x 19
 6 x 31
 6 x 31
 Fixture Size Top piece, in.

le pieces, in 15. Steel Framing Members\* — Main runners, cross tees, cross channels and wall angle as listed below: a. Main Runners — Nom 10 or 12 ft. long, 15/16 in. or 1-1/2 in. wide face, spaced 4 ft. OC. b. Cross Tees — Nom 4 ft. long, 1-1/2 in. wide face or 15/16 in. wide face installed at sides of light fixtures (Item 13' nstalled perpendicular to the main runners, spaced 24 in. OC. When Batts and Blankets\* (Item 21) are used, cross te spaced 16 in. OC. Additional cross tees or cross channels used at 8 in. from each side of butted gypsum board end joints. The cross tees or cross channels may be riveted or screw attached to the wall angle or channel to facilitate th iling installation. When NEMA Type F (Item 13B) light fixtures are used, nom 4ft long cross tees, 1-1/2 in wide face installed perpendicular to main runners and spaced nom 50 in. O.C. Two nom 50 in. long cross tees, 1-1/2 inch wide face, spaced nom 14 in. O.C. to accommodate nom 1 by 2 ft or 1 by 4 ft NEMA Type F fixture or spaced 26 in. O.C. to commodate nom 2 by 2 ft NEMA or 2 by 4 ft NEMA Type F fixture. When nom 2 by 2 ft NEMA Type F fixture is use nom 26 in. long cross tees to be used to form nom 26 in. module at the center of the nom 50 in. long cross tees. Two additional nom 4 ft cross tees, 1-1/2 in, wide face are installed perpendicular to the main runners outside each end o

ture opening to support the end pieces of drywall fixture protection. Small cutoff pieces of cross tees were instal

at the center of the nom 50 in. long cross tees and main runners by inserting the dip end into a cross tee slot on the main runner and securing the other end with a pop rivet to the nom 50 in. long cross tee. c. Cross Channels - Nom 4 ft. long, installed perpendicular to main runners, spaced 24 in. OC. When Batts and Blankets\* (Item 21) are used, cross channels spaced 16 in. C d. Wall Angle or Channel - Painted or galv steel angle with 1 in. legs or 1-9/16 in. deep painted or galv steel channel with 1 in leas attached to walls at perimeter of ceiling with fasteners 16 in QC, to support steel framing member ends t of the gypsum board. CGC INC — Type DGL or RX.

15A. Alternate Steel Framing Members\* — (Not shown) — Main runners nom 12 ft long spaced 48 in. OC. Cross tees non ft long installed perpendicular to main runners and spaced 24 in. OC. Additional cross tees located 8 in. from and on both ROXUL USA INC. D/B/A ROCKFON - Types 650, 650C, 670, 670C 15B. Alternate Steel Framing Members\* — (Not shown) — As an alternate to Items 15 and 15A. Main runners nom 12 ft

USG INTERIORS LLC — Type DGL or RX.

long, spaced 48 in. OC. Primary cross tees (1-1/2 in. wide across flange) or cross channels, nom 4 ft long, installed perpendicular to main runners and spaced 24 in. OC. Additional primary cross tees or cross channels required at each gypsu board end joint. 8 in, from and on each side of gypsum board end joint, and 8 in, from each side of NEMA Type G (Item 13) xtures. Secondary cross tees (15/16 in. wide across flange), nom 4 ft long, installed at sides of NEMA Type G light fixtures. When NEMA Type F (Item 13A) light fixtures are used, nom 4 ft long primary cross tees installed perpendicular to runners and spaced nom 50 in. OC. Two nom 50 in. long primary cross tees installed perpendicular to nom 4 ft long primary romes and spaced nom 20 m. 20c. We form 30 m. ong pinning closs tees instance perpendicular to form 4 m closg pinning cross tees and spaced nom 14 in. OC to accommodate nom 1 by 2 ft or 1 by 4 ft NEMA Type F fixtures are use accommodate nom 2 by 2 ft or 2 by 4 ft NEMA Type F fixture. When nom 1 by 2 ft or 2 by 2 ft NEMA Type F fixtures are use nom 14 in, or 26 in, long primary cross tees to be used to form nom 26 in, long modules at the center of the nom 50 in, long primary cross tees. Additional lengths of primary cross tee to be installed at each en cross tee to create a nominal 14 or 26 in. by 22 or 24 in. module at each end of light fixture module. Ends of these additional lengths of primary cross tee are to engage cross tee routs at end of fixture and are to be riveted to nom 4 ft long cross tee ite end. Additional short lengths of primary cross tee to be installed perpendicular to main runners near center of r 50 in. long cross tee on each side of light fixture. Ends of these additional short lengths of cross tee are to engage rout of m runner at one end and are to be riveted to nom 50 in long primary cross tee at opposite end. The main runners, cross tees cross channels may be riveted or screw-attached to the wall angle or channel to facilitate the ceiling installation. **ARMSTRONG WORLD INDUSTRIES INC** — Type DFR-8000.

15C. Alternate Steel Members\* — (Not shown) — As an alternate to Items 15, 15A and 15B. For use with 1/2 in. thick gyps board only. Main runners nom 12 ft long, spaced 48 in. OC. Cross channels, 4 ft. long, installed perpendicular to main runner and spaced 24 in. OC. Additional cross channels required 8 in. from and on each side of gypsum board end joints, and 8 in rom each side of light fixtures. Cross tees, 4 ft. long installed perpendicular to main runners to support the 4 ft sides of ligh fixtures. J-shaped metal trim molding, installed at perimeter of light fixtures to cover and support the exposed gypsum boar ROXUL USA INC. D/B/A ROCKFON — Type 630.

15D. Alternate Steel Framing Members\* — (Not Shown) — As an alternate to Items 15, 15A, 15B and 15C. For use in corridors or rooms having a maximum width dimension of 14 ft. Steel framing members consist of grid runners, locking ang wall molding and hanger bars. Locking angle wall molding secured to walls with steel nails or screws spaced max 24 in. OC. Slots of locking angle wall molding parallel with hanger bars to be aligned with tabbed cutouts in bottom edge of hanger bars Hanger bars spaced max 50 in. OC and suspended with No. 12 AWG steel hanger wires spaced max 48 in. OC. Adjoining lengths of hanger bar to overlap 12 in. and to be secured together and suspended by a shared hanger wire. A min clearance 1/4 in. shall be maintained between the ends of the hanger bars and the walls. Grid runners cut-to-length and installed perpendicular to hanger bars and spaced max 24 in OC with additional grid runners installed 8 in. OC at gypsum board end joints and adjacent to each side of nom 2 by 2 ft or nom 2 by 4 ft NEMA Type F light fixtures (Item 13A). Grid runners paralle with walls to be spaced max 16 in, from wall. Ends of grid runners to rest on and engage slots of locking angle wall molding with a clear access of 3/8 in to 1/2 in. maintained between each end of the grid runner and the wall. Builds of grid runner to be captured by tabbed cutouts in bottom edge of hanger bars. When NEMA Type F light fixtures are used, flange of grid runne on each side of fixture module is to be slit and bent upward 90 deg along the length dimension of the fixture. Nom 24 in. Ic cross tees with tabbed ends bent 90 deg are to be formed from lengths of grid runner and are to be secured to the grid runner at each end of the fixture module using steel screws or rivets. Additional cross tees, nom 8 in. long with tabbed ends

bent 90 deg, are to be formed from lengths of grid runner and are to be secured to the grid runners at the corners and cent

ARMSTRONG WORLD INDUSTRIES INC — Type DFR-8000-SS

E = 0.000 for 0.000 for 0.000 models and 0.000 for 0.0000 for 0.0000 for 0.0000 for 0.0000 for 0.0000 for of cross tee are to engage cross tee routs at end of fixture and are to be riveted to nom 6 ft long cross tee at opposite end. al short lengths of cross tee to be installed perpendicular to main runners near center of nom 50 in. long cross tee each side of 1 by 4 ft or 2 by 4 ft light fixture which is installed with its long dimension parallel with the main runners. Ends of these additional short lengths of cross tee are to engage rout of main runner at one end and are to be riveted to nom 50 in cross tee at opposite end. The main runners and cross tees may be riveted or screw-attached to the wall angle or channel USG INTERIORS LLC — Type DGL or RX 5G. Alternate Steel Framing Members\* — (Not Shown) — As an alternate to Items 15 through 15F - Main runners nom 1. ft. long, 1-1/2 in. wide face, spaced 4 ft. OC. Cross tees, nom 4 ft. long, installed perpendicular to the main runners, spaced 24 in. OC. Additional cross tees used at 6 in. from each side of butted gypsum board end joints. The cross tees shall be riveted with 1/8 in. dia. rivets to the wall angle and to the main tee where the cross tee does not align with slot in the main tee. When NEMA Type F (Item 13A) light fixtures are used, nom 4ft long cross tees, 1-1/2 in wide face, installed perpendicular to main runners and spaced nom 50 in. O.C. Two nom 50 in. long cross tees, 1-1/2 inch whet face, spaced nom 14 in. O.C. to accommodate nom 1 by 2 ft or 1 by 4 ft NEMA Type F fixture or spaced 26 in. O.C. to accommodate nom 2 by 2 ft NEMA or by 4 ft NEMA Type F fixture. When nom 2 by 2 ft NEMA Type F fixture is used, nom 26 in. long cross tees to be used to form in most in model at the center of the nom 5 in. Inog cross tees. Two additional nom 4 ft cross tees, 1-1/2 in. wide face are installed perpendicular to the main runners outside each end of fixture opening to support the end pieces of drywall fixture protection. Small cutoff pieces of cross tees were installed at the center of the nom 50 in. long cross tees and main runners by g the dip end into a cross tee slot on the main runner and securing the other end with a pop rivet to the nom 50 long cross tee. Wall angle is a galvanized steel angle with 1-1/2 in. legs attached to walls at perimeter of ceiling with fasteners at 16 in. OC to support steel framing member ends and for screw-attachment of the gypsum board CERTAINTEED CORP — Types DWS12-13-20, DWS4.16-13-20, DWS4-13-20, DWS2-13-20, DWS2.16-13-20 and DWA1.5-1.5 15H. Alternate Framing Members\* — (Not Shown) — As an alternate to Items 15 through 15G. Main runners nom 12 ft long, spaced 72 in. OC. Main runners suspended by min 12 SWG galv steel hanger wires spaced 48 in. OC. Cross tees, nom 6 ft long, installed perpendicular to main runners and spaced 24 in. OC. Additional 6 ft long cross tees required at each gypsum board nd joint with butted gypsum board end joints centered between cross tees spaced 8 in. OC. The main runners and cross tees o the wall angle or channel to facilitate the ceiling installation. ROXUL USA INC. D/B/A ROCKFON — Type 670C 6. Gypsum Board\* — (For use with steel framing members described in Items 15 and 15C)— 1/2 and 5/8 in. thick, 4 ft wide alled with long dimension perpendicular to cross channels with side joints centered along main runners. Gypsum board: astened to cross channels with 1 in. long drywall screws located 1/2 in. from end joints and 1-3/4 in. from each side joint and paced 12 in. C along the end joints and in the field. End joints of adjacent gypsum board sheets shall be staggered not less nan 2 ft. Gypsum board sheets screw-attached to leg of wall angle with drywall screws spaced 12 in. OC. hen alternate Steel Framing Members\* (Item 15C) are used, gypsum board installed with long dimension (side joints) perpendicular to e cross channels and 4 ft cross tees, and with the side joints centered along the main runners. Gypsum board fastened to cross channels vall screws located 1/2 in. from butted end joints, with one screw located at the n n and on each side of the channel midspan, and one screw located 2-3/4 in. from each side joint. End joints of the sheets shal When alternate Steel Framing Members\* (Item 15D) are used, gypsum board sheets installed with long dimension (side joints) rpendicular to the grid runners with the end joints staggered min 4 ft and centered between grid runners which are spaced 8 in. OC. ior to installation of the gypsum board sheets, backer strips consisting of nom 7-3/4 in. wide by 48 in. long pieces of gypsum board ar be laid atop the grid runner flanges and centered over each butted end joint location. The backer strips are to be secured to the ges of the grid runners at opposite corners of the backer strip to prevent the backer strips from being uplifted during sc nent of the gypsum board sheets. Gypsum board fastened to grid runners with drywall screws spaced 1 in, and 4 pints and max 8 in. OC in the field of the board. The butted end joints are to be secured to the backer strip with No. 10 by 1-1/2 i rs located 1 in. from each side of the butted end joint and spaced 1 in. and 4 in. from the side join When alternate Steel Framing Members\* (Item 15E) are used, gypsum board sheets installed with long dimension (side joints) erpendicular to the 6 ft long cross tees with the end joints staggered min 4 ft and centered between cross tees which are spaced 8 in. C. Gypsum board side joints may occur beneath or between main runners. Prior to installation of the gypsum board sheets, backer strips of nom 7-3/4 in. wide pieces of gypsum board are to be laid atop the cross tee flanges and centered over each butted er location. The backer strips are to be secured to the flanges of the cross tees at opposite corners of the backer strip to prevent the back lifted during screw-attachment of the gypsum board sheets. Gypsum board fastened to cross tees with dry ced 1 in, and 4 in, from the side joints and max 8 in, OC in the field of the board. The butted end joints are to be secured to the ba laminating screws located 1 in. from each side of the butted end joint and spaced 1 in. and

15E. Alternate Steel Framing Members\* — (Not Shown) — As an alternate to Items 15, 15A, 15B, 15C and 15D. Main runners

tional 6 ft long cross tees required at each gypsum board end joint with butted gypsum board end joints center

ar to main runners and spaced nom 14 in., 26 in. or 50 in. OC, dependent upon fixture size and

accommodate nom 1 by 2 ft, 1 by 4 ft, 2 by 2 ft and 2 by 4 ft NEMA Type F fixtures. Additional lengths of cross tee to be

fixture module. Ends of these additional lengths of cross tee are to engage cross tee routs at end of fixture and are to be

lled between the 6 ft long cross tees at each end of each nominal 14 in., 26 in. or 50 in. long cross tee forming a li

riveted to nom 6 ft long cross tee at opposite end. Additional short lengths of cross tee to be installed perpendicular to mair

Trunners near center of nom 50 in. long cross tee on each side of 194 for 2 by 4 for 2 by 4 for 2 by 4 for is installed with its long dimension parallel with the main runners. Ends of these additional short lengths of cross tee are to engage rout of main

runner at one end and are to be riveted to nom 50 in. long cross tee at opposite end. The main runners and cross tees may be

15F. Alternate Steel Framing Members\* — (Not Shown) - As an alternate to Items 15 through 15E - Main runners nom 12 ft

ng, spaced 72 in. OC. Cross tees, nom 6 ft long, installed perpendicular to main runners and spaced 24 in. OC. Additional 6 ft

ing cross tees required at each gypsum board end joint with butted gypsum board end joints centered between cross tees

baced 8 in. OC. When NEMA Type F (Item 13A) light fixtures are used, nom 6 ft long cross tees installed perpendicular to ma

runners and spaced nom 14 in., 26 in. or 50 in. OC, dependent upon fixture size and orientation. Nominal 14 in., 26 in. and/o

50 in, cross tees used in combination with the 6 ft long cross tees to create modules to accommodate nom 1 by 2 ft. 1 by 4 ft

nnel to facilitate the ceiling installation.

Nominal 14 in., 26 in. and/or 50 in. cross tees used in combination with the 6 ft long cross tees to create modules to

ARMSTRONG WORLD INDUSTRIES INC — Type DFR-8000

between cross tees spaced 8 in. OC. When NEMA Type F (Item 13A) light fixtures are used, nom 6 ft long cross tees installed

When alternate Steel Framing Members\* (Item 15F and 15G) are used, gypsum board sheets installed with long dimension (side joints) erpendicular to the 6 ft long cross tees with the end joints staggered min 4 ft and centered between cross tees which are spaced 8 in. KC. Gypsum board side joints may occur beneath or between main runners. Prior to installation of the gypsum board sheets, backer strips g of nom 7-3/4 in. wide pieces of gypsum board are to be laid atop the cross tee flanges and centered over each butted end ation. The backer strips are to be secured to the flanges of the cross tees at opposite corners of the backer strip with hold down clips to vent the backer strips from being uplifted during screw-attachment of the gypsum board sheets. Gypsum board fastener 1 in, drywall screws spaced 1 in, and 4 in, from the side joints and max 8 in, OC in the field of the board. The butted end join o the backer strip with No. 10 by 1-1/2 in. long Type G laminating screws located 1 in. from each side of the butted end Restrained Unrestrained Assembly Thkns Rating Hr Rating Hr AMERICAN GYPSUM CO — Type AG-C. CABOT MANUFACTURING ULC — Type C

CERTAINTEED GYPSUM INC - Type

CGC INC — Types C, IP-X2, IPC-AR, ULIX. CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C — Type LGFC-C/A. GEORGIA-PACIFIC GYPSUM L L C — Types 5, DAPC, TG-C

NATIONAL GYPSUM CO — Types FSK-C, FSW-C. PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type C or PG-PANEL REY S A — Type PRC

THAI GYPSUM PRODUCTS PCL - Type O UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR, ULIX

USG BORAL DRYWALL SFZ LLC — Type O USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR.

16A Gynsum Board\* — (For use with steel framing members described in Item 15A) — 1/2 and 5/8 in thick 4 ft wide endicular to cross tees with side joints centered along main runners. Gypsum board fastened to each cross tee with five drywall screws with one screw located at the midspan of the cross tee, one screw locate la in from and on each side with the drywin sclens with the sclene hocated at the midspart of the close tee, the sclene hocated J2 in from and on each side of the cross tee midspart, and one screw located 1-1/2 in from each gypsum board side joint. Except at gypsum board end joints, drywall screws shall be located on alternating sides of cross tee flange. At gypsum board end joints, drywall screws shall be located 1/2 in. from the joint. Gypsum board fastened to main runners with drywall screws '2 in. from side joints, midway between intersections with cross tees (24 in. OC). End joints of adjacent gypsum board shee shall be staggered not less than 4 ft OC. Gypsum board sheets screw-attached to leg of wall angle with drywall screws spaced

Restrained Unrestrained Gypsum Board Thkns Assembly Assembly Rating Hr Rating Hr 1-1/2 hr

AMERICAN GYPSUM CO — Types AG-C, AGX-CERTAINTEED GYPSUM INC - Type C

CGC INC — Types C, IP-X2, IPC-AR, ULIX. CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C — Type LGFC-C/A.

GEORGIA-PACIFIC GYPSUM L L C — Types 5, DAPC, TG-C. NATIONAL GYPSUM CO — Types FSK-C, FSW-C

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Types C, PG-C.

PANEL REY S A — Type PRO THAI GYPSUM PRODUCTS PCL — Type O

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR, ULIX USG BORAL DRYWALL SFZ LLC — Type C

USG MEXICO S A DE C V — Type C, IP-X2 or IPC-AR. 58. Gypsum Board\* — For use when Batts and Blankets\* (Item 21) and Steel Framing Members\* (Item 15) are used - 5/8 in. thick, 4 ft wide; installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Fastened to cross tees with 1 in, long steel drywall screws spaced 8 in. OC in the field and OC along end joints. Fastened to main runners with 1 in. long drywall screws spaced midway between cross tees. Screw along sides and ends of boards spaced 3/8 to 1/2 in. from board edge. End joints of the sheets shall be staggered with spacing en joints on adjacent boards not less than 4 ft OC. CGC INC — Types C, IP-X2, IPC-AR, ULIX.

UNITED STATES GYPSUM CO - Types C, IP-X2, IPC-AR, ULIX USG BORAL DRYWALL SFZ LLC — Type C USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR.

16C. Gypsum Board\* — For use when Steel Framing Members\* (Item 15G) are used - 5/8 in. thick, 4 ft. wide by 10 ft. long; installed with the long dimension parallel to the main runners. Sheets fastened to cross tees with screws spaced 8 in. OC adjacent to end joints, and 8 in. OC along each cross tee in the field. At the side and end joints, screw shall be located 1-1/2 in he board edges. End joints to be staggered 4 ft. and to occur over cross tees. Additional cross tees to be located 6 in. e of the end joints. Joints to be covered with joint tape and joint compound. CERTAINTEED GYPSUM INC — Type C

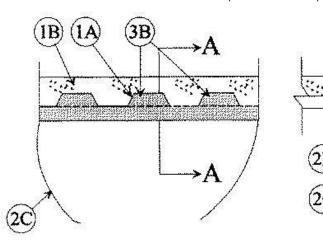
17. Metal Trim Molding — Min 0.026 in. thick (22 gauge) galv steel molding, measuring 5/8 in. wide with 9/16 and 1-3/8 in ing legs. Placed on gypsum board edges around light fixtures and secured to the cross tees and main runners with 1 in. long drywall screws. Spacing of screws approx 8 in. O.C. along 4 ft side and 10 in. O C. along 2 ft side of light fixtures. 18. Drywall Screw — Type S-12, 1 in. long, self-drilling and self-tapping, 0.163 in. thread diam, 5/16 in. diam heads. 19. Finishing System — Paper tape embedded in compound over joints and covered with additional compound. Exposed screw heads covered with compound. Edges of compound feathered out. 20. Wall Angle — (Not shown) — Min 0.019 in. thick (26 gauge) galv steel angle with 1-1/8 in. legs, nailed to the walls along eiling to support steel framing member ends and for screw-attach 21. Batts and Blankets\* — (Optional, Not Shown) - When used, ratings are limited to 1 Hr. - For use with Steel Framing Members\* (specifically Item 15) and Gypsum Board\* (specifically Item 16B) - Any thickness mineral wool or glass fiber

insulation bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over steel framing members/gypsum board ceiling membrane. 22. Discrete Products Installed in Air-handling Spaces\* — Automatic Balancing Valve/Damper (Not Shown - Optional) — For use with item 12. Valve/Damper to be provided with ducted installation with steel duct per damper manufacturer's instructions. Automatic Balancing Valve/Damper shall be installed within duct such that it is not directly above the ceiling

METAL INDUSTRIES INC — Model ABV-4, ABV-5, ABV-6

UL DESIGN P510

# System No. HW-D-0046 August 21, 2002 Assembly Rating -- 1 and 2 Hr Nominal Joint Width -- 3/4 In.



### 1. Floor Assembly The fire-rated fluted steel floor unit/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 or D900 Floor-Ceiling Design in the Fire Resistance Directory and shall include the following construction features:

A. Steel Floor and Form Units\* Max 3 in. deep galv steel fluted floor units.

B. Concrete Min 2-1/2 in, thick reinforced concrete, as measured from the top plane of the floor units. C. Spray-Applied Fire Resistive Materials (Optional) -- (Not Shown) -- Prior to the installation of the ceiling runner, Forming Material and Fill, Void or Cavity Materials (Items 2A, 3A, 3B, respectively), the steel floor units may be sprayed with a min 5/16 in. thickness to a max 11/16 in. thickness of fire resistive material.

### W R GRACE & CO - CONN CONSTRUCTION PRODUCTS DIV -- Type MK-6/HY

1A. Roof Assembly (Not Shown) -- As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. Steel Roof Deck Max 3 in. deep galv steel fluted roof deck. B. Roof Insulation Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the floor units.

used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. Steel Roof Deck Max 3 in. deep galv steel fluted roof deck. B. Spray--Applied Fire Resistive Materials\* (Not Shown)--Prior to the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B), the roof assembly shall be sprayed with the

2. Wall Assembly The 1 or 2 hr fire-rated gypsum board /stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. Steel Floor and Ceiling Runners Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with 2 in. flanges. Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys of steel deck (Item 1A) with steel fasteners or by welds spaced 12 in. OC. When optional spray-applied fire resistive material is used on steel deck, slotted ceiling runner shall be secured through spray-applied fire resistive material to valleys of steel deck with min

3/16 in. diam steel masonry anchors spaced 12 in. OC.

A1. Light Gauge Framing\*-Slotted Ceiling Runner As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Slotted ceiling runner installed perpendicular to direction of fluted steel deck and secured to vallevs with steel fasteners spaced max 24 in. OC. When optional spray-applied fire resistive material is used on steel deck, slotted ceiling runner shall be secured through spray-applied fire resistive material to valleys of steel deck with min 3/16 in. diam steel masonry anchors spaced 12 in. OC. METAL-LITE INC -- The System

SLIPTRACK SYSTEMS INC -- SLP-TRK

A2. Light Gauge Framing\*-Vertical Deflection Ceiling Runner As an alternate to the ceiling runners in Items 2A and 2A1, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with step bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2B). Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners spaced max 24 in. OC. When optional spray-applied fire resistive material is used on steel deck, vertical deflection ceiling runner shall be secured through spray-applied fire resistive material to valleys of steel deck with min 3/16 in. diam steel masonry anchors spaced 12 in. OC.

A3. Light Gauge Framing\* -- Clipped Ceiling Runner As an alternate to the ceiling runner in Items 2A, 2A1 and 2A2, clipped runner to consist of galv steel channel with clips preformed in track flanges which positively engage the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 2-1/2 in. Clipped ceiling runner installed perpendicular to direction of fluted steel floor units and secured to valleys with steel fasteners spaced max 24 in. OC. TOTAL STEEL SOLUTIONS L L C -- Snap Trak

B. Studs Steel studs to be min 2-1/2 in. wide. Studs cut 1/2 to 3/4 in. less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. Stud spacing not to exceed 24 in. OC. When vertical deflection ceiling runner (Item 2A2) is used steel studs secured to slotted vertical deflection clips, through the bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. OC.

Partition Design. For 2 hr assembly, two layers of 5/8 in, thick gypsum board is required in the individual Wall and Partition Design. For both hourly ratings, a nominal 3/4 in. gap shall be maintained between the top of the gypsum board and the bottom surface of the steel deck and the top row of screws shall be installed into the studs 3 in. below the valleys of the steel deck. The hourly rating of the joint system is dependent on the hourly rating of the

### designed to accommodate a max 33 percent compression or extension from its installed width. The joint system consists of a packing material and a fill material between the top of the gypsum board and the bottom of the floor, as follows: A. Forming Material\* Nom 4 pcf mineral wool batt cut to the shape of the fluted deck, approx 20 percent larger than the area of the flutes and compressed into the flutes of the steel deck flutes above the ceiling runner. The mineral wool insulation is to project beyond each side of ceiling runner, recessed 1/4 in. from both wall surfaces. For 2 hr assembly, additional 1-1/2 in. thick by 1 in. wide sections of mineral wool batt insulation compressed 50 percent and installed cut edge first to fill the 3/4 in, gap between the top of gypsum board and bottom of the steel deck. For 1 hr assembly, additional 1-1/2 in. thick by 3/8 in. wide sections of mineral wool batt insulation compressed 50 percent and installed cut edge first to fill the 3/4 in. gap between the top of gypsum board and bottom of the steel deck. The forming material shall be recessed 1/4 in. from each side of the wall.

FIBREX INSULATIONS INC -- FBX Safing Insulation A1. Forming Material\*--Plugs (Optional-Not Shown) Performed mineral wool plugs, formed to the shape of the fluted floor units, friction fit to completely fill the flutes above the ceiling channel. The plugs shall project beyond each side of the ceiling runner, recessed 1/4 in. from wall surfaces. Additional forming material, described in Item

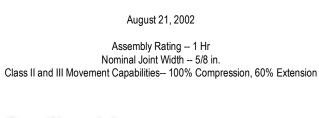
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP777 Speed Plugs

floor units.

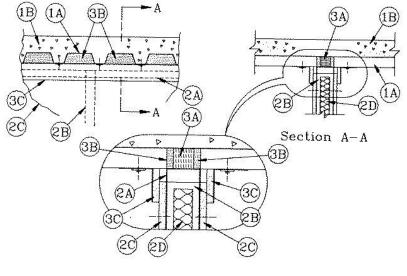
B. Fill, Void or Cavity Material\* -- Sealant Min 1/4 in. thickness of fill material installed on each side of the wall in the flutes of the steel deck and between the top of the gypsum board and the bottom of the steel deck, flush with each surface of the wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP601S Elastomeric Firestop Sealant \*Bearing the UL Classification Mark

UL DESIGN HW-D-0001

\*Bearing the UL Classification Mark



System No. HW-D-0001



1. Floor Assembly -- The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features: A. Steel Floor and Form Units\* -- Max 3 in. deep galv steel fluted floor units.

B. Concrete -- Min 2 1/2 in. thick reinforced concrete, as measured from the top plane of the floor units. 1A. Roof Assembly -- As an alternate to Item 1 Floor Assembly, the fire-rated roof assembly shall be constructed of the materials and in the manner described in the individual P700, P800 or P900 series Roof-Ceiling Designs in the UL Fire Resistance Directory and shall contain max 1-1/2 in. deep galv steel fluted roof units. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly . In the case of spray-applied protection materials on the steel roof units, the joint system shall be installed prior to the spray-applied protection material. 1B. Floor Assembly -- As an alternate to Item 1, Floor Assembly , min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. 2. Wall Assembly -- The 1 hr fire-rated nonbearing gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400-Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Steel Floor And Ceiling Runners -- Floor and ceiling runners of wall assembly shall consist of min 25 ga galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with 2 in. flanges. Ceiling runner secured to valleys of steel floor units (Item 1A) with steel fasteners or by welds spaced max 12 in. OC. A1. Light Gauge Framing\* -- Clipped Ceiling Runner -- As an alternate to the ceiling runner in Item 2A, clipped runner to consist of galv steel channel with clips preformed in track flanges which positively engage the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 2-1/2 in. Clipped ceiling runner installed perpendicular to direction of fluted steel floor units and secured to valleys with steel fasteners spaced max 12 in.

TOTAL STEEL SOLUTIONS L L C -- Snap Trak

B. Studs -- Steel studs to be min 2 1/2 in. wide. Studs cut 5/8 to 1 in. less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. Stud spacing not to exceed 24 in . OC C. Gypsum Board\* - Gypsum board sheets installed to a min total thickness of 1/2 in. on each side of wall. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory except that a nom

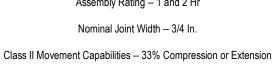
5/8 in. gap shall be maintained between the top of the gypsum board and the bottom of the steel floor units. 3. Joint System -- The joint system is designed to accommodate a max 5/8 in. compression and 3/8 in. extension from its installed width. The joint system consists of a forming material and fill material in the flutes of the steel floor units and a "slip track" detail consisting of restraining angles in combination with wallboard on the vertical flanges. When the floor assembly consists of a flat concrete slab (Item 1A), the forming material and fill material are not used. the system are as follows: A. Forming Material\* -- Min 1 1/2 in. thickness of min 4 pcf density mineral wool batt insulation firmly packed into flutes of steel floor units above ceiling runner as a permanent form. Forming material to be recessed from edges of ceiling runner on each side of wall to accommodate the required thickness of fill material. THERMAFIBER INC -- Type SAF

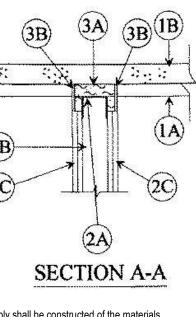
B. Fill, Void or Cavity Material\* -- Min 1/2 in. thickness of fill material applied within the recess of each steel floor unit flute, flush with the vertical flange of the ceiling track on each side of the wall. Dry mix material mixed with water at a rate of 2.1 parts dry mix to 1 part water, by weight, in accordance with accompanying instructions. UNITED STATES GYPSUM CO -- Type FC

B1. Fill, Void or Cavity Material\* -- Not Shown -- Two component fill material used as an alternate to Item 3B. Min. 1/2 in. thickness of fill material applied within the recess of each steel floor unit flute. flush with the vertical flance of the ceiling track on each side of the wall. Ready-mixed component mixed with accelerator component at a rate of 66 parts of readymixed component to 1 part of accelerator component by weight in accordance with the accompanying installation instructions. UNITED STATES GYPSUM CO -- Type RFC

C. Restraining Angles -- Min 2 1/2 by 2 1/2 in. angles formed from min 25 ga galv steel with one leg lined with a 2 1/2 in. wide piece of gypsum wallboard used for the wall (Item 2C). Gypsum wallboard liner secured to steel angle with min 1 in. long self-drilling, self-tapping Type S bugle head steel screws spaced max 8 in. OC. along longitudinal centerline of steel angle. Screws installed through face of wallboard such that excess screw length protrudes through leg of steel angle. Restraining angles installed along top of wall on each side of wall assembly with gypsum wallboard liner against wall surface and with horizontal leg of steel angle against valleys of steel floor units. Restraining angles secured to valleys of steel floor units or min 1/2 in. long powder-driven steel fasteners, spaced 12 in. OC.







1B. Roof Assembly As an alternate to Items 1 and 1A, a fire rated protected fluted steel deck roof assembly may be

type and thickness of fire resistive material indicated in the individual P700 Series design.

THE STEEL NETWORK INC -- VertiTrack VTD250, VTD358, VTD400, VTD600 and VTD800

C. Gypsum Board\* For 1 hr assembly, one layer of 5/8 in. thick gypsum board is required in the individual Wall and

3. Joint System Max separation between bottom of floor or roof and top of wall is 3/4 in. The joint system is

3A, to be used in conjunction with the plugs to fill the gap between the top of gypsum board and bottom of steel



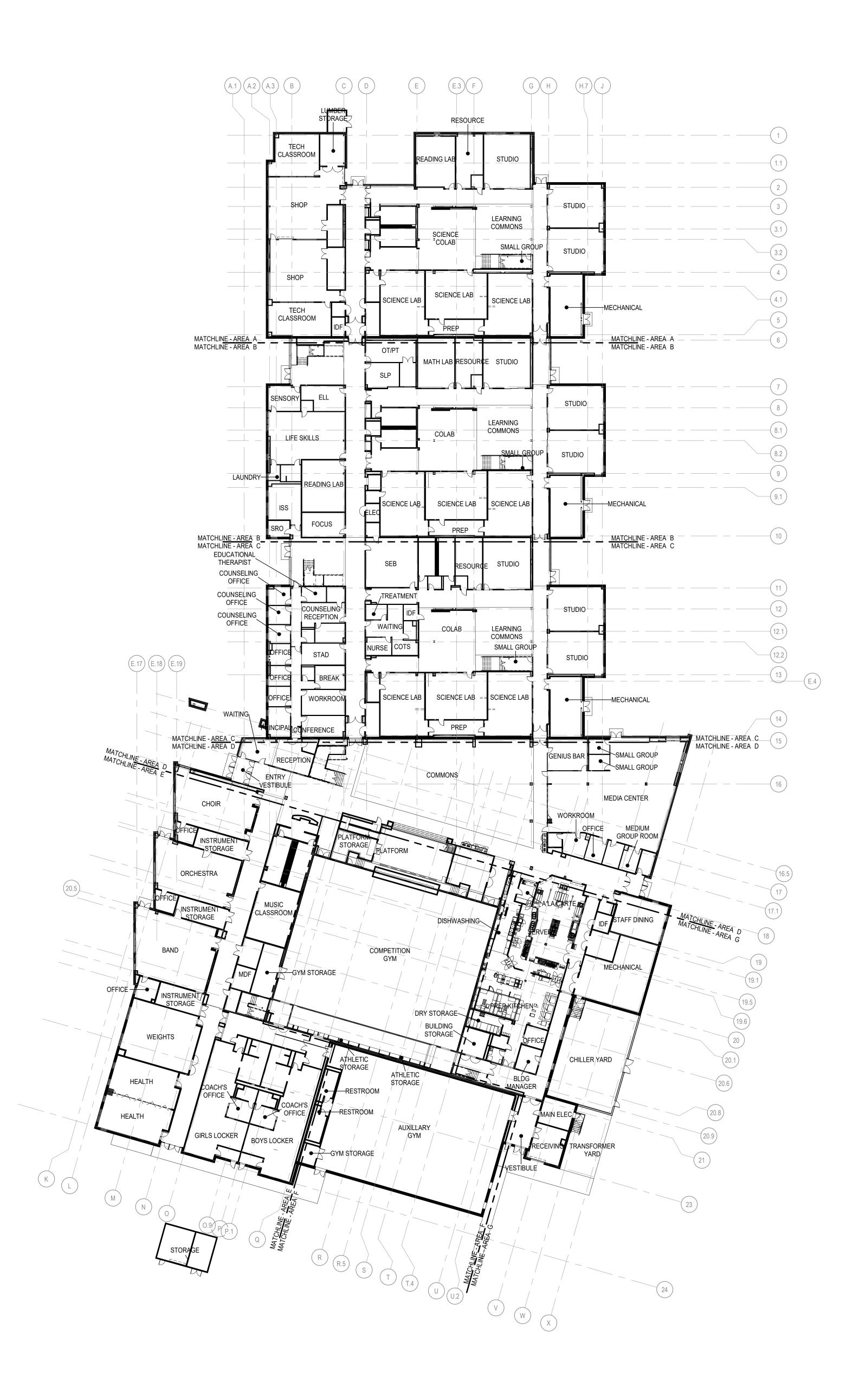
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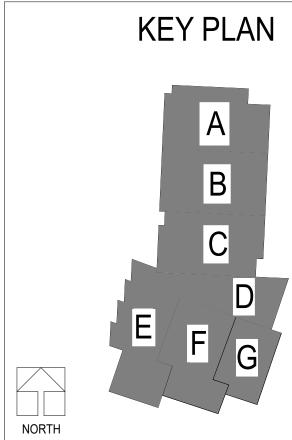
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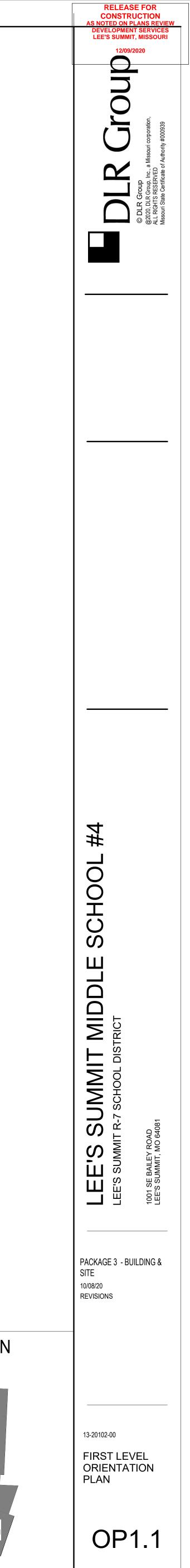
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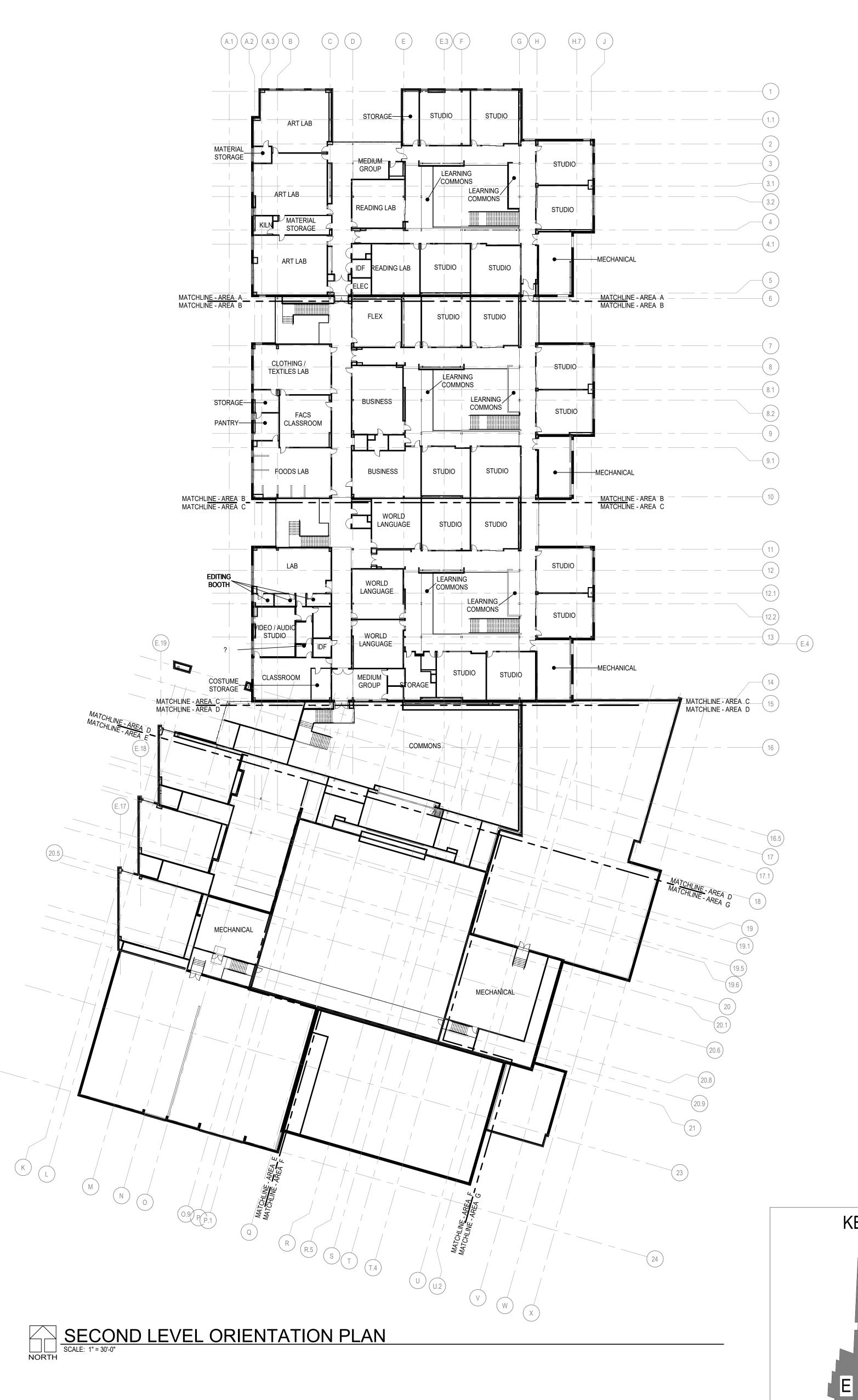


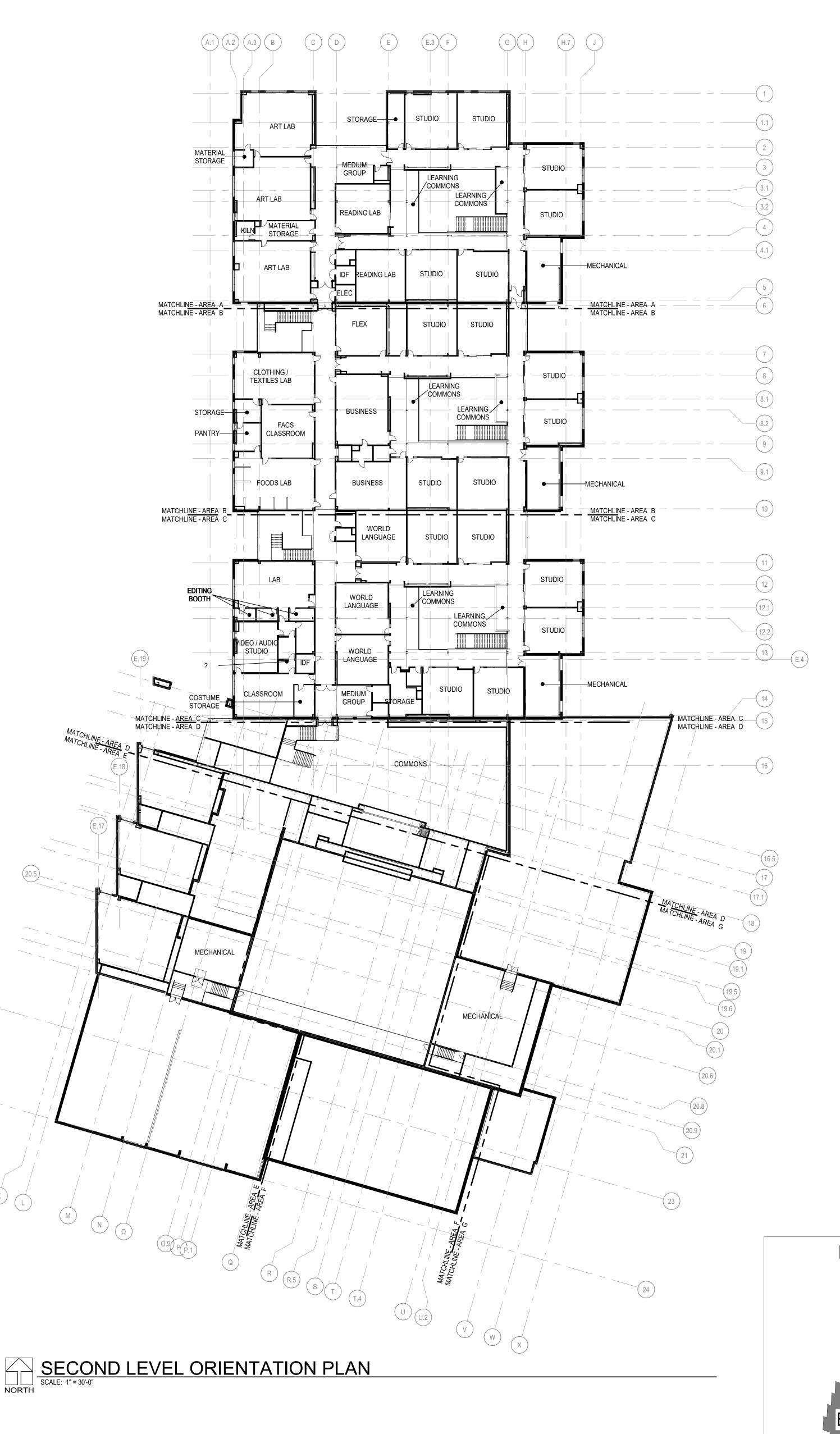


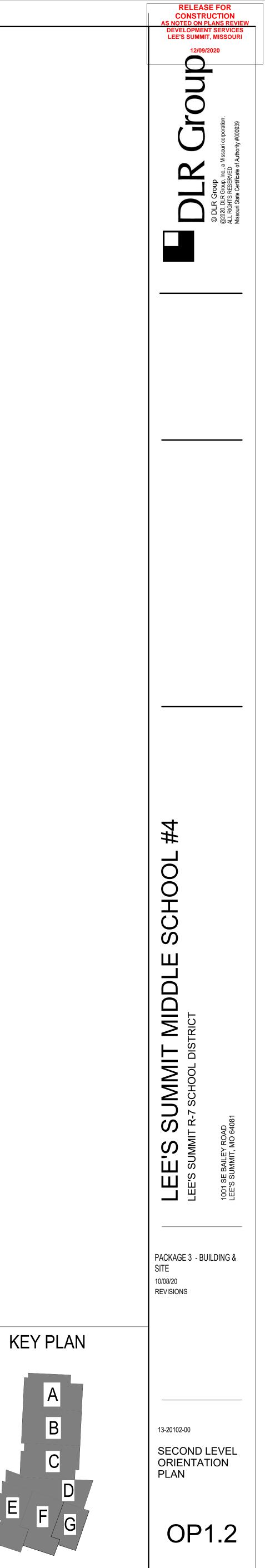




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NORTH