

	Re home SHEET LIST		Re_l
Sheet Number	Sheet Name	Sheet Number	
G-001	TABLE OF CONTENTS	S-908	WEST CAN
G-002	GENERAL NOTES AND SYMBOLS	S-909	WEST CAN
G-003	ABBREVIATIONS	S-910	WEST CAN
G-101	FINISHED SQUARE FOOTAGE COMPLIANCE PLAN	S-911	WEST CAN
G-102	EGRESS PLAN	A-111	FIRST FLC
G-103	ADA TOUR ROUTE COMPLIANCE PLAN	A-121	FIRST FLC
G-201	SOLAR ENVELOPE COMPLIANCE ELEVATIONS	A-112	ROOF PLA
G-901	GENERAL PROJECT RENDERINGS	A-202	ELEVATIO
G-902	PUBLIC EXHIBIT DISPLAY BOARDS	A-201	ELEVATIO
G-903	PUBLIC EXHIBIT DISPLAY BOARDS	A-301	BUILDING
G-904	PUBLIC EXHIBIT DISPLAY BOARDS	A-311	WALL SEC
G-905	PUBLIC EXHIBIT DISPLAY TITLE BOARDS	A-501	ENVELOP
G-906	PUBLIC HANDOUT LAYOUTS	A-213	INTERIOR
G-000	COVER SHEET	A-601	OPENING
H-101	LIQUID LOCATION AND SPILL CONTAINMENT PLAN	A-001	ARCHITEC
C-001	CIVIL NOTES AND SYMBOLS	A-101	SITE PLAN
C-102	ORGANIZER SUPPLIED PAVING PLAN	A-214	INTERIOR
C-103	SITE UTILITY PLAN	A-321	FLOOR SE
C-501	LOT CONDITION ADJUSTMENT DETAILS	A-401	LARGE SC
C-101	GROUND CONTACT PLAN	A-561	ROOF DET
101	LANDSCAPE AND PLANTING SITE PLAN	A-113	ROOF OPE
102	LANDSCAPE IRRIGATION AND GREYWATER	I-001	FINISH PLA
201	LANDSCAPE ELEVATIONS AND DETAILS	I-002	INTERIOR
103	RAINWATER COLLECTION	I-003	INTERIOR
S-101	FOUNDATION PLAN	F-101	FIRE DETE
S-102	FIRST FLOOR FRAMING PLAN	F-102	FIRE SUPF
S-103	ROOF FRAMING PLAN	P-102	DOMESTIC
S-104	DECK FRAMING PLAN	P-101	PLUMBING
S-001	STRUCTURAL NOTES AND SYMBOLS	P-103	DOMESTIC
S-201	FRAMING ELEVATIONS SOUTH UNIT	P-901	SUPPLY IS
S-501	FOUNDATION DETAILS	P-902	RETURN IS
S-511	SECTION DETAILS	P-104	WATER DE
S-521	DECK DETAILS	P-105	WATER RE
S-531	ROOF DETAILS	P-903	PLUMBING
S-701	TYPICAL DETAILS	M-001	MECHANIC
S-512	PARAPET DETAILS	M-101	HVAC EQL
S-202	FRAMING ELEVATIONS NORTH UNIT	M-901	HVAC ISOI
S-515	FLOOR CONNECTION DETAILS	E-101	ELECTRIC
S-513	CANOPY SECTION DETAILS	E-102	PV WIRING
S-514	CANOPY PLANS	E-001	ELECTRIC
S-502	CANOPY FOUNDATION DETAILS	E-103	AC CIRCU
S-532	SOLAR PANEL SUBMOUNT DETAILS	E-201	ELECTRIC
S-901	SOUTH CANOPY SHOP DRAWINGS	E-601	ONE-LINE
S-902	SOUTH CANOPY SHOP DRAWINGS	E-602	THREE-LIN
S-903	SOUTH CANOPY SHOP DRAWINGS	E-104	LIGHTING
S-904	EAST CANOPY SHOP DRAWINGS	E-105	WINDOW A
S-905	EAST CANOPY SHOP DRAWINGS	T-101	TELECOM
S-906	EAST CANOPY SHOP DRAWINGS	O-101	ARRIVAL S
S-907	EAST CANOPY SHOP DRAWINGS	O-102	DEPARTU
	<del></del>		1

Sheet Number	Sheet Name
S-908	WEST CANOPY SHOP DRAWINGS
S-909	WEST CANOPY SHOP DRAWINGS
S-910	WEST CANOPY SHOP DRAWINGS
S-911	WEST CANOPY SHOP DRAWINGS
A-111	FIRST FLOOR PLAN
A-121	FIRST FLOOR REFLECTED CEILING PLAN
A-112	ROOF PLAN
A-202	ELEVATIONS
A-201	ELEVATIONS
A-301	BUILDING SECTIONS
A-311	WALL SECTIONS
A-501	ENVELOPE AND FACADE DETAILS
A-213	INTERIOR ELEVATIONS
A-601	OPENING SCHEDULE AND DETAILS
A-001	ARCHITECTURAL SYMBOLS AND NOTES
A-101	SITE PLAN
A-214	INTERIOR ELEVATIONS
A-321	FLOOR SECTIONS
A-401	LARGE SCALE PLANS
A-561	ROOF DETAILS
A-113	ROOF OPENING PLAN
I-001	FINISH PLAN
I-002	INTERIOR ELEVATIONS
I-002	INTERIOR ELEVATIONS
F-101	FIRE DETECTION AND ALARM
F-101	FIRE SUPPRESSION
P-102	DOMESTIC SUPPLY
P-102	PLUMBING SITE PLAN
P-101	DOMESTIC RETURN
P-901	SUPPLY ISOMETRICS
P-902	RETURN ISOMETRICS
P-104	WATER DELIVERY SEQUENCE
P-105	WATER REMOVAL SEQUENCE
P-903	PLUMBING SYSTEM ISOMETRICS
M-001	MECHANICAL SYMBOLS AND NOTES
M-101	HVAC EQUIPMENT AND DISTRIBUTION PLAN
M-901	HVAC ISOMETRICS
E-101	ELECTRICAL DISTRIBUTION PLAN
E-102	PV WIRING PLAN
E-001	ELECTRICAL SYMBOLS AND NOTES
E-103	AC CIRCUIT PLAN
E-201	ELECTRICAL ELEVATIONS
E-601	ONE-LINE DIAGRAM
E-602	THREE-LINE DIAGRAM
E-104	LIGHTING PLAN
E-105	WINDOW AND DOOR SENSOR PLAN
T-101	TELECOMMUNICATIONS WIRING PLAN
O-101	ARRIVAL SEQUENCE PLANS
O-102	DEPARTURE SEQUENCE PLAN

### **Re**\_home

The University of Illinois at Urbana-Champaign 2011 Solar Decathlon Competition Entry

As Built Contract Document Submital Submission Date: August 11, 2011

Lead Contact: Xinlei Wang email: xwang2@illinois.edu phone: (217) 333-4446 address: 332C ASEB

1304 W. Pennsylvania Ave.

Urbana, II 61801

Architecture Contact: Mark Taylor email: mstaylor@illinois.edu phone: (217) 244-3425

address: 117 Temple Hoyne Buell Hall

611 E. Loredo Taft Urbana, II 61801

Architecture Student Contact: Michael Hines

email: mhhines2@illinois.edu

Engineering Student Contact: Chris Cirone email: ccirone2@illinois.edu

www.solardecathlon.illinois.edu

www.solardecathlon.gov



UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820 ADDRESS: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

CONSULTANTS MSA PROFESSIONAL SERVICES

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MR		
1711 \	3/18/2011	DOE CD Submission
MH	5/3/2011	Documents adjusted per
		CD submittal review
		commentary
MH	8/11/2011	As Built Drawing Submission
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TABLE OF CONTENTS

G-001

1////// 3////// 6////// 4////// 7////// 2////// 5/////

## **A**

### ARCHITECTURAL

#### A. FIRE RESISTANCE COMPLIANCE

- A.01 SEE CODE COPMLIANCE PLANS IN A-SERIES FOR DETAILED CODE COMPLIANCE REQUIREMENTS
- A.02 FIRE RATING INDICATION ON A WALL SHALL MEAN THE ENTIRE LENGTH OF THE WALL IS TO BE FIRE RATED.
- A.03 ALL PIPING, DUCTS, ETC. THAT PENETRATE FLOOR SLABS SHALL BE INSTALLED IN A MANNER THAT WILL PERESERVE THE FIRE-RESISTIVE AND STRUCTURAL INTEGRITY. PENETRATIONS INTO FIRE-REATED WALLS OF MORE THAN 1 HR. RATING SHALL BE PROVIDED WITH APPROVED FIRE DAMPERS WHETHER OR NOT SHOWN IN THE MECHANICAL DRAWINGS.
- A.04 ALL RATINGS ARE TO COMPLY WITH UNDERWRITERS LABORATORIES (UL) TEST RATINGS. IN THE ABSENCE OF TESTED ASSEMBLY, PROVIDE CERTIFICATE OF EQUIVALENCY FROM UL. MEET ALL THE REQUIREMENTS OF FACTORY MUTUAL ENGINEERING FOR BOTH CONSTRUCTION AND FIRE PROTECTION

#### B. DIMENSIONING

- B.01 UNLESS NOTED OTHERWISE, PARTITIONS ARE DIMENSIONED TO THE FACE OF THE WALL
- B.02 ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BEFORE PROCEEDING WITH THE WORK. THE ARCHITECT SHALL BE NOTIFIED OF ANY CORRECTION.
- B.03 DOOR OPENINGS ARE GENERALLY DIMENSIONED TO CENTERLINE OF OPENING. DOOR OPENINGS THAT ARE NOT DIMENSIONALLY LOCATED ARE TO BECENTERED BETWEEN WALLS OR POSITIONED WITH ONE JAMB AGAINST AN ADJACENET WALL OR COLUMN AS SHOWN ON THE PLANS.
- B.04 ALL DIMENSIONS SHALL BE VERIFIED AND COORDINATED WITH THE WORK OF ALL

### C. INSULATION

- C.01 WHETHER SPECIFICALLY SHOWN, OR NOT, PROVIDE INSULATION WITH VAPOR BARRIER BETWEEN ALL EXTERIOR AND INTERIOR HEATED SPACES TO MAINTAIN DESIGN U VALUES
- C.02 ALL JOINTS AND PENETRATIONS IN INSULATION BARRIER SHALL BE FULLY
  BUTTED/SEALED WITH ADHESIVE/SEALANT TO PROVIDE A CONTINUOUS AIR/VAPOR
  TIGHT INSTALLATION
  - D. MECHANICAL AND ELECTRICAL AREAS
- D.01 UNLESS OTHERWISE NOTED, ALL WALLS BETWEEN MECHANICAL OR ELECTRICAL SPACES AND OCCUPIED SPACES SHALL BE ACOUSTICALLY ISOLATED FROM THE OCCUPIED SPACES AND SHALL MAINTAIN A MINIMUM STC RATING OF 52.
- D.02 GENERAL CONTRACTOR TO COORDINATE ALL MECHANICAL AND ELECTRICAL FLOOR, ROOF AND WALL SLEEVES AND ALL MECHANICAL SHAFTS AND OPENINGS WITH MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES. GENERAL CONTRACTOR SHALL PROVIDE SLEEVES AND FLOOR AND ROOF OPENINGS AS REQUIRED TO ALLOW INSTALLATION OF ALL DUCTS AND PIPING AS SHOWN ON THE MECHANICAL AND ELECTRICAL DRAWINGS.
- D.03 FIRE DAMPERS SHALL BE PROVIDED AS SHOWN AND WHEREVER AIR DUCTS PENETRATE FIRE RATED WALLS OR CEILINGS. FIRE DAMPERS SHALL BE FIRE DEPARTMENT LISTED AND APPROVED.

### E. EXTERIOR WALLS

- E.01 THE EXTERIOR WALL AS SHOWN SHALL BE A COMPLETE SYSTEM INCLUDING ALL STIFFENERS, FASTENERS, STEALANTS, JOINGING MISCELLANEOUS PIECES AND MATERIAL THICKNESS AS REQUIRED TO FORM A WATERTIGHT ENCLOSURE.
- E.02 DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO THOSE DETAILED.
- E.03 ALL DETAILS ARE TO BE COORDINATED WITH THE STRUCTURAL FRAMING AND OTHER BUILDING COMPONENTS INCLUDING ROOFING, EXTERIOR-CLADDING ITEMS, GLAZING, INTERIOR FINISH AND OTHER RELATED BUILDING COMPONENTS.
- E.04 ALL SEALANT JOINTS SHALL BE SIDED SUCH THAT THEY WILL BE WITHIN THE SIZE RANGE RECOMMENDED BY THE SEALANT MANUFACTURER
- E.05 VERIFY OR GUARANTEE ALL CLEAR OPENINGS FOR LOUVERS AND WINDOW INSTALLATION.
- E.06 ALL SILLS, WINDOW HEADS, AND SHELF ANGLES SHALL HAVE FLASHING EXTENDED TO THE OUTSIDE OF THE WALL WHETHER OR NOT SHOWN ON THE DRAWINGS.
- E.07 U.N.O. PROVIDE EXTERIOR WALL COMPONENTS SUCH AS WINDOWS, DOORS, TO RESIST A WIND LOAD OF A MINIMUM OF 30 psf
- E.08 U.N.O. PROVIDE SOFFITS DESIGNED TO RESIST A WIND LOAD OF A MINIMUM OF 45psf OR 1.5 TIMES THE DESIGN WIND LOAD.

### F. MISCELLANEOUS NOTES

- F.01 ALL BASE BUILDING INTERIOR PARTITIONS SHALL WITHSTAND MINIMUM INWARD AND OUTWARD ACTING PRESSURES OF 5 psf.
- F.02 ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FORM EACH OTHER TO AVOID MOLECULAR BREAKDOWN.
- F.03 PROVDIE ACCESS PANELS AS REQUIRED BY APPLICABLE CODES AND AS REQUIRED FOR ACCESS OR MAINTENANCE OF MECHANICAL AND ELECTRICAL EQUIPMENT INCLUDING JUNCTION BOXES. ALL ACCESS PANELS LOCATIONS SHALL BE REVIEWED WITH THE ARCHITECT PRIOR TO PROCEEDING.
- F.04 WHERE DISCREPANCIES EXIST BETWEEN THE DRAWINGS OF THE VARIOUS TRADES, CONSULT THE ARCHITECT BEFORE PROCEEDING WITH WORK.
- F.05 WHETHER OR NOT EXPLICITYL INDICATED, ALL GLAZING SHALL BE SAFETY GLAZED WHEN WITHIN 18" OF THE FLOOR OR WITHIN 3'-0" HORIZONTAL DISTANCE FROM ANY DOOR. A CERTIFICATE MUST ACCOMPANY ALL GLAZING PRODUCTS STATING THAT THE PRODUCTS CONFORM WITH APPICABLE CONSUMER PRODUCT SAFETY STANDARDS.
- F.06 UNLESS OTHERWISE NOTED, ALL EXTERIOR EXPOSED METAL SHALL BE GALVANIZED AND PAINTED.
- F.07 ALL EXTERIOR JOINTS AROUND WINDOW AND DOOR FRAMES, WETWEEN WALLS AND FOUNDATION, BETWEEN WALLS AND ROOF, BETWEEN WALL PANEL, AT PENETRATION OF UTILITIES THROUGH THE ENVELOPE, SHALL BE SEALED, CAULKED OR WEATHER-STRIPPED TO PRVENT AIR LEAKAGE / INFILTRATION.
- F.08 ALL REFUSE AND DEBRIS SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF BY THE CONTRACTOR.

### GENERAL

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE REQIREMENTS OF THE APPLICABLE CODES. ENGINEERING SHALL CONFIRM WITH ALL APPICABLE MUNICIPAL, STATE AND FEDERAL REGULATIONS HAVING JURISDICTION INCLUDING ACCESSIBILITY STANDARDS AND ILLINOIS ACCESSIBILITY REQUIREMENTS

THE CONTRACTOR ALONG SHALL BE RESPONSIBLE FOR THE SAFETYAND ADEQUANCY OF HIS PLANT, APPLIANCES, METHODS AND FOR DAMAGE WHICH MAY RESULT FROM THEIR IMPROPOER REMOVAL, CONSTRUCTION, MAINTENANCE OR OPERATION. HE SHALL ERECT AND PROPERLY MAINTAIN AT ALL TIMES AS REQUIRED BY THE CONDITIONS AND PROGRESS OF THE WORK, PROPER SAFEGUARDS FOR THE PROTECTION OF WORKMEN, OWNER, AND OWNERS PROPERTY, AND SHALL POST DANGER WARNINGS AGAINST HAZARDS CREATED BY CONSTRUCTION OPERATIONS.

INSPECTION BY CONTRACTOR: THE CONTRACTOR ACKNOWLEDGES AND AGREES THAT HE HAS INIVISIBLE INDELEGABLE AND INTRANSFERABLE AND CONTRACTURAL OBLICATION TO THE OWNER TO MAKE HIS OWN INSPECTIONS ON HIS OWN WORK AT THE STAGES OF CONSTRUCTION, AND SHALL SUPERVISE AND SUPERINTEND PERFORMANCE OF WORK IN SUCH MANNER AS TO ENABLE HIM TO CONFIRM, CERTIFY AND CORROBORATE AT ALL TIMES THAT ALL WORK HAS BEEN EXECUTED ACCORDING TO THE CONTRACT DOCUMENT.

THE CONTRACTOR SHALL SUPPLY ALL LABOR, TRANSPORTATION, APPARATUS, SCAFFOLDING, AND ANY TOOLS FOR THE COMPLETION OF THE WORK, MAINTAIN AND REMOVE ANY TEMPORARY EQUIPMENT, AND CONSTRUCTION THE COMPLETE WORK AND EVERYTHING PROPERLY INCIDENTAL THERTO AS STATED IN THE CONTRACT DOCUMENTS OR REASONABLY IMPLIED THEREFROM. ALL PARTS MUST BE COORDINATED, COMPLETE, READY TO OPERATE AND DELIVERED TO THE OWNER IN NEW CONDITION.

- CONTRACTOR'S WARRANTY: THE CONTRACTOR WARRENTS THAT HE IS FAMILAR WITH THE CODES AND REGULATIONS APPLICABLE TO THE WORK AND THAT HE

  5.) HAS THE SKILL, KNOWLEDGE, COMPETENCE, ORGANIZATION AND PLANT TO EXECUTE THE WORK PROMPTELY AND EFFICIENTLY IN COMPIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, INCLUDING THE TIMESCHEDULE.
- 6.) THE OWNER WILL NOT ACCEPT REQUESTS FOR EXTRA WORK CONDITIONS WHICH CAN BE REASONABLY ASCERTAINED FROM THE DRAWINGS AND SPECIFICATIONS.
- 7.) ABESTOS CONTAINING MATERIALS MAY NOT BE USED ON THIS PROJECT
- 3.) LEAD-CONTAINING PAINT MAY NOT BE USED ON THIS PROJECT.
- SUBCONTRACTORS FOR EACH TRADE ARE ADVISED THAT INFORMATION PERTINENT TO THEIR WORK MAY OCCUR IN OTHER PORTIONS OF THE CONTRACT DOCUMENTS. ALL SHEETS AND NOTES TO BE REVIEWED.

THE STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS ARE OF EQUAL IMPORTANCE WITH THE ARCHITECTURAL DRAWINGS IN DEFINING THE WORK OF THE CONTRACT DOCUMENTS. SHOULD THERE BE A DISCREPANCE

10.) BETWEEN THE ARCHITECTURAL DRAWINGS AND THE ENGINEERING DRAWINGS THAT WOULD CAUSE AN IMPROPER INSTALLATION, IT SHALL BE BROUGHT TO THE ARCHITECTS ATTENTENTION FOR CLARIFICATION PRIOR TO INSTALLATION OF SAID WORK. ANY WORK INSTALLED IN CONFLICT WITH THE ARCHITECTURAL DRAWINGS SHALL BE CORRECTED BY THE CONTRACTOR AT HIS EXPENSE.

- 11.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURATE PLACEMENT OF BUILDINGS ON THE SITE.
- 12.) DO NOT SCALE THE DRAWINGS. THE DRAWINGS ARE NOT NECESSARILY TO SCALE. EXPLICIT DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALE.
- 13.) NOTES ON DRAWINGS SHALL APPLY TO ALL SIMILAR CONDITIONS WHETHER REPEATED OR NOT. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO THOSE SHOWN.
- 14.) THE CONTRACTOR SHALL VISIT THE SITE AND BE KNOWLEDGEABLE OF CONDITIONS THEREON. PRIOR TO SUBMITTING A BID HE SHALL INVESTIGATE, VERIFY AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT AND SHALL NOTIFY THE OWNER OF ANY CONDITIONS REQUIRING MODIFICATION BEFORE PROCEEDING WITH THE WORK.

SYMBOL	_S
0	COLUMN LINE W/ COLUMN NUMBER / LETTER
1 A101	DETAIL TAG  — DETAIL IDENTIFICATION  — SHEET WHERE DETAIL IS DRAWN
	— AREA DETAIL REFERENCES
A1 SCALE	DETAIL TAG  — DETAIL TITLE  — DETAIL IDENTIFICATION  — DETAIL SCALE
1 Ref  A101  1 Ref	ELEVATION (S) TAG  — ELEVATION IDENTIFICATION  — SHEET WHERE ELEVATION IS DRAWN
	NORTH ARROW
11 13 00.A1	REFERENCE NOTE TAG  REFERENCE NOTE NUMBER
01	REVISION TAG  — REVISION NUMBER  — CLOUD AROUND REVISION
ROOM NAME	ROOM IDENTIFICATION TAG  ROOM NAME  ROOM NUMBER
1L	WALL TYPE TAG
ÎT	WINDOW TAG — WINDOW NUMBER
4 4	CONCRETE
	EARTH
	GYPSUM BOARD
	INSULATION - RIGID
	INSULATION - SPRAY FOAM
	STEEL
	WOOD (FINISH)
	WOOD ROUGH
A4 A101	WALL SECTION TAG  SECTION IDENTIFICATION  SHEET WHERE SECTION IS DRAWN
A4 A101	BUILDING SECTION TAG  — SECTION IDENTIFICATION  — SHEET WHERE SECTION IS DRAWN
A4 A101	SECTION TAG  — SECTION IDENTIFICATION  — SHEET WHERE SECTION IS DRAWN
A4	DETAIL SECTION TAG  — DETAIL IDENTIFICATION
A101	— SHEET WHERE SECTION IS DRAWN
A4	ELEVATION TAG — ELEVATION IDENTIFICATION
A101	SHEET WHERE ELEVATION IS DRAWN



TEAM NAME: UNIVERSITY OF ILLINOIS
ADDRESS: 611 LORADO TAFT DR.
CHAMPAIGN, IL 61820

CONTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

#### CONSULTANTS

MSA PROFESSIONAL SERVICES

#### HOMEWAY HOMES

UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES

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MR 3/18/2011 DOE CD Submission

MH	8/11/2011	As Built Drawing Submission
MARK	DATE	DESCRIPTION
LOT NUMI	BER:	LOT #305
DRAWN B	Y:	AUTHOR
CHECKED	BY:	CHECKER
COPYRIG	HT:	NONE: PROJECT IS PUBLIC DOMAIN

SHEET TITLE

GENERAL NOTES AND SYMBOLS

G-002

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ABBF	REVIATIONS				
ADADFADFA	ANGLE	FE	FIRE EXTINGUISHER	PL	PLATE
&	AND	FIN	FINISH	PLWD	PLYWOOD
@	AT	FLR	FLOOR	PLUM	PLUMBING
ę	CENTER LINE	FOS	FACE OF STUD	PR	PAIR
	DIAMETER	FT	FOOT OR FEET	PT	PAINT
#	POUND OR NUMBER	FTG	FOOTING	QTY	QUANTITY
ADD	ADJACENT	GA	GAUGE	RAD	RADIUS
AFF	ABOVE FINISH FLOOR	GALV	GALVANIZED	RCP	REFLECTED CEILING PLAN
AGR	AGGREGATE	GB	GYPSUM BOARD	REINF	REINFORCED
AL	ALUMINUM	GL	GLASS	REQ	REQUIRED
APPROX	APPROXIMATE	GND	GROUND	REV	REVERESE
ARCH	ARCHITECTURAL	GR	GRADE	RM	ROOM
B/	BOTTOM OF	GYP	GYPSUM	RO	ROUGH OPENING
BD	BOARD	НС	HANDICAPPED	s	SOUTH
BLDG	BUILDING	HDWR	HARDWARE	SCHED	SCHEDULE
BLOC	BLOCKING	НМ	HOLLOW METAL	SECT	SECTION
BLK	BLOCK	HORIZ	HORIZONTAL	SHT	SHEET
ВМ	BEAM	HP	HIGHPOINT	SIM	SIMILAR
CER	CERAMIC	HR	HOUR	SPEC	SPECIFICATION
CJ	CONTROL JOINT	HT	HEIGHT	SQ	SQUARE
CLG	CEILING	ID	INSIDE DIAMETER	SS	STAINLESS STEEL
CL	CLOSET	IN	INCH	ST	STAIN
CLRC	CLEAR	INSUL	INSULATION	STD	STANDARD
COL	COLUMN	INT	INTERIOR	STL	STEEL
CONC	CONCRETE	INV	INVERT	SUSP	SUSPENDED
CONCR	CONSTRUCTION	KF	KNOCK DOWN	SYM	SYMMETRICAL
CONT	CONTINUOUS	KIT	KITCHEN	T/	TOP OF
CONTR	CONTRACTOR	ко	KNOCKOUT	THK	THICK
СТ	CERAMIC TILE	KW	KILOWATT	THSH	THRESHOLD
CTR	CENTER	KWH	KILOWATT HOUR	TYP	TYPICAL
DBL	DOUBLE	LBR	LUMBER	UNO	UNLESS NOTED OTHERWISE
DET	DETAIL	LG	LONG	VERT	VERTICAL
DIA	DIAMETER	LL	LIVE LOAD	V.I.F.	VERIFY IN FEILD
DIM	DIMENSION	LP	LOW POINT	VOL	VOLUME
DN	DOWN	LT	LIGHT	W	WEST
DO	DOOR OPENING	MAT	MATERIAL	WC	WATER CLOSET
DR	DOOR	MAX	MAXIMUM	WD	WOOD
DS	DOWNSPOUT	MECH	MECHANICAL	WP	WATER PROOF
DWG	DRAWING	MTL	METAL	WT	WEIGHT
Е	EAST	MFR	MANUFACTURER	W/	WITH
EA	EACH	MIN	MINIMUM	W/0	WITH OUT
ELEC	ELECTRICAL	MISC	MISCELLANEOUS	TD	YARD
ELEV	ELEVATION	N	NORTH		
E.P.	ELECTRICAL PANEL	NIC	NOT IN CONTACT		
EPE	EPOXY PAINT	NO	NUMBER		
EPDM	ETHYLENE PROPYLENE DIENE MONOMER	NOM	NOMINAL		
EQUIP	EQUIPMENT	NTS	NOT TO SCALE		
EXP	EXPOSED	ос	ON CENTER		
EXT	EXTERIOR	OD	OUTSIDE DIAMETER		
FD	FLOOR DRAIN	ОН	OPPOSITE HAND		
FDN	FOUNDATION	OPNG	OPENING		
		1		1	

OPPOSITE



TEAM NAME: ADDRESS: UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

NTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

CONSULTANTS

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MH	8/11/2011	As Built Drawing Submission
MARK	DATE	DESCRIPTION

LOT NUMBER: LOT #305

DRAWN BY: AUTHOR

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SHEET TITLE

**ABBREVIATIONS** 

G-003

FINISH FLOOR

GENERAL SHEET NOTES 1.) SQUARE FOOTAGE IS DEFINED BY ANSI Z765-2003 PER SOLAR DECATHLON RULE 6.2 2.) FINISHED SQUARE FOOTAGE OF 977.4 SQUARE 3.) FINISHED SQUARE FOOTAGE CALCULATIONS FOR THIS HOUSE WERE MADE BASED ON PLAN DIMENSIONS ONLY AND MAY VARY SLIGHTLY FROM THE FINISHED SQUARE FOOTAGE OF THE HOUSE AS BUILT. l illinois 2011 UNIVERSITY OF ILLINOIS TEAM NAME: ADDRESS: 611 LORADO TAFT DR. CHAMPAIGN, IL 61820 SOLARDECATHLON@UIUC.EDU CONTACT: WWW.SOLARDECATHLON.ILLINOIS.EDU CONSULTANTS MSA PROFESSIONAL SERVICES HOMEWAY HOMES UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2011 WWW.SOLARDECATHLON.GOV U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON MR 3/18/2011 DOE CD Submission MH 8/11/2011 As Built Drawing Submission DESCRIPTION MARK DATE LOT NUMBER: LOT #305 DRAWN BY: Author CHECKED BY: NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT: SHEET TITLE FINISHED SQUARE FOOTAGE COMPLIANCE PLAN (A1) FINISHED SQUARE FOOTAGE PLAN

1/4" = 1'-0" G-101 3////// 7////// 2////// 6 5

Re

TEAM NAME: UNIVERSITY OF ILLINOIS

ADDRESS: 611 LORADO TAFT DR.
CHAMPAIGN, IL 61820

CONTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

l illinois 2011

CONSULTANTS

MSA PROFESSIONAL SERVICES
HOMEWAY HOMES
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SOLAR DECATHLON

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MH 8/11/2011 As Built Drawing Submission  MARK DATE DESCRIPTION			
MARK DATE DESCRIPTION	MH	8/11/2011	As Built Drawing Submission
MARK DATE DESCRIPTION			
	MARK	DATE	DESCRIPTION

LOT #305

MEGAN ROBERTSON

NONE: PROJECT IS PUBLIC DOMAIN

MICHAEL HINES

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EGRESS PLAN

G-102

KITCHEN **BEDROOM** MECHANICAL EXIT PATH DISTANCE EXIT PATH DISTANCE 19' 10 1/2" LIVING ROOM **FLEX SPACE** 

3//////

**A** 

(A1) EGRESS PLAN

1/4" = 1'-0"

1//////

2/////

4//////

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6

2//////

GENERAL SHEET NOTES

1.) ADA ACCESSIBLE ROUTE AS PER SOLAR DECATHLON RULE 11.4



TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

CONTACT:

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

CONSULTANTS

MSA PROFESSIONAL SERVICES HOMEWAY HOMES

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MR 3/18/2011 DOE CD Submission

MH	8/11/2011	As Built Drawing Submission
MARK	DATE	DESCRIPTION

LOT #305 LOT NUMBER: DRAWN BY: MEGAN ROBERTSON CHECKED BY: MICHAEL HINES NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT:

SHEET TITLE

ADA TOUR ROUTE COMPLIANCE PLAN

G-103

4//////

5

6

60' - 0" TOP OF PARAPET TOP OF FLOOR SOLAR ENVELOPE COMPLIANCE EAST ELEVATION

1/4" = 1'-0" TOP OF FLOOR
1'-5" SOLAR ENVELOPE COMPLIANCE SOUTH ELEVATION

1/4" = 1'-0"

3/////

2//////

### GENERAL SHEET NOTES

1.) ALL HOME ELEMENTS MUST BE PLACED WITHING THE SOLAR ENVELOPE DEFINED BY THE DEPARTMENT OF ENERGY, DURING THE DESIGNATED COMPETITION PERIOD.



### ○ SHEET KEYNOTES

ORGANIZER DEFINED SOLAR ENVELOPE WATER TANK ENCLOSURE

STEEL PERGOLA STRUCTURE

PHOTOVOTAIC ARRAY

TEAM NAME: UNIVERSITY OF ILLINOIS ADDRESS: 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU CONTACT:

UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES

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### SHEET TITLE

SOLAR ENVELOPE COMPLIANCE **ELEVATIONS** 

G-201

4////// 6////// 7////// 5





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UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

CONTACT:

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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GENERAL PROJECT RENDERINGS

G-901

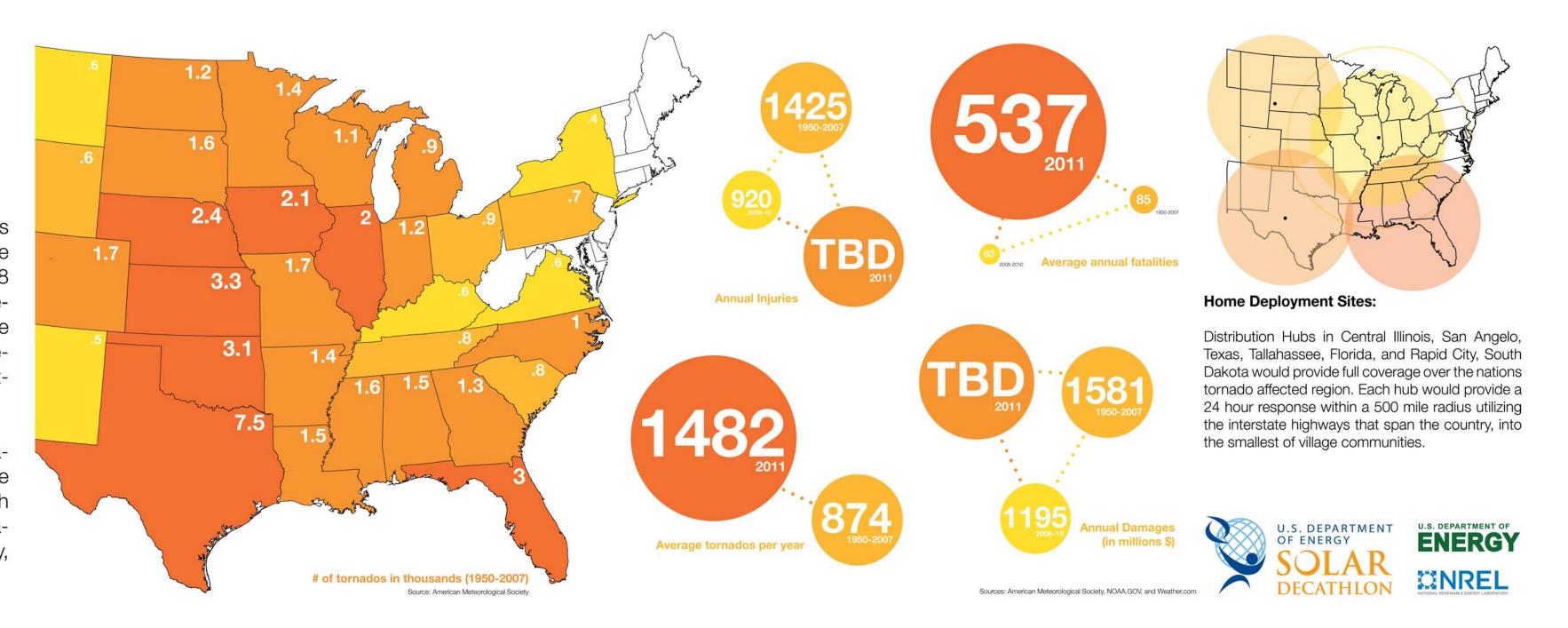
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## Re\_act

Showing the ability to Re\_act to local disasters.

Between 1950 and 2007 approximately 54,000 tornadoes have impacted communities across 32 states (check these numbers based on the figure). In Illinois alone, there are 8 strong to violent (F2-F5) tornadoes on average per year, demolishing homes and neighborhoods. By finding a balance between good design and smart planning, the Re\_home responds to the physical and emotional needs of those affected.

Distribution Hubs in Central Illinois, San Angelo, Texas, Tallahassee, Florida, and Rapid City, South Dakota would provide full coverage over the nations tornado affected region. Each hub would provide a 24 hour response within a 500 mile radius utilizing the interstate highways that span the country, into the smallest of village communities.



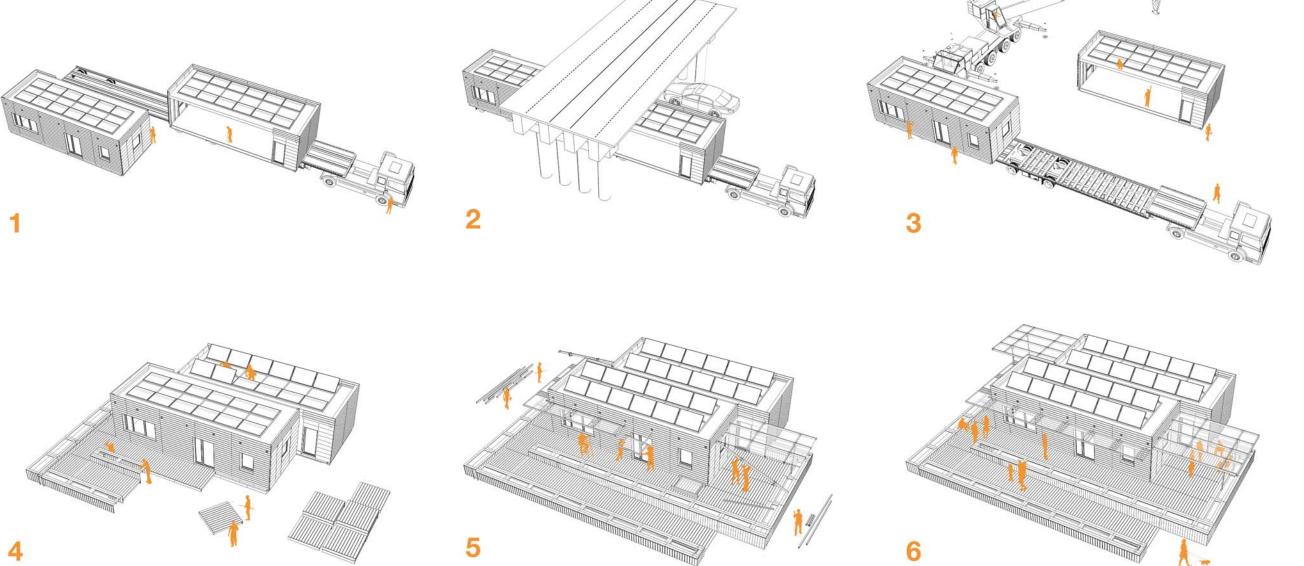
### PUBLIC EXHIBIT DISPLAY BOARD 1

# Re\_spond

Prepared to **Re\_spond** to the immediate and long term needs of a community

When disaster strikes a rapid response is critical. The Re\_home is designed with optimum dimensions to allow rapid deployment into any community. Assembled, the Re\_home accommodates families of varying size with different preferences for room arrangements. The two pre-constructed modules can be set in place and occupied the same day of delivery, providing shelter for disaster victims or temporary accommodation for first responders.

Pre-installed adjustable solar panels provide a potential standalone renewable energy source. Modular decks, added as normality returns, offer unique places for private reflection or community celebration. Landscape features constructed from salvaged material gathered in the region link the house to the past, while the plants themselves provide hope and nourishment for the homes inhabitants.



### Descriptions:

- 1. Pre-assembled by a modular home manufacturer, the house is put on a truck at their site using available machinery
- 2. Designed for highway transport, both units fit on one truck and travel comfortably on most roadways
- 3. Once on site the two units are unloaded and joined to create the heart of a new home.
- 4. Pre-installed solar panels are oriented and and modular decks are assembled.
- 5. Modular shading canopies are installed over both deck areas.

6. A new home is created, housing displaced victims and creating a new hub of community interaction.



PUBLIC EX

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ENERGY

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Re home

TEAM NAME: UNIVERSITY OF ILLINOIS

ADDRESS: 611 LORADO TAFT DR.
CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU

WWW.SOLARDECATHLON.ILLINOIS.EDU

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PUBLIC EXHIBIT DISPLAY BOARDS

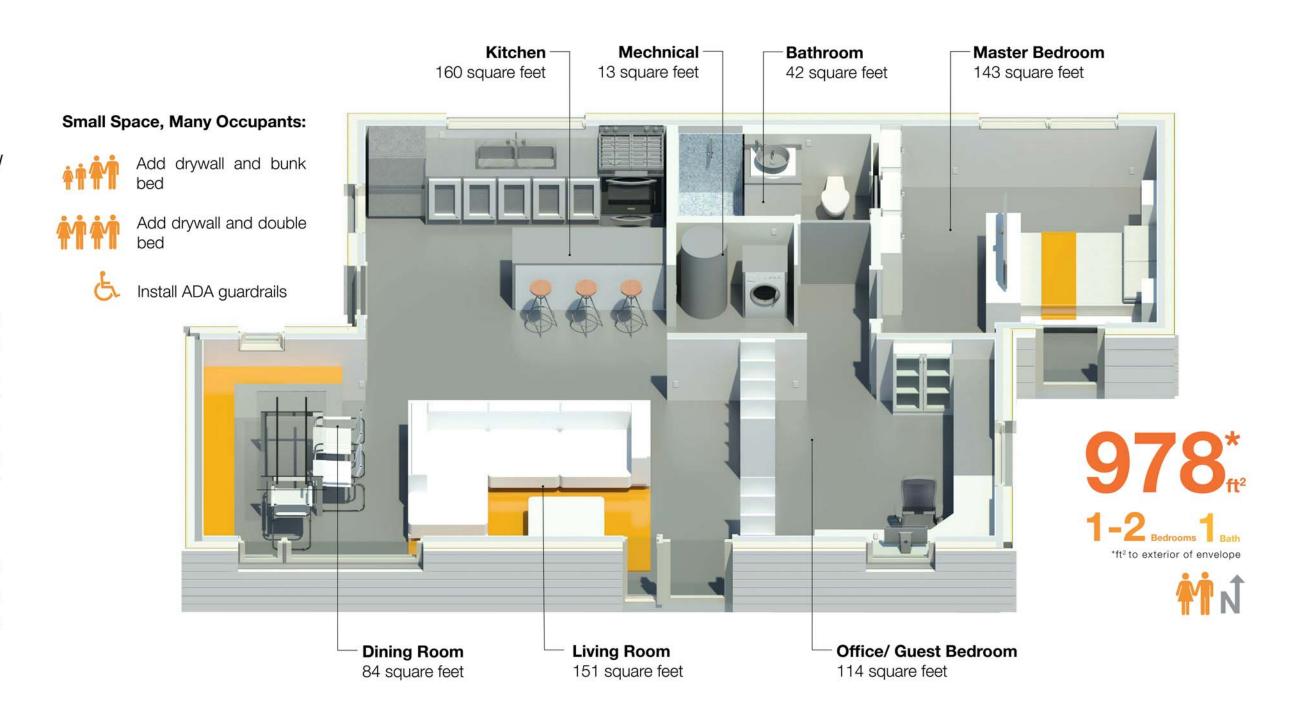
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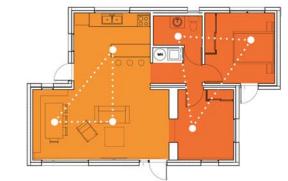
## Re\_consider

Allowing disaster victims to Re\_consider their personal personal living environment.

Previous disaster relief housing has often proven inflexible to the various lifestyles of disaster victims. An efficient open floor plan accommodates the various needs of many users. Designed around two triangular organizations, one open for public interaction, and one enclosed for intimacy. Minimizing wasted circulation space, the spatial arrangements in the house encourage a close interaction between both interior and exterior spaces.

The "flex space" allows the house to transition from a one to two bedroom home. Allowing the occupants to customize their own living space to their personal needs. embracing the individuality a homeowner will bring to the Re\_home.





### **Triangular Interior Space Organization**



Interior-Exterior Space Relationship





### PUBLIC EXHIBIT DISPLAY BOARD 3

## Re\_build

Creating a high performance, prototype to Re\_build communities for the future.

Following the devastation of a community, it is important to rebuildbackstrongerandsmarter.TheRe\_homeaccomplishes both goals through thoughtful design, efficient construction and careful monitoring. A super insulated, double-layered envelope minimizes thermal transfer between the interior and exterior of the building, drastically reducing the energy needs of the home.

Careful placed glazing reduces cost and preserves the integrity of the building envelope. Desired views from the house are maintained and shading devices controls solar gains while permitting comfortable levels of day-lighting. Built to comply with the stringent structural components of the Illinois Building Code the house is built significantly stronger than the homes it would replace.

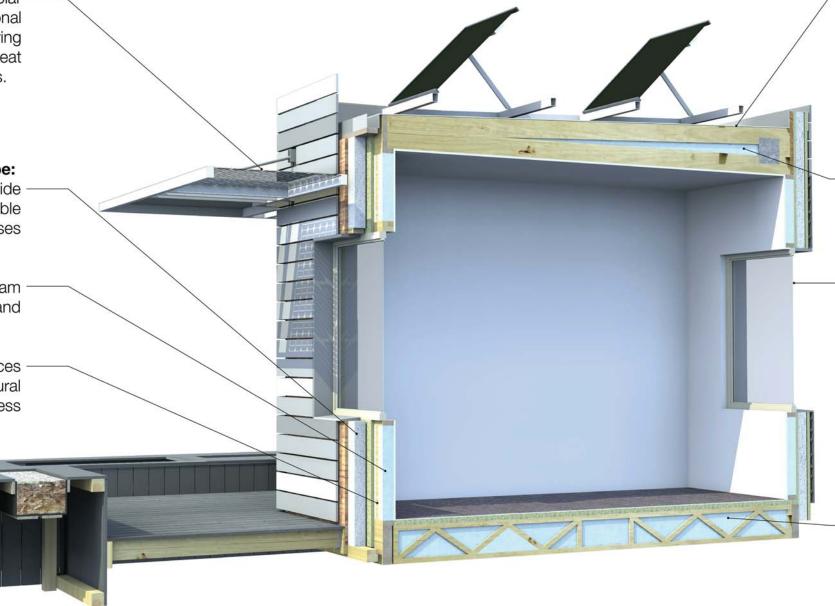
Smart Shading: Integrated solar shading, reducing heat gain during the warm summer and allowing heat gains during cold winter months.

### Super Insulated R45 Envelope: -Exterior insulation panels provide

extra insulation and a double layer installation greatly decreases thermal bridging.

-3.5 inches of interior spray foam insulation provide an airtight and highly insulated inner wall.

-24" o.c wall construction reduces the thermal bridging of structural members and utilizes less construction material.



heat absorbance of the building, reducing ambient temperatures and increasing solar power production.

R60+ Roof: Spray foam insulation between 9.5 and 15 inches creates a super insulated and air-tight roof.

**High Performance Glazing:** 

#### Triple-pane, Low-E coated, argon filled windows greatly reduce heat transmission through exterior glazing and improving energy efficiency. Strategic placement of built, and cost effective. windows, mainly on the north and south facade, minimize

R60 Floor: 9.5 inches of highly insulated floor, important when placed on above ground foundations



**Benefits of Modular Construction:** 

Through the use of modular construction, Team Illinois was able to utilize factory conditions and assembly line efficiency to minimize construction waste. The result is a home that is quickly assembled, quality

The high level of quality creates a tighter exterior harsh east and west solar heat envelope enabling better building performance and energy savings throughout the year.



**ENERGY** ≅NREL



PUBLIC EXHIBIT DISPLAY BOARD 4

PUBLIC EXHIBIT DISPLAY BOARDS

LOT #305

Author

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SOLARDECATHLON@UIUC.EDU

WWW.SOLARDECATHLON.ILLINOIS.EDU

611 LORADO TAFT DR.

CHAMPAIGN, IL 61820

TEAM NAME:

CONSULTANTS

HOMEWAY HOMES

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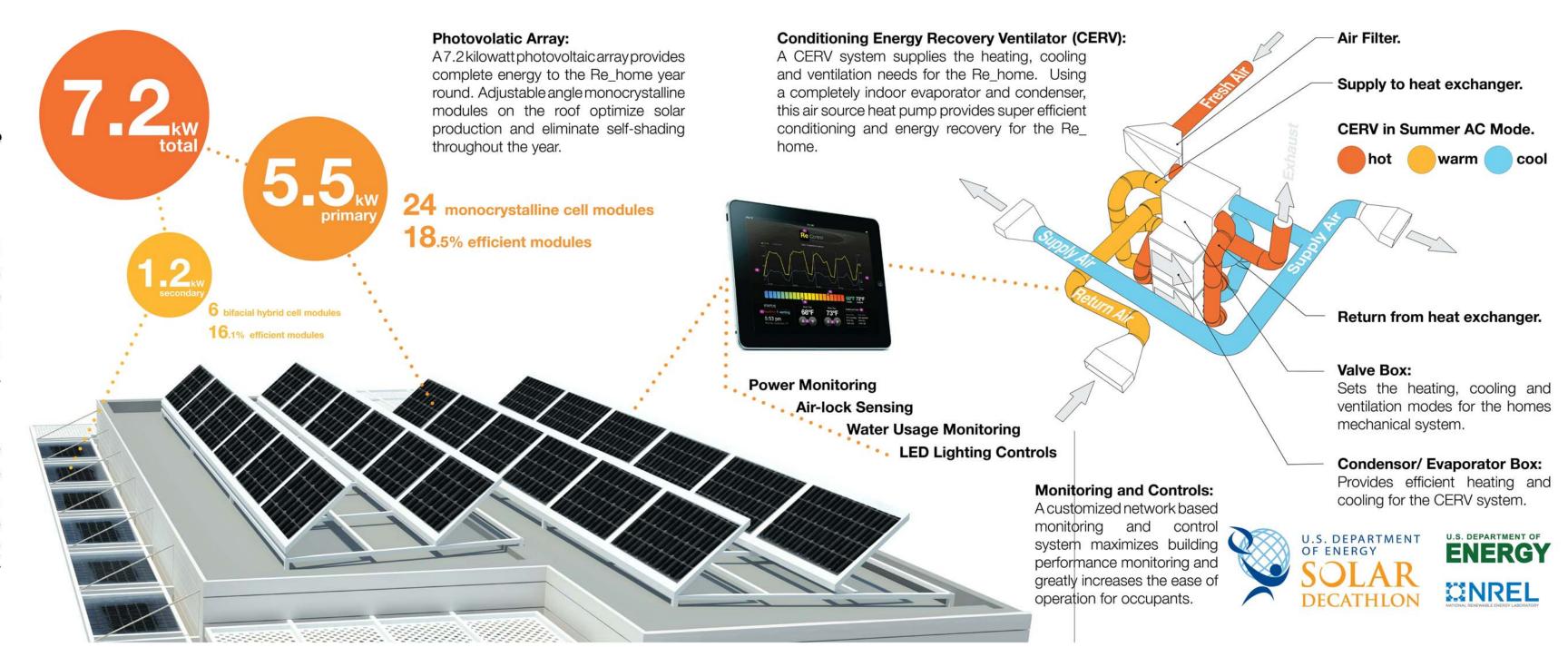
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## Re\_newable

Cutting edge technology is used to sustain a Re\_newable

When disasters strike there is an opportunity to depart with the technologies of the past and take control of the resources of the future. The Re\_home will demonstrate harnessing the power of the sun and the recovery of energy typically wasted in current residences. With a super insulated airtight building envelope the energy demands for heating or cooling the Re\_ home are reduced.

With demand reduced, through passive features, active systems in the house can be down sized. A stand-alone CERV conditioning communicates with an I-Pad application, allowing the homeowner to track and modify the performance of the home in real time. The combination of highly efficient roof mounted photovoltaic (PV) panels with integrated HIT PV panels ensures a Net Zero energy balance for the home



PUBLIC EXHIBIT DISPLAY BOARD 5

### 101/00

Re\_investing in local communities, our country, and the future of our planet.

Sustainability and cost effectiveness are at the heart of the design of the Re\_home. In selecting the materials for the interior and exterior of the Re\_home a balance was achieved between affordability and environmental impact. Materials with reused or recycled content can be found throughout the Re\_home, reflecting a consideration for our planet's dwindling resources. Windows and doors provide performance that reduces heating and cooling demands at a price that keeps the house affordable. The use of reclaimed wood around the house preserves old growth lumber, while all natural flooring inside helps maintain a desirable indoor air-quality.

Minimal operational expenses and quality construction makes the Re\_home a smart investment for its occupants. At \$275,000 the house provides an adaptable living environment.

**Affordable Windows:** Triple-pane vinyl windows from Kolbe™ strike an optimum balance between cost and performance.

Recyled Steel Canopies: Perforated shade canopies made with recycled steel from McNichols™ provide a durable exterior shading solution.

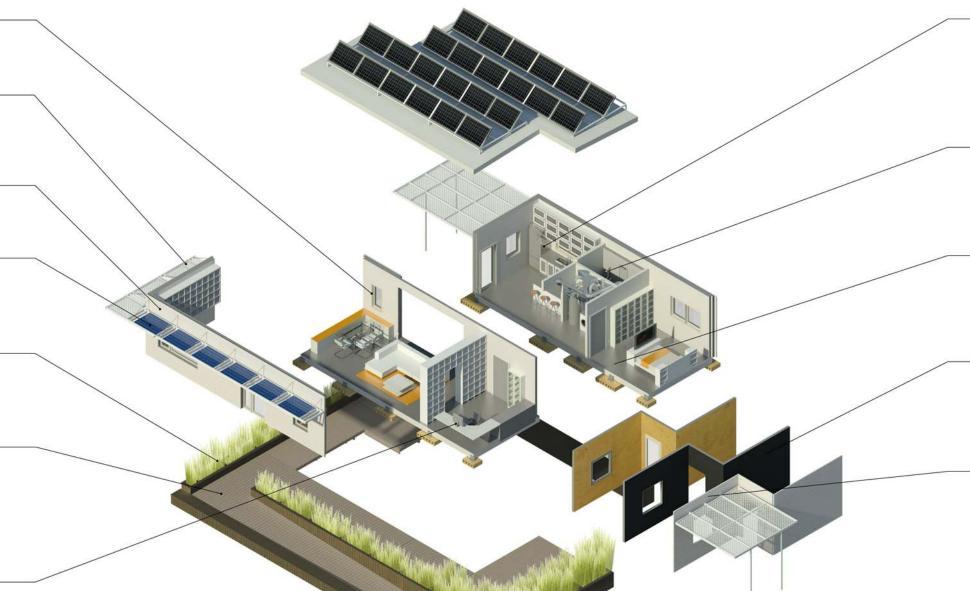
Cedar Siding: One of the most stable and durable wood materials, the siding will reduce maintenance costs over time.

**Building Integrated Solar Panels:** Photovolatic panels in the shading canopies double as shading devices for the front porch and south facing windows.

Edible Plantings: All the vegetation around the house is edible, providing a healthy sustainable food source for the homes residents following a disaster.

Reclaimed Decking and Planters: The decking and planters are reclaimed wood from a 19th century grain elevator in Wisconsin and a fence in Champaign, giving new life to the material and saving virgin timber.

**LED lighting:** LED lighting from Juno greatly decreases the electricity demands of the home and provides extended life over standard and CFL bulbs.



**Energy Efficient Appliances:** Energy-efficient appliances from Bosch™ and Whirlpool™ provide affordable, high-performance interior fixtures. These items both decrease the energy usage of the home and greatly increase the living quality of the home occupants

Water Saving Plumbing Fixtures: Kohler™ water fixtures throughout the home meet the EPA's strict new WaterSense program requirements. The toilet for the home could save up to 16,500 gallons a

Marmoleum<sup>™</sup> Flooring: Forbo<sup>™</sup> Marmoleum Click tile flooring presents a environmentally-friendly flooring solution that is quickly installed, highly durable, low maintenance and allergen neutral to improve the indoor air quality of the home.

**Lamboo**™ **Sheathing:** Bamboo, one of the planets most rapidly renewable materials, is the sheathing for the exterior insulation panels. Once laminated the bamboo becomes an extremely strong base for the exterior siding.

**Resysta**<sup>™</sup> **Siding:** Made from recycled rice husks and natural oils and salts, Resysta siding presents a sustainable durable and weather resistant siding



≅NREL

PUBLIC EXHIBIT DISPLAY BOARD 6

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TEAM NAME: UNIVERSITY OF ILLINOIS ADDRESS: 611 LORADO TAFT DR. CHAMPAIGN, IL 61820 SOLARDECATHLON@UIUC.EDU

WWW.SOLARDECATHLON.ILLINOIS.EDU

CONSULTANTS

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PUBLIC EXHIBIT DISPLAY BOARDS

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College of Agricultural, Consumer, and Environmental Sciences
College of Engineering
College of Fine and Applied Arts
College of Business

The University of Illinois at

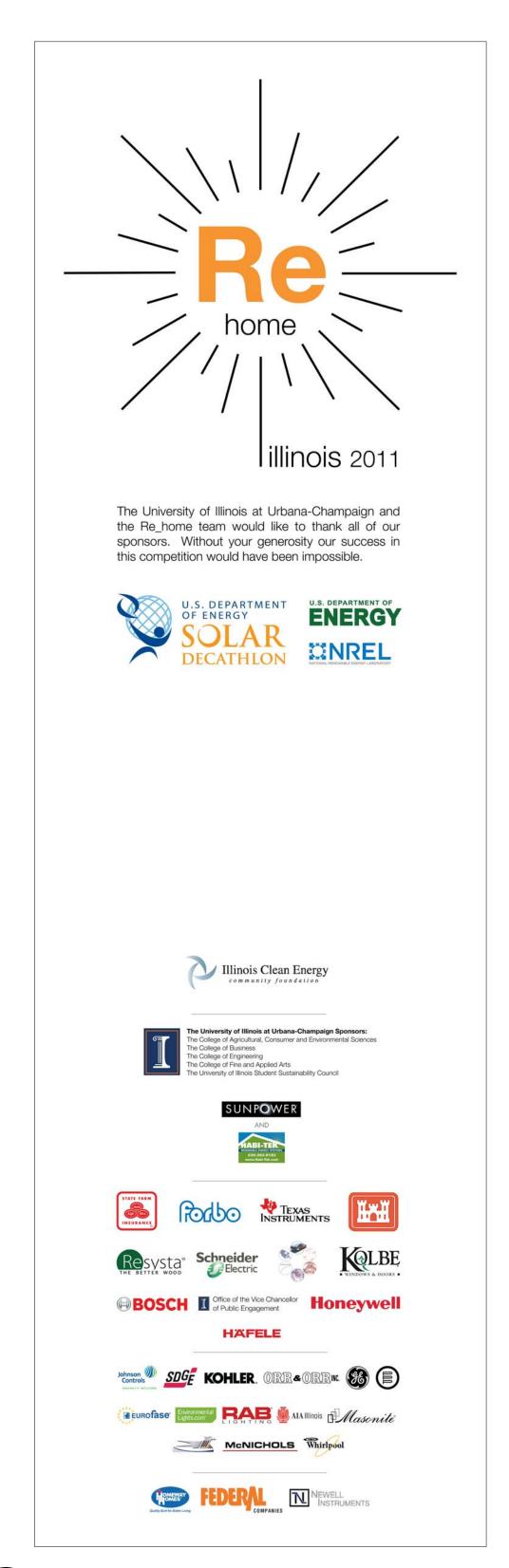
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CONTACT:

CT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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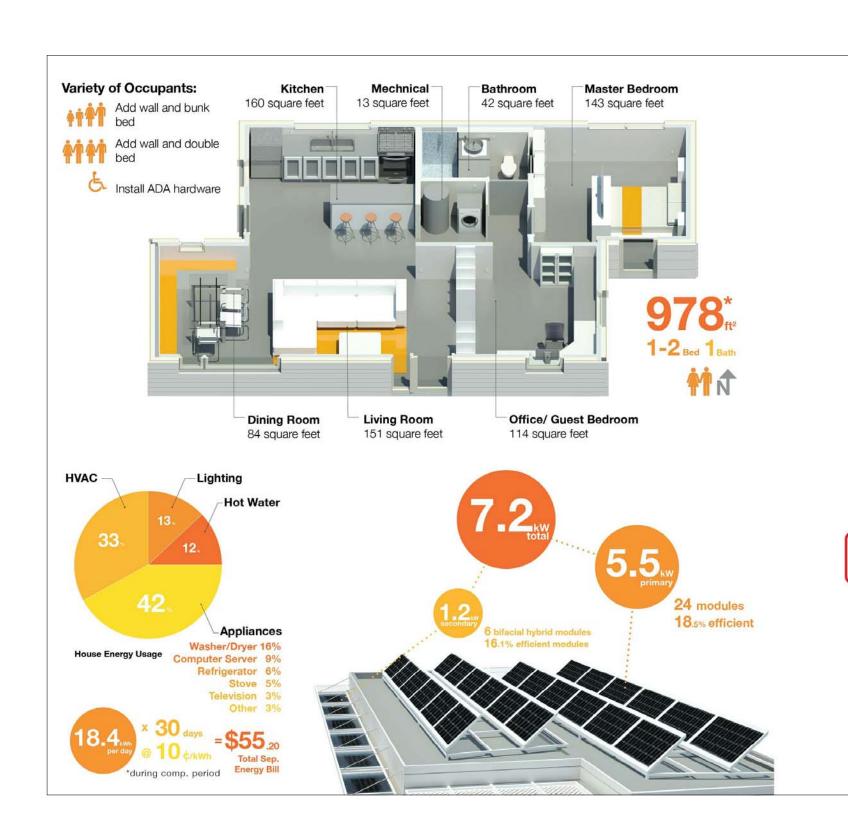
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The University of Illinois at Urbana-Champaign and the Re\_home team would like to thank all of our sponsors for their generosity and commitment to our sucess.





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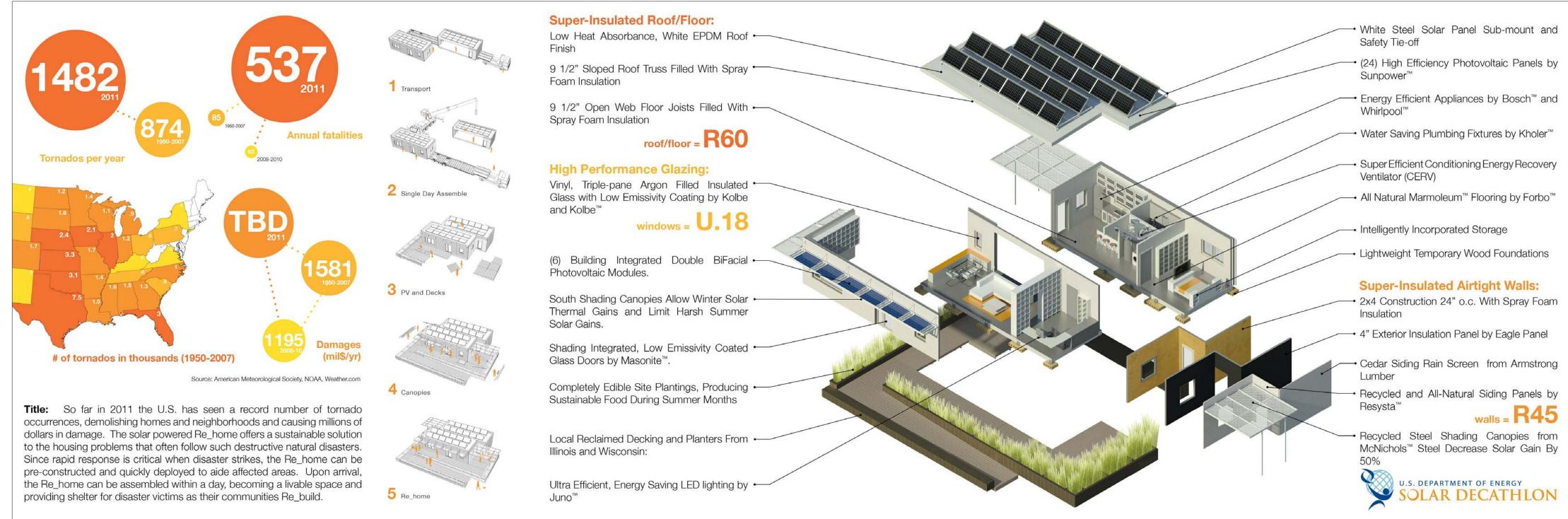






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### PUBLIC HANDOUT SIDE 1



3/////

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PUBLIC HANDOUT SIDE 2

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UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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PUBLIC HANDOUT LAYOUTS

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29 (A1) LIQUID LOCATION AND SPILL CONTAINMENT PLAN

1/4" = 1'-0"

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GENERAL SHEET NOTES

- ALL EQUIPMENT, TANKS AND TANKS THAT WILL CONTAIN FLUIDS AT ANY POINT DURING THE COMPETITION ARE OUTLINED ON THIS DRAWING. THE ILLINOIS SOLAR DECATHLON TEAM IS NOT UTILIZING SOLAR HOT WATER OR THERMAL WATER STORAGE DURING THE COMPETITION.
- ALL PRESSUREIZED WATER SYSTEMS SHALL HAVE PROPER CONTAINMENT AND WILL BE EQUIPPED WITH AN OVERFLOW PAN AND DRAIN BELOW THE
- A CONDENSATION PAN WITH DRAIN TUBING HAS BEEN PROVIDED FOR EACH HEAT EXCHANGER LOCATED WITHIN THE HOUSE.
- THE TOILET, WHILE SHOWN, WILL NOT BE PLUMBED OR FUNCTIONAL FOR THE EVENT AND WILL BE MARKED AS SUCH WITH SIGNAGE TO PREVENT ANY ACCIDENTIAL USE.
- IN THE EVENT OF ANY SPILL, THE TEAM SHALL CONSULT THE SAFETY PLAN AND CONTACT THE EVENT ORGANIZERS
- IN ALL CASES THIS DOCUMENT IS SUPERCEDED BY THE REQUIREMENTS SET FORTH BY THE NATIONAL PARK SERVICE. THIS DOCUMENT SERVES AS A SUPPLEMENT TO THESE REQUIREMENTS.



TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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HOMEWAY HOMES

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### ○ SHEET KEYNOTES

- KITCHEN SINK
- DISHWASHER
- GREYWATER STORAGE
- 20 SHOWER
- 21 SINK 22 TOILET
- HOTWATER TANK WITH DRIP PAN 23
- CLOTHES WASHER
- SUMP PUMP BLACK WATER TANK
- 28 SUPPLY WATER TANK GAS GENERATOR DRIP PAN 29
- RAIN BARREL PRESSURE TANK

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MH	5/2/2011	Updated to reflect movement
		of rear water storage tanks
MH	8/11/2011	As Built Drawing Submission
MARK	DATE	DESCRIPTION

LOT #305

MEGAN ROBERTSON

MICHAEL HINES

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LIQUID LOCATION AND SPILL CONTAINMENT PLAN

H-101

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### GENERAL CIVIL NOTES

- 1.) THE LOCATION OF EXISTING UNDERGROUND UTILITIES, SUCH AS WATER MAINS, SEWERS, GAS LINES, ETC. HAS NOT BEEN DETERMINED AND HAS NOT BEEN SHOWN ON THE PLANS. BEFORE CONSTRUCTION, OWNER SHOULD HIRE A LICENSED CIVIL ENGINEER TO DETERMINE LOCATION BASED ON THE BEST AVALIABLEINFORMATION, ALL INFORMATION SHOWN IS GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE OWNER AND THE ENGINEER DO NOT ASSUME RESPONSIBILITY IN THE EVENT THAT DURING CONSTRUCTION, UTILITIES OTHER THAN THOSE SHOWN MAY BE ENCOUNTERED AND THAT THE ACTUAL LOCATION OF THOSE WHICH EXIST MAY BE DIFFERENT FROM THE LOCATION ASSUMED.
- CONTRACTOR SHALL NOTIFY THE OWNER, ENGINEER AND THE LOCAL PRESIDING MUNICIPALITY A MINIMUM OF 48 HOURS IN ADVANCE OF PERFORMING ANY WORK.
- ALL AREAS, ON OR OFF SITE, DISTURBED DURING CONSTRUCTION OPERATIONS AND NOT PART OF THE WORK AS SHOWN HERON SHALL BE RESTORED TO ORIGINAL CONDITION TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST TO THE OWNER. IT IS INCUMBENT UPON CONTRACTOR TO SHOW THAT DAMAGED AREAS WERE NOT DISTURBED BY CONSTRUCTION OPERATIONS
- THESE DRAWINGS ASSUME THAT THE CONTRACTOR WILL UTILIZE AN ELECTRONIC DRAWING FILE AND STAKE ALL SITE IMPROEVEMNTS USING COORDINATES TIED INTO THE CONTROL POINTS. THE DIMENSIONS INDICATED ON THE DRAWINGS ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY.
- IN THE CASE OF CONFLICT BETWEEN THESE DRAWINGS, THE FOUNDATION DRAWINGS AND THE ARCHITECTURAL SITE PLAN, THE USER OF THIS INFORMATION SHALL CONTACT THE ENGINEER IMMEDIATELY.
- OWNER TO COORDINATE THE EXACT LOCATIONS OF ALL UTILITY SERVICE LINES WITH PLUMBING DRAWINGS. REFER TO PLUMBING DRAWINGS FOR CONTINUATION OF ALL UTILITIES WITHIN 5 FEET OF BUILDING AREA
- CONTRACTOR SHALL FIELD VERIFY INVERT & LOCATIONS OF EXISTING UTILITY MAINS PRIOR TO INSTALLING ANY ON-SITE UTILITIES OR STRUCTURES.
- SEPARATION OF WATER AND SEWER LINES SHALL BE 10' MINIMUM HORIZONTALLY. IF 10' IS NOT POSSIBLE, SEWER SHALL BE OF WATER MAIN QUALITY MATERIAL AND CONSTRUCTION.
- CLEAN OUT ALL EXISTING AND PROPOSED STORM INLETS AND CATCH BASISNS AT THE COMPLETION OF CONSTRUCTION
- 10.) THE "STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS" CURRENT EDITION SHALL GOVERN WORK WHERE APPLICABLE.



TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

CONTACT:

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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MARK	DATE	DESCRIPTION

LOT NUMBER: LOT #305 DRAWN BY: MEGAN ROBERTSON CHECKED BY MICHAEL HINES NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT:

SHEET TITLE

CIVIL NOTES AND SYMBOLS

C-001

GENERAL CIVIL NOTES

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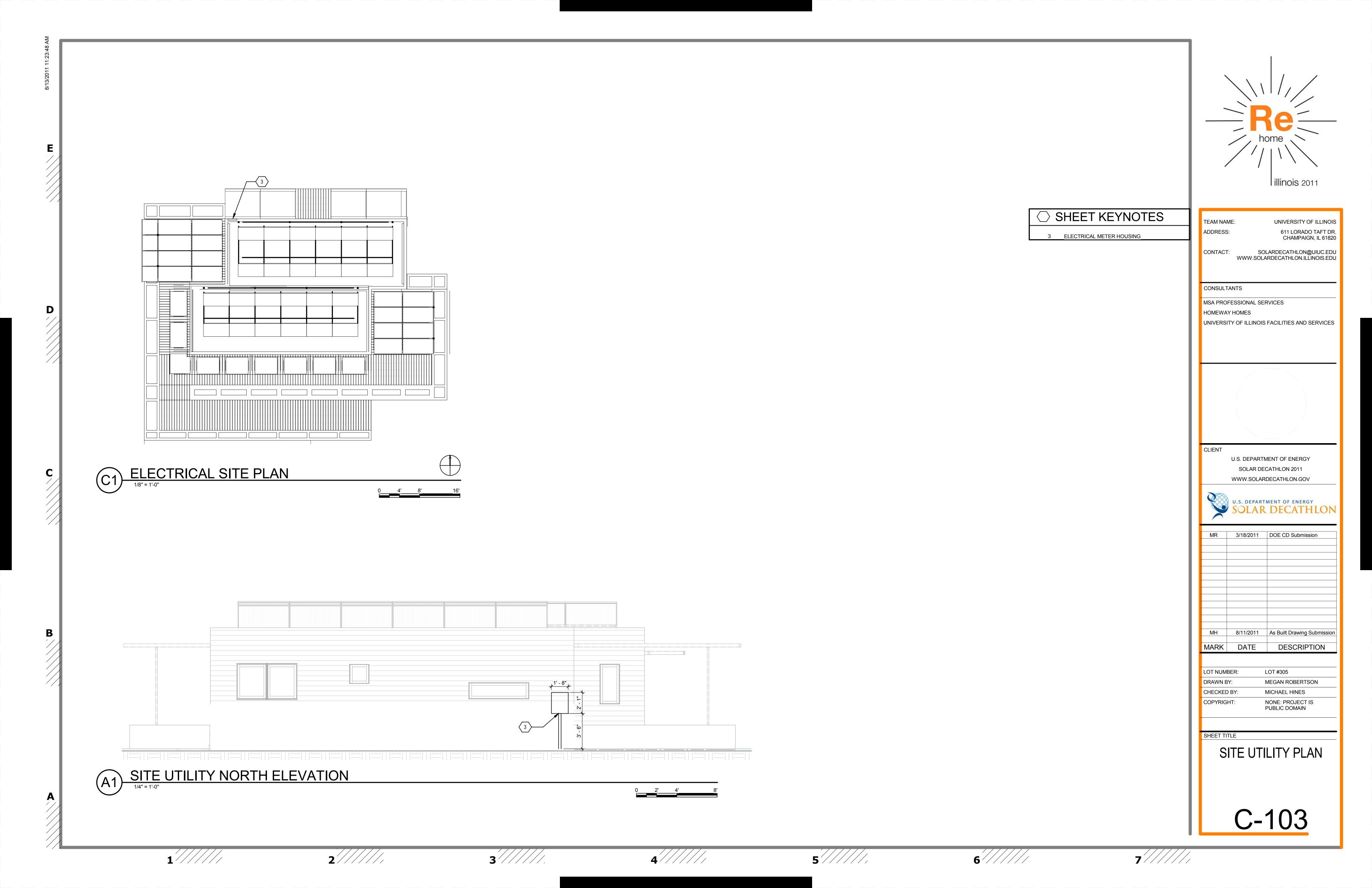
GENERAL SHEET NOTES EACH DWELLING SHALL BE PROVIDED WITH GROUNDING ELECTRODES IN ACCORDANCE WITH IRC E3608.1.4 ROD AND PIPE ELECTRODES. THE LENGTH OF THE GROUND ROD SHALL BE EXACTLY 8 FEET IN LENGTH. PLEASE REFER TO THE STAMPED STRUCTURAL CALCULATIONS IN THE PROJECT MANUAL FOR FURTHER CLARIFICATION ON GROUND LOADING CONDITIONS. √ 1151.8 PSF 1151.8 PSF 1198.75 PSF √ 1026.4 PSF --- 1198.75 PSF l illinois 2011 ○ SHEET KEYNOTES UNIVERSITY OF ILLINOIS TEAM NAME: ADDRESS: 611 LORADO TAFT DR. 72 ELECTRICAL METER HOUSING CHAMPAIGN, IL 61820 535.9 PSF CONTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU CONSULTANTS MSA PROFESSIONAL SERVICES 478.5 PSF HOMEWAY HOMES UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES \_1310.3 PSF\_ 478.5 PSF 535.9 PSF U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2011 WWW.SOLARDECATHLON.GOV SOLAR DECATHLON MR 3/18/2011 DOE CD Submission MH 8/11/2011 As Built Drawing Submission DESCRIPTION MARK DATE LOT NUMBER: LOT #305 DRAWN BY: Author 6' - 0" CHECKED BY: Checker 6' - 0" 6' - 0" NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT: SHEET TITLE **GROUND CONTACT** PLAN GROUND CONTACT PLAN

1/4" = 1'-0" C-101 3////// 7////// 6 2////// 5//////

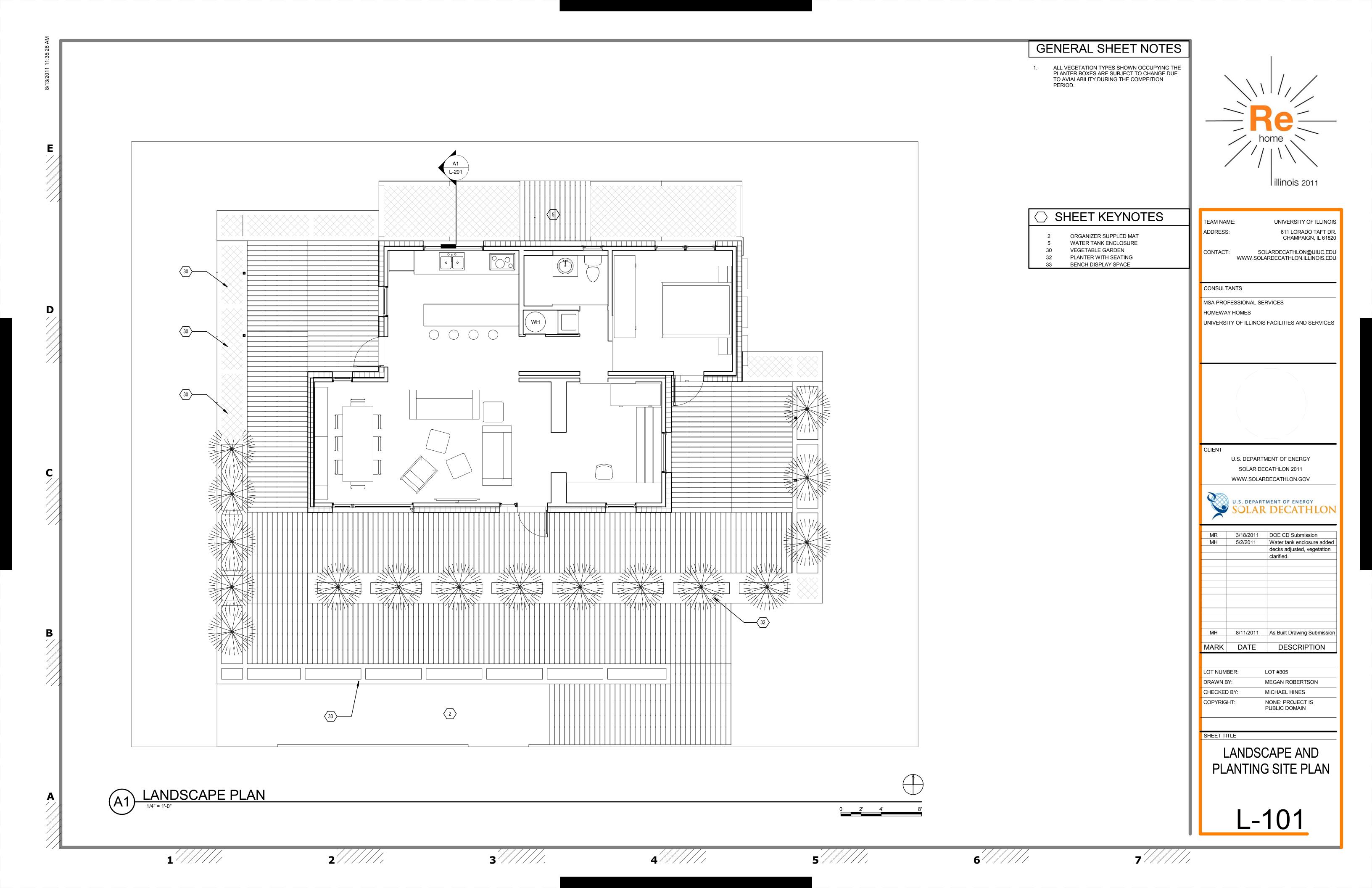




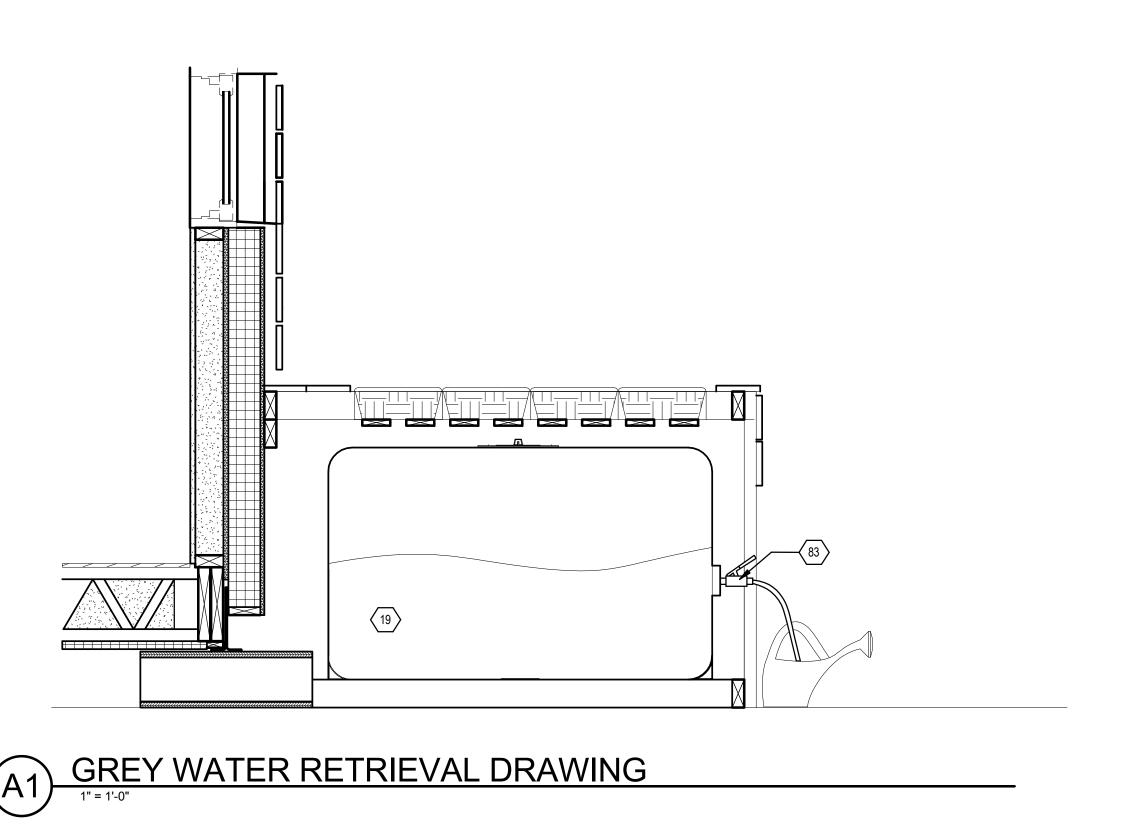
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MARK	DATE	DESCRIPTION

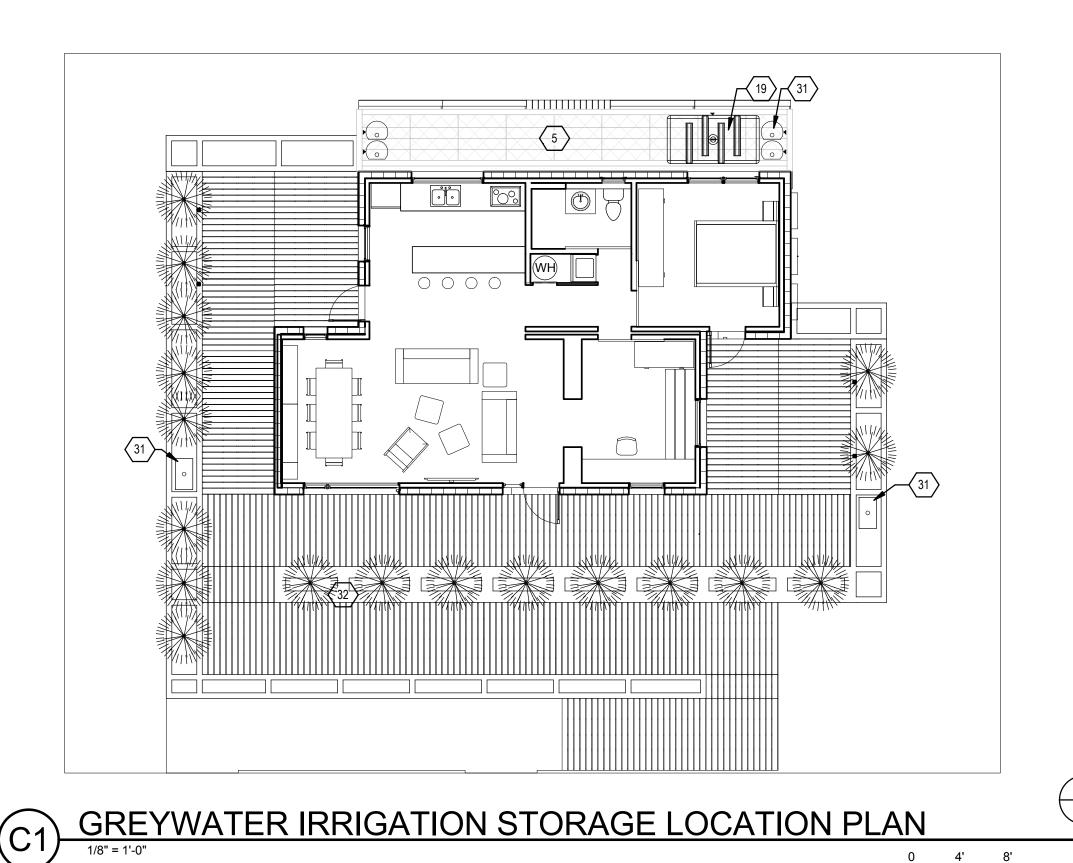


GENERAL SHEET NOTES 1/2" STEEL SHIM PLATES ARE TO BE ADDED TO WOOD FOUNDATIONS TO ACCOMODATE POSSIBLE 18" VARIATION IN SITE CONDITIONS. l illinois 2011 REFERENCE KEYNOTES TEAM NAME: UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. ADDRESS: 05 05 23.H6 1" SHEAR CONNECTORS CHAMPAIGN, IL 61820 05 05 23.I1 1/2" STEEL PLATE 05 12 77.N99 WT8X18 SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU CONTACT: 06 11 00.F1 2X6 06 16 00.D14 1" PLYWOOD CONSULTANTS MSA PROFESSIONAL SERVICES HOMEWAY HOMES UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2011 WWW.SOLARDECATHLON.GOV U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON MR 3/18/2011 DOE CD Submission \_\_\_05 12 77.N99 -05 05 23.H6  $\bigcirc$ MH 8/11/2011 As Built Drawing Submission DESCRIPTION MARK DATE  $\bigcirc$ LOT NUMBER: LOT #305 ─06 16 00.D14 DRAWN BY: MEGAN ROBERTSON CHECKED BY: MICHAEL HINES NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT: SHEET TITLE LOT CONDITION ─06 16 00.D14 ADJUSTMENT DETAILS FOUNDATION FOOTING FOR SITE ADJUSTMENT
3" = 1'-0" C-501 3////// 6 7////// 1///// 2////// 5



1





2//////

3//////

### GENERAL SHEET NOTES

- 1. GREYWATER ACCESS AND DISTRIBUTION FOR IRRIGATION PURPOSES SHALL BE DONE MANUALLY ON SITE BY ILLINOIS SOLAR DECATHLON TEAM MEMBERS. NO PIPING OR AUTOMATIC DISTRIBUTION IS EMPLOYEED IN THE IRRIGATION PROCESS.
- 2. ONLY GREYWATER AND RAINWATER TANKS
  SHOULD BE ACCESSED DURING THE HOURS OF
  9AM-5PM. AT NO POINT IN THE REMOVAL OF
  GREYWATER SHOULD THE MAIN SUPPLY TANK BE
  EXPOSED TO DIRECT SUNLIGHT.
- ALL TANKS USED TO TRANSMIT GREYWATER
  FOR IRRIGATION SHALL BE CLEARLY LABELED FOR
  THEIR INTENDED PURPOSE. THESE CONTAINERS
  WILL AT NO TIME CONTAIN WATER MEANT FOR
  POTABLE USE.
- 4. PLEASE REFER TO THE PROJECT MANUAL FOR FULL DETAILS ON WATER CONTAINMENT DEVICES.

### ○ SHEET KEYNOTES

- WATER TANK ENCLOSURE
- GREYWATER STORAGE
- 31 RAIN BARREL
- 32 PLANTER WITH SEATING83 GUZZLER 400H HAND PUMP FOR IRRIGATION

TEAM NAME: ADDRESS: UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

l illinois 2011

CONTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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Greywater irrigation schematic added.

MR 3/18/2011 DOE CD Submission

MH	8/11/2011	As Built Drawing Submission	
MARK	DATE	DESCRIPTION	
LOT NUMBER:		LOT #305	
DRAWN BY:		Author	
CHECKED BY:		CHECKER	
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LANDSCAPE IRRIGATION AND GREYWATER

SHEET TITLE

7//////

6

L-102

4////// 5//////

GENERAL SHEET NOTES PLEASE REFER TO THE PROJECT MANUAL FOR FULL DETAILS ON WATER CONTAINMENT DEVICES. RAINWATER COLLECTED ON SITE IS TO BE USED FOR EXTERIOR IRRIGATION ONLY. AT NO TIME SHALL THIS WATER BE USED FOR POTABLE l illinois 2011 REFERENCE KEYNOTES TEAM NAME: UNIVERSITY OF ILLINOIS ADDRESS: 611 LORADO TAFT DR. WATER TANK ENCLOSURE CHAMPAIGN, IL 61820 07 71 00.B3 DOWNSPOUT \_07 71 00.B3 SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU RAIN BARREL CONTACT: PLANTER WITH SEATING CONSULTANTS MSA PROFESSIONAL SERVICES HOMEWAY HOMES UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2011 WWW.SOLARDECATHLON.GOV SOLAR DECATHLON MR 3/18/2011 DOE CD Submission MH 8/11/2011 As Built Drawing Submission MARK DATE DESCRIPTION LOT NUMBER: LOT #305 DRAWN BY: Author CHECKED BY: NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT: SHEET TITLE RAINWATER COLLECTION (A1) RAINWATER COLLECTION PLAN

1/4" = 1'-0" L-103 3////// 7////// 1///// 4////// 6 2////// 5

GENERAL SHEET NOTES

PLANTING ON TOP OF THE WATER TANK ENCLOSURE IS TO BE INSTALLED ON AFTER THE NECESSARY WATER HAS BEEN DISTRIBUTED TO THE ENCLOSED TANKS.

DURING THE COMPETITION PERIOD THE PLANTINGS ABOVE THE TANKS ARE TO REMAIN IN PLACE BETWEEN 9 AM AND 5PM TO ENSURE WATER TANKS REMAIN FULLY SHADED PER SD RULE 9-1.



### REFERENCE KEYNOTES

06 11 00.B5 1X4 06 11 00.D1 2X4

06 11 00.L1 4X4 SUPPLY WATER TANK 32 93 23 PLANTS AND BULBS

TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU CONTACT:

CONSULTANTS

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MH 5/2/2011 Water tank enclosure detailed.

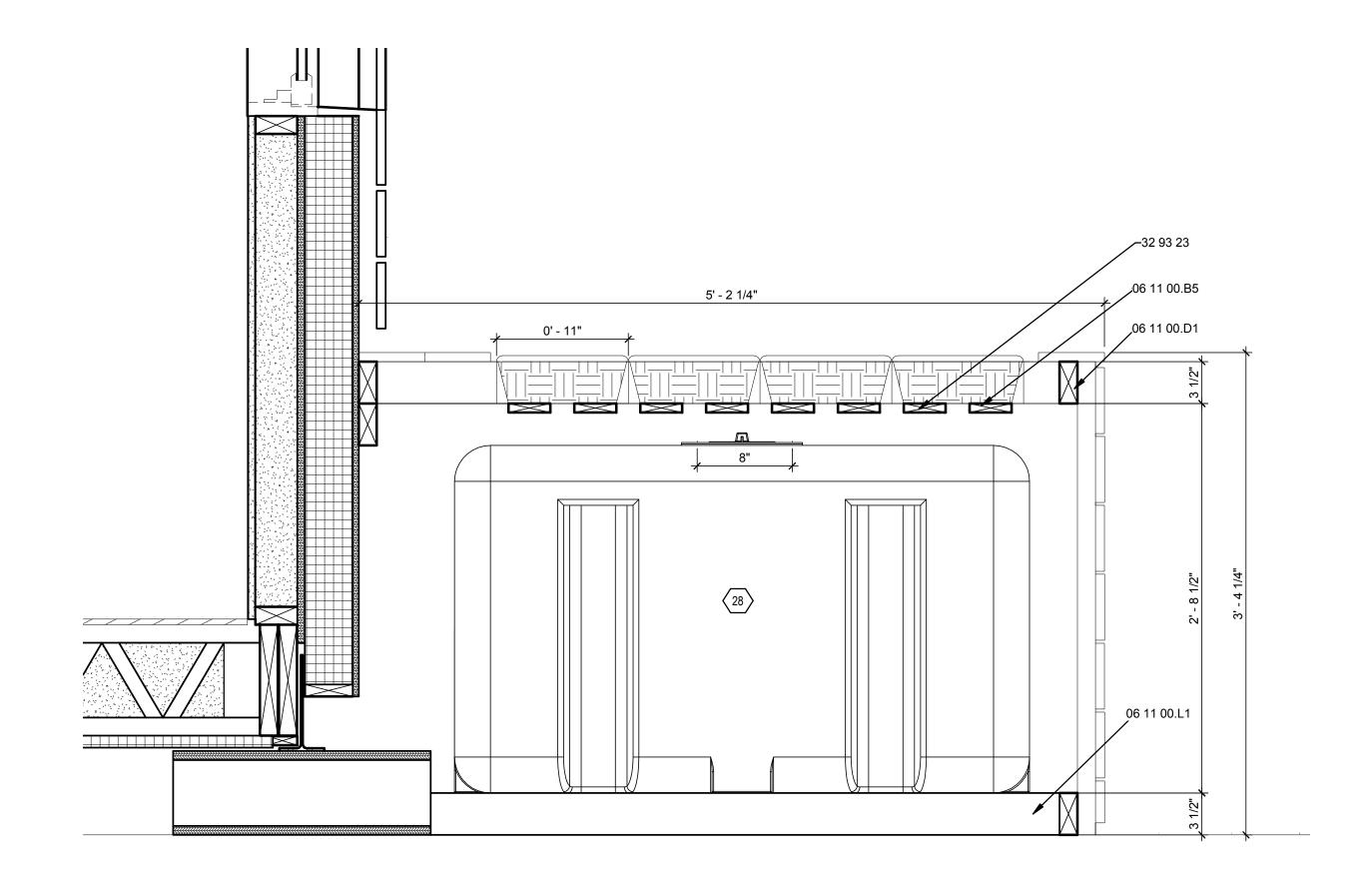
MR 3/18/2011 DOE CD Submission

MH	8/11/2011	As Built Drawing Submission
MARK	DATE	DESCRIPTION
LOT NUM	BER: L	OT #305
LOT NUM DRAWN E		OT #305 Author
	BY: /	

SHEET TITLE

LANDSCAPE **ELEVATIONS AND DETAILS** 

L-201



2//////

(A1) WATER TANK ENCLOSURE SECTION
1 1/2" = 1'-0"

1/////

3//////

5//////

6

BUILDING CODE:

INTERNATIONAL BUILDING CODE 2009
ASCE 7-2005 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

STRUCTURAL STEEL:
INTERNATIONAL BUILDING CODE 2009, CHAPTER 22
ALSO SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS ALSO 260

AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS -- AISC 360-05 AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION -- AISC 325-05

STRUCTURAL WOOD:

INTERNATIONAL BUILDING CODE 2009, CHAPTER 23
NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION ASD/LRFD -- ANSI/AF&PA NDS-05

DC DESIGN CRITERIA

DC-1 <u>LIVE LOADS</u>

ROOF 20 PSF

RESIDENTIAL FLOOR 50 PSF

RAILINGS 200 LB CONCENTRATED LOAD APPLIED IN ANY DIRECTION AT ANY POINT AT TOP OF RAIL

DC-2 <u>SUPERIMPOSED DEAD LOADS</u> FLOOR: 9.3 PSF

DECKS, RAMPS

ROOF: 10.0 PSF

SOLAR PANELS: 1.5 PSF SOLAR PANEL SUPPORT FRAME / TIE-OFF: 3053 LB

DC-3 SNOW LOADS: 1 GROUND SNO

 1. GROUND SNOW LOAD Pg
 20 PSF

 2. FLAT-ROOF SNOW LOAD Pf
 14 PSF

 3. SNOW EXPOSURE FACTOR Ce
 1.0

 4. SNOW LOAD IMPORTANCE FACTOR Is
 1.0

 5. THERMAL FACTOR Ct
 1.0

DC-4 <u>WIND LOADS:</u>

60 MPH (GIVEN) 1. BASIC WIND SPEED 2. WIND IMPORTANCE FACTOR IW 3. WIND EXPOSURE C (GIVEN) 4. INTERNAL PRESSURE COEFFICIENT ± 0.18 PRIMARY WIND RESISTING FRAME PRESSURES ± 10 PSF 6. ROOF FRAME WIND PRESSURES - 2.1 PSF 7. ROOF OVERHANG WIND PRESSURES - 4.5 PSF 8. COMPONENTS & CLADDING WIND PRESSURES - 14 PSF 9. COMPONENTS & CLADDING OVERHANG WIND PRESSURES - 14 PSF

OC-5 SERVICEABILITY CRITERIA.

SERVICEABILITY CRITERIA:

FLOOR FRAMING LIVE LOAD DEFLECTION TYPICAL

FLOOR FRAMING SUPERIMPOSED DEAD + LIVE LOAD DEFLECTION

LATERAL DRIFT DUE TO WIND LOAD IS LIMITED TO H/400

ROOF FRAMING SUPERIMPOSED DEAD + LIVE LOAD DEFLECTION

L/240

(MINUS SIGN SIGNIFIES WIND PRESSURE AWAY FROM SURFACE)

DC-6 STRUCTURAL STABILITY IS ACHIEVED IN THE FINISHED CONSTRUCTION USING THE FOLLOWING STRUCTURAL COMPONENTS AND CONNECTIONS, AS INDICATED IN THE STRUCTURAL DOCUMENTS, INSTALLED IN ENTIRETY: WOOD FLOOR FRAMING DIAPHRAGM WOOD SHEAR WALLS

PRE-ENGINEERED WOOD TRUSSES AND FRAMING
WOOD ROOF FRAMING DIAPHRAGM

DC-7 THE STRUCTURE HAS BEEN DESIGNED AS AN UNRESTRAINED CONDITION FOR FIRE RATING AND FIREPROOFING ASSEMBLY EVALUATIONS.

DC-8 EXTERIOR CLADDING IS ASSUMED TO IMPOSE VERTICAL GRAVITY LOADS AND HORIZONTAL LATERAL LOADS ON THE STRUCTURAL MEMBERS WITHOUT GENERATING MOMENTS OR TORSION IN THE STRUCTURAL MEMBERS, UNLESS OTHERWISE NOTED.

**FO FOUNDATIONS** 

FO-1 THE FOUNDATION DESIGN IS BASED ON THE ALLOWABLE SPREAD AND CONTINUOUS FOOTING PRESSURE EQUAL TO 1500 PSF ACCORDING TO THE SOLAR DECATHLON BUILDING CODE REQUIREMENT.

**RE REINFORCEMENT** 

RE-1 REINFORCEMENT SHALL CONFORM TO THE FOLLOWING STANDARDS AND MATERIAL PROPERTIES:

DEFORMED BARS: ASTM A615 GRADE 60

RE-2 DETAIL REINFORCEMENT BASED ON THE PROJECT REQUIREMENTS, ACI-318, ACI-315, ACI-117, AND CRSI MANUAL OF STANDARD PRACTICE.

**CM CONCRETE MATERIAL PROPERTIES** 

CM-1 CONCRETE SHALL BE PRE-MIXED FROM BAGS REQUIRING WATER ONLY TO COMPLETE THE MIX TO ACHIEVE NORMAL WEIGHT (145 PCF) CONCRETE.

CM-2 CONCRETE STRENGTH SHALL MEET THE FOLLOWING 28-DAY COMPRESSIVE STRENGTHS (f'c) UNLESS OTHERWISE NOTED: TYPICAL: 3000 PSI, NORMAL WEIGHT CONCRETE (NWC)

SS STRUCTURAL STEEL

SS-1 STRUCTURAL STEEL AS CLASSIFIED BY AISC'S "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", INCLUDING BUT NOT LIMITED TO STRUCTURAL STEEL FRAMING MEMBERS, BASE PLATES, ANCHOR BOLTS, CONNECTIONS, AND GROUTING UNDER BASE PLATES.

SS-2 FABRICATE AND ERECT STRUCTURAL STEEL FOLLOWING REFERENCED BUILDING AND STRUCTURAL STEEL CODES., AND AISC'S CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.

SS-3 STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS AND MATERIAL PROPERTIES, UNLESS OTHERWISE NOTED:

ROLLED SHAPES:
CHANNELS, PLATES, ANGLES:
BASE PLATES:
PIPE:
HOLLOW STRUCTURAL SECTIONS:
ASTM A992, GRADE 50
ASTM A36, MINIMUM
ASTM A36, MINIMUM
ASTM A500 OR A53, TYPE E OR S
ASTM A500, GRADE B

SS-4 FIELD MODIFICATION OF STRUCTURAL STEEL IS PROHIBITED WITHOUT PRIOR APPROVAL OF THE ARCHITECT AND STRUCTURAL ENGINEER.

SS-5 SHOP PAINT: POWER TOOL CLEANING (SSPC-SP3) PRIOR TO PAINTING. FOR INTERIOR EXPOSURE: APPLY TWO COATS OF MODIFIED ALKYD, CHEMICALLY ACTIVE, RUST-INHIBITIVE METAL PRIMER TO A MINIMUM THICKNESS OF 3.5 MILS PER COAT. ACCEPTABLE MANUFACTURER-TNEMEC SERIES 10-1009 GRAY METAL PRIMER OR SHERWIN WILLIAMS KEM KROMIK UNIVERSAL METAL PRIMER.

SS-6 FOR STEEL MEMBERS AND EMBEDMENTS EXPOSED TO WEATHER OR WITHIN SEMI-CONDITIONED SPACE, PROVIDE HOT-DIPPED GALVANIZED STEEL TYPICAL, UNLESS OTHERWISE NOTED.

SC STRUCTURAL STEEL CONNECTIONS

SC-1 STRUCTURAL STEEL CONNECTION MATERIAL SHALL CONFORM TO THE FOLLOWING STANDARDS AND MATERIAL PROPERTIES:

ANGLES ASTM A36
WTS ASTM A992, GRADE 50
PLATES ASTM A36 MIN
BOLTS, NUTS, WASHERS: ASTM A325 OR A490
WELD ELECTRODES: E70XX

SC-2 ALL CONNECTIONS ARE FULLY DESIGNED ON THE STRUCTURAL DRAWINGS, BY A LICENSED STRUCTURAL ENGINEER IN THE STATE OF ILLINOIS. THE DESIGN AND DETAILING SHALL COMPLY WITH ALL APPLICABLE CODES AND SPECIFICATION SECTIONS.

SC-3 ALL SHOP AND FIELD CONNECTIONS SHALL BE BOLTED OR WELDED.

SC-4 FOR BOLTED CONNECTIONS, DESIGN USING TYPE 'N' BOLTS, IN ROUND OR SHORT-SLOTTED BOLT HOLES UNLESS OTHERWISE NOTED.

SC-5 ALL BOLTS SHALL BE SNUG TIGHT UNLESS SPECIFICALLY NOTED OTHERWISE. BOLTING FOR STRUCTURAL STEEL SHALL CONFORM TO THE PROVISIONS OF THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS."

SC-6 THE MINIMUM SIZE OF BOLTS SHALL BE 5/8" Ø UNLESS OTHERWISE NOTED, AND EACH CONNECTION SHALL HAVE A MINIMUM OF TWO BOLTS.

SC-7 ALL WELDING SHALL BE PERFORMED BY PRE QUALIFIED WELDERS, AND SHALL CONFORM TO THE REQUIREMENTS OF THE STRUCTURAL WELDING CODE, ANSI/AWS D1.1, LATEST EDITION UNLESS OTHERWISE NOTED.

SC-8 ALL WELDING ELECTRODES SHALL COMPLY WITH THE REQUIREMENTS OF TABLE 4.1 OF THE STRUCTURAL WELDING CODE, ANSI/AWS D1.1, LATEST EDITION.

SC-9 FOR EXPOSED WELDS, PROVIDE WELDING IN CONFORMANCE WITH AWS D1.5.

SC-10 WELDS NOT OTHERWISE NOTED ON DRAWINGS SHALL BE CONTINUOUS FILLET WELDS. THE MINIMUM SIZE SHALL BE 3/16" OR AS REQUIRED BY THE AISC SPECIFICATIONS, WHICHEVER IS LARGER.

WT PRE-ENGINEERED STRUCTURAL WOOD TRUSSES, FRAMING, AND CONNECTIONS

WT-1 TYPICAL FRAMING PLANS AND DETAILS INDICATE GENERAL CRITERIA FOR DESIGN AND DETAILING OF PRE-ENGINEERED WOOD TRUSSES, FRAMING, CONNECTIONS, TEMPORARY AND PERMANENT TRUSS BRACING, AND UPLIFT CONNECTION TO WALL. PRE-ENGINEERED WOOD TRUSSES, FRAMING, CONNECTIONS, TEMPORARY AND PERMANENT TRUSS BRACING, AND UPLIFT CONNECTIONS TO WALL SHALL BE DESIGNED AND DETAILED BY A LICENSED ARCHITECT OR STRUCTURAL ENGINEER IN THE STATE OF ILLINOIS AND SUBMITTED TO THE PROJECT ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION. THE DESIGN AND DETAILING SHALL COMPLY WITH DESIGN INTENT AND WITH ALL APPLICABLE CODES.

WT-2 TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH "NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION AND ITS SUPPLEMENT", TPI 1, "NATIONAL DESIGN STANDARD FOR METAL PLATE CONNECTED WOOD TRUSS CONSTRUCTION" AND TPI DSB "RECOMMENDED DESIGN SPECIFICATION FOR TEMPORARY BRACING OF METAL PLATE CONNECTED WOOD TRUSSES."

A. DESIGN CRITERIA:

TOP CHORD DEAD LOAD = 10 PSF (SEE SUPERIMPOSED DEAD LOADS)
BOTTOM CHORD DEAD LOAD = 3 PSF

TOP CHORD LIVE LOAD = SNOW OR MINIMUM ROOF LIVE LOAD, WHICHEVER IS GREATER

B. DESIGN TRUSSES FOR LOADS APPLIED BY ROOFTOP SOLAR PANELS & SUPPORT FRAME AT LOCATIONS SHOWN ON ARCHITECTURAL DRAWINGS.

WT-3 HANDLING AND ERECTION OF TRUSSES SHALL BE IN ACCORDANCE WITH TPI HIB, "COMMENTARY AND RECOMMENDATIONS FOR HANDLING, INSTALLING, & BRACING METAL PLATE CONNECTED WOOD TRUSSES."

WT-4 MOISTURE CONTENT OF LUMBER SHALL BE NO LESS THAN 7% NOR GREATER THAN 19% AT TIME OF ERECTION.

WT-5 COORDINATE TRUSS FRAMING AND DETAILS WITH ARCHITECTURAL DRAWINGS.

WD STRUCTUAL WOOD FRAMING AND CONNECTIONS

WD-1 TYPICAL FRAMING PLANS AND DETAILS INDICATE GENERAL CRITERIA FOR DESIGN AND DETAILING OF WOOD FRAMING AND CONNECTIONS. PRE-FABRICATED WOOD COMPONENTS AND CONNECTIONS SHALL BE SIZED BY THE SUPPLIER BASED ON DESIGN LOADS SPECIFIED IN THE STRUCTURAL NOTES.

WD-2 COORDINATE FRAMING AND DETAILS WITH ARCHITECTURAL DRAWINGS.

WD-3 DIMENSION LUMBER:

A. JOISTS, BEAMS, & RAFTERS: SOUTHERN PINE #2 OR BETTER: Fb = 1200 PSI, Fcp = 565 PSI, Fv = 90 PSI, E = 1,600,000 PSI.

B. STUDS: SPRUCE-PINE-FIR CONSTRUCTION GRADE: Fb = 975 PSI, Fc = 1350 PSI, Fcp = 425 PSI, E = 1,300,000 PSI, OR BETTER.

C. WOOD PLATES: SOUTHERN PINE CONSTRUCTION GRADE: Fb = 1100 PSI, Fcp = 565 PSI, Fv = 100 PSI, E = 1,500,000 PSI.

WD-4 ALL LOAD-BEARING EXTERIOR AND CORRIDOR WOOD-FRAMED WALLS TO BE 2x4 @ 24" O.C. UNLESS OTHERWISE NOTED.

WD-6
ALL DIMENSION LUMBER PERMANENTLY EXPOSED TO WEATHER, IN CONTACT WITH GROUND, OR IN CONTACT WITH MASONRY OR CONCRETE SHALL BE PRESSURE TREATED TO THE AWPB STANDARD AND CONFORM WITH LOCAL EPA REQUIREMENTS. FASTENERS AND SHEET METAL CONNECTORS USED WITH PRESSURE-TREATED WOOD MEMBERS MUST HAVE SPECIAL COATINGS. FOR SBX TREATMENT USE A MINIMUM G60 GALVANIZED COATING. FOR ACQ, CBA-A, AND CA-B TREATMENTS USE EITHER G185 OR HOT-DIPPED GALVANIZED COATING OR STAINLESS STEEL. FOR ACZA TREATMENT USE ONLY STAINLESS STEEL CONNECTORS AND FASTENERS.

WD-7 PLYWOOD SHALL BE EXTERIOR GRADE, EXPOSURE 1, OF SIZE SHOWN ON DRAWINGS OR ORIENTED STRAND BOARD WITH A STRUCTURAL RATING EQUIVALENT TO THE SPECIFIED PLYWOOD. SHEETS SHALL BE EITHER TONGUE-AND-GROOVE, JOINTED, OR PLY-CLIPPED.

A. ROOF & FLOOR SHEATHING: 7/16" APA-RATED STRUCTURAL I SHEATHING AND AN EXPOSURE DURABILITY RATING OF EXPOSURE I, OR OTHER APPROVED MATERIAL. NAIL SHEATHING TO ROOF TRUSSES USING 16GA. STAPLES - 1 3/4 LG - 7/16 CROWN WIDTH AT 3" O.C. AT PANEL EDGES AND AT 6" O.C. AT INTERMEDIATE SUPPORTS.

WALL SHEATHING: 7/16" APA-RATED OSB. NAIL SHEATHING TO STUDS USING 16GA. STAPLES - 1 3/4 LG - 7/16 CROWN WIDTH AT 3" O.C. AT PANEL EDGES AND AT 6" O.C. AT INTERMEDIATE STUDS.

WD-8 CONNECTORS (SEE ITEM WD-4 FOR COATING REQUIREMENTS WITH PRESSURE-TREATED WOOD MEMBERS):

A. ANCHOR BOLTS SHALL CONFORM TO ASTM-A307 OR ASTM-A36 ROD STOCK.

B. STEEL-TO-WOOD OR -MASONRY, WOOD-TO-WOOD, AND WOOD-TO-MASONRY CONNECTIONS - ASTM A307 BOLTS.

C. EXPANSION ANCHORS: CARBON STEEL PARTS AND ZINC PLATED PER ASTM B633 - HILTI KWIK BOLT 3.

D. LAG SCREWS (PRE-DRILL FOR THREAD & SHANK) - ASTM A307.

E. NAILS - ASTM D1761. THE NAIL OR STAPLE SIZE, TYPE, NUMBER, AND LOCATION SHALL COMPLY WITH TABLE 2305.2 - FASTENING SCHEDULE IN 2006 IBC. USE RING SHANKED NAILS FOR FASTENING SHEATHING TO ROOF, FLOOR, OR WALL FRAMING MEMBERS.

F. SHEET METAL CONNECTORS SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY OR APPROVED EQUAL. STORM CONNECTORS SHALL BE USED AT TRUSS BEARING POINTS, TOP AND BOTTOM PLATES OF STUD WALLS, ETC. FOR THE FORCES INDICATED AND WHERE SHOWN ON THE DETAILS. CAPACITIES TO BE VERIFIED BY MANUFACTURER'S CATALOG TABLES. CONTRACTOR SHALL PROVIDE ALL CONNECTOR NAILS, SCREWS, AND BOLTS AS REQUIRED BY MANUFACTURER.

G. POWDER-ACTUATED FASTENERS BY HILTI OR RAMSET FOR WOOD-TO-STEEL OR WOOD-TO-CONCRETE CONNECTIONS
- MINIMUM DIA 0.145", MINIMUM PENETRATION FOR CONCRETE 1-1/4".

H. ELASTOMERIC ADHESIVE SUCH AS 3M SCOTCH GRIP WOOD ADHESIVE 5230 TO BE USED IN COMBINATION WITH NAILS FOR COMPOSITE ACTION OF BUILT-UP WOOD COLUMNS, BEAMS, AND WOOD DECKING.

I. SHIMMING MATERIAL SHALL BE APPROVED HARDBOARD OR STEEL SHIMS. NO CEDAR, PLYWOOD, OR DIMENSION LUMBER SHIMS SHALL BE USED. SHIMS SHALL BE PLACED TO PROVIDE FULL LENGTH OF BEARING ON SUPPORTING WOOD PLATE OR MASONRY PIER/WALL.

J. LATERAL STABILITY SHALL BE PROVIDED BY PLYWOOD SHEAR WALLS AS DETAILED.

WD-11 OPENINGS FOR MECHANICAL DUCTS/EQUIPMENT IN WOOD LVL BEAMS MUST BE VERIFIED BY MFR REPRESENTATIVE

WD-12 ALL LVL ENGINEERED LUMBER SHALL PROVIDE:

GRADE: E1.9 WIDTH: 1 3/4"

WIDTH: 1 3/4"

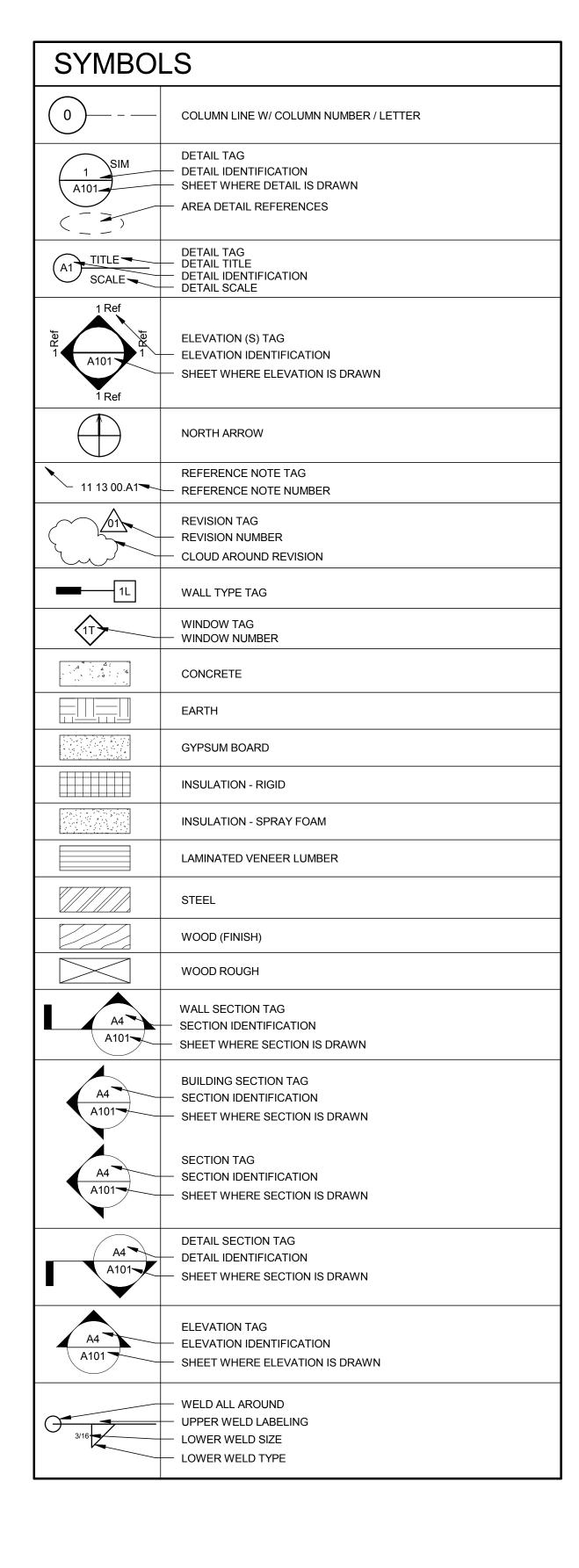
MANUFACTURER: WEYERHAUSER, TRUS JOIST MAC MILLAN OR APPROVED EQUAL

WD-13 INSTALL BRIDGING AS RECOMMENDED BY MFR BETWEEN JOISTS IN ALL WOOD FLOOR FRAMING.

WD-14 BORE LEAD HOLES FOR ALL LAG SCREWS. LEAD HOLE FOR THREADED PORTION SHALL BE 50% OF THE SHANK DIAMETER. CLEARANCE HOLE FOR THE SHANK SHALL BE THE SAME DIAMETER.

WD-15 REFER TO IBC-2006 TABLE 2304.9.1 FOR MINIMUM REQUIREMENTS FOR WOOD FASTENERS.

WD-16 HOLES AND NOTCHES IN DIMENSION WOOD MEMBERS SHALL COMPLY WITH IBC 2006 SECTIONS 2308.9.10 AND 2308.9.11 FOR WALL FRAMING AND IBC 2006 SECTION 2308.10.4.2 FOR FLOOR AND ROOF FRAMING.





TEAM NAME: UNIVERSITY OF ILLINOIS

ADDRESS: 611 LORADO TAFT DR.
CHAMPAIGN, IL 61820

CONTACT: SOLARDECATHLON@UIUC.EDU
WWW.SOLARDECATHLON.ILLINOIS.EDU

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MR 3/18/2011 DOE CD Submission

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MARK DATE DESCRIPTION

LOT NUMBER: LOT #305

DRAWN BY: AUTHOR

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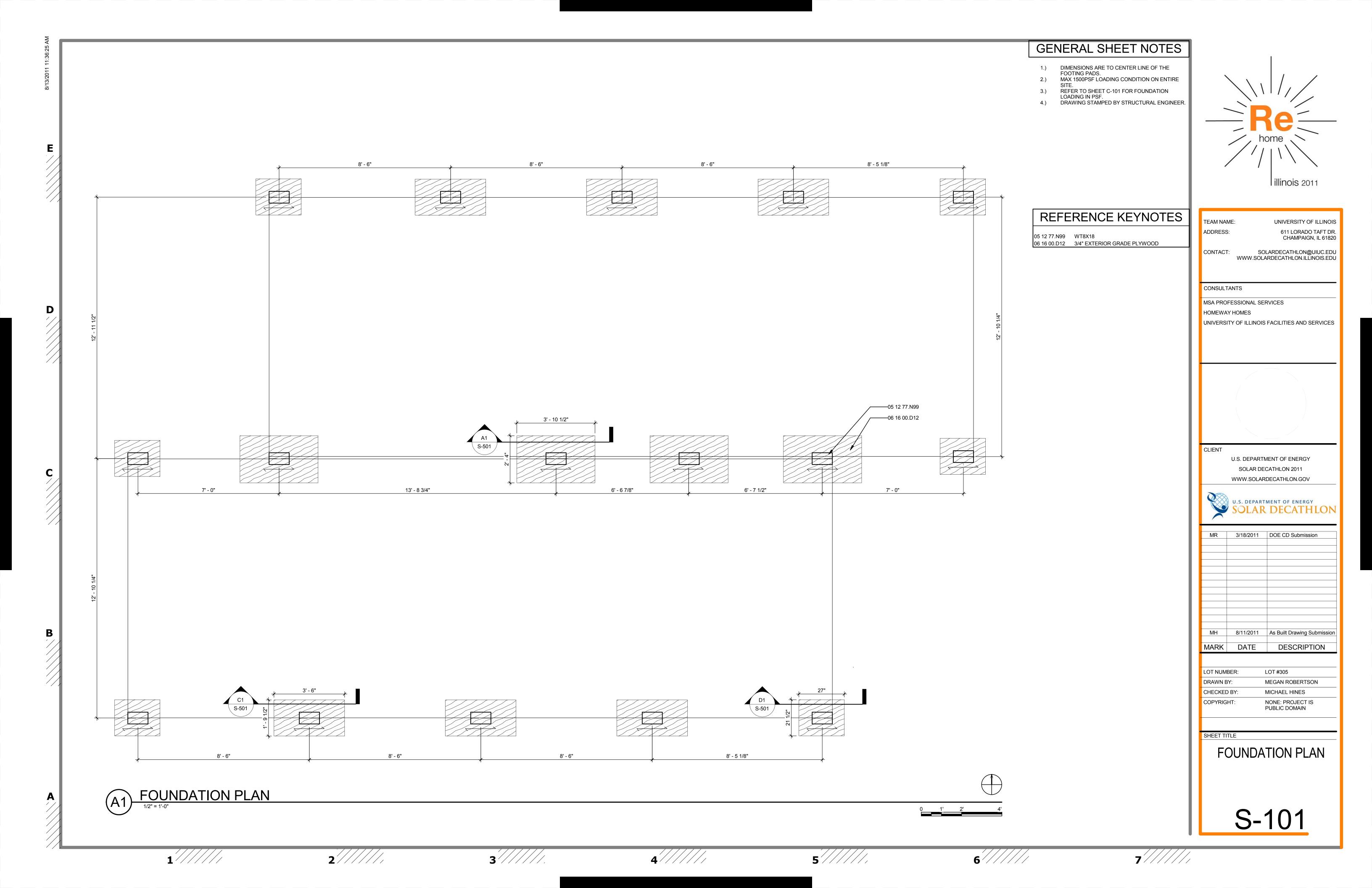
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AND SYMBOLS

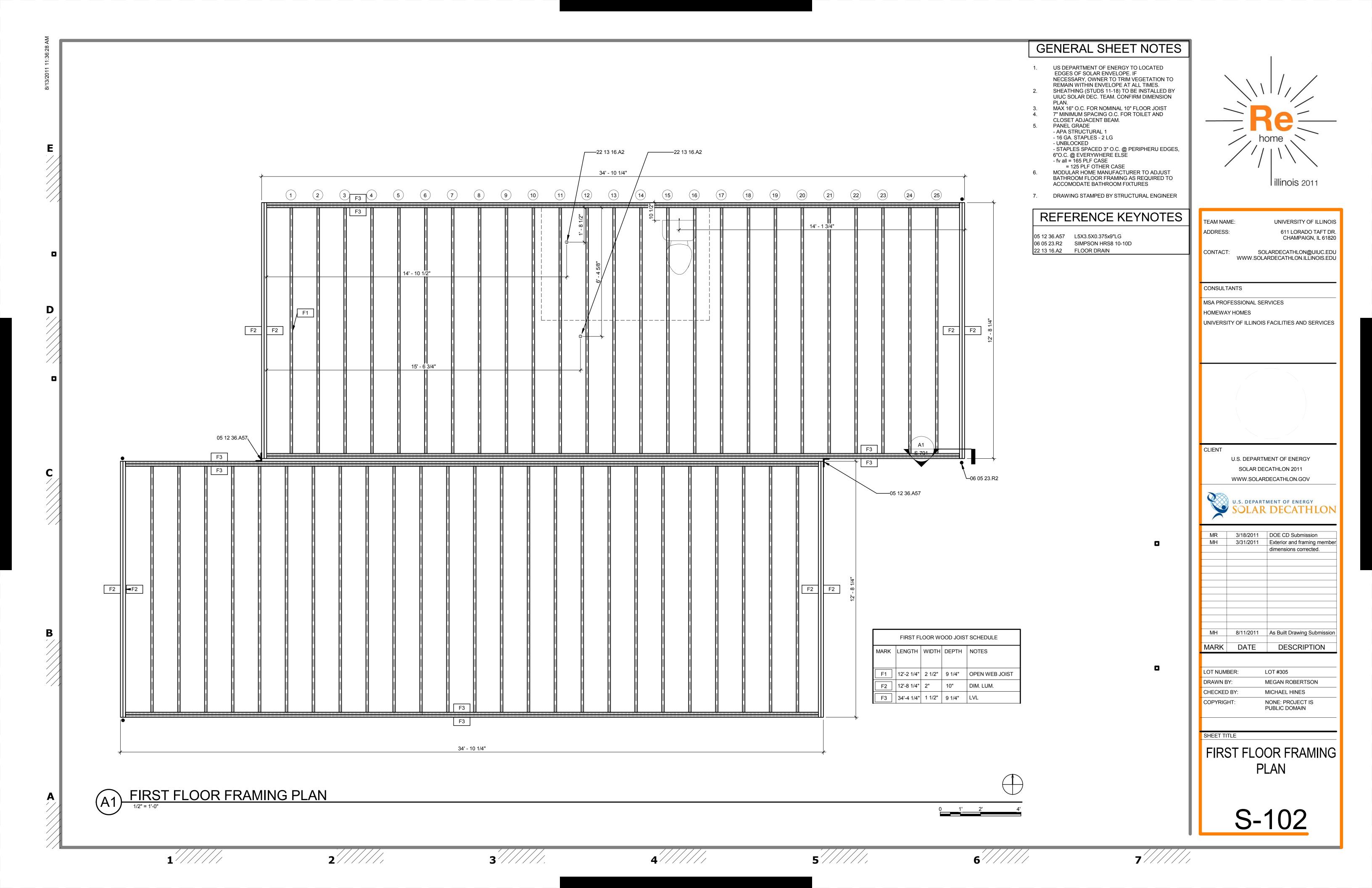
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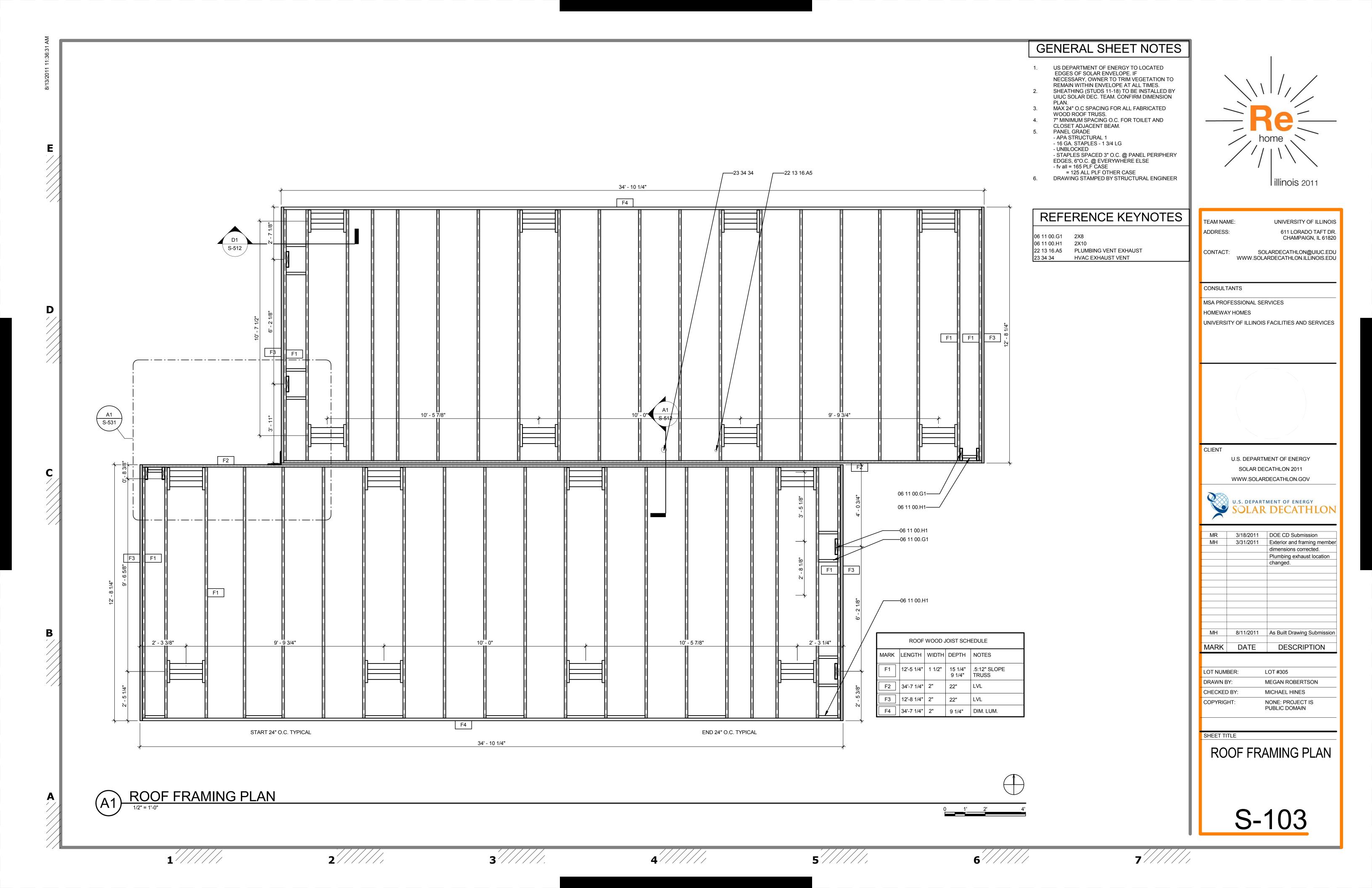
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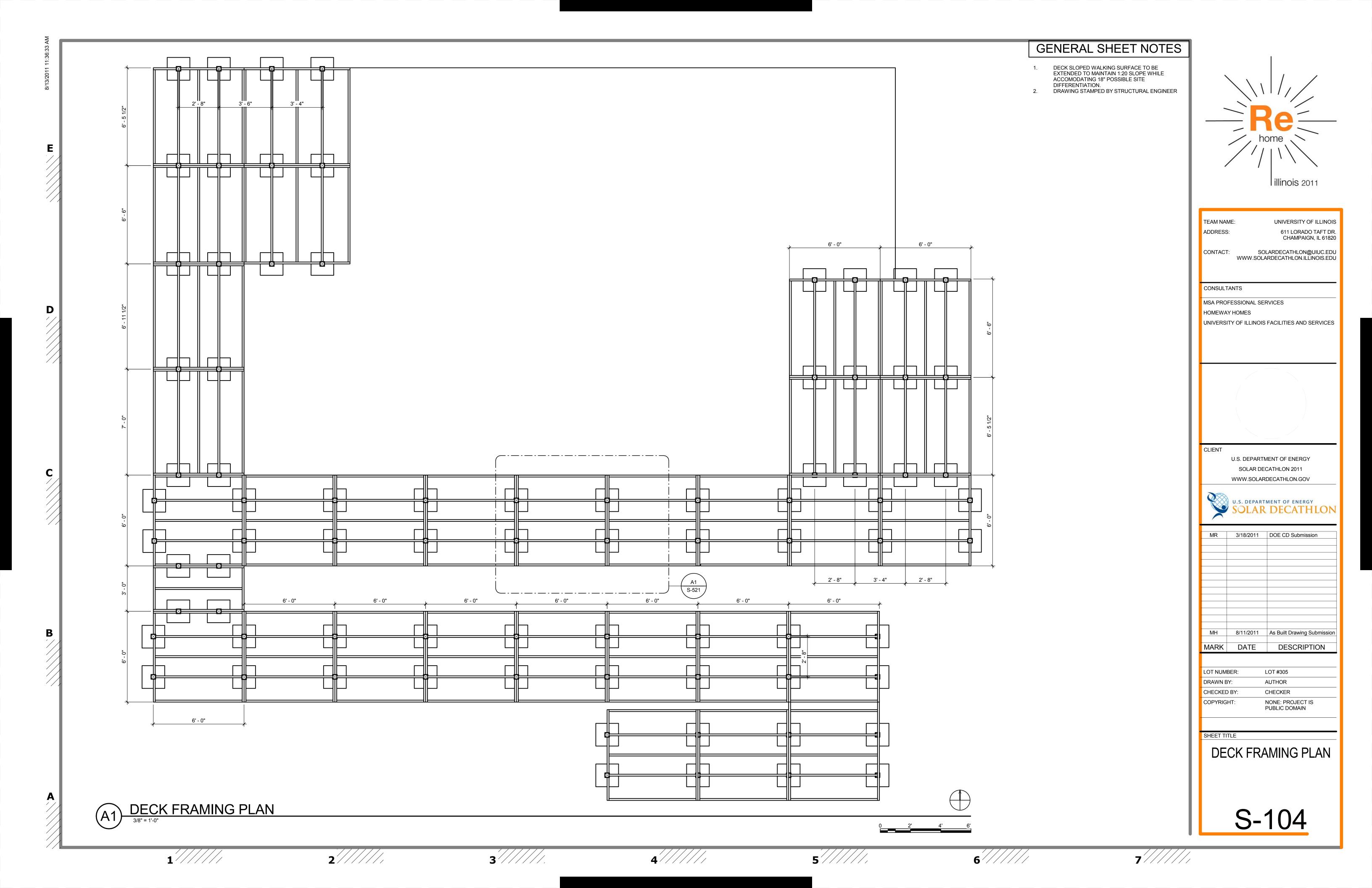
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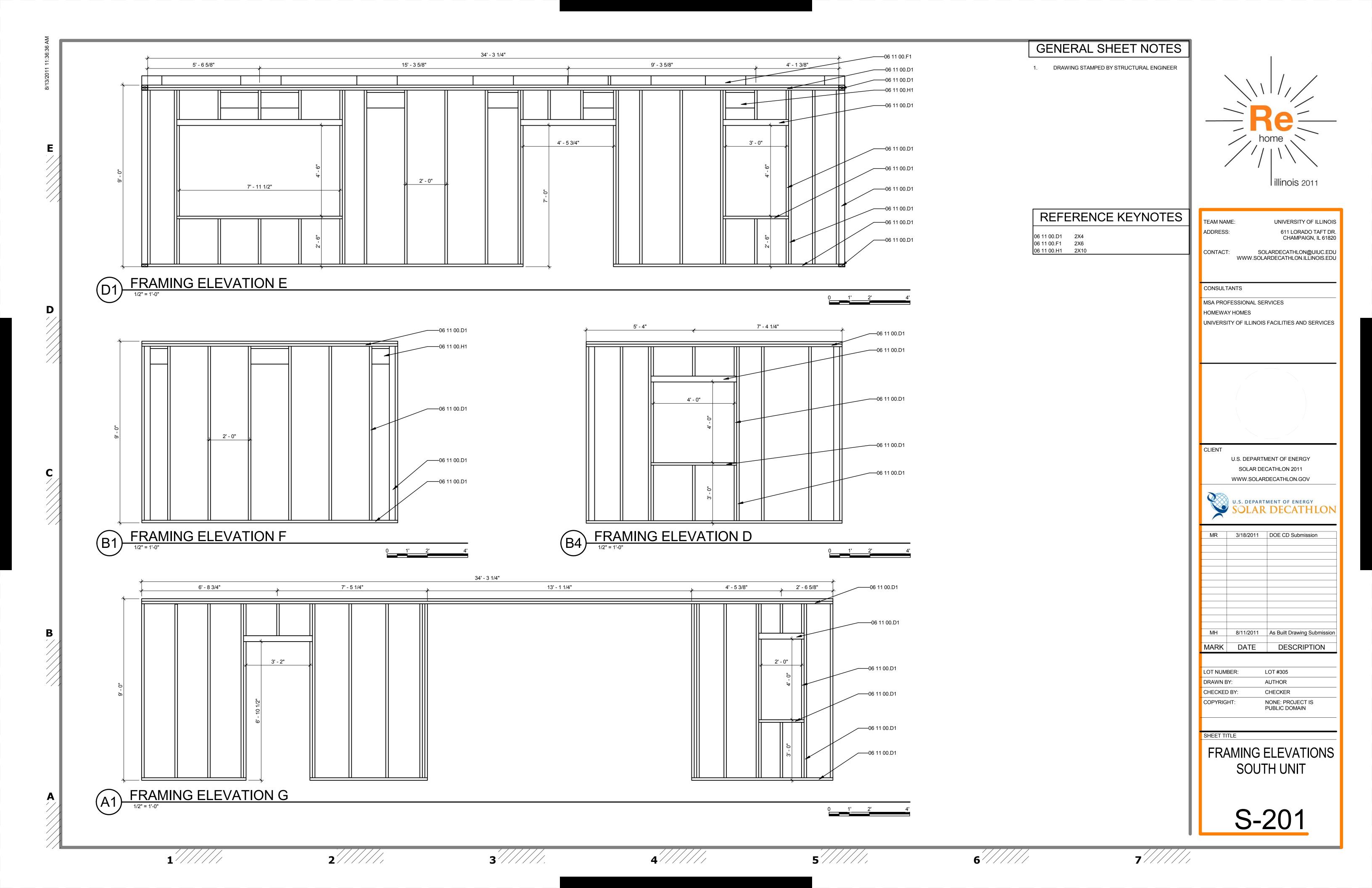
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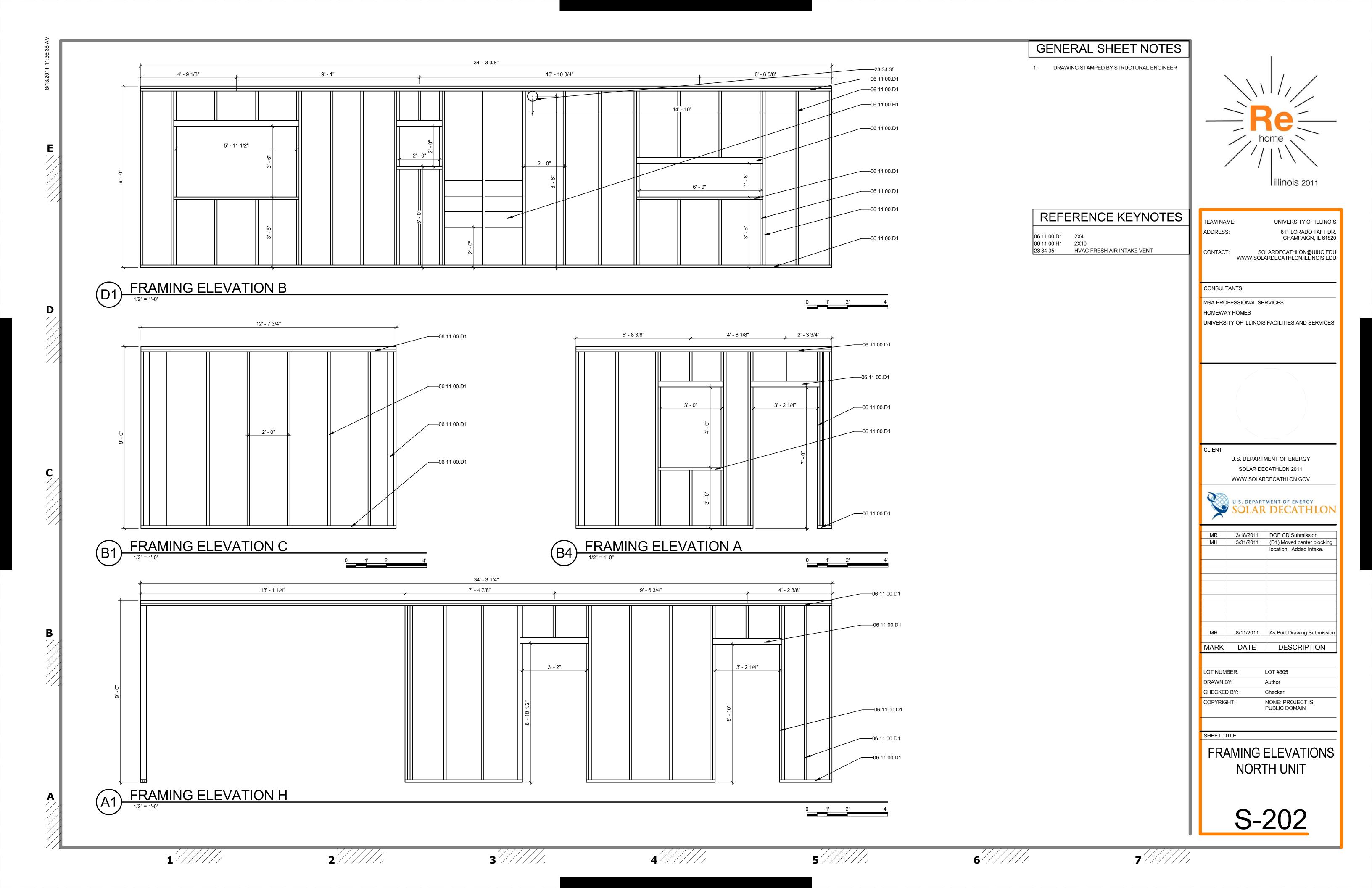


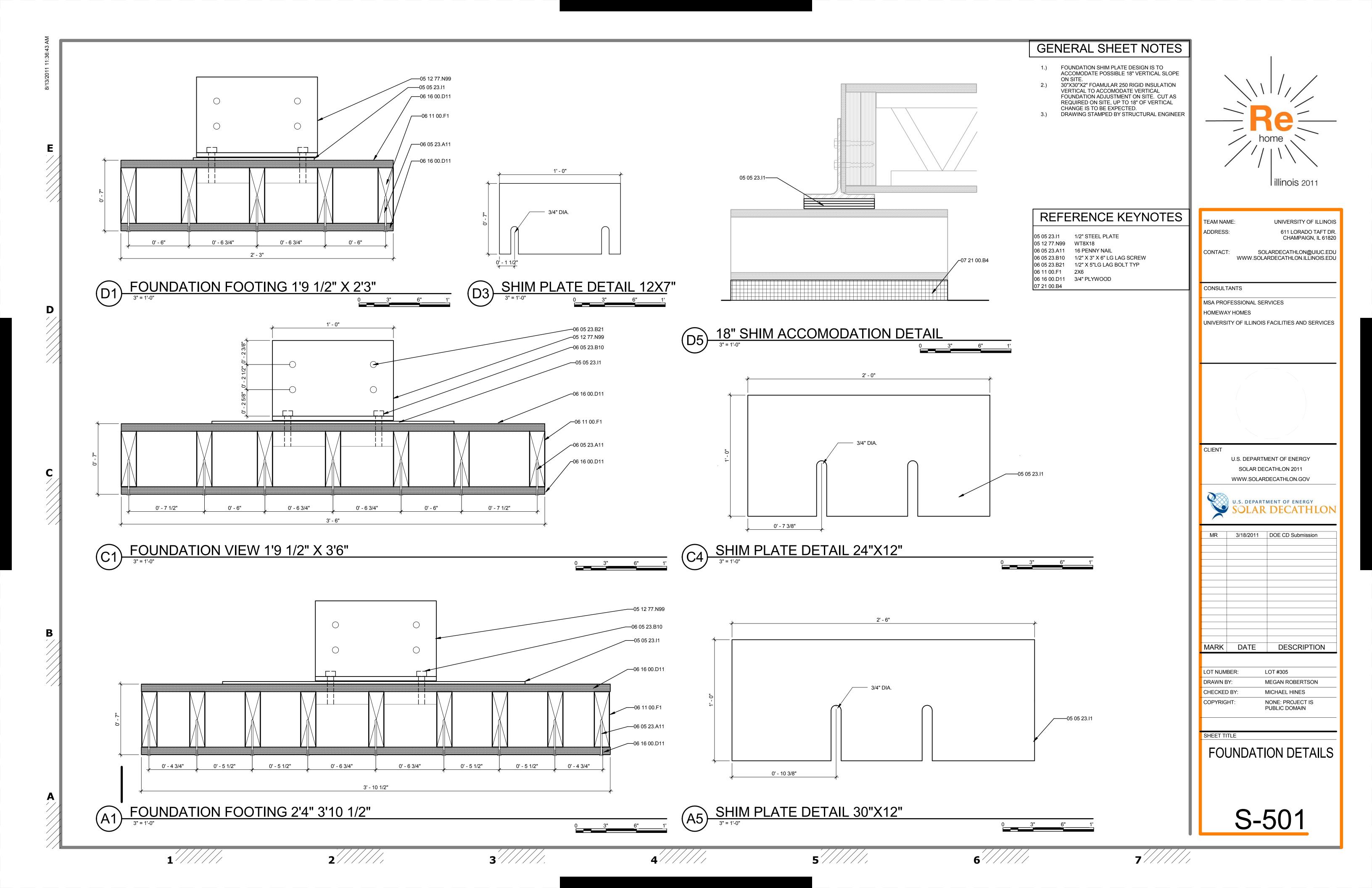


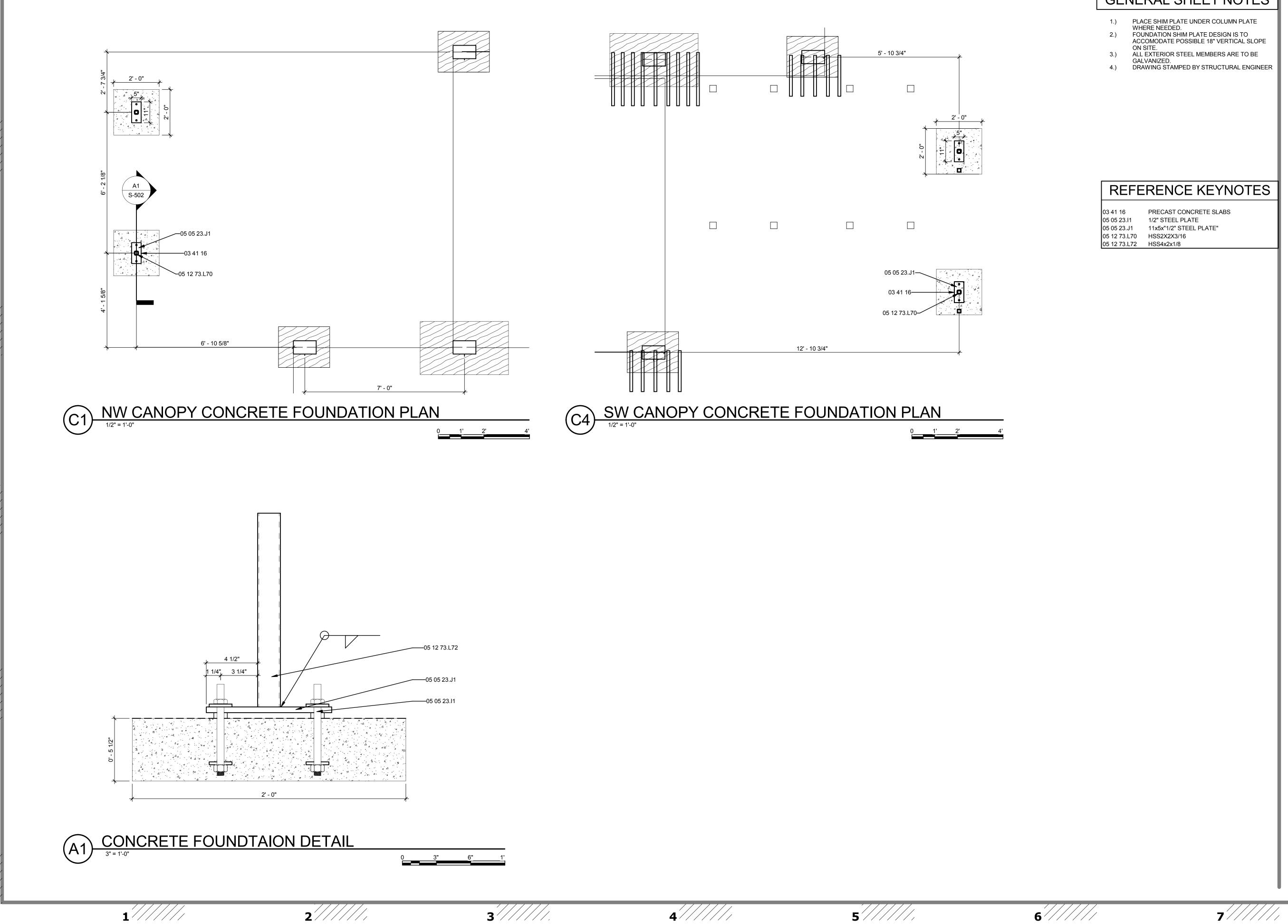












GENERAL SHEET NOTES



TEAM NAME: UNIVERSITY OF ILLINOIS ADDRESS: 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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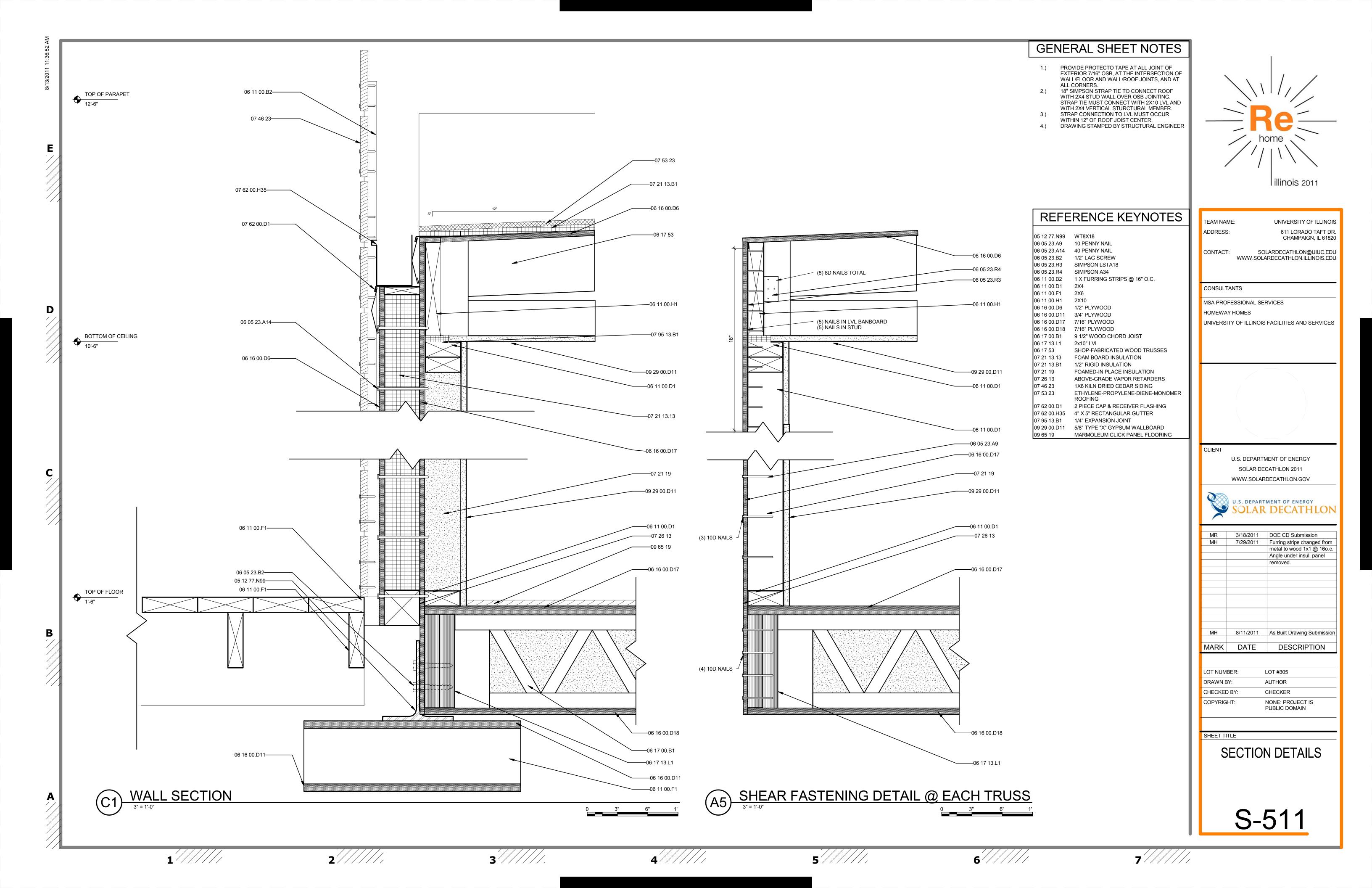


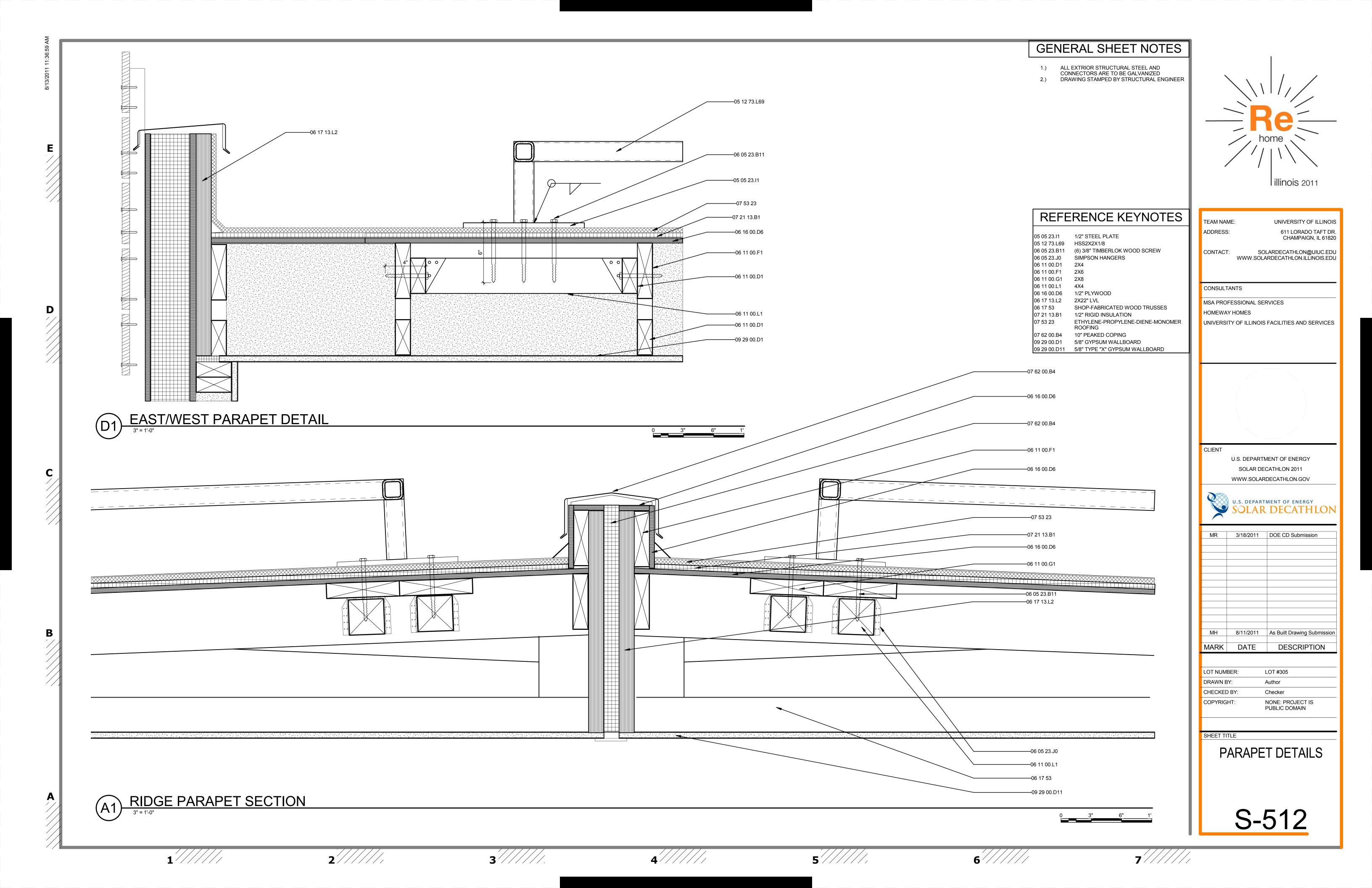
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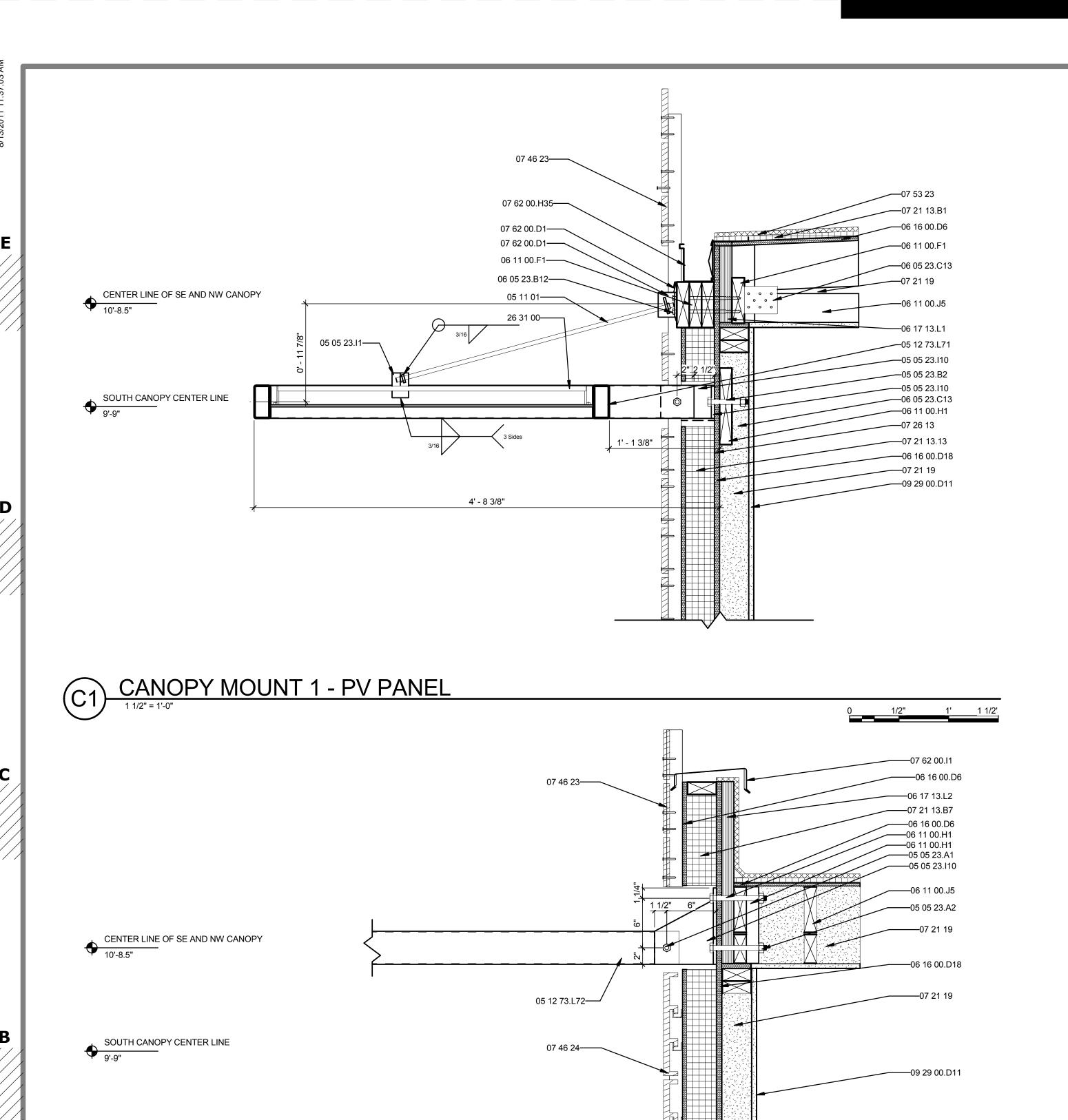
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MARK	DATE	DESCRIPTION
		DESCRIPTION  LOT #305
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CANOPY FOUNDATION **DETAILS** 

S-502

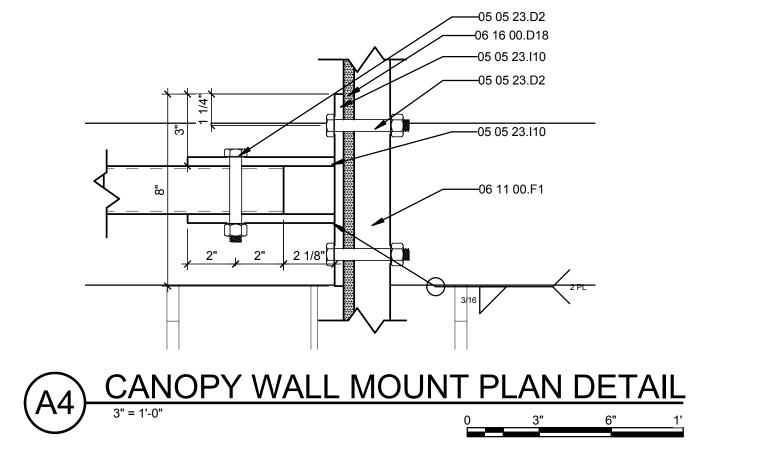






(A1) CANOPY MOUNT 2

1 1/2" = 1'-0"



### GENERAL SHEET NOTES

- ALL EXTRIOR STRUCTURAL STEEL AND CONNECTORS ARE TO BE GALVANIZED
   SIMPSON A34 MEMBERS NEED TO BE INSTALLED AT FACH END OF BLOCKING A
- INSTALLED AT EACH END OF BLOCKING AT CANOPY CONNECTION.
- 3.) ALL HEIGHTS ARE TAKEN FROM GRADE.
  4.) FINISHED FLOOR HEIGHT IS 1'6" ABOVE GRADE.
  5.) DRAWING STAMPED BY STRUCTURAL ENGINEER



### REFERENCE KEYNOTES

REFL	RENCE RETNOTES
05 05 23.A1	1/2" A307 BOLT
	5/8" A307 BOLT
	5/8" A325 BOLT
	1/2" ANCHOR BOLT
	1/2" STEEL PLATE
05 05 23.I10	
	1/2" THREADED STEEL ROD
	HSS4X2X3/16
05 12 73.L72	
06 05 23.B12	(4) 3/8" X 8"LG TIMBERLOK WOOD SCREW
	SIMPSON A34
06 11 00.F1	
06 11 00.H1	2X10
06 11 00.J5	ROOF JOISTS @ 24" O.C.
06 16 00.D6	1/2" PLYWOOD
06 16 00.D18	7/16" PLYWOOD
06 17 13.L1	2x10" LVL
06 17 13.L2	2X22" LVL
07 21 13.13	FOAM BOARD INSULATION
07 21 13.B1	1/2" RIGID INSULATION
07 21 13.B7	
07 21 19	FOAMED-IN PLACE INSULATION
07 26 13	ABOVE-GRADE VAPOR RETARDERS
07 46 23	1X6 KILN DRIED CEDAR SIDING
07 46 24	RESYSTA ALL NATURAL SIDING
07 53 23	ETHYLENE-PROPYLENE-DIENE-MONOMER ROOFING
07 62 00.D1	2 PIECE CAP & RECEIVER FLASHING
07 62 00.H35	4" X 5" RECTANGULAR GUTTER
07 62 00.I1	6" COPING
09 29 00.D11	5/8" TYPE "X" GYPSUM WALLBOARD
26 31 00	PHOTOVOLTAIC COLLECTORS

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ADDRESS: 611 LORADO TAFT DR.
CHAMPAIGN, IL 61820

CONTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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MR	3/18/2011	DOE CD Submission
MH	7/29/2011	Canopy HSS members
		downsized. Reference
		drawings for new dimensions
MH	8/11/2011	As Built Drawing Submission
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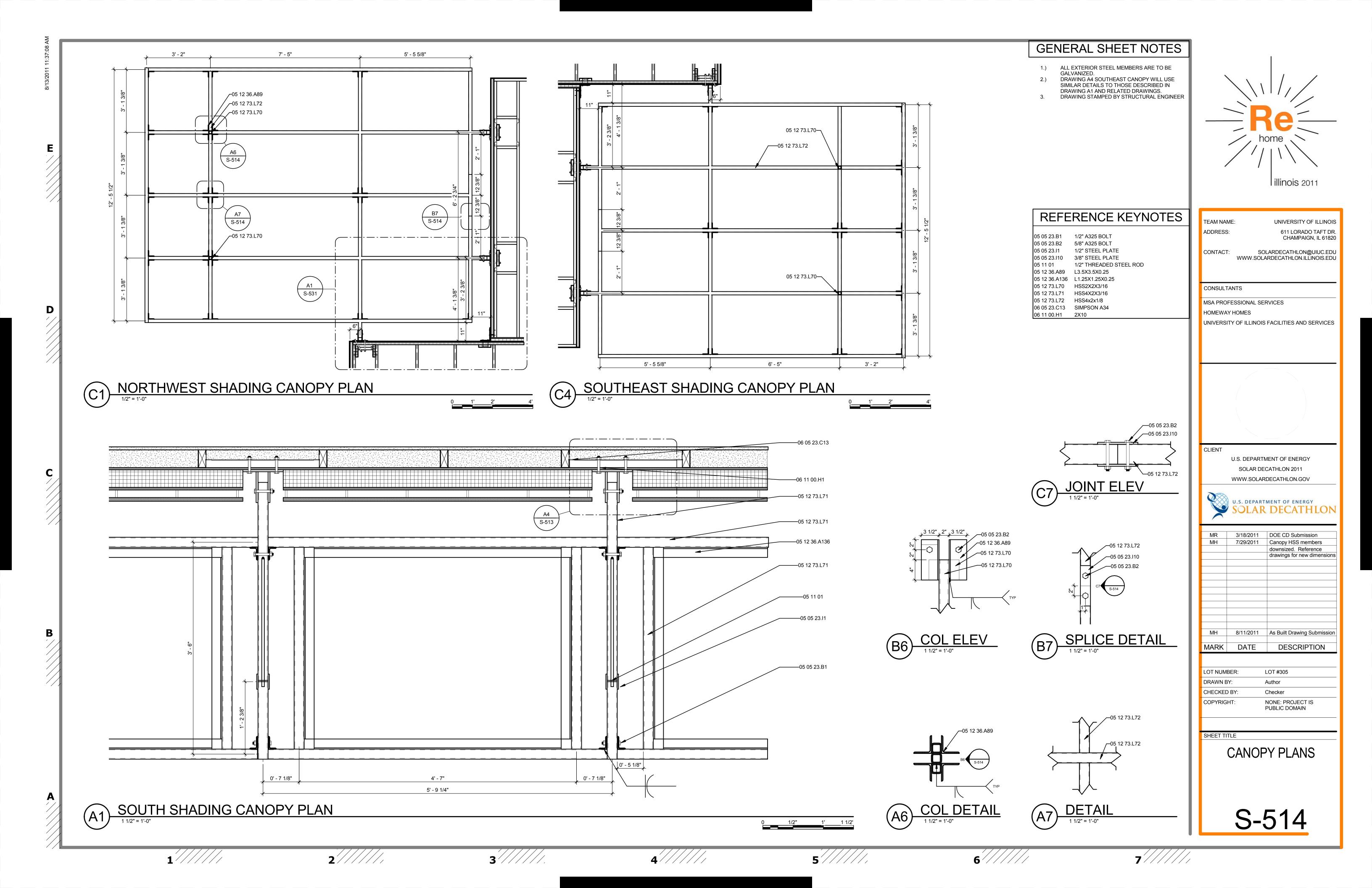
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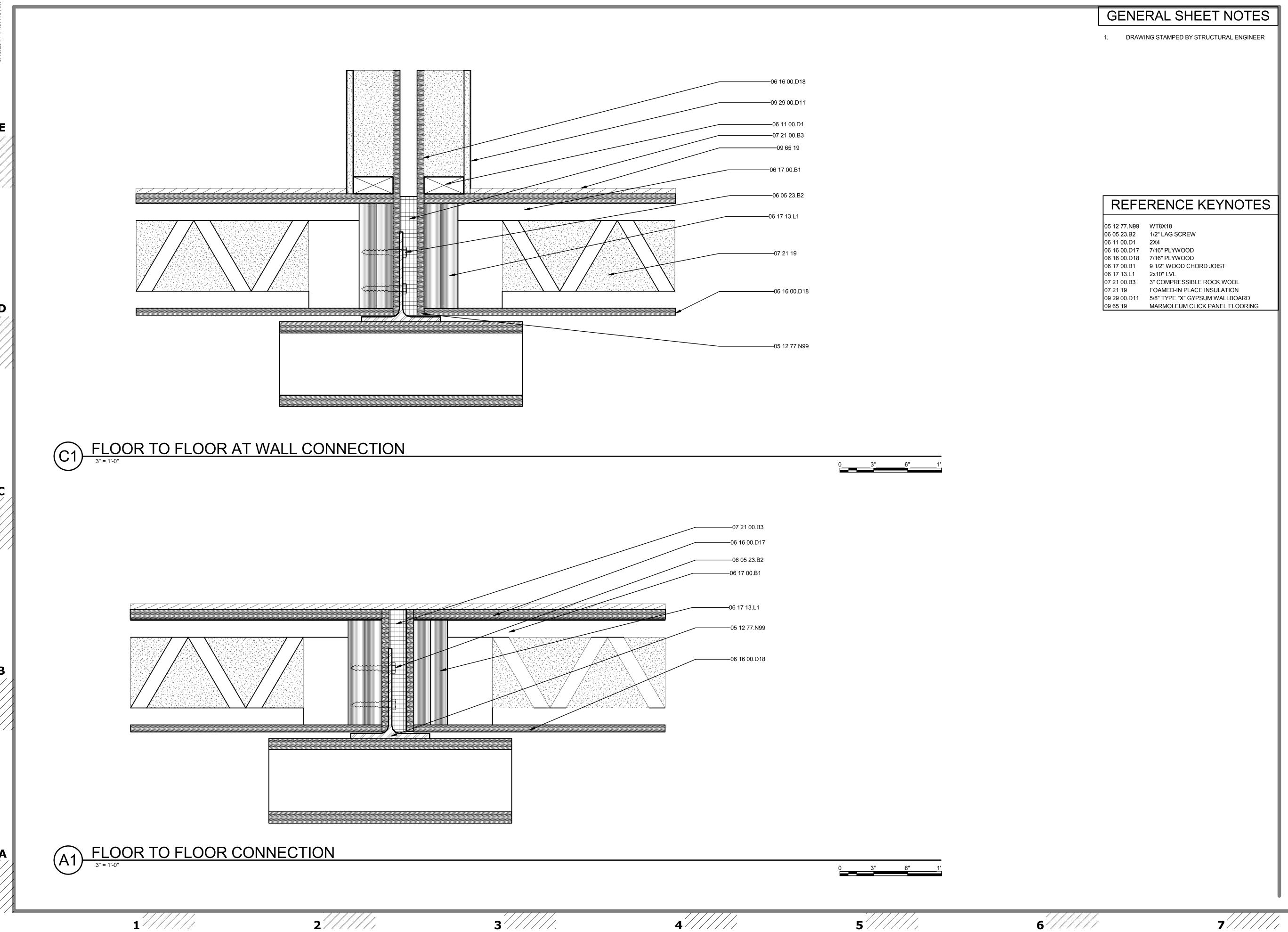
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CANOPY SECTION DETAILS

S-513







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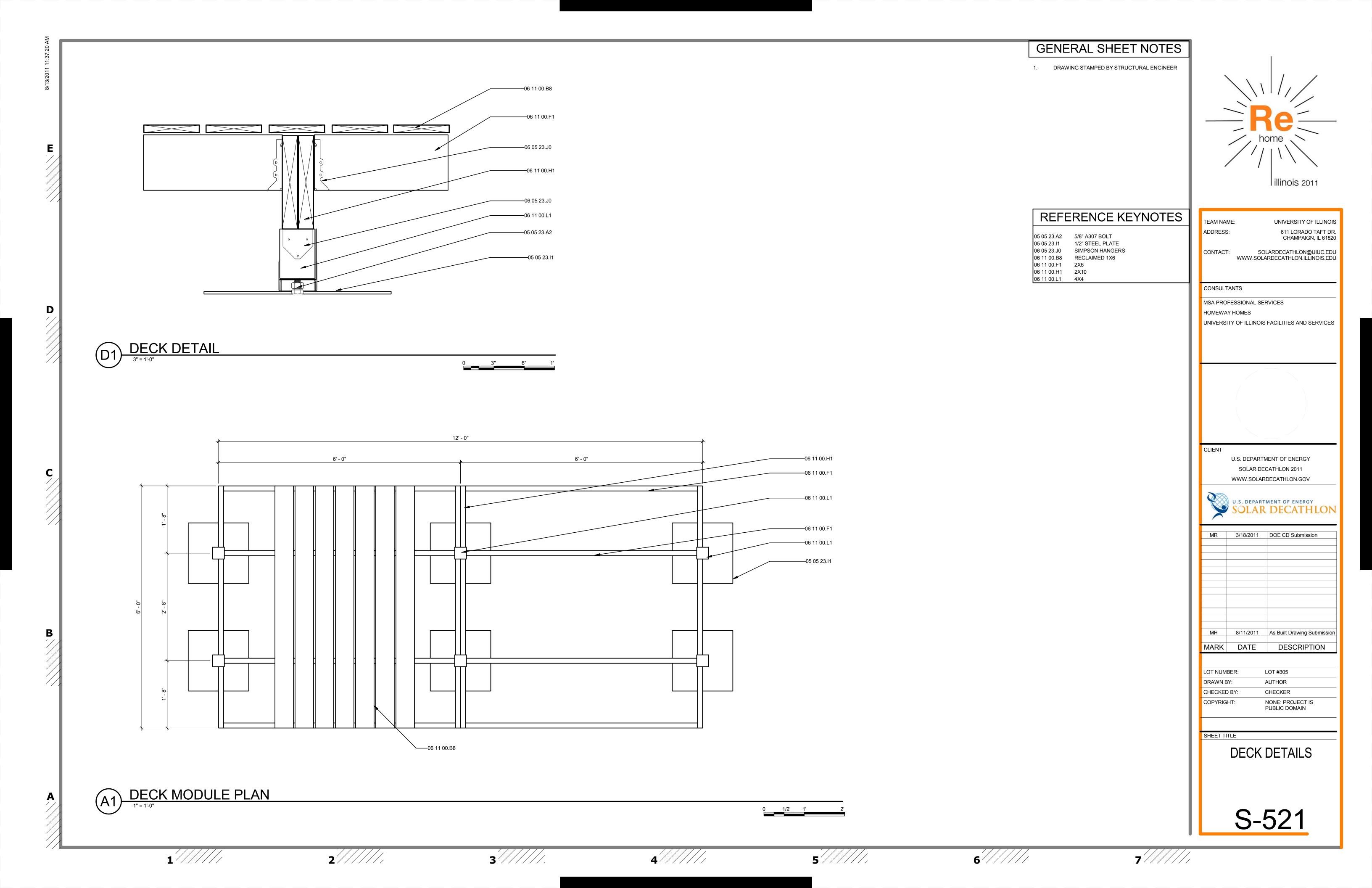
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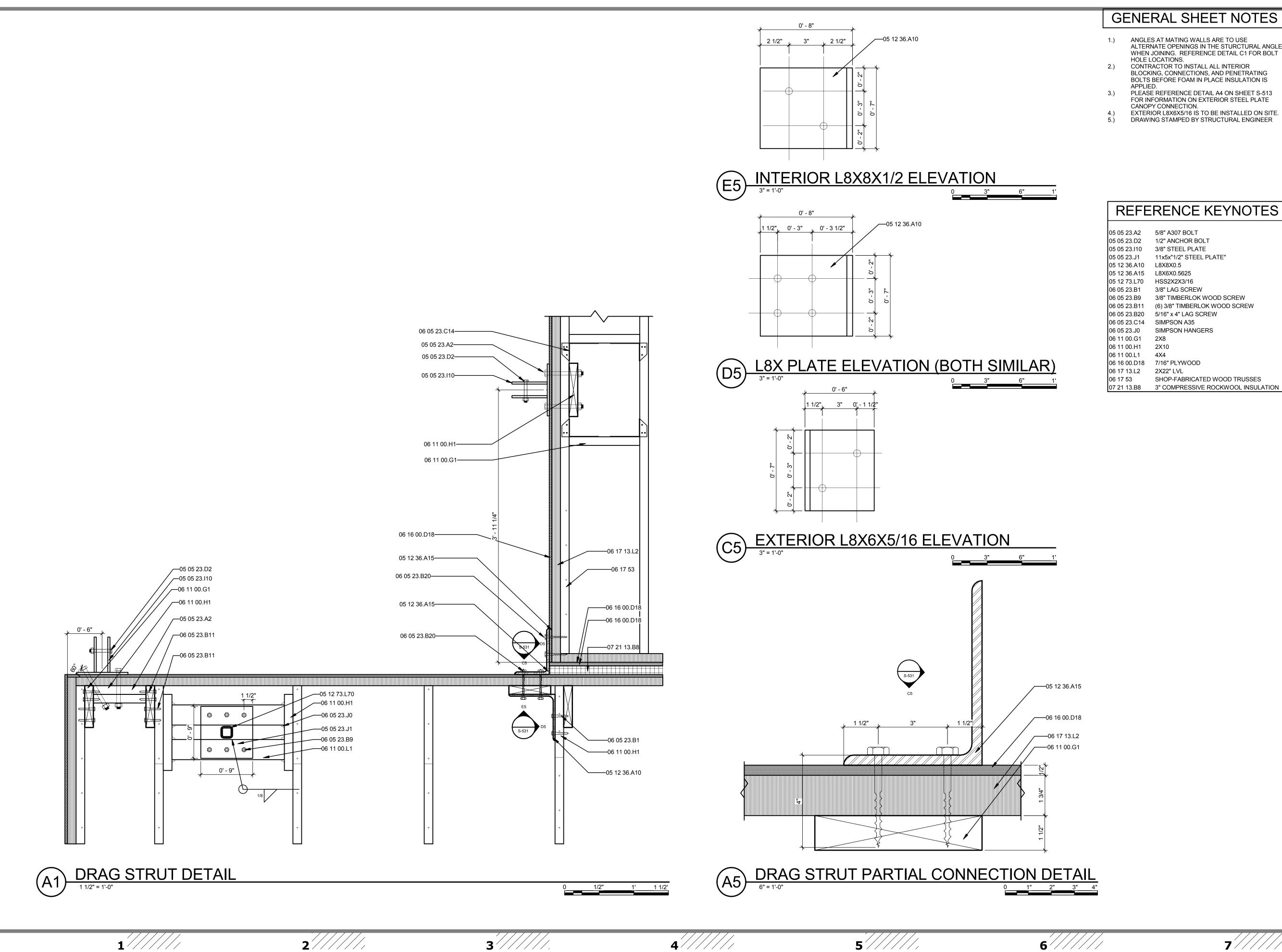
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FLOOR CONNECTION **DETAILS** 

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# GENERAL SHEET NOTES

- ANGLES AT MATING WALLS ARE TO USE ALTERNATE OPENINGS IN THE STURCTURAL ANGLE WHEN JOINTIES REFERENCE DETAIL C1 FOR BOLT
- HOLE LOCATIONS. CONTRACTOR TO INSTALL ALL INTERIOR BLOCKING, CONNECTIONS, AND PENETRATING
- PLEASE REFERENCE DETAIL A4 ON SHEET S-513 FOR INFORMATION ON EXTERIOR STEEL PLATE
- EXTERIOR L8X6X5/16 IS TO BE INSTALLED ON SITE.
  DRAWING STAMPED BY STRUCTURAL ENGINEER



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# REFERENCE KEYNOTES

	1121102112111012
05 05 23.A2	5/8" A307 BOLT
05 05 23.D2	1/2" ANCHOR BOLT
05 05 23.I10	3/8" STEEL PLATE
05 05 23.J1	11x5x"1/2" STEEL PLATE"
05 12 36.A10	L8X8X0.5
05 12 36.A15	L8X6X0.5625
05 12 73.L70	HSS2X2X3/16
06 05 23.B1	3/8" LAG SCREW
06 05 23.B9	3/8" TIMBERLOK WOOD SCREW
06 05 23.B11	(6) 3/8" TIMBERLOK WOOD SCREW
06 05 23.B20	5/16" x 4" LAG SCREW
06 05 23.C14	SIMPSON A35
06 05 23.J0	SIMPSON HANGERS
06 11 00.G1	2X8
06 11 00.H1	2X10

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	0/10/2011	BOL OB CODITIONION	
MH	3/31/2011	(A1) Missing LVL added at	
		mating wall.	
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ROOF DETAILS

SHEET TITLE

S-531

7////// 6 5//////

5' - 1 3/8" 1' - 8 3/4" • 5' - 1 3/8" SOLAR PANEL SUBMOUNT PLAN

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

# GENERAL SHEET NOTES

- REFERENCE STRUCTURAL CALCULATIONS FOR DETAILS ON STRUCTURAL DESIGN OF SOLAR PANEL SUBMOUNT REGARDING FALL PROVENTION CAPABILITY AND COMPENSATION FOR UPLIFT FROM SOLAR PANELS.
- INNER LINE OF ROOF PLAN IS REFERENCED AS THE INTERIOR OF THE ROOF PARAPET. PLEASE CONFIRM LOCATIONS OF SUBROOF MOUNTING ON SITE TO ENSURE CORRECT MOUNTING LOCATIONS.
- DRAWING STAMPED BY STRUCTURAL ENGINEER



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CONTACT:

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SOLAR PANEL SUBMOUNT DETAILS

S-532

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34' - 2" 4' - 1" —06 11 00.D1 ----06 16 00.D17 ----06 11 00.D1 ----06 11 00.D1 ----06 11 00.H1 TYPICAL EXTERIOR FRAMING ELEVATION -06 16 00.D18 -09 29 00.D11 2' - 0" -06 11 00.D1 -06 16 00.D17 ──06 11 00.D1 —06 11 00.H1 -06 16 00.D18 06 05 23.R2—— —06 11 00.D1 ---06 05 23.R2 TYPICAL SHEAR WALL EXTERIOR FRAMING ELEVATION

1/2" = 1'-0" (A1) SHEAR WALL TO FLOOR DETAIL AT CORNERS
3" = 1'-0"

# GENERAL SHEET NOTES

- 10' TALL, VERTICAL ORIENTED PLYWOOD TO BE INSTALLED AT ALL WALLS FOR FULL HEIGHT OF
- 2. DRAWING STAMPED BY STRUCTURAL ENGINEER



# REFERENCE KEYNOTES

06 05 23.R2 SIMPSON HRS8 10-10D

06 11 00.D1 2X4 06 11 00.H1 2X10

06 16 00.D17 7/16" PLYWOOD 06 16 00.D18 7/16" PLYWOOD

09 29 00.D11 5/8" TYPE "X" GYPSUM WALLBOARD

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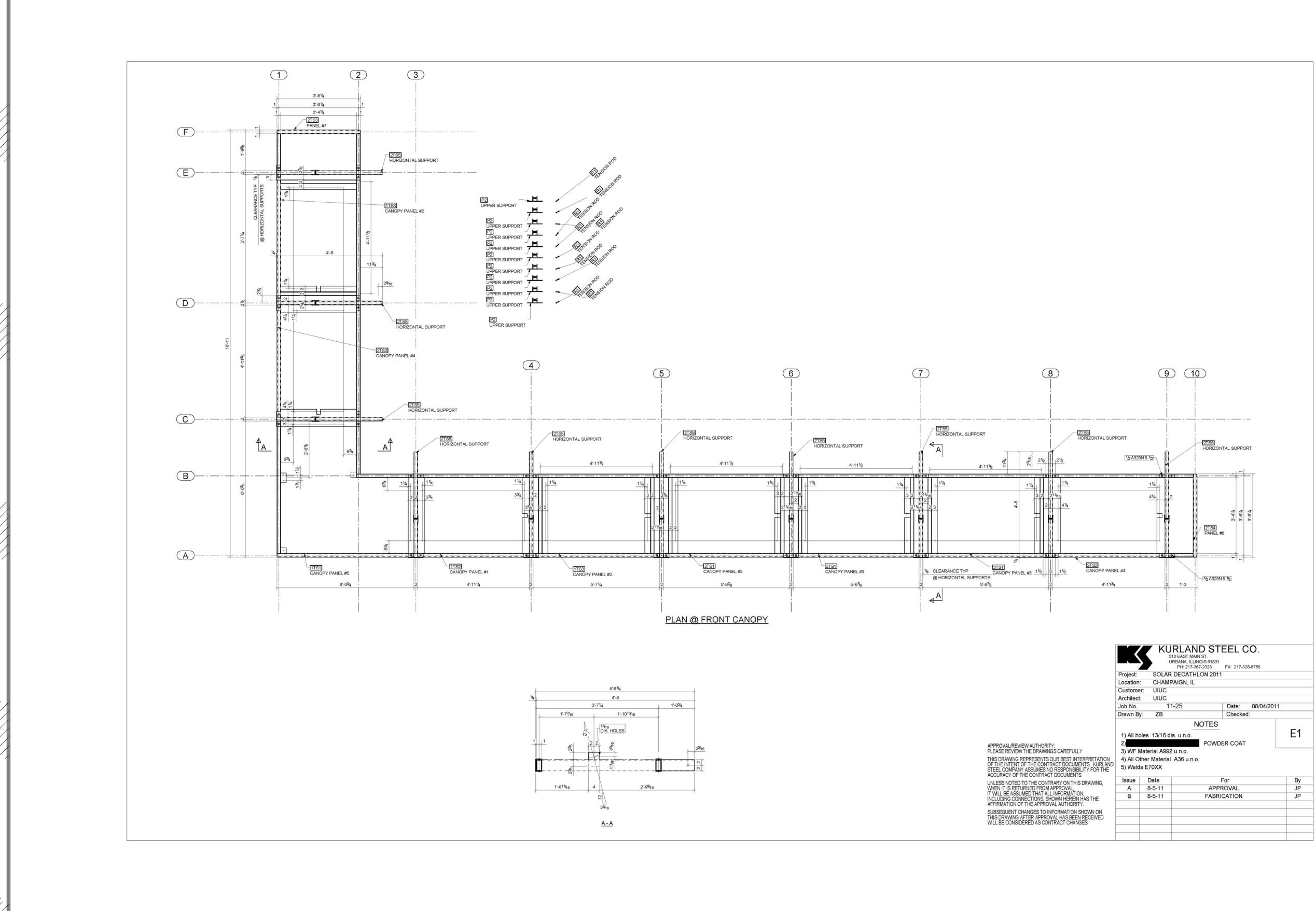
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TYPICAL DETAILS

S-701

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SOUTH CANOPY SHOP DRAWINGS

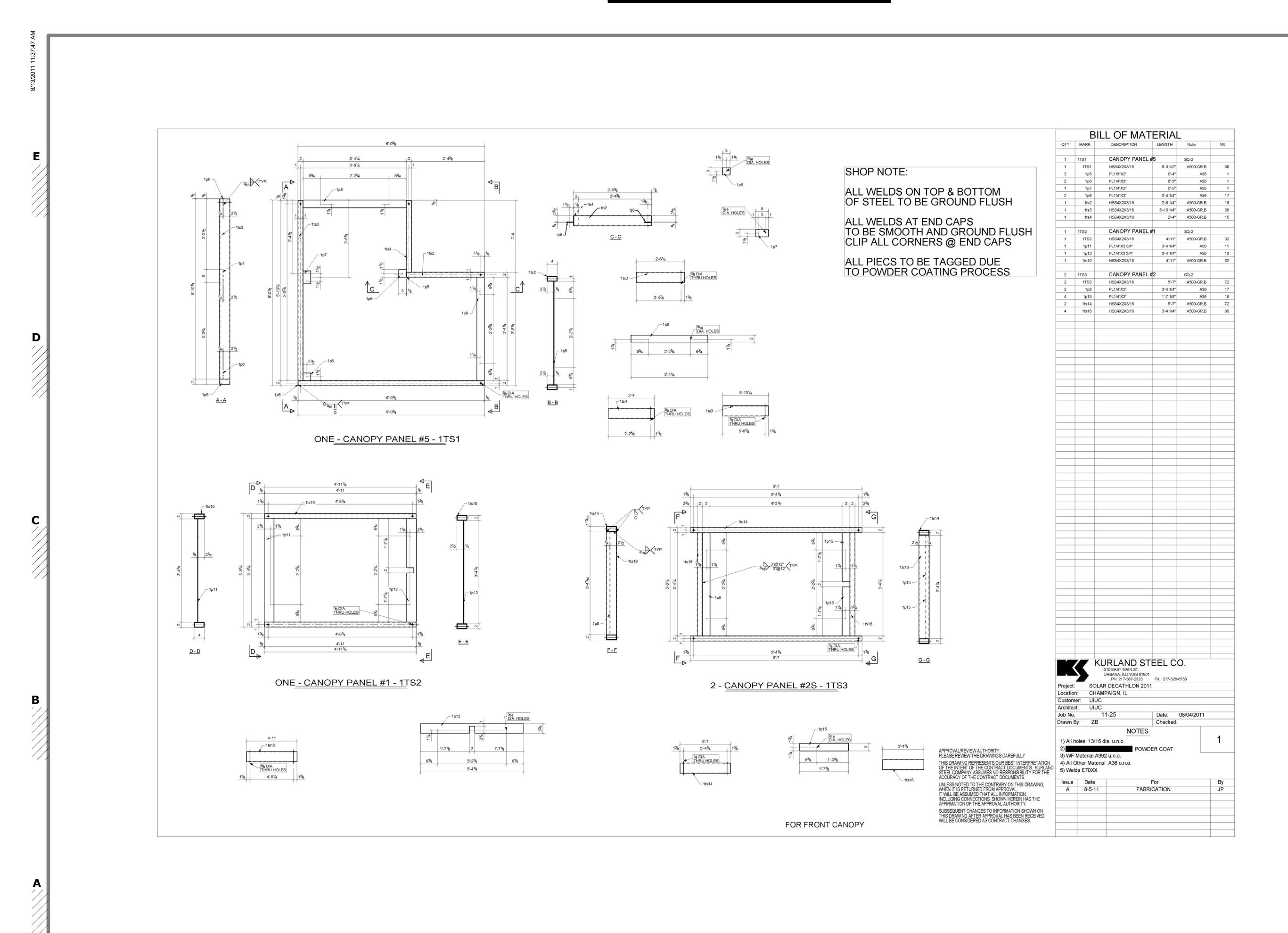
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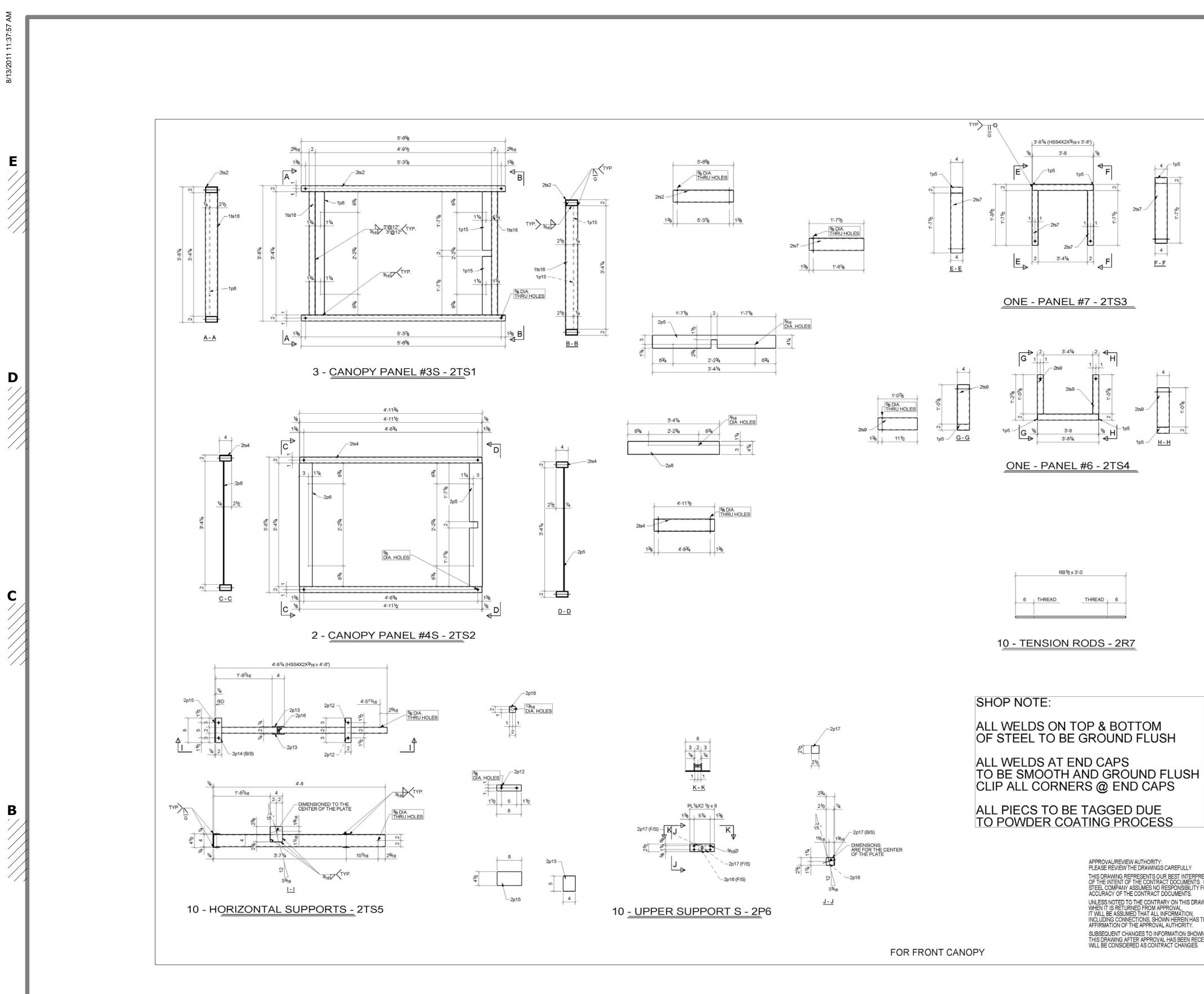
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SOUTH CANOPY SHOP DRAWINGS

S-902





**BILL OF MATERIAL** 

0'-2 1/2"

5'-6 5/8" A500-GR.B

3'-4 1/4" A500-GR.B

5'-6 5/8" A500-GR.B

4'-11 1/2" A500-GR.B

4'-11 1/2" A500-GR.B

3'-8" A500-GR.B 0'-4" A36

3'-8" A500-GR.B

1'-0 7/8" A500-GR.B

1'-7 1/2" A500-GR.B

3'-4 1/4"

PL1/4"X2 1/2"

PL1/4"X4 1/4"

PL1/4"X4 1/2"

KURLAND STEEL CO.
510 EAST MAIN ST.
URBANA, ILLINOIS 61801
PH: 217-367-2323 FX: 217-328-6758

NOTES

Date: 08/04/2011

Checked:

POWDER COAT

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CHAMPAIGN, IL

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TENSION ROD

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SOUTH CANOPY SHOP DRAWINGS

S-903

THIS DRAWING REPRESENTS OUR BEST INTERPRETATION OF THE INTENT OF THE CONTRACT DOCUMENTS. KURLAND STEEL COMPANY ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE CONTRACT DOCUMENTS.

UNLESS NOTED TO THE CONTRARY ON THIS DRAWING, WHEN IT IS RETURNED FROM APPROVAL, IT WILL BE ASSUMED THAT ALL INFORMATION, INCLUDING CONNECTIONS, SHOWN HEREIN HAS THE AFFIRMATION OF THE APPROVAL AUTHORITY.

SUBSECUENT CHANGES TO INFORMATION SHOWN ON 4) All Other Material A36 u.n.o. A 8-5-11 FABRICATION SUBSEQUENT CHANGES TO INFORMATION SHOWN ON THIS DRAWING AFTER APPROVAL HAS BEEN RECEIVED WILL BE CONSIDERED AS CONTRACT CHANGES. 5//////

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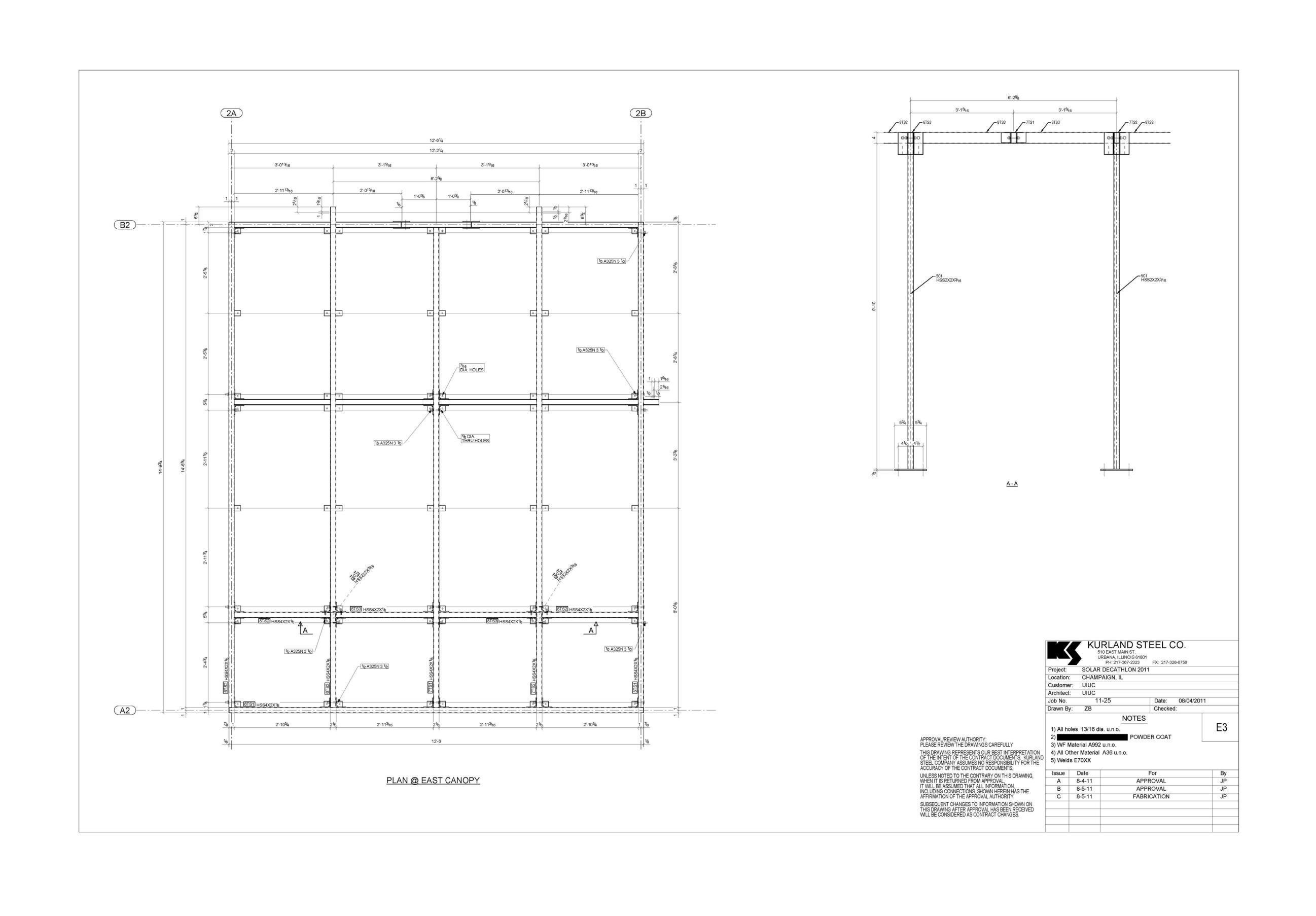
Customer: UIUC
Architect: UIUC
Job No. 1

Drawn By: ZB

1) All holes 13/16 dia. u.n.o.

3) WF Material A992 u.n.o.

2//////





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CHAMPAIGN, IL 61820

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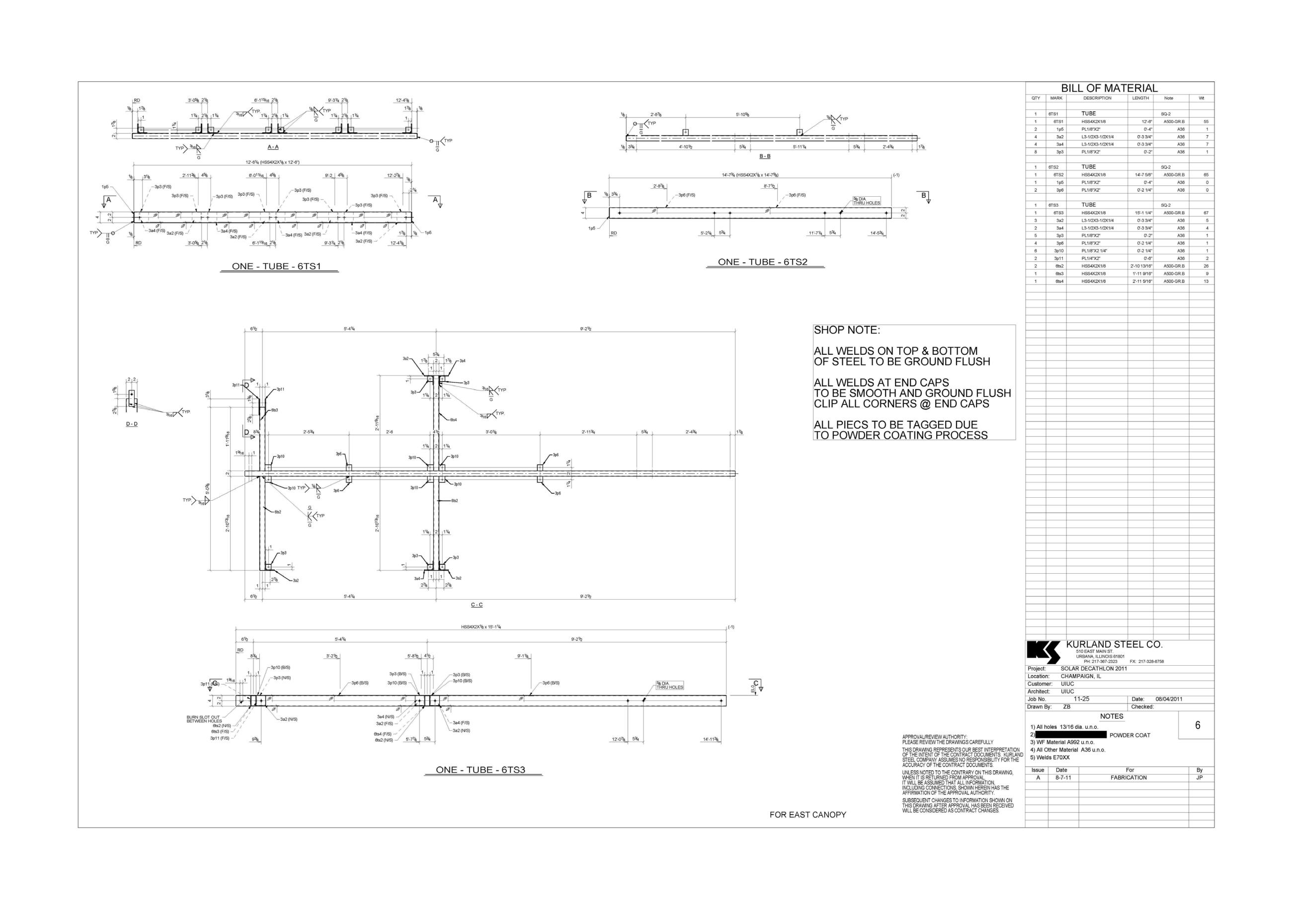
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EAST CANOPY SHOP DRAWINGS

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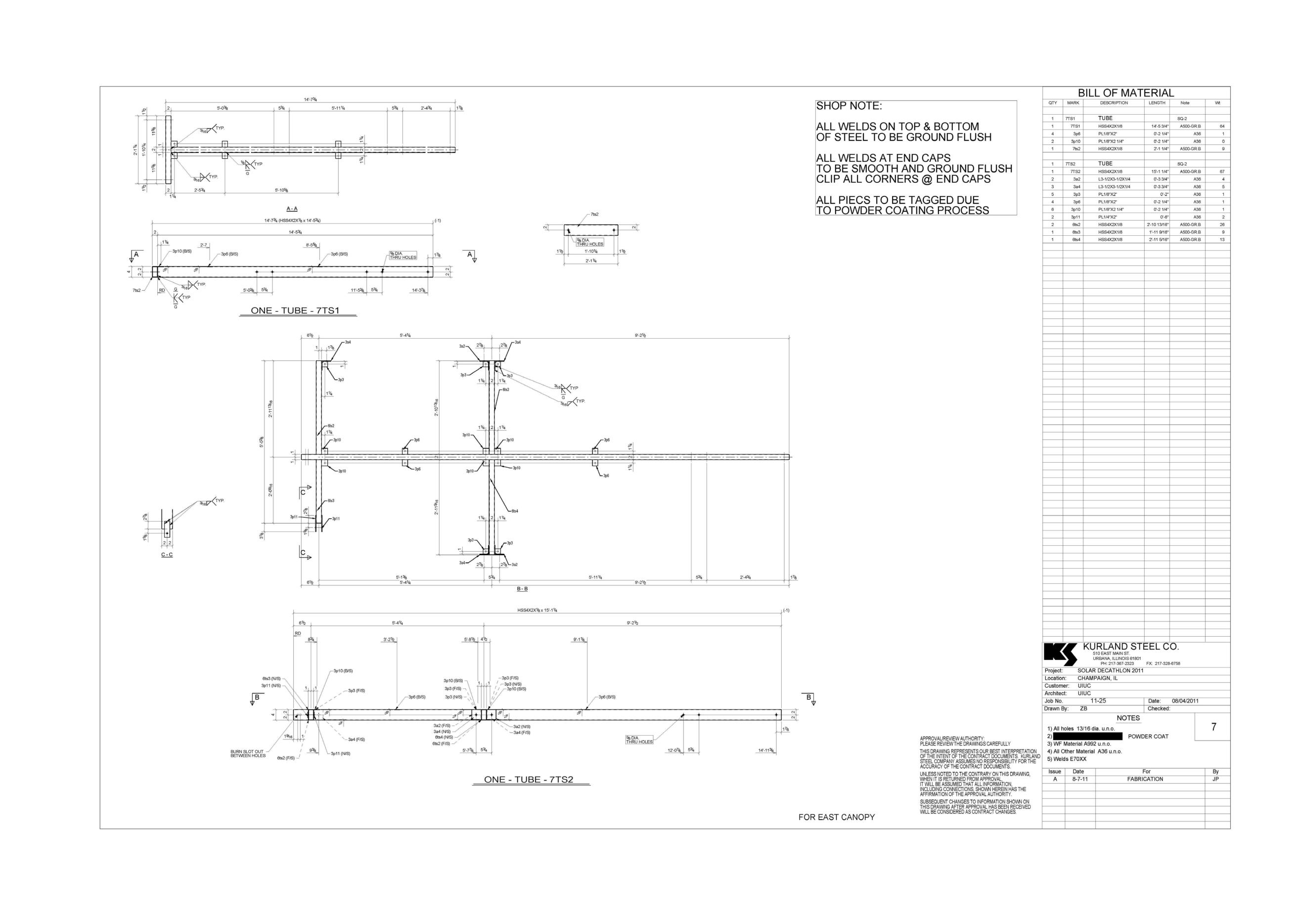
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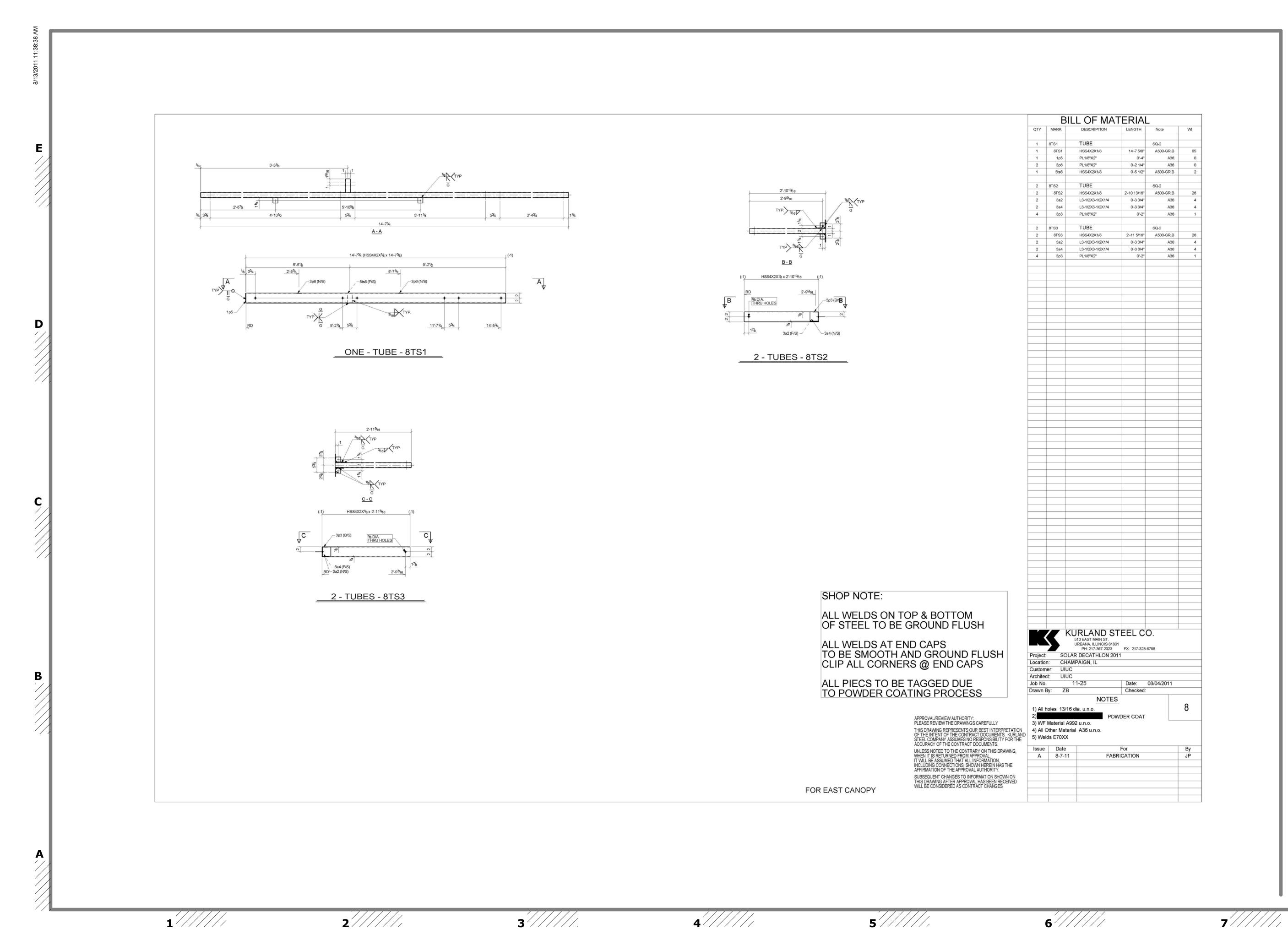
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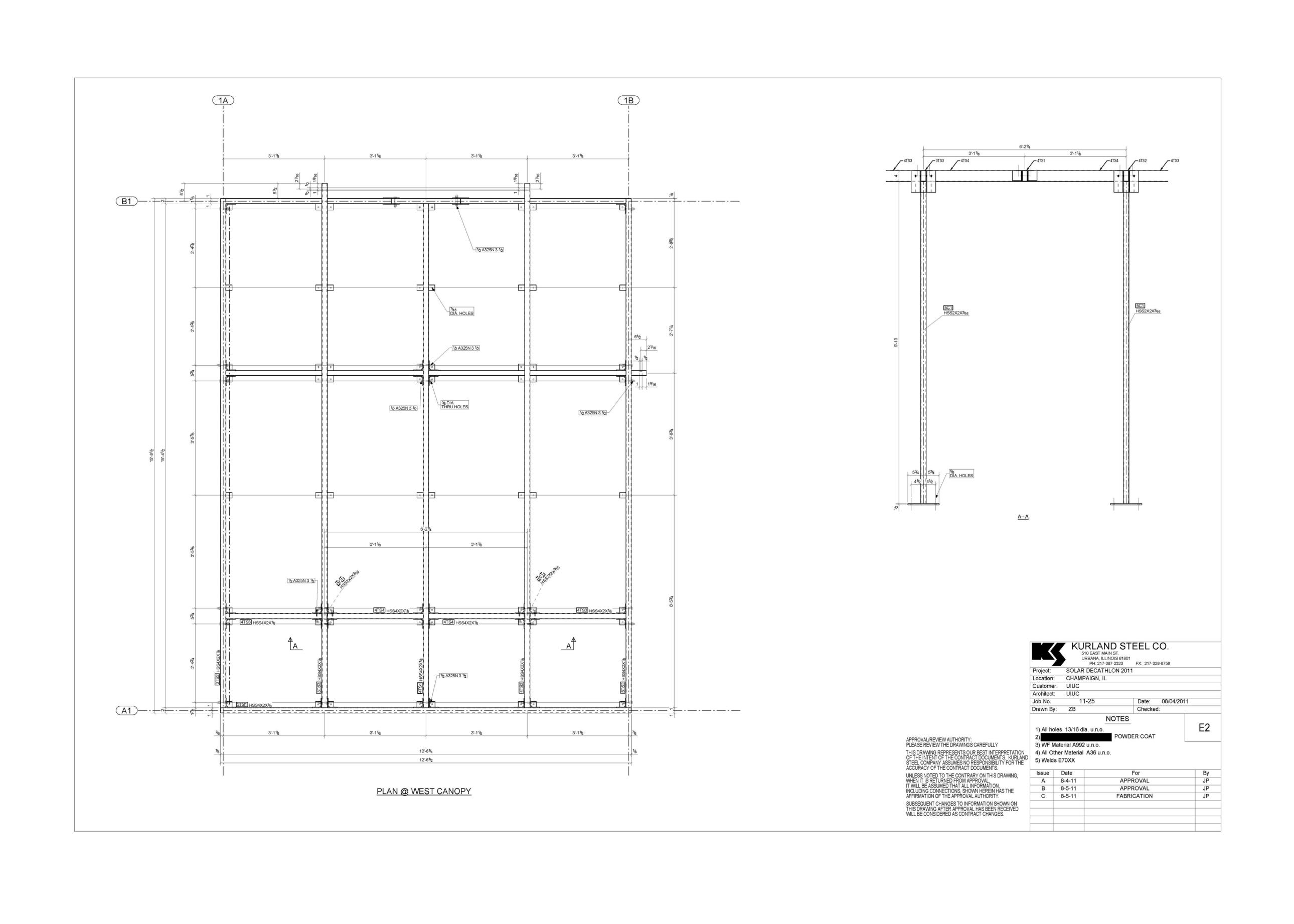
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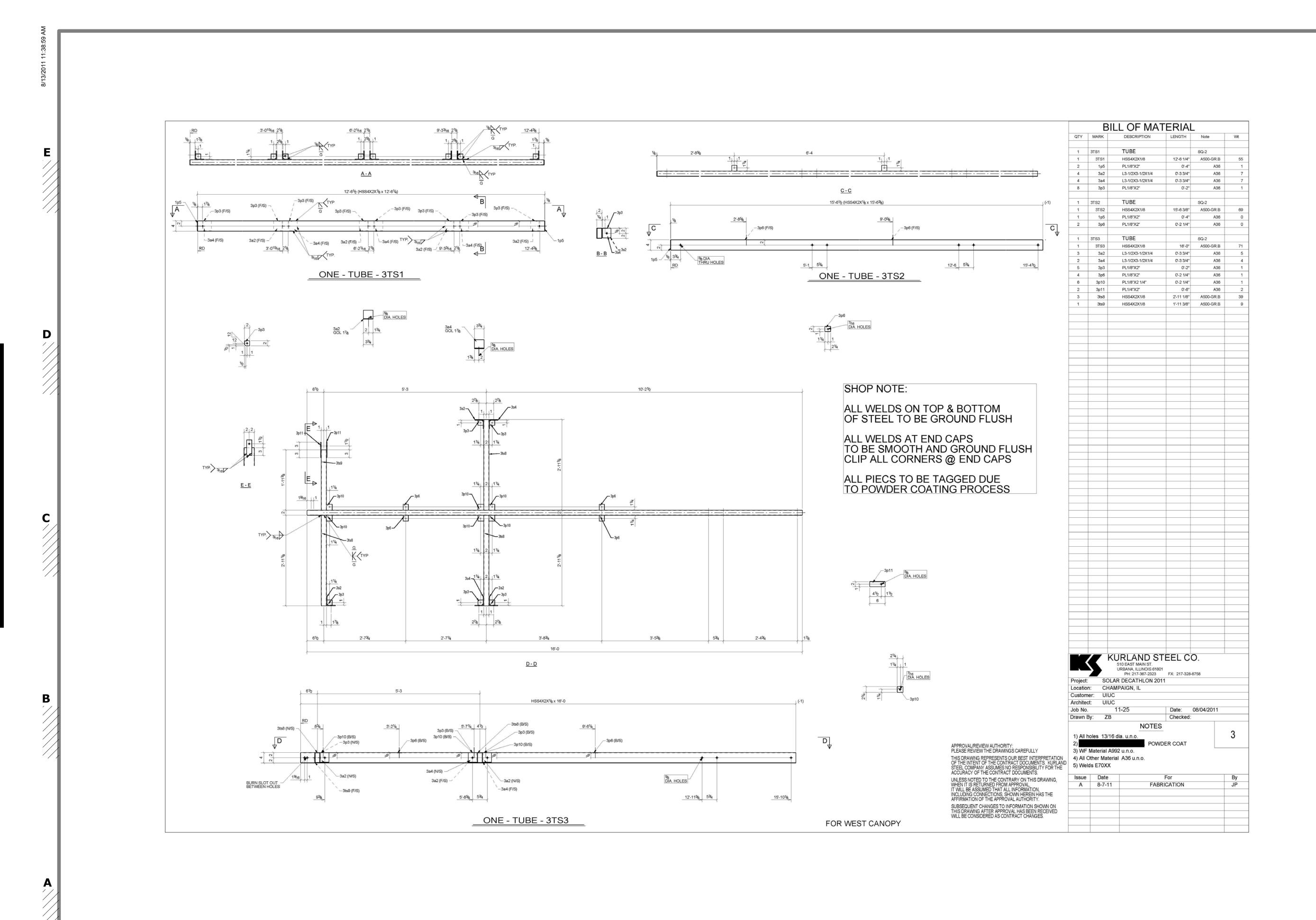
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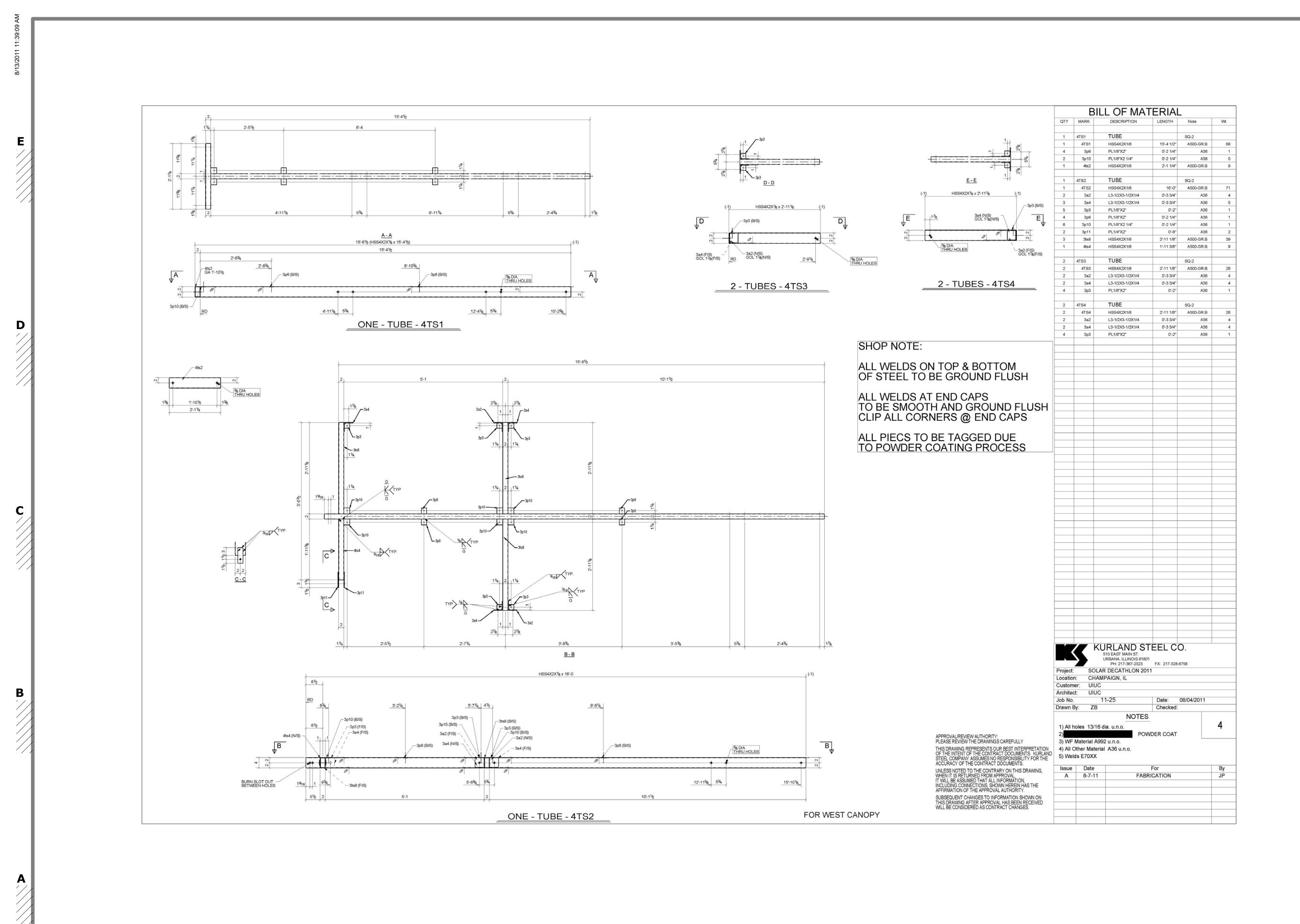
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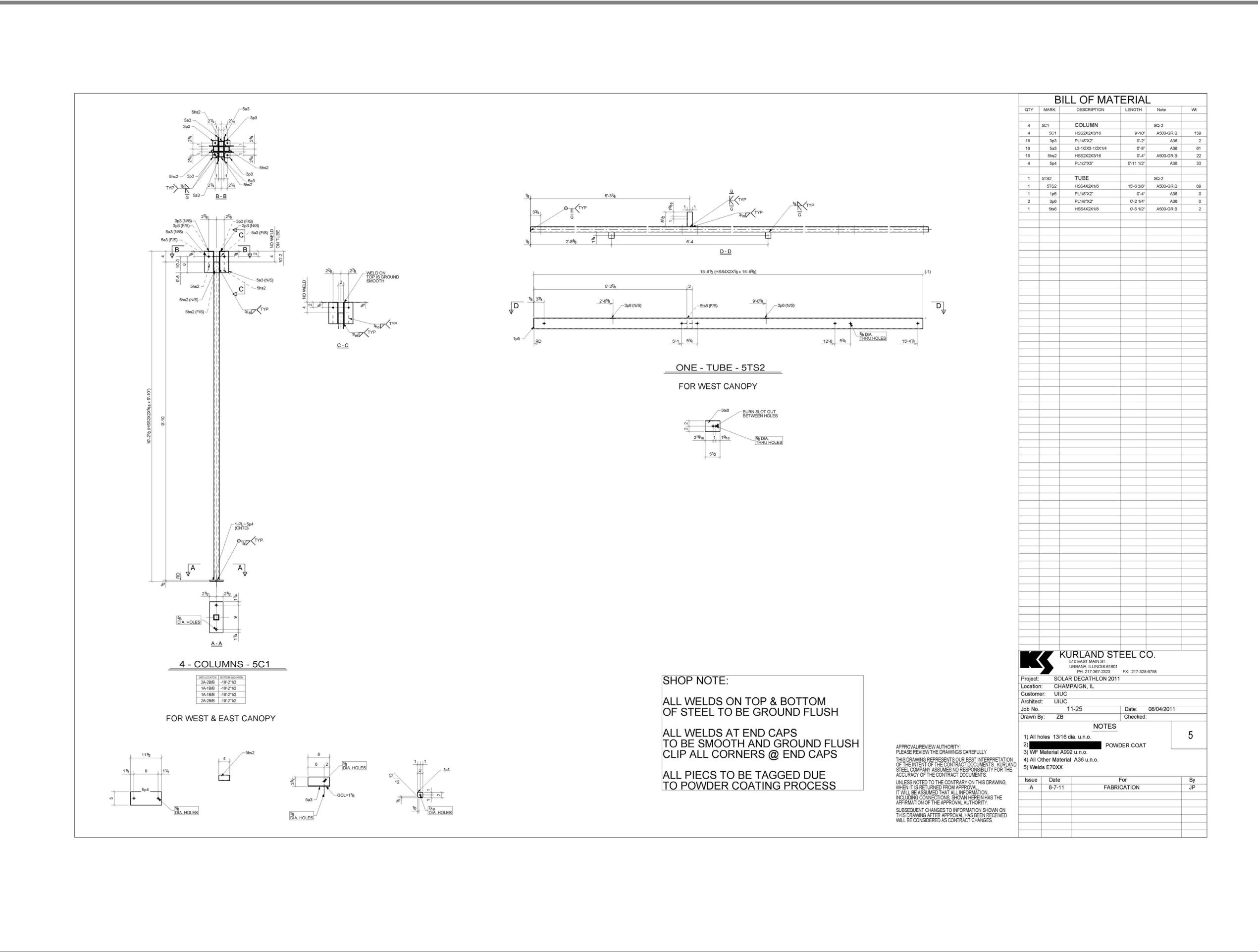
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# **ARCHITECTURAL**

- A. FIRE RESISTANCE COMPLIANCE
- A.01 SEE CODE COPMLIANCE PLANS IN A-SERIES FOR DETAILED CODE COMPLIANCE
- A.02 FIRE RATING INDICATION ON A WALL SHALL MEAN THE ENTIRE LENGTH OF THE WALL IS TO BE FIRE RATED.
- A.03 ALL PIPING, DUCTS, ETC. THAT PENETRATE FLOOR SLABS SHALL BE INSTALLED IN A MANNER THAT WILL PERESERVE THE FIRE-RESISTIVE AND STRUCTURAL INTEGRITY. PENETRATIONS INTO FIRE-REATED WALLS OF MORE THAN 1 HR. RATING SHALL BE PROVIDED WITH APPROVED FIRE DAMPERS WHETHER OR NOT SHOWN IN THE MECHANICAL DRAWINGS.
- ALL RATINGS ARE TO COMPLY WITH UNDERWRITERS LABORATORIES (UL) TEST RATINGS. IN THE ABSENCE OF TESTED ASSEMBLY, PROVIDE CERTIFICATE OF EQUIVALENCY FROM UL. MEET ALL THE REQUIREMENTS OF FACTORY MUTUAL ENGINEERING FOR BOTH CONSTRUCTION AND FIRE PROTECTION
  - B. DIMENSIONING
- B.01 UNLESS NOTED OTHERWISE, PARTITIONS ARE DIMENSIONED TO THE FACE OF THE
- B.02 ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BEFORE PROCEEDING WITH THE WORK. THE ARCHITECT SHALL BE NOTIFIED OF ANY CORRECTION.
- B.03 DOOR OPENINGS ARE GENERALLY DIMENSIONED TO CENTERLINE OF OPENING. DOOR OPENINGS THAT ARE NOT DIMENSIONALLY LOCATED ARE TO BECENTERED BETWEEN WALLS OR POSITIONED WITH ONE JAMB AGAINST AN ADJACENET WALL OR COLUMN AS SHOWN ON THE PLANS.
- ALL DIMENSIONS SHALL BE VERIFIED AND COORDINATED WITH THE WORK OF ALL

#### C. INSULATION

- C.01 WHETHER SPECIFICALLY SHOWN, OR NOT, PROVIDE INSULATION WITH VAPOR BARRIER BETWEEN ALL EXTERIOR AND INTERIOR HEATED SPACES TO MAINTAIN
- C.02 ALL JOINTS AND PENETRATIONS IN INSULATION BARRIER SHALL BE FULLY BUTTED/SEALED WITH ADHESIVE/SEALANT TO PROVIDE A CONTINUOUS AIR/VAPOR
  - D. MECHANICAL AND ELECTRICAL AREAS
- UNLESS OTHERWISE NOTED, ALL WALLS BETWEEN MECHANICAL OR ELECTRICAL SPACES AND OCCUPIED SPACES SHALL BE ACOUSTICALLY ISOLATED FROM THE OCCUPIED SPACES AND SHALL MAINTAIN A MINIMUM STC RATING OF 52.
- D.02 GENERAL CONTRACTOR TO COORDINATE ALL MECHANICAL AND ELECTRICAL FLOOR, ROOF AND WALL SLEEVES AND ALL MECHANICAL SHAFTS AND OPENINGS WITH MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES. GENERAL CONTRACTOR SHALL PROVIDE SLEEVES AND FLOOR AND ROOF OPENINGS AS REQUIRED TO ALLOW INSTALLATION OF ALL DUCTS AND PIPING AS SHOWN ON THE MECHANICAL AND ELECTRICAL DRAWINGS.
- FIRE DAMPERS SHALL BE PROVIDED AS SHOWN AND WHEREVER AIR DUCTS PENETRATE FIRE RATED WALLS OR CEILINGS. FIRE DAMPERS SHALL BE FIRE DEPARTMENT LISTED AND APPROVED.

#### E. EXTERIOR WALLS

- E.01 THE EXTERIOR WALL AS SHOWN SHALL BE A COMPLETE SYSTEM INCLUDING ALL STIFFENERS, FASTENERS, STEALANTS, JOINGING MISCELLANEOUS PIECES AND MATERIAL THICKNESS AS REQUIRED TO FORM A WATERTIGHT ENCLOSURE.
- E.02 DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO THOSE DETAILED.
- ALL DETAILS ARE TO BE COORDINATED WITH THE STRUCTURAL FRAMING AND OTHER BUILDING COMPONENTS INCLUDING ROOFING, EXTERIOR-CLADDING ITEMS, GLAZING, INTERIOR FINISH AND OTHER RELATED BUILDING COMPONENTS.
- E.04 ALL SEALANT JOINTS SHALL BE SIDED SUCH THAT THEY WILL BE WITHIN THE SIZE RANGE RECOMMENDED BY THE SEALANT MANUFACTURER
- E.05 VERIFY OR GUARANTEE ALL CLEAR OPENINGS FOR LOUVERS AND WINDOW INSTALLATION.
- E.06 ALL SILLS, WINDOW HEADS, AND SHELF ANGLES SHALL HAVE FLASHING EXTENDED TO THE OUTSIDE OF THE WALL WHETHER OR NOT SHOWN ON THE DRAWINGS.
- E.07 U.N.O. PROVIDE EXTERIOR WALL COMPONENTS SUCH AS WINDOWS, DOORS, TO RESIST A WIND LOAD OF A MINIMUM OF 30 psf
- E.08 U.N.O. PROVIDE SOFFITS DESIGNED TO RESIST A WIND LOAD OF A MINIMUM OF
  - 45psf OR 1.5 TIMES THE DESIGN WIND LOAD. F. MISCELLANEOUS NOTES
- F.01 ALL BASE BUILDING INTERIOR PARTITIONS SHALL WITHSTAND MINIMUM INWARD AND OUTWARD ACTING PRESSURES OF 5 psf.
- F.02 ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FORM EACH OTHER TO AVOID MOLECULAR BREAKDOWN.
- PROVDIE ACCESS PANELS AS REQUIRED BY APPLICABLE CODES AND AS REQUIRED FOR ACCESS OR MAINTENANCE OF MECHANICAL AND ELECTRICAL EQUIPMENT INCLUDING JUNCTION BOXES. ALL ACCESS PANELS LOCATIONS SHALL BE REVIEWED WITH THE ARCHITECT PRIOR TO PROCEEDING.
- WHERE DISCREPANCIES EXIST BETWEEN THE DRAWINGS OF THE VARIOUS TRADES, CONSULT THE ARCHITECT BEFORE PROCEEDING WITH WORK.
- WHETHER OR NOT EXPLICITYL INDICATED, ALL GLAZING SHALL BE SAFETY GLAZED WHEN WITHIN 18" OF THE FLOOR OR WITHIN 3'-0" HORIZONTAL DISTANCE FROM ANY DOOR. A CERTIFICATE MUST ACCOMPANY ALL GLAZING PRODUCTS STATING THAT THE PRODUCTS CONFORM WITH APPICABLE CONSUMER PRODUCT SAFETY STANDARDS.
- F.06 UNLESS OTHERWISE NOTED, ALL EXTERIOR EXPOSED METAL SHALL BE GALVANIZED AND PAINTED.
- F.07 ALL EXTERIOR JOINTS AROUND WINDOW AND DOOR FRAMES, WETWEEN WALLS AND FOUNDATION, BETWEEN WALLS AND ROOF, BETWEEN WALL PANEL, AT PENETRATION OF UTILITIES THROUGH THE ENVELOPE, SHALL BE SEALED, CAULKED OR WEATHER-STRIPPED TO PRVENT AIR LEAKAGE / INFILTRATION.
- ALL REFUSE AND DEBRIS SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF BY THE CONTRACTOR.

# **GENERAL**

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE REQIREMENTS OF THE APPLICABLE CODES. ENGINEERING SHALL CONFIRM WITH ALL APPICABLE MUNICIPAL, STATE AND FEDERAL REGULATIONS HAVING JURISDICTION INCLUDING ACCESSIBILITY STANDARDS AND ILLINOIS ACCESSIBILITY REQUIREMENTS

THE CONTRACTOR ALONG SHALL BE RESPONSIBLE FOR THE SAFETYAND ADEQUANCY OF HIS PLANT, APPLIANCES, METHODS AND FOR DAMAGE WHICH MAY RESULT FROM THEIR IMPROPOER REMOVAL, CONSTRUCTION, MAINTENANCE OR OPERATION. HE SHALL ERECT AND PROPERLY MAINTAIN AT ALL TIMES AS REQUIRED BY THE CONDITIONS AND PROGRESS OF THE WORK, PROPER SAFEGUARDS FOR THE PROTECTION OF WORKMEN, OWNER, AND OWNERS PROPERTY, AND SHALL POST DANGER WARNINGS AGAINST HAZARDS CREATED BY CONSTRUCTION OPERATIONS.

INSPECTION BY CONTRACTOR: THE CONTRACTOR ACKNOWLEDGES AND AGREES THAT HE HAS INIVISIBLE INDELEGABLE AND INTRANSFERABLE AND CONTRACTURAL OBLICATION TO THE OWNER TO MAKE HIS OWN INSPECTIONS ON HIS OWN WORK AT THE STAGES OF CONSTRUCTION, AND SHALL SUPERVISE AND SUPERINTEND PERFORMANCE OF WORK IN SUCH MANNER AS TO ENABLE HIM TO CONFIRM, CERTIFY AND CORROBORATE AT ALL TIMES THAT ALL WORK HAS BEEN EXECUTED ACCORDING TO THE CONTRACT DOCUMENT.

THE CONTRACTOR SHALL SUPPLY ALL LABOR, TRANSPORTATION, APPARATUS, SCAFFOLDING, AND ANY TOOLS FOR THE COMPLETION OF THE WORK, MAINTAIN AND REMOVE ANY TEMPORARY EQUIPMENT, AND CONSTRUCTION THE COMPLETE WORK AND EVERYTHING PROPERLY INCIDENTAL THERTO AS STATED IN THE CONTRACT DOCUMENTS OR REASONABLY IMPLIED THEREFROM. ALL PARTS MUST BE COORDINATED, COMPLETE, READY TO OPERATE AND DELIVERED TO THE OWNER IN NEW CONDITION.

- CONTRACTOR'S WARRANTY: THE CONTRACTOR WARRENTS THAT HE IS FAMILAR WITH THE CODES AND REGULATIONS APPLICABLE TO THE WORK AND THAT HE HAS THE SKILL, KNOWLEDGE, COMPETENCE, ORGANIZATION AND PLANT TO EXECUTE THE WORK PROMPTELY AND EFFICIENTLY IN COMPIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, INCLUDING THE TIMESCHEDULE.
- THE OWNER WILL NOT ACCEPT REQUESTS FOR EXTRA WORK CONDITIONS WHICH CAN BE REASONABLY ASCERTAINED FROM THE DRAWINGS AND SPECIFICATIONS.
- ABESTOS CONTAINING MATERIALS MAY NOT BE USED ON THIS PROJECT
- LEAD-CONTAINING PAINT MAY NOT BE USED ON THIS PROJECT.
- SUBCONTRACTORS FOR EACH TRADE ARE ADVISED THAT INFORMATION PERTINENT TO THEIR WORK MAY OCCUR IN OTHER PORTIONS OF THE CONTRACT DOCUMENTS. ALL SHEETS AND NOTES TO BE REVIEWED.
- THE STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS ARE OF EQUAL IMPORTANCE WITH THE ARCHITECTURAL DRAWINGS IN DEFINING THE WORK OF THE CONTRACT DOCUMENTS. SHOULD THERE BE A DISCREPANCE BETWEEN THE ARCHITECTURAL DRAWINGS AND THE ENGINEERING DRAWINGS THAT WOULD CAUSE AN IMPROPER INSTALLATION, IT SHALL BE BROUGHT TO THE ARCHITECTS ATTENTENTION FOR CLARIFICATION PRIOR TO INSTALLATION OF SAID WORK. ANY WORK INSTALLED IN CONFLICT WITH THE ARCHITECTURAL DRAWINGS SHALL BE CORRECTED BY THE CONTRACTOR AT HIS EXPENSE.
- 11.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURATE PLACEMENT OF BUILDINGS ON THE SITE.
- 12.) DO NOT SCALE THE DRAWINGS. THE DRAWINGS ARE NOT NECESSARILY TO SCALE.
- 13.) NOTES ON DRAWINGS SHALL APPLY TO ALL SIMILAR CONDITIONS WHETHER REPEATED OR NOT. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO THOSE
- THE CONTRACTOR SHALL VISIT THE SITE AND BE KNOWLEDGEABLE OF CONDITIONS THEREON. PRIOR TO SUBMITTING A BID HE SHALL INVESTIGATE, VERIFY AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT AND SHALL NOTIFY THE OWNER OF ANY CONDITIONS REQUIRING MODIFICATION BEFORE PROCEEDING WITH THE WORK.

SYMBOL	_S
0	COLUMN LINE W/ COLUMN NUMBER / LETTER
1 SIM	DETAIL TAG  — DETAIL IDENTIFICATION  — SHEET WHERE DETAIL IS DRAWN
	— AREA DETAIL REFERENCES
A1 SCALE  1 Ref	DETAIL TAG  — DETAIL TITLE  — DETAIL IDENTIFICATION  — DETAIL SCALE
1 A101 1 Ref	ELEVATION (S) TAG  — ELEVATION IDENTIFICATION  — SHEET WHERE ELEVATION IS DRAWN
	NORTH ARROW
11 13 00.A1	REFERENCE NOTE TAG  REFERENCE NOTE NUMBER
	REVISION TAG  — REVISION NUMBER  — CLOUD AROUND REVISION
ROOM NAME	ROOM IDENTIFICATION TAG  ROOM NAME  ROOM NUMBER
1L	WALL TYPE TAG WINDOW TAG
117	WINDOW TAG  WINDOW NUMBER  CONCRETE
	EARTH
	GYPSUM BOARD
	INSULATION - RIGID
	INSULATION - SPRAY FOAM
	STEEL WOOD (FINISH)
	WOOD (FINISH)  WOOD ROUGH
A4 A101	WALL SECTION TAG  — SECTION IDENTIFICATION  — SHEET WHERE SECTION IS DRAWN
A4 A101	BUILDING SECTION TAG  — SECTION IDENTIFICATION  — SHEET WHERE SECTION IS DRAWN
A4 A101	SECTION TAG  — SECTION IDENTIFICATION  — SHEET WHERE SECTION IS DRAWN
A4 A101	DETAIL SECTION TAG  — DETAIL IDENTIFICATION  — SHEET WHERE SECTION IS DRAWN
A4 A101	ELEVATION TAG  — ELEVATION IDENTIFICATION  — SHEET WHERE ELEVATION IS DRAWN



TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU

CONTACT: WWW.SOLARDECATHLON.ILLINOIS.EDU

CONSULTANTS

MSA PROFESSIONAL SERVICES

HOMEWAY HOMES

UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES

U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2011 WWW.SOLARDECATHLON.GOV



MR 3/18/2011 DOE CD Submission

	03-22-11			
MH	01-31-111	As Built Drawing Submissio		
	11-23-10			
MARK	DATE	DESCRIPTION		
LOT NUM	LOT NUMBER: LOT #305			

MEGAN ROBERTSON

NONE: PROJECT IS

MICHAEL HINES

PUBLIC DOMAIN

SHEET TITLE

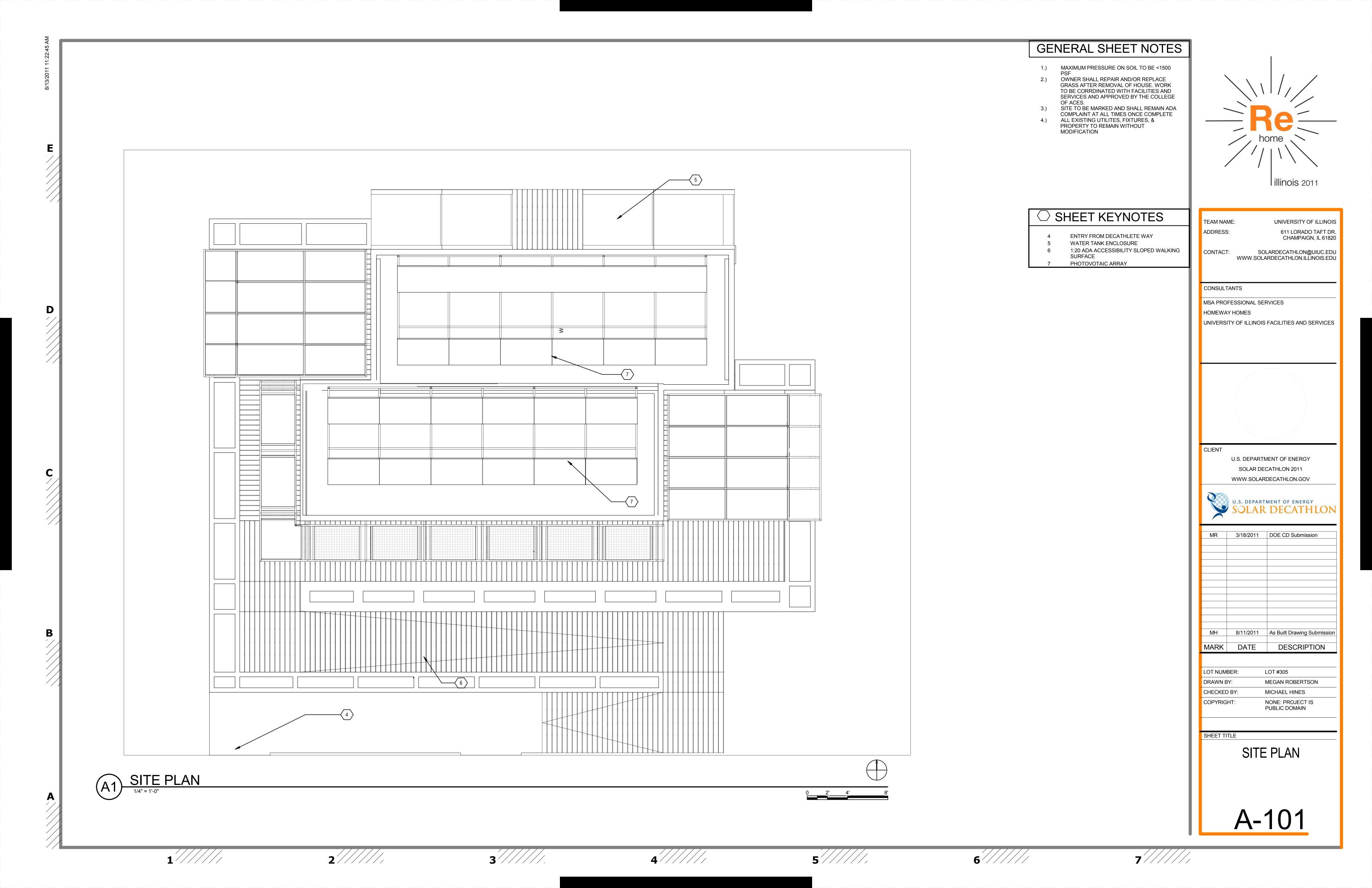
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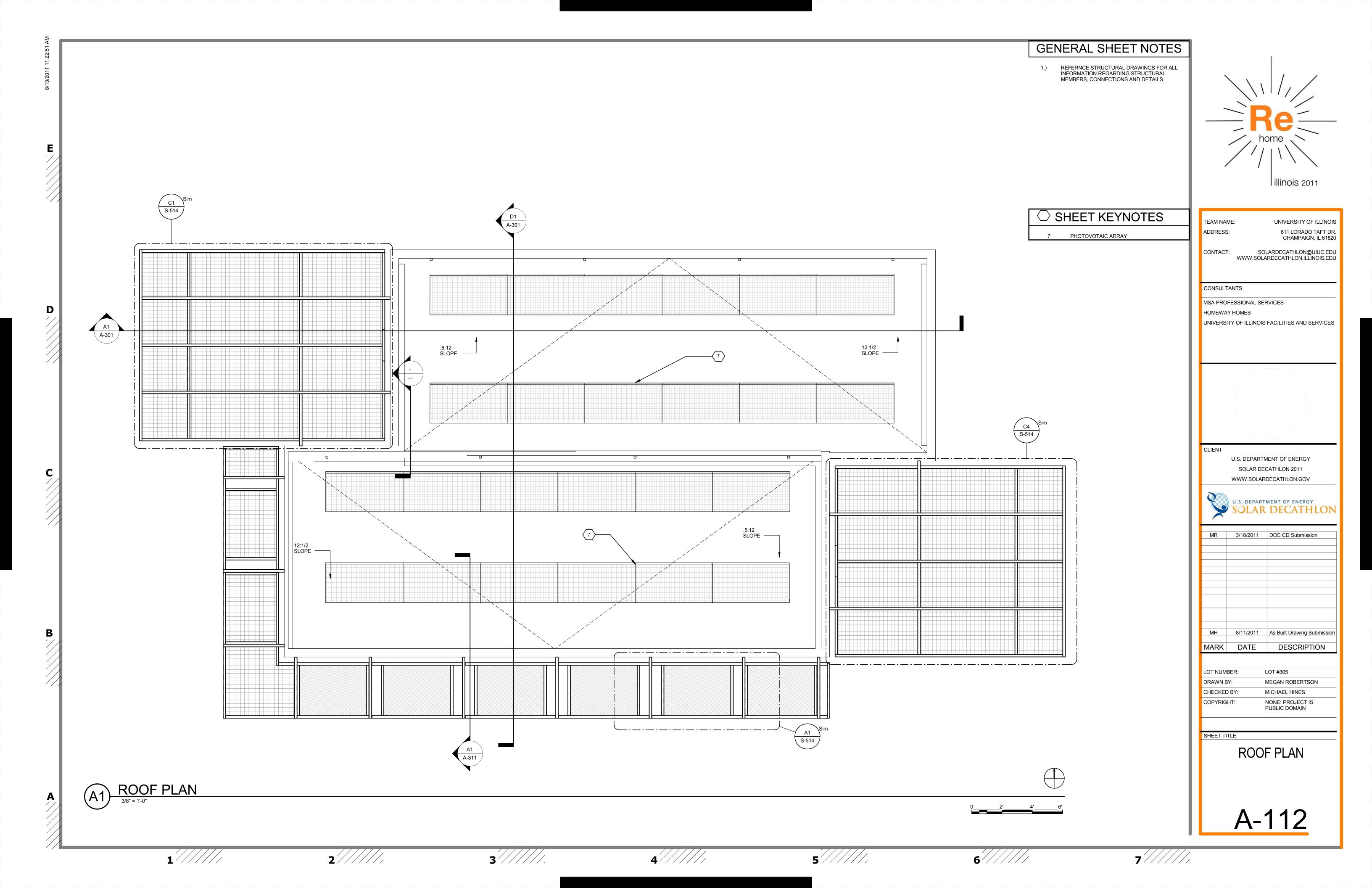
ARCHITECTURAL SYMBOLS AND NOTES

3////// 5//////



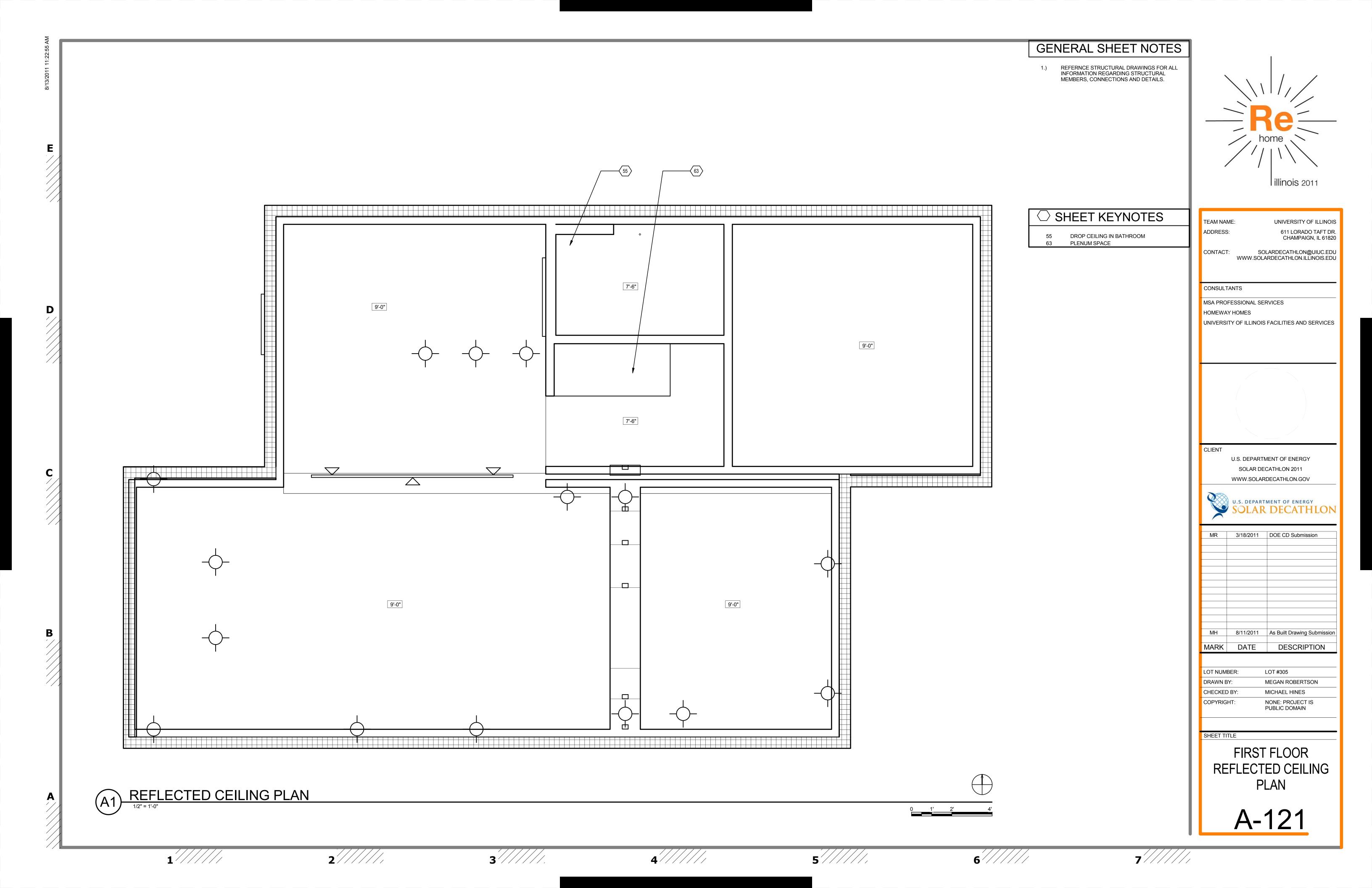
GENERAL SHEET NOTES 1.) REFERNCE STRUCTURAL DRAWINGS FOR ALL INFORMATION REGARDING STRUCTURAL MEMBERS, CONNECTIONS AND DETAILS. l illinois 2011 36' - 0 5/8" 7' - 5 3/8" 7' - 8" 4' - 1 3/8" TEAM NAME: UNIVERSITY OF ILLINOIS ADDRESS: 611 LORADO TAFT DR. CHAMPAIGN, IL 61820 CONTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU 11' - 11" 13' - 0" CONSULTANTS **BEDROOM** BATHROOM A-301 MSA PROFESSIONAL SERVICES HOMEWAY HOMES UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES **MECHANICAL** A1 ` 1' - 8 3/4" - -5' - 3 1/4" A-401 DINING LIVING **FLEX SPACE ROOM** U.S. DEPARTMENT OF ENERGY 34' - 5 1/2" SOLAR DECATHLON 2011 WWW.SOLARDECATHLON.GOV 23' - 5 3/4" 9' - 5 3/4" SOLAR DECATHLON MR 3/18/2011 DOE CD Submission MH 3/31/2011 4' tall closet in bathroom has continuous floor with bathroom MH 7/29/2011 Closet Construction Changed MH 8/11/2011 As Built Drawing Submission DESCRIPTION MARK DATE LOT NUMBER: LOT #305 DRAWN BY: MEGAN ROBERTSON CHECKED BY: MICHAEL HINES NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT: D1 A-301 SHEET TITLE FIRST FLOOR PLAN FLOOR PLAN

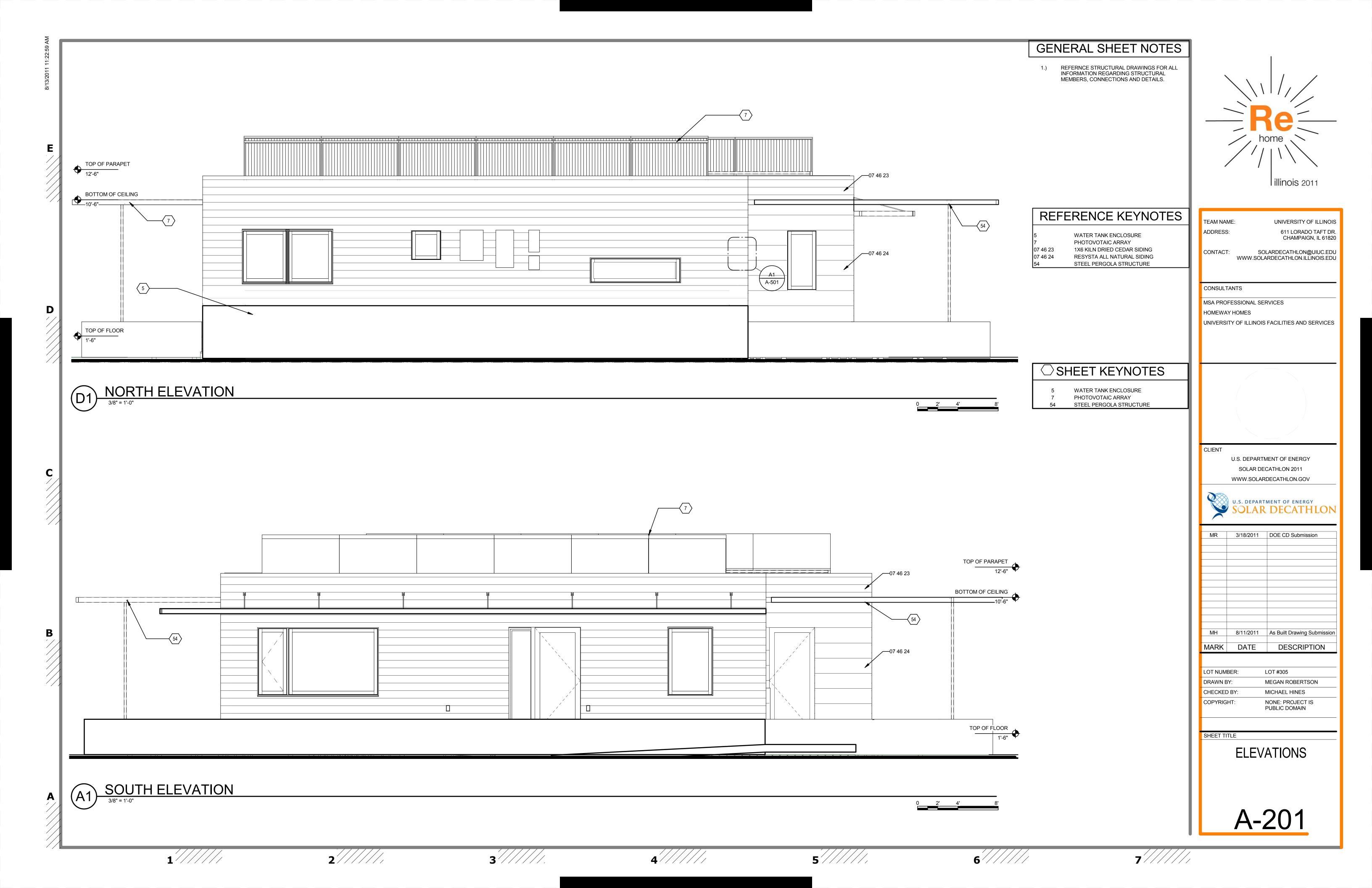
1/4" = 1'-0" 3////// 4////// 6////// 7////// 1///// 2////// 5//////

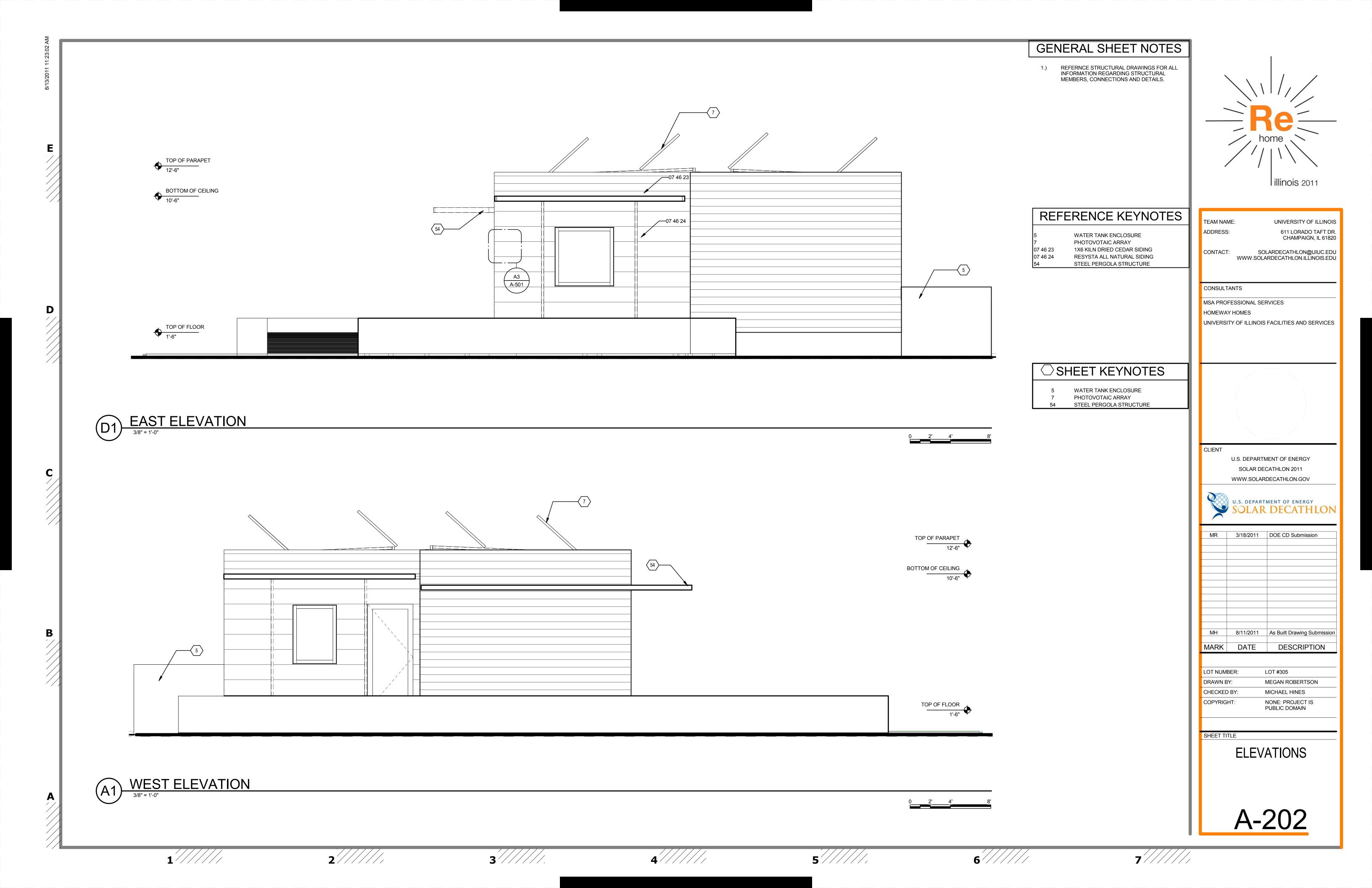


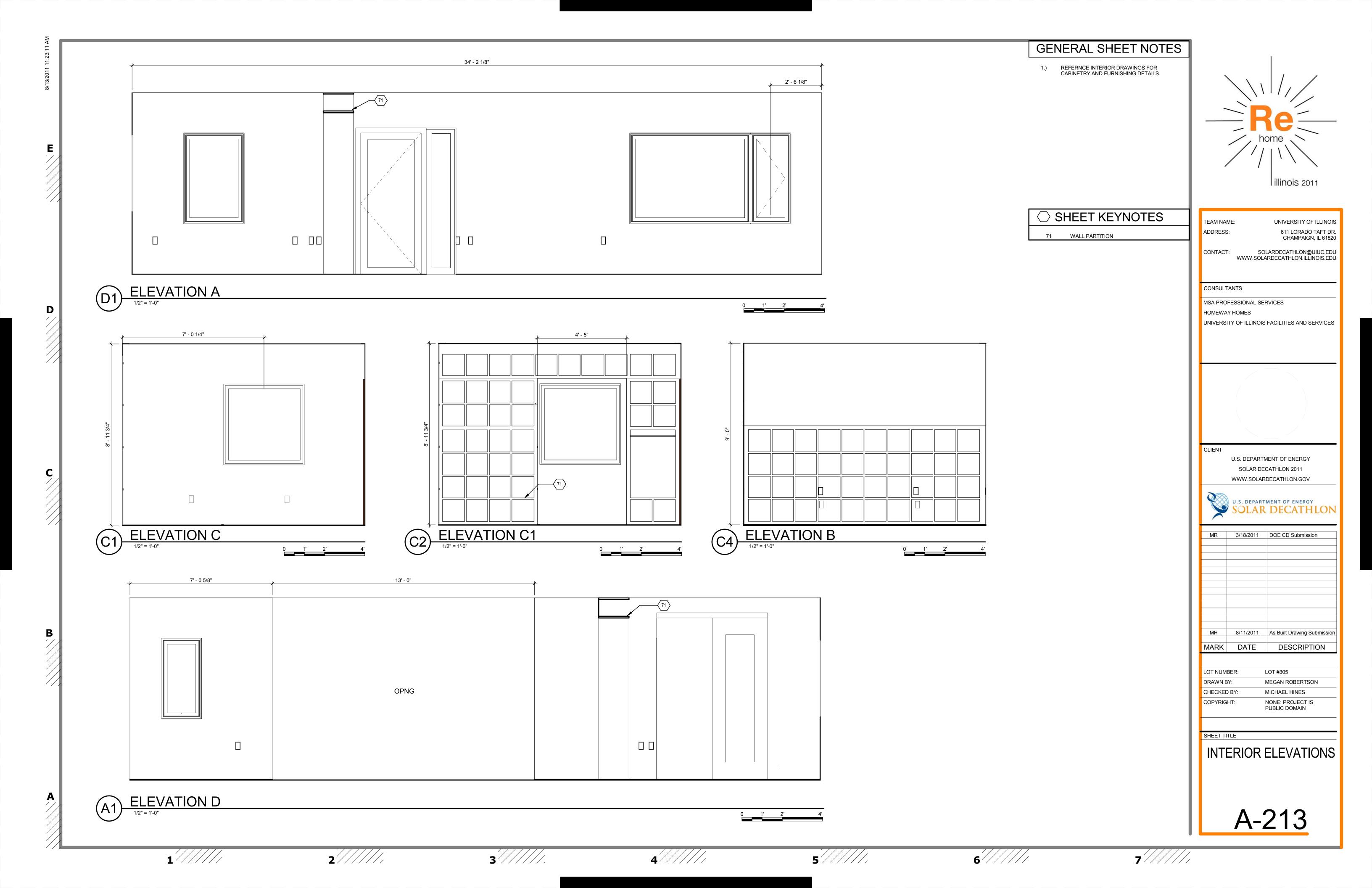
GENERAL SHEET NOTES 1.) PLEASE COORDINATE ROOF OPENINGS WITH MECHANICAL ENGINEERING AND PLUMBING TEAMS IN ORDER TO ENSURE ACCURACY WITH FIXTURES TO BE INSTALLED. THE ENTIRE WALL THICKNESS IS SHOWN IN THESE DRAWINGS. INTERIOR DIMENSION OF EXTERIOR WALL IS TO BE TAKEN AS THE INSIDE OF STRUCTURAL WOOD STUDS l illinois 2011 REFERENCE KEYNOTES TEAM NAME: UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. ADDRESS: 22 13 16.A5 PLUMBING VENT EXHAUST CHAMPAIGN, IL 61820 23 34 34 HVAC EXHAUST VENT SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU CONTACT: CONSULTANTS \_\_\_\_23 34 34 ----22 13 16.A5 MSA PROFESSIONAL SERVICES HOMEWAY HOMES 12:1/2 SLOPE 12' - 4 1/2" UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES 12' - 7 1/8" U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2011 WWW.SOLARDECATHLON.GOV U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON MR 3/18/2011 DOE CD Submission 12:1/2 SLOPE MH 8/11/2011 As Built Drawing Submission DESCRIPTION MARK DATE LOT NUMBER: LOT #305 DRAWN BY: MEGAN ROBERTSON CHECKED BY: MICHAEL HINES NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT: SHEET TITLE ROOF OPENING PLAN ROOF OPENING PLAN

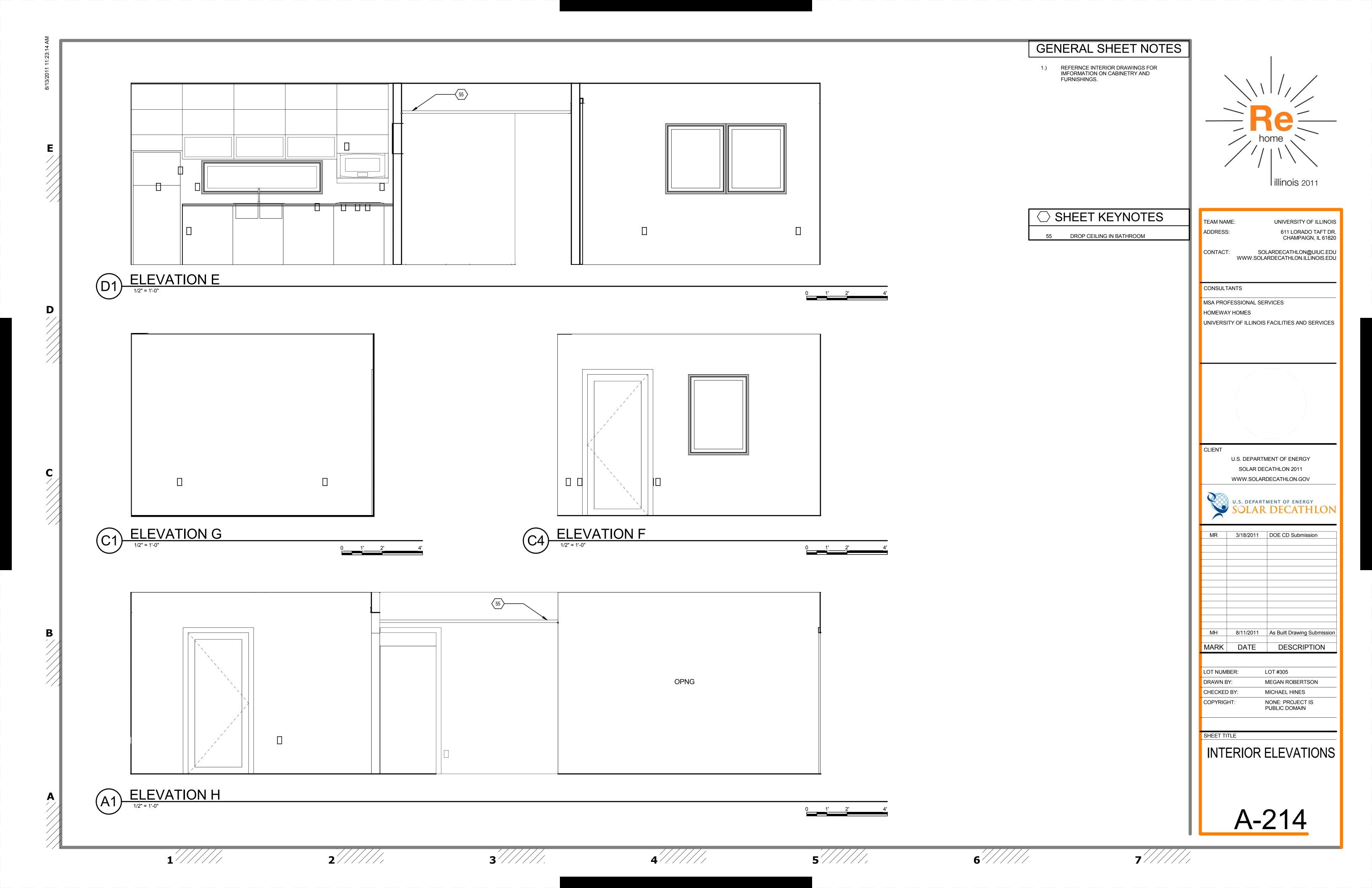
1/2" = 1'-0" A-113 2////// 4////// 6////// 1///// 5/////

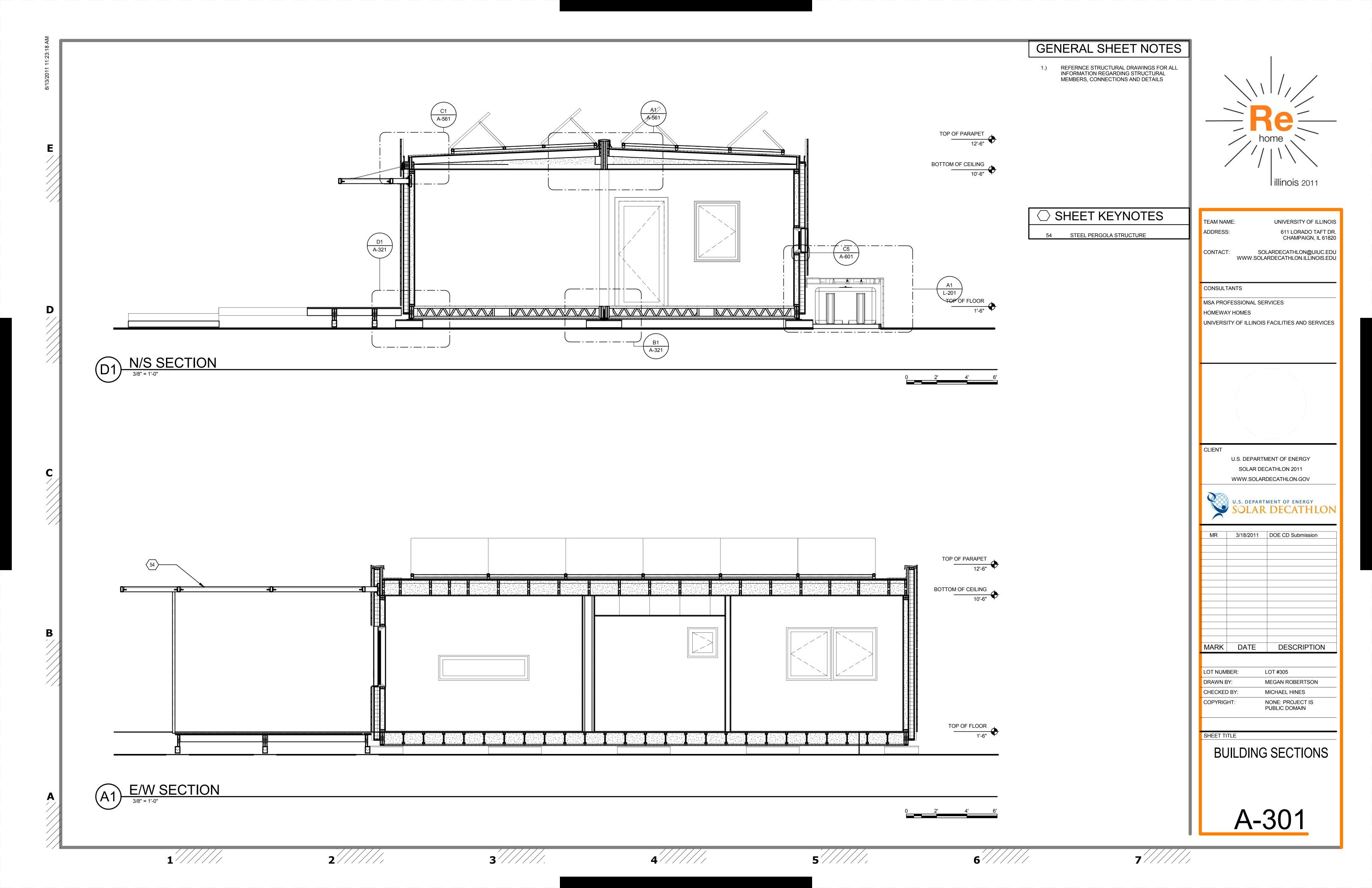


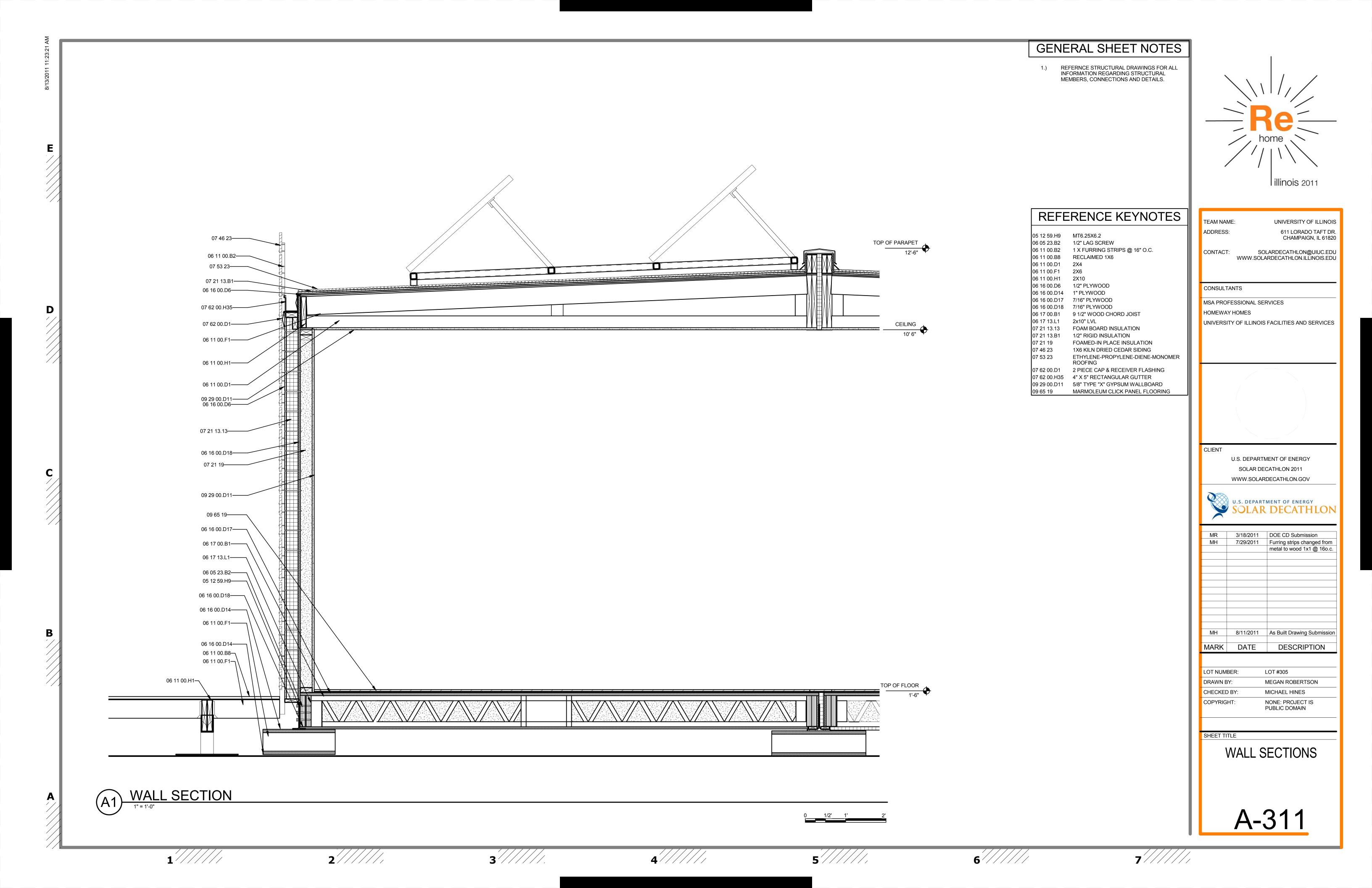


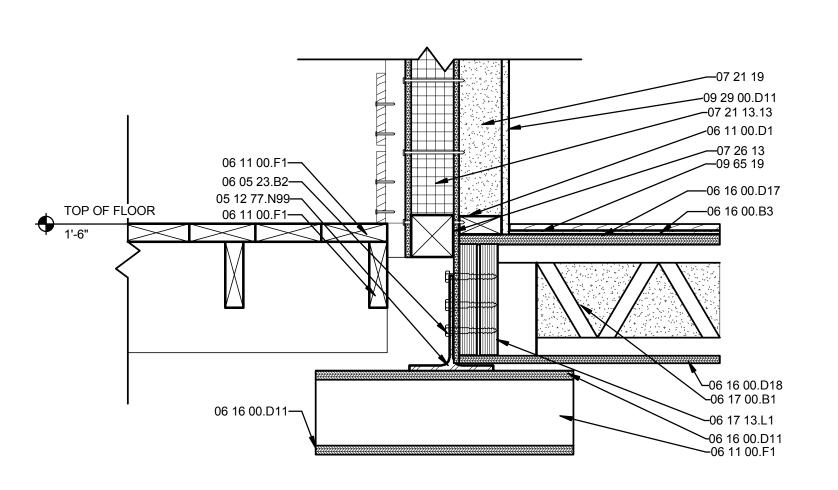




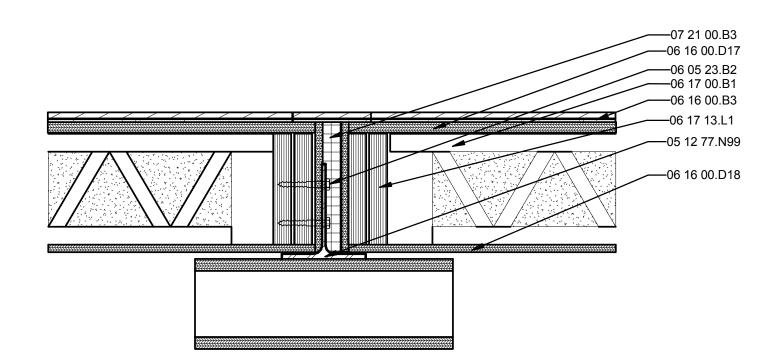




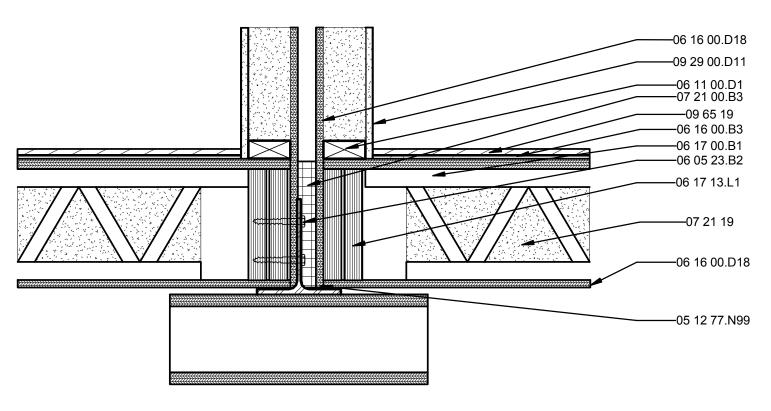




# WALL TO FLOOR CONNECTION 1 1/2" = 1'-0" 1 1/2" = 1'-0"







2//////

3//////

FLOOR TO FLOOR WALL CONNECTION

1 1/2" = 1'-0"

1 1/2" = 1'-0"

1/////

# GENERAL SHEET NOTES

- 1.) REFERNCE STRUCTURAL DRAWINGS FOR ALL INFORMATION REGARDING STRUCTURAL CONNECTIONS AND NAILING SCHEDULES.
- 2.) VAPOR BARRIER TO BE INSTALLED BEFORE INSTALLATION OF MARMOLEUM CLICK TILE FLOORING OR CORK TILE FLOORING.
- 3.) ALL FLOOR PENETRATIONS ARE TO BE SEALED WITH EXPANDING SPRAY FOAM INSULATION BEFORE INSTALLATION OF FINISH FLOOR.



# REFERENCE KEYNOTES

05 12 77.N99	WT8X18
06 05 23.B2	1/2" LAG SCREW
06 11 00.D1	2X4
06 16 00.B3	1/4" HARDBOARD
06 16 00.D18	7/16" PLYWOOD
06 17 00.B1	9 1/2" WOOD CHORD JOIST
06 17 13.L1	2x10" LVL
07 21 00.B3	3" COMPRESSIBLE ROCK WOOL
07 21 13.13	FOAM BOARD INSULATION
07 21 19	FOAMED-IN PLACE INSULATION
09 29 00.D11	5/8" TYPE "X" GYPSUM WALLBOARD
09 65 19	MARMOLEUM CLICK PANEL FLOORING

TEAM NAME:	UNIVERSITY OF ILLINO
ADDRESS:	611 LORADO TAFT D CHAMPAIGN, IL 618:

ONTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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MR 3/18/2011 DOE CD Submission

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	MH	8/11/2011	As Built Drawing Submissio
	MARK	DATE	DESCRIPTION

LOT NUMBER: LOT #305

DRAWN BY: MEGAN ROBERTSON

CHECKED BY: MICHAEL HINES

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## SHEET TITLE

FLOOR SECTIONS

A-321

4////// 5////// 6////// 7///////

# GENERAL SHEET NOTES

CONFIRM ALL EXISTING DIMENSIONS BEFORE INSTALLING PLUMBING AND MECHANICAL FIXTURES



# REFERENCE KEYNOTES

11 31 23.B1 COMBINATION WASHER DRYER
22 33 30.26 RESIDENTIAL, COLLECTOR-TO-TANK,
HEAT-EXCHANGER-COIL, SOLAR-ELECTRIC
DOMESTIC WATER HEATERS
22 41 13.A1 WATER CLOSET
22 41 16.A7 WALL MOUNT SINK

TEAM NAME: ADDRESS: UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

CONTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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LOT #305

MEGAN ROBERTSON

MICHAEL HINES

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SHEET TITLE

7//////

LOT NUMBER:

CHECKED BY:

DRAWN BY:

LARGE SCALE PLANS

A-401

4////// 6//////

# GENERAL SHEET NOTES

1.) INSULATION AND SIDING AT NORTHWEST AND SOUTHEAST CORNER CONNECTIONS TO BE INSTALLED ON SITE.



# REFERENCE KEYNOTES

06 11 00.B2 1 X FURRING STRIPS @ 16" O.C. 2X4 1/2" PLYWOOD 3" COMPRESSIBLE ROCK WOOL

FOAM BOARD INSULATION 1X6 KILN DRIED CEDAR SIDING RESYSTA ALL NATURAL SIDING 09 22 13.13 METAL CHANNEL FURRING 09 29 00.D1 5/8" GYPSUM WALLBOARD

TEAM NAME: UNIVERSITY OF ILLINOIS ADDRESS: 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

> SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

CONSULTANTS

MSA PROFESSIONAL SERVICES

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MH	8/11/2011	As Built Drawing Submission
MARK	DATE	DESCRIPTION

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SHEET TITLE

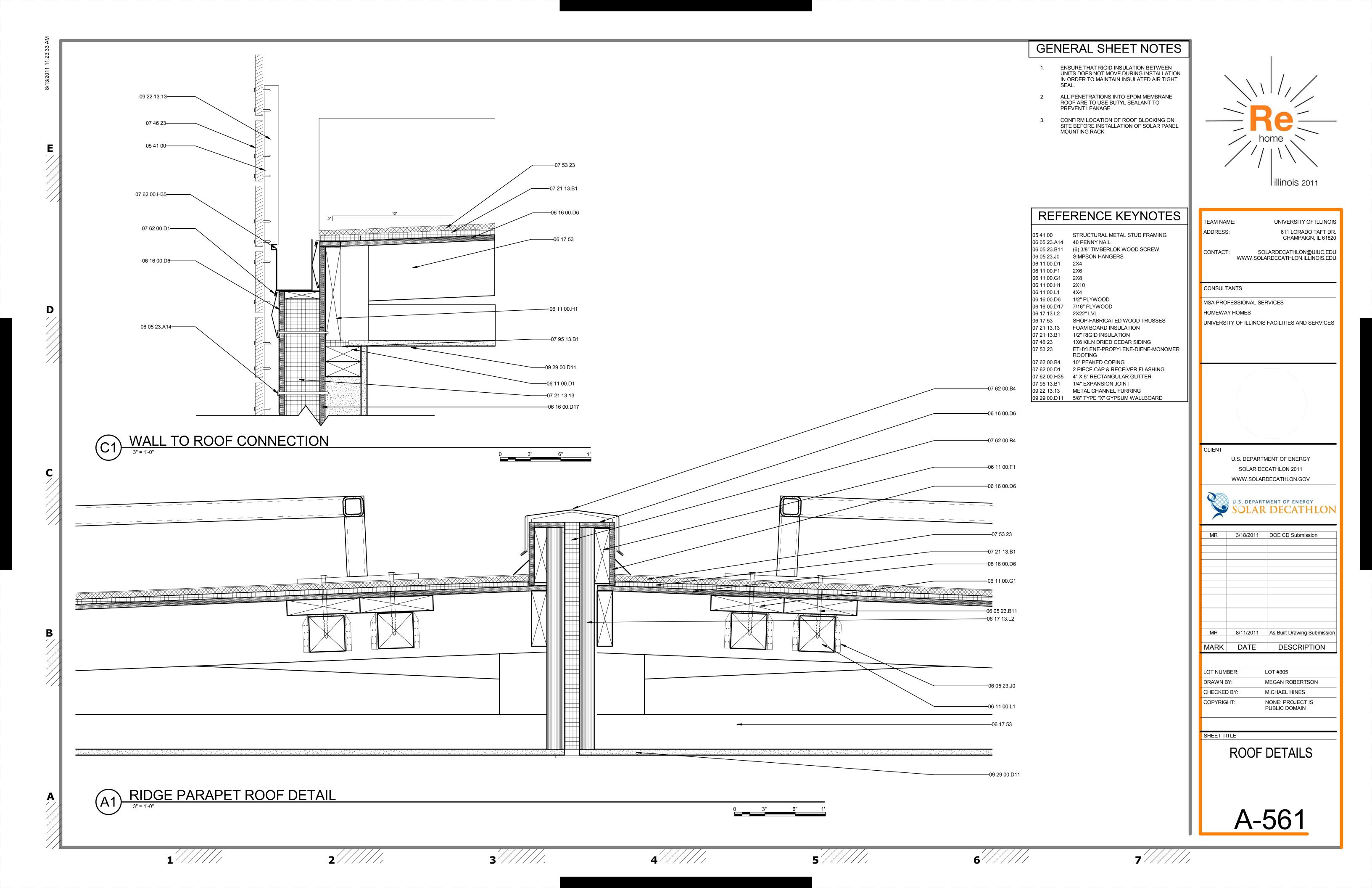
**ENVELOPE AND** FACADE DETAILS

A-501

4//////

6

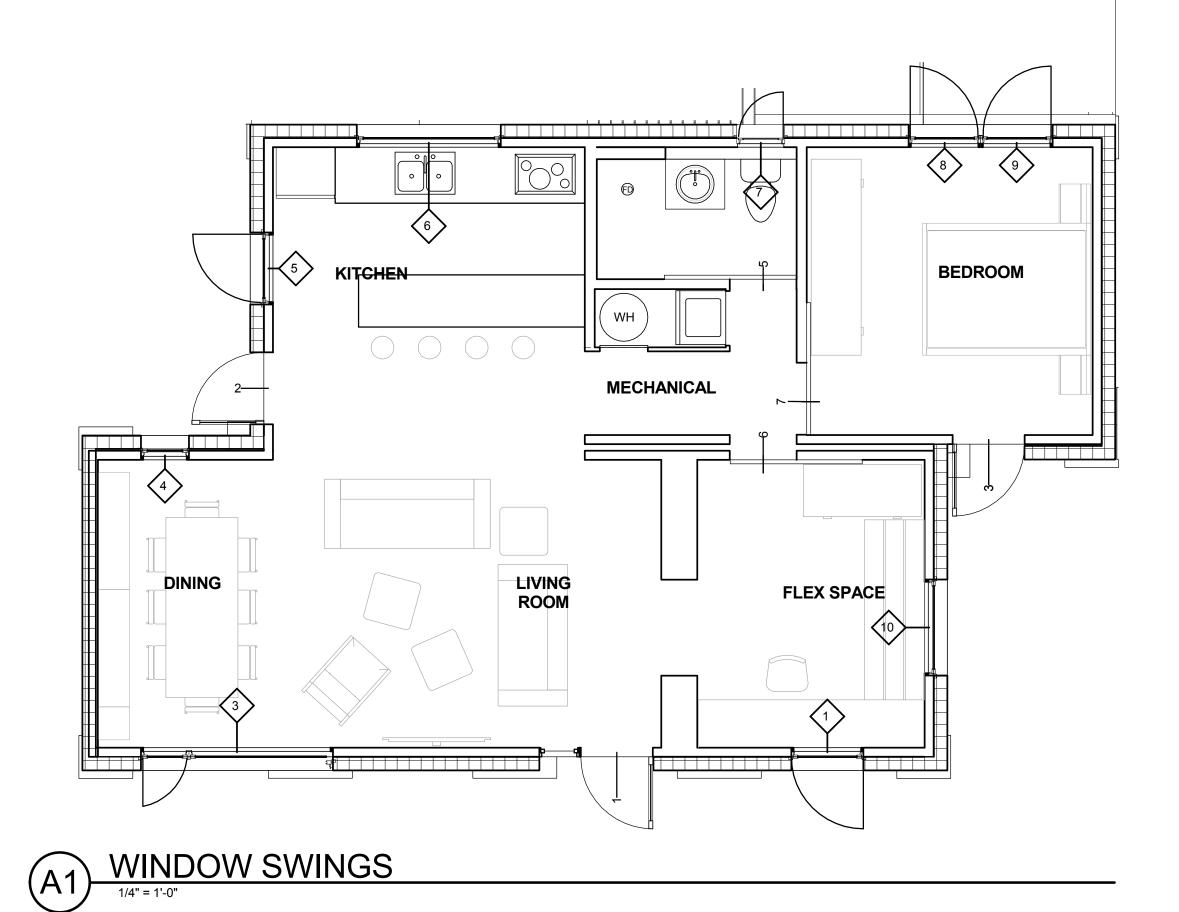
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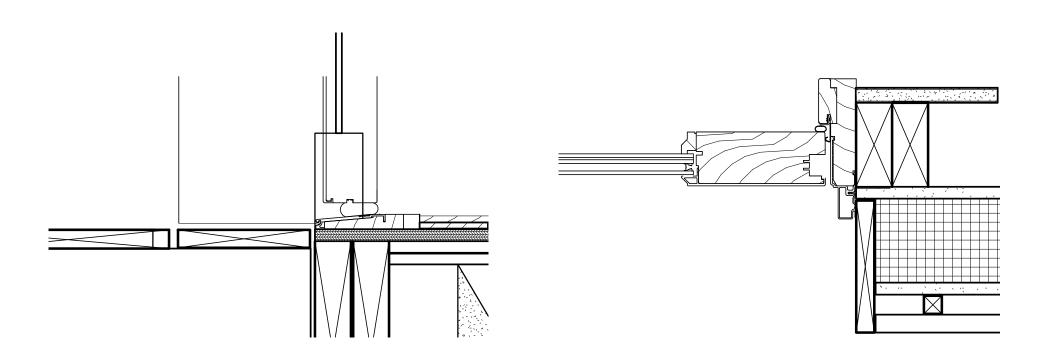
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			WINDO	W SCHEDUL	.E		
ROUGH OPENING			MANUFAC	MANUFAC			
MARK	WIDTH	HEIGHT	TYPE	TURER	MODEL	HEIGHT	COMMENTS
1	3' - 0"	4' - 6"	Window_Push-Out_Casement-1-Wid e_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKC3046	7' - 8"	
3	8' - 0"	4' - 6"	Window_Push-Out_Casement-Pictur e-Combination-Flanker-Left_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKS6046+VKC 2046	7' - 8"	TEMPERED GLASS
4	2' - 0"	4' - 0"	Window_Push-Out_Casement-1-Wid e_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKS2040	7' - 8"	
5	3' - 0"	4' - 0"	Window_Push-Out_Casement-1-Wid e_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKC3040	7' - 8"	
6	6' - 0"	1' - 8"	Window_Push-Out_Casement-1-Wid e_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKS2018	5' - 10"	
7	2' - 0"	2' - 0"	Window_Push-Out_Casement-1-Wid e_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKC2020	7' - 8"	
8	3' - 0"	3' - 6"	Window_Push-Out_Casement-1-Wid e_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKC3036	7' - 8"	
9	3' - 0"	3' - 6"	Window_Push-Out_Casement-1-Wid e_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKC3036	7' - 8"	
10	4' - 0"	4' - 0"	Window_Push-Out_Casement-1-Wid e_Kolbe	Kolbe & Kolbe Millwork Co., Inc.	VKS4040	7' - 8"	
39	1' - 8"	7' - 0"	Fixed			7' - 8"	

			DOC	R SCEDULE				
LOCATION	FRAME SIZE	R.O.	DOOR TYPE	HINGE	FINISH	GLASS TYPE	HARDWARE	NOTES
1	3'x7'	53.75"x84"	A	LH	PAINTABLE	DOUBLE PANE LOW E	Α	INTREGAL BLINDS
2	3'x7'	38.25"x84"	В	LH	PAINTABLE	DOUBLE PANE LOW E	Α	INTREGAL BLINDS
3	3'x6'8"	38.25"x82"	С	RH	PAINTABLE	DOUBLE PANE LOW E	Α	INTREGAL BLINDS
4	3'x6'8"	38.25"x82"	D	SLIDING	BIRCH PLY VENEER		В	
5	3'x6'8"	38.25"x82"	E	BARN	BIRCH PLY VENEER		С	
6	3'x6'8"	38.25"x82"	F	BARN	BIRCH PLY VENEER		С	
7	3'x6'8"	38.25"x82"	G	BARN	BIRCH PLY VENEER		D	

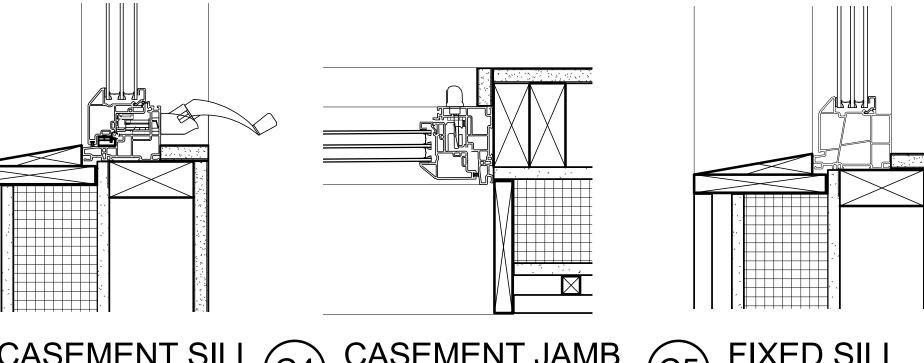


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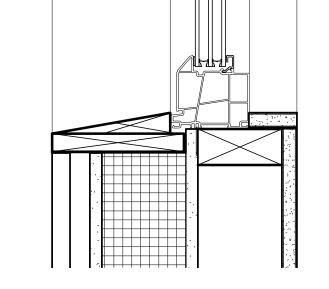






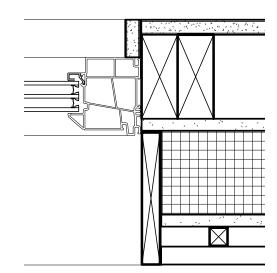




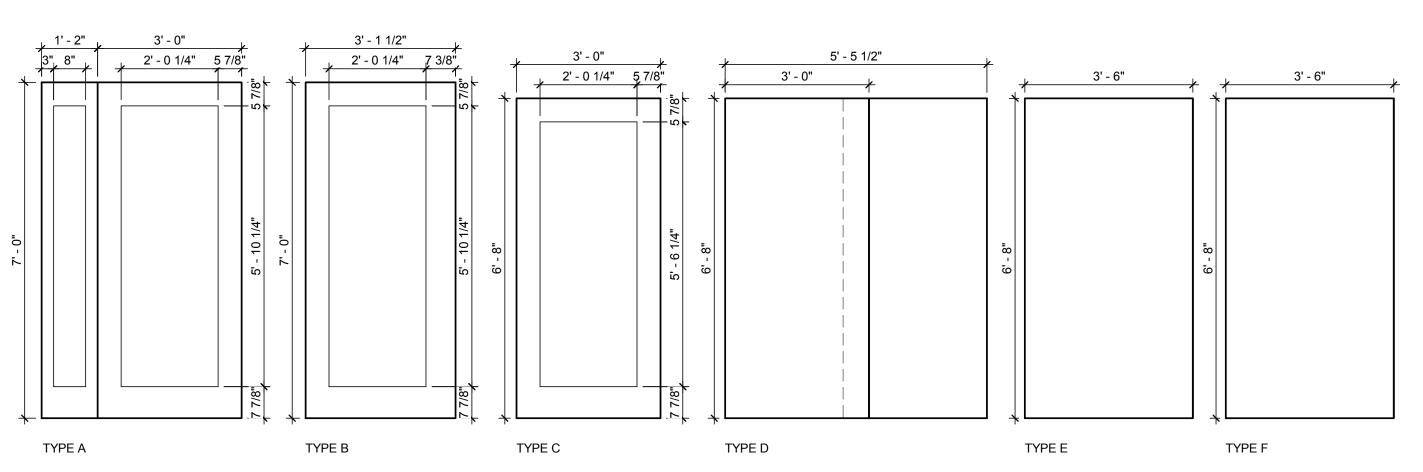




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5//////

DOOR TYPES
1/2" = 1'-0"

3//////

7//////



1.) ALL WINDOW AND DOOR DIMENSIONS ARE TO BE CONFIRMED ON SITE BEFORE

INSTALLATION. INSTALLATION IS TO FOLLOW PROVIDED INSTRUCTIONS FROM MANUFACTURER IN ORDER TO AVOID A BREACH OF PRODUCT WARRANTY.

APPLY EXPANDING SPRAY FOAM INSULATION
ALL OPENINGS AROUND WINDOW FRAMES BEFORE INSTALLING WINDOW TRIM



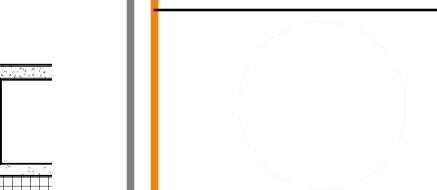
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-	ш		
	ш	TEAM NAME:	UNIVERSITY OF ILLINOIS
1		ADDRESS:	611 LORADO TAFT DR. CHAMPAIGN, IL 61820
ı		CONTACT:	SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

CONSUL	TANTS

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UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES



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3/18/2011 DOE CD Submission

Window and door swing directions added.



MH	8/11/2011	As Built Drawing Submission				
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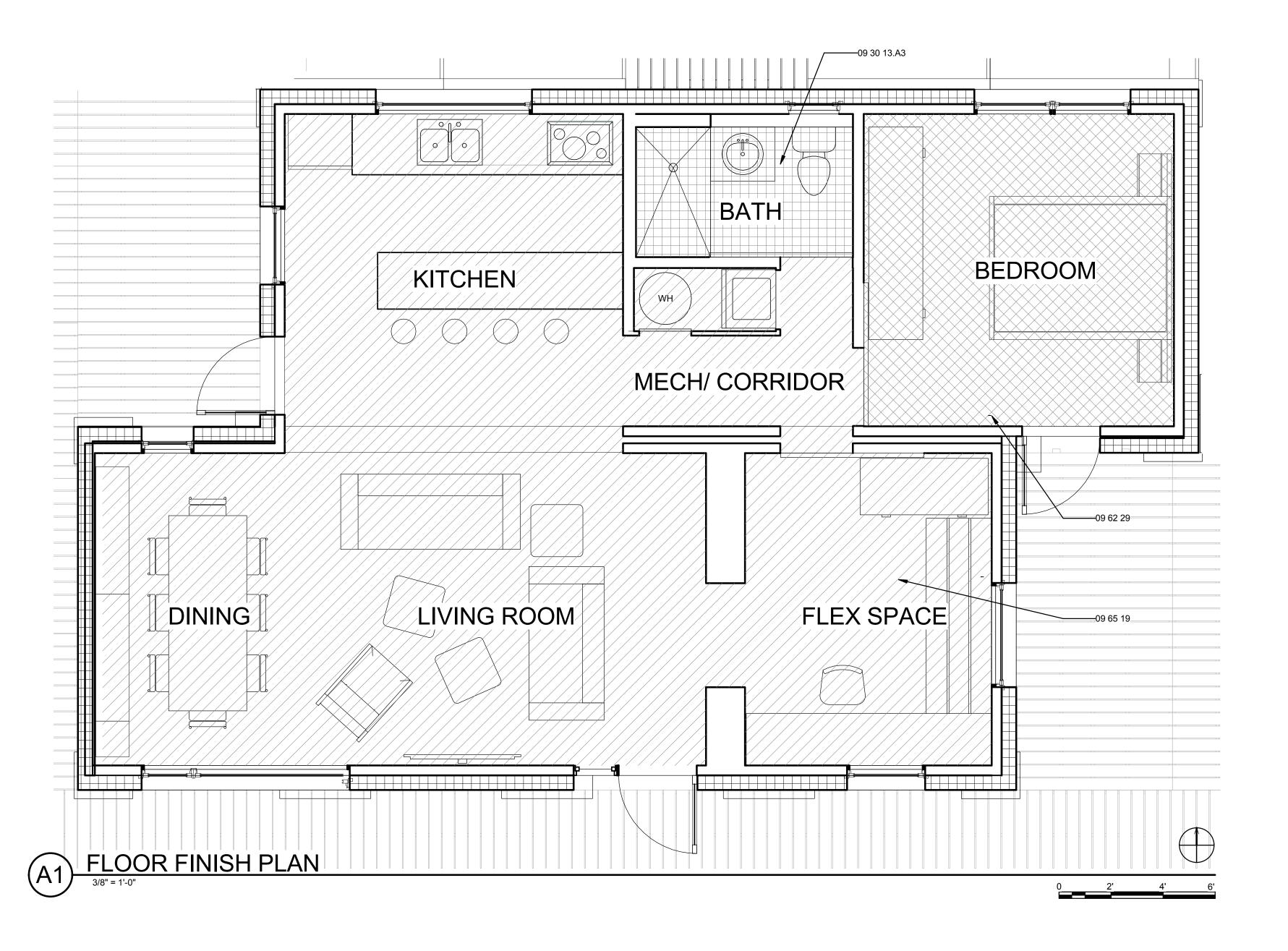
OPENING SCHEDULE AND DETAILS

A-601

1/////

	RO	OOM	FINI	SH S	SCHE	EDULE		
ROOM NAME	FLOOR	N	WAI	_LS	W	CEIL MATL	ING HEIGHT	NOTES
DINING	F1	PT	PT	PT	PT	GYP	9' 0"	
LIVING	F1	PT	PT	PT	PT	GYP	9' 0"	
FLEX SPACE	F1	PT	PT	PT	PT	GYP	9' 0"	
BEDROOM	F2	PT	PT	PT	PT	GYP	9' 0"	
MECH/CORR	F1	PT	PT	PT	PT	SUSP	7' 8"	
BATH	F3	TILE	T/PT	PT	TILE	SUSP	7' 8"	SEE INTERIOR ELEVATIONS FOR TILE LOCATIONS
KITCHEN	F1	PT	PT	PT	PT	GYP	9' 0"	

2//////



3//////

# GENERAL SHEET NOTES

- 1.) REFER TO PROJECT MANUAL FOR FURTHER INFORMATION ON FLOORING TYPES AND INSTALLATION TECHNIQUES.
- 2.) FLOORING IS TO BE INSTALLED PER THE MANUFACTURERS RECOMMENDATIONS.
- 3.) FLOORING BETWEEN UNITS IS TO BE INSTALLED ON SITE AND IS TO BE INSTALLED FLUSH BETWEEN BOTH UNITS.



# REFERENCE KEYNOTES

09 30 13.A3 FLOOR TILE

09 62 29 CORK FLOORING PANELS 09 65 19 MARMOLEUM CLICK PANEL FLOORING

TEAM NAME: ADDRESS:

CONTACT:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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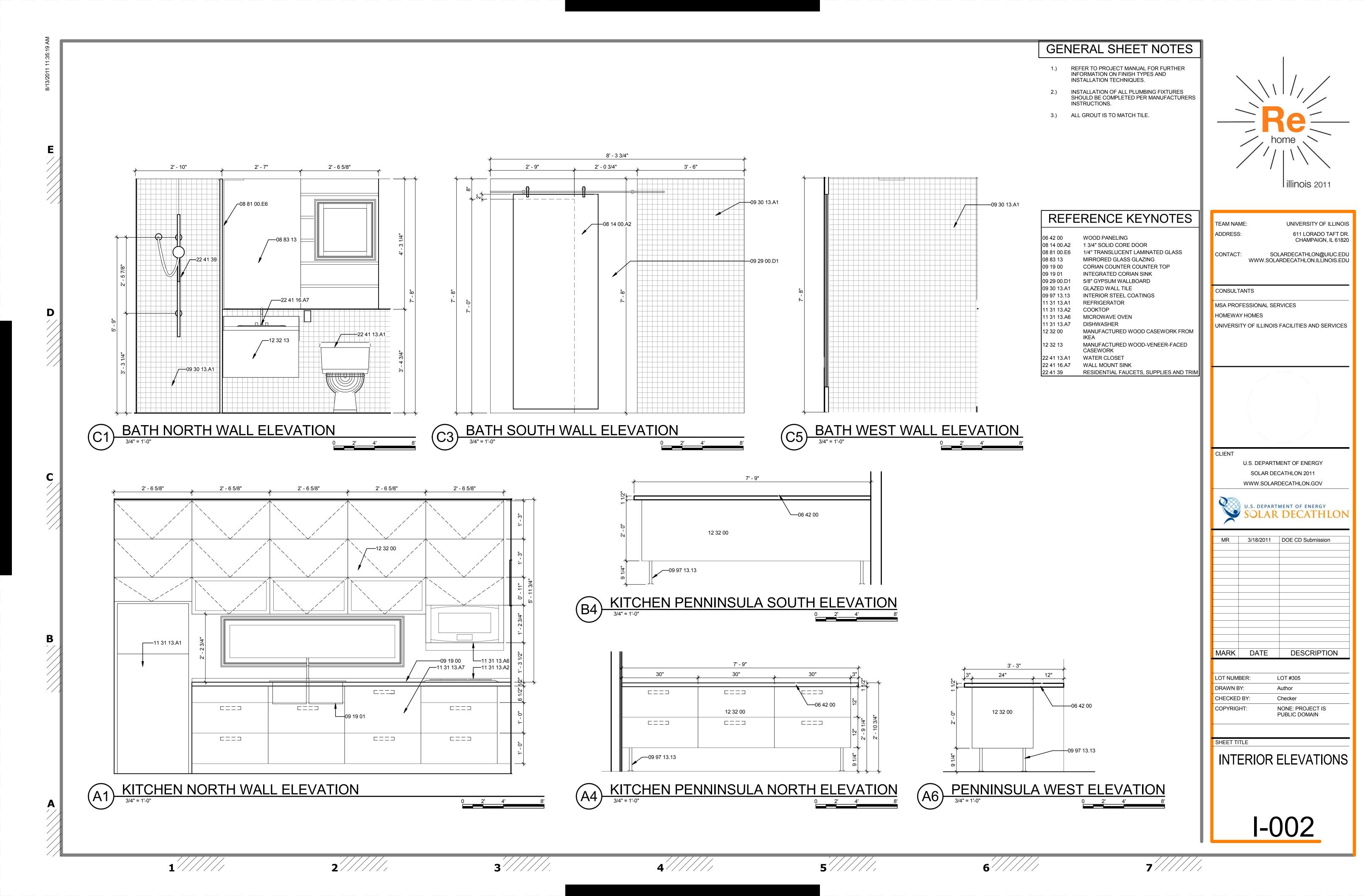
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FINISH PLAN

SHEET TITLE

I-001

7////// 4////// 6 5



INSTALLATION TECHNIQUES. 2.) INSTALLATION OF ALL PLUMBING FIXTURES SHOULD BE COMPLETED PER MANUFACTURERS 3.) ALL GROUT IS TO MATCH TILE. 5' - 7 1/4" 2' - 7 1/8" 09 29 00.D1 REFERENCE KEYNOTES TEAM NAME: UNIVERSITY OF ILLINOIS 06 25 16 ADDRESS: 611 LORADO TAFT DR. 06 25 16 PREFINISHED PLYWOOD PANELING CHAMPAIGN, IL 61820 08 35 13.13 ACCORDION FOLDING DOORS 5/8" GYPSUM WALLBOARD 09 29 00.D1 SOLARDECATHLON@UIUC.EDU COMBINATION WASHER DRYER WWW.SOLARDECATHLON.ILLINOIS.EDU <del>\_\_\_\_</del>08 35 13.13 MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK FROM IKEA RESIDENTIAL, COLLECTOR-TO-TANK, HEAT-EXCHANGER-COIL, SOLAR-ELECTRIC DOMESTIC WATER HEATERS CONSULTANTS MSA PROFESSIONAL SERVICES HOMEWAY HOMES 22 33 30.26 11 31 23.B1 MECH SOUTH ELEV 12' - 0" 4' - 10 5/8" 4' - 5" 2' - 8 3/8" MR 3/18/2011 DOE CD Submission SHEET TITLE INTERIOR ELEVATIONS PARTITION WALL ELEVATION

3/4" = 1'-0" (A1) DINING WEST WALL STORAGE ELEVATION

3/4" = 1'-0" I-003 3////// 7////// 1///// 2////// 5 6

### GENERAL SHEET NOTES

1.) REFER TO PROJECT MANUAL FOR FURTHER INFORMATION ON FINISH TYPES AND



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	ED.	LOT #205	_
OT NUMB	ER:	LOT #305	_
OT NUMB		LOT #305 Author	
	<b>/</b> :		_

l illinois 2011 REFERENCE KEYNOTES TEAM NAME: 611 LORADO TAFT DR. CHAMPAIGN, IL 61820 ADDRESS: 10 44 16.13 PORTABLE FIRE EXTINGUISHERS 28 31 46 SMOKE DETECTION SENSORS SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU CONSULTANTS MSA PROFESSIONAL SERVICES <u>/</u>—10 44 16.13 HOMEWAY HOMES UNIVERSITY OF ILLINOIS FACILITIES AND SERVICES \_\_\_\_10 44 16.13 \_\_\_\_28 31 46 U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2011 WWW.SOLARDECATHLON.GOV MR 3/18/2011 DOE CD Submission NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT: SHEET TITLE FIRE DETECTION AND ALARM A1) FIRE DETECTION PLAN

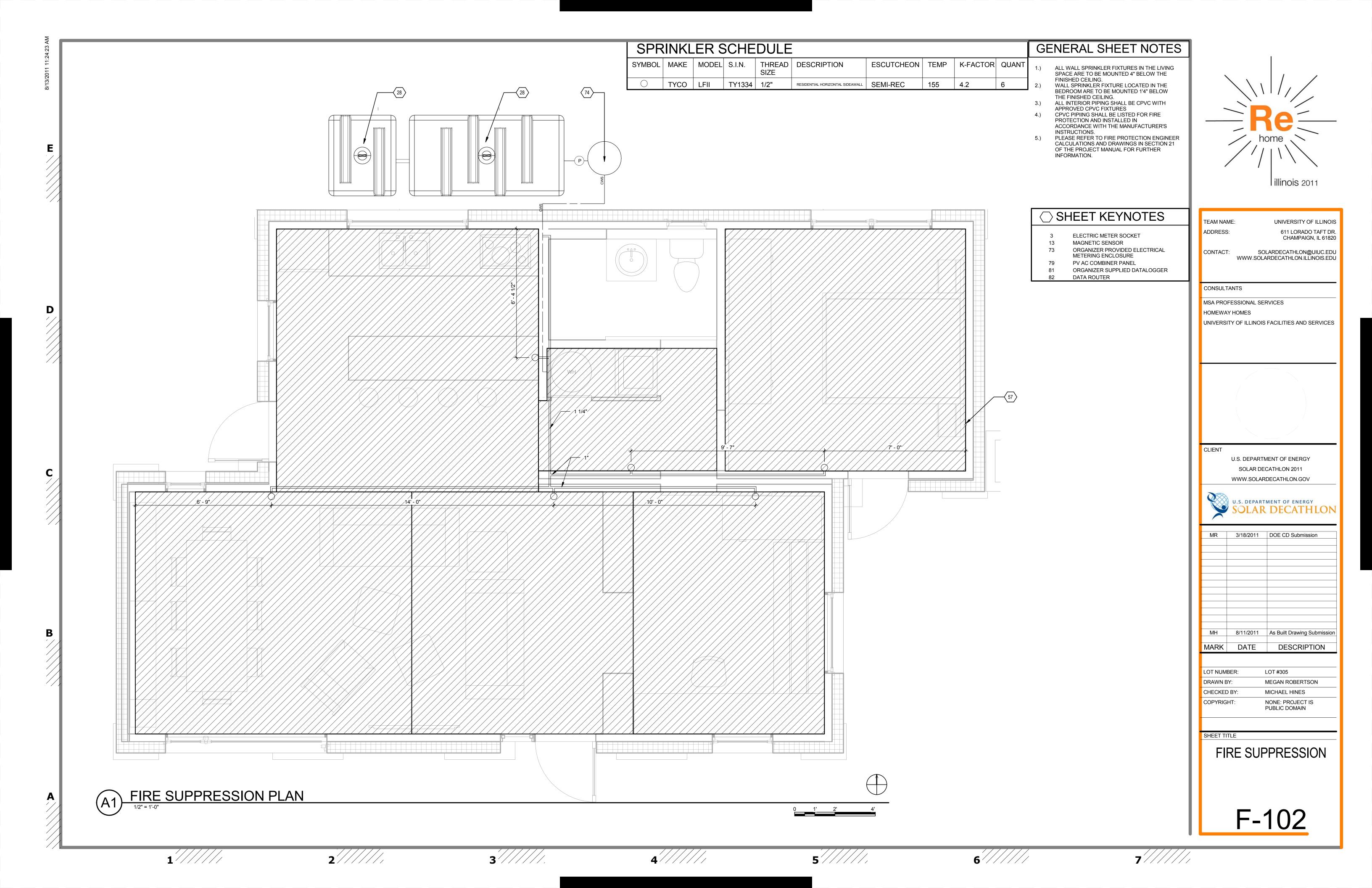
1/4" = 1'-0" F-101 3////// 6 7////// 1///// 5 2//////

UNIVERSITY OF ILLINOIS





MH	8/11/2011	As Built Drawing Submission
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(A1) PLUMBING SITE PLAN

1/4" = 1'-0" 1/////

## GENERAL SHEET NOTES

- PLEASE REFER TO THE PROJECT MANUAL FOR FULL DETAILS ON WATER CONTAINMENT DEVICES.
- PLEASE REFER TO DRAWING L-103 FOR DETAILS ON WATER ENCLOSURE AND FOUNDATION



### SHEET KEYNOTES

- ELECTRIC METER SOCKET
- MAGNETIC SENSOR ORGANIZER PROVIDED ELECTRICAL
- METERING ENCLOSURE
- PV AC COMBINER PANEL
- ORGANIZER SUPPLIED DATALOGGER DATA ROUTER

TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU CONTACT:

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MR 3/18/2011 DOE CD Submission

MH 5/2/2011		Water tank enclosure detailed	
		location of water storage tank	
		updated.	
MH	8/11/2011	As Built Drawing Submission	
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PLUMBING SITE PLAN

P-101

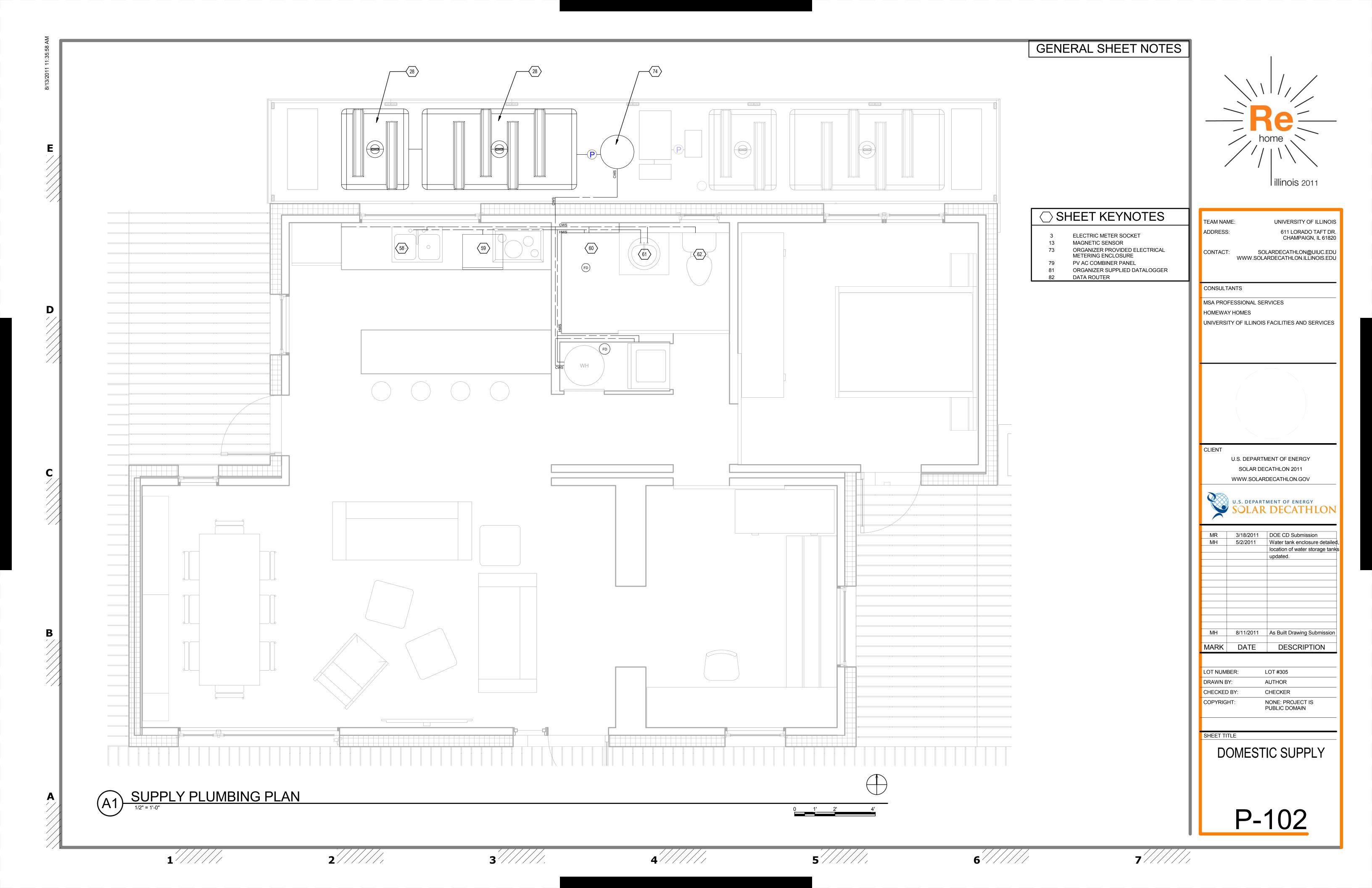
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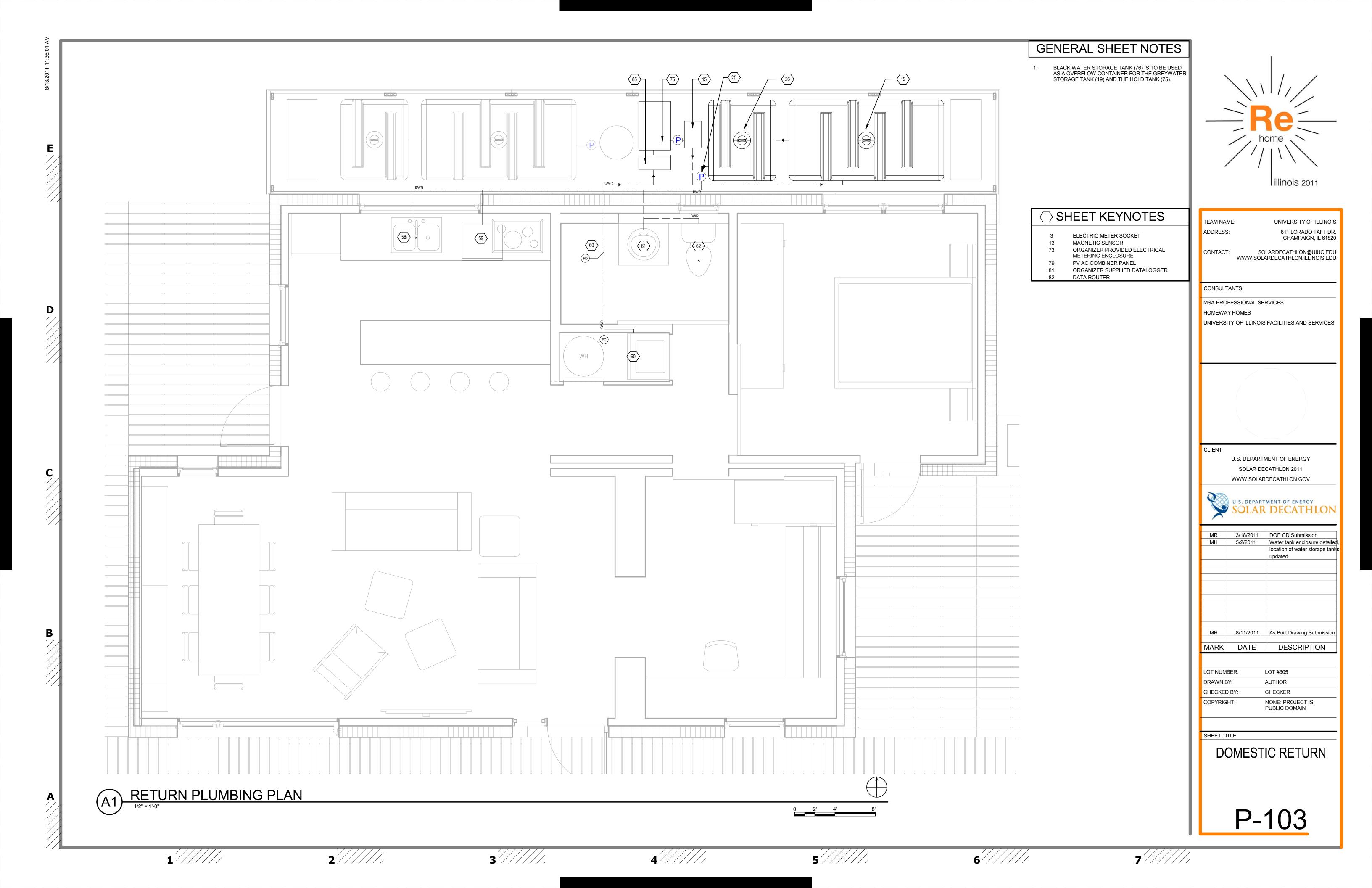
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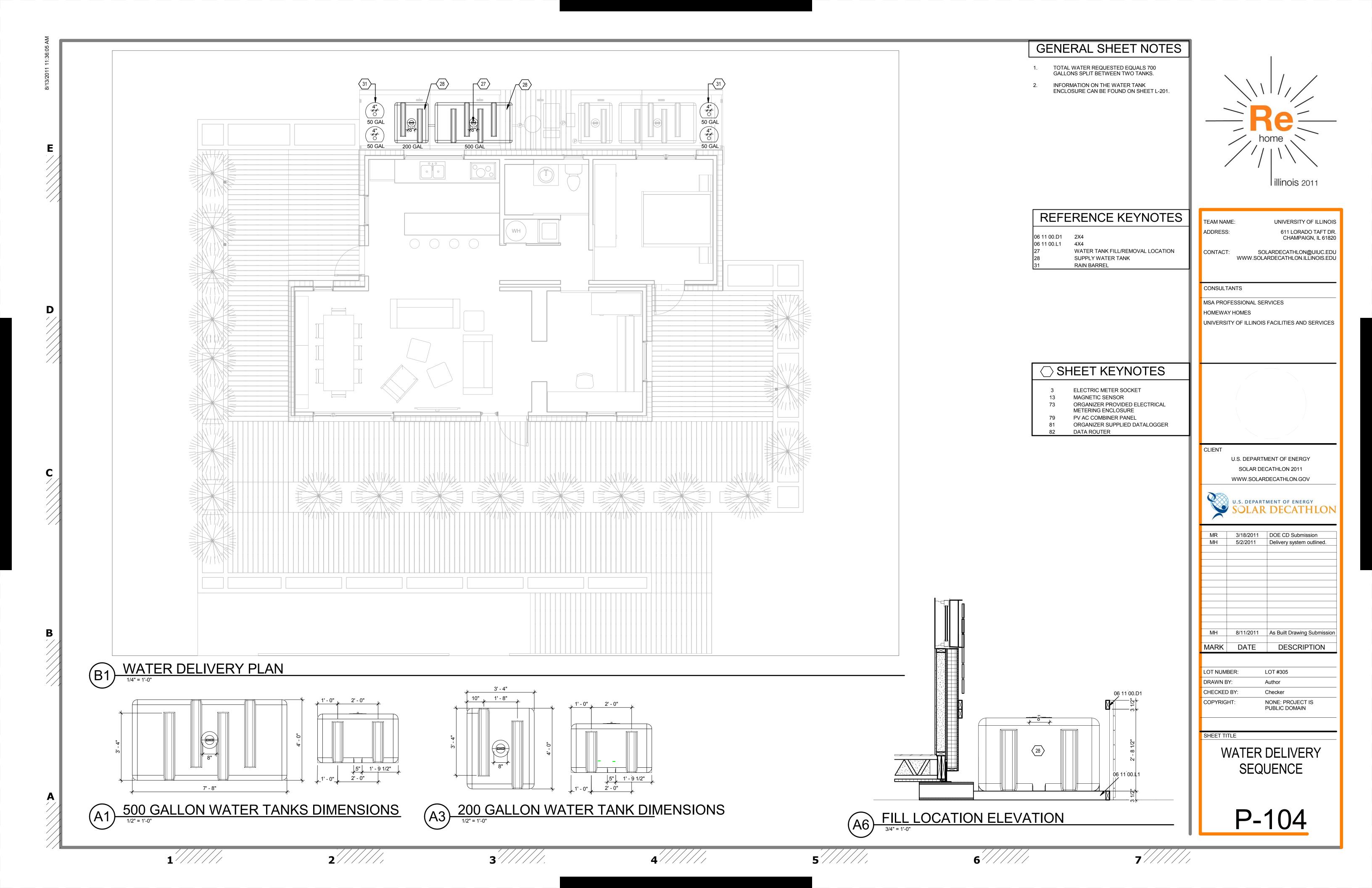
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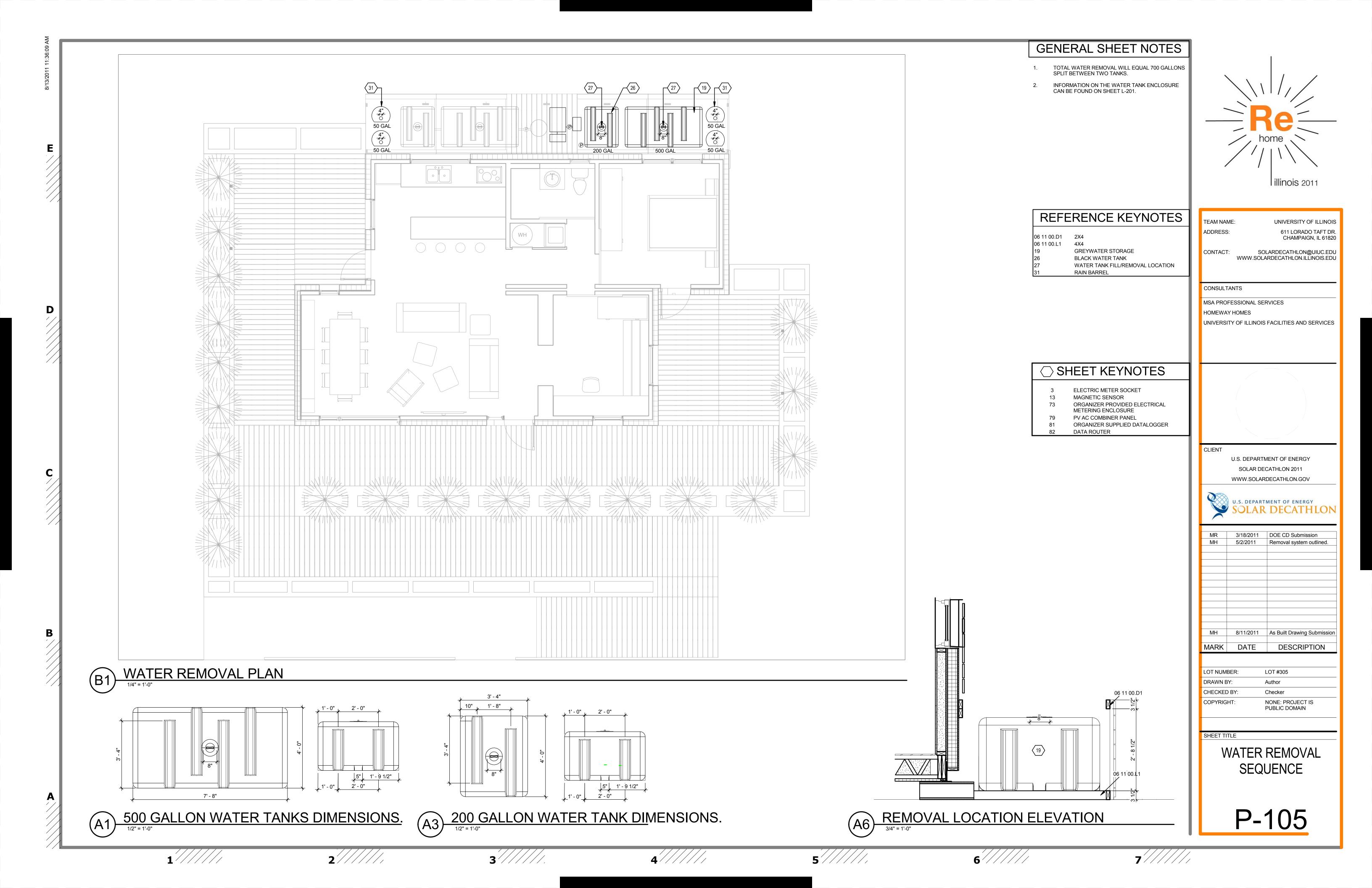
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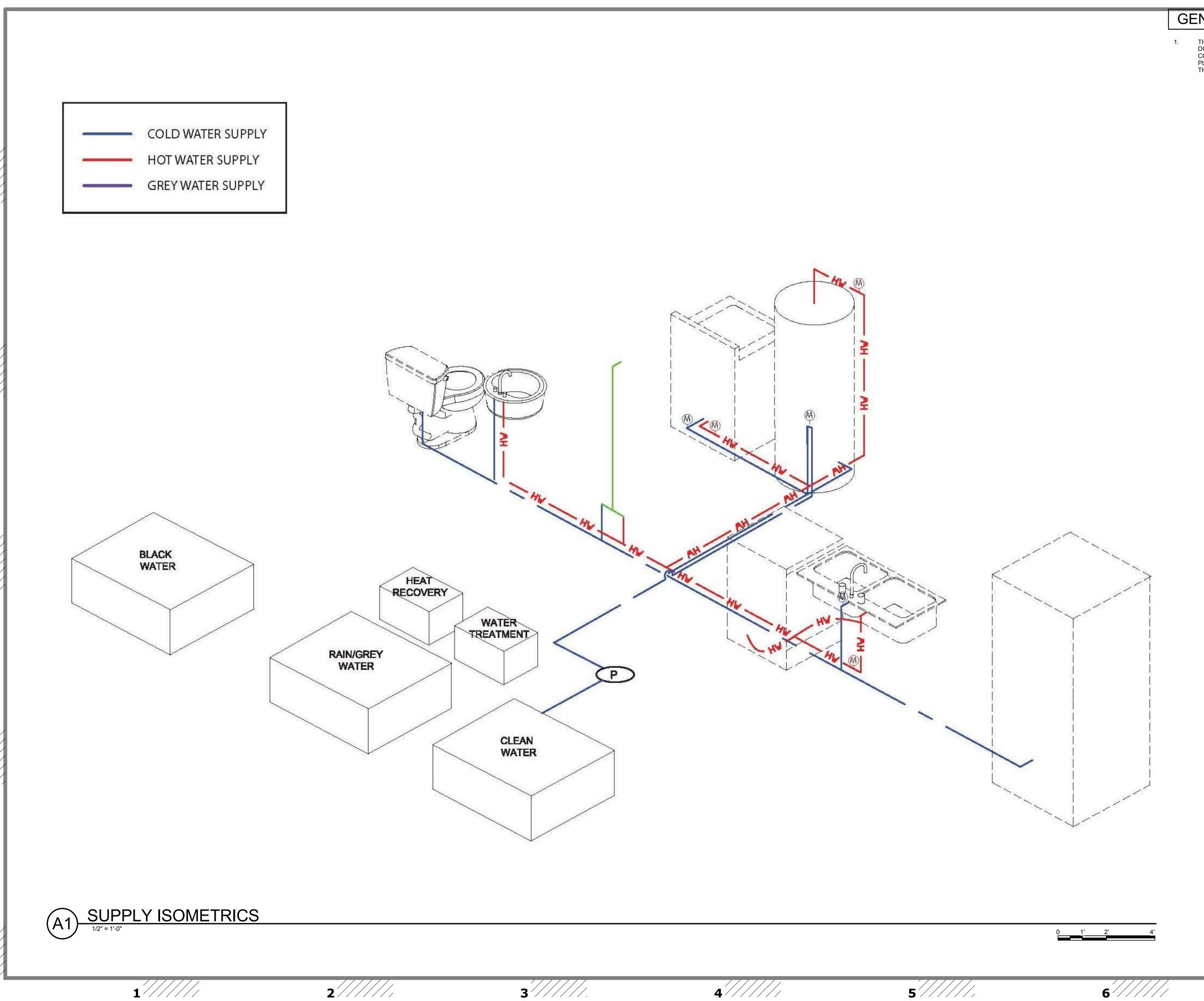
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GENERAL SHEET NOTES

THE WATER CLOSET WILL NOT BE CONNECTED DURING THE COMPETITION PERIOD. PIPE CONNECTIONS BETWEEN THE WC AND THE PLUMBING SYSTEM WILL BE DISCONNECTED FOR THE ENTIRETY OF THE COMPETITION PERIOD.



TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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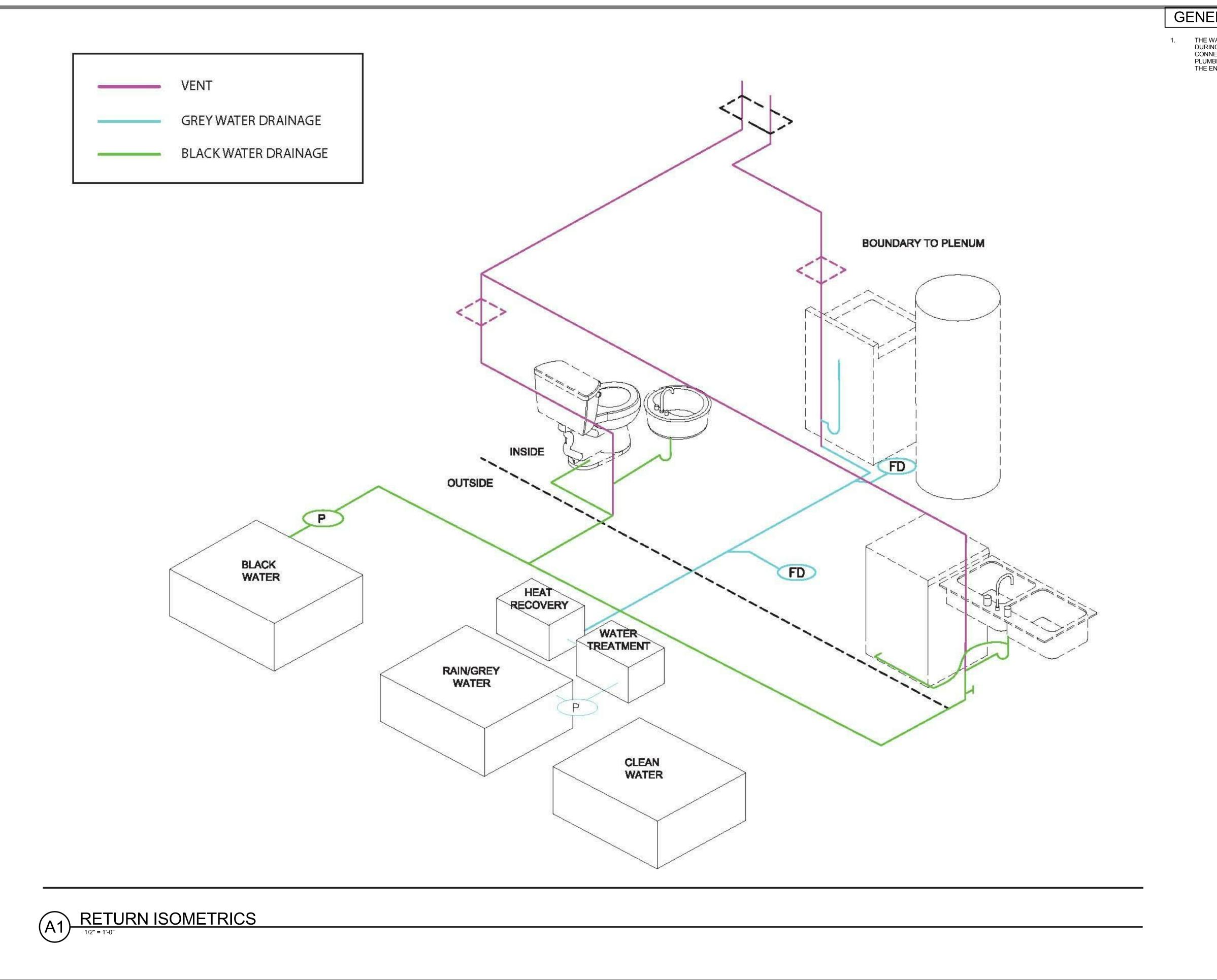
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P-901

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GENERAL SHEET NOTES

THE WATER CLOSET WILL NOT BE CONNECTED DURING THE COMPETITION PERIOD. PIPE CONNECTIONS BETWEEN THE WC AND THE PLUMBING SYSTEM WILL BE DISCONNECTED FOR THE ENTIRETY OF THE COMPETITION PERIOD.



TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

CONTACT:

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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MARK	DATE	DESCRIPTION

LOT #305

**AUTHOR** 

CHECKED BY: CHECKER NONE: PROJECT IS PUBLIC DOMAIN COPYRIGHT:

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LOT NUMBER:

DRAWN BY:

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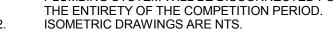
P-902

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GENERAL SHEET NOTES

THE WATER CLOSET WILL NOT BE CONNECTED DURING THE COMPETITION PERIOD. PIPE CONNECTIONS BETWEEN THE WC AND THE PLUMBING SYSTEM WILL BE DISCONNECTED FOR





TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

CONTACT:

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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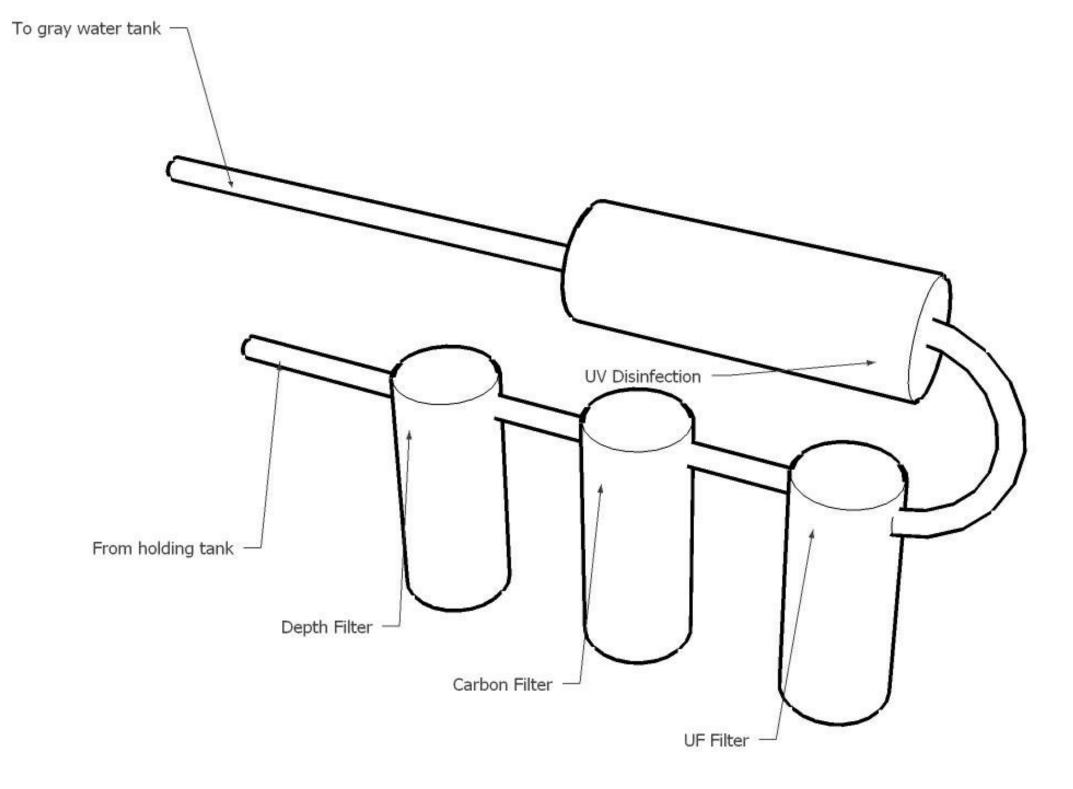
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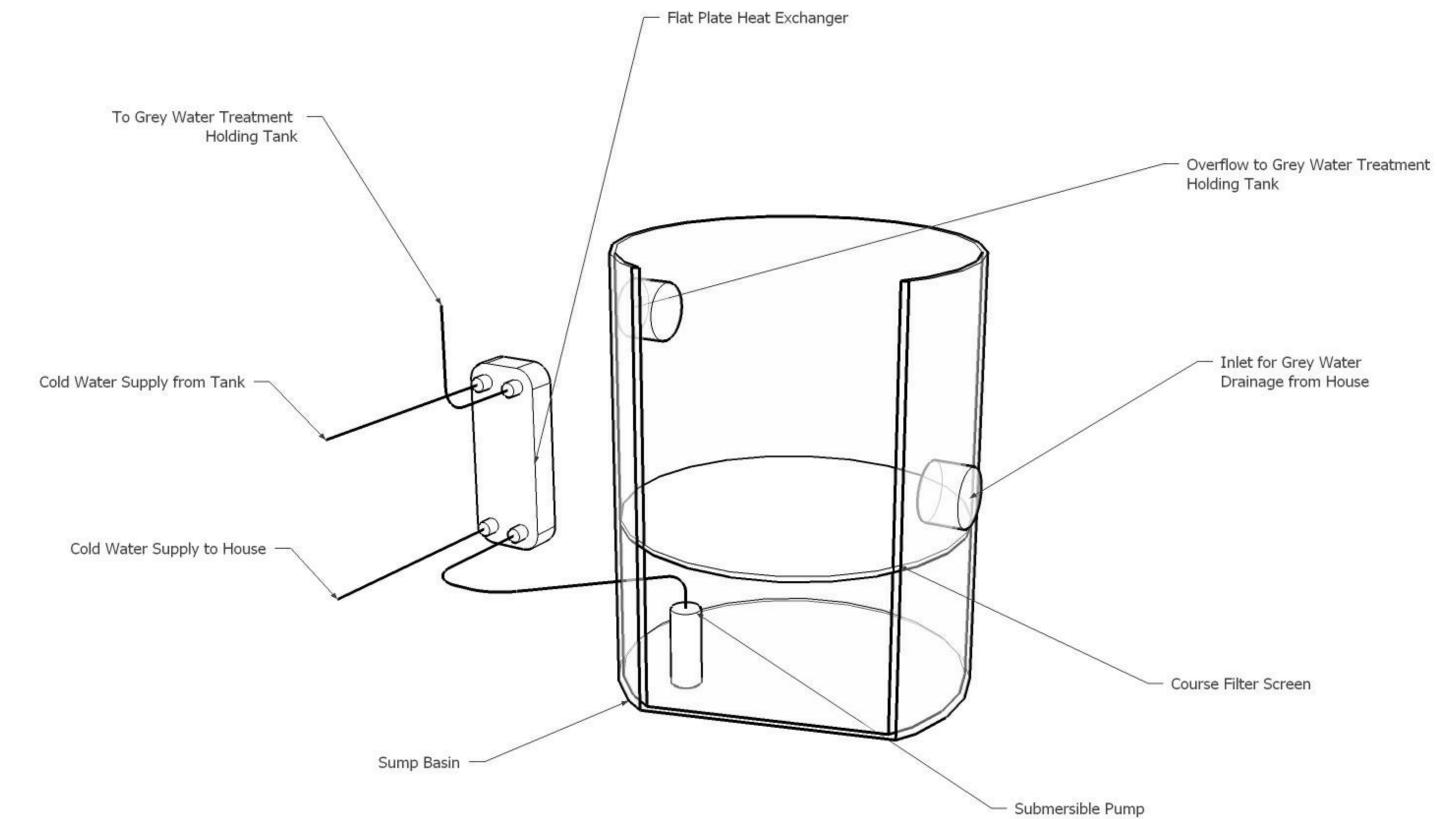
PLUMBING SYSTEM **ISOMETRICS** 

P-903



GREYWATER TREATMENT ISOMETRIC

12" = 1'-0"



GREY WATER HEAT RECOVERY ISOMETRIC

12" = 1'-0"

2////// 3///// 4//////

5/////

6

# GENERAL MECHANICAL NOTES

- 1.) THESE GENERAL NOTES APPLY TO ALL WORK IN THIS PROJECT
- 2.) DO NOT SCALE DRAWINGS, USE FILED MEASUREMENTS
- 3.) NOTES ON DRAWINGS SHALL APPLY TO ALL, SIMILAR CONDITIONS WHETHER THEY ARE REPEATED OR NOT
- 4.) ALL EXPOSED DUCTWORK, PIPING, ELECTRICAL CONDUIT, TEMPERATURE CONTROLS CONDUIT AND ASSOCIATED COMPONENTS SHALL BE STAINLESS STEEL OR COLOR AS SELECTED BY THE ARCHITECT

THE WORK HAS BEEN DESIGNED FOR THE EQUIPMENT INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE AND PROVIDE ANY MODIFICATIONS TO THE WORK INCLUDING BUT NOT NECESSARILY LIMITED TO DUCTWORK, PIPING, ELECTRICAL, PLUMBING, PIPE PROTECTION, STRUCTURAL, LIGHTING, OUTLETS AND ARCHITECTURAL FEATURES SUCH AS CEILINGS, DOORS AND FRAMES, CASEWORK, ETC. REQUIRED TO PROPERLY

THE DRAWINGS AND DETAILS SHOWN SHALL BE TAKEN AS A DIAGRAMMATIC MEANS OF PROVIDING PIPING AND DUCTWORK. THEY DO NOT SHOW EVERY FITTING AND OFFSET, NOR EVERY STRUCTURAL, ELECTRICAL, PIPING OR DUCTWORK DIFFICULTY THAT MAY BE ENCOUNTERED DURING THE INSTALLATION OF THE WORK.

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PROVIDE EQUIPMENT OTHER THAN THAT INDICATED ON THE DRAWINGS



TEAM NAME: ADDRESS: UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

CONTACT:

ACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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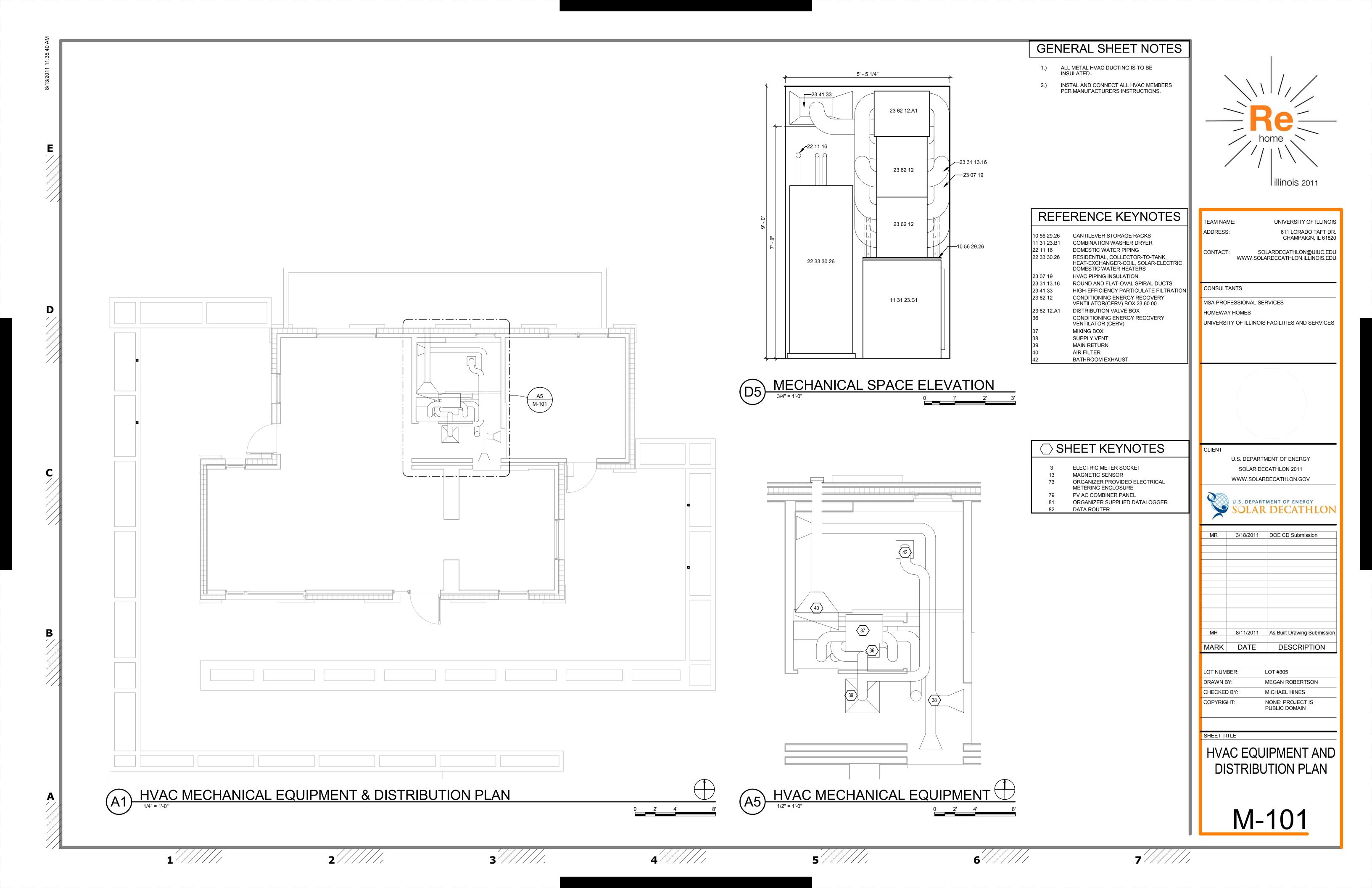
LOT NUMBER:	LOT #305
DRAWN BY:	MEGAN ROBERTSON
CHECKED BY:	MICHAEL HINES
COPYRIGHT:	NONE: PROJECT IS PUBLIC DOMAIN

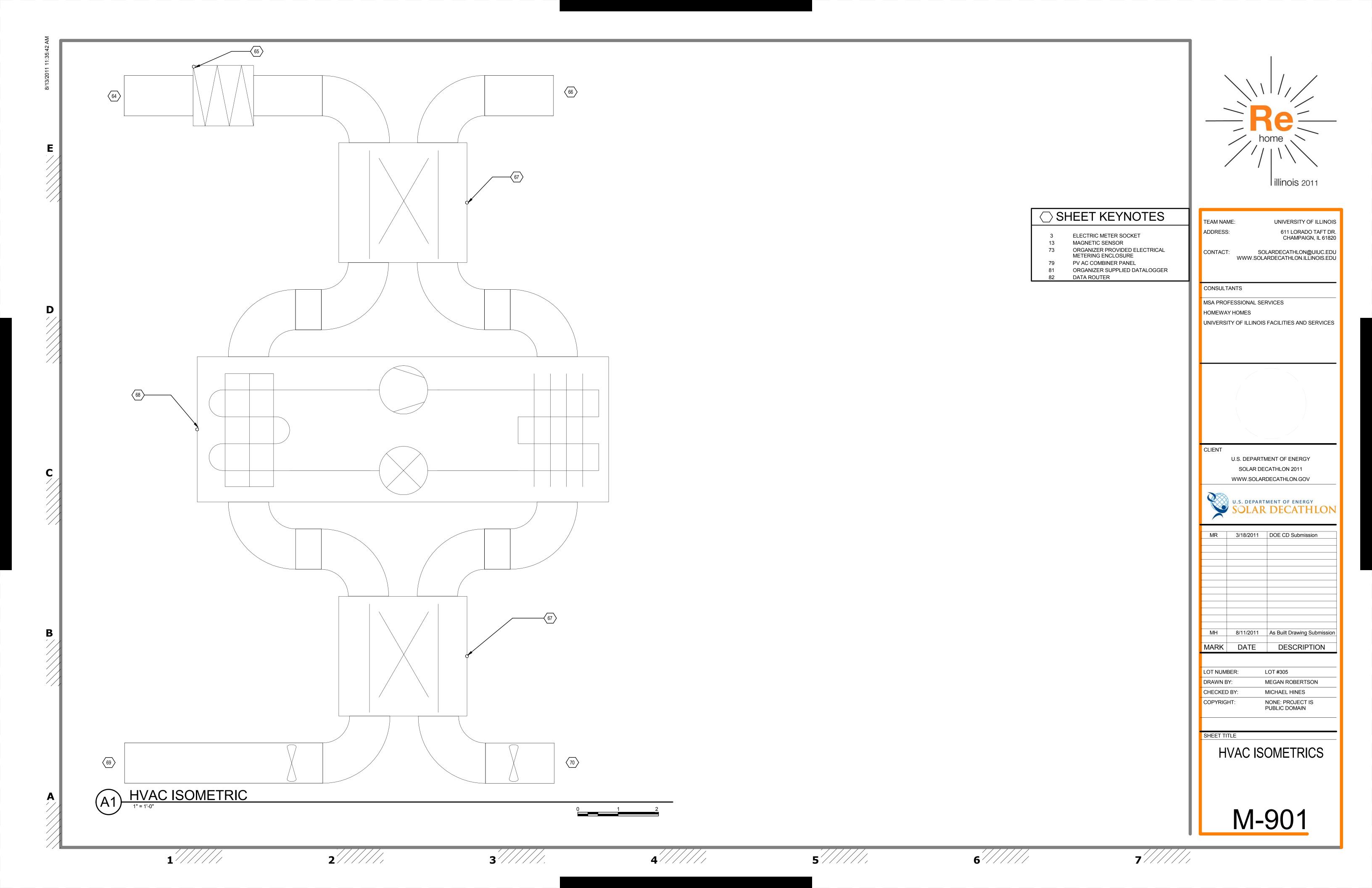
SHEET TIT

MECHANICAL SYMBOLS
AND NOTES

M-001

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GENERAL ELECTRICAL NOTES

- 1.) THESE GENERAL NOTES APPLY TO ALL WORK IN THIS PROJECT
- REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR ADDTIONAL GENERAL NOTES WHICH WILL APPLY HERE
- 3.) DO NOT SCALE DRAWINGS, USE FILED MEASUREMENTS

ACCOMODATE FURNITURE AND / OR EQUIPMENT

- NOTES ON DRAWINGS SHALL APPLY TO ALL, SIMILAR CONDITIONS WHETHER THEY ARE REPEATED OR NOT
- THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH ANSI 710.1 AND THE A.D.A.A.G (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES), ILLINOIS ACCESSIBILITY CODE AND ANY OTHER GOVERNING ACCESSIBILITY CODE
- ELECTRICAL CONTRACTOR SHALL VERIFY TOTAL CONNECTED LOAD / IIP AND
  VOLTAGE WITH MECHANICAL CONTRACTOROR PRIOR TO WIRING ALL HVAC
  EQUIPMENT. MAKE ANY CHANGES TO OVERCURRENT DEVICES OR FEEDER SIZE PER
  CURRENT NATIONAL ELECTRIC CODE
- CONTRACTOR SHALL VERIFY ALL FURNITURE, MOUDLAR FURNITURE AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS AND REVIEWED SHOP DRAWINGS PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION. THIS CONTRACTOR SHALL ADJUST RECEPTACLES. OUTLETS OR CONNCTION LOCATIONS TO
- ALL LIGHTING FIXTURES SHALL BE RATED FOR BUILDING SYSTEM VOLTAGE. CONTRACTOR MUST VERIFY ALLLOCATIONS
- 9.) ELECTRICAL CONTRACTOR SHALL CHECK AND COORDINATE ALL LIGHTING FIXTURE CATALOG NUMBERS WITH THE INTENT OF FIXTURE DESCRIPTIONS, LISTED ACCESSORIES AND TYPE OF INSTALLATION
- ALL FIXTURES TO BE "U.L." LABELED. ALL LIGHTING FIXTURES EXPOSED TO WEATHER

  OR MOISTURE SHALL BEAR "U.L." WET LOCATION LABEL AND LIGHTING FIXTURES

  EXPOSED TO DAMPNESS SHALL BEAR U.L. "DAMP LOCATION" LABEL.
- 11.) VERIFY ALL LIGHTING FIXTURE LOCATIONS, FINISHES, AND CEILING TYPES WITH ARCHITECT PRIOR TO INSTALLATION
- 12.) REFER TO APPLICABLE SECTIONS OF THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR LIGHTING FIXTURES

### **ELECTRICAL CALCULATIONS**

The PV system design consists of two arrays which together produce 6.9kW under standard temperature and conditions (STC). The primary PV array will have 24 SunPower E18 230W panels mounted on the roof. The secondary array will have 6 Sanyo HIT Bifacial 195W panels mounted in a shading canopy over the south facade. Both arrays will be utility-connected.

### Specifications

The SunPower array will have panels of eight modules each. A total of three panels of modules will be mounted at the optimum angle on the roof. These modules have the following specifications at STC: VOC is 48.2V and ISC is 6.05A with a rated Imp = 5.68A. The SunPower E18/230 panels have a current derating of 3.5mA/°C and voltage derating of -132.5mV/°C with standard temperature measured at 25 °C.

The Sanyo HIT array will have one panel of 6 modules. These panels have a VOC of 68.7V and ISC of 3.73A and Imp = 3.5A at STC. These modules also have a current temperature derating of 1.70mA/°C and voltage temperature derating of -192mV/°C with a standard temperature of 25 °C.

Taken from *ASHRAE Handbook- Fundamentals*, the mean extreme annual minimum temperature in Champaign, Illinois is -23.1 °C. The temperature in Washington DC is less extreme than that of Illinois, so the previous value will be used. The other temperature consideration will be the temperature of the modules themselves. These temperatures can reach up to 65 °C for an array mounted above 6 inches from the roof, so that will also be considered when the module wires are being run.

### Array Module to Inverter Calculation

To begin, it is important to make sure that the voltage of the arrays does not exceed the inverter maximum. The SunPower arrays will be connected to the SPR-5000m inverter and then the Sanyo HIT's will be connected to a Kaco 1502xi inverter. The voltage of the SunPower arrays will be 8 x (VOC + 0.1325(25-(-23.1)). This voltage is 436.6V. This ensures that under all possible temperatures the voltage of the array will not be over the inverter limit. It is also necessary to check the current. The equation applied is ISC +.0035(65-25)) which equals 6.19A. After applying the same equations to the Sanyo HIT panels the max voltage will be 472.4V and 4.92A. These will be below the given inverter maximums.

Section 690-8 of the NEC states that an additional 1.25 multiplier must be added to the traditional 80% multiplier for PV DC source circuits. To appropriately size these conductors, the following equation is utilized.

Ampacity = ISC \* 1.25 \* 1.25. The ampacity for the SunPower conductors must be 9.66A and the Sanyo HIT conductors must at least 7.68A.

Since the temperature of the modules can reach up to 75°C the wires have to be derated before the appropriate wires can be selected. A couple of different wires can be used after applying the .41 multiplier to derate the wires. The wires exposed to the elements also have to be a USE-2/RHW/RHW-2 since it will be in direct sunlight. The following wires could work:

8 AWG USE-2/RHW/RHW-2 55 A \*0.41 = 22.5A Rated Ampacity for 70-80°C Ambient

10 AWG USE-2/RHW/RHW-2 40 A \*0.41 = 16.4A Rated Ampacity for 70-80°C Ambient

12 AWG USE-2/RHW/RHW-2 30 A \*0.41 = 12.3A Rated Ampacity for 70-80°C Ambient

The wires will also have to be derated because of the amount of wires in the raceway. [NEC 310.15] Due to the fact that 6 current carrying wires are going to fit inside a raceway their ampacity will have to be derated by another 80%. The wire that will be used will be the #10 AWG with a final ampacity of 18.6A. Before this wire can be finalized the losses in the wire have to be checked. It is recommended that there are 3% or less for losses. For these calculations we will assume rated voltage, so the total voltage for a single array would be 8\*54.7 = 437.6, so we need to restrict the losses to 13.1V. The resistance for #10 AWG wire is 9989 ohms/1000ft. The longest portion that the wire will travel will be roughly 400 feet, the largest resistance would be .4 ohms. Assuming rated current the maximum voltage drop would be 3.08V so this wire would be acceptable. This wire will be THWN-2 and run through conduit. There will be 9 total wires being run through the conduit, so 3/4" PVC conduit will be used.

The same equations were used for the Sanyo HIT array. Both #12 and #14 AWG wire can be used for the ampacity of 7.47A. The #12 AWG wire will be used since that is the wire that is outputted from the junction box. This wire will also travel around 400 feet and will result in a 3.49V which is less than the 3% limit as well. The maximum voltage on 55.6V\*6 =334 and the 3% value is 10.08V. Since only 3 wires will be used in the conduit the 1/2" PVC will work.

According to NEC requirements, DC disconnects and overcurrent protection devices are necessary. Both of the inverters have built in disconnects and the inputs are fusable up to 15A, so that will satisfy all the requirements. The SunPower inverter also has spaces for 6 different module arrays, so a combiner box is not necessary.

The grounding conductors for these cable runs will be #10 AWG bare copper still fulfilling all ampacities.

### ELECTRICAL CALCULATIONS CON.

#### **Inverter to Combiner Box**

The next step of the design will bring both of the two inverters and combine them into one. This is desirable because we want to have one input into the main load center.

The SunPower inverter will output a maximum 20.8A and the Kaco inverter will output a maximum of 8.0A at 240 Vac. It is also important to note that both of these inverters have enclosures that are NEMA 3R, so they can be outside. Since these wires will be outside in conduit as well, the wires will also be wet rated THWN-2 wires.

The overcurrent protection for the SunPower inverter in the combiner box should be a 30 A double pole breaker (20.8 X 1.25 = 26). Since the maximum temperature is 41°C the wires will be derated using the 0.87 factor. The closest wire to be used would be the AWG #10 wire because the ampacity at 90°C is 40A and when derated it is 34.8A. This matches NEC requirements that the ampacity of the wire must be greater than or equal to the breaker. These wires will also run through 1/2" PVC conduit.

The overcurrent protection for the Kaco inverter in the combiner box should be a 15 A double pole breaker (8 X 1.25 = 10). Since the maximum temperature is 41°C the wires will be derated using the 0.87 factor. The closest wire to be used would be the AWG #12 wire because the ampacity at 90°C is 30A and when derated it is 26.1A. This matches NEC requirements that the ampacity of the wire must be greater than or equal to the breaker. These wires will also run through 1/2" PVC conduit.

The final part of this design portion is to decide upon a Sub-Panel rating. Governed by the NEC, the sub-panel's rating is z in the equation 40+30+15 = 1.2z. Rounding to the next available size, the rating must then be 75A rated panel to meet the NEC. A 100A rated combiner box will be used.

#### Combiner Box to AC Disconnect

The required ampacity for the wires from the combiner box to the AC disconnect and on to the main load center is 70.8 A. This wire will be in conduit outside, so the THWN-2 wire will be used. The appropriate wire for this situation is AWG #4 wire. After the derating the wire for ambient temperature to 40°C the final ampacity is 86.5A. This wire will be run through a 1.25" PVC conduit. The AC disconnect will also be rated at 100A from requirements also of NEC 690.64(B)(2).

#### AC Disconnect to Main Panel

From the externally mounted AC disconnect, the wires run inside, to be connected to the main panel. This run will utilized the #4 AWG wire inside of 1.25" PVC. The wire will end at an 40A breaker connected to the main panel.

### **Main Panel to Utility**

To ensure proper size of the Main-panel, we refer to NEC 690.64(B)(2) and denote the minimum allowed rating as y given that there is a 150 amp main breaker and 40 amp backfed breaker from the PV system on the same bus:  $1.2 \text{ y} = 40 + 150 \Rightarrow \text{y} = 158 \text{ A}$ . The panel will have a rating of 200A and fed from the utility with 2/0 conductor. This load center rating satisfies the NEC.

### AC Grounding

The next portion of this will explain the use of wires for AC Grounding. NEC table 250.122 will be the main reference for the data. We will also reference NEC 250.66. Assuming that a 2/0 AWG conductor will be used to service the house, Table 250.66 indicates that the Grounding Electrode Conductor should be #4 AWG Bare Cu.

Also per the Solar Decathlon rules, we will use an 8' ground rod driven at a 45 degree angle into the earth.

The grounding from the inverters to Sub-Panel is governed by the NEC 250.122 In wire is gauged by the OCPD at the end. The wire from the SunPower inverter ends in with a 30A breaker so it will need #10 AWG Solid Bare Cu wire and the Kaco ends with a 15A breaker so it will need a #14 AWG Solid Bare Cu wire because those wires will be outside. The grounding conductor from the Sub-Panel to Main Panel will be a #8 Solid Bare Cu. Next, the conductor to ground the inverters will be analyzed. This conductor is utilized to connect the grounding point in the inverter to the grounding bus bar in the main electrical panel. This conductor originates from the grounding point of one of the inverters and erminates at the grounding rod. The other inverter's grounding point is spliced irreversibly to this conductor as depicted in the electrical schematic. The conductors will be enclosed in <sup>3</sup>/<sub>4</sub>" PVC conduit up to the point of floor penetration. NEC 690.47(C)(2) dictates that the bonding conductor between the DC and AC systems should be sized as the larger of the DC requirement (in accordance with NEC 690.45) and the Inverter alternating current overcurrent device rating [NEC 250.122]. In addition, NEC 690.47(C)(4) indicates that a bonding conductor that serves multiple inverters shall be sized based on the sum of applicable currents used in NEC 690.47(C)(2). The data sheet of the SPR 5000m inverter indicates that the maximum permissible DC current is 30.4 A and the Kaco is 12A. In addition, a 40 A circuit breaker and 20A breaker are installed on the AC output of each inverter. Denoting the minimum ampacity of the bonding conductor as z, to satisfy the postulates of NEC 690.47(C) z = (50+20+38+16)/1.2 = 91 A.

Based on NEC 250.122, we will employ a 6 AWG Cu conductor to realize the ground bonding



TEAM NAME: ADDRESS: UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

CONTACT:

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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MR 3/18/2011 DOE CD Submission

MH	8/11/2011	As Built Drawing Submissio
MARK	DATE	DESCRIPTION

LOT #305

**MEGAN ROBERTSON** 

MICHAEL HINES

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LOT NUMBER:

DRAWN BY

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ELECTRICAL SYMBOLS
AND NOTES

E-001

GENERAL ELECTRICAL NOTES

ELECTRICAL CALCULATIONS

ELECTRICAL CALCULATIONS CON.

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### GENERAL SHEET NOTES

- 1.) ELECTRIC METER HOUSING AT 50-65" ABOVE GRADE (48" A.F.F.) TO ACCEPT A STANDARD, 4-JAW, RINGLESS ROUND, UTILITY GRADE SOCKET METER FOR USE WITH 240/120 V SERVICE
- 2.) AC DISCONNECT AT 65" ABOVE GRADE (48" A.F.F.)
- 3. EACH DWELLING SHALL BE PROVIDED WITH GROUNDING ELECTRODES IN ACCORDANCE WITH IRC E3608.1.4 ROD AND PIP ELECTRODES. THE LENGTH OF THE GROUND ROD SHALL BE EXACTLY 8 FEET IN LENGTH.



## REFERENCE KEYNOTES

3	ELECTRIC METER SOCKET
10	DISTRIBUTION PANEL
26 05 33.A3	1 1/4" SCH 40 PVC
26 05 33.A4	2 1/4" SCH 40 PVC
56	MODULE ELECTRICAL CONNECTION
72	8' GROUNDING ROD
73	ORGANIZER PROVIDED ELECTRICAL METERING ENCLOSURE
77	SUNPOWER 5000M INVERTER
78	KACO 1502xi INVERTER
79	PV AC COMBINER PANEL
84	UTILITY AC DISCONNECT

TEAM NAME: UNIVERSITY OF ILLINOIS
ADDRESS: 611 LORADO TAFT DR.
CHAMPAIGN, IL 61820

NTACT: SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

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# ○ SHEET KEYNOTES

- 3 ELECTRIC METER SOCKET
  10 DISTRIBUTION PANEL
  56 MODULE ELECTRICAL CONNECTION
  72 8' GROUNDING ROD
  73 ORGANIZER PROVIDED ELECTRICAL
- METERING ENCLOSURE
  77 SUNPOWER 5000M INVERTER
  78 KACO 1502xi INVERTER
  79 PV AC COMBINER PANEL
  84 UTILITY AC DISCONNECT

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MH 3/31/2011 Inverters (11,12) moved east

MR 3/18/2011 DOE CD Submission

MH	5/2/2011	Ground rod added, terminal
		box moved to N wall, inverter
		location adjusted to match
		electrical elevations E-201
MH	8/11/2011	As Built Drawing Submission
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LOT NUMBER:		LOT #305
ORAWN BY:		MEGAN ROBERTSON

MICHAEL HINES

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SHEET TITLE

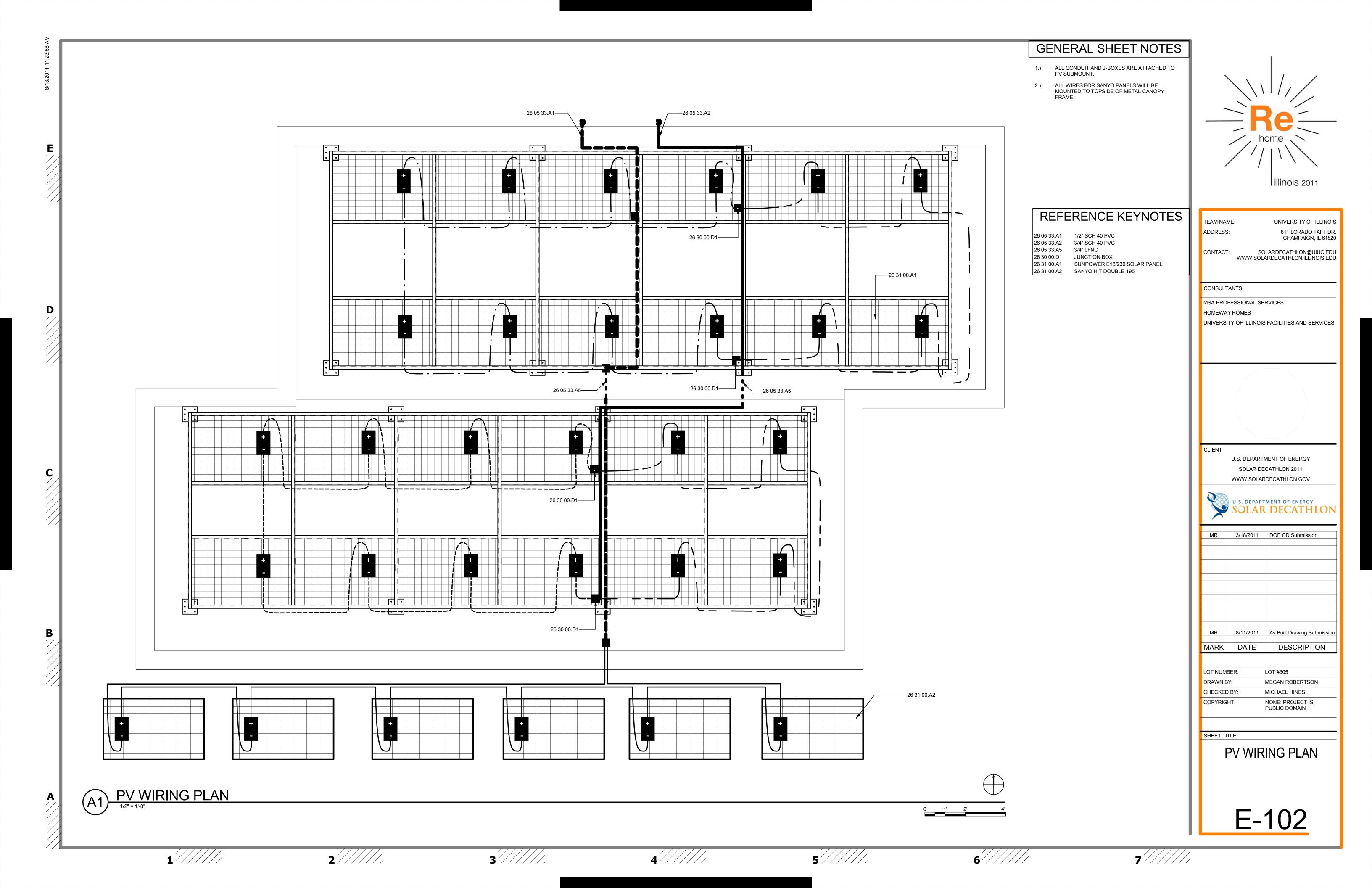
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ELECTRICAL DISTRIBUTION PLAN

E-101

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GENERAL SHEET NOTES CIRCUIT PANEL LOCATION NOTES DESCRIPTION BREAKER SIZE Largest Motor: Spin Extractor @ 1800 VA 25% OF LARGEST MOTOR LOAD (220.14) . NEC 220 LOAD CALCULATIONS: : 450 VA General Lighting: 858 Sq. Feet x 3 VA = 2574 VA BATHROOM 20 A 13 SINGLE POLE, TANDEM BREAKER ELECTRIC METER HOUSING AT 65 DEGREES Small Appliance .: 2 Circuits x 1500 VA = 3000 VA ABOVE GRADE (48 DEGREES A.F.F) TO ACCEPT Laundry ......: 1 Circuits x 1500 VA = 1500 VA

Total General Light & Small Appliance ....: 7074 VA

The First 3000 VA @ 100% = 3000 VA SINGLE POLE, AFCI BREAKER BEDROOM 20 A NET COMPUTED LOAD .. : 27776 VA 2 2 A STANDARD 4-JAW, RINGLESS, ROUND, UTILITY 3 KITCHEN OUTLETS 1 20 A SINGLE POLE, TANDEM BREAKER GRADE SOCKET METER FOR USE WITH 13 120/240 VOLT SERVICE/FEEDER LOAD. : 116 AMP 240/120V SERVICE Remaining 4074 VA @ 35% = 1426 VA
GENERAL LIGHTING, SMALL APPLIANCE & LAUNDRY DEMAND LOAD (NEC 220.42): FLEX SPACE 20 A SINGLE POLE, AFCI BREAKER 4 AC DISCONNECT AT 65" ABOVE GRADE NEUTRAL LOAD (NEC 220.61): (48" A.F.F) General Lighting .....: 4426 VA 5 KITCHEN OUTLETS 2 20 A 15 SINGLE POLE, TANDEM BREAKER ÀLL RECÉPTACLES SHALL BE TAMPER-: 3750 VA Appliances ..... RESISTANT. NEC 406.11 Heating Demand : 700 VA @ 100% = 700 VA Cooling Demand : 700 VA @ 100% = 700 VA LARGER OF HEATING OR COOLING DEMAND LOADS ( Equal ) (NEC 220.60) ... : 700 VA 6 LIVING ROOM 20 A SINGLE POLE, AFCI BREAKER : 6650 VA Cooking .... ALL RECEPTABLES INSTALLED OUTDOORS : 3500 VA Dryer ... 7 MICROWAVE/OVEN SINGLE POLE, TANDEM BREAKER SHALL BE WEATHER-RESISTANT. NEC 406.8(B) 20 A 15 Largest Motor .....: 450 VA Heating/Cooling .....: 700 VA SINGLE POLE, AFCI BREAKER **GENERAL INTERIOR LIGHTS** 20 A 8 Cooktop: 9600 VA Total Neutral Demand Load: 19476 VA SINGLE POLE, TANDEM BREAKER Wall Oven: 1500 VA 9 REFRIGERATOR & FREEZER 20 A COOKING EQUIPMENT DEMAND LOAD (NEC 220.55). 81 AMP 10 EXTERIOR OUTLETS 20 A SINGLE POLE, GFCI BREAKER 10 Dryer: 5000 VA 11 DISHWASHER 20 A 17 SINGLE POLE, TANDEM BREAKER DRYER DEMAND LOAD (NEC 220.54) .. : 5000 VA 12 20 A SINGLE POLE CERV 12 Water Heater: 4500 VA 13 STOVE 1,3 DOUBLE POLE 40 A Dishwasher: 1200 VA Sump Pump: 500 VA 14 WASHING MACHINE 20 A SINGLE POLE 14 Well Pump: 1000 VA Fixed Appliance Total: 7200 VA 15 WATER HEATER 40 A 5,7 DOUBLE POLE ○ SHEET KEYNOTES 7200 VA @ 75% Demand: 5400 VA FIXED APPLIANCE DEMAND LOAD (NEC 220.53) .... : 5400 VA DRYER 16 30 A 9,11 DOUBLE POLE DOUBLE POLE Other Appliance #1 1800 VA [ Spin Extractor ]
Other Appliance #2 500 VA [ Refrigerator ] 17 INVERTER 50 A 18,20 DISTRIBUTION PANEL EXTERIOR LIGHTS SINGLE POLE MODULE ELECTRICAL CONNECTION 20 A 16 OTHER NON FIXED APPLIANCE DEMAND LOAD (220.14). 2 8 A1) AC CIRCUIT PLAN

1:40 1///// 3/////. 4////// 2//////

TEAM NAME: UNIVERSITY OF ILLINOIS ADDRESS:

611 LORADO TAFT DR. CHAMPAIGN, IL 61820

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SOLARDECATHLON@UIUC.EDU CONTACT: WWW.SOLARDECATHLON.ILLINOIS.EDU

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	MR	3/18/2011	DOE CD Submission
П	JP	3/30/2011	Added outlet to bathroom.
ш			Located on S. wall of
П			compartment space
П	JP	4/01/2011	Revising Schedule. Combining
П			lighting circuits and outlets
ш	JP	4/04/2011	Schedule finished
ш			Deleted one switch in bedroor
ш			Made flex wall lighting 3-way
Ш			Re-annotated drawing
ш	JP	4/06/2011	Ext. Lights
ш			Moved lighting over the 2 table
ш	JP	4/13/2011	Ext. Lights
ш	JP	5/1/2011	Update to match as built
ш	MH	8/11/2011	As Built Drawing Submission
ш			
	MARK	DATE	DESCRIPTION
I 1			

	LOT NUMBER:	LOT #305			
DRAWN BY:		MEGAN ROBERTSON			
	CHECKED BY:	MICHAEL HINES			
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SHEET TITLE

AC CIRCUIT PLAN

E-103

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6

GENERAL SHEET NOTES 1.) ALWAYS FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS. 2.) ARCHITECT TO CONFIRM LIGHT TEMPERATURES ON SITE FOR FINAL APPROVAL. LIGHTING SCHEDULE MANUFACTURER MARK & CATALOG No. LAMP & WATTAGE RECESSED DEPTH MOUNTING MISCELLANEOUS MONOPOINT SYSTEM. FIXTURE @5'-6" AT DINING TABLE, FIXTURE @ 5'6" AT KITCHEN TABLE JUNO LIGHTING P175MFLA3STNFRT PENDANT 12V 5W LED RAB LIGHTING LPACK MOUNTED AT 7'-0" 12V 10W LED RAB LIGHTING LSTEP MOUNTED TO PLANTERS AT 1'-0" 12V 5W LED JUNO RECESSED LIGHTING IC20LEDG2-3K RECESSED 120V, 14W LED CONTACT: JUNO LIGHTING TQJ1114-3K-FL 12V 6W LED PENDANT EUROFASE 14754 EXTERIOR WALL WASHING FIXTURES. RECESSED 35 DEGREE BEAM SPREAD. RECESSED IN DECK LIGHTING SCIENCE GROUP DFN 16 WW FL 12 BULB FOR EUROFASE FIXTURES 5W LED 09 LIGHTING SCIENCE GROUP DFN 19 WW 120 BULBS FOR THE FLOOR FIXTURES IN THE 8W LED BEDROOM AND MAIN LIVING SPACE\_ ENVIRONMENTAL LIGHTS WALL 12V 40W LED LIGHTS TO BE MOUNTED ON NORTH WALL RGBrf-sheath-waterproof-reel JUNO LIGHTING 6 1W LED TRACK TO RUN THE LENGTH OF ROOM OPENING TRACK T8WH 8" TRAC MONOPOINT SYSTEM. USED FOR PENDANT FIXTURES ABOVE DINING AND KITCHEN TABLES JUNO LIGHTING MONOPOINT 12V 5W LED PENDANT MONOPOINT SYSTEM. FIXTURE @5'-6" AT DINING TABLE, FIXTURE @ 5'6" AT KITCHEN TABLE FLOOR LAMPS 12V 5W LED PENDANT ONE FIXTURE TO BE MOUNTED ON CENTER OF EACH CABINET IN THE KITCHEN EDEN PARK ILLUMINATION UNDERCABINET 6 1W LED PLASMA LIGHTING 8"X8" MR 3/18/2011 DOE CD Submission
JP 4/06/2011 Ext. Lights 031 LIGHTING PLAN 7////// 1/////



TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU

CONSULTANTS

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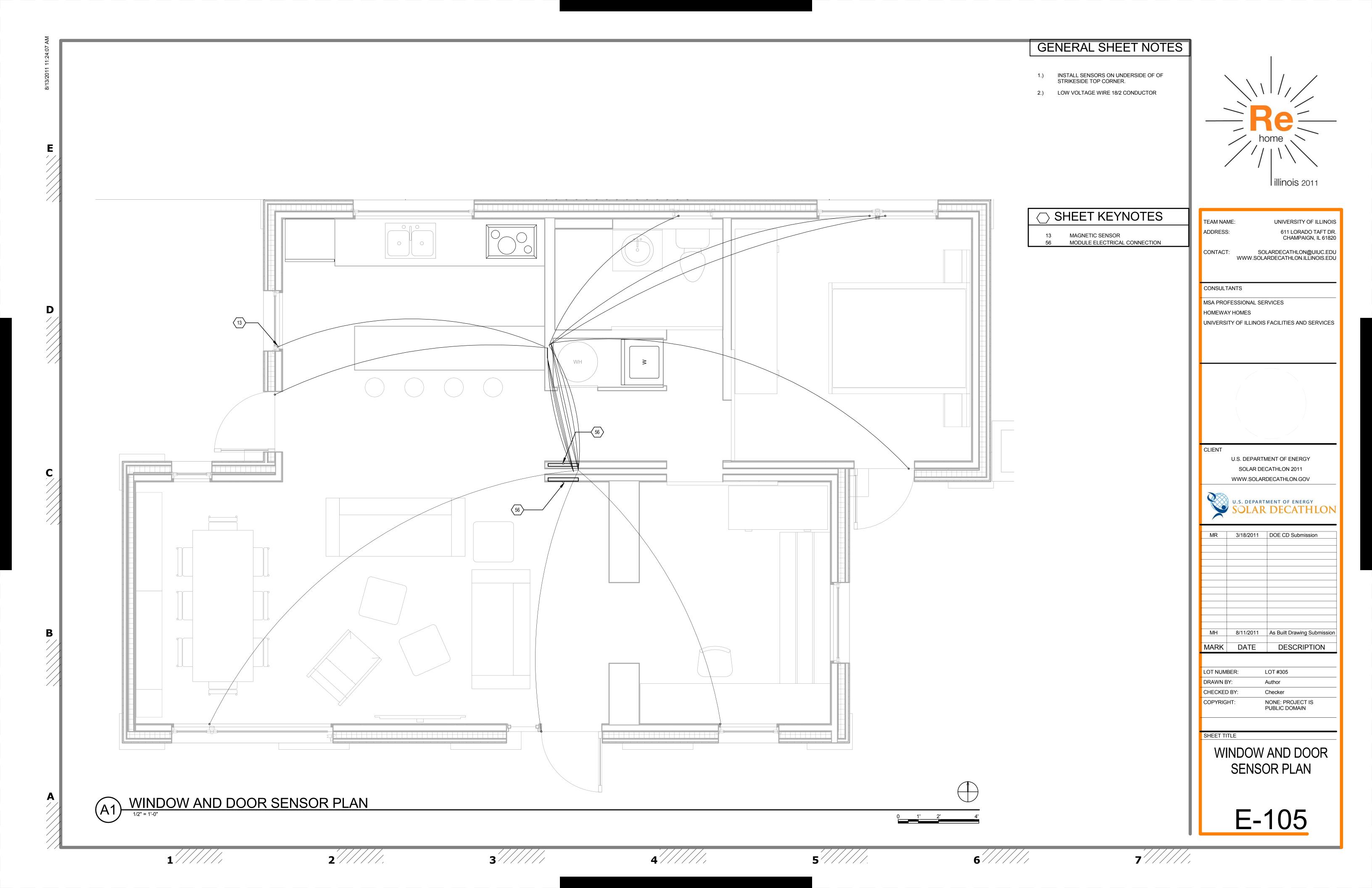
	4/06/2011	Ext. Lights				
		Moved lighting over the 2 table				
		Schedule. changed lamp types				
JP	4/13/2011	Changed Schedule				
	0/44/0044	A D !!! D . O				
MH	8/11/2011	As Built Drawing Submission				
	0.7.0.20.0					
MH MARK	8/11/2011 DATE	As Built Drawing Submission  DESCRIPTION				
	0.7.0.20.0					
	0.7.0.20.0					
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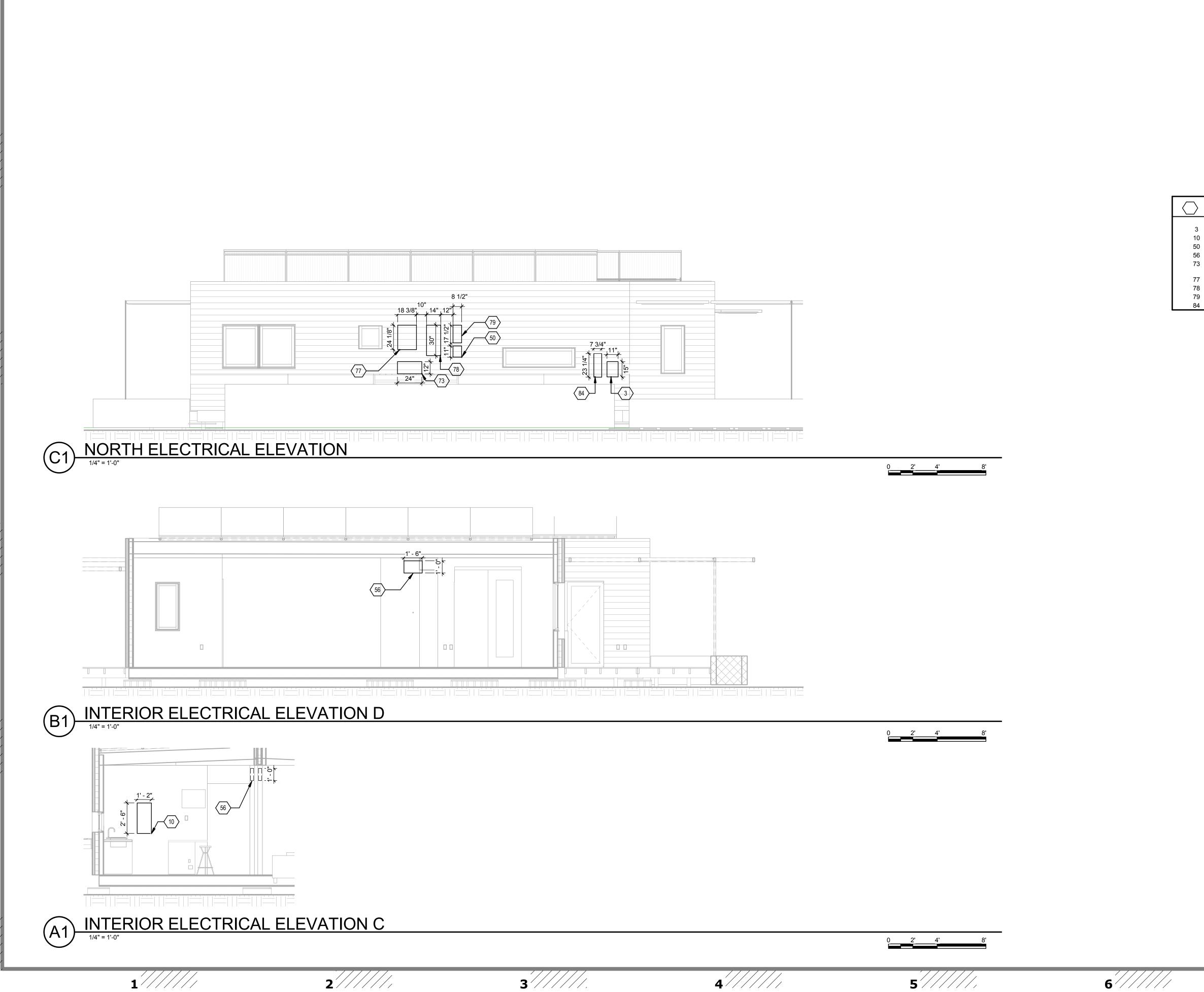
SHEET TITLE

LIGHTING PLAN

E-104

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# SHEET KEYNOTES

ELECTRIC METER SOCKET

DISTRIBUTION PANEL

100A AC DISCONNECT

MODULE ELECTRICAL CONNECTION ORGANIZER PROVIDED ELECTRICAL

METERING ENCLOSURE SUNPOWER 5000M INVERTER

KACO 1502xi INVERTER PV AC COMBINER PANEL

UTILITY AC DISCONNECT

TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU WWW.SOLARDECATHLON.ILLINOIS.EDU CONTACT:

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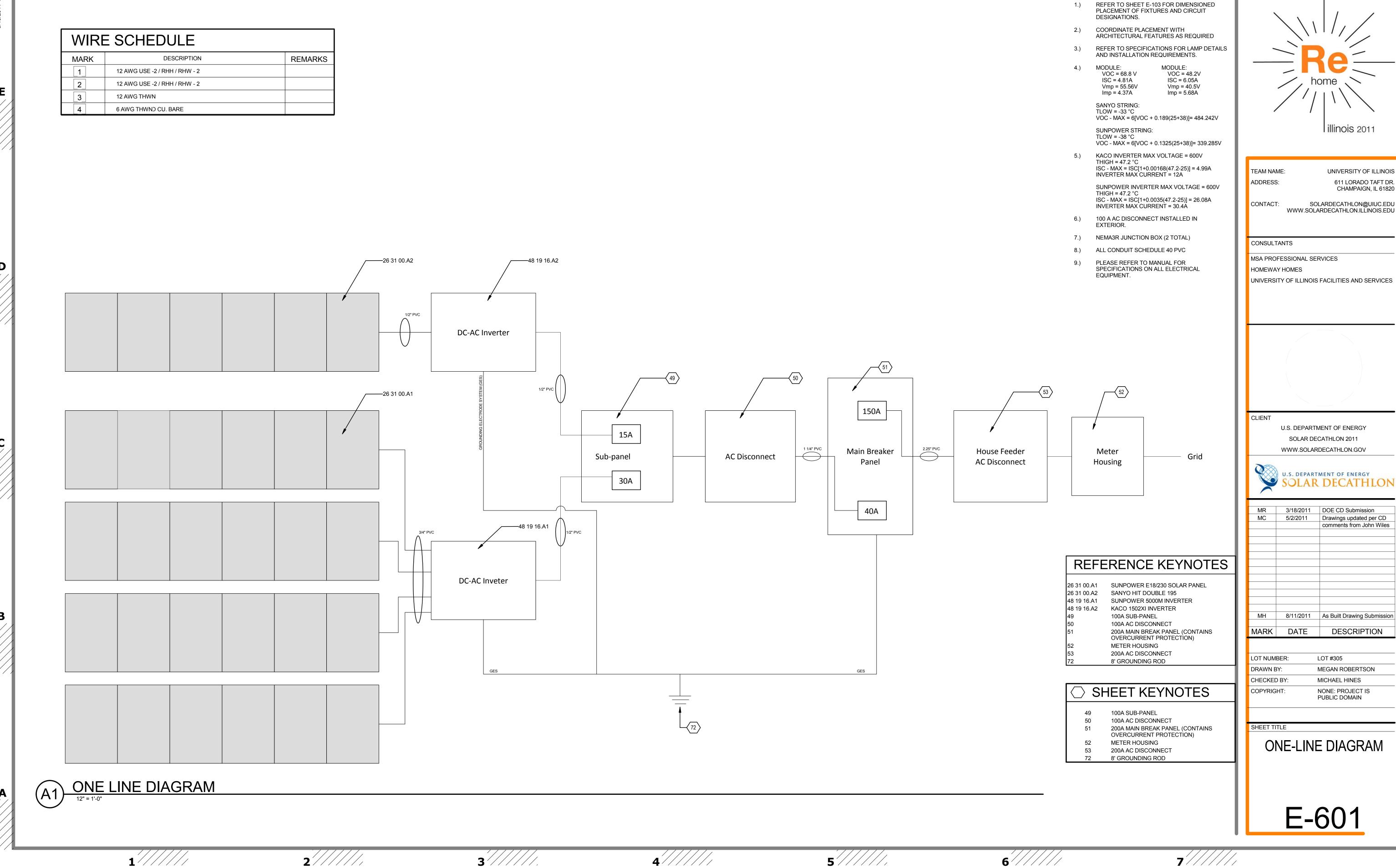
MR	3/18/2011	DOE CD Submission
MH	3/31/2011	(D1) Inverters Moved East
MR	5/1/2011	Meter housing moved to N
		wall. Inverters moved. Com
		organizer enclosure added, a
		disconnect added.
MH	8/11/2011	As Built Drawing Submission
MARK	DATE	DESCRIPTION

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SHEET TITLE

ELECTRICAL **ELEVATIONS** 

E-201



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GENERAL SHEET NOTES

6/////

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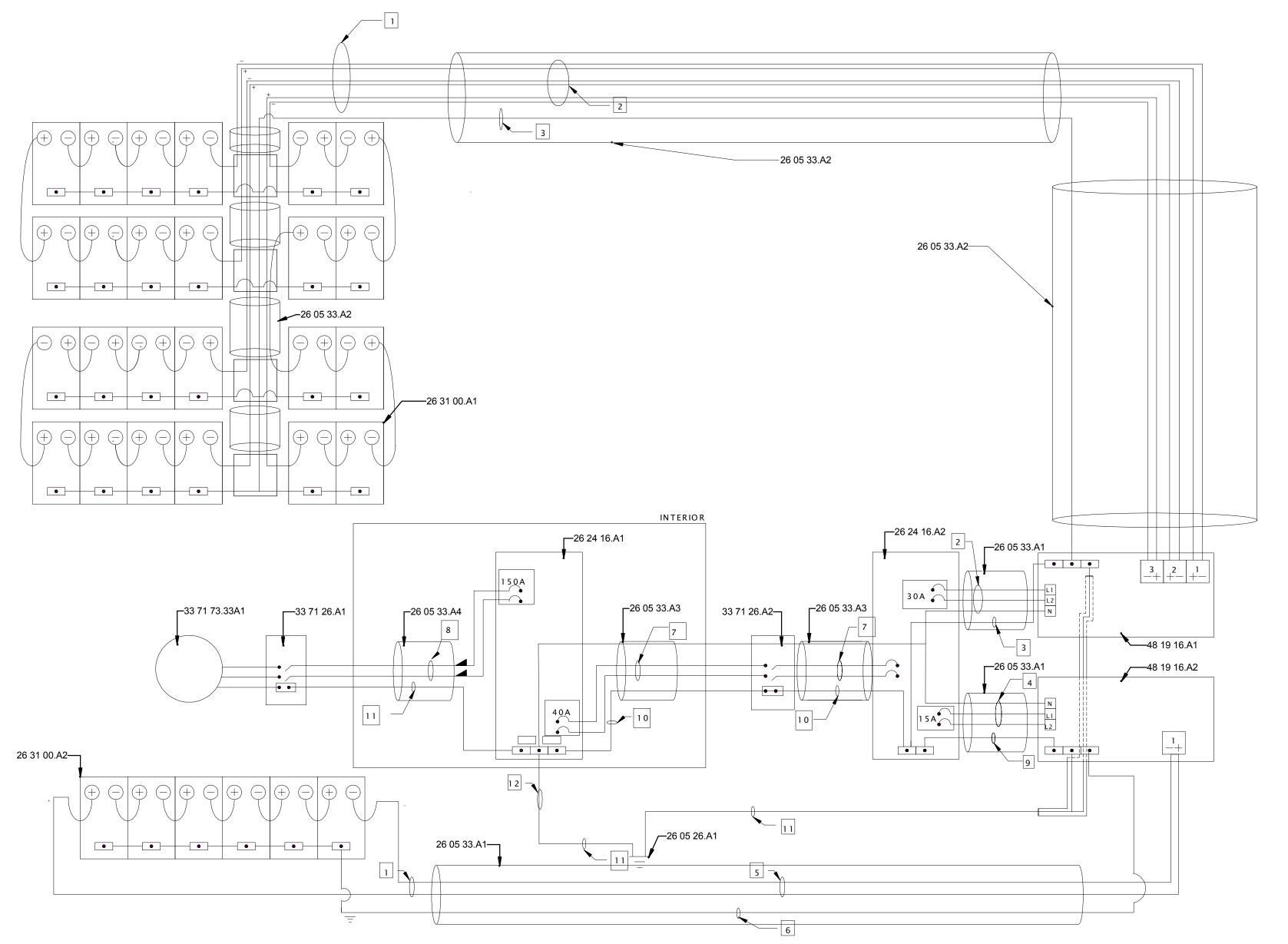
1H	8/11/2011	As Built Drawing Submission			
NRK	DATE	DESCRIPTION			
NUMBER: LOT #305					
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		AECAN DOREDTSON			

MEGAN ROBERTSON NONE: PROJECT IS

WIRE SCHEDULE DESCRIPTION MARK 10 AWG USE-2 10 AWG THWN-2 10 AWG SOLID CU BARE 14 AWG THWN-2 12 AWG THWN-2 12 AWG SOLID CU BARE 4 AWG THWN-2 2/0 SE CABLE 14 AWG SOLID CU BARE 10 8 AWG SOLID CU BARE 6 AWG SOLID CU BARE

4 AWG SOLID CU BARE

DESIGN CHOICES SUMMARY										
CIRCUIT	CONTINUOUS CURRENT (A)	MULTIPLIER	REQUIRED AMPACITY (A)	CONDUCTOR	AMBIENT TEMPERATURE (CELCIUS)	CONDUCTOR RATED AMPACITY (A)	CIRCUIT BREAKER RATING (A)	GROUNDING CONDUCTOR (A)	CONDUIT	CONDUCTORS IN RACEWAY
SANYO OUTPUT CIRCUIT	4.92	x 1.56	7.7	#12 THWN-2	45	17.4 A	15 (IN INVERTER)	#12 BARE CU	1/2" PVC	2
SUNPOWER OUTPUT CIRCUIT	6.19	x 1.56	9.7	#10 THWN-2	45	18.6 A	15 (IN INVERTER)	#10 BARE CU	3/4" PVC	6
KACO INVERTER OUTPUT CIRCUIT	8	x 1.25	10	#14 THWN-2	40 C	16.2 A	15	#14 BARE CU	1/2" PVC	3
SUNPOWER INVERTER OUTPUT CIRCUIT	20.8	x 1.25	26	#10 THWN-2	40 C	31.8 A	30	#10 BARE CU	1/2" PVC	3
COMBINER BOX TO PV AC DISCONNECT	15+30+40=1	.2R	70.8	#4 THWN-2	40 C	77.3 A	40	#8 BARE CU	1.25" PVC	3
PV AC DISCONNECT TO MAIN PANEL	15+30+40=1	.2R	70.8	#4 THWN-2	40 C	77.3 A	40	#8 BARE CU	1.25" PVC	3



### GENERAL SHEET NOTES

- 1.) REFER TO SHEET E-103 FOR DIMENSIONED PLACEMENT OF FIXTURES AND CIRCUIT DESIGNATIONS.
- COORDINATE PLACEMENT WITH ARCHITECTURAL FEATURES AS REQUIRED
- REFER TO SPECIFICATIONS FOR LAMP DETAILS AND INSTALLATION REQUIREMENTS.

SANYO MODULE: SPR MODULE: VOC = 68.7 V VOC = 48.2V ISC = 3.73 A ISC = 6.05A Vmp = 55.8 VVmp = 40.5VImp = 3.5 AImp = 5.68A

T\_LOW = -18.3 °C; T\_HIGH=33.6 °C

SANYO STRING: V\_OC-MAX = 6\*[69.5 + 0.192(25+18.3)]= 466.9 V  $I\_SC-MAX = 4.85+0.0017(33.6-25)] = 4.86 A$ 

SUNPOWER STRING: V\_OC-MAX = 8\*[48.2 + 0.1325(25+18.3)]= 431.5 V  $I\_SC-MAX = 6.05+0.0035(33.6-25)] = 6.08 A$ 

5.) KACO INVERTER MAX VOLTAGE = 600V INVERTER MAX CURRENT = 8A @ 240V

> SUNPOWER INVERTER MAX VOLTAGE = 600V INVERTER MAX CURRENT = 20.8A @ 240V

6.) ALL EXTERIOR MOUNTED ELECTRICAL ENCLOSURES MEET NEMA 3R OR EQUIVALENT.



TEAM NAME: ADDRESS:

UNIVERSITY OF ILLINOIS 611 LORADO TAFT DR. CHAMPAIGN, IL 61820

SOLARDECATHLON@UIUC.EDU CONTACT: WWW.SOLARDECATHLON.ILLINOIS.EDU

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## REFERENCE KEYNOTES

GROUNDING ROD 26 05 26.A1 26 05 33.A1 1/2" SCH 40 PVC 26 05 33.A2 3/4" SCH 40 PVC 26 05 33.A3 1 1/4" SCH 40 PVC 26 05 33.A4 2 1/4" SCH 40 PVC 26 24 16.A1 200A MAIN PANEL 26 24 16.A2 100A SUB PANEL 26 31 00.A1 SUNPOWER E18/230 SOLAR PANEL 26 31 00.A2 SANYO HIT DOUBLE 195

48 19 16.A2 KACO 1502XI INVERTER

33 71 26.A1 200A UTILITY AC DISCONNECT 33 71 26.A2 100A PV AC DISCONNECT 33 71 73.33A1 200A ELECTRIC UTILITY METER 48 19 16.A1 SUNPOWER 5000M INVERTER

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MR	3/18/2011	DOE CD Submission
MC	5/2/2011	Drawings updated per CD
		comments from John Wiles
MH	8/11/2011	As Built Drawing Submission
MARK	DATE	DESCRIPTION

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THREE-LINE DIAGRAM

E-602

6

5//////

7//////

THREE LINE DIAGRAM

2//////

3/////.

