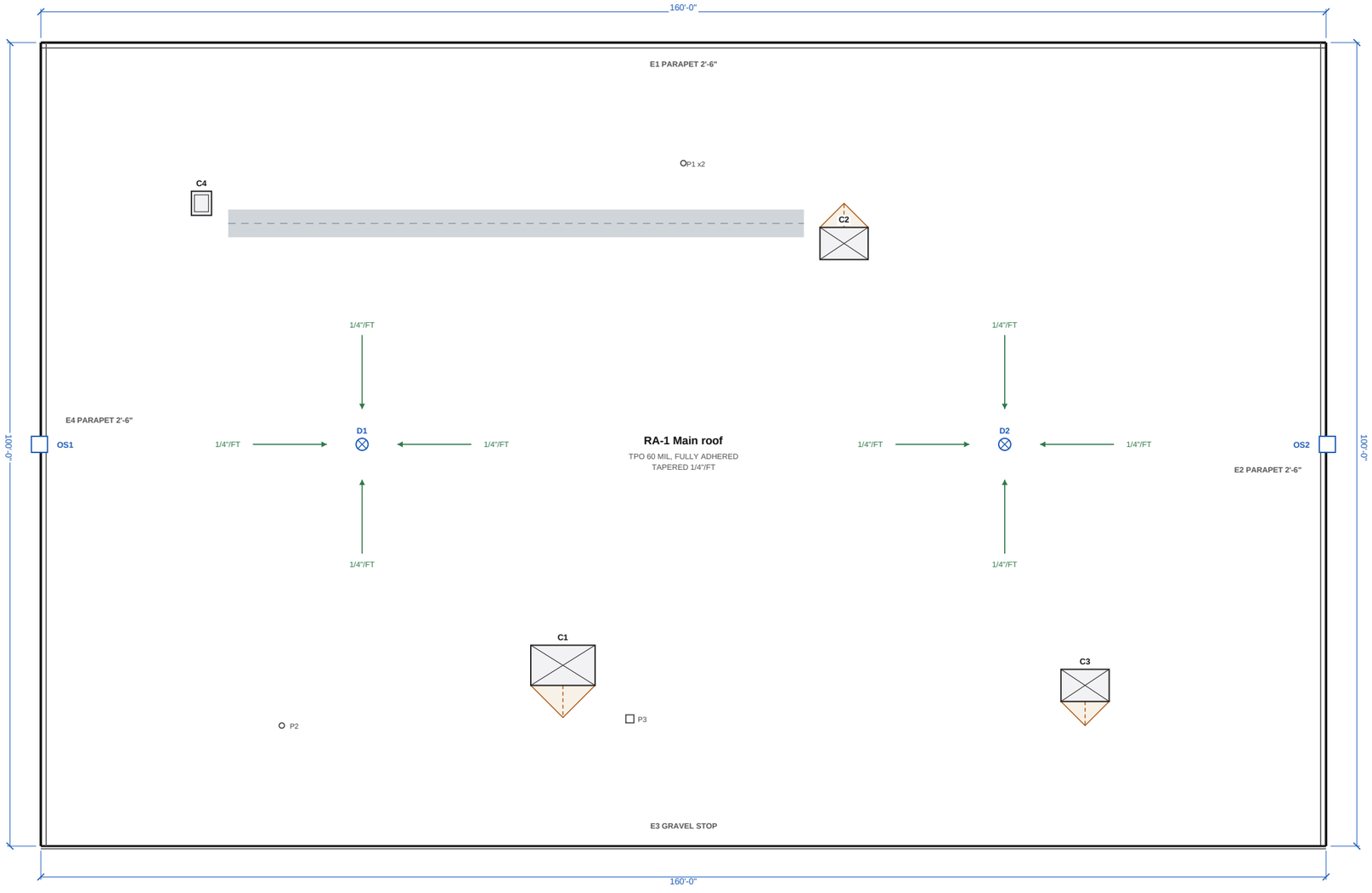


1 ROOF PLAN

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

- Roof area (RA-n); E1, E2... its edges (edge schedule)
- Roof drain D-n (double ring: overflow drain OD-n)
- Scupper SC-n (open: overflow OS-n)
- Curb C-n (RTU, hatch, skylight, fan)
- Slope to the drain
- Expansion joint
- Cricket

PREPARED BY

PROJECT

Sample Retail Building, TPO roof

Client: Sample Retail Co.

NOTICE

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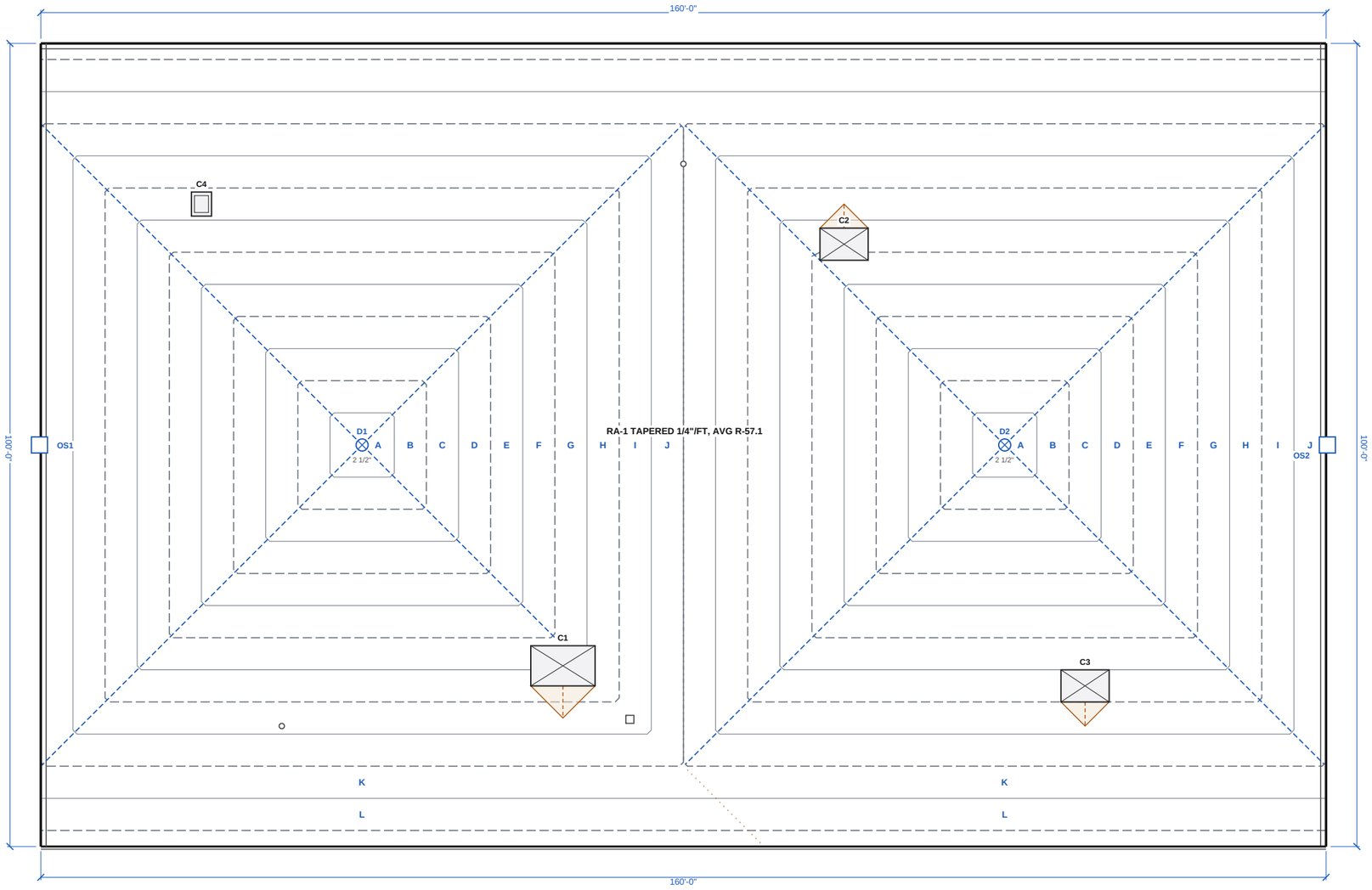
SCALE
1/16" = 1'-0"

DRAWN BY

SHEET SIZE
ANSI B (11" x 17")

SHEET TITLE
ROOF PLAN

A7-1



1 TAPERED INSULATION PLAN

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

- Panel row (every 4'-0" along the slope); A, B, C... the panel marks (schedule)
- Panel row where a flat fill layer starts
- Valley into a drain or scupper
- Saddle (high line between drains)
- Cricket (upslope side of a curb, or between drains)
- Number at a drain: the insulation there

PREPARED BY

PROJECT

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Client: Sample Retail Co.

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1/16" = 1'-0"

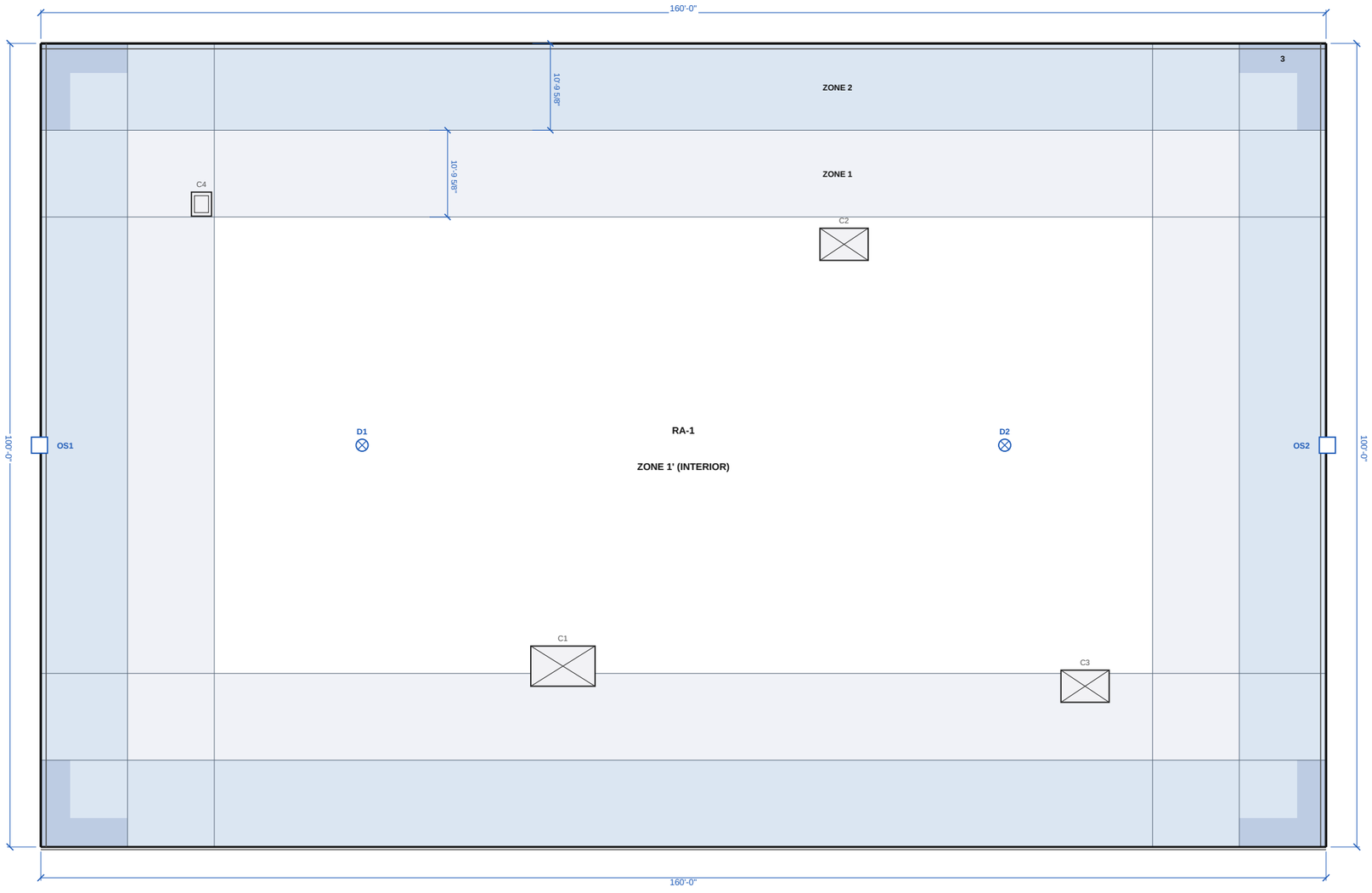
DRAWN BY

SHEET SIZE
ANSI B (11" x 17")

SHEET TITLE

TAPERED INSULATION PLAN

A7-2



1 **ATTACHMENT ZONE PLAN**

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

- Zone 1', interior field (beyond 1.2h)
- Zone 1, field (0.6h to 1.2h from the edges)
- Zone 2, perimeter (0.6h along the edges and parapets)
- Zone 3, corners (L, 0.6h by 0.2h; ASCE 7-16)
- Fastening and adhesive per zone: the attachment schedule

PREPARED BY

PROJECT

Sample Retail Building, TPO roof

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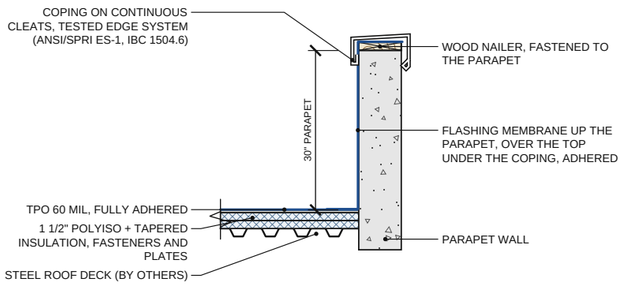
SCALE
1/16" = 1'-0"

DRAWN BY

SHEET SIZE
ANSI B (11" x 17")

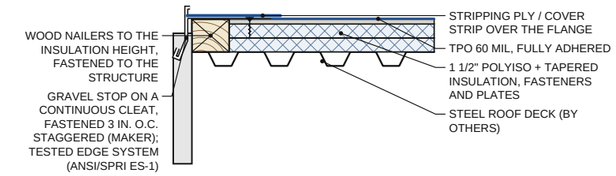
SHEET TITLE
ATTACHMENT ZONE PLAN

A7-3



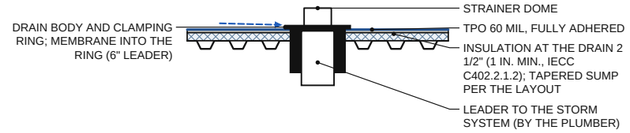
1 PARAPET WITH COPING (RA-1) NTS

REF: IBC 2021 1503.2, 1504.6 (ANSI/SPRI ES-1)



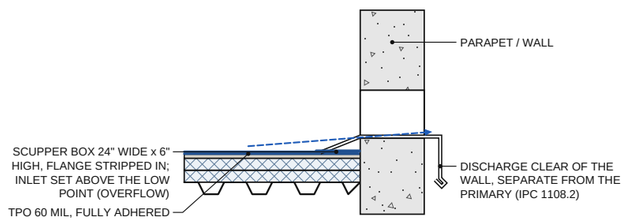
2 GRAVEL STOP AT THE ROOF EDGE (RA-1) NTS

REF: IBC 2021 1504.6 (ANSI/SPRI ES-1)



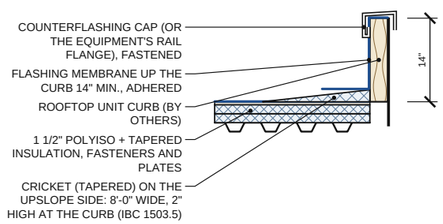
3 ROOF DRAIN (D1) NTS

REF: IBC 2021 1502; IPC 1106, 1108; IECC 2021 C402.2.1.2



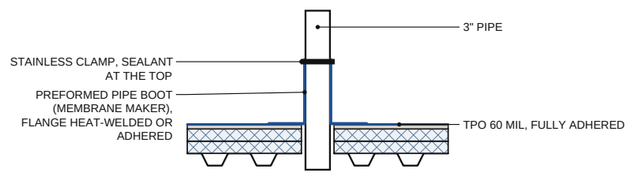
4 OVERFLOW SCUPPER THROUGH THE PARAPET (OS1) NTS

REF: IBC 2021 1502.3 (4 in. min.)



5 CURB FLASHING AND CRICKET (C1) NTS

REF: IBC 2021 1503.5



6 PIPE BOOT (P1) NTS

REF: Membrane maker's pipe flashing detail

Typical detail, not to scale. Not an engineered design: verify with your building department and the manufacturer's installation instructions.

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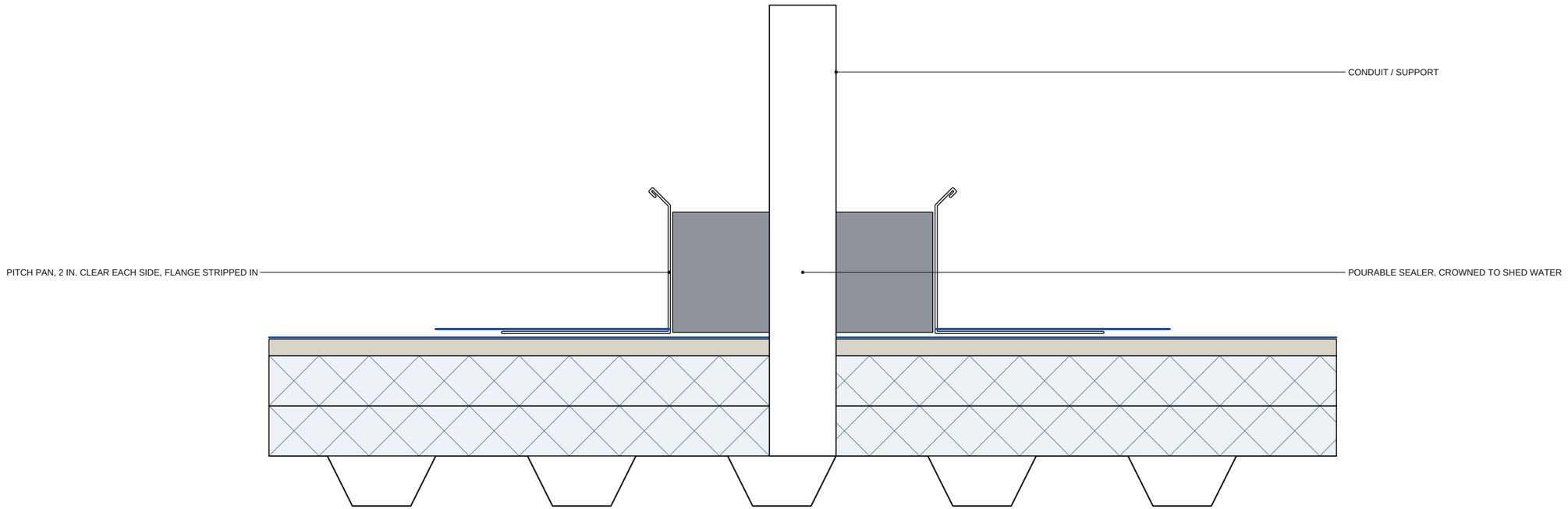
SCALE **NTS**

DRAWN BY

SHEET SIZE **ANSI B (11" x 17")**

SHEET TITLE **DETAILS**

A7-4



7 **PITCH PAN (P3)** NTS

REF: Membrane maker's pitch pan detail

Typical detail, not to scale. Not an engineered design: verify with your building department and the manufacturer's installation instructions.

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NTS

DRAWN BY

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ANSI B (11" x 17")

SHEET TITLE
DETAILS

A7-5

TAPERED INSULATION BY MARK (RA-1: 2 PANELS T1-T2 A CYCLE, 1/2" START, 2" FILL)

AREA	MARK	PANEL	FLAT FILL UNDER	THICKNESS	SF	4x4 PANELS	FILL BOARDS
RA-1	**A**	T1	-	1/2" to 1 1/2"	128	9	0
RA-1	**B**	T2	-	1 1/2" to 2 1/2"	384	27	0
RA-1	**C**	T1	1 x 2"	2 1/2" to 3 1/2"	640	44	22
RA-1	**D**	T2	1 x 2"	3 1/2" to 4 1/2"	896	62	31
RA-1	**E**	T1	2 x 2"	4 1/2" to 5 1/2"	1,152	80	80
RA-1	**F**	T2	2 x 2"	5 1/2" to 6 1/2"	1,402	97	97
RA-1	**G**	T1	3 x 2"	6 1/2" to 7 1/2"	1,625	112	168
RA-1	**H**	T2	3 x 2"	7 1/2" to 8 1/2"	1,870	129	193
RA-1	**I**	T1	4 x 2"	8 1/2" to 9 1/2"	2,176	150	300
RA-1	**J**	T2	4 x 2"	9 1/2" to 10 1/2"	2,432	168	335
RA-1	**K**	T1	5 x 2"	10 1/2" to 11 1/2"	1,280	88	220
RA-1	**L**	T2	5 x 2"	11 1/2" to 12 1/2"	1,280	88	220
RA-1	**M**	T1	6 x 2"	12 1/2" to 13 1/2"	640	44	132

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SHEET SIZE
ANSI B (11" x 17")

SHEET TITLE
INSULATION SCHEDULE

A7-6

INSULATION ASSEMBLIES (R: TYPICAL R PER INCH; TAPERED LAYERS AT THEIR AVERAGE THICKNESS, IECC C402.2.1.1)

AREA	ASSEMBLY	VAPOR RETARDER	FLAT LAYERS	TAPER	COVER BOARD	AVG R	R AT DRAINS
RA-1	IA-1	None	1 1/2" polyiso	Tapered 1/4" per ft, 1/2" to 12 15/16" (avg 8 1/16")	High-density polyiso cover board 1/2 in.	57.1	13.9

DRAINS AND SCUPPERS

TAG	AREA	TYPE	SIZE	BODY / OUTLET	CAPACITY
D1	RA-1	Primary drain	6" leader	New drain body, clamping ring	538 gpm (Table 1106.2 leader)
D2	RA-1	Primary drain	6" leader	New drain body, clamping ring	538 gpm (Table 1106.2 leader)
OS1	RA-1	Overflow scupper	24" x 6" at E4	Through the parapet	203 gpm (weir, 2" head)
OS2	RA-1	Overflow scupper	24" x 6" at E2	Through the parapet	203 gpm (weir, 2" head)

CURBS

TAG	AREA	TYPE	SIZE	HEIGHT	CRICKET (UPSLOPE SIDE)
C1	RA-1	Rooftop unit curb	8'-0" x 5'-0"	14"	8'-0" wide, 4'-0" long, 2" high
C2	RA-1	Rooftop unit curb	6'-0" x 4'-0"	14"	6'-0" wide, 3'-0" long, 1 1/2" high
C3	RA-1	Rooftop unit curb	6'-0" x 4'-0"	14"	6'-0" wide, 3'-0" long, 1 1/2" high
C4	RA-1	Roof hatch	2'-6" x 3'-0"	12"	-

EDGES AND SHEET METAL

AREA	EDGE	KIND	LF	HEIGHT	SHEET METAL
RA-1	E1	Parapet with coping	160	30"	Coping with cleats
RA-1	E2	Parapet with coping	100	30"	Coping with cleats
RA-1	E3	Gravel stop / edge metal	160	-	Edge metal with continuous cleat
RA-1	E4	Parapet with coping	100	30"	Coping with cleats

PENETRATIONS

TAG	AREA	TYPE	QTY	DIA.
P1	RA-1	Pipe (boot)	2	3"
P2	RA-1	Plumbing vent (boot)	1	4"
P3	RA-1	Conduit / cable (pitch pan)	1	2"

ATTACHMENT BY ZONE (THE MAKER'S RATES FOR THE LISTED ASSEMBLY; TYPICAL HERE)

AREA	ZONE	SF	MEMBRANE ATTACHMENT	INSULATION ATTACHMENT
RA-1	Interior field (zone 1')	6,629	fully adhered	1658 (8 per 4x8 board)
RA-1	Field (zone 1)	4,178	fully adhered	1045 (8 per 4x8 board)
RA-1	Perimeter (zone 2)	4,847	fully adhered	1818 (12 per 4x8 board)
RA-1	Corner (zone 3)	250	fully adhered	126 (16 per 4x8 board)

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ANSI B (11" x 17")

SHEET TITLE

ROOF SCHEDULES

A7-7

BUY LIST (GENERIC PRODUCTS AT THE CONTRACTOR'S PRICES; INSTALL HOURS)

GROUP	ITEM	QTY	EACH	MATERIAL	HOURS
Insulation	Flat roof insulation (board feet: sf x inches)	23,857 bf	$0	$7,634	0
Insulation	Tapered insulation and flat fill (board feet)	141,424 bf	$0	$59,398	0
Insulation	Crickets and saddles (tapered, sf)	34 sf	$2	$75	1
Insulation	Cover board / recovery board	16,700 sf	$1	$18,370	167
Insulation	Insulation fasteners and plates	4,647 each	$0	$2,091	46.5
Insulation	Adhesive (insulation, bonding or cold adhesive)	467 gal	$38	$17,746	23.4
Membrane	TPO membrane, fully adhered	179.9 sq	$230	$41,377	539.7
Membrane	Seam tape, primer and edge sealant (seams)	1,791 LF	$1	$1,075	0
Membrane	Flashing membrane at parapets, walls and curbs	1,460 sf	$3	$3,650	58.4
Flashing & sheet metal	Edge metal (gravel stop / drip edge) with continuous cleat	160 LF	$9	$1,440	12.8
Flashing & sheet metal	Coping with cleats and joint covers	360 LF	$18	$6,480	54
Drains & penetrations	Roof drain clamping ring / retrofit drain	2 each	$220	$440	6
Drains & penetrations	Overflow scupper	2 each	$180	$360	5
Drains & penetrations	Curb flashing (membrane up the curb, counterflashing cap)	4 each	$120	$480	12
Drains & penetrations	Pipe boot	3 each	$35	$105	1.5
Drains & penetrations	Pitch pan with sealer	1 each	$55	$55	1
Accessories	Walkway pads	72 LF	$9	$648	4.3
Safety & access	Warning line and stanchions	520 LF	$1	$624	10.4
Safety & access	Hoist / conveyor	4 day	$350	$1,400	0
TOTAL				$163,448	943

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ANSI B (11" x 17")

SHEET TITLE
BUY LIST

A7-8

CHECKS AND NOTES

RESULT	WHAT	CHECK
CHECKS, NOT A CERTIFICATION. SOURCES: IBC 2021 CH. 15, IPC CH. 11 (AS ADOPTED), IECC 2021 C402		
NOTE	RA-1 Main roof	Fully adhered: the fastening or adhesive rates per zone are the maker's for the listed assembly at the zone design pressures (IBC 1504.4); typical values here.
NOTE	Roof wind	ASCE 7-16 low-slope zones (h 18'-0"): zone 2 10'-9 5/8" (0.6h) along the roof edges and parapets, zone 1 the next 10'-9 5/8", zone 1' beyond 21'-7 1/4" (1.2h), zone 3 an L at outside corners (10'-9 5/8" legs, 3'-7 1/4" wide); not along walls of a taller roof. ASCE 7 governs.
OK	RA-1 Main roof	Slope 1/4" per ft meets the 1/4" per ft minimum for TPO (IBC 1507.12.1).
OK	RA-1 Main roof	2 overflow drains or scuppers for the secondary drainage (IBC 1502.2).
OK	RA-1 Main roof	Primary drainage 1076 gpm for 333 gpm (2 in/h).
OK	RA-1 Main roof	Overflow drainage 407 gpm for 333 gpm.
OK	RA-1 Main roof	Average R-57.1 (the tapered layers at their average thickness, C402.2.1.1) meets R-35ci (zone 7).
OK	RA-1 Main roof	Insulation at the drains 2 1/2" (R-13.9) meets the 1 in. minimum at the lowest point (C402.2.1.2).
OK	C1 RA-1 Main roof	Cricket on the upslope side, 8'-0" wide (IBC 1503.5).
OK	C2 RA-1 Main roof	Cricket on the upslope side, 6'-0" wide (IBC 1503.5).
OK	C3 RA-1 Main roof	Cricket on the upslope side, 6'-0" wide (IBC 1503.5).
OK	Edge metal	Edge metal and copings marked as tested per ANSI/SPRI ES-1 (IBC 1504.6).
OK	Roof wind	Listed uplift rating 75 psf covers the zone pressures (zone 1' 16, zone 1 28, zone 2 46, zone 3 64 psf).
OK	Fire classification	Listed class A meets the required class B (typed).

GENERAL NOTES

NO.	NOTE
1	Verify the roof dimensions, the deck, the drains and the curbs in the field before ordering. Quantities on the buy list are from the layout shown, with the laps and waste listed.
2	Roof system, insulation attachment and membrane attachment per the membrane maker's published requirements for the listed assembly at the zone design pressures the engineer gives (IBC 1504.4); the fastening and adhesive rates shown are typical.
3	Tapered insulation: the panel marks on the tapered plan; every panel row is the panel width along the slope; crickets on the upslope side of curbs and between drains on a sloped deck. Thickness at the drains not under 1 in. (IECC C402.2.1.2).
4	Edge metal and copings: a system tested per ANSI/SPRI ES-1 (IBC 1504.6). Flashings, edgings and drain outlets that are rusted or damaged are not reinstalled (IBC 1512.4).
5	Drains, leaders and the overflow discharge by the plumbing contractor unless noted; overflow drains and scuppers discharge separately from the primary system.
6	The checks in this set flag the code sections named. They are not a certification: the building department, the engineer and the project documents govern.

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SHEET TITLE
CHECKS AND NOTES

A7-9

SHEET 9 OF 9