

union™

Tempe Apartments

Exterior Signage - City Submittal

110 University Dr. Tempe, AZ

February 19, 2018

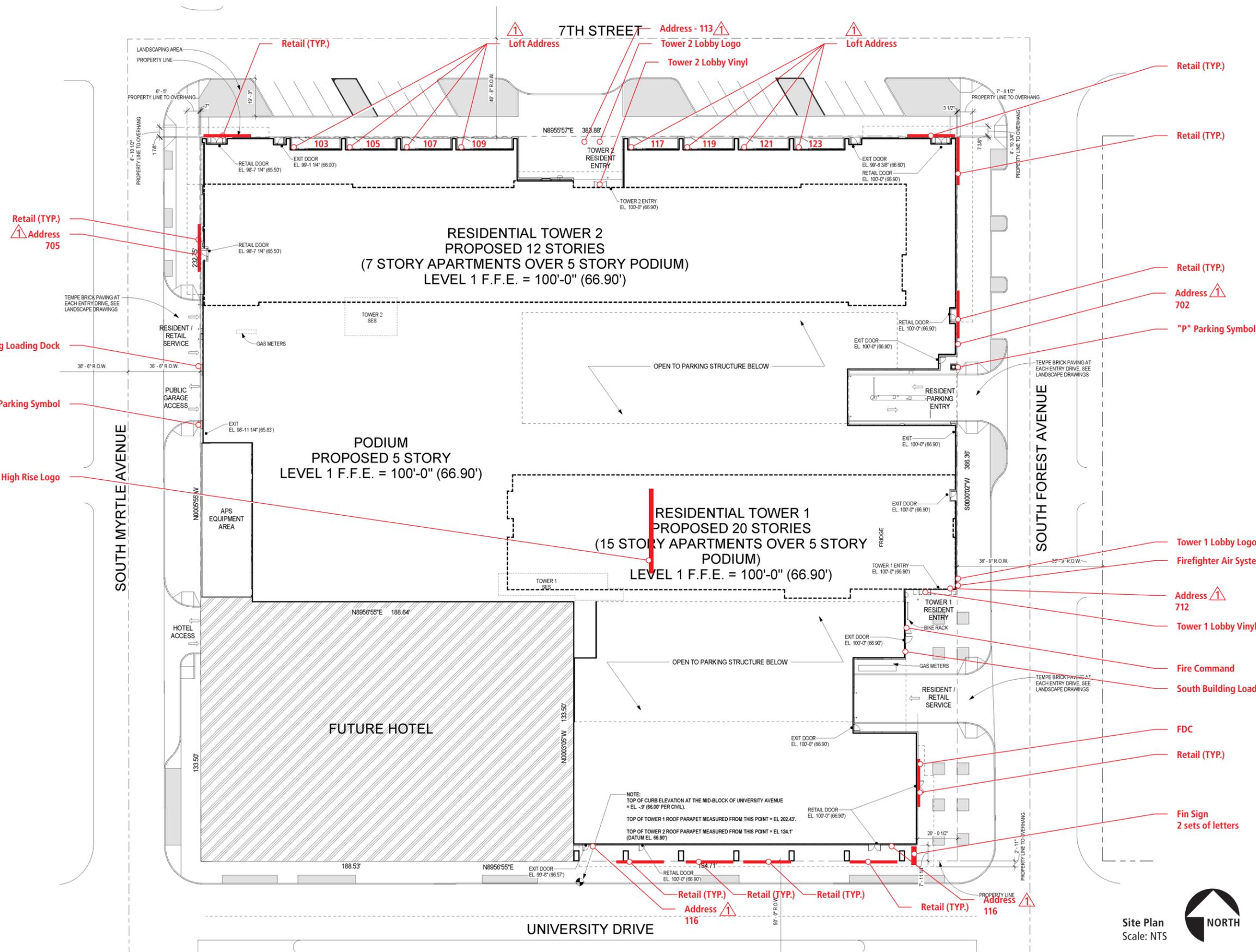
1 February 23, 2018

2 March 2, 2018

September 7, 2018 - Raceway and Retail updates

SMITHCRAFT
CUSTOM ARCHITECTURAL SIGNS

602.268.1349
3643 S. 7th Street, Phoenix, AZ 85040

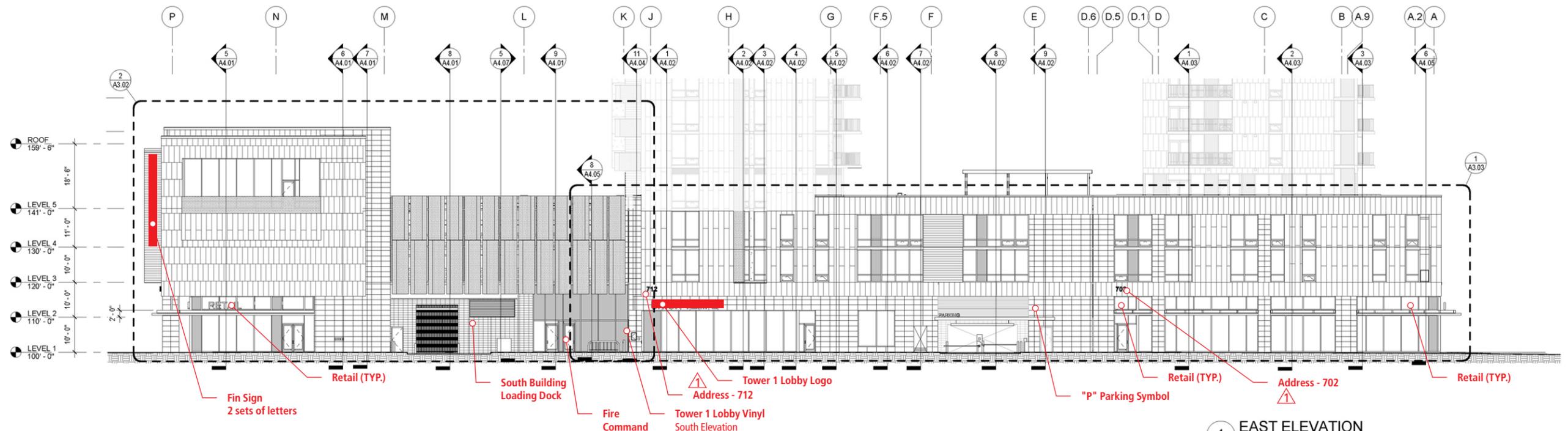


Site Plan
Scale: NTS

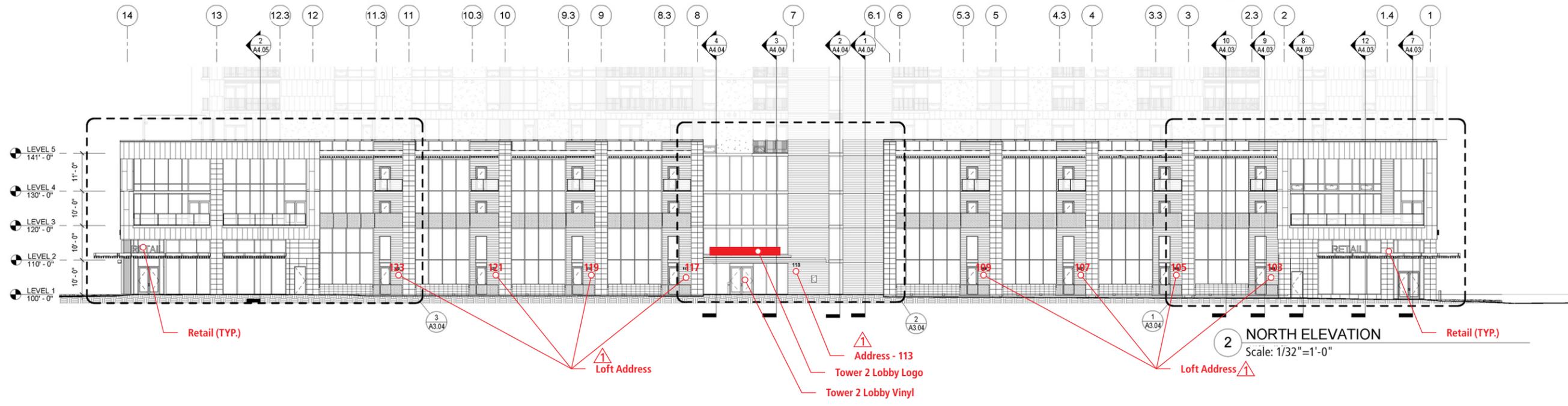


RETAIL UPDATED 9/7/18

4/5/18
PRODUCTION RELEASE



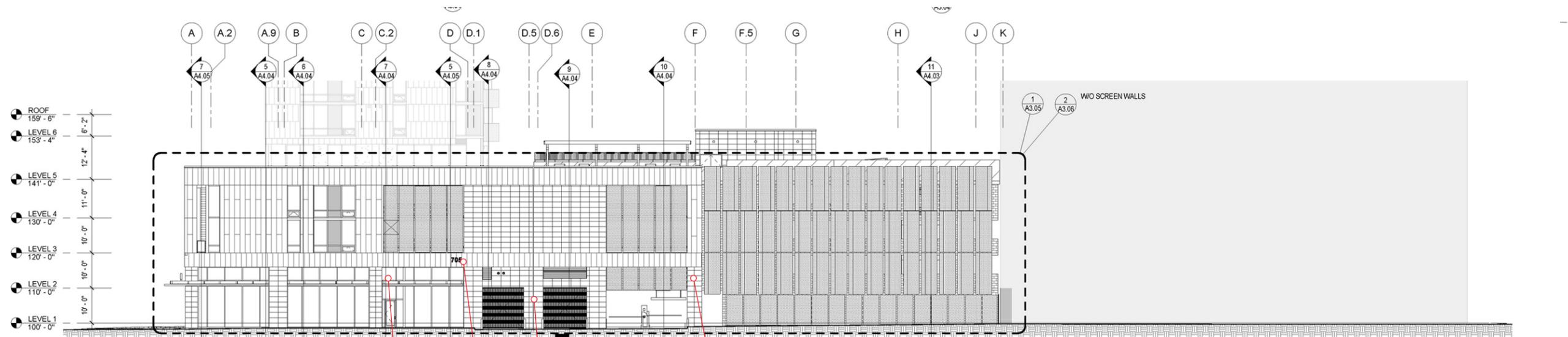
1 EAST ELEVATION
Scale: 1/32" = 1'-0"



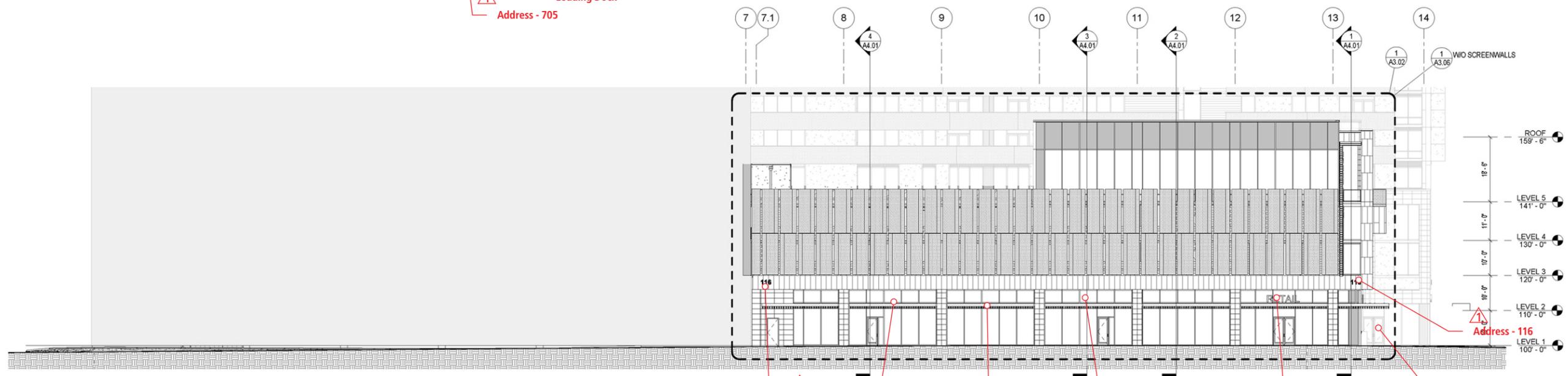
2 NORTH ELEVATION
Scale: 1/32" = 1'-0"

RETAIL UPDATED 9/7/18

4/5/18
PRODUCTION RELEASE



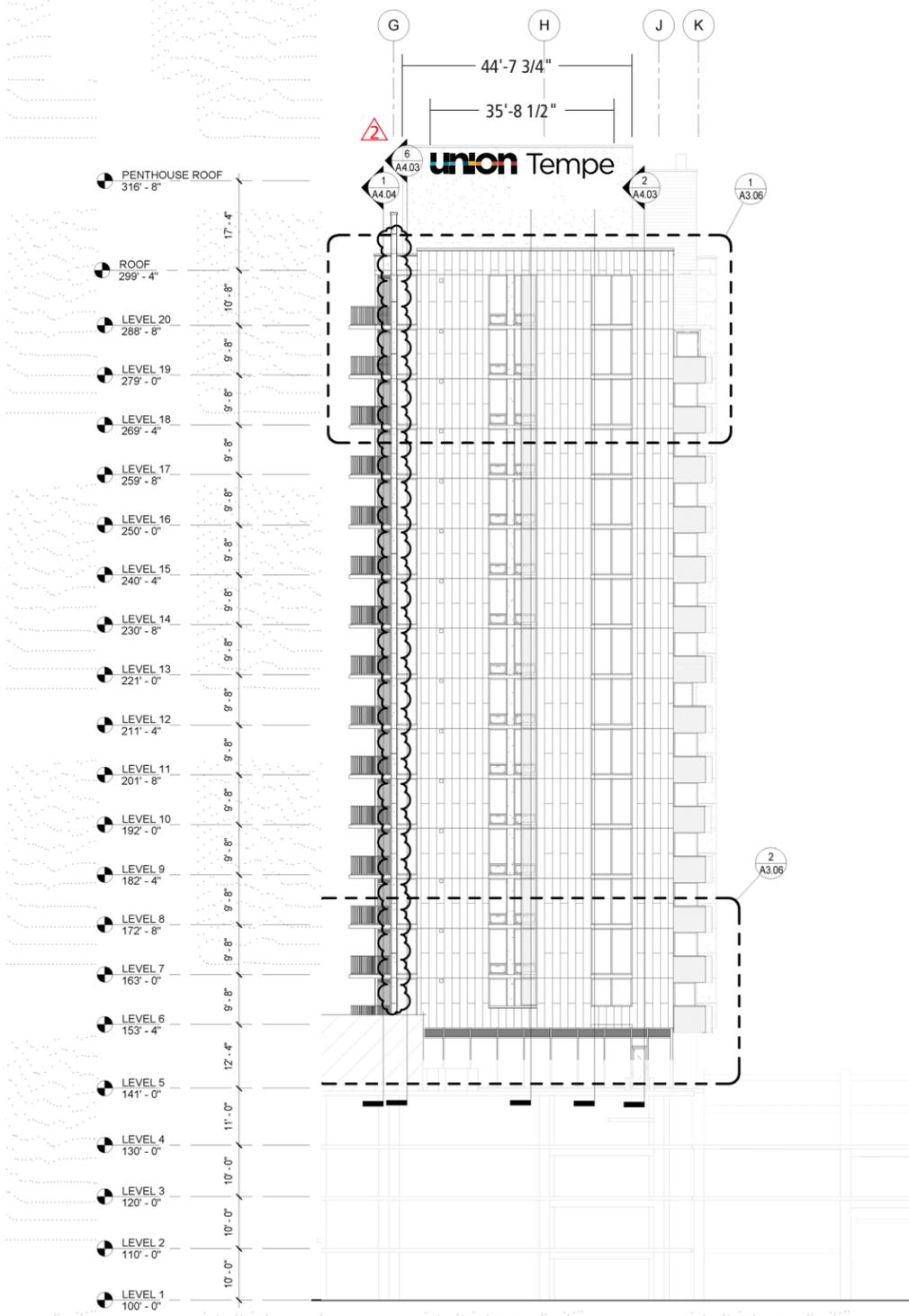
3 WEST ELEVATION
Scale: 1/32"=1'-0"



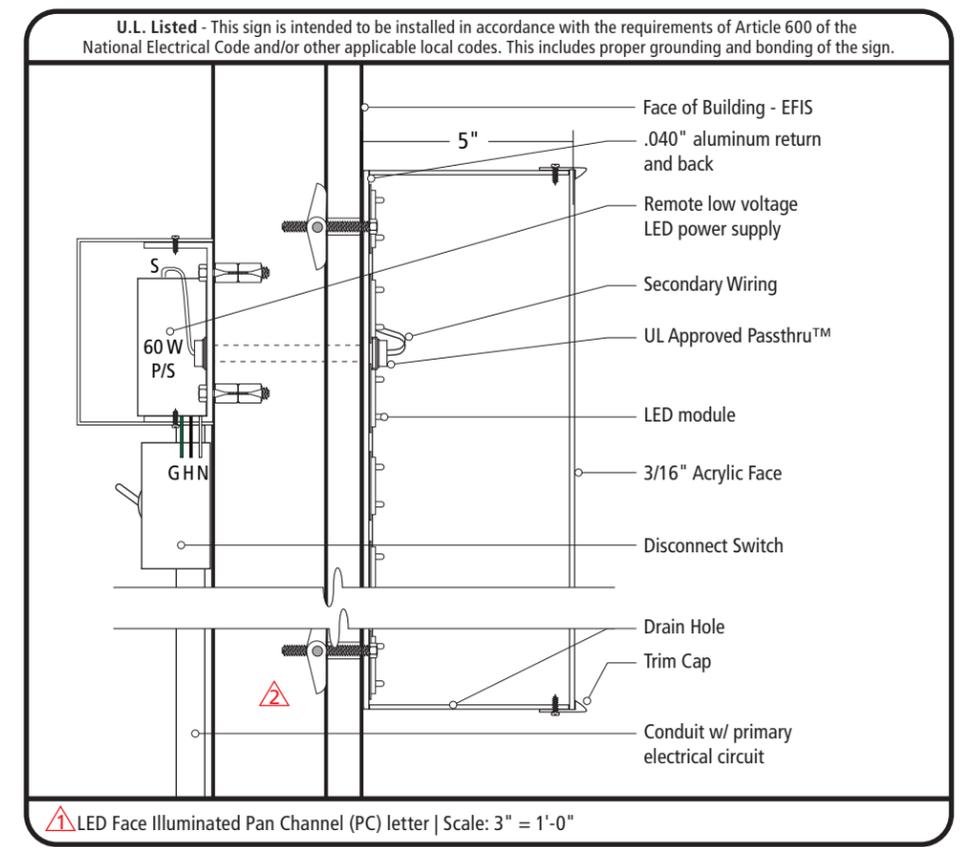
4 SOUTH ELEVATION
Scale: 1/32"=1'-0"

RETAIL UPDATED 9/7/18

4/5/18
PRODUCTION RELEASE

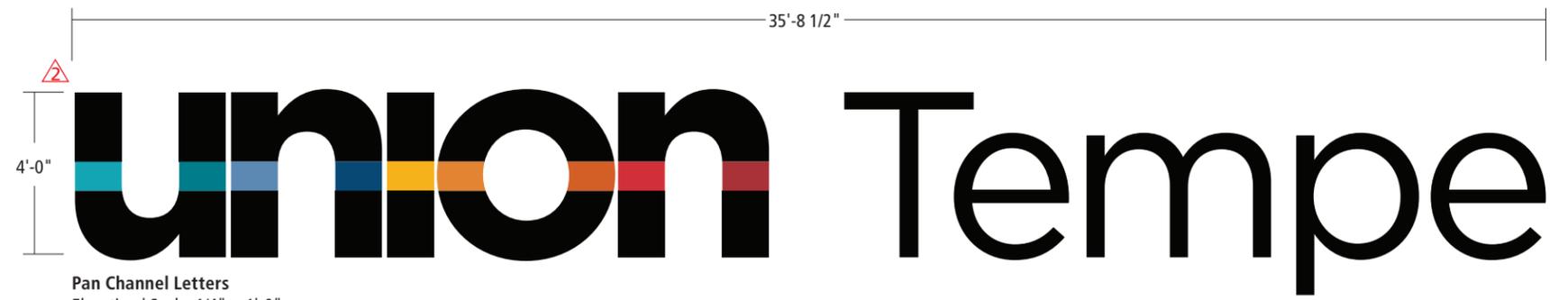


Res Tower 1
West Elevation | Scale: 1/32" = 1'-0"



LED Face Illuminated Pan Channel (PC) letter | Scale: 3" = 1'-0"

**CITY OF TEMPE REQUIREMENT
DIMMABLE LEDS WITH DIMMABLE POWER SUPPLIES
ON ALL FACE LIT LETTERS**

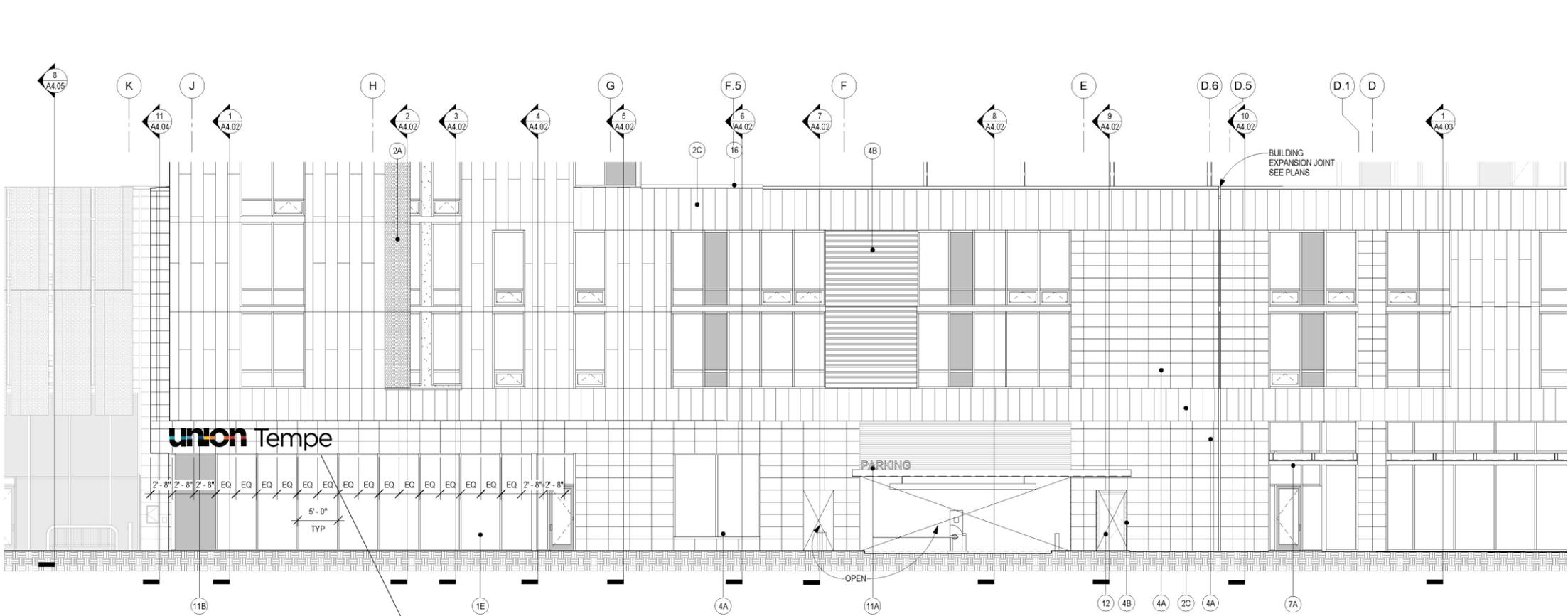


Pan Channel Letters
Elevation | Scale: 1/4" = 1'-0"

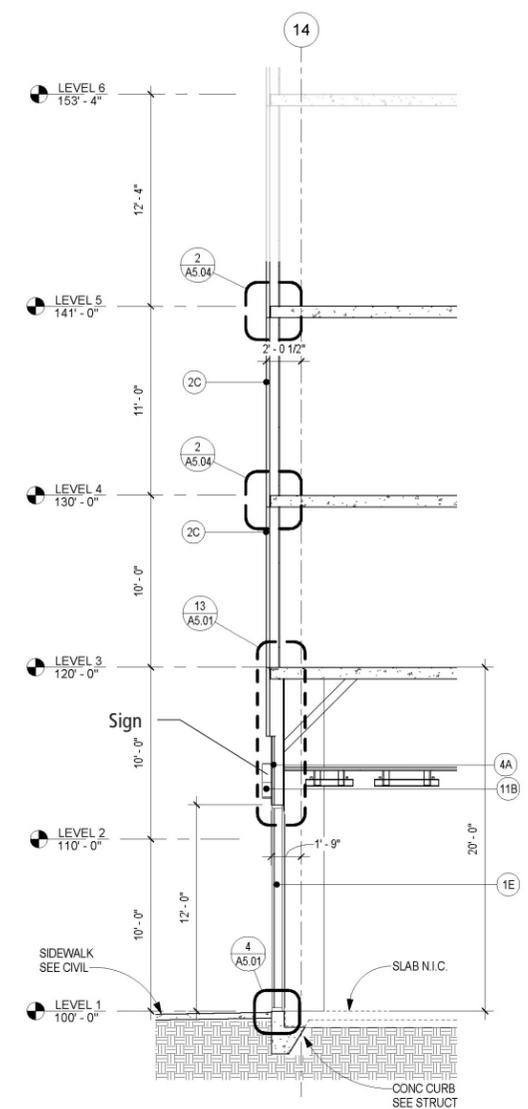
Manufacture and Install One (1) set of Pan Channel Letters - Illuminated - **142.83 sq. ft.**

5" deep fabricated pan channel letters with black returns and backs. Black trim cap.
3/16" white acrylic faces with 3M black perf vinyl. Digitally print translucent vinyl for logo colors, applied 1st surface.
Internal White LEDs with remote power supplies.
Mount to wall.

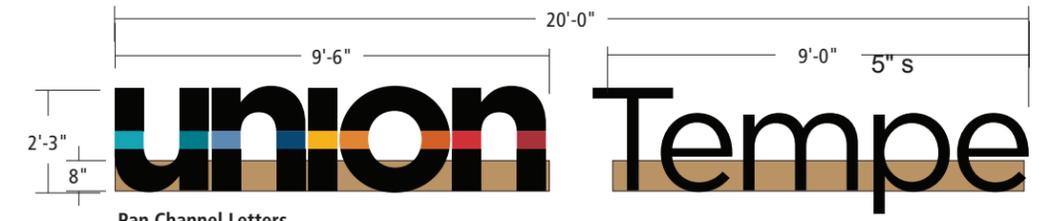
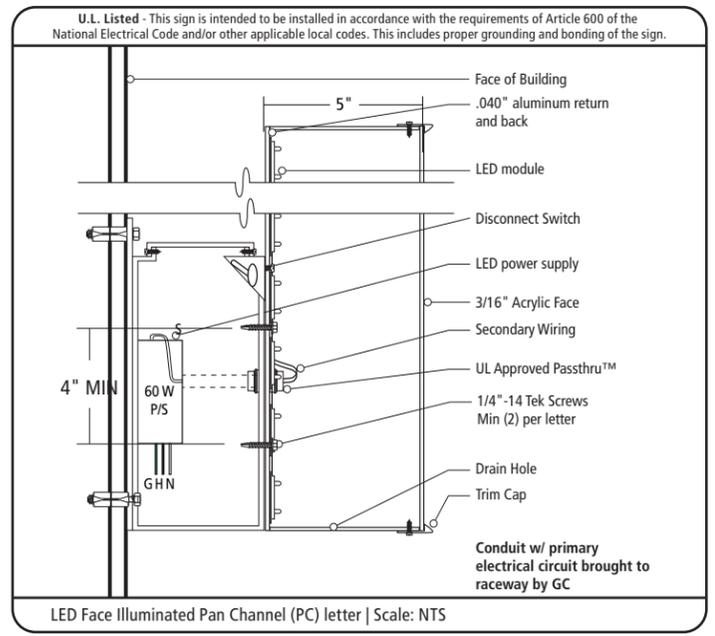
**4/5/18
PRODUCTION RELEASE**



Podium - Tower 1
East Elevation | Scale: 1/16" = 1'-0"



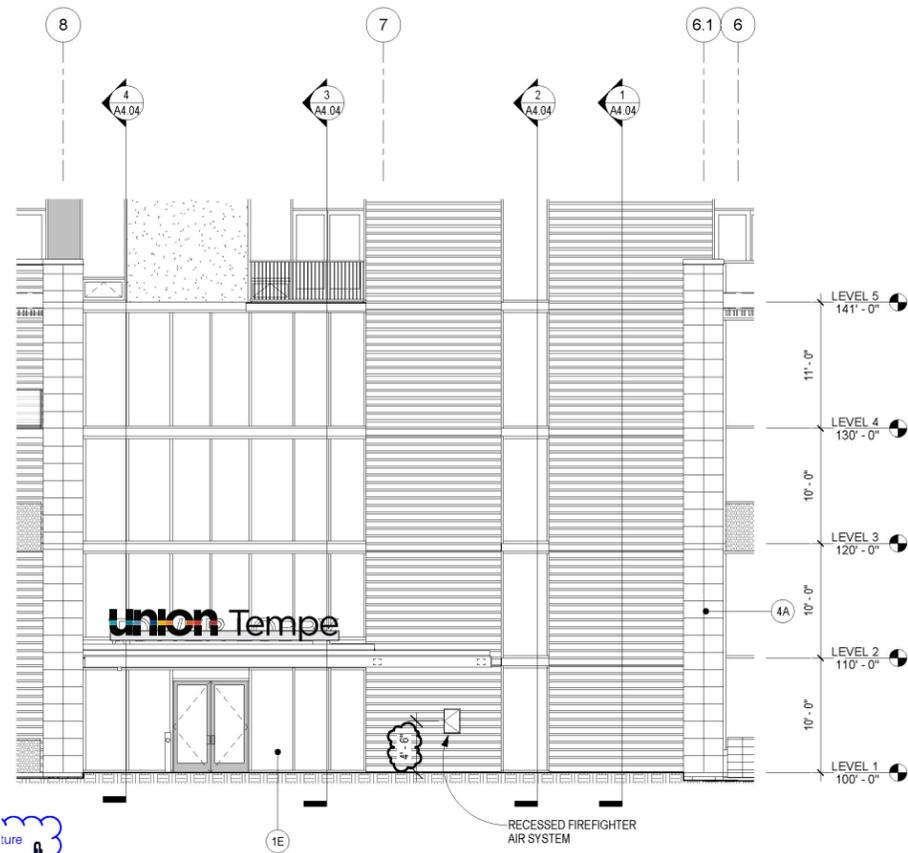
1 WALL SECTION - EAST
Scale: 3/32" = 1'-0" (REF. 1/ A2.01)



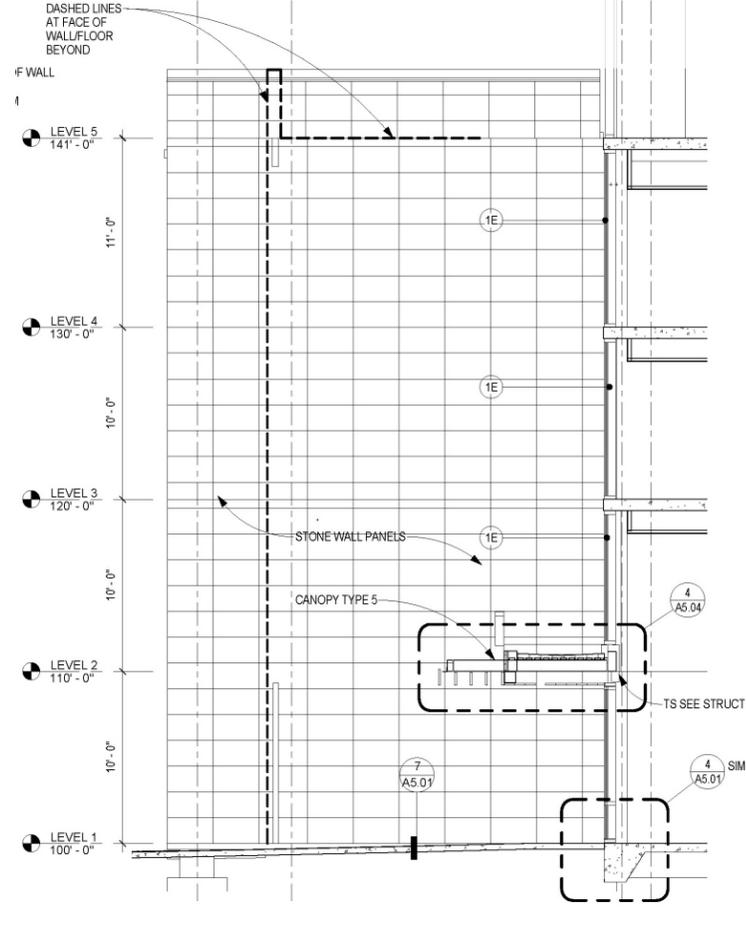
Pan Channel Letters
Elevation | Scale: 1/4" = 1'-0"

5" deep aluminum pan channel letters with black returns and backs. Black tripcap. 3/16" white acrylic faces with 3M black perf vinyl. Digitally printed translucent vinyl for logo colors, applied first surface. Internal White LEDs with power supplies. Letters mount to 8" x 4" deep raceway painted to match stone wall color. Benjamin Moore Classic Caramel 1118. Flush mount race to wall

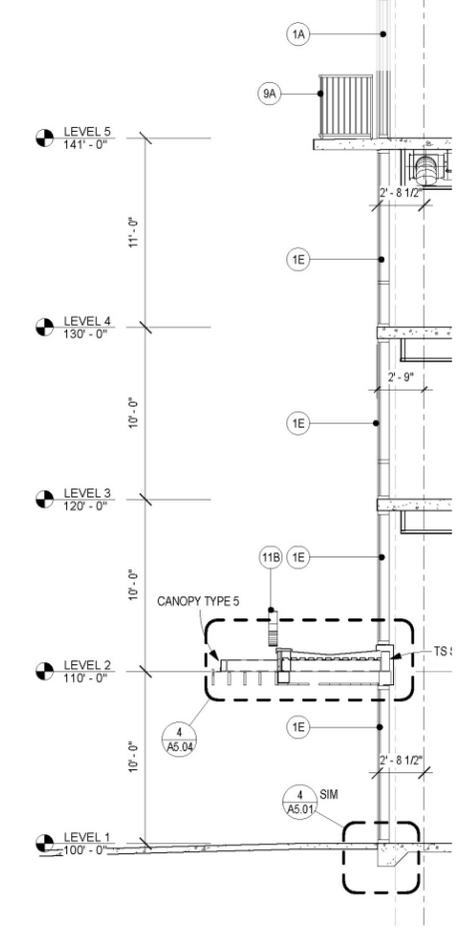
9/13/18
PRODUCTION RELEASE



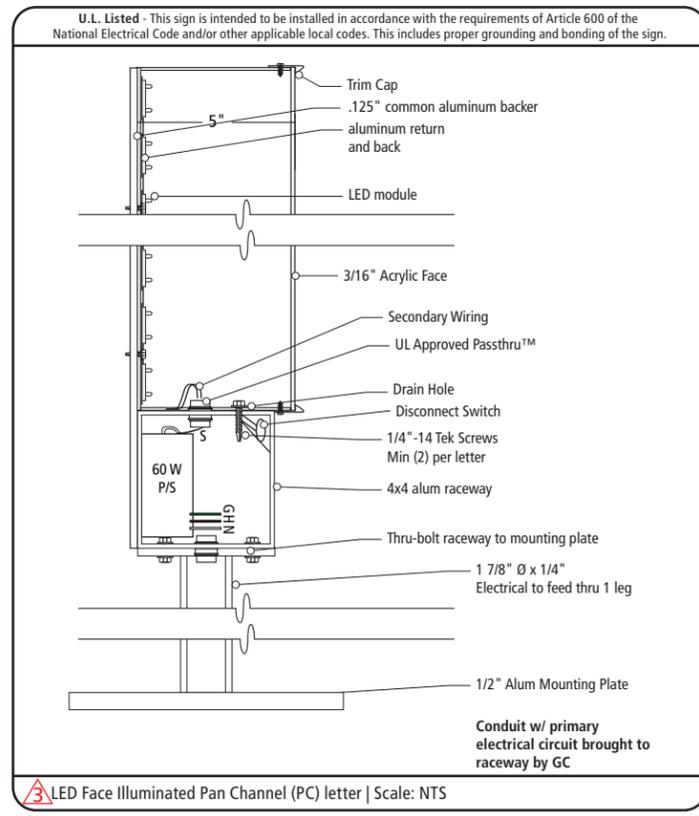
Podium - Tower 2
North Elevation | Scale: 1/16" = 1'-0"



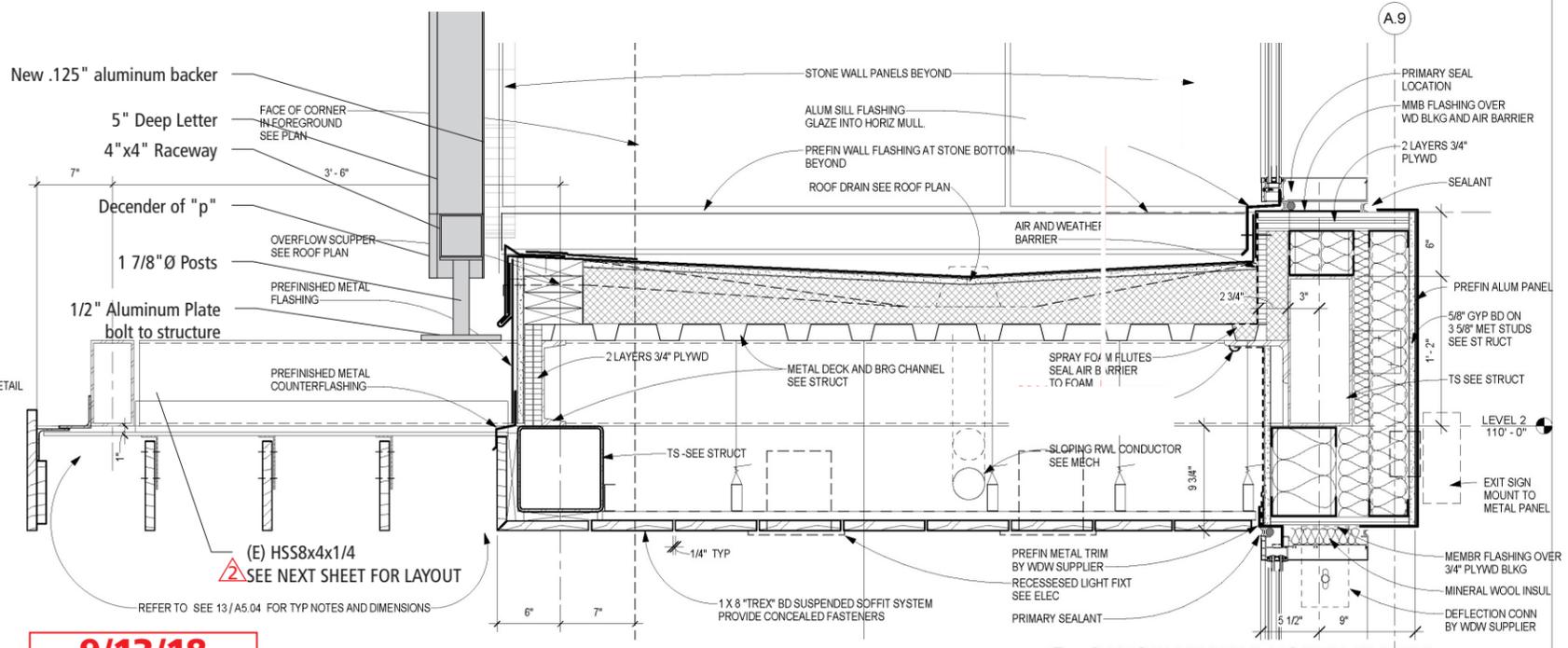
4 WALL SECTION - NORTH
Scale: 3/32" = 1'-0" (REF. 1/ A2.01)



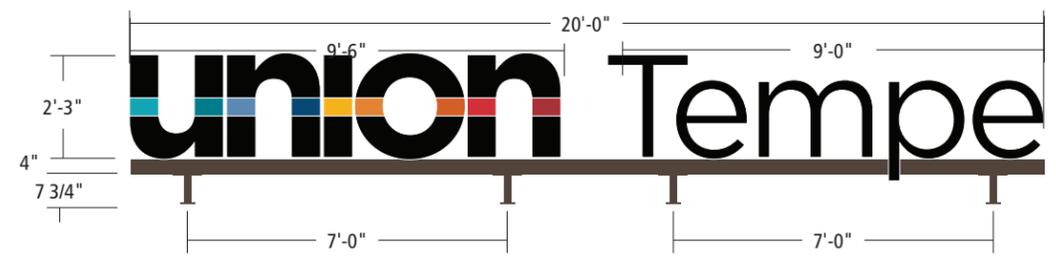
3 WALL SECTION - NORTH
Scale: 3/32" = 1'-0" (REF. 1/ A2.01)



LED Face Illuminated Pan Channel (PC) letter | Scale: NTS



4 CANOPY TYPE 5 NORTH ENTRY
Scale: 3/4" = 1'-0" (REF. 3/ A4.04)



Pan Channel Letters w/ Raceway on Canopy
Elevation | Scale: 1/4" = 1'-0"

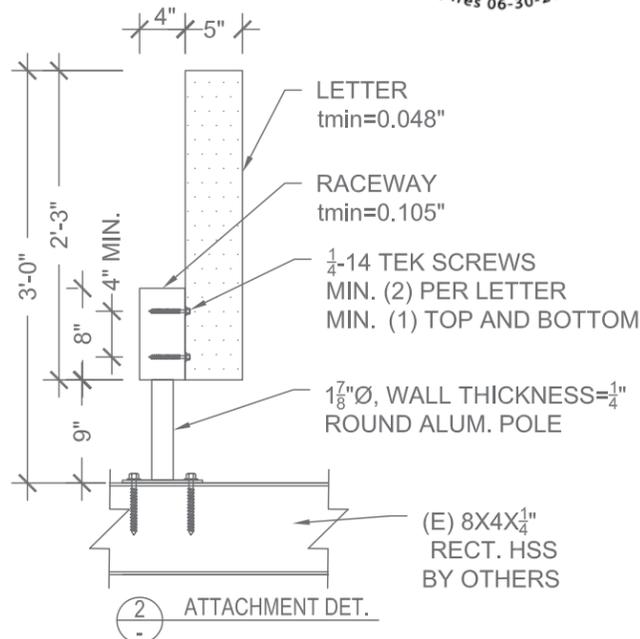
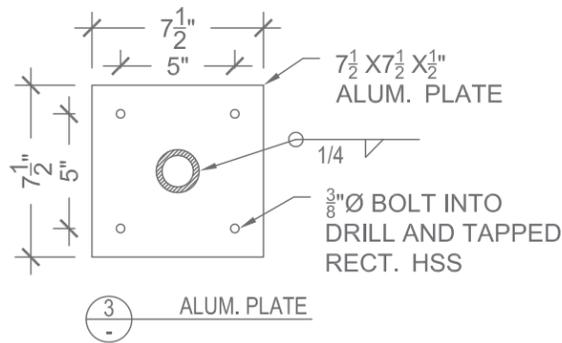
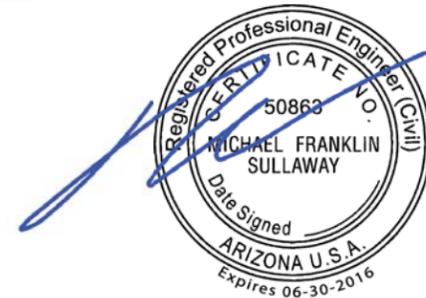
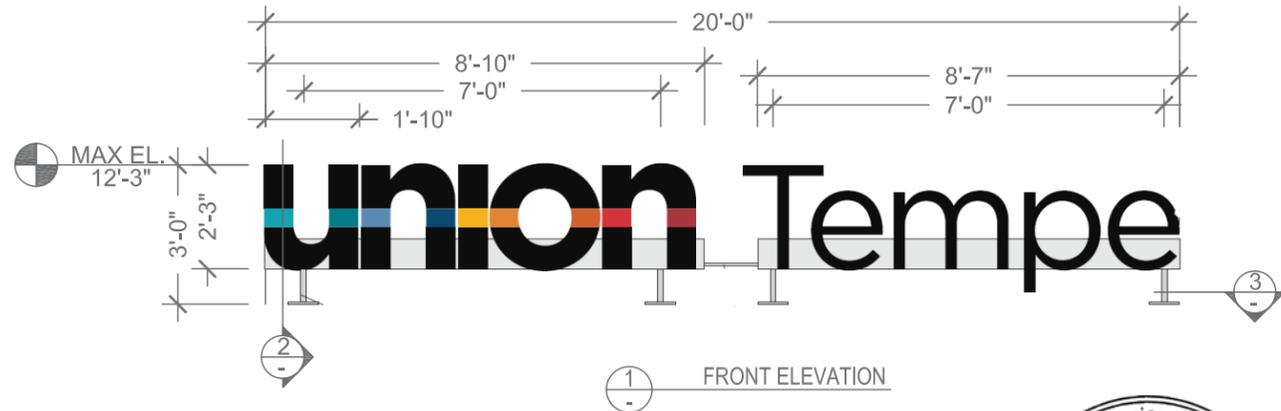
5" deep aluminum pan channel letters with black returns and backs. White trim cap to aid in visibility. 3/16" white acrylic faces with 3M black perf vinyl. Digitally printed translucent vinyl for logo colors, applied first surface. Internal White LEDs with power supplies. Letters mount to 4" x 4" deep raceway painted to match flashing color. Benjamin Moore Mink 2112-10. Sign mounts to existing building canopy.

This is a change from the originally approved specifications

9/13/18
PRODUCTION RELEASE

PROJECT: UNION TEMPE APARTMENTS, 110 UNIVERSITY DR., TEMPE, AZ
 PROJECT #: 17296A
 CLIENT: SMITHCRAFT

DATE: 3/8/2018
 ENGINEER: JC
 LAST REVISED:



GENERAL NOTES

- DESIGN CODE: IBC 2012
- DESIGN LOADS: ASCE 7-10
- WIND VELOCITY 115 MPH EXPOSURE C
- ALUMINUM EXTRUSION 6061-T6
- TEK SCREWS PER ESR-1976
- RECT. HSS STEEL ASTM A500 F_y = 46 KSI MIN.
- BOLT STEEL ASTM A307 HOT DIP GALVANIZE PER ASTM A153
- PLATE STEEL ASTM A36
- PROVIDE PROTECTION AGAINST DISSIMILAR METALS
- GENERAL CONTRACTOR SHALL VERIFY THAT EXISTING ELEMENTS ARE ADEQUATELY SUPPORTED AND CONNECTED BEFORE INSTALLATION
- ALL EXISTING CONDITIONS SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION

PROJECT: UNION TEMPE APARTMENTS
 PROJ. NO.: 17296A
 CLIENT: SMITHCRAFT

DATE: 3/9/2018
 ENGINEER: JC

4.1 bldg code; IBC 2012

units; pounds, feet unless noted otherwise

Applied Wind Loads; from ASCE 7-10

$P_{net} = \lambda K_{zt} P_{net30}$		(ASCE 30.5-1)
$\lambda =$	1.21	(ASCE Fig. 28.6-1)
$K_{zt} =$	1.0	(unless unusual landscape)
$V =$	115 mph	Exposure = c
Area =	45.0 ft ²	
max. height =	12.3	
max $P_{net30} =$	21.53 psf	$P_{net} = 26.06$
min $P_{net30} =$	-27.37 psf	$P_{net} = -33.11$

Loads Worst case pole

Area = (53/12) * (27/12) = 9.94 ft²
 DL = (1.2 * 10psf * area) / 1000 = 0.12 k
 WL = (P_{net} * area) / 1000 = 0.33 k

total Shear = WL = 0.33 k
 DLM = DL * (4.5/12) = 0.04 k-ft
 WLM = WL * (22.5/12) = 0.62 k-ft

ALUM RD. PIPE 1 7/8" Dia. 1/4" thick

Total Moment = WLM + DLM = 0.66 k-ft
 Alum RD. PIPE 1 1/2" Dia. 1/4" thick, $\phi Mn = 0.75$ k-ft ok

1/4-14 Tek screws per ESR-1976 ASD Letter to Raceway

Trib Area =	area "U" = (2+3/12) * (1+10/12) =	4.125 ft ²	
Wind Load =	(P _{net} * TribArea) =	136.594 lbs	member not contact w/ screw head = 0.105 in
Dead Load =	(1.2 * 10psf * TribArea) =	49.5 lbs	member contact w/ screw head = 0.048 in
armw =	=	9.50 in	
armd =	=	2.5 in	
MWL =	armw * WL =	1297.64 lbs-in	
MDL =	armd * DL =	470.25 lbs-in	
S =	spacing between bolts =	4 in	
n =	#bolts/row =	2 bolts	
Tu =	MWL/s/n + MDL/s/n + WL/n =	289.283 lbs	
Vu =	DL/n =	5.21053 lbs	
Tc =	=	335 lbs ok	
Vc =	=	468 lbs ok	
Combined Tension and Shear Check:			
(Tu/Tc) + (Vu/Vc) =		0.87467	<= 1 ok

PROJECT: UNION TEMPE APARTMENTS
 PROJ. NO.: 17296A
 CLIENT: SMITHCRAFT

 DATE: 3/8/2018
 ENGINEER: JC

Check 1.875" dia. x 0.25" aluminum tube (ADM 2015 - Ch F)

	TM=WLM+DLM=	7.92 k-in	d	t
			1.88	0.250
Yielding (Governs)	Mn = Fy Z =	9.98 k-in	welded?	yes
(ADM 15, F.2)	Mn = 1.5 Fy S =	10.35 k-in	φ =	0.9
			Fy =	15 ksi
LB:	λ1 = (Bt-Fcy/Dt) ² =	47.34	Z =	0.665 in ³
(ADM 15 F.3.1)	λ2 = Ct =	389	S =	0.460 in ³
	Rb/t =	3.25 < λ1	Bt =	19.5 ksi
			Dt =	0.654 ksi
	Fc = Fy =	15 ksi	Ct =	389
			E =	10100 ksi
	λ1 = Ctb =	120.8	Btb =	29.2 ksi
	λ2 = Ct =	389	Dtb =	1.539 ksi
	Rb/t =	3.25 < λ1	Ctb =	120.8
			If =	0.431 in ⁴
	Fb = Btb-Dtb (Rb/t) ^{1/2} =	26.426 ksi	lw =	0.431 in ⁴
			ccf =	0.813 in
	Mnlb = Fc If / ccf + Fb lw / ccw =	20.12 k-in	ccw =	0.938 in
	φMn =	8.98 k-in OK		

 PROJECT: UNION TEMPE APARTMENTS
 PROJ. NO.: 17296A
 CLIENT: SMITHCRAFT

 DATE: 3/9/2018
 ENGINEER: JC

building code; IBC 2012

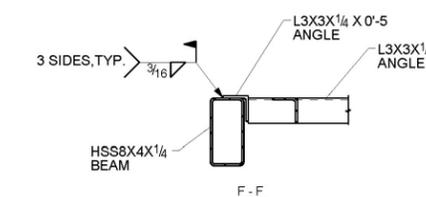
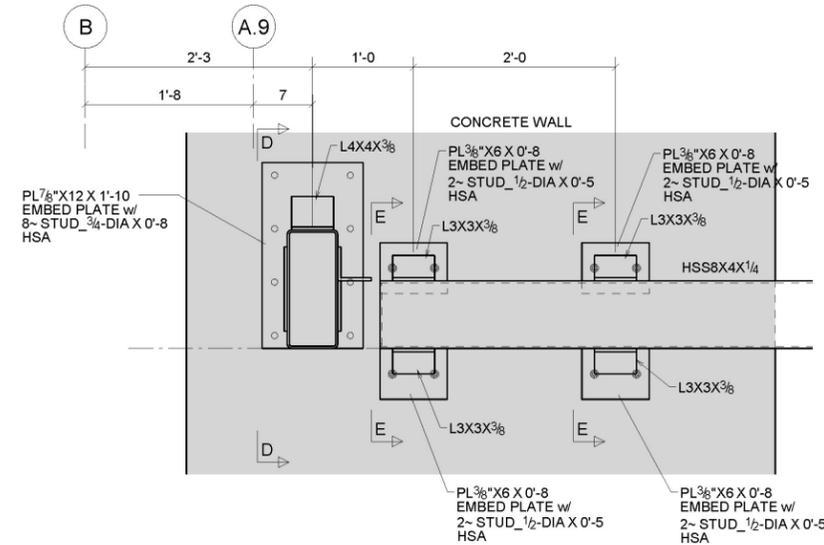
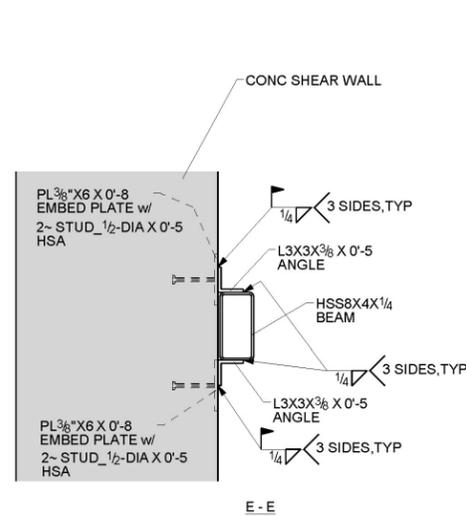
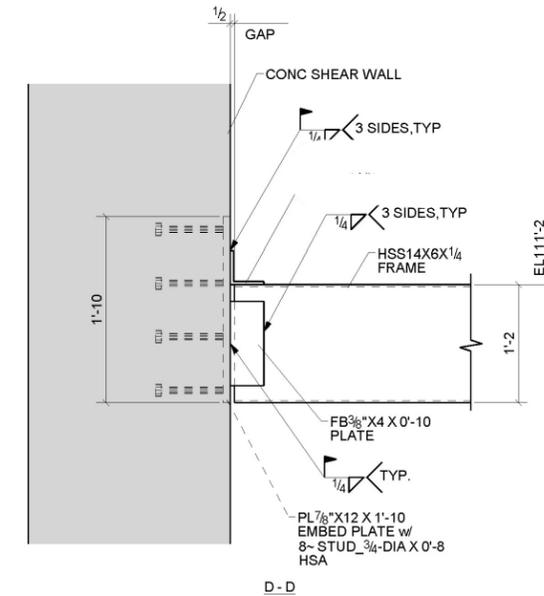
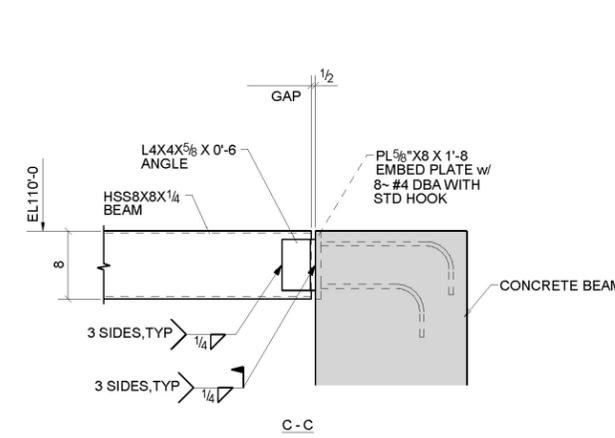
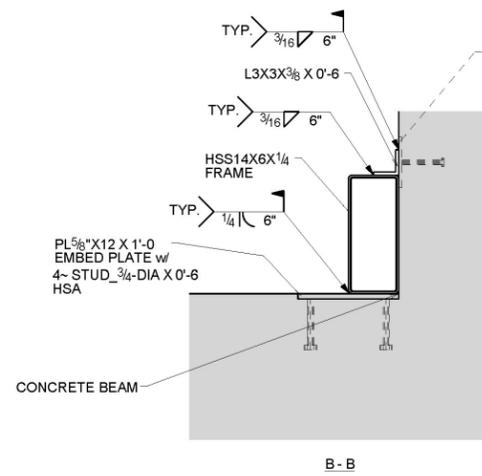
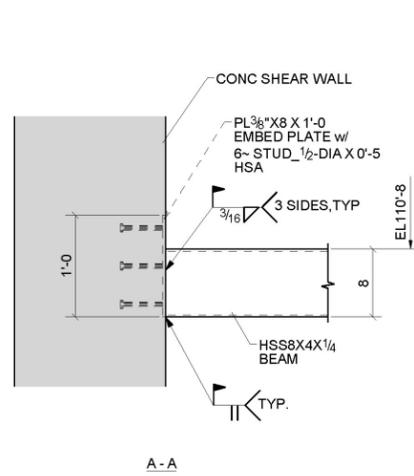
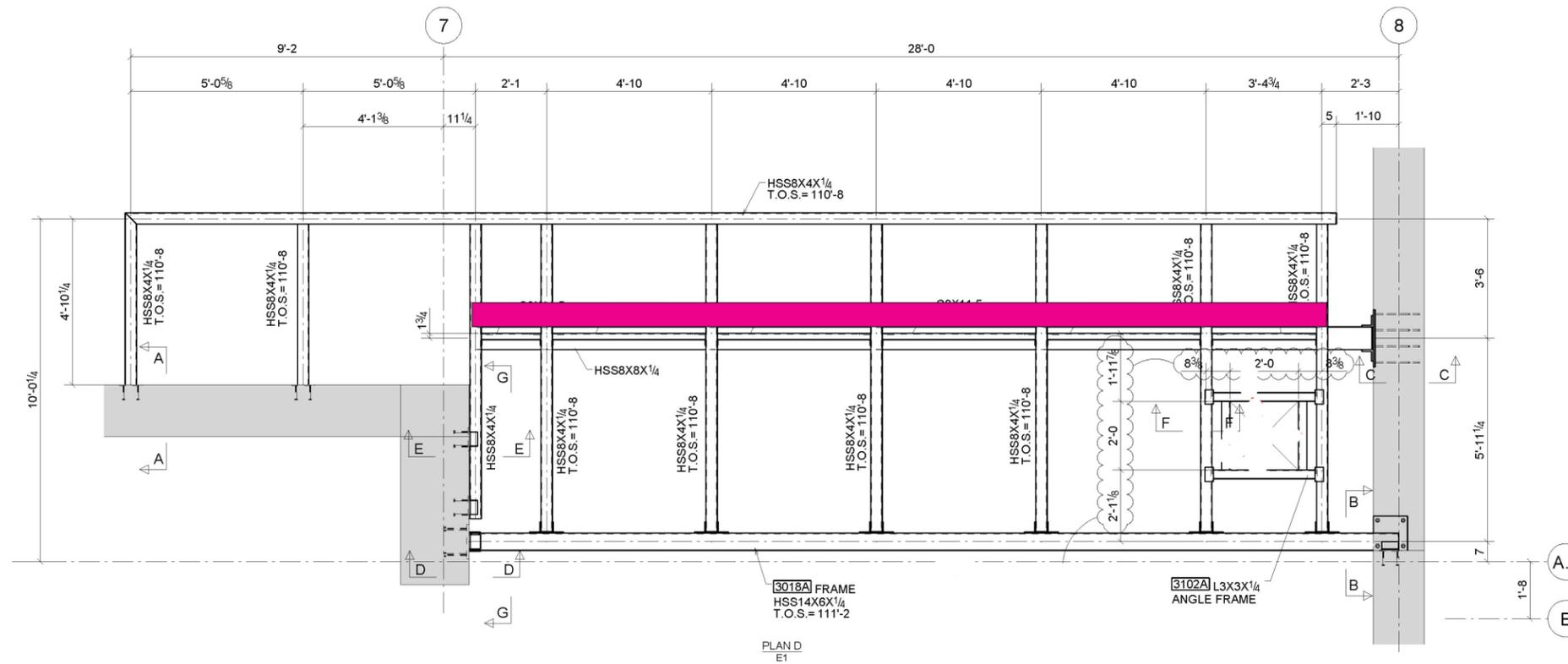
units; pounds, feet unless noted otherwise

Check 0.375" dia. Drill and Tap (AISC 14 J3)

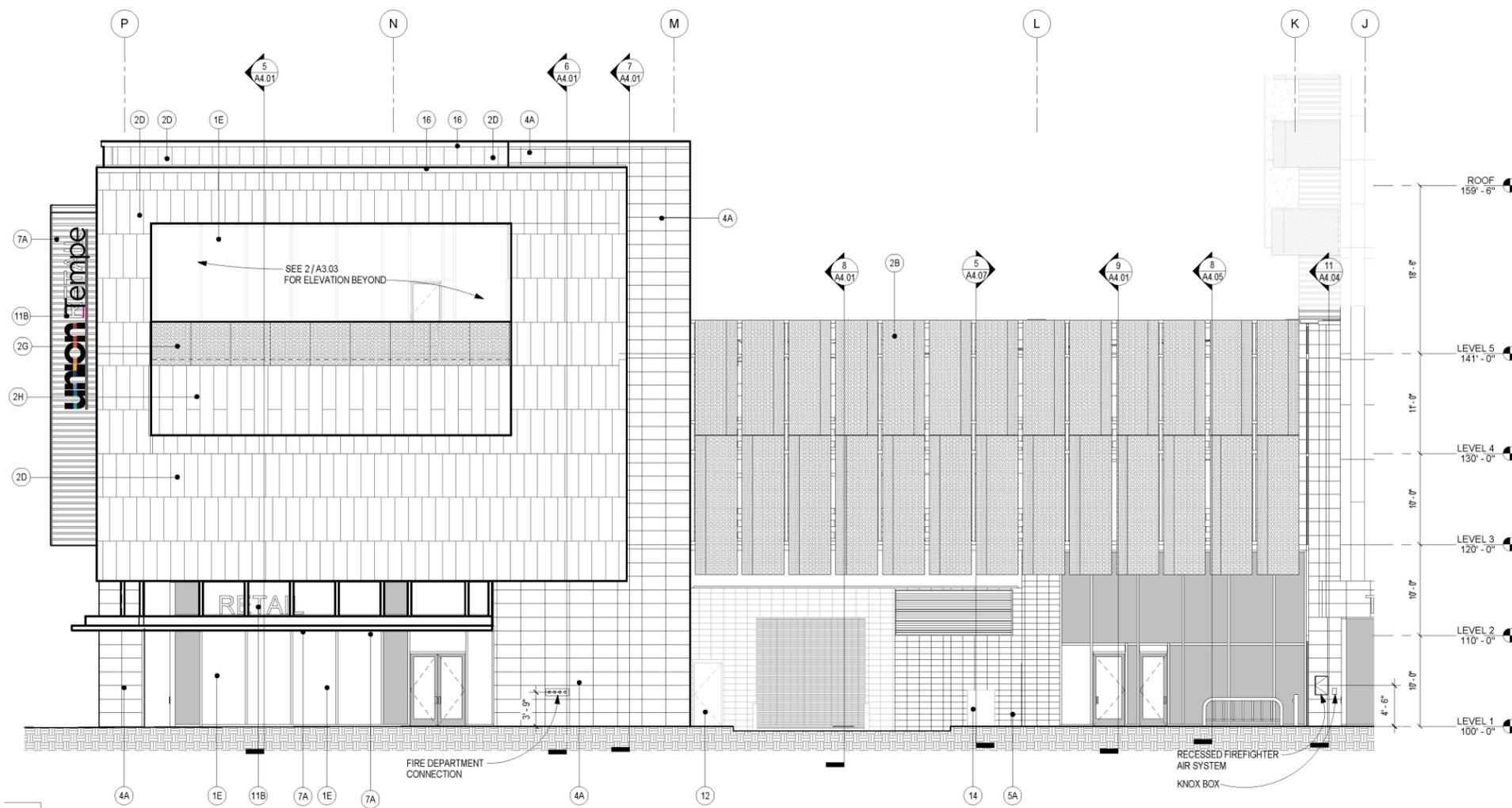
	Mu =	7.941 k-in	s =	5 in
	Vu = WL =	0.33 k	r = # rows :	2
			n = bolts per row =	2
	Tb = Mu / s / n =	0.794	φ =	0.75
(eq'n. J3-2)	T _{cap} = φ F' _{nt} A _{bolt} *(Wt/db) =	2.40 k OK	F _u =	58 ksi
			F _{nt} =	43.5 ksi
	Vb = WL / (n*r) =	0.1 k	F' _{nt} =	43.5 ksi
(eq'n. J3-1)	V _{cap} = φ F _{nv} A _{bolt} *(Wt/db) =	1.441 k OK	F _{nv} =	26.1 ksi
			d _b =	0.375 in
			A _b =	0.110 in ²
			Wt=Wall thickness=	0.25 in

Check 7.5" x 7.5" x 0.5" Alum. plate

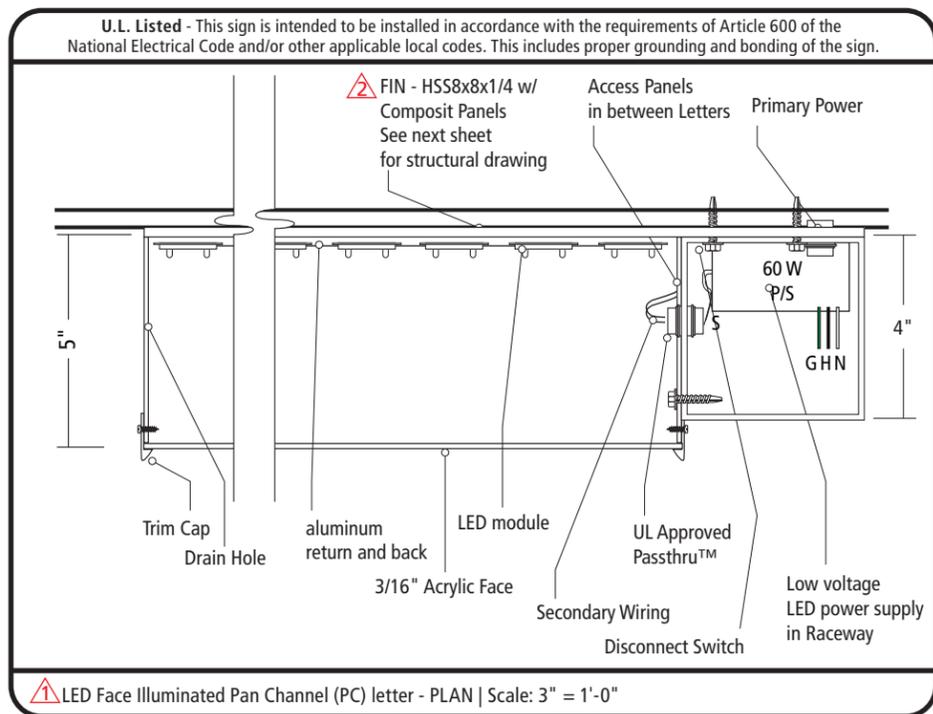
	T =	0.794 k	Section:	Round
	Mp = 2*T* arm =	2.78 k-in	d =	1.875 in
	Z = bt ² /4 =	0.313 in ³	arm =	1.75 in
	φM _n = φ F _y Z =	4.22 k-in OK	b =	5 in
			t =	0.5 in
			φ =	0.9
			F _y =	15 ksi



SURFACE PREP	SSPC-SP3	UNO	PROJECT NAME	7th Street Mixed Use	
STEEL ASTM	A36	UNO	LOCATION	110 East University Drive, Tempe, AZ	
ELECTRODES	E70XX	UNO	CONTRACTOR	Sundt Construction	
WELDS	1/4" FILLET	UNO	ARCHITECT	OPUS AE GROUP, L.L.C.	
OPEN HOLES	13/16 DIA	UNO	DATE	03/08/2017	JOB No. 600-16
BOLTS	A325N	UNO	DATE	03/08/2017	JOB No. 600-16
PAIN	1 SIC PRIMER (DARK GRAY)	UNO	DATE	03/08/2017	JOB No. 600-16
			DESCRIPTION	ENLARGED TYPE 5 CANOPY PLAN	
			ENCORE STEEL INC	3420 S. 39TH AVE PHOENIX, AZ 85009	
			480-663-3505	FAX 480-361-7920	
			encoresteelinc.com		
				DATE	03/08/2017
				BY	GN



Podium
East Elevation | Scale: 1/16" = 1'-0"

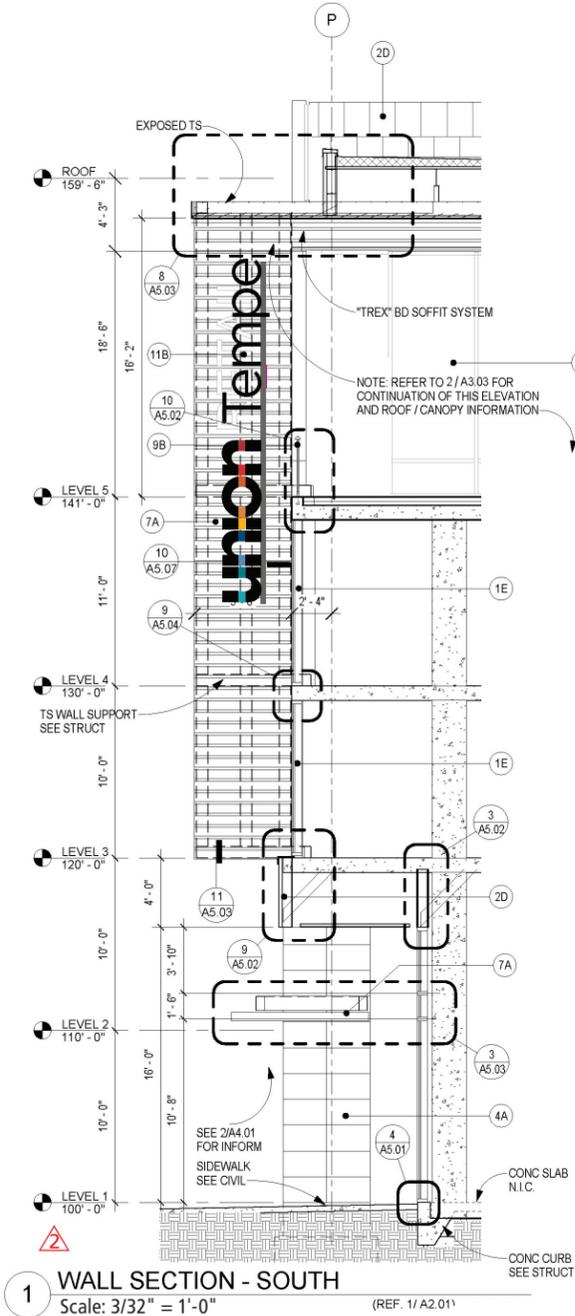


CITY OF TEMPE REQUIREMENT
DIMMABLE LEDS WITH DIMMABLE POWER SUPPLIES
ON ALL FACE LIT LETTERS

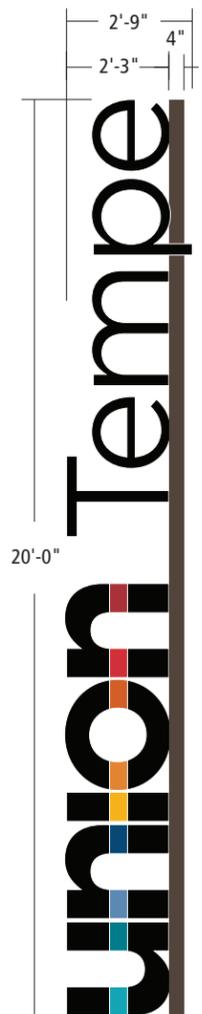
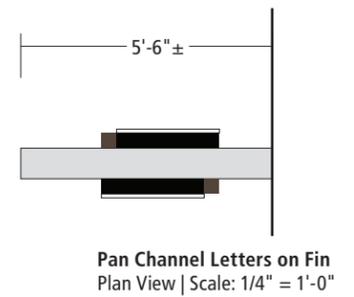
Manufacture and Install Two (2) sets of Pan Channel Letters on D/F Fin - Illuminated - 45 sq. ft.

5" deep fabricated pan channel letters with black returns and backs. White trim cap to aid in visibility. Common 1/8" aluminum backer for letter returns and raceway to mount to. 3/16" white acrylic faces with 3M black perf vinyl. Digitally printed translucent vinyl for logo colors, applied first surface. Internal White LEDs with power supplies in 4" x 4" raceway painted Benjamin Moore Mink 2112-10 to match mounting surface of the building fin.

This is a change from the originally approved specifications

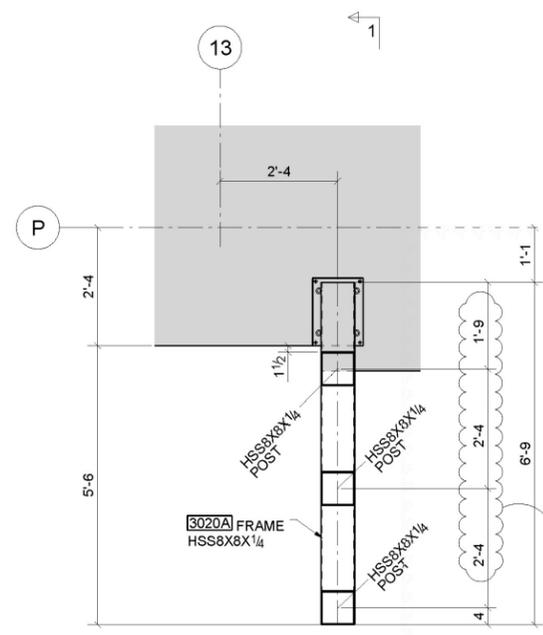


1 WALL SECTION - SOUTH
Scale: 3/32" = 1'-0"

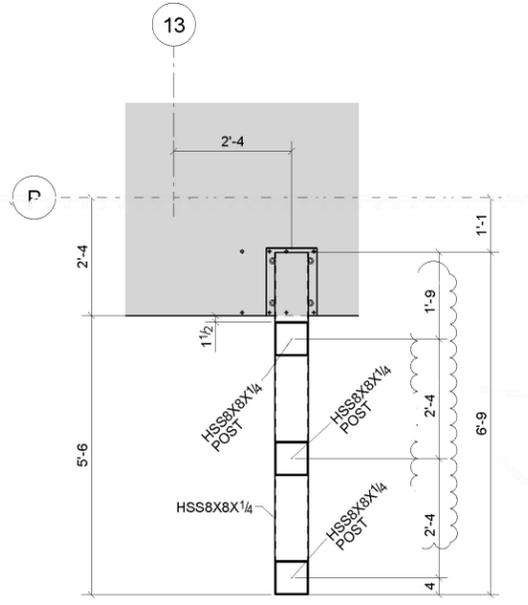


Pan Channel Letters on Fin
Elevation | Scale: 1/4" = 1'-0"

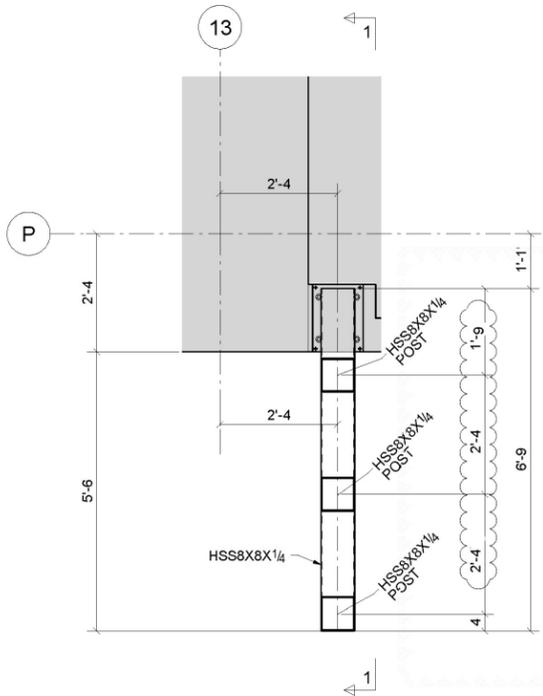
9/13/18
PRODUCTION RELEASE



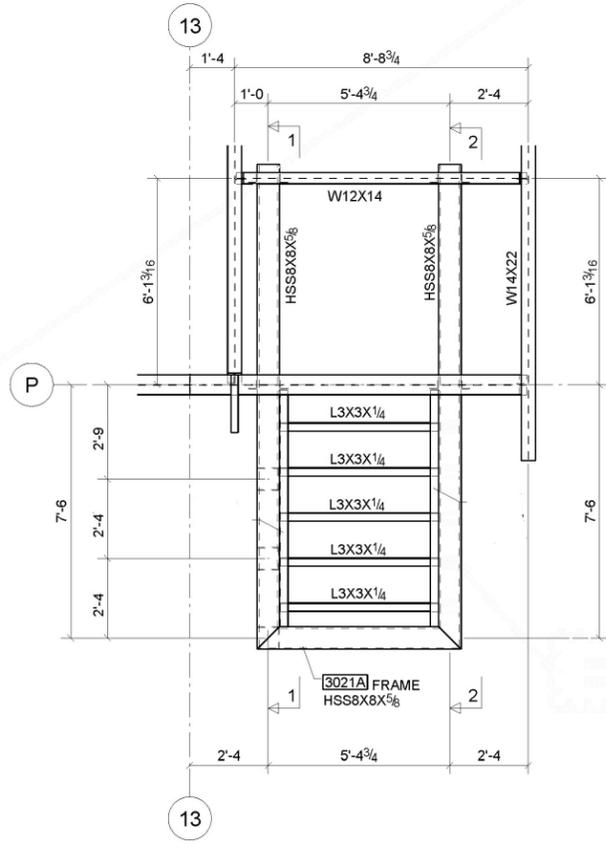
SIGNAGE PLAN @ LEVEL 3
PLAN A



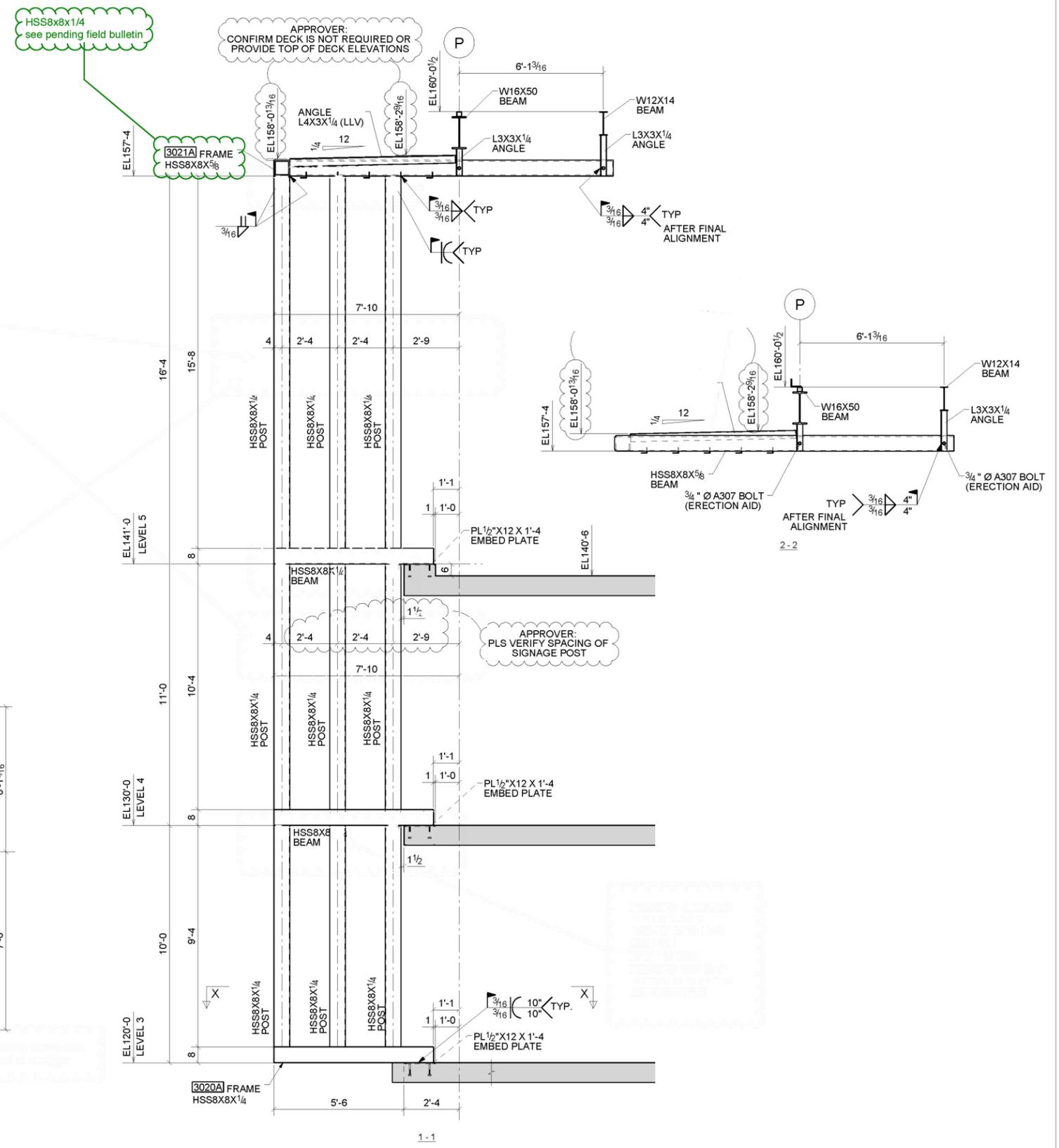
SIGNAGE PLAN @ LEVEL 4
PLAN B



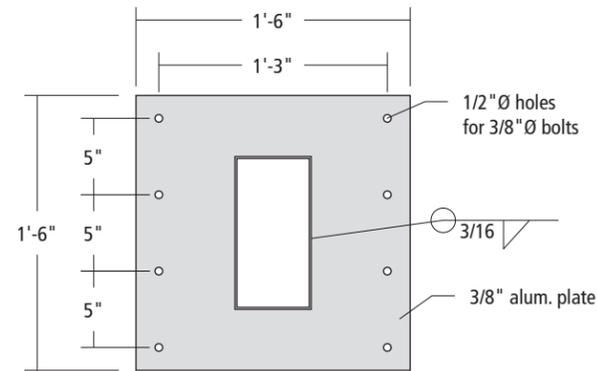
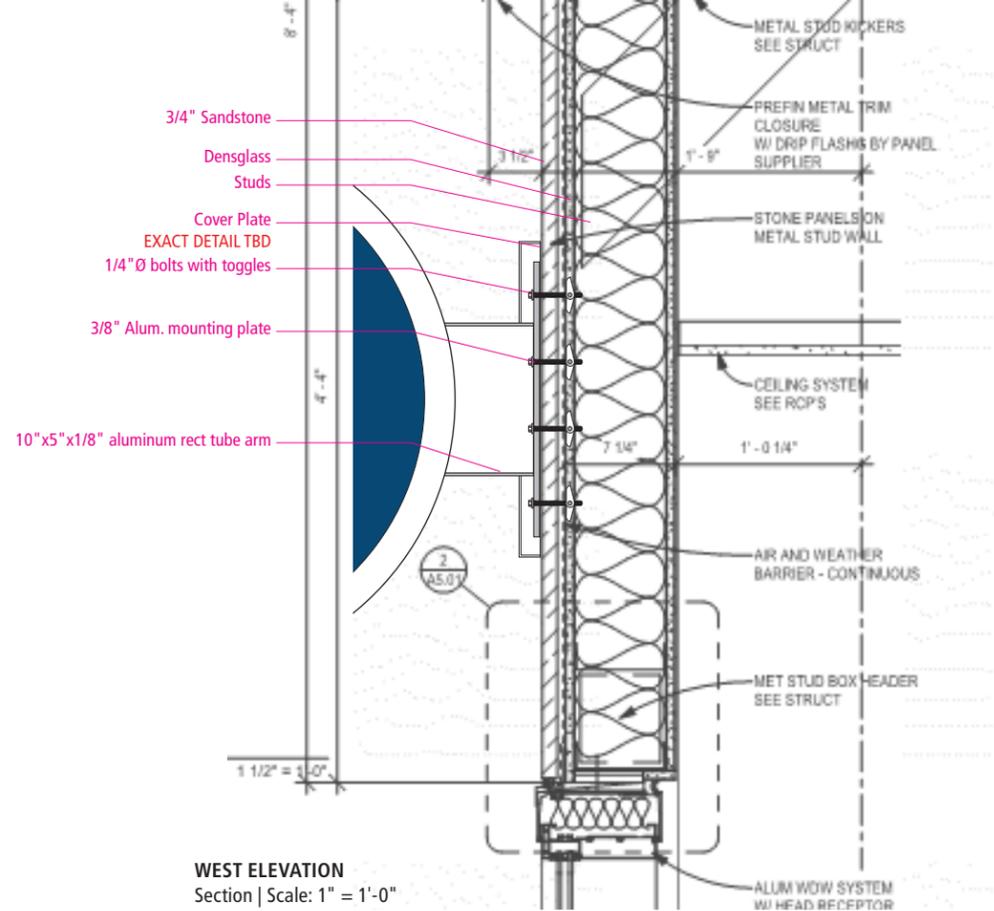
SIGNAGE PLAN @ LEVEL 5
PLAN C



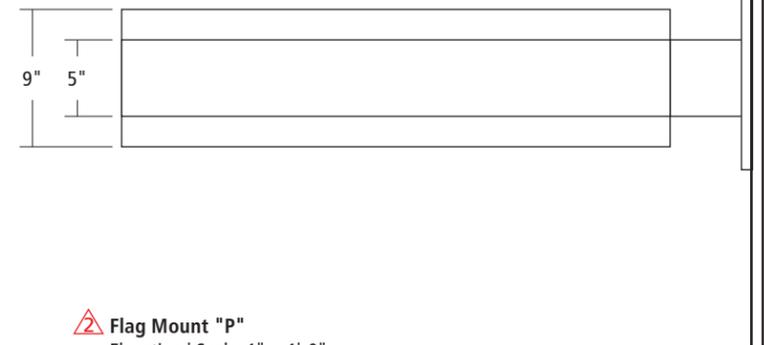
SIGNAGE PLAN @ PODIUM ROOF
PLAN D



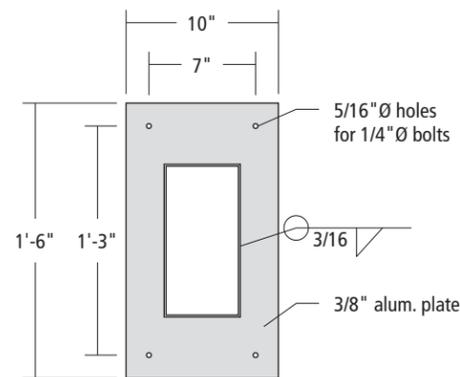
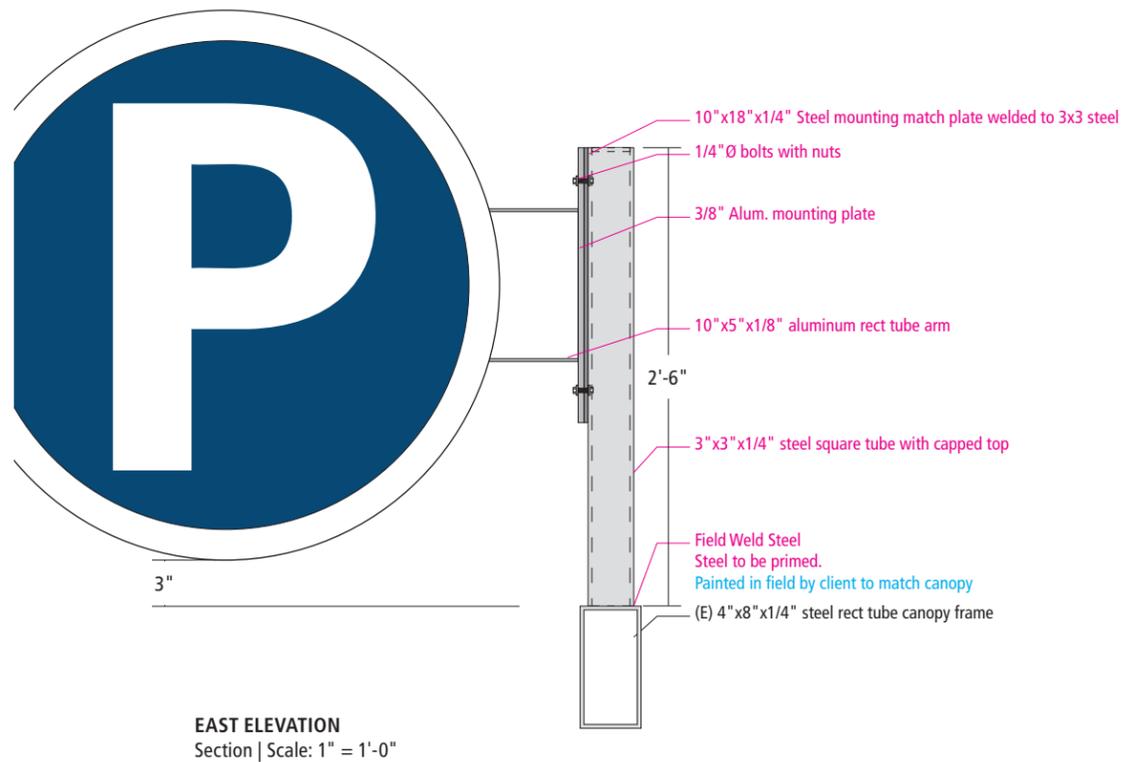
SURFACE PREP: SSPC-SP3 UNO		PROJECT NAME: 7th Street Mixed Use	
STEEL ASTM: A36 UNO		LOCATION: 110 East University Drive, Tempe, AZ	
ELECTRODES: E70XX UNO		CONTRACTOR: Sundt Construction	
WELDS: 1/4" FILLET UNO		ARCHITECT: OPUS AE GROUP, L.L.C.	
OPEN HOLES: 1 3/16 DIA UNO		DATE: 05/24/2017	
BOLTS: A325N UNO		JOB No: 600-16	
PAINT: 1 S/C PRIMER (DARK GRAY) UNO		DRAWN BY: DM	
DATE: 08/18/2017		CHECKED BY: GN	
NO. For Approval		DESCRIPTION: ENLARGED SIGNAGE PLAN & DETAILS	
		JOB No: 600-16	
		E18	



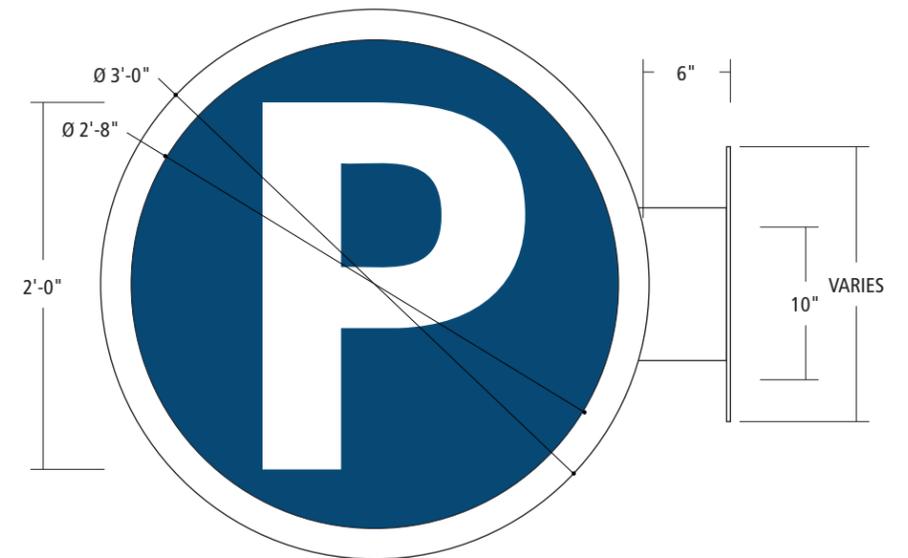
Mounting Plate @ Sign on Stone
EAST ELEVATION
Detail | Scale: 1" = 1'-0"



Flag Mount "P"
Elevation | Scale: 1" = 1'-0"



Mounting Plate @ Sign on Steel
WEST ELEVATION
Detail | Scale: 1" = 1'-0"



Flag Mount "P"
Elevation | Scale: 1" = 1'-0"

Manufacture and Install Two (2) D/F "P" Symbol - Flag Mount - Illuminated - 9 sq. ft.

9" deep fabricated aluminum circle. .125" aluminum faces and "P".
10"x5"x1/8" aluminum rect tube arm with 3/8" aluminum mounting plate. Paint all aluminum Matthews White.
3/16" white acrylic back up faces with 3M Translucent Cobalt Blue (230-157) vinyl applied 1st surface.
Internal White LEDs with power supplies.

POWER RUN TO BE DETERMINED AT EACH LOCATION.

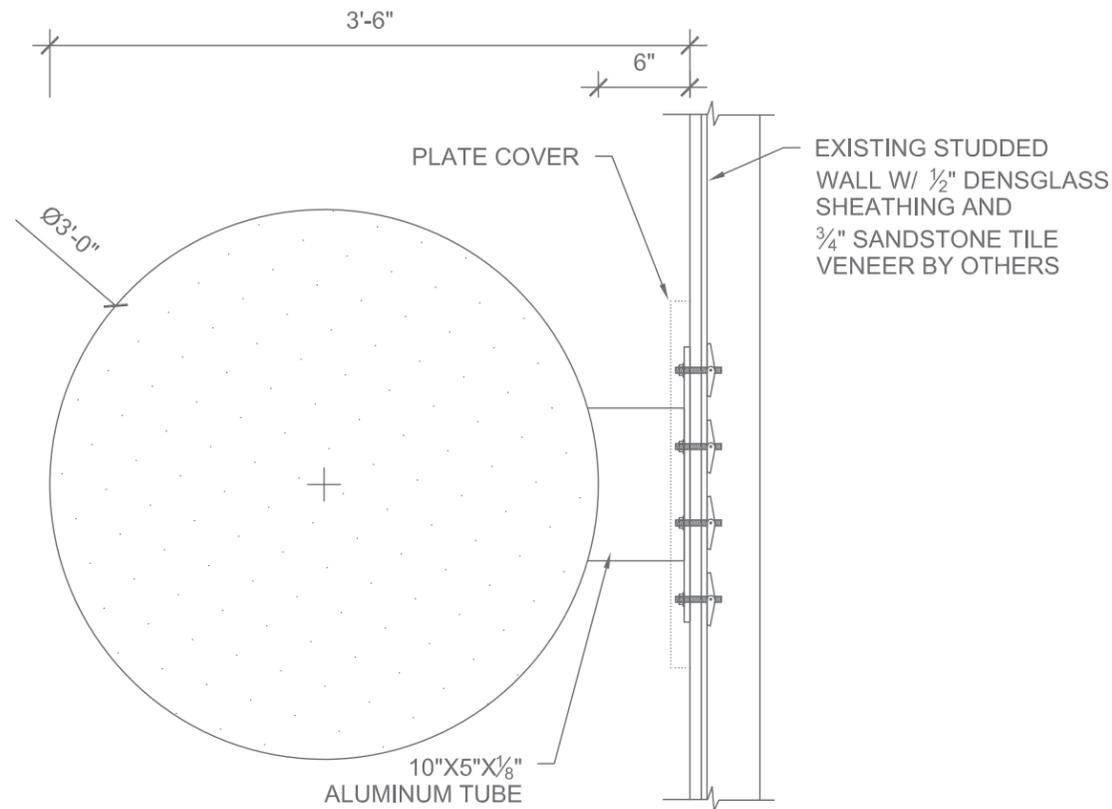
REVISED 7/24/18

**4/5/18
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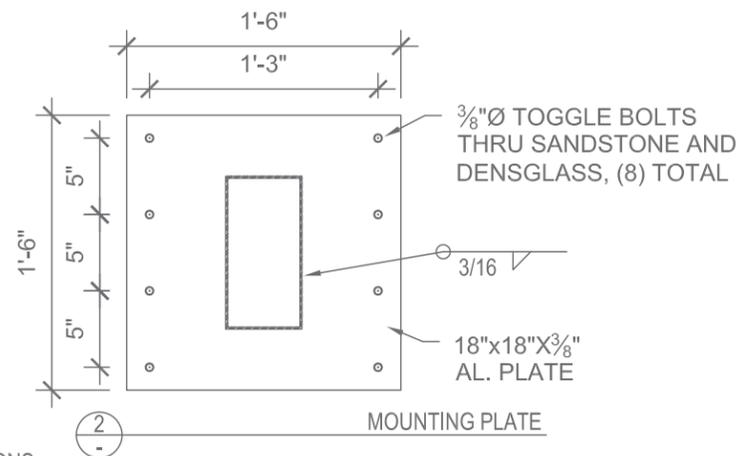


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PROJECT: UNION TEMPE APARTMENTS - P SIGN WEST ELEVATION - 110 UNIVERSITY DR., TEMPE, AZ DATE: 7-2-2018
 PROJECT #: 17296B-1 ENGINEER: JS
 CLIENT: SMITHCRAFT LAST REVISED: 7-10-18 JS



1 FRONT ELEVATION FOR WEST ELEVATION P SIGN



GENERAL NOTES

- DESIGN CODE: IBC 2012
- DESIGN LOADS: ASCE 7-10
- WIND VELOCITY: 115 MPH EXPOSURE C
- ALUMINUM TUBE 6061-T6
- ALUMINUM PLATE 6061-T6
- TOGGLE BOLTS PER POWERS FASTENERS SPECIFICATIONS.
- PROVIDE PROTECTION AGAINST DISSIMILAR METALS USING ANTI-CORROSIVE PAINT OR NEOPRENE GASKETS.
- ALL EXISTING ELEMENTS TO BE VERIFIED IN FIELD.
- ALL DIMENSIONS TO BE VERIFIED PRIOR TO CONSTRUCTION.



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PROJECT: Union Tempe Apartments - Blade Sign
 PROJ. NO.: 17296B-1
 CLIENT: SmithCraft

DATE: 7/2/2018
 ENGINEER: JS

building code; IBC 2012

units; pounds, feet unless noted otherwise

Applied Wind Loads; from ASCE 7-10

$p_{net} = \lambda K_{zt} I p_{net30}$		(ASCE 30.5-1)	
$\lambda =$	1.21	(ASCE Fig. 28.6-1)	
$K_{zt} =$	1.0	(unless unusual landscape)	for structural category II
$V =$	115 mph		Exposure= c
Area=	7.07 ft ²		
max. height=	13.0		
max $p_{net30} =$	23.80 psf		$p_{net} = 28.80$ psf
min $p_{net30} =$	-31.90 psf		$p_{net} = -38.60$ psf

Loads

wind force= (7 ft²)(39 psf)= 273 lbs

dead load= 1.2(55 lbs)= 66 lbs

M dead= (.066 k)(21") = 1.39 k-in

M wind= (.273 k)(21") = 5.73 k-in

Check 18"x18"x3/8" Aluminum Mounting Plate w/(8) 3/8" Toggle Bolts

Toggle bolts thru 3/4" sandstone and 1/2" densglass

T per anchor LRFD= (1.39 k-in/ 10")/ 4 + (5.73 k-in/15")/ 4 = .130 k = 130 lbs

T per anchor ASD= .6(130 lbs) = 78 lbs

T capacity (allowable)= 85 lbs per Powers Specifications OK

V per anchor LRFD= sqrt(273² + 66²)/8 = 35 lbs

V per anchor ASD= sqrt(164² + 55²)/8 = 22 lbs

V capacity (allowable)= 90 lbs per Powers Specifications OK

Plate Mu= 4(.130 k)(5")= 2.60 k-in

Z= .25(18")(0.375")²= .633 in³

$\phi M = \phi f_y Z = (.9)(15 \text{ ksi})(.633 \text{ in}^3) = 8.54 \text{ k-in}$ OK

PROJECT: Union Tempe Apartments - Blade Sign - West Elevation
PROJ. NO.: 17296B-1
CLIENT: SmithCraft

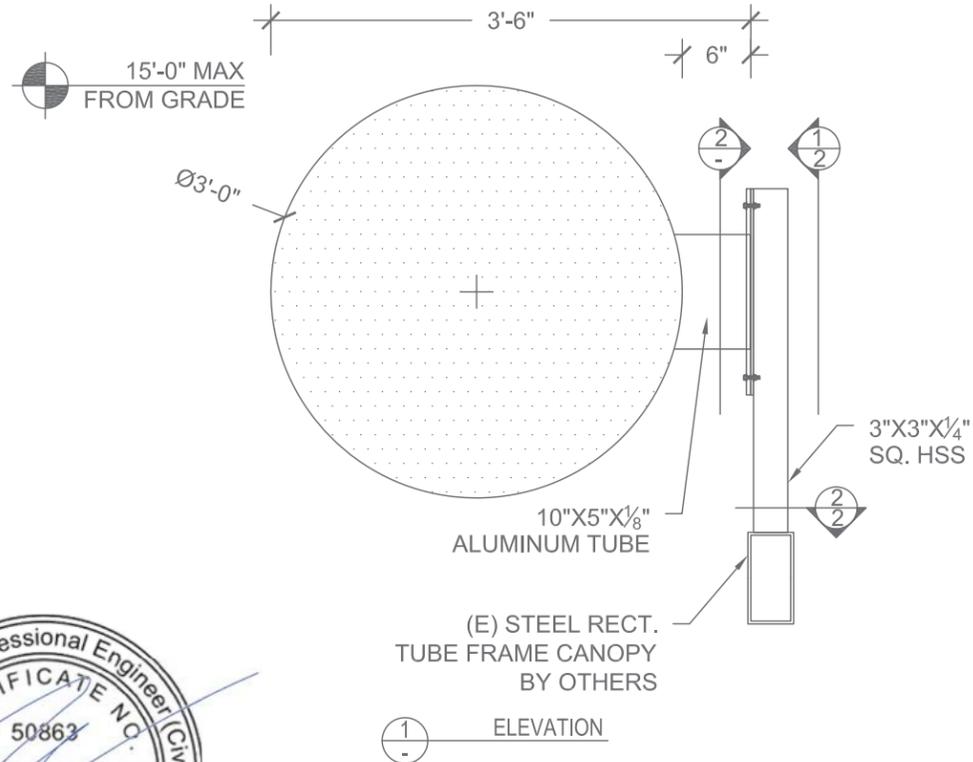
DATE: 7/2/2018
ENGINEER: JS

Check 10"x5"x0.125" Rect. Aluminum Tube (ADM 2015 - Ch F)

	Mux =	1.39 k-in	d	b	t
	Muy =	5.73 k-in	10	5	0.125
Yielding (Governs)			welded?		yes
(ADM 15, F.2)	Mnx = Zx Fcy =	181.7 k-in	Fcy = Fty =		15 ksi
	Mnx = 1.5 Sx Fcy =	224.0 k-in	Zx =		12.113 in ³
			Sx =		9.957 in ³
	φMnx =	163.5 k-in OK	Zy =		7.504 in ³
			Sy =		6.836 in ³
	Mny = Zy Fcy =	112.6 k-in	φ =		0.9
	Mny = 1.5 Sy Fcy =	153.8 k-in	κ =		1 ksi
			E =		10100 ksi
	φMny =	101.3 k-in OK	k1c =		0.35
LB:	Bp =	19.9 ksi	k2c =		2.27
x-axis bending	Dp =	0.11 ksi	k1f =		0.5
(ADM 15 F.3.1)	Cp =	122.7	k2f =		2.04
			b/t =		38.0
			d/t =		78.0
	λ1 = Bp-Fcy/1.6Dp =	28.4	m =		0.65
	λ2 = k1 Bp/1.6Dp =	57.4	lx =		49.785 in ⁴
			ly =		17.090 in ⁴
	since b/t < λ1: Fc = Fcy =	13.33	ccfx =		4.938 in
			ccwx =		2.5 in
	Bbr =	26.4 ksi	ccfy =		2.438 in
	Dbr =	0.17 ksi	ccwy =		5.0 in
	Cbr =	107			
	λ1 = Bbr-1.5 Fcy/mDbr =	36.4			
	λ2 = k1 Bbr/mDbr =	123.1			
	since d/t < λ1: Fc = 1.5 Fcy =	18.03			
	Mnlb = Fc lf / ccx + Fb lw / ccw =	257.72 k-in			
	φMnlb =	231.95 k-in OK			
LB:	Bp =	19.9 ksi			
y-axis bending	Dp =	0.11 ksi			
(ADM 15 F.3.1)	Cp =	122.7			
	λ1 = Bp-Fcy/1.6Dp =	28.4			
	λ2 = k1 Bp/1.6Dp =	40.3			
	since d/t < λ1: Fc = Fcy =	8.15			
	Bbr =	26.4 ksi			
	Dbr =	0.17 ksi			
	Cbr =	107			
	λ1 = Bbr-1.5 Fcy/mDbr =	36.4			
	λ2 = k1 Bbr/mDbr =	123.1			
	since b/t < λ1: Fc = 1.5 Fcy =	22.32			
	Mnlb = Fc lf / ccx + Fb lw / ccw =	279.46 k-in			
	φMnlb =	251.51 k-in OK			

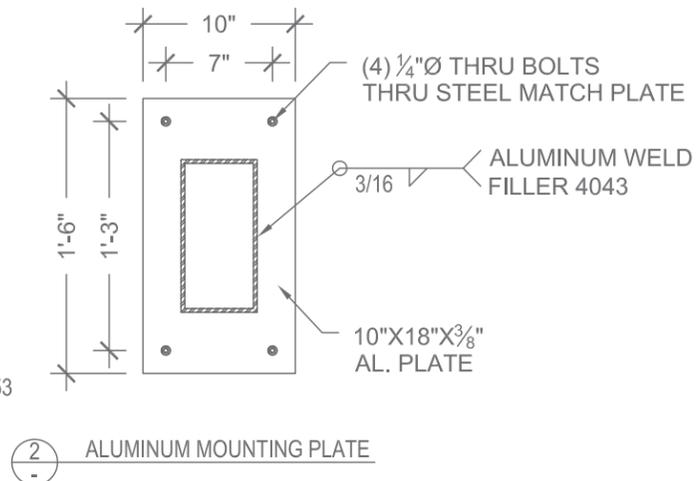
PROJECT: UNION TEMPE APARTMENTS, 110 UNIVERSITY DR., TEMPE, AZ
 PROJECT #: 17296C
 CLIENT: SMITHCRAFT

DATE: 06/29/18
 ENGINEER: TC



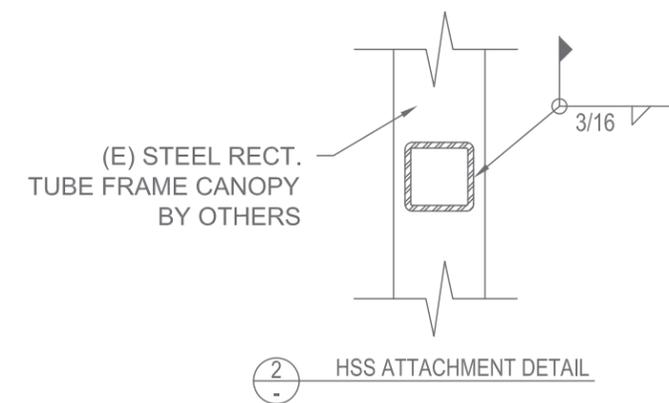
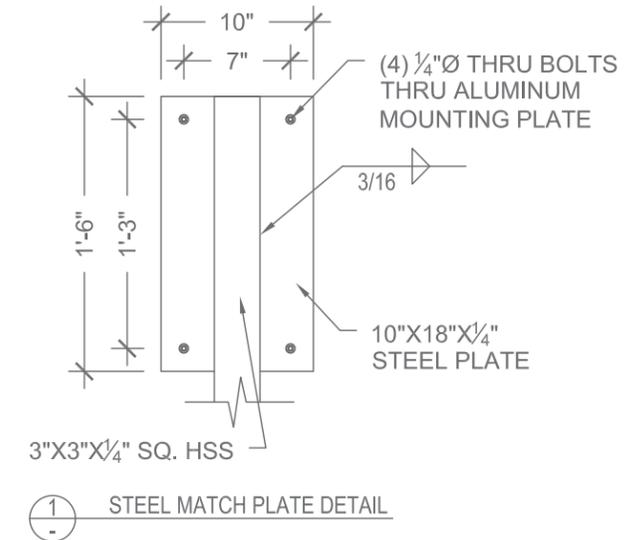
GENERAL NOTES

1. DESIGN CODE: IBC 2012
2. DESIGN LOADS: ASCE 7-10
3. WIND VELOCITY 115 MPH EXPOSURE C
4. ALUMINUM TUBE 6061-T6
5. ALUMINUM PLATE 6061-T6
6. PLATE STEEL ASTM A36, $F_y = 36$ KSI MIN.
7. SQ./RECT. HSS STEEL ASTM A500 GR. B, $F_y = 46$ KSI MIN.
8. BOLT STEEL ASTM A307 HOT DIP GALVANIZE PER ASTM A153
8. WELDING STRENGTH, $F_{exx} = 70$ KSI
9. ALUMINUM WELD FILLER 4043 OR EQUIVALENT
10. PROVIDE PROTECTION AGAINST DISSIMILAR METALS
11. GENERAL CONTRACTOR SHALL VERIFY THAT EXISTING ELEMENTS ARE ADEQUATELY SUPPORTED AND CONNECTED BEFORE INSTALLATION.
12. ALL EXISTING ELEMENTS TO BE VERIFIED IN FIELD.
13. ALL DIMENSIONS TO BE VERIFIED PRIOR TO CONSTRUCTION.



PROJECT: UNION TEMPE APARTMENTS, 110 UNIVERSITY DR., TEMPE, AZ
 PROJECT #: 17296C
 CLIENT: SMITHCRAFT

DATE: 06/29/18
 ENGINEER: TC





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PROJECT: Union Tempe Apartments -East Elev. Blade Sign
 PROJ. NO.: 17296C
 CLIENT: SmithCraft

DATE: 6/29/2018
 ENGINEER: TC

building code; IBC 2012 units; pounds, feet unless noted otherwise

Applied Wind Loads; from ASCE 7-10

$p_{net} = \lambda K_{zt} I p_{net30}$ (ASCE 30.5-1)

$\lambda = 1.21$ (ASCE Fig. 28.6-1)
 $K_{zt} = 1.0$ (unless unusual landscape) for structural category II
 $V = 115$ mph Exposure = c
 Area = 7.07 ft²
 max. height = 15.0

max $p_{net30} = 23.80$ psf $p_{net} = 28.80$ psf
 min $p_{net30} = -31.90$ psf $p_{net} = -38.60$ psf

Loads LRFD

wind force, $F_w = (7 \text{ ft}^2)(39 \text{ psf}) = 273 \text{ lbs}$
 dead load, $F_d = 1.2(55 \text{ lbs}) = 66 \text{ lbs}$

Moment from dead load, $M_d = (.066 \text{ k})(21") = 1.39 \text{ k-in}$ (plate to 3x3x1/4" Sq. HSS) & (3x3x1/4" Sq. HSS to Exiting Steel Tube)
 Moment from wind load, $M_w = (.273 \text{ k})(21") = 5.73 \text{ k-in}$ (plate to 3x3x1/4" Sq. HSS)
 Moment from wind load d1, $M_{w1} = (.273 \text{ k})(21") = 5.73 \text{ k-in}$ (3x3x1/4" Sq. HSS to Exiting Steel Tube)
 Tor. Moment from wind load d2, $M_{w2} = (.273 \text{ k})(21") = 5.73 \text{ k-in}$ (3x3x1/4" Sq. HSS to Exiting Steel Tube)

Check 3/16" Fillet Welds, Plate to 3x3x1/4" Sq. HSS

LRFD

Shear on welds $(F_w + F_d) / 1000 + (M_w + M_d) / (3")$ **Vu,weld = 2.71 k**
 AISC p.16.1-115, Table J2.5 $\phi = 0.750$
 $F_{EXX} = 70 \text{ ksi}$
 $D = 3 \text{ sixteenths}$
 $L = 3.0 \text{ in.}$
 Shear Capacity, $\phi R_n = \phi 0.60 F_{EXX} (\text{Sqrt}(2)/2) (D/16) * L = 12.53 \text{ k}$ per weld line
 $\phi R_n, \text{ total} = 2 \text{ weld lines} * \phi R_n = 25.06 \text{ k}$
 $V / \phi R_n, \text{ total} = 0.108 < 1? \text{ OK}$

Use 3/16" all around fillet weld

Check 3/16" Fillet Welds, 3x3x1/4" Sq. HSS to Existing Steel tube

LRFD

Shear on welds $(F_w + F_d) / 1000 + (M_{w1} + M_{w2} + M_d) / (3")$ **Vu,weld = 4.62 k**
 AISC p.16.1-115, Table J2.5 $\phi = 0.750$
 $F_{EXX} = 70 \text{ ksi}$
 $D = 3 \text{ sixteenths}$
 $L = 3.0 \text{ in.}$
 Shear Capacity, $\phi R_n = \phi 0.60 F_{EXX} (\text{Sqrt}(2)/2) (D/16) * L = 12.53 \text{ k}$ per weld line
 $\phi R_n, \text{ total} = 2 \text{ weld lines} * \phi R_n = 25.06 \text{ k}$
 $V / \phi R_n, \text{ total} = 0.184 < 1? \text{ OK}$

Use 3/16" all around fillet weld



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PROJECT: Union Tempe Apartments -East Elev. Blade Sign
 PROJ. NO.: 17296C
 CLIENT: SmithCraft

DATE: 6/29/18
 ENGINEER: TC

building code; IBC 2012 units; pounds, feet unless noted otherwise

Check 3x3x1/4" Sq. HSS

$M_u = M_{w1} + M_d = 7.12 \text{ k-in} = 0.593 \text{ k-ft}$
 Torsional Moment, $T_u = 5.73 \text{ k-in} = 0.478 \text{ k-ft}$

$\phi M_n = 8.56 \text{ k-ft OK}$ Per AISC Table 3-13

Check Torsional Capacity on 3x3x1/4" Sq. HSS, A500

$f_y = 46 \text{ ksi}$ $E = 29000 \text{ ksi}$
 $b = 3 \text{ in}$
 $t = 0.233 \text{ in}$ $h/t = 9.88$
 $J = 5.08 \text{ in}^4$ $2.45(E/F_y)^{0.5} = 61.5$
 $C = 3.52 \text{ in}^3$ $3.07(E/F_y)^{0.5} = 77.1$
 $\phi = 0.9$ AISC H3

if $h/t \leq 2.45(E/F_y)^{0.5}$; $F_{cr} = 0.6F_y$; $F_{cr} = 27.6 \text{ ksi}$
 if $2.45(E/F_y)^{0.5} < h/t \leq 3.07(E/F_y)^{0.5}$; $F_{cr} = 0.6F_y (2.45(E/F_y)^{0.5} / (h/t))$; $F_{cr} = 171.8 \text{ ksi}$
 if $3.07(E/F_y)^{0.5} < h/t \leq 260$; $F_{cr} = 0.458\pi^2 E / ((h/t)^2)$; $F_{cr} = 1342.9 \text{ ksi}$

$T_n = F_{cr} C$; Use $F_{cr} = 27.6 \text{ ksi}$
 $T_u = 0.478 \text{ k-ft}$
 $\phi T_n = 87 \text{ k-in} = 7 \text{ k-ft}$
 $M_u = 0.593 \text{ k-ft}$
 $\phi M_n = 8.55 \text{ k-ft}$

$M_u / \phi M_n + (T_u / \phi T_n)^2 = 0.07$ less than 1? **OK**



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PROJECT: Union Tempe Apartments -East Elev. Blade Sign DATE: 6/29/18
 PROJ. NO.: 17296C ENGINEER: TC
 CLIENT: SmithCraft

building code: IBC 2012 units; pounds, feet unless noted otherwise

Check 1/4" Thru Bolts

screws thru 12 ga. Backing steel

T per anchor = $(1.39 \text{ k-in} / 15") / 2 + (5.73 \text{ k-in} / 7") / 2 = 0.455 \text{ kips}$
 V per anchor = $\text{sqrt}(273^2 + 66^2) / 4 = 70 \text{ lbs} = 0.070 \text{ kips}$

$d(\text{bolt}) = 0.250 \text{ in}$ $F_u = 58 \text{ ksi}$ $\phi = 0.75$
 $A(\text{bolt}) = 0.049 \text{ in}^2$
 $F_{nt} = 0.75 * F_u = 43.5 \text{ ksi}$
 $F_{nv} = 0.45 * F_u = 26.1 \text{ ksi}$
 Per AISC J3: $\phi R_{nt} = \phi * F_{nt} * A(\text{bolt}) = 1.60 \text{ kips}$ **OK**
 $T_u \text{ per bolt} / \phi R_{nt} = 0.28$
 $\phi R_{nv} = \phi * F_{nv} * A(\text{bolt}) = 0.96 \text{ kips}$ **OK**
 $V_u \text{ per bolt} / \phi R_{nv} = 0.07$

Combined Tension & Shear Check:

$f_{rv} = V \text{ per bolt} / A(\text{bolt}) = 1.43 \text{ ksi}$
 $F'_{nt} = 1.3F_{nt} - F_{nt} / \phi F_{nv} * f_{rv} \leq F_{nt} = 44 \text{ ksi}$
 $\phi R_{nt} = \phi F'_{nt} * A(\text{bolt}) = 1.60 \text{ kips}$ **OK**
 $T_u \text{ per bolt} / \phi R_{nt} = 0.28$ **OK**

Check Mounting Plates

Plate $M_u = 2(.455 \text{ k})(2.5") = 2.28 \text{ k-in}$

For 10x18x3/8" Aluminum Mounting Plate

$Z = .25(10")(0.375")^2 = .351 \text{ in}^3$

Aluminum Plate, $\phi M = \phi f_y Z = (.9)(15 \text{ ksi})(.351 \text{ in}^3) = 4.73 \text{ k-in}$ **OK**

For 10x18x1/4" Steel Mounting Plate

$Z = .25(10")(0.25")^2 = .156 \text{ in}^3$

Steel Plate, $\phi M = \phi f_y Z = (.9)(36 \text{ ksi})(.156 \text{ in}^3) = 5.05 \text{ k-in}$ **OK**



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PROJECT: Union Tempe Apartments - Blade Sign DATE: 6/29/2018
 PROJ. NO.: 17296C ENGINEER: TC
 CLIENT: SmithCraft

Check 10"x5"x0.125" Rect. Aluminum Tube (ADM 2015 - Ch F)

	$M_{ux} = 1.39 \text{ k-in}$	$d = 10$	$b = 5$	$t = 0.125$
	$M_{uy} = 5.73 \text{ k-in}$	welded? yes		
Yielding (Governs) (ADM 15, F.2)	$M_{nx} = Z_x F_{cy} = 181.7 \text{ k-in}$	$F_{cy} = F_{ty} = 15 \text{ ksi}$	$Z_x = 12.113 \text{ in}^3$	
	$M_{ny} = 1.5 S_x F_{cy} = 224.0 \text{ k-in}$	$Z_y = 7.504 \text{ in}^3$	$S_x = 9.957 \text{ in}^3$	
	$\phi M_{nx} = 163.5 \text{ k-in}$ OK	$\phi = 0.9$	$S_y = 6.836 \text{ in}^3$	
	$M_{ny} = Z_y F_{cy} = 112.6 \text{ k-in}$	$\kappa = 1 \text{ ksi}$	$E = 10100 \text{ ksi}$	
	$M_{ny} = 1.5 S_y F_{cy} = 153.8 \text{ k-in}$	$k1c = 0.35$	$k2c = 2.27$	
	$\phi M_{ny} = 101.3 \text{ k-in}$ OK	$k1f = 0.5$	$k2f = 2.04$	
LB: x-axis bending (ADM 15 F.3.1)	$B_p = 19.9 \text{ ksi}$	$b/t = 38.0$	$d/t = 78.0$	
	$D_p = 0.11 \text{ ksi}$	$m = 0.65$	$l_x = 49.785 \text{ in}^4$	
	$C_p = 122.7$	$l_y = 17.090 \text{ in}^4$	$c_{cfx} = 4.938 \text{ in}$	
	$\lambda1 = B_p - F_{cy} / 1.6 D_p = 28.4$	$\lambda2 = k1 B_p / 1.6 D_p = 57.4$	$c_{cw} = 2.5 \text{ in}$	
	$\lambda2 = k1 B_p / 1.6 D_p = 57.4$		$c_{cfy} = 2.438 \text{ in}$	
	since $b/t < \lambda1$: $F_c = F_{cy} = 13.33$		$c_{cw} = 5.0 \text{ in}$	
	$B_{br} = 26.4 \text{ ksi}$			
	$D_{br} = 0.17 \text{ ksi}$			
	$C_{br} = 107$			
	$\lambda1 = B_{br} - 1.5 F_{cy} / m D_{br} = 36.4$			
	$\lambda2 = k1 B_{br} / m D_{br} = 123.1$			
	since $d/t < \lambda1$: $F_c = 1.5 F_{cy} = 18.03$			
	$M_{nlb} = F_c I_f / c_{cf} + F_b I_w / c_{cw} = 257.72 \text{ k-in}$			
	$\phi M_{nlb} = 231.95 \text{ k-in}$ OK			

LB:
y-axis bending
(ADM 15 F.3.1)

$B_p = 19.9 \text{ ksi}$
 $D_p = 0.11 \text{ ksi}$
 $C_p = 122.7$

$\lambda1 = B_p - F_{cy} / 1.6 D_p = 28.4$
 $\lambda2 = k1 B_p / 1.6 D_p = 40.3$

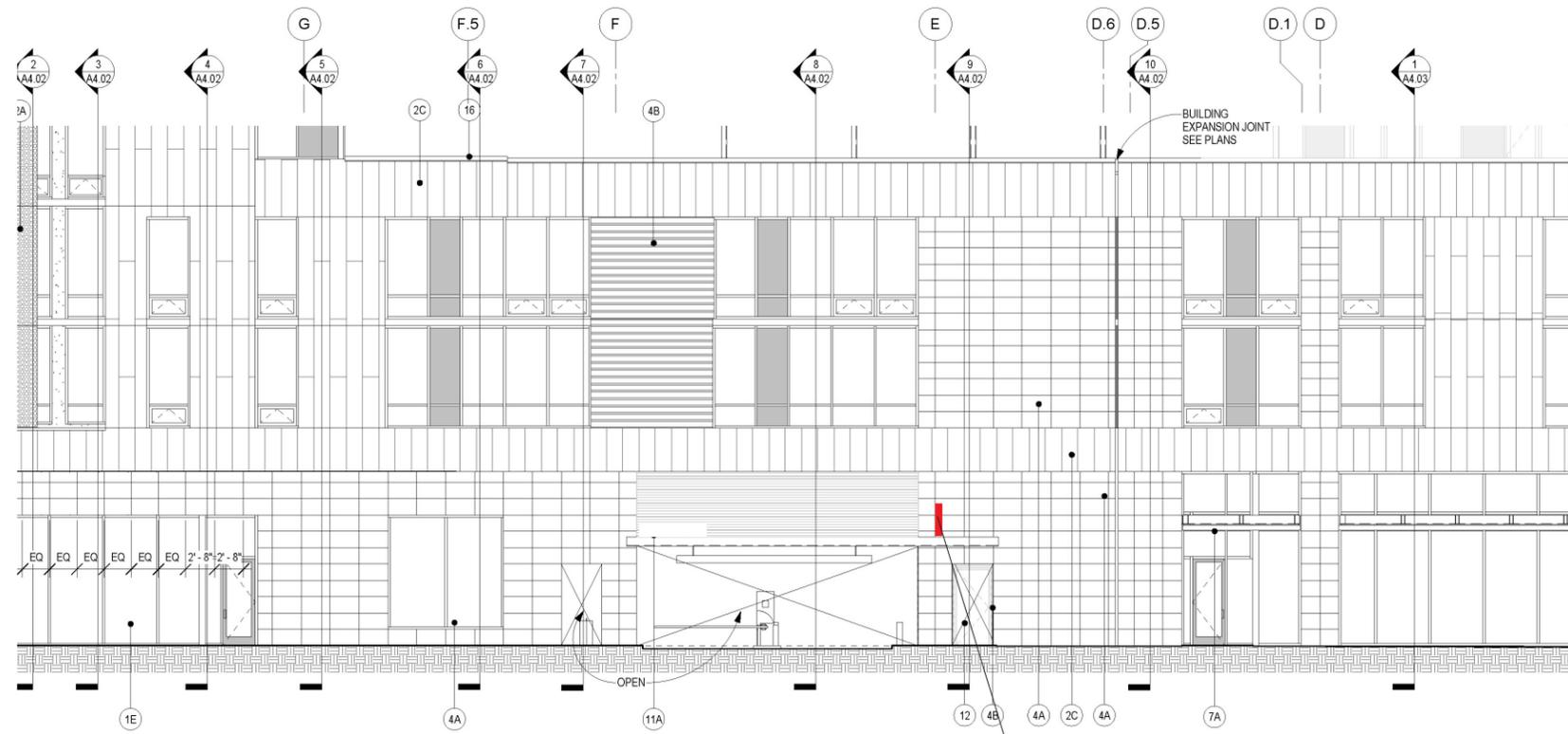
since $d/t < \lambda1$: $F_c = F_{cy} = 8.15$

$B_{br} = 26.4 \text{ ksi}$
 $D_{br} = 0.17 \text{ ksi}$
 $C_{br} = 107$

$\lambda1 = B_{br} - 1.5 F_{cy} / m D_{br} = 36.4$
 $\lambda2 = k1 B_{br} / m D_{br} = 123.1$

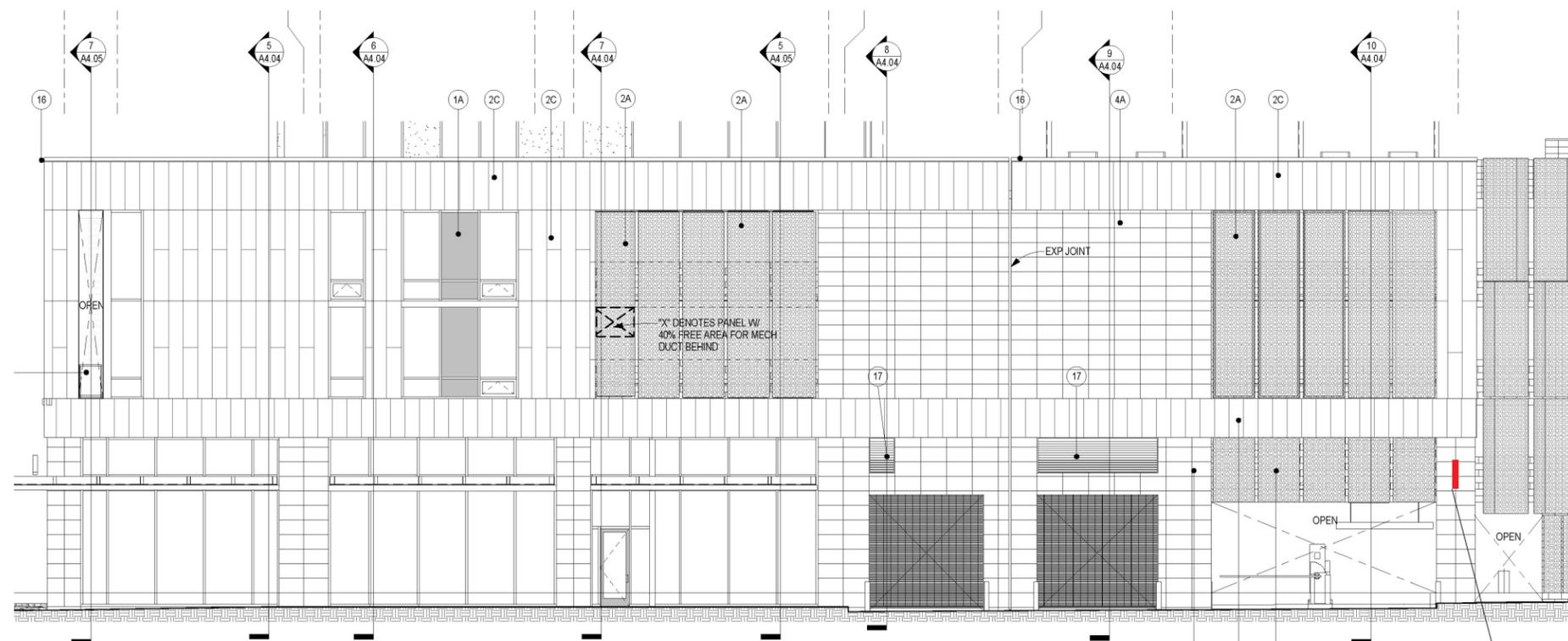
since $b/t < \lambda1$: $F_c = 1.5 F_{cy} = 22.32$

$M_{nlb} = F_c I_f / c_{cf} + F_b I_w / c_{cw} = 279.46 \text{ k-in}$
 $\phi M_{nlb} = 251.51 \text{ k-in}$ **OK**



Podium - Tower 1
East Elevation | Scale: 1/16" = 1'-0"

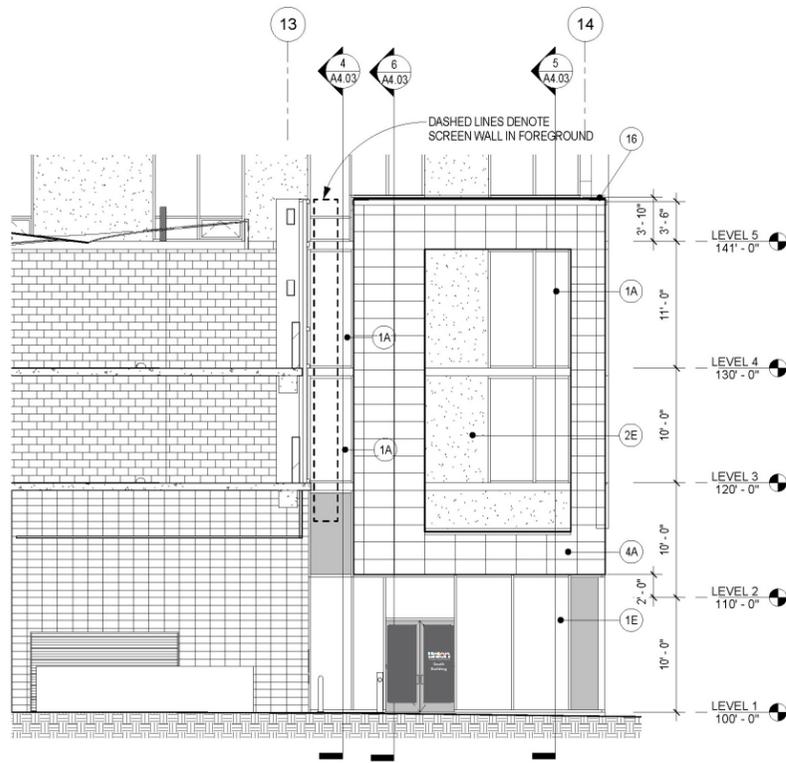
"P" Symbol Location
Exact Location TBD



Podium
West Elevation | Scale: 1/16" = 1'-0"

"P" Symbol Location
Exact Location TBD

4/5/18
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Podium - Tower 1
South Elevation | Scale: 1/16" = 1'-0"

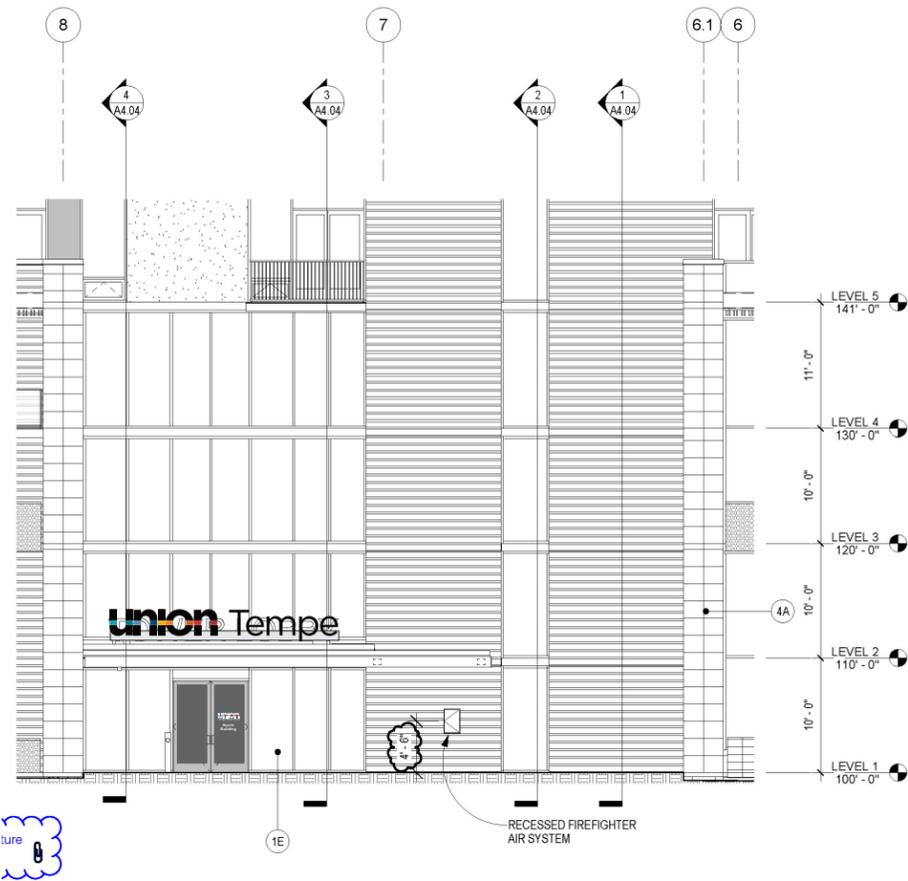


Vinyl
Elevation | Scale: 3/4" = 1'-0"

Manufacture and Install One (1) set of Vinyl

3M Matte White vinyl. Digitally printed vinyl colors.
Applied 1st surface to entry glass doors. Apply 2nd surface if glass is clear. **VERIFY**

4/5/18
PRODUCTION RELEASE



Podium - Tower 2
North Elevation | Scale: 1/16" = 1'-0"

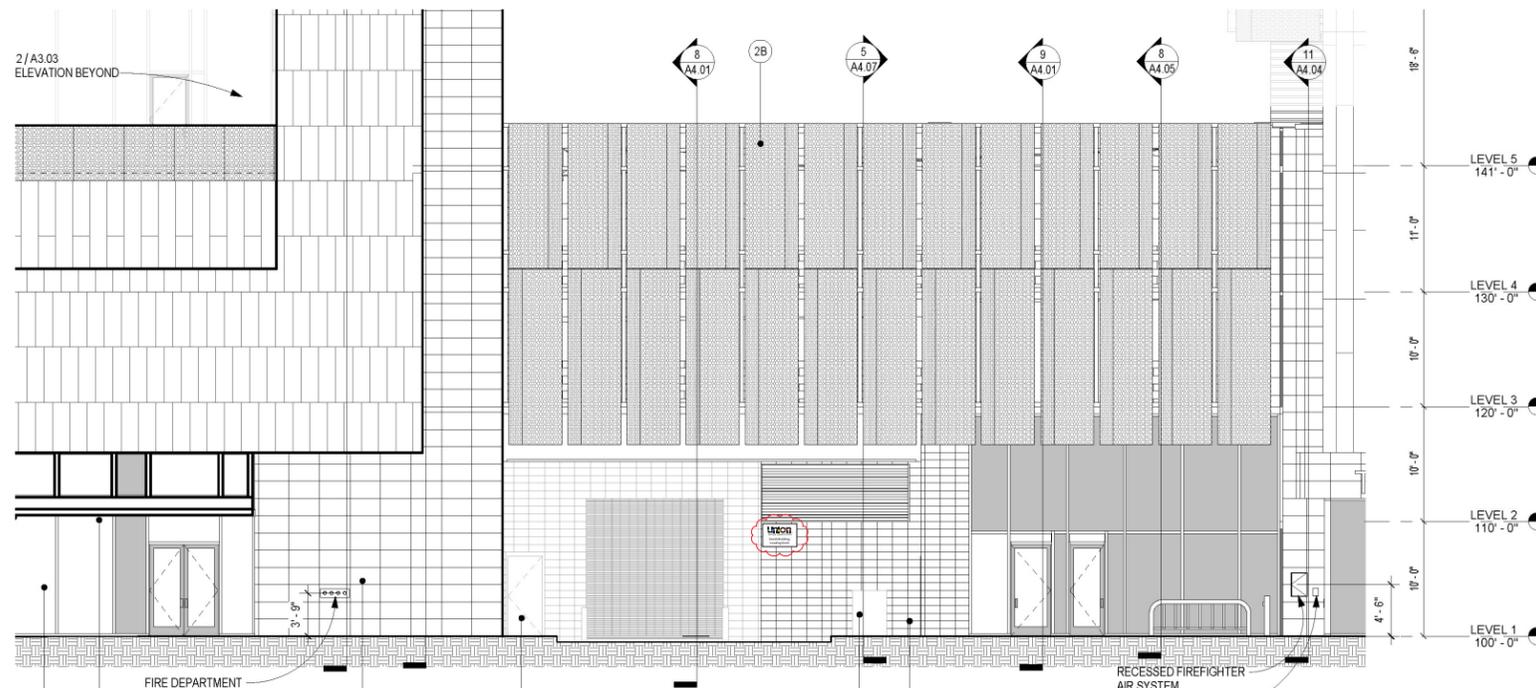


Vinyl
Elevation | Scale: 3/4" = 1'-0"

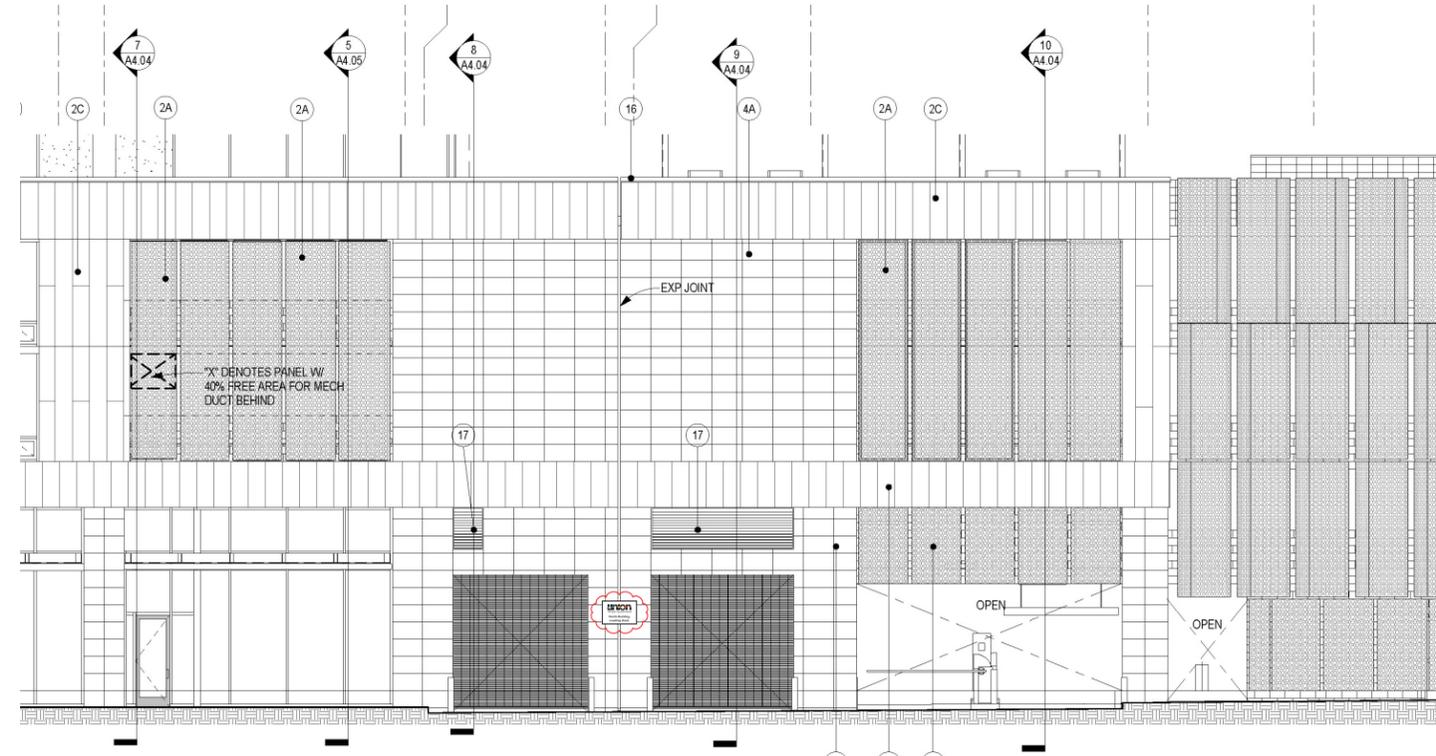
Manufacture and Install One (1) set of Vinyl

3M Matte White vinyl. Digitally printed vinyl colors.
Applied 1st surface to entry glass doors. Apply 2nd surface if glass is clear. **VERIFY**

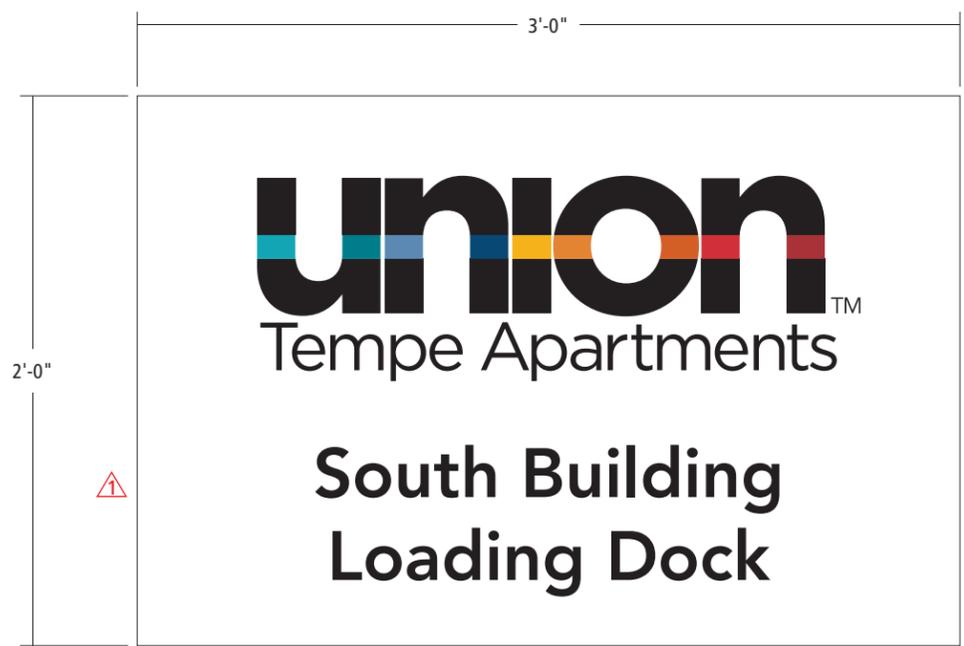
4/5/18
PRODUCTION RELEASE



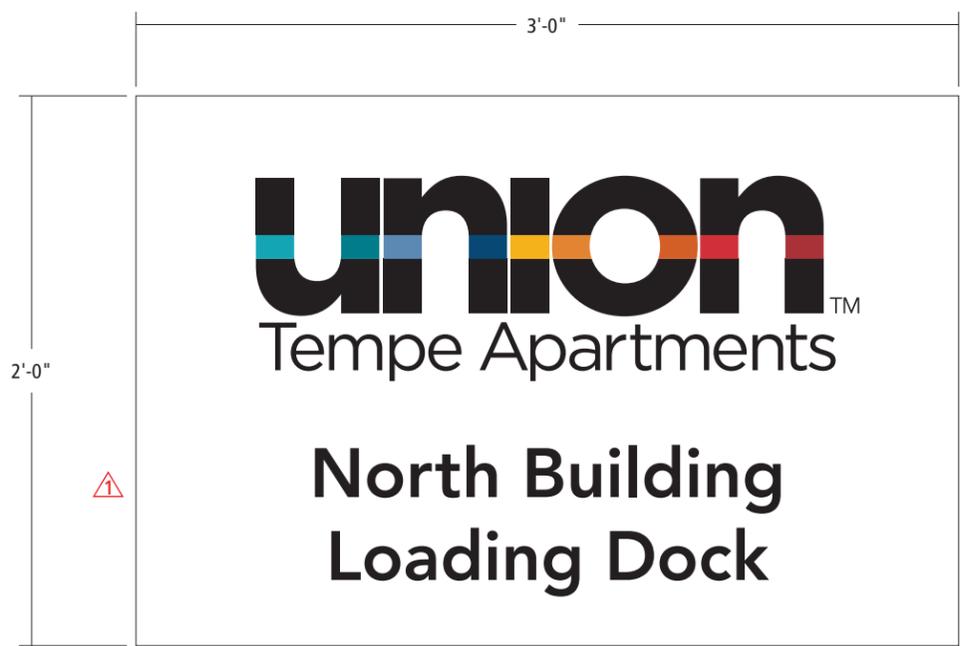
Podium
East Elevation | Scale: 1/16" = 1'-0"



Podium
West Elevation | Scale: 1/16" = 1'-0"



Panel - Tower 1
Elevation | Scale: 1 1/2" = 1'-0"



Panel - Tower 2
Elevation | Scale: 1 1/2" = 1'-0"

Manufacture and Install Two (2) Loading Dock Panels (1 of each) - 6 sq. ft.

.125" aluminum panel, painted Matthews White.
3M Matte Black vinyl. Digitally printed vinyl colors.
Applied 1st surface to panels.
Panels mounted to wall with blind studs and silicone adhesive.
(EXACT TEXT TBD)

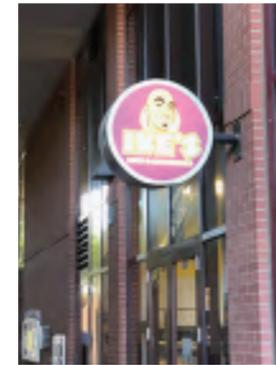
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RETAIL TENANT

Raceway Behind Letters
Paint to match Canopy

CANOPY MOUNTED SIGN - SIZE TBD based on Frontage

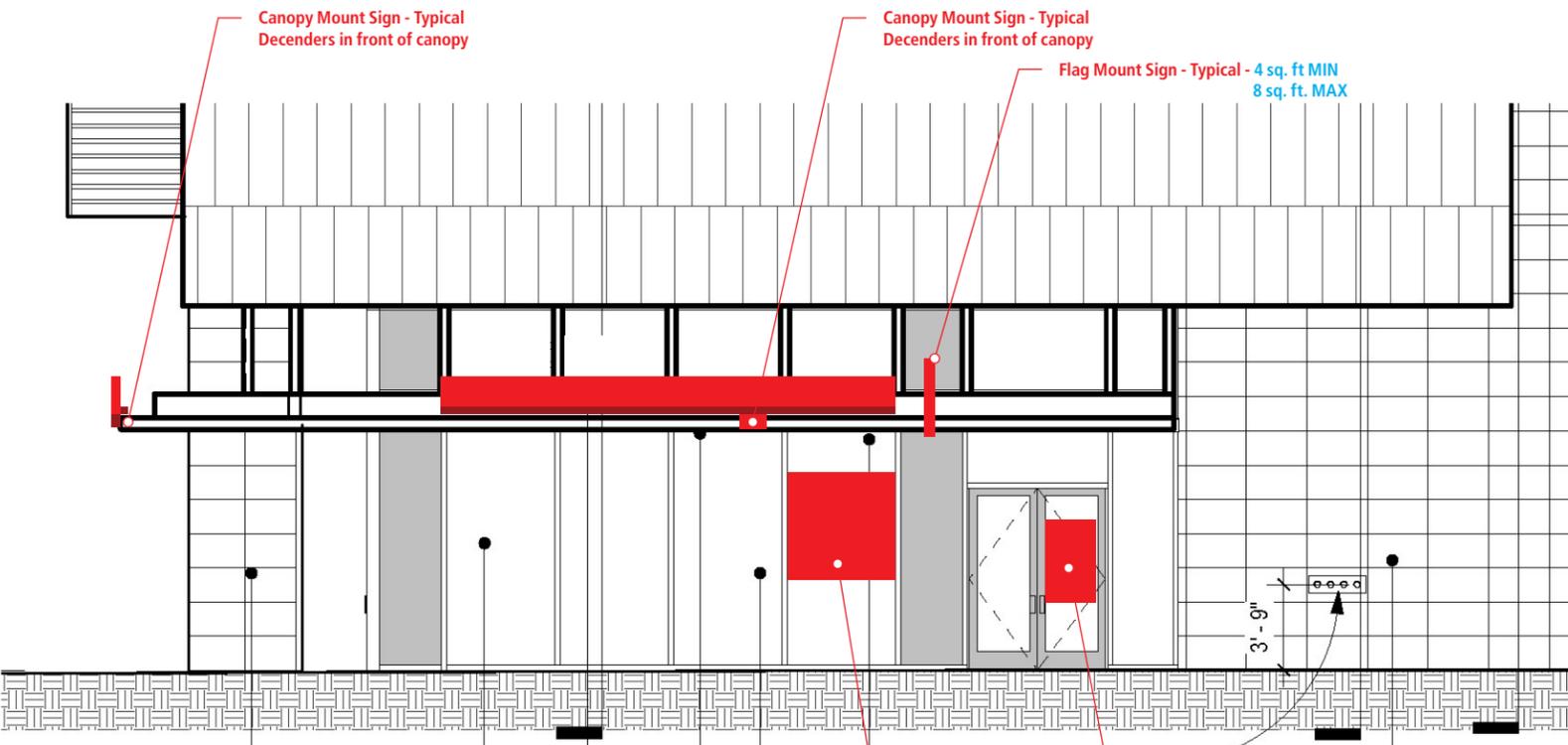
Individual face illuminated letters (logos) with dimmer.
Letters mounted to face of 4x4 aluminum raceway (raceway painted to match canopy).
Letter decenders to drop in front of canopy. Mounted to top of canopy.
Illuminated



Examples of Allowed Signs



Examples of NOT Allowed Signs
*No Signs with Primarily white illuminated background



Podium
East Elevation | Scale: 1/8" = 1'-0"

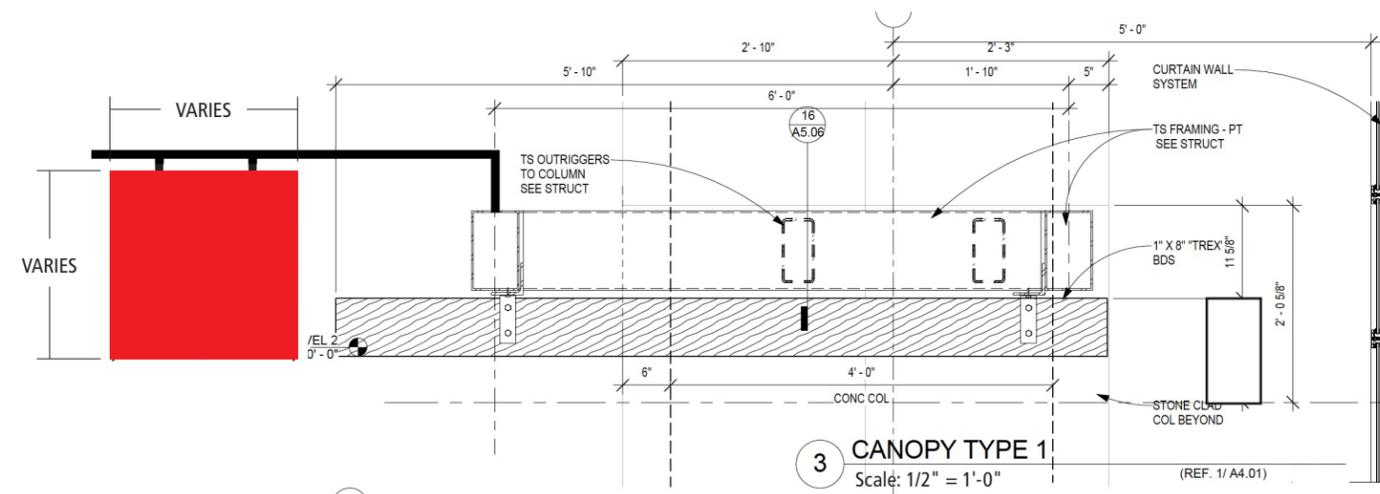
RETAIL TYPICALS. ALLOWABLE AT EACH RETAIL ENTRANCE

WINDOW VINYL - 16 sq. ft MAX
Various vinyl logo or text allowed, MAX 4'x4' size.

DOOR VINYL - 8.75 sq. ft MAX
Various vinyl logo or text allowed, MAX 2'-3" x 3'-6" size.

WINDOW/DOOR VINYL UNDER 25% DOES NOT REQUIRE PERMITS

Retail tenants, if desired, will be allowed both the flag mounted and canopy letters.



RETAIL TYPICALS. ALLOWABLE AT EACH RETAIL ENTRANCE

FLAG MOUNTED SIGN - 4 sq. ft MIN 8 sq. ft. MAX
Various shapes allowed - circles, squares, rectangles or abstract shapes allowed.
8" to 10" deep fabricated aluminum cabinet, painted.
Aluminum or plastic faces allowed.
Either routed aluminum and backed with plastic or
Plastic face with majority of sign face to have opaque or translucent vinyl background.
*NO ILLUMINATED FACE WITH PRIMARILY WHITE BACKGROUND
Illuminated or non-illuminated
Maximum extension from front of canopy = 3'-6"

RETAIL UPDATED 9/7/18