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GENERAL

- ALL MATERIALS AND WORK SHALL CONFORM TO THE REQUIREMENTS OF THE WASHINGTON STATE BUILDING CODE REF. 2021 INTERNATIONAL BUILDING CODE (IBC).
- CONSTRUCTION METHODS AND PROJECT SAFETY: DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE METHODS, PROCEDURES, OR SEQUENCE OF CONSTRUCTION. TAKE NECESSARY PRECAUTIONS TO MAINTAIN AND ENSURE THE INTEGRITY OF THE STRUCTURE DURING CONSTRUCTION. THE EOR WILL NOT ENFORCE SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL DESIGN, CONSTRUCT, AND MAINTAIN ALL SAFETY DEVICES AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE, AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS, AND REGULATIONS.
- VERIFY ALL DIMENSIONS, ELEVATIONS AND SITE CONDITIONS PRIOR TO THE START OF CONSTRUCTION AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES OR INCONSISTENCIES THAT ARE FOUND. NOTED DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. DO NOT SCALE DRAWINGS.
- ALL OMISSIONS AND/OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND FIELD INSPECTOR. THE ENGINEER SHALL PROVIDE A SOLUTION PRIOR TO PROCEEDING WITH ANY WORK AFFECTED BY THE CONFLICT OR OMISSION.
- WHERE NO CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF THE WORK, USE THOSE FOR OTHER SIMILAR WORK.
- WHEN A DETAIL IS IDENTIFIED AS TYPICAL, APPLY IN ESTIMATING AND CONSTRUCTION TO EVERY LIKE CONDITION WHETHER OR NOT THE REFERENCE IS REPEATED IN EVERY INSTANCE.
- CHANGES TO THE DRAWINGS: OBTAIN PRIOR WRITTEN APPROVAL.
- WORK PERFORMED IN CONFLICT WITH THE DRAWINGS OR APPLICABLE BUILDING CODE REQUIREMENTS SHALL BE CORRECTED AT THE EXPENSE OF THE CONTRACTOR.

DESIGN CRITERIA

- STRUCTURE IS DESIGNED IN ACCORDANCE WITH ASCE 7-16: MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
- WIND LOAD:
BASIC WIND SPEED, V_{ULT} = 100 MPH MAXIMUM
RISK CATEGORY: II EXPOSURE: C
- SNOW LOAD:
IMPORTANCE FACTOR, I_s = 1.0
SURFACE ROUGHNESS: C EXPOSURE: C
GROUND 20 PSF MAXIMUM.
ROOF --- PSF
4. ROOF LIVE LOAD: --- PSF

STEEL

- STEEL SHAPES SHALL CONFORM TO THE FOLLOWING (U.N.O.):
RND. HSB ASTM A500, GR C $F_y=46$ KSI MIN.
SQ./RECT. HSB ASTM A500, GR C $F_y=50$ KSI MIN.
THREADED ROD ASTM A36 $F_y=36$ KSI MIN.
STEEL PLATE ASTM A36 $F_y=36$ KSI MIN.
ANGLE & CHANNEL ASTM A36 $F_y=36$ KSI MIN.
STD. PIPE ASTM A53, GR B $F_y=35$ KSI MIN.
STRUCT. PIPE ASTM A252, GR 3 $F_y=45$ KSI MIN.
WIDE FLANGE ASTM A992 $F_y=50$ KSI MIN.
- MACHINE BOLTS SPECIFIED AS "A307" SHALL CONFORM TO ASTM A307 w/ NUTS PER ASTM A563A & WASHERS PER ASTM F844 (U.N.O.). THREADED PARTS, NUTS, AND WASHERS SHALL BE HDG OR ZP AS DEFINED HEREIN.
- STRUCTURAL BOLTS SHALL CONFORM TO ASTM F3125 GRADES A325 OR A490 AS SPECIFIED ("A325" OR "A490") w/ NUTS PER ASTM A563DH & WASHERS PER ASTM F436.
A. WHERE DESIGNATED AS "X", CARE MUST BE TAKEN TO ENSURE THREADS ARE EXCLUDED FROM THE SHEAR PLANE(S).
B. WHERE DESIGNATED AS "N" OR IF NO DESIGNATION IS NOTED, THREADS MAY BE INCLUDED IN THE SHEAR PLANE(S).
C. WHERE SPECIFIED, "A325" MAY BE HDG OR ZP AS DEFINED HEREIN.
D. GRADE "A490" SHALL NOT BE HDG OR ZP AS DEFINED HEREIN.
- ANCHORS CAST IN CONCRETE SHALL CONFORM TO ASTM F1554 GR. 36 (U.N.O.) w/ NUTS TO ASTM A563 AND WASHERS TO ASTM F436. PARTS SHALL BE HOT-DIP GALVANIZED (HDG) OR ZINC (MECHANICAL) PLATED (ZP). PARTS EMBEDDED ENTIRELY IN CONCRETE MAY BE PLAIN STEEL.
- WHERE SPECIFIED FOR STEEL THREADED PARTS, NUTS, AND WASHERS, HOT-DIP GALVANIZING (HDG) SHALL CONFORM TO ASTM F2329 AND ZINC (MECHANICAL) PLATING (ZP) TO CLASS 55 PER ASTM B695.
- PLAIN STEEL FASTENERS ARE NOT TO BE USED UNLESS SPECIFIED.
- ZINC ELECTRO-PLATED FASTENERS PER ASTM F1941 MAY BE SUBSTITUTED FOR INTERIOR APPLICATIONS, BUT ARE OTHERWISE NOT TO BE USED UNLESS SPECIFIED.
- NUTS AND WASHERS SHALL HAVE THE SAME COATING AS THE CORRESPONDING THREADED PART.
- WHERE SPECIFIED, IRON AND STEEL HARDWARE SHALL BE HOT-DIP GALVANIZED PER ASTM A153.
- STAINLESS STEEL (SS) BOLTS, STUDS, AND THREADED ROD SHALL CONFORM TO ASTM F593 AND BE ALLOY 304 OR 316 w/ NUTS TO ASTM F594. NUTS AND WASHERS SHALL MATCH THE ALLOY OF THE THREADED PART.
1.1. WELDING:
A. WELD STRUCTURAL STEEL IN COMPLIANCE WITH ANSI/AWS D1.1 AND AISC SPECIFICATION, CHAPTER J. WELDERS SHALL BE CERTIFIED AS REQUIRED BY THE LOCAL BUILDING AUTHORITY. WELDING SHALL BE DONE BY ELECTRIC ARC PROCESS USING LOW-HYDROGEN ELECTRODES WITH SPECIFIED TENSILE STRENGTH NOT LESS THAN 70 KSI UNLESS NOTED OTHERWISE.
B. UNLESS A LARGER WELD SIZE IS INDICATED, PROVIDE MINIMUM SIZE WELD PER AISC SPECIFICATION, SECTION J2, TABLE J2.4.

ALUMINUM

- FABRICATE AND ERECT ALUMINUM IN COMPLIANCE WITH THE 2020 ALUMINUM DESIGN MANUAL (ADM1), THE SPECIFICATIONS FOR ALUMINUM SHEET METAL WORK (ASM35), AND CHAPTER 20 OF THE BUILDING CODE.
- ALUMINUM SHAPES SHALL CONFORM TO THE FOLLOWING:
PIPE & TUBE 6061-T6 ASTM B429 $F_y=35$ KSI MIN.
STRUCT. PROFILES 6061-T6 ASTM B308 $F_y=35$ KSI MIN.
SHEET & PLATE 6061-T6 ASTM B209 $F_y=35$ KSI MIN.

- STAPLE TUBE 6063-T5 ASTM B221 $F_y=16$ KSI MIN.
- ALL SHOP AND FIELD WELDS SHALL BE PERFORMED BY AN AISC QUALITY CERTIFIED FABRICATOR.
 - UNLESS A LARGER WELD SIZE IS INDICATED, PROVIDE MINIMUM SIZE WELD PER ADM 1.
 - FILLER SHALL BE 5556 ALLOY REGARDLESS OF MEMBER THICKNESS. NO OTHER FILLER ALLOY SHALL BE USED UNLESS NOTED OTHERWISE.

CONCRETE & REINFORCEMENT

- MINIMUM 28-DAY COMPRESSIVE STRENGTH (f_c) SHALL BE 2,500 PSI.
- REINFORCEMENT TO BE ASTM A615 GR. 60, $F_y=60$ KSI UNO.
- CALCIUM CHLORIDE OR ADDED CHLORIDE IS NOT PERMITTED.
- ALL REINFORCED CONCRETE SHALL BE CONSOLIDATED WITH MECHANICAL VIBRATORS.
- MINIMUM CONCRETE COVER:
CAST AGAINST & EXPOSED TO EARTH 3"
EXPOSED TO EARTH OR WEATHER 2"
- CHAIRS AND SPACERS: AS REQUIRED TO MAINTAIN COVER.
- GROUT SHALL BE NON-SHRINK AND NON-METALLIC WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT (1) DAY. MIX AND PLACE IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.

FOUNDATIONS

- DESIGN BEARING PRESSURES ARE PER IBC CLASS 4 PRESUMPTIVE VALUES (NO SPECIAL INSPECTION REQUIRED):
LATERAL BEARING: 150 PSF/FT
VERTICAL BEARING: 2,000 PSF

EXISTING CONDITIONS

- ENGINEER WILL NOT BE PERFORMING ON-SITE INSPECTIONS OR VERIFICATIONS. IT IS THE RESPONSIBILITY OF THE INSTALLER AND OWNER(S) TO IDENTIFY EXISTING CONDITIONS AND CONTACT ENGINEER WITH ANY DISCREPANCIES OR CONCERNS.
- EXISTING INFORMATION HAS BEEN FURNISHED BY THE ENTITY WHOM THIS DOCUMENT WAS PREPARED FOR. ENGINEER IN NO WAY CERTIFIES THIS INFORMATION AS "AS-BUILT".
- FEATURES OF WORK ANNOTATED AS "VERIFY" (OR SIMILAR) MUST BE INSPECTED, VERIFIED AS SUCH, AND DOCUMENTED PRIOR TO FABRICATION AND INSTALLATION.
- IF THERE IS ANY REASON TO BELIEVE THE EXISTING CONDITIONS DETAILED HEREIN ARE NOT ACCURATE, CONTRACTOR SHALL CEASE WORK AND NOTIFY ENGINEER IMMEDIATELY.
- CONTRACTOR SHALL INSPECT AND CONFIRM THE QUALITY OF EXISTING STRUCTURE AS "IN GOOD REPAIR". STRUCTURE SHALL BE FREE OF CORROSION, DECAY, AND ANY OTHER MATERIAL, FABRICATION, ASSEMBLY, OR INSTALLATION DEFECT. IF THERE ARE ANY INDICATIONS THAT THIS IS NOT THE CASE, CONTRACTOR SHALL CEASE WORK IMMEDIATELY AND NOTIFY ENGINEER.

EVALUATION REPORT SCHEDULE

ANCHORS, FASTENERS, AND OTHER PRODUCTS SHALL CONFORM TO AND BE INSTALLED PER THEIR RESPECTIVE EVALUATION REPORT(S) AS FOLLOWS (NOT ALL APPLICABLE THIS PROJECT):

ANCHOR TYPE	REPORT #
HILTI KB-T22 (C5 & S5) ANCHORS IN CONCRETE	ICC-ESR-4266
HILTI KB-T22 (C5 & S5) ANCHORS IN MASONRY	ICC-ESR-4561
HILTI KH-EZ (C5 & S5) ANCHORS IN CONCRETE	ICC-ESR-3027
HILTI KH-EZ (C5 & S5) ANCHORS IN MASONRY	ICC-ESR-3056
HILTI HIT-HY 200 ADHESIVE IN CONCRETE	ICC-ESR-3187
HILTI HIT-HY 200 ADHESIVE IN MASONRY	ICC-ESR-3963
SIMPSON TITEN HD (C5) ANCHORS IN CONCRETE	ICC-ESR-2713
SIMPSON TITEN HD (C5 & S5) ANCHORS IN MASONRY	ICC-ESR-1056
SIMPSON TITEN HD (S5) ANCHORS IN CONCRETE	UES-ER-493
TAPCON ANCHORS IN MASONRY	ICC-ESR-1671
TAPCON ANCHORS IN CONCRETE	ICC-ESR-2202
TAPCON+ SCREW ANCHORS IN CONCRETE	ICC-ESR-3699
ITW BUILDEX TEKS SD5	ICC-ESR-1976

ABBREVIATIONS

ABV.	ABOVE	G.C.	GENERAL CONTRACTOR
ADD'L.	ADDITIONAL	HDG	HOT DIP GALVANIZED
AFF	ABOVE FINISHED FLOOR	HOR.	HORIZONTAL
ALT.	ALTERNATE	O.C.	ON CENTER
ALUM.	ALUMINUM	LOC.	LOCATION
A.O.R.	ARCHITECT OF RECORD	MAX.	MAXIMUM
ARCH.	ARCHITECTURAL	MIN.	MINIMUM
BTM.	BOTTOM	(N)	NEW
BLK'G.	BLOCKING	N.T.E.	NOT TO EXCEED
CIRC.	CIRCLE/CIRCULAR	o/	OVER
CONC.	CONCRETE	O.D.	OUTSIDE DIAMETER
CONN.	CONNECTION	OPT.	OPTIONAL
CONT.	CONTINUOUS	PFM.	PENETRATION
CTR.	CONTRACTOR	REINF.	REINFORCEMENT
DIA.	DIAMETER	RND.	ROUND
DET.	DETAIL	SIM.	SIMILAR
(E)	EXISTING	SS	STAINLESS STEEL
EXIST.	EXISTING	STD	STANDARD
EA.	EACH	SUPP.	SUPPLEMENTAL
E.W.	EACH WAY	SQ.	SQUARE
ELEV.	ELEVATION	T/O	TOP OF
EMBED.	EMBEDMENT	TYP.	TYPICAL
E.O.R.	ENGINEER OF RECORD	THK.	THICK(NESS)
FAB.	FABRICATOR/FABRICATION	U.N.O.	UNLESS NOTED OTHERWISE
FDN.	FOUNDATION	VERT.	VERTICAL
FRM'G.	FRAMING	w/	WITH
FTG.	FOOTING	w/o	WITHOUT
F.V.	FIELD VERIFY	ZP	ZINC (MECHANICAL) PLATED

The presumptive soils class of the site is class 5, and vertical foundation pressure and lateral bearing pressure will need to be updated along with any calculations.

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PREPARED FOR:

PERSONA SIGNS

PROJECT #:

2509136

MCDONALDS 43903

FLAGPOLE

2902 E PIONEER
PUYALLUP, WA 98372

No.	Issue/Revision:	Date:
----	Initial Submittal	9-24-2025
1		
2		
3		
4		

PRSG20251040



24-Sep-25

SHEET TITLE:

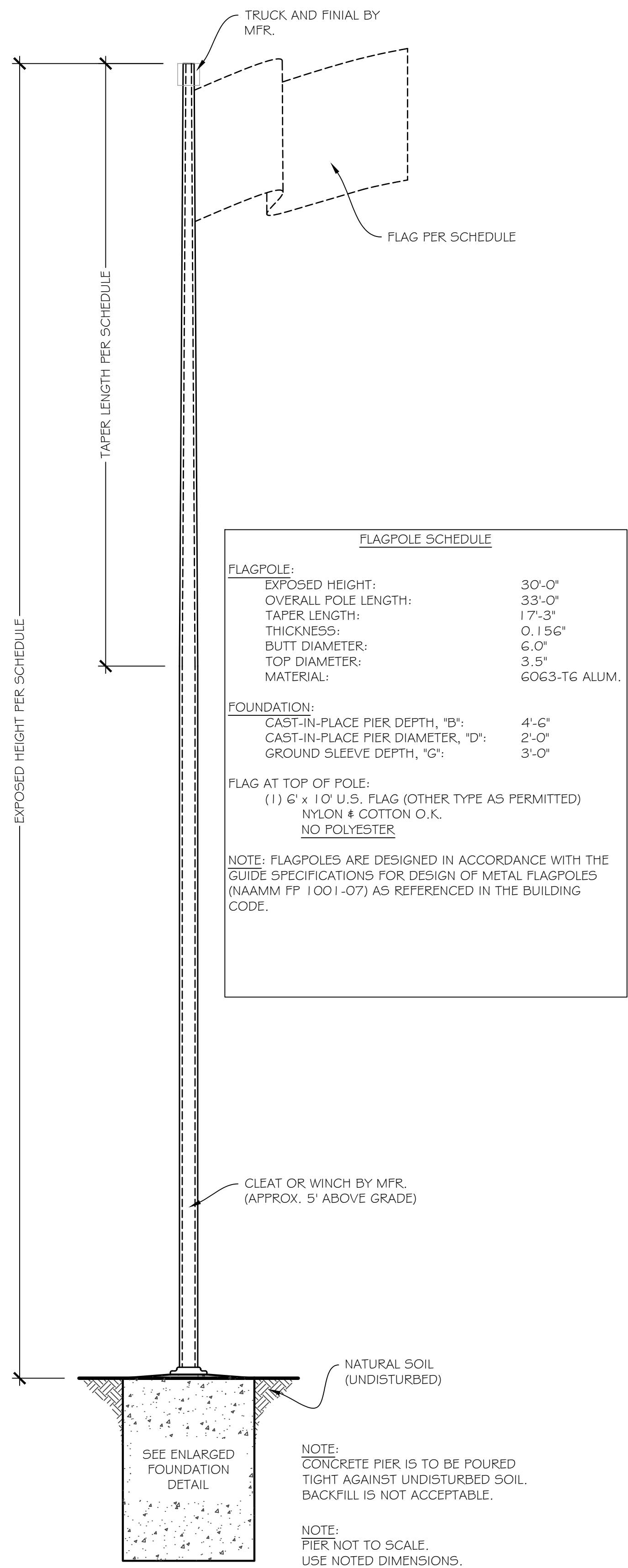
STRUCTURAL

SHEET:

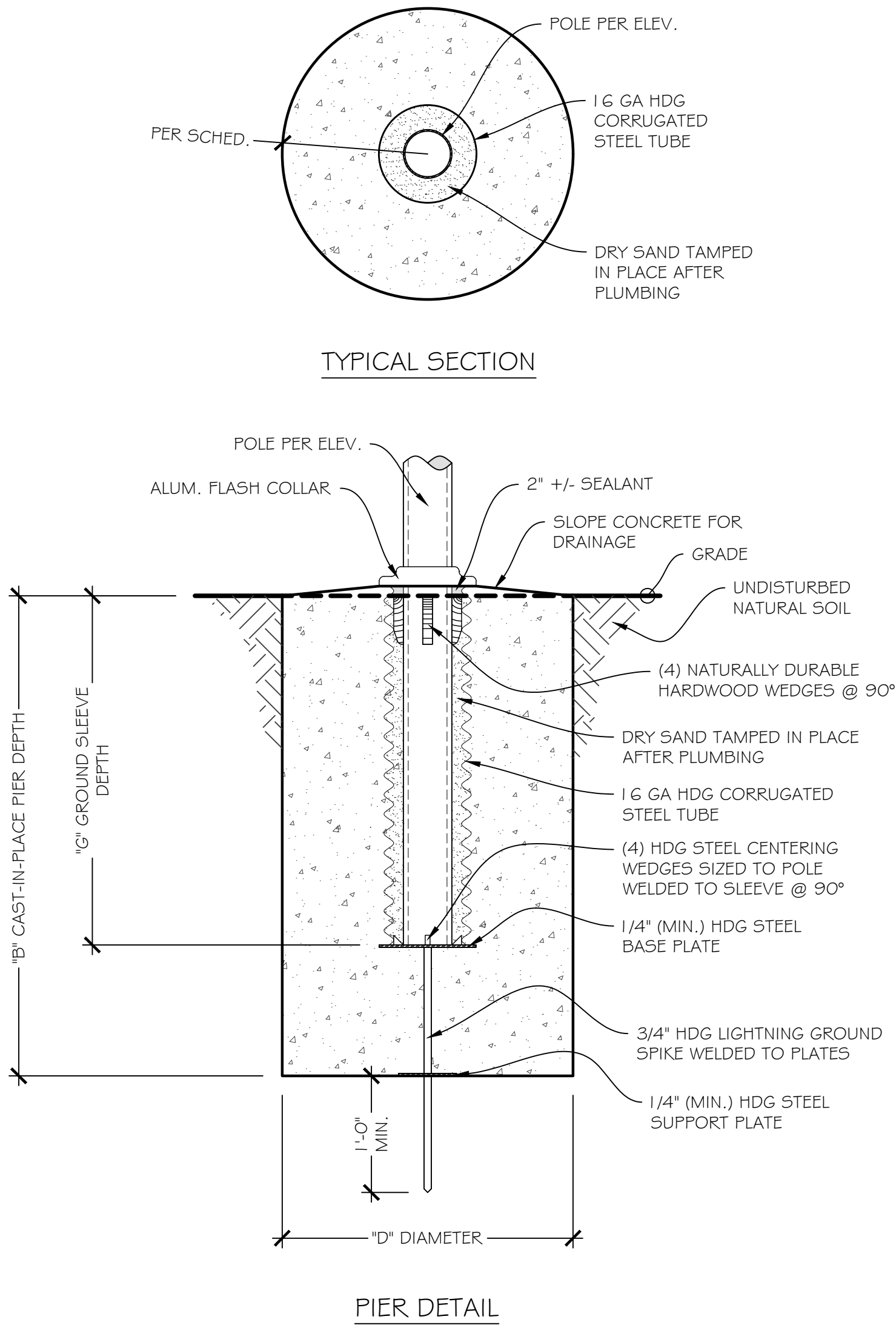
S.1

ORIGINAL SHEET SIZE: 24x36

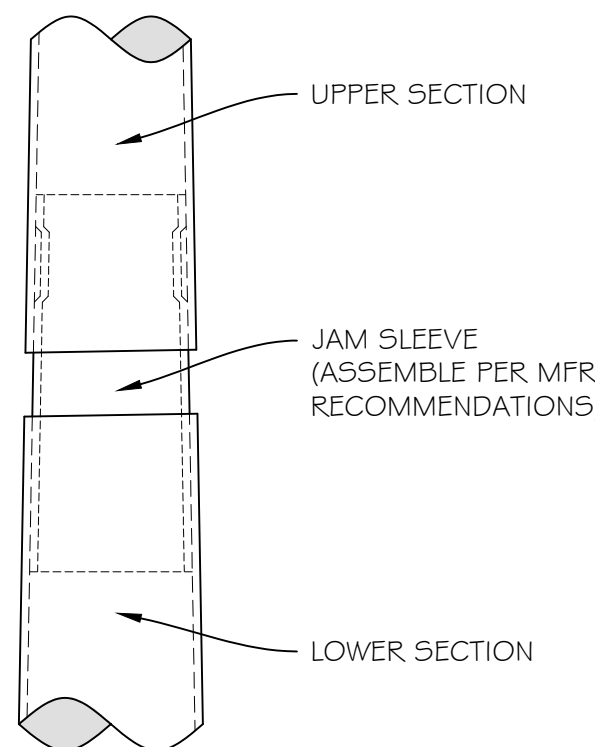
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1 FLAGPOLE ELEVATION



2 FOUNDATION DETAIL



3 CONNECTION DETAIL (WHERE APPLIES)



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REVERENCE ENGINEERING

STRUCTURAL CALCULATIONS

for

McDonalds 43903 Flagpole

at

2902 E Pioneer

Puyallup, WA 98372

Prepared for:

Persona Signs

Package Type:

Initial Submittal

Project #:

2509136

DESIGN SPECIFICATIONS

- 1 Washington State Building Code, ref. 2021 IBC
- 2 ASCE 7-16: Minimum Design Loads for Buildings and Other Structures
- 3 ACI 318-14: Building Code Requirements for Structural Concrete
- 4 ANSI/AISC 360-16: Specification for Structural Steel Buildings
- 5 Aluminum Design Manual (ADM-1) 2015

DESIGN CRITERIA

::Wind:: $V_{ult} = 100$ mph
Exposure: C
::Ground Snow Load:: $p_g = 20$ psf
::Soils::
Per Building Code Presumptive Class 4
Allowable Lateral Bearing: 150 psf/ft
Allowable Vertical Bearing: 2000 psf

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Date Signed: 24/09/2025



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McDonalds 43903 Flagpole

2902 E Pioneer, Puyallup, WA 98372

REVERENCE
ENGINEERING

FLAGPOLE WIND LOADING - ANSI/NAAMM FP 1001-07 APPROACH

h = 30 ft Exposed Height
T = 17.25 ft Tapered Height
S = 12.75 ft Straight Pole Height
d_b = 6 in Butt diameter
d_t = 3.5 in Top diameter
t = 0.1563 in Pole thickness
V = 100 mph Basic Wind Speed
G = 1.14 - Gust effect factor
m = -0.145 in/ft Taper slope

POLE WIND LOADS

Sect.	z (ft)	L (ft)	d (in)	A (ft ²)	C _h	V x d	C _d	P	W _p	M (k-ft)
1	12.75	6.375	6	6.375	0.86	50	0.7979	20.025	101.85	0.6493
2	15	13.875	5.837	1.0944	0.86	48.641	0.827	20.755	18.784	0.2606
3	18	16.5	5.4565	1.3641	0.8661	45.471	0.9027	22.816	28.095	0.4636
4	21	19.5	5.0217	1.2554	0.8971	41.848	1.0056	26.327	33.236	0.6481
5	24	22.5	4.587	1.1467	0.9245	38.225	1.1	29.68	37.438	0.8424
6	27	25.5	4.1522	1.038	0.9492	34.601	1.1	30.472	34.794	0.8873
7	30	28.5	3.7174	0.9293	0.9717	30.978	1.1	31.194	31.889	0.9088
8										
9										
10										
11										
12										
13										
14										

Base Bending Moment: 4.66 k-ft
Base Shear: 286.09 lb

FLAG LOADS

Type: Nylon or Cotton
b = 6 ft Flag height
w = 10 ft Flag width
A_F = 60 ft² Flag area
C_h = 0.9823 - Coefficient of height
W_F = 86.737 lb Force on Flag
Type: Polyester
b = 0 ft Flag height
w = 0 ft Flag width
A_F = 0 ft² Flag area
C_h = 0.86 - Coefficient of height
W_F = 0 lb Force on Flag

+ Base Bending Moment: 2.3419 k-ft
Base Shear: 86.737 lb

+ Base Bending Moment: 0 k-ft
Base Shear: 0 lb

TOTAL LOADS

Base Bending Moment: 7.00 k-ft
Base Shear: 0.3728 kip

POLE CHECK AT BASE

Alloy: 6063 Temper: T6

M_u = 7.00 k-ft F_w = 30 ksi F_{ty} = 25 ksi k_t = 1
Yielding Rupture
d_b = 6 in Z = 5.4461 in³ ϕ_b = 0.9 - ϕ_b = 0.75 - ϕM_n = 10.211 k-ft
t = 0.1563 in S = 4.0845 in³ M_{np} = 11.346 k-ft M_{nu} = 13.615 k-ft D/C: 0.6857 OK

CAST-IN-PLACE PIER DESIGN

b = 2 ft Footing diameter*
M_u = 7.00 k-ft Moment at grade V_u = 0.37 k Shear at grade ω = 1.3 Per IBC 1605.3.2
M_s = 4.2012 k-ft Service M (0.6*M_u) V_s = 0.224 k Service V (0.6*V_u) P = 290.8 lb Lateral Wind Force
s = 150 psf/ft Lateral Bearing per IBC Table 1806.2
s' = 400 psf/ft Increased per IBC 1806.1 & 1806.3.4
ITERATION PER IBC 1807.3.2.1
h = 18.78 ft S1 = 528.73 psf
d = 3.9655 ft A = 0.6435 ft

DESIGN RESULTS

MIN. PIER DEPTH: 4 ft and 0 in
MIN. PIER DIAMETER*: 2 ft and 0 in

Ratio
2

*Also refers to diagonal of a square or rectangle



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