

# NEW 6'X12' MVI CP Monument

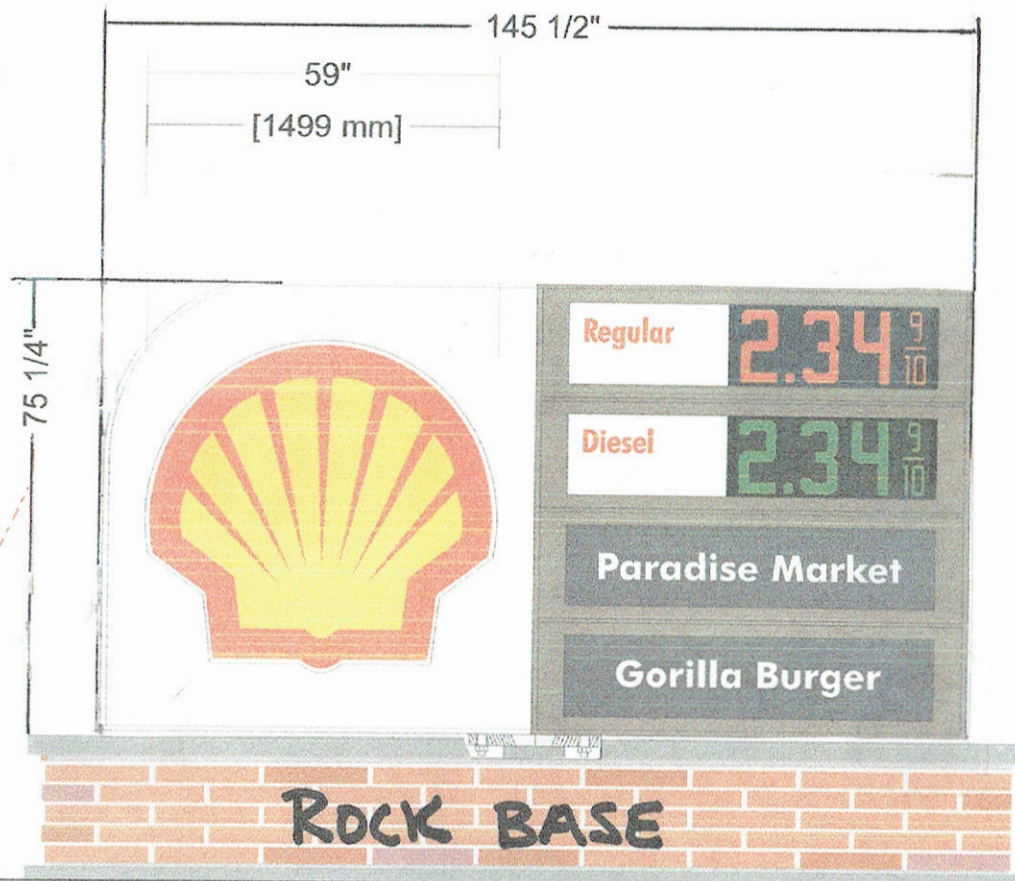
## Cabinet on 2' Base

- 1x REG 12" LED
- 1x Diesel 12" LED
- 1x Paradise Market Copy
- 1x Gorilla Burger Copy

Overall Height of Sign: 8.27'

75.93 sq ft.

Shell Logo  
closest to the road



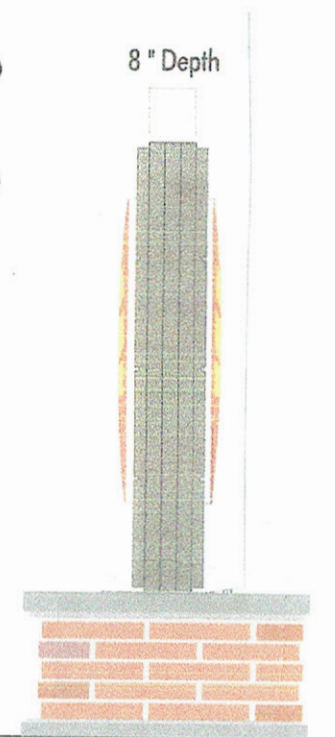
**Proposed Elevation**

SCALE: 3/8" = 1'

12" LED

12" LED

8" Depth



**Side View**

**GENERAL**

THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND CORRELATION OF ALL ITEMS AND WORK NECESSARY FOR COMPLETION OF THE PROJECT AS INDICATED BY THE CONTRACT DOCUMENTS. SHOULD ANY QUESTION ARISE REGARDING THE CONTRACT DOCUMENTS OR SITE CONDITIONS, THE CONTRACTOR SHALL REQUEST INTERPRETATION AND CLARIFICATION FROM THE ENGINEER BEFORE BEGINNING THE PROJECT. THE ABSENCE OF SUCH REQUEST SHALL SIGNIFY THAT THE CONTRACTOR HAS REVIEWED AND FAMILIARIZED HIMSELF WITH ALL ASPECTS OF THE PROJECT AND HAS COMPLETE COMPREHENSION THEREOF. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE TO ALL SAFETY REGULATIONS DURING CONSTRUCTION.

THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. UNLESS OTHERWISE SPECIFICALLY NOTED, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION OR CONSTRUCTION LOADS. ONLY THE CONTRACTOR SHALL PROVIDE ALL METHODS, DIRECTION AND RELATED EQUIPMENT NECESSARY TO PROTECT THE STRUCTURE, WORKMEN AND OTHER PERSONS AND PROPERTY DURING CONSTRUCTION. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, ENGAGE PROPERLY QUALIFIED PERSONS TO DETERMINE WHERE AND HOW TEMPORARY PRECAUTIONARY MEASURES SHALL BE USED AND INSPECT SAME IN THE FIELD. ANY MATERIAL NOT AS SPECIFIED OR IMPROPER MATERIAL INSTALLATION OR WORKMANSHIP SHALL BE REMOVED AND REPLACED WITH SPECIFIED MATERIAL IN A WORKMANLIKE MANNER AT THE CONTRACTOR'S EXPENSE.

THESE PLANS, SPECIFICATIONS, ENGINEERING AND DESIGN WORK ARE INTENDED SOLELY FOR THE PROJECT SPECIFIED HEREIN. MILLER CONSULTING ENGINEERS DISCLAIMS ALL LIABILITY IF THESE PLANS AND SPECIFICATIONS OR THE DESIGN, ADVICE AND INSTRUCTIONS ATTENDANT THERETO ARE USED ON ANY PROJECT OR AT ANY LOCATION OTHER THAN THE PROJECT AND LOCATION SPECIFIED HEREIN. OBSERVATION VISITS TO THE JOB SITE AND SPECIAL INSPECTIONS ARE NOT PART OF THE STRUCTURAL ENGINEER'S RESPONSIBILITY UNLESS THE CONTRACT DOCUMENTS SPECIFY OTHERWISE.

NON STRUCTURAL PORTIONS OF PROJECT, INCLUDING BUT NOT LIMITED TO PLUMBING, FIRE PROTECTION, LAND USE, SITE PLANNING, EROSION CONTROL, ELECTRICAL, MECHANICAL, FLASHING AND WATER-PROOFING ARE BEYOND THE SCOPE OF THESE DRAWINGS AND ARE PROVIDED BY OTHERS. EXISTING STRUCTURAL ELEMENTS ARE DESIGNED BY OTHERS.

CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO FABRICATION OR INSTALLATION. ENGINEER OF RECORD FOR THE PROJECT IS TO BE NOTIFIED IF CONDITIONS DIFFER FROM WHAT IS SHOWN ON THE DRAWINGS.

**BUILDING CODE**

ALL PHASES OF THE WORK SHALL CONFORM TO THE 2021 INTERNATIONAL BUILDING CODE, INCLUDING ALL REFERENCE STANDARDS, UNLESS NOTED OTHERWISE.

**DESIGN LOADS**

THE FOLLOWING ARE THE DESIGN REQUIREMENTS:

**STRUCTURAL DESIGN CRITERIA:** RISK CATEGORY II

**WIND DESIGN DATA:** BASIC WIND SPEED (3 SEC GUST) = 135 MPH

**EXPOSURE:** C

**SNOW LOAD:** N/A

**PASSIVE LATERAL BEARING PRESSURE:** 150PSF (INCREASE PRESSURE X2 PER SECTION 1806.3.4 TO 300 PSF)

**FOOTINGS**

CONTRACTOR SHALL VERIFY SOIL CONDITIONS AT THE FOOTINGS AND MAKE ANY NECESSARY CORRECTIONS TO PLACE THEM ON FIRM NATIVE SOIL OR STRUCTURAL FILL COMPACTED TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT PER AMERICAN SOCIETY FOR TESTING AND MATERIALS, ASTM D698 (STANDARD PROCTOR), OR ASTM D1557 (MODIFIED PROCTOR). THE COMPACTION SHALL BE VERIFIED BY A QUALIFIED INSPECTOR APPROVED BY THE BUILDING OFFICIAL. COMPACTED STRUCTURAL FILL FOR DEPTHS GREATER THAN 12 INCHES SHALL COMPLY WITH PROVISIONS OF AN APPROVED GEOTECHNICAL REPORT. ASSUMED SOIL BEARING PRESSURE 1500 POUNDS PER SQUARE FOOT (PSF).

**CONCRETE**

MIXING, PLACING AND CURING OF CONCRETE SHALL BE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE, ACI 318 AND IBC CHAPTER 19.

CONCRETE SHALL BE 3,000 POUNDS PER SQUARE INCH (PSI) MINIMUM AT 28 DAYS, UNO. ALL CONCRETE WITH REINFORCEMENT SHALL HAVE NO CHLORINE OR CHLORIDES. FOOTING DESIGNED FOR 2,500 PSI, NO SPECIAL INSPECTION REQUIRED.

WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, THE EXISTING CONCRETE SURFACE SHALL BE CLEANED AND ROUGHENED TO A MINIMUM 1/4" AMPLITUDE PER ACI 318 11.6.9. SET ALL ANCHOR BOLTS AND DOWELS BEFORE POURING CONCRETE.

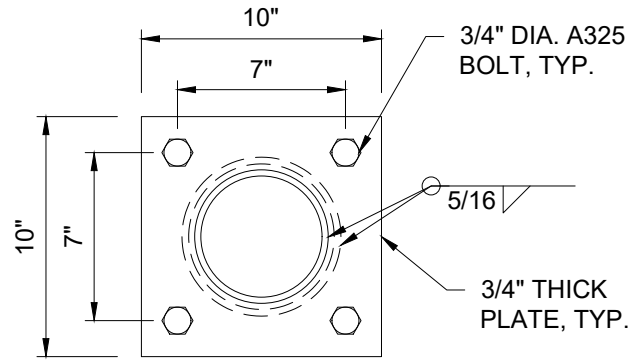
**STRUCTURAL STEEL**

ALL STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE ASTM A992 FOR W-SECTIONS AND ASTM A36 FOR ALL OTHER SECTIONS, PLATES AND BARS. ALL RECTANGULAR HSS SECTIONS SHALL BE ASTM A500, GRADE B, FY= 46000 PSI AND ALL ROUND HSS SECTIONS SHALL BE ASTM A500, GRADE B, FY = 42000 PSI. ALL STRUCTURAL STEEL PIPE SHALL BE ASTM A53, GRADE B, TYPE E OR S, FY= 35000 PSI.

UNLESS NOTED OTHERWISE, ALL BOLTS TO BE ASTM A307 AND ALL ANCHOR RODS TO BE ASTM F1554 GRADE 36, WITH MATCHING NUTS. ALL FASTENERS IN CONTACT WITH ALUMINIUM TO BE HOT-DIPPED GALVANIZED WITH MATCHING NUTS OR HAVE A PROTECTIVE BARRIER TO PREVENT CORROSION. NUTS SHALL BE TIGHTENED TO A SNUG TIGHT CONDITION PER RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCS) SPECIFICATION FOR STRUCTURAL JOINTS, SECTION 8.1.

ALL STRUCTURAL STEEL SHALL HAVE ONE COAT OF PRIMER, EXCEPT SURFACES TO BE EMBEDDED IN CONCRETE OR MASONRY. EMBEDDED SURFACES SHALL BE FREE OF CONTAMINANTS. ALL ZINC (GALV.) COATINGS ON IRON AND STEEL PRODUCTS SHALL CONFORM TO ASTM A123. REPAIRS OF GALVANIZED COATINGS ARE TO CONFORM TO ASTM A780. ALL EXPOSED STRUCTURAL STEEL TO HAVE ONE FINISH COAT OF RUST INHIBITING PAINT, COLOR BY OWNER.

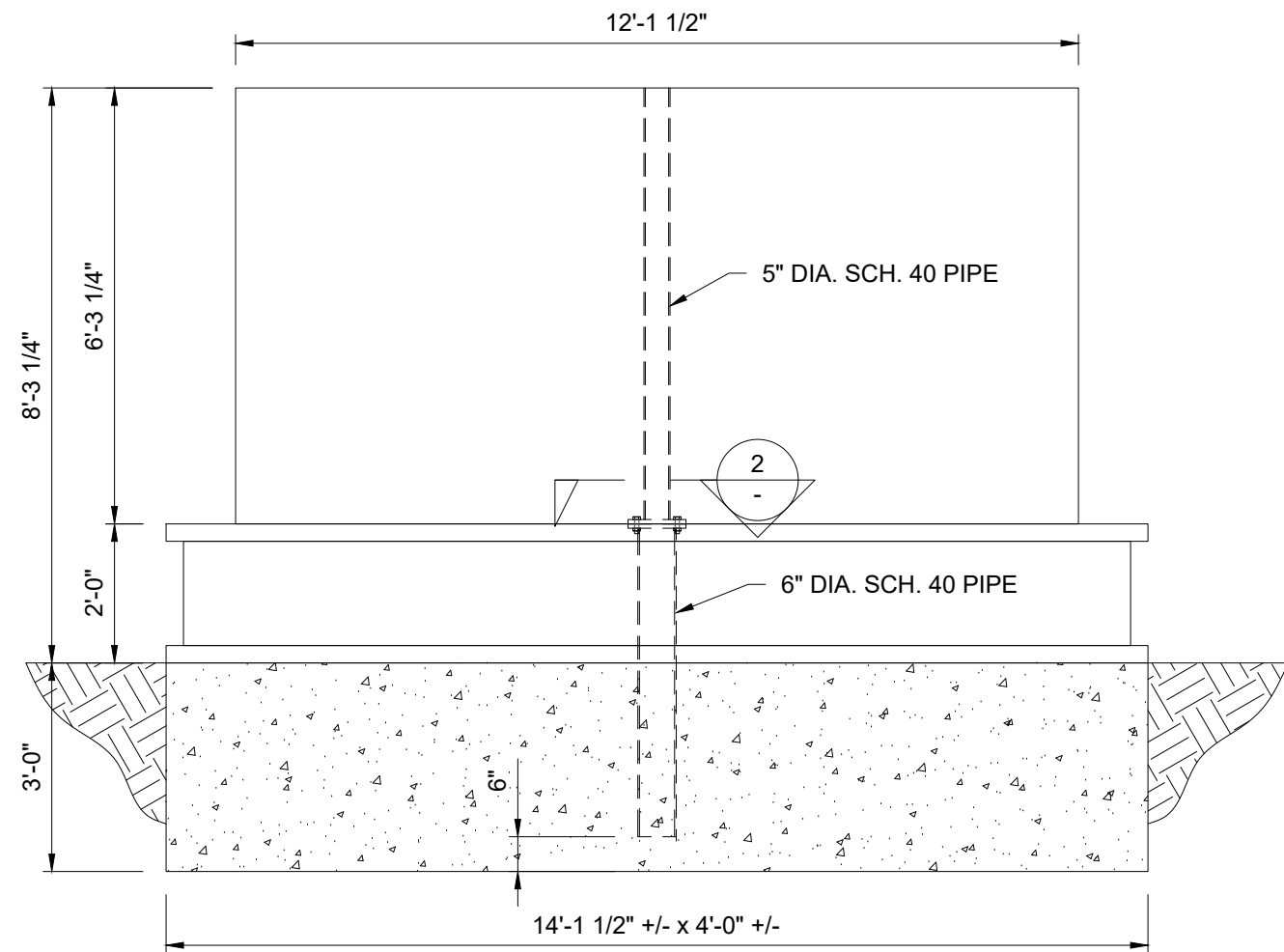
ALL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS) D1.1 USING E70XX ELECTRODES. WELD LENGTHS SHOWN ARE EFFECTIVE AS SPECIFIED PER THE SPECIFICATIONS OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC). WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS FOR WELD TYPES SPECIFIED AND ALL SHOP WELDS TO BE PERFORMED IN AN APPROVED SHOP. WHERE WELD LENGTHS ARE NOT SHOWN, THE WELD SHALL BE FULL LENGTH OF MEMBERS BEING JOINED. ALL BUTT WELDS SHALL BE FULL PENETRATION WELDS UNLESS NOTED OTHERWISE ON STRUCTURAL DRAWINGS. ALL WELDS SHALL RECEIVE THE SAME FINISH COAT AS THE MEMBER BEING WELDED.



2 MATCH PL. 1 1/2"=1'-0"



NOTES:  
1. SCOPE OF WORK IS FOR THE DESIGN OF THE POLES SUPPORTING THE CABINET, SPLICE AND THE FOUNDATION.



1 SIGN ELEVATION 3/8"=1'-0"



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SHELL MVI MONUMENT SIGN  
RAMSAY SIGNS  
2814 NW 319TH STREET  
RIDGEFIELD, WA

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LINE IS 2 INCHES  
AT FULL SCALE  
(IF NOT 2" - SCALE ACCORDINGLY)

DRAWN BY: CJM  
CHECKED BY: ERW

MCE PROJECT NO: 231520

ISSUE DATE: 10-24-23

REV.	DATE	DESCRIPTION

SHEET CONTENT

SHEET  
S1 of 1




**MILLER**  
CONSULTING  
ENGINEERS

## STRUCTURAL CALCULATIONS

**Shell MVI Monument Sign  
2814 NW 319th Street, Ridgefield, WA  
Ramsay Signs**

**October 24, 2023  
Project No. 231520  
2 pages**

**Principal Checked:** 





**Upper Splice Design:**

Location: Upper splice  
 V = 1862 lb  
 Mx = 6608 ft-lb  
 My = 0 ft-lb  
 Torsion = 4525 ft-lb

**MATCH PLATE SPLICE DESIGN**

**Circular Weld:**

$V_{torsion} = 19522 \text{ lb} = 4525 / ((5.563'' / 12) / 2)$   
 Weld size, w = 0.3125 in = 0.707 \* 0.3125"  
 Eff. Throat, E = 0.22 in = 5.563'' \* 2 \* 0.22"  
 Diameter, d1 = 5.56 in = 5.563'' + 2 \* 0.22"  
 Outer dia. of weld = 6.00 in = 3.14 \* (6'' \* 2 - 5.563'' \* 2) / 4  
 A = 3.97 in<sup>2</sup> = 3.14 \* (6'' \* 4 - 5.563'' \* 4) / 64  
 I = 16.61 in<sup>4</sup> = 16.61 / (6 / 2)  
 S = 5.54 in<sup>3</sup> = 21000 \* 3.97  
 F = 21000 psi = 21000 \* 5.54 / 12  
 Vc = 83370 lb  
 Mc = 9695 ft-lb  
 Capacity = 0.94 < 1.00 OK

**Use 0.3125" fillet weld**

**Upper Match Plate Bolt Check:**

Steel Bolt/Rod Design - AISC 13th Addition

Type: Bolt  
 Grade: A325

Threads are included in the shear plane

Diameter: 0.75 in

Loading: ASD

No. of bolts = 4

in tension = 2

Dist. btwn. bolts = 7.00 in

oriz. dist. btwn. bolts = 7.00 in

Couple Distance = 7.00 in

T = 5.66 k = 6.608 / ((7'' / 12) / (2 bolts))  
 V = 4.34 k = (1862 + 4525 / (SQRT((7'' / 2) / 12 \* (7'' / 2) / 12))) / 1000 / (4 bolts)

A = 0.442 in<sup>2</sup>

dr = 0.642 in

ft = 12.8 ksi = 5.66 / 0.442

fv = 9.8 ksi = 4.34 / 0.442

Ω = 0.5

**Bolt Capacity Summary:**

Fnt = 90 ksi, Table J3.2

Fnv = 48 ksi, Table J3.2

Tc = 19.89 k = 90 \* 0.442 \* 0.5

Vc = 10.61 k = 48 \* 0.442 \* 0.5

ft / (Fnt \* 0.5) = 0.28

fv / (Fnv \* 0.5) = 0.41

Effects on tension capacity due to combined stresses:

F'nt = 80.3 ksi, Eq. J3-3, page 16.1-109

T'c = 17.7 k, reduced tension capacity

17.75 > 5.7 OK

**Use 0.75" diameter A325 bolt**

**Upper Match Plate Check:**

arm = 2.25 in

t = 0.75 in

b = 8 in

Moment = 12735 in-lb = 5.66k \* 2.25'' \* 1000

Z = 1.13 in<sup>3</sup> = 0.75'' \* 2 \* 8'' / 4

Mc = 24359 in-lb

12735 < 24359 OK

**Use 0.75" thick plate**



Project Name Shell MVI Monument Sign Project # 231520

Location 2814 NW 319th Street, Ridgefield, WA

Client Ramsay Signs