STAFF REPORT FOR PLANNING COMMISSION MEETING OF MARCH 29, 2023

FILE NO: LU-2022-00489 **AGENDA ITEM: 6.G**

STAFF CONTACT: Heather Ferris, Planning Manager

AGENDA TITLE: For Possible Action: Discussion and possible action regarding a request from Charles Kilpatrick ("Applicant") for a special use permit ("SUP") to retain an existing billboard on property zoned Retail Commercial ("RC") located at 3590 N. Carson Street, Assessor's Parcel Number ("APN") 007-462-03. (Heather Ferris, hferris@carson.org)

Staff Summary: Per Carson City Development Standards ("CCDS") an SUP for a billboard automatically expires five years from the date of approval unless a new SUP is obtained. The Applicant is requesting to retain the billboard in its present location. The Planning Commission is authorized to approve an SUP.

PROPOSED MOTION: "I move to approve LU-2022-0489, based on the findings and subject to the conditions of approval contained in the staff report."

VICINITY MAP:

RECOMMENDED CONDITIONS OF APPROVAL:

1. The Applicant must sign and return the Notice of Decision for conditions for approval within 10 days of receipt of notification. If the Notice of Decision is not signed and returned within 10 days, then the item may be rescheduled for the next Planning Commission meeting for further consideration.

2. All development shall be substantially in accordance with the approved plans.

3. This approval is for the continued use of the existing off premises sign only. The sign support structure must remain painted an earth-tone color as approved by the Planning Division of the Carson City Community Development Department. Replacement of the sign structure may only

be done in accordance with the provisions of the Carson City Municipal Code for new off premises signs, and with the approval of a new special use permit.

4. Without further notice, the subject special use permit shall expire on March 31, 2028, unless a new special use permit to continue the use of the off-premises sign is acquired by that date. It is the Applicant's responsibility to submit a complete special use permit application in sufficient time to be scheduled for review prior to the expiration date.

5. Carson City business license fees shall be paid for the billboard and kept current at all times.

6. All portions of the billboard structure shall be maintained free of graffiti. Failure to do so may constitute cause for revocation of Applicant's business license and special use permit.

7. The billboard shall have static displays only (no animation, moving video, or change in intensity of lighting).

8. Any change in display shall be accomplished immediately or by means of fade or dissolve modes with each frame being displayed for a minimum of 4 seconds.

9. There shall be no continuous, traveling, or scrolling displays or movement, nor shall it have the appearance or illusion of movement of any part of the sign structure or display, including movement of any illumination, or flashing or varying light intensity.

10. The sign must be equipped with automatic photocell dimming capabilities based on the ambient outside light, set at 75% of full capacity for daytime (full sun) and 40% for nighttime (or equivalent for other lighting technologies). The Director may require the applicant to reduce the brightness permitted based upon review of the actual sign in the field for compatibility with the surrounding area.

11. At time of building permit, the applicant shall provide written verification from the sign contractor that the sign's light intensity has been factory pre-set not to exceed the above limits and that the intensity levels are protected from end-use manipulation.

LEGAL REQUIREMENTS: Carson City Municipal Code ("CCMC") 18.02.050 (Review); 18.02.080 (Special Use Permits) 18.04.130 (Retail Commercial (RC)), and Carson City Development Standards, Section 4.8 (Requirements for Billboards and Off-Premises Signs).

MASTER PLAN DESIGNATION: Mixed-Use Commercial

ZONING: Retail Commercial

KEY ISSUES: Does the application meet the Carson City Development Standards regulations for off-premises (billboard) signs, and does the application continue to meet the required findings for approval of an SUP? Is the billboard still compatible with surrounding properties? Has the billboard caused any material damage to surrounding properties?

SURROUNDING ZONING AND LAND USE INFORMATION:
NORTH: Retail Commercial / W. College Parkway & grocery store
EAST: Retail Commercial / N. Carson Street & restaurant
SOUTH: Retail Commercial-Planned Unit Development / restaurant & bar
WEST: Retail Commercial-Planned Unit Development / vacant retail

ENVIRONMENTAL INFORMATION:
FLOOD ZONE: X Shaded (areas of minimal flooding)
SLOPE/DRAINAGE: project area is relatively flat with a city drainage facility on-site
SEISMIC ZONE: Zone I, greatest severity, with fault zone beyond 500 feet

PREVIOUS REVIEWS:
SUP-18-018- Special Use Permit for the continued use of a billboard.
SUP-13-011- Special Use Permit for the continued use of a billboard.
SUP-08-015- Special Use Permit for the continued use of a billboard.
MPR-03-160- Major Project Review for a new office building.
U-02/03-26- Special Use Permit for the continued use of a billboard.
MPR-94/95-16- Major Project Review for a new office building.

SITE DEVELOPMENT INFORMATION:
PARCEL AREA: 0.2988 acres
EXISTING PRIMARY USE: billboard
HEIGHT: Approximately 25 feet to top of billboard above existing grade.
AREA: 200 square feet per face
NUMBER OF FACES: double face

BACKGROUND:
The subject parcel is located at the southwest corner of the intersection of N Carson Street and College Parkway. A billboard has been at this location for at least 48 years. The billboard is near the southern-most corner of the property and perpendicular to N. Carson Street.

The current owner purchased the subject property in 2022 and began researching options for making changes to the billboard, including changing the sign face. The owner of the billboard removed the existing billboard and structure.

The property is the subject of a settlement agreement between the City and the property owner wherein the City agreed to allow the property owner to reinstall the billboard on the property in the same location and to continue to treat the billboard as a non-conforming use, as if it had not been removed. The billboard will remain subject to the design standards for existing billboards, as outlined in Division 4.8 of the Carson City Development Standards.

DISCUSSION:
This SUP was last reviewed in March of 2018, at which time the Planning Commission approved the SUP, subject to 8 conditions of approval, for a 5-year period. Per condition 6 of SUP-18-018 the SUP for the placement of this billboard will expire on March 31, 2023, unless approval of a new SUP is granted. The Applicant is seeking approval to continue the use of the billboard at this location. Staff has not received any complaints regarding this billboard.

The Applicant is requesting to retain a billboard in its present location. The Planning Commission is authorized to approve an SUP.

PUBLIC COMMENTS: Public notices were mailed on March 15, 2023 to 39 property owners, within 900 feet of the subject site, pursuant to the provisions of the Nevada Revised Statutes and the CCMC. As of the writing of this report no public comments have been received. Any comments that are received after this report is completed will be submitted prior to or at the Planning Commission meeting on March 29, 2023 depending on their submittal date to the Planning Division.

CITY DEPARTMENTS OR OUTSIDE AGENCY COMMENTS: The following comments have been received and have been incorporated into conditions of approval as appropriate.

DEVELOPMENT ENGINEERING:
The Carson City Public Works Department, Development Engineering Division ("Development Engineering") has no preference or objection to the special use request provided that the following conditions are met:

- The project must meet all Carson City Development Standards and Standard Details.

Development Engineering has reviewed the application within our areas of purview relative to adopted standards and practices and to the provisions of CCMC 18.02.080, Conditional Uses. Development Engineering offers the following discussion:

CCMC 18.02.080(5)(a) - Master Plan
The request is not in conflict with any Engineering Master Plans.

CCMC 18.02.080(5)(b) – Use, Peaceful Enjoyment, Economic Value, Compatibility
Development Engineering has no comment on this finding.

CCMC 18.02.080(5)(c) - Traffic/Pedestrians
The project will have a negligible impact on vehicular and pedestrian traffic.

CCMC 18.02.080(5)(d) - Public Services
The project will have a negligible impact to City storm drainage and no impact to City sewer and water.

CCMC 18.02.080(5)(e) – Title 18 Standards
Development Engineering has no comment on this finding.

CCMC 18.02.080(5)(f) – Public health, Safety, Convenience, and Welfare
The project meets will meet engineering standards for health and safety.

Earthquake faults: The closest fault is over 500 feet away with a slip rate that is less than 0.2 mm/yr. No special geotechnical mitigation is required.
FEMA flood zones: The current FEMA flood zone is Zone X (shaded) so no special flood mitigation is required.
Site slope: The current slope is between 0 to 2%.
Soils and Groundwater: The soil is a fine sandy loam with the water table estimated to be more than 80 inches.

CCMC 18.02.080(5)(g) – Material Damage or Prejudice to Other Property
Development Engineering has no comment on this finding.

CCMC 18.02.080(5)(h) – Adequate Information
The plans and reports provided were adequate for this analysis.

Building Division:
The following requirements apply at the time of building permit.

1. Designs to the 2018 Code Series and Northern Nevada Amendments (Building and Fire), Please verify plans follow the Nevada Blue Book guidelines.

2. Apply at Carson City permit center digitally at permitcenter.carson.org.

3. Provide design criteria on cover pages along with complete set of plans.

4. Provide a fully dimensioned site plan with all setbacks, provide a dashed line for fall zone outside of ROW, pedestrian access and adjacent property lines.

FINDINGS: Staff's recommendation is based upon the findings as required by CCMC Section 18.02.080 (Special Use Permits) enumerated below and substantiated in the public record for the project.

1. The project will be consistent with the master plan elements.

The project is consistent with the master plan, specifically Goal 5.2a-- Encourage Regional Retail. The billboard promotes economic vitality by promoting regional businesses, products, and services along the Carson City corridor as tourists and travelers drive into or from Carson City.

2. **The project will not be detrimental to the use, peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood; and is compatible with and preserves the character and integrity of adjacent development and neighborhoods or includes improvements or modifications either on-site or within the public right-of-way to mitigate development related to adverse impacts such as noise, vibrations, fumes, odors, dust, glare or physical activity.**

This billboard is in an area zoned for commercial activity with traffic passing. The billboard does not generate any noise vibrations, fumes, odors, dust or physical activity that would cause an adverse impact on adjacent uses. The billboard lit, however, with the recommended conditions of approval, impacts from lighting will be mitigated.

3. Will have little or no detrimental effect on vehicular or pedestrian traffic.

The billboard will have little or no detrimental effect on vehicular or pedestrian traffic. No additional traffic will be generated in conjunction with the existing sign that could adversely impact vehicular or pedestrian circulation in the subject area.

4. The project will not overburden existing public services and facilities, including schools, police and fire protection, water, sanitary sewer, public roads, storm drainage, and other public improvements.

The existing sign will not require the extension or expansion of any public services and facilities.

5. The project meets the definition and specific standards set forth elsewhere in this Title for such particular use and meet the purpose statement of that district.

Per Development Standards Division 4.8.3, the following requirements have been met:

Special Use Permit Required:
Approval of an SUP is required for a billboard. The current SUP is scheduled to expire on March 31, 2023. The Applicant has submitted an application for review with adequate time to be reviewed prior to the expiration date.

Permitted Streets:
Billboards are permitted along North and South Carson Street between Douglas and Washoe Counties, US Highway 50 between Lyon County and North Carson Street, and the south side of US Highway 50 West from the Douglas County line to 660 feet (one-eighth mile) east of that point within Section 31 of Township 15N, Range 20E. This property is addressed as 3590 N. Carson Street. The location is compliant.

Height:
The maximum permitted sign height is 28 feet from the adjacent permitted street elevation. The sign will be in compliance with the permitted sign height, as it is proposed at 25 feet above base ground and existing grade.
Number of Sign Faces:
One sign face per side (single or double-faced sign) is permitted. The subject billboard will be double-faced.

Zoning of the Site:
New billboards are only permitted within the General Commercial or General Industrial zoning districts. The subject site is in the Retail Commercial zoning. This site is not in compliance; however, existing billboards that are being reviewed are not required to meet this requirement as they were lawfully established.

Spacing Distance:
New billboards may not be located within 1,000 feet of each other. This billboard complies.

Area of Sign:
The maximum permitted sign area for billboards is 400 square feet per side. This billboard measures 200 square feet per side and is in compliance.

Setback from Certain Uses and Zoning:
A billboard sign may not be closer than 300 feet to a property zoned Agriculture (“A”), Conservation Reserve (“CR”), or any residential zoning district. This billboard complies with this standard, in that it is over 300 feet to the nearest property zoned Agriculture, Conservation Reserve, or residential zoning. However, existing billboards that are being renewed are not required to meet this requirement.

Setback from Redevelopment Areas:
A billboard sign may not be within 1,000 feet of a redevelopment area. This billboard is not in compliance as it is located approximately 200 feet from the old K-Mart parcel which is located in Redevelopment Area #2. However, existing billboards that are being renewed are not required to meet this requirement.

Prohibited Supporting Structures:
A sign may not be attached to a roof or wall or other surface of a building. A sign must be a freestanding sign. This billboard will be freestanding and therefore in compliance with this standard.

Prohibited Characteristics and Materials:
Signs cannot display three-dimensional objects, have movable reflective/lighted materials or beams, flash, be internally lit, have or simulate moving parts, nor may external lighting glare onto adjacent properties or rights-of-way. The proposed billboard will be digital and will be required to have static displays only (no animation, moving video, or change in intensity of lighting) with any change in display being accomplished immediately or by means of fade or dissolve modes with each frame being displayed for a minimum of 4 seconds. There will be no continuous, traveling, or scrolling displays or movement,

nor shall it have the appearance or illusion of movement of any part of the sign structure or display, including movement of any illumination, or flashing or varying light intensity. The sign must also be equipped with automatic photocell dimming capabilities based on the ambient outside light, set at 75% of full capacity for daytime (full sun) and 40% for nighttime (or equivalent for other lighting technologies). The applicant will be required to provide written verification from the sign contractor that the sign's light intensity has been factory pre-set not to exceed these limits and that the intensity levels are protected from end-use manipulation. With the recommended conditions of approval, staff finds that the sign will comply.

6. The project will not be detrimental to the public health, safety, convenience and welfare.

As conditioned, the sign meets all the requirements of the CCMC and will not be detrimental to the public health, safety, convenience, and welfare and will cause no adverse impacts to surrounding properties.

7. The project will not result in material damage or prejudice to other property in the vicinity, as a result of proposed mitigation measures.

A billboard has been at this location for at least the last 48 years. The area is developed with commercial uses. The continued use of the billboard sign is not anticipated to result in material damage or prejudice to other properties in the vicinity.

Attachments:

Application LU-2022-0489

RECEIVED
JAN 31 2023
CARSON CITY
PLANNING DIVISION

Carson City Planning Division
108 E. Proctor Street · Carson City NV 89701
Phone: (775) 887-2180 · E-mail: planning@carson.org

FOR OFFICE USE ONLY:

CCMC 18.02.080

SPECIAL USE PERMIT

FILE # LU-2022-0489

FEE*: $2,450.00 MAJOR
$2,200.00 MINOR (Residential zoning districts)
+ noticing fee
*Due after application is deemed complete by staff

APPLICANT	PHONE #
Charles Kilpatrick	(775) 882-6112
MAILING ADDRESS, CITY, STATE, ZIP	
412 N. Division St., Carson City, NV 89703	
EMAIL ADDRESS	
charlie@kilpatrickbullentini.com	
PROPERTY OWNER	PHONE #
Kilpatrick Family Trust	(775) 883-3085
MAILING ADDRESS, CITY, STATE, ZIP	
2244 W. Washington St., Carson City, NV 89703	
EMAIL ADDRESS	
charlie@kilpatrickbullentini.com	
APPLICANT AGENT/REPRESENTATIVE	PHONE #
MAILING ADRESS, CITY STATE, ZIP	
EMAIL ADDRESS	

☐ **SUBMITTAL PACKET – 4 Complete Packets (1 Unbound Original and 3 Copies) including:**
- ☐ Application Form
- ☐ Detailed Written Project Description
- ☐ Site Plan
- ☐ Building Elevation Drawings and Floor Plans
- ☐ Special Use Permit Findings
- ☐ Master Plan Policy Checklist
- ☐ Applicant's Acknowledgment Statement
- ☐ Documentation of Taxes Paid-to-Date
- ☐ Project Impact Reports (Engineering)

☐ **CD or USB DRIVE with complete application in PDF**

Application Received and Reviewed By:

Submittal Deadline: Planning Commission application submittal schedule.

Note: Submittals must be of sufficient clarity and detail for all departments to adequately review the request. Additional information may be required.

Project's Assessor Parcel Number(s):	Street Address	
007-462-03	3590 N. Carson Street, Carson City, Nevada	
Project's Master Plan Designation	**Project's Current Zoning**	**Nearest Major Cross Street(s)**
MUC	RC	College Parkway

Please provide a brief description of your proposed project and/or proposed use below. Provide additional pages to describe your request in more detail.

Billboard renewal

PROPERTY OWNER'S AFFIDAVIT

I, Charles Kilpatrick, being duly deposed, do hereby affirm that I am the record owner of the subject property, and that I have knowledge of, and I agree to, the filing of this application.

Signature Trustee — Address: 2244 W. Washington St., Carson City, NV 89703 — Date: 1-31-2023

Use additional page(s) if necessary for additional owners.

STATE OF NEVADA
COUNTY Carson city

On January 31, 2023 Charles Kilpatrick, personally appeared before me, a notary public, personally known (or proved) to me to be the person whose name is subscribed to the foregoing document and who acknowledged to me that he/she executed the foregoing document.

Notary Public

NOTE: If your project is located within the Historic District or airport area, it may need to be scheduled before the Historic Resources Commission or the Airport Authority in addition to being scheduled for review by the Planning Commission. Planning staff can help you make this determination.

DAWN BRENNEIS
NOTARY PUBLIC
STATE OF NEVADA
No. 12-6763-12 My Appt. Exp. Jan. 9, 2024

If there is any additional information that would provide a clearer picture of your proposal that you would like to add for presentation to the Planning Commission, please be sure to include it in your detailed description.

Please type and sign the statement on the following page at the end of your findings response.

ACKNOWLEDGMENT OF APPLICANT

I certify that the forgoing statements are true and correct to the best of my knowledge and belief. I agree to fully comply with all conditions as established by the Planning Commission. I am aware that this permit becomes null and void if the use is not initiated within one-year of the date of the Planning Commission's approval; and I understand that this permit may be revoked for violation of any of the conditions of approval. I further understand that approval of this application does not exempt me from all City code requirements.

Applicant's Signature	Charles Kilpatrick Print Name	1-31-2023 Date

Master Plan Policy Checklist

Special Use Permits & Major Project Reviews & Administrative Permits

PURPOSE

The purpose of a development checklist is to provide a list of questions that address whether a development proposal is in conformance with the goals and objectives of the 2006 Carson City Master Plan that are related to non-residential and multi-family residential development. This checklist is designed for developers, staff, and decision-makers and is intended to be used as a guide only.

Development Name: _____

Reviewed By: _____

Date of Review: _____

DEVELOPMENT CHECKLIST

The following five themes are those themes that appear in the Carson City Master Plan and which reflect the community's vision at a broad policy level. Each theme looks at how a proposed development can help achieve the goals of the Carson City Master Plan. A check mark indicates that the proposed development meets the applicable Master Plan policy. The Policy Number is indicated at the end of each policy statement summary. Refer to the Comprehensive Master Plan for complete policy language.

CHAPTER 3: A BALANCED LAND USE PATTERN

The Carson City Master Plan seeks to establish a balance of land uses within the community by providing employment opportunities, a diverse choice of housing, recreational opportunities, and retail services.

Is or does the proposed development:

- ☐ Meet the provisions of the Growth Management Ordinance (1.1d, Municipal Code 18.12)?
- ☐ Use sustainable building materials and construction techniques to promote water and energy conservation (1.1e, f)?
- ☐ Located in a priority infill development area (1.2a)?
- ☐ Provide pathway connections and easements consistent with the adopted Unified Pathways Master Plan and maintain access to adjacent public lands (1.4a)?

- ☐ Protect existing site features, as appropriate, including mature trees or other character-defining features (1.4c)?
- ☐ At adjacent county boundaries or adjacent to public lands, coordinated with the applicable agency with regards to compatibility, access and amenities (1.5a, b)?
- ☐ In identified Mixed-Use areas, promote mixed-use development patterns as appropriate for the surrounding context consistent with the land use descriptions of the applicable Mixed-Use designation, and meet the intent of the Mixed-Use Evaluation Criteria (2.1b, 2.2b, 2.3b, Land Use Districts, Appendix C)?
- ☐ Meet adopted standards (e.g. setbacks) for transitions between non-residential and residential zoning districts (2.1d)?
- ☒ Protect environmentally sensitive areas through proper setbacks, dedication, or other mechanisms (3.1b)?
- ☒ Sited outside the primary floodplain and away from geologic hazard areas or follows the required setbacks or other mitigation measures (3.3d, e)?
- ☒ Provide for levels of services (i.e. water, sewer, road improvements, sidewalks, etc.) consistent with the Land Use designation and adequate for the proposed development (Land Use table descriptions)?
- ☐ If located within an identified Specific Plan Area (SPA), meet the applicable policies of that SPA (Land Use Map, Chapter 8)?

CHAPTER 4: EQUITABLE DISTRIBUTION OF RECREATIONAL OPPORTUNITIES

The Carson City Master Plan seeks to continue providing a diverse range of park and recreational opportunities to include facilities and programming for all ages and varying interests to serve both existing and future neighborhoods.

Is or does the proposed development:

- ☐ Provide park facilities commensurate with the demand created and consistent with the City's adopted standards (4.1b)?
- ☐ Consistent with the Open Space Master Plan and Carson River Master Plan (4.3a)?

CHAPTER 5: ECONOMIC VITALITY

The Carson City Master Plan seeks to maintain its strong diversified economic base by promoting principles which focus on retaining and enhancing the strong employment base, include a broader range of retail services in targeted areas, and include the roles of technology, tourism, recreational amenities, and other economic strengths vital to a successful community.

Is or does the proposed development:

- ☐ Encourage a citywide housing mix consistent with the labor force and non-labor force populations (5.1j)
- ☐ Encourage the development of regional retail centers (5.2a)
- ☐ Encourage reuse or redevelopment of underused retail spaces (5.2b)?
- ☐ Support heritage tourism activities, particularly those associated with historic resources, cultural institutions and the State Capitol (5.4a)?
- ☐ Promote revitalization of the Downtown core (5.6a)?
- ☐ Incorporate additional housing in and around Downtown, including lofts, condominiums, duplexes, live-work units (5.6c)?

CHAPTER 6: LIVABLE NEIGHBORHOODS AND ACTIVITY CENTERS

The Carson City Master Plan seeks to promote safe, attractive and diverse neighborhoods, compact mixed-use activity centers, and a vibrant, pedestrian-friendly Downtown.

Is or does the proposed development:

- ☐ Use durable, long-lasting building materials (6.1a)?
- ☐ Promote variety and visual interest through the incorporation of varied building styles and colors, garage orientation and other features (6.1b)?
- ☐ Provide variety and visual interest through the incorporation of well-articulated building facades, clearly identified entrances and pedestrian connections, landscaping and other features consistent with the Development Standards (6.1c)?
- ☐ Provide appropriate height, density and setback transitions and connectivity to surrounding development to ensure compatibility with surrounding development for infill projects or adjacent to existing rural neighborhoods (6.2a, 9.3b 9.4a)?
- ☐ If located in an identified Mixed-Use Activity Center area, contain the appropriate mix, size and density of land uses consistent with the Mixed-Use district policies (7.1a, b)?
- ☐ If located Downtown:
  - ☐ Integrate an appropriate mix and density of uses (8.1a, e)?
  - ☐ Include buildings at the appropriate scale for the applicable Downtown Character Area (8.1b)?
  - ☐ Incorporate appropriate public spaces, plazas and other amenities (8.1d)?
- ☐ Incorporate a mix of housing models and densities appropriate for the project location and size (9.1a)?

CHAPTER 7: A CONNECTED CITY

The Carson City Master Plan seeks promote a sense of community by linking its many neighborhoods, employment areas, activity centers, parks, recreational

amenities and schools with an extensive system of interconnected roadways, multi-use pathways, bicycle facilities, and sidewalks.

Is or does the proposed development:

- ☐ Promote transit-supportive development patterns (e.g. mixed-use, pedestrian-oriented, higher density) along major travel corridors to facilitate future transit (11.2b)?
- ☐ Maintain and enhance roadway connections and networks consistent with the Transportation Master Plan (11.2c)?
- ☐ Provide appropriate pathways through the development and to surrounding lands, including parks and public lands, consistent with the Unified Pathways Master Plan (12.1a, c)?

Kilpatrick Bullentini
TRIAL ATTORNEYS
412 N. DIVISION STREET
CARSON CITY, NV 89703-4168

CHARLES M. KILPATRICK, LTD.
ANGELA D. BULLENTINI

(775) 882-6112
FAX (775) 882-6114
assistance@KilpatrickBullentini.com

January 31, 2023

Via Hand Delivery

Heather Ferris
Carson City Planning Division
108 E. Proctor Street
Carson City, NV 89701

Re: Building Permit - 3590 N. Carson Street

Hi Heather:

Per the Agreement reached with the City, enclosed is our Billboard Renewal Application and support documents. Please me know if any changes or additions are required.

Thanks again!

Sincerely,

Charles M. Kilpatrick

CMK/db
enc.

The Kilpatrick Family Trust
2244 West Washington street
Carson City, NV 89703

SPECIAL USE PERMIT PROJECT SUMMARY & COMPLIANCE STATEMENT

1. **Project Description**:

This is a billboard renewal at 3590 North Carson Street, Carson City, NV 89706.

2. **Findings:**

(1) The project will be consistent with the master plan elements.

This project is consistent with master plan objectives because it is very low impact using no water or sewer and reduces the billboard size from 10x30 to 10x20. The project will also dedicate 20% of screen time to local public service announcements. The project is a new LED installation with the latest technology.

(2) The project will not be detrimental to the use, peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood; and is compatible with and preserves the character and integrity of adjacent development and neighborhoods or includes improvements or modifications either on-site or within the public right-of-way to mitigate development related to adverse impacts such as noise, vibrations, fumes, odors, dust, glare or physical activity.

The continued use of this billboard is located in an area zoned for commercial activity, with traffic passing in all four directions adjacent to this site while traveling on West College Parkway and North Carson Street. This is an area that has been previously developed with commercial enterprises and the billboard has had no complaints. The sign generates no significant noise, vibrations, fumes, orders dust, glare or physical activity which could have an adverse impact on adjacent uses.

(3) Will have little or no detrimental effect on vehicular or pedestrian traffic.

The billboard has had little or no detrimental effect on vehicular of pedestrian traffic. No additional traffic will be generated in conjunction with the existing sign that could adversely impact vehicular or pedestrian circulation in the subject area.

(4) The project will not overburden existing public services and facilities,

including schools, police and fire protection, water, sanitary sewer, public roads, storm drainage, and other public improvements.

The existing sign will not require the extension or expansion of any public services, facilities and services.

(5) The project meets the definition and specific standards set forth elsewhere in this Title for such particular use and meet the purpose statement of that district.

The existing sign meets all the specific standards for the continued use of existing billboards set forth in Division 4.8 of the Carson City Development Standards.

(6) The project will not be detrimental to the public health, safety, convenience and welfare.

The existing sign meets all the requirements of the Carson City Municipal Code and will not be detrimental to the public health, safety, convenience, and welfare.

(7) The project will not result in material damage or prejudice to other property in the vicinity as a result of proposed mitigation measures.

A billboard sign has been at the present location for at least 43 years. It was placed in an area that has been concurrently developed with commercial uses, with no adverse effects noted by or to neighboring properties. The continued use of the billboard sign is not anticipated to result in material damage or prejudice to other properties in the vicinity.

3. Master Plan Checklist:

See attached.

4. Documentation of Paid Taxes:

See attached.

5. Project Impact:

Renewal will not impact traffic, drainage, water, or sewer.

6. Building Elevation Drawings:

See attached.

7. Site Plan:

See attached.

8. Property Lines:

See attached.

9. Existing and Proposed Structures:

See attached.

10. Curb, Gutters, Sidewalks, ADA Facilities, Circulation:

Property is an undeveloped parcel with no public access.

11. Project Access:

Property is an undeveloped parcel with no public access.

12. Assessors Parcel Numbers of Adjoining parcels:

See attached.

13. Parking:

This is an undeveloped parcel with no public access.

14. Utilities:

Project will require electric hook up to existing Nevada Power access.

15. Landscape:

No landscaping is required.

16. **Amenities:**

No amenities are proposed.

No Personal Exemptions

No Billing Information

Payment History

	Fiscal Year	Total Due	Total Paid	Amount Unpaid
⊕	(2022 - 2023)	$923.60	$923.60	$0.00
⊕	(2021 - 2022)	$855.34	$855.34	$0.00
⊕	(2020 - 2021)	$823.28	$823.28	$0.00
⊕	(2019 - 2020)	$794.68	$794.68	$0.00
⊕	(2018 - 2019)	$758.30	$758.30	$0.00

Show 5 More (22)

Related Names

CURRENT OWNER FOR 2023 (2023 - 2024)
Name KILPATRICK, JOSEPHINE K TRUSTEE
Mailing Address
Status Current
Account

CURRENT OWNER FOR 2023 (2023 - 2024)
Name KILPATRICK, CHARLES M III TRUSTEE
Mailing Address
Status Current
Account

CURRENT OWNER FOR 2023 (2023 - 2024)
Name KILPATRICK FAMILY TRUST 7/25/2005
Mailing Address
Status Current
Account

CURRENT Mail To FOR 2023 (2023 - 2024)
Name KILPATRICK FAMILY TRUST 7/25/2005
Mailing Address CHARLES III & JOSEPHINE KILPATRICK TT
412 N DIVISION ST
CARSON CITY, NV, 89703
Status Current
Account

No Structure Information

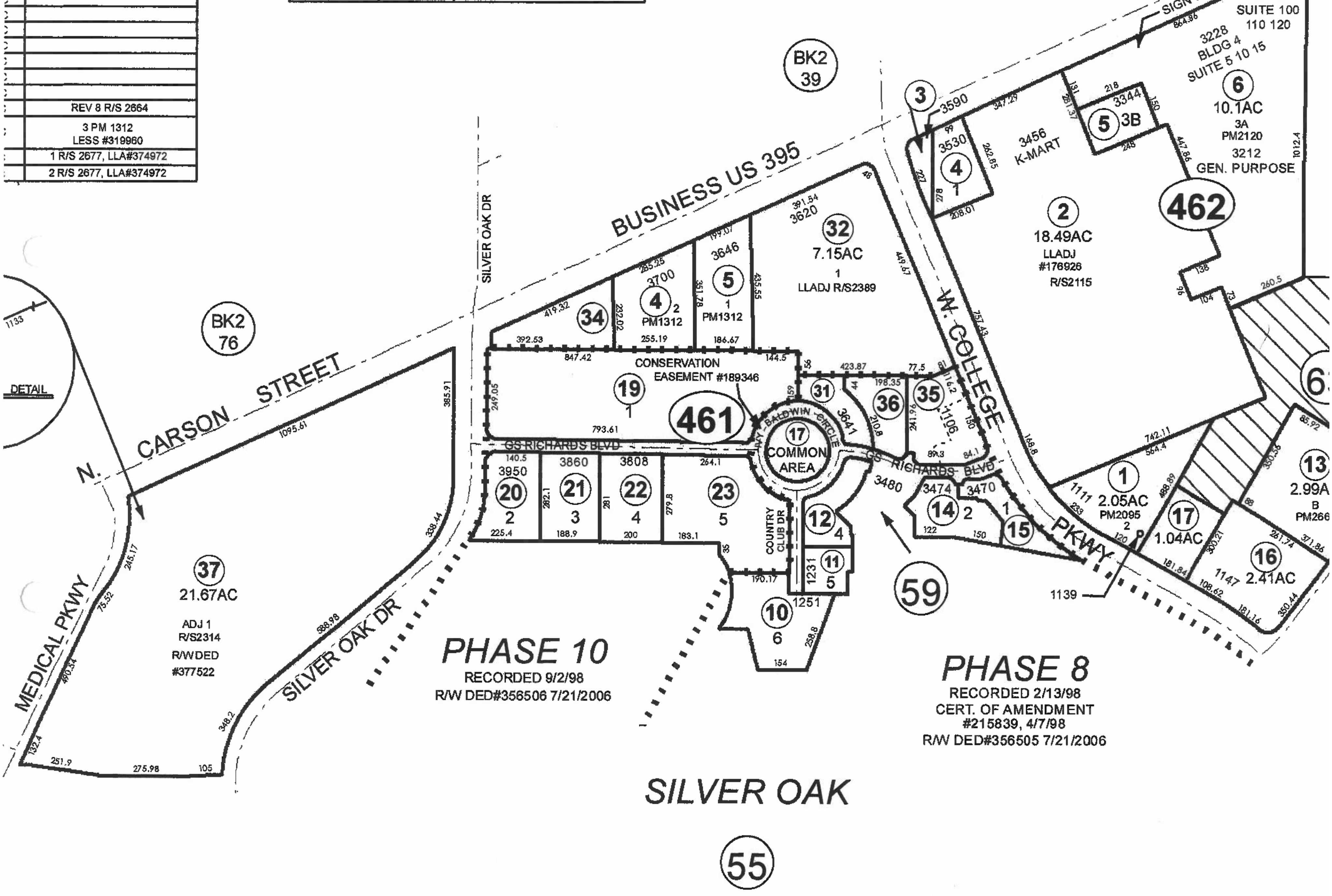
Sales History

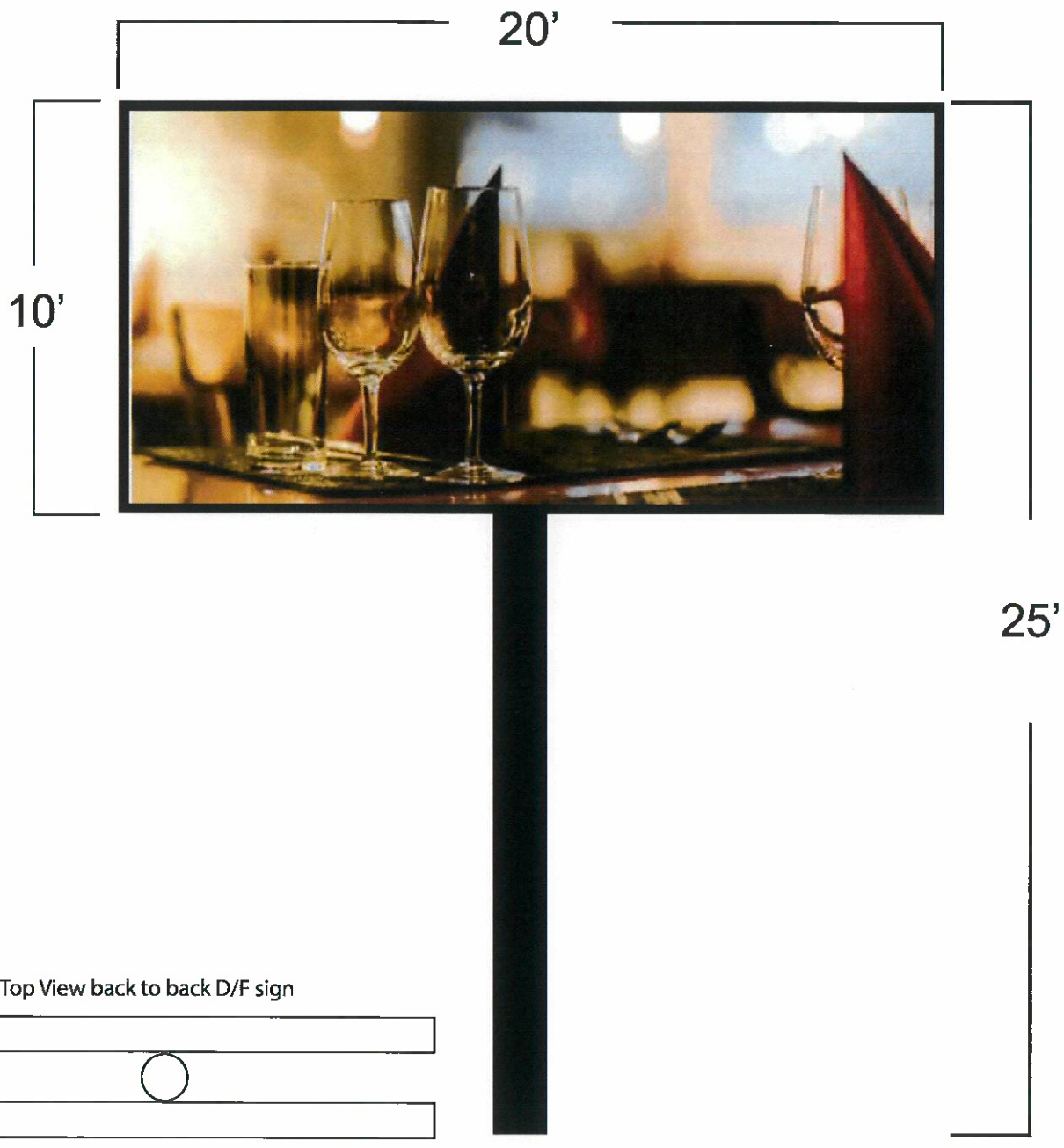
DISCLAIMER: SOME DOCUMENTS MAY NOT BE SHOWN

Year	Document #	Document Type	Sale Date	Sold By	Sold To	Price
2022	533431	GRANT BARGAIN SALE DEED	6/17/2022	ALEXANDER HOLMES JAMES HOLMES JEFFREY HOLMES JOHN HOLMES ELIZABETH TALLEY TALLEY, M & E 2017 FAM TR MICHAEL TALLEY	KILPATRICK FAMILY TRUST 7/25/2005 CHARLES KILPATRICK JOSEPHINE KILPATRICK	$75,000
2022	533429	QUITCLAIM DEED	6/17/2022	ANDREA HOLMES	JEFFREY HOLMES	$0
2022	533430	QUITCLAIM DEED	6/17/2022	RITA HOLMES	JAMES HOLMES	$0

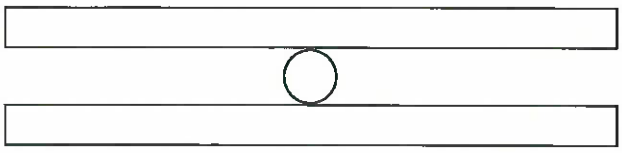
REV 8 R/S 2664
3 PM 1312 LESS #319960
1 R/S 2677, LLA#374972
2 R/S 2677, LLA#374972

7-462-03	0.30 AC	R/S2170
7-462-04	0.92 AC	PM2030
7-462-05	0.75 AC	PM2120
7-462-16	2.41 AC	ADJ 1 R/S2904 LLA #472816
7-462-17	1.04 AC	ADJ 2 R/S2904 LLA #472816
7-462-18	7.57 AC	ADJ 3 R/S2904 LLA #472816





Top View back to back D/F sign



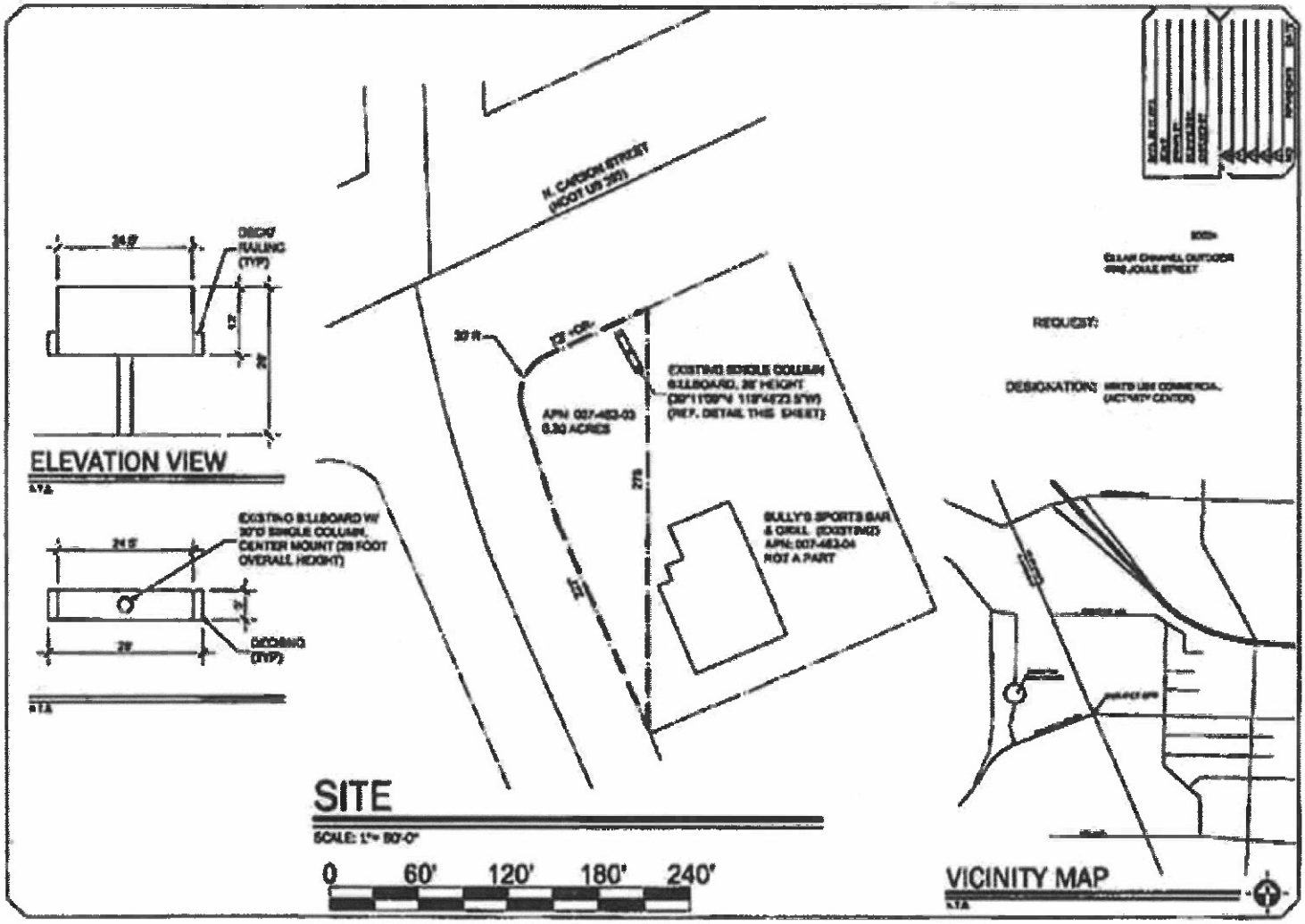
Manufacture and install new 10' tall x 20' long D/F color 10 MM digital sign

CHARLIES

SCALE	SALESMAN	DATE	DESIGNER
NOT TO SCALE	M. LIPKOWITZ	Sept. 13, 2022	T. POLAND

BID LIMIT: $245,000.00, LICENSE CLASSIFICATION: C6, LICENSE NUMBER: 61029 EXP. 12/23

Custom Sign
3350 Centennial Park Dr. Ste #3
Carson City, NV. 89706
Ph. 775-884-1818



SITE PLAN

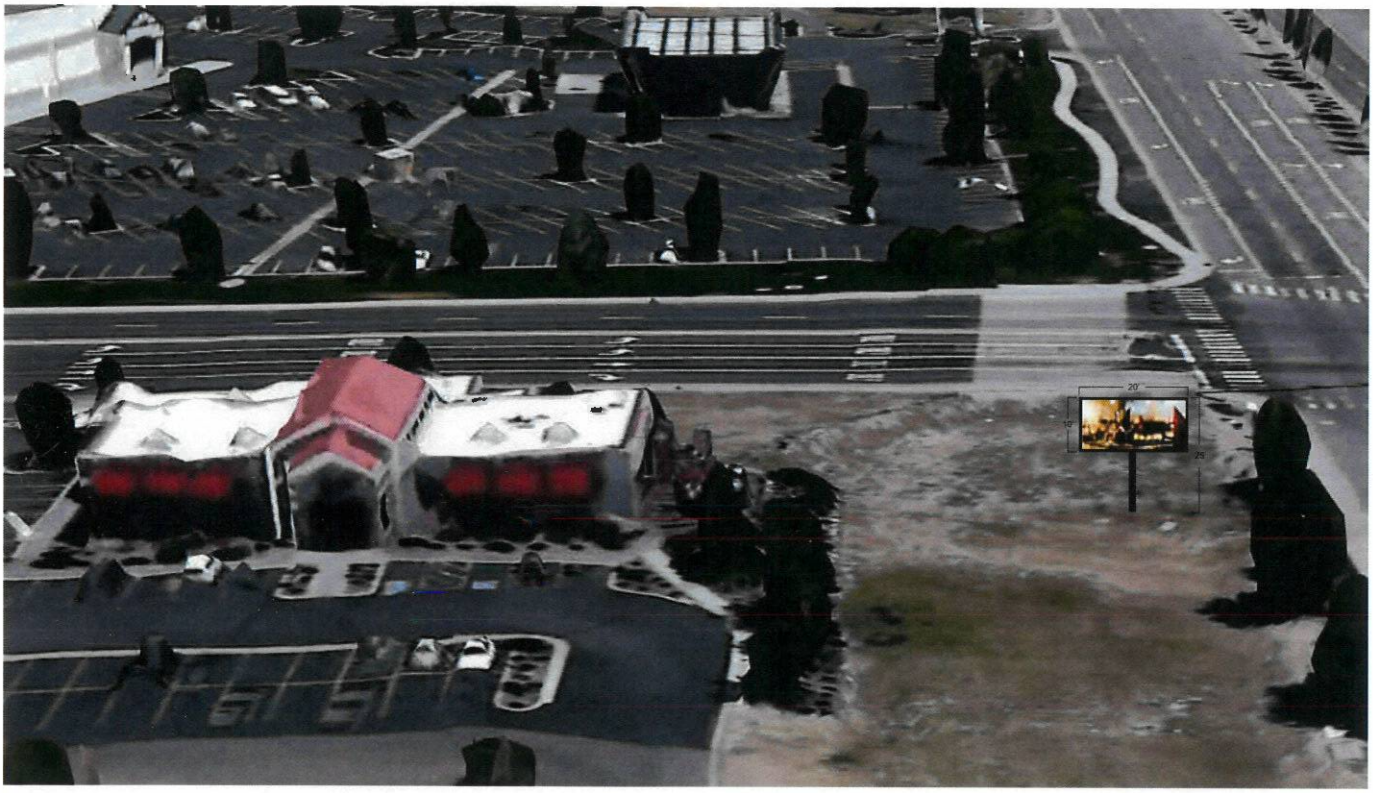
PRIMARY POWER BY OTHERS

CHARLIES

SCALE	SALESMAN	DATE	DESIGNER
NOT TO SCALE	M. LIPKOWITZ	Sept. 2, 2022	T. POLAND
		Sept. 13, 2022	

BID LIMIT: $245,000.00, LICENSE CLASSIFICATION: C6, LICENSE NUMBER: 61029 EXP. 12/23

Custom Sign
3350 Centennial Park Dr. Ste #3
Carson City, NV. 89706
Ph. 775-884-1818



Manufacture and install new 10' tall x 20' long D/F color 10 MM digital sign

CHARLIES

SCALE	SALESMAN	DATE	DESIGNER
NOT TO SCALE	M. LIPKOWITZ	Sept. 13, 2022	T. POLAND

BID LIMIT: $245,000.00, LICENSE CLASSIFICATION: C6, LICENSE NUMBER: 61029 EXP. 12/23

Custom Sign
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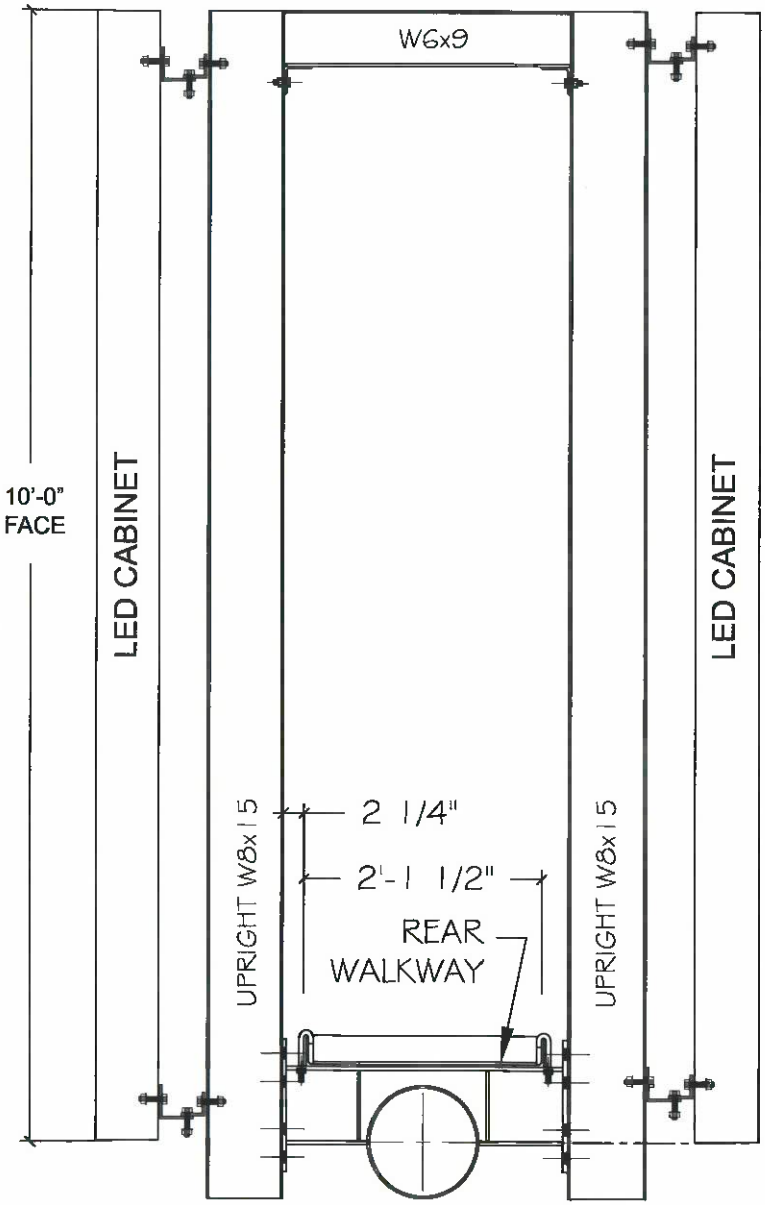
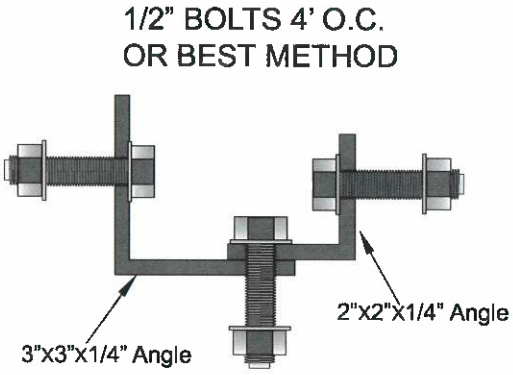




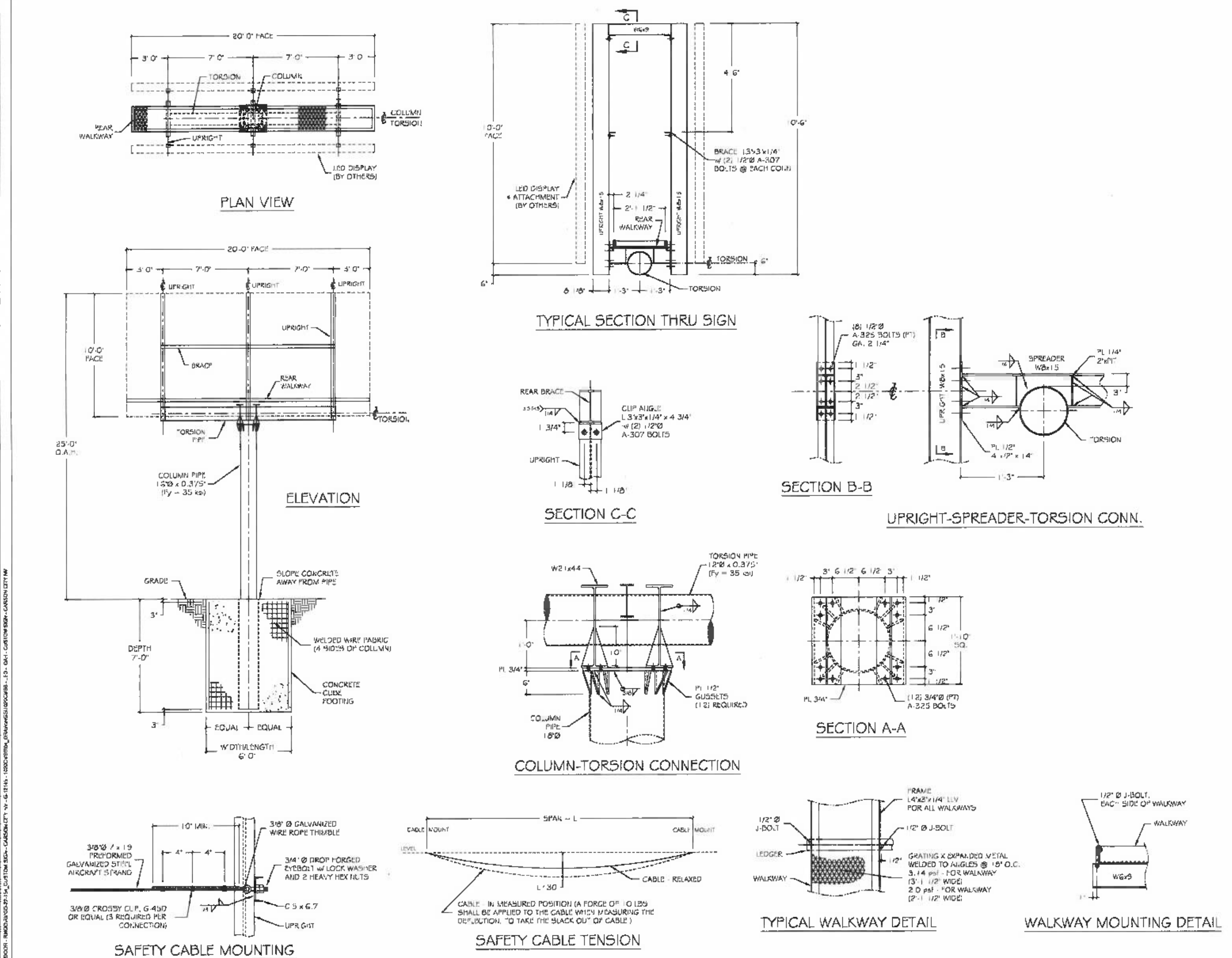
LED MESSAGE CENTER ATTACHMENT

CHARLIES

SCALE	SALESMAN	DATE	DESIGNER
NOT TO SCALE	M. LIPKOWITZ	Sept. 30, 2022	T. POLAND

BID LIMIT: $245,000.00, LICENSE CLASSIFICATION: C6, LICENSE NUMBER: 61029 EXP. 12/23

Custom Sign
3350 Centennial Park Dr. Ste #3
Carson City, NV. 89706
Ph. 775-884-1818



SITE / SIGN NOTES AND SPECIFICATIONS
(APPLY UNLESS OTHERWISE NOTED)

CODE - 2018 IBC

WIND DESIGN - SIGN STRUCTURE WIND LOADS ARE DETERMINED IN ACCORDANCE WITH ASCE 7-16 SECTION 29.3.1.
BASIC WIND SPEED: 96 MPH (3 SECOND GUST)
RISK CATEGORY: II
EXPOSURE: C
DESIGN WIND PRESSURE (SERVICE LEVEL): 17.3 PSF (AVERAGE), 22.3 PSF (MAXIMUM AT ENDS).
REFER TO ASCE 7-16 FIGURE 29.3-1.
ANY SIGN COMPONENTS NOT SPECIFICALLY DETAILED ON THESE DRAWINGS BUT ATTACHED TO THE STRUCTURE SHALL BE DESIGNED IN ACCORDANCE WITH THE INFORMATION ABOVE.

SEISMIC DESIGN - SIGN STRUCTURE SEISMIC LOADS ARE DETERMINED IN ACCORDANCE WITH ASCE 7-16 CHAPTER 15 USING DATA FOR SIGNS AND BILLBOARDS FROM TABLE 15.4-2:
RISK CATEGORY: II
MAPPED SPECTRAL RESPONSE ACCELERATIONS: S_S = 2.097, S_1 = 0.784
SITE CLASS: D - DEFAULT
SPECTRAL RESPONSE COEFFICIENTS: S_{DS} = 1.678, S_{D1} = 0.870
SEISMIC DESIGN CATEGORY: "E"
FORCE RESISTING SYSTEM: CANTILEVERED COLUMN
DESIGN BASE SHEAR: 5.8 KIPS
SEISMIC RESPONSE COEFFICIENT (C_S): 0.559
RESPONSE MODIFICATION FACTOR (R): 3.0
SEISMIC BASE SHEAR IS DETERMINED IN ACCORDANCE WITH SECTION 12.8 "EQUIVALENT LATERAL FORCE PROCEDURE" USING THE DESIGN DATA ABOVE.

DESIGN LIVE LOAD - MAINTENANCE PLATFORM 40 PSF OR 300 LBS CONCENTRATED LOAD

DESIGN DEAD LOAD - LED DISPLAYS: 3000 LBS EACH
OTHER STRUCTURAL MEMBERS: AS NOTED IN CALCULATIONS

CUBE COLUMN FOOTING - EMBEDMENT DEPTH FOR FOOTING DOES NOT APPLY TO LOCATIONS WHERE WALLS OF THE HOLE WILL NOT STAND WITHOUT SUPPLEMENTAL SUPPORT, OR WHERE UNCOMPACTED FILL OR ORGANIC FILL EXISTS. FOUNDATION IS DESIGNED UTILIZING LATERAL BEARING PER IBC SECTION 1807.3.2.1. ALLOWABLE LATERAL SOIL PRESSURE PER IBC TABLE 1806.2 IS 150 PSF/FT (SOIL CLASS 4 - TYPE: SAND, CLAYEY SAND, SILTY SAND, CLAYEY SAND, SILTY GRAVEL, AND CLAYEY GRAVEL). DESIGN LATERAL SOIL PRESSURE HAS BEEN MULTIPLIED BY 2 PER SECTION 1806.3.4. VERIFY SOIL TYPE DURING EXCAVATION. NOTIFY ENGINEER OF ANY DISCREPANCY.

GENERAL NOTES AND SPECIFICATIONS
(APPLY UNLESS OTHERWISE NOTED)

STEEL - WIDE FLANGES - ASTM A-992. OTHER SHAPES & PLATES - ASTM A-36.

PIPE SECTIONS - ASTM A53 GR B OR A252 GR 2 OR API 5L (WITH MINIMUM YIELD STRENGTH AS INDICATED ON DRAWINGS).

EXPANDED METAL GRATING - EXPANDED METAL GRATING SHALL BE MANUFACTURED FROM CARBON STEEL IN CONFORMANCE WITH THE EXPANDED METAL MANUFACTURERS ASSOCIATION (EMMA) STANDARD NO. 557-99, "STANDARDS FOR EXPANDED METAL." EMMA IS A DIVISION OF THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM).

ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED ACCORDING TO LATEST AISC SPECIFICATIONS AND STANDARD PRACTICE.

PAINTING - ALL STRUCTURAL STEEL, EXPOSED TO WEATHER SHALL BE SHOP PRIMED AND PAINTED IN ACCORDANCE WITH AISC 305 (SPECIFICATION) AND AISC 303 (STANDARD PRACTICE).

REINFORCING STEEL - FOR CUBE FOOTING, REINFORCING STEEL SHALL BE WELDED WIRE FABRIC 4x4 - W4 x W4 PER ASTM A185 OR A497M. WELDED WIRE FABRIC CAN BE SUBSTITUTED WITH POLYPROPYLENE FIBER MESH INCORPORATED INTO THE CONCRETE MIX AT THE RATE OF 3 LBS. PER CUBIC YARD. REINFORCING SHALL BE FABRICATED AND SECURED IN ACCORDANCE WITH ACI 318 AND CRSI MANUAL OF STANDARD PRACTICE. DO NOT WELD REINFORCING STEEL UNLESS APPROVAL IS OBTAINED FROM THE ENGINEER PRIOR TO CONSTRUCTION.

CONCRETE - CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI (DESIGNED AT 2,500) AT 28 DAYS AND BE PLACED IN ACCORDANCE WITH ACI 318. CONCRETE MIX SHALL BE PROPORTIONED WITH A MAXIMUM WATER CEMENT RATIO OF 0.50.

WELDING - ALL WELDING MATERIALS AND COMPONENTS SHALL BE IN COMPLIANCE WITH AWS D1.1 USING E70XX ELECTRODES.

BOLTS - ALL REGULAR SHALL CONFORM TO ASTM A-307. HIGH STRENGTH BOLTS SHALL CONFORM TO ASTM A-325N. ALL BOLTS SHALL BE INSTALLED TO A SNUG TIGHT CONDITION UNLESS NOTED TO BE PRE-TENSIONED (PT). PT BOLTS SHALL BE FULLY TENSIONED PER AISC TURN OF THE NUT METHOD (1/3 OF A TURN PAST A SNUG TIGHT CONDITION) OR OTHER AISC APPROVED TENSIONING METHOD.

SPECIAL INSPECTIONS - SPECIAL INSPECTIONS ARE REQUIRED PER CHAPTER 17 FOR THE FOLLOWING ITEMS:
- STEEL CONSTRUCTION: MATERIAL VERIFICATION OF STRUCTURAL STEEL; PERIODIC INSPECTION OF JOINT DETAILS
- HIGH STRENGTH BOLTS: PERIODIC INSPECTION TO REVIEW FASTENER COMPONENTS AND TENSIONING.
- FOUNDATION: PERIODIC INSPECTION TO VERIFY EXCAVATION DIMENSIONS

STEEL FABRICATOR - ALL STRUCTURAL STEEL SHALL BE SHOP FABRICATED BY THE FOLLOWING CITY OF PHOENIX APPROVED FABRICATOR:
PAGE STEEL
2040 INDUSTRIAL DRIVE
PAGE, AZ 86040

UNLESS SPECIFICALLY INDICATED AS FIELD WORK, NO FIELD WELDING IS ALLOWED WITHOUT THE APPROVAL OF THE ENGINEER OF RECORD. SPECIAL INSPECTIONS IS REQUIRED FOR ALL FIELD WELDING.

THE ERECTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD BEFORE ERECTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES. ERECTORS SHALL NOTIFY ENGINEER IF STRUCTURE IS LOCATED NEAR ANY BUILDINGS.

THE UNDERSIGNED ENGINEER WILL NOT SUPERVISE THE FABRICATION OR ERECTION OF THIS STRUCTURE.

CUSTOMER	CUSTOM SIGN & CRANE
SIGN LOCATION	CARSON CITY, NV

10' x 22'
SINGLE POST
CENTER MOUNT
DOUBLE FACE
BACK TO BACK
LED SIGN STRUCTURE

RMG Outdoor Inc.
4425 North 24th Street, Suite 200
Phoenix, Arizona 85016
Phn: (602) 230-8634 Fax: (602) 230-8071

ENG. NO.	DR.	CK.
G-12145	DBM	JS
JOB NO.	DATE	09/30/2022
	SHEET NO.	S1 of 1

FJS ENGINEERING
TUCSON, AZ
520-490-3311
CONTACT@FJSENGINEERING.COM
NV FIRM #22937

RMG Outdoor Inc.
4425 N 24TH ST. - STE 200
PHOENIX, AZ 85016
602-230-8634 / 800-525-8509
FAX 602-230-9071

JOB #:	
ENG. #:	G-12145
DATE:	Sep-22
BY:	JS
SHEET:	COV

COVER SHEET

CUSTOMER: CUSTOM SIGN & CRANE

LOCATION: CARSON CITY, NV

SIZE OF FACE: 10 X 20 (ft)

H.A.G.L.: 15 (ft) **OA HEIGHT:** 25 (ft)

WIND LOAD: 96 MPH , RISK CATEGORY II

SOIL: 150 / 300 (psf/ft)

STRUCTURE DESIGN:

- X CENTER MOUNT
- _____ PARTIAL FLAG - DISTANCE = _____
- _____ FULL FLAG - COLUMN LOCATION _____
- _____ OFFSET = _____ (ft)
- _____ V-BUILD ___° ANGLE OR _(ft) MAX OPENING
- X BACK TO BACK
- _____ SINGLE-FACE
- _____ MULTI POST DESIGN - SPACING = _____ (ft)
- _____ ENCLOSURE

FOOTING DESIGN:

- _____ ROUND
- X SQUARE
- _____ SPREAD
- _____ EXISTING

SPECIAL CONDITIONS:

1. LED READY

PROFESSIONAL ENGINEER-STATE OF NEVADA
JOHN E. SKWIOT
Exp. 6/30/24
CIVIL
No. 20561

Signed: 09/30/2022

REVISIONS:

	TITLE: Specifications	JOB #:
		ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 1

DESIGN SPECIFICATIONS

CODE:	**2018 IBC**
STEEL:	
WIDE FLANGES:	**ASTM A992, F_y = 50 ksi**
OTHER PLATES AND SHAPES:	**ASTM A36, F_y = 36 ksi**
PIPE SECTIONS:	**ASTM A53B, A252 OR API 5LX, Fy AS NOTED**
WELDING:	**AWS D1.1**
BOLTS:	**ASTM A307 OR A325N AS NOTED**
CONCRETE:	**f'_c = 3000 psi AT 28 DAYS (DESIGNED AT 2500)**
REINFORCING STEEL:	**ASTM A706, GRADE 60 (F_y = 60 ksi)**
WOOD:	**DOUGLAS FIR LARCH #2**
FOUNDATION:	**IBC TABLE 1806.2 (CLASS 4 MATERIAL)**
	ALLOWABLE BEARING PRESSURE = 2000 psf
	PASSIVE LATERAL RESISTANCE
	(1806.3.4) 150 x 2 = 300 PSF/FT

DESIGN LOADS:

WIND:	**96 MPH - EXPOSURE C**
LIVE:	
CATWALKS:	**40 psf OR 300#**
DEAD:	
STATIC SIGN FACE	**N/A**
DIGITAL DISPLAY:	**3,000 # EACH**
PIGEON PAN:	**N/A**

OTHER MEMBERS AS NOTED IN CALCULATIONS

	TITLE: Wind Pressures	JOB #:
		ENG. #: G-12145
		DATE: Sep-21
		BY: JS
		SHEET: WIND (2)

Wind Load Design for 2018 IBC / ASCE 7-16

$p_w = q_z G c_f$ ASCE 29.3.1 (Eq. 29.3-1, modified to change to pressure in lieu of force)

$q_z = 0.00256(K_z)(K_{zt})(K_d)(V^2)$ ASCE 26.10.2 (Eq. 26.10-1)

$c_f =$ See Below ASCE Figure 29.3-1

$K_{zt} = 1.0$

$K_d = 0.85$ ASCE Table 26.6-1

$G = 0.85$

$V = 96$ Risk Category II

$K_z = 0.94$ (Exposure C) ASCE Table 26.10-1

Overall Height (ft)	K_z (Exposure C)
0-15	0.85
20	0.90
25	0.94
30	0.98
40	1.04
50	1.09
60	1.13
70	1.17
80	1.21
90	1.24
100	1.26
120	1.31
140	1.36
160	1.39

Structures to be designed using load combination D + L + 0.6W

c_f Calculations per ASCE Figure 29.3-1

Sign Width (B) =	20
Sign Overall Height (h) =	25
Sign HAGL =	15
Sign Face Height (s) =	10
Clearance Ratio (s/h) =	0.4
Aspect Ratio (B/s) =	2.000

Case A and Case B

$c_f =$	1.8	$0.6p_w =$	17.31

(AVERAGE WIND LOAD) - USE FOR GLOBAL DESIGN

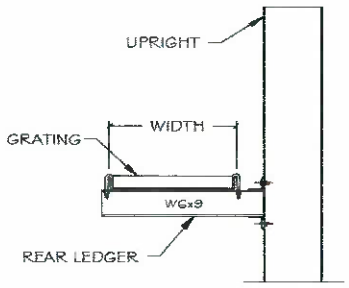
Case C - Only applicable for B/s > 2

0 to s	$c_f =$	2.25	$p_w =$	21.63	(MAXIMUM WIND LOAD) - USE FOR ELEMENT DESIGN
s to 2s	$c_f =$	1.50	$p_w =$	14.42	
Balance	$c_f =$	1.15	$p_w =$	11.06	

FJS ENGINEERING	TITLE: REAR WALKWAY DESIGN	JOB #: ENG. #: G-12145 DATE: Sep-22 BY: JS SHEET: 3

REAR WALKWAY DESIGN :

Walkway Width, (W) =	2	ft
Upright Spacing (L1) =	8	ft
Walkway Cantilever (L2) =	3	ft



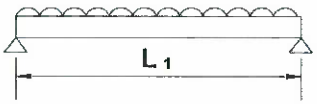
WALKWAY STRINGER DESIGN :

DEAD LOAD :

Stringer (L4x3x1/4) :	5.8	plf	x	2	=	11.60 plf
Grating :	2.00	psf	x	2 ft	=	4 plf
10 % Misc. :					=	1.56 plf
					TOTAL =	17.16 plf

LIVE LOAD :		
Uniform Load =	40	psf.
Point Load =	300	lbs.

SIMPLE SPAN : L_1 = 8 ft



DEAD LOAD

M_{DL} = 17.16 x (8 / 8)^2 = 137.3 ft-lbs

LIVE LOAD

$M_{point\ load}$ = 300 x (8 / 4) = 600 ft-lbs

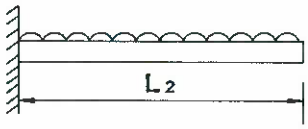
$M_{uniform\ load}$ = (40 x (2) (8)^2 / 8) = 640 ft-lbs

M_{TOTAL} = 137.3 + 640 = 777.3 ft-lbs

M = 977.2 / 2 STR = 0.489 kip-ft / stringer

$S_{req} = \frac{\Omega\ M}{F_y} = \frac{1.67 \times (\ 5.86\ )}{36}$ = 0.272 in^3 < 1.000 in^3 **OK**

CANTILEVER : L_2 = 3 ft



DEAD LOAD

M_{DL} = 17.16 x (3 / 2)^2 = 77.2 ft-lbs

LIVE LOAD

$M_{point\ load}$ = 300 x 3 = 900 ft-lbs

$M_{uniform\ load}$ = (40 x (2) (3)^2 / 2) = 360 ft-lbs

M_{TOTAL} = 77.2 + 900 = 977.2 ft-lbs **GOVERNS**

USE : L 4x3x1/4 AT REAR WALKWAY S_x = 1.000 in^3

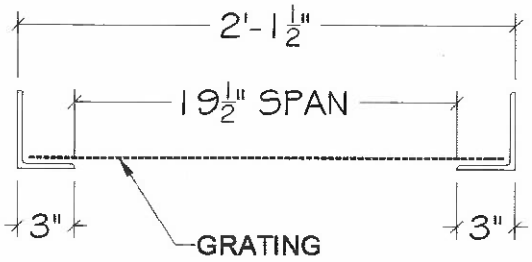
RMG Outdoor Inc.
4425 N. 24th St. - Ste. 200
Phoenix, AZ 85016
602-230-8634 / 800-525-8509
FAX 602-230-9071

TITLE: Walkway grating

Walkway grating

Loads: 40 psf or 300 lb concentrated load (distributed per IBC section 1607.4)

2 ft Walkway

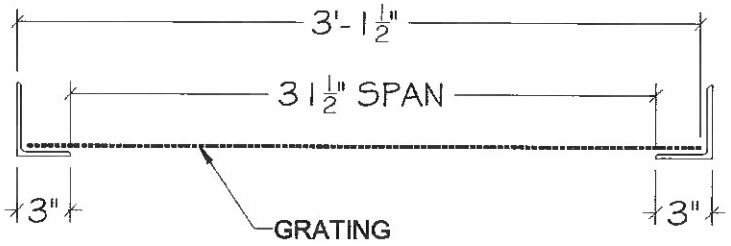


- Concentrated load governs
- Convert to psf:

$$Load := \frac{300\ lbf}{2\ ft \cdot 2.5\ ft} = 60\ psf$$

Use 2.0# carbon steel grate for 2 ft wide walkways

3 ft Walkway



- Convert concentrated load to psf:

$$Load := \frac{300\ lbf}{2.5\ ft \cdot 2.5\ ft} = 48\ psf$$

Use 3.0# carbon steel grate for 3 ft wide walkways

GRATING MANUFACTURER SHALL BE IN CONFORMANCE W/ EMMA 557

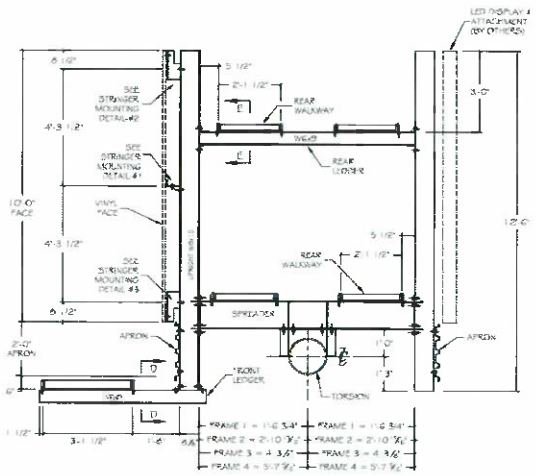
STYLE	LOAD TYPE	CLEAR SPAN	DEFLECTION IN INCHES									
			50 LBS	100 LBS	150 LBS	200 LBS	250 LBS	300 LBS	350 LBS	400 LBS	450 LBS	500 LBS
ALUMINUM												
2.00#	U	18"	0.017	0.340	0.051	0.068	0.085	0.103	0.121	0.139	0.157	--
		24"	0.047	0.094	0.141	0.189	0.236	0.283	--	--	--	--
		30"	0.108	0.216	0.322	--	--	--	--	--	--	--
		36"	0.213	0.430	--	--	--	--	--	--	--	--
	C	18"	0.019	0.039	0.059	0.079	0.099	0.119	0.139	0.159	--	--
		24"	0.046	0.092	0.138	0.184	0.230	0.277	--	--	--	--
		30"	0.092	0.181	0.269	0.360	--	--	--	--	--	--
		36"	0.125	0.255	0.385	0.465	--	--	--	--	--	--
CARBON STEEL												
2.00#	U	18"	0.049	0.099	0.147	0.196	0.245	0.294	0.343	--	--	--
		24"	0.156	0.313	0.468	--	--	--	--	--	--	--
		30"	0.382	--	--	--	--	--	--	--	--	--
		36"	0.791	--	--	--	--	--	--	--	--	--
	C	18"	0.052	0.105	0.158	0.211	0.264	0.317	--	--	--	--
		24"	0.125	0.250	0.175	0.500	--	--	--	--	--	--
		30"	0.244	0.489	--	--	--	--	--	--	--	--
		36"	0.422	--	--	--	--	--	--	--	--	--
3.00#	U	24"	0.073	0.146	0.220	0.293	0.366	0.440	--	--	--	--
		30"	0.155	0.311	0.463	--	--	--	--	--	--	--
		36"	0.330	0.660	--	--	--	--	--	--	--	--
		42"	0.527	--	--	--	--	--	--	--	--	--
	C	24"	0.068	0.132	0.197	0.263	0.329	0.395	0.462	--	--	--
		30"	0.116	0.228	0.345	0.460	--	--	--	--	--	--
		36"	0.192	0.380	0.570	--	--	--	--	--	--	--
		42"	0.280	0.561	--	--	--	--	--	--	--	--
		48"	0.380	0.762	--	--	--	--	--	--	--	--
3.14#	U	24"	0.057	0.115	0.173	0.230	0.288	0.346	0.404	0.462	--	--
		30"	0.129	0.259	0.388	0.517	--	--	--	--	--	--
		36"	0.315	0.626	--	--	--	--	--	--	--	--
		42"	0.449	--	--	--	--	--	--	--	--	--
		48"	0.745	--	--	--	--	--	--	--	--	--
	C	24"	0.049	0.094	0.140	0.187	0.234	0.280	0.326	0.372	0.420	0.465
		30"	0.099	0.198	0.297	0.395	--	--	--	--	--	--
		36"	0.180	0.357	0.535	--	--	--	--	--	--	--
		42"	0.225	0.455	0.684	--	--	--	--	--	--	--
		48"	0.342	0.687	--	--	--	--	--	--	--	--
4.00#	U	24"	0.037	0.073	0.111	0.147	0.184	0.222	0.259	0.296	0.333	0.370
		30"	0.068	0.135	0.205	0.274	0.340	0.410	0.477	0.545	--	--
		36"	0.180	0.358	0.536	--	--	--	--	--	--	--
		42"	0.283	0.565	--	--	--	--	--	--	--	--
		48"	0.487	--	--	--	--	--	--	--	--	--
	C	24"	0.031	0.064	0.096	0.128	0.160	0.192	0.224	0.256	0.288	0.320
		30"	0.060	0.120	0.180	0.240	0.300	0.360	0.420	0.480	--	--
		36"	0.101	0.205	0.310	0.402	0.505	0.605	--	--	--	--
		42"	0.158	0.315	0.473	0.630	--	--	--	--	--	--
		48"	0.218	0.433	0.648	--	--	--	--	--	--	--
4.27#	U	24"	0.038	0.079	0.120	0.160	0.200	0.240	0.280	0.320	0.360	0.400
		30"	0.078	0.156	0.235	0.312	0.390	0.470	--	--	--	--
		36"	0.186	0.373	0.560	--	--	--	--	--	--	--
		42"	0.379	--	--	--	--	--	--	--	--	--
		48"	0.542	--	--	--	--	--	--	--	--	--
	C	24"	0.038	0.078	0.116	0.156	0.196	0.235	0.275	0.315	0.355	0.395
		30"	0.081	0.163	0.245	0.327	0.409	0.491	--	--	--	--
		36"	0.124	0.250	0.379	0.505	--	--	--	--	--	--
		42"	0.0199	0.399	0.598	--	--	--	--	--	--	--
		48"	0.242	0.480	0.720	--	--	--	--	--	--	--

At at span of 19.5 inches & load of 60 psf, deflection is 0.091 inches. OK

At at span of 31.5 inches & load of 48 psf, deflection is 0.20 inches. OK

FJS ENGINEERING	TITLE: UPRIGHT DESIGN	JOB #:
		ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 6

UPRIGHT DESIGN



L.E.D. PANEL WTG., P_{DL} =	1.40	K
# Of Uprights =	2	
Max Wind Pressure =	0.0216	ksf
Height , H =	10	ft
Upright Spacing =	7	ft
e = ±	2	ft

w = 0.0216 x 7 = 0.1514 klf

M_{wind} = 0.1514 x (10.00)^2 / 2 = 7.57 ft-k / 2 uprights

M_{wind} = 7.57 ft-k / 2 Uprights = 3.79 ft-k per upright

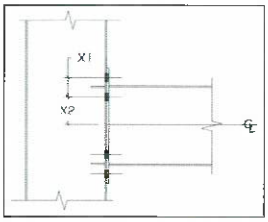
M_{sign} = P_{DL} x e = 1.40 x 2 = 2.80 ft-k per upright

Mtotal = 6.59 ft-k per upright

USE : W 8 x 15

$M_{capacity}$ = 29.0 ft-k UBL : 5'-6"

CONNECTION



X1 =	3	in
X2 =	2.5	in

DEAD LOAD :

								Per Upright
LED Panel =	3000	lbs	÷	3	Uprights	=		1000.00 lbs
Brace (L3x3x1/4) =	4.9	plf	x	7 ft	Trib.	x 1	=	34.3 lbs
Rear Walkway (L4x3x1/4) =	5.8	plf	x	7 ft	Trib.	x 1	=	40.60 lbs
grating =	2.00	psf	x	7 ft Trib.	x 2 ft	x 0.5	=	14.00 lbs
Upright (W8 x 15) =	15.0	plf	x	10.5 ft			=	157.50 lbs
Rear Ledger (W6x9) =	9	plf	x	3 ft			=	27.00 lbs
Misc. 10% =							=	127.34 lbs
							P_{DL} =	1400.74 lbs

Try : 1/2 ø A325 Bolts A_{bolt} = 0.196 in^2

M_{total} = 6.59 ft-k

V = 1.40 k

I = 4 (2.5)^2 + 4 (5.5)^2 = 146 in^4

T = $\frac{6.59}{146}$ x 12 x 5.5 = 2.98 k/bolt

V = $\frac{1.40}{8 \text{ bolts}}$ = 0.18 k/bolt

F_T = 45 ksi

f_T = $\frac{2.98 \text{ k}}{0.196 \text{ in}^2}$ = 15 ksi

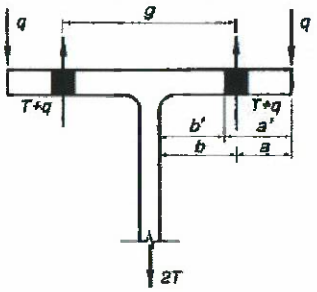
f_T < F_T **OK**

USE : (8) - 1/2 ø A325 BOLTS

	TITLE:	JOB #:
	UPRIGHT FLANGE BENDING	ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 7

UPRIGHT FLANGE BENDING: Prying action governs design. Design flange thickness per AISC 14th Edition on pg. 9-12

Wind Load Design for 2018 IBC / ASCE 7-16



a) prying forces in tee

Check Saddle Beam : **W8X15**

T =	2.98	K			t_f =	0.315	in.
b_f =	4.02	in.					
t_w =	0.245	in.	b' =	0.7525	b =	1.00	in.
gage =	2.25	in.	δ =	0.75	a =	0.885	in.
d_{bolt} =	0.5	in.	α'=	1	F_u =	65	ksi
d'_{bolt} =	0.563	in	β =	3.000			
B =	8.9	K	ρ =	0.6630			
p =	2.25	in	a' =	1.135			

t_{min} = 0.241 in. < 0.315 in. OK

$$t_{min} = \sqrt{\frac{\Omega 4Tb'}{pF_u(1+\delta\alpha')}}$$

Where : F_u = Specified minimum tensile strength of connecting element, ksi.

$\delta = 1 - \frac{d'}{p}$ ratio of the net area at bolt line to gross area oat face of the stem or leg of angle.

α' = 1 if β ≥ 1

α' = the lesser of 1 and $\frac{1}{\delta}\left(\frac{\beta}{1-\beta}\right)$ if $\beta < 1$

$\beta = \frac{1}{\rho}\left(\frac{B}{T} - 1\right)$ $\rho = \frac{b'}{a'}$

$a' = \left(a + \frac{d_b}{2}\right) \le \left(1.25b + \frac{d_b}{2}\right)$ $b' = \left(b - \frac{d_b}{2}\right)$

T = Required strength, kips

b = Distance from bolt centerline to the face of the tee stem, in.

d_b = Bolt diameter, in.

a = distance from the bolt centerline to the edge of the fitting, in,

B = available tension per bolt per Table 7-2

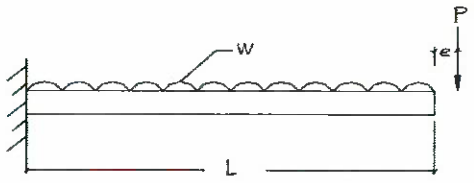
p = Tributary length per pair of bolts for a tee. Which should preferably not to exceed the gage between the pair of bolts, g

Ω = 1.67

	TITLE:	JOB #:
	SPREADER DESIGN	ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 9

SPREADERS : SPREADERS CANTILEVER FROM FIXED CONNECTION AT TORSION

e =	2	ft
MAX CANTILEVER =	1.5	ft
SELF WTG. OF SPREADER, w =	0.015	klf
DEAD LOAD OF HEAD STRUCTURE, P =	1.40	k
M_{wind} FROM UPRIGHT =	3.79	ft-k



$$M_{self\ wtg.} = \frac{wl^2}{2} = \frac{0.015 \times (1.5)^2}{2} = 0.017 \text{ ft-k}$$

$$M_{DL\ of\ Head} = P(l+e) = 1.40 \times (1.5 + 2) = 4.90259 \text{ ft-k}$$

$M_{TOTAL} = M_{wind\ From\ Upright} + M_{self\ wtg.} + M_{DL\ of\ Head} =$ **8.70** ft-k

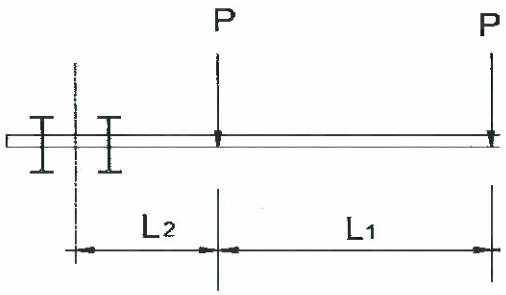
USE : W 8 x 15

M_{allow} = 34 ft-k @ UBL = 1.5 FT

	TITLE:	JOB #:
	TORSION DESIGN	ENG. #: G-12145
	FOR CM	DATE: Sep-22
		BY: JS
		SHEET: 10

TORSION DESIGN : **TRY:** 12.8 X 0.375 in PIPE F_y = 35 ksi

$w_{DL\ Torsion}$ =	0.050	klf
P_{DL} =	1.40	k
wind =	0.017305	ksf
Sign height =	10	ft
Sign length =	20	ft
bot. of upright to center of torsion =	0.5	ft
$w_{Spreader}$ =	0.015	klf
$L_{Spreader}$ =	3	ft
$L_{Torsion}$ =	7	ft
L_1 =	7	ft
L_2 =	0	ft



DEAD LOADS

P_{DL} = 2 x 1.40 + (3 x 0.015) = 2.85 k

V_{DL} = 2 x 2.85 + (7 x 0.050) = 6.04 k

M_{DL} = 2.85 (0 + 7) + 0.050 ($\frac{7}{2}$)^2 = 21.14 ft-k

WIND LOADS

P_{wind} = 0.01731 x 10.00 x 20.00 = 3.461 k

V_{wind} = 0.01731 x 10 x 10 x (5/3) = 2.8842 k

M_{wind} = 3.46 x 0.2 x 20.00 = 13.84 ft-k

Torsion = 2.88 x ($\frac{10}{2}$ - 0.5) = 12.98 ft-k

COMBINED LOADS

$$V = \sqrt{V_{DL}^2 + V_{wind}^2}$$

Torsion = 12.98 ft-k

V = 6.69 ft-k

$$M = \sqrt{M_{DL}^2 + M_{wind}^2}$$

M = 25.27 ft-k

USE: 12.75 Ø x 0.375 PIPE

F_y = 35 ksi

	TITLE: Torsion	JOB #:
		ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 11

Pipe Properties:

Wind L Dia. = D =	12.75	(in)	S =	43.8	(in^3)
Wall = t =	0.375	(in)	I =	279	(in^4)
F_y =	35	(ksi)	Z =	57.4	(in^3)
D/t =	34	Compact Section	A =	14.6	(in^2)
L =	7	(ft)	A_g =	13.6	(in^2)
L_v =	7	(ft)			

Nominal Flexural Strength:

Yielding

$M_n = M_p = F_y Z =$ 167.5 kip-ft

Local Buckling (not applicable for Compact Section)

Noncompact Sections

$$M_n = \left(\frac{0.021E}{\frac{D}{t}} + F_y \right) S =$$

Slender Sections

$$M_n = \left(\frac{0.33E}{\frac{D}{t}} \right) S =$$

M_n =	167.5 kip-ft

Nominal Shear Strength:

$V_n = F_{cr} A_g / 2 =$

$$F_{cr} = \text{Greater of } \frac{1.60E}{\sqrt{L_v/D}\left(D/t\right)^{5/4}} \text{ or } \frac{0.78E}{\left(D/t\right)^{3/2}} =$$ 220.2 ksi

$F_{cr} \le 0.6F_y$ 21.0 ksi

V_n =	142.7 kips

	TITLE: Torsion	JOB #:
		ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 12

Nominal Torsional Strength:

$$T_n = F_{cr} C$$

$$C = \frac{\pi (D-t)^2 t}{2} = \qquad 90.2 \text{ (in}^3\text{)}$$

$$F_{cr} = \quad Greater\ of \quad \frac{1.23E}{\sqrt{L/D}\,(D/t)^{5/4}} \quad or \quad \frac{0.60E}{(D/t)^{3/2}} = \qquad 169.3 \text{ ksi}$$

$$F_{cr} \le 0.6F_y \qquad 21.0 \text{ ksi}$$

T_n =	157.9 kip-ft

Nominal Compressive Strength:

Structures are relatively light and compression loads are minimal when compared to flexural stresses. Conservatively assume that $P_r/P_c = 0.05$.

Applied Loads:

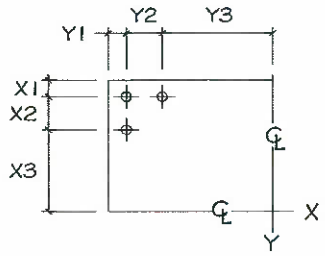
P_r =	kips	$P_c = P_n/\Omega_P$ where $\Omega_P = 1.67$
M_r =	25.27 kip-ft	$M_c = M_n/\Omega_M$ where $\Omega_M = 1.67$
V_r =	6.69 kips	$V_c = V_n/\Omega_V$ where $\Omega_V = 1.67$
T_r =	12.98 kip-ft	$T_c = T_n/\Omega_T$ where $\Omega_T = 1.67$

$$\left(\frac{P_r}{P_c} + \frac{M_r}{M_c}\right) + \left(\frac{V_r}{V_c} + \frac{T_r}{T_c}\right)^2 = \qquad 0.348 < 1.0 \text{ Pipe OK}$$

Final Selection:

Use 12.75" Dia. X 0.375" Wall - 35 ksi steel

	TITLE:	JOB #:
	TORSION/COLUMN CONNECTION FOR CM	ENG. #: G-12145 DATE: Sep-22 BY: JS SHEET: 13



/ ASCE 7-16

OF BOLTS = 12 Bolt dia. = 3/4 in

bolts in x-direction				
x1 =	1.50	in	# of bolt in row 1 =	4
x2 =	3	in	# of bolt in row 2 =	2
x3 =	6.5	in		
bolts in y-direction				
Y1 =	1.50	in	# of bolt in row 1 =	4
Y2 =	3	in	# of bolt in row 2 =	2
Y3 =	6.5			

PLATE SIZE = 22 in. Square

Sign Height = 10 ft

Sign Length = 20 ft

P_{wind} = 3.461 k

$M_{torsion}$ = 13.84 ft-k

P_{DL} = 2.85 k # of point loads = 3

Wtg of Torsion pipe = 0.050 klf

Length of Torsion pipe = 14 ft

P_{Total} = 9.23 k

$M_{DL} = P_{Total}\ (.05x\ Sign\ Length)$

M_{DL} = 9.23 ft-k

4 bolts x(3.0 + 6.50)^2 x 2 sides = 722 in^4

2 bolts x(6.50)^2 x 2 sides = 169 in^4

I_{xx} = 891 in^4

I_{yy} = 891 in^4

I_{Total} = 1782 in^4

c = 3.0 + 6.50 = 9.50 in

r_x = 3.0 + 6.50 = 9.50 in

r_y = 3.0 + 6.50 = 9.50 in

$r = \sqrt{r^2_x + r^2_y}$ = 13.4 in

$$M_{wind} = 3.46 \times \frac{10.0}{2} - 0.25 = 16.44 \text{ ft-k}$$

$$T_{bolt} = \left(\frac{16.44 + 9.2334}{891} \right) \times 12 \times 9.50 = \mathbf{3.3\ k/bolt}$$

$$V_{bolt} = \left(\frac{13.8}{1782} \right) \times 12 \times 13.4 + \frac{3.461002\ k}{12\ BOLTS} = \mathbf{1.5\ k/bolt}$$

BOLT STRESSES

$f_T = \frac{3.3\ k}{0.442\ in^2}$ = 7.4 ksi < F'T **OK**

F_V = 24 ksi

$f_V = \frac{1.5\ k}{0.442\ in^2}$ = 3.5 ksi < F_V **OK**

$F'_T = 1.3\ F_{nt} - \frac{\Omega F_{nt}}{F_{nv}} f_v$ where : F_{nt} = 90 ksi

F_{nv} = 48 ksi

Ω = 2

for A325N bolts per Table J3.2 AISC 15TH Edition

F'T = 45 ksi > f_T OK

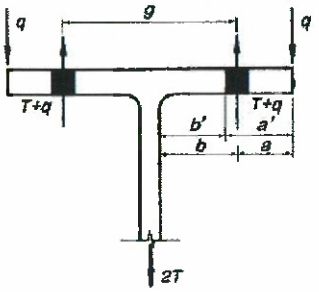
T_{allow} = **19.9 k**

USE (12) 3/4 " DIA. A325 BOLTS

	TITLE:	JOB #:
	TORSION SADDLE BEAM	ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 14

TORSION SADDLE BEAM : Prying action governs design. Design flange thickness per AISC 14th Edition on pg. 9-12

Wind Load Design for 2018 IBC / ASCE 7-16



a) prying forces in tee

Check Saddle Beam : **W21X44**

T =	3.28	K			t_f =	0.450	in.
b_f =	6.50	in.					
t_w =	0.350	in.	b' =	0.95	b =	1.33	in.
gage =	3	in.	δ =	0.6457	a =	1.656	in.
d_b =	0.75	in.	α'=	1			
d'_b =	1.063	in	β =	10.815			
B =	19.90	K	ρ =	0.4677			
p =	3	in	a' =	2.0313			
F_u =	65	ksi					

t_{min} = 0.254 in. < 0.450 in. OK

$$t_{min} = \sqrt{\frac{\Omega 4 T b'}{p F_u (1 + \delta \alpha')}}$$

Where : F_u = Specified minimum tensile strength of connecting element, ksi.

$\delta = 1 - \frac{d'}{p}$ ratio of the net area at bolt line to gross area oat face of the stem or leg of angle.

α' = 1 if β ≥ 1

α' = the lesser of 1 and $\frac{1}{\delta}\left(\frac{\beta}{1-\beta}\right)$ if $\beta < 1$

$\beta = \frac{1}{\rho}\left(\frac{B}{T} - 1\right)$ $\rho = \frac{b'}{a'}$

$a' = \left(a + \frac{d_b}{2}\right) \le \left(1.25b + \frac{d_b}{2}\right)$ $b' = \left(b - \frac{d_b}{2}\right)$

T = Required strength, kips

b = Distance from bolt centerline to the face of the tee stem, in.

d_b = Bolt diameter, in.

a = distance from the bolt centerline to the edge of the fitting, in,

B = available tension per bolt

p = Tributary length per pair of bolts for a tee. Which should preferably not to exceed the gage between the pair of bolts, g

d'_b = Width of the hole along the length of the fitting, in.

Ω = 1.67

	TITLE:	JOB #:
	COLUMN DESIGN	ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 15

COLUMN DESIGN : **TRY: 16 X 0.375 in PIPE** F_y = **35 ksi**

Wind Load Design for 2018 IBC / ASCE 7-16

wind = 0.017305 ksf

Sign height = 10.00 ft

Sign length = 20 ft

O.A. HEIGHT = 25 ft

H.A.G.L. = 15 ft

M_{DL} = 9.2 ft-k (From Torsion/Column Connection)

Torsion = 13.8 ft-k (From Torsion design)

P^{F}_{wind} = 0.017305 x 10.0 x 20 = 3.46 k

P^{col}_{wind} = 0.017 x 1.3 ft x 15 = 0.35 k

$P_{wind\ total}$ = 3.81 k

M_{DL} = 9.23 ft-k

M_{wind} = 3.46 x (10.0 / 2 + 15) + 0.35 x (15 / 2) = 71.82 ft-k

$M_{bending} = \sqrt{M_{DL}^2 + M_{wind}^2}$ = **72.41 ft-k**

USE: 16 " Ø x 0.375 PIPE

F_y = 35 ksi

FOOTING DESIGN :

Moment, M = 72.41 ft-k

Pwind total, P = 3.81 k

h = M / P = 72.41 / 3.81 = 19.02 ft

	TITLE: Column	JOB #:
		ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 16

Pipe Properties:

Wind L Dia. = D =	16	(in)	S =	70.3	(in^3)
Wall = t =	0.375	(in)	I =	562	(in^4)
F_y =	35	(ksi)	Z =	91.6	(in^3)
D/t =	42.6667	Compact Section	A =	18.4	(in^2)
L =	15.0	(ft)	A_g =	17.1	(in^2)
L_v =	15	(ft)			

Nominal Flexural Strength:

Yielding

$M_n = M_p = F_y Z =$ 267.1 kip-ft

Local Buckling (not applicable for Compact Section)

Noncompact Sections

$$M_n = \left(\frac{0.021E}{\frac{D}{t}} + F_y \right) S =$$

Slender Sections

$$M_n = \left(\frac{0.33E}{\frac{D}{t}} \right) S =$$

M_n =	267.1 kip-ft

Nominal Shear Strength:

$V_n = F_{cr} A_g / 2 =$

$$F_{cr} = \text{Greater of } \frac{1.60E}{\sqrt{L_v/D}\left(D/t\right)^{5/4}} \text{ or } \frac{0.78E}{\left(D/t\right)^{3/2}} =$$ 126.9 ksi

$F_{cr} \le 0.6F_y$ 21.0 ksi

V_n =	180.1 kips

	TITLE: Column	JOB #:
		ENG. #: G-12145
		DATE: Sep-22
		BY: JS
		SHEET: 17

Nominal Torsional Strength:

$T_n = F_{cr} C$

$$C = \frac{\pi (D-t)^2 t}{2} = \quad 143.8 \text{ (in}^3\text{)}$$

$$F_{cr} = \quad Greater\ of \quad \frac{1.23E}{\sqrt{L/D}\,(D/t)^{5/4}} \quad or \quad \frac{0.60E}{(D/t)^{3/2}} = \quad 97.5 \text{ ksi}$$

$F_{cr} \le 0.6F_y$ 21.0 ksi

T_n =	251.7 kip-ft

Nominal Compressive Strength:

Structures are relatively light and compression loads are minimal when compared to flexural stresses. Conservatively assume that $P_r/P_c = 0.05$.

Applied Loads:

P_r =	kips	$P_c = P_n/\Omega_P$ where $\Omega_P = 1.67$
M_r =	72.41 kip-ft	$M_c = M_n/\Omega_M$ where $\Omega_M = 1.67$
V_r =	3.81 kips	$V_c = V_n/\Omega_V$ where $\Omega_V = 1.67$
T_r =	13.84 kip-ft	$T_c = T_n/\Omega_T$ where $\Omega_T = 1.67$

$$\left(\frac{P_r}{P_c} + \frac{M_r}{M_c}\right) + \left(\frac{V_r}{V_c} + \frac{T_r}{T_c}\right)^2 = \quad 0.519 < 1.0 \text{ Pipe OK}$$

Final Selection:

Use 16" Dia. X 0.375" Wall - 35 ksi steel

RMG Outdoor Inc.	4425 N 24TH ST. - STE 200 PHOENIX, AZ 85016 602-230-8634 / 800-525-8509 FAX 602-230-9071	TITLE: FOOTING DESIGN	JOB #: ENG. #: G-12145 DATE: 30-Sep-22 BY: JS SHEET: 18

Nonconstrained Embedded Pole Footing Design

Square or Rectangular Footing

Design based on CBC or IBC section 1807.3.2.1.

$$d = \frac{A}{2}\left(1+\sqrt{1+\frac{4.36h}{A}}\right)$$

Where:

$$A = \frac{2.34P}{S_1 b}$$

b = diagonal dimension of square or rectangular footing. (ft)

t = plan thickness of square or rectangular footing. (ft)

w = plan width of square or rectangular footing. (ft)

q = allowable lateral soil bearing pressure. (ksf/ft)

d = actual depth of embedment in earth. (ft)

h = distance in feet from ground surface to point of application of 'P'

P = applied lateral force. (k)

S_1 = allowable lateral soil-bearing pressure as based on a depth of one third the depth of embedment, 12' maximum depth for this consideration. (ksf/ft)

Data:

b =	8.485	$b = \sqrt{t^2 + w^2}$		t =	6
q =	0.3			w =	6
h =	19.02				
P =	3.807				
S_1 =	0.65				
A =	1.615				
d =	6.65				

Use 6'-0" by 6'-0" by 7'-0" deep cube footing

TITLE:

SEISMIC CALCULATIONS

Job: Custom Sign
Eng. #: G-12145
Date: 09/30/22
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SHEET: 19

SEISMIC CALCULATIONS - ASCE 7-16 Chapter 15 "Non-Building Structures"

Coefficients from ASCE 7-16 Table 15.4-2 for "Signs and Billboards"

Response modification factor: $R := 3.0$

Overstrength factor: $\Omega_0 := 1.75$

Deflection amplification factor: $C_d := 3$

Mapped short period spectral response acc. parameter: $S_S := 2.097$

Mapped 1-second period spectral response acc. parameter: $S_1 := 0.764$

Short period spectral response acc. parameter: $S_{DS} := 1.678$

1-second period spectral response acc. parameter: $S_{D1} := 0.870$

Importance factor (Table 1.5-2): $I_e := 1.0$

$$T_S := \frac{S_{D1}}{S_{DS}} = 0.518$$

Use Equivalent Lateral Force Procedures (ASCE 12.8.1):

Structural height of sign (ft): $h_n := 25$

Building period coefficient (Table 12.8-2): $C_t := 0.02$

"x" value (Table 12.8-2): $x := 0.75$

Approximate fundamental period: $T_a := C_t \cdot {h_n}^x = 0.224$ seconds

Seismic response coeff.:
$$C_S := \frac{S_{DS}}{\left(\frac{R}{I_e}\right)} = 0.559$$

Seismic response coeff. (max):
$$C_{S\_max} := \frac{S_{D1}}{T_a \cdot \left(\frac{R}{I_e}\right)} = 1.297$$

Seismic response coeff. (min): $C_{S\_min} := 0.044 \cdot S_{DS} \cdot I_e = 0.074$

SRC min. value check: $C_{S\_mincheck} := \max\left(C_S, C_{S\_min}\right) = 0.559$

SRC max. value check: $C_{S\_dgn} := min\left(C_{S\_mincheck}, C_{S\_max}\right) = 0.559$

Total seismic weight: $W := 14.3\ \boldsymbol{kip}$

Seismic force:

Seismic base shear (ultimate): $V := C_{S\_dgn} \cdot W = 7.998\ \boldsymbol{kip}$

Seismic base shear (ASD): $V_a := V \cdot 0.7 = 5.599\ \boldsymbol{kip}$

Seismic shear of $V_a = 5.599\ \boldsymbol{kip}$ is less than wind shear, therefore design is governed by wind forces