PLANNING AND ZONING COMMISSION AGENDA

Monday, August 13, 2018
Ketchum City Hall
480 East Avenue North, Ketchum, ID 83340

1. **5:00 PM – SITE VISIT: 420 Sage Road #2: Solar Energy Project Mountain Overlay Design Review**

2. **5:30 PM - CALL TO ORDER: City Hall, 480 East Avenue North, Ketchum, Idaho**

3. **PUBLIC COMMENT** - Communications from the public for items not on the agenda.

4. **CONSENT CALENDAR—ACTION ITEMS**

   a. **Minutes:** July 9, 2018

5. **PUBLIC HEARINGS AND COMMUNICATIONS FROM STAFF – ACTION ITEMS**

   a. **ACTION – Long Solar Energy Project Mountain Overlay Design Review:** 420 Sage Road #2 (Winter Sun Condominiums: Lot 25: Unit 2), The Commission will consider and take action on a Mountain Overlay Design Review application by Mitch Long & Margit Donhowe, represented by Alex McKinley of Empowered Solar, for the installation of a 598 sq. ft. ground mounted solar array and a roof mounted solar thermal water heating system.

   b. **ACTION - Long Term Rental in Avalanche Areas Text Amendment:** The Commission will consider and take action on a City-initiated amendment to allow long-term winter season rentals within the City of Ketchum avalanche district for non-engineered single-family dwellings.

   c. **ACTION -- Design Review Administrative Authority**: The Commission will consider City-initiated amendments to Chapter 17.96: Design Review, Section 17.08.020: Terms Defined, and Chapter 17.04: Mountain Overlay Zoning District to modify the authority of the Administrator to review and approve certain Design Review application projects.

   d. **ACTION: Zoning Code Amendment:** Residential Use in the Light Industrial Districts. (*Continued from March 6, March 27th, April 9th, May 14, May 29, June 11, June 25, July 9, 2018.)* The Commission will consider City-initiated amendments to Title 17, Section 17.124.090, Residential, Light Industrial Districts, and Section 17.12.020, District Use Matrix.

6. **STAFF REPORTS & CITY COUNCIL MEETING UPDATE**

   Library Appeal Status

7. **COMMISSION REPORTS AND EX PARTE DISCUSSION DISCLOSURE**

8. **ADJOURNMENT**

Any person needing special accommodations to participate in the meeting should contact the City Clerk's Office as soon as reasonably possible at 726-3841. All times indicated are estimated times, and items may be heard earlier or later than indicated on the agenda.

Planning and Zoning

Regular Meeting

~ Minutes ~

480 East Avenue North
Ketchum, ID 83340
http://ketchumidaho.org/

Maureen Puddicombe
208-726-7801

Monday, July 9, 2018 | **5:30 PM** | **Ketchum City Hall**

1. 5:30 PM - CALL TO ORDER: City Hall, 480 East Avenue North, Ketchum, Idaho

2. Call to Order

The meeting was called to order at 5:32 PM by Chairman Jeff Lamourreux.

Attendee Name	Title	Status	Arrived
Jeff Lamoureux	Chair	Present	
Tim Carter	Commissioner	Present	
Neil Morrow	Vice-Chair	Absent	
Matthew Mead	Commissioner	Present	
Kurt Eggers	Commissioner	Present	

3. CONSENT CALENDAR—ACTION ITEMS

a. ACTION: Roberts Bros. Townhouse Subdivision Findings of Fact and Conclusions of Law

b. ACTION: WDC Ketch Community Housing Proposal Findings of Fact and Conclusions of Law

c. ACTION: Minutes: May 29, 2018

d. ACTION: Minutes: June 11, 2018

e. ACTION: Minutes: June 25, 2018

Motion To: Approve consent calendar items A-E.

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Matthew Mead, Commissioner
SECONDER:	Tim Carter, Commissioner
AYES:	Jeff Lamoureux, Tim Carter, Matthew Mead, Kurt Eggers
ABSENT:	Neil Morrow

4. PUBLIC HEARINGS AND COMMUNICATIONS FROM STAFF – ACTION ITEMS

a. **ACTION: Zoning Code Amendment**: The Commission will consider and take action on a City-Initiated Text Amendment to Title 17 Zoning, to amend regulations for retail square footage and subdistricts in the Community Core.

Senior Planner Brittany Skelton reviewed the Zoning Code Amendment for the retail square footage. There were no additional changes made to the amendment since the previous meeting. This item was noticed for presentation at this meeting.

Public Hearing was called for and closed. Commissioners had no additional comments.

Motion To: Recommend for approval to City Council the proposed Zoning Code amendment to Section 17.08.02 establishing maximum retail square footage in the Community Core.

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Kurt Eggers, Commissioner
SECONDER:	Matthew Mead, Commissioner
AYES:	Jeff Lamoureux, Tim Carter, Matthew Mead, Kurt Eggers
ABSENT:	Neil Morrow

b. **ACTION: Zoning Code Amendment**: Residential Use in the Light Industrial Districts. (Continued from March 6, March 27th, April 9th, May 14, May 29, June 11, June 25, 2018.) The Commission will consider City-initiated amendments to Title 17, Section 17.124.090, Residential, Light Industrial Districts, and Section 17.12.020, District Use Matrix.

Senior Planner Brittany Skelton presented the current version of the LI Residential text amendment. This version focused on definitions of *Purpose* and *Intent* not previously defined. The next meeting will focus on residential use in the Light Industrial District.

Skelton and the Commission discussed the "Intent" definition.

Chairperson Jeff Lamoureux called for Public Comment.

David Hurd commented that the Light Industrial District needs to be preserved. He supported the first-floor minimum height of 18 feet. He commented on the parked cars obstructing 10th Street.

The Commission discussed what types of businesses would be permitted in the LI or in other zones. The importance of lay-down yards and the restriction of office businesses in the LI was discussed. A Public Workshop to be held in August or September was proposed by Skelton.

Public comment: Steve Cook encouraged the Commission and Staff to consider the burdensome qualities of Conditional Use Permits for applicants and Staff.

Motion To: Continue the discussion of this Text Amendment to the August 16th Meeting of the Planning and Zoning Commission.

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Matthew Mead, Commissioner
SECONDER:	Tim Carter, Commissioner
AYES:	Jeff Lamoureux, Tim Carter, Matthew Mead, Kurt Eggers
ABSENT:	Neil Morrow

5. STAFF REPORTS & CITY COUNCIL MEETING UPDATE

Senior Planner Brittany Skelton reported the City Council recommended approval of the First Reading of the Setback Amendment and the Community Core consolidation at the City Council Meeting of July 2, 2018. The Second Reading is scheduled for July 16, 2018.

6. Commission reports and ex parte discussion disclosure

Brittany Skelton related that Staff has not received any new information concerning the Braken Station legal status.

Brittany Skelton looked into a transformer located at the Reed Residence in response to an inquiry by Commissioner Morrow. The transformer is not located on City property.

Chairman Jeff Lamoureux asked about the sidewalks at the 8th and Washington building. Planner Abby Rivin related that the Planning Department and Streets Department are still working on a resolution with the owner.

Community Library Appeal Hearing will be held next Monday, July 16th.

7. PUBLIC COMMENT - Communications from the public for items not on the agenda.

David Hurd commented on the Ketch Housing Project concerning about the lack of parking. Commented on the paid City-owned parking lots. Commented on the Warfield Distillery not being a tourist attraction. He commented on the Lentz work/live proposal as being excessive, but property owner should be able to develop as desired. He doubts the housing problem can be solved when units can be used for short term rentals.

Commissioner Kurt Eggers commented on the changing parking situation since many potential renters do not own multiple cars, or even one car, as in the past.

Matthew Mead felt as density increases, so will Public transportation. Pavers on Public Sidewalks were discussed and staff will research.

8. ADJOURNMENT

Motion to: Adjourn at 7:07 PM.

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Matthew Mead, Commissioner
SECONDER:	Tim Carter, Commissioner
AYES:	Jeff Lamoureux, Tim Carter, Matthew Mead, Kurt Eggers
ABSENT:	Neil Morrow

_____

Jeff Lamoureux

Chairperson

City of Ketchum
Planning & Building

STAFF REPORT
KETCHUM PLANNING AND ZONING COMMISSION
REGULAR MEETING OF AUGUST 13, 2018

PROJECT:	420 Sage Road Solar
FILE NUMBER:	P18-091
REPRESENTATIVE:	Alex McKinley, Empowered Solar
OWNER:	Mitch Long & Margit Donhowe
REQUEST:	Mountain Overlay Design Review
LOCATION:	420 Sage Road 2 (Winter Sun Condominium: Lot 25: Unit 2)
ZONING:	General Residential Low Density District (GR-L)
OVERLAY:	Mountain Overlay (MO) & Avalanche Overlay (A)
NOTICE:	Notice was mailed to adjacent property owners on August 3rd, 2018.
REVIEWER:	Abby Rivin, Associate Planner

BACKGROUND

The subject Mountain Overlay (MO) Design Review request is for the installation of a 598 sq ft ground mounted solar array and a 200 sq ft roof mounted solar thermal water heating system located at 420 Sage Road. Both the ground and roof mounted arrays will be sited within Winter Sun Condominium common area on Lot 25. Existing development on the subject lot consists of two (2) attached condominium units. The site is located in the General Residential Low Density (GR-L) Zoning District and also within both the Mountain Overlay and Avalanche Overlay. Solar energy systems are permitted as an accessory use in the GR-L Zone. Ketchum Municipal Code (KMC) §17.104.050.A requires Design Review approval for the placement of structures within the Mountain Overlay (MO) prior to issuance of a Building Permit.

ANALYSIS

Many of the MO Design Review criteria are not applicable to the subject solar power project as the installation of both the roof and ground mounted arrays involves minimal disturbance to the hillside. The standard most pertinent to the subject MO Design Review application is the assessment of both solar arrays' visual impact on the hillside. The applicant has chosen the most appropriate location on the site for the solar energy system in order to both minimize hillside visibility and enhance solar exposure to the system.

Subject Lot 25 of Winter Sun Condominium Subdivision is located in the City's Avalanche Overlay District as indicated in 1977 Wilson Avalanche Study. The northwest portion of Lot 25 contains blue (moderate) avalanche zone. The 1978 Wilson Study does not designate the site within the avalanche zone.

Exhibit A: Lot 25 of Winter Sun Condominium Subdivision Blue Avalanche Zone

Neither of the proposed solar arrays are proposed to be sited within the blue avalanche zone. The applicant has submitted a structural analysis stamped by a professional engineer licensed in the state of Idaho verifying that the ground mounted array will support the associated snow loads (KMC §17.92.010.D.3), which has been included as Attachment E to the Staff Report. The applicant has not provided a structural analysis for the roof mounted system. Staff has added a recommended condition of approval that the applicant submit a structural analysis stamped by an Idaho licensed engineer for the roof mounted solar thermal system prior to issuance of a Building Permit for the project.

Both the ground and roof mounted arrays will be sited within common area of Winter Sun Condominium Subdivision. The HOA for the subdivision disbanded and is no longer active. The applicant has included emails from the adjacent neighbors within the subdivision approving the solar project, which has been included as Attachment F to the Staff Report. All adjacent property owners indicated their approval for the project. One neighbor requested that any associated vegetative screening utilize native plantings.

Per Ketchum Municipal Code §17.08.020, roof mounted systems may extend an additional two (2) feet beyond the maximum height allowance of the zoning district in which they are located. While the applicant provided the dimensions of the roof mounted system, the maximum height of the existing single-family residence was not included with the Design Review application submittal. The applicant shall provide the maximum height of the single-family residence with the addition of the roof mounted solar array. This height verification shall be reviewed and approved by the Planning & Building Department prior to issuance of a Building Permit for the project and has been included as recommended condition #2.

Staff recommends that the Commission consider the analysis contained in the Staff Report, the applicant's presentation, and any public comment received, deliberate, and move to approve the Mountain Overlay (MO)

Design Review application for the proposed roof and ground mounted solar energy systems located at 420 Sage Road. A full analysis of this recommendation is detailed within the Staff Report.

COMPREHENSIVE PLAN ANALYSIS

The proposed solar energy system project is consistent with the uses, goals, and policies listed below as specified within the 2014 Comprehensive Plan.

Table 1: Comprehensive Plan Analysis

SUPPORTING SECTION	SUMMARY OF COMPLIANCE WITH THE 2014 COMPREHENSIVE PLAN
Future Land Use	
Low Density Residential	**Primary Uses:** Single-family and duplex residences and accessory units. **Secondary Uses:** Supporting and complementary uses, including open space and recreation, agriculture/gardens, schools, places of worship, and other public uses. Senior housing facilities are also appropriate if compatible with the surrounding areas. The intent is for the average density of a residential area in this category is not to exceed about five units per acre. **Characteristics and Location:** New residences should be within neighborhoods that have pedestrian-oriented, connected local streets and sidewalks. New housing should also have access to parks, open space, schools, and other civic activities. Neighborhoods within this category should be accessible via local streets with access to collector streets for circulation.
Community Design and Neighborhoods	
Goal CD-2 Protect and enhance views of the surrounding mountains and natural features.	**Policy CD-2.2 - Mountain Overlay Zone** Continue to protect hillsides within the City and the Area of City Impact from further development. Enforce and encourage strengthening of the Mountain Overlay standards of the City and County, by using a variety of techniques; such as clustering at lower elevations, creating conservation easements, or purchasing private property on hillsides.
Natural Resource Stewardship	
Goal NR6	Promote and support energy conservation and reduction of greenhouse gases.

Table 2: Requirements for All Applications

City Department Comments				
Compliant				
Yes	**No**	**N/A**	**City Code**	**City Standards and *Staff Comments***
☒	☐	☐	**17.104 & 17.96**	**Complete Application**
☒	☐	☐	**Fire Department:** *See Attachment D.*	
☒	☐	☐	**Building:** *The solar energy systems must meet the 2012 International Building Code and the 2012 International Residential Code.* *All drawings and manufacture installation instructions must be on site for all inspections.*	
☒	☐	☐	**Planning and Zoning:** *Comments are denoted throughout the Staff Report.*	

Table 3: Zoning Standards Analysis

Compliance with Zoning Standards				
Compliant			**Standards and *Staff Comments***	
Yes	**No**	**N/A**	**Guideline**	**City Standards and *Staff Comments***
☒	☐	☐	**17.12.040**	**Minimum Lot Area**
			Staff Comment	***Required:*** *8,000 square feet minimum.* ***Existing (Lot 25):*** *109,336 sq ft*
☒	☐	☐	**17.12.040**	***Building Coverage***
			Staff Comment	***Permitted:*** *35%* ***Proposed:*** *Utilizing residential characteristic data from the Blaine County Assessor's Office, Staff estimates that existing building coverage on the subject site is 3% (2,952 square feet/109,336 sq ft lot area). With the addition of the proposed 598 sq ft solar array, the building coverage will remain 3%.*
☒	☐	☐	**17.12.040**	***Minimum Building Setbacks***
			Staff Comment	***Minimum:*** *Front: 15'* *Side: > of 1' for every 3' in building height, or 5'* *Rear: > of 1' for every 3' in building height, or 15'* ***Proposed:*** *The ground mounted solar array meets the required front, side, and rear setbacks.*
☐	☒	☐	**17.12.040**	**Building Height**
			Staff Comment	***Maximum Permitted:*** *35'* *Per Ketchum Municipal Code §17.08.020, roof mounted systems may extend an additional two (2) feet beyond the maximum height allowance of the zoning district in which they are located.* ***Proposed:*** *The maximum height of the ground mounted solar energy system is 4 ft.* *The applicant shall provide the maximum height of the single-family residence with the addition of the roof mounted solar array.*
☐	☐	☒	**17.125. 030.H**	**Curb Cut**
			Staff Comment	***Permitted:*** *A total of 35% of the linear footage of any street frontage can be devoted to access off street parking.* **Proposed:** No Change
☐	☐	☒	**17.125.040.B**	**Parking Spaces**
			Staff Comment	*Off-street parking standards of this chapter apply to any new development and to any new established uses.* ***Required:*** *Residential multiple-family dwelling in all districts except CC, T, T-3000, T-4000, and LI-1, LI-2, and LI-3:* *Units 0 to 2,000 sq ft: 1 parking space* ***Proposed:*** *No Change*
☒	☐	☐	***17.18.050 & 17.08.020***	**Zoning Districts & Definitions**

			Staff Comment	***17.18.050: General Residential - Low Density District (GR-L):*** *The purpose of the GR-L General Residential - Low Density District is to provide areas where low and medium density uses can be properly developed in proximity to each other while still maintaining neighborhood amenities and favorable aesthetic surroundings. The intent of the general residential - low density district is to permit a reasonable amount of flexibility in both land use and development in residential development areas.* ***17.08.020 – Definitions*** ***Dwelling, Multiple-Family:*** *A building, under single or multiple ownership, containing two (2) or more dwelling units used for residential occupancy.* ***Energy System, Solar:*** *Any solar collector panel(s), film(s), shingle(s), or other solar energy device(s), or solar structural component(s), mounted on a building or on the ground and including other appurtenant structures and facilities, whose primary purpose is to provide for the on site collection, storage, and distribution of solar, or radiant, energy received from the sun and used for heating or cooling, for water heating, and/or for generation of electricity. A solar energy system may be ground mounted (i.e., placed on top of the ground surface) or roof mounted (i.e., placed on or as an integral part of a building). Roof mounted systems may extend an additional two feet (2') beyond the maximum height allowance of the zoning district in which they are located. Ground mounted systems shall meet all required dimensional standards for accessory structures.*

Table 4: Mountain Overlay Design Review Standards

IMPROVEMENTS AND STANDARDS: 17.104.070 – Mountain Overlay Design Review: The following list of criteria and those contained in section 17.96.080 of this title must be considered and addressed by each applicant seeking design review approval.				
Yes	**No**	**N/A**	**City Code**	**City Standards and *Staff Comments***
☒	☐	☐	**17.104.070 A (1)**	**There shall be no building on ridges or knolls which would have a material visual impact on a significant skyline visible from a public vantage point entering the city or within the city. "Material", as the term is used herein, shall be construed in light of the magnitude of the negative impact on the objectives of this section.**
			Staff Comment	*The applicant has sited the ground mounted solar array in order to minimize the system's visibility. The system will be sited behind the existing attached condominiums to the east on the hillside. The applicant sited the panels in the subject location so that existing trees would not impact the solar exposure. The topography of the lot as well as the existing development and vegetation adequately screen the solar panels. The roof mounted array will not significantly increase the visibility of the existing attached condominium units.*
☒	☐	☐	**17.104.070 A (2)**	**Building, excavating, filling and vegetation disturbance on hillsides which would have a material visual impact visible from a public vantage point entering the city or within the city shall be minimized. "Material", as the term is used herein, shall be construed in light of the magnitude of the negative impact on the objectives of this section.**
			Staff Comment	*The ground mounted solar energy system will be mounted onto two (2) concrete piers. Disturbance to the hillside has been minimized with this proposal. The ground mounted solar power system is 598 sq ft and covers less than 1% of subject Lot 25.*
☐	☐	☒	**17.104.070 A (3)**	**Driveway standards as well as other applicable standards contained in chapter 12.04 of this code shall be met.**
			Staff Comment	*N/A as the driveway is existing.*
☐	☐	☒	**17.104.070 A (4)**	**All development shall have access for fire and other emergency vehicles to within one hundred fifty feet (150') of the furthest exterior wall of any building.**
			Staff Comment	*N/A as access for fire and other emergency vehicles remains unchanged with this proposal.*

☒	☐	☐	**17.104.070 A (5)**	**Significant rock outcroppings shall not be disturbed.**
			Staff Comment	*The limit of disturbance does not extend into an existing, significant rock outcropping on the site.*
☒	☐	☐	**17.104.070 A (6)**	**International building code (IBC) and international fire code (IFC) and Ketchum fire department requirements shall be met.**
			Staff Comment	*The project must comply with the 2012 International Building Code and the Ketchum Fire Department requirements. See Attachment D for Staff comment from Fire Department. All IBC, IFC, and Ketchum Fire Department requirements shall be verified and met prior to the issuance of a Building Permit for the project.*
☐	☐	☒	**17.104.070 A (7)**	**Public water and sewer service shall comply with the requirements of the city.**
			Staff Comment	*N/A. Water and sewer service is existing on the site.*
☐	☐	☒	**17.104.070 A (8)**	**Drainage shall be controlled and maintained to not adversely affect other properties.**
			Staff Comment	*N/A. Drainage on the subject site is existing and the proposed solar energy system does not require additional drainage improvements.*
☒	☐	☐	**17.104.070 A (9)**	**Cuts and fills allowed for roadways shall be minimized; lengths of driveways allowed shall be minimized; all cuts and fills shall be concealed with landscaping, revegetation and/or natural stone materials. Revegetation on hillsides with a clear zone of thirty feet (30') around all structures is recommended. Said clear zone shall include low combustible irrigated vegetation with appropriate species, on file with the Ketchum planning department. Revegetation outside of this clear zone should be harmonious with the surrounding hillsides.**
			Staff Comment	*Disturbance as required for construction will be revegetated with native material consistent with adjacent hillside. No roadways or driveways are proposed with this project.*
☒	☐	☐	**17.104.070 A (10)**	**No other sites on the parcel are more suitable for the proposed development in order to carry out the purposes of this section.**
			Staff Comment	*Due to the topography and existing development on the site, the applicant has chosen the most suitable area for the proposed solar energy system in order to minimize hillside visibility and enhance solar exposure.*
☐	☐	☒	**17.104.070 A (11)**	**Access traversing twenty five percent (25%) or greater slopes does not have significant impact on drainage, snow and earthslide potential and erosion as it relates to the subject property and to adjacent properties.**
			Staff Comment	*Access will not traverse slopes greater than 25%. The driveway is existing.*
☐	☐	☒	**17.104.070 A (12)**	**Utilities shall be underground.**
			Staff Comment	*N/A*
☒	☐	☐	**17.104.070 A (13)**	**Limits of disturbance shall be established on the plans and protected by fencing on the site for the duration of construction.**
			Staff Comment	*The hillside disturbance will be limited to the 598 sq ft area of the system as indicated on Sheet PV1 of the Design Review submittal. The applicant shall fence the subject area for the duration of construction.*
☒	☐	☐	**17.104.070 A (14)**	**Excavations, fills and vegetation disturbance on hillsides not associated with the building construction shall be minimized.**
			Staff Comment	*The ground mounted solar power system is mounted onto two (2) concrete piers. Hillside disturbance is minimized with this proposal due to the limited construction associated with the installation of the solar power system.*
☐	☐	☒	**17.104.070 A (15)**	**Preservation of significant landmarks shall be encouraged and protected, where applicable. A significant landmark is one which gives historical and/or cultural importance to the neighborhood and/or community.**
			Staff Comment	*No significant landmarks have been identified on-site.*

Table 5: Design Review Standards for all projects

Design Review Requirements IMPROVEMENTS AND STANDARDS: 17.96.060				
Yes	**No**	**N/A**	**City Code**	**City Standards and *Staff Comments***
☐	☐	☒	**17.96.060(A)(1) Streets**	**The applicant shall be responsible for all costs associated with providing a connection from an existing city street to their development.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(A)(2) Streets**	**All street designs shall be approved by the City Engineer.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(B)(1)**	**All projects under 17.96.010(A) that qualify as a "Substantial Improvement" shall install sidewalks as required by the Public Works Department.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060 (B)(2)c**	**Sidewalk width shall conform to the City's right-of-way standards, however the City Engineer may reduce or increase the sidewalk width and design standard requirements at their discretion.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060 (B)(3)**	**Sidewalks may be waived if one of the following criteria is met:** **a. The project comprises an addition of less than 250 square feet of conditioned space.** **b. The City Engineer finds that sidewalks are not necessary because of existing geographic limitations, pedestrian traffic on the street does not warrant a sidewalk, or if a sidewalk would not be beneficial to the general welfare and safety of the public.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060 (B)(4)**	**The length of sidewalk improvements constructed shall be equal to the length of the subject property line(s) adjacent to any public street or private street.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060 (B)(5)**	**New sidewalks shall be planned to provide pedestrian connections to any existing or future sidewalks adjacent to the site. In addition, sidewalks shall be constructed to provide safe pedestrian access to and around a building.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060 (B)(6)**	**The City may approve and accept voluntary cash contributions in-lieu of the above described improvements, which contributions must be segregated by the City and not used for any purpose other than the provision of these improvements. The contribution amount shall be one hundred ten percent (110%) of the estimated costs of concrete sidewalk and drainage improvements provided by a qualified contractor, plus associated engineering costs, as approved by the City Engineer. Any approved in-lieu contribution shall be paid before the City issues a certificate of occupancy.**
			Staff Comments	*N/A.*
☒	☐	☐	**17.96.060(C)(1)**	**All storm water shall be retained on site.**
			Staff Comments	*All storm water shall be retained on site.*
☐	☐	☒	**17.96.060(C)(2)**	**Drainage improvements constructed shall be equal to the length of the subject property lines adjacent to any public street or private street.**
			Staff Comments	*N/A as the drainage system on subject Lot 25 is existing.*
☐	☐	☒	**17.96.060(C)(3)**	**The City Engineer may require additional drainage improvements as necessary, depending on the unique characteristics of a site.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(C)(4)**	**Drainage facilities shall be constructed per City standards.**
			Staff Comments	*N/A*
☐	☐	☒	**17.96.060(D)(1)**	**All utilities necessary for the development shall be improved and installed at the sole expense of the applicant.**
			Staff Comments	*N/A as existing utilities serve the site.*
☐	☐	☒	**17.96.060(D)(2)**	**Utilities shall be located underground and utility, power, and communication lines within the development site shall be concealed from public view.**

			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(D)(3)**	**When extension of utilities is necessary all developers will be required to pay for and install two (2") inch SDR11 fiber optical conduit. The placement and construction of the fiber optical conduit shall be done in accordance with city of Ketchum standards and at the discretion of the City Engineer.**
			Staff Comments	*N/A.*
☒	☐	☐	**17.96.060(E)(1)**	**The project's materials, colors and signing shall be complementary with the townscape, surrounding neighborhoods and adjoining structures.**
			Staff Comments	*The solar panels are sited to minimize visibility and are similar to other solar panels installed in surrounding neighborhoods within the City of Ketchum.*
☐	☐	☒	**17.96.060(E)(2)**	**Preservation of significant landmarks shall be encouraged and protected, where applicable. A significant landmark is one which gives historical and/or cultural importance to the neighborhood and/or community.**
			Staff Comments	*N/A. There are no identified landmarks on the property.*
☐	☐	☒	**17.96.060(E)(3)**	**Additions to existing buildings, built prior to 1940, shall be complementary in design and use similar material and finishes of the building being added to.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(F)(1)**	**Building(s) shall provide unobstructed pedestrian access to the nearest sidewalk and the entryway shall be clearly defined.**
			Staff Comments	*N/A*
☐	☐	☒	**17.96.060(F)(2)**	**The building character shall be clearly defined by use of architectural features**.
			Staff Comments	*N/A.*
☒	☐	☐	**17.96.060(F)(3)**	**There shall be continuity of materials, colors and signing within the project.**
			Staff Comments	*The proposed materials of the ground mounted and roof mounted solar energy systems complement each other and have been sited to reduce visibility.*
☒	☐	☐	**17.96.060(F)(4)**	**Accessory structures, fences, walls and landscape features within the project shall match or complement the principal building.**
			Staff Comments	*The solar energy system is designed to complement the principal building on the site by providing a renewable source of energy.*
☐	☐	☒	**17.96.060(F)(5)**	**Building walls shall provide undulation/relief, thus reducing the appearance of bulk and flatness.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(F)(6)**	**Building(s) shall orient towards their primary street frontage.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(F)(7)**	**Garbage storage areas and satellite receivers shall be screened from public view and located off alleys.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(F)(8)**	**Building design shall include weather protection which prevents water to drip or snow to slide on areas where pedestrians gather and circulate or onto adjacent properties.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(G)(1)**	**Pedestrian, equestrian and bicycle access shall be located to connect with existing and anticipated easements and pathways.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(G)(2)**	**Awnings extending over public sidewalks shall extend five (5') feet or more across the public sidewalk but shall not extend within two (2') feet of parking or travel lanes within the right of way.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(G)(3)**	**Traffic shall flow safely within the project and onto adjacent streets. Traffic includes vehicle, bicycle, pedestrian and equestrian use. Consideration shall be given to adequate sight distances and proper signage.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(G)(4)**	**Curb cuts and driveway entrances shall be no closer than twenty (20') feet to the nearest intersection of two or more streets, as measured along the property line**

				adjacent to the right of way. Due to site conditions or current/projected traffic levels or speed, the City Engineer may increase the minimum distance requirements.
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(G)(5)**	**Unobstructed access shall be provided for emergency vehicles, snowplows, garbage trucks and similar service vehicles to all necessary locations within the proposed project.**
			Staff Comments	*N/A as access for emergency vehicles, snowplows, and garbage trucks remains unchanged with this proposal.*
☐	☐	☒	**17.96.060(H)(1)**	**Snow storage areas shall not be less than thirty percent (30%) of the improved parking and pedestrian circulation areas**.
			Staff Comments	*N/A as no change to existing snow storage is proposed.*
☐	☐	☒	**17.96.060(H)(2)**	**Snow storage areas shall be provided on-site.**
			Staff Comments	*See above Staff comment for Ketchum City Code §17.96.060(H)(1).*
☐	☐	☒	**17.96.060(H)(3)**	**A designated snow storage area shall not have any dimension less than five (5') feet and shall be a minimum of twenty five (25) square feet.**
			Staff Comments	*See above Staff comment for Ketchum City Code §17.96.060(H)(1).*
☐	☐	☒	**17.96.060(H)(4)**	**In lieu of providing snow storage areas, snow melt and hauling of snow may be allowed.**
			Staff Comments	*N/A.*
☐	☐	☒	**17.96.060(I)(1)**	**Landscaping is required for all projects**.
			Staff Comments	*N/A as landscaping is existing on the development site.*
☐	☐	☒	**17.96.060(I)(2)**	**Landscape materials and vegetation types specified shall be readily adaptable to a site's microclimate, soil conditions, orientation and aspect, and shall serve to enhance and complement the neighborhood and townscape.**
			Staff Comments	*See above Staff comment for Ketchum City Code §17.96.060(I)(1).*
☐	☐	☒	**17.96.060(I)(3)**	**All trees, shrubs, grasses and perennials shall be drought tolerant. Native species are recommended but not required.**
			Staff Comments	*See above Staff comment for Ketchum City Code §17.96.060(I)(1).*
☐	☐	☒	**17.96.060(I)(4)**	**Landscaping shall provide a substantial buffer between land uses, including, but not limited to, structures, streets and parking lots. The development of landscaped public courtyards, including trees and shrubs where appropriate, shall be encouraged.**
			Staff Comments	*See above Staff comment for Ketchum City Code §17.96.060(I)(1).*
☐	☐	☒	**17.96.060(J)(1)**	**Where sidewalks are required, pedestrian amenities shall be installed. Amenities may include, but are not limited to, benches and other seating, kiosks, bus shelters, trash receptacles, restrooms, fountains, art, etc. All public amenities shall receive approval from the Public Works Department prior to design review approval from the Commission.**
			Staff Comments	*N/A.*

STAFF RECOMMENDATION:
Staff recommends approval of the 420 Sage Road solar energy project MO Design Review application, subject to conditions 1-9 listed below.

COMMSION OPTIONS:

- Move to continue the MO Design Review for the 420 Sage Road solar energy project to a date certain.
- Move to deny the MO Design Review for the 420 Sage Road solar energy project and draft findings supporting denial.

RECOMMENDED CONDITIONS

1. All departmental conditions as described in Tables 2, 3, 4, and 5;

2. The applicant shall provide the maximum height of the single-family residence with the addition of the roof mounted solar array. This height verification shall be reviewed and approved by the Planning & Building Department prior to issuance of a Building Permit for the project.
3. The applicant shall submit a structural analysis stamped by an Idaho licensed engineer for the roof mounted energy system.
4. This Design Review approval is based on the plans and information presented and approved at the meeting on the date noted herein. Building Permit plans must conform to the approved Design Review plans unless otherwise approved in writing by the Planning and Zoning Commission or Administrator. Any building or site discrepancies which do not conform to the approved plans will be subject to removal;
5. All building and fire code requirements as dictated by 2012 family of international codes shall apply to all construction onsite;
6. Per Title 17, Section 17.96.090: TERM OF APPROVAL: The term of design review approval shall be twelve (12) months from the date that findings of fact, conclusions of law and decision are adopted by the Commission or upon appeal, the date the approval is granted by the Council subject to changes in zoning regulations;
7. All Design Review elements shall be completed prior to final inspection;
8. All existing and new exterior lighting on the property shall be in compliance with Ketchum Municipal Code, Chapter 17.132, Dark Skies, and approved prior the issuance of a Certificate of Completion;
9. In addition to the requirements set forth in this Design Review approval, this project shall comply with all applicable local, state, and federal laws.

ATTACHMENTS:

A. Application
B. Ground Mounted Solar Energy System Plans
C. Roof Mounted Solar Energy System Plans
D. Fire Department Comments
E. Ground Mounted Solar Energy System Structural Analysis
F. Winter Sun Condominium Subdivision Property Owner Approvals
G. Public Comment

ATTACHMENT A. APPLICATION

City of Ketchum
Planning & Building

OFFICIAL USE ONLY	
File Number:	P18-091
Date Received:	7-19-18
By:	MP
Fee Paid:	250.-
Approved Date:	
Denied Date:	
By:	

Mountain Overlay Design Review Application

OWNER INFORMATION			
Project Name: Sage Rd. Solar			
Owner Name: Mitch Long, Margit Donhowe			
Mailing Address: 2463 EASTDALE DR BOISE ID 83712			
Phone: 208-484-6866			
Email: m.long.boise@gmail.com			
PROJECT INFORMATION			
Architect/Representative: Alex McKinley (Empowered Solar)			
Phone: 208-901-5167			
Mailing Address: 1407 E. Jefferson, Boise ID 83712			
Email: alex@empowered.solar			
Engineer of Record:			
Engineer Email:			
Legal Land Description:			
Project Address: 420 Sage Rd. Ketchum, ID 83340			
Lot Area:			
Zoning District:			
Anticipated Use:			
Number of Residential Units:			
TYPE OF CONSTRUCTION			
☐ New	☐ Remodel	☐ Addition	■ Other, please explain: Solar array

TOTAL FLOOR AREA na			
Proposed		Existing	
Basement:			
1st Floor:			
2nd Floor:			
3rd Floor:			
Decks:			
Mezzanine:			
Total:			
Building Coverage: SF %		Curb Cut: SF %	

PROPOSED SETBACKS			
Front:	Side:	Side:	Rear:

ADDITIONAL INFORMATION			
Building Height:		Parking Spaces Provided:	
Will Fill or Excavation Be Required?	Yes	No no	
If Yes, Amount in Cubic Yards	Fill:	Excavation:	
Will Existing Trees or Vegetation Be Removed?	Yes	No no	

Applicant agrees in the event of a dispute concerning the interpretation or enforcement of the Floodplain Management Overlay Application, in which the City of Ketchum is the prevailing party, to pay reasonable attorney fees, including attorney fees on appeal, and expenses of the City of Ketchum. I, the undersigned, certify that all information submitted with and upon this application form is true and accurate to the best of my knowledge and belief.

Mitch Long — 7/13/2018

Signature of Owner/Representative — Date

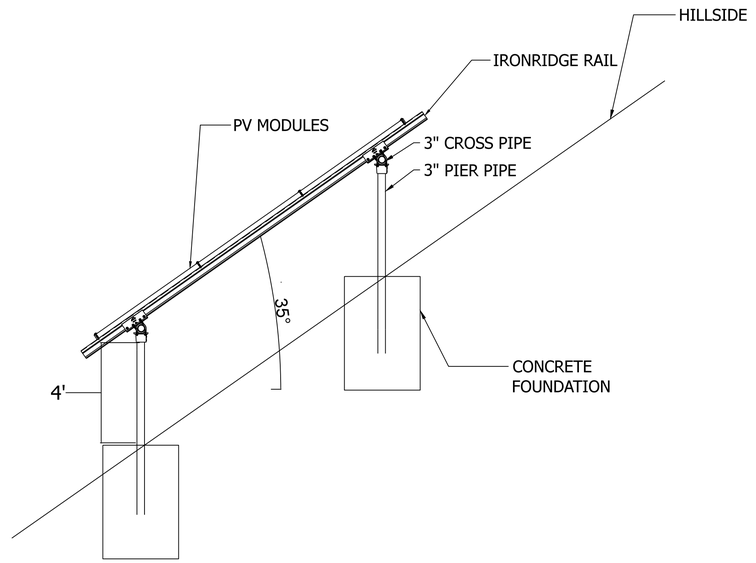
ATTACHMENT B.

GROUND MOUNTED SOLAR ENERGY SYSTEM PLANS

1 PV1 SITE PLAN

1/16"=1'-0"

MAIN COMPONANTS		
EQUIPMENT	**DESCRITION**	**QUANTITY**
SOLAR PANEL	MISSION SOLAR ENERGY MSE320	28
INVERTER	ENPHASE IQ6+	28
MOUNTING SYSTEM	IRONRIDGE GROUND MOUNT SYSTEM	7 ROWS 4 COLUMNS



2 PV1 MAIN COMPONENTS AND SIDE VIEW

PROJECT DESCRIPTION

CONSTRUCTION OF 8960W, NET METERED, GROUND MOUNTED PHOTOVOLTAIC ARRAY.

CONTRACTOR CONTACT

ALEX MCKINLEY
208.901.5167
ALEX@EMPOWERED.SOLAR

REVISIONS:

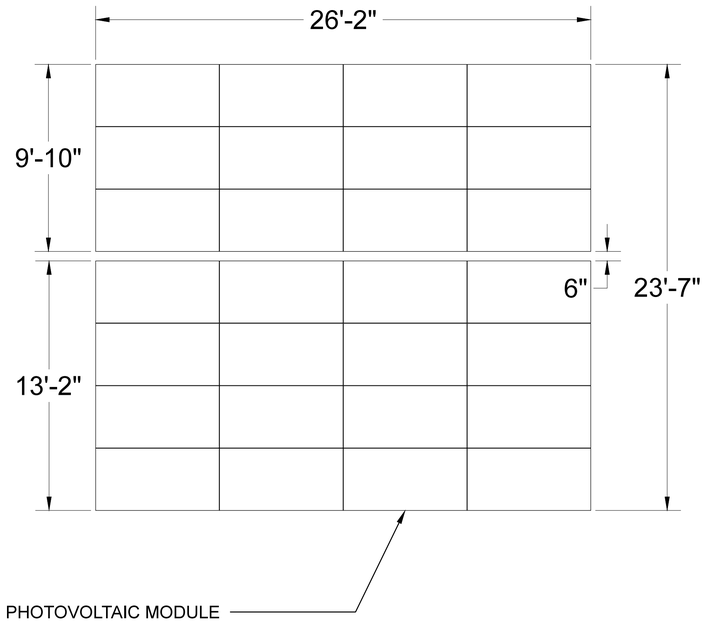
Empowered SOLAR

SINGLE FAMILY RESIDENCE
PHOTOVOLTAIC ARRAY
420 SAGE RD. - KETCHUM, IDAHO 83340

PRELIMINARY DRAWINGS
- NOT FOR CONSTRUCTION

DRAWN BY: ARM
CHECKED BY:
DATE: 02-24-2018

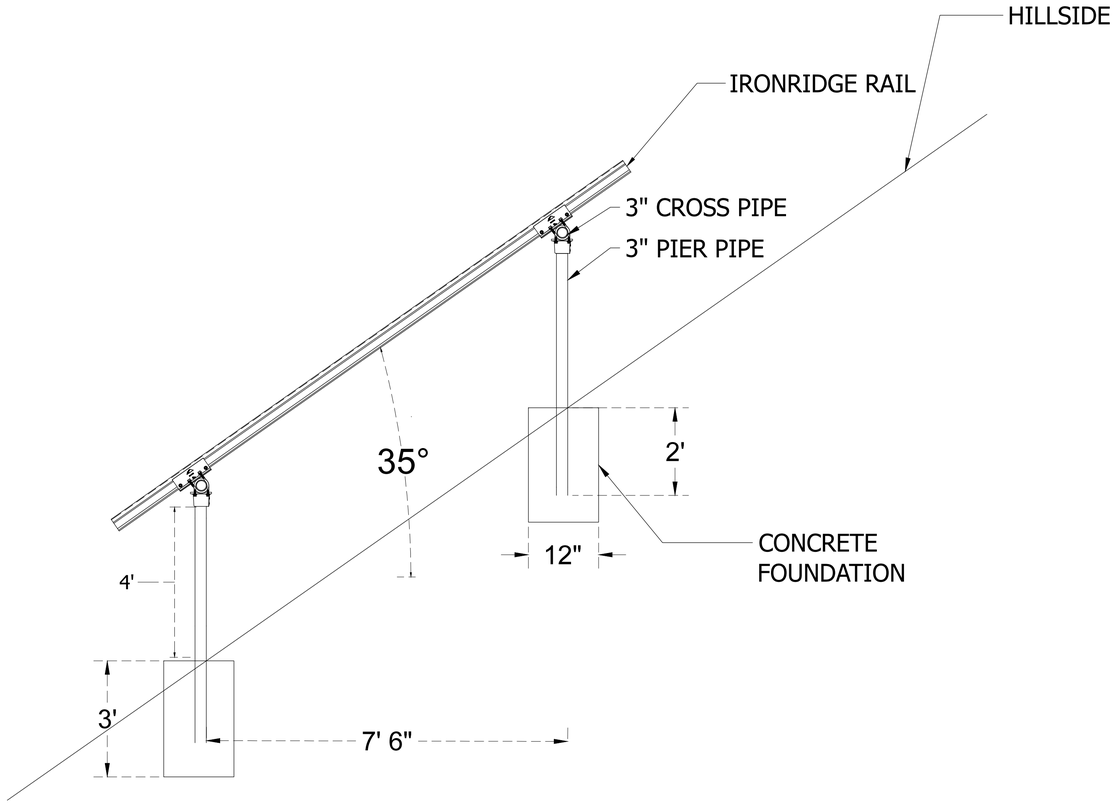
SHEET
PV1



GENERAL NOTES

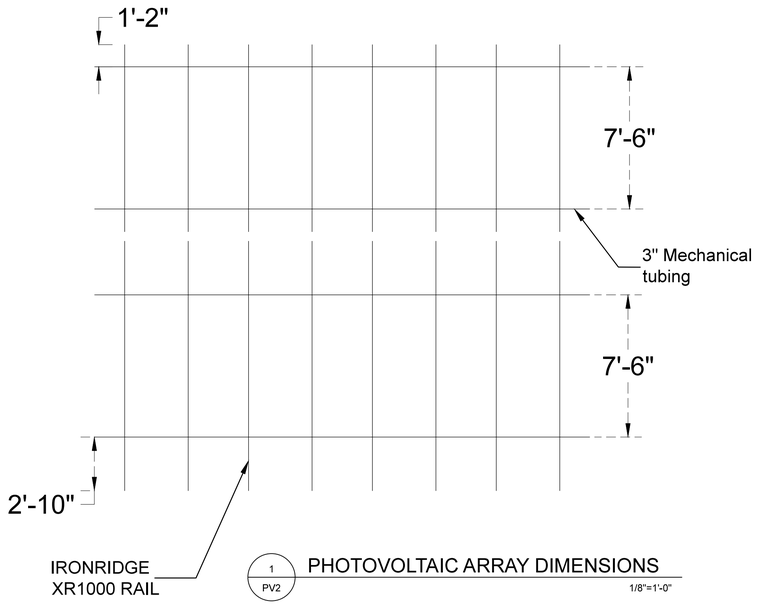
A. TWO ARRAY SECTIONS. BOTH HAVE SAME DIMENSIONS FOR FOUNDATION ARRANGEMENT

B. REFER TO MOUNTING SYSTEM MANUFACTURER'S SPECIFICATIONS FOR ADDITIONAL STRUCTURAL INFORMATION.



2 PV2 RACKING ARRANGEMENT

1/8"=1'-0"



1 PV2 PHOTOVOLTAIC ARRAY DIMENSIONS

1/8"=1'-0"

REVISIONS:

Empowered SOLAR

SINGLE FAMILY RESIDENCE
PHOTOVOLTAIC ARRAY
420 SAGE RD. - KETCHUM, IDAHO 83340

PRELIMINARY DRAWINGS
- NOT FOR CONSTRUCTION

6/16/2018

DRAWN BY: ARM
CHECKED BY:
DATE: 06-24-2018

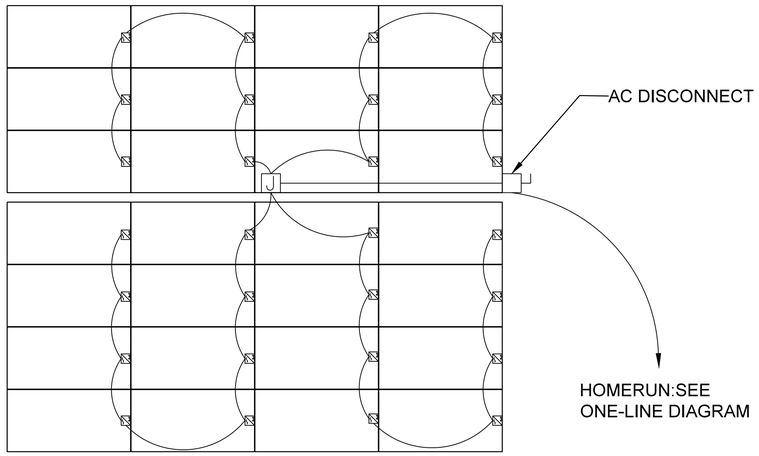
SHEET
PV2

GENERAL NOTES

A. MAIN PANEL LOCATED INSIDE HOME

B. DISCONNECT SWITCH TO BE LOCATED ON ARRAY

C. MAP SHOWING DISCONNECT LOCATION TO BE PLACED AT METER



1 PV3 ELECTRICAL PLAN

1/4"=1'-0"

REVISIONS:

Empowered SOLAR

SINGLE FAMILY RESIDENCE
PHOTOVOLTAIC ARRAY
420 SAGE RD. - KETCHUM, IDAHO 83340

PRELIMINARY DRAWINGS
- NOT FOR CONSTRUCTION

6/16/2018

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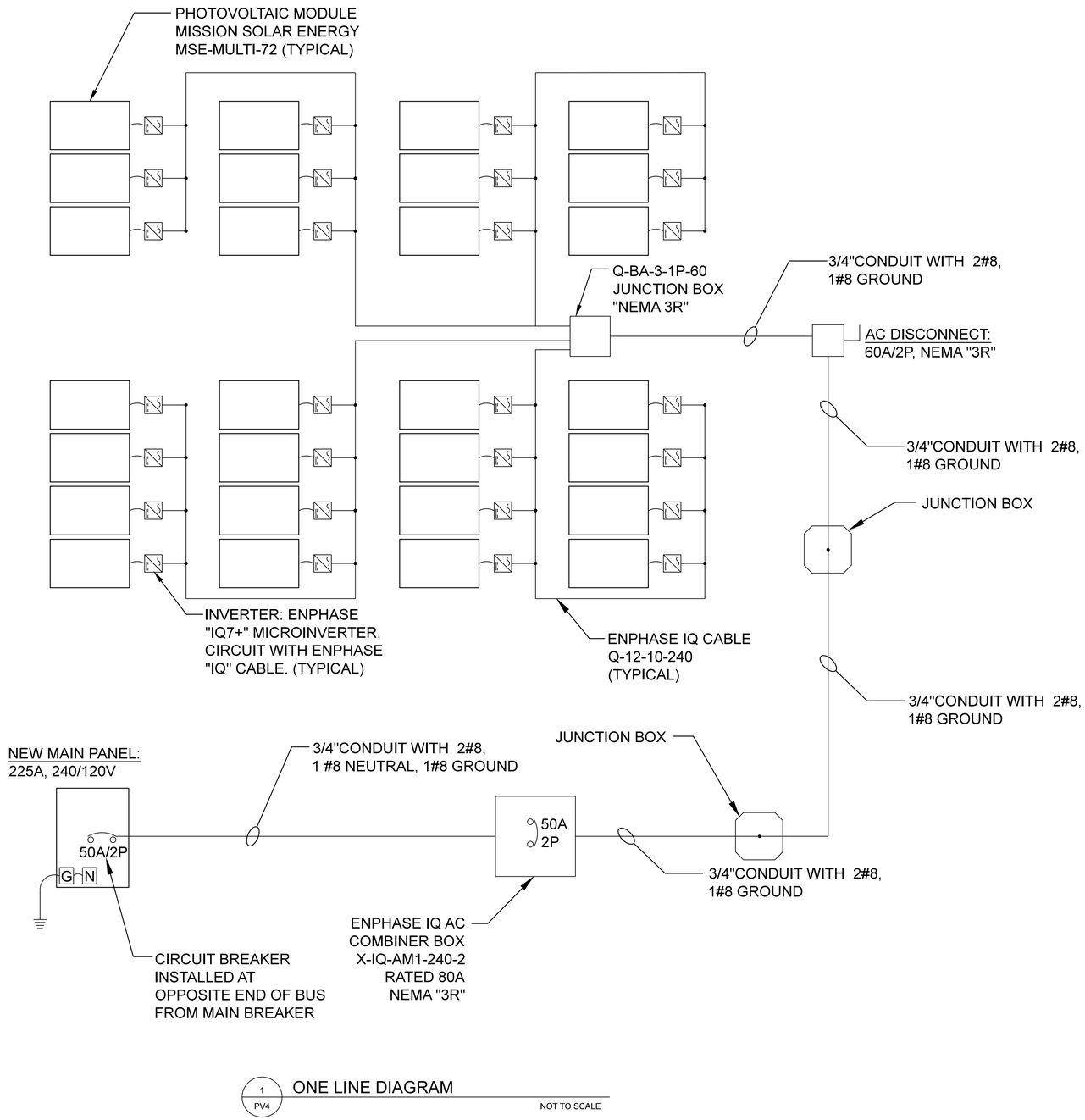
DATE: 06-24-2018

SHEET
PV3



1 PV4 ONE LINE DIAGRAM

NOT TO SCALE

GENERAL NOTES

A. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE LOCALLY ADOPTED ELECTRICAL CODE.

B. ASSESS EXISTING GROUNDING ELECTRODE SYSTEM AND REPAIR OR REPLACE GROUNDING ELECTRODE(S) IN ACCORDANCE WITH NEC 690.47(A). GROUND MODULES IN ACCORDANCE WITH MANUFACTURERS INSTALLATION INSTRUCTIONS.

C. SUPPORT PV WIRING FROM RACKING, MAXIMUM 12" FROM EACH TERMINATION AND AT INTERVALS IN ACCORDANCE WITH CABLE MANUFACTURER, WITH APPROPRIATE STRAP OR CABLE TIE SUCH THAT CABLES DO NOT COME IN CONTACT WITH ROOF SURFACE.

D. SYSTEM PROVIDED WITH RAPID SHUTDOWN IN ACCORDANCE WITH 690.12.

E. PROVIDE SYSTEM WITH LABELING IN ACCORDANCE WITH ARTICLE 690, PART VI

F. TWIN BREAKERS NOT ALLOWED FOR DEDICATED CIRCUIT BREAKER PROVIDED FOR SOURCE INTERCONNECTION

MAIN PANEL LOAD CALCULATIONS	
MAIN BUS RATING (A)	225
MAIN CIRCUIT BREAKER (MCB) RATING (A)	200
125% INVERTER OUTPUT CURRENT (A)	42.3
MCB + 125% INVERTER OUTPUT (A)	242.3
120% MAIN BUS (A)	270
MCB + 125% INVERTER OUTPUT < 120% MAIN BUS	YES

VOLTAGE DROP CALCULATION	
1 WAY WIRE DISTANCE (FT)	175.00
INDIVIDUAL INVERTER NOMINAL CURRENT (A)	1.21
NUMBER OF INVERTERS (LARGEST STRING)	12
TOTAL INVERTER NOMINAL CURRENT (A)	14.52
VOLTAGE (V)	240
VOLTAGE DROP LIMIT (%)	3.00
ALLOWABLE WIRE RESISTANCE (OHM)	0.0014167 7
ALLOWABLE WIRE RESISTANCE PER 1000FT (OHM)	1.41677
12 AWG SOLID	NO
12 AWG STRANDED	NO
10 AWG SOLID	OK
10 AWG STRANDED	OK
8 AWG SOLID	OK
8 AWG STRANDED	OK

WIRE SIZE CALCULATION	
INDIVIDUAL INVERTER NOMINAL CURRENT (A)	1.21
NUMBER OF INVERTERS (LARGEST STRING)	28
TOTAL INVERTER NOMINAL CURRENT (A)	33.88
125% TOTAL INVERTER NOMINAL CURRENT (A) 690.8(B)	42.35
NUMBER OF CURRENT CARRYING CONDUCTORS IN RACEWAY 310.15(B)(3)(a)	2
NUMBER OF CURRENT CARRYING CONDUCTORS < 3	YES
MULTIPLE CONDUCTORS CORRECTION FACTOR 310.15(B)(3)(a)	1.00
ASHRE AMBIENT TEMPERATURE (F)	111
TEMPERATURE CORRECTION FACTOR 310.15(B)(2)(a)	0.87
CONDUIT > 7/8" ABOVE ROOF 310.15(B)(3)(c)	YES
WIRE SIZE AMPACITY REQUIREMENT (A)	48.68
12 AWG	NO
10 AWG	NO
8 AWG	OK

REVISIONS:

Empowered SOLAR

SINGLE FAMILY RESIDENCE
PHOTOVOLTAIC ARRAY
420 SAGE RD. - KETCHUM, IDAHO 83340

PRELIMINARY DRAWINGS
- NOT FOR CONSTRUCTION

6/16/2018

DRAWN BY: ARM
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DATE: 06-24-2018

SHEET
PV4

Enphase Q Aggregator and Q Cable Accessories

The **Enphase Q Aggregator™** and **Enphase Q Cable™** are part of the sixth generation Enphase IQ System™. These accessories provide simplicity, reliability, and faster installation times.

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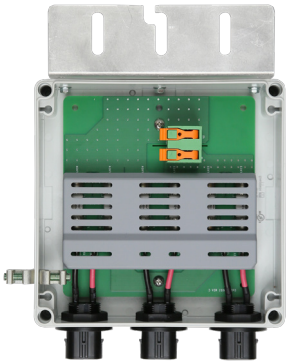
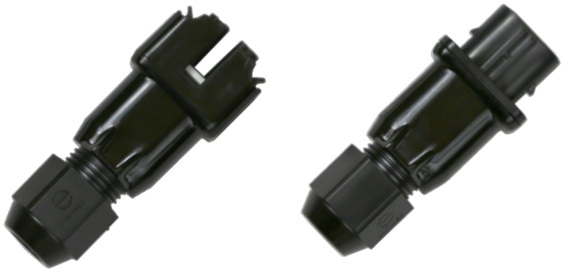


Enphase Q Aggregator

- Reduces electrical labor and eliminates wire nuts for safer, faster installations
- Aggregates up to three fully populated 20A branch circuits
- Supports solar arrays of up to 11.5 kW with a single rooftop aggregator

Enphase Q Cable

- Two-wire Enphase Q Cable is 50% lighter than the previous generation Enphase cable
- New cable numbering and plug and play connectors speed up installation and simplify wire management
- Link connectors eliminate cable waste



Field-Wireable Connectors

- Easily connect Q cables on the roof without complex wiring
- Make connections from any open connector and center feed any section of cable within branch limits
- Available in male and female connector types

c UL US

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

Enphase Q Cable Accessories

Q AGGREGATOR SPECIFICATIONS	
Model number	Q-BA-3-1P-60
Dimensions	190 mm (W) x 227 mm (D) x 80 mm (H) (7.5 in (W) x 9 in (D) x 3.2 in (H))
Enclosure rating	NEMA3 (up to 45° from horizontal)
Temperature range	-40° C to +55° C (-40° F to +122° F)
Compliance	UL1703, EN62109, UL6703A

Q CABLE SPECIFICATIONS	
Voltage rating	600V (connector rating 250 V)
Cable temperature rating	90° C (194° F)
Certification	UL3003, DG cable
Flame test rating	FT4
Compliance	RoHS, OIL RES I, CE, UV resistant, combined UL for Canada and United States
Cable insulator rating	THHN/THWN-2 dry/wet

Q CABLE TYPES / ORDERING OPTIONS

Model Number	Voltage	Connector Spacing	PV Module Orientation	Connector Count per Box
Q-12-10-240	240 (max rating 250 VAC)	1.3 m (4.2 ft)	Portrait	240
Q-12-17-240	240 (max rating 250 VAC)	2.0 m (6.5 ft)	Landscape (60-cell)	240
Q-12-20-200	240 (max rating 250 VAC)	2.3 m (7.5 ft)	Landscape (72-cell)	200

ENPHASE Q CABLE ACCESSORIES

Name	Model Number	Description
Enphase Q Aggregator	Q-BA-3-1P-60	Combines up to three microinverter branches into one home run.
Field-wireable connector (male)	Q-CONN-10M	Make connections from any Q Aggregator open connector
Field-wireable connector (female)	Q-CONN-10F	Make connections from any Q Cable open connector
Cable clip	Q-CLIP-100	Used to fasten cabling to the racking or to secure looped cabling
Disconnect tool	Q-DISC-10	Disconnect tool for Q Cable connectors, DC connectors, and AC module mount
Q Aggregator sealing caps (male)	Q-BA-CAP-10	Sealing cap for unused aggregator connections
Q Cable sealing caps (female)	Q-SEAL-10	One needed to cover each unused connector on the cabling
Terminator	Q-TERM-10	Terminator cap for unused cable ends
Replacement DC Adaptor (MC4)	Q-DCC-2	DC adaptor to MC4 (max voltage 100 VDC)
Replacement DC Adaptor (UTX)	Q-DCC-5	DC adaptor to UTX (max voltage 100 VDC)

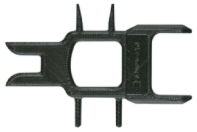
TERMINATOR

Terminator cap for unused cable ends, sold in packs of ten

Q-TERM-10

SEALING CAPS

Sealing caps for unused aggregator and cable connections (Q-BA-CAP-10 and Q-SEAL-10)



DISCONNECT TOOL

Plan to use at least one per installation, sold in packs of ten (Q-DISC-10)

CABLE CLIP

Used to fasten cabling to the racking or to secure looped cabling, sold in packs of ten (Q-CLIP-100)

To learn more about Enphase offerings, visit **enphase.com**

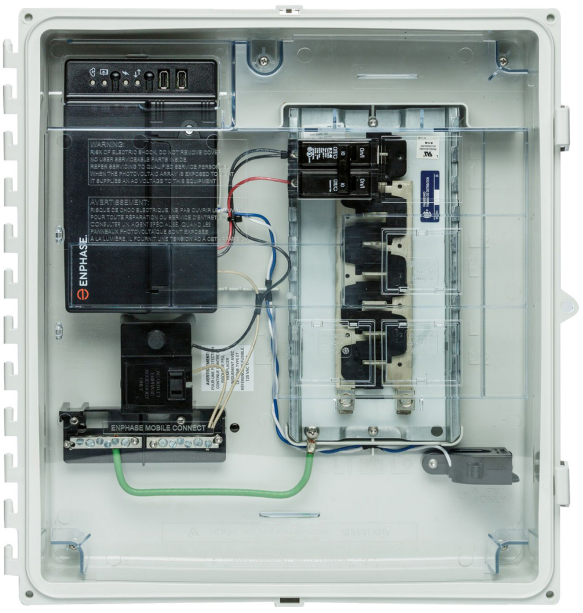
2017-03-09

ENPHASE.

Enphase IQ Combiner+

(X-IQ-AM1-240-2)

The **Enphase IQ Combiner+**™ with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.



Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Provides production metering and optional consumption monitoring
- Supports installation of the Enphase Q Aggregator™

Simple

- Eaton BR series panelboard interior
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year warranty
- UL listed

UL LISTED

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

Enphase IQ Combiner+

MODEL NUMBER	
IQ Combiner+ X-IQ-AM1-240-2	IQ Combiner+ with Enphase IQ Envoy™ for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES (order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G / 12-year data plan) CELLMODEM-01 (3G / 5-year data plan)	Plug and play industrial grade cellular modem with data plan for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.)
Consumption Monitoring CT CT-200-SPLIT	Split core current transformers enable whole home consumption metering* (+/- 2.5%).
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	240 VAC, 60 HZ
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80 A (any combination)
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy
MECHANICAL DATA	
Dimensions (WxHxD)	49.3 x 46.5 x 16.0 cm (19.4” x 18.3” x 6.3”)
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 8 to 1/0 AWG copper conductors • Main lug combined output: 6 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	802.3, Cat5E (or Cat 6) UTP Ethernet cable - not included
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) (not included)
COMPLIANCE	
Compliance, Combiner	UL 1741 CAN/CSA C22.2 No. 107.1 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Compliance, IQ Envoy	UL 916 CAN/CSA C22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

To learn more about Enphase offerings, visit **enphase.com**

2017-10-26

ENPHASE.

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate seamlessly with the Enphase IQ Envoy™, Enphase Q Aggregator™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.

Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell modules.

UL CERTIFIED
SAFETY US-CA
E341165

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US	IQ7PLUS-72-2-US
Commonly used module pairings[1]	235 W - 350 W +	235 W - 440 W +
Module compatibility	60-cell PV modules only	60-cell and 72-cell PV modules
Maximum input DC voltage	48 V	60 V
Peak power tracking voltage	27 V - 37 V	27 V - 45 V
Operating range	16 V - 48 V	16 V - 60 V
Min/Max start voltage	22 V / 48 V	22 V / 60 V
Max DC short circuit current (module Isc)	15 A	15 A
Overvoltage class DC port	II	II
DC port backfeed current	0 A	0 A
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		295 VA	
Maximum continuous output power	240 VA		290 VA	
Nominal (L-L) voltage/range[2]	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A	1.15 A	1.21 A	1.39 A
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit[3]	16 (240 VAC) 13 (208 VAC)		13 (240 VAC) 11 (208 VAC)	
Overvoltage class AC port	III		III	
AC port backfeed current	0 A		0 A	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.7 leading ... 0.7 lagging		0.7 leading ... 0.7 lagging	

EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak CEC efficiency	97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %

MECHANICAL DATA	IQ 7 Microinverter
Ambient temperature range	-40°C to +65°C
Relative humidity range	4% to 100% (condensing)
Connector type	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - No fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environmental category / UV exposure rating	NEMA Type 6 / outdoor

FEATURES	
Communication	Power Line Communication (PLC)
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.
Compliance	CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.

1. No enforced DC/AC ratio. See the compatibility calculator at https://enphase.com/en-us/support/module-compatibility.
2. Nominal voltage range can be extended beyond nominal if required by the utility.
3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

2018-02-08

Datasheet

IRONRIDGE

Ground Mount System

Mount on all terrains, in no time.

The IronRidge Ground Mount System combines our XR1000 rails with locally-sourced steel pipes or mechanical tubing, to create a cost-effective structure capable of handling any site or terrain challenge.

Installation is simple with only a few structural components and no drilling, welding, or heavy machinery required. In addition, the system works with a variety of foundation options, including concrete piers and driven piles.

Rugged Construction

Engineered steel and aluminum components ensure durability.

PE Certified

Pre-stamped engineering letters available in most states.

UL 2703 Listed System

Meets newest effective UL 2703 standard.

Design Software

Online tool generates engineering values and bill of materials.

Flexible Architecture

Multiple foundation and array configuration options.

25-Year Warranty

Products guaranteed to be free of impairing defects.

Datasheet

360° Product Tour
Visit ironridge.com

Substructure

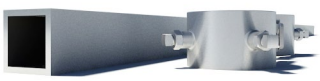
Top Caps

Connect vertical and cross pipes.

Bonded Rail Connectors

Attach and bond Rail Assembly to cross pipes.

Diagonal Braces



Optional Brace provides additional support.

Cross Pipe & Piers

Steel pipes or mechanical tubing for substructure.

Rail Assembly

XR1000 Rails

Curved rails increase spanning capabilities.

UFOs

Universal Fastening Objects bond modules to rails.

Stopper Sleeves

Snap onto the UFO to turn into a bonded end clamp.

Accessories

Wire Clips and End Caps provide a finished look.

Resources

Design Assistant

Go from rough layout to fully engineered system. For free.

Go to ironridge.com/design

NABCEP Certified Training

Earn free continuing education credits, while learning more about our systems.

Go to ironridge.com/training

Tech Brief

Ground Mount Configurations

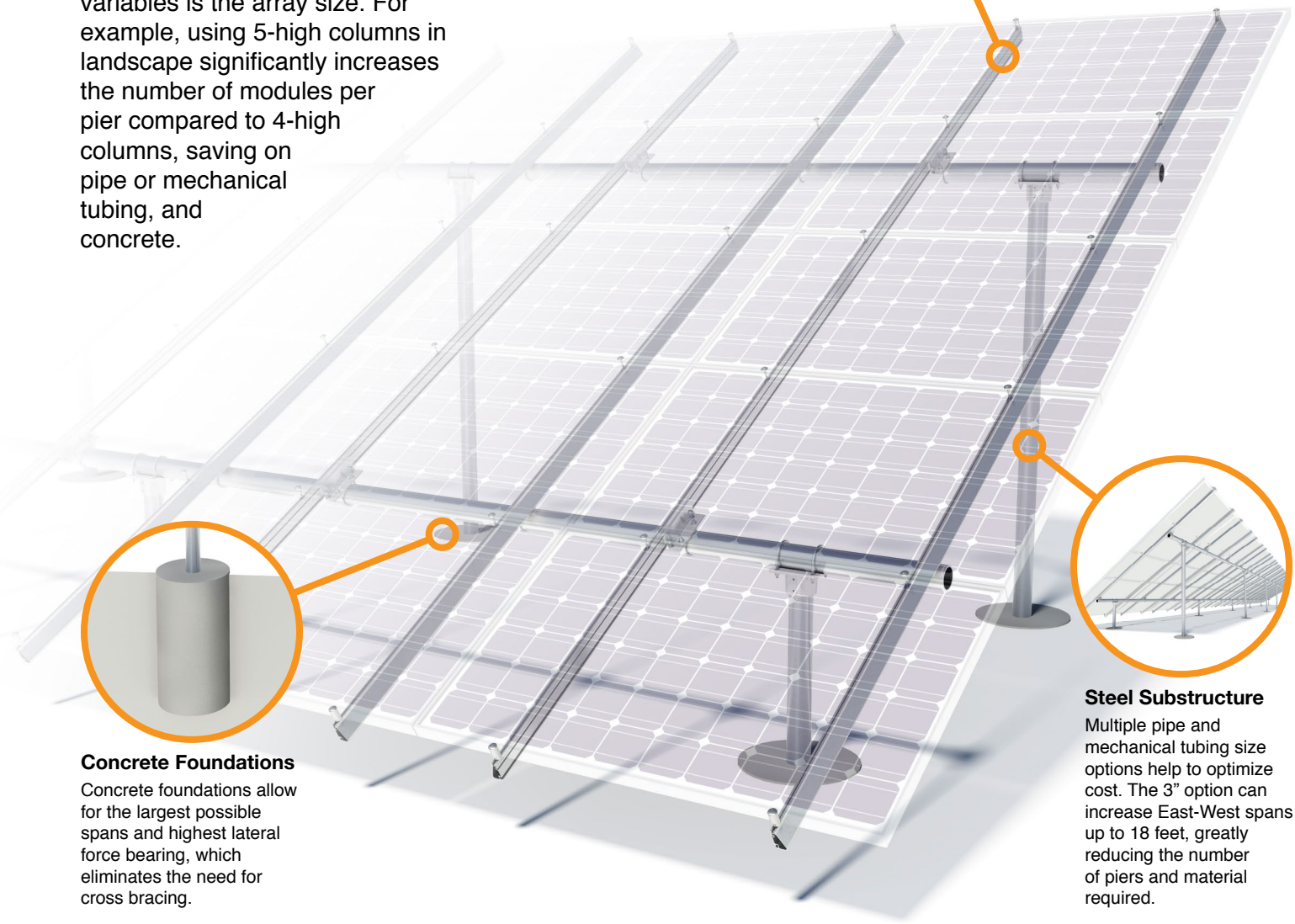
Strength Meets Flexibility

The IronRidge Ground Mount System supports a wide adjustment of tilt angle, foundation size and depth, and module size. These variables can be quickly optimized for cost and performance using the online Design Assistant tool.

One of the most critical engineering variables is the array size. For example, using 5-high columns in landscape significantly increases the number of modules per pier compared to 4-high columns, saving on pipe or mechanical tubing, and concrete.

XR1000 Rail

The curved shape of XR1000 increases vertical and lateral strength, while also resisting bending and twisting. Modules are attached using familiar top-down clamps or under clamps.



Concrete Foundations

Concrete foundations allow for the largest possible spans and highest lateral force bearing, which eliminates the need for cross bracing.

Steel Substructure

Multiple pipe and mechanical tubing size options help to optimize cost. The 3" option can increase East-West spans up to 18 feet, greatly reducing the number of piers and material required.

Compatible with Soil Classes 2-4

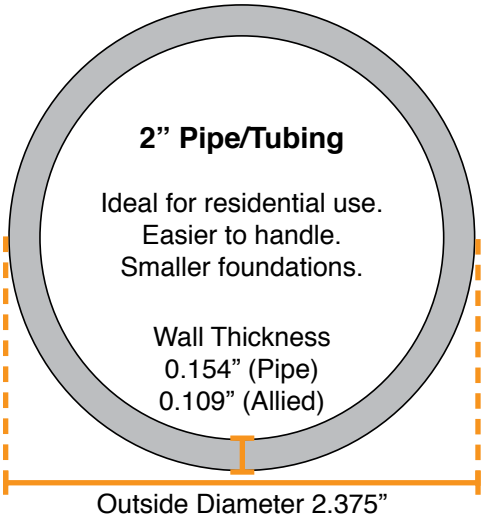
The size of Ground Mount foundations depends on a number of factors, including column height and site loading conditions. Stronger and sturdier soil classes (Class 2 and Class 3) allow for reduced foundation depth, saving on materials and labor.

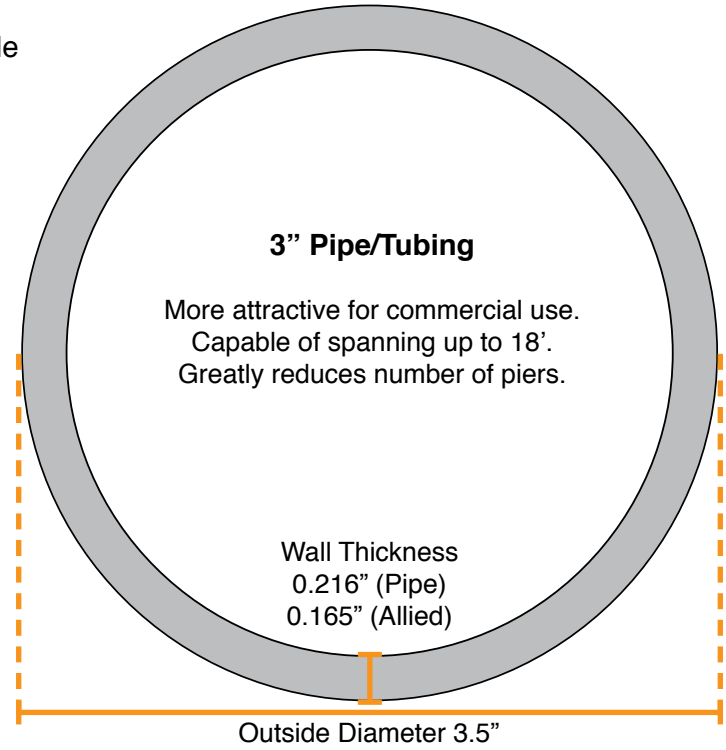
Wide Tilt Angle Range (0-45 Degrees)

Lower tilt angles are an effective way of reducing wind loads on ground mount structures, resulting in increased East-West pipe spans and reduced number of foundations. Refer to table on backside to see how tilt angle affects spans.

Substructure Selection

Ground Mount uses locally-sourced galvanized schedule 40 steel pipe (ASTM A53 Grade B, 35 ksi) or Allied mechanical tubing (2" – 50 ksi, 3" – 45 ksi) to reduce shipping costs. Mechanical tubing is lighter and can be easier to couple when building the substructure.





Refer to the following table to see how size impacts the East-West span between foundations. The table complies with ASCE 7-10 structural code. Values are based on 72-cell modules in Wind Exposure Category B.

Conditions				E-W Span							
Snow	Height	Tilt	Wind (MPH)	4'	6'	8'	10'	12'	14'	16'	18'
0 PSF	4-High	10°	100								
			120								
			140								
		30°	100		*	*					
			120	*	*						
			140	*	*						
	5-High	10°	100	2" Pipe/Tubing			3" Pipe/Tubing				
			120								
			140								
		30°	100		*	*					
			120	*	*			*			
30 PSF	4-High	10°	100								
			120								
			140								
		30°	100		*						
			120	*	*						
			140	*	*		*				
	5-High	10°	100								
			120								
			140								
		30°	100		*						

*Requires Diagonal Bracing

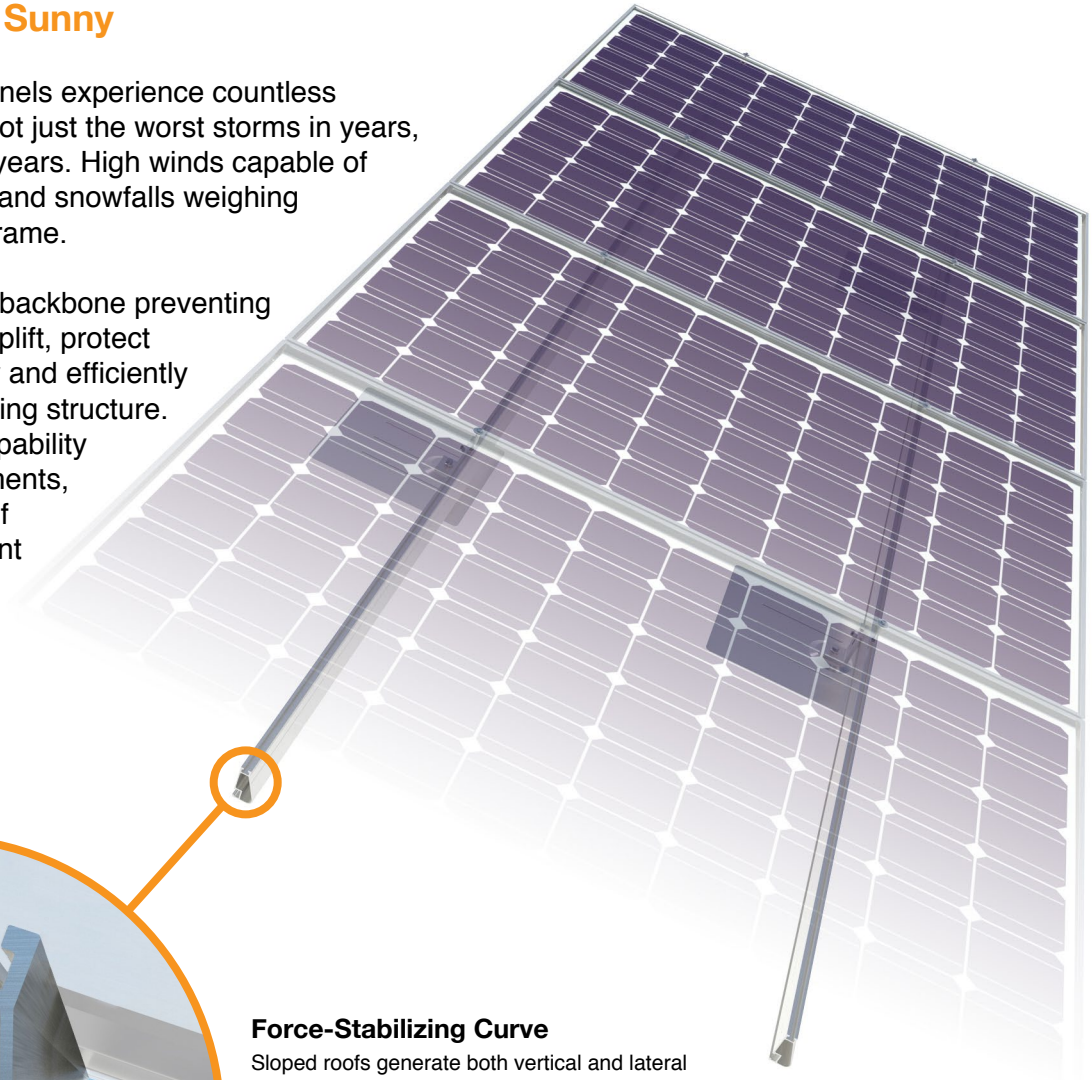
IRONRIDGE

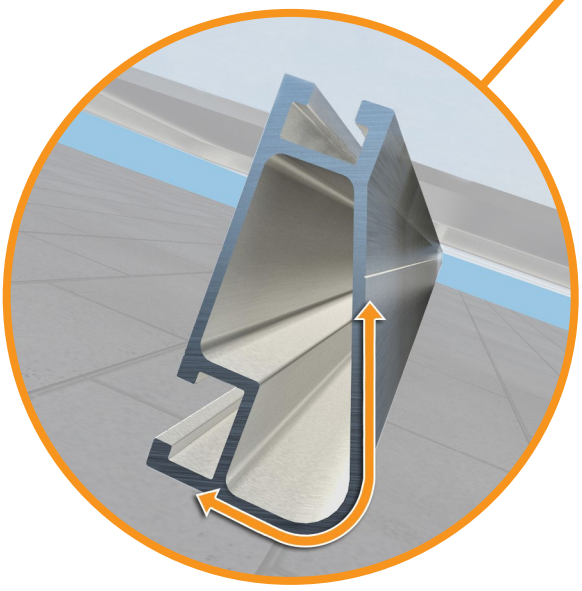
XR Rail Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.





Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.

XR10

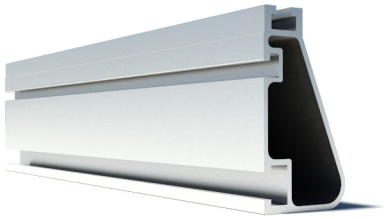
XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available

XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

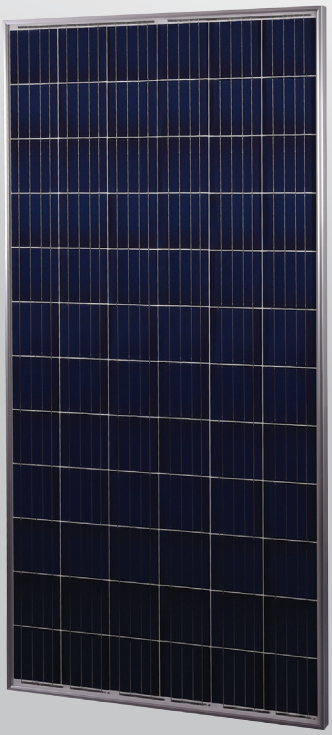
Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

MSE Multi 72

320-330Wp P-Type Multi-crystalline Modules

MISSION SOLAR ENERGY

- Advanced P-Type multi-crystalline cell technology
- Power Output: Up to 330W power
- Certified Reliability
- 5600 Pa snow load 175 mph wind rating *New!*
- Buy American Act



Proudly assembled in the USA
Mission Solar Energy is headquartered in San Antonio, TX with module facilities onsite. Our hardworking team calls Texas home and is devoted to producing high quality solar products and services. Our supply chain includes local and domestic vendors increasing our impact to the U.S. economy.

Assembled in the USA

CERTIFICATIONS

IEC 61215/ IEC 61730/ IEC 61701
UL 1703

TÜVRheinland CERTIFIED
TÜVRheinland US
PowerGuard SPECIALTY INSURANCE SERVICES

*As there are different certification requirements in different markets, please contact your local Mission Solar Energy sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

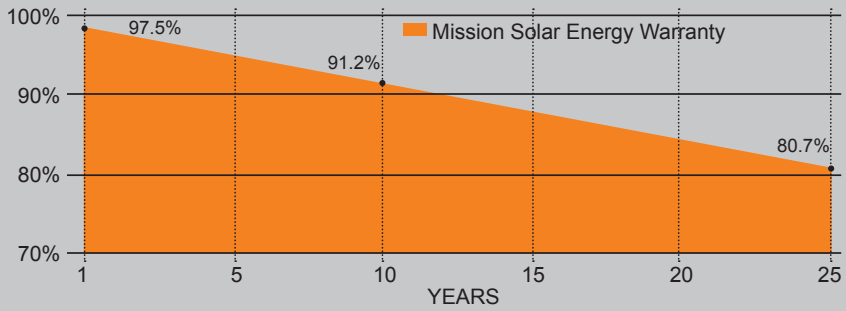
Proven reliability and bankability

Mission Solar Energy panels have been tested by independent testing centers to meet and exceed IEC standards. Its panels are already deployed in multiple installations.

Best in class quality

Mission Solar Energy production lines are fully automated and include multiple quality checks throughout the production process.

25-year linear warranty backed by Powerguard



ELECTRICAL SPECIFICATIONS

Electrical parameters at Standard Test Condition (STC)

Module Type			MSE320MM6J	MSE325MM6J	MSE330MM6J
Power Output	Pmax	Wp	320	325	330
Module Efficiency		%	16.13	16.40	16.64
Tolerance				0~+3%	
Short-Circuit Current	Isc	A	9.24	9.26	9.33
Open Circuit Voltage	Voc	V	45.18	45.80	46.01
Rated Current	Imp	A	8.69	8.72	8.81
Rated Voltage	Vmp	V	36.88	37.34	37.50

STC: Irradiance 1000 W/m², Cell temperature of 25°C, AM 1.5

TEMPERATURE COEFFICIENTS

Normal Operating Cell Temperature (NOCT)	44°C (±2°C)
Temperature Coefficient of Pmax	-0.392%/°C
Temperature Coefficient of Voc	-0.312%/°C
Temperature Coefficient of Imp	0.053%/°C

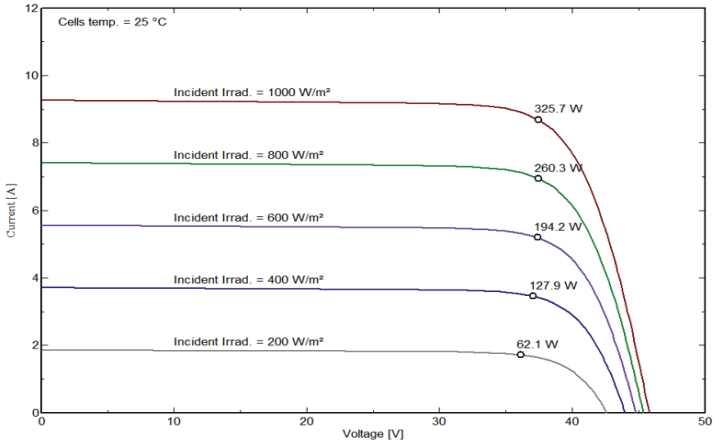
OPERATING CONDITIONS

Maximum System Voltage	1,000VDC
Operating Temperature Range	-40°C (-40°F) to +90°C (194°F)
Maximum Series Fuse Rating	15A
Fire Safety Classification	Type 1, Class C
Front & Back Load (UL standard)	5600 Pa (117 psf) ***New!***
Hail Safety Impact Velocity	25mm at 23 m/s

MECHANICAL DATA

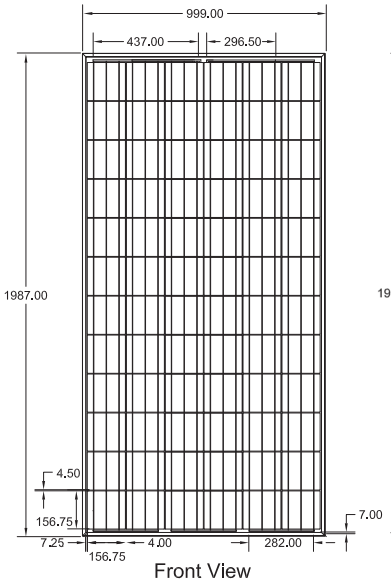
Solar Cells	P-type Multi-Crystalline Silicon (156.75mm)
Cell orientation	72 cells (6x12), 4 busbar
Module dimension	1987mm x 999mm x 40mm (78.23 in. x 39.33 in. x 1.57 in.)
Weight	21.6 kg (47.6 lb)
Front Glass	3.2mm (0.126 in.) tempered, Low-iron, Anti-reflective coating
Frame	Anodized aluminum alloy
Encapsulant	Ethylene vinyl acetate (EVA)
J-Box	Protection class IP67 with bypass-diode
Cables	PV wire, 1.2m (47.2 in.), 4mm2 / 12 AWG
Connector	MC4 or compatible

MSE325MM6J: 325WP, 72CELL SOLAR MODULE CURRENT-VOLTAGE CURVE

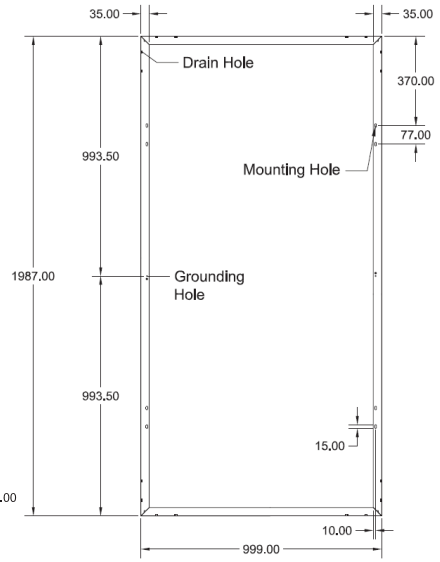


Current-voltage characteristics with dependence on irradiance and module temperature

BASIC DESIGN (UNITS: mm)



Front View



Back View

MISSION SOLAR ENERGY

Mission Solar Energy reserves the right to make specification changes without notice.

Rev. 1.01

8303 South New Braunfels Ave. | San Antonio | TX | 78235 | missionsolar.com | info@missionsolar.com | (210) 531-8600

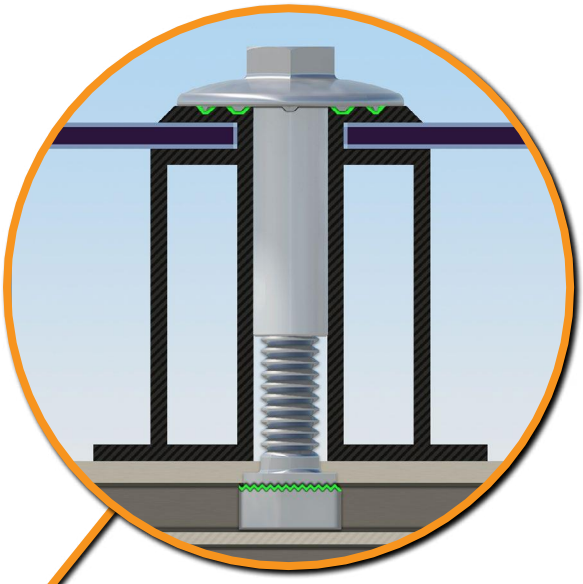
IRONRIDGE

UFO Family of Components

Simplified Grounding for Every Application

The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.

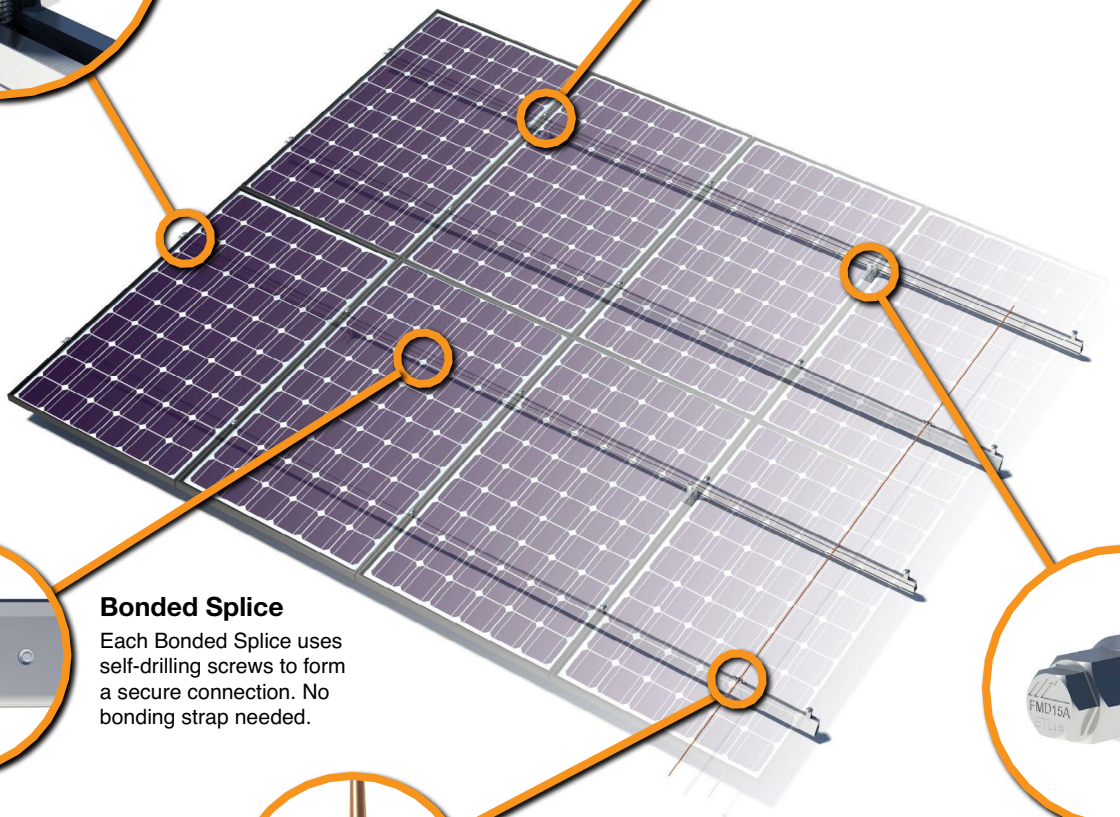


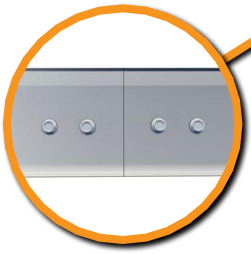
Universal Fastening Object (UFO)

The UFO securely bonds solar modules to XR Rails. It comes assembled and lubricated, and can fit a wide range of module heights.

Stopper Sleeve

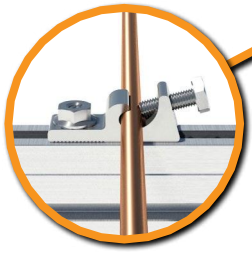
The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.





Bonded Splice

Each Bonded Splice uses self-drilling screws to form a secure connection. No bonding strap needed.



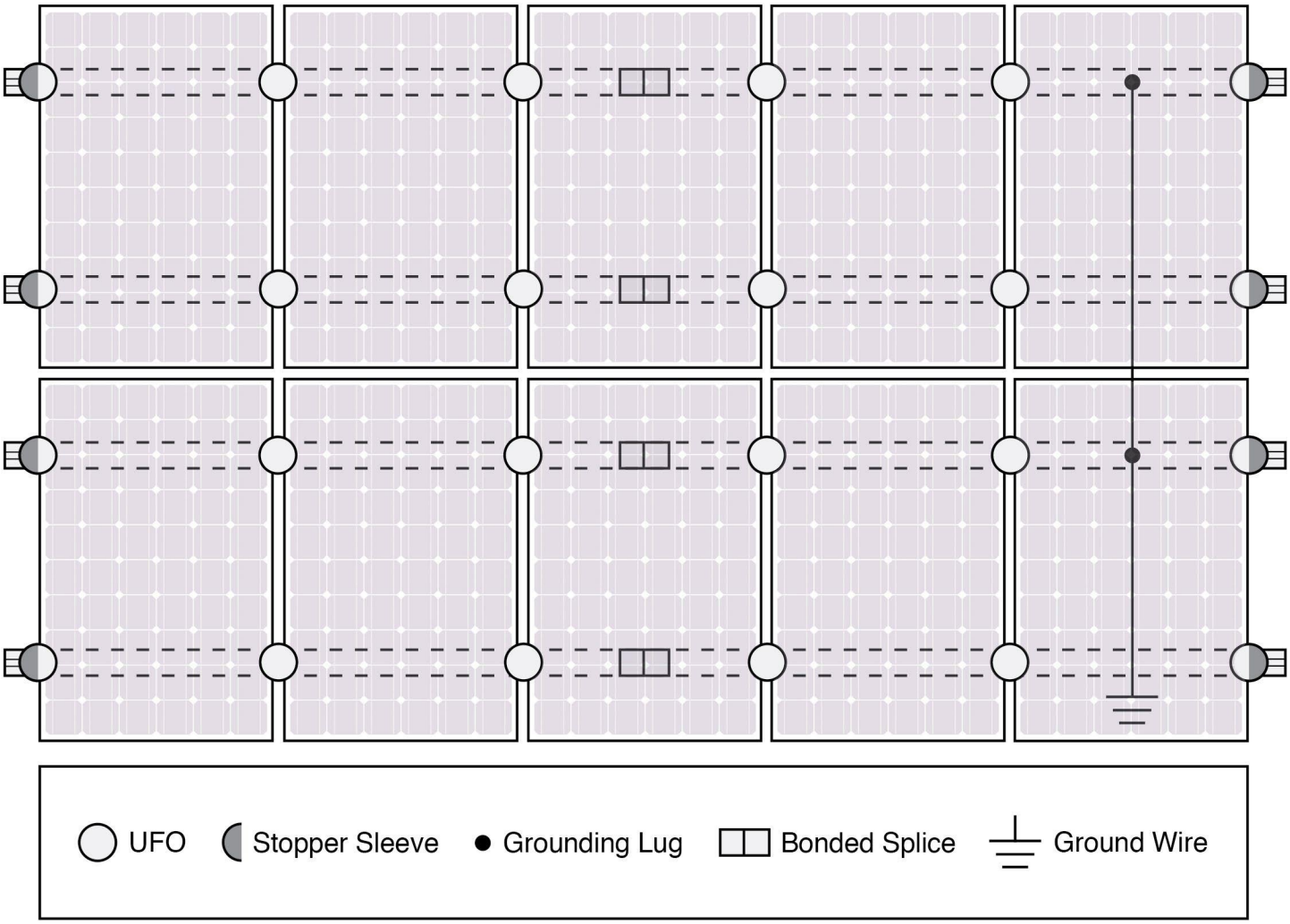
Grounding Lug

A single Grounding Lug connects an entire row of PV modules to the grounding conductor.

Bonded Attachments

The bonding bolt attaches and bonds the L-foot to the rail. It is installed with the same socket as the rest of the system.

System Diagram



Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

UL Certification

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to IronRidge.com/UFO

Cross-System Compatibility			
Feature	**Flush Mount**	**Tilt Mount**	**Ground Mount**
XR Rails	✔	✔	XR1000 Only
UFO/Stopper	✔	✔	✔
Bonded Splice	✔	✔	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Enphase - M250-72, M250-60, M215-60, C250-72 Darfon - MIG240, MIG300, G320, G640 SolarEdge - P300, P320, P400, P405, P600, P700, P730		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list.		

ATTACHMENT C.

ROOF MOUNTED SOLAR ENERGY SYSTEM PLANS

Customer Information:

Date:	6/13/18
Project Name:	Long Thermal
Client:	Long
Address:	420 Sage Rd, Ketchum Idaho
Phone:	
Email:	

Project Details:

AHJ:	City of Ketchum County
Design Loads:	120 mph wind per ASCE 7-10 ; 120 psf ground snow
Thermal Modules:	**(4)** Apricus AP30
Module Tilt:	60°
Module Azimuth:	188°
Tank:	(1) Hydroflex
Racking Type:	Apricus shingle attachments
Attachment Type:	Apricus tilt Rack

ALTENERGY

Solar Energy Solutions
www.altenergyincorporated.com
208-991-3822

Altenergy Incorporated
202 W 38th St.
Garden City, ID 83714
208-991-3822

ALTENERGY

ISSUE 6/13/18

PROJECT NAME
Long
Project Address
420 Sage Rd
Ketchum Idaho

DRAWN BY: BN

DESCRIPTION
Long
Thermal

C

1

A

DRAWN BY: BN

DESCRIPTION
Site Plan

PROJECT NAME
Long

Project Address
420 Sage Rd
Ketchum Idaho

ISSUE
6/13/18

ALTENERGY

Altenergy Incorporated
202 W 38th St.
Garden City, ID 83714
208-991-3822

2

A

DRAWN BY: BN

DESCRIPTION
Roof Array
Dimensions

PROJECT NAME
Long

Project Address
420 Sage Rd
Ketchum Idaho

ISSUE
6/13/18

ALTENERGY

Altenergy Incorporated
202 W 38th St.
Garden City, ID 83714
208-991-3822

DRAWN BY: BN

PROJECT NAME
Long

Project Address
420 Sage Rd
Ketchum Idaho

ISSUE
6/13/18

ALTENERGY

Altenergy Incorporated
202 W 38th St.
Garden City, ID 83714
208-991-3822

Submittal Data Information

ETC-30 Solar Collector

USA Version
A11-01.2.1.3-PB-V3 - June 2015

Job: _____ **Engineer:** _____ **Contractor:** _____ **Rep:** _____

Part Codes

ETC-30 Solar Collector Complete is comprised of:
1 x ETC-30-KIT (Manifold and standard frame)
3 x BOX-ET/HP-10/10 (Tubes and heat pipes)

Applications

The Apricus ETC-30 collector is designed to be used in a wide variety of solar thermal (heat) applications in almost any climate. The evacuated tube and heat pipe technology provides very efficient and reliable solar thermal production in a simple to install design.

Materials of Construction

Evacuated Tubes:	Borosilicate 3.3 Glass
Absorber:	Cu-AL/N-SS
Heat Pipes:	High purity copper
Rubber Components:	HTV Silicone Rubber
Mounting Frame:	6005-T5 Anodized Aluminum 316 SS Fasteners
Manifold Casing:	3003 AL, PVDF coating

Flow Guidelines

Recommended Flow Rate:	0.5 gpm
Max Flow Rate:	4 gpm
Heat Transfer Liquid:	Water or 50% Glycol/water

Physical Specifications

Dimensions (WxHxD):	78.9" x 86.4" x 5.35"
Aperture Area:	30.77 ft²
Gross Area:	47.33 ft²
Gross Dry Weight:	209 lbs
Fluid Capacity:	0.2 gal
Max Operating Pressure:	116 psi
Stagnation Temperature:	442°F

Warranty

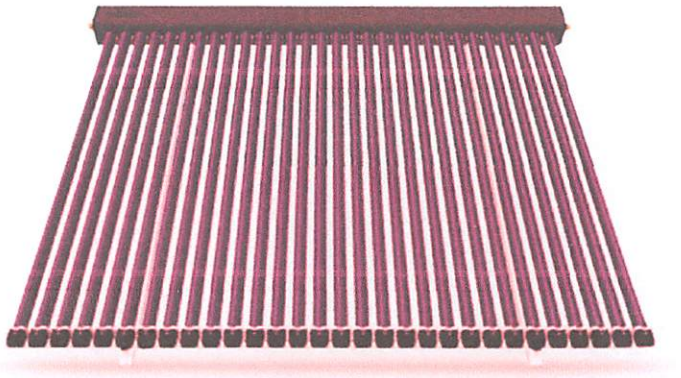
- 10 year limited warranty on tubes and heat pipes
- 15 year limited warranty on copper header and mounting frame

Certifications

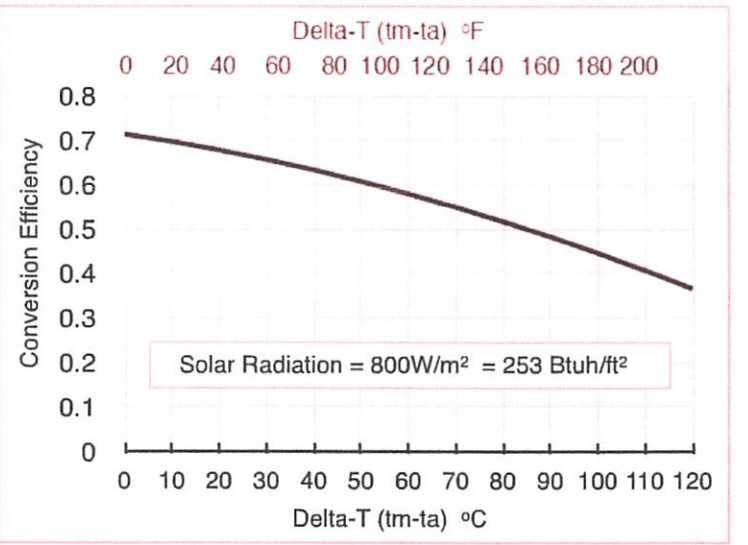
SRCC OG-100:	10001909
USEC:	S-5995
NSF-61 Tested:	17248

OG-100 Performance Ratings

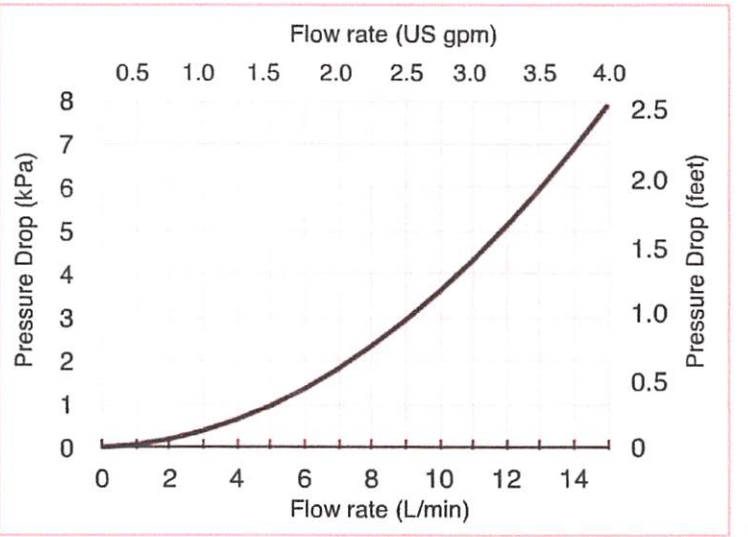
Climate Category (Ti-Ta)	High Radiation (2000 Btu/ft²/day)	Medium Radiation (1500 Btu/ft²/day)
A (-9°F)	45.3	34.2
B (9°F)	43.7	32.6
C (36°F)	40.9	29.8
D (90°F)	34.4	23.5
E (144°F)	26.7	15.8



Collector Performance (aperture area)



Pressure Drop



ATTACHMENT D.

FIRE DEPARTMENT COMMENTS

Ketchum Fire Department MEMORANDUM

To: Altenergy, INC.
CC: Jim Lynch, Building Official
From: Tom Ancona, Fire Marshal
Date: August 9, 2018

Subject: Single Family Residence Photovoltaic Array, 420 Sage Road

The submitted plans for the above project are approved by the Fire District provided all of the following conditions are met and maintained as required:

Solar photovoltaic power systems.
Solar photovoltaic power systems shall be installed in accordance with the International Fire Code, International Building Code and NFPA 70.

The above project shall meet all 2012 International Fire Code requirements in addition to specific City Building and Fire Ordinances.

Vehicle parking and material storage during construction shall not restrict or obstruct public streets or access to any building. A **minimum** twenty-foot travel lane for emergency vehicle access shall be maintained clear and unobstructed at all times. All required Fire Lanes, including within 15 feet of fire hydrants, shall be maintained clear and unobstructed at all times.

Fire extinguishers shall be maintained per 2012 IFC Section 906 during construction.

Marking is required on interior and exterior direct-current (DC) conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes and disconnects.
The materials used for marking shall be reflective, weather resistant and suitable for the environment. Marking as required in Sections 605.11.1.2 through 605.11.1.4 shall have all letters capitalized with a minimum height of 3/8 inch (9.5 mm) white on red background.

The marking shall contain the words "WARNING: PHOTOVOLTAIC POWER SOURCE."

The marking shall be placed adjacent to the main service disconnect in a location clearly visible from the location where the disconnect is operated.

Marking shall be placed on interior and exterior DC conduit, raceways, enclosures and cable assemblies every 10 feet (3048 mm), within 1 foot (305 mm) of turns or bends and within 1 foot (305 mm) above and below penetrations of roof/ceiling assemblies, walls or barriers.

Final inspections of all Fire District required installations by the Fire Chief or an appointee are required and must be scheduled at least 48 hours in advance.

Ketchum Fire Department MEMORANDUM

To: Altenergy, INC.

CC: Jim Lynch, Building Official

From: Tom Ancona, Fire Marshal

Date: August 9, 2018

Subject: Long Thermal, 420 Sage Road

The submitted plans for the above project are approved by the Fire District provided all of the following conditions are met and maintained as required:

The above project shall meet all 2012 International Fire Code requirements in addition to specific City Building and Fire Ordinances.

Vehicle parking and material storage during construction shall not restrict or obstruct public streets or access to any building. A **minimum** twenty-foot travel lane for emergency vehicle access shall be maintained clear and unobstructed at all times. All required Fire Lanes, including within 15 feet of fire hydrants, shall be maintained clear and unobstructed at all times.

Fire extinguishers shall be maintained per 2012 IFC Section 906 both during construction on the building.

Panels/modules installed on residential buildings with a single ridge shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels/modules are located.

Panels/modules installed on residential buildings shall be located no higher than 3 feet (914 mm) below the ridge in order to allow for fire department smoke ventilation operations.

Final inspections of all Fire District required installations by the Fire Chief or an appointee are required and must be scheduled at least 48 hours in advance.

ATTACHMENT E.

GROUND MOUNTED SOLAR ENERGY SYSTEM STRUCTURAL ANALYSIS

Starling Madison Lofquist, Inc.
Consulting Structural and Forensic Engineers
5224 South 39th Street, Phoenix, Arizona 85040
tel: (602) 438-2500 fax: (602) 438-2505 ROC#291316 www.smleng.com

IronRidge
1495 Zephyr Ave
Hayward, CA 94544

February 17, 2017

Attn: Mr. David F. Taggart, Vice President Products

Subject: IronRidge XR1000 Rail, Roof Flush Mounting System – Structural Analysis

Dear Sir:

We have analyzed the IronRidge XR1000 Rail for the subject solar module support system and determined that, for the configurations and criteria described below, it is in compliance with the applicable sections of the following Reference Documents:

Codes: ASCE/SEI 7-10 Min. Design Loads for Buildings & Other Structures
International Building Code 2015 Edition
Other: AC428, Acceptance Criteria for Modular Framing Systems Used to Support PV Modules, dated Effective November 1, 2012 by ICC-ES
Aluminum Design Manual, 2015 Edition

The IronRidge XR1000 Rail is an extruded aluminum section with an overall depth of 3.00 in. and a net area of 0.807 sq.in. The rails are used to support solar modules, typically, on the roof of a building. See Exhibit 0012 – attached. The modules are clamped to the rails by the IronRidge Module Mounting Clamps as shown in the attached Exhibit. The rails are attached to aluminum angle brackets that are either attached directly to the roof framing or attached to a stand that is screwed to the roof framing. The rails are mounted across the slope with a small clearance (flush mounting) to the underlying roof structure. The installed solar modules are at the same slope as the underlying roof structure.

All loads are transferred to the roof framing through the angle brackets by simple bi-axial flexure of the rails. The maximum span of the rails is governed by either the mid-span flexural stresses or the deflection requirement that the rail not come into contact with the roof.

The effect of seismic loads (for all design categories A-F) have been determined to be less than the effect due to wind loads in all load conditions and combinations. Therefore, the maximum allowable spans for common load cases are shown in the tables below. Tables 1A-9A are for modules with a maximum long dimension of 67.5 inches and Tables 1B-9B are for modules with a maximum long dimension of 78.5 inches.

Table 1A - MAXIMUM SPANS (in) - Roof Slope 0° to 6° - Wind Zone 1 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	163	138	116	109	97	88	80	75	70	66
	105	163	138	116	109	97	88	80	75	70	66
	110	163	138	116	109	97	88	80	75	70	66
	120	161	138	116	109	97	88	80	75	70	66
	130	148	138	116	109	97	88	80	75	70	66
	140	137	137	116	109	97	88	80	75	70	66
	150	128	128	116	109	97	88	80	75	70	66
	160	120	120	116	109	97	88	80	75	70	66
	170	113	113	113	109	97	88	80	75	70	66
Category C	100	163	138	116	109	97	88	80	75	70	66
	105	155	138	116	109	97	88	80	75	70	66
	110	148	138	116	109	97	88	80	75	70	66
	120	135	135	116	109	97	88	80	75	70	66
	130	125	125	116	109	97	88	80	75	70	66
	140	116	116	116	109	97	88	80	75	70	66
	150	108	108	108	108	97	88	80	75	70	66
	160	101	101	101	101	97	88	80	75	70	66
	170	95	95	95	95	95	88	80	75	70	66
Category D	100	149	138	116	109	97	88	80	75	70	66
	105	142	138	116	109	97	88	80	75	70	66
	110	135	135	116	109	97	88	80	75	70	66
	120	124	124	116	109	97	88	80	75	70	66
	130	114	114	114	109	97	88	80	75	70	66
	140	106	106	106	106	97	88	80	75	70	66
	150	99	99	99	99	97	88	80	75	70	66
	160	93	93	93	93	93	88	80	75	70	66
	170	88	88	88	88	88	88	80	75	70	66

Notes – see page 20

Table 2A - MAXIMUM SPANS (in) - Roof Slope 0° to 6° - Wind Zone 2 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	143	138	116	109	97	88	80	75	70	66
	105	136	136	116	109	97	88	80	75	70	66
	110	130	130	116	109	97	88	80	75	70	66
	120	119	119	116	109	97	88	80	75	70	66
	130	110	110	110	109	97	88	80	75	70	66
	140	102	102	102	102	97	88	80	75	70	66
	150	95	95	95	95	95	88	80	75	70	66
	160	89	89	89	89	89	88	80	75	70	66
	170	84	84	84	84	84	84	80	75	70	66
Category C	100	121	121	116	109	97	88	80	75	70	66
	105	115	115	115	109	97	88	80	75	70	66
	110	110	110	110	109	97	88	80	75	70	66
	120	101	101	101	101	97	88	80	75	70	66
	130	93	93	93	93	93	88	80	75	70	66
	140	86	86	86	86	86	86	80	75	70	66
	150	81	81	81	81	81	81	80	75	70	66
	160	76	76	76	76	76	76	76	75	70	66
	170	71	71	71	71	71	71	71	71	70	66
Category D	100	111	111	111	109	97	88	80	75	70	66
	105	106	106	106	106	97	88	80	75	70	66
	110	101	101	101	101	97	88	80	75	70	66
	120	92	92	92	92	92	88	80	75	70	66
	130	85	85	85	85	85	85	80	75	70	66
	140	79	79	79	79	79	79	79	75	70	66
	150	74	74	74	74	74	74	74	74	70	66
	160	70	70	70	70	70	70	70	70	70	66
	170	65	65	65	65	65	65	65	65	65	65

Notes – see page 20

Table 3A - MAXIMUM SPANS (in) - Roof Slope 0° to 6° - Wind Zone 3 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	115	115	115	109	97	88	80	75	70	66
	105	109	109	109	109	97	88	80	75	70	66
	110	104	104	104	104	97	88	80	75	70	66
	120	95	95	95	95	95	88	80	75	70	66
	130	88	88	88	88	88	88	80	75	70	66
	140	82	82	82	82	82	82	80	75	70	66
	150	77	77	77	77	77	77	77	75	70	66
	160	72	72	72	72	72	72	72	72	70	66
	170	68	68	68	68	68	68	68	68	68	66
Category C	100	97	97	97	97	97	88	80	75	70	66
	105	92	92	92	92	92	88	80	75	70	66
	110	88	88	88	88	88	88	80	75	70	66
	120	81	81	81	81	81	81	80	75	70	66
	130	75	75	75	75	75	75	75	75	70	66
	140	69	69	69	69	69	69	69	69	69	66
	150	65	65	65	65	65	65	65	65	65	65
	160	61	61	61	61	61	61	61	61	61	61
	170	57	57	57	57	57	57	57	57	57	57
Category D	100	89	89	89	89	89	88	80	75	70	66
	105	85	85	85	85	85	85	80	75	70	66
	110	81	81	81	81	81	81	80	75	70	66
	120	74	74	74	74	74	74	74	74	70	66
	130	69	69	69	69	69	69	69	69	69	66
	140	64	64	64	64	64	64	64	64	64	64
	150	60	60	60	60	60	60	60	60	60	60
	160	56	56	56	56	56	56	56	56	56	56
	170	53	53	53	53	53	53	53	53	53	53

Notes – see page 20

Table 4A - MAXIMUM SPANS (in) - Roof Slope 7° to 27° - Wind Zone 1 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	148	128	109	94	83	75	69	64	60	57
	105	148	128	109	94	83	75	69	64	60	57
	110	148	128	109	94	83	75	69	64	60	57
	120	148	128	109	94	83	75	69	64	60	57
	130	147	128	109	94	83	75	69	64	60	57
	140	137	128	109	94	83	75	69	64	60	57
	150	129	126	108	94	83	75	69	64	60	57
	160	121	121	106	94	83	75	69	64	60	57
	170	115	115	104	93	83	75	69	64	60	57
Category C	100	148	128	109	94	83	75	69	64	60	57
	105	148	128	109	94	83	75	69	64	60	57
	110	147	128	109	94	83	75	69	64	60	57
	120	136	128	109	94	83	75	69	64	60	57
	130	126	125	107	94	83	75	69	64	60	57
	140	117	117	105	93	83	75	69	64	60	57
	150	110	110	103	92	83	75	69	64	60	57
	160	104	104	100	90	82	75	69	64	60	57
	170	98	98	98	88	81	75	69	64	60	57
Category D	100	148	128	109	94	83	75	69	64	60	57
	105	142	128	109	94	83	75	69	64	60	57
	110	136	128	109	94	83	75	69	64	60	57
	120	125	125	107	94	83	75	69	64	60	57
	130	116	116	104	93	83	75	69	64	60	57
	140	109	109	102	91	83	75	69	64	60	57
	150	102	102	100	89	82	75	69	64	60	57
	160	96	96	96	88	80	75	69	64	60	57
	170	90	90	90	86	79	74	69	64	60	57

Notes – see page 20

Table 5A - MAXIMUM SPANS (in) - Roof Slope 7° to 27° - Wind Zone 2 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	140	128	109	94	83	75	69	64	60	57
	105	134	128	109	94	83	75	69	64	60	57
	110	128	128	109	94	83	75	69	64	60	57
	120	118	118	109	94	83	75	69	64	60	57
	130	109	109	109	94	83	75	69	64	60	57
	140	102	102	102	94	83	75	69	64	60	57
	150	96	96	96	94	83	75	69	64	60	57
	160	90	90	90	90	83	75	69	64	60	57
	170	85	85	85	85	83	75	69	64	60	57
Category C	100	120	120	109	94	83	75	69	64	60	57
	105	114	114	109	94	83	75	69	64	60	57
	110	109	109	109	94	83	75	69	64	60	57
	120	101	101	101	94	83	75	69	64	60	57
	130	93	93	93	93	83	75	69	64	60	57
	140	87	87	87	87	83	75	69	64	60	57
	150	81	81	81	81	81	75	69	64	60	57
	160	77	77	77	77	77	75	69	64	60	57
	170	72	72	72	72	72	72	69	64	60	57
Category D	100	110	110	109	94	83	75	69	64	60	57
	105	105	105	105	94	83	75	69	64	60	57
	110	101	101	101	94	83	75	69	64	60	57
	120	93	93	93	93	83	75	69	64	60	57
	130	86	86	86	86	83	75	69	64	60	57
	140	80	80	80	80	80	75	69	64	60	57
	150	75	75	75	75	75	75	69	64	60	57
	160	71	71	71	71	71	71	69	64	60	57
	170	67	67	67	67	67	67	67	64	60	57

Notes – see page 20

Table 6A - MAXIMUM SPANS (in) - Roof Slope 7° to 27° - Wind Zone 3 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	115	115	109	94	83	75	69	64	60	57
	105	110	110	109	94	83	75	69	64	60	57
	110	105	105	105	94	83	75	69	64	60	57
	120	97	97	97	94	83	75	69	64	60	57
	130	90	90	90	90	83	75	69	64	60	57
	140	83	83	83	83	83	75	69	64	60	57
	150	78	78	78	78	78	75	69	64	60	57
	160	73	73	73	73	73	73	69	64	60	57
	170	69	69	69	69	69	69	69	64	60	57
Category C	100	98	98	98	94	83	75	69	64	60	57
	105	93	93	93	93	83	75	69	64	60	57
	110	89	89	89	89	83	75	69	64	60	57
	120	82	82	82	82	82	75	69	64	60	57
	130	76	76	76	76	76	75	69	64	60	57
	140	71	71	71	71	71	71	69	64	60	57
	150	66	66	66	66	66	66	66	64	60	57
	160	62	62	62	62	62	62	62	62	60	57
	170	59	59	59	59	59	59	59	59	59	57
Category D	100	90	90	90	90	83	75	69	64	60	57
	105	86	86	86	86	83	75	69	64	60	57
	110	82	82	82	82	82	75	69	64	60	57
	120	76	76	76	76	76	75	69	64	60	57
	130	70	70	70	70	70	70	69	64	60	57
	140	65	65	65	65	65	65	65	64	60	57
	150	61	61	61	61	61	61	61	61	60	57
	160	57	57	57	57	57	57	57	57	57	57
	170	54	54	54	54	54	54	54	54	54	54

Notes – see page 20

Table 7A - MAXIMUM SPANS (in) - Roof Slope 28° to 45° - Wind Zone 1 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	140	128	110	98	87	79	72	67	63	60
	105	140	128	110	98	87	79	72	67	63	60
	110	139	127	110	98	87	79	72	67	63	60
	120	132	123	107	96	87	79	72	67	63	60
	130	126	119	104	94	86	79	72	67	63	60
	140	120	115	102	92	85	79	72	67	63	60
	150	114	111	99	90	83	78	72	67	63	60
	160	109	108	97	88	82	76	72	67	63	60
	170	105	104	94	86	80	75	71	67	63	60
Category C	100	133	124	107	96	87	79	72	67	63	60
	105	129	121	106	95	87	79	72	67	63	60
	110	126	119	104	94	86	79	72	67	63	60
	120	119	114	101	92	84	79	72	67	63	60
	130	112	110	98	89	83	77	72	67	63	60
	140	107	106	95	87	81	76	71	67	63	60
	150	101	101	92	85	79	74	70	67	63	60
	160	96	96	89	82	77	72	69	65	63	60
	170	91	91	86	80	75	71	67	64	62	59
Category D	100	127	120	105	94	86	79	72	67	63	60
	105	123	117	103	93	85	79	72	67	63	60
	110	119	115	101	92	84	79	72	67	63	60
	120	112	110	98	89	82	77	72	67	63	60
	130	106	105	95	87	80	75	71	67	63	60
	140	100	100	91	84	78	74	70	66	63	60
	150	95	95	88	82	76	72	68	65	62	60
	160	89	89	85	79	74	70	67	64	61	59
	170	84	84	82	77	72	69	65	63	60	58

Notes – see page 20

Table 8A - MAXIMUM SPANS (in) - Roof Slope 28° to 45° - Wind Zone 2 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	140	128	110	98	87	79	72	67	63	60
	105	140	128	110	98	87	79	72	67	63	60
	110	139	127	110	98	87	79	72	67	63	60
	120	132	123	107	96	87	79	72	67	63	60
	130	124	119	104	94	86	79	72	67	63	60
	140	116	115	102	92	85	79	72	67	63	60
	150	109	109	99	90	83	78	72	67	63	60
	160	103	103	97	88	82	76	72	67	63	60
	170	98	98	94	86	80	75	71	67	63	60
Category C	100	133	124	107	96	87	79	72	67	63	60
	105	129	121	106	95	87	79	72	67	63	60
	110	124	119	104	94	86	79	72	67	63	60
	120	115	114	101	92	84	79	72	67	63	60
	130	107	107	98	89	83	77	72	67	63	60
	140	100	100	95	87	81	76	71	67	63	60
	150	94	94	92	85	79	74	70	67	63	60
	160	89	89	89	82	77	72	69	65	63	60
	170	84	84	84	80	75	71	67	64	62	59
Category D	100	125	120	105	94	86	79	72	67	63	60
	105	120	117	103	93	85	79	72	67	63	60
	110	115	115	101	92	84	79	72	67	63	60
	120	106	106	98	89	82	77	72	67	63	60
	130	99	99	95	87	80	75	71	67	63	60
	140	93	93	91	84	78	74	70	66	63	60
	150	87	87	87	82	76	72	68	65	62	60
	160	82	82	82	79	74	70	67	64	61	59
	170	78	78	78	77	72	69	65	63	60	58

Notes – see page 20

Table 9A - MAXIMUM SPANS (in) - Roof Slope 28° to 45° - Wind Zone 3 (67.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	140	128	110	98	87	79	72	67	63	60
	105	140	128	110	98	87	79	72	67	63	60
	110	139	127	110	98	87	79	72	67	63	60
	120	132	123	107	96	87	79	72	67	63	60
	130	124	119	104	94	86	79	72	67	63	60
	140	116	115	102	92	85	79	72	67	63	60
	150	109	109	99	90	83	78	72	67	63	60
	160	103	103	97	88	82	76	72	67	63	60
	170	98	98	94	86	80	75	71	67	63	60
Category C	100	133	124	107	96	87	79	72	67	63	60
	105	129	121	106	95	87	79	72	67	63	60
	110	124	119	104	94	86	79	72	67	63	60
	120	115	114	101	92	84	79	72	67	63	60
	130	107	107	98	89	83	77	72	67	63	60
	140	100	100	95	87	81	76	71	67	63	60
	150	94	94	92	85	79	74	70	67	63	60
	160	89	89	89	82	77	72	69	65	63	60
	170	84	84	84	80	75	71	67	64	62	59
Category D	100	125	120	105	94	86	79	72	67	63	60
	105	120	117	103	93	85	79	72	67	63	60
	110	115	115	101	92	84	79	72	67	63	60
	120	106	106	98	89	82	77	72	67	63	60
	130	99	99	95	87	80	75	71	67	63	60
	140	93	93	91	84	78	74	70	66	63	60
	150	87	87	87	82	76	72	68	65	62	60
	160	82	82	82	79	74	70	67	64	61	59
	170	78	78	78	77	72	69	65	63	60	58

Notes – see page 20

Table 1B - MAXIMUM SPANS (in) - Roof Slope 0° to 6° - Wind Zone 1 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	151	129	108	101	90	81	75	69	65	61
	105	151	129	108	101	90	81	75	69	65	61
	110	151	129	108	101	90	81	75	69	65	61
	120	150	129	108	101	90	81	75	69	65	61
	130	138	129	108	101	90	81	75	69	65	61
	140	128	128	108	101	90	81	75	69	65	61
	150	119	119	108	101	90	81	75	69	65	61
	160	112	112	108	101	90	81	75	69	65	61
	170	105	105	105	101	90	81	75	69	65	61
Category C	100	151	129	108	101	90	81	75	69	65	61
	105	145	129	108	101	90	81	75	69	65	61
	110	138	129	108	101	90	81	75	69	65	61
	120	126	126	108	101	90	81	75	69	65	61
	130	116	116	108	101	90	81	75	69	65	61
	140	108	108	108	101	90	81	75	69	65	61
	150	101	101	101	101	90	81	75	69	65	61
	160	94	94	94	94	90	81	75	69	65	61
	170	89	89	89	89	89	81	75	69	65	61
Category D	100	140	129	108	101	90	81	75	69	65	61
	105	133	129	108	101	90	81	75	69	65	61
	110	127	127	108	101	90	81	75	69	65	61
	120	116	116	108	101	90	81	75	69	65	61
	130	107	107	107	101	90	81	75	69	65	61
	140	99	99	99	99	90	81	75	69	65	61
	150	93	93	93	93	90	81	75	69	65	61
	160	87	87	87	87	87	81	75	69	65	61
	170	82	82	82	82	82	81	75	69	65	61

Notes – see page 20

Table 2B - MAXIMUM SPANS (in) - Roof Slope 0° to 6° - Wind Zone 2 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	134	129	108	101	90	81	75	69	65	61
	105	127	127	108	101	90	81	75	69	65	61
	110	121	121	108	101	90	81	75	69	65	61
	120	111	111	108	101	90	81	75	69	65	61
	130	103	103	103	101	90	81	75	69	65	61
	140	95	95	95	95	90	81	75	69	65	61
	150	89	89	89	89	89	81	75	69	65	61
	160	83	83	83	83	83	81	75	69	65	61
	170	78	78	78	78	78	78	75	69	65	61
Category C	100	113	113	108	101	90	81	75	69	65	61
	105	107	107	107	101	90	81	75	69	65	61
	110	102	102	102	101	90	81	75	69	65	61
	120	94	94	94	94	90	81	75	69	65	61
	130	87	87	87	87	87	81	75	69	65	61
	140	80	80	80	80	80	80	75	69	65	61
	150	75	75	75	75	75	75	75	69	65	61
	160	70	70	70	70	70	70	70	69	65	61
	170	66	66	66	66	66	66	66	66	65	61
Category D	100	104	104	104	101	90	81	75	69	65	61
	105	99	99	99	99	90	81	75	69	65	61
	110	94	94	94	94	90	81	75	69	65	61
	120	86	86	86	86	86	81	75	69	65	61
	130	80	80	80	80	80	80	75	69	65	61
	140	74	74	74	74	74	74	74	69	65	61
	150	69	69	69	69	69	69	69	69	65	61
	160	65	65	65	65	65	65	65	65	65	61
	170	61	61	61	61	61	61	61	61	61	61

Notes – see page 20

Table 3B - MAXIMUM SPANS (in) - Roof Slope 0° to 6° - Wind Zone 3 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	107	107	107	101	90	81	75	69	65	61
	105	102	102	102	101	90	81	75	69	65	61
	110	97	97	97	97	90	81	75	69	65	61
	120	89	89	89	89	89	81	75	69	65	61
	130	82	82	82	82	82	81	75	69	65	61
	140	76	76	76	76	76	76	75	69	65	61
	150	71	71	71	71	71	71	71	69	65	61
	160	67	67	67	67	67	67	67	67	65	61
	170	63	63	63	63	63	63	63	63	63	61
Category C	100	90	90	90	90	90	81	75	69	65	61
	105	86	86	86	86	86	81	75	69	65	61
	110	82	82	82	82	82	81	75	69	65	61
	120	75	75	75	75	75	75	75	69	65	61
	130	70	70	70	70	70	70	70	69	65	61
	140	65	65	65	65	65	65	65	65	65	61
	150	60	60	60	60	60	60	60	60	60	60
	160	57	57	57	57	57	57	57	57	57	57
	170*	53	53	53	53	53	53	53	53	53	53
Category D	100	83	83	83	83	83	81	75	69	65	49
	105	79	79	79	79	79	79	75	69	65	61
	110	76	76	76	76	76	76	75	69	65	61
	120	69	69	69	69	69	69	69	69	65	61
	130	64	64	64	64	64	64	64	64	64	61
	140	59	59	59	59	59	59	59	59	59	59
	150*	55	55	55	55	55	55	55	55	55	55
	160*	52	52	52	52	52	52	52	52	52	52
	170*	49	49	49	49	49	49	49	49	49	49

Notes – see page 20

Table 4B - MAXIMUM SPANS (in) - Roof Slope 7° to 27° - Wind Zone 1 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	138	119	101	88	77	70	64	60	56	53
	105	138	119	101	88	77	70	64	60	56	53
	110	138	119	101	88	77	70	64	60	56	53
	120	138	119	101	88	77	70	64	60	56	53
	130	138	119	101	88	77	70	64	60	56	53
	140	128	119	101	88	77	70	64	60	56	53
	150	120	117	100	88	77	70	64	60	56	53
	160	113	113	98	87	77	70	64	60	56	53
	170	107	107	97	86	77	70	64	60	56	53
Category C	100	138	119	101	88	77	70	64	60	56	53
	105	138	119	101	88	77	70	64	60	56	53
	110	137	119	101	88	77	70	64	60	56	53
	120	127	119	101	88	77	70	64	60	56	53
	130	118	116	99	88	77	70	64	60	56	53
	140	110	110	97	87	77	70	64	60	56	53
	150	103	103	95	85	77	70	64	60	56	53
	160	97	97	93	84	76	70	64	60	56	53
	170	91	91	91	82	75	70	64	60	56	53
Category D	100	138	119	101	88	77	70	64	60	56	53
	105	133	119	101	88	77	70	64	60	56	53
	110	127	119	101	88	77	70	64	60	56	53
	120	117	116	99	88	77	70	64	60	56	53
	130	109	109	97	86	77	70	64	60	56	53
	140	101	101	95	85	77	70	64	60	56	53
	150	95	95	93	83	76	70	64	60	56	53
	160	89	89	89	81	75	69	64	60	56	53
	170	84	84	84	80	73	68	64	60	56	53

Notes – see page 20

Table 5B - MAXIMUM SPANS (in) - Roof Slope 7° to 27° - Wind Zone 2 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	131	119	101	88	77	70	64	60	56	53
	105	125	119	101	88	77	70	64	60	56	53
	110	120	119	101	88	77	70	64	60	56	53
	120	110	110	101	88	77	70	64	60	56	53
	130	102	102	101	88	77	70	64	60	56	53
	140	95	95	95	88	77	70	64	60	56	53
	150	89	89	89	88	77	70	64	60	56	53
	160	84	84	84	84	77	70	64	60	56	53
	170	79	79	79	79	77	70	64	60	56	53
Category C	100	112	112	101	88	77	70	64	60	56	53
	105	107	107	101	88	77	70	64	60	56	53
	110	102	102	101	88	77	70	64	60	56	53
	120	94	94	94	88	77	70	64	60	56	53
	130	87	87	87	87	77	70	64	60	56	53
	140	81	81	81	81	77	70	64	60	56	53
	150	76	76	76	76	76	70	64	60	56	53
	160	71	71	71	71	71	70	64	60	56	53
	170	67	67	67	67	67	67	64	60	56	53
Category D	100	103	103	101	88	77	70	64	60	56	53
	105	98	98	98	88	77	70	64	60	56	53
	110	94	94	94	88	77	70	64	60	56	53
	120	87	87	87	87	77	70	64	60	56	53
	130	80	80	80	80	77	70	64	60	56	53
	140	75	75	75	75	75	70	64	60	56	53
	150	70	70	70	70	70	70	64	60	56	53
	160	66	66	66	66	66	66	64	60	56	53
	170	62	62	62	62	62	62	62	60	56	53

Notes – see page 20

Table 6B - MAXIMUM SPANS (in) - Roof Slope 7° to 27° - Wind Zone 3 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	107	107	101	88	77	70	64	60	56	53
	105	102	102	101	88	77	70	64	60	56	53
	110	98	98	98	88	77	70	64	60	56	53
	120	90	90	90	88	77	70	64	60	56	53
	130	84	84	84	84	77	70	64	60	56	53
	140	78	78	78	78	77	70	64	60	56	53
	150	73	73	73	73	73	70	64	60	56	53
	160	68	68	68	68	68	68	64	60	56	53
	170	65	65	65	65	65	65	64	60	56	53
Category C	100	91	91	91	88	77	70	64	60	56	53
	105	87	87	87	87	77	70	64	60	56	53
	110	83	83	83	83	77	70	64	60	56	53
	120	77	77	77	77	77	70	64	60	56	53
	130	71	71	71	71	71	70	64	60	56	53
	140	66	66	66	66	66	66	64	60	56	53
	150	62	62	62	62	62	62	62	60	56	53
	160	58	58	58	58	58	58	58	58	56	53
	170*	55	55	55	55	55	55	55	55	55	53
Category D	100	84	84	84	84	77	70	64	60	56	53
	105	80	80	80	80	77	70	64	60	56	53
	110	77	77	77	77	77	70	64	60	56	53
	120	71	71	71	71	71	70	64	60	56	53
	130	65	65	65	65	65	65	64	60	56	53
	140	61	61	61	61	61	61	61	60	56	53
	150	57	57	57	57	57	57	57	57	56	53
	160*	53	53	53	53	53	53	53	53	53	53
	170*	50	50	50	50	50	50	50	50	50	50

Notes – see page 20

Table 7B - MAXIMUM SPANS (in) - Roof Slope 28° to 45° - Wind Zone 1 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	130	119	102	91	81	73	67	63	59	56
	105	130	119	102	91	81	73	67	63	59	56
	110	129	118	102	91	81	73	67	63	59	56
	120	123	114	99	89	81	73	67	63	59	56
	130	117	111	97	87	80	73	67	63	59	56
	140	111	107	95	86	79	73	67	63	59	56
	150	106	104	92	84	77	72	67	63	59	56
	160	102	100	90	82	76	71	67	63	59	56
	170	97	97	87	80	74	70	66	62	59	56
Category C	100	124	115	100	89	81	73	67	63	59	56
	105	120	113	98	88	81	73	67	63	59	56
	110	117	111	97	87	80	73	67	63	59	56
	120	110	106	94	85	78	73	67	63	59	56
	130	104	102	91	83	77	72	67	63	59	56
	140	99	98	88	81	75	70	66	63	59	56
	150	94	94	86	79	73	69	65	62	59	56
	160	89	89	83	77	72	67	64	61	58	56
	170	85	85	80	75	70	66	63	60	57	55
Category D	100	118	111	97	88	80	73	67	63	59	56
	105	114	109	96	86	79	73	67	63	59	56
	110	111	107	94	85	78	73	67	63	59	56
	120	104	102	91	83	77	72	67	63	59	56
	130	98	98	88	81	75	70	66	63	59	56
	140	93	93	85	78	73	68	65	62	59	56
	150	88	88	82	76	71	67	63	60	58	55
	160	83	83	79	74	69	65	62	59	57	55
	170	79	79	77	72	67	64	61	58	56	54

Notes – see page 20

Table 8B - MAXIMUM SPANS (in) - Roof Slope 28° to 45° - Wind Zone 2 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	130	119	102	91	81	73	67	63	59	56
	105	130	119	102	91	81	73	67	63	59	56
	110	129	118	102	91	81	73	67	63	59	56
	120	123	114	99	89	81	73	67	63	59	56
	130	116	111	97	87	80	73	67	63	59	56
	140	108	107	95	86	79	73	67	63	59	56
	150	102	102	92	84	77	72	67	63	59	56
	160	96	96	90	82	76	71	67	63	59	56
	170	91	91	87	80	74	70	66	62	59	56
Category C	100	124	115	100	89	81	73	67	63	59	56
	105	120	113	98	88	81	73	67	63	59	56
	110	115	111	97	87	80	73	67	63	59	56
	120	107	106	94	85	78	73	67	63	59	56
	130	100	100	91	83	77	72	67	63	59	56
	140	93	93	88	81	75	70	66	63	59	56
	150	88	88	86	79	73	69	65	62	59	56
	160	83	83	83	77	72	67	64	61	58	56
	170	78	78	78	75	70	66	63	60	57	55
Category D	100	116	111	97	88	80	73	67	63	59	56
	105	112	109	96	86	79	73	67	63	59	56
	110	107	107	94	85	78	73	67	63	59	56
	120	99	99	91	83	77	72	67	63	59	56
	130	92	92	88	81	75	70	66	63	59	56
	140	86	86	85	78	73	68	65	62	59	56
	150	81	81	81	76	71	67	63	60	58	55
	160	76	76	76	74	69	65	62	59	57	55
	170	72	72	72	72	67	64	61	58	56	54

Notes – see page 20

Table 9B - MAXIMUM SPANS (in) - Roof Slope 28° to 45° - Wind Zone 3 (78.5" Max Module Length)											
XR1000 Rail	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	130	119	102	91	81	73	67	63	59	56
	105	130	119	102	91	81	73	67	63	59	56
	110	129	118	102	91	81	73	67	63	59	56
	120	123	114	99	89	81	73	67	63	59	56
	130	116	111	97	87	80	73	67	63	59	56
	140	108	107	95	86	79	73	67	63	59	56
	150	102	102	92	84	77	72	67	63	59	56
	160	96	96	90	82	76	71	67	63	59	56
	170	91	91	87	80	74	70	66	62	59	56
Category C	100	124	115	100	89	81	73	67	63	59	56
	105	120	113	98	88	81	73	67	63	59	56
	110	115	111	97	87	80	73	67	63	59	56
	120	107	106	94	85	78	73	67	63	59	56
	130	100	100	91	83	77	72	67	63	59	56
	140	93	93	88	81	75	70	66	63	59	56
	150	88	88	86	79	73	69	65	62	59	56
	160	83	83	83	77	72	67	64	61	58	56
	170	78	78	78	75	70	66	63	60	57	55
Category D	100	116	111	97	88	80	73	67	63	59	56
	105	112	109	96	86	79	73	67	63	59	56
	110	107	107	94	85	78	73	67	63	59	56
	120	99	99	91	83	77	72	67	63	59	56
	130	92	92	88	81	75	70	66	63	59	56
	140	86	86	85	78	73	68	65	62	59	56
	150	81	81	81	76	71	67	63	60	58	55
	160	76	76	76	74	69	65	62	59	57	55
	170	72	72	72	72	67	64	61	58	56	54

Notes – see page 20

Notes – Tabulated values are based on the following criteria:

1. Building mean roof height = 30 ft
2. Risk Category I
3. Solar maximum module long dimension is 67.5 inches for Tables 1A-9A and 78.5 inches for Tables 1B-9B.
4. Provide 2 in. clear between roof and rail
5. End cantilever span (max) = 0.40 x maximum span (L_{max}) from above tables. See Figure A
6. No rail splices in outer 2/3 of end spans, or the middle 1/3 of interior spans based on the installed attachment spacing ($L_{install}$). See Figure A
7. Single simple span(s). Spans listed in the tables above may be multiplied by 1.08 for continuous rails of 3 or more spans.
8. Module Mounting Mid Clamps shall not be installed less than 20 inches from Roof Zone 3 where wind speeds are marked with an * in Tables 3B and 6B.
9. Connection of the rail to the roof structure is the responsibility of the end user of this letter. SML takes no liability for connections of the rail to the roof by others.

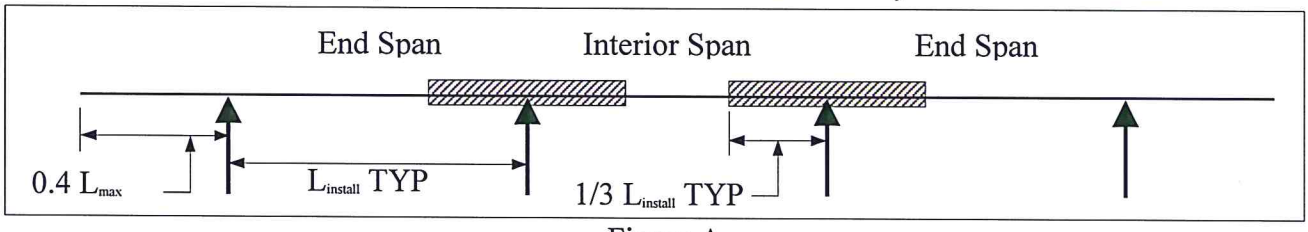


Figure A

L_{max} = Maximum attachment spacing provided in the tables above for the project design criteria

$L_{install}$ = Actual installed attachment spacing

▨ = Indicates region of the rail where splice may be installed

Our analysis assumes that the rails, including the connections and associated hardware, are installed in a workmanlike manner in accordance with the "IronRidge Flush Mount Installation Manual" by IronRidge and generally accepted standards of construction practice. Additional information is available at the IronRidge web site, IronRidge.com. Verification of PV Module capacity to support the loads associated with the given array shall be the responsibility of the Contractor or Owner and not IronRidge or Starling Madison Lofquist.

The adequacy of the supporting roof framing is to be determined by others.

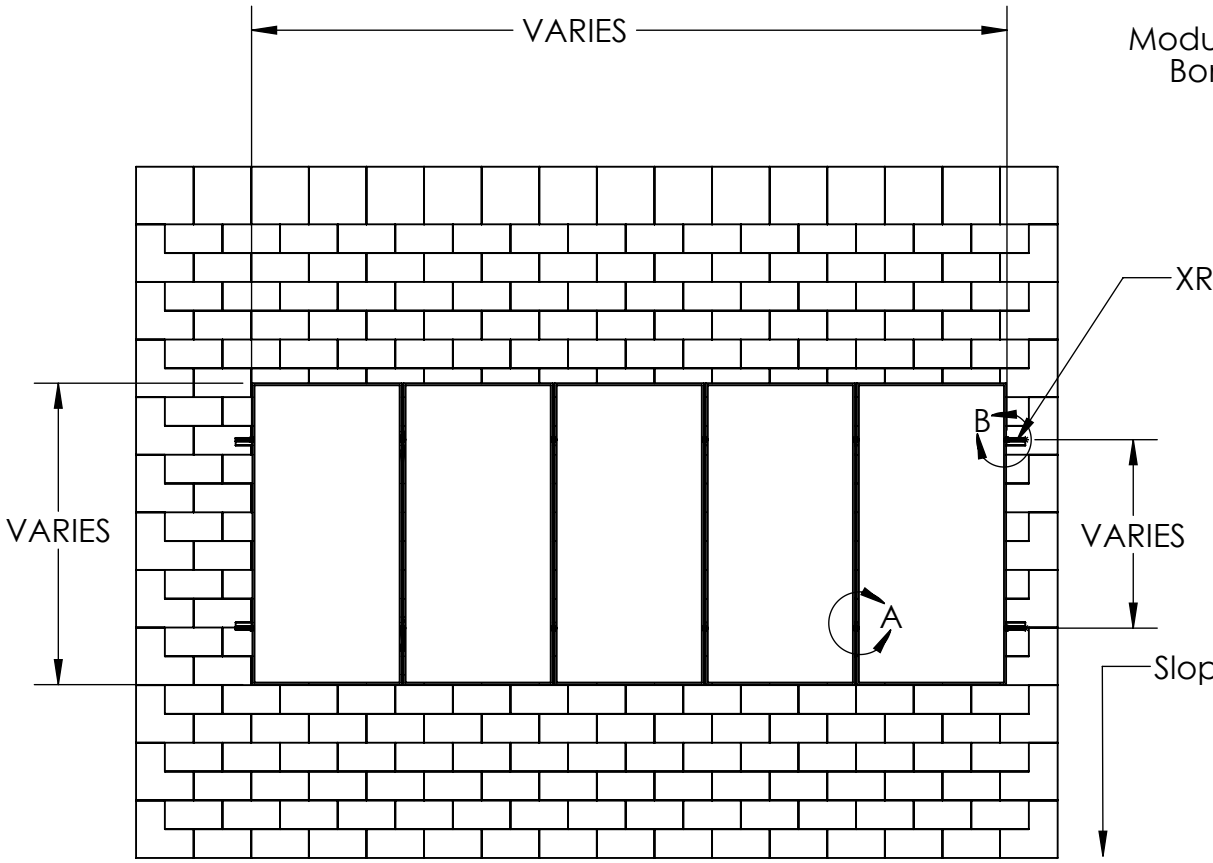
Please feel free to contact me at your convenience if you have any questions.

Respectfully yours,

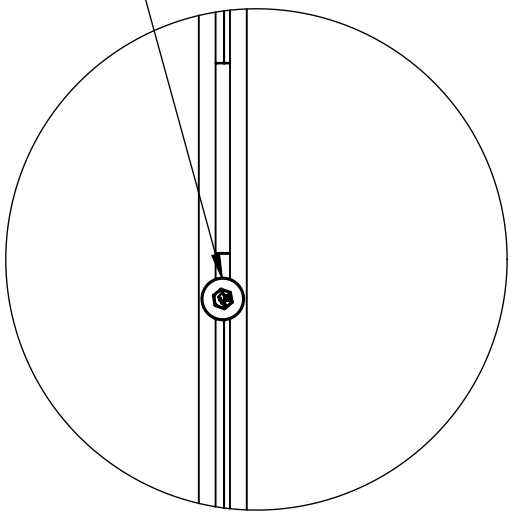
PROFESSIONAL ENGINEER LICENSED 2·17·17 14161 STATE OF IDAHO ANDREW J HUSEMAN
Exp. 2-28-19

Andrew J. Huseman, P.E.
Licensed Professional Engineer

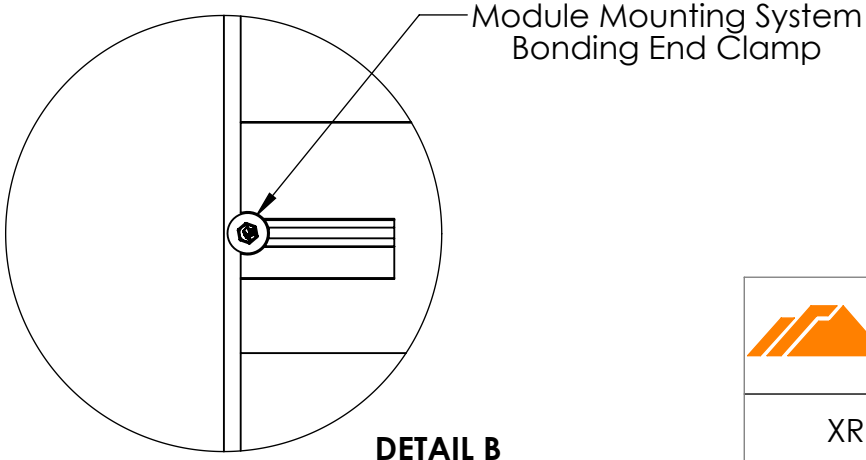
11/01/2016



PLAN VIEW



DETAIL A



DETAIL B

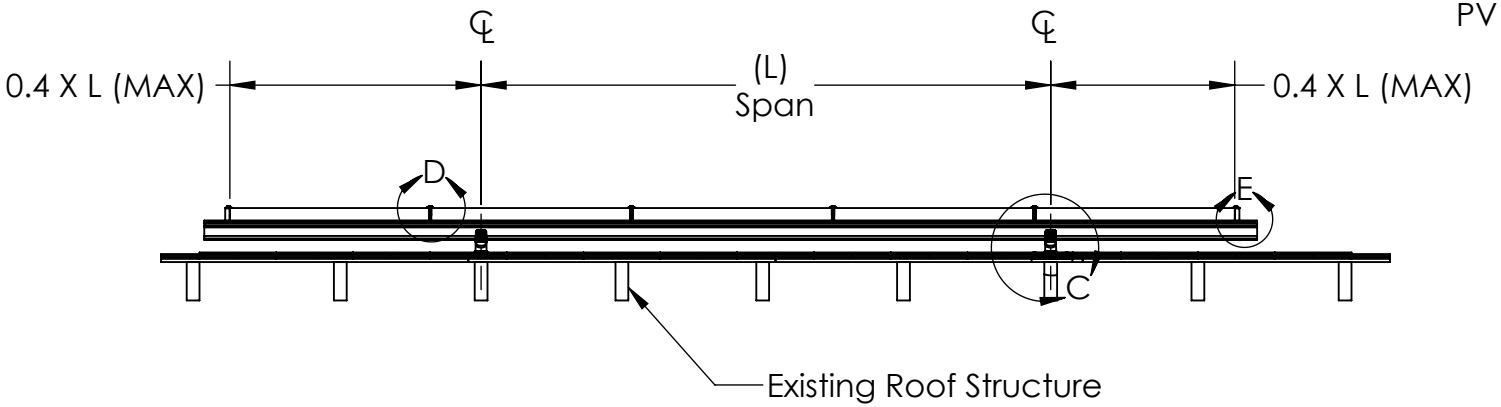
IRONRIDGE

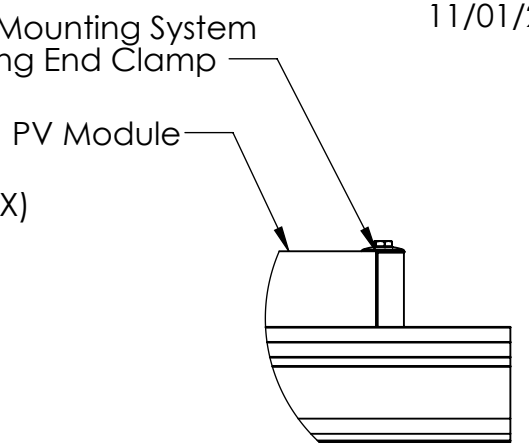
XR1000 FLUSH MOUNT

SIZE	DWG. NO.	
--	EX-0012	
SCALE: NTS	WEIGHT: N/A	SHEET 1 OF 3

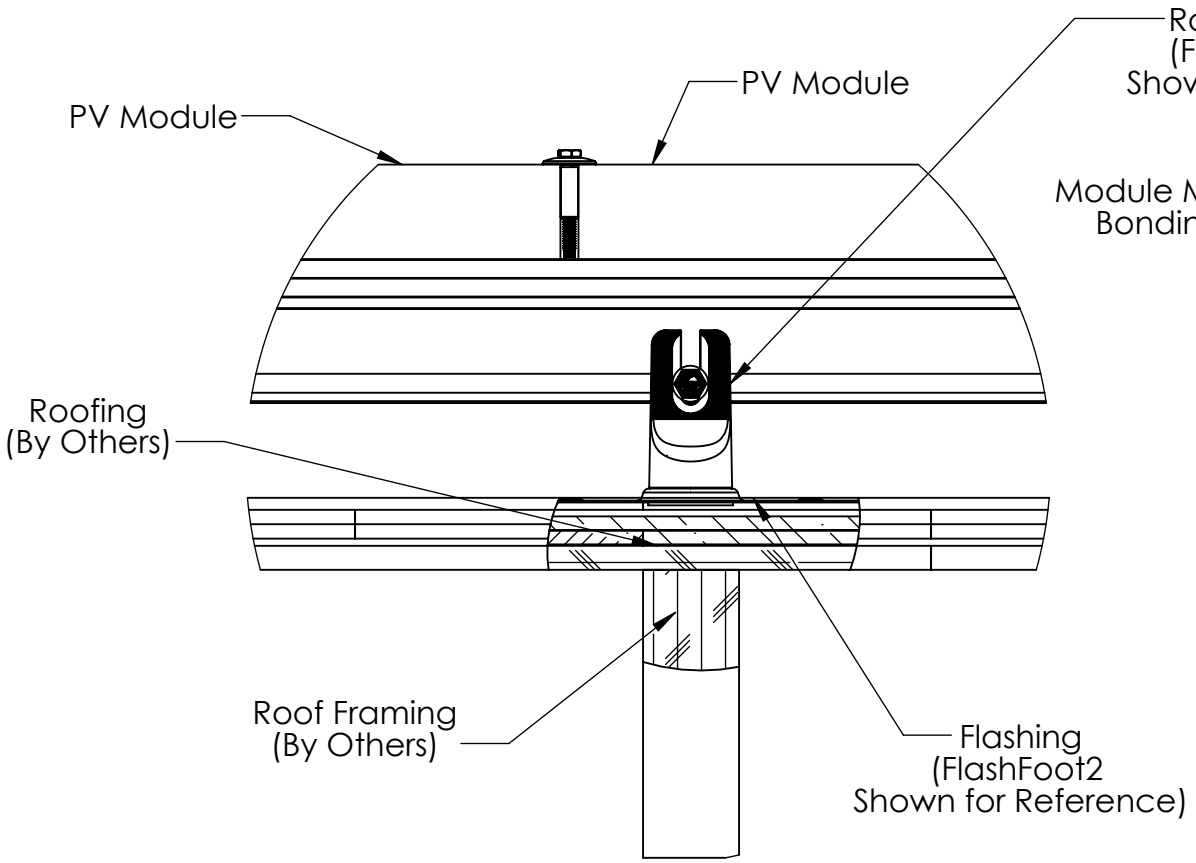
EXHIBIT: EX-0012 - page 1 of 3

11/01/2016

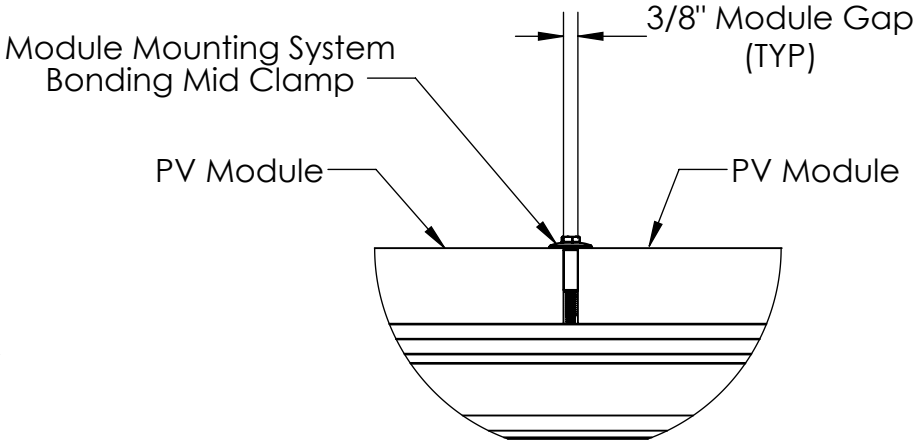




DETAIL E



DETAIL C



DETAIL D

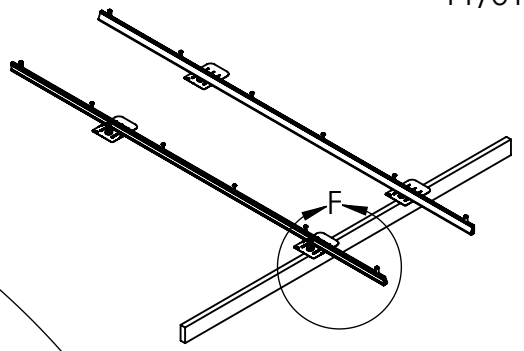
IRONRIDGE

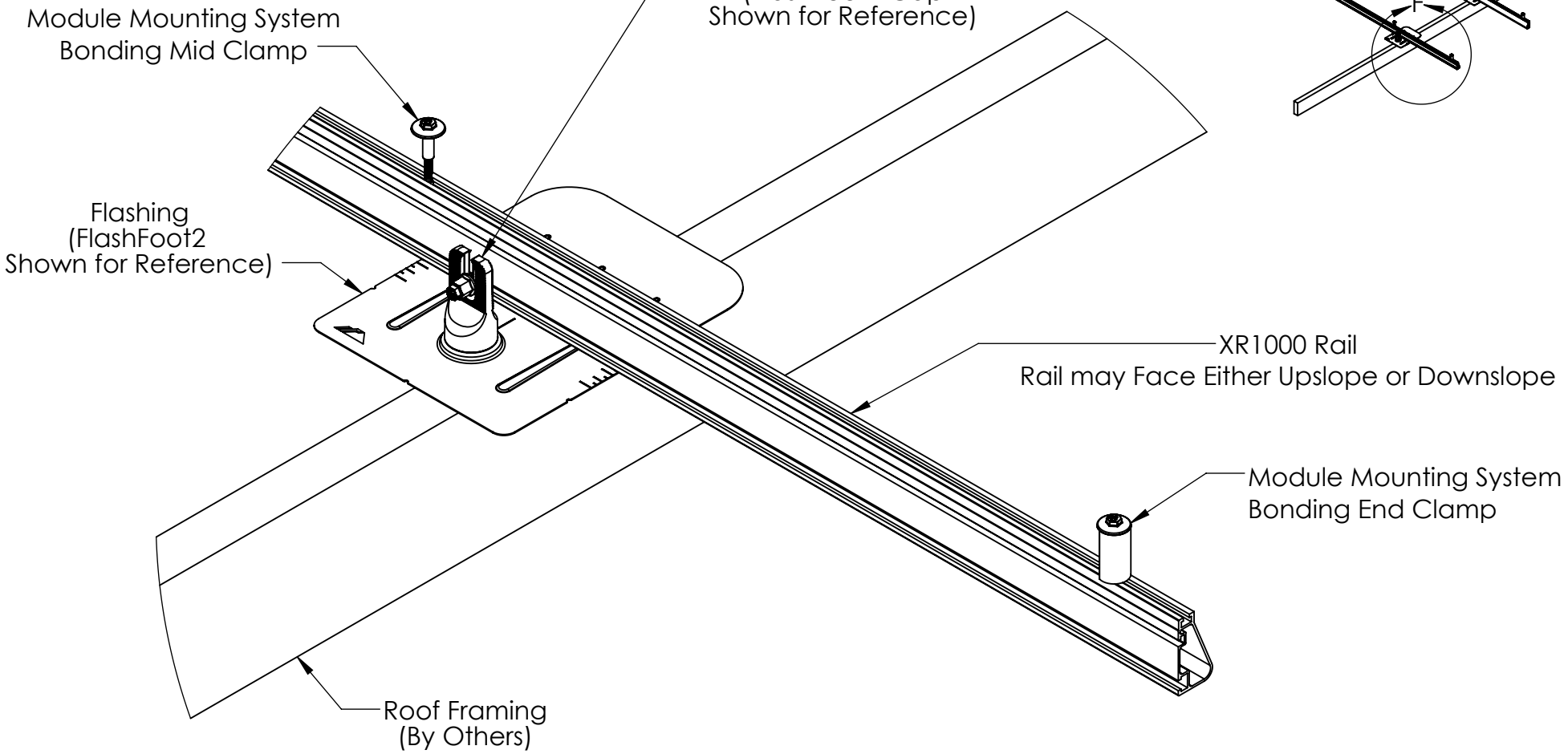
XR1000 FLUSH MOUNT

SIZE	DWG. NO.	
--	EX-0012	
SCALE: NTS	WEIGHT: N/A	SHEET 2 OF 3

EXHIBIT: EX-0012 - page 2 of 3

11/01/2016





DETAIL F

IRONRIDGE

XR1000 FLUSH MOUNT

SIZE	DWG. NO.	
--	EX-0012	
SCALE: NTS	WEIGHT: N/A	SHEET 3 OF 3

EXHIBIT: EX-0012 - page 3 of 3

Starling Madison Lofquist, Inc.
Consulting Structural and Forensic Engineers
5224 South 39th Street, Phoenix, Arizona 85040
tel: (602) 438-2500 fax: (602) 438-2505 ROC#291316 www.smleng.com

IronRidge
1495 Zephyr Ave
Hayward, CA 94544

June 3, 2016

Attn: Mr. David F. Taggart, Vice President Products

Subject: Ground Mounting System – Structural Analysis – 4 Module

Dear Sir:

We have analyzed the subject ground mounted structure and determined that it is in compliance with the applicable sections of the following Reference Documents:

Codes: ASCE/SEI 7-10 Min. Design Loads for Buildings & Other Structures
International Building Code, 2012 Edition
Other: AC428, Acceptance Criteria for Modular Framing Systems Used to Support PV Modules, dated Effective November 1, 2012 by ICC-ES
Aluminum Design Manual, 2010 Edition
IronRidge Exhibit EX-0001

The structure is a simple column (pier) and beam (cross pipe) system. The piers & cross pipes are ASTM A53 Grade B standard weight (schedule 40) steel pipes or Allied Mechanical Tubing. Please refer to Exhibit EX-0001 for approved pipe geometry and material properties. The tops of the piers are connected in the E-W direction by the cross pipes which cantilever over and extend past the end piers. The cross pipes are connected by proprietary IronRidge XR1000 Rails spanning up and down the slope which cantilever over and extend past the top and bottom cross pipes. There are typically two rails per column of modules. The modules are clamped to the rails by the IronRidge Module Mounting Clamps as shown in the attached Exhibit.

Gravity loads are transferred to the piers and foundations by the rails and cross pipes acting as simple beams. For lateral loads the system is either a cantilever structure or, when diagonal braces are provided, a braced frame. The effect of seismic loads (for all design categories A-F) have been determined to be less than the effect due to wind loads in all load conditions and combinations.

The pier spacing in the N-S direction is 7’-6”. The pier spacing in the E-W direction is selected from load tables determined by the structural design for the specified slope, wind load, and snow load. The governing criteria for the pier spacing is either the spanning capacity of the cross pipes or the cantilever capacity of the pier. Simplified Load Tables 1A-F & 2A-F are included herein for reference.

More comprehensive information covering all load combinations is available at the IronRidge website, IronRidge.com.

Table 1A - MAXIMUM PIER SPACING (in)											
2" Unbraced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	0	128	128	125	122	116	92	68	57	49	41
	10	113	113	112	110	109	92	68	57	49	41
	20	96	96	96	95	96	92	68	57	49	41
	30	90	90	90	90	91	92	68	57	49	41
	40	82	82	82	82	84	86	68	57	49	41
	50	75	75	75	76	78	81	68	57	49	41
	60	69	69	69	70	74	76	68	57	49	41
105 mph Exposure B	0	128	128	120	117	111	84	61	52	44	38
	10	113	113	109	108	106	84	61	52	44	38
	20	96	96	94	94	94	84	61	52	44	38
	30	90	90	88	88	89	84	61	52	44	38
	40	82	82	81	81	83	84	61	52	44	38
	50	75	75	75	75	77	80	61	52	44	38
	60	69	69	69	70	73	75	61	52	44	38
110 mph Exposure B	0	128	128	116	113	107	76	56	47	40	34
	10	113	113	107	105	103	76	56	47	40	34
	20	96	96	93	92	92	76	56	47	40	34
	30	90	90	87	87	87	76	56	47	40	34
	40	82	82	80	80	81	76	56	47	40	34
	50	75	75	75	74	76	76	56	47	40	34
120 mph Exposure B	0	123	126	108	105	92	64	47	40	34	29
	10	110	112	102	100	92	64	47	40	34	29
	20	95	96	89	89	88	64	47	40	34	29
	30	89	90	84	84	84	64	47	40	34	29
	40	81	82	78	78	79	64	47	40	34	29
	50	75	75	73	73	74	64	47	40	34	29
130 mph Exposure B	0	115	118	101	98	79	55	40	34	29	25
	10	106	108	97	95	79	55	40	34	29	25
	20	92	93	86	85	79	55	40	34	29	25
	30	86	88	82	81	79	55	40	34	29	25
	40	80	80	76	75	76	55	40	34	29	25
	50	74	75	71	71	72	55	40	34	29	25
140 mph Exposure B	0	108	111	95	92	68	47	35	29	25	21
	10	102	104	93	91	68	47	35	29	25	21
	20	89	90	83	82	68	47	35	29	25	21
	30	84	85	79	78	68	47	35	29	25	21
	40	78	79	74	73	68	47	35	29	25	21
	50	73	73	69	69	68	47	35	29	25	21
150 mph Exposure B	0	102	105	89	86	59	41	30	25	22	18
	10	98	100	89	86	59	41	30	25	22	18
	20	87	88	80	79	59	41	30	25	22	18
	30	82	83	77	76	59	41	30	25	22	18
	40	76	77	72	71	59	41	30	25	22	18
160 mph Exposure B	0	97	100	84	81	52	36	26	22	19	16
	10	94	96	84	81	52	36	26	22	19	16
	20	84	85	77	76	52	36	26	22	19	16
	30	80	81	74	73	52	36	26	22	19	16
	40	74	75	70	69	52	36	26	22	19	16

Notes: see page 14

Table 1B - MAXIMUM PIER SPACING (in)											
2" Unbraced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	0	121	124	106	103	89	62	45	38	33	28
	10	109	111	101	99	89	62	45	38	33	28
	20	94	95	89	88	87	62	45	38	33	28
	30	88	89	84	83	84	62	45	38	33	28
	40	81	82	78	77	78	62	45	38	33	28
	50	75	75	72	72	74	62	45	38	33	28
	60	69	69	68	68	70	62	45	38	33	28
105 mph Exposure C	0	116	120	102	99	81	56	41	35	30	25
	10	107	108	98	96	81	56	41	35	30	25
	20	92	94	87	86	81	56	41	35	30	25
	30	87	88	82	82	81	56	41	35	30	25
	40	80	81	76	76	76	56	41	35	30	25
	50	74	75	71	71	72	56	41	35	30	25
	60	69	69	67	67	69	56	41	35	30	25
110 mph Exposure C	0	112	115	98	95	74	51	38	32	27	23
	10	104	106	95	94	74	51	38	32	27	23
	20	91	92	85	84	74	51	38	32	27	23
	30	86	87	81	80	74	51	38	32	27	23
	40	79	80	75	74	74	51	38	32	27	23
	50	73	74	70	70	71	51	38	32	27	23
120 mph Exposure C	0	104	107	91	88	62	43	32	27	23	19
	10	99	101	90	88	62	43	32	27	23	19
	20	87	89	81	80	62	43	32	27	23	19
	30	83	84	78	77	62	43	32	27	23	19
	40	77	78	72	72	62	43	32	27	23	19
	50	72	72	68	68	62	43	32	27	23	19
130 mph Exposure C	0	97	100	85	82	53	37	27	23	19	16
	10	95	97	85	82	53	37	27	23	19	16
	20	84	86	78	77	53	37	27	23	19	16
	30	80	81	74	73	53	37	27	23	19	16
	40	74	75	70	69	53	37	27	23	19	16
	50	70	71	66	66	53	37	27	23	19	16
140 mph Exposure C	0	91	94	79	72	46	32	23	20	17	14
	10	90	92	79	72	46	32	23	20	17	14
	20	81	83	74	72	46	32	23	20	17	14
	30	77	79	72	70	46	32	23	20	17	14
	40	72	73	68	67	46	32	23	20	17	14
	50	68	69	64	63	46	32	23	20	17	14
150 mph Exposure C	0	86	89	74	63	40	27	20	17	15	12
	10	86	88	74	63	40	27	20	17	15	12
	20	78	80	71	63	40	27	20	17	15	12
	30	75	76	69	63	40	27	20	17	15	12
	40	70	71	65	63	40	27	20	17	15	12
160 mph Exposure C	0	81	84	70	55	35	24	18	15	13	11
	10	81	84	70	55	35	24	18	15	13	11
	20	75	77	68	55	35	24	18	15	13	11
	30	72	74	66	55	35	24	18	15	13	11
	40	68	69	63	55	35	24	18	15	13	11

Notes: see page 14

Table 1C - MAXIMUM PIER SPACING (in)											
2" Unbraced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	0	112	115	98	95	74	51	37	32	27	23
	10	104	106	95	94	74	51	37	32	27	23
	20	91	92	85	84	74	51	37	32	27	23
	30	85	87	81	80	74	51	37	32	27	23
	40	79	80	75	74	74	51	37	32	27	23
	50	73	74	70	70	71	51	37	32	27	23
	60	69	69	67	66	67	51	37	32	27	23
105 mph Exposure D	0	108	111	94	91	67	46	34	29	24	21
	10	101	103	92	91	67	46	34	29	24	21
	20	89	90	83	82	67	46	34	29	24	21
	30	84	85	79	78	67	46	34	29	24	21
	40	78	78	74	73	67	46	34	29	24	21
	50	72	73	69	69	67	46	34	29	24	21
	60	68	69	66	65	66	46	34	29	24	21
110 mph Exposure D	0	104	106	90	87	61	42	31	26	22	19
	10	99	101	90	87	61	42	31	26	22	19
	20	87	88	81	80	61	42	31	26	22	19
	30	82	84	77	76	61	42	31	26	22	19
	40	76	77	72	72	61	42	31	26	22	19
	50	71	72	68	68	61	42	31	26	22	19
120 mph Exposure D	0	96	99	83	81	51	35	26	22	19	16
	10	94	96	83	81	51	35	26	22	19	16
	20	84	85	77	76	51	35	26	22	19	16
	30	79	81	74	73	51	35	26	22	19	16
	40	74	75	69	69	51	35	26	22	19	16
	50	69	70	66	65	51	35	26	22	19	16
130 mph Exposure D	0	90	92	78	69	44	30	22	19	16	14
	10	89	91	78	69	44	30	22	19	16	14
	20	80	82	73	69	44	30	22	19	16	14
	30	77	78	71	69	44	30	22	19	16	14
	40	72	73	67	66	44	30	22	19	16	14
	50	67	68	63	63	44	30	22	19	16	14
140 mph Exposure D	0	84	86	72	60	38	26	19	16	14	12
	10	84	86	72	60	38	26	19	16	14	12
	20	77	79	70	60	38	26	19	16	14	12
	30	74	75	68	60	38	26	19	16	14	12
	40	69	70	64	60	38	26	19	16	14	12
	50	66	67	61	60	38	26	19	16	14	12
150 mph Exposure D	0	79	81	68	52	33	23	17	14	12	10
	10	79	81	68	52	33	23	17	14	12	10
	20	74	76	67	52	33	23	17	14	12	10
	30	71	72	65	52	33	23	17	14	12	10
	40	67	68	62	52	33	23	17	14	12	10
160 mph Exposure D	0	74	77	64	46	29	20	15	12	11	9
	10	74	77	64	46	29	20	15	12	11	9
	20	71	73	64	46	29	20	15	12	11	9
	30	69	70	62	46	29	20	15	12	11	9
	40	65	66	59	46	29	20	15	12	11	9

Notes: see page 14

Table 1D - MAXIMUM PIER SPACING (in)											
2" Braced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	0	128	128	125	122	116	111	107	106	107	108
	10	113	113	112	110	109	108	107	106	107	108
	20	96	96	96	95	96	97	98	101	105	108
	30	90	90	90	90	91	92	94	98	102	107
	40	82	82	82	82	84	86	88	92	97	103
	50	75	75	75	76	78	81	84	88	93	99
	60	69	69	69	70	74	76	79	84	89	96
105 mph Exposure B	0	128	128	120	117	111	106	102	102	103	103
	10	113	113	109	108	106	105	102	102	103	103
	20	96	96	94	94	94	95	95	98	102	103
	30	90	90	88	88	89	90	92	95	99	103
	40	82	82	81	81	83	84	86	90	95	100
	50	75	75	75	75	77	80	82	86	91	96
	60	69	69	69	70	73	75	78	82	88	93
110 mph Exposure B	0	128	128	116	113	107	102	98	98	98	99
	10	113	113	107	105	103	102	98	98	98	99
	20	96	96	93	92	92	93	93	96	98	99
	30	90	90	87	87	87	88	90	93	97	99
	40	82	82	80	80	81	83	85	88	93	97
	50	75	75	75	74	76	78	80	84	89	94
120 mph Exposure B	0	123	126	108	105	99	95	91	90	91	92
	10	110	112	102	100	98	95	91	90	91	92
	20	95	96	89	89	88	88	88	90	91	92
	30	89	90	84	84	84	85	85	88	91	92
	40	81	82	78	78	79	80	81	84	88	92
	50	75	75	73	73	74	76	77	81	85	89
130 mph Exposure B	0	115	118	101	98	92	88	85	84	85	85
	10	106	108	97	95	92	88	85	84	85	85
	20	92	93	86	85	85	84	84	84	85	85
	30	86	88	82	81	81	81	81	84	85	85
	40	80	80	76	75	76	77	78	80	84	85
	50	74	75	71	71	72	73	74	77	81	85
140 mph Exposure B	0	108	111	95	92	87	83	79	79	79	79
	10	102	104	93	91	87	83	79	79	79	79
	20	89	90	83	82	81	80	79	79	79	79
	30	84	85	79	78	78	78	78	79	79	79
	40	78	79	74	73	73	74	74	77	79	79
	50	73	73	69	69	70	71	72	74	77	79
150 mph Exposure B	0	102	105	89	86	81	78	74	74	74	75
	10	98	100	89	86	81	78	74	74	74	75
	20	87	88	80	79	78	77	74	74	74	75
	30	82	83	77	76	75	75	74	74	74	75
	40	76	77	72	71	71	71	71	73	74	75
160 mph Exposure B	0	97	100	84	81	77	73	70	69	70	70
	10	94	96	84	81	77	73	70	69	70	70
	20	84	85	77	76	75	73	70	69	70	70
	30	80	81	74	73	72	72	70	69	70	70
	40	74	75	70	69	69	69	68	69	70	70

Notes: see page 14

Table 1E - MAXIMUM PIER SPACING (in)

2" Braced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	0	121	124	106	103	98	93	89	89	90	90
	10	109	111	101	99	97	93	89	89	90	90
	20	94	95	89	88	87	87	87	89	90	90
	30	88	89	84	83	84	84	84	87	90	90
	40	81	82	78	77	78	79	80	83	87	90
	50	75	75	72	72	74	75	77	80	84	88
	60	69	69	68	68	70	72	74	77	81	86
105 mph Exposure C	0	116	120	102	99	94	89	86	85	86	86
	10	107	108	98	96	94	89	86	85	86	86
	20	92	94	87	86	85	85	85	85	86	86
	30	87	88	82	82	82	82	82	84	86	86
	40	80	81	76	76	76	77	78	81	84	86
	50	74	75	71	71	72	74	75	78	82	86
	60	69	69	67	67	69	70	72	75	79	84
110 mph Exposure C	0	112	115	98	95	90	86	82	82	82	83
	10	104	106	95	94	90	86	82	82	82	83
	20	91	92	85	84	83	83	82	82	82	83
	30	86	87	81	80	80	80	80	82	82	83
	40	79	80	75	74	75	76	76	79	82	83
	50	73	74	70	70	71	72	73	76	79	83
120 mph Exposure C	0	104	107	91	88	83	79	76	75	76	76
	10	99	101	90	88	83	79	76	75	76	76
	20	87	89	81	80	79	78	76	75	76	76
	30	83	84	78	77	76	76	75	75	76	76
	40	77	78	72	72	72	72	72	74	76	76
	50	72	72	68	68	68	69	70	72	75	76
130 mph Exposure C	0	97	100	85	82	77	74	70	70	70	71
	10	95	97	85	82	77	74	70	70	70	71
	20	84	86	78	77	75	74	70	70	70	71
	30	80	81	74	73	73	72	70	70	70	71
	40	74	75	70	69	69	69	69	70	70	71
	50	70	71	66	66	66	66	66	68	70	71
140 mph Exposure C	0	91	94	79	77	72	69	66	65	66	66
	10	90	92	79	77	72	69	66	65	66	66
	20	81	83	74	73	72	69	66	65	66	66
	30	77	79	72	70	69	68	66	65	66	66
	40	72	73	68	67	66	66	65	65	66	66
	50	68	69	64	63	63	63	63	65	66	66
150 mph Exposure C	0	86	89	74	72	68	64	61	61	61	62
	10	86	88	74	72	68	64	61	61	61	62
	20	78	80	71	70	68	64	61	61	61	62
	30	75	76	69	68	66	64	61	61	61	62
	40	70	71	65	64	63	63	61	61	61	62
160 mph Exposure C	0	81	84	70	68	64	61	58	57	58	58
	10	81	84	70	68	64	61	58	57	58	58
	20	75	77	68	67	64	61	58	57	58	58
	30	72	74	66	65	63	61	58	57	58	58
	40	68	69	63	62	61	60	58	57	58	58

Notes: see page 14

Table 1F - MAXIMUM PIER SPACING (in)											
2" Braced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	0	112	115	98	95	90	86	82	82	82	83
	10	104	106	95	94	90	86	82	82	82	83
	20	91	92	85	84	83	83	82	82	82	83
	30	85	87	81	80	80	80	80	82	82	83
	40	79	80	75	74	75	76	76	79	82	83
	50	73	74	70	70	71	72	73	76	79	83
	60	69	69	67	66	67	69	70	73	77	81
105 mph Exposure D	0	108	111	94	91	86	82	78	78	79	79
	10	101	103	92	91	86	82	78	78	79	79
	20	89	90	83	82	81	80	78	78	79	79
	30	84	85	79	78	78	77	77	78	79	79
	40	78	78	74	73	73	74	74	76	79	79
	50	72	73	69	69	69	70	71	74	77	79
	60	68	69	66	65	66	67	69	71	75	79
110 mph Exposure D	0	104	106	90	87	82	79	75	75	75	76
	10	99	101	90	87	82	79	75	75	75	76
	20	87	88	81	80	79	78	75	75	75	76
	30	82	84	77	76	76	75	75	75	75	76
	40	76	77	72	72	72	72	72	74	75	76
	50	71	72	68	68	68	69	69	72	75	76
120 mph Exposure D	0	96	99	83	81	76	72	69	69	69	70
	10	94	96	83	81	76	72	69	69	69	70
	20	84	85	77	76	74	72	69	69	69	70
	30	79	81	74	73	72	71	69	69	69	70
	40	74	75	69	69	68	68	68	69	69	70
	50	69	70	66	65	65	66	66	68	69	70
130 mph Exposure D	0	90	92	78	75	71	67	64	64	64	64
	10	89	91	78	75	71	67	64	64	64	64
	20	80	82	73	72	70	67	64	64	64	64
	30	77	78	71	70	68	67	64	64	64	64
	40	72	73	67	66	65	65	64	64	64	64
	50	67	68	63	63	63	63	63	64	64	64
140 mph Exposure D	0	84	86	72	70	66	63	60	60	60	60
	10	84	86	72	70	66	63	60	60	60	60
	20	77	79	70	69	66	63	60	60	60	60
	30	74	75	68	67	65	63	60	60	60	60
	40	69	70	64	63	62	62	60	60	60	60
	50	66	67	61	61	60	60	59	60	60	60
150 mph Exposure D	0	79	81	68	66	62	59	56	56	56	56
	10	79	81	68	66	62	59	56	56	56	56
	20	74	76	67	66	62	59	56	56	56	56
	30	71	72	65	64	62	59	56	56	56	56
	40	67	68	62	61	60	59	56	56	56	56
160 mph Exposure D	0	74	77	64	62	58	55	53	52	53	53
	10	74	77	64	62	58	55	53	52	53	53
	20	71	73	64	62	58	55	53	52	53	53
	30	69	70	62	61	58	55	53	52	53	53
	40	65	66	59	58	57	55	53	52	53	53

Notes: see page 14

Table 2A - MAXIMUM PIER SPACING (in)											
3" Unbraced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	0	224	224	218	213	202	194	186	175	149	127
	10	197	197	195	193	191	190	186	175	149	127
	20	169	169	168	167	168	170	172	175	149	127
	30	158	158	157	157	159	162	164	171	149	127
	40	144	144	144	144	147	151	155	162	149	127
	50	131	131	132	133	137	141	146	154	149	127
	60	121	121	121	123	129	134	139	147	149	127
105 mph Exposure B	0	224	224	210	205	194	186	179	159	135	115
	10	197	197	191	188	186	184	179	159	135	115
	20	169	169	165	164	165	166	167	159	135	115
	30	158	158	155	154	156	158	161	159	135	115
	40	144	144	142	142	145	148	151	158	135	115
	50	131	131	132	132	135	139	143	151	135	115
	60	121	121	121	123	128	132	137	144	135	115
110 mph Exposure B	0	224	224	203	197	187	179	171	145	123	105
	10	197	197	186	184	181	179	171	145	123	105
	20	169	169	162	161	161	162	163	145	123	105
	30	158	158	153	152	153	155	157	145	123	105
	40	144	144	140	140	142	145	148	145	123	105
	50	131	131	131	130	133	137	141	145	123	105
120 mph Exposure B	0	215	220	189	183	174	166	144	122	104	88
	10	193	196	178	175	172	166	144	122	104	88
	20	166	168	156	155	155	155	144	122	104	88
	30	155	157	148	147	147	148	144	122	104	88
	40	142	144	137	136	138	140	142	122	104	88
	50	131	131	128	127	130	132	135	122	104	88
130 mph Exposure B	0	202	207	176	171	162	155	123	104	88	75
	10	185	188	170	167	162	155	123	104	88	75
	20	161	163	151	149	148	148	123	104	88	75
	30	151	153	143	142	142	142	123	104	88	75
	40	139	141	133	132	133	135	123	104	88	75
	50	130	131	125	124	126	128	123	104	88	75
140 mph Exposure B	0	190	195	165	160	152	144	106	89	76	65
	10	178	181	162	159	152	144	106	89	76	65
	20	156	158	146	144	142	141	106	89	76	65
	30	147	149	139	137	136	136	106	89	76	65
	40	136	138	129	128	129	129	106	89	76	65
	50	127	128	121	121	122	124	106	89	76	65
150 mph Exposure B	0	179	184	156	151	142	126	92	78	66	56
	10	171	175	155	151	142	126	92	78	66	56
	20	151	154	140	138	136	126	92	78	66	56
	30	143	146	134	133	131	126	92	78	66	56
	40	133	135	126	124	124	125	92	78	66	56
160 mph Exposure B	0	169	174	147	142	134	110	81	68	58	50
	10	165	168	147	142	134	110	81	68	58	50
	20	147	149	135	133	131	110	81	68	58	50
	30	140	142	130	128	126	110	81	68	58	50
	40	130	132	122	121	120	110	81	68	58	50

Notes: see page 14

Table 2B - MAXIMUM PIER SPACING (in)											
3" Unbraced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	0	212	217	186	181	171	163	139	117	100	85
	10	191	194	176	174	170	163	139	117	100	85
	20	165	167	155	154	153	153	139	117	100	85
	30	155	156	147	146	146	147	139	117	100	85
	40	142	143	136	135	137	139	139	117	100	85
	50	131	131	127	127	129	131	134	117	100	85
	60	121	121	120	119	122	125	129	117	100	85
105 mph Exposure C	0	204	178	162	148	137	134	126	107	91	77
	10	186	178	162	148	137	134	126	107	91	77
	20	162	164	152	148	137	134	126	107	91	77
	30	152	154	144	143	137	134	126	107	91	77
	40	140	141	134	133	134	134	126	107	91	77
	50	130	131	125	125	126	129	126	107	91	77
	60	121	121	118	118	120	123	126	107	91	77
110 mph Exposure C	0	196	202	171	166	157	150	115	97	83	70
	10	182	185	167	164	157	150	115	97	83	70
	20	159	161	149	147	145	145	115	97	83	70
	30	150	152	141	140	139	140	115	97	83	70
	40	138	139	131	130	131	132	115	97	83	70
	50	128	130	123	123	124	126	115	97	83	70
120 mph Exposure C	0	183	188	159	154	145	132	97	82	69	59
	10	174	177	158	154	145	132	97	82	69	59
	20	153	155	142	140	138	132	97	82	69	59
	30	145	147	136	134	133	132	97	82	69	59
	40	134	136	127	126	126	126	97	82	69	59
	50	125	127	119	119	120	121	97	82	69	59
130 mph Exposure C	0	171	175	148	143	135	112	82	70	59	50
	10	166	169	148	143	135	112	82	70	59	50
	20	147	150	136	134	131	112	82	70	59	50
	30	140	142	130	129	127	112	82	70	59	50
	40	130	132	122	121	121	112	82	70	59	50
	50	122	124	116	115	115	112	82	70	59	50
140 mph Exposure C	0	160	165	138	134	126	97	71	60	51	43
	10	158	162	138	134	126	97	71	60	51	43
	20	142	145	130	128	125	97	71	60	51	43
	30	135	138	125	123	121	97	71	60	51	43
	40	127	128	118	117	116	97	71	60	51	43
	50	119	121	112	111	111	97	71	60	51	43
150 mph Exposure C	0	150	155	130	126	118	84	62	52	44	38
	10	150	154	130	126	118	84	62	52	44	38
	20	137	140	125	123	118	84	62	52	44	38
	30	131	133	120	118	116	84	62	52	44	38
	40	123	125	114	113	111	84	62	52	44	38
160 mph Exposure C	0	142	146	122	118	107	74	54	46	39	33
	10	142	146	122	118	107	74	54	46	39	33
	20	132	135	120	117	107	74	54	46	39	33
	30	127	129	116	114	107	74	54	46	39	33
	40	119	121	110	108	107	74	54	46	39	33

Notes: see page 14

Table 2C - MAXIMUM PIER SPACING (in)											
3" Unbraced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	0	196	201	171	166	157	150	115	97	83	70
	10	182	185	167	164	157	150	115	97	83	70
	20	159	161	148	147	145	145	115	97	83	70
	30	150	152	141	140	139	139	115	97	83	70
	40	138	139	131	130	131	132	115	97	83	70
	50	128	130	123	123	124	126	115	97	83	70
	60	121	121	116	116	118	121	115	97	83	70
105 mph Exposure D	0	188	194	164	159	150	142	104	88	75	64
	10	177	181	162	159	150	142	104	88	75	64
	20	156	158	145	143	141	140	104	88	75	64
	30	147	149	138	137	136	136	104	88	75	64
	40	136	137	129	128	128	129	104	88	75	64
	50	127	128	121	120	122	123	104	88	75	64
	60	119	120	115	114	116	118	104	88	75	64
110 mph Exposure D	0	181	186	158	153	144	129	95	80	68	58
	10	173	176	157	153	144	129	95	80	68	58
	20	152	155	141	140	137	129	95	80	68	58
	30	144	146	135	134	132	129	95	80	68	58
	40	134	135	126	125	125	126	95	80	68	58
	50	125	126	119	118	119	120	95	80	68	58
120 mph Exposure D	0	168	173	146	141	133	109	80	67	57	49
	10	164	167	146	141	133	109	80	67	57	49
	20	146	149	135	133	130	109	80	67	57	49
	30	139	141	129	128	126	109	80	67	57	49
	40	129	131	122	120	120	109	80	67	57	49
	50	122	123	115	114	114	109	80	67	57	49
130 mph Exposure D	0	157	161	136	131	124	92	68	57	49	42
	10	156	159	136	131	124	92	68	57	49	42
	20	140	143	129	126	123	92	68	57	49	42
	30	134	136	124	122	120	92	68	57	49	42
	40	125	127	117	115	114	92	68	57	49	42
	50	118	120	111	110	110	92	68	57	49	42
140 mph Exposure D	0	147	151	127	123	115	80	59	49	42	36
	10	147	151	127	123	115	80	59	49	42	36
	20	135	137	123	120	115	80	59	49	42	36
	30	129	131	118	116	114	80	59	49	42	36
	40	121	123	112	111	109	80	59	49	42	36
	50	115	116	107	106	105	80	59	49	42	36
150 mph Exposure D	0	138	142	119	115	100	69	51	43	37	31
	10	138	142	119	115	100	69	51	43	37	31
	20	130	132	117	115	100	69	51	43	37	31
	30	124	127	113	111	100	69	51	43	37	31
	40	117	119	108	106	100	69	51	43	37	31
160 mph Exposure D	0	130	134	112	108	88	61	45	38	32	27
	10	130	134	112	108	88	61	45	38	32	27
	20	124	127	112	108	88	61	45	38	32	27
	30	120	122	109	107	88	61	45	38	32	27
	40	114	116	104	102	88	61	45	38	32	27

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Table 2D - MAXIMUM PIER SPACING (in)											
3" Braced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	0	224	224	218	213	202	194	186	186	187	188
	10	197	197	195	193	191	190	186	186	187	188
	20	169	169	168	167	168	170	172	177	184	188
	30	158	158	157	157	159	162	164	171	179	187
	40	144	144	144	144	147	151	155	162	170	180
	50	131	131	132	133	137	141	146	154	163	173
	60	121	121	121	123	129	134	139	147	157	167
105 mph Exposure B	0	224	224	210	205	194	186	179	178	180	181
	10	197	197	191	188	186	184	179	178	180	181
	20	169	169	165	164	165	166	167	172	179	181
	30	158	158	155	154	156	158	161	166	174	181
	40	144	144	142	142	145	148	151	158	166	175
	50	131	131	132	132	135	139	143	151	159	169
	60	121	121	121	123	128	132	137	144	153	163
110 mph Exposure B	0	224	224	203	197	187	179	172	171	172	173
	10	197	197	186	184	181	179	172	171	172	173
	20	169	169	162	161	161	162	163	168	172	173
	30	158	158	153	152	153	155	157	162	169	173
	40	144	144	140	140	142	145	148	154	162	170
	50	131	131	131	130	133	137	141	147	156	165
120 mph Exposure B	0	215	220	189	183	174	166	159	158	159	160
	10	193	196	178	175	172	166	159	158	159	160
	20	166	168	156	155	155	155	155	158	159	160
	30	155	157	148	147	147	148	149	154	159	160
	40	142	144	137	136	138	140	142	147	154	160
	50	131	131	128	127	130	132	135	141	149	156
130 mph Exposure B	0	202	207	176	171	162	155	148	147	148	149
	10	185	188	170	167	162	155	148	147	148	149
	20	161	163	151	149	148	148	147	147	148	149
	30	151	153	143	142	142	142	142	146	148	149
	40	139	141	133	132	133	135	136	141	146	149
	50	130	131	125	124	126	128	130	135	142	148
140 mph Exposure B	0	190	195	165	160	152	145	138	138	138	139
	10	178	181	162	159	152	145	138	138	138	139
	20	156	158	146	144	142	141	138	138	138	139
	30	147	149	139	137	136	136	136	138	138	139
	40	136	138	129	128	129	129	130	134	138	139
	50	127	128	121	121	122	124	125	130	135	139
150 mph Exposure B	0	179	184	156	151	142	136	130	129	130	130
	10	171	175	155	151	142	136	130	129	130	130
	20	151	154	140	138	136	135	130	129	130	130
	30	143	146	134	133	131	131	130	129	130	130
	40	133	135	126	124	124	125	125	128	130	130
160 mph Exposure B	0	169	174	147	142	134	128	122	122	122	123
	10	165	168	147	142	134	128	122	122	122	123
	20	147	149	135	133	131	128	122	122	122	123
	30	140	142	130	128	126	125	122	122	122	123
	40	130	132	122	121	120	120	120	122	122	123

Notes: see page 14

Table 2E - MAXIMUM PIER SPACING (in)											
3" Braced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	0	212	217	186	181	171	163	157	156	157	158
	10	191	194	176	174	170	163	157	156	157	158
	20	165	167	155	154	153	153	153	156	157	158
	30	155	156	147	146	146	147	148	152	157	158
	40	142	143	136	135	137	139	141	146	152	158
	50	131	131	127	127	129	131	134	140	147	155
	60	121	121	120	119	122	125	129	135	142	151
105 mph Exposure C	0	204	178	162	148	137	134	134	139	145	151
	10	186	178	162	148	137	134	134	139	145	151
	20	162	164	152	148	137	134	134	139	145	151
	30	152	154	144	143	137	134	134	139	145	151
	40	140	141	134	133	134	134	134	139	145	151
	50	130	131	125	125	126	129	131	136	143	150
	60	121	121	118	118	120	123	126	132	139	146
110 mph Exposure C	0	196	202	171	166	157	150	144	143	144	145
	10	182	185	167	164	157	150	144	143	144	145
	20	159	161	149	147	145	145	144	143	144	145
	30	150	152	141	140	139	140	139	143	144	145
	40	138	139	131	130	131	132	133	138	143	145
	50	128	130	123	123	124	126	128	133	139	145
120 mph Exposure C	0	183	188	159	154	145	139	133	132	133	133
	10	174	177	158	154	145	139	133	132	133	133
	20	153	155	142	140	138	137	133	132	133	133
	30	145	147	136	134	133	132	132	132	133	133
	40	134	136	127	126	126	126	127	130	133	133
	50	125	127	119	119	120	121	122	126	131	133
130 mph Exposure C	0	171	175	148	143	135	129	123	122	123	124
	10	166	169	148	143	135	129	123	122	123	124
	20	147	150	136	134	131	129	123	122	123	124
	30	140	142	130	129	127	126	123	122	123	124
	40	130	132	122	121	121	121	120	122	123	124
	50	122	124	116	115	115	116	116	120	123	124
140 mph Exposure C	0	160	165	138	134	126	120	115	114	115	115
	10	158	162	138	134	126	120	115	114	115	115
	20	142	145	130	128	125	120	115	114	115	115
	30	135	138	125	123	121	120	115	114	115	115
	40	127	128	118	117	116	115	114	114	115	115
	50	119	121	112	111	111	111	111	114	115	115
150 mph Exposure C	0	150	155	130	126	118	113	107	107	107	108
	10	150	154	130	126	118	113	107	107	107	108
	20	137	140	125	123	118	113	107	107	107	108
	30	131	133	120	118	116	113	107	107	107	108
	40	123	125	114	113	111	110	107	107	107	108
160 mph Exposure C	0	142	146	122	118	111	106	101	100	101	101
	10	142	146	122	118	111	106	101	100	101	101
	20	132	135	120	117	111	106	101	100	101	101
	30	127	129	116	114	111	106	101	100	101	101
	40	119	121	110	108	107	105	101	100	101	101

Notes: see page 14

Table 2F - MAXIMUM PIER SPACING (in)											
3" Braced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	0	196	201	171	166	157	150	144	143	144	144
	10	182	185	167	164	157	150	144	143	144	144
	20	159	161	148	147	145	145	144	143	144	144
	30	150	152	141	140	139	139	139	143	144	144
	40	138	139	131	130	131	132	133	138	143	144
	50	128	130	123	123	124	126	128	133	139	144
	60	121	121	116	116	118	121	123	128	135	142
105 mph Exposure D	0	188	194	164	159	150	143	137	137	137	138
	10	177	181	162	159	150	143	137	137	137	138
	20	156	158	145	143	141	140	137	137	137	138
	30	147	149	138	137	136	136	135	137	137	138
	40	136	137	129	128	128	129	130	133	137	138
	50	127	128	121	120	122	123	125	129	135	138
	60	119	120	115	114	116	118	120	125	131	137
110 mph Exposure D	0	181	186	158	153	144	138	131	131	132	132
	10	173	176	157	153	144	138	131	131	132	132
	20	152	155	141	140	137	136	131	131	132	132
	30	144	146	135	134	132	132	131	131	132	132
	40	134	135	126	125	125	126	126	129	132	132
	50	125	126	119	118	119	120	121	125	131	132
120 mph Exposure D	0	168	173	146	141	133	127	121	121	121	122
	10	164	167	146	141	133	127	121	121	121	122
	20	146	149	135	133	130	127	121	121	121	122
	30	139	141	129	128	126	125	121	121	121	122
	40	129	131	122	120	120	119	119	121	121	122
	50	122	123	115	114	114	115	115	119	121	122
130 mph Exposure D	0	157	161	136	131	124	118	112	112	112	113
	10	156	159	136	131	124	118	112	112	112	113
	20	140	143	129	126	123	118	112	112	112	113
	30	134	136	124	122	120	118	112	112	112	113
	40	125	127	117	115	114	114	112	112	112	113
	50	118	120	111	110	110	110	109	112	112	113
140 mph Exposure D	0	147	151	127	123	115	110	105	104	105	105
	10	147	151	127	123	115	110	105	104	105	105
	20	135	137	123	120	115	110	105	104	105	105
	30	129	131	118	116	114	110	105	104	105	105
	40	121	123	112	111	109	108	105	104	105	105
	50	115	116	107	106	105	105	104	104	105	105
150 mph Exposure D	0	138	142	119	115	108	103	98	98	98	98
	10	138	142	119	115	108	103	98	98	98	98
	20	130	132	117	115	108	103	98	98	98	98
	30	124	127	113	111	108	103	98	98	98	98
	40	117	119	108	106	105	103	98	98	98	98
160 mph Exposure D	0	130	134	112	108	102	97	92	92	92	92
	10	130	134	112	108	102	97	92	92	92	92
	20	124	127	112	108	102	97	92	92	92	92
	30	120	122	109	107	102	97	92	92	92	92
	40	114	116	104	102	100	97	92	92	92	92

Notes: see page 14

Notes for Tables 1 & 2:

1. Shaded region denotes special requirements for XR1000 rails – contact IronRidge
2. Cross pipe splices not permitted in outer 2/3 of end spans, or the middle 1/3 of interior spans based on the installed attachment spacing ($L_{install}$). See Figure A
3. End cantilever span of pipe rails (max) = 0.40 x maximum span (L_{max}) from above tables. See Figure A
4. When installations occur on a N-S grade, the design slope of the array shall be determined as the slope relative to level ground. Code required topographic effects have not been considered. Topographic (Wind) Factor = 1.0 (no topographic effects)
5. Dead Load (Weight) = 3 psf
6. Maximum PV Module Dimension = 78”

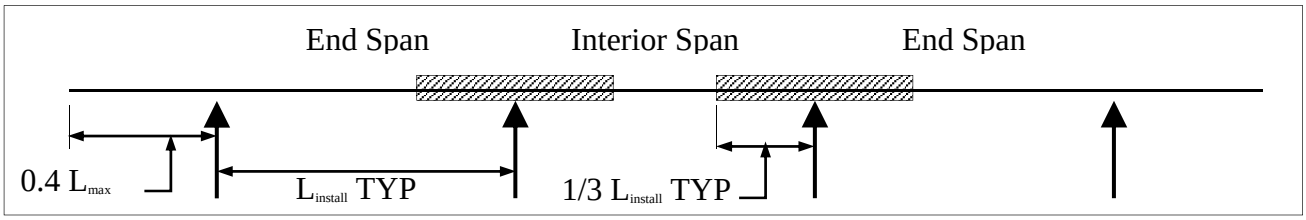


Figure A

L_{max} = Maximum pier spacing provided in the tables above for the project design criteria

$L_{install}$ = Actual installed pier spacing

= Indicates region of the pipe rail where splice may be installed

To avoid potential problems from the effects of thermal expansion, a maximum total continuous cross pipe length of 100 ft is recommended.

Foundation Requirements

The foundation requirements for a cast-in-place drilled concrete pier system and for each soil class 2, 3, & 4 may be obtained from the tables below. The soil class is noted at the top of the tables. For each soil class Tables 3A-3F and 4A-4F are provided for the 2in and 3in systems respectively. These tables are based on the piers being installed at their maximum allowable spacing. For spacing values less than maximum and for loads cases with snow > 0 psf, the requirements can be determined by using the online Design Assistant at IronRidge.com.

Soil Class 2											
Table 3A - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	36	36	36	36	36	36	36
	16	36	36	36	36	36	36	36	36	36	36
	20	36	36	36	36	36	36	36	36	36	36
	24	36	36	36	36	36	36	36	36	36	*
105 mph Exposure B	12	36	36	36	36	36	36	36	36	36	36
	16	36	36	36	36	36	36	36	36	36	36
	20	36	36	36	36	36	36	36	36	36	*
	24	36	36	36	36	36	36	36	36	*	*
110 mph Exposure B	12	36	36	36	36	36	36	36	36	36	36
	16	36	36	36	36	36	36	36	36	36	36
	20	36	36	36	36	36	36	36	36	36	*
	24	36	36	36	36	36	36	36	*	*	*
120 mph Exposure B	12	36	36	36	36	36	36	36	36	36	36
	16	36	36	36	36	36	36	36	36	36	*
	20	36	36	36	36	36	36	36	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
130 mph Exposure B	12	36	36	36	36	36	36	36	36	36	36
	16	36	36	36	36	36	36	36	36	*	*
	20	36	36	36	36	36	36	36	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
140 mph Exposure B	12	36	36	36	36	36	36	36	36	36	*
	16	36	36	36	36	36	36	36	*	*	*
	20	36	36	36	36	36	36	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
150 mph Exposure B	12	36	36	36	36	36	36	36	36	*	*
	16	36	36	36	36	36	36	*	*	*	*
	20	36	36	36	36	36	36	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
160 mph Exposure B	12	36	36	36	36	36	36	36	*	*	*
	16	36	36	36	36	36	36	*	*	*	*
	20	36	36	36	36	36	*	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*

Notes: see page 51

Soil Class 2											
Table 3B - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	36	36	36	36	36	36	36	36	36
	16	36	36	36	36	36	36	36	36	36	*
	20	36	36	36	36	36	36	36	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
105 mph Exposure C	12	36	36	36	36	36	36	36	36	36	36
	16	36	36	36	36	36	36	36	36	*	*
	20	36	36	36	36	36	36	36	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
110 mph Exposure C	12	36	36	36	36	36	36	36	36	36	*
	16	36	36	36	36	36	36	36	*	*	*
	20	36	36	36	36	36	36	*	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
120 mph Exposure C	12	36	36	36	36	36	36	36	36	*	*
	16	36	36	36	36	36	36	*	*	*	*
	20	36	36	36	36	36	36	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
130 mph Exposure C	12	36	36	36	36	36	36	36	*	*	*
	16	36	36	36	36	36	36	*	*	*	*
	20	36	36	36	36	36	*	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
140 mph Exposure C	12	36	36	36	36	36	36	*	*	*	*
	16	36	36	36	36	36	*	*	*	*	*
	20	36	36	36	36	36	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
150 mph Exposure C	12	36	36	36	36	36	36	*	*	*	*
	16	36	36	36	36	36	*	*	*	*	*
	20	36	36	36	36	*	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
160 mph Exposure C	12	36	36	36	36	36	36	*	*	*	*
	16	36	36	36	36	36	*	*	*	*	*
	20	36	36	36	36	*	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*

Notes: see page 51

Soil Class 2											
Table 3C - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	36	36	36	36	36	36	36	36	*
	16	36	36	36	36	36	36	36	*	*	*
	20	36	36	36	36	36	36	*	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
105 mph Exposure D	12	36	36	36	36	36	36	36	36	36	*
	16	36	36	36	36	36	36	36	*	*	*
	20	36	36	36	36	36	36	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
110 mph Exposure D	12	36	36	36	36	36	36	36	36	*	*
	16	36	36	36	36	36	36	*	*	*	*
	20	36	36	36	36	36	36	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
120 mph Exposure D	12	36	36	36	36	36	36	36	*	*	*
	16	36	36	36	36	36	36	*	*	*	*
	20	36	36	36	36	36	*	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
130 mph Exposure D	12	36	36	36	36	36	36	*	*	*	*
	16	36	36	36	36	36	*	*	*	*	*
	20	36	36	36	36	36	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
140 mph Exposure D	12	36	36	36	36	36	36	*	*	*	*
	16	36	36	36	36	36	*	*	*	*	*
	20	36	36	36	36	*	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
150 mph Exposure D	12	36	36	36	36	36	*	*	*	*	*
	16	36	36	36	36	36	*	*	*	*	*
	20	36	36	36	36	*	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
160 mph Exposure D	12	36	36	36	36	36	*	*	*	*	*
	16	36	36	36	36	*	*	*	*	*	*
	20	36	36	36	36	*	*	*	*	*	*
	24	36	36	36	*	*	*	*	*	*	*

Notes: see page 51

Soil Class 2											
Table 3D - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	36	36	36	36	42	42	48
	16	36	36	36	36	36	36	36	36	36	42
	20	36	36	36	36	36	36	36	36	36	36
	24	36	36	36	36	36	36	36	36	36	36
105 mph Exposure B	12	36	36	36	36	36	36	42	42	42	48
	16	36	36	36	36	36	36	36	36	42	42
	20	36	36	36	36	36	36	36	36	36	36
	24	36	36	36	36	36	36	36	36	36	36
110 mph Exposure B	12	36	36	36	36	36	36	42	42	48	48
	16	36	36	36	36	36	36	36	36	42	42
	20	36	36	36	36	36	36	36	36	36	42
	24	36	36	36	36	36	36	36	36	36	36
120 mph Exposure B	12	36	36	36	36	36	36	42	42	48	54
	16	36	36	36	36	36	36	36	42	42	48
	20	36	36	36	36	36	36	36	36	36	42
	24	36	36	36	36	36	36	36	36	36	36
130 mph Exposure B	12	36	36	36	36	36	36	42	48	48	54
	16	36	36	36	36	36	36	36	42	42	48
	20	36	36	36	36	36	36	36	36	42	42
	24	36	36	36	36	36	36	36	36	36	42
140 mph Exposure B	12	36	36	36	36	36	42	42	48	54	54
	16	36	36	36	36	36	36	42	42	48	48
	20	36	36	36	36	36	36	36	36	42	42
	24	36	36	36	36	36	36	36	36	36	42
150 mph Exposure B	12	36	36	36	36	36	42	48	48	54	54
	16	36	36	36	36	36	36	42	42	48	48
	20	36	36	36	36	36	36	36	42	42	48
	24	36	36	36	36	36	36	36	36	42	42
160 mph Exposure B	12	36	36	36	36	42	42	48	54	54	60
	16	36	36	36	36	36	36	42	42	48	54
	20	36	36	36	36	36	36	36	42	42	48
	24	36	36	36	36	36	36	36	36	42	42

Notes: see page 51

Soil Class 2											
Table 3E - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	36	36	36	36	36	42	42	48	54
	16	36	36	36	36	36	36	36	42	42	48
	20	36	36	36	36	36	36	36	36	36	42
	24	36	36	36	36	36	36	36	36	36	36
105 mph Exposure C	12	36	36	36	36	36	36	42	48	48	54
	16	36	36	36	36	36	36	36	42	42	48
	20	36	36	36	36	36	36	36	36	42	42
	24	36	36	36	36	36	36	36	36	36	36
110 mph Exposure C	12	36	36	36	36	36	42	42	48	48	54
	16	36	36	36	36	36	36	36	42	42	48
	20	36	36	36	36	36	36	36	36	42	42
	24	36	36	36	36	36	36	36	36	36	42
120 mph Exposure C	12	36	36	36	36	36	42	48	48	54	54
	16	36	36	36	36	36	36	42	42	48	48
	20	36	36	36	36	36	36	36	42	42	42
	24	36	36	36	36	36	36	36	36	36	42
130 mph Exposure C	12	36	36	36	36	42	42	48	48	54	60
	16	36	36	36	36	36	36	42	42	48	54
	20	36	36	36	36	36	36	36	42	42	48
	24	36	36	36	36	36	36	36	36	42	42
140 mph Exposure C	12	36	36	36	36	42	42	48	54	54	60
	16	36	36	36	36	36	42	42	48	48	54
	20	36	36	36	36	36	36	42	42	48	48
	24	36	36	36	36	36	36	36	36	42	42
150 mph Exposure C	12	36	36	36	42	42	48	48	54	60	60
	16	36	36	36	36	36	42	42	48	54	54
	20	36	36	36	36	36	36	42	42	48	48
	24	36	36	36	36	36	36	36	42	42	48
160 mph Exposure C	12	36	36	36	42	48	48	54	54	60	66
	16	36	36	36	36	36	42	48	48	54	54
	20	36	36	36	36	36	36	42	42	48	54
	24	36	36	36	36	36	36	36	42	42	48

Notes: see page 51

Soil Class 2											
Table 3F - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	36	36	36	36	42	42	48	48	54
	16	36	36	36	36	36	36	36	42	42	48
	20	36	36	36	36	36	36	36	36	42	42
	24	36	36	36	36	36	36	36	36	36	42
105 mph Exposure D	12	36	36	36	36	36	42	48	48	54	54
	16	36	36	36	36	36	36	42	42	48	48
	20	36	36	36	36	36	36	36	36	42	42
	24	36	36	36	36	36	36	36	36	36	42
110 mph Exposure D	12	36	36	36	36	36	42	48	48	54	54
	16	36	36	36	36	36	36	42	42	48	48
	20	36	36	36	36	36	36	36	42	42	48
	24	36	36	36	36	36	36	36	36	36	42
120 mph Exposure D	12	36	36	36	36	42	42	48	54	54	60
	16	36	36	36	36	36	36	42	48	48	54
	20	36	36	36	36	36	36	36	42	42	48
	24	36	36	36	36	36	36	36	36	42	42
130 mph Exposure D	12	36	36	36	42	42	42	48	54	60	60
	16	36	36	36	36	36	42	42	48	48	54
	20	36	36	36	36	36	36	42	42	48	48
	24	36	36	36	36	36	36	36	42	42	42
140 mph Exposure D	12	36	36	36	42	42	48	54	54	60	66
	16	36	36	36	36	36	42	48	48	54	54
	20	36	36	36	36	36	36	42	42	48	48
	24	36	36	36	36	36	36	36	42	42	48
150 mph Exposure D	12	36	36	36	42	48	48	54	54	60	66
	16	36	36	36	36	36	42	48	48	54	60
	20	36	36	36	36	36	36	42	48	48	54
	24	36	36	36	36	36	36	42	42	42	48
160 mph Exposure D	12	36	42	36	48	48	54	54	60	60	66
	16	36	36	36	36	42	42	48	54	54	60
	20	36	36	36	36	36	42	42	48	48	54
	24	36	36	36	36	36	36	42	42	48	48

Notes: see page 51

Soil Class 2											
Table 4A - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	36	42	48	54	60	60	60
	16	36	36	36	36	42	48	48	54	54	54
	20	36	36	36	36	36	42	48	48	48	48
	24	36	36	36	36	36	36	42	42	42	42
105 mph Exposure B	12	36	36	36	36	48	54	60	60	60	60
	16	36	36	36	36	42	48	54	54	54	54
	20	36	36	36	36	36	42	48	48	48	48
	24	36	36	36	36	36	42	42	42	42	42
110 mph Exposure B	12	36	36	36	42	48	54	60	60	60	60
	16	36	36	36	36	42	48	54	54	54	54
	20	36	36	36	36	36	42	48	48	48	48
	24	36	36	36	36	36	42	42	42	42	42
120 mph Exposure B	12	36	36	36	42	48	54	60	60	60	60
	16	36	36	36	36	42	48	54	54	54	54
	20	36	36	36	36	42	42	48	48	48	48
	24	36	36	36	36	36	42	42	42	42	42
130 mph Exposure B	12	36	36	36	42	48	54	60	60	60	60
	16	36	36	36	36	42	48	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	36	42	42	42	42	42
140 mph Exposure B	12	36	36	42	42	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	42
150 mph Exposure B	12	36	42	42	48	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	42
160 mph Exposure B	12	36	42	42	48	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	42

Notes: see page 51

Soil Class 2											
Table 4B - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	36	36	42	48	54	60	60	60	60
	16	36	36	36	36	42	48	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	36	42	42	42	42	42
105 mph Exposure C	12	36	36	36	42	48	54	60	60	60	60
	16	36	36	36	36	42	48	54	54	54	54
	20	36	36	36	36	36	42	48	48	48	48
	24	36	36	36	36	36	42	42	42	42	42
110 mph Exposure C	12	36	36	36	42	48	60	60	60	60	60
	16	36	36	36	36	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	36	42	42	42	42	42
120 mph Exposure C	12	36	42	42	48	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	42
130 mph Exposure C	12	36	42	42	48	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	42
140 mph Exposure C	12	42	48	48	54	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	42	48	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	*
150 mph Exposure C	12	42	48	48	54	60	60	60	60	60	60
	16	36	42	42	42	54	54	54	54	54	54
	20	36	36	36	42	48	48	48	48	48	*
	24	36	36	36	36	42	42	42	42	*	*
160 mph Exposure C	12	48	54	54	60	60	60	60	60	60	60
	16	36	42	42	48	54	54	54	54	54	54
	20	36	36	36	42	48	48	48	48	*	*
	24	36	36	36	36	42	42	42	*	*	*

Notes: see page 51

Soil Class 2											
Table 4C - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	36	36	42	48	60	60	60	60	60
	16	36	36	36	36	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	36	42	42	42	42	42
105 mph Exposure D	12	36	36	42	42	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	42
110 mph Exposure D	12	36	42	42	48	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	42
120 mph Exposure D	12	36	42	42	48	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	42
130 mph Exposure D	12	42	48	48	54	54	60	60	60	60	60
	16	36	36	36	42	48	54	54	54	54	54
	20	36	36	36	42	48	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	*
140 mph Exposure D	12	42	48	48	54	60	60	60	60	60	60
	16	36	42	42	42	54	54	54	54	54	54
	20	36	36	36	42	48	48	48	48	48	*
	24	36	36	36	36	42	42	42	42	*	*
150 mph Exposure D	12	48	54	54	60	60	60	60	60	60	60
	16	36	42	42	48	54	54	54	54	54	*
	20	36	36	36	42	48	48	48	48	*	*
	24	36	36	36	42	42	42	42	*	*	*
160 mph Exposure D	12	48	54	54	60	60	60	60	60	60	60
	16	42	42	42	48	54	54	54	54	54	*
	20	36	36	36	42	48	48	48	*	*	*
	24	36	36	36	42	42	42	*	*	*	*

Notes: see page 51

Soil Class 2											
Table 4D - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	36	36	42	48	54	54	60
	16	36	36	36	36	36	36	42	48	48	54
	20	36	36	36	36	36	36	36	42	42	48
	24	36	36	36	36	36	36	36	36	42	42
105 mph Exposure B	12	36	36	36	36	42	42	48	54	60	60
	16	36	36	36	36	36	42	42	48	48	54
	20	36	36	36	36	36	36	42	42	48	48
	24	36	36	36	36	36	36	36	42	42	48
110 mph Exposure B	12	36	36	36	36	42	48	54	54	60	66
	16	36	36	36	36	36	42	42	48	54	54
	20	36	36	36	36	36	36	42	42	48	48
	24	36	36	36	36	36	36	36	42	42	48
120 mph Exposure B	12	36	36	36	42	48	48	54	60	60	66
	16	36	36	36	36	36	42	48	48	54	60
	20	36	36	36	36	36	36	42	48	48	54
	24	36	36	36	36	36	36	42	42	42	48
130 mph Exposure B	12	36	36	36	42	48	48	54	60	66	66
	16	36	36	36	36	36	42	48	54	54	60
	20	36	36	36	36	36	42	42	48	48	54
	24	36	36	36	36	36	36	42	42	48	48
140 mph Exposure B	12	36	42	36	48	54	54	60	60	66	72
	16	36	36	36	36	42	48	48	54	60	60
	20	36	36	36	36	36	42	48	48	54	54
	24	36	36	36	36	36	36	42	48	48	54
150 mph Exposure B	12	36	42	36	48	54	60	60	66	66	72
	16	36	36	36	42	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	48	54	60
	24	36	36	36	36	36	42	42	48	48	54
160 mph Exposure B	12	36	42	48	54	60	60	60	66	72	78
	16	36	36	36	42	48	48	54	60	60	66
	20	36	36	36	36	36	42	48	54	54	60
	24	36	36	36	36	36	42	48	48	54	54

Notes: see page 51

Soil Class 2											
Table 4E - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	36	36	42	48	48	54	60	60	66
	16	36	36	36	36	36	42	48	48	54	60
	20	36	36	36	36	36	36	42	48	48	54
	24	36	36	36	36	36	36	42	42	48	48
105 mph Exposure C	12	36	36	36	42	42	48	54	60	60	66
	16	36	36	36	36	36	42	48	48	54	60
	20	36	36	36	36	36	36	42	48	48	54
	24	36	36	36	36	36	36	36	42	48	48
110 mph Exposure C	12	36	36	36	48	48	54	54	60	66	72
	16	36	36	36	36	42	42	48	54	54	60
	20	36	36	36	36	36	42	42	48	54	54
	24	36	36	36	36	36	36	42	42	48	48
120 mph Exposure C	12	36	42	36	48	54	54	60	60	66	72
	16	36	36	36	42	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	48	54	60
	24	36	36	36	36	36	36	42	48	48	54
130 mph Exposure C	12	36	42	48	54	60	60	60	66	72	78
	16	36	36	36	42	48	48	54	60	60	66
	20	36	36	36	36	36	42	48	54	54	60
	24	36	36	36	36	36	42	42	48	54	54
140 mph Exposure C	12	42	48	48	54	60	66	66	66	72	78
	16	36	36	36	42	48	48	54	60	66	66
	20	36	36	36	36	42	48	48	54	60	60
	24	36	36	36	36	36	42	48	48	54	60
150 mph Exposure C	12	42	48	54	60	66	66	66	72	78	78
	16	36	42	36	48	54	54	60	60	66	72
	20	36	36	36	42	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	54	54	60
160 mph Exposure C	12	48	54	54	66	72	72	72	72	78	84
	16	36	42	36	48	54	54	60	66	66	72
	20	36	36	36	42	48	48	54	60	60	66
	24	36	36	36	36	42	42	48	54	54	60

Notes: see page 51

Soil Class 2											
Table 4F - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	36	36	48	48	54	54	60	66	72
	16	36	36	36	36	42	42	48	54	54	60
	20	36	36	36	36	36	42	42	48	54	54
	24	36	36	36	36	36	36	42	42	48	48
105 mph Exposure D	12	36	42	36	48	54	54	60	60	66	72
	16	36	36	36	36	42	48	48	54	60	60
	20	36	36	36	36	36	42	48	48	54	54
	24	36	36	36	36	36	36	42	48	48	54
110 mph Exposure D	12	36	42	36	48	54	54	60	66	66	72
	16	36	36	36	42	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	48	54	60
	24	36	36	36	36	36	42	42	48	48	54
120 mph Exposure D	12	36	48	48	54	60	60	60	66	72	78
	16	36	36	36	42	48	48	54	60	60	66
	20	36	36	36	36	36	42	48	54	54	60
	24	36	36	36	36	36	42	48	48	54	54
130 mph Exposure D	12	42	48	48	60	66	66	66	66	72	78
	16	36	36	36	48	48	54	54	60	66	72
	20	36	36	36	36	42	48	48	54	60	60
	24	36	36	36	36	36	42	48	48	54	60
140 mph Exposure D	12	42	54	54	60	66	72	72	72	78	84
	16	36	42	36	48	54	54	60	60	66	72
	20	36	36	36	42	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	54	54	60
150 mph Exposure D	12	48	54	60	66	72	72	72	72	78	84
	16	36	42	36	54	54	60	60	66	72	72
	20	36	36	36	42	48	48	54	60	60	66
	24	36	36	36	36	42	48	48	54	60	60
160 mph Exposure D	12	48	60	60	72	78	78	78	78	84	90
	16	42	48	48	54	60	60	60	66	72	78
	20	36	36	36	42	48	48	54	60	66	72
	24	36	36	36	36	42	48	54	54	60	66

Notes: see page 51

Soil Class 3											
Table 3A - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	42	48	48	48	48	48	48
	16	36	36	36	36	42	42	42	42	42	42
	20	36	36	36	36	36	42	42	42	42	42
	24	36	36	36	36	36	36	36	36	36	*
105 mph Exposure B	12	36	36	36	42	48	48	48	48	48	48
	16	36	36	36	36	42	42	42	42	42	42
	20	36	36	36	36	42	42	42	42	42	*
	24	36	36	36	36	36	36	36	36	*	*
110 mph Exposure B	12	36	36	36	42	48	48	48	48	48	48
	16	36	36	36	36	42	42	42	42	42	42
	20	36	36	36	36	42	42	42	42	42	*
	24	36	36	36	36	36	36	36	*	*	*
120 mph Exposure B	12	36	36	36	42	48	48	48	48	48	48
	16	36	36	36	36	42	42	42	42	42	*
	20	36	36	36	36	42	42	42	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
130 mph Exposure B	12	36	36	36	48	48	48	48	48	48	48
	16	36	36	36	42	42	42	42	42	*	*
	20	36	36	36	36	42	42	42	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
140 mph Exposure B	12	36	36	36	48	48	48	48	48	48	*
	16	36	36	36	42	42	42	42	*	*	*
	20	36	36	36	36	42	42	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
150 mph Exposure B	12	36	36	36	48	48	48	48	48	*	*
	16	36	36	36	42	42	42	*	*	*	*
	20	36	36	36	42	42	42	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
160 mph Exposure B	12	36	36	42	48	48	48	48	*	*	*
	16	36	36	36	42	42	42	*	*	*	*
	20	36	36	36	42	42	*	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*

Notes: see page 51

Soil Class 3											
Table 3B - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	36	36	42	48	48	48	48	48	48
	16	36	36	36	42	42	42	42	42	42	*
	20	36	36	36	36	42	42	42	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
105 mph Exposure C	12	36	36	36	42	48	48	48	48	48	48
	16	36	36	36	42	42	42	42	42	*	*
	20	36	36	36	36	42	42	42	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
110 mph Exposure C	12	36	36	36	48	48	48	48	48	48	*
	16	36	36	36	42	42	42	42	*	*	*
	20	36	36	36	36	42	42	*	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
120 mph Exposure C	12	36	36	36	48	48	48	48	48	*	*
	16	36	36	36	42	42	42	*	*	*	*
	20	36	36	36	36	42	42	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
130 mph Exposure C	12	36	36	42	48	48	48	48	*	*	*
	16	36	36	36	42	42	42	*	*	*	*
	20	36	36	36	42	42	*	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
140 mph Exposure C	12	36	36	42	48	48	48	*	*	*	*
	16	36	36	36	42	42	*	*	*	*	*
	20	36	36	36	42	42	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
150 mph Exposure C	12	36	42	42	48	48	48	*	*	*	*
	16	36	36	36	42	42	*	*	*	*	*
	20	36	36	36	42	*	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
160 mph Exposure C	12	36	42	42	48	48	48	*	*	*	*
	16	36	36	36	42	42	*	*	*	*	*
	20	36	36	36	42	*	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*

Notes: see page 51

Soil Class 3											
Table 3C - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	36	36	48	48	48	48	48	48	*
	16	36	36	36	42	42	42	42	*	*	*
	20	36	36	36	36	42	42	*	*	*	*
	24	36	36	36	36	36	36	*	*	*	*
105 mph Exposure D	12	36	36	36	48	48	48	48	48	48	*
	16	36	36	36	42	42	42	42	*	*	*
	20	36	36	36	36	42	42	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
110 mph Exposure D	12	36	36	36	48	48	48	48	48	*	*
	16	36	36	36	42	42	42	*	*	*	*
	20	36	36	36	42	42	42	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
120 mph Exposure D	12	36	36	42	48	48	48	48	*	*	*
	16	36	36	36	42	42	42	*	*	*	*
	20	36	36	36	42	42	*	*	*	*	*
	24	36	36	36	36	36	*	*	*	*	*
130 mph Exposure D	12	36	36	42	48	48	48	*	*	*	*
	16	36	36	36	42	42	*	*	*	*	*
	20	36	36	36	42	42	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
140 mph Exposure D	12	36	42	42	48	48	48	*	*	*	*
	16	36	36	36	42	42	*	*	*	*	*
	20	36	36	36	42	*	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
150 mph Exposure D	12	36	42	42	48	48	*	*	*	*	*
	16	36	36	36	42	42	*	*	*	*	*
	20	36	36	36	42	*	*	*	*	*	*
	24	36	36	36	36	*	*	*	*	*	*
160 mph Exposure D	12	42	48	48	48	48	*	*	*	*	*
	16	36	36	42	42	*	*	*	*	*	*
	20	36	36	36	42	*	*	*	*	*	*
	24	36	36	36	*	*	*	*	*	*	*

Notes: see page 51

Soil Class 3											
Table 3D - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	36	42	48	54	54	60	66
	16	36	36	36	36	36	42	48	48	54	54
	20	36	36	36	36	36	36	42	42	48	48
	24	36	36	36	36	36	36	36	42	42	48
105 mph Exposure B	12	36	36	36	36	42	48	54	54	60	66
	16	36	36	36	36	36	42	48	48	54	60
	20	36	36	36	36	36	36	42	48	48	54
	24	36	36	36	36	36	36	42	42	42	48
110 mph Exposure B	12	36	36	36	36	42	48	54	60	60	66
	16	36	36	36	36	36	42	48	48	54	60
	20	36	36	36	36	36	36	42	48	48	54
	24	36	36	36	36	36	36	42	42	48	48
120 mph Exposure B	12	36	36	36	36	42	48	54	60	66	72
	16	36	36	36	36	42	42	48	54	60	60
	20	36	36	36	36	36	42	48	48	54	54
	24	36	36	36	36	36	36	42	42	48	54
130 mph Exposure B	12	36	36	36	42	48	54	60	66	66	72
	16	36	36	36	36	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	48	54	60
	24	36	36	36	36	36	36	42	48	48	54
140 mph Exposure B	12	36	36	36	42	48	54	60	66	72	78
	16	36	36	36	36	42	48	54	60	60	66
	20	36	36	36	36	36	42	48	54	54	60
	24	36	36	36	36	36	42	42	48	54	54
150 mph Exposure B	12	36	36	36	42	48	54	66	66	72	78
	16	36	36	36	36	42	48	54	60	66	66
	20	36	36	36	36	42	48	48	54	60	60
	24	36	36	36	36	36	42	48	48	54	54
160 mph Exposure B	12	36	36	36	42	54	60	66	72	72	78
	16	36	36	36	36	48	54	60	60	66	72
	20	36	36	36	36	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	54	54	60

Notes: see page 51

Soil Class 3											
Table 3E - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	36	36	36	48	54	60	60	66	72
	16	36	36	36	36	42	42	48	54	60	60
	20	36	36	36	36	36	42	48	48	54	54
	24	36	36	36	36	36	36	42	42	48	54
105 mph Exposure C	12	36	36	36	42	48	54	60	60	66	72
	16	36	36	36	36	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	48	54	60
	24	36	36	36	36	36	36	42	48	48	54
110 mph Exposure C	12	36	36	36	42	48	54	60	66	66	72
	16	36	36	36	36	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	48	54	60
	24	36	36	36	36	36	42	42	48	48	54
120 mph Exposure C	12	36	36	36	42	48	54	60	66	72	78
	16	36	36	36	36	42	48	54	60	66	66
	20	36	36	36	36	42	42	48	54	54	60
	24	36	36	36	36	36	42	48	48	54	54
130 mph Exposure C	12	36	36	36	42	54	60	66	72	72	78
	16	36	36	36	36	48	54	60	60	66	72
	20	36	36	36	36	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	48	54	60
140 mph Exposure C	12	36	36	36	48	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	66	66	72
	20	36	36	36	36	42	48	54	60	60	66
	24	36	36	36	36	42	42	48	54	54	60
150 mph Exposure C	12	36	42	36	48	54	60	72	72	78	84
	16	36	36	36	42	48	54	60	66	72	78
	20	36	36	36	36	42	48	54	60	66	66
	24	36	36	36	36	42	48	48	54	60	60
160 mph Exposure C	12	36	42	42	48	54	66	72	78	84	90
	16	36	36	36	42	48	54	60	66	72	78
	20	36	36	36	36	48	54	54	60	66	72
	24	36	36	36	36	42	48	54	54	60	66

Notes: see page 51

Soil Class 3											
Table 3F - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	36	36	42	48	54	60	66	66	72
	16	36	36	36	36	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	48	54	60
	24	36	36	36	36	36	42	42	48	48	54
105 mph Exposure D	12	36	36	36	42	48	54	60	66	72	78
	16	36	36	36	36	42	48	54	60	60	66
	20	36	36	36	36	36	42	48	54	54	60
	24	36	36	36	36	36	42	48	48	54	54
110 mph Exposure D	12	36	36	36	42	48	54	60	66	72	78
	16	36	36	36	36	42	48	54	60	66	66
	20	36	36	36	36	42	42	48	54	60	60
	24	36	36	36	36	36	42	48	48	54	54
120 mph Exposure D	12	36	36	36	42	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	60	66	72
	20	36	36	36	36	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	54	54	60
130 mph Exposure D	12	36	42	36	48	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	66	66	72
	20	36	36	36	36	42	48	54	60	60	66
	24	36	36	36	36	42	42	48	54	60	60
140 mph Exposure D	12	36	42	36	48	54	66	72	78	84	90
	16	36	36	36	42	48	54	60	66	72	78
	20	36	36	36	36	42	48	54	60	66	66
	24	36	36	36	36	42	48	54	54	60	66
150 mph Exposure D	12	36	42	48	54	60	66	72	78	84	90
	16	36	36	36	42	48	60	66	66	72	78
	20	36	36	36	42	48	54	60	60	66	72
	24	36	36	36	36	42	48	54	54	60	66
160 mph Exposure D	12	42	48	48	54	60	66	78	78	84	96
	16	36	36	36	42	54	60	66	72	78	84
	20	36	36	36	42	48	54	60	66	66	72
	24	36	36	36	36	42	48	54	60	60	66

Notes: see page 51

Soil Class 3											
Table 4A - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	42	48	60	66	72	78	78	78
	16	36	36	36	42	54	60	66	66	66	66
	20	36	36	36	42	48	54	60	60	60	60
	24	36	36	36	36	42	48	54	60	60	60
105 mph Exposure B	12	36	36	42	48	60	66	78	78	78	78
	16	36	36	36	48	54	60	66	66	66	66
	20	36	36	36	42	48	54	60	60	60	60
	24	36	36	36	36	48	54	60	60	60	60
110 mph Exposure B	12	36	36	42	54	60	72	78	78	78	78
	16	36	36	36	48	54	60	66	66	66	66
	20	36	36	36	42	48	54	60	60	60	60
	24	36	36	36	42	48	54	60	60	60	60
120 mph Exposure B	12	36	36	42	54	66	72	78	78	78	78
	16	36	36	36	48	54	66	66	66	66	66
	20	36	36	36	42	54	60	60	60	60	60
	24	36	36	36	42	48	54	60	60	60	60
130 mph Exposure B	12	36	42	42	54	66	78	78	78	78	78
	16	36	36	42	48	60	66	66	66	66	66
	20	36	36	36	48	54	60	60	60	60	60
	24	36	36	36	42	48	54	60	60	60	60
140 mph Exposure B	12	42	48	48	60	66	78	78	78	78	78
	16	36	36	42	54	60	66	66	66	66	66
	20	36	36	36	48	54	60	60	60	60	60
	24	36	36	36	42	54	60	60	60	60	60
150 mph Exposure B	12	42	48	48	60	72	78	78	78	78	78
	16	36	36	42	54	60	66	66	66	66	66
	20	36	36	36	48	60	60	60	60	60	60
	24	36	36	36	48	54	60	60	60	60	60
160 mph Exposure B	12	42	54	54	60	72	78	78	78	78	78
	16	36	42	42	54	66	66	66	66	66	66
	20	36	36	42	48	60	60	60	60	60	60
	24	36	36	36	48	54	60	60	60	60	60

Notes: see page 51

Soil Class 3											
Table 4B - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	42	42	54	66	72	78	78	78	78
	16	36	36	36	48	54	66	66	66	66	66
	20	36	36	36	42	54	60	60	60	60	60
	24	36	36	36	42	48	54	60	60	60	60
105 mph Exposure C	12	36	36	42	54	60	72	78	78	78	78
	16	36	36	36	48	54	60	66	66	66	66
	20	36	36	36	42	48	54	60	60	60	60
	24	36	36	36	42	48	54	60	60	60	60
110 mph Exposure C	12	36	42	48	54	66	78	78	78	78	78
	16	36	36	42	48	60	66	66	66	66	66
	20	36	36	36	48	54	60	60	60	60	60
	24	36	36	36	42	48	60	60	60	60	60
120 mph Exposure C	12	42	48	48	60	72	78	78	78	78	78
	16	36	36	42	54	60	66	66	66	66	66
	20	36	36	36	48	54	60	60	60	60	60
	24	36	36	36	48	54	60	60	60	60	60
130 mph Exposure C	12	42	54	54	60	72	78	78	78	78	78
	16	36	42	42	54	66	66	66	66	66	66
	20	36	36	42	48	60	60	60	60	60	60
	24	36	36	36	48	54	60	60	60	60	60
140 mph Exposure C	12	48	54	54	66	72	78	78	78	78	78
	16	36	42	42	54	66	66	66	66	66	66
	20	36	36	42	54	60	60	60	60	60	60
	24	36	36	36	48	54	60	60	60	60	*
150 mph Exposure C	12	48	60	60	66	78	78	78	78	78	78
	16	42	48	48	60	66	66	66	66	66	66
	20	36	36	42	54	60	60	60	60	60	*
	24	36	36	42	48	60	60	60	60	*	*
160 mph Exposure C	12	54	60	60	72	78	78	78	78	78	78
	16	42	48	48	60	66	66	66	66	66	66
	20	36	42	42	54	60	60	60	60	*	*
	24	36	36	42	48	60	60	60	*	*	*

Notes: see page 51

Soil Class 3											
Table 4C - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	42	48	54	66	78	78	78	78	78
	16	36	36	42	48	60	66	66	66	66	66
	20	36	36	36	48	54	60	60	60	60	60
	24	36	36	36	42	48	60	60	60	60	60
105 mph Exposure D	12	42	48	48	60	66	78	78	78	78	78
	16	36	36	42	54	60	66	66	66	66	66
	20	36	36	36	48	54	60	60	60	60	60
	24	36	36	36	42	54	60	60	60	60	60
110 mph Exposure D	12	42	48	48	60	72	78	78	78	78	78
	16	36	36	42	54	60	66	66	66	66	66
	20	36	36	36	48	54	60	60	60	60	60
	24	36	36	36	48	54	60	60	60	60	60
120 mph Exposure D	12	42	54	54	60	72	78	78	78	78	78
	16	36	42	42	54	66	66	66	66	66	66
	20	36	36	42	48	60	60	60	60	60	60
	24	36	36	36	48	54	60	60	60	60	60
130 mph Exposure D	12	48	54	54	66	78	78	78	78	78	78
	16	36	42	48	54	66	66	66	66	66	66
	20	36	36	42	54	60	60	60	60	60	60
	24	36	36	36	48	54	60	60	60	60	*
140 mph Exposure D	12	54	60	60	66	78	78	78	78	78	78
	16	42	48	48	60	66	66	66	66	66	66
	20	36	36	42	54	60	60	60	60	60	*
	24	36	36	42	48	60	60	60	60	*	*
150 mph Exposure D	12	54	66	66	72	78	78	78	78	78	78
	16	42	48	48	60	66	66	66	66	66	*
	20	36	42	42	54	60	60	60	60	*	*
	24	36	36	42	54	60	60	60	*	*	*
160 mph Exposure D	12	60	66	66	78	78	78	78	78	78	78
	16	48	54	54	60	66	66	66	66	66	*
	20	36	42	48	54	60	60	60	*	*	*
	24	36	36	42	54	60	60	*	*	*	*

Notes: see page 51

Soil Class 3											
Table 4D - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	42	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	60	66	72
	20	36	36	36	36	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	54	54	60
105 mph Exposure B	12	36	36	36	48	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	66	66	72
	20	36	36	36	36	42	48	54	60	60	66
	24	36	36	36	36	42	42	48	54	60	60
110 mph Exposure B	12	36	36	36	48	54	60	72	72	78	84
	16	36	36	36	42	48	54	60	66	72	78
	20	36	36	36	36	42	48	54	60	66	66
	24	36	36	36	36	42	48	54	54	60	66
120 mph Exposure B	12	36	42	42	48	60	66	72	78	84	90
	16	36	36	36	42	48	60	66	66	72	78
	20	36	36	36	42	48	54	60	60	66	72
	24	36	36	36	36	42	48	54	60	60	66
130 mph Exposure B	12	36	42	48	54	60	66	78	84	90	96
	16	36	36	36	42	54	60	66	72	78	84
	20	36	36	36	42	48	54	60	66	72	72
	24	36	36	36	36	42	48	54	60	66	66
140 mph Exposure B	12	42	48	48	60	60	72	78	84	90	96
	16	36	36	36	48	54	60	72	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	42	48	54	60	60	66	72
150 mph Exposure B	12	42	48	54	60	66	72	84	90	96	*
	16	36	42	36	48	54	66	72	78	84	90
	20	36	36	36	42	48	60	66	72	72	78
	24	36	36	36	42	48	54	60	66	66	72
160 mph Exposure B	12	42	54	54	66	72	78	84	90	96	*
	16	36	42	42	48	60	66	72	78	84	90
	20	36	36	36	42	54	60	66	72	78	84
	24	36	36	36	42	48	54	60	66	72	78

Notes: see page 51

Soil Class 3											
Table 4E - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	42	42	48	60	66	72	78	84	90
	16	36	36	36	42	48	60	66	72	72	78
	20	36	36	36	42	48	54	60	60	66	72
	24	36	36	36	36	42	48	54	60	60	66
105 mph Exposure C	12	36	36	42	48	54	60	72	78	84	96
	16	36	36	36	42	48	54	66	66	72	84
	20	36	36	36	36	42	48	54	60	66	72
	24	36	36	36	36	42	48	54	60	60	66
110 mph Exposure C	12	36	48	48	54	60	72	78	84	90	96
	16	36	36	36	48	54	60	66	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	36	42	48	54	60	66	72
120 mph Exposure C	12	42	48	54	60	66	72	78	84	96	*
	16	36	36	36	48	54	66	72	78	84	90
	20	36	36	36	42	48	60	66	66	72	78
	24	36	36	36	42	48	54	60	60	66	72
130 mph Exposure C	12	42	54	54	66	72	78	84	90	96	*
	16	36	42	42	48	60	66	72	78	84	90
	20	36	36	36	42	54	60	66	72	78	84
	24	36	36	36	42	48	54	60	66	72	78
140 mph Exposure C	12	48	60	60	72	78	78	90	96	*	*
	16	36	42	48	54	60	66	78	84	90	96
	20	36	36	36	48	54	60	66	72	78	84
	24	36	36	36	42	48	54	66	66	72	78
150 mph Exposure C	12	48	60	66	72	84	84	90	96	*	*
	16	42	48	48	54	60	72	78	84	90	96
	20	36	42	36	48	54	66	72	78	84	90
	24	36	36	36	42	54	60	66	72	78	78
160 mph Exposure C	12	54	66	66	78	84	90	90	*	*	*
	16	42	48	54	60	66	72	84	90	96	*
	20	36	42	42	48	60	66	72	78	84	90
	24	36	36	36	48	54	60	66	72	78	84

Notes: see page 51

Soil Class 3											
Table 4F - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	48	48	54	60	72	78	84	90	96
	16	36	36	36	48	54	60	66	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	36	42	48	54	60	66	72
105 mph Exposure D	12	42	48	48	60	66	72	78	84	90	96
	16	36	36	36	48	54	60	72	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	42	48	54	60	60	66	72
110 mph Exposure D	12	42	48	54	60	66	72	84	84	96	*
	16	36	42	36	48	54	66	72	78	84	90
	20	36	36	36	42	48	60	66	66	72	78
	24	36	36	36	42	48	54	60	66	66	72
120 mph Exposure D	12	42	54	54	66	72	78	84	90	96	*
	16	36	42	42	48	60	66	72	78	84	90
	20	36	36	36	48	54	60	66	72	78	84
	24	36	36	36	42	48	54	60	66	72	78
130 mph Exposure D	12	48	60	60	72	78	78	90	96	*	*
	16	36	48	48	54	60	72	78	84	90	96
	20	36	36	36	48	54	60	72	72	78	84
	24	36	36	36	42	48	60	66	66	72	78
140 mph Exposure D	12	54	60	66	78	84	84	90	96	*	*
	16	42	48	48	60	66	72	78	84	90	*
	20	36	42	42	48	54	66	72	78	84	90
	24	36	36	36	42	54	60	66	72	78	84
150 mph Exposure D	12	54	66	72	78	90	90	96	*	*	*
	16	42	54	54	60	66	72	84	90	96	*
	20	36	42	42	48	60	66	72	78	84	90
	24	36	36	36	48	54	60	66	72	78	84
160 mph Exposure D	12	60	72	72	84	96	96	96	*	*	*
	16	48	54	60	66	72	78	84	90	96	*
	20	36	48	48	54	60	66	78	84	90	96
	24	36	36	36	48	54	66	72	78	84	90

Notes: see page 51

Soil Class 4											
Table 3A - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	42	54	54	54	54	54	54
	16	36	36	36	42	48	48	48	48	48	48
	20	36	36	36	36	42	48	48	48	48	48
	24	36	36	36	36	42	42	42	42	42	*
105 mph Exposure B	12	36	36	36	48	54	54	54	54	54	54
	16	36	36	36	42	48	48	48	48	48	48
	20	36	36	36	36	42	48	48	48	48	*
	24	36	36	36	36	42	42	42	42	*	*
110 mph Exposure B	12	36	36	36	48	54	54	54	54	54	54
	16	36	36	36	42	48	48	48	48	48	48
	20	36	36	36	36	42	48	48	48	48	*
	24	36	36	36	36	42	42	42	*	*	*
120 mph Exposure B	12	36	36	36	48	54	54	54	54	54	54
	16	36	36	36	42	48	48	48	48	48	*
	20	36	36	36	42	48	48	48	*	*	*
	24	36	36	36	36	42	42	*	*	*	*
130 mph Exposure B	12	36	36	42	48	54	54	54	54	54	54
	16	36	36	36	48	48	48	48	48	*	*
	20	36	36	36	42	48	48	48	*	*	*
	24	36	36	36	36	42	42	*	*	*	*
140 mph Exposure B	12	36	36	42	54	54	54	54	54	54	*
	16	36	36	36	48	48	48	48	*	*	*
	20	36	36	36	42	48	48	*	*	*	*
	24	36	36	36	42	42	*	*	*	*	*
150 mph Exposure B	12	36	42	42	54	54	54	54	54	*	*
	16	36	36	36	48	48	48	*	*	*	*
	20	36	36	36	42	48	48	*	*	*	*
	24	36	36	36	42	42	*	*	*	*	*
160 mph Exposure B	12	36	42	42	54	54	54	54	*	*	*
	16	36	36	42	48	48	48	*	*	*	*
	20	36	36	36	48	48	*	*	*	*	*
	24	36	36	36	42	42	*	*	*	*	*

Notes: see page 51

Soil Class 4											
Table 3B - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	36	42	48	54	54	54	54	54	54
	16	36	36	36	42	48	48	48	48	48	*
	20	36	36	36	42	48	48	48	*	*	*
	24	36	36	36	36	42	42	*	*	*	*
105 mph Exposure C	12	36	36	42	48	54	54	54	54	54	54
	16	36	36	36	42	48	48	48	48	*	*
	20	36	36	36	42	48	48	48	*	*	*
	24	36	36	36	36	42	42	*	*	*	*
110 mph Exposure C	12	36	36	42	54	54	54	54	54	54	*
	16	36	36	36	48	48	48	48	*	*	*
	20	36	36	36	42	48	48	*	*	*	*
	24	36	36	36	42	42	42	*	*	*	*
120 mph Exposure C	12	36	42	42	54	54	54	54	54	*	*
	16	36	36	36	48	48	48	*	*	*	*
	20	36	36	36	42	48	48	*	*	*	*
	24	36	36	36	42	42	*	*	*	*	*
130 mph Exposure C	12	36	42	42	54	54	54	54	*	*	*
	16	36	36	42	48	48	48	*	*	*	*
	20	36	36	36	42	48	*	*	*	*	*
	24	36	36	36	42	42	*	*	*	*	*
140 mph Exposure C	12	42	48	48	54	54	54	*	*	*	*
	16	36	36	42	48	48	*	*	*	*	*
	20	36	36	36	48	48	*	*	*	*	*
	24	36	36	36	42	*	*	*	*	*	*
150 mph Exposure C	12	42	48	48	54	54	54	*	*	*	*
	16	36	36	42	48	48	*	*	*	*	*
	20	36	36	36	48	*	*	*	*	*	*
	24	36	36	36	42	*	*	*	*	*	*
160 mph Exposure C	12	48	54	54	54	54	54	*	*	*	*
	16	36	42	42	48	48	*	*	*	*	*
	20	36	36	42	48	*	*	*	*	*	*
	24	36	36	36	42	*	*	*	*	*	*

Notes: see page 51

Soil Class 4											
Table 3C - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	36	42	54	54	54	54	54	54	*
	16	36	36	36	48	48	48	48	*	*	*
	20	36	36	36	42	48	48	*	*	*	*
	24	36	36	36	42	42	42	*	*	*	*
105 mph Exposure D	12	36	36	42	54	54	54	54	54	54	*
	16	36	36	36	48	48	48	48	*	*	*
	20	36	36	36	42	48	48	*	*	*	*
	24	36	36	36	42	42	*	*	*	*	*
110 mph Exposure D	12	36	42	42	54	54	54	54	54	*	*
	16	36	36	36	48	48	48	*	*	*	*
	20	36	36	36	42	48	48	*	*	*	*
	24	36	36	36	42	42	*	*	*	*	*
120 mph Exposure D	12	36	42	42	54	54	54	54	*	*	*
	16	36	36	42	48	48	48	*	*	*	*
	20	36	36	36	48	48	*	*	*	*	*
	24	36	36	36	42	42	*	*	*	*	*
130 mph Exposure D	12	42	48	48	54	54	54	*	*	*	*
	16	36	36	42	48	48	*	*	*	*	*
	20	36	36	36	48	48	*	*	*	*	*
	24	36	36	36	42	*	*	*	*	*	*
140 mph Exposure D	12	42	54	54	54	54	54	*	*	*	*
	16	36	42	42	48	48	*	*	*	*	*
	20	36	36	36	48	*	*	*	*	*	*
	24	36	36	36	42	*	*	*	*	*	*
150 mph Exposure D	12	48	54	54	54	54	*	*	*	*	*
	16	36	42	42	48	48	*	*	*	*	*
	20	36	36	42	48	*	*	*	*	*	*
	24	36	36	36	42	*	*	*	*	*	*
160 mph Exposure D	12	48	60	60	54	54	*	*	*	*	*
	16	36	42	42	48	*	*	*	*	*	*
	20	36	36	42	48	*	*	*	*	*	*
	24	36	36	36	*	*	*	*	*	*	*

Notes: see page 51

Soil Class 4											
Table 3D - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	36	36	36	42	48	54	60	60	66	72
	16	36	36	36	36	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	48	54	60
	24	36	36	36	36	36	36	42	48	48	54
105 mph Exposure B	12	36	36	36	42	48	54	60	66	72	72
	16	36	36	36	36	42	48	54	54	60	66
	20	36	36	36	36	36	42	48	54	54	60
	24	36	36	36	36	36	42	42	48	48	54
110 mph Exposure B	12	36	36	36	42	48	54	60	66	72	78
	16	36	36	36	36	42	48	54	60	60	66
	20	36	36	36	36	36	42	48	54	54	60
	24	36	36	36	36	36	42	48	48	54	54
120 mph Exposure B	12	36	36	36	42	48	60	66	72	72	78
	16	36	36	36	36	42	48	54	60	66	72
	20	36	36	36	36	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	48	54	60
130 mph Exposure B	12	36	36	36	48	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	66	66	72
	20	36	36	36	36	42	48	54	60	60	66
	24	36	36	36	36	42	42	48	54	54	60
140 mph Exposure B	12	36	42	36	48	54	60	72	72	78	84
	16	36	36	36	42	48	54	60	66	72	78
	20	36	36	36	36	42	48	54	60	66	66
	24	36	36	36	36	42	48	48	54	60	60
150 mph Exposure B	12	36	42	42	54	54	66	72	78	84	90
	16	36	36	36	42	48	54	66	66	72	78
	20	36	36	36	36	48	54	60	60	66	72
	24	36	36	36	36	42	48	54	54	60	66
160 mph Exposure B	12	36	48	48	54	60	66	72	78	84	90
	16	36	36	36	42	54	60	66	72	72	78
	20	36	36	36	42	48	54	60	60	66	72
	24	36	36	36	36	42	48	54	60	60	66

Notes: see page 51

Soil Class 4											
Table 3E - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	36	36	36	42	54	60	66	72	72	78
	16	36	36	36	36	48	54	60	60	66	72
	20	36	36	36	36	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	54	54	60
105 mph Exposure C	12	36	36	36	48	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	60	66	72
	20	36	36	36	36	42	48	54	54	60	66
	24	36	36	36	36	36	42	48	54	54	60
110 mph Exposure C	12	36	36	36	48	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	66	66	72
	20	36	36	36	36	42	48	54	60	60	66
	24	36	36	36	36	42	42	48	54	60	60
120 mph Exposure C	12	36	42	36	48	54	66	72	78	84	90
	16	36	36	36	42	48	54	60	66	72	78
	20	36	36	36	36	42	48	54	60	66	72
	24	36	36	36	36	42	48	54	54	60	66
130 mph Exposure C	12	36	48	48	54	60	66	72	78	84	90
	16	36	36	36	42	54	60	66	72	72	78
	20	36	36	36	42	48	54	60	60	66	72
	24	36	36	36	36	42	48	54	60	60	66
140 mph Exposure C	12	42	48	48	60	66	66	78	84	90	96
	16	36	36	36	48	54	60	66	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	36	42	48	54	60	66	72
150 mph Exposure C	12	42	54	54	60	66	72	78	84	90	96
	16	36	42	36	48	54	60	72	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	42	48	54	60	60	66	72
160 mph Exposure C	12	48	54	60	66	72	72	84	90	96	*
	16	36	42	42	48	54	66	72	78	84	90
	20	36	36	36	42	54	60	66	72	72	78
	24	36	36	36	42	48	54	60	66	66	72

Notes: see page 51

Soil Class 4											
Table 3F - MINIMUM FOUNDATION DEPTHS (in)											
2" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	36	36	36	48	54	60	66	72	78	84
	16	36	36	36	42	48	54	60	66	66	72
	20	36	36	36	36	42	48	54	60	60	66
	24	36	36	36	36	42	42	48	54	60	60
105 mph Exposure D	12	36	42	36	48	54	60	72	72	78	84
	16	36	36	36	42	48	54	60	66	72	78
	20	36	36	36	36	42	48	54	60	66	66
	24	36	36	36	36	42	48	54	54	60	60
110 mph Exposure D	12	36	42	42	48	54	66	72	78	84	90
	16	36	36	36	42	48	54	60	66	72	78
	20	36	36	36	36	42	48	54	60	66	72
	24	36	36	36	36	42	48	54	54	60	66
120 mph Exposure D	12	36	48	48	54	60	66	72	78	84	90
	16	36	36	36	42	54	60	66	72	78	78
	20	36	36	36	42	48	54	60	66	66	72
	24	36	36	36	36	42	48	54	60	60	66
130 mph Exposure D	12	42	48	54	60	66	72	78	84	90	96
	16	36	36	36	48	54	60	66	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	36	42	48	54	60	66	72
140 mph Exposure D	12	42	54	54	66	72	72	78	84	90	*
	16	36	42	36	48	54	66	72	78	78	90
	20	36	36	36	42	48	60	66	66	72	78
	24	36	36	36	42	48	54	60	60	66	72
150 mph Exposure D	12	48	54	60	66	72	78	84	90	96	*
	16	36	42	48	54	60	66	72	78	84	90
	20	36	36	36	42	54	60	66	72	78	84
	24	36	36	36	42	48	54	60	66	72	72
160 mph Exposure D	12	48	60	60	72	78	84	84	90	96	*
	16	36	48	48	54	60	66	78	78	84	96
	20	36	36	36	48	54	60	66	72	78	84
	24	36	36	36	42	48	54	60	66	72	78

Notes: see page 51

Soil Class 4											
Table 4A - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	42	42	42	54	66	78	84	90	90	90
	16	36	36	42	48	60	66	72	78	78	78
	20	36	36	36	48	54	60	66	72	72	72
	24	36	36	36	42	48	54	60	66	66	66
105 mph Exposure B	12	42	42	48	54	66	78	84	90	90	90
	16	36	36	42	48	60	66	78	78	78	78
	20	36	36	36	48	54	60	72	72	72	72
	24	36	36	36	42	48	60	66	66	66	66
110 mph Exposure B	12	42	42	48	60	66	78	90	90	90	90
	16	36	36	42	54	60	72	78	78	78	78
	20	36	36	36	48	54	66	72	72	72	72
	24	36	36	36	42	54	60	66	66	66	66
120 mph Exposure B	12	42	48	48	60	72	84	90	90	90	90
	16	36	36	42	54	66	72	78	78	78	78
	20	36	36	42	48	60	66	72	72	72	72
	24	36	36	36	48	54	60	66	66	66	66
130 mph Exposure B	12	48	54	54	60	72	84	90	90	90	90
	16	36	42	42	54	66	78	78	78	78	78
	20	36	36	42	54	60	66	72	72	72	72
	24	36	36	36	48	54	66	66	66	66	66
140 mph Exposure B	12	48	60	60	66	78	90	90	90	90	90
	16	36	42	48	60	66	78	78	78	78	78
	20	36	36	42	54	60	72	72	72	72	72
	24	36	36	42	48	60	66	66	66	66	66
150 mph Exposure B	12	54	60	66	72	78	90	90	90	90	90
	16	42	48	48	60	72	78	78	78	78	78
	20	36	36	42	54	66	72	72	72	72	72
	24	36	36	42	48	60	66	66	66	66	66
160 mph Exposure B	12	60	66	66	78	84	90	90	90	90	90
	16	42	48	54	60	72	78	78	78	78	78
	20	36	42	42	54	66	72	72	72	72	72
	24	36	36	42	54	60	66	66	66	66	66

Notes: see page 51

Soil Class 4											
Table 4B - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	42	48	54	60	72	84	90	90	90	90
	16	36	36	42	54	66	72	78	78	78	78
	20	36	36	42	48	60	66	72	72	72	72
	24	36	36	36	48	54	60	66	66	66	66
105 mph Exposure C	12	42	48	48	60	66	78	90	90	90	90
	16	36	36	42	54	60	72	78	78	78	78
	20	36	36	42	48	54	66	72	72	72	72
	24	36	36	36	42	54	60	66	66	66	66
110 mph Exposure C	12	48	54	54	66	78	84	90	90	90	90
	16	36	42	48	54	66	78	78	78	78	78
	20	36	36	42	54	60	72	72	72	72	72
	24	36	36	36	48	54	66	66	66	66	66
120 mph Exposure C	12	54	60	60	72	78	90	90	90	90	90
	16	42	48	48	60	72	78	78	78	78	78
	20	36	36	42	54	66	72	72	72	72	72
	24	36	36	42	48	60	66	66	66	66	66
130 mph Exposure C	12	54	66	66	78	84	90	90	90	90	90
	16	42	48	54	60	72	78	78	78	78	78
	20	36	42	42	54	66	72	72	72	72	72
	24	36	36	42	54	60	66	66	66	66	66
140 mph Exposure C	12	60	72	72	84	84	90	90	90	90	90
	16	48	54	54	66	72	78	78	78	78	78
	20	36	42	48	60	66	72	72	72	72	72
	24	36	36	42	54	66	66	66	66	66	*
150 mph Exposure C	12	66	78	78	90	90	90	90	90	90	90
	16	48	60	60	66	78	78	78	78	78	78
	20	42	48	48	60	72	72	72	72	72	*
	24	36	42	42	54	66	66	66	66	*	*
160 mph Exposure C	12	72	84	84	96	96	90	90	90	90	90
	16	54	60	60	72	78	78	78	78	78	78
	20	42	48	48	60	72	72	72	72	*	*
	24	36	42	48	54	66	66	66	*	*	*

Notes: see page 51

Soil Class 4											
Table 4C - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	48	54	54	66	78	84	90	90	90	90
	16	36	42	48	54	66	78	78	78	78	78
	20	36	36	42	54	60	72	72	72	72	72
	24	36	36	36	48	54	66	66	66	66	66
105 mph Exposure D	12	48	60	60	66	78	90	90	90	90	90
	16	36	42	48	60	66	78	78	78	78	78
	20	36	36	42	54	60	72	72	72	72	72
	24	36	36	42	48	60	66	66	66	66	66
110 mph Exposure D	12	54	60	60	72	78	90	90	90	90	90
	16	42	48	48	60	72	78	78	78	78	78
	20	36	36	42	54	66	72	72	72	72	72
	24	36	36	42	48	60	66	66	66	66	66
120 mph Exposure D	12	60	66	66	78	84	90	90	90	90	90
	16	42	54	54	60	72	78	78	78	78	78
	20	36	42	42	54	66	72	72	72	72	72
	24	36	36	42	54	60	66	66	66	66	66
130 mph Exposure D	12	60	72	72	84	90	90	90	90	90	90
	16	48	54	54	66	78	78	78	78	78	78
	20	36	42	48	60	66	72	72	72	72	72
	24	36	36	42	54	66	66	66	66	66	*
140 mph Exposure D	12	66	78	78	90	96	90	90	90	90	90
	16	54	60	60	66	78	78	78	78	78	78
	20	42	48	48	60	72	72	72	72	72	*
	24	36	42	42	54	66	66	66	66	*	*
150 mph Exposure D	12	72	84	84	96	96	90	90	90	90	90
	16	54	66	66	72	78	78	78	78	78	*
	20	42	54	54	60	72	72	72	72	*	*
	24	36	42	48	60	66	66	66	*	*	*
160 mph Exposure D	12	78	90	90	*	96	90	90	90	90	90
	16	60	66	66	78	78	78	78	78	78	*
	20	48	54	54	66	72	72	72	*	*	*
	24	42	48	48	60	66	66	*	*	*	*

Notes: see page 51

Soil Class 4											
Table 4D - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure B	12	42	42	42	54	60	66	78	84	90	96
	16	36	36	36	42	54	60	66	72	78	84
	20	36	36	36	42	48	54	60	66	72	72
	24	36	36	36	36	42	48	54	60	66	66
105 mph Exposure B	12	42	42	48	54	60	72	78	84	90	96
	16	36	36	36	48	54	60	66	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	36	42	48	54	60	66	72
110 mph Exposure B	12	42	42	48	60	66	72	78	84	90	*
	16	36	36	36	48	54	60	72	72	78	84
	20	36	36	36	42	48	54	60	66	72	78
	24	36	36	36	42	48	54	60	60	66	72
120 mph Exposure B	12	42	48	54	66	72	72	84	90	96	*
	16	36	42	42	48	60	66	72	78	84	90
	20	36	36	36	42	54	60	66	72	78	84
	24	36	36	36	42	48	54	60	66	72	78
130 mph Exposure B	12	48	54	60	72	78	78	84	96	*	*
	16	36	42	48	54	60	66	78	84	90	96
	20	36	36	36	48	54	60	66	72	78	84
	24	36	36	36	42	48	54	66	66	72	78
140 mph Exposure B	12	48	60	66	72	84	84	90	96	*	*
	16	36	48	48	54	60	72	78	84	90	96
	20	36	36	36	48	54	66	72	78	84	90
	24	36	36	36	42	54	60	66	72	78	84
150 mph Exposure B	12	54	66	66	78	90	90	96	*	*	*
	16	42	48	54	60	66	72	84	90	96	*
	20	36	42	42	48	60	66	72	78	84	90
	24	36	36	36	48	54	60	66	72	78	84
160 mph Exposure B	12	60	72	72	84	96	96	96	*	*	*
	16	42	54	54	66	72	78	84	90	96	*
	20	36	42	42	54	60	66	78	84	90	96
	24	36	36	36	48	54	60	72	72	78	84

Notes: see page 51

Soil Class 4											
Table 4E - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	42	54	54	66	72	78	84	90	96	*
	16	36	42	42	48	60	66	72	78	84	90
	20	36	36	36	42	54	60	66	72	78	84
	24	36	36	36	42	48	54	60	66	72	78
105 mph Exposure C	12	42	48	54	60	66	72	84	90	96	*
	16	36	36	42	48	54	60	72	78	84	96
	20	36	36	36	42	48	54	66	72	78	84
	24	36	36	36	42	48	54	60	66	72	78
110 mph Exposure C	12	48	60	60	72	78	84	90	96	*	*
	16	36	42	48	54	60	72	78	84	90	96
	20	36	36	36	48	54	60	72	72	78	84
	24	36	36	36	42	48	60	66	66	72	78
120 mph Exposure C	12	54	66	66	78	84	90	90	*	*	*
	16	42	48	54	60	66	72	78	84	96	*
	20	36	42	42	48	60	66	72	78	84	90
	24	36	36	36	48	54	60	66	72	78	84
130 mph Exposure C	12	54	72	72	84	96	96	96	*	*	*
	16	42	54	54	66	72	78	84	90	96	*
	20	36	42	42	54	60	66	78	84	90	96
	24	36	36	36	48	54	60	72	72	78	84
140 mph Exposure C	12	60	78	78	90	*	*	*	*	*	*
	16	48	54	60	66	78	78	90	96	*	*
	20	36	48	48	54	60	72	78	84	90	96
	24	36	36	42	48	54	66	72	78	84	90
150 mph Exposure C	12	66	78	84	96	*	*	*	*	*	*
	16	48	60	66	72	78	84	90	96	*	*
	20	42	48	48	60	66	72	84	90	96	*
	24	36	42	42	48	60	66	72	78	84	90
160 mph Exposure C	12	72	84	90	*	*	*	*	*	*	*
	16	54	66	66	78	84	90	96	*	*	*
	20	42	54	54	60	66	78	84	90	96	*
	24	36	42	42	54	60	72	78	84	90	96

Notes: see page 51

Soil Class 4											
Table 4F - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Braced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure D	12	48	60	60	72	78	84	90	96	*	*
	16	36	42	48	54	60	72	78	84	90	96
	20	36	36	36	48	54	60	72	72	78	84
	24	36	36	36	42	48	60	66	66	72	78
105 mph Exposure D	12	48	60	66	78	84	90	90	96	*	*
	16	36	48	48	54	60	72	78	84	90	96
	20	36	36	36	48	54	66	72	78	84	90
	24	36	36	36	42	54	60	66	72	78	84
110 mph Exposure D	12	54	66	66	78	90	90	90	*	*	*
	16	42	48	54	60	66	72	78	84	96	*
	20	36	42	42	48	60	66	72	78	84	90
	24	36	36	36	48	54	60	66	72	78	84
120 mph Exposure D	12	60	72	72	84	96	*	*	*	*	*
	16	42	54	54	66	72	78	84	90	96	*
	20	36	42	48	54	60	66	78	84	90	96
	24	36	36	36	48	54	60	72	78	78	90
130 mph Exposure D	12	60	78	78	96	*	*	*	*	*	*
	16	48	60	60	72	78	78	90	96	*	*
	20	36	48	48	54	60	72	78	84	90	96
	24	36	42	42	48	60	66	72	78	84	90
140 mph Exposure D	12	66	84	84	*	*	*	*	*	*	*
	16	54	60	66	78	84	84	90	96	*	*
	20	42	48	54	60	66	72	84	90	96	*
	24	36	42	42	54	60	66	78	78	90	96
150 mph Exposure D	12	72	90	96	*	*	*	*	*	*	*
	16	54	66	72	78	90	90	96	*	*	*
	20	42	54	54	66	72	78	84	90	96	*
	24	36	42	48	54	60	72	78	84	90	96
160 mph Exposure D	12	78	96	*	*	*	*	*	*	*	*
	16	60	72	72	84	96	96	96	*	*	*
	20	48	54	60	66	72	78	90	96	*	*
	24	42	48	48	54	66	72	78	84	90	*

Notes: see page 51

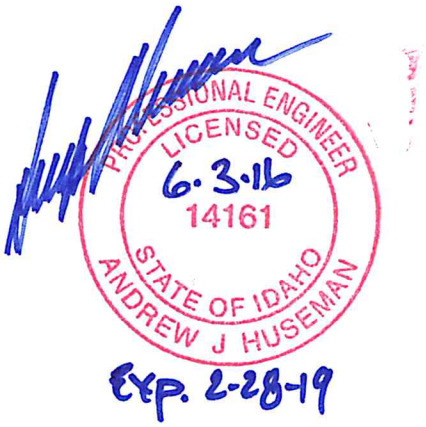
Notes for Tables 3 & 4:

1. Concrete Weight = 145 pcf / f'c = 2500 psi
2. Skin Friction per 2012 IBC 1810.3.3.1.4 & 5
3. Top 1'-0" of soil neglected for Skin Friction
4. Snow Load = 0 psf – tabulated values are conservative for Snow Loads > 0 psf
5. * indicates special foundation required. Contact IronRidge
6. Resistance to corrosion and/or sulfate attack, along with possible adverse effects due to expansive soils has not been considered in these foundation recommendations. SML Engineers assumes no liability with regard to these items.
7. Soil classification is to be determined and verified by the end user of this certification letter.

The analysis assumes that the array, including the connections and associated hardware, are installed in a workmanlike manner in accordance with the IronRidge Ground Mount Installation Manual and generally accepted standards of construction practice. Verification of PV Module capacity to support the loads associated with the given array shall be the responsibility of the Contractor or Owner and not IronRidge or Starling Madison Lofquist.

Please feel free to contact me at your convenience if you have any questions.

Respectfully yours,



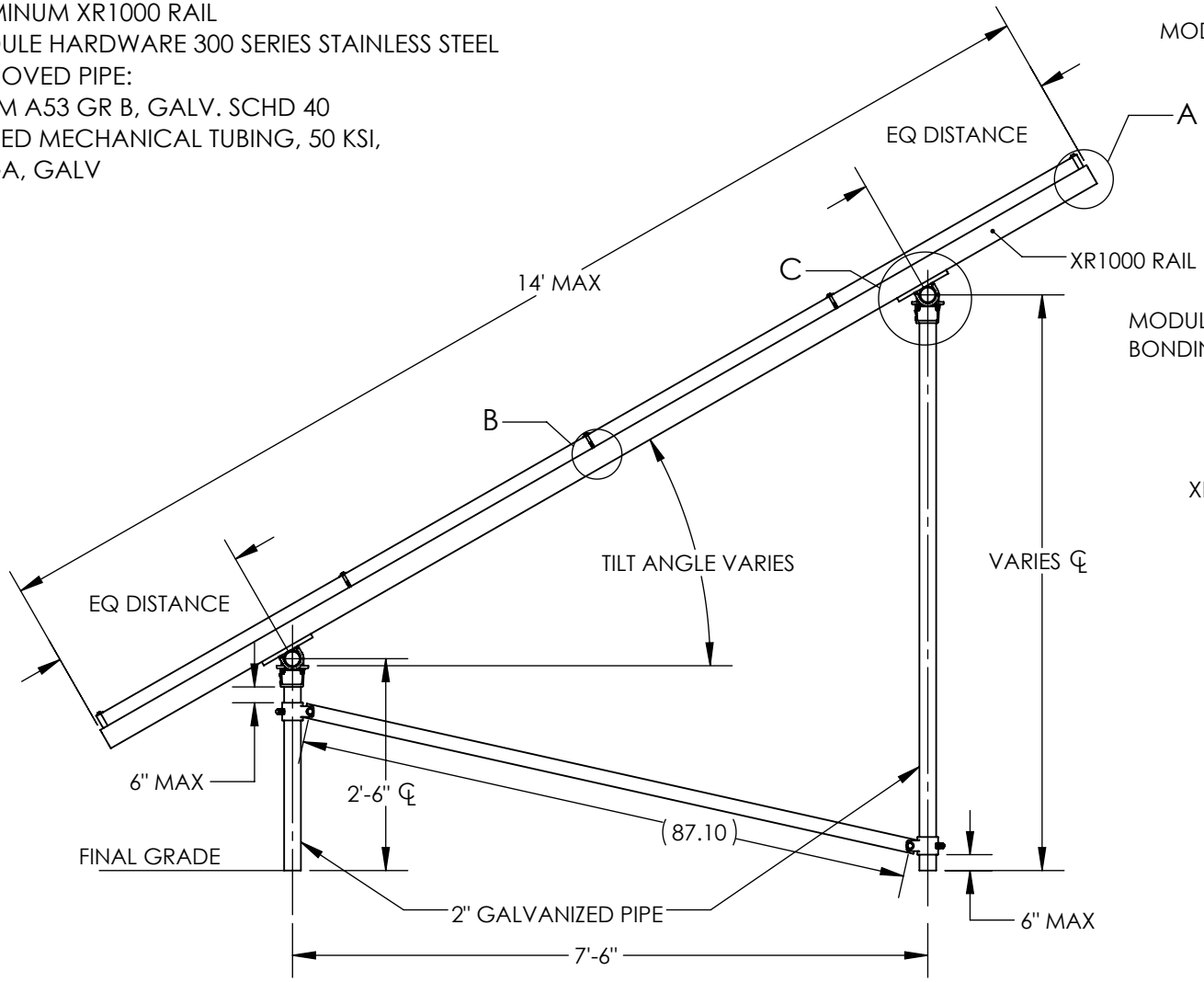
Andrew J. Huseman, P.E.
Licensed Professional Engineer

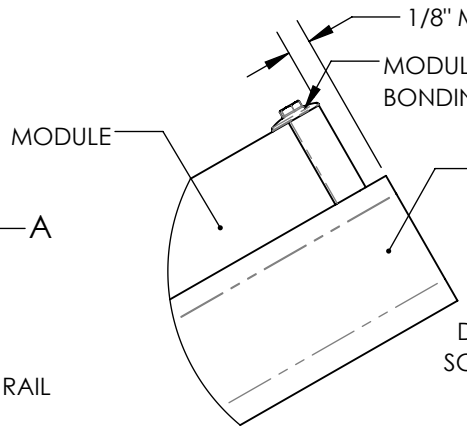
EXHIBIT: EX-0001

05/12/2016

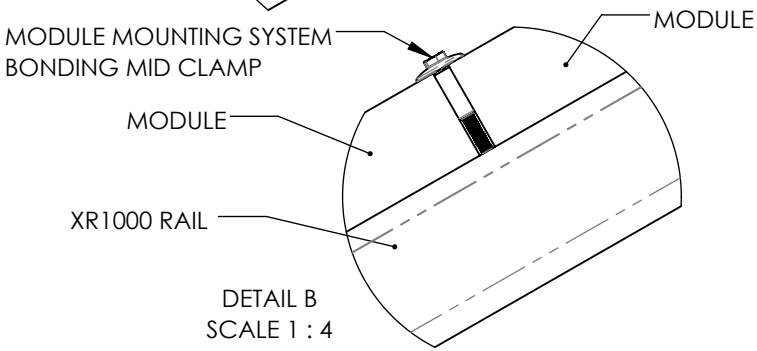
DESIGN CRITERIA & MATERIAL SPECIFICATIONS:
PER ASCE 7-10/WIND LOADING
MAXIMUM MODULE WEIGHT IS 3 psf
ALUMINUM XR1000 RAIL
MODULE HARDWARE 300 SERIES STAINLESS STEEL
APPROVED PIPE:
- ASTM A53 GR B, GALV. SCHD 40
- ALLIED MECHANICAL TUBING, 50 KSI, 12 GA, GALV

4 MODULE ROWS, 2" PIPE



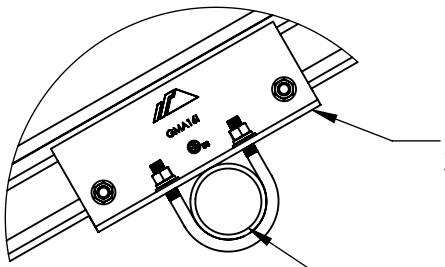


DETAIL A
SCALE 1 : 4



DETAIL B
SCALE 1 : 4

APPROVED 2" PIPE	
- ALLIED MECHANICAL TUBING - 50 ksi YIELD STRENGTH - GALVANIZED (ALLIED FLOCOAT, GATORSHIELD, OR HOT DIPPED) TOP CAP SET SCREW INSTALL TORQUE: 11 ft*lbs	**ALLIED MECH. TUBING, 12 GA** .109 in 2.375 in
- ASTM A53 GR B - 35 ksi YIELD STRENGTH - HOT DIPPED GALVANIZED TOP CAP SET SCREW INSTALL TORQUE: 20 ft*lbs	**SCHD. 40 PIPE** .154 in 2.375 in



DETAIL C
SCALE 1 : 6

XR1000 RAIL CONNECTION DETAIL
TO HORIZONTAL CROSS PIPE
(CONNECTOR, RAIL SGA 2")

CROSS PIPE

THIRD ANGLE PROJECTION	DRAWN	SO	04/10/2015
	CHECKED	--	--
	ENG APPR.	--	--
	MFG APPR.	--	--
DO NOT SCALE DRAWING	Q.A.	--	--

DIMENSIONS ARE IN INCHES.
TOLERANCES:
.XX: +/- .030
XXX: +/- .010
ANGLES: +/- 1°

IRONRIDGE

GROUND MOUNT SYSTEM 2" PIER, 4 SOLAR MODULE ROWS

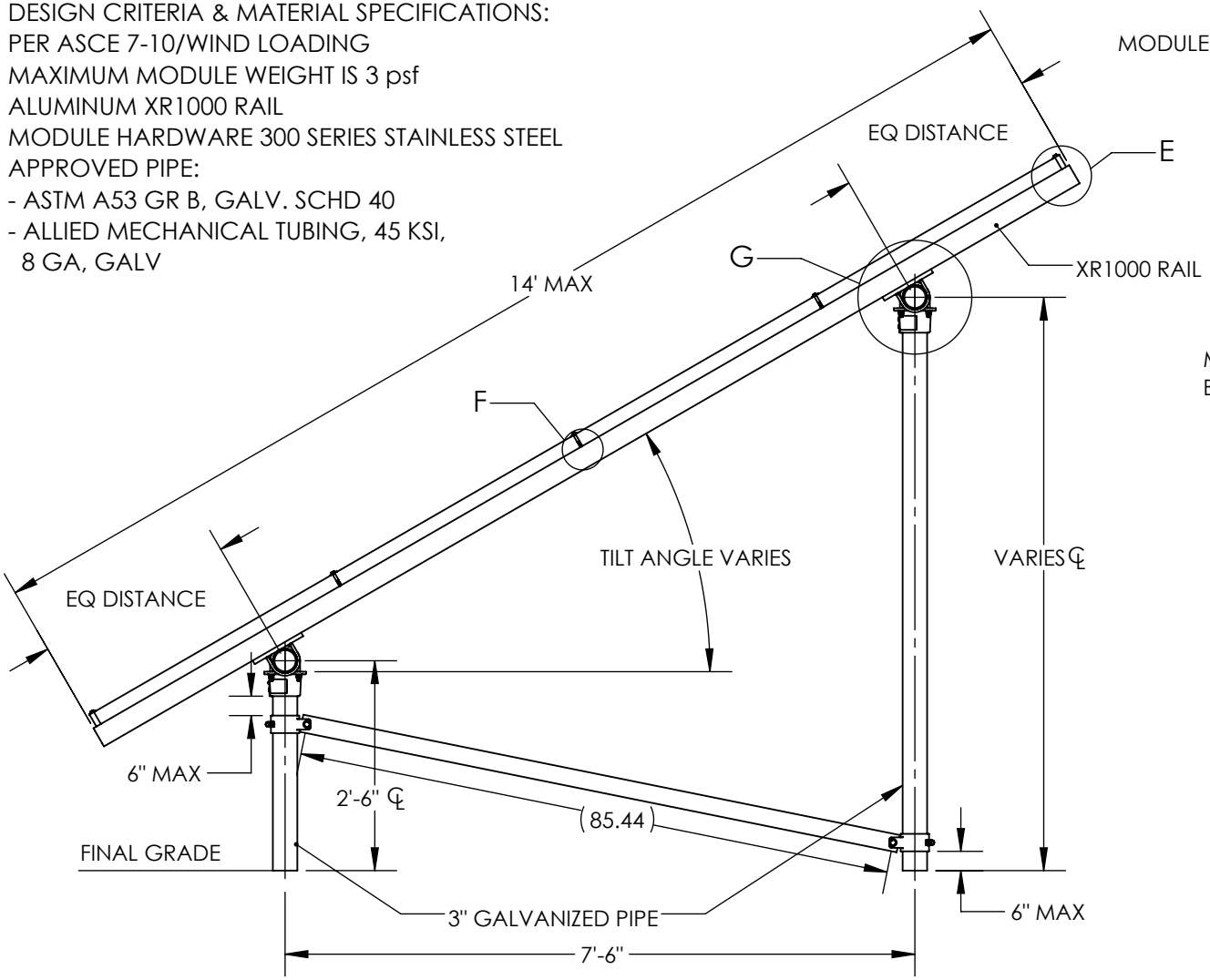
SIZE	DWG. NO	
A	EX-0001	
SCALE:1:25	WEIGHT:	SHEET 1 OF 5

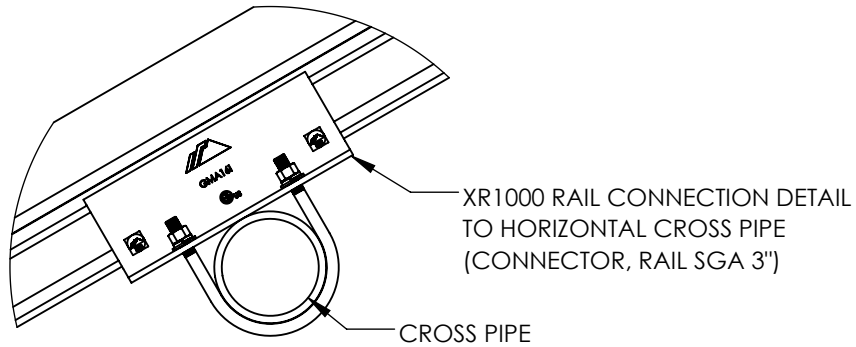
05/12/2016

EXHIBIT: EX-0001

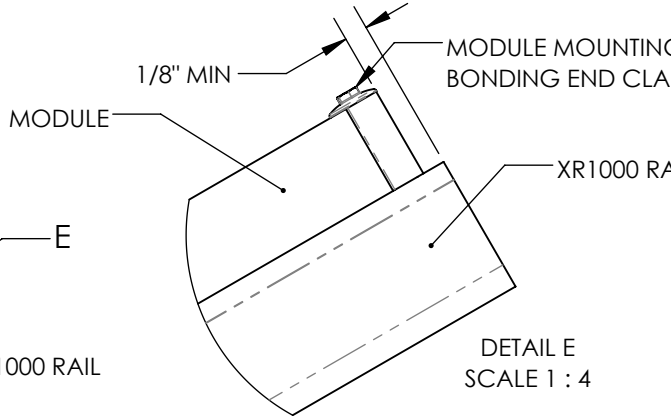
4 MODULE ROWS, 3" PIPE

DESIGN CRITERIA & MATERIAL SPECIFICATIONS:
PER ASCE 7-10/WIND LOADING
MAXIMUM MODULE WEIGHT IS 3 psf
ALUMINUM XR1000 RAIL
MODULE HARDWARE 300 SERIES STAINLESS STEEL
APPROVED PIPE:
- ASTM A53 GR B, GALV. SCHD 40
- ALLIED MECHANICAL TUBING, 45 KSI, 8 GA, GALV

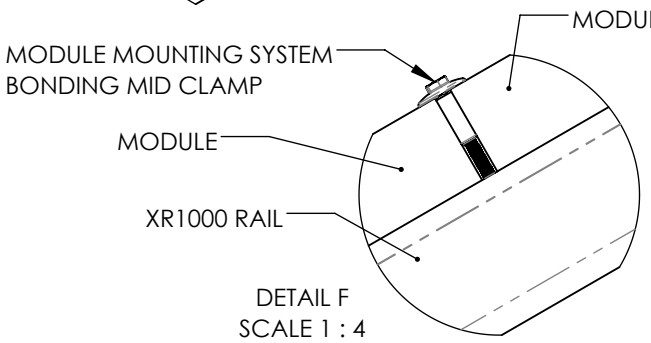




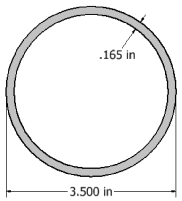
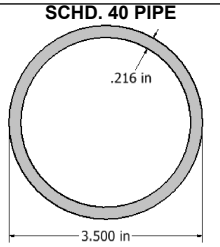
DETAIL G
SCALE 1 : 6



DETAIL E
SCALE 1 : 4



DETAIL F
SCALE 1 : 4

APPROVED 3" PIPE	
- ALLIED MECHANICAL TUBING - 45 ksi YIELD STRENGTH - GALVANIZED (ALLIED FLOCOAT, GATORSHIELD, OR HOT DIPPED) TOP CAP SET SCREW INSTALL TORQUE: 16 ft*lbs	**ALLIED MECH. TUBING, 8 GA** 
- ASTM A53 GR B - 35 ksi YIELD STRENGTH - HOT DIPPED GALVANIZED TOP CAP SET SCREW INSTALL TORQUE: 20 ft*lbs	**SCHD. 40 PIPE** 

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

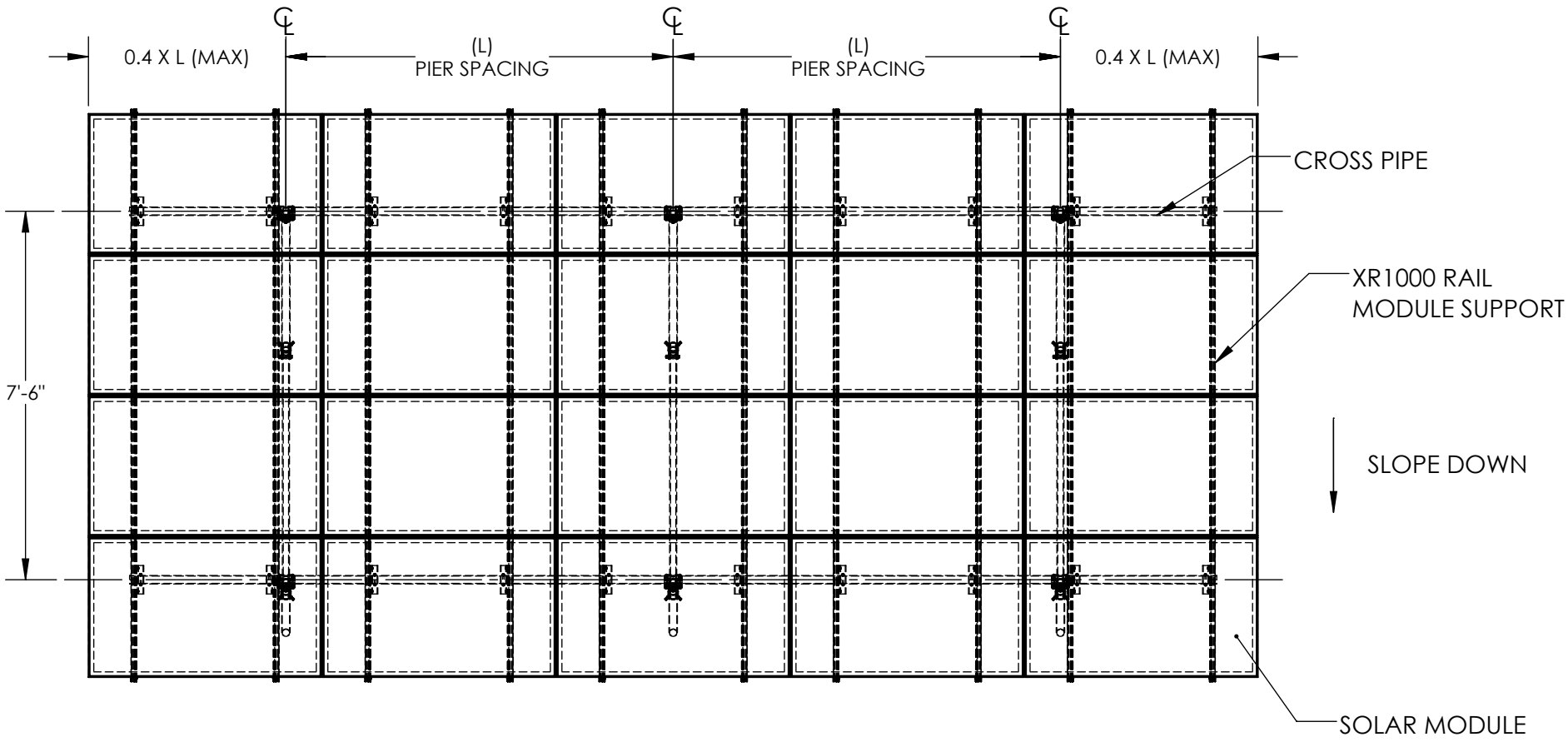
IRONRIDGE

GROUND MOUNT SYSTEM 3" PIER, 4 SOLAR MODULE ROWS

SIZE	DWG. NO.	
A	EX-0001	
SCALE:1:25	WEIGHT:	SHEET 2 OF 5

EXHIBIT: EX-0001

PLAN VIEW (6 PIER LAYOUT SHOWN)



THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

IRONRIDGE

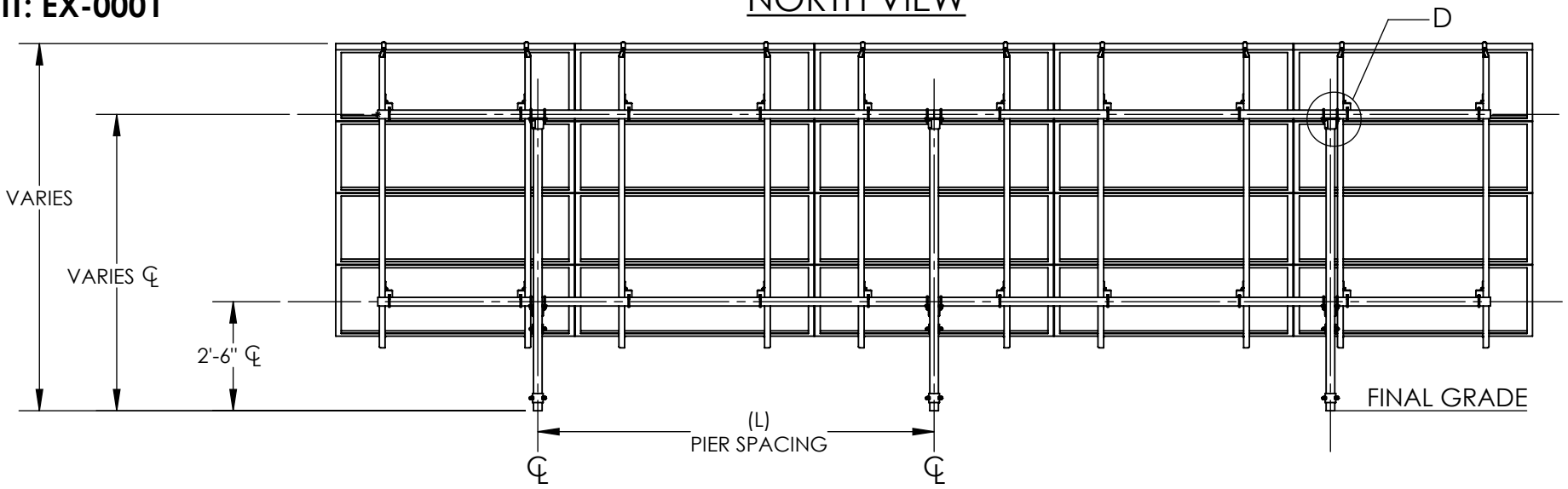
GROUND MOUNT SYSTEM,
4 SOLAR MODULE ROWS

SIZE	DWG. NO.	
A	EX-0001	
SCALE:1:25	WEIGHT:	SHEET 3 OF 5

EXHIBIT: EX-0001

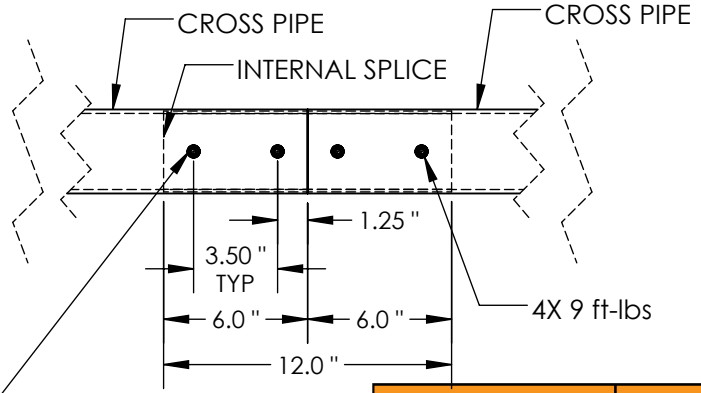
05/12/2016

NORTH VIEW



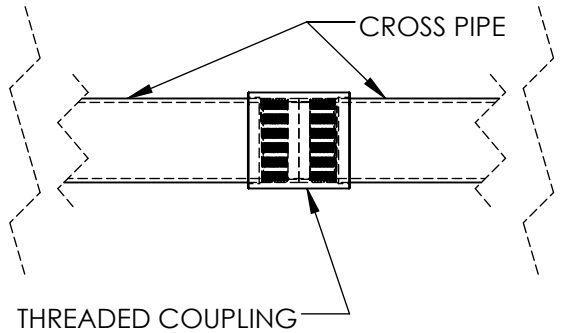
SPLICING CROSS PIPE

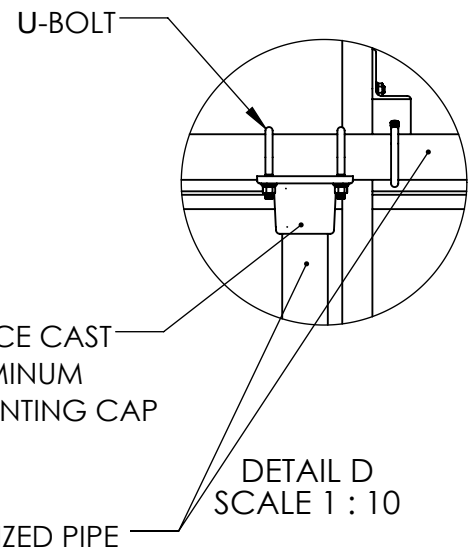
ALLIED MECHANICAL TUBING SPLICES



Mechanical Tube Size of the Structure	Splice Tube Size
2.375" OD, 12 Gauge	2.000" OD, 9 Gauge, Minimum 12" Long
3.500" OD, 8 Gauge	3.000" OD, 12 Gauge, Minimum 12" Long

SCHD. 40 PIPE SPLICES





DETAIL D
SCALE 1 : 10

CONNECTION BETWEEN VERTICAL PIER AND HORIZONTAL CROSS PIPE

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

IRONRIDGE

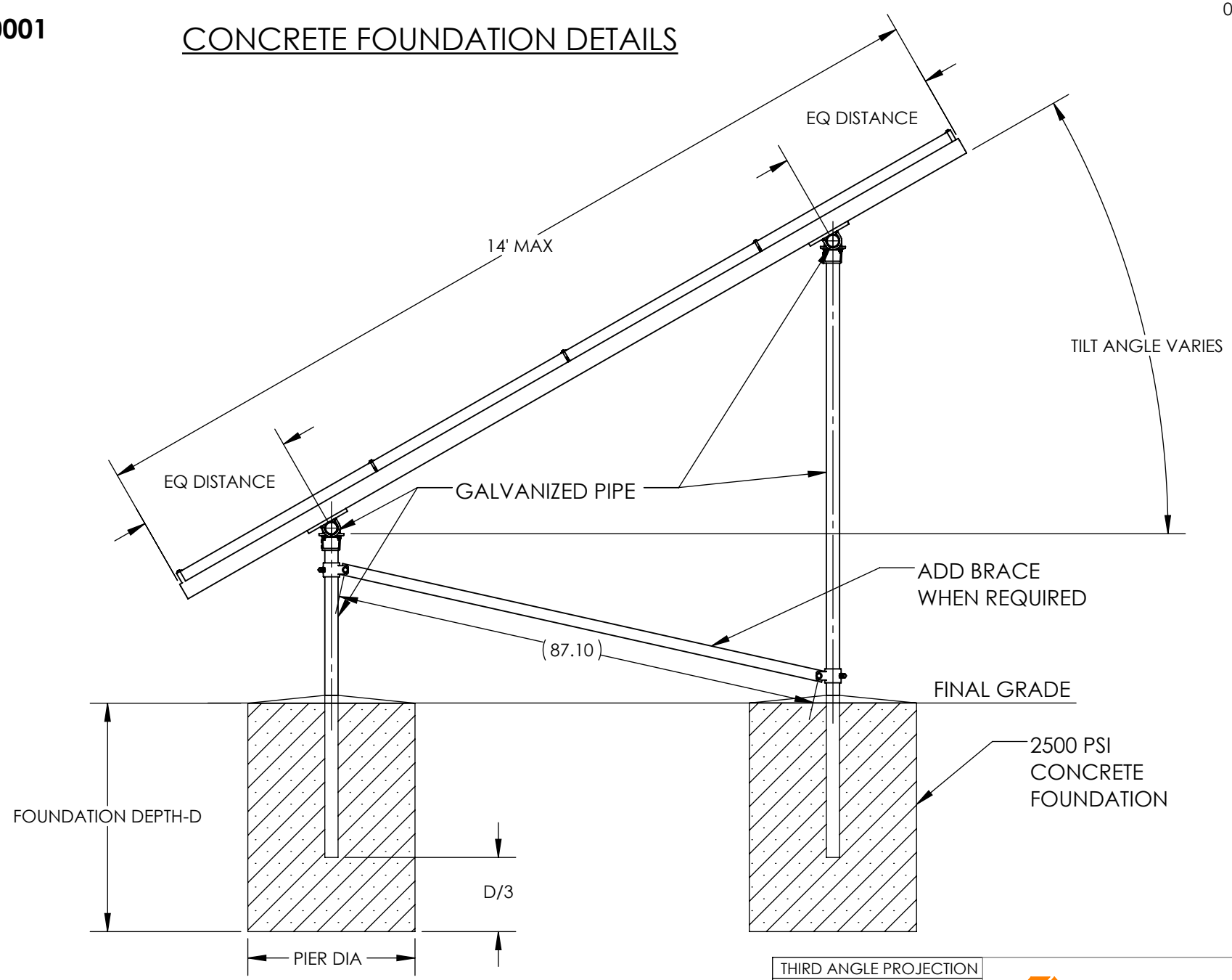
GROUND MOUNT SYSTEM,
4 SOLAR MODULE ROWS

SIZE	DWG. NO.	
A	EX-0001	
SCALE:1:25	WEIGHT:	SHEET 4 OF 5

05/12/2016

EXHIBIT: EX-0001

CONCRETE FOUNDATION DETAILS



NOTE:
THE ATTACHED SPAN TABLES ARE BASED ON USING DRILLED CAST-IN-PLACE CONCRETE PIER FOUNDATION SYSTEM. OTHER FOUNDATION SYSTEMS (EG. SCREW ANCHORS, DRIVEN PIERS) ARE PERMISSIBLE BUT MAY REQUIRE ADDITIONAL BRACING AND/OR REDUCED SPAN. PLEASE CONTACT IRONRIDGE FOR MORE INFORMATION.

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

IRONRIDGE

GROUND MOUNT SYSTEM,
4 SOLAR MODULE ROWS

SIZE	DWG. NO.	
A	EX-0001	
SCALE:1:25	WEIGHT:	SHEET 5 OF 5

ATTACHMENT F.

WINTER SUN CONDOMINIUM SUBDIVISION

PROPERTY OWNER APPROVALS

From: dewayne briscoe <briskyd@earthlink.net>
Date: November 30, 2017 at 5:18:45 PM MST
To: Mitch Long <m.long.boise@gmail.com>
Subject: Re: Hello from 420A Sage Rd

Hi,thanks for the opening conversation. I am out of state u till mid Dec. At first glance I have no objection to the Solar panels . Our units are identical,do you have floor plans as I have none ?

I would like to refinish my drive way to partial pavers like the sage terrace just did at the junction of sage and road from Warm springs, My neighbor Marne who shares the driveway with you is interested . It would improve the appearance and needs replacement anyway.
Another concern is the front landscaping which should be improved and kept low to preserve our views. These two things would improve the appearance and value of all .
There is a problem with the water to the complex.When the sprinklers go on I have no water in summer .
I am pleased you want to upgrade the complex for livability and value .It is my primary residence also . Our previous owners [except Marne } had let the complex deteoriate. Let's meet when I return . DEWAYNE. 208 720 9546
Sent from my iPad

On Nov 30, 2017, at 12:25 PM, Mitch Long <m.long.boise@gmail.com> wrote:
Hi Dwayne,

Angela Hicks gave us your email address. Last April we bought the unit next door at 420A Sage Rd, and are planning to make it our primary residence beginning next fall. Currently we are doing a bunch of remodeling, and this upcoming spring we would like to put in a solar system on the hillside behind our place. Unfortunately, we cannot place it on the roof due to a wrong exposure for our side of the duplex. I understand the HOA for our little complex no longer exists, so I wanted to check with you to see if you have any concerns about our putting in such a system. I have checked with the city who has stated they would not have any concerns about the location. The PV system will probably be 28 panels; 4 rows of 7 panels, likely measuring about 23' X 22'. We would locate it on our side of an imaginary line heading up the hillside from the steps between our place and the building you unit is in, probably about 30-40' behind the trees at the back of the property where the mowing ends. (High enough so that trees would not shade the panels and low enough so that they could not be seen from the street). I don't think you would be able to see it from your place, though. Please let me know your thoughts about this. I would be happy to meet with you sometime if you would like to further explain it, or answer any other questions you might have via email.

Thanks.

Mitch Long and Margit Donhowe

From: ppdean <ppdean@cox.net>
Date: April 17, 2018 at 1:34:26 PM MDT
To: Mitch Long <m.long.boise@gmail.com>
Subject: Re: Proposed hillside solar project

Yes! Nice meeting you as well. I talked to Ryan, and he said fine with the solar panels, not seeing the need for "checking out" the stakes. I will certainly let him know to contact you with any concerns.

Peggy

On Apr 17, 2018, at 10:20 AM, Mitch Long <m.long.boise@gmail.com> wrote:

Nice to meet you today! We're looking forward to meeting Ryan, as well. Let him know to contact either of us if he has any questions about this project, or anything else with the place.
By the way, I did move the stakes so that they will accurately reflect the size of the area involved.

Mitch

On Apr 17, 2018, at 8:05 AM, ppdean <ppdean@cox.net> wrote:

Hi Mitch,

I can't imagine this would be a problem, but since my son, Ryan, is the one who will be living there, I will check with him.
Also, I spoke with Steve of SV Roofing yesterday. He hopes to start on the project the first week of May. Ryan and I checked out the "Weathered Wood" shingles online. Those look fine. We'll hope for nice weather so the project doesn't get delayed.

Peggy

On Apr 16, 2018, at 5:12 PM, Mitch Long <m.long.boise@gmail.com> wrote:

Hi Peggy,

Last fall I had communicated with Karen M. about some solar panels we wanted to put on the hillside behind our place. Because our side of the roof faces north, we are not able to put solar panels on the roof, and instead would need to put them on the hillside. Karen had given her OK on the project, but with you taking ownership soon, I wanted to be sure you were OK with it, as well.
What we are proposing is to place 28 panels on the hillside in a configuration of 4 X 7. I thought that would work best to minimize their impact. That would occupy an area of 13 ft by slightly less than 13 ft. The idea is to place them behind the trees that sit at the bottom of the hillside between our place and the other Winter Sun

building. They would be on our side of an imaginary line that would extend up from the steps that go up the yard between the 2 buildings. They would need to be high enough up the hill so that the trees would not block the sun, and low enough that they could not be seen from the street. I don't think you would be able to see them from you unit except from your hot tub. I have placed 4 stakes on the hillside in the area approximately where I think it would work best.

We are hoping to start the project in the next month or two. Please let me know if the project is OK with you, and what concerns you may have about them.

Thanks.

Mitch and Margit

From: Marnie Roozen <marnieroozen@gmail.com>
Date: April 25, 2018 at 2:16:27 PM MDT
To: Mitch Long <m.long.boise@gmail.com>
Subject: Re: Solar project
Hi, sorry for the delay. I've been out of cell service up in the San Juan Islands for a week.

I don't have a problem with your solar panels. You mentioned you would plant something around the panels to hide them from view. My request would be the plants be something native that looks as natural as possible.
I won't be back there until late June at the earliest. Will you be around? I'd love to sit down and finally have a visit!
Thank you for reaching out. Apologies again for my slow response time. I'm usually pretty good. Just a lot going on as I get back in the swing of being in Washington!

Marnie

On Wed, Apr 25, 2018 at 8:25 AM Mitch Long <m.long.boise@gmail.com> wrote:
Hi Marnie,
I was wondering if you have had a chance to look at those photos, and decide about the solar panel project on the hillside. I have approval from Duane and the Deans to go ahead with the project, but need your decision, as well, before we can apply for the permit and begin the project. The solar contractor would like to get started soon and has been asking me about whether I have approval yet.
If you have any concerns or questions that you would like to talk to me about, I can also be reached at 208–484–6866.

Thanks.

Mitch and Margit

ATTACHMENT G.

PUBLIC COMMENT

From: tapsv@aol.com <tapsv@aol.com>
Sent: Tuesday, August 07, 2018 12:23 PM
To: Participate <participate@ketchumidaho.org>
Subject: 420 Sage Rd Solar

We applaud our neighbors' interest in renewable energy and, although it looks unsightly, we could probably live with the roof mounted solar thermal water heating system. The ground mounted solar array is a different kettle of fish entirely. Constructing this type of solar array on the hillside in the Mountain Overlay District would be completely inappropriate and, at the very least, would constitute a terrible precedent for further hillside development. Judging from the photograph, the roof is about the same size as the solar array and this is where it should be located.

Sincerely yours,

Tom and Jane Pittman

City of Ketchum

August 13, 2018

Planning & Zoning Commission
City of Ketchum
Ketchum, Idaho

Commissioners:

Recommendation to hold a public hearing and consider amending Title 17 of the Ketchum Municipal Code (KMC) to allow long-term winter season rentals within the City of Ketchum avalanche district for non-engineered single-family dwellings

Recommendation and Summary
Staff is recommending the Commission adopt the following motion:

> "Move to recommend approval to Council of the proposed amendment to §17.92.010.D of the Ketchum Municipal Code as set forth herein.

The reasons for the recommendation are as follows:

- The City recently adopted Ordinance #1181, which includes provisions affecting development within the City Avalanche Zone District, and Ordinance #1184, which brings the City's regulations into alignment with the State of Idaho Short-term Rental and Vacation Rental Act (SRVR Act).
- City data was presented that as many as 132 single-family engineered and non-engineered residences in the city are in areas of avalanche hazard and many of these residences are rented.
- Concern exists that many tenants, particularly those occupying a short term rental or tourist housing accommodation for brief periods during winter months may not understand the risk of living in an areas of avalanche hazard.
- The City Council directed staff on June 18, 2018 to investigate issues of safety, Idaho's SRVR Act, and make recommendations, which are set forth below.

Proposed Amendment.
All language proposed be added to the chapter is underlined. Text that is proposed to be repealed is ~~stricken~~.

SECTION 17.92.010.D USE RESTRICTIONS

4. For health and safety reasons, ~~A~~any residence that has not been engineered to withstand avalanche forces consistent with this chapter shall not be leased, rented, or sublet as a Tourist Housing Accommodation or a Short Term Rental from November 15 through April 15 of each year. ~~and any residence that has not been engineered to withstand avalanche forces that is being leased or rented or sublet after April 19, 1974 shall be deemed a zoning violation and shall be governed by chapter 17.156 of this title.~~

Attachment

- Avalanche zone single family map, showing 132 properties. (Note: Of the 132 single family homes in the city's avalanche zone, some of the homes have been engineered to withstand avalanche while many have not. Unfortunately, GIS data is not available to distinguish).

- Copy of Idaho Code §63-2801 *et.seq.* Regarding Short Term and Vacation Rental Act

City of Ketchum
Planning & Building

STAFF REPORT
KETCHUM PLANNING AND ZONING COMMISSION
REGULAR MEETING OF AUGUST 13th, 2018

PROJECT: City-initiated amendments to Chapter 17.96: Design Review, Section 17.08.020: Terms Defined, and Chapter 17.04: Mountain Overlay Zoning District to modify the authority of the Administrator to review certain Design Review application projects.

REPRESENTATIVE: City of Ketchum Planning & Building Department

NOTICE: Notice was published in the Idaho Mountain Express on July 25th, 2018. Notice was mailed to all political subdivisions and outside agencies on July 25th, 2018.

REVIEWER: Abby Rivin, Associate Planner

INTRODUCTION

Staff is proposing amendments to modify the scope of administrative authority to review and approve certain Design Review application projects for initial consideration and discussion. Changes to the scope of Design Review administrative decisions to allow an appropriate level of Staff review and administrative oversight was considered as part of the Phase II Zoning Ordinance rewrite.

Staff recommends the Planning & Zoning Commission consider the amendments proposed, any public comment received, deliberate, provide direction to Staff, and move to continue the public hearing to the meeting of September 10th, 2018.

ANALYSIS

Prior to the adoption of Ordinance No. 1148, which repealed and replaced Chapter 17.96 Design Review in its entirety, the Administrator had the authority to approve minor modifications to projects that had received Design Review approval by the Commission. Minor modifications included changes to exterior finishes, landscape plans, window configurations, dumpster enclosures, and lighting. The Administrator also had the authority to exempt Design Review for projects determined to be so minor as to not conflict with Design Review standards. These projects included minor deck additions, additions of windows or doors, and minor landscape changes. These exemptions were issued in writing by the Administrator and approved by the Chair of the Planning and Zoning Commission. With the adoption of Ordinance No. 1148, projects previously exempted from Design Review became the authority of the Administrator and subject to Administrative Design Review.

Per Ketchum Municipal Code (KMC) §17.96.030, the Administrator may approve the following exterior modifications and projects:

- Minor modifications to projects that have received design review approval by the commission for the duration of a valid design review approval;
- Multi-family residential projects, not located in the Community Core District, with four (4) or less units;
- Changes to exterior finishes including, but not limited to, siding and materials;

- Changes to existing windows or doors;
- Additions of windows or doors;
- Additions under one thousand two hundred (1,200) square feet;
- Accessory structures, including accessory dwelling units;
- Master signage plans; and
- Any project located on property that includes mapped floodplain areas or includes areas within the riparian setback.

Applicants submit a Design Review application with the associated $250 fee to be reviewed administratively and approved by Staff prior to issuance of a Building Permit for the project. For minor projects, such as changes to existing windows or doors, the Design Review application is cumbersome for property owners and contractors eager to receive a Building Permit. Reviewing these minor projects is also burdensome for Staff as many of the Design Review standards are not applicable to such negligible exterior changes. For example, if a property owner proposed to change the size of a window in a townhouse from 3' x 4' to 4' x 4', a $250 fee and complete analysis of the Design Review standards is required. Under the former Design Review chapter, the proposed window reconfiguration could have been exempt.

Staff has proposed amendments, included as Attachment A to the Staff Report, to allow the Administrator to exempt certain minor modifications from Design Review provided the project complies with all applicable Design Review standards, zoning district standards, and other requirements of Ketchum Municipal Code. These proposed amendments include the addition of the term *Minor Modification* to KMC §17.08.20 Terms Defined. Both subsections 17.96.010 and 17.96.030 of Chapter 17.96 Design Review are amended to give the Administrator the discretion to exempt these minor modifications from Design Review. The proposed amendment to Chapter 17.104 Mountain Overlay District would allow the Administrator to review and approve certain projects within the Mountain Overlay District.

When considering the proposed changes it is important to note that while the proposed amendment gives the Administrator the authority to exempt a minor project from Design Review, the Administrator is not required to exempt the project from Design Review; there certainly could be instances where a change to a window or door or landscaping will have a material change to the design of a building or a site and therefore Design Review is warranted. The Administrator also maintains the discretion to forward any project requiring Design Review to the Planning & Zoning Commission.

STAFF RECOMMENDATION

Staff recommends the Planning & Zoning Commission consider the amendments proposed, any public comment received, deliberate, provide direction to Staff, and move to continue the public hearing to the meeting of September 10th, 2018.

ATTACHMENTS

A. Proposed amendments to Chapter 17.96: Design Review, Section 17.08.020: Terms Defined, and Chapter 17.04: Mountain Overlay Zoning District to modify the authority of the Administrator to review certain Design Review application projects.

ATTACHMENT A.

Proposed amendments to Chapter 17.96: Design Review, Section 17.08.020: Terms Defined, and Chapter 17.04: Mountain Overlay Zoning District to modify the authority of the Administrator to review certain Design Review application projects

08.Chapter 17.08: Definitions

17.08.020: TERMS DEFINED:

MINOR MODIFICATIONS: Changes and alterations to an existing building, development project, or undeveloped parcel that do not increase density, intensity, or the size of a feature of a site or building appendage regulated by the dimensional standards established in chapter 17.12 of this title. Minor modifications include, but are not limited to, landscaping alterations that do not significantly alter existing topography or drainage; the removal of dead or diseased vegetation as certified by an arborist that is not located in the Special Flood Hazard Area or riparian zone; the installation of fences, hedges, or walls compliant with section 17.124.130 of this title; changes to exterior finishes including, but not limited to, siding, paint, and materials; maintenance and repair of exterior facades; the addition of windows or doors; the installation of exterior lighting compliant with chapter 17.132 of this title; demolition; reroofs; changes to driveway materials; and the addition or expansion of decks and patios that are less than 30'' above grade.

Chapter 17.96: Design Review

17.96.010: APPLICABILITY:

B. Exemptions:

1. One-family dwellings, provided the property is not located in the Mountain Overlay District.

2. Projects not requiring a building permit.

4. Temporary structures.

5. Public art.

6. Minor modifications as defined by chapter 17.08 of this title that comply with all applicable design review standards, zoning district standards, and other code requirements without requiring a variance or other exception. Said exemptions must be issued in writing by the Administrator prior to issuance of a building permit.

17.96.030: AUTHORITY OF THE ADMINISTRATOR AND THE COMMISSION:

A. Authority Of The Administrator:

1. The Administrator is authorized to approve the following exterior modifications and projects, provided they do not conflict with the provisions and requirements of this chapter:

a. Minor modifications to projects that have received design review approval by the commission for the duration of a valid design review approval.

b. Multi-family residential projects, not located in the Community Core District or the Mountain Overlay District, with four (4) or less units.

~~c. Changes to exterior finishes including, but not limited to, siding and materials.~~

~~d. Changes to existing windows or doors.~~

~~e. Additions of windows or doors.~~

c. ~~f.~~ Additions under one thousand two hundred (1,200) square feet.

d. ~~g.~~ Accessory structures, including accessory dwelling units.

e. ~~h.~~ Master signage plans.

f. Any project located on property that includes mapped floodplain areas or includes areas within the riparian setback.

g. Minor modifications located in an overlay district as indicated upon the City of Ketchum zoning district map and this title. The Administrator may exempt a minor modification from design review if the proposal complies with all overlay district standards.

2. The Administrator shall review all design review requests and determine whether a project can be approved by the Administrator or by the commission.

3. The Administrator shall determine what application materials and fees, as adopted by resolution, are required to approve exterior modifications as described in section 17.96.040 of this chapter.

C. The City Council shall approve all permanent encroachments within the City-owned right-of-way associated with a development project.

Chapter 17.104: Mountain Overlay Zoning District (MO)

17.104.050: USE RESTRICTIONS:

The following restrictions are imposed upon construction, development and use of all real property within the mountain overlay zoning district. Each of the following activities shall be subject to design review and shall require approval by the Administrator or commission under the regulations contained in chapter 17.96 of this title prior to issuance of a building permit, excavation/grading permit or commencement of any work associated with any such activity:

A. Construction or placement of buildings or structures, including additions to any such structures or buildings existing at the effective date hereof, upon real property within the mountain overlay zoning district;

B. Other excavation of materials, grading and filling for any purpose not associated with construction of buildings and structures described in subsection A of this section; and/or

C. Any activity regulated by Ketchum street standards title 12, chapter 12.04 of this code. Included therein are standards for private driveways. (Ord. 1135, 2015)

City of Ketchum

August 13, 2018

Ketchum Planning and Zoning Commission

STAFF REPORT
KETCHUM PLANNING AND ZONING COMMISSION
REGULAR MEETING AUGUST 18, 2018

PROJECT: City-initiated Text Amendments to Title 17, Zoning, to amend regulations affecting Ketchum's Light Industrial Zoning District

REPRESENTATIVE: City of Ketchum Planning and Building Department

DESCRIPTION: Amendments to:
1) §17.18.140, §17.18.150 and §17.18.160, Purpose of LI-1, LI-2, and LI-3;
2) §17.08.020, Definitions;
3) §17.12.020, District Use Matrix;
4) §17.12.030, Dimensional Standards, Districts Matrix; and
5) §17.124.090, Residential, Light Industrial Districts

NOTICE: Notice appeared in the Idaho Mountain Express, was mailed to outside agencies, and was posted in three (3) public locations on February 14, 2018. The hearing was continued to the March 27, April 9, May 14, May 29, June 11, June 25, July 9, and August 13, 2018 meetings.

PUBLIC HEARINGS: Planning and Zoning Commission
- March 12, 2018
- March 27, 2018
- April 9, 2018
- May 14, 2018
- May 29, 2018
- June 11, 2018
- June 25, 2018
- July 9, 2018
- August 13, 2018

PLANNING DIRECTOR: John Gaeddert, PhD

INTRODUCTION

At the July 9, 2018 meeting the Commission discussed four edit areas proposed for amendment in the Light Industrial zoning districts:

1. LI-1, LI-2 and LI-3 purpose (§17.18.140, §17.18.150 and §17.18.160);
2. Definitions affecting LI uses (§17.08.020);
3. Permitted, conditional, and accessory uses in the LI districts, as set forth in the district use matrix (§17.12.020); and
4. Consideration of an additional LI dimensional standard (§17.12.030);

This staff report further refines the four edit areas referenced above as well as a fifth edit area:

5. Amendments to residential light industrial district standards (§17.124.090).

The five edit areas are proposed within the context of the overarching goal and objectives discussed below.

PUBLIC COMMENT

No new written public comment has been received for the August 13th, 2018 meeting.

BACKGROUND

Overarching Goal: Preservation of the Light Industrial zones for L.I. uses

The overarching goal of Light Industrial zone amendments is to facilitate preservation of Ketchum's light industrial area for primary light industrial uses, which are light industrial uses that are not permitted elsewhere in the city, and/or are most appropriately located in a light industrial zone due to the nature of the use. Consideration must be given to the unique and essential operational needs of primary light industrial uses and mitigation of impacts to such operations.

Essential operational needs of primary light industrial uses include:

1. Circulation and parking for vehicles
2. Intensity of use
3. Accommodation of bulk

Uses currently permitted, and proposed new uses and expansions of existing uses, must be viewed through the lens of whether they are complementary to primary light industrial uses and their operations or not. If a use is not complementary it may be appropriate to mitigate the impact of the use, or it may be appropriate to no longer permit the use in the light industrial area.

Circulation and Parking for Vehicles

Several uses are permitted in the LI-1 and LI-2 districts that are not permitted elsewhere in Ketchum with the first 11 uses listed below sharing a defining characteristic: the uses are automobile-oriented.

1. Storage Yard
2. Self-service storage facilities
3. Motor vehicle sales
4. Motor vehicle service

5. Motor vehicle fueling
6. Truck terminal
7. Manufacturing
8. Industrial laundry
9. Warehouse
10. Wholesale
11. Recycling center
12. Boarding kennel
13. TV Radio Broadcasting
14. School residential campus

Automobile-oriented means the use is either specific to automobiles (such as motor vehicle service) or dependent upon vehicles to transport materials and goods to and from the location of use (such as storage yards, self-storage facilities, industrial laundry, etc).

These automobile-oriented uses also fit within the 2014 Comprehensive Plan designations of primary uses for the light industrial are:

> **PRIMARY USES**
> Light manufacturing, wholesale, services, automotive, workshops, studios, research, storage, construction supply, distribution and offices make up the bulk of development within this district.

While numerous Comprehensive Plan sections and the zoning code support the Community Core as a commercial area thriving with pedestrian traffic, the automobile-oriented distinction of the LI is an important departure to keep in mind when considering the meaning of light Industrial and preservation of the primary light industrial uses. Facilitation of circulation of vehicles serving or patronizing primary LI uses is integral to preservation of the LI. For instance, a business serving construction trades will likely be patronized by contractors driving pickup trucks (length of a crew cab Ford F150: 19'), with several trucks circulating in and out of a parking lot at any given time. A storage yard may have a box truck (common length: 30') or pick-up truck towing a trailer (common length: 30') accessing a site multiple times an hour. Contrast the sizes of often-used service vehicles to the sizes of common personal vehicles in Ketchum – a Subaru Crosstrek (14.5') or a Lexus SUV (16'); personal vehicles need far less space for queuing and circulation within and in and out of parking lots than vehicles typically used in the construction trades. Larger service vehicles cause greater traffic congestion because of the slower, and often multiple-point turns required to maneuver parking lots.

High intensity vs. low intensity permitted uses

Some uses permitted in the light industrial zones are more industrial and are therefore higher intensity than others. Intensity can be evaluated in terms of traffic circulation, hours of operation, noise, and visual impact.

High Intensity Permitted Uses	Low Intensity Permitted Uses
Goods and services provided to patrons are dependent on vehicles to transport goods or service; patronage of business cannot be accomplished on foot. *Example*: Lumber yard, industrial laundry	Use could be visited by patrons on foot, bicycle or bus. *Example:* Gym, tutoring center
Use is automobile-related. *Example:* Auto repair, gas station	
Hours of operation conflict with typical nighttime sleep schedule. *Example*: Big Wood Bakery	Quiet operations day and night. *Example:* Architect's office, engineer's office, residential unit.
Operations produce noise, vibration, fumes not appropriate in other commercial areas	

of city. *Example:* Paint store, woodworking shop, Fire Training Facility	
Use is inherently not aesthetically pleasing in form. *Example:* Storage units, outdoor storage yards	Use is intended to be visually appealing. *Example:* Artist studio.

Accommodation of bulk

Ketchum's city limits are constrained by public lands to the west and north, the City of Sun Valley to the east, and County land to the south. Development within Ketchum is often constrained by the topography of hillsides and sensitivity of lands traversed by the Big Wood River, Warm Springs Creek, and Trail Creek. Over the past several decades Ketchum has evolved further into an amenity-rich, desirable mountain-resort community. The constrained supply of land as well as the desirability of living in Ketchum continues to increase real estate values. Yet, the functionality of the city requires land available for light industrial uses, and many primary light industrial uses require disproportionately larger bulk of buildings, floor areas, and parking areas to accommodate their goods and services.

Examples of such uses include automobile repair, retail and rental of construction materials and equipment, storage yards, warehouses and wholesaling. Circulation needs aside, an automobile repair shop will need 160-180 square feet (the size of a parking space) for vehicles awaiting service to be parked in addition to service bays and short-term parking for people dropping vehicles off for service. A storage yard may consist of 8,000 square feet of storage of heavy machinery and construction materials. In contrast, a small office may be 90 square feet (9' x 10'), and desks or workstations in an open office environment may be need as little as 40-60 square feet per person.

In most cities, large and small, light industrial areas have lower land values and command lower rents than the primary commercial and entertainment areas in a city. This trend holds true in Ketchum. Because many primary light industrial uses require disproportionally large land areas and floor areas retaining zoning districts for such uses contributes to both the viability of the town and the viability of the businesses.

Objective: Reassessing secondary uses permitted in the Light Industrial zones

The 2014 Comprehensive Plan defines secondary uses for the Light Industrial area:

> **SECONDARY USES**
>
> A limited range of residential housing types, and supporting retail are provided for within this category. Uses should generate little traffic from tourists and the general public.

The zoning code also permits uses in the light industrial zones beyond the primary uses described earlier in this report. Uses include:

1. Multiple-family dwellings (specifically, residential units located in mixed-use buildings)
2. Daycare center, daycare facility
3. Office
4. Personal service
5. Business support service
6. Hybrid production facility
7. Commercial studio
8. Instructional service
9. Health and fitness facility
10. Recreational facility, public

11. Recreational facility, private
12. Food service
13. Convenience store

Staff proposed amendments to several of the above definitions intended to align the uses with the intent of the Light Industrial area for the July 9th, 2018 meeting. For example, a new definition, "Office, Contractor-related business" was created and the recommendation was to allow this use as a permitted use in all Light Industrial zones and to remove the general use of "Office" as a use for the light industrial zones.

Another recommended change was to remove "Health and Fitness Facility" as a use, to envelop the use into the existing, overlapping definition of "Instructional Service", which includes health and fitness activities, and to require a Conditional Use Permit for such uses going forward. Currently, "Instructional Service" is permitted by-right. Residential recreation facilities were proposed to be limited only to residents and their guests (rather than residents of an entire neighborhood), while public recreation facilities would continue to be a permitted use.

Based on discussion with the Commission, staff revaluated the instructional service, health and fitness facility, and recreation facility uses through the lens of whether the uses complement, or conflict, with primary light industrial uses and the purpose and intent of the light industrial districts. Staff proposes further revisions to these uses, based on intensity of the use; these amendments are articulated in Edit Area #2 (Definitions) and Edit Area #3 (Use Matrix).

At the direction of the Commission, staff also created new definitions for the uses "Industrial Design" and "Cottage Industry" in order to facilitate businesses such as First Lite, Club Ride, Smith and Scott, which did not fit well in other existing categories. These amendments are articulated in Edit Area #2 (Definitions) and Edit Area #3 (Use Matrix).

Objective: Mitigating conflict between permitted uses

Although a secondary use may not complement any or all primary light industrial uses there are secondary uses (such as housing) that are valuable and worthwhile in the light industrial zones because the use advances other city goals (such as the creation of workforce housing). As such, standards and regulations are necessary to mitigate the conflict lower intensity, secondary uses impose on primary uses.

For example, where residential use is secondary and subordinate, residential activity can impede, hinder, and generally conflict with primary LI use operations. During business hours common to construction trades (7 a.m. – 5:00 p.m. Monday through Friday) limited infrastructure (streets, parking) is utilized most effectively when traffic associated with primary light industrial uses is unimpeded. As discussed previously, vehicles associated with construction trades are typically large in size and require proportionally larger time and space for circulation. Residential use in the light industrial area can pose conflict due to the competing spatial needs of residents, their vehicles, their personal items, pets, and so forth. Furthermore, introduction of new opportunities for increased residential development can exacerbate these conflicts.

As discussion of residential use in the light industrial zones continues and evolves during the next several meetings attention will be given to limiting the impacts of residential uses on light industrial uses. New residential development standards designed to simultaneously facilitate the goal of increasing workforce housing while limiting impact to primary light industrial uses are put forward in Edit Area #5 of this staff report for initial consideration.

Finally, there are some permitted uses that are permitted only in the Light Industrial zones that to date have not posed conflict with other uses and have not been detrimental to the health, safety, welfare, and visual appeal of the city. However, should such uses be developed, there is potential for unforeseen impacts; new

development standards can be designed to limit such impacts. Uses flagged by the Commission for further attention are:

- Recycling center
- TV and radio broadcasting facility
- Storage yard
- Construction material laydown yard *(proposed new use)*

EDIT AREAS

Consistent with public comments and staff analysis, the following five sections of Title 17 of the Zoning Ordinance of the Ketchum Municipal Code (KMC) are proposed for amendment (denoted as Edit Areas). Edit Areas #1-5 are attached.

STAFF RECOMMENDATION AND RECOMMENDED MOTION

After reviewing the proposed edits and taking public comment, staff recommends the Commission continue the public hearing to September 10th, 2018.

"I MOVE TO CONTINUE THE PUBLIC HEARING TO September 10th, 2018."

Exhibit

A. Proposed Title 17 Edit Areas #1 – 5 (Draft Edits to Title 17 and, in particular, the Purpose, Uses, Dimensional Standards, and Residential Requirements in Ketchum's Light Industrial Districts)

EDIT AREA #1 - Light Industrial Area Purposes

All new text proposed to be added to the LI purpose section is underlined. Text that is proposed to be repealed is ~~stricken~~. The purpose/intent descriptions discussed at the July 9th, 2018 meeting appears in blue font and the revised purpose/intent descriptions for the August 13th, 2018 meeting appears in black font.

17.18.140: LIGHT INDUSTRIAL DISTRICT NUMBER 1 (LI-1)

7/9/2018

A. Purpose: The LI-1 light industrial district number 1 is established as a transition area providing (1) limited commercial service industries; (2) limited retail; (3) small light manufacturing; (4) research and development; ~~and~~ (5) offices related to building, maintenance and construction; and, (6) multiple-family dwellings, constructed to be secondary and subordinate to the primary light industrial purpose of the LI-1. Uses in the LI-1 are intended to ~~and which~~ generate traffic primarily from the industrial trades (and not ~~little traffic~~ from tourists and the general public).

8/13/2018 proposed

A. Purpose: The LI-1 light industrial district number 1 is established as a transition area between the Community Core and the LI-2 district. The LI-1 district provides suitable locations and environs for (1) limited business and personal services; (2) small light manufacturing; (3) research and development; (4) offices related to building, maintenance and construction; (5) limited retail; and, (6) multiple-family dwellings, constructed to be secondary and subordinate to the primary light industrial purpose of the LI-1. Traffic to the LI-1 district is intended to be generated primarily by uses related to the industrial trades and secondarily by other permitted uses that, due to the natures of the uses, are not reliant on pedestrian traffic or high visibility, and/or are not permitted in other zoning districts, and/or are characterized by sale, rental, or service of large, bulky equipment or materials, necessitating location of such use in a light industrial zone.

17.18.150: LIGHT INDUSTRIAL DISTRICT NUMBER 2 (LI-2)

7/9/2018

A. Purpose: The LI-2 light industrial district number 2 is established with the foremost purpose of providing ~~to provide for~~ a permanent year round employment base ~~and the location of~~ for (1) light manufacturing, (2) wholesale trade and distribution, (3) research and development, (4) service industries, and (5) limited ~~related,~~ bulk retail and offices related to building, maintenance and construction. A secondary purpose of the LI-1 is to provide multiple-family dwellings, constructed to be secondary and subordinate to the primary light industrial purpose of the LI-2. Uses in the LI-2 are intended to ~~and which~~ generate traffic primarily from the industrial trades (and not ~~little traffic~~ from tourists and the general public).

8/13/2018

A. Purpose: The LI-2 light industrial district number 2 is the city's primary light industrial area and is established with the foremost purpose of providing suitable land and environs for uses that are not appropriate in other commercial zones due to their light industrial nature, but which provide an essential or unique service to support the local economy and permanent year-round employment

base. Uses include: (1) light manufacturing; (2) wholesale trade and distribution; (3) research and development; (4) service industries; (5) limited bulk retail and; (6) offices related to building, maintenance and construction. A secondary purpose of the LI-2 is to provide multiple-family dwellings, constructed to be secondary and subordinate to the primary light industrial purpose of the LI-2. Uses in the LI-2 are intended to generate traffic primarily from the industrial trades and secondarily by other permitted uses that, due to the natures of the uses, are not reliant on pedestrian traffic or high visibility, and/or are not permitted in other zoning districts, and/or are characterized by sale, rental, or service of large, bulky equipment or materials, necessitating location of such use in a light industrial zone.

17.18.160: LIGHT INDUSTRIAL DISTRICT NUMBER 3 (LI-3)

7/9/2018

A. Purpose: The LI-3 light industrial district number 3 is established as a transition area providing for a permanent year round employment base and the location of research and development, wholesale trade and distribution and high technology industries along with offices related to building, maintenance and construction. Traffic generated from the LI-3 is primarily from the industrial trades (not ~~little traffic~~ from tourists and the general public) and ~~which generate little traffic from tourists and the general public and providing~~ from a mix of deed restricted and market rate housing.

7/9/2018

A. Purpose: The LI-3 light industrial district number 3 is established as a transition area between the LI-2 zoning district and the residential LR and GR-L districts. The LI-3 district provides suitable locations and environs for a permanent year-round employment base comprised of (1) research and development; (2) wholesale trade and distribution; (3) technology industries; and (4) offices related to building, maintenance and construction uses; and, (5) deed restricted and market rate multi-family dwellings located within mixed-use buildings. Uses in the LI-3 are intended to generate traffic primarily from the employers and employees of permitted uses and secondarily from deed restricted and market rate housing units.

EDIT AREA #2 – Definitions

Proposed amendments to the Definitions (§17.08.020) of Title 17 of the KMC follow. All new text proposed to be added are underlined. Text that is proposed to be repealed is ~~stricken~~. (NOTE: each of these definitions are applicable or proposed to be applicable to the LI Districts). New amendments for the August 13th, 2018 meeting are highlighted in yellow.

BUSINESS SUPPORT SERVICE: The use of land for the sale, rental, or repair of office equipment, supplies, and materials, or the provision of services used by office and service establishments. Uses include: ~~Typical uses include, but are not limited to,~~ office equipment and supply firms, small business machine repair shops, convenience printing and copying establishments, or information technology support services.

CONSTRUCTION MATERIAL LAYDOWN YARD: A site identified and approved as part of a Construction Activity Plan or other city-issued permit for a specific construction project. Construction material laydown yards are intended to be used on an intermittent basis in association with a singular, permitted development project.

CRAFT/COTTAGE INDUSTRY: A facility devoted solely to the arts and crafts that produces or makes items that by their nature, are designed or made by an artist or craftsman by using hand skills.

DAYCARE, ONSITE EMPLOYEE: Child care programs that occur in facilities where parents are on the premises.

HEALTH AND FITNESS FACILITY – WELLNESS FOCUS: HEALTH AND FITNESS FACILITY: A business or membership organization providing exercise facilities and/or nonmedical personal services to patrons, with a focus on wellness and characterized by low-impact movements and/or lack of mechanized equipment, including, but not limited to, yoga and Pilates studios, dance studios, gymnasiums, personal training studios, private clubs (athletic, health, or recreational), tanning salons, and weight control establishments.

INDUSTRIAL DESIGN: The professional service of creating and developing concepts and specifications that optimize the function, value and aesthetics of products and systems for the mutual benefit of both user and manufacturer, often employing design thinking strategies. Typically, industrial design is intended to result in tangible goods that can be mass produced. Industrial design businesses may include on-site prototyping, fabrication, and manufacturing.

INSTRUCTIONAL SERVICE: The use of land for the provision of ~~informational,~~ instructional ~~and similar~~ services for personal improvement other than physical improvement. ~~Typical uses~~ Uses include~~, but are not limited to, health or physical fitness studios facilities, dance,~~ music, painting, ceramics, ~~arts or~~ photography ~~studios,~~ fiber arts, educational tutoring facilities, handicraft or hobby instruction.

OFFICE, CONTRACTOR-RELATED BUSINESS: An establishment wherein the primary use is the conduct of a business or profession specifically related to building contracting including, design services, engineering, construction and property.

PRODUCT DESIGN: See Industrial Design.

PROFESSIONAL RESEARCH SERVICES: An establishment that specializes in ~~performing~~ professional, scientific, and technical research ~~services~~ and is ~~may~~ inclusive of light manufacturing as an accessory use. Uses are limited to: ~~Typical uses include, but are not limited to, construction contractors,~~ physical

distribution and logistics, engineering and specialized design services, electronic and computer services, ~~photographic services,~~ research, development and scientific services.~~, and internet or remote sales and marketing.~~ This definition does not include uses which create vibration outside the exterior building walls, or uses that would diminish the quality of air and water in the city.

PUBLIC UTILITY: An organization that maintains the infrastructure for a public service, which often also provides a service using that infrastructure.

QUALIFYING GROUND FLOOR: A ground floor of a building, where the start of the second story is 18 feet or more above the level of the finished floor. In the LI zoning districts, buildings with a Qualifying Ground Floor are permitted a higher overall height.

RECREATION FACILITY, HIGH INTENSITY: A recreation facility that, due to the nature of the use, requires floor area or mass and volume, or generates higher decibel levels, that are more appropriately accommodated in the light industrial area or are buffered from residential or pedestrian-oriented commercial activity on a large recreational use zoned parcel district than in the Community Core or a Tourist zone. Uses include indoor shooting range, dryland hockey training facility, gymnastics/tumbling gym, and instructional or personal training facilities wherein the instruction involves throwing, dragging, or launching heavy equipment.

RESTRICTIVE COVENANTS: A restrictive covenant runs with the land and, thereby, binds present and future owners of the property. Restrictive covenants are used to implement the conditions of a land use approval or ensure implementation of project mitigations and components.

STORAGE YARD: Storage of large equipment, operable vehicles and construction/property maintenance materials on an ongoing or permanent basis. This shall not include junkyards or wrecking yards.

TV AND RADIO BROADCASTING: An installation consisting of one or more transmitters or receivers used for radio, television or cable communications or broadcasting.

WORK-LIVE UNITS: Work-Live units incorporate residential living space in a non-residential building. Joint live-work units are held in common ownership and cannot be sold or platted as separate condominiums, as documented with a city-approved restrictive covenant recorded against the property.

EDIT AREA #3 – LI-1, LI-2, and LI-3 Land Use Matrix

Title 17 of the KMC sets forth a series of regulated uses by district.

In the LI-1, LI-2, and LI-3 the following uses, as defined in §17.08.020, are either Permitted (P), Conditional (C), or Accessory (A).

Proposed amendments to the District Use Matrix (§17.12.020) and Definitions (§17.08.020) are as follows. All new text proposed to be added to the land use matrix and/or definitions section of Title 17 are underlined. New text added for the August 13th, 2018 staff report is underlined and highlighted in yellow. Text that is proposed to be repealed is ~~stricken~~. Definitions that appear in **bold** in the left hand column, e.g., adult only, are exclusively referenced in the LI Districts.

USES	DEFINITIONS	LI-1	LI-2	LI-3	MATRIX NOTES
Residential					
Dwelling, multi-family	DWELLING, MULTIPLE-FAMILY: A building, under single or multiple ownership, containing two (2) or more dwelling units used for residential occupancy.	C [14]	C [14]	C [14]	14. See section 17.124.090 of this title for industrial districts residential development standards.
Work-Live Unit	Work-Live units incorporate residential living space in a non-residential building. Joint live-work units are held in common ownership and cannot be sold or platted as separate condominiums, as documented with a city-approved restrictive covenant recorded against the property.	C[14]	C[14]	C[14]	
Commercial					
Adult only business	**ADULT ONLY BUSINESS: A premises where minors are excluded by virtue of their age as a prevailing business practice or as required by law and which stock in trade and offers for sale, trade or rent of products are characterized by an emphasis upon the depiction or description of sexual activities or exposed anatomical areas or for use in connection with sexual activities or exposed anatomical areas**		~~P~~ C		

Business support service	BUSINESS SUPPORT SERVICE: The use of land for the sale, rental, or repair of office equipment, supplies, and materials, or the provision of services used by office and service establishments. Uses include: ~~Typical uses include, but are not limited to,~~ office equipment and supply firms, small business machine repair shops, convenience printing and copying establishments, or information technology support services.	P	P		

USES	DEFINITIONS	LI-1	LI-2	LI-3	MATRIX NOTES
Craft/Cottage Industry	**CRAFT/COTTAGE INDUSTRY: A facility devoted solely to the arts and crafts that produces or makes items that by their nature, are designed or made by an artist or craftsman by using hand skills.**	**P**	**P**		
Convenience store	CONVENIENCE STORE: A retail store with a floor area of less than one thousand five hundred (1,500) square feet that sells groceries and small convenience items. Convenience stores provide no motor vehicle service of any kind.	P [12]	P [16]		12. The following forms of retail trade are permitted: a) equipment rental, including sporting equipment and entertainment equipment, b) building, construction and landscaping materials; small engines with associated sales, c) retail in conjunction with manufacturing, warehousing or wholesaling not to exceed 30 percent gross floor area or 800 square feet, whichever is less; no advertising is displayed from windows or building facades; and no access onto a major arterial is allowed if an alternative access is available. 16. The following forms of retail trade are permitted: a) equipment rental, including sporting equipment and entertainment equipment; b) building, construction and landscaping materials; small engines with associated sales; c) furniture and appliances in conjunction with warehousing not to exceed 18 percent gross floor area or 900 square feet, whichever is less; d) other retail in conjunction with manufacturing, warehousing or wholesaling; it is limited to 10 percent gross floor area or 500 square feet, whichever is less. Retail uses c) and d) of this note shall have no advertising displayed from windows or building facades; and no access will be permitted onto a major arterial if an alternative access is available.
Construction Material Laydown Yard	CONSTRUCTION MATERIAL LAYDOWN YARD: A site identified and approved as part of a Construction Activity Plan or other city-issued permit for a specific construction project. Construction material laydown yards are intended to be used on an intermittent basis in association	P	P	P	**Note: This is a new use and because construction material laydown yards occur in other zoning districts, the District Use Matrix will need to be amended for other districts as well. The intent is that laydown yards are permitted only when associated with a Construction Activity Plan approved for an active building project.**

	with a singular, permitted development project.				
Daycare center	DAYCARE CENTER: A daycare business providing care for thirteen (13) or more children on the premises at any one time. A daycare center is required to be licensed by the Idaho department of health and welfare.	C [17]		C [17]	17. See subsection 17.124.120.C of this title for industrial districts daycare development standards
Daycare Facility	DAYCARE FACILITY: A daycare business providing care for no more than twelve (12) children on the premises at any one time and having not more than four (4) employees. A daycare facility is required by state law to have a fire inspection.	C [17]		C [17]	17. See subsection 17.124.120.C of this title for industrial districts daycare development standards
Food Service	FOOD SERVICE: An establishment where food and drink are prepared, served and consumed on site with associated outdoor dining, or distributed to customers through take out, delivery or catering. Typical uses include, but are not limited to restaurants, cafes, delis, catering services and brewpubs that do not distribute beer produced for off site consumption.	PC [15]	PC [15]		15. Catering and food preparation is permitted. Restaurants require a conditional use permit and shall not exceed 1,000 square feet and serve no later than 9:00 P.M. unless expressly permitted through approval of the conditional use permit.
USES	**DEFINITIONS**	**LI-1**	**LI-2**	**LI-3**	**MATRIX NOTES**
Health and fitness facility - wellness focus	HEALTH AND FITNESS FACILITY: A business or membership organization providing exercise facilities and/or nonmedical personal services to patrons, with a focus on wellness and characterized by low-impact movements and/or lack of mechanized equipment, including, but not limited to, yoga and Pilates studios, dance studios, gymnasiums, personal training studios, private clubs (athletic, health, or recreational), tanning salons, and weight control establishments.	~~C~~	~~C~~		
Hybrid production facility	HYBRID PRODUCTION FACILITY: A commercial operation or use, on one or more premises within the same zoning district, where finished consumer goods are manufactured or produced and those same goods are offered for sale to the general public. Hybrid production facilities must be similar in size, scale and scope of operation with adjacent or nearby uses.	P	P		

Instructional service	INSTRUCTIONAL SERVICE: The use of land for the provision of ~~informational,~~ instructional ~~and similar~~ services for personal improvement other than physical improvement. ~~Typical uses~~ Uses include~~, but are not limited to, health or physical fitness studios facilities, dance,~~ music, painting, ceramics, ~~arts or~~ photography ~~studios,~~ fiber arts, educational tutoring facilities, handicraft or hobby instruction.	~~P~~ C	~~P~~ C		
Industrial Design	**INDUSTRIAL DESIGN: The professional service of creating and developing concepts and specifications that optimize the function, value and aesthetics of products and systems for the mutual benefit of both user and manufacturer, often employing design thinking strategies. Typically, industrial design is intended to result in tangible goods that can be mass produced. Industrial design businesses may include on-site prototyping, fabrication, and manufacturing.**	**P**	**P**	**P**	
Kennel, boarding	KENNEL, BOARDING: A facility providing for the commercial boarding, grooming or training of household pets not owned by the owner or occupant of the premises.	P	P		
Laundry, industrial	LAUNDRY, INDUSTRIAL: An industrial facility where fabrics are cleaned on a commercial or wholesale basis.	P	P		
Maintenance service facility	MAINTENANCE SERVICE FACILITY: A facility containing the necessary supplies and equipment to provide janitorial services and routine maintenance of buildings and property.	P	P		

USES	DEFINITIONS	LI-1	LI-2	LI-3	MATRIX NOTES

Manufacturing	**MANUFACTURING: The use of land for production, processing, compounding, assembly, testing, treatment, or fabrication of materials and products from processed or previously manufactured materials. Uses may include, but are not limited to, a machine shop, the manufacturing of apparel, ceramic products, cosmetics and toiletries, electrical appliances, electronics or information technology equipment, medical equipment or devices, paper products, pharmaceuticals, plastic products (but not the processing of raw materials), welding services, or tools and hardware. Uses with significant external effects that cannot be eliminated or contained during the manufacturing process are not allowed. Such external effects include, but are not limited to, smoke, noise, particulates, dirt, vibration, or odor.**	**P**	**P**		
Motor vehicle fueling station	**MOTOR VEHICLE FUELING STATION: A facility providing the retail sale and direct delivery to motor vehicles of fuel, including electric charging stations associated with a motor vehicle fueling station, lubricants and minor accessories, and retail sales for the convenience of the motoring public.**	**C** [31]	**C** [31]		**31. Vehicular access from Highway 75 to motor vehicle fueling stations is prohibited.**
Motor vehicle sales	**MOTOR VEHICLE SALES: A facility providing for the sale, lease, or rental of new or used noncommercial vehicles, including automobiles, noncommercial vehicles or trucks, motorcycles, recreational vehicles, or boats. The cleaning and routine maintenance of motor vehicles is allowed as an accessory use.**	**C**	**C**		

USES	**DEFINITIONS**	**LI-1**	**LI-2**	**LI-3**	**MATRIX NOTES**

Motor vehicle service	**MOTOR VEHICLE SERVICE: A facility providing service for all types of repairs and maintenance of automobiles, commercial vehicles or trucks, trailers, construction equipment, agricultural implements, or similar industrial equipment, but does not include "junkyard" as defined by this chapter. Typical uses include, but are not limited to, automobile and truck repair garages, tire sales and installation, electronics installation and repair, oil and lubrication, windshield glass replacement services, vehicle cleaning and detailing, transmission shops, radiator shops, body and fender shops, painting, equipment service centers, machine shops, or other similar uses where repair activities are conducted.**	**P**	**P**		
Office, business	OFFICE, BUSINESS: An establishment wherein the primary use is the conduct of a business or profession including, but not limited to, accounting, design services, computer software, information systems, engineering, insurance, legal services, management and administration, organization and association offices, psychology, real estate, travel and medical offices. Medical care facilities and hospitals are not included in this definition.			~~P~~	
Office, Contractor-related business	OFFICE, CONTRACTOR-RELATED BUSINESS: An establishment wherein the primary use is the conduct of a business or profession specifically related to building contracting including, design services, engineering, construction and property management.	P	P	P	

USES	**DEFINITIONS**	**LI-1**	**LI-2**	**LI-3**	**MATRIX NOTES**

Personal Service	PERSONAL SERVICE: The use of land for the provision of frequently or recurrently needed services of a personal nature. Such services include, but are not limited to, beauty and barber shops, grooming of household pets, seamstresses, tailors, shoe repair, laundromats or dry cleaning pick up/drop off where the processing of garments or fabrics is located in a separate facility.	P [13]			13. Personal service is not allowed except for laundromats and dry cleaning establishments.
Professional Research Services	**PROFESSIONAL RESEARCH SERVICES: An establishment that specializes in ~~performing~~ professional, scientific, and technical research ~~services~~ and ~~may~~ includes light manufacturing as an accessory use. Uses are limited to: ~~Typical uses include, but are not limited to, construction contractors,~~ physical distribution and logistics, engineering and specialized design services, electronic and computer services, photographic services, research, development and scientific services.~~, and internet or remote sales and marketing. This definition does not include uses which create vibration outside the exterior building walls, or uses that would diminish the quality of air and water in the city.~~**	**P**	**P**	**P**	
Repair Shop	REPAIR SHOP: An establishment primarily engaged in repair services of sporting equipment and household appliances; not including motor vehicle service.	P	P		

USES	**DEFINITIONS**	**LI-1**	**LI-2**	**LI-3**	**MATRIX NOTES**

Retail Trade	RETAIL TRADE: An establishment which provides the final step in the retailing process for the distribution of goods and commodities to customers. Retailers are organized to sell or rent merchandise in small quantities to the general public and operate a fixed point of sale location designed to attract a high volume of walk-in customers. Typical uses include, but are not limited to, establishments selling office supplies and equipment, building materials, plumbing supply, antiques or consignment items, home improvement and garden supplies, books and educational material, clothing, sporting goods, pharmaceuticals, medical devices, health and fitness supplies, art and associated material and household pet supplies. Motor vehicle sales are not included in this definition.	P [12]	P [16]		12. The following forms of retail trade are permitted: a) equipment rental, including sporting equipment and entertainment equipment, b) building, construction and landscaping materials; small engines with associated sales, c) retail in conjunction with manufacturing, warehousing or wholesaling not to exceed 30 percent gross floor area or 800 square feet, whichever is less; no advertising is displayed from windows or building facades; and no access onto a major arterial is allowed if an alternative access is available. 16. The following forms of retail trade are permitted: a) equipment rental, including sporting equipment and entertainment equipment; b) building, construction and landscaping materials; small engines with associated sales; c) furniture and appliances in conjunction with warehousing not to exceed 18 percent gross floor area or 900 square feet, whichever is less; d) other retail in conjunction with manufacturing, warehousing or wholesaling; it is limited to 10 percent gross floor area or 500 square feet, whichever is less. Retail uses c) and d) of this note shall have no advertising displayed from windows or building facades; and no access will be permitted onto a major arterial if an alternative access is available.
Self-storage facility	**SELF-SERVICE STORAGE FACILITY: A building or group of buildings of a controlled access and fenced compound that contains varying sizes of individual, compartmentalized and controlled access stalls or lockers for the storage of customers' goods or wares.**	**P**	**P**		

USES	**DEFINITIONS**	**LI-1**	**LI-2**	**LI-3**	**MATRIX NOTES**
Storage yard	**STORAGE YARD: Storage of large equipment, operable vehicles and construction/property maintenance materials. This shall not include junkyards or wrecking yards.**	**P**	**P**	**P**	

Studio, commercial	STUDIO, COMMERCIAL: Work space within an enclosed structure for artists and artisans, including individuals practicing, teaching, or demonstrating in one of the fine arts or performing arts, or skilled in an applied art or craft. Also includes recording studios. Incidental retail sales of items produced on the premises is allowed. A commercial studio may hold occasional events solely and exclusively in connection with the permitted uses conducted by the commercial studio. The events shall be subordinate in nature to the commercial studio and subject to the standards of section 17.124.150 of this title.	P 35	P 35	P 35	35. Commercial studios in the Light Industrial District are subject to the standards of section 17.124.150 of this title.
TV and radio broadcasting	**TV AND RADIO BROADCASTING: An installation consisting of one or more transmitters or receivers used for** radio**, television or cable communications or broadcasting.**	**P**	**P**	**P**	
Truck terminal	**TRUCK TERMINAL: A facility for the receipt, transfer, short term storage, and dispatching of goods transported by truck. Included in the use type would be express and other mail and package distribution facilities.**	**P**	**P**		
Veterinary service establishment	VETERINARY SERVICE ESTABLISHMENT: A facility rending surgical and medical treatment to large animals and household pets, providing boarding kennels, and/or outdoor runs. Crematoriums are not included as an accessory use.	P	P		

USES	**DEFINITIONS**	**LI-1**	**LI-2**	**LI-3**	**MATRIX NOTES**
Warehouse	**WAREHOUSE: A facility for the use of dry/cold storage, wholesale, and distribution of manufactured products, supplies, and equipment, excluding storage of materials that are inflammable or explosive or that present hazards or conditions commonly recognized as offensive.**	**P**	**P**	**P**	
Wholesale	**WHOLESALE: The sale of commodities in quantity for resale.**	**P**	**P**		

Wireless Communication facility	WIRELESS COMMUNICATION FACILITY (WCF): A facility that transmits and/or receives electromagnetic signals, including antennas, microwave dishes, parabolic antennas, directional antennas and other types of equipment for the transmission or reception of such signals, towers or similar structures supporting the equipment, equipment buildings, shelters, cabinets, parking area, and other accessory development.	C 23	C 23	C 23	23. See chapter 17.140 of this title for wireless communications facility provisions
Public and institutional					
Nature preserve	NATURE PRESERVE: An area designated or set aside for the purpose of preserving natural areas or features, contains a minimum of six (6) acres, is held under lease or title by a nonprofit tax exempt organization under section 501c(3) of the internal revenue service code of 1954, or corresponding provisions of any amendments or any future United States revenue code for said purposes.	~~P~~	~~P~~	~~P~~	
Public use	PUBLIC USE: A structure or use intended or used for a public purpose by a city, other than the city of Ketchum, a school district, the county, the state, or by any other public agency, or by a public utility.	C	C	C	
USES	**DEFINITIONS**	**LI-1**	**LI-2**	**LI-3**	**MATRIX NOTES**
Public utility	PUBLIC UTILITY: An organization that maintains the infrastructure for a public service, which often also provides a service using that infrastructure.	P	P	P	
Recreation facility, public	RECREATION FACILITY, PUBLIC: A publicly owned and operated recreation facility.	~~P~~	~~P~~	~~P~~	
Recreation facility, high intensity	RECREATION FACILITY, HIGH INTENSITY: A recreation facility that, due to the nature of the use, requires floor area or mass and volume, or generates higher decibel levels, that are more appropriately accommodated in the light industrial area or are buffered from residential or pedestrian-oriented commercial activity on a large	C	C		

	recreational use zoned parcel district than in the Community Core or a Tourist zone. Uses include indoor shooting range, dryland hockey training facility, gymnastics/tumbling gym, and instructional or personal training facilities wherein the instruction involves throwing, dragging, or launching heavy equipment.				
Recycling center	**RECYCLING CENTER: A facility designed to be a collection point where only recyclable materials are sorted and/or temporarily stored prior to delivery to a permanent disposal site, or shipment to others for reuse, and/or processing into new products. This shall not include junkyards or wrecking yards.**		**P**		
School residential campus	**SCHOOL RESIDENTIAL CAMPUS: Multiple use building(s) and outdoor facilities/areas directly affiliated with an established public or semipublic educational institution for learning that include, but are not limited to, spaces devoted to dormitory, central kitchen and dining, office, classroom, study, school employee dwelling unit, study hall, gym/fitness, meeting, and parking.**			**P** [30]	**30. Development agreement and compliance with §17.124.090.C required.**

Accessory

Agriculture, urban	AGRICULTURE, URBAN: The production of vegetables, fruits, honey, and eggs by residents for personal consumption and may include production by members of a neighborhood or by a nonprofit organization on one or more vacant lots for personal consumption or for the off site sale of small quantities.		A 22	A 22	See Section 17.124.080 of this title for urban agriculture development standards

USES	DEFINITIONS	LI-1	LI-2	LI-3	MATRIX NOTES
Daycare home	DAYCARE HOME: A daycare business providing care for six (6) or fewer children on the premises at any one time, having not more than one employee in addition to the operator, and operating between the hours of seven o'clock (7:00) A.M. and six o'clock (6:00) P.M. A daycare home is required by the city to have a basic fire inspection.	C 4			4. Use is not permitted in the Avalanche Zone. Reference Zoning Map.

Daycare, onsite employee	**DAYCARE, ONSITE EMPLOYEE: Child care programs that occur in facilities where parents are on the premises.**	**A**	**A**	**A**	
Electric vehicle charging station	ELECTRICAL VEHICLE CHARGING STATION: A public or private parking space that is served by battery charging station equipment that has as its primary purpose the transfer of electric energy (by conductive or inductive means) to a battery or other energy storage device in an electric vehicle.	A	A	A	
Energy system, solar	ENERGY SYSTEM, SOLAR: Any solar collector panel(s), film(s), shingle(s), or other solar energy device(s), or solar structural component(s), mounted on a building or on the ground and including other appurtenant structures and facilities, whose primary purpose is to provide for the on site collection, storage, and distribution of solar, or radiant, energy received from the sun and used for heating or cooling, for water heating, and/or for generation of electricity. A solar energy system may be ground mounted (i.e., placed on top of the ground surface) or roof mounted (i.e., placed on or as an integral part of a building). Roof mounted systems may extend an additional two feet (2') beyond the maximum height allowance of the zoning district in which they are located. Ground mounted systems shall meet all required dimensional standards for accessory structures.	A	A	A	

USES	**DEFINITIONS**	**LI-1**	**LI-2**	**LI-3**	**MATRIX NOTES**
Energy system, wind	ENERGY SYSTEM, WIND: Any electric generation facility, whose main purpose is to convert and store wind energy into usable forms of energy and that includes the wind turbine(s), structural supports, electrical infrastructure, and other appurtenant structures and facilities. Wind energy systems may be freestanding (i.e., placed on top of the ground surface) or roof mounted and shall meet all dimensional requirements of principal buildings for the zoning district in which they are located.	A	A	A	

Home occupation	HOME OCCUPATION: A business related activity conducted entirely within a dwelling which is incidental and secondary to the use of a dwelling as a residence and does not negatively impact the surrounding neighborhood.	A	A	A	
Recreation facility, residential	RECREATION FACILITY, RESIDENTIAL: A recreation facility for use solely by the residents and guests of a particular residential development, planned unit development, or residential neighborhood, including outdoor and indoor facilities. These facilities are usually proposed or planned in association with development and located within or adjacent to such development.	A 36	A 36	A 36	36. Residential recreation facilities in the Light Industrial District are not allowed except for residents and guests of a particular residential development.

EDIT AREA #4 – LI-1, LI-2, and LI-3 DIMENSIONAL STANDARDS, DISTRICTS MATRIX

	LI-1	LI-2	LI-3	
Dimensional Standards				
Minimum Lot Area	8,000 Square Feet			
Minimum Lot Width	80'			
Maximum Building Coverage	75%			
Minimum Building Setbacks				
Front	20'			
Side	0' [1] for internal side yards and a minimum of 10' for street side yards			
Rear	0' [1]			
Cantilevered decks and overhangs	0'			
Setback for fourth or fifth floors, if permitted, from State Highway 75	**35'**			
Maximum Buiilding Height				
Building Height	35'		35' [2]	
Building Height with Qualifying Ground Floor				**initial concept for discussion purposes**
Two Story	**35'**		**35' [2]**	**initial concept for discussion purposes**
Three Story	**40'**			**initial concept for discussion purposes**
Four Story[3]	**not permitted**	**48'[3]**	**48'[3]**	**initial concept for discussion purposes**
Five Story[3]	**not permitted**	**48'[3]**	**48'[3]**	**initial concept for discussion purposes**
Nonhabitable structures located on building rooftops	**6'**			
Perimeter walls enclosing rooftop deck and structures	**4' above roof surface height. Perimeter rooftop walls are required to be at least 75% transparent**			
Rooftop solar and mechanical equipment above roof surface	**5'**			

Footnotes:

1. If the lot adjoins a more restrictive residentil district on the side or rear, the more restrictive setbacks of that district shall apply.

2. For buildings with a minimum roof pitch of 4:12 may go to 40 feet.

3. Only buildings with deed restricted community hosuing units consistent with 17.124.090 are permitted to have a fourth or fifth floor.

EDIT AREA #5 – Light Industrial District Residential Standards.

All new text proposed to be added to the LI District Residential standards section is underlined. Text that is proposed to be repealed is ~~stricken~~.

17.124.090: RESIDENTIAL, LIGHT INDUSTRIAL DISTRICTS:

A. Residential units in the light industrial districts shall comply with the following minimum criteria:

1. Dwelling units shall not occupy the ground floor.

2. Design review under chapter 17.96 of this title shall be required whether new building, addition to existing building or remodel of existing building.

3. Unless otherwise specified in this section, up ~~Up~~ to fifty percent (50%) of any light industrial building may be devoted to dwelling units~~, unless otherwise specified in the section.~~ and up to fifty percent (50%) of a work/live units gross residential floor area may be devoted to a work/live unit.

4. Dwelling units shall not be separated in any manner for sale as individual units.

5. In the approval of work/live units, the city shall find in addition to the conditional use standards set forth in Section 17.116 that:

a. The work portion of the unit meets the definition of work/unit set forth in Section 17.08.020, including that the Project is subject to Council approval of a restrictive covenant;

b. The work unit is:

(1) suitable for on-site employees, foot traffic/customers, and meets applicable building and fire codes;

(2) signed and posted with regular hours of operation;

(3) served by the prominent means of access for the work/live unit; and,

(4) associated with a business license for a use allowed (either conditionally or permitted) in the district.

c. The residential portion of the living space is secondary to the primary use as a place of work. A finding that the residential space is secondary to the work space shall be based on measurable findings, including but not limited to:

(1) the size of the live portion of the work/live unit is both smaller than the work portion of the unit and, further, the live portion of the work/live unit does not exceed one thousand (1,000) gross square feet;

(2) means of access to the residential portion of the unit is not prominent and, preferably, is located to the side or rear of the property; and

(3) suitable residential parking that does not interfere with snow removal or the operation of proximate LI uses and, further, is in accordance with the parking and loading requirements set forth in Section 17.125.

~~5~~6. Dwelling units shall be a minimum of four hundred (400) square feet and shall not exceed one thousand (1,000) square feet total and shall contain no~~t~~ more than two (2) bedrooms, unless otherwise specified in this section.

7. Multi-family dwelling units proposing a fourth or fifth floor with a qualifying ground floor consistent with Section 17.12.050 shall comply with the following minimum criteria:

a. Approval of the development is subject to a deed restrictive covenant approved by City Council;

b. A minimum of two-third (2/3) of the total square footage of housing units shall be deed restricted community housing units;

c. Deed restricted community housing units shall be designed and administered in accordance with the Blaine-Ketchum housing authority guidelines;

d. The area designated as light industrial shall be a minimum of fifty percent (50%) of the gross floor area in four story buildings. The area designated as light industrial shall be a minimum of forty percent (40%) of the gross floor area in five story buildings. Said light industrial use shall not be for personal storage by dwelling occupants; and

e. Up to fifty percent (50%) of the gross square footage of any four story building and up to sixty percent (60%) of the gross square footage of a five story building may be devoted to dwelling units.

f. Unless otherwise deemed appropriate by the Administrator, common area allocation shall be assessed at a LI to residential ratio of 1:1 for four story buildings and 2:3 for five story buildings.

~~6~~8. Anti-nuisance and Notice Provisions.

a. The applicant is aware the mixed use of the property can result in conflict, that the light industrial use may on occasion or in certain respects be incompatible with the quiet enjoyment of the dwelling units, that due to the subordinate and junior nature of the residential use to the light industrial use, the city will not condition, limit, restrict

or otherwise interfere with any lawful light industrial use solely because it interferes with a residential use.

b. ~~7.~~ All persons who rent or sublet any residential living unit within the light industrial zones shall provide the tenant, lessee or subtenant with written notice that such unit is located within the light industrial zone and, as such, is junior and, therefore, subordinate in nature to all legal light industrial activities.

c. ~~8.~~ Each and every real estate agent, sales person and broker and each and every private party who offers for rent or shows a parcel of real property and/or structure for lease or rent within such light industrial zones shall, upon first inquiry, provide the prospective lessee or tenant, prior to viewing such real property, with written notice that such real property and/or structure is located within such light industrial zone.

d. ~~9.~~ All brochures and other printed materials advertising rental or lease of a living unit within the light industrial zones shall contain a provision designating that such unit or units are located within the light industrial zone and are within a mixed use area. Lessees and tenants shall be notified that the residential uses within the light industrial zone are subordinate and, therefore, junior in nature to the legal light industrial activities within the zone.

9. Compliance with all applicable code sections, including among others, the city's parking and loading standards as set forth in Section 17.125.

10. Conditions including, but not limited to, the following may be attached to the conditional use permit approval:

a. Access to the apartments relative to design and relationship to light industrial uses;

b. ~~Location~~ Separation of residential and light industrial parking on the site to minimize conflicts;

c. Restrictions on exterior storage of personal property of tenants;

d. Certificate of occupancy required prior to occupancy of units;

e. Ketchum fire department and Ketchum building department requirements shall be met prior to occupancy;

f. Snow removal required to ensure utility of residential spaces and non-interference with continuous LI operations;

g. Any portion or all waived fees become due and payable upon conversion of resident housing unit(s) to light industrial uses; and/or

h. Any other condition deemed to enhance the purposes under this use, or to establish or promote the criteria referenced in subsections A1 through A10 of this section.

~~11.~~ The city council, after receiving a recommendation from the commission, may waive fees otherwise required in connection with development of such rental housing. The following findings shall be made to waive any such fees:

~~a. There is a need for rental housing stock in Ketchum;~~

~~b. The proposal meets the criteria contained in this subsection;~~

~~c. The housing proposed is an integral part of the project; and/or~~

~~d. Ketchum is in an acceptable financial position to waive such fees.~~

BEFORE THE CITY COUNCIL
OF THE
CITY OF KETCHUM

In the Matter of the Appeal of: Gary and Susan Martin Of Design Review Approval For The Community Library, DR 18-008	)	**FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION**

This matter comes before the City Council of the City of Ketchum ("Council"), pursuant to Ketchum City Code 17.144.020, as an appeal by an affected party of a Planning and Zoning Commission ("Commission") decision. An appeal hearing on the matter was held before the Council on July 16, 2018. The matter was heard for adoption of this written Decision on August 6, 2018. The Council does hereby make and set forth the following Record of Proceedings and the Council's Decision as follows:

I. RECORD OF PROCEEDINGS

A Record of Proceedings before the Ketchum Planning and Zoning Commission ("Commission Record") was prepared and submitted to the Council on May 21, 2018. That Commission Record is hereby referenced and incorporated in full into the Record and this Decision. The Commission Record includes the following Attachments:

A. Commission Findings of Fact, Conclusions of Law, and Decision on DR 18-008.

B. Staff Report for Commission Meeting of March 27, 2018.

C. Memorandum for Commission Meeting of March 27, 2018.

D. Staff Presentation for Commission Meeting of March 27, 2018.

E. Staff Report for Commission Meeting of April 9, 2018.

F. Staff Presentation for Commission Meeting of April 9, 2018.

G. Public Hearing Notice for Commission Meeting of March 27, 2018, and Public Comments Received.

H. Transcript of Proceedings Before the Commission.

I. File Memo of April 25, 2018 Concerning Pre-application Design Review Waiver Determination

J. Notice of Appeal, dated April 24, 2018.

On May 21, 2018, upon receipt of the Commission Record, the Council made procedural determinations and set deadlines as to submission of written argument by the Parties. Gary and Susan Martin ("Appellants") through legal counsel timely submitted Appellant's Memorandum on June 25, 2018. The Community Library ("Applicant" or "Respondent") through legal counsel timely submitted a Response Memorandum on July 6, 2018. Both Memorandums are hereby referenced and made a part of the Record in this matter.

An appeal hearing on this matter was held on July 16, 2018, at which hearing the Council received a staff report and oral arguments by the Parties. The July 16, 2018 Staff Report is made a part of the Record in this matter, including the following exhibits thereto:

Exhibit A: Appeal Hearing Process, per Ketchum Municipal Code (KMC) 17.144.020

Exhibit B: Timeline

Exhibit C: KMC §17.08.020 Defintions and KMC §17.12.020 District Use Matrix Excerpt

Exhibit D: Appellant's Memorandum

Exhibit E: Applicant's Response Memorandum

Exhibit F: Commission Record.

Appearing on behalf of the Appellants was Gary Slette, attorney at law of the law firm of Robertson & Slette, PLLC. Appearing on behalf of the Respondent were Jenny Emery Davidson, Executive Director of The Community Library, and John Seiller, attorney at law. Such hearing was recorded and that recording is made a part of the Record in this matter.

II. JUDICIAL NOTICE AND REVIEW STANDARD

The Council takes judicial notice of the Ketchum Municipal Code (KMC).

Pursuant to KMC § 17.144.020 (C), the Council makes its determination considering only the Commission Record below along with written and oral arguments by the Parties. No new facts or evidence are considered in the appeal.

III. FINDINGS, CONCLUSIONS, AND DECISION

1. Incorporation of Commission Findings.

The bulk of the Commission Findings (Commission Record, Attachment A) are undisputed as to the merits and to such extent the Commission Findings are hereby affirmed and incorporated herein by reference, unless specifically excepted below.

2. Determination and Definition of District Use.

The Parties dispute under which District Use the Project is appropriately defined. Appellants argue that the Project should be defined as a "Place of Assembly," which would lead to a requirement for a conditional use permit in the Project Zone prior to design review consideration. Respondent argues that the definition of "Cultural Facility," a permitted use in the

Project Zone, is the applicable definition. The Parties agreed on record that the Project is not appropriately defined as a "Public Use."

The Council initially finds that Appellants' argument regarding definition and the need for a conditional use permit (or to amend a previously issued permit) was not raised in the proceedings before the Planning and Zoning Commission, nor in the Appellants' Notice of Appeal, dated April 24, 2018 (Attachment J).

Further the Council finds that the appropriate definition for the Project is "Cultural Facility." As the matter concerns zoning regulations the appropriate reference for definitions is in KMC 17.08. In the definitions of terms at KMC 17.08.020, the definition of "Cultural Facility" specifically references libraries (with no restriction as to whether public or semi-public) as such a facility and use. Alternatively the definition of "Assembly, Place of" contains no reference to libraries and explicitly excludes use under the definition of "Cultural Facility." The Project does not result in overlapping regulations that require more restrictive review procedures as set forth in KMC 17.04.040.B. The Project was appropriately considered by City staff and the Commission as a permitted use able to proceed to design review.

3. Issuance of Building Permit.

Appellants argue that the City should not have issued a building permit for the Project when the Commission decision on design review was being appealed. Appellants rely on KMC 17.96.090 (A)(1) for their argument. *Appellant Memorandum*, 4.

The purpose of KMC 17.96.090 is to protect the term of design review approval for an applicant who appeals a Commission determination to the Council. The intent is that the term of design review approval is not adversely impacted or exhausted by the pendency of an appeal to the Council. KMC 17.96.090 is silent as to whether further proceedings on an approved design

review must be stayed pending an appeal. The City Code and Idaho Code likewise provide no specification that proceedings on a project must be stayed pending an appeal of a planning and zoning commission to a city council.

At the time of appeal, the status quo was that City staff had a design review approved by the Commission as required and an application for building permit from Applicant in process. The Council finds that City staff acted appropriately in continuing applicable processes under the status quo and in the absence of any directive for a stay of proceedings. City staff could not presume the initiation or outcome of an appeal. Further City staff appropriately notified Applicant of the pending appeal and that Applicant bore the risk of proceeding under an issued building permit during the pendency of the appeal.

4. Site Visit by Council

Appellants argue that the Council should have conducted a site visit of the Project as part of the appeal proceedings. A request for such a site visit as part of the appeal was raised by Appellants at the May 21, 2018 Council meeting and was denied at that time.

KMC 17.144.020(C) specifies that "the council shall consider only matters which were previously considered by the commission as evidenced by the record, the order, requirement, decision or determination of the commission and the notice of appeal, together with oral presentation and written legal by the [Parties]." That section further explicitly notes that the Council "shall not" consider new facts or evidence.

The Council finds that a site visit is not included within the list of matters which may be considered on an appeal. Further the Council finds that such a site visit would have significant danger of crossing the line into consideration of new facts or evidence which is not allowed under the appellate procedure of KMC 17.144.020(C).

5. Appellate Filing Fee

Appellants argue the filing fee for appeal is excessive. The Council finds that such fee has been established and previously set by the City as a reasonable amount necessary to offset the substantial administrative and legal costs incurred by the City in handling such an appeal.

6. Process

Appellants argue that they were not sufficiently notified and/or involved in the process on the Project. The Council, on review and as evidenced by the Commission Record, finds that the procedural requirements for a design review application, under the term of both the Idaho Local Land Use Planning Act and the zoning regulation of Ketchum Municipal Code were satisfied. Appellants were given sufficient notice and opportunity to be involved in the required public process.

7. Pre-application Design Review.

Appellants argue that pre-application design review was required in this matter. This issue was not raised before the Commission. The Council takes notice of the administrative determination that pre-application design review was not necessary. See Commission Record, *Attachment I.* That administrator decision was not appealed to the Commission, which would have been the appropriate step to dispute such determination per KMC 17.144.010. The Council believes that this administrative determination was likely correctly made, but finds simply that this issue was waived by Appellants due to failure to raise at the appropriate time.

8. Evaluation of Standards

Appellants raise a number of concerns related to the design and appearance of the Project, particularly as to bulk and flatness, landscaping, weather protection, parking, lighting, accessibility, and complementariness and impact on neighboring property. These issues raised

essentially amount to that the Appellants disagree with the opinions and determinations of the Commission.

The Council finds that these standards and factors were all appropriately considered by staff and the Commission in the proceedings below. In reviewing the Commission Record, the Council finds that the Commission considered and made reasonable findings and determinations on these issues in coming to the Commission's decision to approve the design review. As allowed by state law, the Council has previously delegated substantial design review approval authority to the Commission and the Council acts with great restraint in second-guessing the review and determination of the Commission on appeal in such situations. The Council finds that there is no showing that the Commission made substantial error or exceeded the Commission's authority in evaluating these factors and approving the design review in this matter.

9. Applicant Request for Removal of Commission Decision Paragraph 14.

Applicant requests that the Council not only affirm the Commission Decision, but go further and find that certain landscaping as presented is sufficient and therefore remove the condition of Paragraph 14 from the Commission Decision. The Council again finds that in its appellate capacity it should generally defer to the expertise and closeness of the Commission in such specifics and findings of fact. Additionally it is not clear that such a determination may even be made by the Council when the Applicant has not initially appealed that determination. Applicant has not submitted any argument that the Commission's condition requiring additional review and approval on this landscaping portion of the Project exceeds the authority of the Commission or is violative of any standard. Therefore the Council will not take action to supersede such determination and denies the Applicant's request for removal of Paragraph 14.

10. Additional Conclusions of Law.

i Every City in the State of Idaho shall exercise the powers conferred upon it by the Local Land Use Planning Act, codified at Chapter 65 Title 67 Idaho Code [I.C. § 67-6503] ("LLUPA").

ii The City Council may delegate powers required and authorized under LLUPA except the power to adopt ordinances by the establishment of a Planning and Zoning Commission by ordinance pursuant to Idaho Code § 67-6504, which the City Council of Ketchum has established at KMC 4.12.020.

iii The City Council is empowered to establish administrative review and appeal procedures pursuant to its authority under LLUPA, including pursuant to Idaho Code § 67-6521, and which the City of Ketchum has established for zoning regulation matters under KMC 17.144.

iv

Based upon the foregoing review and analysis, and good cause appearing from the record in these proceedings, the Council AFFIRMS the Decision of the Commission as presented in this matter, with no changes, and does order that the design review approval for DR 18-008 be upheld and authorize the Mayor to sign this Decision on behalf of the City Council.

Neil Bradshaw, Mayor

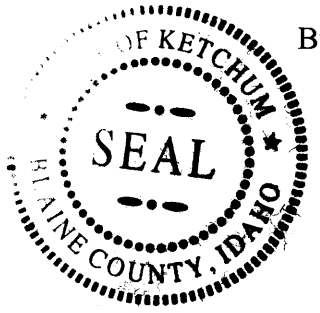
ATTEST:

By: _____
Robin Crotty, City Clerk

NOTICE OF APPEAL RIGHTS:

This Decision constitutes the written decision of the Council pursuant to KMC 17.144.020(D). The City Clerk is directed to transmit this Decision to the Appellants and Applicant and any other affected person who has requested a copy in writing. All parties and affected persons are hereby notified of this final decision and their option to consider further action, including appeal, pursuant to the proceedings set forth in Idaho Code § 67-6521.

A copy of this Decision has been provided to the Appellant, the Applicant and the City Attorney, and the original has been retained in the records of this City on this 7th day of August, 2018.



By: _____
City Clerk