ORDINANCE NO.: 2019-092

Granting an encroachment to Central Midlands Transit Authority – The COMET for the use of the right of way areas of the 1300 block of Bower Parkway adjacent to 350 Harbison Boulevard, 2300 block of Elmwood Avenue adjacent to 2325 Elmwood Avenue, and 5300 Block of Forest Drive adjacent to 5340 Forest Drive for the installation and maintenance of bus Shelters, Lexington County TMS#002898-01-031, and Richland County TMS#11505-05-01 and 16706-04-09

WHEREAS, the Central Midlands Transit Authority – The COMET (hereinafter "Grantee") desires to utilize a portion of the right of way area of the 1300 block of Bower Parkway adjacent to Sam’s at 350 Harbison Boulevard, Lexington County TMS#002898-01-031, for the installation and maintenance of a concrete pad measuring approximately eleven (11’) feet in width eighteen (18’) feet in length, an enclosed aluminum bus shelter approximately five (5’) feet in width, sixteen (16’) feet in length and eight (8’) feet in height, a bench approximately six (6’) feet in length two (2’) feet in width, and a trash receptacle; the right of way area of the 2300 block of Elmwood Avenue adjacent to 2325 Elmwood Avenue, Richland County TMS#11505-05-01, for the installation and maintenance of a concrete pad measuring approximately eleven (11’) feet in width and eighteen (18’) feet in length, an enclosed aluminum bus shelter approximately five (5’) feet in width, sixteen (16’) feet in length and eight (8’) feet in height, a bench approximately six (6’) feet in length two (2’) feet in width, and a trash receptacle; and the right of way area of the 5300 Block of Forest Drive adjacent to Wendy’s at 5340 Forest Drive, Richland County TMS#16706-04-09, for the installation and maintenance of a concrete pad measuring approximately nine (9’) feet in width and twelve (12’) feet in length, a concrete ramp approximately six (6’) feet in width and twenty (20’) feet in length, a bench approximately six (6’) feet in length and two (2’) feet in width, and a trash receptacle, as shown on the attached drawings; and,

WHEREAS, it appears that the encroachment will not interfere with the use of the medians or street for traffic, utility locations or other uses within the foreseeable future; NOW, THEREFORE,

BE IT ORDAINED by the Mayor and City Council of the City of Columbia, South Carolina, this 3rd day of December, 2019, that Grantee is hereby granted the right to use the right of way areas of the 1300 block of Bower Parkway adjacent to Sam’s at 350 Harbison Boulevard, Lexington County TMS#002898-01-031, for the installation and maintenance of a concrete pad measuring approximately eleven (11’) feet in width eighteen (18’) feet in length, an enclosed aluminum bus shelter approximately five (5’) feet in width, sixteen (16’) feet in length and eight (8’) feet in height, a bench approximately six (6’) feet in length two (2’) feet in width, and a trash receptacle; the right of way area of the 2300 block of Elmwood Avenue adjacent to 2325 Elmwood Avenue, Richland County TMS#11505-05-01, for the installation and maintenance of a concrete pad measuring approximately eleven (11’) feet in width and eighteen (18’) feet in length, an enclosed aluminum bus shelter approximately five (5’) feet in width, sixteen (16’) feet in length and eight (8’) feet in height, a bench approximately six (6’) feet in length two (2’) feet in width, and a trash receptacle; and the right of way area of the 5300 Block of Forest Drive adjacent to Wendy’s at 5340 Forest Drive, Richland County TMS#16706-04-09, for the installation and maintenance of a concrete pad measuring approximately nine (9’) feet in width and twelve (12’) feet in length, a concrete ramp approximately six (6’) feet in width and twenty (20’) feet in length, a bench approximately six (6’) feet in length and two (2’) feet in width, and a trash receptacle, as shown on the attached drawings.

ALL WORK SHALL COMPLY with the requirements of The City of Columbia, South Carolina Department of Transportation (SCDOT) and Federal Emergency Management Agency (FEMA) now in existence or hereafter enacted. The materials and type of finish to be used are to be approved by the City Engineer prior to installation. Any damage to the street or sidewalk caused by construction shall be repaired to the satisfaction of the City Manager. Improvements within the encroachment shall be maintained by the grantee at no cost to the City in a manner approved by the City Manager.
PROVIDED FURTHER that the privilege granted hereby is subject to the Grantee complying with the following conditions, restrictions or limitations:

1. No item, including landscaping, shall be placed, planted or allowed to grow such that it creates a visual impediment to persons safely entering or exiting the driveway or to persons safely walking along the sidewalk. The City reserves the right to remove or cut any item located within the right of way which it deems to be a safety hazard.
2. Grantee is responsible for all maintenance and assuring that all accessibility and ADA requirements are met and maintained.
3. Landscaping to be maintained by property owner.
4. Existing irrigation should not spray walkways, sidewalks and streets and/or creating hazardous conditions upon the walkways, sidewalks and streets.
5. Obstructions of more than be four (4') feet in height are prohibited within the sight-visibility triangle.
6. Forestry and Beautification shall be provided access to trees within the right of way for maintenance purposes.
7. All trees shall be protected and no large tree roots shall be removed from any existing trees.
8. Applicant shall coordinate with Traffic Engineering and Street Division to determine exact locations of the shelters in an effort to avoid stacking issues at adjacent intersections.

PROVIDED FURTHER that the privilege granted hereby may be modified or terminated by Columbia City Council at any time without notice to the Grantee, its successors and assigns.

BE IT FURTHER ORDAINED that Grantee, in consideration of the above privilege, shall at its expense provide for protection and relocation of all utilities that might be within this area to the satisfaction of the City Manager.

Requested by:
Assistant City Manager Shealy

Approved by:

City Manager

Approved as to form:
City Attorney

Introduced: 11/25/2019
Final Reading: 12/3/2019

Mayor

ATTEST:
City Clerk
**BUS STOP #335**

**BOVER PARKWAY & PARK TERRACE DRIVE**

- The proposed concrete pad flush with the back of the existing sidewalk. Pad must have a transverse slope no less than 0.1 and no greater than 0.15. The longitudinal slope of the new pad shall match the longitudinal slope of the existing sidewalk.
- Concrete pad shall be 8" thick.
- See shop drawings for all details and dimensions of shelter, concrete pad, and trash can.
- Bus shelter and trash can to be maintained by the Comet.
- Mount new trash can to new bus stop sign.

---

**EXISTING 33' RW**

- 15' CaG
- 75' to stopbar

**PROPOSED CONCRETE PAD (PINK)**

- Proposed 16' bus shelter (blue)
- Relocated bus stop sign w/ trash can (change)

**EDGE OF TRAVELWAY**

**INSET "A" 1" = 10'**

---

**BOVER PARKWAY**

**PARK TERRACE DRIVE**

---

**35 FT REQUIRED SIGHT DISTANCE FOR VEHICLES APPROACHING FROM THE LEFT FOR 35 MPH DESIGN SPEED AND PASSENGER CAR DESIGN VEHICLE**

---

**35 FT REQUIRED SIGHT DISTANCE FOR VEHICLES APPROACHING FROM THE RIGHT FOR 35 MPH DESIGN SPEED AND PASSENGER CAR DESIGN VEHICLE**

---

**BENCH**

**4X6X3 AREA**

**18" GAL**
REQUEST FOR A PERMANENT COMMERCIAL ENCROACHMENT ORDINANCE (INCLUDING OUTDOOR DINING/LANDSCAPING/STUDENT HOUSING)

For a continuing encroachment on any type of property in which the City has an interest (i.e., rights of way, tree zone, sidewalk, streets), the person or entity is required to have an encroachment ordinance enacted by City Council permitting the encroachment. Encroachment ordinances are required for but not limited to: irrigation systems; landscaping; fencing; walls; pavers; walkways; outdoor dining items (chairs, tables, umbrellas, etc.); awnings; bollards and directional signs (i.e., churches) business signs are NOT permitted via an encroachment. Encroachments must comply with all existing City codes, rules and regulations, the Americans with Disabilities Act, if applicable, and are subject to review and approval by City staff. Enactment of the encroachment ordinance by a majority vote of City Council, which is a discretionary legislative act, is also required. In order to obtain an encroachment ordinance from the City of Columbia, it will be necessary for the City of Columbia to be named as an additional insured on your insurance policy with limits being increased to $600,000 as required by Sec. 11-71. It is recommended that you contact your insurance provider to determine if it will name the City of Columbia as an additional insured prior to submitting your request for an encroachment ordinance. If you have any questions concerning these requirements, please contact Chip Timmons with Risk Management, (803) 733-4306 or ctimmons@columbiarc.net.

Please complete and submit this form along with photographs or drawings or site plan drawn to scale (including a 8-1/2 x 11) to Johnathan Chambers by email at jchambers@columbiarc.net; fax at 803-343-8779; or mail to Johnathan Chambers, Development Services, POB 147 Columbia, SC 29217, for preparation of an encroachment ordinance. Copies to City departments should be directed to the contact person for that department as shown below.

All work shall comply with the requirements of the City of Columbia and South Carolina Department of Transportation now in existence or hereafter enacted. The materials and type of finish to be used are to be approved by the City Engineer prior to installation. Any damage to the street or sidewalk caused by construction shall be repaired to the satisfaction of the City Manager. Improvements within the encroachment shall be maintained by the grantee at no cost to the City in a manner approved by the City Manager. Property owned, operated and maintained by SCDOT shall comply with SCDOT encroachment requirements.

Date: 05/29/2019 Property Owner: City of Columbia
Applicant's Name if different from Property Owner: Central Midlands Transit Authority - The COMET
Contact Information: Telephone Number: 803-255-7087 Fax Number:
Mailing Address: 3013 Lucius Road, Columbia, SC 29204 E-mail address: zmcyhee@davisfloyd.com
Business Name/Development Name for Encroachment: Central Midlands Transit Authority - The COMET
Encroachment Type: Wall Fence Columns Steps Irrigation System Landscaping Driveway Pavers Sidewalk/Walkway
Planners Awnings Underground Utilities Other: Bus Shelter
Dimensions (height/width/length): 6' x 12' x 18' Concrete Pad
(i.e. 6'x12' wooden privacy fence; 9'x6'x16' Bus Shelter;
two 12x9x3 concrete steps)
Construction Material: Shelter-Aluminum Frame with Safety Glass Panels

OUTDOOR DINING: The Fire Marshal's posted capacity allowed within the business at the time of enactment of the outdoor dining encroachment ordinance shall include the total number of patron seating approved for the outdoor dining encroachment area, if not already included in the posted capacity allowance, so that patrons relocating from inside to the outside or from outside to the inside do not cause the posted capacity to be exceeded.

Hours/day of operation for outdoor dining: N/A
Posted Maximum Capacity Allowance (inside/outside combined): N/A
No. of chairs outdoor: N/A
No. of Tables Outdoors: N/A
Do you serve: [ ] Wine [ ] Beer [ ] Liquor SC DOR ABL No.: N/A
If not, do you intend to apply for an ABL license: N/A

I acknowledge that the adjoining property owners and businesses have been contacted and approve the addition of outdoor dining at this location to include the service of beer, wine and/or liquor if applicable during the business hours noted above, and that any changes made to the business hours, use of the encroachment area or items allowed within the encroachment area will require an amendment to the encroachment ordinance.

<table>
<thead>
<tr>
<th>Name/Title:</th>
<th>Date:</th>
</tr>
</thead>
</table>

The proposed ordinance will be sent to the requesting party and City offices for review and approval. Johnathan Chambers will compile the recommendations and forward them to the City Clerk for scheduling before City Council. This process may take from 30-90 days.

CONTACT
Johnathan Chambers
John Fellows
Brian Cook
Jerry Thompson
Fanessa Pinckney
Amy Moore
Robert Harkins
Denny Daniels
Robert Anderson
Robert Sweat
David Brewer
Sara Hollar
John Hooks
Chip Timmons
David Koon
John David Spade
L.R. 7/2014

DEPARTMENT
Development Services (Land Development)
Development Services (Planning)
Development Services (Zoning)
Development Services (Building Inspections)
Development Services (Permit)
Development Services (Historic Preservation)
Development Services (Plans Review)
Utilities & Engineering (Construction Management)
Public Works (Administration)
Public Works (Street Division)
Public Works (Traffic Engineering)
Public Works (Forestry & Beautification)
Public Works (Solid Waste)
Risk Management
Fire Department
Parking Services

PHONE
803-545-3333
803-545-3222
803-545-3332
803-545-3420
803-545-3420
803-545-3222
803-545-3420
803-545-3420
803-545-3540
803-545-3780
803-545-3790
803-545-3850
803-545-3860
803-545-3800
803-733-8306
803-545-3701
803-545-3700

FAX
803-343-8779
803-733-8647
803-733-8647
803-733-8699
803-733-8699
803-733-8699
803-733-8647
803-988-8199
803-733-8648
803-545-3857
803-733-8648
803-733-8648
803-733-8647
803-733-8245
803-401-0839
803-733-8523

E-MAIL
jchambers@columbiarc.net
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bkcok@columbiarc.net
jthompson@columbiarc.net
fpinckney@columbiarc.net
armoore@columbiarc.net
rharkins@columbiarc.net
jdaniels@columbiarc.net
raanderson@columbiarc.net
rwstante@columbiarc.net
dbrewer@columbiarc.net
jhollar@columbiarc.net
jhooks@columbiarc.net
ctimmons@columbiarc.net
dkoon@columbiarc.net
jspadec@columbiarc.net
GENERAL NOTES:
1. ALL STRUCTURAL STEEL, UNLESS OTHERWISE NOTED, SHALL BE ASTM A-36, MINIMUM YIELD STRENGTH 36,000 PSI.
2. ALL STRUCTURAL ALUMINUM MEMBERS, UNLESS OTHERWISE NOTED, SHALL BE OF ALLOY 6063-T5 OR GREATER.
3. ALL HOLES TO BE DRILLED OR PUNCHED.
4. STEEL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STANDARD D1. 1-10.
5. ELECTRODES SHALL CONFORM TO AWS S1. CLASS E70S-5.5. ALUMINUM WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STANDARD D1. 2-08.
6. ALL WELDING TO BE DONE AT TOLAR MANUFACTURING COMPANY, INC. FACILITY.
7. ALL CORPORATE PROCEDURES, INCLUDING FABRICATION, MUST BE IN COMPLIANCE WITH TOLAR MANUFACTURING CO. INC'S QUALITY CONTROL MANUAL.

REVISION HISTORY

ZONE REV DESCRIPTION DATE APPROVED

SCALE 1/8

THE DESIGN AND DRAWINGS REMAIN THE INTELLECTUAL PROPERTY OF TOLAR MFG. AND ARE PROTECTED BY LAW. THEY MAY NOT BE ALTERED, REPRODUCED OR USED FOR FABRICATION WITHOUT EXPIRED WRITTEN CONSENT FROM TOLAR MFG.

ALL DOCUMENTS TO BE RETURNED TO TOLAR MFG. AT COMPLETION OF WORK. CONTRACTOR TO SITE VERIFY ALL DETAILS AND DIMENSIONS AND REPORT ANY AND ALL DISCREPANCIES TO TOLAR MFG. BEFORE COMMENCING WITH THAT RELATED PORTION OF THE WORK.
**Parts List**

<table>
<thead>
<tr>
<th>Item</th>
<th>QTY</th>
<th>Part Number</th>
<th>Description</th>
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<td>1115020</td>
<td>Steel drum, 20 gal, 21&quot; high</td>
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<tr>
<td>2</td>
<td>1</td>
<td>1623-01</td>
<td>Bracket, trash can channel</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1624-00</td>
<td>Bracket, trash can</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>7935-00</td>
<td>Water deflector, trash</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>7945-00</td>
<td>Top trash can lock plate</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>7946-00</td>
<td>Bottom trash can lock plate</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1345-00</td>
<td>Top, trash recept, 20 gal</td>
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<tr>
<td>8</td>
<td>1</td>
<td>4030020</td>
<td>Rod, 3/8&quot; O.D., steel, 20' long hr</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>20136-00</td>
<td>Tab, for lid support</td>
</tr>
</tbody>
</table>

**Diagram Description**

- APPLY CLEAR SILICONE @ ASSEMBLY

---

**Revision History**

<table>
<thead>
<tr>
<th>Zone</th>
<th>REV</th>
<th>Description</th>
<th>Date</th>
<th>Approved</th>
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<tr>
<td>A</td>
<td></td>
<td>Supercedes dwg #1578 REV. B</td>
<td>6/4/07</td>
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<tr>
<td>A</td>
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<td>Added ref. dwg's</td>
<td>1/17/08</td>
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<tr>
<td>B</td>
<td></td>
<td>Size change (ref. #20270)</td>
<td>8/16/10</td>
<td>VB</td>
</tr>
</tbody>
</table>

---

**Tolar Manufacturing Company, Inc**
258 Mariah Circle, Corona CA, 92879

**Description**
Trash Can 20 Gal Smooth, Post Mounted

**Material**
Steel

**Drawing Date**
2/8/2014

**Scale**
1/10

**Drawing No.**
1578-01

---

**Artist**
mfuantes
STRUCTURAL CALCULATIONS

FOR

33271-00 Shelter

Columbia, South Carolina
Code Search


Occupancy:
Occupancy Group = U Utility & Miscellaneous

Risk Category & Importance Factors:
Risk Category = II
Wind factor = 1.00
Snow factor = 1.00
Seismic factor = 1.00

Type of Construction:
Fire Rating:
  Roof = 0.0 hr
  Floor = 0.0 hr

Building Geometry:
  Roof angle (B) 0.00 / 12 0.0 deg
  Building length (L) 15.0 ft
  Least width (B) 5.0 ft
  Mean Roof Ht (h) 7.0 ft
  Parapet ht above grd 0.0 ft
  Minimum parapet ht 0.0 ft

Live Loads:
  Roof
    0 to 200 sf: 20 psf
    200 to 600 sf: 24 - 0.02 Area, but not less than 12 psf
    over 600 sf: 12 psf

Floor:
  Typical Floor
  Partitions N/A
**Wind Loads:**

**ASCE 7-10**

- Ultimate Wind Speed: 116 mph
- Nominal Wind Speed: 69.9 mph
- Risk Category: II
- Exposure Category: C
- Enclosure Classification: Partially Enclosed
- Internal pressure: +/-0.55
- Directionality (Kd): 0.85
- Kh case 1: 0.849
- Kh case 2: 0.849
- Type of roof: Monoslope

**Topographic Factor (Kzt)**

- Topography: Flat
- Hill Height (H): 80.0 ft
- Half Hill Length (Lh): 100.0 ft
- Actual H/Lh = 0.80
- Use H/Lh = 0.50
- Modified Lh = 160.0 ft
- From top of crest: x = 50.0 ft
- Bldg up/down wind? downwind

\[
\begin{align*}
H/Lh &= 0.50 \\
x/Lh &= 0.31 \\
z/Lh &= 0.09 \\
K_1 &= 0.000 \\
K_2 &= 0.792 \\
K_3 &= 1.000 \\
K_{zt} &= (1+K_1K_2K_3)^{1/2} = 1.00
\end{align*}
\]

**Gust Effect Factor**

- \( h = 7.0 \text{ ft} \)
- \( B = 5.0 \text{ ft} \)
- \( f_z (0.6h) = 15.0 \text{ ft} \)

**Rigid Structure**

- \( \bar{\sigma} = 0.20 \)
- \( t = 500 \text{ ft} \)
- \( z_{min} = 15 \text{ ft} \)
- \( c = 0.20 \)
- \( g_0 = 3.4 \)
- \( l_z = 427.1 \text{ ft} \)
- \( Q = 0.97 \)
- \( l_z = 0.23 \)
- \( G = 0.91 \text{ use } G = 0.85 \)

**Flexible or Dynamically Sensitive Structure**

- \( f = 0.85 \text{ using rigid structure default} \)
- \( \bar{\sigma} = 0.00 \)
- \( t = 0.65 \)
- \( z = 0.15 \)
- \( V_z = 98.0 \)
- \( N_z = 0.00 \)
- \( R_z = 0.000 \)
- \( R_h = 28.282 \text{ use } \eta = 0.000 \)
- \( R^* = 7.0 \text{ ft} \)
- \( R = 0.000 \)
- \( G_f = 0.000 \)

Flexible structure if natural frequency < 1 Hz (T > 1 second).
If building h/B > 4 then may be flexible and should be investigated.

- \( h/B = 1.40 \)

**G** = 0.85
Enclosure Classification

Test for Enclosed Building: A building that does not qualify as open or partially enclosed.

Test for Open Building: All walls are at least 80% open.
   Ao ≥ 0.8Ag

Test for Partially Enclosed Building: Predominately open on one side only

<table>
<thead>
<tr>
<th>Input</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ao</td>
<td>500.0 sf</td>
</tr>
<tr>
<td>Ag</td>
<td>600.0 sf</td>
</tr>
<tr>
<td>Ao</td>
<td>1000.0 sf</td>
</tr>
<tr>
<td>Agi</td>
<td>10000.0 sf</td>
</tr>
</tbody>
</table>

Conditions to qualify as Partially Enclosed Building. Must satisfy all of the following:
   Ao ≥ 1.1Aoi
   Ao > smaller of 4' or 0.01 Ag
   Aoi / Agi ≤ 0.20

Where:
   Ao = the total area of openings in a wall that receives positive external pressure.
   Ag = the gross area of that wall in which Ao is identified.
   Aoi = the sum of the areas of openings in the building envelope (walls and roof) not including Ao.
   Agi = the sum of the gross surface areas of the building envelope (walls and roof) not including Ag.

Reduction Factor for large volume partially enclosed buildings (RI):
If the partially enclosed building contains a single room that is unpartitioned, the internal pressure coefficient may be multiplied by the reduction factor RI.

Total area of all wall & roof openings (Aog): 0 sf
Unpartitioned internal volume (Vi): 0 sf

RI = 1.00

Altitude adjustment to constant 0.00256 (caution - see code):

Grd level above sea level = 0.0 ft
Constant = 0.00256
Adj Constant = 0.00256

Average Air Density = 0.0755 lbm/ft³
Wind Loads - MWFRS all h (Except for Open Buildings)

Kh (case 2) = 0.85  h = 7.0 ft  GCpI = +0.55
Base pressure (qI) = 24.9 psf  ridge h = 7.0 ft  G = 0.85
Roof Angle (θ) = 0.0 deg  L = 15.0 ft  z for qI = 7.0 ft
Roof tributary area - (h/2)*L:  53 sf  B = 5.0 ft  qI = 24.9 psf for positive internal pressures
(h/2)*B:  18 sf

Ultimate Wind Surface Pressures (psf)

<table>
<thead>
<tr>
<th>Surface</th>
<th>Wind Normal to Ridge</th>
<th>Wind Parallel to Ridge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B/L = 0.33</td>
<td>L/B = 3.00</td>
</tr>
<tr>
<td></td>
<td>h/L = 1.40</td>
<td>h/L = 0.47</td>
</tr>
<tr>
<td></td>
<td>Cp</td>
<td>qIGCp</td>
</tr>
<tr>
<td>Windward Wall (WW)</td>
<td>0.60</td>
<td>16.9</td>
</tr>
<tr>
<td>Leeward Wall (LW)</td>
<td>-0.50</td>
<td>-10.6</td>
</tr>
<tr>
<td>Side Wall (SW)</td>
<td>-0.70</td>
<td>-14.8</td>
</tr>
<tr>
<td>Leeward Roof (LR)</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Neg Windward Roof. h/2*</td>
<td>-1.30</td>
<td>-27.5</td>
</tr>
<tr>
<td>&amp; h/2**</td>
<td>-0.70</td>
<td>-14.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 h to 2h*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 2h*</td>
</tr>
</tbody>
</table>

**Roof angle < 10 degrees. Therefore, leeward roof is included in windward roof pressure zones.

Windward Wall Pressures at "z" (psf)

<table>
<thead>
<tr>
<th>z</th>
<th>Kz</th>
<th>Kzt</th>
<th>qI-GCp</th>
<th>w+qIGCm</th>
<th>w/qICGp</th>
<th>Combined WW + LW Normal to Ridge</th>
<th>Combined WW + LW Parallel to Ridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.65</td>
<td>1.00</td>
<td>16.9</td>
<td>3.2</td>
<td>30.6</td>
<td>27.5</td>
<td>22.2</td>
</tr>
</tbody>
</table>

NOTE:
See figure in ASCE7 for the application of full and partial loading of the above wind pressures. There are 4 different loading cases.

Parapet

<table>
<thead>
<tr>
<th>z</th>
<th>Kz</th>
<th>Kzt</th>
<th>qI (psf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>0.65</td>
<td>1.00</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Windward parapet: 0.0 psf (GCpI = +1.5)
Leeward parapet: 0.0 psf (GCpI = -1.0)

Windward roof overhangs (add to windward roof pressure) : 16.9 psf (upward)
Snow Loads : ASCE 7-10

Type of Roof
Ground Snow Load
Importance Factor
Thermal Factor
Exposure Factor
Pf = 0.7Ce'Ct'Pg = 10.1 psf
Unobstructed Slippery Surface
Sloped-roof Factor
Balanced Snow Load
Rain on Snow Surcharge Angle
Code Maximum Rain Surcharge
Rain on Snow Surcharge
Ps plus rain surcharge
Minimum Snow Load
Uniform Roof Design Snow Load

Nominal Snow Forces

Near ground level surface balanced snow load = 10.0 psf

NOTE: Alternate spans of continuous beams shall be loaded with half the design roof snow load so as to produce the greatest possible effect - see code for loading diagrams and exceptions for gable roofs.

Windward Snow Drifts 1 - Against walls, parapets, etc

Upwind fetch = 0.0 ft
Projection height = 0.0 ft
Snow density = 15.3 psf
Balanced snow height

hc/hb < 0.2 = -1.0
Drift height (hc) = 0.00 ft
Drift width = -5.27 ft
Surcharge load: pd = y'hd = 1.01 psf
Balanced Snow load: = 10.1 psf

Windward Snow Drifts 2 - Against walls, parapets, etc

Upwind fetch = 0.0 ft
Projection height = 0.0 ft
Snow density = 15.3 psf
Balanced snow height

hc/hb < 0.2 = -1.0
Drift height (hc) = 0.00 ft
Drift width = -5.27 ft
Surcharge load: pd = y'hd = 1.01 psf
Balanced Snow load: = 10.1 psf
Design Loads:

\[
\begin{align*}
D &= 10 \text{ psf} \\
Lr &= 20 \text{ psf} \\
S &= 15 \text{ psf} \\
W &= -32.7 \text{ psf}
\end{align*}
\]

Aluminium Type: 6061-T6

\[
\begin{align*}
F_y &= 35,000 \text{ psi} \\
E &= \text{####### psi}
\end{align*}
\]

Load Combinations:

\[
\begin{align*}
D+Lr &= 30.0 \text{ psf} \\
D+S &= 25.1 \text{ psf} \\
D+0.6W &= -9.6 \text{ psf} \\
D+0.75Lr+0.45W &= 10.3 \text{ psf} \\
D+0.75S+0.45W &= 6.6 \text{ psf} \\
0.6D+0.6W &= -13.6 \text{ psf}
\end{align*}
\]

Decking

\[
\begin{align*}
L &= 4.00 \text{ ft} \\
\text{Trib Width} &= 1.00 \text{ ft} \\
M_{\text{max}} &= 60.00 \text{ ft-lb} \\
V_{\text{max}} &= 60.00 \text{ lb} \\
I &= 0.0492 \text{ in}^4 \\
y &= 0.125 \text{ in} \\
S &= 0.39323 \text{ in}^3
\end{align*}
\]

Fy = 3021.1 psi \hspace{1cm} \text{OK}

Limit = 0.274 in \hspace{1cm} \text{L/175}

D = 0.145 in \hspace{1cm} \text{OK}

Section = 1/8" Aluminium panel System

Rear Header:

\[
\begin{align*}
L &= 15 \text{ ft} \\
\text{Trib Width} &= 2.50 \text{ ft} \\
M_{\text{max}} &= 2109.38 \text{ ft-lb} \\
V_{\text{max}} &= 562.50 \text{ lb} \\
I &= 28.1 \text{ in}^4 \\
y &= 3 \text{ in} \\
S &= 9.36667 \text{ in}^3
\end{align*}
\]

Fy = 4459.0 psi \hspace{1cm} \text{OK}

Limit = 1.029 in \hspace{1cm} \text{L/175}

D = 0.301 in \hspace{1cm} \text{OK}

Section = 6" Tube
### Front Header:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>15 ft</td>
</tr>
<tr>
<td>Trib Width</td>
<td>2.50 ft</td>
</tr>
<tr>
<td>M&lt;sub&gt;max&lt;/sub&gt;</td>
<td>2109.36 ft·lb</td>
</tr>
<tr>
<td>V&lt;sub&gt;max&lt;/sub&gt;</td>
<td>562.50 lb</td>
</tr>
<tr>
<td>I</td>
<td>7.23 in&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>y</td>
<td>2 in</td>
</tr>
<tr>
<td>S</td>
<td>3.615 in&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>F&lt;sub&gt;y&lt;/sub&gt;</td>
<td>11553.4 psi</td>
<td>OK</td>
</tr>
<tr>
<td>Limit</td>
<td>1.500 in</td>
<td>L/120</td>
</tr>
<tr>
<td>D</td>
<td>1.170 in</td>
<td>OK</td>
</tr>
</tbody>
</table>

Section = 4" Tube
4" Tube

Height = 7.1 ft
Trib Width = 7.5 ft
Trib Depth = 2.500 ft
Defl Limit = L/120 = 0.71 in
DL = 0 psf
WL = 18 psf
W_total = 138 psf

End Rxn's = 487 lbs
Moment = 863 ft-lb = 10354 in-lb
Provided OK?

S_x >= 0.2 in^3 3.21 in^3 OK
I_x >= 0.7 in^4 7.23 in^4 OK

Axial Force = 563 lb
Moment M_x = 863 lb-ft
Moment M_y = 288 lb-ft

k = 1
F_{ex} = 31458 psi
λ = 56
L_x = 7.083 ft
L_y = 7.083 ft
F_{ey} = 35000 psi
r_x = 1.51 in
B_c = 307222
r_y = 1.51 in
D_c = 5358
kL/r_x = 56
C_c = 24
kL/r_y = 56
λ_1 = 51

Limit State = YIELDING

F_c = 35000 psi
A_g = 3.2 in^2
P_{nc} = 67242.4 lb
F_b = 21212 psi
S_{xc} = 3.21 in^3
M_{max} = 5674 lb-ft
S_{yc} = 3.21 in^3
M_{try} = 5674 lb-ft

Interaction 0.21 <= 1 OK

Base Plate Design:

P = 563 lb
Area = 18.75 ft^2
Bearing Area = 64.0 in^2
Uplift = -255.2 lb
f_{avg} = 9 psi OK
t = 0.06 in
F_{avg} = 1,000 psi
Actual t = 0.5 in OK
1 Input data

Anchor type and diameter: Kwik Bolt TZ - SS 304 1/2 (2)
Effective embedment depth: $h_e = 2.000$ in., $h_{con} = 2.375$ in.
Material: AISI 304
Evaluation Service Report: ESR-1917
Issued I Valid: 4/1/2018 | 5/1/2019
Proof: Design method ACI 318 / AC193
Stand-off installation: $e_z = 0.000$ in. (no stand-off); $t = 0.500$ in.
Anchor plate: $l_1 \times l_2 \times t = 9.000$ in. x $9.000$ in. x $0.500$ in.; (Recommended plate thickness: not calculated
Profile: Round HSS, Steel pipe (AISC); $(L \times W \times t) = 4.000$ in. x $4.000$ in. x $0.125$ in.
Base material: cracked concrete, 2500, $f' = 2,500$ psi; $h = 6.000$ in.
Reinforcement: tension: condition B, shear: condition B; no supplemental splitting reinforcement present
edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F) no

- The anchor calculation is based on a rigid baseplate assumption.

Geometry [in.] & Loading [lb, in.lb]
2 Load case/Resulting anchor forces

Load case: Design loads

Anchor reactions [lb]
Tension force: (+Tension, -Compression)

<table>
<thead>
<tr>
<th>Anchor</th>
<th>Tension force</th>
<th>Shear force x</th>
<th>Shear force y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>64</td>
<td>105</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>64</td>
<td>105</td>
<td>75</td>
</tr>
<tr>
<td>3</td>
<td>64</td>
<td>105</td>
<td>75</td>
</tr>
<tr>
<td>4</td>
<td>64</td>
<td>105</td>
<td>75</td>
</tr>
</tbody>
</table>

max. concrete compressive strain: - [%]
max. concrete compressive stress: - [psi]
resulting tension force in (x,y)=(0.000/0.000): 256 [lb]
resulting compression force in (x,y)=(0.000/0.000): 0 [lb]

Anchor forces are calculated based on the assumption of a rigid baseplate.

3 Tension load

<table>
<thead>
<tr>
<th>Steel Strength*</th>
<th>Pullout Strength*</th>
<th>Concrete Breakout Strength**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load N_{as} [lb]</td>
<td>Capacity $\phi$ N_{n} [lb]</td>
<td>Utilization $\beta = N_{as}/\phi N_n$</td>
</tr>
<tr>
<td>64</td>
<td>8,665</td>
<td>1</td>
</tr>
<tr>
<td>64</td>
<td>1,749</td>
<td>4</td>
</tr>
<tr>
<td>259</td>
<td>6,274</td>
<td>5</td>
</tr>
</tbody>
</table>

* anchor having the highest loading **anchor group (anchors in tension)

3.1 Steel Strength

$N_{as} = ESR$ value refer to ICC-ES ESR-1917
$\phi N_{as} \approx N_{us}$ ACI 318-08 Eq. (D-1)

Variables

\[
\begin{align*}
A_{as,N} & \quad \text{in.}^2 \\
f_{ua} & \quad \text{ksi}
\end{align*}
\]

0.10 115,000

Calculations

$N_{as} [lb]$

11,554

Results

$N_{as} [lb] \quad \phi_{steel} \quad $ $N_{sa} [lb] \quad N_{sa} [lb]$

11,554 0.750 8,665 64
3.2 Pullout Strength

\[ N_{\text{pm,l}} = N_{p,2500} \sqrt{\frac{f_p}{2500}} \]

\[ \phi N_{\text{pm,l}} \geq N_{u,s} \]

\[ \text{ACI 318-08 Eq. (D-1)} \]

Variables

\[ f_p \ [\text{psi}] \quad N_{p,2500} \ [\text{lb}] \]

\[
\begin{array}{c|c}
2,500 & 3,180 \\
\hline
\end{array}
\]

Calculations

\[ \sqrt{\frac{f_p}{2500}} \]

\[ 1.000 \]

Results

\[ N_{\text{pm,l}} \ [\text{lb}] \quad \phi \text{ concrete} \quad \phi N_{\text{pm,l}} \ [\text{lb}] \quad N_{u,s} \ [\text{lb}] \]

\[
\begin{array}{c|c|c|c}
3,180 & 0.550 & 1,749 & 64 \\
\hline
\end{array}
\]

3.3 Concrete Breakout Strength

\[ N_{\text{dag}} = \left( \frac{A_{\text{dag}}}{A_{\text{d10}}} \right) \psi_{\text{ex,N}} \psi_{\text{ap,N}} \psi_{\text{op,N}} N_0 \]

\[ \phi N_{\text{dag}} \geq N_{u,s} \]

\[ A_{\text{d10}} = 9 h_0 \]

\[ \psi_{\text{ex,N}} = \frac{1}{1 + \frac{2 e_{\text{ex}}}{3 h_0}} \leq 1.0 \]

\[ \psi_{\text{ap,N}} = 0.7 + 0.3 \left( \frac{c_{\text{min}}}{1.5 h_0} \right) \leq 1.0 \]

\[ \psi_{\text{op,N}} = \text{MAX} \left( c_{\text{ap}}, \frac{1.5 h_0}{1.5 h_0} \right) \leq 1.0 \]

\[ N_0 = k_k N_{\text{e,l}}^2 \phi_{\text{concrete}} h_0 \]

Variables

\[ r_{\text{ex}} \ [\text{in.}] \quad e_{\text{ex,l}} \ [\text{in.}] \quad e_{\text{ap,l}} \ [\text{in.}] \quad c_{\text{min}} \ [\text{in.}] \quad \psi_{\text{ex,N}} \]

\[
\begin{array}{c|c|c|c|c}
2.000 & 0.000 & 0.000 & 6.000 & 1.000 \\
\hline
2.500 & 24 & 1 & 2,500 \\
\hline
\end{array}
\]

Calculations

\[ A_{\text{d10}} \ [\text{in.}^2] \quad A_{\text{d10}} \ [\text{in.}^2] \]

\[
\begin{array}{c|c|c|c|c|c|c|c|c|c|c}
121.00 & 36.00 & 1.000 & 1.000 & 1.000 & 1.000 & 3,394 \\
\hline
\end{array}
\]

Results

\[ N_{\text{dag}} \ [\text{lb}] \quad \phi \text{ concrete} \quad \phi N_{\text{dag}} \ [\text{lb}] \quad N_{u,s} \ [\text{lb}] \]

\[
\begin{array}{c|c|c|c}
11,408 & 0.550 & 6,274 & 256 \end{array}
\]
4 Shear load

<table>
<thead>
<tr>
<th></th>
<th>Load $V_{ua}$ [lb]</th>
<th>Capacity $\phi V_u$ [lb]</th>
<th>Utilization $p_u = V_{ua} / \phi V_u$</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel Strength*</td>
<td>106</td>
<td>4,472</td>
<td>3</td>
<td>OK</td>
</tr>
<tr>
<td>Steel failure (with lever arm)*</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Pryout Strength**</td>
<td>424</td>
<td>7,986</td>
<td>6</td>
<td>OK</td>
</tr>
<tr>
<td>Concrete edge failure in direction x***</td>
<td>424</td>
<td>2,591</td>
<td>17</td>
<td>OK</td>
</tr>
</tbody>
</table>

* anchor having the highest loading  **anchor group (relevant anchors)

4.1 Steel Strength

\[ V_{sa} = \text{ESR value} \]

\[ \phi V_{steel} \geq V_{sa} \quad \text{ACI 318-08 Eq. (D-2)} \]

Variables

<table>
<thead>
<tr>
<th>$A_{st,V}$ [in.(^2)]</th>
<th>$f_{sa}$ [ksi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10</td>
<td>115,000</td>
</tr>
</tbody>
</table>

Calculations

$V_{sa}$ [lb]

<table>
<thead>
<tr>
<th>$V_{sa}$ [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,880</td>
</tr>
</tbody>
</table>

Results

<table>
<thead>
<tr>
<th>$V_{sa}$ [lb]</th>
<th>$\phi_{steel}$</th>
<th>$\phi V_{sa}$ [lb]</th>
<th>$V_{sa}$ [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,880</td>
<td>0.650</td>
<td>4,472</td>
<td>106</td>
</tr>
</tbody>
</table>

4.2 Pryout Strength

\[ V_{org} = k_p \left( \frac{A_{org}}{A_{hcd}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{ep,N} N_b \quad \text{ACI 318-08 Eq. (D-31)} \]

\[ \phi V_{org} \geq V_{sa} \quad \text{ACI 318-08 Eq. (D-2)} \]

\[ A_{HCD} = 9 h_d^2 \quad \text{ACI 318-08 Eq. (D-6)} \]

\[ \psi_{ec,N} = \frac{1 - 2 a_{c,N}}{3 h_d} \leq 1.0 \quad \text{ACI 318-08 Eq. (D-9)} \]

\[ \psi_{ed,N} = 0.7 + 0.3 \frac{C_{e,min}}{C_{ed}} \leq 1.0 \quad \text{ACI 318-08 Eq. (D-11)} \]

\[ \psi_{ep,N} = \text{MAX} \left( \frac{C_{e,min}}{C_{ep}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-13)} \]

\[ N_b = k_b \lambda \sqrt{f_{c}} h_d^{1.5} \quad \text{ACI 318-08 Eq. (D-7)} \]

Variables

<table>
<thead>
<tr>
<th>$k_p$</th>
<th>$h_d$ [in.]</th>
<th>$e_{c,N}$ [in.]</th>
<th>$e_{cd,N}$ [in.]</th>
<th>$c_{e,min}$ [in.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.000</td>
<td>0.000</td>
<td>0.000</td>
<td>6.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$\psi_{c,N}$</th>
<th>$\psi_{ed,N}$</th>
<th>$\psi_{ep,N}$</th>
<th>$N_b$ [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>24</td>
<td>1</td>
<td>2,500</td>
</tr>
</tbody>
</table>

Calculations

<table>
<thead>
<tr>
<th>$A_{org}$ [in.(^2)]</th>
<th>$A_{HCD}$ [in.(^2)]</th>
<th>$\psi_{ec,N}$</th>
<th>$\psi_{ed,N}$</th>
<th>$\psi_{ep,N}$</th>
<th>$N_b$ [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>121.0</td>
<td>30.00</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>3,394</td>
</tr>
</tbody>
</table>

Results

<table>
<thead>
<tr>
<th>$V_{org}$ [lb]</th>
<th>$\phi_{concrete}$</th>
<th>$\phi V_{org}$ [lb]</th>
<th>$V_{org}$ [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,408</td>
<td>0.700</td>
<td>7,986</td>
<td>424</td>
</tr>
</tbody>
</table>
4.3 Concrete edge failure in direction x+

\[ V_{ed} = \left( \frac{b}{d/2} \right) \psi_{eLV} \psi_{eLV} \psi_{eLV} \psi_{eLV} \psi_{pLV} V_b \]  
ACI 318-08 Eq. (D-22)

\[ \psi_{eLV} = \frac{1}{1 + \frac{2h}{3d/2}} \leq 1.0 \]  
ACI 318-08 Eq. (D-23)

\[ \psi_{ed} = 0.7 + 0.3 \left( \frac{c_{at}}{h_{at}} \right) \leq 1.0 \]  
ACI 318-08 Eq. (D-24)

\[ \psi_{hV} = \sqrt{0.5c_{at}/h_{at}} \geq 1.0 \]  
ACI 318-08 Eq. (D-26)

\[ V_b = \left( \frac{f_y}{f_y} \right) V_0 \]  
ACI 318-08 Eq. (D-26)

Variables

\[ \begin{align*}
  c_{at} [\text{in.}] & \quad 4.000 \\
  d_{at} [\text{in.}] & \quad 6.000 \\
  c_{LV} [\text{in.}] & \quad 0.000 \\
  \psi_{eLV} & \quad 1.000 \\
  h_{at} [\text{in.}] & \quad 6.000 \\
  f_y [\text{psi}] & \quad 2.000 \\
  V_0 & \quad 1.000 \\
  \lambda & \quad 1.000 \\
  d_a [\text{in.}] & \quad 0.500 \\
  f_y [\text{psi}] & \quad 2.500 \\
  V_{pLV} & \quad 1.000 \\
\end{align*} \]

Calculations

\[ \begin{align*}
  A_{at} [\text{in.}^2] & \quad 102.00 \\
  A_{ef} [\text{in.}^2] & \quad 72.00 \\
  \psi_{eLV} & \quad 1.000 \\
  \psi_{eLV} & \quad 1.000 \\
  \psi_{hV} & \quad 1.000 \\
  V_b & \quad 2,612 \\
\end{align*} \]

Results

\[ \begin{align*}
  V_{ed} [\text{lb}] & \quad 3,701 \\
  \psi_{concrete} & \quad 0.700 \\
  V_{ed} [\text{lb}] & \quad 2,591 \\
  V_{at} [\text{lb}] & \quad 424 \\
\end{align*} \]

5 Combined tension and shear loads

\[ \begin{align*}
  \beta_H & \quad 0.041 \\
  \beta_V & \quad 0.164 \\
  \zeta & \quad 5/3 \\
  \beta_{HV} [%] & \quad 6 \\
  \text{Status} & \quad \text{OK} \\
\end{align*} \]

\[ \beta_{HV} = \beta_H + \beta_V \leq 1 \]

6 Warnings

- The anchor design methods in PROFIS Anchor require rigid anchor plates per current regulations (ETAG 001/Annex C, EOTA TR029, etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Anchor calculates the minimum required anchor plate thickness with FEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid base plate assumption is valid is not carried out by PROFIS Anchor. Input data and results must be checked for agreement with the existing conditions and for plausibility!

- Condition A applies when supplementary reinforcement is used. The \( \Phi \) factor is increased for non-steel Design Strengths except Pullout Strength and Pryout Strength. Condition B applies when supplementary reinforcement is not used and for Pullout Strength and Pryout Strength. Refer to your local standard.

- Refer to the manufacturer's product literature for cleaning and installation instructions.

- Checking the transfer of loads into the base material and the shear resistance are required in accordance with ACI 318 or the relevant standard!

Fastening meets the design criteria!
7 Installation data

Anchor plate, steel: -
Profile: Round HSS, Steel pipe (AISC); 4.000 x 4.000 x 0.125 in.
Hole diameter in the fixture: \( d_1 = 0.563 \) in.
Plate thickness (input): 0.500 in.
Recommended plate thickness: not calculated
Drilling method: Hammer drilled
Cleaning: Manual cleaning of the drilled hole according to instructions for use is required.

Anchor type and diameter: Kwik Bolt TZ - SS 304 1/2 (2)
Installation torque: 480.001 in.lbf
Hole diameter in the base material: 0.500 in.
Hole depth in the base material: 2.625 in.
Minimum thickness of the base material: 6.000 in.

7.1 Recommended accessories

<table>
<thead>
<tr>
<th>Drilling</th>
<th>Cleaning</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Suitable Rotary Hammer</td>
<td>• Manual blow-out pump</td>
<td>• Torque controlled cordless impact tool</td>
</tr>
<tr>
<td>• Properly sized drill bit</td>
<td></td>
<td>(Hilti Safeset System)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Torque wrench</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hammer</td>
</tr>
</tbody>
</table>

Coordinates Anchor in.

<table>
<thead>
<tr>
<th>Anchor</th>
<th>x</th>
<th>y</th>
<th>( c_x )</th>
<th>( c_{xy} )</th>
<th>( c_y )</th>
<th>( c_{yy} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-2.500</td>
<td>2.500</td>
<td>0.000</td>
<td>11.000</td>
<td>6.000</td>
<td>11.000</td>
</tr>
<tr>
<td>2</td>
<td>2.500</td>
<td>2.500</td>
<td>11.000</td>
<td>6.000</td>
<td>6.000</td>
<td>11.000</td>
</tr>
<tr>
<td>3</td>
<td>-2.500</td>
<td>2.500</td>
<td>6.000</td>
<td>11.000</td>
<td>6.000</td>
<td>6.000</td>
</tr>
<tr>
<td>4</td>
<td>2.500</td>
<td>2.500</td>
<td>11.000</td>
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Input data and results must be checked for agreement with the existing conditions and for plausibility!
8 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly compiled with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.

- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.
REQUEST FOR A PERMANENT COMMERCIAL ENCROachment ORDINANCE
(INCLUDING OUTDOOR DINING/LANDSCAPING/STUDENT HOUSING)

For a continuing encroachment on any type of property in which the City has an interest (i.e., rights of way, tree zone, sidewalk, streets), the person or entity is required to have an encroachment ordinance enacted by City Council permitting the encroachment. Encroachment ordinances are required for but not limited to: irrigation systems, landscaping, fences, walls, pavers, walkways, outdoor dining items (chairs, tables, umbrellas, etc.); awnings; billboards and directional signs (i.e., church); business signs are NOT permitted via an encroachment. Encroachments must comply with all existing City codes, rules and regulations, the Americans with Disabilities Act, if applicable, and are subject to review and approval by the City Staff. Enactment of the encroachment ordinance by a majority vote of the City Council, which is a discretionary legislative act, is also required. In order to obtain an encroachment ordinance from the City of Columbia, it will be necessary for the City of Columbia to be named as an additional insured on your insurance policy with limits being increased to $600,000 as required by Sec. 11-71. It is recommended that you contact your insurance provider to determine if it will name the City of Columbia as an additional insured prior to submitting your request for an encroachment ordinance. If you have any questions concerning these requirements, please contact Chip Timmons with Risk Management, (803) 733-8306 or catimmons@columbiasc.net.

Please complete and submit this form along with photographs and drawings or site plan drawn to scale (including a 6-1/2 x 11) to Johnathan Chambers by email at jechambers@columbiasc.net; fax at 803-343-8779; or mail to Johnathan Chambers, Development Services, POB 147 Columbia, SC 29217, for presentation of an encroachment ordinance. Copies to City departments should be directed to the contact person for that department as shown below.

All work shall comply with the requirements of the City of Columbia and South Carolina Department of Transportation now in existence or hereafter enacted. The materials and type of finish to be used are to be approved by the City Engineer prior to installation. Any damage to the street or sidewalk caused by construction shall be repaired to the satisfaction of the City Manager. Improvements within the enclosure shall be maintained by the grantee at no cost to the City in a manner approved by the City Manager. Property owned, operated and maintained by SCDO shall comply with SCDOI encroachment requirements.

Date: 3/7/2019

Property Owner: Second Nazareth Baptist Church
Applicant’s Name if different from Property Owner: Central Midlands Transit Authority - The COMET

Contact Information:
Telephone Number: 803-255-7136
Fax Number: __________

Mailing address: 3813 Lucius Road, Columbia, SC 29204
E-mail address: zmcghee@davisfloyd.com

Business Name/Development Name for Encroachment: Central Midlands Transit Authority- The COMET

Encroachment Type: Wall __________ Fence __________ Columns __________ Steps __________ Irrigation System __________ Landscaping __________ Driveway __________ Pavers __________ Sidewalk/Walkway __________

Plants __________ Awning __________ Underground Utilities __________ Other: Bus Shelter __________

Dimensions (height/width/length): 6”x7’x18’ Concrete Pad
(i.e. 6x24’ wooden privacy fence; 9’x6’x16’ Bus Shelter
two 12’x4’x3 concrete steps)

Construction material: Shelter-Aluminum Frame with Safety Glass Panels

OUTDOOR DINING: The Fire Marshall’s posted capacity allowed within the business at the time of enactment of the outdoor dining encroachment ordinance shall include the total number of patron seating approved for the outdoor dining encroachment area, if not already included in the posted capacity allowance, so that patrons relocating from inside to the outside or from outside to the inside do not cause the posted capacity to be exceeded.

Hours/days of operation for outdoor dining: N/A

Posted Maximum Capacity Allowance (inside/outside combined): N/A

No. of chairs outside: N/A

No. of Tables Outside: N/A

Do you serve: Wine __________ Beer __________ Liquor __________

If “Yes,” are you an ABL licensee? N/A

SCDO ABL No.: N/A

I acknowledge that the adjoining property owners and businesses have been contacted and approve the addition of outdoor dining at this location to include the service of beer, wine and/or liquor if applicable during the business hours noted above, and that any changes made to the business hours, use of the encroachment area or items allowed within the encroachment area will require an amendment to the encroachment ordinance.

Date:

The proposed ordinance will be sent to the requesting party and City offices for review and approval. Johnathan Chambers will compile the recommendations and forward them to the City Clerk for scheduling before City Council. This process may take from 30-90 days.
1/4-20 x 2" S.S. CARRIAGE BOLT WITH LOCKWASHER & HEX NUT - (6) PER SLAT

1/4-20 x 2 1/2" S.S. HEX HEAD BOLT WASHER, LOCKWASHER, & HEX NUT (2) PER ARMREST CONNECTION

3/8-16 x 2 3/4" S.S. WEDGE ANCHOR (2) PER PEDESTAL FOOT

DRILL A Ø3/8" - 2 1/2" DEEP FOR INSTALL FOLLOW INSTRUCTIONS FOR ANCHOR BOOTS FOR LOCATING AND PREPPING WEDGE ANCHOR HOLES

LOCATE AS NEEDED

PLAN VIEW

72,000" TYP.

5.500"

6,000"

30,000"

30,000"

24,000" REF.

24,000" REF.

5.500" 11.500" 6,125" 4,750"

FRONT ELEVATION

-- BENCH LAYOUT --

BRASCO INTERNATIONAL, INC.
32400 INDUSTRIAL DRIVE
MADISON HEIGHTS, MICHIGAN 48071
1-800-893-3665 WWW.BRASCO.COM

THIS DRAWING IS PROPRIETARY AND IS FOR THE SOLE USE OF OUR CUSTOMERS AND MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION FROM BRASCO INTERNATIONAL. LEAD TIME BEGINS UPON RECEIPT OF SIGNED APPROVAL.

SIGNED:_________________ DATE:_________________

CUSTOMER: CENTRAL MIDLANDS TRANSIT
PROJECT: INSTALLATION INSTRUCTIONS
MODEL: LEAN RAIL INSTALL

ENGINEER: MAUS
DATE: 7-21-14
CHECKER: BDH
DATE: 7-22-14

JOB # 3763 SHEET #: INSTALL-9
BR-1022 Bracket Kit for WR-10/22
For Pole or Wall Mount Applications

Bracket Kit Includes:
Qty. Description
(1) - Large pole / wall bracket
(2) - "2" brackets
(4) - 1/4-20 x 1 1/2" hex head bolts
(4) - 1/4-20 hex "kep" nuts
(2) - Stainless steel straps

Mounting
1. Decide proper height for basket, and mount large bracket to pole or wall. Bottom of bracket should be positioned 3/4" higher than final height to bottom of basket.

For Pole Mount
1. Insert straps as shown through the top and bottom of large bracket, and tighten onto pole. Cut off any unused portion of the strap. (Approx. 2" beyond the clip).

For Wall Mount
1. Screw or bolt the large bracket using the recommended hardware for your particular substrate, through the two large hole (3/8" dia.) located between the strap mounting slots on the large bracket.

To Mount "2" Brackets
1. Drill (4) 4/16" dia. holes in the basket adjacent to the seam in the back of the basket. (See sketch for dimensional layout).
2. Mount both "2" brackets on the baskets with the pad lock hole flange pointing down, using (2) 1/4-10 x 1 1/2" hex head bolts and hex "kep" nuts per bracket.
Todd,
Please proceed with the shelter on our easement. We are in agreement and give our approval. Paperwork to follow when I return. Thank you for all of your help.

Johnny Ray Noble, PhD

On Monday, March 4, 2019 Todd Warren <twarren@davisfloyd.com> wrote:

Pastor Noble,

Per our conversation this morning, We understand that the Church is in favor of the COMET placing a new shelter across from the Church. We understand that you guys have signed the easement agreement but that you are currently out of town. Please respond with your approval to this email and we will get the construction scheduled while we wait for the receipt of the easement document. Thank you for your help with this project.

Thanks,
Todd Warren, PE
ASSOCIATE | PROJECT MANAGER
---
240 Stoneridge Drive, Suite 305, Columbia, SC 29210
O. (803) 256-4121 | F. (803) 254-4549
E. twarren@davisfloyd.com | www.davisfloyd.com

~CONFIDENTIALITY NOTICE~

The information and all attachments contained in this email message are for the use of the intended recipients only. If you are not an intended recipient, please be advised that any use, dissemination, distribution, or copying of this email is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone or return email, and delete this email message and all attachments from your system.
REQUEST FOR A PERMANENT COMMERCIAL ENCROACHMENT ORDINANCE
(INCLUDING OUTDOOR DINING/LANDSCAPING/STUDENT HOUSING)

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Please complete and submit this form along with photographs and drawings or site plan drawn to scale (including a 8-1/2 x 11" to Johnathan Chambers by email at jechambers@columbiasc.net; fax at 803-343-8779; or mail to Johnathan Chambers, Development Services, P.O.B. 147, Columbia, SC 29217, for preparation of an encroachment ordinance. Copies to City departments should be directed to the contact person for that department as shown below.

All work shall comply with the requirements of the City of Columbia and South Carolina Department of Transportation now in existence or hereafter enacted. The materials and type of finish to be used are to be approved by the City Engineer prior to installation. Any damage to the street or sidewalk caused by construction shall be repaired to the satisfaction of the City Manager. Improvements within the encroachment shall be maintained by the grantee at no cost to the City in a manner approved by the City Manager. Property owned, operated, and maintained by SCDOT shall comply with SCDOT encroachment requirements.

Date: 10/15/2019  Property Owner: City of Columbia
Applicant's Name if different from Property Owner: Central Midlands Transit Authority - The COMET
Contact Information: Telephone Number: 803-355-7087  Fax Number: 
Mailing Address: 3513 Lucius Road, Columbia, SC 29024  E-mail: zmcghee@davisfloyd.com
Business Name/Development Name for Encroachment: Central Midlands Transit Authority - The COMET

Encroachment Type: Wall  Fence  Column  Steps  Irrigation System  Landscaping  Driveway  Pavers  Sidewalk/Walkway
Pl drugs: Awning  Underground Utilities  Other: Bus Shelter
Dimensions (height/width/length): 6"x12"x8'1" Concrete Pad
(i.e. 6x42" wooden privacy fence; 14"x8'x12' Concrete Retaining Wall
two 12x3' concrete steps)
6' Bench

Construction Material: Bench - Aluminum Frame with Composite boards

☐ OUTDOOR DINING: The Fire Marshal's posted capacity allowed within the business at the time of enactment of the outdoor dining encroachment ordinance shall include the total number of patron seating approved for the outdoor dining encroachment area, if not already included in the posted capacity allowance, so that patrons relocating from inside to the outside or from outside to the inside do not cause the posted capacity to be exceeded.

Hours/Day for Operation for Outoor Dining: N/A

No. of Chairs Outside: N/A  No. of Tables Outside: N/A

Do you serve: ☐ Wine  ☐ Beer  ☐ Liquor  SCDOT ABL No.: N/A

☐ if not, do you intend to apply for an ABL license? N/A

I acknowledge that the adjoining property owners and businesses have been contacted and approved the addition of outdoor dining at this location to include the service of beer, wine or liquor if applicable during the business hours noted above, and that any changes made to the business hours, use of the encroachment area or items allowed within the encroachment area will require an amendment to the encroachment ordinance.

Name/Title:  Date: ____________________________

The proposed ordinance will be sent to the requesting party and City offices for review and approval. Johnathan Chambers will compile the recommendations and forward them to the City Clerk for scheduling before City Council. This process may take from 30-90 days.

CONTACT
Johnathan Chambers  DEPARTMENT  PHONE  FAX
John Fellows
Brian Cook
Jerry Thompson
Fanessa Pinckney
Amy Moore
Robert Harkins
Denny Daniels
Robert Anderson
Robert Sweat
David Brewer
Sara Hollar
John Hooks
Chip Timmons
David Koon
John David Spade
LR: 7/2014
Development Services (Land Development)  803-545-3333  803-343-8779
Development Services (Planning)  803-545-3222  803-733-8306
Development Services (Zoning)  803-545-3332  803-733-8647
Development Services (Building Inspections)  803-545-3420  803-733-8699
Development Services (Permits)  803-545-3420  803-733-8699
Development Services (Historic Preservation)  803-545-3222  803-733-8647
Public Works Services (Civil Engineering)  803-545-3420  803-733-8647
Utilities & Engineering (Construction Management)  803-545-3780  803-733-8648
Public Works (Administration)  803-545-3790  803-545-3785
Public Works (Street Division)  803-545-3850  803-733-8648
Public Works (Traffic Engineering)  803-545-3850  803-733-8648
Public Works (Forestry & Beautification)  803-545-3860  803-733-8648
Public Works (Solid Waste)  803-545-3860  803-733-8648
Risk Management  803-545-8306  803-545-8306
Fire Department  803-545-3701  803-401-8839
Parking Services  803-545-3070  803-733-8523

E-MAIL
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