



BOARD OF ADJUSTMENT

Notice of Public Meeting
February 20, 2018 at 5:00 PM
10 W. State Street, Marshalltown, IA 50158

1. Call To Order & Roll Call

Frederick
Hitchins
Schulze
Thurston
Wenner

2. PUBLIC HEARING: Special Use Permit Request For 909 S. 2nd Street (Public Safety Facility) - Communication Antenna Structure

Documents:

022018_909 S 2ND ST_MEMO.PDF
SUP_PUBLIC SAFETY_022018.PDF

3. PUBLIC HEARING: Home Occupation Special Use Permit - 2606 Hilltop Drive - Brian & Sarah Murphy

Documents:

022018_2606 HILLTOP DR_MEMO.PDF
2606 HILLTOP APPLICATION.PDF
WORKING OUT IN THE GARAGE _ NEWS, SPORTS, JOBS - TIMES
REPUBLICAN.PDF

MARSHALLTOWN

I O W A

TO: Board of Adjustment

FROM: Michelle Spohnheimer, Housing & Community Development Director

DATE: February 20, 2018 – Meeting Date

SPECIAL USE PERMIT request for 909 S. 2nd Street – Communication Antenna Structure

The City of Marshalltown is proposing to install a communication antenna structure at the new Public Safety Facility at 909 S. 2nd Street. This proposed tower will be 175' monopole with a 15' lightning rod above the pole, set directly behind the new building. Details are included in the application packet.

Zone:	CC – Community Commercial District.
Use:	Antennas structures are allowed in all districts with a Special Use Permit.
Comprehensive Plan:	Commercial

Zoning Ordinance - Chapter 31 Section 6.1.

- b. Special Use Permit Required:** Antenna support structures and antennas for entities providing licensed or unlicensed communications services, including but not limited to cellular, personal communications services (PCS), specialized mobilized radio (SMR), enhanced specialized mobilized radio (ESMR), paging and similar services that is either not mounted on existing tall structure, or is more than 20 feet higher than the tall structure on which it is to be mounted shall not be permitted except pursuant to the following conditions:
- 1) An application must be completed and returned to the zoning officer accompanied by a current fee for a special use permit. The application at a minimum must contain the following information:
 - i) **Necessity:** The wireless communications company shall demonstrate, using technological evidence that the antenna must be located where it is proposed in order to satisfy the antenna's function in the company's system.
 - ii) **Co-Location Effort:** If the applicant proposes to build an antenna support structure (as opposed to mounting the antenna on an existing tall structure), it shall demonstrate that it contacted the owners of tall structures within a one-quarter mile radius of the site proposed, asked for a permission to install the antenna on those tall structures, and was denied for reasons other than failure to agree on compensation. The Board of Adjustment may deny the permit if it concludes that the applicant has not made a good faith effort to mount the antenna on an existing tall structure.
 - iii) **Antenna Height:** The applicant shall demonstrate, to the reasonable satisfaction of the Board of Adjustment, that the antenna is the minimum height required to function satisfactorily. No antenna that is taller than this minimum height shall be approved.
 - iv) **Setbacks from Base of Antenna Support Structure:** The minimum distance between the base of the support structure or any guy anchors and any property line shall be the largest of the following:
 - a). 50% of the antenna height;
 - b). The minimum setback in the underlying zoning district;
 - c). 60 feet.
 - v) **Antenna Support Structure Safety:** The applicant shall demonstrate, to the reasonable satisfaction of the Board of Adjustment, that the proposed antenna and support structure are safe and the surrounding areas will not be negatively affected by support structure failure, falling ice or other debris, or radio frequency interference. All structures shall be fitted with anti-climbing devices, as approved by the manufacturers.

- vi) Fencing:** An opaque fence shall be installed around the antenna support structure and other equipment, unless the antenna is mounted on an existing structure. The fence shall be a maximum of 6 feet in height and serve to screen the base of the structure and to improve security.
 - vii) Co-Location:** In order to reduce the number of antenna support structures needed in the community in the future, the proposed support structure shall be required to accommodate other users, including other wireless communications companies, and local police, fire, and ambulance companies.
 - viii) FCC License:** The applicant shall provide proof that it is licensed by the Federal Communications Commission.
 - ix) Required Parking:** If the site is fully automated, adequate parking shall be required for maintenance workers. If the site is not automated, the number of required parking spaces shall equal the number of people on the largest shift.
 - x) Painting:** Antenna support structures should be painted in such a manner as to reduce the visual impact and create a harmonious appearance with its surroundings.
 - xi) Site Plan:** A full site plan shall be required for all cell sites, showing the antenna, antenna support structure, building, fencing, buffering, and access.
 - xii) Air Safety:** Support structures 200 feet in height or taller, or those near airports, shall meet all Federal Aviation Administration requirements.
- c.** Applicant must show that the proposed antenna support structure, antenna or accessory structure will be placed in a reasonably available location that will minimize the visual impact on the surrounding area and allow the facility to function in accordance with the minimum standards imposed by applicable communications regulations and applicant's technical design requirements.
 - d.** Antenna support structures in residential neighborhoods are strongly discouraged. The application for a permit in a residential neighborhood must prove that the area cannot be adequately served by a facility placed in a non-residential neighborhood for valid technical reasons.
 - e.** All antenna support structures and communications facilities at sites other than the A-1 and 'M' Districts at a minimum shall be a monopole. All antennas shall be designed to blend into the surrounding environment or to look other than a tower, such as light poles, power poles and trees. At a minimum, all towers not requiring FAA painting or markings shall have an exterior finish which is galvanized or painted dull blue, gray or black. Existing non-monopole antenna support structures shall be allowed to continue. Additional antenna may be added to existing non-monopole structures provided that other requirements of this special use section are followed. If an existing non-monopole structure has been damaged by more than 50% of the fair market value prior to the damage, the replacement of the antenna shall conform to all requirements of this section including the monopole requirement.

Recommendation: The Plan Zoning Commission recommended approval of the request to the Board of Adjustment with no additional conditions.

DATE SUBMITTED & FEE PAID: 1/30/18
HEARING DATE: 2/20/18



BOARD OF ADJUSTMENT

Special Use & Home Occupation Special Use Permit Application

36 N. Center Street, Marshalltown, IA 50158 Ph: 641-754-5756 Fax: 641-754-5742

All items listed must be submitted with this application:

☒ **A site plan, drawn in ink to scale.** This site plan shall not be larger than 11" X 17."

☒ **Any other applicable drawings or diagrams.** Home Occupation Special use permits must submit a floor plan diagram.

☒ **Application fee.** A \$300 fee is required for a special use request (\$50 for a Home Occupation Special Use request). Make check payable to "City of Marshalltown." The fee must be paid when the application is submitted to the Housing Department.

☐ **Legal description of the property.** The property owner should have a copy of the legal description of the property. *Please note that the tax description on the Marshall County assessor's webpage is NOT the legal description.* The legal description is listed on the property's abstract or owners may obtain a copy of the recorded deed from the Marshall County Recorder's Office for a fee.

It is the burden of the applicant to provide sufficient facts with this application and at the Board of Adjustment meeting to support a finding that all the standards for approval have been met. For all special use requests, with the exception of a Home Occupation Special Use request, the Plan & Zoning Commission shall first review the proposal and make a recommendation to the Board of Adjustment.

Attendance at all meetings is required.

Please type or print legibly in ink.

Property Address: 909 South 2nd Street, Marshalltown, IA 50158

Owner: City of Marshalltown

Mailing Address: 24 N Center Street

Phone: 941-754-5734

Email: inickel@marshalltown-ia.gov

Owner's Agent (if applicable):

Agent Address:

Agent Phone:

Agent Email:

The board will use this information to review your request. Please attach any additional supporting information. If you have any questions, please contact the Zoning Department at 754-5756.

Please describe the request and what justification there is for the proposal. Attach additional pages if necessary. If applicable, please provide a description of the business or use, discuss any signage to be used, and parking issues.

Owner/Agent Signature:

Date:



Joel T.S. Greer, Mayor
Jessica Kinser, Administrator
Justin Nickel, Public Works Director
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5734
Fax - (641) 754-5793

DEPARTMENT OF PUBLIC WORKS

January 30, 2018

To: Michelle Spohnheimer
Housing & Community Development Director

From: Justin Nickel
Director of Public Works

Re: 175 Monopole to be erected at the new Police and Fire Joint Facility

Policy Issue: Special Use Permit must be approved by the Board of Adjustment

Recommendation: To approve the special use permit for a 175 foot monopole as proposed

Background: Supporting information

- Necessity – communication line of site from new Police and Fire Facility to Racom building
- Co-Location effort – N/A
- Antenna Height – 175 feet tall
- Setbacks from nearest property line – drawing enclosed
- Antenna Support structure safety – engineer stamped footing design enclosed
- Fencing – N/A
- Co- Location - N/A
- FCC Licensure – City is not licensed by FCC, but the City is seeking FCC approval for installation
- Required Parking – N/A
- Painting – the support structure will be painted to match the colors of the surrounding facility

City Council
Susan Cahill, Mike Gowdy, Joel Greer,
Al Hoop, Leon Lamer, Bill Martin, Bethany Wirin



- Site Plan – enclosed
- Air Safety – the monopole installation has received FAA clearance. Finding enclosed.

Budget Impact: None

Attachment: Resolution and Agreement

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Mike Gowdy, Joel Greer,
Al Hoop, Leon Lamer, Bill Martin, Bethany Wirin

Marshalltown



NOTES

1. ALL SHEET-BUILDING THICKNESS AT MIN. OF 10 INCHES W.G. 1.
2. EXISTING BUILDING SHALL BE MAINTAINED AS IS. IF ANY PART OF THE EXISTING BUILDING IS TO BE REMOVED, IT SHALL BE DEMOLISHED AND THE SITE SHALL BE RESTORED TO ITS ORIGINAL CONDITION.
3. THE EXISTING BUILDING SHALL BE MAINTAINED AS IS. IF ANY PART OF THE EXISTING BUILDING IS TO BE REMOVED, IT SHALL BE DEMOLISHED AND THE SITE SHALL BE RESTORED TO ITS ORIGINAL CONDITION.

**MARSHALLTOWN
POLICE & FIRE
HEADQUARTERS**

909 SOUTH 2ND STREET
MARSHALLTOWN, IOWA 50518

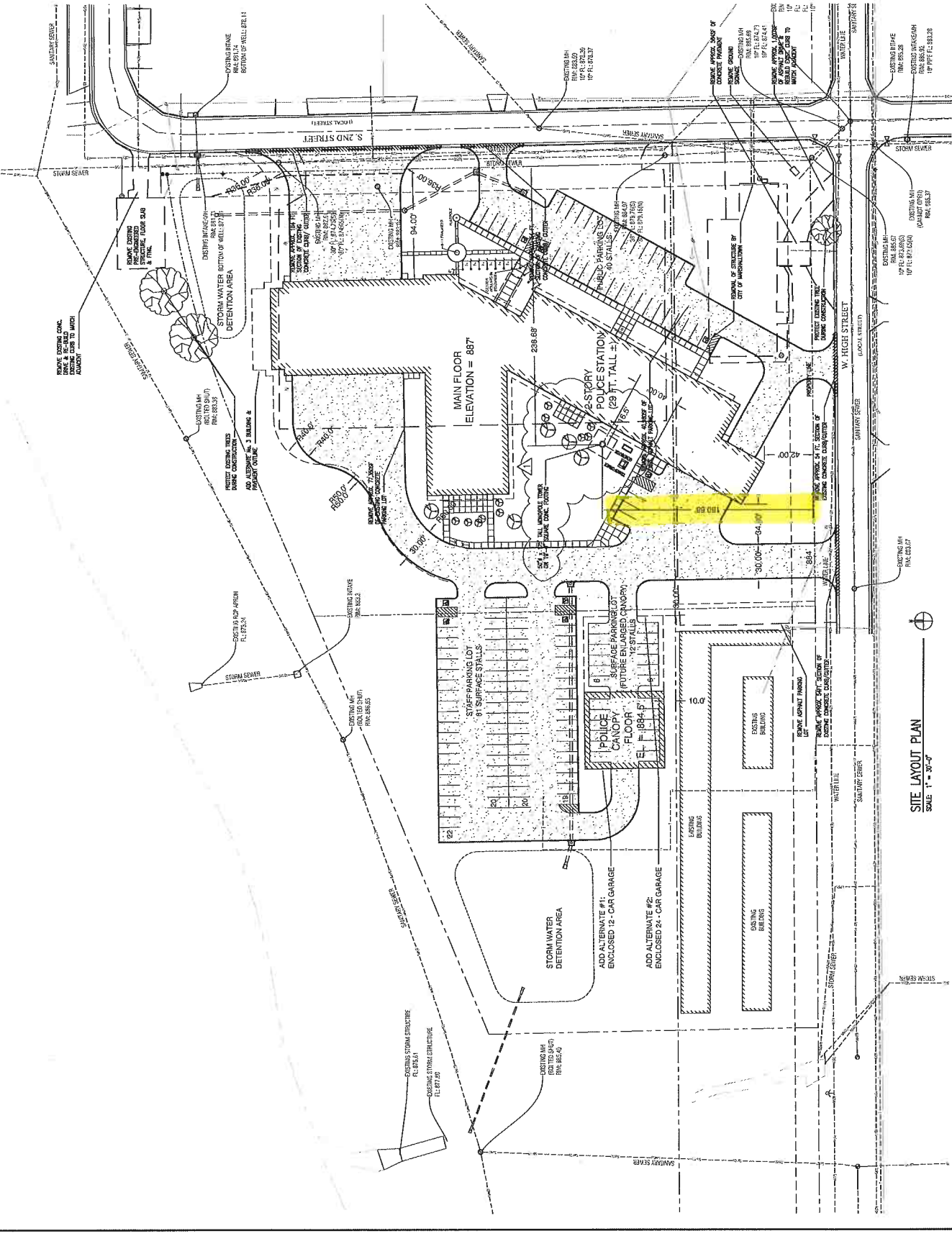
PROPOSED - THE DESIGN OF THE EXISTING BUILDING
SHALL BE MAINTAINED AS IS. IF ANY PART OF THE
EXISTING BUILDING IS TO BE REMOVED, IT SHALL
BE DEMOLISHED AND THE SITE SHALL BE RESTORED
TO ITS ORIGINAL CONDITION.



PROCHASKA & ASSOCIATES
INTERIORS & FACILITY MANAGEMENT
1000 UNIVERSITY AVENUE, SUITE 100
MARSHALLTOWN, IOWA 50555
PHONE: 319.336.1111 FAX: 319.336.1112
WWW.PROCHASKA.COM

SITE LAYOUT PLAN

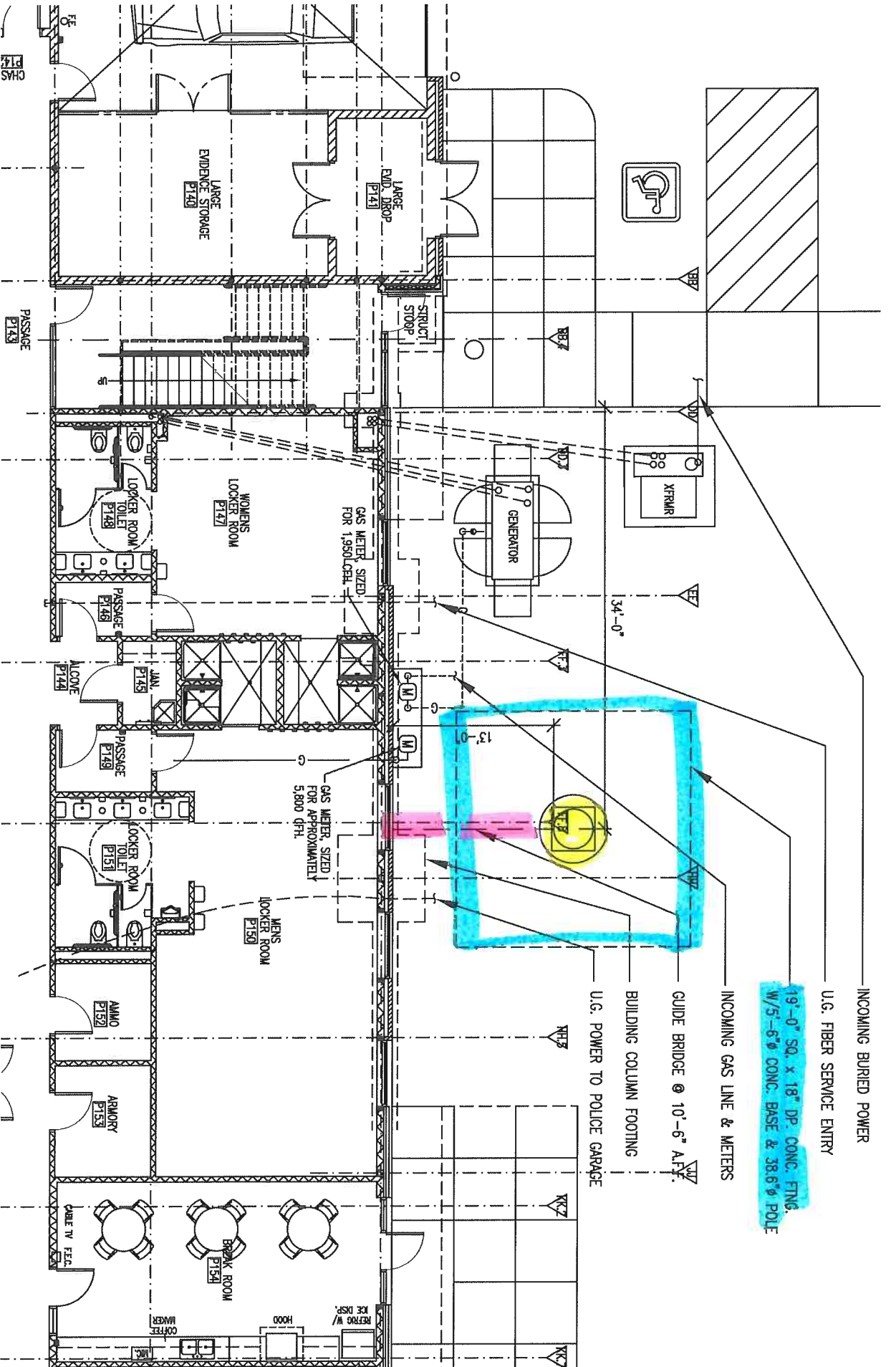
Date: 05-21-2017 Project No.:
Drawing No.:
Drawing By: C1.1

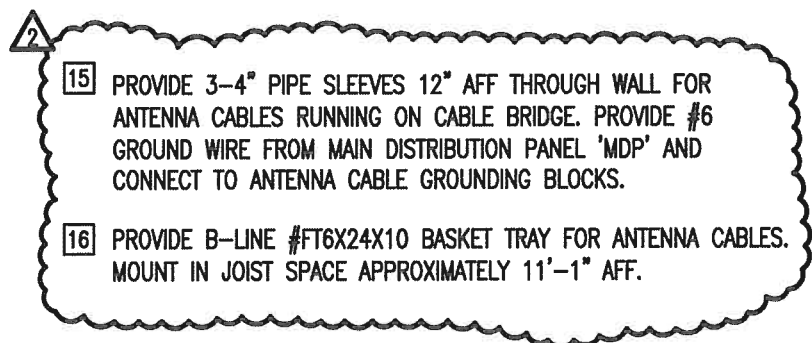


SITE LAYOUT PLAN
SCALE: 1" = 30'-0"

PROPOSED DISPATCH TOWER - UTILITIES COORD. DRAWING

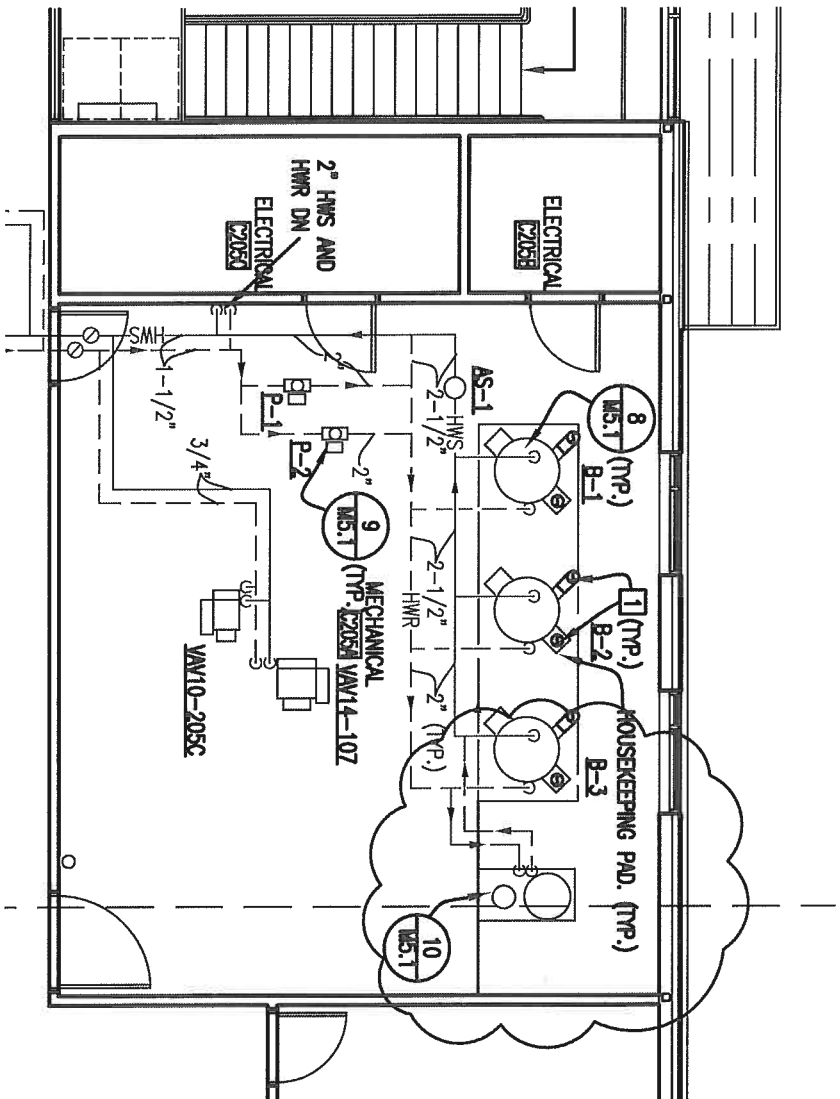
SCALE: 3/32" = 1'-0"





Sheet:

E2.2b



Date:
12/04/17
Project No.
160308

Project: MARSHALLTOWN POLICE AND
FIRE HEADQUARTERS
MARSHALLTOWN IA
PR 007



Planning Architecture Engineering
Interiors & Facility Management
11317 Chicago Circle Omaha, Nebraska 68104-2833
Phone (402) 334-0785 Fax (402) 334-0889
E-Mail: mef@prohda.com

Sheet:

M4.2a



Structural Design Report

175' Monopole

Site: Marshalltown, IA

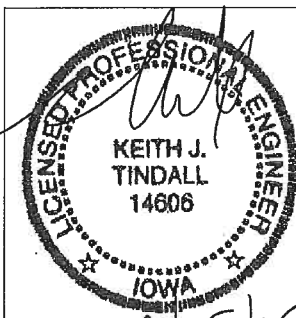
Prepared for: CITY OF MARSHALLTOWN

by: Sabre Towers & Poles™

Job Number: 175730

December 14, 2017

Monopole Profile.....	1
Foundation Design Summary.....	2
Pole Calculations.....	3-12
Foundation Calculations.....	13-14



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the Laws of the State of Iowa.

Keith J. Tindall (signature)

12/15/17 (dated)

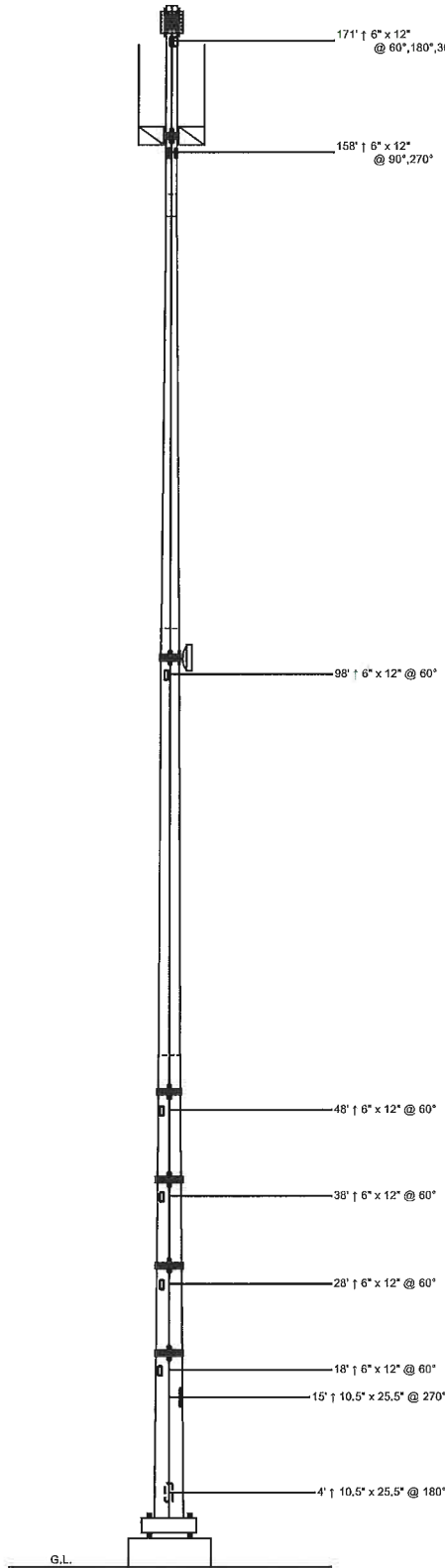
KEITH J. TINDALL

My license renewal date is December 31, 2018.

Pages or sheets covered by this seal: 1-15

12/15/17

Length (ft)	53'-3"	53'-6"	53'-6"	18	53'-6"	24'-3"
Number Of Sides						
Thickness (in)	5/16"					
Lap Splice (ft)	4'-6"					
Top Diameter (in)	30.51"					
Bottom Diameter (in)	38.5"					
Taper (in/ft)						
Grade						
Weight (lbs)	7648	4256	AS72-45	0.15	3156	1227
Overall Steel Height (ft)						



Designed Appurtenance Loading

Elev	Description	Tx-Line
173	Flush Mount (Monopole Only)	
173	(4) PMP 400	(4) 7/8"
170.62	(2) DB224	(2) 7/8"
160	(2) 3ft Sidearms	
100	(1) Dish Mount (Monopole Only) - Pipe Mount (up to 6' Dish)	
100	(1) 3' H.P. Dish	(1) 7/8"
50	Flush Mount (Monopole Only)	
50	(1) 6' Yagi	(1) 7/8"
40	Flush Mount (Monopole Only)	
40	(1) 6' Yagi	(1) 7/8"
30	Flush Mount (Monopole Only)	
30	(1) 6' Yagi	(1) 7/8"
20	Flush Mount (Monopole Only)	
20	(1) 6' Yagi	(1) 7/8"

Load Case Reactions

Description	Axial (kips)	Shear (kips)	Moment (ft-k)	Deflection (ft)	Sway (deg)
3s Gusted Wind	21.6	17.24	1765.34	20.22	12.33
3s Gusted Wind 0.9 Dead	16.23	17.3	1735.72	19.67	11.93
3s Gusted Wind&Ice	36.52	4.36	527.94	6.93	4.29
Service Loads	18.06	3.74	383	4.55	2.72

Base Plate Dimensions

Shape	Width	Thickness	Bolt Circle	Bolt Qty	Bolt Diameter
Square	42"	2.5"	44.75"	8	2.25"

Anchor Bolt Dimensions

Length	Diameter	Hole Diameter	Weight	Type	Finish
84"	2.25"	2.625"	968.8	A615-75	Galv

Material List

Display	Value
A	3' - 6"
B	2' - 6"

Notes

- 1) Antenna Feed Lines Run Inside Pole
- 2) All dimensions are above ground level, unless otherwise specified.
- 3) Weights shown are estimates. Final weights may vary.
- 4) The Monopole was designed for a basic wind speed of 90 mph with 0" of radial ice, and 40 mph with 3/4" of radial ice, in accordance with ANSI/TIA-222-G, Structure Class III, Exposure Category C, Topographic Category 1.
- 5) Full Height Step Bolts
- 6) Tower Rating: 93.7%
- 7) The tower design meets the requirements for an Ultimate Wind Speed of 120 mph (Risk Category III), in accordance with the 2015 International Building Code.
- 8) This structure has been designed with a 100% increase in antenna and line loading.



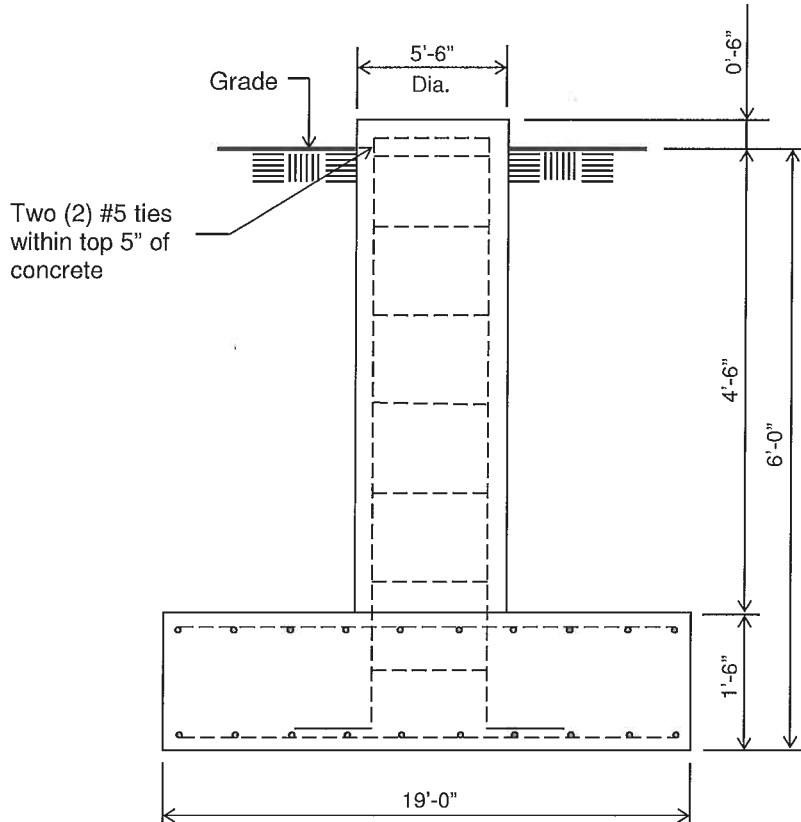
Sabre Communications Corporation
7101 Southbridge Drive
P.O. Box 658
Sioux City, IA 51102-0658
Phone: (712) 258-6690
Fax: (712) 279-0814

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Job:	175730
Customer:	CITY OF MARSHALLTOWN
Site Name:	Marshalltown, IA
Description:	175' Monopole
Date:	12/14/2017
By:	MH

Customer: City of Marshalltown
Site: Marshalltown, IA

175' Monopole at
90 mph Wind with no ice and 40 mph Wind with 0.75 in. Ice per ANSI/TIA-222-G.
Antenna Loading per Page 1



ELEVATION VIEW
(24.46 Cu. Yds.)
(1 REQUIRED; NOT TO SCALE)

Notes:

- 1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-11.
- 2) Rebar to conform to ASTM specification A615 Grade 60.
- 3) All rebar to have a minimum of 3" concrete cover.
- 4) All exposed concrete corners to be chamfered 3/4".
- 5) The foundation design is based on the geotechnical report by Terracon Consultants, Inc., Project No. AB175001-01 dated: April 5th, 2017.
- 6) See the geotechnical report for compaction requirements, if specified.
- 7) 4.5 ft of soil cover is required over the entire area of the foundation slab.
- 8) The foundation is based on the following factored loads:
Moment (kip-ft) = 1766.20
Axial (kips) = 21.67
Shear (kips) = 17.23

Rebar Schedule for Pad and Pier	
Pier	(30) #7 vertical rebar w/ hooks at bottom w/ #5 ties, two within top 5" of pier, then 12" C/C
Pad	(20) #8 horizontal rebar evenly spaced each way top and bottom (80 total)

175730

(USA 222-G) - Monopole Spatial Analysis (c)2015 Guymast Inc.

Tel:(416)736-7453 Fax:(416)736-4372 Web:www.guymast.com

Processed under license at:

Sabre Towers and Poles on: 14 dec 2017 at: 10:05:36

175' Monopole / Marshalltown, IA

* All pole diameters shown on the following pages are across corners.
See profile drawing for widths across flats.

POLE GEOMETRY

ELEV ft	SECTION NAME	No. SIDE	OUTSIDE DIAM in	THICK -NESS in	RESISTANCES ♦*Pn ♦*Mn kip ft-kip	SPLICE TYPE	...OVERLAP... LENGTH ft	RATIO	w/t
174.0	A	18	14.22	0.250	810.6 227.0				
			17.52	0.250	1002.5 348.3				8.1
152.2	A/B	18	17.52	0.250	1002.5 348.3	SLIP	2.50	1.75	
			17.41	0.250	996.0 343.8				
149.7	B	18	17.41	0.250	996.0 343.8				10.3
			24.63	0.250	1415.2 697.0				
102.2	B/C	18	24.63	0.250	1415.2 697.0	SLIP	3.50	1.73	
			24.67	0.250	1417.5 699.4				
98.7	C	18	24.67	0.250	1417.5 699.4				15.4
			31.58	0.250	1711.5 1085.9				
53.2	C/D	18	31.58	0.250	1711.5 1085.9	SLIP	4.50	1.73	
			31.78	0.312	2283.1 1451.9				
48.7	D	18	31.78	0.312	2283.1 1451.9				15.9
			39.20	0.312	2661.0 2095.0				
0.0									

POLE ASSEMBLY

SECTION NAME	BASE ELEV ft	BOLTS NUMBER	AT BASE TYPE	OF SECTION DIAM in	STRENGTH ksi	THREADS IN SHEAR PLANE	CALC BASE ELEV ft
A	149.750	0	A325	0.00	92.0	0	149.750
B	98.750	0	A325	0.00	92.0	0	98.750
C	48.750	0	A325	0.00	92.0	0	48.750
D	0.000	0	A325	0.00	92.0	0	0.000

POLE SECTIONS

SECTION NAME	No. of SIDES	LENGTH ft	OUTSIDE DIAMETER BOT in	TOP in	THICK- NESS in	MAT- ERIAL ID	FLANGE ID BOT	TOP	FLANGE WELD ..GROUP ID.. BOT	TOP
A	18	24.25	17.91	14.22	0.250	1	0	0	0	0
B	18	53.50	25.17	17.02	0.250	2	0	0	0	0
C	18	53.50	32.28	24.13	0.250	3	0	0	0	0
D	18	53.25	39.20	31.08	0.312	4	0	0	0	0

* - Diameter of circumscribed circle

MATERIAL TYPES

TYPE OF SHAPE	TYPE NO	NO OF ELEM.	ORIENT & deg	HEIGHT in	WIDTH in	THICKNESS WEB	FLANGE	IRREGULARITY PROJECTION % OF ORIENT AREA
						in	in	deg

175730

PL									
PL	1	1	0.0	17.91	0.25	0.250	0.250	0.00	0.0
PL	2	1	0.0	25.17	0.25	0.250	0.250	0.00	0.0
PL	3	1	0.0	32.28	0.25	0.250	0.250	0.00	0.0
PL	4	1	0.0	39.20	0.31	0.312	0.312	0.00	0.0

& - with respect to vertical

MATERIAL PROPERTIES

MATERIAL TYPE NO.	ELASTIC MODULUS ksi	UNIT WEIGHT pcf	.. STRENGTH .. Fu ksi	Fy ksi	THERMAL COEFFICIENT /deg
1	29000.0	490.0	80.0	65.0	0.00001170
2	29000.0	490.0	80.0	65.0	0.00001170
3	29000.0	490.0	80.0	65.0	0.00001170
4	29000.0	490.0	80.0	65.0	0.00001170

* Only 3 condition(s) shown in full

* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

LOADING CONDITION A

90 mph wind with no ice. Wind Azimuth: 0°

LOADS ON POLE

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD..AT AZI	LOAD AZI	FORCES.....		MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	172.000	0.00	0.0	0.0	0.0000	0.8916	0.0000	0.0000
C	172.000	0.00	0.0	0.0	0.9629	0.4778	0.0000	0.0000
C	169.620	0.00	0.0	0.0	0.0000	0.4397	0.0000	0.0000
C	169.620	0.00	0.0	0.0	1.3795	0.2429	0.0000	0.0000
C	159.000	0.00	0.0	0.0	1.2001	0.9696	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0000	0.1283	0.0000	0.0000
C	49.000	0.00	0.0	0.0	0.0000	0.0635	0.0000	0.0000
C	49.000	0.00	0.0	0.0	0.4001	0.2956	0.0000	0.0000
C	39.000	0.00	0.0	0.0	0.0000	0.0505	0.0000	0.0000
C	39.000	0.00	0.0	0.0	0.3818	0.2956	0.0000	0.0000
C	29.000	0.00	0.0	0.0	0.0000	0.0376	0.0000	0.0000
C	29.000	0.00	0.0	0.0	0.3593	0.2956	0.0000	0.0000
C	19.000	0.00	0.0	0.0	0.0000	0.0246	0.0000	0.0000
C	19.000	0.00	0.0	0.0	0.3299	0.2956	0.0000	0.0000
D	174.000	0.00	180.0	0.0	0.0452	0.0464	0.0000	0.0000
D	159.500	0.00	180.0	0.0	0.0482	0.0499	0.0000	0.0000
D	159.500	0.00	180.0	0.0	0.0517	0.0637	0.0000	0.0000
D	102.250	0.00	180.0	0.0	0.0658	0.0694	0.0000	0.0000
D	102.250	0.00	180.0	0.0	0.0683	0.1557	0.0000	0.0000
D	98.750	0.00	180.0	0.0	0.0683	0.1557	0.0000	0.0000
D	98.750	0.00	180.0	0.0	0.0695	0.0816	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0754	0.0963	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0761	0.2252	0.0000	0.0000
D	48.750	0.00	180.0	0.0	0.0761	0.2252	0.0000	0.0000
D	48.750	0.00	180.0	0.0	0.0748	0.1293	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0700	0.1513	0.0000	0.0000

ANTENNA LOADING

.....ANTENNA..... TYPE	ELEV ft	AZI	ATTACHMENT RAD ft	AZI	ANTENNA FORCES..... AXIAL kip	SHEAR kip	GRAVITY kip	TORSION ft-kip
HP	99.0	0.0	1.7	0.0	0.90	0.00	0.20	0.00

LOADING CONDITION M

90 mph wind with no ice. Wind Azimuth: 0°

LOADS ON POLE

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD..AT AZI	LOAD AZI	FORCES.....		MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip

175730

C	172.000	0.00	0.0	0.0	0.0000	0.6687	0.0000	0.0000
C	172.000	0.00	0.0	0.0	0.9629	0.3584	0.0000	0.0000
C	169.620	0.00	0.0	0.0	0.0000	0.3297	0.0000	0.0000
C	169.620	0.00	0.0	0.0	1.3795	0.1822	0.0000	0.0000
C	159.000	0.00	0.0	0.0	1.2001	0.7272	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0000	0.0962	0.0000	0.0000
C	49.000	0.00	0.0	0.0	0.0000	0.0476	0.0000	0.0000
C	49.000	0.00	0.0	0.0	0.4001	0.2217	0.0000	0.0000
C	39.000	0.00	0.0	0.0	0.0000	0.0379	0.0000	0.0000
C	39.000	0.00	0.0	0.0	0.3818	0.2217	0.0000	0.0000
C	29.000	0.00	0.0	0.0	0.0000	0.0282	0.0000	0.0000
C	29.000	0.00	0.0	0.0	0.3593	0.2217	0.0000	0.0000
C	19.000	0.00	0.0	0.0	0.0000	0.0185	0.0000	0.0000
C	19.000	0.00	0.0	0.0	0.3299	0.2217	0.0000	0.0000
D	174.000	0.00	180.0	0.0	0.0452	0.0348	0.0000	0.0000
D	159.500	0.00	180.0	0.0	0.0482	0.0374	0.0000	0.0000
D	159.500	0.00	180.0	0.0	0.0517	0.0478	0.0000	0.0000
D	102.250	0.00	180.0	0.0	0.0658	0.0520	0.0000	0.0000
D	102.250	0.00	180.0	0.0	0.0683	0.1168	0.0000	0.0000
D	98.750	0.00	180.0	0.0	0.0683	0.1168	0.0000	0.0000
D	98.750	0.00	180.0	0.0	0.0695	0.0612	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0754	0.0722	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0761	0.1689	0.0000	0.0000
D	48.750	0.00	180.0	0.0	0.0761	0.1689	0.0000	0.0000
D	48.750	0.00	180.0	0.0	0.0748	0.0969	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0700	0.1135	0.0000	0.0000

ANTENNA LOADING

=====

.....ANTENNA.....	ATTACHMENT	ANTENNA	FORCES.....
TYPE	ELEV	RAZ	AXIAL
	ft	ft	kip
HP	99.0	0.0	1.7
			0.0
			0.90
			0.00
			0.15
			0.00

LOADING CONDITION Y

40 mph wind with 0.75 ice. Wind Azimuth: 0°

LOADS ON POLE

=====

LOAD	ELEV	APPLY.	LOAD.	AT	LOAD	FORCES.....	MOMENTS.....
TYPE	ft	RADIUS	ft	RAZ	RAZ	HORIZ	VERTICAL
						kip	ft-kip
C	172.000	0.00	0.0	0.0	0.0000	0.8916	0.0000
C	172.000	0.00	0.0	0.0	0.2262	0.7080	0.0000
C	169.620	0.00	0.0	0.0	0.0000	0.4397	0.0000
C	169.620	0.00	0.0	0.0	0.7000	1.1445	0.0000
C	159.000	0.00	0.0	0.0	0.2661	1.8479	0.0000
C	99.000	0.00	0.0	0.0	0.0000	0.1283	0.0000
C	49.000	0.00	0.0	0.0	0.0000	0.0635	0.0000
C	49.000	0.00	0.0	0.0	0.1132	0.3268	0.0000
C	39.000	0.00	0.0	0.0	0.0000	0.0505	0.0000
C	39.000	0.00	0.0	0.0	0.1065	0.3261	0.0000
C	29.000	0.00	0.0	0.0	0.0000	0.0376	0.0000
C	29.000	0.00	0.0	0.0	0.0985	0.3253	0.0000
C	19.000	0.00	0.0	0.0	0.0000	0.0246	0.0000
C	19.000	0.00	0.0	0.0	0.0883	0.3241	0.0000
D	174.000	0.00	180.0	0.0	0.0116	0.0922	0.0000
D	159.500	0.00	180.0	0.0	0.0122	0.0985	0.0000
D	159.500	0.00	180.0	0.0	0.0129	0.1189	0.0000
D	133.917	0.00	180.0	0.0	0.0135	0.1131	0.0000
D	133.917	0.00	180.0	0.0	0.0144	0.1270	0.0000
D	118.083	0.00	180.0	0.0	0.0144	0.1270	0.0000
D	118.083	0.00	180.0	0.0	0.0153	0.1400	0.0000
D	102.250	0.00	180.0	0.0	0.0153	0.1400	0.0000
D	102.250	0.00	180.0	0.0	0.0158	0.2249	0.0000
D	98.750	0.00	180.0	0.0	0.0158	0.2249	0.0000
D	98.750	0.00	180.0	0.0	0.0160	0.1525	0.0000
D	83.583	0.00	180.0	0.0	0.0160	0.1525	0.0000
D	83.583	0.00	180.0	0.0	0.0165	0.1642	0.0000
D	68.417	0.00	180.0	0.0	0.0165	0.1642	0.0000
D	68.417	0.00	180.0	0.0	0.0169	0.1754	0.0000
D	53.250	0.00	180.0	0.0	0.0169	0.1754	0.0000
D	53.250	0.00	180.0	0.0	0.0169	0.3065	0.0000
D	48.750	0.00	180.0	0.0	0.0169	0.3065	0.0000
D	48.750	0.00	180.0	0.0	0.0166	0.2123	0.0000
D	0.000	0.00	180.0	0.0	0.0151	0.2312	0.0000

ANTENNA LOADING

=====

175730

.....ANTENNA.....	ATTACHMENT	175730			ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	99.0	0.0	1.7	0.0	0.11	0.00	0.87	0.00

=====

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175' Monopole / Marshalltown, IA

MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)

MAST ELEV ft	DEFLECTIONS (ft).....			ROTATIONS (deg).....		
	HORIZONTAL ALONG	ACROSS	DOWN	TILT ALONG	ACROSS	TWIST
174.0	20.22A	-0.39W	3.20A	12.33A	-0.19W	0.03E
166.7	18.73A	0.37C	2.88A	12.30A	-0.19W	0.03E
159.5	17.24A	0.35C	2.56A	12.18A	-0.19W	0.03E
149.7	15.28A	0.32C	2.15A	11.84A	-0.18W	0.03E
133.9	12.26A	0.27C	1.55A	10.89A	-0.18W	0.02E
118.1	9.50A	0.22C	1.06A	9.70A	-0.18W	0.02E
102.2	7.05A	0.18C	0.67A	8.41A	0.17C	0.02E
98.7	6.56A	0.17C	0.60A	8.12A	0.17C	0.02E
83.6	4.62A	0.12C	0.35A	6.75A	0.16C	0.01E
68.4	3.04A	0.08C	0.18A	5.35A	0.14C	0.01E
53.2	1.82A	0.05C	0.08A	3.95A	0.11C	0.01E
48.7	1.52A	0.04C	0.06A	3.62A	0.10C	0.01E
36.6	0.85A	0.02C	0.03A	2.69A	0.07C	0.00E
24.4	0.38A	0.01C	0.01A	1.78A	0.05C	0.00E
12.2	0.09A	0.00C	0.00A	0.88A	0.02C	0.00E
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

MAXIMUM ANTENNA AND REFLECTOR ROTATIONS

ELEV ft	ANT AZI deg	ANT TYPE	 BEAM DEFLECTIONS (deg)			
			ROLL	YAW	PITCH	TOTAL
99.0	0.0	HP	-8.005 J	0.501 C	8.143 A	8.143 A

MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t.WIND.DIR		MOMENT.w.r.t.WIND.DIR		TORSION ft-kip
		ALONG kip	ACROSS kip	ALONG ft-kip	ACROSS ft-kip	
174.0	0.01 W	0.01 H	0.00 L	0.02 P	0.01 L	0.00 L
166.7	3.86 AA	2.68 H	0.00 L	-11.88 B	-0.03 C	0.03 W
	3.87 AA	2.68 H	0.01 I	-11.91 J	-0.04 C	0.03 W
159.5	4.57 AA	3.02 H	0.01 I	-35.42 H	-0.15 I	0.10 K

					175730	
	4.57 AA	3.03 E	-0.01 W	-35.40 H	-0.14 I	0.10 K
149.7	7.56 AA	4.73 E	-0.01 W	-84.41 H	-0.32 I	-0.23 C
	7.56 AC	4.74 H	0.02 L	-84.43 H	-0.32 I	-0.24 C
133.9	9.38 AC	5.61 H	0.02 L	-177.84 H	-0.66 I	0.48 K
	9.38 AC	5.61 H	0.02 I	-177.84 H	-0.66 I	0.48 K
118.1	11.39 AC	6.55 H	0.02 I	-287.15 H	-1.17 I	0.79 K
	11.39 AC	6.55 H	0.02 I	-287.15 H	-1.17 I	0.79 K
102.2	13.60 AC	7.55 H	0.02 I	-412.83 H	-1.67 I	1.12 K
	13.60 AC	7.58 E	0.04 E	-412.92 H	-1.66 I	1.12 K
98.7	15.39 AC	8.66 M	0.48 O	-443.39 H	-2.12 I	1.76 E
	15.40 AC	8.71 M	0.46 O	-443.38 H	-2.17 I	1.76 E
83.6	17.71 AC	9.77 M	0.46 O	-594.37 H	8.37 W	1.63 E
	17.71 AC	9.76 M	0.47 C	-594.36 H	8.37 W	1.63 E
68.4	20.20 AC	10.85 M	0.47 C	-763.73 A	15.67 W	1.58 E
	20.20 AC	10.84 M	0.47 C	-763.73 A	15.68 W	1.58 E
53.2	22.85 AC	11.97 M	0.47 C	-948.85 A	22.96 W	1.59 E
	22.85 AC	11.97 M	0.49 C	-948.86 A	22.96 W	1.59 E
48.7	24.62 AC	12.71 M	0.49 C	-1006.87 A	-25.17 C	1.59 E
	24.62 AC	12.73 M	0.49 C	-1006.85 A	-25.18 C	1.59 E
36.6	27.62 AC	14.01 M	0.49 C	-1176.62 A	-31.41 C	1.60 E
	27.62 AC	14.00 M	0.49 C	-1176.62 A	-31.41 C	1.60 E
24.4	30.65 AC	15.25 M	0.49 C	-1360.96 A	-37.57 C	1.63 E
	30.65 AC	15.24 M	0.49 C	-1360.96 A	-37.57 C	1.63 E
12.2	33.73 AC	16.44 M	0.49 C	-1558.59 A	-43.68 C	1.66 E
	33.73 AC	16.44 M	0.49 C	-1558.60 A	-43.69 C	1.66 E
	36.52 AC	17.30 M	0.49 C	-1765.34 A	-49.74 C	1.67 E
base						
reaction	36.52 AC	-17.30 M	-0.49 C	1765.34 A	49.74 C	-1.67 E

COMPLIANCE WITH 4.8.2 & 4.5.4
=====

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL SATISFIED	D/t(w/t)	MAX ALLOWED
174.00	0.00W	0.00B	0.00H	0.00B	YES	8.11A
	0.00AA	0.04B	0.01H	0.05B	YES	8.88A
166.75	0.00AA	0.05J	0.01H	0.05J	YES	8.88A
	0.00AA	0.12H	0.01H	0.12H	YES	9.65A
159.50	0.00AA	0.12H	0.01E	0.12H	YES	9.65A
	0.01AA	0.23H	0.01E	0.24H	YES	10.68A
149.75	0.01AC	0.25H	0.01H	0.25H	YES	10.32A
	0.01AC	0.40H	0.01H	0.40H	YES	12.00A
133.92	0.01AC	0.40H	0.01H	0.40H	YES	12.00A
	0.01AC	0.51H	0.01H	0.51H	YES	13.67A
118.08	0.01AC	0.51H	0.01H	0.51H	YES	13.67A
	0.01AC	0.59H	0.01H	0.60H	YES	15.35A
102.25	0.01AC	0.59H	0.01E	0.60H	YES	15.35A
	0.01AC	0.61H	0.01M	0.61H	YES	15.72A

175730							
98.75	0.01AC	0.63H	0.01M	0.64H	YES	15.37A	45.2
83.58	0.01AC	0.72H	0.01M	0.73H	YES	16.97A	45.2
	0.01AC	0.72H	0.01M	0.73H	YES	16.97A	45.2
68.42	0.01AC	0.80A	0.01M	0.81A	YES	18.58A	45.2
	0.01AC	0.80A	0.01M	0.81A	YES	18.58A	45.2
53.25	0.01AC	0.87A	0.01M	0.88A	YES	20.18A	45.2
	0.01AC	0.66A	0.01M	0.67A	YES	15.79A	45.2
48.75	0.01AC	0.67A	0.01M	0.68A	YES	16.17A	45.2
	0.01AC	0.69A	0.01M	0.70A	YES	15.89A	45.2
36.56	0.01AC	0.73A	0.01M	0.74A	YES	16.92A	45.2
	0.01AC	0.73A	0.01M	0.74A	YES	16.92A	45.2
24.37	0.01AC	0.77A	0.01M	0.78A	YES	17.95A	45.2
	0.01AC	0.77A	0.01M	0.78A	YES	17.95A	45.2
12.19	0.01AC	0.81A	0.01M	0.82A	YES	18.99A	45.2
	0.01AC	0.81A	0.01M	0.82A	YES	18.99A	45.2
0.00	0.01AC	0.84A	0.01M	0.85A	YES	20.02A	45.2

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)

DOWN	SHEAR.w.r.t.WIND.DIR	MOMENT.w.r.t.WIND.DIR	TORSION	
kip	ALONG kip	ACROSS kip	ALONG ft-kip	ACROSS ft-kip
36.52 AC	17.30 M	0.49 C	-1765.34 A	-49.74 C
				1.67 E

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175' Monopole / Marshalltown, IA

***** Service Load Condition *****

* Only 1 condition(s) shown in full
* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

LOADING CONDITION A

60 mph wind with no ice. wind Azimuth: 0°

LOADS ON POLE

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	..AT AZI	LOAD AZI	FORCES..... HORIZ kip	DOWN kip	MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	172.000	0.00	0.0	0.0	0.0000	0.7430	0.0000	0.0000
C	172.000	0.00	0.0	0.0	0.2081	0.3982	0.0000	0.0000
C	169.620	0.00	0.0	0.0	0.0000	0.3664	0.0000	0.0000
C	169.620	0.00	0.0	0.0	0.2981	0.2024	0.0000	0.0000
C	159.000	0.00	0.0	0.0	0.2594	0.8080	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0000	0.1069	0.0000	0.0000
C	49.000	0.00	0.0	0.0	0.0000	0.0529	0.0000	0.0000
C	49.000	0.00	0.0	0.0	0.0865	0.2463	0.0000	0.0000

175730								
C	39.000	0.00	0.0	0.0	0.0000	0.0421	0.0000	0.0000
C	39.000	0.00	0.0	0.0	0.0825	0.2463	0.0000	0.0000
C	29.000	0.00	0.0	0.0	0.0000	0.0313	0.0000	0.0000
C	29.000	0.00	0.0	0.0	0.0777	0.2463	0.0000	0.0000
C	19.000	0.00	0.0	0.0	0.0000	0.0205	0.0000	0.0000
C	19.000	0.00	0.0	0.0	0.0713	0.2463	0.0000	0.0000
D	174.000	0.00	180.0	0.0	0.0098	0.0387	0.0000	0.0000
D	159.500	0.00	180.0	0.0	0.0104	0.0415	0.0000	0.0000
D	159.500	0.00	180.0	0.0	0.0112	0.0531	0.0000	0.0000
D	102.250	0.00	180.0	0.0	0.0142	0.0578	0.0000	0.0000
D	102.250	0.00	180.0	0.0	0.0148	0.1297	0.0000	0.0000
D	98.750	0.00	180.0	0.0	0.0148	0.1297	0.0000	0.0000
D	98.750	0.00	180.0	0.0	0.0150	0.0680	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0163	0.0802	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0164	0.1877	0.0000	0.0000
D	48.750	0.00	180.0	0.0	0.0164	0.1877	0.0000	0.0000
D	48.750	0.00	180.0	0.0	0.0162	0.1077	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0151	0.1261	0.0000	0.0000

ANTENNA LOADING
=====

.....ANTENNA.....	ATTACHMENT	ANTENNA FORCES.....						
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	99.0	0.0	1.7	0.0	0.19	0.00	0.17	0.00

MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)
=====

MAST	DEFLECTIONS (ft).....	ROTATIONS (deg).....				
ELEV	HORIZONTAL	TILT	DOWN	ALONG	ACROSS	TWIST
ft	ALONG	ACROSS				
174.0	4.55B	0.09C	0.16A	2.72B	0.04C	0.00D
166.7	4.21B	0.08C	0.15A	2.71B	0.04C	0.00D
159.5	3.87B	0.08C	0.13A	2.68B	0.04C	0.00D
149.7	3.42B	0.07C	0.11A	2.61B	0.04C	0.00D
133.9	2.72B	0.06C	0.08A	2.39B	0.04C	0.00D
118.1	2.10B	0.05C	0.05A	2.13B	0.04C	0.00D
102.2	1.55B	0.04C	0.03A	1.84B	0.04C	0.00D
98.7	1.44B	0.04C	0.03A	1.78B	0.04C	0.00D
83.6	1.01B	0.03C	0.02A	1.47B	0.03C	0.00D
68.4	0.66B	0.02C	0.01A	1.16B	0.03C	0.00D
53.2	0.40B	0.01C	0.00A	0.86B	0.02C	0.00D
48.7	0.33B	0.01C	0.00A	0.79B	0.02C	0.00D
36.6	0.18B	0.01C	0.00A	0.58B	0.02C	0.00J
24.4	0.08B	0.00C	0.00A	0.39B	0.01C	0.00J
12.2	0.02B	0.00C	0.00A	0.19B	0.01C	0.00J
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

MAXIMUM ANTENNA AND REFLECTOR ROTATIONS
=====

ELEV	ANT	ANT	 BEAM DEFLECTIONS (deg)			
ft	AZI	TYPE	ROLL	YAW	PITCH	TOTAL
	deg					
99.0	0.0	HP	-1.749 J	0.025 C	1.778 A	1.778 A

MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)
=====

MAST	TOTAL	SHEAR.w.r.t.WIND.DIR	MOMENT.w.r.t.WIND.DIR	TORSION
ELEV	AXIAL	ALONG	ALONG	ft-kip
ft	kip	kip	ft-kip	

175730						
174.0	0.00 E	0.00 K	0.00 E	0.00 H	0.00 E	0.00 E
166.7	2.00 E	0.58 J	0.00 E	-2.62 A	0.01 K	0.00 K
	2.00 K	0.58 B	0.00 L	-2.61 H	-0.01 C	0.00 K
159.5	2.29 K	0.65 B	0.00 L	-7.80 B	0.02 E	0.00 K
	2.29 K	0.66 I	0.00 H	-7.80 B	0.02 L	0.00 K
149.7	3.62 K	1.03 I	0.00 H	-18.59 B	-0.06 H	0.01 K
	3.62 K	1.03 F	0.00 K	-18.58 B	-0.06 H	0.01 K
133.9	4.49 K	1.22 F	0.00 K	-39.08 B	-0.10 H	0.03 K
	4.49 K	1.22 I	0.00 H	-39.08 B	-0.10 H	0.03 K
118.1	5.37 K	1.42 I	0.00 H	-63.00 B	-0.17 H	0.04 K
	5.37 K	1.42 I	0.00 H	-63.00 B	-0.17 H	0.04 K
102.2	6.28 K	1.64 I	0.00 H	-90.39 B	-0.24 H	0.06 K
	6.27 K	1.65 J	0.01 B	-90.38 B	-0.24 H	0.06 K
98.7	7.00 K	1.89 A	0.10 C	-97.19 F	-0.40 H	0.24 D
	7.01 K	1.87 B	0.11 C	-97.19 F	-0.40 H	0.24 D
83.6	8.07 K	2.10 B	0.11 C	-130.09 B	-1.58 C	0.24 D
	8.07 K	2.10 B	0.11 C	-130.09 B	-1.58 C	0.24 D
68.4	9.19 K	2.34 B	0.11 C	-166.75 B	-3.25 C	0.24 D
	9.19 K	2.34 B	0.11 C	-166.75 B	-3.25 C	0.24 D
53.2	10.38 K	2.58 B	0.11 C	-206.67 B	-4.92 C	0.24 D
	10.38 K	2.59 B	0.11 C	-206.67 B	-4.92 C	0.24 D
48.7	11.52 K	2.75 B	0.11 C	-219.18 B	-5.42 C	0.24 D
	11.52 K	2.74 L	0.11 C	-219.19 B	-5.43 C	0.24 D
36.6	13.15 K	3.02 L	0.11 C	-255.80 B	-6.81 C	0.24 D
	13.15 K	3.02 L	0.11 C	-255.80 B	-6.81 C	0.24 D
24.4	14.83 K	3.29 L	0.11 C	-295.55 B	-8.19 C	-0.24 J
	14.83 K	3.29 L	0.11 C	-295.55 B	-8.19 C	-0.24 J
12.2	16.55 K	3.55 L	0.11 C	-338.25 B	-9.55 C	-0.24 J
	16.55 K	3.55 L	0.11 C	-338.25 B	-9.55 C	-0.24 J
	18.06 K	3.74 L	0.11 C	-383.00 B	-10.89 C	-0.24 J
base reaction	18.06 K	-3.74 L	-0.11 C	383.00 B	10.89 C	0.24 J

COMPLIANCE WITH 4.8.2 & 4.5.4

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL SATISFIED	D/t(w/t)	MAX ALLOWED	
174.00	0.00E	0.00H	0.00K	0.00H	YES	8.11A	45.2
166.75	0.00E	0.01A	0.00J	0.01A	YES	8.88A	45.2
	0.00K	0.01H	0.00B	0.01H	YES	8.88A	45.2
159.50	0.00K	0.03B	0.00B	0.03B	YES	9.65A	45.2
	0.00K	0.03B	0.00I	0.03B	YES	9.65A	45.2
149.75	0.00K	0.05B	0.00I	0.05B	YES	10.68A	45.2
	0.00K	0.05B	0.00F	0.06B	YES	10.32A	45.2
133.92	0.00K	0.09B	0.00F	0.09B	YES	12.00A	45.2
	0.00K	0.09B	0.00I	0.09B	YES	12.00A	45.2

					175730		
118.08	0.00K	0.11B	0.00I	0.12B	YES	13.67A	45.2
	0.00K	0.11B	0.00I	0.12B	YES	13.67A	45.2
102.25	0.00K	0.13B	0.00I	0.13B	YES	15.35A	45.2
	0.00K	0.13B	0.00J	0.13B	YES	15.35A	45.2
98.75	0.00K	0.13H	0.00A	0.14F	YES	15.72A	45.2
	0.00K	0.14F	0.00B	0.14F	YES	15.37A	45.2
83.58	0.01K	0.16B	0.00B	0.16B	YES	16.97A	45.2
	0.01K	0.16B	0.00B	0.16B	YES	16.97A	45.2
68.42	0.01K	0.17B	0.00B	0.18B	YES	18.58A	45.2
	0.01K	0.17B	0.00B	0.18B	YES	18.58A	45.2
53.25	0.01K	0.19B	0.00B	0.20B	YES	20.18A	45.2
	0.00K	0.14B	0.00B	0.15B	YES	15.79A	45.2
48.75	0.00K	0.15B	0.00B	0.15B	YES	16.17A	45.2
	0.01K	0.15B	0.00L	0.16B	YES	15.89A	45.2
36.56	0.01K	0.16B	0.00L	0.16B	YES	16.92A	45.2
	0.01K	0.16B	0.00L	0.16B	YES	16.92A	45.2
24.37	0.01K	0.17B	0.00L	0.17B	YES	17.95A	45.2
	0.01K	0.17B	0.00L	0.17B	YES	17.95A	45.2
12.19	0.01K	0.18B	0.00L	0.18B	YES	18.99A	45.2
	0.01K	0.18B	0.00L	0.18B	YES	18.99A	45.2
0.00	0.01K	0.18B	0.00L	0.19B	YES	20.02A	45.2

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)

DOWN	SHEAR.w.r.t.WIND.DIR	MOMENT.w.r.t.WIND.DIR	TORSION
kip	ALONG kip	ALONG ft-kip	ft-kip
	ACROSS kip	ACROSS ft-kip	
18.06	3.74	-383.00	-10.89
K	L	B	C
			J

Square Base Plate and Anchor Rods per ANSI/TIA 222-G

Pole Data

Diameter: 38.600 in (flat to flat)
Thickness: 0.3125 in
Yield (Fy): 65 ksi
of Sides: 18 "0" IF Round
Strength (Fu): 80 ksi

Reactions

Moment, Mu: 1765.34 ft-kips
Axial, Pu: 21.6 kips
Shear, Vu: 17.24 kips

Anchor Rod Data

Quantity: 8 (multiple of 4)
Diameter: 2.25 in
Rod Material: A615
Strength (Fu): 100 ksi
Yield (Fy): 75 ksi
BC Diam. (in): 44.75 BC Override:
Rod Spacing: 6 in

Anchor Rod Results

Maximum Rod (Pu+ Vu/η): 243.7 Kips
Allowable Φ *Rnt: 260.0 Kips (per 4.9.9)
Anchor Rod Interaction Ratio: **93.7% Pass**

Plate Data

Width (in): 42 Width Override:
Thickness: 2.5 in
Yield (Fy): 50 ksi
Eff. Width: 20.80 in
Corner Clip: 6.00 in
Drain Hole: 2.625 in. diameter
Drain Location: 17 in. center of pole to center of drain hole
Center Hole: 26 in. diameter

Base Plate Results

Base Plate (Mu/Z): 42.0 ksi
Allowable Φ *Fy: 45 ksi (per AISC)
Base Plate Interaction Ratio: **93.2% Pass**

MAT FOUNDATION DESIGN BY SABRE TOWERS & POLES

175' Monopole City of Marshalltown Marshalltown, IA (175730) 12-14-17 NM

Overall Loads:

Factored Moment (ft-kips)	1766.2
Factored Axial (kips)	21.67
Factored Shear (kips)	17.23
Bearing Design Strength (ksf)	3.75
Water Table Below Grade (ft)	13
Width of Mat (ft)	19
Thickness of Mat (ft)	1.5
Depth to Bottom of Slab (ft)	6
Quantity of Bolts in Bolt Circle	8
Bolt Circle Diameter (in)	44.75
Top of Concrete to Top of Bottom Threads (in)	60
Diameter of Pier (ft)	5.5
Ht. of Pier Above Ground (ft)	0.5
Ht. of Pier Below Ground (ft)	4.5
Quantity of Bars in Mat	20
Bar Diameter in Mat (in)	1
Area of Bars in Mat (in ²)	15.71
Spacing of Bars in Mat (in)	11.63
Quantity of Bars Pier	30
Bar Diameter in Pier (in)	0.875
Tie Bar Diameter in Pier (in)	0.625
Spacing of Ties (in)	12
Area of Bars in Pier (in ²)	18.04
Spacing of Bars in Pier (in)	6.06
f _c (ksi)	4.5
f _y (ksi)	60
Unit Wt. of Soil (kcf)	0.11
Unit Wt. of Concrete (kcf)	0.15

Max. Net Bearing Press. (ksf) 3.37

Allowable Bearing Pressure (ksf) 2.50

Safety Factor 2.00

Ultimate Bearing Pressure (ksf) 5.00

Bearing Φ_s 0.75

Minimum Pier Diameter (ft) 5.06

Equivalent Square b (ft) 4.87

Square Pier? (Y/N) N

Recommended Spacing (in) 5 to 12

Minimum Pier A_s (in²) 17.11

Recommended Spacing (in) 5 to 12

Volume of Concrete (yd³) 24.46**Two-Way Shear Action:**

Average d (in)	14
ϕv_c (ksi)	0.228
$\phi v_c = \phi(2 + 4/\beta_c)f'_c{}^{1/2}$	0.342
$\phi v_c = \phi(\alpha_s d/b_o + 2)f'_c{}^{1/2}$	0.241
$\phi v_c = \phi 4f'_c{}^{1/2}$	0.228
Shear perimeter, b _o (in)	251.33
β_c	1

v_u (ksi) 0.131**One-Way Shear:** ϕV_c (kips) 364.0V_u (kips) 176.9**Stability:**

Overturning Design Strength (ft-k) 2428.5

Total Applied M (ft-k) 1878.2

Pier Design:

ϕV_n (kips)	398.7	V_u (kips)	17.2
$\phi V_c = \phi 2(1 + N_u / (2000 A_g)) f'_c{}^{1/2} b_w d$	398.7		
V_s (kips)	0.0	*** $V_s \text{ max} = 4 f'_c{}^{1/2} b_w d$ (kips)	935.1
Maximum Spacing (in)	11.09	(Only if Shear Ties are Required)	
Actual Hook Development (in)	13.00	Req'd Hook Development l_{dh} (in)	10.39
		*** Ref. To Spacing Requirements ACI 11.5.4.3	

Flexure in Slab:

ϕM_n (ft-kips)	951.4	M_u (ft-kips)	912.3
a (in)	1.08		
Steel Ratio	0.00492		
β_1	0.825		
Maximum Steel Ratio (ρ_t)	0.0197		
Minimum Steel Ratio	0.0018		
Rebar Development in Pad (in)	81.75	Required Development in Pad (in)	25.65

Condition	1 is OK, 0 Fails
Maximum Soil Bearing Pressure	1
Pier Area of Steel	1
Pier Shear	1
Interaction Diagram Visual Check	1
Two-Way Shear Action	1
One-Way Shear Action	1
Overturning	1
Flexure	1
Steel Ratio	1
Length of Development in Pad	1
Hook Development	1

MARSHALLTOWN

I O W A

TO: Board of Adjustment

FROM: Michelle Spohnheimer, Housing & Community Development Director

DATE: February 20, 2018 – Meeting Date

HOME OCCUPATION SPECIAL USE PERMIT request for 2606 Hilltop Drive – Brian & Sarah Murphy

The Home Occupation Special Use Permit request has been submitted to allow the operation of a home business, which holds fitness classes out of the garage. This is neither a permitted nor a prohibited home occupation, which is why it is before the Board. This was brought to our attention when featured in the Times Republican. The owner was sent a notice and subsequently submitted an application.

Zone:	R-2, low Density Residential
Use:	Home Occupation
Comprehensive Plan:	Low Density Residential

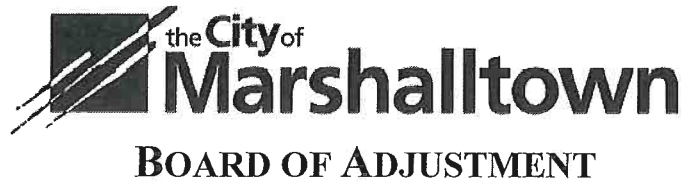
Zoning Ordinance - Chapter 4 Section 11.

2. Criteria:

- a) No Exterior Display. That in connection with which there is no display that will indicate from the exterior that the building is being utilized in part for any purpose other than that of a dwelling, with the exception of section 'd' herein;
- b) Residential Design Features. That the building shall include no features of design not customary for residential use;
- c) Residential Character. That the building or premises occupied shall not be rendered objectionable or detrimental to the residential character of the neighborhood due to exterior appearance or by the emission of dust, gas, noise, odor, or smoke, or in any other way.
- d) Signs. Any sign utilized by a home occupation in an "R" district shall be limited to one building mounted sign which shall not exceed one square foot in area.
- e) Equipment. Any merchandise or stock in trade sold, repaired or displayed shall be stored entirely within the residential structure or in an accessory building.
- f) Employment. On-site employees must be members of the immediate family residing on the premises. Additional employees may be permitted as required by law or may be permitted through the Special Use Permit process by the Board of Adjustment.
- g) Traffic and Parking. Traffic generated by the home occupation shall not be objectionable to the neighboring residents. Off-street parking shall be adequate to accommodate the parking demand generated by the home occupation.
- h) Structural modifications or additions to the residence for the expansion of a home-occupation are prohibited.
- i) Non-compliance. Any home-occupation which does not abide by the terms of this section shall be punishable under the Violation and Penalty section of the zoning ordinance.

Recommendation: The Board of Adjustment may consider the request and place conditions on the application as determined to be necessary.

DATE SUBMITTED & FEE PAID: 1/30/18
HEARING DATE: 2/20/18



Special Use & Home Occupation Special Use Permit Application

36 N. Center Street, Marshalltown, IA 50158 Ph: 641-754-5756 Fax: 641-754-5742

All items listed must be submitted with this application:

- ☒ **A site plan, drawn in ink to scale.** This site plan shall not be larger than 11" X 17."
- ☒ **Any other applicable drawings or diagrams.** Home Occupation Special use permits must submit a floor plan diagram.
- ☒ **Application fee.** A \$300 fee is required for a special use request (\$50 for a Home Occupation Special Use request). Make check payable to "City of Marshalltown." The fee must be paid when the application is submitted to the Housing Department.
- ☒ **Legal description of the property.** The property owner should have a copy of the legal description of the property. Please note that the tax description on the Marshall County assessor's webpage is NOT the legal description. The legal description is listed on the property's abstract or owners may obtain a copy of the recorded deed from the Marshall County Recorder's Office for a fee.

It is the burden of the applicant to provide sufficient facts with this application and at the Board of Adjustment meeting to support a finding that all the standards for approval have been met. For all special use requests, with the exception of a Home Occupation Special Use request, the Plan & Zoning Commission shall first review the proposal and make a recommendation to the Board of Adjustment.

Attendance at all meetings is required.

Please type or print legibly in ink.

Property Address: 2606 Hilltop Drive, Marshalltown, IA 50158

Owner: Brian and Sarah Murphy

Mailing Address: 2606 Hilltop Drive

Phone: (641) 295-0800

Email: sjemurphy@gmail.com

Owner's Agent (if applicable):

Agent Address:

Agent Phone:

Agent Email:

The board will use this information to review your request. Please attach any additional supporting information. If you have any questions, please contact the Zoning Department at 754-5756.

Please describe the request and what justification there is for the proposal. Attach additional pages if necessary. If applicable, please provide a description of the business or use, discuss any signage to be used, and parking issues.

Owner/Agent Signature:

Date: 1/13/18

Sarah Murphy

PERMIT # _____

Home Occupation Registration Form

City of Marshalltown, 24 North Center Street, Marshalltown, IA 50158

Phone: 641-754-5756; Fax: 641-754-5742

This form must be complete or the application cannot be accepted.

Applicant Name: Sarah Murphy	Business Name: The Garage
Address: 2606 Hilltop Drive, Marshalltown, IA 50158	
Phone: (641) 295-0860	Fax:

Please describe your home occupation (attach additional information if necessary).

Small-group fitness classes that meet Monday-Thursday. Current classes run at 5:15AM, 5:15PM, and 6:30PM. Current class sizes are 4-6 clients.

Please check the appropriate category for your home occupation:

- | | |
|--|--|
| ☐ Office facilities for accountant, architect, engineer, lawyer, clergyman, or other similar professional occupations. | ☐ Telephone answering. |
| ☐ Office facilities for telecommuters, salesmen, sales representatives, manufacturer's representatives, and other similar trades or occupations | ☐ Catering, home-cooking and preserving for the purpose of selling the product. |
| ☐ Home sewing or tailoring. | ☐ Tutoring or giving lessons, limited to four students simultaneously. |
| ☐ Studio for an artist, photographer, writer, or composer. | ☐ Day care homes.
(List the number of permitted Children: _____) |
| | ☒ None of the above, Special Use permit required. |
| | ☐ None of the above, use "grandfathered". |

The following home occupations are prohibited: Animal hospitals, private clubs, restaurants, stables and kennels, automobile repair or auto body shops (More than 2 vehicles per year which are not registered at the residence and are rebuilt, repaired, or reconstructed shall constitute an automobile repair or auto body shop), automobile paint shops, any occupation which is considered illegal by law, and any use which does not meet the Home occupation regulations.

Home Occupation Regulations

- a) **Appearance.** That in connection with which there is no display that will indicate from the exterior that the building is being utilized in part for any purpose other than that of a dwelling, with the exception of one home occupation sign defined in section c) below.
Initial that you understand this appearance requirement: **SM**
- b) **Design.** That the building shall include no features of design not customary for residential use; That the building or premises occupied shall not be rendered objectionable or detrimental to the residential character of the neighborhood due to exterior appearance or by the emission of dust, gas, noise, odor, or smoke, or in any other way.
Initial that you understand this design requirement: **SM**
- c) **Signs.** Any sign utilized by a home occupation in an "R" (residential zoning) district shall be limited to one building mounted sign which shall not exceed one square foot in area.

Attach a photo or drawing of the home occupation sign to be used showing all dimensions and where it will be mounted. Initial that you understand this design requirement: SM (N/A)

- d) Equipment. Any merchandise or stock in trade sold, repaired or displayed shall be stored entirely within the residential structure or in an accessory building.

Are any dangerous materials stored? Yes X SM No
If yes, please list the materials: _____

- e) Employment. On-site employees must be members of the immediate family residing on the premises. Additional employees may be permitted as required by law or may be permitted through the Home Occupation Special Use Permit process by the Board of Adjustment.

How many people are employed? 1

How many employees are not members of the immediate family residing on the premises? 0

List all employees: Sarah Murphy

- f) Traffic and Parking. Traffic generated by the home occupation shall not be objectionable to the neighboring residents. Off-street parking shall be adequate to accommodate the parking demand generated by the home occupation.

How many visits per day are made to your business? appx. 12

How many parking spaces are available? 9

- g) Structural modifications. Structural modifications or additions to the residence for the expansion of a home occupation is prohibited.

Initial that you understand this requirement: SM

- h) Non-compliance. Any home-occupation which does not abide by the terms of this section shall be punishable under the Violation and Penalty section of the zoning ordinance. Any person, firm or corporation who violates, disobeys, omits, neglects, or refuses to comply with, or who resists the enforcement of any of the provisions of this Ordinance shall, upon conviction, be fined not more than one hundred (\$100.00) dollars for each offense. After a written notice of such violation, each day that the violation is permitted to exist beyond the expiration of the time designated on said notice, shall constitute a separate offense.

- Please read the attached Section 10-Home Occupations excerpt from the Zoning Ordinance.
- Please attach a photo of the residence and site map showing parking.
- This home occupation permit does NOT continue with the land and is NOT transferable.
- Any changes to the operation of the home occupation requires a re-registration.

Agreement: I hereby state I have received, have read and understand the terms of the home occupation section of the Zoning Ordinance of 1998. I agree to comply with the ordinance.

Signature of applicant: Sarah Murphy

Date: 1/13/18

- ☐ Home Occupation permitted
☐ Home Occupation grandfathered (Legal non-conforming)
☐ Special Use permit granted on _____

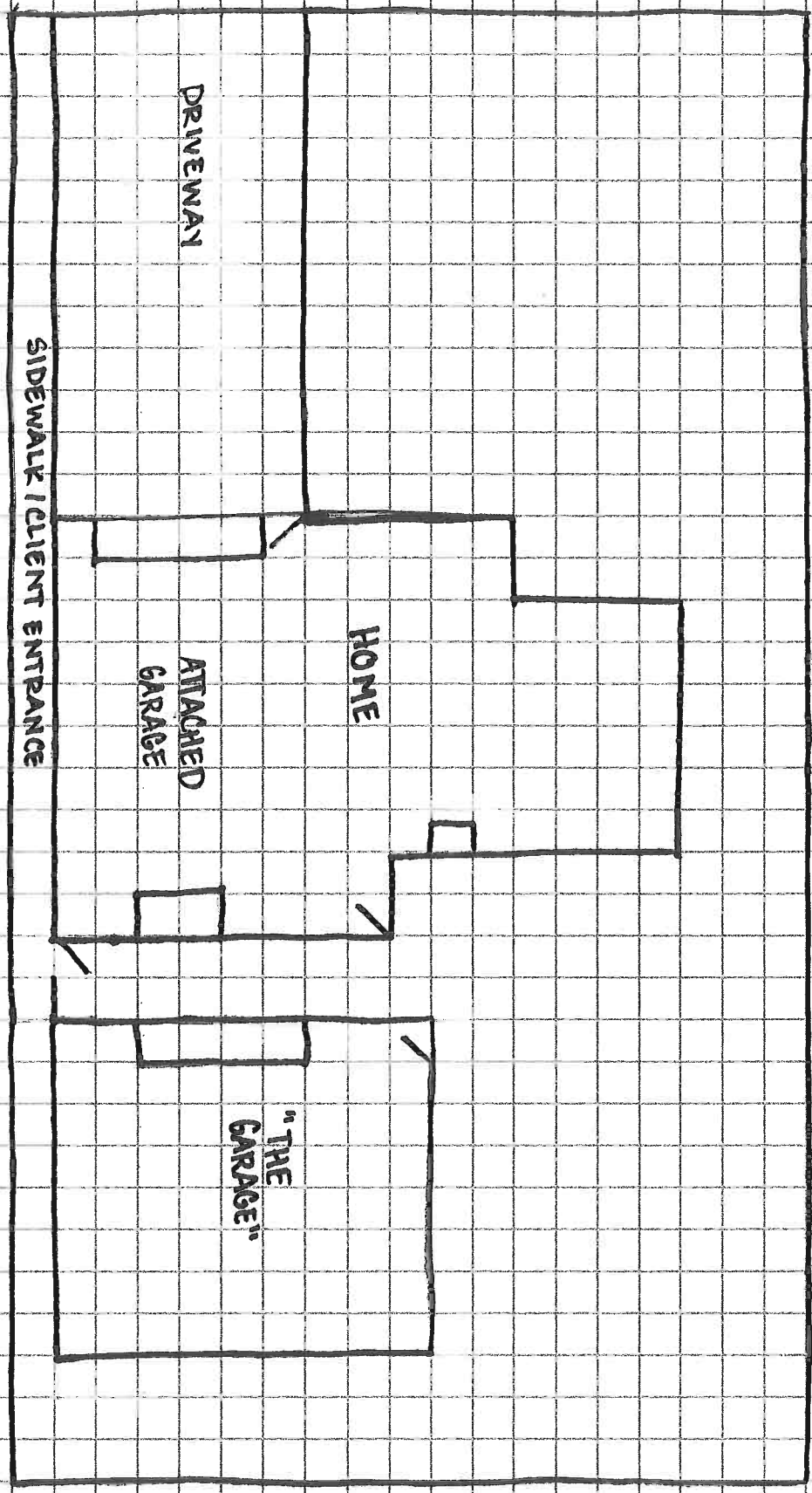
Zoning Officer, City of Marshalltown

Date

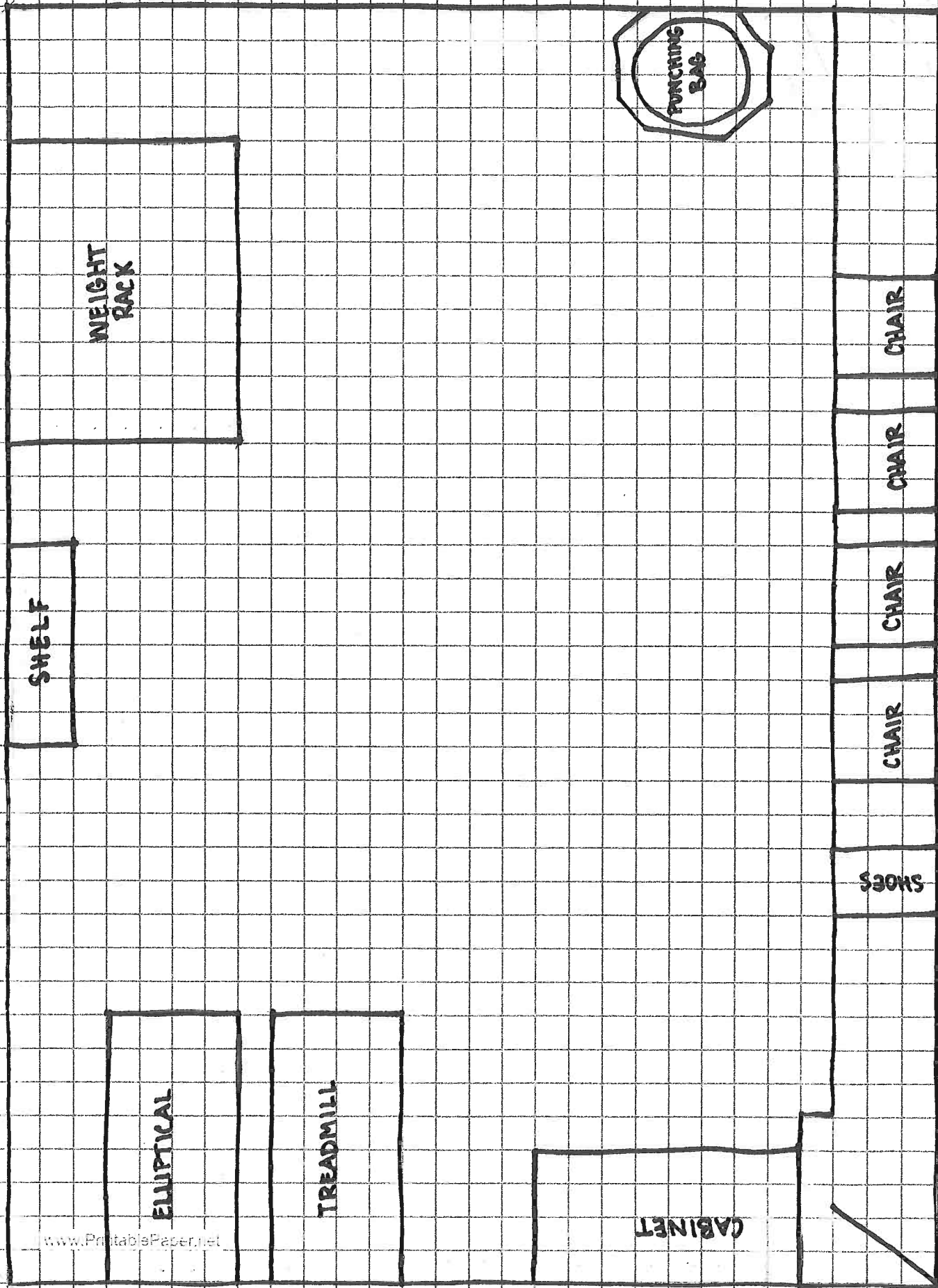
/ DOOR

GARAGE /
SLIDING
DOOR

SITEMAP FOR 2606 HILTOP DRIVE
MARSHALLTOWN, IA



FLOOR PLAN FOR "THE GARAGE"



Unique Doc ID: 1270245

Recorded: 11/1/2016 at 10:55:02.550 AM

Fee Amount: \$12.00

Revenue Tax: \$243.20

Marshall County, Iowa

Deanne Raymond - Recorder

Doc. Number: 201600005958

WARRANTY DEED-JOINT TENANCY

Preparer & Return To: William J. Lorenz, 26 S. 1st Ave. Suite 302, Marshalltown, IA 50158, 641-752-4271

Taxpayer: Brian S. Murphy and Sarah J. Murphy, 2606 Hilltop Drive, Marshalltown, IA 50158

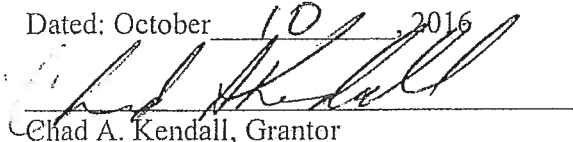
For the consideration of One Dollar(s) and other valuable consideration, **Chad A. Kendall and Nicole M. Kendall, husband and wife**, do hereby Convey to **Brian S. Murphy and Sarah J. Murphy, as Joint Tenants with Full Rights of Survivorship, and not as Tenants in Common**, the following described real estate in Marshall County, Iowa:

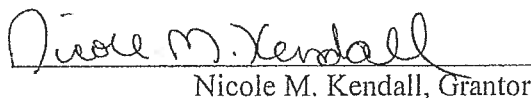
Lot 11 of Lot 17 of the Southeast Quarter of the Southwest Quarter of Section 28, Township 84 North, Range 18 West of the 5th P.M., Marshall County, Iowa,

Grantors do Hereby Covenant with Grantees, and successors in interest, that Grantors hold the real estate by title in fee simple; that they have good and lawful authority to sell and convey the real estate; that the real estate is free and clear of all liens and encumbrances except as may be above stated; and Grantors Covenant to Warrant and Defend the real estate against the lawful claims of all persons except as may be above stated. Each of the undersigned hereby relinquishes all rights of dower, homestead and distributive share in and to the real estate.

Words and phrases herein, including acknowledgment hereof, shall be construed as in the singular or plural number, and as masculine or feminine gender, according to the context.

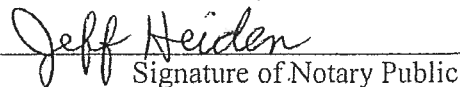
Dated: October 10, 2016


Chad A. Kendall, Grantor


Nicole M. Kendall, Grantor

STATE OF IOWA, MARSHALL COUNTY, ss:

This record was acknowledged before me this 10th day of October, 2016, by
Chad A. Kendall and Nicole M. Kendall.


Signature of Notary Public

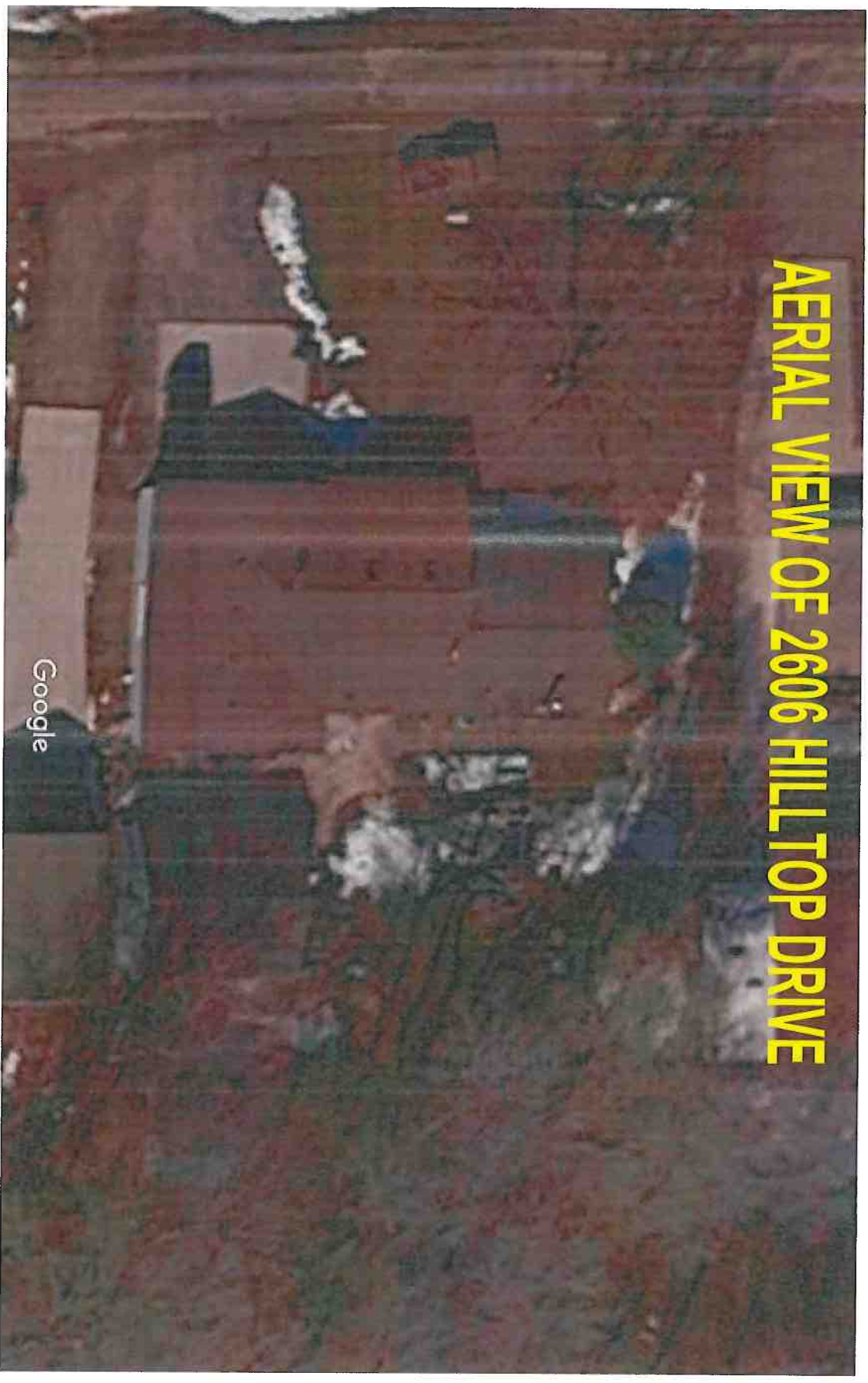


Available parking for 2606 Hilltop Dr.

"The Garage"



AERIAL VIEW OF 2606 HILLTOP DRIVE



Google

Working out in the Garage

P.E. teacher launches new business

TODAYS NEWS

DEC 26, 2017

SARA JORDAN-HEINTZ

Staff Writer

sjordan@timesrepublican.com



T-R PHOTO BY SARA JORDAN-HEINTZ Sarah Murphy recently opened the Garage, a “fitness boot camp” gym, operated out of the large garage behind her property, located at 2606 Hilltop Dr. She offers 10-week long sessions, with workouts that can be modified.

For Sarah Murphy, staying physically fit isn’t just a personal goal, but a new business enterprise. She recently opened the Garage, a “*fitness boot camp*” gym, operated out of the large garage behind her property, located at 2606 Hilltop Drive.

“My husband Brian and I bought a house here in Marshalltown a year ago, and it came with this awesome garage,” Murphy said. *“At first, we just worked out with neighbors, then we decided to open it up to the public. We kind of stumbled into it.”*

By day, Murphy, a native of Oskaloosa, works as an elementary school physical education teacher at the Meskwaki Settlement School. But in the wee morning hours and the early evening, she runs the gym. Her first boot camp sessions, which ended earlier this month, were a way of gauging whether or not to formally launch the business.

“It was a successful test run,” she said. *“My next sessions (which run for 10 weeks), start back up Jan. 8.”*

The 10-week long course consists of 40 classes, offered Monday-Thursday. The sessions last for about an hour each. The boot camp may be repeated as many times as the participant would like.

The gym offers the use of boxing bags, an elliptical, a treadmill, kettlebells, ropes, and a variety of weights. Murphy can work with up to seven clients per session. Participants must be age 18 and older.

“I provide a structured exercise that’s filled with a lot of variety,” Murphy said. *“It’s just me being creative.”*

She said what makes her stand out from more traditional gyms is the small class size and structure of the workouts.

“A small group makes it easier to hold others accountable,” she said. “I can meet the needs of novices, and modify the program to challenge people that are ready for that. It’s a range.”

Workout sessions are held at 5:15 a.m., 5:15 p.m., and 6:30 p.m. For more information, Murphy may be reached at 641-285-0860 or thegaragemarshalltown@gmail.com

Contact Sara Jordan-Heintz at 641-753-6611 or sjordan@timesrepublican.com