Iowa Air Monitoring Network Plan: A Proposal for a New Near Road Nitrogen Dioxide Monitor

Iowa Department of Natural Resources
Air Quality Bureau

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Overview

In 2010, the U.S. Environmental Protection Agency revised the nitrogen dioxide (NO_2) health standards and the associated monitoring network requirements. This rule requires a that a new NO_2 monitoring site be established near a busy roadway in Des Moines by January 2013. Air monitoring in Polk County is delegated to the Polk County Local Program, and the Iowa DNR requested that Polk County locate a site that meets the federal requirements. Polk County has proposed three sites[1] that meet these requirements (Appendix A). Polk County believes that it is important to identify three sites at this time to account for the possibility that unforeseen circumstances (such as inability to secure site access) may disallow one of these sites. Federal monitoring rules require that States provide public notice when they intend to add long-term monitoring sites to the State's ambient air monitoring network, and provide a detailed comparison of the sites to the federal requirements. This document is intended to fulfill these two requirements for a new near road NO_2 monitoring site in Des Moines.

Introduction

States and other agencies delegated to perform air monitoring under the Clean Air Act are required to examine their networks annually to insure that they meet federal requirements (Appendix B). These requirements include the number and type of monitors operated and the frequency of sampling. Certain monitors in the network, known as State and Local Air Monitoring Stations (SLAMS) are required by federal regulations, and modifications of the SLAMS monitoring network requires concurrence from EPA (Appendix C). Special purpose monitors (SPM's) provide important additional air quality information (such as background concentrations for permitting activities[2,3]) but changes to the SPM network do not require concurrence from EPA.

One of the requirements of the network plan is to provide specific information for monitors that produce data that may be compared with federal air standards. This information, along with information concerning NO_2 monitors operated in the Iowa air monitoring network, is contained in Appendix D and Appendix E.

Nitrogen Dioxide Monitoring Network Analysis

On January 22, 2010, the U.S. Environmental Protection Agency revised the nitrogen dioxide (NO_2)[4] NAAQS (reproduced in Appendix F). The rule requires one monitor in any MSA with a population of 1 million or more to measure community-wide concentrations. Iowa does not contain or share any MSA's with populations this large (Appendix G) and no community-wide monitoring stations are required at this time.

NO_2 levels are expected to be highest near major roadways, and the NAAQS includes a requirement to install a microscale near-roadway monitor in each MSA with a population of 500,000 or more, by January 2013. Iowa will be required to operate one near roadway monitor in the Des Moines MSA, and shares the responsibility for monitoring in the Omaha MSA with Nebraska. The majority of the population and traffic in the Omaha MSA is on the Nebraska side. The Nebraska network plan includes a potential location for a near-roadway monitor in Omaha.[5]

The rule requires an additional near-roadway monitor in MSA's with populations of 2,500,000 or greater as well as in MSA's that contain roadway segments with average daily traffic counts of 250,000 or more. Iowa does not have MSA's of this size, or road segments with traffic counts that are this large, so additional near-roadway monitors are not

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[1] Polk County submitted an earlier proposal for a near roadway site that suggested two potential locations along Interstate 235, one at 939 25th St in Des Moines and the other at 6525 Center St in Windsor Heights. The department posted this proposal on its website for 30 days, beginning on 1/13/2012. During the public input period, Polk County notified the department that because of public opposition, it would be unable to secure the building permit required to place a monitor at the 939 25th St location. After the close of the public input period, Polk County provided the department with 2 additional locations and requested that the department take public input on a new proposal that included the 6525 Center St location from the earlier proposal and the two new alternate locations. This document contains Polk County's new proposal.

[2] For examples of the way monitoring data is used to develop background concentrations for permitting activities, see the discussions of $PM_{2.5}$, NO_2 and SO_2 at: http://www.epa.gov/ttn/scram/guidance_clarificationmemos.htm.

[3] The federal statute that requires baseline ambient air quality data in an area before initiating construction of a new "major source" of air pollution is available here: http://www.law.cornell.edu/uscode/html/uscode42/usc_sec_42_00007475----000-.html.

[4] 75 FR 6474, February 9, 2010

[5] 2011 Ambient Air Monitoring Network Plan

required.

Iowa's current NO_2 monitors are listed in Appendix E and displayed in Appendix H. The candidate near road monitoring sites, including GPS coordinates and a proposed EPA (AQS) ID for the sites, are indicated in Appendix I.

Appendix J shows an aerial photo of the candidate sites from which a final site will be selected.

Appendix A: Proposal from Polk County Public Works Air Quality Division

Proposal:
Near-Road NO_2 Monitoring Candidate Site Selection

Polk County Air Quality
Ambient Air Monitoring Personnel

February 24, 2012

1. Background

In February of 2010, the EPA revised the minimum monitoring requirements for the nitrogen dioxide (NO_2) monitoring network in support of a new 1-hour NO_2 national Ambient Air Quality Standards (NAAQS) (75 FR 6474, Feb. 9, 2010). State and local agencies are required to install a near-road NO_2 monitoring station where peak hourly NO_2 concentrations are most likely to occur. The site selection process should include consideration of traffic volume, fleet mix, congestion, roadway design, terrain, and meteorology. Population exposure and site logistics are also important determining factors in the site selection process. In addition, the monitoring site needs to be placed within 50 meters of the roadway. It must also be large enough to expand the monitoring network to include, but is not limited to: carbon monoxide, sulfur dioxide, ozone and particulates. The near-road NO_2 monitoring site must be established by January 1, 2013.

2. Core Based Statistical Area (CBSA)

According to the 40 CFR Part 58 Appendix D Section 4.3.2, a Core Base Statistical Area (CBSA) with a population of 500,000 or more is required to run one (1) microscale near-road NO_2 monitoring station. The U.S. Office of Management and Budget (OMB) defines a CBSA as **"**a geographic entity for use by Federal statistical agencies in collecting, tabulating, and publishing Federal statistics. The term "Core Base Statistical Area" is a collective term for both micropolitan and Metropolitan Statistical Areas (MSA).

2.1 Identifying Core Based Statistical Area Boundaries

As of December of 2009, the U.S. OMB's official name for the Des Moines area CBSA is the Des Moines-West Des Moines MSA. The counties that make up this MSA are Polk, Dallas, Warren, Madison, and Guthrie. According to the 2010 census data from the

U.S Census Bureau, the population of the Des Moines-West Des Moines MSA is 569,633. Table 1 displays the 2010 census data for each county.

Table 1: 2010 Census Data for the Des Moines-West Des Moines MSA

County	Population
Polk	430,640
Dallas	66,135
Warren	46,225
Madison	15,679
Guthrie	10,954
Total	569,633

2.2 Identifying Roadway Traffic Volumes in Excess of 250,000 AADT

The Des Moines-West Des Moines MSA contains no road segments in excess of 250,000 Annual Average Daily Traffic (AADT). Therefore, only one near-road NO_2 monitoring site will be required for this area.

3. Selection of Candidate Road Segments for Near-Road NO2 Monitoring

The first step in identifying candidate near-road NO_2 monitoring sites is to collect and analyze traffic data. Traffic data was obtained from the Iowa Department of Transportation's (DOT) website for the calendar year 2010.

3.1 Road Segments Ranked According to AADT Data

According to the 40 CFR Part 58 Appendix D Section 4.3.2(a)(1), candidate near-road monitoring sites will be selected by ranking all road segments within a CBSA by Annual Average Daily Traffic (AADT), then identifying locations adjacent to those with the highest rankings. AADT is a measure of the total volume of traffic on a roadway segment (in both directions) for one year divided by the number of days in the year. This includes both light-duty (LD) passenger vehicles and heavy-duty (HD) trucks. This parameter can be used to identify the relative traffic activity and corresponding potential for pollutant emissions experienced along roads. Data from the Iowa Department of Transportation is

representative of a length or stretch of roadway, not a single point location, and uses both estimated and measured road segments. Table 2 identifies the top 20 AADT counts for Polk County in 2010. These road segments were evaluated for candidate near-road NO_2 monitoring sites.

Table 2: Top 20 Road Segments Ranked According to Annual Average Daily Traffic (AADT)

Interstate	FROM	TO	Section Length (Miles)	AADT	AADT RANK
I-235	42ND STREET	56TH STREET	1.009	115100	1
I-235	31ST STREET	42ND STREET	0.802	110500	2
I-235	COTTAGE GROVE	31ST STREET	0.636	109700	3
I-235	56TH STREET	63RD STREET	0.507	107900	4
I-235	73RD/8TH STREET	22ND STREET	1.08	104900	5
I-235	63RD STREET	73RD/8TH STREET	0.61	104800	6
I-80/I-35	HICKMAN AVENUE	SOUTH LIMITS OF CLIVE	0.997	104600	7
I-80/I-35	DOUGLAS AVENUE	HICKMAN	1.007	104200	8
I-235	22ND STREET	35TH STREET	0.819	96200	9
I-80/I-35	IA 141/GRIMES	DOUGLAS AVENUE	1.397	90900	10
I-235	E 6TH ST & PENN AVENUE	3RD AVENUE	0.489	90200	11
I-80/I-35	IA 415/2ND AVENUE	MERLE HAY ROAD	3.791	89000	12
I-80/I-35	SOUTH LIMITS OF CLIVE	UNIVERSITY AVENUE	0.568	88100	13
I-80/I-35	MERLE HAY ROAD	86TH STREET	2.008	87300	14
I-235	19TH STREET	COTTAGE GROVE	0.271	86800	15
I-235	KEO WAY	19TH STREET	0.339	86800	15
I-235	35TH STREET	51ST STREET	0.738	86700	16
I-80/I-35	86TH STREET	IA 141/GRIMES	1.976	83300	17
I-80/I-35	US 69/NE 14TH STREET	IA 415/2ND AVENUE	1.248	80100	18
I-80/I-35	I 80 & I 235 EAST INTERCHANGE	US 69/NE 14TH STREET	1.293	75900	19
1-235	9TH STREET INTERCHANGE	KEO WAY	0.286	75500	20

3.2 Congestion Pattern Considerations

It is important to consider congestion patterns when selecting a near-road NO_2 monitoring site. Stop-and-go traffic may lead to an increase in emissions per vehicle as compared to vehicles operating at steady-state highway speeds. The level of service (LOS) metric system was used to analyze congestion patterns. LOS uses information including time-resolved traffic counts, traffic speeds, and the relative frequency of occurrence of congested conditions to determine the congestion level of a particular road segment. LOS uses a letter grading system from A to F, with F representing the most congested road segments. According to the 2010 data provided by the Des Moines Area Metropolitan Planning Organization (DMAMPO), in the Des Moines-West Des Moines MSA, the worst interstate segments were characterized by LOS D, and are indicated by the parallel black lines connected by black bars.

In addition, the volume-to-capacity (V/C) ratio compares peak traffic volumes on a road segment with the capacity of the road based on the number of lanes. This calculation accounts for the larger size of HD vehicles and focuses on traffic conditions during peak hours of operation. Figure 1 displays the color coding used to denote the different ratios displayed on the map in Figure 2. Ratios in the highest category of 0.93 to 1.17 are designated by a thick red line. Table 3 displays road segments ranked for highest V\C ratios. Only those in the highest two categories (red and yellow) are displayed.

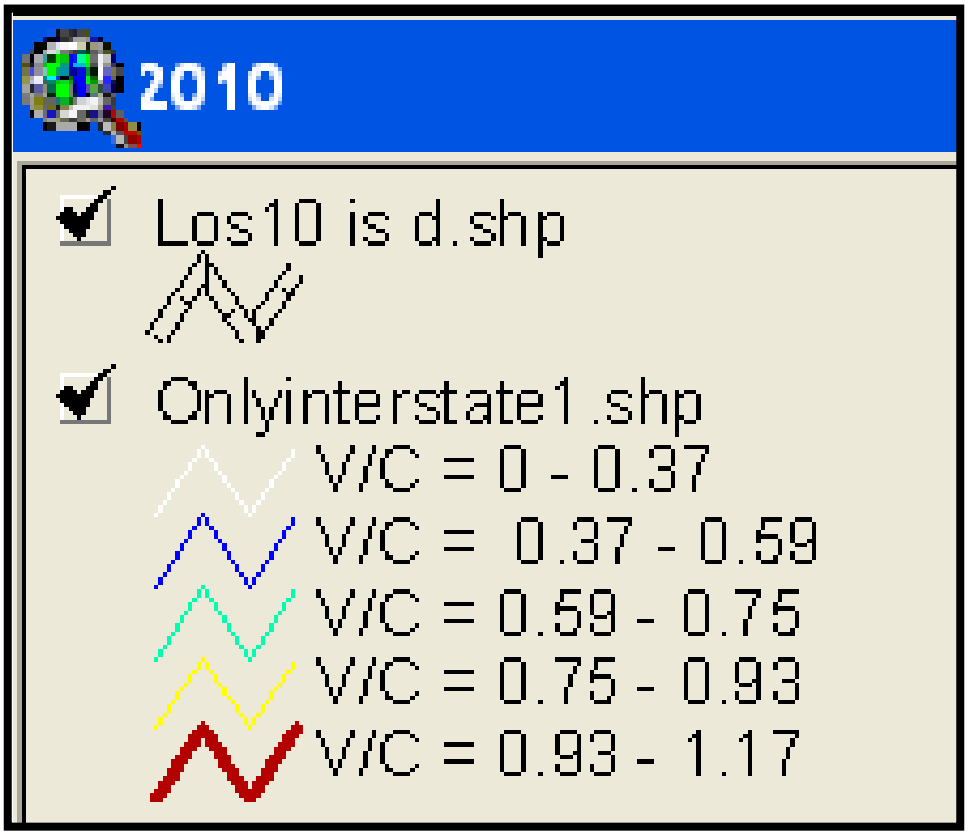

Figure 1: Legend for 2010 Congestion Ratings Based on LOS and V\C Ratios

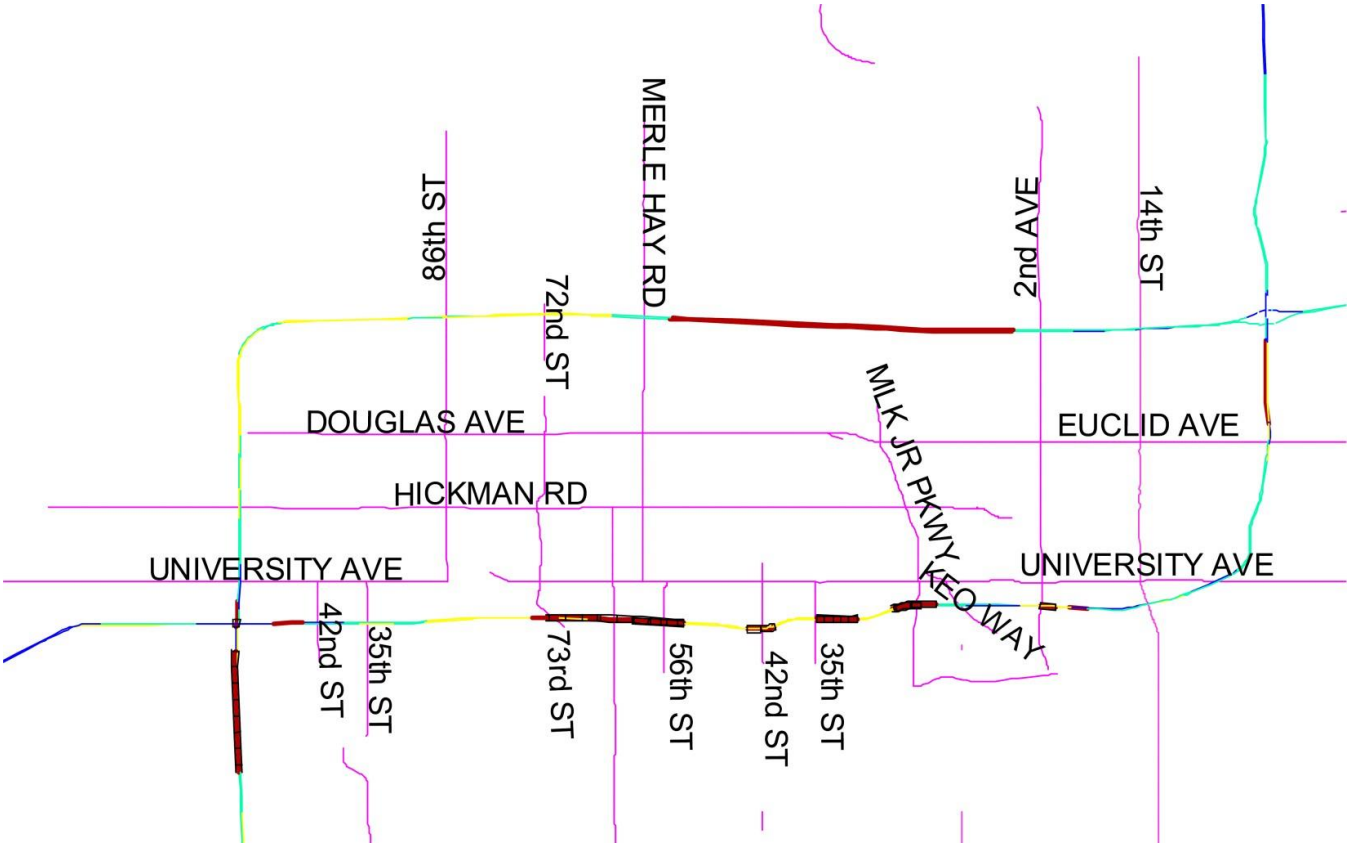

Figure 2: 2010 LOS and V\C Congestion Ratings of the Major Road Segments in the Des Moines-West Des Moines MSA

Table 3: Road Segments Ranked According to the Volume-to-Capacity Ratio

Interstate	FROM	TO	Section Length (Miles)	AADT	AADT RANK	LOS	Average V/C Ratio 2010	V/C Rank
I-235	56TH ST	63RD ST	0.507	107900	4	D	1.14	1
I-235	19TH ST	COTTAGE GROVE	0.271	86800	15	D	1.14	1
I-235	63RD ST	73RD / 8TH ST	0.61	104800	6	D	0.98	2
I-80/I-35	IA 415/2ND AVE	MERLE HAY RD	3.791	89000	12	C	0.975	3
I-80/I-35	I 80 & I 235 WEST INTERCHANGE	MILLS CIVIC PKWY	2.282	56900	37	C	0.945	4
I-235	I 35 & I 80 EAST INTERCHANGE	EUCLID	1.054	61500	36	C	0.915	5
I-235	KEO WAY	19TH ST	0.339	86800	16	C	0.91	6
I-235	42ND ST	56TH ST	1.009	115100	1	C	0.885	7
I-235	31ST ST	42ND ST	0.802	110500	2	C	0.875	8
I-80/I-35	MERLE HAY RD	86TH ST	2.008	87300	14	C	0.87	9
I-235	COTTAGE GROVE	31ST ST	0.636	109700	3	C	0.87	9
I-235	E 6TH ST & PENN AVE	3RD AVE	0.489	90200	11	C	0.845	10
I-80/I-35	DOUGLAS AVE	HICKMAN	1.007	104200	8	C	0.84	11
I-80/I-35	86TH ST	IA 141/GRIMES	1.976	83300	18	C	0.835	12
I-235	73RD / 8TH ST	22ND ST	1.08	104900	5	C	0.795	13
I-80/I-35	MILLS CIVIC PKWY	GRAND AVE	1.243	44800	40	C	0.78	14

*****Color coding corresponds with the different rankings displayed in the legend in Figures 2 and 3

3.3 Population Exposure

Population Exposure was considered in the selection process for Polk County Air Quality Division's near-road NO_2 monitoring site. Census data from the U.S. Census bureau 2010 Population Profile Maps was used to determine the most population dense locations. Figure 3 shows the 2010 census profile for Iowa.

More specifically, Figure 4 displays the population density layered over the I-35/I-80 and I-235 corridors. Polk County Air Quality Division attempted to focus our near-road NO_2 monitoring site search to the most population-dense area along I-235, which also experienced the highest congestion patterns.

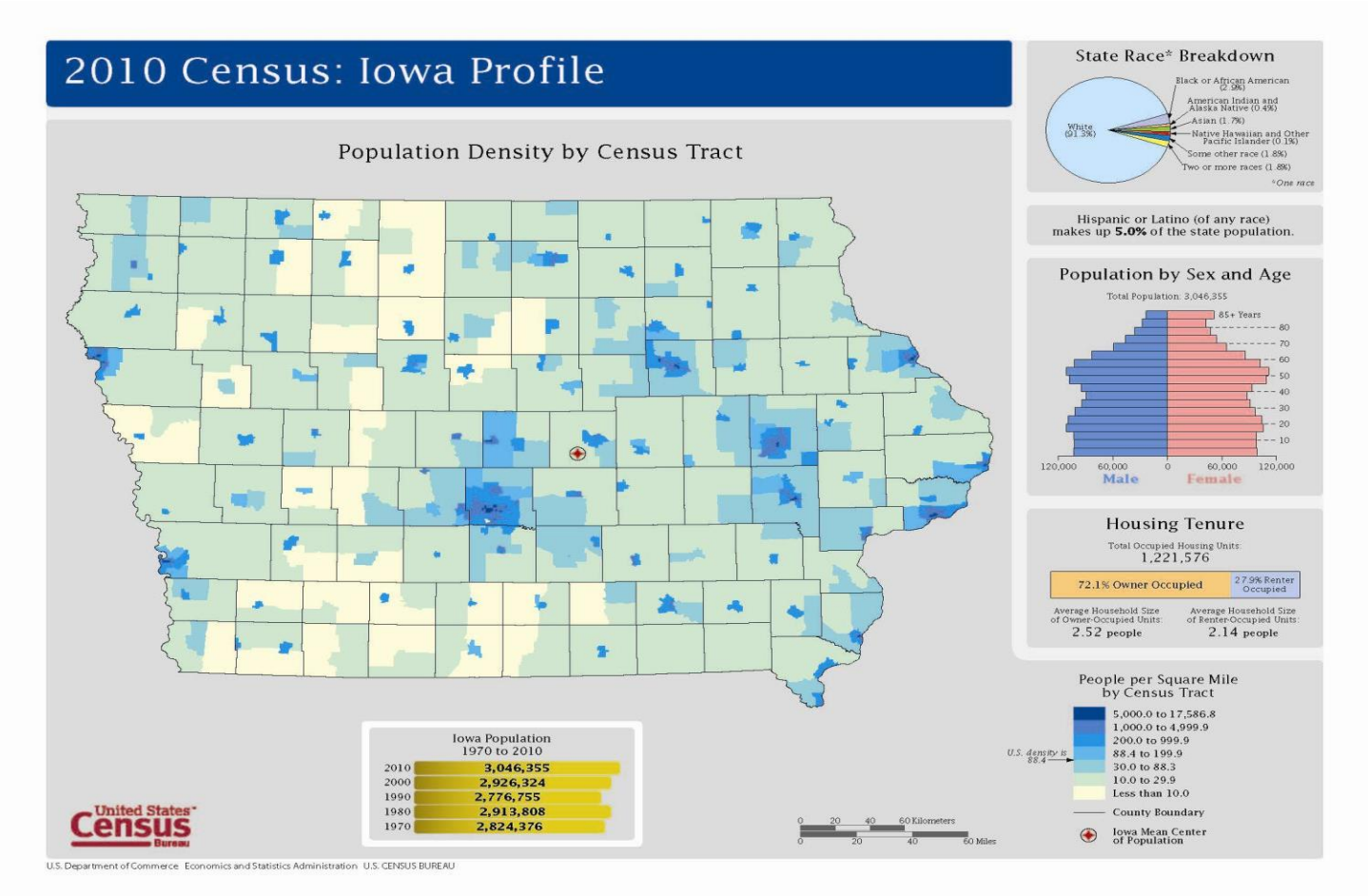

Figure 3: 2010 Iowa Census Profile Including the Des Moines-West Des Moines MSA

Figure 4: Population Density Layered Over the I-35/I-80 and I-235 Corridors

3.4 Meteorology

Figure 5 displays the average monthly 30-year wind speeds and directions for Des Moines provided by the National Climate Data Center (NCDC). There is a definite trend in wind direction out of the Northwest during the winter months,

when inversions are most likely to occur. Wind direction is predominantly out of the South during the summer months. Considering that the EPA recommends downwind monitoring, it is Polk County Air Quality Division's goal to select a site on the south side of the interstate, where highest concentrations of NO_2 are most likely to be observed.

30 Years Normals (1971-2000)	January	February	March	April	May	June	July	August	September	October	November	December
Mean Speed (MPH)	10.6	10.4	11.2	11.4	10.1	9.1	8.4	7.9	8.8	9.7	10.5	10.2
Prevailing Wind Direction (Degrees)	330	330	330	330	150	190	190	160	170	190	330	330

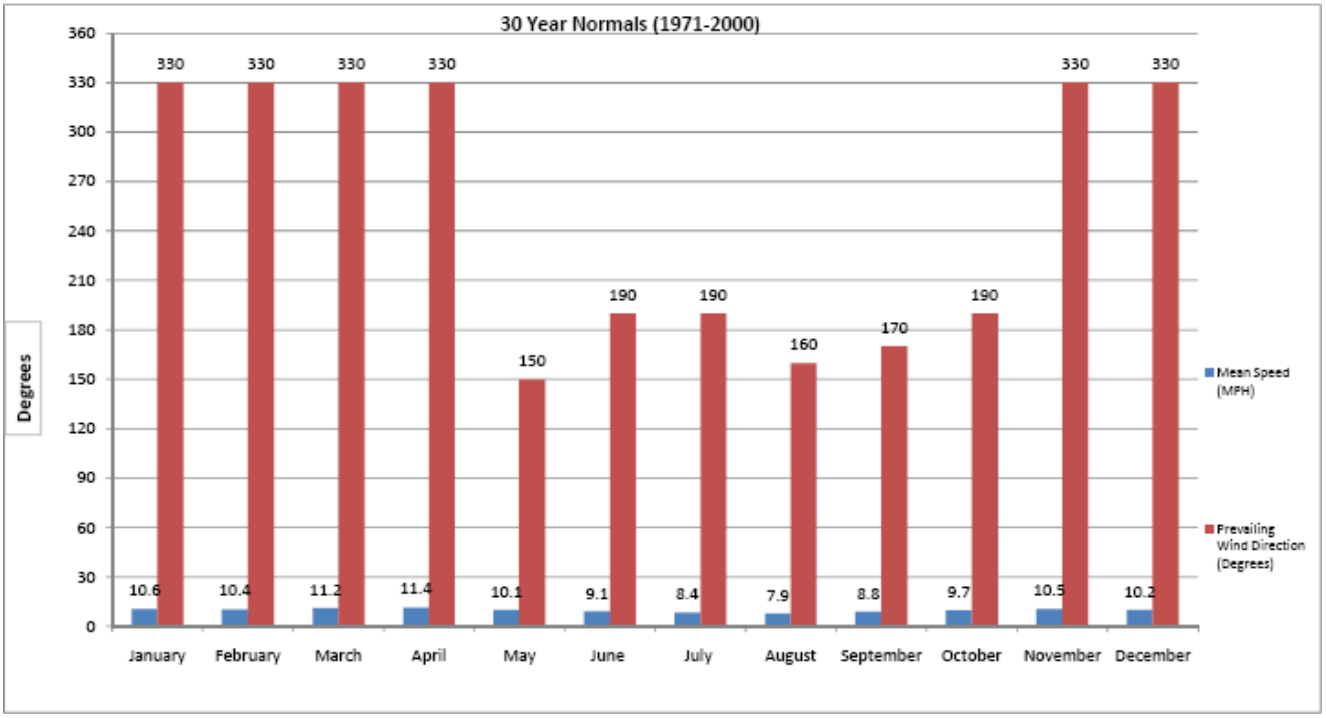

Figure 5: 30-Year Trends in Wind Speed and Wind Direction for Des Moines, IA

3.5 Other Considerations

Ultimately, the determining factor in Polk County Air Quality Division's near-road NO_2 monitoring site selection process came down to feasibility. Sites were evaluated for land availability, safety of site, and accessibility. Two sites were selected that would allow for the establishment of a permanent near-road shelter for NO_2 monitoring. These sites will be safe and easily accessible by Polk County Air Quality Staff year-round.

4. Proposed Candidate Near-Road NO2 Site 1

Polk County Air Quality Division's first candidate near-road NO_2 monitoring site is located at 6525 Center Street, Windsor Heights, IA. This is commercial property owned by Budget Storage. This site is located along the I-235 within the road segment from 63rd Street to 73rd/8th Street. This road segment has a AADT of 104,800 with a rank of 6. According to the 2010 congestion data, this road segment has a LOS rating of D and V/C ratio of 0.98. This road segment has the second highest congestion ranking for the Des Moines-West Des Moines MSA.

4.1 Physical Components

Figure 6 displays an aerial view of Polk County Air Quality Division's proposed candidate near-road NO_2 site. The Budget Storage site is South of I-235. Figure 7 displays the topography map with site elevations. The monitoring shelter will be below- grade of the south edge of I-235 by approximately 10 feet. It is located within 50 meters of an exit ramp. The only barrier present is a chain link fence. Vegetation includes a typical maintained grass roadside. Appendix A contains a complete site description.

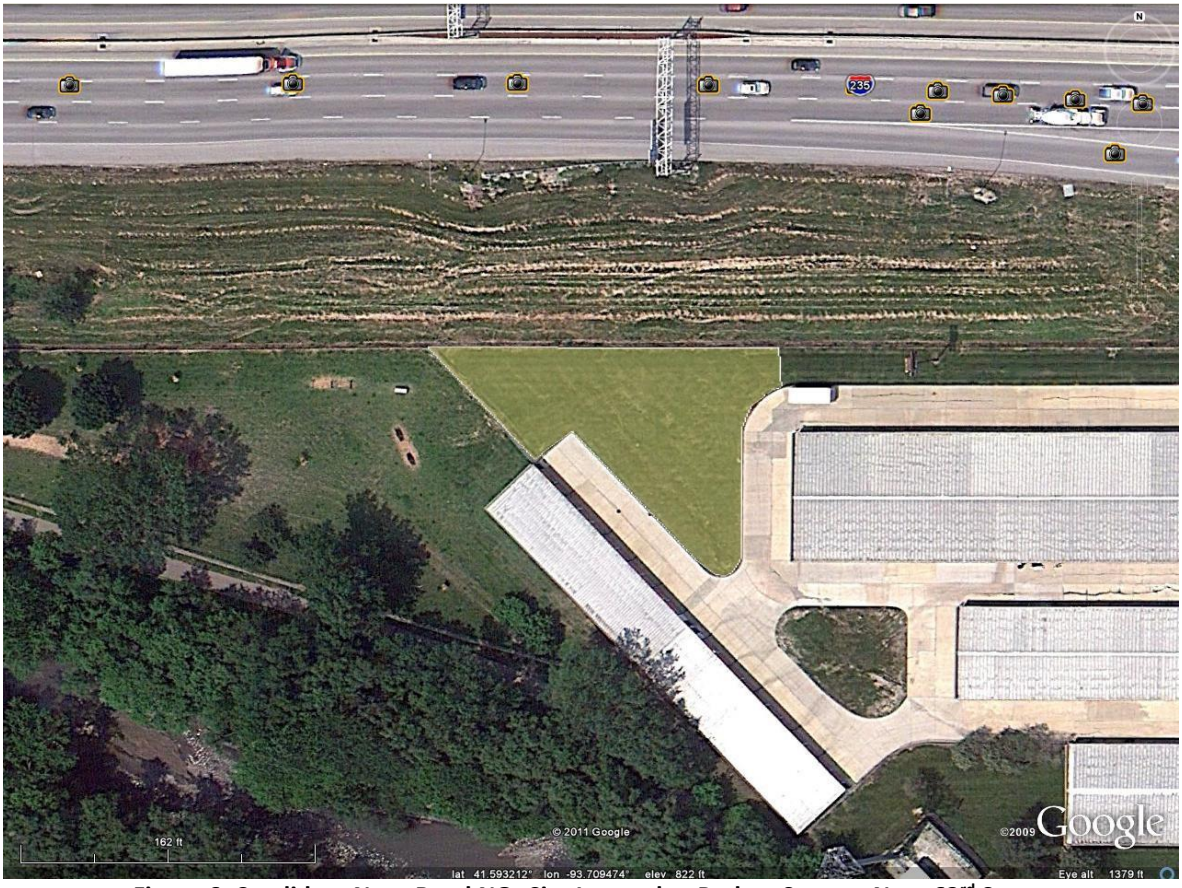

Figure 6: Candidate Near-Road NO_2 Site Located at Budget Storage Near 63rd Street

4.2 Siting of Shelter

Polk County Air Quality Division proposes to site the shelter on the Northwest corner of the property. Assuming the probe will be located at the fence line, the probe will be 38 meters from the nearest lane of traffic.

4.3 Conclusions

The advantages to the Budget Storage site include:

- It is located next to one of the most congested road segments in the Des Moines- West Des Moines MSA.
- It is located close to an exit ramp.
- The site would be on the south side of the interstate.
- The site is in a secure location with 24-hour access.

Note that detailed site plans have been submitted to the city of Windsor Heights. The feasibility of this site is still pending their approval.

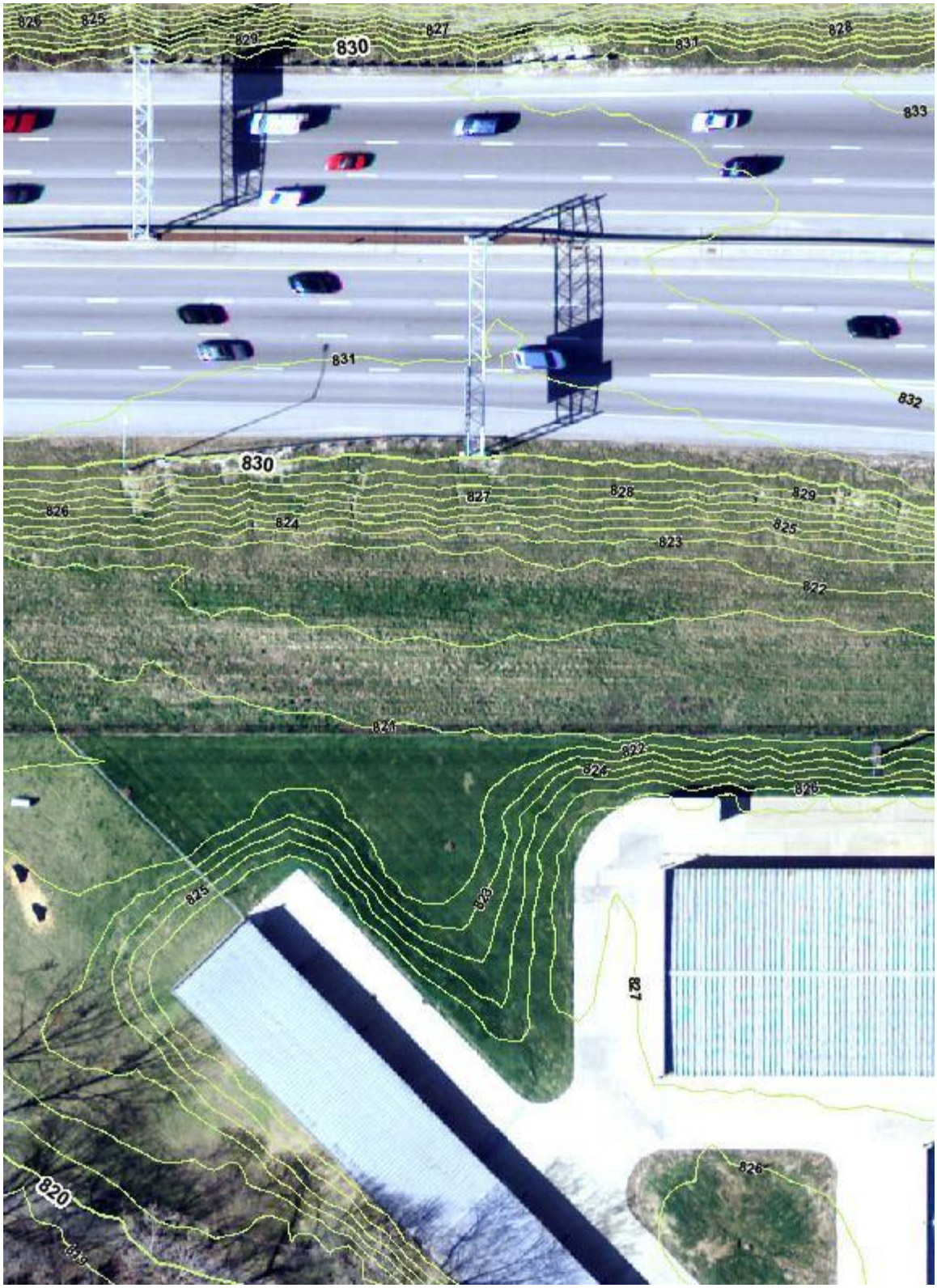

Figure 7: Topography Map of the Budget Storage Candidate Site

5. Proposed Candidate Near-Road NO2 Site 2

Polk County Air Quality Division's second candidate near-road NO_2 monitoring site is located at 6011 Rollins Avenue. This is open land owned by the DOT. This site is located along I-235 within the road segment from 56th to 63rd Street. This road segment has an AADT of 107,900 with a rank of 4. According to the 2010 congestion data, this road segment has a LOS rating of D and V/C ratio of 1.14, giving this road segment a congestion ranking of 1.

5.1 Physical Components

Figure 8 displays an aerial view of Polk County Air Quality Division's proposed candidate near-road NO_2 site two. The Rollins Avenue site is South of I-235. Figure 9 displays the topography map with site elevations. The monitoring shelter will be located below-grade of the south edge of I-235 by approximately 12-14 feet. The only barrier present is a chain link fence. Vegetation includes a typical maintained grass roadside.
Appendix B contains a complete site description.

5.2 Siting of Shelter

Polk County proposes to site the shelter 10 feet off the fence line. A security fence will be installed around the shelter. Assuming the probe will be located at the fence line, the probe will be approximately 14 meters from the nearest lane of traffic.

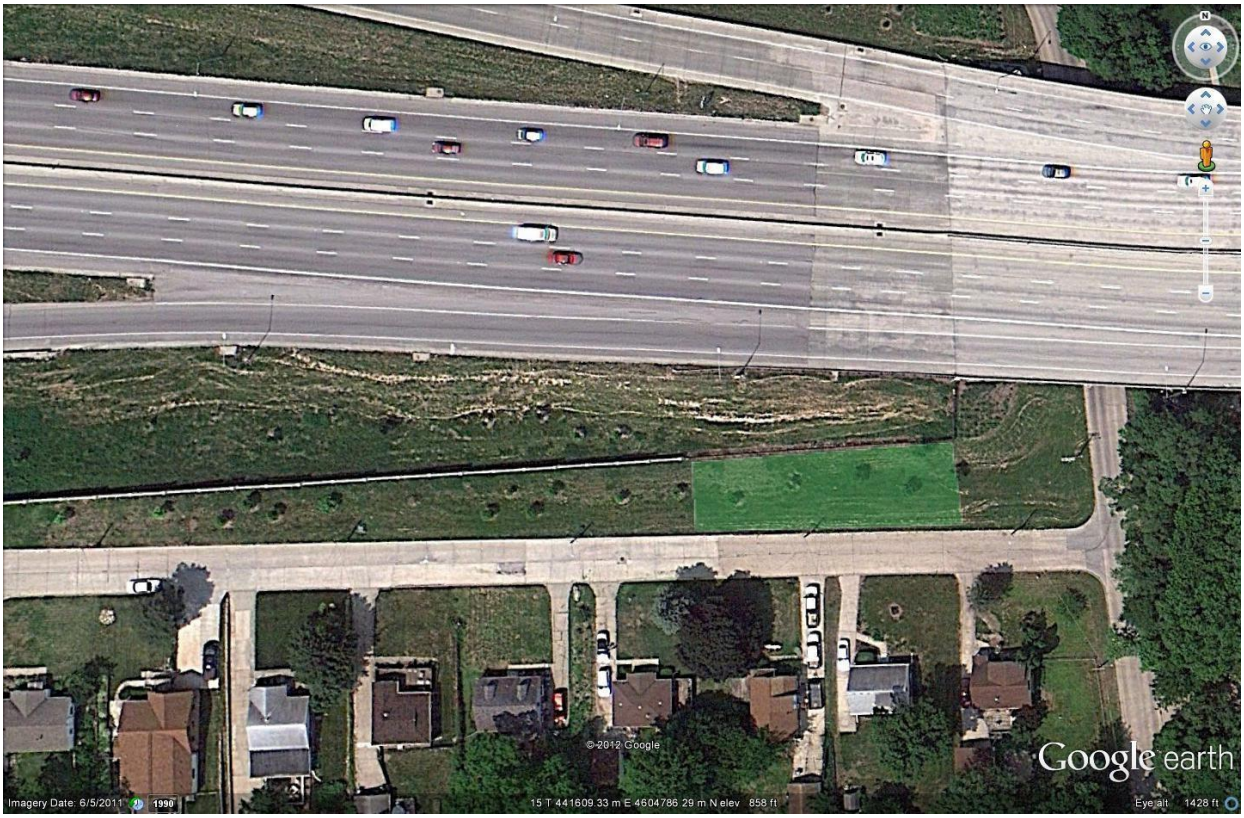

Figure 8: Candidate Near-Road NO_2 Site Located On Rollins Avenue

5.3 Conclusions

The advantages of the Rollins Avenue Site include:

- It is located within the 4th highest ranked road segments for AADT.
- It is located next to the most congested road segment in the Des Moines-West Des Moines MSA.
- It is located close to access ramps.
- It is located on the south side of the interstate.
- The probe would be located within 20 meters of the interstate.

Note that detailed site plans have been submitted to the City of Des Moines. The feasibility of this site is still pending their approval.

Figure 9: Topography Map of the Rollins Avenue Candidate Site

6. Proposed Candidate Near-Road NO2 Site 3

Polk County Air Quality Division's third candidate near-road NO_2 monitoring site is located at the Southeast corner of Polk Boulevard and Center Street, District/Parcel: 090/08158-001-000. This is a sanitary water lift station owned by the City of Des Moines. This site is located along I- 235 within the road segment from 42nd to 56th Street. This road segment has an AADT of 115,100 with a rank of 1. According to the 2010 congestion data, this road segment has a LOS rating of C and V/C ratio of 0.885, giving this road segment a congestion ranking of 7.

6.1 Physical Components

Figure 10 displays an aerial view of Polk County Air Quality Division's proposed candidate near-road NO_2 site three. The Polk Boulevard Site is North of I-235. Figure 11 displays the topography map with site elevations. The monitoring station will be located above-grade of the north edge of I-235 by approximately 14 feet. The only barrier present is a retaining

wall. Vegetation includes a typical maintained grass roadside. Appendix C contains a complete site description.

6.2 Siting of Shelter

Polk County will place their monitoring equipment within the existing sanitary water lift station. Assuming the probe will be located at the fence line, the probe will be approximately 18 meters from the nearest lane of traffic.

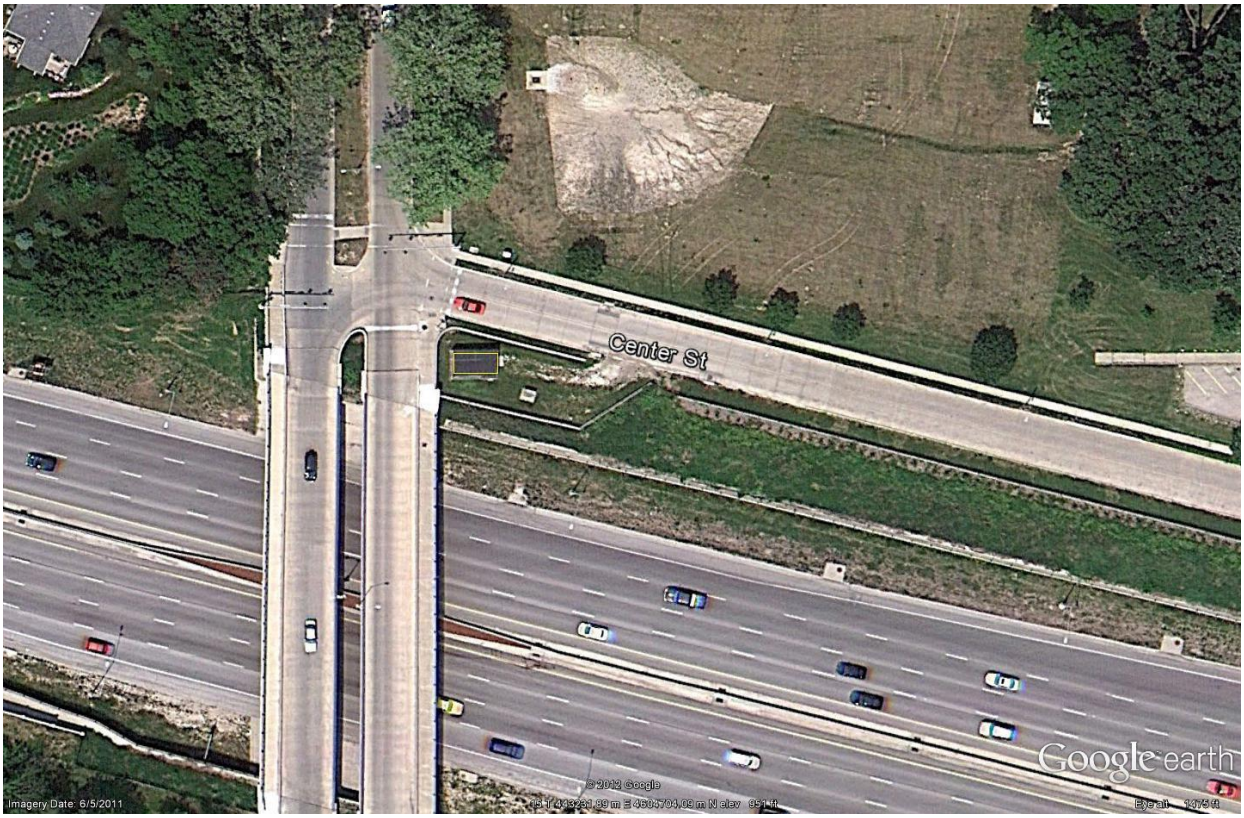

Figure 10: Candidate Near-Road NO_2 Site Located Near Polk Boulevard

6.3 Conclusions

The advantages of the Polk Boulevard Site include:

- It is located within the highest ranked road segments for AADT.
- An existing building is already in place.
- The probe would be located within 20 meters of the interstate.

Note that detailed site plans have been submitted to the City of Des Moines. The feasibility of this site is still pending their approval.

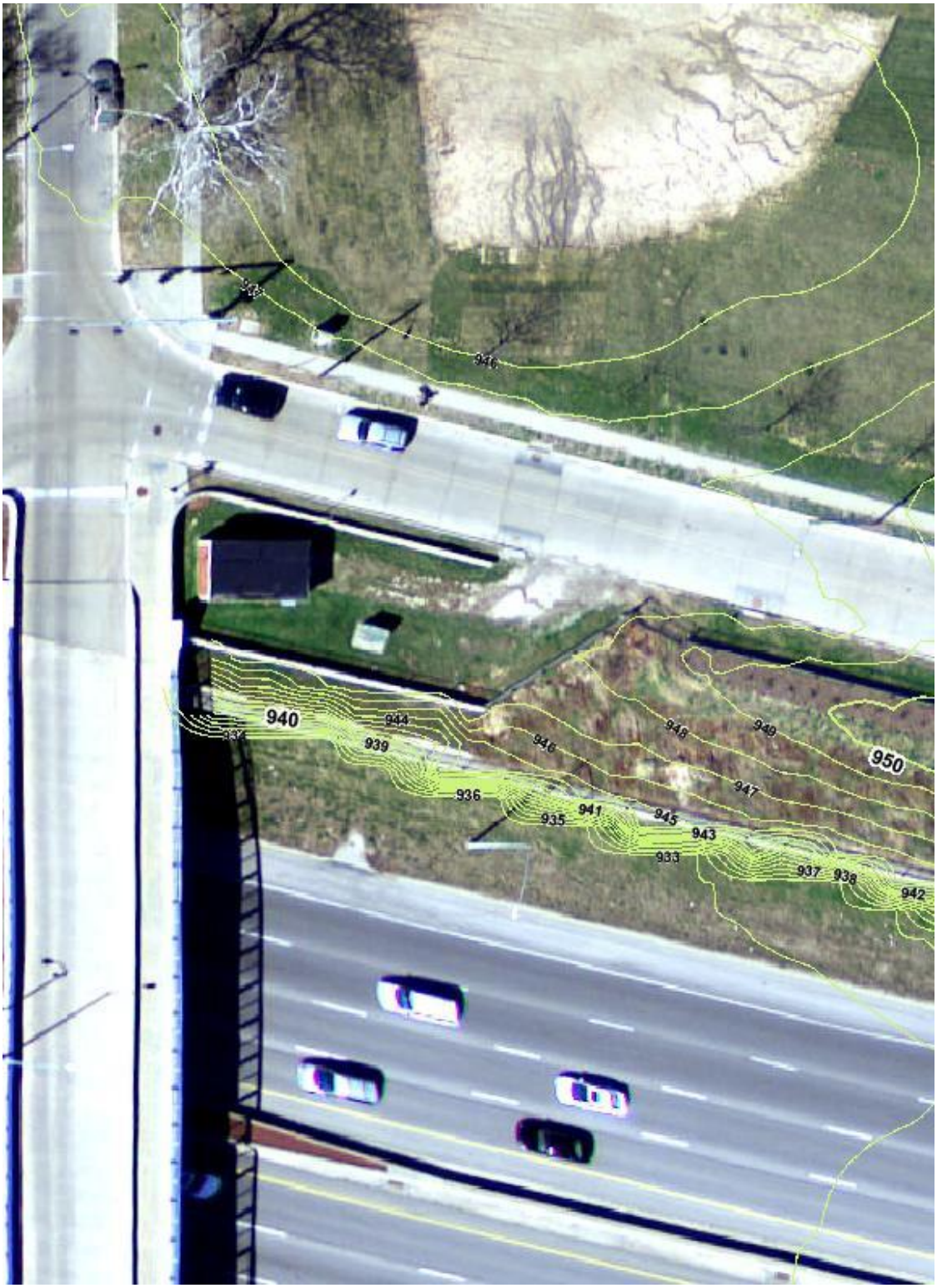

Figure 11: Topography Map of the Polk Boulevard Candidate Site

7. The Monitoring Shelter

The structure housing the monitoring equipment will be a 10' by 18' shelter designed specifically for air monitoring purposes. A detailed description of the monitoring shelter can be found in Appendix D. A clean, dry, secure and temperature controlled space is required so that the sampling equipment can operate properly. Careful thought and planning is required in locating a monitoring station. For shelter installation, Polk County Air Quality will consider the following:

- Proximity to the nearest power source. A 120 VAC source is required for operation of the near-road NO_2

monitoring instruments.

- The shelter where the equipment is housed must maintain a temperature range of 20-30ºC. This usually requires the need for an air conditioner and a heater controlled by a thermostat.
- The accessibility of the equipment to the operator. The operator must be able to safely access the equipment during regular business hours.
- The security of the equipment. Monitoring instruments are expensive. They must be placed in a location where security can be assured.
- Contracts for rental of space or power. Contracts need to be signed with the owner of the property where the instruments are to be located.
- Ethernet lines for data transmission to a central computer.
- Local building codes. In most cases, the contractor installing the power, structure, concrete, etc. knows the local building codes.

8. Probe Placement

Once the location of the station has been identified, the individual responsible for the installation must be familiar with the criteria for locating the probe. The location of the sample probe is critical and individuals performing the installation must follow specific guidelines for microscale near-road NO_2 monitoring sites involving:

- The distance of the probe inlet from nearby obstructions (buildings and trees) must be greater than 10 meters
- The vertical and horizontal distance of the probe inlet from the ground and support structure must be greater than 1 meter
- The height from the ground to the probe inlet must be within 2 – 7 meters
- The distance of the probe inlet from nearby roads must be less than 50 meters

For specific information on probe placement refer to 40 CFR Part 58 Appendix E.

9. References

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U.S. EPA, 2010: Primary National Ambient Air Quality Standards for Nitrogen Dioxide. Federal Register, Rules and Regulations, Volume 75, No. 26.

U.S. EPA, 2011: Network Design Criteria for Ambient Air Quality Monitoring: Requirements for Near-road NO_2 Monitors. 40 Code of Federal Regulations Part 58 Appendix D.

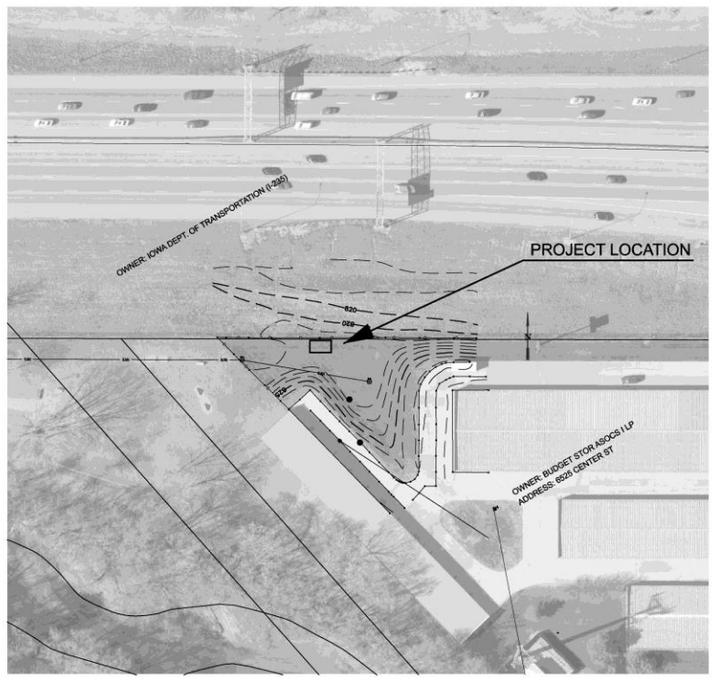
U.S. EPA, 2011: Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring. 40 Code of Federal Regulations Part 58 Appendix E.

Appendix A: Complete Site Description of the Budget Storage Candidate Site

SITE PLAN

FOR

POLK COUNTY PUBLIC WORKS
AIR QUALITY 2011 MONITORING SITE



VICINITY MAP

INDEX OF SHEETS

1. TITLE SHEET
2.-3. PROJECT INFROMATION
4. SITE LAYOUT

Certification Statement

SITE PLAN

☐ APPROVED ☐ APPROVED WITH CONDITIONS

See Exhibit "A" attached hereto.

IN ACCORDANCE WITH SECTION 82-207(C.) DES MOINES MUNICIPAL CODE. AS AMENDED. NO CHANGES TO THIS PLAN UNLESS APPROVED IN WRITINGFROM THE PLANNING DIRECTOR or NEW AMENDED DATED PLAN.

DATE PLANNING DIRECTOR

LICENSED PROFESSIONAL ENGINEER Kurt D. Bailey 12976 IOWA

I hereby certify that this plan was prepared by me or under my supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Date

Kurt D. Bailey

My license renewal date is December 31, 2011

Pages or sheets covered by this seal:

Sheets 1 - 4

MARK	REVISION	DATE	BY

Engineer : KDB Drawn by : SRN Date : 11/1/11

Sheet 1 of 4

AIR QUALITY 2011 MONITORING SITE

TITLE SHEET

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa

Sheet 1 of 4

Plotted by SRN

File Name: C:\DGN\Misc\PW_AirQuality_MonitoringSites\Site 1 - Windsor Heights\1Site1_TitleSheet.dgn Model Name: Title Sheet Date: 12/28/2011 10:42AM

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PROPERTY ADDRESS:
6525 CENTER ST
WINDSOR HEIGHTS, IA 50324

PROPERTY DESCRIPTION:
LOTS 32 & 33 WINDSOR PARK PLAT NO 2

OWNER:
BUDGET STOR ASOCS I LP
125 N MARKET ST STE 1255
WICHITA, KS 67202-1719

PROJECT CONTACT:
JEREMY BECKER
POLK COUNTY PUBLIC WORKS
5885 NE 14TH ST
DES MOINES, IA

ZONING : GC
TOTAL AREA OF PROPERTY: 187,930 SF
PROPOSED BUILDING USE: AIR QUALITY MONITORING EQUIPMENT
SETBACKS: N/A
WATER: DES MOINES WATER WORKS
WASTEWATER: WRA
ELECTRIC: MIDAMERICAN ENERGY

UTILITY WARNING

A. THE UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND/OR RECORDS OBTAINED . THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFY LOCATION OF ALL UTILITIES BEFORE CONSTRUCTION .

B. NOTIFY UTILITY PROVIDERS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES AND COORDINATE WITH UTILITY PROVIDERS AS NECESSARY DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR DETERMINING EXISTENCE, EXACT LOCATION, AND DEPTH OF ALL UTILITIES. PROTECT ALL UTILITY LINES AND STRUCTURES NOT SHOWN FOR REMOVAL OR MODIFICATION. ANY DAMAGES TO UTILITY ITEMS NOT SHOWN FOR REMOVAL OR MODIFICATION SHALL BE REPAIRED TO THE UTILITY OWNER'S SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE.

C. CONSTRUCTION OF ALL STREET AND UTILITY IMPROVEMENTS SHALL CONFORM TO THE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND THE SOILS REPORTS PREPARED BY OTHERS.

D. ALL TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), WHEN CONSTRUCTION ACTIVITIES OBSTRUCT PORTIONS OF THE ROADWAY, FLAGGERS SHALL BE PROVIDED. FLAGGERS SHALL CONFORM TO THE MUTCD IN APPEARANCE, EQUIPMENT AND ACTIONS.

E. NOTIFY OWNER, ENGINEER, DES MOINES WATER WORKS, AND CITY OF DES MOINES AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.

F. IN THE EVENT OF A DISCREPANCY BETWEEN THE QUANTITY ESTIMATES AND THE DETAILED PLANS, THE DETAILED PLANS SHALL GOVERN.

G. ALL FIELD TILES ENCOUNTERED DURING CONSTRUCTION SHALL BE RECONNECTED AND NOTED ACCORDINGLY ON THE AS BUILT DOCUMENTS.

H. DIMENSIONS, BUILDING LOCATION, UTILITIES AND GRADING OF THIS SITE ARE BASED ON AVAILABLE INFORMATION AT THE TIME OF DESIGN . DEVIATIONS MAY BE NECESSARY IN THE FIELD. ANY SUCH CHANGES OR CONFLICTS BETWEEN THIS PLAN AND FIELD CONDITIONS ARE TO BE REPORTED TO THE ARCHITECT/ENGINEER PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT VERIFICATION OF ALL SITE IMPROVEMENTS PRIOR TO CONSTRUCTION.

I. CONTRACTOR TO LOAD AND TRANSPORT ALL MATERIALS CONSIDERED TO BE UNDESIRABLE TO BF: INCORPORATED INTO THE PROJECT TO AN APPROVED OFF-SITE WASTE SITE .

J. CONTRACTOR TO STRIP AND STOCKPILE TOPSOIL FROM ALL AREAS TO BE CUT OR FILLED. RE-SPREAD TO MINIMUM 6" DEPTH TO FINISH GRADES.

K. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS SHOWN ARE FINISHED GRADES AND/OR TOP OF PAVING SLAB (GUTTER), UNLESS OTHERWISE NOTED.

L. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING DIRT AND DEBRIS FROM NEIGHBORING STREETS, DRIVEWAYS, AND SIDEWALKS CAUSED BY CONSTRUCTION ACTIVITIES IN A TIMELY MANNER.

M. THE ADJUSTMENT OF ANY EXISTING UTILITY APPURTENANCES TO FINAL GRADE IS CONSIDERED INCIDENTAL TO THE SITE WORK.

N. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING EROSION CONTROL MEASURES AS NECESSARY. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING ANY EXISTING EROSION CONTROL MEASURES ON SITE AT THE TIME OF CONSTRUCTION. GRADING AND SOIL EROSION CONTROL CODE REQUIREMENTS SHALL BE MET BY CONTRACTOR. A GRADING PERMIT IS NOT REQUIRED FOR THIS PROJECT .

O. CONTRACTOR TO COORDINATE NATURAL GAS, ELECTRICAL, TELEPHONE AND ANY OTHER FRANCHISE UTILITY SERVICES WITH UTILITY SERVICE PROVIDER, POLK COUNTY, AND THE OWNER PRIOR TO CONSTRUCTION.

P. CONTRACTOR TO VERIFY ALL UTILITY CROSSINGS AND MAINTAIN MINIMUM 18" VERTICAL AND HORIZONTAL CLEARANCE BETWEEN UTILITIES. CONTRACTOR TO COORDINATE UTILITY ROUTING TO BUILDING AND VERIFY CONNECTION LOCATIONS AND INVERTS PRIOR TO CONSTRUCTION .

MARK	REVISION	DATE	BY

Engineer : KDB
Drawn by : SRN
Date : 1/1/11

Sheet 2 of 4

AIR QUALITY 2011 MONITORING SITE

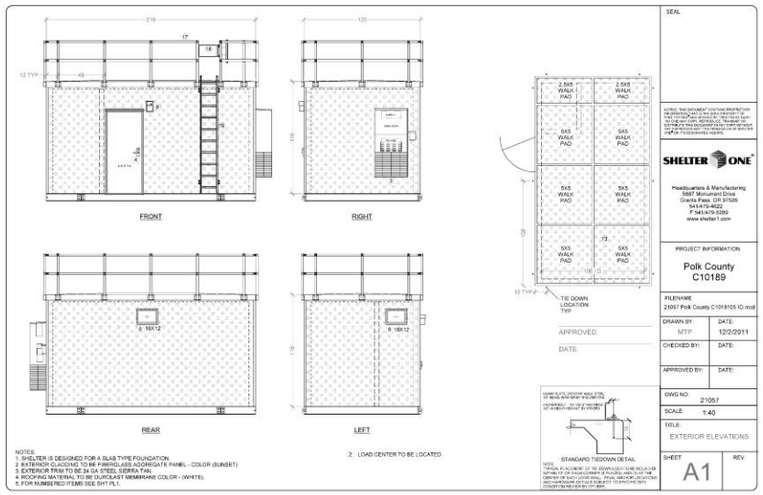
PROJECT INFORMATION

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION
5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

Sheet 2 of 4

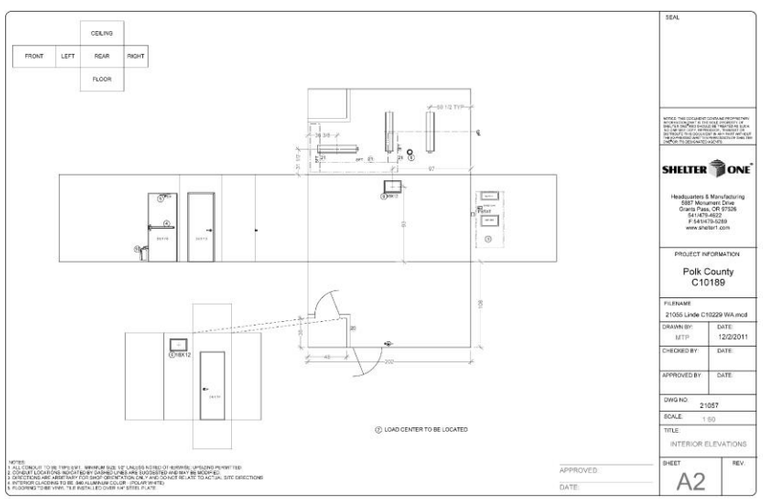
File Name: C:\DGN\Misc\PW_AirQuality_MonitoringSites\Site 1 - WindsorHeights\2Site1_InfoSheet1.dgn Model Name: Site Plan 1 Date: 12/28/2011 10:42AM

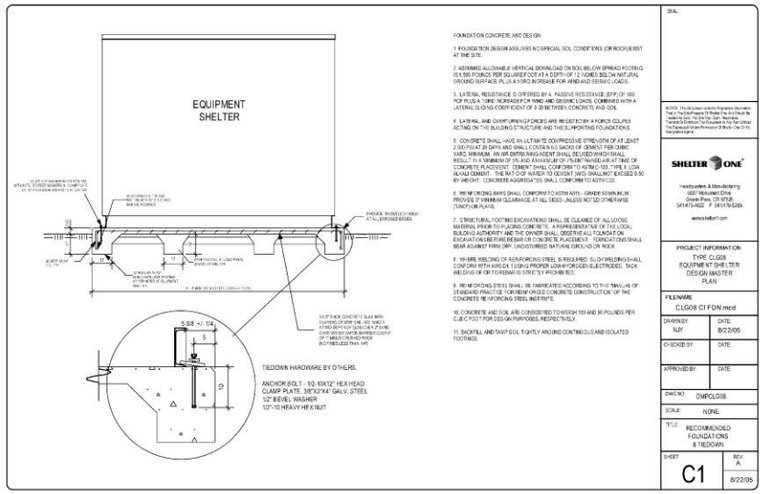
Plotted by SRN



Item #	Quote Line Item	Qty.	Description	Manufacturer	Manuf Part#
1	C10189	1	Model C Shelter, 10'W (OD) X 18'L (OD) X 9'H (ID)	Shelter One	C10189
2	150A1P3SSD	1	LOAD CENTER, 150 A, 1PH, 30 POS, NEMA1, SQD	Square D	QO13MQ150 / QOC30US
3	HVAC2460	1	H V A C, 24K BTU, w/ STANDARD t'stat, DISC SW & GFCI RECEPT	BARD	W24A-A05XPHXXJ / TH5220D1151
4	PANIC	1	Von Duprin Rim Panic	Von Duprin	22EO 36 SP28 / 230L / 626 1-1/4 25412
5	CLOSER2	1	Automatic Closer w/ holdopen	Norton	8301H
6	BHP50	2	Bulkhead panel Removable plate 18"X12"	Shelter One	SF-0084
7	GNDPDAL	2	Ground Pad Aluminum Nema 2-hole		
8	EXLT3	2	EXT. HPS, 70 W, 120 V w/ p-cell	Farmtek	105747
9	SMOKEHEAT	1	SMOKE & HEAT DETECTOR, 120 VAC W/ RELAY	GENTEX	9120TF
10	FECO25	1	FIRE EXT, ELA CO2		
11	RMR1	2	Receptacle, Duplex Roof Mount, Primary		
12	SPECIAL1	1	Ethernet Entry Point, (3) Interior Ceiling & (1) Wall Jack		
13	WALKPAD2	8	Roof Safety Walk Pad 5'X5'		
14	R178-1	1	Hammond Rack	Hammond Rack	C2F197823BK1 / PMR-9454
15	SPECIAL	1	Install Customer Supplied rack	Shelter One	
16	TL1	2	Receptacle, Single, Twist Lock, Primary		
17	RAIL1918	1	Roof Permeter railing, 10X18 / OSHA / PE Engineered		
18	GATE	1	Hand Rail Saftey Gate	Fabenco	AT1-21PC
19	SA-0052	1	Ladder Std Duty	Shelter One	
20	CLOSET	1	Closet, 3'X4' W/ 30" Door / Pwe Receipts / Light / Sound Atten	Shelter One	
21	CTRAY	28	Cable Tray (cable68), 12", Per Foot	CABOFLOFIL	CF 30/300

SEAL
SHELTER ONE
Headquarters & Manufacturing
5887 Monument Drive
Grants Pass, OR 97526
541479-4622
F 541479-5289
www.shelter1.com
PROJECT INFORMATION
Polk County
C10189
FILENAME
21057 Polk County C10189105 IO.mcd
DRAWN BY: MTP
DATE: 12/2/2011
CHECKED BY:
DATE:
APPROVED BY:
DATE:
DWG NO: 21057
SCALE: NONE
TITLE: PARTS LIST
SHEET PL1
REV.





MARK	REVISION	DATE	BY

Engineer: KDB | Drawn by: SRN | Date: 11/1/11

Sheet 3 of 4

AIR QUALITY 2011 MONITORING SITE

PROJECT INFORMATION

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

Sheet 3 of 4

Plotted by SRN

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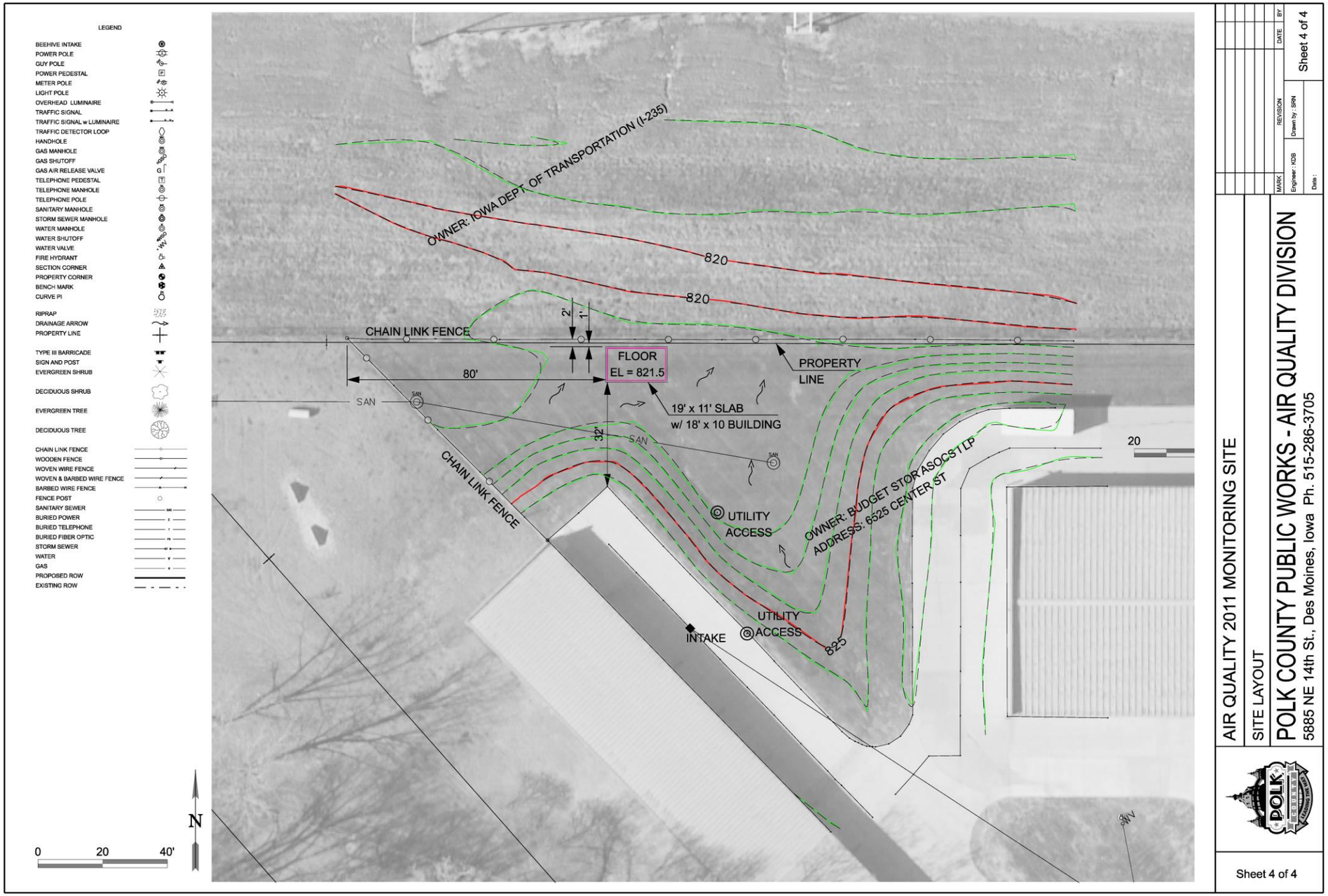


MARK	REVISION	DATE	BY

Engineer : KDB
Drawn by : SRN
Date :

Sheet 4 of 4

AIR QUALITY 2011 MONITORING SITE

SITE LAYOUT

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

Sheet 4 of 4

Plotted by SRN

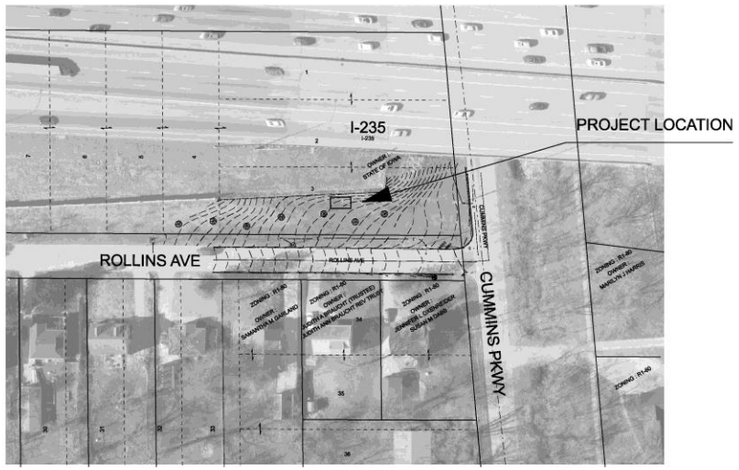
File Name: C:\DGN\Misc\PW_AirQuality_MonitoringSites\Site 1 - Windsor Heights\4Site1_SitePlan.dgn Model Name: Site Plan 1 Date: 12/28/2011 10:43AM

Appendix B: Complete Site Description of the Rollins Avenue Candidate Site

SITE PLAN

FOR

POLK COUNTY PUBLIC WORKS AIR QUALITY MONITORING SITE



VICINITY MAP

INDEX OF SHEETS

1. TITLE SHEET
2.-3. PROJECT INFORMATION
4. SITE LAYOUT

Certification Statement

SITE PLAN

☐ APPROVED ☐ APPROVED WITH CONDITIONS

See Exhibit "A" attached hereto.

IN ACCORDANCE WITH SECTION 82-207(C.) DES MOINES MUNICIPAL CODE. AS AMENDED. NO CHANGES TO THIS PLAN UNLESS APPROVED IN WRITINGFROM THE PLANNING DIRECTOR or NEW AMENDED DATED PLAN.

DATE PLANNING DIRECTOR

LICENSED PROFESSIONAL ENGINEER Kurt D. Bailey 12976 IOWA

I hereby certify that this plan was prepared by me or under my supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Date

Kurt D. Bailey

My license renewal date is December 31, 2013

Pages or sheets covered by this seal:
Sheets 1 - 4

MARK	REVISION	DATE	BY

Engineer : KDB Drawn by : SRN Date : 2/17/12

Sheet 1 of 4

AIR QUALITY MONITORING SITE - 6011 ROLLINS AVE

TITLE SHEET

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

Sheet 1 of 4

File Name: C:\DGN\Misc\PW_AirQuality_Monitoring\Sites\Site 4 - RollinsAve\1Site4_TitleSheet.dgn Model Name: Title Sheet 3 Date: 2/23/2012 10:09AM

Plotted by SRN

UTILITY WARNING

1 THE UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND/OR RECORDS OBTAINED . THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFY LOCATION OF ALL UTILITIES BEFORE CONSTRUCTION .

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15 CONTRACTOR TO COORDINATE NATURAL GAS, ELECTRICAL, TELEPHONE AND ANY OTHER FRANCHISE UTILITY SERVICES WITH UTILITY SERVICE PROVIDER, POLK COUNTY, AND THE OWNER PRIOR TO CONSTRUCTION.

16 CONTRACTOR TO VERIFY ALL UTILITY CROSSINGS AND MAINTAIN MINIMUM 18" VERTICAL AND HORIZONTAL CLEARANCE BETWEEN UTILITIES. CONTRACTOR TO COORDINATE UTILITY ROUTING TO BUILDING AND VERIFY CONNECTION LOCATIONS AND INVERTS PRIOR TO CONSTRUCTION .

17 ALL PCC DRIVES TO BE 5" DEPTH WITH 2" ROADSTONE BASE.

18 THIS SITE SHALL BE MAINTAINED IN COMPLIANCE WITH ALL CITY CODE APPLICABLE ON THE DATE OF SITE PLAN APPROVAL.

19 ANY NEW ROOFTOP MECHANICAL EQUIPMENT MUST BE SCREENED FROM STREET LEVEL VIEW.

20 TRANSFORMERS, JUNCTION BOXES, AIR CONDITIONERS OVER 3 FT. IN HEIGHT OR OTHER SUCH ITEMS MAY NOT BE LOCATED IN THE REQUIRED SETBACK AREAS.

21 ANY AMENDMENTS OR CHANGES TO THE PROJECT SITE THAT DO NOT MEET WHAT IS SHOWN ON THE SITE PLAN NEED TO BE APPROVED WITH THE PERMIT AND DEVELOPMENT CENTER PRIOR TO INSTALLATION/CONSTRUCTION.

22 LIGHTING MUST BE LOW GLARE CUT-OFF TYPE FIXTURES TO REDUCE THE GLARE OF LIGHT POLLUTION ON SURROUNDING PROPERTIES.

23 THE REQUIRED LANDSCAPING, BOTH EXISTING AND PROPOSED, SHALL BE MAINTAINED FOR THE LIFE OF THE CERTIFICATE OF OCCUPANCY.

24 ALL DISTURBED AREAS SHOULD BE RESTORED BY SEEDING OR SODDING.

25 CHAIN LINK FENCING SHALL BE 75% OPAQUE ON SOUTH, EAST AND NORTH SIDE OF LOT.

PROPOSED BUILDING USE: AIR QUALITY MONITORING EQUIPMENT
WATER: DES MOINES WATER WORKS
WASTEWATER: WRA
ELECTRIC: MIDAMERICAN ENERGY

OWNER:
STATE OF IOWA
800 LINCOLN WAY
AMES, IA 50010-6915

ADDRESS:
6011 ROLLINS AVE
DES MOINES, IOWA

LEGAL DESCRIPTION:
LTS 1 THRU 18 & W OF LN BEG 15F E OF
NW COR LT19 THN S TO SW COR LT 21
LTS 19, 20 & 21 SIXTY-THIRD ST PL

PROJECT CONTACT:
JEREMY BECKER
POLK COUNTY PUBLIC WORKS
5885 NE 14TH ST
DES MOINES, IA

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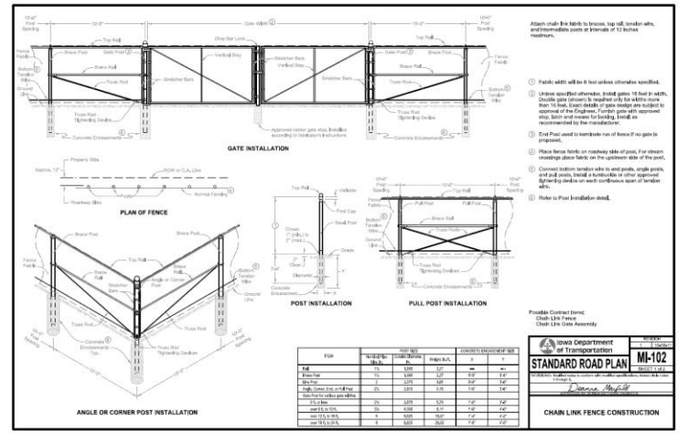
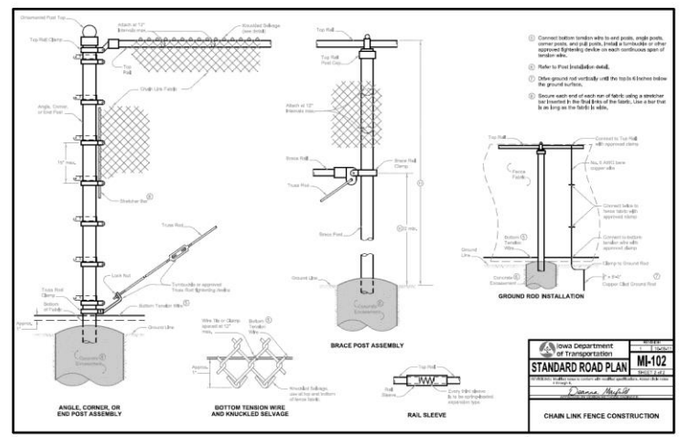




MARK	REVISION	DATE	BY

Engineer : KDB | Drawn by : SRN | Date : 2/17/12

Sheet 2 of 4

AIR QUALITY MONITORING SITE - 6011 ROLLINS AVE

PROJECT INFORMATION

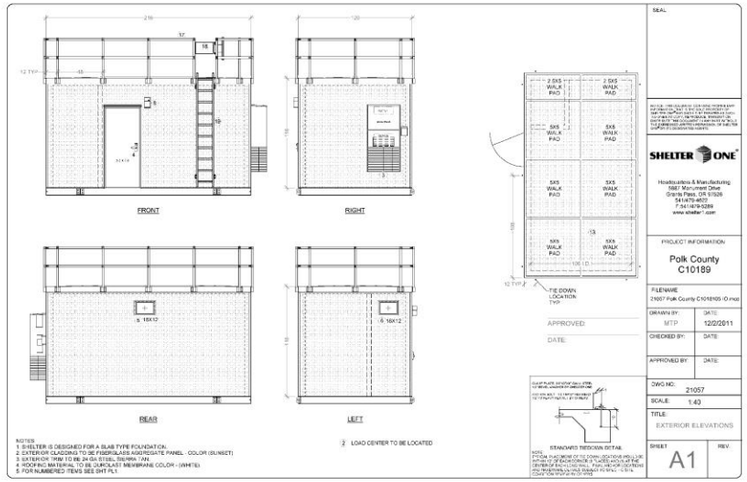
POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

Sheet 2 of 4

Plotted by SRN

File Name: C:\DGN\Misc\PW_AirQuality_Monitoring\Sites\Site 4 - RollinsAve\259a4_InfoSheet1.dgn Model Name: Site Plan 3 Date: 2/23/2012 10:09AM



Item #	Quote Line Item	Qty.	Description	Manufacturer	Manuf Part#
1	C10189	1	Model C Shelter, 10'W (OD) X 18'L (OD) X 9'H (ID)	Shelter One	C10189
2	150A1P30SD	1	LOAD CENTER, 150 A, 1PH, 30 POS, NEMA1, SQD	Square D	QO13MQ150 / QOC30US
3	HVAC2460	1	H V A C, 24K BTU, w/ STANDARD t'stat, DISC SW & GFCI RECEPT	BARD	W24A-A06KP4XXJ / TH522D1151
4	PAWC	1	Von Duprin Rim Panic	Von Duprin	2292 35 SP28 / 230L / 626 1-1/4 25412
5	CLOSER2	1	Automatic Closer w/ holdopen	Norton	8301H
6	BHP60	2	Bulkhead panel Removable plate 18"X12"	Shelter One	SF-0084
7	GNDRQAL	2	Ground Rod Aluminum Items 2-hole		
8	EXLT3	2	EXT., HPS, 79 W, 120 V w/ p-cell	Farmtek	105747
9	SMOKEHEAT	1	SMOKE & HEAT DETECTOR, 120 VAC W RELAY	GENTEX	9120TF
10	FECO25	1	FIRE EXT, 5Lb CO2		
11	RMR1	2	Receptacle, Duplex Roof Mount, Primary		
12	SPECIAL1	1	Ethernet Entry Point, (3) Interior Ceiling & (1) Wall Jack		
13	WALKPAD2	8	Roof Safety Walk Pad 5'X5'		
14	R17B-1	1	Hammond Rack	Hammond Rack	C2F197B23BK1 / PMR-9454
15	SPECIAL	1	Install Customer Supplied rack	Shelter One	
16	TL1	2	Receptacle, Single, Twist Lock, Primary		
17	RAIL1018	1	Roof Perimeter railing, 10X18 / OSHA / PE Engineered		
18	GATE	1	Hand Rail Safety Gate	Fabenco	A71-21PC
19	SA-0052	1	Ladder Std Duty	Shelter One	
20	CLOSET	1	Closet, 3'X4' W 30" Door / Pwr Receipts / Light / Sound Atten.	Shelter One	
21	CTRAY	28	Cable Tray (cablofil), 12", Per Foot	CABOFLOFIL	CF 30/300

SEAL

SHELTER ONE
Headquarters & Manufacturing
5887 Monument Drive
Grants Pass, OR 97526
541-476-4622
F 541-479-5289
www.shelter1.com

PROJECT INFORMATION
Polk County
C10189

FILENAME
21057 Polk County C10189DS IO.mcd

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CHECKED BY: — DATE:
APPROVED BY: — DATE:
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SCALE: NONE
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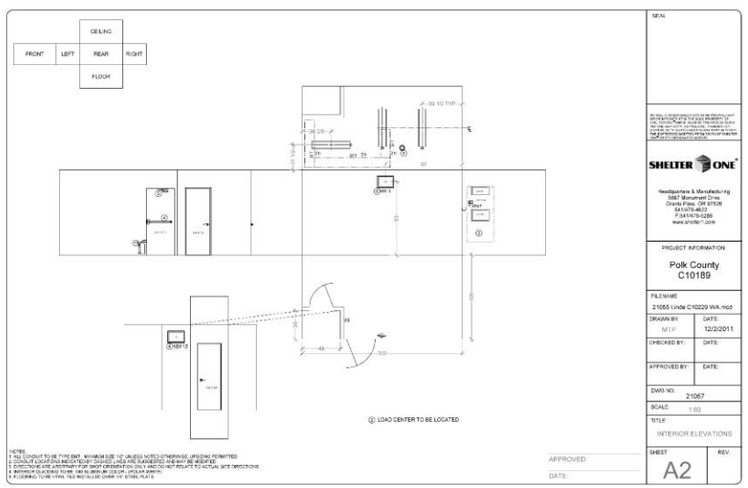

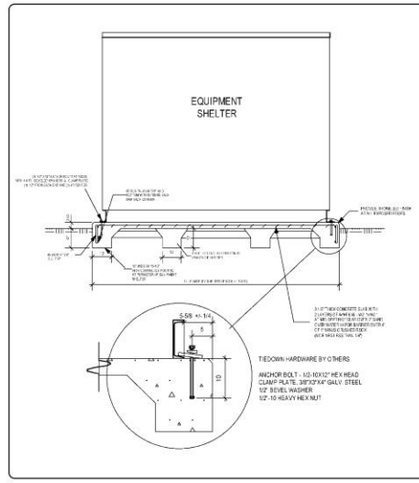

FOUNDATION CONCRETE AND DESIGN

1. FOUNDATION DESIGN ASSUMES NO SPECIAL SOIL CONDITIONS OR ROCKS EXIST AT THE SITE.

2. ASSURED ALLOWABLE VERTICAL DOWNLOAD ON SOIL BELOW SPREAD FOOTING IS 1,500 POUNDS PER SQUARE FOOT AT A DEPTH OF 12 INCHES BELOW NATURAL GROUND SURFACE, PLUS A 1/3RD INCREASE FOR WIND AND SEISMIC LOADS.

3. LATERAL RESISTANCE IS OFFERED BY A PASSIVE RESISTANCE SUPPOR 100 PCF PLUS A 1/3RD INCREASE FOR WIND AND SEISMIC LOADS COMBINED WITH A LATERAL SLIDING COEFFICIENT OF 0.35 BETWEEN CONCRETE AND SOIL.

4. LATERAL AND OVERTURNING FORCES ARE RESISTED BY A FORCE COUPLE ACTING ON THE BUILDING STRUCTURE AND THE SUPPORTING FOUNDATIONS.

5. CONCRETE SHALL HAVE MINIMUM 28 COMPRESSIVE STRENGTH OF AT LEAST 2,500 PSI AT 28 DAYS AND SHALL CONTAIN 6.5 SACKS OF CEMENT PER CUBIC YARD (564 LBS). AIR AIR ENTRAINING AGENT SHALL BE USED WHICH SHALL RESULT IN A MINIMUM OF 3% AND A MAXIMUM OF 7% ENTRAINED AIR AT TIME OF CONCRETE PLACEMENT. CEMENT SHALL CONFORM TO ASTM C-150, TYPE I, LOW ALKALI CEMENT. THE RATIO OF WATER TO CEMENT (WC) SHALL NOT EXCEED 5.5 BY WEIGHT. CONCRETE AGGREGATES SHALL CONFORM TO ASTM C33.

6. REINFORCING BARS SHALL CONFORM TO ASTM A615 - GRADE 60 BAR MUST PROVIDE 2" MINIMUM CLEARANCE AT ALL SIDES UNLESS NOTED OTHERWISE (TYPICAL FOUNDATION PLAN).

7. STRUCTURAL FOUNDATION EXCAVATIONS SHALL BE CLEARED OF ALL LOOSE MATERIAL PRIOR TO PLACING CONCRETE. A REPRESENTATIVE OF THE LOCAL BUILDING AUTHORITY AND THE OWNER SHALL OBSERVE ALL FOUNDATION EXCAVATION BEFORE REBAR OR CONCRETE PLACEMENT. FOUNDATIONS SHALL BEAR AGAINST FIRM, UNDISTURBED NATURAL GROUND OR ROCK.

8. WHERE WELDING OF REINFORCING STEEL IS REQUIRED, SUCH WELDING SHALL CONFORM WITH AWS D1.4 USING PROPER LOW HYDROGEN ELECTRODES. BACK WELDING OF OPTIONAL BAR IS STRICTLY PROHIBITED.

9. REINFORCING STEEL SHALL BE FABRICATED ACCORDING TO THE "MANUAL OF STANDARD PRACTICE FOR REINFORCED CONCRETE CONSTRUCTION" OF THE CONCRETE REINFORCING STEEL INSTITUTE.

10. CONCRETE AND SOIL ARE CONSIDERED TO WEIGH 150 AND 90 POUNDS PER CUBIC FOOT FOR DESIGN PURPOSES, RESPECTIVELY.

11. BACKFILL AND TAMP SOIL TIGHTLY AROUND CONTINUOUS AND ISOLATED FOOTINGS.

SEAL

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Headquarters & Manufacturing
5887 Monument Drive
Grants Pass, OR 97526
541-476-4622 F 541-479-5289
www.shelter1.com

PROJECT INFORMATION
TYPE C1028
EQUIPMENT SHELTER
DESIGN MASTER
PLAN

FILENAME
CL028 C1 FDN.mcd

DRAWN BY: NJY — DATE: 8/22/06
CHECKED BY: — DATE:
APPROVED BY: — DATE:
DWG NO: DM/PCL028
SCALE: NONE
TITLE: RECOMMENDED FOUNDATIONS & TIEDOWN
SHEET C1 — REV. A — 8/22/06

MARK	REVISION	DATE	BY

Engineer : KDB
Drawn by : SRN
Date : 2/17/12

Sheet 3 of 4

AIR QUALITY MONITORING SITE - 6011 ROLLINS AVE

PROJECT INFORMATION

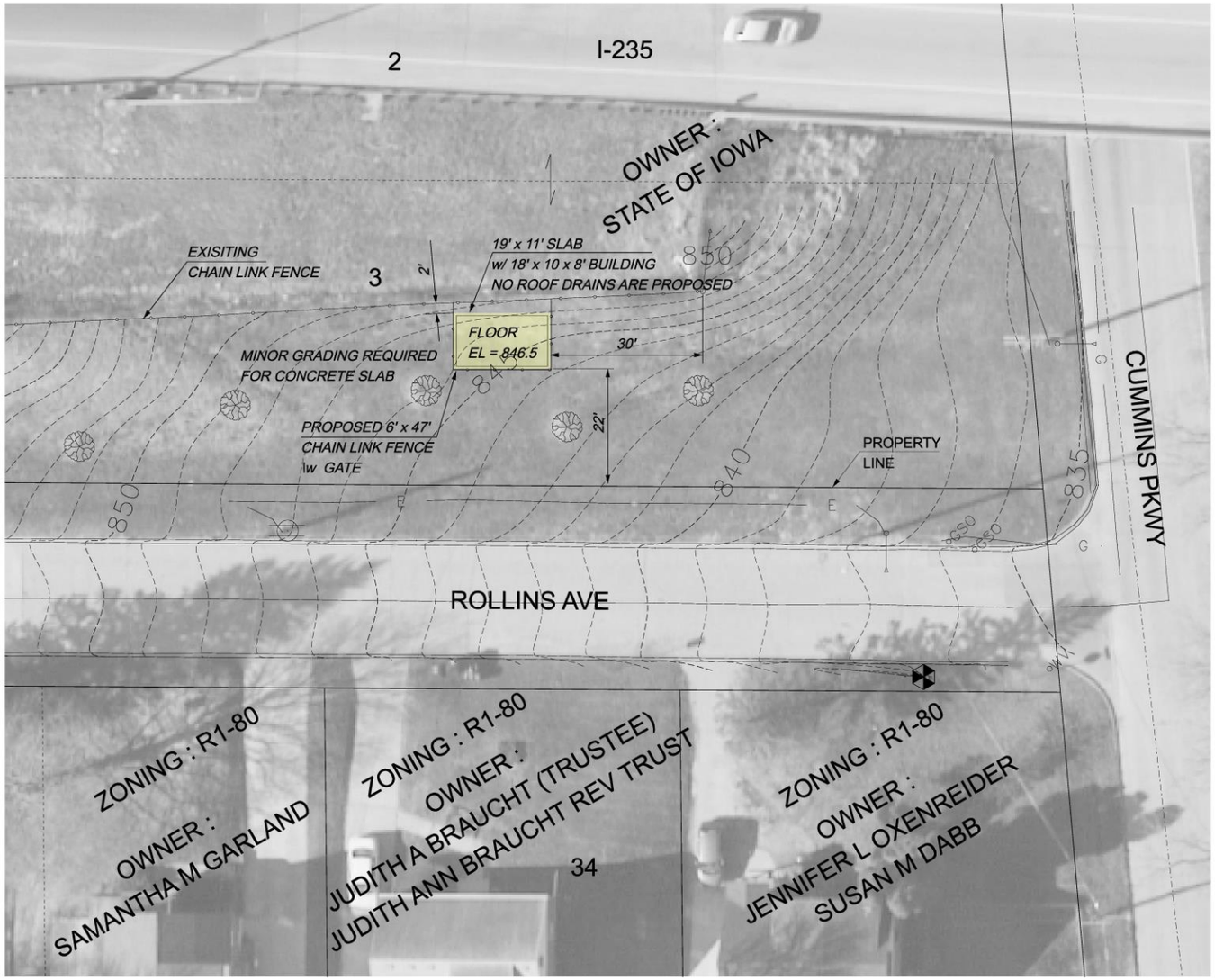
POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

Sheet 3 of 4

Plotted by SRN

File Name: C:\DGN\Misc\PW_AirQuality_Monitoring\Sites\Site 4 - RollinsAve\35\Sw4_LinbSheet2.dgn Model Name: Site Plan 3 Date: 2/23/2012 10:10AM



LEGEND

BEEHIVE INTAKE
POWER POLE
GUY POLE
POWER PEDESTAL
METER POLE
LIGHT POLE
OVERHEAD LUMINAIRE
TRAFFIC SIGNAL
TRAFFIC SIGNAL w LUMINAIRE
TRAFFIC DETECTOR LOOP
HANDHOLE
GAS MANHOLE
GAS SHUTOFF
GAS AIR RELEASE VALVE
TELEPHONE PEDESTAL
TELEPHONE MANHOLE
TELEPHONE POLE
SANITARY MANHOLE
STORM SEWER MANHOLE
WATER MANHOLE
WATER SHUTOFF
WATER VALVE
FIRE HYDRANT
SECTION CORNER
PROPERTY CORNER
BENCH MARK
CURVE PI

RIPRAP
DRAINAGE ARROW
PROPERTY LINE

TYPE III BARRICADE
SIGN AND POST
EVERGREEN SHRUB

DECIDUOUS SHRUB

EVERGREEN TREE

DECIDUOUS TREE

CHAIN LINK FENCE
WOODEN FENCE
WOVEN WIRE FENCE
WOVEN & BARBED WIRE FENCE
BARBED WIRE FENCE
FENCE POST
SANITARY SEWER
BURIED POWER
BURIED TELEPHONE
BURIED FIBER OPTIC
STORM SEWER
WATER
GAS
PROPOSED ROW
EXISTING ROW

N

0 10 20

MARK	REVISION	DATE	BY

Engineer : KDB
Drawn by : SRN
Date : 2/17/12

Sheet 4 of 4

AIR QUALITY MONITORING SITE - 6011 ROLLINS AVE

SITE LAYOUT

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

Sheet 4 of 4

File Name: C:\DGN\Misc\PW_AirQuality_Monitoring\Sites\Site 4 - RollinsAve\4Site4_SitePlan.dgn Model Name: Site Plan 3 Date: 2/23/2012 10:11AM

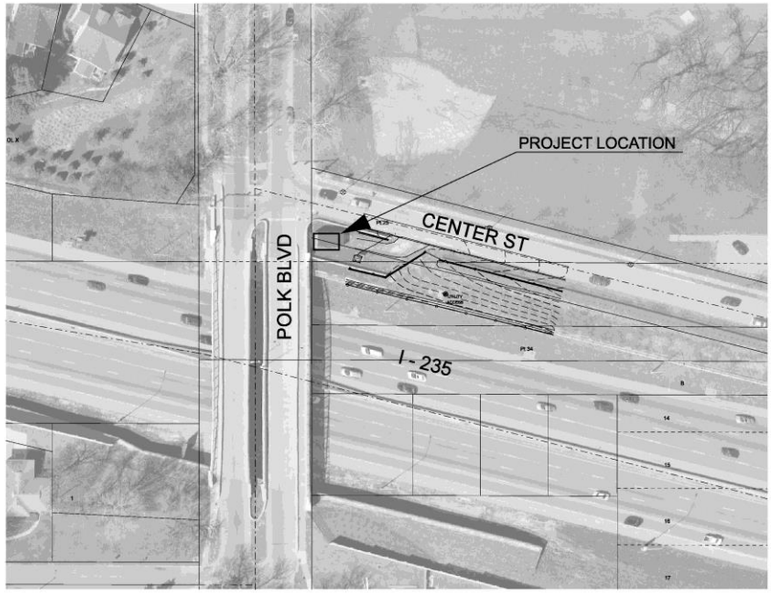
Plotted by SRN

Appendix C: Complete Site Description of the Polk Boulevard Candidate Site

SITE PLAN

FOR

POLK COUNTY PUBLIC WORKS
AIR QUALITY MONITORING SITE



VICINITY MAP

INDEX OF SHEETS

1. TITLE SHEET
2. PROJECT INFROMATION
3. SITE LAYOUT

Certification Statement

SITE PLAN

☐ APPROVED ☐ APPROVED WITH CONDITIONS

See Exhibit "A" attached hereto.

IN ACCORDANCE WITH SECTION 82-207(C.) DES MOINES MUNICIPAL CODE. AS AMENDED. NO CHANGES TO THIS PLAN UNLESS APPROVED IN WRITINGFROM THE PLANNING DIRECTOR or NEW AMENDED DATED PLAN.

DATE PLANNING DIRECTOR

LICENSED PROFESSIONAL ENGINEER Kurt D. Bailey 12976 IOWA

I hereby certify that this plan was prepared by me or under my supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Date

Kurt D. Bailey

My license renewal date is December 31, 2011

Pages or sheets covered by this seal:

Sheets 1 - 4

AIR QUALITY MONITORING SITE - POLK BLVD & CENTER ST

TITLE SHEET

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa

MARK	REVISION	DATE	BY

Engineer : KDB Drawn by : SRN Date : 2/21/12

Sheet 1 of 3

Sheet 1 of 3

File Name: C:\DGN\Misc\PW_AirQuality_Monitoring\Sites\Site 2 - Polk Blvd\1Site2_TitleSheet.dgn Model Name: Title Sheet Date: 2/23/2012 10:23AM

Plotted by SRN

IOWA ONE CALL
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1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

PROPERTY ADDRESS:
POLK BLVD & CENTER ST
DES MOINES, IA

PROPERTY DESCRIPTION:
IREG PC SW COR LT 25 OFF REPLAT
OP NE 1/4 SEC 1-78-25

OWNER:
CITY OF DES MOINES
400 ROBERT D RAY DR
DES MOINES, IA 50309-1813

PROJECT CONTACT:
JEREMY BECKER
POLK COUNTY PUBLIC WORKS
5885 NE 14TH ST
DES MOINES, IA

PROPOSED BUILDING USE: AIR QUALITY MONITORING EQUIPMENT
SETBACKS: N/A
WATER: DES MOINES WATER WORKS
WASTEWATER: WRA
ELECTRIC: MIDAMERICAN ENERGY

UTILITY WARNING

A. THE UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND/OR RECORDS OBTAINED . THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFY LOCATION OF ALL UTILITIES BEFORE CONSTRUCTION .

B. NOTIFY UTILITY PROVIDERS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES AND COORDINATE WITH UTILITY PROVIDERS AS NECESSARY DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR DETERMINING EXISTENCE, EXACT LOCATION, AND DEPTH OF ALL UTILITIES. PROTECT ALL UTILITY LINES AND STRUCTURES NOT SHOWN FOR REMOVAL OR MODIFICATION. ANY DAMAGES TO UTILITY ITEMS NOT SHOWN FOR REMOVAL OR MODIFICATION SHALL BE REPAIRED TO THE UTILITY OWNER'S SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE.

C. CONSTRUCTION OF ALL STREET AND UTILITY IMPROVEMENTS SHALL CONFORM TO THE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND THE SOILS REPORTS PREPARED BY OTHERS.

D. ALL TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), WHEN CONSTRUCTION ACTIVITIES OBSTRUCT PORTIONS OF THE ROADWAY, FLAGGERS SHALL BE PROVIDED. FLAGGERS SHALL CONFORM TO THE MUTCD IN APPEARANCE, EQUIPMENT AND ACTIONS.

E. NOTIFY OWNER, ENGINEER, DES MOINES WATER WORKS, AND CITY OF DES MOINES AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.

F. IN THE EVENT OF A DISCREPANCY BETWEEN THE QUANTITY ESTIMATES AND THE DETAILED PLANS, THE DETAILED PLANS SHALL GOVERN.

G. ALL FIELD TILES ENCOUNTERED DURING CONSTRUCTION SHALL BE RECONNECTED AND NOTED ACCORDINGLY ON THE AS BUILT DOCUMENTS.

H. DIMENSIONS, BUILDING LOCATION, UTILITIES AND GRADING OF THIS SITE ARE BASED ON AVAILABLE INFORMATION AT THE TIME OF DESIGN . DEVIATIONS MAY BE NECESSARY IN THE FIELD. ANY SUCH CHANGES OR CONFLICTS BETWEEN THIS PLAN AND FIELD CONDITIONS ARE TO BE REPORTED TO THE ARCHITECT/ENGINEER PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT VERIFICATION OF ALL SITE IMPROVEMENTS PRIOR TO CONSTRUCTION.

I. CONTRACTOR TO LOAD AND TRANSPORT ALL MATERIALS CONSIDERED TO BE UNDESIRABLE TO BF: INCORPORATED INTO THE PROJECT TO AN APPROVED OFF-SITE WASTE SITE .

J. CONTRACTOR TO STRIP AND STOCKPILE TOPSOIL FROM ALL AREAS TO BE CUT OR FILLED. RE-SPREAD TO MINIMUM 6" DEPTH TO FINISH GRADES.

K. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS SHOWN ARE FINISHED GRADES AND/OR TOP OF PAVING SLAB (GUTTER), UNLESS OTHERWISE NOTED.

L. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING DIRT AND DEBRIS FROM NEIGHBORING STREETS, DRIVEWAYS, AND SIDEWALKS CAUSED BY CONSTRUCTION ACTIVITIES IN A TIMELY MANNER.

M. THE ADJUSTMENT OF ANY EXISTING UTILITY APPURTENANCES TO FINAL GRADE IS CONSIDERED INCIDENTAL TO THE SITE WORK.

N. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING EROSION CONTROL MEASURES AS NECESSARY. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING ANY EXISTING EROSION CONTROL MEASURES ON SITE AT THE TIME OF CONSTRUCTION. GRADING AND SOIL EROSION CONTROL CODE REQUIREMENTS SHALL BE MET BY CONTRACTOR. A GRADING PERMIT IS NOT REQUIRED FOR THIS PROJECT .

O. CONTRACTOR TO COORDINATE NATURAL GAS, ELECTRICAL, TELEPHONE AND ANY OTHER FRANCHISE UTILITY SERVICES WITH UTILITY SERVICE PROVIDER, POLK COUNTY, AND THE OWNER PRIOR TO CONSTRUCTION.

P. CONTRACTOR TO VERIFY ALL UTILITY CROSSINGS AND MAINTAIN MINIMUM 18" VERTICAL AND HORIZONTAL CLEARANCE BETWEEN UTILITIES. CONTRACTOR TO COORDINATE UTILITY ROUTING TO BUILDING AND VERIFY CONNECTION LOCATIONS AND INVERTS PRIOR TO CONSTRUCTION .

MARK	REVISION	DATE	BY

Engineer : KDB
Drawn by : SRN
Date : 2/21/12

Sheet 2 of 3

AIR QUALITY MONITORING SITE - POLK BLVD & CENTER ST

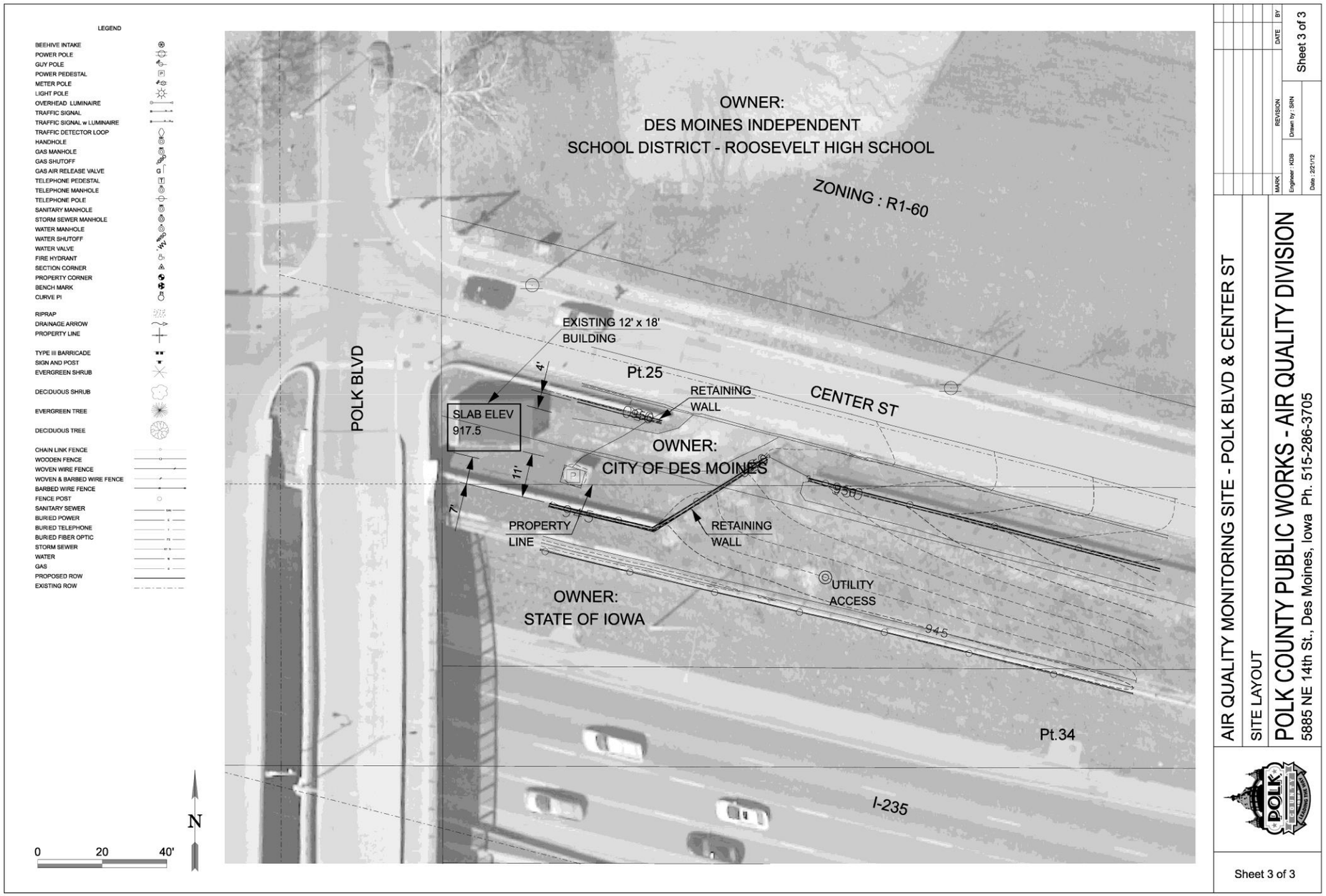
PROJECT INFORMATION

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION
5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

Sheet 2 of 3

File Name: C:\DGN\Misc\PW_AirQuality_Monitoring\Sites\Site 2 - Polk Blvd\2Site2_Info\Sheet1.dgn Model Name: Site Plan 1 Date: 2/23/2012 10:24AM

Plotted by SRN



AIR QUALITY MONITORING SITE - POLK BLVD & CENTER ST

SITE LAYOUT

POLK COUNTY PUBLIC WORKS - AIR QUALITY DIVISION

5885 NE 14th St., Des Moines, Iowa Ph. 515-286-3705

MARK	REVISION	DATE	BY

Engineer : KDB

Drawn by : SRN

Date : 2/21/12

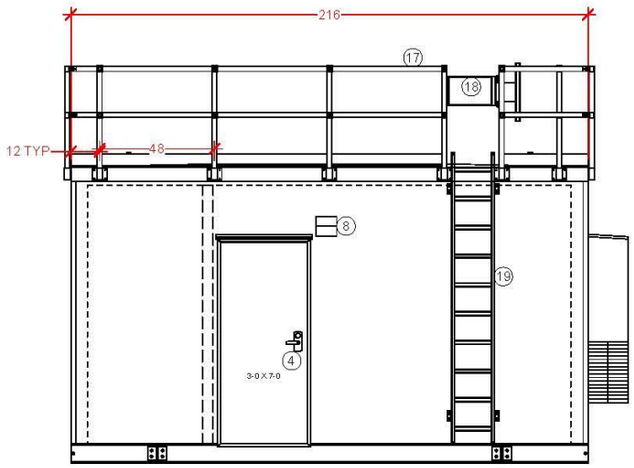
Sheet 3 of 3

Sheet 3 of 3

File Name: C:\DGN\Misc\PW_AirQuality_Monitoring\Sites\Site 2 - Polk Blvd\SSite2_SitePlan.dgn Model Name: Site Plan 1 Date: 2/23/2012 10:24AM

Plotted by SRN

Appendix D: Shelter Description



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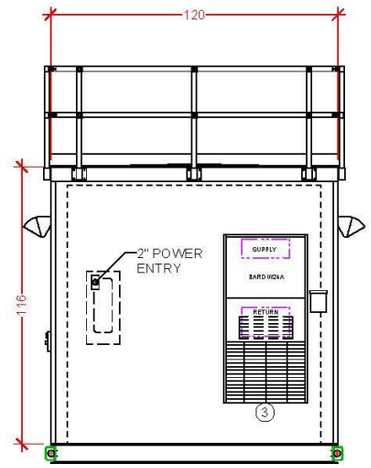

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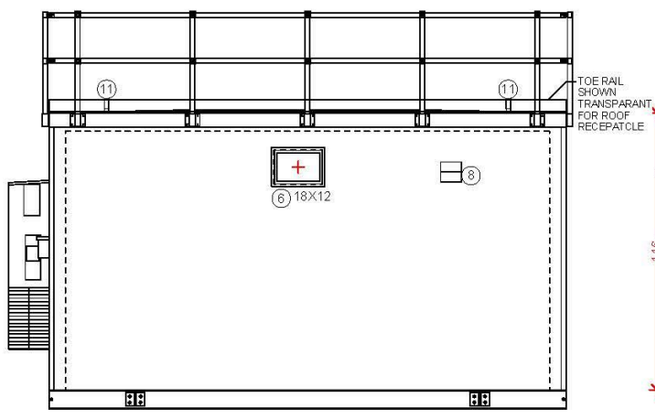

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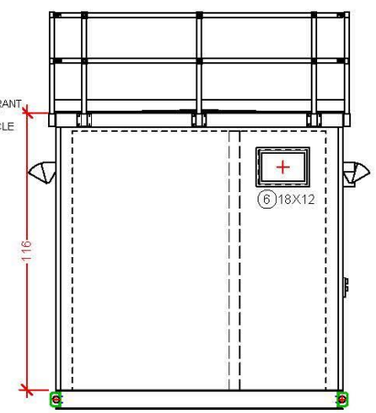

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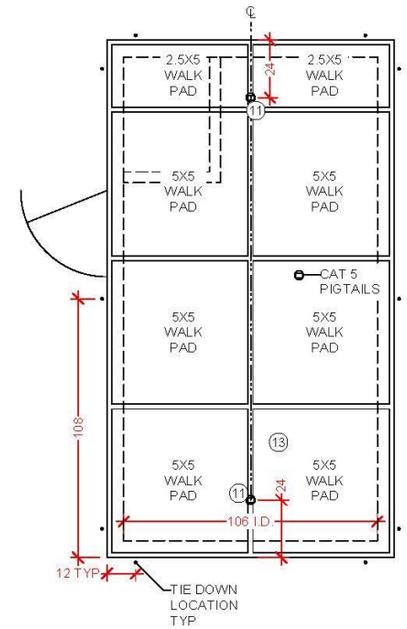

APPROVED:

DATE:

NOTES:
1. SHELTER IS DESIGNED FOR A SLAB TYPE FOUNDATION.
2. EXTERIOR CLADDING TO BE FIBERGLASS AGGREGATE PANEL - COLOR (SUNSET)
3. EXTERIOR TRIM TO BE 24 GA STEEL SIERRA TAN.
4. ROOFING MATERIAL TO BE DUROLAST MEMBRANE COLOR - (WHITE).
5. FOR NUMBERED ITEMS SEE SHT PL1.

7 TBD

STANDARD TIEDOWN DETAIL

NOTE:
TYPICAL PLACEMENT OF TIE DOWN LOCATIONS WOULD BE WITHIN 12" OF EACH CORNER (8 PLACES) AND (1) AT THE CENTER OF EACH LONG WALL. FINAL ANCHOR LOCATIONS AND HARDWARE DETIALS SUBJECT TO SPECIFIC SITE CONDITION REVIEW BY OTHERS.

SEAL

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Grants Pass, OR 97526
541/479-4622
F:541/479-5289
www.shelter1.com

PROJECT INFORMATION

Polk County
C10189

FILENAME
21057 Polk County C1018105 IO.mcd

DRAWN BY:	DATE:
MTP	12/2/2011
CHECKED BY:	DATE:
APPROVED BY:	DATE:

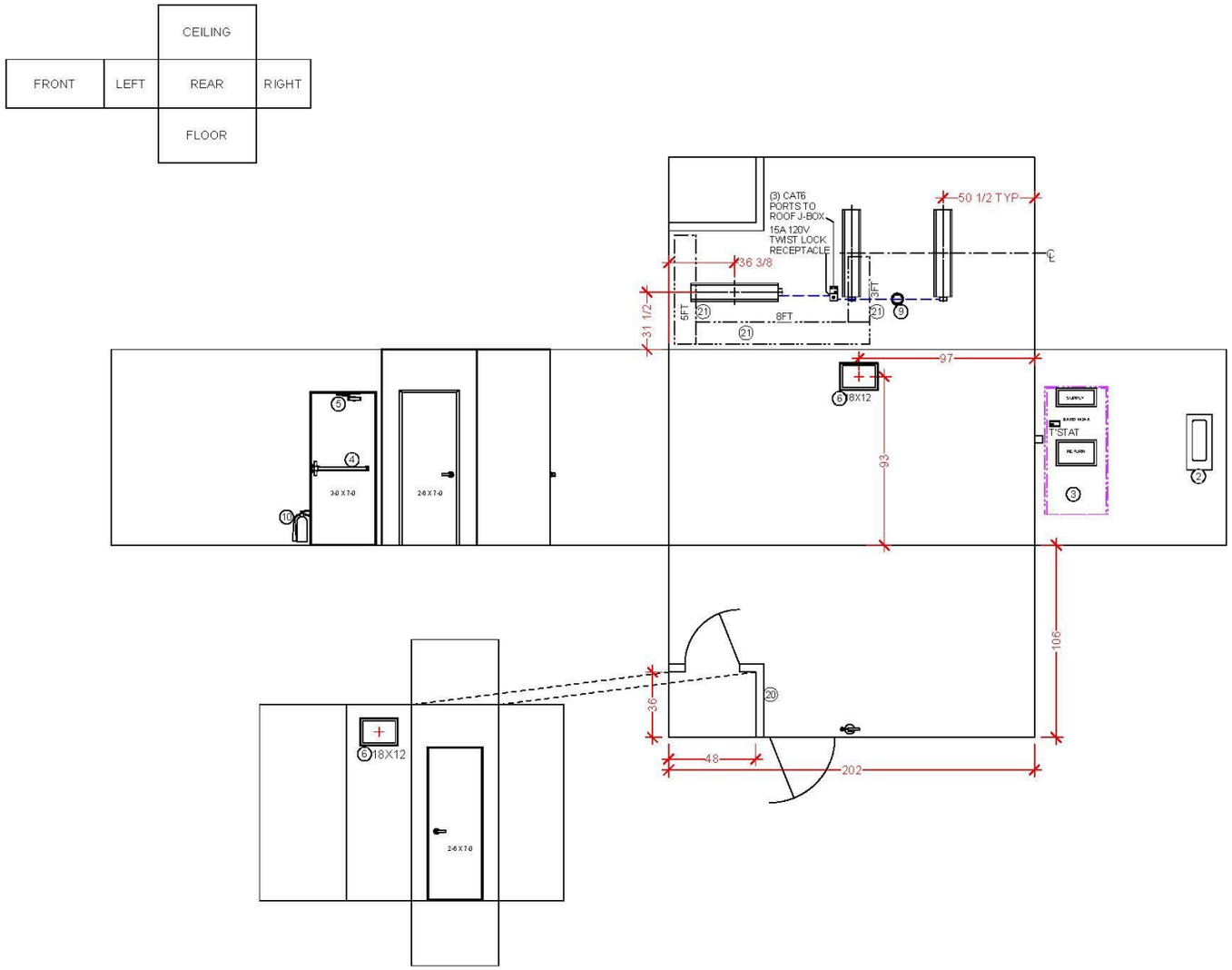
DWG NO: 21057

SCALE: 1:40

TITLE: EXTERIOR ELEVATIONS

SHEET A1

REV.



NOTES:
1. ALL CONDUIT TO BE TYPE EMT, MINIMUM SIZE 1/2" UNLESS NOTED OTHERWISE; UPSIZING PERMITTED.
2. CONDUIT LOCATIONS INDICATED BY DASHED LINES ARE SUGGESTED AND MAY BE MODIFIED.
3. DIRECTIONS ARE ARBITRARY FOR SHOP ORIENTATION ONLY AND DO NOT RELATE TO ACTUAL SITE DIRECTIONS
4. INTERIOR CLADDING TO BE .040 ALUMINUM COLOR - (POLAR WHITE)
5. FLOORING TO BE VINYL TILE INSTALLED OVER 1/4" STEEL PLATE.

APPROVED:

DATE:

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PROJECT INFORMATION

Polk County
C10189

FILENAME	21055 Linde C10229 WA.mcd
DRAWN BY: MTP	DATE: 12/2/2011
CHECKED BY:	DATE:
APPROVED BY:	DATE:
DWG NO:	21057
SCALE:	1:60
TITLE:	INTERIOR ELEVATIONS
SHEET	A2
REV.	

Item #	Quote Line Item	Qty.	Description	Manufacturer	Manuf Part#
1	C10189	1	Model C Shelter, 10'W (OD) X 18'L (OD) X 9'H (ID)	Shelter One	C10189
2	150A1P30SD	1	LOAD CENTER, 150 A, 1PH, 30 POS, NEMA1, SQD	Square D	QO13MQ150 / QOC30US
3	HVAC2460	1	H V A C, 24K BTU, w/ STANDARD t'stat, DISC SW & GFCI RECEPT	BARD	W24A-A05XP4XXJ / TH522D1151
4	PANIC	1	Von Duprin Rim Panic	Von Duprin	22E0 36 SP28 / 230L / 626 1-1/4 25412
5	CLOSER2	1	Automatic Closer w/ holdopen	Norton	8301H
6	BHP60	2	Bulkhead panel Removable plate 18"X12"	Shelter One	SF-0084
7	GNDPDAL	2	Ground Pad Aluminum Nema 2-hole		
8		2	EXT, MH, 100 W, 120 V light	Lithonia	WC100ML M4
9	SMOKEHEAT	1	SMOKE & HEAT DETECTOR, 120 VAC W/ RELAY	GENTEX	9120TF
10	FECO25	1	FIRE EXT, 5Lb CO2		
11	RMR1	2	Receptacle, Duplex Roof Mount, Primary		
12	SPECIAL1	1	Ethernet Entry Point, (3) Interior Ceiling & (1) Wall Jack		
13	WALKPAD2	8	Roof Safety Walk Pad 5'X5'		
14	R178-1	1	Hammond Rack	Hammond Rack	C2F197823BK1 / PMR-9454
15	SPECIAL	1	Install Customer Suplied rack	Shelter One	
16	TL1	2	Receptacle, Single, Twist Lock, Primary		
17	RAIL1018	1	Roof Perimeter railing, 10X18 / OSHA / PE Engineered		
18	GATE	1	Hand Rail Saftey Gate	Fabenco	A71-21PC
19	SA-0052	1	Ladder Std Duty	Shelter One	
20	CLOSET	1	Closet, 3'X4' W/ 30" Door / Pwe Receipts / Light / Sound Atten.	Shelter One	
21	CTRAY	28	Cable Tray (cabofill), 12", Per Foot	CABOFLOFIL	CF 30/300

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PROJECT INFORMATION

Polk County
C10189

FILENAME
21057 Polk County C1018105 IO.mcd

DRAWN BY:	DATE:
MTP	12/2/2011
CHECKED BY:	DATE:
APPROVED BY:	DATE:

DWG NO: 21057

SCALE: NONE

TITLE: PARTS LIST

SHEET PL1

REV.

COPPER WIRE SIZE

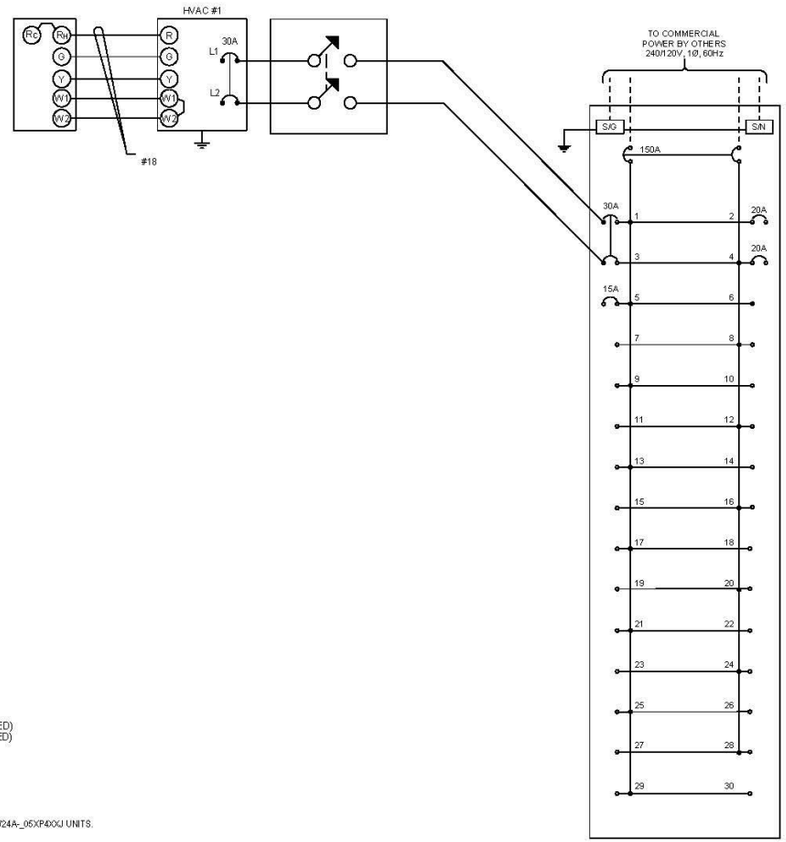
BREAKER SIZE	MINIMUM WIRE SIZE
15A	12 AWG
20A	12 AWG
30A	10 AWG
40A	8 AWG
50A	8 AWG
60A	6 AWG
70A	4 AWG
80A	4 AWG
90A	3 AWG
100A	3 AWG
125A	1 AWG
150A	1/0
200A	3/0

GROUNDING ELECTRODE CONDUCTOR

ENTRY WIRE SIZE	GROUND WIRE SIZE
2 AWG OR SMALLER	8 AWG
1 AWG OR 1/0	6 AWG
2/0 OR 3/0	4 AWG

EQUIPMENT GROUNDING CONDUCTOR

BREAKER SIZE	MINIMUM WIRE SIZE
15A	12 AWG
20A	12 AWG
30A	10 AWG
40A	10 AWG
60A	10 AWG
100A	8 AWG
200A	6 AWG



NOTES:

1. ALL WORK TO CONFORM TO N.E.C. LATEST EDITION
2. ALL WIRE (UNLESS OTHERWISE NOTED) TO BE:
   * #12 AWG (COPPER) STRANDED
   * THHN, THWN OR THW.
   ALL THERMOSTAT WIRING (UNLESS OTHERWISE NOTED) TO BE:
   * #18 AWG (COPPER) SOLID
   ALL ALARM WIRING (UNLESS OTHERWISE NOTED) TO BE:
   * #18 OR #22 AWG (COPPER) SOLID
3. WIRE COLORS ARE AS FOLLOWS:
   PRIMARY POWER:
   * ALL PHASE "A" WIRES ARE TO BE BLACK
   * ALL PHASE "B" WIRES ARE TO BE RED
   * ALL PHASE "C" WIRES ARE TO BE BLUE (IF APPLICABLE)
   * ALL GROUND WIRES ARE TO BE GREEN (UNLESS OTHERWISE NOTED)
   * ALL NEUTRAL WIRES ARE TO BE WHITE (UNLESS OTHERWISE NOTED)
4. ALL CIRCUITS TO HAVE AN EQUIPMENT GROUNDING CONDUCTOR
5. ----- DASHED LINES DENOTE FIELD WORK
6. NEUTRAL AND GROUND ARE TO BE BONDED AS REQUIRED
7. HVAC EQUIPPED WITH INTEGRAL DISCONNECT. HVAC SYSTEM UTILIZING (1) BARD W24A-_05XP400J UNITS.

Load Calculations

Item	Qty	Unit VA	Continuous VA	Non-Cont. VA
Receptacles, duplex	5	180		900
HVAC	1	11520	11520	
Lights	4	90	360	
Total Continuous VA x 1.25			14850	
Total Non-Continuous VA				900
Total VA				15750
Total Amp load @ 240 V, 1Ø				65.63

SEAL

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PROJECT INFORMATION

Polk County
C10189

FILENAME
21057 Polk County C1018105 IO.mcd

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MTP	12/2/2011
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ELECTRICAL SCHEDULE

SHEET: E1

REV.

Appendix B: 40 CFR Part 58 Requiring Annual Network Plans

§ 58.10 Annual monitoring network plan and periodic network assessment.

(a) (1) Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.

(2) Any annual monitoring network plan that proposes SLAMS network modifications including new monitoring sites is subject to the approval of the EPA Regional Administrator, who shall provide opportunity for public comment and shall approve or disapprove the plan and schedule within 120 days. If the State or local agency has already provided a public comment opportunity on its plan and has made no changes subsequent to that comment opportunity, and has submitted the received comments together with the plan, the Regional Administrator is not required to provide a separate opportunity for comment.

(3) The plan for establishing required NCore multipollutant stations shall be submitted to the Administrator not later than July 1, 2009. The plan shall provide for all required stations to be operational by January 1, 2011.

(4) A plan for establishing Pb monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator no later than July 1, 2009 as part of the annual network plan required in paragraph (a)(1) of this section. The plan shall provide for the required source-oriented Pb monitoring sites to be operational by January 1, 2010, and for all required non-source-oriented Pb monitoring sites to be operational by January 1, 2011. Specific site locations for the sites to be operational by January 1, 2011 are not required as part of the July 1, 2009 annual network plan, but shall be included in the annual network plan due to be submitted to the EPA Regional Administrator on July 1, 2010.

(5) A plan for establishing NO2 monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the Administrator by July 1, 2012. The plan shall provide for all required monitoring stations to be operational by January 1, 2013.

(b) The annual monitoring network plan must contain the following information for each existing and proposed site:

(1) The AQS site identification number.

(2) The location, including street address and geographical coordinates.

(3) The sampling and analysis method(s) for each measured parameter.

(4) The operating schedules for each monitor.

(5) Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.

(6) The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part.

(7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM2.5 NAAQS as described in § 58.30.

(8) The MSA, CBSA, CSA or other area represented by the monitor.

(9) The designation of any Pb monitors as either source-oriented or nonsource- oriented according to Appendix D to 40 CFR part 58.

(10) Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.

(11) Any source-oriented or nonsource- oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb-PM10 monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.

(12) The identification of required NO2 monitors as either near-road or area-wide sites in accordance with appendix D, section 4.3 of this part.

(c) The annual monitoring network plan must document how States and local agencies provide for the review of changes to a PM2.5 monitoring network that impact the location of a violating PM2.5 monitor or the creation/change to a community monitoring zone, including a description of the proposed use of spatial averaging for purposes of making comparisons to the annual PM2.5 NAAQS as set forth in appendix N to part 50 of this

chapter. The affected State or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

(d) The State, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies. For PM2.5, the assessment also must identify needed changes to population-oriented sites. The State, or where applicable local, agency must submit a copy of this 5- year assessment, along with a revised annual network plan, to the Regional Administrator. The first assessment is due July 1, 2010.

(e) All proposed additions and discontinuations of SLAMS monitors in annual monitoring network plans and periodic network assessments are subject to approval according to § 58.14. [71 FR 61298, Oct. 17, 2006, as amended at 72 FR 32210, June 12, 2007; 73 FR 67059, Nov. 12, 2008; 73 FR 77517, Dec. 19, 2008; 75 FR 6534, Feb. 9, 2010]

EFFECTIVE DATE NOTE: At 75 FR 35601, June 22, 2010, § 58.10 was amended by adding paragraph (a)(6), effective Aug. 23, 2010. For the convenience of the user, the added text is set forth as follows:

§ 58.10 Annual monitoring network plan and periodic network assessment.

(a) * * *

(6) A plan for establishing SO2 monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator by July 1, 2011 as part of the annual network plan required in paragraph (a) (1). The plan shall provide for all required SO2 monitoring sites to be operational by January 1, 2013.* * * * *

Appendix C: SLAMS Network Modification

40 CFR Part 58, § 58.14 System modification.

(a) The State, or where appropriate local, agency shall develop and implement a plan and schedule to modify the ambient air quality monitoring network that complies with the findings of the network assessments required every 5 years by §58.10(e). The State or local agency shall consult with the EPA Regional Administrator during the development of the schedule to modify the monitoring program, and shall make the plan and schedule available to the public for 30 days prior to submission to the EPA Regional Administrator. The final plan and schedule with respect to the SLAMS network are subject to the approval of the EPA Regional Administrator. Plans containing modifications to NCore Stations or PAMS Stations shall be submitted to the Administrator. The Regional Administrator shall provide opportunity for public comment and shall approve or disapprove submitted plans and schedules within 120 days.

(b) Nothing in this section shall preclude the State, or where appropriate local, agency from making modifications to the SLAMS network for reasons other than those resulting from the periodic network assessments. These modifications must be reviewed and approved by the Regional Administrator. Each monitoring network may make or be required to make changes between the 5-year assessment periods, including for example, site relocations or the addition of PAMS networks in bumped-up ozone nonattainment areas. These modifications must address changes invoked by a new census and changes due to changing air quality levels. The State, or where appropriate local, agency shall provide written communication describing the network changes to the Regional Administrator for review and approval as these changes are identified.

(c) State, or where appropriate, local agency requests for SLAMS monitor station discontinuation, subject to the review of the Regional Administrator, will be approved if any of the following criteria are met and if the requirements of appendix D to this part, if any, continue to be met. Other requests for discontinuation may also be approved on a case-by-case basis if discontinuance does not compromise data collection needed for implementation of a NAAQS and if the requirements of appendix D to this part, if any, continue to be met.

(1) Any $PM_{2.5}$, O_3, CO, PM_{10}, SO_2, Pb, or NO_2SLAMS monitor which has shown attainment during the previous five years, that has a probability of less than 10 percent of exceeding 80 percent of the applicable NAAQS during the next three years based on the levels, trends, and variability observed in the past, and which is not specifically required by an attainment plan or maintenance plan. In a nonattainment or maintenance area, if the most recent attainment or maintenance plan adopted by the State and approved by EPA contains a contingency measure to be triggered by an air quality concentration and the monitor to be discontinued is the only SLAMS monitor operating in the nonattainment or maintenance area, the monitor may not be discontinued.

(2) Any SLAMS monitor for CO, PM_{10}, SO_2, or NO_2which has consistently measured lower concentrations than another monitor for the same pollutant in the same county (or portion of a county within a distinct attainment area, nonattainment area, or maintenance area, as applicable) during the previous five years, and which is not specifically required by an attainment plan or maintenance plan, if control measures scheduled to be implemented or discontinued during the next five years would apply to the areas around both monitors and have similar effects on measured concentrations, such that the retained monitor would remain the higher reading of the two monitors being compared.

(3) For any pollutant, any SLAMS monitor in a county (or portion of a county within a distinct attainment, nonattainment, or maintenance area, as applicable) provided the monitor has not measured violations of the applicable NAAQS in the previous five years, and the approved SIP provides for a specific, reproducible approach to representing the air quality of the affected county in the absence of actual monitoring data.

(4) A $PM_{2.5}$SLAMS monitor which EPA has determined cannot be compared to the relevant NAAQS because of the siting of the monitor, in accordance with §58.30.

(5) A SLAMS monitor that is designed to measure concentrations upwind of an urban area for purposes of characterizing transport into the area and that has not recorded violations of the relevant NAAQS in the previous five years, if discontinuation of the monitor is tied to start-up of another station also characterizing transport.

(6) A SLAMS monitor not eligible for removal under any of the criteria in paragraphs (c)(1) through (c)(5) of this section may be moved to a nearby location with the same scale of representation if logistical problems beyond the State's control make it impossible to continue operation at its current site

Appendix D: Iowa Ambient Air Monitoring Sites for NO_2

City	Site	Address	County	MSA	Latitude	Longitude	AQS Site ID	Responsible Agency
Davenport	Jefferson School	10th St. & Vine St.	Scott	DMR	41.53001	-90.58761	191630015	DNR
Des Moines	Health Dept.	1907 Carpenter	Polk	DSM	41.60318	-93.64330	191530030	Polk Local Prog.
-	Lake Sugema	24430 Lacey Trl, Keosauqua	Van Buren	-	40.69508	-92.00632	191770006	DNR

Site Table Definitions

City – the city closest to the monitor location.
Site – the name of the monitoring site.
Address – an intersection or street address close to the monitoring site.
County – the county where the monitoring site resides.
MSA – Metropolitan Statistical Area. Iowa's Metropolitan Statistical Areas (MSA's) according to July, 2009 U.S. Census Bureau estimates:

U.S. Census Geographic area	Abbreviation
Omaha-Council Bluffs, NE-IA	OMC
Des Moines-West Des Moines, IA	DSM
Davenport-Moline-Rock Island, IA-IL	DMR
Cedar Rapids, IA	CDR
Waterloo-Cedar Falls, IA	WTL
Sioux City, IA-NE-SD	SXC
Iowa City, IA	IAC
Dubuque, IA	-
Ames, IA	-

From: http://www.census.gov/popest/data/metro/totals/2009/index.html Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2000 to July 1, 2009 (CBSA-EST2009-01). Source: Population Division, U.S. Census Bureau, Release Date: March 2010

Maximum ozone concentrations are typically measured 10-30 miles downwind of an MSA. The site intended to record the maximum ozone concentration resulting from a given MSA may be located outside the MSA boundaries. Sites intended to measure background levels of pollutants for an MSA may also be located upwind and outside of that particular MSA.

Latitude – the latitude of a monitoring site**,** given in decimal degrees using the WGS (World Geodetic System) 84 datum.
Longitude – the longitude of a monitoring site, given in decimal degrees using the WGS (World Geodetic System) 84 datum.
AQS Site ID – The identifier of a monitoring site used in the US EPA Air Quality System (AQS) database. It has the form XX-XXX-XXXX where the first two digits specify the state (19 for Iowa), the next set of three digits the county, and the last four digits the site.
Responsible Agency – The agency responsible for performing ambient air monitoring at a monitoring site. The Polk County Local Program operates sites in or near Polk County. The Linn County Local Program operates sites in or near Linn County. The Department of Natural Resources (DNR) contracts with the State Hygienic Laboratory at the University of Iowa (SHL) to operate monitoring sites not operated by the Polk or Linn County Local Programs.

Appendix E: Iowa Ambient Air NO_2 Monitors

Site Name	Pollutants Measured	Monitor Type	Sampling Method	Operating Schedule	Primary Monitoring Objective	Spatial Scale	NAAQS Comparable?
Davenport, Jefferson Sch.	NO2	SPM	Chemiluminescence	Continuous	Population Exposure	Neighborhood	Yes
Des Moines, Health Dept.	NO2	SPM	Chemiluminescence	Continuous	Population Exposure	Neighborhood	Yes
Keosauqua, Lake Sugema	NO2	SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood	Yes

Monitor Table Definitions:

Site Name – a combination of the city and site name from the previous table
Pollutants Measured – indicates the pollutant, or set of pollutants, measured by each monitor

- NO_2 – nitrogen dioxide

Monitor Type – This column indicates how the monitor is classified in the AQS database.

- IMPROVE – a speciation monitor developed by the IMPROVE program to identify and quantify the chemical components of $PM_{2.5}$.
- Proposed NCore – monitors operated at a site which has been proposed for inclusion in EPA's national network of long term multi-pollutant sites (NCore).
- SLAMS – State and Local Air Monitoring Stations. SLAMS make up the ambient air quality monitoring sites that are primarily needed for NAAQS comparisons, but may serve other data purposes. SLAMS exclude special purpose monitor (SPM) stations and include NCore, and all other State or locally operated stations that have not been designated as SPM stations.
- SPM – means a monitor that is designated as a special purpose monitor in the monitoring network plan and in EPA's AQS database. SPM monitors do not count when showing compliance with minimum SLAMS requirements for monitor numbers and siting.
- Supplemental Speciation – a speciation site with monitors that are operated according to CSN protocols, but not contained in the STN Network.

Sampling Method – Indicates how the sample is collected. This column also shows how the sample is analyzed, if it is analyzed on site at the time of collection.

- Chemiluminescence – When a nitric oxide (NO) molecule collides with an ozone molecule, a nitrogen dioxide (NO_2) molecule and an oxygen (O_2) molecule result. The NO_2 molecule is in an excited state, and subsequently emits infrared light that can be measured by a photomultiplier tube. This property is the basis of the analytical method used to quantify NO. To measure NO_2, the NO_2 must first be converted to NO using a heated molybdenum converter. To measure Nitrate, the collected particulate is heated rapidly, and the vaporization/decomposition process converts the particulate nitrate contained in the collected sample to nitrogen oxides, which are quantified by the chemiluminescence method.

Operating Schedule – Continuous monitors run constantly and measure hourly average concentrations in real time. Manual samplers, such as PM filter samplers or toxics samplers, collect a single 24 hour sample from midnight to midnight on a particular day, which is quantified later in an analytical laboratory.

Monitoring Objective – the primary reason a monitor is operated at a particular location.

- General Background – The objective is to establish the background levels of a pollutant.
- Highest Conc. – The objective is to measure at a site where the concentration of the pollutant is highest.
- Max. Ozone Conc. – The objective is to record the maximum ozone concentration. Because ozone is a secondary pollutant, ozone concentrations are typically highest 10-30 miles downwind of an urban area.
- Population Exposure – The objective is to monitor the exposure of individuals in the area represented by the monitor.
- Regional Transport – The objective is to assess the extent to which pollutants are transported between two regions that are separated by tens to hundreds of kilometers.
- Source Oriented – The objective is to determine the impact of a nearby source.
- Transport – The objective is to assess the extent to which pollutants are transported from one location to another.
- Upwind Background – The objective is to establish the background levels of a pollutant, typically upwind of a source or urban area.

Spatial Scale – The scale of representativeness is described in terms of the physical dimensions of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar. Monitors are classified

according to the largest applicable scale below:

- Microscale - defines the concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters.
- Middle scale - defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometer.
- Neighborhood scale - defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers range. The neighborhood and urban scales listed below have the potential to overlap in applications that concern secondarily formed or homogeneously distributed air pollutants.
- Urban scale - defines concentrations within an area of city-like dimensions, on the order of 4 to 50 kilometers. Within a city, the geographic placement of sources may result in there being no single site that can be said to represent air quality on an urban scale.
- Regional scale – usually defines a rural area of reasonably homogeneous geography without large sources, and extends from tens to hundreds of kilometers.

NAAQS Comparable? - This column shows whether the data from the monitor can be compared to the National Ambient Air Quality Standards (NAAQS). Entries under this column are Yes, No, and 24 Hour Only. For a monitor's data to be eligible for comparison against the NAAQS, the type of monitor used must be defined as a federal reference method or federal equivalent method by EPA.

Appendix F: Federal Requirements for NO_2 Sites

Appendix D to Part 58—Network Design Criteria for Ambient Air Quality Monitoring
* * * * *

4.3 Nitrogen Dioxide (NO2) Design Criteria

4.3.1 General Requirements

(a) State and, where appropriate, local agencies must operate a minimum number of required NO2 monitoring sites as described below.

4.3.2 Requirement for Near-road NO2 Monitors

(a) Within the NO2 network, there must be one microscale near-road NO2 monitoring station in each CBSA with a population of 500,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts as specified in paragraph 4.3.2(a)(1) of this appendix. An additional near-road NO2 monitoring station is required for any CBSA with a population of 2,500,000 persons or more, or in any CBSA with a population of 500,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts to monitor a second location of expected maximum hourly concentrations. CBSA populations shall be based on the latest available census figures.

(1) The near-road NO2 monitoring stations shall be selected by ranking all road segments within a CBSA by AADT and then identifying a location or locations adjacent to those highest ranked road segments, considering fleet mix, roadway design, congestion patterns, terrain, and meteorology, where maximum hourly NO2 concentrations are expected to occur and siting criteria can be met in accordance with appendix E of this part. Where a State or local air monitoring agency identifies multiple acceptable candidate sites where maximum hourly NO2 concentrations are expected to occur, the monitoring agency shall consider the potential for population exposure in the criteria utilized to select the final site location. Where one CBSA is required to have two near-road NO2 monitoring stations, the sites shall be differentiated from each other by one or more of the following factors: fleet mix; congestion patterns; terrain; geographic area within the CBSA; or different route, interstate, or freeway designation.

(b) Measurements at required near-road NO2 monitor sites utilizing chemiluminescence FRMs must include at a minimum: NO, NO2, and NOX.

4.3.3 Requirement for Area-wide NO2 Monitoring

(a) Within the NO2 network, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO2 concentrations representing the neighborhood or larger spatial scales. PAMS sites collecting NO2 data that are situated in an area of expected high NO2 concentrations at the neighborhood or larger spatial scale may be used to satisfy this minimum monitoring requirement when the NO2 monitor is operated year round. Emission inventories and meteorological analysis should be used to identify the appropriate locations within a CBSA for locating required area-wide NO2 monitoring stations. CBSA populations shall be based on the latest available census figures.

4.3.4 Regional Administrator Required Monitoring

(a) The Regional Administrators, in collaboration with States, must require a minimum of forty additional NO2 monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations. The Regional Administrators, working with States, may also consider additional factors described in paragraph (b) below to require monitors beyond the minimum network requirement.

(b) The Regional Administrators may require monitors to be sited inside or outside of CBSAs in which:

(i) The required near-road monitors do not represent all locations of expected maximum hourly NO2 concentrations in an area and NO2 concentrations may be approaching or exceeding the NAAQS in that area;

(ii) Areas that are not required to have a monitor in accordance with the monitoring requirements and NO2 concentrations may be approaching or exceeding the NAAQS; or

(iii) The minimum monitoring requirements for area-wide monitors are not sufficient to meet monitoring objectives.

(c) The Regional Administrator and the responsible State or local air monitoring agency should work together

to design and/ or maintain the most appropriate NO2 network to address the data needs for an area, and include all monitors under this provision in the annual monitoring network plan.

4.3.5 NO2 Monitoring Spatial Scales

(a) The most important spatial scale for near-road NO2 monitoring stations to effectively characterize the maximum expected hourly NO2 concentration due to mobile source emissions on major roadways is the microscale. The most important spatial scales for other monitoring stations characterizing maximum expected hourly NO2 concentrations are the microscale and middle scale. The most important spatial scale for area-wide monitoring of high NO2 concentrations is the neighborhood scale.

(1) *Microscale*—This scale represents areas in close proximity to major roadways or point and area sources. Emissions from roadways result in high ground level NO2 concentrations at the microscale, where concentration gradients generally exhibit a marked decrease with increasing downwind distance from major roads. As noted in appendix E of this part, near-road NO2 monitoring stations are required to be within 50 meters of target road segments in order to measure expected peak concentrations. Emissions from stationary point and area sources, and non-road sources may, under certain plume conditions, result in high ground level concentrations at the microscale. The microscale typically represents an area impacted by the plume with dimensions extending up to approximately 100 meters.

(2) *Middle scale*—This scale generally represents air quality levels in areas up to several city blocks in size with dimensions on the order of approximately 100 meters to 500 meters. The middle scale may include locations of expected maximum hourly concentrations due to proximity to major NO2 point, area, and/or non-road sources.

(3) *Neighborhood scale*—The neighborhood scale represents air quality conditions throughout some relatively uniform land use areas with dimensions in the 0.5 to 4.0 kilometer range. Emissions from stationary point and area sources may, under certain plume conditions, result in high NO2 concentrations at the neighborhood scale. Where a neighborhood site is located away from immediate NO2 sources, the site may be useful in representing typical air quality values for a larger residential area, and therefore suitable for population exposure and trends analyses.

(4) *Urban scale*—Measurements in this scale would be used to estimate concentrations over large portions of an urban area with dimensions from 4 to 50 kilometers. Such measurements would be useful for assessing trends in area-wide air quality, and hence, the effectiveness of large scale air pollution control strategies. Urban scale sites may also support other monitoring objectives of the NO2 monitoring network identified in paragraph 4.3.4 above.

4.3.6 NOy Monitoring

(a) NO/NOy measurements are included within the NCore multi-pollutant site requirements and the PAMS program. These NO/NOy measurements will produce conservative estimates for NO2 that can be used to ensure tracking continued compliance with the NO2 NAAQS. NO/NOy monitors are used at these sites because it is important to collect data on total reactive nitrogen species for understanding O3 photochemistry.

* * * * *

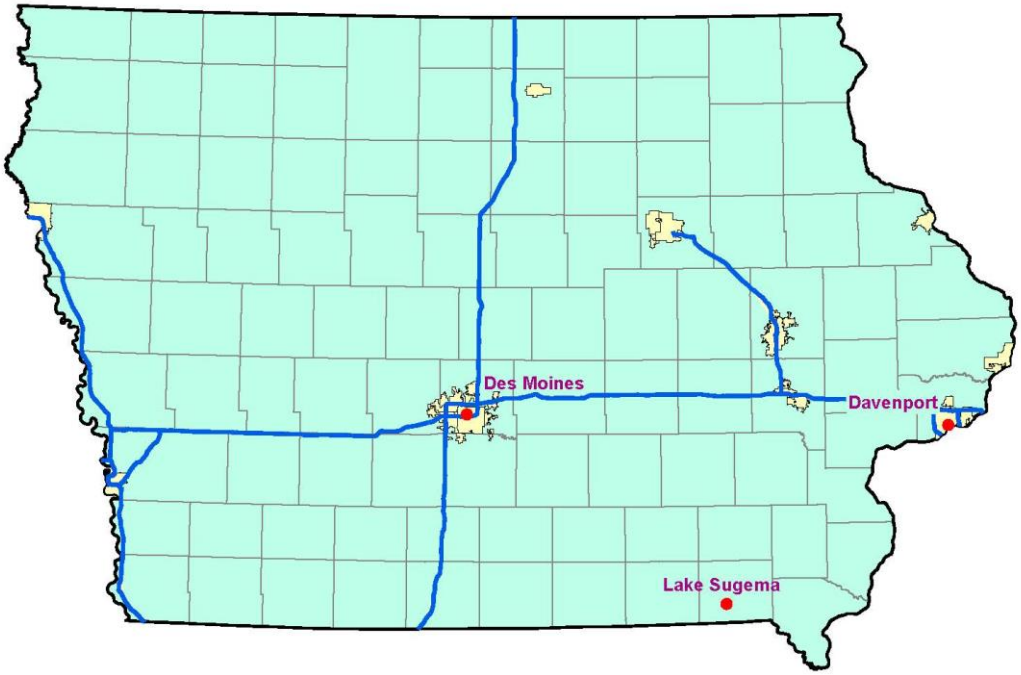
Appendix G: Census Bureau Estimates for Iowa MSA's

US Census Geographic Area	US Census Population Estimate, 2010
Omaha-Council Bluffs, NE-IA	865,350
Des Moines-West Des Moines, IA	569,633
Davenport-Moline-Rock Island, IA-IL	379,690
Cedar Rapids, IA	257,940
Waterloo-Cedar Falls, IA	167,819
Iowa City, IA	152,586
Sioux City, IA-NE	143,577
Dubuque, IA	93,653
Ames, IA	89,542

From:
http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_NSRD_GCTPL2.US24PR&prodType=table

Appendix H: Iowa Ambient Air Monitoring Network Maps for NO_2

The following maps show the locations for the criteria pollutant monitors in the state of Iowa, which are current as of January 1, 2012.



NO_2 Monitoring Sites

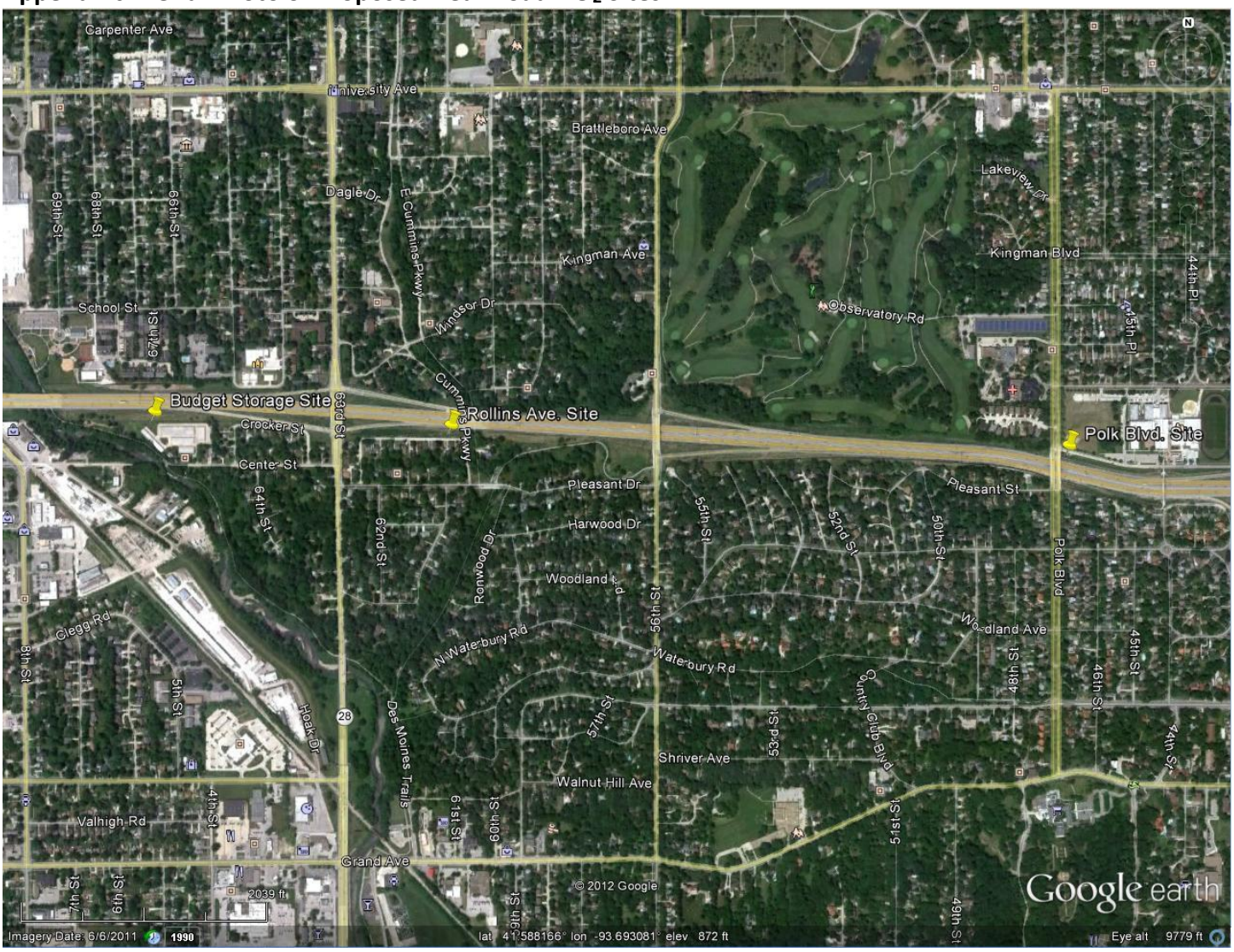
Appendix I: Network Change Tables

The DNR proposes to add one near road NO_2 monitoring site to the Des Moines MSA, as detailed below. A final selection between the three candidates is contingent upon getting the appropriate building permits and site license agreement from the property owner.

City	Site	Address	County	MSA	Latitude	Longitude	AQS Site ID	Responsible Agency
Windsor Heights	Budget Storage	6525 Center St	Polk	DSM	41.59285	-93.70947	191530053	Polk Local Prog.
Des Moines	Rollins Ave	6011 Rollins Ave	Polk	DSM	41.59257	-93.70014	191530053	Polk Local Prog.
Des Moines	Polk Blvd	Polk Blvd and Center St	Polk	DSM	41.59203	-93.68129	191530053	Polk Local Prog.

See Appendix D for definitions of the elements in this table.

Site Name	Pollutant	Monitor Type	Sampling Method	Operating Schedule	Primary Monitoring Objective	Spatial Scale	NAAQS Comparable?
Windsor Heights, Budget Storage	NO2	SLAMS	Chemiluminescence	Continuous	Source Oriented	Microscale	Yes
Des Moines, Rollins Ave	NO2	SLAMS	Chemiluminescence	Continuous	Source Oriented	Microscale	Yes
Des Moines, Polk Blvd	NO2	SLAMS	Chemiluminescence	Continuous	Source Oriented	Microscale	Yes

See Appendix E for definitions of the elements in this table.

Appendix J: Aerial Photo of Proposed Near Road NO_2 Sites