

TRACT 1 OF SE1/4NE1/4 LESS  
CONNECTOR SUBDIVISION LESS  
LOT H1 & LESS TLC SUBDIVISION  
SECTION 27, T1N, R7E  
F & D SHULTZ LIMITED PARTNERSHIP

LOT 1 (ALSO IN SECTION 27)  
OF CONNECTOR SUBDIVISION  
SECTION 26, T1N, R7E  
F & D SHULTZ LIMITED PARTNERSHIP

2331 CATRON BLVD  
LOT 2 OF TLC SUBDIVISION  
SECTION 27, T1N, R7E  
BLACK HILLS CORPORATION

7001 S. HIGHWAY 16  
LOT 1 (ALSO IN SECTION 26)  
OF C2B ADDITION  
SECTION 27, T1N, R7E  
BLACK HILLS CORPORATION

7051 S. HIGHWAY 16  
JUDICIAL LOT A OF LOT 2  
OF GODFREY ADDITION  
SECTION 27, T1N, R7E  
DANIEL C. GODFREY

7045 S. HIGHWAY 16  
LOT 1  
OF STAMPER SUBDIVISION  
SECTION 26, T1N, R7E  
RODOLPH INVESTMENTS LLC

NOT INCLUDED  
IN COVENANT  
AGREEMENT

NOT INCLUDED  
IN STREET LIGHT  
AGREEMENT

STREET LIGHT  
(TYP)

COVENANT AGREEMENT APPLIES  
TO ENERGY PARK DRIVE ONLY

STREET LIGHT  
POWER

**NOTE:**  
1. THIS EXHIBIT SHOWS STREET LIGHTING AND SIGNALIZATION FOR  
CATRON BOULEVARD, LES HOLLERS WAY AND ENERGY PARK DRIVE.

ARCHITECT:  
**ARC** HITECTURE  
INTERNATIONAL  
8808 SHERIDAN LAKE ROAD  
RAPID CITY, SOUTH DAKOTA 57702 TEL: 605-341-2066 FAX: 341-3651  
www.ARCatIa.com  
BRINGING ARCHITECTURE TO YOUR WORLD

CIVIL ENGINEER:  
**FEC** Ferber  
Engineering  
Company, Inc.  
Civil Engineering • Water Resources • Transportation • Land Surveying • GIS  
729 East Watertown St., Rapid City, SD 57701 • Phone: (605) 343-3311

LANDSCAPE ARCHITECT:  
**WALLGRASS**  
Landscape Architecture for the American West  
P. 605.317.1894 2318 LITTLE EASY ROAD, CUSTER, SD 57730

MECHANICAL/ELECTRICAL ENGINEER:  
Consulting Engineers  
7780 W. 119th St.  
Overland Park, Kansas 66213  
phone 913.322.1400  
fax 913.825.6697  
miec.com  
**Malone Finkle Eckhardt & Collins, Inc.**

STRUCTURAL ENGINEER:  
3202 West Main  
Suite C  
Rapid City, South Dakota 57702  
605.343.9606  
**Albertson Engineering Inc.**

**SITE INFRASTRUCTURE**  
DATE: 1/29/2016  
PROJECT MANAGER: DMM  
PROJECT NUMBER: 14-145

NOT FOR  
CONSTRUCTION

**BH**  
Black Hills Corporation  
Improving life with energy  
**NEW HEADQUARTERS**  
Rapid City, South Dakota

STREET LIGHTING

**EXHIBIT B**

P:\14-145\AutoCAD\PlanSheets\14-145PERMITS\14-145LIGHTINGOVERVIEW.dwg 01-29-16

(average maintained to minimum maintained foot-candles) of 3:1 and less using the following parameters:

Setback:	4 Ft.
Lamp Loss Factor (LLF):	0.7
Width of Lighted Area:	61 Ft.
Spacing:	140 Ft.
Configuration:	One-Sided
Mounting Height:	50 Ft.
Lamp:	400W HPS

The following luminaires meet the requirements for this design:

- a.) Hubbell: Test No. HP03019.IES High Pressure Sodium, Medium, semi-cutoff, Type 3
- b.) Cooper Lighting: Test No. OVY40S3E.IES High Pressure Sodium, Medium, semi-cutoff, Type 3

The accepted design for the roadway luminaires for L10-L17 shall provide 0.6 and greater average maintained foot-candles and a uniformity ratio (average maintained to minimum maintained foot-candles) of 6:1 and less using the following parameters:

Setback:	4 Ft.
Lamp Loss Factor (LLF):	0.95
Width of Lighted Area:	48 Ft.
Spacing:	244 Ft.
Configuration:	One-Sided
Mounting Height:	30 Ft.
Lamp:	138W LED

The following luminaires meet the requirements for this design:

- a.) Lithonia Lighting: DSX1LED-40C-1000-40K-T2M-240-SPA-PER-DDBXD, with pole SSS-30-5C-DM19-VD-DDB, Type 2 Medium; or equal by Cooper Lighting

Three copies of the isofootcandle charts and utilization curves shall be furnished to the Engineer for approval. The Contractor must get approval from the Engineer prior to installation of the luminaires.

The approved isofootcandle data for each case shall be used to determine the correct socket position at each site. Each luminaire shall be installed with its lamp socket in the proper position and in a level attitude.

#### TRAFFIC SIGNAL METER SOCKETS

The meter sockets provided for traffic signals by the Contractor shall be a 200 amp, positive by-pass.

#### SIGNAL BACKPLATES

Signal backplates shall extend not less than 5 inches from the edge of the signal head at the top, bottom, and sides. The bottom of the backplate on vehicle signal faces mounted directly above pedestrian signal indications shall be sized to permit the separate adjustment of the vehicle and pedestrian signal indication and may be less than 4 inches. All backplates shall have a dull black finish.

Signal backplates shall be polycarbonate. All signal mounting pipes to be natural aluminum.

#### TRAFFIC SIGNAL CONTROLLER

The controller shall be a solid state, digital, NEMA TS2 Type 1 compatible with existing signal control equipment and software in the City of Rapid City.

The controller shall be two through twelve phase controller.

Vehicle detectors E1-E3 and S1-S3 shall operate in the presence (non-locking) mode and shall have call delay timing capability. The call delay feature shall be inhibited by the controller. Set these detectors to 3 seconds delay.

Vehicle detectors E4-E9 and W1-W2 shall operate in the passage (locking) mode.

The controller cabinet doors shall be hinged on the right side.

Digital timing shall be provided with a battery backup.

The controller shall alternate the red and yellow indication in malfunction flash.

The interface panels shall be capable of inserting up to sixteen load switches.

The controller cabinet shall be pad mounted.

The controller shall be capable of programming by manual entry via the front keyboard, data downloading from a portable PC computer via null-modem cable, and data downloading from one controller to another using a Ethernet port on each controller.

The controller shall be capable of operating coordinated by time-based, hardwire, and telemetry.

The controller cabinet shall be capable of placing vehicle and pedestrian calls into the controller. Placed calls shall provide for eight vehicle phases and four pedestrian phases. The placed calls for vehicle phases shall be capable of extending the associated vehicle phase by continuous or intermittent contact.

The controller shall have a copy function to copy all timing data from one phase to another. The controller shall also permit copying all coordination pattern data from one pattern to another.

A Malfunction Management Unit shall be installed in each cabinet and shall conform to the requirements of NEMA Standard TS-2 Section 4. The provided MMU shall have visual displays for programming and operational procedures.

A sufficient quantity of BUS Interface Units shall be installed in the cabinet to provide communication between detectors, load switches, controller unit, etc. Each BUS Interface Unit shall conform to NEMA Standard TS-2, Section 8.

The controller shall have internal signal dimming.

The controller Solid State Flasher shall have dimming capability.

The Contractor is responsible for programming controllers with the signal timings provided in these plans.

All costs for constructing the concrete pad and footing, materials, labor, and furnishing and installing the controller cabinet shall be incidental to the contract unit price per each for "Traffic Signal Controller".

#### CONTROLLER PROGRAMMING

The Contractor shall furnish the Engineer with a copy of the data programmed into the Controller prior to the full operation of the Controller for approval. The address is as follows:

Ferber Engineering Company, Inc.  
729 East Watertown St.  
Rapid City, SD 57701

#### RISER UNIT

The Contractor shall supply 18" riser unit for the new controller cabinet for housing the battery backup.

All work involved in supplying and installing the riser unit shall be incidental to the contract unit price per each for "Signal Head Battery Backup and Flash System".

#### FIBER OPTIC CABLE INTERCONNECTION

The contractor shall install managed Gigabit Ethernet communication including switches, between traffic signal controllers at Catron Blvd. & Les Hollers Way and US16 & Catron Blvd. intersections using LC connectors.

An existing master controller is located at the intersection of US16 & Catron Blvd.

All costs for establishing managed Gigabit Ethernet communication between the new and existing traffic signal controllers shall be incidental to the contract unit price per each for "Traffic Signal Controller".

#### FIBER OPTIC CABLE

The fiber optic cable shall be a 24 strand sin glemode fiber optic cable with each buffer containing six fibers. The buffer tubes shall be color coded according to EIA/TIA specifications.

Fiber optic cable provided on this project shall meet the latest applicable EIA/TIA Specifications for multimode and REA PE- 90 Specifications for single mode. All fiber optic cable shall be rated for outdoor use.

Singlemode optical cable shall have the following optical and physical characteristics:

1. Cladding diameter of 125µm +/- 2µm.
2. Zero dispersion slope shall be 0.092 ps/ (nm<sup>2</sup>•km) or less.
3. Zero dispersion wavelength, 1300 to 1322 nm.
4. Cutoff wavelength, less than 1250 nm.
5. Maximum attenuation at 1310 nm shall be 0.4 dB per Kilometer.
6. The outside diameter shall be less than 22.1 nm.
7. One factory fusion splice per kilometer per fiber shall be allowed.

The fiber optic cable shall have a seven- core configuration, dielectric central strength member, and thermoplastic tubes. The minimum bending radii of the

ARCHITECT:  
**ARC** HITECTURE  
INTERNATIONAL  
5808 SHERIDAN LAKE ROAD  
RAPID CITY, SOUTH DAKOTA 57702 TEL 605-341-2066 www.ARCatK.com  
FAX 341-3651  
BRINGING ARCHITECTURE TO YOUR WORLD

CIVIL ENGINEER:  
**Ferfer**  
Engineering  
Company, Inc.  
Civil Engineering • Water Resources • Transportation • Land Surveying • GIS  
729 East Watertown St., Rapid City, SD 57701 • Phone: (605) 343-3311

LANDSCAPE ARCHITECT:  
**LLGRASS**  
Landscape Architecture for the American West  
P.O. Box 511999 • 2518 WEST 51ST ROAD • COOR, SD 57702

ELECTRICAL ENGINEER:  
**WPE #BR15036**  
**WEST PLAINS**  
ENGINEERING, INC.  
1750 BAND ROAD • RAPID CITY SD, 57702  
PHONE: (605) 348-7455 • FAX: (605) 348-9445  
WWW.WESTPLAINSENGINEERING.COM  
RAPID CITY, SD • SIOUX FALLS, SD • COSHO, NY • COAR RAPID, IA • BERNARD, MO

STRUCTURAL ENGINEER:  
**Albertson Engineering Inc.**  
3202 West Main  
Suite C  
Rapid City, South Dakota 57702  
605.343.9606

### FINAL

DATE: 12/10/2015  
PROJECT MANAGER: DMM  
PROJECT NUMBER: 14-145



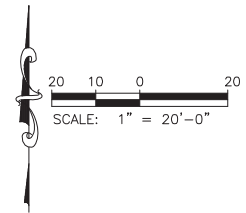
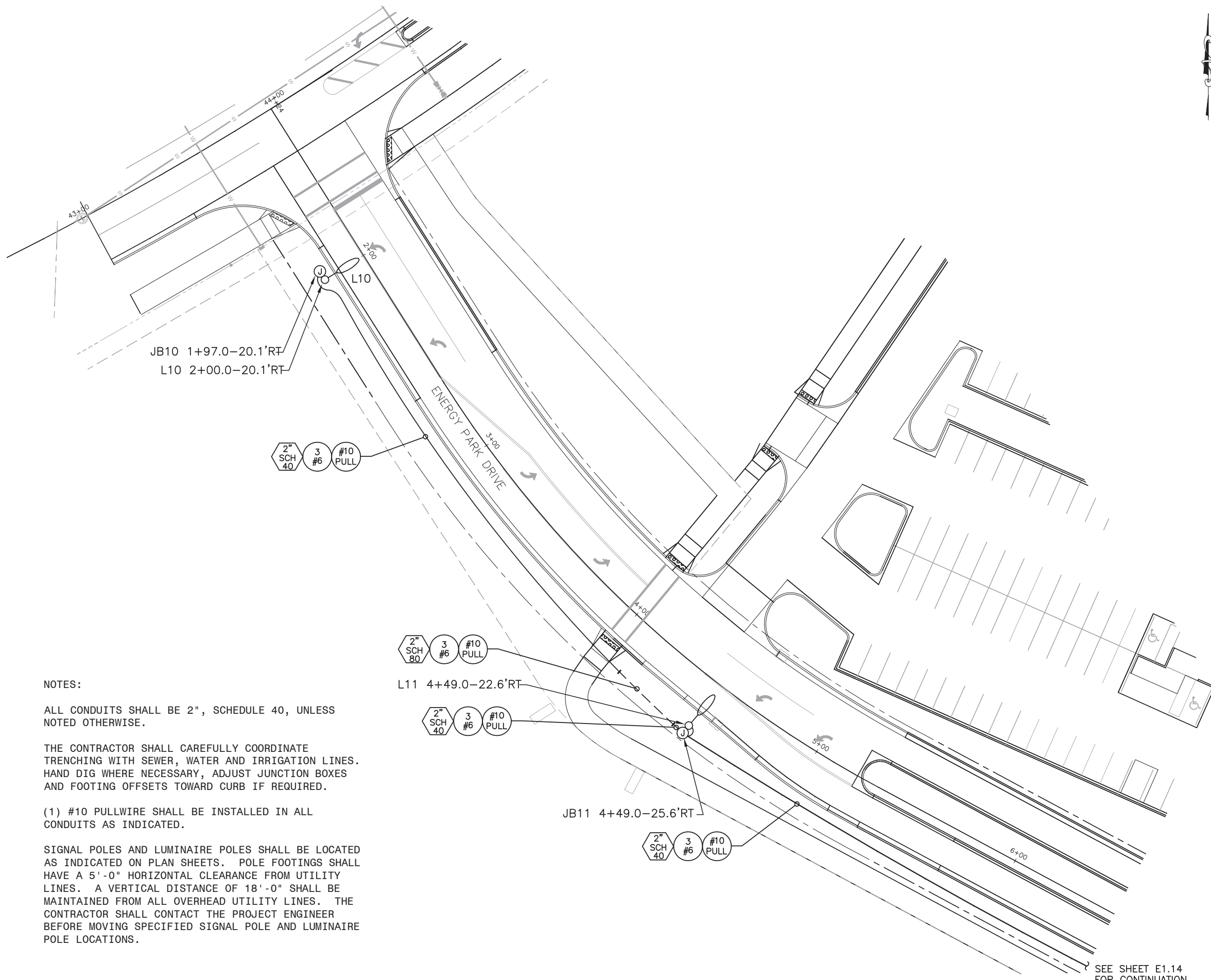
**BH**  
Black Hills Corporation  
Improving life with energy  
NEW HEADQUARTERS  
Rapid City, South Dakota

#### LIGHTING & SIGNAL NOTES

# E1.2



12-10-15 K:\2015\BR15036 - Black Hills Corp Street Lighting and Signalization\WPE-BR15036-E-R.dwg



**NOTES:**

ALL CONDUITS SHALL BE 2", SCHEDULE 40, UNLESS NOTED OTHERWISE.

THE CONTRACTOR SHALL CAREFULLY COORDINATE TRENCHING WITH SEWER, WATER AND IRRIGATION LINES. HAND DIG WHERE NECESSARY, ADJUST JUNCTION BOXES AND FOOTING OFFSETS TOWARD CURB IF REQUIRED.

(1) #10 PULLWIRE SHALL BE INSTALLED IN ALL CONDUITS AS INDICATED.

SIGNAL POLES AND LUMINAIRE POLES SHALL BE LOCATED AS INDICATED ON PLAN SHEETS. POLE FOOTINGS SHALL HAVE A 5'-0" HORIZONTAL CLEARANCE FROM UTILITY LINES. A VERTICAL DISTANCE OF 18'-0" SHALL BE MAINTAINED FROM ALL OVERHEAD UTILITY LINES. THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER BEFORE MOVING SPECIFIED SIGNAL POLE AND LUMINAIRE POLE LOCATIONS.

SEE SHEET E1.14 FOR CONTINUATION

ARCHITECT:

**ARC** HITECTURE  
INTERNATIONAL

5808 SHERIDAN LAKE ROAD  
RAPID CITY, SOUTH DAKOTA 57702 TEL 605-341-2066 www.ARCaTek.com  
FAX 341-3651

BRINGING ARCHITECTURE TO YOUR WORLD

CIVIL ENGINEER:

**Ferfer**  
Engineering  
Company, Inc.

Civil Engineering • Water Resources • Transportation • Land Surveying • GIS  
729 East Watertown St., Rapid City, SD 57701 • Phone: (605) 343-3311

LANDSCAPE ARCHITECT:

**LLGRASS**  
Landscape Architecture for the American West

P.O. Box 511399 • 2518 LITTLE ROCK ROAD, COOR, SD 57702

ELECTRICAL ENGINEER:  
**WPE #BR15036**

**WEST PLAINS**  
ENGINEERING, INC.

1750 RAND ROAD • RAPID CITY SD, 57702  
PHONE: (605) 348-7455 • FAX: (605) 348-9445  
www.westplainsengineering.com

RAPID CITY, SD • SOUX FALLS, SD • OGDEN, WY • CEDAR RAPIDS, IA • BISMARCK, ND

STRUCTURAL ENGINEER:

3202 West Main  
Suite C  
Rapid City, South Dakota 57702  
605.343.9606

**Albertson Engineering Inc.**

**FINAL**

DATE: 12/10/2015

PROJECT MANAGER: DMM

PROJECT NUMBER: 14-145

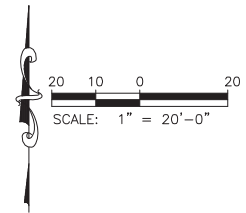


**BH**  
Black Hills Corporation  
Improving life with energy

**NEW HEADQUARTERS**  
Rapid City, South Dakota

ENERGY PARK DR  
1+23.56 TO 6+50

**E1.13R**



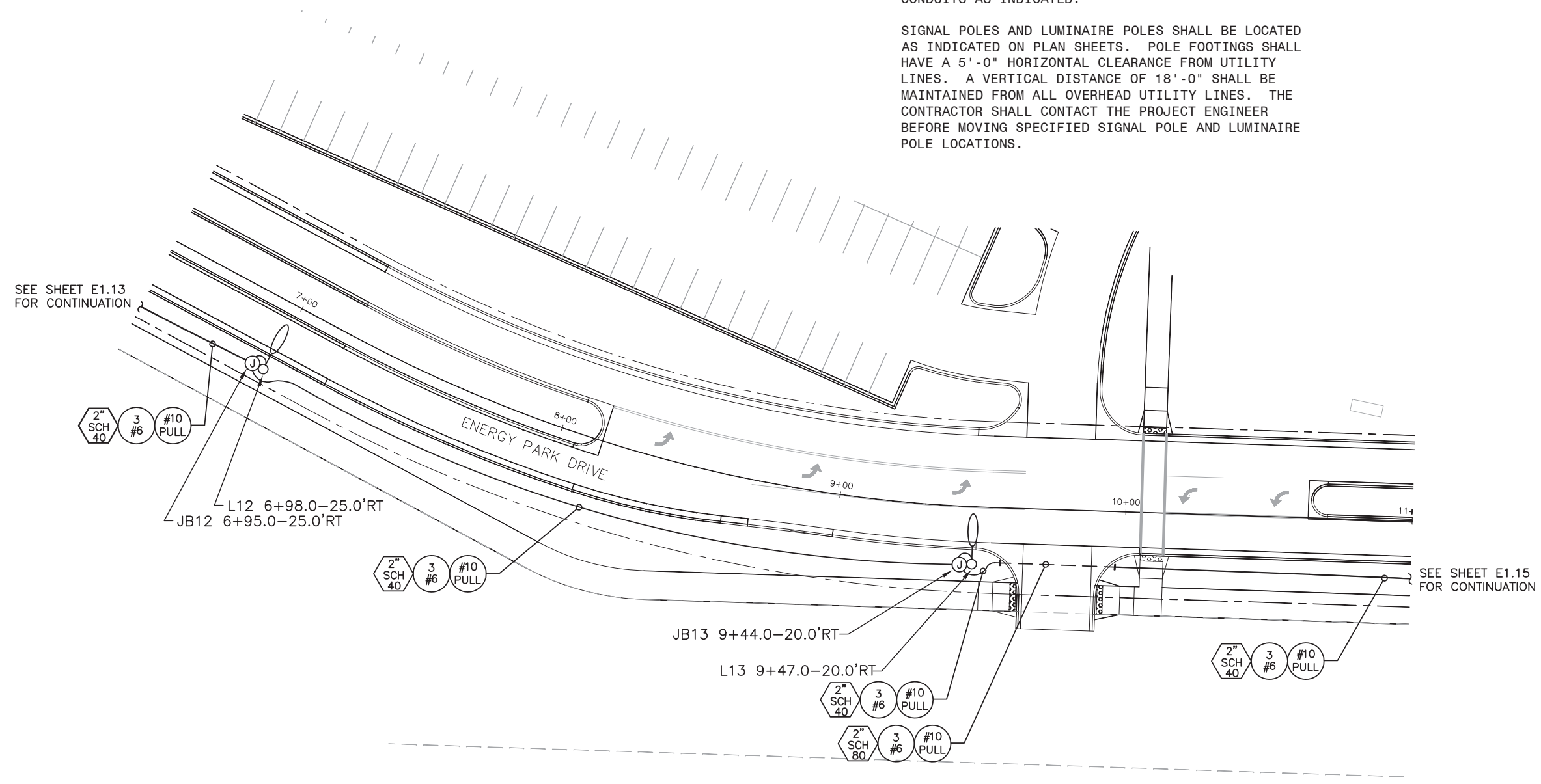
**NOTES:**

ALL CONDUITS SHALL BE 2", SCHEDULE 40, UNLESS NOTED OTHERWISE.

THE CONTRACTOR SHALL CAREFULLY COORDINATE TRENCHING WITH SEWER, WATER AND IRRIGATION LINES. HAND DIG WHERE NECESSARY, ADJUST JUNCTION BOXES AND FOOTING OFFSETS TOWARD CURB IF REQUIRED.

(1) #10 PULLWIRE SHALL BE INSTALLED IN ALL CONDUITS AS INDICATED.

SIGNAL POLES AND LUMINAIRE POLES SHALL BE LOCATED AS INDICATED ON PLAN SHEETS. POLE FOOTINGS SHALL HAVE A 5'-0" HORIZONTAL CLEARANCE FROM UTILITY LINES. A VERTICAL DISTANCE OF 18'-0" SHALL BE MAINTAINED FROM ALL OVERHEAD UTILITY LINES. THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER BEFORE MOVING SPECIFIED SIGNAL POLE AND LUMINAIRE POLE LOCATIONS.



SEE SHEET E1.13 FOR CONTINUATION

SEE SHEET E1.15 FOR CONTINUATION

ARCHITECT:

**ARC**HITECTURE  
INTERNATIONAL  
5808 SHERIDAN LAKE ROAD  
RAPID CITY, SOUTH DAKOTA 57702 TEL 605-341-2066 www.ARCaTek.com  
BRINGING ARCHITECTURE TO YOUR WORLD

CIVIL ENGINEER:

**Fer**ber  
**Engineering**  
**Company, Inc.**  
Civil Engineering • Water Resources • Transportation • Land Surveying • GIS  
729 East Watertown St., Rapid City, SD 57701 • Phone: (605) 343-3311

LANDSCAPE ARCHITECT:

**LLGRASS**  
Landscape Architecture for the American West  
P.O. Box 511399 • 2518 U.S. 85th Road, Coon Rapids, MN 55439

ELECTRICAL ENGINEER:

**WPE** WEST PLAINS  
**ENGINEERING, INC.**  
1750 RAND ROAD • RAPID CITY SD, 57702  
PHONE: (605) 348-7455 • FAX: (605) 348-9445  
www.westplainsengineering.com  
RAPID CITY, SD • SIOUX FALLS, SD • OGDEN, WY • CEDAR RAPIDS, IA • BISMARCK, ND

STRUCTURAL ENGINEER:

3202 West Main  
Suite C  
Rapid City, South Dakota 57702  
605.343.9606  
**Albertson Engineering Inc.**

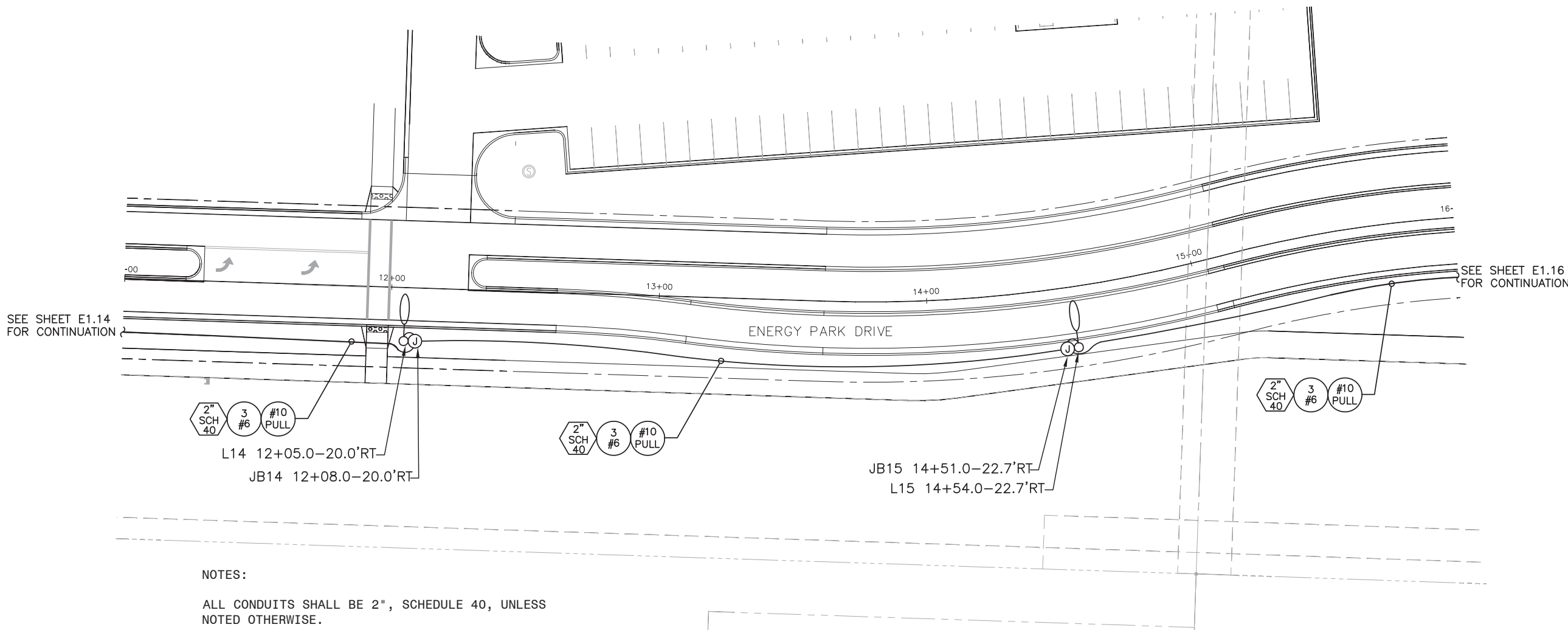
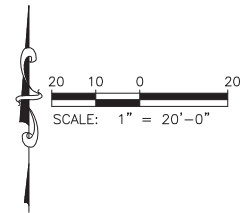
**FINAL**

DATE: 12/10/2015  
PROJECT MANAGER: DMM  
PROJECT NUMBER: 14-145



**BH**  
**Black Hills Corporation**  
Improving life with energy  
NEW HEADQUARTERS  
Rapid City, South Dakota

ENERGY PARK DR  
6+50 TO 11+00  
**E1.14R**



**NOTES:**

ALL CONDUITS SHALL BE 2", SCHEDULE 40, UNLESS NOTED OTHERWISE.

THE CONTRACTOR SHALL CAREFULLY COORDINATE TRENCHING WITH SEWER, WATER AND IRRIGATION LINES. HAND DIG WHERE NECESSARY, ADJUST JUNCTION BOXES AND FOOTING OFFSETS TOWARD CURB IF REQUIRED.

(1) #10 PULLWIRE SHALL BE INSTALLED IN ALL CONDUITS AS INDICATED.

SIGNAL POLES AND LUMINAIRE POLES SHALL BE LOCATED AS INDICATED ON PLAN SHEETS. POLE FOOTINGS SHALL HAVE A 5'-0" HORIZONTAL CLEARANCE FROM UTILITY LINES. A VERTICAL DISTANCE OF 18'-0" SHALL BE MAINTAINED FROM ALL OVERHEAD UTILITY LINES. THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER BEFORE MOVING SPECIFIED SIGNAL POLE AND LUMINAIRE POLE LOCATIONS.

ARCHITECT:  
**ARC** HITECTURE  
 INTERNATIONAL  
 5808 SHERIDAN LAKE ROAD  
 RAPID CITY, SOUTH DAKOTA 57702 TEL: 605-341-2066 www.ARCatEk.com  
 BRINGING ARCHITECTURE TO YOUR WORLD

CIVIL ENGINEER:  
**Fer**ber  
**Engineering**  
**Company, Inc.**  
 Civil Engineering • Water Resources • Transportation • Land Surveying • GIS  
 729 East Water town St., Rapid City, SD 57701 • Phone: (605) 343-3311

LANDSCAPE ARCHITECT:  
**LLGRASS**  
 Landscape Architecture for the American West  
 P.O. Box 511 999 • 2518 WEST 104TH ROAD, COOR, SD 57029

ELECTRICAL ENGINEER:  
**WPE #BR15036**  
**WEST PLAINS**  
**ENGINEERING, INC.**  
 1750 RAND ROAD • RAPID CITY SD, 57702  
 PHONE: (605) 348-7455 • FAX: (605) 348-9445  
 www.westplainsengineering.com  
 RAPID CITY, SD • SOUX FALLS, SD • OGDEN, WY • CEDAR RAPIDS, IA • BISMARCK, ND

STRUCTURAL ENGINEER:  
**Albertson Engineering Inc.**  
 3202 West Main  
 Suite C  
 Rapid City, South Dakota 57702  
 605.343.9606

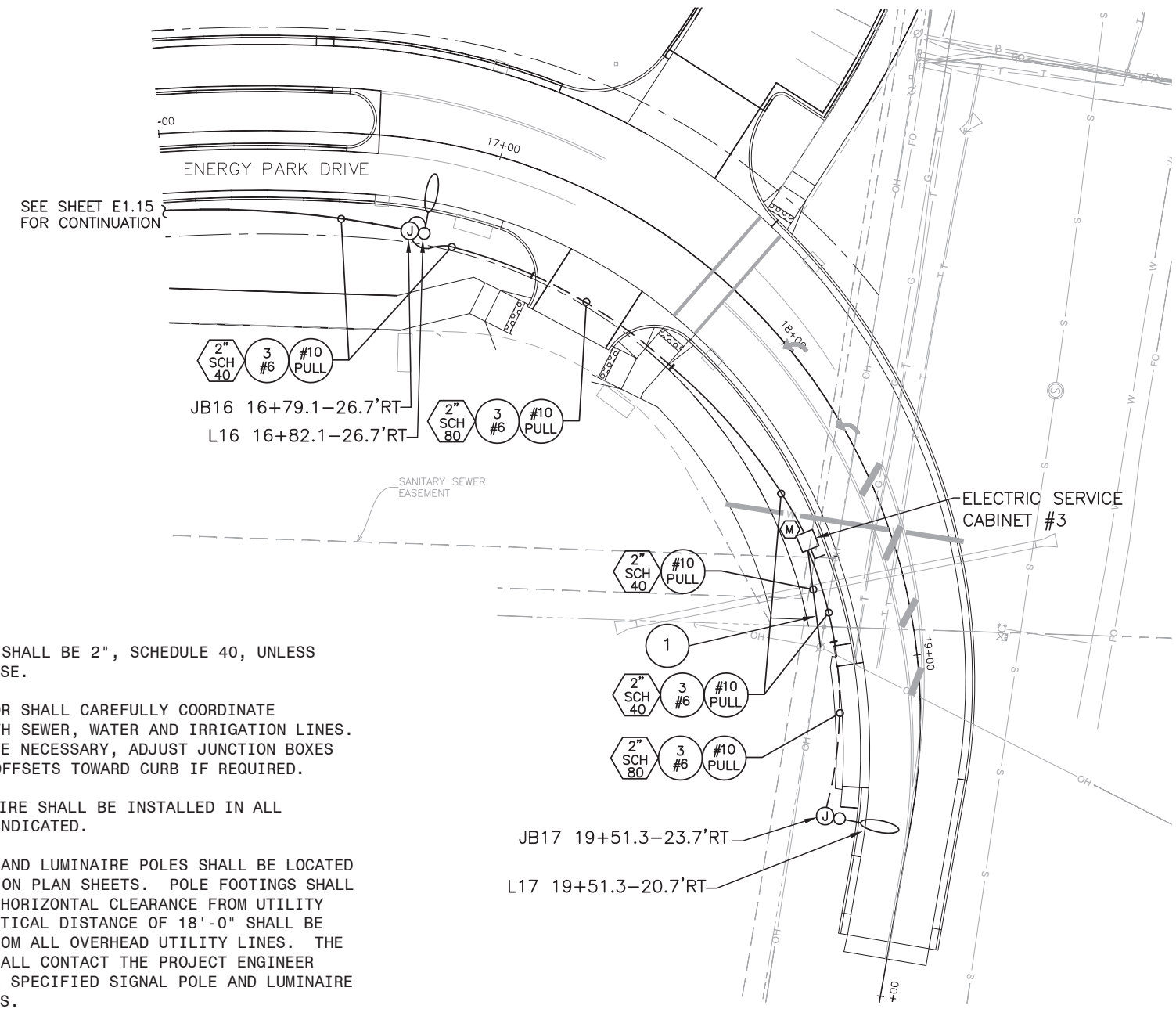
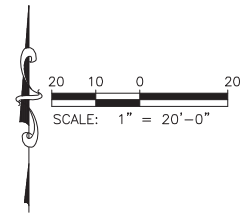
**FINAL**

DATE: 12/10/2015  
 PROJECT MANAGER: DMM  
 PROJECT NUMBER: 14-145



**NEW HEADQUARTERS**  
 Rapid City, South Dakota

ENERGY PARK DR  
 11+00 TO 16+00  
**E1.15R**



SEE SHEET E1.15  
FOR CONTINUATION

**NOTES:**

ALL CONDUITS SHALL BE 2", SCHEDULE 40, UNLESS NOTED OTHERWISE.

THE CONTRACTOR SHALL CAREFULLY COORDINATE TRENCHING WITH SEWER, WATER AND IRRIGATION LINES. HAND DIG WHERE NECESSARY, ADJUST JUNCTION BOXES AND FOOTING OFFSETS TOWARD CURB IF REQUIRED.

(1) #10 PULLWIRE SHALL BE INSTALLED IN ALL CONDUITS AS INDICATED.

SIGNAL POLES AND LUMINAIRE POLES SHALL BE LOCATED AS INDICATED ON PLAN SHEETS. POLE FOOTINGS SHALL HAVE A 5'-0" HORIZONTAL CLEARANCE FROM UTILITY LINES. A VERTICAL DISTANCE OF 18'-0" SHALL BE MAINTAINED FROM ALL OVERHEAD UTILITY LINES. THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER BEFORE MOVING SPECIFIED SIGNAL POLE AND LUMINAIRE POLE LOCATIONS.

**SPECIFIC ELECTRICAL NOTES:** #

1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE UNDERGROUND SECONDARY CONDUIT FROM SERVICE CABINET TO BASE OF OVERHEAD UTILITY POLE. THE UTILITY WILL PROVIDE SECONDARY DOWN THE POLE TO THE ELECTRIC METER. THE ELECTRICAL CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH THE UTILITY COMPANY.

ARCHITECT:

**ARC HITECTURE INTERNATIONAL**  
 5808 SHERIDAN LAKE ROAD  
 RAPID CITY, SOUTH DAKOTA 57702 TEL 605-341-2066 www.ARCaTek.com FAX 341-3651  
 BRINGING ARCHITECTURE TO YOUR WORLD

CIVIL ENGINEER:

**Ferber Engineering Company, Inc.**  
 Civil Engineering • Water Resources • Transportation • Land Surveying • GIS  
 729 East Watertown St., Rapid City, SD 57701 • Phone: (605) 343-3311

LANDSCAPE ARCHITECT:

**LLGRASS**  
 Landscape Architecture for the American West  
 P. 605.313.9999 2518 U.S. HWY 16, R.D. 1, R.D. 107

ELECTRICAL ENGINEER:

**WPE #BR15036**  
**WEST PLAINS ENGINEERING, INC.**  
 1750 RAND ROAD - RAPID CITY SD, 57702  
 PHONE: (605) 348-7455 • FAX: (605) 348-9445  
 www.westplainsengineering.com  
 RAPID CITY, SD • SOUX FALLS, SD • OGDEN, WY • CEDAR RAPIDS, IA • BISMARCK, ND

STRUCTURAL ENGINEER:

**Albertson Engineering Inc.**  
 3202 West Main  
 Suite C  
 Rapid City, South Dakota 57702  
 605.343.9606

**FINAL**

DATE: 12/10/2015

PROJECT MANAGER: DMM

PROJECT NUMBER: 14-145



**Black Hills Corporation**  
 Improving life with energy  
**NEW HEADQUARTERS**  
 Rapid City, South Dakota

ENERGY PARK DR  
 16+00 TO 20+00

**E1.16R**