

**KNOXVILLE/KNOX COUNTY METROPOLITAN PLANNING COMMISSION
 USE ON REVIEW REPORT**

▶ **FILE #:** 4-C-12-UR

AGENDA ITEM #: 47

AGENDA DATE: 4/12/2012

▶ **APPLICANT:** OPTIMA TOWERS IV, LLC KEITH POWELL

OWNER(S): Robert Smith

TAX ID NUMBER: 100 010

JURISDICTION: County Commission District 8

▶ **LOCATION:** North side of Dave Smith Rd., east of Smith School Rd.

▶ **APPX. SIZE OF TRACT:** 48.97 acres

SECTOR PLAN: East County

GROWTH POLICY PLAN: Rural Area

ACCESSIBILITY: Access is via Dave Smith Rd., a local street with a 16' pavement width within a 40' right-of-way.

UTILITIES: Water Source:

Sewer Source:

WATERSHED: Holston and French Broad & Tuckahoe Creek

▶ **ZONING:** A (Agricultural)

▶ **EXISTING LAND USE:** Agriculture

▶ **PROPOSED USE:** Modification of the previous condition for a paved access driveway.
 (Case # 5-F-11-UR)

HISTORY OF ZONING: None noted

SURROUNDING LAND USE AND ZONING:
 North: Woods / A (Agricultural)
 South: Pasture and rural residential / A (Agricultural) and Sevier County
 East: Pasture and rural residential / Sevier County
 West: Woods / A (Agricultural)

NEIGHBORHOOD CONTEXT: The proposed site is located in an agricultural/rural residential area of eastern Knox County.

STAFF RECOMMENDATION:

▶ **APPROVE a modification of condition #2 of the use on review approval for Optima Towers IV (Case # 5-F-11-UR) as follows**

2. (Revised) The access drive for the tower site shall be designed and installed to a standard acceptable to the Knox County Fire Marshal and the Knox County Department of Engineering and Public Works. A revised plan for the access drive and turnaround area shall be submitted to the Knox County Fire Marshal and the Knox County Department of Engineering and Public Works for review and approval prior to any permits being issued.

COMMENTS:

The applicant had received approval for a 270 foot lattice telecommunications tower to be located on a portion

of a 48.97 acre tract having access to Dave Smith Road. The existing access to the lease area is a driveway that currently serves a couple of barns. Staff had included a condition of the approval that the driveway be upgraded to meet utility access driveway standards of the Knox County Fire Prevention Bureau which requires at a minimum a 16' wide paved driveway. A copy of the Fire Prevention Bureau's "Utility Access Driveways" standard is included as Attachment A in the applicant's application package.

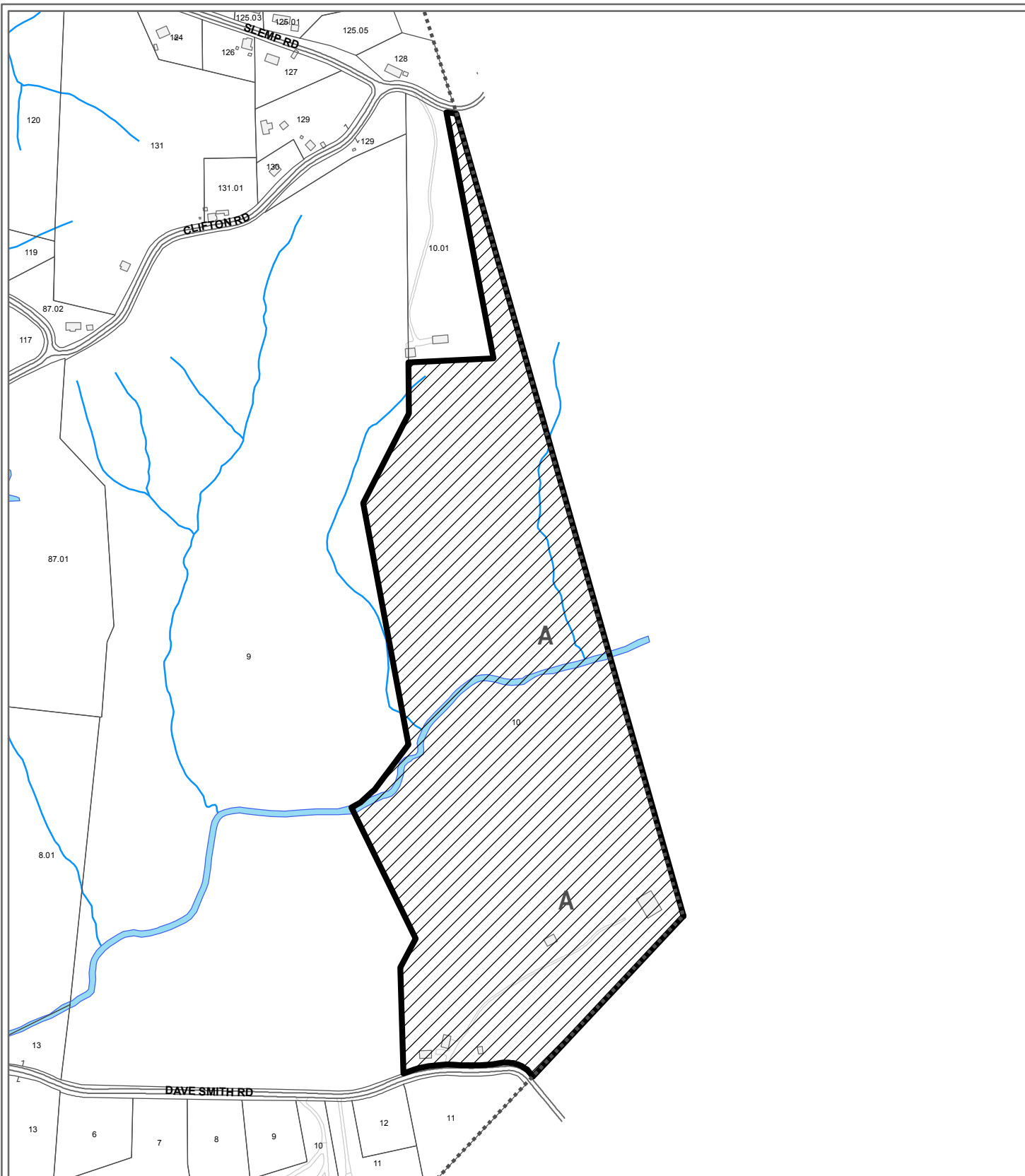
The Knox County Fire Prevention Bureau's utility driveway standard was developed in early 2010 in order to require minimum pavement standards that would meet the bearing load requirements, minimum width requirements, turning radii and long term surface maintenance needed to insure Public Safety vehicular access.

The applicant has submitted alternative pavement standards for consideration by the Knox County Fire Marshal and the Knox County Department of Engineering and Public Works. The alternatives have not been found to be acceptable by the County. In order for the County to accept an alternative driveway design, the original condition of the use on review must be modified. Planning Staff is recommending a modified condition. It is important that any modified condition allow for the Knox County Fire Marshal and the Knox County Department of Engineering and Public Works to determine if the revised pavement standard is acceptable.

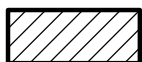
ESTIMATED TRAFFIC IMPACT: Not calculated.

ESTIMATED STUDENT YIELD: Not applicable.

MPC's approval or denial of this request is final, unless the action is appealed to the Knox County Board of Zoning Appeals. The date of the Knox County Board of Zoning Appeals hearing will depend on when the appeal application is filed. Appellants have 30 days to appeal an MPC decision in the County.



**4-C-12-UR
USE ON REVIEW**



Modification of the previous condition for a paved access driveway. (Case # 5-F-11-UR) in A (Agricultural)

Original Print Date: 3/21/2012 Revised:
Metropolitan Planning Commission * City / County Building * Knoxville, TN 37902

Petitioner: Optima Towers IV, LLC, Keith Powell

Map No: 100
Jurisdiction: County





*Optima Towers IV, LLC
PO Box 2041
Mount Pleasant, SC 29465*

Via Hand Delivery

March 14, 2012

Knox County Metropolitan Planning Commission
400 Main St, Suite 403
City County Building
Knoxville, Tennessee 37902

Re: Proposed modification t of roadway conditions to approved UOR 5-F-11-UR

Dear MPC Staff and Commissioners,

Please accept this package as a request to modify the MPC Staff Recommendation #2 (Recommendation #2) of the approval of Use on Review approval 5-F-11-UR on 5/12/11. In reference to Recommendation #2, the result is for Optima Towers (Optima) to have to pave its entire access driveway of approximately 1084-feet per the Knox County Driveway standards for Utility Access Driveways ("Attachment A"). Optima respectfully requests a modification to the recommended pavement typical cross section design of the Knox County Utility Access Driveway Requirements which are:

- 1 compacted sub grade with 4" of base (mineral aggregate type A, grade D);
- 2 1-3/4" of binder bituminous hot mix grade B-M
- 3 1-1/4" of topping (asphaltic concrete surfacing grade D)

This driveway surface typical cross section requirement is over engineered, un-needed, and subsequently too costly of a design for a low volume and long distance private access driveway to a Wireless Communications Facility (WCF). A more efficient and less expensive alternative can easily be designed meeting all the bearing load requirements, minimum width requirements, turning radii, and long term surface maintenance needed to insure easy Public Safety (vehicular) access per Attachment A.

After reviewing with Optima's Engineer, Tennessee Professional Engineer Jim Duncan has provided two (2) designs of access driveway cross sections for the WCF that meet or exceed all loading requirements for Public Safety vehicles access per Attachment A. Mr. Duncan's access driveway surface cross section designs are included ("Attachment B"). The remainder of Recommendation #2 regarding the standards for Utility Access Driveways are acceptable to Optima. The only contention by Optima is to modify the surface cross section above (items #1,2,3) to one of the two design options by Mr. Duncan to reduce the total linear feet paved with a more reasonably accepted and efficient road surface design cross section.

Optima reviewed other utility locations in regards to requesting this modification. The utility locations visited are listed below and photographs and details (width x length) of the paved access are included ("Attachment C"):

- 1 Electric substation located at 400 South Peters Road
 - Approximate 60-ft x 35-ft of paved driveway
- 2 Electric substation located at 9735 Kodak Road
 - Approximate 24-ft x 5-ft of paved driveway (remaining gravel)
- 3 Lift/Pump Station located at 1151 Cherokee Trail

- Approximate 16-ft x 30-ft of paved driveway (remaining gravel)
- 4. Wastewater Treatment Plant at 310 Broome Road
 - Approximate 45-ft x 26-ft of paved driveway (remaining gravel)
- 5. Electric substation located at 8350 East Walker Springs Road
 - Approximate 21-ft x 60-ft of paved driveway (dual driveways)

As depicted on Attachment C, the utility station driveways meet the requirements of the Utility Access Driveway requirements. However, the extremely short length of access driveways of the utility substations are very definitive. Additionally, the use of aggregate rock for the remainder of access driveways are acknowledged. The illustrations of the utility stations clearly depict the majority of the access driveway costs are borne by the public ROW the utility station is located adjacent to. As a result, the access driveways built from the ROW to the utility stations are very short, efficient, and can easily accept Public Safety vehicles from the ROW the utility station affronts. Compared the normal garden-variety access driveways to WCFs the access driveways to the depicted utility stations are generally much shorter in length.

The access driveways of WCFs are unique to the utility-type facility. Located on naturally higher elevations, consistent setbacks from property lines and ROWs, and implementing steep slopes/grades accessing hilltops are all difficulties that create long access driveways in excess of 1,000- 2,000 feet for WCFs. All these unique characteristics make access driveways to WCFs extremely challenging. Building a short and efficient paved driveway, per the cross section above, to WCFs present themselves rarely in the East Tennessee environment.

The average daily traffic (ADT) counts of WCF access driveways are less than 1 (< 1) vehicle per day sometimes just once a month, an extremely low volume of traffic. However, the access driveways of WCFs are built to handle the rigors and bearing loads of heavy construction equipment such as cranes, concrete trucks, water trucks, dump trucks, tracked vehicles, tractor trailers, and other permit/wide load vehicles, but on a low volume basis. The access driveways to WCFs are private driveways, **NOT public access ways** with moderate ADT (>400 vehicles/day). The substructure and surfaces of the WCF access driveways are made to withstand the bearing loads equal to or greater than Public Safety vehicles. The low volume traffic and extreme length of these WCF access driveways are very unique versus the other utility access driveways and do not precipitate the need to pave the equivalent of a County street pavement cross section just to allow easy access by Public Safety vehicles to WCFs. A more efficient design meeting all of the Utility Access Driveway requirements and easy access by Public Safety vehicles can be achieved with understanding the uniqueness of WCFs versus other utility stations and it can be designed with less paved surface.

Optima proposes that the Staff Condition #2, be modified to approve the cross section of the access driveway design of one of the following options as depicted in Roadway Surface Exhibit X-1 ("Attachment D") and the engineering design reviews by Tennessee Professional Engineer, Jim Duncan in Attachment A:

Option #1: Optima will surface access driveway from ROW to Point A, approximately 200-linear feet, with the Knox County Utility Access Driveway cross section detail (compacted sub grade with 4" of base mineral aggregate type A, grade D, 1-3/4" of binder bituminous hot mix grade B-M, and 1-1/4" of topping (asphaltic concrete surfacing grade D). Surface the remainder of the driveway with a compacted 12" aggregate rock base to the WCF.

Option #2: Optima will surface access driveway from ROW to Point B, approximately 475-linear feet, with 2" of binder bituminous hot mix grade B-M to conform to IDOT section 404 with 6" of mineral aggregate type "A", grade "D" below. Surface the remainder of the driveway with a compacted 12" aggregate rock base to WCF.

These two options provided by Optima and its engineer will provide the equal or better loading requirements needed to get Public Safety Vehicles proper and efficient access to the WCF and meeting all

the remainder of the Utility Access Driveway requirements. Additionally, both options provide access driveways 200% to 400% longer than most utility stations access driveways. The uniqueness to the

Optima respectfully requests the approval of either one or both of these two changes modify the Staff recommendation #2 to the approval of UOR 5-F-11-UR. If you have any questions, please feel free to give me a call at 843-324-9745.

Sincerely,



Keith Powell
Managing Member
Optima Towers IV, LLC

Attachments:

- A: Utility Access Driveway Requirements
- B: Terracon (Jim Duncan) Driveway Surface Cross Section Designs (two)
- C: Utility station photographs
- D: Roadway Surface Exhibit X-1 with proposal descriptions

Utility Access Driveways

Plans submitted require both a plan view and a profile and sometimes a grading plan is needed as well.

The **plan** view needs to show:

1. stationing,
2. radii of centerline horizontal curves,
3. points of curvature and tangency of the horizontal curves,
4. horizontal curves that tie the driveway to the roadway,
5. width of the pavement,
6. width of the easement,
7. and the turnaround area for the fire truck.

The minimum width of pavement permitted is 16 feet.

Turning templates are needed to show that the fire truck can make the necessary movements. The design vehicle is a BUS-40 as it is similar to the fire truck in that it has a 40 foot length and a 25 foot wheelbase. The turning templates should be applied on a separate plan view.

For layouts and dimensions of the **turn around area**, use Appendix C of the International Fire Code (IFC) as a guideline.

The **profile** needs to show:

1. stations,
2. grades,
3. vertical curves,
4. points of vertical intersection of the grades,
5. and no grade shall exceed 15%.

The **typical cross section** of pavement to be provided meets the driveway requirements of what Knox County uses for business driveways on capital projects. The section is as follows:

1. a compacted subgrade with 4 inches of base (mineral aggregate type "A", grade "D",
2. 1-3/4 inches binder (bituminous hot mix grade B-M),
3. and 1-1/4 inches topping (asphaltic concrete surfacing grade "D". This cross-section provides 7 inches of material.

The need for a **grading plan** is decided on a case by case basis. The effects of stormwater runoff on the side slopes of the proposed access driveway may require curbs, culverts, catch basins or road side swales. Once again the need for these items is decided on a case by case basis.

Previously approved sites: If a utility wishes to co-locate with a previously approved utility site, then the access driveway will need to meet the conditions listed above



December 21, 2011

Optima Towers II, LLC.
PO Box 2041
Mt Pleasant, South Carolina 29465

Attn: Mr. Keith Powell

Re: Access Road Surfacing
Proposed Telecommunications Tower Site
Site Name: Dave Smith Road
Site Number: TN-2002
941 Dave Smith Road
Kodak, Knox County, Tennessee
Terracon Project No. 18117322

Dear Mr. Powell:

Terracon Consultants, Inc. (Terracon) has performed an engineering review and calculation for proposed surfacing treatment for the subject access road. We understand the road section is to be constructed to accommodate heavy emergency response vehicles in addition to routine maintenance vehicle and farm implement traffic. The project team has requested alternates for the road surfacing. In addition, based on their initial analyses, the team has indicated a rigid section would be cost prohibitive for the 900 feet long, 16 feet wide road. We performed a geotechnical study for the proposed tower in July 2011.

Traffic loading and pavement sections were assessed using AASHTO Design Guide parameters. Assumptions for the pavement section include a California Bearing Ratio of 3, a 20-year design life, and weekly visits by maintenance (medium truck) and heavy duty (tandem axle) vehicles (one each). The recommended alternate includes the following.

Material	Material Thickness (inches)
	Stone Section Option
Asphalt Surface	--
Aggregate Base	12
Total Pavement Section	12

The base course materials should conform to the 2006 Tennessee Department of Transportation (TDOT) "Standard Specifications for Road and Bridge Construction",

- Section 903.05 for Aggregate Base Course material, Grading C or D

Terracon Consultants, Inc 5217 Linbar Drive Suite 309 Nashville, TN 37211
P [615] 333 6444 F [615] 333 6443 terracon.com

Geotechnical

Environmental

Construction Materials

Facilities

Access Road Surfacing

Dave Smith Road – Tower Site TN 2002 ■ Knoxville, TN
December 21, 2011 ■ Terracon Project No 18117322

Terracon

We recommend the pavement areas be rough graded and then thoroughly proofrolled with a loaded tandem-axle dump truck. Areas where unsuitable conditions are located should be repaired by replacing the materials with properly compacted fill. To help obtain the assumed CBR value in the field, the upper 12 inches of the roadway subgrade should be compacted to at least 98 percent of the standard Proctor density at moisture content within -1 to +3 percent of its optimum moisture.

We understand that the proposed road's centerline grade will generally follow existing terrain. Based upon our review of site photographs and perusal of published information, we understand the gradient along the proposed access road alignment is gentle and cut and fill requirements are minimal (less than 3 feet of cut or fill). Our recommendations are predicated on the foregoing and our assumption that the inclination of surface conditions and final subgrades will be amenable for conventional compacting equipment to achieve minimum stated densities for backfill and stone base.

Long term performance of pavements constructed on the site will be dependent upon maintaining stable moisture content of the subgrade soils, and providing for a planned program of preventative maintenance. Pavement performance can be enhanced by minimizing excess moisture that can reach the subgrade soils. The following recommendations should be considered at a minimum:

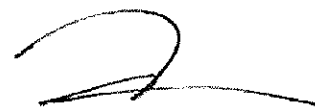
- Final grade adjacent to the access drives should slope down from pavement edges at a minimum 2%;
- Lateral ditches and culverts will be installed as necessary to promote positive drainage and to prevent water ponding against, and saturation of, the stone base; and,
- The subgrade and the pavement surface should have a minimum ¼ inch per foot slope to promote proper surface drainage.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service to you in any way, please do not hesitate to contact us.

Sincerely,
TERRACON



J. Samuel Vance, P.E.
Geotechnical Manager



James A. Duncan, P.E.
Environmental Manager



SITE NAME:
DAVE SMITH ROAD
 SITE NUMBER:
TN-2002
 SITE ADDRESS:
**2404 DAVE SMITH ROAD
 KNOXVILLE, TN 37764**

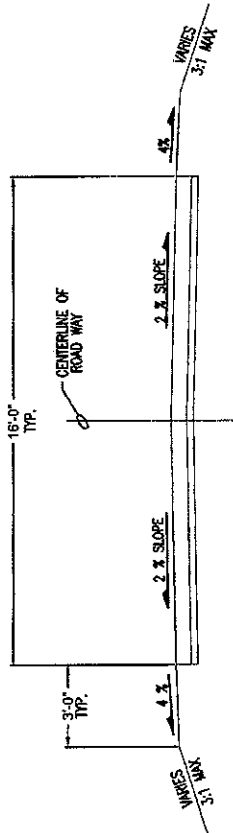
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1	REVISED	CLIENT REVISIONS
2	12/21/10	ZONING REQUIRE CORRECTIONS
3	1/20/11	ZONING DRAWINGS
4	03/03/11	FOR CLIENT REVIEW
5		
6		
7		
8		
9		
10		
NO.	DATE	SUBJECT

REVISION OR ISSUE
SSOE, Inc.
 214 Cambridge Drive, Suite 300
 Knoxville, TN 37927
 T 615-597-7535
 F 615-597-7535
 PROJECT NO.: **010-01362-00**
 PROJECT MANAGER: **FLOYD WHITE**
 DESIGNER: **JUSTIN FIELDS**
 CHECKED: **MARK CATES**
 DRAWING TITLE:

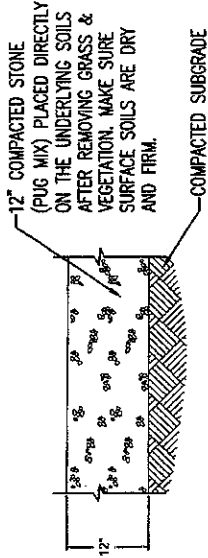
ROADWAY SECTION

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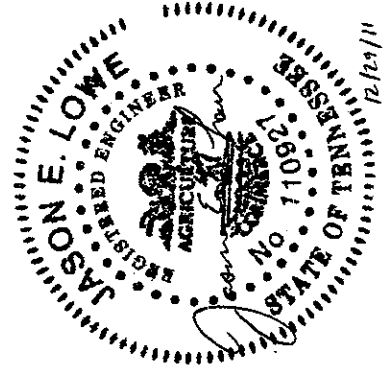
1 ROADWAY CROSS SECTION

SCALE: N.T.S.



2 PAVEMENT SECTION OPTION 1

SCALE: N.T.S.





December 16, 2011

Optima Towers II, LLC.
PO Box 2041
Mt Pleasant, South Carolina 29465

Attn: Mr. Keith Powell

Re: Access Road Surfacing
Proposed Telecommunications Tower Site
Site Name: Dave Smith Road
Site Number: TN-2002
941 Dave Smith Road
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Traffic loading and pavement sections were assessed using AASHTO Design Guide parameters. Assumptions for the pavement section include a California Bearing Ratio of 3, a 20-year design life, and weekly visits by maintenance (medium truck) and heavy duty (tandem axle) vehicles (one each). The recommended alternate includes the following.

Material	Material Thickness (inches)
	Asphalt Paved Section Option
Asphalt Surface	2
Aggregate Base	6
Total Pavement Section	8

Asphalt concrete aggregates and base course materials should conform to the 2006 Tennessee Department of Transportation (TDOT) "Standard Specifications for Road and Bridge Construction",

- Section 903.11 for Surface Course, Grading E
- Section 903.05 for Aggregate Base Course material, Grading C or D

Terracon Consultants Inc 5217 Linbar Drive Suite 309 Nashville TN 37211
P [615] 333 6444 F [615] 333 6443 terracon.com

Geotechnical

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Construction Materials

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Access Road Surfacing

Dave Smith Road – Tower Site TN 2002 ■ Knoxville, TN
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Terracon

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We understand that the proposed road's centerline grade will generally follow existing terrain. Neither field-run topographic survey nor road centerline profile was available for our review. Based upon our review of site photographs and perusal of published information, we understand the gradient along the proposed access road alignment is gentle and cut and fill requirements are minimal (less than 3 feet of cut or fill). Our recommendations are predicated on the foregoing and our assumption that the inclination of surface conditions and final subgrades will be amenable for conventional compacting equipment to achieve minimum stated densities for backfill, stone base, and asphalt (93% of maximum theoretical density per TDOT manual)

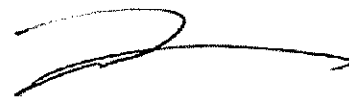
Long term performance of pavements constructed on the site will be dependent upon maintaining stable moisture content of the subgrade soils, and providing for a planned program of preventative maintenance. Pavement performance can be enhanced by minimizing excess moisture that can reach the subgrade soils. The following recommendations should be considered at a minimum:

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- Lateral ditches and culverts will be installed as necessary to promote positive drainage and to prevent water ponding against, and saturation of, the stone base; and,
- The subgrade and the pavement surface should have a minimum ¼ inch per foot slope to promote proper surface drainage

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service to you in any way, please do not hesitate to contact us

Sincerely,
TERRACON


J. Samuel Vance, P.E.
Geotechnical Manager


James A. Duncan, P.E.
Environmental Manager



SITE NAME:
DAVE SMITH ROAD
 SITE NUMBER:
TN-2002
 SITE ADDRESS:
2404 DAVE SMITH ROAD
KNOXVILLE, TN 37764

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CLIENT PROJECT NO: TBD

NO.	DATE	SUBJECT
1	11/01/10	CLIENT REVISIONS
2	12/01/10	ZONING RECLINE CORRECTIONS
3	11/02/10	ZONING DRAWINGS
4	10/06/10	FOR CLIENT REVIEW

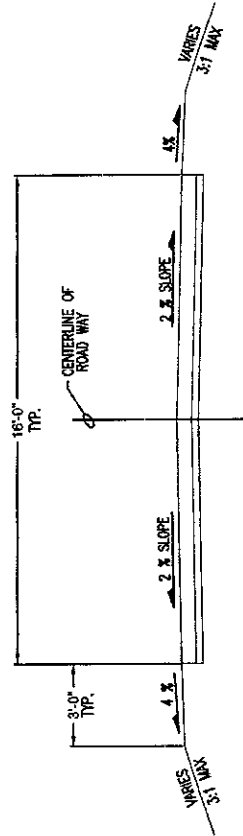
REVISION OF ISSUE
 SSOE, INC.
 2000 Parkville, Suite 300
 Knoxville, TN 37927
 T 615-661-7885

PROJECT NO: **010-01362-00**
 PROJECT MANAGER: **FLOYD WHITE**
 DESIGNER: **JUSTIN FIELDS**
 CHECKER: **MARK GATES**
 DRAWING TITLE

ROADWAY SECTION

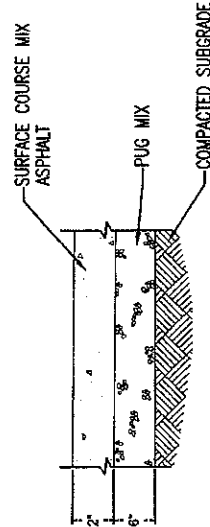
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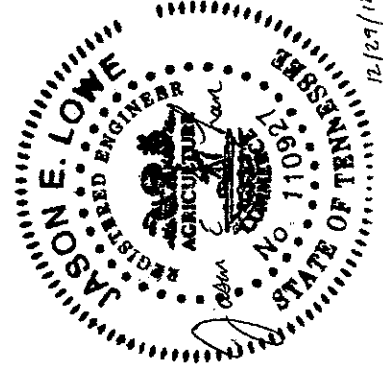
1 ROADWAY CROSS SECTION

SCALE: N.T.S.



3 PAVEMENT SECTION OPTION 2

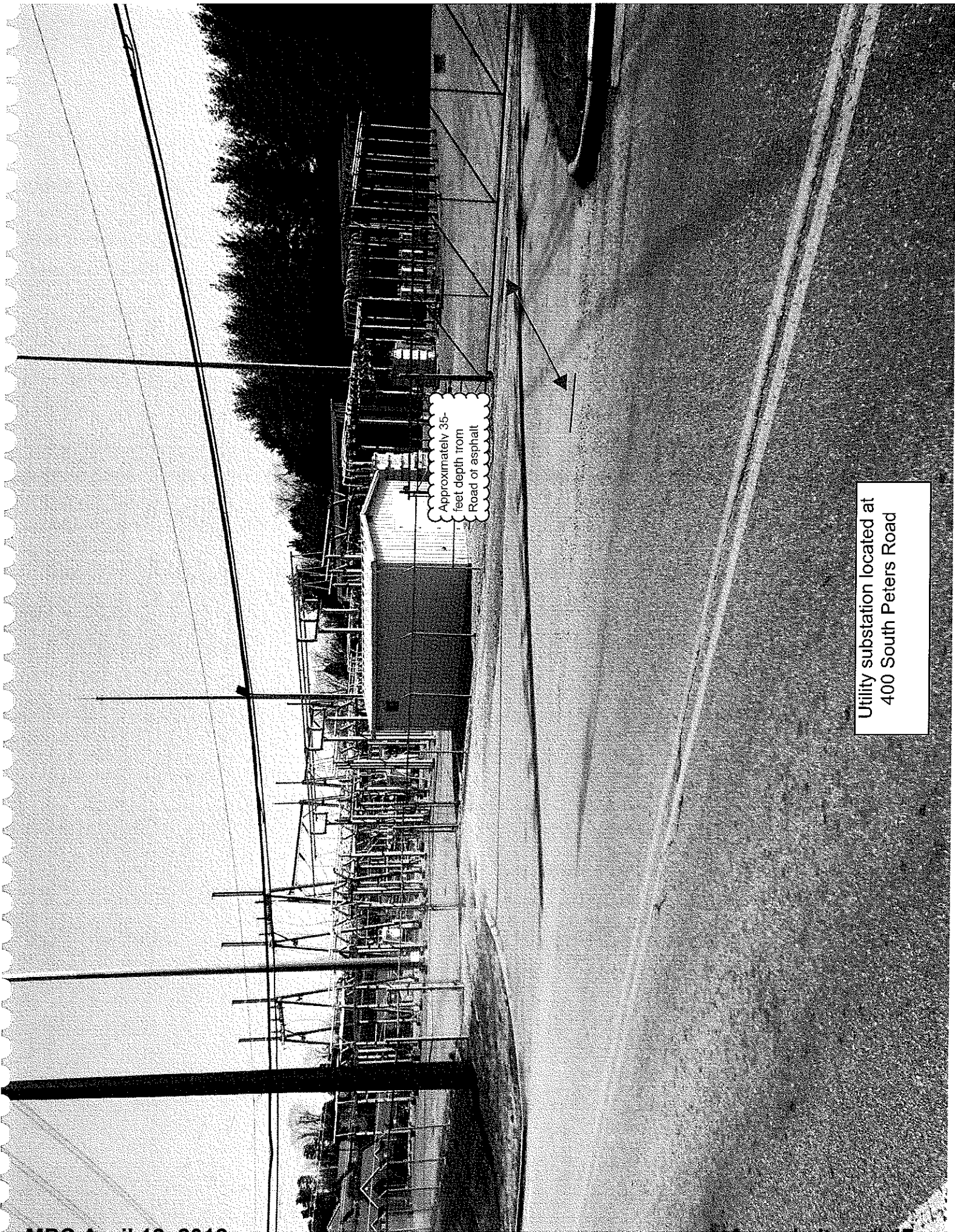
SCALE: N.T.S.



Attachment C

Approximately 60-foot width
or asphalt

Utility substation located at
400 South Peters Road



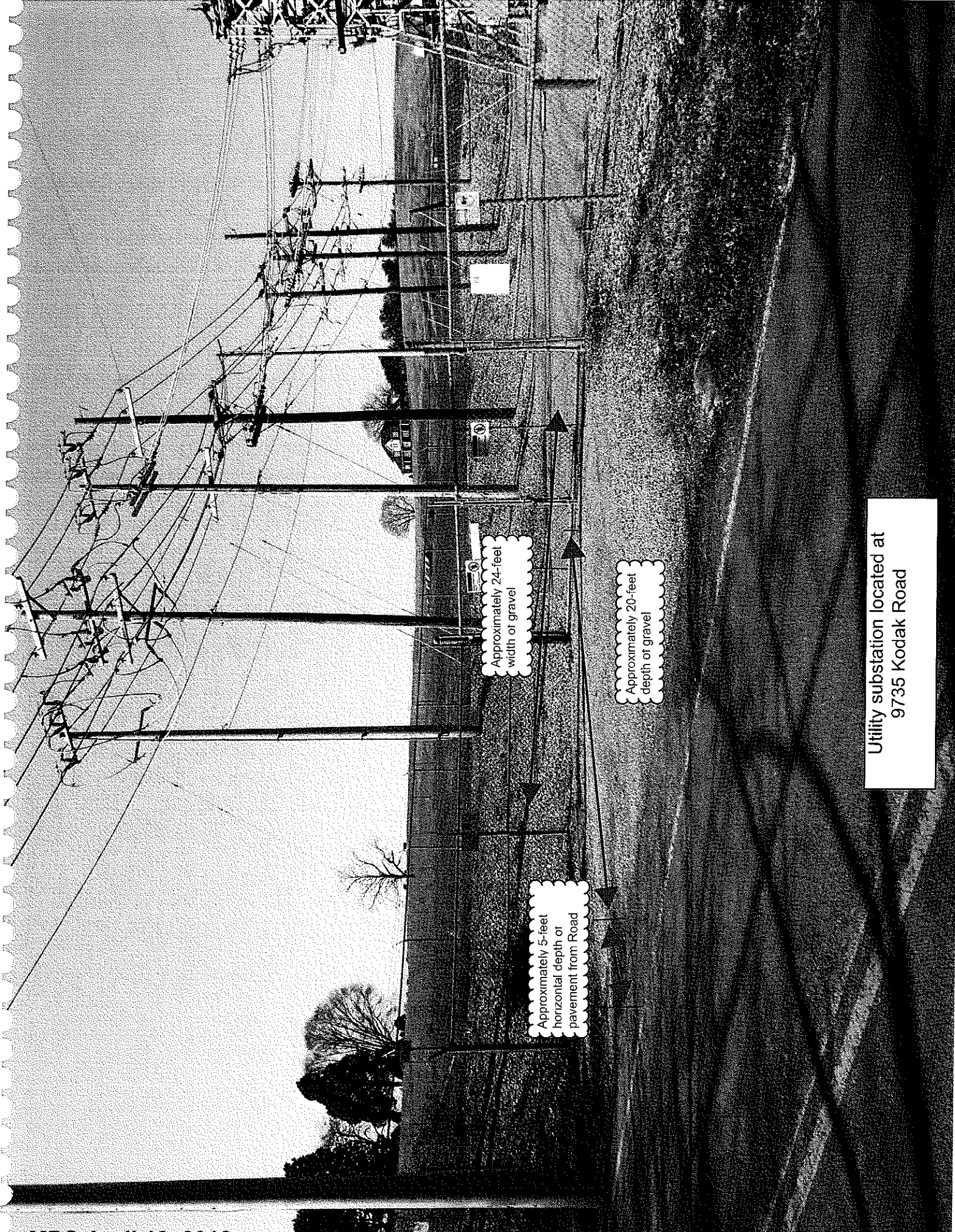
Approximately 36-foot depth from Road or asphalt

Utility substation located at 400 South Peters Road

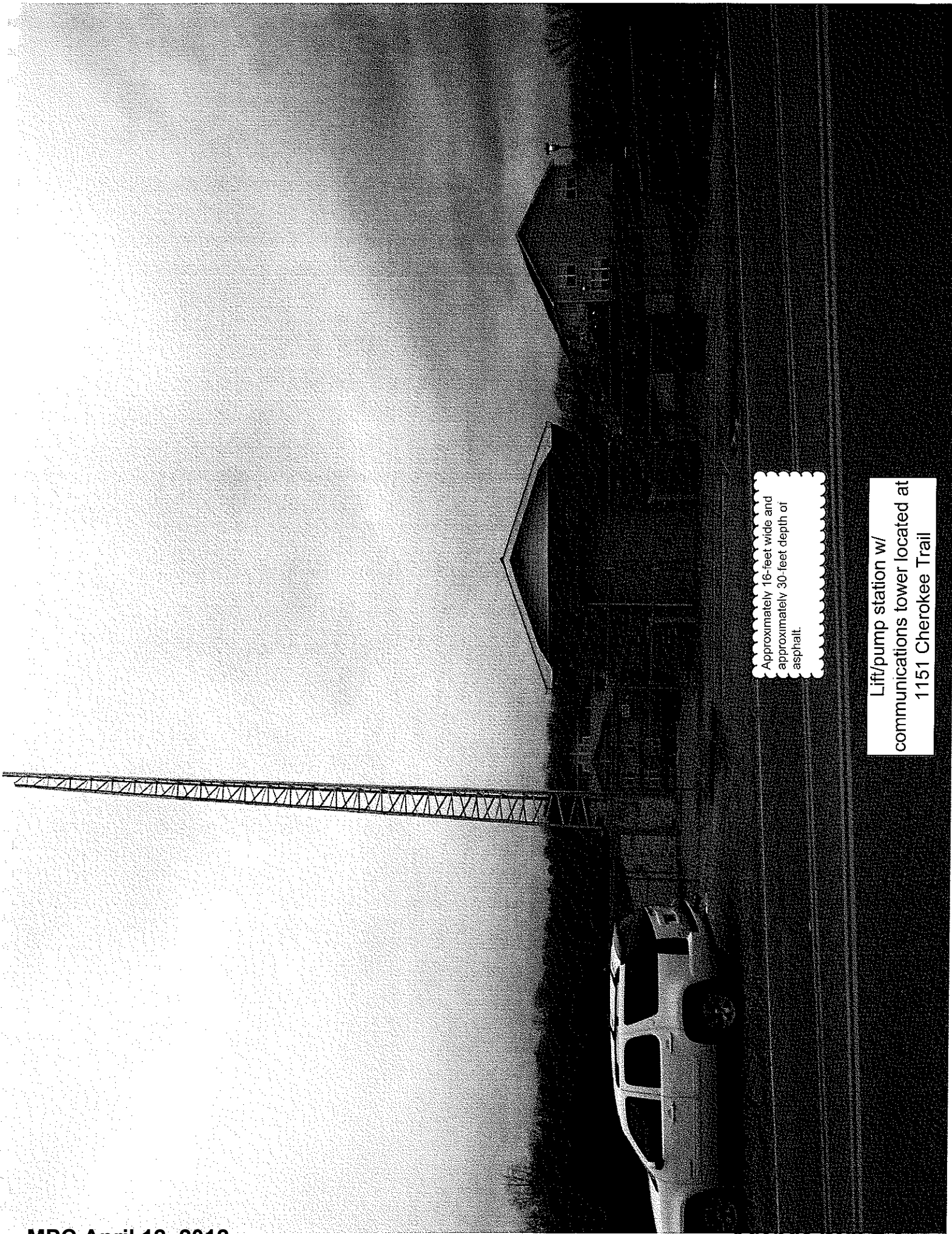


Approximate 24-ft
Width of gravel

Utility substation located at
9735 Kodak Road



Utility substation located at
9735 Kodak Road

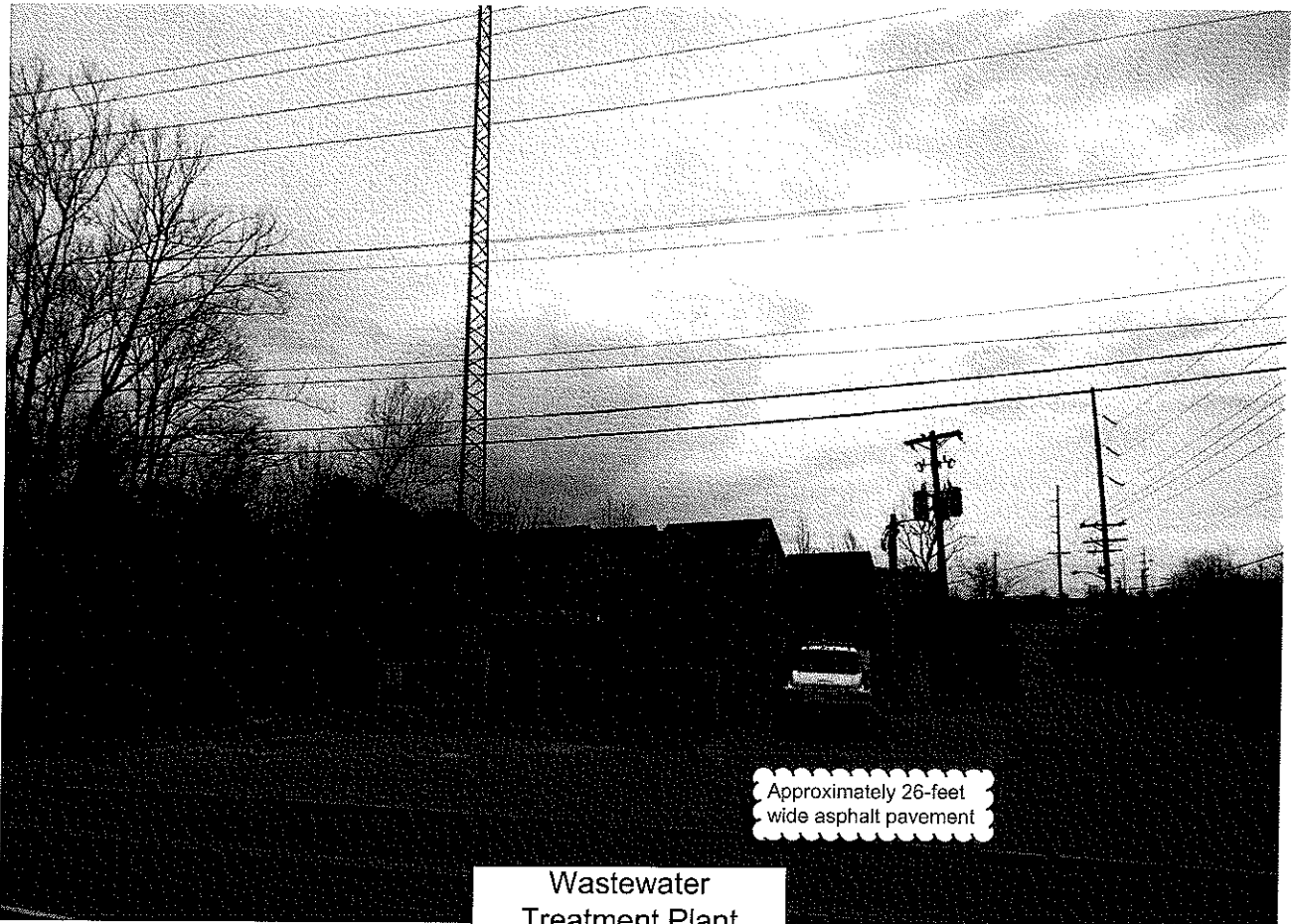


Approximately 16-foot wide and
approximately 30-foot depth of
asphalt.

Lift/pump station w/
communications tower located at
1151 Cherokee Trail

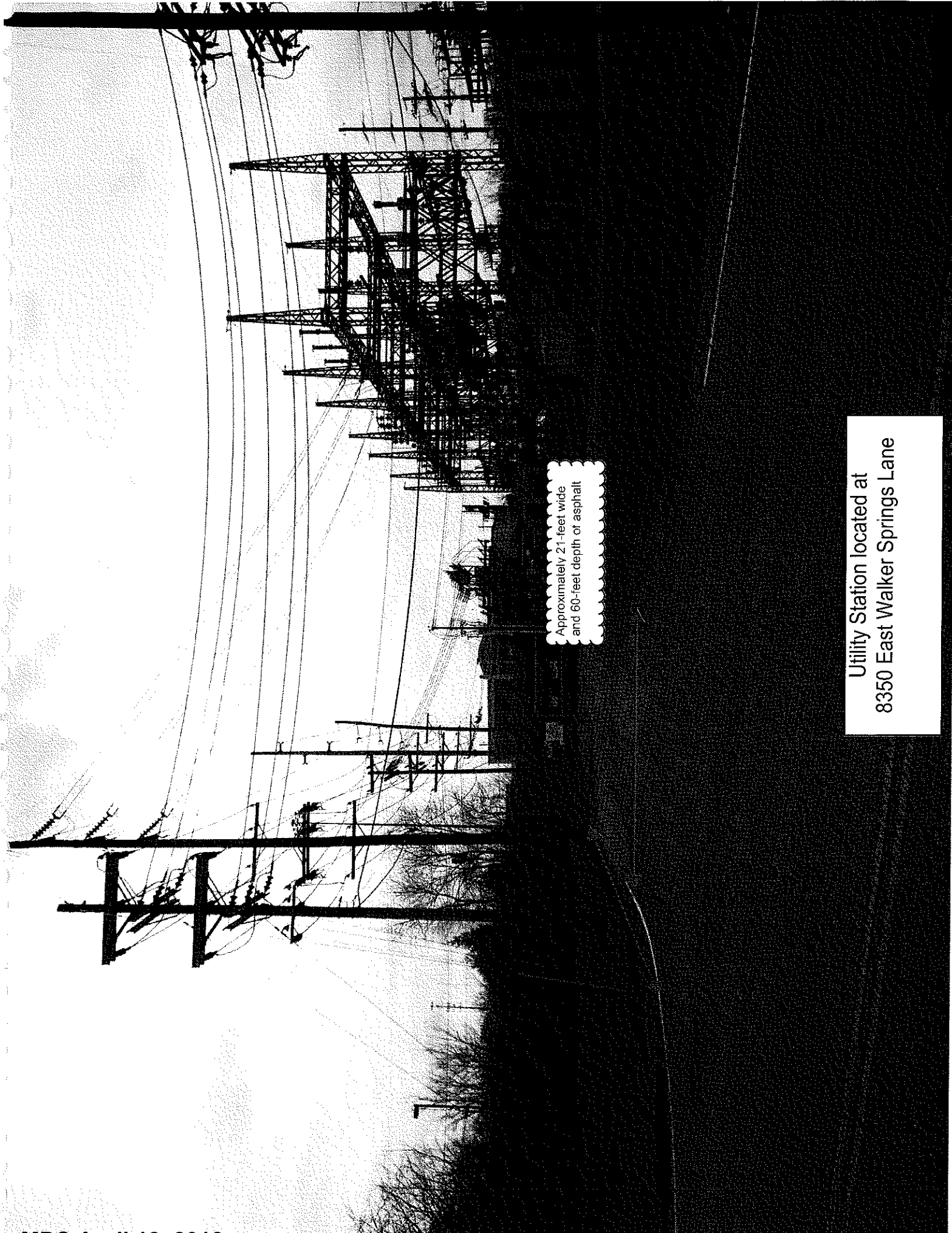


Approximately 45-feet depth of asphalt



Approximately 26-feet wide asphalt pavement

Wastewater Treatment Plant
310 Broome Road



Approximately 21-foot wide
and 60-foot depth of asphalt

Utility Station located at
8350 East Walker Springs Lane



SITE NAME: DAVE SMITH ROAD
 SITE NUMBER: TN-2002
 SITE ADDRESS: 2404 DAVE SMITH ROAD
 KNOXVILLE, TN 37764

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY AND INTENDED FOR THE USE OF THE CLIENT. NO OTHER THAN THAT WHICH RELATES TO THE CLIENT IS STRICTLY PROHIBITED.

NO.	DATE	REVISION
1		PRELIMINARY
2		FINAL
3		CONSTRUCTION
4		AS BUILT

PROJECT: ROADWAY SURFACE EXHIBIT
 DRAWN BY: JUSTIN WILSON
 CHECKED BY: MARK CATES
 SCALE: 1"=40'-0"

Attachment D

