Appendix D: Preliminary Geotechnical Assessment

P-007-2014

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M E M O R A N D U M

TO: John Moore, P.E.
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Geotechnical Branch Manager

DATE: August 29, 2014

SUBJECT: **Ohio County**
Bluegrass Crossing Business Center Improved Access Road
12FO C35 D625 02 FH02 0410 CO92 E143
Mars # 8931407P
Preliminary Geotechnical Assessment

The Division of Planning is conducting a study for the subject project. This project is located in Ohio County, KY between Old Liberty Church Road and the Western Kentucky Parkway at the Bluegrass Crossing Business Center. The study area is located in the Western Kentucky Coal Field Physiographic Region. This abbreviated review will discuss some general geotechnical concerns with the area.

The approximate coordinates for the center of this site is site are: 37.368814 degrees North and -86.8376.78 degrees West. The site is located in the Cromwell Geologic Quadrangle as depicted on the attached map.

The available mapping indicates that the bedrock in this area is of the Tradewater and Caseyville formations. No notable faults were mapped in the immediate vicinity of the project. Extensive coal mining has taken place in the region but nothing was found to indicate that any mining has taken place at this location. It appears that some grading may have taken place on the site in the past and the area had likely been cultivated in the past.

Soil strata in this area tend to be relatively thin. Bedded material can be seen in outcrops for the Parkway Ramps. The soils encountered in the area are generally suitable for embankment construction. Generally, embankments built from the native soils and durable bedrock can be constructed to a height of 30 feet or greater with 2H:1V side slopes if the foundation is suitable and proper compaction methods are used. Building embankments with non-durable shales may require special methods to obtain acceptable long term results. Soil cuts over approximately 10 feet often require analyses to design proper side slopes. In no case should soil cuts be steeper than 2H:1V. Soil cuts along Old Liberty Church road showed some signs of instability. Suitable rock for embankment construction and rock roadbed is often available in this area of the state. Soils in the area are considered erodible. Wet areas may be present and could require remediation.

California Bearing Ratio (CBR) values used in pavement design generally range from 2-4 for soil subgrades. Chemical modification or undercutting and replacement with rock are often used in this area.

Rock cuts in the area can be problematic due to weatherable shales.

Foundations for bridges in the study area are generally rock bearing (end bearing piles, drilled shafts or spread foundations). Smaller structures such as retaining walls and box culverts are commonly founded on soil or bedrock.

A list of previously completed Geotechnical Investigations near the study area is located below. The reports can be accessed through the KYTC Geotechnical Branch Database which can be accessed through the KYTC Division of Structural Designs home page (Click on Geotech and Search KYTC Completed Projects).

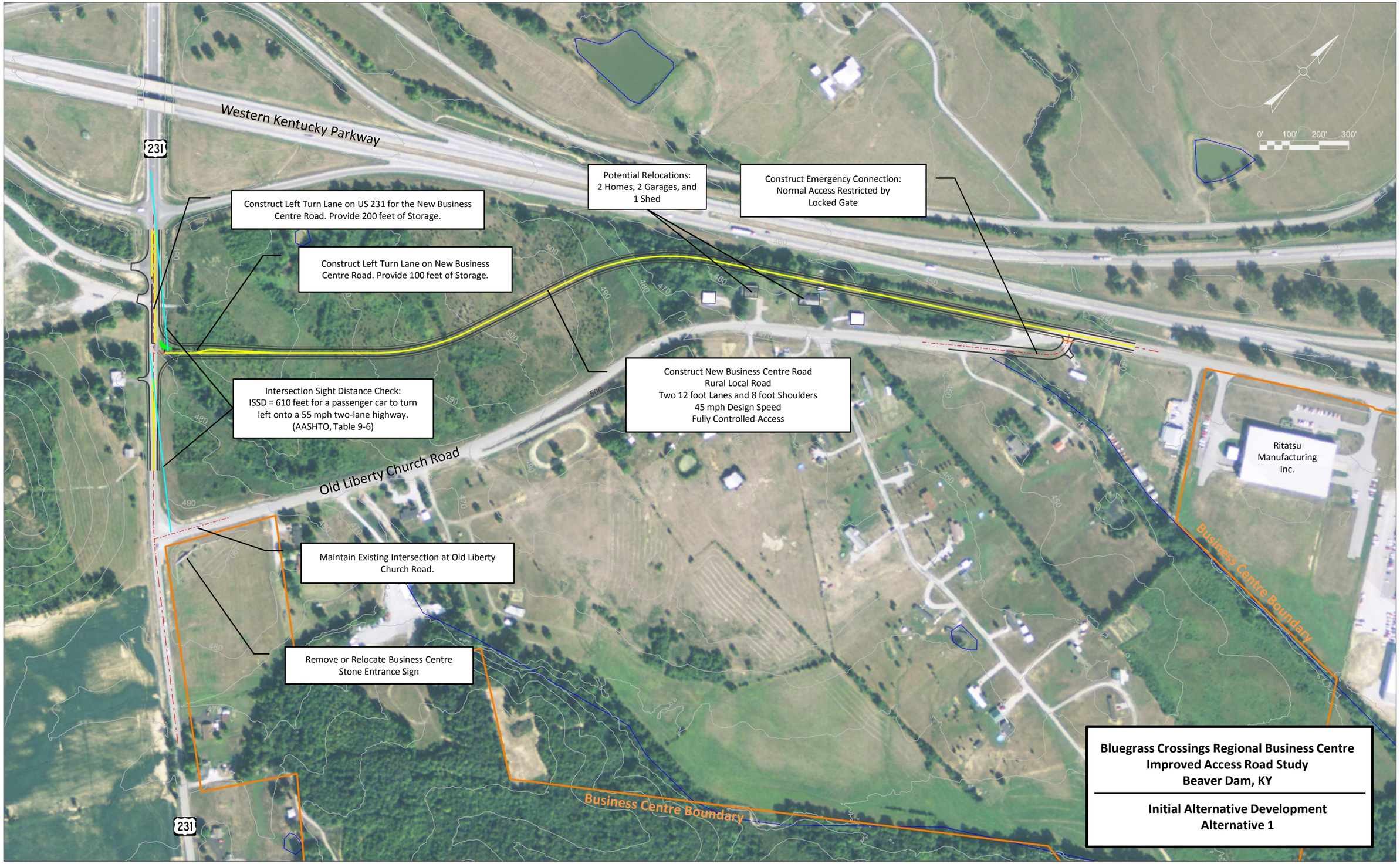
Previous Reports:

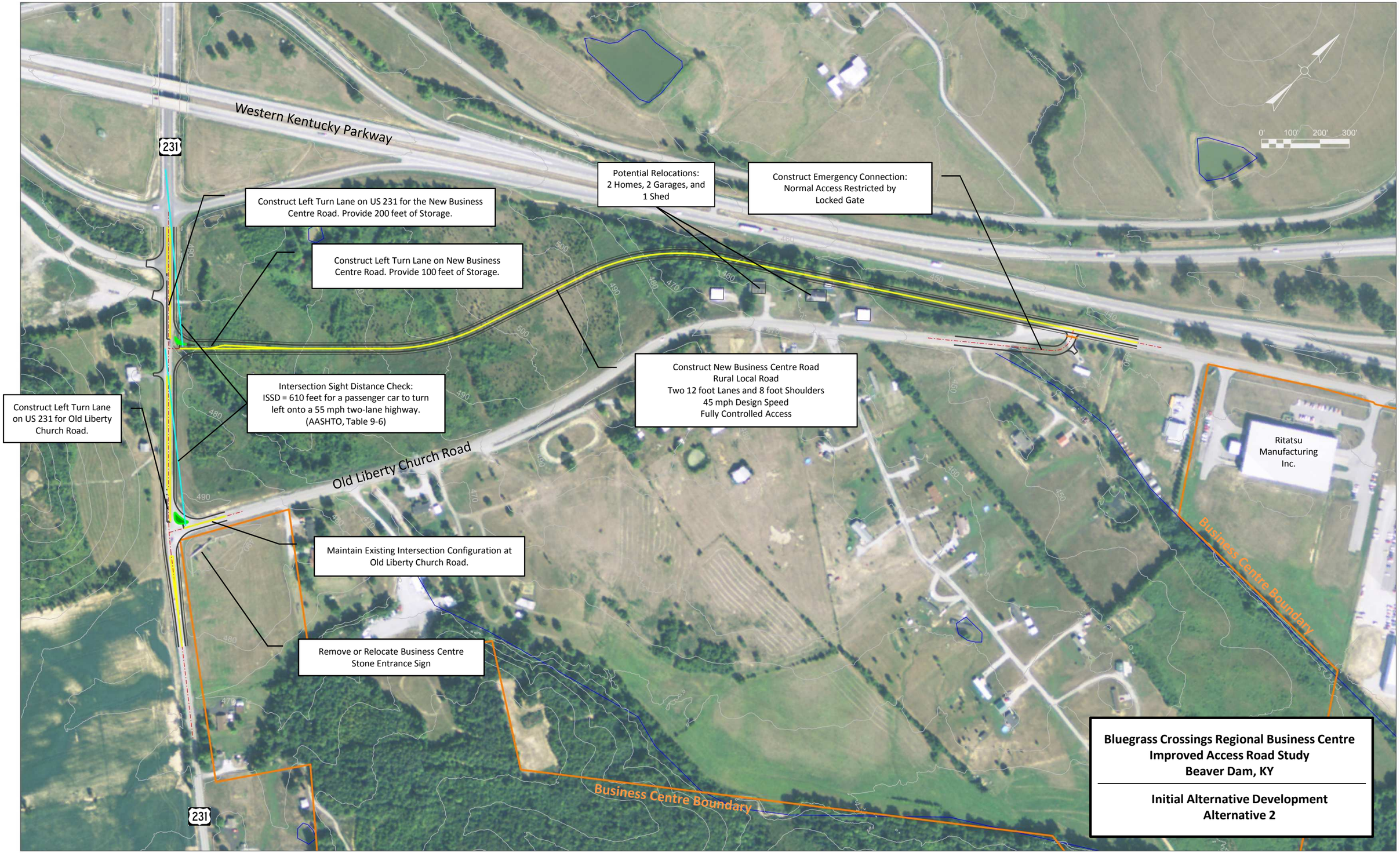
R-010-1990 – Beaver Dam to Hartford US 231 Geotechnical Roadway Report

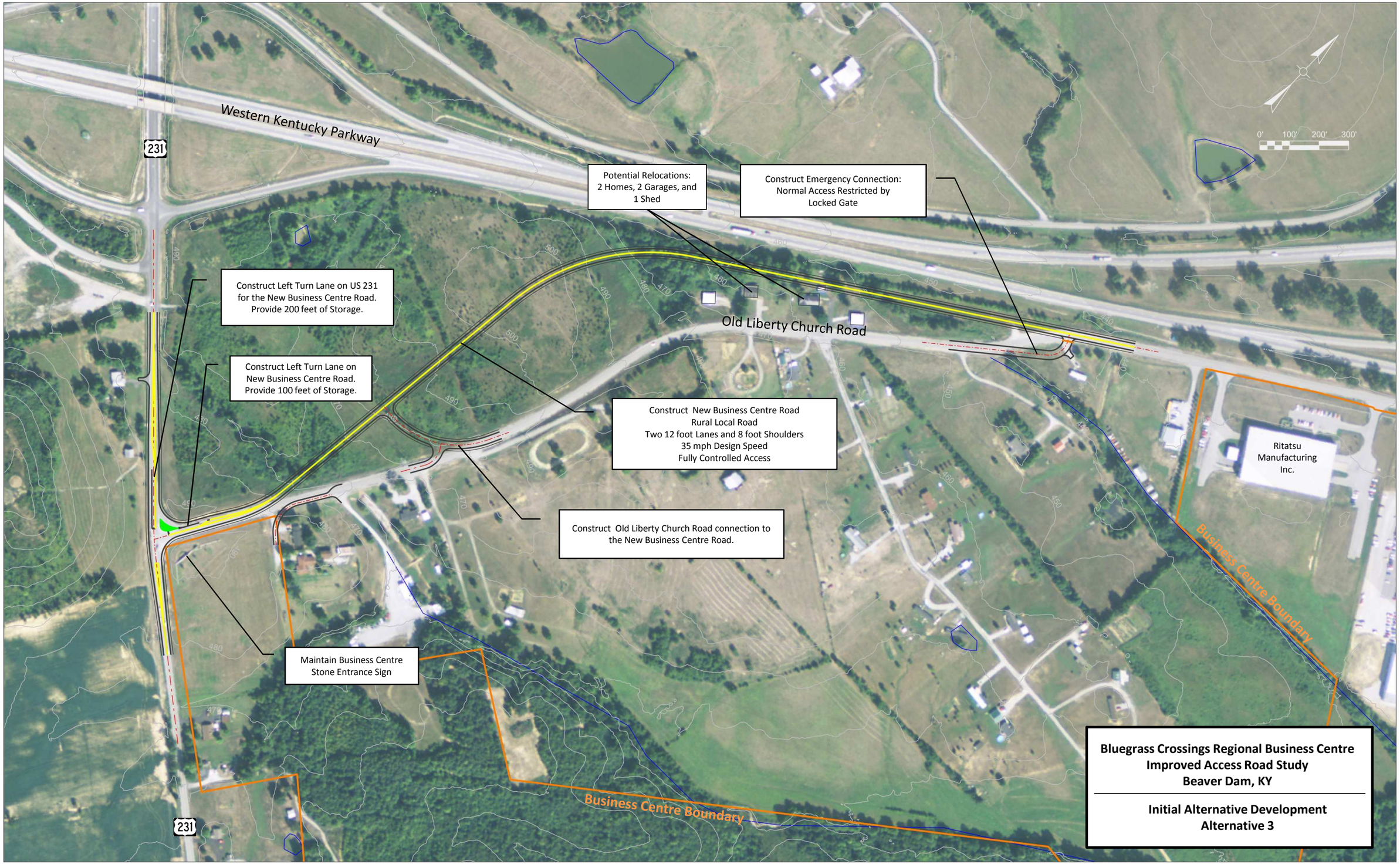
Site specific Geotechnical investigations are critical in this region for design.

Attachments:

Project Site Map
Geologic Quadrangle Project Site Map


Western Kentucky Parkway
231
Construct Left Turn Lane on US 231 for the New Business Centre Road. Provide 200 feet of Storage.
Construct Left Turn Lane on New Business Centre Road. Provide 100 feet of Storage.
Intersection Sight Distance Check:
ISSD = 610 feet for a passenger car to turn left onto a 55 mph two-lane highway.
(AASHTO, Table 9-6)
Potential Relocations:
2 Homes, 2 Garages, and 1 Shed
Construct Emergency Connection:
Normal Access Restricted by Locked Gate
Construct New Business Centre Road
Rural Local Road
Two 12 foot Lanes and 8 foot Shoulders
45 mph Design Speed
Fully Controlled Access
Old Liberty Church Road
Maintain Existing Intersection at Old Liberty Church Road.
Remove or Relocate Business Centre Stone Entrance Sign
Ritatsu Manufacturing Inc.
Business Centre Boundary
Business Centre Boundary
0' 100' 200' 300'
Bluegrass Crossings Regional Business Centre
Improved Access Road Study
Beaver Dam, KY
Initial Alternative Development
Alternative 1


Western Kentucky Parkway
231
Construct Left Turn Lane on US 231 for the New Business Centre Road. Provide 200 feet of Storage.
Construct Left Turn Lane on New Business Centre Road. Provide 100 feet of Storage.
Potential Relocations: 2 Homes, 2 Garages, and 1 Shed
Construct Emergency Connection: Normal Access Restricted by Locked Gate
Construct New Business Centre Road
Rural Local Road
Two 12 foot Lanes and 8 foot Shoulders
45 mph Design Speed
Fully Controlled Access
Intersection Sight Distance Check: ISSD = 610 feet for a passenger car to turn left onto a 55 mph two-lane highway. (AASHTO, Table 9-6)
Construct Left Turn Lane on US 231 for Old Liberty Church Road.
Old Liberty Church Road
Maintain Existing Intersection Configuration at Old Liberty Church Road.
Remove or Relocate Business Centre Stone Entrance Sign
Ritatsu Manufacturing Inc.
Business Centre Boundary
Business Centre Boundary
0' 100' 200' 300'
Bluegrass Crossings Regional Business Centre
Improved Access Road Study
Beaver Dam, KY
Initial Alternative Development
Alternative 2


Western Kentucky Parkway
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Potential Relocations:
2 Homes, 2 Garages, and
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Construct Emergency Connection:
Normal Access Restricted by
Locked Gate
Old Liberty Church Road
Construct Left Turn Lane on US 231
for the New Business Centre Road.
Provide 200 feet of Storage.
Construct Left Turn Lane on
New Business Centre Road.
Provide 100 feet of Storage.
Construct New Business Centre Road
Rural Local Road
Two 12 foot Lanes and 8 foot Shoulders
35 mph Design Speed
Fully Controlled Access
Construct Old Liberty Church Road connection to
the New Business Centre Road.
Maintain Business Centre
Stone Entrance Sign
Ritatsu
Manufacturing
Inc.
Business Centre Boundary
Business Centre Boundary
0'
100'
200'
300'
Bluegrass Crossings Regional Business Centre
Improved Access Road Study
Beaver Dam, KY
Initial Alternative Development
Alternative 3

Bluegrass Crossings Regional Business Center
Improved Access Road Study

N

Horton

Cromwell

KATES HILL LN

KATES HILL LOOP

WHITE ST

SUNCREST AVE

SILVER ST

HOCKER ST

MILLER ST

APPLEHOUSE RD

WENDELL FORD WESTERN KENTUCKY PKWY

WENDELL FORD WESTERN KENTUCKY PKWY NC

OLD LIBERTY CHURCH RD

KEYSTONE DR

RED LN

PARKWAY DR

LEWIS CREEK LN

2718

231

Qal

Pct

Legend

- Parkways
- US Highways
- State Roads
- Local Roads
- Qal — Alluvium
- Pct — Tradewater and Caseyville Formation

0 500 1,000 2,000 Feet

USGS, DGI, Kentucky Geological Survey, U.S. Geological Survey