

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

▶ **FILE #:** 3-B-17-UR **AGENDA ITEM #:** 63
 POSTPONEMENT(S): 3/9/2017 **AGENDA DATE:** 4/13/2017
 ▶ **APPLICANT:** URBAN ENGINEERING, INC.
 OWNER(S): John McBride

TAX ID NUMBER: 106 O A 039 & 040 (PART OF) [View map on KGIS](#)
 JURISDICTION: City Council District 2
 STREET ADDRESS: 800 Broome Rd
 ▶ **LOCATION:** East side Broome Rd., south of Middlebrook Pike
 ▶ **APPX. SIZE OF TRACT:** 4.9 acres
 SECTOR PLAN: Northwest City
 GROWTH POLICY PLAN: Urban Growth Area (Inside City Limits)
 ACCESSIBILITY: Access is via Broome Rd., a major collector street with 18' of pavement width within 50' of right-of-way.
 UTILITIES: Water Source: Knoxville Utilities Board
 Sewer Source: Knoxville Utilities Board
 WATERSHED: Ten Mile Creek

▶ **ZONING:** RP-1 (Planned Residential) < 6 du/ac
 ▶ **EXISTING LAND USE:** Dwelling and vacant land
 ▶ **PROPOSED USE:** Assisted living facility

HISTORY OF ZONING: Rezoning of the property to RP-1 < 6 du/ac was approved by MPC in February 2017 and will be considered by City Council in March 2017.
 SURROUNDING LAND USE AND ZONING: North: Houses, vacant land / RP-1 (Planned Residential) <6 du/ac (pending)
 South: Vacant land, houses / RP-1 (Planned Residential) <6 du/ac (pending) & R-1E (Low Density Exclusive Residential)
 East: Houses / R-1E (Low Density Exclusive Residential)
 West: Houses, church / R-1 (Low Density Residential)
 NEIGHBORHOOD CONTEXT: This area is developed with low density residential uses under R-1, R-1E and RP-1 zoning.

STAFF RECOMMENDATION:

- ▶ **APPROVE the development plan for up to 104-room (116-bed) assisted living facility limited to occupancy by senior citizens as shown on the site plan subject to 10 conditions.**
1. Connection to sanitary sewer and meeting any other relevant requirements of the Knox County Health Department.
 2. All residents shall be required to participate in a meal plan that provides a minimum of two meals a day provided by the facility.
 3. Construction of all sidewalks shown on the site plan. All sidewalk construction must comply with the

Americans with Disabilities Act.

4. Obtaining an approved Final Plat for the proposed lot.
5. Obtaining any necessary easements or right-of-way to ensure adequate sight distance along Broome Road, as required by the City of Knoxville Department of Engineering.
6. Meeting all applicable requirements of the Knoxville Urban Forester.
7. Provide landscaping in accordance with the City of Knoxville Tree Protection Ordinance and Article 5, Section 7.A.5 (Miscellaneous Design Requirements for Surface Parking Facilities) of the City of Knoxville Zoning Ordinance.
8. Installation of landscaping within six months of the issuance of occupancy permits for this project.
9. Meeting all other applicable requirements of the Knoxville Department of Engineering.
10. Meeting all other applicable requirements of the Knoxville Zoning Ordinance.

With the conditions noted, this plan meets the requirements for approval of an independent living senior apartments (classified as an assisted living facility per the interpretation of the Chief Building Official) via the Use-on-Review process in the RP-1 (Planned Residential) district.

COMMENTS:

The proposed development will provide apartments for senior citizens. The development will contain 104 rooms (116 beds) in a two story structure, including studio, one and two bedroom units. Approximately 35% of the units will meet the definition of a dwelling unit. In order to be defined as a dwelling unit, living space, sanitation and cooking facilities must be provided. Most of these units will not have cooking facilities. All residents of this development will be provided at least 2 meals per day as part of their rent.

The development will be marketed as "independent living senior apartments" which is similar to an assisted living facility in that senior citizens are required to be the primary occupants, however, are differentiated in that assisted living facilities is licensed by the state and provides nursing services and assistance with medications whereas an independent living facility is not licensed and do not provide healthcare assistance to residents. The Chief Building Official for the City of Knoxville has opined that an independent living facility will be considered an assisted living facility for the purposes of determining use if all residents are required to participate in a meal plan.

Access to this site will be via Broome Road which will be widened to a minimum width of 20 feet from their entrance to Middlebrook Pike. A deceleration lane will also be provided on the south side of the entrance for vehicles traveling northeast on Broome Road, turning right into the facility. The exit will be designed to force traffic north on Broome Road to Middlebrook Pike. A sidewalk will be provided along the entire Broome Road frontage of the subject property, as well as making the connection to the Middlebrook Pike sidewalk.

EFFECT OF THE PROPOSAL ON THE SUBJECT PROPERTY, SURROUNDING PROPERTIES AND THE COMMUNITY AS A WHOLE

1. The proposal will have no impact on schools.
2. Senior housing does not have a significant traffic impact as compared to other residential use types. The proposed facility will generate an estimated 319 trips per day. The majority of those trips should be to and from Middlebrook Pike since the exit from the facility restricts left turn movements onto Broome Road.
3. All utilities are in place to serve this site.

CONFORMITY OF THE PROPOSAL TO CRITERIA ESTABLISHED BY THE KNOXVILLE ZONING ORDINANCE

1. This proposed independent senior living facility (assisted living facility) in a RP-1 zone district is consistent with the general standards for uses permitted on review: The proposed development is consistent with the adopted plans and policies of the General Plan and Sector Plan. The use is in harmony with the general purpose and intent of the Zoning Ordinance. The use is compatible with the character of the neighborhood where it is proposed. The use will not significantly injure the value of adjacent property. The use will not draw additional traffic through residential areas.

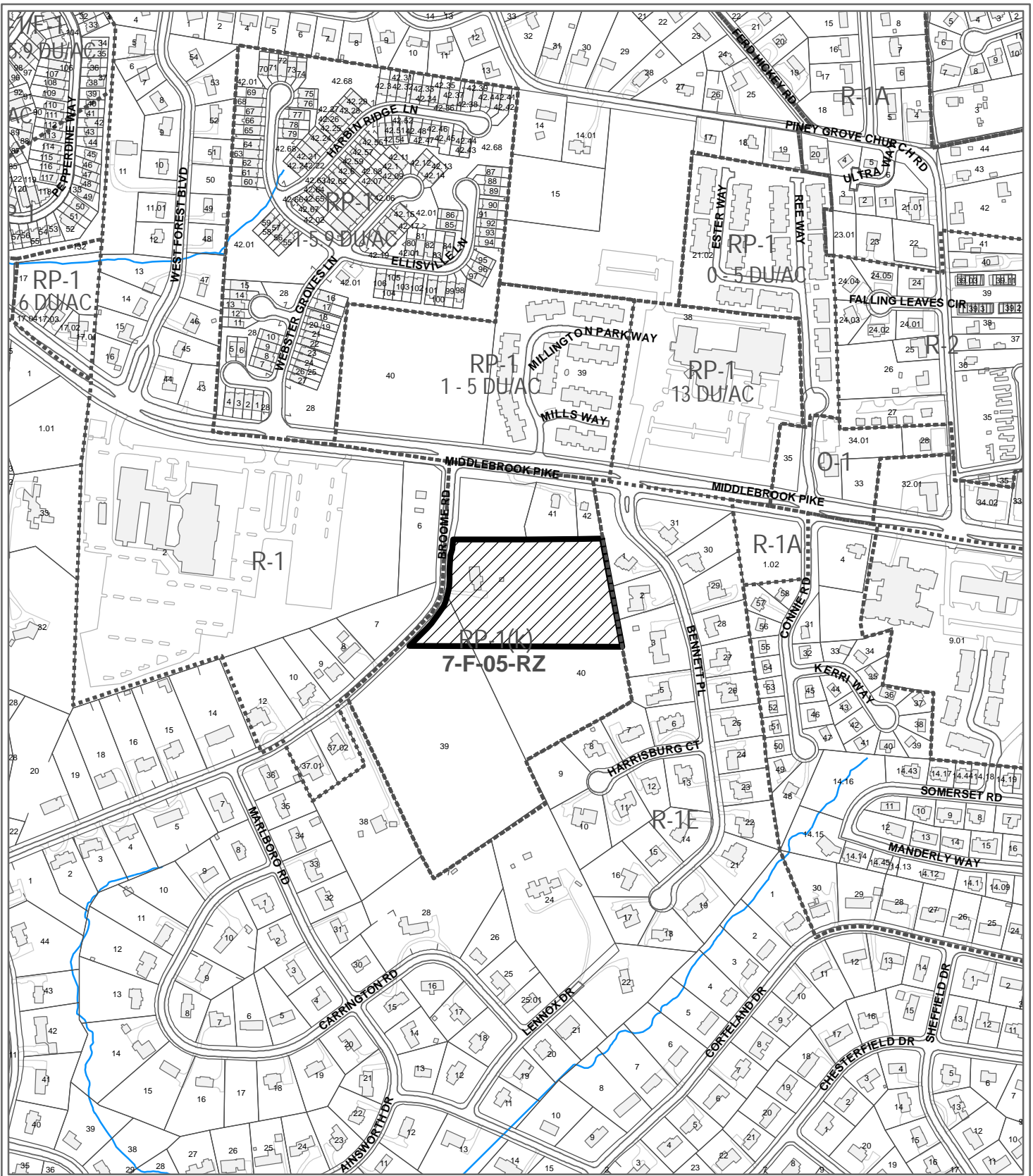
CONFORMITY OF THE PROPOSAL TO ADOPTED MPC PLANS

1. The One Year Plan and West City Sector Plan propose LDR (Low Density Residential) uses for this site.
2. The site is located within the city limits of Knoxville on the Urban Growth Area on the Knoxville, Knox County, Farragut Growth Policy Plan map.

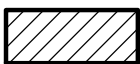
ESTIMATED TRAFFIC IMPACT: A traffic impact study was prepared by the applicant. The findings of that study were used in formulating the recommendations of this staff report.

ESTIMATED STUDENT YIELD: Not applicable.

MPC's approval or denial of this request is final, unless the action is appealed to the Knoxville City Council. The date of the Knoxville City Council hearing will depend on when the appeal application is filed. Appellants have 15 days to appeal an MPC decision in the City.



**3-B-17-UR
USE ON REVIEW**



Assisted living facility in RP-1 (Planned Residential) < 6 du/ac

Petitioner: Urban Engineering, Inc.

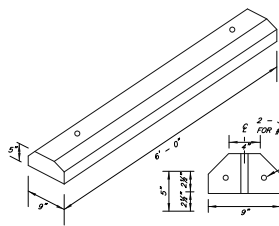
Original Print Date: 2/15/2017
 Metropolitan Planning Commission * City / County Building * Knoxville, TN 37902

Revised:

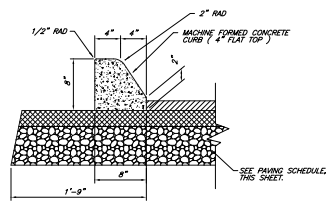
Map No: 106
 Jurisdiction: City

0 500
Feet

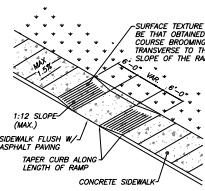




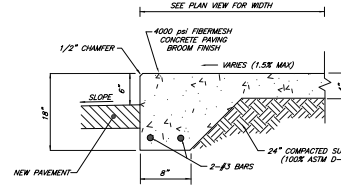
CONCRETE TIRE STOP
N.T.S.



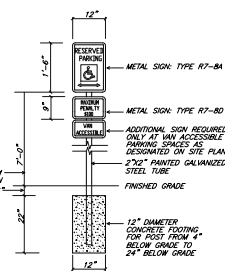
TYPE 'B' CURB AND PAVEMENT DETAIL
N.T.S.



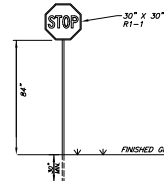
HANDICAPPED RAMP
N.T.S.



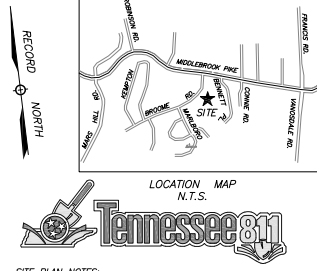
TURNDOWN SIDEWALK DETAIL
N.T.S.



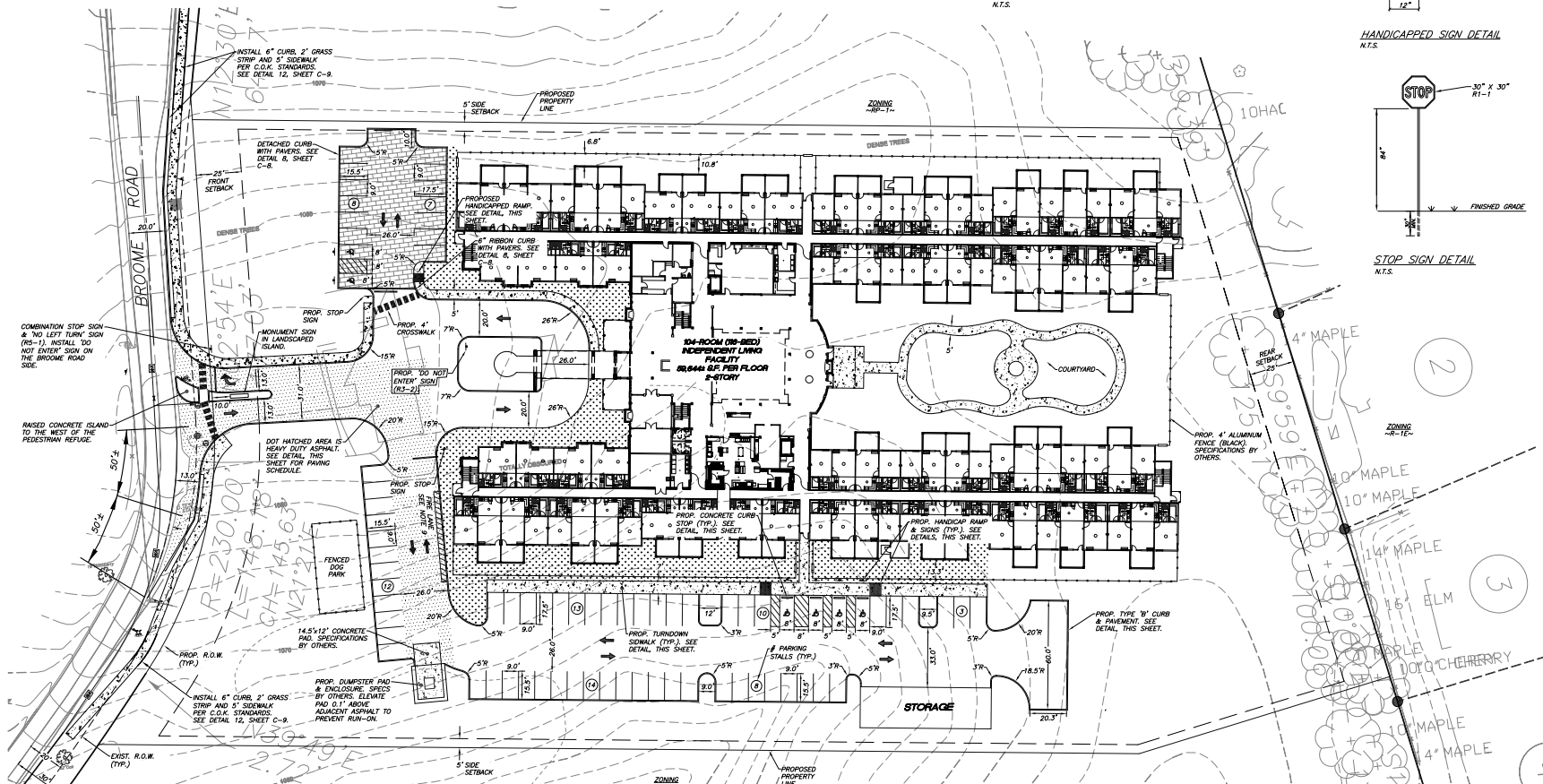
HANDICAPPED SIGN DETAIL
N.T.S.



STOP SIGN DETAIL
N.T.S.



- LOCATION MAP
N.T.S.
- Tennessee81**
- SITE PLAN NOTES:**
1. THE LOCATIONS OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED ON FIELD LOCATION OF VISIBLE STRUCTURES SUCH AS CATCH BASINS, MANHOLES, WATER VALVES, ETC., AND COMPLYING INFORMATION FROM PLANS SUBMITTED BY MEMBERS, UTILITY COMPANIES AND GOVERNMENT AGENCIES. THE CONTRACTORS SHALL VERIFY BY WRITING ALL UTILITIES COMPANIES AND GOVERNMENT AGENCIES AND ALSO CALL TOWN ONE-CALL PRIOR TO ANY EXCAVATION WORK. TO VERIFY INFORMATION SHOWN AND DETERMINE THE LAYOUT OF THE IRRIGATION SYSTEM AND IF ADDITIONAL IMPROVEMENTS MAY EXIST.
 2. ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF KNOXVILLE'S SPECIFICATIONS FOR SITE DEVELOPMENT.
 3. PARKING SUMMARY: 1 PER 4 BEDS + 1 PER EACH EMPLOYEE OF LARGEST SHIFT:
(1/4) x (116) + 6 = 35 SPACES (INCLUDING 2-H.C.)
PROPOSED PARKING = 75 SPACES (INCLUDING 6-H.C.)
 4. FIRST FLOOR SQUARE FOOTAGE: 59,644 S.F.
 5. ALL LANDSCAPING SHALL CONFORM TO THE CITY OF KNOXVILLE'S TREE PROTECTION ORDINANCE.
 6. TREE INSTALLATION / REPLACEMENT SUMMARY:
PER THE CITY OF KNOXVILLE ZONING ORDINANCE:
FOR EACH TEN THOUSAND (10,000) SQUARE FEET OF PARKING, OR FRACTION THEREOF, A MINIMUM QUALITY FURNISHED (QDF) SQUARE FEET OF LANDSCAPING SHALL BE REQUIRED. FOR EACH FIVE THOUSAND (5,000) SQUARE FEET OF PARKING AREA A TREE SHALL BE PROVIDED THAT WILL OBTAIN A MINIMUM HEIGHT OF FIFTY (50) FEET AT MATURITY.
PROPOSED PARKING AREA = 36,390 S.F.
REQUIRED LANDSCAPING = 1,020 S.F.
PROPOSED LANDSCAPING = 8,794 S.F.
REQUIRED TREES = 36,390 / 5,000 = 8
PER THE CITY OF KNOXVILLE TREE PROTECTION ORDINANCE:
TREES SHALL BE PROVIDED AT THE RATE OF FIFTY (50) TREES PER ACRE, WITH AT LEAST ONE HALF OF THE REQUIRED NUMBER BEING SPECIES CAPABLE OF ATTAINING A HEIGHT OF FIFTY (50) FEET OR MORE AT MATURITY.
TOTAL DISTURBED AREA = 4.95-ACRES
REQUIRED TREES = 4.95 x 50 = 248 (248 CAPABLE OF REACHING 50')
EXISTING TREES TO REMAIN = 8
TOTAL NUMBER OF NEW TREES = 40-8=32 TREES, 8 OF WHICH ARE WITHIN OR ADJACENT TO PARKING AREAS AND 19 TREES CAPABLE OF REACHING 50' IN HEIGHT AT MATURITY.
 7. OPEN SPACE REQUIREMENT (15% OF TOTAL AREA):
TOTAL AREA = 39,610 S.F.
REQUIRED OPEN SPACE = 0.15 x 216,810 = 32,521 S.F.
PROPOSED OPEN SPACE = 38,402 S.F.
 8. DRIVEWAY AND CURB CUT VARIANCES WERE APPROVED BY THE CITY OF KNOXVILLE BZA ON 3/16/17.
 9. FIRE LANES SHALL BE 3' WIDE WITH 1'-9" LETTERING AS SHOWN ON THE PLAN.



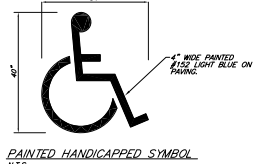
3-B-17-UR
Revised: 3/29/2017



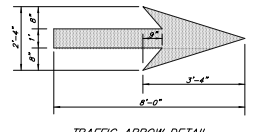
SHEET C-1 (SHEET 2 OF 10)

PAVING SCHEDULE
N.T.S.

DIMENSION	MEDIUM DUTY	HEAVY DUTY
A	1 1/2"	2"
B	2"	3"
C	6"	8"



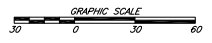
PAINTED HANDICAPPED SYMBOL
N.T.S.



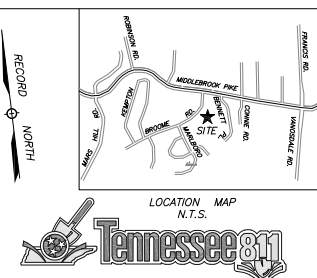
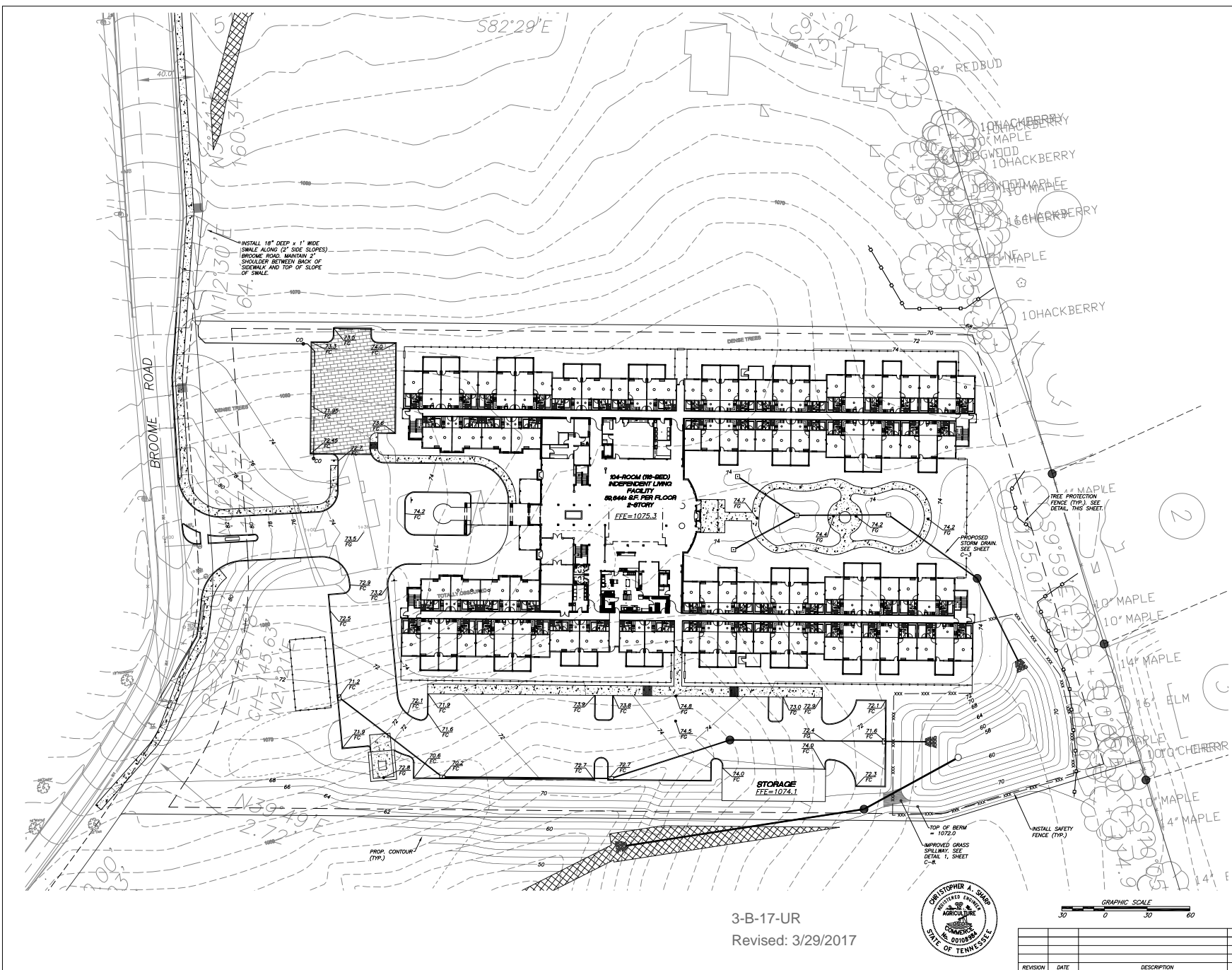
TRAFFIC ARROW DETAIL
N.T.S.

LOT COVERAGE SUMMARY

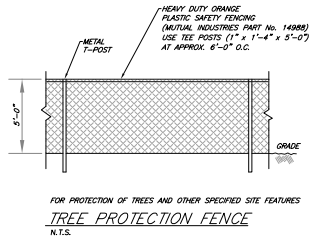
CURRENT USE	RESIDENCE
PROPOSED USE	INDEPENDENT LIVING SENIOR APARTMENTS
ZONING	RP-1
TOTAL AREA	4.9-ACRES
MAIN BUILDING AREA	59,644 S.F. (1ST FLOOR)
ACCESSORY BUILDING AREA	1,647 S.F.
WALKS AND ASPHALT	56,852 S.F.
TOTAL IMPERVIOUS AREA	118,143 S.F.
PERCENT IMPERVIOUS	50%



REVISION	DATE	DESCRIPTION	BY	DWN: BGS	CHK: GAS	DWG. NO. 1612035



- GRADING PLAN NOTES:**
1. THE LOCATIONS OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED ON FIELD LOCATION OF VISIBLE STRUCTURES SUCH AS CATCH BASINS, MANHOLES, WATER MAINS, ETC. AND COMPILED INFORMATION FROM PLANS SUPPLIED BY VARIOUS UTILITY COMPANIES AND GOVERNMENT AGENCIES. THE CONTRACTOR SHALL NOTIFY IN WRITING ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES AND ALSO CALL TOWN ONE-CALL PRIOR TO ANY EXCAVATION WORK TO VERIFY INFORMATION SHOWN AND DETERMINE THE LAYOUT OF THE IRIGATION SYSTEM AND IF ADDITIONAL IMPROVEMENTS ARE NEEDED.
 2. ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF KNOXVILLE'S SPECIFICATIONS FOR SITE DEVELOPMENT.
 3. ALL WORK SHALL BE SOUGHTENED AND COMPLETED IN ACCORDANCE WITH THE SWAMP AND RELATED PERMITS ISSUED BY THE CITY OF KNOXVILLE.
 4. CLEAR AND GRUB PER SPECS. REMOVE TREES, BRUSH, DEBRIS, AND STUMPS FROM THE WORK AREA. REMOVE ALL BUILDINGS, DRIVES, CROSS FENCES, AND MISCELLANEOUS EQUIPMENT.
 5. STRIP AND STOCKPILE TOPSOIL NEEDED FOR RESEEDING AND SEEDING. SURROUND TOPSOIL PILE WITH SILT FENCE, STAKE SALES, TEMPORARY SEEDING OR ADDITIONAL MEASURES AS NEEDED TO PREVENT EROSION/SEMI-DECOMPOSITION.
 6. AFTER STRIPPING AND REMOVAL, PROOF ROLL ENTIRE DISTURBED AREA WITH TANDEM TRUCK FULLY LOADED WITH EARTH. REMOVE ANY AREAS WHICH ARE SOFT OR YIELDING UNDER LOAD AND REPLACE WITH NEW MATERIAL MEETING PROJECT SPECIFICATIONS.
 7. IF UNSATURABLE SUBGRADE MATERIALS ARE ENCOUNTERED, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT WITH APPROVED MATERIAL FROM ONSITE OR APPROVED OFFSITE. BORROW AREA UNSATURABLE MATERIALS ARE THOSE CLASSIFIED AS ML, CL, OL, CL, AND PEAT IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.
 8. COMPACTION REQUIREMENTS ARE SUMMARIZED AS FOLLOWS: (PLACE IN 4" LIFTS)
 - a. TOP 24 INCHES OF SUBGRADE UNDER PAVED AREAS 100 PERCENT STANDARD PROCTOR - 100% MIN. 4 INCHES BELOW PAVED AREA 95 PERCENT STANDARD PROCTOR.
 - b. AREAS WITHIN THE BUILDING ENVELOPE TO BE PREPARED IN ACCORDANCE WITH REQUIREMENTS IN REPORT OF GEOTECHNICAL INVESTIGATION AND/OR AS DIRECTED BY THE SOILS ENGINEER.
 9. ALL FINISHED YARD AREAS SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL. YARD FINISHED GRADES SHOWN ARE AFTER PLACEMENT OF 4 INCHES OF TOPSOIL. ALL FINISHED YARD SURFACES SHALL BE SMOOTHLY AND UNIFORMLY GRADED. FREE FROM IRREGULARITIES AND SHALL BE FULLY FUNCTIONAL TO PROVIDE POSITIVE DRAINAGE AT ALL LOCATIONS.
 10. THE TOTAL AREA DISTURBED AS PART OF THIS PROJECT (4.964 ACRES).
 11. PROPOSED SPOT ELEVATIONS AND PROPOSED CONTOURS ARE AFTER THE INSTALLATION OF TOPSOIL IN GRASSED AREAS, PAVING WITH DRIVES AND FLOWING.
 12. A FINAL PLAN SHALL BE RECORDED TO CREATE TRAVELABLE ACCESS, STORM WATER DETENTION AND WATER QUALITY ELEMENTS, AS SHOWN.
 13. IT IS THE RESPONSIBILITY OF THE OWNER TO OBTAIN PERMISSION FROM THE NEIGHBOR TO WORK ON HIS OR HER PROPERTY.
 14. SLOPE POND BOTTOMS AT 2% (MIN) TOWARD LOW FLOW OFFICES.



FOR PROTECTION OF TREES AND OTHER SPECIFIED SITE FEATURES
TREE PROTECTION FENCE
 N.T.S.

SHEET C-2 (SHEET 3 OF 10)

GRADING PLAN
PARKVIEW BROOME ROAD
 SITE ADDRESS: 800 BROOME ROAD, KNOXVILLE, TN 37909

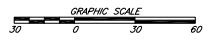
CITY OF KNOXVILLE KNOX CO., TN
 WARD NO. 46 CITY BLOCK NO. 46700
 CLT MAP 106 PARCEL 40
 SCALE: 1"=30' MARCH 20, 2017

DEVELOPER:
 JOHN McBRIDE
 P.O. BOX 502115
 KNOXVILLE, TN 37950
 (865) 330-0013

URBAN ENGINEERING, INC.
 11852 KINGSTON PIKE
 FARRAGUT, TENNESSEE 37922
 (865) 966-1924

DWN: BGS CHW: GAS DWG. NO. 1612035

3-B-17-UR
 Revised: 3/29/2017



REVISION	DATE	DESCRIPTION	BY



1 SOUTH ELEVATION
A31 3/22/17 FRONT



2 WEST ELEVATION
A31 3/22/17 SEE DWG. 3 FOR SIDING COLORS



3 WEST COURTYARD ELEVATION
A31 3/22/17

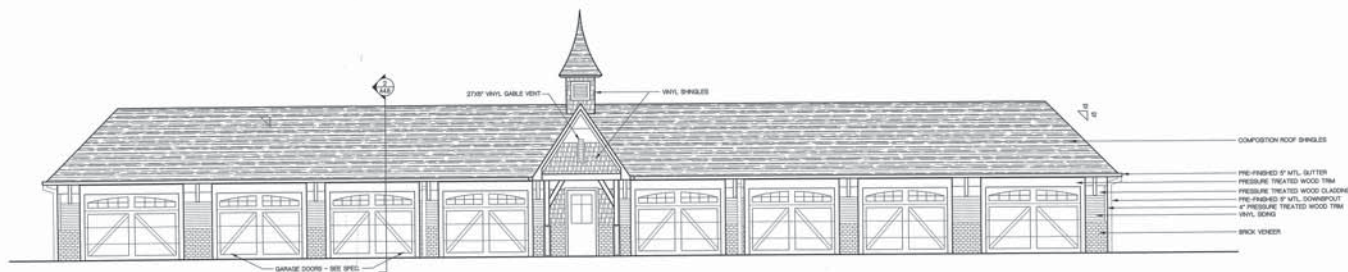
3-A-17-UR
Revised: 2/22/2017

ELEVATIONS

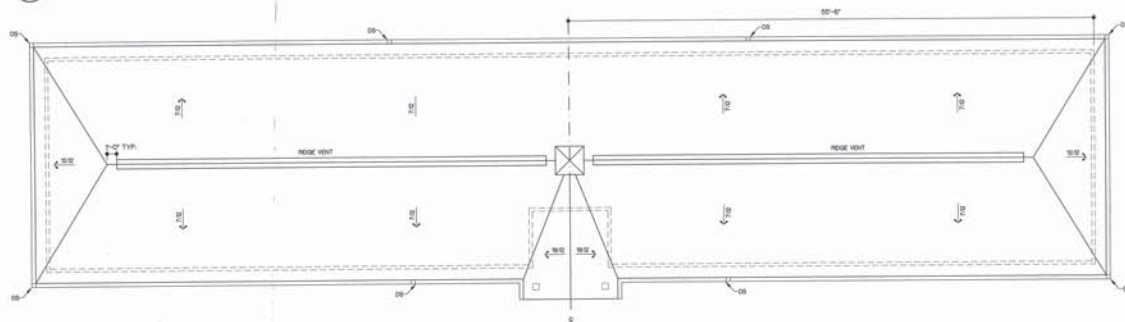
PRELIMINARY
- NOT FOR
CONSTRUCTION

DESIGN FOR REVIEW
YES PROJECT NUMBER

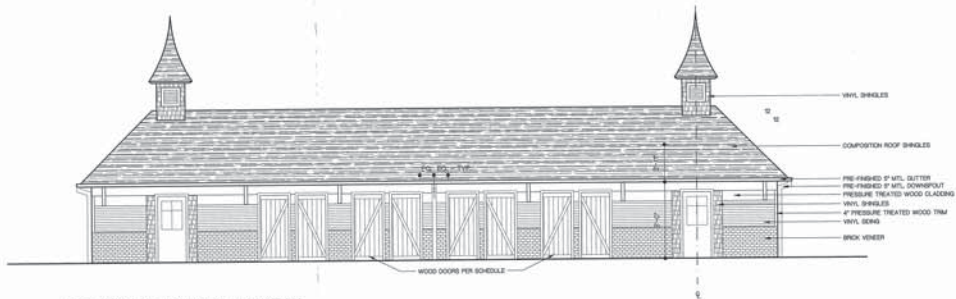
A3.1



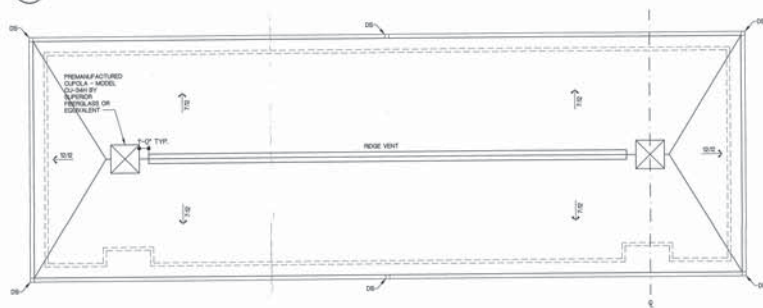
1 GARAGE BUILDING ELEVATION
A3.2 3/8" = 1'-0"



2 GARAGE BUILDING ROOF PLAN
A3.2 3/8" = 1'-0"



3 STORAGE BUILDING ELEVATION
A3.2 3/8" = 1'-0"



4 STORAGE BUILDING ROOF PLAN
A3.2 3/8" = 1'-0"

3-A-17-UR
Revised: 2/22/2017

ROOF PLANS AND
ELEVATIONS

PRELIMINARY
- NOT FOR
CONSTRUCTION

08/25/17 FOR REVIEW
TOP PROJECT NUMBER

A3.2



URBAN ENGINEERING, INC.
CIVIL ENGINEERS • LAND PLANNERS • LAND SURVEYORS

March 2, 2017

City of Knoxville Stormwater Engineering
Curtis Williams, P.E.
City County Building, Suite 480
P.O. Box 1631
Knoxville, TN 37901

3-B-17-UR

Revised: 3/2/2017

and

Knox County / Knoxville MPC
Mike Reynolds, AICP
Suite 403, City County Building
400 Main Street
Knoxville, TN 37902

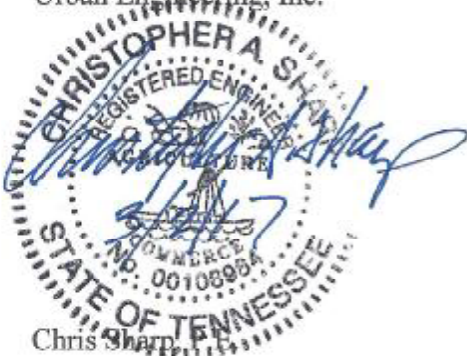
Re: Broome Road Senior Living (3-B-17-UR)

Dear Curtis and Mike:

Sight distance was evaluated at two locations. The first location is at the eye position of a motorist turning right onto Broome Road. The second is from the eye position of a motorist traveling southbound on Broome Road, turning left into the Parkview site. At both locations, the available sight distance is at or exceeds the 300-foot minimum and greater than 300 feet along the path of travel. I attached a sketch that show pertinent information related to our sight distance measurement along with pictures from both eye positions to accompany the aforementioned sketch. The lines of sight shown are contained within public right of way (at most, approximately 25' out of the road centerline – R.O.W. per the Major Road Plan is 30 feet from the centerline). Please do not hesitate to contact me if you have questions or need additional information.

Sincerely,

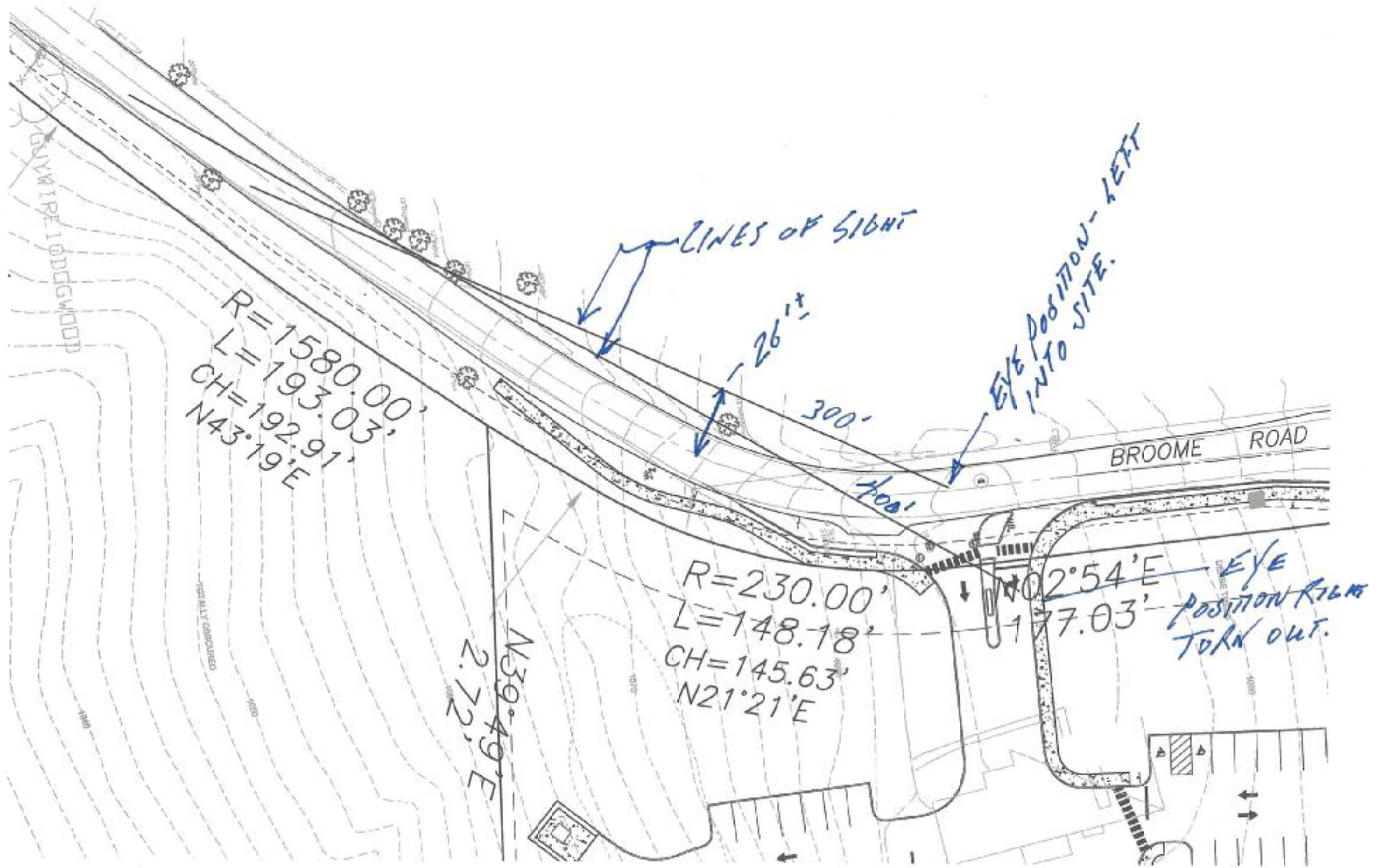
Urban Engineering, Inc.



11852 KINGSTON PIKE • FARRAGUT, TENNESSEE 37934 • PHONE: 865-966-1924 • FAX: 865-671-1933

SIGHT DISTANCE EXHIBIT

1" = 50'









URBAN ENGINEERING, INC.

CIVIL ENGINEERS • LAND PLANNERS • LAND SURVEYORS

February 22, 2017

Mr. Mike Reynolds
Knox County Metropolitan Planning Commission
Suite 403, City/County Building
400 Main Street
Knoxville, TN 37902

2/22/2017
REMOVED

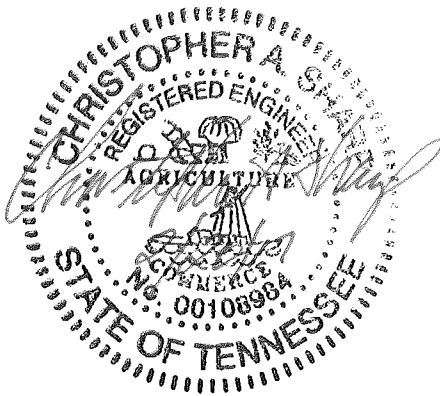
Re: Parkview Broome Road Use on Review (File# 3-B-17-UR)

Dear Mr. Reynolds:

For an Assisted Living Facility (Land Use 254) with 116 occupied beds, the estimated number of weekday trips generated per ITE guidelines would be 319 trips/day.

Sincerely,

Urban Engineering, Inc.



Chris Sharp, P.E.



URBAN ENGINEERING, INC.

CIVIL ENGINEERS • LAND PLANNERS • LAND SURVEYORS

February 27, 2017

City of Knoxville Stormwater Engineering
Curtis Williams, P.E.
City County Building, Suite 480
P.O. Box 1631
Knoxville, TN 37901

and

Knox County / Knoxville MPC
Mike Reynolds, AICP
Suite 403, City County Building
400 Main Street
Knoxville, TN 37902

Re: Broome Roade Senior Living (3-B-17-UR) Deceleration Lane

Dear Curtis and Mike:

The proposed deceleration lane shown on the attached drawings is approximately 100 feet in length, which is less than the recommended 160 feet by AASHTO for a 30 MPH roadway. Saying that, there is verbiage in the Green Book that states that “Desirably, the total physical length of the auxiliary lane should be the sum of the length for these three components. Common practice, however, is to accept a moderate amount of deceleration within the through lanes and to consider the taper length as a part of the deceleration within the through lanes”. The three components of a deceleration lane, as discussed by AASHTO are the taper distance, distance traveled to decelerate to a complete stop and storage length. For this particular use, very little to no storage is anticipated.

Motorists would recognize a hazardous situation well in advance of the deceleration lane, react and have sufficient time to brake to a complete stop before reaching the proposed entrance.

Attached to this letter are the following:

- Excerpts from the AASHTO Green Book, 6th Edition

Please do not hesitate to call if you have questions about this letter or attachments, or need additional clarification.



URBAN ENGINEERING, INC.

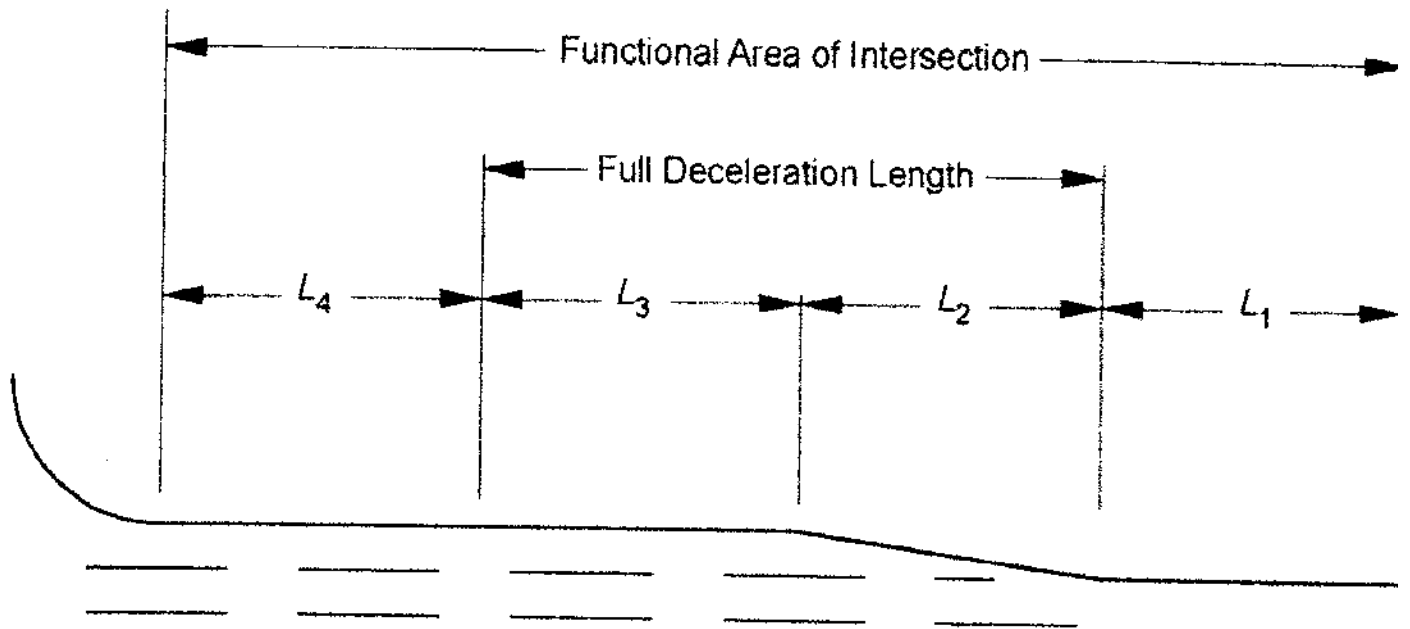
CIVIL ENGINEERS • LAND PLANNERS • LAND SURVEYORS

Sincerely,

Urban Engineering, Inc.



Chris Sharp, P.E.



- Notes: L_1 = Distance traveled during perception-reaction time
 L_2 = Taper distance to begin deceleration and complete lateral movement
 L_3 = Distance traveled to complete deceleration to a stop
 L_4 = Storage length

Figure 9-48 Functional Area Upstream of an Intersection Illustrating Components of Deceleration Lane Length

Deceleration Length

Provision for deceleration clear of the through-traffic lanes is a desirable objective on arterial roads and streets and should be incorporated into design, whenever practical. [Table 9-22](#) presents the estimated distances needed by drivers to maneuver from the through lane into a turn bay and brake to a stop (5).

Table 9-22 Desirable Full Deceleration Lengths

Metric		U.S. Customary	
Speed, km/h	Distance, ^a m	Speed [mph]	Distance ^a [ft]
^a Rounded to 5 m [5 ft]			
Notes:			
1. The above full deceleration lengths are $L_2 = L_3$ in Figure 9-48 .			

Metric		U.S. Customary	
Speed, km/h	Distance, ^a m	Speed [mph]	Distance ^a [ft]
<p>2. Assumes a turning vehicle has "cleared the through lane" when it has moved laterally approximately 3 m [9 ft] so that a following through vehicle can pass without encroaching upon the adjacent traffic lane.</p> <p>3. The speed differential between the turning vehicle and following through vehicles is 15 km/h [10 mph] when the turning vehicle "clears the through traffic lane."</p> <p>4. 1.8 m/s² deceleration while moving from the through lane into the turn lane; 2.0 m/s² average deceleration after completing lateral shift into the turn lane.</p>			
30	20	[20]	[70]
50	45	[30]	[160]
65	85	[40]	[275]
80	130	[50]	[425]
95	185	[60]	[605]
110	245	[70]	[820]

On many facilities, it is not practical to provide the full length of the auxiliary lane for deceleration due to constraints such as restricted right-of-way, distance available between adjacent intersections, and extreme storage needs. In such cases, at least part of the deceleration by drivers needs to be accomplished before entering the auxiliary lane. Inclusion of the taper length as part of the deceleration distance for an auxiliary lane assumes that an approaching turning vehicle can decelerate comfortably up to 15 km/h [10 mph] before clearing a through lane. Shorter auxiliary lane lengths will increase the speed differential between turning vehicles and through traffic. A 15-km/h [10-mph] differential is commonly considered acceptable on arterial roadways. Higher speed differentials may be acceptable on collector highways and streets due to higher levels of driver tolerance for vehicles leaving or entering the roadway due to slow speeds or high volumes. Therefore, the distances discussed above should be accepted as a desirable goal and should be provided where practical. The deceleration distances discussed above are applicable to both left- and right-turning lanes, but the approach speed is usually lower in the right lane than in the left lane.

Storage Length

The auxiliary lane should be sufficiently long to store the number of vehicles, or queue, likely to accumulate during a critical period. The storage length should be sufficient to avoid turning vehicles stopping in the through lanes waiting for a signal change or for a gap in the opposing traffic flow.

Stopping sight distance object

The selection of a 0.60-m [2.00-ft] object height was based on research indicating that objects with heights less than 0.60 m [2.00 ft] are seldom involved in crashes (17). Therefore, it is considered that an object 0.60 m [2.00 ft] in height is representative of the smallest object that involves risk to drivers. An object height of 0.60 m [2.00 ft] is representative of the height of automobile headlights and taillights. Using object heights of less than 0.60 m [2.00 ft] for stopping sight distance calculations would result in longer crest vertical curves without a documented decrease in the frequency or severity of crashes (17). Object height of less than 0.60 m [2.00 ft] could substantially increase construction costs because additional excavation would be needed to provide the longer crest vertical curves. It is also doubtful that the driver's ability to perceive situations involving risk of collisions would be increased because recommended stopping sight distances for high-speed design are beyond most drivers' capabilities to detect objects less than 0.60 m [2.00 ft] in height (17).

Passing sight distance object

An object height of 1.08 m [3.50 ft] is adopted for passing sight distance. This object height is based on a vehicle height of 1.33 m [4.35 ft], which represents the 15th percentile of vehicle heights in the current passenger car population, less an allowance of 0.25 m [0.85 ft], which represents a near-maximum value for the portion of the vehicle height that needs to be visible for another driver to recognize a vehicle as such (32). Passing sight distances calculated on this basis are also considered adequate for night conditions because headlight beams of an opposing vehicle generally can be seen from a greater distance than a vehicle can be recognized in the daytime. The choice of an object height equal to the driver eye height makes passing sight distance design reciprocal (i.e., when the driver of the passing vehicle can see the opposing vehicle, the driver of the opposing vehicle can also see the passing vehicle).

Intersection sight distance object

As in the case of passing sight distance, the object to be seen by the driver in an intersection sight distance situation is another vehicle. Therefore, design for intersection sight distance is based on the same object height used in design for passing sight distance, 1.08 m [3.50 ft].

9.7.2 Deceleration Lanes

Figure 9-48 illustrates the upstream functional area of an intersection in relation to the components of deceleration lane length, which consist of the perception-reaction distance, the full deceleration length (also called the maneuver distance), and the storage length (also called the queue storage length) (23). The physical length of a deceleration lane for turning vehicles consists of the entering taper length, L_2 , the deceleration length, L_3 , and the storage length, L_4 .

Desirably, the total physical length of the auxiliary lane should be the sum of the length for these three components. Common practice, however, is to accept a moderate amount of deceleration within the through lanes and to consider the taper length as a part of the deceleration within the through lanes. Each component of the deceleration lane length is discussed below.

Metric	U.S. Customary
$d_s = 0.039 \frac{V^2}{a}$	$d_s = 1.075 \frac{V^2}{a}$
where:	where:
d_s = braking distance, m	d_s = braking distance, ft
V = design speed, km/h	V = design speed, mph
a = deceleration rate, m/s ²	a = deceleration rate, ft/s ²

Studies documented in the literature (17) show that most drivers decelerate at a rate greater than 4.5 m/s² [14.8 ft/s²] when confronted with the need to stop for an unexpected object in the roadway. Approximately 90 percent of all drivers decelerate at rates greater than 3.4 m/s² [11.2 ft/s²]. Such decelerations are within the driver's capability to stay within his or her lane and maintain steering control during the braking maneuver on wet surfaces. Therefore, 3.4 m/s² [11.2 ft/s²] (a comfortable deceleration for most drivers) is recommended as the deceleration threshold for determining stopping sight distance. Implicit in the choice of this deceleration threshold is the assessment that most vehicle braking systems and the tire-pavement friction levels of most roadways are capable of providing a deceleration rate of at least 3.4 m/s² [11.2 ft/s²]. The friction available on most wet pavement surfaces and the capabilities of most vehicle braking systems can provide braking friction that exceeds this deceleration rate.

Table 3-1 Stopping Sight Distance on Level Roadways

Metric					U.S. Customary				
Design Speed (km/h)	Brake Reaction Distance (m)	Braking Distance on Level (m)	Stopping Sight Distance		Design Speed (mph)	Brake Reaction Distance (ft)	Braking Distance on Level (ft)	Stopping Sight Distance	
			Calculated (m)	Design (m)				Calculated (ft)	Design (ft)
Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s ² [11.2 ft/s ²] used to determine calculated sight distance.									
20	13.9	4.6	18.5	20	15	55.1	21.6	76.7	80
30	20.9	10.3	31.2	35	20	73.5	38.4	111.9	115
40	27.8	18.4	46.2	50	25	91.9	60.0	151.9	155
50	34.8	28.7	63.5	65	30	110.3	86.4 *	196.7	200
60	41.7	41.3	83.0	85	35	128.6	117.6	246.2	250
70	48.7	56.2	104.9	105	40	147.0	153.6	300.6	305
80	55.6	73.4	129.0	130	45	165.4	194.4	359.8	360
90	62.6	92.9	155.5	160	50	183.8	240.0	423.8	425
100	69.5	114.7	184.2	185	55	202.1	290.3	492.4	495
110	76.5	138.8	215.3	220	60	220.5	345.5	566.0	570
120	83.4	165.2	248.6	250	65	238.9	405.5	644.4	645
130	90.4	193.8	284.2	285	70	257.3	470.3	727.6	730
					75	275.6	539.9	815.5	820
					80	294.0	614.3	908.3	910

Design Values

The stopping sight distance is the sum of the distance traversed during the brake reaction time and the distance to brake the vehicle to a stop. The computed distances for various speeds at the assumed conditions on level roadways are shown in Table 3-1 and were developed from the following equation:

* BRAKING DISTANCE ON 10% INCLINE

$$d_B = \frac{V^2}{2 \left[\frac{a}{32.2} + G \right]} = \frac{30^2}{2 \left[\frac{11.2}{32.2} + 0.1 \right]} = 67'$$

Fencing proposed to enclose the decks, courtyard, etc., is a 4' tall, black aluminum fence with 2-1/2" posts.



KNOXVILLE KNOX COUNTY
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 COMMISSION
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Use on Review **Development Plan**

Name of Applicant: URBAN ENGINEERING, INC.
 Date Filed: 1-23-17 Meeting Date: 3/2/17
 Application Accepted by: Thomas Brucko
 Fee Amount: — File Number: Development Plan —
 Fee Amount: \$1200 File Number: Use on Review 3-B-17-UR



PROPERTY INFORMATION

Address: 800 BROOME ROAD
 General Location: BROOME RD
@ MIDDLEBROOK PIKE
 Tract Size: 4.9-AC No. of Units: 104
 Zoning District: RP-1
 Existing Land Use: RESIDENCE

Planning Sector: NORTHWEST CITY
 Sector Plan Proposed Land Use Classification:
LDR

Growth Policy Plan Designation: Urban
 Census Tract: 45
 Traffic Zone: 158
 Parcel ID Number(s): Part of 1060A040+039
 Jurisdiction: City Council 2 District
 County Commission _____ District

PROPERTY OWNER/OPTION HOLDER

PLEASE PRINT
 Name: JOHN McBRNE
 Company: _____
 Address: P.O. BOX 50215
 City: KNOXVILLE State: TN Zip: 37950
 Telephone: (865) 330-0013
 Fax: (865) 584-6230
 E-mail: _____

APPLICATION CORRESPONDENCE

All correspondence relating to this application should be sent to:

PLEASE PRINT
 Name: CHRIS SHARP
 Company: URBAN ENGINEERING, INC.
 Address: 11852 KINGSTON PK.
 City: KNOXVILLE State: TN Zip: 37934
 Telephone: (865) 966-1924
 Fax: (865) 315-7011
 E-mail: UES@TDS.NET

APPROVAL REQUESTED

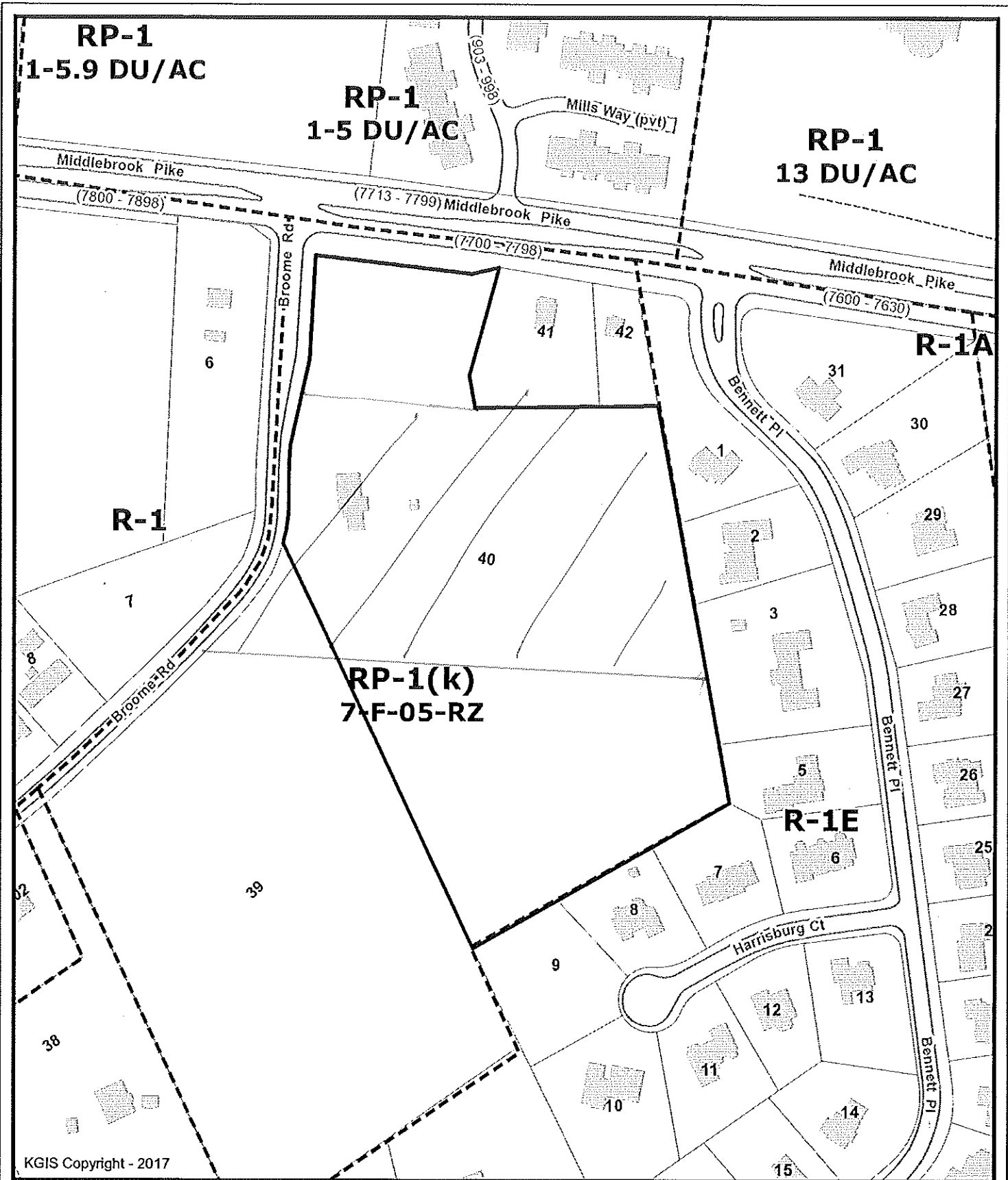
Development Plan: Residential Non-Residential
 Home Occupation (Specify Occupation)

 Other (Be Specific)
WOR Assisted Living

APPLICATION AUTHORIZATION

I hereby certify that I am the authorized applicant, representing ALL property owners involved in this request or holders of option on same, whose signatures are included on the back of this form.

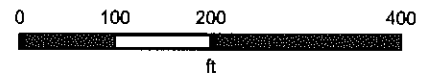
Signature: [Signature]
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