

▶ **FILE #:** 10-C-08-UR

AGENDA ITEM #: 64

AGENDA DATE: 10/9/2008

▶ **APPLICANT:** JIM DICKSON
 OWNER(S): JIM DICKSON YMCA

TAX ID NUMBER: 162 PART OF 057.02

JURISDICTION: County Commission District 5

▶ **LOCATION:** Northwest side of S. Northshore Dr., southwest side of Charlottesville Blvd.

▶ **APPX. SIZE OF TRACT:** 3.667 acres

SECTOR PLAN: Southwest County

GROWTH POLICY PLAN: Planned Growth Area

ACCESSIBILITY: Access is via S. Northshore Dr., a two lane minor arterial street with a 21' pavement width within a 50' right-of-way.

UTILITIES: Water Source: First Knox Utility District

Sewer Source: First Knox Utility District

WATERSHED: Tennessee River

▶ **ZONING:** PR (Planned Residential)

▶ **EXISTING LAND USE:** Vacant land

▶ **PROPOSED USE:** YMCA Facility

HISTORY OF ZONING: Property rezoned to PR (Planned Residential) at a density of up to 2.5 du/ac by Knox County Commission on June 25, 2007.

SURROUNDING LAND USE AND ZONING:
 North: Vacant land (Jefferson Park West Subdivision) / PR (Planned Residential)
 South: Vacant land (Jefferson Park West Subdivision) and residences / PR (Planned Residential)
 East: Vacant land and residence / A (Agricultural)
 West: Vacant land (Jefferson Park West Subdivision) / PR (Planned Residential)

NEIGHBORHOOD CONTEXT: This site is located in an area that has experienced considerable residential development over the past few years under PR zoning.

STAFF RECOMMENDATION:

▶ **APPROVE the development plan for the proposed YMCA facility subject to 9 conditions.**

1. Connection to sanitary sewer and meeting any other relevant requirements of the Knox County Health Department.
2. Installing the on-site and off-site improvements outlined in the recommendations from the Jefferson Park and YMCA Property Traffic Impact Study, prepared by Wilbur Smith Associates and dated September 23, 2008 (see attached study), subject to approval by the Knox County Department of Engineering and Public Works. All improvements shall be in place prior to issuance of an occupancy permit for the YMCA building.

3. Installing all landscaping, as shown on the development plan, within six months of the issuance of occupancy permits for this project, or posting a bond with the Knox County Dept. of Engineering and Public Works to guarantee such installation
4. All site landscaping shall be installed and maintained to preserve a sight distance of 500' along S. Northshore Dr. in both directions at the development entrance.
5. Providing documentation to the Knox County Department of Engineering and Public Works for their review and approval on how the stormwater detention facilities for this site will be coordinated with the stormwater detention facilities for the Jefferson Park West Subdivision.
6. All site lighting shall be deflected, shaded and focused away from all adjoining property. There shall be no lighting for night use of the outdoor basketball court.
7. Meeting all applicable requirements of the Knox County Department of Engineering and Public Works.
8. Obtaining approval and recording a final plat for this site.
9. Meeting all applicable requirements of the Knox County Zoning Ordinance.

With the conditions noted, this plan meets the requirements for approval of a Use-on-Review in the PR Zoning District.

COMMENTS:

The applicant is proposing to develop a YMCA facility on a 3.667 acre site located on the southwest side of the entrance for Jefferson Park West Subdivision. The site which is zoned PR (Planned Residential) is part of the property that was included in the concept plan for Jefferson Park West Subdivision. The Knox County Zoning Ordinance allows consideration of this type of use under the PR zoning. With the approval of the YMCA on this site, a revised concept plan will be required for Jefferson Park West Subdivision to address changes to the proposed street layout and drainage system in this area and re-evaluation of the remaining residential units/lots that would be allowed under the maximum density of 2.5 du/ac. The acreage that has been transferred for the YMCA cannot be used for density calculations for the subdivision.

The proposed development plan for the YMCA includes a building with approximately 24,200 square feet, a basketball court and parking lot. Access to the site will be directly off of S. Northshore Dr. at a location that is approximately 450' southwest of Charlottesville Blvd., the entrance to Jefferson Park West Subdivision. The site/parking lot layout also allows for a possible connection to the internal street layout for Jefferson Park West Subdivision. A pedestrian connection is also recommended. As previously stated, a revised concept plan is required for this area of the subdivision.

A traffic impact study update has been submitted evaluating the traffic impacts from Jefferson Park West Subdivision and the YMCA development. The study recommends both on-site and off-site improvements. One of the off-site improvements includes a northbound left-turn lane on S. Northshore Dr. at the development entrance. Staff has recommended a condition that the improvements be implemented, subject to approval by the Knox County Department of Engineering and Public Works.

The outdoor basketball court will not have any night lighting. The only proposed outdoor lighting will be in the parking lot. Site lighting shall be deflected, shaded and focused away from all adjoining property.

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

1. The proposed facility will have minimal impact on local services since utilities are available to serve this site.
2. The proposed YMCA facility is a compatible use with the adjoining detached residential subdivision with the recommended conditions. Since this proposed development will require a revision to the subdivision concept plan for this area, any future lot/home owners should be aware of the YMCA being a neighbor prior to purchase of the lot/home.
3. With the potential for an internal connection (pedestrian and vehicular) to Jefferson Park West Subdivision, residents of the subdivision would be able to use the facility without having to go out onto S. Northshore Dr.

CONFORMITY OF THE PROPOSAL TO CRITERIA ESTABLISHED BY THE KNOX COUNTY ZONING ORDINANCE

1. The proposed YMCA facility meets the standards for development within the PR (Planned Residential) Zone and all other requirements of the Zoning Ordinance.
2. The proposed facility 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. With direct access to a minor arterial street, the proposed facility will not draw additional traffic through residential neighborhoods.

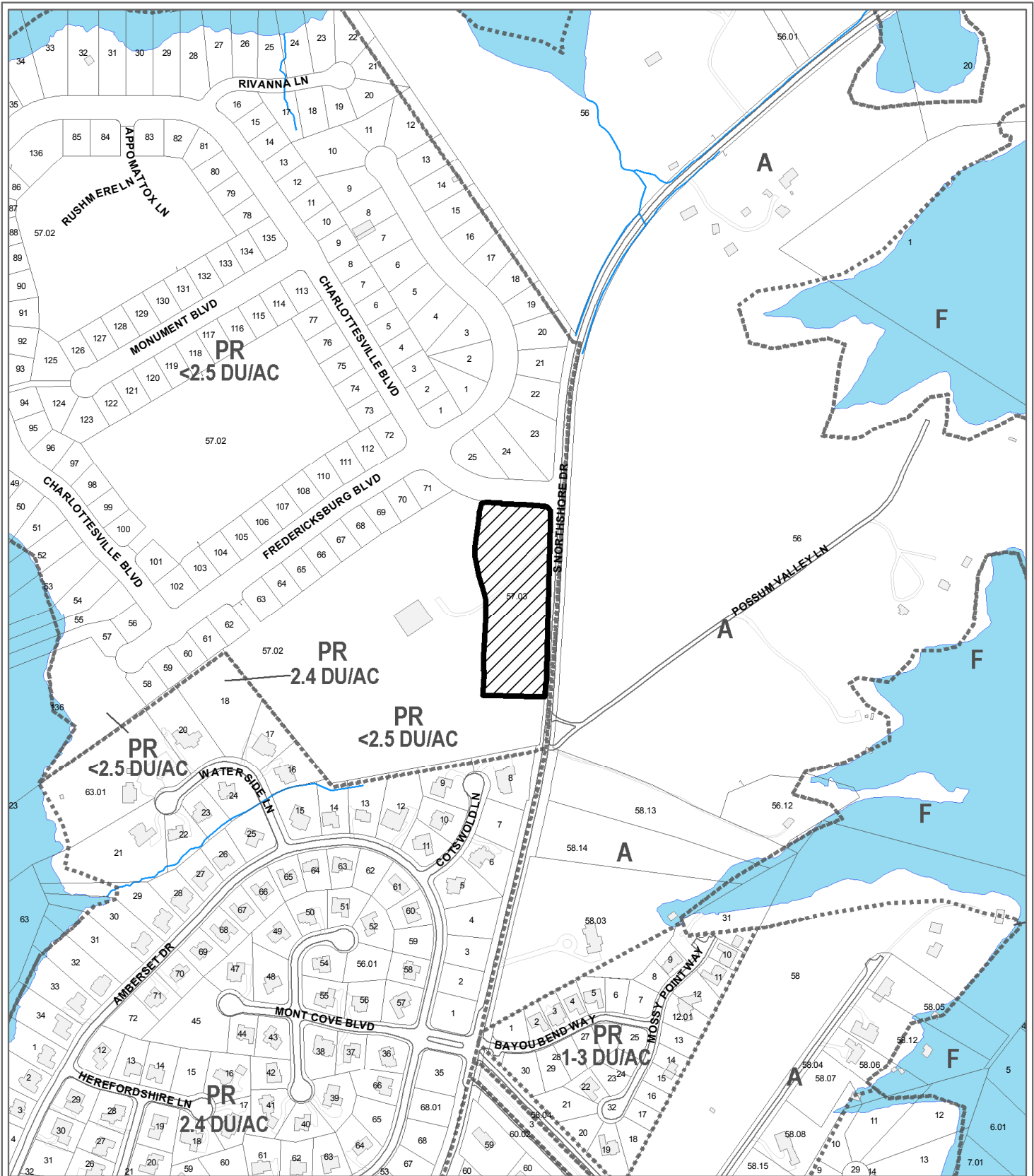
CONFORMITY OF THE PROPOSAL TO ADOPTED PLANS

1. The Southwest County Sector Plan designates this property for low density residential use. The proposed YMCA with the mix of fitness and recreational facilities is a compatible use with the adjoining residential development and is consistent with the Sector Plan and PR zoning designation.
2. The site is located within the Planned Growth Area on the Knoxville-Knox County-Farragut Growth Policy Plan map.

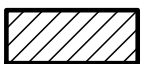
ESTIMATED TRAFFIC IMPACT: Not calculated.

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.



**10-C-08-UR
USE ON REVIEW**



YMCA in PR (Planned Residential)

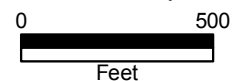
Original Print Date: 9/18/2008
 Metropolitan Planning Commission * City / County Building * Knoxville, TN 37902

Revised:

Petitioner: Dickson, Jim

Map No: 162

Jurisdiction: County



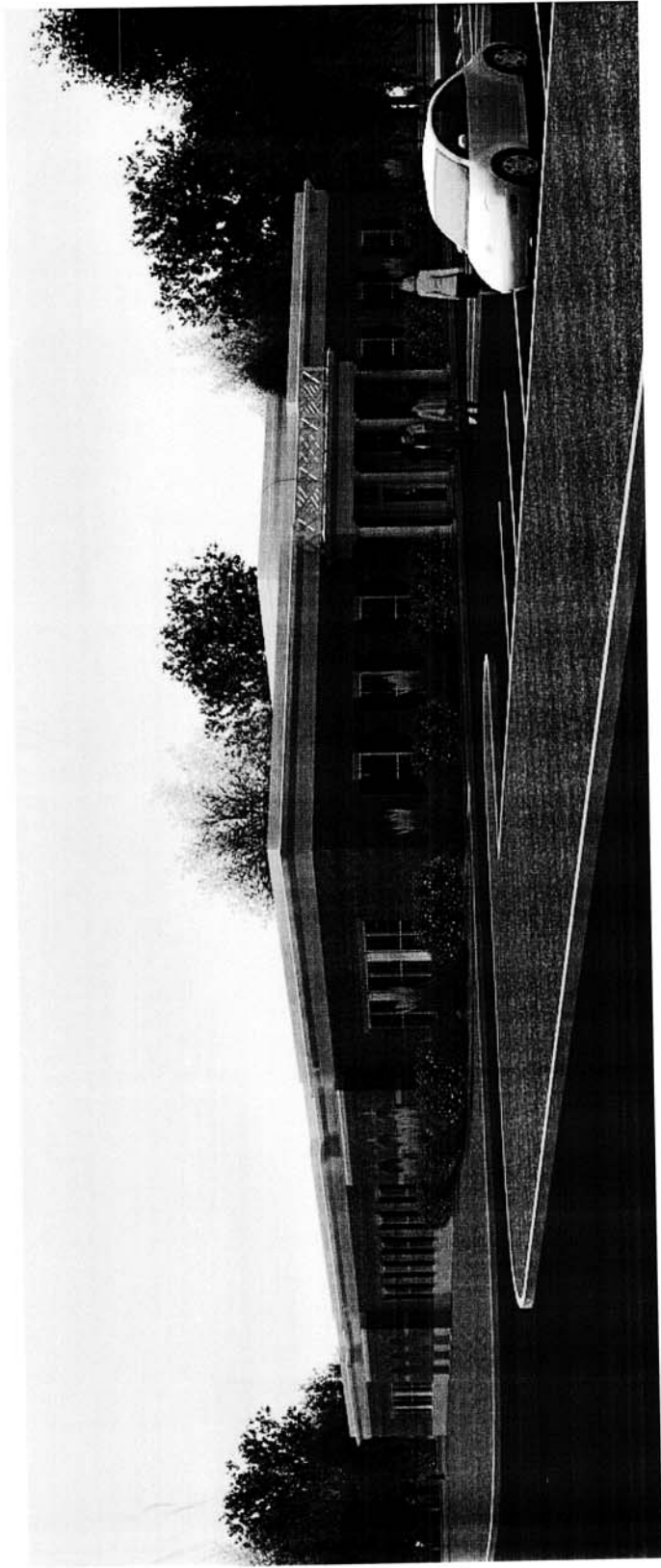
JEFFERSON PARK YMCA

YMCA Knoxville

Design Development
September 2, 2008

KNOXVILLE, TENNESSEE

- ARCHITECTS**
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E-Mail: info@mhmc.com



03-08-10 03-08-10

MCCARTY
HOLSAPPLE
MCCARTY
MHM
ARCHITECTS
DESIGNERS

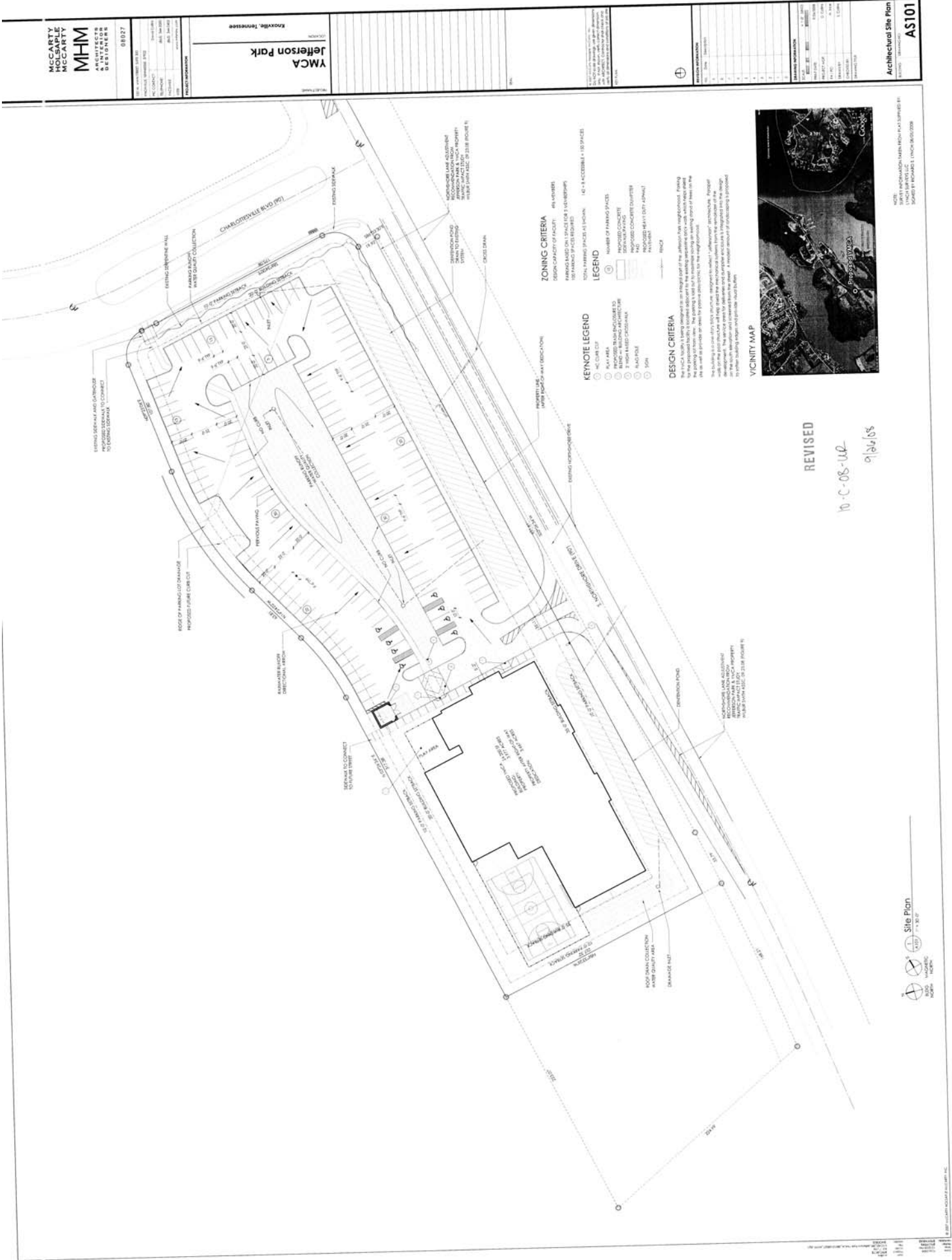
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JEFFERSON PARK YMCA

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KNOXVILLE: 615.252.4444
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PRELIMINARY PACKAGE
NOT FOR CONSTRUCTION

COVER SHEET
G001



REVISED
10-C-08-1102
9/26/08



Site Plan
1" = 20'

Architectural Site Plan
AS101

NOTE: ALL INFORMATION HEREIN HAS BEEN PROVIDED BY THE CLIENT AND IS NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN CONSENT OF THE ARCHITECTURAL FIRM.

DESIGNED BY: MICHAEL J. LINDSEY, ARCHITECT
DATE: 09/26/08

PROJECT NO.: 080327

CLIENT: YMCA OF TENNESSEE

LOCATION: JEFFERSON PARK, KNOXVILLE, TENNESSEE

DATE: 09/26/08

SCALE: 1" = 20'

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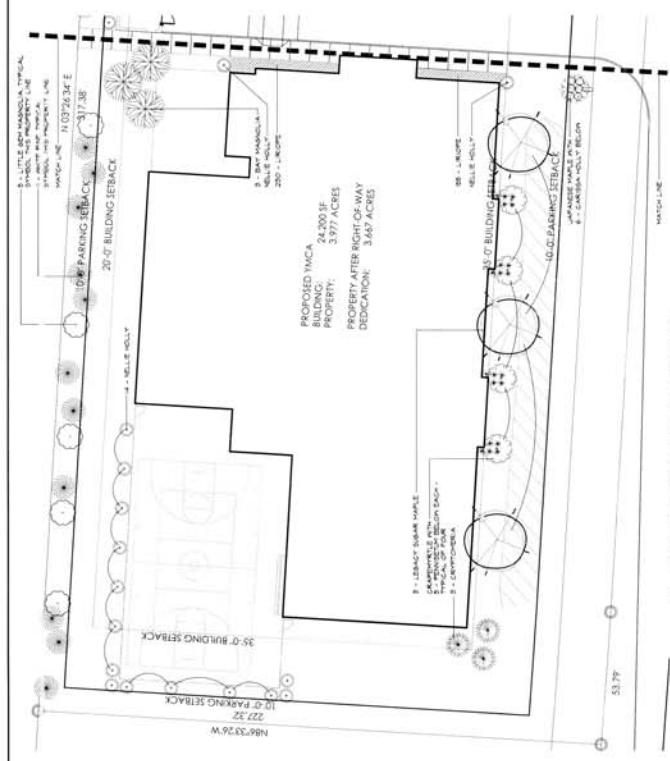
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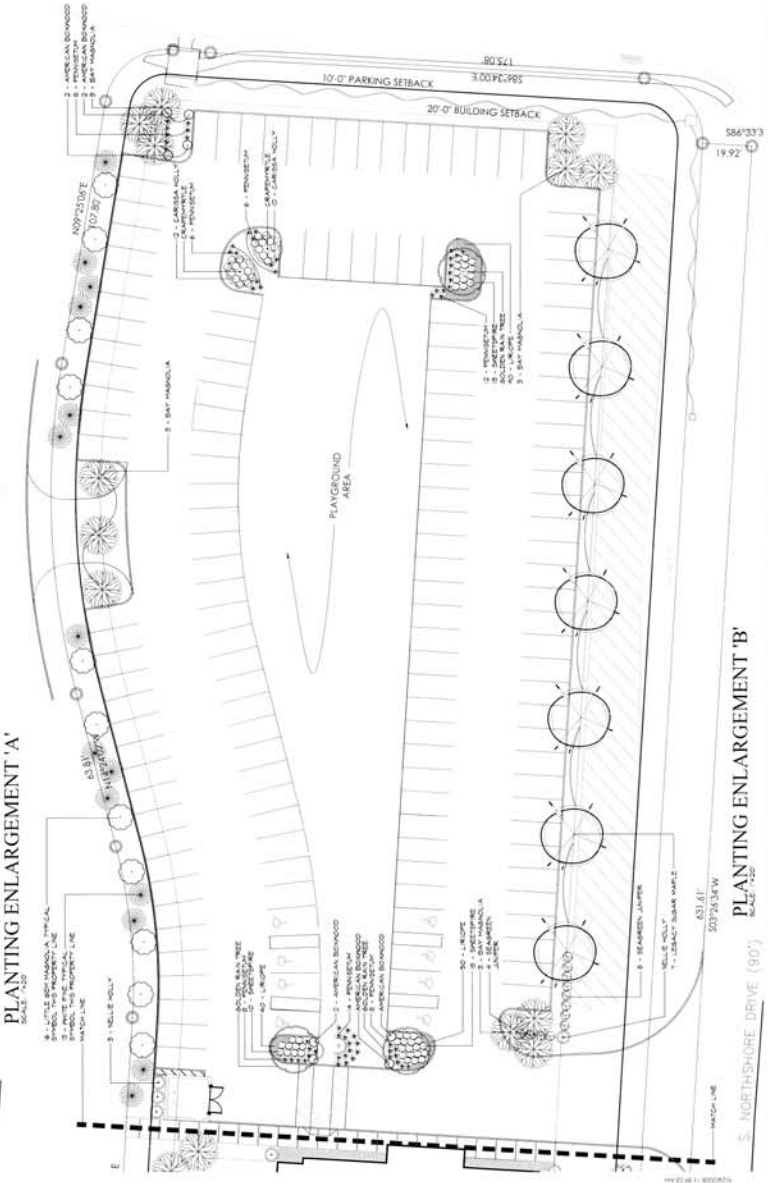
LOCATION: JEFFERSON PARK, KNOXVILLE, TENNESSEE

DATE: 09/26/08

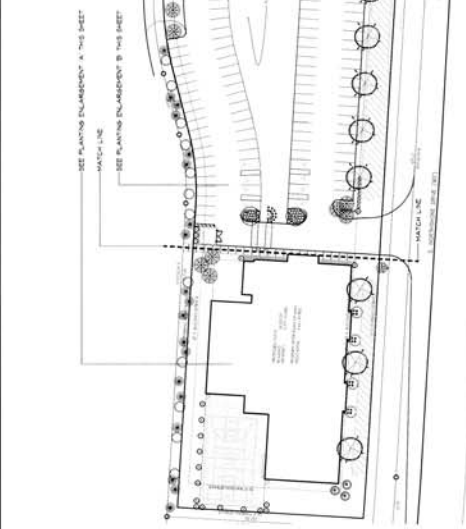
SCALE: 1" = 20'



PLANTING ENLARGEMENT 'A'



PLANTING ENLARGEMENT 'B'



PLANTING KEY

SEE ENLARGEMENTS THIS SHEET.

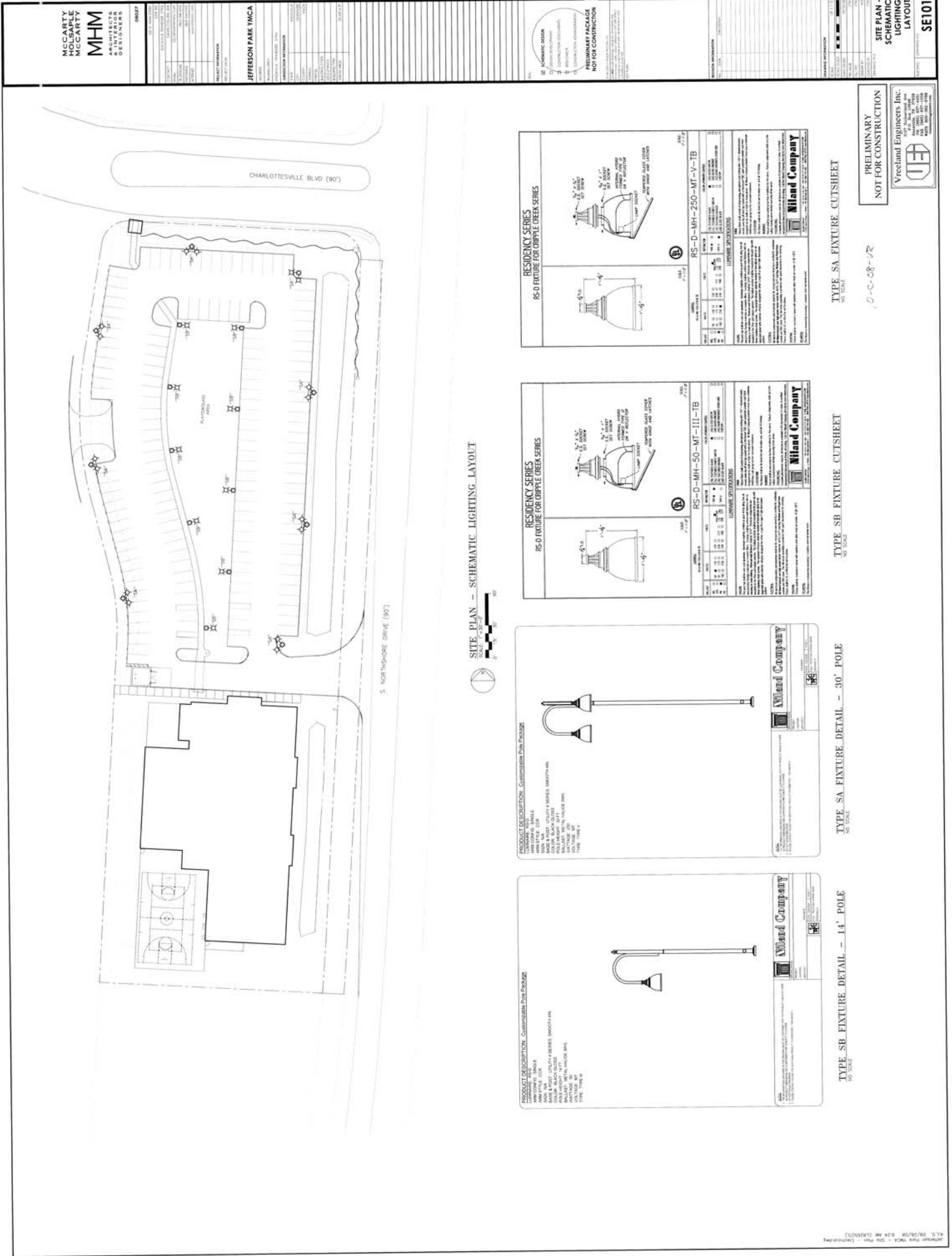
PLANT MATERIAL SCHEDULE
 ALL PLANT MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE CITY OF KANSAS CITY, MISSOURI.

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2	2	2 - BAY MAGNOLIA
3	4	4 - BAY MAGNOLIA
4	4	4 - BAY MAGNOLIA
5	4	4 - BAY MAGNOLIA
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49	4	4 - BAY MAGNOLIA
50	4	4 - BAY MAGNOLIA

10'-0-08' U/R

SCALE: 1/4" = 1'-0"

GRAPHIC SCALE



MCCARTY
MCCARTY
MCCARTY
ARCHITECTS
CONSULTANTS
PLANNERS

MHM

08077
PROJECT INFORMATION
PROJECT NAME: JEFFERSON PARK YMCA
PROJECT ADDRESS: 1000 N. JEFFERSON PARK
PROJECT CITY: CHARLOTTE, NC
PROJECT STATE: NC
PROJECT ZIP: 28202
PROJECT PHONE: (704) 366-1100
PROJECT FAX: (704) 366-1100
PROJECT EMAIL: info@mhmmccarty.com

JEFFERSON PARK YMCA
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RESIDENCY SERIES
RS-D FIXTURE FOR COPPLE CREEK SERIES

TYPE SA FIXTURE CUTSHEET
NO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

Vreeland Engineers Inc.
1000 N. JEFFERSON PARK
CHARLOTTE, NC 28202
PHONE: (704) 366-1100
FAX: (704) 366-1100
EMAIL: info@mhmmccarty.com

RESIDENCY SERIES
RS-D FIXTURE FOR COPPLE CREEK SERIES

TYPE SB FIXTURE CUTSHEET
NO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

Vreeland Engineers Inc.
1000 N. JEFFERSON PARK
CHARLOTTE, NC 28202
PHONE: (704) 366-1100
FAX: (704) 366-1100
EMAIL: info@mhmmccarty.com

PRODUCT DESCRIPTION - Columnar Pole Package
MAX HEIGHT: 30' POLE
MAX WIDTH: 14' POLE
COLOR: BLACK
MATERIAL: GALVANNEAL STEEL
FINISH: POLYURETHANE
TYPE: TYPE SA

TYPE SA FIXTURE DETAIL - 30' POLE
NO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

Vreeland Engineers Inc.
1000 N. JEFFERSON PARK
CHARLOTTE, NC 28202
PHONE: (704) 366-1100
FAX: (704) 366-1100
EMAIL: info@mhmmccarty.com

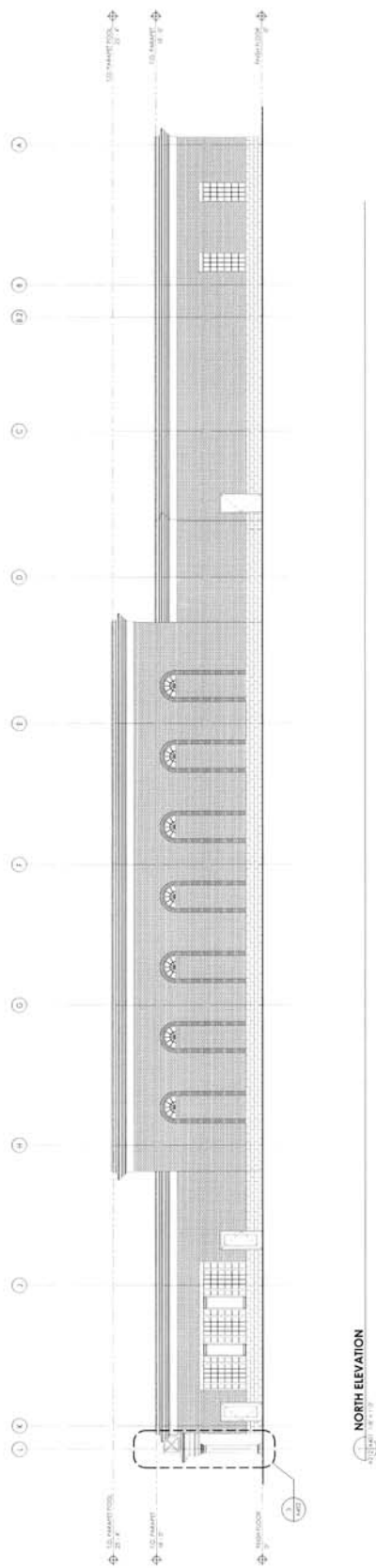
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MAX HEIGHT: 14' POLE
MAX WIDTH: 14' POLE
COLOR: BLACK
MATERIAL: GALVANNEAL STEEL
FINISH: POLYURETHANE
TYPE: TYPE SB

TYPE SB FIXTURE DETAIL - 14' POLE
NO SCALE

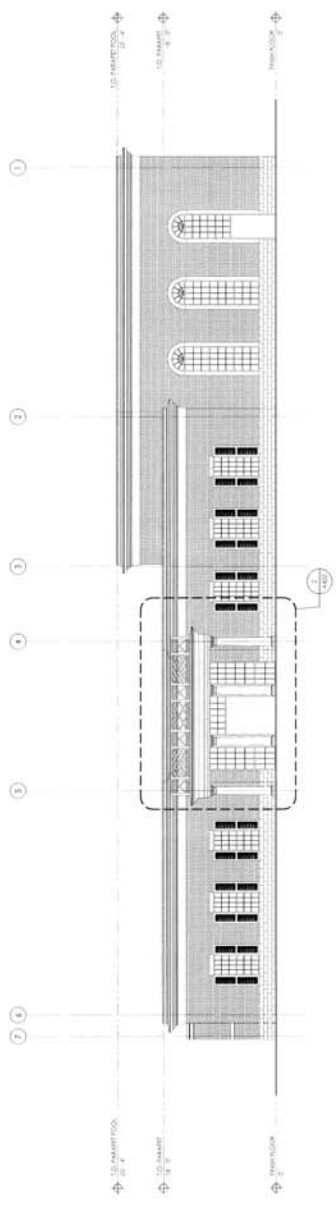
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CHARLOTTE, NC 28202
PHONE: (704) 366-1100
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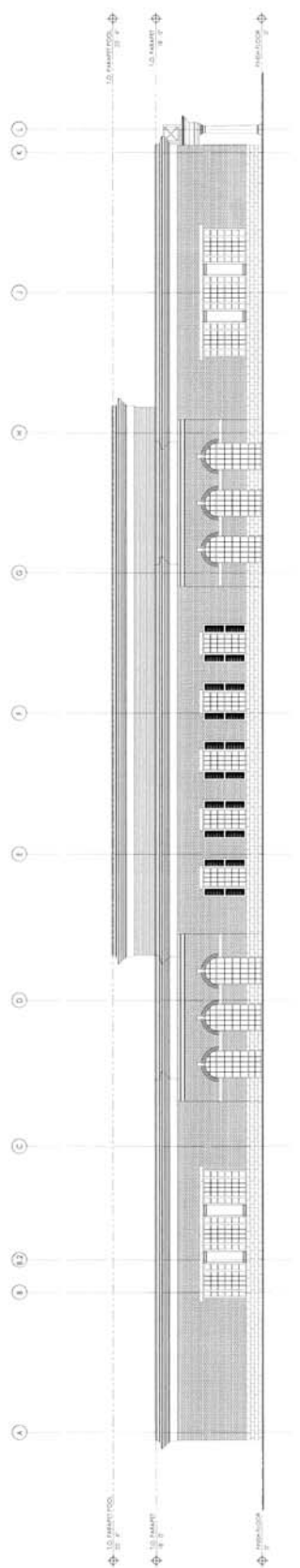
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NORTH ELEVATION
10-08-08



EAST ELEVATION
10-08-08



SOUTH ELEVATION
10-08-08

10-C-08-UR

PROJECT INFORMATION	
PROJECT NAME	JEFFERSON PARK YMCA
PROJECT ADDRESS	1000 W. ALPINE AVENUE, DENVER, CO 80202
OWNER	JEFFERSON PARK YMCA
DATE	10-08-08
SCALE	AS SHOWN
DESIGNED BY	MHM
DRAWN BY	MHM
CHECKED BY	MHM
DATE	10-08-08

REVISIONS	
NO.	DESCRIPTION
1	ISSUED FOR PERMITS
2	ISSUED FOR CONSTRUCTION
3	ISSUED FOR CONSTRUCTION
4	ISSUED FOR CONSTRUCTION
5	ISSUED FOR CONSTRUCTION
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18	ISSUED FOR CONSTRUCTION
19	ISSUED FOR CONSTRUCTION
20	ISSUED FOR CONSTRUCTION

JEFFERSON PARK YMCA
1000 W. ALPINE AVENUE
DENVER, CO 80202
TEL: 303.751.1100
WWW.MHMARCHITECTS.COM

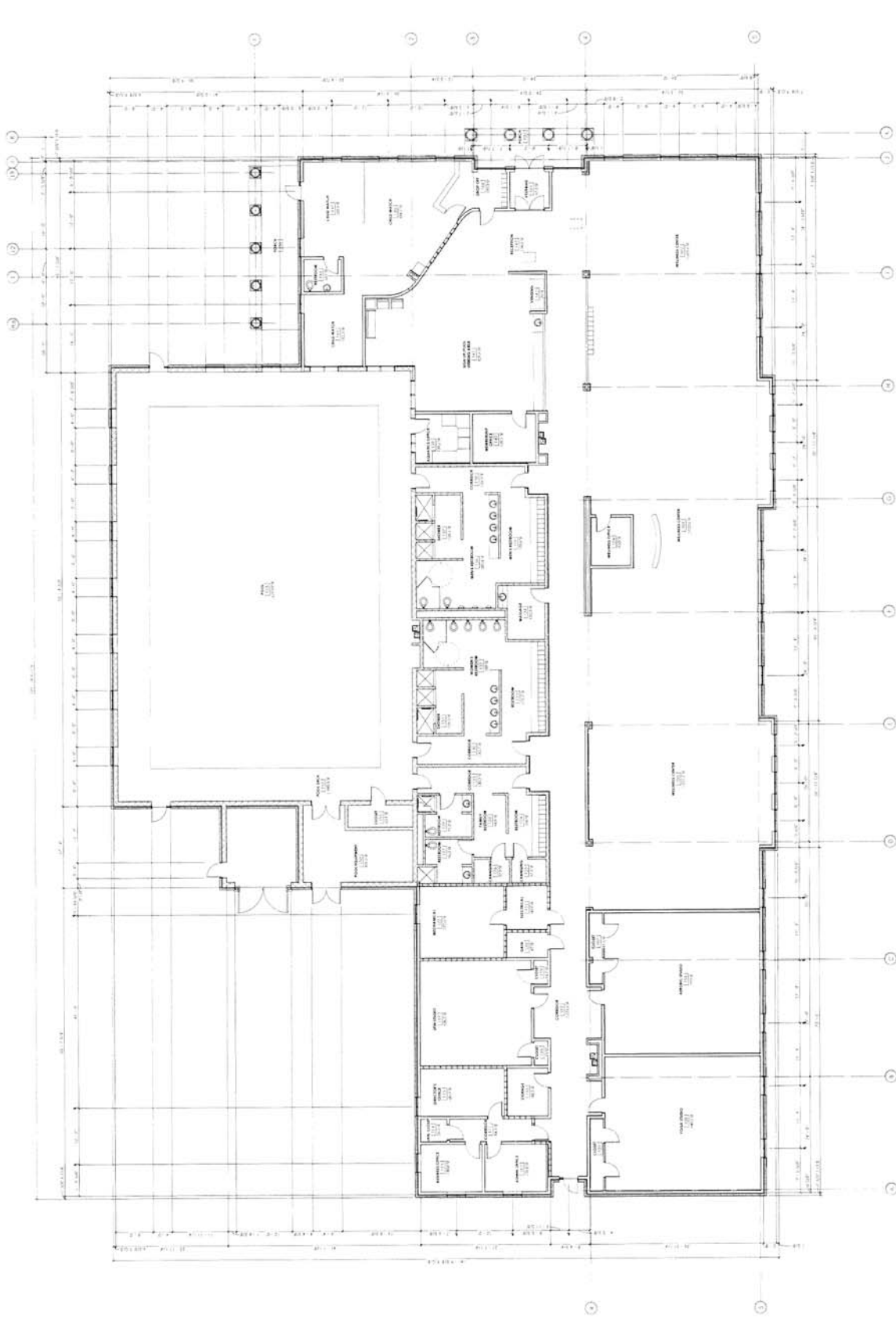
PRELIMINARY PACKAGE
NOT FOR CONSTRUCTION

10-08-08

10-08-08

10-08-08

DIMENSION PLAN
A211



10-C-08-UR

FINISH FLOOR
10-08-08

BINDING EDGE

BINDING EDGE

BINDING EDGE



September 23, 2008

Mr. Dave Collins
McCarty Holsaple McCarty
550 W. Main Street, Suite 300
Knoxville, Tennessee 37902

RE: JEFFERSON PARK AND YMCA PROPERTY TRAFFIC IMPACT STUDY

Dear Mr. Collins:

Wilbur Smith Associates (WSA) is pleased to submit this letter report pertaining to the anticipated traffic impacts of the proposed Jefferson Park residential subdivision and YMCA development to be located on Northshore Drive in southwest Knox County, Tennessee. The Jefferson Park residential subdivision was previously referred to as Prater Property in a traffic impact study conducted May 2007. The 2007 proposed Prater Property development consisted of approximately 300 single family lots and a 2.6-acre commercial tract. The 2.6-acre commercial parcel was not considered in the final approved plans. The scope of the 2007 study was defined by the Knox County Department of Engineering and Public Works to address intersection capacity and the need for auxiliary lanes at the proposed access point and at the intersection of Northshore Drive and Choto Road. They also required that the study investigate the need for signalization of Northshore Drive at Choto Road.

A 24,200 SF YMCA facility is proposed on a section of the Jefferson Park waterfront community (previously Prater Property). The update to the 2007 study has been requested based on the new land use being considered and the reduction in the number of single family lots. The YMCA is proposed to locate on what was previously designated as approximately 12-15 single family lots. Currently, Jefferson Park Phase 1 is platted at 161 single family lots, has 3 boulevard roadways, and two homes occupied. Additional parcels would be platted as infrastructure is provided. With the assumption that the YMCA facility would require the acreage of approximately 15 units, there would be a total of approximately 285 lots in Jefferson Park. Figure 1 presents the general site location. Figure 2 presents the proposed conceptual site plan for the YMCA. An inset map is included to reference the location with respect to Jefferson Park.

Data Collection and General Site Description

The proposed development will consist of approximately 285 single family lots as well as a 24,200 SF YMCA facility. Charlottesville Boulevard, which is a boulevard-type driveway, is the single subdivision access from Northshore Drive. The YMCA access is approximately 465 feet west of Charlottesville Boulevard. A future connection between the YMCA and Jefferson Park subdivision is provided.

WSA conducted a field investigation in the environs of the proposed development to note any existing or potential geometric deficiencies. Northshore Drive is a collector roadway with 10-foot travel lanes and paved shoulders one foot wide. The posted speed limit is 40 MPH. The available intersection sight distance at Northshore Drive and Charlottesville Boulevard is approximately 450 feet to the north (left) and approximately 1,200 feet to the south (right). The proposed YMCA site driveway's available intersection sight distance is greater than 1,000 feet to the north (left) and approximately 200 feet to the south (right). The sight distance looking right would be improved with the clearing of trees and vegetation within the limits of the project. Approximately 500 feet of sight distance is expected to be achievable with clearing.

Choto Road intersects Northshore Drive from the east and west and serves substantial residential development. It also provides a connection to Farragut via Harvey Road, McFee Road and Virtue Road. The intersection of Northshore Drive and Choto Road includes single lane approaches from each direction with STOP control on Choto Road.

The WSA turning movement counts at the intersections of Northshore Drive with Choto Road and with Mont Cove Boulevard (entrance to Montgomery Cove subdivision) and Bayou Bend Way conducted last year were approved to be used in this update. The 2007 counts were conducted to determine existing traffic volumes and directional distribution in the proposed site vicinity. The previous study projected future traffic growth at a 4.0% annual rate. The 2007 traffic data were factored by 1.04 to establish 2008 volumes. Figure 3 shows the 2008 AM and PM peak hour traffic volumes at the count locations. The Mont Cove Boulevard count was conducted to estimate residential trip distribution and was not included in analyses.

Background Growth of Traffic Volumes

The Tennessee Department of Transportation (TDOT) maintains two count stations on Northshore Drive and one on Choto Road in the study area. Station #297 is located on Northshore Drive approximately one mile north of Choto Road. A trend line representing traffic growth at the station over the past twenty

years results in a growth rate of 3.60% per year. Station #141 is located on Northshore Drive approximately one-half mile south of Choto Road and exhibits a growth rate of 3.50% per year. Station #362 is located on Choto Road approximately 0.7 mile west of Northshore Drive and exhibits a growth rate of 3.96% per year. These growth rates are comparable to the previous study. For study purposes and consistency, a growth rate of 4% per year was used. This annual growth rate was applied to the 2008 traffic volumes. Figure 4 presents the projected 2015 peak hour traffic at the intersection of Northshore Drive and Choto Road assuming this background traffic growth rate.

Trip Generation

Table 1 shows the daily, AM peak hour, and PM peak hour traffic expected to be generated by the proposed 285 parcel residential development and the 24,200 SF YMCA facility. The procedures of *Trip Generation, 7th Edition*, published by the Institute of Transportation Engineers, were used to estimate these volumes. This reference represents national data collected for many different land uses including industrial, residential, community, and commercial uses. **Trip Generation** is an essential tool in calculating the traffic, which may be generated by a proposed development. From the trip generation calculations, the proposed site may generate approximately 3,280 daily trips.

Table 1 Jefferson Park & YMCA TIS Trip Generation Summary					
Residential (ITE Land Use 210)					
Time Period	Total Trips	Percent		Number	
		Enter	Exit	Enter	Exit
Weekday (24 hours)	2,726	50%	50%	1,363	1,363
AM Peak Hour	209	25%	75%	52	157
PM Peak Hour	275	63%	37%	173	102
Recreational Community Center (ITE Land Use 495)					
Weekday (24 hours)	554	50%	50%	277	277
AM Peak Hour	66	61%	39%	40	26
PM Peak Hour	68	29%	71%	20	48
Total					
Weekday (24 hours)	3,280			1,640	1,640
AM Peak Hour	275			92	183
PM Peak Hour	343			193	150

Trip Distribution and Assignment

The directional distribution of traffic generated by the proposed Jefferson Park subdivision was assumed based on the 2007 traffic patterns evident in the turning movement counts at the intersection of Northshore Drive with Mont Cove Boulevard as well as density of residential development in the study area. It was assumed that 90% of the proposed residential subdivision traffic would depart to the north in the morning and 90% would return from the north in the evening. The remaining 10% was assigned to and from the south and was assumed to travel to and from the west on Choto Road toward Farragut. Figure 5A presents the traffic distributions for the Jefferson Park residential development.

The members and workers utilizing the YMCA facility were assumed to have a more balanced distribution pattern than the residential/work trips. Members may originate from the subdivisions to the west (Montgomery Cove, Amberwood, Choto Fields, Choto Bend, Cabot Ridge, ...), residential lots over the Loudon County line, and subdivisions north and east of Concord Road. The members that would originate and travel from the east include Jefferson Park subdivision, subdivisions accessing Concord Road, subdivisions accessing Northshore Drive (SR332), subdivisions accessing Westland Drive, subdivisions accessing Bluegrass Road, and subdivisions accessing Hart Road. A distribution of 40% and 60% were assumed to and from the west and east, respectively. Figure 5B presents the traffic distributions for the 24,200 SF YMCA facility.

Project Traffic Volumes

By multiplying the trips generated by the distribution percentages, the project traffic volumes are determined. Figures 6A and 6B illustrate the resulting project traffic volumes associated with the respective proposed land uses.

Traffic Conditions

Unsignalized intersection capacity analyses were performed for the AM and PM peak hours to evaluate the traffic conditions at the intersection of Northshore Drive with Choto Road under current and future conditions and at Northshore Drive with the site driveways under build out conditions. The capacity analysis reports are contained in the Appendix. The methodology of the *2000 Highway Capacity Manual* as contained in the *Highway Capacity Software (version 5.2)* was used. One of the measures employed in such analyses is "level of service" (LOS), a qualitative statement of the acceptability of traffic conditions based on delay. The LOS index ranges from LOS A, indicating excellent traffic conditions with minimal delay, to LOS F indicating very congested conditions with excessive delay. LOS D generally is considered the minimum acceptable condition in urban areas.

Based on capacity analyses and the volumes of Figure 3, Northshore Drive drivers at Choto Road currently experience LOS A conditions during both peak hours. The westbound Choto Road stop approach operated at a LOS B during the AM and PM peak hours. The eastbound Choto Road stop approach operated at a LOS E and F during the AM and PM peak hours, respectively. With background traffic growth, but without the proposed Jefferson Park residential and YMCA traffic (Figure 4), the traffic conditions are projected to remain at LOS A on Northshore Drive, LOS C on westbound Choto Road, and LOS F on eastbound Choto Road. With future background traffic growth plus the proposed Jefferson Park residential and YMCA traffic (Figure 7), the traffic conditions are projected to remain at LOS A on Northshore Drive, LOS C on westbound Choto Road, and LOS F on eastbound Choto Road. The additional site traffic is expected to have minimal impact to the approaches operating at LOS C or better. Mitigation to consider may be additional lanes and traffic signal control to improve the failing level of service. These possible mitigations are analyzed in the next few sections.

Upon build out, drivers on Northshore Drive at the intersection of Charlottesville Boulevard and Northshore Drive are expected to experience very acceptable LOS A to B conditions, but left-turning traffic exiting the site will operate at LOS F during both peak hours due to the volumes on Northshore Drive. The right-turning traffic exiting the site will operate at LOS B or better.

The YMCA facility access is expected to operate at LOS D for the left-turning exit traffic in both peak hours. The right-turning exit traffic is expected to operate at LOS A and C during the AM and PM peak hour, respectively. The YMCA approach was analyzed assuming one entering lane, a left-turn exit lane, and a right-turn exit lane. Due to the limited on-site queue storage and the LOS D of the left-turn traffic, a right-turn lane provides some additional capacity and minimizes the delay to a right-turn vehicle behind to a left-turn vehicle.

Evaluation of Signal Warrants

The need for signalization of the intersection of Northshore Drive and Choto Road was evaluated. Warrants for traffic signals are set forth in the *2003 Manual on Uniform Traffic Control Devices* (MUTCD) published by the FHWA. Three volume-based warrants are defined in the MUTCD as follows:

- Warrant 1: Eight-Hour Vehicular Volume,
- Warrant 2: Four-Hour Vehicular Volume, and
- Warrant 3: Peak Hour.

Warrant 1 is subdivided into three conditions. Condition A (Minimum Vehicular Volume) is applicable where a large volume of intersecting traffic is the principal reason for signalization. Condition B (Interruption of Continuous Traffic) is applicable where major street traffic volumes are so heavy that minor street drivers suffer excessive delay or conflict entering or crossing the major street. The third condition provides for a combination of Conditions A and B.

Based on 2008 traffic and the posted speed of 40 MPH signalization of the intersection is not warranted, but will meet Warrant 2 and 3 with background growth at 2015. A speed study was conducted as a recommendation of the previous study and it was determined that the 85th percentile operating speeds are approximately 50 MPH. With operating speeds greater than 40 MPH, the 2008 volumes satisfy Warrant 3 and six of the required eight hours of Warrant 1. At 2015, Warrants 1, 2, and 3 will be satisfied with operating speeds greater than 40 MPH. As part of the previous study, WSA also tested the appropriateness of installing all-way STOP control at the intersection. However, the imbalance of volumes on the approaches make this type of control inadvisable. Given the large number of turning movements, it may be feasible to construct a roundabout if topographical and right-of-way constraints allow.

Evaluation of Turn Lane Warrants

Using the Knox County policy for turn lane requirements, found in the Knox County's **Access Control and Driveway Design Policy**, projected traffic volumes for the proposed street were evaluated for the need to provide auxiliary lanes. The Knox County policy for left-turn lanes is based on the **Highway Research Record** report titled, *Volume Warrants for Left-turn Storage Lanes at Unsignalized Grade Intersections*, by M.D. Harmelink, and an extrapolation of that report by Knox County. The criterion relates volume thresholds to prevailing speeds on two-lane roadways. The speed classifications are 35 MPH or less, 36-45 MPH, and 46-55 MPH. Since a speed study was conducted to determine that prevailing speed on this section of Northshore Drive is approximately 50 MPH, the intersections of Northshore Drive with Choto Road and the proposed site access points were evaluated using the 46-55 MPH criteria. The evaluation worksheets are contained in the Appendix.

Based on these evaluations, a southbound left-turn lane is currently warranted on Northshore Drive at Choto Road. When background growth occurs at levels projected in 2015, a southbound right-turn lane on Northshore Drive at Choto Road will be warranted. This is a background condition not resulting from the proposed site development.

The existing northbound left-turn lane and southbound right-turn lane on Northshore Drive at the intersection of Charlottesville Boulevard continue to be warranted as in the 2007 traffic impact study. The southbound right-turn lane has a storage length of approximately 95 feet. The northbound left-turn lane has a 75-foot storage length and striping which fully shadows the left-turn lane. Figure 8 displays a clip of the construction plans showing the roadway and striping at the Charlottesville Boulevard and Northshore Drive intersection.

The evaluation of the YMCA driveway indicates that the expected left- and right- turn lane volumes are below the threshold warranting turn lanes based on the assumed trip distribution and the 50 MPH prevailing travel speed. The anticipated AM peak hour left-turn volume of 16 with an opposing traffic volume of approximately 276 vehicles is less than the 20 vehicle criteria for a prevailing speed between 46 and 55 MPH. However, with the possibility of more members arriving from the west than expected and the 50 MPH prevailing speed on Northshore Drive, a minimum 100-foot left-turn lane is recommended to provide refuge from the through traffic on northbound Northshore Drive. The design and construction should consider a uniform three-lane cross-section by creating a two-way left-turn lane between Charlottesville Boulevard and the YMCA access. This would further improve the already acceptable operations at the YMCA exit by allowing a two-stage movement, if needed in the long term future. Figures 9A and 9B display a conceptual plan for the roadway improvements and striping.

The PM peak hour right-turn volume from Northshore Drive to the proposed YMCA access is expected to be 12vph and the advancing through traffic flow should be approximately 742vph; therefore, a right-turn lane is not needed because the volume is less than the 24vph threshold in the Knox County criteria. However, a right-turn lane or large curb radius would facilitate the right turn and provide a deceleration/refuse to improve safety and reduce mainline friction. The right-turn lane provides an area for vehicles to reduce their speed upon turning right into the development without having to excessively slow the traffic on Northshore Drive. The large turning radius is an option that allows the right-turn to occur with less of a speed reduction. With regard to safety, queues, and travel speed, the northbound Northshore Drive approach at the YMCA access should consist of an exclusive left-turn lane and a through lane; the southbound Northshore Drive approach should be a single lane with a 45-foot right-turn radius at the YMCA access; and the YMCA access should consist of a single entrance lane, a left-turn exit lane, and a right-turn exit lane.

Conclusions and Recommendations

Based on the analyses and evaluations reported herein, WSA reached the following conclusions and makes the recommendations set forth below.

- *Sight distance at Proposed YMCA access*
 - Discussion: The minimum required stopping sight distance is 425 feet and the Knox County minimum required corner sight distance is 500 feet based on the approximate 50 MPH prevailing speed on Northshore Drive. Thus, the available sight distance at the proposed driveway location looking left (north) is greater than 1,000 feet and exceeds both requirements. Currently, the sight distance looking right (south) is restricted by vegetation overgrowth and trees.
 - Recommendation: Removal of vegetation overgrowth and trees should occur during site preparation and roadway improvements to achieve a minimum of 500 feet to meet both AASHIO standards and Knox County requirements. Site landscaping should be low height and maintained to preserve the required sight distances.

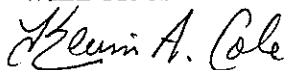
- *Auxiliary lanes*
 - Discussion: A southbound left-turn lane on Northshore Drive at Choto Road is currently warranted. A southbound right-turn lane on Northshore Drive at Choto Road will be warranted with background growth. The northbound left-turn lane and southbound right-turn lane on Northshore Drive at the intersection of Charlottesville Boulevard continue to be warranted as in the 2007 traffic impact study. The northbound left-turn traffic at the YMCA access is less than the threshold to be warranted.
 - Recommendation: It is recommended that the above-described turn lanes be constructed or modified. The justification for the southbound left-turn lane on Northshore Drive at Choto Road is independent of the proposed development. The newly constructed 75-foot northbound left-turn lane at Charlottesville Boulevard should be modified to provide a two-way left-turn lane between Charlottesville Boulevard and the YMCA access. This modification is due to the recommended northbound left-turn lane (100-foot storage minimum) on Northshore Drive at the YMCA access. The turn radius for the southbound Northshore Drive approach to the YMCA access should be 45-foot.

- *Proposed driveway exit lanes*
 - Discussion: It is not clear from the site plan if the proposed driveway includes separate lanes for left and right turns. However, given the projected LOS D conditions for the left-turn movement and minimal queue storage, it would be prudent to provide the separate lanes to minimize delay to right-turn drivers.
 - Recommendation: It is recommended that the site driveway include separate left- and right-turn lanes.

- *Signalization of Northshore Drive at Choto Road*
 - Discussion: The current volumes fail to meet the warrant volume thresholds for the signal based on the posted speed of 40 MPH, but the signal is justified based on background growth at 2015. With consideration of operating speeds exceeding 40 MPH, warrants are met currently and in the future. Further, given the poor existing level of service for eastbound Choto Road traffic, it is evident that the need for signalization is approaching.
 - Recommendation: It is recommended that traffic growth be monitored and that installation of the signal be included in jurisdictional programming of improvements. It is emphasized that the need for the signal is not associated with the proposed Jefferson Park and YMCA developments.
- *Minimize landscaping, using low growing vegetation, and signing at the proposed YMCA access to insure that safe sight distance is maintained*
- *Post STOP signs (R1-1) at the proposed YMCA access at Northshore Drive.*
- *Intersection design and roadway improvements should conform to the recommended standards and practices of the American Association of State Highway and Transportation Officials, the Institute of Transportation Engineers, and the Knox County Engineering and Public Works Department.*

Please find enclosed the supporting figures and appendix items cited herein. Do not hesitate to call if you have any questions or wish to discuss this report.

Sincerely,
WILBUR SMITH ASSOCIATES



Kevin A. Cole, PE
Senior Transportation Engineer

Enclosures:

FIGURES

- Figure 1: Location Map
- Figure 2: Site Plan
- Figure 3: Year 2008 Peak Hour Traffic
- Figure 4: Year 2015 Peak Hour Traffic Without Development
- Figure 5A: Residential Site Trip Distribution
- Figure 5B: YMCA Site Trip Distribution
- Figure 6A: New Residential Generated Traffic
- Figure 6B: New YMCA Site Generated Traffic
- Figure 7: Year 2015 Peak Hour Traffic With Development
- Figure 8: 2008 Geometry at Jefferson Park Subdivision
- Figure 9: Geometric Recommendation

APPENDIX

