



CITY OF WESTWOOD, KANSAS

PLANNING COMMISSION MEETING

4700 RAINBOW BLVD. WESTWOOD, KS 66205

Monday, October 09, 2023 at 7:00 PM

AGENDA

Welcome to your Westwood City Council meeting. This meeting may be attended remotely via Zoom:

Access Online: <https://us02web.zoom.us/j/89009964959>

Access by Phone: (312) 626-6799 / **Webinar ID:** 890 0996 4959

[Note: This agenda is subject to changes, additions, or deletions at the discretion of the Governing Body]

REGULAR MEETING AGENDA

I. CALL TO ORDER

II. APPROVAL OF THE AGENDA AND MEETING MINUTES

A. Consider approving the October 9, 2023 Planning Commission meeting agenda

[B.](#) Consider approving the September 11, 2023 Planning Commission meeting minutes

III. PUBLIC HEARINGS

IV. PRESENTATIONS

V. OLD BUSINESS

[A.](#) FP-2023-01 - Consider application of Karbank Holdings, LLC on behalf of owner City of Westwood to replat property at 5000 and 5050 Rainbow Blvd.

B. FP-2023-02 - Consider application of Karbank Holdings, LLC on behalf of owner Shawnee Mission School District to replat property at 2511 W. 50th St., et. al.

VI. NEW BUSINESS

[A.](#) FDP-2023-01 Consider application of Karbank Holdings, LLC on behalf of owners Shawnee Mission School District and City of Westwood, KS, jointly, for approval of a final development plan at 2511 W. 50th St., 5000 Rainbow Blvd., and 5050 Rainbow Blvd, Westwood, KS 66205

VII. ANNOUNCEMENTS/PLANNING COMMISSIONER COMMENTS

VIII. STAFF REPORTS

A. City Administrator Report (Leslie Herring)

- B. Public Works Director Report (John Sullivan)
- C. Codes Administrator/Building Official Report (Eddie McNeil)

IX. UPCOMING ITEMS

X. ADJOURNMENT

UPCOMING MEETINGS

Regular meetings of the Westwood Planning Commission are held at 7:00 PM on the first Monday of each month. The next regular meeting of the Westwood Planning Commission will be held November 6, 2023, at 7:00 PM at Westwood City Hall or virtually, depending on current public health protocols in place. The City Calendar may be accessed at www.westwoodks.org. To receive further updates and communications, please see or sign up for the following:

Westwood Buzz Email: <https://bit.ly/3wA4DWx>

Facebook: [City of Westwood Kansas-Government](#)
[Westwood, KS Police Department](#)

**City of Westwood, Kansas
Planning Commission Meeting
4700 Rainbow Boulevard
September 11, 2023 – 7:00 PM**

Commissioners Present: Kevin Breer, Vice Chair
Clay Fulghum
Ann Holliday
Samantha Kaiser
David Kelman
Mark Neibling
Sarah Page, Chair
Matt Prout
M. Scott Weaver

Commissioners Absent: None

Staff Present: Leslie Herring, City Administrator
John Sullivan, Public Works Director
Spencer Low, City Attorney Co-Counsel

Call to Order

Chair Page called the meeting to order at 7:05 PM on September 11, 2023.

Approval of Agenda and Meeting Minutes

Chair Page called for modifications or discussion of the August 7, 2023 meeting minutes. Commissioner Neibling noted a correction to the description of the building material, as “glazed” and not “stained” terra cotta. Chair Page also noted that public commenter Chamberlin’s name is Teri and not Tara. Commissioner Breer moved to approve the minutes as modified. Commissioner Weaver seconded. Motion passed unanimously.

Chair Page called for modifications or discussion of the September 11, 2023 agenda. Commissioner Breer moved to approve the agenda as presented. Commissioner Neibling seconded. Motion passed unanimously.

Public Hearings

[Continued from August 7, 2023] RZ-2023-01 Consider application of Karbank Holdings, LLC, on behalf of owner City of Westwood, KS to rezone property at 5000 and 5050 Rainbow Blvd., Westwood, KS 66205 from R-1 (Single-Family Residential) to PD (Planned Development); and

[Continued from August 7, 2023] RZ-2023-02 Consider application of Karbank Holdings, LLC, on behalf of owner Shawnee Mission School District to rezone property at 2511 W. 50th Street, et al., Westwood, KS 66205 from R-1 (Single-Family Residential) to PD (Planned Development); and

[Continued from August 7, 2023] PDP-2023-01 Consider application of Karbank Holdings, LLC on behalf of owners Shawnee Mission School District and City of Westwood, KS, jointly, for approval of a preliminary development plan at 2511 W. 50th St., 5000 Rainbow Blvd., and 5050 Rainbow Blvd, Westwood, KS 66205.

Chair Page provided an overview of the items before the Planning Commission on the agenda and the process to-date and moving forward. Page also shared additional future steps in the consideration of these applications.

Chair Page invited the applicant to address the Planning Commission. Mike Paxton, Architect w/ Perspective Architecture + Design, addressed the Planning Commission and presented a slide deck (included as Exhibit A to these minutes).

Chair Page invited questions of the applicant from the Planning Commissioners.

Commissioner Breer asked whether the trees to be removed would be replaced with the same type of tree. Paxton responded that trees would be replaced in kind based on arborist's recommendations for what varieties are successful in this area. Breer also asked who would be responsible for maintenance of the fountain planned for the corner of 50th & Rainbow Blvd. Paxton responded that the responsibility would be Karbank's.

Commissioner Kelman asked about balance and placement of conifer versus deciduous trees. Paxton responded that conifers would likely be concentrated on 50th and 51st Streets since those are the most sensitive areas to buffer but that they will work to create a balance. Kelman also asked for more information on the reduced leasable area. Paxton responded that the overall scale has been reduced and the structures have been pulled in from the edges of the property. A smaller scale is compatible with more boutique tenants who do not have the larger area needs that national brands have. Kelman also asked whether right turning movements could be considered on 51st St. to funnel traffic to Rainbow and away from residential streets. Paxton responded that a left turn lane would be added to 51st St. within the subject property (not impacting the existing curb placement at the residential properties on the south side of the road) so that a right and left turn lane are created and only one westbound lane from Rainbow Blvd. to help to encourage trips onto and off Rainbow Blvd.

Commissioner Weaver asked for clarification on the developer's intent and vision for this project as a unique space. Paxton responded that placemaking and synergy are ideal, which lead people in other areas of the city to know Westwood by this project. Weaver also asked what the site lighting will look like. Paxton showed and described the lighting on the east side of the structures and described the fixtures in the parking lot on the interior of the site in the parking lot. Weaver also asked about the berming and buffer. Paxton responded that the natural grade of the site creates a buffer and landscape hedges and graded buffers are being added in the lower areas of the site, at the southeast corner of the site.

Commissioner Kelman asked whether prospective tenants are known. Paxton responded that it's too early to begin recruiting tenants because final approvals haven't yet been received, which dictate when leasable spaces are available and how large they are.

Chair Page asked for context about why the level of LEED isn't being committed to. Paxton responded that Karbank is seeking LEED Certified level but that any level higher than that cannot yet be committed to due to the process of rating and certification.

Commissioner Weaver asked for the applicant to demonstrate how this proposal conforms to the 2017 Comprehensive Plan. Paxton responded that this application provides a mixed-use place for the community and combines walkable retail, office, and park offering for the community.

Commissioner Prout asked why the park restrooms cannot be included in the pavilion building(s). Paxton responded that the pavilion tenants will likely desire separate restrooms for their patrons.

Commissioner Kaiser asked whether and how the structures could be reused if the currently-proposed use is no longer viable or desired. Paxton responded that the structure and materials and stairwells and ingress and egress could allow the main building(s) to be reused for something other than retail and office but that change would require Planning Commission and/or City Council review and approval.

Commissioner Kelman asked what assurance there is that the materials or other details won't change again since they have been changing up to this point. Paxton responded that some small details could change (e.g. balcony railing or building envelope details for energy efficiency). The materials are now set and the applicant has spent a lot of time debating and deciding on the final materials.

Commissioner Fulghum and Commissioner Neibling asked questions about the traffic study and traffic counts (attached as Exhibit B to these minutes). Mark Sherfy, Engineer for BHC, addressed the Planning Commission. Sherfy responded that moving the Rainbow Blvd. access further to the south of the site does not impact the traffic counts provided in the report and improves sight distances from where it was originally proposed at 50th Ter. Neibling asked about resolution of onsite queuing issues spotted in the last version of the plan. Sherfy responded that 95% of the time, there shouldn't be any queuing issues but that 5% of the time there could be an internal backup into the site.

Commissioner Holliday asked whether an additional traffic signal is warranted due to this development. Sherfy responded that there aren't enough trips forecast to be generated from the site to warrant an additional signal at 51st St.

Commissioner Prout asked whether pass-by trips were intentionally excluded from the forecasts. Sherfy responded that they were excluded so that the most conservative forecasts could be used. Prout further asked what traffic controls were considered on 50th & 51st Streets to reduce the impact on development traffic on residential streets. Sherfy responded that signage restricting turning movements is certainly something the City could consider but that law enforcement would need stay vigilant for the signage to be most impactful. Sherfy further noted that the trips generated by this site in the afternoon are about 30% less than the traffic on 50th St. currently created by Rushton Elementary being located on this site.

Commissioner Weaver asked Sherfy what intensity level he would consider this development. Sherfy said due to the mix of uses and size of the development, he would classify the project as mid to low intensity. Weaver asked, for comparison, what level of intensity Walmart Neighborhood Market would be considered. Sherfy responded mid-intensity.

Chair Page invited City Staff to address the Planning Commission. City Administrator Herring provided a review of the various application processes related to this project and how they relate to one another and how both the Planning Commission and City Council are involved in the process. Herring also read from the staff report included in the meeting packet.

Commissioner Weaver asked how staff considers this plan to be in compliance with the 2017 Comprehensive Plan and the 2021 ULI TAP recommendations. Herring responded that mixed-use is called out as an acceptable and contemplated use for 5050 Rainbow and that this project is that. Herring further shared that the ULI TAP was specifically focused on diversifying housing, enhancing the City's revenue portfolio, and enhanced civic spaces and that, even though this plan does not include housing

on the site, it's not entirely counter to the recommendations. Herring also pointed out that the ULI TAP was commissioned and performed in the absence of specific proposals and so this project was not considered nor contemplated by the ULI TAP panel.

Chair Page called for public comment on the application and shared ground rules for the public comment period.

Lou Wetzel, 4832 Adams St., Westwood, addressed the Planning Commission. Wetzel noted that difference of the proposed building height to the City Hall building height. Wetzel stated that the park area isn't just one acre, that children and families effectively use five to six acres for recreational space and not just the one acre park. Wetzel implored the Planning Commission to do something more special than the current proposal and offered to lead an effort to raise private money to be an alternative to the current proposal.

Dennis Dupont, 1930 W. 50th Ter., Westwood Hills, addressed the Planning Commission. Dupont asked a series of questions related to the development's impact to neighboring property values, the details of the business terms, the possibility that City Hall could be relocated to the site. Dupont stated that the conversations he's having indicated clearly that the community doesn't want this project.

Nicki Dupont, 1930 W. 50th Ter., Westwood Hills, addressed the Planning Commission. Dupont expressed concern that Karbank would redevelop single family homes, questioned why Karbank isn't seeking to redevelop existing commercial buildings where they already exist, and that Karbank's relationship with the City of Mission Woods should be instructive to Westwood.

Jan Kyle, 4946 Belinder Ave., Westwood, addressed the Planning Commission (via Zoom). Kyle expressed a desire that the subject property be used only for single family residential housing. Further stating that this development would be more appropriate at 47th & Rainbow. Kyle asked whether an open bid process was conducted and also asked whether any officials have a prior relationship with Karbank.

Mike Coffman, 2217 W. 50th St., Westwood Hills, addressed the Planning Commission. Coffman stated that the proposed project does not comply with the 2015 ULI TAP, 2017 Comprehensive Plan, nor 2021 ULI TAP. Coffman further stated that, living at 50th & Rainbow Blvd., he has seen several accidents and that the intersection is unsafe and that the development will make it less safe. Coffman further stated that the project is not in line with the character of the neighborhood.

Adam Troutwine, 2019 W. 49th St., Westwood Hills, addressed the Planning Commission (via Zoom). Troutwine stated that he supports this project and that this is a net positive for the community, and is additive. He believes this will make the Westwood (and Westwood Hills) community more attractive for current and future residents and that the expanded park is an enhancement and is not concerned about the traffic forecasts.

Steven Platt, 4910 Glendale Rd., Westwood Hills, addressed the Planning Commission. Platt expressed a preference for single family residential homes on the school property and that Karbank focus on redeveloping existing commercial buildings and not this site.

Spencer Day, 3003 W. 49th Ter., Westwood, addressed the Planning Commission (via Zoom). Day discussed the feasibility of alternatives he has heard suggested, including developing the entire area as a park or for the site(s) to be developed with single family homes and he believes both options to be

financially unfeasible. Day expressed support for the proposal and believes the applicant has done a good job addressing community concerns, he finds the traffic study believable, and does not believe the project will lead to an increase in crime.

Tara Laird Hensley, 4944 Norwood St., Westwood, addressed the Planning Commission. Laird Hensley expressed concern about the environmental impact of the proposed development. Laird Hensley further expressed concern about Karbank as a development partner for the City.

Malisa Monyakula, 2821 W. 51st Ter., Westwood, addressed the Planning Commission. Monyakula expressed dissatisfaction with the size of the proposed park. Further, she requested disclosures of City Officials prior interactions and involvement with Karbank and expressed concern that there wasn't an open bid process for this site.

Beth Ciperson, 4535 Cambridge, Kansas City, Kansas, addressed the Planning Commission. Ciperson expressed an interest in the developer exploring specific environmentally-sustainable design elements she suggests.

Dave Buck, 2332 W. 51st St., Westwood, addressed the Planning Commission. Buck asked at what cost to the community is the City getting a new park? Buck expressed concerns about the non-local vehicular traffic to the site and requested a smaller development. He requests that the Planning Commission delay a decision but should the Planning Commission approve the applications, the conditions he suggests be considered. (Attached as Exhibit C to these minutes.)

Andrew Becker, 2914 W. 48th Ter., Westwood, addressed the Planning Commission. Becker expressed support for the proposal. He stated that changes in land use are inevitable in Westwood and that this is the City's opportunity to control the former Westwood View School and that private development of the site should Karbank's proposal not be approved would result in future rounds of redevelopment requests for different projects. He further stated that the counter to more vehicular traffic is more mixed-use, higher intensity, walkable (re)developments.

Cydney Millstein, 1537 Bellview Ave., Kansas City, Missouri, addressed the Planning Commission. Millstein cited the 2021 ULI TAP and stated her position that the current proposal does not conform to those recommendations. She further stated concern that approval of this proposal would create a precedent for future takings and that the historic district of Westwood Hills would be harmed by the approval of this project.

Ben Hobert, 2208 W. 49th St., Westwood Hills, addressed the Planning Commission. Hobert expressed concern about the impact of this development on immediately surrounding residents on 50th & 51st Streets. Hobert further requests that the Donation Agreement be made public as he has concerns related to the legal and tax implications of the related transactions.

Brandon Joiner, 2016 W. 47th Ter., Westwood, addressed the Planning Commission. Joiner stated support for the project and the additional amenities and park enhancements resulting from this proposal. He expressed favor and support for Karbank as a partner and requests the Planning Commission make specific instruction to Karbank if there are elements keeping this from approval and asks that the project not be indefinitely delayed.

Bernard Brown, 2805 W. 51st Ter., Westwood, addressed the Planning Commission. Brown expressed concern about the scale of the proposed development, specifically the building height and the high number of parking spaces. Brown stated that he doesn't feel this is the right project in this place. Further, he expressed concern about how this proposal came to Westwood to begin with and whether there were previous ties between City Officials and Karbank.

Karen Johnson, 4950 Adams St., Westwood, addressed the Planning Commission. Johnson provided the Planning Commissioners with a copy of correspondence she previously provided to the Planning Commissioners ahead of the meeting and which was included in the September 11, 2023 Planning Commission meeting packet. Johnson does not feel that the proposal conforms to the 2017 Master Plan and that single-family residential homes are the only appropriate use for the site. She requests that the Planning Commission recommend denial of this application.

Ellen Marsee, 4957 Adams St., Westwood, addressed the Planning Commission. Marsee expressed concern that not all City Officials and Staff are elected and that she is concerned that the City Officials are not advocating for her as a resident.

Jamie Harkar, 2212 W. 50th Ter., Westwood Hills, addressed the Planning Commission. Harkar expressed concern that the City will lose control over the use of the site once the rezoning is approved and also expressed a position that the amount of green space currently accessible to residents is sufficient. Harkar also expressed concern that a private developer could engage the City in costly litigation if they don't get everything they want.

Carrol Thomas, 2100 W. 51st St., Mission Woods, addressed the Planning Commission. Thomas expressed concern that a study hasn't been conducted as to the impact of the development on the values of surrounding properties. Thomas further expressed concern about the levels of vehicular traffic and the loss of mature trees along Rainbow due to the development and that the mature trees shown in the renderings is a farce and that the development will not fit in with the community.

Sara Keehn, 4957 Booth St., Westwood, addressed the Planning Commission. Keehn expressed her opposition to this and other commercial developments in Westwood and stated a desire to maintain the zoning on the site as single-family residential. Keehn further expressed concern about traffic and advocates for any use other than single-family residential to be for the full use of the site as a park. She cited that the 2017 Comprehensive Plan calls for commercial development to be kept at 47th & Rainbow Blvd. and states that the City shouldn't be concerned with increasing revenues but that costs should be reduced.

Richard Ralls, 5311 Mission Woods Rd., Mission Woods, addressed the Planning Commission. Ralls shared that he does not believe the Planning Commission needs to consider a Planned Development District and that the underlying zoning district of C-1 has regulations in place that would be appropriate for this project.

John Ye, 4836 Belinder Ct., Westwood, addressed the Planning Commission. Ye cited multiple historical examples in Westwood where public commenters and community members expressed concerns loudly about the proposals before the community and City Officials in those instances. Ye stated that there are lines in the 2017 Comprehensive Plan that people could use to reinforce positions both for and against this project. He asks the Planning Commission to follow true north and allow calmer heads to prevail in the decision making process.

Chair Page asked for any additional commenters to come forward; seeing none, Page closed the public comment portion of the meeting.

Chair Page invited the applicant to address the Planning Commission again to share responses to any questions posed during the public comment portion of the hearing. The applicant declined to provide responses.

Chair Page invited City Administrator Herring to address the Planning Commission again to share responses to any questions posed during the public comment portion of the hearing. Herring declined to provide responses.

Chair Page invited discussion amongst the Planning Commissioners. Commissioner Breer acknowledged how much Karbank and its architects had been responsive to the community and input and thanked everyone for hard work on the project and for the community to invest so much time following the project. Breer further stated that he researched during the meeting the history of litigation Karbank is involved in and found nothing but invited members of the public to send him headlines or legal case numbers for litigation not immediately available online. Breer further stated that the City Officials, including Planning Commission, City Council, the Mayor, and City staff undergo legalities training and would disclose any conflicts of interest if there were any and that he, himself, has recused himself before from participating in discussions and voting when he has a conflict or client involved in Planning Commission proceedings. Breer further shared appreciation for City Staff's work in making so much information and readily available as this project has evolved over the past several months.

Commissioner Weaver asked for clarification from the City Attorney about what, legally, the Planning Commission is responsible for and how the Planning Commission acts as a quasi-judicial arm of the City government. City Attorney Spencer Low stated that the Planning Commission's authority is clearly set out in the staff report included in the meeting packet.

Commissioner Kelman stated that he is an architect by trade and is very familiar with the process this project has taken in its review and consideration to get from idea to built and he feels he needs to address some comments he has heard that City Officials have already decided this is happening despite the public process and that the decision has been pre-conceived. He further shared that he feels Karbank has genuinely responded in its revised submittals to community concerns and that he is still struggling with how he will ultimately vote on the project and lost sleep over the decision.

Chair Page stated that some of the concerns she has heard are about Rainbow Blvd. and its safety and comfort for road users and that the road corridor is being evaluated for improvements outside of this proposal. Further, she shared that she has had lots of conversations with community members about the project and that what she is hearing is pretty evenly divided between people who are for and against the development, despite most people who spoke at the public hearing sharing comments in opposition to or concerns about the project.

Commissioner Holliday stated concerns about the accident prevalence at 50th & Rainbow Blvd. cited during public comment and was directed by fellow Planning Commissioners to the page in the traffic study that states those numbers.

Herring asked for the Planning Commission to provide clear or specific direction or changes to staff or to the applicant so that the process can come to some resolution/conclusion, whether that conclusion is denial, conditional approval, or denial. Herring also noted that the Planning Commission Bylaws require that meetings end at 11 PM unless extended by majority vote of the Planning Commission.

Chair Page noted that she would like to see the City's traffic engineer's review and opinion on the applicant's traffic study, which was just received today and hasn't yet undergone review. Page asked for fellow Planning Commissioners to state whether they have clear, specific direction for additional items to come to a decision on the applications. Page further noted that she would also entertain a motion from the Planning Commission. Commissioner Breer stated that he is ready to make a motion but invited additional conversation from the Planning Commission before making a motion.

Commissioner Neibling noted that he is interested in looking further into the applicant incorporating the park restroom facility into the pavilion structure(s) and asked what others thought. Commissioner Breer stated that he would be comfortable adding that as a condition but that he also understands that a separate park restroom may also have value to park users.

There was some discussion about the process for making a motion with conditions.

Motion made at 10:55 PM by Breer to extend the meeting to 11:15 PM. Seconded by Kelman. Motion passed unanimously.

Motion made by Commissioner Breer to approve **RZ-2023-01** – *Application of Karbank Holdings, LLC, on behalf of owner City of Westwood, KS to rezone property at 5000 and 5050 Rainbow Blvd., Westwood, KS 66205 from R-1 (Single-Family Residential) to PD (Planned Development);*

RZ-2023-02 – *Application of Karbank Holdings, LLC, on behalf of owner Shawnee Mission School District to rezone property at 2511 W. 50th St., et al., Westwood, KS 66205 from R-1 (Single-Family Residential) to PD (Planned Development); and*

PDP-2023-01 – *Application of Karbank Holdings, LLC on behalf of owners Shawnee Mission School District and City of Westwood, KS, jointly, for approval of a preliminary development plan at 2511 W. 50th St., 5000 Rainbow Blvd., and 5050 Rainbow Blvd, Westwood, KS 66205; with the following conditions:*

- a. Karbank to perform at its sole expense a study prior to any demolition permits being issued, such study to include the following scope of work:
 1. provide an inventory of all existing trees, identifying by location each tree's:
 - i. specie type;
 - ii. estimated age;
 - iii. condition (and to the extent possible an estimate on remaining lifespan);
 - iv. ability to be relocated elsewhere on the development site or at the City Park (with emphasis on relocating as many as possible on the development site); and
 - v. if proposed to be kept, a tree preservation and protection plan for use during the demolition and construction period;

- b. Karbank to mitigate the removal of mature trees from 5000 and 5050 Rainbow Blvd. by providing one (1) new tree for every tree less than 12" caliper removed and for trees over 12" caliper, replace at 2:1. Preference for new tree plantings is for them to be located in the north and south side yard of the of the development; however, exact location will be determined at a later date following the conclusion of the study defined above;
- c. Karbank to provide as part of the final development plan consideration sufficient and acceptable in-school traffic counts and traffic modeling and any necessary resulting modifications to the site access to ensure levels of service do not worsen as a result of the development;
- d. Karbank, prior to final development plan approval, conclude with KDOT its review of the site access as applicable to KDOT and its jurisdiction on Rainbow Blvd. conditioned upon the approval of the City traffic engineer following review of the traffic study and per her recommendations to the applicant and City Staff; and
- e. Karbank and the City in good faith study whether the park restroom should be part of the Karbank development or be a separate structure serviced by the City.

Second by Commissioner Holliday.

Commissioner Neibling moved to amend the motion to change the last condition to direct the City and Karbank to evaluate incorporating the park restroom within the Karbank property and seeking an agreement for public use of the restroom. Second of the amendment by Commissioner Breer. Motion passed unanimously.

Discussion on the amended motion. Commissioner Fulghum asked whether the motion should be changed to acknowledge that traffic counts are now available. Commissioner Breer stated he prefers the language stay as stated tonight. Herring acknowledged City Staff does not have a problem leaving the language as-is even though condition c. is already resolving itself.

Herring called the role. Motion passed 7-2 with Kaiser and Kelman voting against.

Adjournment

Motion by Commissioner Breer to adjourn the meeting. Second by Commissioner Kelman. Motion passed unanimously. The meeting adjourned at 11:06 PM.

Upcoming Items

- A. FDP-2023-01 Consider application of Karbank Holdings, LLC on behalf of owners Shawnee Mission School District and City of Westwood, KS, jointly, for approval of a final development plan at 2511 W. 50th St., 5000 Rainbow Blvd., and 5050 Rainbow Blvd, Westwood, KS 66205

- B. FP-2023-01 - Consider application of Karbank Holdings, LLC on behalf of owner City of Westwood to replat property at 5000 and 5050 Rainbow Blvd.
- C. FP-2023-02 - Consider application of Karbank Holdings, LLC on behalf of owner Shawnee Mission School District to replat property at 2511 W. 50th St., et. al.

APPROVED: _____
Sarah Page, Chair

ATTEST: _____
Leslie Herring, Secretary

DRAFT

WESTWOOD

CITY PARK AND MIXED-USE PROPOSAL

PLANNING COMMISSION
MEETING
9.11.23

Exhibit A

ion II, Item



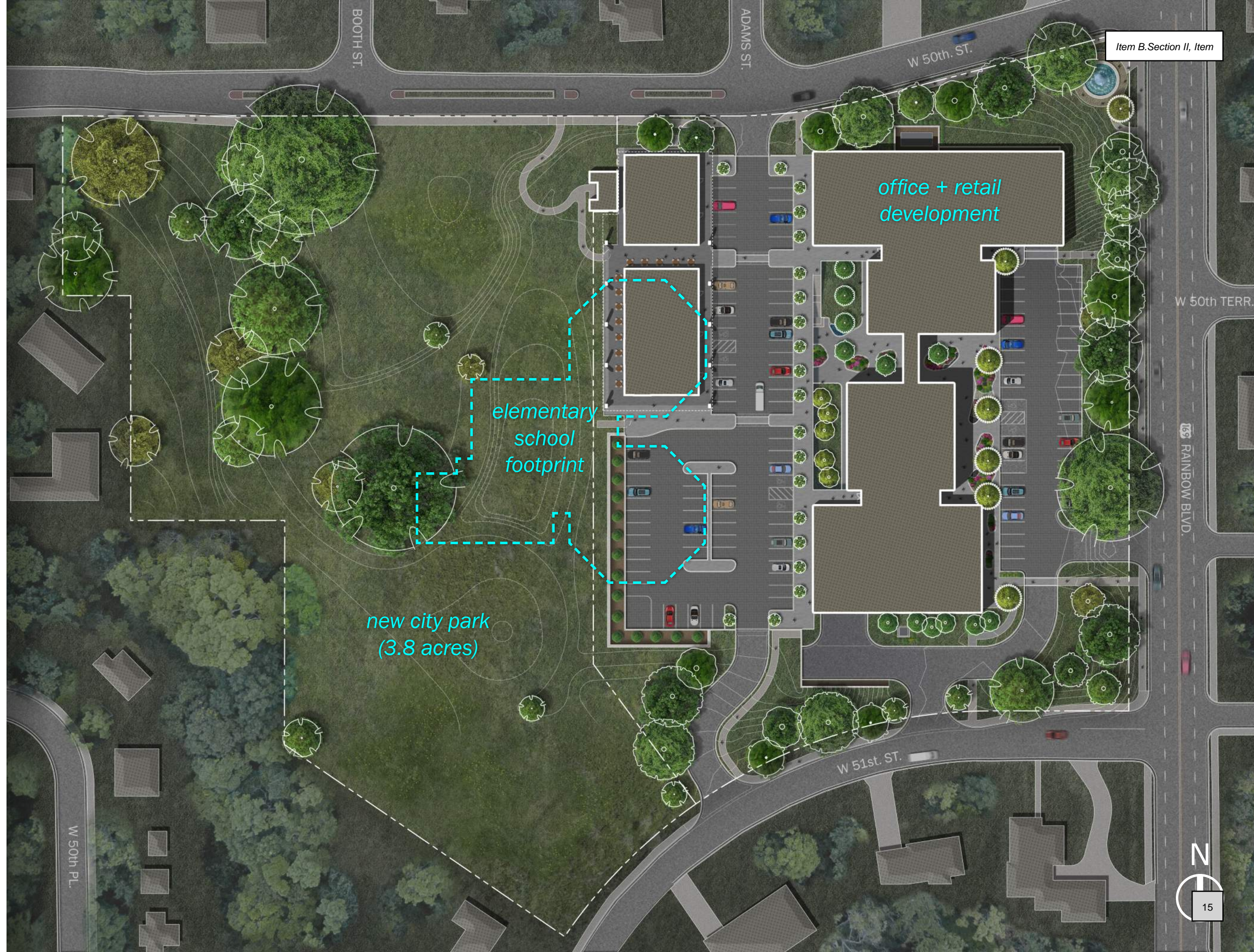
EXISTING

- 7.6 acres.
- 1.0 acre Dennis Park.
- 4.8 acre school.
- 1.8 acre former church.



PROPOSED

- 3.8 acre City Park.
- 4.2 acre mixed-use development.



MATERIALS

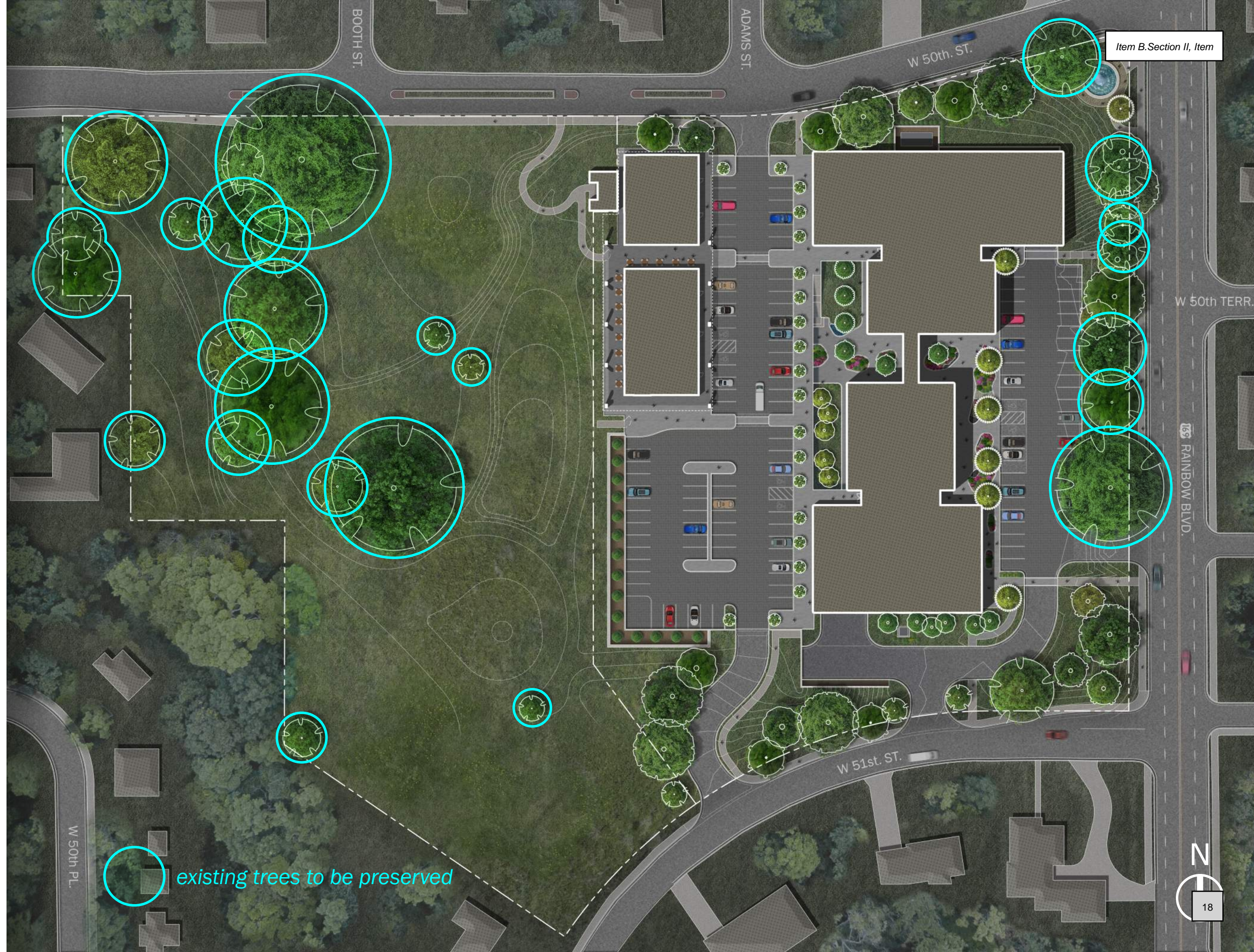
- Switch to exterior wood cladding.
- Muted, earth tones in natural colors.
- Blends more seamlessly into the landscape.
- Natural limestone accents throughout.





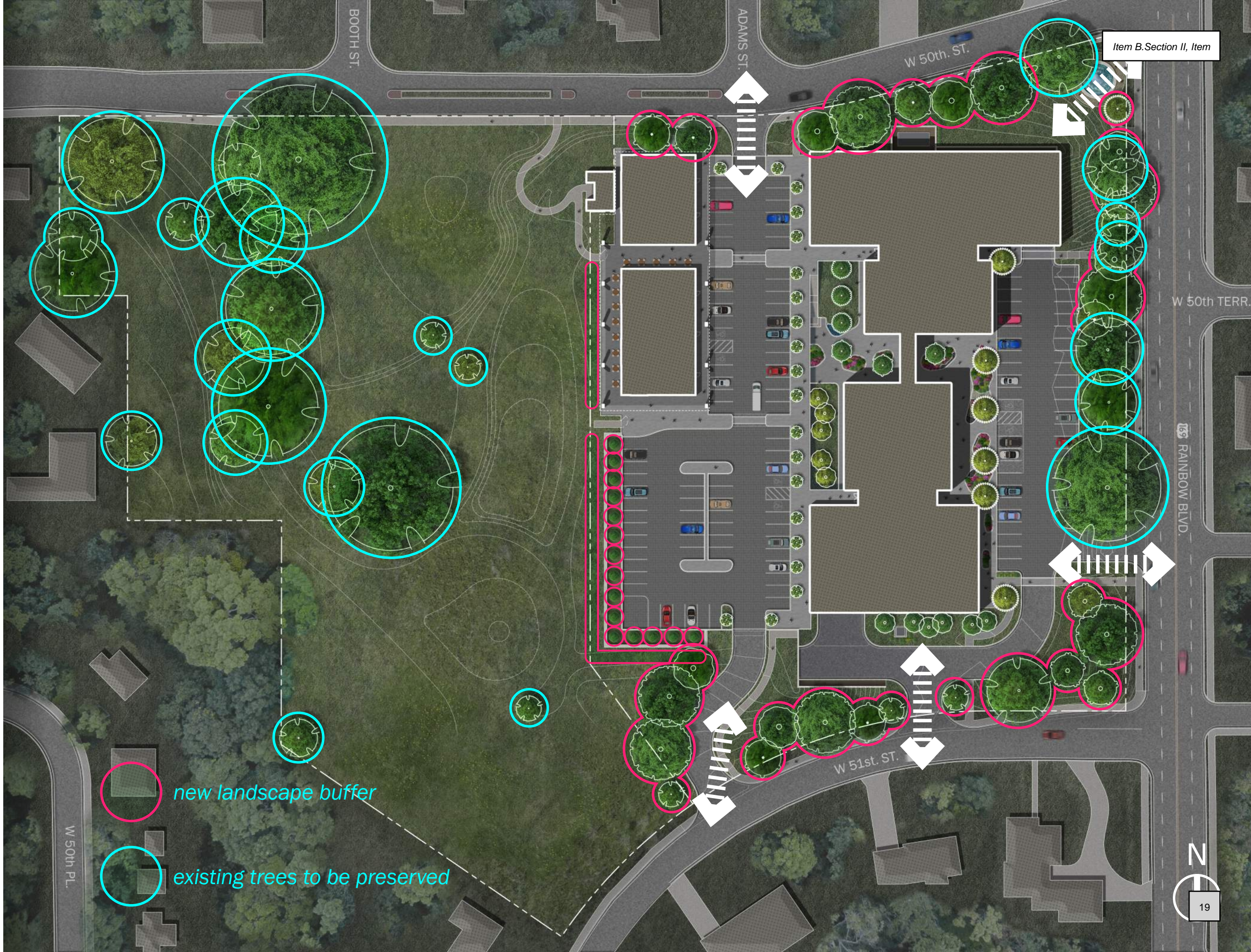
LANDSCAPE

- Trees are an integral part of the neighborhood and the environment.
- Existing trees will be preserved whenever possible.
- Existing street trees to be maintained to preserve street canopy.
- When not possible to save, existing trees will be replaced with new trees in City Park:
 - Trees 12" in caliper or less will be replaced with 1 new tree.
 - Trees more than 12" in caliper will be replaced with 2 new trees.



LANDSCAPE

- Additional trees and landscape will be planted along perimeter of site to maximize screening.
- Landscape buffers will also shield service areas/equipment.
- Arborist is engaged to inventory all existing trees on site, and create tree preservation plan.
- Recommendations will be implemented in final permit documents.





PARK EXPANSION

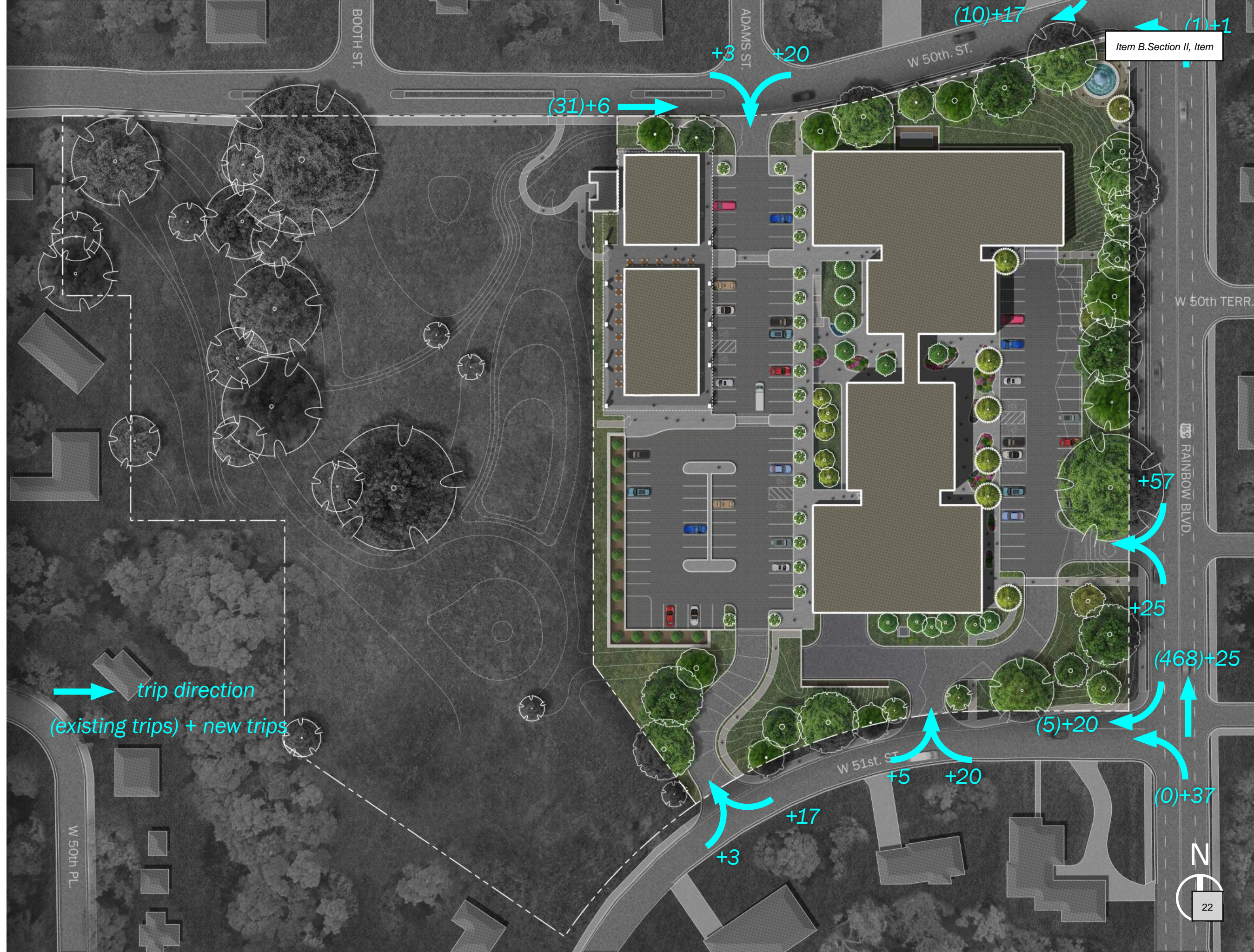
- Karbank is privately and independently under contract to acquire adjacent property at the southwest corner of the site.
- Park area increases to 3.8 acres.



TRAFFIC

AM Traffic Study:
Peak hours (7:30-8:30am)
Incoming Traffic

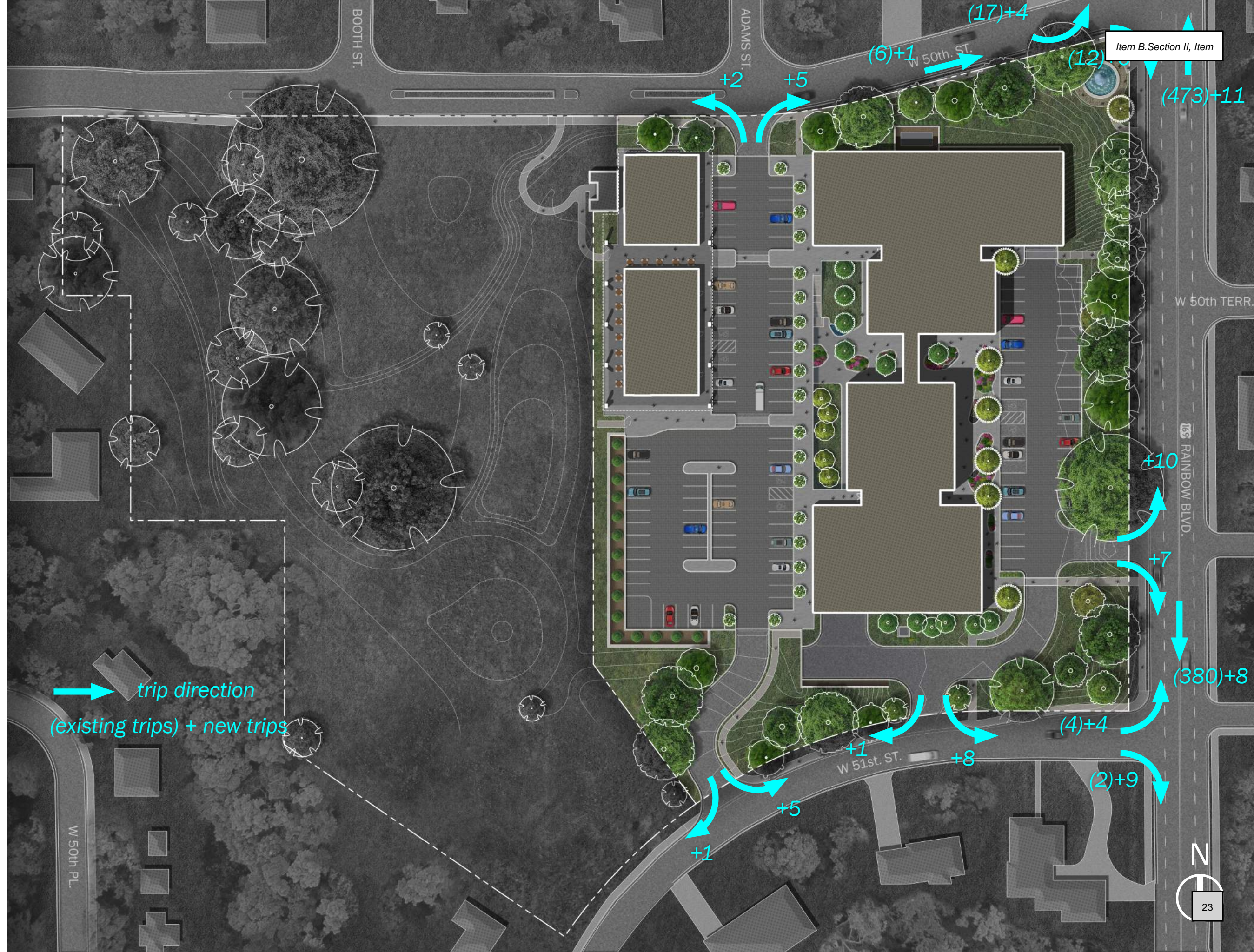
- Traffic engineers have reviewed existing conditions and proposed project.
- Pedestrian safety is important.
- NO drive-thrus.
- NO street parking.
- Minimal appointment based tenants.



TRAFFIC

AM Traffic Study:
Peak hours (7:30-8:30am)
Outbound Traffic

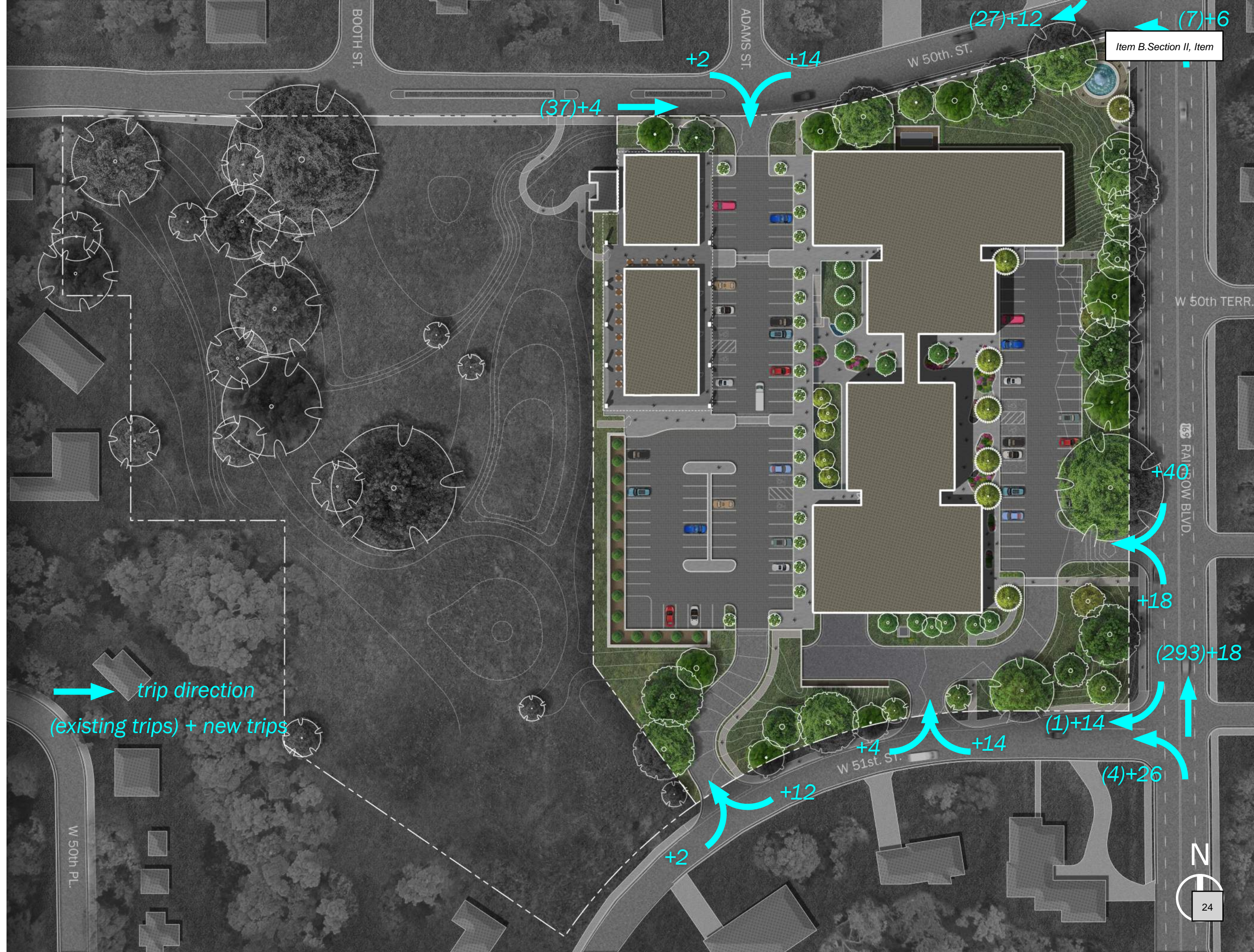
- Traffic engineers have reviewed existing conditions and proposed project.
- Pedestrian safety is important.
- NO drive-thrus.
- NO street parking.
- Minimal appointment based tenants.



TRAFFIC

PM Traffic Study:
Peak hours (4:30-5:30pm)
Incoming Traffic

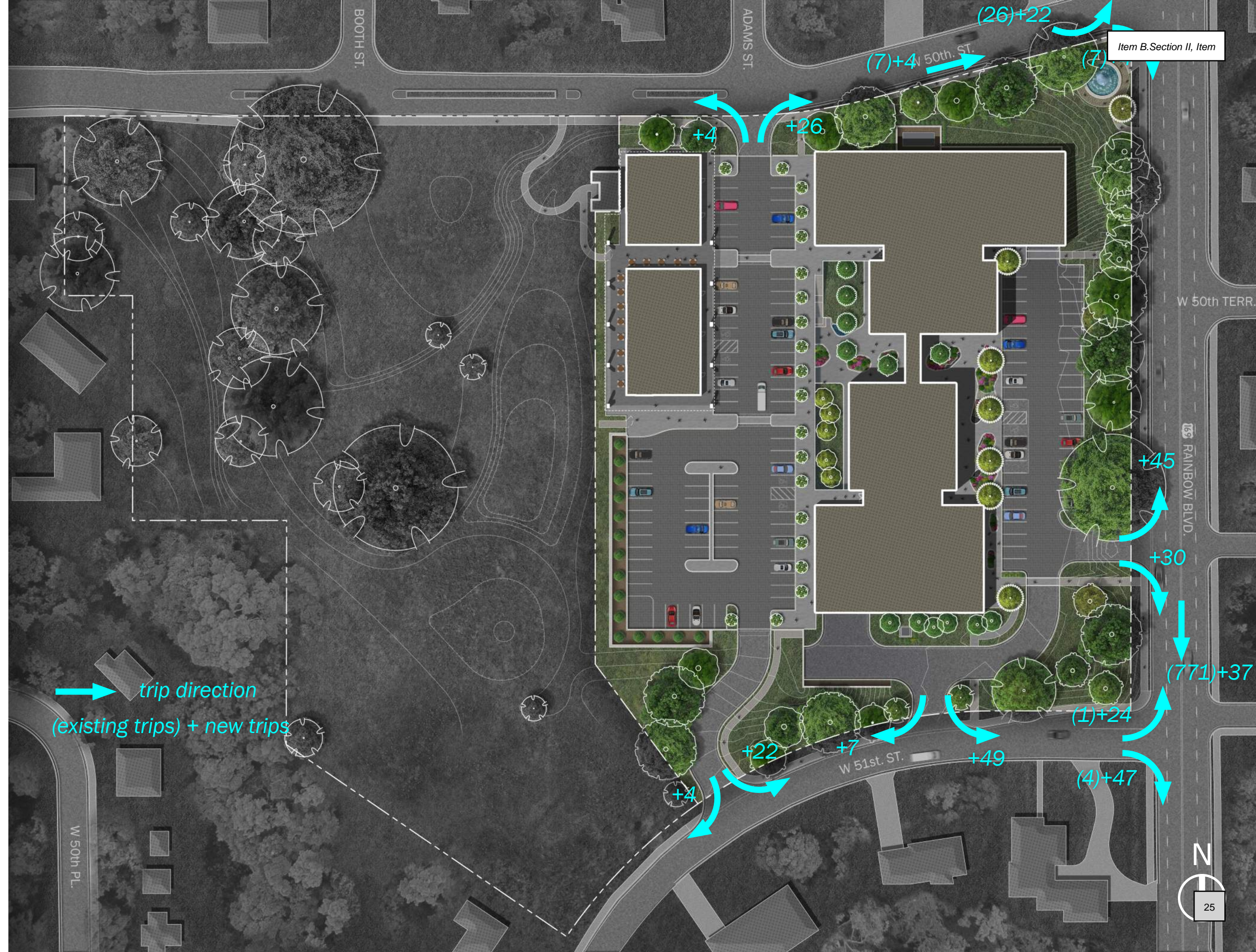
- 75% of traffic (including most office users) will enter off 51st Street or Rainbow access drive to minimize effect on pedestrian/school traffic on 50th Street.
- Diversity of tenants and park visitors create distributed traffic throughout the day.
- Currently engaged with City and KDOT.



TRAFFIC

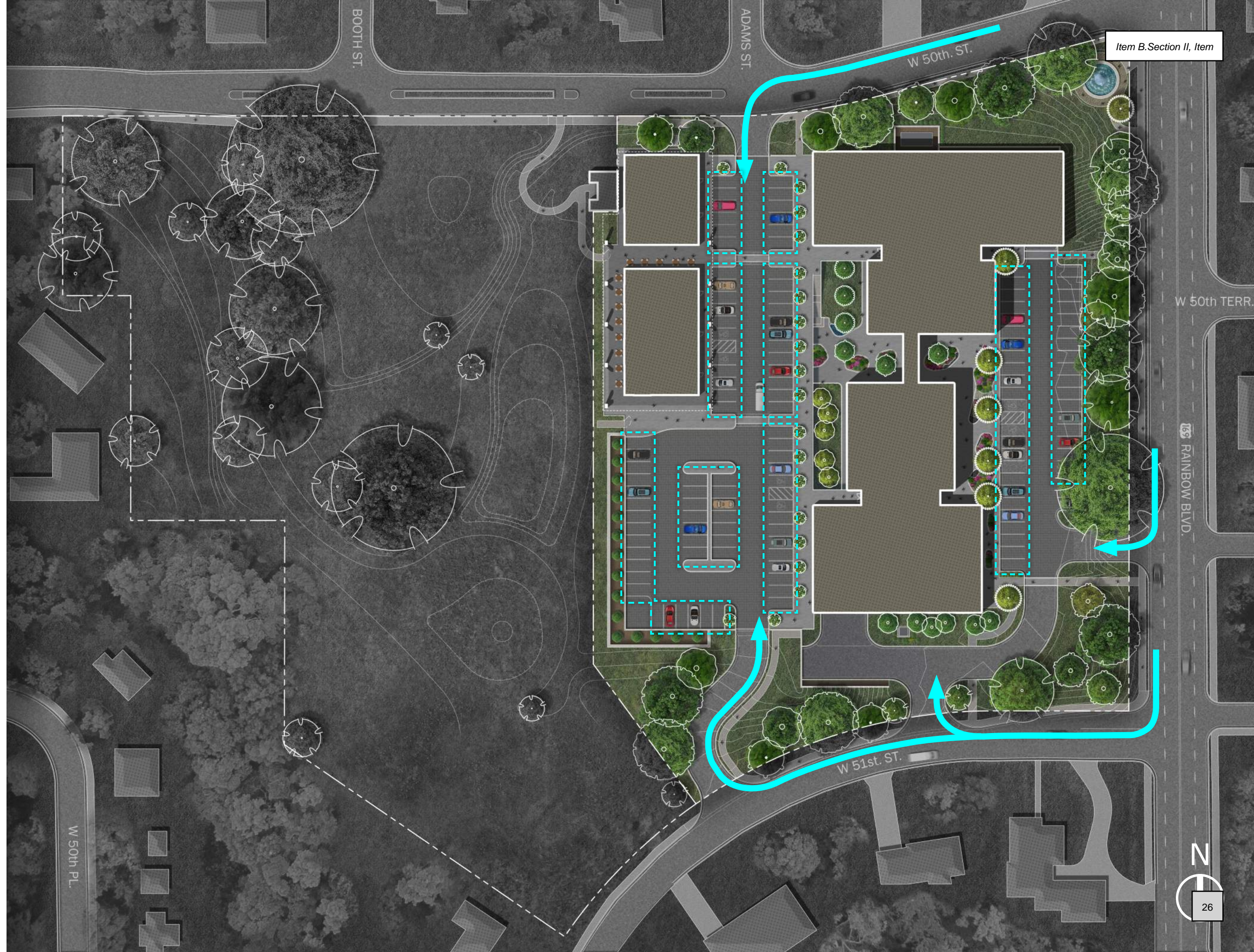
PM Traffic Study:
Peak hours (4:30-5:30pm)
Outbound Traffic

- 75% of traffic (including most office users) will enter off 51st Street or Rainbow access drive to minimize effect on pedestrian/school traffic on 50th Street.
- Diversity of tenants and park visitors create distributed traffic throughout the day.
- Currently engaged with City and KDOT.



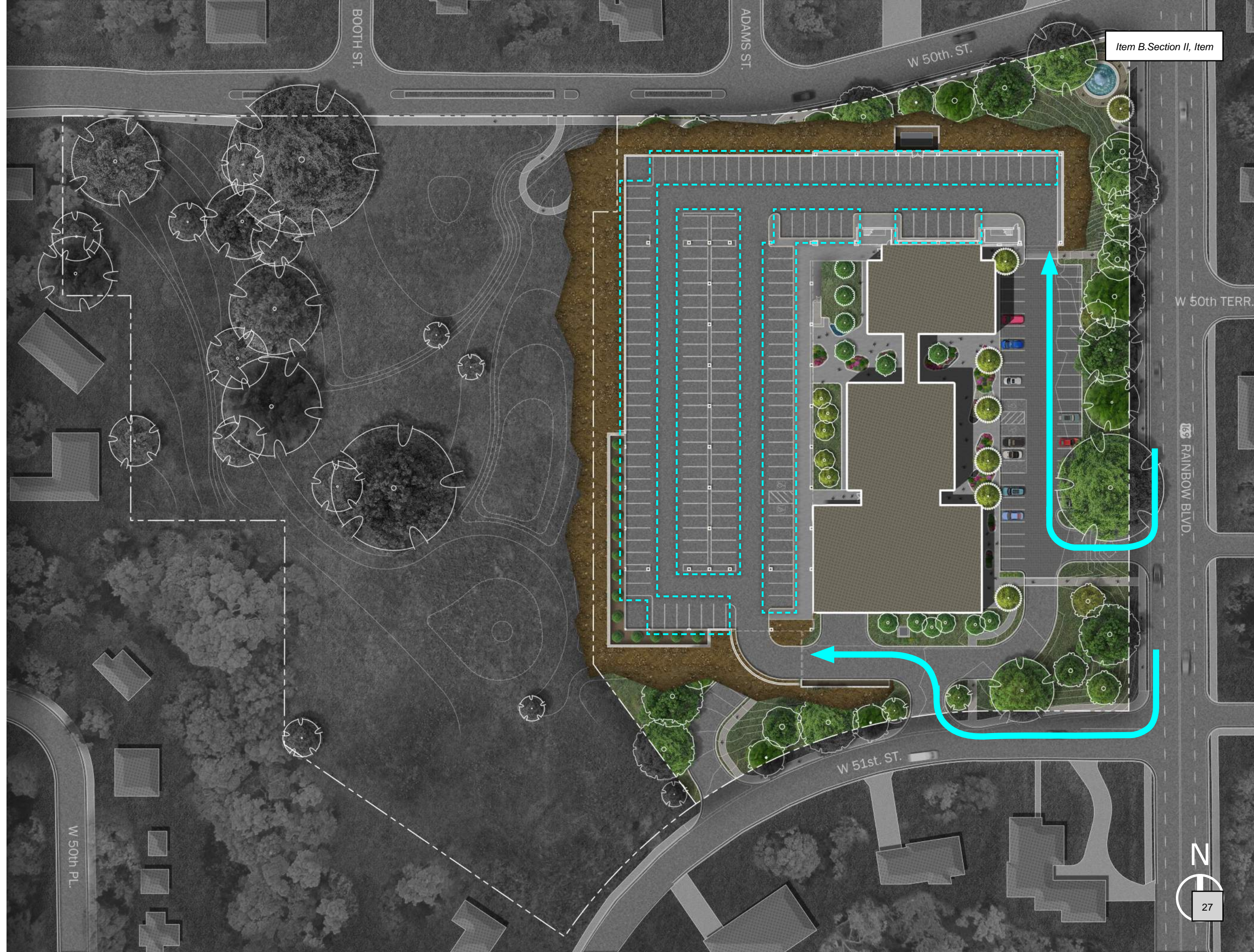
PARKING

- 290 total spaces.
- 123 spaces above ground.
- 42% of total spaces.



PARKING

- 290 total spaces.
- 167 below ground.
- 58% of total spaces.



TRAFFIC

- Proposed project is smaller than 51st and State Line office park.
- Office and Pembroke Hill traffic enters/exits through single location.
- Since 2012 opening, no major traffic backups or complaints.
- Traffic flow scattered throughout the day with slight increase between 7-9am and 4-6pm M-F.



TRAFFIC

- Karbank renovated intersection (at own expense) to improve visibility and safety.
- It is in everyone's best interest to ensure safe, flowing traffic.



SCALE

- The overall project square footage has been reduced by 15%.
- 125,000 sf down to 106,000 sf.



SCALE

- Building height concentrated at interior of site.
- Park green space increased by 14%.



SCALE

- Building utilizes site slope to reduce effective height on north and west sides.
- Buildings are two and three stories from park.
- Two stories from 50th street.
- Two stories + retail from 51st Street.





SCALE

- Enlarged setbacks create relief to adjacent residences.
- Current zoning calls for zero lot-lines and minimum setbacks.
- Large setback allow for landscape buffer and create a transition between residential and commercial uses.
- Tallest building is over 100 feet from Rainbow.



FOUNTAIN

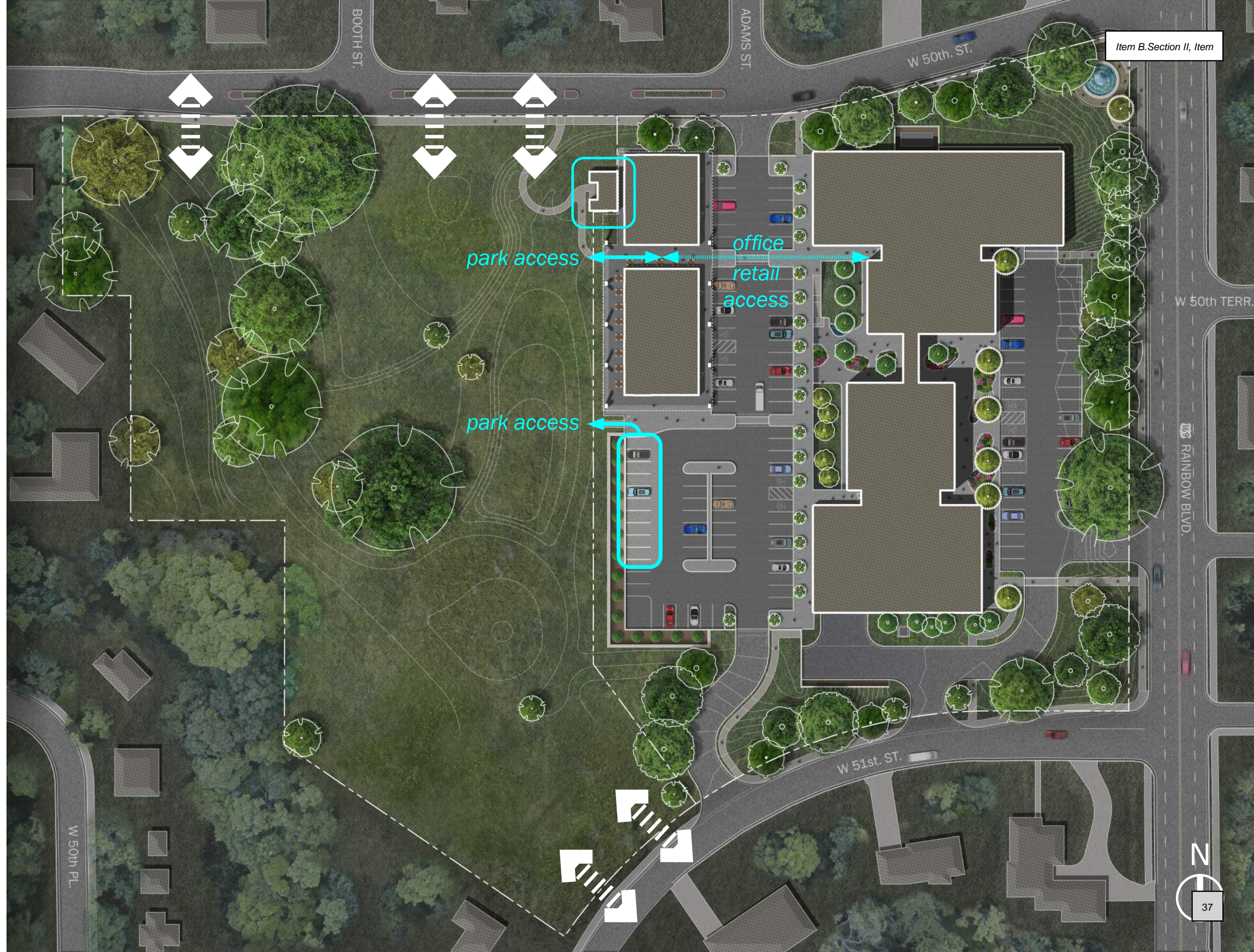
- New fountain at 50th and Rainbow will be closer to the corner.
- Design will reflect the current fountain in look and character for residents and visitors to enjoy.





CONNECTION

- The park will seamlessly connect to the new development.
- 10 dedicated parking spaces for park visitors.
- Access to the park from 50th and 51st streets.
- Walk from the park, directly across and down stairs to retail and restaurants.
- Restroom location and design to be finalized upon City Park design completion.
- Park design is yet to be determined.







5050

view from pavilion entry to office build







SUSTAINABILITY

- Development will be built to LEED Certified standards. Green features include:
- Bicycle storage and shower rooms.
- Reduced parking space count below zoning requirements .
- 15 parking spaces for green vehicles.
- 6 parking spaces for electric vehicle charging.
- Erosion and sedimentation control plan for all construction activities.



SUSTAINABILITY

- Vegetated green roofs on north, south, and pavilion buildings.
- High reflectance roofing materials.
- Minimized light pollution.
- Reduced outdoor water consumption by planting native and drought tolerant plants.
- High efficiency plumbing and fixtures.
- Enhanced design of building envelope and MEP systems.
- High performance glass.



SUSTAINABILITY

- Optimized energy performance.
- Storage and collection of recyclables.
- Construction and demolition waste management plan.
- Utilization of building products that have improved environmental life cycle impacts and high recycled contents.
- Naturally ventilated, daylit parking garage.



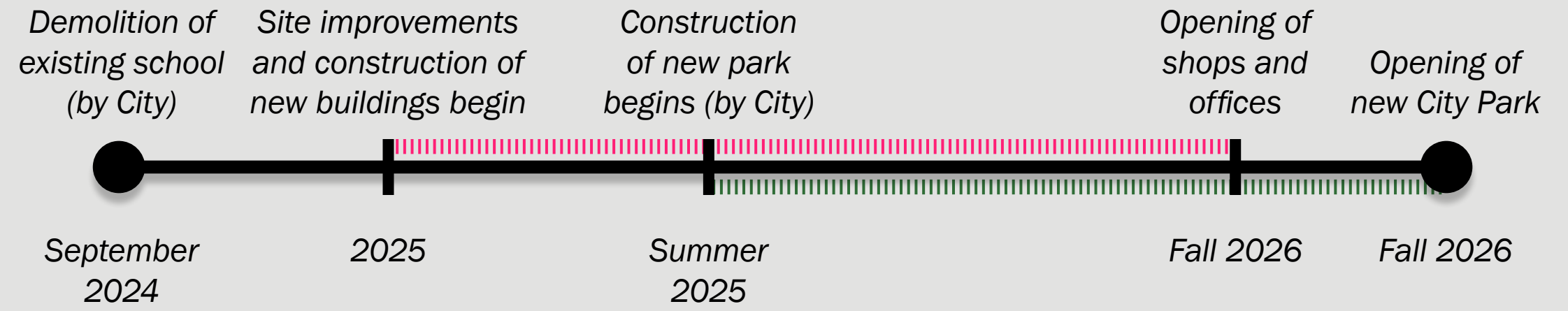
SUSTAINABILITY

- Enhanced air quality through prohibited smoking inside and within 25 feet of buildings.
- Focus on wellness and healthy lifestyle with tenant building amenities (locker rooms, fitness center, etc.).
- LED lighting throughout.



SCHEDULE

- September 2024: Demolition of existing School (by City).
- Calendar year 2025: Site improvements and construction of new buildings begins.
- Summer 2025: Construction on new park begins (design and construction by City).
- Fall 2026: Opening of shops and offices to residents and public.
- Fall 2026: Opening of new City Park to residents and public.



WHY OFFICE?

- Proposed development provides comfortable work-life environment.
- Central Location in the metro.
- Restaurants and retail services downstairs.
- Strong connection to adjacent city park.
- Class A amenities: covered parking, fitness center.
- Developer has owned and developed many office projects in the area.
- Market for high-quality, well located, new green properties is strong.
- COVID work-from-home trend is reversing.



WHY RETAIL?

- Location in the heart of Westwood creates destination and synergy.
- Location, surrounding residents, park visitors and office workers create strong retail traffic.
- Neighborhood project in which tenant mix will complement and connect to the neighborhood.
- Possible tenants include:
 - Cafes
 - Restaurants
 - Fitness
 - Apparel
 - Bookstores
 - Bank without drive-thru
 - Local Market
 - Galleries



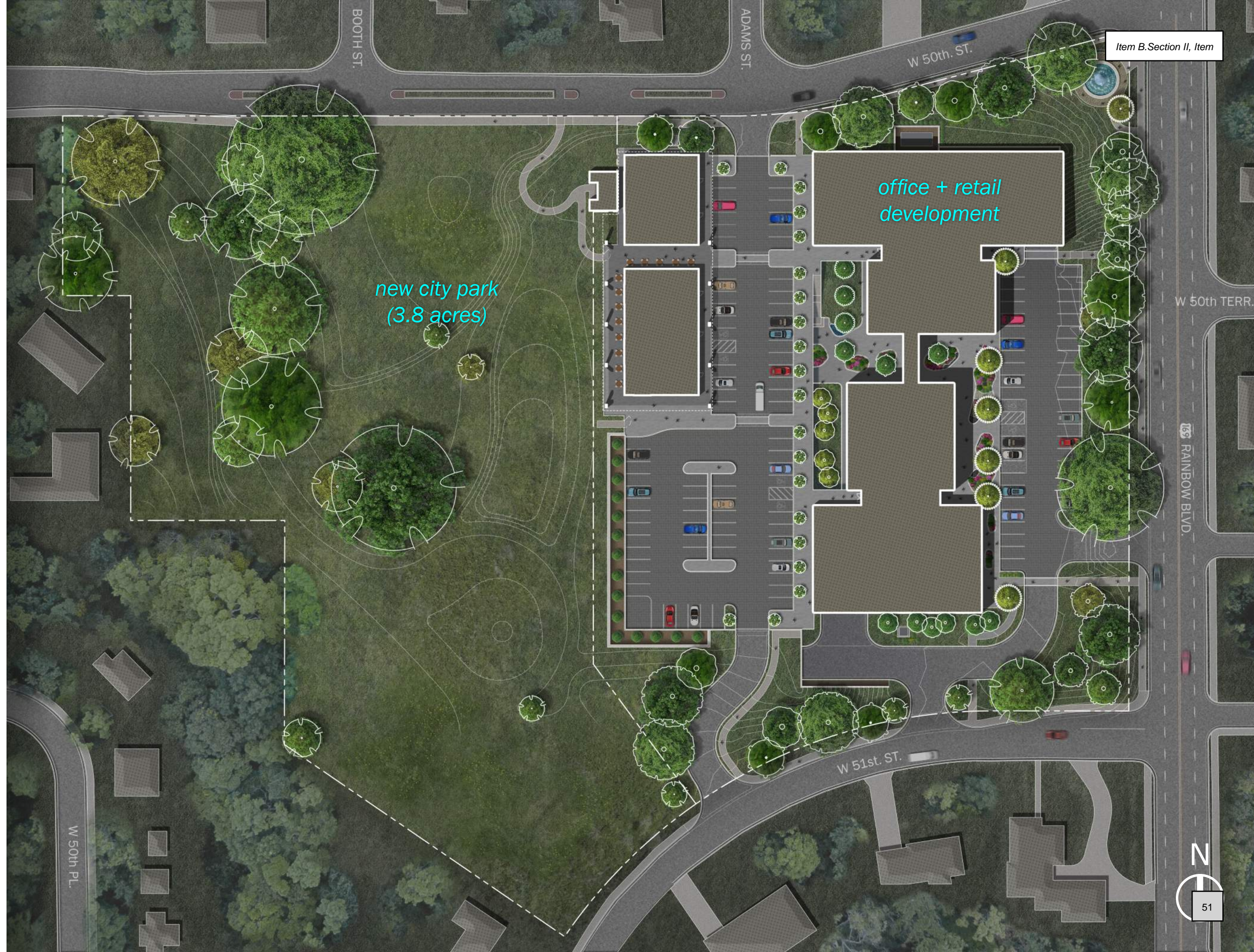
WHY KARBANK?

- Hands on management.
- High level of customer service.
- Keep and maintain properties for generations.
- Understanding of unique office market:
 - Amenities.
 - Live / Work Balance.
 - High Quality - High Expectation.
- Proven concept blocks away with fully leased buildings.
- Maintained and growing Tenants.
- NO developer incentives. Public TIF to benefit only City and residents.



50TH AND RAINBOW DEVELOPMENT

- 28,248 sf retail.
- 78,201 sf office.
- 106,449 sf total.



SUMMARY

- Warmer exterior building materials.
- Keeping mature trees wherever possible.
- Privately and independently acquiring more park land for the City.
- Keeping tenant traffic off 50th street where children walk to/from school and the park.
- Hiding as much parking away from public view as possible.
- Scaling down the development and bringing it more to the interior of the site.
- Retaining large setbacks to provide spaciousness from the streets and from neighboring property.
- Retaining a water feature on the corner of 50th & Rainbow.
- Accommodating park parking on development site.
- Accommodating park restrooms next to pavilion buildings (if desire by City).
- Adding green roofs and features to meet LEED certification.



September 12, 2023

Leslie Herring
City Administrator
City of Westwood, KS

Re: Traffic Impact Study for 50th and Rainbow Development

BHC has been asked to review the traffic impact of a proposed redevelopment located in the southwest corner of 50th Street and Rainbow Boulevard. The site includes Joe D. Dennis Park and the former Westwood View Elementary School.

Westwood View Elementary School operations have relocated to the northeast corner of 50th Street and Belinder Avenue, approximately 500 feet west of this site. For the 2023-2024 school year, Rushton Elementary School operations will utilize the original Westwood View Elementary School while their school is being rebuilt. After the school year, the proposed development would replace the site for a proposed mixed-use site consisting of 85,193 square feet of general office buildings and 29,963 square feet of retail.

This traffic study provides existing traffic counts, a traffic distribution, trip generation and intersection capacity/queuing analyses for the proposed development for the AM, PM school peak, and PM peak hour traffic volumes. The traffic data was collected on Wednesday, September 6th while both Westwood View Elementary and Rushton Elementary were in session.

Sight and intersection analyses, crash analysis, and left-turn lane warrant analyses have also been completed for Rainbow Boulevard. This traffic study also provides a future 20-year condition scenario for year 2043 where a 0.5% annual traffic growth rate is applied to Rainbow Boulevard.

TABLE OF STUDY CONTENTS

Section	Pages
Existing Conditions	2-4
Proposed Conditions	5
Trip Distribution	6-7
Trip Generation	8-10
Existing + Proposed Conditions	11
Intersection Capacity	12-14
Queuing Analysis	15
Intersection Stopping and Sight Distance Analysis	16
Crash Analysis	17
Access Management	18-19
KDOT Left-Turn Lane Warrants	20
Traffic Signal Warrant (Peak Hour)	21
Future Year 2043 Conditions	22-23
Findings and Recommendations	24-25
List of Appendices	26

EXISTING CONDITIONS

The location currently includes Joe D. Dennis Park and the former Westwood View Elementary School. Rainbow Boulevard (169 Highway) is a 35mph 4-lane road that runs along the eastern side of the site. Rainbow Boulevard provides access to Shawnee Mission Parkway approximately 1000 feet to the south, and I-35 approximately 2.5 miles to the north.

The intersection of Rainbow Boulevard and 50th Street is a signalized 4-leg intersection with 50th Street being offset by approximately 70 feet. 50th Street runs along the northern side of the site and is a 25-mph 2-lane minor collector street connecting Mission Road to State Line Road.

51st Street is a 25-mph 2-lane residential street along the southern side of the site that connects Rainbow Boulevard to 51st Terrace. 51st Street forms a T-intersection with Rainbow Boulevard that is Stop-sign controlled for 51st Street.

The existing street network along with AM and PM traffic counts were taken on Tuesday, July 18th may be seen in Figure 1.

EXISTING CONDITIONS (continued)

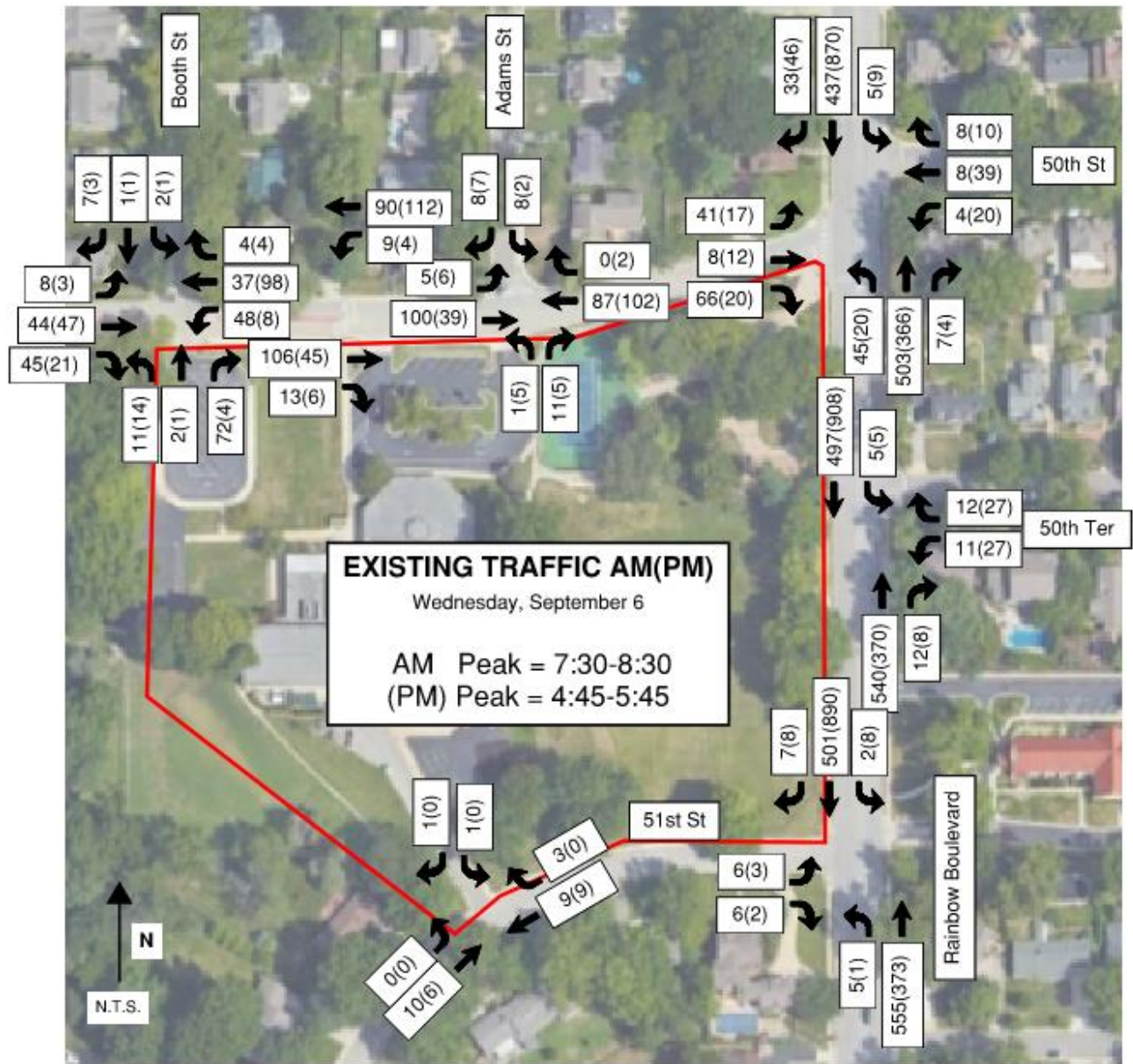


Figure 1: Existing Conditions

The intersections included in Figure 1 include:

- 50th Street and Booth Street
- 50th Street and west school drive
- 50th Street and Adams Street
- 50th Street and Rainbow Boulevard
- 50th Terrace and Rainbow Boulevard
- 51st Street and Rainbow Boulevard
- 51st Street and west school drive

EXISTING CONDITIONS (continued)

Concerns about school traffic have been heard which resulted in further analysis of the school peak times. School begins at 8:10 AM, which coincides with the regions 7:30-8:30 AM traffic peak. In the afternoon school dismisses at 3:10 PM, which correlates to a 2:45-3:45 PM school peak that is different than the regions 4:45-5:45 PM traffic peak.

The traffic count results from the 2:45-3:45 PM school peak traffic may be seen in Figure 2.

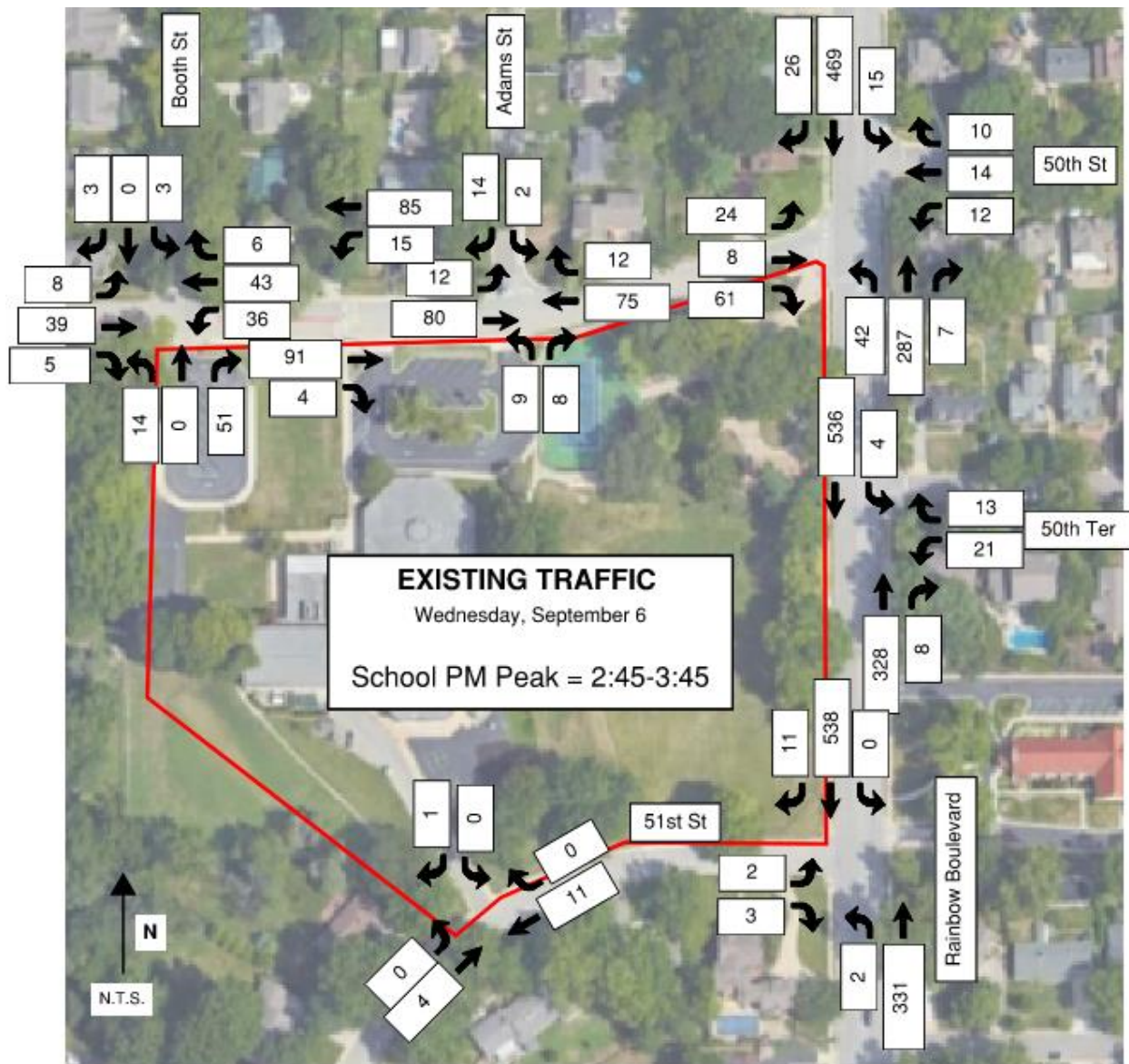


Figure 2: School PM Peak 2:45-3:45

PROPOSED CONDITIONS

The proposed mixed-use site will consist of 85,193 square feet of general office building and 29,963 square feet of retail. These are gross floor areas, not leasable space.

Along the eastern side of the site (Rainbow Boulevard), a new access driveway is proposed that would align itself across from 50th Terrace. The access driveway will provide access to the ground level of a parking garage with 215 parking spaces.

Along the northern side of the site (50th Street), a single proposed driveway that aligns with Adams Street would provide access to the second level of the parking garage with 80 parking spaces.

Along the southern side of the site (51st Street), the eastern of two proposed driveways approximately 150 feet west of Rainbow Boulevard will provide a second access point to the ground level of the parking garage. The western proposed driveway will provide a second access point the second level of the parking garage. There is no internal connectivity between the two levels of the parking garage.

The proposed site layout may be seen in Figure 3. Intersection site triangles have been provided on the plans and may also be seen in Figure 3.

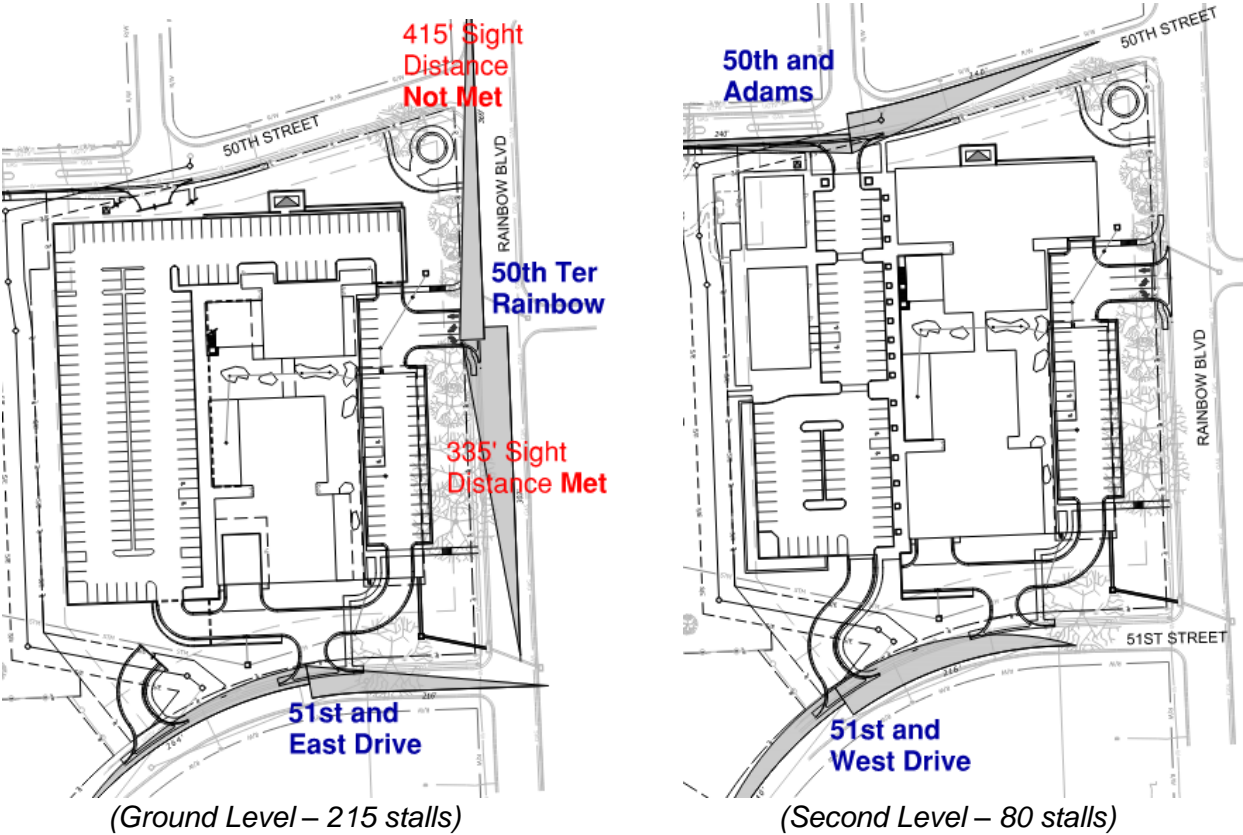


Figure 3: Proposed Site Layout

TRIP DISTRIBUTION

The project is situated within a well-established neighborhood. Rainbow Boulevard is anticipated to carry a larger percentage of the proposed site-related traffic due to the nature of a mixed-use site as opposed to a centrally located community elementary school. It is also assumed that a notable percentage of the retail traffic is expected to be pass-by and/or internal capture trips already on the surrounding roadway network.

The fact that Rushton Elementary will (and has) operated in the former Westwood View Elementary school for the 2023-2024 complicates existing traffic counts, traffic patterns, and the future trip distribution. Traffic distributions for a neighborhood school and a mixed-use development are expected to operate differently. Figure 4 illustrates where each school is relative to the project and where its traffic would be expected to originate.

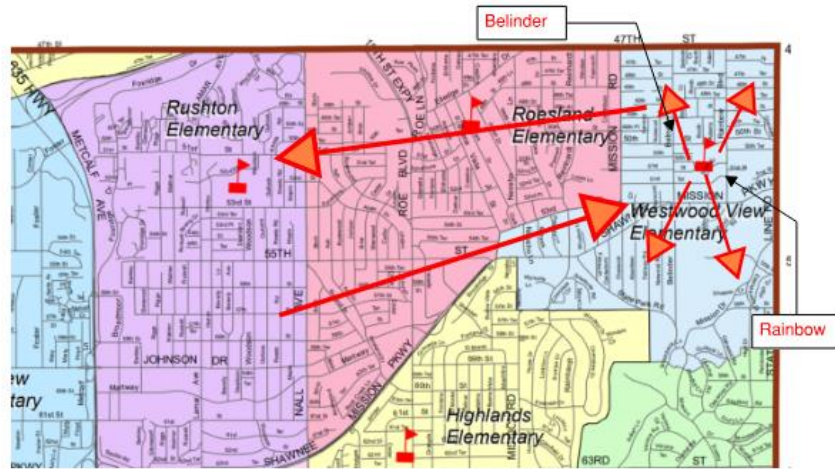


Figure 4: Rushton Elementary Traffic Flow

Figure 5 illustrates where it is anticipated the proposed site office and retail traffic will originate. General office employees would be expected to draw from a much larger population radius within the metropolitan area and less likely to use the residential street networks in their commute. The trip distribution assumptions utilized for distributing the proposed traffic are explained on the following page.

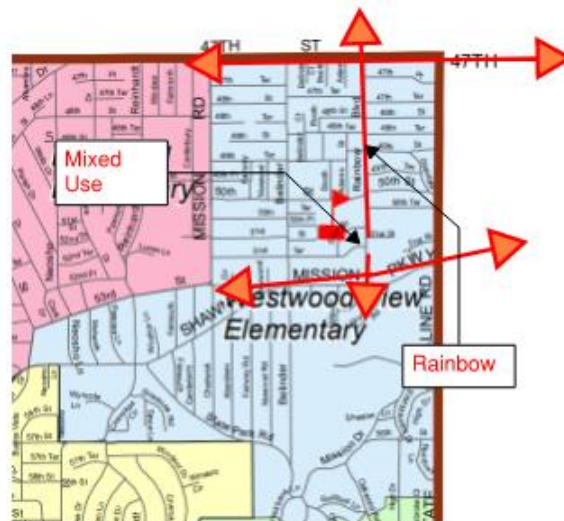


Figure 5: Proposed Mixed-Use Traffic Flow

TRIP DISTRIBUTION (continued)

A review of the surrounding population centers, existing roadway network, and September traffic counts along Rainbow Boulevard was completed to develop the trip distribution. Several assumptions were made for the distribution and are summarized below:

- 1) 15% of site generated traffic will be assigned to filter through the surrounding neighborhoods via 50th Street and 51st Street.
- 2) 85% of the site generated traffic will be assigned to Rainbow Boulevard with close to a 50%/50% northbound/southbound directional split.

Figure 6 illustrates the entering (blue numbers) and exiting (red numbers) trip distribution percentage selected based on these assumptions. The numbers in orange represent the directional distributions from each entering street/direction. The sum of the red numbers leaving the site boundary, as well as the sum of the blue numbers entering the site boundary total 100% and represent where the trip generation numbers will be assigned.

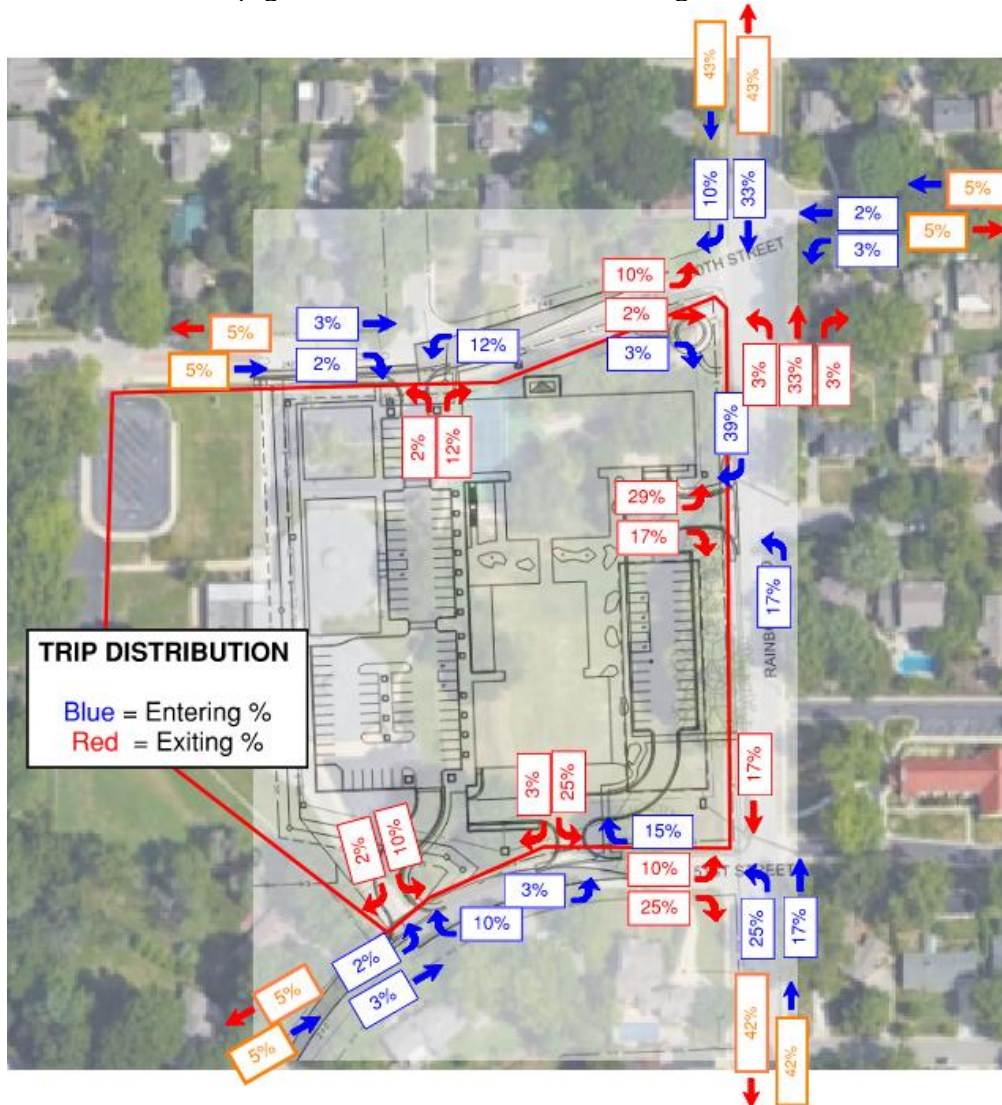


Figure 6: Proposed Trip Distribution

TRIP GENERATION

A trip generation analysis was performed using the Institute of Transportation Engineers (ITE) TripGen web-based app. The 11th edition of the Trip Generation Manual was used. The land use codes used for the proposed site were 710 – General Office Building, and 822 – Strip Retail Plaza.

The ITE Average Rate was used for General Office Building, and the ITE Fitted Curve Equation was used for the Strip Retail Plaza. The fitted curve equation was chosen as a better fit for the ITE data points collected for a Strip Retail Plaza site (the proposed retail is 29,963 square feet which is close to the 40,000 square foot threshold). See ITE Trip Gen plots in Appendix for justification between average and fitted curve rates. The number of trips generated may be seen in Table 1 for the AM peak hour, PM peak hour, and weekday total.

Table 1 – Trip Generation						
ITE Code	Land Use	1000 SF	Avg. Rate	Trips Generated		
				Total	Enter	Exit
AM Peak Hour (7-9 AM)						
710	General Office Building	85.19	1.52	129	114	15
822	Strip Retail Plaza (<40k)	29.96	2.36*	59	36	23
Total AM Peak Hour				188	150	38
PM Peak Hour (4-6 PM)						
710	General Office Building	85.19	1.44	123	21	102
822	Strip Retail Plaza (<40k)	29.96	6.59*	170	85	85
Total PM Peak Hour				293	106	187
Weekday Total						
710	General Office Building	85.19	10.84	923	462	461
822	Strip Retail Plaza (<40k)	29.96	54.45*	1494	747	747
Total Weekday				2417	1209	1208

* ITE Average Rate shown, ITE Fitted Curve Equation used for Strip Retail Plaza <40k

Pass-By Assumption

Not all traffic entering or exiting a site driveway is necessarily new traffic added to the roadway network. The actual amount of new traffic is dependent upon the purpose of the trip and route used from its origin to its destination. For example, retail-oriented developments such as shopping centers, restaurants, service stations, and convenience markets are often located adjacent to busy roads with the intent of attracting motorists already on the roadway network. These developments attract a portion of their trips from existing traffic passing the site. Thus, these “pass-by” trips do not add new traffic and may be reduced from the total external trips generated by a study site.

Considering the proposed Strip Retail Plaza land use, an average pass-by percentage reduction of 30% is an acceptable practice. ITE indicates that the average pass-by rate for a Shopping Plaza is 40%. This study will stay conservative by not using any pass-by percentage which overestimates the mixed-use traffic generation lowering intersection levels of service. If a pass-by of 30% were applied to the retail plaza this study would decrease those trips by 30%.

TRIP GENERATION (continued)

Figure 7 illustrates the Trip Generations provided in Table 1 and distributes them to the proposed site and surrounding street network to the percentages provided in Figure 5.

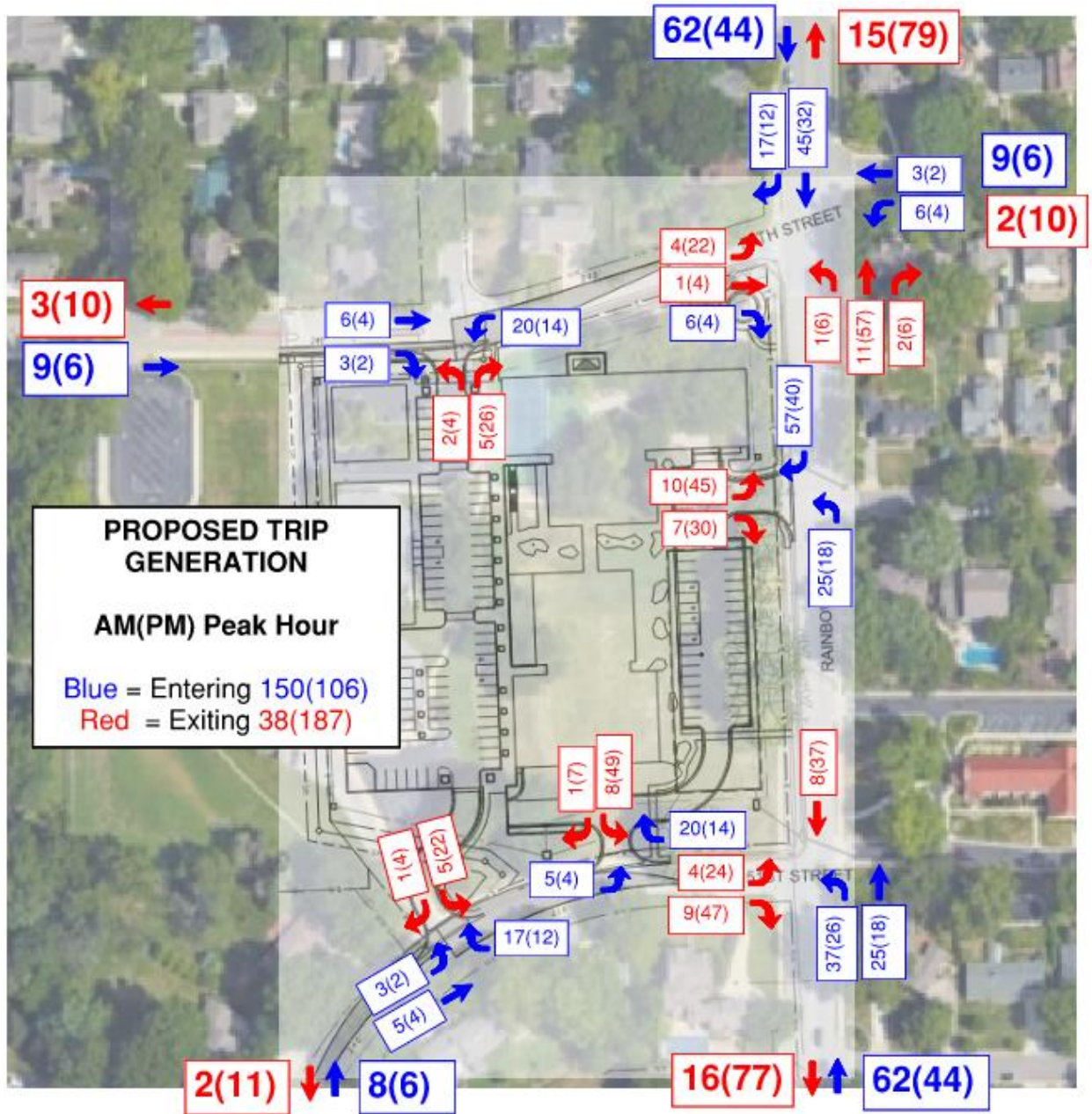


Figure 7: Proposed Trip Generation

TRIP GENERATION (continued)

Figure 7 represents the peak hour traffic increases associated with the site and the trip distribution assumptions. The information in Figure 7 helps identify intersections where projected left-turn movement increases could impact intersection operations.

The highest left-turn volume increases in Figure 7 are the southbound left-turn from the proposed driveway to 51st Street (49 vehicles) and the westbound left-turn from the proposed site driveway onto Rainbow Boulevard (45 vehicles). Both movements occur in the PM peak.

The highest left-turn increase on Rainbow Boulevard is projected to occur on northbound Rainbow at 51st Street with 37 additional vehicles in the AM peak.

EXISTING + PROPOSED CONDITIONS

The existing traffic volumes in Figure 1 from September have been added to the proposed site traffic volumes in Figure 7 to determine the existing+proposed volumes in Figure 8. These volumes will be used in the intersection capacity analyses for existing+proposed conditions.

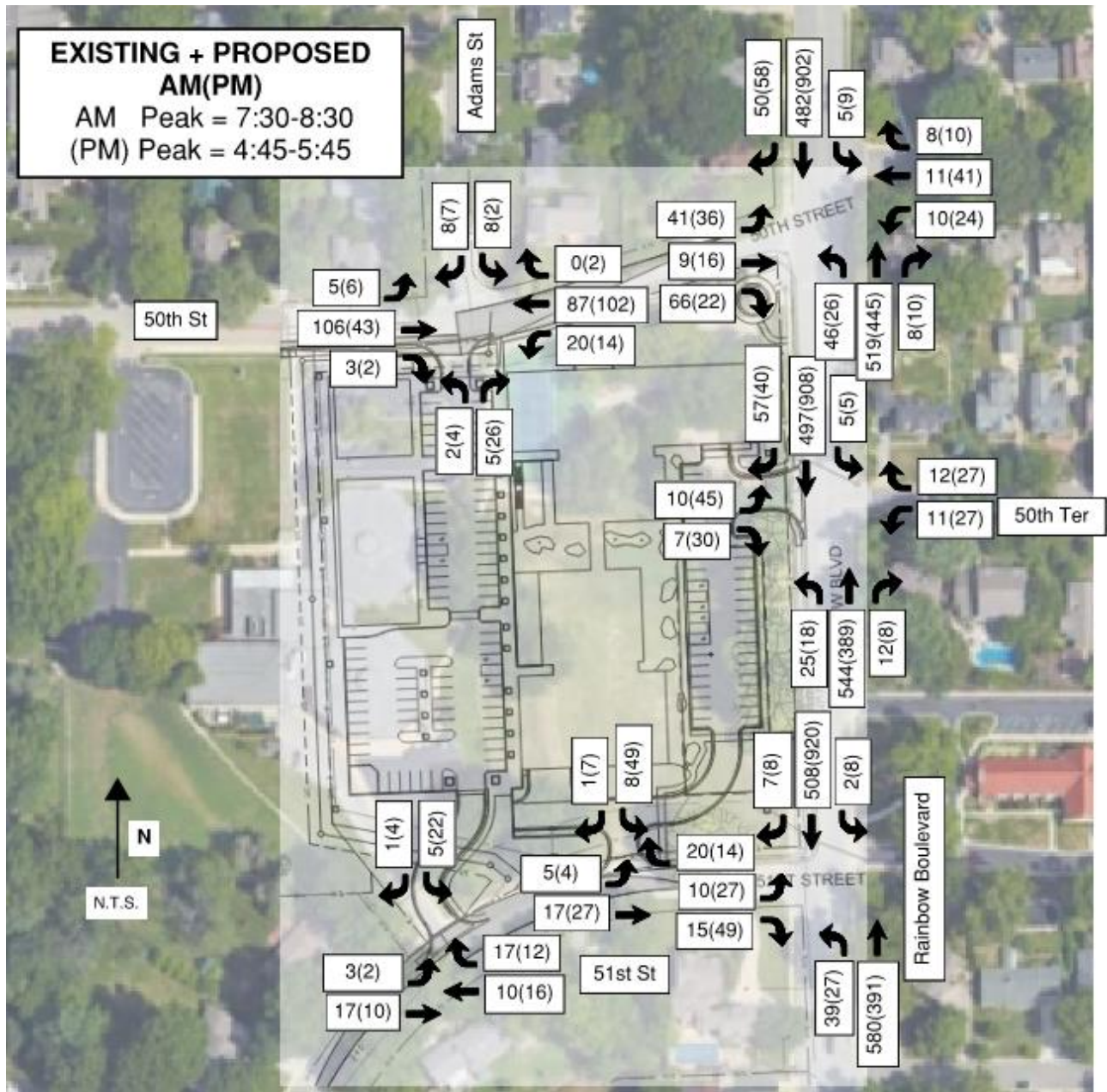


Figure 8: Existing + Proposed Traffic

INTERSECTION CAPACITY ANALYSES

Intersection capacity analyses were performed using the Highway Capacity Manual (HCM) 6th Edition Methodology provided in Synchro v11. The amount of delay is equated to a Level of Service (LOS) based on defined thresholds. A grade of A through F is assigned, with LOS A representing the best intersection operation. Table 2 shows the LOS associated with intersection approach delays, in seconds per vehicle (sec/veh), for signalized and unsignalized intersection cases.

Table 2 – Level of Service Criteria		
Level of Service (LOS)	Stop Control Approach Delay (sec/veh)	Signal Control Approach Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Existing traffic signal timings for 50th Street and Rainbow Boulevard was provided by the City of Westwood. The timings were entered into the Synchro v11 program along with the existing AM and PM peak hour traffic volumes from Figure 1. Analyses were also performed for the existing + proposed peak hour volumes in Figure 8. The results of the analyses for the project intersections may be viewed in Table 3 on the next page.

INTERSECTION CAPACITY ANALYSES (continued)

Table 3 – Intersection Capacity Analyses											
	Existing Conditions					Existing + Proposed Conditions					
	AM					PM					
Intersection		Avg. Delay (sec)	LOS		Avg. Delay (sec)	LOS		Avg. Delay (sec)	LOS		
50th and Adams Street (Two-Way Stop)											
	NB	9.0	A		9.1	A		9.3	A	8.8	A
	SB	9.5	A		9.0	A		9.7	A	9.2	A
	EB	0.4	A		1.0	A		0.3	A	0.9	A
	WB	0.0	A		0.0	A		1.4	A	0.9	A
50th and Rainbow Boulevard (Signalized Intersection)											
	NB	11.1	B		9.3	A		11.6	B	10.7	B
	SB	10.5	B		13.1	B		11.2	B	14.9	B
	EB	33.5	C		46.8	D		33.7	C	38.7	D
	WB	47.0	D		38.2	D		45.2	D	37.7	D
50th Terrace and Rainbow Boulevard (Two-Way Stop)											
	NB	0.0	A		0.0	A		0.6	A	0.6	A
	SB	0.1	A		0.0	A		0.1	A	0.0	A
	EB	-	-		-	-		17.8	C	39.2	E
	WB	15.5	C		17.2	C		16.8	C	19.8	C
51st and Rainbow Boulevard (Eastbound One-Way Stop)											
	NB	0.1	A		0.0	A		0.7	A	1.0	A
	SB	0.0	A		0.2	A		0.0	A	0.2	A
	EB	15.2	C		23.7	C		16.0	C	29.7	D
51st Street and East Drive (Southbound One-Way Stop)											
	SB	-	-		-	-		8.8	A	9.0	A
	EB	-	-		-	-		1.7	A	0.9	A
	WB	-	-		-	-		0.0	A	0.0	A
51st Street and West Drive (Southbound One-Way Stop)											
	SB	8.5	A		0.0	A		8.7	A	8.8	A
	EB	0.0	A		0.0	A		1.1	A	1.2	A
	WB	0.0	A		0.0	A		0.0	A	0.0	A

For existing conditions, all intersections and lane movements operate at LOS of D or better. For the existing+proposed conditions, all intersections and lane movements continue to operate at LOS of D or better with one exception. The eastbound lane movement from the ground level parking garage to Rainbow Boulevard at 50th Terrace is estimated to operate at LOS E during the PM peak hour. Vehicle delays and queues associated with this movement would occur internal to the site.

Note: A pass-by reduction was not applied to the mixed-use component of the trip generation used for these analyses. If applied, average delays would improve.

INTERSECTION CAPACITY ANALYSES (continued)

PM School Peak Hour -vs- PM Peak Hour

The afternoon schools dismiss at 3:10 PM, which correlates to a 2:45-3:45 PM school peak that is different than the regional 4:45-5:45 PM traffic peak.

A comparison of the 2:45-3:45 PM school peak to the 4:45-5:45 PM peak hour may be seen in Table 4.

Table 4 – PM School Peak -vs- PM Peak Hour					
		Existing Conditions			
		PM School (2:45-3:45)		PM Peak (4:45-5:45)	
Intersection		Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
50th and Adams Street (Two-Way Stop)					
	NB	9.4	A	9.1	A
	SB	8.9	A	9.0	A
	EB	1.0	A	1.0	A
	WB	0.0	A	0.0	A
50th and Rainbow Boulevard (Signalized Intersection)					
	NB	9.6	A	9.3	A
	SB	10.5	B	13.1	B
	EB	35.8	D	46.8	D
	WB	44.4	D	38.2	D
50th Terrace and Rainbow Boulevard (Two-Way Stop)					
	NB	0.0	A	0.0	A
	SB	0.1	A	0.0	A
	EB		-	-	-
	WB	13.8	B	17.2	C
51st and Rainbow Boulevard (Eastbound One-Way Stop)					
	NB	0.1	A	0.0	A
	SB	0.0	A	0.2	A
	EB	13.2	C	23.7	C

Table 4 indicates that the study intersections operate at lower levels of service during the PM peak than the afternoon school peak.

Review of the traffic count video at 50th and Adams reveals that traffic is minimal and moves smoothly along 50th Street until 3:08 PM. At 3:10 PM, westbound traffic stops along 50th Street, and progresses slowly through 3:18 PM. Traffic normalizes around 3:20 PM and the Rushton school buses leave at 3:25 PM. Traffic is minimal and moving smoothly by 3:26 PM.

The observed school traffic congestion (less than 20-minutes) is typical of elementary schools. The proposed site traffic associated with the upper parking garage will distribute less trips during that peak congestion than Rushton School does presently.

QUEING ANALYSES

Synchro signalized intersection queuing analyses were performed using Highway Capacity Manual 6th Edition methodology in Synchro v11. The results of the analyses may be seen for the study intersections in Table 5.

Table 5 – Intersection 95% Queues						
Intersection	Storage Provided	Existing Conditions		Existing + Proposed Conditions		
		95% Queue (feet)		95% Queue (feet)		
		AM	PM	AM	PM	
50th Street and Adams Street						
Approach Lane						
NB	30'	0'	0'	0'	20'	
SB	20'	20'	0'	20'	0'	
50th Street and Rainbow Boulevard						
Approach Lane						
NB	300'	162'	106'	172'	142'	
SB	450'	133'	284'	154'	323'	
EB	250'	103'	55'	105'	75'	
WB	150'	31'	70'	40'	76'	
50th Terrace and Rainbow Boulevard						
Approach Lane						
EB	55'	0'	0'	20'	40'	
WB	200'	20'	20'	20'	20'	
NBL	280'	N/A	N/A	20'	20'	
51st Street and Rainbow Boulevard						
Approach Lane						
EB	140'	20'	20'	20'	40'	
NBL	130'	N/A	N/A	20'	20'	
51st Street and East Drive						
Approach Lane						
SB	40'	N/A	N/A	0'	20'	
51st Street and West Drive						
Approach Lane						
SB	160'	0'	0'	0'	20'	

All intersections lane movements are expected to have calculated 95% queues within their existing or proposed storage areas.

Note: A pass-by reduction was not applied to the mixed-use component of the trip generation used for these analyses.

INTERSECTION STOPPING AND SIGHT DISTANCE ANALYSES

Southbound Rainbow Boulevard adjacent to the proposed site is posted as 35 mph and is on a 4.5% downgrade. The required stopping sight distance is measured as the distance where from a 3.5' height, a 2' high object may be seen in the roadway. Based on Table 4-12 of KDOT's Access Management Policy, the required distance is 264'.

Field measurements were taken and found the existing stopping sight distance for southbound Rainbow Boulevard to 50th Terrace to be 292'. There is adequate stopping distance for southbound Rainbow as it approached 50th Terrace.

Intersection sight distance requirements for 50th Terrace and Rainbow were pulled from Table 4-14 of the KDOT Policy. The required intersection sight distance for a 50th Terrace right-turn onto Rainbow is 335' and is available. The required intersection sight distance for a 50th Terrace left-turn onto Rainbow is 415' and is not available.

There is not adequate intersection site distance for a left-turn movement from 50th Terrace onto Rainbow Boulevard. This distance could be met if the proposed access point was moved further south to the northern driveway of St. Rose Church and Rainbow Boulevard.

CRASH ANALYSES

The Kansas Department of Transportation (KDOT) provided accident data for Rainbow Boulevard from 50th Street to 51st Street during the 5-year period between 2018 and 2022.

Based on the provided data, no intersections reported an average of more than one accident per year during the reporting period (this is less than the requirement for an accident-based traffic signal warrant). A summary of the data can be seen in Table 6.

Table 6 - Crash Analysis Summary						
Rainbow Boulevard Intersection	Five Year (2018-2022) Accident Totals					
	PDO	Injury	Fatal	Total	Reported Acc. / Year	Reported Acc. / MEV
50 th Street	2	2	0	4	0.8	0.127
50 th Terrace	1	0	0	1	0.2	0.032
51 st Street	1	1	0	1	0.2	0.032

The KDOT Traffic Count map indicates a 24-hour traffic volume of 17,200 vehicles per day on Rainbow Boulevard just north of Shawnee Mission Parkway in Year 2017. The Accident Rate per Million Entering Vehicles @ 50th and Rainbow is calculated as:

$$\frac{(4 \text{ accidents}) * (1,000,000)}{(17,200 \text{ entering vehicles per day}) * (365 \text{ days/year}) * (5 \text{ years})} = 0.127 \text{ Acc./MEV}$$

Three of the six reported accidents over the period were fixed object related.

ACCESS MANAGEMENT

By KDOT standards, Rainbow Boulevard is best classified as a Class B roadway, as it is located on the National Highway System. 50th Street, 50th Terrace, and 51st Street are best classified as Class E roadways, as they provide local service only for very short trips.

50th Terrace is situated 220 feet south of 50th Street and currently forms a T-intersection with Rainbow Boulevard. The proposed site adds a fourth leg to the existing intersection. See Figure 9.

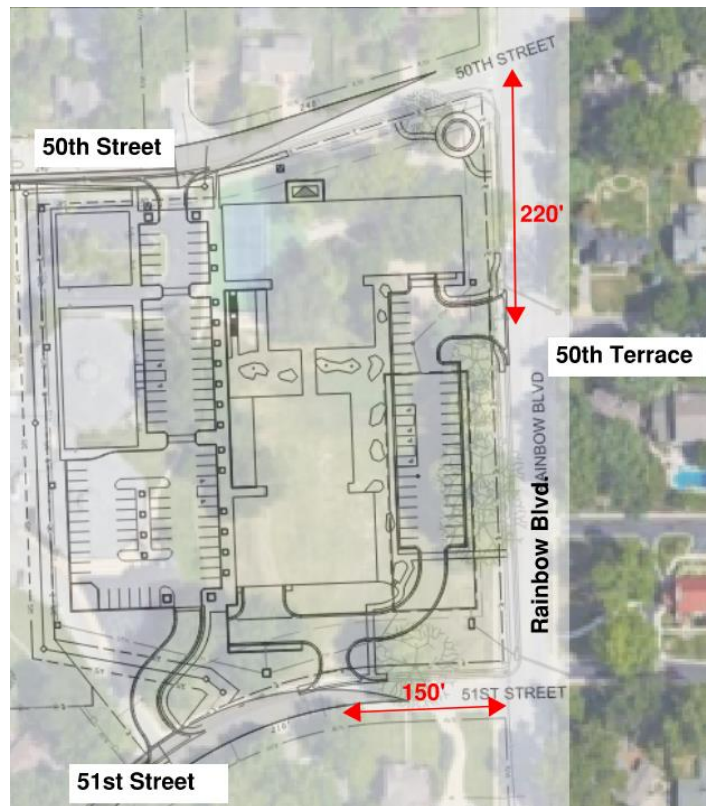


Figure 9: Access Points

With Rainbow being a 35-mph Class B roadway, Table 4-6 of the KDOT Access Management Policy was reviewed to determine unsignalized access spacing. With 50th Terrace already existing 220 feet south of 50th Street, a case for an area type of central business district (CBD) can be made. CBD indicates 205-foot spacing criteria.

Table 4-6. Unsignalized access spacing criteria

Access Route Classification	Area Type	Posted Speed Limit (mph)										
		20	25	30	35	40	45	50	55	60	65	70
B	Undeveloped				350	420	515	610	720	825	955	1075
	Developed	115	170	225	295	365	450	535	640	740		
	CBD	85	120	155	205							

Figure 10: KDOT Unsignalized Access Spacing

ACCESS MANAGEMENT (continued)

Signalized Intersection Influence Area

KDOT Access Management Policy provides guidelines for the upstream and downstream intersection influence area of a signalized intersection. Figure 4-17 and Table 4-4 of the Policy have been reviewed for the signalized intersection of 50th Street and Rainbow Boulevard which is in a developed area.

The upstream functional area for northbound Rainbow Boulevard as it approaches 50th Street is the sum of reaction time at 35mph (80') plus a deceleration distance (220') and two times the calculated northbound 95% queue ($2 * 173'$ (see Table 5) = 346') which totals 646'.

A variance would be required to meet KDOT's upstream intersection influence area for any new driveway adjacent to the proposed site.

The downstream functional area for southbound Rainbow Boulevard as it departs 50th Street is 195'. The distance from 50th Terrace to 50th Street is 220'. No variance is required.

Unsignalized Access Spacing

KDOT Access Management Policy provides guidelines for unsignalized access spacing. Table 4-6 of the Policy has been reviewed for a developed Class B route with a posted speed of 35 mph. The access spacing is found to be 295'.

A variance would be required to meet KDOT's unsignalized spacing criteria for any new driveway adjacent to the proposed site as there is only 535' between 50th Street and 51st Street

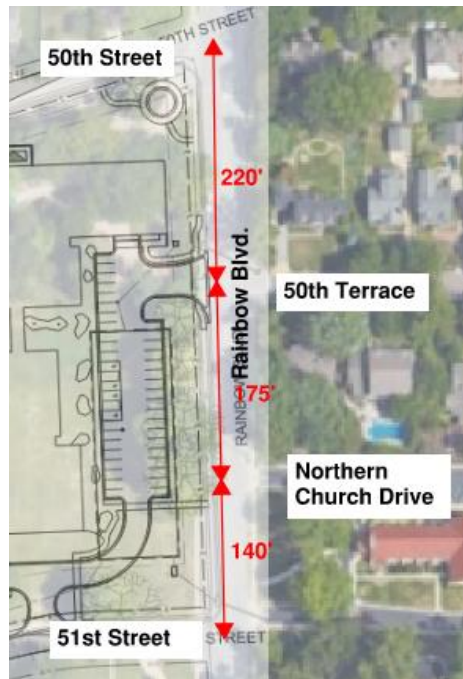


Figure 10: Access Spacing

KDOT RECOMMENDED LEFT-TURN LANE WARRANTS

KDOT Access Management Policy provides guidelines for left-turn lane warrants, which were reviewed. The northbound Rainbow Boulevard existing + proposed traffic volumes found in Figure 8 are shown in the following tables which conclude that left-turn lane recommended warrants are met at 50th Terrace and 51st Street. See Figure 11 below.

50th Terrace @ Rainbow

Table 4-28. Recommended left-turn lane warrants for four-lane highways

Left-Turn Volume V_L (vph)	4-Lane Undivided Opposing Volume V_o (vph)	4-Lane Divided Opposing Volume V_o (vph)
≥ 29	Turn lane not warranted unless $V_o > 400$ vph	Turn lane not warranted unless $V_o > 400$ vph
28		422
26		474
24		530
22		589
20		652
18		719
16		793
14		873
12	414	962
10	542	1062
8	690	1179
6	867	1319
4	1094	1499
2	1429	1762

AM = 25
 PM = 18
 AM = 497 Warranted
 PM = 908 Warranted

51st Street @ Rainbow

Table 4-28. Recommended left-turn lane warrants for four-lane highways

Left-Turn Volume V_L (vph)	4-Lane Undivided Opposing Volume V_o (vph)	4-Lane Divided Opposing Volume V_o (vph)
≥ 29	Turn lane not warranted unless $V_o > 400$ vph	Turn lane not warranted unless $V_o > 400$ vph
28		422
26		474
24		530
22		589
20		652
18		719
16		793
14		873
12	414	962
10	542	1062
8	690	1179
6	867	1319
4	1094	1499
2	1429	1762

AM = 39
 PM = 27
 AM = 508 Warranted
 PM = 920 Warranted

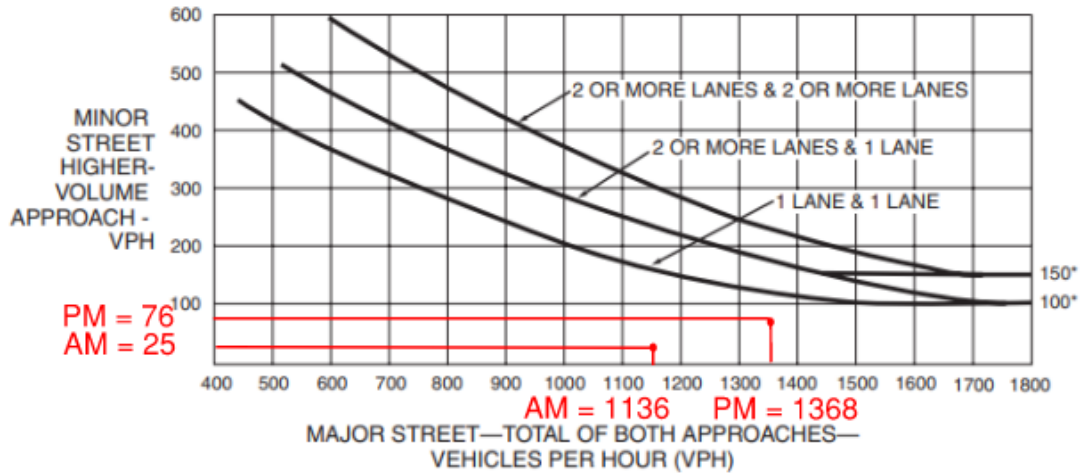
Figure 11: Left-Turn Lane Warrants

TRAFFIC SIGNAL WARRANT

The Manual on Uniform Traffic Control Devices was reviewed for a peak hour traffic warrant for the intersection of 51st Street and Rainbow Boulevard for the existing + proposed conditions. The result from that analysis may be seen in Figure 12.

51st Street @ Rainbow

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 12: Peak Hour Traffic Signal Warrant

FUTURE YEAR 2043 CONDITIONS (continued)

Intersection capacity analyses were conducted on the three intersections along Rainbow Boulevard for the year 2043 condition and can be seen in Table 7.

Table 7 – Future 2043 Conditions						
Intersection		AM		PM		
		Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	
50th and Rainbow Boulevard (Signalized Intersection)						
	NB	11.9	B	11.1	B	
	SB	11.5	B	16.2	B	
	EB	33.7	D	38.7	D	
	WB	45.2	D	37.7	D	
50th Terrace and Rainbow Boulevard (Two-Way Stop)						
	NB	0.5	A	0.6	A	
	SB	0.1	A	0.1	A	
	EB	19.8	C	52.7	F	
	WB	18.5	C	22.7	C	
51st and Rainbow Boulevard (Eastbound One-Way Stop)						
	NB	0.8	A	0.9	A	
	SB	0.0	A	0.2	A	
	EB	17.6	C	37.8	E	

All intersection movements remain at LOS D or above with the exception of the eastbound movements of 50th Terrace and 51st Street which fall to LOS F and E respectively.

Consideration should be given to adding an eastbound right-turn lane for 51st Street which would keep that approach at LOS D in future conditions. This improvement would also help with the existing + proposed condition.

There is not much that can be done to improve the level of service of the 50th Terrace eastbound approach if the 20-year growth rates are indeed met.

FINDINGS AND RECOMMENDATIONS

This traffic study has conducted traffic counts, provided a traffic distribution, trip generation and analyses for the proposed 50th and Rainbow development.

The trip generation in Table 1 (page 8) is based on the ITE trip generation manual for the proposed land uses. These represent conservative estimates as pass-by and internal capture factors were not applied. The trips were added to the existing traffic counts taken on Wednesday, September 6th and may be seen in Figure 8 (page 11).

Intersection capacity analyses were completed for all of the study intersections and may be seen in Table 3 (page 13). For all movements except one (the eastbound approach of 50th Terrace and Rainbow) the anticipated LOS is D or above.

A review of the PM school peak versus the PM peak hour may be seen in Table 4 (page 14). While there is concern about the impact of the proposed development during the school peak, it is not substantiated by the study findings. PM peak hour LOS's are lower than PM school peak LOS's.

Queuing analyses were completed for all the study intersections and may be seen in Table 5 (page 15). All intersections lane movements are expected to have calculated 95% queues within their existing or proposed storage areas.

Intersection and stopping sight distances were field verified (page 16). There is adequate stopping sight distance for southbound Rainbow Boulevard as it approaches 50th Terrace. There is not; however, adequate left-turn sight distance from eastbound 50th Terrace. This requirement could be met if the proposed driveway is moved from 50th Terrace to the northern driveway of St. Rose Church.

There has been no significant reported crash experience along Rainbow Boulevard over the past 5-years.

Per KDOT policy, the upstream functional area for northbound Rainbow Boulevard as it approaches 50th Street is calculated at 646' (page 19). A KDOT variance would be required for any new driveway along Rainbow Boulevard to meet this requirement. Currently, 50th Terrace, St. Rose Church driveway and 51st Street do not meet this requirement.

Per KDOT policy, unsignalized access spacing for a 35 mph Class B roadway is 295'. Following that criterion, no access would be allowed between 50th Street and 51st Street. A variance is required.

KDOT left-turn lane warrant analyses indicate that both northbound Rainbow to 50th Terrace and 51st Street warrant consideration of an auxiliary northbound left-turn lane (page 20). Variances would be required from KDOT for these movements.

An annual 0.5% growth rate was applied for 20-years to determine ultimate year 2043 traffic volumes. Capacity analyses were completed for the three study intersections along Rainbow in Table 7 (page 23). For all movements except two (eastbound approaches of 50th Terrace and 51st Street) the anticipated LOS is D or above. The eastbound approach to 51st Street would return to LOS D with the addition of an eastbound right-turn lane.

FINDINGS AND RECOMMENDATIONS (continued)

Recommendation 1: Relocate the proposed site entrance at 50th Terrace to the northern driveway of St. Rose Church. Sign the two-lane eastbound approach as Left-Turn Only and Right-Turn Only. This driveway relocation provides adequate intersection sight distances, and should be expected to operate in a similar fashion as the analyses performed at the 50th Terrace location.

Recommendation 2: Consider widening eastbound 51st Street in the future to accommodate a second eastbound right-turn lane at Rainbow Boulevard. This public improvement would improve delays in the near term, and keep the intersection at LOS D in the future.

Recommendation 3: Make the developer aware that the eastbound approach from their lower parking area to Rainbow Boulevard may experience backups during the PM peak hour.

With implementation of these recommendations, the following KDOT variances are required:

- Variance for upstream functional area at the signalized intersection of 50th Street
- Variance for unsignalized access spacing
- Variance for northbound left-turn warrant at northern St. Rose Church driveway
- Variance for northbound left-turn warrant at 51st Street

This study has been submitted to both the City and KDOT for consideration.

If there are any questions regarding this traffic study, please contact me at your convenience at 913-663-1900 or mark.sherfy@ibhc.com.

Sincerely,



Mark Sherfy, P.E., PTOE
Traffic Engineer
BHC



LIST OF APPENDICES

APPENDIX A - TRAFFIC COUNTS

- 50th Street and Booth Street
- 50th Street and west school drive
- 50th Street and Adams Street
- 50th Street and Rainbow Boulevard
- 50th Terrace and Rainbow Boulevard
- 51st Street and Rainbow Boulevard
- 51st Street and west school drive

APPENDIX B – ITE TRIP GENERATION REPORTS

APPENDIX C - CAPACITY AND QUEUING ANALYSES

- 50th Street and Adams Street
 - AM Existing
 - PM School Existing (2:45-3:45)
 - PM Existing
 - AM Existing+Proposed
 - PM Existing+Proposed
- 50th Street and Rainbow Boulevard
 - AM Existing
 - PM School Existing (2:45-3:45)
 - PM Existing
 - AM Existing+Proposed
 - PM Existing+Proposed
 - AM Future 2043
 - PM Future 2043
- 50th Terrace and Rainbow Boulevard
 - AM Existing
 - PM School Existing (2:45-3:45)
 - PM Existing
 - AM Existing+Proposed
 - PM Existing+Proposed
 - AM Future 2043
 - PM Future 2043
- 51st Street and Rainbow Boulevard
 - AM Existing
 - PM School Existing (2:45-3:45)
 - PM Existing
 - AM Existing+Proposed
 - PM Existing+Proposed
 - AM Future 2043
 - PM Future 2043
- 51st Street and East Drive
 - AM Existing+Proposed
 - PM Existing+Proposed
- 51st and West Drive
 - AM Existing
 - PM Existing
 - AM Existing+Proposed
 - PM Existing+Proposed

West 50th Street & Booth Street - TMC

Wed Sep 6, 2023

Full Length (7:30 AM-8:30 AM, 2:45 PM-5:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1101962, Location: 39.037369, -94.614012



Item B. Section II, Item

Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Booth St Southbound						W 50th St Westbound						Elementary Driveway Northbound						W 50th St Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2023-09-06 7:30AM	0	0	1	0	1	0	0	7	9	0	16	0	11	1	3	0	15	0	10	11	0	0	21	0	53
7:45AM	2	0	0	0	2	33	3	10	24	0	37	0	30	1	4	0	35	1	20	9	4	0	33	0	107
Hourly Total	2	0	1	0	3	33	3	17	33	0	53	0	41	2	7	0	50	1	30	20	4	0	54	0	160
8:00AM	2	1	0	0	3	99	1	11	15	0	27	1	29	0	1	0	30	2	14	11	4	0	29	0	89
8:15AM	3	0	1	0	4	1	0	9	0	0	9	0	2	0	3	0	5	2	1	13	0	0	14	0	32
Hourly Total	5	1	1	0	7	100	1	20	15	0	36	1	31	0	4	0	35	4	15	24	4	0	43	0	121
2:45PM	0	0	1	0	1	2	1	11	1	0	13	0	0	0	1	0	1	2	0	10	7	0	17	0	32
Hourly Total	0	0	1	0	1	2	1	11	1	0	13	0	0	0	1	0	1	2	0	10	7	0	17	0	32
3:00PM	1	0	2	0	3	88	5	5	7	1	18	1	12	0	1	0	13	4	1	7	0	0	8	2	42
3:15PM	2	0	0	0	2	25	0	10	27	0	37	1	36	0	6	0	42	3	1	9	1	0	11	1	92
3:30PM	0	0	0	0	0	4	0	17	1	0	18	0	3	0	6	0	9	20	3	13	0	0	16	0	43
3:45PM	0	0	1	0	1	4	3	7	0	0	10	1	2	0	1	0	3	23	1	8	0	0	9	0	23
Hourly Total	3	0	3	0	6	121	8	39	35	1	83	3	53	0	14	0	67	50	6	37	1	0	44	3	200
4:00PM	1	0	0	0	1	0	0	10	0	0	10	0	1	0	2	0	3	3	2	15	0	0	17	0	31
4:15PM	1	0	0	0	1	2	1	14	0	0	15	1	1	0	3	0	4	3	3	17	1	0	21	1	41
4:30PM	2	0	0	0	2	5	3	5	1	0	9	2	0	0	5	0	5	1	1	8	0	0	9	0	25
4:45PM	2	0	0	0	2	6	0	14	4	0	18	1	0	0	2	0	2	1	2	12	0	0	14	3	36
Hourly Total	6	0	0	0	6	13	4	43	5	0	52	4	2	0	12	0	14	8	8	52	1	0	61	4	133
5:00PM	0	1	1	0	2	4	3	28	1	0	32	0	2	0	4	0	6	2	5	17	2	0	24	2	64
5:15PM	1	0	0	0	1	5	1	24	2	0	27	1	0	1	7	0	8	2	11	10	1	0	22	2	58
5:30PM	0	0	0	0	0	0	0	32	1	0	33	0	2	0	1	0	3	6	3	8	0	0	11	0	47
Hourly Total	1	1	1	0	3	9	4	84	4	0	92	1	4	1	12	0	17	10	19	35	3	0	57	4	169
Total	17	2	7	0	26	278	21	214	93	1	329	9	131	3	50	0	184	75	78	178	20	0	276	11	815
% Approach	65.4%	7.7%	26.9%	0%	-	-	6.4%	65.0%	28.3%	0.3%	-	-	71.2%	1.6%	27.2%	0%	-	-	28.3%	64.5%	7.2%	0%	-	-	-
% Total	2.1%	0.2%	0.9%	0%	3.2%	-	2.6%	26.3%	11.4%	0.1%	40.4%	-	16.1%	0.4%	6.1%	0%	22.6%	-	9.6%	21.8%	2.5%	0%	33.9%	-	-
Lights	16	2	7	0	25	-	21	212	92	1	326	-	129	3	50	0	182	-	78	174	20	0	272	-	805
% Lights	94.1%	100%	100%	0%	96.2%	-	100%	99.1%	98.9%	100%	99.1%	-	98.5%	100%	100%	0%	98.9%	-	100%	97.8%	100%	0%	98.6%	-	98.8%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Buses and Single-Unit Trucks	1	0	0	0	1	-	0	2	1	0	3	-	2	0	0	0	2	-	0	4	0	0	4	-	10
% Buses and Single-Unit Trucks	5.9%	0%	0%	0%	3.8%	-	0%	0.9%	1.1%	0%	0.9%	-	1.5%	0%	0%	0%	1.1%	-	0%	2.2%	0%	0%	1.4%	-	1.2%
Pedestrians	-	-	-	-	-	259	-	-	-	-	8	-	-	-	-	72	-	-	-	-	-	9	-		
% Pedestrians	-	-	-	-	-	93.2%	-	-	-	-	88.9%	-	-	-	-	96.0%	-	-	-	-	-	81.8%	-		
Bicycles on Crosswalk	-	-	-	-	-	19	-	-	-	-	1	-	-	-	-	3	-	-	-	-	-	2	-		
% Bicycles on Crosswalk	-	-	-	-	-	6.8%	-	-	-	-	11.1%	-	-	-	-	4.0%	-	-	-	-	-	18.2%	-		

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

West 50th Street and west Elementary Dr - TMC

Wed Sep 6, 2023

Full Length (7:30 AM-8:30 AM, 2:45 PM-5:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1101963, Location: 39.037365, -94.613384



Item B. Section II, Item

Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	W 50th St Westbound					Elementary Driveway Northbound					W 50th St Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
Time																
2023-09-06 7:30AM	17	5	0	22	0	0	0	0	0	0	6	17	0	23	0	45
7:45AM	39	2	0	41	0	0	0	1	1	15	5	35	0	40	13	82
Hourly Total	56	7	0	63	0	0	0	1	1	15	11	52	0	63	13	127
8:00AM	25	1	0	26	0	0	0	0	0	35	1	39	0	40	36	66
8:15AM	9	1	0	10	0	0	0	0	0	2	1	15	0	16	0	26
Hourly Total	34	2	0	36	0	0	0	0	0	37	2	54	0	56	36	92
2:45PM	13	5	0	18	0	1	0	0	1	0	1	11	0	12	0	31
Hourly Total	13	5	0	18	0	1	0	0	1	0	1	11	0	12	0	31
3:00PM	24	4	1	29	1	0	0	0	0	13	1	20	0	21	14	50
3:15PM	30	4	1	35	1	0	0	0	0	41	0	46	0	46	44	81
3:30PM	18	0	0	18	0	0	0	0	0	24	2	14	0	16	0	34
3:45PM	9	1	0	10	0	0	0	0	0	23	1	9	1	11	3	21
Hourly Total	81	9	2	92	2	0	0	0	0	101	4	89	1	94	61	186
4:00PM	10	0	0	10	0	0	0	1	1	3	2	14	0	16	0	27
4:15PM	16	2	1	19	0	0	0	0	0	4	6	11	0	17	0	36
4:30PM	9	0	0	9	0	0	0	0	0	3	1	8	0	9	0	18
4:45PM	18	0	0	18	1	1	0	1	2	4	0	11	0	11	3	31
Hourly Total	53	2	1	56	1	1	0	2	3	14	9	44	0	53	3	112
5:00PM	32	0	0	32	0	0	0	0	0	4	3	16	0	19	0	51
5:15PM	29	3	0	32	0	0	0	0	0	5	3	8	0	11	0	43
5:30PM	33	1	0	34	0	0	0	0	0	7	0	10	0	10	0	44
Hourly Total	94	4	0	98	0	0	0	0	0	16	6	34	0	40	0	138
Total	331	29	3	363	3	2	0	3	5	183	33	284	1	318	113	686
% Approach	91.2%	8.0%	0.8%	-	-	40.0%	0%	60.0%	-	-	10.4%	89.3%	0.3%	-	-	-
% Total	48.3%	4.2%	0.4%	52.9%	-	0.3%	0%	0.4%	0.7%	-	4.8%	41.4%	0.1%	46.4%	-	-
Lights	329	18	1	348	-	2	0	3	5	-	30	282	1	313	-	666
% Lights	99.4%	62.1%	33.3%	95.9%	-	100%	0%	100%	100%	-	90.9%	99.3%	100%	98.4%	-	97.1%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses and Single-Unit Trucks	2	11	2	15	-	0	0	0	0	-	3	2	0	5	-	20
% Buses and Single-Unit Trucks	0.6%	37.9%	66.7%	4.1%	-	0%	0%	0%	0%	-	9.1%	0.7%	0%	1.6%	-	2.9%
Pedestrians	-	-	-	-	2	-	-	-	-	167	-	-	-	-	103	-
% Pedestrians	-	-	-	-	66.7%	-	-	-	-	91.3%	-	-	-	-	91.2%	-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	16	-	-	-	-	10	-
% Bicycles on Crosswalk	-	-	-	-	33.3%	-	-	-	-	8.7%	-	-	-	-	8.8%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

West 50th Street and east Elementary Dr - TMC

Wed Sep 6, 2023

Full Length (7:30 AM-8:30 AM, 2:45 PM-5:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1101964, Location: 39.037377, -94.612976



Item B. Section II, Item

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Adams St Southbound						W 50th St Westbound						Elementary Driveway Northbound						W 50th St Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2023-09-06 7:30AM	2	0	2	0	4	0	0	19	0	0	19	0	0	0	0	0	0	0	0	14	0	0	14	0	37
7:45AM	1	0	2	0	3	1	0	38	0	0	38	0	6	0	0	0	6	18	0	33	2	0	35	0	82
Hourly Total	3	0	4	0	7	1	0	57	0	0	57	0	6	0	0	0	6	18	0	47	2	0	49	0	119
8:00AM	3	0	4	0	7	9	0	22	0	0	22	0	3	0	0	0	3	32	0	37	3	0	40	2	72
8:15AM	2	0	0	0	2	1	0	8	0	0	8	0	2	0	1	0	3	2	0	16	0	0	16	0	29
Hourly Total	5	0	4	0	9	10	0	30	0	0	30	0	5	0	1	0	6	34	0	53	3	0	56	2	101
2:45PM	1	0	0	0	1	1	2	15	0	0	17	0	0	0	2	0	2	1	0	10	1	0	11	0	31
Hourly Total	1	0	0	0	1	1	2	15	0	0	17	0	0	0	2	0	2	1	0	10	1	0	11	0	31
3:00PM	8	0	0	0	8	4	6	24	0	0	30	0	1	0	0	0	1	10	0	14	4	0	18	1	57
3:15PM	4	0	1	0	5	5	3	27	0	0	30	5	7	0	0	0	7	31	0	43	6	0	49	1	91
3:30PM	1	0	1	0	2	0	1	9	0	0	10	1	0	0	7	0	7	20	0	13	1	0	14	0	33
3:45PM	2	0	1	0	3	1	0	8	0	0	8	1	0	0	1	0	1	13	0	10	0	1	11	0	23
Hourly Total	15	0	3	0	18	10	10	68	0	0	78	7	8	0	8	0	16	74	0	80	11	1	92	2	204
4:00PM	1	0	0	0	1	0	0	8	0	0	8	1	1	0	1	0	2	9	0	11	2	0	13	0	24
4:15PM	1	0	0	0	1	1	2	16	0	0	18	0	5	0	1	0	6	4	0	12	0	0	12	0	37
4:30PM	0	0	0	0	0	1	0	8	0	0	8	0	4	0	1	0	5	1	0	8	1	0	9	0	22
4:45PM	3	0	0	0	3	0	1	14	0	0	15	1	0	0	0	0	0	7	0	11	0	0	11	0	29
Hourly Total	5	0	0	0	5	2	3	46	0	0	49	2	10	0	3	0	13	21	0	42	3	0	45	0	112
5:00PM	1	0	0	0	1	1	0	28	0	0	28	7	1	0	2	0	3	5	0	12	3	0	15	2	47
5:15PM	1	0	1	0	2	2	1	29	0	0	30	0	1	0	2	0	3	4	0	6	3	0	9	2	44
5:30PM	2	0	1	0	3	0	0	31	0	0	31	2	3	0	1	0	4	6	0	10	0	0	10	0	48
Hourly Total	4	0	2	0	6	3	1	88	0	0	89	9	5	0	5	0	10	15	0	28	6	0	34	4	139
Total	33	0	13	0	46	27	16	304	0	0	320	18	34	0	19	0	53	163	0	260	26	1	287	8	706
% Approach	71.7%	0%	28.3%	0%	-	-	5.0%	95.0%	0%	0%	-	-	64.2%	0%	35.8%	0%	-	-	0%	90.6%	9.1%	0.3%	-	-	-
% Total	4.7%	0%	1.8%	0%	6.5%	-	2.3%	43.1%	0%	0%	45.3%	-	4.8%	0%	2.7%	0%	7.5%	-	0%	36.8%	3.7%	0.1%	40.7%	-	-
Lights	33	0	13	0	46	-	16	290	0	0	306	-	22	0	19	0	41	-	0	258	25	1	284	-	677
% Lights	100%	0%	100%	0%	100%	-	100%	95.4%	0%	0%	95.6%	-	64.7%	0%	100%	0%	77.4%	-	0%	99.2%	96.2%	100%	99.0%	-	95.9%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Buses and Single-Unit Trucks	0	0	0	0	0	-	0	14	0	0	14	-	12	0	0	0	12	-	0	2	1	0	3	-	29
% Buses and Single-Unit Trucks	0%	0%	0%	0%	0%	-	0%	4.6%	0%	0%	4.4%	-	35.3%	0%	0%	0%	22.6%	-	0%	0.8%	3.8%	0%	1.0%	-	4.1%
Pedestrians	-	-	-	-	-	25	-	-	-	-	-	18	-	-	-	-	-	145	-	-	-	-	-	6	
% Pedestrians	-	-	-	-	-	92.6%	-	-	-	-	-	100%	-	-	-	-	-	89.0%	-	-	-	-	-	75.0%	-
Bicycles on Crosswalk	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	18	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	7.4%	-	-	-	-	-	0%	-	-	-	-	-	11.0%	-	-	-	-	-	25.0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

West 50th Street & Rainbow Boulevard - TMC

Wed Sep 6, 2023

Full Length (7:30 AM-8:30 AM, 2:45 PM-5:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1101966, Location: 39.037647, -94.611883



Item B. Section II, Item

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Rainbow Blvd Southbound						W 50th St Westbound						Rainbow Blvd Northbound						W 50th St Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2023-09-06 7:30AM	4	89	0	0	93	0	3	2	0	0	5	0	2	132	15	0	149	0	9	4	3	0	16	0	263
7:45AM	14	118	0	0	132	0	1	4	1	0	6	12	1	133	19	0	153	16	24	1	12	0	37	6	328
Hourly Total	18	207	0	0	225	0	4	6	1	0	11	12	3	265	34	0	302	16	33	5	15	0	53	6	591
8:00AM	10	117	3	0	130	0	2	2	1	0	5	5	4	113	9	0	126	27	28	0	17	0	45	1	306
8:15AM	5	113	2	0	120	0	2	0	2	0	4	4	0	125	2	0	127	3	5	3	9	0	17	1	268
Hourly Total	15	230	5	0	250	0	4	2	3	0	9	9	4	238	11	0	253	30	33	3	26	0	62	2	574
2:45PM	2	112	2	0	116	0	4	4	3	0	11	3	3	74	7	0	84	4	6	3	3	0	12	1	223
Hourly Total	2	112	2	0	116	0	4	4	3	0	11	3	3	74	7	0	84	4	6	3	3	0	12	1	223
3:00PM	13	127	4	0	144	0	3	2	1	0	6	5	2	70	23	0	95	6	10	1	3	0	14	2	259
3:15PM	9	118	6	0	133	1	3	4	6	0	13	14	1	75	9	0	85	23	38	1	13	0	52	1	283
3:30PM	2	112	3	0	117	0	2	4	0	0	6	1	1	68	3	0	72	21	7	3	5	0	15	0	210
3:45PM	5	150	0	0	155	0	0	2	1	0	3	3	4	81	1	0	86	6	4	1	7	0	12	0	256
Hourly Total	29	507	13	0	549	1	8	12	8	0	28	23	8	294	36	0	338	56	59	6	28	0	93	3	1008
4:00PM	3	180	6	0	189	0	2	5	3	0	10	0	2	86	0	0	88	23	2	2	8	0	12	0	299
4:15PM	8	194	3	0	205	0	1	6	2	0	9	2	5	78	5	0	88	3	9	3	5	0	17	0	319
4:30PM	3	220	1	0	224	0	1	1	2	0	4	1	2	91	3	0	96	1	4	2	6	0	12	0	336
4:45PM	6	201	2	0	209	0	1	7	1	0	9	0	2	92	4	0	98	0	5	1	7	0	13	3	329
Hourly Total	20	795	12	0	827	0	5	19	8	0	32	3	11	347	12	0	370	27	20	8	26	0	54	3	1283
5:00PM	13	224	2	0	239	0	1	10	2	0	13	12	1	82	4	0	87	13	3	5	4	0	12	0	351
5:15PM	10	228	2	0	240	0	1	12	8	0	21	4	1	93	8	0	102	7	6	2	2	0	10	5	373
5:30PM	17	217	3	0	237	0	7	10	9	0	26	2	0	99	4	0	103	5	6	4	4	0	14	1	380
Hourly Total	40	669	7	0	716	0	9	32	19	0	60	18	2	274	16	0	292	25	15	11	10	0	36	6	1104
Total	124	2520	39	0	2683	1	34	75	42	0	151	68	31	1492	116	0	1639	158	166	36	108	0	310	21	4783
% Approach	4.6%	93.9%	1.5%	0%	-	-	22.5%	49.7%	27.8%	0%	-	-	1.9%	91.0%	7.1%	0%	-	-	53.5%	11.6%	34.8%	0%	-	-	-
% Total	2.6%	52.7%	0.8%	0%	56.1%	-	0.7%	1.6%	0.9%	0%	3.2%	-	0.6%	31.2%	2.4%	0%	34.3%	-	3.5%	0.8%	2.3%	0%	6.5%	-	-
Lights	124	2484	39	0	2647	-	34	75	41	0	150	-	31	1460	103	0	1594	-	153	36	106	0	295	-	4686
% Lights	100%	98.6%	100%	0%	98.7%	-	100%	100%	97.6%	0%	99.3%	-	100%	97.9%	88.8%	0%	97.3%	-	92.2%	100%	98.1%	0%	95.2%	-	98.0%
Articulated Trucks	0	4	0	0	4	-	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	7
% Articulated Trucks	0%	0.2%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.1%
Buses and Single-Unit Trucks	0	32	0	0	32	-	0	0	1	0	1	-	0	29	13	0	42	-	13	0	2	0	15	-	90
% Buses and Single-Unit Trucks	0%	1.3%	0%	0%	1.2%	-	0%	0%	2.4%	0%	0.7%	-	0%	1.9%	11.2%	0%	2.6%	-	7.8%	0%	1.9%	0%	4.8%	-	1.9%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	68	-	-	-	-	-	154	-	-	-	-	-	20	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	97.5%	-	-	-	-	-	95.2%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	2.5%	-	-	-	-	-	4.8%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

West 50th Terrace & Rainbow Boulevard - TMC

Wed Sep 6, 2023

Full Length (7:30 AM-8:30 AM, 2:45 PM-5:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1101965, Location: 39.036957, -94.611879



Item B. Section II, Item

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Rainbow Blvd Southbound					W 50th Terr Westbound					Rainbow Blvd Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2023-09-06 7:30AM	99	0	0	99	0	1	0	0	1	0	2	144	0	146	0	246
7:45AM	146	1	0	147	0	4	1	0	5	1	3	153	0	156	0	308
Hourly Total	245	1	0	246	0	5	1	0	6	1	5	297	0	302	0	554
8:00AM	140	2	0	142	0	6	1	0	7	0	2	116	0	118	0	267
8:15AM	112	2	0	114	0	1	9	0	10	0	5	127	0	132	0	256
Hourly Total	252	4	0	256	0	7	10	0	17	0	7	243	0	250	0	523
2:45PM	116	2	0	118	0	2	0	0	2	0	2	91	0	93	0	213
Hourly Total	116	2	0	118	0	2	0	0	2	0	2	91	0	93	0	213
3:00PM	132	1	0	133	0	4	0	0	4	0	1	91	0	92	0	229
3:15PM	168	1	0	169	0	5	14	0	19	0	2	78	0	80	0	268
3:30PM	120	0	0	120	0	2	7	0	9	0	3	68	0	71	0	200
3:45PM	157	1	0	158	0	3	2	0	5	0	1	83	0	84	0	247
Hourly Total	577	3	0	580	0	14	23	0	37	0	7	320	0	327	0	944
4:00PM	183	0	0	183	0	5	7	0	12	0	1	81	0	82	0	277
4:15PM	200	2	0	202	0	6	5	0	11	1	1	84	0	85	0	298
4:30PM	213	2	0	215	0	1	6	0	7	0	3	90	0	93	0	315
4:45PM	208	0	0	208	0	6	4	0	10	0	2	93	0	95	0	313
Hourly Total	804	4	0	808	0	18	22	0	40	1	7	348	0	355	0	1203
5:00PM	225	2	0	227	0	6	4	0	10	0	0	87	0	87	0	324
5:15PM	243	2	0	245	0	7	12	0	19	0	4	94	0	98	0	362
5:30PM	232	1	0	233	0	8	7	0	15	0	2	96	0	98	0	346
Hourly Total	700	5	0	705	0	21	23	0	44	0	6	277	0	283	0	1032
Total	2694	19	0	2713	0	67	79	0	146	2	34	1576	0	1610	0	4469
% Approach	99.3%	0.7%	0%	-	-	45.9%	54.1%	0%	-	-	2.1%	97.9%	0%	-	-	-
% Total	60.3%	0.4%	0%	60.7%	-	1.5%	1.8%	0%	3.3%	-	0.8%	35.3%	0%	36.0%	-	-
Lights	2643	18	0	2661	-	67	79	0	146	-	33	1533	0	1566	-	4373
% Lights	98.1%	94.7%	0%	98.1%	-	100%	100%	0%	100%	-	97.1%	97.3%	0%	97.3%	-	97.9%
Articulated Trucks	3	0	0	3	-	0	0	0	0	-	0	2	0	2	-	5
% Articulated Trucks	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	-	0%	0.1%	0%	0.1%	-	0.1%
Buses and Single-Unit Trucks	48	1	0	49	-	0	0	0	0	-	1	41	0	42	-	91
% Buses and Single-Unit Trucks	1.8%	5.3%	0%	1.8%	-	0%	0%	0%	0%	-	2.9%	2.6%	0%	2.6%	-	2.0%
Pedestrians	-	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

West 51st Street & Rainbow Boulevard (north) - TMC

Wed Sep 6, 2023

Full Length (7:30 AM-8:30 AM, 2:45 PM-5:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1101967, Location: 39.036062, -94.611884



Item B. Section II, Item

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Rainbow Blvd Southbound						Access Westbound						Rainbow Blvd Northbound						W 51st St Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2023-09-06 7:30AM	3	95	0	0	98	0	0	0	0	0	0	0	0	150	1	0	151	0	1	0	3	0	4	0	253
7:45AM	0	148	0	0	148	0	0	0	0	0	0	0	0	155	4	0	159	0	2	0	2	0	4	6	311
Hourly Total	3	243	0	0	246	0	0	0	0	0	0	0	0	305	5	0	310	0	3	0	5	0	8	6	564
8:00AM	1	138	2	0	141	0	0	0	0	0	0	0	0	120	0	0	120	0	1	0	1	0	2	7	263
8:15AM	3	120	0	0	123	0	0	0	0	0	0	0	0	130	0	0	130	0	2	0	0	0	2	1	255
Hourly Total	4	258	2	0	264	0	0	0	0	0	0	0	0	250	0	0	250	0	3	0	1	0	4	8	518
2:45PM	2	114	0	0	116	0	0	0	0	0	0	0	0	92	0	0	92	0	0	0	0	0	0	0	208
Hourly Total	2	114	0	0	116	0	0	0	0	0	0	0	0	92	0	0	92	0	0	0	0	0	0	0	208
3:00PM	3	130	0	0	133	0	0	0	0	0	0	0	0	92	1	0	93	0	0	0	0	0	0	3	226
3:15PM	6	173	0	0	179	0	0	0	0	0	0	0	0	77	1	0	78	0	2	0	2	0	4	11	261
3:30PM	0	121	0	0	121	0	0	0	0	0	0	0	0	70	0	0	70	0	1	0	0	0	1	1	192
3:45PM	1	161	0	0	162	0	0	0	0	0	0	0	0	85	0	0	85	0	0	0	0	0	0	0	247
Hourly Total	10	585	0	0	595	0	0	0	0	0	0	0	0	324	2	0	326	0	3	0	2	0	5	15	926
4:00PM	3	185	0	0	188	0	0	0	0	0	0	1	0	91	0	0	91	0	0	0	0	0	0	4	279
4:15PM	2	210	0	0	212	0	0	0	0	0	0	1	0	87	0	0	87	0	1	0	0	0	1	0	300
4:30PM	4	222	1	0	227	0	0	0	0	0	0	0	0	94	1	0	95	0	0	0	3	0	3	0	325
4:45PM	3	203	2	0	208	0	0	0	0	0	0	1	0	95	0	0	95	0	0	0	1	0	1	0	304
Hourly Total	12	820	3	0	835	0	0	0	0	0	0	3	0	367	1	0	368	0	1	0	4	0	5	4	1208
5:00PM	1	216	0	0	217	0	0	0	0	0	0	0	3	89	0	0	92	0	0	1	0	0	1	0	310
5:15PM	4	245	2	0	251	0	0	0	0	0	0	0	1	94	0	0	95	0	1	0	1	0	2	1	348
5:30PM	0	226	4	0	230	0	0	0	0	0	0	2	3	95	1	0	99	0	1	0	1	0	2	1	331
Hourly Total	5	687	6	0	698	0	0	0	0	0	0	2	7	278	1	0	286	0	2	1	2	0	5	2	989
Total	36	2707	11	0	2754	0	0	0	0	0	0	5	7	1616	9	0	1632	0	12	1	14	0	27	35	4413
% Approach	1.3%	98.3%	0.4%	0%	-	-	0%	0%	0%	0%	-	-	0.4%	99.0%	0.6%	0%	-	-	44.4%	3.7%	51.9%	0%	-	-	-
% Total	0.8%	61.3%	0.2%	0%	62.4%	-	0%	0%	0%	0%	0%	-	0.2%	36.6%	0.2%	0%	37.0%	-	0.3%	0%	0.3%	0%	0.6%	-	-
Lights	34	2657	11	0	2702	-	0	0	0	0	0	-	7	1570	7	0	1584	-	10	1	13	0	24	-	4310
% Lights	94.4%	98.2%	100%	0%	98.1%	-	0%	0%	0%	0%	-	-	100%	97.2%	77.8%	0%	97.1%	-	83.3%	100%	92.9%	0%	88.9%	-	97.7%
Articulated Trucks	0	3	0	0	3	-	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	6
% Articulated Trucks	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	-	-	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.1%
Buses and Single-Unit Trucks	2	47	0	0	49	-	0	0	0	0	0	-	0	43	2	0	45	-	2	0	1	0	3	-	97
% Buses and Single-Unit Trucks	5.6%	1.7%	0%	0%	1.8%	-	0%	0%	0%	0%	-	-	0%	2.7%	22.2%	0%	2.8%	-	16.7%	0%	7.1%	0%	11.1%	-	2.2%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	25	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	60.0%	-	-	-	-	-	-	-	-	-	-	-	71.4%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	10	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	40.0%	-	-	-	-	-	-	-	-	-	-	-	28.6%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

West 51st Terrace & rear driveway of Element... - TMC

Wed Sep 6, 2023

Full Length (7:30 AM-8:30 AM, 2:45 PM-5:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1101968, Location: 39.035909, -94.613021



Item B.Section II, Item

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Elementary Driveway Rear Southbound					W 51st St Westbound					W 51st St Eastbound					Int
	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	
Time																
2023-09-06 7:30AM	0	0	0	0	0	1	3	0	4	0	4	0	0	4	0	8
7:45AM	0	1	0	1	0	1	3	0	4	0	3	0	0	3	0	8
Hourly Total	0	1	0	1	0	2	6	0	8	0	7	0	0	7	0	16
8:00AM	0	0	0	0	1	1	0	0	1	0	1	0	0	1	0	2
8:15AM	1	0	0	1	0	0	3	0	3	0	2	0	0	2	0	6
Hourly Total	1	0	0	1	1	1	3	0	4	0	3	0	0	3	0	8
2:45PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
Hourly Total	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
3:00PM	1	0	0	1	1	0	5	0	5	0	0	0	0	0	0	6
3:15PM	0	0	0	0	3	0	5	0	5	0	3	0	0	3	0	8
3:30PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1
3:45PM	0	0	0	0	3	0	1	0	1	0	0	0	0	0	0	1
Hourly Total	1	0	0	1	7	0	11	0	11	0	4	0	0	4	0	16
4:00PM	0	0	0	0	4	0	3	0	3	0	0	0	0	0	0	3
4:15PM	0	0	0	0	3	0	2	0	2	0	1	0	0	1	0	3
4:30PM	0	0	0	0	0	0	4	0	4	0	3	0	0	3	0	7
4:45PM	0	0	0	0	3	0	3	0	3	0	0	0	0	0	0	3
Hourly Total	0	0	0	0	10	0	12	0	12	0	4	0	0	4	0	16
5:00PM	0	0	0	0	2	0	1	0	1	0	1	0	0	1	0	2
5:15PM	0	0	0	0	2	0	3	0	3	0	2	0	0	2	0	5
5:30PM	0	0	0	0	4	0	2	0	2	0	3	0	0	3	0	5
Hourly Total	0	0	0	0	8	0	6	0	6	0	6	0	0	6	0	12
Total	2	1	0	3	26	3	39	0	42	0	24	0	0	24	0	69
% Approach	66.7%	33.3%	0%	-	-	7.1%	92.9%	0%	-	-	100%	0%	0%	-	-	-
% Total	2.9%	1.4%	0%	4.3%	-	4.3%	56.5%	0%	60.9%	-	34.8%	0%	0%	34.8%	-	-
Lights	2	0	0	2	-	3	35	0	38	-	22	0	0	22	-	62
% Lights	100%	0%	0%	66.7%	-	100%	89.7%	0%	90.5%	-	91.7%	0%	0%	91.7%	-	89.9%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses and Single-Unit Trucks	0	1	0	1	-	0	4	0	4	-	2	0	0	2	-	7
% Buses and Single-Unit Trucks	0%	100%	0%	33.3%	-	0%	10.3%	0%	9.5%	-	8.3%	0%	0%	8.3%	-	10.1%
Pedestrians	-	-	-	-	22	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	84.6%	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	4	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	15.4%	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

General Office Building (710)

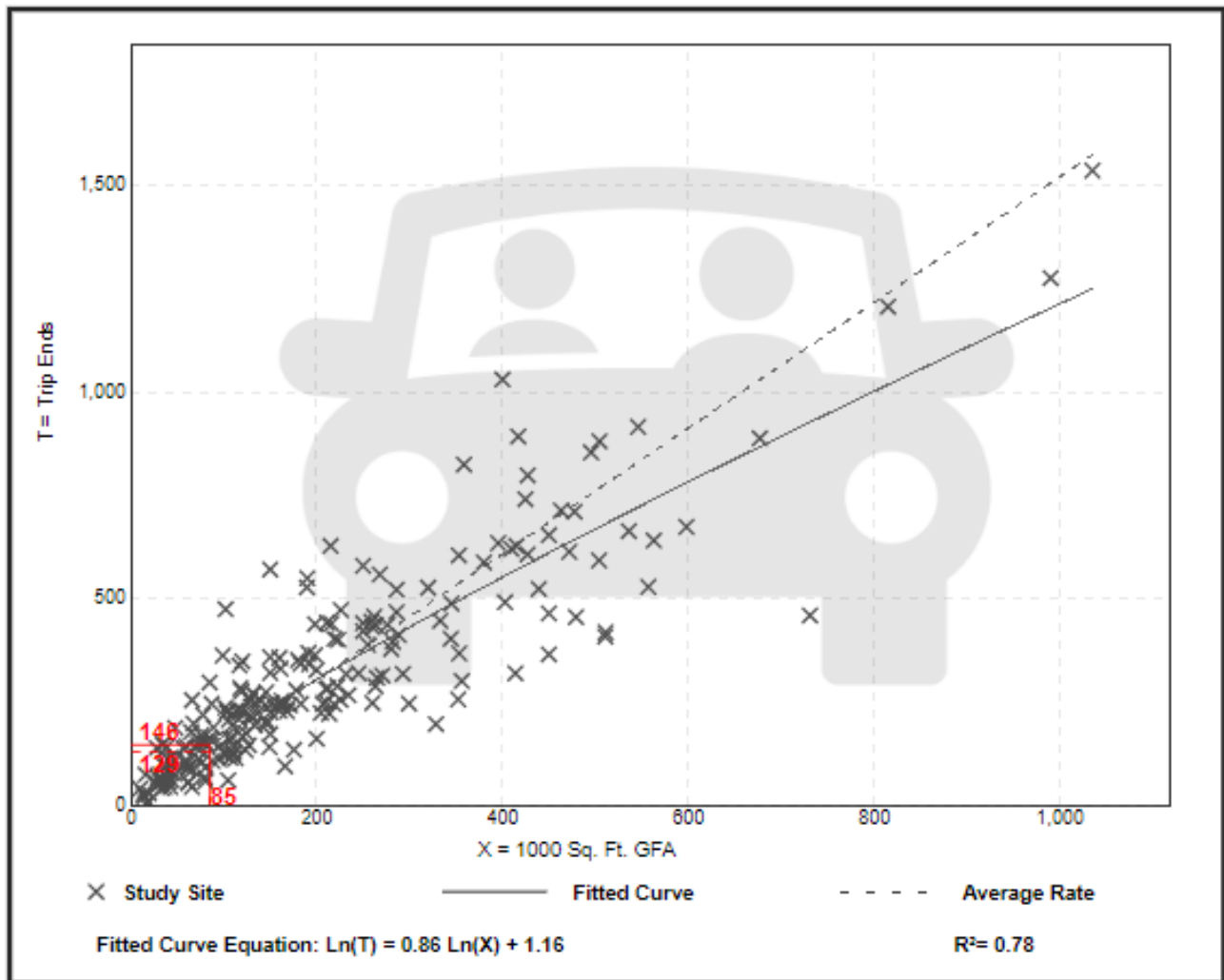
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban
 Number of Studies: 221
 Avg. 1000 Sq. Ft. GFA: 201
 Directional Distribution: 88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.52	0.32 - 4.93	0.58

Data Plot and Equation



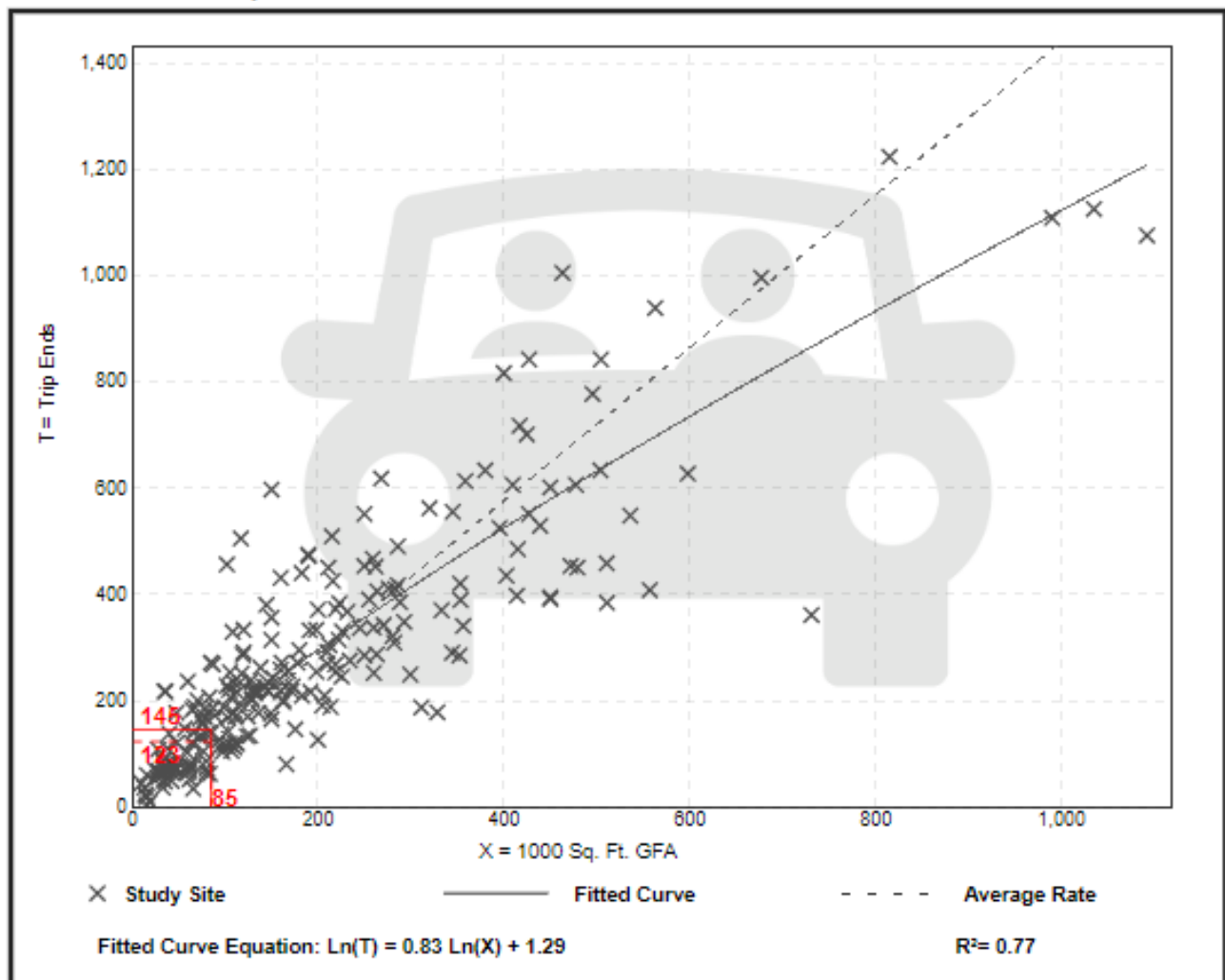
General Office Building (710)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 232
 Avg. 1000 Sq. Ft. GFA: 199
 Directional Distribution: 17% entering, 83% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.44	0.26 - 6.20	0.60

Data Plot and Equation



Strip Retail Plaza (<40k) (822)

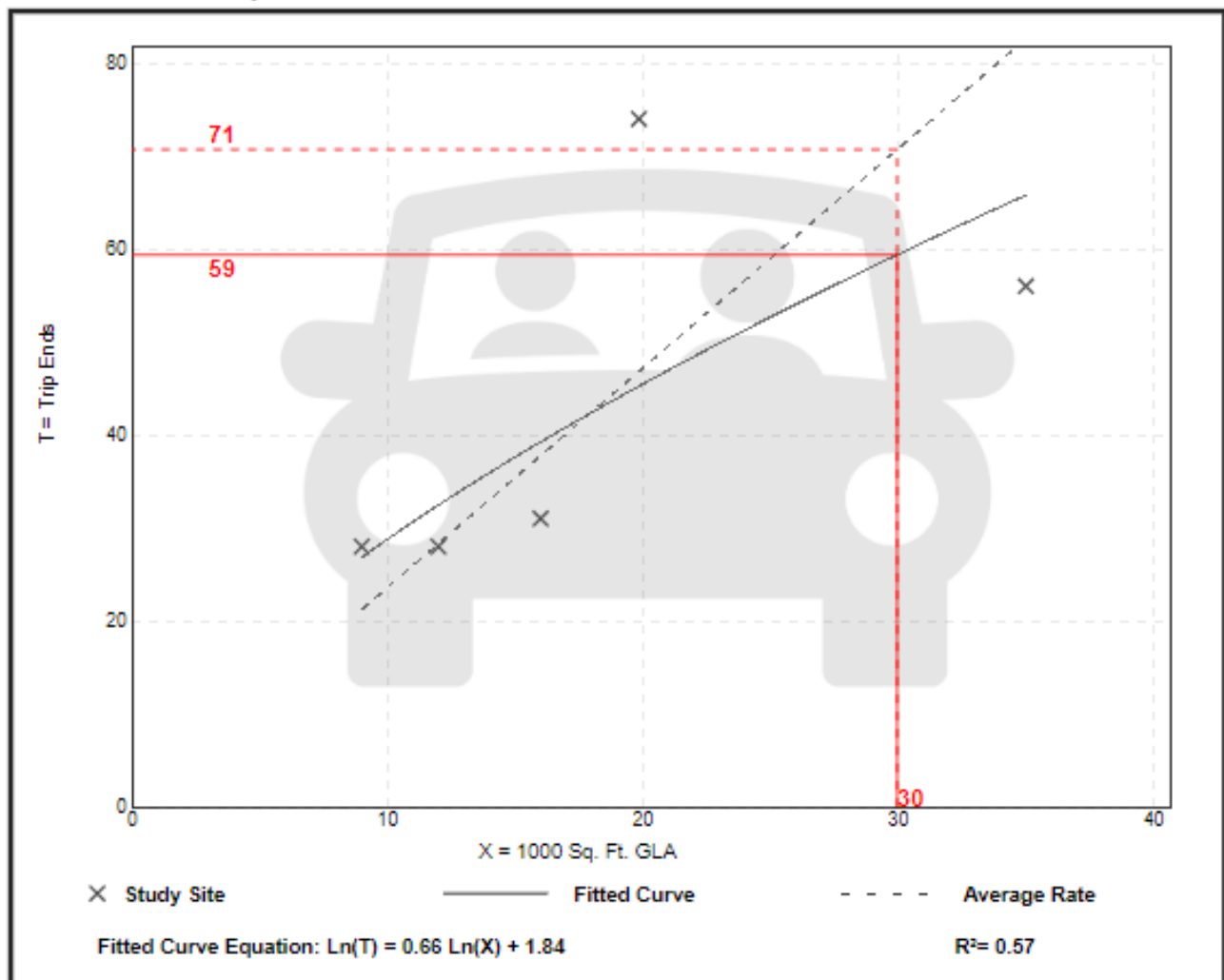
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GLA: 18
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation

Caution – Small Sample Size



Strip Retail Plaza (<40k) (822)

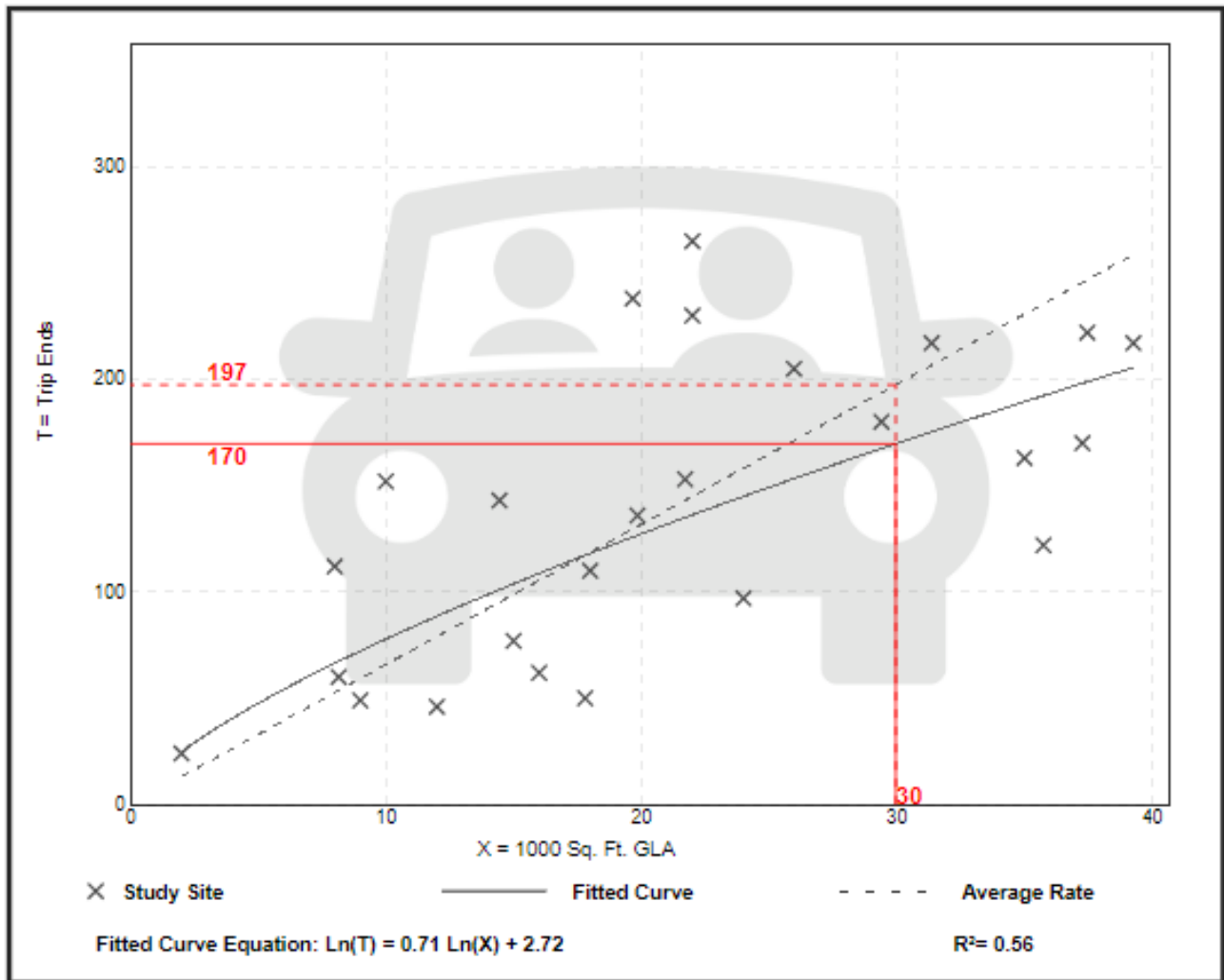
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban
 Number of Studies: 25
 Avg. 1000 Sq. Ft. GLA: 21
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation



Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	100	0	0	87	0	1	0	11	8	0	8
Future Vol, veh/h	5	100	0	0	87	0	1	0	11	8	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	109	0	0	95	0	1	0	12	9	0	9

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	95	0	0	109
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1499	-	-	1481
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1499	-	-	1481
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	9	9.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	922	1499	-	-	1481	-	-	826
HCM Lane V/C Ratio	0.014	0.004	-	-	-	-	-	0.021
HCM Control Delay (s)	9	7.4	0	-	0	-	-	9.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	80	0	0	75	12	9	0	8	2	0	14
Future Vol, veh/h	12	80	0	0	75	12	9	0	8	2	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	87	0	0	82	13	10	0	9	2	0	15

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	95	0	0	87
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1499	-	-	1509
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1499	-	-	1509
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	9.4	8.9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	828	1499	-	-	1509	-	-	933
HCM Lane V/C Ratio	0.022	0.009	-	-	-	-	-	0.019
HCM Control Delay (s)	9.4	7.4	0	-	0	-	-	8.9
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	39	0	0	102	2	5	0	5	2	0	7
Future Vol, veh/h	6	39	0	0	102	2	5	0	5	2	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	42	0	0	111	2	5	0	5	2	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	113	0	0	42	0	0	172	169	42	171	168	112
Stage 1	-	-	-	-	-	-	56	56	-	112	112	-
Stage 2	-	-	-	-	-	-	116	113	-	59	56	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1476	-	-	1567	-	-	791	724	1029	792	725	941
Stage 1	-	-	-	-	-	-	956	848	-	893	803	-
Stage 2	-	-	-	-	-	-	889	802	-	953	848	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1476	-	-	1567	-	-	782	720	1029	785	721	941
Mov Cap-2 Maneuver	-	-	-	-	-	-	782	720	-	785	721	-
Stage 1	-	-	-	-	-	-	951	844	-	889	803	-
Stage 2	-	-	-	-	-	-	882	802	-	943	844	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	9.1	9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	889	1476	-	-	1567	-	-	901
HCM Lane V/C Ratio	0.012	0.004	-	-	-	-	-	0.011
HCM Control Delay (s)	9.1	7.5	0	-	0	-	-	9
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	106	3	20	87	0	2	0	5	8	0	8
Future Vol, veh/h	5	106	3	20	87	0	2	0	5	8	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	115	3	22	95	0	2	0	5	9	0	9

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	95	0	0	118
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1499	-	-	1470
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1499	-	-	1470
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.4	9.3	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	838	1499	-	-	1470	-	-	791
HCM Lane V/C Ratio	0.009	0.004	-	-	0.015	-	-	0.022
HCM Control Delay (s)	9.3	7.4	0	-	7.5	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	43	2	14	102	2	4	0	26	2	0	7
Future Vol, veh/h	6	43	2	14	102	2	4	0	26	2	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	47	2	15	111	2	4	0	28	2	0	8

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	113	0	0	49
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1476	-	-	1558
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1476	-	-	1558
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.9	8.8	9.2
HCM LOS			A	A

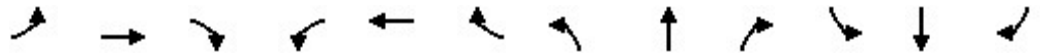
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	971	1476	-	-	1558	-	-	877
HCM Lane V/C Ratio	0.034	0.004	-	-	0.01	-	-	0.011
HCM Control Delay (s)	8.8	7.5	0	-	7.3	0	-	9.2
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

4: Rainbow & 50th St
 HCM 6th Signalized Intersection Summary

AM_Existi

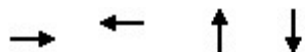
Item B.Section II, Item

09/09/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	41	8	66	4	8	8	45	503	7	5	437	33
Future Volume (veh/h)	41	8	66	4	8	8	45	503	7	5	437	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	9	72	4	9	9	49	547	8	5	475	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	12	96	6	14	14	151	1526	22	62	1580	119
Arrive On Green	0.10	0.10	0.10	0.02	0.02	0.02	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	596	119	954	314	707	707	173	3155	45	7	3268	245
Grp Volume(v), veh/h	126	0	0	22	0	0	305	0	299	273	0	243
Grp Sat Flow(s),veh/h/ln	1669	0	0	1727	0	0	1679	0	1694	1862	0	1658
Q Serve(g_s), s	4.6	0.0	0.0	0.8	0.0	0.0	0.0	0.0	6.9	0.0	0.0	5.5
Cycle Q Clear(g_c), s	4.6	0.0	0.0	0.8	0.0	0.0	6.2	0.0	6.9	5.5	0.0	5.5
Prop In Lane	0.36		0.57	0.18		0.41	0.16		0.03	0.02		0.15
Lane Grp Cap(c), veh/h	169	0	0	35	0	0	880	0	819	960	0	802
V/C Ratio(X)	0.75	0.00	0.00	0.63	0.00	0.00	0.35	0.00	0.37	0.28	0.00	0.30
Avail Cap(c_a), veh/h	538	0	0	557	0	0	880	0	819	960	0	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.1	0.0	0.0	30.2	0.0	0.0	9.9	0.0	10.0	9.7	0.0	9.7
Incr Delay (d2), s/veh	6.4	0.0	0.0	16.8	0.0	0.0	1.1	0.0	1.3	0.7	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.0	0.5	0.0	0.0	2.4	0.0	2.4	2.0	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	0.0	0.0	47.0	0.0	0.0	11.0	0.0	11.3	10.4	0.0	10.7
LnGrp LOS	C	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		126			22			604				516
Approach Delay, s/veh		33.5			47.0			11.1				10.5
Approach LOS		C			D			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.5		14.3		38.5		9.3				
Change Period (Y+Rc), s		8.5		8.0		8.5		8.0				
Max Green Setting (Gmax), s		30.0		20.0		30.0		20.0				
Max Q Clear Time (g_c+I1), s		8.9		6.6		7.5		2.8				
Green Ext Time (p_c), s		3.7		0.5		3.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				13.7								
HCM 6th LOS				B								

4: Rainbow & 50th St
Queues



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	126	22	604	516
v/c Ratio	0.48	0.13	0.33	0.26
Control Delay	32.8	31.8	12.4	11.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.8	31.8	12.4	11.6
Queue Length 50th (ft)	40	7	55	44
Queue Length 95th (ft)	103	31	162	133
Internal Link Dist (ft)	236	436	184	566
Turn Bay Length (ft)				
Base Capacity (vph)	523	540	1805	1969
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.04	0.33	0.26
Intersection Summary				

4: Rainbow & 50th St
 HCM 6th Signalized Intersection Summary

PM_School_Existi

Item B.Section II, Item

09/10/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	24	8	61	12	14	10	42	287	7	15	469	26
Future Volume (veh/h)	24	8	61	12	14	10	42	287	7	15	469	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	9	66	13	15	11	46	312	8	16	510	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	12	88	18	21	16	217	1392	36	79	1611	87
Arrive On Green	0.08	0.08	0.08	0.03	0.03	0.03	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	426	147	1081	584	674	494	294	2850	74	36	3300	178
Grp Volume(v), veh/h	101	0	0	39	0	0	182	0	184	291	0	263
Grp Sat Flow(s),veh/h/ln	1654	0	0	1752	0	0	1529	0	1689	1843	0	1670
Q Serve(g_s), s	3.7	0.0	0.0	1.4	0.0	0.0	0.0	0.0	3.8	0.0	0.0	5.9
Cycle Q Clear(g_c), s	3.7	0.0	0.0	1.4	0.0	0.0	5.9	0.0	3.8	5.8	0.0	5.9
Prop In Lane	0.26		0.65	0.33		0.28	0.25		0.04	0.05		0.11
Lane Grp Cap(c), veh/h	134	0	0	55	0	0	820	0	825	962	0	815
V/C Ratio(X)	0.75	0.00	0.00	0.70	0.00	0.00	0.22	0.00	0.22	0.30	0.00	0.32
Avail Cap(c_a), veh/h	539	0	0	570	0	0	820	0	825	962	0	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	0.0	29.5	0.0	0.0	8.9	0.0	9.0	9.5	0.0	9.5
Incr Delay (d2), s/veh	8.1	0.0	0.0	15.0	0.0	0.0	0.6	0.0	0.6	0.8	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	0.8	0.0	0.0	1.3	0.0	1.3	2.2	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	0.0	0.0	44.4	0.0	0.0	9.5	0.0	9.6	10.3	0.0	10.6
LnGrp LOS	D	A	A	D	A	A	A	A	A	B	A	B
Approach Vol, veh/h		101			39			366			554	
Approach Delay, s/veh		35.8			44.4			9.6			10.5	
Approach LOS		D			D			A			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.5		13.0		38.5		9.9				
Change Period (Y+Rc), s		8.5		8.0		8.5		8.0				
Max Green Setting (Gmax), s		30.0		20.0		30.0		20.0				
Max Q Clear Time (g_c+I1), s		7.9		5.7		7.9		3.4				
Green Ext Time (p_c), s		2.1		0.4		3.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				13.8								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

Item B.Section II, Item

4: Rainbow & 50th St

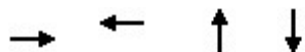
09/09/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	17	12	20	20	39	10	20	366	4	9	870	46
Future Volume (veh/h)	17	12	20	20	39	10	20	366	4	9	870	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	13	22	22	42	11	22	398	4	10	946	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	23	16	28	30	57	15	107	1624	16	66	1666	87
Arrive On Green	0.04	0.04	0.04	0.06	0.06	0.06	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	582	420	711	527	1006	263	82	3262	32	10	3346	176
Grp Volume(v), veh/h	53	0	0	75	0	0	215	0	209	531	0	475
Grp Sat Flow(s),veh/h/ln	1713	0	0	1797	0	0	1681	0	1696	1861	0	1670
Q Serve(g_s), s	1.8	0.0	0.0	2.5	0.0	0.0	0.0	0.0	4.3	0.0	0.0	12.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	2.5	0.0	0.0	3.9	0.0	4.3	12.0	0.0	12.0
Prop In Lane	0.34		0.42	0.29		0.15	0.10		0.02	0.02		0.11
Lane Grp Cap(c), veh/h	67	0	0	101	0	0	903	0	844	988	0	832
V/C Ratio(X)	0.79	0.00	0.00	0.74	0.00	0.00	0.24	0.00	0.25	0.54	0.00	0.57
Avail Cap(c_a), veh/h	569	0	0	596	0	0	903	0	844	988	0	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	0.0	28.0	0.0	0.0	8.6	0.0	8.7	10.6	0.0	10.6
Incr Delay (d2), s/veh	18.1	0.0	0.0	10.2	0.0	0.0	0.6	0.0	0.7	2.1	0.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	1.3	0.0	0.0	1.4	0.0	1.4	4.5	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	0.0	38.2	0.0	0.0	9.2	0.0	9.4	12.7	0.0	13.5
LnGrp LOS	D	A	A	D	A	A	A	A	A	B	A	B
Approach Vol, veh/h		53			75			424				1006
Approach Delay, s/veh		46.8			38.2			9.3				13.1
Approach LOS		D			D			A				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.5		10.4		38.5		11.4				
Change Period (Y+Rc), s		8.5		8.0		8.5		8.0				
Max Green Setting (Gmax), s		30.0		20.0		30.0		20.0				
Max Q Clear Time (g_c+I1), s		6.3		3.8		14.0		4.5				
Green Ext Time (p_c), s		2.6		0.2		5.8		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				14.4								
HCM 6th LOS				B								

Queues

4: Rainbow & 50th St



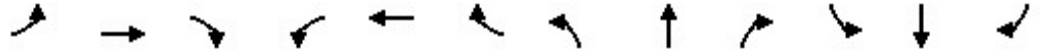
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	53	75	424	1006
v/c Ratio	0.28	0.34	0.24	0.52
Control Delay	33.2	33.5	12.4	15.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.2	33.5	12.4	15.5
Queue Length 50th (ft)	22	30	61	180
Queue Length 95th (ft)	55	70	106	284
Internal Link Dist (ft)	236	436	184	566
Turn Bay Length (ft)				
Base Capacity (vph)	516	536	1771	1925
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.14	0.24	0.52
Intersection Summary				

4: Rainbow & 50th St
 HCM 6th Signalized Intersection Summary

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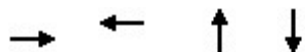
Item B.Section II, Item

09/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	41	9	66	10	11	8	46	519	8	5	482	50
Future Volume (veh/h)	41	9	66	10	11	8	46	519	8	5	482	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	10	72	11	12	9	50	564	9	5	524	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	13	96	16	18	13	148	1504	24	61	1523	155
Arrive On Green	0.10	0.10	0.10	0.03	0.03	0.03	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	592	132	947	602	657	493	169	3137	49	6	3176	324
Grp Volume(v), veh/h	127	0	0	32	0	0	313	0	310	309	0	274
Grp Sat Flow(s),veh/h/ln	1670	0	0	1752	0	0	1662	0	1693	1863	0	1644
Q Serve(g_s), s	4.6	0.0	0.0	1.1	0.0	0.0	0.0	0.0	7.3	0.0	0.0	6.5
Cycle Q Clear(g_c), s	4.6	0.0	0.0	1.1	0.0	0.0	6.5	0.0	7.3	6.5	0.0	6.5
Prop In Lane	0.35		0.57	0.34		0.28	0.16		0.03	0.02		0.20
Lane Grp Cap(c), veh/h	170	0	0	48	0	0	863	0	812	952	0	788
V/C Ratio(X)	0.75	0.00	0.00	0.67	0.00	0.00	0.36	0.00	0.38	0.32	0.00	0.35
Avail Cap(c_a), veh/h	534	0	0	560	0	0	863	0	812	952	0	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	0.0	30.2	0.0	0.0	10.2	0.0	10.4	10.2	0.0	10.2
Incr Delay (d2), s/veh	6.4	0.0	0.0	15.0	0.0	0.0	1.2	0.0	1.4	0.9	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.0	0.7	0.0	0.0	2.5	0.0	2.6	2.4	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	0.0	0.0	45.2	0.0	0.0	11.4	0.0	11.7	11.1	0.0	11.4
LnGrp LOS	C	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		127			32			623				583
Approach Delay, s/veh		33.7			45.2			11.6				11.2
Approach LOS		C			D			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.5		14.4		38.5		9.7				
Change Period (Y+Rc), s		8.5		8.0		8.5		8.0				
Max Green Setting (Gmax), s		30.0		20.0		30.0		20.0				
Max Q Clear Time (g_c+I1), s		9.3		6.6		8.5		3.1				
Green Ext Time (p_c), s		3.8		0.5		3.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				14.3								
HCM 6th LOS				B								

4: Rainbow & 50th St
Queues



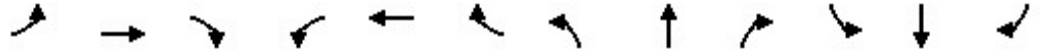
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	127	32	623	583
v/c Ratio	0.48	0.17	0.35	0.30
Control Delay	32.9	32.0	12.8	12.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.9	32.0	12.8	12.2
Queue Length 50th (ft)	40	10	57	52
Queue Length 95th (ft)	105	40	172	154
Internal Link Dist (ft)	236	436	184	566
Turn Bay Length (ft)				
Base Capacity (vph)	525	547	1772	1948
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.06	0.35	0.30
Intersection Summary				

HCM 6th Signalized Intersection Summary
4: Rainbow & 50th St

PM_Existing+Pr

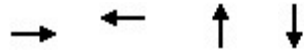
Item B.Section II, Item

09/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	36	16	22	24	41	10	26	445	10	9	902	58
Future Volume (veh/h)	36	16	22	24	41	10	26	445	10	9	902	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	17	24	26	45	11	28	484	11	10	980	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	52	23	32	35	61	15	105	1539	34	64	1594	102
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	846	369	520	570	987	241	86	3190	71	10	3304	211
Grp Volume(v), veh/h	80	0	0	82	0	0	263	0	260	556	0	497
Grp Sat Flow(s),veh/h/ln	1734	0	0	1798	0	0	1658	0	1689	1860	0	1664
Q Serve(g_s), s	2.8	0.0	0.0	2.8	0.0	0.0	0.0	0.0	5.9	0.0	0.0	13.7
Cycle Q Clear(g_c), s	2.8	0.0	0.0	2.8	0.0	0.0	13.7	0.0	5.9	13.6	0.0	13.7
Prop In Lane	0.49		0.30	0.32		0.13	0.11		0.04	0.02		0.13
Lane Grp Cap(c), veh/h	107	0	0	111	0	0	864	0	815	956	0	803
V/C Ratio(X)	0.75	0.00	0.00	0.74	0.00	0.00	0.30	0.00	0.32	0.58	0.00	0.62
Avail Cap(c_a), veh/h	558	0	0	578	0	0	864	0	815	956	0	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	0.0	28.7	0.0	0.0	9.7	0.0	9.8	11.9	0.0	11.9
Incr Delay (d2), s/veh	10.0	0.0	0.0	9.1	0.0	0.0	0.9	0.0	1.0	2.6	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.0	1.4	0.0	0.0	2.0	0.0	2.0	5.3	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	0.0	0.0	37.7	0.0	0.0	10.6	0.0	10.9	14.4	0.0	15.4
LnGrp LOS	D	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		80			82			523				1053
Approach Delay, s/veh		38.7			37.7			10.7				14.9
Approach LOS		D			D			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.5		11.8		38.5		11.9				
Change Period (Y+Rc), s		8.5		8.0		8.5		8.0				
Max Green Setting (Gmax), s		30.0		20.0		30.0		20.0				
Max Q Clear Time (g_c+I1), s		15.7		4.8		15.7		4.8				
Green Ext Time (p_c), s		2.8		0.3		5.8		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				15.8								
HCM 6th LOS				B								

Queues
4: Rainbow & 50th St



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	80	82	523	1053
v/c Ratio	0.37	0.37	0.33	0.60
Control Delay	34.8	34.7	15.2	19.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.8	34.7	15.2	19.1
Queue Length 50th (ft)	33	34	83	201
Queue Length 95th (ft)	75	76	142	#323
Internal Link Dist (ft)	236	436	184	566
Turn Bay Length (ft)				
Base Capacity (vph)	509	526	1580	1756
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.16	0.16	0.33	0.60

Intersection Summary

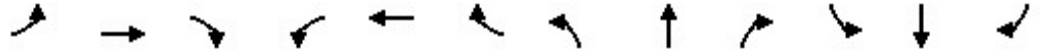
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

4: Rainbow & 50th St
 HCM 6th Signalized Intersection Summary

AM_Future 20

Item B.Section II, Item

09/12/2023



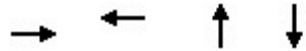
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	41	9	66	10	11	8	46	571	8	5	530	50
Future Volume (veh/h)	41	9	66	10	11	8	46	571	8	5	530	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	10	72	11	12	9	50	621	9	5	576	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	13	96	16	18	13	137	1520	22	61	1538	143
Arrive On Green	0.10	0.10	0.10	0.03	0.03	0.03	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	592	132	947	602	657	493	148	3171	45	6	3207	298
Grp Volume(v), veh/h	127	0	0	32	0	0	341	0	339	337	0	298
Grp Sat Flow(s),veh/h/ln	1670	0	0	1752	0	0	1670	0	1694	1863	0	1648
Q Serve(g_s), s	4.6	0.0	0.0	1.1	0.0	0.0	0.0	0.0	8.1	0.0	0.0	7.2
Cycle Q Clear(g_c), s	4.6	0.0	0.0	1.1	0.0	0.0	7.3	0.0	8.1	7.1	0.0	7.2
Prop In Lane	0.35		0.57	0.34		0.28	0.15		0.03	0.01		0.18
Lane Grp Cap(c), veh/h	170	0	0	48	0	0	867	0	812	951	0	790
V/C Ratio(X)	0.75	0.00	0.00	0.67	0.00	0.00	0.39	0.00	0.42	0.35	0.00	0.38
Avail Cap(c_a), veh/h	534	0	0	560	0	0	867	0	812	951	0	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	0.0	30.2	0.0	0.0	10.4	0.0	10.6	10.3	0.0	10.4
Incr Delay (d2), s/veh	6.4	0.0	0.0	15.0	0.0	0.0	1.3	0.0	1.6	1.0	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.0	0.7	0.0	0.0	2.8	0.0	2.9	2.7	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	0.0	0.0	45.2	0.0	0.0	11.7	0.0	12.2	11.4	0.0	11.7
LnGrp LOS	C	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		127			32			680				635
Approach Delay, s/veh		33.7			45.2			11.9				11.5
Approach LOS		C			D			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.5		14.4		38.5		9.7				
Change Period (Y+Rc), s		8.5		8.0		8.5		8.0				
Max Green Setting (Gmax), s		30.0		20.0		30.0		20.0				
Max Q Clear Time (g_c+I1), s		10.1		6.6		9.2		3.1				
Green Ext Time (p_c), s		4.2		0.5		3.8		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				14.4								
HCM 6th LOS				B								

4: Rainbow & 50th St
Queues

AM_Future 20

Item B.Section II, Item

09/10/2023



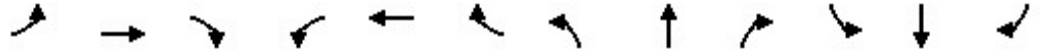
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	127	32	684	648
v/c Ratio	0.48	0.17	0.39	0.33
Control Delay	32.9	32.0	13.2	12.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.9	32.0	13.2	12.4
Queue Length 50th (ft)	40	10	65	59
Queue Length 95th (ft)	105	40	192	174
Internal Link Dist (ft)	236	436	184	566
Turn Bay Length (ft)				
Base Capacity (vph)	525	547	1766	1950
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.06	0.39	0.33
Intersection Summary				

HCM 6th Signalized Intersection Summary
4: Rainbow & 50th St

PM_Future 20

Item B.Section II, Item

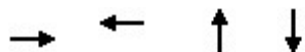
09/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	36	16	22	24	41	10	26	490	10	9	992	58
Future Volume (veh/h)	36	16	22	24	41	10	26	490	10	9	992	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	17	24	26	45	11	28	533	11	10	1078	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	52	23	32	35	61	15	97	1528	31	63	1604	93
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	846	369	520	570	987	241	69	3167	65	9	3326	193
Grp Volume(v), veh/h	80	0	0	82	0	0	286	0	286	607	0	544
Grp Sat Flow(s),veh/h/ln	1734	0	0	1798	0	0	1611	0	1690	1860	0	1667
Q Serve(g_s), s	2.8	0.0	0.0	2.8	0.0	0.0	0.3	0.0	6.5	0.0	0.0	15.6
Cycle Q Clear(g_c), s	2.8	0.0	0.0	2.8	0.0	0.0	15.8	0.0	6.5	15.5	0.0	15.6
Prop In Lane	0.49		0.30	0.32		0.13	0.10		0.04	0.02		0.12
Lane Grp Cap(c), veh/h	107	0	0	111	0	0	841	0	815	956	0	804
V/C Ratio(X)	0.75	0.00	0.00	0.74	0.00	0.00	0.34	0.00	0.35	0.63	0.00	0.68
Avail Cap(c_a), veh/h	558	0	0	578	0	0	841	0	815	956	0	804
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	0.0	28.7	0.0	0.0	9.8	0.0	10.0	12.3	0.0	12.4
Incr Delay (d2), s/veh	10.0	0.0	0.0	9.1	0.0	0.0	1.1	0.0	1.2	3.2	0.0	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.0	1.4	0.0	0.0	2.2	0.0	2.3	6.1	0.0	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	0.0	0.0	37.7	0.0	0.0	10.9	0.0	11.2	15.5	0.0	16.9
LnGrp LOS	D	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		80			82			572				1151
Approach Delay, s/veh		38.7			37.7			11.1				16.2
Approach LOS		D			D			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.5		11.8		38.5		11.9				
Change Period (Y+Rc), s		8.5		8.0		8.5		8.0				
Max Green Setting (Gmax), s		30.0		20.0		30.0		20.0				
Max Q Clear Time (g_c+I1), s		17.8		4.8		17.6		4.8				
Green Ext Time (p_c), s		2.8		0.3		5.9		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				16.5								
HCM 6th LOS				B								

Queues


4: Rainbow & 50th St



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	80	82	588	1161
v/c Ratio	0.37	0.37	0.38	0.66
Control Delay	34.8	34.7	15.7	20.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.8	34.7	15.7	20.8
Queue Length 50th (ft)	33	34	95	232
Queue Length 95th (ft)	75	76	163	#410
Internal Link Dist (ft)	236	436	184	566
Turn Bay Length (ft)				
Base Capacity (vph)	509	526	1559	1757
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.16	0.16	0.38	0.66

Intersection Summary


95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	11	0	12	0	540	12	5	497	0
Future Vol, veh/h	0	0	0	11	0	12	0	540	12	5	497	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	12	0	13	0	587	13	5	540	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	844	-	270	874	1144	300	540	0	0	600	0	0
Stage 1	550	-	-	594	594	-	-	-	-	-	-	-
Stage 2	294	-	-	280	550	-	-	-	-	-	-	-
Critical Hdwy	7.54	-	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	-	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	256	0	728	244	198	696	1025	-	-	973	-	-
Stage 1	487	0	-	458	491	-	-	-	-	-	-	-
Stage 2	690	0	-	703	514	-	-	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	250	-	728	243	197	696	1025	-	-	973	-	-
Mov Cap-2 Maneuver	250	-	-	243	197	-	-	-	-	-	-	-
Stage 1	487	-	-	458	491	-	-	-	-	-	-	-
Stage 2	677	-	-	698	510	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		15.5		0		0.1	
HCM LOS	A		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1025	-	-	-	-	368	973	-	-
HCM Lane V/C Ratio	-	-	-	-	-	0.068	0.006	-	-
HCM Control Delay (s)	0	-	-	0	0	15.5	8.7	0	-
HCM Lane LOS	A	-	-	A	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2	0	-	-


Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	21	0	13	0	328	8	4	536	0
Future Vol, veh/h	0	0	0	21	0	13	0	328	8	4	536	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	23	0	14	0	357	9	4	583	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	770	-	292	662	953	183	583	0	0	366	0	0
Stage 1	591	-	-	362	362	-	-	-	-	-	-	-
Stage 2	179	-	-	300	591	-	-	-	-	-	-	-
Critical Hdwy	7.54	-	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	-	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	290	0	704	347	258	828	987	-	-	1189	-	-
Stage 1	460	0	-	629	624	-	-	-	-	-	-	-
Stage 2	805	0	-	684	493	-	-	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	284	-	704	346	257	828	987	-	-	1189	-	-
Mov Cap-2 Maneuver	284	-	-	346	257	-	-	-	-	-	-	-
Stage 1	460	-	-	629	624	-	-	-	-	-	-	-
Stage 2	791	-	-	681	491	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		13.8		0		0.1	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	987	-	-	-	-	445	1189	-	-
HCM Lane V/C Ratio	-	-	-	-	-	0.083	0.004	-	-
HCM Control Delay (s)	0	-	-	0	0	13.8	8	0	-
HCM Lane LOS	A	-	-	A	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3	0	-	-

HCM 6th TWSC
13: Rainbow & Drive/50th Ter

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	27	0	27	0	370	8	5	908	0
Future Vol, veh/h	0	0	0	27	0	27	0	370	8	5	908	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	29	0	29	0	402	9	5	987	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1198	-	494	911	1404	206	987	0	0	411	0	0
Stage 1	997	-	-	407	407	-	-	-	-	-	-	-
Stage 2	201	-	-	504	997	-	-	-	-	-	-	-
Critical Hdwy	7.54	-	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	-	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	141	0	521	229	138	800	696	-	-	1144	-	-
Stage 1	262	0	-	592	596	-	-	-	-	-	-	-
Stage 2	782	0	-	518	320	-	-	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	135	-	521	227	137	800	696	-	-	1144	-	-
Mov Cap-2 Maneuver	135	-	-	227	137	-	-	-	-	-	-	-
Stage 1	262	-	-	592	596	-	-	-	-	-	-	-
Stage 2	753	-	-	513	317	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		17.2		0		0	
HCM LOS	A		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	696	-	-	-	-	354	1144	-	-
HCM Lane V/C Ratio	-	-	-	-	-	0.166	0.005	-	-
HCM Control Delay (s)	0	-	-	0	0	17.2	8.2	0	-
HCM Lane LOS	A	-	-	A	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0.6	0	-	-

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	7	11	0	12	25	544	12	5	497	57
Future Vol, veh/h	10	0	7	11	0	12	25	544	12	5	497	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	8	12	0	13	27	591	13	5	540	62

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	931	-	301	932	1264	302	602	0	0	604	0	0
Stage 1	581	-	-	652	652	-	-	-	-	-	-	-
Stage 2	350	-	-	280	612	-	-	-	-	-	-	-
Critical Hdwy	7.54	-	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	-	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	222	0	695	221	168	694	971	-	-	970	-	-
Stage 1	467	0	-	423	462	-	-	-	-	-	-	-
Stage 2	639	0	-	703	482	-	-	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	210	-	695	210	160	694	971	-	-	970	-	-
Mov Cap-2 Maneuver	210	-	-	210	160	-	-	-	-	-	-	-
Stage 1	447	-	-	405	443	-	-	-	-	-	-	-
Stage 2	601	-	-	690	478	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	17.8		16.8		0.6			0.1		
HCM LOS	C		C							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	971	-	-	210	695	330	970	-	-
HCM Lane V/C Ratio	0.028	-	-	0.052	0.011	0.076	0.006	-	-
HCM Control Delay (s)	8.8	0.2	-	23.1	10.2	16.8	8.7	0	-
HCM Lane LOS	A	A	-	C	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0	0.2	0	-	-

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	0	30	27	0	27	18	389	8	5	908	40
Future Vol, veh/h	45	0	30	27	0	27	18	389	8	5	908	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	0	33	29	0	29	20	423	9	5	987	43

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1271	-	515	972	1508	216	1030	0	0	432	0	0
Stage 1	1019	-	-	468	468	-	-	-	-	-	-	-
Stage 2	252	-	-	504	1040	-	-	-	-	-	-	-
Critical Hdwy	7.54	-	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	-	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	125	0	505	207	120	789	670	-	-	1124	-	-
Stage 1	254	0	-	545	560	-	-	-	-	-	-	-
Stage 2	730	0	-	518	306	-	-	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	116	-	505	186	114	789	670	-	-	1124	-	-
Mov Cap-2 Maneuver	116	-	-	186	114	-	-	-	-	-	-	-
Stage 1	244	-	-	524	538	-	-	-	-	-	-	-
Stage 2	675	-	-	479	303	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	39.2		19.8		0.6		0	
HCM LOS	E		C					


Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	670	-	-	116	505	301	1124	-	-
HCM Lane V/C Ratio	0.029	-	-	0.422	0.065	0.195	0.005	-	-
HCM Control Delay (s)	10.5	0.2	-	57	12.6	19.8	8.2	0	-
HCM Lane LOS	B	A	-	F	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.8	0.2	0.7	0	-	-

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	7	11	0	12	25	599	12	5	547	57
Future Vol, veh/h	10	0	7	11	0	12	25	599	12	5	547	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	8	12	0	13	27	651	13	5	595	62

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1016	-	329	1020	1379	332	657	0	0	664	0	0
Stage 1	636	-	-	712	712	-	-	-	-	-	-	-
Stage 2	380	-	-	308	667	-	-	-	-	-	-	-
Critical Hdwy	7.54	-	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	-	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	192	0	667	191	143	664	926	-	-	921	-	-
Stage 1	433	0	-	389	434	-	-	-	-	-	-	-
Stage 2	614	0	-	677	455	-	-	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	180	-	667	181	135	664	926	-	-	921	-	-
Mov Cap-2 Maneuver	180	-	-	181	135	-	-	-	-	-	-	-
Stage 1	413	-	-	371	414	-	-	-	-	-	-	-
Stage 2	574	-	-	663	451	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	19.8		18.5		0.5			0.1		
HCM LOS	C		C							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	926	-	-	180	667	292	921	-	-
HCM Lane V/C Ratio	0.029	-	-	0.06	0.011	0.086	0.006	-	-
HCM Control Delay (s)	9	0.2	-	26.3	10.5	18.5	8.9	0	-
HCM Lane LOS	A	A	-	D	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0	0.3	0	-	-

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	0	30	27	0	27	18	428	8	5	999	40
Future Vol, veh/h	45	0	30	27	0	27	18	428	8	5	999	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	0	33	29	0	29	20	465	9	5	1086	43

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1391	-	565	1063	1649	237	1129	0	0	474	0	0
Stage 1	1118	-	-	510	510	-	-	-	-	-	-	-
Stage 2	273	-	-	553	1139	-	-	-	-	-	-	-
Critical Hdwy	7.54	-	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	-	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	-	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	102	0	468	177	98	764	615	-	-	1084	-	-
Stage 1	221	0	-	514	536	-	-	-	-	-	-	-
Stage 2	710	0	-	485	274	-	-	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	94	-	468	158	93	764	615	-	-	1084	-	-
Mov Cap-2 Maneuver	94	-	-	158	93	-	-	-	-	-	-	-
Stage 1	211	-	-	491	512	-	-	-	-	-	-	-
Stage 2	653	-	-	445	270	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	52.7		22.7		0.6		0.1	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	615	-	-	94	468	262	1084	-	-
HCM Lane V/C Ratio	0.032	-	-	0.52	0.07	0.224	0.005	-	-
HCM Control Delay (s)	11	0.2	-	79	13.3	22.7	8.3	0.1	-
HCM Lane LOS	B	A	-	F	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.3	0.2	0.8	0	-	-

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	6	0	0	0	5	555	0	2	501	7
Future Vol, veh/h	6	0	6	0	0	0	5	555	0	2	501	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	7	0	0	0	5	603	0	2	545	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	865	1166	277	890	1170	302	553	0	0	603	0	0
Stage 1	553	553	-	613	613	-	-	-	-	-	-	-
Stage 2	312	613	-	277	557	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	248	193	720	237	192	694	1013	-	-	971	-	-
Stage 1	485	513	-	446	481	-	-	-	-	-	-	-
Stage 2	673	481	-	706	510	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	246	191	720	233	190	694	1013	-	-	971	-	-
Mov Cap-2 Maneuver	246	191	-	233	190	-	-	-	-	-	-	-
Stage 1	482	511	-	443	478	-	-	-	-	-	-	-
Stage 2	668	478	-	698	508	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.2	0	0.1	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1013	-	-	367	-	971	-	-
HCM Lane V/C Ratio	0.005	-	-	0.036	-	0.002	-	-
HCM Control Delay (s)	8.6	0	-	15.2	0	8.7	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	-	0	-	-

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	3	0	0	0	2	331	0	0	538	11
Future Vol, veh/h	2	0	3	0	0	0	2	331	0	0	538	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	3	0	0	0	2	360	0	0	585	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	775	955	299	657	961	180	597	0	0	360	0	0
Stage 1	591	591	-	364	364	-	-	-	-	-	-	-
Stage 2	184	364	-	293	597	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	288	257	697	350	255	832	976	-	-	1195	-	-
Stage 1	460	493	-	627	622	-	-	-	-	-	-	-
Stage 2	800	622	-	691	490	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	287	256	697	348	254	832	976	-	-	1195	-	-
Mov Cap-2 Maneuver	287	256	-	348	254	-	-	-	-	-	-	-
Stage 1	459	493	-	625	620	-	-	-	-	-	-	-
Stage 2	798	620	-	688	490	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	0	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	976	-	-	444	-	1195	-
HCM Lane V/C Ratio	0.002	-	-	0.012	-	-	-
HCM Control Delay (s)	8.7	0	-	13.2	0	0	-
HCM Lane LOS	A	A	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	0	2	0	0	0	1	373	0	8	890	8
Future Vol, veh/h	3	0	2	0	0	0	1	373	0	8	890	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	2	0	0	0	1	405	0	9	967	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1195	1397	488	909	1401	203	976	0	0	405	0	0
Stage 1	990	990	-	407	407	-	-	-	-	-	-	-
Stage 2	205	407	-	502	994	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	142	140	526	230	139	804	703	-	-	1150	-	-
Stage 1	264	323	-	592	596	-	-	-	-	-	-	-
Stage 2	778	596	-	520	321	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	140	137	526	226	136	804	703	-	-	1150	-	-
Mov Cap-2 Maneuver	140	137	-	226	136	-	-	-	-	-	-	-
Stage 1	263	318	-	591	595	-	-	-	-	-	-	-
Stage 2	776	595	-	509	316	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.7	0	0	0.2
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	703	-	-	198	-	1150	-	-
HCM Lane V/C Ratio	0.002	-	-	0.027	-	0.008	-	-
HCM Control Delay (s)	10.1	0	-	23.7	0	8.2	0.1	-
HCM Lane LOS	B	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	-	0	-	-

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	0	15	0	0	0	39	580	0	2	508	7
Future Vol, veh/h	10	0	15	0	0	0	39	580	0	2	508	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	16	0	0	0	42	630	0	2	552	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	959	1274	280	994	1278	315	560	0	0	630	0	0
Stage 1	560	560	-	714	714	-	-	-	-	-	-	-
Stage 2	399	714	-	280	564	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	211	166	717	199	165	681	1007	-	-	948	-	-
Stage 1	480	509	-	388	433	-	-	-	-	-	-	-
Stage 2	598	433	-	703	507	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	200	155	717	184	154	681	1007	-	-	948	-	-
Mov Cap-2 Maneuver	200	155	-	184	154	-	-	-	-	-	-	-
Stage 1	449	507	-	363	405	-	-	-	-	-	-	-
Stage 2	560	405	-	685	505	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16		0		0.7		0	
HCM LOS	C		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	353	-	948	-	-
HCM Lane V/C Ratio	0.042	-	-	0.077	-	0.002	-	-
HCM Control Delay (s)	8.7	0.2	-	16	0	8.8	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	0	-	-

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	0	49	0	0	0	27	391	0	8	920	8
Future Vol, veh/h	27	0	49	0	0	0	27	391	0	8	920	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	0	53	0	0	0	29	425	0	9	1000	9

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1294	1506	505	1001	1510	213	1009	0	0	425	0	0
Stage 1	1023	1023	-	483	483	-	-	-	-	-	-	-
Stage 2	271	483	-	518	1027	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	120	120	512	197	119	792	683	-	-	1131	-	-
Stage 1	252	311	-	534	551	-	-	-	-	-	-	-
Stage 2	712	551	-	509	310	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	113	111	512	167	110	792	683	-	-	1131	-	-
Mov Cap-2 Maneuver	113	111	-	167	110	-	-	-	-	-	-	-
Stage 1	238	305	-	504	520	-	-	-	-	-	-	-
Stage 2	672	520	-	448	304	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.7	0	1	0.2
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	683	-	-	227	-	1131	-
HCM Lane V/C Ratio	0.043	-	-	0.364	-	0.008	-
HCM Control Delay (s)	10.5	0.3	-	29.7	0	8.2	0.1
HCM Lane LOS	B	A	-	D	A	A	A
HCM 95th %tile Q(veh)	0.1	-	-	1.6	-	0	-

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	0	15	0	0	0	39	638	0	2	559	7
Future Vol, veh/h	10	0	15	0	0	0	39	638	0	2	559	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	16	0	0	0	42	693	0	2	608	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1047	1393	308	1085	1397	347	616	0	0	693	0	0
Stage 1	616	616	-	777	777	-	-	-	-	-	-	-
Stage 2	431	777	-	308	620	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	182	141	688	171	140	649	960	-	-	898	-	-
Stage 1	445	480	-	356	405	-	-	-	-	-	-	-
Stage 2	573	405	-	677	478	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	172	131	688	157	130	649	960	-	-	898	-	-
Mov Cap-2 Maneuver	172	131	-	157	130	-	-	-	-	-	-	-
Stage 1	413	479	-	331	376	-	-	-	-	-	-	-
Stage 2	532	376	-	659	477	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.6	0	0.8	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	960	-	-	313	-	898	-
HCM Lane V/C Ratio	0.044	-	-	0.087	-	0.002	-
HCM Control Delay (s)	8.9	0.3	-	17.6	0	9	0
HCM Lane LOS	A	A	-	C	A	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.3	-	0	-

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	0	49	0	0	0	27	430	0	8	1012	8
Future Vol, veh/h	27	0	49	0	0	0	27	430	0	8	1012	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	0	53	0	0	0	29	467	0	9	1100	9

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1415	1648	555	1093	1652	234	1109	0	0	467	0	0
Stage 1	1123	1123	-	525	525	-	-	-	-	-	-	-
Stage 2	292	525	-	568	1127	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	97	98	475	169	98	768	625	-	-	1091	-	-
Stage 1	219	279	-	504	528	-	-	-	-	-	-	-
Stage 2	692	528	-	475	278	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	91	90	475	140	90	768	625	-	-	1091	-	-
Mov Cap-2 Maneuver	91	90	-	140	90	-	-	-	-	-	-	-
Stage 1	205	273	-	472	495	-	-	-	-	-	-	-
Stage 2	648	495	-	412	272	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.8	0	0.9	0.2
HCM LOS	E	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	625	-	-	190	-	1091	-	-
HCM Lane V/C Ratio	0.047	-	-	0.435	-	0.008	-	-
HCM Control Delay (s)	11	0.3	-	37.8	0	8.3	0.1	-
HCM Lane LOS	B	A	-	E	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2	-	0	-	-

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	5	17	26	20	8	1
Future Vol, veh/h	5	17	26	20	8	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	18	28	22	9	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	50	0	-	0	67 39
Stage 1	-	-	-	-	39 -
Stage 2	-	-	-	-	28 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1557	-	-	-	938 1033
Stage 1	-	-	-	-	983 -
Stage 2	-	-	-	-	995 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1557	-	-	-	935 1033
Mov Cap-2 Maneuver	-	-	-	-	935 -
Stage 1	-	-	-	-	980 -
Stage 2	-	-	-	-	995 -

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1557	-	-	-	945
HCM Lane V/C Ratio	0.003	-	-	-	0.01
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	4.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	4	27	9	14	49	7
Future Vol, veh/h	4	27	9	14	49	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	29	10	15	53	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	25	0	-	0	55 18
Stage 1	-	-	-	-	18 -
Stage 2	-	-	-	-	37 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1589	-	-	-	953 1061
Stage 1	-	-	-	-	1005 -
Stage 2	-	-	-	-	985 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1589	-	-	-	950 1061
Mov Cap-2 Maneuver	-	-	-	-	950 -
Stage 1	-	-	-	-	1002 -
Stage 2	-	-	-	-	985 -

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1589	-	-	-	963
HCM Lane V/C Ratio	0.003	-	-	-	0.063
HCM Control Delay (s)	7.3	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection

Int Delay, s/veh 0.7

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	10	9	3	1	1
Future Vol, veh/h	0	10	9	3	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	10	3	1	1

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	13	0	-	0	23	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	11	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1606	-	-	-	993	1069
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	1012	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1606	-	-	-	993	1069
Mov Cap-2 Maneuver	-	-	-	-	993	-
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	1012	-

Approach EB WB SB

HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1606	-	-	-	1030
HCM Lane V/C Ratio	-	-	-	-	0.002
HCM Control Delay (s)	0	-	-	-	8.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection

Int Delay, s/veh 0

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	6	9	0	0	0
Future Vol, veh/h	0	6	9	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	10	0	0	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	10	0	-	0	17	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	7	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1610	-	-	-	1001	1071
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	1016	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1610	-	-	-	1001	1071
Mov Cap-2 Maneuver	-	-	-	-	1001	-
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	1016	-

Approach EB WB SB

HCM Control Delay, s 0 0 0
HCM LOS A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1610	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	3	17	10	17	5	1
Future Vol, veh/h	3	17	10	17	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	18	11	18	5	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	29	0	-	0	44 20
Stage 1	-	-	-	-	20 -
Stage 2	-	-	-	-	24 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1584	-	-	-	967 1058
Stage 1	-	-	-	-	1003 -
Stage 2	-	-	-	-	999 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1584	-	-	-	965 1058
Mov Cap-2 Maneuver	-	-	-	-	965 -
Stage 1	-	-	-	-	1001 -
Stage 2	-	-	-	-	999 -

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1584	-	-	-	979
HCM Lane V/C Ratio	0.002	-	-	-	0.007
HCM Control Delay (s)	7.3	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	2	10	16	12	22	4
Future Vol, veh/h	2	10	16	12	22	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	11	17	13	24	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	30	0	-	0	39 24
Stage 1	-	-	-	-	24 -
Stage 2	-	-	-	-	15 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1583	-	-	-	973 1052
Stage 1	-	-	-	-	999 -
Stage 2	-	-	-	-	1008 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1583	-	-	-	972 1052
Mov Cap-2 Maneuver	-	-	-	-	972 -
Stage 1	-	-	-	-	998 -
Stage 2	-	-	-	-	1008 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1583	-	-	-	984
HCM Lane V/C Ratio	0.001	-	-	-	0.029
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

David & Donna Buck

2332 W 51st Street
Westwood, KS 66205

Exhibit C

Sept. 10, 2023

To: Westwood's Planning Commission

Ref: Suggested CONDITIONS of Approval for your consideration

Although our preference would be a denial of the request for Re-Zoning, what follows are a few suggestions for conditional approval:

1. Reduce the number of stories allowed to a maximum of 2 at the perimeter and 3 on the interior of the site. Maximum building height of 48' (same as in COD-3 of the existing zoning ordinance.)
2. Reduce Maximum lot coverage to 35% (from current 47.8% indicated on Karbank drawing C1.0 to closer to COD-3), i.e., increase amount of "private" green space.
3. Reiterate that no Multi Family housing is allowed.
4. And our last condition is arguably very subjective. But the building's appearance should be much more in character with the surrounding residential neighborhood. Hard to define that but the ordinance tries to address it in section 7.1.2 Building Design and further references the Comp Plan. Again, very difficult to define or describe in words.

That's not an all-inclusive list. Just our attempt at asking for some measurable concession to the enormous, presented project. And obviously the Planning Commission and/or your attorney may want to change some of the wording to suit.

Thanks, Dave & Donna

From: [Leslie Herring](#)
To: [Stephen Platt](#)
Cc: kevin@breerlawfirm.com
Bcc: [Info](#)
Subject: RE: Request to amend September 11 Westwood Planning Commission Meeting Notes
Date: Monday, October 9, 2023 2:16:00 PM
Attachments: [image001.png](#)

Steve:

Your email has been received. As I'm sure you can understand, the minutes don't reflect the full extent and language used by public commenters nor do they reflect every point made; these are a very short summary to capture concisely what main points are shared and serve as a historical record that can be understood decades from now. I appreciate that you would like a fuller account of your comments included in the public record. What I am willing to do is attach a copy of this email to the minutes and ask that the Planning Commission consider approving the minutes tonight with this additional attachment.

I hope this resolution will be acceptable to you.

Kind regards,

Leslie



Leslie Herring
 City Administrator
 City of Westwood, KS
Phone: 913-942-2128
Mobile: 913-406-7164

From: Stephen Platt <westport.platt@gmail.com>
Sent: Sunday, October 8, 2023 8:14 PM
To: Info <info@westwoodks.org>; kevin@breerlawfirm.com
Subject: Request to amend September 11 Westwood Planning Commission Meeting Notes

Some people who received this message don't often get email from westport.platt@gmail.com. [Learn why this is important](#)

Dear Gentlemen and Ladies,

The meeting notes read as follow –

Steven Platt, 4910 Glendale Rd., Westwood Hills, addressed the Planning Commission. Platt expressed a preference for single family residential homes on the school property and that Karbank focus on redeveloping existing commercial buildings and not this site.

Although accurate, the minutes are not complete. I would like the meeting notes revised to reflect my comments for these additional points I voiced.

- 1) The city is about to give away \$1- \$2 million dollars based on the values presented in the

2022 City Facilities Assessment and feasibility Analysis.

- 2) There are significant risks that this project may not be developed as an office park and return less revenue than anticipated. At worst Westwood could end up with a project like Mission Gateway.
- 3) Leaving the zoning as R-1 will generate tax revenue going forward but less. Leaving the zoning as it is has lower risk.

My a complete reference my comments from which I read are included below-

My name is Stephen Platt. I live at 4910 Glendale which is within 1000 feet of the proposed rezoning. I also own some commercial property and am an accountant.

I have personally spoken with a number of residents, some say they like the Karbank proposal because it raises revenue. Like it or not, the city's own tax revenues have become a key part of Karbank's proposal.

The feasibility study in my opinion was stacked to get different outcomes from those in the Master Plans and the conclusions in the Urban Land Institute study.

The feasibility study values commercial parcels suitable for sale or development at \$30-\$35 per square foot. By making a zoning change from residential to commercial, more than 4 acres of land ... including the Joe D. Dennis park and church... would be valued at over 6 million to 6.5 million dollars. Considering Karbank is paying approximately \$4 million dollars for the property and demolition, it appears the Westwood City Government is about to give away \$1 to 2 million dollars.

Second point – How much office space do we need? Karbank has 100,000 square feet of office space for lease in Olathe and an acre of vacant commercial industrial land advertised for sale and build to suit in Merriam. On a local level closer to home, First Washington realty has 128,000 square feet of empty space at the old Macy's store in Prairie Village. In Westwood, there is currently empty space already zoned commercial at 47th and Rainbow

After a developer has ownership and rights to the property there is no recourse to claw back the property. This proposal is a big ask and the city has been let down by developments in the past. Yes, if this is office space it will return \$50-60,000 in additional property tax a year for the city. However, if the development changes to mixed use, office and retail get assessed at 25%, but the residential apartment units get assessed at only 11.5% based on income valuation. That's a big drop. Worst case is the development gets resold to a non profit and the city collects no tax.

There are promises but no guarantees, The city could end up with another Mission Gateway project.

Third. The city does not have to buy the school. If residential homes are built as zoned, it could add \$20 to \$25,000 of city tax revenue. In other words, The school property would remain zoned residential if the planning commission does nothing. These lots are easy to sell.

Residential revenue is lower but more secure and more in line with the long-standing vision of the community. The residential homes don't have TIF's and **do** pay sales taxes on building materials.

It is unnecessary to try to frighten Westwood residents over large property tax increases if this proposal is not pushed through. And let's avoid the spin that the city is tripling the size of the park when there is already 3 acres of green space along Rainbow. Many would like to see the green space improved, but by not changing the rezoning we do not have to start over.

The cart is before the horse. With all due respect for those behind this proposal, I suggest focusing on and developing the currently zoned commercial property first and solicit Mr. Karbank in that pursuit. Secondly, get a loan or roll over the debt which is possible. Buy the city time to consider less controversial plans.

The planning commission needs to leave the zoning alone and vote NO.

Thank you, Stephen Platt

Leslie Herring

From: Nikki DuPont <ndupontkc@gmail.com>
Sent: Monday, October 9, 2023 3:17 PM
To: Info
Subject: Planning Commission meeting edit request

Some people who received this message don't often get email from ndupontkc@gmail.com. [Learn why this is important](#)

Greetings, Planning Commissioners!

You already know where we and many others in the community stand on the Karbank proposal. In light of this, and the fact that you have already passed the proposal, I will spare you the rehash. Instead, I'd like to inquire about the notes of record within the minutes from the last two Planning Commission meetings.

In August, twenty (20) people spoke out publicly on this issue. Though it is a challenge to paraphrase anyone in this circumstance, overall, the city made a good effort to capsulize what was said on both sides of this proposal. However, there is a stark discrepancy in quickly and easily recognizing those in favor versus those against.

The three (3) citizens who spoke in favor of the proposal are noted as such in the August minutes; they are recognized, in print, approving of the proposal. Yet not even one of the people who spoke out against the proposal are officially recognized in the minutes as being against the proposal. By looking at the minutes, at least twelve (12) appear to be against the proposal; five (5) speakers are unclear from the notes taken.

In September, twenty-four (24) people spoke publicly on this issue. This time there were two individuals where it was tough to decipher their opinion through the minutes. Three (3) people spoke in favor of the proposal, with each recognized as such. But eighteen (18) of the nineteen (19) who spoke out in opposition of the proposal were not recognized officially as being opposed.

Anyone with a vested interest will probably take the time to thoroughly comb through these minutes and make note of the overwhelming number of residents opposed to the Karbank proposal. Those with a *passing* interest, the ones that would quickly scan over the minutes (and we realize, sadly, that is the majority of the citizenry), would not easily see the "quick take" that the numbers speaking on this issue leaned heavily against this proposal.

Our hope is that these omissions were mere oversights by the Recording Secretary. The cynics in us think this makes the City of Westwood appear to have a bias toward the council's wishes, instead of recording a true consideration of desires of the community.

We ask that one of you attempt to have this corrected before voting to approve the minutes from last month in tonight's meeting.

We would also ask that you **table all Karbank old and new business** until the City Council votes. Take some time to attempt to look at the other side of this proposal and the irreversible harm that moving forward could cause.

Thank you for your continued service to the community.

Nikki & Dennis DuPont

WESTWOOD PLANNING COMMISSION

Staff Report

Meeting Date: October 9, 2023

Staff Contact: Leslie Herring, City Administrator

FP-2023-01 – Consider application of Karbank Holdings, LLC on behalf of owner City of Westwood to replat property at 5000 and 5050 Rainbow Blvd.

FP-2023-02 – Consider application of Karbank Holdings, LLC on behalf of owner Shawnee Mission School District to replat property at 2511 W. 50th St., et. al.

OWNER OF RECORD:

- 5000 Rainbow Blvd.: City of Westwood, Kansas
- 5050 Rainbow Blvd.: City of Westwood, Kansas
- 2511 W. 50th St.: Unified School District No. 512 (Shawnee Mission School District)

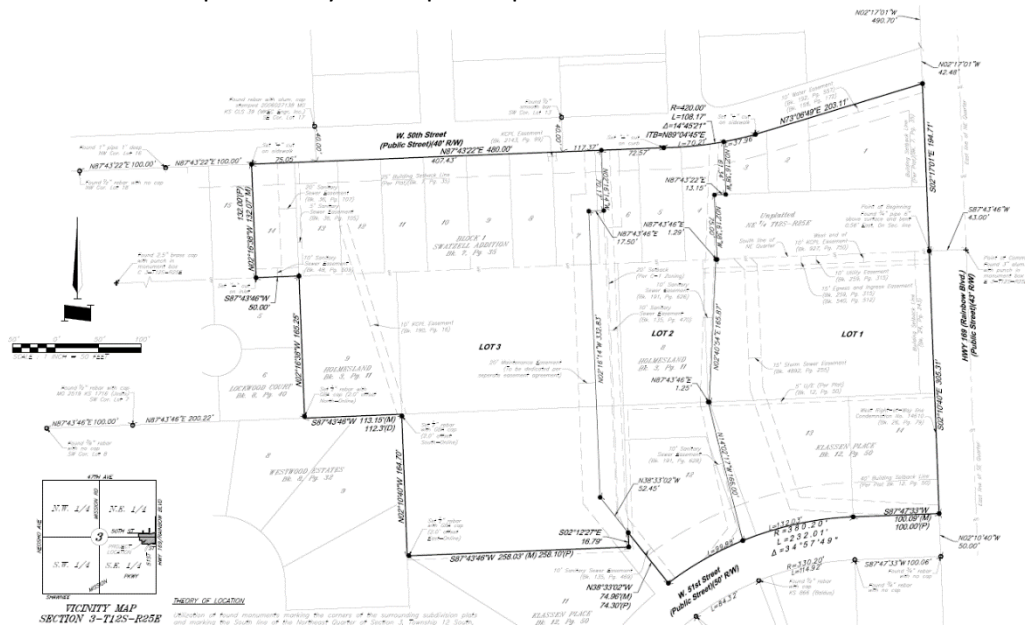
APPLICANT: Karbank Holdings, LLC, agent for property owners City of Westwood, Kansas and Unified School District No. 512, jointly.

LOCATION: The property is located on the southwest corner of W. 50th St. and Rainbow Blvd.

EXISTING ZONING: The property is currently zoned R-1 (D): single-family residential.

REQUESTED ACTION: Approval of a final plat to consolidate and divide portions of the subject site amongst parties currently under contract to purchase portions of the subject site and to establishing property intended for public use, including easements.

EXISTING CONDITIONS: The subject property parcels are a mixture of both platted and unplatted lots. Lots 1 and 2 (as proposed and illustrated on the plat below) of the subject property are currently the subject of an application for rezoning from R-1 to PD with an underlying C-1 zoning designation and review of the associated preliminary development plan.



REVIEW AND APPROVAL PROCESS:

Section 1.5. of the Westwood Zoning Ordinance specifies the procedures and requirements for the consideration of a final plat, which includes submission to the Planning Commission for review and approval and then submission to the Governing Body for acceptance/approval. Following approval by both the Planning Commission and Governing Body, the plat shall be recorded with the County Register of Deeds.

The submitted final plat creates three (3) lots on the subject property. Lot 1 is currently entirely owned by the City of Westwood and Lots 2 and 3 are currently entirely owned by USD 512. The concurrently-running rezoning, preliminary development plan, and final development plan applications and the existing purchase agreements dated June 8, 2023 by and between the three parties – The City of Westwood, USD 512, and Karbank Holdings, LLC – contemplate that Karbank Holdings will acquire Lots 1 and 2 upon closing of the sale, scheduled for January 4, 2024 and subject to land entitlements and other conditions as identified in the purchase agreements and a development agreement still under negotiation by the City of Westwood and Karbank Holdings, LLC.

The City of Westwood and Karbank Holdings, LLC – the two sole resulting property owners within the proposed new addition – are currently anticipating that, at a later date, certain existing utility easements will be vacated due to either relocation of utilities or where easements are no longer necessary and so an eventual future replat of the area is expected.

This replat is necessary at this time to allow for the purchase/sale of the properties to close and for the resulting property owners to secure title to their respective properties.

STAFF ANALYSIS: The Planning Commission originally reviewed the replat at its August 7, 2023 meeting and, at that time, staff review of the application submittal concluded that the following items were to be resolved prior to approval of the plat:

- a. Rationale for offset property line at southern portion of Lots 2 and 3;
- b. Clarity on the plat as to which existing easements are to be vacated; and
- c. Coordination of lot lines on plat with those shown on the preliminary development plan.

Staff concludes that these items have been resolved.

In August, staff further noted that a complementing Private Detention Basin/Stormwater Quality Best Management Practice Maintenance Agreement and Easement setting out rights and responsibilities related to the dedicated stormwater detention facility, was to be agreed upon in form by Karbank Holdings, LLC and the City, with the expectation that such Agreement will be recorded with the plat on the property.

This item has also been resolved.

STAFF RECOMMENDATION: Staff recommends that the Planning Commission allow this Final Plat to track concurrently with the rezoning and preliminary development plan applications so that all applications – which are inextricably linked – will complement one another and be updated and reviewed simultaneously.

Suggested Motion

I move to approve the final plat for property at 5000 and 5050 Rainbow Blvd. and 2511 W. 50th St., et. al., as submitted, to direct the Planning Commission's approval be affixed thereto, and to forward said plat to the Governing Body for the dedication of land for public purposes.

Final Plat HENRY'S ADDITION

(A replat of all of Lots 12, 13 and 14, Block 1, KLASSEN PLACE; all of Lots 1 through 14, Block 1, SWATZELL ADDITION; part of Lots 8 and 9, HOLMESLAND; and part of the Northeast Quarter of Section 3, Township 12 South, Range 25 East, all in the City of Westwood, Johnson County, Kansas)

DESCRIPTION

A tract of land being all of Lots 12, 13 and 14, Block 1, KLASSEN PLACE, a subdivision recorded in Bk. 12, Pg. 50; all of Lots 1 through 14, Block 1, SWATZELL ADDITION, a subdivision recorded in Bk. 7, Pg. 35; part of Lots 8 and 9, HOLMESLAND, a subdivision recorded in Bk. 3, Pg. 11; and part of the Northeast Quarter of Section 3, Township 12 South, Range 25 East, of the 6th Principal Meridian, in the City of Westwood, Johnson County, Kansas, being more particularly described by Timothy Blair Wiswell, LS 1136, of George Butler Associates Inc., CLS 8, on July 7, 2023, as follows:

Commencing at the Southeast Corner of said Northeast Quarter; thence South 87°43'46" West, on the South line of said Northeast Quarter, a distance of 43.00 feet, to a point on the West Right-of-Way line of Highway 169, also known as Rainbow Boulevard, as now established per Condemnation No. 14610, recorded in Bk. 26, Pg. 79; said point also being the Point of Beginning; thence South 02°10'40" East, departing said South line, on said West Right-of-Way line, a distance of 305.31 feet, to the Southeast corner of said Lot 14, KLASSEN PLACE; thence South 87°43'33" West, departing said West Right-of-Way line, on the Northerly Right-of-Way line of W. 51st Street, as now established per said KLASSEN PLACE, a distance of 100.09 feet (100.0 feet per plat), to a point of curvature, said point also being the Southwest corner of said Lot 14; thence Southwesterly, continuing on said Northerly Right-of-Way line, and on a curve to the left, having a radius of 380.20 feet, a central angle of 34°57'49", and an arc length of 232.01 feet, to the most Southerly corner of said Lot 12, KLASSEN PLACE; thence North 38°33'02" West, continuing on said Northerly Right-of-Way line, a distance of 74.96 feet (74.30 feet per plat), to a point on the West line of said Lot 12; thence South 02°12'27" East, continuing on said Northerly Right-of-Way line, a distance of 16.79; thence South 87°43'46" West, continuing on said Northerly Right-of-Way line and the extension thereof being the North line of said Lot 11, KLASSEN PLACE, a distance of 258.03 feet (258.10 feet per plat), to the Northwest corner of said Lot 11, also being the Southwest corner of said Lot 8, HOLMESLAND; thence North 02°10'40" West, departing said North line of Lot 11, on the West line of said Lot 8, a distance of 164.70 feet, to the Southeast corner of the North Half of said Lot 9, HOLMESLAND; thence South 87°43'46" West, departing said West line of Lot 8, on the South line of the North Half of said Lot 9, a distance of 113.15 feet (112.3 feet per deed), to the Southeast corner of Lot 6, LOCKWOOD COURT, a subdivision recorded in Bk. 8, Page 40; thence North 02°16'38" West, departing said South line, on the East line of Lots 6 and 5, LOCKWOOD COURT, a distance of 165.25 feet, to the Northeast corner of said Lot 5, also being the Southeast corner of said Lot 14, Block 1, SWATZELL ADDITION; thence South 87°43'46" West, departing the East line of said Lots 6 and 5, on said South line of said Lot 14, a distance of 50.00 feet, to the Southwest corner of said Lot 14; thence North 02°16'38" West, departing said South line, on the West line of said Lot 14, a distance of 132.07 feet (132.00 feet per plat), to the Northwest corner of said Lot 14; thence North 87°43'22" East, departing said West line, on the Southerly Right-of-Way line of W. 50th Street, as now established per said SWATZELL ADDITION, a distance of 480.00 feet, to a point on a non-tangent curve; thence Northeasterly, continuing on said Southerly Right-of-Way line, and on a curve to the left, having an initial tangent bearing of North 89°04'45" East, a radius of 420.00 feet, a central angle of 14°45'21", and an arc length of 108.17 feet; thence North 73°06'49" East, continuing on said Southerly Right-of-Way line, a distance of 203.11 feet, to a point on the West Right-of-Way line of said Highway 169; thence South 02°17'01" East, departing said Southerly Right-of-Way line, on said West Right-of-Way line, a distance of 194.71 feet, to the Point of Beginning, containing 332,094.03 square feet, or 7.62 acres, more or less.

DEDICATIONS

The undersigned proprietors of the above described tract of land have caused the same to be subdivided in the manner as shown on the accompanying plat, which subdivision shall hereafter be known as "HENRY'S ADDITION."

The undersigned proprietor of the above tract of land hereby agrees and consents that the Board of County Commissioners of Johnson County, Kansas, and the City of Westwood, Johnson County, Kansas, shall have the power to release such land proposed to be dedicated for public ways and thoroughfares, or parts thereof, for public use, from the lien and effect of any special assessment, and that the amount of unpaid special assessments on such land so dedicated shall become and remain a lien on the remainder of this land fronting or abutting on such dedicated public way or thoroughfare.

An easement or license to lay, construct, maintain, alter, repair, replace and operate one or more sewer lines and all appurtenances convenient for the collection of sanitary sewage, together with the right of ingress and egress, over and through those areas designated as "Sanitary Sewer Easement" or "SSE" on this plat, together with the right of ingress and egress over and through adjoining lands may be reasonably necessary to access said easement and is hereby dedicated to Johnson County Wastewater of Johnson County, Kansas or their assigns. Alteration of land contours will be permitted only with the express written approval of JCW. Any placing of improvements or planting of trees on said permanent right-of-way will be done at the risk of subsequent damage thereto without compensation therefor.

Any streets shown hereon and not heretofore dedicated to public use as street right-of-way are hereby so dedicated. IN TESTIMONY WHEREOF, the undersigned proprietors have hereto subscribed their names.

Owner of Lot 1: City of Westwood, Kansas

Signer - TBD

STATE OF _____
COUNTY OF _____

Be it remembered that on this _____ day of _____, 2023, before me a notary public in and for said county and state came _____, who is personally known to me to be the same person who executed the foregoing instrument of writing on behalf of said owner, and who duly acknowledged the execution of the same to be the free act and deed of said owner.

In witness whereof, I have hereto subscribed my name and affixed my notarial seal the day and year last above written.

Notary Public: _____ My Appointment Expires: _____

AND

Owner of Lot 2 and 3: Unified School District No. 512, Johnson County, State of Kansas

Dr. Joe Gilhaus
STATE OF _____
COUNTY OF _____

Be it remembered that on this _____ day of _____, 2023, before me a notary public in and for said county and state came _____, who is personally known to me to be the same person who executed the foregoing instrument of writing on behalf of said owner, and who duly acknowledged the execution of the same to be the free act and deed of said owner.

In witness whereof, I have hereto subscribed my name and affixed my notarial seal the day and year last above written.

Notary Public: _____ My Appointment Expires: _____

APPROVALS

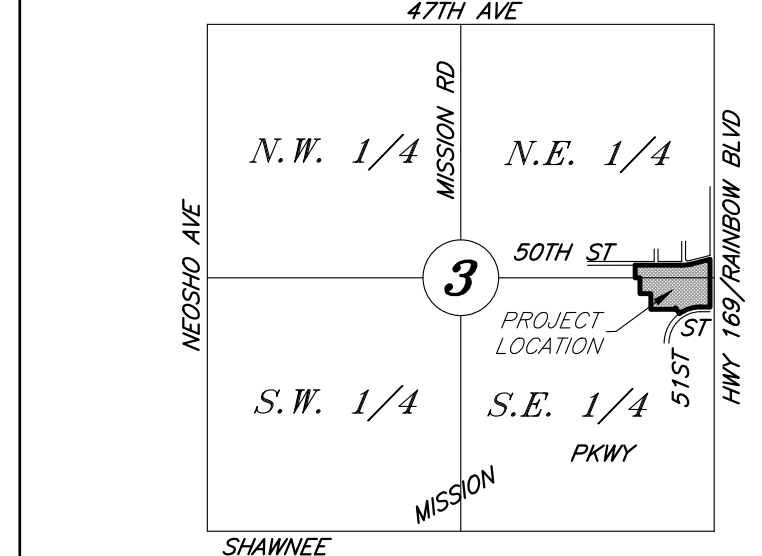
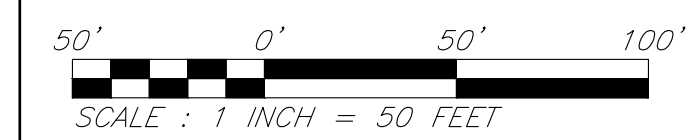
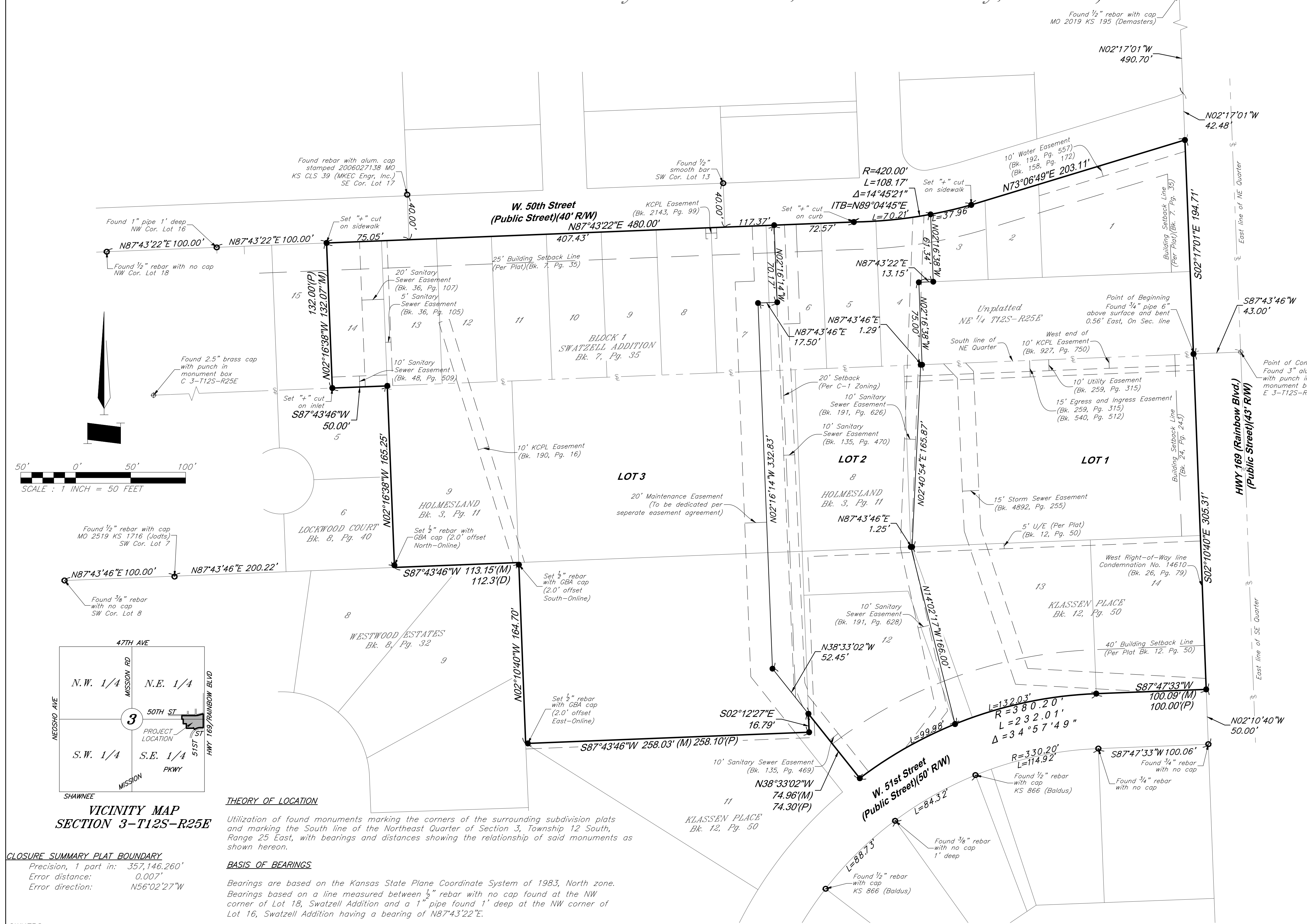
Approved by the Planning Commission of the City of Westwood, Johnson County, Kansas, this _____ day of _____, 2023.

By: _____
Chairperson, Sarah Page

Approved by the Governing Body of the City of Westwood, Johnson County, Kansas, this _____ day of _____, 2023.

By: _____
Mayor, David E. Waters

Attest: _____
City Clerk, Abby Schneewis



VICINITY MAP
SECTION 3-T12S-R25E

CLOSURE SUMMARY PLAT BOUNDARY
Precision, 1 part in: 357,146,260'
Error distance: 0.007'
Error direction: N56°02'27"W

- OWNERS**
School District No. 93
Deed Record No. 139 Pg. 482
Deed Record No. 144 Pg. 33
Deed Record No. 144 Pg. 110
Deed Record No. 166 Pg. 630
Deed Record No. 170 Pg. 67
Deed Record No. 173 Pg. 26
Deed Record No. 191 Pg. 321
Bk. 540, Pg. 512
Bk. 554, Pg. 260
Bk. 563, Pg. 543
Bk. 564, Pg. 252
City of Westwood
Bk. 661, Pg. 184
Bk. 201404, Pg. 002898
Bk. 201404, Pg. 002900
Bk. 201404, Pg. 002902

THEORY OF LOCATION

Utilization of found monuments marking the corners of the surrounding subdivision plats and marking the South line of the Northeast Quarter of Section 3, Township 12 South, Range 25 East, with bearings and distances showing the relationship of said monuments as shown hereon.

BASIS OF BEARINGS

Bearings are based on the Kansas State Plane Coordinate System of 1983, North zone. Bearings based on a line measured between 1/2" rebar with no cap found at the NW corner of Lot 18, Swatzell Addition and a 1" pipe found 1' deep at the NW corner of Lot 16, Swatzell Addition having a bearing of N87°43'22"E.

NOTES

The easement information shown hereon is based upon "Commitment for Title Insurance", prepared by First American Title Company, Commitment Number: NCS-1125126-KCTY, Effective Date: April 10, 2023 at 8:00 a.m.; and Commitment Number: NCS-1125130-KCTY, Effective Date: April 10, 2023 at 8:00 a.m.
Current zoning for the property is R-1.

CLIENT/DEVELOPER

Adam Feldman
Karbark Real Estate Company
2000 Shawnee Mission Parkway, Suite 400
Mission Woods, KS 66205

AREA TABLE	
LOT 1	117,463.55 sqft or 2.70 acres
LOT 2	67,183.18 sqft or 1.54 acres
LOT 3	147,447.30 sqft or 3.38 acres
Total	332,094.03 sqft or 7.62 acres

LEGEND

- Denotes 1/2" x 24" rebar with GBA cap CLS #8 set at property corner unless otherwise noted
- o - Denotes monument found as noted at property corner
- ⊕ - Denotes Section Corner found as noted
- (M) - Measured Dimension
- (P) - Platted Dimension
- (D) - Deeded Dimension
- R/W - Right-of-Way

CERTIFICATION

I, Timothy Blair Wiswell, hereby certify that during the month of August 2023, I or someone under my direct supervision have made a survey of the above described tract of land and the results of said survey meets or exceeds the "Kansas Minimum Standards" for Boundary Surveys pursuant to K.A.R. 66-12-1. The field work was completed on 06/23/2023.

Job No. 14031.15 July 13, 2023 Drawn By: MAP
Rev. August 30, 2023

GBA
GEORGE BUTLER ASSOCIATES, INC.
CONSULTING ENGINEERS / ARCHITECTS / LANDSCAPE ARCHITECTS / PLANNERS
ONE RENNER RIDGE, 9801 RENNER BLVD, LENEXA, KS 66219 / (913)492-0400
C.O.A. CLS-8 Surveyor Email: twiswell@gbateam.com

HENRY'S ADDITION, a subdivision in
Section 3, Township 12 South, Range 25 East,
City of Westwood, Johnson County, Kansas

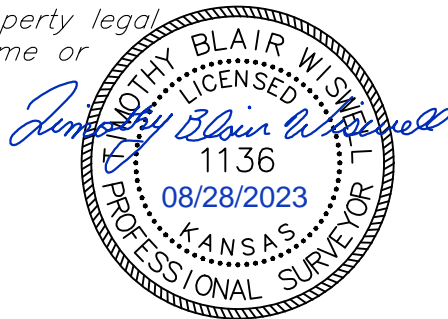
SHEET 1 OF 1

PROPOSED LOT 3 DESCRIPTION:

A tract of land being part of Lots 6 and 7, and all of Lots 8 through 14, Block 1, SWATZELL ADDITION, a subdivision recorded in Bk. 7, Pg. 35; part of Lot 8 and 9, HOLMESLAND, a subdivision recorded in Bk. 3, Pg. 11, in the City of Westwood, Johnson County, Kansas, being more particularly described by Timothy Blair Wiswell, LS 1136, of George Butler Associates Inc., CLS 8, on August 28, 2023, as follows:

Commencing at the Southeast Corner of the Northeast Quarter of Section 3, Township 12 South, Range 25 East of the 6th Principal Meridian; thence South 87°43'46" West, on the South line of said Northeast Quarter, a distance of 43.00 feet, to a point on the West Right-of-Way line of Highway 169, also known as Rainbow Boulevard, as now established per Condemnation No. 14610, recorded in Bk. 26, Pg. 79; thence South 02°10'40" East, departing said South line, on said West Right-of-Way line, a distance of 305.31 feet, to the Southeast corner of said Lot 14, KLASSEN PLACE; thence South 87°47'33" West, departing said West Right-of-Way line, on the Northerly Right-of-Way line of W. 51st Street, as now established per said KLASSEN PLACE, a distance of 100.09 feet (100.0 feet per plat), to a point of curvature, said point also being the Southwest corner of said Lot 14; thence Southwesterly, continuing on said Northerly Right-of-Way line, and on a curve to the left, having a radius of 380.20 feet, a central angle of 34°57'49", and an arc length of 232.01 feet; thence North 38°33'02" West, continuing on said Northerly Right-of-Way line, a distance of 74.96 feet (74.30 feet per plat), to a point on the West line of said Lot 12, said point being the Point of Beginning; thence South 02°12'27" East, continuing on said Northerly Right-of-Way line, a distance of 16.79 feet; thence South 87°43'46" West, continuing on said Northerly Right-of-Way line and the extension thereof being the North line of said Lot 11, KLASSEN PLACE, a distance of 258.03 feet (258.10 feet per plat), to the Northwest corner of said Lot 11, also being the Southwest corner of said Lot 8, HOLMESLAND; thence North 02°10'40" West, departing said North line of Lot 11, on the West line of said Lot 8, a distance of 164.70 feet, to the Southeast corner of the North Half of said Lot 9, HOLMESLAND; thence South 87°43'46" West, departing said West line of Lot 8, on the South line of the North Half of said Lot 9, a distance of 113.15 feet (112.3 feet per deed), to the Southeast corner of Lot 6, LOCKWOOD COURT, a subdivision recorded in Bk. 8, Page 40; thence North 02°16'38" West, departing said South line, on the East line of Lots 6 and 5, LOCKWOOD COURT, a distance of 165.25 feet, to the Northeast corner of said Lot 5, also being the Southeast corner of said Lot 14, Block 1, SWATZELL ADDITION; thence South 87°43'46" West, departing the East line of said Lots 6 and 5, on said South line of said Lot 14, a distance of 50.00 feet, to the Southwest corner of said Lot 14; thence North 02°16'38" West, departing said South line, on the West line of said Lot 14, a distance of 132.07 feet (132.00 feet per plat), to the Northwest corner of said Lot 14; thence North 87°43'22" East, departing said West line, on the Southerly Right-of-Way line of W. 50th Street, as now established per said SWATZELL ADDITION, a distance of 407.43 feet; thence South 02°16'14" East, departing said Southerly Right-of-Way line, a distance of 70.17 feet; thence South 87°43'46" West, a distance of 17.50 feet; thence South 02°16'14" East, a distance of 332.83 feet; thence South 38°33'02" East, a distance of 52.45 feet, to the Point of Beginning, containing 147,447.30 square feet, or 3.38 acres, more or less.

This is to certify that this real property legal description has been prepared by me or under my direct supervision.

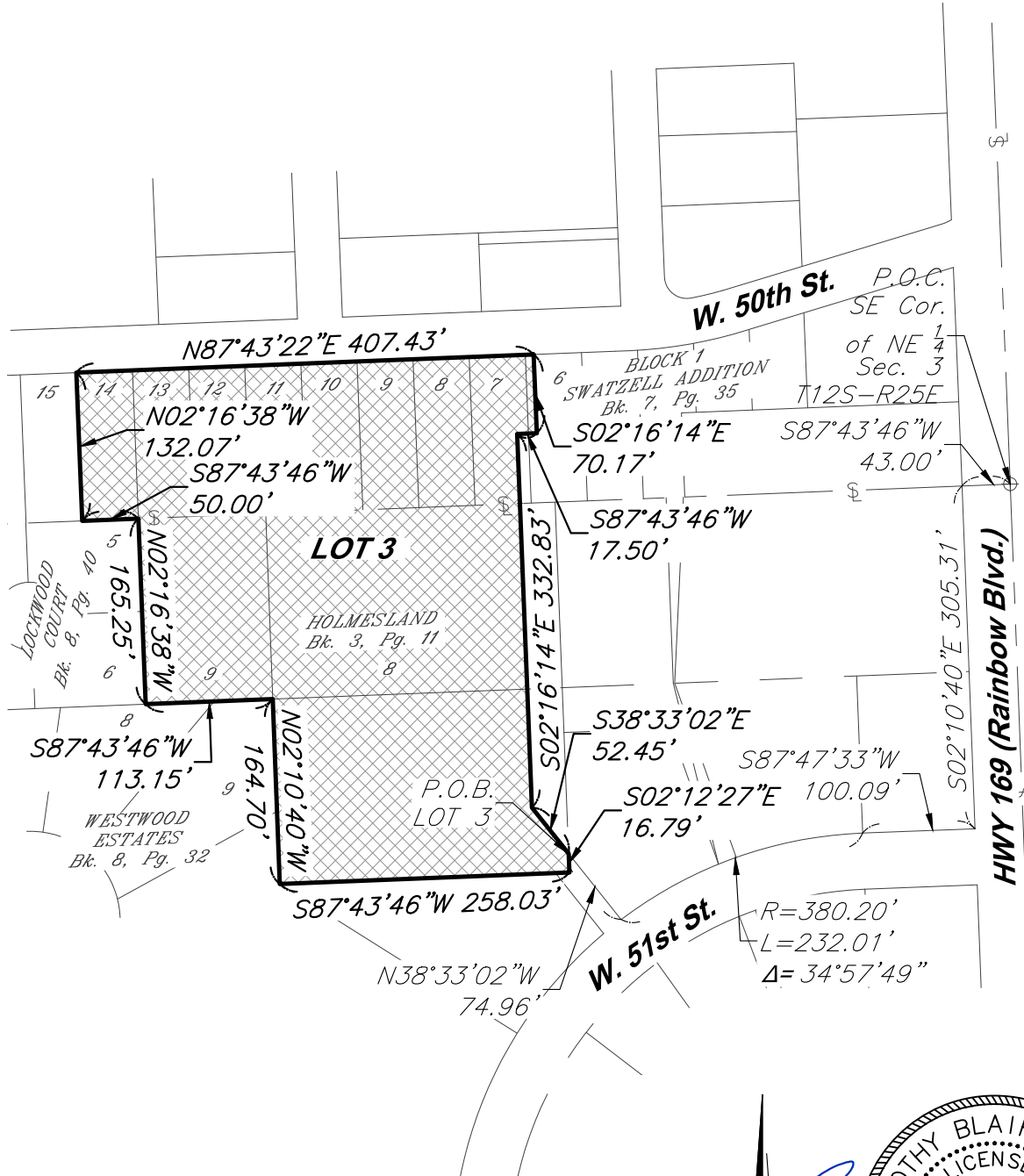


GBA
architects
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9801 Renner Boulevard
Lenexa, Kansas 66219
913.492.0400
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twiswell@gbateam.com
© George Butler Associates, Inc. 2023 C.O.A. # CLS-8

PROJECT NUMBER
14031.15
DATE
08/28/2023

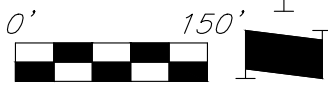
Proposed Lot Description
Lot 3
HENRY'S ADDITION
Westwood, Jo. Co., KS


SHEET NUMBER
1 of 2



This is to certify that this real property exhibit was prepared by me or under my direct supervision. This exhibit does not warrant that a boundary survey was performed upon the hereon shown tract of land.

SCALE:
1 INCH =
150 FEET



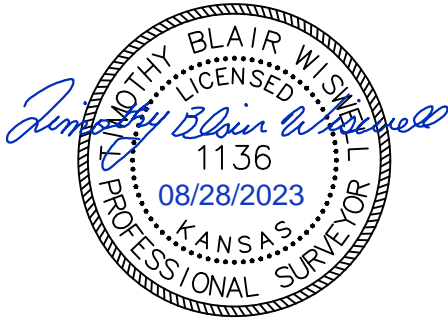
 LOT 3 147,447.30 Square Feet

GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com twiswell@gbateam.com	PROJECT NUMBER 14031.15	Proposed Lot Description Lot 3 HENRY'S ADDITION Westwood, Jo. Co., KS	SHEET NUMBER 2 of 2
	DATE 08/28/2023		

PROPOSED LOT 1 DESCRIPTION:

A tract of land being all of Lots 13 and 14, and part of Lot 12, Block 1, KLASSEN PLACE, a subdivision recorded in Bk. 12, Pg. 50; all of Lots 1, 2, and 3, Block 1, SWATZELL ADDITION, a subdivision recorded in Bk. 7, Pg. 35; part of Lot 8, HOLMESLAND, a subdivision recorded in Bk. 3, Pg. 11; and a portion of unplatted land, recorded in Book 661, Page 184, and lying in the Northeast Quarter of Section 3, Township 12 South, Range 25 East of the 6th Principal Meridian, in the City of Westwood, Johnson County, Kansas, being more particularly described by Timothy Blair Wiswell, LS 1136, of George Butler Associates Inc., CLS 8, on August 28, 2023, as follows:

Commencing at the Southeast Corner of said Northeast Quarter; thence South 87°43'46" West, on the South line of said Northeast Quarter, a distance of 43.00 feet, to a point on the West Right-of-Way line of Highway 169, also known as Rainbow Boulevard, as now established per Condemnation No. 14610, recorded in Bk. 26, Pg. 79, said point also being the Point of Beginning; thence South 02°10'40" East, departing said South line, on said West Right-of-Way line, a distance of 305.31 feet, to the Southeast corner of said Lot 14, KLASSEN PLACE; thence South 87°47'33" West, departing said West Right-of-Way line, on the Northerly Right-of-Way line of W. 51st Street, as now established per said KLASSEN PLACE, a distance of 100.09 feet (100.0 feet per plat), to a point of curvature, said point also being the Southwest corner of said Lot 14; thence Southwesterly, continuing on said Northerly Right-of-Way line, and on a curve to the left, having a radius of 380.20 feet, a central angle of 19°53'46", and an arc length of 132.03 feet; thence North 14°02'17" West, departing said Northerly Right-of-Way line, a distance of 166.00 feet; thence North 87°43'46" East, a distance of 1.25 feet; thence North 02°40'54" East, a distance of 165.87 feet; thence North 87°43'46" East, a distance of 1.29 feet; thence North 02°16'38" West, a distance of 75.00 feet; thence North 87°43'22" East, a distance of 13.15 feet; thence North 02°16'38" West, a distance of 61.34 feet, to a point on the Southerly Right-of-Way line of W. 50th Street, as now established per said SWATZELL ADDITION, said point also being a point on a non-tangent curve; thence Northeasterly, on said Southerly Right-of-Way line, and on a curve to the left, having an initial tangent bearing of North 79°30'06" East, a radius of 420.00 feet, a central angle of 05°10'42", and an arc length of 37.96 feet; thence North 73°06'49" East, continuing on said Southerly Right-of-Way line, a distance of 203.11 feet, to a point on the West Right-of-Way line of said Highway 169; thence South 02°17'01" East, departing said Southerly Right-of-Way line, on said West Right-of-Way line, a distance of 194.71 feet, to the Point of Beginning, containing 117,463.55 square feet, or 2.70 acres, more or less.



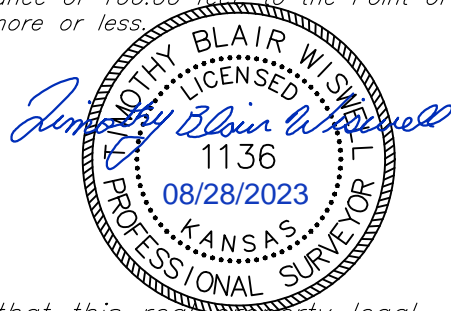
This is to certify that this real property legal description has been prepared by me or under my direct supervision.

GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com twiswell@gbateam.com	PROJECT NUMBER 14031.15	Proposed Lot Description Lot 1 HENRY'S ADDITION Westwood, Jo.Co., KS	SHEET NUMBER 1 of 3
	DATE 08/28/2023		

PROPOSED LOT 2 DESCRIPTION:

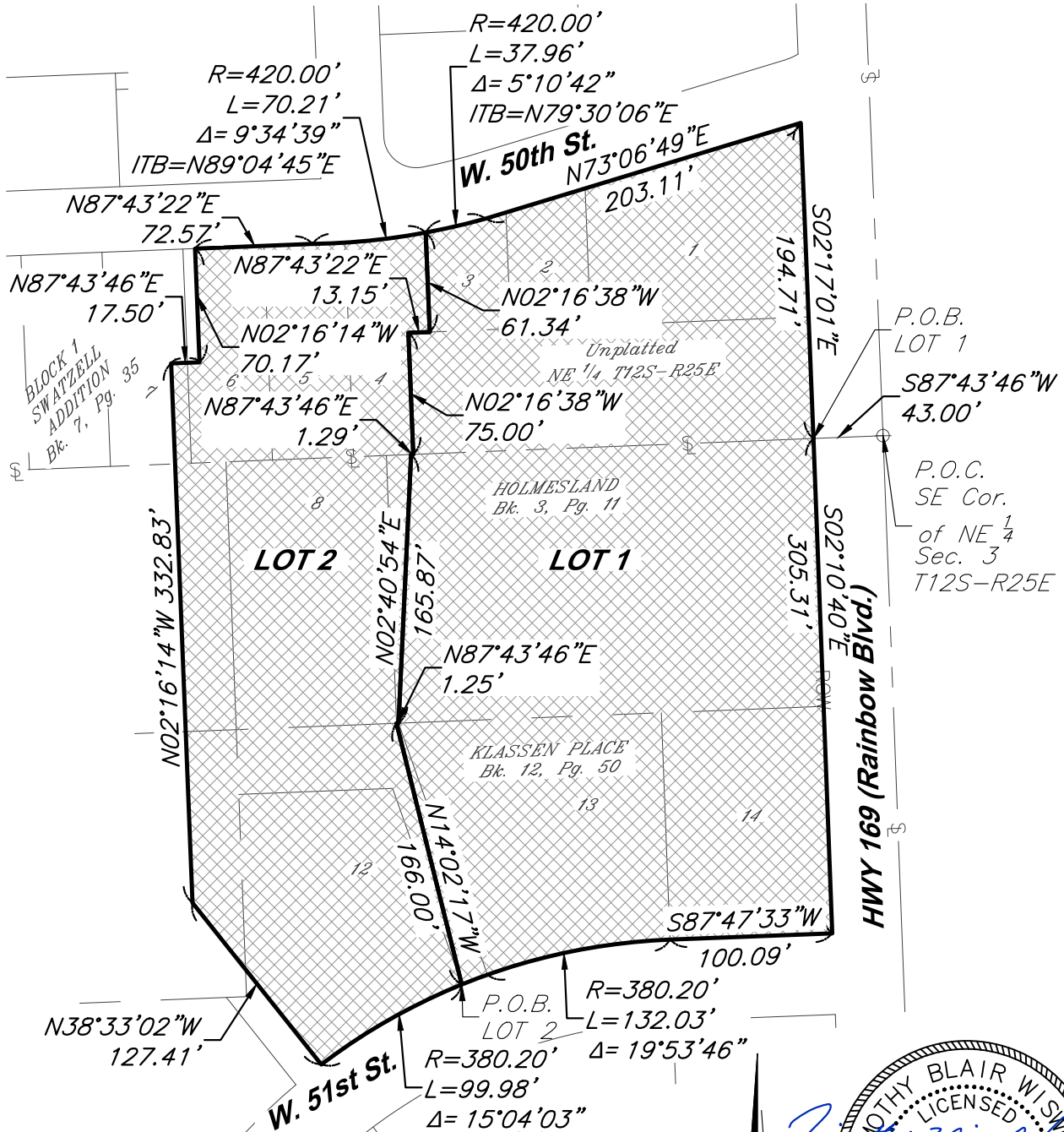
A tract of land being part of Lot 12, Block 1, KLASSEN PLACE, a subdivision recorded in Bk. 12, Pg. 50; all of Lots 4, 5, and part of Lots 6 and 7, Block 1, SWATZELL ADDITION, a subdivision recorded in Bk. 7, Pg. 35; part of Lot 8, HOLMESLAND, a subdivision recorded in Bk. 3, Pg. 11, in the City of Westwood, Johnson County, Kansas, being more particularly described by Timothy Blair Wiswell, LS 1136, of George Butler Associates Inc., CLS 8, on August 28, 2023, as follows:

Commencing at the Southeast Corner of the Northeast Quarter of Section 3, Township 12 South, Range 25 East of the 6th Principal Meridian; thence South 87°43'46" West, on the South line of said Northeast Quarter, a distance of 43.00 feet, to a point on the West Right-of-Way line of Highway 169, also known as Rainbow Boulevard, as now established per Condemnation No. 14610, recorded in Bk. 26, Pg. 79; thence South 02°10'40" East, departing said South line, on said West Right-of-Way line, a distance of 305.31 feet, to the Southeast corner of said Lot 14, KLASSEN PLACE; thence South 87°47'33" West, departing said West Right-of-Way line, on the Northerly Right-of-Way line of W. 51st Street, as now established per said KLASSEN PLACE, a distance of 100.09 feet (100.0 feet per plat), to a point of curvature, said point also being the Southwest corner of said Lot 14; thence Southwesterly, continuing on said Northerly Right-of-Way line, and on a curve to the left, having a radius of 380.20 feet, a central angle of 19°53'46", and an arc length of 132.03 feet, to the Point of Beginning; thence Southwesterly, continuing on said Northerly Right-of-Way line, and on a curve to the left, having a radius of 380.20 feet, a central angle of 15°04'03", and an arc length of 99.98 feet; thence North 38°33'02" West, continuing on said Northerly Right-of-Way line and the extension thereof, a distance of 127.41 feet; thence North 02°16'14" West, a distance of 332.83 feet; thence North 87°43'46" East, a distance of 17.50 feet; thence North 02°16'14" West, a distance of 70.17 feet, to a point on the Southerly Right-of-Way line of W. 50th Street, as now established per said SWATZELL ADDITION; thence North 87°43'22" East, on said Southerly Right-of-Way line, a distance of 72.57 feet, to a point on a non-tangent curve; thence Northeasterly, continuing on said Southerly Right-of-Way line, and on a curve to the left, having an initial tangent bearing of North 89°04'45" East, a radius of 420.00 feet, a central angle of 09°34'39", and an arc length of 70.21 feet; thence South 02°16'38" East, departing said Southerly Right-of-Way line, a distance of 61.34 feet; thence South 87°43'22" West, a distance of 13.15 feet; thence South 02°16'38" East, a distance of 75.00 feet; thence South 87°43'46" West, a distance of 1.29 feet; thence South 02°40'54" West, a distance of 165.87 feet; thence South 87°43'46" West, a distance of 1.25 feet; thence South 14°02'17" East, a distance of 166.00 feet, to the Point of Beginning, containing 67,183.18 square feet, or 1.54 acres, more or less.



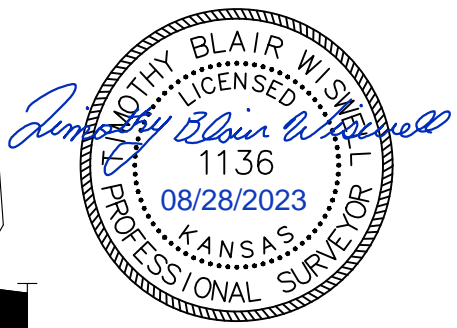
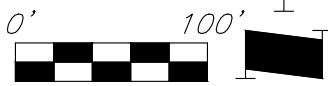
This is to certify that this real property legal description has been prepared by me or under my direct supervision.

GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com twiswell@gbateam.com	PROJECT NUMBER 14031.15	Proposed Lot Description Lot 2 HENRY'S ADDITION Westwood, Jo.Co., KS	SHEET NUMBER 2 of 3
	DATE 08/28/2023		



This is to certify that this real property exhibit was prepared by me or under my direct supervision. This exhibit does not warrant that a boundary survey was performed upon the hereon shown tract of land.

SCALE:
1 INCH =
100 FEET



- LOT 1 117,463.55 Square Feet
- LOT 2 67,183.18 Square Feet

GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com twiswell@gbateam.com	PROJECT NUMBER 14031.15	Proposed Lot Description Lot 1 and Lot 2 HENRY'S ADDITION Westwood, Jo. Co., KS	SHEET NUMBER 3 of 3
	DATE 08/28/2023		



Adam Feldman

(Contact Person's Name), hereby certify the attached and completed application contains the information as specified below in accordance with the Westwood Zoning Ordinance. I understand the submission of incomplete or inaccurate information may result in a delay in processing and action on this application and may be subject to other penalties provided by law.

Adam Feldman

6/29/23

Signature of Contact Person

Date

Note: The following items apply to all applications for plat approval. The Applicant is strongly encouraged to work closely with Staff in advance of an actual application submittal. Please submit ONLY THOSE DRAWINGS necessary to provide information required by this checklist. Submission of construction drawings or other nonessential drawings may delay the review process.

Final Plats

- 1. A final plat for record shall be prepared and submitted to the Department of Community Development for review and recommendation by the Planning Commission and acceptance by the Governing Body. The original plat shall be in sheets of such materials, dimensions and scale as meets the current requirements for the County official in whose office the plats are required to be filed; provided, that when more than one sheet is required, an index sheet of the same size shall be filed showing the entire subdivision on one sheet with block and lot numbers, In no event shall the final plat be on a scale smaller than 200 feet to the inch.

General Requirements for all Final Plat Applications

- 1. Plat application form, filled out completely and accurately with all required contact information, signatures, etc.
- 2. All files must be electronic. A PDF file shown as 24 x 36 pages to include all general final plat data, existing conditions, proposed conditions, and any ancillary items shall be provided with sufficient information included as to allow for an appropriate review by the City. The plat must be sealed by a licensed land surveyor as required.
- 3. Include a PDF of the Stormwater report, all pages must be in one document. **All plat sets must be one document. Individual pages will not be accepted.**

General Final Plat Data

- 1. Legal description and drawing.
- 2. Proposed name of subdivision and the words "FINAL PLAT".
- 3. Location map at a scale of not less than 1" = 2,000' with the site plan clearly marked to identify the location of the property.
- 4. The number of each lot and block, in accordance with a systematic numbering system and "letter" identification of all other parcels, proposed buildings, if any, and proposed ownership.
- 5. The length of all straight lines, deflection angles or bearings, and radii, arcs and central angles of all curves along the centerline and the property line of each street. All dimensions of property lines along each street and all the lines bordering each lot shall be in feet and decimal fractions of a foot. The true bearings and angles of intersections, and any other data necessary for the location of any dedicated easement in the field; calculated bearings shall be used.
- 6. The lines and names, with accurate dimensions in feet and decimals of feet, of all proposed streets or other ways or easements and other open spaces intended to be dedicated for public use or granted for use of inhabitants of the subdivision, also lines of all adjoining streets.
- 7. Suitable primary control points approved by the City Engineer or descriptions and "ties" to such control points, to which all dimension, angles, bearings and similar data given on the plat shall be referred. All dimensions shall be shown in feet and decimals of a foot.
- 8. The north arrow, scale, and date.
- 9. Properly executed dedication of all streets, highways, alleys, parks, playgrounds, and other lands as may be appropriate, intended for use by the owner, or owners.
- 10. Surveyor's certificate of actual field survey with bearings and distances referenced to section or fractional section, corners, township, and range. This survey must be balanced and closed by a Registered Land Surveyor.
- 11. Dedication language as provided by the Development Review Staff.
- 12. Blanks for date of approval and for Planning Commission Chair, Mayor and City Clerk's signatures with name printed under the signature line.



13. Blank space in the upper right hand corner of the plat for recording purposes.
14. The area, in square feet, of each lot, parcel or tract in the proposed subdivision. Such area may be indicated on each lot or parcel or on a separate chart on the face of the plat.
15. Dimension of the lot at the front building line on cul-de-sac lots or unusually shaped lots.
16. Final sidewalk/trail location plan included widths.
17. All lot dimensions clearly noted on each lot, parcel or tract.

Existing Conditions

Information, in report and map form (seven copies of each), showing:

1. Zoning.
2. Acreage to be subdivided.
3. Names of adjoining property owners or subdivisions and accurately showing existing property lines, streets, alleys, and other pertinent physical features.
4. Location of 100 year flood plain if located on the property.
5. Vicinity map indicating location of subdivision in relationship to major roadways.
6. Location of all existing structures, wells, etc. and whether they are to be retained or demolished.
7. Location of significant natural features, including the location and identification by common name, of trees and other significant vegetation prepared from aerial photos with on-site verification or survey.
8. Boundaries of any mined, underground space and submittal of any required engineering structural safety studies.

Stormwater / Watershed

1. Existing and proposed storm drainage, indicating location and connections to existing drainage system.
2. Existing topography with contours at vertical intervals of not more than five feet (5') where the slope is greater than ten percent (10%); and not more than two feet (2') where the slope is less than ten percent (10%).
3. Proposed preliminary grading by contours at vertical intervals of not more than five feet (5') where the slope is greater than ten percent (10%); and not more than two feet (2') where the slope is less than ten percent (10%), supplemented by spot elevations where necessary.
4. Provide at a scale appropriate for clear readability the drainage basins, but not less than 1" = 100', both on-site and off-site drainage sub-basins coming to the subject site, including all points at which it leaves the site. Each sub-basin should be clearly labeled with a designation letter or number, acreage of the sub-basin, and CN value of the sub-basin.
5. Limits of the 100 year flood plain and floodway of all existing water courses that would impact this development.
6. Such additional information as may reasonably be required in writing by the City Engineer or Public Works Director.

Submission following recording and prior to issuance of building permits.

After approval of the plat by the Governing Body but prior to assignment of street addresses or issuance of any partial or full building permits, the following additional items must be submitted:

1. One copy of the plat containing original recording information, date, book, and page of recording information
2. One copy of all covenants and restrictions applicable to said subdivision, bearing the recording information.
3. One full size copy and one reduced copy of the address plan for electronic distribution (11"x14"). (Developer's ¼ item) (as recorded at the register of Deeds office) plus sidewalks locations and bearing addresses as assigned by the City of Westwood.

Authorization of Agent / Proof of Ownership

	<p>City of Westwood 4700 Rainbow Blvd Westwood, Kansas 66205 913-362-1550 – Fax 913-362-3308 www.westwoodks.org</p>
---	--

Where an application has been filed by, or on behalf of, a landowner, an affidavit of ownership shall be submitted to the City. Further, where an application has been filed by an agent of a landowner, an affidavit of the landowner establishing the agent's authorization to act on behalf of the landowner shall also be submitted. This form shall be submitted to the City Clerk at the time of filing the application.

Scope of Project/Description of Work: Replatting and preliminary and final development plans.

Property IDs: RP63000001 0001; RF251203-3060; RP27000000 0008D; RP30000001 0012B
Project Location/Address: (some of which are known as 5000 Rainbow and 5050 Rainbow)

Agent's Name: Adam Feldman

Company: Karbank Holdings LLC Fax: _____

Mailing Address: 2000 Shawnee Mission Parkway, Suite 400, Mission Woods, KS 66205

E-mail Address: af@karbank.com

Property Owner's Name(s): City of Westwood, Kansas Phone: 913-362-1550

Company: City of Westwood, Kansas Fax: _____

Mailing Address: 4700 Rainbow Blvd, Westwood, KS 66205

E-mail Address: david.waters@westwoodks.org

I declare under penalty of perjury that I am the owner for the address listed above and I personally completed the above information and certify its accuracy.

Signature of Owner:  Date: 06/29/2023

Printed Name of Property Owner: City of Westwood, Kansas

By: David E. Waters
Mayor and Authorized Agent

City of Westwood, Kansas Ownership Affidavit

State of Kansas)
)
County of Johnson) ss.

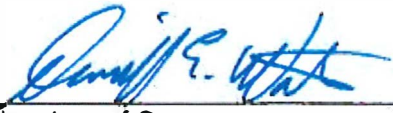
Comes now David E. Waters (as Mayor and Authorized Agent of City of Westwood, Kansas [owner]) who being duly sworn upon their oath, does state that they are the owner of the property legally described as:

Property IDs: RP63000001 0001; RF251203-3060; RP27000000 0008D; RP30000001 0012B
See attached Legal Description.

in the application for Replatting and preliminary and final development plans.
(description of application)

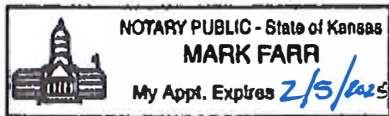
and acknowledges that the submission of said application and agrees to bind the subject property in accordance with the plan submitted as part of the above application.

Dated this 29th day of June, 2023.



Signature of Owner
City of Westwood, Kansas
By: David E. Waters, Mayor and Authorized Agent
Printed Name or Owner

Subscribed and sworn to before me this 29 day of June, 2023.





Notary Public
2/5/2025
My Commission Expires

EXHIBIT A

Legal description for the Land:

Lots 13 and 14, Block 1, KLASSEN PLACE, a subdivision in Johnson County, Kansas;

And,

All that part of Lot 12, Block 1, KLASSEN PLACE, a subdivision of land in Johnson County, Kansas described as follows: Beginning at the Northeast corner of said Lot 12; thence Southeasterly, along the Easterly line of said Lot 12, to the Southeast corner thereof; thence Southwesterly, along the Southerly line of said Lot 12, a distance of 16.87 feet; thence Northwesterly, to the Point of Beginning.

And,

East 286.58 feet of the North one-half of Lot Eight (8), HOLMESLAND, a subdivision in Johnson County, Kansas, the Easterly 23 feet thereof being subject to rights of the State Highway Commission under condemnation for road purposes; EXCEPT All that part of the East 286.58 feet of the North half of Lot 8, HOLMESLAND, a subdivision of land in Johnson County, Kansas, more particularly described as follows: Beginning at a point on the North line and 286.58 feet West of the Northeast corner of said Lot 8; thence South, along a line 286.58 feet West of and parallel to the East line of said Lot 8, a distance of 165.39 feet, to the South line of the North half of said Lot 8; thence East, along the South line of the North half of said Lot 8, a distance of 1.28 feet, to the Northeast corner of Lot 12, Block 1, KLASSEN PLACE, a subdivision of land in Johnson County, Kansas; thence Northeasterly, to a point on the North line and 271.28 feet West of the Northeast corner of said Lot 8; thence West, along the North line of said Lot 8, a distance of 15.30 feet, to tie Point of Beginning;

And,

Lots 1, 2 and 3, block 1, Swatzell Addition, a subdivision in the City of Westwood, Johnson County, Kansas;

And,

All that part of the Northeast 1/4 of Section 3, Township 12, Range 25 in the City of Westwood, Johnson County, Kansas, being more particularly described as follows:

Beginning at the Southeast corner of the Northeast quarter of Section 3, Township 12, Range 25; thence West along the East-West center lines of said Section 3; 290.40 feet to the Southeast corner of Lot 4, Block 1, Swatzell Addition; thence North along the East

line of Lot 4, 75 feet; thence East along the South line of a portion of Block 1, Swatzell Addition 290.50 feet to the East line of Section 3; thence South 75 feet to the point of beginning, less the East 43 feet taken for public road, all in the City of Westwood, Johnson County, Kansas,

All except any other part used or dedicated for streets, roads and public rights of way.

Legal description for the Lot Line Adjustment Parcel:

To be developed by survey.

Corrected by Desc. on Plat

Ent	Name	Acct No	Invoice	Date	P.O. Num	Reference	Amount	Discount	Check Amt
090000	KARBANK HOLDING	1350-001	REPLATAPP2	6/27/2023		School Dist Parcels	150.00	0.00	150.00

Payor:	KARBANK HOLDINGS LLC	Date	Check No.	Check Amount
Payee:	CITY OF WESTWOOD	6/28/2023	108984	150.00

Retain this statement for your records



Adam Feldman

(Contact Person's Name), hereby certify the attached and completed application contains the information as specified below in accordance with the Westwood Zoning Ordinance. I understand the submission of incomplete or inaccurate information may result in a delay in processing and action on this application and may be subject to other penalties provided by law.

Handwritten signature of Adam Feldman

Handwritten date: 6/29/23

Signature of Contact Person

Date

Note: The following items apply to all applications for plat approval. The Applicant is strongly encouraged to work closely with Staff in advance of an actual application submittal. Please submit ONLY THOSE DRAWINGS necessary to provide information required by this checklist. Submission of construction drawings or other nonessential drawings may delay the review process.

Final Plats

- 1. A final plat for record shall be prepared and submitted to the Department of Community Development for review and recommendation by the Planning Commission and acceptance by the Governing Body. The original plat shall be in sheets of such materials, dimensions and scale as meets the current requirements for the County official in whose office the plats are required to be filed; provided, that when more than one sheet is required, an index sheet of the same size shall be filed showing the entire subdivision on one sheet with block and lot numbers, In no event shall the final plat be on a scale smaller than 200 feet to the inch.

General Requirements for all Final Plat Applications

- 1. Plat application form, filled out completely and accurately with all required contact information, signatures, etc.
2. All files must be electronic. A PDF file shown as 24 x 36 pages to include all general final plat data, existing conditions, proposed conditions, and any ancillary items shall be provided with sufficient information included as to allow for an appropriate review by the City. The plat must be sealed by a licensed land surveyor as required.
3. Include a PDF of the Stormwater report, all pages must be in one document. All plat sets must be one document. Individual pages will not be accepted.

General Final Plat Data

- 1. Legal description and drawing.
2. Proposed name of subdivision and the words "FINAL PLAT".
3. Location map at a scale of not less than 1" = 2,000' with the site plan clearly marked to identify the location of the property.
4. The number of each lot and block, in accordance with a systematic numbering system and "letter" identification of all other parcels, proposed buildings, if any, and proposed ownership.
5. The length of all straight lines, deflection angles or bearings, and radii, arcs and central angles of all curves along the centerline and the property line of each street. All dimensions of property lines along each street and all the lines bordering each lot shall be in feet and decimal fractions of a foot. The true bearings and angles of intersections, and any other data necessary for the location of any dedicated easement in the field; calculated bearings shall be used.
6. The lines and names, with accurate dimensions in feet and decimals of feet, of all proposed streets or other ways or easements and other open spaces intended to be dedicated for public use or granted for use of inhabitants of the subdivision, also lines of all adjoining streets.
7. Suitable primary control points approved by the City Engineer or descriptions and "ties" to such control points, to which all dimension, angles, bearings and similar data given on the plat shall be referred. All dimensions shall be shown in feet and decimals of a foot.
8. The north arrow, scale, and date.
9. Properly executed dedication of all streets, highways, alleys, parks, playgrounds, and other lands as may be appropriate, intended for use by the owner, or owners.
10. Surveyor's certificate of actual field survey with bearings and distances referenced to section or fractional section, corners, township, and range. This survey must be balanced and closed by a Registered Land Surveyor.
11. Dedication language as provided by the Development Review Staff.
12. Blanks for date of approval and for Planning Commission Chair, Mayor and City Clerk's signatures with name printed under the signature line.



13. Blank space in the upper right hand corner of the plat for recording purposes.
14. The area, in square feet, of each lot, parcel or tract in the proposed subdivision. Such area may be indicated on each lot or parcel or on a separate chart on the face of the plat.
15. Dimension of the lot at the front building line on cul-de-sac lots or unusually shaped lots.
16. Final sidewalk/trail location plan included widths.
17. All lot dimensions clearly noted on each lot, parcel or tract.

Existing Conditions

Information, in report and map form (seven copies of each), showing:

1. Zoning.
2. Acreage to be subdivided.
3. Names of adjoining property owners or subdivisions and accurately showing existing property lines, streets, alleys, and other pertinent physical features.
4. Location of 100 year flood plain if located on the property.
5. Vicinity map indicating location of subdivision in relationship to major roadways.
6. Location of all existing structures, wells, etc. and whether they are to be retained or demolished.
7. Location of significant natural features, including the location and identification by common name, of trees and other significant vegetation prepared from aerial photos with on-site verification or survey.
8. Boundaries of any mined, underground space and submittal of any required engineering structural safety studies.

Stormwater / Watershed

1. Existing and proposed storm drainage, indicating location and connections to existing drainage system.
2. Existing topography with contours at vertical intervals of not more than five feet (5') where the slope is greater than ten percent (10%); and not more than two feet (2') where the slope is less than ten percent (10%).
3. Proposed preliminary grading by contours at vertical intervals of not more than five feet (5') where the slope is greater than ten percent (10%); and not more than two feet (2') where the slope is less than ten percent (10%), supplemented by spot elevations where necessary.
4. Provide at a scale appropriate for clear readability the drainage basins, but not less than 1" = 100', both on-site and off-site drainage sub-basins coming to the subject site, including all points at which it leaves the site. Each sub-basin should be clearly labeled with a designation letter or number, acreage of the sub-basin, and CN value of the sub-basin.
5. Limits of the 100 year flood plain and floodway of all existing water courses that would impact this development.
6. Such additional information as may reasonably be required in writing by the City Engineer or Public Works Director.

Submission following recording and prior to issuance of building permits.

After approval of the plat by the Governing Body but prior to assignment of street addresses or issuance of any partial or full building permits, the following additional items must be submitted:

1. One copy of the plat containing original recording information, date, book, and page of recording information
2. One copy of all covenants and restrictions applicable to said subdivision, bearing the recording information.
3. One full size copy and one reduced copy of the address plan for electronic distribution (11"x14"). (Developer's ¼ item) (as recorded at the register of Deeds office) plus sidewalks locations and bearing addresses as assigned by the City of Westwood.

Authorization of Agent / Proof of Ownership

	<p>City of Westwood 4700 Rainbow Blvd Westwood, Kansas 66205 913-362-1550 – Fax 913-362-3308 www.westwoodks.org</p>
---	--

Where an application has been filed by, or on behalf of, a landowner, an affidavit of ownership shall be submitted to the City. Further, where an application has been filed by an agent of a landowner, an affidavit of the landowner establishing the agent's authorization to act on behalf of the landowner shall also be submitted. This form shall be submitted to the City Clerk at the time of filing the application.

Scope of Project/Description of Work: Replatting and preliminary and final development plans.

Project Location/Address: Property IDs: RP30000001 0012A and RP27000000 0008

Agent's Name: Adam Feldman

Company: Karbank Holdings LLC Fax: _____

Mailing Address: 2000 Shawnee Mission Parkway, Suite 400, Mission Woods, KS 66205

E-mail Address: af@karbank.com

Property Owner's Name(s): Unified School District #512 Phone: _____

Company: Unified School District #512 Fax: _____

Mailing Address: 8200 W. 71st Street, Shawnee Mission, KS 66204

E-mail Address: joegilhaus@smsd.org

I declare under penalty of perjury that I am the owner for the address listed above and I personally completed the above information and certify its accuracy.

Signature of Owner: 

Date: 6-26-23

Printed Name of Property Owner: Dr. Joe G. Gilhaus

By: Dr. Joe Gilhaus, Authorized Agent

City of Westwood, Kansas Ownership Affidavit

State of Kansas)
)
County of Johnson) ss.

Dr. Joe Gilhaus, Authorized Agent
Comes now for Unified School District #512 (owner) who being duly sworn upon their oath, does

state that they are the owner of the property legally described as:

Property IDs: RP30000001 0012A and RP27000000 0008

See attached Legal Description.

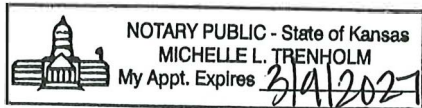
in the application for Replatting and preliminary and final development plans.
(description of application)

and acknowledges that the submission of said application and agrees to bind the subject property in accordance with the plan submitted as part of the above application.

Dated this 26 day of June, 2023.

Dr. Joe Gilhaus
Signature of Owner Unified School District #512
By: Dr. Joe Gilhaus, Authorized Agent
Dr. Joe Gilhaus
Printed Name or Owner

Subscribed and sworn to before me this 26 day of June, 2023.



Michelle L. Trenholm
Notary Public
3/19/2027
My Commission Expires

EXHIBIT "A"
LEGAL DESCRIPTION OF THE LAND

Legal Description to the Developed by Survey

TRACT 1:

THE WEST TWO HUNDRED FIFTY-EIGHT AND ONE-TENTH (258.1) FEET OF THE SOUTH HALF (1/2) OF LOT EIGHT (8), HOLMESLAND, A SUBDIVISION IN THE CITY OF WESTWOOD, IN JOHNSON COUNTY, KANSAS, ACCORDING TO THE RECORDED PLAT THEREOF.

AND ALSO:

THE NORTH HALF OF LOT 8, HOLMESLAND, A SUBDIVISION IN THE CITY OF WESTWOOD, JOHNSON COUNTY, KANSAS EXCEPT THE EAST 286.58 FEET THEREOF, AND THE WEST 258.1 THEREOF.

AND ALSO:

ALL THAT PART OF THE EAST 286.58 FEET OF THE NORTH 1/2 OF LOT 8, HOLMESLAND, A SUBDIVISION IN THE CITY OF WESTWOOD, JOHNSON COUNTY, KANSAS, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT A POINT ON THE NORTH LINE AND 286.58 FEET WEST OF THE NORTHEAST CORNER OF SAID LOT 8; THENCE SOUTH, ALONG A LINE 286.58 FEET WEST OF AND PARALLEL TO THE EAST LINE OF SAID LOT 8, A DISTANCE OF 165.39 FEET, TO THE SOUTH LINE OF THE N 1/2 OF SAID LOT 8; THENCE EAST, ALONG THE SOUTH LINE OF THE N 1/2 OF SAID LOT 8, A DISTANCE OF 1.28 FEET, TO THE NORTHEAST CORNER OF LOT 12, BLOCK 1, KLASSEN PLACE, A SUBDIVISION IN THE CITY OF WESTWOOD, JOHNSON COUNTY, KANSAS; THENCE NORTHEASTERLY, TO A POINT ON THE NORTH LINE AND 271.28 FEET WEST OF THE NORTHEAST CORNER OF SAID LOT 8; THENCE WEST, ALONG THE NORTH LINE OF SAID LOT 8, A DISTANCE OF 15.30 FEET, TO THE POINT OF BEGINNING.

EXCEPT ANY PART USED OR DEDICATED FOR STREETS, ROADS AND PUBLIC RIGHTS

OF WAY. TRACT 2:

ALL OF LOTS 4 THROUGH 14, BOTH INCLUSIVE, BLOCK 1, SWATZELL ADDITION, A SUBDIVISION IN THE CITY OF WESTWOOD, JOHNSON COUNTY, KANSAS.

TRACT 3:

THE EAST 112.3 FEET OF THE NORTH HALF OF LOT 9, HOLMESLAND, A SUBDIVISION IN THE CITY OF WESTWOOD, JOHNSON COUNTY, KANSAS.

Corrected by Desc. on Plat

TRACT 4:

ALL OF LOT 12, BLOCK 1, KLASSEN PLACE, A SUBDIVISION IN THE CITY OF WESTWOOD, JOHNSON COUNTY, KANSAS, EXCEPT THE FOLLOWING TRACT OF LAND:

ALL THAT PART OF LOT 12, BLOCK 1, KLASSEN PLACE, A SUBDIVISION OF LAND IN THE CITY OF WESTWOOD, JOHNSON COUNTY, KANSAS, DESCRIBED AS FOLLOWS: BEGINNING AT THE NORTHEAST CORNER OF SAID LOT 12; THENCE SOUTHEASTERLY, ALONG THE EASTERLY LINE OF SAID LOT 12, TO THE SOUTHEAST CORNER THEREOF; THENCE SOUTHWESTERLY, ALONG THE SOUTHERLY LINE OF SAID LOT 12, A DISTANCE OF 16.87 FEET THENCE NORTHWESTERLY, TO THE POINT OF BEGINNING.

Corrected by Desc. on Plat

WESTWOOD PLANNING COMMISSION

Staff Report

Meeting Date: October 9, 2023

Staff Contact: Leslie Herring, City Administrator

FDP-2023-01 – Consider application of Karbank Holdings, LLC on behalf of owners Shawnee Mission School District and City of Westwood, KS, jointly, for approval of a final development plan at 2511 W. 50th St., 5000 Rainbow Blvd., and 5050 Rainbow Blvd, Westwood, KS 66205

OWNER OF RECORD:

- 5000 Rainbow Blvd.: City of Westwood, Kansas
- 5050 Rainbow Blvd.: City of Westwood, Kansas
- 2511 W. 50th St.: Unified School District No. 512 (Shawnee Mission School District)

APPLICANT: Karbank Holdings, LLC, agent for property owners City of Westwood, Kansas and Unified School District No. 512, jointly.

LOCATION: The property is located on the southwest corner of W. 50th St. and Rainbow Blvd.

EXISTING ZONING: The property is currently zoned R-1 (D): single-family residential.

PROPOSED PROJECT: Build a mixed-use office and retail development (an adjoining future City Park to the west of the subject site but located on the western portion of 2511 W. 50th St. outside of the rezoning subject site).

BACKGROUND: The applicant is requesting approval to rezone a portion of the subject site and for approval of a preliminary development plan to build a mixed-use office and retail development on property currently under contract at 5000 Rainbow Blvd., 5050 Rainbow Blvd., and 2511 W. 50th St.

The rezoning and preliminary development plan are subject to public hearing before the Planning Commission and were considered on both August 7 and September 11, 2023. On September 11th, the Planning Commission made a recommendation to the Governing Body of conditional approval of those applications. The Governing Body is set to consider the three application at its October 12, 2023 regular meeting.

City Park Not Included in this Application

The proposed City Park is not included in this application, as its existence in the location proposed on the west side of the subject site is wholly dependent on the outcome of the applications filed by Karbank for its proposal on the east side of the subject site. The park planning process – including final grading and features/amenities – will take place only if and when approvals for the Karbank proposal have been obtained, lot lines determined and platted¹, and the successful sale and purchase of the various property parcels within the subject site has closed².

¹ Subject to a separate but related process being run commensurate with these applications.

² Pursuant to Purchase Agreements executed jointly by and between USD 512, the City of Westwood, and Karbank Holdings, LLC dated June 8, 2023.

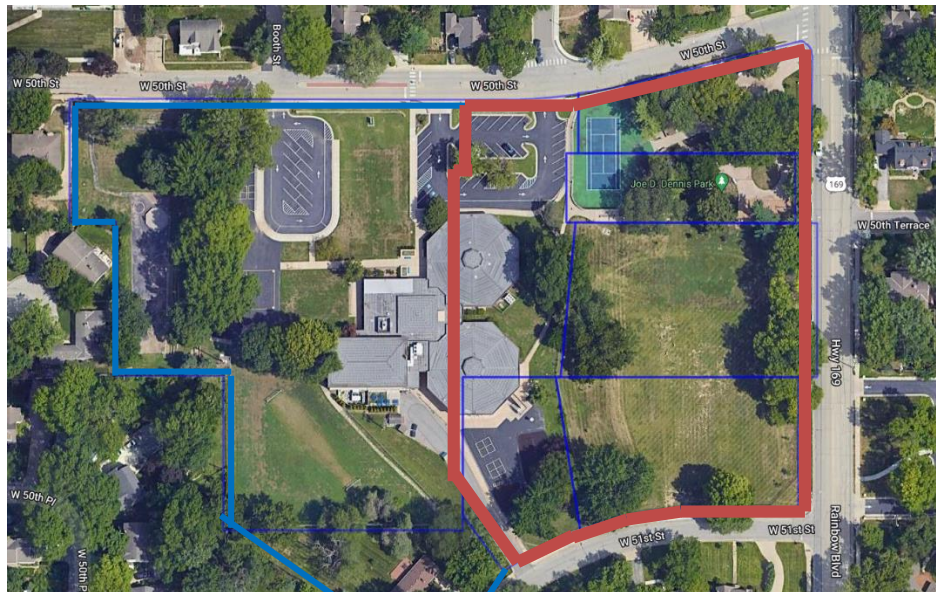
Application Subject to Final Development Plan Approval

This application is subject to both preliminary and a final development plan approval. The preliminary development plan was the subject of the previous three meetings and the final development plan submittal and review process is taking place at this meeting and, it is anticipated to be continued for final action to the November 6, 2023 regular Planning Commission meeting so that it is not approved prior to the Governing Body’s action on the rezoning and preliminary development plan. Unlike the preliminary development plan, which must in this case run concurrently with the rezoning application and which are subject to public hearing, the final development plan is not subject to public hearing so long as it is not substantially changed from the preliminary development plan and so long as the Planning Commission finds that it satisfies the requirements for site planning, landscaping, and other technical studies.

The purpose of the final development plan is to provide for more detailed technical plans and site details that cannot be finalized until the site layout and general elements of the site are agreed upon by the parties (i.e. the City via Staff and the Planning Commission/Governing Body and the applicant).

EXISTING CONDITIONS: This application is to rezone 4.124 acres of the total 7.624 acres of the combined project area. The red outline in the illustration below indicates the area subject to the rezoning request. The area to the west (outlined in blue) indicates the area of the proposed City Park, which is to remain zoned R-1 and which would be subject to a later planning process in the event this rezoning application and preliminary development plan is approved and the sale and purchase of the various properties closes.

The area subject to this rezoning request (outlined in red) currently contains: a portion of an elementary school building and parking lot(s) (to be decommissioned and sold by USD 512 in 2024, regardless of the outcome of these joint applications), a City tennis court, a City playground, and a vacant parcel.



REQUESTED ACTION:

The applicant is requesting approval of a final development plan to construct a mixed-use office and retail development.

GUIDANCE FOR REVIEW:

The following provisions of the Westwood Zoning Ordinance apply to this application.

1.6.26 Consideration of Final Development Plans.

A. No property which has a planned zoning district classification or which requires approval of a final development plan may be developed or significantly redeveloped without a final development plan having been submitted to and approved by the Planning Commission indicating that the site will conform to the current applicable requirements of City code. Final development plans for planned zoning districts which contain no modifications or additions from the approved preliminary development plan shall be approved by the Planning Commission if the Commission determines that the landscaping and screening plan is adequate and that all other submission requirements have been satisfied.

B. A final development plan which contains modifications from the approved preliminary development plan, but is in substantial compliance with the preliminary plan, may be approved by the Planning Commission without a public hearing; provided, that the Commission determines that the landscaping and screening plan is adequate and that all other submission requirements have been satisfied. For purposes of this section, lack of “substantial compliance” shall have the same meaning as “substantial or significant changes” as set forth in Section 1.6.25. Any determination made by the Planning Commission under this subsection shall be appealable to the Governing Body by the applicant within 10 days of the date of the Planning Commission determination.

C. In the event of a determination that the proposed final development plan is not in substantial compliance with the approved preliminary development plan, the application may not be considered except at a public hearing, following publication notice and notice to surrounding property owners as provided in Section 1.6.8 through 1.6.9.

D. Revisions to approved final development plans which are insignificant in nature may be approved administratively by the Building Official. In no event may revisions to approved final development plans be approved administratively if the proposed revised final plan contains “substantial or significant changes” as defined in Section 1.6.25.

E. The Building Official may accept final development plans submitted concurrently with the preliminary development plan. The Planning Commission may approve a final development plan prior to the approval of a preliminary development plan by the Governing Body with the conditions on the final development plan approval that it is consistent with the approved preliminary development plan and subject to the preliminary development plan being approved by the Governing Body.

STAFF ANALYSIS: Staff review and comments have been satisfied by revisions to the final development plan and, as such, staff recommends approval of the final development plan subject to the Governing

Body's review and action on the preliminary development plan and any changes thereto that would impact the final development plan's compliance with the preliminary development plan.

STAFF RECOMMENDATION: Staff recommends that the Planning Commission review the final development plan and ask any questions or share any concerns that may arise from such review so that action may be taken at the November 6th Planning Commission meeting subject to any revisions required.

Suggested Motion:

No action recommended at this time.



FINAL PLAN APPLICATION AND CHECKLIST

Final Plan

FINAL PLAN /REVISED FINAL PLAN

\$400.00

Office Use Only
Fee Paid: \$
Date Paid:
Case No.:
Meeting Date:

NAME OF DEVELOPMENT 50th and Rainbow Development
 ADDRESS / PARCEL ID # RP30000001 0012A and RP27000000 0008
 CURRENT ZONING R-1 Single Family Residential (rezoning in progress to PD - Planned Development District)

APPLICANT

FIRM Karbank Holdings LLC CONTACT Adam Feldman
 ADDRESS 2000 Shawnee Mission Parkway, Suite 400
 CITY Mission Woods STATE KS ZIP 66205
 PHONE 816-221-4488 E-MAIL _____

OWNER

NAME Unified School District #512 CONTACT Dr. Joe Githaus
 ADDRESS 8200 W 71st Street
 CITY Shawnee Mission STATE KS ZIP 66205
 PHONE 913-957-2560 E-MAIL joegithaus@smnr

ARCHITECT

FIRM Perspective Architecture + Design CONTACT Mike Paxton
 ADDRESS 2000 Shawnee Mission Parkway, Suite 100
 CITY Shawnee Mission STATE KS ZIP 66204
 PHONE 816-502-1500 E-MAIL mike@pad.studio

ENGINEER

FIRM BHC CONTACT Austin Lage
 ADDRESS 7101 College Blvd # 400
 CITY Overland Park STATE KS ZIP 66210
 PHONE 913-663-1900 E-MAIL austin.lage@bhc



FINAL PLAN APPLICATION AND CHECKLIST

I, **Adam Feldman** (Contact Person's Name), hereby certify the attached and completed application contains the information as specified below in accordance with the Westwood Zoning Ordinance. I understand the submission of incomplete or inaccurate information may result in a delay in processing and action on this application.

Signature of Contact Person

Date

Note: The following items apply to all applications for final plan approval. Some plans, because of their scale and complexity may require additional information. The Applicant is strongly encouraged to work closely with Staff in advance of an actual application submittal. **Please submit ONLY THOSE DRAWINGS necessary to provide information required by this checklist. Do not submit construction drawings or other nonessential drawings may delay the review process.**

General Requirements for all Final Plan Applications

1. Plan application form filled out completely and accurately with all required contact information, signatures, etc.
2. All files must be electronic. A PDF file shown as 24 x 36 pages to include all general site development data, landscape and fence data, engineering data, utility plans, floor plans and building elevations, and any ancillary information shall be provided with sufficient information included as to allow for an appropriate review by the City. Three (3) full-sized and three (3) half-sized full plan sets are required.
3. Please label documents, i.e.: Final Plan Set, Stormwater Report, Cross Access Easement, Cut Sheets for Lighting, Cut Sheets for Major Site Furnishings (benches, fountains, planters, statuary), etc. All plans must be sealed by a licensed architect, professional engineer as required.
4. A PDF of the Stormwater report, all pages must be one document.
5. A project narrative. Where tenants are known, the project narrative should consist of: a business description, hours/days of operation, number of employees, goods or services rendered, products sold at wholesale or retail on site or distributed off-site, any flammable products or chemicals with method of storage, etc. (MSDS sheets will be required at time of Building Permit application).

General Information required for all Final Plan submittals

1. North arrow.
2. A scale appropriate to clearly express the design intent for the project, but not less than 1" = 100'
3. A project location map at a scale of not less than 1" = 2000', with the site plan clearly marked.
4. Dates of plan preparation and or plan revisions.
5. Owner's name, zoning and present use of adjoining tracts.

Project plans must include the following information:

General Site Development Data

1. Boundary survey tied to established section lines.
2. Section, Township, and Range.
3. Gross and net acreage of the site.
4. Location, width and names of all existing (or proposed) streets and water courses.
5. Location and dimensions of all existing buildings; and location and dimensions of all proposed buildings.
6. Current use of each existing structure; and proposed use of each proposed structure.
7. Adjacent development including lot lines, building footprint, access points and parking.
8. Location, type, and width of sidewalks and walkways.
9. Location of and type of trash disposal with proposed screening materials.
10. Location of all existing (or proposed) easements.
11. All parcels of land proposed to be dedicated to public use and the conditions of such dedication, if any.
12. Boundaries of any mined, underground space and submittal of any required engineering structural safety studies.

Parking

1. Location and dimensions of off-street parking including spaces for the disabled, curb cuts, ramps, and location of all loading areas.
2. Angle of parking stalls.
3. Dimensioned width of parking aisles, islands, and drives.
4. Curb radii.
5. Show calculations used to determine the number of parking spaces required by ordinance.



FINAL PLAN APPLICATION AND CHECKLIST

Landscape Plan and Fence Data

Detailed site and landscape plans must be prepared to clearly describe proposed improvements within the buffer areas, internal parking lot landscape areas, pedestrian-oriented public open space, stormwater management tracts and other common open space areas. Plans must include the following information:

1. Existing and proposed contours, [Minimum of five foot (5') intervals for slopes over ten percent (10%) and two foot (2') intervals for slopes under ten percent (10%)].
2. Plans must reflect pedestrian access to, as well as circulation within, common open areas. Public sidewalks must be completed with the initial street improvements. Pedestrian links to the public walks and trails within a planned development must also be reflected on plan.
3. Identification of existing individual trees and significant other vegetation to be removed and to be retained.
4. A plant schedule to provide plant name (common and botanical), quantity, planting size, and unique planting and maintenance requirements).
5. Calculations for planting areas.
6. Planting details to describe the various planting situations (tree, shrub, planting bed, tree protection, set back from parking stalls, etc.).
7. Sight distance analysis with relation to the street and perimeter planting programs.
8. Major site furnishings (benches, fountains, planters, statuary, etc.) should be identified.
9. Site feature buffering and screening as specified by code.
10. Location of all utility meters, HVAC units, control boxes, pollution control units, etc. and proposed screening methods.
11. Location and complete design details must be submitted to describe the type height, and appearance of fences, retaining walls and architectural screens.
12. Perimeter planting and land use intensity buffer requirements will need to be addressed as they may apply.
13. Plans must reflect all ground cover and pavement types.
14. With regard to native grass and wildflower areas, the landscape plan must include detailed specifications to describe the proposed seed mix and explain how the native planting areas are to be established and maintained. Planting methods other than seeding may be determined necessary where plant uniformity or stability of the soil surface is considered essential.
15. Plans must indicate that all turf areas are to be established with the use of sod unless specifically noted for seeding in the approved final landscape plan.
16. Landscape irrigation plans must be included to show location of hose bibs and sprinkler heads and must reflect suggested coverage.
17. Other information as may be determined necessary by the Applicant/City to address site specific details.
18. The final landscape plans must be properly sealed by a registered Landscape Architect, licensed to practice in the state of Kansas, prior to a building permit being issued.

Lighting

Exterior lighting information must be submitted to include a complete description of fixtures and a photometric layout for the overall site development. Cut sheets must be provided for all exterior fixtures to clearly describe equipment type, location and mounting height.

Signs

A written sign criteria and sign construction drawings as well as a mock layout of signs applied to the building elevation plan, must be submitted to describe the allowable signs and sign area in detail per code specification. The criteria must also contain signature blocks for the property owner(s) and city approval.

Building Plans

1. Complete floor plans of existing and proposed buildings must be submitted to include dimensions and a description of use areas.
2. Building elevation plans of all sides of the building(s) are required to illustrate the proposed architectural quality and character of the building(s). Plans must include necessary dimensions, a detailed description of finish materials and colors, and must accurately describe proposed architectural detailing. Material and color samples must also be included at this time.
3. Plans must reflect suggested location of wall mounted meters and other service equipment and address required screening and coordination with exterior wall colors.
4. Building drainage must be through integrated downspout system / roof drains.
5. Show floor area by use, access points, and loading area, height of the structures and number of stories.
6. Identify any / all building(s) that are proposed to have automatic sprinkler systems.



FINAL PLAN APPLICATION AND CHECKLIST

Engineering Information

Streets & Access

1. Location, type and size of access points, driveways, curb cuts to the proposed site and all adjacent sites.
2. Existing street network.
3. Proposed street network, including horizontal and vertical curvature data and profiles.
4. Show, label, and dimension all existing and proposed right of way.
5. Provide intersection site distance analysis.
6. Provide traffic lane markings and regulatory signs where applicable.
7. Street light plan. Where existing street lights must be relocated, said street lights must be noted as "to be relocated" on the plans along with the name and mailing address of the party who will assume relocation costs.
8. Vehicle maneuvering / turning templates reflecting the site can accommodate a minimum SU-30 class vehicle (for emergency access to all areas of the site), and the appropriate maneuver/turning templates for any other vehicles that will be accessing the site (such as delivery or dock areas, etc.).

Stormwater / Watershed

1. Existing and proposed storm drainage, indicating location, types of materials, sizes, types and grades of ditches, storm sewers, catch basins, and connections to existing drainage system.
2. Existing topography with contours at vertical intervals of not more than five (5) feet where the slope is greater than ten percent (10%); and not more than two (2) feet where the slope is less than ten percent (10%).
3. Proposed finished grading by contours at vertical intervals of not more than five (5) feet where the slope is greater than ten percent (10%); and not more than two (2) feet where the slope is less than ten percent, supplemented by spot elevations where necessary.
4. Provide at a scale appropriate for clear readability the drainage basins, but not less than 1" = 100', both on-site and off-site drainage sub-basins coming to the subject site, including all points at which it leaves the site. Each sub-basin should be clearly labeled with a designation letter or number, acreage of the sub-basin, and CN value of the sub-basin.
5. Limits of the 100 year flood plain and floodway of all existing water courses that would impact this development.
6. Impervious area calculations.
7. Level of service calculations with all appropriate maps / plans to identify and justify the areas utilized.
8. Proposed BMP types and locations in plan, profile, and detail form.
9. Memorandum of Resource Management including:
 - a. Identification of the soil types (and their properties) found on the project site, identified from the NRCS Soil Survey map.
 - b. Identification of wetland delineation in the form of a copy of National Wetland Inventory index.
 - c. Habitat evaluation for threatened and endangered species.
 - d. Location and general type of existing trees and significant vegetation and trees proposed for preservation and removal if estimated to be greater than 10" caliper, (prepared from aerial photo or survey).
 - e. Latest (not more than two years old) aerial photograph of the site.
 - f. Existing contour information for the site.
10. Such additional information as may reasonably be required in writing by the City Engineer or Public Works Director.
11. All engineering plans must be wet sealed by a Kansas Registered Professional Engineers.

Utility Site Plans / Data

1. Location of all utilities shown on plan.
2. Location of all utility meters, HVAC units, control boxes, pollution control units, etc. and proposed screening methods.
3. All utilities are required to be placed underground.
4. Sanitary sewer plan.

Ancillary Information (as necessary)

1. General restrictions imposed by the developer.
2. Proposed restrictions, to run with the property that will guarantee adherence to the design standards (architectural, landscape, and other) agreed to at the time of plan approval.
3. Cross Access, Parking, and Maintenance Agreements as necessary for multiple building projects.
4. Letters of approval for encroachment from easement holders (e.g. utilities) for which site development encroaches upon the utility holder's easement.
5. Such other information as the Planning Commission shall by written rule require.
6. Any other information the applicant believes will support the request.
7. At the time of final plan revision submission (for Agenda presentation) the following must be submitted:
 - a. PDF files must include one full size. All pages of the full size set must be included in one document. *Do not submit individual pages.*
 - b. A digital copy of all stormwater components must accompany revisions.

50TH & RAINBOW DEVELOPMENT

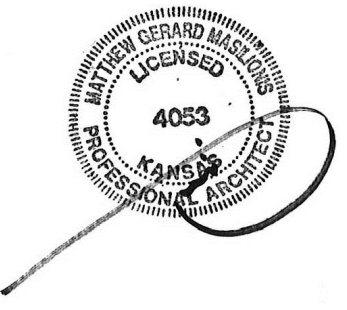
W 50TH STREET & RAINBOW BLVD
WESTWOOD, KANSAS 66205

Perspective
ARCHITECTURE

2000 SHAWNEE MISSION PKWY
SUITE 100
MISSION WOODS, KS 66205

816 502 1500

WWW.PAD.STUDIO



MATTHEW MASILIONIS - ARCHITECT
KANSAS # 4053

I have prepared the drawings and assume responsibility for the above-mentioned project have been by and are the responsibility of the licensed engineer whose stamp and firm appear on these sheets.
The Architect is not responsible for the design of the mechanical, electrical, plumbing, civil, landscaping, structural, signage (not specified), fire sprinkler or fire suppression systems, and does not take responsibility for the compliance of these areas with the laws of the above governmental entities. The architect is not responsible for materials, components or equipment installed on the project by others. The architect is not liable or responsible for verification, during construction or upon completion of construction. The architect is not responsible for improper operation due to faulty installation or product failure during construction or after completion of construction when operation has begun by the landlord or tenant.
The licensed professional whose stamp appears on sheets other than those specifically noted above shall be responsible for those items in paragraph three.

CONSULTANT

KARBANK
REAL ESTATE COMPANY

PROJECT
50TH AND RAINBOW DEVELOPMENT

50TH ST & RAINBOW BLVD,
WESTWOOD KS, 66205

MARK	DATE	DESCRIPTION
1	10/05/23	CITY COMMENTS

SHEET TITLE

COVER SHEET

PROJECT NUMBER
2021073.000

SHEET AUTHOR
K MILLER

CHECKED BY
M PAXTON

DATE
9.15.23

FDP SUBMITTAL

SHEET NUMBER

A000

36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01

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MAIN BUILDING PERSPECTIVE RENDERING L19



PAVILION PERSPECTIVE RENDERING A19

The 50th and Rainbow Development is a proposed Planned Development District (PD) located on the west side of Rainbow Boulevard between 50th Street and 51st Street in the City of Westwood, Kansas. The proposed project will feature approximately 19,498 leasable square feet of retail space on the 1st floor of the building and approximately 78,351 leasable square feet of office space on 3 floors above the retail. Adjacent to the main building is a smaller 8,750 leasable square foot single story office / retail building broken into two masses.

Because of the mixed-use nature of the proposed project, it is anticipated that portions of the first and second floors of the buildings may be a mix of retail and office uses in lieu of being strictly office or strictly retail. An underground parking structure is located to the west and north of the main building with 167 covered parking spaces. 123 surface parking spaces are also provided on the east and west sides of the main building.

With regard to the 2017 Westwood Comprehensive Use Plan, the land use map in Section 3.3 identifies the proposed development location as Public / Semi-Public and Open Space. This usage type per Figure 3.2 accounts for only 4.4% and 0.8% of the overall city land use. Given the small percentage of space allocated to these uses, it seems vital to the community to maintain these land use types. The proposed development would offer a mixture of Public and Semi-Public spaces with office and retail buildings, and maintain the Open Space components with the proposed City Park. Alternatively, if the plan reverted to the R-1 Single Family Residence Zoning of the surrounding neighborhood, the location would become private space which would seem in conflict with the Comprehensive Use Plan.

The specific stated desired outcomes of the 5050 Rainbow Site, and the Westwood View Elementary site per the Westwood Comprehensive Use Plan are to:

- Protect and minimize impacts to adjacent residential property.
- Offer indoor and/or outdoor community activity/gathering spaces.
- Attract and keep residents.
- Retain and grow property values.
- Support local / small business development

The proposed project would provide a vital fully integrated, mixed-use, pedestrian oriented commercial neighborhood that would meet all of the desired outcomes as listed in the Comprehensive Use Plan. Specifically related to Section 1.6.17 of the Zoning Ordinance Criteria for Considering Applications for a Rezoning Request:

Per Section 6.2.2, a PD Planned Development district is equivalent to C-1 Zoning. The proposed development would be in substantial compliance with current C-1 Zoning. Minor deviations are anticipated and included in the deviations list on the cover sheet.

- A. The conformance of the proposed use to the City's Comprehensive Plan and other adopted planning policies. **Per Section 6.2.2, a PD Planned Development district is equivalent to C-1 Zoning. The proposed development would be in substantial compliance with current C-1 Zoning. Minor deviations are anticipated and included in the deviations list on the cover sheet.**
- B. The character of the neighborhood including, but not limited to: Land use, zoning, density (residential), architectural style, building materials, height, structural mass, siting, open space, and floor-to-area ratio (commercial and industrial). **The proposed buildings have intentionally been pushed back from Rainbow Boulevard and the tallest of the buildings are at the center of the site to best fit in with the scale and character of the surrounding neighborhood. Additionally, the majority of existing trees will be preserved at the perimeter of the site to create a large multistory landscape buffer from surrounding neighbors and preserve the existing quality of the streetscape. Building massing has been broken down in plan and elevation to create smaller scaled facades of varying colors to also complement and blend into the surrounding residential neighborhood.**
- C. The zonings and uses of nearby properties, and the extent to which the proposed use would be in harmony with such zonings and uses. **All nearby properties are Zoned R-1 Single Family Residential. The proposed Development would bring a mix of office and retail uses to the project compatible with the surrounding neighborhood providing residents walkable places to work and shop fulfilling the purpose of a fully integrated, mixed-use, pedestrian oriented neighborhood.**
- D. The suitability of the property for the uses to which it has been restricted under the applicable zoning district regulations. **While the current property could be utilized for single family residential, adding a mixture of office, retail and park functions would serve to provide additional amenities to the residents in the area.**
- E. The length of time the property has remained vacant as zoned. **The former church site property along Rainbow Boulevard was acquired by the City of Westwood and the church was demolished to accommodate the city's plan for future development The school, while still in use, is scheduled to be vacated in August 2024.**
- F. The extent to which approval of the application would detrimentally affect nearby properties. **Approval of the application would have no detrimental effect on nearby properties.**
- G. The extent to which the proposed use would substantially harm the value of nearby properties. **The proposed use will not harm and may enhance the value of nearby properties.**
- H. The extent to which the proposed use would adversely affect the capacity or safety of the portion of the road network influenced by the use, or present parking problems in the vicinity of the property. **The existing site functions as both a school and a park, creating peak traffic times as well as various visitor traffic throughout the day. Traffic flow for the proposed development would be of a similar nature with peak traffic times at the beginning and end of the office work day, and various visitor traffic to retail shops throughout the day. Parking for the proposed development would be handled internally on the site so there would be minimal overflow to the surrounding area.**
- I. The extent to which the proposed use would create excessive air pollution, water pollution, noise pollution, or other environmental harm. **No excess air, water or noise pollution or other environmental harm would occur.**
- J. The economic impact of the proposed use on the community. **The Economic Impact of the proposed project would result in a net increase to the sales and property taxes received by the City of Westwood. No tax incentives are being requested by the developer as part of this project apart from a sales tax waiver on construction materials.**
- K. The gain, if any, to the public health, safety, and welfare due to denial of the application as compared to the hardship imposed upon the landowner, if any, as a result of denial of the application. **No gain to the public health, safety and welfare would occur due to denial of the application, however if the application is denied, a substantial portion of the site would remain vacant and the future of city park would be in jeopardy.**

PROJECT NARRATIVE M01

The following Deviations from the equivalent C-1 Zoning are requested as part of the proposed PD Planned Development District:

5.3.7 A Unless otherwise indicated in a specific Overlay District, the facade of building in the C-1 District shall be constructed directly on the build-to line along at least seventy percent of the length of the building.

The proposed development is surrounded by residential housing of 2 story scale set back typically 35- 60 feet from Rainbow Boulevard. Placing the buildings at property line is inconsistent with surrounding scale and development. Placing the buildings back from Rainbow allows a softening of the perimeter to create a better scale with the neighboring houses as well as opportunity to create more habitable spaces for pedestrians, restaurants and retail. In effect it allows a place to be created versus a space directly adjacent to a major boulevard.

Additionally, 5.5.1 B states that in C-1 Districts, off-street parking of no less than 75% of the parking places shall be to the rear or side of the building. As proposed 85% of the parking spaces will be.

Underground rock is currently located at elevation 936 only a few feet below grade. Due to the natural slope of the site from a high on the northwest to a low on the southeast, placing all parking to the rear of buildings would create a primary retail entrance via an underground parking garage.

5.3.7 C Parking areas and parking garages shall be recessed or placed to the rear of buildings.

5.3.7.H.2 The required setbacks shall be as indicated in each Overlay District, or, in the absence of such criteria, as follows.
2. rear setback: 20 feet minimum.

Due to site constraints and in effort to align the drive isle on the upper level of the parking deck with Adams street we would ask for a deviation on the 20' setback requirement in the rear yard adjacent to the future park.

5.5.1 B states that in C-1 Districts, off-street parking of no less than 75% of the parking places shall be to the rear or side of the building. The proposed development has 85% of parking areas and parking garages at the rear or side of the building, hidden from view. The natural topography of the site sets itself up to place a recessed garage at the rear of the buildings with a small surface parking lot in front of the buildings to allow visible access to the retail and office entries.

5.3.8 A B C One-, two-, and three-story buildings are permitted in the C-1 Mixed-use Districts.

The proposed four-story portions remain in compliance with the zoning requirements and maximum allowable height restrictions of a "mid-rise building". Portions of the building at the center of the project are 4 stories along Rainbow Boulevard. The additional story creates a stronger mass at the center of the site, allowing for rooftop terraces and a stronger sense of hierarchy and visual interest toward the center of the site. Because the project is set into a hillside, the four-story portions of the building allow for a more varied appearance in keeping with the massing and variety of the neighboring residential area. Moreover, on the west and north sides of the site the buildings will only have 3 stories visible above grade.

5.4.2.1 Minimum Parking Spaces Per Use

Based on the developer's experience with the local market and retail and office uses of a similar type to those of the proposed development, the amount of parking proposed is less than the minimum requirement and in keeping with market expectations and standards in this location.

DEVIATION REQUESTS F01

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BHC
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austin.lage@bhc.com

ARCHITECT
KENNY MILLER
PERSPECTIVE ARCHITECTURE
& DESIGN
2000 SHAWNEE MISSION PKWY
SUITE 100
MISSION WOODS, KS 66205
816.842.1549
kenny@pad.studio

PROJECT EXTENTS

PROPERTY LOCATION MAP A11

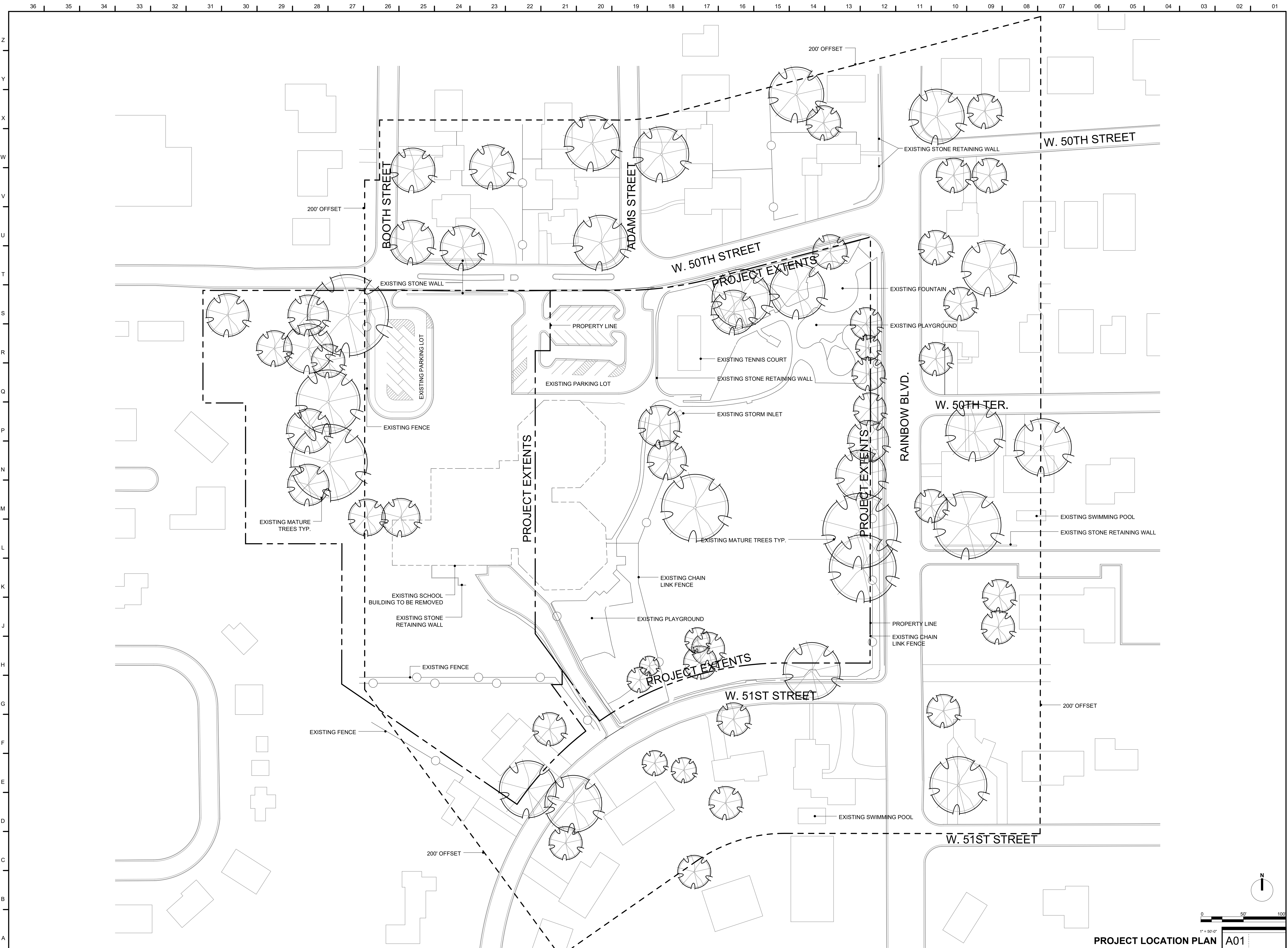
CONTACT INFORMATION A06

SHEET INDEX A01

GENERAL	ARCHITECTURAL
A000	COVER SHEET
A001	PROJECT LOCATION PLAN
CIVIL	
C1.0	DEMO PLAN
C2.0	OVERALL SITE PLAN
C2.1	SITE PLAN - GROUND LEVEL
C2.2	SITE PLAN - SECOND LEVEL
C2.3	DIM PLAN - GROUND LEVEL
C2.4	DIM PLAN - SECOND LEVEL
C2.5	SIGHT DISTANCE PLAN
C2.6	FIRE TRUCK MANEUVERABILITY
C3.0	GRADING PLAN
C3.1	DETAIL GRADING - GROUND LEVEL
C3.2	DETAIL GRADING - SECOND LEVEL
C4.0	UTILITY PLAN
C5.0	EXISTING DRAINAGE MAP
C5.1	PROPOSED DRAINAGE MAP
C6.0	BMP PLAN
L1.1	TREE PRESERVATION PLAN
L1.0	LANDSCAPE PLAN - GROUND LEVEL
L1.1	LANDSCAPE PLAN - SECOND LEVEL
L3.0	PLANTING DETAILS
PH.1	PHOTOMETRICS PLAN
ARCHITECTURAL	
AS101	ARCHITECTURAL SITE PLAN
AS102	ARCHITECTURAL SITE PLAN
AS103	ARCHITECTURAL SITE PLAN
A201	BUILDING ELEVATIONS
A202	BUILDING ELEVATIONS
A203	BUILDING ELEVATIONS
A600	DETAILS

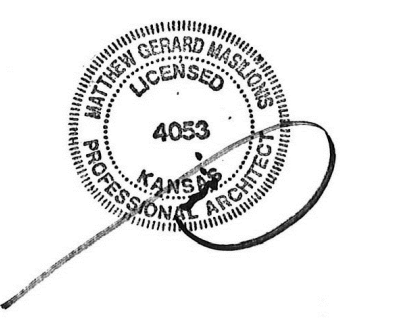
CONTACT INFORMATION A06

SHEET INDEX A01



Perspective

2000 SHAWNEE MISSION PKWY
SUITE 100
MISSION WOODS, KS 66205
816 502 1500
WWW.PAD.STUDIO



MATTHEW MASILIONIS - ARCHITECT
KANSAS # 4053

I have prepared the drawings and assume responsibility for the sheets numbered with an "A" prefix for the project named below.

Other drawings and specifications attached for the above-mentioned project have been by and are the responsibility of the licensed engineer whose stamp and firm appear on that sheet.

The Architect is not responsible for the design of the mechanical, electrical, plumbing, civil, landscaping, structural, signage (not specified), fire sprinkler or fire suppression systems, and does not take responsibility for the compliance of these areas with the laws of the above governmental entities. The architect is not responsible for materials, components or equipment, as well as the method in which they are installed on the project by others. The architect is not liable or responsible for verification, during construction or upon completion of construction. The architect is not responsible for improper operation due to faulty installation or product failure during construction or after completion of construction when operation has begun by the landlord or tenant.

The licensed professional whose stamp appears on sheets other than those specifically noted above shall be responsible for those items in paragraph three.

CONSULTANT



PROJECT
50TH AND RAINBOW DEVELOPMENT

50TH ST. & RAINBOW BLVD.
WESTWOOD KS, 66205

MARK	DATE	DESCRIPTION

SHEET TITLE

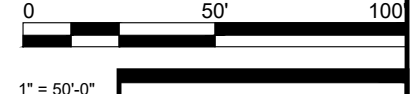
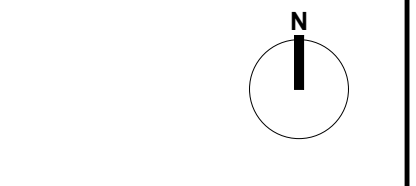
PROJECT LOCATION PLAN

PROJECT NUMBER
2021073.000
SHEET AUTHOR
K. MILLER

CHECKED BY
M. PAXTON
DATE
9.16.23

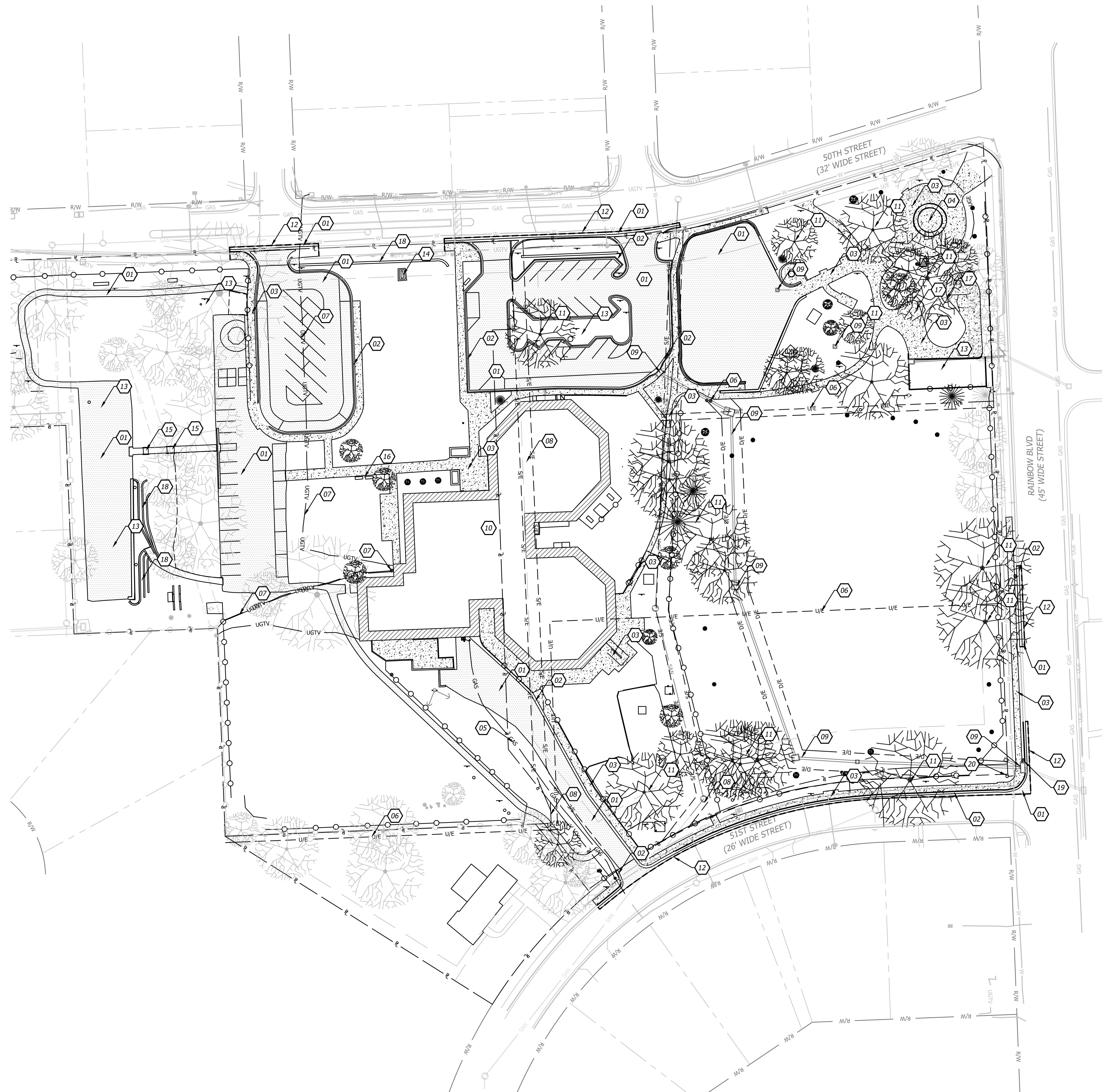
FDP SUBMITTAL

SHEET NUMBER
A001



PROJECT LOCATION PLAN A01

Oct 05, 2023 9:59am Plotted By: austin@lago V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SRFS-DEMO.dwg Layout: DEMO PLAN



GENERAL NOTES

1. Contractor shall verify the location, size, material and depth of all utilities prior to any excavation or construction activity.
2. All materials shall be removed and disposed of off-site. It is the contractors responsibility to meet all applicable laws and regulations pertaining to the disposal of construction/demolition material.
3. The Contractor shall ensure that any structures to remain which are damaged during demolition operations shall be repaired to meet current code, at no additional cost to the owner.
4. The Contractor shall remove any and all existing debris which is encountered from the existing site. This shall include, but shall not be limited to, footings, concrete slabs, conduits, granular subgrade, utility services, and/or unsuitable structural fill material as determined by the owner's engineer. The cost for these removals shall be considered incidental to the project. Said debris shall become property of the contractor and it shall be the responsibility of the contractor to dispose of properly off-site.
5. It shall be the Contractor's responsibility to meet all applicable laws and regulations pertaining to the disposal of construction/demolition material.
6. The Contractor shall be responsible for obtaining and payment of any permits for demolition that pertain to this project.
7. All protection fencing shall be installed prior to demolition/construction activity. The Contractor shall provide a 6-foot security fence around the entire job site with locked gated access points, if required by the owner or the city.
8. All existing utilities removed during construction shall have their trenches backfilled with structural fill and be compacted to the requirements for structural fill.
9. All removals required to properly perform the work (whether shown on the plans or not) shall be performed by the Contractor at no additional cost to the owner.

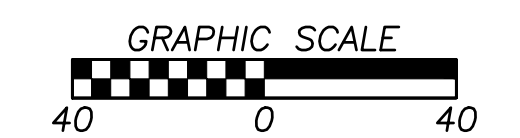
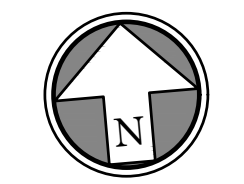
DEMOLITION NOTES

- 01 REMOVE & DISPOSE OF EXISTING ASPHALT.
- 02 REMOVE & DISPOSE OF EXISTING CURB.
- 03 REMOVE & DISPOSE OF CONCRETE.
- 04 REMOVE & DISPOSE OF CONCRETE FOUNTAIN.
- 05 REMOVE EXISTING GAS LINE BACK TO MAIN AND CAP LINE AT CONNECTION POINT TO PRESERVE CONNECTION POINT FOR FUTURE USE.
- 06 REMOVE ELECTRIC STRUCTURES AND ASSOCIATED UNDERGROUND SERVICE LINES.
- 07 REMOVE & DISPOSE OF EXISTING UNDERGROUND FIBER.
- 08 REMOVE EXISTING SANITARY STRUCTURES AND LINE BACK TO STUB AND CAP LINE TO PRESERVE CONNECTION POINT FOR FUTURE USE.
- 09 REMOVE EXISTING STORM SEWER STRUCTURES & PIPES
- 10 REMOVE & DISPOSE OF EXISTING BUILDING.
- 11 REMOVE & DISPOSE OF EXISTING TREES; RE. SHEET L1.0.
- 12 SAW CUT EXISTING PAVEMENT TO FULL DEPTH & CLEAN EDGE.
- 13 REMOVE & DISPOSE OF PLAYGROUND EQUIPMENT
- 14 REMOVE & DISPOSE OF MONUMENT SIGN
- 15 REMOVE & DISPOSE OF CONCRETE STAIRS AND HANDRAILS
- 16 REMOVE & DISPOSE OF PARK BENCH
- 17 REMOVE & DISPOSE OF ROCK AND TUNNEL
- 18 REMOVE & DISPOSE RETAINING WALL
- 19 REMOVE & RELOCATE STREET LIGHT; RE. SITE PLAN.
- 20 REMOVE & RELOCATE OF EXISTING FIRE HYDRANT; RE. UTILITY PLAN.

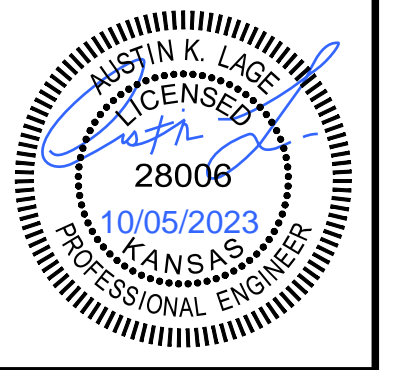
DEMOLITION LEGEND

- SAW CUT LINE
- [Hatched Box] EXISTING BUILDING TO BE REMOVED
- [Dotted Box] ASPHALT PAVEMENT TO BE REMOVED
- [Stippled Box] CONCRETE TO BE REMOVED

ENTIRETY OF SHEET WAS UPDATED



Rev.	Date	Description
1	10/05/23	CITY COMMENTS



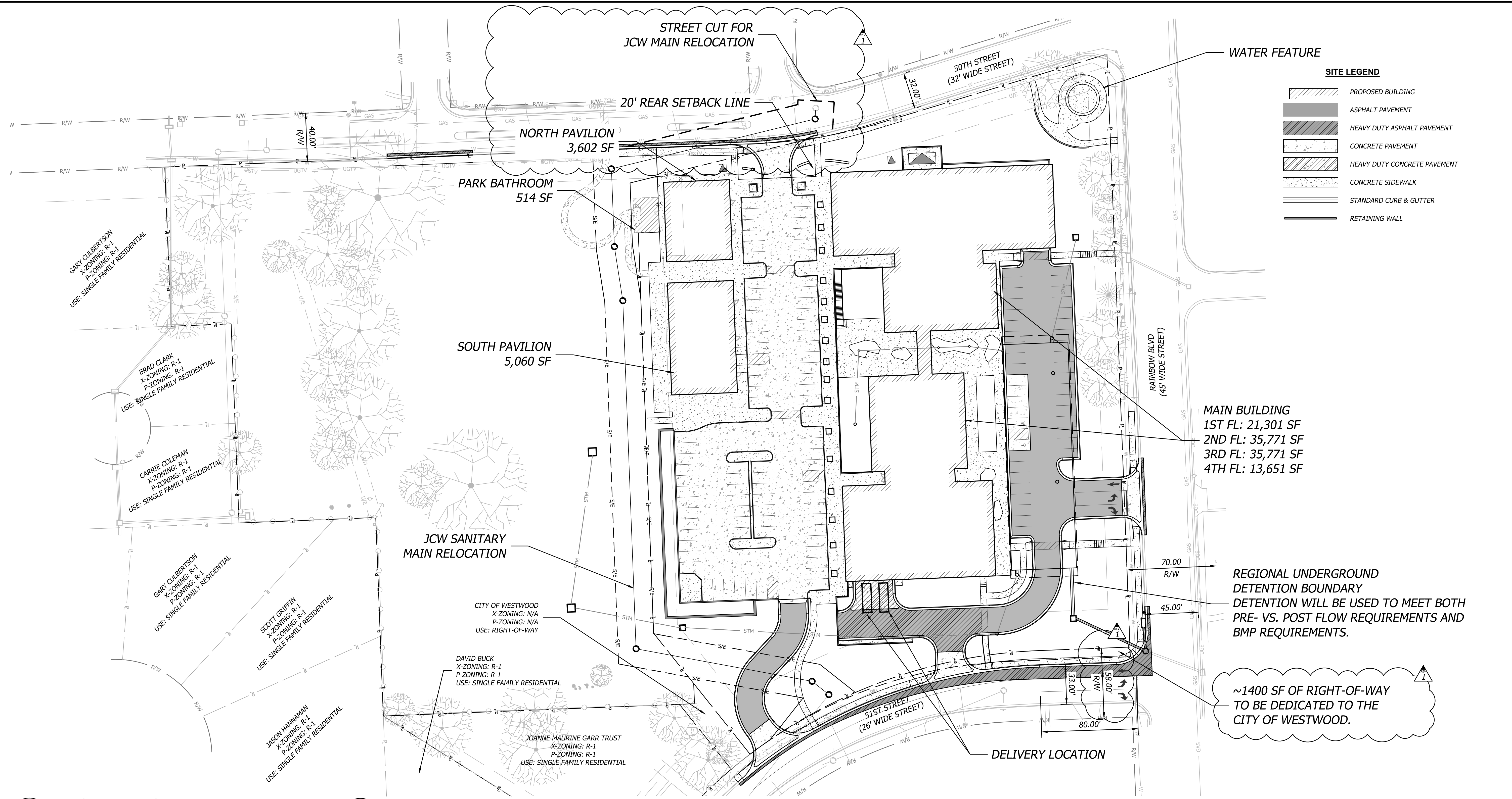
Prepared For:
 KARBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SW PKWY, SUITE 400
 MISSION WOODS, KS 66205
 816-221-4488

FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
DEMO PLAN

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

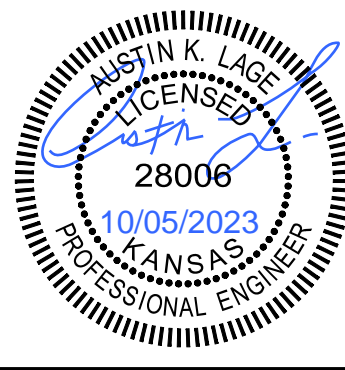
C1.0

Oct 05, 2023 - 10:00am Plotted By: custin.lope V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITE-SITE.dwg Layout: OVERALL SITE PLAN



SITE LEGEND

	PROPOSED BUILDING
	ASPHALT PAVEMENT
	HEAVY DUTY ASPHALT PAVEMENT
	CONCRETE PAVEMENT
	HEAVY DUTY CONCRETE PAVEMENT
	CONCRETE SIDEWALK
	STANDARD CURB & GUTTER
	RETAINING WALL



Prepared For:
 KARIBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SW PARKWAY, SUITE 400
 MISSION WOODS, KS 66205
 816-221-4488

FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
OVERALL SITE PLAN

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

C2.0

SITE DATA

OVERALL SITE	
SITE AREA:	7.62 AC 332,129 SF
WEST SITE	
SITE AREA:	3.38 AC 147,412 SF
IMPERVIOUS AREA:	
EXISTING:	56,265 SF (38.2%)
PROPOSED:	3,758 SF (2.55%)
EAST SITE	
SITE AREA:	4.24 AC 184,717 SF
IMPERVIOUS AREA:	
EXISTING:	65,035 SF (35.2%)
PROPOSED:	127,462 SF (69.0%)

BUILDING DATA - GROSS AREA

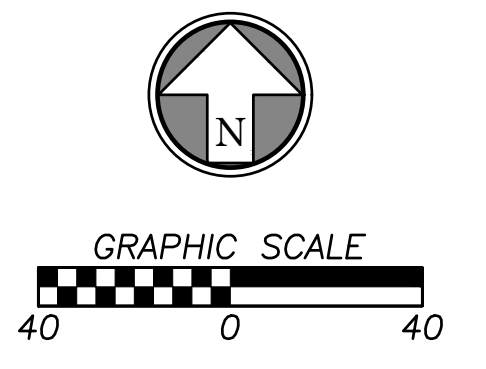
WEST SITE	
PUBLIC BATHROOM:	514 SF (0.35%)
EAST SITE	
TOTAL BUILDING FOOTPRINT:	44,433 SF (24.1%)
TOTAL BUILDING SF:	115,156 SF
MAIN BUILDING:	
FOOTPRINT:	35,771 SF (19.4%)
TOTAL SF (4 FLOORS):	106,494 SF
PAVILION BUILDINGS:	
NORTH FOOTPRINT:	3,602 SF (1.95%)
SOUTH FOOTPRINT:	5,060 SF (2.74%)
LOT COVERAGE	
BUILDING/STRUCTURE (100% TOTAL AREA)	106,906 SF (57.0%)
OVERHANG ABOVE OPEN AIR (50% TOTAL AREA)	4,125 SF (2.20%)
TOTAL	111,031 SF (59.2%)

PARKING DATA

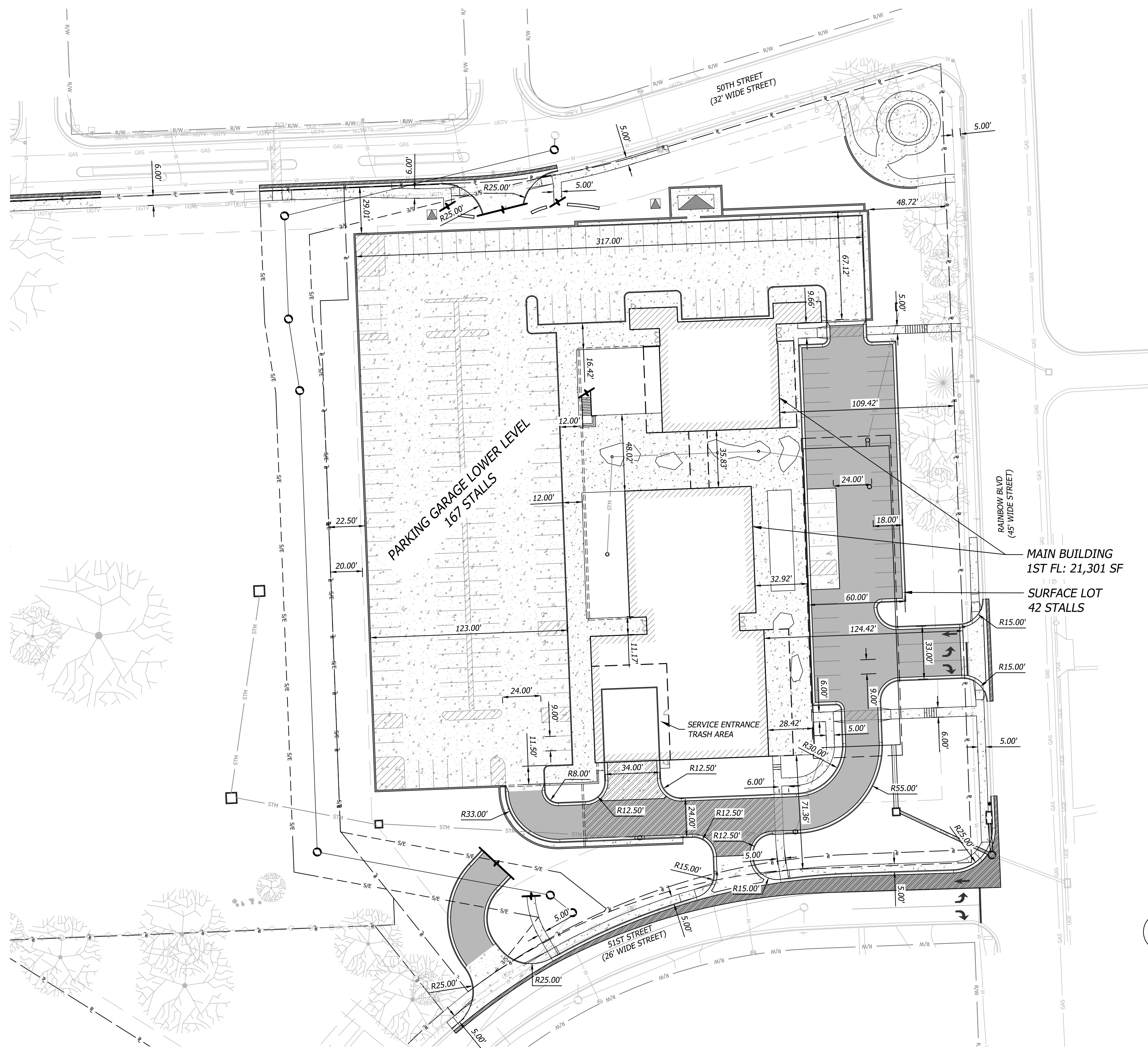
PARKING	
PARKING PROVIDED:	291 STANDARD 8 ADA ACCESSIBLE (4 VAN)
PARKING REQUIRED:	
STANDARD PARKING STALLS: REFER TO ARCHITECTURAL SHEETS FOR CALCULATIONS	
ADA ACCESSIBLE STALLS: (BASED ON 291 PROVIDED PARKING)	7 ADA ACCESSIBLE (2 VAN)

EXISTING ZONING
 R-1 (SINGLE FAMILY RESIDENTIAL)

PROPOSED ZONING
 CP-1 (PLANNED COMMERCIAL)



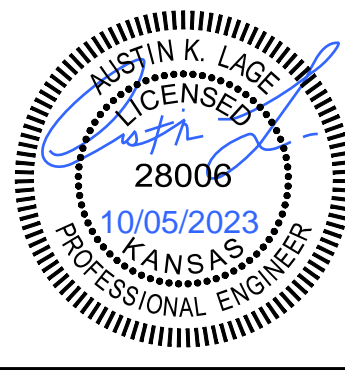
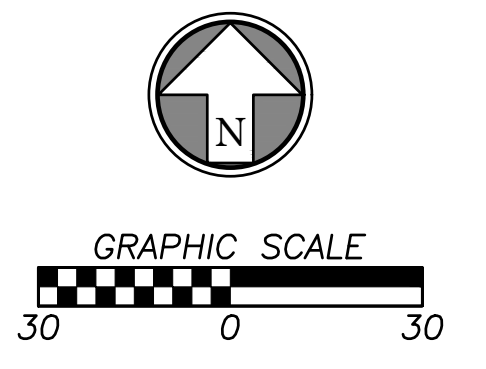
Oct 05, 2023 10:00am Plotted By: custom.leg V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-SITE.dwg Layout: SITE PLAN-GROUND LEVEL



SITE LEGEND

	PROPOSED BUILDING
	ASPHALT PAVEMENT
	HEAVY DUTY ASPHALT PAVEMENT
	CONCRETE PAVEMENT
	HEAVY DUTY CONCRETE PAVEMENT
	CONCRETE SIDEWALK
	STANDARD CURB & GUTTER
	RETAINING WALL

ENTIRETY OF SHEET WAS UPDATED



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 101 Cliff Road, Suite 400
 Overland Park, Kansas 66210
 p. 913.663.1900
BHC is a member of Hensel Phelps Construction Company, P.A.

Prepared For:
 KARBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SM PKWY, SUITE 400
 MISSION WOODS, KS 66205
 816-221-4488

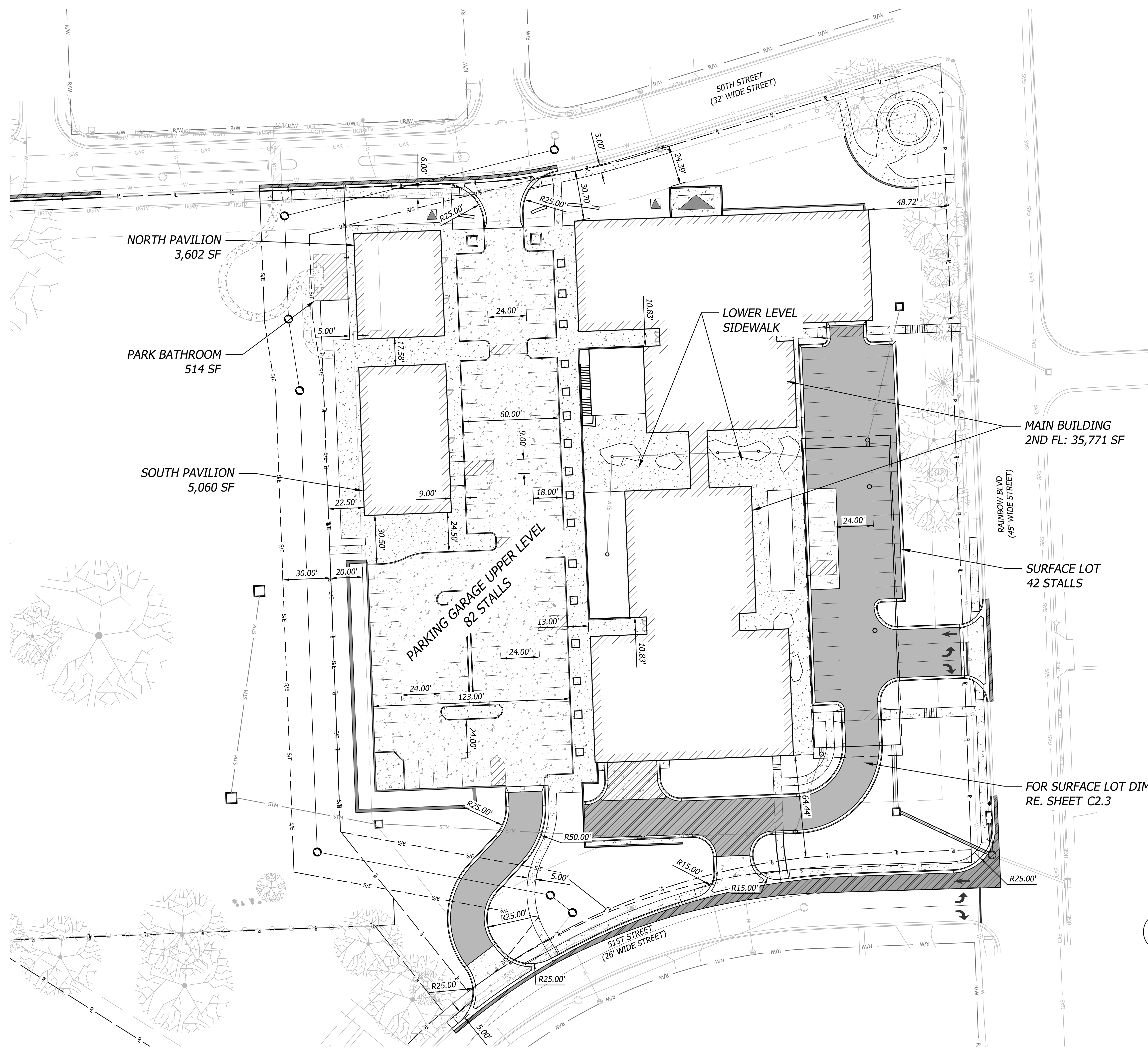
FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
SITE PLAN-GROUND LEVEL

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

C2.1

Rev.	Date	Description	By	App.
1	10/05/23	CITY COMMENTS	AKL	AKL

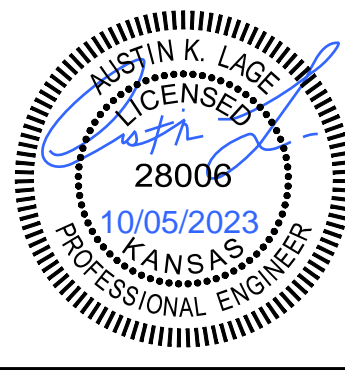
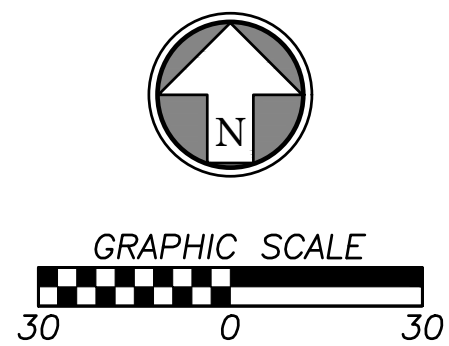
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SITE LEGEND

	PROPOSED BUILDING
	ASPHALT PAVEMENT
	HEAVY DUTY ASPHALT PAVEMENT
	CONCRETE PAVEMENT
	HEAVY DUTY CONCRETE PAVEMENT
	CONCRETE SIDEWALK
	STANDARD CURB & GUTTER
	RETAINING WALL

ENTIRETY OF SHEET WAS UPDATED



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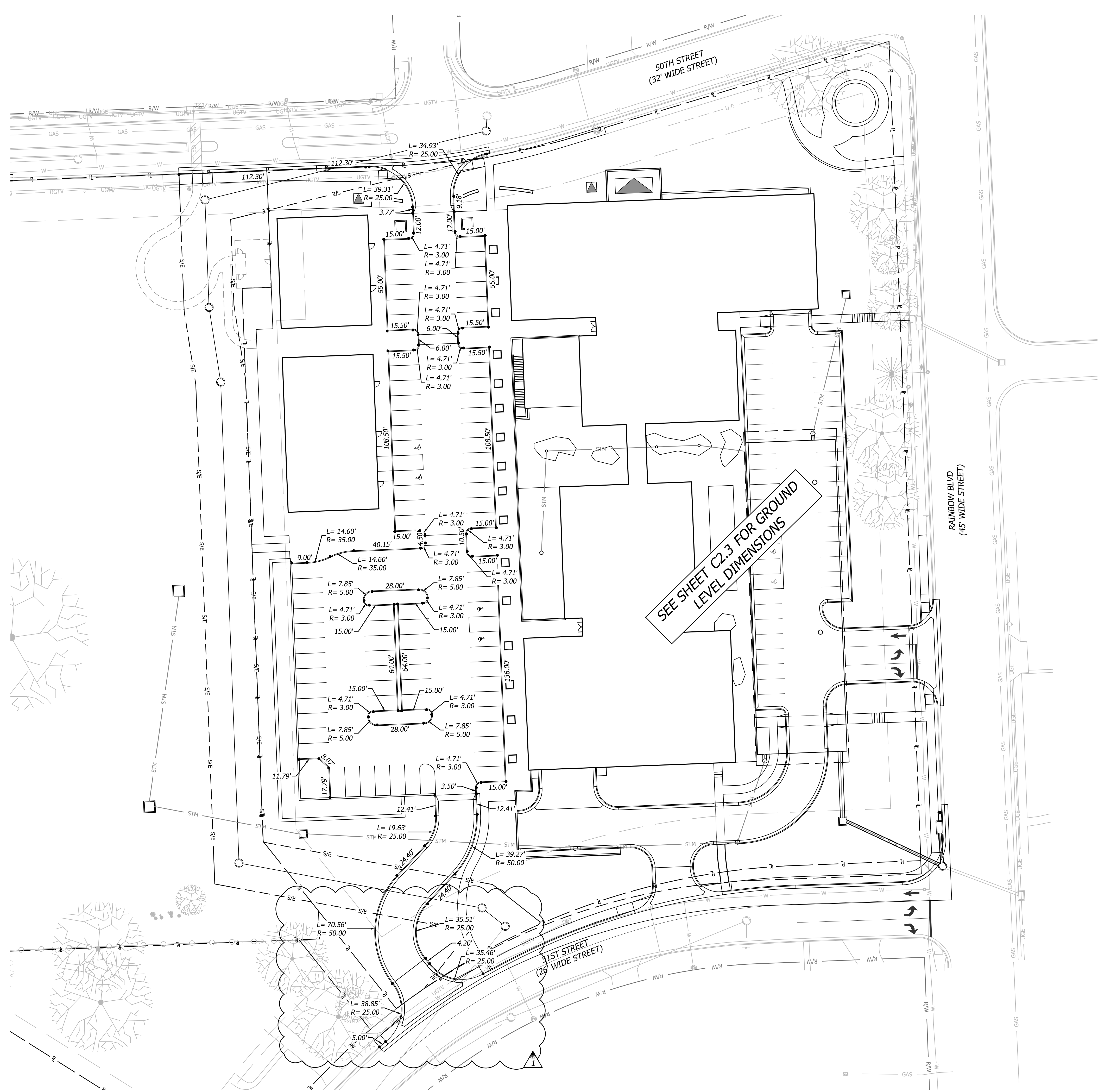
FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
SITE PLAN-SECOND LEVEL

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

C2.2

Rev.	Date	Description	By	App.
1	10/05/23	CITY COMMENTS		

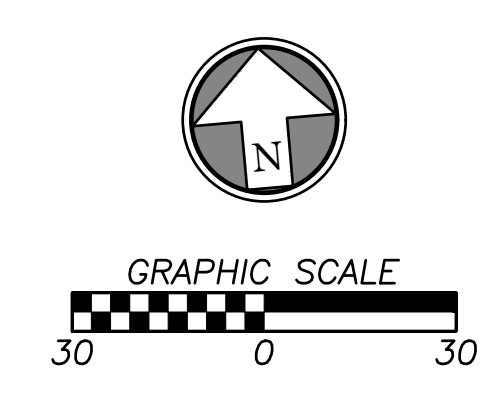
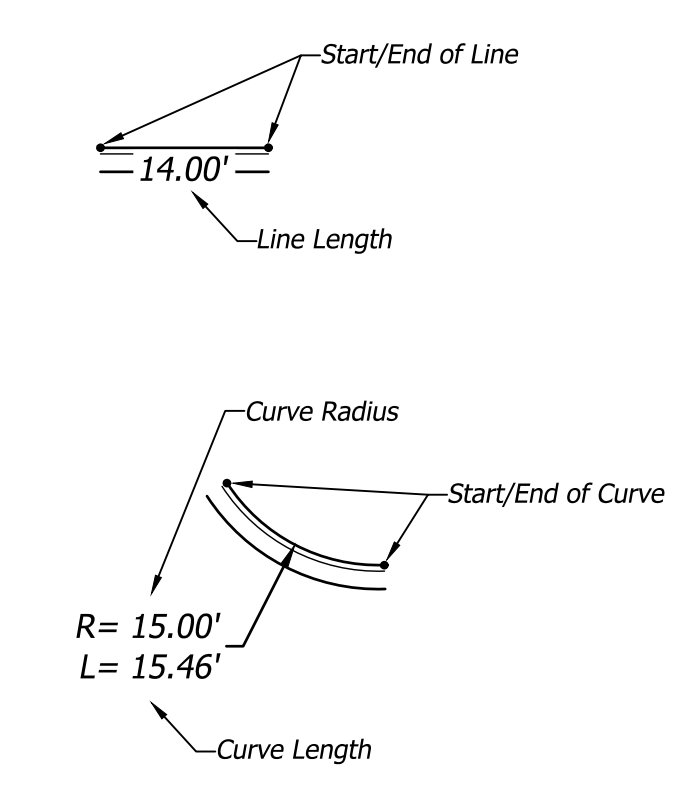
Oct 05, 2023 10:00am Plotted By: custin.egg V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-DIMS.dwg Layout: DIM PLAN-SECOND LEVEL



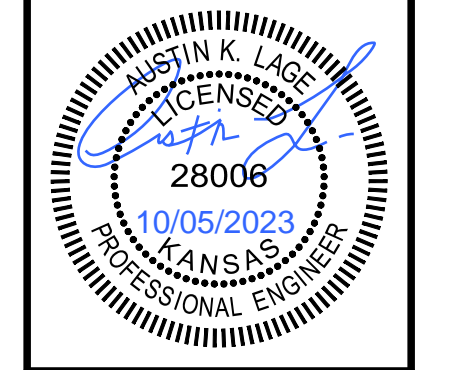
DIMENSION NOTES

- 1. ALL DIMENSIONS ARE TO/ALONG BACK OF CURB UNLESS OTHERWISE NOTED
- 2. ALL DIMENSIONS ARE TO BOTTOM OF WALL UNLESS OTHERWISE NOTED

DIMENSION LEGEND



Rev.	Date	Description	By	App.
1	10/05/23	CITY COMMENTS		



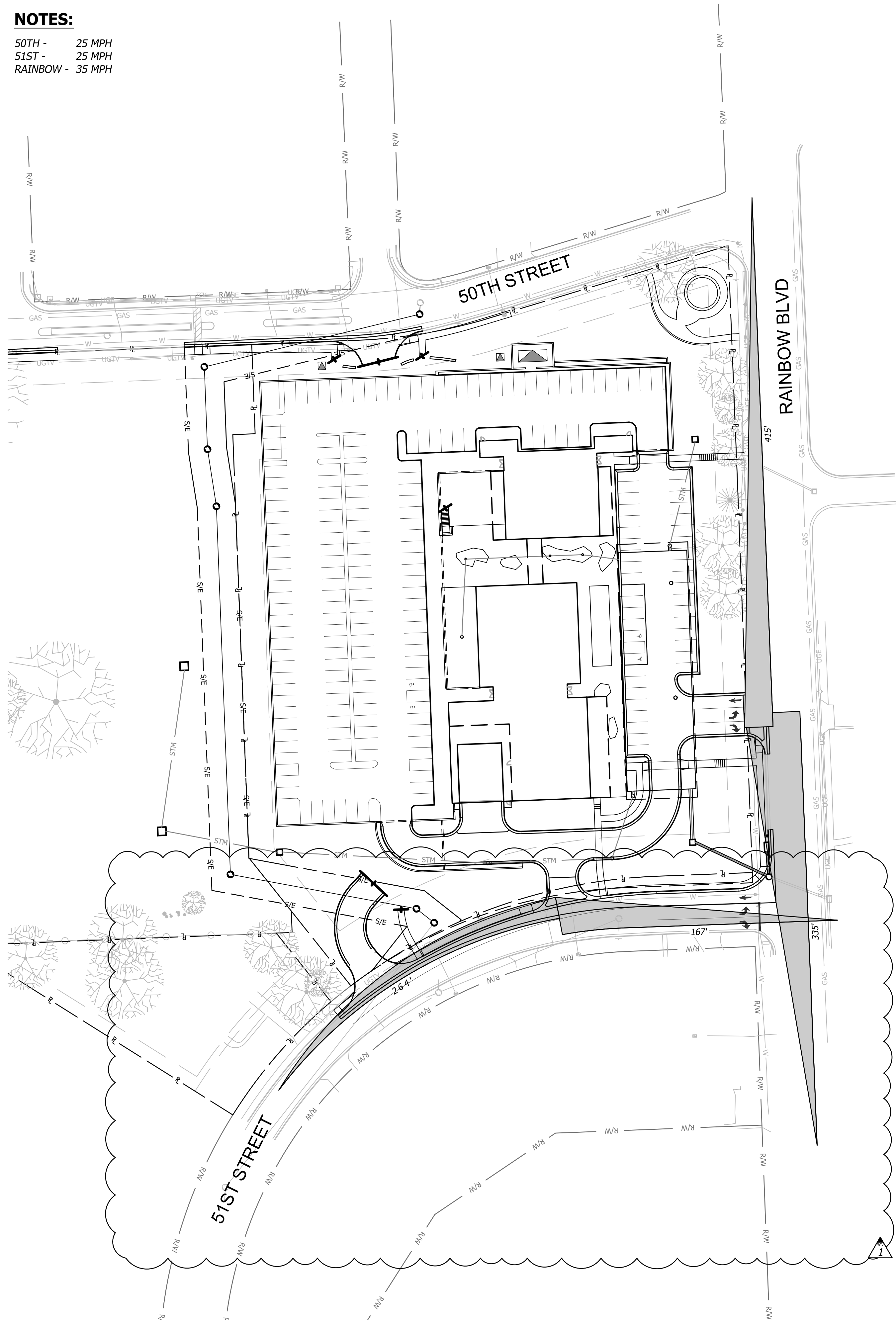
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FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
DIM PLAN-SECOND LEVEL

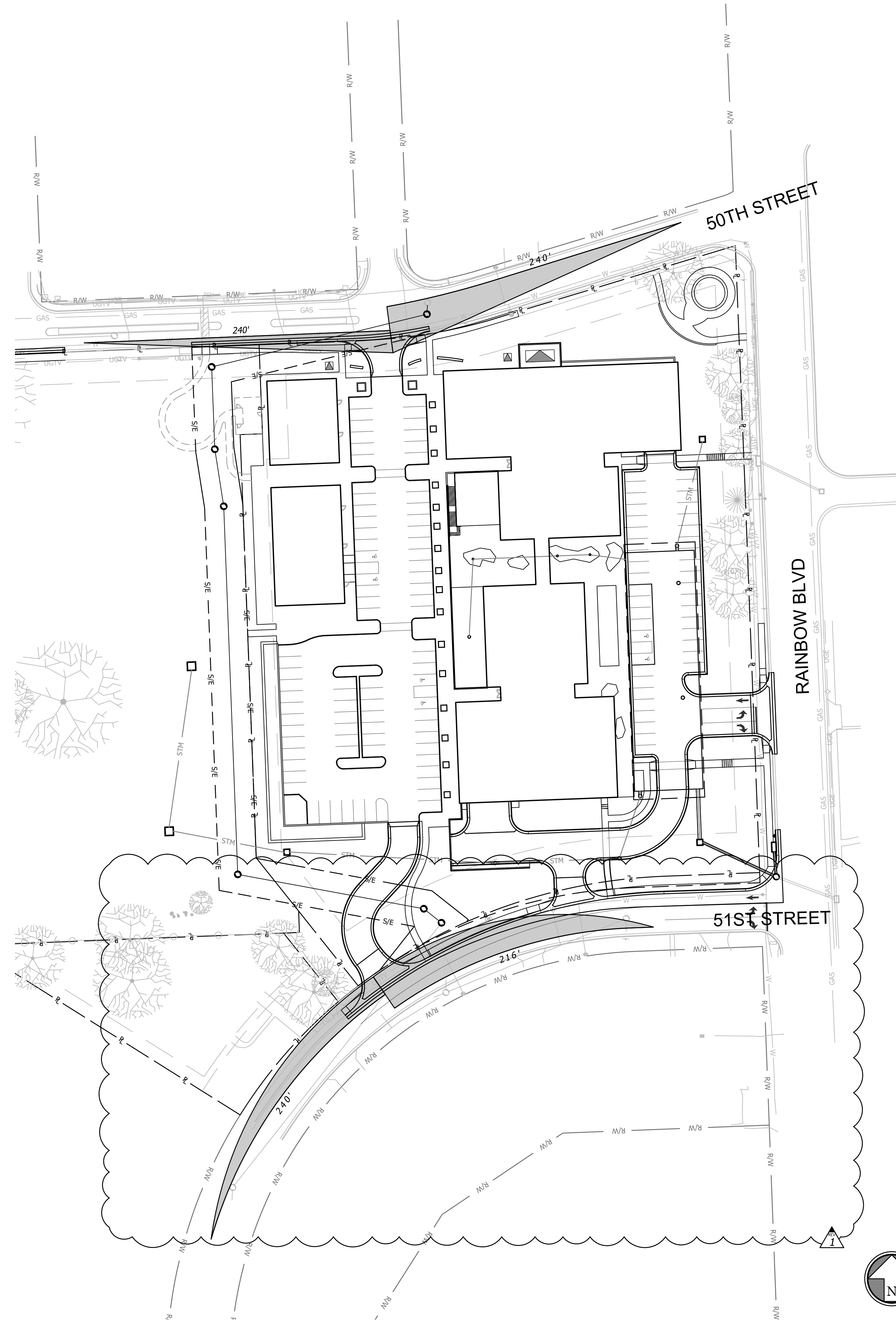
Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

C2.4

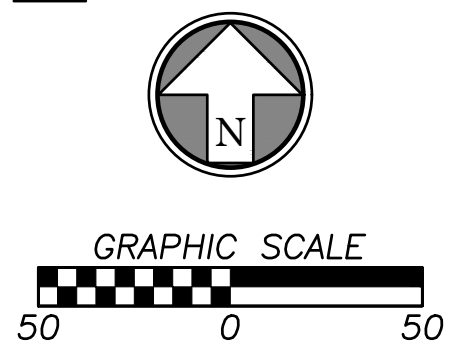
NOTES:
 50TH - 25 MPH
 51ST - 25 MPH
 RAINBOW - 35 MPH



GROUND LEVEL

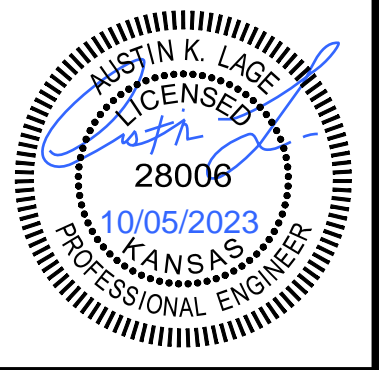


SECOND LEVEL



Oct 05, 2023 - 10:00am Plotted By: custin.lope V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SFRS-SITE.dwg Layout: SIGHT DISTANCE PLAN

Rev.	Date	Description	By	App.
1	10/05/23	CITY COMMENTS	AKL	AKL

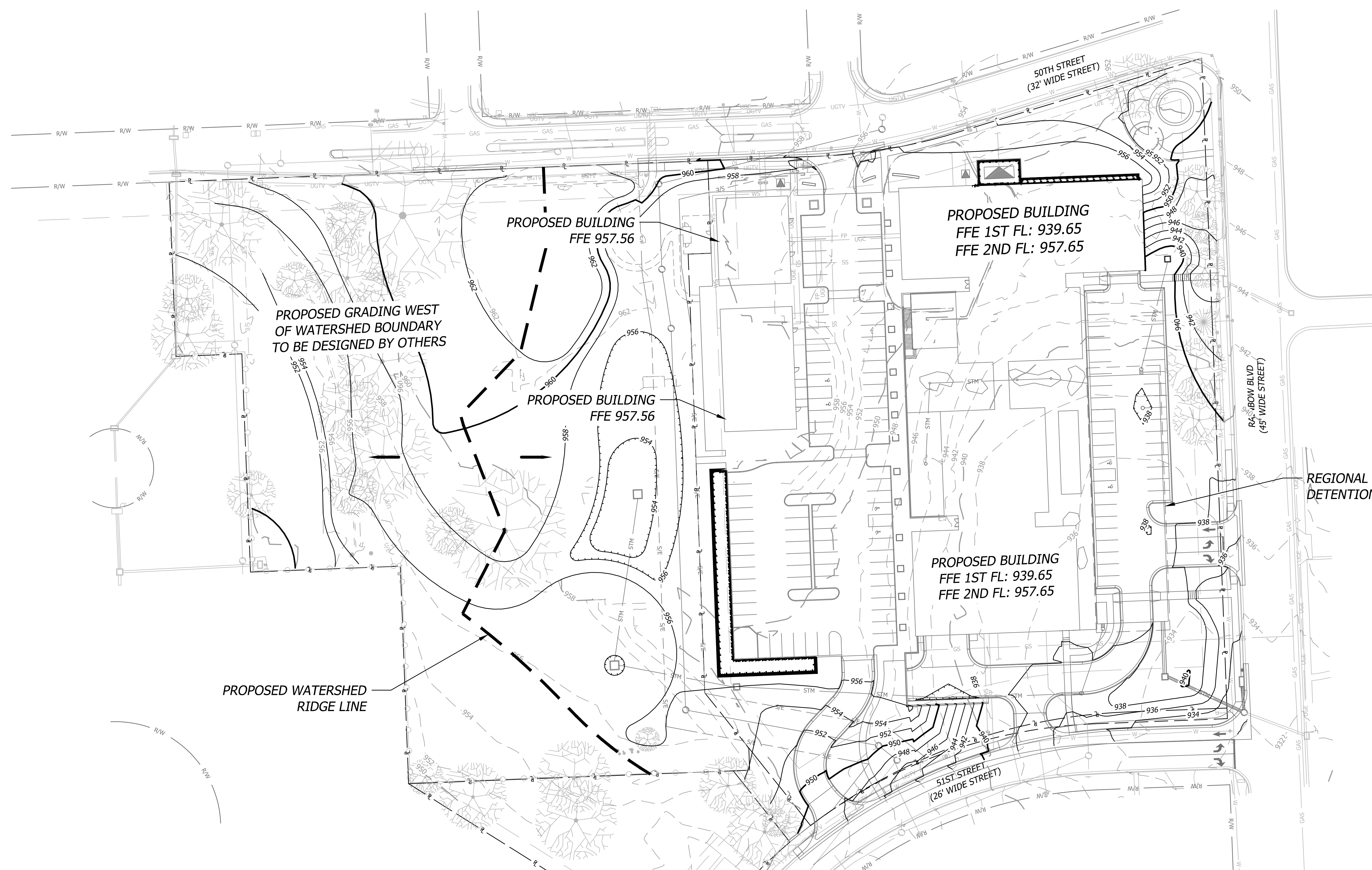


Prepared For:
 KARIBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SM PKWY, SUITE 400
 MISSION WOODS, KS 66205
 816-221-4488

**FDP SUBMITTAL
 50TH & RAINBOW DEVELOPMENT
 WESTWOOD, KS 66205
 SIGHT DISTANCE PLAN**

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

C2.5



GRADING LEGEND

— 980 —	FINISH GRADE MAJOR CONTOURS
— 982 —	FINISH GRADE MINOR CONTOURS
- - - 980 - - -	EXISTING GRADE MAJOR CONTOURS
- - - 982 - - -	EXISTING GRADE MINOR CONTOURS
— R —	PROPERTY LINE

GRADING NOTES

- Contractor shall obtain a copy of the Geotechnical Services Report for the project and be familiar with the existing conditions and recommendations contained in the report if such a report has been prepared.
- Contractor is responsible for any over excavation of existing unsuitable soils will be required under building and pavement areas. Contractor shall perform over excavation of unsuitable soils as a part of this work.
- Contractor shall obtain soils suitable as structural fill from off-site sources. All borrow materials must be tested and approved by the Geotechnical Engineer prior to importing the soils to the project site.
- Contractor shall operate under the terms and permits included in the Stormwater Pollution Prevention Plan (SWPPP) prepared for this project and permitted through the State of Kansas. Contractor shall employ a qualified person to conduct regular inspections of the site erosion control measures and document such inspections in the SWPPP document maintained by the Contractor.
- All topsoil, vegetation, root structures, and deleterious materials shall be stripped from the ground surface prior to the placement of embankments. Contractor shall obtain the on-site geotechnical representative's acceptance of the existing ground surface materials and the proposed fill material prior to the placement of fill.
- All proposed contour lines and spot elevations shown are finish ground elevations. Contractor shall account for pavement depths, building pads, topsoil, etc when grading the site.
- All disturbed areas that are not to be paved (green spaces) shall be finish graded with a minimum of six inches of topsoil.
- All excavation and embankments shall comply with the recommendations provided by the geotechnical engineer.
- Prior to placing any concrete or asphalt pavement the contractor shall perform a proof roll of the pavement sub-grade with a fully loaded tandem axle dump truck. The proof roll shall be conducted in the presence of the on-site geotechnical representative. Areas that display rutting or pumping that are unsatisfactory to the geotechnical representative shall be re-worked and a follow-up proof roll shall be conducted prior to acceptance of the sub-grade for paving. The contractor may, at its own expense, stabilize the sub-grade using Class C fly ash or quicklime, as approved by the geotechnical engineer.
- Finished grades shall not be steeper than 3:1.
- All grading work shall be considered unclassified. No additional payments shall be made for rock excavation. Contractor shall satisfy himself as to any rock excavation required to accomplish the improvements shown hereon.
- A 2.0% maximum cross slope shall be maintained on all pedestrian sidewalks and paths.

FLOOD STATEMENT

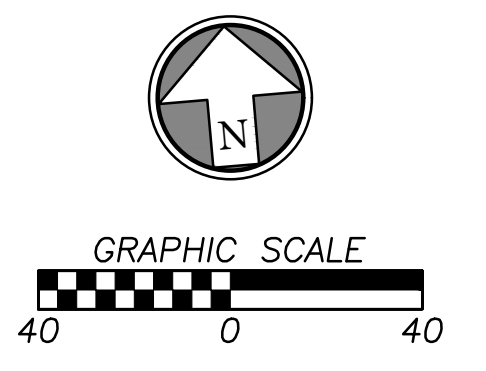
The subject property lies within Flood Zone "X" (unshaded) (Areas determined to be outside the 0.2% annual chance floodplain.), as shown on the Johnson County, Kansas and Incorporated Areas Flood Insurance Rate Map (F.I.R.M.).
 Map Number: 20091C0010G
 Panel No: 10 of 161
 Map Revised Date: August 3, 2009
NOTE: This statement is provided for informational purposes only and shall in no way constitute a basis for a flood certificate. No field work was performed to establish the boundaries of this zone. The information was derived by scaling the subject property on the above referenced map.

BENCHMARKS (DATUM: NAVD88)

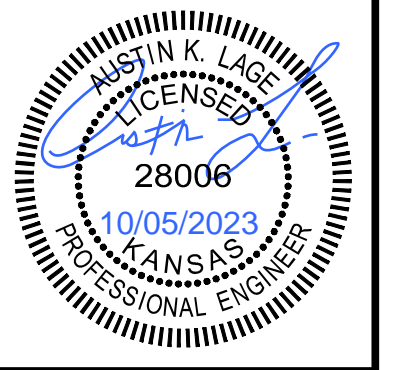
JOHNSON COUNTY VERTICAL CONTROL POINT BENCHMARK
 BENCHMARK NUMBER: 901
 ELEVATION= 883.46

BERNTSEN ALUMINUM DISK STAMPED BM 901. TOP 24 INCH CONCRETE CURB IN LINE WITH WEST FACE OF RCB, 20 FEET SOUTH OF RCB ON THE NORTH SIDE 50TH TERR.

ENTIRETY OF SHEET WAS UPDATED



Rev.	Date	Description
1	10/05/23	CITY COMMENTS



Prepared For:
 KARBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SM PKWY, SUITE 400
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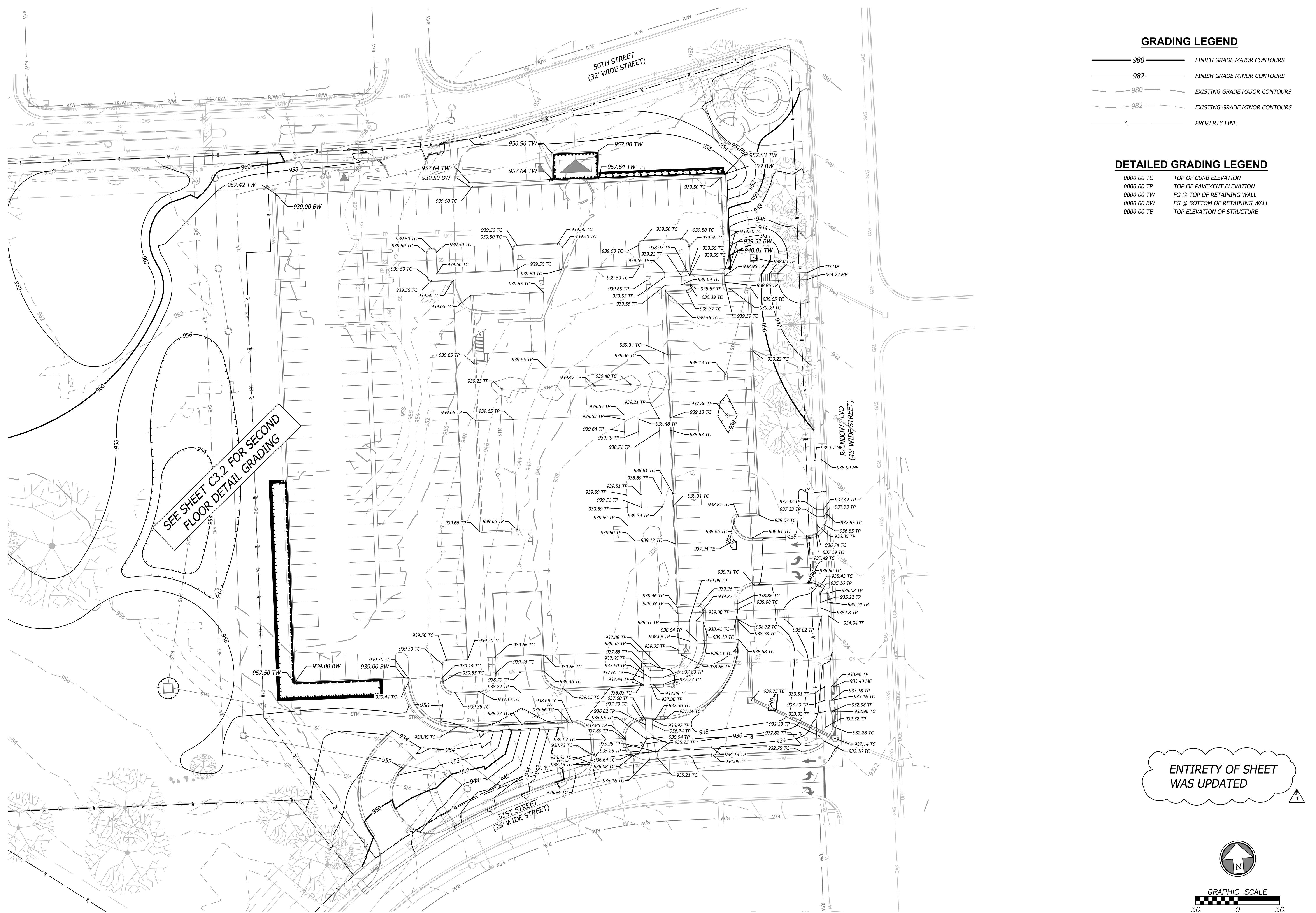
FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205

GRADING PLAN

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

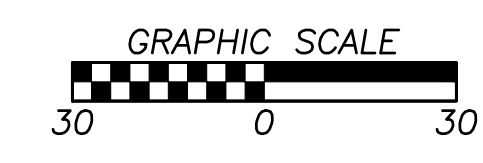
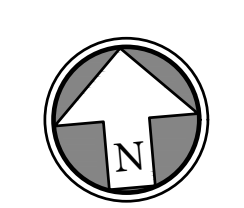
C3.0

Oct 05, 2023 - 10:00am Plotted By: custom.egp V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-GRAD.dwg Layout: DETAIL GRADING - GROUND LEVEL



SEE SHEET C3.2 FOR SECOND FLOOR DETAIL GRADING

ENTIRETY OF SHEET WAS UPDATED



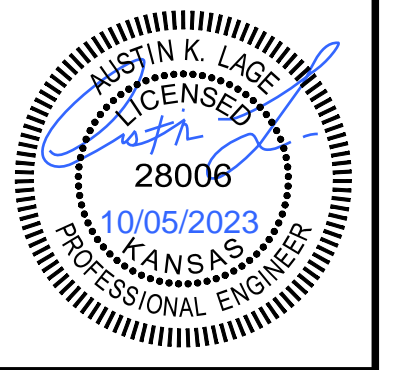
GRADING LEGEND

- 980 — FINISH GRADE MAJOR CONTOURS
- 982 — FINISH GRADE MINOR CONTOURS
- - - 980 - - - EXISTING GRADE MAJOR CONTOURS
- - - 982 - - - EXISTING GRADE MINOR CONTOURS
- R — PROPERTY LINE

DETAILED GRADING LEGEND

- 0000.00 TC TOP OF CURB ELEVATION
- 0000.00 TP TOP OF PAVEMENT ELEVATION
- 0000.00 TW FG @ TOP OF RETAINING WALL
- 0000.00 BW FG @ BOTTOM OF RETAINING WALL
- 0000.00 TE TOP ELEVATION OF STRUCTURE

Rev.	Date	Description
1	10/05/23	CITY COMMENTS



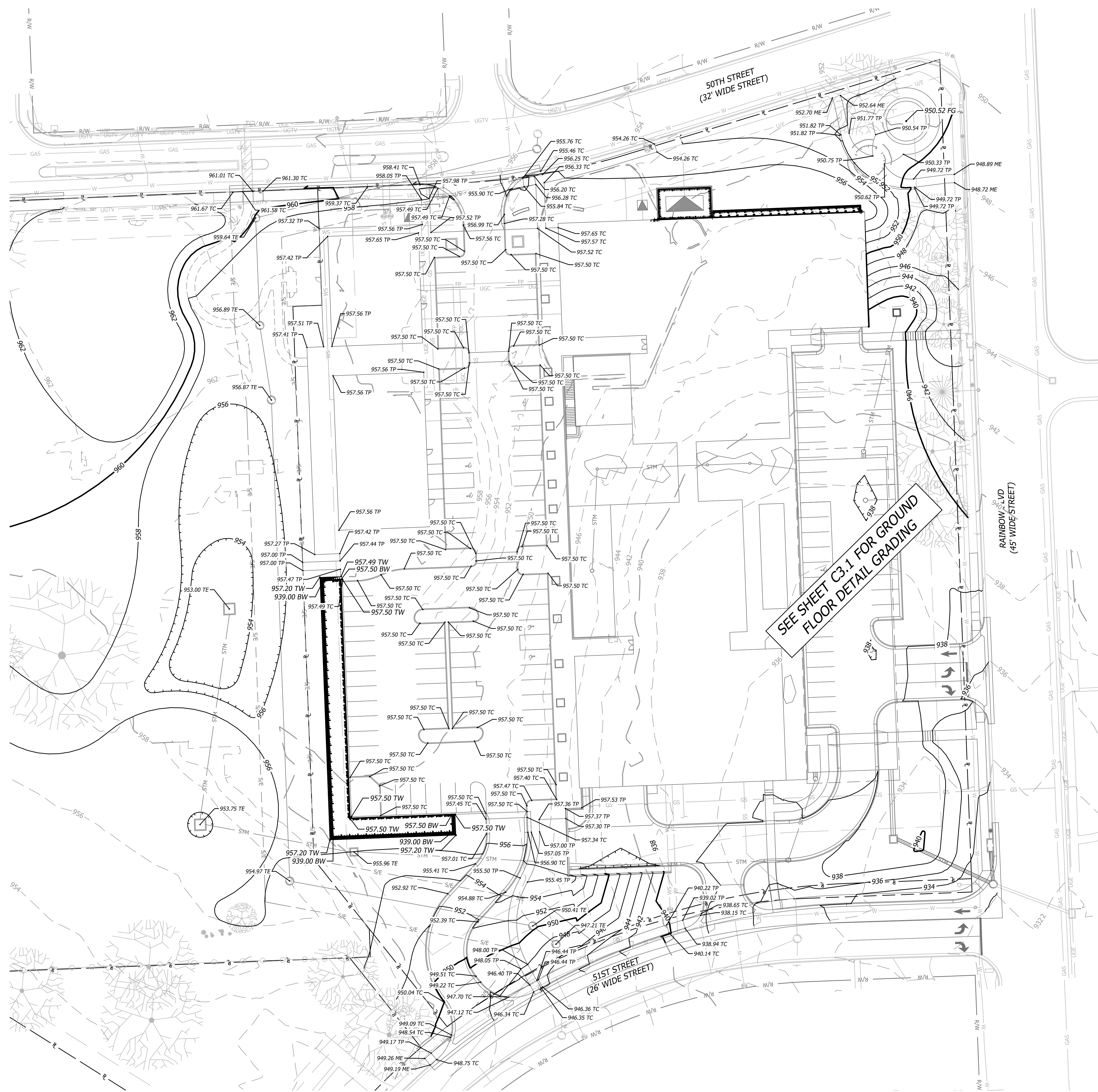
Prepared For:
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FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
DETAIL GRADING - GROUND LEVEL

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

C3.1

Oct 05, 2023 10:00am Plotted By: customrge V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-GRAD.dwg Layout: DETAIL GRADING - SECOND LEVEL

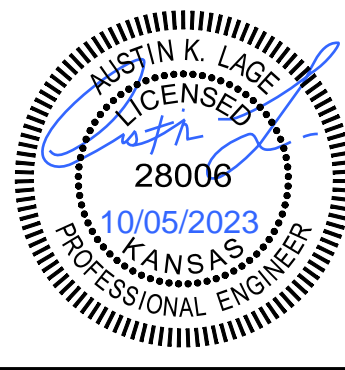


GRADING LEGEND

- 980 — FINISH GRADE MAJOR CONTOURS
- 982 — FINISH GRADE MINOR CONTOURS
- - - 980 - - - EXISTING GRADE MAJOR CONTOURS
- - - 982 - - - EXISTING GRADE MINOR CONTOURS
- R — PROPERTY LINE

DETAILED GRADING LEGEND

- 0000.00 TC TOP OF CURB ELEVATION
- 0000.00 TP TOP OF PAVEMENT ELEVATION
- 0000.00 TW FG @ TOP OF RETAINING WALL
- 0000.00 BW FG @ BOTTOM OF RETAINING WALL
- 0000.00 TE TOP ELEVATION OF STRUCTURE



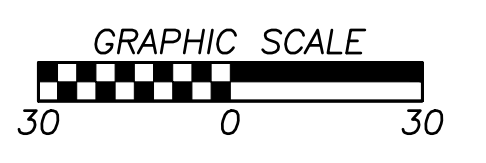
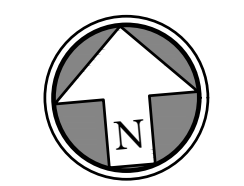
Prepared For:
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 ADAM FELDMAN
 2000 SM PKWY, SUITE 400
 MISSION WOODS, KS 66205
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FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
DETAIL GRADING - SECOND LEVEL

Design: DSN | Drawn: DRN
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 Issue Date: 09/15/2023
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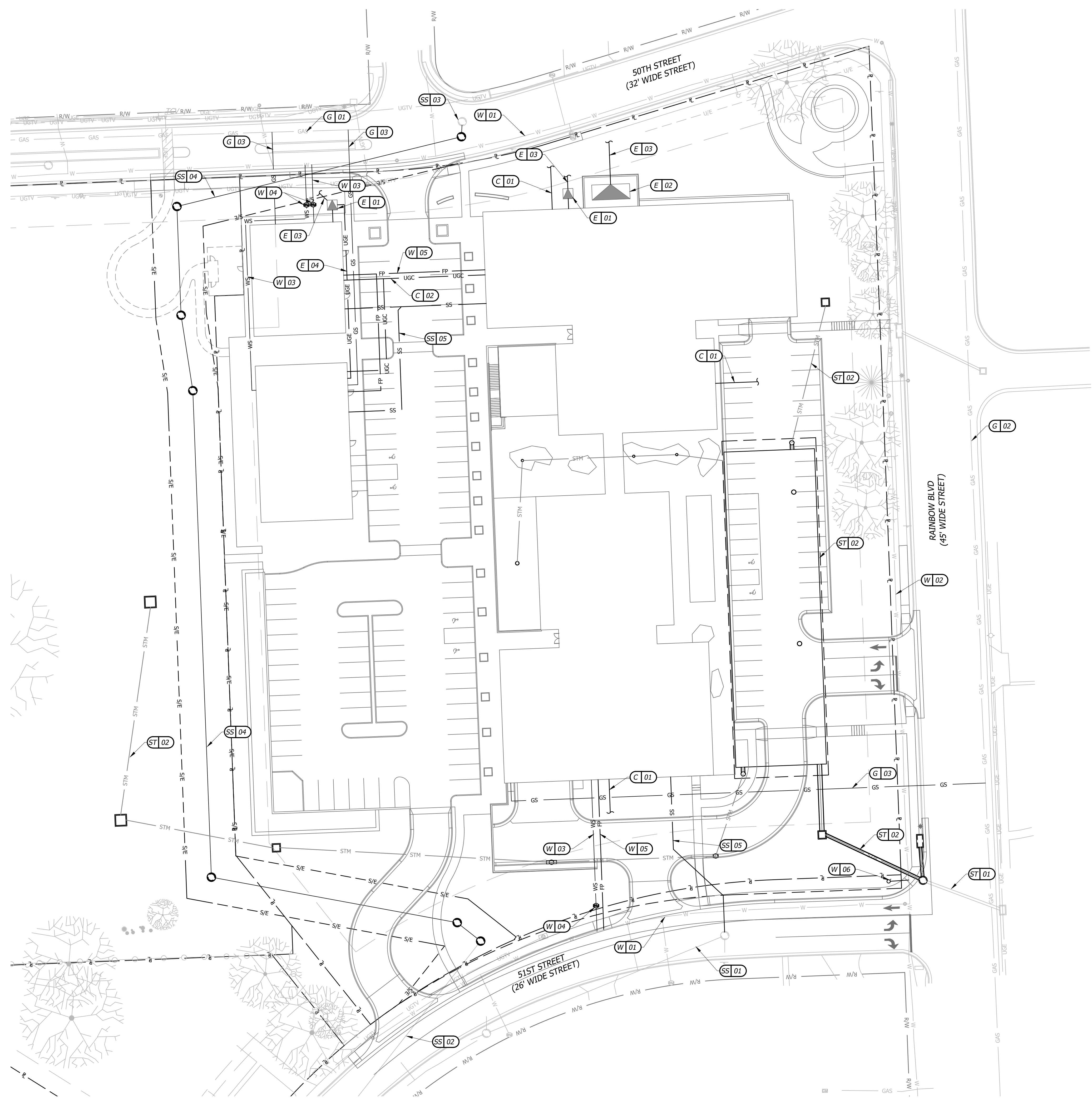
C3.2

ENTIRETY OF SHEET
 WAS UPDATED



Rev.	Date	Description
1	10/05/23	CITY COMMENTS

Oct 05, 2023 - 10:01am Plotted By: custin.oge V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-UTIL.dwg Layout: UTILITY PLAN



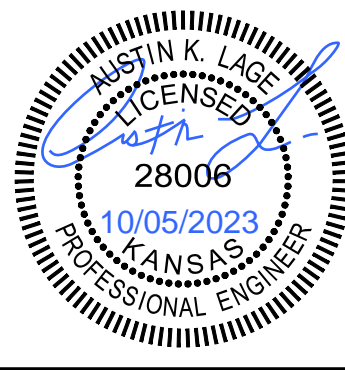
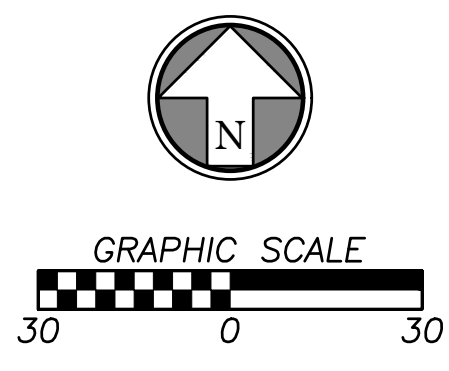
(X) 00 CONSTRUCTION NOTES

- W - WATER SERVICE INFORMATION - WATERONE**
 - 01 EXISTING 6" WATER MAIN LINE.
 - 02 EXISTING 8" WATER MAIN LINE.
 - 03 PROPOSED WATER SERVICE LINE.
 - 04 PROPOSED WATER METER.
 - 05 PROPOSED FIRE PROTECTION LINE.
 - 06 RELOCATED FIRE HYDRANT; CONTRACTOR TO COORDINATE WITH WATERONE/CITY ON INSTALLATION.
- E - ELECTRIC SERVICE INFORMATION - EVERGY**
 - 01 PROPOSED TRANSFORMER PAD.
 - 02 PROPOSED GENERATOR.
 - 03 PROPOSED UNDERGROUND ELECTRICAL.
 - 04 PROPOSED ELECTRICAL LINE; LINE TO BE IN OVERHEAD BAYS IN PARKING GARAGE.
- C - COMMUNICATION SERVICE INFORMATION - SPECTRUM/AT&T**
 - 01 PROPOSED UNDERGROUND COMMUNICATION LINE
 - 02 PROPOSED COMMUNICATION LINE; LINE TO BE IN OVERHEAD BAYS IN PARKING GARAGE.
- G - GAS SERVICE INFORMATION - KANSAS GAS SERVICE**
 - 01 EXISTING 2" GAS MAIN.
 - 02 EXISTING 4" GAS MAIN.
 - 03 PROPOSED GAS SERVICE LINE.
- ST - STORM SEWER INFORMATION - CITY OF WESTWOOD**
 - 01 EXISTING STORM SEWER MAIN.
 - 02 PROPOSED STORM SEWER ROUTING.
- SS - SANITARY SEWER INFORMATION - JOHNSON COUNTY WASTEWATER (JCW)**
 - 01 EXISTING 8" SANITARY SEWER GRAVITY MAIN.
 - 02 EXISTING 10" SANITARY SEWER GRAVITY MAIN.
 - 03 EXISTING 10" SANITARY SEWER FORCE MAIN.
 - 04 PROPOSED 10" SANITARY SEWER MAIN EXTENSION.
 - 05 PROPOSED SERVICE LINE

UTILITY NOTES

1. CONTRACTOR SHALL REFER TO ALL SPECIFICATIONS, GUIDELINES, AND INSTALLATION DRAWINGS FROM WATERONE, KANSAS GAS SERVICE, SPECTRUM, AT&T, JCW, CITY OF WESTWOOD STORM, AND EVERGY FOR THE INSTALLATION OF ALL SERVICE LINES.
2. THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES FOR FIELD LOCATION OF ALL UNDERGROUND UTILITY LINES PRIOR TO ANY EXCAVATION AND FOR MAKING HIS OWN VERIFICATION AS TO TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.
3. CONTRACTOR TO ENSURE 6" MINIMUM SEPARATION BETWEEN UTILITIES AT CROSSINGS. CONTRACTOR TO CALL CIVIL IF ANY CONFLICTS BETWEEN UTILITIES ARE FOUND.
4. FIRE LINE NOTES:
 - 4.1. ALL PRIVATE FIRE LINES SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 24, AND OTHER APPLICABLE CODES AND STANDARDS.
 - 4.2. CONTACT THE FIRE DEPARTMENT TO SCHEDULE INSPECTIONS PRIOR TO PRIVATE FIRE LINES BEING BACKFILLED.
 - 4.3. CONTACT THE FIRE DEPARTMENT TO WITNESS SCHEDULED HYDROSTATIC TESTS AND FLUSHES OF PRIVATE FIRE LINES.
5. STUB ALL CONNECTIONS TO WITHIN 5' OF THE BUILDING TO PROVIDE CONNECTION INTO THE BUILDING BY MECHANICAL/PLUMBING CONTRACTOR.
6. CONTRACTOR TO ENSURE MIN. 18" VERTICAL SEPARATION BETWEEN UTILITIES AT CROSSING. CONTRACTOR TO CALL ENGINEER IF ANY CONFLICTS BETWEEN UTILITIES ARE FOUND.

ENTIRETY OF SHEET WAS UPDATED



BHC
 CIVIL ENGINEERING & SURVEYING CONSULTANTS
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 BHC is a member of the Hensel Construction Group, P.A.

Prepared For:
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 ADAM FELDMAN
 2000 SW PKWY, SUITE 400
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FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
UTILITY PLAN

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
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C4.0

Oct 05, 2023 10:01am Plotted By: custin.oge V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-DMAP.dwg Layout: EXISTING DRAINAGE MAP



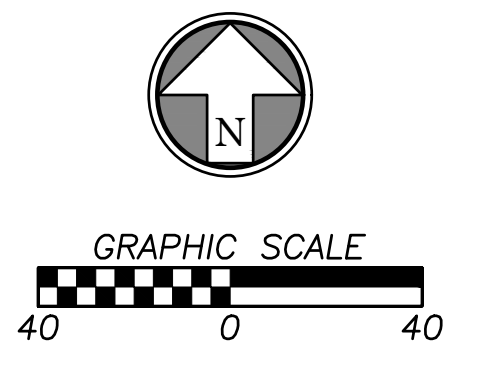
DRAINAGE AREAS							
Basin ID	AREA	PERVIOUS	IMPERVIOUS	CN-Value	C-VALUE		
EX 1	106,112 SF (2.44 ac)	71,408 SF (1.64 ac)	34,704 SF (0.80 ac)	86	0.50		
EX 2	226,017 SF (5.19 ac)	139,421 SF (3.20 ac)	86,596 SF (1.99 ac)	87	0.53		
Total	332,129 SF (7.62 ac)	210,829 SF (4.84 ac)	121,300 SF (2.78 ac)	87	0.52		

EX-1
AREA - 2.44 Ac.
CN VALUE - 86

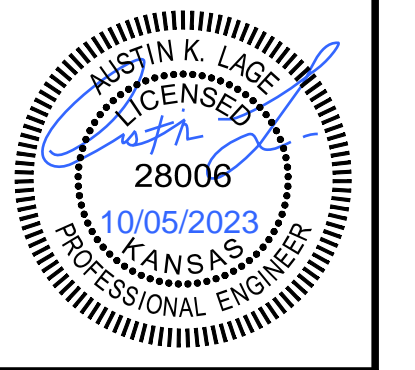
EX-2
AREA - 5.19 Ac.
CN VALUE - 87

DRAINAGE LEGEND

	DRAINAGE AREA BOUNDARY
	EXISTING GRADE MAJOR CONTOUR
	EXISTING GRADE MINOR CONTOUR
	PROPERTY LINE
	RIGHT-OF-WAY LINE



Rev.	Date	Description	By	App.
1	10/05/23	CITY COMMENTS	AKL	AKL



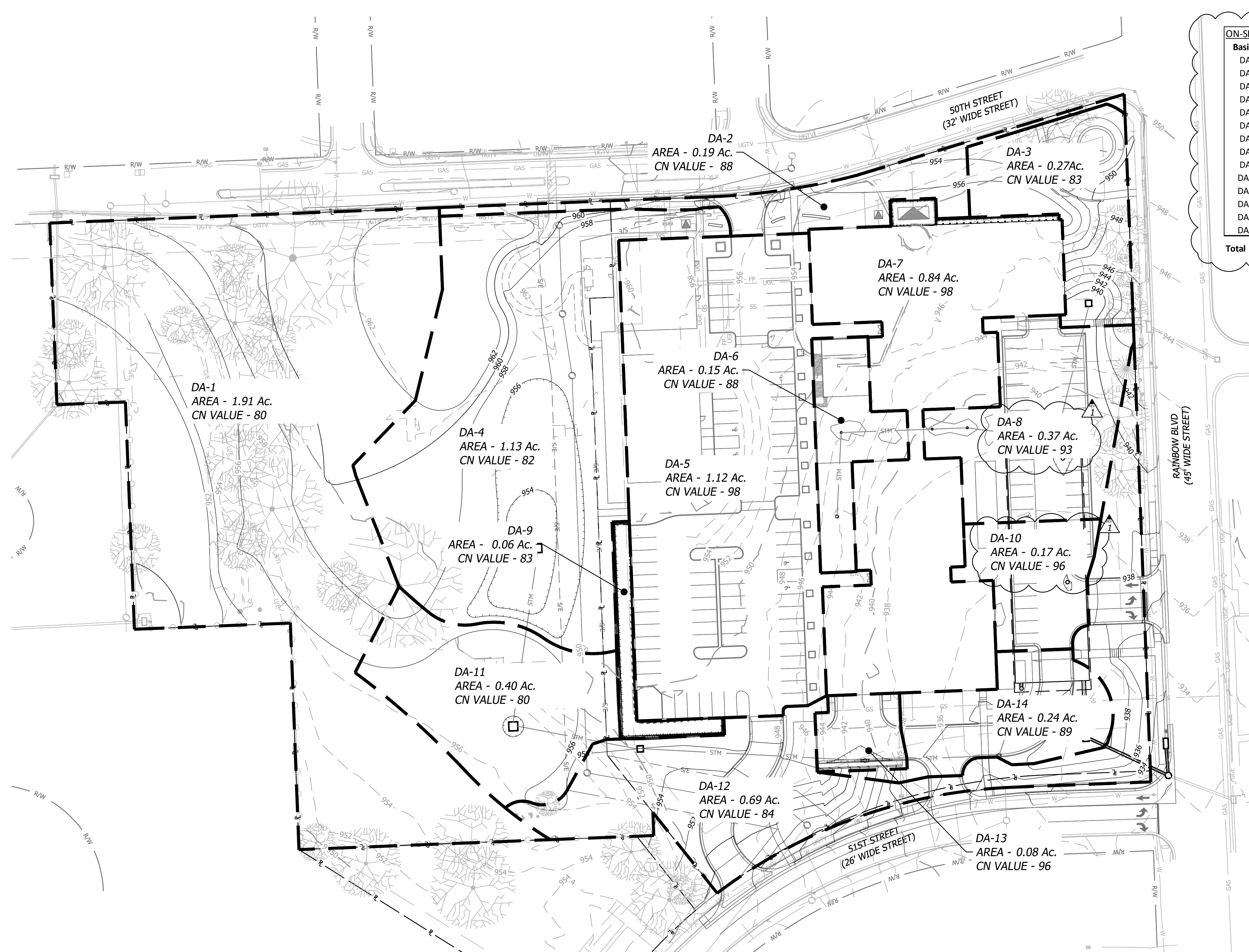
Prepared For:
KARBANK REAL ESTATE COMPANY
ADAM FELDMAN
2000 SW PKWY, SUITE 400
MISSION WOODS, KS 66205
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**FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
EXISTING DRAINAGE MAP**

Design: DSN | Drawn: DRN
Checked: CHK
Issue Date: 09/15/2023
Project Number: 037920

C5.0

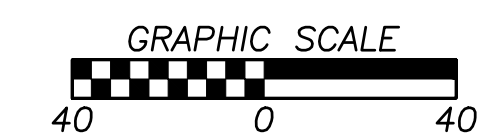
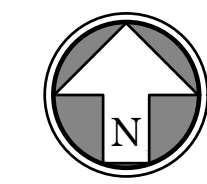
Oct 05, 2023 10:01am Plotted By: custin.oge V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-DMAP.dwg Layout: PROPOSED DRAINAGE MAP



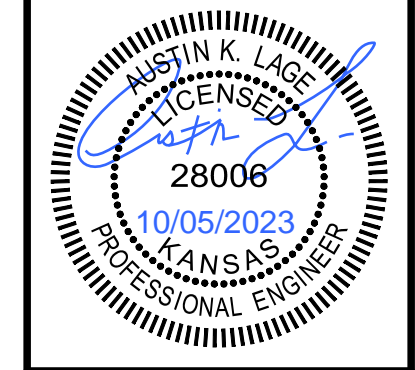
ON-SITE DRAINAGE AREAS							
Basin ID	AREA	PERVIOUS		IMPERVIOUS		CN-Value	C-VALUE
DA 1	83,347 SF (1.91 ac)	83,347 SF (1.91 ac)		000 SF (0.00 ac)		80	0.30
DA 2	8,169 SF (0.19 ac)	4,660 SF (0.11 ac)		3,509 SF (0.08 ac)		88	0.56
DA 3	11,696 SF (0.27 ac)	9,795 SF (0.22 ac)		1,902 SF (0.04 ac)		83	0.40
DA 4	49,115 SF (1.13 ac)	44,764 SF (1.03 ac)		4,351 SF (0.10 ac)		82	0.35
DA 5	48,863 SF (1.12 ac)	365 SF (0.01 ac)		48,499 SF (1.11 ac)		98	0.90
DA 6	6,716 SF (0.15 ac)	3,830 SF (0.09 ac)		2,886 SF (0.07 ac)		88	0.56
DA 7	36,773 SF (0.84 ac)	000 SF (0.00 ac)		36,773 SF (0.84 ac)		98	0.90
DA 8	15,932 SF (0.37 ac)	4,330 SF (0.10 ac)		11,602 SF (0.27 ac)		93	0.74
DA 9	2,763 SF (0.06 ac)	2,258 SF (0.05 ac)		505 SF (0.01 ac)		83	0.41
DA 10	7,448 SF (0.17 ac)	808 SF (0.02 ac)		6,640 SF (0.15 ac)		96	0.83
DA 11	17,567 SF (0.40 ac)	17,567 SF (0.40 ac)		000 SF (0.00 ac)		80	0.30
DA 12	30,084 SF (0.69 ac)	23,647 SF (0.54 ac)		6,437 SF (0.15 ac)		84	0.43
DA 13	3,353 SF (0.08 ac)	371 SF (0.01 ac)		2,982 SF (0.07 ac)		96	0.83
DA 14	10,303 SF (0.24 ac)	5,168 SF (0.12 ac)		5,135 SF (0.12 ac)		89	0.60
Total	332,129 SF (7.62 ac)	200,909 SF (4.61 ac)		131,220 SF (3.01 ac)		87	0.54

DRAINAGE LEGEND

- DRAINAGE AREA BOUNDARY
- PROPOSED FINISH GRADE MAJOR CONTOUR
- PROPOSED FINISH GRADE MINOR CONTOUR
- EXISTING GRADE MAJOR CONTOUR
- EXISTING GRADE MINOR CONTOUR
- PROPOSED STORM SEWER LINE
- PROPERTY LINE
- RIGHT-OF-WAY LINE



Rev.	Date	Description
1	10/05/2023	CITY COMMENTS



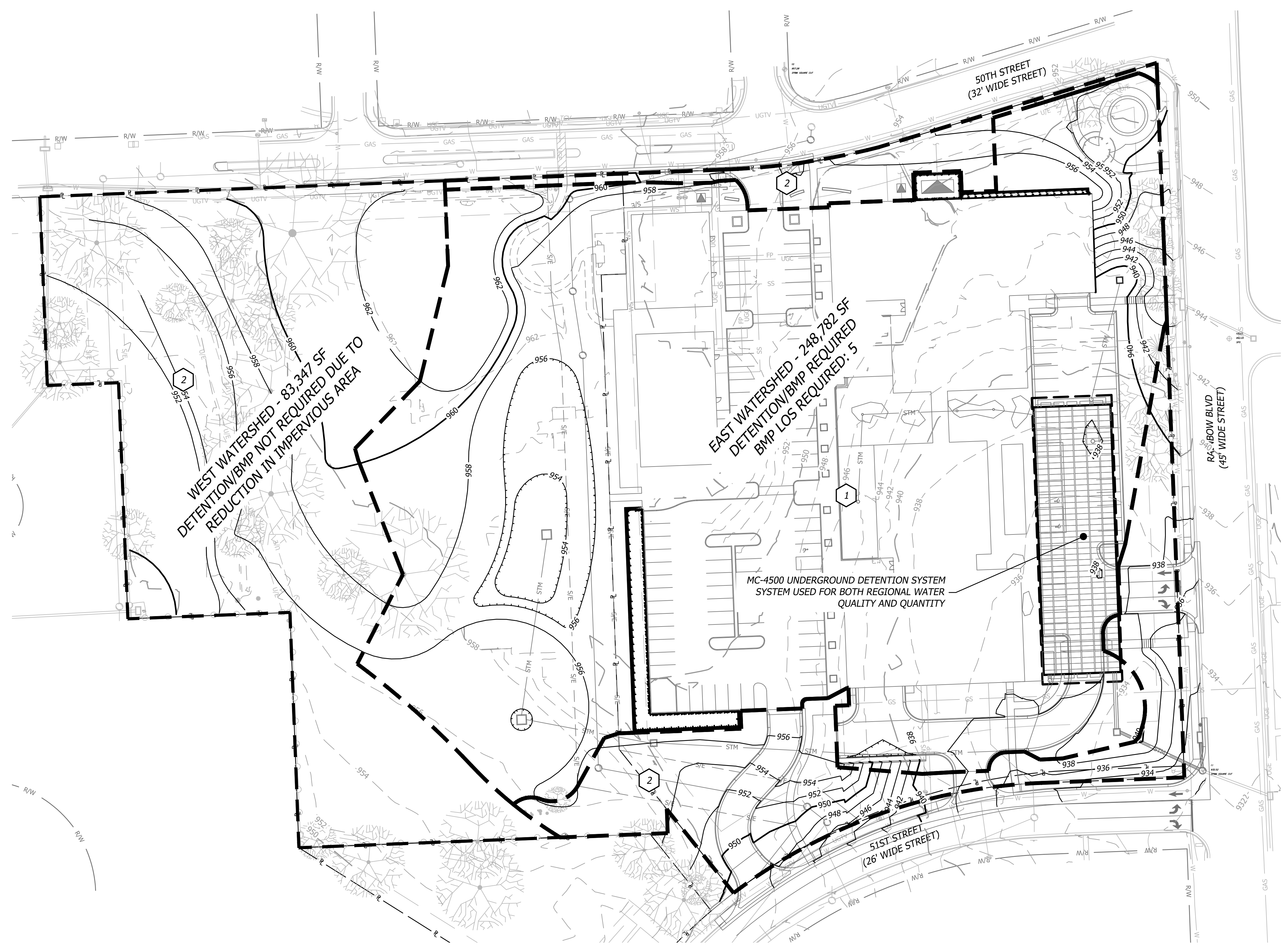
Prepared For:
KARBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SW PKWY, SUITE 400
 MISSION WOODS, KS 66205
 816-221-4488

FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
PROPOSED DRAINAGE MAP

Design: DSN | Drawn: DRN
 Checked: CHK
 Issue Date: 09/15/2023
 Project Number: 037920

C5.1

Oct 05, 2023 - 10:01am Plotted By: custin.lope V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-GRAD.dwg Layout: BMP PLAN



DRAINAGE LEGEND

- BMP AREA BOUNDARY
- BMP ID
- PROPOSED FINISH GRADE MAJOR CONTOUR
- PROPOSED FINISH GRADE MINOR CONTOUR
- EXISTING GRADE MAJOR CONTOUR
- EXISTING GRADE MINOR CONTOUR
- PROPOSED STORM SEWER LINE
- PROPERTY LINE

1. Runoff Curve Number - East Watershed

A. Predevelopment CN

Cover Description	Soil HSG	CN From Table 1	Area (sf)	Area (ac.)	Product of CN x Area
Open Space (turf), Good	D	80	162186	3.72	297.9
Impervious	D	98	86596	1.99	194.8
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
Totals:				5.71	492.7

Area-Weighted CN = total product/total area = **86** (Round to integer)

B. Postdevelopment CN

Cover Description	Soil HSG ¹	CN From Table 1	Area (sf)	Area (ac.)	Product of CN x Area
Open Space (turf), Good	D	80	117562	2.70	215.9
Impervious	D	98	131220	3.01	295.2
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
Totals:				5.71	511.1

¹ Postdevelopment CN is one HSG higher for all cover types except preserved vegetation, absent documentation showing how postdevelopment soil structure will be preserved.

Area-Weighted CN = total product/total area = **89** (Round to integer)

C. Level of Service Calculation

	LS
Predevelopment CN: 86	Change in CN 17+ 8
Post Development CN: 89	7 to 16 7
Difference: 3	4 to 6 6
	1 to 3 5
	0 4
	-7 to -1 3
LS Required (see scale at right): 5	-8 to -17 2
	-18 to -21 1
	-22- 0

1. Required LS (New Development, Wksht 1) or Total VR (Redevelopment, Wksht 1A): **5**

2. Proposed BMP Option Package No. 1

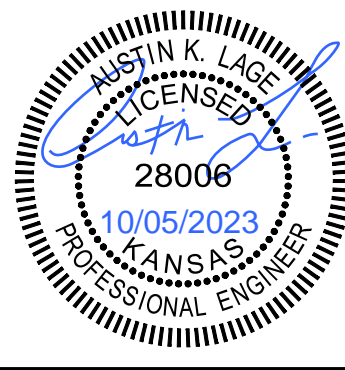
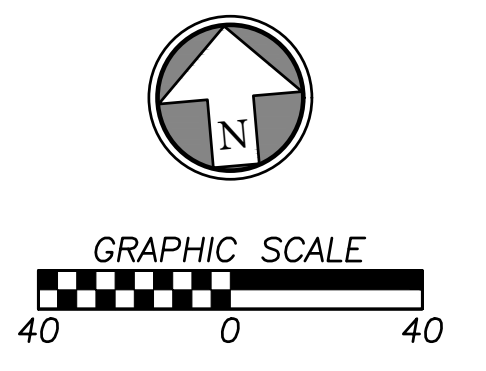
BMP ID	Cover/BMP Description	Treatment Area	VR from Table 4.4 or 4.6	Product of VR x Area
1	ADS Isolator Row	4.82	9.0	43.4
2	No BMP	0.89	0.0	0.0
Total ² :		5.71	Total:	7.6

¹ VR calculated for final BMP only in Treatment Train
² Total treatment area cannot exceed 100 percent of the actual site area.
 * Blank in Redevelopment

Meets required LS (Yes/No)? **Yes** (If No, or if additional options are being tested, proceed below.)

NOTE:
 EAST WATERSHED IS TREATED AS A DEVELOPED SITE
 WEST WATERSHED IS TREATED AS AN UNDEVELOPED SITE

ENTIRETY OF SHEET WAS UPDATED



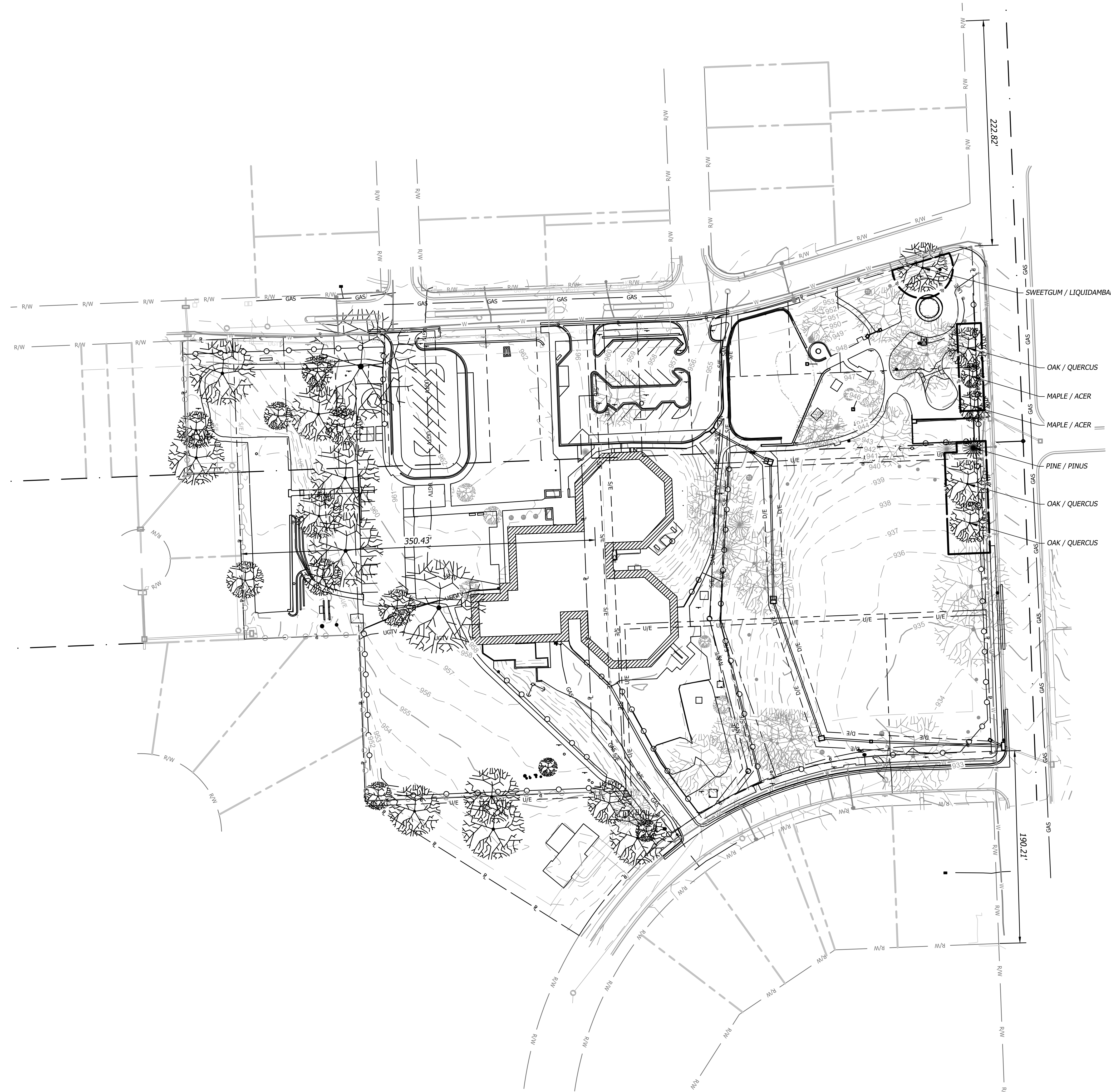
Prepared For:
 KARBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SW PKWY, SUITE 400
 MISSION WOODS, KS 66205
 816-221-4488

FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
BMP PLAN

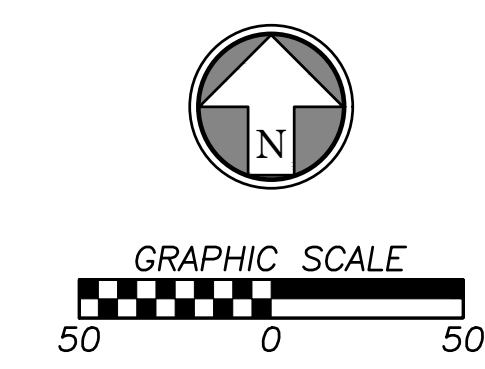
Design: DSN | Drawn: DRN
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 Issue Date: 09/15/2023
 Project Number: 037920

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Oct 05, 2023 10:01am Plotted By: custin.eggs V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-LISC-TREE.dwg Layout: TREE_PRESERVATION_PLAN



NOTE: Per City requirement, existing trees to be removed shall be replaced based on caliper size and installed in the future park area. Trees with caliper at or below 12" shall be replaced 1:1. Trees with caliper greater than 12" shall be replaced 2:1.

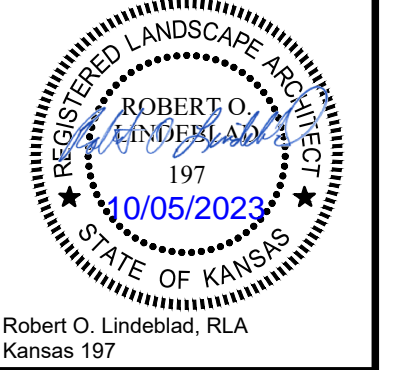


LEGEND

	EXISTING GRADE MAJOR CONTOUR
	EXISTING GRADE MINOR CONTOUR
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	TREE PROTECTION FENCE
	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED

ENTIRETY OF SHEET WAS UPDATED

Rev.	Date	Description	By	App.
1	10/05/23	CITY COMMENTS		



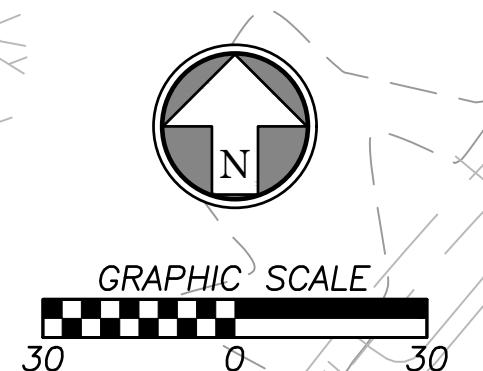
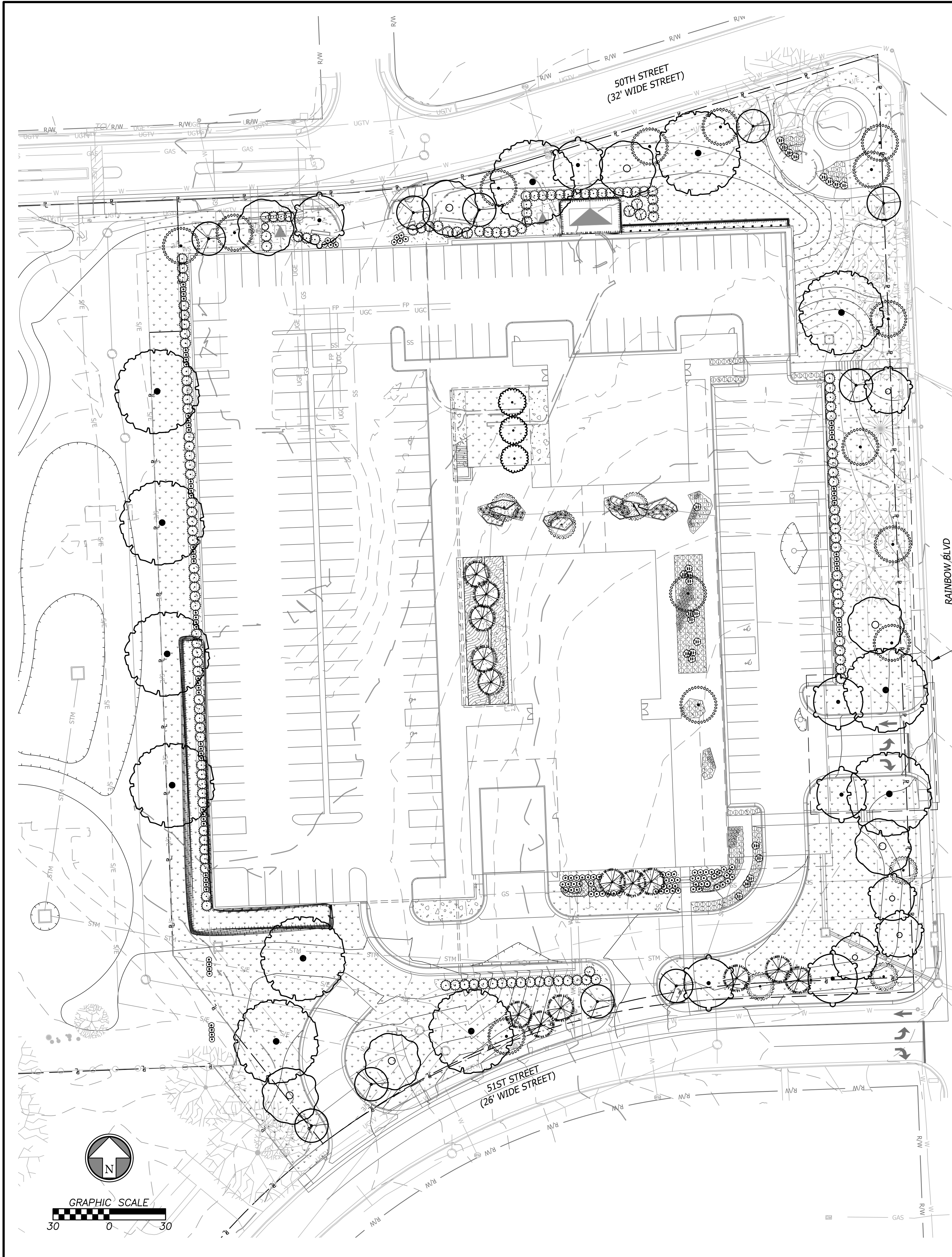
Prepared For:
 KARBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SM PKWY, SUITE 400
 MISSION WOODS, KS 66205
 816-221-4488

**FDP SUBMITTAL
 50TH & RAINBOW DEVELOPMENT
 WESTWOOD, KS 66205
 EXISTING FEATURES AND
 TREE PRESERVATION PLAN**

Design: ADM | Drawn: ADM
 Checked: ROL
 Issue Date: 09/15/2023
 Project Number: 037920

L1.0

Oct 05, 2023 - 10:01am Plotted By: custom.lge V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SITS-LANDSCAPE.dwg Layout: LANDSCAPE PLAN-GROUND LEVEL



PLANT SCHEDULE

TREES	QTY	BOTANICAL / COMMON NAME	CONT	CAL	HEIGHT
	7	Celtis occidentalis 'Prairie Pride' / Prairie Pride Hackberry	B & B	2"	cal
	3	Ginkgo biloba 'PNI 2720' / Princeton Sentry® Maidenhair Tree	B & B	2"	cal
	6	Gymnocladus dioica 'Espresso' / Kentucky Coffeetree	B & B	2"	cal
	4	Nyssa sylvatica 'Wildfire' / Wildfire Tupelo	B & B	2"	cal
	12	Quercus imbricaria / Shingle Oak	B & B	2.5"	cal
	10	Zelkova serrata 'JFS-KW1' / City Sprite® Japanese Zelkova	B & B	2"	cal
EVERGREEN TREES	QTY	BOTANICAL / COMMON NAME	CONT	CAL	HEIGHT
	14	Pinus thunbergii / Japanese Black Pine	B & B	6' - 8'	H
ORNAMENTAL TREES	QTY	BOTANICAL / COMMON NAME	CONT	CAL	HEIGHT
	14	Amelanchier x grandiflora 'Autumn Brilliance' / Autumn Brilliance Apple Serviceberry	B & B	1.5"	cal
	6	Chionanthus virginicus 'Dirr' / Dirr White Fringetree	B & B	1.5"	cal
SHRUBS	QTY	BOTANICAL / COMMON NAME	SPEC	HEIGHT	
	6	Viburnum dentatum 'Blue Muffin' / Blue Muffin Arrowwood Viburnum	5 gal		
EVERGREEN SHRUBS	QTY	BOTANICAL / COMMON NAME	SPEC	HEIGHT	
	134	Taxus x media 'Densiformis' / Dense Anglo-Japanese Yew	5 gal		
PERENNIALS	QTY	BOTANICAL / COMMON NAME	SPEC	HEIGHT	
	28	Amsonia hubrichtii / Arkansas Bluestar	1 gal		
	25	Baptisia x 'Purple Smoke' / Purple Smoke Wild Indigo	1 gal		
	215	Bouteloua gracilis 'Blonde Ambition' / Blonde Ambition Blue Grama	1 gal		
	101	Heuchera x 'Plum Pudding' / Plum Pudding Coral Bells	1 gal		
	133	Muhlenbergia capillaris / Pink Muhly Grass	1 gal		
SHRUB AREAS	QTY	BOTANICAL / COMMON NAME	CONT		
	128	Asclepias tuberosa / Butterfly Milkweed	quart		
	27	Carex grayi / Gray's Sedge	quart		
	199	Carex muskingumensis / Palm Sedge	quart		
	107	Chelone obliqua 'Armtipp02' / Tiny Tortuga Turtlehead	quart		
	263	Helleborus x ballardiae 'Cinnamon Snow' / HGC® Cinnamon Snow Lenten Rose	quart		
	507	Tiarella x 'Sugar and Spice' / Sugar and Spice Foamflower	quart		
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	SPEC		
	51,917 sf	Festuca arundinacea 'Watersaver Blend' / Watersaving Blend of Tall Fescue	sod		

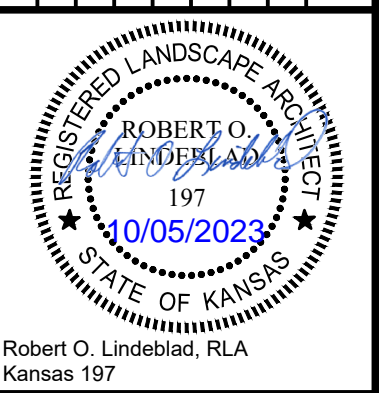
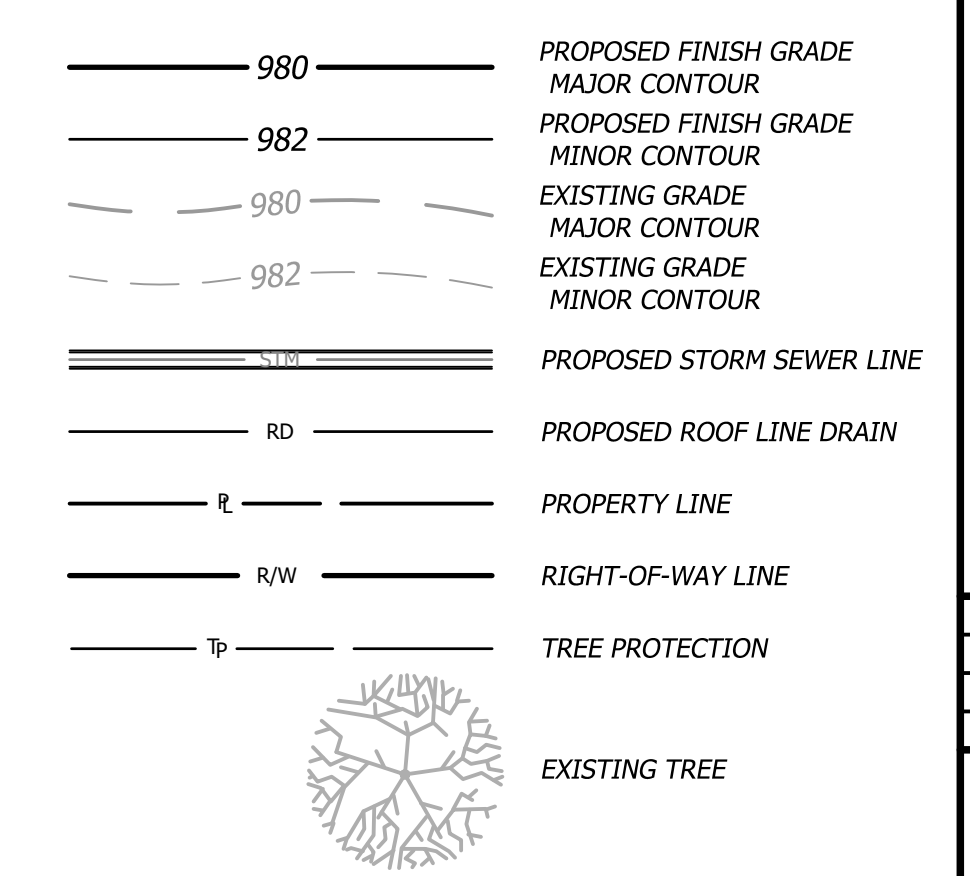
MULCH SCHEDULE

	WOOD MULCH	11,899 sf
	Double ground hardwood mulch. 3" depth.	

SITE DATA

	Quantity	Required	Existing	Provided	Total
Transitional Buffer					
West 50th Street: 1 tree / 20LF	325	16.25	1	16	17
West 51st Street: 1 tree / 20LF	289	14.45	n/a	18	18
Perimeter Parking Landscape					
continuous screen of 3' shrubs		Y		Y	
Interior Parking Landscape					
surface lot: 1 tree / 8 spaces	42	5.25	3	7	10*
			*(called out on plan as "parking lot shade trees")		
Utility Screening					
all above ground utilities screened		Y		Y	

LEGEND



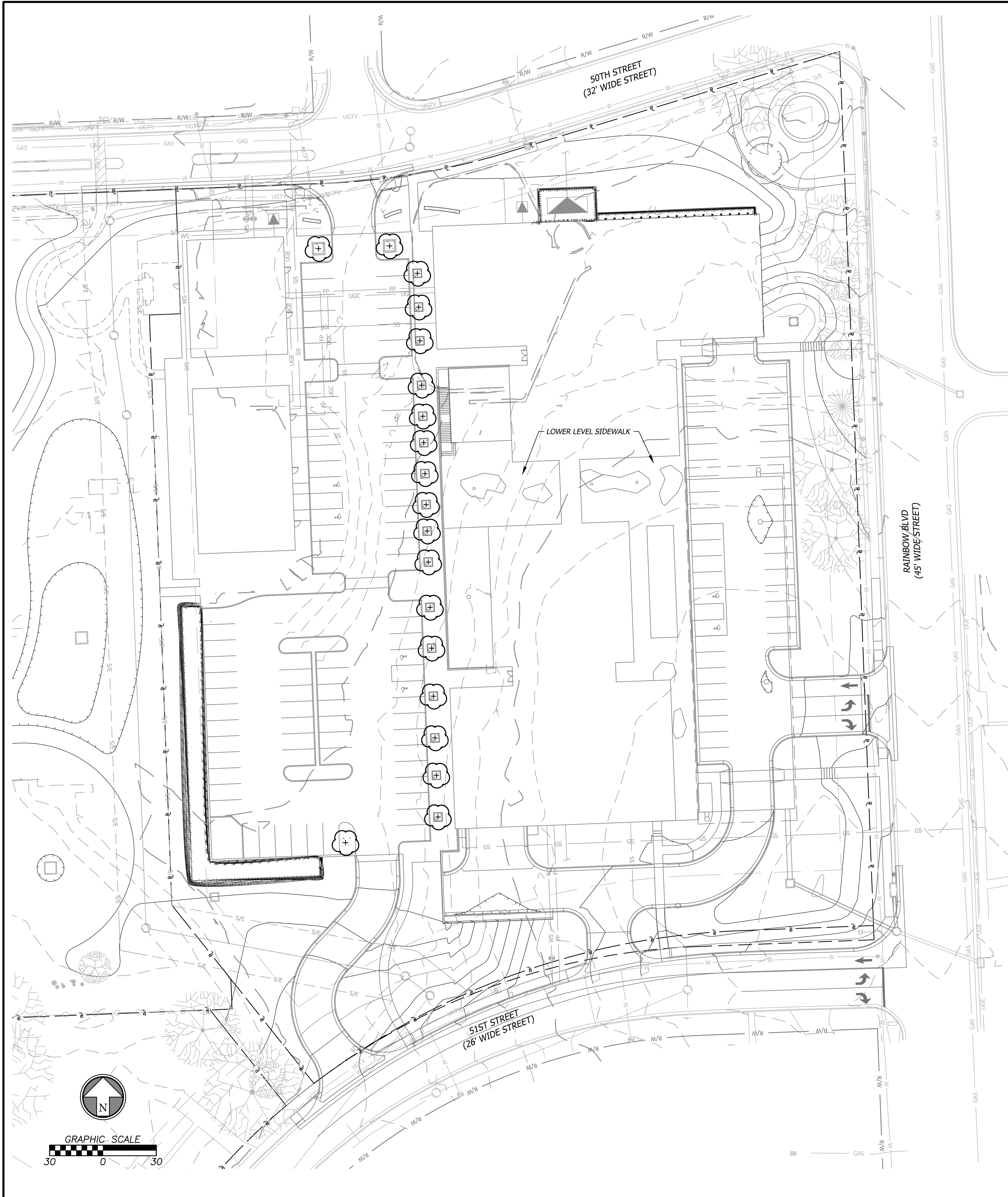
Prepared For:
KARBANK REAL ESTATE COMPANY
 ADAM FELDMAN
 2000 SM PKWY, SUITE 400
 MISSION WOODS, KS 66205
 816-221-4488

FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
LANDSCAPE PLAN-GROUND LEVEL

Design: ADM | Drawn: ADM
 Checked: ADM
 Issue Date: 09/15/2023
 Project Number: 037920

L2.0

Oct 05, 2023 - 10:01am Plotted By: custin.oge V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SIFS-SISC.dwg Layout: LANDSCAPE PLAN - SECOND LEVEL



PLANT SCHEDULE

ORNAMENTAL TREES	QTY	BOTANICAL / COMMON NAME	CONT	CAL
	19	Malus ioensis 'Prairie Rose' / Prairie Rose Crabapple	B & B	1.5" cal

MULCH SCHEDULE

	WOOD MULCH Double ground hardwood mulch. 3" depth.	397 sf
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LEGEND

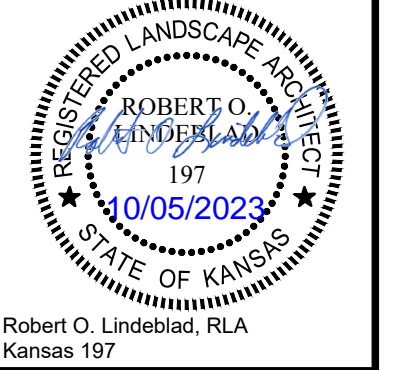
	PROPOSED STORM SEWER LINE
	PROPOSED ROOF LINE DRAIN
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	TREE PROTECTION

ENTIRETY OF SHEET
WAS UPDATED

GENERAL LANDSCAPE NOTES

- The Contractor shall verify and coordinate all final grades with the Landscape Architect and or design team prior to completion.
- Location and placement of all plant material shall be coordinated with the Landscape Architect prior to installation.
- Location of all utilities are approximate, the Contractor shall field verify locations prior to commencement of construction operations.
- Refer to Civil Drawings for all grading and berming, erosion control, storm drainage, utilities and site layout.
- The Contractor shall arrange and conduct a pre-construction meeting onsite with Landscape Architect prior to work.
- Plant quantities are for information only, drawing shall prevail if conflict occurs. Contractor is responsible for calculating own quantities and bid accordingly. Minimum quantities for each category of planting required by City Code must be maintained.
- The Contractor is to notify Landscape Architect after staking is complete and before plant pits are excavated.
- Tree locations in areas adjacent to drives, walks, walls and light fixtures may be field adjusted as approved by Landscape Architect.
- The Contractor shall report subsurface soil or drainage problems to the Landscape Architect.
- The plan is subject to changes based on plant size and material availability. All changes or substitutions must be approved by the City of Westwood, Kansas and the Landscape Architect.
- Aluminum landscape edging to be used on all landscape beds adjoining turf areas as noted on landscape plans. Edging shall not be used between pavement and landscape beds.
- Landscape Contractor shall be responsible for watering all plant material until the time that a permanent water source is ready.
- The Contractor shall provide a submittal to show proof of procurement, sources, quantities, and varieties for all shrubs, perennials, ornamental grasses, and annuals within 21 days following the award of the contract.
- Contractor shall provide full maintenance for newly landscaped areas for a period of 30 days after the date of final acceptance. At the end of the maintenance period, a healthy, well-rooted, even-colored, viable turf and landscaped area must be established. The landscaped areas shall be free of weeds, open joints, bare areas, and surface irregularities.
- Landscape Contractor shall provide rock mulch sample to owner for approval.

Rev.	Date	Description
1	10/05/2023	CITY COMMENTS



BHC
 CIVIL ENGINEERING & ARCHITECTURE
 101 East Park, Suite 400
 Overland Park, Kansas 66201
 p. 913.653.1900
 BHC is a member of Hensel Phelps Construction Company, P.A.

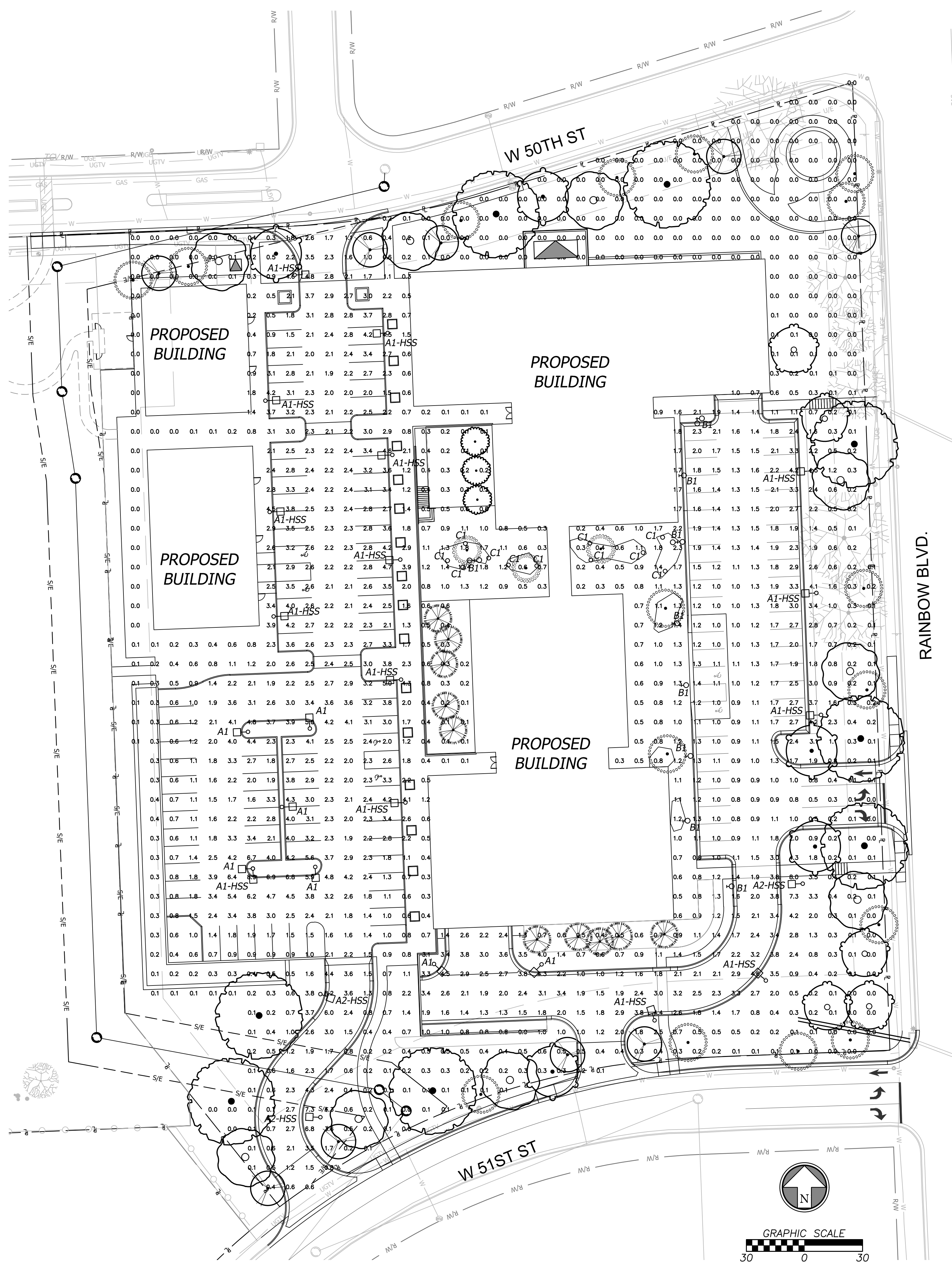
Prepared For:
KARBANK REAL ESTATE COMPANY
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FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
LANDSCAPE PLAN - SECOND LEVEL

Design: ADM | Drawn: ADM
 Checked: ADM
 Issue Date: 09/15/2023
 Project Number: 037920

L2.1

Sep 15, 2023 14:49pm Plotted By: austin.lage V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SFFS-1-JMC.dwg Layout: PHOTOMETRICS PLAN



LUMINAIRE SCHEDULE

CALLOUT	SYMBOL	DESCRIPTION	MODEL	QUANTITY	DEFAULT ELEVATION
A1	□	DALVIK 650S	HessAmerica, DAL650S-2LVC-WW-T4	7	15'
A1-HSS	□	DALVIK 650S	HessAmerica, DAL650S-2LVC-WW-T4-HSS	15	15'
A2-HSS	□	DALVIK 650S	HessAmerica, DAL650S-2LVC-WW-T3-HSS	3	15'
B1	○	Formed cast aluminum housing, LED strips with no enclosure	Landscape Forms Inc, CQ701-HE-LO	12	20'
C1	○	Pathway Luminaire	Forms And Surfaces, 104971299CRT-002, Radio Pathway LBRAD CHECK CCT	11	1'

FIXTURE A

Dalvik - 650S
Pole Mounted Luminaire

PRIMAR

DESCRIPTION
Contemporary LED pole mounted luminaire for public spaces where clean minimalist styling is desired. Concealed hardware and unique styling cast through low profile reveals highlight the shallow profile of the extruded aluminum housing. Luminaire is available with up to 3 LED modules in a choice of three asymmetric distributions. Dalvik is available on 15' or 20' four inch diameter poles in aluminum or steel. Steel poles are hot-dip galvanized prior to painting for proven long-term corrosion protection. Exclusive PRIMAR is available in finely textured matte silver, dark grey, graphite grey, black, or bronze. Custom RAL colors available on request. All hardware is stainless steel.

ORDERING INFORMATION

MODEL	LED MODULE	CCT	DISTRIBUTION	VOLT	MOUNTING	POLE	POLE MAT	FINISH (Primar)	OPTIONS
DAL650S	1VC	30K	T2	UNV	A	1595	A	SG	DM
	1Module	3000K	Type 1	120/277	Single Post Mount	12" Round Single	Aluminum	Matte Silver Grey	DM 1/2" Dia Drilling
	2VC	40K	T3	208	W	2085	S	DG	HSS
	2Modules	4000K	Type II	208	W	20" Round Single	Steel	Dark Grey	HSS House Side Street
	3VC	40K	T3	208	W	20" Round Single	Steel	Dark Grey	HSS House Side Street
	3Modules	4000K	Type II	208	W	20" Round Single	Steel	Dark Grey	HSS House Side Street

.hess

GENERAL PHOTOMETRIC SCHEDULE

AVERAGE FOOT-CANDLES	2.3
MAXIMUM FOOT-CANDLES	8.8
MINIMUM FOOT-CANDLES	0.2
MINIMUM TO MAXIMUM FC RATIO	0.0
MAXIMUM TO MINIMUM FC RATIO	46.4
AVERAGE TO MINIMUM FC RATIO	12.1

FIXTURE C

RADIA™ PATHWAY BOLLARD

FORMS+SURFACES

FIXTURE B

Typology Ring Light

Spec Sheet | CQ700

Housing & Materials
Cast aluminum construction. Flexible LED light engine is clamped into fixture housing with aluminum segmented caps. Housing features a clear aluminum glass white powdercoat reflector. All hardware is magnet-coated steel.

Electrical
Surge protected 120V through 277V 50/60Hz electronic driver, 9-10V dimming, -40°C start temperature. Cast aluminum driver housing assembly located at top of pole. Available with optional ANSI C136.41 twist lock receptacle or Watstopper FSP-3118 photolumination sensor.

Light Engine
Fully encapsulated flexible linear LED fixture delivers downward direct and indirect lighting in conjunction with the glass white metal reflector. A RFI/EMF compliant circuit board is included. Available in 2700K, 3000K, 3500K, and 4000K. 360° CRI across all available color temperatures.

Distribution
TV

Warranty
LED lighting products are warranted for six years.

Certification
UL Listed for Wet Location, CE, International Dark Sky Approved, Bay Area Compliant, RoHS Compliant

Designed by Designworks, a BMW Group company

Click here for patent information related to this product.

Weight: 48lbs (luminaire and driver housing)
EPA: 1.64ft²

TM01 L7070K: 60,000hrs
Protection Class: IP67

Rev.	Date	Description	By	App.

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PHOTOMETRICS PLAN

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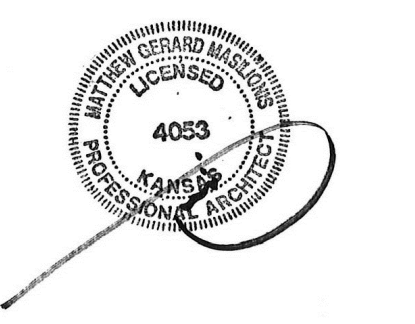
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PH1.0

2000 SHAWNEE MISSION PKWY
SUITE 100
MISSION WOODS, KS 66205
816 502 1500
WWW.PAD.STUDIO



MATTHEW MASILIONIS - ARCHITECT
KANSAS # 4053

I have prepared the drawings and assume responsibility for the sheets numbered with an "A" prefix for the project named below.
Other drawings and specifications attached for the above-mentioned project have been by and are the responsibility of the licensed engineer whose stamp and firm appear on that sheet.
The Architect is not responsible for the design of the mechanical, electrical, plumbing, civil, landscaping, structural, signage (not specified), fire sprinkler or fire suppression systems, and does not take responsibility for the compliance of these areas with the laws of the above governmental entities. The architect is not responsible for materials, components or equipment, as well as the method in which they are installed on the project by others. The architect is not responsible for improper operation due to faulty installation or product failure during construction or after completion of construction when operation has begun by the landlord or tenant.
The licensed professional whose stamp appears on sheets other than those specifically noted above shall be responsible for those items in paragraph three.

CONSULTANT



PROJECT
50TH AND RAINBOW DEVELOPMENT

50TH ST. & RAINBOW BLVD.
WESTWOOD KS, 66205

MARK	DATE	DESCRIPTION
1	10/05/23	CITY COMMENTS

SHEET TITLE

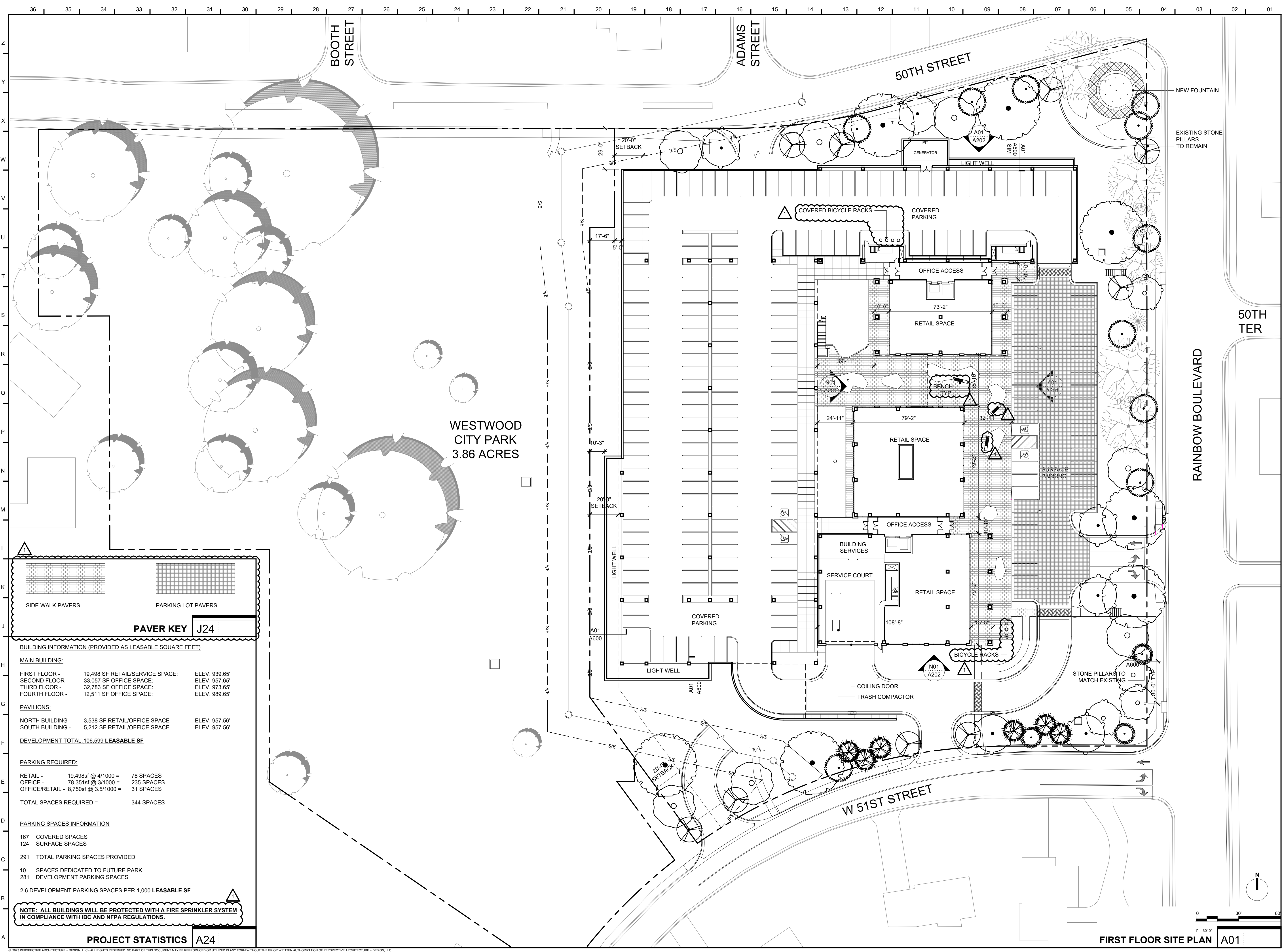
ARCHITECTURAL SITE PLAN

PROJECT NUMBER
2021073.000
SHEET AUTHOR
K. MILLER

CHECKED BY
M. PAXTON
DATE
9.15.23

FDP SUBMITTAL

SHEET NUMBER
AS101



WESTWOOD CITY PARK
3.86 ACRES

PAVER KEY J24

SIDE WALK PAVERS	PARKING LOT PAVERS
------------------	--------------------

BUILDING INFORMATION (PROVIDED AS LEASABLE SQUARE FEET)

MAIN BUILDING:

FIRST FLOOR -	19,498 SF RETAIL/SERVICE SPACE:	ELEV. 939.65'
SECOND FLOOR -	33,057 SF OFFICE SPACE:	ELEV. 957.65'
THIRD FLOOR -	32,783 SF OFFICE SPACE:	ELEV. 973.65'
FOURTH FLOOR -	12,511 SF OFFICE SPACE:	ELEV. 989.65'

PAVILIONS:

NORTH BUILDING -	3,538 SF RETAIL/OFFICE SPACE	ELEV. 957.56'
SOUTH BUILDING -	5,212 SF RETAIL/OFFICE SPACE	ELEV. 957.56'

DEVELOPMENT TOTAL: 106,599 LEASABLE SF

PARKING REQUIRED:

RETAIL -	19,498sf @ 4/1000 =	78 SPACES
OFFICE -	78,351sf @ 3/1000 =	236 SPACES
OFFICE/RETAIL -	8,750sf @ 3.5/1000 =	31 SPACES
TOTAL SPACES REQUIRED =		344 SPACES

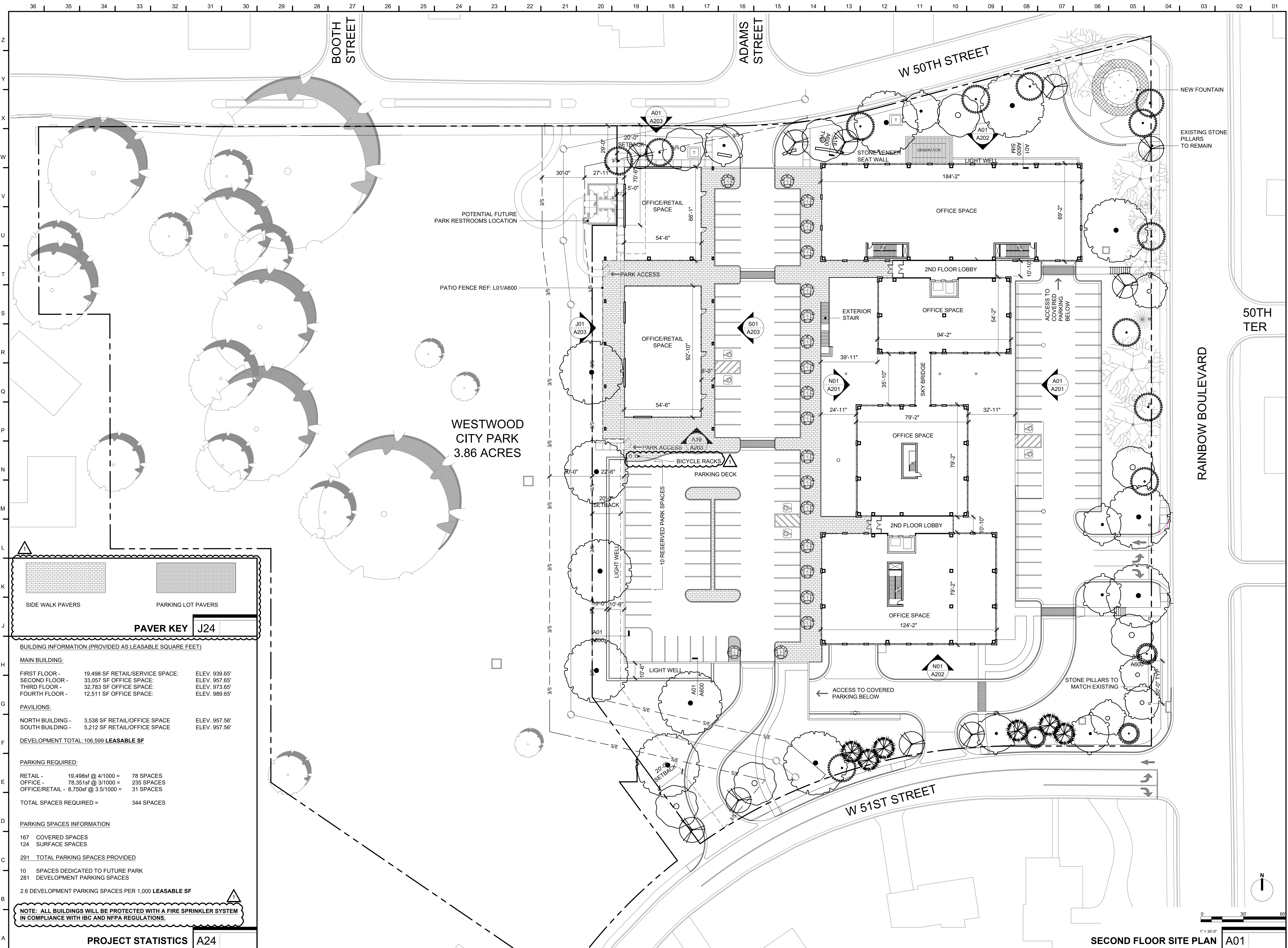
PARKING SPACES INFORMATION

167	COVERED SPACES
124	SURFACE SPACES
291	TOTAL PARKING SPACES PROVIDED
10	SPACES DEDICATED TO FUTURE PARK
281	DEVELOPMENT PARKING SPACES
2.6 DEVELOPMENT PARKING SPACES PER 1,000 LEASABLE SF	

NOTE: ALL BUILDINGS WILL BE PROTECTED WITH A FIRE SPRINKLER SYSTEM IN COMPLIANCE WITH IBC AND NFPA REGULATIONS.

PROJECT STATISTICS A24

FIRST FLOOR SITE PLAN A01



WESTWOOD CITY PARK
3.86 ACRES

PAVER KEY J24

SIDE WALK PAVERS	PARKING LOT PAVERS
------------------	--------------------

BUILDING INFORMATION (PROVIDED AS LEASABLE SQUARE FEET)

MAIN BUILDING:

FIRST FLOOR -	19,498 SF RETAIL/SERVICE SPACE:	ELEV. 939.65'
SECOND FLOOR -	33,057 SF OFFICE SPACE:	ELEV. 957.65'
THIRD FLOOR -	32,783 SF OFFICE SPACE:	ELEV. 973.65'
FOURTH FLOOR -	12,511 SF OFFICE SPACE:	ELEV. 989.65'

PAVILIONS:

NORTH BUILDING -	3,538 SF RETAIL/OFFICE SPACE	ELEV. 957.56'
SOUTH BUILDING -	5,212 SF RETAIL/OFFICE SPACE	ELEV. 957.56'

DEVELOPMENT TOTAL: 106,599 LEASABLE SF

PARKING REQUIRED:

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OFFICE -	78,351sf @ 3/1000 =	236 SPACES
OFFICE/RETAIL -	8,750sf @ 3.5/1000 =	31 SPACES
TOTAL SPACES REQUIRED =		344 SPACES

PARKING SPACES INFORMATION

167	COVERED SPACES
124	SURFACE SPACES
291	TOTAL PARKING SPACES PROVIDED
10	SPACES DEDICATED TO FUTURE PARK
281	DEVELOPMENT PARKING SPACES
2.6 DEVELOPMENT PARKING SPACES PER 1,000 LEASABLE SF	

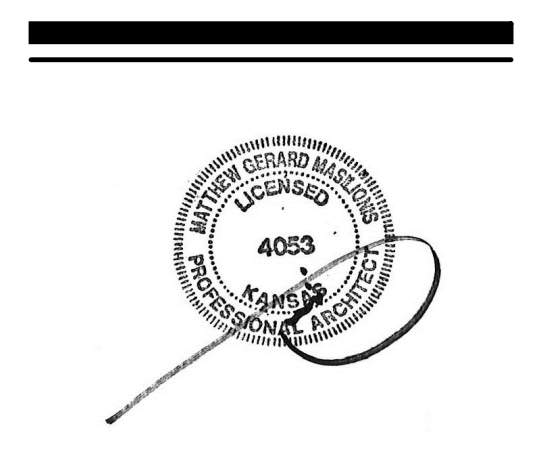
NOTE: ALL BUILDINGS WILL BE PROTECTED WITH A FIRE SPRINKLER SYSTEM IN COMPLIANCE WITH IBC AND NFPA REGULATIONS.

PROJECT STATISTICS A24

Perspective

ND1930 + 38N1331H09V

2000 SHAWNEE MISSION PKWY
SUITE 100
MISSION WOODS, KS 66205
816 502 1500
WWW.PAD.STUDIO



MATTHEW MASILIONIS - ARCHITECT
KANSAS # 4053

I have prepared the drawings and assume responsibility for the sheets numbered with an "A" prefix for the project named below.

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CONSULTANT



PROJECT
50TH AND RAINBOW DEVELOPMENT

50TH ST. & RAINBOW BLVD.
WESTWOOD KS, 66205

MARK	DATE	DESCRIPTION
1	10/05/23	CITY COMMENTS

SHEET TITLE

ARCHITECTURAL SITE PLAN

PROJECT NUMBER
2021073.000

SHEET AUTHOR
K. MILLER

CHECKED BY
M. PAXTON

DATE
9.15.23

FDP SUBMITTAL

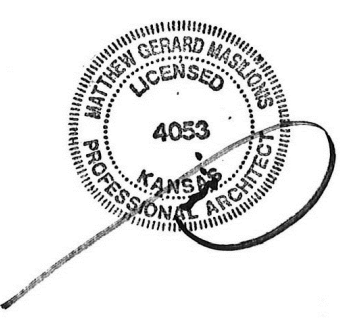
SHEET NUMBER
AS102

1" = 30'-0"
SECOND FLOOR SITE PLAN A01

Perspective

NO1930 + 3811311H09V

2000 SHAWNEE MISSION PKWY
SUITE 100
MISSION WOODS, KS 66205
816 502 1500
WWW.PAD.STUDIO



MATTHEW MASILIONIS - ARCHITECT
KANSAS # 4053

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CONSULTANT



PROJECT
50TH AND RAINBOW DEVELOPMENT

50TH ST. & RAINBOW BLVD.
WESTWOOD KS, 66205

MARK	DATE	DESCRIPTION
1	10/05/23	CITY COMMENTS

SHEET TITLE

ARCHITECTURAL SITE PLAN

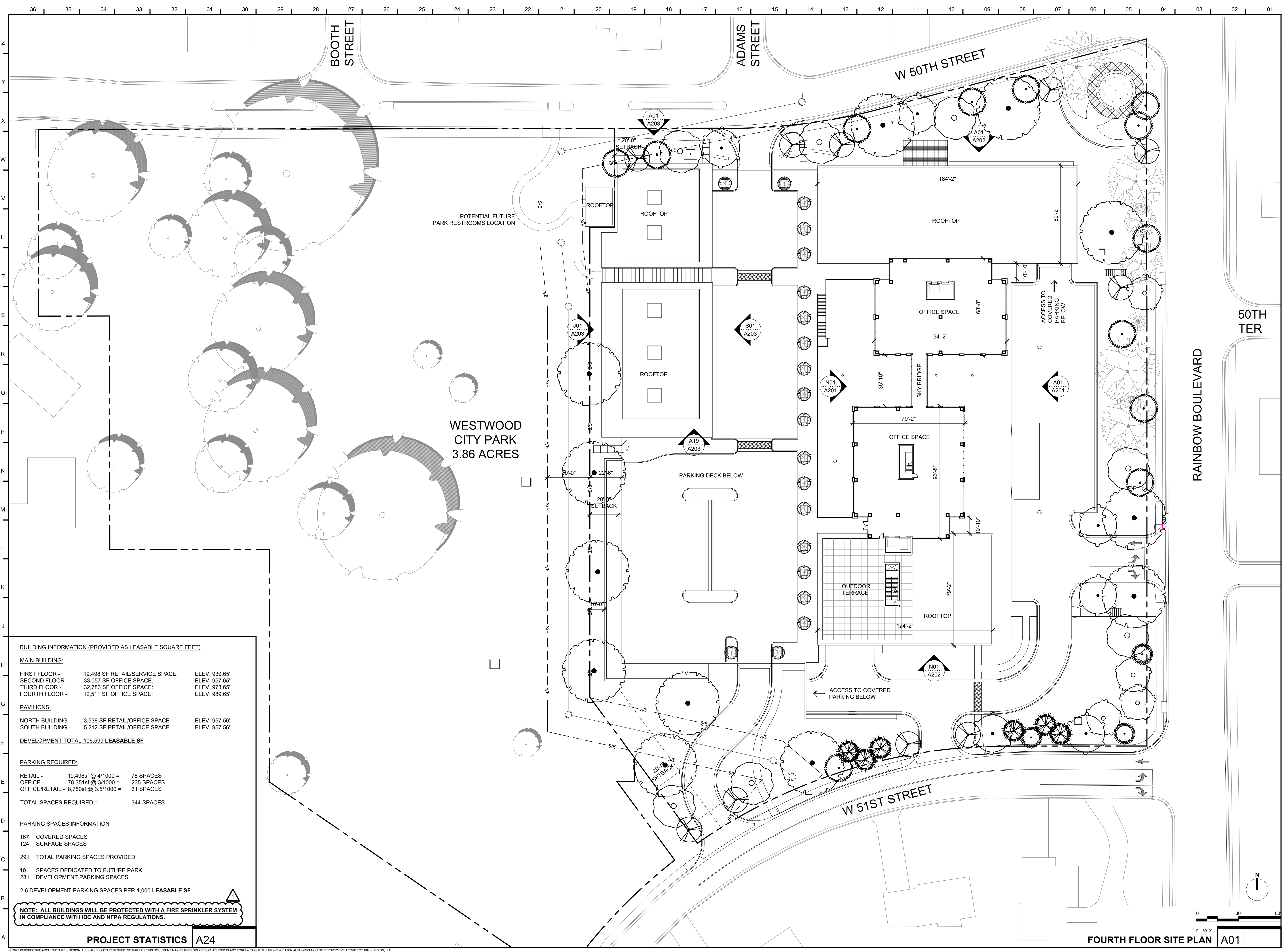
PROJECT NUMBER
2021073.000
SHEET AUTHOR
K. MILLER

CHECKED BY
M. PAXTON

DATE
9.15.23

FDP SUBMITTAL

SHEET NUMBER
AS103

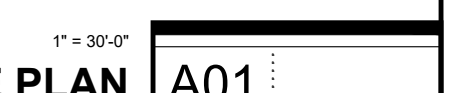


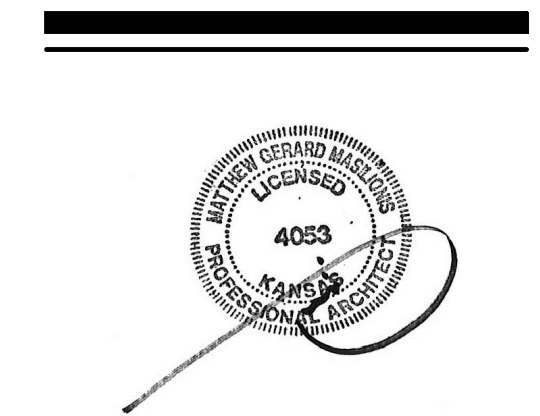
BUILDING INFORMATION (PROVIDED AS LEASABLE SQUARE FEET)		
MAIN BUILDING:		
FIRST FLOOR -	19,498 SF RETAIL/SERVICE SPACE:	ELEV. 939.65'
SECOND FLOOR -	33,057 SF OFFICE SPACE:	ELEV. 957.65'
THIRD FLOOR -	32,783 SF OFFICE SPACE:	ELEV. 973.65'
FOURTH FLOOR -	12,511 SF OFFICE SPACE:	ELEV. 989.65'
PAVILIONS:		
NORTH BUILDING -	3,538 SF RETAIL/OFFICE SPACE	ELEV. 957.56'
SOUTH BUILDING -	5,212 SF RETAIL/OFFICE SPACE	ELEV. 957.56'
DEVELOPMENT TOTAL: 106,599 LEASABLE SF		
PARKING REQUIRED:		
RETAIL -	19,498sf @ 4/1000 =	78 SPACES
OFFICE -	78,351sf @ 3/1000 =	236 SPACES
OFFICE/RETAIL -	8,750sf @ 3.5/1000 =	31 SPACES
TOTAL SPACES REQUIRED =		344 SPACES
PARKING SPACES INFORMATION		
167	COVERED SPACES	
124	SURFACE SPACES	
291 TOTAL PARKING SPACES PROVIDED		
10	SPACES DEDICATED TO FUTURE PARK	
281	DEVELOPMENT PARKING SPACES	
2.6 DEVELOPMENT PARKING SPACES PER 1,000 LEASABLE SF		

NOTE: ALL BUILDINGS WILL BE PROTECTED WITH A FIRE SPRINKLER SYSTEM IN COMPLIANCE WITH IBC AND NFPA REGULATIONS.

PROJECT STATISTICS A24

FOURTH FLOOR SITE PLAN A01





MATTHEW MASILIONIS - ARCHITECT
KANSAS #4053

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CONSULTANT



PROJECT
50TH AND RAINBOW DEVELOPMENT

50TH ST. & RAINBOW BLVD.
WESTWOOD KS, 66205

MARK	DATE	DESCRIPTION

SHEET TITLE

BUILDING ELEVATIONS

PROJECT NUMBER
2021073.000
SHEET AUTHOR

CHECKED BY
DATE
9.16.23

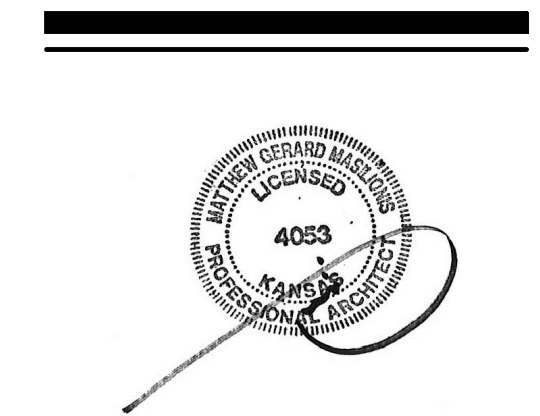
FDP SUBMITTAL

SHEET NUMBER
A201



1/16" = 1'-0"
MAIN BUILDING - WEST ELEVATION N01

1/16" = 1'-0"
MAIN BUILDING - EAST ELEVATION A01



MATTHEW MASILIONIS - ARCHITECT
KANSAS #4053

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CONSULTANT



PROJECT
50TH AND RAINBOW DEVELOPMENT

50TH ST. & RAINBOW BLVD.
WESTWOOD KS, 66205

MARK	DATE	DESCRIPTION

SHEET TITLE

BUILDING ELEVATIONS

PROJECT NUMBER

2021073.000

SHEET AUTHOR

CHECKED BY

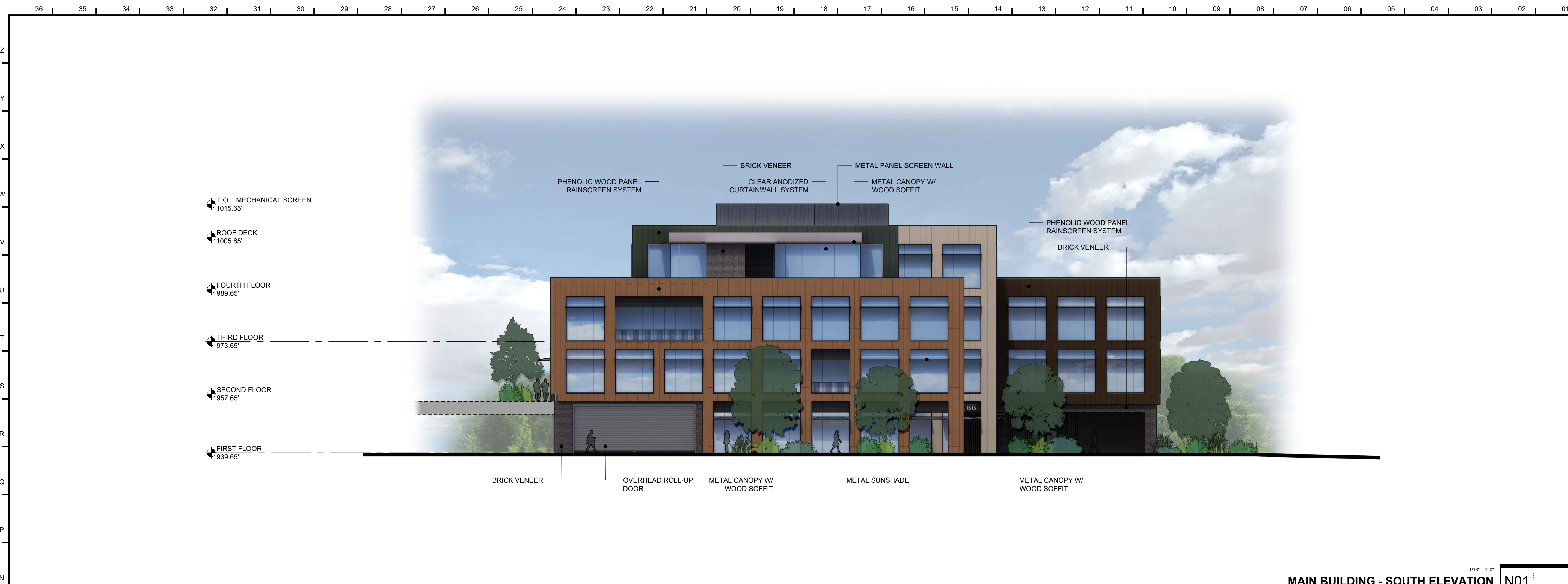
DATE

9.16.23

FDP SUBMITTAL

SHEET NUMBER

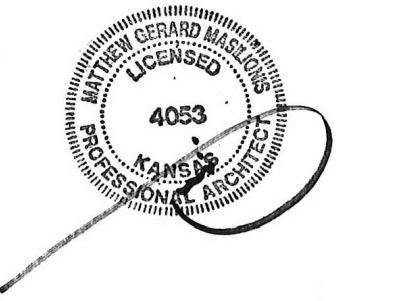
A202



1/16" = 1'-0"
MAIN BUILDING - SOUTH ELEVATION N01



1/16" = 1'-0"
MAIN BUILDING - NORTH ELEVATION A01



MATTHEW MASILIONIS - ARCHITECT
KANSAS #4053

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CONSULTANT



PROJECT

50TH AND RAINBOW DEVELOPMENT

50TH ST. & RAINBOW BLVD.
WESTWOOD KS, 66205

MARK	DATE	DESCRIPTION
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SHEET TITLE

BUILDINGS ELEVATIONS

PROJECT NUMBER

2021073.000

SHEET AUTHOR

CHECKED BY

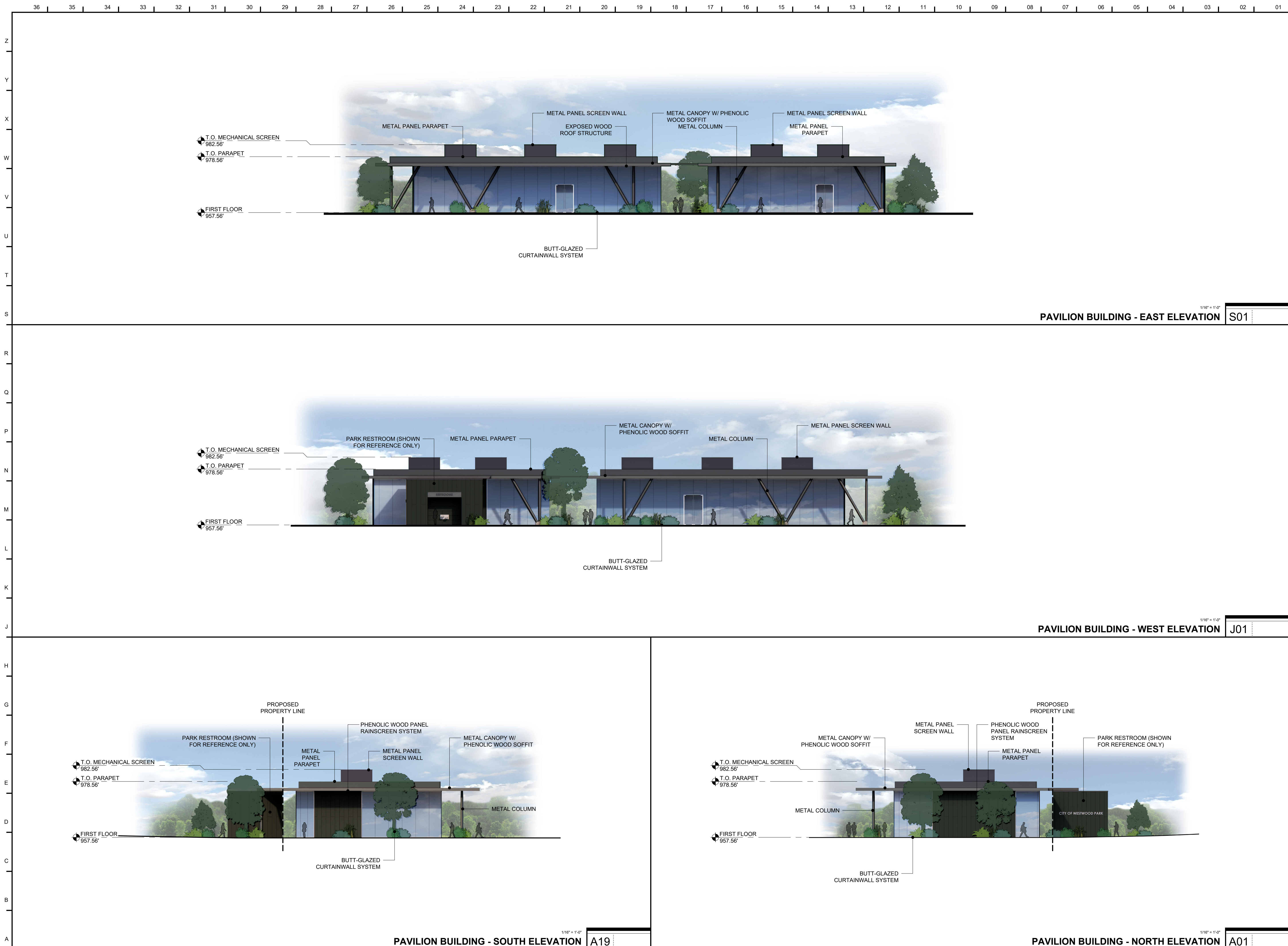
DATE

9.16.23

FDP SUBMITTAL

SHEET NUMBER

A203



PAVILION BUILDING - EAST ELEVATION 1/16" = 1'-0" S01

PAVILION BUILDING - WEST ELEVATION 1/16" = 1'-0" J01

PAVILION BUILDING - SOUTH ELEVATION 1/16" = 1'-0" A19

PAVILION BUILDING - NORTH ELEVATION 1/16" = 1'-0" A01

LINE

Product Data Sheet

landscapeforms



The timeless, minimalist form of L I N E landscape panels, designed by Shane Coen and Coen + Partners, defines the landscape within and around its boundaries. L I N E panels delineate space, provide enclosure, and give landscape architects a new medium with which to express their unique visions. L I N E takes the hassle out of creating custom boundary elements. L I N E's flexibility supports custom patterns and sizes to reflect a landscape architect's unique design.

General Specifications

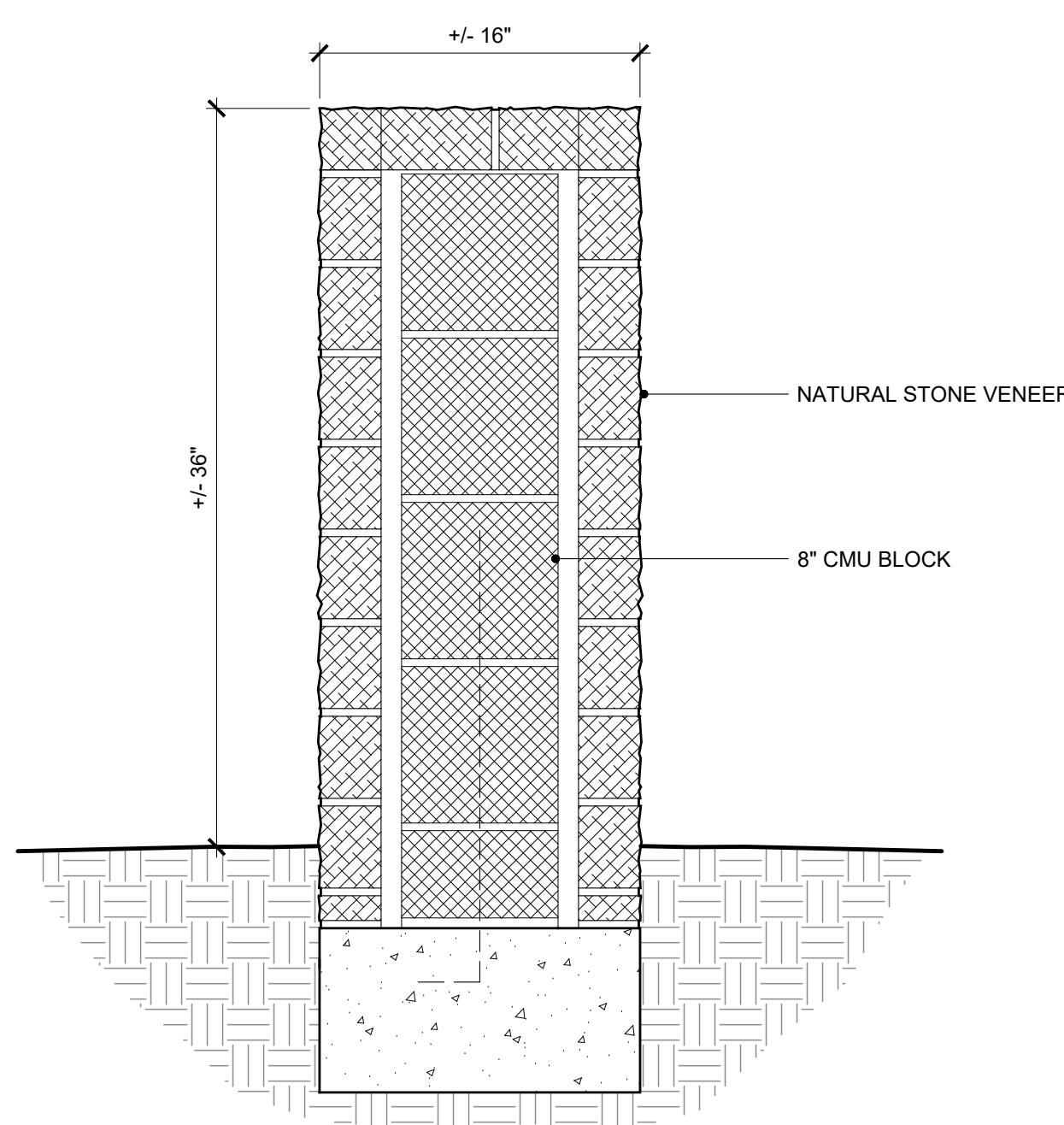
- L I N E is available as standard in 8 panel types
- All panels are constructed of extruded and fabricated aluminum
- All panel types are available with a matching gate option
- Gate hardware (hinges, handle mechanism) are included with an order; bespoke hardware may be specified as a custom
- All panel types are available in 4', and 6' panel heights
- Posts are spaced at 6' intervals for 4' height panels, and at 4' intervals for 6' height panels as standard; modified post spacing is available to accommodate a specific site plan
- All panel types are available surface mounted or embedded

	Style
	Half Inch Vertical Rod
	Vertical Picket
	Vertical Louver - Angled
	Vertical Louver - Straight
	Half Inch Horizontal Rod
	One Inch Horizontal Slat
	Perforated Panel
	Solid Panel
	Gate option available for all panel types

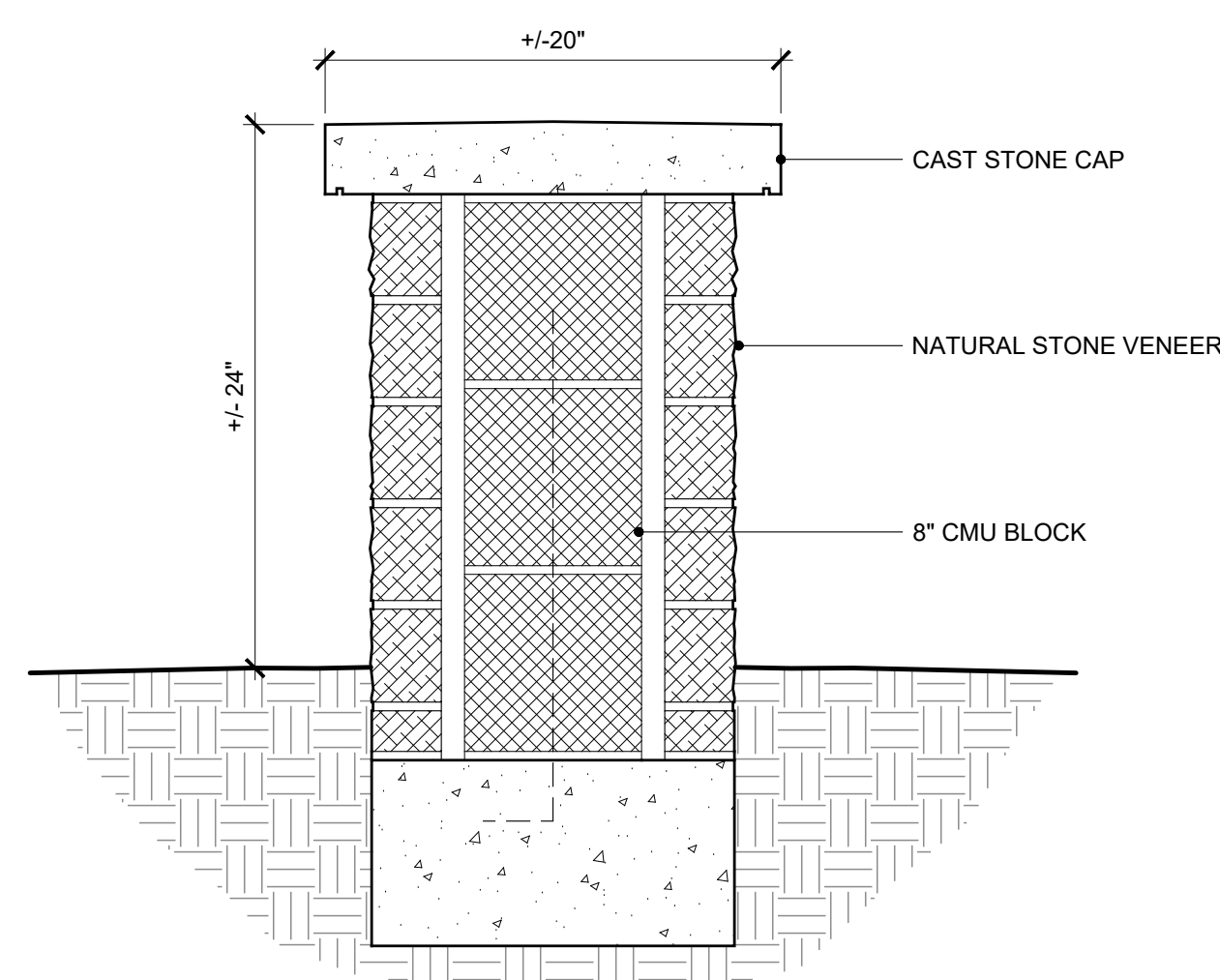


1 Revised December 1, 2020 | Landscape Forms Inc. | 800.521.2546 | F 269.381.3455 | 7800 E. Michigan Ave., Kalamazoo, MI 49048

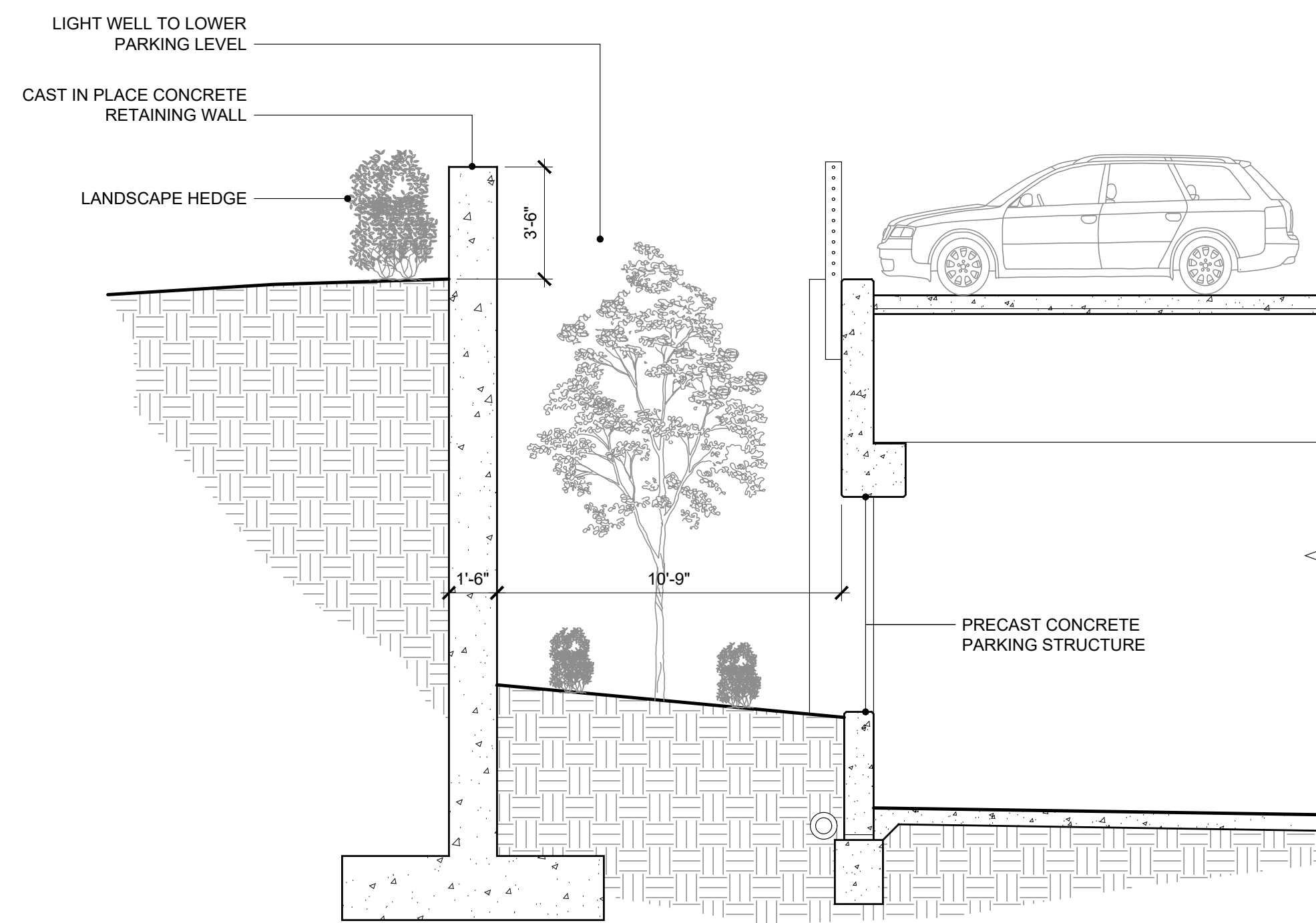
FENCING L01



STONE PILLAR SECTION A26



LANDSCAPE SEAT WALL SECTION A16



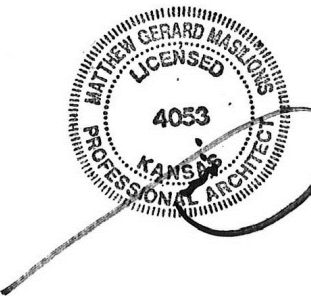
LIGHT WELL SECTION A01

Perspective

2000 SHAWNEE MISSION PKWY
SUITE 100
MISSION WOODS, KS 66205

816 502 1500

WWW.PAD.STUDIO



MATTHEW MASILIONIS - ARCHITECT
KANSAS # 4053

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CONSULTANT



PROJECT

50TH AND RAINBOW DEVELOPMENT

750TH ST. & RAINBOW BLVD.
WESTWOOD KS, 66205

MARK DATE DESCRIPTION

SHEET TITLE

DETAILS

PROJECT NUMBER

2021073.000

SHEET AUTHOR

K. MILLER

CHECKED BY

M. PAXTON

DATE

9.15.23

FDP SUBMITTAL

SHEET NUMBER

A600



October 3, 2023

Ms. Leslie Herring
City Administrator
City of Westwood, KS

RE: 50th & Rainbow Development – Westwood, Kansas

Dear Ms. Herring,

As requested, Priority Engineers, Inc. has reviewed the traffic impact study prepared for the 50th & Rainbow Development project dated September 29, 2023. Overall, the study addresses previous comments and ongoing changes to the project. However, while sight distance was measured for the drives accessing Rainbow Boulevard, the sight distance for the drives onto 50th Street and onto 51st Street has still not been field verified as requested in the scope provided at the beginning of the project. The sight triangle exhibits provided are helpful, but we still recommend that the sight distance be field verified to ensure that there are not vertical alignment, landscaping, or other unexpected obstacles present.

The following comments and observations are for documentation only, and do not require a response.

- Figure 1 illustrates the existing traffic volumes as counted on September 6th with school in session. Existing traffic volumes (Figure 1) were combined with development traffic volumes (Figure 7) to generate the traffic volumes illustrated in Figure 8 as those to be used for the proposed development scenario. The Rushton School traffic volumes were to be subtracted out of this scenario. However, it appears that only those vehicles utilizing the drive opposite Adams Streete were subtracted. The drive opposite Booth Street actually has a higher utilization. While this parking area will remain post-development, it is clearly being used for school traffic at this time. These vehicles could be subtracted from the intersection of 50th Street and Rainbow. The intersection operates well as modeled, and the analyzed conditions can be considered to be conservative.
- On page 10, in the second paragraph, the proposed driveway movement described as a westbound left-turn should be eastbound.
- Left turn lanes are warranted on northbound Rainbow at both the Church Drive and 51st Street. These movements operate well without the turn lanes. Absence of turn lanes should be verified by City staff as consistent with regional goals and plans for the Rainbow corridor.
- KDOT may have comments regarding the trip generation rates used. The decision not to apply internal capture reductions or pass-by trip reductions should offset minor changes to the trip generation rates utilized and are not expected to impact the overall results of the study.

Please let me know if you have any questions or require additional information. I can be reached at (816) 738-4400.

Sincerely,

PRIORITY ENGINEERS, INC.



Kristin L. Skinner, P.E., PTOE

FINAL STORMWATER MANAGEMENT STUDY FOR 50TH AND RAINBOW DEVELOPMENT

PREPARED FOR

KARBANK REAL ESTATE COMPANY

Project Location:

50TH AND RAINBOW
WESTWOOD, KANSAS 66205

FINAL PLAT, HENRY'S ADDITION
SECTION 3, TOWNSHIP 12 SOUTH, RANGE 25 EAST

BHC Project # 037920.00.01

September 15, 2023
REV 1: October 5, 2023



Austin Lage
KS PE 28006
10/05/2023



Table of Contents

Executive Summary

1.0 Introduction

- 1.1 Design Criteria

2.0 Existing Condition

- 2.1 Project Site
- 2.2 Hydrology

3.0 Proposed Condition

- 3.1 Project Site
- 3.2 Hydrology
- 3.3 Detention System

4.0 Stormwater Quality

- 4.1 Level of Service
- 4.2 Stormwater Quality System Design

5.0 Permitting

- 6.1 United State Army Corps of Engineers (USACE)
- 6.2 Federal Emergency Management Agency (FEMA)
- 6.3 Kansas Department of Health and Environment (KDHE)
- 6.4 Kansas Division of Water Resources (DWR)
- 6.5 Kansas State Historical Preservation Office (SHPO)
- 6.6 Kansas Department of Wildlife, Parks and Tourism (KDWPT)

6.0 Conclusion

Table of Appendices

Appendix A – Reference Documents

- A1 – Existing Drainage Areas Map
- A2 – Proposed Drainage Areas Map
- A3 – FEMA Firmette
- A4 – National Wetlands Inventory Map

Appendix B – LOS Calculations

- B1 – BMP Worksheet #1
- B2 – BMP Worksheet #2

Appendix C – Computer Output Summaries

- C1 – Existing HydroCAD output
- C2 – Proposed HydroCAD output

Appendix D – USDA NRCS Soils Report

Appendix E – MC-4500 StormTech Detail Sheet

Executive Summary

BHC has been retained as the Civil Engineer for the development at 50th and Rainbow in Westwood, KS. The 7.62-acre site is located on the west side of Rainbow Blvd between W 50th street and W 51st street. The project site has two water sheds, one being the east half of the site with the other the west half. The east watershed has approximately 5.19-acres, collecting into the public storm system within the site and being conveyed to the northwest corner of 51st and Rainbow Blvd. The west watershed has approximately 2.44-acres discharging to the public storm system running along the west side of the property.

The proposed development will be divided into two properties; the west property is to be a city park where the east property is to include the construction of one 4-story building & two single story pavilion buildings, associated parking, underground utilities, and water quality and quantity facilities.

This report documents the existing and proposed drainage conditions on the site. Furthermore, the report proves that the project will not have an adverse impact on surrounding properties, the existing storm sewer network, and the watershed adjacent to and downstream from the property.

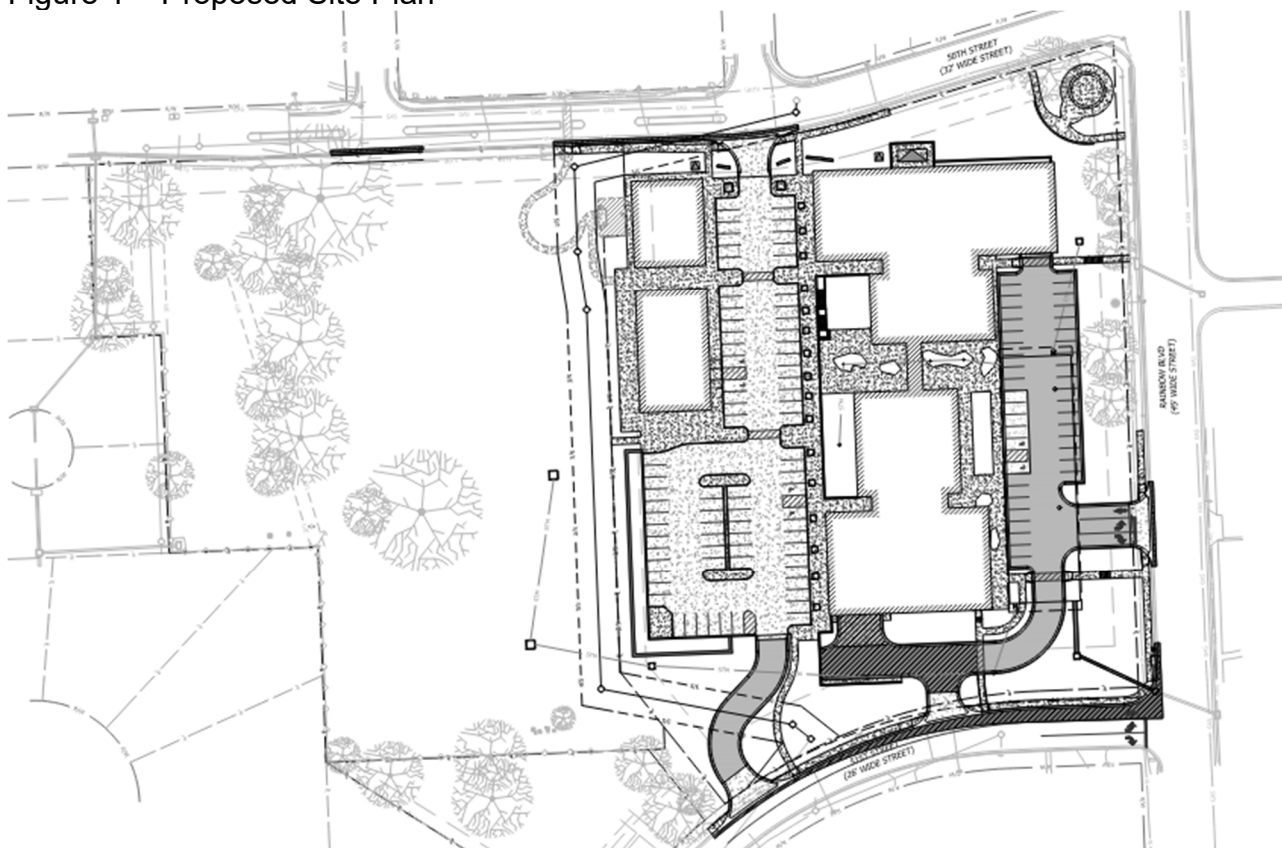
Per the City of Westwood, the proposed design is in accordance with the Westwood codes and ordinances as well as the 2012 MARC Manual. To meet the allowable release rates, an underground detention pond providing roughly 1.0 acre-feet of storage will be constructed east of the 4-story building, under the surface parking lot.

1.0 Introduction

This Stormwater Management Study is prepared for the development of 50th and Rainbow in Westwood, Kansas. The purpose of this study is to determine the stormwater infrastructure needs for the project, evaluate the existing drainage patterns, and determine that the development will not have an adverse impact on the adjacent properties and downstream watersheds.

The proposed development will be divided into two properties; the west property is to be a city park where the east property is to include the construction of one 4-story building & two single story pavilion buildings, associated parking, underground utilities, and water quality and quantity facilities.

Figure 1 – Proposed Site Plan



1.1 Design Criteria

City of Westwood Codes & Ordinances

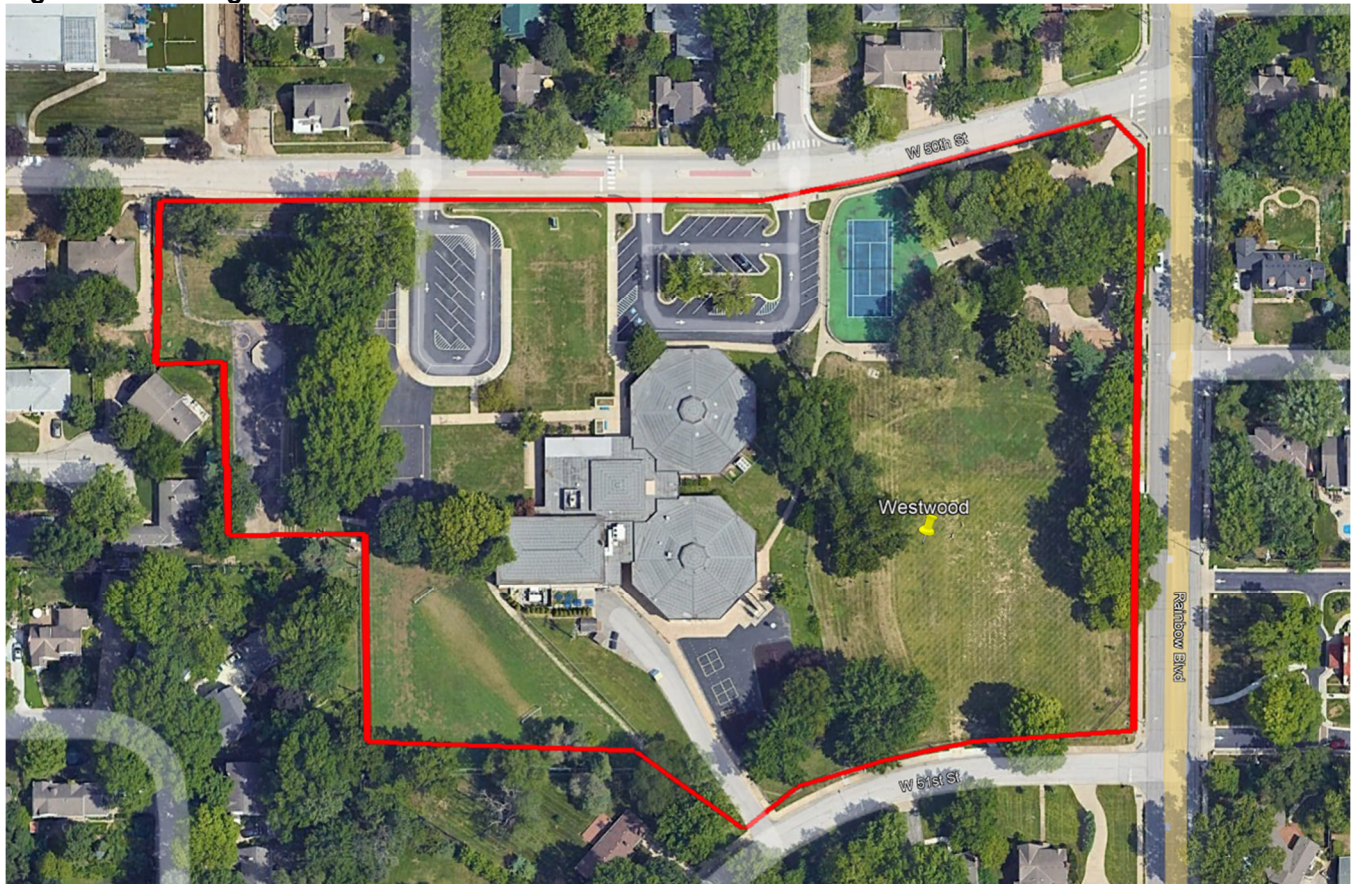
Mid-America Regional Council Manual for Best Management Practices For Stormwater Quality (October 2012).

2.0 Existing Conditions

2.1 Project Site

The project site at W 50th street and Rainbow Blvd consists of the existing school property and the park property. These lots have been combined into one 7.62 acres lot and platted as Henry's Addition. See Existing Site Aerial below for illustration. The site has one existing building, paved areas, and utilities all to be demolished and removed by the developer. The current site is roughly 36.5% Impervious.

Figure 2 – Existing Site Aerial



2.2 Hydrology

The site is divided by a north-south ridge line creating two separate watersheds – One watershed area, EX-1, drains to the west side of the lot and the other, EX-2, drains to the southeast corner of the lot. See Appendix A for Existing Drainage Map. There are no existing detention or BMP facilities on site. Table 1 demonstrates existing impervious cover of the two described drainage areas in the existing condition.

Table 1 – Existing Drainage Area Calculations

<u>DRAINAGE AREAS</u>									
Basin ID	AREA		PERVIOUS		IMPERVIOUS		CN-Value	C-VALUE	
EX 1	106,112 SF	(2.44 ac)	71,408 SF	(1.64 ac)	34,704 SF	(0.80 ac)	86	0.50	
EX 2	226,017 SF	(5.19 ac)	139,421 SF	(3.20 ac)	86,596 SF	(1.99 ac)	87	0.53	
Total	332,129 SF	(7.62 ac)	210,829 SF	(4.84 ac)	121,300 SF	(2.78 ac)	87	0.52	

*EX-1 & EX-2 drain to separate watersheds

**Refer to Appendix A for Existing Drainage Map

The existing soils located on the site were identified as Sharpsburg-Urban land complex (4% to 8% slopes) by the USDA Soil Map Survey which can be found in Appendix D of this report. The Hydraulic Soil Group (HSG) was classification C from the USDA soil survey attached, however due to the site being fully developed a classification of D has been used. It should be noted that the open green space in the southeast quadrant of the site was previously developed and then demolished. Table 2-2a of TR-55 gives the runoff curve numbers for urban areas. The curve numbers given were determined from class D lawn cover and impervious area corresponding to the overall site area, 80 and 98 respectively.

Table 2 below shows existing conditions peak flows release rates from the site associated with the 2-, 10-, and 100-year storms. As the existing site does not provide any on-site detention, all peak flow rates are of un-detained runoff. The drainage areas are separated into EX-1 and EX-2 drainage to correspond with the two drainage areas. All modeling was performed using HydroCAD Stormwater Modeling Software, the results of which can be found in the attached Appendix A and C. NOAA rain data was used in calculating peak discharge for the 2-, 10-, & 100-year event storms.

Table 2 – Existing Release Rate Calculations

<u>Release Rates</u>			
Basin ID	2 - Year	10 - Year	100 - year
EX 1	9.84 cfs	16.90 cfs	29.42 cfs
EX 2	15.40 cfs	26.39 cfs	45.91 cfs

Total **25.24 cfs** **43.29 cfs** **75.33 cfs**

3.0 Proposed Condition

3.1 Project Site

This project will result in change for both watersheds. The west watershed will be reduced in size and impervious area, a reduction of 22,774 square feet & 34,704 square feet respectively. The east watershed will both increase in size and impervious area, an increase of 22,774 square feet & 44,624 square feet respectively. To offset the additional impervious area water quality and quantity facilities are proposed. The site will be controlled by the public storm system downstream, and that system has been analyzed to not overload it during the 10-year storm event. See Figure 1 for the Proposed Site Plan.

3.2 Hydrology

The site will continue to drain to two separate watersheds and proposed drainage patterns are similar to exiting drainage patterns. The two watershed areas have been split into smaller drainage areas that are collected by the proposed onsite storm system or drain offsite at specific locations. See below for Table 3 – Proposed Drainage Areas & Appendix A for the Proposed Drainage Map.

As stated above the watersheds will change in size and due to this change the west watershed will not need to be detained nor treated, however, the east watershed will require both stormwater detention and BMP treatment facilities.

Table 3 – Proposed Drainage Areas

ON-SITE WATERSHED AREAS									
Basin ID	AREA		PERVIOUS		IMPERVIOUS		CN-Value	C-VALUE	
WS 1	83,347 SF	(1.91 ac)	83,347 SF	(1.91 ac)	000 SF	(0.00 ac)	80	0.30	
WS 2a	210,529 SF	(4.83 ac)	89,255 SF	(2.05 ac)	121,275 SF	(2.78 ac)	90	0.65	
WS 2b	38,253 SF	(0.88 ac)	28,307 SF	(0.65 ac)	9,946 SF	(0.23 ac)	85	0.46	
Total	332,129 SF	(7.62 ac)	200,909 SF	(4.61 ac)	131,220 SF	(3.01 ac)	87	0.54	

ON-SITE DRAINAGE AREAS									
Basin ID	AREA		PERVIOUS		IMPERVIOUS		CN-Value	C-VALUE	
DA 1	83,347 SF	(1.91 ac)	83,347 SF	(1.91 ac)	000 SF	(0.00 ac)	80	0.30	
DA 2	8,169 SF	(0.19 ac)	4,660 SF	(0.11 ac)	3,509 SF	(0.08 ac)	88	0.56	
DA 3	11,696 SF	(0.27 ac)	9,795 SF	(0.22 ac)	1,902 SF	(0.04 ac)	83	0.40	
DA 4	49,115 SF	(1.13 ac)	44,764 SF	(1.03 ac)	4,351 SF	(0.10 ac)	82	0.35	
DA 5	48,863 SF	(1.12 ac)	365 SF	(0.01 ac)	48,499 SF	(1.11 ac)	98	0.90	
DA 6	6,716 SF	(0.15 ac)	3,830 SF	(0.09 ac)	2,886 SF	(0.07 ac)	88	0.56	
DA 7	36,773 SF	(0.84 ac)	000 SF	(0.00 ac)	36,773 SF	(0.84 ac)	98	0.90	
DA 8	15,932 SF	(0.37 ac)	4,330 SF	(0.10 ac)	11,602 SF	(0.27 ac)	93	0.74	
DA 9	2,763 SF	(0.06 ac)	2,258 SF	(0.05 ac)	505 SF	(0.01 ac)	83	0.41	
DA 10	7,448 SF	(0.17 ac)	808 SF	(0.02 ac)	6,640 SF	(0.15 ac)	96	0.83	
DA 11	17,567 SF	(0.40 ac)	17,567 SF	(0.40 ac)	000 SF	(0.00 ac)	80	0.30	
DA 12	30,084 SF	(0.69 ac)	23,647 SF	(0.54 ac)	6,437 SF	(0.15 ac)	84	0.43	
DA 13	3,353 SF	(0.08 ac)	371 SF	(0.01 ac)	2,982 SF	(0.07 ac)	96	0.83	
DA 14	10,303 SF	(0.24 ac)	5,168 SF	(0.12 ac)	5,135 SF	(0.12 ac)	89	0.60	
Total	332,129 SF	(7.62 ac)	200,909 SF	(4.61 ac)	131,220 SF	(3.01 ac)	87	0.54	

*WS 1 – Not to be detained or treated. Contains DA 1

WS 2a – To be detained and treated. Contains DA 3-11, 13, 14

WS 2b – Not to be detained or treated. Contains DA 2, 12

**Refer to Appendix A for Proposed Drainage Map

3.3 Detention System

Per the codes and ordinances of the City of Westwood detention will be required on site. The amount of detention is based on pre-construction release rates vs. post-construction release rates as well as what the downstream public system can handle. Due to the nature of the proposed improvements, there is no area for above ground detention and therefore underground detention is proposed with a custom outlet device. 270 prefabricated MC-4500 (100" wide, 52" deep, & 60" tall) semi-elliptical chambers manufactured by Advanced Drainage Solutions will be used. The proposed release rates can be found in Table 4 – Drainage Area 1: Proposed Release Rate Calculations, Table 5 – Drainage Area 2: Proposed Release Rate Calculations, and the output from HydroCAD can be found in Appendix C.

Table 4 – Drainage Area 1: Proposed Release Rate Calculations

<u>Release Rates - West Watershed</u>			
Basin ID	2 - Year	10 - Year	100 - year
WS 1	5.16 cfs	9.74 cfs	18.18 cfs

Total	5.16 cfs	9.74 cfs	18.18 cfs
Change in Rate	-4.68 cfs	-7.16 cfs	-11.24 cfs

Table 5 – Drainage Area 2: Proposed Release Rate Calculations

<u>Release Rates - East Watershed</u>			
Basin ID	2 - Year	10 - Year	100 - year
WS 2a	10.50 cfs	14.60 cfs	22.31 cfs
WS 2b	3.43 cfs	5.97 cfs	10.49 cfs

Total	13.93 cfs	20.57 cfs	32.80 cfs
Change in Rate	-1.47 cfs	-5.82 cfs	-13.11 cfs

The proposed condition release rates, as shown in the tables above, are below the required release rates as determined by the City of Westwood. The table above compares the existing flow rates and the proposed flow rates for each storm event; 2-, 10-, & 100-year events. Overall, there will be a large reduction in release rates for each drainage area with the addition of detention. Table 6 – Release Rate Comparison shows a comparison between pre- and post-construction release rates.

Table 6 – Release Rate Comparison

<u>Release Rate Comparison</u>			
AREA ID	2 - Year (cfs)	10 - Year (cfs)	100 - year (cfs)
	Exst./Prop.	Exst./Prop.	Exst./Prop.
WS 1	9.84 / 5.16	16.90 / 9.74	29.42 / 18.18
WS 2	15.40 / 13.93	26.39 / 20.57	45.91 / 32.80

Total	25.24 / 19.09	43.29 / 30.31	75.33 / 50.98
Change in Rate	-6.15 cfs	-12.98 cfs	-24.35 cfs

4.0 Stormwater Quality

4.1 LOS of BMP Package

Stormwater quality considerations are required for this project using the MARC BMP Manual for reference. In a meeting with the City of Westwood, the watersheds would be analyzed separately, with the west watershed being looked at as a developed site and the east an undeveloped site. Due to the reduction in impervious area in the west watershed, BMPs will not be required, however the east watershed will need water quality infrastructure.

Level of service for the project site is determined using net increase in impervious and Worksheet 1 for an undeveloped site in the MARC BMP Manual. From the level of service, a total value rating of BMP package can be found by using the difference in CN value from existing to proposed and finding the corresponding LOS. Per the BMP Worksheet #1 included in Appendix B the required LOS of the BMP package of 5.

4.2 Stormwater Quality System Design

To achieve the required level of service our proposed design underground detention isolator rows will be used. This system will be used as a treatment train and give a value of 9 per acre treated. BMP Worksheet #2 included in Appendix B demonstrates the water quality design provides an LOS of the BMP package of 7.6, which is greater than the required LOS of the BMP package of 5.

5.0 Permitting

5.1 United State Army Corps of Engineers (USACE)

The National Wetland Inventory and USGS Mapping does not identify and jurisdictional waters within the site area. There are no known USACE regulated levees with 500-feet of the site.

5.2 Federal Emergency Management Agency (FEMA)

The site is located within the Zone X, and outside of the 1% and 0.2% annual chance flood hazard, as shown on FEMA FIRM Map 20091C0010G (Panel Number 10 of 161), effective August 3, 2009. The FEMA Firmette for the project site can be found in Appendix A, Figure 6.

5.3 Kansas Department of Health and Environment (KDHE)

The area to be disturbed by the project site exceeds 1-acre; a Notice of Intent (NOI) is required to be submitted to KDHE and a Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the project.

5.4 Kansas Division of Water Resources (DWR)

The tributary area above and including the site is less than 240 acres and the land is not inundated by any backwater effects. The project is considered non-jurisdictional by the DWR. No permits are required.

5.5 Kansas State Historical Preservation Office (SHPO)

In compliance with federal requirements, SHPO will be provided with advance notice of construction.

5.6 Kansas Department of Wildlife, Parks and Tourism (KDWPT)

In compliance with federal requirements, KDWPT will be provided with advanced notice of construction.

6.0 Conclusion

The development of the site will result in an overall decrease in impervious; however, due to watersheds and site boundaries water quality and quantity facilities will offset a small increase in impervious within the east watershed. The addition of underground detention will reduce peak runoff from the site by at least 30% across all storm events which exceeds the City of Westwood's requirement to not exceed the existing peak runoff rates. Underground detention isolator rows will help filter and clean the storm water before discharging into the public storm system. This report demonstrates that the 50th and Rainbow project will not negatively impact adjacent watersheds or downstream public storm systems and reduce peak runoff rates from existing conditions.

Appendix A – Reference Documents

- A1 – Existing Drainage Areas Map
- A2 – Proposed Drainage Areas Map
- A3 – FEMA Firmette
- A4 – National Wetlands Inventory Map

Oct 05, 2023 9:46am Plotted By: austin.lage V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-SFIS-DMAP.dwg Layout: EXISTING DRAINAGE MAP



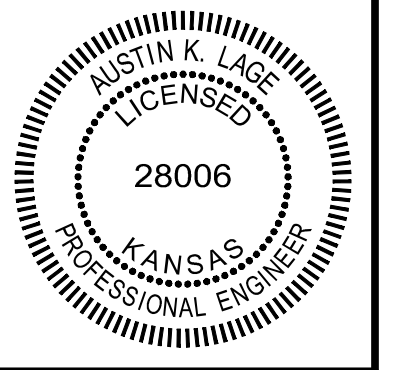
DRAINAGE AREAS		PERVIOUS		IMPERVIOUS		CN-Value	C-VALUE
Basin ID	AREA						
EX 1	106,112 SF (2.44 ac)	71,408 SF (1.64 ac)	34,704 SF (0.80 ac)	86	0.50		
EX 2	226,017 SF (5.19 ac)	139,421 SF (3.20 ac)	86,596 SF (1.99 ac)	87	0.53		
Total	332,129 SF (7.62 ac)	210,829 SF (4.84 ac)	121,300 SF (2.78 ac)	87	0.52		

DRAINAGE LEGEND

- DRAINAGE AREA BOUNDARY
- EXISTING GRADE MAJOR CONTOUR
- EXISTING GRADE MINOR CONTOUR
- PROPERTY LINE
- RIGHT-OF-WAY LINE

GRAPHIC SCALE
0 20 40

Rev.	Date	Description	By	App.
1	10/05/23	CITY COMMENTS		



BHC
Civil Engineering, Surveying & Utilities
101 Call Blvd., Suite 400
Overland Park, Kansas 66210
p. 913.653.1900
BHC is a member of the Brinkmann Group, P.A.

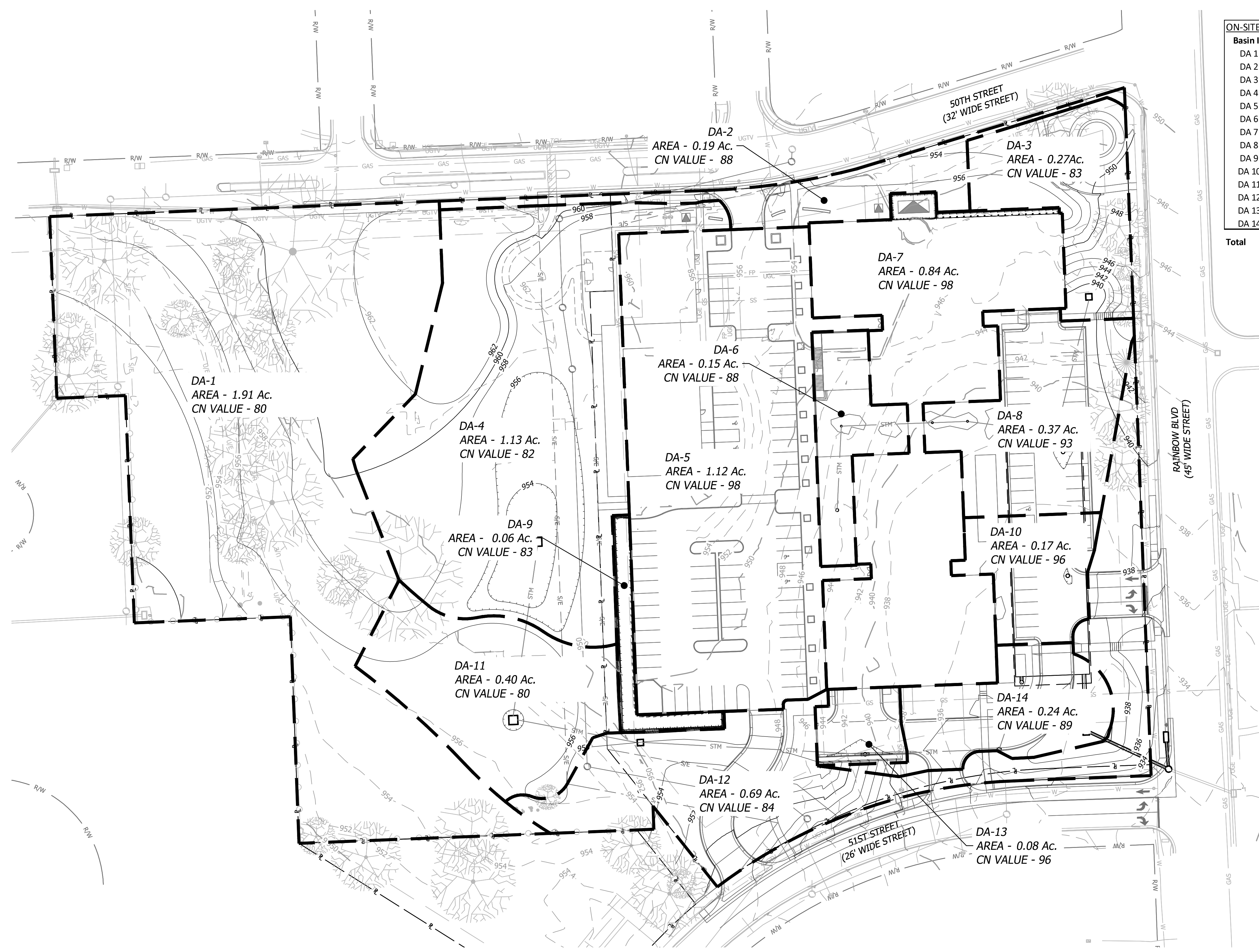
Prepared For:
KARBANK REAL ESTATE COMPANY
ADAM FELDMAN
2000 SW PKWY, SUITE 400
MISSION WOODS, KS 66205
816-221-4488

**FDP SUBMITTAL
50TH & RAINBOW DEVELOPMENT
WESTWOOD, KS 66205
EXISTING DRAINAGE MAP**

Design: DSN | Drawn: DRN
Checked: CHK
Issue Date: 09/15/2023
Project Number: 037920

C5.0

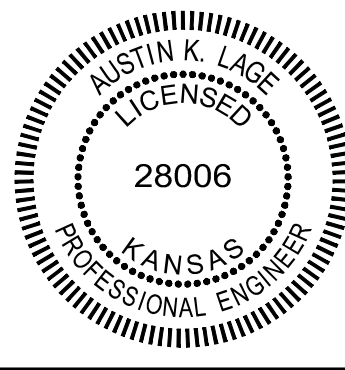
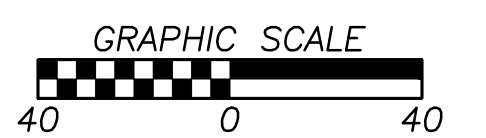
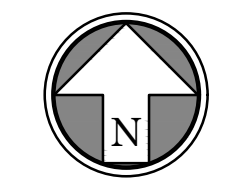
Oct 05, 2023 - 9:25am Plotted By: outstf@log V:\037920-Westwood\04-DWG\Eng\Sheet\FDP\037920-STIS-DMAP.dwg Layout: PROPOSED DRAINAGE MAP



ON-SITE DRAINAGE AREAS							
Basin ID	AREA	PERVIOUS		IMPERVIOUS		CN-Value	C-VALUE
DA 1	83,347 SF (1.91 ac)	83,347 SF (1.91 ac)		000 SF (0.00 ac)		80	0.30
DA 2	8,169 SF (0.19 ac)	4,660 SF (0.11 ac)		3,509 SF (0.08 ac)		88	0.56
DA 3	11,696 SF (0.27 ac)	9,795 SF (0.22 ac)		1,902 SF (0.04 ac)		83	0.40
DA 4	49,115 SF (1.13 ac)	44,764 SF (1.03 ac)		4,351 SF (0.10 ac)		82	0.35
DA 5	48,863 SF (1.12 ac)	365 SF (0.01 ac)		48,499 SF (1.11 ac)		98	0.90
DA 6	6,716 SF (0.15 ac)	3,830 SF (0.09 ac)		2,886 SF (0.07 ac)		88	0.56
DA 7	36,773 SF (0.84 ac)	000 SF (0.00 ac)		36,773 SF (0.84 ac)		98	0.90
DA 8	15,932 SF (0.37 ac)	4,330 SF (0.10 ac)		11,602 SF (0.27 ac)		93	0.74
DA 9	2,763 SF (0.06 ac)	2,258 SF (0.05 ac)		505 SF (0.01 ac)		83	0.41
DA 10	7,448 SF (0.17 ac)	808 SF (0.02 ac)		6,640 SF (0.15 ac)		96	0.83
DA 11	17,567 SF (0.40 ac)	17,567 SF (0.40 ac)		000 SF (0.00 ac)		80	0.30
DA 12	30,084 SF (0.69 ac)	23,647 SF (0.54 ac)		6,437 SF (0.15 ac)		84	0.43
DA 13	3,353 SF (0.08 ac)	371 SF (0.01 ac)		2,982 SF (0.07 ac)		96	0.83
DA 14	10,303 SF (0.24 ac)	5,168 SF (0.12 ac)		5,135 SF (0.12 ac)		89	0.60
Total	332,129 SF (7.62 ac)	200,909 SF (4.61 ac)		131,220 SF (3.01 ac)		87	0.54

DRAINAGE LEGEND

	DRAINAGE AREA BOUNDARY
	PROPOSED FINISH GRADE MAJOR CONTOUR
	PROPOSED FINISH GRADE MINOR CONTOUR
	EXISTING GRADE MAJOR CONTOUR
	EXISTING GRADE MINOR CONTOUR
	PROPOSED STORM SEWER LINE
	PROPERTY LINE
	RIGHT-OF-WAY LINE



Prepared For:
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**FDP SUBMITTAL
 50TH & RAINBOW DEVELOPMENT
 WESTWOOD, KS 66205
 PROPOSED DRAINAGE MAP**

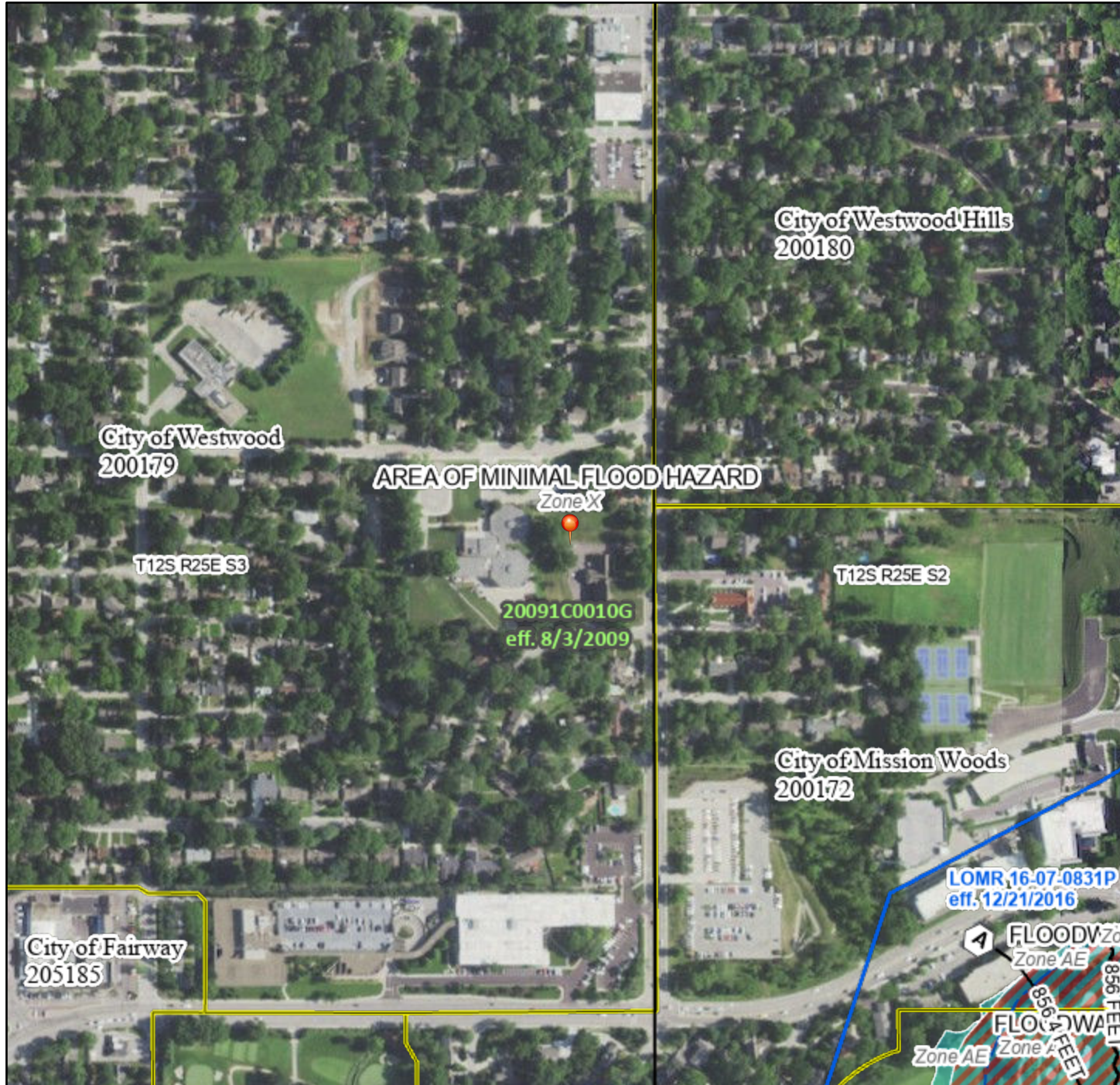
Design: DSN | Drawn: DRN
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 Issue Date: 09/15/2023
 Project Number: 037920

C5.1

National Flood Hazard Layer FIRMette



94°37'4"W 39°2'26"N



Legend

Item A, Section VI, Item

SEE FIS REPORT FOR DETAILED LEGEND

- | | | |
|------------------------------------|--|---|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE)
Zone A, V, A99 |
| | | With BFE or Depth Zone AE, AO, AH, VE, AR |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
| | | Future Conditions 1% Annual Chance Flood Hazard Zone X |
| | | Area with Reduced Flood Risk due to Levee. See Notes. Zone X |
| | | Area with Flood Risk due to Levee Zone D |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard Zone X |
| | | Effective LOMRs |
| | | Area of Undetermined Flood Hazard Zone D |
| GENERAL STRUCTURES | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| OTHER FEATURES | | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | 17.5 Water Surface Elevation |
| | | Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| MAP PANELS | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |

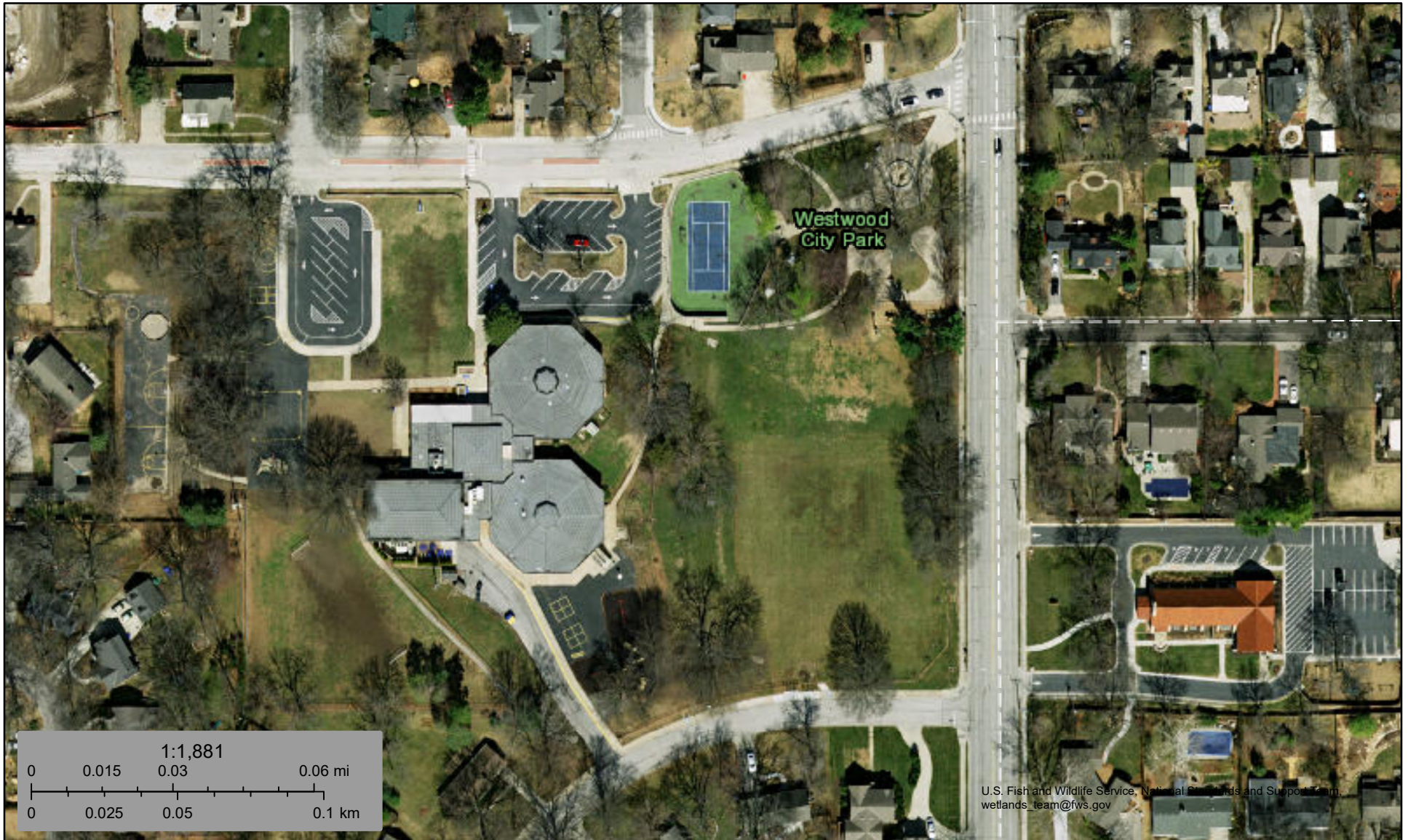


The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/20/2023 at 12:28 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community id, FIRM panel number, and FIRM effective date. Map is unmapped and unmodernized areas cannot be used for regulatory purposes.



September 8, 2023

Wetlands

- | | | |
|--|---|--|
|  Estuarine and Marine Deepwater |  Freshwater Emergent Wetland |  Lake |
|  Estuarine and Marine Wetland |  Freshwater Forested/Shrub Wetland |  Other |
| |  Freshwater Pond |  Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Appendix B – LOS Calculations

B1 – BMP Worksheet #1

B2 – BMP Worksheet #2

1. Runoff Curve Number - East Watershed

A. Predevelopment CN

Cover Description	Soil HSG	CN From Table 1	Area (sf)	Area (ac.)	Product of CN x Area
Open Space (turf), Good	D	80	162186	3.72	297.9
Impervious	D	98	86596	1.99	194.8
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
Totals:				5.71	492.7

Area-Weighted CN = total product/total area = 86 (Round to integer)

B. Postdevelopment CN

Cover Description	Soil HSG ¹	CN From Table 1	Area (sf)	Area (ac.)	Product of CN x Area
Open Space (turf), Good	D	80	117562	2.70	215.9
Impervious	D	98	131220	3.01	295.2
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
				0.00	0.0
Totals:				5.71	511.1

- 1 Postdevelopment CN is one HSG higher for all cover types except preserved vegetation, absent documentation showing how postdevelopment soil structure will be preserved.

Area-Weighted CN = total product/total area = 89 (Round to integer)

C.

Level of Service Calculation			LS
Predevelopment CN:	86	Change in CN	
		17+	8
		7 to 16	7
Post Development CN:	89	4 to 6	6
		1 to 3	5
Difference:	3	0	4
		-7 to -1	3
LS Required (see scale at right):	5	-8 to -17	2
		-18 to -21	1
		-22 -	0

1. Required LS (New Development, Wksht 1) or Total VR (Redevelopment, Wksht 1A):

2. Proposed BMP Option Package No. 1

BMP ID	Cover/BMP Description	Treatment Area	VR from Table 4.4 or 4.6 ¹	Product of VR x Area
1	ADS Isolator Row	4.82	9.0	43.4
2	No BMP	0.89	0.0	0.0
Total ² :		5.71	Total:	7.6

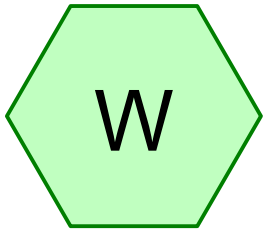
- 1 VR calculated for final BMP only in Treatment Train
- 2 Total treatment area cannot exceed 100 percent of the actual site area.
- * Blank In Redevelopment

Meets required LS (Yes/No)? (If No, or if additional options are being tested, proceed below.)

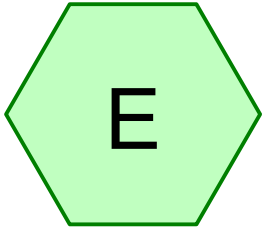
Appendix C – Computer Output Summaries

C1 – Existing HydroCAD output

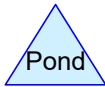
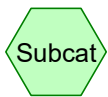
C2 – Proposed HydroCAD output



EX 1



EX 2



Routing Diagram for Westwood Existing
Prepared by {enter your company name here}, Printed 9/15/2023
HydroCAD® 10.00-18 s/n 09518 © 2016 HydroCAD Software Solutions LLC

Westwood Existing

Prepared by {enter your company name here}

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Printed 9/15/2023

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.840	80	>75% Grass cover, Good, HSG D (E, W)
2.785	98	Paved parking, HSG D (E, W)
7.625	87	TOTAL AREA

Westwood Existing

Prepared by {enter your company name here}

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
7.625	HSG D	E, W
0.000	Other	
7.625		TOTAL AREA

Westwood Existing

Prepared by {enter your company name here}

Printed 9/15/2023

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Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	4.840	0.000	4.840	>75% Grass cover, Good	E, W
0.000	0.000	0.000	2.785	0.000	2.785	Paved parking	E, W
0.000	0.000	0.000	7.625	0.000	7.625	TOTAL AREA	

Westwood Existing

Type II 24-hr 2 year Rainfall=3.64"

Prepared by {enter your company name here}

Printed 9/15/2023

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Page 5

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentE: EX 2

Runoff Area=226,017 sf 38.31% Impervious Runoff Depth=2.31"
Tc=15.0 min CN=87 Runoff=15.40 cfs 0.998 af

SubcatchmentW: EX 1

Runoff Area=106,112 sf 32.72% Impervious Runoff Depth=2.22"
Tc=5.0 min CN=86 Runoff=9.84 cfs 0.451 af

Total Runoff Area = 7.625 ac Runoff Volume = 1.449 af Average Runoff Depth = 2.28"
63.47% Pervious = 4.840 ac 36.53% Impervious = 2.785 ac

Westwood Existing

Type II 24-hr 2 year Rainfall=3.64"

Prepared by {enter your company name here}

Printed 9/15/2023

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Page 6

Summary for Subcatchment E: EX 2

Runoff = 15.40 cfs @ 12.07 hrs, Volume= 0.998 af, Depth= 2.31"

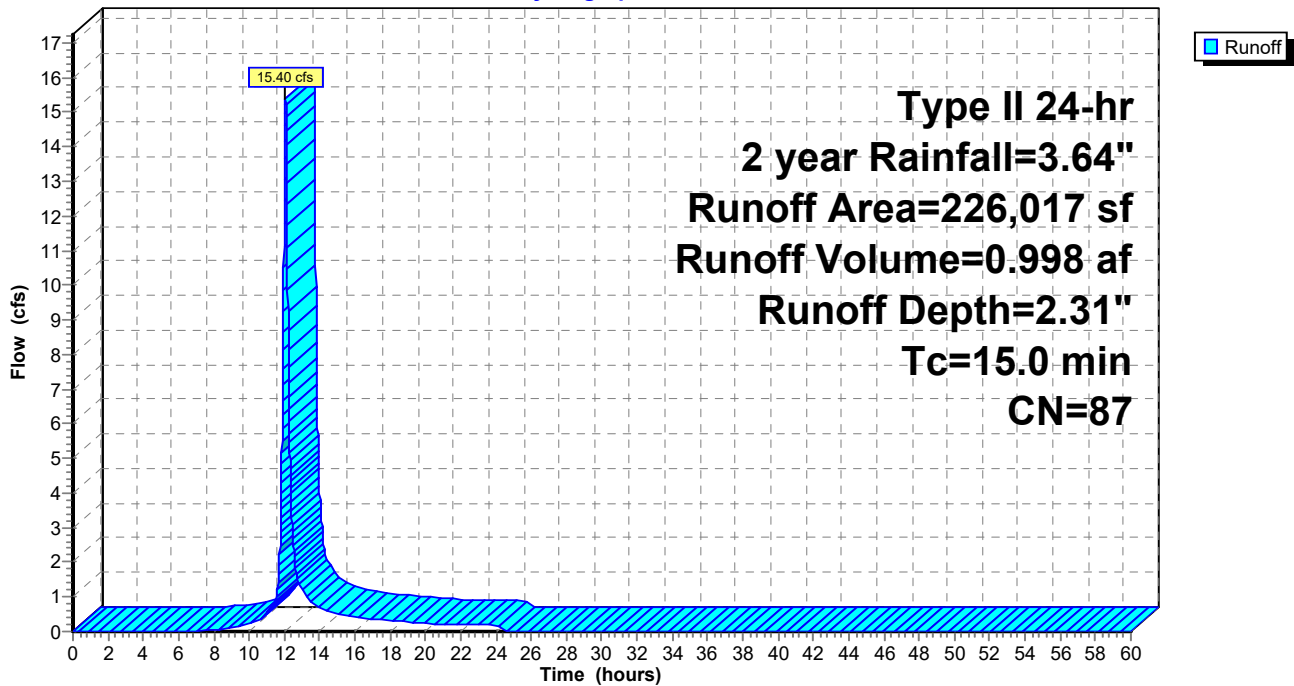
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 year Rainfall=3.64"

Area (sf)	CN	Description
139,421	80	>75% Grass cover, Good, HSG D
86,596	98	Paved parking, HSG D
226,017	87	Weighted Average
139,421		61.69% Pervious Area
86,596		38.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment E: EX 2

Hydrograph



Westwood Existing

Type II 24-hr 2 year Rainfall=3.64"

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Page 7

Summary for Subcatchment W: EX 1

Runoff = 9.84 cfs @ 11.96 hrs, Volume= 0.451 af, Depth= 2.22"

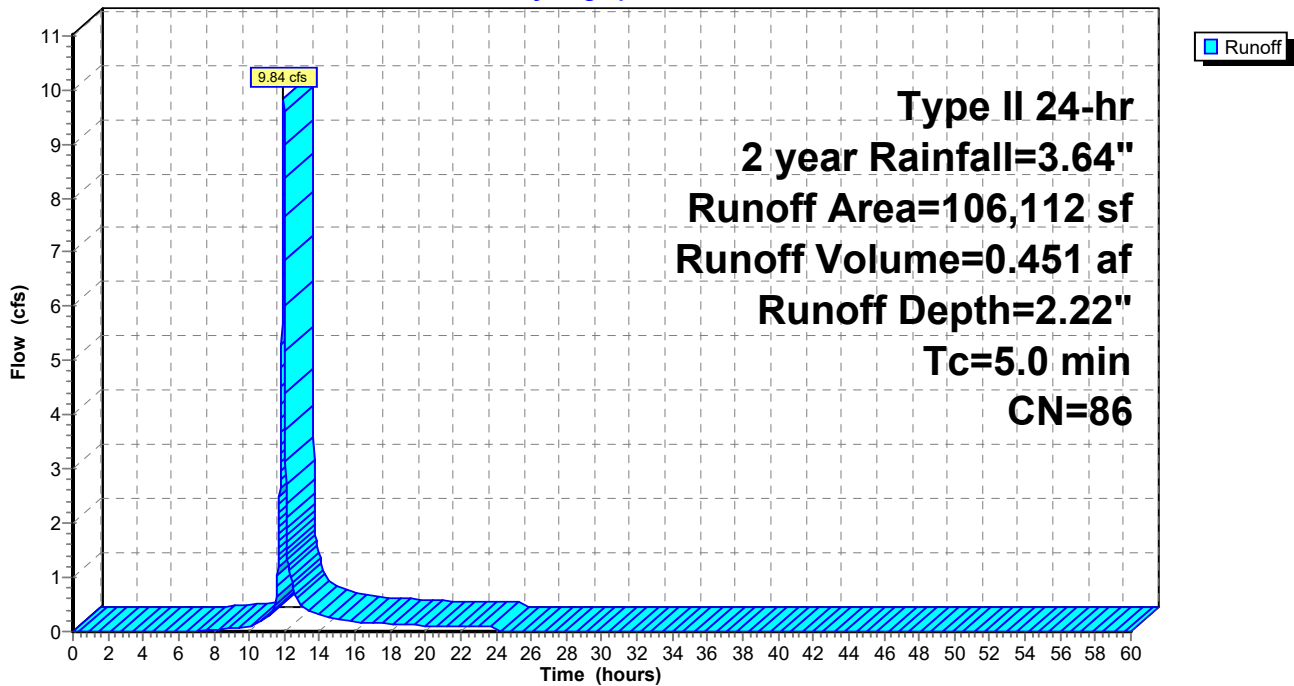
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 year Rainfall=3.64"

Area (sf)	CN	Description
71,394	80	>75% Grass cover, Good, HSG D
34,718	98	Paved parking, HSG D
106,112	86	Weighted Average
71,394		67.28% Pervious Area
34,718		32.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment W: EX 1

Hydrograph



Westwood Existing

Type II 24-hr 10 year Rainfall=5.50"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentE: EX 2

Runoff Area=226,017 sf 38.31% Impervious Runoff Depth=4.04"
Tc=15.0 min CN=87 Runoff=26.39 cfs 1.747 af

SubcatchmentW: EX 1

Runoff Area=106,112 sf 32.72% Impervious Runoff Depth=3.94"
Tc=5.0 min CN=86 Runoff=16.90 cfs 0.799 af

Total Runoff Area = 7.625 ac Runoff Volume = 2.546 af Average Runoff Depth = 4.01"
63.47% Pervious = 4.840 ac 36.53% Impervious = 2.785 ac

Westwood Existing

Type II 24-hr 10 year Rainfall=5.50"

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Page 9

Summary for Subcatchment E: EX 2

Runoff = 26.39 cfs @ 12.07 hrs, Volume= 1.747 af, Depth= 4.04"

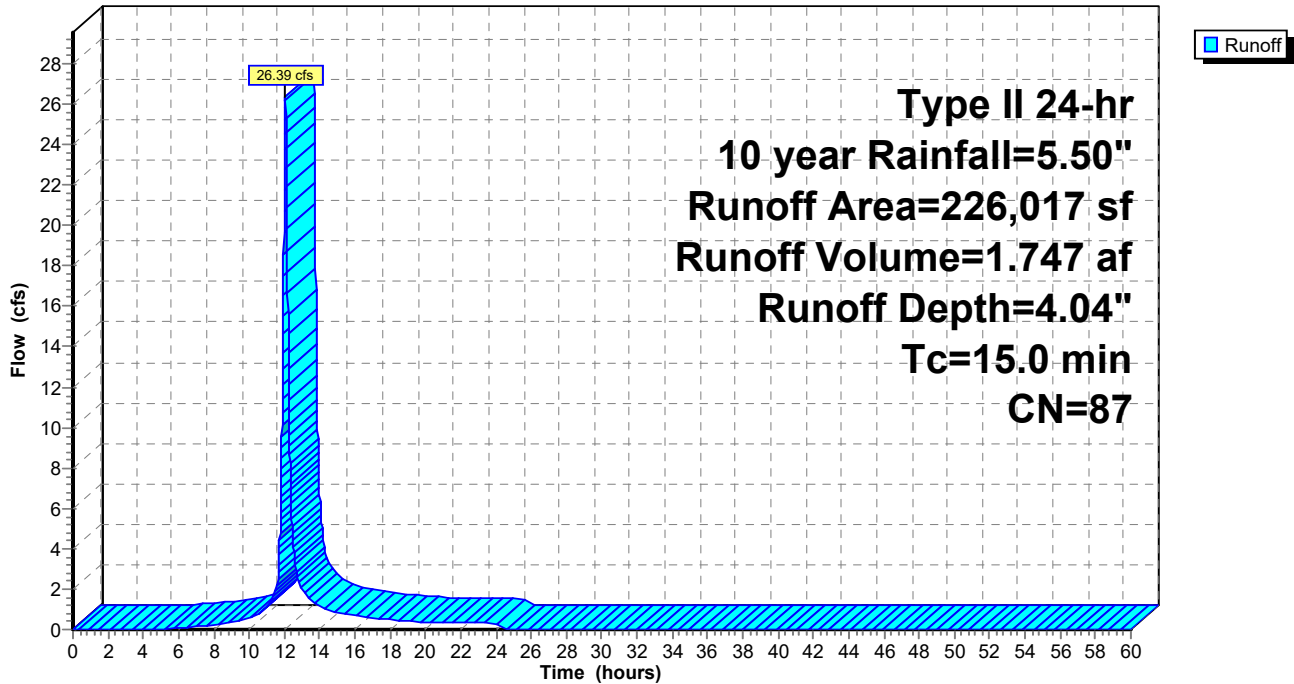
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 year Rainfall=5.50"

Area (sf)	CN	Description
139,421	80	>75% Grass cover, Good, HSG D
86,596	98	Paved parking, HSG D
226,017	87	Weighted Average
139,421		61.69% Pervious Area
86,596		38.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment E: EX 2

Hydrograph



Westwood Existing

Type II 24-hr 10 year Rainfall=5.50"

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Page 10

Summary for Subcatchment W: EX 1

Runoff = 16.90 cfs @ 11.96 hrs, Volume= 0.799 af, Depth= 3.94"

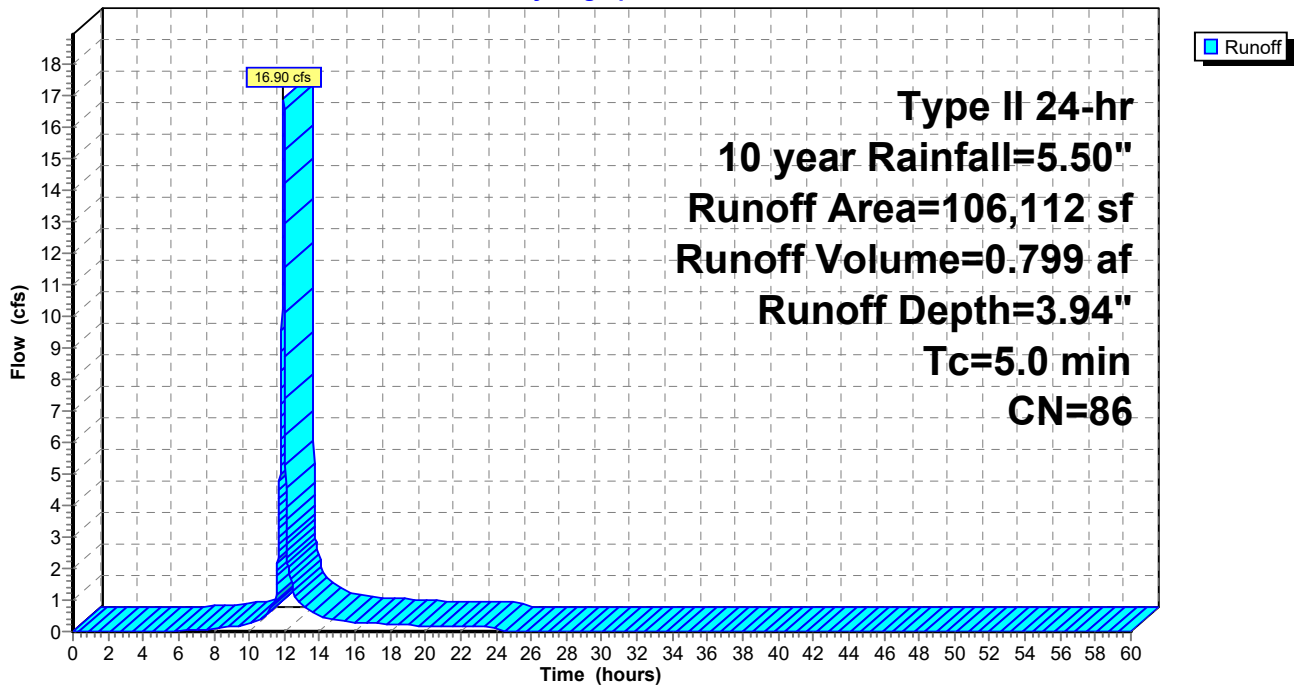
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 year Rainfall=5.50"

Area (sf)	CN	Description
71,394	80	>75% Grass cover, Good, HSG D
34,718	98	Paved parking, HSG D
106,112	86	Weighted Average
71,394		67.28% Pervious Area
34,718		32.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment W: EX 1

Hydrograph



Westwood Existing

Type II 24-hr 100 year Rainfall=8.82"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentE: EX 2

Runoff Area=226,017 sf 38.31% Impervious Runoff Depth=7.25"
 Tc=15.0 min CN=87 Runoff=45.91 cfs 3.135 af

SubcatchmentW: EX 1

Runoff Area=106,112 sf 32.72% Impervious Runoff Depth=7.13"
 Tc=5.0 min CN=86 Runoff=29.42 cfs 1.447 af

Total Runoff Area = 7.625 ac Runoff Volume = 4.582 af Average Runoff Depth = 7.21"
63.47% Pervious = 4.840 ac 36.53% Impervious = 2.785 ac

Westwood Existing

Type II 24-hr 100 year Rainfall=8.82"

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Page 12

Summary for Subcatchment E: EX 2

Runoff = 45.91 cfs @ 12.06 hrs, Volume= 3.135 af, Depth= 7.25"

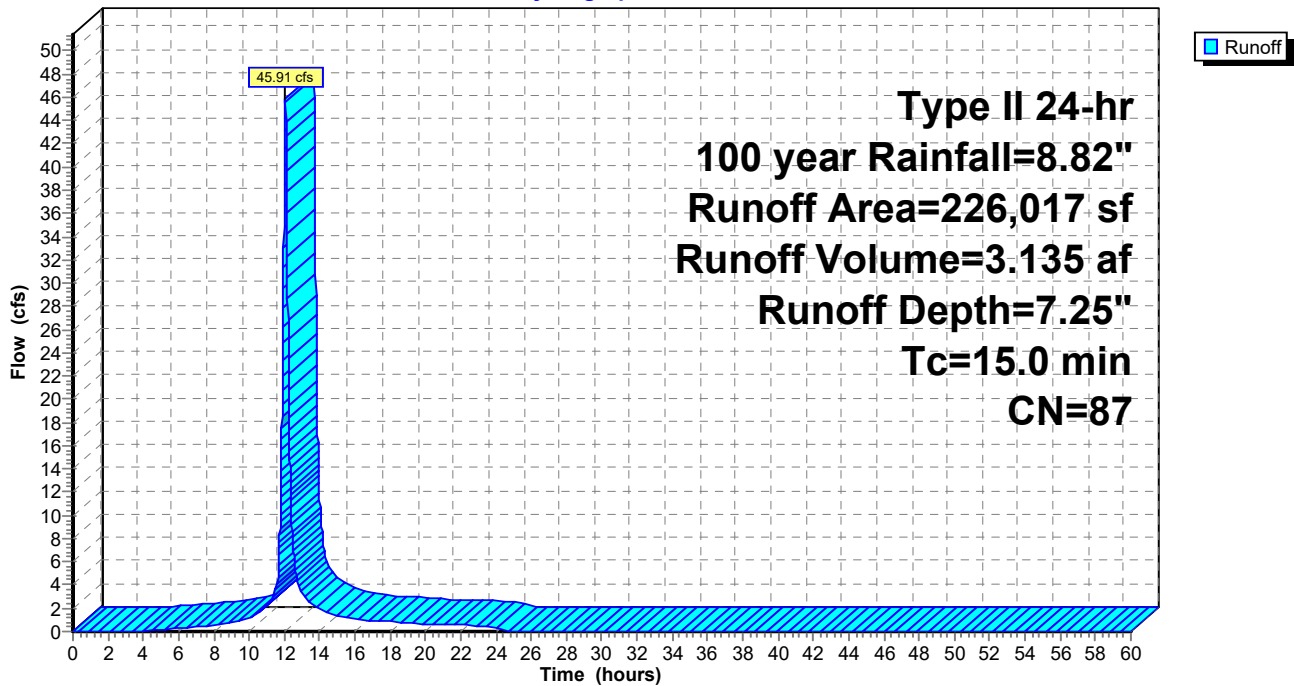
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 year Rainfall=8.82"

Area (sf)	CN	Description
139,421	80	>75% Grass cover, Good, HSG D
86,596	98	Paved parking, HSG D
226,017	87	Weighted Average
139,421		61.69% Pervious Area
86,596		38.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment E: EX 2

Hydrograph



Westwood Existing

Type II 24-hr 100 year Rainfall=8.82"

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Page 13

Summary for Subcatchment W: EX 1

Runoff = 29.42 cfs @ 11.96 hrs, Volume= 1.447 af, Depth= 7.13"

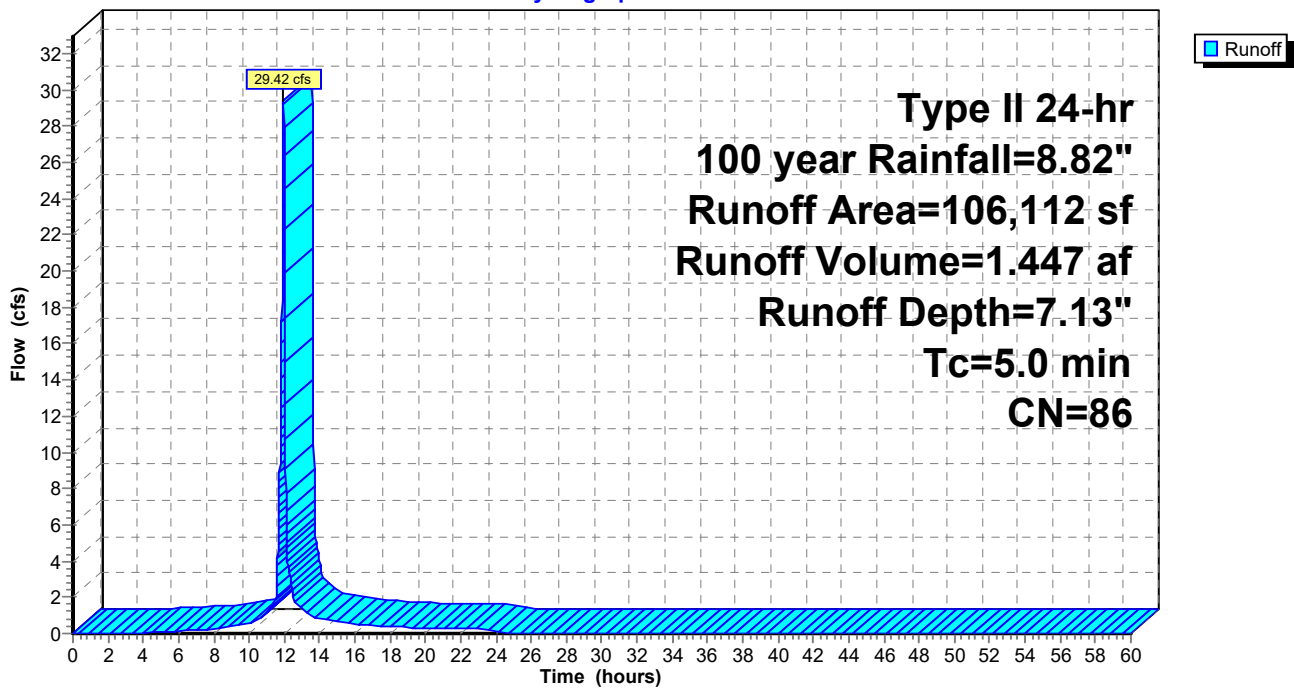
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 year Rainfall=8.82"

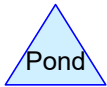
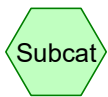
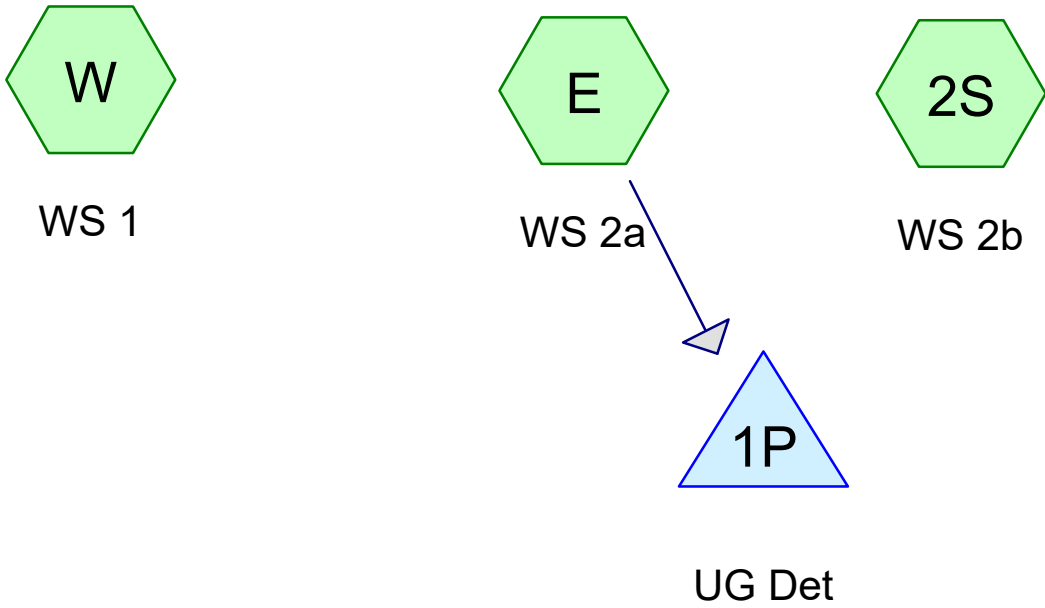
Area (sf)	CN	Description
71,394	80	>75% Grass cover, Good, HSG D
34,718	98	Paved parking, HSG D
106,112	86	Weighted Average
71,394		67.28% Pervious Area
34,718		32.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment W: EX 1

Hydrograph





Routing Diagram for Westwood Proposed
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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.564	80	>75% Grass cover, Good, HSG D (2S, E, W)
3.061	98	Paved parking, HSG D (2S, E, W)
7.625	87	TOTAL AREA

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
7.625	HSG D	2S, E, W
0.000	Other	
7.625		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	4.564	0.000	4.564	>75% Grass cover, Good	2S, E, W
0.000	0.000	0.000	3.061	0.000	3.061	Paved parking	2S, E, W
0.000	0.000	0.000	7.625	0.000	7.625	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	930.00	929.19	50.0	0.0162	0.013	18.0	0.0	0.0

Westwood Proposed

Type II 24-hr 2 year Rainfall=3.64"

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Page 6

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment2S: WS 2b

Runoff Area=38,253 sf 26.00% Impervious Runoff Depth=2.14"
 Tc=5.0 min CN=85 Runoff=3.43 cfs 0.157 af

SubcatchmentE: WS 2a

Runoff Area=210,529 sf 57.96% Impervious Runoff Depth=2.58"
 Tc=5.0 min CN=90 Runoff=22.02 cfs 1.039 af

SubcatchmentW: WS 1

Runoff Area=83,359 sf 1.65% Impervious Runoff Depth=1.75"
 Tc=10.0 min CN=80 Runoff=5.16 cfs 0.279 af

Pond 1P: UG Det

Peak Elev=931.68' Storage=0.418 af Inflow=22.02 cfs 1.039 af
 Outflow=10.50 cfs 0.958 af

Total Runoff Area = 7.625 ac Runoff Volume = 1.474 af Average Runoff Depth = 2.32"
59.85% Pervious = 4.564 ac 40.15% Impervious = 3.061 ac

Westwood Proposed

Type II 24-hr 2 year Rainfall=3.64"

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Page 7

Summary for Subcatchment 2S: WS 2b

Runoff = 3.43 cfs @ 11.96 hrs, Volume= 0.157 af, Depth= 2.14"

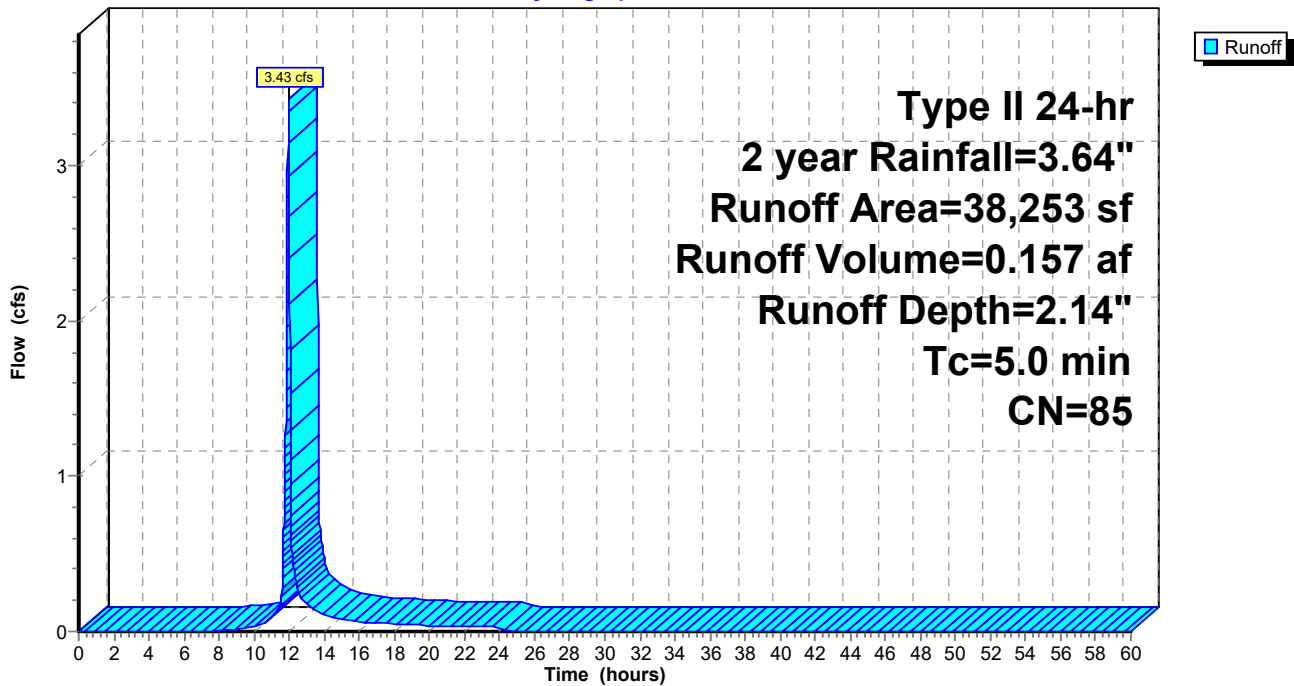
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 year Rainfall=3.64"

Area (sf)	CN	Description
28,307	80	>75% Grass cover, Good, HSG D
9,946	98	Paved parking, HSG D
38,253	85	Weighted Average
28,307		74.00% Pervious Area
9,946		26.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: WS 2b

Hydrograph



Westwood Proposed

Type II 24-hr 2 year Rainfall=3.64"

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Page 8

Summary for Subcatchment E: WS 2a

Runoff = 22.02 cfs @ 11.96 hrs, Volume= 1.039 af, Depth= 2.58"

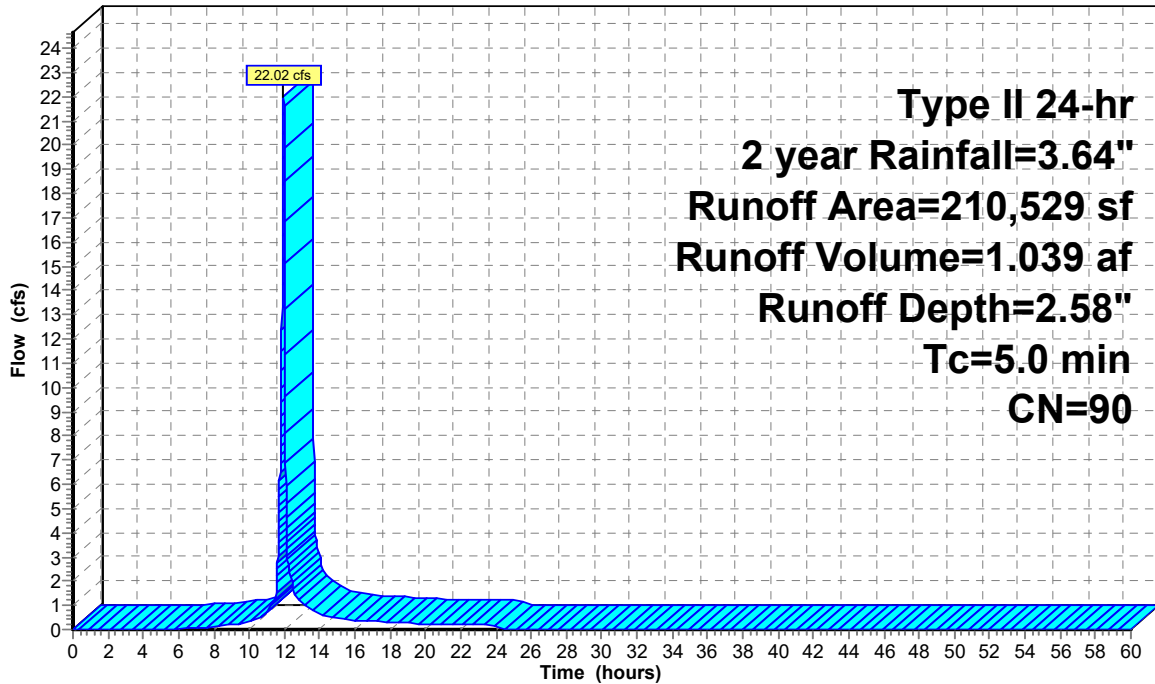
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 year Rainfall=3.64"

Area (sf)	CN	Description
88,504	80	>75% Grass cover, Good, HSG D
122,025	98	Paved parking, HSG D
210,529	90	Weighted Average
88,504		42.04% Pervious Area
122,025		57.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment E: WS 2a

Hydrograph



Westwood Proposed

Type II 24-hr 2 year Rainfall=3.64"

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Summary for Subcatchment W: WS 1

Runoff = 5.16 cfs @ 12.02 hrs, Volume= 0.279 af, Depth= 1.75"

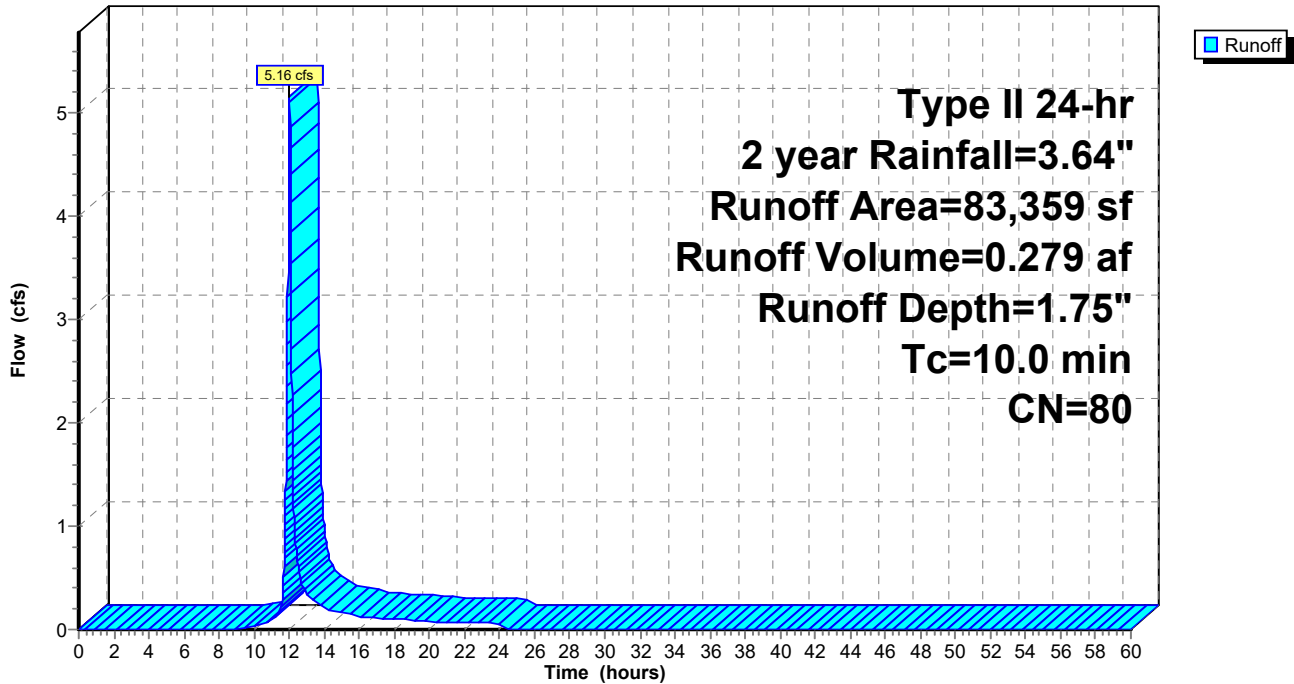
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 year Rainfall=3.64"

Area (sf)	CN	Description
81,980	80	>75% Grass cover, Good, HSG D
1,379	98	Paved parking, HSG D
83,359	80	Weighted Average
81,980		98.35% Pervious Area
1,379		1.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment W: WS 1

Hydrograph



Westwood Proposed

Type II 24-hr 2 year Rainfall=3.64"

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Page 10

Summary for Pond 1P: UG Det

Inflow Area = 4.833 ac, 57.96% Impervious, Inflow Depth = 2.58" for 2 year event
 Inflow = 22.02 cfs @ 11.96 hrs, Volume= 1.039 af
 Outflow = 10.50 cfs @ 12.05 hrs, Volume= 0.958 af, Atten= 52%, Lag= 5.5 min
 Primary = 10.50 cfs @ 12.05 hrs, Volume= 0.958 af

Routing by Sim-Route method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 931.68' @ 12.05 hrs Surf.Area= 0.241 ac Storage= 0.418 af

Plug-Flow detention time= 189.9 min calculated for 0.958 af (92% of inflow)
 Center-of-Mass det. time= 148.3 min (946.2 - 798.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	929.25'	0.383 af	55.75"W x 188.24"L x 6.75"H Field A 1.626 af Overall - 0.670 af Embedded = 0.956 af x 40.0% Voids
#2A	930.00'	0.670 af	ADS_StormTech MC-4500 +Cap x 270 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 6 Rows of 45 Chambers Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
		1.052 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	18.0" Round RCP_Round 18" L= 50.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 930.00' / 929.19' S= 0.0162 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	930.00'	2.5" Vert. Orifice/Grate C= 0.600
#3	Device 1	930.40'	36.0" W x 60.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=10.50 cfs @ 12.05 hrs HW=931.68' (Free Discharge)

↑ **1=RCP_Round 18"** (Barrel Controls 10.50 cfs @ 6.62 fps)

↑ **2=Orifice/Grate** (Passes < 0.21 cfs potential flow)

↑ **3=Orifice/Grate** (Passes < 13.96 cfs potential flow)

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Type II 24-hr 2 year Rainfall=3.64"

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Page 11

Pond 1P: UG Det - Chamber Wizard Field A**Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)**

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

45 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 186.24' Row Length +12.0" End Stone x 2 =
188.24' Base Length

6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width

9.0" Base + 60.0" Chamber Height + 12.0" Cover = 6.75' Field Height

270 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 6 Rows = 29,180.8 cf Chamber Storage

70,837.7 cf Field - 29,180.8 cf Chambers = 41,656.9 cf Stone x 40.0% Voids = 16,662.8 cf Stone Storage

Chamber Storage + Stone Storage = 45,843.6 cf = 1.052 af

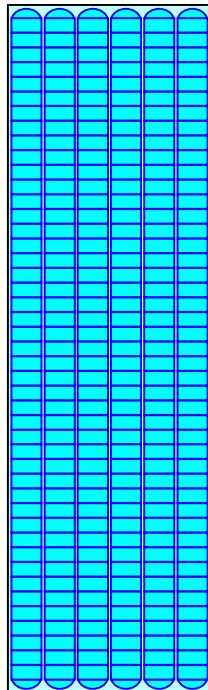
Overall Storage Efficiency = 64.7%

Overall System Size = 188.24' x 55.75' x 6.75'

270 Chambers

2,623.6 cy Field

1,542.8 cy Stone



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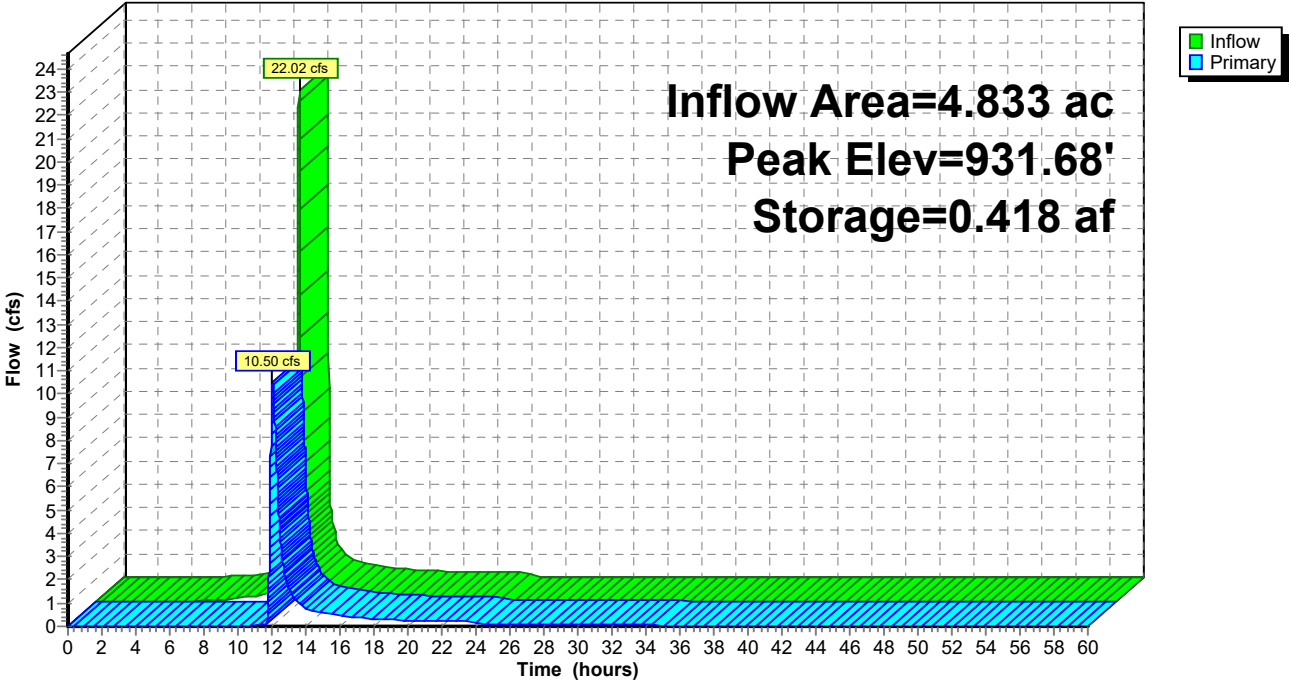
Type II 24-hr 2 year Rainfall=3.64"

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Page 12

Pond 1P: UG Det

Hydrograph



Westwood Proposed

Type II 24-hr 10 year Rainfall=5.50"

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Page 13

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment2S: WS 2b

Runoff Area=38,253 sf 26.00% Impervious Runoff Depth=3.83"
 Tc=5.0 min CN=85 Runoff=5.97 cfs 0.280 af

SubcatchmentE: WS 2a

Runoff Area=210,529 sf 57.96% Impervious Runoff Depth=4.36"
 Tc=5.0 min CN=90 Runoff=35.97 cfs 1.756 af

SubcatchmentW: WS 1

Runoff Area=83,359 sf 1.65% Impervious Runoff Depth=3.33"
 Tc=10.0 min CN=80 Runoff=9.74 cfs 0.532 af

Pond 1P: UG Det

Peak Elev=932.82' Storage=0.636 af Inflow=35.97 cfs 1.756 af
 Outflow=14.60 cfs 1.675 af

Total Runoff Area = 7.625 ac Runoff Volume = 2.568 af Average Runoff Depth = 4.04"
59.85% Pervious = 4.564 ac 40.15% Impervious = 3.061 ac

Westwood Proposed

Type II 24-hr 10 year Rainfall=5.50"

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Page 14

Summary for Subcatchment 2S: WS 2b

Runoff = 5.97 cfs @ 11.96 hrs, Volume= 0.280 af, Depth= 3.83"

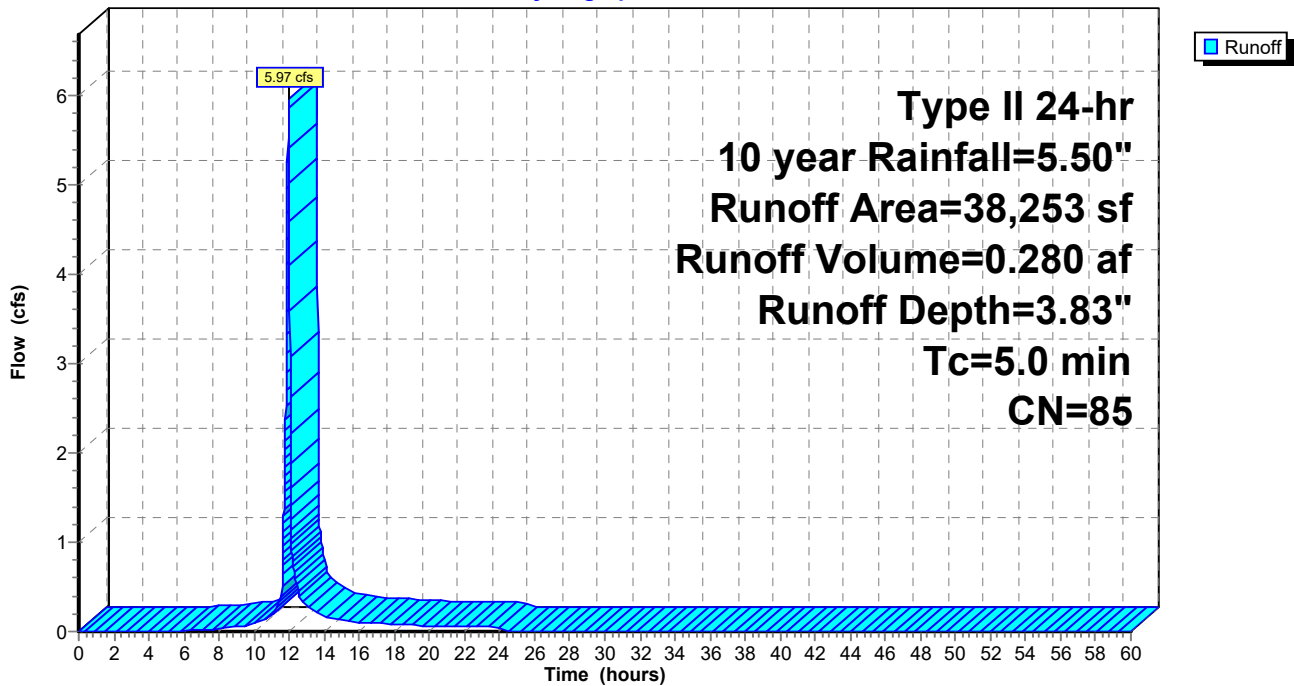
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 year Rainfall=5.50"

Area (sf)	CN	Description
28,307	80	>75% Grass cover, Good, HSG D
9,946	98	Paved parking, HSG D
38,253	85	Weighted Average
28,307		74.00% Pervious Area
9,946		26.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: WS 2b

Hydrograph



Westwood Proposed

Type II 24-hr 10 year Rainfall=5.50"

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Page 15

Summary for Subcatchment E: WS 2a

Runoff = 35.97 cfs @ 11.96 hrs, Volume= 1.756 af, Depth= 4.36"

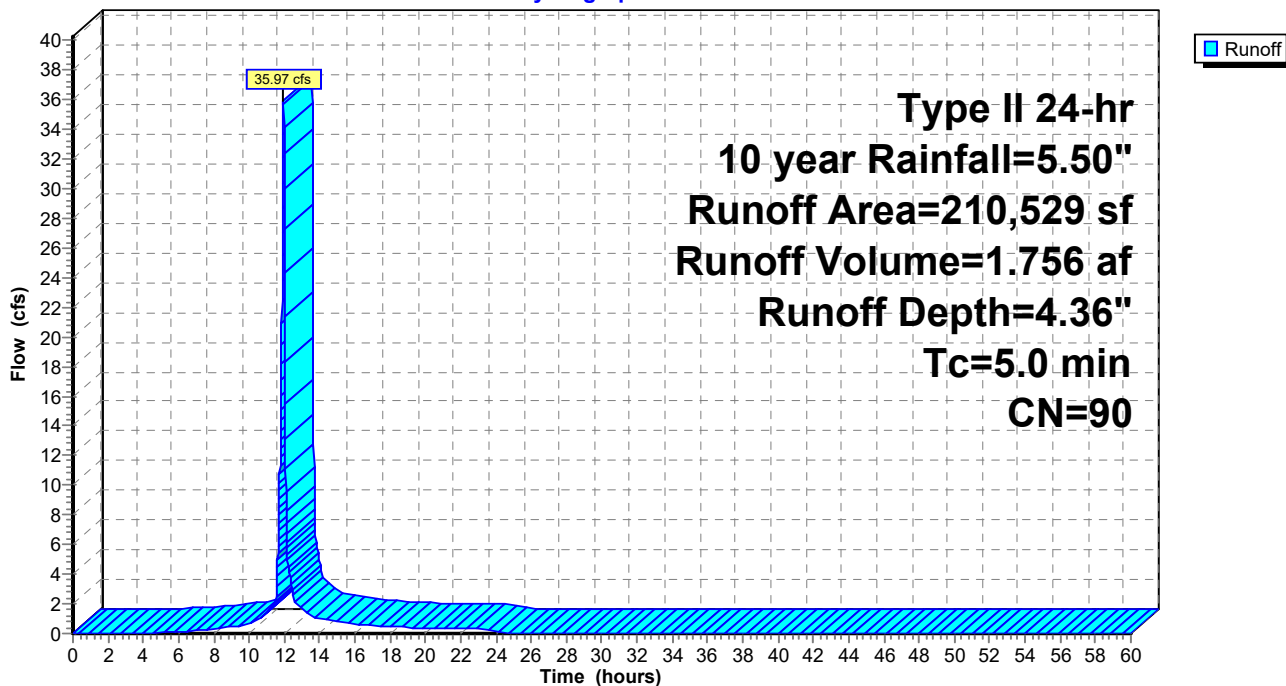
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 year Rainfall=5.50"

Area (sf)	CN	Description
88,504	80	>75% Grass cover, Good, HSG D
122,025	98	Paved parking, HSG D
210,529	90	Weighted Average
88,504		42.04% Pervious Area
122,025		57.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment E: WS 2a

Hydrograph



Westwood Proposed

Type II 24-hr 10 year Rainfall=5.50"

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Page 16

Summary for Subcatchment W: WS 1

Runoff = 9.74 cfs @ 12.01 hrs, Volume= 0.532 af, Depth= 3.33"

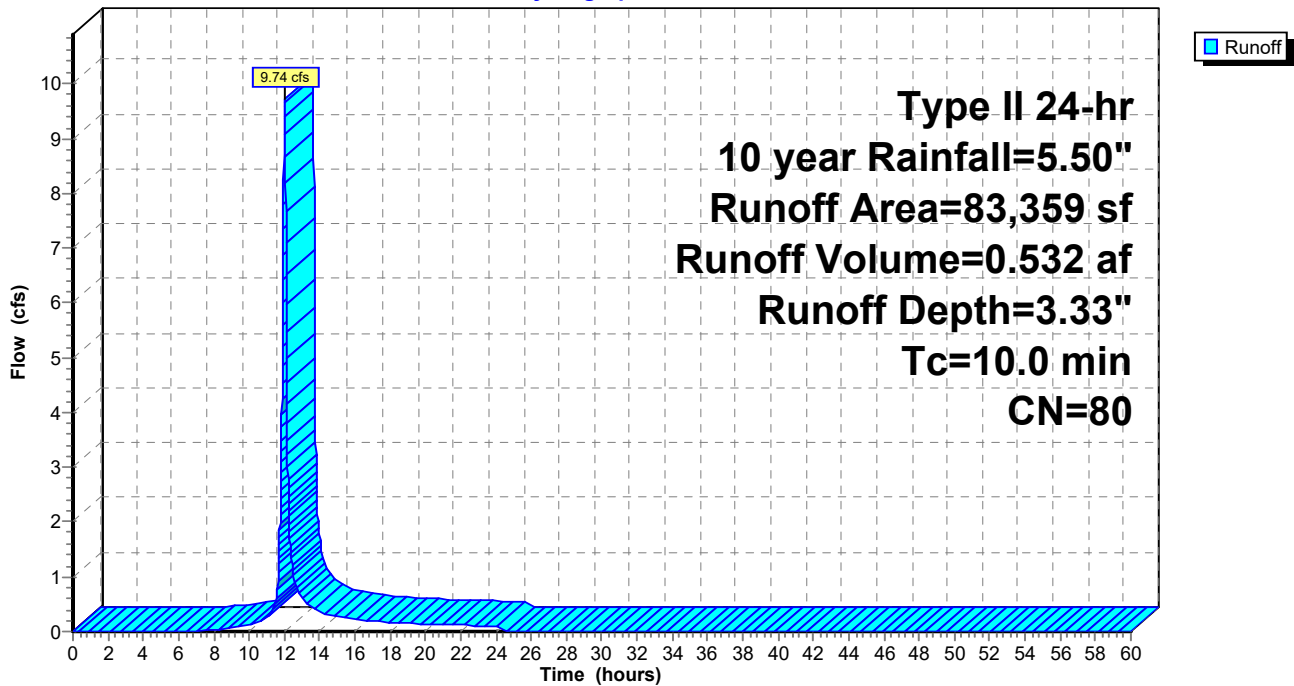
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 year Rainfall=5.50"

Area (sf)	CN	Description
81,980	80	>75% Grass cover, Good, HSG D
1,379	98	Paved parking, HSG D
83,359	80	Weighted Average
81,980		98.35% Pervious Area
1,379		1.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment W: WS 1

Hydrograph



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Type II 24-hr 10 year Rainfall=5.50"

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Page 17

Summary for Pond 1P: UG Det

Inflow Area = 4.833 ac, 57.96% Impervious, Inflow Depth = 4.36" for 10 year event
 Inflow = 35.97 cfs @ 11.96 hrs, Volume= 1.756 af
 Outflow = 14.60 cfs @ 12.06 hrs, Volume= 1.675 af, Atten= 59%, Lag= 6.1 min
 Primary = 14.60 cfs @ 12.06 hrs, Volume= 1.675 af

Routing by Sim-Route method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 932.82' @ 12.06 hrs Surf.Area= 0.241 ac Storage= 0.636 af

Plug-Flow detention time= 131.7 min calculated for 1.675 af (95% of inflow)
 Center-of-Mass det. time= 104.9 min (888.2 - 783.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	929.25'	0.383 af	55.75"W x 188.24"L x 6.75"H Field A 1.626 af Overall - 0.670 af Embedded = 0.956 af x 40.0% Voids
#2A	930.00'	0.670 af	ADS_StormTech MC-4500 +Cap x 270 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 6 Rows of 45 Chambers Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
		1.052 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	18.0" Round RCP_Round 18" L= 50.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 930.00' / 929.19' S= 0.0162 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	930.00'	2.5" Vert. Orifice/Grate C= 0.600
#3	Device 1	930.40'	36.0" W x 60.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=14.60 cfs @ 12.06 hrs HW=932.82' (Free Discharge)

↑ **1=RCP_Round 18"** (Barrel Controls 14.60 cfs @ 8.26 fps)

↑ **2=Orifice/Grate** (Passes < 0.27 cfs potential flow)

↑ **3=Orifice/Grate** (Passes < 36.34 cfs potential flow)

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Type II 24-hr 10 year Rainfall=5.50"

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Page 18

Pond 1P: UG Det - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

45 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 186.24' Row Length +12.0" End Stone x 2 = 188.24' Base Length

6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width

9.0" Base + 60.0" Chamber Height + 12.0" Cover = 6.75' Field Height

270 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 6 Rows = 29,180.8 cf Chamber Storage

70,837.7 cf Field - 29,180.8 cf Chambers = 41,656.9 cf Stone x 40.0% Voids = 16,662.8 cf Stone Storage

Chamber Storage + Stone Storage = 45,843.6 cf = 1.052 af

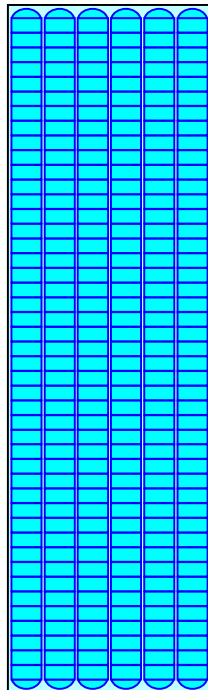
Overall Storage Efficiency = 64.7%

Overall System Size = 188.24' x 55.75' x 6.75'

270 Chambers

2,623.6 cy Field

1,542.8 cy Stone



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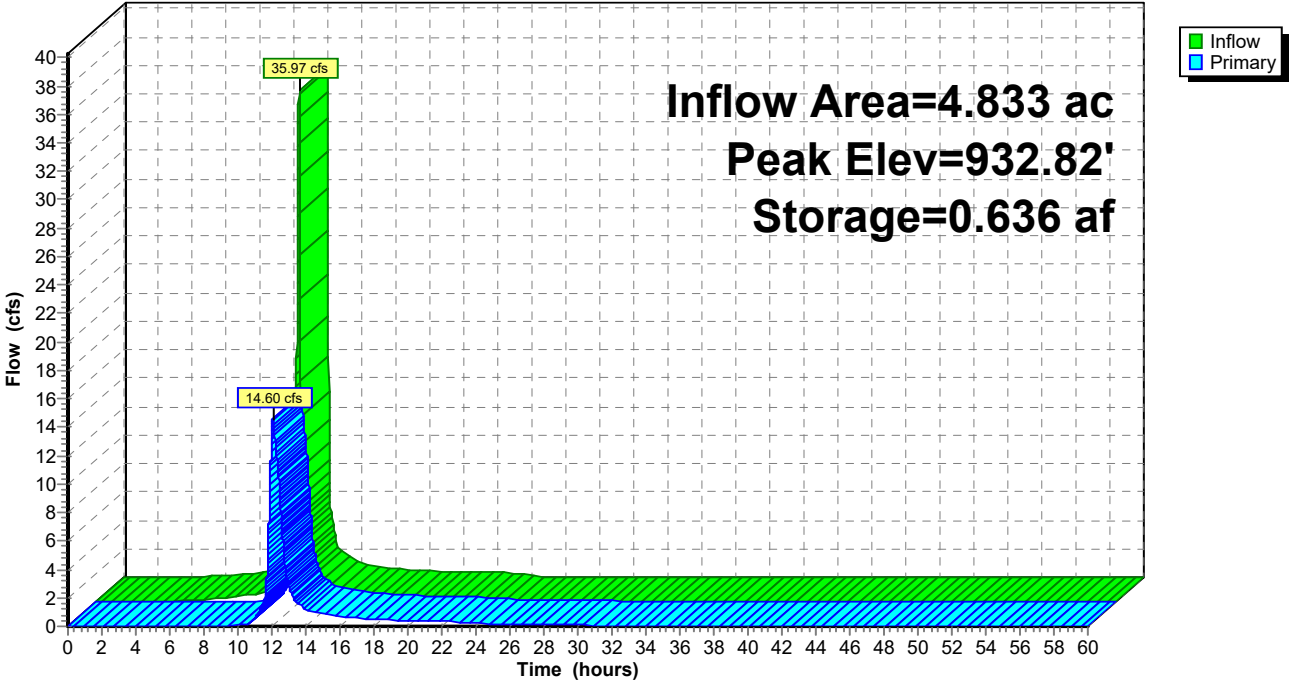
Type II 24-hr 10 year Rainfall=5.50"

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Page 19

Pond 1P: UG Det

Hydrograph



Westwood Proposed

Type II 24-hr 100 year Rainfall=8.82"

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Page 20

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment2S: WS 2b

Runoff Area=38,253 sf 26.00% Impervious Runoff Depth=7.01"
 Tc=5.0 min CN=85 Runoff=10.49 cfs 0.513 af

SubcatchmentE: WS 2a

Runoff Area=210,529 sf 57.96% Impervious Runoff Depth=7.61"
 Tc=5.0 min CN=90 Runoff=60.48 cfs 3.067 af

SubcatchmentW: WS 1

Runoff Area=83,359 sf 1.65% Impervious Runoff Depth=6.40"
 Tc=10.0 min CN=80 Runoff=18.18 cfs 1.020 af

Pond 1P: UG Det

Peak Elev=935.67' Storage=1.021 af Inflow=60.48 cfs 3.067 af
 Outflow=22.31 cfs 2.985 af

Total Runoff Area = 7.625 ac Runoff Volume = 4.600 af Average Runoff Depth = 7.24"
59.85% Pervious = 4.564 ac 40.15% Impervious = 3.061 ac

Westwood Proposed

Type II 24-hr 100 year Rainfall=8.82"

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Page 21

Summary for Subcatchment 2S: WS 2b

Runoff = 10.49 cfs @ 11.96 hrs, Volume= 0.513 af, Depth= 7.01"

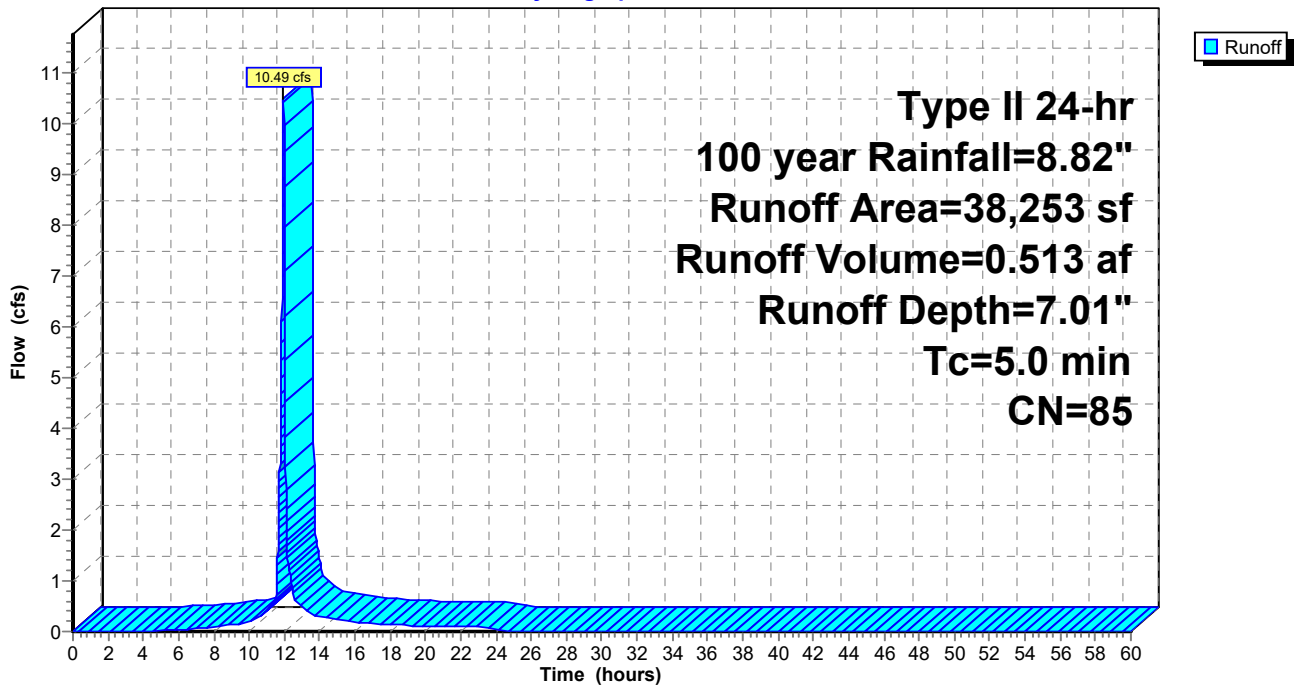
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100 year Rainfall=8.82"

Area (sf)	CN	Description
28,307	80	>75% Grass cover, Good, HSG D
9,946	98	Paved parking, HSG D
38,253	85	Weighted Average
28,307		74.00% Pervious Area
9,946		26.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: WS 2b

Hydrograph



Westwood Proposed

Type II 24-hr 100 year Rainfall=8.82"

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Page 22

Summary for Subcatchment E: WS 2a

Runoff = 60.48 cfs @ 11.96 hrs, Volume= 3.067 af, Depth= 7.61"

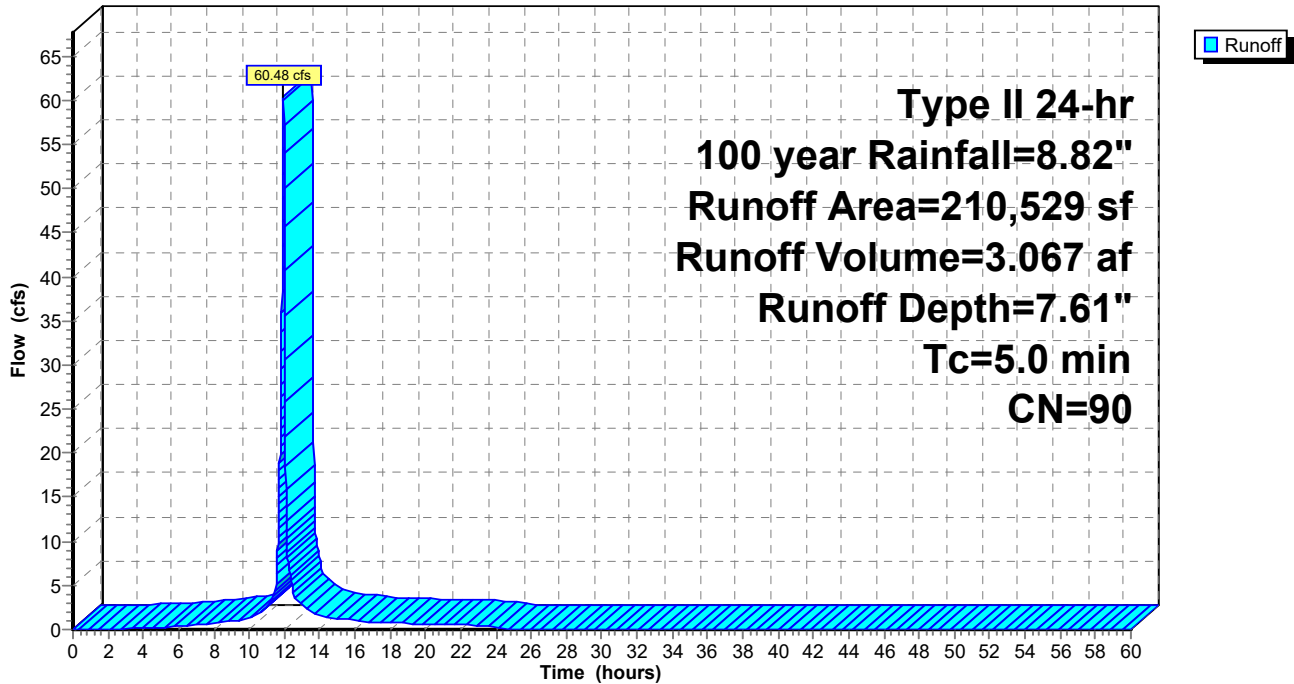
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 year Rainfall=8.82"

Area (sf)	CN	Description
88,504	80	>75% Grass cover, Good, HSG D
122,025	98	Paved parking, HSG D
210,529	90	Weighted Average
88,504		42.04% Pervious Area
122,025		57.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment E: WS 2a

Hydrograph



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Type II 24-hr 100 year Rainfall=8.82"

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Page 23

Summary for Subcatchment W: WS 1

Runoff = 18.18 cfs @ 12.01 hrs, Volume= 1.020 af, Depth= 6.40"

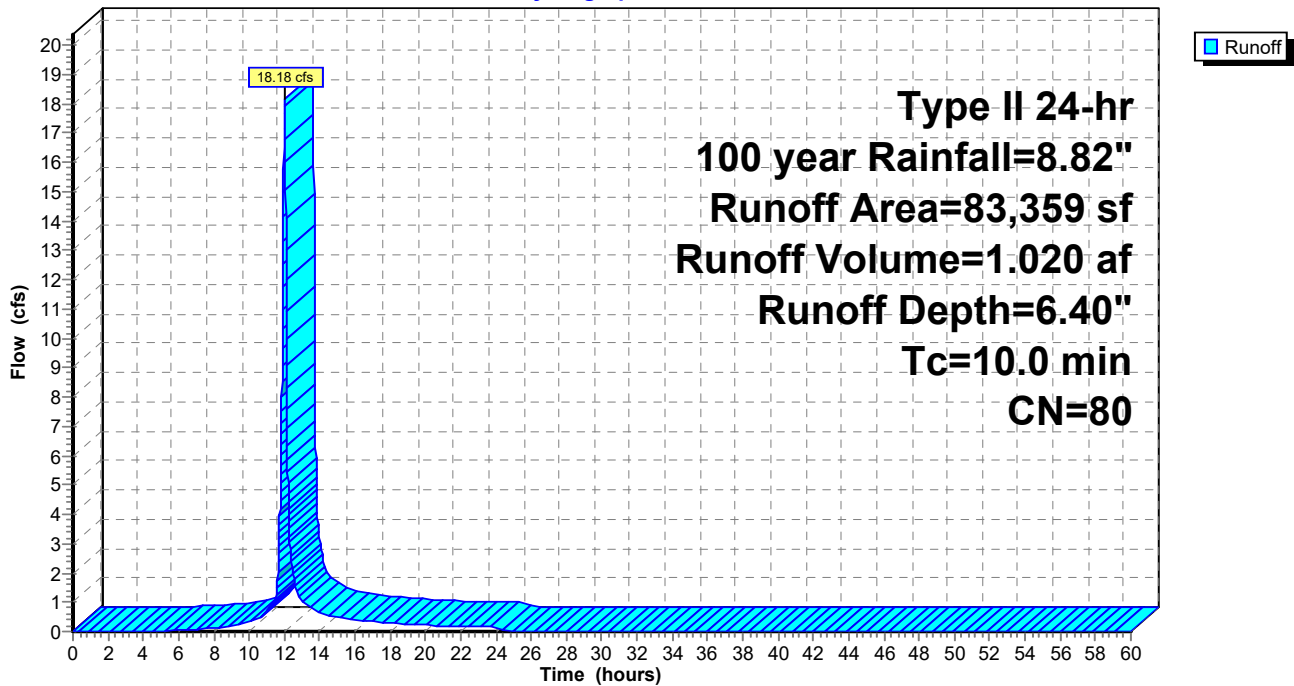
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 year Rainfall=8.82"

Area (sf)	CN	Description
81,980	80	>75% Grass cover, Good, HSG D
1,379	98	Paved parking, HSG D
83,359	80	Weighted Average
81,980		98.35% Pervious Area
1,379		1.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment W: WS 1

Hydrograph



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Type II 24-hr 100 year Rainfall=8.82"

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Page 24

Summary for Pond 1P: UG Det

Inflow Area = 4.833 ac, 57.96% Impervious, Inflow Depth = 7.61" for 100 year event
 Inflow = 60.48 cfs @ 11.96 hrs, Volume= 3.067 af
 Outflow = 22.31 cfs @ 12.06 hrs, Volume= 2.985 af, Atten= 63%, Lag= 6.4 min
 Primary = 22.31 cfs @ 12.06 hrs, Volume= 2.985 af

Routing by Sim-Route method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 935.67' @ 12.06 hrs Surf.Area= 0.241 ac Storage= 1.021 af

Plug-Flow detention time= 93.7 min calculated for 2.985 af (97% of inflow)
 Center-of-Mass det. time= 77.4 min (846.1 - 768.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	929.25'	0.383 af	55.75"W x 188.24"L x 6.75"H Field A 1.626 af Overall - 0.670 af Embedded = 0.956 af x 40.0% Voids
#2A	930.00'	0.670 af	ADS_StormTech MC-4500 +Cap x 270 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 6 Rows of 45 Chambers Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
		1.052 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	18.0" Round RCP_Round 18" L= 50.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 930.00' / 929.19' S= 0.0162 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	930.00'	2.5" Vert. Orifice/Grate C= 0.600
#3	Device 1	930.40'	36.0" W x 60.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=22.30 cfs @ 12.06 hrs HW=935.67' (Free Discharge)

↑ **1=RCP_Round 18"** (Barrel Controls 22.30 cfs @ 12.62 fps)

↑ **2=Orifice/Grate** (Passes < 0.39 cfs potential flow)

↑ **3=Orifice/Grate** (Passes < 115.15 cfs potential flow)

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Page 25

Pond 1P: UG Det - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

45 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 186.24' Row Length +12.0" End Stone x 2 = 188.24' Base Length

6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width

9.0" Base + 60.0" Chamber Height + 12.0" Cover = 6.75' Field Height

270 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 6 Rows = 29,180.8 cf Chamber Storage

70,837.7 cf Field - 29,180.8 cf Chambers = 41,656.9 cf Stone x 40.0% Voids = 16,662.8 cf Stone Storage

Chamber Storage + Stone Storage = 45,843.6 cf = 1.052 af

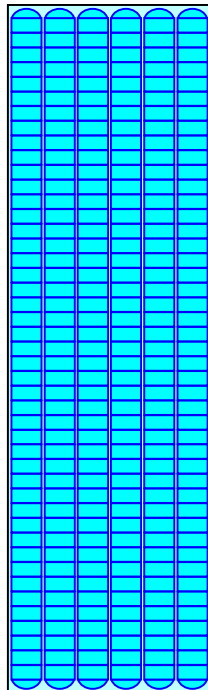
Overall Storage Efficiency = 64.7%

Overall System Size = 188.24' x 55.75' x 6.75'

270 Chambers

2,623.6 cy Field

1,542.8 cy Stone



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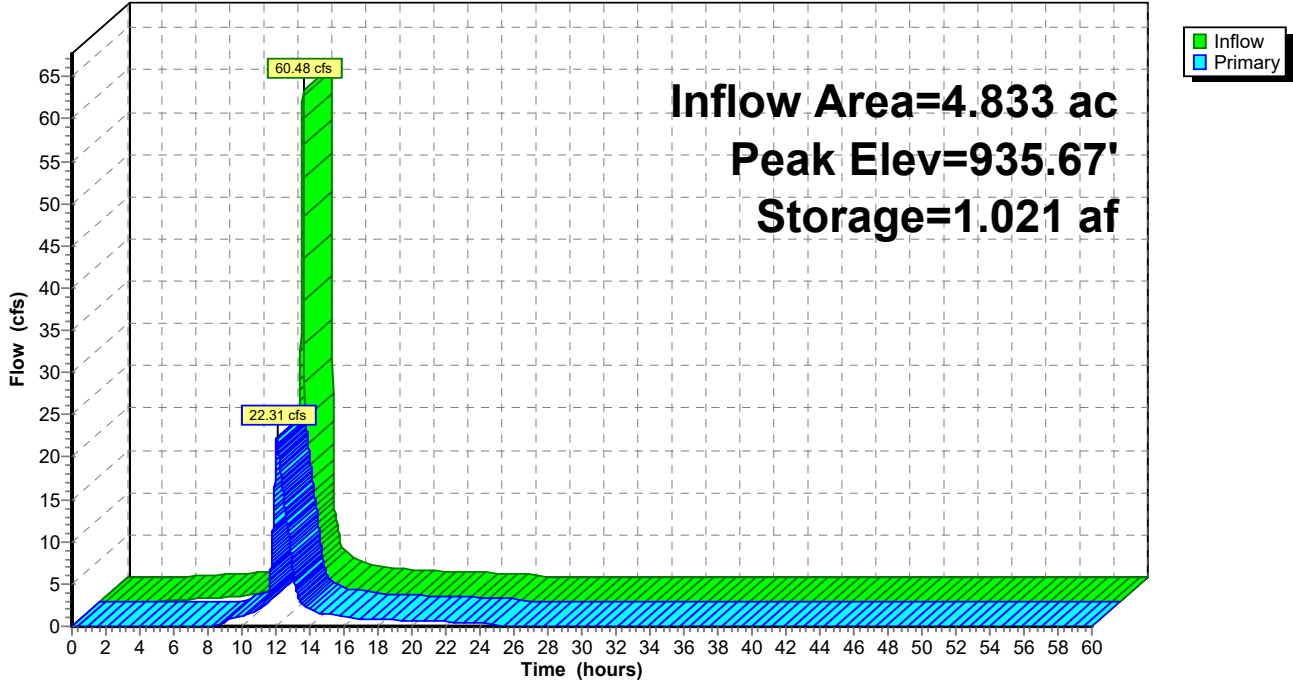
Type II 24-hr 100 year Rainfall=8.82"

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Page 26

Pond 1P: UG Det

Hydrograph



Westwood Proposed

Type II 24-hr WQ Event Rainfall=1.37"

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Page 27

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment2S: WS 2b

Runoff Area=38,253 sf 26.00% Impervious Runoff Depth=0.37"
 Tc=5.0 min CN=85 Runoff=0.59 cfs 0.027 af

SubcatchmentE: WS 2a

Runoff Area=210,529 sf 57.96% Impervious Runoff Depth=0.58"
 Tc=5.0 min CN=90 Runoff=5.25 cfs 0.235 af

SubcatchmentW: WS 1

Runoff Area=83,359 sf 1.65% Impervious Runoff Depth=0.22"
 Tc=10.0 min CN=80 Runoff=0.54 cfs 0.036 af

Pond 1P: UG Det

Peak Elev=930.41' Storage=0.159 af Inflow=5.25 cfs 0.235 af
 Outflow=0.10 cfs 0.155 af

Total Runoff Area = 7.625 ac Runoff Volume = 0.298 af Average Runoff Depth = 0.47"
59.85% Pervious = 4.564 ac 40.15% Impervious = 3.061 ac

Westwood Proposed

Type II 24-hr WQ Event Rainfall=1.37"

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Page 28

Summary for Subcatchment 2S: WS 2b

Runoff = 0.59 cfs @ 11.97 hrs, Volume= 0.027 af, Depth= 0.37"

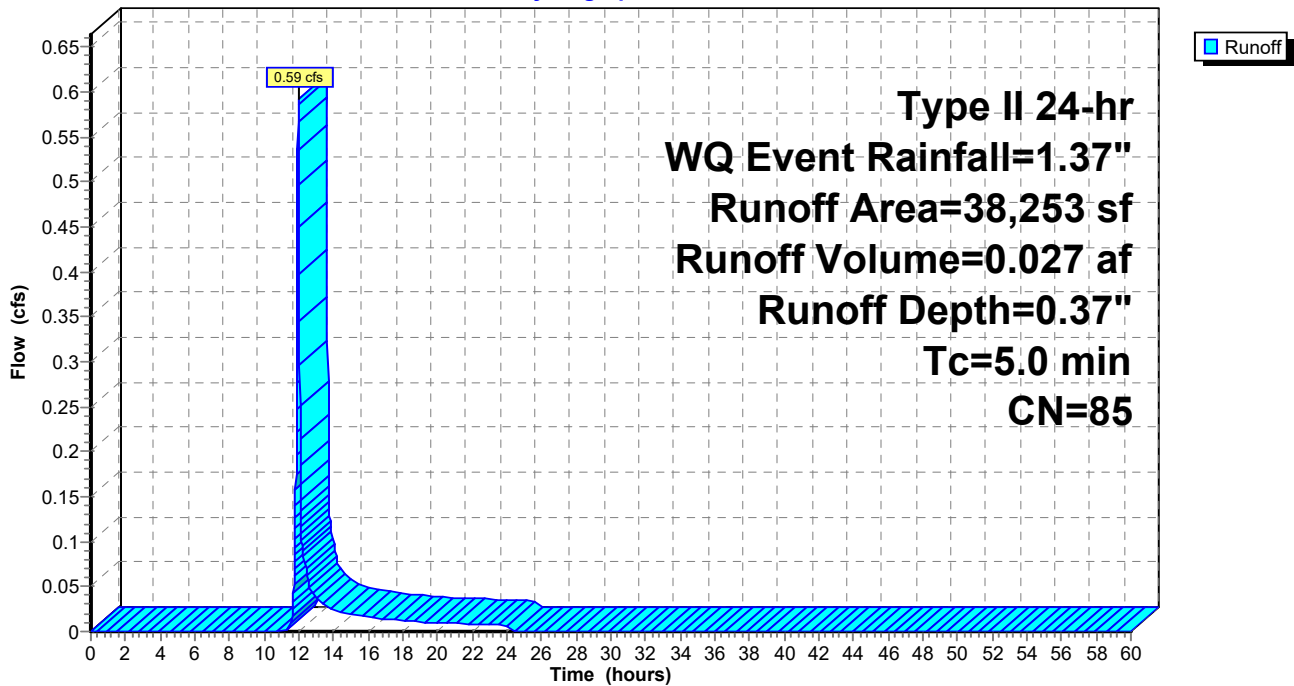
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Type II 24-hr WQ Event Rainfall=1.37"

Area (sf)	CN	Description
28,307	80	>75% Grass cover, Good, HSG D
9,946	98	Paved parking, HSG D
38,253	85	Weighted Average
28,307		74.00% Pervious Area
9,946		26.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: WS 2b

Hydrograph



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Type II 24-hr WQ Event Rainfall=1.37"

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Page 29

Summary for Subcatchment E: WS 2a

Runoff = 5.25 cfs @ 11.96 hrs, Volume= 0.235 af, Depth= 0.58"

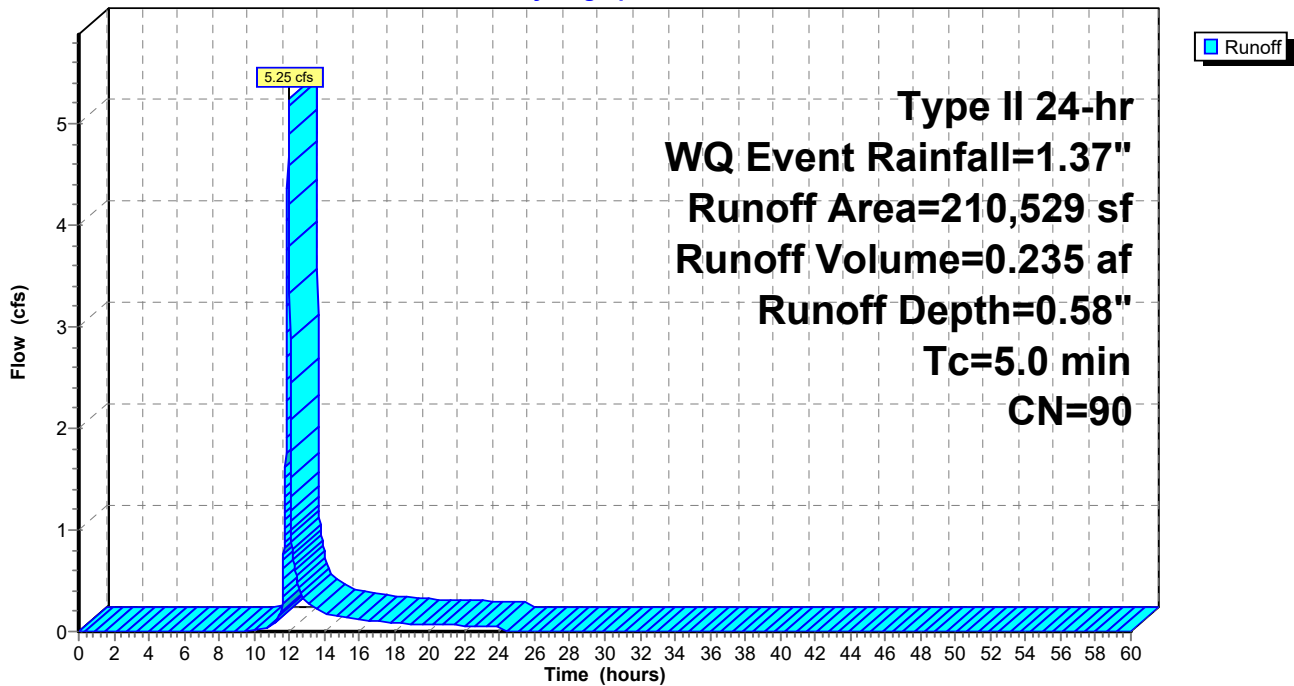
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQ Event Rainfall=1.37"

Area (sf)	CN	Description
88,504	80	>75% Grass cover, Good, HSG D
122,025	98	Paved parking, HSG D
210,529	90	Weighted Average
88,504		42.04% Pervious Area
122,025		57.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment E: WS 2a

Hydrograph



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Page 30

Summary for Subcatchment W: WS 1

Runoff = 0.54 cfs @ 12.04 hrs, Volume= 0.036 af, Depth= 0.22"

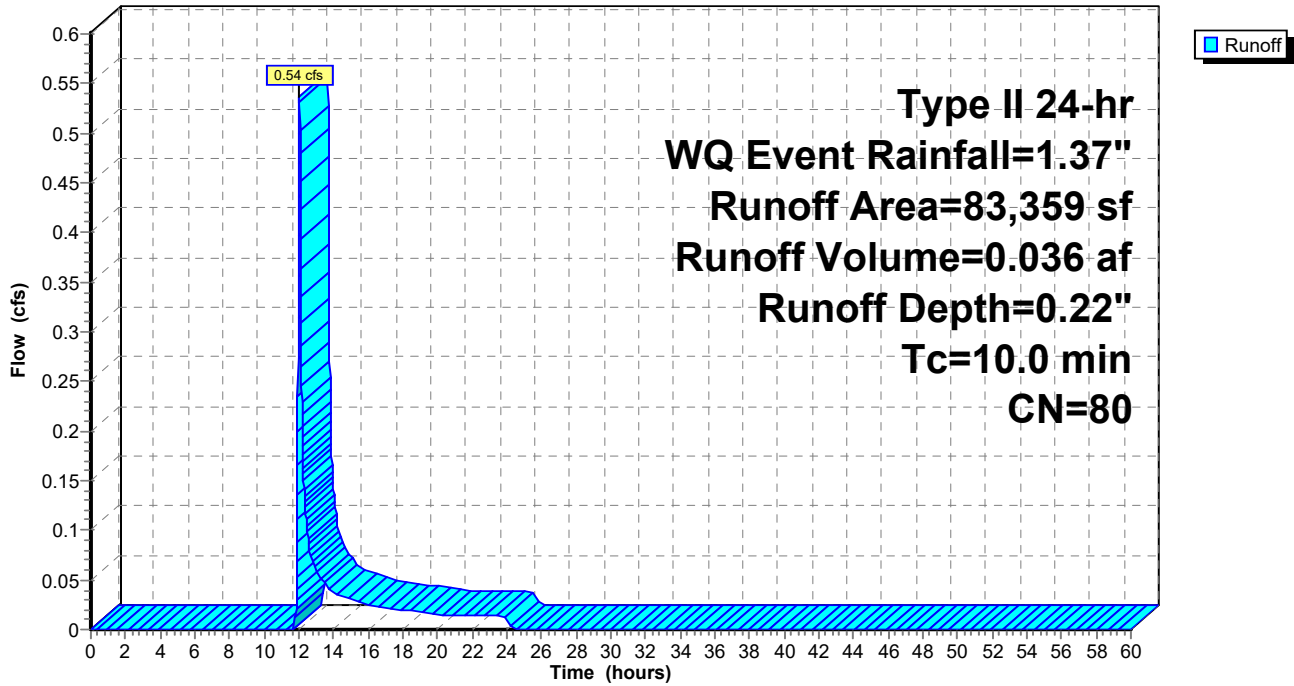
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Type II 24-hr WQ Event Rainfall=1.37"

Area (sf)	CN	Description
81,980	80	>75% Grass cover, Good, HSG D
1,379	98	Paved parking, HSG D
83,359	80	Weighted Average
81,980		98.35% Pervious Area
1,379		1.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment W: WS 1

Hydrograph



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Type II 24-hr WQ Event Rainfall=1.37"

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Page 31

Summary for Pond 1P: UG Det

Inflow Area = 4.833 ac, 57.96% Impervious, Inflow Depth = 0.58" for WQ Event event
 Inflow = 5.25 cfs @ 11.96 hrs, Volume= 0.235 af
 Outflow = 0.10 cfs @ 16.63 hrs, Volume= 0.155 af, Atten= 98%, Lag= 280.2 min
 Primary = 0.10 cfs @ 16.63 hrs, Volume= 0.155 af

Routing by Sim-Route method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 930.41' @ 16.63 hrs Surf.Area= 0.241 ac Storage= 0.159 af

Plug-Flow detention time= 735.8 min calculated for 0.155 af (66% of inflow)
 Center-of-Mass det. time= 621.9 min (1,462.3 - 840.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	929.25'	0.383 af	55.75"W x 188.24"L x 6.75"H Field A 1.626 af Overall - 0.670 af Embedded = 0.956 af x 40.0% Voids
#2A	930.00'	0.670 af	ADS_StormTech MC-4500 +Cap x 270 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 6 Rows of 45 Chambers Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
		1.052 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	18.0" Round RCP_Round 18" L= 50.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 930.00' / 929.19' S= 0.0162 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	930.00'	2.5" Vert. Orifice/Grate C= 0.600
#3	Device 1	930.40'	36.0" W x 60.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.10 cfs @ 16.63 hrs HW=930.41' (Free Discharge)

↑ **1=RCP_Round 18"** (Passes 0.10 cfs of 1.09 cfs potential flow)

↑ **2=Orifice/Grate** (Orifice Controls 0.09 cfs @ 2.67 fps)

↑ **3=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.36 fps)

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Type II 24-hr WQ Event Rainfall=1.37"

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Page 32

Pond 1P: UG Det - Chamber Wizard Field A**Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)**

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

45 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 186.24' Row Length +12.0" End Stone x 2 =
188.24' Base Length

6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width

9.0" Base + 60.0" Chamber Height + 12.0" Cover = 6.75' Field Height

270 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 6 Rows = 29,180.8 cf Chamber Storage

70,837.7 cf Field - 29,180.8 cf Chambers = 41,656.9 cf Stone x 40.0% Voids = 16,662.8 cf Stone Storage

Chamber Storage + Stone Storage = 45,843.6 cf = 1.052 af

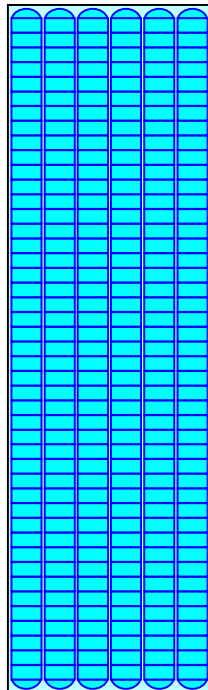
Overall Storage Efficiency = 64.7%

Overall System Size = 188.24' x 55.75' x 6.75'

270 Chambers

2,623.6 cy Field

1,542.8 cy Stone



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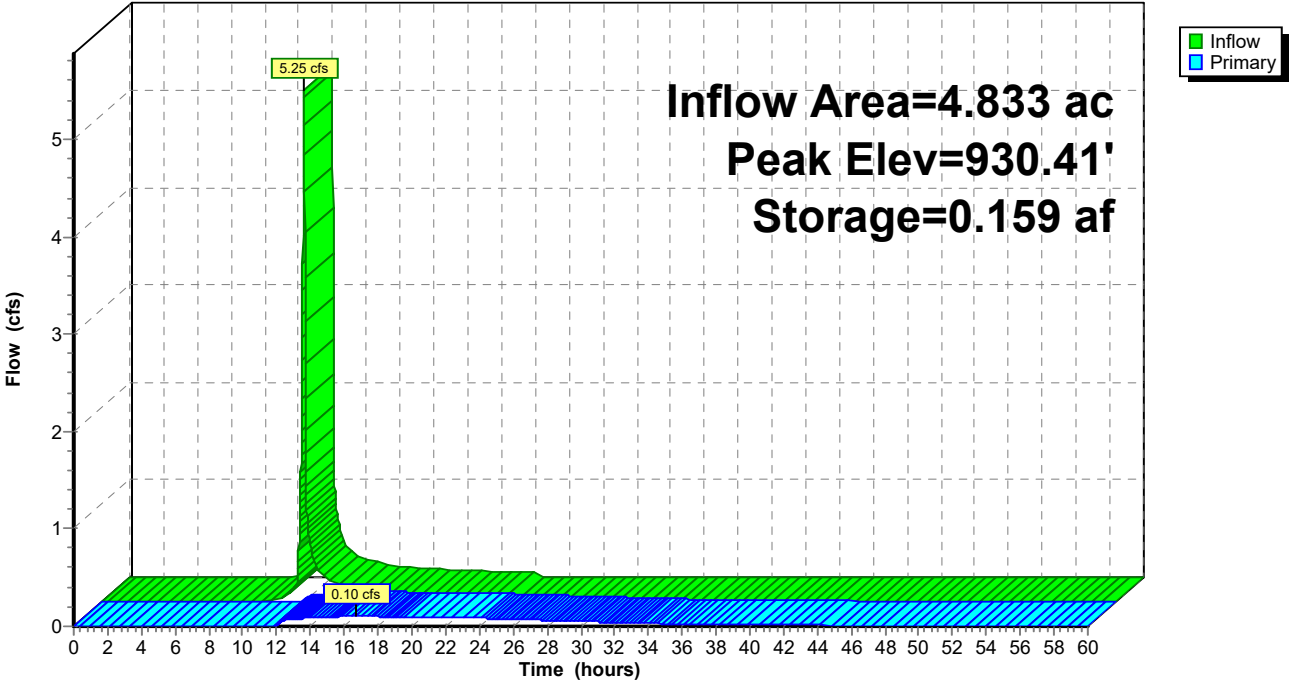
Type II 24-hr WQ Event Rainfall=1.37"

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Page 33

Pond 1P: UG Det

Hydrograph



Appendix D – USDA NRCS Soils Report



United States
Department of
Agriculture

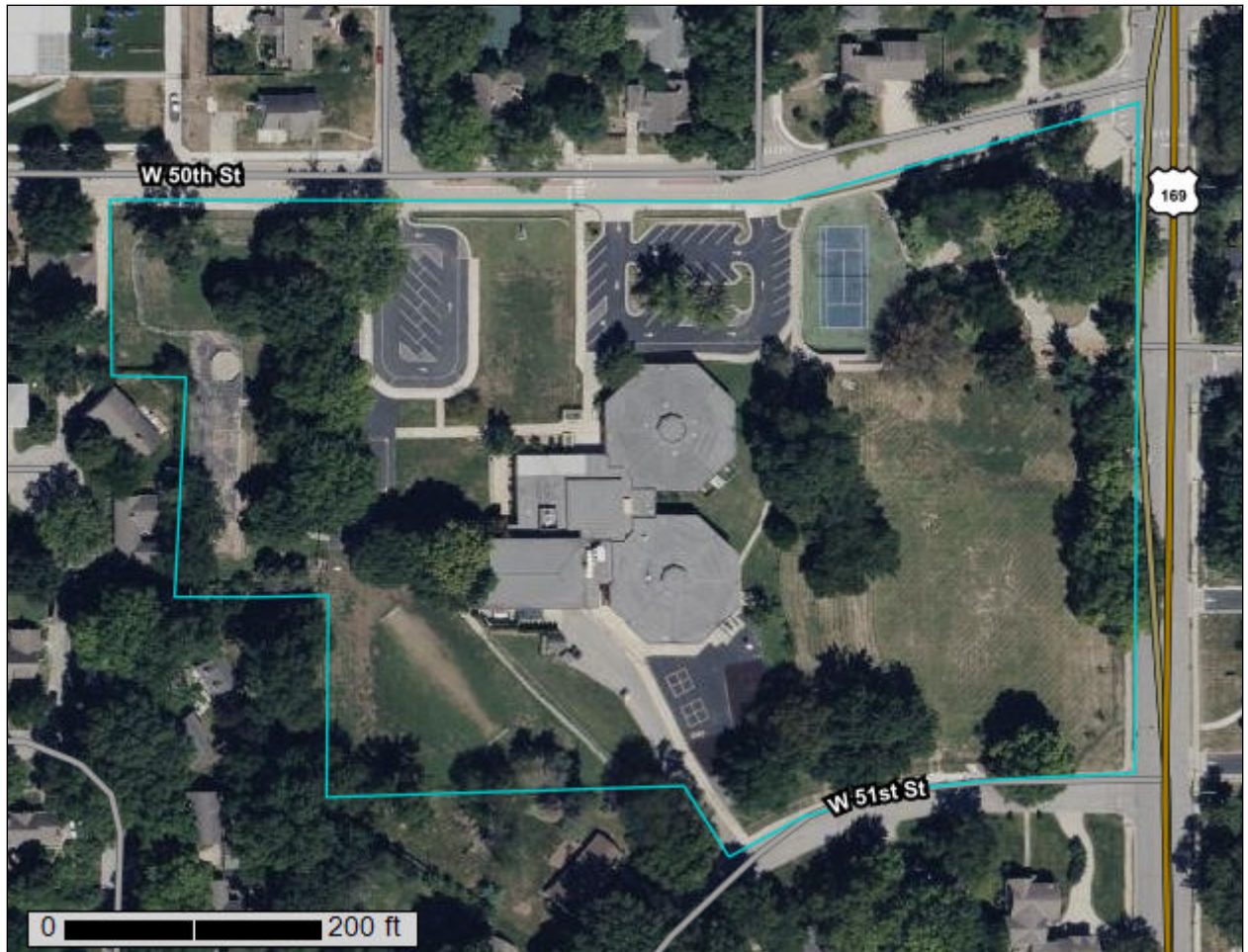
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Item A. Section VI, Item

Custom Soil Resource Report for Johnson County, Kansas



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Johnson County, Kansas.....	13
7545—Sharpsburg-Urban land complex, 4 to 8 percent slopes.....	13
References	15

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

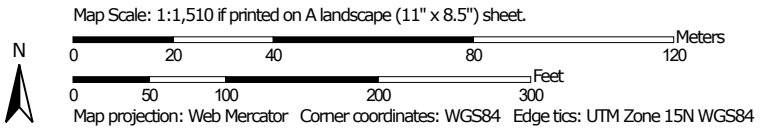
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map





































The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Item A. Section VI, Item



MAP LEGEND

- Area of Interest (AOI)**
-  Area of Interest (AOI)
- Soils**
-  Soil Map Unit Polygons
-  Soil Map Unit Lines
-  Soil Map Unit Points
- Special Point Features**
-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features
- Water Features**
-  Streams and Canals
- Transportation**
-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads
- Background**
-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Johnson County, Kansas
 Survey Area Data: Version 21, Sep 12, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 30, 2022—Sep 16, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7545	Sharpsburg-Urban land complex, 4 to 8 percent slopes	7.9	100.0%
Totals for Area of Interest		7.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Johnson County, Kansas

7545—Sharpsburg-Urban land complex, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: tq4z
Elevation: 1,000 to 1,300 feet
Mean annual precipitation: 31 to 47 inches
Mean annual air temperature: 45 to 64 degrees F
Frost-free period: 185 to 255 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sharpsburg and similar soils: 55 percent
Urban land: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sharpsburg

Setting

Landform: Hillslopes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty and clayey loess

Typical profile

A - 0 to 9 inches: silt loam
AB - 9 to 13 inches: silty clay loam
Bt - 13 to 35 inches: silty clay loam
BC - 35 to 60 inches: silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 36 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R106XY015KS - Loamy Upland (PE 30-37)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Hillslopes
Down-slope shape: Convex
Across-slope shape: Convex

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix E – MC-4500 StormTech Detail Sheet

MC-4500 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-4500.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS <1 MIN AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT²%, THE ASD IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

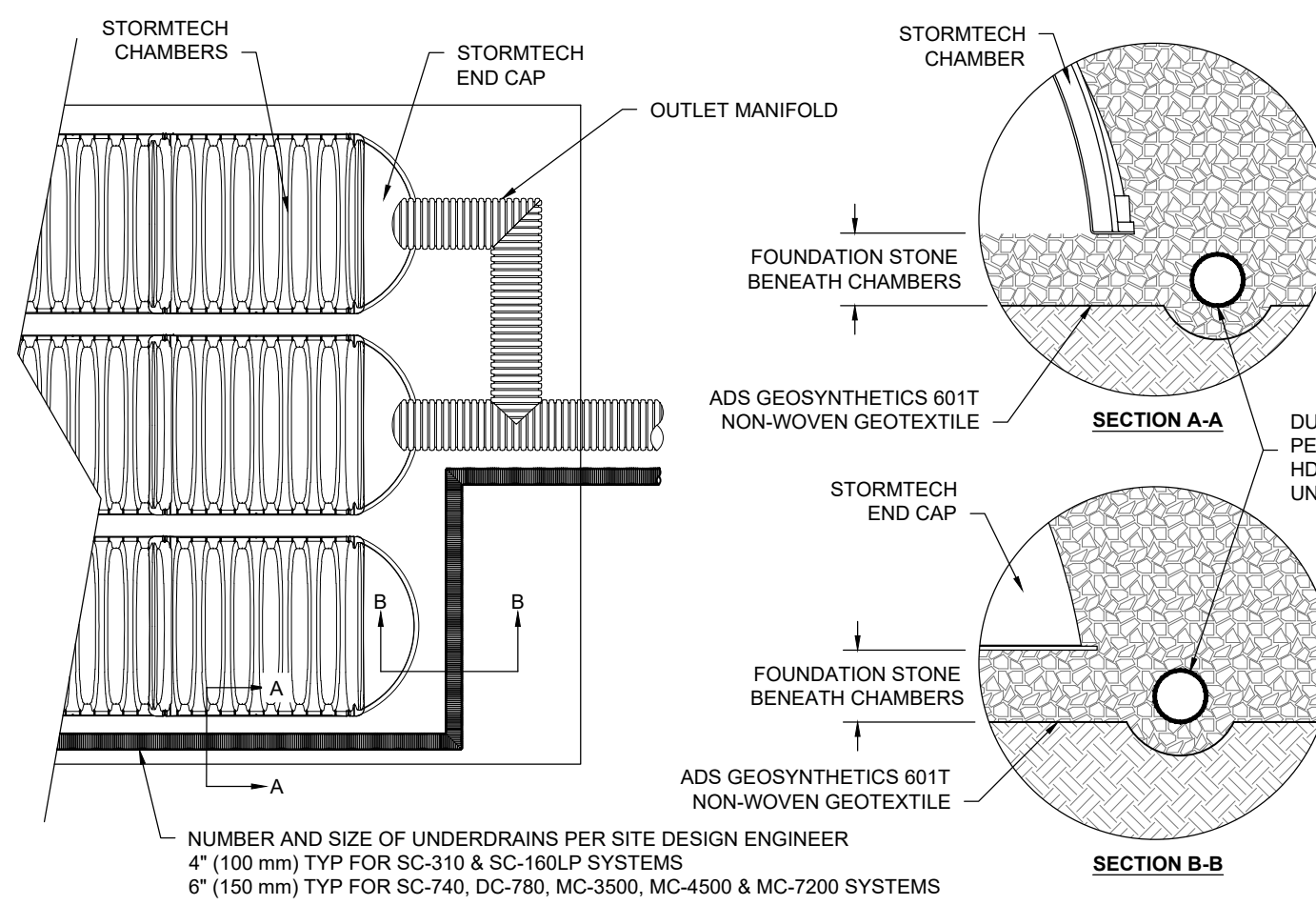
- STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOTTER LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
- STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

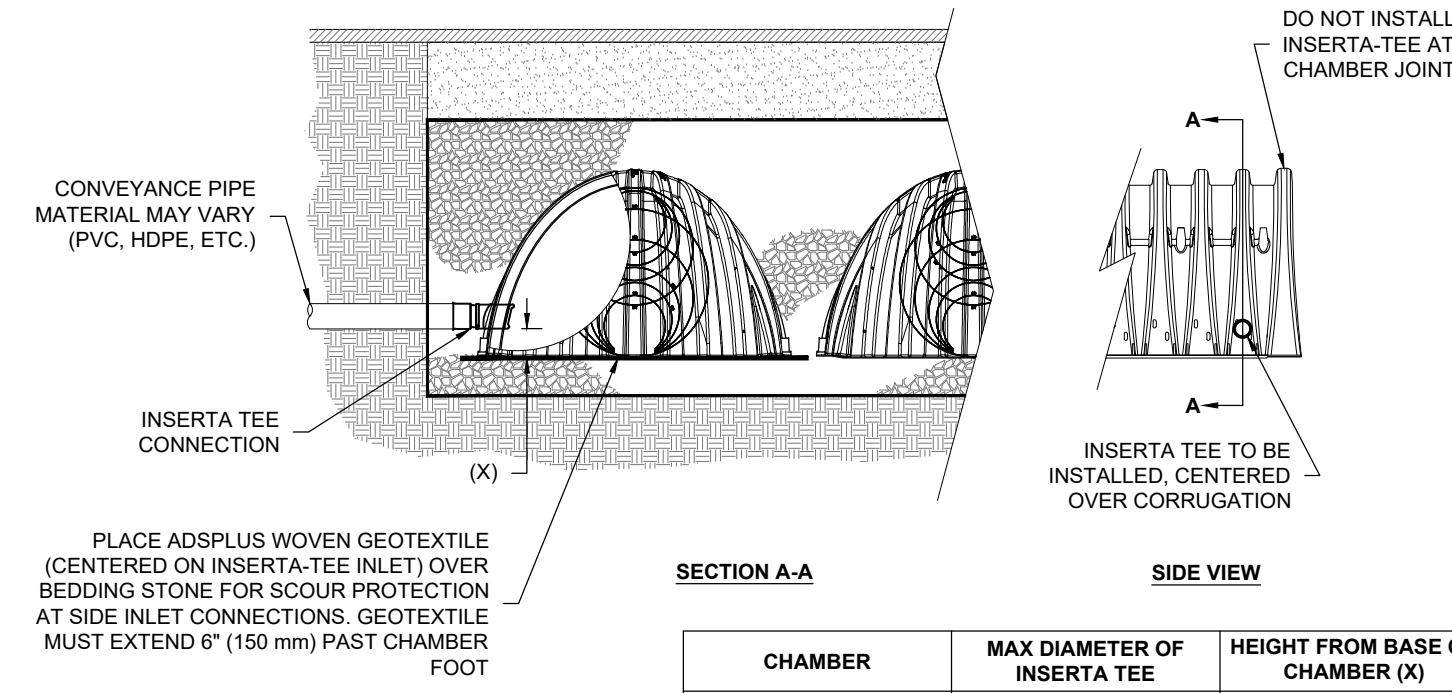
- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER TIRE LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



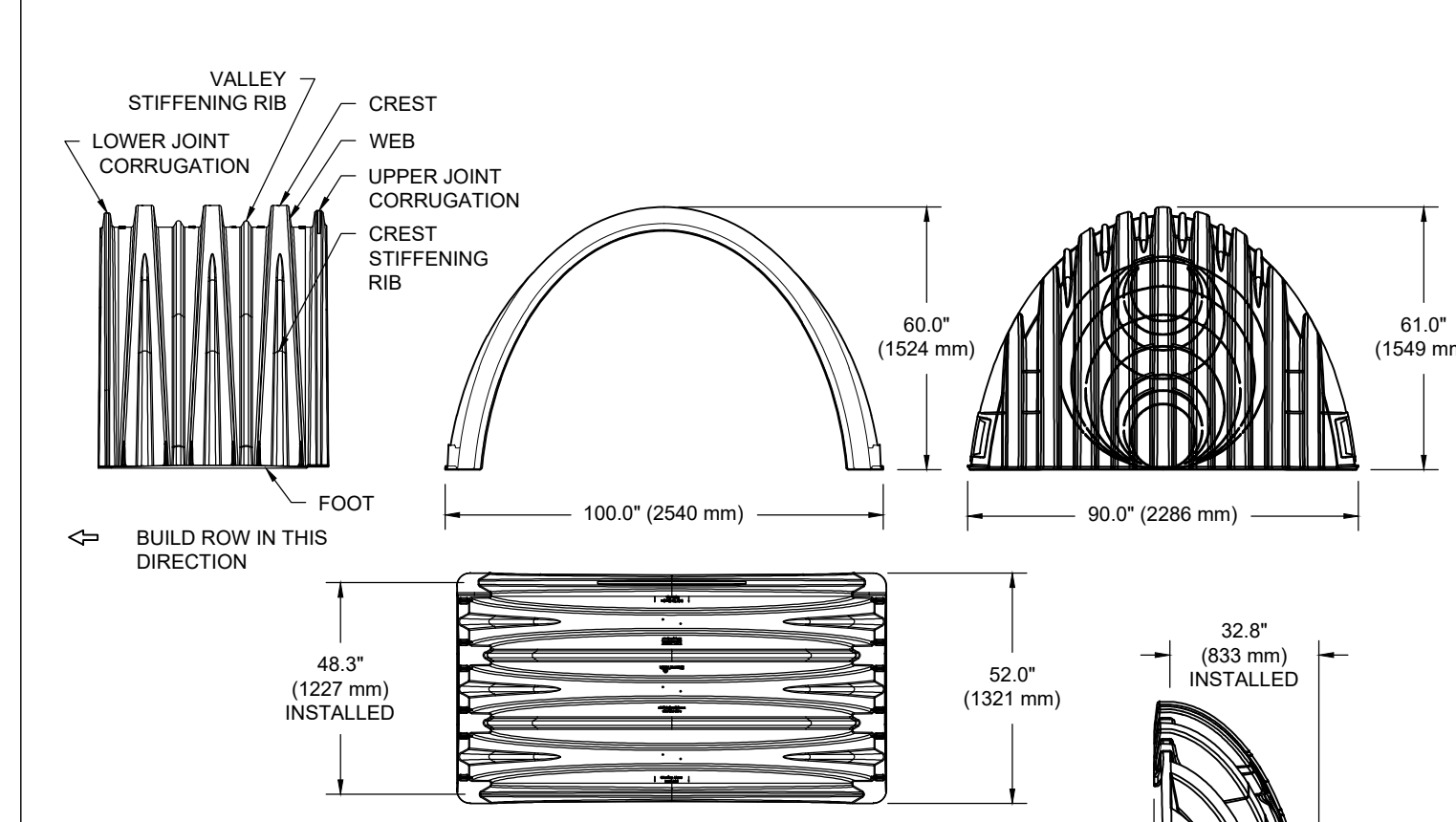
5 UNDERDRAIN DETAIL



CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
MC-7200	12" (300 mm)	8" (200 mm)

- NOTES:
- PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.
 - CONTACT ADS ENGINEERING SERVICES IF INSERTA TEE INLET MUST BE RAISED AS NOT ALL INVERTS ARE POSSIBLE.

6 INSERTA-TEE SIDE INLET DETAIL



NOMINAL CHAMBER SPECIFICATIONS
 SIZE (W X H X INSTALLED LENGTH) 100.0" X 60.0" X 48.3" (2540 mm X 1524 mm X 1227 mm)
 CHAMBER STORAGE 106.5 CUBIC FEET (3.01 m³)
 MINIMUM INSTALLED STORAGE* 162.6 CUBIC FEET (4.60 m³)
 WEIGHT (NOMINAL) 125.0 lbs. (56.7 kg)

NOMINAL END CAP SPECIFICATIONS
 SIZE (W X H X INSTALLED LENGTH) 90.0" X 61.0" X 32.8" (2286 mm X 1549 mm X 833 mm)
 END CAP STORAGE 39.5 CUBIC FEET (1.12 m³)
 MINIMUM INSTALLED STORAGE* 115.3 CUBIC FEET (3.26 m³)
 WEIGHT (NOMINAL) 90 lbs. (40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"

PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC4500IEPP02B	6" (150 mm)	42.54" (1081 mm)	---
MC4500IEPP06B	---	---	0.86" (22 mm)
MC4500IEPP08B	8" (200 mm)	40.50" (1029 mm)	---
MC4500IEPP10T	---	---	1.01" (26 mm)
MC4500IEPP10B	10" (250 mm)	38.37" (975 mm)	---
MC4500IEPP12T	---	---	1.33" (34 mm)
MC4500IEPP12B	12" (300 mm)	35.69" (907 mm)	---
MC4500IEPP15T	---	---	1.55" (39 mm)
MC4500IEPP15B	15" (375 mm)	32.72" (831 mm)	---
MC4500IEPP18T	---	---	1.70" (43 mm)
MC4500IEPP18B	18" (450 mm)	29.36" (746 mm)	---
MC4500IEPP18TW	---	---	1.97" (50 mm)
MC4500IEPP24T	---	---	---
MC4500IEPP24TW	24" (600 mm)	23.05" (585 mm)	---
MC4500IEPP24B	---	---	2.26" (57 mm)
MC4500IEPP24BW	---	---	---
MC4500IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC4500IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC4500IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL.

CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12" (300-600 mm) SIZE ON SIZE AND 15" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

2 MC-4500 TECHNICAL SPECIFICATIONS

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- INSPECTION PORTS (IF PRESENT).
 - REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN.
 - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED.
 - USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG.
 - LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL).
 - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
- REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS USING A FLASHLIGHT. INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE.
 - MIRRORS OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY.
 - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE.
 - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED.
 - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN.
 - VACUUM STRUCTURE SUMP AS REQUIRED.
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

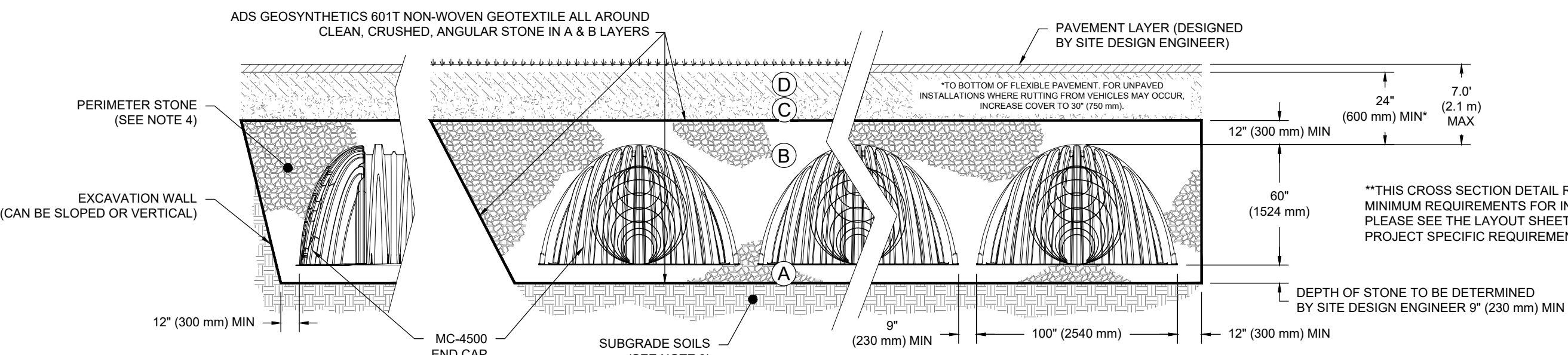
- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT	
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE.	AASHTO M145 ¹ A-1, A-2.4, A-3 OR AASHTO M43 ² 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 ¹ 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 ¹ 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

PLEASE NOTE:

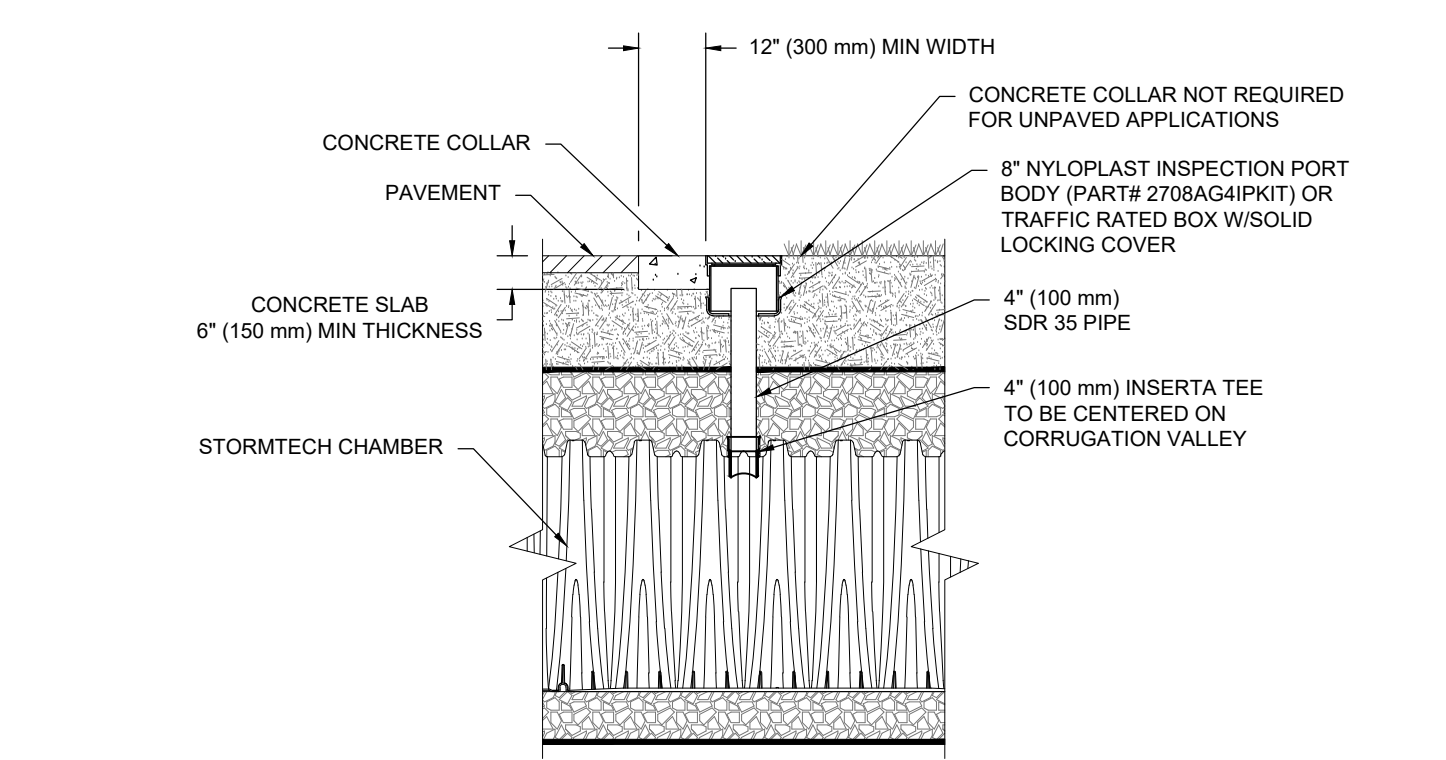
- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



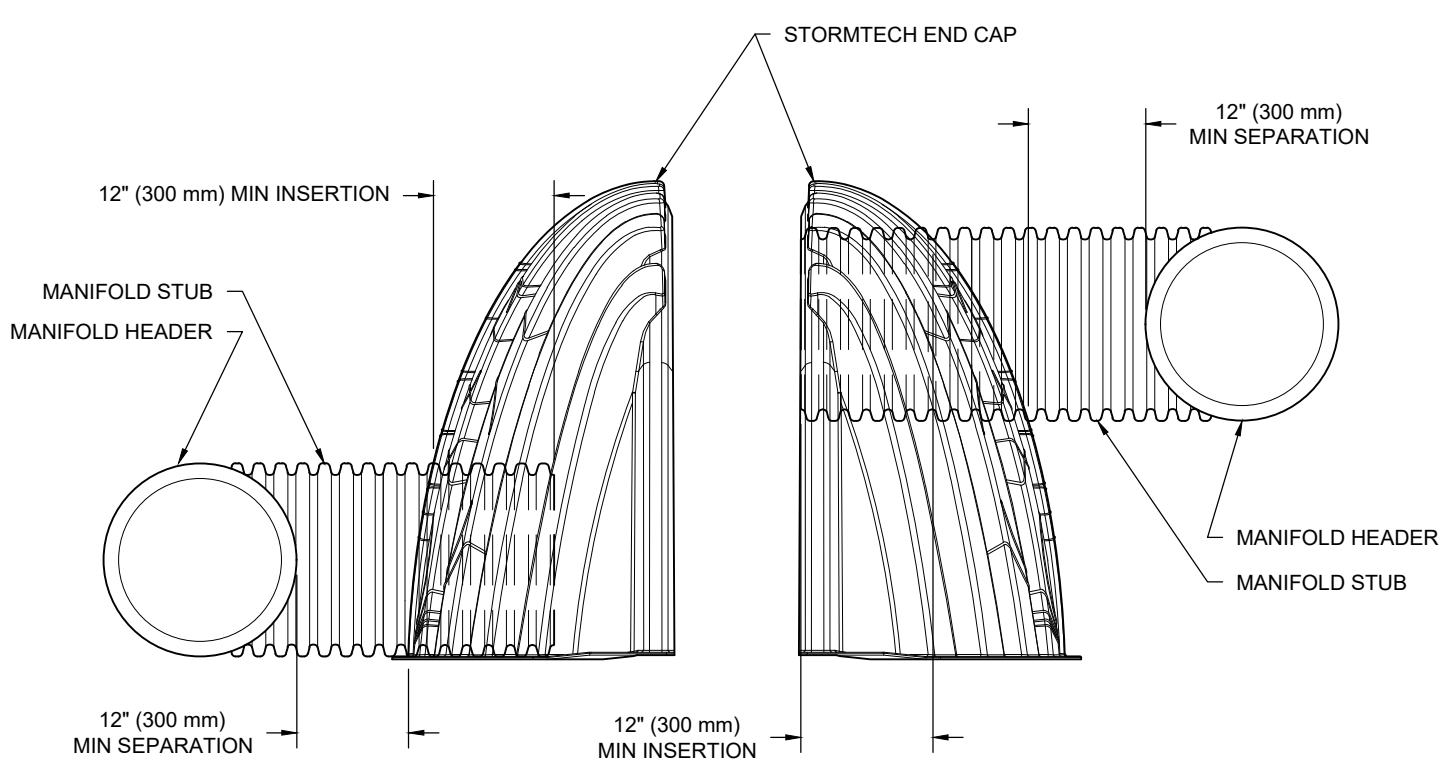
NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT²%, AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

3 MC-4500 ISOLATOR ROW PLUS DETAIL



NOTE: INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

4 4" PVC INSPECTION PORT DETAIL (MC SERIES CHAMBER)

7 MC-SERIES END CAP INSERTION DETAIL

1 MC-4500 CROSS SECTION DETAIL

Item A Section VI, Item

DATE: PROJECT NO: NOT TO SCALE

DRAWN: REVIEWED: REV:

MC-4500 STANDARD DETAILS

StormTech Chamber System
888-892-2694 | WWW.STORMTECH.COM

4640 TRUJEMAN BLVD
HILLIARD, OH 43026

ADS Advanced Drainage Systems, Inc.

SHEET

ADVANCED DRAINAGE SYSTEMS, INC. ("ADS") HAS PREPARED THIS DETAIL BASED ON REFERENCED STANDARDS. ADS HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICES FOR THIS PROJECT. NOR HAS ADS INDEPENDENTLY VERIFIED THE INFORMATION SUPPLIED. THE INSTALLATION DETAILS PROVIDED HEREIN ARE GENERAL RECOMMENDATIONS AND ARE NOT SPECIFIC FOR THIS PROJECT. UNLESS THE PLANS ARE SIGNED AND SEALED BY THE SITE DESIGN ENGINEER, THE SITE DESIGN ENGINEER SHALL REVIEW THESE DETAILS PRIOR TO CONSTRUCTION AND SEALING THE DOCUMENT. IT IS THE SITE DESIGN ENGINEER'S RESPONSIBILITY TO ENSURE THE DETAILS PROVIDED HEREIN MEET OR EXCEEDS THE APPLICABLE NATIONAL, STATE, OR LOCAL REQUIREMENTS AND TO ENSURE THAT THE DETAILS PROVIDED HEREIN ARE ACCEPTABLE FOR THIS PROJECT.

284

KARBANK
REAL ESTATE COMPANY



Perspective
ARCHITECTURE + DESIGN

50th AND RAINBOW DEVELOPMENT
Comprehensive Signage Guidelines | October 2023

CONTENTS

INTRODUCTION

- Organization of Document • 03
- Document Intent • 03
- Regulatory Framework • 03
- Criteria for Review • 03

BUILDING SIGNAGE

- Building Signage Design Principles • 04
- Building Signage Definitions • 05
- Location/ Site Plan • 06–09

SIGN TYPES BY CONSTRUCTION

Wall and Canopy Signs: Identification

- A1 - Wall and Canopy Sign - Tenant • 10
- A2 - Upper Story, Wall Sign • 11

Window Signs

- B - Tenant or Project • 12

Monument/Ground Signs

- C - Tenant or Project • 13

Blade Signs

- D - Tenant - Blade Sign • 14

Parking/Traffic Directional Signs

- E - Parking - Projecting Sign • 15
- E - Parking Entrance - Wall Sign • 15
- E - Wayfinding Directional Parking - Ground Sign • 15

Wayfinding: Pedestrian Directories

- F - Wall/Ground Signs • 16

MATERIAL & PERFORMANCE SPECIFICATIONS

- Material & Performance Requirements • 17
- Acceptable Building Sign Material Examples • 18
- Acceptable Building Sign Illumination Examples • 19
- Prohibited Building Sign Types • 20

INTRODUCTION

A. ORGANIZATION OF DOCUMENT

This document begins with this Introduction which describes this document's intent and identifies the Regulatory Framework—the language drawn from previous documents and criteria that form the basis of this Comprehensive Sign Plan. The Introduction also identifies what is not regulated by this document.

The second section is the Building Signage Design Guidelines which applies to the building identification and to all businesses operating within the boundaries of the project. This section describes the Design Principles, the different Sign Types—their maximum size and quantity, and suggested Materials & Illumination.

The third section is the Approvals Process as outlined for each sign plan applicant.

B. DOCUMENT INTENT

The purpose of this document is to create a policy for a comprehensive and balanced system of signs for the 50th and Rainbow Development in the City of Westwood, Kansas. The standards are intended to set out a coordinated program for retail/tenant signage.

These criteria were developed to aid the tenant in the development of a retail design that emphasizes the merchandise, enhances the product or service, and reinforces the design quality of the building as a whole. It is hoped that tenants will generate imaginative designs for their space with integral, creative graphics and quality merchandising. Tenants are encouraged to express their own unique design statement within the parameters of the criteria outlined in this document.

All tenants must adhere to these criteria and all applicable state and local sign and building codes. Tenants are encouraged to understand the criteria prior to beginning design for their space. At that time, questions should be raised with Landlord and the City of Westwood to avoid delays later in the design process.

This Comprehensive Sign Plan (CSP) is intended to support the creation of a unified, integrated and enhanced character for the 50th and Rainbow Development, zoned as a Planned Development District (PD), through signage rules and regulations that respond to the unique attributes of the area. This CSP is also intended to ensure that all signage will contribute to the vitality and interest of the project, creating a lively and provocative atmosphere.

The requirements of this Comprehensive Sign Plan shall be supplemented by the City of Westwood regulations and codes in all areas which are not addressed in this document. All City of Westwood ordinances and regulations remain in full effect except as varied by this Comprehensive Sign Plan.

C. REGULATORY FRAMEWORK

This project is located in a planned development district as established by the City of Westwood Zoning Code.

ZONING

In accordance with the City of Westwood, Article Nine shall govern and control the erection, remodeling, enlarging, moving, operation and maintenance of all signs by permitted uses within all zoning districts. Nothing in the CSP shall be deemed a waiver of the provisions of any other ordinance or regulation applicable to signs. Signs located in areas governed by several ordinances and/or applicable regulations shall comply with all such ordinances and regulations.

DESIGN STANDARDS

1. All building signs shall conform to the City of Westwood Zoning Code.
2. Buildings with ground floor uses shall provide a uniform zone for signage over the ground floor.
3. All signs shall be measured in conformance with the City of Westwood Zoning Code.
4. The signage zone shall be provided with electrical power to enable the installation of illuminated signs.
5. All building signs shall be constructed of durable materials suited to the urban environment and climate of Kansas.
6. All conduits, junction boxes, and other functional elements shall be completely hidden from view and safely concealed once the sign is installed.
7. No flashing signs shall be permitted.

BUILDING SIGNAGE INTENT

1. To integrate private business signage in a manner that facilitates commerce, enlivens the public realm, and respects the character of the 50th and Rainbow Development and surrounding area.
2. To ensure that the signs of individual buildings and businesses can express a unique identity, while not detracting from the more important wayfinding and identification signage.
3. To encourage creative sign design.

D. CRITERIA FOR REVIEW

- a. The sign plan allows flexibility in the size, type and location of signs identifying the use(s) and location of a large facility, structure, or building group.
- b. The sign plan shall exhibit design excellence, inventiveness and sensitivity to the context.
- c. Signs shall not be oriented or illuminated so that they adversely affect the surrounding area, particularly existing nearby residential uses or structures. Examples of adverse effects are glare from intense illumination, and large signs or structures which visually dominate and area.
- d. Roof signs shall not be allowed. Portable roof signs, flashing signs, and animated signs are prohibited.
- e. Signs shall be professionally designed and fabricated from quality, durable materials.

BUILDING SIGNAGE - DESIGN PRINCIPLES

This section is intended to be used by all Owners, Developers, Tenants and their Designers who will be operating within the 50th and Rainbow Development.

All exterior signage should address both the communicative functions of a sign and its aesthetic integration with the overall retail concept. The building's architecture sets the tone for the signage program and the Landlord has established standards for identity signage as outlined in these criteria. Engaging an environmental graphic designer to work with the retail designer will assure a coordinated design program. Their knowledge of typography, materials, and fabrication contribute to design success. Experienced designers are aware of the interplay between aesthetics and function, and possess the skills necessary to achieve a synthesis of these conflicting factors.

National and regional "standard" storefront concepts and signage are respected; however, some concept modification may be necessary for compliance. Tenant signs and related logo graphics located along the 50th and Rainbow Development perimeter should express a refined urban sophistication through the use of clean and contemporary shapes and forms. The use of similar architectural materials used throughout the building are encouraged so as to create a seamless transition between the building and the tenant space.

All tenant signage should be appropriate to and expressive of the tenant business activity for which they communicate. Tenant sign designs shall be compatible with and be an enhancement of the architectural character of the 50th and Rainbow Development building(s), expressing scale, color, materials and lighting levels. The Landlord reserves the right to disapprove any sign design which is not compatible with these criteria and the aesthetics of this project. Exceptions to these specifications are rare but will be considered if, in the Landlord's opinion, the sign design is of exceptional merit and architectural quality. Such exceptions must be approved in advance by the Landlord.

As with all undertakings, the ultimate success of the 50th and Rainbow Development depends on the positive contributions of all participants.

Tenants should take advantage of the opportunity to use unique two-and three-dimensional forms/shapes, profiles and iconography that reflect both the personality of the tenant, product/service and the surrounding building architecture. The tenant is encouraged to use color, typography, pattern, texture and materials to create a dynamic interface with the streetscape. Designs which simply maximize size and volume in rectangular form are not acceptable. The Signage Design Criteria should act as a guide for the design of the tenant's signage in conjunction with the provisions of the tenant's lease with the Landlord. Furthermore, these criteria are subject to revision by the Landlord, and the Landlord's interpretation of these criteria are final and governing.

All signage designed for exterior identification of a retail store shall be designed for total compatibility with building finishes, color scheme and lighting levels, in order to maintain a design standard throughout the building. All primary signage will be limited to trade names and shall not include specification of merchandise sold or services rendered, regardless of the tenant's legal name. Corporate crests, logos or insignias may be acceptable pending the Landlord's approval and provided they are part of the tenant's name.

All signage requires review by the City of Westwood Zoning Administration and issuance of a Sign Permit.

BUILDING SIGNAGE: SIGNAGE DEFINITIONS

PERMITTED SIGN TYPES

Exterior signs for tenants and businesses operating covered by this section of the Comprehensive Sign Plan are:

Identification Signs: Project or Tenant

- Wall and Canopy Signs
- Window Signs
- Monument Signs
- Blade Signs

Parking/Traffic Directional Wayfinding

- Projecting Signs
- Wall Signs
- Ground Wayfinding Signs

Wayfinding: Pedestrian Directories

- Ground Signs
- Wall Signs

Refer to pages 10–16 of this document for further definitions of each sign type.

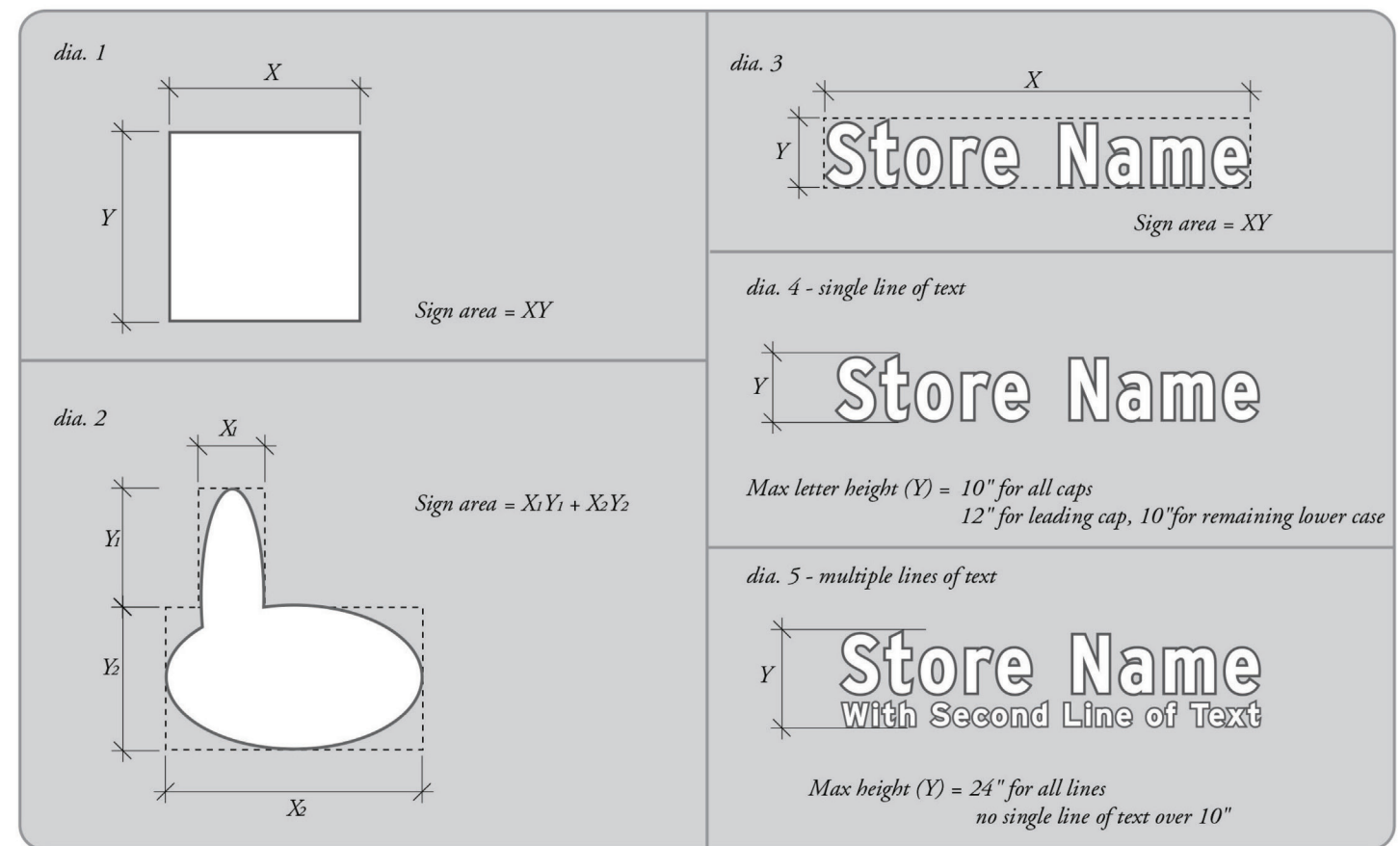
CALCULATING SIGNAGE AREA

The area of a sign is determined by the sum of all areas or portion of each triangle, parallelogram, circle, ellipses or any combination thereof which creates the smallest single continuous perimeter enclosing the extreme limits of decorative sign elements; this includes all words, letters, logos, frames, backing, face plates, non-structural trim or other components not used for support.

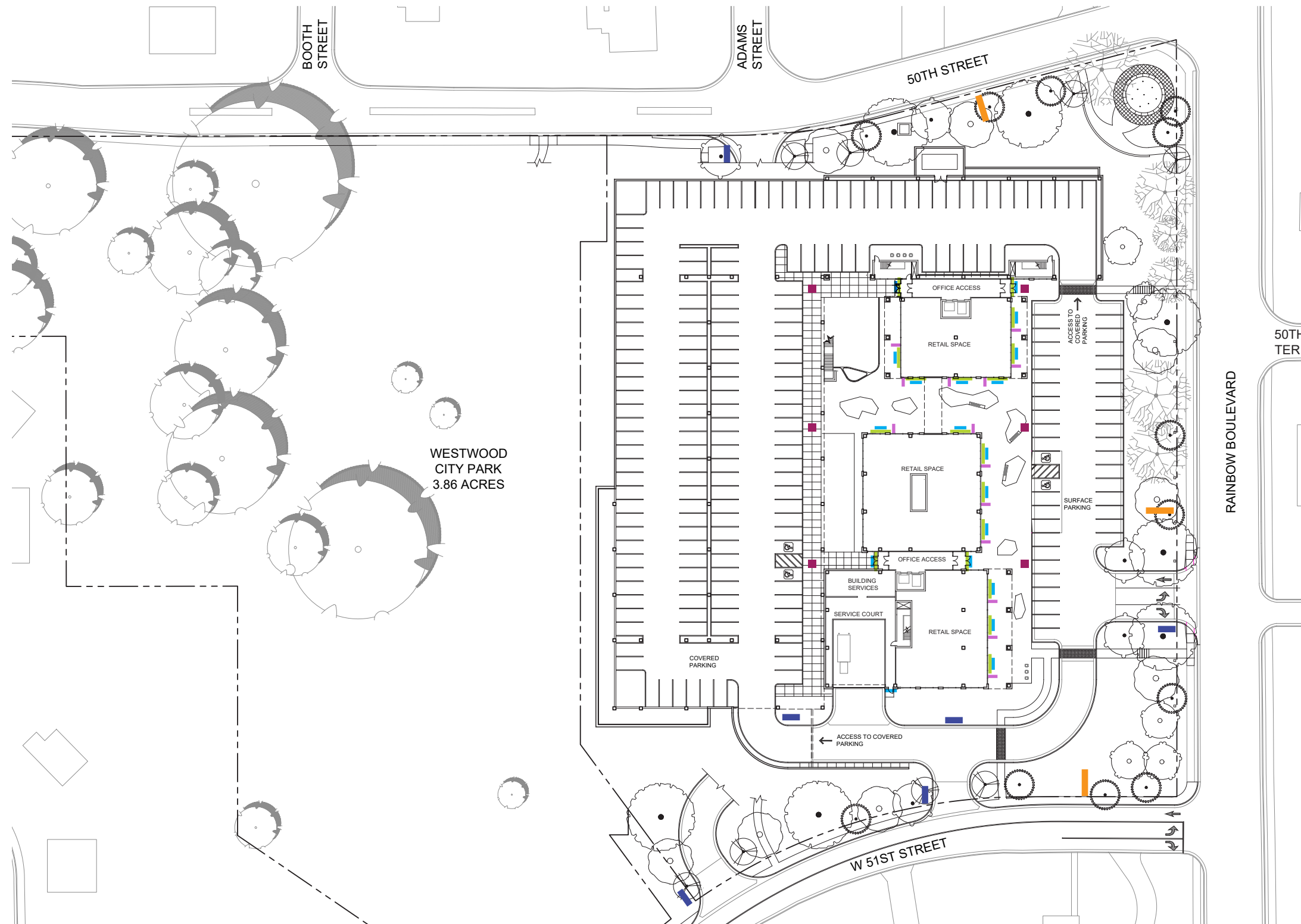
Sign armature or bracing shall not be included in the sign area measurement unless it is made part of the message or face of the sign. Where a sign has two (2) or more display faces, the area of all faces shall be included in the calculation unless the display faces are back to back and parallel to each other and not more than twenty four inches (24") apart, or form a "V" type angle of less than ninety degrees (90°).

For regular shaped signs the area of the sign will be computed by using standard mathematical formulas for regular geometric shapes, including, without limitation, triangles, parallelograms, circles, ellipses, or combinations thereof.

In the case of an irregularly shaped sign or a sign with letters or symbols directly affixed or painted on the wall of a building, the area of the sign is the entire area within a single continuous rectilinear perimeter of not more than eight straight lines enclosing the extreme limits of any writing, representation, emblem, or any figure of similar character, together with any material or color forming an integral part or background of the display if used to differentiate such sign from the backdrop of structure against which it is placed, but if a freestanding sign structure is not a fence which functions as such, the sign area shall be the area of the entire structure.

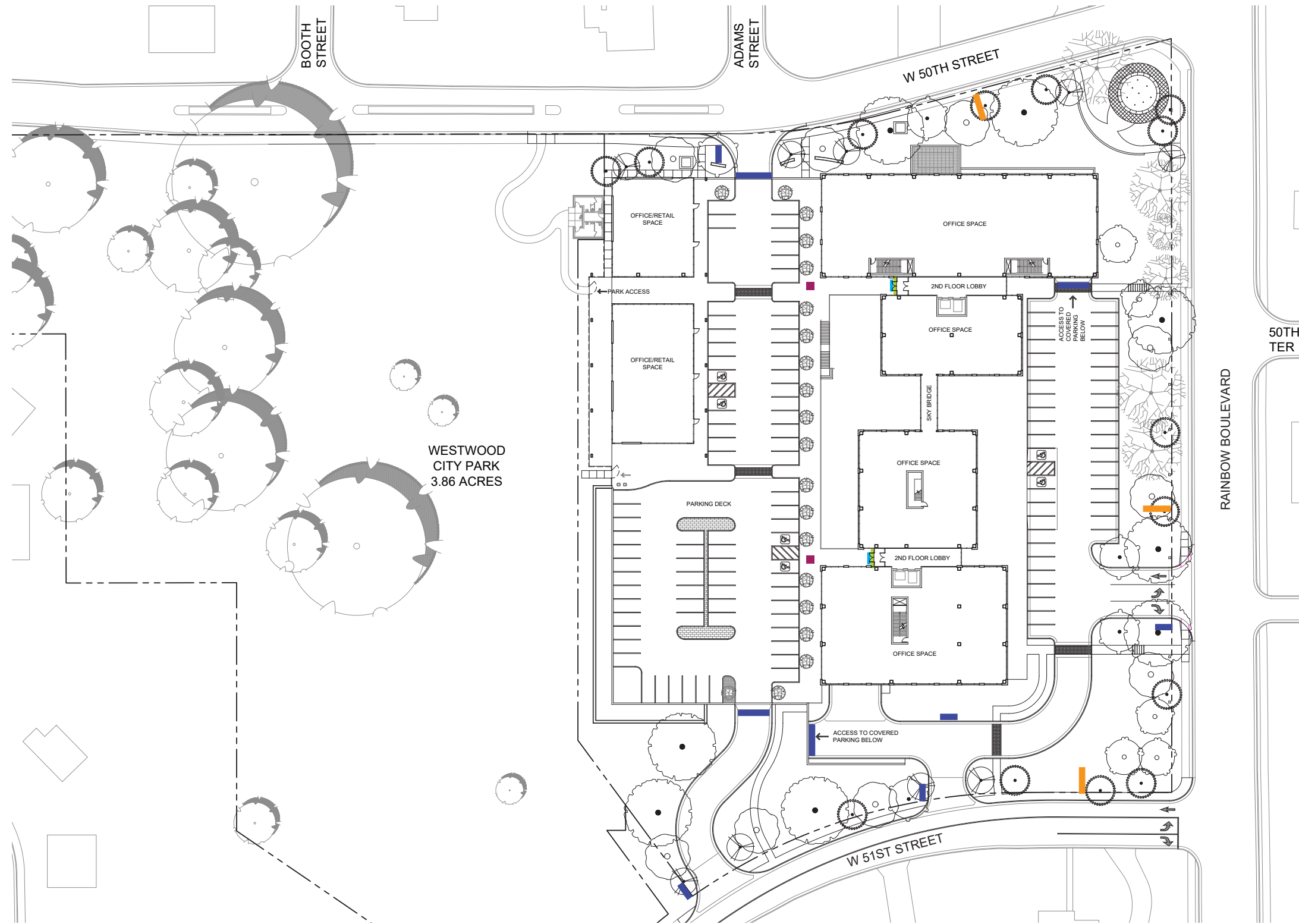


SITE LOCATION PLAN, LEVEL 1



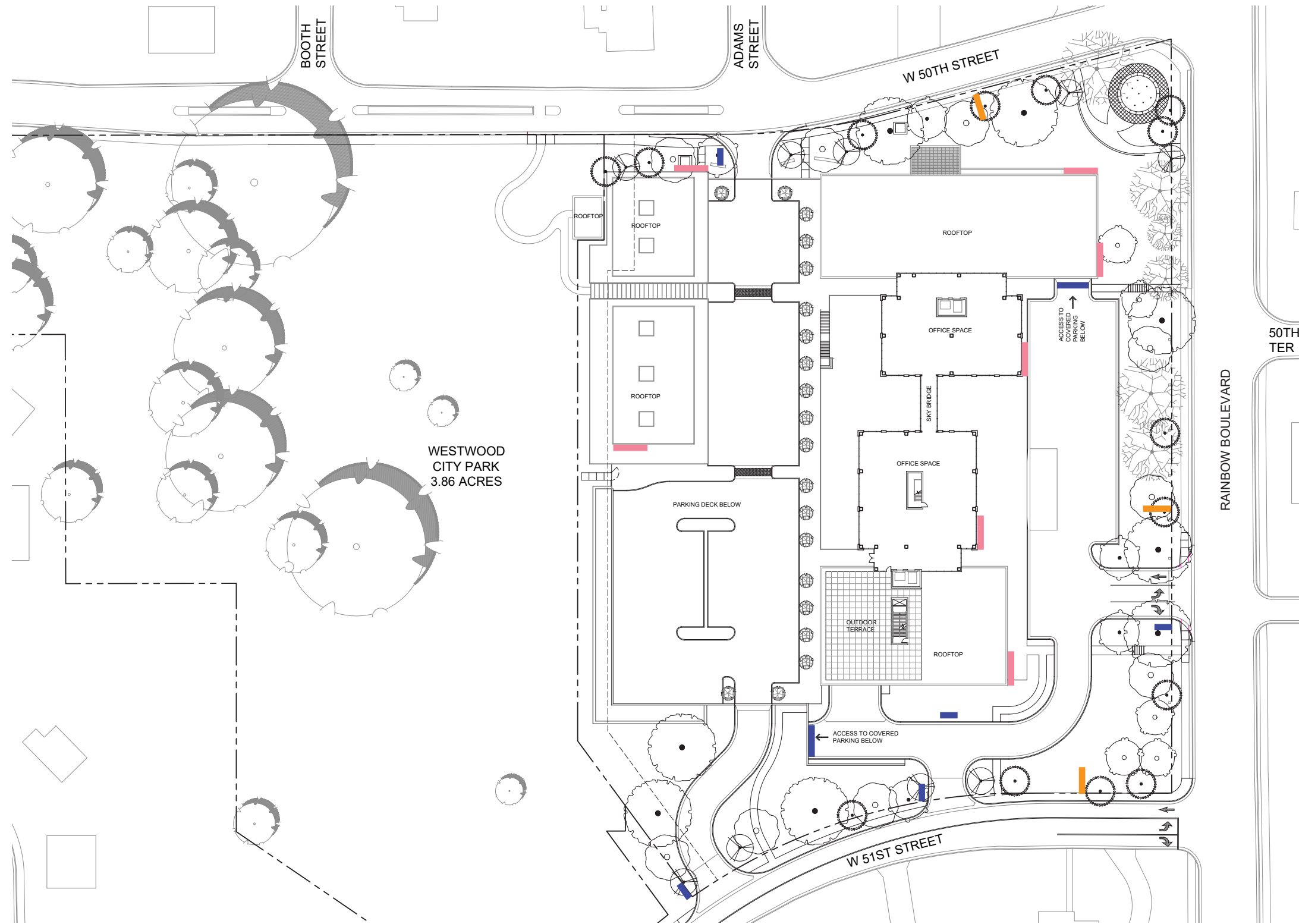
SIGN TYPE LEGEND	
A1	Wall Sign - Tenant or Project
A2	Wall Sign - Upper Story
B	Window Sign - Tenant or Project
C	Monument Sign - Tenant or Project
D	Blade Signs - Tenant or Project
E	Parking/Traffic Directional Sign
F	Wayfinding Sign - Pedestrian

SITE LOCATION PLAN, LEVEL 2



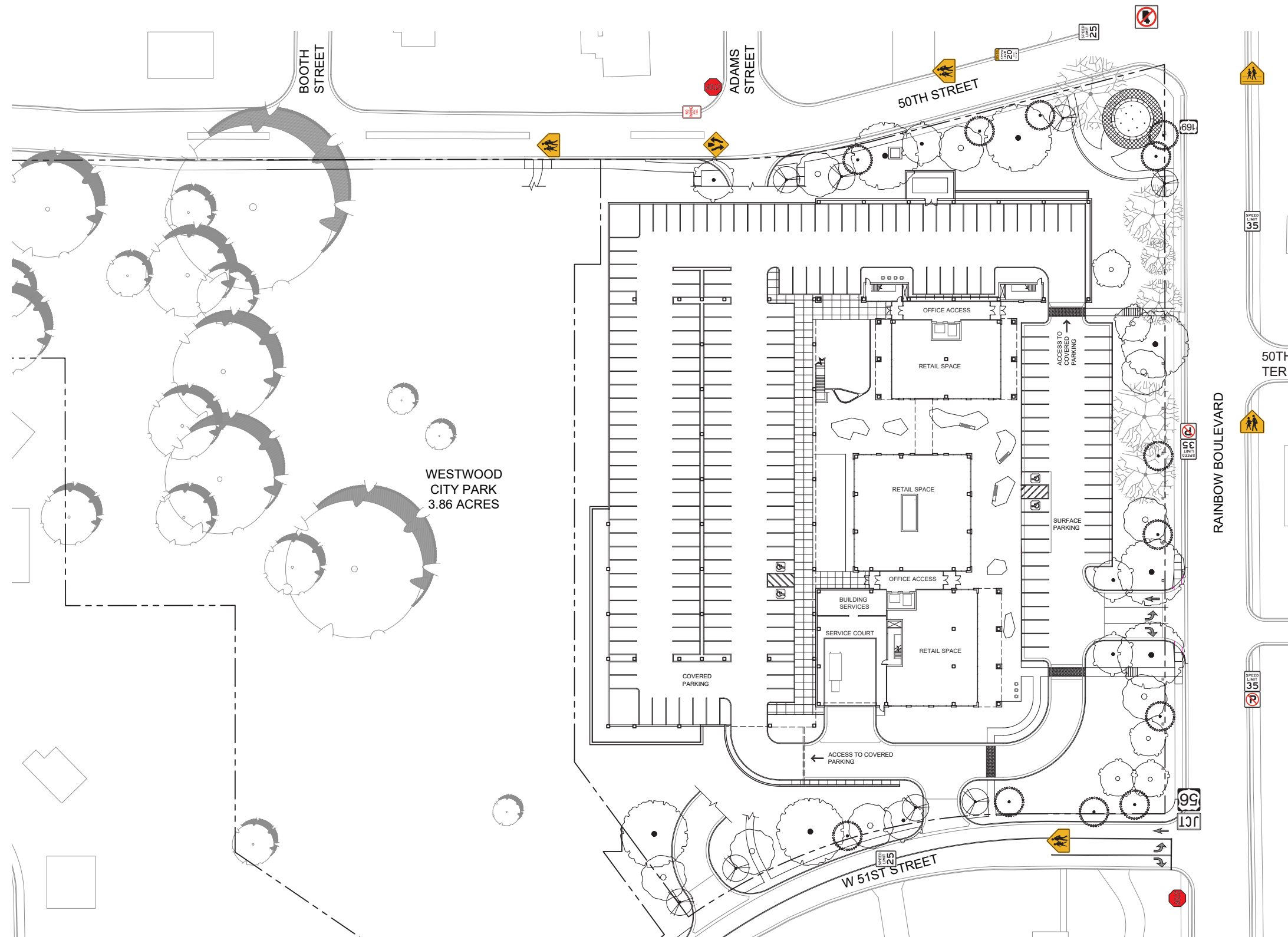
SIGN TYPE LEGEND	
A1	Wall Sign - Tenant or Project
A2	Wall Sign - Upper Story
B	Window Sign - Tenant or Project
C	Monument Sign - Tenant or Project
D	Blade Signs - Tenant or Project
E	Parking/Traffic Directional Sign
F	Wayfinding Sign - Pedestrian

SITE LOCATION PLAN, LEVEL 4



SIGN TYPE LEGEND	
A1	Wall Sign - Tenant or Project
A2	Wall Sign - Upper Story
B	Window Sign - Tenant or Project
C	Monument Sign - Tenant or Project
D	Blade Signs - Tenant or Project
E	Parking/Traffic Directional Sign
F	Wayfinding Sign - Pedestrian

SITE LOCATION PLAN, EXISTING NEIGHBORHOOD SIGNAGE



Sign 1: St. Rose Philippine Duchesne Church



Sign 2: St. Rose Philippine Duchesne Church

A1: WALL & CANOPY SIGNS, TENANT IDENTIFICATION

INTENT:

Wall and Canopy Signs are integrated with the building walls where available or above main entries of tenant lease spaces and/or entrances into the project. These signs are mounted to the wall of the building; all connecting hardware should not be visible unless it is an integral part of the sign design.

LOCATION:

Wall and Canopy Signs are integrated with the building walls where available or on canopies above main entries of tenant lease spaces. All connecting hardware should not be visible unless it is an integral part of the sign design. In lieu of the wall, signs may be applied to entry canopies or awnings where applicable, and with approval of the Landlord. When using an existing sign band, provide space between the sign and the sign band border or edge to follow a traditional application. When using an existing sign band, keep signage flush to the wall surface. Do not design wall signs that project in front of adjacent architectural details, such as a wall band frame.

ALLOWANCE:

The maximum allowable is one (1) sign per each tenant on exterior wall/wall frontage. No more than 10% of total Tenant's elevation area may be used, and no more than 100 square feet total area per tenant.

ILLUMINATION:

Wall Signs may be illuminated. If illuminated, signs are to have static, unobtrusive illumination. Face-lit or back-lit letters (halo), neon or a shielded lamp or goose-neck located at top of the sign is allowed.

All direct illumination shall not exceed 25 watts per bulb. Flashing signs are prohibited.

ENCOURAGED APPROACHES:

The following are approaches commonly encouraged:

- Tenant logo/logo type to be fabricated or flat cut-out and layered to achieve a 3-dimensional form to the signage components.
- Tenant logo/logo type should not fill the entire designated sign zone.
- Paint and metal finishes that connect to the building wall should reflect the overall architectural color palette.
- Sign/sign armature attachment to building wall with custom designed metal armature/brackets.
- External and or internal illumination integrated into sign canopy recommended.
- All designs subject to review for scale and proportion relative to the building architectural context.
- Three-dimensional logo or iconography are encouraged.
- Cut-out letters with fabricated returns and shapes encouraged.

ENCOURAGED EXAMPLES:



Flat cut out pin-mounted halo-lit letters



Deep single-mounted letters with high contrast



Fabricated letters integrated into architecture



Face-lit flush-mounted logo



Cabinet sign box



Canopy Signage

A2: WALL SIGNS, UPPER STORY

INTENT:

The intent for Upper Story Wall Signs is to bring greater hierarchy and large-scale vehicular wayfinding opportunity for said-tenant.

LOCATION:

Upper Story Wall Signs to be located near top of building, not to extend above the roof line on front facade of building.

ALLOWANCE:

Upper Story Wall Signs are not to exceed 100 sq-ft total per allowed location.

ILLUMINATION:

Upper Story Wall Signs may be illuminated. If illuminated, signs are to have static, unobtrusive illumination. Face-lit or back-lit letters (halo), neon or a shielded lamp or goose-neck located at top of the sign is allowed.

All direct illumination shall not exceed 25 watts per bulb. Flashing signs are prohibited.

ENCOURAGED APPROACHES:

The following are approaches commonly encouraged:

- Tenant logo/logo type to be fabricated or flat cut-out and layered to achieve a 3-dimensional form to the signage components.
- Tenant logo/logo type should not fill the entire designated sign zone.
- Paint and metal finishes that connect to the building facade should reflect the overall architectural color palette.
- Sign/sign armature attachment to building facade with custom designed metal armature/brackets.
- External and or internal illumination integrated into sign canopy recommended.
- All designs subject to review for scale and proportion relative to the building architectural context.
- Three-dimensional logo or iconography are encouraged.
- Cut-out letters with fabricated returns and shapes encouraged.
- No back-lit sign boxes will be allowed.

ENCOURAGED EXAMPLES:



Cut-out logo, halo-lit



High contrast color internally-illuminated letters

B: WINDOW SIGNS, TENANT

INTENT:

To identify the entrance and hours of operation, identify the tenants storefront and display windows and create visual interest.

LOCATION:

If any window signs are located on the door, the following design standards must be met: Use door signage to identify business name, address, hours of operation and a possible logo if needed.

Window graphics are typically located at eye level on doors or adjacent to entrances for door signs or in the lower 20% of storefront windows for window signs for each tenant. Patterns/graphics may be installed at transoms, but shall not contain any text. Limit opaque and solid materials to no more than 10 percent of a window's area, and place appropriately to avoid blocking visibility in and out of a window.

ALLOWANCE:

Any element that is attached to or located within 36 inches of a window is considered to be a window sign. A window sign should not exceed 20% of the total window area with 10% allowed to be opaque or solid. All words or pictures located on a window or door shall be considered signs and shall meet all criteria for signage defined herein and shall be permitted as signs by the City of Westwood.

ATTACHMENTS:

Install directly inside (second surface) to tenant glass.

ENCOURAGED APPROACHES:

The following are approaches commonly encouraged:

- Maximum graphic image area not to exceed 20% of total window area.
- Message height is recommended to be at eye level for door signs or in the lower 20% of storefronts for window signs.
- Digitally cut vinyl, silk-screened, gold leaf, hand painted or neon graphics should be applied to the interior surface of the window (second surface if single paned glass, fourth surface if double paned glass).
- Avoid repeating business wording and tenant ID's in every window when this information already exists on other signage.
- Provide secondary information on products, services, etc. that are not available on other signs.
- Plan window signage to draw the pedestrian's eye into a business and to create additional interest.
- Use door signage to identify business name, address, hours of operation and a possible ID if needed.
- Vinyl, silk-screened or gold leaf signage on doors is

ENCOURAGED EXAMPLES:



Logo & Hours



Logo, Tag-line & Hours



Retail ID and less than 20% window coverage brand graphic

C: MONUMENT SIGN, TENANT AND PROJECT

INTENT:

Monument Signs are for the purpose of identifying the Project as well as the tenants occupying space within it and is used for wayfinding.

LOCATION:

The permitted location shall be set in at least five (5) feet from every boundary line of the zone lot. Locate in a high traffic area out of the public right of way.

ALLOWANCE:

A maximum of three (3) monument signs are allowed on the site.

Monument signs for the site have a maximum height of 14 ft above finished grade. No more than 100 square feet total area per location.

ILLUMINATION:

Monument Signs may be illuminated. If illuminated, signs are to have static, unobtrusive illumination. Internal illumination of channel letters, back-lit letters (halo), push through letters, shielded, concealed or external, shielded, downward facing fixtures are allowed.

May be illuminated and all direct illumination shall not exceed 25 watts per bulb. Flashing signs are prohibited.

ENCOURAGED APPROACHES:

The following are approaches commonly encouraged:

- Signs must be consistent with or complement the building, hardscape and existing signage material palettes.
- Use permanent, durable materials such as metals, metal composites, and other high quality materials. Do not use signs with plastic or acrylic.

ENCOURAGED EXAMPLES:



Contemporary materials & cut out logo



Industrial solution with contrast logo and background



Simple solution with small project ID



Complimentary material usage

D: BLADE SIGN, TENANT

INTENT:

Blade Signs are signs that attach and project from the building facade.

LOCATION:

All Blade Signs are to project perpendicular to the building facade and will be a minimum of 18" wide and be no greater than 36" wide in their horizontal dimension. Blade Signs must maintain a minimum clearance of eight feet (8'-0") above the sidewalk.

ALLOWANCE:

Blade Signs are limited to the Landlord or Tenants whose entry is on the exterior of the building, or those who have limited wall surface at their storefront. Eligible tenants are allowed one (1) Blade Sign.

ILLUMINATION:

Any sign configuration by multi-storefront tenants shall not exceed the allowance for total square feet area. Static, unobtrusive illumination allowed. Internal illumination of channel letters, Back-lit letters (halo), push through acrylic letters, or a shielded spot light located at top of the sign is allowed. May be illuminated and all direct illumination shall not exceed 25 watts per bulb. Flashing signs are prohibited.

ATTACHMENT DETAILS:

Blade Signs are attached to the building facades at main entries of tenant lease spaces. These signs are mounted directly to the exterior wall of the building; all connecting hardware should not be visible unless it is an integral part of the sign design. No more than 10% of total wall area may be used per tenant.

ENCOURAGED APPROACHES:

The following are approaches commonly encouraged:

1. Artistic, three-dimensional object signs of logo or primary sales product(s) fabricated/sculpted from suitable materials.
2. Router-cut or dimensional letters/ logos attached to or pushed through sign panels or cabinet construction boxes.
3. Painted, screen printed or gilded sign panels or cabinet construction boxes.
 - A combination of materials. Cut-out, layered, built up or pinned-off metal or wood borders or graphics.
 - Raceways, conduits and transformers must be concealed within the sign assembly.
 - Flush, discreet attachment of the acrylic faces to the metal channel letters without typical trim cap edging.
 - The acrylic face of the letter forms must have a matte finish to avoid reflections in the letter face when not illuminated.

Blade Signs for businesses and retail tenants are encouraged to have internal, integral, edge, halo or external illumination, or any combination thereof.

ENCOURAGED EXAMPLES:



Box sign



Custom shape



Cabinet sign box with push-through letters



Pushed through sign panel

E: PARKING/TRAFFIC DIRECTIONAL SIGNAGE

INTENT:

The intent of Parking/Traffic Directional Signage is to provide identification, information and direction to guests, residents and workers visiting and interacting with the project. These signs provide a general understanding of the project which allows users to move about with confidence and ease. These signs assist the guests, from well positioned and highly visible identification of the vehicular garage entries, to navigating within the garage, to emerging into the street-level public realm.

LOCATION:

To be mounted above the garage entrance as clear messaging for vehicular arrival. Wall signs are integrated with the building walls where available or above main parking entrances and vehicular flow routes.

ALLOWANCE:

Maximum of two (2) parking identification sign per garage entrance.

ILLUMINATION:

Parking/Traffic Directional signs may be illuminated. If illuminated, signs are to have static, unobtrusive illumination. Halo, shielded, concealed or external, shielded, downward facing fixtures are allowed.

ATTACHMENT DETAILS:

Wall signs are integrated with the building walls where available or above main parking entrances and vehicular flow routes. All connecting hardware should not be visible unless it is an integral part of the sign design.

ENCOURAGED APPROACHES:

The following are approaches commonly encouraged:

- Signs must be consistent with or complement the building, hardscape and existing signage material palettes.
- Use permanent, durable materials such as metals metal composites, and other high quality materials. Do not use signs with plastic or acrylic faces.

ENCOURAGED EXAMPLES:



Signage integrated into building architecture



Parking projecting ID



Cabinet sign box



Cabinet sign box

F: WAYFINDING, PEDESTRIAN DIRECTORIES

INTENT:

Wayfinding Signs are a specific type of sign that are intended for pedestrian wayfinding purposes, presenting multiple Tenants and public use destinations in a single display.

LOCATION:

Locate in a high traffic area out of the public right of way. Wayfinding Signs to be permitted location shall be set in at least five (5) feet from every boundary line of the zone lot. Wayfinding Signs may integrate with the building walls where available or above main entries of tenant(s) entrances into the project. All connecting hardware should not be visible unless it is an integral part of the sign design.

ALLOWANCE:

Wayfinding Signs for the complex may have a maximum height of 8 ft above finished grade. The maximum allowable is one (1) sign housing three or more tenant logos on exterior wall/wall frontage. Thirty-six (36) square feet maximum total area per sign.

ILLUMINATION:

Wayfinding Signs may be illuminated. If illuminated, signs are to have static, unobtrusive illumination. Halo, shielded, concealed or external, shielded, downward facing fixtures are allowed.

ENCOURAGED APPROACHES:

The following are approaches commonly encouraged:

- Fabricated, weather protective enclosures.
- Changeable graphics may be silk-screened or digitally printed. Units may be installed to be flush with wall (column) surface or may be secured to column faces. Illumination, if included, must be externally washed by concealed fixtures.
- Framed panel or open pan construction with expose or concealed external illumination sources. Changeable graphics may be silk-screened or digitally printed.
- Layered sandwich construction with protective glass face, changeable content and rear panel surface of appropriate materials and finishes all secured by vandal-resistant mechanical fasteners.
- Changeable cut-out metal letters or panels secured in a frame or track. External or halo illumination.

ENCOURAGED EXAMPLES:



Sleek solution with clear wayfinding messaging and Project ID logo



Contemporary materials high contrast letters



Simple, modern solution



Complimentary material usage with tenant wayfinding.

MATERIAL & PERFORMANCE SPECIFICATIONS

In keeping with the high standards of design being applied to the overall project, all signage must utilize the highest quality materials and fabrication methods. The following minimum quality standards shall apply to all the 50th and Rainbow Development signs:

GENERAL

The environmental graphic designers and their project teams shall be responsible for verifying and ensuring compliance of the signage with all ADA, OSHA, MUTCD, environmental regulations and all other applicable governing code requirements.

Should there be a conflict between these documents and federal, state or local code requirements, code shall take precedence unless a specific agreement has been established with the City of Westwood providing a variance to the local codes.

FABRICATION & INSTALLATION REQUIREMENTS

A. STRUCTURAL REQUIREMENTS

The designer shall follow this document for exterior visual appearance. The internal structure, engineered connections, mounting assemblies and foundations shall be developed by the sign fabricator as required for each sign type. The structural design shall utilize self-supportive framing and prevent irregularities in exposed surfaces.

B. ELECTRICAL REQUIREMENTS

All transformers and electrical hardware shall be concealed (i.e. non-audible and non-visible to vehicular and pedestrian traffic) but easily accessible for maintenance and servicing. All connections must be in compliance with the requirements of the NEC and all other applicable governing code requirements. All necessary electrical components and assemblies are to be UL listed, or approved by a nationally recognized testing lab and shall be warranted by the manufacturer against failure for at least ninety days. All conduit, junction boxes and races shall be concealed within the sign or the building.

C. LIGHTING

All lighting components must be easily accessible for maintenance and servicing. All lighting components shall be constructed per recognized national standards, and/or specific manufacturer's recommendations. It is strongly encouraged that all illumination shall be provided by LED light sources for longevity, ease of maintenance and life-cycle cost purposes. Unless otherwise noted, the interior of all illuminated enclosures shall be painted bright white to increase reflectivity. Should exposed neon components be used, they shall be warranted against failure for at least three years, and all other lighting components shall be warranted for at least ninety days.

D. LABELING

Manufacturer's or testing laboratory labels shall clearly appear on all completed elements, as required by code but shall be located on secondary or less obvious surfaces.

MATERIAL & WORKMANSHIP STANDARDS

When selecting final materials to be used for the signage, the design must bear in mind the unsecured, urban environment in which these signs will be installed and the high potential for their abuse. Furthermore, these signs will likely be in place for an extended period of time, materials should be selected for longevity

A. PAINTS & FINISHES

Given the potential for abuse, painted finishes should be used sparingly or located at a height less susceptible to abuse. All pretreats, primers, coatings, and finishes shall be applied in strict accordance with the paint manufacturer's specifications to provide the highest level of ultraviolet light resistance, weatherability and overall longevity for both the materials indicated and the environmental conditions of the final install locations. Paints and finishes shall be warranted against color fading, UV damage, cracking, peeling, blistering and other defects in materials or workmanship for a minimum of five years.

B. METALS

Metals shall be the best commercial quality for the purposes specified and free from defects impairing strength, durability or appearance. Unless specifically designed otherwise as a feature element, all visible seams are to be continuously welded, filled and ground smooth. All sheet metal shall have brake formed edges with radii not greater than sheet thickness. All metals must be treated to prevent corrosion and staining of other finishes.

C. FASTENERS

Unless specifically designed otherwise as a feature element, all exposed fasteners shall be tamper-proof, resistant to oxidation and other corrosion and of a finish to match adjacent surfaces. Concealed fasteners must be resistant to oxidation and corrosion to prevent staining of other finishes.

D. VINYL

All vinyl products shall be specified and installed in strict accordance with the manufacturer's recommendations to provide the highest level of ultraviolet light resistance, weatherability and overall longevity for both the materials

indicated and the environmental conditions of the final installation locations. All vinyl material shall be warranted against color fading, UV damage, de-lamination and peeling for a period of five years.

E. DIGITAL PRINTS

Technological advances in digital printing make this medium ideal for easily updatable content. As such, this material must be periodically refreshed, whether the content has changed or not. All digital prints must provide the highest level of ultraviolet light resistance, weatherability and overall longevity for both the materials indicated and the environmental conditions of the Kansas region. Unless specifically designed otherwise as a feature element, digital prints shall have a minimum resolution of 200 dpi. Printed products shall be warranted against color fading, UV damage, delamination or peeling for a minimum of five years.

F. GENERAL ASSEMBLY

Unless otherwise stated above, all installed elements shall be warranted against manufacturer defects for a minimum of one year and all installed elements shall be warranted against defects in installation or workmanship for a minimum of three years.

G. NEWLY CREATED MATERIALS

Newly created materials meeting the intent of the CSP may be considered for approval based upon the guidelines set forth in this document.

ACCEPTABLE BUILDING SIGN MATERIAL EXAMPLES

Selected materials should reflect their use and the anticipated longevity of the sign. Materials should be urban in character, durable, easily maintained and of the highest quality. Elements such as acrylic and wood should be used selectively and their location should be considered to minimize the potential for damage. The materials used for all freestanding signage shall be designed and constructed to be durable enough to withstand the equipment to be used for snow removal and other maintenance.



ACCEPTABLE WALL SIGN ILLUMINATION EXAMPLES

Signage illumination should be chosen based upon the purpose of the sign, the required legibility and visibility, the anticipated ambient lighting and the competing signage elements in the area(s) in which the signs will be located. All illuminated signs must be controlled by a central timer or photosensitive switch (photo cell) to regulate the hours of operation.

It is additionally encouraged that the controls for the lighting allow for dimming during the late night/early morning hours.



PROHIBITED BUILDING SIGN TYPES

PROHIBITED SIGN TYPES

In order to maintain a high level of quality and a character appropriate to the 50th and Rainbow Development project, the sign types and fabrication methods described below will not be permitted for any businesses or developments within its limits. All signs are subject to the review and approval of the Landlord and the City of Westwood Zoning Administration.

The following identity sign types are prohibited:

1. Internally illuminated signs with vacuum formed plastic faces.
2. Internally illuminated box signs with exposed acrylic or stretched vinyl sheet faces without additional materiality and layering.
3. Internally illuminated awnings.
4. Parked motor vehicles and/or trailers intentionally located so as to serve as a sign or advertising device.
5. Signs with exposed raceways.
6. Signs with individual changeable plastic letters.
7. Sign boards using explicitly inexpensive materials.
8. Painted or printed window graphics which cover more than twenty (20) percent of a tenant's glazing area.
9. Off the shelf portable signs that do not reflect the quality demanded of this district.
10. Inflatable signs.



Internally illuminated signs with plastic faces



Exposed raceways, heavy trim cap



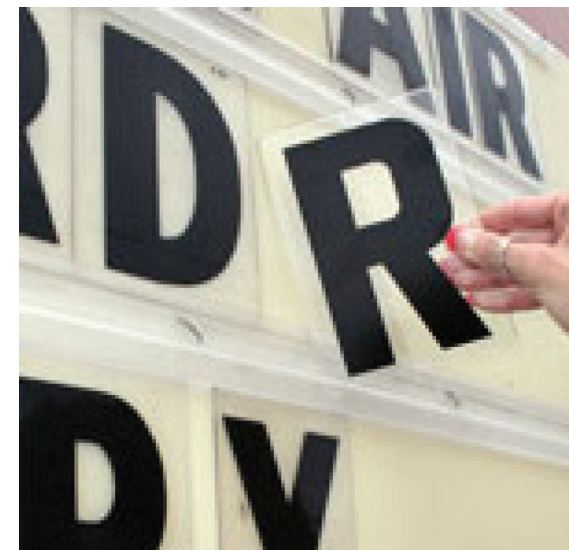
More than 20% of window area with graphics



Low quality off-the-shelf portable signs



Temporary inflatables, of any kind



Signs with individual changeable plastic letters



Internally illuminated signs with vacuum formed plastic faces

APPROVAL

PROPERTY OWNER

CITY APPROVAL



Item A. Section VI, Item

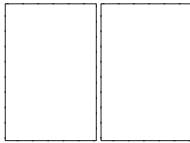
INDUSTRIA 900 SERIES

DESCRIPTION: Paver TEXTURE: HD² Polished

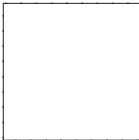
PALLET OVERVIEW - 900x300



PALLET OVERVIEW - 900x600



PALLET OVERVIEW - 900x900



NOTES

See page 62 to 64 for more technical information.

See page 30 for more information about applications.

900 Series HD² Polished and HD² Granitex are made-to-order, minimum order of 500 sq. ft. Deposit required. HD² Smooth is in stock with shorter lead times.

*For this application, it is recommended that this product be installed on a concrete base as designed by a local Engineer.

Specifications per pallet		Imperial	Metric
900x300	Cubing	81.38 ft²	7.56 m ²
	Approx. Weight	3 821 lbs	1 733 kg
	Number of rows	7	
	Coverage per row	11.63 ft ²	1.08 m ²

Unit dimensions		in	mm	Units/pallet
	Height	3 7/8	98	28 units
	Width	35 7/16	900	
	Length	11 13/16	300	

Specifications per pallet		Imperial	Metric
900x600	Cubing	81.38 ft²	7.56 m ²
	Approx. Weight	3 839 lbs	1 741 kg
	Number of rows	7	
	Coverage per row	11.63 ft ²	1.08 m ²

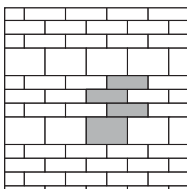
Unit dimensions		in	mm	Units/pallet
	Height	3 7/8	98	14 units
	Width	35 7/16	900	
	Length	23 5/8	600	

Specifications per pallet		Imperial	Metric
900x900	Cubing	61.00 ft²	5.67 m ²
	Approx. Weight	2 893 lbs	1 312 kg
	Number of rows	7	
	Coverage per row	8.72 ft ²	0.81 m ²

Unit dimensions		in	mm	Units/pallet
	Height	3 7/8	98	7 units
	Width	35 7/16	900	
	Length	35 7/16	900	

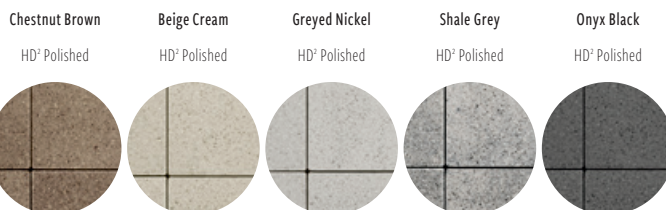
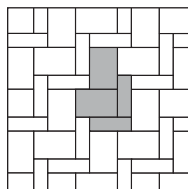
42 | Linear pattern

60% - 900x300 | 40% - 900x600



44 | Herringbone pattern

70% - 900x600 | 30% - 900x300



Patterns are for design inspiration only. The installer is responsible to calculate & purchase the correct amount of material.

PAVERS

techo-bloc.com

Universe System

Product Data Sheet



The Universe System is a set of simple, comfortable and universal accessories, suitable for any element that requires a seat. It was designed as a complement to Escofet's concrete backless bench collection. The system includes lightweight steel and wood benches and chairs with armrests and a backless bench and backless seat. All rest on standard backless benches or on "in situ" masonry walls.

Bench





- The Universe System is a wall mounted bench made of lightweight steel and wood.
- Available backed or backless, in lengths of 70" (177.8 cm) or 24" (60.96 cm).
- Wood options for Universe benches include Jarrah, Ipe and DSTMA.
- Exterior woods are unfinished and will weather to a soft pewter gray, requiring no future maintenance.
- All metal is finished with Landscape Forms' proprietary Pangard II® polyester powdercoat, a hard yet flexible finish that resists rusting, chipping, peeling and fading.
- Backed benches comes standard with arm rests.
- The Universe System is manufactured by Landscape Forms in the USA in partnership with Escofet.

Mounting

- The Universe System is anchored to wall with screws.
- Benches can be mounted on masonry walls or some of Escofet's cast stone backless benches (such as, Socrates).

Warranty

- Landscape Forms warrants the durability of the Universe product for a period of three (3) years from the date of invoice.
- The warranty covers the repair or replacement of the product or components at no charge.
- Notwithstanding, this warranty does not cover damages to ESCOFET products resulting from unloading; handling; installation; abuse; exposure to paint, liquids or corrosives; or any other damage not attributable to ESCOFET.
- The warranty shall also be void if ESCOFET products are tampered with, handled, removed or modified by persons not authorized by ESCOFET; or if the product has not been properly maintained by the customer.

	Depth	Width	Height	Weight
	23¾"	70"	24"	114 lbs
	16½"	70"	8"	70 lbs
	23¾"	23¾"	24"	56 lbs
	16½"	23¾"	8"	28 lbs

*Weights shown are in Ipe

To Specify

- Specify Universe, select bench size and backed or backless. Choose wood type and frame powdercoat color. Bench is anchored to wall or concrete bench with screws. Universe ships fully assembled.

Designed by Escofet.

[Click here](#) for patent information related to this product.

Visit landscapeforms.com for more information. Specifications are subject to change without notice. Landscape Forms supports the Landscape Architecture Foundation at the Second Century level. ©2023 Landscape Forms, Inc. Printed in U.S.A. All Rights Reserved.

landscapeforms.com | specify@landscapeforms.com

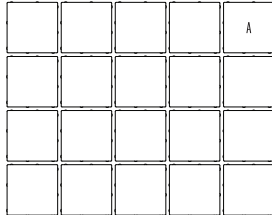


Item A, Section VI, Item

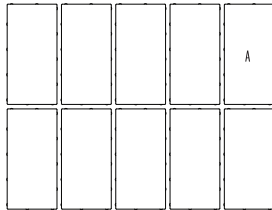
INDUSTRIA 200 SERIES

DESCRIPTION: Paver TEXTURE: HD² Polished

PALLET OVERVIEW - 200x200



PALLET OVERVIEW - 200x400



NOTES

See page 62 to 64 for more technical information.

See page 30 for more information about applications.

All 200 Series items are on order only.
Minimum order required: 2,000 sq. ft.
Deposit required

Specifications per pallet		Imperial	Metric
200x200	Cubing	60.28 ft²	5.60 m ²
	Approx. Weight	2 848 lbs	1 292 kg
	Number of rows	7	
	Coverage per row	8.61 ft ²	0.80 m ²
	Linear coverage per row	13.12 lin. ft	4 lin. m

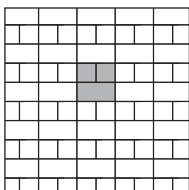
Unit dimensions		in	mm	Units/pallet
	Height	3 7/8	98	140 units
	Width	7 7/8	200	
	Length	7 7/8	200	

Specifications per pallet		Imperial	Metric
200x400	Cubing	60.28 ft²	5.60 m ²
	Approx. Weight	2 848 lbs	1 292 kg
	Number of rows	7	
	Coverage per row	8.61 ft ²	0.80 m ²
	Linear coverage per row	Depth 6.56 lin. ft Length 13.12 lin. ft	2 lin. m 4 lin. m

Unit dimensions		in	mm	Units/pallet
	Height	3 7/8	98	70 units
	Width	7 7/8	200	
	Length	15 3/4	400	

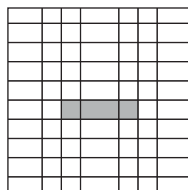
05 | Linear pattern

50% - 200x200 | 50% - 200x400

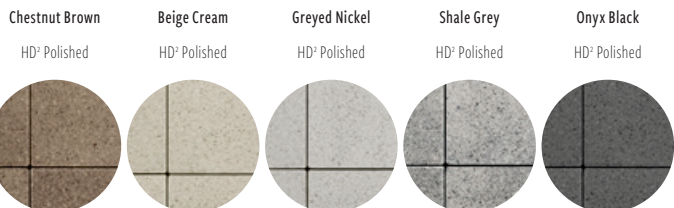


06 | Linear pattern

60% - 200x200 | 40% - 200x400



Patterns are for design inspiration only. The installer is responsible to calculate & purchase the correct amount of material.



PAVERS

techo-bloc.com

LINE

Product Data Sheet



The timeless, minimalist form of LINE landscape panels, designed by Shane Coen and Coen + Partners, defines the landscape within and around its boundaries. LINE panels delineate space, provide enclosure, and give landscape architects a new medium with which to express their unique visions. LINE takes the hassle out of creating custom boundary elements. LINE's flexibility supports custom patterns and sizes to reflect a landscape architect's unique design.

General Specifications

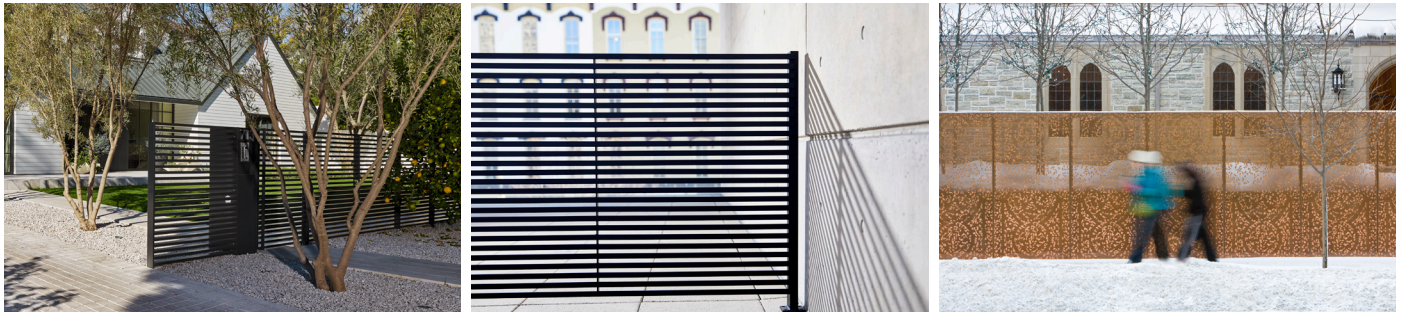
- LINE is available as standard in 8 panel types
- All panels are constructed of extruded and fabricated aluminum
- All panel types are available with a matching gate option
- Gate hardware (hinges, handle mechanism) are included with an order; bespoke hardware may be specified as a custom
- All panel types are available in 4' and 6' panel heights
- Posts are spaced at 6' intervals for 4' height panels, and at 4' intervals for 6' height panels as standard; modified post spacing is available to accommodate a specific site plan
- All panel types are available surface mounted or embedded

	Style
	Half Inch Vertical Rod
	Vertical Picket
	Vertical Louver - Angled
	Vertical Louver - Straight
	Half Inch Horizontal Rod
	One Inch Horizontal Slat
	Perforated Panel
	Solid Panel
	Gate option available for all panel types

LINE

landscapeforms®

Product Data Sheet



Finishes

- All metal is finished with Landscape Forms' proprietary Pangard II® polyester powdercoat, a hard yet flexible finish that resists rusting, chipping, peeling and fading.

Visit landscapeforms.com for standard color chart.

To Specify

- Select panel type
- Select panel height
- Select length in feet (total linear feet of paneling needed)
- Select total number of gates needed
- Select powdercoat color(s)

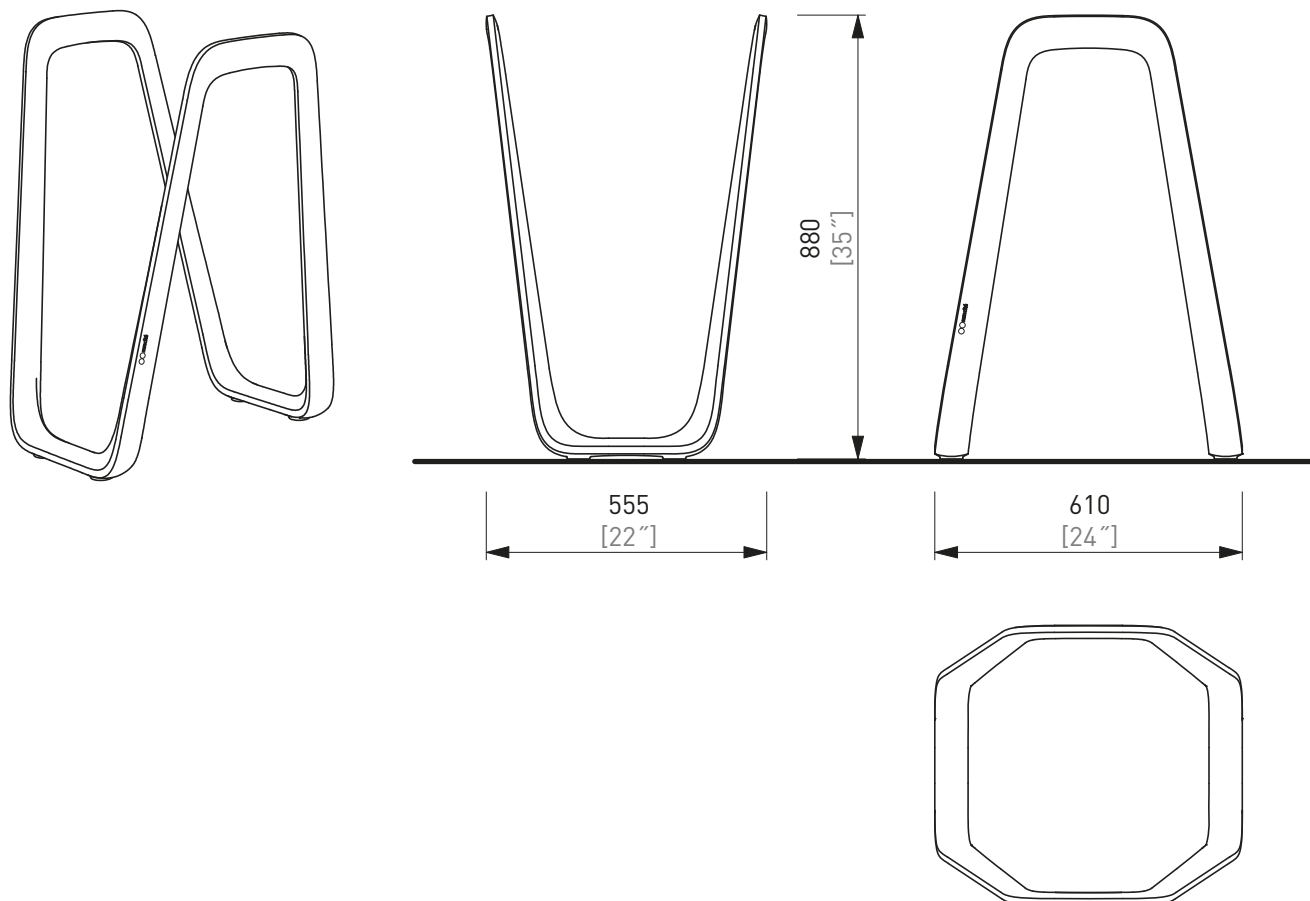
Designed by Shane Coen

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Item A, Section VI, Item



ILLUSTRATIVE PHOTO



DATE: 9. 11. 2021 V: 03
dimensions in mm [inch]

ELK110 - ELK

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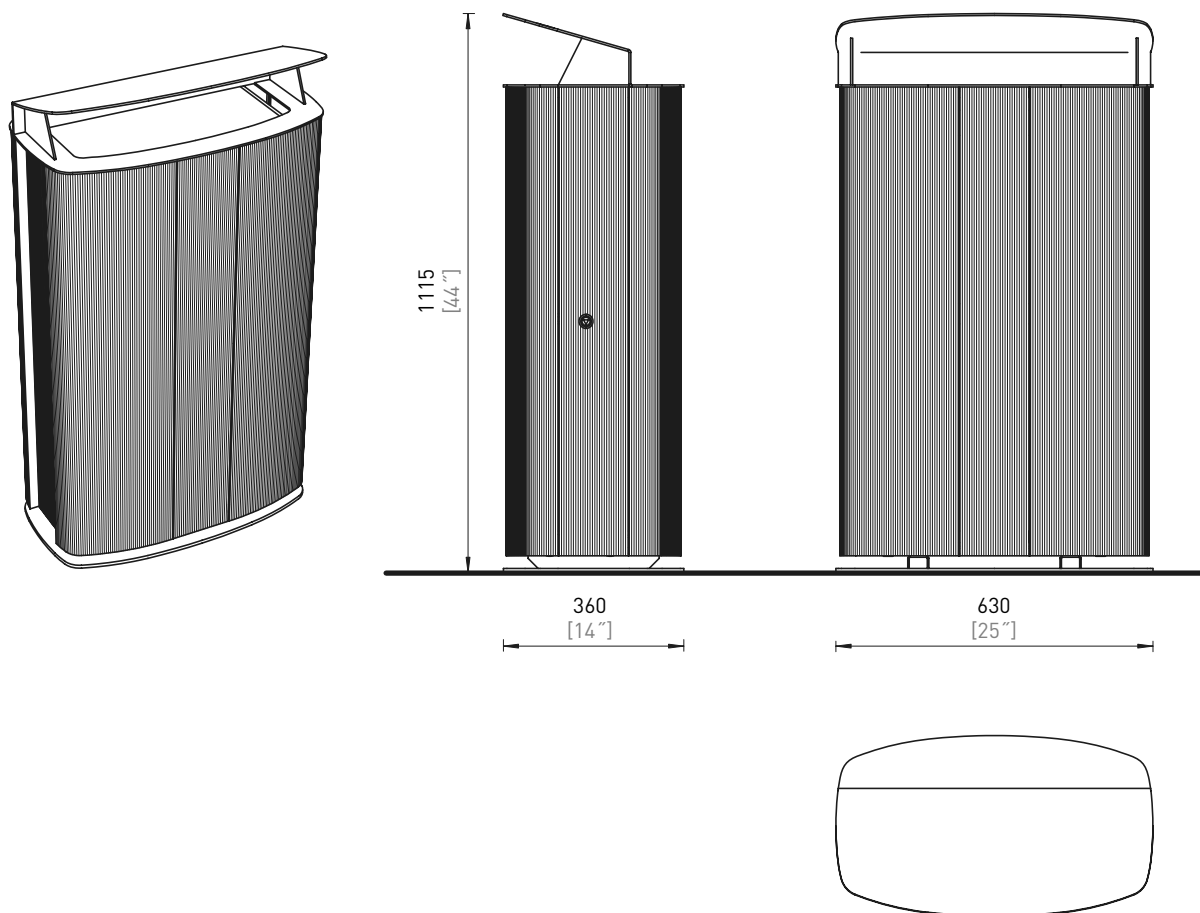
311



Rozměry výrobků jsou zaokrouhlené. Výrobce si vyhrazuje právo na změnu technické specifikace bez předchozího upozornění. Rozměry spodní stavby a způsob osazení výrobku jsou závazné. Roztče kotvě rozměřovat dle rozměrů dodaného výrobku.
Dimensions of the products are rounded. The producer reserves the right to amend the technical specification at any time without previous warning. The size of foundation baseplate and the method of mounting of the product are imperative. Anchor spacing measure out by measurements of supplied product.
Die Produktmaße sind gerundet. Der Hersteller behält sich das Recht an Änderungen der technischen Spezifikationen vor, ohne vorher darauf hinzuweisen. Abmessungen der Fundamentierung - Unterbau und Art des Produkteinbaus sind verbindlich. Ankerabstand gemäß der gelieferten Produktabmessungen dimensionieren.
Les dimensions des produits sont arrondies. Le fabricant se réserve le droit de modifier les spécifications techniques sans préavis. Dimensions des fondations et manière de l'implantation du produit sont obligatoire. Ancre écartement dimensions à partir des dimensions du produit livré.
Los datos de las dimensiones estan redondeados. El fabricante se reserva el derecho de cambio de la especificación técnica sin aviso previo. Tanto las dimensiones de las bases de cimentación como el sistema de fijación son inalterables. Hay que medir el espaciamiento de anclajes según las dimensiones del producto suministrado.

Item A, Section VI, Item

ILLUSTRATIVE PHOTO



DATE: 18. 08. 2021 V: 03

dimensions in mm [inch]

MAU556 / MAU-B556 - MAXIMINIUM

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Litter bin with oval section, roofing with aluminum extruded profiles, with steel cover

Item A. Section VI, Item

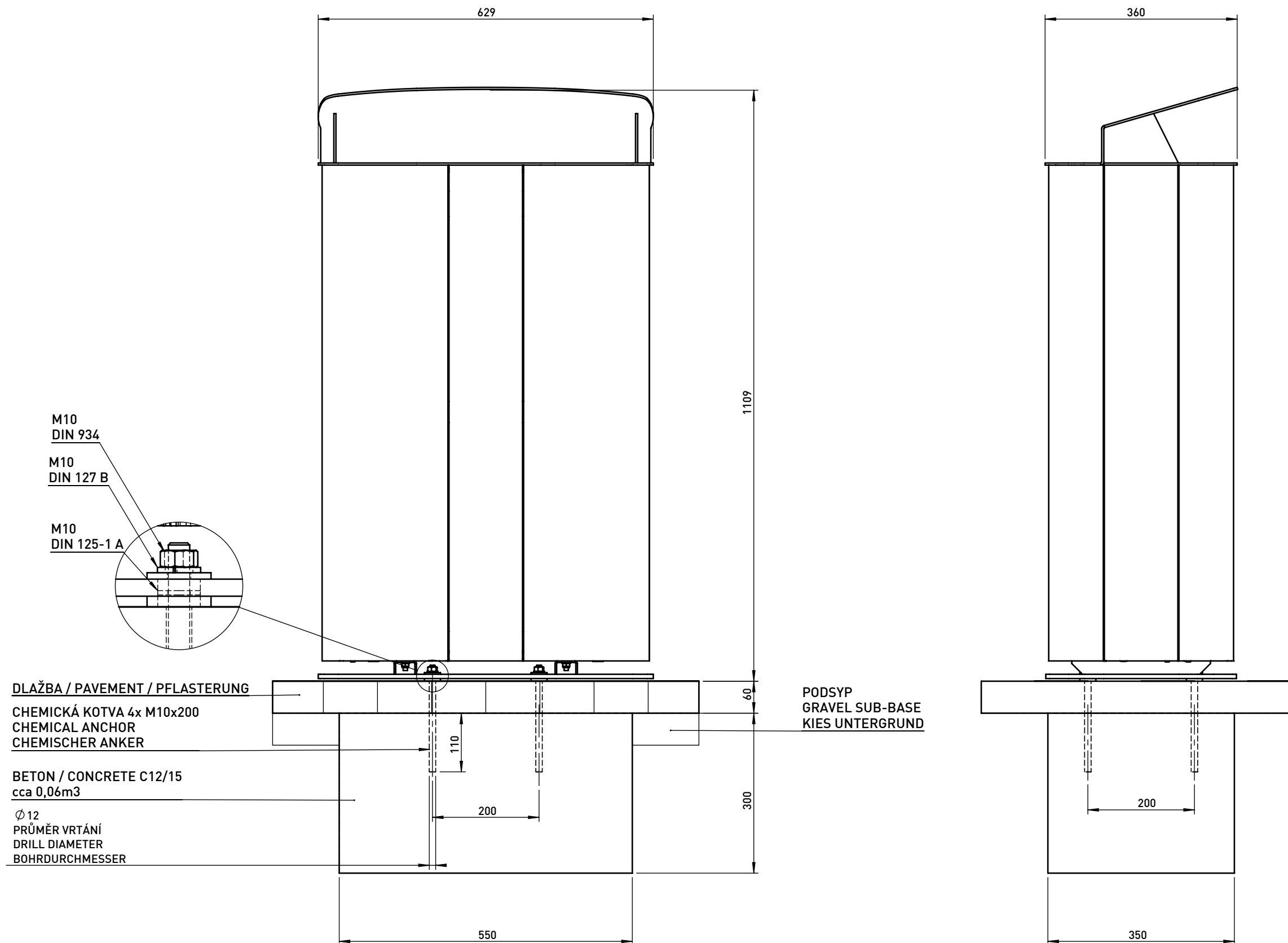
Versions:	MAU556	version with bin made of zinc-coated sheet
	MAU-B556	version with tipping frame for fixing the plastic bag
Structure type:	steel structure with lower base and upper steel roof and aluminum extruded profiles connected by means of stainless steel screw joints.	
Supporting frame:	welded of steel sheet laser-cut shapes.	
Roofing:	aluminum extruded profiles.	
Roof:	welded of steel sheet laser-cut shapes.	
Inner bin:	bent zinc-coated sheet, volume 120l (26,4 gal.) or tipping frame of light steel structure for fixing the plastic bag.	
Other equipment:	lock with 9 mm (0,35") triangle.	
Coating:	steel structure is treated with zinc and powder coating. Surface of aluminium profiles is treated either with anodizing, hard-anodizing or powder coating.	
Colour options:	shades of polyester powder coatings in the fine matt finish, standardly provided by mmcité. Other shades according to the RAL color book are available upon request.	
Anchoring:	ground fixing using M10 threaded rods – see the fixing drawing. All street furniture elements must be properly anchored according to the producer's technical instructions. The manufacturer declines responsibility for any damages caused by careless use or by non-compliance with the instructions.	
Weight:	MAU556	58,3 kg (129 lb)
	MAU-B556	54,6 kg (120 lb)
Option:	different than standard colour.	

DATE: 27.10.2017 V:01
TECHNICAL SPECIFICATIONS

MAXIMINIUM

MAU556 / MAU-B556

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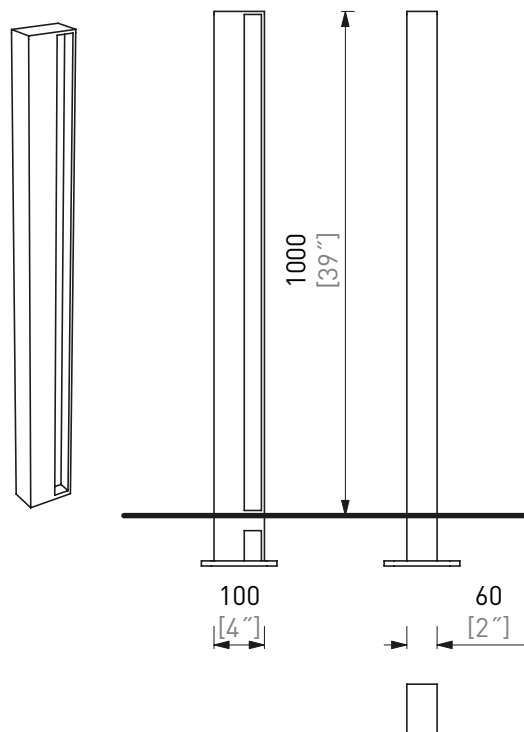
DATE: 31.03.2017 V: 02
minimal load-bearing capacity of the soil 150kPa
dimensions in mm

MAU 5X6 - MAXIMINIUM

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ILLUSTRATIVE PHOTO



DATE: 30. 08. 2021 V: 02

dimensions in mm [inch]

SEE100 - ELIAS

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