City of Louisville
COLORADO • SINCE 1878

Planning Commission

October 10, 2019
City Hall, Council Chambers
749 Main Street
6:30 PM

For agenda item detail see the Staff Report and other supporting documents included in the complete meeting packet.

Public Comment will be limited to three (3) minutes per speaker.

1. Call to Order
2. Roll Call
3. Approval of Agenda
4. Approval of Minutes
   a. September 12, 2019 Minutes
5. Public Comment on Items Not on the Agenda
6. New Business – Public Hearing Items

   a. Speedy Sparkle PUD Amendment: A request for approval of a Planned Unit Development Amendment to allow sign design waivers for 1414 and 1408 Hecla Way and 1712 Plaza Drive. (Resolution 14, Series 2019)

   - Applicant: Speedy Sparkle Car Wash – Louisville, LLC
   - Case Manager: Rob Zuccaro, Director of Planning and Building Safety

   b. The Business Center at CTC GDP Amendment G, The Business Center at CTC Replat I Final Plat and Final PUD: A request for an amendment to The Business Center at CTC General Development Plan, a request for a Final Plat and Final Planned Unit Development to allow the construction of an office building and associated site improvements at 1411 S. Arthur Avenue. (Resolution 17, Series 2019)

   - Applicant: Andy Johnson, DAJ Design
   - Case Manager: Lisa Ritchie, Senior Planner

   c. The Business Center at CTC Replat J Final Plat and Final PUD: A request for approval of a Final Plat to consolidate two lots into one, and approval of a Final Planned Unit Development to allow construction of a structure and associated site improvements at 1875 Taylor Ave.

(Resolution 18, Series 2019) ***REQUEST TO CONTINUE TO NOVEMBER 14, 2019***

- Applicant: RVP Architecture
- Case Manager: Harry Brennan, Planner II

7. Planning Commission Comments
8. Staff Comments
9. Items Tentatively Scheduled for the regular meeting November 14, 2019:
    - The Business Center at CTC Replat J Final Plat and Final PUD – Continuance
    - Moxie SRU
    - Parcel O GDP Amendment
10. Adjourn

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Planning Commission
Meeting Minutes
September 12th, 2019
City Hall, Council Chambers
749 Main Street
6:30 PM

Call to Order – Chair Brauneis called the meeting to order at 6:30 PM.

Roll Call was taken and the following members were present:

Commission Members Present:	Steve Brauneis, Chair
	Tom Rice, Vice Chair
	Keaton Howe
	Jeff Moline
	Dietrich Hoefner
	Debra Williams
Commission Members Absent:	None.
Staff Members Present:	Lisa Ritchie, Senior Planner
	Harry Brennan, Planner II
	Kathleen Kelly, City Attorney
	Shaida Libhart, TEI Consultant
	Amelia Brackett Hogstad, Planning Clerk

APPROVAL OF AGENDA

Howe moved and Williams seconded a motion to approve the September 12th, 2019 agenda. Motion passed unanimously by voice vote.

APPROVAL OF MINUTES

Moline moved and Williams seconded a motion to approve the August 8th, 2019 minutes. Motion passed unanimously by voice vote.

PUBLIC COMMENTS ON ITEMS NOT ON THE AGENDA

None.

NEW BUSINESS – PUBLIC HEARING ITEMS

Speedy Sparkle PUD Amendment Continuance July 11, 2019: This application will be heard at a later Planning Commission meeting following new public notice.

LMC Amendment: Oil and Gas Operator Registration: An ordinance amending Chapter 17.68 of the Louisville Municipal Code to require Oil and Gas Operator Registration. (Resolution 16, Series 2019)

- Applicant: City of Louisville
- Case Manager: Lisa Ritchie, Senior Planner

All required notice was met.

Ritchie presented the proposed ordinance, which will comply with the new state regulations for S.B. 19-181, “Protect Public Welfare Oil and Gas Operations,” allowing for greater local control. There are no current drilling activities or actively-producing wells within the city and no active permits have been filed with the state since 1999. The intent of this ordinance is to require a 30-day notice for oil and gas operator registration, which includes the following:

- Good faith estimate on number of well sites and wells within 5 years
- Map showing locations
- Well estimates
- Information demonstrating capability to meet requirements
- Requirement to update information as necessary
- Requirement to reapply after 5 years if no application has been submitted

Staff recommends approval of Resolution 16, Series 2019.

Rice disclosed that his wife is an executive with a large oil and gas company, but he did not consider it a conflict of interest since that company was not doing in business in Boulder County and likely not doing business anywhere in Colorado.

Howe asked about the moratorium.

Kelly replied that the draft proposed a 6-month moratorium, though staff was also presenting a draft to Council without a moratorium. Updating the regulations would be an expensive and long process and there had been some discussion about the relevance of making those updates, given how much staff time would be needed and the possibility that the ordinance may no longer be up-to-date by the time an application came through. The moratorium would allow for a timely review of regulations. Council had talked through scenarios in which the 6-month timeline would not be long enough or the Council would not be able to secure a super majority if there were any absent council members when an application came through. Therefore, the language meant that a filing would trigger the moratorium.

Howe asked if 6 months was an adequate amount of time.

Kelly replied that the courts view temporary moratoria as legitimate means to update ordinances. When you push it to a year, it starts looking like a ban on the activity. If the City found that it needed more than 6 months while it was actively working on its regulations, it could choose to extend a moratorium.

Moline asked if this would apply to properties that the City had an ownership share in but that were outside the City limits.

Kelly replied that it would not.

Williams asked what the ramifications would be if there were a ban.

Kelly replied that the City was not authorized to ban oil and gas operations. She noted that it was not a bright line and there were some jurisdictions that had enacted 12-month moratoria. A 6-month moratorium also created a record of the City's efforts in those times in case of the need for an extension.

Brauneis asked about the language that referenced Boulder County.

Kelly replied that it was based on a provision from Boulder County's language to preserve the public's health and welfare.

Brauneis asked about the well permit filed in 1999.

Kelly and Ritchie explained that there was property that was rezoned and intended for drilling but that was never fulfilled.

Brauneis asked about the 1995 update to the Municipal Code, which allowed drilling in all zones.

Kelly replied that that period of time there were a few significant court decisions that dealt with "operational preemption" and the limits of what a local government could regulate. That ordinance change was in response to the authority change in the courts, such that the City was no longer allowed to limit drilling to agricultural zones.

Moline asked if directional drilling would change those regulations and allowances.

Kelly responded that they would learn more about the breadth of authority in SB if it got tested in the courts. She noted that directional drilling and other technological changes could allow a surface location within the City of Louisville to be directionally drilled to a reservoir outside of the City.

Brauneis asked about the setbacks.

Kelly replied that they corresponded to the existing ordinance.

Williams asked if the buffer could change once staff reviews the ordinance in the future.

Kelly replied that there were no plans to change the regulations in the future. The operator registration was intended to trigger a review of the ordinances. There was no telling when, if ever, that would happen.

Brauneis asked for public comment.

Ron Spaulding, 597 Casper Drive in Lafayette, stated that his family lived in Louisville and he encouraged the Commission to endorse this proposal. A few localities have enacted stricter legislation, but he did not think the City needed to go there yet. The moratorium was a good, preemptive tool. He noted that it did take quite a bit of time and effort to rework regulations.

Deb Fahey, 1118 West Enclave Circle in Louisville, stated that the proposal was a good first step and she would like to see it a bit stronger. Broomfield is planning on drilling very close to the City's southeast border and she asked if Louisville setback requirements would affect their drilling.

Brauneis asked about the ability for someone to drill sideways into City limits.

Kelly replied the City of Louisville did not have authority if the surface site of the drilling occurred outside its limits.

Brauneis asked what would happen if there was something that was up against the city line.

Kelly confirmed that the City could not do anything in that case since it was outside city limits.

Brauneis closed the public hearing and opened commissioner discussion.

Rice noted that the question tonight was limited to the registration amendment and that the City could not legislate for other jurisdictions. He thought it was a reasonable change to the ordinance and not overly burdensome to those who might apply.

Hoefner agreed with Commissioner Rice that it seemed like a common-sense first step that did not do too much too fast, especially considering there was no current development.

Howe agreed.

Williams stated that she liked the idea that they were not needlessly tapping into staff resources.

Moline agreed with his fellow commissioners about the proposal. He added that the community should address the issues that come with the production of the minerals. If we were going to use oil and gas resources in Louisville, and they weren't going to be found here, they would have to be found somewhere else. So to be good neighbors we should limit our use of the resources.

Brauneis was in favor and asked for a motion.

Moline moved to approve Resolution 16, Series 2019. Williams seconded. Motion passed unanimously by roll call vote.

DISCUSSION

Draft Transportation Master Plan

Ritchie noted that staff had presented the draft for the first time last year and tonight's draft included community feedback. She requested thoughts, ideas, and uniform consensus in situations where the Commission wanted to change the plan.

Shaida Libhart presented the Transportation Master Plan, or TMP, which she explained was meant to function as a blueprint for transportation project development and to identify funding needs and priorities. There were further details to figure out and studies to conduct after the completion of the TMP.

Libhart explained that the TMP had received over 1,500 comments and hundreds of map ideas and that, overall, substantial community involvement helped shape the plan.

The TMP contained 4 key policies:

1. Great Streets: Street design coordinated with community needs and land uses.
2. Walkable/Bikeable Places: Network connectivity and accommodations.
3. TOD Guidelines: Opportunities to leverage investments, increase economic development, and support sustainability.
4. Applications for Technology: Utilize technology to increase equitable mobility options and improve efficiency of the network.

The TMP contains many projects that fall into the following categories, all of which are meant to work together and focus on safety:

1. Corridor improvements
2. All ages and abilities bicycle network

Libhart explained that this category emphasizes safety and connectivity using low-volume, low-speed streets where possible. The plan divides streets into larger streets and neighborhood streets, which allows staff to make sure that neighborhood streets maintain their low-speed, low-volume character.

3. Connectivity and safety improvements
4. Downtown connector trail
5. Transit vision and service needs

Brauneis asked if there was an overlay that would help determine the routes students take between home and school.

Libhart replied that they did not have specific information on where students live, but they tried to look at where the schools are and look at the primary trails and corridors nearby to create safe routes to schools. She added that there was a program to create safe routes to school in the plan.

Libhart noted that intersections were the places with the most crashes and the TMP identified the safety hotspots to focus on, particularly school intersections, key destinations in the city, and trail crossings. The TMP also identified potential underpass locations.

Brauneis asked if the TMP gave staff enough to make any aspect of this plan a reality.

Ritchie replied that planning staff had spent hours and hours with other department staff, talking about feasibility in these specific places and the plan represented a good collaboration with an outside consultant.

Moline asked if the Plan would unwind some of the legacy of the automobile- and suburbanization-history of the city.

Libhart replied that the plan included a set of best practices for future design.

Moline observed that it sounded like the plan included retrofitting streets that were meant for automobiles and adding in safety for bikes and pedestrians.

Libhart added that the recommended reference materials contained the most up-to-date best practices on how to make those transformations.

Moline noted that Boulder had more people biking than Louisville, probably because of some of the improvements there.

Howe asked if the research had found any underused pedestrian crossings.

Libhart replied that they did not have additional pedestrian counts to gather that information. They did provide a basis for staff to look at the intersections critically based on primary destinations and safety.

Howe wondered if people avoided some crosswalks because of the safety factor, and if, in that case, it may be better to remove those crosswalks than to enhance them.

Libhart replied that she thought the plan provided the tools and resources to help the City make those decisions.

Howe asked if it was possible to make things safer by making them simpler rather than adding things, in some instances.

Williams explained that the bike system in Vancouver was completely separate from other traffic systems in the city, making cyclists feel safe by being apart from other types of movement. She noted that there were some streets in Louisville that would not work for that type of plan, but some streets could.

Libhart replied that a lot of the design treatments for the neighborhood streets were taken from places like Vancouver in creating safe biking spaces.

Williams asked if the TMP took into account surrounding municipalities' transportation plan.

Libhart replied that they had met with Superior and their staff said that the recommendations were aligned with what their plans, as well. They had not discussed specifics since those were still in flux.

Ritchie added that early in the development, staff met with Boulder County, Superior, Broomfield, and Lafayette. Staff had also met with school board and individuals schools. They didn't want to do anything in the TMP that would conflict with other jurisdictions. Boulder County sent robust comments on the plan, as well. There was also a map that

showed projects by priority and funding scenarios. She noted that this plan was not 100% funded.

Brauneis noted that there were students who moved between Lafayette and Louisville to go to school.

Howe asked about the delineation among walking, biking, and driving in the plan.

Libhart replied that it depended on street usage, surrounding land uses, the context of the area, safety, and speed.

Libhart explained that transit had to be coordinated with RTD and Via, but the plan presented a vision for transit development, including recommendations to serve the CTC, the hospital, and schools, and accommodate future higher-capacity options. She explained that the plan also contained 10 different programs that the City could implement to support the recommended projects.

Break around 8 PM. Reconvened after 5 minutes.

Howe asked what the biggest feedback points were from the community.

Libhart replied that there was a desire for separation among different types of transportation.

Moline noted that one of the graphs showed that around 43% of respondents never walked and that part of the challenge was creating programming to get people out, since there were certainly some unsafe places but there were already a lot of safe ones.

Libhart showed a walk-shed map how far people can walk within different time constraints. She added that some people shared that they did not have anything to walk to.

Moline suggested getting people familiar with the resources we already have, like other RTD buses besides the Flatiron Flyer.

Libhart observed that the goals for this plan were broad, but the plan identified performance metrics and targets that linked back to the goals.

Ritchie explained that the GIS map on the screen provided different ways to visualize funding information. Staff would like feedback on prioritization of the downtown connector as a less expensive or a more involved system; ideas in the interim before re-striping Pine Street; and short and long term goals for the downtown connector project.

Williams cited a bike plan in Boulder on Folsom Street that included a barrier between the bike and the traffic that ended up being a nuisance and scarier as a driver than as a cyclist. In Vancouver, they painted concrete barriers, which looked better.

Libhart noted that Calgary also had a protected bike network using barriers as a pilot for a year to get feedback before finalizing the whole plan.

Brauneis noted that opportunities like needing to repave Pine Street were great times to take advantage of other improvements. He suggested prioritizing safety where we know things are unsafe and increased connectivity.

Rice noted that sufficient parking in the downtown area may come into conflict with some of the multi-modal goals of the Plan.

Ritchie replied that there had been a lot of discussion about the parking impact.

Rice added that from a planning perspective, the Commission would prefer a higher level of facility save for the budget issues, which were not the Commission's bailiwick.

Moline recommended pursuing scenario 3.

Hoefner stated that the report was organized by priority, but he did not have a sense of cost-benefit ranking among the different projects with their vastly different costs.

Libhart replied that cost-benefit analysis was very complicated but she thought the comment was important. She noted that scenario 3 would fund everything except that it did not factor in transit.

Williams asked about how to increase CIP funding, for example, were there conversations about increasing taxes or having specific taxes for transportation. She also asked about outside funds.

Libhart replied that there would be additional funding mechanisms, but what they budgeted into the plan anticipated grant funding. Some of the costing involved budgeting for different levels of local involvement based on the availability of other funds for certain projects, like Highway 42. The cost also used a higher amount for grant funding than the City was currently receiving.

Moline asked about the transportation service fee in scenario 3.

Libhart replied that there would have to be nexus study, but there was a possibility to use a system would be a fee-accessed to contribute to maintenance funding, which would free up the CIP for more capital, which could also be leveraged for more grant funding as well.

Brauneis asked what level of feedback Council wanted from the Commission.

Ritchie suggested noting any concerns with the plan or any recommendations for top-priority projects.

Hoefner recommended keeping the Commission's input at a high level.

Ritchie added that Council may appreciate specific feedback on policy.

Hoefner noted that walking and biking and safety were the most important community issues but the highest dollar amounts were going to road-widening projects and he wondered whether the financial priorities matched the input from the community. He asked if the reduction of a 3-minute delay was worth $25 million.

Moline noted that some road projects included multi-modal elements, as well.

Ritchie noted that the cost of that project would not be borne entirely by the City. The City had funding to do additional study for the Highway 42 in partnership with Lafayette and Boulder County.

Libhart noted that the ones that are high-priority and short-term could be completed in 5 to 10 years, such as roadway crossings, intersection improvements, small trail additions, and bikeway network enhancements.

Moline stated that there were two new signals at Highway 42 and Dillon Road to which C-DOT was contributing zero dollars and the state did not have funding to take care of state roads. A robust transportation network is within the purview of the Planning Commission to emphasize and prioritize.

Rice commented on the Highway 42/96th Street issue, observing that 96th was an entry point for Louisville but it was a blighted area. There should be some priority given to that project for the gateway reason so it could look the way we wanted it to for the community.

Moline asked if Libhart ever saw that residents in mixed use and downtown residential developments walked more.

Libhart replied that they had not looked at that in Louisville, but nationally in similar communities with destinations and connectivity, there were significant increases in the number of people who were using walking and biking.

Brauneis noted that he wanted all the projects and since the Commission could leave worrying about the budget to the Council, he thought that the commissioners could feel good about saying that they valued all the projects.

Williams noted that it was important to focus on multi-modal projects to get the biggest bang for our buck and leverage the most funds. Another priority was to finish trail connections for walking and biking. There were a lot in the city that were disjointed and not completed and finishing those might be faster and cheaper than other projects.

Williams asked why you wouldn’t pick scenario 3.

Rice stated that the Commission should endorse the report and that the policies, projects, and programs were all appropriate and that the Commission could go further and say that they support scenario 3. The reality of budgeting was a City Council function.

Libhart added that the funding scenarios were meant to help the City with budgeting and practicality conversations in the future.

Moline liked that the approach to funding was good in the plan because it looked at different funding avenues. He suggested to Council that they consider different ways to fund these improvements.

Williams added that Moline's suggestion also allowed the plan to spread out the pain and not overtax any one area.

Howe noted that the downside of scenario 3 might be limited flexibility in the future.

Ritchie replied that the Plan was meant to be updated over time as needed, approximately every 5-8 years.

Rice quoted from the staff report:

> It is important to note that the plan reflects a particular moment in time. The TMP should provide guidance, but City priorities may change over time and transportation decisions will need to reflect these updated community needs, opportunities and priorities. The City should update the TMP periodically to ensure consistency with changing conditions.

Williams added that the TMP was like the Comp Plan in that way.

Moline added that the CIP planning horizon was approximately 5 years as well.

Ritchie noted that Council would take the TMP into account among all the other funding demands of the City.

Libhart noted that scenarios 2 and 3 provided more flexibility to the City with how the implement the plan.

Howe observed that it was important to understand that the Commission thought the plan was important to invest in. He noted that while the community wanted to prioritize biking and walking, 93% of people who work in Louisville commute from elsewhere and efficiency in auto movement was still important, as was making streets more efficient overall. He recommended looking at the high crash locations to guide future conversations. Safety should be a priority and policy 4 could improve safety. There were also a lot of collisions on South Boulder Road and the corridor going downtown and looking at that area should be a priority. He also noted that consistent signposting across the city would help make the system less confusing. He agreed with the importance of separating bikes and cars, taking into account where people are coming from and where they're trying to get to.

Libhart noted that commute trips in Louisville were significant, but about 60% of all trips were not commute trips.

Howe responded that making the streets more efficient would also help people who were moving across town.

Moline liked the Level of Concern ("LOC") designation because it allowed for a distinction between streets for cars and streets not for cars, increasing separation and efficiency. He also wanted to make sure the plan included the latest safety data, including the fatality.

Libhart noted that the safety data on the newest draft would be 2015-2017, not 2013-2015 as it was in this draft.

Brauneis recommended a sidebar in the report to acknowledge the fatality on Highway 42.

Libhart asked Commissioner Howe if he was referring to the Long-Term Vision for South Boulder Road as far as efficiency and separation.

Howe confirmed.

Hoefner made a motion to endorse the report with its policies and projects, recommending scenario 3, and recognizing that the Planning Commission did not have to consider budget. Rice seconded.

Brauneis asked for public comments.

Fahey asked the Commission to consider that there were specific needs for seniors, which was an exploding population and in the next 10-15 years the percentage of seniors was going to be huge, and they would not be driving. There were some people who suggested having golf carts on some of the neighborhood street or on part of the trail system.

Spaulding stated that this plan was well-done. He was formally of the Maryland Department of Transportation and he had never seen a local plan with such detail. He was supportive of the work and the conversation among the commissioners.

Brauneis returned to consideration of the motion. Approved unanimously by voice vote.

COMMISSIONER COMMENTS

None.

STAFF COMMENTS

Ritchie explained that Council withdrew the Parcel O GDP Amendment with the hopes that discussions with the property owners could continue at the staff level and there would be no special meeting later in September. The Development Review Audit was proposed for spring and she requested commissioner comment on how to make the audit more productive.

General agreement that it was worthwhile to travel around together for the audit.

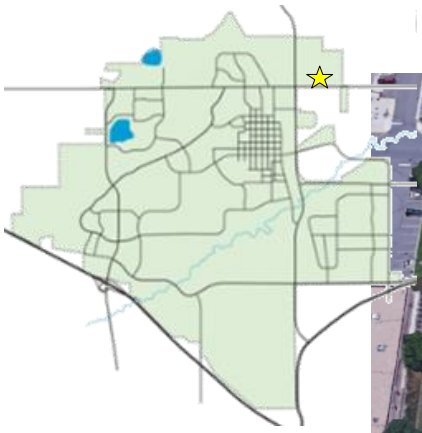
Brauneis thought it was unfortunate that the Commission had to discuss the Parcel O amendment as though the church had no plans at the point and he hoped the next conversation could be more grounded in current reality.

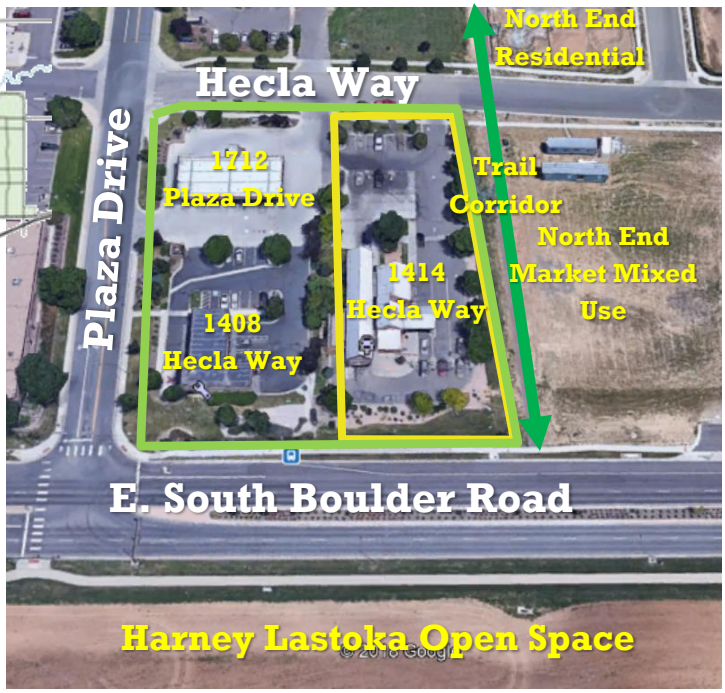
ITEMS TENTATIVELY SCHEDULED FOR OCTOBER 10TH, 2019

- Moxie Special Review Use
- 1875 Taylor PUD
- Business Center at CTC Replat I GDP Amendment, Plat and PUD

Adjourn: Rice moved and Howe seconded a motion to adjourn. Adjourned at 9:05 PM.

ITEM:	PUD-0222-2019; 1414 Hecla Way; 1408 Hecla Way and 1712 Plaza Drive - Planned Unit Development Amendment Addressing Sign Design Waivers
PLANNER:	Rob Zuccaro, AICP, Planning and Building Safety Director
OWNER:	Car Wash 2, LLC
REPRESENTATIVE:	Chip Weincek CW Associates, PLLC 672 W. Pine Street Louisville, CO 80027
EXISTING ZONING:	Planned Community Zone District – Commercial (PCZD-C)
LOCATION:	1414 Hecla Way; 1408 Hecla Way; and 1712 Plaza Drive (Lot 6, Louisville Plaza Filing 2 and Lots 1 and 2 Louisville Plaza Filing 3)
TOTAL SITE AREA:	90,682 Square Feet
REQUEST:	Approval of Resolution 14, Series 2019, a resolution recommending denial of an amendment to the PUD addressing sign design and waivers for the properties at 1414 Hecla Way; 1408 Hecla Way and 1712 Plaza Drive





SUMMARY:
The applicant, Speedy Sparkle Car Wash – Louisville, LLC, requests approval of an amended Planned Unit Development (PUD) to modify the sign allowance for their property at 1414 Hecla Way and modify the joint monument sign facing South Boulder Road that also serves 1408 Hecla Way (Jiffy Lube) and 1712 Plaza Drive (King Soopers Fueling Center) (see Attachment 2 for application materials). More specifically, the proposal includes the following:

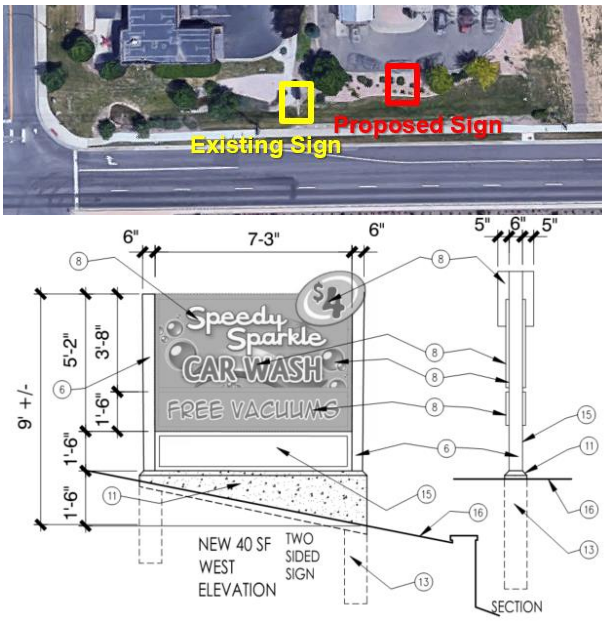
- Modification to the existing shared monument sign to remove the Speedy Sparkle sign face. This is noted under Keynote No. 1 on Sheet A1.0 of the proposed PUD amendment. The note does not specify if the sign panel would be permanently restricted to include a blank sign panel, the color, material or opacity of such blank sign panel, if the sign panel would continue to be illuminated or if a new sign face could be added at a later date for any property owner. Staff requested clarification on this element of the proposal and the applicant has declined to provide clarification. Because the City does not control content of sign panels, without a formal restriction, a sign for any of the three current property owners that share the sign, including Speedy Sparkle, could add copy to the sign panel.

KEYNOTES:

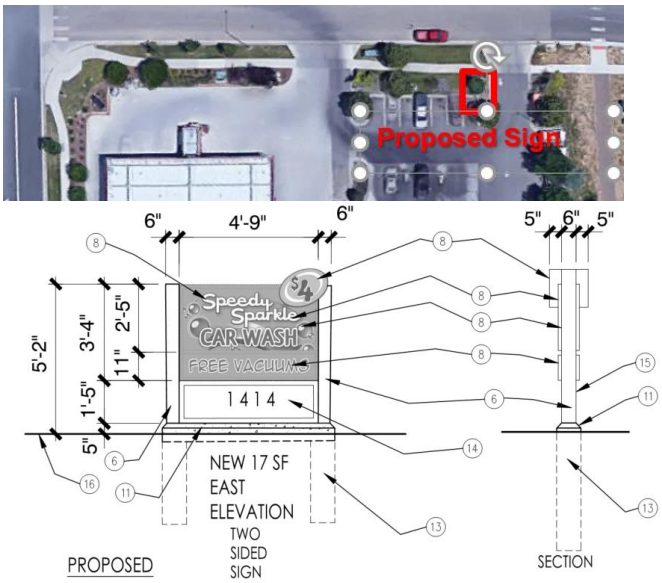
1 EXISTING SOUTH BOULDER ROAD MONUMENT SIGN. EXISTING SPEEDY SPARKLE CAR WASH SIGN FACE WITH BE REMOVED.

Designated by application for removal. Clarification needed on potential restriction or use.

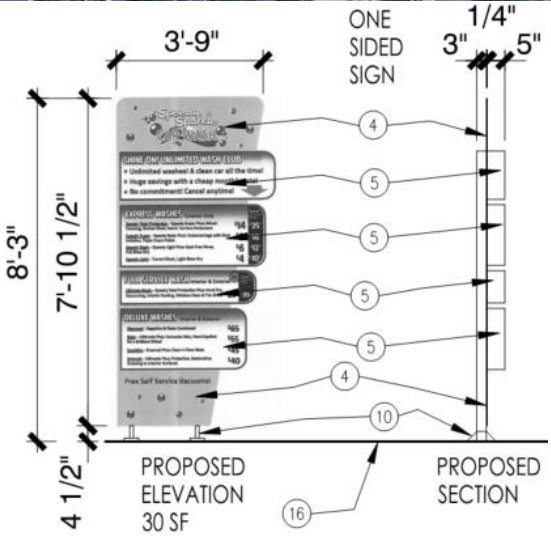
- In addition to the existing shared monument sign, the application proposes adding a second monument sign facing South Boulder Road that would serve as a stand-alone monument sign for Speedy Sparkle. The proposed sign has an unfinished concrete base, metal panel frame on the sides, three separate sign panels, is 9'-6" tall and has a sign area of 47.5 sq. ft. The panel is internally illuminated. The areas of the panel that are translucent and opaque are not specified. Staff requested this information and the applicant declined to provide it. Thus, staff assumes the entire panel is translucent.



- A monument sign facing Hecla Way. This replaces the design of a previously approved monument sign facing Hecla Way that was never constructed. The proposed sign has a short unfinished concrete base, metal panel frame on the side, three separate sign panels, is 5'- 8" tall and has a sign area of 26 sq. ft. The panel is internally illuminated. The areas of the panel that are translucent and opaque are not specified. Staff requested this information and the applicant declined to provide it. Thus, staff assumes the entire panel is translucent.



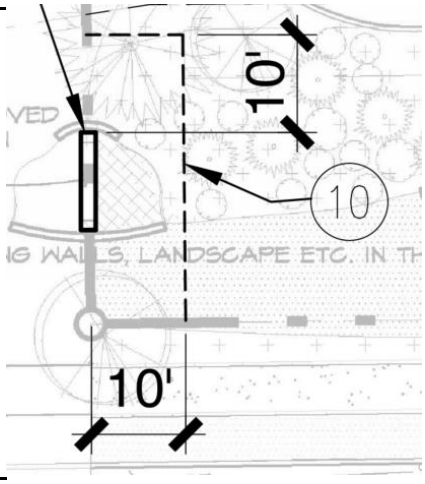
- Two menu board sign on the north side of the building. The signs are on a short dual-pole mounted based, are 8’-3” tall and 27 sq. ft. in sign area. The sign cabinets are internally illumined. The areas of the panel that are translucent and opaque are not specified. Staff requested this information and the applicant declined to provide it. Thus, staff assumes the entire panel is translucent.



- There is an existing wall-mounted sign extending over a canopy on the south side of the building. This sign is not noted as an existing sign on the proposed PUD. Staff requested it be added as an existing sign on the PUD so that the context of all signs on the property could be considered. The applicant declined to add the sign to the PUD. The sign does not comply with the CDDSG because it projects more than 8” from the face of the building. The sign includes individual, 24” internally illuminated letters, is 14’ wide and has a sign area of 28 sq. ft.

- The applicant proposes an easement on their property to cover a portion of the shared monument sign. The current sign was designed to straddle both properties at 1414 and 1408 Hecla. Staff is not aware of any easements for this sign on either property. Any such easement needs to be dedicated through separate instrument and recorded. Staff requested a copy of the easement for review. The applicant declined to provide a draft of the proposed easement.

(10) NEW ACCESS EASEMENT FOR KING SOOPERS AND JIFFY LUBE TO ALLOW THEIR PORTION OF SIGN ON THE SPEEDY SPARKLE CAR WASH PROPERTY AND FOR MAINTENANCE OF THEIR MONUMENT SIGN. EASEMENT ALLOWED TILL SIGN IS REMOVED.



Application Authorization

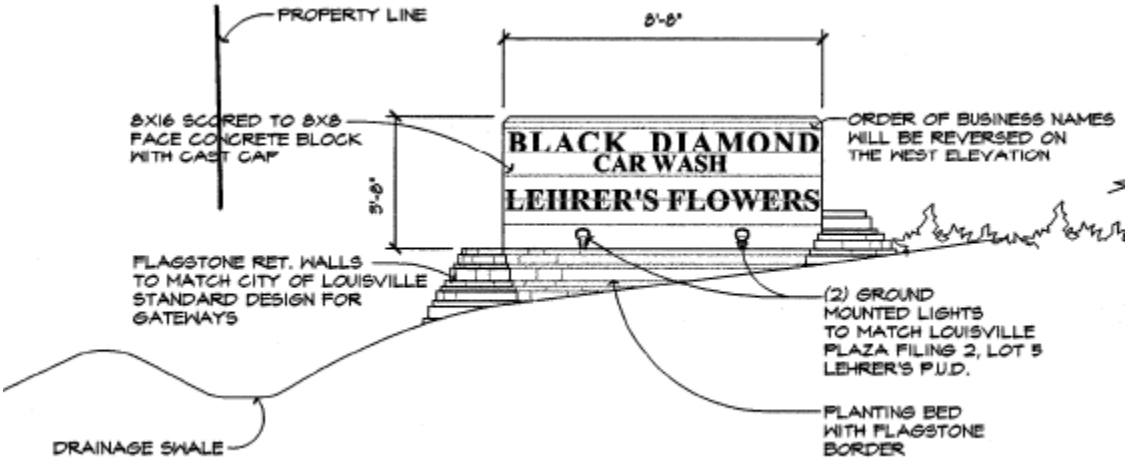
Because the proposal modifies and potentially restricts the existing shared monument sign facing South Boulder road, authorization from all three property owners is required. The application form submitted to the City notes that application is for an "Amendment to correct and update signage. For site and neighboring properties." The initial application submitted in February this year included authorization letters from the other two property owners. The letters specifically reference approval of the sign design proposed at that time, which included a major modification to the existing monument sign substantially different from what is now proposed (see Attachment 3 for old authorization letter). The application has been substantially modified since that time and staff has requested that new authorization letters be provided reflecting the new proposal and signature blocks be added for all property owners. Staff has consulted with the City Attorney and she concurs such authorization letters and signatures on the PUD should be required. The applicant declined to provide updated letters of authorization or add approval signatures for the other property owners to the PUD.

BACKGROUND:

Several previous PUDs were approved for the subject properties addressing signage. These are summarized below:

- Black Diamond Car Wash and Lehrer Flowers PUDs, 2000. These two PUDs were approved in 2000 and established a joint monument sign facing South Boulder Road for the Black Diamond Car Wash and Lehrer's Flowers. The Lehrer's Flowers property was later split into two lots that are now the 1408 Hecla (Jiffy Lube) and 1712 Plaza Drive (King Soopers Fueling Station). The sign included two panels for each business. The PUDs also allowed separate monument signs for both the car wash and Lehrer's Flowers facing Hecla Way. The PUD does not show the existing car wash wall sign on

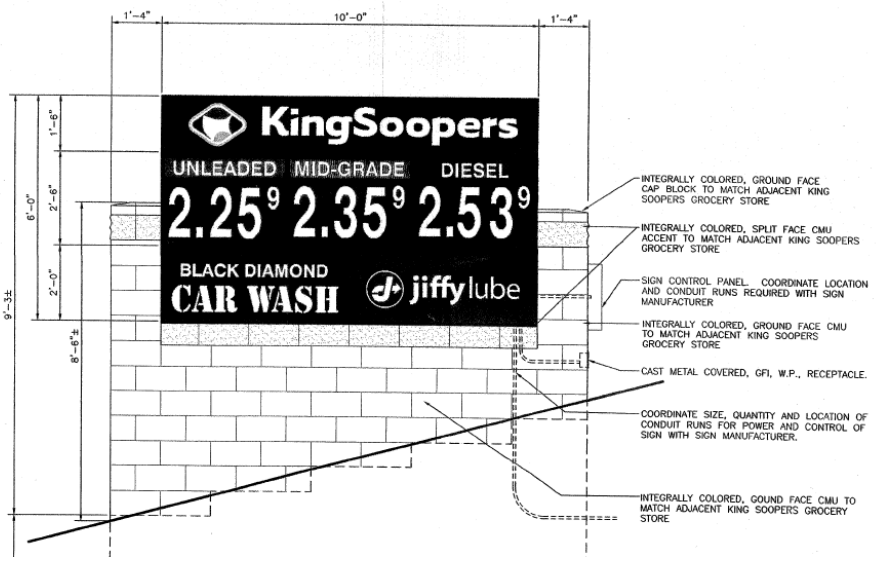
the south side of the building. The staff report noted that the two applicants "have worked together to develop a sign program that minimizes the impact of signs in this suburban-rural setting of the City while recognizing the needs of the businesses." The subject properties are located directly across the street from the Harney Lastoka Open Space adding to the rural context of the area.



- Lehrer's Flowers and Jiffy Lube PUD, 2005. This PUD, and accompanying plat, split the Lehrer's Flowers lot to allow the Jiffy Lube development. Wall signs for each building were approved and a note was included stating:

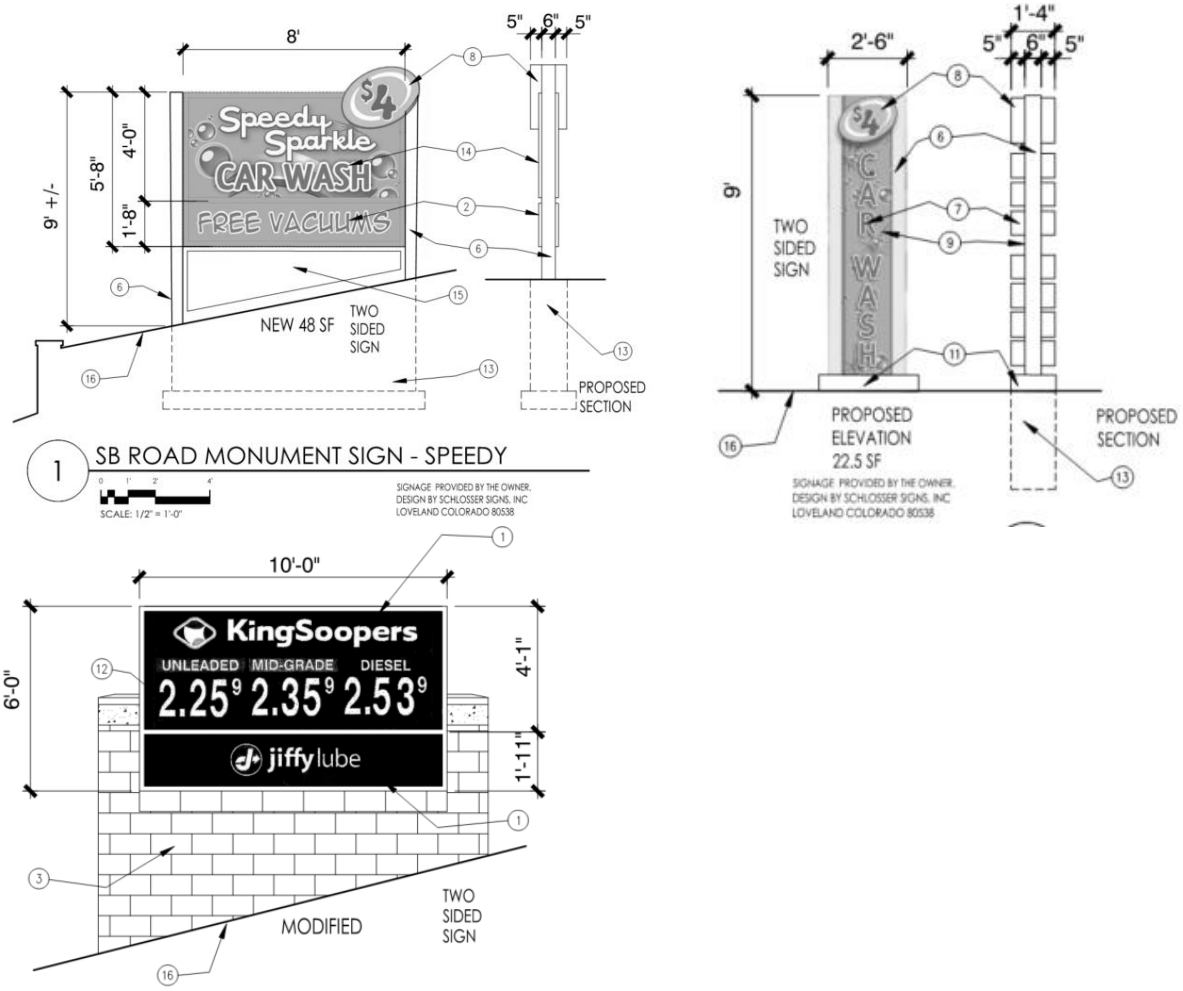
  An existing monument sign is currently located on the east property line at the SE corner of the Site. This monument sign will be shared between Black Diamond Car Wash, Lehrer's Flowers and Jiffy Lube. A revised drawing will be submitted at a later date.

- King Soopers Fueling Center PUD, 2010. This PUD allowed the redevelopment of the Lehrer's Flowers property to the King Soopers Fueling Center and included sign allowances for that property as well as modifications to the shared monument sign facing South Boulder Road. This PUD outlines the currently allowed sign design for the shared sign.



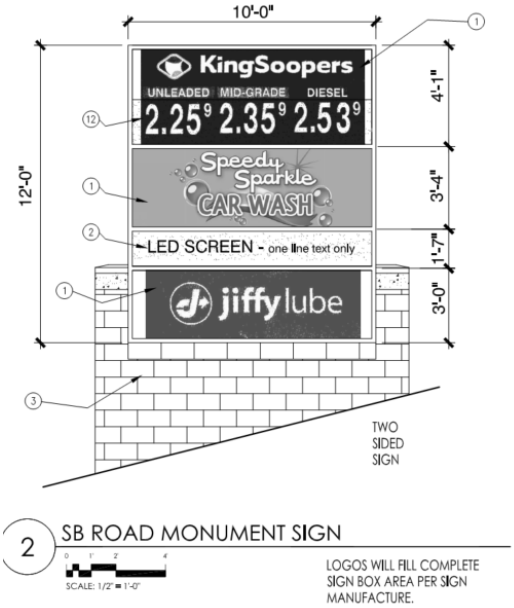
PLANNING COMMISSION REVIEW – JULY 11, 2019:
The Planning Commission reviewed a previous version of this proposal on July 11th and tabled the hearing so that staff and the applicant could work on revisions (see Attachment XX for minutes). The proposal included modification of the existing South Boulder Road monument sign to combine the lower panel for Jiffy Lube, adding a second South Boulder Road monument sign to the east, which included a variable message panel (where "Free Vacuums" is shown). The same menu signs as currently proposed were also included.

Signs Proposed on July 11th.



Original Submittal in February
For additionalcontext and background, the applicant's original submittal that was not reveiwed by the Planning Commission included an expansion of the existing monument sign that was over 17 ft. tall with 120 sq. ft. of sign area. This is double the allowed sign area in the code of 60 sq. ft. This sign would have been amongst the largest signs in the City for any development and the individual sign panels would have been signficanly larger than any individual sign panel on a multi-panel sign in the City. The sign also

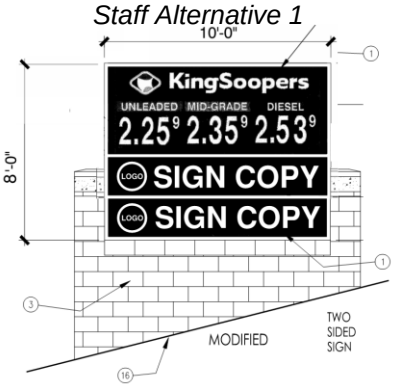
included a variable message panel, which would have been the only commercial variable panel in the City outside of schools, which are not subject to City zoning.



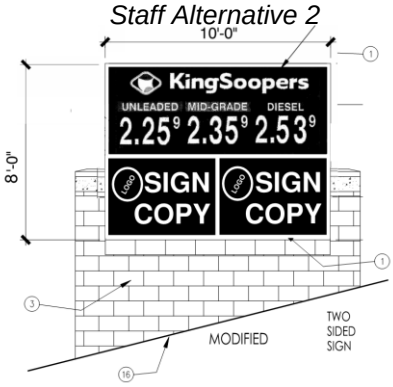
Following the July 11th Planning Commission meeting, staff met with the applicant to discuss alternative proposals. Staff recommends, as one potential alternative, expanding the sign panels at the base of the sign into either 2' x 10' or 4' x 5' panels. These two panels could be used for the Speedy Sparkle and Jiffy Lube properties, would adhere to the original agreement and intent for a joint monument sign, and double the sign size for each property. This would also provide each business with what is among the largest individual sign panels for any business in the City that has a multi-panel joint sign. Overall, this would result in a total sign area of 80 sq. ft., and still requires a waiver to exceed the 60 sq. ft. maximum currently allowed in the CDDSG.

Existing Sign

Staff Alternative 1



Staff Alternative 2



To better understand the scale of the panel size in the alternatives, staff has provided on the following page scaled comparisons of a 2' x 10' sign panel with other multi-panel signs in the City.

CENTENNIAL MARKET PLACE
KOHL'S
8'
1.5'
SAFEWAY
10'
2'
LOGO SIGN COPY

6.5'
1.5'
McCASLIN MARKETPLACE
2.5'
BELLCO
1'
SMASHBURGER
MADgreens
JIMMY JOHN'S
MOD PIZZA
10'
2'
LOGO SIGN COPY

officeevolution
RESTAURANT & BAR
9'
1.75'
Jersey Mike's SUBS
10'
2'
LOGO SIGN COPY
30 MIN KICKBOX FITNESS

DRIVE THRU
QDOBA
NAILS&SPA
Runners Roost
5'
ORGANIC SANDWICH
1'
BlackPaw
10'
2'
LOGO SIGN COPY

CENTRE COURT
RESIDENCES
7'
1.5'
ALFALFA'S
10'
2'
LOGO SIGN COPY

CENTENNIAL PAVILION
KidSPOT
GREASE MONKEY
LUBE & OIL PROS
CRIMSON CIRCLE
CHAMPION CLEANERS
Edward Jones
5'
1'
StateFarm
HIGHER STRENGTH FITNESS
LaMar's DONUTS
AMAZING DECKS AND WATERFALLS
murrayfamily
BUSABA
THAI RESTAURANT
10'
2'
LOGO SIGN COPY

ANALYSIS:
Sign design is subject to LMC Chapter 17.24 and Chapter 7 of the Commercial Development Design Standards and Guidelines (CDDSG). The CDDSG includes "standards" that must be met and "guidelines" that are preferred design elements. Any proposal that does not comply with LMC Chapter 17.24 or a CDDSG "standard" must receive a waiver through the Planned Unit Development (PUD) process.

The Goal statement from the CDDSG for signs is the following:

> *Signs should be consistent with project and overall development design but should be subordinate to architectural and landscape elements. Signs serve to identify, inform, direct, regulate and interpret. Each commercial building or group of commercial buildings should have a consistent and comprehensive sign program from project identification at the street through individual tenant suite identity. Placement, scale, and readability should be considered in developing a sign package*

Waivers needed for current proposal:

- Number of Signs Allowed. CDDSG Sec. 7.2.B.1) states: "One monument sign is allowed per free standing building." The proposal includes two individual stand-alone signs for Speedy Sparkle, including a stand-along sign facing South Boulder Road, a stand-alone sign facing Hecla Way. Staff is not clear on how to categorize the existing sign panel on South Boulder Road and must assume any of the three existing property owners could utilize that sign panel with the proposed note on the PUD, including Speedy Sparkle.

- Sign illumination. CDDSG Sec. 7.4.E. states: "When using an internally illuminated sign cabinet, only that portion of the sign face dedicated to the trademark or characters may be translucent. The balance of the sign face shall be opaque." The proposed panels do not specify what portions are opaque and translucent. Staff has requested this information on multiple occasions and the applicant has declined to provide specifications. Thus, staff assumes the cabinets are fully translucent.

- Sign Cabinet. CDDSG Sec. 7.5.A.5) states: "All monument signs using a sign cabinet design shall have an architectural border that integrates a minimum of two sides of the sign cabinet into the base." The proposed stand-alone monument signs have a sign panel that extends outside of the proposed border (see oval panel with "$4" copy).

- Sign Material. CDDSG Sec. 7.5.A.5) states: "The architectural base and border shall be consistent with and/or compliment the building materials." The proposed bases for the new stand-alone monument signs are proposed to be unfinished concrete and the side panels painted to match a building material. Staff finds the unfinished concrete base does not meet the criteria of a building material that is consistent with or compliments the building materials. Staff also finds that just by painting the frame panels to match the paint of the I-beams on the building does not meet the meaning and intent of this requirement.

The criteria to waive any of these above requirements is found in LMC Sec. 17.28.110, which states "requirements may be waived or modified through the approval process of the planned unit development if the spirit and intent of the development plan criteria contained in Sec.

17.28.120 are met and…that the modification or waiver is warranted by the design and amenities incorporated into the development plan."

PUD Waiver Criteria – Waiver Warranted by Design and Amenities
In consideration of what would constitute a sign design that would justify a waiver based on this criteria, staff utilized the following sign design concepts. These concepts are often thought of as best practice when designing and regulating signs and can have an important impact on maintaining standards that promote high quality commercial areas.

- Sign Clutter. This is a concept of having too many signs located in proximity to other signs leading to signage that is not affective in wayfinding, signage that may distract drivers creating unsafe environments, and signage that detracts from a quality built environment.

  Staff finds that the proposal adds unneeded sign clutter to the South Boulder Road frontage. The existing and proposed sign would be located in close proximity and separate signs are not needed to accommodate adequate signage for all properties involved. The intent of the four previously approved PUD sign plans for this group of properties was to have a single shared sign on South Boulder Road in order to reduce sign clutter, but still accommodating the needs of the businesses. Allowing an enlarged sign panel on the existing sign, as suggested by staff, would reduce sign clutter while continuing to accommodate business needs. Staff's alternative proposal would allow a sign panel larger than any other business sign panel on a multi-panel sign in the City.

  In addition, staff finds the oval panels and lower panels on both the South Boulder Road and Hecla Monument signs are not needed for adequate wayfinding and add to sign clutter.

- Proportionality of the sign area to the development, the lot area and lot frontage.

  Staff finds that adding an additional monument sign on South Boulder Road in such close proximity to the existing and for a relatively small lot area and frontage is excessive in proportion to the lot area and frontage. Although all businesses are on individual lots and have their own buildings, it is common to have joint signs for multiple lots throughout the City. The Goal statement of the CDDSG also states that "Each commercial building <u>or group of commercial buildings</u> should have a consistent and comprehensive sign program [emphasis added] ….'

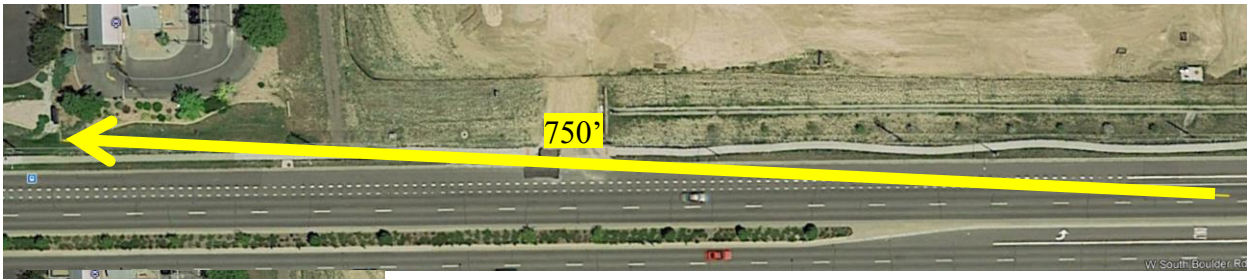
- Quality sign materials and design. Best practice in sign design is matching sign materials to building materials, and the incorporation of a substantial base and architectural frame.

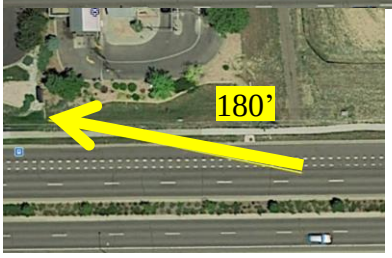
  Staff finds that the sign material and design for both the South Boulder Road and Hecla Way monument signs does not meet the minimum requirements of the CDDSG. To meet the waiver criteria, sign materials and design should exceed minimum standards and exemplify best practices on incorporating materials and elevated design. An example of best practice in incorporating sign material and design is the recently constructed McCaslin Marketplace sign. This sign includes a substantial base, frame and cap that matches the building material. Multiple materials are used and vary throughout the sign to provide interest and texture to the design.

In addition, staff finds that a restricting blank sign panel on the existing monument sign will detract from the design of that sign and negatively impact the character of the area. It will appear as if the development has a vacancy and staff is unclear based on the information proposed what would material would be used to cover or replace the sign panel and if it would continue to be illuminated.

- Visibility needs for the sign. Understanding that setbacks for the sign, and sign and logo copy height play into visibility for drivers, minimum sign areas to allow good visibility are important for wayfinding.

  Staff finds that a separate monument sign on South Boulder Road is not needed for adequate visibility. Staff's alternative to allow sign panels at 2' x 10' or 4' x 5' would allow text and logos up to 18-20" in height. Color contrast and fonts used in a sign play a big role in sign visibility. If a sign is designed well, based on a "Letter Visibility Chart" commonly used in sign design (developed by Penn State University, Pennsylvania Transportation Institute, and United States Sign Council), letter heights of 18" will start to be visible and legible from as far as 750' away. As you move closer to the sign its readability will increase and "maximum impact" will occur at 180'. The images below show a 750' distance and 180' distance from the existing sign. In addition, two signs in such close proximity will detract from each other and the existing monument sign will block the new monument sign from the view of eastbound traffic from some angles.





Consistent with Spirit and Intent of Approval Criteria in Sec. 17.28.120
Sec. 17.28.120.A.1. states that an application must have "An appropriate relationship to the surrounding area." Staff finds this to be the only relevant criteria for this application.

Staff finds that the proposal does not have an appropriate relationship to the surrounding area. Specifically, the original intent of having a joint monument sign was to limit the impact of signage on the rural-suburban character of the area. The property is located directly across the street from the Harney Lastoka Open Space, which is preserved agricultural and open space property jointly owned by Boulder County, Lafayette and Louisville. There is also a trail corridor immediately to the east of this property connecting to the North End development and larger City trail system. Allowing additional monument signs on South Boulder Road and allowing signs with minimal architectural features to compliment the development adds to sign clutter and detracts from community character, especially in this location.

STAFF RECOMMENDATON:
Based on the analysis of the PUD waiver criteria discussed above, staff recommends adoption of Resolution 14, Series 2019, recommending denial of the application to City Council.

ATTACHMENTS:
1. Resolution No.14, Series 2019
2. Application Materials
3. 1408 Hecla Way and 1712 Plaza Drive Authorization Letters
4. Black Diamond Carwash PUD
5. Lehrer's Flowers PUD
6. Lehrer's Flowers and Jiffy Lube PUD
7. King Soopers Fueling Center PUD
8. July 11, 2019 Planning Commission Minutes
9. Chapter 7, CDDSG – Sign Regulations
10. Public Comments

RESOLUTION NO. 14
SERIES 2019

A RESOLUTION RECOMMENDING DENIAL OF A REQUEST FOR A PLANNED UNIT DEVELOPMENT AMENDMENT ADDRESSING SIGN DESIGN WAIVERS FOR 1414 HECLA WAY; 1408 HECLA WAY; AND 1712 PLAZA DRIVE (LOT 6, LOUISVILLE PLAZA FILING 2 AND LOTS 1 AND 2 LOUISVILLE PLAZA FILING 3)

WHEREAS, there has been submitted to the Louisville Planning Commission an application for approval of a request for a Planned Unit Development Amendment to allow design changes to the signs on the subject properties that required waivers from Louisville Municipal Code (LMC) Chapter 17.24 and the Commercial Development Design Standards and Guidelines (CDDSG); and

WHEREAS, the City Staff has reviewed the information submitted and found that the application does not comply with applicable PUD waiver criteria in LMC Sec. 17.28.110 as described in the Louisville Planning Commission Staff Report dated October 10, 2019; and

WHEREAS, the Planning Commission has considered the application at a duly noticed public hearing on October 10, 2019, where evidence and testimony were entered into the record, including the findings in the Louisville Planning Commission Staff Report dated October 10, 2019.

NOW THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Louisville, Colorado does hereby recommend denial of a request for a Planned Unit Development Amendment to allow changes to the signage that include waivers from the adopted City standards for properties at 1414 Hecla Way; 1408 Hecla Way and 1712 Plaza Drive.

PASSED AND ADOPTED this 10th day of October, 2019.

By: _____
Steve Brauneis, Chairperson
Planning Commission

Attest: _____
Debra Williams, Secretary
Planning Commission

City of Louisville
COLORADO · SINCE 1878

Department of Planning and Building Safety
749 Main Street • Louisville CO 80027 • 303.335.4592 • www.louisvilleco.gov

LAND USE APPLICATION

CASE NO. _____

APPLICANT INFORMATION

Firm: Speedy Sparkle Car Wash - Louisville, LLC
Contact: Robert Kearney
Address: 1414 Hecla Way
Louisville, CO 80027
Mailing Address: 549 N 4th Street
Berthoud, CO 80513
Telephone: (970) 532-4243
Fax: (970) 532-3603
Email: robert@coloansonline.com

OWNER INFORMATION

Firm: Car Wash 2, LLC
Contact: Robert Kearney
Address: 549 N. 4th Street
Berthoud, CO 80513
Mailing Address: 549 N. 4th Street
Berthoud, CO 80513
Telephone: (970) 532-4243
Fax: (970) 532-3603
Email: robert@coloansonline.com

REPRESENTATIVE INFORMATION

Firm: CW Associates, PLLC
Contact: Chip Weincek
Address: 672 W. Pine Street
Louisville, CO 80027
Mailing Address: P.O. BOX 271033
LOUISVILLE, CO 80027
Telephone: (303) 666-8941
Fax: _____
Email: chip@cwa-architect.com

PROPERTY INFORMATION

Common Address: 1414 Hecla Way
Legal Description: Lot 6 Blk _____
Subdivision Louisville Plaza Filing #2
Area: 44,026 Sq. Ft.

TYPE (S) OF APPLICATION

- ☐ Annexation
- ☐ Zoning
- ☐ Preliminary Subdivision Plat
- ☐ Final Subdivision Plat
- ☐ Minor Subdivision Plat
- ☐ Preliminary Planned Unit Development (PUD)
- ☐ Final PUD
- ☒ Amended PUD
- ☐ Administrative PUD Amendment
- ☐ Special Review Use (SRU)
- ☐ SRU Amendment
- ☐ SRU Administrative Review
- ☐ Temporary Use Permit: _____
- ☐ CMRS Facility: _____
- ☐ Other: (easement / right-of-way; floodplain; variance; vested right; 1041 permit; oil / gas production permit)

PROJECT INFORMATION

Summary: -See Attached-
Amendment to correct and update signage.
For site and neighboring properties.

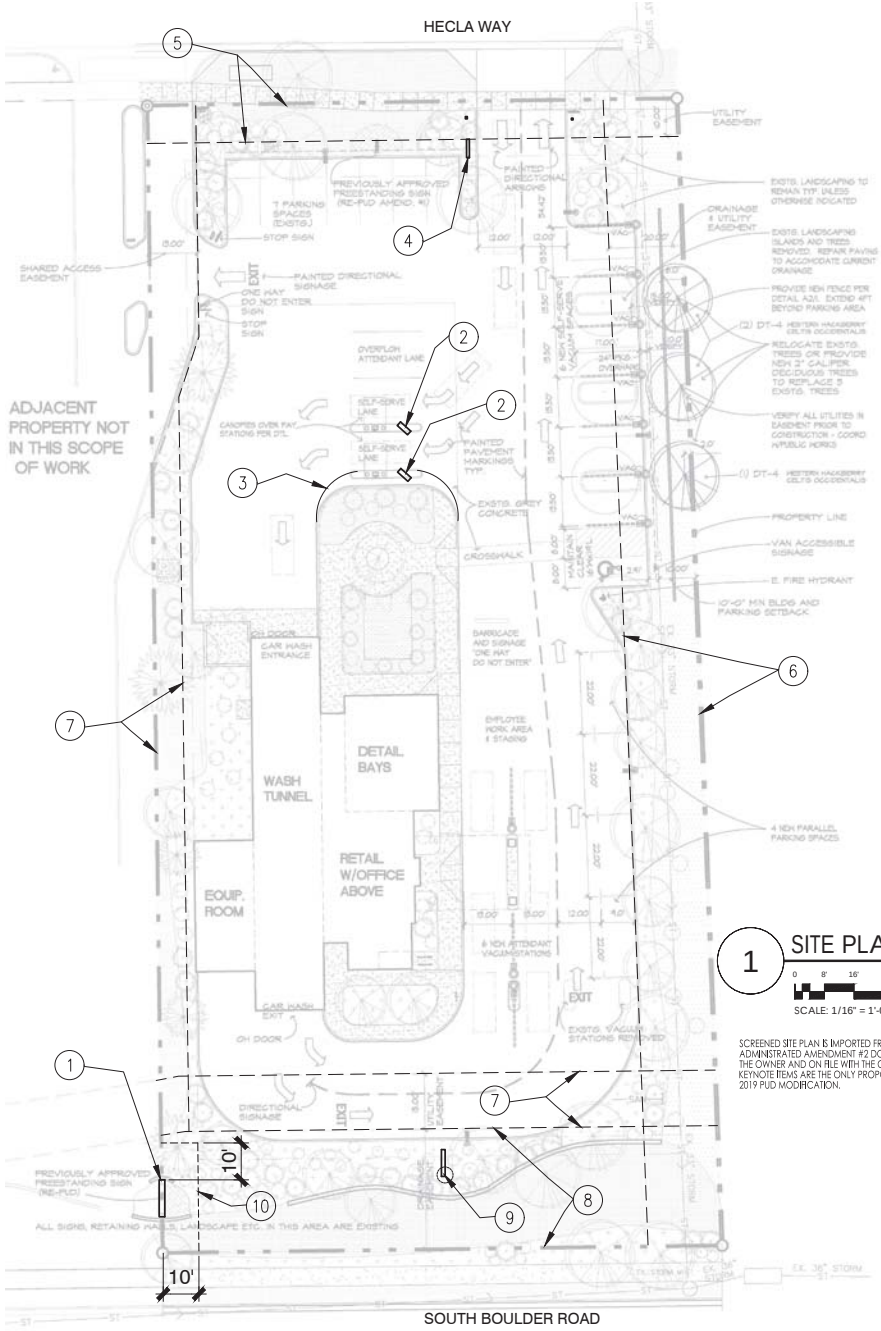
Current zoning: PUD Proposed zoning: PUD

SIGNATURES & DATE

Applicant: [signature] Manager
Print: Robert E. Kearney, Manager
Owner: [signature] Mgr.
Print: Robert E. Kearney, Manager
Representative: _____
Print: _____

CITY STAFF USE ONLY

- ☐ Fee paid: _____
- ☐ Check number: _____
- ☐ Date Received: _____



1 SITE PLAN

SCALE: 1/16" = 1'-0"

SCREENED SITE PLAN IS IMPORTED FROM THE 2017 PUD ADMINISTRATED AMENDMENT #2 DOCUMENTS AS PROVIDED BY THE OWNER AND ON FILE WITH THE CITY OF LOUISVILLE, CO. KEYNOTE ITEMS ARE THE ONLY PROPOSED CHANGES WITH THIS 2019 PUD MODIFICATION.

PLANNED UNIT DEVELOPMENT P.U.D. AMENDMENT #3

Project Data

PROJECT: P.U.D. AMENDMENT - SITE SIGNAGE MODIFICATIONS
ZONING: PLANNED COMMUNITY COMMERCIAL
LOT SIZE = 45,687 SF
USE: CAR WASH
LEGAL: LOT 6, LOUISVILLE PLAZA SUBDIVISION, FILING No. 2
LOUISVILLE, COLORADO
COUNTY: BOULDER COUNTY

Project Team

OWNER:
ROBERT KEARNEY
SPEEDY SPARKLE CAR WASH - LOUISVILLE
549 N. 4th STREET
BERTHOUND, COLORADO 80513
970-532-4243 - phone
robert@speedysparklecarwash.com

ARCHITECT PLANNER:
CWA - CW ASSOCIATES, PLLC
672 WEST PINE STREET
LOUISVILLE, COLORADO 80027
303-666-8941 - phone
CONTACT - CHIP WEINCEK, AIA
chip@cwa-architect.com

SURVEY:
FLATIRONS, INC.
BOULDER, COLORADO
303-936-6997 - phone

PLANNING:
CITY OF LOUISVILLE
PLANNING DEPARTMENT
749 MAIN STREET
LOUISVILLE, COLORADO 80027
303-335-4594 - PHONE
CONTACT - FELICITY SELVOSKI, PLANNER
fselvoski@louisvilleco.gov

Signatures

Ownership Signature Block

By signing this PUD, the owner acknowledges and accepts all the requirements and intent set forth in this PUD. Witness my/our hand(s) seal(s) this ___ day of _____ 20___.

_____
Owner Name and Signature

_____ (Notary Seal)
Notary Name (print)

_____
Notary Signature

My Commission Expires _____

Clerk and Recorder Certificate (County of Boulder, State of Colorado)

I hereby certify that this instrument was filed in my office at _____ o'clock, ____ M., this _____ day of _____, 20___, and is recorded in Plan File _____. Fee _____ paid _____ Film No. _____ Reception _____.

_____
Clerk & Recorder

_____
Deputy

Planning Commission Certificate

Approved this ___ day of _____, 20___ by the Planning Commission of the City of Louisville, Colorado.
Resolution No _____ Series _____

City Council Certificate

Approved this ___ day of _____, 20___ by the City Council of the City of Louisville, Colorado.
Resolution No _____ Series _____

_____ (City Seal)

_____
Mayor Signature

_____
City Clerk Signature

Vicinity Map

KEYNOTES:

1. EXISTING SOUTH BOULDER ROAD MONUMENT SIGN. EXISTING SPEEDY SPARKLE CAR WASH SIGN FACE WITH BE REMOVED.
2. EXISTING/PROPOSED MENU SIGNS. REFERENCE THE ATTACHED DETAIL 2 & 2a/A2.1 FOR THE EXISTING/PROPOSED SIGN DESIGN.
3. AS-BUILT EXISTING CURB LOCATION.
4. PROPOSED HECLA WAY MONUMENT SIGN. REFERENCE DETAIL 1/A2.2 FOR THE APPROVED SIGN DESIGN AND NEW PROPOSED SIGN DESIGN.
5. 10' UTILITY EASEMENT - SEE SURVEY.
6. 20' DRAINAGE EASEMENT AND ACCESS EASEMENT - SEE SURVEY.
7. UTILITY EASEMENT - SEE SURVEY.
8. UTILITY AND DRAINAGE EASEMENT - SEE SURVEY.
9. NEW SPEEDY SPARKLE CAR WASH SOUTH BOULDER MONUMENT SIGN. SEE DETAIL 1/A2.1. REMOVE ONE EXISTING BUSH FOR NEW SIGN.
10. NEW ACCESS EASEMENT FOR KING SOOPERS AND JIFFY LUBE TO ALLOW THEIR PORTION OF SIGN ON THE SPEEDY SPARKLE CAR WASH PROPERTY AND FOR MAINTENANCE OF THEIR MONUMENT SIGN. EASEMENT ALLOWED TILL SIGN IS REMOVED.

NOTES:

1. PLANNED UNIT DEVELOPMENT (P.U.D.) CAR WASH HISTORY:

   BLACK DIAMOND CAR WASH PUD
   5 SEPT 2000
   RES. 55 SERIES 2000
   RECEPTION NO. 2126651

   BLACK DIAMOND CAR WASH ADMIN PUD
   30 MAY 2001
   RECEPTION NO. 2160401

   BLACK DIAMOND CAR WASH ADMIN 2 PUD
   28 SEPT. 2017
   RECEPTION NO. 03617546

2. PLANNED UNIT DEVELOPMENT (P.U.D.) KING SOOPERS FUELING STATION; PUD APPROVAL - OCTOBER 2010. FOR SOUTH BOULDER MONUMENT SIGN.
3. THESE ARE PLANNING DOCUMENTS. CONSTRUCTION DOCUMENTS NOT INCLUDED.

CWA
CW ASSOCIATES, PLLC
Architecture, Planning & Development Services
672 West Pine Street
Louisville, Colorado 80027
303-666-8941, fax 303-665-3020
www.cwa-architect.com

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No	Date	Revisions
1	11-26-18	Progress Set
2	12-11-18	Progress Set
3	1-15-19	PUD Submittal
4	5-20-19	PUD Modification
5	6-4-19	PUD Amen. #3 Modifications
6	6-21-19	PUD Amen. #3 Modifications
7	6-23-19	PUD Amen. #3 Modifications

SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027
TITLE
COVER SHEET & SITE PLAN

Date:	11-26-18
CWA #	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT

Sheet: **A1.0**

1 S.B.MONUMENT SIGN

NTS

PROPOSED SOUTH BOULDER ROAD SPEEDY SPARKLE SIGN SHOWED WITH SIGHT LINE TO EXISTING KING SOOPERS/JIFFY LUBE SOUTH BOULDER MONUMENT SIGN.

KEYNOTES:

1. NEW SPEEDY SPARKLE CAR WASH SOUTH BOULDER MONUMENT SIGN.
2. EXISTING KING SOOPERS/JIFFY LUBE SOUTH BOULDER MONUMENT SIGN.
3. 550' SIGHT LINE FROM NORTH LANE OF SOUTH BOULDER ROAD. THE NEW SPEEDY SPARKLE SOUTH BOULDER MONUMENT SIGN SHOWS NO INTERFERENCE WITH THE SIGHT LINE VISION TO THE EXISTING KING SOOPERS/JIFFY LUBE MONUMENT SIGN.

NOTES:

1. SIGN MANUFACTURE WILL BE RESPONSIBLE FOR FINAL SIGN PANEL DESIGN, PERMIT AND CONSTRUCTION.

CWA

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Architecture, Planning & Development Services
672 West Pine Street
Louisville, Colorado 80027
303-666-8941, fax 303-665-3020
www.cwa-architect.com

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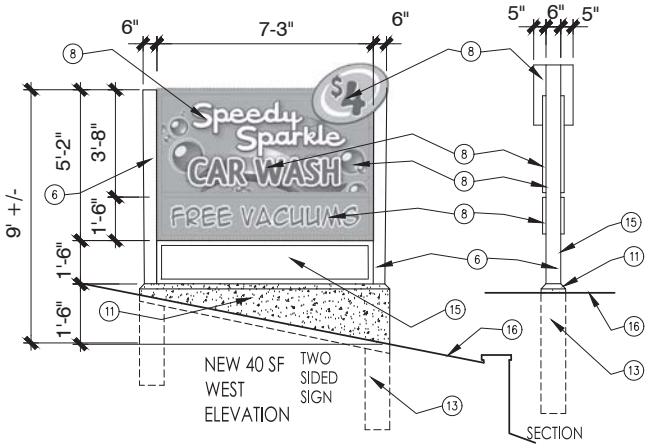
No	Date	Revisions
3	12-10-18	SB Monument LED
4	12-27-18	SB Monument King Soopers
5	12-28-18	SB Monument King Soopers
6	1-15-19	PUD Submittal
7	5-20-19	PUD Modification
8	5-28-19	PUD Modification
9	6-4-19	PUD Amen. #3 Modifications
10	8-21-19	PUD Amen. #3 Modifications
11	8-23-19	PUD Amen. #3 Modifications

SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027

TITLE
SIGNAGE

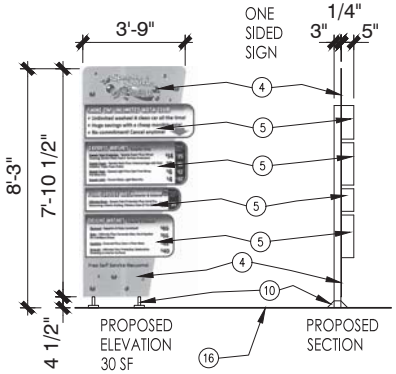
Date:	11-26-18
CWA #	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT
Sheet:	A2.0



1 SB ROAD MONUMENT SIGN - SPEEDY

SCALE: 1/2" = 1'-0"

SIGNAGE PROVIDED BY THE OWNER.
DESIGN BY SCHLOSSER SIGNS, INC
LOVELAND COLORADO 80538



2 DRIVE-UP MENU SIGN

SCALE: 1/2" = 1'-0"

SIGNAGE PROVIDED BY THE OWNER.
DESIGN BY SCHLOSSER SIGNS, INC
LOVELAND COLORADO 80538

2a DRIVE-UP MENU SIGNS

SIGNS SHOWN AS-BUILT

KEYNOTES:

1. N/A
2. N/A
3. N/A
4. METAL PLATE WITH FULL COVER PRINTED GRAPHICS .
5. SIGN BOX - ILLUMINATED.
6. STEEL I-BEAM SUPPORTS PAINT TO MATCH METAL ON BUILDING.
7. N/A
8. METAL CABINET SIGN BOX WITH FULL COVER PRINTED SPEEDY GRAPHICS, BACK-LIT WITH LED LIGHTS.
9. N/A
10. METAL BASE PLATE.
11. CONCRETE BASE CAP.
12. N/A
13. POURED CONCRETE FOUNDATION.
14. PLATE METAL BASE BOX WITH ADDRESS.
15. PLATE METAL BASE BOX.
16. GRADE.

NOTES:

1. SIGN MANUFACTURE WILL BE RESPONSIBLE FOR FINAL SIGN PANEL DESIGN, PERMIT AND CONSTRUCTION.

CWA
CW ASSOCIATES, PLLC
Architecture, Planning & Development Services
672 West Pine Street
Louisville, Colorado 80027
303-666-8941, fax 303-665-3020
www.cwa-architect.com

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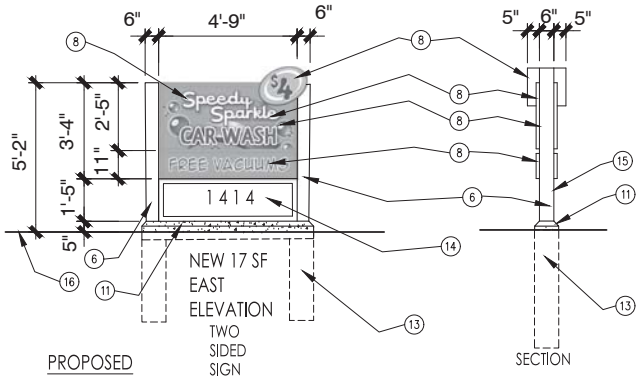
These drawings reflect the architect and consultant services. They have been performed and assembled with due diligence and care, but due to the complexity and number of trades/persons/products involved in construction, perfection is not guaranteed. Every contingency in the complex world of construction cannot be anticipated. The architect shall be notified immediately of any omissions or errors in these plans and drawings. If the architect is not notified in writing of any of the above mentioned items, the architect and consultants shall not be responsible for any consequences.

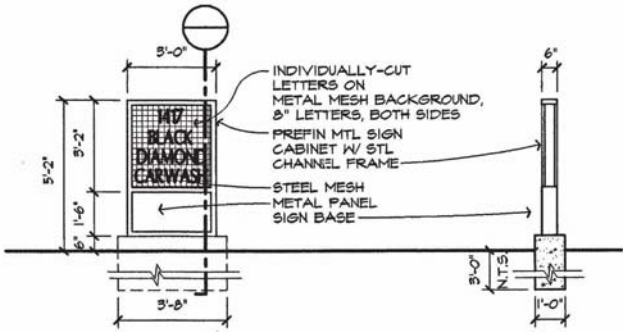
No	Date	Revisions
3	12-10-18	SB Monument LED
4	12-27-18	SB Monument King Soopers
5	12-28-18	SB Monument King Soopers
6	1-15-19	PUD Submittal
7	5-20-19	PUD Modification
8	5-28-19	PUD Modification
9	6-4-19	PUD Amen. #3 Modifications
10	8-21-19	PUD Amen. #3 Modifications
11	9-23-19	PUD Amen. #3 Modifications

SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027

TITLE
SIGNAGE

Date:	11-26-18
CWA #	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT
Sheet:	A2.1





HECLA WAY MONUMENT SIGNAGE IS IMPORTED FROM THE 2001 PUD DOCUMENTS AS APPROVED BY THE CITY AND ON FILE WITH THE CITY OF LOUISVILLE, CO. NEVER BUILT AT THE SITE.

PRIOR PUD

1 HECLA WAY MONUMENT SIGN

0 1' 2' 4'

SCALE: 1/2" = 1'-0"

KEYNOTES:

1. N/A
2. N/A
3. N/A
4. METAL PLATE WITH FULL COVER PRINTED GRAPHICS .
5. SIGN BOX - ILLUMINATED.
6. STEEL I-BEAM SUPPORTS PAINT TO MATCH METAL ON BUILDING.
7. N/A
8. METAL CABINET SIGN BOX WITH FULL COVER PRINTED SPEEDY GRAPHICS, BACK-LIT WITH LED LIGHTS.
9. N/A
10. METAL BASE PLATE.
11. CONCRETE BASE CAP.
12. N/A
13. POURED CONCRETE FOUNDATION.
14. PLATE METAL BASE BOX WITH ADDRESS.
15. PLATE METAL BASE BOX.
16. GRADE.

NOTES:

1. SIGN MANUFACTURE WILL BE RESPONSIBLE FOR FINAL SIGN PANEL DESIGN, PERMIT AND CONSTRUCTION.

CWA

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No	Date	Revisions
1	1-15-19	PUD Submittal
2	5-20-19	PUD Modification
3	5-29-19	PUD Modification
4	6-4-19	PUD Amen. #3 Modifications
5	6-21-19	PUD Amen. #3 Modifications
6	8-22-19	PUD Amen. #3 Modifications

SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027

TITLE: SIGNAGE

Date:	1-15-19
CWA #	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT
Sheet:	A2.2

CWA

28 August 2019

Mr. Rob Zuccaro
Director of Planning & Building Safety
749 Main Street
Louisville, CO 80027

RE: Speedy Sparkle Car Wash
PUD Amendment #3 – Signage
CWA #18021

Dear Mr. Zuccaro,

As we understood at the 7-11-19 Planning Commission meeting, the Planning Commission granted Speedy Sparkle Car Wash a continuance to the 9-12-19 hearing date to modify the PUD Amendment #3 – Signage proposal to reflect discussions we had at this meeting. The following is a brief summary of our understanding of the Planning Commission meeting discussions:

1. Speedy Sparkle inherited the existing 10 sf of monument signage area that currently exists at the existing joint South Boulder Road monument sign.
2. Generally, the Planning Commission agreed the current 10 sf of signage for Speedy Sparkle is not adequate signage for this small business. Businesses need signage to stay in business.
3. Speedy Sparkle inherited the prior PUD conflict. This conflict consists of the existing South Boulder Road Monument Sign being built over the property line between Jiffy Lube and Speedy Sparkle. In which the King Soopers PUD granted an off-site monument sign and readjusted the allocation of sign areas. The original Car Wash PUD allocated a 50/50 shared sign area. The King Soopers PUD provide for an allocation of the shared sign area at 67% King Soopers, 16.5% Car Wash and 16.5% Jiffy Lube. Thus a 33.5% reduction of sign area for the Car Wash from their original PUD.
4. Speedy Sparkle has the largest property (between Speedy Sparkle, King Soopers Fueling Station and Jiffy Lube properties) with the smallest sign area allocated.
5. Speedy Sparkle should be allowed fair and equitable sign area.
6. LED messaging signage is not allowed.
7. Hecla Way monument sign height is too high at the proposed 9'.
8. Menu signs as presented are "Ok" with the Planning Commission and City Staff.
9. The Planning Commission generally agreed the steel beams presented as supports for the monument signs match the architectural features of the existing building architecture.
10. This PUD Amendment #3 – Signage will follow the current sign code (CDDSG – Commercial Development Design Standards and Guidelines) since the new sign code was not adopted at the time of application. General review of the new draft sign code should be considered.

C W A S S O C I A T E S, P L L C
ARCHITECTURE • PLANNING • DEVELOPMENT SERVICES
P.O. Box 271033 • Louisville, Colorado • 80027
303-666-8941 • chip@cwa-architect.com • www.cwa-architect.com

The applicant has met with the City Staff and discussed the following:

1. The applicant is disappointed the Planning Directors limited meeting times during the continuance time frame, didn't allow the applicant time to meet the resubmittal continuance schedule for the 9-12-19 hearing date. The Planning Director has continued the Planning Commission hearing to the 10-10-19 hearing date. Reference the attached City Review Comments document. The applicant started discussions with the City on this PUD Amendment #3 – Signage just over (1) year ago.

2. South Boulder Monument Sign discussions:
    - Staff - Speedy modify their existing sign panel from 10 sf to 15 sf.
        - Speedy Sparkle – King Soopers existing two monument signs = 70 sf (property size is less then haft of Speedy Sparkle). Staff's recommendation for an extra 5 sf of sign area is not fair and equitable sign area for Speedy Sparkle. Staff contends that Gas stations are allowed larger sign areas than other businesses – the applicant sees no reference to this claim within the CDDSG – Commercial Development Design Standards and Guidelines. Reference the attached City Review Comments document. Also reference the attached City proposed signage study survey where the public preferred commercial monument signs to have a moderate increase in sign area and height above the 60 sf area and 12' height per the CDDSG.
    - Staff - Speedy gets their own monument sign to the east on their own property but needs to move the existing monument sign further west.
        - Owner – this current PUD Amendment #3 – Signage modification does not include any sign modifications for Jiffy Lube or King Soopers monument sign. Speedy Sparkle will grant Jiffy Lube and King Soopers a 10' easement around the existing South Boulder Monument Sign to resolve the existing PUD conflict and remove their existing sign panel. The City confirmed with the owner that this easement grant is the legal and appropriate solution to resolve the existing PUD conflict. Speedy Sparkle does not have the legal right to force other property owners to move their existing sign.
    - Staff - Speedy gets their own monument sign to the east on their property but leave the existing sign where it is. (not supported by the City)
        - Owner – with these current PUD modifications Speedy Sparkle has reduced their proposed-on property monument sign from the original proposed 48 sf to 40 sf and has removed the LED message panel. A concrete base was also been added. This monument sign is modest in size and is less than allowed in the CDDSG – Commercial Development Design Standards and Guidelines section 7.2.C.1 which allows for monument signs not to exceed 60 sf. Reference the drawings sheet A2.0 for confirmation the new Speedy Sparkle monument sign has no interference with the

existing King Soopers/Jiffy Lube monument sign with a site line of 550'. This drawing also shows no sign clutter on South Boulder Road with this new proposed Speedy Sparkle monument sign.

3. Hecla Way Monument Sign discussions:
    - Staff – sign should be the max. height of the original PUD monument sign at 5'-2".
        - Owner – Lowered the original proposed sign height from 9' to the City requested 5'-2" height and decreased the sign area from the original proposed 22.5 sf to 17 sf. The building address numbers were added. This sign is located at the primary entry to the business and provides individual business identification and building address, per the CDDSG – Commercial Development Design Standards and Guidelines 7.5.A.2.

4. Menu Signs discussions:
    - Staff – no discussions since the Planning Commission, Staff and applicant all indicate they are OK with the original proposed signs.

Staff has concerns that the community is not interested in Speedy Sparkle's two new proposed monument signs, one at South Boulder road and the other at Hecla Way. Thus, Speedy Sparkle took a survey sampling of their customers to determine what their thoughts are on the proposed signs. 203 customers responded in support of the proposed Speedy Sparkle monument signs. Please reference the attached survey description and the support of 203 customers for the proposed Speedy Sparkle signs.

Please reference the attached drawings reflecting the applicant's sign modifications proposal as referenced above.

With the above comments the applicant has addressed the Planning Commission and Staff discussions. The applicant believes their proposed business signage conforms with the City of Louisville middle of the road-built sign environment sign sizes and meets the current City sign code in the CDDSG – Commercial Development Design Standards and Guidelines. This current family of signs proposed for Speedy Sparkle are consistent and serve to identify, inform and direct the public to this business.

We believe this current PUD Amendment #3 – Signage modifications provide fair and equitable sign sizes for Speedy Sparkle Car Wash and request approval by the Planning Commission.

Sincerely,

Robert Kearney
Owner
Speedy Sparkle Car Wash - Louisville

Chip Weincek, AIA LEED AP
Principal Architect/Planner
CWA

attachments

203 Signatures in Support of Speedy Sparkle Car Wash Signage

For a few hours on several days between July 28 and August 7, my daughter and I asked our customers if they supported additional signage for Speedy Sparkle Car Wash.

The overwhelming result was 203 signatures supporting our request. The support requested:

"I support Speedy Sparkle Car Wash's sign request with the City of Louisville as shown on the attached sheet.

The request is for 50% as much signage as King Soopers Fuel Station currently has.

I believe local small businesses require adequate signage to serve our community and prosper, just like big businesses require adequate signage.

Small businesses should receive fair treatment in their signage requests."

A scan of the laminated sheet is attached.

The response was dramatic a mere handful of customers declined to sign the sheet, usually due to time constraints. This response is a clear indication that consumers doing business in Louisville appreciate adequate signage. Some commented that Google or another app did not do a great job of helping them navigate directly to the car wash's entrance on Hecla Way. Others noted South Boulder Road as requiring better signage and still others noted uncertainty as to how to enter the car wash facility.

This appreciation of how signage helps was reflected in the research done by the City on the upcoming sign code update...consumers appreciate good signage and agree that bigger signs are helpful. No comments were made regarding too many signs or sign clutter.

We are providing these signatures and the address information to the City for sharing with the staff, Planning Commission and City Council. We respectfully request that these signature pages NOT be made public or posted on the internet as part of public disclosure documents. This request is to protect the privacy and security of our customers and their participation in the signing.

The point is that a small sample of our customers over a handful of days brought very strong support to signs, sign sizes and our designs that are dwarfed by the very large number and size of those King Soopers has on its tiny gas station plot. The support is for signs larger than our amended application includes. We submit this as evidence of need, support and interest in the community.

Speedy Sparkle Car Wash – Louisville Signage Support

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Date	Print Name	Street Address	City	Signature
7/28	Julia Moritz	649 Paulina Way	80026	
7/28	TODD THOMAS	1417 WILFRD	80303	
7/28	Joe Mirrelson	547 East St	80027	
7/28		2885 E Midwest	80027	
7/28	Ryann Rice	472 King	80027	
7/28	Robin Galloway	928 Treece	80027	
7/28	James Richards	5624 Kipling	80002	
7/28	Nicole Brayendin	587 Augusta Lane	80027	
7/28	Matt Canfield	435 Strathmore	80026	
7/28		1545 HELLAWAY	80027	
7/28	Gary Genevese	1356 Snowberry	80027	
7/28		1175 Atlantis	80026	
7/28	Randy Baker	608 Sequoia Way	80026	
7/28	Judy Baker	"		
7/28		405 Mulberry Cir. Lafayette	80026	
7/28	Michael Hejjgang	1848 Pioneer	80026	

Signature Sheet Number _____

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Date	Print Name	Street Address	City	Signature
7/28/19	Anya Williams	470 Strathmore Ln	Lafayette	
7/28	Brian Murphy	930 Homer	Lafayette	
7/28	MARTIN KELLY	1202 KENNEDY	LOUISVILLE	
7/28	Melissa Fryer	2345 Dogwood	"	
7/28	Lisa Bondhash	138 S. Washington Ave	Louisville	
7/28	LINDA HUNSINGER	542 HAYTUN	LAFAYETTE	
7/28	Lupe Lomeli	1330 Cimarron	Lafayette	
7/28	CHRIS COPPA	430 BRUCE ST.	"	
7/28	JESUS MERR	11990 S Sombrero	Lafayette	JESUS MERR
7/28	Aimee Miller	2974 Shoshone	Lafayette	
7/28	[illegible]	303-346-4516		
7/28	[illegible]	[illegible]	Boulder	
7/28	MATTHEW KING	1199 Ridgeline	Bloomfield	
7/2	[illegible]	1115 Buckingham Dr	Lafayette	
7/28	COBURN [illegible]	[illegible] CT.	LOUISVILLE	
7/28	Carol House	2034 E Sanborn	Louisville	

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Date	Print Name	Street Address	City	Signature
7/28	Bill Jenkins	1776 Steel St #313	Louisville, CO	
9/29	Betty Luna	473 Pheasant Run	Louisville CO	
7/28	Mary Alford	1642 Anchor	Lafayette	
7/28	Jim Little		Erie	
7/28	Linda Rodmann		Erie	
7/28	Meredith Dans	1509 Madison Ct	LSVC	
	Erica Davila	1403 Garfield Ave	Louisville	
7/28	Brad Herbstritt	2538 Sweetwater	Lafayette	
7/28	Chris Ellis	1977 Powell	Lafayette	
7/28	Adrian Padilla	855 Dillard	Louisville	
7/29	Laura Wendt	1130 W Enclave Ct	Louisville	
7/29	[illegible]	[illegible]	Brighton	
7/29	Amy Tafoya	702 W Cleveland	Lafayette	
7/29	Janice Keefer	1450 Linden	Louisville	
7/29	tamara bodner	2355 Hillstone	Boulder	
7/29	Kelli Ohm	155 Commerce Pkwy	Louisville	

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Date	Print Name	Street Address	City	Signature
7/29	Emily Marshall		Louisville,	
7/29			Boulder	
7/29	Helen Towlerton		Louisville	
7/29	Mark Vanzwaard		Lafayette	
7/29	Steve Stark		Boulder	
7/29	[illegible] Thomas		Erie	
7/8	Wendy Hartman		Erie	
7/29	Cory Cox		Lafayette	
7/29	Andrew Kean		Boulder	
7/29	Will Schoen		Louisville	
7/29	Daniel Skean		Loveland	
7/29	Ivan Ramirez		Louisville	
7/29	Melanie Fang		Louisville	
7/29	Denise Bender		Superior	
7/29	Roland Voss		Louisville	
7/29	KIRK WITTE		LSUL	

Signature Sheet Number _____

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Date	Print Name	Street Address	City	Signature
07/28	Nick Sitchart	296 S Lark	Louisville	
7/29	Ally Wilton	1225 Apollo Dr	Lafayette	
7/29	Lisa McKellar	415 Sunnyside	Boulder	
7/29	C.P. AMARAL	16252 WAY RED MOUNTAIN	BROOMFIELD	
7/29	Jill Ayde	4260 Hanover Ave Boulder, CO	Boulder	
7/29	MILAN Vizcarra	13593 Vizcarra Broomfield		
7/29	Sharlubu Anstu	7100 S Rock Creek Pkwy CT-102, Superior, 80027	Superior	
7/29	Caitlyn Hubbell	380 Pheasant Run Louisville, CO		
7/29	[illegible]	LAFAYETTE		
7/29	Amber Cunningham	1155 Cannon St	Louisville	
7/29	Jonathan Chongdy	3100 S Pierce St	Lakewood	
7/29	Ron Moss	6230 Lantern Lane	Frederick	
7/29	JANE VOHS	2335 Symphonian Cir Longmont		
7/29	Austin Elm		Denver	
7/29	[illegible]	WUDERACEN	LAF	
7/29	Sean Rutledge	2432 Gorgeland	Loveland	

Signature Sheet Number _____

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Date	Print Name	Street Address	City	Signature
7/28	Spencer Helling	1004 Aspen	Erie	
7/28	Jonathan G.	Sir galahad	Lafayette	
7/28	Michael Wengryn	2980 Hawk Ct	Lafayette	
7/28	Treccie Wengryn	2980 Hawk ct	Lafayette	
7/28	Tim Richards	750 S LAFAYETTE	Lafayette	
7/28	John Beaupre	289 Pheasant	Louisville	
8/3	Sarah Weber	2738 Big Horn Cir	Lafayette	
8/3	[illegible]	240 Skylark	Lafayette	
8.3	[illegible]	1760 Steel	Louisville	
8/3	Joe Spirko	1265 Fillmore	Louisville	
8-3	Kevin Wagner	4363 Cicely	Longmont	
8-3	Joseph Campa	816 E. Geneseo	Lafayette	
8/3	Timothy Aldrich	816 E Geneseo	Lafayette	
8/3	Yongil Kim	1112 Steel	Louisville	
8/3	John Fox	1315 Jackson Ct.	"	
8/3	Brian Warrenburg	17576 Via Varia	Broomfield	

Signature Sheet Number _____

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Date	Print Name	Street Address	City	Signature
8/30	Josh [illegible]	1060 [illegible]	Louisville	[illegible]
7/30	JEFF GOODING	786 Meadowlark Dr	Lafayette	[illegible]
7/30	John [illegible]	728 Meadowlark	Lafayette	[illegible]
7/30	[illegible]	7416 P. Place	Boulder	[illegible]
7/30	[illegible]	420 Strathmore Ln #106	Lafayette	Beau Bourdon
7/30	Jan Shirey	224 Fairfield	Lafayette	Jan Shirey
7/30	DIANE BARNWELL	2551 N. Franklin Ave	Louisville	Diane Barnwell
7/30	BJ Smith	1430 Agate Way	Lafayette	[illegible]
7/30	Bonnie A. Wilensky	1100 Delphi Dr.	"	Bonnie A. Wilensky
7-30	Charles Kramer	204 Johnson	Louisville	Charles Kramer
7-30	Susie Lenny	2077 Eagle Ave	Superior CO	[illegible]
7-30	Missy Lewis	514 Hogtree	Louisville	Missy
7-30	Stacy Wyck	1411 Dahlia	Louisville	[illegible]
7-30	[illegible]	385 Rainbow Ln	Lafayette	[illegible]
7/30	SCOTT Elmore	PO BOX 517	Lafayette	[illegible]
7-30	Sue MacDonald	11305 Kestrel	Louisville	Sue MacDonald

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Date	Print Name	Street Address	City	Signature
07/30/18	Shivang	1146n franklin ave	louisville	Shivang Patel
7/30	Bethany	1905 Chakis Dr	Lafayette	Bethany
7/30	Lyra Saul	1545 Heela Way	Louisville	[illegible]
7/30	Jim Moore	492 Dublin Way	Louisville	[illegible]
7/31	Jill Sommer		Lafayette	[illegible]
7/31	Walt Cunningham	4538 Sunset	Broomfield	[illegible]
7/31	Adam Heemsen	310 Bates Ave	Boulder	[illegible]
7/31	Cindy Wise	2294 Eaglesmere	Lafayette	[illegible]
7/31	WILLIAM RYAN	516 GRIFFITH	LOUISVILLE	William B Ryan
7-31	Claudia Bu	1801 Lydia	Lafayette	[illegible]
8/1	Gretchen Heine	302 Lowson	Lafayette	[illegible]
8/1	Stephanie Texera		Boulder	S L Texera
8/1	Noel Brindefair		Superior	[illegible]
8/1	Manuel Escamilla	500 Eisenhower Dr. 80027	Louisville	[illegible]
8/1	Jennica Peterson	325 Buchanan Ct.	Louisville	[illegible]
8/1	[illegible]	[illegible] Rd	Boulder	[illegible]

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I believe local small businesses require adequate signage to serve our community and prosper, just like big businesses require adequate signage.

Small businesses should receive fair treatment in their signage requests.

Date	Print Name	Street Address	City	Signature
8.1.19	Leanna Eakins	7630 Spring Dr.	Boulder	[illegible]
8/1/19	Mackenzie Cooper	645 Viridian Dr.	Lafayette	[illegible]
8/1/19	Mady Sari	993 E Moorhen Cir	Boulder	[illegible]
8/1/19	Linda Strange	630 Colorado Ave	Loveland	[illegible]
8/1/19	Aaron Wilfong	330 County Rd	Louisville	[illegible]
8/1/19	Carolyn Yates	3100 Broadway 103	Boulder	[illegible]
8/1/19	Valerie Whittle	365 Carson St	Louisville	[illegible]
8/1/19	Derek Lariolette	349 Jasper Pl	Lafayette	[illegible]
8/1/19	Kathy Maloney	548 W. Cactus	Louisville	Kathy Maloney
8/3/19	Morgan McBride	11775 Wadsworth Blvd apt 10309	Broomfield	[illegible]
8/3	Sarah Cooney	1223 Cantera Circle	Lafayette	[illegible]
8/3	Pete Ricupero	1140 Hillside Ln Louisville	Louisville	[illegible]
8/3	Joe Bartmess	300 Lilac Circle	Louisville	[illegible]
8/3	Sabrina Bakerstus	733 Marine ST Boulder Co	Boulder	[illegible]
8/3	Elaine Feeney	2348 Shadow Lake Rd Lafayette, Co	Lafayette	[illegible]
8/3	Les Nat	1407 Impala Dr Bellevue NE	Omaha	[illegible]

Signature Sheet Number _____

Speedy Sparkle Car Wash – Louisville Signage Support

I support Speedy Sparkle Car Wash's sign request with the City of Louisville as shown on the attached sheet.

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Date	Print Name	Street Address	City	Signature
8/3	Carol Hammer	103 High Country	Laf.	C Hammer
8/3	Remington Stebo	1035 S. Boulder Rd	Louisville	[illegible]
8/3	Jill Linsley	714 Nighthawk Louisville, CO	Louisville	[illegible]
8/3	Lus Chavez	666 Anington Ave	Lafayette	[illegible]
8/3	Steve Savino	184 W. Elm St.	Louisville	Steve Savino
8/3	Mary Cheney	7811 Redtop Ct, Longmont, CO		[illegible]
8/3	[illegible]	[illegible]	Lafayette	[illegible]
8/3	[illegible]	1923 Pioneer [illegible]	Lafayette	[illegible]
8/3	Lynne Scheriff	3415 17th	Boulder	Lynne Scheriff
8/7	Dave Miles	507 W Geneseo St.	Lafayette	[illegible]
8/7	[illegible]	8543 W Foker Rd	Boulder	[illegible]
8/7	Roger Etzinger	670 W Locust	Louis	[illegible]
8/7	Dave Holsclaw		Lafayette	Dave Holsclaw
8/7	Alex Kampert	223 Summit Cir	Lafayette	[illegible]
8/7	Tim King	3471 Eisenhower	Mead	[illegible]
8/7	Ryan Nudon	1505 Hecla Way	Louisville	[illegible]

Signature Sheet Number _____

Speedy Sparkle Car Wash – Louisville Signage Support

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Date	Print Name	Street Address	City	Signature
8/3	Sean Quinlan	141 S Washington	Louisville	
8/3	Rene Segura	1350 Cimarron	Lafayette	
8/3	Trevor Wenzl	7165 Burgundy	Boulder	
8/3	Madeline Ruiz	2128 Hecla Dr	Louisville	
8/3	Paul Herrera	6936 Baseline	Louisville	
8/3	Gary Fetham	300 Center	Superior	GARY FETHAM
8/3	M Maetz		Boulder	
8/3	Debbie Siegel	1209 James Cr.	Lafayette	
8/3	Judy Thompson		Louisville	J Thompson
8/3	[illegible]	1635 [illegible]	[illegible]	
8/3	Duane Harrison	1145 Achilles Cir	Lafayette	
8/3	Greg Lumb	11206 Colony Cir	Broomfield	
8/3	Anna Royal	1000 Milo	Lafayette	
8/3	Laura C Fox	2907 Shadow	Creek Dr Boulder	
8/3	Brad M Tan	2019 LASALLE	SUPERIOR, CO	
8/3	Nina Heeren	968 Milo Circle Unit B	Lafayette	N. Heeren

Signature Sheet Number _____

Speedy Sparkle Car Wash – Louisville Signage Support

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Date	Print Name	Street Address	City	Signature
8/3	Marlene		Louisville	
8/3	Fabiola		Louisville	Fab P.
8/3	David		Lafayette	
8/3	Brayton Maine		Louisville	
8/3	Shawna		Lafayette	
8/3	Lisa		Louisville	
8/3	Gwen Brandenburg		Lafayette	
8/3			Louisville	
8-3	Margaret Lopez		Lafayette	Margaret Lopez
8.3			Lafayette	
8.3			Lafayett	
8.3	Jm Harry		Louisville	
8.3	Jason Kohler		Lafayette	
8.3	Jesus Mena		Lafayette	Jesus Mena
8/3	Austin Bratton		Broomfield	
8/3	Eric Ellison		Louisville	

Signature Sheet Number _____

Speedy Sparkle Car Wash – Louisville Signage Support

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Small businesses should receive fair treatment in their signage requests.

Date	Print Name	Street Address	City	Signature
8/7	Patti Wade	1057 W. Century Dr	Louisville	Patti Wade
8/7	Betsy Greenwood		Lafayette	Betsy Greenwood
8/7	[illegible]	608 Mills St	Lafayette	[illegible]
8/7	Amanda Martinez	518 W. South Boulder Rd	Louisville	[illegible]
8/7	Joe Rudolph	6/6 Marine St Boulder Co	Boulder	[illegible]
8/7	Kip Lawlay	1245 James Cir	Lafayette	[illegible]
8/7	Zach Aliott	309 Wanekah Pkwy Lafayette		[illegible]
8/7	Evan House		Arvada	[illegible]
8/7	Kiki Ryland	539 Sawtooth Point	Lafayette	[illegible]
8/7	Devon Flynn		Lafayette	[illegible]
8/7	Brooke Anderson		Broomfield	[illegible]

Signature Sheet Number _____

CITY REVIEW COMMENTS:

From: Rob Zuccaro <rzuccaro@louisvilleco.gov>
Sent: Thursday, August 22, 2019 4:29 PM
To: Robert <robert@speedysparklecarwash.com>; 'Chip Weincek' <chip@cwa-architect.com>; 'Robert Kearney' <robert@coloansonline.com>; Stan Zemler <szemler@louisvilleco.gov>
Subject: RE: PUD re-submittal

Robert,

I understand this was confusing. There was discussion at the meeting on whether to continue to a date certain or to table for a future date. We typically continue to a date certain only if more information or time is needed. If the proposal itself is amended, we need to advertise the public notice again and hold a new public hearing.

Since we didn't know at the hearing if you wanted to amended your proposal, the Commission continued to September in case you chose not to amend your proposal and wanted to complete the hearing that was already started. Again, because you are amending your proposal, this will be a new hearing with a new public notice requirement.

If you have additional questions please let me know.

Thanks,

Rob

Robert Zuccaro, AICP
Planning & Building Safety Director
rzuccaro@louisvilleco.gov
303-335-4590 (direct)
303-335-4592 (office)

City of Louisville
COLORADO • SINCE 1878

From: Robert [mailto:robert@speedysparklecarwash.com]
Sent: Thursday, August 22, 2019 4:10 PM
To: Rob Zuccaro <rzuccaro@louisvilleco.gov>; 'Chip Weincek' <chip@cwa-architect.com>; 'Robert

Kearney' <robert@coloansonline.com>; Stan Zemler <szemler@louisvilleco.gov>
Subject: RE: PUD re-submittal

Gentlemen:
Thanks for this information. It was my clear understanding from the Planning Commission folks at the meeting that a continuation of the hearing would not require new advertising or notice, since it is the same hearing and was so noted by the Planning Commission as being continued.

All the best,
Robert
Speedy Sparkle Car Wash
Loveland and Louisville, Colorado

Robert E Kearney
Cell 303-902-9100
Business Office:
549 N 4th Street
Berthoud, CO 80513

(970) 532-4243
Fax (970) 532-3603

www.speedysparklecarwash.com

From: Rob Zuccaro <rzuccaro@louisvilleco.gov>
Sent: Thursday, August 22, 2019 11:50 AM
To: Chip Weincek <chip@cwa-architect.com>; 'Robert Kearney' <robert@coloansonline.com>; Stan Zemler <szemler@louisvilleco.gov>
Cc: 'Robert Kearney' <robert@speedysparklecarwash.com>
Subject: RE: PUD re-submittal

Hello Chip,

With a resubmittal we will need to publish an additional round of public notice for the next meeting. The deadline to meet public notice requirements for the September meeting has passed. Here is a recommended schedule:

Submit revisions by August 30.
Staff will provide review comments by Sept 6th.
Provide revisions, if any, by Sept. 20th.
Publish Public Notice on Sept. 25
Planning Commission Hearing on Oct. 10.

Thanks,

Rob

Robert Zuccaro, AICP
Planning & Building Safety Director
rzuccaro@louisvilleco.gov
303-335-4590 (direct)
303-335-4592 (office)

City of Louisville
COLORADO • SINCE 1878

From: Chip Weincek [mailto:chip@cwa-architect.com]
Sent: Tuesday, August 20, 2019 10:53 AM
To: Rob Zuccaro <rzuccaro@louisvilleco.gov>; 'Robert Kearney' <robert@coloansonline.com>; Stan Zemler <szemler@louisvilleco.gov>
Cc: 'Robert Kearney' <robert@speedysparklecarwash.com>
Subject: RE: PUD re-submittal

Hello Rob,
Please, let us know the City schedule for our granted PC 9/12 extension track?
Thank you,

Chip Weincek, AIA, LEED AP
Principal Architect/Planner
CWA
CW ASSOCIATES, PLLC
ARCHITECTURE • PLANNING • DEVELOPMENT SERVICES
P.O. Box 271033 • Louisville, Colorado • 80027
303-666-8941
chip@cwa-architect.com
www.cwa-architect.com

"Crafting Spaces, Achieving Sustainability and Creating Value"

From: Rob Zuccaro <rzuccaro@louisvilleco.gov>
Sent: Tuesday, August 20, 2019 8:48 AM
To: Chip Weincek <chip@cwa-architect.com>; 'Robert Kearney' <robert@coloansonline.com>; Stan Zemler <szemler@louisvilleco.gov>
Cc: 'Robert Kearney' <robert@speedysparklecarwash.com>
Subject: RE: PUD re-submittal

Chip,

Let me know when you plan to submit revised plans and I'll put together the review schedule from that date forward.

Thanks,

Rob

Robert Zuccaro, AICP
Planning & Building Safety Director
rzuccaro@louisvilleco.gov
303-335-4590 (direct)
303-335-4592 (office)

City of Louisville
COLORADO • SINCE 1878

From: Chip Weincek [mailto:chip@cwa-architect.com]
Sent: Monday, August 19, 2019 12:37 PM
To: Rob Zuccaro <rzuccaro@louisvilleco.gov>; 'Robert Kearney' <robert@coloansonline.com>; Stan Zemler <szemler@louisvilleco.gov>
Cc: 'Robert Kearney' <robert@speedysparklecarwash.com>
Subject: RE: PUD re-submittal

Hi Rob,

Yes, we plan to revise the application. Please let us know the schedule.
Thank you,

Chip Weincek, AIA, LEED AP
Principal Architect/Planner
CWA
CW ASSOCIATES, PLLC
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chip@cwa-architect.com
www.cwa-architect.com

"Crafting Spaces, Achieving Sustainability and Creating Value"

From: Rob Zuccaro <rzuccaro@louisvilleco.gov>
Sent: Friday, August 16, 2019 9:41 AM
To: Chip Weincek <chip@cwa-architect.com>; 'Robert Kearney' <robert@coloansonline.com>; Stan Zemler <szemler@louisvilleco.gov>
Cc: 'Robert Kearney' <robert@speedysparklecarwash.com>
Subject: RE: Meeting times the week of August 5

Chip and Robert,

I'm sorry we didn't have a more productive meeting this week, but we still need to determine how you would like to move forward. Do you want to make any updates to your application or come back to Planning Commission with the same proposal? If you want to make some amendments let me know and I can provide a schedule for review of those changes.

Thanks,

Rob

Robert Zuccaro, AICP
Planning & Building Safety Director
rzuccaro@louisvilleco.gov
303-335-4590 (direct)
303-335-4592 (office)

City of Louisville
COLORADO · SINCE 1878

From: Stan Zemler <szemler@louisvilleco.gov>
Sent: Tuesday, August 13, 2019 11:21 AM
To: Chip Weincek <chip@cwa-architect.com>; 'Robert Kearney' <robert@coloansonline.com>
Cc: 'Robert Kearney' <robert@speedysparklecarwash.com>; Rob Zuccaro <rzuccaro@louisvilleco.gov>
Subject: RE: Meeting times the week of August 5

Robert

I'm concerned that I may have not been accurate in representing an option yesterday.

For discussion today:

1. You modify the existing sign as has been represented by Planning.

2. You get your own sign to the east but move the existing sign further west.

3. You get your sign to the east but leave the existing sign where it is. (not supported by the City).

Also your sign Hecla would be the as previously recommended by planning.

Stan Zemler

From: Rob Zuccaro <rzuccaro@louisvilleco.gov>
Sent: Friday, July 26, 2019 12:20 PM
To: Chip Weincek <chip@cwa-architect.com>; robert@speedysparklecarwash.com
Subject: Speedy Sparkle Sign Follow Up

Chip and Robert:

As you have requested I'm looking to set up two meetings next week. One is to meet with the City Manager to discuss your concerns with the current sign PUD that includes the South Boulder Road sign. The second is to continue our discussion on the sign design proposal with your PUD application. I'm hoping we can schedule these two meetings back to back so that we can all make the best use of our time.

Options next week include:
7/30 3-4 with City Manager and 4-5 to discuss sign design
8/1 3:30-4:30 with City Manager and 4:30 – 5:30 to discuss sign design
8/2 10-11 with City Manager and 11-12 to discuss sign design; 2-3 with City Manager and 3-4 to discuss sign design.

I am also recommending that you consider an amendment to your application based on the feedback I provided today. Here are just a few signs that I think provide good examples of multi-panel and stand-alone signs that provide guidance on sign size. These signs provide good visibility based on road speeds and distance.

- Safeway Sign Panel – Dillon Rd, 12 sq. ft. 9" letter height 11" logo height
- Alfalfas Sign Panel, 8.25 sq. ft. 7" Letters
- Alfalfas Stand Alone Sign, 10.5 sq. ft. 10" letters
- Centennial Pavilions Shopping Center sign panels, 5 sq. ft. up to 10" letters.
- Great Western Bank Stand Alone, 24 sq. ft. and 13" text
- The Shops and Centennial Valley, 5 sq. ft. and 7" letter and 9" logo
- 1st National Bank Stand Alone, 25 sq. ft. and 8" letter and 18" logo

Based on these examples, only 1st National had a sign panel height greater than 2' and is a stand-alone sign set back further from the road than your sign. I would recommend a 1.5'x10' panel for your sign, which would accommodate sign text and logo heights up to 12", which is larger than most signs I've noted as comparable. It also allows you to continue to use the existing sign base. In addition, based on sign industry standards would provide a visible sign from up to 525' and maximum impact visibility at 120' which provides drivers significant time to view and react to the sign. We also discussed up to a 2'x10' panel at our meeting. I am happy to have further

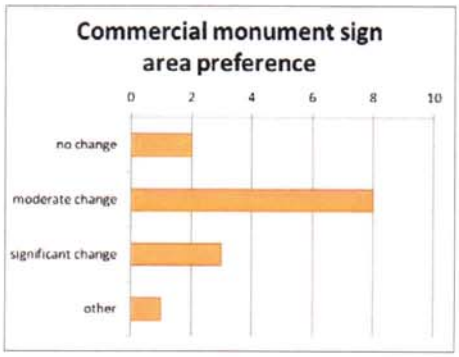
discussions on the possibility of this size sign if you believe it makes the sign more desirable and is part of a comprehensive sign plan. Please note that a 2'x10' would be amongst the largest, if not the largest multi-panel sign panel we have on South Boulder Road if you exclude gas station signs. While I understand you may disagree, gas station signs are traditionally larger than other signs based on the gas price component of the sign that is unique to that industry. For the Hecla sign I recommend not exceeding 5' in height considering the nearby residential area.

Please let me know if any of these times noted above work for a meeting.

-Rob

Robert Zuccaro, AICP
Planning & Building Safety Director
rzuccaro@louisvilleco.gov
303-335-4590 (direct)
303-335-4592 (office)

City of Louisville
COLORADO · SINCE 1878

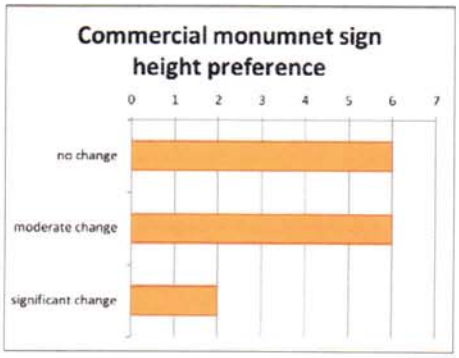


Current:
maximum sign area 60 sf

Moderately increase sign area

Significantly increase sign area

Comments:
- Consider increase and decrease in standards
- Unknown-depends on building/location
- It's a waste of time and resources to have continuous waivers



Current:
maximum sign height 12 ft

Moderately increase sign height

Significantly increase sign height

Comments:
- to reduced

Speedy Sparkle Car Wash

1414 Hecla Way
Louisville, CO 80027

Date:	3 December 2018. Rev. 12/11/18
Project:	Speedy Car Wash, Louisville, CO
CWA No:	18021
Prepared By:	**CWA** cwa-architect.com

Monument Signs

Shared Monument Sign = 60 sf
Speedy Sign Area = 10 sf
S. Boulder Rd.

CWA

Monument Signs

King Soopers Gas Monument Sign = 29 sf
Corner Plaza/Helca

Louisville Car Wash Monument Sign = 77 sf
Cannon Cir.

Monument Signs

Atomic Carwash Monument Sign = 21 sf
West Dahlia

Atomic Carwash Menu Sign = 8.5 sf
West Dahlia

Monument Signs

Office Evolution (Total = 105 sf)
Monument Sign 1 = 92.5 sf
Monument Sign 2 = 12.5 sf
McCaslin Blvd.

Christopher Plaza (Total = 197 sf)
Monument Signs – (2) at 73.5 sf each = 147 sf
One each at Hwy 42 & S. Boulder
Epower Yoga, etc. Monument Sign = 50 sf

CWA

Monument Signs

Centennial Market Place (Total = 270.5 sf)
(3) Monument Signs at 70 sf = 210 sf
Chase Monument Sign = 30 sf
Paul's Coffee Monument Sign = 30.5
McCaslin/Cherry/Dillon

CWA

Monument Signs

Louisville Middle School
LED Sign Screen on Monument Sign
Main Street

Menu Signs

Speedy Sparkle Car Wash (Total = 70.5 sf)
Menu Signs – (2) at 30 sf each = 60 sf
Pay Machine – (2) at 4.5 sf each = 9 sf
Fast Pass – (2) at .8 sf each = 1.5 sf

CWA

Menu Signs

Conoco Car Wash (Total = 70.75 sf)
Enter Sign = 19.5 sf
Wall Signs Menu/Instructions = 18 sf
Pay Machine/Caution Signs = 7.75
Enter Sign = 7.5 sf
Menu Sign = 18 sf
McCaslin Blvd.

Menu Signs

McDonalds (Total = 131 sf)
Menu Signs – (2) at 52 sf each = 110 sf
Order Machine – (2) at 4 sf each = 9 sf
Lane/Logo/Drive Thru = 12 sf
Dillon Rd.

Menu Signs

Burger King (Total = 72.5 sf)
Menu Sign = 41.5 sf
Pole Sign = 7 sf
Order Sign = 24 sf
S. Boulder Rd.

Mad Greens (Total = 69 sf)
Menu Sign = 38 sf
Picture Sign = 9.5 sf
Order Sign = 9.5 sf
Direction Sign = 12 sf
McCaslin Blvd.

CWA

Speedy Hecla Way Monument Sign

Location of Proposed Speedy Sparkle Car Wash
Hecla Way Monument Sign

Location of NAPA Auto
Hecla Way Monument Sign

Location of King Soopers
Fueling Station
Hecla Way Monument Sign

CWA

MEMO

Date: 2 January 2018
To: City of Louisville, Colorado
From: Robert Kearney, Owner
Project: **PUD Amendment #3 - Signage**
Re: Speedy Sparkle Car Wash, Jiffy Lube and King Soopers Fuel Station – Signage

History

The original PUD for the Black Diamond Car Wash provided for a shared monument sign. This PUD allocated ½ the space to the car wash and ½ the space to the property which now includes Jiffy Lube and King Soopers Fuel Station.

Upon King Soopers' development of its site a PUD was required by the City and included the same monument sign on S Boulder Road, however, the sharing of the sign was dramatically changed, providing the bulk of the space to King Soopers' gas prices.

In addition, the signage allocated to the car wash property along Hecla Way was never installed. The super small face of the sign probably made it unreadable and therefore, ineffective information for a passing motorist. Speedy Sparkle proposes a solution in the same footprint as the original sign, but in a format that can be read by a Hecla Way Motorist.

Issues and PUD Conflicts

Recorded PUD Conflict Resolution Agreeable to All parties:

The City of Louisville approved the same sign to be shared in a different manner during two different PUD submissions and did not obtain a signature consent from Black Diamond Car Wash on the PUD document filed for the King Soopers Sign PUD document.

In the case of the King Soopers sign, it is both an "off premises" sign and in conflict with the original PUD. It violates the use of the sign according to the Black Diamond Car Wash signage portion of the PUD, which was recorded against both properties.

The opportunity is to rectify the conflict between the two PUD documents, one covering both properties and the other only affecting the King Soopers/Jiffy Lube property and violating the PUD for the Car Wash property.

None of the parties' benefits from the PUD conflict and now have an opportunity to bring the signage up to modern standards agreeable to all parties with both adequate size space for the signage and LED informational screens, which allow varied messages of interest to consumers.

Owner Proposes a Winning Solution for All

There are a number of solutions available for correcting the conflict between the separately recorded PUD's and their treatment of the signage. Fortunately the PUD process allows the flexibility to resolve this conflict created by the old PUD. The goal is to minimize the disruption, expense to each of the three businesses, resolve past PUD conflicts and to improve the visibility of the signage for the businesses along S. Boulder Road.

Kroger/King Soopers, the Jiffy Lube franchisee and Speedy Sparkle Car Wash - Louisville all encourage the City to support our plan to resolve this issue by increasing the size of the allowed sign on South Boulder Road, which will resolve the issue/conflict and allow all of us better exposure to the traffic.

The mock up attached shows an allocation of the space equitably to each of the three businesses, maintains a single monument sign, improves the visibility of the signage improving traffic safety, provides LED gas price readout screen and allows an LED option on the sign face for any of the three parties who may choose to adopt this modern technology. This solution also allows Kroger/King Soopers to retain its gas price sign (we all support this outcome), rather than forcing them to reduce their sign area and deal with off premises sign issues.).

By resolving the problems of conflicting signage allowances under the PUD we will see that not one of the three businesses is shortchanged.

Catch Up Signage Issues for Speedy Sparkle Car Wash – Louisville:

Confusion regarding the menu boards for customers to select a wash in advance of the payment terminals lead to us not including them in the original administrative PUD amendment. Graciously, Louisville's staff simply asked us to deal with these on this PUD Amendment #3 – Signage.

First, the payment terminal menu signs are shown on an attached site plan. They are a vital and fundamental part of the customer service process. We would like to include them on this PUD Amendment #3 that will be required above, resolving the PUD conflict.

Second, the original sign along Hecla Way was probably never installed due to its size and extraordinarily small size. We have an alternative which will have the same footprint and location, but will be taller, allowing a readable sign along the access road. This allows use of the sign space originally allocated to signage in a way that will be helpful to motorists and the business. This Speedy Hecla Way monument sign's small footprint remains much smaller than all the signage on the adjacent fuel center or the NAPA store, but we feel fits adequately for this roadway and provides visibility from Plaza Drive roadway.

Hey, Chip,

Here is my last official act before vacation.

You have the studies and reports regarding signage. Here are a few excerpts, which may prove useful and illuminating to some of the folks down at Louisville City Hall:

Federal Highway Administration studies indicate that 41% of accidents occur due to lack of adequate signage. The most important element identified by the FHWA is the distance between the sign and the viewer. Of course, we are not putting in roadway control signs, but the idea of having easily readable signs within the cone of vision of drivers is important to road safety.

DSD – is the Decision Sign Distance is the time to read, react, and take safe action.

Minimum sign legibility to meet the DSD is one inch of letter height per 40 feet of distance.

Manual on Uniform Traffic Code Devices For design purposes, considers the cone of vision, which is narrow for drivers, which means sign proximity to the roadway, size and legibility are fundamentally important to safety.

Sign Quality affects ability to attract shoppers –

54% of shoppers failed to find a business in 4 year study due to small or unclear sign!

38.5% of shoppers make quality assumptions about a business based on clear and attractive signs!

Consumers' Issues with signage –

83% say letters too small

71% identify poor sign placement

64% find illumination inadequate at night

53% indicated digital sign messages change too fast

Digital Signage and Traffic Safety study - Statistical Analysis of the Relationship between On-Premise Digital Signage and Traffic Safety - from the Texas A&M Civil Engineering Department in December 2017.

The largest study of digital signage impacts on safety undertaken to date in the USA.

Conclusion – There is no statistically significant change in crashes due to on-premises digital signs. Zero.

Value of On-Premise Signage – from the Economics Center of the University of Cincinnati

This was a National Business Survey of sign changes –

60% of businesses reported a sales increase of greater than 10%

Higher sales lead to employment increases

Signage particularly important to smaller companies' success in local market

Electronic Message Boards Impact on Sales – University of Cincinnati Economics Center

Across multiple industries, message boards lead to an average sales increase of 2.1%

Shopper Perceptions of Electric Message Boards –

Detracts from community attractiveness?	7% Yes	81% No
Shows store cares about community	55% Yes	10% No
Message Board should have community messages	67% Yes	11% No

Item and Price messages generate 55% more sales of that item than Item only messages….in controlled tests.

I hope some of these are helpful to educate the staff, commission and council.

All the best, I will be back in the office June 24th.

Thank you so much!

Robert

The Economic Impact of Exterior Electronic Message Boards

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Executive Summary

Electronic message boards are increasingly used by businesses as exterior on-premise signage. Are these signs, which allow businesses to communicate more information at a lower cost, associated with better store performance? This research provides new insights into the benefits of investing in electronic message boards, based on the latest performance metrics from a major retailer.

- The analysis used data from 19 stores which implemented an electronic message board sometime between July 2010 and February 2012. During this period, each of the test stores went from having either no message board or a manual message board to an LED message board.

- By using a control-treatment store methodology, the Economics Center found a 2.1 percent increase in weekly store sales in the first year after installing an electronic message board.

- The increase in store performance from the electronic message board was consistent across various measures including: weekly store sales, weekly transactions, and transactions for both convenience sales and destination sales.

- Based on these estimates, the break-even figure for an electronic message board installation may be as low as 3 months and as high as 15 months – depending on labor capacity and other fixed costs. Therefore, in most cases, the installation of such a sign generally pays for itself in less than a year and contributes positively to the business bottom line for the remainder of its life cycle.

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Introduction

Certain types of retail businesses prefer high-traffic locations. Such businesses have long used supplemental message boards to inform prospective customers about their location and products. Businesses like gas stations and banks regularly provide information about the availability and price of particular items, such as gas, convenience items, loans, and savings certificates. The display of this information plays a central role in these companies' business strategies for increasing traffic and sales. Indeed, the value of a corner or other highly-visible location rests largely on the ability to use signs to inform passers-by about the availability of a business' goods and services.

One particularly important characteristic of these supplemental message boards is that they provide key information to consumers, thus lowering their cost of finding products they want to buy. This function has benefits for businesses, consumers, and the communities in which they are located (Rexhausen et al, 2012).

The subject of this case study is one of the largest retailers in its industry, with hundreds of locations across the country. It offers its customers a broad range of merchandise that includes both convenience and destination-type consumer products. This large retail chain operates in a highly competitive industry, where nearly all of the goods and services offered by its stores are also available from other retail establishments. In this environment, providing information to prospective customers about the availability of its products is essential to maintain profitability. Stores are situated in high-traffic locations, with good visibility that enables the company to employ a variety of signage strategies to drive foot traffic and sales.

At most locations, the subject retailer has at least three types of on-premise signage. First, the one or two most visible sides of the building receive standard branding and descriptive wall signage. Second, pylon and/or monument signage with the company's branding is employed along the major thoroughfare. Third, a two-sided electronic message board is placed below the largest corporate logo on a pylon or monument sign.

For the subject retailer, these signs were historically manual message boards, with plastic letters that were changed by store personal to convey new information. These messages were occasionally disrupted by windy weather and vandalism, and repairs or message changes were time consuming. Message consistency across the chain was also difficult to maintain. In recent years, the subject retailer has incorporated electronic message boards as part of its exterior signage program.[1] These electronic message boards are a key element in informing customers about things such as sales on particular products and the availability of new items. The electronic boards can be centrally controlled to ensure proper messaging, while simultaneously being customizable at the store level to provide information of value to the local community.

[1] LED signs are the most common type of variable-message electronic signs, which are sometimes referred to as digital signs.

Previous Research

In a 2011 report on "EMC and Digital Sign Issues," Freeborg, Moeller, and Drury identified a range of business and community impacts that may constitute reasons for expanding the use of electronic message boards. For businesses, these benefits include an enhanced ease of changing the sign message, which creates an opportunity to more effectively respond to the needs of potential customers, and the potential for including images, all of which lead to increased sales.

For communities, the benefits are even more numerous. Increased sales for businesses lead to increased tax revenues. By improving business viability, these signs can also reduce vacancies and blight in commercial areas. Such signs can also serve community interests by improving sign visibility, readability, and attractiveness, and by communicating public service messages. In addition, fears about safety issues appear to be misplaces, because five major studies between 2007 and 2010 found no statistical relationship between vehicular accidents and digital billboards. (Freeborg, Moeller, and Drury, 2011).

In his research, Hendrikus E.J.M.L. van Bulck (2011) surveyed 36 business establishments in Sumter SC, a dataset believed to constitute the majority of electronic sign users in the city. Van Bulck collected data on business and sign characteristics as well as attitudes about the potential benefits of these signs. Using factor analysis, van Bulck found two dimensions that underlie respondents' attitudes about their electronic signs. The first factor – Cost-Effective and Easy – reflects their views about the cost of such signs and the low level of effort required for updating their messaging. The second factor – Helps Customers – captures their attitudes about the value of electronic signs for enhancing the visibility of their businesses. Van Bulck also found that two sign characteristics were significantly related to respondents' perceptions of the signs' effectiveness. His most significant finding was that signs with one-line or three-line messages were considered less effective than signs of other lengths. He also determined that two-sided signs were seen as significantly more effective than one-sided signs (van Bulck, 2011).

Hawkins, Kuo, and Lord (2012) have studied the relationship between the installation of on-premise digital signs and traffic accidents. Through extensive research, Hawkins and his colleagues were able to identify 135 locations with accident data available, and where new digital signs were installed in either 2006 or 2007. Examining this multi-state dataset, which contained 12 times as many sites as the combined count in all related studies in the previous ten years, they found that the installation of these digital signs had no effect on the number of traffic accidents within a tenth of a mile of the sign locations. These findings held for both single-vehicle and multi-vehicle crashes.

In a 2012 study on "The Economic Value of On-Premise Signage," Rexhausen, Hildebrandt, and Auffrey included two case studies that considered the effects of electronic message boards. The first case study examined data from roughly 170 locations of an extended-stay lodging chain. Those with electronic signs had higher average occupancy rates than those with plastic signs, and this difference was most pronounced in the bottom quartile of locations. The study notes that "the performance gain from the use of electronic signs was in the range of one to two percent in the top three quartiles, but in jumps up to a ten percent advantage in the lowest quartile."

The second case study concerned the installation of a pylon video board to promote a car dealer's service business. Positive metrics for the sign change included an increase in the number of customers in the first ten months that averaged 4.5 percent every two months, an overall year-over-year increase of 6.5 percent, and a service revenue growth of 10.8 percent, compared to a 5.5 percent increase in a related national indicator.

In the course of implementing its conversion to electronic message boards, the retailer conducted exit surveys with shoppers to gain a better understanding of their views about message boards. As shown in the tables below, shopper perceptions of message boards were positive overall, and their awareness of electronic message boards was greater than for manual boards.

Table 1

Shopper Perceptions		
	Yes	No
Message board detracts from community attractiveness	7%	81%
Message board shows store cares about community	55%	10%
Message board should have community messages	67%	11%

Table 2

Shopper Awareness			
	Electronic	Manual	Gain
Read the sign	41%	28%	**+13%**
Remember the message	21%	10%	**+11%**

Overall, 30 percent of exiting shoppers read the sign, but the rate was nearly 50 percent higher among those using a store with an electronic board. Among demographic groups, the sign was more likely to be noticed by parents, African Americans, and frequent shoppers. In addition, consumers indicated a preference for monument message boards in suburban settings.

This corporate research also revealed that customers are selective about their use of these electronic signs: they report that such signs are ignored when consumers don't have any interest in store offerings or when the street has congested traffic conditions. Conversely, the messages receive attention when the prospective customer wants the information – at the point of decision about whether to stop at the business.

Finally, it was determined that prospective shoppers want timely messages about "mass appeal" products, and that "item and price" messages have a greater impact on customers. In a controlled test, such a message produced 55 percent more sales than a message that only named the item, with no price information.

Research Data Description

The analysis conducted in this paper utilizes data from 19 test stores (i.e., stores which received a new electronic message board) and 55 control stores (i.e., stores which were similar to the test stores in demographics and sales, but did not undergo a sign change). The test stores did not undergo complete signage makeovers; changes only affected the message boards, which generally represent less than one fourth of a store's total signage area.

The data in this sample ranged from July 2009 through June 2013 and was aggregated on a weekly basis. During this time period, each of the test stores went from having either no message board or a manual message board to an electronic message board. Of the sample of 55 control stores, 22 had electronic message boards and 23 either had a manual message board or no message board.

Weekly data for test stores and their corresponding control stores were normalized relative to the week in which the test store had an electronic message board installed. The week of the installation was denoted as week zero (0). For the analysis, weeks prior to the installation where denoted and -1, -2, … relative to week zero (0) and weeks following the installation were denoted 1,2,… relative to week zero (0). No other normalization techniques were utilized. Each test store was matched with an appropriate control store. For example, for a test store located in an area where residents earn only $30,000 a year, the residents' incomes for the matching control stores were nearly identical.

No data was available on a number of other factors that could affect store performance. Competition, site characteristics, management, and temporary factors such as road construction were not included in the analysis.

Outcomes of Interest

The performance variables examined in this analysis include:

- Total Store Sales
- Total Store Transactions
- Convenience Sales (All sales excluding destination sales)
- Convenience Transactions (All transactions excluding destination transactions)
- Destination Transactions

Summary Statistics

Table 3

Variable	Test Stores (Avg.)	Control Stores (Avg.)
Weekly Store Sales*	96	100
Weekly Store Transactions*	96	100
Median Age	34	34
Median Income	$62,851	$63,370
Percent White	77%	74%
Percent African American	12%	15%

* For confidentiality reasons, the control store sales and transactions data has been normalized to an index of 100.

Methodology

In developing our methodology, the Economics Center utilized an approach similar to a *Differences-in-Differences* model. In this model, we compared the performance of a test store which installed an LED message board across outcome variables for differing time periods relative to one or more control stores. The differences between the performance of the test store relative to the control store(s) was then measured and tested for statistical significance.

Identifying comparable stores to use in the analysis was an essential preparatory step in this study. The research team determined that a multi-faceted set of criteria offered the greatest potential for matching test stores to appropriate control stores. The criteria for identification of control stores are divided into two equally weighted categories: market area characteristics and store performance metrics.

Market area characteristics consisted of income, race/ethnicity, and geographic region. The retailer created a category known as "Demographic Peer Group," which combines all three of these characteristics, and this was given a weight of 0.35. Some examples of peer groups are:

- "Above Average Income ($60-80K), White (>80%), Midwest"
- "Average Income ($40-60K), White (15-40%), African American (15-40%), Hispanic, (15-40%), East."

In addition, the Economics Center decided to place greater emphasis on income compared to other demographics, so median income was given a weight of 0.15.

Store performance metrics (prior to test store changes) account for the other half of the criteria weights. In this case, we used "Weekly Total Convenience Sales" for the 2009 calendar year because this was the last full year prior to the sign changes at any of the test stores. This sales figure was given a weight of 0.35. In addition, we used customer traffic, measured as "Total Transaction Count" for the 2009 calendar year, which was given a weight of 0.15.

Control Store Pairings

Test stores were paired against control stores in three distinct approaches.

One: The sales of each of the three control stores for each test store were averaged together. This control store average was then paired with a corresponding test store for analysis. A test store was paired with the average of the control stores. Two individual underlying control stores were part of the average of multiple control stores.

Two: The Economics Center created a new set of control stores by modifying Approach One above and adding the criteria that the underlying control stores must also currently be stores with an LED message board installed. Besides adding this additional criterion, the approach is the same as in Approach One. One control store was excluded since it had a manual message board.

Three: By using the same three underlying control stores as in Approach One as a basis for each test store, the Economic Center created a set of test-control store pairs based on which underlying control store had the highest total store sales correlation during the 52 weeks prior to the sign change at the test store. For instance, test store "B" was paired with control store "B2" because its correlation, 0.667, was the highest. Detailed correlations are found below.

Result details from all three approaches can be made available upon request. The article will focus on results from approach one since the findings are similar across all three approaches.

Table 4

Test Store	Control Store	Correlation
A	1	0.685
B	2	0.667
C	3	0.651
D	4	0.771
E	5	0.615
F	6	0.800
G	7	0.762
H	8	0.715
I	9	0.894
J	10	0.596
K	11	0.569
L	12	0.746
M	13	0.578
N	14	0.718
O	15	0.668
P	16	0.692
Q	17	0.786
R	18	0.646
S	19	0.693

Time-Frames Modeled

Outcome variables were analyzed across two different time frames:

1. A 4 week duration after the sign change relative to a 4 week duration before the sign change

2. A 52 week duration after the sign change relative to a 52 week duration before the sign change

Results

Analysis of an Initial 4-Week Time Period

As shown in the second data column, the average performance of test stores relative to control stores showed positive results across all outcome variables except destination transactions. However, the p-values in columns 3 and 4 indicate that these results were not statistically meaningful.[2]

Table 5

Performance Variable	Average Difference Between Test Store and Control Store	P(T<=t) One-Tail	P(T<=t) Two-Tail
Total Sales	1.05%	0.335	0.669
Convenience Sales	1.49%	0.382	0.763
Total Transactions	1.42%	0.305	0.609
Convenience Transactions	1.74%	0.301	0.603
Destination Transactions	-0.02%	0.494	0.988

Possible reasons that we find statistically insignificant results from these early returns include: a time period too short for customers to change behaviors and/or an insufficient sample size. In addition, the time of the year when the electronic message board was installed might contribute to the lack of a significant finding. Suppose the electronic message board was installed when there were no major holidays or events upcoming for which consumers would increase their shopping behavior or look for bargains. Accordingly, in the given four week period, the consumer might not notice a new electronic message board. However, consider a period in which the electronic message board is installed just prior to a major holiday sales rush. In this case, consumers might be particularly alert to signage that might offer a bargain to the consumer. While the results of our model are robust given the scope and parameters of our analysis, possible future analysis with a larger dataset and more parameters could provide additional insights into the impact of electronic message boards over shorter durations of time.

[2] The p-value for a one-tail test is the probability that the performance measure (e.g., an increase in sales or transactions) is not greater than 0, which means that a low p-value tells us this probability is low. The p-value for a two-tail test is the probability that the true performance measure is equal to 0, which means that a high p-value tells us there is no difference between the test and control groups.

Analysis of 52-Week Tests

The results of our statistical analysis are more revealing when comparing performance in the year after the electronic message board installation relative to the year prior. Table 6 below shows that one year after installing an exterior electronic message board, stores sales increased by 2.12 percent on average. This increase in store performance holds across total sales, convenience sales, total transactions, convenience transactions, and destination transactions. The p-values for the one-tail t-test are approximately 0.2 or lower. With these results, a business owner should feel reasonably confident (about 80%) of the claim that a store's sales performance will improve after installing an exterior electronic message board, and even more confident (85-90%) that the other performance measures will improve.

Table 6

Performance Variable	Average Difference Between Test Store and Control Store	P(T<=t) One-Tail	P(T<=t) Two-Tail
Total Sales	2.12%	0.203	0.405
Convenience Sales	1.95%	0.141	0.282
Total Transactions	1.97%	0.117	0.234
Convenience Transactions	1.58%	0.137	0.275
Destination Transactions	3.22%	0.112	0.223

Total Store Sales

Total store sales for test stores relative to their paired control stores increased an average of 2.12 percent. Of the 12 test stores whose market area median income was between $35,000 and $75,000, nine of these test stores experienced relative gains in their total store sales, year-over-year, relative to their control stores' average. Of the seven test stores outside this income range, only two test stores outperformed their control store pairing. While this evidence is merely anecdotal, it would suggest that further research in the future should closely consider the impact of electronic message boards with respect to median income.

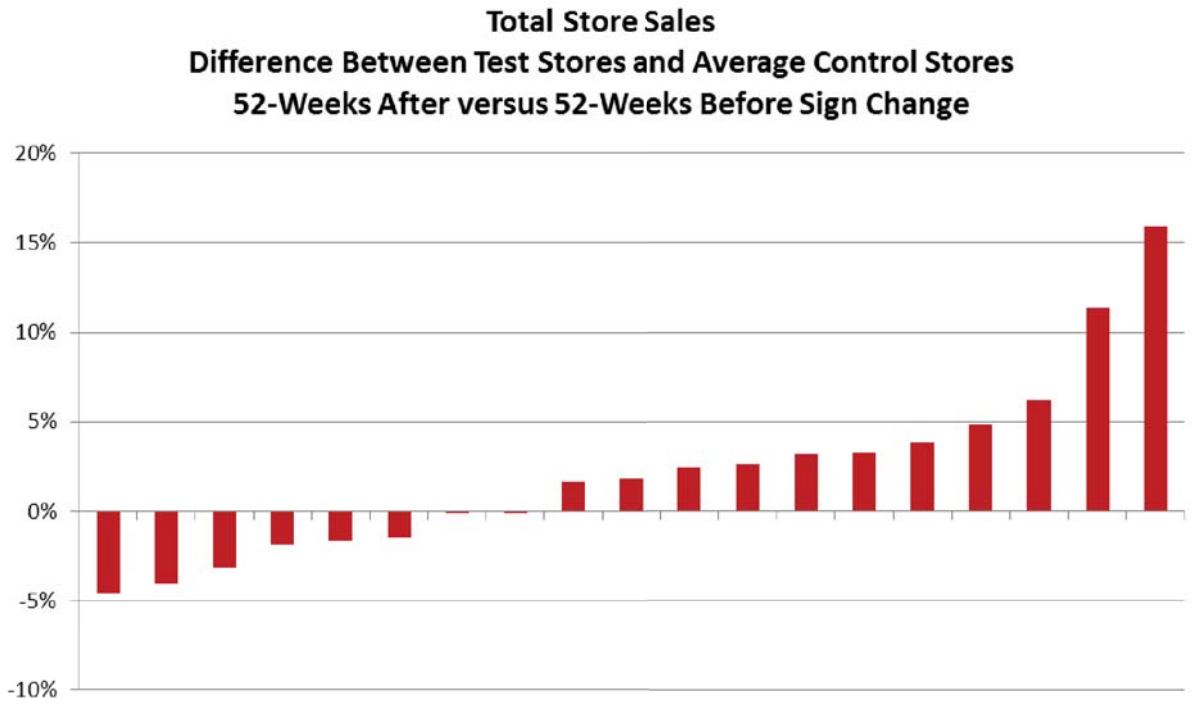
Table 7

Store	Difference-in-Differences
A	-4.06%
B	1.66%
C	2.61%
D	3.28%
E	11.37%
F	4.84%
G	-4.55%
H	-0.12%
I	1.87%
J	3.84%
K	3.21%
L	-3.16%
M	-0.04%
N	-1.87%
O	-1.67%
P	-1.46%
Q	6.21%
R	2.43%
S	15.9%
Average	**2.12%**

P(T<=t) one-tail: 0.2027
P(T<=t) two-tail: 0.4054

Table seven shows that while the average sales lift was 2.12 percent, there is considerable variability across each store. Some stores saw a slight decline, while other stores saw double-digit increases. The advantage of using a difference-in-difference model is that the idiosyncratic difference of each control-treatment store pair should produce the correct estimate on average.

Figure 1


Total Store Sales
Difference Between Test Stores and Average Control Stores
52-Weeks After versus 52-Weeks Before Sign Change
20%
15%
10%
5%
0%
-5%
-10%

Total Store Transactions

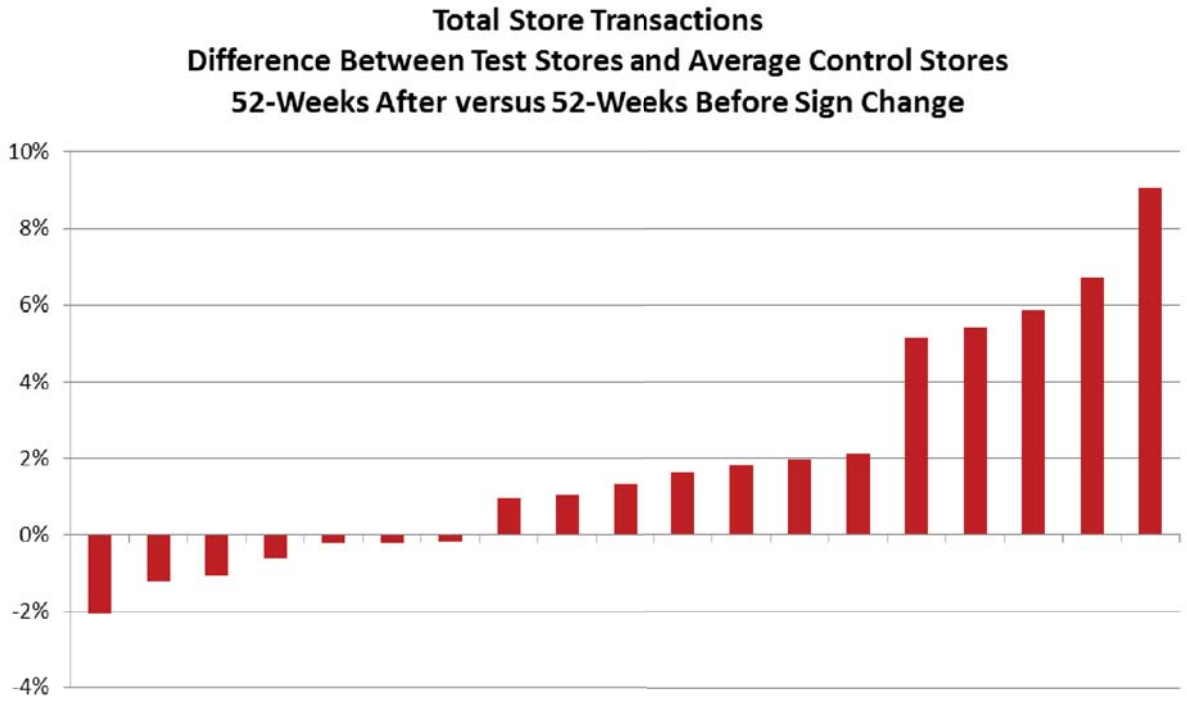
Total weekly transactions for test stores relative to their paired control stores increased an average of 1.97 percent. Of the 12 test stores whose market area median income was between $35,000 and $75,000, nine of these test stores experienced relative gains in their total store transactions, year-over-year, compared to their control store. Of the seven test stores outside this income range, only three test stores outperformed their control store pairing. The statistical significance testing is improved for transactions data relative to sales data. With a p-value of 0.12, business decision makers should feel confident about the ability of an electronic message board to improve weekly store transactions.

Table 8

Store	Difference-in-Differences
A	-2.05%
B	-0.21%
C	5.12%
D	1.81%
E	9.06%
F	2.11%
G	-0.60%
H	-0.19%
I	1.97%
J	1.63%
K	1.04%
L	1.33%
M	-1.22%
N	-0.20%
O	0.98%
P	-1.06%
Q	5.85%
R	5.40%
S	6.70%
Average	**1.97%**

P(T<=t) one-tail: 0.1168
P(T<=t) two-tail: 0.2336

Figure 2


Total Store Transactions
Difference Between Test Stores and Average Control Stores
52-Weeks After versus 52-Weeks Before Sign Change
10%
8%
6%
4%
2%
0%
-2%
-4%

Convenience Transactions

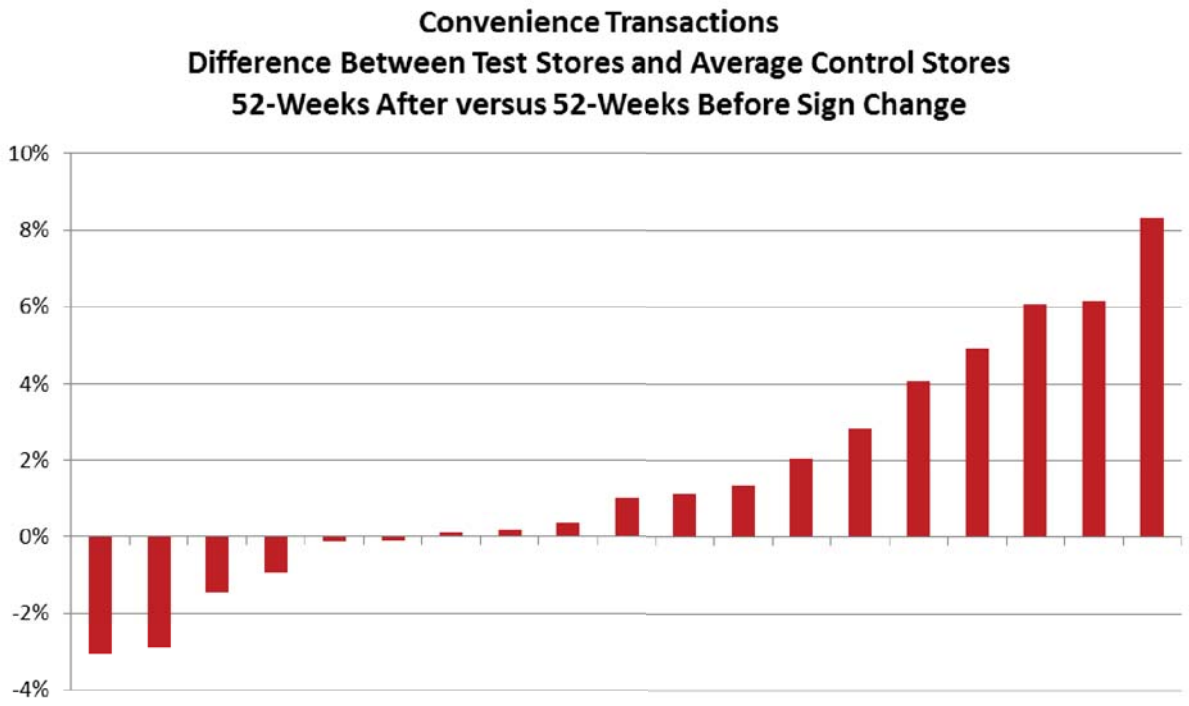
Convenience transactions include every type of purchase outside of destination purchases. Examples of these items include personal care, food, and household products. These purchases could be considered as "impulse" purchases, in that a consumer might be more likely to respond to an electronic message board advertising a price reduction in milk. Convenience weekly transactions for test stores relative to their paired control stores increased an average of 1.58 percent. Of the 12 test stores whose market area median income was between $35,000 and $75,000, nine of these test stores experienced relative gains in their convenience store transactions, year-over-year, compared to their control stores. Of the seven test stores outside this income range, only four test stores outperformed their control store pairings. With a one-tail p-value of 0.14, a decision maker should feel confident about the ability for an electronic message board to marginally improve convenience transactions.

Table 9

Store	Difference-in-Differences
A	-2.91%
B	-0.94%
C	4.91%
D	1.01%
E	8.34%
F	2.85%
G	0.11%
H	0.18%
I	1.36%
J	0.36%
K	-0.09%
L	2.04%
M	-3.05%
N	-0.12%
O	1.14%
P	-1.46%
Q	6.08%
R	6.15%
S	4.09%
Average	**1.58%**

P(T<=t) one-tail: 0.1374
P(T<=t) two-tail: 0.2748

Figure 3


Convenience Transactions
Difference Between Test Stores and Average Control Stores
52-Weeks After versus 52-Weeks Before Sign Change
10%
8%
6%
4%
2%
0%
-2%
-4%

Destination Transactions

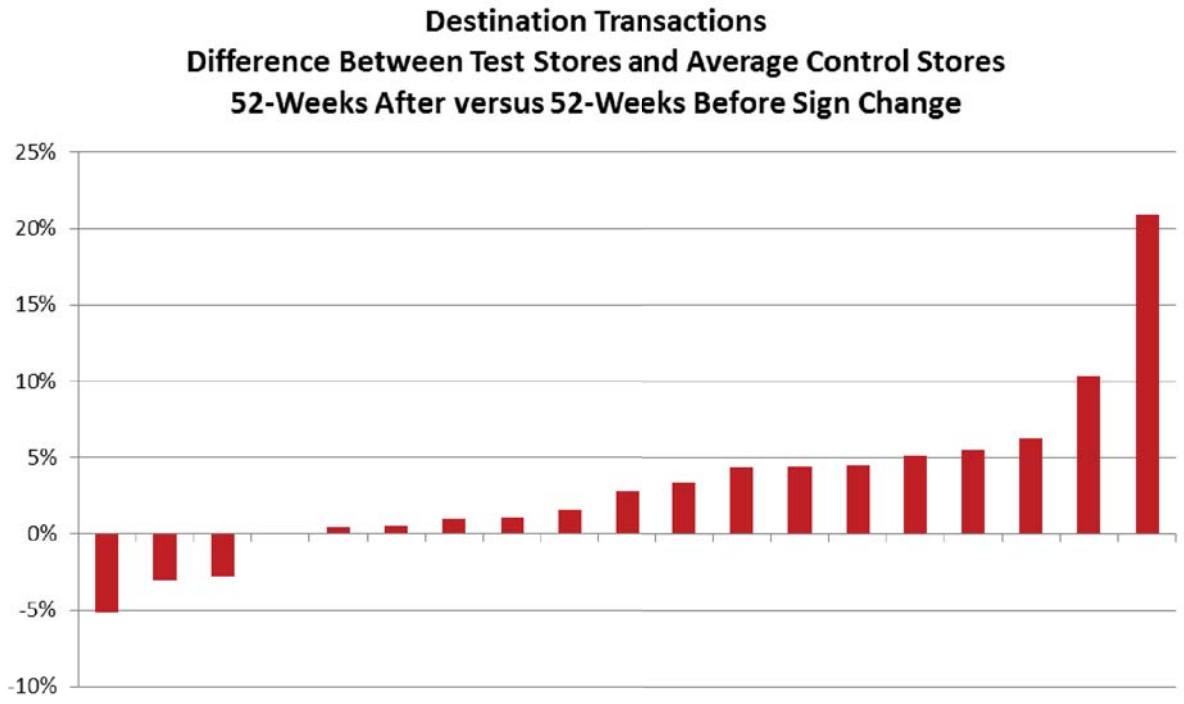
Finally, we present results for destination transactions. These are not "impulse" purchases; consumers will go to a particular retailer to purchase these items. A consumer who makes one of these purchases likely planned the trip and its subsequent purchases in advance. Weekly destination transactions for test stores relative to their paired control stores increased an average of 3.22 percent. The increase in destination transactions is likely due to the retailer advertising destination services on the exterior electronic message boards. The lift in convenience sales transactions is likely driven by the advertisements of convenience sales products, but there is an additional benefit to a retailer with the additional destination sales. These customers are likely a repeat and more valuable customer, suggesting that advertising convenience sale products can generate ancillary benefits.

Table 10

Store	Difference-in-Differences
A	1.01%
B	1.59%
C	4.56%
D	2.81%
E	10.34%
F	0.94%
G	-2.77%
H	-3.01%
I	4.44%
J	5.15%
K	6.23%
L	-5.15%
M	4.37%
N	0.01%
O	0.43%
P	0.52%
Q	5.47%
R	3.36%
S	20.93%
Average	**3.22%**

P(T<=t) one-tail: 0.1115
P(T<=t) two-tail: 0.2230

Figure 4

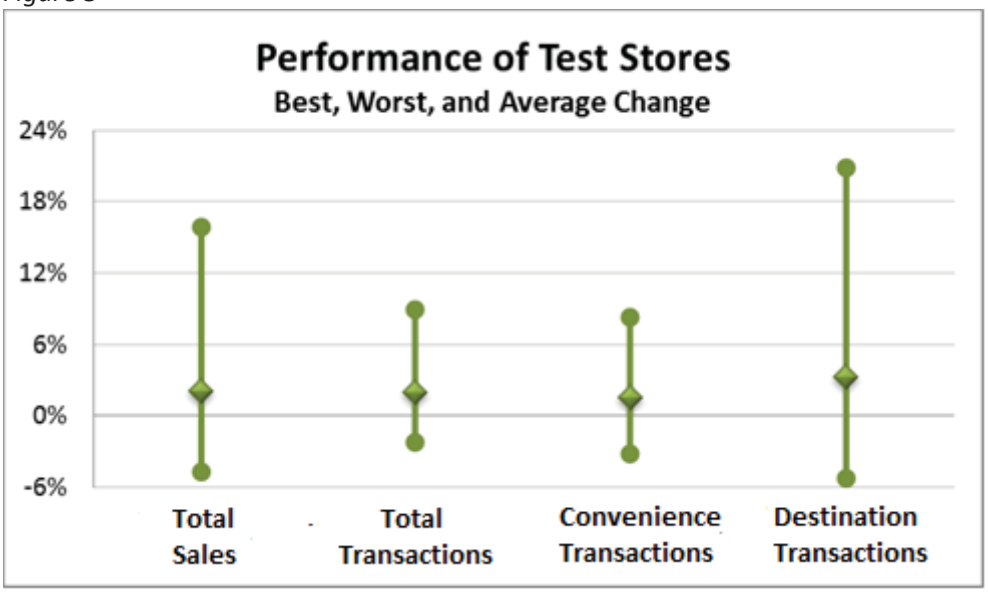


Return on Investment (ROI)

Based on conversations that the Economics Center conducted with sign installation companies, the average cost of a new electronic message board is approximately $13,000. Using the point estimate for our 52 week finding, for a store with annual sales of $10 million, the increase in sales would be close to $212,000. Using the retailer industry's gross margins and operating margins, the break-even for an electronic message board installation may be as low as 3 months and as high as 15 months – depending on labor capacity and other fixed costs. Consequently, in nearly all cases, the installation of such a sign pays for itself in less than a year and contributes positively to the business bottom line for the remainder of its life cycle.

Limitations and Conclusions

Figure 5



The chart above illustrates the improved sales performance from implementing electronic message boards. While the average point estimate across all measures is positive (and the majority of stores saw a positive increase), there is still considerable variability in store performance. Table 11 shows that 3 of the stores saw an increase in sales greater than 5 percent while no stores saw a decrease greater than 5 percent. The strongest increase in sales was over 15 percent in one store while the worst-performing store actually saw a decrease in sales of 4.5 percent after implementing the electronic message board.

Table 11

	Total Sales	Total Transactions	Convenience Transactions	Destination Transactions
Large Increase (> 5%)	3	5	3	5
Moderate Increase (2% to 5%)	6	1	4	5
Little or no change (-2% to 2%)	7	12	10	6
Moderate decrease (-5% to -2%)	3	1	2	2
Large decrease (below -5%)	0	0	0	1

These findings illustrate a potential limitation to the difference-in-differences methodology. The methodology assumes that in the absence of implementing an electronic message board, the growth trajectory of the treatment store would be the same as the matched control store. If a negative event happened at a particular store, it may inadvertently affect the results. For example, suppose that road construction occurred over an extended time period at a particular store and subsequently reduced store traffic or a new competitor moved into the market area. The decline in sales observed in the data,

despite the introduction of an electronic message board, may then be due to the road construction and not the message board. Unfortunately, the Economics Center was not able to control for all of these potential effects that may affect the store performance. Some aspects were controlled: stores were selected from metropolitan areas in the Midwest and South, and test and control stores were matched on the basis of particular market area demographics and similar store performance before the sign change. On the other hand, we had to take what was available: sign changes occurred over a period of nearly two years, in all different seasons, and under varying economic and business competitiveness conditions.

There are a variety of factors that have the potential to affect store performance, in addition to market demographics, including: store and site characteristics, competition, management, seasonality, and temporary factors such as weather and road construction. Unfortunately, we lack data on the degree to which these other variable may explain store performance. However, with a large enough sample of stores, the positive and negative "noise" in the data should cancel out and produce an unbiased estimate of the effect of an electronic message board. Future research might focus on what particular components of an electronic message board drive improved performance (e.g. the frequency of message changes, which products are featured, etc.) None of these characteristics were available to the Economics Center at the time of the study.

In conclusion, exterior electronic message boards offer business a lift in store sales performance and generate a relatively quick return on investment. While the overall 2.12 percent lift in sales is modest, in a high-volume store with low installation costs, the investment returns to using this technology can be significant.

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Statistical Analysis of the Relationship between On-Premise Digital Signage and Traffic Safety

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ABBREVIATIONS

The abbreviations shown below are used in this report.

AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
AIC	Akaike Information Criterion
ANOVA	Analysis of Variance
BIC	Bayesian Information Criterion
CEVMS	Commercial Electronic Variable Message Signs
CG	Control Group
DF	Degrees of Freedom
EB	Empirical Bayes
EBB	Electronic Billboard
FHWA	Federal Highway Administration
HSIS	Highway Safety Information System
HSM	*Highway Safety Manual*
LCD	Liquid Crystal Display
LED	Light-Emitting Diode
MS	Mean of Sum of Squares
MSE	Error Mean Square
MST	Treatment Mean Square
RTM	Regression to the Mean
SAR	Spatial Autoregressive Model
SEM	Spatial Error Model
SFI	Signage Foundation, Inc.
SPF	Safety Performance Function
SS	Sum of Squares
SSE	Sum of Squares for Error
SST	Total Sum of Squares
TTI	Texas A&M Transportation Institute

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EXECUTIVE SUMMARY

The use of digital on-premise signs, which are typically business-related signs that have the ability to change the displayed message, has increased significantly in recent years. On-premise digital signs are located on the same property as the businesses they promote, and some part — or a significant part in some cases — of the sign contains a digital display that can be programmed to change the message at pre-set intervals. Because the use of these signs has increased, jurisdictions have used local sign codes or ordinances to regulate the manner in which digital messages are displayed. Jurisdictions typically justify these regulations by citing traffic safety impacts. However, no comprehensive and scientifically based research efforts have evaluated the relationship between on-premise digital signs and traffic safety.

In this study, researchers collected large amounts of sign and crash data in order to conduct a robust statistical analysis of the safety impacts of on-premise digital signs. The statistical tools used the latest safety analysis theory developed for analyzing the impacts of highway safety improvements. The research team acquired the crash data from the Highway Safety Information System, which is a comprehensive database of crash records from several states. One of the advantages of these data is that they also include information about roadway characteristics, such as the number of lanes, speed limit, and other factors. The research team then acquired information about the location of on-premise digital signs from two sign manufacturing companies. Through significant effort by the researchers, these two datasets were merged into a single dataset that represented potential study locations in California, North Carolina, Ohio, and Washington. Of the initial set of over 3,000 possible sites, the research team was able to identify 135 sign locations that could be used for the safety analysis. Potential sites were eliminated from consideration due to any of the following factors:

- The sign location was not on a roadway that was included in the crash dataset; only major roads were represented in the crash data.
- The sign location provided by a sign manufacturing company could not be verified through online digital images of the location.
- Only signs installed in calendar years 2006 or 2007 could be included in order to have adequate amounts of crash data before and after the sign was installed.

The research team then used the empirical Bayes method to perform a before-after statistical analysis of the safety impacts of the on-premise digital signs. In a before-after study, the safety impact of a treatment (in this case, the installation of an on-premise digital sign) is defined by the change in crashes between the periods before and after the treatment was installed. However, simply comparing the crash frequencies (known as a naïve before-after analysis) is not adequate to account for factors such as regression to the mean (a statistical concept that explains why after data can be closer to the mean value than the before data) and to provide a means of controlling for external factors that can also cause a difference in crash frequencies. The empirical Bayes method represents the recommended procedure for evaluating the impacts of safety treatments because it overcomes the deficiencies of the naïve method. The safety impacts are represented by the safety index, which is indicated by the symbol θ. In simple terms, the safety index represents a ratio of safety in the after period compared to safety in the before period, although it is not as

simple as dividing the crashes in the after period by the crashes in the before period. A safety index greater than 1.0 indicates an increase in crashes in the after period, and a value less than 1.0 indicates a reduction in crashes in the after period. However, because of the variability in the crash data, the analysis must have statistical validity. Statistical variability is established by defining the 95 percent confidence interval for the safety index, which is based on factors such as sample size and the variability of the data. If the 95 percent confidence interval includes the value of 1.0, then there is a 95 percent chance that there is no statistically significant change in crashes between the before and after periods.

The results of the statistical analysis are presented in Figure 1. This figure shows that the safety index for all of the states was 1.0 with a 95 percent confidence interval that ranged from 0.93 to 1.07. This indicates that, for the 135 sites included in the analysis, there was no statistically significant change in crashes due to the installation of on-premise digital signs. The same can also be said about the results for each of the four states on an individual basis because the confidence interval for safety index for each state includes 1.0. The larger confidence intervals for some of the states are due to greater variability in the data and/or smaller sample sizes. The researchers also analyzed single-vehicle and multi-vehicle crashes and found the same result of no statistically significant change in crashes. Finally, the researchers performed an analysis of variance for the sign factors of color, size, and type of business and found no statistically significant differences in the mean safety index values for individual factors.

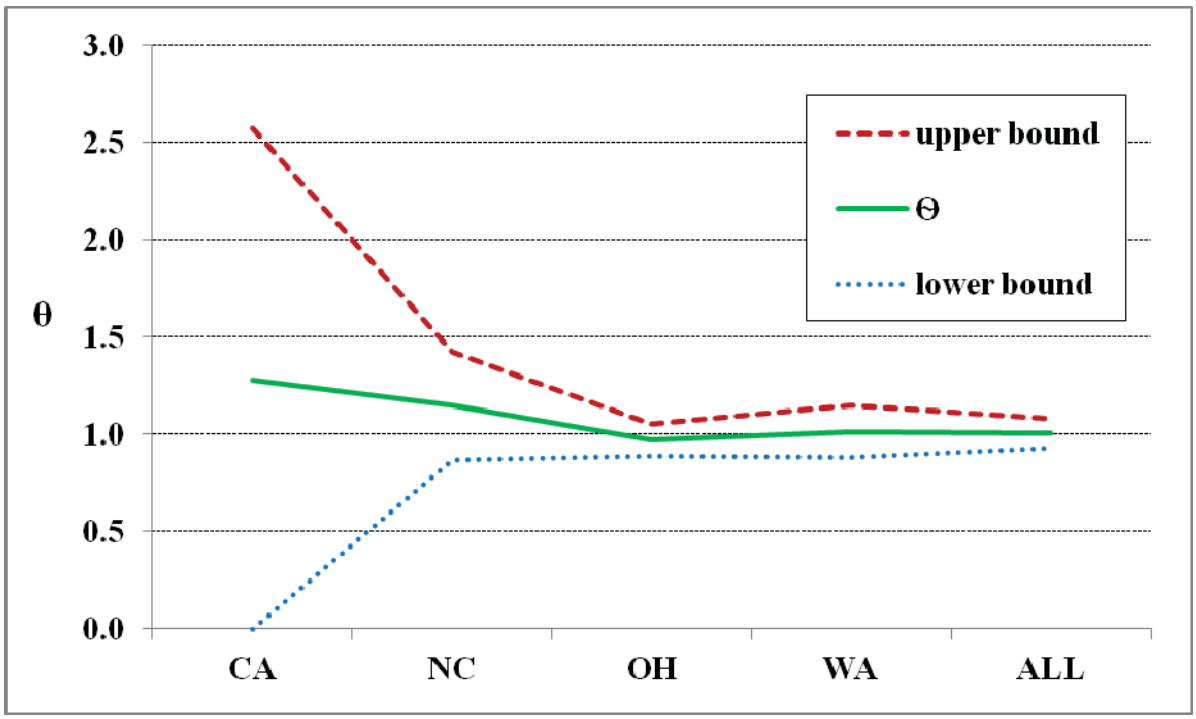

Figure 1. Summary of study results

The results of this study provide scientifically based data that indicate that the installation of digital on-premise signs does not lead to a statistically significant increase in crashes on major roads.

CHAPTER 1:
INTRODUCTION

For many generations, most signs — including both traffic and business signs — were static. They displayed only one message that did not change with time. Advances in information display technologies in recent years have led to an increase in the use of many types of digital signs, particularly in the area of on-premise and off-premise business signs. On-premise digital signs provide the ability to communicate a wide variety of messages and to change the manner in which the message is presented over time. As such, these digital signs represent a significant advancement in communication technologies and the ability to deliver valuable marketing information to potential customers. However, some groups have raised questions related to the traffic safety aspects of business signs that change messages on a frequent basis. The traffic safety concerns are often related to issues of potential driver distraction from the roadway due to the dynamic nature of these signs. These safety concerns are sometimes addressed through local regulation of these types of signs, which may prohibit or limit the use of on-premise digital signs. These regulations tend to be developed at the local level and do not have a significant level of scientific, nationally based research supporting the regulations.

The traffic safety concerns associated with on-premise digital signs have existed for some time, but there has been little research, particularly on a national level, that directly addresses the safety impacts of on-premise digital signs. In part, this is due to the fact that the use of such signs has grown only in the last 5–10 years. The research described in this report was conducted to provide a scientifically based, national analysis of on-premise digital signs so that the traffic safety impacts of such signs can be better understood.

RESEARCH APPROACH

The basic research method used in this study is a before-after statistical analysis of the change in traffic crashes at locations where digital signs were installed. The research team used digital sign installation information provided by sign manufacturers to identify locations in selected states where digital signs had been installed in the 2006–2007 time frame (this time frame was selected to provide adequate numbers of crashes in both the before and after periods). The analysis locations were limited to California, North Carolina, Ohio, and Washington because these states are part of the Federal Highway Administration (FHWA) Highway Safety Information System (HSIS). The HSIS is a database of crash records that includes detailed information about the roadway and crashes, including such factors as the number of lanes, the speed limit, crash severity, and other factors. The researchers then mapped the sign sites to the crash datasets to identify locations with crashes. These locations were then analyzed to compare the crashes before installation of the digital sign to the crashes after installation of the sign using statistical analysis procedures.

DESCRIPTION OF A DIGITAL SIGN

For the purposes of this study, a digital sign is defined as a sign that uses an electrical display, such as a liquid crystal display (LCD) or light-emitting diode (LED), to provide changeable

messages or graphics. There are several types of digital signs, including digital billboards, indoor video advertisements, and street-level advertisements (such as LED signs on bus shelters). For this study, the researchers focused only on on-premise digital signs, which are signs located on the same property as the business with which they are associated. The research effort did not include or address off-premise signs or billboards.

RESEARCH ACTIVITIES AND REPORT ORGANIZATION

There were five major activities associated with this research effort. The study began by reviewing and evaluating previous research on the safety aspects of digital signs and the statistical methods that other researchers have used to evaluate the safety aspects of signs. Chapter 2 describes the results of the review of background information. The researchers then began to collect information related to digital signs and crash data in the selected states. The sign information included the location and date of installation, and the crash data included the location and date. The researchers then devoted extensive effort to matching the locations and dates of the signs and crash datasets. Chapter 3 describes the sign and crash data and how the two datasets were merged together. Once this was accomplished, the next step was to develop a valid and scientifically based statistical analysis procedure to determine if there were any statistically significant changes in crashes after installation of digital signs. Chapter 4 describes the development of a statistical methodology, including a comparison of the advantages of the different options for conducting the statistical analysis. Finally, the research team used the results of the statistical analysis to define the key study findings, which are described in Chapter 5. Chapter 6 presents the conclusions and recommendations for the research study.

CHAPTER 2:
BACKGROUND INFORMATION

This chapter provides a review of the literature related to on-premise digital signs and their impacts on traffic safety. The review also includes a summary of statistical methods that can be used for evaluating the safety effects for these types of signs. Although the majority of the work has been related to off-premise digital signs, key studies associated with off-premise signs are nonetheless briefly discussed here. It should be pointed out that compared to other types of roadway-related operational and design features, such as access point density on urban arterials or on-street parking designs, the number of documents that are related to either on- or off-premise signs is relatively small.

On-premise signs are signs that are located on the same property as the activity described in the sign, while off-premise signs are located away from the activity identified in the sign. Off-premise signs are also known as third-party signs or outdoor advertising, and the most common example is a billboard. In general, off-premise signs have a larger visible area, which is attributed to the fact that these signs usually have greater surface areas and have higher mounting heights than on-premise signs. Furthermore, off-premise signs have a larger viewership because they are usually located adjacent to freeways and major highways with higher traffic volume. On the other hand, on-premise signs are installed on private property where a company conducts its business, and most are located along urban streets or local roadways. According to *The Signage Sourcebook* (U.S. Small Business Administration, 2003), the viewing opportunities for outdoor advertising (typically 333,350 cars per day) are much greater than those for an on-premise sign (30,000 cars per day).

The literature review is divided into two sections. The first section summarizes studies related to on-premise digital signs. The second section presents the summary of two key studies associated with off-premise digital signs.

ON-PREMISE DIGITAL SIGNS

This section describes the characteristics of the studies that have examined the relationship between safety and on-premise digital signs. To the knowledge of the authors, only two studies have investigated this relationship. It should be pointed out that the safety relationships identified in these research documents were not based on crash data but more on opinions and hypotheses, which limits their value as a direct measure of on-premise sign safety. The first study was conducted by Mace (2001). This author performed a literature review and listed two hypotheses about how on-premise signs can influence crash risk. The first hypothesis states that on-premise business signs distract drivers' attention from their primary driving tasks, resulting in higher crash risks. The second hypothesis asserts that on-premise business signs may mask the visibility of regulatory and warning road signs, which also can negatively influence crash risk.

On the other hand, Mace (2001) noted positive effects associated with commercial signs. He reported that commercial signs could reduce unnecessary traffic exposure by providing adequate navigation information for drivers, such as providing restaurant information for hungry drivers.

However, only measuring the frequency and duration of drivers' distraction may not represent the safety impacts of on-premise signs because a study published earlier showed that half of the objects that drivers see are not related to driving tasks (Hughes and Cole, 1986). In other words, besides on-premise signs, other roadside features may also distract drivers. The possible solution to minimize the negative effects of an on-premise sign, but still keep its positive effects, is to separate the sign's content to primary (navigation) and secondary (commercial) information.

Although, in the past, on-premise signs and off-premise signs were treated as distinct signage, they are becoming more homogeneous in terms of characteristics. In the second study, Wachtel (2009) mentioned that more roadside businesses, especially those with multiple users (e.g., shopping centers, auto malls, sports complexes, and entertainment places), now install larger-sized on-premise digital signs because of the lower cost and better performance of the LED display. Wachtel indicated that the largest digital advertising sign in the world is an on-premise sign in New York City. This sign is 90 ft tall and 65 ft wide, and is mounted on a 165-ft-tall steel post on the roof of the warehouse. The visible distance is over 2 miles. Wachtel also suggested that some on-premise signs affect traffic safety more than some off-premise digital signs because the locations and elevations of on-premise signs might be closer to the road users. In addition, the angles of on-premise signs may be out of the cone of vision and require extreme head movements to read.

In summary, these two studies showed more research is needed for understanding the relationship between on-premise digital signs and crash risk.

OFF-PREMISE DIGITAL SIGNS

This section is divided into two parts. The first part describes two key studies that have examined the safety effects of off-premise digital signs. The second part covers methodologies that have been used for estimating these effects.

Safety Effects

There are two reports that provide reviews of the findings, methods, and key factors related to the safety effects of off-premise digital signs. The first systematic study related to the impacts of off-premise signs was conducted 11 years ago by Farbry et al. (2001). Their study reviewed earlier reports and analyses (including those about electronic billboards and tri-vision signs) and provided the foundation for the second study written by Molino et al. (2009). In the second report, Molino et al. (2009) reviewed 32 related studies, which included those initially reviewed by Farbry et al. (2001), and noted that the majority of studies reported a negative effect between digital billboards and traffic safety. Although the number of studies that showed harmful impacts is five times more than the number of studies that showed no harmful impacts, the authors suggested that this ratio may not be strong evidence to prove the negative effects linked to electronic billboards (EBBs). The individual studies considered by these researchers had very different study methods and statistical powers, which can have a significant effect on the quality and results of the research.

Another important finding in the Molino et al. (2009) report is that drivers usually have spare attention capacities, and they can be distracted from their driving tasks by roadside objects (such as EBBs). However, these distractions may be riskier when the driving demands increase, such as in fixed hazard areas (e.g., intersections, interchanges, and sharp curves), in transient risky conditions (e.g., adverse weather, vehicle path intrusions, and slow traffic), or when other important information is processed at the same time (e.g., an official traffic sign). In other words, not only will the sign's internal characteristics (overall size, legend size, color, contrast, luminance level, etc.) affect crash risk, but so will external environmental factors (type of road, speed, weather conditions, time of day, etc.). Hence, Molino et al. list all possible key factors and suggest further studies to examine how they could influence safety. These factors are categorized into two groups: independent and dependent variables. The independent variables are separated by subject into five subgroups: billboard, roadway, vehicle, driver, and environment. It should be noted that the relationship between EBBs and on-premise signs is discussed in the environment subgroup, and dynamic factors of on-premise signs, such as change rate, motion, video, and sound, are listed as extremely important. The dependent variables are separated into vehicle behavior, driver/vehicle interaction, driver attention/distraction, and crash categories. Since there are hundreds of related key factors, the authors claimed that "No single experiment can provide the solution" and suggested future research programs to address the following topics: (1) determining when distraction caused by commercial electronic variable message signs (CEVMSs) affects safe driving, (2) investigating the relationship between distraction and various CVEMS parameters, and (3) examining the relationship between distraction and safety surrogate measures, such as eye glance and traffic conflicts.

Table 1 summarizes the literature review results from these two reports. This table shows that the results of crash studies are not consistent, and most studies have some important weaknesses, such as neglecting biases related to the regression to the mean (RTM) (discussed below) and site-selection effects (using the naïve method), low statistical power, and analysis results based on erroneous assumptions. It should be noted that only post-hoc crash studies are listed here because this study focuses on the change of crash rate caused by on-premise digital signs.

As mentioned, Table 1 shows that the results related to the safety effects of off-premise signs are inconsistent. The inconsistencies can be fully or partly attributed to various study limitations. For instance, the studies in the Wachtel and Netherton report (1980) and Wisconsin Department of Transportation report (1994) both used a naïve before-after study methodology (methodology approaches are described in Chapter 4), and they did not account for the RTM bias, which may change their estimates of crash rate and safety effects of signs. The general idea of RTM is that when observations are characterized by very high (or low) values in a given time period and for a specific site (or several sites), it is anticipated that observations occurring in a subsequent time period are more likely to regress toward the long-term mean of a site (Hauer and Persaud, 1983). Also, these studies should provide the variance of estimators (that is the uncertainty associated with the estimator) for judging the statistical significance of their results. Moreover, grouping studies where the objectives or types of signs are different is not appropriate. For example, the goal of the report prepared by Tantala and Tantala (2007) was to study the safety impacts caused by converting traditional billboards to digital billboards, while other studies focused on the safety impacts after installation of new digital billboards. Those are two distinct effects that are examined and should not be grouped together to evaluate the safety effects of on-premise digital

signs. Wachtel (2009) also noted other limitations in Tantala and Tantala's study, such as a lack of adequate before-after and comparison group data; no clear definition and reasonable calculation of the visual range and legibility range of EBBs; and no crash data related to adverse weather, impaired drivers, and interchanges.

Table 1. Safety effects of off-premise digital signs

Study	Methods	Data Type	Results	Location	Sample Size
Wachtel and Netherton (1980)	Naïve before-after study	Crash frequency	The crash reduction of target area was 10% less than the overall reduction (after the installation of the signs)	Tele-Spot sign, Boston	Not provided
Wisconsin Department of Transportation (1994)	Naïve before-after study	Crash frequency, Average daily traffic (ADT)	Crash rate (eastbound): all crashes increased 36%, sideswipe crashes increased 8%, and rear-end crashes increased 21%	Milwaukee, Wisconsin	2
			Crash rate (westbound): all crashes increased 21%, sideswipe crashes increased 35%, and rear-end crashes increased 35%		
Smiley et al. (2005)	Before-after study (empirical Bayes)	Crash frequency, ADT, safety performance function	Downtown intersection sites: no significant change in crash rate (all crashes increased 0.6%, injury crashes increased 43%, and rear-end crashes increased 13%)	Toronto, Canada	3
	Before-after study (control group)	Crash frequency, ADT, control group	Rural sites: no significant change in crash rate based on most compared sites	Toronto, Canada	1
Tantala and Tantala (2007)	Naïve before-after study	Crash frequency, control group, ADT	No significant change in crash rate	Cuyahoga, Ohio	7
Tantala and Tantala (2009)	No description of the method		No significant change in crash rate	Cuyahoga, Ohio	7

The second shortcoming in Tantala and Tantala (2007) is that they used a simple correlation analysis between sign density and crash rate to examine safety effects of billboards. Using this approach, they found that the correlation coefficients among the scenarios analyzed were very low (around 0.20), indicating that the installation of billboards did not increase the number of crashes. This may well be true, but they did not use the right analysis tool. For investigating the relationship between sign density and the number of crashes, it is more appropriate to develop one or several regression models since the safety analyst can have a better control over other factors that can influence the number and severity of crashes (Lord and Mannering, 2010). In a regression model, several independent variables can be included, which is better to estimate the variable of interest (such as the installation of digital signs). However, it should be pointed out that the before-after study, as performed in this study, still remains the best methodological approach for estimating the safety effects of an intervention.

Among all studies in Table 1, Smiley et al. (2005) provides the more reliable results since they used a before-after method using a control group (CG) and empirical Bayes (EB) approach. The

only limitation is related to the small sample size. The authors of the study only evaluated three sites. Even with a small sample size, the EB method can still be successfully used to evaluate the safety effects of an intervention, as was done by Ye et al. (2011). Ye et al. (2011) used the EB method to estimate the safety impacts of gateway monument signs, which can be categorized as one type of off-premise sign. Gateway monuments are roadside structures used to introduce a city or town. These monuments usually have the name of the city or town and are located at the city limits.

According to Wachtel et al. (2009) and Farbry, (2001), using crash data might not be a precise method because crashes usually have multiple causal events, which are difficult to extract from crash datasets. For example, they noted that sign internal variables (such as size, brightness, viewing angle, etc.) might play main roles in drivers' distraction or ignoring of official traffic signs, while other external factors affect conflicts and crash risk. Although those reasons may be legitimate, utilizing crash data is still the best approach for evaluating the safety effects of interventions as well as those associated with operational and design features (Hauer 1997). As stated by Hauer, "*It follows that, in the final account, to preserve the ordinary meaning of words, the concept of safety must be linked to accidents.*" Furthermore, using crash data have other advantages: lower cost and fewer artificial errors. Firstly, the cost of conducting a before-after crash study is much lower than human-centered methods because the researchers do not need to purchase equipment and hire participants for conducting driving tests. Secondly, crash data are based on crash reports, which can provide a more accurate measure of safety than surrogate measures such as speed, driver behavior, or other measures. Only by conducting a before-after crash study can one provide results that combine multiple casual variables in the real world. Other methods cannot displace the above advantages, which explain why the research team selected the before-after methodology for estimating the safety effects of digital signs.

Characteristics of the Evaluation Methods Used in Previous Studies

This section describes the characteristics of other methods used in previous studies for examining the safety effects of off-premise digital signs. In addition to a crash before-after study approach, the most common study methods that have been used for examining the safety impacts of off-premise signs include eye fixations, traffic conflicts, headways and speeds, and public surveys. Most studies used one or more of the above methods to examine the impacts of off-premise signs (Molino et al., 2009). For instance, Smiley et al. (2005) used four different methods (eye fixation, conflict study, before-after crash study, and public survey) for examining a video sign located in Toronto. On the other hand, Lee et al. (2007) used eye fixations and a questionnaire for their study. It should be noted that the results from multiple measurements are usually inconsistent.

Briefly, the eye fixation study method uses an eye-tracking system to record drivers' eye movements. The results (e.g., eye glances and durations) can provide direct evidence of where drivers are looking while driving, leading to assumptions as to whether drivers are distracted when they are driving near or toward a sign (or at other roadside features). Traffic conflicts, often referred to as surrogate measures of safety, can be used for identifying risky driving behaviors, such as braking without good reason, inappropriate lateral lane displacement, and delays at the start of the green traffic signal phase. Headways and vehicle speed can be used to

assess distracted drivers since those drivers tend to have shorter headways and higher speed variances.

Most details about experiment design, such as the participant number, study site size, driving route length, and experiment duration can be found in Appendix B of the report prepared by Molino et al. (2009). In the current study, the researchers focus the discussion on the before-after crash data study method for two reasons. First, Molino et al. (2009) did not provide a detailed experimental design for using crash data, and some studies were criticized for inappropriate methodology (Tantala and Tantala, 2007; 2009). Second, the costs associated with other experimental methods are significant and are greater than the resources that were allocated for the current research study. According to Molino et al. (2009), the budgetary costs to conduct research using other experimental methods vary between $0.4 million and $0.8 million for using on-road instrumented vehicles, $2 million and $4 million for conducting a naturalistic driving study, and $1 million and $3 million for using an unobtrusive observation approach.

CHAPTER 3:
STUDY DATA

To conduct the safety analysis, the research team had to develop plans for collecting the necessary data, manipulating the data into a format that could be used for the safety analyses, and then conducting the statistical analysis to identify the safety impacts of on-premise digital signs. The success of this project relied upon the ability to acquire two distinct sets of data and the robustness of the individual datasets. The two datasets needed for the analysis included (1) information regarding the location and installation dates for on-premise digital signs, and (2) data regarding crash histories on the roadways in the vicinity of the on-premise digital signs. The latter also included information about operational (e.g., traffic flow and speed limit) and geometric (e.g., functional class and lane width) design features located at and adjacent to the on-premise digital signs. From the beginning of the project, the research team expected to use the HSIS crash data for the crash history dataset. The real challenge of this project was identifying specific information about on-premise digital signs for the states represented in the HSIS, and the researchers encountered numerous challenges in acquiring this information. Once the data for both groups were acquired, the researchers had to overcome differences in the datasets so that the data could be merged into a single dataset for analysis. The activities associated with the acquisition of the crash data, acquisition of the sign data, and the merging of the two datasets are described in this chapter.

CRASH DATA

The HSIS is operated and maintained by the FHWA, and is widely used for safety research programs that provide input for public policy decisions. The HSIS is a multistate relational database that contains crash, roadway, and vehicle information. Crash information/files contain basic crash information, such as location (based on reference location or mile-point), time of day, lighting condition (e.g., daylight, dark and no lighting, dark and roadway lighting, etc.), weather conditions, crash severity, the number of related vehicles, and the type of crash (e.g., head-on, right angle, sideswipe, etc.). Each row in the spreadsheet file contains crash information for individual crashes and a unique ID number, and each column represents a variable. The roadway information/files provide traffic and geographic information for each roadway segment, such as annual average daily traffic (AADT), speed limit, beginning mile-point, end mile-point, number of lanes, lane and median width, shoulder width and type, rural or urban designation, and functional classification. The vehicle information/files contain driver and vehicle information, such as a crash identification number, driver gender, driver age, contributing factor (possible casual factor), vehicle type, and others. These individual file types can be linked together as a whole dataset. For example, crash files and road files can be linked by their location information (route number and mileage), or crash files and vehicle files can be linked together by their crash identification number.

Currently, there are seven states that actively participate in the HSIS: California, Illinois, Maine, Minnesota, North Carolina, Ohio, and Washington. However, the HSIS has an upper limit on the amount of data that can be requested by researchers (including the number of states, the request area, and total variables). To maximize the value of the crash data that they could request, the

research team held discussions with the research advisory panel to identify the states (from the list of seven HSIS participating states) where there would be higher concentrations of on-premise digital signs. Based on this input, the research team requested HSIS data for California, North Carolina, Ohio, and Washington in order to get a maximum number of study sites. All crash datasets were downloaded from the HSIS website and stored in a spreadsheet format. The definitions for the variables in a state's crash data were found in the HSIS guidebooks. It should be noted that each state has its own guidebook and data record format. In other words, one specific variable might be available for some states, but this variable may have different meanings or category types, or even be unavailable for other states. The inconsistent definitions among different states' crash datasets can affect the quality of analysis and results when selecting specific variables for identifying target crashes (such as rear-end crash) needed for more advanced analysis. The differences between states also create challenges when trying to merge data into a single dataset for analysis.

Although the HSIS dataset provides the most comprehensive crash data from different states, the HSIS has some limitations. First, the HSIS only includes crashes that occur on major roads, such as interstate highways, U.S. highways, and state highways. The HSIS dataset may not include crash-related data for secondary roads in rural areas or city streets in urban areas, including arterial streets that are major roads in a city but are not on the state highway system. Table 2 identifies the level of crash coverage and roadway length for each state selected for the analysis.

Table 2. HSIS crash coverage and roadway length by state

California	1. More than 500,000 crashes occur each year; HSIS includes about 38% of those crashes. 2. HSIS includes 15,500 miles of mainline (non-ramp) roadways.
North Carolina	1. About 230,000 crashes occur each year; HSIS includes 70% of those crashes. 2. Of the 77,000 miles of roadway on the North Carolina state system, approximately 62,000 miles are included in the database.
Ohio	1. About 380,000 crashes occur each year; HSIS includes 40% of those crashes. 2. In Ohio, about 116,000 miles of highway in total; HSIS includes approximately 19,500 miles of roadway.
Washington	1. 130,000 crashes occur each year; HSIS includes 37% of those crashes. 2. HSIS contains 7,000 miles of mainline (non-ramp) roadway.

Another limitation of the HSIS data is that the dataset is not continuously updated. The HSIS data represent the final crash datasets from each state after the state has processed the crash data. As a result, the HSIS dataset may not include the last several months or more of crash data from a state. Currently, the most updated HSIS crash data are through 2009 (California is updated to 2008), so the most recent one or two years of crashes are not included in the HSIS data. Also, the oldest HSIS crash data extend back only through 2004. Limiting crash data to the period from 2004 to 2009 was a significant consideration in this research project because the large growth of on-premise digital signs is relatively recent, having mostly grown since the mid- to late 2000s. The lack of data for the last two to three years created challenges with respect to developing a robust statistical analysis procedure. For a comparison of safety impacts of a treatment (such as installation of a digital sign) to be meaningful, both the before and after analysis periods need to be about equal and as long as possible. This meant that, to have two-year analysis periods (two years before and two years after) in the safety analysis, on-premise digital signs needed to be

installed in either 2006 or 2007. In order to focus the safety analysis on the long-term impacts of on-premise digital signs, the researchers did not include the calendar year of installation of a sign in the analysis. For example, if a sign was installed in 2006, the before period was calendar years 2004 and 2005, and the after period was calendar years 2007 and 2008.

An additional limitation of the HSIS crash data is that the crash location within the HSIS is identified to the nearest 0.1 mile (528 ft) on the roadway. This required the safety analysis to be conducted for the tenth of a mile length of roadway that a sign was located within. The level of accuracy is the primary reason that 0.1 miles was chosen as the effective area of the sign.

The researchers viewed the limitations mentioned above as minor and ones that had minimal impact on the study results. There are no comparable crash datasets available to researchers that could be used for a similar type of analysis of crashes. The only alternative available to the researchers would have been to try and obtain crash data from individual agencies where on-premise digital signs have been installed. Such an approach may have provided more specific data about individual signs and site characteristics, but would have resulted in an extremely small dataset. The researchers felt that such small sample sizes would not provide sufficient robustness for statistical analysis and that the approach using the HSIS data provided greater scientific validity and robustness, as discussed in the previous chapter.

SIGN DATA

With the acquisition of the HSIS data, the research team had information to analyze crashes but had no idea about where to conduct the analysis. Determining the location for the crash analysis required information regarding the location of on-premise digital signs. Furthermore, due to the date limitations of the HSIS data, only sign sites where the sign was installed in 2006 or 2007 could be used for the crash analysis. So the research team began the process of identifying locations in California, North Carolina, Ohio, and Washington where on-premise digital signs had been installed on major roads in 2006 or 2007.

Initial attempts to identify sign locations focused upon getting information from the Signage Foundation, Inc., (SFI) research advisory panel. However, the results did not provide a large enough sample size for a robust statistical analysis. The research team began to contact sign installation companies but encountered challenges in acquiring the large amount of data needed to conduct the research. The primary challenge associated with contacting sign installation companies (which are the same companies that market the signs to individual businesses) was the proprietary nature of the business information the research team was requesting. Another challenge was the large number of individual companies that needed to be contacted to develop a robust sample size.

Because of the challenges of working with sign installation companies, the research team shifted the focus to sign-manufacturing companies. Eventually, the research team was able to work with two electronic sign-manufacturing companies to get a list of on-premise digital signs installed in any of the four study states during 2006 or 2007. Each of the two lists was converted into datasets for use in the research effort. The first dataset (dataset #1) contained 2,953 sign sites and 27 variables, which included the characteristics of signs and roads, such as sign order date, sign

address (road, county, and state), the nearest cross street and its distance from the sign, the nearby cross street with the highest volume and its distance from the subject intersection, and traffic volume on the subject road. The research team did not use the road information from dataset #1, relying instead upon the road data in the HSIS crash dataset. This ensured consistency in the approach with the different sign datasets. Also, the sign installation date was considered to be the sign order date plus two weeks. This assumption was based on input from the sign-manufacturing company. Since the entire year that the sign was installed was excluded from the analysis, this was considered not to be a critical issue.

The second dataset (dataset #2) had 63 site addresses and 10 variables. Unlike the first dataset, most variables in dataset #2 were related to product information, such as installation data, sales representative, product name, matrix, color, customer ID (address), and status of signs.

For the analysis, these two datasets were combined as one for use in analyzing the crashes by individual state. The combined dataset was further refined by removing all sign locations that were not installed in either 2006 or 2007. The calendar year that a sign was installed was treated as the construction year, and the crashes that occurred in that year were removed from the analysis. The entire calendar year was removed from the analysis due to uncertainty over the actual installation date of the sign since the data provided only the order date for the sign. Removing the entire calendar year associated with installation also eliminated the novelty effect associated with implementing a new feature. The second variable, the sign installation address, was used to select related crashes by the sign's location and default sign-effective areas. For example, the researchers defined the crashes located within 0.1 miles from the target signs as related crashes. In reality, the effective area could be larger or smaller depending upon the sign size. The procedure used for this analysis did not adjust the effective area based on sign size or other factors. Overall, significant effort was put into ensuring the accuracy of the sign datasets because the quality of the data had a huge impact on the precision and accuracy of the analysis.

DATA-MERGING PROCEDURE

The previous sections explain how the researchers obtained their study data (the sign dataset and the crash dataset) and the characteristics of each dataset. This section gives more details about the dataset-merging procedure. Several steps were involved in merging the crash and sign location datasets into a single dataset that could be used for statistical analysis. The early steps focused on confirming that the digital sign was still in place and near the road that it is related to. This was needed because a site could have an address on one road but have the sign facing traffic on another road bordering the site property. The later steps focused upon converting the street address of the sign location to a route and milepost value that could be used with the crash dataset. This complex effort was necessary due to the fact that the sign and crash datasets used different location methods. The sign dataset was based on the site address, while the crash database was based on route number and milepost. For example, a location in the sign dataset would record a location with "1234 North Highway 101, Anytown, WA 98584," but the HSIS would show the same location as "route number = 23101" and "mile post = 335.72." In order to define the related crashes that were adjusted to the target signs, the researchers needed to transfer sign locations into the HSIS location system. The basic steps are described below and illustrated in Figure 2.

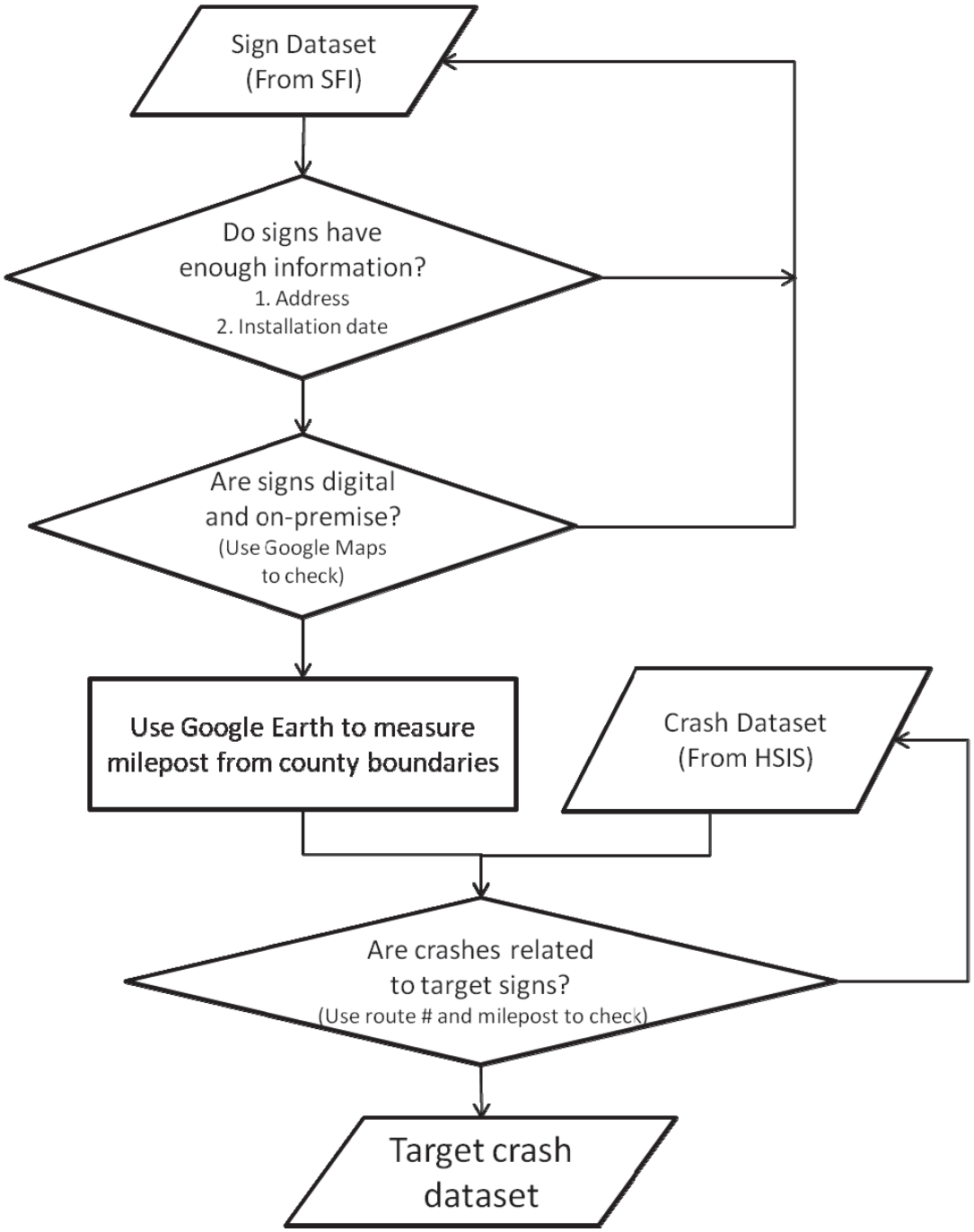

Figure 2. The flow chart for data collection and merging procedure

1. For each record of the combined sign dataset (3,016 total records), the research team evaluated the location information (typically a street address) and the sign order date. Records with missing or incomplete location information or with assumed sign installation dates that were not in 2006 or 2007 were deleted from the dataset.

2. Research team members then verified the location of the sign using the site address in the sign dataset and taking the steps listed below. Figure 3 shows an example table that the researchers used for the above data collection, including screenshots of Google Maps and Google Earth (Google Earth, 2008). Columns 1–3 are the address information given by the sign companies. Columns 4–7 are determined through Google Maps, and Columns 8–11 are determined through Google Earth.
   a. The sign was located in Google Maps using the site address.
   b. Using the Street View feature of Google Maps, a member of the research team identified the sign on the site or deleted the record with a note that the on-premise digital sign could not be identified. There were some challenges associated with finding digital signs using the Street View pictures from Google Maps, including fuzzy pictures with low resolution, which made it difficult to evaluate some signs, and digital signs that were not obvious during the daytime (Street View provides only daytime pictures).
   c. The screen image of the subject sign was saved, and basic sign characteristics were identified and/or estimated. Examples include sign color, size, and business type.
   d. An initial determination was made as to whether the sign was located on a major road that would be part of the HSIS crash dataset. If the road was not expected to be a major road, the record was deleted from the dataset.
3. The sign location was entered into Google Earth to determine the county in which the sign was located and the mileage from the county border. This included identifying the county identification code in the appropriate HSIS manual for a given state. This provided the milepost location information needed to relate the sign location to the location information in the crash dataset. Defining the milepost information required doing the following:
   a. Identifying the neighboring county, which was used to determine in which direction the mileposts were increasing.
   b. If the county had mileposts restarting at zero at the county borders, determining in which direction they were increasing, based on the number of lanes at the borders. If the direction could not be determined, a general rule of increasing from west to east or south to north was used.
   c. Using the path tool in Google Earth to measure the distance from the county border to the sign. This distance and the beginning milepost at the county border established the milepost of the sign.

An example (using the above procedure) can be founded in Appendix A. After target sign locations were transferred into the HSIS locating system, a statistics software package, “R,” was used to select the related crashes among the whole HSIS dataset.

Sign ID	Address	Installation date	Google Map				Google Earth				Note
			Picture	Color (Single/ Multi.)	Dimension	Business Type	County ID	Route #	Distance	Mile post	

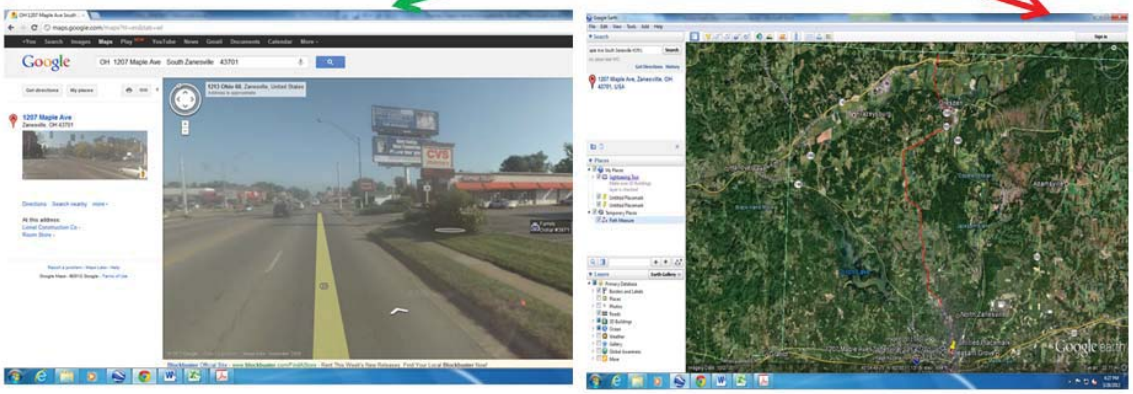

Figure 3. Example work table of site data collection

CHAPTER 4:
STUDY METHODOLOGY

Evaluating the effects of treatment on the number and severity of crashes is a very important topic in highway safety. For the last 30 years, various methods have been proposed for evaluating safety treatments (Abbess et al., 1981; Danielsson, 1986; Davis, 2000; Hauer, 1980a; Hauer, 1980b; Hauer et al., 1983; Maher and Mountain, 2009; Miranda-Moreno, 2006; Wright et al., 1988). The methods are classified under two categories: the before-after study and the cross-sectional study. In a before-after study, the safety impacts of an improvement or treatment at a given location are determined by comparing the change in crashes before and after the improvement/treatment was installed. In a cross-sectional study, crashes or crash rates on two different facilities with similar characteristics except for the improvement of interest are compared. The before-after study is typically more desirable because it provides a more direct evaluation of the safety impacts. Although they have been used by some researchers (Noland, 2003; Tarko et al., 1998), cross-sectional studies are more difficult to conduct because different facilities are rarely identical in all features except the one of interest. Hence, the cross-sectional approach was not used in this research. The before-after type of study can be further divided into several types:

- naïve before-after study,
- before-after study with control group,
- before-after study using the EB method, and
- before-after study using the full Bayes approach.

The before-after study using the full Bayes approach is a more recent development in statistical safety analysis, developed and used by several noted safety researchers (Hauer and Persaud, 1983; Hauer et al., 1983; Hauer, 1997; Li et al., 2008; Persaud and Lyon, 2007). The advantages and disadvantages for each of the above before-after methods are described in more detail in this chapter.

A BEFORE-AFTER STUDY AND A CROSS-SECTIONAL STUDY

As mentioned previously, observational crash studies can be grouped into two types: the before-after study and the cross-sectional study. The selection of the study type is based on the availability of historical crash data, traffic volume, or the comparison group. The following sections provide details about the before-after methodology.

The Before-After Study

The before-after study is a commonly used method for measuring the safety effects of a single treatment or a combination of treatments in highway safety (Hauer, 1997). Short of a controlled and full randomized study design, this type of study is deemed superior to cross-sectional studies since many attributes linked to the converted sites where the treatment (or change) was implemented remain unchanged. Although not perfect, the before-after study approach offers a

better control for estimating the effects of a treatment. In fact, as the name suggests, it implies that a change actually occurred between the "before" and "after" conditions (Hauer, 2005).

As described by Hauer (1997), the traditional before-after study can be accomplished using two tasks. The first task consists of predicting the expected number of target crashes for a specific entity (i.e., intersection, segment where an on-premise sign was installed, etc.) or series of entities in the after period, had the safety treatment not been implemented. In other words, the before-after approach described by Hauer compares the expected number of crashes in the after period with the treatment installed to the expected number of crashes in the after period had the treatment not been installed. The calculation for each expected number of crashes is based on numerous factors, including the actual number of crashes in the before condition, the actual number of crashes in the after period, and incorporation of site-specific and statistical considerations. The symbol π is used to represent the expected number of crashes in the after period (a summary of all statistical symbols used in this report are presented in Appendix B). The second task consists of estimating the number of target crashes (represented by the symbol λ) for the specific entity in the after period. The estimates of π and λ are $\hat{\pi}$ and $\hat{\lambda}$ (the caret or hat represents the estimate of an unknown value). Here, the term "after" means the time period after the implementation of a treatment; correspondingly, the term "before" refers to the time before the implementation of this treatment (an on-premise digital sign in this study). In most practical cases, either $\hat{\pi}$ or $\hat{\lambda}$ can be applied to a composite series of locations (the sum of *i*'s below) where a similar treatment was implemented at each location.

Hauer (1997) proposed a four-step process for estimating the safety effects of a treatment. The process is described as follows (see also Ye and Lord, 2009):

- Step 1: For $i = 1,\ 2,\ ...,\ \mathrm{n}$, estimate $\lambda(i)$ and $\pi(i)$. Then, compute the summation of the estimated and predicted values for each site i, such that $\hat{\lambda} = \sum \hat{\lambda}(i)$ and $\hat{\pi} = \sum \hat{\pi}(i)$.
- Step 2: For $i = 1,\ 2,\ ...,\ \mathrm{n}$, estimate the variance for each, $Var\{\hat{\lambda}(i)\}$ and $Var\{\hat{\pi}(i)\}$. For each single location, it is assumed that observed data (e.g., annual crash counts over a long time frame) are Poisson distributed and $\hat{\lambda}(i)$ can be approximated by the observed value in the before period. On the other hand, the calculation of $Var\{\hat{\pi}(i)\}$ will depend on the statistical methods adopted for the study (e.g., observed data in naïve studies, method of moments, regression models, or EB technique). Assuming that crash data in the before and after periods are mutually independent, then $Var\{\hat{\lambda}\} = \sum Var\{\hat{\lambda}(i)\}$ and $Var\{\hat{\pi}\} = \sum Var\{\hat{\pi}(i)\}$.
- Step 3: Estimate the parameters δ and θ, where $\hat{\delta} = \hat{\pi} - \hat{\lambda}$ (again, referring to estimated values) is defined as the reduction (or increase) in the number of target crashes between the predicted and estimated values, and $\hat{\theta} = \hat{\lambda} / \hat{\pi}$ is the ratio between these two values. When θ is less than one, the treatment results in an improvement in traffic safety, and when it is larger than one, the treatment has a negative effect on traffic safety. The term θ has also been referred to in the literature as the index of effectiveness (Persaud et al., 2001). Hauer (1997) suggests that when less than 500 crashes are used in the before-after study, θ should be corrected to remove the bias caused by the small sample size using

the following adjustment factor: $1/[1+Var\{\hat{\pi}\}/\hat{\pi}^2]$. The total number of crashes was over 500, but the adjustment factor had to be applied when subsets of the data, such as single- or multi-vehicle crashes, were analyzed.

- Step 4: Estimate the variances $Var\{\hat{\delta}\}$ and $Var\{\hat{\theta}\}$. These two variances are calculated using the following equations (note: $Var\{\hat{\theta}\}$ is also adjusted for the small sample size):
  - $Var\{\hat{\delta}\} = Var\{\hat{\lambda}\} + Var\{\hat{\pi}\}$ (Eq. 1)
  - $Var\{\hat{\theta}\} = \dfrac{\hat{\theta}^2[(Var\{\hat{\lambda}\}/\hat{\lambda}^2) + (Var\{\hat{\pi}\}/\hat{\pi}^2)]}{[1+(Var\{\hat{\pi}\}/\hat{\pi}^2)]^2}$ (Eq. 2)

The four-step process provides a simple way for conducting before-after studies. Three common before-after methods will be introduced in the following sections. All three methods use the same four-step process.

COMMON METHODS FOR CONDUCTING A BEFORE-AFTER STUDY

Having selected the before-after study approach, the research team then needed to decide which specific before-after method would be the most appropriate for analyzing the safety impacts of on-premise digital signs. This section of the report describes the methodologies and data needs associated with three before-after study types: naïve before-after studies, before-after studies with a CG, and the EB method.

Naïve Method

Among all the before-after methods, the naïve method is the simplest. The estimation of θ is simply equal to the ratio between the number of crashes in the after period and the number of crashes in the before period (which is used to predict the number of crashes in the after period if the treatment was not implemented). Equation 3 illustrates how the index of safety effectiveness is calculated. This method is very straightforward, but it is seldom used in the current safety study because it does not account for the RTM bias. Not including the RTM bias could overestimate the effects of the treatment or underestimate the safety impacts. The naïve method does not account for external factors that occur at the local or regional level, such as changes in weather patterns or economic conditions.

$$\hat{\theta}_{naive} = \frac{\hat{\lambda}}{\hat{\pi}} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{t} N_{ij2}^{T}}{\sum_{i=1}^{n}\sum_{j=1}^{t} N_{ij1}^{T}} \quad \text{(Eq. 3)}$$

Where

$\hat{\theta}_{naive}$ = the estimate of safety effectiveness by using the naïve method,

$\hat{\pi}$ = the predicted number of crashes for the treatment group in the after period,

$\hat{\lambda}$ = the estimated number of crashes for the treatment group in the after period,

n = the sample size,

t = the time period,

N_{ij1}^{T} = the observed response for site i (T = treatment group) and year j (in the before period), and

N_{ij2}^{T} = the observed response for site i (T = treatment group) and year j (in the after period).

The result can be adjusted when the traffic flow and time interval are different between the before and after periods. It is adjusted by modifying the predicted number of crashes as shown in Equation 4:

$$\pi = r_d r_f \sum_{i=1}^{n} \sum_{j=1}^{t} N_{ij1}^{T} \qquad \text{(Eq. 4)}$$

Where

r_d = the ratio of the duration between the after and before periods, and

r_f = the ratio of the traffic flow between the after and before periods.

Control Group Method

The CG method can be used to help control for external factors. The number of crashes collected at the control sites is defined as μ (before) and ν (after). The adjusting factor, the ratio of ν to μ, is used to remove the effects caused by other external factors from π in the theorem. Equation 5 illustrates how to adjust the naïve estimate. It should be pointed out that the RTM could technically be removed if the characteristics of the control group are exactly the same as those of the treatment group. However, getting control group data with the exact same characteristics may not be possible in practice, as discussed in Kuo and Lord (2012). Collecting control group data usually adds extra cost and time compared to the naïve method since more data needs to be collected.

$$\hat{\theta}_{CG} = \frac{\hat{\lambda}}{\hat{\pi} \times \frac{\hat{\nu}}{\hat{\mu}}} = \frac{\sum_{i=1}^{n} \sum_{j=1}^{t} N_{ij2}^{T}}{\sum_{i=1}^{n} \sum_{j=1}^{t} N_{ij1}^{T} \times \sum_{i=1}^{n} \sum_{j=1}^{t} \frac{N_{ij2}^{C}}{N_{ij1}^{C}}} \qquad \text{(Eq. 5)}$$

Where

$\hat{\theta}_{CG}$ = the estimate of safety effectiveness by using the control group method,

$\hat{\lambda}$ = the estimated number of crashes for the treatment group in the after period,

$\hat{\pi}$ = the predicted number of crashes for the treatment group in the after period,

$\hat{\nu}$ = the estimated number of crashes for the control group in the after period,

$\hat{\mu}$ = the estimated number of crashes for the control group in the before period,

N_{ij1}^{T}, N_{ij1}^{C} = the observed responses for site i (T = treatment group and C = control group) and year j (in the before period), and

N_{ij2}^{T}, N_{ij2}^{C} = the observed responses for site i (T = treatment group and C = control group) and year j (in the after period).

Empirical Bayes Method

The EB method is recommended in the *Highway Safety Manual* (HSM), published by the American Association of State Highway and Transportation Officials (AASHTO) and approved for use by the FHWA (AASHTO, 2010). The HSM is a recent document that defines standardized procedures for conducting safety analyses of highway safety improvements. The EB method combines short-term observed crash numbers with crash prediction model data in order to get a more accurate estimation of long-term crash mean. The EB method is used to refine the predicted value by combining information from the site under investigation and the information from sites that have the same characteristics, such as range of traffic flow, number of lanes, lane width, etc.

As an illustration, Hauer et al. (2002) use a fictional "Mr. Smith" to illustrate use of the EB method: Mr. Smith is a new driver in a city. He has no crash records during his first year of driving. Based on past crash histories for the city, a new driver in that city has 0.08 accidents per year. Based only on Mr. Smith's record, it is not reasonable to say that he will have zero accidents or have 0.08 accidents for the next year (based on the average of all new drivers but disregarding Smith's accident record). A reasonable estimate should be a mixture of these two values. Therefore, when estimating the safety of a specific road segment, the accident counts for this segment and the typical accident frequency of such roads are used together.

The index of safety effectiveness is illustrated in Equation 6. With the EB method, the analyst first estimates a regression model or safety performance function (SPF) using the data collected with the control group. Then, the model is applied to the sites where the treatment was implemented to get a preliminary predicted value for the after period. The EB method is then used to refine the estimate to account for the RTM bias and the external factors. It is possible for the EB method to be biased if the characteristics of the treatment and control groups are not the same (Lord and Kuo, 2012).

$$\hat{\theta}_{EB} = \frac{\hat{\lambda}}{\hat{\pi}} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{t} N_{ij2}^{T}}{\sum_{i=1}^{n}\sum_{j=1}^{t} M_{ij1}^{T}} \qquad \text{(Eq. 6)}$$

Where

$\hat{\theta}_{EB}$ = the estimate of safety effectiveness based on the EB method;

$\hat{\pi}$ = the predicted number of crashes for the treatment group in the after period;

$\hat{\lambda}$ = the estimated number of crashes for the treatment group in the after period;

M_{ij1} = the expected responses for site i for the EB method,

$$\mathrm{M_{ij1}} = \mathrm{W} \times (\hat{\Lambda}_1) + (1 - \mathrm{W}) \times (\sum_{\mathrm{j=1}}^{\mathrm{t}} N_{\mathrm{ij1}});$$

W = the weight for sites for the EB method, $W = \dfrac{1}{1 + \hat{\Lambda}_1 \times \hat{\alpha}}$;

$\hat{\Lambda}_1$ = the estimate for the average number of crashes of all sites in the before period; and

$\hat{\alpha}$ = the estimate of the dispersion parameter.

$\hat{\Lambda}_1$ and $\hat{\alpha}$ can be estimated using two different approaches (Hauer, 1997). They can be estimated based on a regression model or the method of moment. Both are calculated using data collected as part of the control group. For this research, the average number of crashes and dispersion parameter were estimated using a regression model.

CALCULATION PROCEDURES AND EXAMPLES

The EB before-after method was applied to this study with the regression models or SPFs selected from the HSM (AASHTO, 2010), which includes road types from two to five lanes. As for sites located on wider roads (six lanes and eight lanes, which are not covered in the HSM), the researchers used the SPFs from a Texas A&M Transportation Institute (TTI) study (Bonneson and Pratt, 2009). The number of crashes in each year during the before period (Λ_i) was estimated using the regression model shown in Equation 7:

$$\Lambda_i = \exp(a + bLn(AADT_i) + Ln(L_i)) \qquad \text{(Eq. 7)}$$

Where
Λ_i = the estimator for the average number of crashes per year for site i,
a, b = the coefficients in the regression model,
$AADT_i$ = the average daily traffic volume for site i,
L_i = the road length for site i, and
Ln = natural logarithm.

Table 3 shows the regression coefficients (a, b) used in Equation 7 for multi- and single-vehicle crashes.

One of the sign sites in Ohio provides an example of the detailed calculation of $M_{i,EB}$. This site is on an urban 4-lane divided highway segment in Allen County. As shown in Table 3, its intercept is -12.34 for multi-vehicle crashes and -5.05 for single-vehicle crashes, while the coefficients for the AADT are 1.36 and 0.47, respectively. For the analysis used in this report, a multi-vehicle crash is one involving two or more vehicles in the same collision.

Using the EB method, the analysis procedure to get the expected number of crashes in the before period has the following steps:

1. Identify the route number and milepost by the site's address. More specifically, the address of the example site is "1234 ABC St, Name of City, Allen County, OH." Follow the data analysis procedures discussed in Chapter 3 to identify that the route number is 657676309 and the milepost is 7.58.

Table 3. Coefficients for multi and single-vehicle crash regression model

Crash Type	Road Type*	Regression Coefficients		Dispersion Parameter (α)
		Intercept (a)	AADT (b)	
Multi-vehicle	2U	−15.22	1.68	0.84
	3T	−12.4	1.41	0.66
	4U	−11.63	1.33	1.01
	4D	−12.34	1.36	1.32
	5T	−9.7	1.17	0.81
Single-vehicle	2U	−5.47	0.56	0.81
	3T	−5.74	0.54	1.37
	4U	−7.99	0.81	0.91
	4D	−5.05	0.47	0.86
	5T	−4.82	0.54	0.52

Note: *U = undivided road, T = road with two-way left turn lane, D = divided road.

2. Based on the route number and milepost obtained above, use R statistical software to select the related crashes and road files from the HSIS dataset, which includes (1) the observed crashes near the target sign site, (2) the observed crashes in the control group sites (10 sites, which are adjusted to the target sign site on the same road), and (3) the target road file, such as traffic volume, the number of lanes, and median type. For example, the number of observed crashes at the example site is 1 in 2004, and the crash counts of the related 10 control group sites are 0, 0, 1, 1, 0, 0, 0, 0, 1, and 1. The AADT of the site is 19,753 (vehicles/day), and it has four lanes.
3. Use Equation 9 to predict the crash number of the example site:

   $$\hat{\Lambda}_{2004} = \exp(a + b(Ln(AADT)) + Ln(L)$$

   $$\hat{\Lambda}_{2004,\text{multi}} = \exp(-12.34 + 1.36 \times Ln(19753) + Ln(0.2)) = 0.61$$

   $$\hat{\Lambda}_{2004,\text{single}} = \exp(-5.05 + 0.47 \times Ln(19753) + Ln(0.2)) = 0.13$$

   $$\hat{\Lambda}_{2004} = \hat{\Lambda}_{2004,\text{multi}} + \hat{\Lambda}_{2004,\text{single}} = 0.74 \text{ (crashes/year)}$$

   The estimated crash counts of the site and its control group sites are 0.74 and 6.64, respectively (the estimated multi-and single crash counts of its control group are 5.36 and 1.28).
4. Due to using the SPFs from the HSM instead of the local SPFs from any existing studies conducted in the same study area, it is necessary to multiply the results by a calibration factor to adjust the prediction value (refer to Appendix A in the HSM for more details). The calibration factor of single-vehicle crashes at the example site in 2004 is 3.13, which is equal to the ratio of observed crashes in the control group divided by the predicted crash number in the control group (3.13 = (1×4+0×6)/1.28). By multiplying the above calibration factor, the final crash number estimation for the example site in 2004 should be 0.42 (=0.13×3.13). A calibration factor was calculated for each site and each year included in the study.

5. Repeat steps 3 and 4 to get the final prediction crash number for the example site for each year in the before period. By doing so, the estimated multi- and single-vehicle crash counts of the site in 2005 are 4.65 and 0.21, respectively. Using the summary of this prediction crash number and dispersion parameter (obtained from Table 3) results in the weights (*W*) for this site for the multi- and single-vehicle crashes, which are 0.07 and 0.65, respectively:

$$W = \frac{1}{1+\hat{\Lambda}_1 \times \hat{\alpha}}$$

$$W_{multi} = \frac{1}{1+(5.43+4.65)\times 1.32} = \frac{1}{1+10.08\times 1.32} = 0.07,$$

$$W_{\text{single}} = \frac{1}{1+(0.42+0.21)\times 0.86} = \frac{1}{1+0.63\times 0.86} = 0.65$$

6. Because traffic volume and other explanatory variables may change between the before and after periods, the researchers used one factor to account for this difference. The crash counts of the example site in 2007 and 2008 can be estimated by repeating steps 3 and 4. The estimated multi- and single-vehicle crash counts of the site in the after period are 0.84 and 0.67, respectively. Factors are estimated by:

$$r = \hat{\Lambda}_{after} \big/ \hat{\Lambda}_{before}$$

$$r_{i,multi} = (12.76/3)/(10.08/2) = 0.84$$

$$r_{\text{i,single}} = (0.63/3)\big/(0.63/2) = 0.67$$

Also, if the time periods (*Y*) of the before and after periods are different, one factor is needed to adjusted it. Here, the before and after period are both two years:

$$t_i = Y_{i,after} \big/ Y_{i,before} = 3/2 = 1.5$$

7. Using the EB method, the expected total number of crashes that would occur during the after period had the on-premise digital sign not been installed was 2.63:

$$\mathrm{M}_{\text{i,EB}} = \left[\mathrm{W} \times (\hat{\Lambda}_1) + (1-\mathrm{W}) \times (\sum_{\text{j=1}}^{\text{t}} N_{\text{ij1}}) \right] \times r_i \times t_i$$

$$\mathrm{M}_{\text{i,multi,EB}} = \left[0.07\times 10.08 + (1-0.07)\times 0\right] \times 0.84 \times 1.5 = 1.14$$

$$\mathrm{M}_{\text{i,single,EB}} = \left[0.65\times 0.63 + (1-0.65)\times 3\right] \times 0.67 \times 1.5 = 1.49$$

$$\mathrm{M}_{\text{i,all,EB}} = 1.14 + 1.49 = 2.63$$

8. The variance of the EB estimate at the example site is calculated by:

$$\mathrm{Var}(\mathrm{M}_{\text{1,EB}}) = (1-\mathrm{W}) \times \mathrm{M}_{1,EB} \times r_i \times t_i$$

$$\mathrm{Var}(\mathrm{M}_{\text{1,multi,EB}}) = (1-0.07) \times 1.14 \times 0.84 \times 1.5 = 1.31$$

$$\mathrm{Var}(\mathrm{M}_{\text{1,single,EB}}) = (1-0.65) \times 1.49 \times 0.67 \times 1.5 = 0.54$$

$$\mathrm{Var}(\mathrm{M}_{\text{1,all,EB}}) = 1.31 + 0.54 = 1.85$$

9. The safety index of the example site is:

$$\hat{\theta}_{EB} = \frac{\hat{\lambda}}{\hat{\pi}} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{t} N_{ij2}^{T}}{\sum_{i=1}^{n}\sum_{j=1}^{t} M_{ij1}^{T}} = \frac{9}{2.63} = 3.43$$

10. The 95 percent confidence interval of the example site is given as.

$$\hat{\theta} \pm Z_{0.25}\sqrt{Var\left(M_{1,EB}\right)} = \left[3.43 \pm 1.96 \times \sqrt{1.85}\right] = \left[0.76, 6.10\right]$$

The same method was applied to other locations using the appropriate SPFs. The next chapter provides the final results of the completed safety analysis.

CHAPTER 5:
RESULTS

The previous chapter explained why the research team chose to use the EB analysis procedure and provided an example of how the EB analysis was conducted. The first section of this chapter provides the results of the before-after study for each state and all the states combined. The second section provides more details about how digital on-premise signs impact traffic safety for multi-vehicle and single-vehicle crashes. The third section provides a description of an analysis of variance of the means of the safety index (θ) among the different sign characteristics such as sign color, sign size, and type of business.

INDIVIDUAL AND COMBINED RESULTS

As described in Chapter 3, the research team acquired the sign dataset from sign manufacturers. However, many signs were excluded from the analysis because of missing information in the dataset provided by the sign manufacturers or limitations in the HSIS crash dataset. The researchers retained only sign sites satisfying the following conditions:

1. the sign was located in Washington, North Carolina, Ohio, or California;
2. the sign was installed in 2006 or 2007 in order to have adequate time in both the before and after analysis periods to compare crash histories; and
3. the sign was located on a major road because the HSIS crash dataset usually does not include crashes that are located on minor roads or private driveways.

Table 4 shows the progression in sample sizes based on sites meeting the conditions identified above. For example, the original dataset for Washington included 413 site addresses that might have an on-premise digital sign. In order to make sure there was an adequate before-after crash data period for further analysis, the researchers had to filter these site addresses. The first filter excluded sites where the sign was not installed in 2006 or 2007, which was needed so that there was adequate time before and after the sign was installed to perform the safety analysis. About 40 percent of the Washington sites (159 sites) met this criterion. Then, the research team used the Street View function in Google Maps to double-check whether a digital sign was present at the given addresses and whether the sign was on a major road since the HSIS crash dataset only included crashes on major roads. Only 33 sites fit this criterion. The result was that in Washington, the research team was able to use about 33 of the 400 original sites, giving an 8.0 percent yield on the raw data.

Chapter 3 mentions that the main advantage of this study is the large sample size of data and advanced statistical methods that provide more accurate results than in similar studies. Figure 4 shows the sample size of this study in relation to other published papers and reports. This study has 135 sites from four states, a number much higher than the sample size of other similar studies. Hence, the results of this study are more robust and accurate.

Table 4. Sign site sample size yield

Number of Sites	California	North Carolina	Ohio	Washington	All States
Included in original list from sign manufacturers	86	249	372	413	1,120
Sign installation time between 2006–2007	27	94	178	159	458
Digital signs & located on major roads	6	40	73	34	153
With HSIS crash data (all crashes)	6	33	63	33	135
Data yield rate	7.0%	13.3%	16.9%	8.0%	12.1%
With HSIS crash data (multiple-vehicle crashes)	6	31	61	33	131
With HSIS crash data (single-vehicle crashes)	6	32	63	33	134

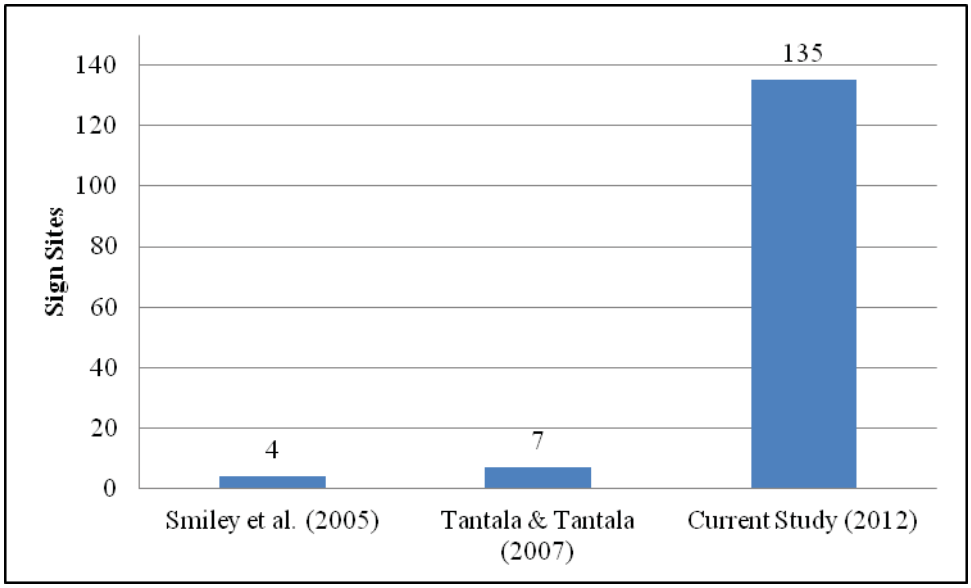

Figure 4. A comparison of sample sizes from similar studies

Table 5 presents the before-after results from the EB and the naïve statistical analysis methods. The naïve method results are provided only for comparison purposes as the naïve analysis method does not provide as meaningful results as the EB method. The results are also presented graphically in Figure 5. A safety effectiveness index (θ) of 1.0 indicates that there was no change in crashes between the before and after conditions. An index greater than 1.00 indicates that there was an increase in crash frequency in the after condition, while a value less than 1.00 indicates a decrease in crash frequency. The upper and lower bounds indicate the limits of statistical significance. If the value for θ is between the upper and lower bounds, then the change in crashes is not statistically significant at a 95 percent confidence level. A larger sample size usually leads to a smaller difference between the upper and lower bounds, but this may not always be the case since it is also governed by the variability observed in the data.

Table 5. Results of statistical analysis of before-after crash condition

State	EB Method			Naïve Method		
	Lower Bound	θ	Upper Bound	Lower Bound	θ	Upper Bound
California	0.00	1.25	2.53	0.28	0.85	1.41
North Carolina	0.87	1.14	1.41	0.88	1.13	1.39
Ohio	0.89	0.97	1.05	0.95	1.05	1.15
Washington	0.88	1.01	1.15	0.79	0.90	1.01
All states*	0.93	1.00	1.07	0.93	1.00	1.07

Notes: *"All states" represents the combined data of the four states.
Naïve method values provided for comparison purposes only.

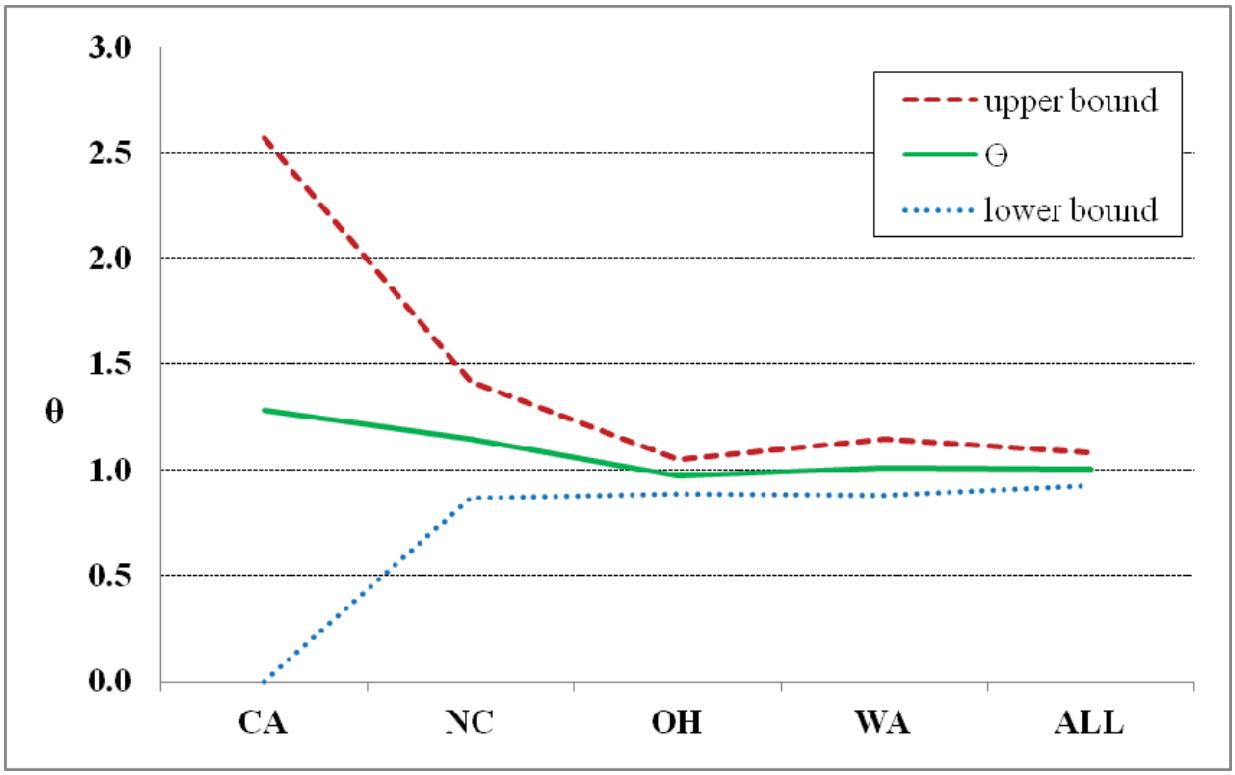

Figure 5. The safety effectiveness index and the 95 percent confidence interval for each state (all crash types)

The overall results show that there is no statistically significant increase in crash frequency after installing the on-premise digital sign because the safety effectiveness index (θ) for the entire dataset (all states) is 1.00, and the 95 percent confidence interval is 0.93–1.07 (which includes the index value of 1.00). The results for individual states are similar: no statistically significant safety impacts were observed after the installation of digital signs. In addition, one can see the width of the 95 percent confidence interval is largest for the California data. This is due to the variability of the California data and the small size of the sample set (only 6 sites). Comparing the width of the confidence intervals, from the widest to narrowest, the order is California > North Carolina > Washington > Ohio > All States.

RESULTS FOR CRASHES RELATED TO MULTIPLE AND SINGLE VEHICLES

The next analysis effort evaluated the possible safety impacts of on-premise digital signs on different types of crashes. There are several common methods to group crashes into different categories, such as the number of related vehicles, the injury levels, the collision types, and so on. Such groupings may provide some insight into the safety impacts of specific crash types, but the estimated impacts might not be precise because of a smaller sample size.

The additional analysis separated crashes into two subgroups: single- and multi-vehicle crashes. All calculations and notations were the same as used previously. By using the EB method to analyze crash data related to multiple vehicles, the researchers determined that the safety effectiveness index is equal to 1.00 for all states, and the 95 percent confidence interval varies between 0.96 and 1.21. Because the confidence interval of the safety effectiveness includes 1.00, there is no statistically significant change in crash frequency after installing the on-premise digital sign. Figure 6 graphically illustrates the results for multi-vehicle crashes. The 95 percent confidence intervals are slightly larger in this figure than in Figure 5.

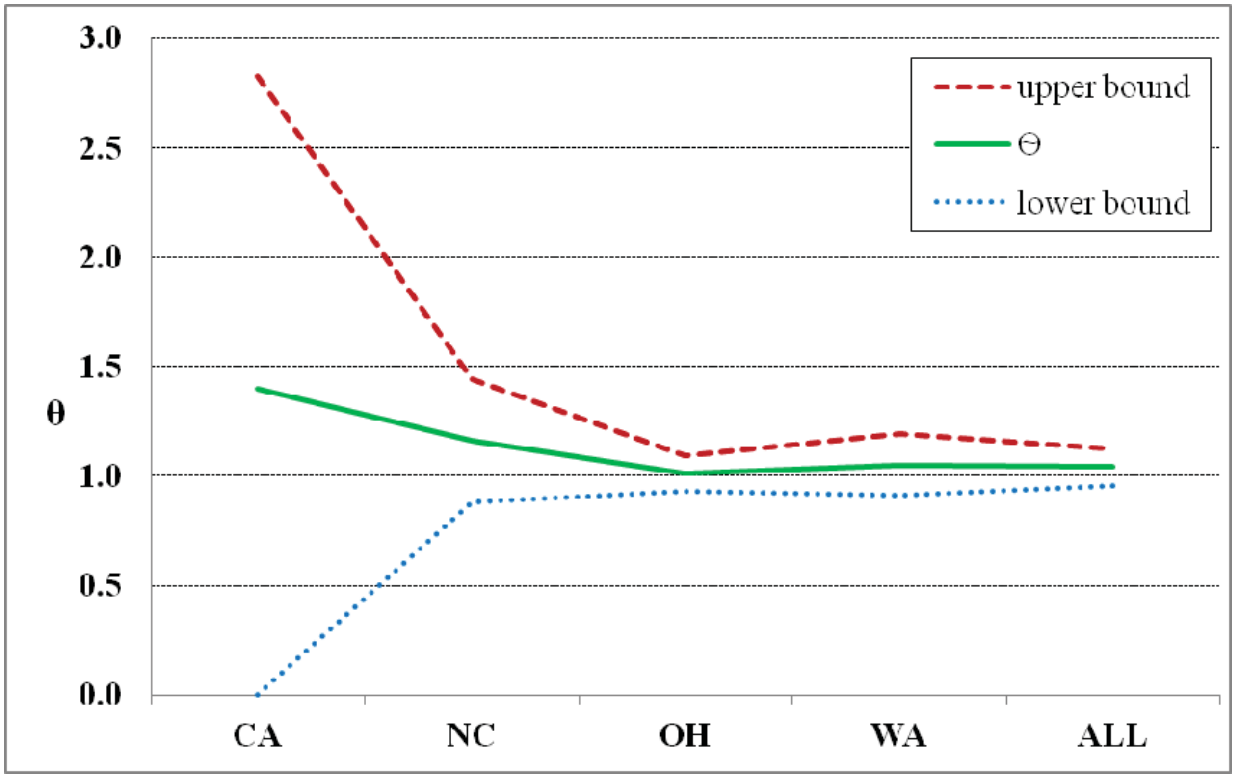

Figure 6. The safety effectiveness index and the 95 percent confidence interval for each state (multi-vehicle crashes)

The results for single-vehicle crashes are presented in Figure 7. The overall results are the similar: there are no statistically significant safety impacts from digital signs, except for California. The California results for single-vehicle crashes indicate a statistically significant decrease in crash frequency in the after period. Although the before-after results of California show a decrease in the after period, it does not affect the overall result because the low sample

size (6 sites) makes it more difficult to establish statistical significance in the analysis results. It is also worth noting that the North Carolina data has the largest confidence interval, due to the variability in the North Carolina single-vehicle crash data.

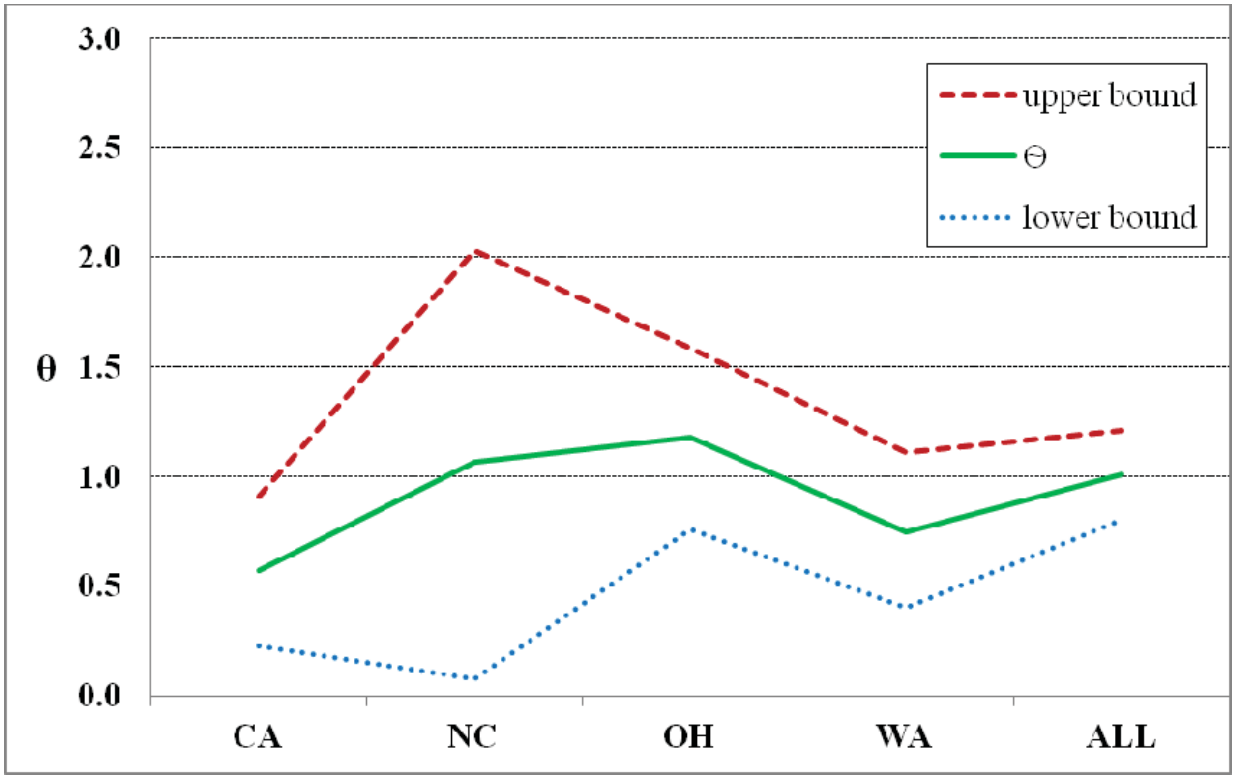

Figure 7. The safety effectiveness index and the 95 percent confidence interval for each state (single-vehicle crashes)

RESULTS FOR CRASHES RELATED TO DIFFERENT TYPES OF SIGNS

The research team also conducted an analysis to investigate the impacts of specific on-premise digital sign characteristics on the safety impacts of those signs. Specific sign characteristics that the research team evaluated included color (single or multi-color), size (small, medium, or large), and type of business. The research team used the analysis of variance (ANOVA) analysis method to evaluate whether the means of the safety index (θ) among the different characteristics of signs are equal.

An ANOVA is one of the most common statistical methods used to compare two or more means in the analysis of experimental data. In short, ANOVA provides a statistical test of whether or not the means of multiple groups are all equal, while a t-test is suitable only for the two-group case because doing multiple two-sample t-tests would increase the risk of a Type I error (for datasets containing more than 30 observations). In addition, when there are only two means to compare, the t-test and the ANOVA are equivalent. As a result, the research team chose the one-way ANOVA as the study tool to simplify the methodology, although some digital sign characteristics, such as sign color, have only two subgroups (i.e., single color and multi-color).

The theory of an ANOVA test is to separate the total variation in the data into a portion due to random error (sum of squares for error [SSE]) and portions due to the treatment (total sum of squares [SST]). Table 6 shows the typical form of a one-way ANOVA table. If the calculated F value (= treatment mean square [MST] / error mean square [MSE]) is significantly larger than F (k-1, N-k), the null hypothesis is rejected. F (k-1, N-k) is the critical value when the means of each group are equal. Most statistic software will also provide the corresponding p-value for researchers making their decisions in different confidence intervals.

Table 6. The typical form of a one-way ANOVA table

Source	SS	DF	MS	F	P(>F)
Treatments	SST	k-1	SST / (k-1)	MST/MSE	
Error	SSE	N-k	SSE / (N-k)		
Total (corrected)	SS	N-1			

Notes: *SS* = sum of squares, *DF* = degrees of freedom, *MS* = mean of sum of squares, *F* = F-distribution (because the test statistic is the ratio of two scaled sums of squares, each of which follows a scaled chi-squared distribution), *P(>F)* = the p-value when the F value (= MST/MSE) is larger than F (k-1, N-k), *k* = number of treatments, and *N* = total number of cases.

There are three data assumptions for applying the ANOVA method:

1. Independence: The study data are independently, identically, and normally distributed.
2. Normality: The distributions of the data or the residuals are normal. This assumption is true when the sample size is larger than 30.
3. Homogeneity of variability: Equality of variances — the variance of data between groups — should be the same.

If the above conditions do not exist, the ANOVA results may not be reliable. However, if the sample size of each group is similar, one can usually ignore independence and homogeneity problems. Or statisticians may transform data (such as into the logarithmic form) to satisfy these assumptions of the ANOVA.

Based on the existing sign dataset, the research team focused on three digital sign characteristics: color (single color or multi-color), sign dimension (small, medium, or large), and business type (restaurants, pharmacies and retail stores, hotels, gas stations, auto shops, or others). The definitions of sign dimension level are based on the balance principle (making the sample size of each group equal). Figure 8 shows the distribution of signs as a function of different dimensions, and the research team defined signs with an area less than 10 ft^2 as small signs. The medium sign size had an area of at least 10 ft^2 but no more than 15 ft^2, and the large sign size had an area greater than 15 ft^2. The sign size represents the area of the electronic display, not the overall size of the complete sign. It was estimated from the Street View image in Google Maps and may not be an accurate assessment of the sign dimensions.

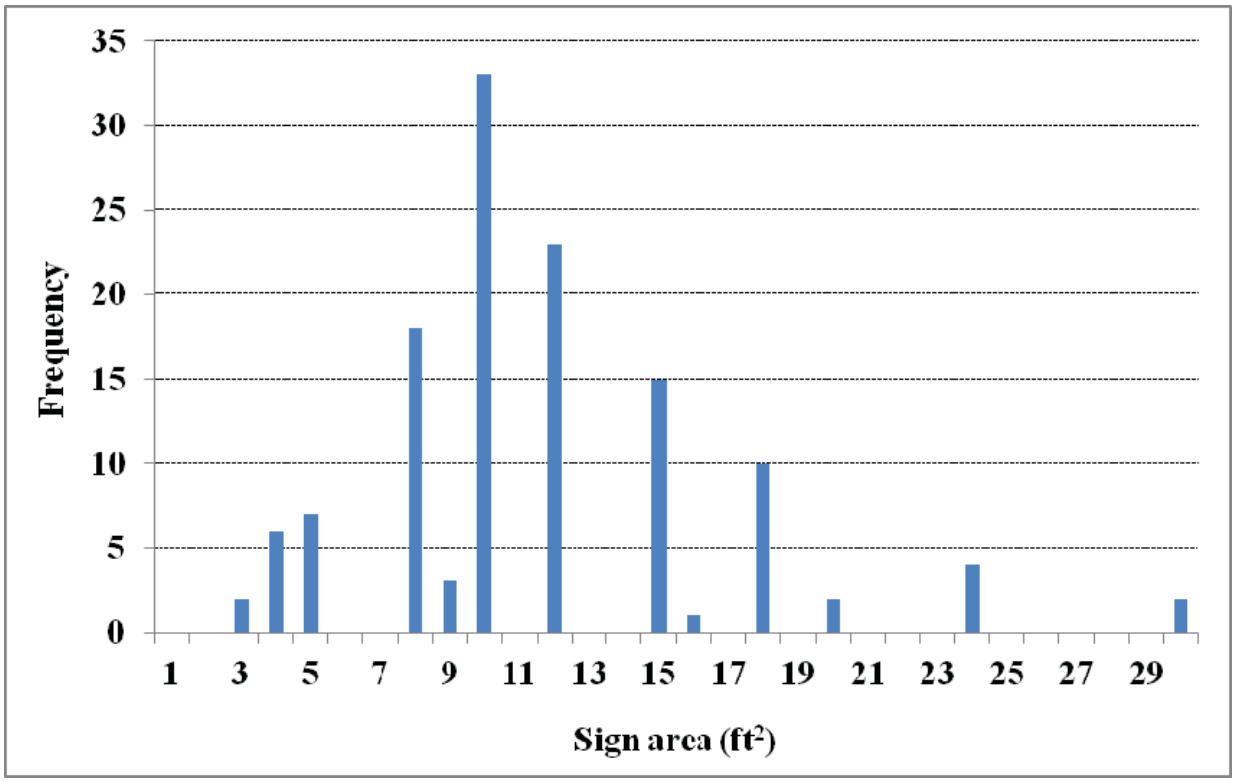

Figure 8. The histogram of digital signs for each sign dimension

Using the ANOVA method to analyze crash data related to specific design characteristics of the sign led to the conclusion that there is no statistically significant difference among the population means of the safety effectiveness index. The following descriptions provide more detail for each of the digital sign characteristics:

- **Color:** According to images obtained from the Street View feature of Google Maps, 89 signs are single-color signs, and 37 signs are multi-colored signs. Table 7 shows the ANOVA results. The test statistic (F value) is 2.07, and its p-value is 0.1527. Because the probability is larger than the critical value (0.05 for 95 percent confidence interval), the null hypothesis of equal population means cannot be rejected. In other words, the ANOVA table shows no significant difference between the mean of safety index (θ_{EB} = crash mean in the before period/crash mean in the after period) among signs having a single color or multiple colors.
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Table 7. Analysis of variance table (color)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	1	4.464	4.4640	2.0704	0.1527
Residuals	124	267.352	2.1561		

- **Sign dimensions:** In the final sign dataset, 36 signs have a sign area less than 10 ft^2, 56 signs have a sign area 10–15 ft^2, and 34 signs have a sign area greater than 15 ft^2. In Table 8, the F value is 0.7767, and its p-value is 0.4622. Because the probability is larger

than the critical value (0.05 for 95 percent confidence interval), the null hypothesis of equal population means cannot be rejected. Accordingly, researchers conclude that there is no (statistically) significant difference among the population means.

Table 8. Analysis of variance table (sign dimension)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	3.39	1.6950	0.7767	0.4622
Residuals	123	268.43	2.1823		

- **Business type:** In the final sign dataset, 7 signs are for restaurants, 18 for pharmacies and retail stores, 3 for hotels, 3 for gas stations, 7 for auto shops, and 84 for other business types. Based on Table 9, the F value is 0.5401, and its p-value is 0.7455. As with the above types, the null hypothesis of equal population means cannot be rejected because the p-value is much larger than the critical value (0.05). The sample size of some business type groups is less than 30, so the research team combined all categories of business types with less than 20 samples into one large group, the "other" category. The resulting ANOVA analysis (Table 10) provides similar results: there is no significant difference among the population means.

Table 9. Analysis of variance table (six business types)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	5	5.983	1.1966	0.5401	0.7455
Residuals	120	265.833	2.2153		

Table 10. Analysis of variance table (two business types)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	1	0.728	0.7289	0.333	0.5649
Residuals	123	271.088	2.18619		

IMPACT OF SIGN HOLD TIME

As an additional effort for this research effort, the research team worked with members of the SFI advisory panel to identify the potential impact of hold time on the relationship between on-premise digital signs and traffic safety. One of the advantages of digital signs is the ability to change the displayed message. The minimum length of time that a message must be displayed is often an element of local sign codes because some believe that frequent changing of sign messages can increase driver distraction and lead to increased crashes. Because the researchers were working with a large number of individual sites and crash records for the after period that spanned two years, it was not possible within the available resources of this project to determine what message(s) were displayed at the time of a crash or the hold time used at a particular site at the time of a crash.

As a surrogate for including hold times as part of the individual site characteristics, the research team acquired information for the hold time regulations in the jurisdictions where the signs were

located. The 135 sign sites were located in 108 jurisdictions. A member of the SFI advisory panel contacted these jurisdictions and was able to identify hold time regulations for 66 of them. The hold time regulations of these 66 jurisdictions are summarized in Table 11. Input from the advisory panel indicated that when a jurisdiction has no statutory language regarding digital sign hold times, it most often means that sign users are able to program their sign to change messages as often as they see fit. In some cases, it could mean that the state standard for digital signs applies, which ranges from 6 to 8 seconds in the four states included in the analysis.

Table 11. Summary of sign hold times

Minimum Hold Time	Number of Jurisdictions
2–6 seconds	14
7–10 seconds	12
20 seconds	3
1–60 minutes	2
24 hours	2
Variance required*	4
No specific restriction	29
Total	66

* Hold times were established by variance on a case-by-case basis.

CHAPTER 6:
SUMMARY AND CONCLUSIONS

While there have been significant amounts of research devoted to the safety impacts of geometric design features and other aspects of the publicly owned transportation infrastructure, the same cannot be said about research on the safety impacts of privately owned signs that are directed to users of public roads. This research effort focused on addressing the safety impacts of on-premise digital signs. Previous research by others has documented the safety effects of on- and off-premise digital signs and their potential influence on crash risk to some extent. However, the results of recent crash studies are not consistent, and most studies have some important weaknesses, such as neglecting biases related to the regression-to-the-mean effects, low statistical power, and analysis results based on erroneous assumptions. In addition, Molino et al. (2009) report that the results from these studies are not comparable because of their different study methods, statistical powers, and cares of execution, which affected the quality of the research.

The research effort described in this report examined the safety impacts of on-premise digital signs using a large sample size of data and advanced statistical methods that provide more accurate results than previous studies. With the help of sign data provided by sign-manufacturing companies and crash data obtained from the Federal Highway Administration Highway Safety Information System, the research team obtained extensive datasets for signs and crashes in four states. The research team began the safety analysis with 1,120 potential study sites, but only 135 sites were usable due to limitations related to the individual signs or the related crash data. Although the yield of usable data was only 11.3 percent, the final sample size of 135 sites was much higher than the sample size of other published papers and reports related to on- and off-premise signs, indicating the results of this research are more robust and accurate.

The research team used the empirical Bayes (EB) statistical analysis method, which is the method recommended in the *Highway Safety Manual*, to conduct the safety analysis described in this report. The *Highway Safety Manual* is a recently published document that is recognized within the transportation profession as the authoritative document for analyzing the safety impacts of various transportation improvements or treatments. The EB analysis procedure uses a before-after approach, with the before and after values modified to address local safety characteristics, regression to the mean, and other factors. The EB method reports the safety impacts through the use of a safety index indicator (represented by θ). A value greater than 1 indicates an increase in crashes, and a value less than 1 indicates a decrease in crashes from the before to the after period. However, for the results to be statistically significant, the θ value must be outside the limits of the 95 percentile confidence interval.

For the entire sample size of 135 sites, the results from the EB method show that there is no statistically significant change in crash frequency associated with installing on-premise digital signs because the safety effectiveness index (θ) is determined to be 1.00, and the 95 percent confidence interval is equal to 0.93 to 1.07 (which includes 1.00, indicating no statistically significant change). The research team also conducted the analysis for each of the four individual states and obtained the same results: there are no statistically significant safety impacts from

installing on-premise digital signs. In addition, the researchers analyzed the safety impacts related to both single- and multi-vehicle crashes. The results for these analyses were also the same: there is no statistically significant increase in crashes associated with the installation of on-premise digital signs. Chapter 5 includes plots that illustrate the safety index values and confidence intervals for all of these results. As a final analysis, the research team performed an ANOVA to evaluate whether the means of the safety index (θ) varied as a function of sign factors (color, size, and type of business). The color analysis evaluated whether there was a difference in the means of the safety index for single- and multi-colored signs, and the results did not find a difference. The size analysis divided the signs in the study into three categories (<10 ft^2, 10–15 ft^2, and >15 ft^2), and the results did not find a difference. Signs were also categorized by the type of business (restaurants, pharmacies and retail stores, hotels, gas stations, auto shops, and others). Once again, there were no differences in the means. Overall, the ANOVA analysis did not identify any factor that led to an increase or decrease in traffic safety for the subcategories evaluated in the ANOVA.

Based on the analysis performed for this research effort, the authors are able to conclude that there is no statistically significant evidence that the installation of on-premise signs at the locations evaluated in this research led to an increase in crashes.

CHAPTER 7:
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APPENDIX A:
STEP-BY-STEP INSTRUCTIONS FOR STUDENTS TO RECORD SIGN DATA

1. Open one SFI sign dataset (e.g., "Washington_2006-2007.xls"). This dataset includes about 150 signs located in the state of Washington during 2006–2007.
2. Input the address information (such as Primary Street Address, City, ZIP Code, County Name, and State) of each sign in Google Maps and use the Street View function to identify the target signs. Please see this link, http://maps.google.com/help/maps/starthere/index.html#streetview&utm_campaign=en&utm_medium=et&utm_source=en-et-na-us-gns-svn&utm_term=gallery, for a demo about how to use the Street View. If you did not find any on-premise digital signs near this site, please make a note in Table 12. Check the characteristics of each sign (including colors, dimensions, and business types) and fill out Table 12. Then, use the "Print Screen" button to copy each sign's picture, and paste it in this document (such as Figure 9). The different business types are classified as (1) Restaurant, (2) Pharmacy and Retail Store, (3) Hotel, (4) Gas Station, (5) Auto Shop, and (6) Other.

Table 12. Example work table of site data collection procedure

Sign ID	Address	Installation Date	Google Maps				Google Earth				Note
			Picture	Color (Single/ Multi.)	Dimension (Estimated)	Business Type	County ID	Route #	Distance	Mile-post	
79016	19330 N US HIGHWAY 101 Shelton 98584 Mason County, WA	2006/9/15	Fig 2	S	3 ft × 6 ft	6	Mason (23)	101	19.3	335.72	

3. Then, use Google Earth to determine the county and route number, and to measure the distance between the closet county boundaries and sign location along the route (recorded in the distance column). The corresponding ID for county and route number is based on the HSIS data manual (file name: guidebook_WA[1].pdf). Then, estimate the milepost value of the sign by the distance and the milepost of the route in the boundaries (based on the HSIS road file, such as wa04road.xls). Take Figure 10; for example, the end mile point of Highway 101 in the county boundary is 355.18, and the distance between the sign and the county boundary is 19.3; so, the milepost of our sign is 335.72. Generally, the milepost value increases from south to north and from west to east. However, the best way to check it is to compare the value of the milepost of adjusted counties. For example, the milepost of US 101 in Mason County is 313.96~355.18, and the milepost of US 101 in Thurston County (located south of Mason) is 355.18~365.56. So, it is known that the mileposts increase from north to south in Mason County. The above variables will be used in the R software to select target crashes from HSIS crash datasets.
4. Write down any questions or comments in the note column. Feel free to ask us if you have any questions.

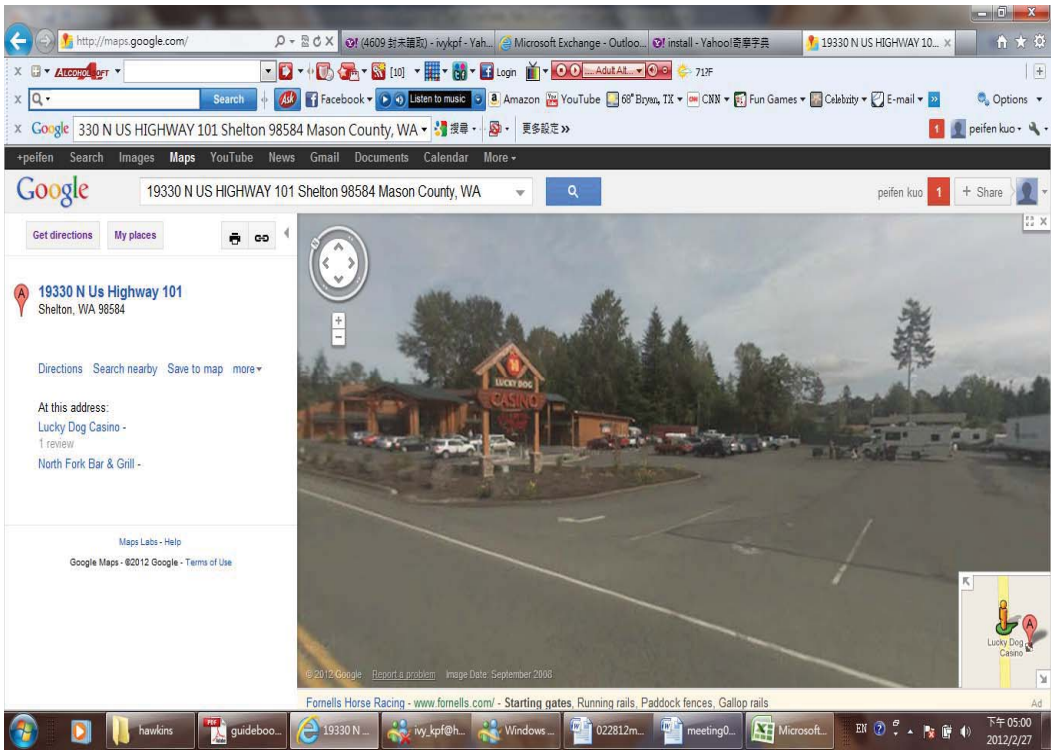

Figure 9. Example screenshot of Google Maps

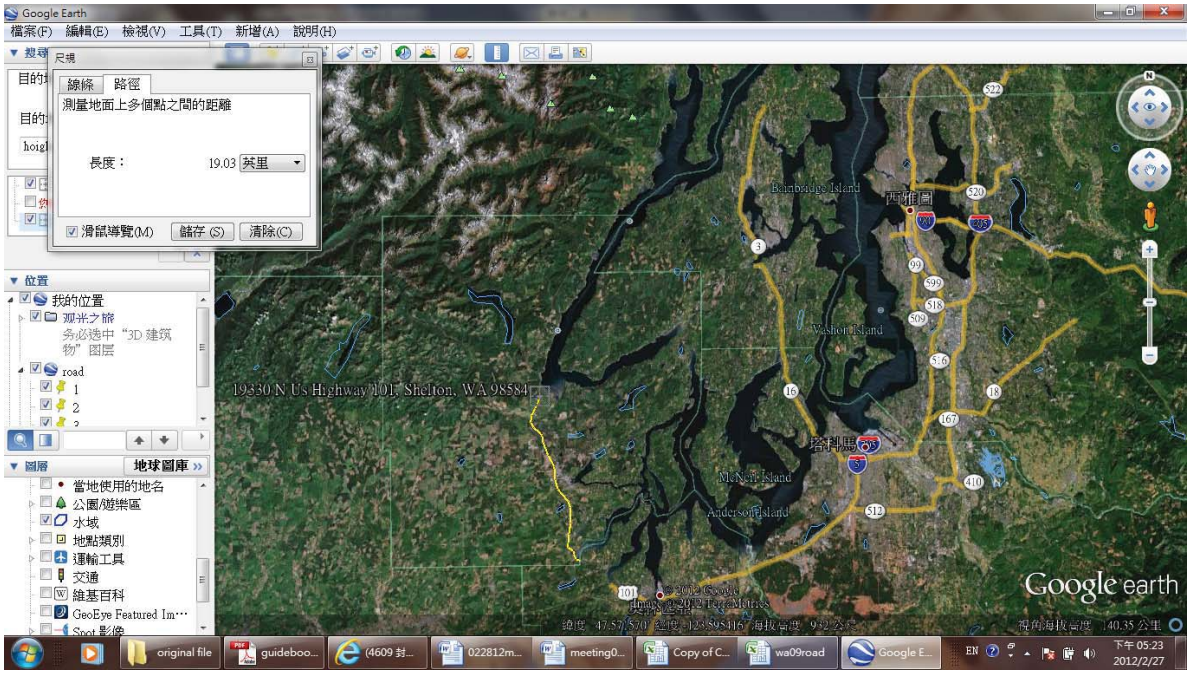

Figure 10. Example screenshot of Google Earth

APPENDIX B:
STATISTICAL SYMBOLS

The following statistical symbols are used throughout this report.

θ = the safety effectiveness, $0 < \theta \leq 1$ (can be theoretically higher, but not in this study).
n = the sample size.
α = the dispersion parameter (of the negative binomial model).
t = the time period.
$\hat{\theta}_{CS}$ = the estimate of safety effectiveness by using the CS method.
$\hat{\theta}_{naive}$ = the estimate of safety effectiveness by using the naïve method.
$\hat{\theta}_{CG}$ = the estimate of safety effectiveness by using the control group method.
$\hat{\theta}_{EB}$ = the estimate of safety effectiveness by using the EB method.
$\hat{\lambda}$ = the estimated number of crashes for the treatment group in the after period.
$\hat{\pi}$ = the estimated number of crashes for the treatment group in the before period.
$\hat{\nu}$ = the estimated number of crashes for the control group in the after period.
$\hat{\mu}$ = the estimated number of crashes for the control group in the before period.
N_{ij1}^{T}, N_{ij1}^{C} = the observed responses for site i (T = treatment group and C = control group) and year j (in the before period).
N_{ij2}^{T}, N_{ij2}^{C} = the observed responses for site i (T = treatment group and C = control group) and year j (in the after period).
M_{ij1} = the expected responses for site i for the EB method,

$$\mathrm{M}_{\mathrm{ij1}} = \mathrm{W} \times (\hat{\Lambda}_1) + (1 - \mathrm{W}) \times (\sum_{\mathrm{j=1}}^{\mathrm{t}} N_{\mathrm{ij1}}).$$

W = the weight for sites for the EB method, $W = \dfrac{1}{1 + \hat{\Lambda}_1 \times \hat{\alpha}}$.

$\hat{\Lambda}_1$ = the estimate for the average crash rate of all sites in the before period.
$\hat{\alpha}$ = the estimate of the dispersion parameter (from the negative binomial model).

UNIVERSITY OF Cincinnati

The Economic Value of On-Premise Signage

Prepared for the Signage Foundation, Inc.

Prepared by the Economics Center, University of Cincinnati

August 2012

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Executive Summary

Businesses of all sizes and types use on-premise signs to communicate with their customers. It has been suggested that on-premise signs and the regulations that limit them can significantly impact the performance of some types of businesses, yet there has been limited recent research to inform decisions about sign investment or regulation.

To provide more current insight, researchers at the University of Cincinnati conducted a national survey of businesses and a series of case studies. The purpose was to assess how changes in on-premise signage affect business performance. This report provides details about that research's approach and results. Business owners responding to the national survey reported that additional and improved signs are associated with increases in their revenues and profits. The case studies suggest that signage visibility and conspicuousness are especially important, and that signage plays an important role in a business' overall branding and marketing strategy. This research indicates that appropriately designed and located on-premise signage can be an important factor for retail business success. The implication of these results is that on-premise signage indirectly influences the vitality of a community and the quality of life of consumers by providing information about the availability of goods and services.

Examination of one field of economic theory – search theory – and application of this concept to the subject of signage presents a new explanation for why on-premise signs have positive economic impacts, not only for businesses, but also for consumers and communities: namely, signs make it easier for shoppers to obtain the information they need to make a purchase.

A national survey asked businesses about sign changes and the impact of those changes on business performance. In addition, detailed questions inquired about the nature of the business and the use of signs. The survey produced some significant findings regarding both economic impacts and sign preferences.

- Sign changes generally had significant, positive impacts on sales, number of transactions and profits. Roughly 60 percent of businesses reported increases averaging about 10 percent.

- Sign changes also led to small positive impacts on employment. Nearly a quarter of respondents reported hiring more people.
- While most single establishments and small firms have either wall signs or pole signs, most large companies have both. In general, larger companies tend to have more types of signs.
- Helping customers find their location was the most important purpose for respondents. Legibility is the most important characteristic of signs across all sizes of companies.
- Business logos and the size and location of the signs were more important for companies with more establishments, for whom branding is presumably more important, compared with single establishment companies.

Among the case studies, positive business performance was generally associated with greater use of on-premise signage and better quality signs, as the following results indicate.

- The national lodging chain case study found that the use of a digital electronic sign to display pricing was associated with increased average occupancy rates. The impact appeared to be especially strong for properties with lower occupancy rates.
- The national retail banking business case study found that pylon signs were strongly associated with high visibility, monument signs were moderately associated with high visibility, and wall signs contributed to identity but not visibility. In addition, pylon signs were associated with significantly more teller transactions.
- The specialty store small business case study demonstrated the need for signage to reaffirm the value offered by a niche retailer. Sign design must be sensitive to community and customer expectations, and able to reinforce the brand of a small business. The signage should communicate a "promise" of value for a product and/or service that is not commonly found elsewhere.
- The car dealership small business case study found that the addition of a video sign board was associated with increases in both service department revenue and customer traffic. An added benefit was the "goodwill" and reputational gain associated with using the video board for community-related public service messages.

Given the economic importance of signs, regulations should balance community design objectives with full knowledge of how sign design and location impact businesses success. Business success is important because of its impact on a community's tax base, and it ultimately leads to the availability of greater fiscal resources to provide needed community services.

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I. Introduction

Communication is perhaps the single most important activity for the success of human societies (Richmond & McCroskey, 2009). Signs are among the most important elements of visual communication. The visual communication provided by signs on our streets and highways is essential for an effective transportation system to aid in getting us where we want to go. Similarly, the visual communication provided by on-premise business signage is essential for the efficient function of our system of commerce and the success of many businesses. Effective signage can drive job creation, generate tax revenues, and provide quality access to goods and services.

Communities depend on clear, legible and conspicuous signs for direction, safety and information. Businesses have a long established history of using signs to announce their products and services. On-premise business signs are especially important within the context of our highly mobile society where we frequently venture to unfamiliar areas. On-premise signage allows a business to cost-effectively communicate with potential customers who are moving through its trade area. The wayfinding, identification and marketing information provided by on-premise signage is essential for assisting existing and potential customers in finding the goods and services they seek. This connection between customers and businesses is crucial for business success, and the local governments that depend on the employment and tax revenues which businesses generate.

On-premise signs are a potentially powerful medium for commercial communication. Frequently, on-premise signage is a key element, which is often used with other media, to develop and maintain a business brand. The more consistently that brand is communicated, the greater the likelihood that existing and potential customers will associate it with specific expectations for price, product brand, or service quality at specific locations.

On-premise signs that are designed well and properly located are especially important for generating impulse sales. While some goods and services are primarily purchased on the basis of careful consideration and forethought, many others are impulse purchases. Indeed, impulse sales generate an important part of revenue for a wide variety of retail businesses. One study (Conroy 2004) found 68 percent of purchases during major shopping trips were unplanned, and 54 percent on smaller shopping trips. In these cases, on-premise signage is critical.

This study provides current analysis of how on-premise signage is linked to business success. A California study from the 1990s indicated that changes to the number and location of on-premise signage can have a direct impact on business performance (Ellis, Johnson & Murphy, 1997). That study – which used statistical analysis of signage, business performance and location-specific data for two business chains – found that an increase in the number of on-premise signs at a particular site had a significant and positive impact on sales, number of customer transactions, and the amount of the average transaction. Case studies also have been used extensively in the small business and signage trade literature to document the impact of signage on the economic performance of businesses. For example, the New York State Small Business Development Center (Conroy 2004) details a number of case studies. One case, based on the experience of a car wash, documents the association of improved sign legibility and visibility with higher sales, as well as suggesting that the introduction of message boards can lead to increased sales. Another case, based on the experience of a small restaurant, documents the association of improved sign visibility and conspicuousness with increased sales. While these case studies do not provide conclusive evidence of the economic value of on-premise signage, they do provide insight to specific causal mechanisms that may be useful for interpreting the statistical analyses of the survey data.

For decades, alancing the signage needs of individual businesses with the broader concerns of communities has been a concern of local officials, the sign industry, and planning and design professionals. Funding for essential local government services such as police, fire, roads, and education often depend on the success of local businesses. This linkage between on-premise signage, business success, and local government revenues (and the public services they fund) highlights the need for sign regulation process to be informed by research such as is being conducted here. Signs regulations can and should promote designs that promote business success while meeting appropriate local standards.

The impact of on-premise signage is dependent on visual elements that may interact with and complement a business' marketing and branding strategies. Visual characteristics and perceptual concepts related to signs, symbols, semiotics, and the built environment have been addressed in Berger's *Seeing is Believing* (2007) and the two groundbreaking treatises by Tufte (*Envisioning Information* (1990) and *Visual Explanations* (1997)). An appreciation for the layering of economic and marketing roles together with a visual identity program becomes important for understanding the contribution of on-premise signage within a comprehensive marketing strategy.

The research presented in this report provides an analysis of the economic effects of signage within a context of varied scales and types of business. The objective of the study is to provide an updated assessment of the impact of signage on businesses and communities. Several earlier publications have identified key issues and economic factors associated with on-premise signage, with "The Economic Value of On-Premise Signage", "The Signage Sourcebook", and" What's Your Signage" providing reference and guidance for much of the past two decades. Except for the recent work of Taylor (2010; Taylor, Sarkees & Bang, 2012), the value of signage has lacked recent rigorous analysis.

This study uses survey data and case studies to bring the economic impact of on-premise signage into a clearer focus within prescribed theoretical frameworks and a diversity of sign applications. Venturi and Brown in "Learning from Las Vegas" (1971) analyzed the Las Vegas strip, its sign/buildings relationships, and their impact within our urban / suburban environment. Their study systematically assessed the visual impact of signs within a concentrated market area with ever-changing views from the automobile. Venturi was the first to connect on-premise signage to commercial symbols that contained economic value in their meanings beyond the direct communication objective and architectural product. Berger, Tufte, and others have provided additional understanding to advance the symbolic meanings contained in signage and signs. It is within such a broader framework that this research utilizes case studies in combination with economic data to bring the value of on-premise signage into a clear focus. Case studies are used for illustrating the diverse sign typologies and as an analytical interface with communities, brand identity, and the "marketing functions" of signs (Taylor, 2010).

II. Context

A. The Problem

The success of local retail businesses is important for creating jobs, generating tax revenues, and providing access to goods and services in communities both large and small (Blakely & Leigh, 2010). For most businesses, but especially those that sell retail goods and services, on-premise signs can be an important mechanism for attracting new customers and providing wayfinding for returning customers. This is especially true for businesses such as fast food restaurants, convenience stores, and gas stations for which impulse sales represent a substantial proportion of their total revenue (Conroy, 2004). Consequently, for a variety of economic and quality-of-life reasons, it is critical for the signage industry, businesses, and government agencies to maintain a current and nuanced understanding of how on-premise signs contribute to business performance.

B. Research Challenge

The primary research challenge has been to gather sufficient signage and business performance data to be able to reach conclusions about the effectiveness of on-premise signage. The need to collect both signage and performance data from a wide range of businesses, and draw from businesses' own experiences became clear from understanding the strengths and limitations of previous studies. A two-stage online survey model was designed and implemented with an initial survey, coupled with an opportunity for approaching self-identifying businesses to participate in follow-up, in-depth case studies.

Despite the relatively large number of survey respondents that we contacted, few businesses were willing to share detailed information about their signage and business performance. Assurances were given that proprietary information would be kept confidential and, where requested, names of businesses would not be used in any study disclosures. Ultimately, after persistent pursuit of leads from a variety of sources, three national/regional businesses agreed to share the necessary signage and performance data.

C. Previous Research

Research assessing the impact of signage on business performance must begin with an understanding of the fundamental purpose of on-premise signage: communicating with potential customers about where the business is located and the nature of its product or service. As such, signs may serve to establish or fortify a consistent business brand or image (Conroy, 2004). For some businesses, multi-media branding strategies may involve static on- and off-premise (billboard) signs, as well as television, radio, newspapers and flyers. Few small businesses can afford or justify such strategies, and rely on their on-premise signs for much of their marketing, particularly if communicating with potential customers is simply about identifying their product or service and location. New technology is expanding the sign choices available to businesses for communicating with potential customers. Electronic messaging and video displays on signs are becoming increasingly common, especially for businesses whose brand or image requires that they are perceived as cutting-edge in the quality of their products or services (Post & Pfaff, 2007).

On-premise signage is one of the most basic and yet complex forms of visual communication. Signage serves as a multi-purpose media that can identify an organization, business or place while at the same time marketing an idea, service, or product. There are a number of factors that should be considered in choosing a design and location for an on-premise sign because of the different communication purposes and audiences. For example, businesses seeking to capture impulse sales along a major highway will need different types of signage to be successful than those located in a pedestrian-oriented business district (Conroy, 2004).

Previous research has established the importance of well-designed and appropriately-placed signage for generating business revenue and associated tax dollars (Ellis et al., 1997). The exhaustive literature review and annotated bibliography by Christadoulou (2009) is the most comprehensive assessment of the recent signage research literature, containing 227 citations. Edelman (2009), in his presentation of Christadoulou's work, organized the literature into six areas: Business & Marketing, Graphic Design & Architecture, Engineering & Technology, Planning & Urban Design, Law and Psychology. Among these he found extensive overlap that made it difficult for researchers to organize the literature in a meaningful way.

Local governments recognize that sales, property, and income tax revenue are closely linked to the success of their businesses. In part to fortify arguments that signs are important for business success, seminal research was conducted to assess the impact of on-premise signage on the performance of a Southern California fast food restaurant chain and a national specialty import retailer (Ellis et al., 1997). The research used cross-sectional and time-series regression analyses to predict the impact of sign changes on site performance. For the fast food chain, a cross-sectional analysis estimated the effect of sign characteristics and control variables on sales revenue, number of transactions, and average amount per transaction. Among the variables included in the models, various signage improvements were the best predictors for all three outcome variables. For the specialty import retailer, multiple regression and time-series analysis estimated that sign specific changes or addition were associated with significant increases in sales revenues.

While the Southern California studies focused on fast food and specialty import chains, it has been argued that on-premise signage is likely to be even more important for small non-chain businesses (Conroy, 2004). Many small businesses do not have the relatively large marketing budgets and shared electronic media buys of national franchises. These small businesses are more likely to be dependent on their signage for most of their communication with potential customers.

Because the seminal investigation of the economic impact of signage used data from two chains, additional research is needed to determine if similar results extend to a broader range of retail businesses. Subsequent studies have contributed important and useful research in this area, yet none have estimated the economic value of on-premise signs across diverse business and local government contexts (Conroy, 2004). Consequently, important decisions about signage by businesses and local governments are frequently based on limited or no research because the results of existing studies are not adequately disseminated or are simply inapplicable. Indeed, local governments may impose stringent signage regulations based on vague aesthetic concerns, making it difficult for businesses to be creative and effective with their signage as a means of communicating with potential customers and without appreciating the potential economic and fiscal impacts of the restrictions. When a business depends on potential customers from outside of their community, effective signage becomes especially important. In such cases, signage location, visibility, and design are particularly critical. Equally critical is that local sign regulators recognize the need for creative approaches to signage for both business and community success (Blakely and Leigh, 2010).

The idea of communicating a coordinated visual message is important for business performance. A consistent approach to visual communication supports the branding of place by giving it a consistent identity. Businesses are working to sell their image, and local communities are doing the same but on a much larger scale. The ability of a business to successfully market itself is critical for the local economy. Branding serves to establish a base of customers, whether for a business or a community. When a sign is serving a community to its highest potential, such that it is visually appealing and noticed, it also seems to brand the business or organization that it represents. Eventually this image will be a familiar element for its viewers and they may want to know more about it (Heather, 2003). For both businesses and local governments, effectively designed and located signage is an essential part of a branding strategy (Heather, 2003).

D. Research Approach

Given the limitations of the earlier work, there is a clear need for an updated, rigorous study of the economic value of on-premise signage to guide both business and public policy decision-making. The purpose of this research is to address that need.

At the beginning of this project, the research team developed a conceptual framework for identifying possible relationships between on-premise signs and various economic impacts. The left side of this figure illustrates the complexity of on-premise signage. Research must consider more than just the size, number, and placement of signs; other signage and site characteristics can also play significant roles. On the right side, the listing of possible economic impacts suggests that signs may generate economic benefits not only for businesses but also for customers and communities.

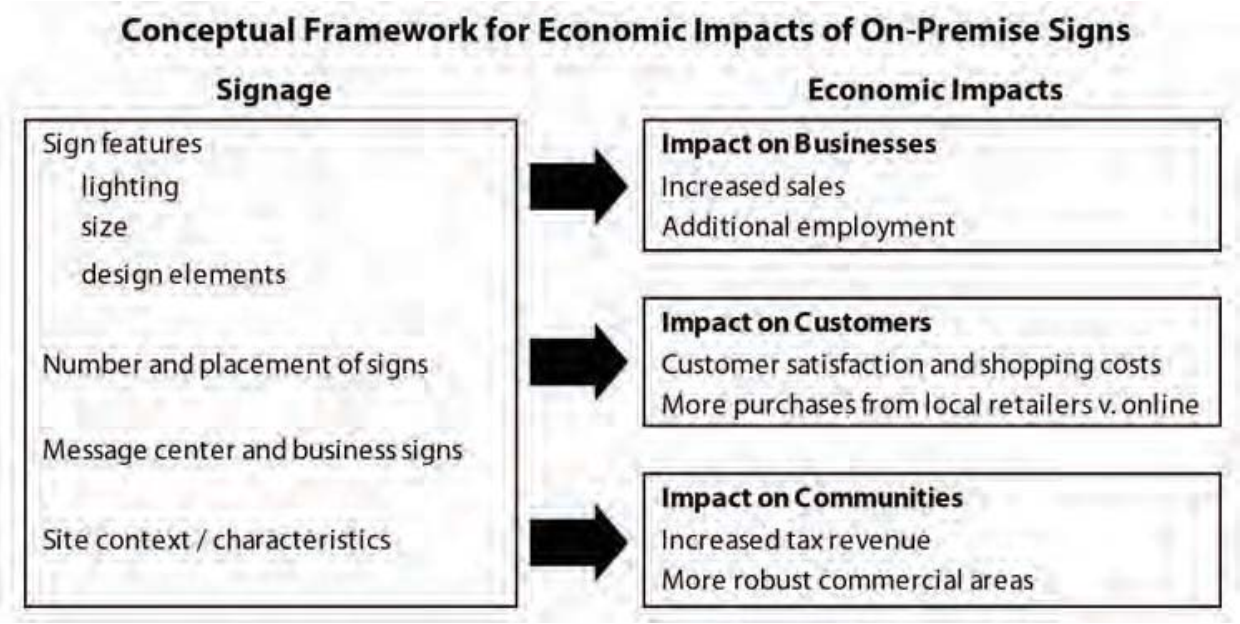

Figure 1: Conceptual Framework for Economic Impacts of On-Premise Signs

While no single research project can examine all of these elements and their interrelationships, this study attempts to move beyond the basic considerations that have characterized most previous research. Toward this end, a multi-faceted approach was selected, which includes applying elements of economic theory, developing and implementing a survey of sign users, and conducting case studies of a diverse set of businesses.

It is clear that on-premise signage is identified as a critical element for retail business and service industry providers for success, and it is also seen as indirectly influencing the vitality of the community. Therefore, this analysis takes a broad approach to considering the economic value of on-premise signage. This study is designed to appeal to a wide audience by attempting to use a common vocabulary to facilitate discussion of these findings among design professionals, regulatory professionals, and the sign industry.

III. Economic Theory and On-Premise Signs

Consideration of how signs benefit customers is an often overlooked, but a highly important dimension of the impact of on-premise signs. The recipients of the 2010 Nobel Prize in Economics were recognized for work in the area of search theory – a field that recognizes that information is not perfectly available, and obtaining it often requires time and other resources. Consequently, buyers often cannot purchase what or as much as they would like, nor can sellers meet these market demands efficiently. This research has implications for the sign industry because the principal purpose of on-premise signs – to provide information to potential buyers – is an area where this theory can be applied effectively.

The most fundamental sign message is typically about a) the existence of willing sellers and b) the types and prices of the items for sale, thus providing the most significant information that customers typically want. To the extent that signs effectively communicate the information sought by prospective customers, they reduce costs for consumers; conversely, when signs fail to communicate this information, they fail to reduce search costs of the consumers, businesses and communities. For businesses, a sign is often the primary way for the consumer to learn that the business even exists (Taylor, 2010). Significant economic research in this field continues today.

Customers' search costs include the value of the additional time spent searching for goods and services that match their wants. The consumer must make a decision—informed by any available signage—about the shopping potential of the store versus the option of continuing to search for other potential opportunities. For this section, we use this well-developed search theory to explain the process of a consumer evaluating prospective stores. This theory can help researchers better understand the effect of information on consumer behavior, such as the impact of a more visible sign on "downstream" businesses. The theory can also help researchers better understand how quality signage can lead to less total driving, increasing safety and reducing travel costs.

This figure provides an overview of the implications of applying search theory to the field of business signage. Just as good signage has a series of three consequences that produce positive economic impacts, impaired signage has a comparable series of three adverse consequences that produce negative economic impacts.

Impacts and Economic Theory: What Search Theory Tells Us	
Good Signage	Impaired Signage
1. Proper signage yields information to potential buyers, reduces transaction costs, improves well-being.	1. Inadequate information has costs for both sellers and buyers.
2. Better information allows buyers and sellers to find each other for a transaction.	2. Consumers are less well-off because of higher search costs.
3. Sign information moves markets toward an efficient outcome.	3. Internet sellers gain at the expense of other sellers and the communities where those sellers are located.

Figure 2: Impacts and Economic Theory: What Search Theory Tells Us

A. Origins of Search Theory

Most students of economics are taught the basic model in which consumers enter a market, a price is determined, and then a subset of these consumers will complete transactions with producers if that price jointly suits them. This outcome depends on a set of assumptions that lead us to a familiar conclusion: that a single price will be established, allowing potential buyers and sellers to choose whether they will take part in a transaction, and leading to determination of how much of the product will be sold. One of these simplifying assumptions – that information is freely available to everyone –does not reflect the realities of imperfect and costly information that business owners and consumers face on a daily basis. In reality, perfect information rarely exists, which often leads to many different prices for the same product.

Economists in the middle of the 20th Century sought to reconcile the theoretical prediction of the basic model with the variation in prices observed all around us. It became clear that adjustments to the basic model would be necessary to gain understanding of a world in which transactions for the same good were being completed at quite different prices, or in which inferior goods were bought and sold for the same price as superior ones.

B. Relevance of Search Theory to On-Premise Signage

Toward this goal, search theory, which examines how people make choices with limited information was pursued most famously by economists George Stigler and John McCall. In order to properly study information, its costly[1] nature had to be recognized. Search theory was originally applied to labor markets in the 1970s by Dale Mortenson and Christopher Pissarides. In 2010 the Royal Bank of Sweden chose to honor Professors Mortenson and Pissarides with a Nobel Memorial Prize in Economic Sciences[2]. In recent years, mainstream circles are recognizing the work that had already been scrutinized and affirmed by numerous scholars and graduate students for a generation.

In the work of Mortenson and Pissarides, search theory considers the employment decision of a job-seeker comparing an offer in hand against the "shadow of the future." The certainty of the offer on the table must be balanced against the prospect of continuing his job search into the future to seek potentially an even greater wage. Continuing the search is risky, and takes time. Because any other offer would begin at a later time, it would have to be at a more lucrative wage to match the value of the offer in hand; and there is always the possibility that future job offers might be at lower wages, not higher.

A well-known finding from search theory is that more uncertainty about the future causes a delay in the searcher's commitment. In other words, an offer in the present may be less attractive compared to a better offer that might occur if the search should continue. The job-seeker balances that potential upside gain by preparing to decline offers that are seen as unfavorable in comparison to anticipated future options.

Thus, in search theory, the searcher – whether a job seeker or a shopper – compares the value of the known alternative against the potential costs and benefits of continuing to search. It is clear that better information about these options makes it easier for searchers to form expectations about the unknown alternatives and whether or not to continue searching, assisting in producing a better match.
In order to connect search theory with signage, suppose that the person is a prospective buyer driving down the street in search of a gift for a friend. She encounters a series of stores that may or may not sell an acceptable item. If business signage is inadequate, learning about a price and other qualities of a potential purchase may involve a costly decision to enter a store, requiring expenditures of both time and travel. It is in this situation that information -- not just about pricing but also about the quality and nature of the goods on sale -- will be useful in sharpening the perception of the future that enables a purchase to take place. In such a situation, higher quality signage reduces these information costs, making buyers and sellers better off.

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[1] Economists use the term "scarce" to recognize something that is inherently limited in quantity, and therefore deserving of a price; information represents different tiers of cost, with some of it being readily available and easily processed, and some being only one of those or neither.

[2] Peter Diamond also shared in the Nobel Memorial Prize in Economics in 2010.

Signs provide signals to consumers. A store's sign may signal price, quality, convenience, and/or reliability. This signaling is illustrated by competing gas stations that post their prices immediately next to each other. Other information on their signs may help them to compete on other factors, all of which assist the purchaser by providing information that reduces consumer uncertainty. This sign information not only helps stores compete with each other but also with internet retailers, who generally have a large advantage over store retailers in providing information to consumers.

Search theory also provides insights about businesses that are trying to complete a transaction with a searcher. In the labor market application of search theory, making a job offer is costly to the employer because he must invest time, first in finding and screening job candidates and then in training a new employee. Because of these costs (and the risk of entrusting key business elements to a new employee whose competence is uncertain), the employer is highly motivated to find effective means in searching for prospective employees. This is comparable to the circumstances in which business owners compete for customers. Although stores and other businesses are searching for customers and clients rather than employees, many forms of advertising -- television, radio, celebrity endorsements -- represent costly signals because advertising space is scarce. Among these, outdoor signage ranks favorably in terms of effectiveness according to surveys of consumers (Kellaris, 2011).

James Kellaris, who holds the Gemini Chair of Signage and Visual Communications in the University of Cincinnati's Carl H. Lindner College of Business has illustrated how good signs reduce search costs by making information more available to consumers. Utilizing data collected in a 2011 survey of over 100,000 North American shoppers, Kellaris found that:

- Shoppers associate sign quality with store and product quality (34%); and
- Shoppers make store choices based on the information communicated by store signs (29%).

Potential customers often lack significant pieces of information. Even when businesses attempt to convey this information through their on-premise signage, characteristics of those signs and the surrounding environment, as well as other impediments, often inhibit the communication of this information. Kellaris also found that nearly half (49.7%) of American consumers have driven by a desired business without finding it because of insufficient signage.

There are significant anecdotal examples where the loss of good signage caused measurable decreases in the value of businesses. When one motel that had a highly visible sign moved to a less conspicuous location, it found that occupancy rates decreased 36 percent, which reduced its $960,000 value by 42 percent (Bass, 2010). Furthermore, the loss of a sign can have consequences that extend to surrounding businesses and the larger community. Real estate appraiser Richard Bass documented the case of a business on the back side of a Florida mall that lost the pylon sign that gave it visibility. The loss of customers eventually led to closing the store. Because surrounding mall businesses relied on the traffic generated by that store, they also closed.

Search theory has explained the role of information and how higher costs of obtaining information reduces the welfare of both the consumer and the producer. For job seekers, lower search costs allow them to be more selective, implying greater productivity shared between worker, firm, and (ultimately) the consumer. For consumers, improving information through better signage will decrease the time and resources needed to investigate another vendor. Reducing information costs effectively makes everyone better off.

By facilitating less costly sales, better information through signage can positively affect the broader community through economic growth (especially through increased employment and wages) and a stronger base for sales, income and property taxes. While others may focus on the intangible impacts on communities of quality signage, such as their contributions to a sense of place and identity, as well as building social capital and community pride, we emphasize that search theory explains the economic benefit of signage.

IV. National Survey

A. Survey Approach

To gain a broad perspective about a variety of on-premise signage considerations, a survey was prepared and distributed to all types of businesses in the US that use signs. The survey provided businesses the option of responding either online or by a mailed response. Questions were asked about sign changes and the impact of those changes on business performance. In addition, detailed questions inquired about the nature of the business and the use of signs (number, size, location, type).

Respondents were initially solicited by email, post cards and personal contacts. Also, newspaper and newsletter articles about the survey included information about the survey's Internet address and asked businesses to complete the survey online. An effort was made to gain responses from a geographically diverse cross section of the different types of large and small businesses that use signs to attract and retain customers. This approach was used in order to collect responses from a wide range of such businesses rather than to produce a random national sample. While the objective of employing this method was to collect data from respondents who have greater awareness of on-premise signage issues, responses did not indicate a response bias toward heavy signage users; in fact, one third of respondents reported no sign changes in recent years.

B. Survey Results

A total of 225 businesses responded to the nationwide survey of business sign users. Of these, 213 were usable responses. Of these respondents, 70 percent had a single establishment, while the remaining 30 percent were classified as either small (2-10 establishments) or large companies (more than 10 establishments). Single establishment businesses are more common among retail trade respondents (84%), and comprise about half of respondents in the accommodation and food service industry (52%).

The following table shows that, as large as these proportions are among survey respondents, single establishment businesses are even more common nationally, based on a census of U.S. businesses. However, these proportions are sufficiently comparable to be able to draw conclusions from the survey about general use of business signage.

Table 1: Single-Establishment Businesses as a Proportion of All

	Survey Respondents	2008 National Data[3]
All businesses	70%	90%
Retail trade	84%	90%
Accommodation and food services	52%	70%

In order to understand whether having multiple signs was important for their perceived impact on business performance, respondents were asked about the number of signs at a typical establishment. As shown in Table 2, over two-thirds of respondents had only one or two signs, a little more than a quarter had three to five signs, and only 4 percent reported 6 or more signs. Larger companies (10+ establishments) were far more likely to have more than 2 signs, with over half reporting 3 or more signs at a typical establishment.

Table 2: Number of Signs at a Typical Establishment by Size of Company

	All (n=213)	Single (n=150)	Small (n=35)	Large (n=28)
1-2 signs	69%	72%	71%	46%
3-5 signs	26%	23%	26%	43%
6+ signs	5%	5%	3%	11%

(Small companies have <10 establishments, Large companies have 10 or more establishments)

Left: Oakley Pub & Grill; Right: Buca di Beppo

[3] These national figures come from the 2008 Statistics of U.S. Businesses (SUSB). The SUSB is an annual series of national economic data by enterprise size and industry. SUSB covers most of the country's economic activity. The series excludes data on non-employer businesses, private households, railroads, agricultural production, and most government entities.

Questions about the types of signs were also included in the survey because this is frequently an issue addressed as part of sign regulations. As shown in Table 3, among the types of signs at a typical location, wall and pole signs were most common. While most single establishments and small firms have either wall signs or pole signs, most large companies have both. In general, larger companies tend to have more types of signs.

Table 3: Types of Signs at a Typical Establishment by Size of Company

	All (n=213)	Single (n=150)	Small (n=28)	Large (n=28)
Wall sign/s	60%	53%	54%	89%
Pole sign/s	53%	46%	49%	86%
Wall & pole signs	27%	19%	23%	75%
Monument sign/s	25%	15%	29%	71%
Other sign/s	30%	28%	31%	39%

(Small companies have <10 establishments, Large companies have 10 or more establishments)

Some of this variation in the amount of signage may be due to the different industry mix among large companies, but even when restaurants are the only category considered, large companies use more signs. This may be the result of a number of factors, such as differences in types of location and different customer markets.

As part of the survey, respondents were asked to rate on a 0 (zero) to 3 scale -- with 0 being not at all important and 3 being extremely important -- the relative importance of their signage for several common purposes of signs. Overall, the two sign purposes with the highest scores are: 1) making their business stand out; 2) helping potential customers find their location. These two purposes received generally high scores across all business size categories.

As shown in Table 4, the size of the company (and presumably access to multiple marketing modes to facilitate "branding") did make a difference. Companies with more establishments perceived 'brand reinforcement' as relatively more important compared to companies with a single establishment ($\gamma = 0.73$)[4]. This was reinforced when businesses were asked which purpose is the most important: 38 percent of large companies identified branding/image, compared to 14 percent of small firms and just 3 percent of single establishments. Other sign purposes showed measurable but weaker association with company size: compared to large companies, single establishments tended to give slightly more weight to using signs to inform about goods/services, and small companies generally use signs a bit more to inform about promotions ($\gamma = 0.16, 0.25$).

[4] A commonly-used statistical test for measuring the strength of association between two variables such as those used in this survey is Goodman and Kruskal's gamma (γ). Gamma measures the proportional reduction in error; it identifies how much the error in predicting variable "y" is reduced by taking variable "x" into account. In general, if $\gamma = 0.60$ or greater, the association is very strong, while a figure of 0.30 reflects a moderate association; if $\gamma = 0.20$, the association is weak.

Table 4: Mean Scores for Perceived Importance of Signs for Common Purposes, by Company Size (n = Number of Respondents)				
	All (n=213)	Single (n=150)	Small (n=35)	Large (n=28)
Help customers find location	2.73	2.75	2.63	2.79
Make business stand out	2.68	2.67	2.68	2.75
Reinforce branding/image	2.42	2.30	2.57	2.86
Inform about goods/services	2.23	2.28	2.17	2.04
Inform about promotions	1.76	1.71	2.03	1.64

(0=Not at all important, 1=Slightly important, 2=Moderately important, 3=Extremely important)

When data on sign types and purposes are compared, those reporting that the sign purposes of "making their business stand out" and "reinforcing their branding/ image" are extremely important were slightly more likely to have pole signs $\gamma = 0.20$, 0.31). Some of the survey's findings about sign quality, number, and readability have been replicated in a more recent survey (FedEx Office, 2012), which found that:

- About three fourths of consumers have entered a store or referred a friend because of a sign that made the business stand out, and two thirds have made a purchase as a result.
- Conversely, most consumers indicate that bad or no signage deters them from entering a store.
- Sign readability is the most important sign factor in causing consumers to try a store's product or service.

Respondents also were asked to rate various signage characteristics in order to determine which specific characteristics were perceived to be most important. As shown in Table 5, among all companies, "being clearly readable" was the most important characteristic. This was true across all sizes of companies. However, again, the size of the companies did make a difference. Among companies with more establishments, and for whom branding is presumably more important, including their business logo was reported as more important compared with single establishment companies ($\gamma = 0.72$). Compared to other businesses, large companies also gave somewhat greater weight to "size / location" ($\gamma = 0.51$). Among small businesses, including single establishments, "conspicuousness" was the second most important characteristic, rated considerably higher than 'size and location' and "logo or branding" ($\gamma = 0.49$, 0.31).

Table 5: Mean Scores for Perceived Importance of Sign Characteristics, by Company Size				
	All (n=213)	Single (n=150)	Small (n=35)	Large (n=28)
Clearly readable	2.90	2.91	2.79	2.96
Conspicuousness	2.75	2.78	2.62	2.75
Size and location	2.64	2.65	2.43	2.86
Illumination	2.56	2.57	2.46	2.61
Logo or branding	2.43	2.30	2.60	2.86

(0=Not at all important, 1=Slightly important, 2=Moderately important, 3=Extremely important

Two of these sign elements were associated with signage types. Those businesses reporting that the sign elements of being 'clearly readable' and 'size/location' are "extremely important" were somewhat more likely to have pole signs (γ = 0.48, 0.44).

In order to assess how actual changes in signage might be related to the perception of the importance of signs, businesses were asked if they had made improvements in their signage over the past five years and their perceptions of the impact the sign changes had on four measures of business performance: (1) sales, (2) number of transactions, (3) profits and (4) staffing. About two thirds (66%) of all respondents reported one or more types of changes. Among the changes, as shown in Table 6, seven in ten of these companies reported making changes in their sign design. More than half (52%) improved sign visibility, while nearly half (47%) increased the number of signs, and three in ten made the signs larger. Because almost all changes consisted of more than one of these types of change, it was not possible to determine whether one change produces greater impacts than another.

Table 6: Types of Changes Made to Signs Over the Past 5 Years

Changed the design of signs	70%
Enhanced the visibility of signs	52%
Increased the number of signs	47%
Increased the size of signs	30%

Most of the companies reporting sign changes indicated that these sign changes had large, positive impacts across three of the four measures of business performance, with smaller but still positive impacts on the fourth measure. As shown in Table 7, between 59 percent and 65 percent of the companies making sign changes reported increases in profts, transactions and sales, with average increases of 9, 11, and 12 percent, respectively. These findings about the impact of enhancing on-premise signage are consistent with findings recently reported by Dr. Charles R. Taylor, John A. Murphy Professor of Marketing, and his colleagues at Villanova University (Taylor, Sarkees & Bang, 2012).

Increases in staffing were reported by a smaller proportion of the companies (23%), with an average increase of 6 percent. Employment growth may have been tempered by the national economic downturn rather than representing a different type of relationship with signage changes compared to sales, transactions and profits.

Table 7: Perceived Impact of Sign Changes on Business Performance

Performance Measure	% Reporting Increase	Average Increase
Sales	65%	12%
Transactions	62%	11%
Profits	59%	9%
Staffing	23%	6%

Additional analysis of the relationship between business performance and various signage factors revealed a number of sign characteristics that correlated with positive economic impacts.

- Businesses emphasizing 'conspicuousness' as a sign element were somewhat more likely to report larger increases in store sales ($\gamma = 0.45$), and those giving a high priority to size/location were slightly more likely to report larger increases in store sales ($\gamma = 0.28$).
- Businesses with pole signs were somewhat more likely to report larger sales gains ($\gamma = 0.42$).
- Those that experienced gains in sales, customers, and profits were much more likely to attribute those gains at least partially to their sign changes ($\gamma = 0.80, 0.74, 0.75$).

Some survey respondents included contact information with their surveys for additional follow-up. Researchers were able to reach roughly one third of those who provided this information (13 of 38), and they provided additional responses to questions during a brief interview. Most of these businesses surveyed were single establishments in free-standing structures or storefronts in a main business district . They were located on a site either having 45-50 mph speed limits and far from curb, or 25-30 mph and within 20ft of curb. Most interviewees indicated that 60 percent or more of their revenues were obtained from regular/repeat customers.

Most of these interviewed businesses added electronic message signs, and they indicated that their new signs had positive business impacts, but the results are skewed by what they characterized as poor general economic conditions. All affirmed that they had experienced an increase in business since they added new signs, but most were not very significant. Three or four contacts reported vast improvements (increases of over 40%) compared to business revenue prior to new signs. When questioned about use of their new signs, these businesses generally indicated that they had become more involved with sign "activities." They referenced very active updating information (a couple times a week), constant design change, and posting community "reputation boosting" information. Illumination at night was mentioned by customers as a great attention-getting advertisement while closed. When asked what they would do differently or what they would do for their next sign update, many said they wanted more electronic messaging capabilities, having already witnessed the impact on business performance. Some wished for a video board, feeling this would dramatically boost business, but couldn't be justified with current revenues and budget. These types of dialogues can serve as yet another foundation for future research.

This survey has generated numerous insights into how on-premise signage affects the business performance of retailers, hotels and eating places in order to inform important decisions about private signage investments as well as public discussions about signage restrictions. This research would have been much easier, and perhaps already completed, if the required data was available as part of public secondary datasets. Unfortunately, this is not the case, and this research has been required to rely on the cooperation of businesses to share proprietary data. Businesses agree to share data, usually on the condition that the results are shared with them, because they appreciate the need for this research for their own benefit as well as that of the communities where they operate.

Given that this survey captured self-reported information about individual businesses, questions may arise about its objectivity and validity. Fortunately, a body of marketing research has established that the self-reports of business owners about the factors that influence the performance of their business are highly correlated with those factors that could be identified using independent, objective data (see Robinson & Pearce, 1988; Venkatraman & Ramanuiam, 1986). Consequently, the results here can be reasonably considered to reflect the role of on-premise signage for a broad range of retail businesses.

V. Case Studies

Four case studies, drawn from a wide range of business sizes and types, offer detailed insights about the economic impacts that on-premise signage can have. Among the case studies, positive business performance was generally associated with greater use of on-premise signage and better quality signs.

A. National Lodging Chain – Value Place

Value Place is the largest economy extended-stay franchise in the country. Founded in 2002, it opened its 100th location in 2008, and its 175th in 2010. All properties have about 120 suites and are newly constructed.

According to the company's website, its properties combine hotel convenience and apartment essentials. Its business model is designed to appeal particularly to small and mid-sized business owners and families who are relocating to a new community.

The company has specific signage standards. The primary sign requirements consist of a wall sign with the company's logo on at least one side of the building, and a pole sign that displays its logo and pricing information.

The company also has several location criteria for its properties. The primary criteria are: interstate visibility, or at least a location along a primary arterial; a middle- to moderate-income area; and strong population density within a five-mile radius. These characteristics made it a useful case study.

Value Place Sign Configurations: Benefit of an Electronic Sign

Value Place has developed a number of pole sign configurations to help it communicate its message to potential customers. Its preferred arrangement utilizes an LED-lit changeable electronic sign. Changeable electronic signs are preferred because they can more effectively communicate multiple messages and because they are considered to be better at attracting attention.
In those locations where sign regulations prevent the use of such signs, Value Place uses signs with large plastic numerals, similar to those that gasoline stations post to advertise their prices. Approximately 73 percent of all properties have changeable electronic signs, while 26 percent use signs with plastic numerals, and the remaining one percent lack any pricing signage.

How does the type of signage affect the performance of various properties? For those with changeable electronic signs, 2010 occupancy averaged 11.2 percentage points above breakeven, while those with plastic signs averaged 9.5 points above this threshold. However, further analysis of this data shows that the advantage attributable to changeable electronic signs is predominately realized by properties in the bottom performance quartile.

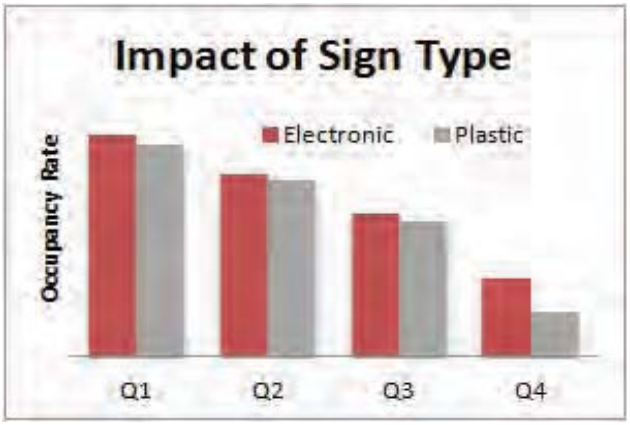

Figure 3: Impact of Sign Type

To perform this analysis, properties were first divided according to the type of sign they use to advertise their pricing. Next, each of these two groups was divided into four quartiles, based on their occupancy rates, and each group was compared with the other on a quartile-by-quartile basis.

As shown in the figure 3, in each quartile, electronic sign properties had a higher average occupancy rate than properties with plastic signs, but the difference was small, except in the lowest-performing quartile (Q4). This graph omits the scale for occupancy rate figure to protect the confidentiality of performance data provided by the company.

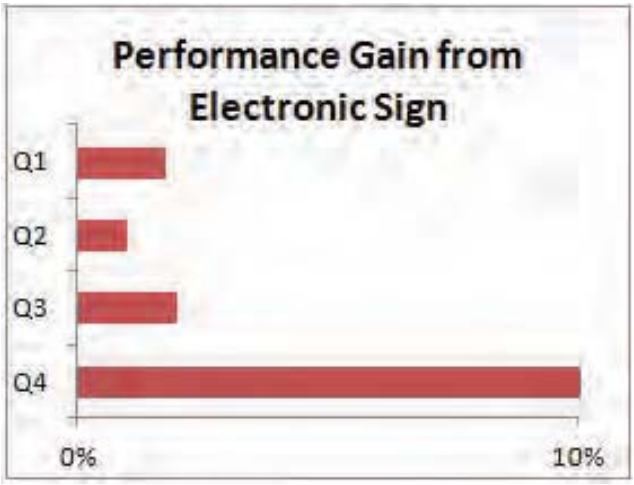

Figure 4: Performance Gain from Electronic Sign

Specifically, the performance gain from the use of electronic signs was in the range of one to two percent in the top three quartiles, but it jumps up to a ten percent advantage in the lowest quartile, as shown in figure 4. This suggests that those locations that are already performing well and have plastic signs are likely to experience limited benefit from the installation of an electronic sign. On the

other hand, such a sign change is likely to produce a substantial boost to the occupancy rates of properties that are currently struggling. This finding about economic benefits is consistent with other research on changeable electronic signs (van Bulck, 2011).

Signage with Price Information: Story of One Property

A second component of this case study involved a signage change at one property. At one Value Place location where local officials prohibited any pricing data on the property's sign, occupancy rates were so low that it was, at best, breaking even. After an extended period of discussions and negotiation, the company reached a compromise with local officials that provided for a multi-tenant sign that included space for Value Place, as the lead tenant in the development, to post its pricing. The new sign was erected in late October of 2010, nearly three years after the property opened.

For this analysis, information provided by the company consisted primarily of three years of monthly data on occupancy rates. Monthly data on posted and actual charged weekly rates were also provided in order to demonstrate that only negligible changes had occurred in prices.

The impact of the new sign has been significant. In the first nine months after its installation, the property has experienced an average occupancy rate that is 19 percentage points higher than the same nine-month period for the two preceding years. As a result, the property has now become consistently profitable, even in traditionally slower months. In addition, the property is now projected to generate an additional $30,000 a year in hotel tax revenues.

B. National Retail Banking Business

A bank with more than 500 branches nationally, which we will call Secure Savings, agreed to provide data about the use of signage as it pertains to Secure Savings' branch characteristics and performance. Secure Savings requested that its identity not be disclosed in the presentation of this case study.

The banking industry uses on-premise signage extensively and spends a great deal of money on branding, design, placement, purchase, and maintenance of its signs. Retail banking is a highly competitive industry, and branch visibility receives much attention and investment.

Some of the operating characteristics in retail banking are similar to those in the retail trade and accommodation/ food service industries. For example, in resource materials prepared for its members, the Bank Marketing Association advises: "Banks need to think more like retailers. Convenience retailers such as restaurants or gas stations know the value of good visibility. If your customers can't see your sign or find your building, they won't visit your branch" (Beery, 2002).

Signage concerns begin at the site selection stage. Selection criteria for Secure National Bank include visibility and convenience of access, along with population density and size. "We need to be visible so that, when people need us, in their minds, they know where we are," stated one of the bank's real estate executives.

Case Study Approach and Data

Secure Savings has extensive data on its branches, which permit a more extensive analysis that explores issues beyond the basic signage considerations that have dominated previous research. As with the previous case study, this analysis focused on 47 locations within a single metropolitan area, which serves to eliminate many non-signage factors that would otherwise be difficult or impossible to control for.

The dataset for this analysis includes details about:

- Standard sign factors: number, type, size, height, design;
- Unique data on visibility and placement;
- Assessments of market factors for each branch location; and
- Business performance metrics.

Two types of analysis are described here. The first examines the relationship between the sign packages for individual branches and an independently-conducted evaluation of branch visibility. The second analysis examines the impact of both of these dimensions on branch performance.

Comparing Signage to Banking Center Visibility

Using the data on these individual banking locations, it is possible to examine the relationship between the visibility score assigned to the banks and their on-premise signage characteristics. These scores were part of a broader six-factor assessment of banking center conditions that was performed by an outside consultant. To illustrate how scores were assigned to banking centers on these characteristics, the description of the visibility categories is presented. For more detail on the remaining categories please see the technical appendix.

The other five characteristics on which bank branches received a score from one to five (with 5 being the best score) were: location, accessibility, and parking for the banking center; and land use pattern (land use mix and density, traffic flow) and life cycle (age and economic vitality) of the surrounding area.

Table 8. Banking Center Visibility Score Categories

5	4	3	2	1
Location is immediately visible from a great deal of distance and is easily found.	Location is immediately visible and can be seen in the traffic patterns with little difficulty.	Is visible but no more or less than surrounding competitors or retailers.	Is partially visible from the surrounding roadway although obscured by impediment like landscaping or other building.	Building is easily missed when driving by and is likely wholly or partially obscured.

Table 12 contains information on the proportion of banking centers in each score category for the factors mentioned above. The great majority of banking centers (nearly 80%) received a visibility score of 4 or better. On the other three banking center characteristics – their location, accessibility and parking – the banking centers showed greater variation. The surrounding areas tended to receive average to strong scores for land use patterns, indicating they generally would be expected to give reasonable support to the bank branches, while life cycle showed greater variation.

Table 9. Banking Center Condition Scores

Score	Banking Center Characteristics				Surrounding Area Characteristics	
	Visibility	Location	Accessibility	Parking	Land Use Pattern	Life Cycle
5	36.2%	23.4%	17.0%	4.3%	40.4%	14.9%
4	48.9%	46.8%	38.3%	34.0%	25.5%	14.9%
3	12.8%	25.5%	40.4%	46.8%	27.7%	44.7%
2	2.1%	4.3%	4.3%	10.6%	6.4%	25.5%
1	0.0%	0.0%	0.0%	4.3%	0.0%	0.0%

The primary question is the extent to which sign characteristics of the banking centers are related to the independently assigned visibility score. The table below contains summary statistics on the sign characteristics of the banking centers, grouped according to the visibility score. Generally speaking, banking centers with higher visibility scores also tend to have more signage. In particular, pylon (or pole) and wall letter signs are more prevalent among locations with the highest visibility score. Across the 17 locations with a visibility rating of 5, there are 0.94 pylon signs, on average. These locations also have substantially more square footage of signage, 226 square feet on average, than lower scoring locations.

Table 10. Banking Center Sign Characteristics by Visibility Score

Visibility Score	Number of Banking Centers	Average Number of Signs				Average Square Feet
		Pylon	Monument	Wall Letters (Vertical)	Wall Letters (Other)	
5	17	0.94	0.29	0.71	1.29	226
4	23	0.30	0.52	0.61	1.17	165
3	6	0.17	0.50	0.67	1.17	108
2	1	0.00	1.00	1.00	1.00	105

The amount and type of signage are not the only factors that contribute to a banking center's visibility score; the characteristics of the physical location and surrounding area also play a role. To examine this relationship, the Economics Center analyzed a statistical model predicting the probability that a banking center would have the highest visibility rating. The model calculated the probability that a banking center location received a visibility level of 5 as a result of the following:

- the number of signs by type (pylon, monument, wall letters);

- the total square footage of signage;
- other banking center characteristic scores (location, accessibility, parking);
- surrounding area characteristic scores (land use pattern, life cycle).

The modeling technique allows for estimating the impact that each included variable contributes to the outcome of interest. Thus, by taking into account what is known about the banking centers and the surrounding areas (condition scores), the model permits an assessment of the added value of the included sign characteristics on the visibility score. The table below contains the results.[5]

Table 11. Probability of Having the Highest Visibility Score

Explanatory Variable	Impact on Probability	Statistically Different From Zero
Number of Signs, by Type		
Pylon	0.91	Yes
Monument	0.38	Yes
Wall Letters Vertical	0.08	No
Wall Letters Other	0.12	No
Total Square Footage of Signage	-0.003	Yes
Banking Center Characteristics		
Location	0.43	Yes
Accessibility	0.08	No
Parking	-0.08	No
Surrounding Area Characteristics		
Land Use Pattern	-0.06	No
Life Cycle	0.12	No

[5] See the technical appendix for a table containing the full regression results.

Factors That Affect Bank Visibility

The statistical analysis indicates that three factors have effects of much greater magnitude than the others. These three –location, pylon signs, and monument signs – are illustrated in the figures 5 and 6.

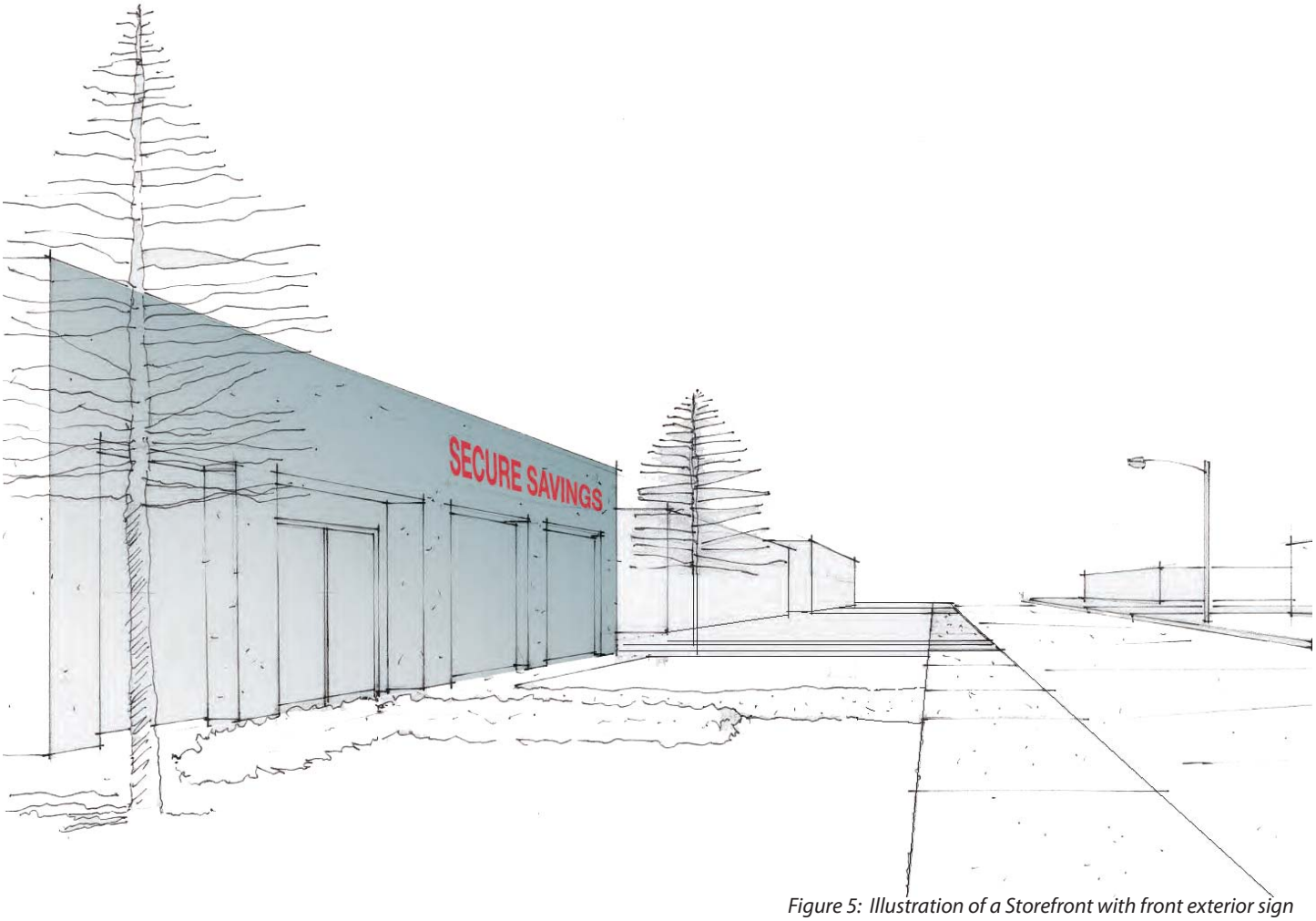

Figure 5: Illustration of a Storefront with front exterior sign

Having the prime location in the market results in a 43% greater likelihood of receiving the highest visibility score, compared to just a good and visible location.

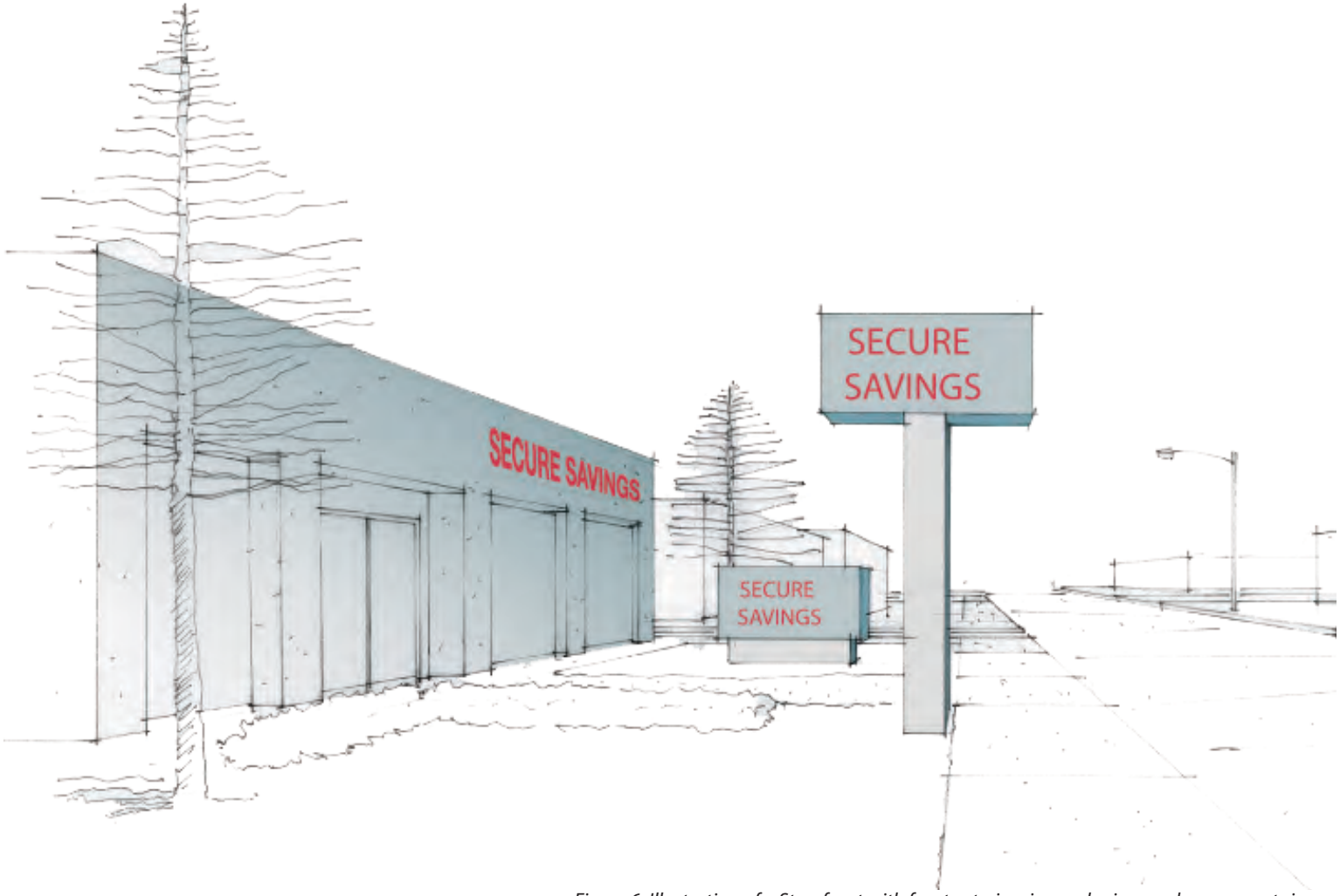

Figure 6: Illustration of a Storefront with front exterior sign, pole sign, and monument sign

The monument sign increases the probability of a maximum visibility score by 38%; the pylon sign increases the probability by 91%.

As shown above, certain on-premise signage has the greatest impact on bank visibility. The presence of pylon and monument signs increases the probability that a banking center has the highest visibility rating, even after taking into account other characteristics of the banking center and surrounding area. Specifically, each pylon sign is estimated to nearly double the probability (91% increase) of a visibility rating of 5, while a monument sign increases the probability by a little more than one-third (38%). According to one bank executive, "Pylon is the first choice because it can be seen from farther away." Acknowledging that mature trees occasionally block views of the signs, he observed that a pylon sign stands out more, which helps customers locate and drive to the bank more easily and safely.

Among the factors included in the model, the only other one that appears to have a significantly positive impact on visibility is one of the banking center characteristics – location – which produces a 43 percent increase in the probability of a top visibility score. The total square footage of signage is estimated to have a weak, negative

relationship to the probability of having the highest visibility rating. Each additional square foot of signage on premise is associated with a decrease of 0.3 percent in the likelihood of the location having the highest visibility rating. This result may occur because banking centers in poorer quality locations are compensating with more signage.

Comparing Signage to Banking Center Performance

The second part of the analysis examines the impact of signage and other condition characteristics on branch performance. The sample consisted of the same 47 banking locations previously analyzed. The outcome of interest was average monthly teller transactions in 2011. This component of the analysis modeled the incremental impacts of on-premise signage and condition characteristics on the number of average monthly teller transactions. The model analyzed teller transactions as a function of:

- the number of signs by type (pylon, monument, wall letters);
- other banking center condition scores (location, accessibility, parking); and
- surrounding area condition scores (land use characteristics, life cycle).

Table 16 contains the results of the model.[6] The results indicate that, when taking into account the other variables, a pylon sign is associated with 1.15 times the average monthly number of teller transactions. The statistical significance of this result is relatively weak, but the magnitude is roughly the difference between a bank having 375 daily teller transactions and 325 transactions. This difference is a considerable impact on monthly transactions, and no other signage characteristics exert a statistically significant impact on the outcome of interest.

Not surprisingly, the rating given to banking center parking is the only other variable that has an impact on teller transactions. As these transactions occur on-site, it is reasonable that banking centers with more available and more easily accessed parking would also tend to have more transactions.

[6] See the technical appendix for a table containing the full regression results.

Table 12. Average Monthly Number of Teller Transactions		
Explanatory Variable	Impact on Monthly Transactions	Statistically Different From Zero
Number of Signs		
Pylon	1.15	Yes
Monument	1.03	No
Wall Letters Vertical	1.09	No
Wall Letters Other	1.00	No
Banking Center Conditions		
Location	0.93	No
Access	1.09	No
Parking	1.15	Yes
Surrounding Area Conditions		
Land Use Characteristics	1.08	No
Life Cycle	1.03	No

C. Specialty Retail Small Business – Bob Roncker's Running Spot

This case study addresses a small business retail establishment in its expansion from one store to four stores in a major Midwestern city. The study examines a local specialty store chain of four small stores specializing in running and walking shoes, accessories, and apparel. These niche specialty retail stores provide an ideal case study for the effectiveness of signage and branding. The four retail outlets have a single owner. The original store has been in business for 30 years, adding three stores over the past several years. A program to refresh store signage in the context of an expanded branding strategy has paralleled the company's bricks-and- mortar growth.

The first Bob Roncker's was established in 1981, offering industry-specific advice and high quality running/walking products. This first store was located in an older streetcar suburb business strip on a busy commuter artery that leads to both the downtown and a major university within the region. The regional trade area has about 1.2 million residents. Early in 2008, a second store was added in a similar, well-established commuter suburb near the outer interstate beltway, a substantial distance from the city core..Later in that year, a third store was opened in an historic suburb located alongside a popular bike / running path. A fourth store opened in 2009 near

a successful riverfront commercial development. All four stores are devoted to retail sales of quality specialty running / walking lifestyle products.

This small specialty retail store case study offers insight into the role of on-premise signs at several levels: as an element of communication within the context of a specific streetscape; as an element of a comprehensive branding strategy within a niche market; and as reaffirming the stores' commitment to quality goods and services. This study also demonstrates how a small retailer can use signage to target a specific, narrow market within an upscale residential community with strict sign regulations. The small retailer has fewer options for communicating with its existing and potential customers. This requires that signage and branding strategies be an integrated package that is consistently applied.

Each of the four stores' building configurations, architectural styles and signage regulations present unique challenges for on-premise signage. Each requires site-specific signage design while maintaining consistency in graphic communication. Graphic composition and sign 'appropriateness' need to be balanced while maintaining conspicuity and legibility.

Store One: The original store location

This two-story brick structure sits close to a major busy street in a small suburban commercial district outside the urban core of a major river city. The modest face-mounted sign has a distinctive logo and san serif calligraphic style typeface. The clarity of the sign itself is due to the careful composition of elements – logo and graphically-stylized business name. The clean design and signature-styled font letters reflect the owner's desire for straightforward business dealings, personal service, and quality products. The well-designed painted sign is constructed and composed to reflect the commitment to customer satisfaction and product quality rather than conspicuity and over -powering visibility. Modesty and visual restraint set the theme for all of the four store signs, allowing consumers to focus on quality and service of their brand over expediency and budget.

Store One has four on-premise signs: a face-mounted building sign on the second floor façade, a small face-mounted door sign providing store hour information, a very small bayonet mounted sign, and a sandwich curb sign for special events and sale announcements. Because of the 10-foot sidewalk set back distance of the building and the parallel curb parking, the two small face-mounted signs are only readable from directly across the street. It is a direct

view perpendicular to the building's brick façade. This doesn't allow visual access to the sign from moving traffic in either direction. A moveable sidewalk sandwich sign provides an opportunity to announce specials, but the curb parking and small sidewalk trees obscure any chance for good readability to the fast moving traffic. The bayonet sign is so small (approximately 9" x 20") and placed under the awning as to obscure the communication value to all but pedestrians within 10 to 20 feet of the store entry.

The store has updated its awning and added a distinctive brand graphic logo and descriptive stylized text that is located on the front of the awning's sloped surface and fascia. The new awning design strategically plays off the color palette of the city's dominant university to reinforce the store's local commitment to its customer base. The awning is the best choice for added signage because regulatory codes allow only limited signage development and is restrictive to face-mount signs. The new awing signage has added a distinctive branding presence to the façade and a new communication identity that the building's other signs are unable to provide. This signage addition also adds a 'freshness' to the façade and provides a point of location for the fast moving traffic. Personal interviews with customers noted that the new signage graphics have helped identify the store from the street and have contributed to their interest in visiting.

Store Two: Expansion store 1999

The first addition to the store chain occurred in 1999. Following the precedent of the original store, modest signs are placed more for communication with pedestrian and slow moving traffic. This attitude and restraint is a response to the context of the small historic commercial district located within a quaint suburban neighborhood. A tenuous free-standing sign and a small, stylized, bayonet sign identify the store entry. Because of the building's setbacks, curb parking, and adjacent buildings, the store window displays and entry are hidden from street traffic. A sandwich sign is also used to announce sales and events. The low-key signage attitude fits with the community's desire for residential scale and historic references to maintain the upscale historic suburban lifestyle. Signage here is only a reminder for the entry and is not intended to take on much of a leadership role in expanding the consumer base. Other branding means are utilized. Signage is down-played with the bayonet-style sign, adding to the traditional small town atmosphere.

Store Three: Expansion store 2009

The established logo and stylized type of the original store helps the on-premise signs take a more prominent role at the third location. Located in a refurbished suburban train station, the signage must reach out to the community to pinpoint the store's location and attract new customers. The abandoned railroad tracks are now a popular biking and running / walking route that generates many retail opportunities. This location allows and requires the signs to pull away from the building and be located for vehicular traffic, bicyclists, runners and walkers. A prominent sign gives motorists good viewing from adequate distances, and a temporary sandwich sign adds to the attractiveness of a quaint business. The ambiance of the park-like setting with generous entry distances allows the building's face sign to be larger and out of balance to the station's low roof profile and large overhangs. This location tolerates stronger on-premise signage with an increased scale. Conspicuity and readability are balanced within the established sign composition that contains the store brand. Impulse purchases happen often as the bike / running path attracts many consumers that require replacement of their specialized running / walking appeal, or are attracted to the new product availability.

Store Four: Expansion store 2009

The last expansion store is located within a revitalized urban setting near the downtown area. A renovated building awning and logo bayonet sign announce the store to pedestrians and vehicular traffic. Located in a popular evening entertainment district, this running store attracts persons that would not be visiting the suburban locations. A large wall sign that faces the active evening retail and entertainment area also helps attract customers to the store for impulse and special sales buying.

The building integration is successful in attracting retail sales in its entertainment district location, with the store offering expanded evening shopping hours. The signs are well-organized and the design quality supports the clean, well-manicured building. At this location the signage supports an image and message of quality retail products, and presents a comfortable 'fit' with the adjacent

businesses. As such, it demonstrates an inviting quality that supports its brand identity. Signage in this location has an opportunity to impact sales. Sales are reported to be increasing, and this store and the original store generate the highest sales per month of the four store chain. It is also important to note that other branding activities are utilized less in this location than in the other stores. It can be inferred that the on-premise signage is a major contributing factor to the store's solid sale performance. On–premise signage is the most developed in this location, with the most signs in number and size as compared to the other three locations.

Overall Assessment

At first glance, small specialty businesses such as Bob Roncker's may not seem to offer much in on-premise signage impact. Closer examination provides a greater understanding of the complex variables in on-premise signage and provides a view of a strategic approach to expansion and signage updating, which could be applied to future research involving the analysis of chain retailers. This case study provides a good illustration of how implementation of a branding plan and retail expansion plan that includes on-premise signage can positively impact business performance. According to the Bob Roncker's business manager, Verne Johnson:
"One of our primary goals, since converting our Glendale shop from a New Balance Concept store in 2008, has been on branding the Bob Roncker's Running Spot name. It continued to be a key element in our marketing and advertising programs as we added stores in Loveland, later on in 2008, and Newport in 2009.

"Store signage has no doubt helped us in achieving that goal; improving the image of the Running Spot brand / identity in the greater Cincinnati marketplace. That, along with our continued focus on customer service and quality solution in footwear, apparel, fitness training programs, and other associated running / walking gear has helped us improve our sales performance at all store locations. This target branding strategy has helped make the Running Spot a successful and profitable business for over 30 years and has allowed the brand to expand into four complete stores."

These comments are consistent with the results of a recent national consumer survey that indicates that potential buyers take note of business signage, and make decisions based on it. Nearly three-quarters of respondents reported that they entered a business because signage caught their attention. Similarly almost 80 percent said that they remembered a business later because of the signs. Seventy-five percent of respondents also referred someone else to a business because of notable signage. (FedEx Office, 2012).

Small businesses like the Running Spot depend upon on-premise signage because of the communication value with potential customers. Better economic performance was reported in stores having the most complete and prominent signage. All stores are on healthy economic footing, with the original store and the store in the urban entertainment district showing the best performance. These two stores have the most complete signage package with fresh, legible signs placed in visible locations. While location and signage differences among the four stores preclude a rigorous statistical analysis of the role of on-premise signage in business performance, there

does appear to be a general correlation between superior signage and superior performance. This is also consistent with the business managers' assessment that their signage has resulted in positive performance because it is able to effectively communicate with large numbers of potential customers.

D. Small Business – Chuck Anderson Ford

Chuck Anderson Ford is located in Excelsior Springs MO, which is part of the Kansas City metro area. The business is located within a typical commercial strip on an arterial highway.

In March of 2011, owner Mike Anderson added a new pylon video board to the existing dealership signage, which includes a traditional Ford-logo pylon sign and other business signage. This sign was added primarily as part of an effort to increase the dealership's service business. The new 30-foot pylon sign has a 96-square-foot full-animation, electronic message center. Previously, that portion of the dealership was identified by a 22-square-foot sign that read "Body Shop."

The new sign was not only larger, but it offered better illumination and design, in addition to its messaging capabilities. The electronic sign draws much more attention to Anderson's business.

For example, in 2011, Anderson used the new sign to advertise a corporate tire sale, and even though a Goodyear Tire Center is located directly across the street, Anderson Ford had the fourth-highest tire sales figure among US Ford dealers.

To assess the economic impact of the new sign, Anderson Ford provided monthly data on service department customers and sales for 2010 and 2011. To smooth out monthly fluctuations, the chart below presents the data as two-month averages. Using a base of 100 for the average monthly customer count during 2010, customer figures during 2011 increased from an index of 90 in January and February (the two months prior to adding the new sign) to 108 in the first two months after the new sign and 119 at the end of 2011, showing an average gain of 4.5 percent every two months.

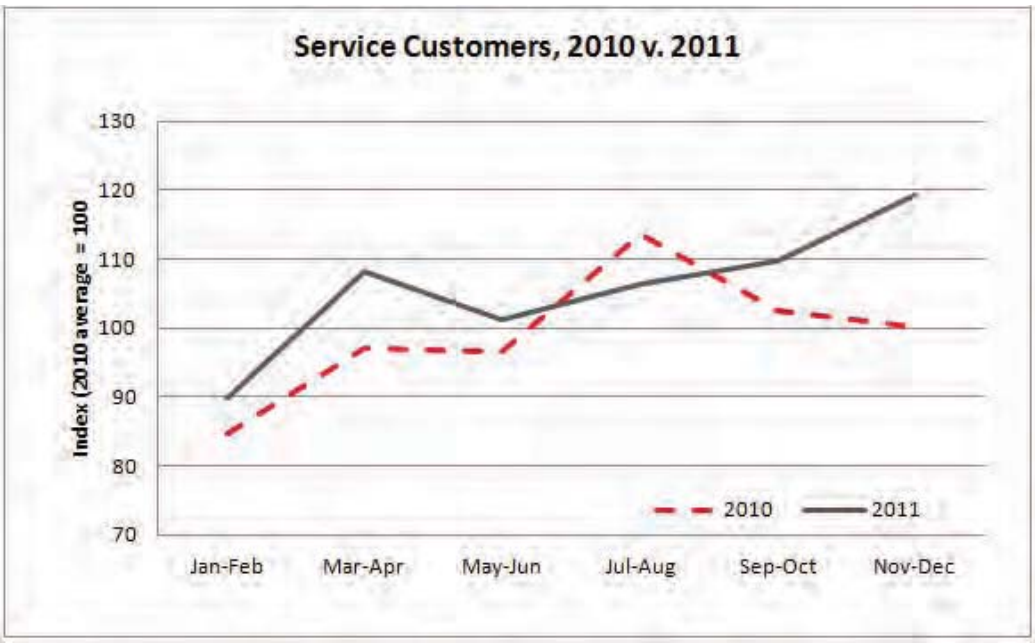

Figure 7: Service Customers, 2010 v. 2011

In figure 7, note that 2011 showed an average year-over-year increase in the number of service customers of 6.5 percent during the ten months after the installation of the new sign.

Mike Anderson indicates that his current service clientele can be identified as 34 percent first-time/new customers and 66 percent regular/repeat customers. This suggests that more customers are learning about his business, and it is reasonable to assume that at least a portion of this new business is coming as a result of the new sign.

A similar analysis was performed on the sales figures, but these numbers were tracked against national auto parts store sales to account for the generally improving national economy. This analysis avoided figures for the winter months (December, January, February) because of the potential for weather-related distortions. Year-over-year figures were compared for the March-to-November periods of 2010 and 2011. This also corresponded well to the introduction of the new sign at Anderson Ford. While US auto parts sales for March-November 2011 were up 5.5 percent over the previous year, Anderson Ford service revenue increased by 10.8 percent in this nine-month period of 2011, compared to 2010. Overall, given the increase in busi-

ness since the sign was installed, Mike has hired three new salespeople, two service technicians and one body-shop person, increasing his employees from 28 to 34, and his business is still growing.

As important as these sales figures are for the dealership, revenue doesn't tell the whole story. The new sign has directly contributed to other positive impacts – on the reputation/brand and visibility of the business. An estimated 30 percent of the new sign's message time is focused on community announcements and public service messages. Examples include:

- Tornado-watch notices,
- The community's annual Oktoberfest,
- A cancer walk-a-thon, and
- Local student recognitions.

These messages generate attention and positive feedback for the business. According to Anderson, "It's about goodwill and being a member of the community. The sign has had a big impact on how we're perceived." When the company first decided to add the new sign, it was seen as an innovative idea that would help to set it apart for its competitors. Now, Anderson says, "The attention I've received has endorsed my decision. The sign has helped us to communicate with the customer on a continual basis. We would for sure do it again!"

VI. Summary of Research Findings

The research shown in this report indicates that appropriately designed and located on-premise signage can be an important factor for retail business success. The implication of these results is that on-premise signage indirectly influences the vitality of a community though the availability of goods and services, jobs and public services. Sign regulations should balance community design objectives with full knowledge of how sign design and location impact businesses success. Business success is important because of its impact on a community's tax base and ultimately leads to the availability of fiscal resources to provide needed services.

We began by providing an intellectual underpinning that uses economic theory to present a new explanation for why on-premise signs have positive economic impacts, not only for businesses, but also for consumers and communities. This explanation can foster more well-informed discussions between sign vendors and users and between sign users and regulators.

The following summarizes this study's findings, based on a national business survey and business cases studies assessing the impact of on-premise signage on business performance.

The national business survey found:

- Legibility is the most important characteristic of signs across all sizes of companies;
- Use of business logos, and the size and location of the signs were more important for companies with more establishments, compared with single establishment companies;
- Sign changes generally had significant, positive impacts on sales, number of transactions, and profits;
- Sign changes had smaller positive impacts on employment.

Among the case studies, positive business performance was generally associated

with on-premise signage changes as the following indicates:

- The national lodging chain case found that the use of a digital electronic sign to display pricing was associated with higher average occupancy rates. The impact appeared to be especially strong for properties with lower occupancy rates;
- The national banking case study found that pylon signs were strongly associated with high visibility; monument signs were moderately associated with high visibility; wall signs contributed to identity but not visibility. In addition, pylon signs were associated with significantly more teller transactions;
- The small specialty store case study demonstrated the need for signage to reaffirm the value offered by a niche retailer. Sign design must be sensitive to community and customer expectations, and able to reinforce the limited brand of a small business. The signage should communicate a "promise" of value for a product and/or service that is not commonly found elsewhere;
- The car dealership case study found that the addition of a video sign board was associated with large increases in both service department revenue and customer count. An added benefit was the "goodwill" and reputational gains associated with using the video board for community-related public service messages.

While many of these findings are statistically significant, larger sample sizes in surveys and case studies should be sought in future research. It is always appropriate to exercise caution when interpreting case study findings because results do not necessarily transfer from one industry or geographic setting to another. While these case study findings about particular individual businesses are not necessarily generalizable, they are important, particularly because the subject is so complex that a comprehensive analysis covering all business types and signage considerations is unlikely to be undertaken. Furthermore, the similarity of some case study findings with survey results suggests that this study deserves careful consideration by researchers, practitioners, and local officials.

VII. Conclusion

The research presented in this report provides current information for better understanding the economic impact of on-premise signage. The national business survey results provide insight to how different types and sizes of businesses use and value their signage. The survey results also provide details about the specific aspects of signs that different types of businesses consider most important. The case study results have reinforced the survey results and provide detailed examples of improved business performance resulting from specific changes in signage.
The ultimate goal of this research has been to provide the signage stakeholders with timely, relevant information to inform their decisions about using on-premise signs to jointly serve the needs of both individual businesses and communities where they are located. As we have attempted to convey, the impact of signage on an individual business location is complicated by a number of factors related to the specific physical, social, and regulatory context of that location, as well as the specific customer base and product offered by the business. Our results suggest that careful identification and consideration of those factors is likely to result in more effective signage. The implication is that with respect to on-premise signage, one size does not fit all, and that to maximize their effectiveness, different types and sizes of business need tailor their signs to their specific needs. Most reputable sign companies already know and appreciate this, though this may be new insight for some businesses. Perhaps the stakeholders that can most benefit from our analyses are some of the sign regulators.

Our work should not be interpreted to suggest that all sign regulations hinder business performance. While this research has emphasized the important role of successful businesses in a community's overall quality of life, we recognize that thoughtful signage design standards can accommodate both the needs of businesses and communities. Indeed, it is clear from our work that sign regulation incentivizing legible, visible, and conspicuous signs can boost business performance, especially for the small businesses that can catalyze growth.

A. Implications for Businesses

Businesses make decisions about their signage within the context of their available financial resources, target customer base, and location characteristics. The results

presented in this report emphasize the importance of carefully assessing the role signage plays in a business' overall marketing and branding strategy given the specific characteristics of a particular location. The specific sign designs and types used to achieve these objectives will depend on multiple factors related to the business location, including view distance, street/road curvature, number of traffic lanes, speed limits, landscaping, building setback, and sightline obstructions from other signs, buildings, poles and berms, and potentially many other factors. The case studies reinforce the idea that particular signs may be effective for one type of business but not be well-suited for another. Clearly the digital electronic signs that work so well for the hotel chain would be ineffective for the specialty shoe store. Likewise, the video sign that works well to enhance sales and community relations for a single-establishment car dealer may be difficult for a banking chain to use at neighborhood branches and integrate into their national branding strategy.

B. Implications for Communities

Both private and public decisions about signs can have important implications for communities. As previously indicated, the results of this study show that signs that are legible, visible, and conspicuous are important for retail businesses. The implication is that sign regulations should balance community design standards with site-specific technical requirements for promoting business success. The alternative is that businesses are less successful and governments have less revenue to support their services. Second, it is important for planners and local officials to understand how the purposes and uses of signs differ for single establishments, small companies, and larger companies. Sign regulations that constrain one purpose may disadvantage the businesses that depend on it. This may be the case especially for smaller, single establishments, which are frequently more dependent on signs as a primary means of communicating their location and products or services to potential customers. On the other hand, regulations that encourage quality signage that communicates effectively at low cost may help small businesses. Given that such small businesses frequently serve as engines of job growth, such policies can be especially appropriate as part of neighborhood economic growth strategies.

C. Implications for Future Research

Taken together, the results of this research have significant implications for businesses and communities, and they suggest important considerations to guide future research in this area. Much of the work reported here is based on data collected directly from businesses, which are an irreplaceable source of information for signage research. Those who attempt to replicate this research will find that most businesses, regardless of size, are hesitant to share such detailed data about individual locations despite extensive assurances of confidentiality. Because research in this field is important for informing business investments as well as public policy, future research will benefit from efforts that would enable business signage and performance data to be made more accessible to researchers. Associations within the signage industry might be able to establish mechanisms or protocols to facilitate data availability while ensuring confidentiality.

This study can serve as a foundation and guide for practitioners and researchers who want to contribute to the development of more effective signs and improved signage practices. For those who are committed to this collaborative venture, new questions will arise from their application of these research findings, and future research will play a key role in the success of their efforts.

Appendicies

1. Survey Instruments

UC Sign Survey

1. Introduction

The University of Cincinnati is examining how differences or changes in on-premise signs affect businesses.

We are using this brief survey, which you can complete in about 5 minutes, to obtain information about the views and experiences of sign users.

If you have any questions or want to contact us regarding this research, please call or email me.

Jeff Rexhausen, Associate Director of Research 513-556-3047
Economics Center, University of Cincinnati jeff.rexhausen@uc.edu

2. Purposes of Signs

Signs play an important role in contributing to business success. Their economic value comes from the impacts they have on business activity. To produce these effects, signs serve a variety of functions.

A. How important is each of these purposes for your on-premise signs?

Importance *(Check one box in each row)*	Extremely	Moderately	Slightly	Not at all
Make your business stand out from others				
Reinforce branding/image				
Help potential customers find your location				
Inform about available goods/services				
Inform about promotions (sales, etc.)				
Other *(describe below)*				

B. What do you consider the most important purpose of your on-premise signs? *(Check one)*

Provide visual identity and uniqueness	
Reinforce brand familiarity	
Show location to potential customers	
Provide information about available goods and services	

3. How important are each of these elements in your sign?

Importance *(Check one box in each row)*	Extremely	Moderately	Slightly	Not at all
Conspicuous ("stands out")				
Clearly readable				
Logo or branding				
Illumination (lighting/brightness)				
Size and location				

3. Your Business

If you have more than one type of business, please limit your responses to the one type for which signs are most important. You may also complete an additional survey for a separate type of business.
To make it easier for you to respond, we encourage you to base answers on estimates or your best recollections, if you don't have specific data at hand.

A. Which of these best describes your business? *(Check one)*

Small business - independent	
Small business - franchise of a chain	
Large retailer (incl. food service and retail banking)	
Other type of business *(describe below)*	

B. How many establishments (business locations) do you have? ☐

C. At a typical business location, which of these types of exterior signs do you use? *(check all that apply)*

Wall sign	
Pole sign	
Monument sign	
Other signs *(describe below)*	

D. At a typical business location, how many exterior signs do you have? *(Check one)* 1-2 ☐ 3-5 ☐ 6 or more ☐

E. Please give a brief description and/or the NAICS or IRS Business Activity Code for your type of business.

4. Sign Changes and Impacts

A. Do you have any business locations at which there have been any of these types of changes to one or more signs in the past 5 years? *(check all that apply)*

Increase in number of signs	
Increase in sign size	
Enhancement of sign visibility (higher, closer to street, placement on building, etc.)	
Change in sign design (refresh look, new type, illumination)	

B. In connection with these sign changes, what business impacts did you experience, and how large were they?

(Check direction and amount of change)	Increase	Decrease	No change	<2.0%	2-4.9%	5-9.9%	10-14.9%	15-19.9%	20% or more	unknown
Total sales volume										
Number of transactions										
Staffing (employment)										
Profits										

C. If sales, staffing, and/or profits increased, what were the top 2 reasons for growth? *(check two)*

New or refreshed signs	
Increased number of signs	
Increased other advertising/marketing	
Increased product/service offerings	
Facilities renovated, refreshed, or expanded	
External factors (the economy, competition, traffic/accessibility, or temporary circumstances) *(describe below)*	

D. Do you have any business locations at which there have been any of these reductions in signs in the past 5 years? *(check all that apply)*

Temporary loss of a sign	
Permanent loss of a sign	
Reduction in sign size	
Loss of sign visibility (obstructed, lowered, farther from street)	

E. In connection with these sign changes, what business impacts did you experience?

(Check direction and amount of change)	Increase	Decrease	No change	<2.0%	2-4.9%	5-9.9%	10-14.9%	15-19.9%	20% or more	unknown
Total sales volume										
Number of transactions										
Other *(describe below)*										

5. Other Information and Interest in Research Findings

A. Please indicate what types of information you might be willing to share about your sign changes. *(check all that apply)*

Details/stories about types of sign changes	
Data on business impacts (data to be kept confidential; no reference to your business in the study)	
Data on business impacts (data to be kept confidential, but naming your business in the study)	

If so, please provide your phone number and/or email for us to contact you

B. Would you like to receive a brief summary of the findings of this research project? *(If "yes," please provide email or other address.)*

Yes		
No		

Thank you for contributing to this research. Please invite your business colleagues to also participate.
The more information we receive, the better the insights we will be able to provide in our report. We also welcome your comments and suggestions.

Return survey to: Jeff Rexhausen, Economics Center, Box 0223, University of Cincinnati, Cincinnati, OH 45217-0223

Impact of On-Premise Signs

2. What do you consider the most important purpose of your on-premise signs?

- Provide visual identity and uniqueness
- Reinforce brand familiarity
- Show location to potential customers
- Provide information about available goods and services

Impact of On-Premise Signs

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Signs play an important role in contributing to business success. Their economic value comes from the impacts they have on business activity. To produce these effects, signs serve a variety of functions.

1. How important is each of these purposes for your on-premise signs?

	Extremely important	Moderately important	Slightly important	Not at all important
Make your business stand out from others				
Reinforce branding/image				
Help potential customers find your location				
Inform about available goods/services				
Inform about promotions (sales, etc.)				
Other (describe)				

Other:

Impact of On-Premise Signs

2. What do you consider the most important purpose of your on-premise signs?

- Provide visual identity and uniqueness
- Reinforce brand familiarity
- Show location to potential customers
- Provide information about available goods and services

3. How important are each of these elements in your sign?

	Extremely important	Moderately important	Slightly important	Not at all important
Conspicuous ("stands out")				
Clearly readable				
Logo or branding				
Illumination (lighting/brightness)				
Size and location				

3. Your Business

If you have more than one type of business, please limit your responses to the one type for which signs are most important. You may also complete an additional survey for a separate type of business.

To make it easier for you to respond, we encourage you to base answers on estimates or your best recollections, if you do not have specific data at hand.

1. Which of these best describes your business?

- Small business - independent
- Small business - franchise of a chain
- Large retailer (incl. food service and retail banking)
- Other type of business

If other, please specify

2. How many establishments (business locations) do you have?

(number)

Impact of On-Premise Signs

2. What do you consider the most important purpose of your on-premise signs?

- Provide visual identity and uniqueness
- Reinforce brand familiarity
- Show location to potential customers
- Provide information about available goods and services

Impact of On-Premise Signs

3. If sales, staffing, and/or profits increased, what were the top 2 reasons for growth?

- New or refreshed signs
- Increased number of signs
- Increased other advertising/marketing
- Increased product/service offerings
- Facilities renovated, refreshed, or expanded
- External factors (the economy, competition, traffic/accessibility, or temporary circumstances)

If "external factors," please specify

4. Do you have any business locations at which there have been any of these reductions in signs in the past 5 years? (check all that apply)

- Temporary loss of a sign
- Permanent loss of a sign
- Reduction in sign size
- Loss of sign visibility (obstructed, lowered, farther from street, etc.)

5. In connection with these sign changes, what business impacts did you experience?

	Change	% change
Total sales volume		
Number of transactions		
Other		

If other, please specify:

5. Other Information and Interest in Research Findings

Impact of On-Premise Signs

2. What do you consider the most important purpose of your on-premise signs?

- Provide visual identity and uniqueness
- Reinforce brand familiarity
- Show location to potential customers
- Provide information about available goods and services

Impact of On-Premise Signs

1. Please indicate what types of information you might be willing to share about your sign changes. (check all that apply)

- Details/stories about types of sign changes
- Data on business impacts (data to be kept confidential; no reference to your business in the study)
- Data on business impacts (data to be kept confidential, but naming your business in the study)

If you have information, please provide your phone number and/or email so that we may contact you.

2. Would you like to receive a brief summary of the findings of this research project?

- Yes
- No

If "yes," please provide email address.

3. Thank you for contributing to this research. Please invite your business colleagues to also participate. The more information we receive, the better the insights we will be able to provide in our report.

Please go to "http://business.uc.edu/uc-sign-survey-extra" to answer a few more questions about sign impacts.

We also welcome your comments and suggestions.

2. Retail Banking Technical Appendix

To examine the impact of signage and location characteristics on the visibility score, a binary variable taking on a value of 1 if the location received the highest score, and 0 otherwise, was constructed. Assuming that the probability of the outcome of interest is normally distributed gives rise to a standard probit model. As the coefficients from a probit model are not directly interpretable they have been transformed into marginal effects. The marginal effects displayed in the table below give the change in the predicted probability of having the highest visibility rating for a given one-unit change in the explanatory variable.

Dependent Variable: Visibility Score of 5			
Explanatory Variable	Marginal Effect	Coefficient Estimate	z-value of Coefficient Estimate
Number of Signs, by Type			
Pylon	0.91	14.411**	1.99
Monument	0.38	6.010**	1.96
Wall Letters Vertical	0.08	1.314	1.01
Wall Letters Other	0.12	1.959	1.42
Total Square Footage of Signage	-0.003	-0.053*	-1.79
Banking Center Characteristics			
Location	0.43	6.777**	2.09
Accessibility	0.08	1.318	1.15
Parking	-0.08	-1.236	-1.09
Surrounding Area Characteristics			
Land Use Pattern	-0.06	-0.929	-0.95
Life Cycle	0.12	1.822	1.43
Intercept		-35.011**	-1.97
Pseudo R^2		0.7952	

*** significant at the 1% level
** significant at the 5% level
* significant at the 10% level

The measure of banking center performance selected for analysis was the number of average monthly teller transactions in 2011. Because the outcome of interest is a quantity that takes on discrete, nonnegative values, a count regression assuming a negative binomial distribution was used. The functional form assumed that the variance of the outcome was a linear function of the mean. The coefficient estimates are not easily, directly interpretable. The transformed impacts are the estimated change in the number of teller transactions for a one unit change in the corresponding explanatory variable. The estimate for "alpha" appearing in the table below is statistically significant, indicating that the conditional variance of the dependent variable is over-dispersed relative to the conditional mean, confirming the use of a negative binomial distribution as opposed to a Poisson distribution.

Dependent Variable: Number of Average Monthly Teller Transactions

Explanatory Variable	Impact on Monthly Transactions	Coefficient	t-value
Number of Signs, by Type			
Pylon	1.15	0.144*	1.73
Monument	1.03	0.027	0.27
Wall Letters Vertical	1.09	0.084	1.08
Wall Letters Other	1.00	-0.004	-0.09
Banking Center Characteristics			
Location	0.93	-0.071	-1.03
Access	1.09	0.086	1.54
Parking	1.15	0.138**	2.1
Surrounding Area Characteristics			
Land Use Pattern	1.08	0.081	1.25
Life Cycle	1.03	0.03	0.6
Alpha		0.101***	4.91
Intercept		7.981***	21.02
Log-Likelihood		-429.52	

*** significant at the 1% level
** significant at the 5% level
* significant at the 10% level

There are several important potential sources of biases that impact the reliability of the results. As mentioned previously, the datasets analyzed were small and also focused on a single type of business in one industry. The small number of observations may render the point estimates themselves inaccurate. Additionally, there may be important variables that have been omitted from the analyses due to lack of data. These omitted variables may be another source of inaccuracy. It is possible that, where data available, inclusion of these variables would change the sign, magnitude or significance of the remaining variables. Finally, as the data were not a random sample of businesses the results are not necessarily applicable to other industries or indicative of the impacts of business signage generally.

Banking Center Condition Analysis Scorecard

	Score Descriptions				
	5	**4**	**3**	**2**	**1**
Visibility	Location is immediately visible from a great deal of distance and is easily found.	Location is immediately visible and can be seen in the traffic patterns with little difficulty.	Is visible but no more or less than surrounding competitors or retailers.	Is partially visible from the surrounding roadway although obscured by impediment like landscaping or other building.	Building is easily missed when driving by and is likely wholly or partially obscured.
Location	Banking Center is in the prime location within the immediate submarket or trade area. Easily accessible.	Banking Center is in good and visible location within the trade area, although it is not on the prime corner.	Banking Center is serviceable. Its location is generally acceptable and would be easily found by those looking for it.	Banking Center location is flawed in some way (i.e. poor traffic patterns, development moving traffic away from site).	Immediate trade area has moved away from this location or deteriorated in that it is not servicing the customer base.
Access	BC is immediately accessible from either direction from the roadway for both entry and exit. Traffic signal at access. Easy left, in & out.	BC is accessible from either direction although may have shared easement with contiguous retailer. Easy to modestly easy left, in or out.	Is generally accessible, however is susceptible to traffic issues at peak times. Tough to moderately tough left, in or out.	Has some consistent access issues attributable to traffic or easement points. Tough left, in or out.	Access is poor due to constant traffic issues or shared egress points that are far away from BC location. No left, in or out.
Parking	Immediate parking around the banking center is abundant. Plenty of parking even at peak times.	Parking is plentiful. As long as employees park in designated spaces, there is typically enough spaces.	Parking is generally good, however at peak times customers pay have to use surrounding retail for overflow parking.	Parking is tight and at peak times it is likely customers have to wait on spaces.	Inadequate or no designated parking.
Land Use Pattern	Trade area is strong mix of residential, retail and business. Marked by density and high traffic. Compact.	High density and good traffic flows, however, is either retail heavy or residential heavy.	Trade area has strong commuter traffic but is not buoyed by a strong retail cluster. Sprawling.	Trade area is retail destination location. Sometimes termed "On an Island".	Trade area is spread out and not buoyed by a dominant strong traffic path or retail destination.
Life Cycle	Trade area is growing quickly. Expectations for considerable amount of population and retail growth in the immediate area.	Strong trade area. Expectation for modest growth and improving surrounding development.	Mature trade area. Growth has plateaued due to lack of space that constrain further development.	Declining trade area. Demographics are declining and surrounding retail vacancy is increasing.	Trade area is marked with high vacancy of both retail and residential.

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SIGN RESEARCH FOUNDATION™

RETAIL SIGNAGE: PRACTICES TO INCREASE RETURN ON INVESTMENT

Project Methodology

The goal of the Retail Signage: Practice to Increase Return on Investment report is to further explore the connection between high-level design practices outlined in the *Landmark Design Survey and Digital Sign Design Survey* developed by the Sign Research Foundation in 2014 and successful strategies developed by executives, consultants, designers, and fabricators for employing signs to support business success.

Interviews:
An initial survey group was selected across a spectrum of disciplines to develop an overview of sign best practices in two major areas:

Management
Executives in leading retailers and leading consultants were selected after initial discussion with the project team and a review of the business areas where sign decisions were made.

Design Integration
After the initial interviews with executives these participants were surveyed on the specialty areas that were in the purview of sign and identity practices. Architects, designers, retail specialists, display specialists, and digital specialists were selected based on this survey.

These survey subjects also recommended examples that could be used in the summary of the report to illustrate the practices.

The interview subjects were given access to the *Landmark Design Survey and Digital Sign Design Survey* to compare the leading sign practices with standards for design excellence determined by the research. They later used this information to help support making selections of leading case studies.

Identification of Best Practice Case Studies
After the interview session determined the range of best practices and a series of statistical approaches for determining corporate success across a variety of retail groups, the selection process for case studies began. The process started by referencing the practices outlined in the interviews with a report published by the Design Management Institute of leading retailers based on a dollars per square foot (The most commonly used approach to determining retail performance). While all these companies exhibited the design attributes for success found in the interviews and in the previous research surveys the goal was to seek examples across a wide spectrum of industries. Selected case studies were based on research of leading companies across a range of commercial building types followed by recommendations from the steering committee based on the overall best practices derived from the interviews.

Report Content Summary

Introduction - ROI and Design Focused Organizations
Case Studies - Leading Design Focused Organizations
Management Strategies that Are Central to ROI
Case Studies - Leading Small Community Based Organizations
Collaboration Strategies that are Central to ROI
Case Studies - Leading Collaborative Projects including Convenience Stores, Historic Districts, and Digital Signs

Restaurants
A review of the fastest growing new restaurant chains in the last decade followed by recommendations from the survey group.
Apparel
A review of the most successful retailers in the last five years using dollars per square foot as a reference followed by recommendations from the survey group.
Banks
A review of a publication on the leading community banks in America using Return on Equity as a reference followed by recommendations from the survey group.
Convenience Stores
A review of the most successful retailers in the last five years using dollars per square foot as a reference followed by recommendations from the survey group.
Strip Shopping Centers
A review of the literature of leading commercial developments using lease rates as a reference followed by a recommendations from the survey group.
Downtown Districts
A review of the literature of leading commercial developments using lease rates as a reference followed by a recommendations from the survey group.
Digital Signs
Recommendations from the survey group based on successful new commercial developments utilizing digital signs. These signs were too recent to provide statistical background information.

Case Study Analysis
Case studies were analyzed by utilizing the interview results and the results of the previous research survey to determine best practices. Descriptions were based on observation with follow-up questions to the survey group. In some cases executives, designers, and consultants for the case study companies were added to the survey group for follow-up questions and review. Statistical information was also added to paint a picture of how the profiled organizations perform relative to their peers.

Introduction ROI and Design Focused Organizations

Organizations calculate return on investment (ROI) when making investment decisions. Companies establish their own benchmarks for ROI in order to prioritize which media approaches should receive greater investment based on an anticipated return. Signs are physical elements that serve multiple roles for a business. A sign can reinforce an organization's brand, communicate and inform customers, or support an enriched customer experience. While most organizational investment strategies are proprietary, there are three common approaches that companies utilize to integrate ROI in sign decisions:

Return Based on Sales in Dollars Per Square Foot
Retailers make investment decisions based on how much revenue they can generate in a set footprint of space. Developers also invest in properties based on how much they can charge per square foot of space and the entire building value is also based on how much can be charged. Sign design decisions can be extrapolated on how much it is felt that the sign contributes to the retail layout and location's value. This metric used to be more simply applied, but is now clouded by other technological approaches to finding destinations.

Brand Equity
Brand management has become a significant metric on a company's balance sheet for measuring value, particularly if the company is publicly traded. Signs reinforce the quality of a company's brand and have steadily become a major part of a company's overall marketing strategy. Because of advances made by branding firms, signs are often integrated into architecture which increases their overall aesthetic value.

Return Based on Experience Design Analysis
Experience Design is a relatively new management approach, but plays an integral role in the investment process of a company who wants to establish close relationships with its customers. In experience planning, elements of the customer experience are broken into touchpoints and measured. Touchpoints most important to the customer experience receive greater investment.

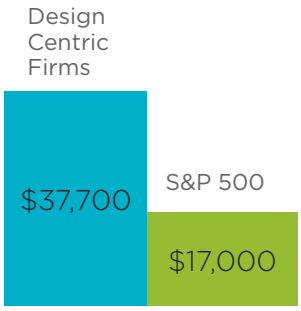
While companies use a combination of the approaches profiled to the left, they all are unique based on their strategy for achieving success. We can analyze how successful companies integrate signs in their value calculations by observing what people consider effective signs and reviewing the companies that employ those signs. In the *Landmark Design Survey and Digital Sign Design Survey* developed by the Signage Foundation Inc. in 2014, a number of attributes were analyzed for their effectiveness.

LEADING ATTRIBUTES INCLUDE

- Legibility
- Enjoyable to View
- Informational
- Quality
- Appropriately Scaled
- Uniqueness

Fortunately many top companies incorporate effective sign design approaches into their development strategies. The Design Management Institute, in its annual report on design-oriented companies, has measured the returns on design-oriented companies and have found they have increased in value at a much faster rate than other companies. In addition, many top retailers employ effective sign strategies, allowing us to provide a closer look at the effects of those strategies.

10-year stock return based on a $10,000 investment in Design Centric Firms Versus the S&P 500



LEADING RETAILERS IN TERMS OF ROI BASED ON $ PER SQUARE FOOT IN SALES (2013)

Apple Stores®
Tiffany & Co.®
lululemon athletica®
Coach®
Michael Kors®
Select Comfort®
True Religion®
Vera Bradley®
Birks & Mayors®
Fairway Market®

Buffalo Wild Wings

Summary
Buffalo Wild Wings is an owner, operator and franchisor of sports-themed restaurants. Its restaurants focus on creating a community around the sports experience including watching sporting events or other programs on its projection and flat screens, competing in Buzztime Trivia, or playing video games. The open layout of its restaurants offers dining and bar areas that provide seating choices for sports fans and families. The restaurants are spread through all 50 states.

Management Team
Buffalo Wild Wings boasts a strong internal design team of in-house designers and architects with a holistic approach to building design that touches every aspect of the exterior and interior. Innovation is led by the senior executives who manage the complete visitor experience. The company works with outside consultants and architects like Fitch on guideline development, with a focus on creating a vocabulary that can be integrated into every aspect of the experience.

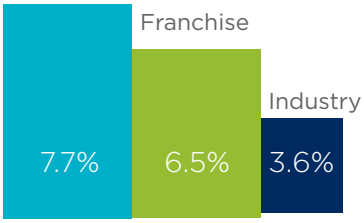
Slightly more than 40 percent of Wild Wings stores (485 of 1080) are managed internally, providing ample opportunities for experimentation. For franchisees, the organization offers extensive design, permitting and documentation support.

Design Strategy
Buildings are developed to adapt to local conditions based on a seven-year rolling plan for organic expansion. The company has an anti-big box approach focused on extensive repurposing of a wide variety of building types at locations near commercial concentrations of power centers, hospitals, movie theaters and college campuses.

KEY STATISTICS

485 of the 1080 Buffalo Wild Wings stores are owned by the company.

Sales Growth in 2014



Key Design Success Attributes:
Buffalo Wild Wings utilizes a sign approach that balances consistent branding adapted to unique environments. Based on visitor research by the Signage Foundation, Inc., as a part of Signs and the Downtown Experience, this approach produces the highest score across a range of design metrics including:

Architectural Integration:
Every Buffalo Wild Wings exterior is designed as a complete building envelope. Signs and architectural elements are designed together and adapted to specific urban and suburban site conditions.

Legibility:
A focus on a diversity of brand elements ensures recognition from a distance, even with relatively small individual elements. A balance of symbol, color, type and pattern ensures the messaging is conveyed from long distances.

Enjoyable to View:
The restaurant uses an ensemble of design elements and creates areas around crowd elements like outdoor seating and dramatic landmark entrance towers.

Well Designed:
Buffalo Wild Wings offers a modern and fresh design approach, focused on simple but effective messaging integrated into the entire customer experience. The graphics approach shares similarities with the most recent design innovations in stadium design, seen at the University of Phoenix Stadium (home to the Arizona Cardinals) and MAPFRE Stadium (home to the Columbus S.C. Crew) and others.

Balanced Illumination:
A combination of internal illumination for tightly controlled messages and external illumination for highlighting architectural elements.

H&M

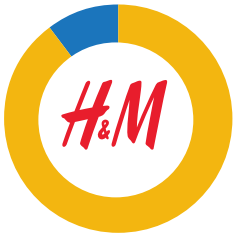
Summary
H&M is one of the largest retailers in the world with a focus on quality discount clothing and accessories. Its key goal is to focus on quality, value and sustainability. To meet these goals, the company has an in-house product design team to stay current and wring efficiency from every level of the process. H&M also has a strong partnership model employing a global supply chain of manufacturers. The company has been on an aggressive expansion strategy, with 400 stores opening worldwide in 2015, mainly in the U.S. and China. Most stores are owned by the company.

Based in Sweden, H&M has more than 3,500 stores in 57 countries.

Management Team
Following its partnership approach from the product side to the building sign design and management team the company employs close loyal partnerships that allow the company to expand quickly and efficiently into new markets. The central management team focuses extensively on keeping costs down while encouraging creativity, which results in extensive experimentation in new materials and lighting technologies.

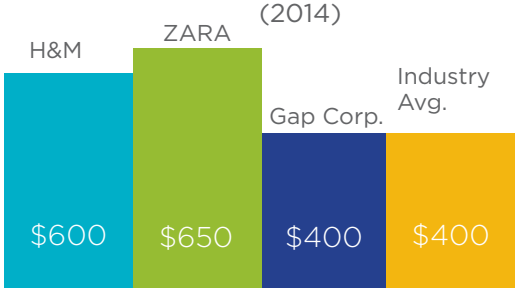
Strategy
In its global strategy H&M has focused on key urban locations with a focus on architectural and interior novelty and sustainable material approaches. Most stores are leased instead of owned to provide speed and flexibility when expanding into new markets. The stores follow a transparent and lean architectural model to keep a tight focus on marketing new product rollouts, which are frequent concentrations of power centers, hospitals, movie theaters and college campuses.

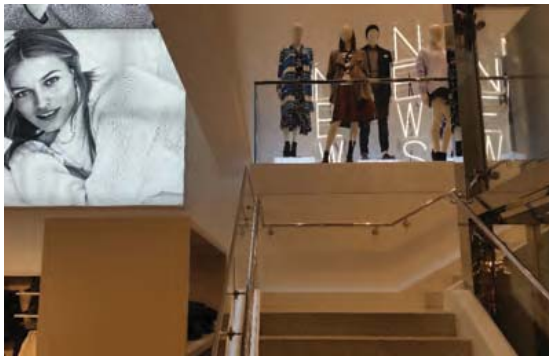
KEY STATISTICS



400 New Stores planned for 2015. An 11% increase

Revenues in Dollars per Square Foot (2014)





Key Design Success Attributes:
H&M has a highly successful formula, focused heavily on anchoring its iconic brand name, integration of high-quality architectural elements and dynamic changing display.

Legibility
The H&M brand name is the only major element in the store that utilizes the icon color and dimensionality, which allows it to contrast starkly with the unique interior and exterior environments. The signs are always among the highest-quality elements and are often used to both anchor building exteriors and serve as central interior icons.

Architectural Integration
While graphics and signs follow a consistent approach, the buildings and interiors are unique with specialty fixtures and high quality materials. Most H&M buildings are highly transparent to allow for the sign/graphic/display vocabulary to be seen from multiple exterior and interior vantage points.

Enjoyable to View
The key to H&M's marketing strategy is the frequent changing of products to reflect new fashion trends. Sign graphics and displays support this dramatic change and provide an exciting customer experience by being refreshed often. Only a small palette of signs stay consistent in the store including neon signs that accent and support specific services.

Varied Illumination
H&M stores utilize a variety of different lighting approaches that liven the building façade including channel letters, back lighting, spot lighting and faux neon.

Management Strategies that are Central to ROI

In interviews with leading executives, architects, designers, consultants and retail industry specialists, we are able to observe the management approaches that companies, developers and even cities employ to achieve greater returns on their investment in design, planning and fabrication. In this report these strategies will be divided into management and collaborative methods.

Management

For signs to be part of a company's value proposition they need to be well integrated into an organization's management practices including the executive level.

Leading Management Practices for Increasing ROI

- Making Sign Excellence a Strategy to Reward
- Integrating Signs into ROI Metrics
- Community Engagement
- Experience Designers Making Signs Central to an Integrated Brand Strategy

Making Sign Excellence a Strategy to Reward

Many companies with effective sign strategies also have tight controls over design development. Many of the leading companies have strong internal staffs that manage and control store development including signs. James Damian of Buffalo Wild Wings® believes that rewarding strong sign and building design through staff accountability, rewards based on brand excellence, and executive recognition leads to stronger sign and building development practices. Many design-oriented companies also collect extensive data on store performance and conduct surveys on customer satisfaction that are included in the compensation process. This has driven many companies to take control of top stores, with tight franchise controls over the store development and approval process.

If you want design excellence you need to reward it.

James Damia, CEO, Buffalo Wild Wings®

Integrating Signs into ROI Metrics

Most major retail companies have developed elaborate metrics to determine ROI when investing in retail developments. These ROI calculations are based on the same metrics used for successful retail development, dollars per square foot. Successful companies usually rate elements such as identity signs and wayfinding signs very high when making ROI calculations.

Linda Lombardi, Head of Global Store Design for Godiva®, explains that ROI metrics govern every aspect of store investment. Better locations receive more money for signs and design improvements and lower revenue locations receive less investment. This is often seen as a self-fulfilling prophecy as the rich stores get richer and the poor are starved of investment. Well-managed companies increase store revenues by making calculated improvements based on increasing ROI in underperforming space.

If you want to see innovation in signs and brand design, observe how companies expend their resources in less conventional locations. This strategy if improvement is a clue that the company is serious about location as a key revenue generator.

Linda Lombardi, Head Of Global Store Design, Godiva®

Many of the companies that utilize sign best practices often have tight controls over the design program of their facilities, with many operating internally or through strict franchise agreements. Crate & Barrel is considered a leader in this area with extensive design management control, allowing for design programs that both flexibly meet criteria in a variety of locations and also fulfill specific standards for identity.

Starbucks® is perhaps the most famous company to upgrade its corporate brand through a deliberate sign and identity strategy. In 2008, its store identity was considered by many customers to be similar to fast food restaurants. After overhauling the graphic and sign identity as part of a unique store strategy, the brand took off again.

Community Engagement

Successful companies have developed strong community outreach strategies for new stores, but less known is the impact on sign design strategy. Christina Galgan, Design Services Manager at Walgreens®, found companies following a strategy focused on extensive community engagement with local stakeholders develop unique design concepts for store signs, which in turn increases customer loyalty. This approach includes having extensive, clearly designed community engagement methodologies as well as a proactive approach to sign design. This requires design standards that are highly flexible and can be adapted to circumstances on the ground. This approach is the mark of communities that have pursued successful design strategies in sign codes by offering stores an approach to the sign development process that reinforces creativity and unique solutions.

> *Once a company commits to a sophisticated community participation process design approaches grow much deeper and unique since a structured participation will impact exterior, interior and even merchandising standards.*
>
> Christina Galgan, Design Services Manager, Walgreens

> *The mistake most designers and customers make is looking at sign or building ROI in isolation of the entire customer experience. When seen as a key touchpoint or as a complement to other experiences that support brand, the qualities that make effective signs become more apparent and its value goes up.*
>
> Leonard Barzsap, Senior Associate, Lippincott

Experience Designers Making Signs Central to an Integrated Brand Strategy

All of the examples profiled had one major characteristic in common. They all involved experience design teams. Leonard Barzsap, Senior Associate at Lippincott, defines these firms as organizations that can conduct consumer research, map complete customer experiences, and visualize and implement solutions from management improvements to complete design overhaul. The rise of experience design firms like Prophet and Lippincott, along with architectural firms that also develop experience research like Gensler, FRCH and Little have enabled retailers to integrate signs into a larger branding approach that includes advertising, architecture and digital initiatives. These firms are also able to develop metrics to measure the specific ROI effectiveness of different aspects of the customer experience. Making signs part of a holistic brand reinforces their importance, both as conveyers of quality and as a complement to a complete branding strategy. Experience strategy is not just utilized by outside firms. Companies have internalized these practices as well with management teams organizing designers and consultants in-house.

Dairy Queen was a large company that completely re-invented its brand through an experience design process working with Lippincott. Gourmet Burger Kitchen is a much smaller company that also developed a complete experience approach working with Prophet. Both companies made identity signs a key part of the overall strategy.

Valley Green Bank, Kens Market/Marketime Foods

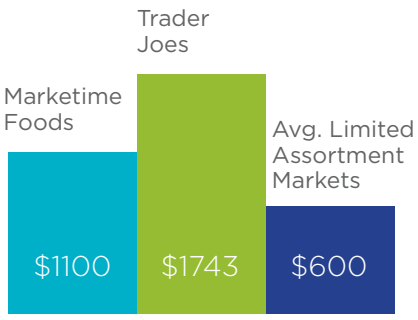
Summary
Small neighborhood businesses today frequently have undertaken major rebranding and redesign approaches including signs in their best practices. With architects, marketing professionals and designers having access to many of the same best practices used by larger organizations, these businesses have been able to achieve many of the same dramatic successes by employing sign excellence in their strategies.

Valley Green Bank
Valley Green Bank opened in 2006 and expanded to three banks in the city of Philadelphia. The bank has a clear strategy of utilizing new bank branches as part of its efforts to rejuvenate urban neighborhoods. The small bank developed a strong brand early, hiring professional branding company Spark5 Design & Marketing to develop its graphic palette, website and all print collateral. Metcalfe Architecture and Design utilized the graphic palette when designing new banks inside of renovated existing buildings, with each of the three community banks reflecting the unique neighborhood character. The bank was purchased by a larger community bank in early 2015, which will utilize many of the design practices developed by Valley Green Bank.

Ken's Market/Marketime Foods
Owned by one family, these two independent supermarkets are located in Seattle neighborhoods. The family grew the store organically over the years, with Marketime Foods being renovated by I-5 Design & Manufacture in 2008 and by LDG Architects in 2015 and Ken's Market was renovated in 2010. Both stores have unique architectural and graphic approaches focused on complementing their communities.

KEY STATISTICS

Return on Equity (2014) Valley Green was 8th in ROE of 4,000 U.S. Community Banks



Revenues in Dollars per Square Foot

Valley Green Bank branch in South Philadelphia

Marketime Foods

Key Design Success Attributes:
While reflecting different industries, both organizations are focused on creating environments that complement their local communities.

Unique
Both organizations have focused on ensuring each location has characteristics unique to the neighborhood in which it is located. Marketime Foods and Ken's Market each use distinct landmark signs that match the character and scale of the neighborhoods. Valley Green Bank utilizes a common graphic palette, but applies it to three distinct sign approaches.

Architectural Integration
Both organizations take architectural integration of signs and building very seriously by designing signs into awnings, facades and fascia. Valley Green Bank utilizes color and pattern extensively in its bank designs along with opening up the storefronts with larger windows. Ken's Market/Marketime Foods utilizes awnings and overhangs as sign supports and to tie its buildings together.

Graphic Integration
Both organizations incorporate extensive graphic integration into their store design. Valley Green Bank applies iconography as a graphic pattern in both large format graphics and marketing materials. Marketime Foods integrates large format graphics into awnings and window displays.

Shops Around Lenox, Classen Curve and Nichols Hill Plaza

Summary

Shops Around Lennox and Classen Curve are strip shopping centers that are part of much larger shopping complexes that follow dramatically different architectural and sign design strategies. What they share is a desire to utilize sign innovation to elevate traditional car-oriented strip shopping centers into leading retail destinations.

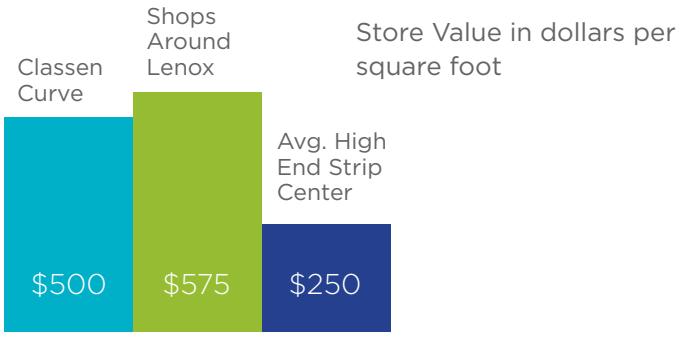
Shops Around Lenox Design Approach

The shopping center was developed as part of a $35 million renovation strategy in 2011 by Healey Weatherholtz Properties. Adjacent to the Lenox Mall in Atlanta, the center was renovated by design firms ASD and Cooper Carry to raise the profile of the aging shopping center which had a 40% vacancy rate. The center is anchored by one key tenant, but all the stores have distinct modern storefronts and signs that share few consistencies beyond modern design and quality materials. The one area with the most consistency is the pylon sign where the different brands utilize a similar background color.

Classen Curve and Nichols Hill Design Approach

Developed in Oklahoma City in 2010, the shops utilize a distinctly modern approach with large areas of glass and display surfaces. Mall tenants must utilize a well-organized sign and display strategy to be successful within the tightly consistent architectural approach. Instead of a pylon sign that communicates all the destinations in the complex, one distinct gateway is utilized. WP Glimcher purchased the retail complex in 2014 and sells the location as a singular destination.

KEY STATISTICS



Shops Around Lenox

Classen Curve

Key Design Success Attributes:

Both developments are fundamentally different in terms of design, planning and location, but they share some of the fundamental best practices for achieving high value utilizing signs and identity.

Legibility

Both complexes use dramatically different approaches towards identifying stores that are equally acceptable. Classen Curve uses only one iconic landmark gateway sign with no support stores listed. The stores themselves have iconic dimensional signs that pop off the high contrast facades. Shops Around Lenox takes the opposite approach. The pylon signs features all the stores but in a consistent graphic approach while each individual store receives its distinct architectural approach.

Quality Materials

Both developments treat signs as high-quality elements that use strong materials, both for the foreground icons and the sign backgrounds.

Architectural Integration

While both developments are fundamentally different, they utilize clear standards for integration of architecture and sign. Shops Around Lenox conceives the sign and façade as one design while Classen Curve has tight standards for integration of sign and façade including illumination, size and placement.

Integration of Display

Both developments take display very seriously as landmark elements that complement signs. Shops Around Lenox utilizes distinct large windows across all stores, even while each storefront has its own individual architectural façade. Classen Curve has consistent glass facades along with specific landmark window elements that allow showcase displays to stand in stark relief.

Collaboration

Increased collaboration between designers and contractors responsible for each area of the retail development process has helped place signs as a value generator. These groups—including architects, visual merchandisers, marketers and fabricators—are increasingly seeing the value of their work as interrelated.

Leading Collaborative Approaches

- Architectural Integration
- Integration and Management of Sign, Print and Display
- Cooperation between Retailer and Fabricator
- Careful Management of Digital Media Content

Architectural Integration

Advances in the integration of architecture, landscape and signs has led developers and retailers to value signs in development projects. Jan Lorenc, Director of Design of Lorenc+Yoo Design believes that this confluence of developers recognizing the premium prices given to mixed-use developments ($100 or more per square foot) and the rise of architecture firms with the ability to integrate signs, graphics and architecture at a higher level has made signs central to the development equation. In addition, the shift of retail from internally focused malls to exterior complexes has put signs at a premium in new renovations. Alan Metcalfe, Principle of Metcalfe Architect & Design, reinforced the idea that retailer's understanding the value of signs as central to building investment has shaped the structure of architecture firms, with even the smallest companies having the ability to bring graphics and architecture into the design process.

ASD | Sky specializes in upgrading retail strip malls, enclosed malls and town centers with integrated architectural façades, streetscape elements, and signs. The close collaboration between sign designer and architects has been one of the major reasons that signs and graphics are seen as fundamental to the improvements in shopping centers.

Integration and Management of Sign, Print and Display

Another new and important strategy that has led to more effective signs is expanding the idea of a sign to go beyond just one on-premise sign to a complete strategy. Anne Kong, Professor of Visual Presentation and Exhibition Design, Fashion Institute of Technology, describes this practice as reshaping sign, architecture and display. Retail buildings are becoming much more transparent, making window and fixture display part of the overall brand identity development process. This also has made sign quality important to the visual merchandising and display teams that control how store design is managed over time.

> *Signs today have become part of the larger display environment which has improved their value significantly. Sign integrated into larger displays use higher quality materials and have a much more extensive use of creative lighting including neon, marquees, and dynamic LED.*
>
> Anne Kong, Associate Professor, Fashion Institute of Technology

Urban Outfitters® has developed a comprehensive design management team that considers architecture, signs and window display on projects. When a sign is treated as part of a display, its value becomes more multi-dimensional. The company has had an impressive rate of return attributed to its overarching design performance.

> *Developers now have clearer ROI metrics on store improvements which has put the integration of architecture and signs as a significant strategy for mall and shopping center renovations.*
>
> Jan Lorenc, Director of Design, Lorenc + Yoo Design

Cooperation between Retailer and Fabricator

Retailing is extremely cost sensitive and many retailers and developers have been known to skimp on material and illumination quality beyond a surface approach. Leading companies are also cost sensitive but have a more nuanced approach to balancing quality and value by having a close relationships with fabricators, who are asked increasingly to take a larger role in the development process. Paul Dudley, President of id Signsystems, believes that advances in the fabrication and project management industry have raised the value of signs as part of the store development process. This includes taking a leadership role in prototype development, value engineering, rollout management and project management.

Transparent buildings have meant interior signs must do double duty as key identity elements, raising both their profile and the need of fabricators to coordinate them closely with the store team.

Very few companies have closely integrated digital content into their signs, but a few companies like Cumberland Farms have been exceptions, experimenting in digital signs as a key component of its marketing strategy.

Successful retailers usually look beyond the race to the bootom approach for sign pricing and implementation to take a more balanced approach between quality and pricing. This produces incredible pressure on fabricators to create value based quality solutions but also has fueled innovation in the industry.
Paul Dudley, President, id Signsystems

Careful Management of Digital Media Content

Gauging the effectiveness of digital media as a complement or replacement to static signage is still a complex evaluation. The biggest dilemma according to Ben Barr, Sales Manager at Watchfire Signs has been investing in both quality signs and ongoing content. Successful retailers make dynamic digital signs central to their marketing and information strategy, with long-term content strategies and an eye-to-design quality equal to physical signs.

The quality of digital signs and their content is so visible in the environment it is dangerous to skimp on this investment.
Ben Barr, Sales Manager, Watchfire Signs

Wawa Convenience Stores, Sheetz Convenience Stores

Summary

Over the last 40 years two convenience store companies in the Mid-Atlantic and Northeast have grown to dominate their local areas while setting a standard for the convenience store industry. While relatively small in the number of stores compared to franchise chains like 7-Eleven, Wawa and Sheetz stores are known for high performance, often having five or more times the revenue of rivals. Both companies also focus heavily on combining gas stations with convenience stores for newer stores to raise their visibility and allow for stores to grow. Both stores are expanding beyond their current base slowly while maintaining ownership.

Management Approach

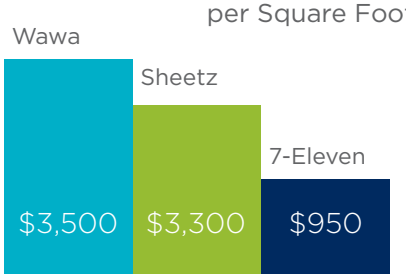
Wawa and Sheetz are privately owned, and own all their stores. This allows for both strong internal design control as well as tight performance metrics for each company. The management approach has resulted in a tight expansion strategies; stores maintain very similar customer experiences when growing into new communities. Store layouts and promotions also stay very consistent along with the growth strategy.

Strategic Design Approach

Both organizations have dramatically different and distinct store design while sharing a number of consistencies when it comes to following design best practices. Both organizations have been focused on combining gas and building architecture in most of their locations, with large distinct canopies for gas and architecturally distinct buildings. Sheetz utilizes a more graphically oriented approach, using red as a key identifier for the larger monument structure and building. Wawa utilizes a strong icon along with a powerful architectural structure and gas canopy and less obtrusive monument lighting.

KEY STATISTICS

Revenue in Dollars per Square Foot (2014)*



*Wawa and Sheetz stores include gas

Wawa

Sheetz

Key Design Success Attributes:
While both stores have distinctly different design approaches, they share similar design attributes which have reinforced their success.

Legibility
Both stores utilize key brand elements that extend beyond signs to reinforce their identity. This allows the stores to be identifiable from long distances. For Sheetz, it is the use of color while Wawa combines a large logo identifier and consistent architecture. Both stores minimize additional sign clutter by having clear guidelines for the use of temporary promotional signs.

Architectural Integration
Both organizations integrate sign design into their architecture in distinctly different ways that are both highly effective. Sheetz uses color on large surface areas and particularly awnings and metal pylons structures. Wawa uses a simple half arch and pitches roof that is reconfigured for a variety of urban and suburban conditions, and is also reflected in monument and wayfinding signs.

Consistency
Both organizations have focused on simple consistent messaging and tight controls of messaging on all of their stores. Tight management control of stores keeps the organization from having too many distinct signs in terms of material, color or logo.

Illumination
Both organization use illumination in distinctly different ways to highlight their identity. Sheetz focuses on the illumination of their awnings and sign canopies. Wawa focuses on internal and external lighting of their key iconic elements.

Larimer Square, Beale Street Historic District

Summary

Historic Districts must balance a careful respect for historic architectural precedence with the need to create a modern, business-oriented district. Historic Districts also require a clear management approach that integrates city guidelines with encouragement of best design practices for revitalizing the community. These two communities share the exciting private and public best practices for the development of signs in historic districts.

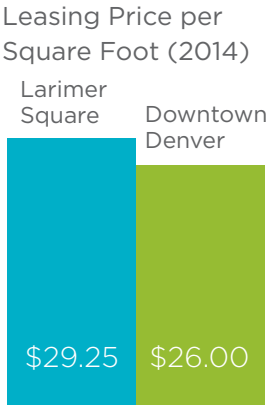
Larimer Square

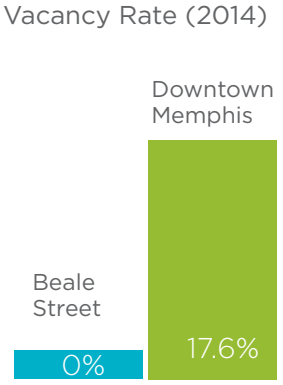
A historic block in Denver that was saved from destruction through the creation of the Larimer Square Associates in 1963 to manage the properties on the block. The block became a historic district in 1971 and was bought by a development company, Larimer Associates, in 1993. The company has encouraged the local stores and restaurants to take modern and creative approaches to the design of their stores. This is matched by progressive historic district sign guidelines from the city which includes best practices. The development company utilizes lighting and street infrastructure to tie the eclectic storefronts together.

Beale Street Historic District

The main commercial street for Downtown Memphis had been in extreme disrepair with nearly every commercial storefront vacant. Historic landmark status was granted in 1966, but little change occurred until the creation of the Beale Street Development Corporation in the 1970s. The city later developed sign regulations that address the unique scale and characteristics of different districts in downtown Memphis, which encouraged more flamboyant and exciting sign design in the historic district and surrounding sports and entertainment area.

KEY STATISTICS





Larimer Square

Beale Street Historic District

Key Design Success Attributes:
Both historic districts represent the blend of aggressive private investment and progressive city codes and infrastructural support. This has resulted in sign excellence in the following areas:

Experience
Both districts looked beyond just the historic architecture of the district to envision how signs could support a vibrant street life and to incorporate these ideas into guidelines and best practices. For Larimer Square, this includes creating a lighting structure that spans and links the street, street-spanning banners and signs that reinforce the major corners. For Beale Street Historic District, this includes major investments in signs for institutions including theaters and public offices which support private sign investment.

Illumination
Both districts make illumination central to sign strategy. For Larimer Square, this includes a more restrictive approach, minimizing individual sign lighting and maximizing streetscape lighting and interior window lighting display. Beale Street allows for eclectic and dynamic lighting approaches using neon and LED light displays as well as projected lighting.

Graphic Display Integration
Both districts encourage the use of multiple graphic approaches in addition to signs, including awnings, window graphics, wall murals and object displays. These practices are also part of the city guidelines for the historic districts. In Larimer Square having more than 100 businesses in a small area requires diverse graphic approaches for locations where large-scale traditional projecting signs are not possible. For Beale Street Historic District, painted building signs and murals with projected lighting adds diversity and minimizes clutter from the large-scale projected illuminated signs.

Taphouse 23, Lit Brothers

Summary

Digital signage is a new area where effective practices are still being explored by leading companies. While there is not yet easy to establish return improvements for companies employing successful digital signage, we can still identify and analyze organizations that are utilizing the new medium effectively.

Lit Brothers Design Strategy

In 2015 Brickstone Realty installed a large digital billboard sign along the roofline of its Lit Brothers retail/office building in Center City Philadelphia. The sign was proposed based on guidelines established by the Market Street East Advertising District which encourages more vibrant signs in the area. In addition to make public investments in return for the large sign, the company had to show the sign was not a safety hazard through a traffic study. The developers also had to show that the sign would not take away from the historic nature of the building, using a design approach in keeping with signs placed on the building in the past. The sign itself was developed using see through GKD media mesh which complements the architecture of the historic building. The company hired a digital media advertising company to ensure that the digital content on the signs will be interesting and reflects the potential of the technology.

Key Design Success Attributes

Architectural Integration

The developers worked with local community officials to make sure the sign was in keeping with the historic nature of the building while updating to a modern commercial environment. The use of a more transparent digital technology allows the sign to have a more subtle presence on the building, and maintains a strong appearance even when the sign turned off.

Legibility and Quality

Prototype testing produced a sign that would appear highly legible from a distance and from multiple view corridors and angles.

Content Management

Working with a specialized media advertising firm succeeds in developing content that takes advantage of the unique features of the sign. In addition the firm develops scripted content when there advertising is not active on the sign.

Taphouse 23 Design Strategy

Creating and managing digital signs are among the most challenging developments for a small business. Gary Johnson, the developer behind Taphouse 23 in Bridgeport, Pennsylvania, focused on making digital signs the cornerstone of the development of the restaurant. The company went through a prototype process with Watchfire Signs to select a digital display, eventually going with a 10mm solution that would have high resolution for both drivers and pedestrians. The developer worked closely with Braun Signs to integrate the digital sign both into a landmark sign pylon and into the architecture of the building and outdoor patio. The developer than worked with the manufacturer and marketing company to develop templates for the digital display that could be applied to concerts and special events.

Key Design Success Attributes

Architectural and Landscape Integration

The digital display is integrated not just into the larger sign, but also into the outdoor seating area of the restaurant. This approach of considering both pedestrian and vehicular users makes the sign a central part of the visitor experience.

Legibility and Quality

Taphouse 23 made a significant investment in a state of the art display to ensure that pedestrians and people sitting in the outdoor areas of the restaurant would be able to read the display at the same level of comfort as a driver viewing from a distance. Creating templates in advance also ensure a high quality and clear image.

Content Management

A formal content display approach utilizing sophisticated templates that take advantage of the high resolution screen keeps the display exciting. Frequent content changes and an event driven approach ensures that the digital sign keeps a central role in the success of the bar.

Credits

Editor
Craig Berger, Chair, Visual Presentation and Exhibition Design
Fashion Institute of Technology
Editor

Project Manager
Sapna Budev, Signage Foundation, Inc.

Interview Survey Subjects
Ben Barr, Sales Manager, Watchfire Signs

James Damian: CEO, Buffalo Wild Wings

Leonard Barzsap: Senior Associate, Lippincott

Peter Dixon: Chief Creative Officer, Prophet

Paul Dudley: President, idSignsystems

Christina Galgan: Design Services Manager, Walgreens

Anne Kong, Professor: Professor, Fashion Institute of Technology

Linda Lombardi: Head of Global Store Design, Godiva

John Lutz: Partner, Selbert Perkins

Jan Lorenc: Director of Design, Lorenc+Yoo

Alan Metcalfe: Principal, Metcalfe Architecture

W. Todd Vaught: Vice President, Sky Design

John Yarger, President, North American Signs

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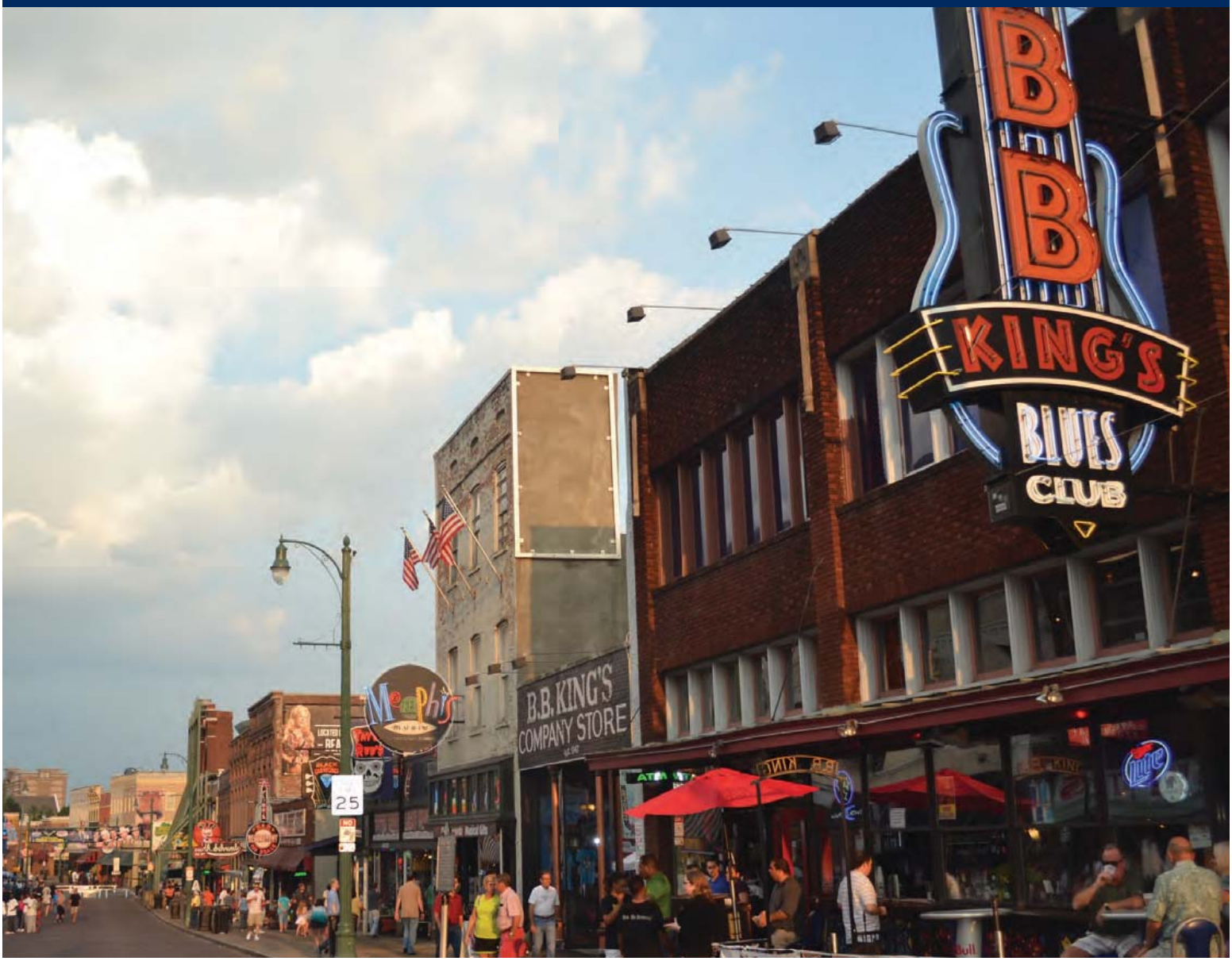

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From: Robert Kearney [mailto:robert@speedysparklecarwash.com]
Sent: Friday, May 31, 2019 7:01 PM
To: 'Aaron DeJong' <aarond@louisvilleco.gov>
Subject: RE: signage

Aaron,
Thanks, again!
I am attaching a small collection of sign research studies and digital message board studies, which I found fascinating. Here are my five favorite takeaways:

1. FHWA studies confirm inadequate signage leads to 41% of accidents - must be important to commercial signage, too!
2. 54% of shoppers failed to find business due to poor signage!
3. ZERO correlation between digital signage and traffic accidents!
4. 81% of consumers say Electric Message Boards DO NOT detract from community appeal!
5. Signage can generate more the 10% more sales and Digital signage adds an average of 2.1% to sales - Plus, signage is particularly important to success of small businesses!

All the best to you, I will be out of the office for a while this month.
Robert
Robert E Kearney

Speedy Sparkle Car Wash
Loveland and Louisville, Colorado

Robert E Kearney
Cell 303-902-9100
Business Office:
549 N 4th Street
Berthoud, CO 80513

(970) 532-4243
Fax (970) 532-3603

www.speedysparklecarwash.com

From: Aaron DeJong [mailto:aarond@louisvilleco.gov]
Sent: Thursday, May 09, 2019 3:51 PM
To: robert@speedysparklecarwash.com
Subject: signage

Robert,

I did finally get a chance to talk with my colleagues about your signage requests. One of the options that we discussed that I think is a good option to request is for the car wash to be allowed

to build its own monument sign on South Boulder Road at 40 sf. I think that is one of the options we discussed. If you were to request that modification, it would be looked upon favorably.

aaron

Aaron M. DeJong
Economic Development Director
City of Louisville, CO
749 Main Street
Louisville, CO 80027
Phone: (303) 335-4531
aarond@louisvilleco.gov

Speedy Sparkle Car Wash - Louisville, LLC
1414 Hecla Way
Louisville, CO 80027
303-666-6696

Business Address:
549 N. 4th Street
Berthoud, CO 80513
970-532-4243

January 29, 2019

Liz Harpole
Dillon Companies, LLC
dba King Soopers
65 Tejon Street
Denver, Colorado 80223

EMAIL to Liz.harpole@kingsoopers.com

RE: PUD Signage Conflict Resolution – PUD Amendment

Dear Ms. Harpole:

We have started the process with the City of Louisville (the "City") to amend the Speedy Sparkle PUD. This amendment will include resolving the PUD signage conflict between the original Black Diamond PUD and the King Soopers PUD.

The City has proven very receptive to the PUD amendment in our initial face to face meeting on December 3, 2018.

The City has requested a letter indicating King Soopers' consent and authorization to proceed with official action under the application which will include increasing the size of the South Boulder Road signage, while maintaining the existing King Soopers fuel sign. I have attached the PUD amendment sheet showing the expanded sign with King Soopers placed at the top of the signage. The LED initiative has been added since the December meeting with the City. We will present your desire for LED illumination of King Soopers sign due to the advancement of technology, consumer appreciation, and desire for variable information.

You may return this letter with a signature indicating King Soopers consent and authorization.

Thank you for your interest and assistance. My office number is shown above, my cell phone is 303-902-9100 and my email is robert@coloansonline.com.

Sincerely,

Robert E Kearney
Principal

Dillon Companies, LLC, a Kansas limited liability company

By: _____
Name: Liz Harpole
Its: Real Estate Manager

We recycle our water

Speedy Sparkle Car Wash - Louisville, LLC
1414 Hecla Way
Louisville, CO 80027
303-666-6696

Business Address:
549 N. 4th Street
Berthoud, CO 80513
970-532-4243

December 6, 2018

Jiffy Lube Management
1408 Hecla Way
Louisville, CO 80027

RE: PUD Signage Conflict Resolution – PUD Amendment

Dear Sir or Madam:

We have started the process with the City of Louisville to amend the Speedy Sparkle PUD. This amendment will include resolving the PUD signage conflict between the original Black Diamond PUD and the Kroger/Jiffy Lube PUD.

The City has proven very receptive to the PUD amendment in our initial face to face meeting on December 3, 2018.

The City has requested a letter indicating your agreement and authorization to proceed with official action under the application which will include increasing the size of the South Boulder Road sign, while maintaining the existing King Soopers fuel sign. I have attached the Draft PUD sheets showing the expanded sign, which is the same as I sent originally.

You may return this letter with a signature indicating agreement and authorization.

Thank you for your interest and assistance. My office number is shown above, my cell phone is 303-902-9100 and my email is robert@coloansonline.com.

Sincerely,

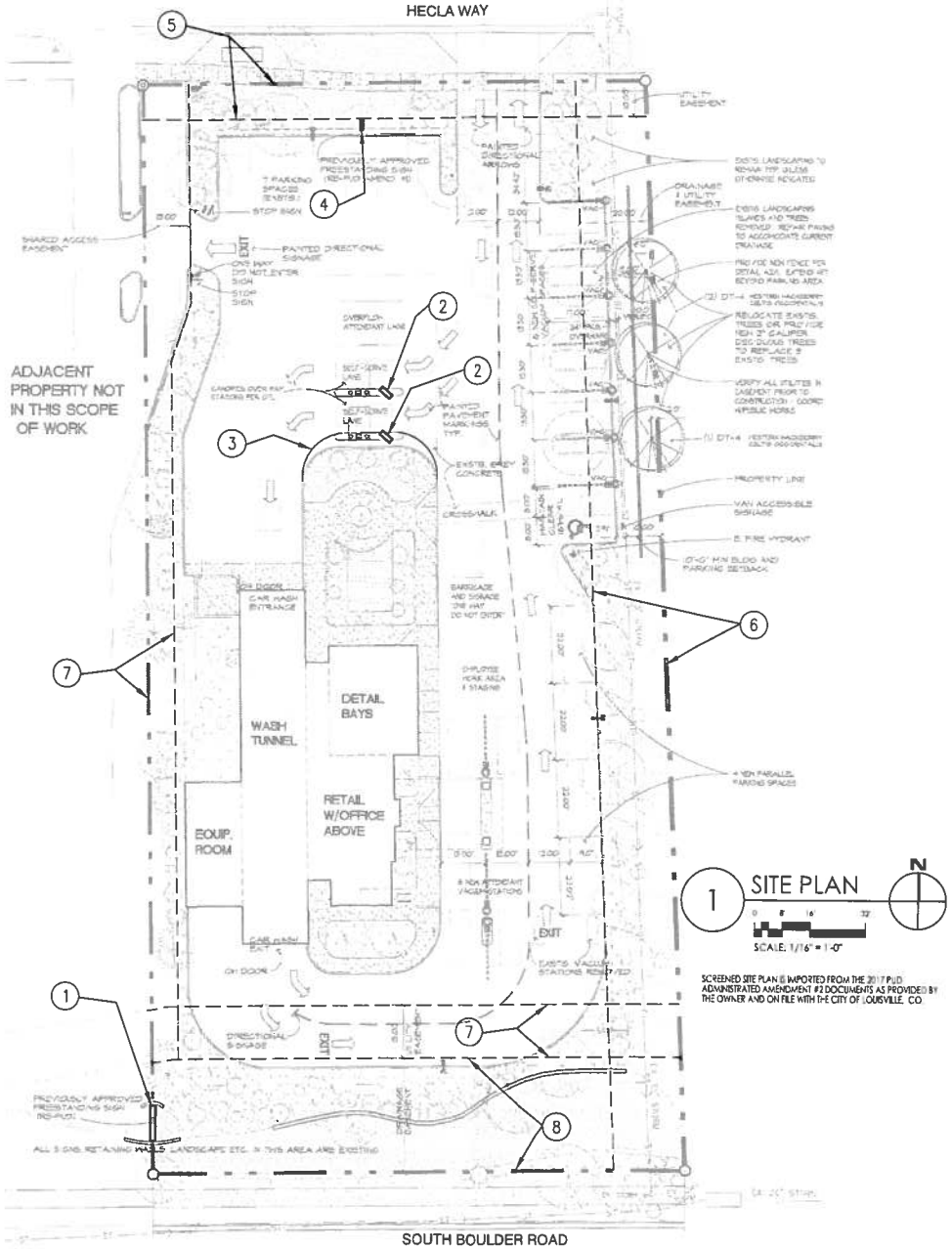
Robert E Kearney
Principal

Jiffy Lube - Louisville

By: _____

Its: General manager

We recycle our water



1 SITE PLAN

SCALE: 1/16" = 1'-0"

SCREENED SITE PLAN IS IMPORTED FROM THE 2017 PUD ADMINISTRATED AMENDMENT #3 DOCUMENTS AS PROVIDED BY THE OWNER AND ON FILE WITH THE CITY OF LOUISVILLE, CO.

PLANNED UNIT DEVELOPMENT P.U.D. AMENDMENT #3

Project Data

PROJECT: P.U.D. AMENDMENT - SITE SIGNAGE MODIFICATIONS
ZONING: PLANNED COMMUNITY COMMERCIAL
LOT SIZE = 45,887 SF
USE: CAR WASH
LEGAL: LOT 6, LOUISVILLE PLAZA SUBDIVISION, FILING No. 2
LOUISVILLE, COLORADO
COUNTY: BOULDER COUNTY

Project Team

OWNER: ROBERT KEARNEY
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robert@coloonsonline.com

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fselvoski@louisvilleco.gov

Signatures

Owner/Owner Representative Block

By signing this PUD, the owner acknowledges and accepts all the requirements and restrictions set forth in this PUD. Witness my hand this(s) day of _____, 20__.

Owner Name and Signature

Notary Name (print)

Notary Signature

My Commission Expires _____

Planning Commission Certificate

Approved this ___ day of _____, 20___ by the Planning Commission of the City of Louisville, Colorado.

Resolution No. _____ Series _____

City Council Certificate

Approved this ___ day of _____, 20___ by the City Council of the City of Louisville, Colorado.

Resolution No. _____ Series _____

(City Seal)

Mayor Signature

City Clerk Signature

Clerk and Recorder Certificate (County of Boulder, State of Colorado)

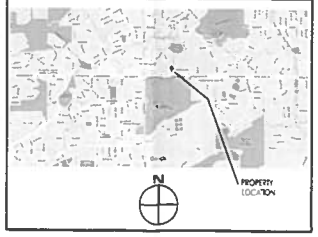
I hereby certify that this instrument was filed in my office at _____ o'clock ____ M., this _____ day of _____, 20___, and is recorded in Plat File _____, Fee _____ paid.

Reception _____

Clerk & Recorder

Deputy

Vicinity Map



KEYNOTES:

1. EXISTING AND NEW PROPOSED SOUTH BOULDER ROAD MONUMENT SIGN. EXISTING SIGN WAS APPROVED WITH THE KING SOOPER CITY OF LOUISVILLE PUD PLAN AMENDMENT 2011. REFERENCE THE ATTACHED DETAIL 1/A2.0 FOR THE APPROVED SIGN AND DETAIL 2/A2.0 FOR THE PROPOSED SIGN DESIGN.
2. EXISTING/PROPOSED MENU SIGNS. REFERENCE THE ATTACHED DETAIL 5/A2.0 FOR THE EXISTING/PROPOSED SIGN DESIGN.
3. AS-BUILT EXISTING CURB LOCATION.
4. PROPOSED HECLA WAY MONUMENT SIGN. REFERENCE DETAIL 3/A2.0 FOR THE APPROVED SIGN DESIGN AND DETAIL 6/A2.0 FOR NEW PROPOSED SIGN DESIGN.
5. 10' UTILITY EASEMENT - SEE SURVEY.
6. 20' DRAINAGE EASEMENT AND ACCESS EASEMENT - SEE SURVEY.
7. UTILITY EASEMENT - SEE SURVEY.
8. UTILITY AND DRAINAGE EASEMENT - SEE SURVEY.

NOTES:

1. PLANNED UNIT DEVELOPMENT (P.U.D.) CAR WASH HISTORY:

   BLACK DIAMOND CAR WASH PUD
   5 SEPT 2000
   RES. 55 SERIES 2000
   RECEPTION NO. 2126651

   BLACK DIAMOND CAR WASH ADMIN PUD
   30 MAY 2001
   RECEPTION NO. 2160401

   BLACK DIAMOND CAR WASH ADMIN 2 PUD
   28 SEPT. 2017
   RECEPTION NO. 03617546

2. PLANNED UNIT DEVELOPMENT (P.U.D.) KING SOOPER'S FUELING STATION: PUD APPROVAL - OCTOBER 2010. FOR SOUTH BOULDER MONUMENT SIGN.
3. THESE ARE PLANNING DOCUMENTS. CONSTRUCTION DOCUMENTS NOT INCLUDED.

CWA
CW ASSOCIATES, PLLC
Architecture, Planning & Development Services
672 West Pine Street
Louisville, Colorado 80027
303-666-8941, fax 303-665-3020
www.cwa-architect.com

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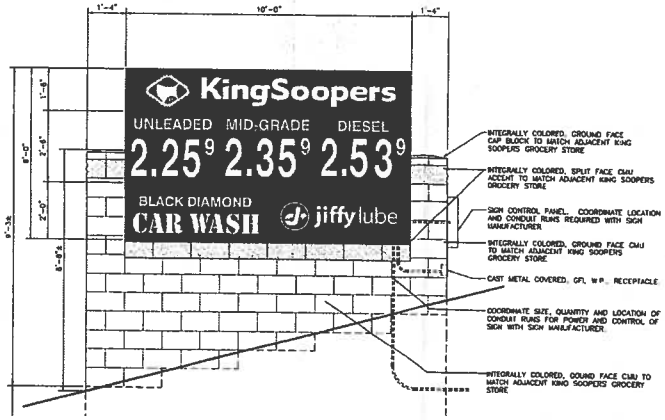
© CW Associates, PLLC (CWA)

Field drawings reflect the contractor's and consultant's efforts. They have been performed and checked with due diligence and care and due to the complexity and number of interdependent elements involved in construction documents, field guarantees, every contingency in the field cannot be anticipated. Contractor shall be responsible for all dimensions. Do not scale drawings. Report discrepancy or errors with these drawings. If the architect is not notified in writing of any of the above mentioned items, the architect and consultants shall not be responsible for any deviations in construction.

No	Date	Revisions
1	11-26-18	Progress Set
2	12-11-18	Progress Set
3	1-15-19	PUD Submittal

SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027
COVER SHEET & SITE PLAN
TITLE

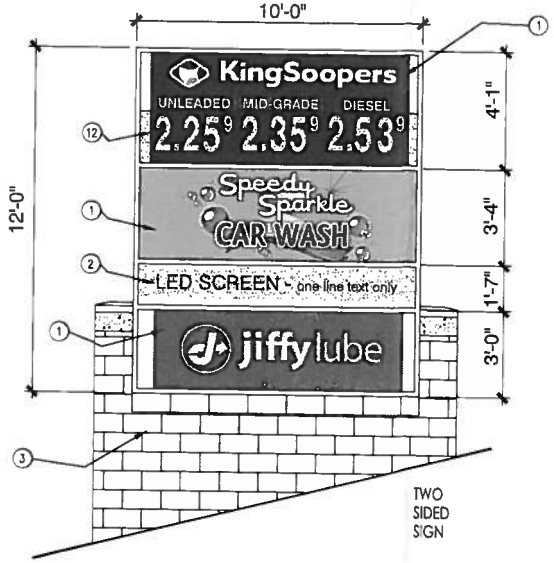
Date:	11-26-18
CWA #:	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT
Sheet:	A1.0



1 APPROVED SB MONUMENT SIGN

SCALE: 1/2" = 1'-0"

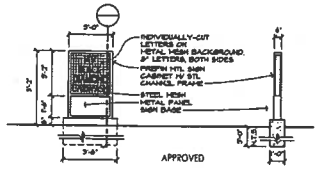
SOUTH BOULDER MONUMENT SIGNAGE IS IMPORTED FROM THE 2010 PUD DOCUMENTS AS APPROVED BY THE CITY AND ON FILE WITH THE CITY OF LOUISVILLE, CO. SIGNAGE IS WHAT IS CURRENTLY BUILT AT THE SITE.



2 SB ROAD MONUMENT SIGN

SCALE: 1/2" = 1'-0"

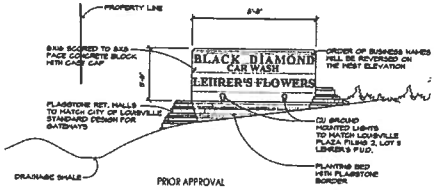
LOGOS WILL FILL COMPLETE SIGN BOX AREA PER SIGN MANUFACTURE.



3 HECLA WAY MONUMENT SIGN

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

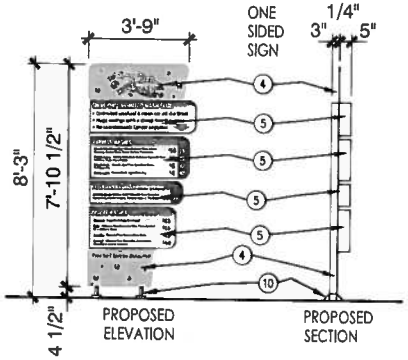
SIGNAGE IS IMPORTED FROM THE 2001 PUD ADMINISTRATED AMENDMENT DOCUMENTS AS PROVIDED BY THE OWNER AND ON FILE WITH THE CITY OF LOUISVILLE, CO. NOT BUILT.



4 SOUTH BOULDER MONUMENT SIGN

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

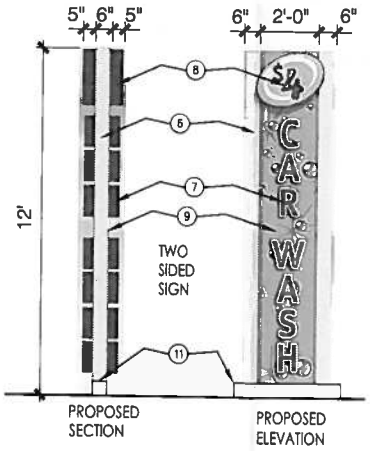
SIGNAGE IS IMPORTED FROM THE 2000 PUD DOCUMENTS AS PROVIDED BY THE OWNER AND ON FILE WITH THE CITY OF LOUISVILLE, CO. NOT BUILT.



5 DRIVE-UP MENU SIGN

SCALE: 1/2" = 1'-0"

SIGNAGE DESIGN AND INSTALL PROVIDED BY THE OWNER.



6 HECLA WAY MONUMENT SIGN

SCALE: 1/2" = 1'-0"

SIGNAGE PROVIDED BY THE OWNER. DESIGN BY SCHLOSSER SIGNS, INC LOVELAND COLORADO 80538

KEYNOTES:

1. NEW SIGN BOX TO MATCH EXISTING METAL SIGN BOX WITH CHANGEABLE ILLUMINATED SIGN FACES.
2. NEW SIGN BOX WITH LED SIGNAGE READOUT SCREEN.
3. EXISTING BASE TO REMAIN.
4. METAL PLATE WITH FULL COVER PRINTED GRAPHICS.
5. METAL SIGN BOX - ILLUMINATED.
6. STEEL I-BEAM SUPPORTS PAINT TO MATCH METAL ON BUILDING.
7. METAL FACE-LIT CHANNEL LETTERS - TYPICAL.
8. METAL FACE-LIT CHANNEL SIGN BOX - ILLUMINATED.
9. METAL CABINET SIGN BOX WITH FULL COVER PRINTED GRAPHICS.
10. METAL BASE PLATE.
11. METAL PANEL SIGN BASE.
12. LED GAS PRICE READOUT SCREEN.

NOTES:

1. SIGN MANUFACTURE WILL BE RESPONSIBLE FOR FINAL SIGN PANEL DESIGN, PERMIT AND CONSTRUCTION

CWA
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Architecture, Planning & Development Services
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Louisville, Colorado 80027
303-666-8941, fax 303-665-3020
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© CW Associates, PLLC (CWA)

These drawings reflect the architect and consultant work as they have been performed and assembled with due diligence and care but due to the complexity and number of interdependencies involved in construction, perfection is not guaranteed. Field conditions in the concrete world of construction are not to be taken as fact. The architect and the related professionals of any discipline do not guarantee the accuracy of drawings. If the architect is not notified in writing of any of the above deficiencies, the architect and consultants shall not be responsible for any consequences.

No	Date	Revisions
1	11-26-18	Progress Set
2	12-11-18	Progress Set
3	12-14-18	SB Monument LED
4	12-21-18	SB Monument Sing Swappen
5	12-28-18	SB Monument Sing Swappen
6	1-16-19	PUD Submittal

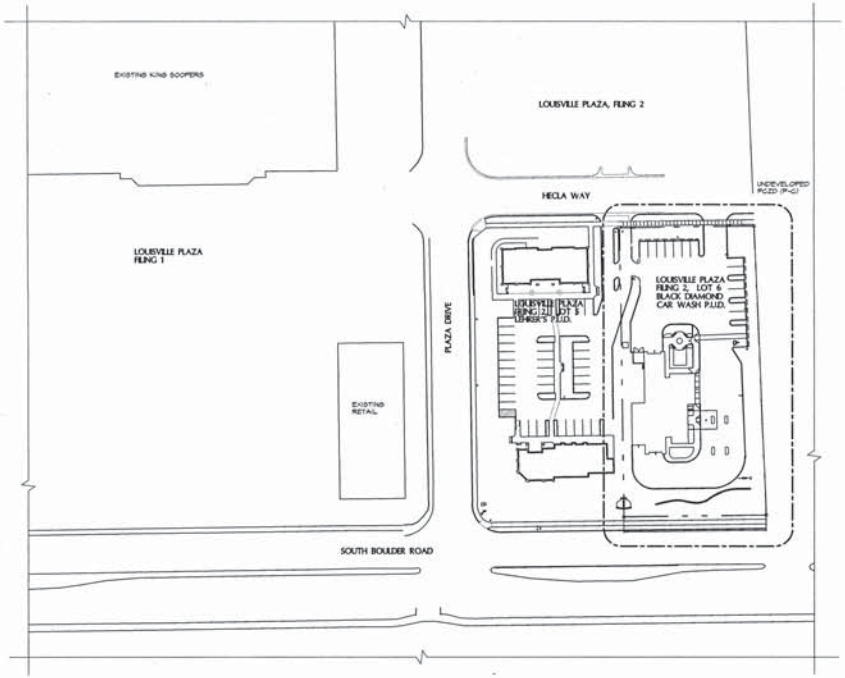
SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027

TITLE: SIGNAGE

Date:	11-26-18
CWA #:	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT
Sheet:	A2.0

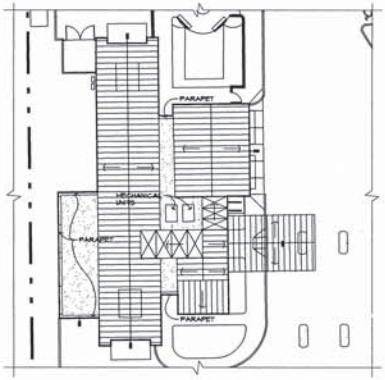
BLACK DIAMOND CARWASH
FINAL PLANNED UNIT DEVELOPMENT
LOT 6, LOUISVILLE PLAZA
FILING NO. 2
COUNTY OF BOULDER
STATE OF COLORADO

2/1 PERSPECTIVE
NTS



1/1 IMMEDIATE VICINITY PUD PLAN
1" = 60'

VICINITY MAP
N.T.S.



2/1 ROOF PLAN
1" = 20'

NOTES

1. Improvement plans shall be approved by the Public Works Department prior to construction of public improvements.
2. The property owner shall install and maintain the landscape located within the right-of-way adjacent to their lot.
3. Deciduous trees shall not be planted within 5 feet and conifervoe trees shall not be planted within 10 feet of a public utility or sidewalk.
4. Site lighting shall be provided by means of pole-mounted fixtures and building mounted fixtures. Building and pole-mounted lighting shall not exceed 24' in height. Fixture design, spacing and shielding shall be provided to cut-off effect of lighting at abutting properties, exclusive of shared access easements. Locations of pole-mounted fixtures shall be as shown on sheet 2.
5. All trash enclosures shall be constructed of materials to match the building architecture, per details on sheet.
6. Outdoor sales, storage or display, other than the temporary storage of vehicles being serviced on site for not more than 72 hours, is prohibited.
7. No building permits shall be issued until Hecla Way is completed with curb, gutter and first lift of asphalt. The Subdivision Agreement stipulates that no certificates of occupancy will be issued until all Subdivider obligations are met.
8. Ingress-egress easement to be vacated by separate instrument.
9. Window signage shall be prohibited.
10. At such time the parcel abutting Lot 6 to the east is improved, the slope along the east lot line shall be modified. The City may at its discretion require additional landscape materials be provided in this area consistent with applicable regulations at such time this requirement is triggered.
11. Off-site trees along the east lot line shall not be disturbed by activities occuring on or related to lot 6.
12. The native grasses shall be drilled at 30 PLS.
13. Noise levels shall comply with current State statutes for noise regulations in a commerical area or current applicable municipal regulations.
14. All planting beds should be mulched with wood or decorative rock to stabalize soils, control erosion, and conserve water use.
15. The City shall not be responsible for damage to, maintenance of, or repair of any private improvements affected by City activities related to the public sanitarty sewer easement (to be dedicated by separate instrument) traversing the southerly portion of the site.
16. The canopy downlight shall not hang below the bottom plane of the canopy. The parking lot and building mounted luminaries shall be of a fully cut-off design.
17. Temporary banners/signage are not permitted.

PUD DEVELOPMENT GUIDELINES

BLACK DIAMOND CARWASH, LOT 6, LOUISVILLE PLAZA, FILING NO. 2

ZONING DISTRICT	PCZD/P-C (COMMERCIAL)
MIN SETBACK FROM ARTERIAL STREET	50 FEET BUILDING SETBACK 25 FEET PARKING SETBACK
MIN SETBACK COLLECTOR STREET	20 FEET BUILDING SETBACK 15 FEET PARKING SETBACK
MIN SETBACK FROM INTERNAL BOUNDARY	10 FEET BUILDING & PARKING SETBACK
MAXIMUM ALLOWABLE HEIGHT	35 FEET (PER CDDSG) 42 FEET TO TOP OF MECHANICAL SCREENS (PER CDDSG)
PROPOSED BUILDING HEIGHT:	35 FEET ABOVE GRADE (TO PEAK OF SLOPED ROOF)
TOTAL LOT AREA	45,687 SQ FT

SITE SUMMARY:

LOT SUMMARY:	
SITE AREA	45,687 SQ FT
BLDG, PKG & DRIVEWAY	29,907 SF = 65%
OPEN SPACE	16,780 SF = 37%
PARKING SUMMARY:	
RETAIL 2278 SF (4.5/1000 SF)	10 SPACES
OFFICE 704 SF (4/1000 SF)	3 SPACES
PARKING REQUIRED:	13 SPACES
PARKING PROVIDED:	13 SPACES + 2 LOADING
BUILDING SUMMARY:	
FIRST LEVEL RETAIL	2,278 SQ FT
SECOND LEVEL OFFICE	704 SQ FT
TOTAL RETAIL/OFFICE	2,982 SQ FT
CAR WASH	3,516 SQ FT
TOTAL:	6,498 SQ FT

PROPOSED BUILDING USE: FULL SERVICE CAR WASH

SIGNATURE BLOCKS

CITY COUNCIL CERTIFICATE:

Approved this 5th day of September, 20 00, By the City Council of the City of Louisville, Colorado.
Resolution No. 55 Series 2000

Tom Davis
Mayor

Nancy Varra
City Clerk

PLANNING COMMISSION CERTIFICATE:

Recommended approval this 11th day of July, 20 00, By the Planning Commission of the City of Louisville, Colorado.
Resolution No. 25 Series 2000

Chairperson

Secretary

CLERK AND RECORDER'S CERTIFICATE:

(COUNTY OF BOUNDER
STATE OF COLORADO)

I hereby certify that this instrument was filed in my office at 11:00 o'clock A.M. this 13th day of MARCH, 20 01, and is recorded in Plan File 283 F-24 Reception No. 15,16,17,18,19,20,21 Film No. 2576 and 1 Fee 70.00 Paid

Charlotte Houston
Recorder

Deputy

OWNERSHIP SIGNATURE BLOCK:

BY SIGNING THIS PUD, THE OWNER ACKNOWLEDGES AND ACCEPTS ALL THE REQUIREMENTS AND INTENT SET FORTH IN THIS PUD.
Witness our hands and seals this 11 day of October, 20 00.

RACHEL S. GERRITY
Owner

Celeste M. Dining
Notary

CELINE M. DINING
NOTARY PUBLIC
STATE OF COLORADO
My Commission Expires 9/15/2002

SHEET INDEX

P.U.D. SUBMITTAL:

1 VICINITY MAP, VICINITY MAP, DEVELOPMENT GUIDELINES, NOTES, INDEX SIGNATURE BLOCKS
2 PUD PLAN, LANDSCAPE PLAN, LANDSCAPE LEGEND, SIGN ELEVATION
3 ELEVATIONS
4 ELEVATIONS
C1 GRADING & DRAINAGE PLAN
C2 MASTER UTILITY PLAN

ATTACHMENTS
PHOTOMETRICS & LUMINAIRE SCHEDULE

HARTRONFT FAURI ARCHITECTS
Planning • Architecture • Interiors
801 MAIN STREET
SUITE 300
LOUISVILLE, CO 80027
VOICE: 303.673.9304
FAX: 303.673.9319

BLACK DIAMOND CAR WASH
FINAL PLANNED UNIT DEVELOPMENT
LOUISVILLE PLAZA SUBDIVISION, FILING 2
LOUISVILLE, COLORADO

FINAL PUD SUBMITTAL

PROJECT # 9963
DATE: 20 APRIL 2000
DRAWN BY: SLA/BSF
CHECKED BY: JEH
REVISIONS:
FINAL P.C. 4 JUNE 00
FINAL P.C. 5 JULY 00
FINAL C.C. 24 JULY 00
FINAL MYLAR 9 OCT 00

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VICINITY PLAN
GUIDELINES
NOTES, INDEX
SIGNATURE
BLOCKS

Sheet
1
1 of 7 Sheets

LOT 6, LOUISVILLE PLAZA FILING #2 SEPT. 2000

DRAWING NUMBER

DRAWING NUMBER

Black Diamond Car Wash
1 of 7

D:/-PROJ/9963/PUD/B01CN15.DWG • 10/04/2000 • 10:23 • 46.13/46.13 • e:\B01B01XX\B01L05TXX\CHGFXXX\L05CNT14

LOT 6, LOUISVILLE PLAZA FILING #2 SEPT. 2000

DRAWING NUMBER

DRAWING NUMBER

Black Diamond Car Wash

2 of 7

LANDSCAPE SCHEDULE - SHRUBS

QTY	TAG	SIZE	COMMON NAME	SCIENTIFIC NAME	NOTES:
DECIDUOUS SHRUBS					
16	DS-1	5 GAL	ROCK COTONEASTER	COTONEASTER HORIZONTALIS	
15	DS-2	5 GAL	SNOWMOUND SPIRAEA	SPIRAEA NIPPONICA 'SNOWMOUND'	
17	DS-3	5 GAL	REDTWIG DOGWOOD	CORNUS STOLONIFERA	
45	DS-4	5 GAL	FORSYTHIA INTERMEDIA	CARYOPTERIS INCANA	
CONIFEROUS SHRUBS					
15	CS-1	5 GAL	CREEPING HOLLYGATE	MAHONIA REPENS	
51	CS-2	5 GAL	FIRE THORN	PYRACANTHA COCCINEA	
7	CS-3	5 GAL	BUFFALO JNIPER	JNIPERUS SABINA 'BUFFALO'	
CONIFEROUS SHRUBS					
4	OG-1	5 GAL	BLUE OATGRASS	HELICTOTRICHON SEMPERVIRENS	
4	OG-2	5 GAL	FEATHER REEDGRASS	CALAMAGROSTIS ACUTIFLORA STRICTA	
11	OG-2	5 GAL	JAPANESE BLOODGRASS	IMPERATA CYLINDRICA RED BARON	

LANDSCAPE SCHEDULE

- Planting bed - perennials/annuals, ground cover
- Ground cover Vinca minor, Periwinkle
- Sod/Turf areas 90% Fescue 10% Bluegrass
- Native Grasses 10% Indian Rice Grass 40% Sheep Fescue 50% Native Wild Flowers
- Coniferous Shrub 5 GAL
- Deciduous Shrub 5 GAL.
- Deciduous Tree 5" Caliper
- Ornamental Tree 2" Caliper
- Conc. paving 4" thick w/ reinf., typ. U.O.N.
- Coniferous Tree
- Landscape Boulders

LANDSCAPE SCHEDULE - TREES

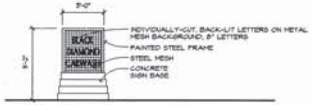
QTY	TAG	SIZE	COMMON NAME	SCIENTIFIC NAME	NOTES:
DECIDUOUS TREES					
11	DT-1	5" CALIPER	RICHMOND LINDEN	TILIA EUCHLORA REDMOND	
8	DT-2	5" CALIPER	RED MAPLE	ACER RUBRUM	
5	DT-3	5" CALIPER	WIERS CUTLEAF MAPLE	ACER SACCHARINUM WIER	
7	DT-4	5" CALIPER	WESTERN HACKBERRY	CELTIS OCCIDENTALIS	
CONIFEROUS TREES					
4	CT-1	6' TALL	WHITE FIR	ABIES CONCOLOR	
1	CT-2	6' TALL	COLORADO BLUE SPRUCE	PICEA PUNGENS GLAUCA	
ORNAMENTAL TREES					
2	OT-1	2" CALIPER	BRADFORD PEAR	PYRUS CALLERYANA BRADFORD	
2	OT-2	2" CALIPER	CORALBURST CRABAPPLE		
2	OT-3	2" CALIPER	AMUR MAPLE	ACER GINNALA	

PERENNIAL LIST

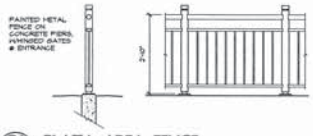
COMMON NAME

*PERENNIAL LIST IS INCLUSIVE BUT NOT LIMITED TO THE LIST BELOW

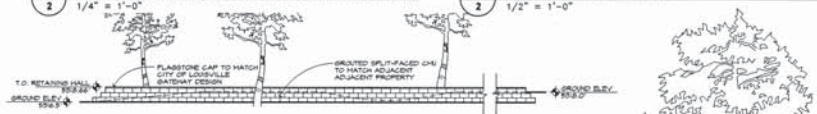
DAFFODIL	PHLOX
TULIP	SUNFLOWER
PERIWINKLE	THISTLE
LILY OF THE VALLEY	GOLDENROD
ROCKY MOUNTAIN COLUMBINE	ASTER
DAISY	MUM
FLAX	SNAPDRAGON
IRIS	BUGLOSS
POPPY'S	LAVENDER
IRIS'S	CROCUS
SAGE	NARCISSUS
PEONY	
CORALBELLS	
VERBENA	
YARROW	
DAYLILY	
EVENING PRIMROSE	



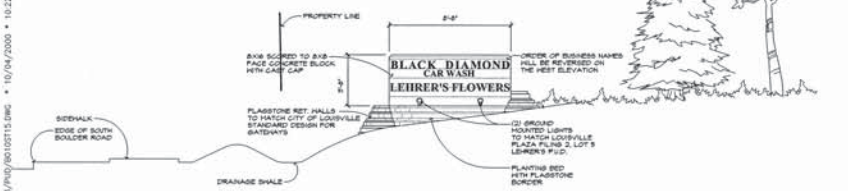
C2 / 2 HECLA WAY MONUMENT SIGN ELEVATION
1/4" = 1'-0"



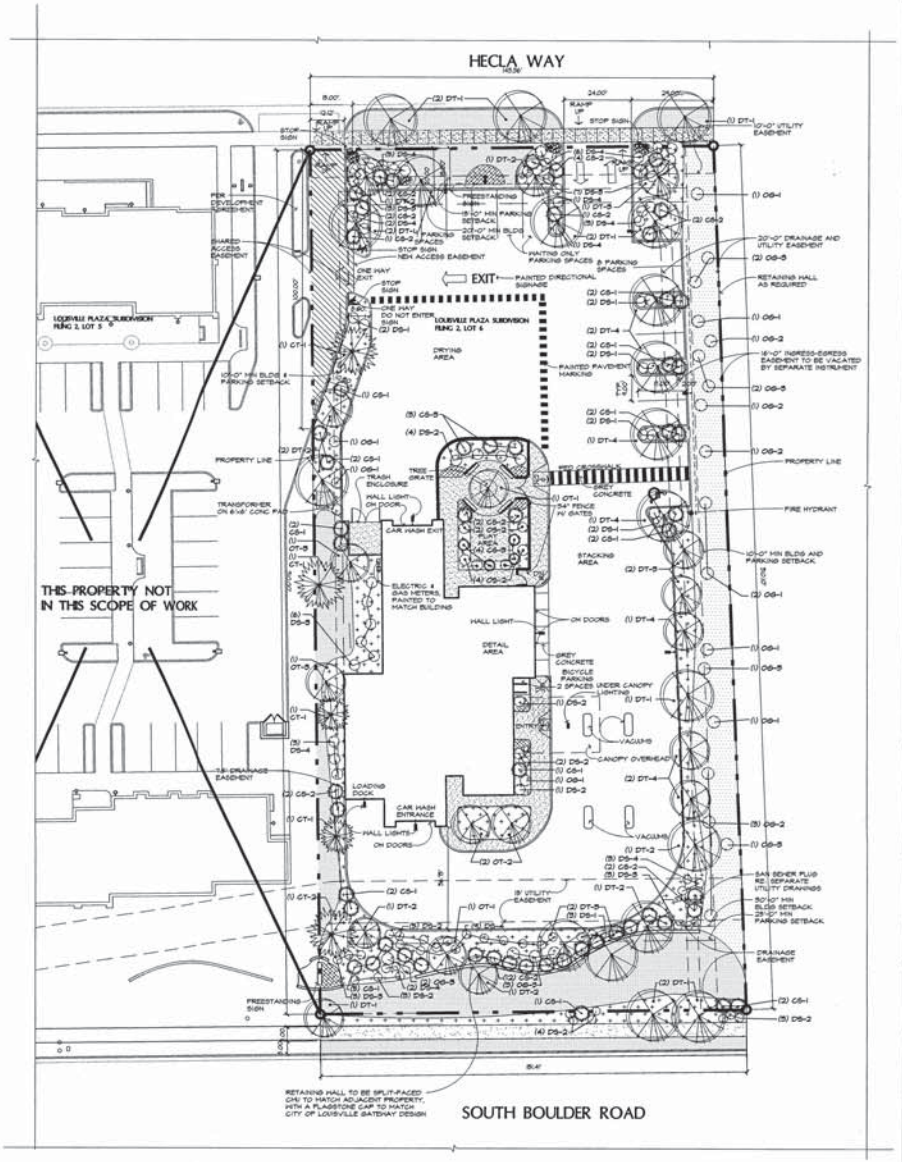
B1 / 2 PLAZA AREA FENCE
1/2" = 1'-0"



B2 / 2 SOUTH BOULDER ROAD RETAINING WALL
1/8" = 1'-0"



A2 / 2 SOUTH BOULDER ROAD MONUMENT SIGN ELEVATION – COMBINED FOR LOT 5 & LOT 6
1/4" = 1'-0"



A1 / 2 P.U.D. PLAN
1" = 20'

NORTH

HARTRONFT FAURI ARCHITECTS
Planning • Architecture • Interiors

801 MAIN STREET
SUITE 300
LOUISVILLE, CO 80027
VOICE 303.673.9364
FAX 303.673.9319

BLACK DIAMOND CAR WASH FINAL PLANNED UNIT DEVELOPMENT

LOUISVILLE PLAZA SUBDIVISION, FILING 2
LOUISVILLE, COLORADO

FINAL PUD SUBMITTAL

PROJECT # 9963
DATE: 20 APRIL 00
DRAWN BY: SLA/BSF
CHECKED BY: JEH
REVISIONS:
FINAL P.C. 4 JUNE 00
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FINAL MYLAR 5 OCT 00

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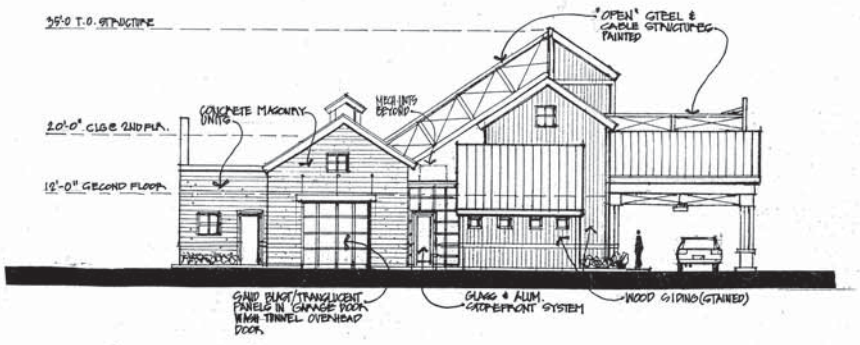
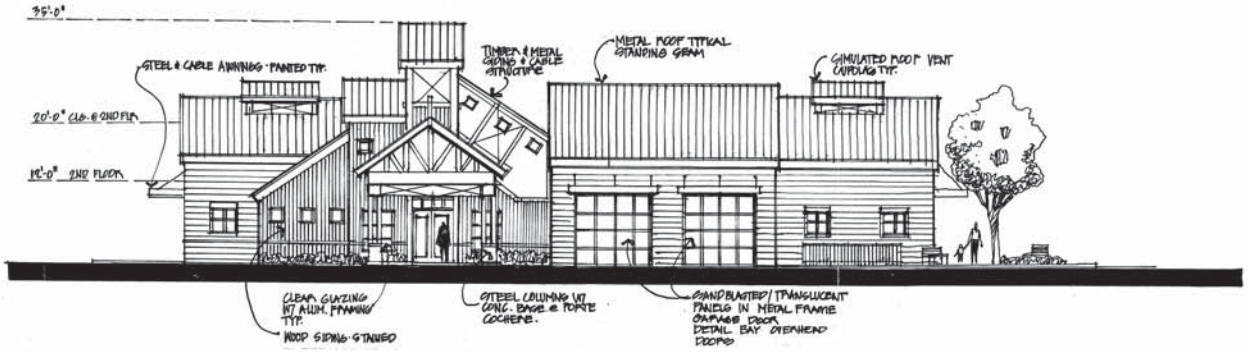
PUD PLAN
LANDSCAPE
LEGEND
SIGNAGE

Sheet
2
2 of 7 Sheets



B1 / 3 SOUTH ELEVATION
1/8" = 1'-0"



A1 / 3 EAST ELEVATION
1/8" = 1'-0"

LOT 6, LOUSVILLE PLAZA FILING #2
SEPT. 2000

DRAWING NUMBER

DRAWING NUMBER

Black Diamond Car Wash
3 of 7

HARTRONFT FAURI ARCHITECTS
Planning • Architecture • Interiors
801 MAIN STREET
SUITE 300
LOUISVILLE, CO 80027
VOICE: 303.673.9304
FAX: 303.673.9319

BLACK DIAMOND CAR WASH

FINAL PUD SUBMITTAL

PROJECT # 9963
DATE: 20 APRIL 00
DRAWN BY: HBF
CHECKED BY: JEH
REVISIONS: 01 JUNE 00
TC 03 JULY 00
CC 24 JULY 00
HTGAC 3 OCT 00

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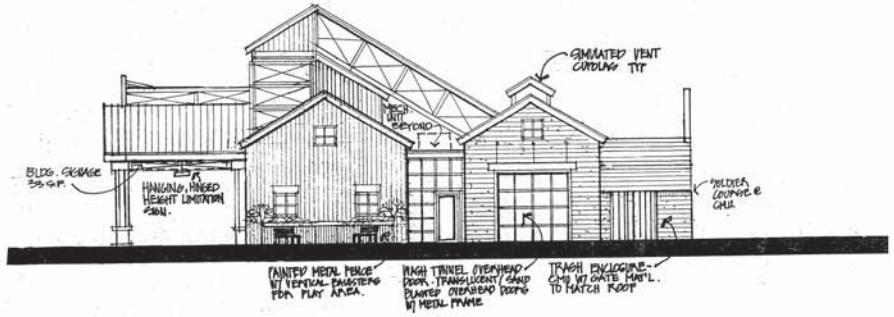
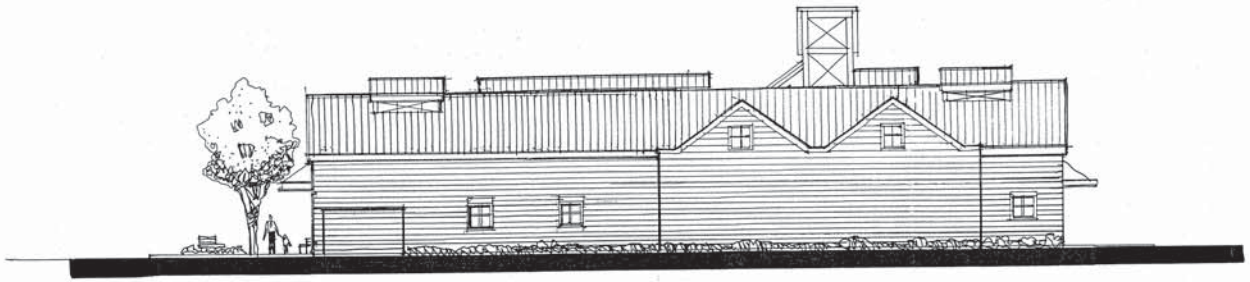
ELEVATIONS

Sheet
3
3 of 7 Sheets



B1 / 4 NORTH ELEVATION
1/8" = 1'-0"



A1 / 4 WEST ELEVATION
1/8" = 1'-0"

LOT 6, LOUISVILLE PLAZA
FILING #2
SEPT. 2000

DRAWING NUMBER

DRAWING NUMBER

Black Diamond Car Wash
4 of 7

PLAN-HOLD CORPORATION • IRVINE, CALIFORNIA

\ //STADA/~PROJ_54/9963/B210EL11.DWG • 06/09/2000 • 07:56 • 6.85/6.85 •

HARTRONFT FAURI ARCHITECTS
Planning • Architecture • Interiors
801 MAIN STREET
SUITE 300
LOUISVILLE, CO 80027
VOICE: 303.673.9304
FAX: 303.673.9319

BLACK DIAMOND CAR WASH

FINAL PUD SUBMITTAL

PROJECT # 9963
DATE: 20 APRIL 00
DRAWN BY: HEF
CHECKED BY: JEH
REVISIONS: 04 JUNE 00
PC 05 JULY 00
CC 24 JULY 00
PRIME 5 OCT 00

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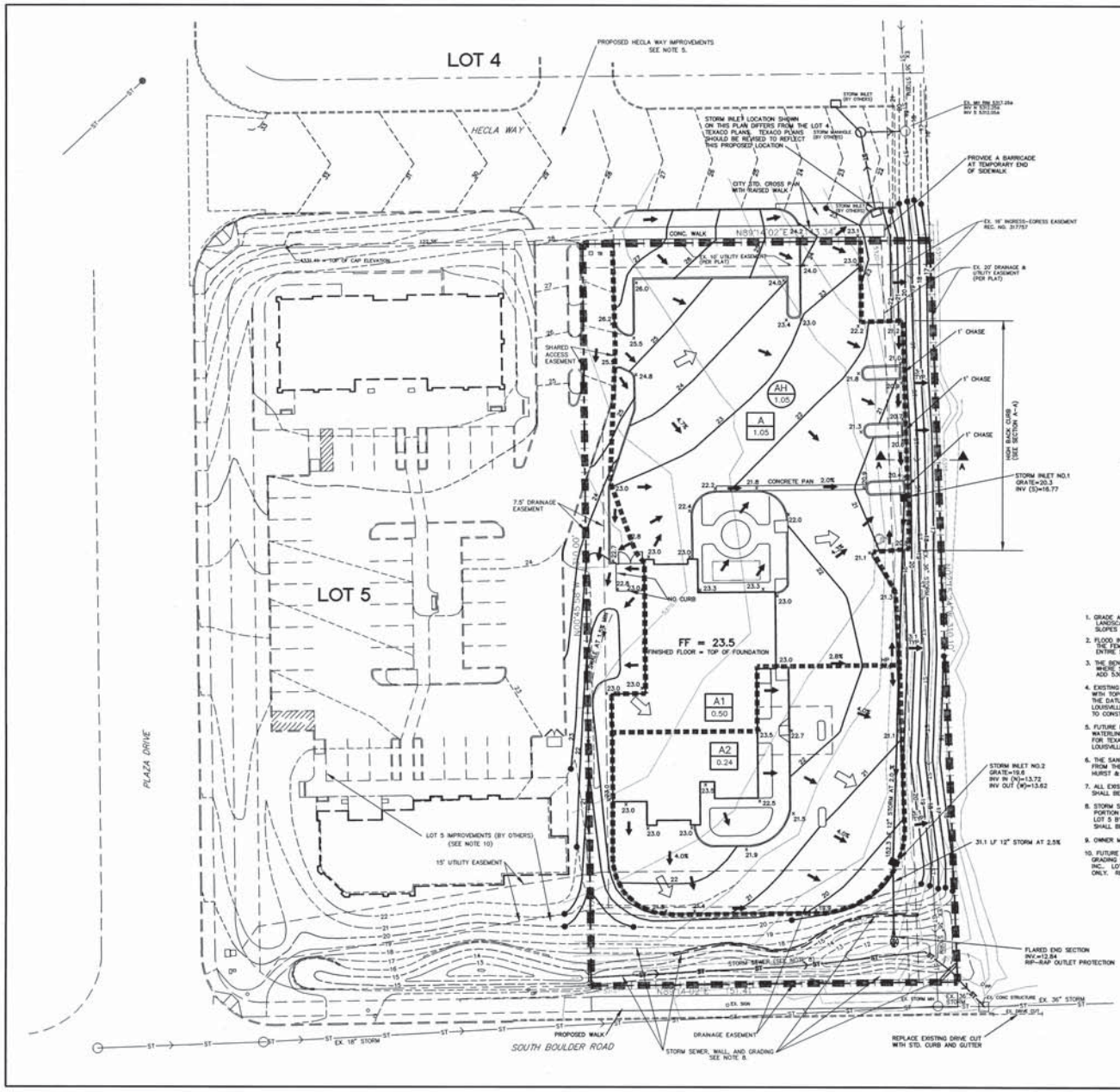
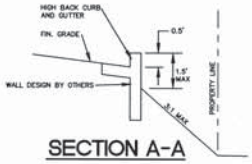
ELEVATIONS

Sheet
4
4 of 7 Sheets



LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR (DESIGNED BY OTHERS)
- PROPOSED CONTOUR
- x 25.8 PROPOSED SPOT ELEVATION
- HISTORIC SHEET FLOW
- PROPOSED FLOW DIRECTION
- DRAINAGE BASIN BOUNDARY (HISTORIC)
- PROPOSED BASIN BOUNDARY
- A / 23.5 BASIN DESIGNATION (HISTORIC) / AREA IN ACRES
- A / 23.5 BASIN DESIGNATION (PROPOSED) / AREA IN ACRES
- ST EXISTING STORM SEWER W/MANHOLE
- ST PROPOSED STORM SEWER W/MANHOLE (DESIGNED BY OTHERS)
- STORM PROPOSED STORM SEWER W/MANHOLE
- FF FINISHED FLOOR ELEVATION (NOMINAL, SEE ARCH. DWGS.)



SECTION A-A

NOTES

1. GRADE AWAY FROM BUILDINGS A MINIMUM OF A 12 INCH DROP IN THE FIRST 10 FEET IN LANDSCAPE AREAS, AND AT A MINIMUM 2% SLOPE IN THE FIRST 10 FEET IN IMPERVIOUS AREAS. SLOPES IN LANDSCAPED AREA SHALL NOT EXCEED 4H:1V UNLESS OTHERWISE NOTED.
2. FLOOD INFORMATION: THE FEMA FLOOD INSURANCE RATE MAP PANEL 080130C0576 Z DATED JUNE 1995 INDICATES THAT THE ENTIRE SITE IS OUTSIDE OF ANY MAPPED 100 YEAR FLOODPLAIN.
3. THE BENCHMARK FOR THIS PLAN IS THE TOP OF THE CAP ON THE NORTHWEST CORNER OF LOT 5 WHERE SHOWN ON THIS PLAN. ASSUMED ELEVATION = 4331.41 ADD 5300 TO ALL PROPOSED SPOT ELEVATIONS AND PROPOSED CONTOUR LABELS.
4. EXISTING TOPOGRAPHY SHOWN ON THESE PLANS ON LOT 6 IS BASED ON THE "LAND SURVEY PLAT WITH TOPO OF LOT 6, LOUISVILLE PLAZA FILING NO.2", BY DREXEL BARRELL & CO., DATED 1/25/00. THE DATUM OF THE TOPOGRAPHY HAS BEEN ADJUSTED FROM THE ORIGINAL PLAN TO REFLECT CITY OF LOUISVILLE DATUM. THE EXISTING BENCHMARK SHOWN ON THIS PLAN SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND ANY DISCREPANCIES SHALL BE REPORTED TO THE OWNER.
5. FUTURE IMPROVEMENTS FOR HECLA WAY SHOWN ON THESE PLANS INCLUDING CURB AND GUTTER, WATERLINES, STORM SEWERS, INLETS, AND FINISHED GRADES ARE FROM THE SITE CONSTRUCTION PLANS FOR TEXACO EXPRESS LUBE BY TSP FIVE INC. DATED 12-20-99 AND APPROVED BY THE CITY OF LOUISVILLE ON 3-8-00.
6. THE SANITARY SEWER MAIN AT THE SOUTHERN END OF THE SITE SHOWN ON THESE PLANS IS FROM THE SANITARY SEWER PLAN FOR LEHRER'S FLOWERS, LOT 5, LOUISVILLE PLAZA FILING 2 BY HURST & ASSOCIATES, INC. DATED JUNE 5, 2000.
7. ALL EXISTING CONCRETE ADJACENT TO THE PERIMETER OF THE SITE THAT IS SETTLED OR OTHERWISE DAMAGED SHALL BE REMOVED AND REPLACED AS PART OF THIS PROJECT, AT THE DEVELOPER'S EXPENSE.
8. STORM SEWER IMPROVEMENTS, RETAINING WALL AND FUTURE GRADING SHOWN IN THE SOUTHERN PORTION OF LOT 6 HAS BEEN DESIGNED BY HURST & ASSOCIATES, INC.. REFER TO THE DESIGN PLANS FOR LOT 5 BY HURST & ASSOCIATES FOR DESIGN INFORMATION IN THIS AREA. THE WATER QUALITY SWALE SHALL BE MAINTAINED AS REQUIRED (SEE DRAINAGE REPORT).
9. OWNER MUST ENSURE COMPACTION OF 95% OF ASTM D698 AT TRENCHES AND SUBGRADES WITHIN PUBLIC EASEMENTS.
10. FUTURE IMPROVEMENTS FOR LOT 5 SHOWN ON THESE PLANS ARE FROM THE MASTER DRAINAGE AND GRADING PLAN FOR LEHRER'S FLOWERS, LOT 5, LOUISVILLE PLAZA, FILING 2, BY HURST & ASSOCIATES, INC.. LOT 5 GRADING AND IMPROVEMENTS ARE SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO HURST & ASSOCIATES, INC. PLANS FOR ANY LOT 5 IMPROVEMENTS.

Scale: 1" = 20'

GRADING AND DRAINAGE PLAN
BLACK DIAMOND CAR WASH
LOT 6, FILING 2,
LOUISVILLE PLAZA
LOUISVILLE, COLORADO

SCOTT, COX & ASSOCIATES, INC.
consulting engineers • surveyors
1530 55th Street • Boulder, Colorado 80303
(303) 444 - 3051

Designed by RGB	Date	Scale	Survey	Sheet C1	Drawing no.
Drawn by RGB	4/14/00	1"=20'	Page		00280
Checked by WHM	Revision	Description		Date	Project no.
	1	CITY COMMENTS		6/9/00	00280

LOT 6, LOUISVILLE PLAZA FILING #2 SEPT. 2000

DRAWING NUMBER

DRAWING NUMBER

Black Diamond Car Wash

5 of 7

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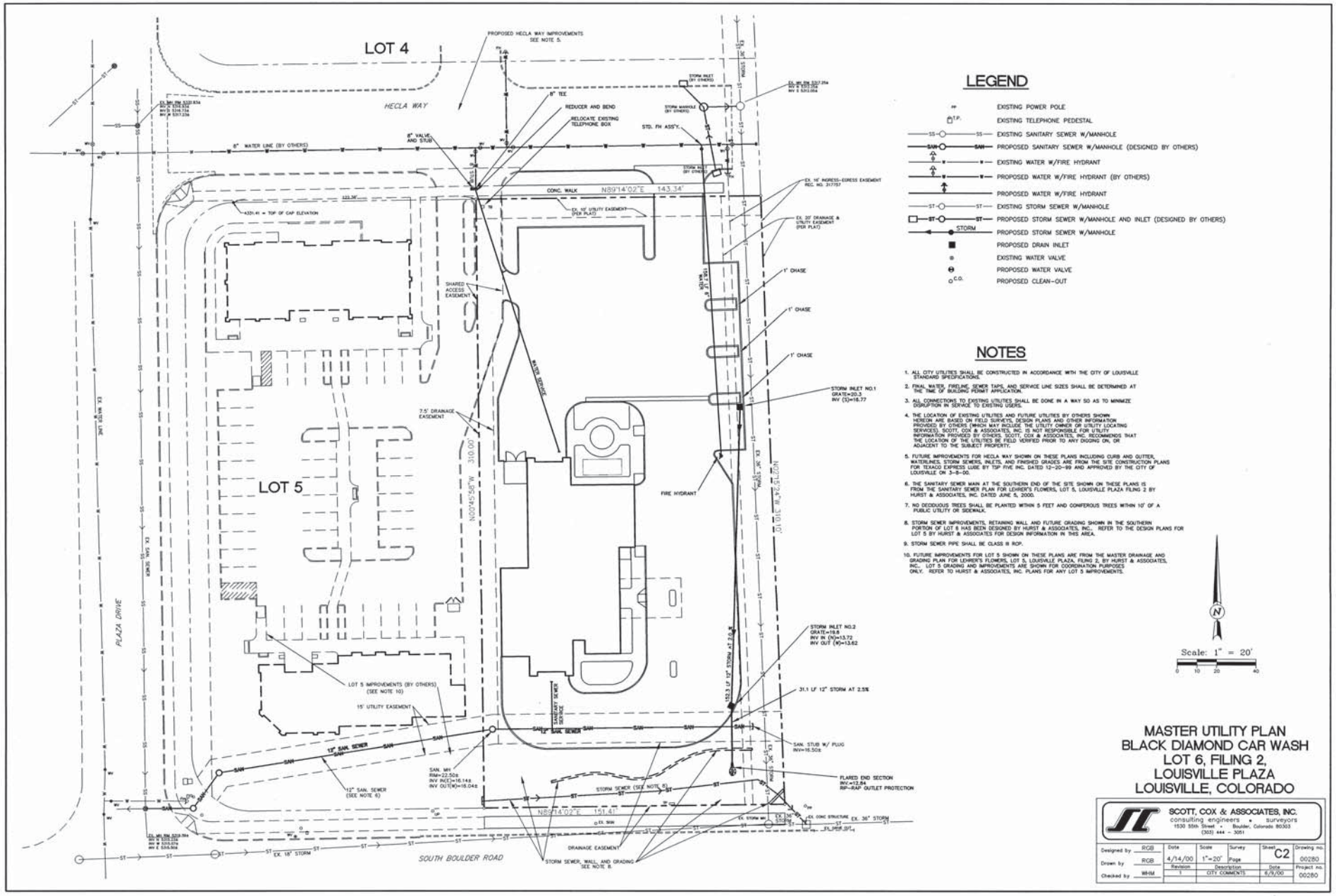


LEGEND

- EXISTING POWER POLE
- EXISTING TELEPHONE PEDESTAL
- EXISTING SANITARY SEWER W/MANHOLE
- PROPOSED SANITARY SEWER W/MANHOLE (DESIGNED BY OTHERS)
- EXISTING WATER W/FIRE HYDRANT
- PROPOSED WATER W/FIRE HYDRANT (BY OTHERS)
- PROPOSED WATER W/FIRE HYDRANT
- EXISTING STORM SEWER W/MANHOLE
- PROPOSED STORM SEWER W/MANHOLE AND INLET (DESIGNED BY OTHERS)
- PROPOSED STORM SEWER W/MANHOLE
- PROPOSED DRAIN INLET
- EXISTING WATER VALVE
- PROPOSED WATER VALVE
- PROPOSED CLEAN-OUT

NOTES

1. ALL CITY UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF LOUISVILLE STANDARD SPECIFICATIONS.
2. FINAL WATER, FIRELINE, SEWER TAPS, AND SERVICE LINE SIZES SHALL BE DETERMINED AT THE TIME OF BUILDING PERMIT APPLICATION.
3. ALL CONNECTIONS TO EXISTING UTILITIES SHALL BE DONE IN A WAY SO AS TO MINIMIZE DISRUPTION IN SERVICE TO EXISTING USERS.
4. THE LOCATION OF EXISTING UTILITIES AND FUTURE UTILITIES BY OTHERS SHOWN HEREON ARE BASED ON FIELD SURVEYS, DESIGN PLANS AND OTHER INFORMATION PROVIDED BY OTHERS (WHICH MAY INCLUDE THE UTILITY OWNER OR UTILITY LOCATING SERVICES). SCOTT, COX & ASSOCIATES, INC. IS NOT RESPONSIBLE FOR UTILITY INFORMATION PROVIDED BY OTHERS. SCOTT, COX & ASSOCIATES, INC. RECOMMENDS THAT THE LOCATION OF THE UTILITIES BE FIELD VERIFIED PRIOR TO ANY DIGGING ON, OR ADJACENT TO THE SUBJECT PROPERTY.
5. FUTURE IMPROVEMENTS FOR HECLA WAY SHOWN ON THESE PLANS INCLUDING CURB AND GUTTER, WATERLINES, STORM SEWERS, INLETS, AND FINISHED GRADES ARE FROM THE SITE CONSTRUCTION PLANS FOR TEXACO EXPRESS LUBE BY TSP FIVE INC. DATED 12-20-99 AND APPROVED BY THE CITY OF LOUISVILLE ON 3-8-00.
6. THE SANITARY SEWER MAIN AT THE SOUTHERN END OF THE SITE SHOWN ON THESE PLANS IS FROM THE SANITARY SEWER PLAN FOR LEHRER'S FLOWERS, LOT 5, LOUISVILLE PLAZA FILING 2 BY HURST & ASSOCIATES, INC. DATED JUNE 5, 2000.
7. NO DECIDUOUS TREES SHALL BE PLANTED WITHIN 5 FEET AND CONIFEROUS TREES WITHIN 10' OF A PUBLIC UTILITY OR SIDEWALK.
8. STORM SEWER IMPROVEMENTS, RETAINING WALL AND FUTURE GRADING SHOWN IN THE SOUTHERN PORTION OF LOT 6 HAS BEEN DESIGNED BY HURST & ASSOCIATES, INC.. REFER TO THE DESIGN PLANS FOR LOT 5 BY HURST & ASSOCIATES FOR DESIGN INFORMATION IN THIS AREA.
9. STORM SEWER PIPE SHALL BE CLASS III RCP.
10. FUTURE IMPROVEMENTS FOR LOT 5 SHOWN ON THESE PLANS ARE FROM THE MASTER DRAINAGE AND GRADING PLAN FOR LEHRER'S FLOWERS, LOT 5, LOUISVILLE PLAZA, FILING 2, BY HURST & ASSOCIATES, INC.. LOT 5 GRADING AND IMPROVEMENTS ARE SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO HURST & ASSOCIATES, INC. PLANS FOR ANY LOT 5 IMPROVEMENTS.

Scale: 1" = 20'

MASTER UTILITY PLAN
BLACK DIAMOND CAR WASH
LOT 6, FILING 2,
LOUISVILLE PLAZA
LOUISVILLE, COLORADO

SCOTT, COX & ASSOCIATES, INC.
consulting engineers • surveyors
1530 55th Street • Boulder, Colorado 80303
(303) 444 - 3051

Designed by RGB	Date	Scale	Survey	Sheet	Drawing no.
Drawn by RGB	4/14/00	1"=20'	Page	C2	00280
Checked by WHM	Revision	Description		Date	Project no.
	1	CITY COMMENTS		6/9/00	00280

LOT 6, LOUISVILLE PLAZA FILING #2 SEPT. 2000

DRAWING NUMBER

DRAWING NUMBER

Black Diamond Car Wash

6 of 7

LOT 6, LOUISVILLE PLAZA
FILING # 2
SEPT. 2000

DRAWING NUMBER

DRAWING NUMBER

Black Diamond Car Wash
7 of 7

Arm-Mounted/Canopy Die-Cast Cutoff, Drop/Flat Lens

Use for parking garages, convenience stores, hotels and walkways.

Catalog Number — Example: KAC 400M FP 120 SPD09

KAC 400M	FP	120	SPD09
Designation	Distribution	Voltage	Mounting

Designation

HIGH PRESSURE SODIUM
150W KAC 150S
150W KACM 150S
250W KAC 250S
250W KACM 250S
400W KAC 400S
400W KACM 400S

METAL HALIDE[1]
175W KAC 175M
175W KACM 175M
250W KAC 250M
250W KACM 250M
400W KAC 400M
400W KACM 400M

Distribution

FP
DFA
DFP

FP = Flat Prismatic Lens (FP)

DFP = Drop Prismatic Lens (Pictured/standard)

Voltage

120
208
240
277
347
480
TS[2]

Mounting

SPD06 Square pole arm[3]
SPD08 Square pole arm[3]
RPD06 Round pole arm[3]
RPD08 Round pole arm[3]
WWD04 Wood pole or wall[3]
WWD06 Wood pole or wall[3]
WBD04 Wall bracket[3]
WBD06 Wall bracket[3]
Lists When ordering KAA, DAD (3) YK Yoke (KACM Only)
TC Thru-wire conduit tee capability (KACM only)

Options/Accessories

For options and accessories, see page 285-286.

NOTES
1. Contoured multi-tap ballast (120, 208, 240, 277V).
2. For use with KAC ONLY.
3. SPD06, RPD06 and WWD06 must be used with SPD08, RPD08 and WWD08 on DAD4, DAD3 or DAD6 ordering pattern.
4. Includes mounting arm.
5. Additional voltages available for some cast metal lamps. Contact factory for details.

All dimensions are inches (centimeters) unless otherwise specified.

STANDARD PACKAGING

Nature ship cartons in unit cartons pkg. Sample

Qty. 10 KAC 400M FP 120 SPD09
(10 cartons of 1 fixture)

Accessories ship separately.

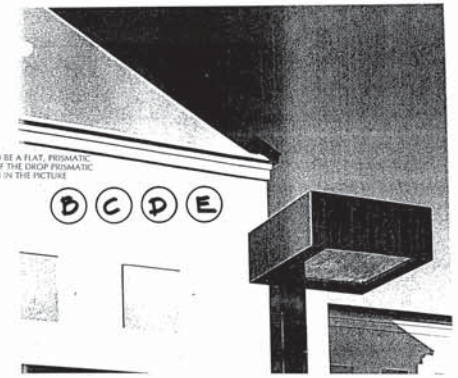
Area Lighting

(A) KAC KACM

Contour™ Series

THIS FIXTURE TO BE A FLAT, PRISMATIC LENS INSTEAD OF THE DROP PRISMATIC LENS AS SHOWN IN THE PICTURE

Optional white finish shown. Standard finish is dark bronze.



Features

Housing: Rugged, die-cast, soft-corner aluminum housing with 0.12" nominal wall thickness. Die-cast aluminum door frame has prismatic, impact-resistant, tempered glass; drop dish acrylic lens or drop dish polycarbonate lens. Door frame is fully gasketed with one-piece tubular silicone. KAC utilizes extruded 4" soft-corner mounting arm. KACM is surface mounted utilizing four 0.5" mounting holes and one 0.875 wire-entry hole (KACM mounting hardware not included). Dark bronze polyester powder finish is standard. Other architectural colors available.

Optics: Reflector is optical-quality aluminum that works in tandem with a light-diffusing prismatic lens.

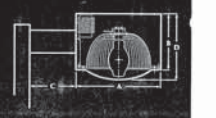
Ballast/Electrical System: Ballast is high-reactance, high-power factor (150W HPS) or high-reactance, high-power factor constant-wattage autotransformer (175-400W MH & HPS).

Socket: Mogul-base porcelain socket, 4KV pulse rated. Position-oriented socket standard on all metal halide units.

Listings: UL listed for wet locations. Covered ceiling, mount on concrete, steel or aluminum. Not for use in dwellings. Listed and labeled to comply with Canadian Standards (outdoor only).

Poles: See pages 259-283.

ARS-SQ-18 AND ARS-SQ-22



ARS-SQ LAMP SPECIFICATIONS

All lamps supplied with luminaires have a mogul base and are non-coated. Available lamp/housing configurations:

	ARS-SQ-18	ARS-SQ-22
LAMP TYPE	175 MH ED28	400 MH ED37
	250 MH ED28	1000 MH ED37*
	400 MH ED28*	400 HPS E18
	100 HPS ED23½	1000 HPS ED37
	250 HPS E18	
	400 HPS E18	

*Reduced Jacketed Lamp

DIMENSIONS

DIM	ARS-SQ-18	ARS-SQ-22
A	18" SQ.	22" SQ.
B	7"	10"
C	8"	12"
D	N/A	17"W*

TWAC HOME

Control Glare — **Reduce Wasted Light Control Light**
Rugged Die-Cast Aluminum

TECHNICAL INFORMATION (F)

The TWAC provides this performance:
- True cutoff lighting;
- Pleasant, highly uniform lighting;
- Wattage capability up to 100 watts MH and HPS, or 42 watt instant-on fluorescent
- Contour Series aesthetics and quality construction (IP65 listed).

Traditional Mini-Wallpak — TWAC Cutoff Mini-Wallpack

Traditional security lighting fixtures can throw half their light either into the sky (wasteful and inefficient), or straight into the neighbors' windows

Footcandle Correction for Mounting Height:

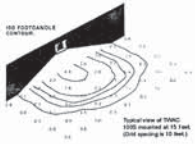
Actual mounting ht.	8'	10'	12'	15'
Correction factor	0.25	2.25	1.56	1.00

(Multiply the values on the photometric layout by these factors to calculate light levels for different mounting heights.)

Footcandle Correction for Wattage:

	HPS	MH	Fluor.
42	—	—	0.34
50	0.42	0.36	—
70	0.66	0.55	—
100	1.00	0.89	—

(Multiply the values on the photometric layout by these factors to calculate light levels for different lamps and wattages.)



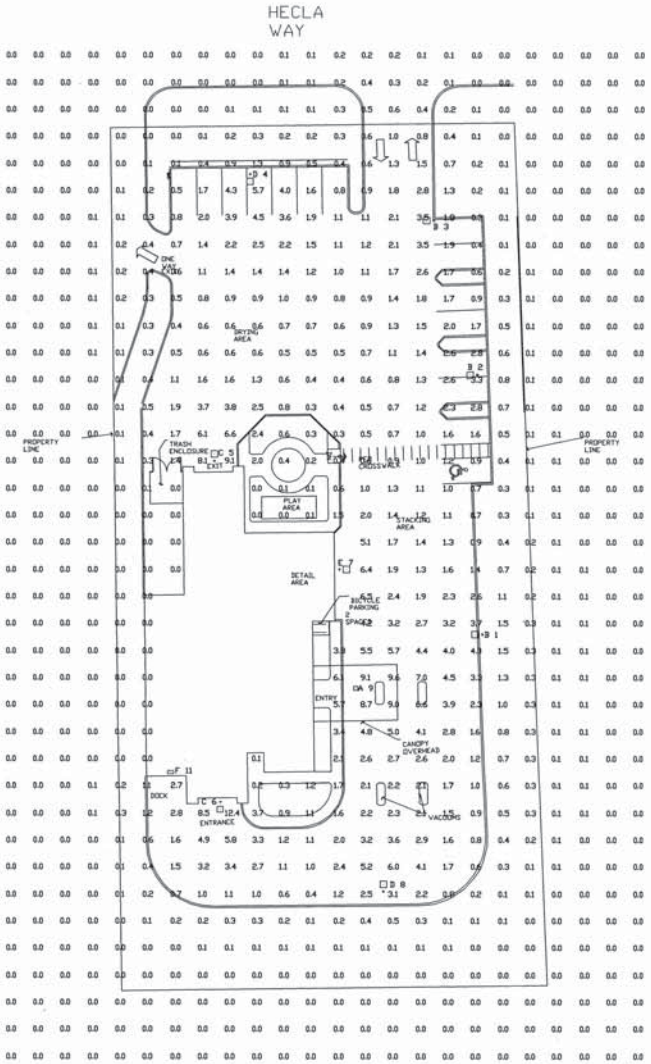
Typical view of TWAC 100S mounted at 15 feet. (Grid spacing is 10 feet.)

LUMINAIRE SCHEDULE

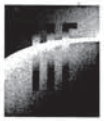
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF
	A	1	KAC 250M DP	CONTOUR SERIES SOFT SQUARE LUMINAIRE	250 WATT METAL HALIDE	92122101.IES	20000	0.72
	B	3	ARSSQ18250MHOS	AREA LIGHT 18-HYDROFORMED TYPE III-CLR LENS-HS SHIELD	250W CLEAR METAL HALIDE- ED28	18250MOS.IES	20000	0.72
	C	2	ARSSQ18175MHF	AREA LIGHT 18-PEENED FAB REFL-CLR LENS	175W CLEAR SUPER METAL HALIDE- ED28	18175MF.IES	13200	0.72
	D	2	ARSSQ18250MHPS	AREA LIGHT 18-PEENED FORWARD THROW-CLR LENS-HS SHIELD	250W CLEAR METAL HALIDE- ED28	18250MPS.IES	20000	0.72
	E	1	ARSSQ18175MHO	AREA LIGHT 18-HYDRO-FORMED TYPE III REFL-CLR LENS	175W CLEAR SUPER METAL HALIDE- ED28	18175MO.IES	13200	0.72
	F	1	TWAC 70M (NEW LENS/BLK TAPE 5/8")	WALL MOUNTED AREA LIGHT W/CUTOFF LENS	ONE 70-WATT CLEAR ED-17 METAL HALIDE, HORIZONTAL POS.	00042NIZ.IES	5200	0.72

LUMINAIRE LOCATIONS

No.	Label	Location X	Location Y	Location Z	MH	Orientation	Tilt	Aim X	Aim Y	Aim Z
1	B	494.0	225.0	24.0	24.0	270.0	0.0	491.3	225.0	0.0
2	B	492.0	321.0	24.0	24.0	267.3	0.0	489.3	320.9	0.0
3	B	476.0	378.0	24.0	24.0	268.0	0.0	473.3	377.9	0.0
4	D	409.0	395.0	24.0	24.0	179.4	0.0	409.0	392.3	0.0
5	C	396.0	289.0	14.0	14.0	0.0	0.0	396.0	291.6	0.0
6	C	396.0	163.0	14.0	14.0	180.0	0.0	396.0	160.4	0.0
7	E	442.0	248.0	14.0	14.0	90.0	0.0	444.7	249.0	0.0
8	D	458.0	130.0	24.0	24.0	1.5	0.0	458.1	132.7	0.0
9	A	448.0	205.0	24.0	24.0	0.0	0.0	448.0	205.0	0.0
11	F	380.0	174.0	15.0	15.0	180.0	0.0	380.0	174.0	0.0



(A1) 7 PHOTOMETRIC PLAN
1" = 20'



HARTRONFT FAURI ARCHITECTS
Planning • Architecture • Interiors

801 MAIN STREET
SUITE 300
LOUISVILLE, CO 80027
VOICE: 303.673.9304
FAX: 303.673.9319

BLACK DIAMOND CAR WASH
FINAL PLANNED UNIT DEVELOPMENT
LOUISVILLE PLAZA SUBDIVISION, FILING 2
LOUISVILLE, COLORADO

FINAL PUD SUBMITTAL

PROJECT # 9963
DATE: 20 APRIL 00
DRAWN BY: SLA
CHECKED BY: JEH
REVISIONS:
4 JUNE 00 PC
5 JULY 00 PC
24 JULY 0000
FINAL MYLAR 5 OCT 00

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PHOTOMETRIC PLAN
LUMINAIRE SCHEDULE

Sheet
7
7 of 7 Sheets

LEHRER'S FLOWERS
PLANNED UNIT DEVELOPMENT
FOR
LOT 5, LOUISVILLE PLAZA FILING NO. 2
CITY OF LOUISVILLE, BOULDER COUNTY, COLORADO

SIGNATURE BLOCKS

CITY COUNCIL CERTIFICATE

APPROVED THIS 5th DAY OF September, 2000 BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO. RESOLUTION NO. 54 SERIES 2000

Tom Davidson
MAYOR

Nancy Varra
CITY CLERK

PLANNING COMMISSION CERTIFICATE

RECOMMENDED APPROVAL THIS 11th DAY OF July, 2000 BY THE PLANNING COMMISSION OF THE CITY OF LOUISVILLE, COLORADO. RESOLUTION NO. 24 SERIES 2000

CHAIRPERSON

SECRETARY

CLERK AND RECORDER CERTIFICATE
(COUNTY OF BOULDER
STATE OF COLORADO)

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED IN MY OFFICE AT 2:30 O'CLOCK P. M. THIS 6th DAY OF February, 2001 AND IS RECORDED IN PLAN FILE P-83, F-1-1,2,3 FEE 490.00 PAID FILM NO. 2 RECEPTION NO. 2017677

Charlotte Houston
RECORDER

Beatrice J. Mulcahy
DEPUTY

OWNERSHIP SIGNATURE BLOCK

BY SIGNING THIS PUD, THE OWNER ACKNOWLEDGES AND ACCEPTS ALL THE REQUIREMENTS AND INTENT SET FORTH IN THIS PUD.

Witness our hands and seals this 12 day of October, 2000.

Lehrer's Flowers
OWNER

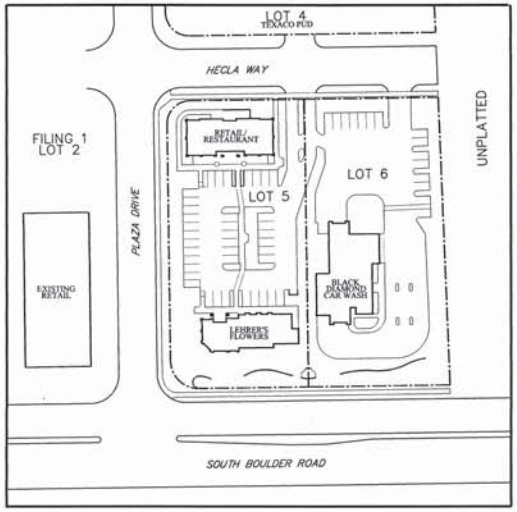
OWNER

NOTARY PUBLIC
CHRISTY C. OTIPSBY
STATE OF COLORADO

Christy Otipsby
NOTARY

My commission expires 11/25/2002

LOCATOR MAP



VICINITY MAP
1" = 60'

DRAWING INDEX

A1	SITE PLAN
A2	LEHRER'S FLOWERS ELEVATIONS
A3	RETAIL/RESTAURANT ELEVATIONS
A4	DETAILS/SIGN CRITERIA
L1	LANDSCAPE PLAN
C1	MASTER DRAINAGE AND GRADING PLAN
C2	MASTER UTILITIES PLAN
E1	PHOTOMETRIC SITE PLAN LIGHT FIXTURES

PROPERTY OWNER
SOUTH BOULDER ROAD CORP.
BOB BRISNEHAN, PRESIDENT
913 MAIN STREET
LOUISVILLE, CO 80027
303-666-5005

APPLICANT/TENANT/ BUILDING OWNER
LEHRER'S FLOWERS
DAVID BYERLY, PRESIDENT
3191 WEST 38TH AVENUE
DENVER, CO 80211
303-433-6892

GENERAL CONTRACTOR
WILLIAMS CONSTRUCTION CORPORATION
965 S. KIPLING PARKWAY
LAKEWOOD, CO 80226
303-989-9009

ARCHITECTS
ROBERT CHISHOLM ARCHITECTS, INC.
1108 WASHINGTON AVENUE
GOLDEN, CO 80401
303-277-9390

LANDSCAPE ARCHITECTS
ARNOLD ASSOCIATES
5414 ALLISON STREET
ARVADA, CO 80002
303-423-1968

CIVIL ENGINEERS
HURST AND ASSOCIATES, INC.
4999 PEARL EAST CIRCLE, SUITE 106
BOULDER, CO 80301
303-449-9105

ELECTRICAL ENGINEERS
MICHAEL J. HUTCHINSON ASSOCIATES, INC.
1737 CENTRAL STREET
DENVER, CO 80211
303-480-5144

DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER

LEHRER'S FLOWERS
LOT 5, LSVL. PLZ., FILING #2
SEPT. 2000 1 OF 9

GENERAL DATA

ZONING:	PCZD
OCCUPANCY GROUP:	M
CONSTRUCTION TYPE:	V-N
NUMBER OF STORIES:	1

SITE AREA DATA

SITE AREA:	45,360 S.F. (1.04 ACRES)	
PARKING AND DRIVEWAY (INCL. CURBS)	16,060 S.F.	OR 35%
LANDSCAPED AREA:	17,030 S.F.	OR 38%
BUILDING AREA:	6,850 S.F.	OR 15%
PEDESTRIAN AREA: (INCL. SIDEWALKS)	5190 S.F.	OR 11%
RETAINING WALLS	90 S.F.	
DUMPSTER AND UTILITIES	140 S.F.	

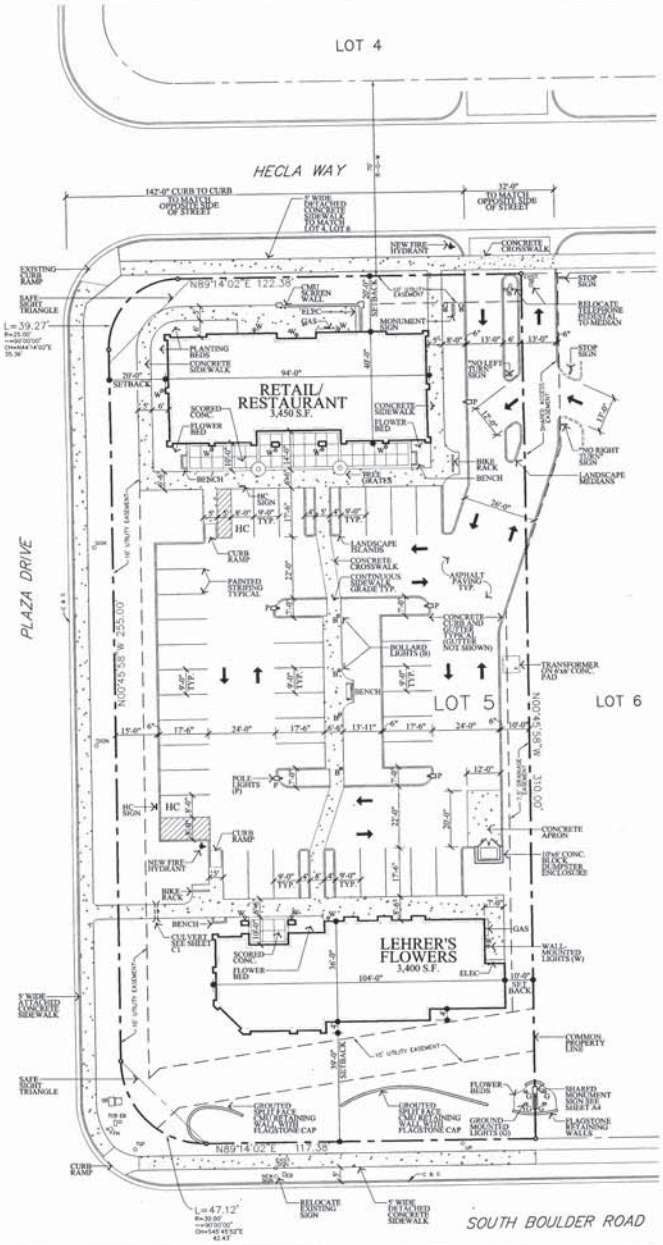
PARKING DATA

TOTAL PARKING SPACES: 38
(INCLUDES 2 HANDICAPPED SPACES)

1. LEHRER'S RETAIL	1,300 S.F.
PARKING SPACES:	6
PARKING RATIO:	4.6/1000
2. LEHRER'S DESIGN/ STORAGE/COOLERS	2,100 S.F.
PARKING SPACES:	5
PARKING RATIO:	2.4/1000
3. RETAIL/RESTAURANT	3,450 S.F.
PARKING SPACES:	27
PARKING RATIO:	7.8/1000

LEGAL DESCRIPTION

LOT 5, LOUISVILLE PLAZA FILING NO. 2, CITY OF LOUISVILLE, BOULDER COUNTY, COLORADO. ACCORDING TO THE PLAT THEREOF RECORDED ON JULY 1, 1991 AS RECEPTION NO. 1113009, IN THE RECORDS OF BOULDER COUNTY.



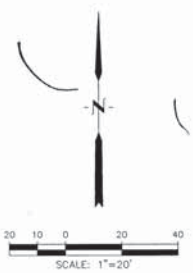
SITE PLAN NOTES

1. THE 3,450 S.F. RETAIL/RESTAURANT BUILDING IN THIS PUD IS DESIGNED TO ACCOMODATE ANY RETAIL TENANTS, AND THE FOLLOWING LIMITED SERVICE RESTAURANT AND FOOD SERVICE TENANTS:
   - DONUT SHOPS
   - BAGEL SHOPS
   - BAKERIES
   - COFFEE SHOPS
   - DELIS
   - PIZZA DELIVERY
   - OTHER DELIVERY

   NO DRIVE THRU TENANTS SHALL BE ALLOWED. OTHER RESTAURANT AND FOOD SERVICE USES ARE BY SPECIAL REVIEW USE AUTHORIZATION ONLY.
2. NO BUILDING PERMITS SHALL BE ISSUED UNTIL HECLA WAY IS COMPLETED WITH CURB, GUTTER, AND FIRST LIFT OF ASPHALT, AS REFLECTED IN THE DEVELOPMENT AGREEMENT.
3. NO CERTIFICATES OF OCCUPANCY SHALL BE ISSUED UNTIL ALL SUBDIVIDER OBLIGATIONS ARE MET, AS REFLECTED IN THE SUBDIVISION AGREEMENT. THE SUBDIVISION AGREEMENT RUNS WITH THE LAND AND APPLIES TO ANY PROPERTY OWNER WITHIN THIS SUBDIVISION.
4. THE CITY SHALL NOT BE RESPONSIBLE FOR DAMAGE TO, MAINTENANCE OF, OR REPAIR OF ANY PRIVATE IMPROVEMENTS AFFECTED BY CITY ACTIVITIES RELATED TO THE PUBLIC SANITARY SEWER AND SANITARY SEWER EASEMENT (TO BE DEDICATED BY SEPARATE INSTRUMENT) TRAVERSING THE SOUTHERLY PORTION OF THE SITE.
5. WINDOW SIGNAGE SHALL BE PROHIBITED.
6. DRAINAGE, GRADING, UTILITY, AND ACCESS EASEMENTS SHALL BE RECORDED WITH THE PUD DEVELOPMENT PLAN.
6. MONUMENT SIGNS MAY NOT DISPLAY THE NAME OF ANY SPECIFIC TENANT OF THE RETAIL/RESTAURANT BUILDING.
7. GAS AND ELECTRIC METERS SHALL BE PAINTED TO MATCH THE BUILDING.
8. FLAGSTONE RETAING WALLS (AT MONUMENT SIGN) AND FLAGSTONE CAPS (OVER CMU RETAINING WALLS) SHALL BE BUFF FLAGSTONE TO MATCH THE LOUISVILLE CITY-STANDARD DESIGN FOR GATEWAYS.
9. NO OUTSIDE SALES SHALL BE CONDUCTED ON THE PROPERTY.

LEGEND

C. & G.	CURB & GUTTER
EB	ELECTRIC BOX
FH	FIRE HYDRANT
SB	SIGNAL BOX
TB	TELEPHONE BOX
TSB	TRAFFIC SIGNAL BOX
TSP	TRAFFIC SIGNAL POLE
UP	UTILITY POLE



SITE PLAN

ROBERT CHISHOLM ARCHITECTS
1 · 1 · 0 · 8
WASHINGTON AVE
GOLDEN CO 80401
PH. 303 277 9390
FAX 303 277 0967
E.M. CHISHOLM@USWEST.NET

LEHRER'S FLOWERS
LOT 5, LOUISVILLE PLAZA FILING 2
LOUISVILLE, COLORADO

SITE PLAN

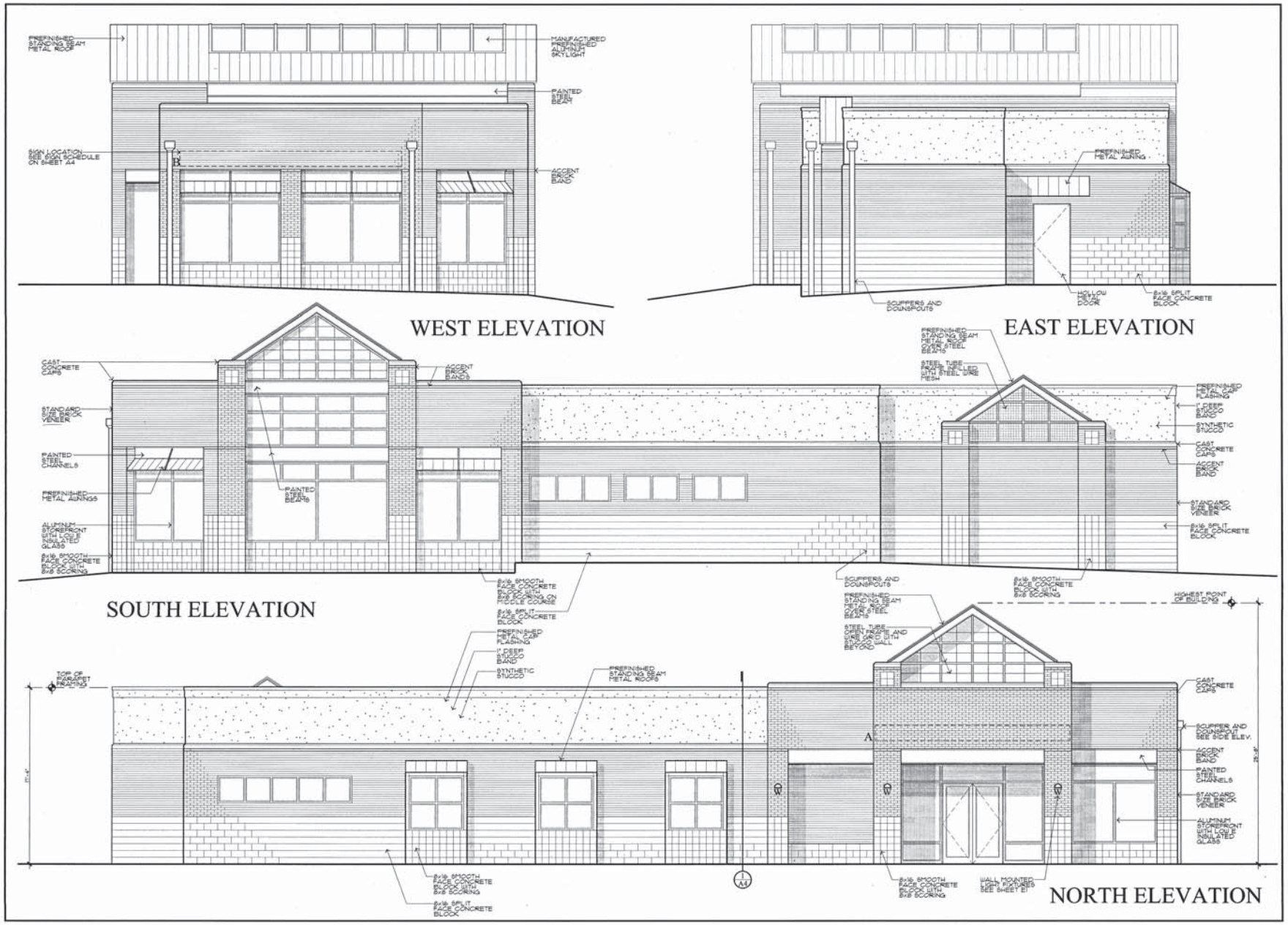
SEP. 20, 2000

1" = 20'

A1

DRAWING NUMBER

LEHRER'S FLOWERS
LOT 5, LSVL. PLZ., FILING #2
2 OF 9



ROBERT CHISHOLM ARCHITECTS

1108 WASHINGTON AVE
GOLDEN CO 80401
PH. 303 277 9300
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E.M. CHISHOLM@USWEST.NET

LEHRER'S FLOWERS
LOT 5, LOUISVILLE PLAZA FILING 2
LOUISVILLE, COLORADO

LEHRER'S FLOWERS ELEVATIONS

SEP. 20, 2000

1/4" = 1'-0"

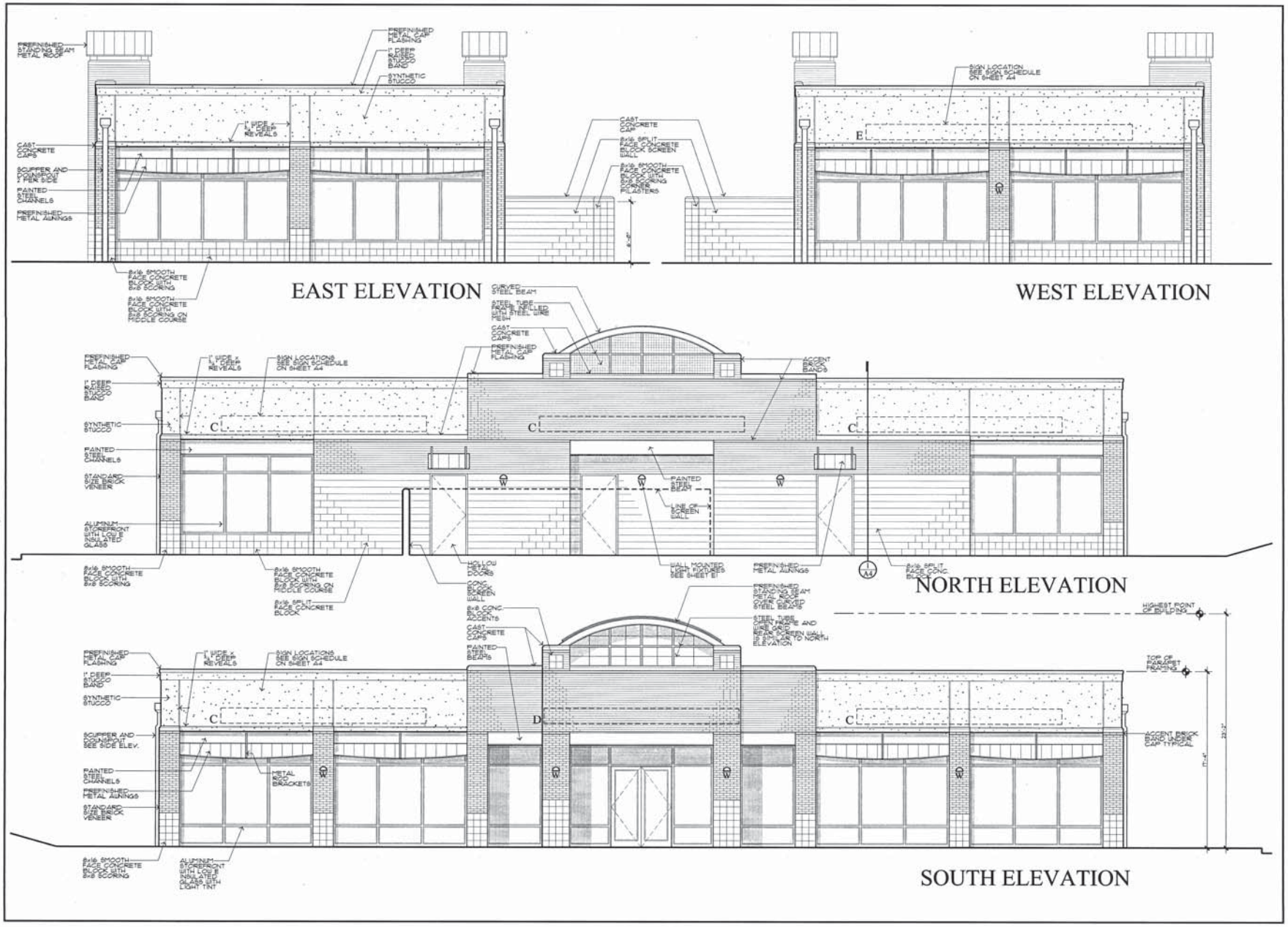
A2

DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER

LEHRER'S FLOWERS
LOT 5, LSVL. PLZ., FILING #2
3 OF 9



ROBERT CHISHOLM ARCHITECTS

1 - 1 - 0 - 8
WASHINGTON AVE
GOLDEN CO 80401
PH. 303 277 9090
FAX 303 277 0967
E.M. CHISHOLM@USWEST.NET

LEHRER'S FLOWERS
LOT 5, LOUISVILLE PLAZA FILING 2
LOUISVILLE, COLORADO

RETAIL/ RESTAURANT ELEVATIONS

SEP. 20, 2000

1/4" = 1'-0"

A3

DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER

LEHRER'S FLOWERS
LOT 5, LSVL. PLZ., FILING #2
4 OF 9

OUTLINE OF MAXIMUM SIGN SIZE SCHEDULE

LEHRER'S FLOWERS

TYPICAL WALL MOUNTED SIGN

1/4" = 1'-0"

NOTE: STYLE OF LETTERS MAY DIFFER FROM THAT SHOWN AND MAY VARY FROM TENENT TO TENANT

WALL MOUNTED SIGN SCHEDULE

A MAXIMUM SIZE: 1'-6" HIGH x 19'-0" LONG
AREA: 28.5 S.F.
QUANTITY: 1

B MAXIMUM SIZE: 1'-6" HIGH x 22'-0" LONG
AREA: 33 S.F.
QUANTITY: 1

C MAXIMUM SIZE: 1'-6" HIGH x 20'-0" LONG
AREA: 30 S.F.
QUANTITY: 5

D MAXIMUM SIZE: 1'-6" HIGH x 19'-0" LONG
AREA: 28.5 S.F.
QUANTITY: 1

E MAXIMUM SIZE: 1'-6" HIGH x 26'-0" LONG
AREA: 39 S.F.
QUANTITY: 1

WALL MOUNTED SIGN NOTES

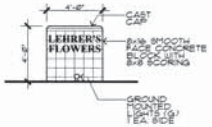
1. TEMPORARY BANNERS WILL NOT BE ALLOWED.
2. NO WINDOW SIGNS SHALL BE VISIBLE FROM S. BOULDER RD.
3. GRAPHICAL LOGOS ARE LIMITED TO 20% OF THE SIGN AREA.

WALL MOUNTED SIGN SPECIFICATIONS

INDIVIDUAL "CHANNEL" LETTERS
MIN. 20GA. METAL RETURNS AND BACKS
5" DEPTH
INTERNAL NEON ILLUMINATION
TRANSLUCENT ACRYLIC FACES

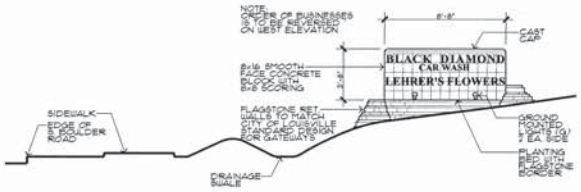
WALL MOUNTED SIGNS

NOTE: STYLE OF LETTERS MAY DIFFER FROM THAT SHOWN.



TYP. ELEVATION HECLA WAY SIGN

1/4" = 1'-0"



EAST ELEVATION S. BOULDER ROAD SIGN

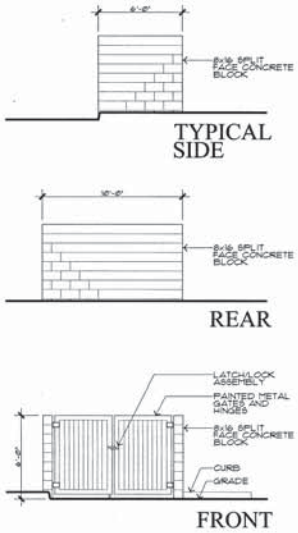
1/4" = 1'-0"

MONUMENT SIGN SPECIFICATIONS

SOUTH BOULDER ROAD SIGN AREA: 32 S.F.
HECLA WAY SIGN AREA: 16 S.F.

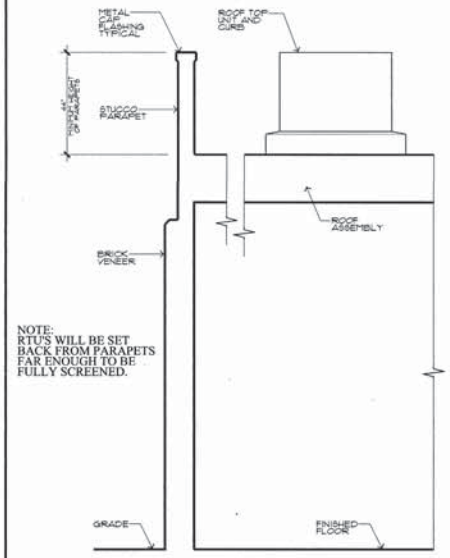
LETTERS:
INDIVIDUAL "CHANNEL" LETTERS
MIN. 20GA. METAL FRONTS, BACKS, AND RETURNS
2" DEPTH
EXTERNAL ILLUMINATION

MONUMENT SIGNS



DUMPSTER ENCLOSURE

1/4" = 1'-0"



1/A4 RTU SCREENING

1/2" = 1'-0"

ROBERT CHISHOLM ARCHITECTS

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LEHRER'S FLOWERS
LOT 5, LOUISVILLE PLAZA FILING 2
LOUISVILLE, COLORADO

DETAILS
SIGN CRITERIA

SEP. 20, 2000
SCALE NOTED

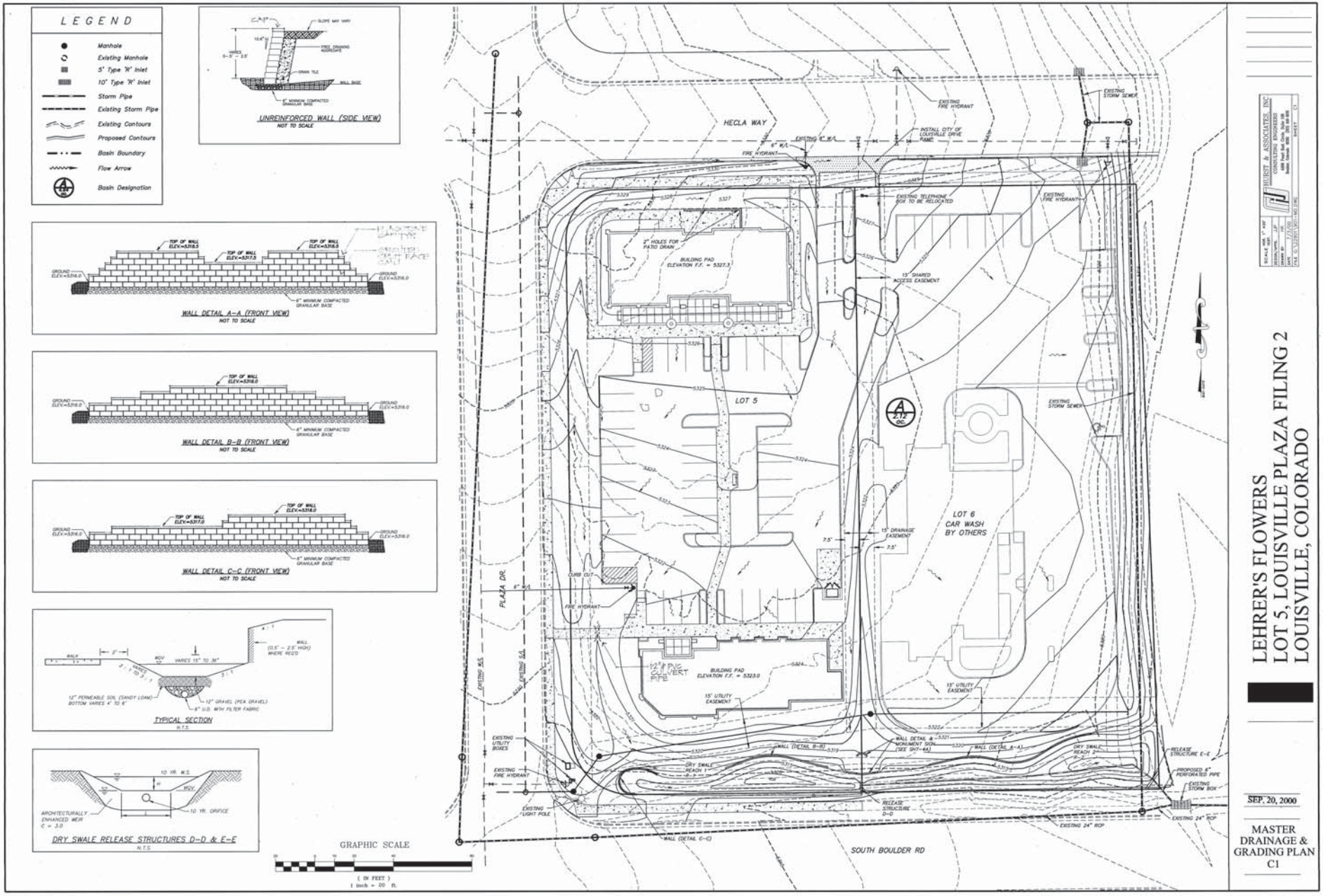
A4

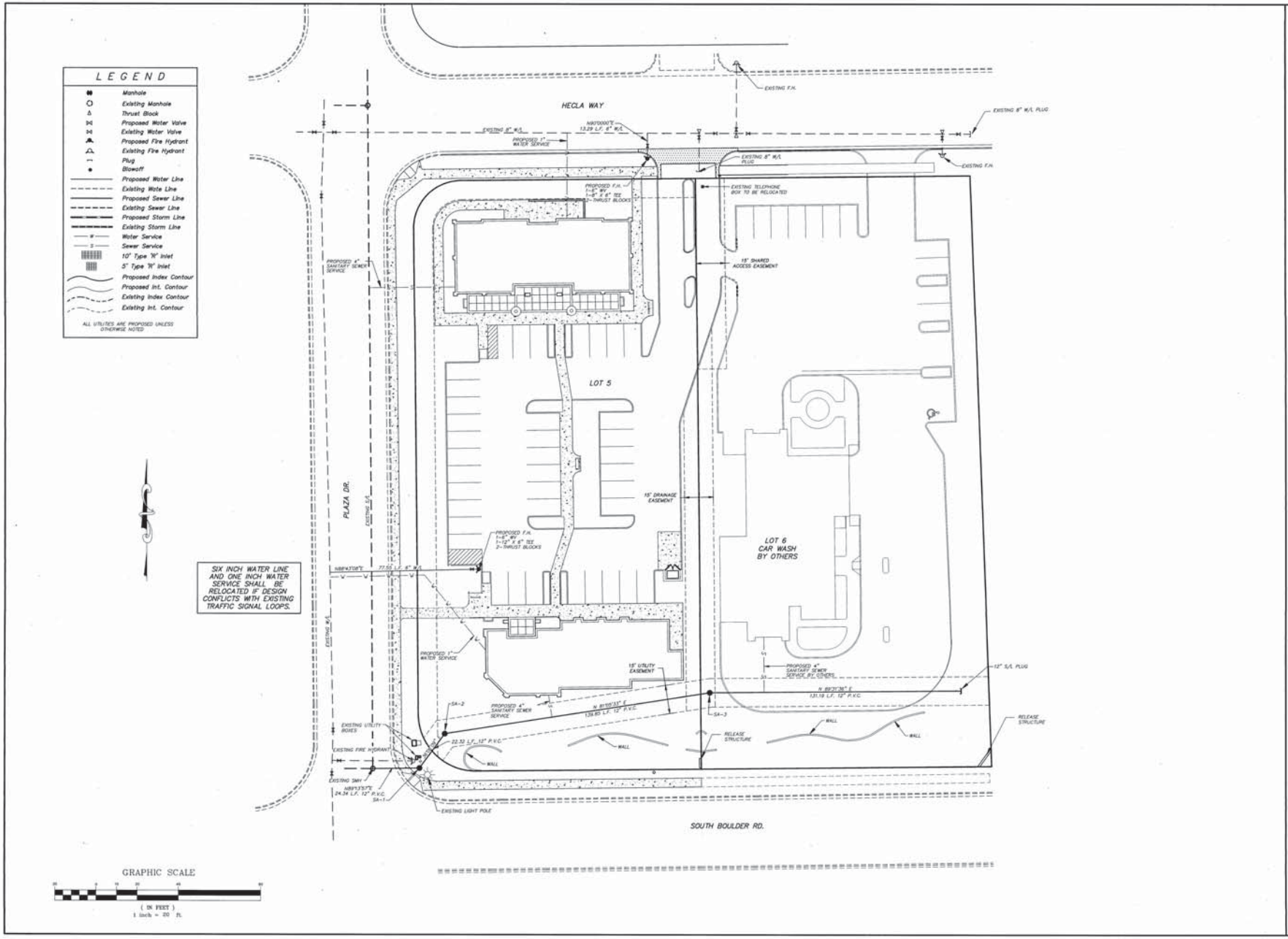
DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER

LEHRER'S FLOWERS
LOT 5, LSVL. PLZ., FILING # 2
5 OF 9


LEGEND
Manhole
Existing Manhole
5' Type 'R' Inlet
10' Type 'R' Inlet
Storm Pipe
Existing Storm Pipe
Existing Contours
Proposed Contours
Basin Boundary
Flow Arrow
Basin Designation
UNREINFORCED WALL (SIDE VIEW)
NOT TO SCALE
WALL DETAIL A-A (FRONT VIEW)
NOT TO SCALE
WALL DETAIL B-B (FRONT VIEW)
NOT TO SCALE
WALL DETAIL C-C (FRONT VIEW)
NOT TO SCALE
TYPICAL SECTION
N.T.S.
DRY SWALE RELEASE STRUCTURES D-D & E-E
N.T.S.
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.
HECLA WAY
PLAZA DR.
SOUTH BOULDER RD
LOT 5
LOT 6
CAR WASH
BY OTHERS
BUILDING PAD
ELEVATION F.F. = 5327.3
BUILDING PAD
ELEVATION F.F. = 5323.0
EXISTING FIRE HYDRANT
EXISTING STORM SEWER
EXISTING TELEPHONE BOX TO BE RELOCATED
INSTALL CITY OF LOUISVILLE DRIVE RAMP
15' SHARED ACCESS EASEMENT
15' DRAINAGE EASEMENT
15' UTILITY EASEMENT
12" PVC CULVERT PIPE
CURB CUT
EXISTING UTILITY BOXES
EXISTING LIGHT POLE
DRY SWALE REACH 1
DRY SWALE REACH 2
RELEASE STRUCTURE D-D
RELEASE STRUCTURE E-E
PROPOSED 6" PERFORATED PIPE
EXISTING STORM BOX
EXISTING 24" RCP
WALL (DETAIL A-A)
WALL (DETAIL B-B)
WALL (DETAIL C-C)
WALL DETAIL & MONUMENT SIGN (SEE SHT-4A)
HURST & ASSOCIATES, INC
CONSULTING ENGINEERS
LEHRER'S FLOWERS
LOT 5, LOUISVILLE PLAZA FILING 2
LOUISVILLE, COLORADO
SEP. 20, 2000
MASTER
DRAINAGE &
GRADING PLAN
C1
DRAWING NUMBER
LEHRER'S FLOWERS
LOT 5, LSVL. PLZ. FILING #2
6 OF 9



HURST & ASSOCIATES, INC
CONSULTING ENGINEERS
4600 Pearl East Circle, Suite 100
Boulder, Colorado 80301 (303) 443-8616
SHEET C2
SCALE NONE
DESIGN CHK. JJP
DRAWN BY DC
DATE 9/20/00
P.E. # 27201 (JJP) (MJ)

LEHRER'S FLOWERS
LOT 5, LOUISVILLE PLAZA FILING 2
LOUISVILLE, COLORADO

SEP. 20, 2000

MASTER UTILITY PLAN C2

DRAWING NUMBER

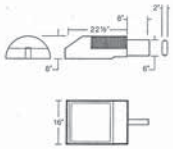
LEHRER'S FLOWERS
LOT 5, LSVL. PLZ., FILING #2
7 OF 9

POLE LIGHT (P)

KIM LIGHTING AR ARCHETYPE

DESCRIPTION: ONE PIECE DIE-CAST ALUMINUM WITH POWDER COAT PAINT.
LENS: CLEAR FLAT TEMPERED GLASS IN ONE-PIECE DIE-CAST ALUMINUM LENS FRAME.
MOUNTING: ALUMINUM SUPPORT ARM WITH INTERNAL DRAW BOLTS. 22' SQUARE BRONZE POLE ON CONCRETE BASE (SEE DETAIL)
LAMP: ONE 250W METAL HALIDE
COLOR: DARK BRONZE

QUANTITY: 5

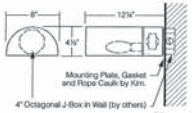


WALL MOUNTED FIXTURE (W)

KIM LIGHTING SW1 SITE WALLFORMS

DESCRIPTION: ONE PIECE CAST ALUMINUM WITH POWDER COAT PAINT.
LENS: CLEAR FLAT TEMPERED GLASS.
MOUNTING: CONCEALED BOLT ATTACHMENT TO WALL.
LAMP: ONE 50W METAL HALIDE
COLOR: DARK BRONZE

QUANTITY: 12



GROUND MOUNTED FIXTURE (G)

KIM LIGHTING EL205 SQUARE HOOD

DESCRIPTION: DIE-CAST ALUMINUM WITH POWDER COAT PAINT.
LENS: CONVEX CLEAR TEMPERED GLASS.
MOUNTING: PORTABLE SPEAR MOUNT.
LAMP: ONE 50w PAR 50 HALOGEN.
COLOR: BLACK

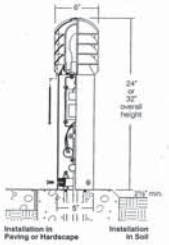
QUANTITY: 4

BOLLARD (B)

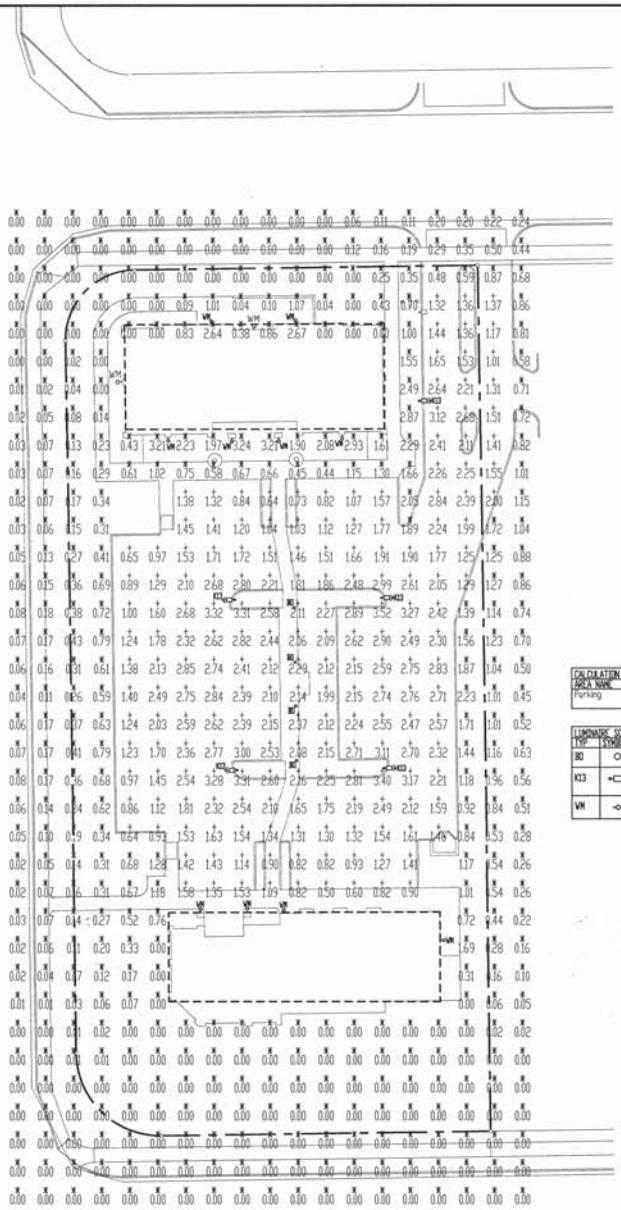
KIM LIGHTING CB COMPACT BOLLARD

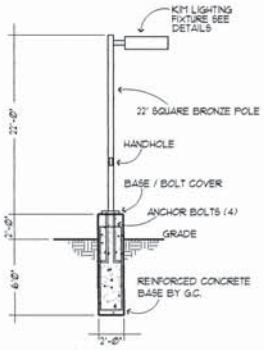
DESCRIPTION: INTERLOCKING DIE-CAST ALUMINUM SECTIONS WITH CONCEALED STAINLESS STEEL SCREWS. POWDER COAT PAINT.
MOUNTING: ANCHOR BOLTS IMBEDDED IN A POURED-IN-PLACE CONCRETE FOOTING.
LAMP: ONE 50W METAL HALIDE
COLOR: DARK BRONZE

QUANTITY: 4



LIGHT FIXTURE DETAILS





POLE BASE DETAIL
NOT TO SCALE

CALCULATION SUMMARY-

AREA NAME	DIMENSIONS	GRID NAME	AVE	MAX	MIN
Parking		grade	(+) 1.9	3.5	0.5
			(x) 6.3	3.2	0.0

LUMINAIRE SCHEDULE

TYP	SYMBOL	DESCRIPTION	LAMP	LUMENS	MOUNTING/BALLAST	LLF	QTY
BO	○	Kim LB32/50MH26/BL-P BOLLARD	(1) 50MH/MED	3500	STD	0.78	4
K13		KIM LIGHTING 250MH III (1) "2" AR3/250MHMW/	(1) MS-250/HOR	23000	22' SQS 2' concrete	0.68	5
WM		Progress P5641-31	(1) 50PAR20	1190	N/A	0.74	10

PHOTOMETRIC SITE PLAN

1" = 20'

ROBERT CHISHOLM ARCHITECTS
1 · 1 · 0 · 8
WASHINGTON AVE
GOLDEN CO 80401
PH. 303 277 9390
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E.M. CHISHOLM@USWEST.NET

LEHRER'S FLOWERS
LOT 5, LOUISVILLE PLAZA FILING 2
LOUISVILLE, COLORADO

PHOTOMETRIC SITE PLAN

LIGHT FIXTURE DETAILS

SEP. 20, 2000

SCALE NOTED

E1

DRAWING NUMBER

LEHRER'S FLOWERS
LOT 5, LSVL. PLZ. FILING #2
8 OF 9

PLANT LIST

KEY	BOTANIC NAME	COMMON NAME	SIZE	QTY.	NOTES
DECIDUOUS TREES					
AP	ACER PLATANOIDES	EMERALD QUEEN MAPLE	3"	7	
CT	CELTIS OCCIDENTALIS	HACKBERRY	"	6	
GT	GLEDITSIA TRIACANTHOS VAR.	SKYLINE LOCUST	"	12	
PYR	PYRUS CALLERYANA VAR.	BRADFORD PEAR	2"	8	
TCG	TILIA CORDATA GREENSPIRE	GREENSPIRE LINDEN	3"	7	
EVERGREEN TREES					
AC	ABIES CONCOLOR	WHITE FIR	6-8'	4	BB
PP	PICEA PUNGENS	COLORADO SPRUCE	"	2	BB
DECIDUOUS SHRUBS					
CA	COTONEASTER APICULATA	CRANBERRY COTONEASTER	5 GAL.	23	2'+SPREAD
CAA	CORNUS ALBA ARGENTEO MAR.	VARIEGATED DOGWOOD	"	17	2'+ HT.
CB	CORNUS BAILEYI	BAILEY DOGWOOD	"	16	3'+ HT.
CD	COTONEASTER DIVARICATA	SPREADING COTONEASTER	"	13	"
PJ	POTENTILLA FRUTICOSA VAR.	JACKMAN POTENTILLA	"	23	2'+ HT.
RA	RIBES AUREUM	GOLDEN CURRANT	"	4	3'+ HT.
SBF	SPIRAEA BUMALDA FROEBELI	FROEBEL SPIREA	"	18	2'+ HT.
VL	VIBURNUM LANTANA	WAYFARINGTREE	"	22	3'+ HT.
VOC	VIBURNUM OPULUS COMPACTUM	COMPACT CRANBERRY	"	22	2'+ HT.
EVERGREEN SHRUBS					
JMS	JUNIPERUS MEDIA 'SEA GREEN'	SEA GREEN JUNIPER	5 GAL.	24	2'+SPREAD
JHA	JUNIPERUS HORIZONTALIS ANDORRA	ANDORRA JUNIPER	"	15	"
MA	MAHONIA AQUIFOLIUM COMPACTA	COMPACT OREGON GRAPE HOLLY	"	27	"
JSB	JUNIPERUS SABINA BROADMOOR	BROADMOOR JUNIPER	"	31	"
GROUNDCOVERS					
GT	CERASTIUM TOMENTOSA	SNOW IN SUMMER	1 GAL.	50	
VM	VINCA MINOR	PERIWINKLE	"	100	
PERENNIALS					
AST	ASTER	FALL ASTER	1 GAL.	10	
AQ	AQUILEGIA	COLUMBINE	"	25	
CM	CHRYSANTHEMUM	CUSHION MUMS	"	20	
LSU	LEUCANTHEMUM VAR.	DWARF SHASTA DAISY	"	15	
EVERGREEN TREE					
PGC	PICEA GLAUCA CONICA	DWARF ALBERTA SPRUCE	5-6'	1	BB

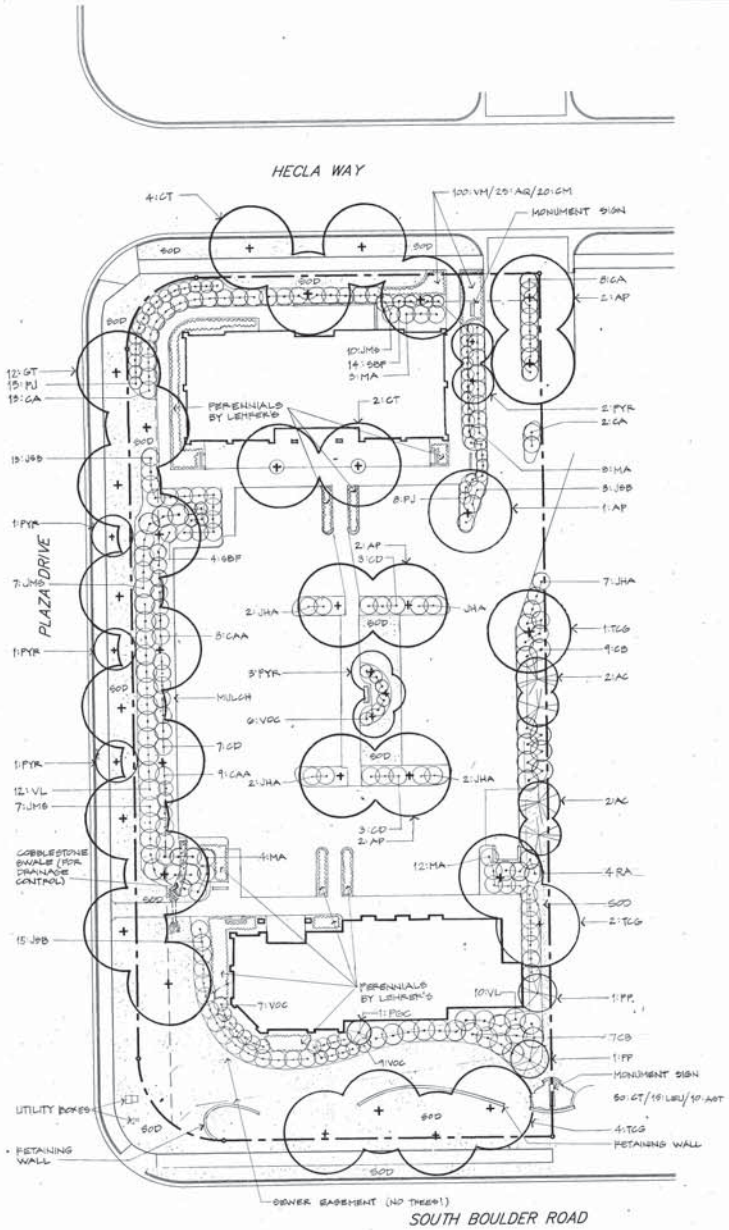
LANDSCAPE NOTES

- STEEL EDGER TO BE USED WHERE PLANTING BEDS ARE ADJACENT TO SOD.
- ALL PLANTING BEDS SHALL BE MULCHED TO A DEPTH OF 4" MINIMUM. USE COARSE WOOD MULCH WITH WEED BARRIER FABRIC BENEATH.
- IN GROUNDCOVER BEDS PLACE WOOD MULCH IN A 1" LAYER WITHOUT WEED BARRIER.
- SOIL PREP ALL SOD AND GROUNDCOVER AREAS WITH WELL ROTTED ORGANICS AT THE RATE OF 3 CU. YDS. PER 1,000 SQ. FT., SPREAD EVENLY AND ROTOTILL TO A MINIMUM DEPTH OF 6 INCHES.
- MAINTAIN POSITIVE DRAINAGE IN ALL AREAS. (2% MINIMUM SLOPE)
- STAKE AND GUY ALL TREES FOR ONE YEAR. REMOVE AFTER ONE YEAR.
- SOD TO BE A DROUGHT TOLERANT VARIETY CONTAINING A MIX OF FESCUES AND BLUE GRASSES.
- SPRAY IRRIGATE SOD AND GROUNDCOVERS. DRIP IRRIGATE SHRUBS AND TREES. PROVIDE FULLY AUTOMATIC IRRIGATION SYSTEM ADJUSTED FOR OPTIMAL COVERAGE.
- CONTRACTOR TO PROVIDE ONE YEAR GUARANTEE ON ALL PLANTS, SOD AND IRRIGATION SYSTEM FOLLOWING FINAL ACCEPTANCE.
- THE PROPERTY OWNER, THE SUCCESSORS AND ASSIGNEES ARE RESPONSIBLE FOR PROVIDING, PROTECTING AND MAINTAINING ALL LANDSCAPING IN A HEALTHY AND GROWING CONDITION.

PLAN PREPARED BY:

ARNOLD ASSOCIATES
5414 ALLISON STREET
ARVADA, CO 80002
(303) 423-1968

LANDSCAPE ARCHITECTS



LANDSCAPE PLAN

LEHRER'S FLOWERS
LOT 5, LOUISVILLE PLAZA FILING 2
LOUISVILLE, COLORADO

LANDSCAPE PLAN

SEP. 20, 2000

1" = 20'

L1

DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER

LEHRER'S FLOWERS
LOT 5, LSVL. PLZ., FILING #2

9 OF 9

Lot 5
Louisville Plaza
Filing 2

DRAWING NUMBER

DRAWING NUMBER

Jiffy Lube &
Lehrer's Flowers

2703354

H:\L Louisville_2416\PUD\Plotting\A0-0.dwg

jiffy lube and Lehrer's Flowers

FINAL PUD DEVELOPMENT PLAN

LOUISVILLE, CO

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OWNER:
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Austin, TX 78759
512.346.7030 tel.

ARCHITECT:
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Denver, CO 80202
303.302.7110 tel.

MECH / ELECTRICAL ENGINEER:
Belfay Engineering
2811 West 9th Avenue
Denver, CO 80204
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CIVIL ENGINEER:
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4840 Pearl E Circle
Boulder, CO 80301
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STRUCTURAL ENGINEER:
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12596 W Bayaud Ave, Suite 450
Lakewood, CO 80228
303.433.8486 tel.

LANDSCAPE ARCHITECT:
Design Concepts
211 N Public Road, Suite 200
Lafayette, CO 80026
303.664.5301 tel.

REQUIRED PUD & SPECIAL REVIEW USE CERTIFICATES

CITY COUNCIL CERTIFICATE

APPROVED THIS 15 DAY OF March, 2005 BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO. RESOLUTION NO. 9 SERIES 2005

MAYOR — CITY CLERK

PLANNING COMMISSION CERTIFICATE

RECOMMENDED APPROVAL THIS 10th DAY OF February, 2005 BY THE PLANNING COMMISSION OF THE CITY OF LOUISVILLE, COLORADO. RESOLUTION NO. 4 SERIES 2005.

CHAIRPERSON — SECRETARY

CLERK AND RECORDER CERTIFICATE
(COUNTY OF BOULDER, STATE OF COLORADO)

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED IN MY OFFICE AT 4:42 O'CLOCK P.M. THIS 11th DAY OF July, 2005 AND IS RECORDED IN PLAN FILE 2-43 F-53 FEE $12.00 PAID FILM NO. 2703354 RECEPTION # 29,30,31,32,33,34,35, 36,37,38,39,40

LINDA N. SALAS — RECORDER — DEPUTY

OWNERSHIP SIGNATURE BLOCK

BY SIGNING THIS PUD, THE OWNER ACKNOWLEDGES AND ACCEPTS ALL THE REQUIREMENTS AND INTENT SET FORTH IN THIS PUD.

Witness my hands and seals this 29th day of June, 2005.

OWNER — OWNER

NOTARY

SIGNATURE BLOCK

PROJECT DATA:

Original Legal Description:

Lot 5, Louisville Plaza Filing No. 2, City of Louisville, Boulder County, Colorado.

Proposed Legal Description:

Lots 1 and 2, Louisville Plaza Filing No. 3, City of Louisville, Boulder County, Colorado.

Area Calculations:	**Jiffy Lube**	**Lehrer's**
Building Footprint	2680sf (10.3%)	3376sf (17.3%)
Access Drives	6945sf (26.7%)	2797sf (14.2%)
Parking Circulation	4653sf (17.9%)	5354sf (27.0%)
Open Area		
Landscape	10156sf (39.0%)	6290sf (32.5%)
Hardscape	1601sf (6.1%)	1804sf (9.0%)
Total Area	26035sf (0.60± ac)	19326sf (0.44± ac)
Floor Area Ratio (FAR):		
Total Building Area	4180sf	3376sf
Total Site Area	26035sf	19326sf
FAR =	16.1%	17.5%
Parking Calculations:		
Total Parking Required: (4.5 spaces per 1000sf) * Service pit/basement not included in sf	2680sf* = 12 spaces	3376sf = 16 spaces
Total Parking Provided:	17 spaces	16 spaces
Accessible Spaces Required: (Per IBC 1106.2)	1 space	1 space
Accessible Spaces Provided:	1 space	1 space

General Note:
Any existing curb, gutter or sidewalk adjacent to the site (Lots 1 and 2) that is damaged, settled or heaved shall be removed and replaced by the developer, at the developer's expense as part of the project.

PROJECT DATA

DRAWING INDEX:

A0.0 COVER SHEET
C1 GRADING PLAN
C2 UTILITY SERVICE PLAN
L1.0 LANDSCAPE PLAN
A1.1 SITE PLAN / SITE DETAILS
A2.1 JIFFY LUBE EXTERIOR ELEVATIONS
A2.2 JIFFY LUBE EXTERIOR ELEVATIONS
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A2.4 LEHRER'S EXTERIOR ELEVATIONS
A3.1 PHOTOMETRIC PLAN & LIGHTING DETAILS
A3.2 SIGNAGE PLAN & DETAILS
A3.3 PHASING PLAN

DRAWING INDEX

VICINITY MAP

NTS

jiffy lube
and
Lehrer's Flowers

S BOULDER RD AT PLAZA DR
LOUISVILLE, CO

CARCOLO #1 LTD.
9111 JOLLYVILLE ROAD, SUITE 106
AUSTIN, TX 78759

LICENSED ARCHITECT JERRY GORDON PEDERSEN NO. B-1863 STATE OF COLORADO

O+P

PROJ. NO. 2416	FINAL PUD & DEV. PLAN 12 NOV 2004	PLAN. COMM. CONDITIONS 21 FEB 2005
	PUD COMMENTS 03 JAN 2005	
	PLAN. COMM. COMMENTS 28 JAN 2005	

COVER SHEET

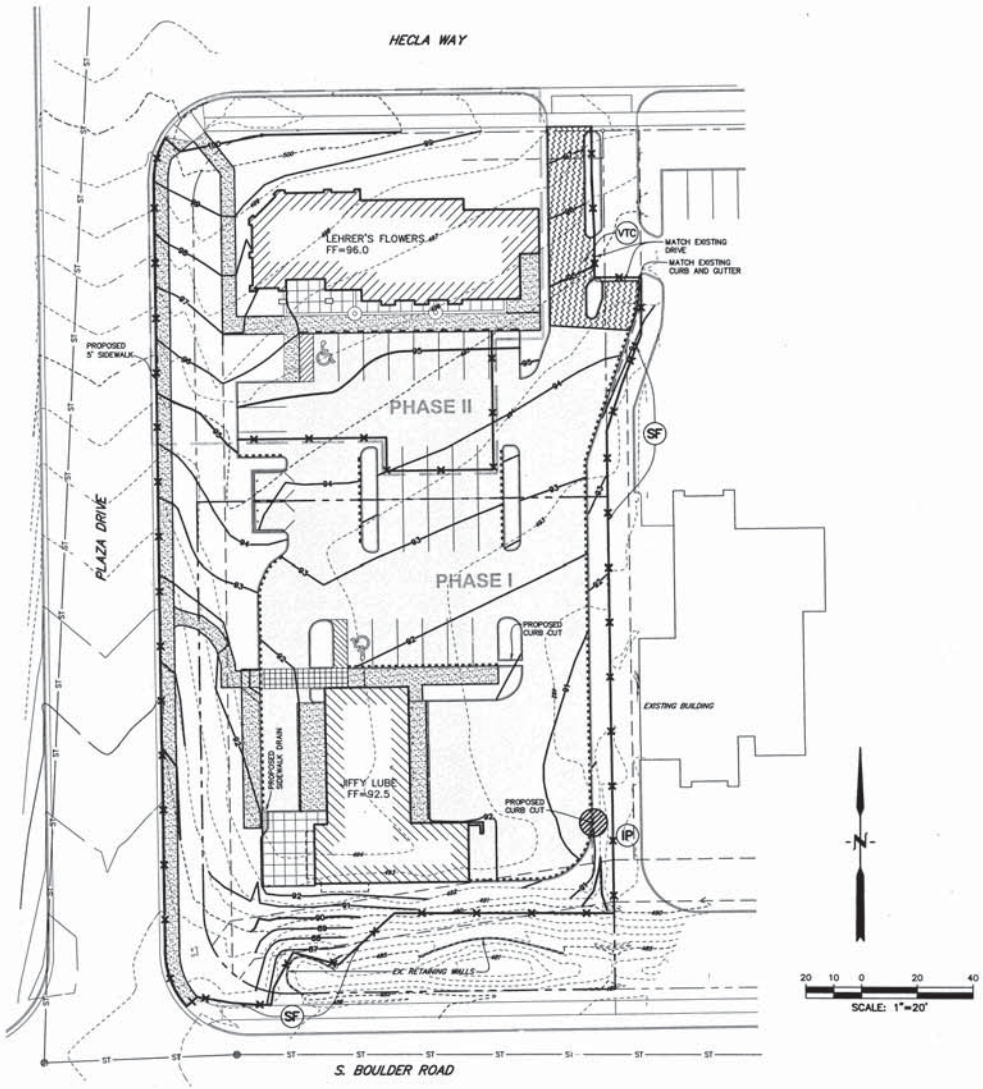
A0.0

Lot 5
Louisville Plaza
Filing 2

DRAWING NUMBER

DRAWING NUMBER

Jiffy Lube &
Lehrer's Flowers



LEGEND

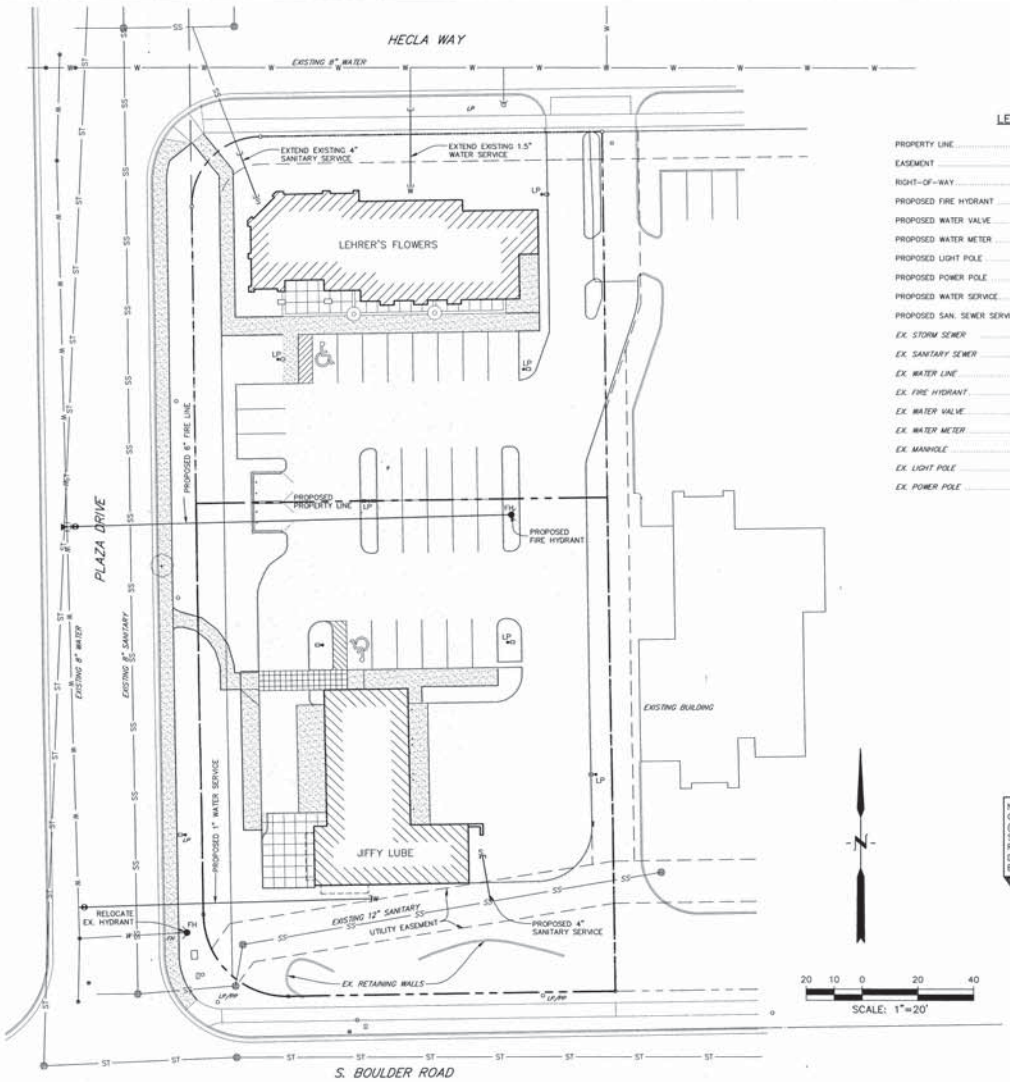
PROPOSED INTERMEDIATE CONTOUR	64
PROPOSED INDEX CONTOUR	65
PROPOSED SPOT ELEVATION (ALL C&G ELEVATIONS ARE ? U.N.O.)	54.67
EX. INTERMEDIATE CONTOUR	5364
EX. INDEX CONTOUR	5365
CATCH CURB AND GUTTER (ALL OTHER SHALL BE SPILL)	
THICKENED EDGE WALK	
HIGH POINT	HP
GRADE BREAK	GB
LOW POINT	LP
TOP BACK OF CURB	TOC
FLOWLINE	? or FL
EX. STORM SEWER	ST
EX. MANHOLE	MH
PROPOSED CONCRETE	
PROPOSED ASPHALT	
SILT FENCE	SF
INLET PROTECTION	IP
VEHICLE TRACKING CONTROL	VTC

N

20 10 0 20 40
SCALE: 1"=20'

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

PREPARED BY: Drexel, Barrell & Co. Engineers • Surveyors 4640 PEAR, EAST CIRCLE, SUITE 114 BOULDER, COLORADO 80301 (303) 442-4338 6385 CORPORATE DRIVE COLORADO SPRINGS, COLORADO 80919 (719) 260-0887 910 54TH AVENUE, SUITE 210 GREELEY, COLORADO 80634 (970) 351-0640 CONTACT: ANNE M. PAGANO, P.E.	PREPARED FOR: OVERWAY + PEDERSEN ARCHITECTS 1675 LARIMER STREET, SUITE 640 DENVER, COLORADO 80202 (303) 302-7110 CONTACT: JEFF PEDERSEN	PROJECT INFO: JIFFY LUBE AND LEHRER'S FLOWERS LOT 5, LOUISVILLE PLAZA FILING 2 LOUISVILLE, COLORADO	DESIGNED BY: MAA/SNW DRAWN BY: MAA CHECKED BY:	REVISION DESCRIPTIONS: CITY COMMENTS DATE: 12/30/04	DRAWING INFO.: EROSION CONTROL AND GRADING PLAN	DATE: 17 NOV 2004 SCALE: = 1" = 20' = NONE	JOB NO.: E-5571 DRAWING NO.: 6D 076	SHEET 1 SHEETS 2



LEGEND

PROPERTY LINE	
EASEMENT	
RIGHT-OF-WAY	
PROPOSED FIRE HYDRANT	FH
PROPOSED WATER VALVE	
PROPOSED WATER METER	
PROPOSED LIGHT POLE	LP
PROPOSED POWER POLE	PP
PROPOSED WATER SERVICE	W
PROPOSED SAN. SEWER SERVICE	S
EX. STORM SEWER	ST
EX. SANITARY SEWER	SS
EX. WATER LINE	W
EX. FIRE HYDRANT	FH
EX. WATER VALVE	WV
EX. WATER METER	WM
EX. MANHOLE	MH
EX. LIGHT POLE	LP
EX. POWER POLE	PP

NOTE: ANY EXISTING CURB, GUTTER, OR SIDEWALK ADJACENT TO THE SITE (LOTS 1 AND 2) THAT IS DAMAGED, SETTLED OR HEAVED SHALL BE REMOVED AND REPLACED BY THE DEVELOPER, AT THE DEVELOPER'S EXPENSE AS PART OF THE PROJECT

CALL UTILITY NOTIFICATION CENTER OF COLORADO

1-800-922-1987

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

PREPARED BY: Drexel, Barrell & Co. Engineers • Surveyors 4640 PEARL EAST CIRCLE, SUITE 114 BOULDER, COLORADO 80301 (303) 442-4338 8365 CORPORATE DRIVE COLORADO SPRINGS, COLORADO 80919 (719) 260-0887 910 54TH AVENUE, SUITE 210 GREELEY, COLORADO 80634 (970) 351-0645 CONTACT: ANNE M. PAGANO, P.E.	PREPARED FOR: OVERWAY + PEDERSEN ARCHITECTS 1675 LARIMER STREET, SUITE 640 DENVER, COLORADO 80202 (303) 302-7110 CONTACT: JEFF PEDERSEN	PROJECT INFO: JIFFY LUBE AND LEHRER'S FLOWERS LOT 5, LOUISVILLE PLAZA FILING 2 LOUISVILLE, COLORADO	DESIGNED BY: MAA/BNN DRAWN BY: MAA CHECKED BY:	REVISION DESCRIPTIONS: CITY COMMENTS DATE: 12/30/04	DRAWING INFO: UTILITY SERVICE PLAN

DATE: 17 NOV 2004	JOB NO: E-5571	SHEET 2
SCALE: H 1" = 20' V AS SHOWN	DRAWING NO: 6D 076	SHEETS 2

Lot 5 Louisville Plaza Filing 2

DRAWING NUMBER

DRAWING NUMBER

Jiffy Lube & Lehrer's Flowers

Lot 5
Louisville Plaza
Filing 2

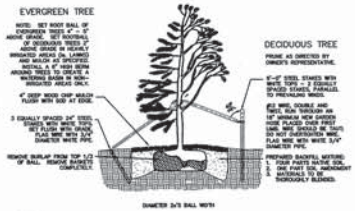
DRAWING NUMBER

DRAWING NUMBER

Jiffy Lube &
Lehrer's Flowers

NOTES:

1. THE CONTRACTOR IS TO FURNISH AND INSTALL PLANT MATERIALS AS NOTED. ALL PLANT MATERIAL MUST EQUAL OR EXCEED THE STANDARDS CURRENTLY REQUIRED BY THE AMERICAN ASSOCIATION OF NURSERYMAN, ALL MATERIALS SHALL BE NO. #1 GRADE, NURSERY GROWN STOCK. COLLECTED MATERIALS SHALL NOT BE USED UNLESS APPROVED BY THE OWNER'S REPRESENTATIVE.
2. THE CONTRACTOR IS TO STAKE THE LAYOUT OF THE PLANT MATERIALS PRIOR TO PLANTING AND HAVE SUCH LAYOUT APPROVED BY THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.
3. CONTRACTOR TO REPAIR OR REPLACE ANY SOD, MULCH OR SITE IMPROVEMENTS DISTURBED OR DAMAGED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR TO PROVIDE FOR PROTECTION OF ALL UTILITIES AND APPURTENANCES PRIVATE OR PUBLIC PROPERTY, AND PUBLIC SAFETY FOR THE DURATION OF THE CONTRACT AND SHALL REPAIR OR REPLACE ANY DAMAGES TO SAME WITHOUT ADDITIONAL COST TO THE OWNER.
5. CONTACTOR SHALL SECURE AND PAY ALL APPLICABLE TAXES, PERMITS, FEES AND COSTS IN CONNECTION WITH THE WORK UNDER THE CONTRACT.
6. CONTRACTOR SHALL KEEP THE PREMISES AND PUBLIC RIGHTS OF WAY, CLEAN AND ORDERLY ON DAILY BASIS SAND SHALL DISPOSE OF ALL WASTE AND DEBRIS AT AN APPROVED LOCATION OFF-SITE PRIOR TO FINAL ACCEPTANCE.
7. CONTRACTOR TO MAINTAIN ALL PLANTINGS, MULCHES, GRADES, SURFACES AND IRRIGATION SYSTEM COMPONENTS, INSTALLED UNDER THIS CONTRACT UNTIL FINAL ACCEPTANCE AND TURNOVER TO OWNER.
8. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR ONE FULL YEAR. ANY PLANT MATERIAL THAT IS IN QUESTIONABLE CONDITION SHALL RECEIVE AN EXTENDED GUARANTEE OF THE OWNER'S REPRESENTATIVE. ALL GUARANTEES ON PLANTS ARE 100% INCLUDING MATERIALS, LABOR AND COSTS BASED UPON A ONE-TIME REPLACEMENT.
9. PRIOR TO ANY PLANTING OPERATIONS, ALL PLANTING AREAS SHALL BE PREPARED WITH 3 CUBIC YARDS/1,000 SQUARE FETOR SCREENED WELL ROTTED AND COMPOSED MANURE ROTOTILLED A MINIMUM OF 6" DEEP INTO THE SOIL PROFILE. CONTRACTOR SHALL PROVIDE DELIVERY/JOB TICKETS VERIFYING QUANTITY AND TYPE OF MATERIAL UTILIZED IN THE WORK FOR THE OWNER'S REPRESENTATIVES REVIEW AND APPROVAL.
10. ALL TREES AND SHRUBS ARE TO BE PLANTED AFTER ROUGH GRADING AND PRIOR TO PLACING OF GROUND COVER MATERIAL. ALL FINISH GRADES OF SURFACES AND MATERIALS SHALL BE ONE (1") INCH BELOW SURROUNDING HARDSCAPE FINISH GRADES (I.E. WALKWAYS, EDGING, CURBS, ETC.)
11. SOD SHALL BE A BLEND OF 4 VARIETIES OF IMPROVED BLUEGRASS AND FESCUE, APPROVED BY THE OWNER'S REPRESENTATIVE. THE SOD SHALL BE LAID ON A FIRM PREPARED BED WITH TIGHT JOINTS AND NO VOIDS BETWEEN STRIPS. AREAS SHALL BE SETTLED AND FINE GRADED TO A SMOOTH, UNIFORM, FIRM SURFACE LEAVING NO DEPRESSIONS WHERE WATER MAY COLLECT ("0.10"). ALL DEBRIS, VEGETATION, OR ROCKS ECT. OVER 1" IN DIAMETER SHALL BE REMOVED BY THE CONTRACTOR AND PROPERLY DISPOSED OF OFF-SITE.
12. PLANTING BED STEEL EDGE TO BE RYERSON STEEL EDGE, 1/8"X4"X10', OR EQUAL, AS APPROVED BY THE OWNER'S REPRESENTATIVE.
13. ALL PLANTING BEDS TO BE MULCHED WITH CEDAR WOOD CHIP MULCH OVER GEOTEXTILE FABRIC AS SPECIFIED ON THE PLAN. SUBMIT SAMPLE TO OWNER'S REPRESENTATIVE FOR APPROVAL. MULCH ALL PLANTING BEDS AT A MINIMUM DEPTH OF FOUR (4") INCHES.
14. ALL TREES PLANTED IN LAWN SHALL BE MULCHED WITH CEDAR WOOD CHIP MULCH TO A DEPTH OF FOUR (4") INCHES. CONTRACTOR TO SUBMIT SAMPLE FOR OWNER'S REPRESENTATIVE. RING TO BE 4' DIAMETER.
15. PLACE GEOTEXTILE FABRIC (MIRAFI #140-S OR EQUAL)) UNDER ALL MULCH IN ALL PLANTING BEDS.
16. ALL PLANT AREAS SHALL BE WATERED BY AN AUTOMATIC IRRIGATION SYSTEM.
17. ALL HEADS TO BE ADJUSTED TO PREVENT OVERSPRAY ONTO BUILDINGS AND WALKWAYS.
18. BACKFLOW PREVENTION DEVICE SHALL BE IN ACCORDANCE WITH CITY OR COUNTY SPECIFICATIONS.
19. ALL PLANTED TREES TO MAINTAIN 10' MINIMUM CLEARANCE FROM SEWER AND WATER LINES, 4' FROM GAS LINES. ALL PLANTED SHRUBS TO MAINTAIN 4' MINIMUM CLEARANCE FROM SEWER, WATER AND GAS LINES. (TO PREVENT CONFLICTS WITH EXISTING UTILITIES, STREET TREE QUANTITIES AND LOCATIONS HAVE BEEN LIMITED TO THE AREAS SHOWN ON THE PLAN.)
20. SEED MIX SHALL BE AS INDICATED IN TABLE. BROADCAST SEED IN TWO EQUAL APPLICATIONS, IN PERPENDICULAR DIRECTIONS. LIGHTLY RAKE AFTER SEED IS BROADCAST IN A DIRECTION PERPENDICULAR TO THE SLOPE OF THE LAND. HYDROMULCH SEED AREAS AT A RATE OF 2,000 LBS/ACRE.



2 L1.0 TREE PLANTING DETAIL
NOT TO SCALE

3 L1.0 SHRUB PLANTING DETAIL
NOT TO SCALE

PLANT SCHEDULE:

ABB	QTY	COMMON NAME / Botanical Name	WATER USEAGE	MAINT. REQUIRE	MATURE SPREAD	SIZE
DECIDUOUS SHADE TREES:						
ACFL	6	FAIRVIEW MAPLE Acer platanoides 'Fairview' **	(M)	(L)	40'-50'	2-1/2" B&B
CEOC	4	WESTERN HACKBERRY Celtis occidentalis**	(M-L)	(L)	40'-50'	2-1/2" B&B
GLSK	1	SKYLINE LOCUST Gleditsia triacanthos inermis 'Skyline' **	(L)	(L)	25'	2-1/2" B&B
GLSH	4	SHADEMASTER LOCUST Gleditsia triacanthos inermis 'Shademaster' **	(L)	(L)	25'	2-1/2" B&B
TICO	4	GREENSPIRE LINDEN Tilia cordata 'Greenspire' **	(M)	(L)	25'-30'	2-1/2" B&B
QUMA	9	BUR OAK Quercus macrocarpa **	(L)	(L)	30'-40'	2-1/2" B&B
ORNAMENTAL TREES:						
CROR	1	THORNLESS COCKSPUR HAWTHORN Crataegus crus-galli inermis **	(M-L)	(L)	25'-35'	2" B&B
CRPH	4	WASHINGTON HAWTHORN Crataegus phaenopyrum **	(M-L)	(L)	15'-20'	2" B&B
PRPA	1	MAYDAY TREE Prunus padus **	(M-L)	(L)	20'	2" B&B
PRVI	9	CANADA RED CHOKECHERRY Prunus virginiana 'Canada Red' **	(M-L)	(L)	15'-20"	6' CLUMP B&B
MASS	2	SPRING SNOW CRAB Malus x 'Spring Snow' **	(M-L)	(M)	15'	2" B&B
EVERGREEN TREES:						
PIED	2	PINON PINE Pinus edulis **	(L)	(L)	10'-15'	6' B&B
PIFL	3	VANDERWOLF'S PYRAMID PINE Pinus flexilis 'Vanderwolf's Pyramid' **	(L)	(L)	10'	6' B&B
DECIDUOUS SHRUBS:						
CHNA	28	DWARF BLUE RABBITBRUSH Chrysothamnus nauseosus nauseosus **	(L)	(M)	1'-4'	#5 Cont.
PEAT	20	RUSSIAN SAGE Perovskia atriplicifolia **	(L)	(M)	4'-6'	#5 Cont.
PBPB	19	CREEPING WESTERN SAND CHERRY Prunus besseyi Pawnee Buttes **	(L)	(M)	4'-6'	#5 Cont.
RHTR	19	THREE LEAF SUMAC Rhus trilobata **	(L)	(M)	6'	#5 Cont.
RHTY	5	STAGHORN SUMAC Rhus typhina **	(L)	(M)	8'	#5 Cont.
RIAL	17	ALPINE CURRANT Ribes alpinum **	(L-M)	(M)	3'-6'	#5 Cont.
COHO	13	ROCK COTONEASTER Cotoneaster horizontalis **	(M-L)	(M)	3'-6'	#5 Cont.
ROME	8	DOUBLE RED SHRUB ROSE Rosa x 'Meidland Sevillana' **	(L-M)	(M)	3'-4'	#5 Cont.
SYCH	58	HANCOCK CORALBERRY Symphoricarpos x chenaultii 'Hancock' **	(M-L)	(L)	3'-6'	#5 Cont.
POFR	12	SUTTER'S GOLD POTENTILLA Potentilla fruticosa 'Sutter's Gold' **	(M-L)	(M)	2'-3'	#5 Cont.
HODU	14	ROCK SPIREA Holodiscus dumosus **	(M-L)	(L)	3'-6'	#5 Cont.
EVERGREEN SHRUBS:						
JUBF	35	BUFFALO JUNIPER Juniperus sabina 'Buffalo' **	(L)	(L)	6'	#5 Cont.
JUBC	36	BLUE CHIP JUNIPER Juniperus horizontalis 'Blue Chip' **	(L)	(L)	6'	#5 Cont.
GRASSES:						
CAOC	13	Calamagrostis acutiflora 'Karl Foerster' FEATHER REED GRASS	(L)		2'-3'	1 GAL
BOGR	167	Bouteloua gracilis BLUE GRAMA GRASS	(L)		1'-2'	1 GAL
PERENNIALS:						
LAAN	81	ENGLISH LAVENDER Lavandula angustifolia 'Munstead'			12"-18"	1 GAL
EOHI	88	NATIVE BLANKET FLOWER Gaillardia aristata			18"-24"	1 GAL
ECPU	60	RUBY STAR CONEFLOWER Echinacea purpurea 'Ruby Star'			18"-24"	1 GAL

**PLANT CHOSEN FROM THE LOUISVILLE COMMERCIAL DESIGN GUIDELINES RECOMMENDED PLANT LIST

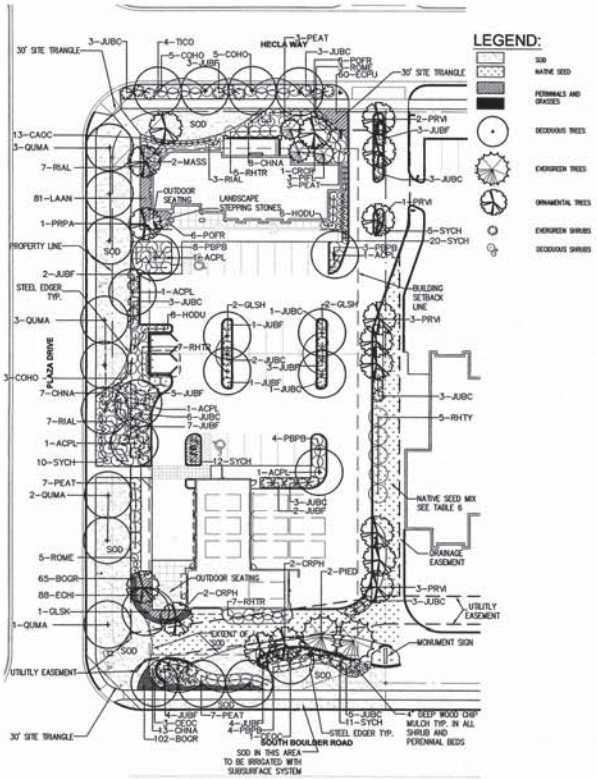
TABLE 1: REQUIRED LANDSCAPE AREA CALCULATIONS

NET SITE AREA	54,451 SF
REQUIRED LANDSCAPE AREA (30%) 0.30 x 54,451	16,335 SF
PROVIDED LANDSCAPING PERIMETER / OTHER* PARKING LOT	25,208 SF 709 SF
TOTAL PROVIDED LANDSCAPING	25,917 SF (48%)

*INCLUDES PEDESTRIAN SIDEWALK CONNECTIONS (PLANTINGS 19,625 SF, SIDEWALK CONNECTIONS 5,583 SF)

TABLE 2: PERIMETER PLANTING CALCULATIONS

	LENGTH L.F.	REQUIRED PLANTINGS	PROVIDED PLANTINGS
STREET EDGE NORTH	160 L.F.	4 TREES & 32 SHRUBS	4 TREES & 19 SHRUBS
STREET EDGE SOUTH	160 L.F.	4 TREES & 32 SHRUBS	6 TREES, 48 SHRUBS & 102 GRASSES
STREET EDGE WEST	340 L.F.	17 TREES & 85 SHRUBS	12 TREES & 41 SHRUBS
EAST BUFFER	340 L.F.	9 TREES	11 TREES & 22 SHRUBS
TOTAL		34 TREES & 149 SHRUBS	33 TREES, 130 SHRUBS & 102 GRASSES



1 L1.0 LANDSCAPE PLAN
SCALE: 1" = 30'-0"

TABLE 3: BUILDING PERIMETER PLANTING CALCULATIONS

BUILDING	TOTAL PERIMETER (L.F.)	REQUIRED PLANTING (25%)	PROVIDED PLANTING	PROVIDED PLANTINGS
LEHRER'S	274 L.F.	69 L.F.	191 L.F. (70%)	7 TREES, 70 SHRUBS, 13 GRASSES & 141 PERENNIALS
JIFFY LUBE	264 L.F.	66 L.F.	123 L.F. (47%)	2 TREES, 19 SHRUBS, 65 GRASSES & 88 PERENNIALS

TABLE 4: PARKING LOT AND SCREENING PLANTING CALCULATIONS

	PROVIDED	REQUIRED PLANTING	PROVIDED PLANTINGS
PARKING	33 SPACES	1 TREE PER 8 SPACES = 5 TREES	8 TREES & 53 SHRUBS
DUMPSTER	DOUBLE	PER REVIEW	12 SHRUBS

TABLE 5: AREA CALCULATION TOTALS

AREA DESCRIPTION	REQUIRED PLANTINGS	PROVIDED PLANTINGS
PARKING AND SCREENING	5 TREES	8 TREES & 65 SHRUBS
PERIMETER	34 TREES & 149 SHRUBS	33 TREES, 130 SHRUBS & 102 GRASSES
BUILDING PERIMETER	PER REVIEW	9 TREES, 89 SHRUBS, 78 GRASSES & 229 PERENNIALS
TOTALS		50 TREES, 284 SHRUBS, 180 GRASSES & 229 PERENNIALS

TABLE 6: NATIVE SEED MIX

COMMON NAME	SPECIES	VARIETY	LBS./ACRE
WESTERN WHEATGRASS	Agropyron smithii	Arriba	5.0
MOUNTAIN MUHLY	Muhlenbergia montana	Native	1.5
BIG BLUESTEM	Agropodon gerardii	Native	2.5
BLUE GRAMA	Bouteloua gracilis	Lovington	1.5
LITTLE BLUESTEM	Schizachyrium scoparius	Pastura	2.0
PRAIRIE JUNEGRASS	Koeleria cristata	Native	1.0
SIDEOATS GRAMA	Bouteloua curtipendula	Vaughn	1.0
GREEN NEEDLEGRASS	Stipa viridula	Lodorm	1.0
SEEDING RATE:			15.5

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jiffy lube
and
Lehrer's Flowers

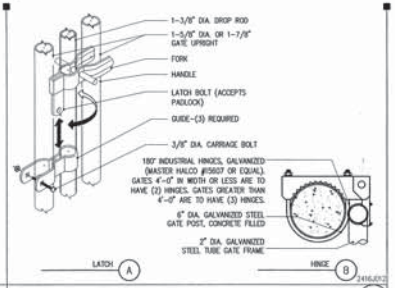
S BOULDER RD AT PLAZA DR
LOUISVILLE, CO

CARCOLO #1 LTD.
9111 JOLLYVILLE ROAD, SUITE 106
AUSTIN, TX 78759

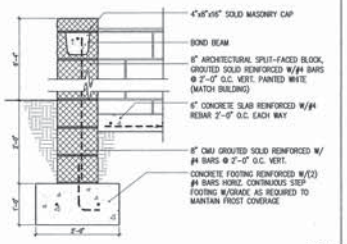
DESIGN CONCEPTS
Community and Landscape Architects
215 North Public Road, Suite 200 • Lafayette, Colorado 80026
(303) 664-5301 • FAX (303) 664-5315 • concepts@dcla.net

PROJ. NO. 2418	FINAL PUD & DEV. PLAN	PLAN. COMM. CONDITIONS
	17 NOV 2004	21 FEB 2005
	PUD COMMENTS	
	03 JAN 2005	
	FUD COMMENTS	
	28 JAN 2005	

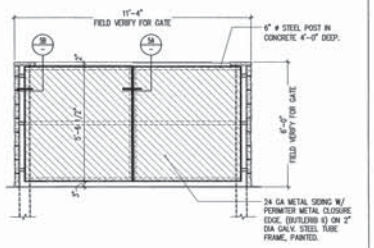
L1.0
LANDSCAPE PLAN



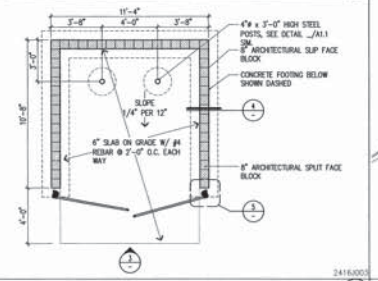
INDUSTRIAL LATCH + HINGE 1/2"=1'-0" 5



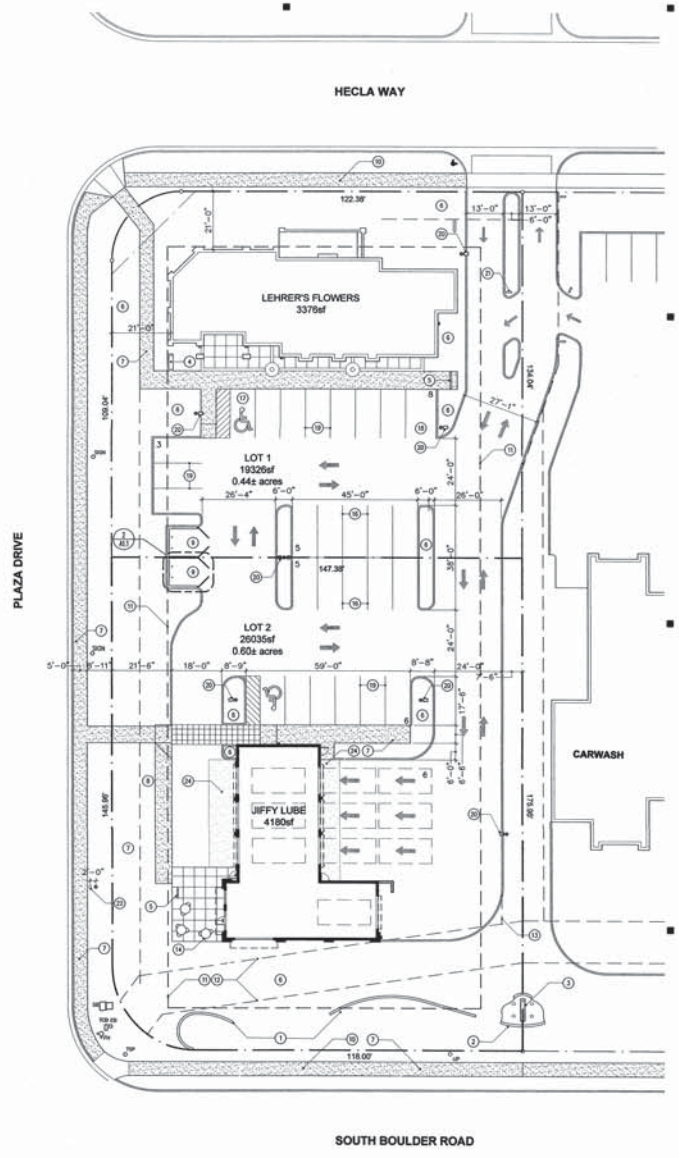
SECTION AT TRASH ENCLOSURE 3/4"=1'-0" 4



TRASH ENCLOSURE ELEVATION 3/8"=1'-0" 3



PLAN AT TRASH ENCLOSURE 1/4"=1'-0" 2



SITE PLAN 1:20 1

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KEYNOTES:

1. GROUTED SPLIT FACE CMU RETAINING WALL WITH FLAGSTONE CAP
2. FLAGSTONE RETAINING WALL
3. MONUMENT SIGN
4. BENCH
5. BIKE RACK
6. LANDSCAPED AREA
7. NEW 5'-0" SIDEWALK
8. 6' PLANTER
9. DUMPSTER ENCLOSURE
10. EXISTING SIDEWALK
11. BUILDING SETBACK LINE
12. UTILITY EASEMENT
13. DRAINAGE EASEMENT
14. OUTDOOR SEATING
15. METAL CANOPY
16. STANDARD PARKING SPACE, 9'-0"x 19'-0"
17. ACCESSIBLE PARKING SPACE, 14'-0"x 17'-6"
18. DELIVERY VAN PARKING SPACE, 10'-0"x 17'-6"
19. PARKING SPACE, 9'-0"x 17'-6"
20. 20'-0" LIGHT POLE
21. 'NO LEFT TURN' SIGN
22. EXISTING STREET LIGHT, RELOCATED BY TENANT
23. PARALLEL PARKING SPACE, 10'-0"x 22'-0"
24. BLACK CONC. APRON 10'-0" WIDE @ FRONT/ 7'-0" AT REAR

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PROJ. NO. 2416	FINAL PUD & DEV. PLAN 17 NOV 2004	PLAN. COMM. CONDITIONS 22 FEB 2005
	PLAN COMMENTS 03 JAN 2005	
	PLAN COMM. COMMENTS 28 JAN 2005	

SITE PLAN/
SITE DETAILS

A1.1

Lot 5
Louisville Plaza
Filing 2

DRAWING NUMBER

DRAWING NUMBER

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Lot 5
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Filing 2

DRAWING NUMBER

DRAWING NUMBER

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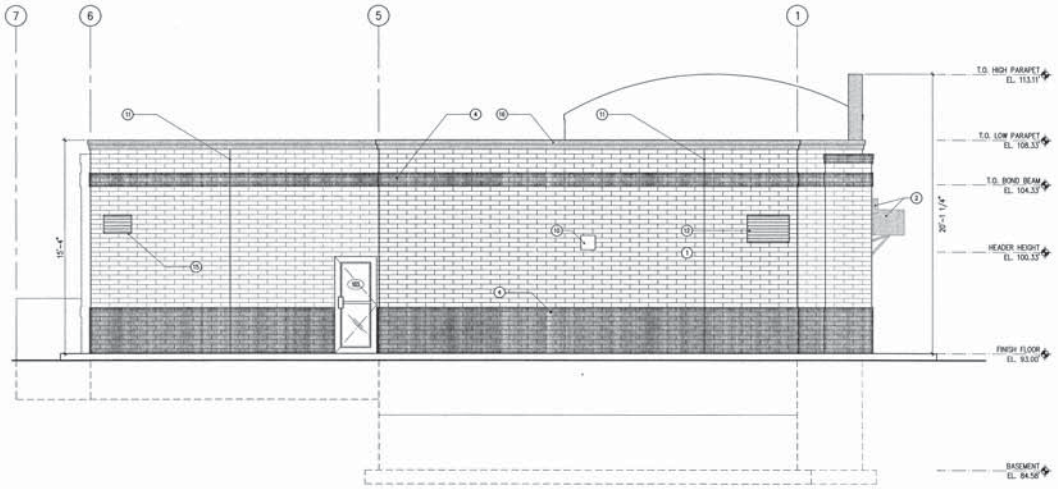
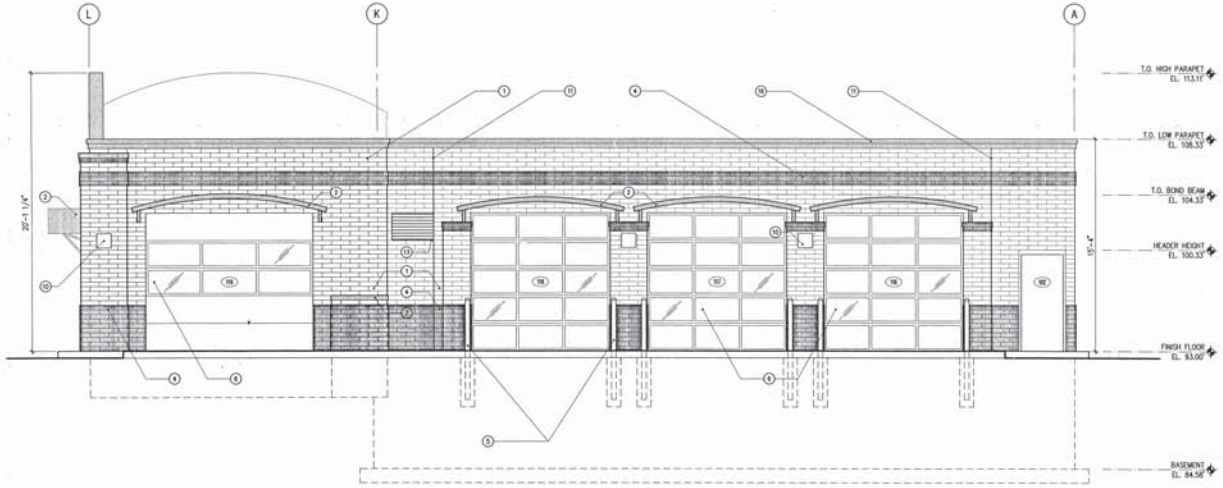


NORTH ELEVATION 1/4"=1'-0" (2)



EAST ELEVATION 1/4"=1'-0" (1)

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KEYNOTES:

1. SMOOTH-FACED ARCHITECTURAL MASONRY
2. METAL CANOPY
3. NOT USED
4. SPLIT-FACED ARCHITECTURAL MASONRY
5. STEEL BOLLARDS
6. ALUMINUM & TINTED GLASS SECTIONAL O.H. DOOR
7. METAL CAP
8. 1" INSULATED, TINTED GLASS IN ALUM. STOREFRONT
9. 1" TEMP. INSULATED, TINTED GLASS IN ALUM. STOREFRONT
10. WALL MOUNTED FULL CUTOFF LIGHT FIXTURE, SEE DETAIL 2/A3.1
11. MASONRY CONTROL JOINTS
12. 36"x24" EXHAUST LOUVER
13. 36"x24" MAKE UP AIR LOUVER
14. 24"x16" EXHAUST LOUVER
15. 24"x16" MAKE UP AIR LOUVER
16. DOUBLE-STEPPED METAL CAP

GENERAL NOTE:
ALL MECHANICAL EQUIPMENT IS LOCATED WITHIN THE BUILDING, NO ROOFTOP EQUIPMENT EXISTS

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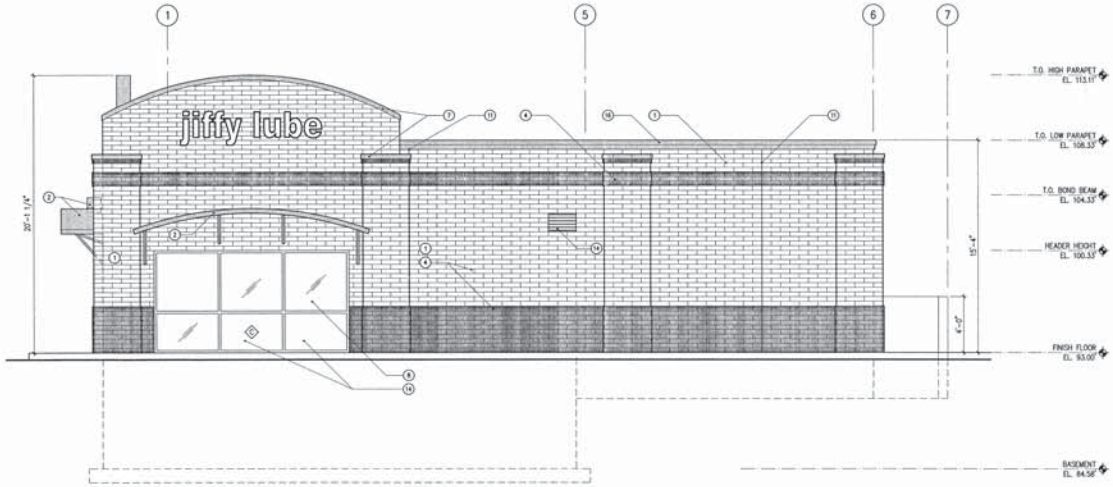
O+P

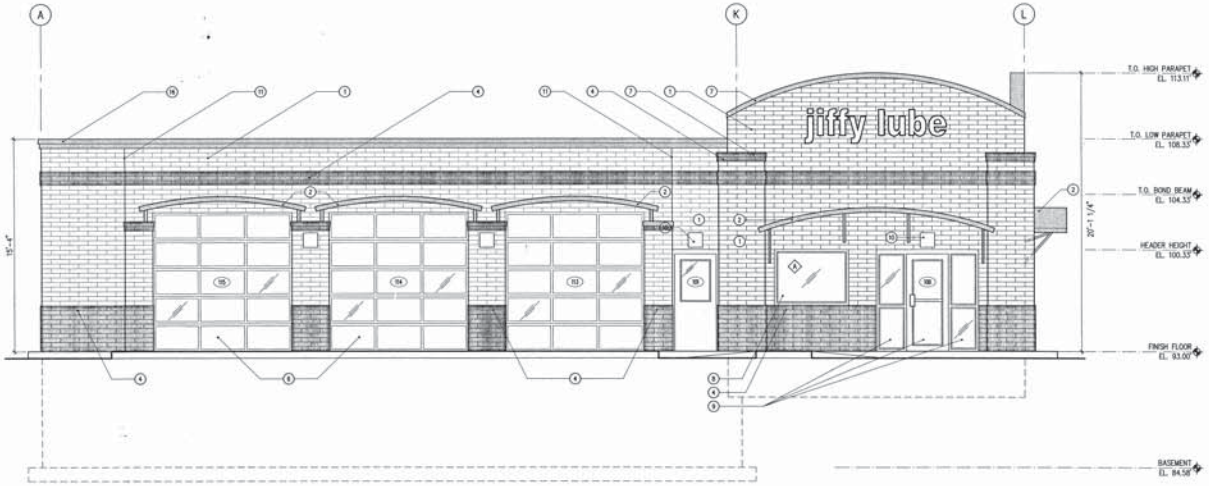
PROJ. NO.		
2416	FINAL PUD & DEV. PLAN -17 NOV 2004	PLAN. COMM. CONDITIONS -01 FEB 2005
	PUD COMMENTS -03 JAN 2005	
	PLAN. COMM. COMMENTS -28 JAN 2005	

JIFFY LUBE
EXTERIOR ELEVATIONS

A2.1



SOUTH ELEVATION 1/4"=1'-0" (2)



WEST ELEVATION 1/4"=1'-0" (1)

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KEYNOTES:

1. SMOOTH-FACED ARCHITECTURAL MASONRY
2. METAL CANOPY
3. NOT USED
4. SPLIT-FACED ARCHITECTURAL MASONRY
5. STEEL BOLLARDS
6. ALUMINUM & TINTED GLASS SECTIONAL O.H. DOOR
7. METAL CAP
8. 1" INSULATED, TINTED GLASS IN ALUM. STOREFRONT
9. 1" TEMP. INSULATED, TINTED GLASS IN ALUM. STOREFRONT
10. WALL MOUNTED FULL CUTOFF LIGHT FIXTURE, SEE DETAIL 2/A3.1
11. MASONRY CONTROL JOINTS
12. 36"x24" EXHAUST LOUVER
13. 36"x24" MAKE UP AIR LOUVER
14. 24"x16" EXHAUST LOUVER
15. 24"x16" MAKE UP AIR LOUVER
16. DOUBLE-STEPPED METAL CAP

GENERAL NOTE:
ALL MECHANICAL EQUIPMENT IS LOCATED WITHIN THE BUILDING, NO ROOFTOP EQUIPMENT EXISTS

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PROJ. NO. 2416	FINAL PUD & DEV. PLAN 17 NOV 2004	PLAN. COMM. CONDITIONS 21 FEB 2005
	PUD COMMENTS 03 JAN 2005	
	PLAN. COMM. COMMENTS 28 JAN 2005	

JIFFY LUBE
EXTERIOR ELEVATIONS

A2.2

Lot 5
Louisville Plaza
Filing 2

DRAWING NUMBER

DRAWING NUMBER

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Lot 5
Louisville Plaza
Filing 2

DRAWING NUMBER

DRAWING NUMBER

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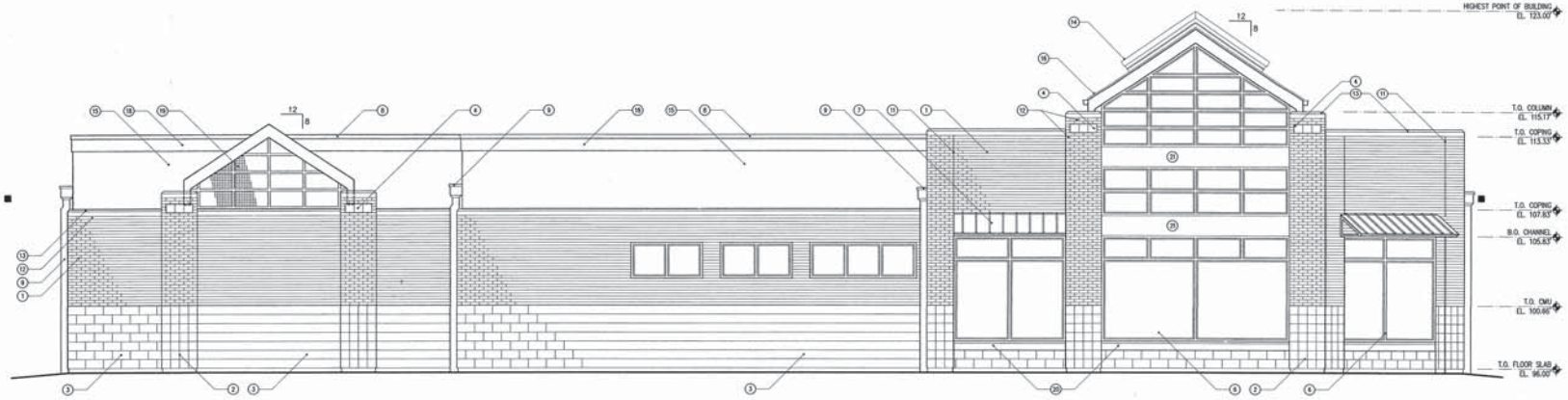

NORTH ELEVATION 1/4"=1'-0" (2)

KEYNOTES:

1. STANDARD SIZE BRICK VENEER
2. 8x16 SMOOTH FACE CMU VENEER W/8x8 SCORING PATTERN
3. 8x16 SPLIT FACE CMU VENEER
4. 8x8 CMU VENEER ACCENTS
5. STEEL CHANNELS, PAINTED
6. ALUMINUM STOREFRONT
7. PREFINISHED METAL ROOFING
8. PREFINISHED ALUMINUM COPING
9. SCUPPER & DOWNSPOUT
10. WALL MOUNTED FULL CUTOFF LIGHT FIXTURE, SEE DETAIL 4/A3.1
11. MASONRY CONTROL JOINTS
12. ACCENT BRICK BAND
13. CAST CONCRETE COPING
14. PREFINISHED ALUMINUM RIDGE SKYLIGHT
15. EXT. INSULATION & FINISH SYSTEM (EIFS)
16. PREFINISHED STANDING SEAM METAL ROOFING OVER PAINTED STEEL TUBE FRAME
17. BUILDING SIGNAGE
18. 1" DEEP RAISED BAND
19. PERFORATED METAL SCREEN, PAINTED
20. CAST CONCRETE SILL
21. STEEL TUBES, PAINTED
22. AUTOMATIC SLIDING DOOR
23. 3'-4" HIGH BRICK WALL SPANNING BETWEEN COLUMNS

EAST ELEVATION 1/4"=1'-0" (1)

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	PLAN. COMM. COMMENTS 28 JAN 2005	

LEHRER'S
EXTERIOR ELEVATIONS

A2.3

Lot 5
Louisville Plaza
Filing 2

DRAWING NUMBER

DRAWING NUMBER

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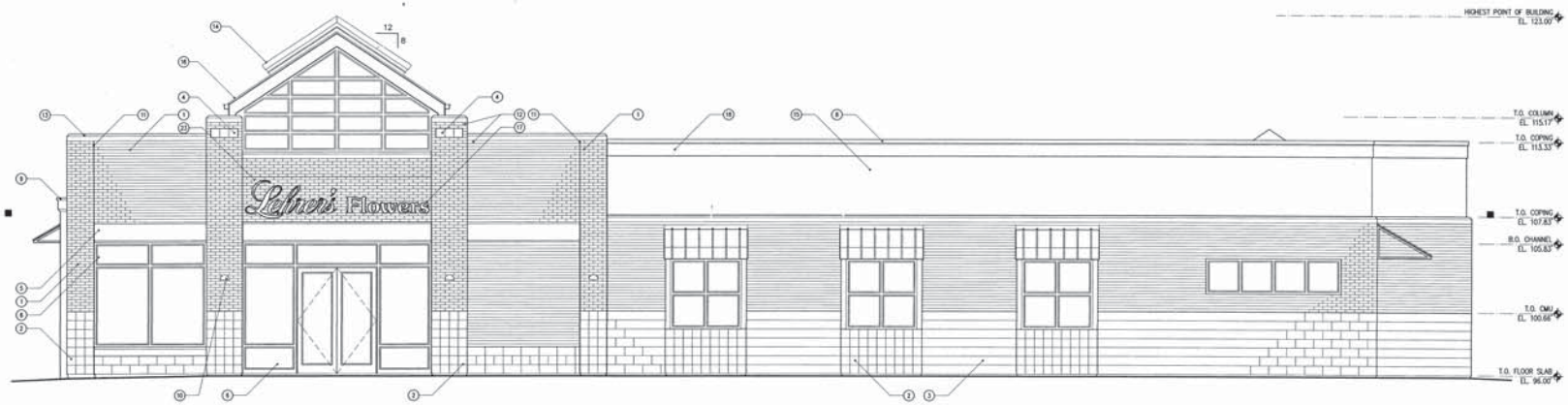

KEYNOTES:

1. STANDARD SIZE BRICK VENEER
2. 8x16 SMOOTH FACE CMU VENEER W/8x8 SCORING PATTERN
3. 8x16 SPLIT FACE CMU VENEER
4. 8x8 CMU VENEER ACCENTS
5. STEEL CHANNELS, PAINTED
6. ALUMINUM STOREFRONT
7. PREFINISHED METAL ROOFING
8. PREFINISHED ALUMINUM COPING
9. SCUPPER & DOWNSPOUT
10. WALL MOUNTED FULL CUTOFF LIGHT FIXTURE, SEE DETAIL 4/A3.1
11. MASONRY CONTROL JOINTS
12. ACCENT BRICK BAND
13. CAST CONCRETE COPING
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19. PERFORATED METAL SCREEN, PAINTED
20. CAST CONCRETE SILL
21. STEEL TUBES, PAINTED
22. AUTOMATIC SLIDING DOOR
23. 3'-4" HIGH BRICK WALL SPANNING BETWEEN COLUMNS

SOUTH ELEVATION 1/4"=1'-0" (2)

WEST ELEVATION 1/4"=1'-0" (1)

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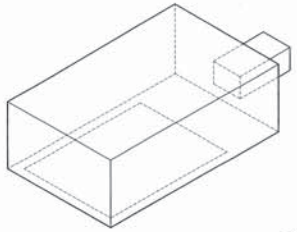
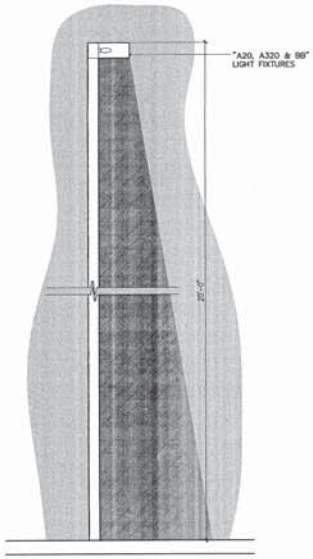
LEHRER'S
EXTERIOR ELEVATIONS

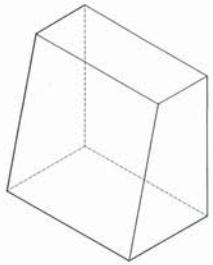
A2.4



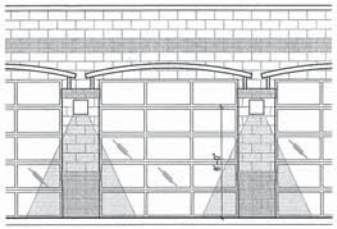
FIXTURE DETAIL - A, AA20 NTS (5)



SITE LIGHTING DETAIL 3/4"=1'-0" (6)



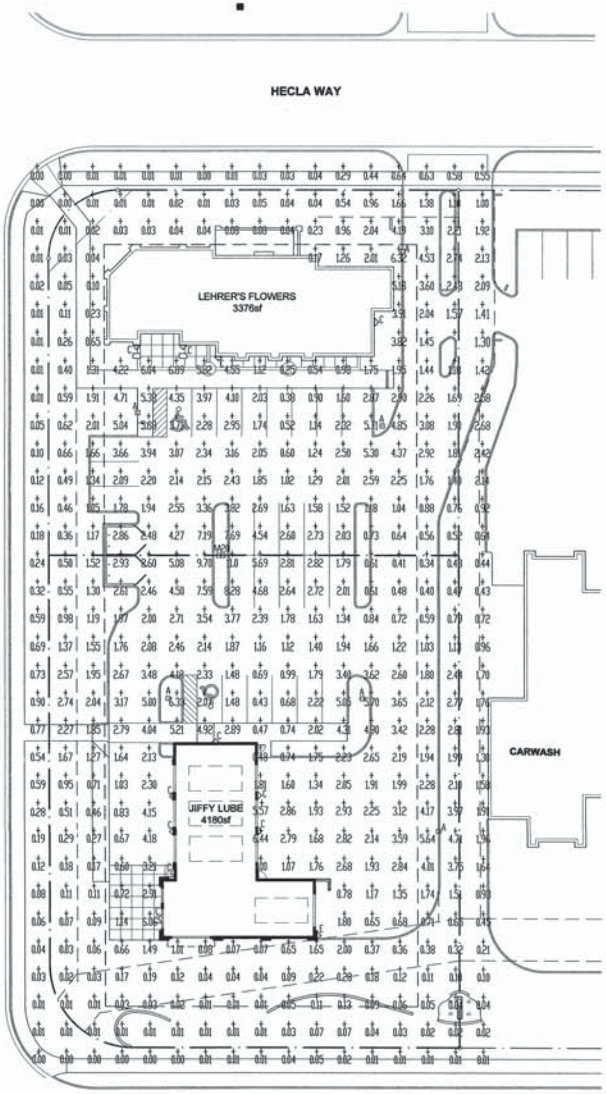
FIXTURE DETAIL - C, E NTS (4)



LIGHTING DETAIL 1/4"=1'-0" (3)

CALCULATION SUMMARY										
Area Name	Dimensions		Grid / Type	# Pts	Space	Group	Ave	Max	Min	Max / Min	Ave / Min
R1 Exterior	175.00 x 345.00 Feet		Pavement / H-H	497	10.00	(+)	1.6	11.0	0.0	N / A	N / A
FIXTURE SCHEDULE											
Qty	Label	Lumens	Watts	Lamp	Mounting Ballast	LLF	Description				
6	A	23000	250	(1) M-250	24'-0" S.S.S Flush Concrete	0.65	Spaulding CM-H25-H4-F (1) 'M254' CM-M25-H4-F				
1	AA20	23000	250	(2) M250	24'-0" S.S.S Flush Concrete	0.65	Spaulding CM-H25-H4-F (2) 'CM74' CM-H25-H4-F				
11	C	5900	70	(1) M57 MVR70/U/MED	Surface Mount	0.70	Teron Lighting, HN-70MH-MTH (1) 'HOGB' HN-70MH-MTH				
1	E	3450	50	(1) M57 MVR50/U/MED	Surface Mount	0.70	Teron Lighting, HN-50MH-MTH (1) 'HOGC' HN-50MH-MTH				

PHOTOMETRIC DATA



(2) PHOTOMETRIC PLAN 1:20 (1)

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LICENSED ARCHITECT SIDNEY LORON PEDERSEN NO. 8-1863 STATE OF COLORADO

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PROJ. NO. 2416	FINAL PUD & DEV. PLAN 17 NOV 2004	PLAN. COMM. CONDITIONS 21 FEB 2005
	PUD COMMENTS 03 JAN 2005	
	PLAN. COMM. COMMENTS 28 JAN 2005	

PHOTOMETRIC PLAN
LIGHTING DETAILS

A3.1

Lot 5 Louisville Plaza Filing 2

DRAWING NUMBER

DRAWING NUMBER

Jiffy Lube & Lehrer's Flowers

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Lot 5
Louisville Plaza
Filing 2

DRAWING NUMBER

DRAWING NUMBER

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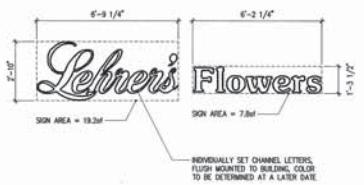
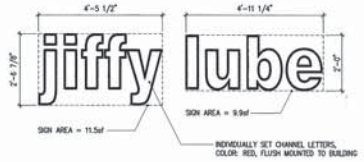


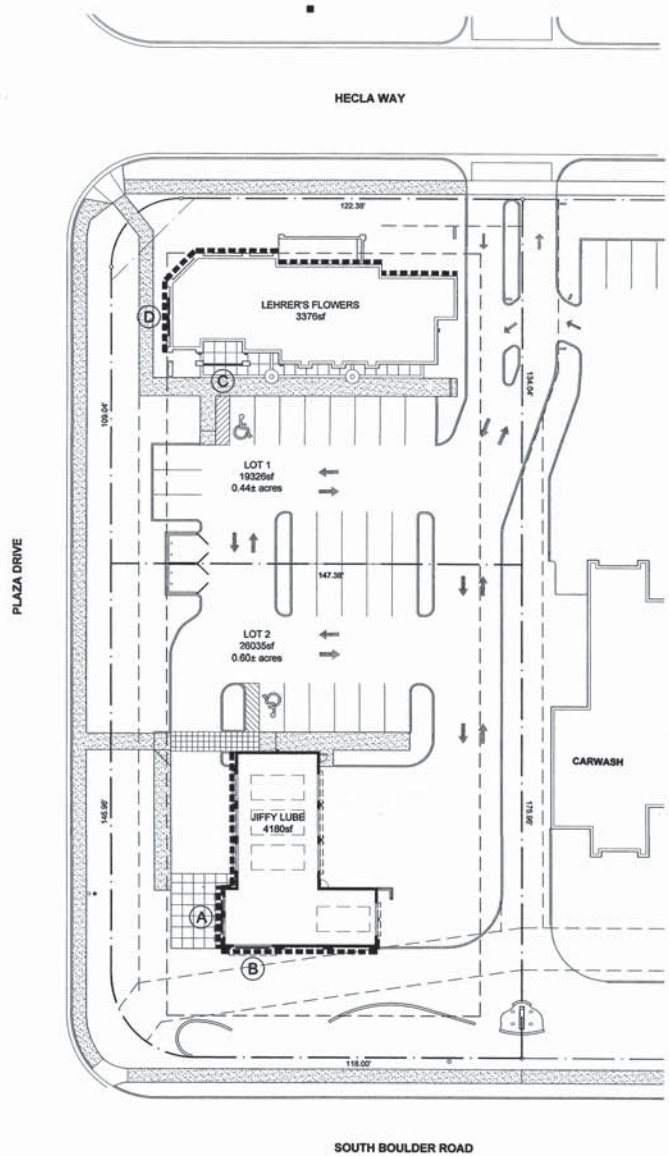
NOTES:
TOTAL SIGN AREA = 27.0sf
AVERAGE HEIGHT OF INDIVIDUAL LETTERS = 1'-3 1/4"

7 LEHRER'S SIGN (SIGNS C, D) 3/8"=1'-0" 3



NOTES:
TOTAL SIGN AREA = 21.8sf
AVERAGE HEIGHT OF INDIVIDUAL LETTERS = 1'-11 1/2"

6 JIFFY LUBE SIGN (SIGNS A, B) 1/2"=1'-0" 2



9 5 8 4

NTS 1

SIGN AREA CALCULATIONS:

THICK DASHED LINE DESIGNATES BUILDING FRONTAGE FOR AREA CALCULATIONS.

JIFFY LUBE BUILDING FRONTAGE IS 127 LINEAL FEET.

SIGN A: 21.8sf
SIGN B: 21.8sf

TOTAL SIGN AREA: 43.6sf
TOTAL SIGN AREA ALLOWED*: 127.0sf

SIGN AREA ALLOWED*

LEHRER'S BUILDING FRONTAGE IS 128 LINEAL FEET.

SIGN C: 27.0sf
SIGN D: 27.0sf

TOTAL SIGN AREA: 54.0sf
TOTAL SIGN AREA ALLOWED*: 128.0sf

SIGN AREA ALLOWED*

* PER LOUISVILLE DESIGN GUIDELINES SECTION 7.2.

AN EXISTING MONUMENT SIGN IS CURRENTLY LOCATED ON THE EAST PROPERTY LINE AT THE SE CORNER OF THE SITE. THIS MONUMENT SIGN WILL BE SHARED BETWEEN BLACK DIAMOND CAR WASH, LEHRER'S FLOWERS AND JIFFY LUBE. A REVISED DRAWING WILL BE SUBMITTED AT A LATER DATE.

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NO. B-1863
STATE OF COLORADO

O+P
OVERWAY PEDERSEN ARCHITECTS
DEVELOPMENT CONSULTANTS

PROJ. NO. 2416		
	FINAL PUD & DEV. PLAN 12 NOV 2004	PLAN COMM CONDITIONS 21 FEB 2005
	PUD COMMENTS 03 JAN 2005	
	PLAN COMM COMMENTS 28 JAN 2005	

SIGNAGE PLAN/
DETAILS

A3.2

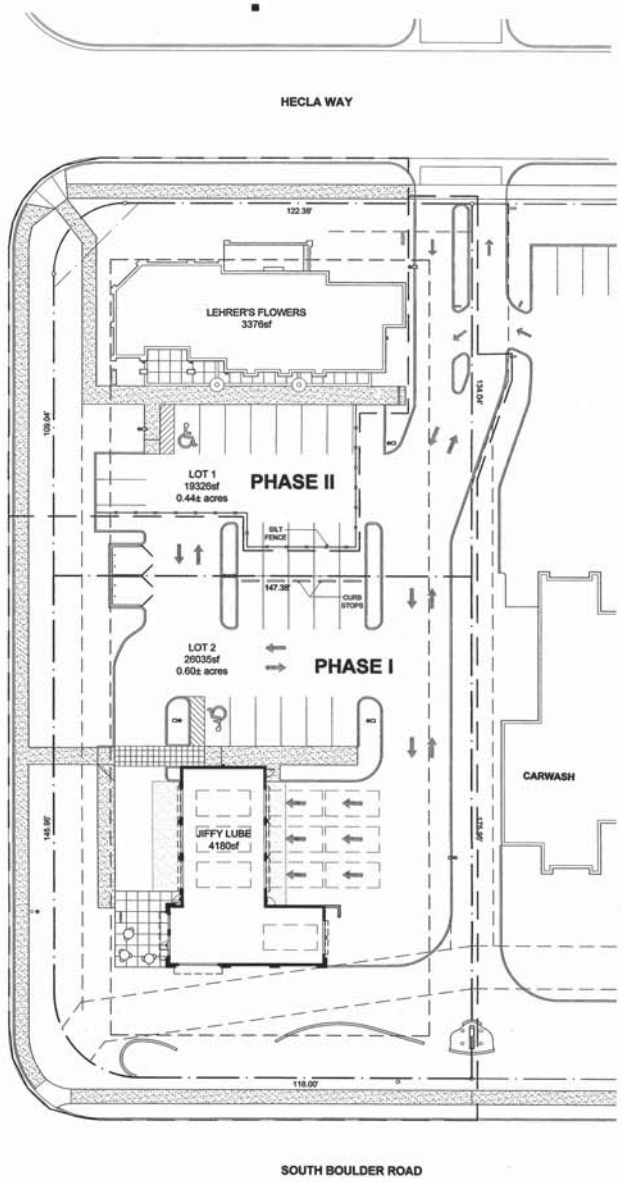
Lot 5
Louisville Plaza
Filing 2

DRAWING NUMBER

DRAWING NUMBER

Jiffy Lube &
Lehrer's Flowers

H:\JL Louisville_2416\PUD\Plotting\A3.3



PHASING PLAN

1:20 (1)

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PHASING NOTES:

1. EXTENT OF AREA TO BE IMPROVED WITH JIFFY LUBE IS DESCRIBED AS PHASE I.
2. EXTENT OF AREA TO BE IMPROVED WITH LEHRER'S FLOWERS IS DESCRIBED AS PHASE II.
3. ADD CURB STOPS & SILT FENCE AS SHOWN WITH PHASE I WORK.
4. RESEED WITH NATIVE SEED ANY AREAS DISTURBED WITHIN PHASE II. TEMPORARILY IRRIGATE IF NECESSARY.

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	PUD COMMENTS 03 JAN 2005	
	PLAN COMM. COMMENTS 28 JAN 2005	

PHASING PLAN

A3.3

PUD PLAN AMENDMENT
LOT 1 OF LOUISVILLE PLAZA, FILING NO. 3
KING SOOPERS FUELING CENTER #13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

PROPERTY OWNER

DILLON COMPANIES INC. A KANSAS CORPORATION
KING SOOPERS (DIVISION OF KROGER)
65 TEJON STREET
DENVER, COLORADO 80223
TEL. (303) 715-4500
FAX. (303) 778-3349

ATTN: DREW WAROT
EMAIL: drewwarot@kingsoopers.com

APPLICANT

KING SOOPERS (DIVISION OF KROGER)
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DENVER, COLORADO 80223
TEL. (303) 715-4500
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ATTN: DREW WAROT
EMAIL: drewwarot@kingsoopers.com

ENGINEERING\ARCHITECT\PLANNING CONSULTANT

GALLOWAY & CO, INC.
5300 DTC PARKWAY, SUITE 100
GREENWOOD VILLAGE, COLORADO 80111
TEL. (303) 770-8884
FAX. (303) 770-3636

ATTN: MATTHEW DUHAIME P.E., P.L.S.
EMAIL: mattduhaime@GALLOWAYUS.COM

LEGAL DESCRIPTION:

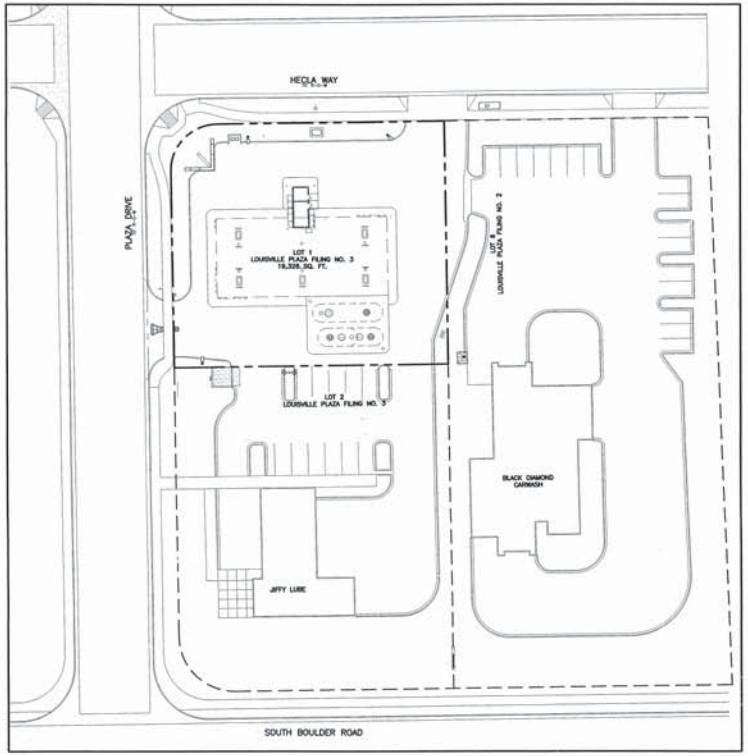
LOT 1, LOUISVILLE PLAZA FILING NO. 3 LOCATED IN THE SW1/4 OF SECTION 4, T1S, R69W OF THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

ADDRESS:

1712 PLAZA DRIVE LOUISVILLE COLORADO 80027

DATE OF PREPARATION

INITIAL: AUGUST 12, 2010
REVISED: SEPTEMBER 29, 2010
REVISED: FEBRUARY 28, 2011



SITE MAP
SCALE 1" = 30'

AREA MAP
SCALE 1" = 500'

SHEET INDEX

SHEET	SHEET TITLE
1 OF 7	COVER SHEET
1 OF 1	ALTA SURVEY
2 OF 7	OVERALL SITE PLAN
3 OF 7	SITE AND UTILITY PLAN
4 OF 7	GRADING AND EROSION CONTROL PLAN
5 OF 7	LANDSCAPE PLAN
6 OF 7	CANOPY AND KIOSK ELEVATIONS
7 OF 7	PHOTOMETRIC PLAN

SITE DATA:	PROPOSED WITHIN DISTURBED AREA:	
USE:	AUTOMOTIVE REFUELING STATION	
EXISTING ZONING:	P-C	
LOT FRONTAGE:	PLAZA DRIVE 107.1' HECLA WAY 122.4'	
BUILDING AREA:	4,136 SQ. FT. (CANOPY & KIOSK)	21.4%
	KIOSK 180 SQ. FT.	
	CANOPY 3,956 SQ. FT.	
PAVED AREA:	12,936 SQ. FT.	66.9%
LANDSCAPING:	2,254 SQ. FT.	11.7%
LOT AREA:	19,326 SQ. FT.	100.0%
BUILDING HEIGHT:	KIOSK 11'-0"	
	CANOPY 19'-0"	
CANOPY STREET ROW SETBACK:	23.75 PLAZA DRIVE	34.4' HECLA WAY
CANOPY REAR LOT SETBACKS:	SOUTH 37.8"	EAST 31.6'
PUMP ISLANDS:	5	
CURB CUT ACCESS:	1 EXISTING ACCESS POINT, 1 NEW ACCESS POINT	

OWNERSHIP SIGNATURE BLOCK

By signing this PUD Plan Amendment the owner acknowledges and accepts all the requirements & intent set forth herein.

Witness our hands and seals this 8th day of March, 2011

For and on the behalf of the Dillon Company, a Kansas Corporation

Susan R. McKnight
NOTARY SEAL

NOTARY PUBLIC

MY COMMISSION EXPIRES 4-6-2014

PLANNING COMMISSION CERTIFICATE

RECOMMENDED APPROVAL THIS 14 DAY OF OCTOBER 20 10 BY THE PLANNING COMMISSION OF THE CITY OF LOUISVILLE, COLORADO.

RESOLUTION NO. 26 SERIES 2010

CHAIRMAN

CITY COUNCIL CERTIFICATE

APPROVED THIS 19 DAY OF OCTOBER, 2010 CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO.

RESOLUTION NO. 62 SERIES 2010

MAYOR

Nancy Varra
CITY CLERK

CITY OF LOUISVILLE SEAL COLORADO

CLERK AND RECORDER CERTIFICATE

(COUNTY OF BOULDER
STATE OF COLORADO)

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED IN MY OFFICE AT 3:13 O'CLOCK, P.M., THIS 29th DAY OF July, 2011, AND IS RECORDED IN PLAN FILE _____, FEE $71.00 PAID $71.00

FILM NO. _____, RECEPTION 3162405

Hillary Hall
CLERK & RECORDER

DEPUTY

No.	REVISION	DES. BY	DRAWN BY	DATE
1	PER CITY COMMENTS	MFD	EVR	9/29/10
2	UPDATED PER CONSTRUCTION DOCUMENTS	MFD	EVR	2/28/11

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Supermarkets
Petroleum
65 Tejon Street
Denver, CO 80223
Tel: 303-715-4500
Fax: (303) 871-5822

KING SOOPERS
FUEL FACILITY
CANOPY AND KIOSK
STORE # 13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No: KSF000013
Sheet Scale: AS NOTED
Designed By: MFD
Drawn By: RDG
Date: AUGUST 2010
Disk File: KSF13_P_01-Cover

COVER SHEET

1 OF 7

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment
DRAWING NUMBER
DRAWING NUMBER
King Soopers 1712 Plaza Dr.

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

DRAWING NUMBER

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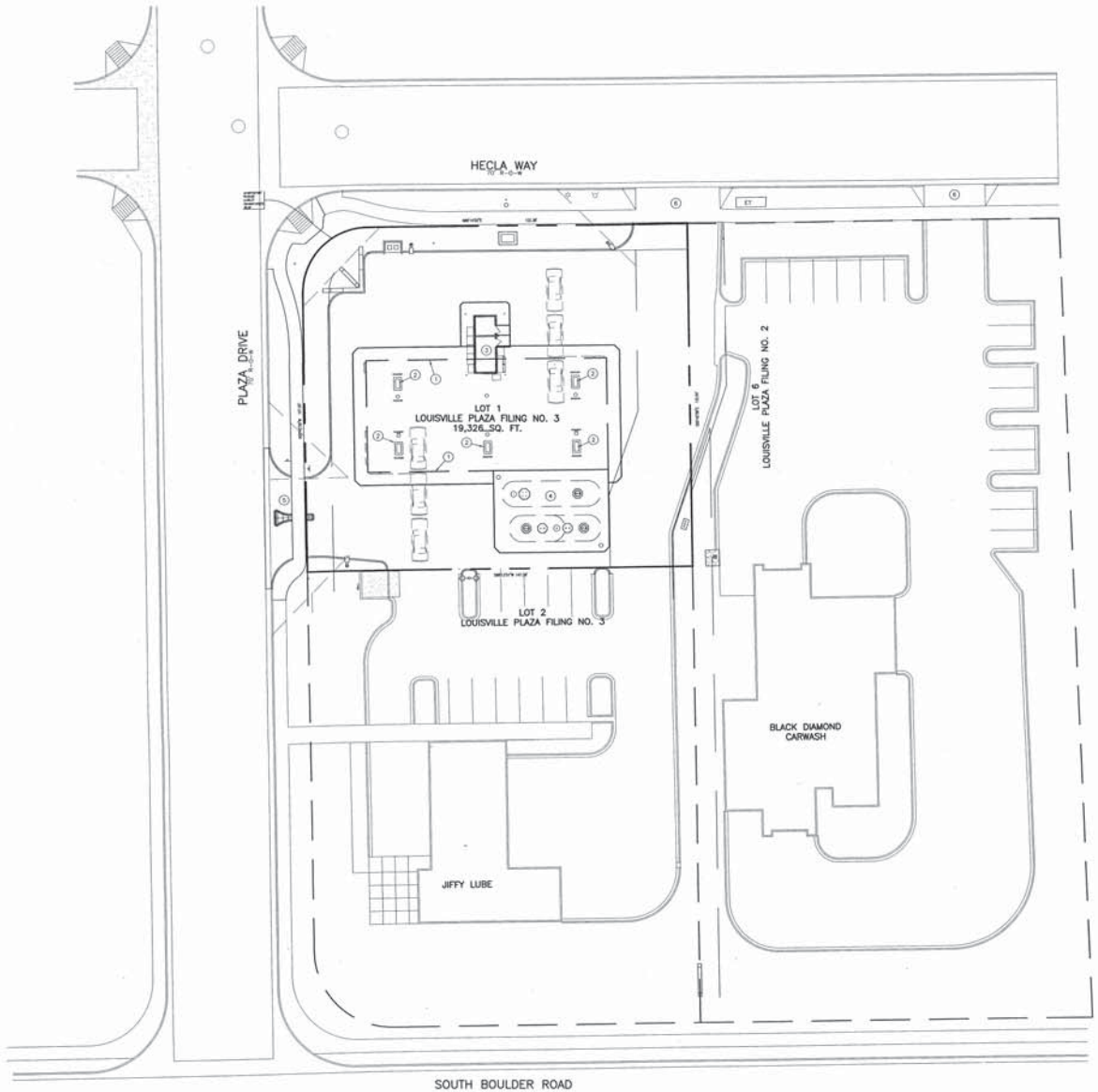
King Soopers 1712 Plaza Dr.



N

SCALE: 1"=20'

SITE LEGEND

- PROPERTY BOUNDARY LINE
- ADJACENT PROPERTY BOUNDARY LINE
- SECTION LINE
- CENTER LINE
- EASEMENT BOUNDARY LINE
- TRAFFIC DIRECTION
- PARKING COUNT
- SITE LIGHTING
- WALL PACK LIGHT
- STREET LIGHT
- EXISTING TRAFFIC POLE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- EXISTING MANHOLE COVER
- PROPOSED MANHOLE COVER
- UTILITY PEDESTAL
- EXISTING INLET
- PROPOSED INLET
- EXISTING FENCE TO REMAIN
- EXISTING TO REMAIN
- EXISTING RETAINING WALL
- EXISTING TO BE REMOVED
- PROPOSED NEW
- PROPOSED RETAINING WALL

SCHEDULE:

1. PROPOSED 43'-0" WIDE, 92'-0" LONG CANOPY (3,956 SF)
2. PROPOSED 3'-0" x 5'-0" ISLAND W/MULTIPLE PRODUCT DISPENSER (TYP.5)
3. PROPOSED 8'-2" x 21'-6" KIOSK (WITH BATHROOM 180 SF)
4. PROPOSED ONE 20,000 GALLON SINGLE COMPARTMENT UNDERGROUND DOUBLE WALL STORAGE TANK (UNLEADED) AND ONE 18,000 GALLON TWO COMPARTMENT UNDERGROUND DOUBLE WALL STORAGE TANK (8,000 GALLON PREMIUM AND 10,000 GALLON DIESEL)
5. PROPOSED RIGHT IN/RIGHT OUT 30' CURB CUT
6. EXISTING CURB CUT

CONTRACTOR TO REFER TO GEOTECHNICAL REPORT FOR PAVING, SUBGRADE AND COMPACTION RECOMMENDATIONS. SEE GRADING PLAN FOR DETAILED INFORMATION ON FINAL GRADES AND PAVING.

CONTRACTOR TO REFER TO THE LANDSCAPE PLANS AND TREE PROTECTION NOTES FOR LOCATION OF EXISTING TREES, TREE PRESERVATION DETAILS, STORAGE OF EQUIPMENT UNDER TREES, AND PRUNING.

No.	REVISION:	DES. BY	DRAWN BY	DATE
1	PER CITY COMMENTS	MFD	EVR	9/29/10
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303.770.9636 F
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King Soopers Supermarket Petroleum
Project No. KSF13
Sheet No. 2 OF 7
Date: 2/28/11
Dwg. Scale: 1"=20'

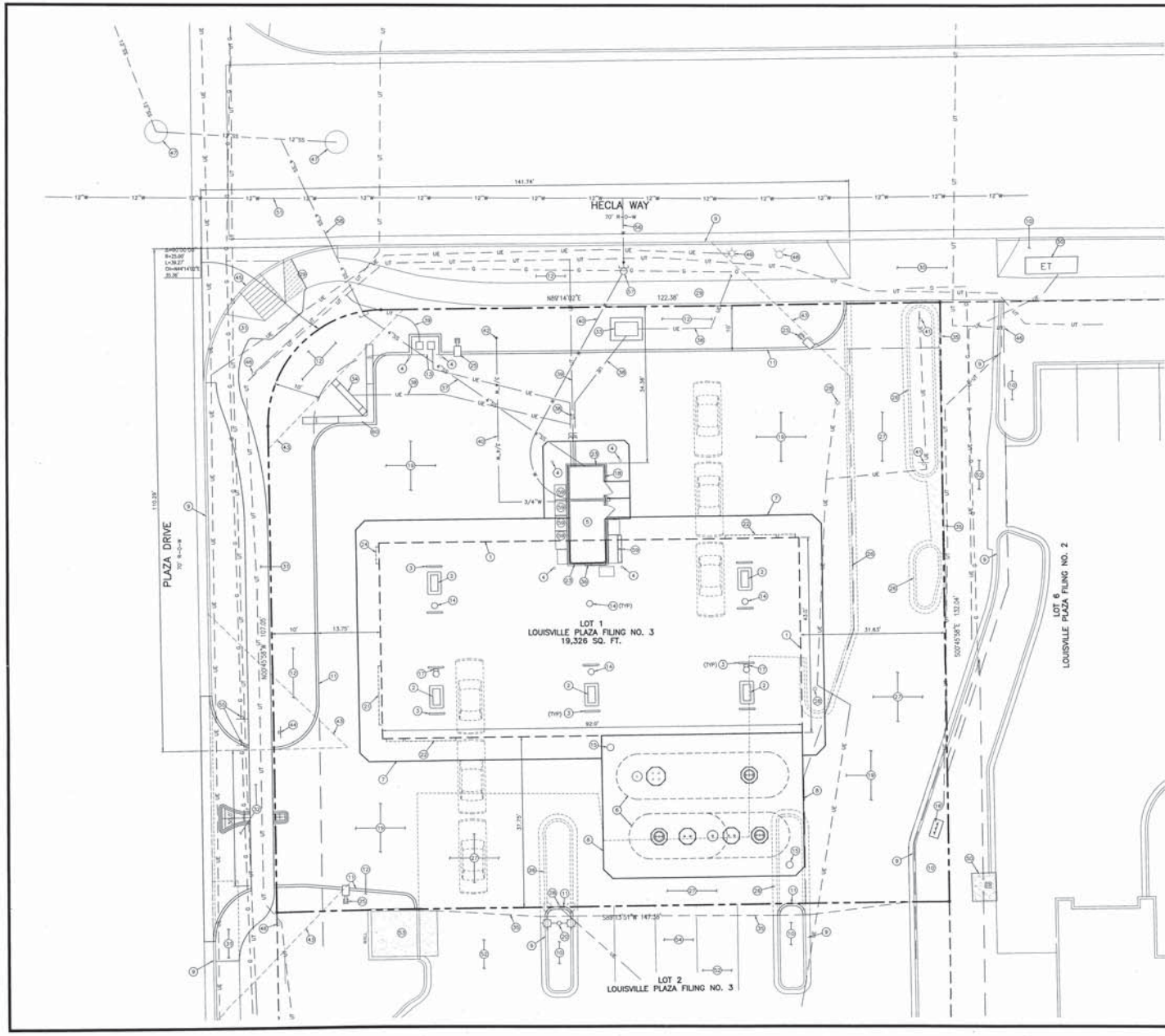
KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13

HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF13
Sheet Scale:	FULL
Designed By:	MFD
Drawn By:	CWB
Date:	AUGUST 16, 2010
Disk File:	KSF13_P_02-Ovsite

OVERALL SITE PLAN

2 OF 7



SITE LEGEND

- PROPERTY BOUNDARY LINE
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SCHEDULE:

1. PROPOSED 43'-0" WIDE, 92'-0" LONG CANOPY (3,956 SF)
2. PROPOSED 3'-0" x 9'-0" ISLAND W/MULTIPLE PRODUCT DISPENSER (TYP.5)
3. PROPOSED INVERTED U-SHAPED BOLLARD (TYP.10)
4. PROPOSED 6" PIPE BOLLARD (TYP.6)
5. PROPOSED 8'-2" x 21'-6" KIOSK (WITH BATHROOM 180 SF)
6. PROPOSED ONE 20,000 GALLON SINGLE COMPARTMENT UNDERGROUND DOUBLE WALL STORAGE TANK (UNLEADED) AND ONE 18,000 GALLON TWO COMPARTMENT UNDERGROUND DOUBLE WALL STORAGE TANK (8,000 GALLON PREMIUM AND 10,000 GALLON DIESEL)
7. PROPOSED 6" THICK REINFORCED CONCRETE SLAB UNDER CANOPY WITH 2' CHAMFER CORNERS
8. PROPOSED 8" THICK REINFORCED CONCRETE SLAB OVER FUEL STORAGE TANKS
9. EXISTING CURB AND GUTTER TO REMAIN
10. EXISTING LANDSCAPE ISLANDS/AREA TO REMAIN
11. PROPOSED 6" CURB AND 1' GUTTER
12. PROPOSED LANDSCAPE ISLANDS/AREA
13. PROPOSED PUBLIC AIR STAND AND PUBLIC PAY PHONE ON 6' X 4' CONCRETE PAD BOTTOM OF PAD WILL BE FLUSH WITH DRIVE
14. PROPOSED CANOPY COLUMN (TYP. 6)
15. PROPOSED TANK OBSERVATION WELLS.
16. PROPOSED 2" BLACK STEEL VENT RISERS.
17. PROPOSED OVERFILL ALARM STROBE AND ACKNOWLEDGMENT SWITCH ON CANOPY COLUMN
18. PROPOSED EMERGENCY SHUT-OFF SWITCH MOUNTED ON KIOSK, WITH DISTINCTLY LABELED SIGN READING "EMERGENCY FUEL SHUTDOWN DEVICE"
19. PROPOSED 6" CONCRETE PAVEMENT
20. PROPOSED RELOCATED SITE LIGHT (EXISTING UNDERGROUND ELECTRICAL SHALL BE RE-ROUTED TO NEW LOCATION)
21. ILLUMINATED 3-FUEL PRODUCT PRICE SIGNAGE (45.5 SQ.FT.)
22. ILLUMINATED LOGO AND KING SOOPERS SIGNAGE (18.1 SQ. FT.)
23. NON-ILLUMINATED KIOSK LOGO SIGNAGE (5.0 SQ. FT.)
24. ILLUMINATED CANOPY LOGO SIGNAGE
25. PROPOSED SITE LIGHT
26. EXISTING CONCRETE CURB AND GUTTER TO BE REMOVED
27. EXISTING PAVING TO BE REMOVED
28. EXISTING SITE LIGHT TO BE REMOVED
29. EXISTING CONCRETE SIDEWALK TO REMAIN
30. EXISTING CURB CUT TO REMAIN
31. PROPOSED CONCRETE SIDEWALK
32. PROPOSED CURB CUT (CONSTRUCT PER CITY OF LOUISVILLE STANDARDS)
33. PROPOSED PAD MOUNTED TRANSFORMER
34. PROPOSED MONUMENT SIGN, SIGN FACE MINIMUM 10'-0" FROM RIGHT-OF-WAY LINE, REFER TO MONUMENT SIGN DETAIL ON ARCHITECTURAL DRAWINGS
35. PROPOSED ASPHALT SAWCUT LINE
36. PROPOSED PAY WINDOW
37. PROPOSED 4" SDR 35 SANITARY SEWER SERVICE TO KIOSK
38. PROPOSED UNDERGROUND ELECTRICAL, CONTRACTOR TO VERIFY POINT OF SERVICE WITH UTILITY COMPANY PRIOR TO CONSTRUCTION
39. PROPOSED UNDERGROUND TELEPHONE
40. PROPOSED 3/4" WATER LINE
41. EXISTING SIGN TO BE REMOVED
42. PROPOSED FROST FREE YARD HYDRANT
43. 30' SITE TRIANGLE
44. PROPOSED R1-1 STOP SIGN AND "NO LEFT TURN" SIGN MOUNTED ON SAME POST
45. EXISTING HANDICAP RAMP
46. EXISTING TELEPHONE PEDESTAL
47. EXISTING SANITARY SEWER MANHOLE
48. EXISTING FIRE HYDRANT
49. EXISTING STREET LIGHT
50. EXISTING ELECTRICAL TRANSFORMER
51. EXISTING WATER LINE
52. EXISTING ASPHALT PAVEMENT TO REMAIN
53. EXISTING TRASH ENCLOSURE
54. EXISTING PARKING STALLS TO REMAIN
55. EXISTING R3-76 (LEFT LANE MUST TURN LEFT) TO BE RELOCATED
56. EXISTING 1.5" SERVICE TAP TO REMAIN
57. PROPOSED 3/4" WATER METER AND PIT PER CITY OF LOUISVILLE CRITERIA
58. EXISTING SANITARY SEWER STUB INTO PROPERTY
59. OUTSIDE SODA POP, ICE, AND OIL VENDOR CASES, ETC.
60. PROPOSED MSE GRAVITY WALL

No.	REVISION	DES. BY	DRAWN BY	DATE
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King Soopers Supermarket Petroleum
Project Manager: J. Ellis
Phone: 303-968-8000
Fax: (303) 971-5262

KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13

HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF13
Sheet Scale:	FULL
Designed By:	MFD
Drawn By:	CWB
Date:	AUGUST 10, 2010
Disk File:	KSF13_P_03-Site

SITE AND UTILITY PLAN

3 OF 7

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment 3 of 7

DRAWING NUMBER

DRAWING NUMBER

King Soopers 1712 Plaza Dr.

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

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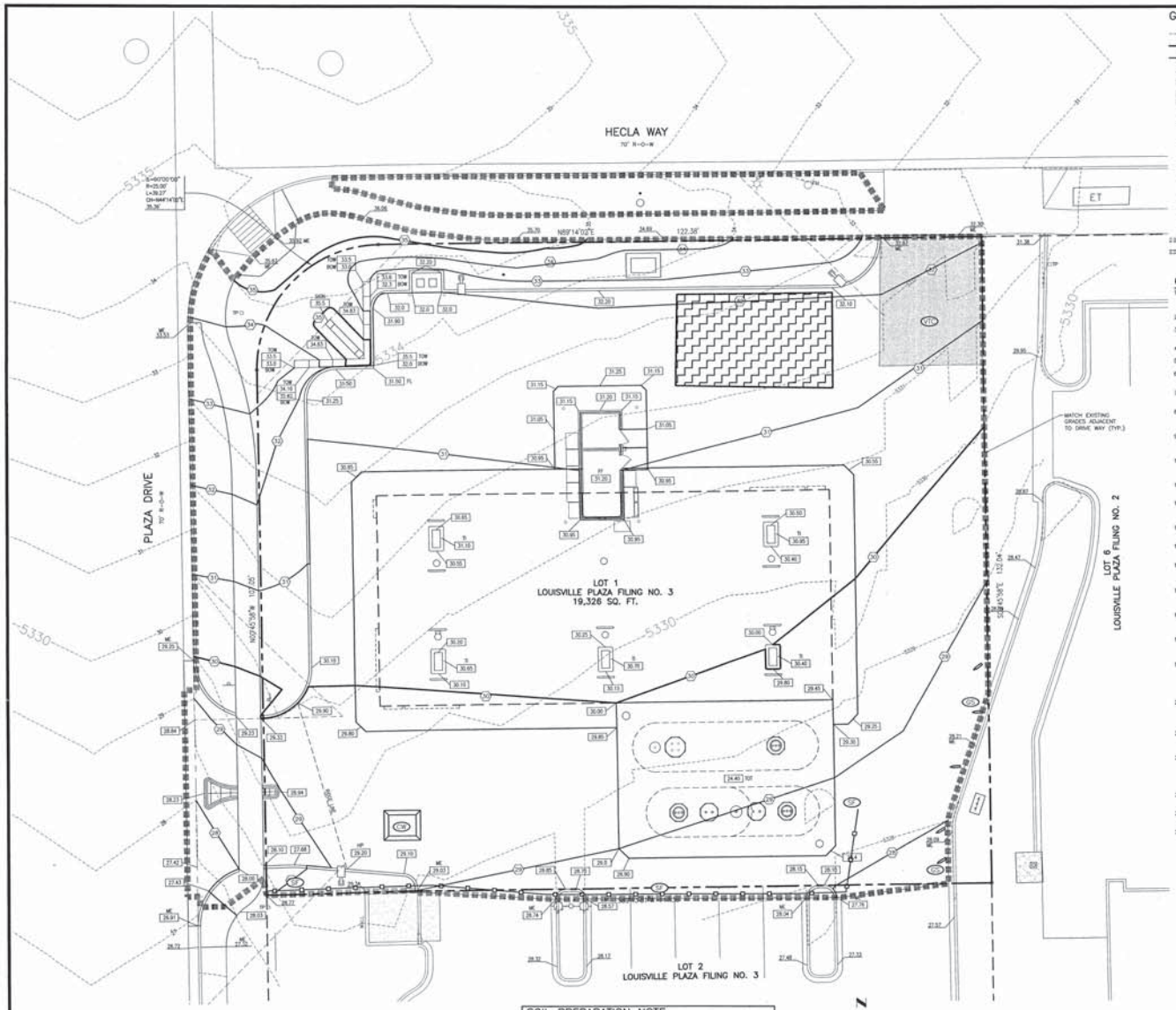

GRADING LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED CONTOUR (BY OTHERS)
- 24.00 EXISTING SPOT ELEVATION
- 24.0 PROPOSED SPOT ELEVATION
- 24.0 / 24.0 PROPOSED TOP OF CURB ELEVATION / PROPOSED FLOWLINE ELEVATION
- FF FINISHED FLOOR
- TOT TOP OF TANKS
- TI TOP OF ISLAND
- TOG TOP OF GRATE
- TC TOP OF CURB
- TOS TOP OF SIDEWALK
- FL FLOWLINE
- HP HIGH POINT
- LP LOW POINT
- ME MATCH EXISTING
- INV INVERT ELEVATION
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- SOIL SWALE
- FLOW ARROW
- VEHICLE TRACKING CONTROL CONSTRUCTION ENTRANCE
- SILT FENCE
- GRAVEL SOCK IN GUTTER
- CONCRETE WASHOUT AREA
- CONTRACTOR STAGING AREA (APPROXIMATE)

GENERAL NOTES

1. REQUIREMENTS SHOWN ON SITE PLAN SHALL GOVERN. DRAWINGS AND SPECIFICATIONS SHOWING OTHERWISE NOTWITHSTANDING. CONTRACTOR TO POINT OUT ANY DISCREPANCIES TO THE OWNERS REP. PRIOR TO BID.
2. NO WORK IS TO BEGIN UNTIL ALL PERMITS HAVE BEEN OBTAINED.
3. CONTRACTOR TO PROVIDE ALL EQUIPMENT AND PERSONNEL REQUIRED FOR FINAL CHECKOUT OF ALL FACILITIES BY OWNER'S REPRESENTATIVE.
4. ENTIRE INSTALLATION SHALL MEET ALL APPLICABLE CODES.
5. VERIFY ALL DIMENSIONS AND CONDITIONS ON SITE.
6. ALL LANDSCAPING AREAS SHALL BE GRADED TO WITHIN 0.10' WITH COMPANY APPROVED TOP SOIL TO A MINIMUM 6" DEPTH.
7. FINAL GRADES ARE SUBJECT TO MINOR CHANGE BY COMPANY REPRESENTATIVE. NO GRADE CHANGES IN EXCESS OF 0.05' WITHOUT COMPANY APPROVAL.
8. ANY FILL MATERIAL REQUIRED TO BRING THE SITE TO GRADE SHALL BE CLEAN FILL DIRT APPROVED BY GEOTECHNICAL ENGINEER AND SHALL BE PLACED PER GEOTECHNICAL RECOMMENDATIONS.
9. SET PROPERTY CORNER PINS IN CONCRETE. IF PROPERTY CORNERS ARE DESTROYED BY CONTRACTOR, THE CONTRACTOR SHALL BEAR THE EXPENSE OF RELOCATING CORNERS BY A REGISTERED SURVEYOR.
10. THIS DESIGN IS BASED ON A SOIL AND FOUNDATION INVESTIGATION. CONTRACTOR SHALL FOLLOW ALL GEOTECHNICAL RECOMMENDATIONS. A COPY OF THIS REPORT IS AVAILABLE FOR INSPECTION BY THE CONTRACTORS.
11. ALL UTILITY CONNECTIONS, FOOTINGS, FOUNDATIONS SHALL BE INSTALLED BY GENERAL CONTRACTOR UNLESS OTHERWISE SPECIFICALLY EXCLUDED IN NOTES.
12. GENERAL CONTRACTOR SHALL RECEIVE, UNLOAD, STORE AND UNCRATE ALL EQUIPMENT FURNISHED BY THE OWNER AND SHIPPED TO THE SITE. SEE SPECIFICATIONS FOR EQUIPMENT FURNISHED BY OWNER.
13. LANDSCAPING AND IRRIGATION SYSTEM SHALL BE INSTALLED BY GENERAL CONTRACTOR. SEE LANDSCAPE AND IRRIGATION PLANS FOR DETAILS.
14. GENERAL CONTRACTOR TO PERFORM GENERAL YARD AND BUILDING CLEAN-UP AT COMPLETION OF WORK.
15. SEE THE SITE SURVEY FOR SURVEY INFORMATION. CONTRACTOR'S CONSTRUCTION SURVEYOR TO OBTAIN AUTOCAD FILE PRIOR TO CONSTRUCTION STAKING. CONSTRUCTION SURVEYOR SHALL ADHERE TO ALL ACSM GUIDELINES FOR CONSTRUCTION STAKING.
16. ALL TOP OF CURB GRADES ARE 6" HIGHER THAN FINISH GRADES SHOWN ON DRIVE UNLESS OTHERWISE NOTED. ALL SPOT ELEVATIONS SHOWN ADJACENT TO CURBS AND SIDEWALKS REFER TO FLOWLINE UNLESS NOTED OTHERWISE.
17. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MINIMIZING DEPOSITION OF ONSITE SEDIMENTS ONTO SURROUNDING PUBLIC STREETS DURING CONSTRUCTION. SEE SWMP EROSION CONTROL PLANS FOR ADDITIONAL DETAILS.
18. GENERAL CONTRACTOR SHALL PROVIDE COMPREHENSIVE TRAFFIC CONTROL PLAN WHICH SHALL BE SUBMITTED TO AND APPROVED BY THE CITY AND/OR STATE PRIOR TO ANY WORK IN THE PUBLIC R.O.W.
19. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
20. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.
21. IF DEWATERING IS REQUIRED TO INSTALL UTILITIES, A STATE CONSTRUCTION DEWATERING WASTEWATER DISCHARGE PERMIT IS REQUIRED IF WATER IS DISCHARGED INTO A STORM SEWER, CHANNEL, IRRIGATION DITCH OR ANY WATERS OF THE UNITED STATES.
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING AS-BUILT INFORMATION ON A SET OF RECORD DRAWINGS KEPT ON THE CONSTRUCTION SITE, AND AVAILABLE TO THE CITY, ITS AGENTS, OWNER OR GALLOWAY AT ALL TIMES. DIMENSIONS SHALL BE ANNOTATED ON AS-BUILT RECORD DRAWINGS. AS-BUILT DRAWINGS ARE REQUIRED PRIOR TO ISSUANCE OF FINAL PAYMENT. AS BUILT DRAWINGS WILL BE SUPPLIED TO OWNER AND CITY PRIOR TO FINAL PAYMENT.
23. ALL TRENCH EXCAVATION SHALL BE PROPERLY SLOPED OR SUPPORTED IN A MANNER REQUIRED BY OSHA OR AS REQUIRED BY STATE OR LOCAL LAWS.
24. ALL RAMPS SLOPES SHALL BE 12:1 OR LESS. SIDEWALKS AND DRIVES WHERE RAMPS CROSS SHALL HAVE LONGITUDINAL SLOPES 5% OR LESS AND CROSS SLOPES 2% OR LESS.
25. PUBLIC IMPROVEMENTS CONSTRUCTION FOR UTILITY AND CONCRETE WORK WITHIN RIGHT OF WAY SHALL MEET THE REQUIREMENTS OF THE CITY OF LOUISVILLE DESIGN AND CONSTRUCTION STANDARDS. CONTRACTORS WORKING WITHIN PUBLIC PROPERTY ARE REQUIRED TO OBTAIN A RIGHT OF WAY PERMIT AVAILABLE FROM THE CITY OF LOUISVILLE PUBLIC WORKS DEPARTMENT

EROSION CONTROL NOTES:

1. OS: GRAVEL SOCKS CAN BE PLACED AT CURB INLETS (COMBINATION INLET) IN LIEU OF THE GRAVEL FILTER. INSTALL GRAVEL SOCKS SIMILAR TO "GRAVEL SOCKS AT AREA INLET" DETAIL. THE GRAVEL SOCKS MUST BE PLACED PERPENDICULAR TO FLOW AND COMPLETELY AROUND GRATE WITH NO SPACES BETWEEN SOCKS.
2. VTC: VEHICLE TRACKING PAD SHOULD BE EXTENDED ACROSS THE ENTIRE ENTRANCE IF TRUCK TRAFFIC TRAVELS OFF DESIGNATED PAD.
3. SF: STRAW ROLLS MAY BE STAKED DOWN SIMILAR TO THE HAY BALE DETAIL IN LIEU OF SILT FENCE WHEN FINE GRADING OR FINAL STABILIZATION IS OCCURRING.
4. CW: SEVERAL CONCRETE WASHOUT LOCATIONS ARE SHOWN HERE AS OPTIONS FOR THE CONTRACTOR'S USE DURING VARIOUS CONSTRUCTION PHASING. **ONLY ONE LOCATION MAY BE USED AT A TIME.**
5. CONTRACTOR TO REPLACE STRAW BALE INLET PROTECTION AROUND INLETS WITH CURB INLET GRAVEL FILTERS ONCE PAVING OF SITE HAS STARTED.
6. VTC – VEHICLE TRACKING CONTROL SHALL BE RELOCATED, AS REQUIRED, AS CONSTRUCTION PROGRESSES, FOR ADEQUATE SEDIMENT CONTROL.

BENCHMARK

THE BENCHMARK UTILIZED FOR THIS SURVEY IS A NGS MONUMENT Q 413, PID – KK1556, WITH A PUBLISHED ELEVATION OF 5296.02 FEET, NAVD 88 DATUM

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

SOIL PREPARATION NOTE

SOIL PREPARATION FOR NON-LANDSCAPE AREAS SHALL BE PER RECOMMENDATIONS FROM A GEOTECHNICAL REPORT PREPARED FOR THIS SITE AS FOLLOWS:

GEOTECHNICAL ENGINEER:
REPORT No:

THE CONTRACTOR MUST FULLY REVIEW THIS REPORT PRIOR TO CONSTRUCTION. INFORMATION IN THE GEOTECHNICAL REPORT SUPERSEDES ANY CONFLICTING INFORMATION CONTAINED IN THE CONSTRUCTION PLANS AND SPECIFICATIONS. REFER TO GENERAL, STRUCTURAL NOTES FOR SPECIFIC SOIL PREPARATION AT SITE STRUCTURES. REFER TO THE LANDSCAPE PLANS FOR SPECIFIC PLANTING AREA SOIL AMENDMENT PROCEDURES.

No.	REVISION	DES. BY	DRAWN BY	DATE
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Project Manager: J. Smith
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Fax: 303-779-4527
Cell: 303-917-5662
Fax Cell: 877-732-8262

KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13

HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF00013
Sheet Scale:	1" = 10'
Designed By:	MFD
Drawn By:	CWB
Date:	AUGUST 10, 2010
Disk File:	KSF13_P_05-Grad

GRADING AND EROSION CONTROL PLAN

4 OF 7

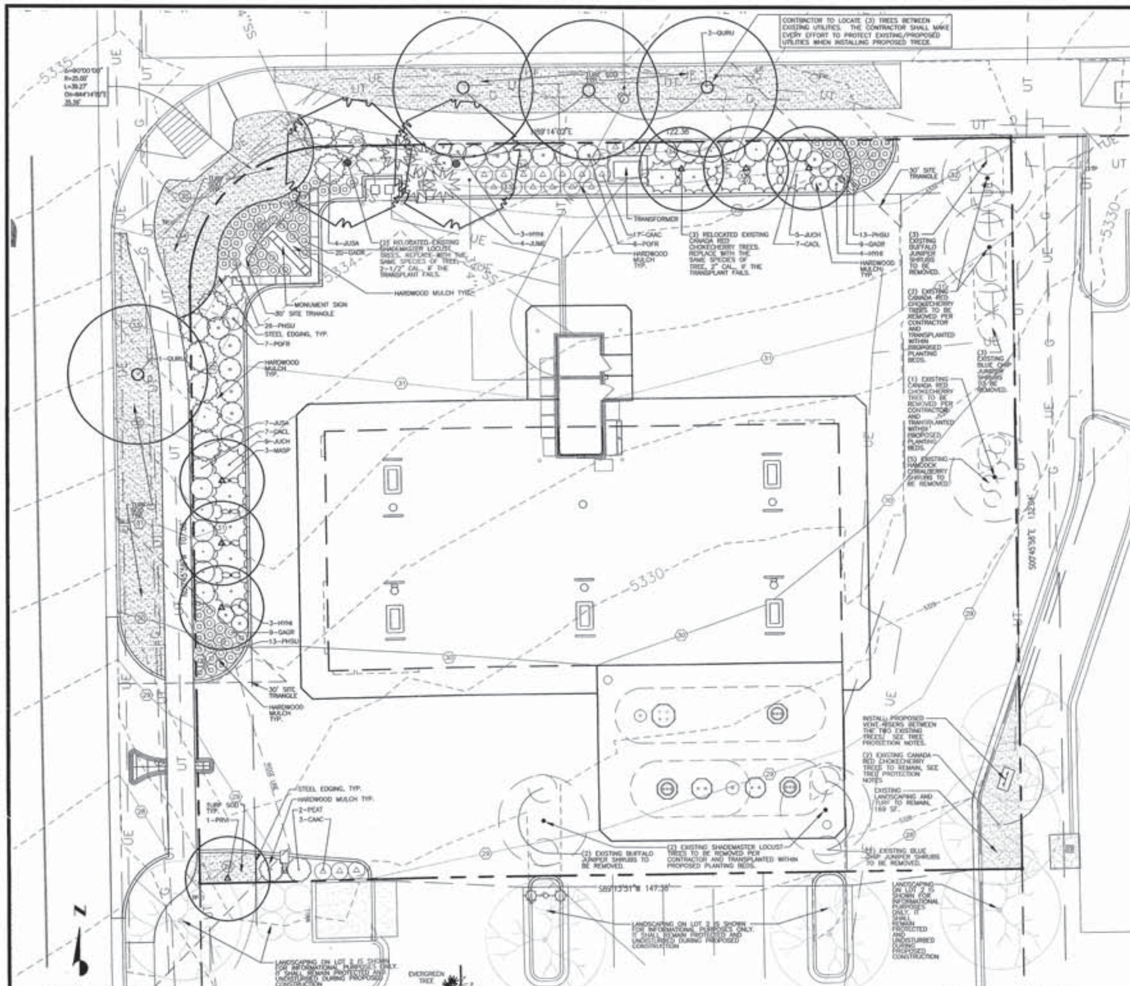
Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

5 of 7

DRAWING NUMBER

DRAWING NUMBER

King Soopers 1712 Plaza Dr.



PLANTING LEGEND (APPROVED BY THE LOUISVILLE COMMERCIAL DESIGN GUIDELINES RECOMMENDED PLANT LIST)

SYMBOL	BOTANIC NAME	COMMON NAME	SIZE	HYDROZONE	MAINT. REQ.	HT. X SPD	QUANT.
DECIDUOUS SHADE TREES							
QURU	QUERCUS RUBRA	NORTHERN RED OAK	2.5" CALIPER	LOW	LOW	50' X 45'	4
~~EXRS~~	~~EXISTING SHADE TREES TO BE REMOVED AND TRANSPLANTED PER PLAN LOCATIONS. GROUP SIMILAR TREE SPECIES TOGETHER.~~						2
							6
DECIDUOUS ORNAMENTAL TREES							
MASP	MALUS X 'SPRING SNOW'	SPRING SNOW CRAB	2.0" CALIPER	MODERATE/LOW	LOW	25' X 20'	3
PRVI	PRUNUS VIRGINIANA 'CANADA RED'	CANADA RED CHOKECHERRY	2.0" CALIPER	MODERATE/LOW	MODERATE	20' X 15'	1
EXRO	EXISTING ORNAMENTAL TREES TO BE REMOVED AND TRANSPLANTED PER PLAN LOCATIONS. GROUP SIMILAR TREE SPECIES TOGETHER.						3
							7
DECIDUOUS SHRUBS							
CACL	CARYOPTERIS X CLANDONENSIS	BLUE MIST SPIREA	5 GALLON	LOW	LOW	5' X 5'	14
HYHI	HYPERICUM HIDCOTE	ST. JOHNS WORT	5 GALLON	LOW	LOW	2' X 3'	10
PEAT	PEROCSKIA ATRIPLICIFOLIA	RUSSIAN SAGE	5 GALLON	LOW	MODERATE	4' X 4'	2
POFR	POTENTILLA FRUTICOSA 'GOLD STAR'	GOLD STAR POTENTILLA	5 GALLON	MODERATE/LOW	MODERATE	2' X 3'	13
							39
EVERGREEN SHRUBS							
JUCH	JUNIPERUS CHINENSIS 'ARMSTRONGII'	ARMSTRONG JUNIPER	5 GALLON	LOW	LOW	4' X 4'	10
JUME	JUNIPERUS X MEDIA 'PFITZERIANA COMPACT'	COMPACT PFITZER	5 GALLON	LOW	LOW	4' X 5'	4
JUSA	JUNIPERUS SABINA 'BUFFALO'	BUFFALO JUNIPER	5 GALLON	LOW	LOW	1' X 6'	12
							25
PERENNIALS AND ORNAMENTAL GRASSES							
CAAC	CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	FEATHER REED GRASS	1 GALLON	LOW	MODERATE	4.5' X 2'	20
GAGR	GAILLARDIA X GRANDIFLORA	BLANKET FLOWER	1 GALLON	LOW	MODERATE	1.5' X 2'	55
PHSU	PHLOX SUBULATA	CREEPING PHLOX	1 GALLON	LOW	MODERATE	6" X 2'	36
							111
SOD AND MULCH							
	100% REVEILLE SOD, OR APPROVED EQUAL	TURF SOD	SOD	MODERATE	- - -	- - -	1,307 SF
	DOUBLE SHREDDED CEDAR BARK MULCH	BARK MULCH	MULCH	LOW	- - -	- - -	2,029 SF

MULCH NOTES

HARDWOOD MULCH

AFTER ALL PLANTING IS COMPLETE, CONTRACTOR SHALL INSTALL LANDSCAPE FABRIC AND A MINIMUM 4" THICK LAYER OF DOUBLE SHREDDED CEDAR BARK MULCH OR APPROVED EQUAL IN ALL PLANTING AREAS AS INDICATED ON PLANS. CONTRACTOR SHALL SUBMIT SAMPLE OF ALL MULCHES TO THE OWNER AND LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION. ABSOLUTELY NO EXPOSED GROUND SHALL BE LEFT SHOWING ANYWHERE ON THE PROJECT AFTER MULCH HAS BEEN INSTALLED.

SOD NOTES:

1) ALL SOD IS AVAILABLE THROUGH:
GRAFF'S TURF FARMS
8909 N. FRONTAGE ROAD (I-76)
FT. MORGAN, CO 80701
970-867-8873

2) INSTALL AND MAINTAIN IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

3) REVEILLE SOD IS A MODERATE HYDROZONE PLANT MATERIAL.

PERIMETER PLANTING CALCULATIONS

	LENGTH L.F.	REQUIRED PLANTINGS	PROVIDED PLANTINGS
STREET EDGE NORTH DETACHED SIDEWALK	160 L.F.	8 TREES & 32 SHRUBS	8 TREES, 33 SHRUBS & 51 PERN/ORN GRASSES
STREET EDGE WEST DETACHED SIDEWALK	145 L.F.	8 TREES & 29 SHRUBS	5 TREES, 31 SHRUBS & 56 PERN/ORN GRASSES
TOTAL		16 TREES & 61 SHRUBS	13 TREES, 64 SHRUBS & 107 PERN/ORN GRASSES

PLANTING NOTES

GENERAL

1. CALL UNCC AT (303) 232-1991 PRIOR TO ANY EXCAVATION.
2. ALL WORK SHALL CONFORM TO APPLICABLE LOCAL CODES
3. PLANT QUANTITIES SHOWN ON LEGENDS ARE FOR GENERAL INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS OWN TAKEOFFS AND QUANTITY CALCULATIONS. MINOR ADJUSTMENTS TO THE LANDSCAPE MATERIAL AND LOCATIONS MAY BE PROPOSED FOR THE CITY CONSIDERATION AT THE CONSTRUCTION DOCUMENT STAGE TO RESPOND TO MARKET AND FIELD CONDITIONS. HOWEVER, THERE SHALL BE NO REDUCTION IN THE NUMBER AND SIZE OF MATERIALS.
4. THE CONTRACTOR SHALL MAKE HIMSELF AWARE OF THE LOCATIONS OF EXISTING AND PROPOSED UTILITIES, AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE UTILITIES AND/OR ANY INJURY TO ANY PERSON. FIELD LOCATE ALL UTILITIES PRIOR TO PLANTING.
5. THE CONTRACTOR SHALL TAKE EXTREME CARE NOT TO DAMAGE ANY EXISTING PLANTS INDICATED AS "TO REMAIN". ANY SUCH PLANTS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED WITH THE SAME SPECIES, SIZE, AND QUANTITY AT THE CONTRACTOR'S OWN EXPENSE, AND AS ACCEPTABLE TO THE OWNER. REFER TO THE TREE PROTECTION NOTES ON THE PLANS (AS APPLICABLE).
6. IF SITE CONDITIONS OR PLANT AVAILABILITY REQUIRE CHANGES TO THE PLAN, THEN AN APPROVAL WILL BE OBTAINED FROM THE CITY OF LOUISVILLE.
7. ALL UTILITY EASEMENTS SHALL REMAIN UNOBSTRUCTED AND FULLY ACCESSIBLE ALONG THEIR ENTIRE LENGTH FOR MAINTENANCE EQUIPMENT.

FINISH GRADING AND SOIL PREPARATION

8. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN FINISH GRADES AS RECOMMENDED BY THE GEOTECHNICAL REPORT. ALL LANDSCAPE AREAS SHALL HAVE POSITIVE DRAINAGE AWAY FROM STRUCTURES AT THE MINIMUM SLOPE SPECIFIED IN THE REPORT, AND AREAS OF POTENTIAL PONDING SHALL BE REGRADED TO BLEND IN WITH THE SURROUNDING GRADES AND ELIMINATE PONDING POTENTIAL. SHOULD ANY CONFLICTS AND/OR DISCREPANCIES ARISE BETWEEN THE GEOTECHNICAL REPORT, THE GRADING PLANS, THESE NOTES, AND ACTUAL CONDITIONS, THE CONTRACTOR SHALL IMMEDIATELY BRING SUCH ITEMS TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND OWNER.
9. AFTER FINISH GRADES HAVE BEEN ESTABLISHED, CONTRACTOR SHALL HAVE SOIL SAMPLES TESTED BY AN ESTABLISHED SOIL TESTING LABORATORY FOR THE FOLLOWING: GENERAL SOIL FERTILITY, pH, ORGANIC MATTER CONTENT, SALT (CEC), LIME, SODIUM ADSORPTION RATIO (SAR) AND BORON CONTENT. EACH SAMPLE SUBMITTED SHALL CONTAIN NO LESS THAN ONE QUART OF SOIL. CONTRACTOR SHALL ALSO SUBMIT THE PROJECT'S PLANT LIST TO THE LABORATORY ALONG WITH THE SOIL SAMPLES. THE SOIL REPORT PRODUCED BY THE LABORATORY SHALL CONTAIN RECOMMENDATIONS FOR THE FOLLOWING (AS APPROPRIATE): GENERAL SOIL PREPARATION AND BACKFILL MIXES, PRE-PLANT FERTILIZER APPLICATIONS, AND ANY OTHER SOIL RELATED ISSUES. THE REPORT SHALL ALSO PROVIDE A FERTILIZER PROGRAM FOR THE ESTABLISHMENT PERIOD AND FOR LONG-TERM MAINTENANCE.
10. THE CONTRACTOR SHALL INSTALL SOIL AMENDMENTS AND FERTILIZERS PER THE SOILS REPORT RECOMMENDATIONS, AND AFTER RECEIVING A CHANGE ORDER FROM THE OWNER. ANY CHANGE IN COST DUE TO THE SOIL REPORT RECOMMENDATIONS SHALL BE SUBMITTED TO THE OWNER WITH THE REPORT. REFER TO SPECIFICATIONS FOR SOIL PREPARATION METHODS.
11. FOR BIDDING PURPOSES ONLY, THE SOIL PREPARATION SHALL CONSIST OF THE FOLLOWING:

TURF
(INCORPORATED INTO THE TOP 6" OF SOIL BY MEANS OF ROTOTILLING AFTER CROSS-RIPPING, AND NOT INCLUDING SLOPES OR SHRUB-PLANTED BEDS):
NITROGEN STABILIZED ORGANIC AMENDMENT - 3 CU. YDS. PER 1,000 S.F.
AMMONIUM PHOSPHATE 16-20-0 - 15 LBS PER 1,000 S.F.

TREES, SHRUBS, AND PERENNIALS - BEDS:
5 PARTS BY VOLUME ON-SITE SOIL
2 PARTS BY VOLUME NITROGEN STABILIZED ORGANIC AMENDMENT
10 LBS. 12-12-12 FERTILIZER PER CU. YD.

NO MANURE OR ANIMAL-BASED PRODUCTS SHALL BE USED FOR ORGANIC AMENDMENTS.

PLANTING

12. PLANT QUANTITIES SHOWN ON LEGENDS ARE FOR GENERAL INFORMATION. IN THE EVENT OF A DISCREPANCY BETWEEN THE PLAN AND THE LANDSCAPE LEGEND, THE PLANT QUANTITY AS SHOWN ON THE PLAN SHALL TAKE PRECEDENCE.
13. ALL PLANT LOCATIONS ARE DIAGRAMMATIC. ACTUAL LOCATIONS SHALL BE VERIFIED WITH THE LANDSCAPE ARCHITECT PRIOR TO PLANTING.
14. ALL PLANTS WITHIN A SPECIES SHALL HAVE SIMILAR SIZE, AND SHALL BE OF A FORM TYPICAL FOR THE SPECIES. ANY PLANT DEEMED UNACCEPTABLE BY THE LANDSCAPE ARCHITECT SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND SHALL BE REPLACED WITH AN ACCEPTABLE PLANT OF LIKE TYPE AND SIZE AT THE CONTRACTOR'S OWN EXPENSE. ANY PLANTS APPEARING TO BE UNHEALTHY, EVEN IF DETERMINED TO STILL BE ALIVE, SHALL NOT BE ACCEPTED. THE LANDSCAPE ARCHITECT SHALL BE THE SOLE JUDGE AS TO THE ACCEPTABILITY OF PLANT MATERIAL.
15. ALL PLANT MATERIAL SHALL FOLLOW THE GUIDELINES OF THE "AMERICAN STANDARD FOR NURSING STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
16. ALL TREES SHALL BE STANDARD IN FORM, UNLESS OTHERWISE SPECIFIED. TREES WITH CENTRAL LEADERS WILL NOT BE ACCEPTED IF LEADER IS DAMAGED OR REMOVED. PRUNE ALL DAMAGED TWIGS AFTER PLANTING.
17. THE CONTRACTOR SHALL INSTALL ROOT BARRIERS NEAR ALL NEWLY-PLANTED TREES THAT ARE LOCATED WITHIN FIVE (5) FEET OF PAVING OR CURBS. ROOT BARRIERS SHALL BE EQUIVALENT TO "CENTURY" OR "DEEP-ROOT" 24" DEEP PANELS. BARRIERS SHALL BE LOCATED IMMEDIATELY ADJACENT TO HARDSCAPE AND AS PER THE ROOT BARRIER DETAIL ON THESE PLANS. INSTALL PANELS PER MANUFACTURER'S RECOMMENDATIONS. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR USE ROOT BARRIERS OF A TYPE THAT COMPLETELY ENCIRCLE THE ROOTBALL.
18. ALL TREES SHALL BE GUYED AND STAKED ACCORDING TO THE TYPICAL AMERICAN NURSERY STANDARDS FOR THE STATE OF COLORADO. ALL TREES AND SHRUBS SHALL BE INSTALLED PER AMERICAN NURSERY STANDARDS FOR THE STATE OF COLORADO.
19. ALL SHRUB BEDS SHALL BE CONTAINED WITH STEEL EDGER. STEEL EDGER IS NOT REQUIRED ALONG CURBS, WALKS OR BUILDING FOUNDATIONS. STEEL EDGER SHALL BE AN APPROVED 4"X 1/16" SIZED ROLLED TOP, GREEN PAINTED STEEL EDGER.
20. THE INSTALLATION OF ALL LANDSCAPING SHALL BE DONE BY AN ESTABLISHED LANDSCAPE CONTRACTOR WHO FOLLOWS THE PROCEDURES SET FORTH BY THE AMERICAN ASSOCIATION OF LANDSCAPE CONTRACTORS AND ITS LOCAL AGENCIES.
21. LANDSCAPE AND IRRIGATION WORK SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY.
22. THE DEVELOPER, HIS SUCCESSOR, OR ASSIGNEE SHALL BE RESPONSIBLE FOR ESTABLISHING AND CONTINUING A REGULAR PROGRAM OF MAINTENANCE FOR ALL LANDSCAPED AREAS.
23. FLUSH AND ADJUST ALL SPRINKLER HEADS FOR OPTIMUM PERFORMANCE AND TO PREVENT OVERSPRAY ONTO WALKS, ROADWAYS, AND/OR BUILDINGS AS MUCH AS POSSIBLE. THIS SHALL INCLUDE SELECTING THE BEST NOZZLE ARC AND RADIUS TO FIT THE EXISTING SITE CONDITIONS.

MULCHING

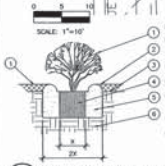
24. ALL PLANTING AREAS WITH LESS THAN A 4:1 GRADIENT SHALL RECEIVE A LAYER OF MULCH, TYPE AND DEPTH PER PLANS. SUBMIT 1 CUBIC FOOT SAMPLE OF MULCH (ONE SAMPLE PER TYPE) TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION. THE MULCH SHALL BE SPREAD EVENLY THROUGHOUT ALL PLANTING AREAS EXCEPT SLOPES 4:1 OR STEEPER, OR AS OTHERWISE DENOTED ON THE PLAN. ABSOLUTELY NO EXPOSED GROUND SHALL REMAIN IN AREAS TO RECEIVE MULCH AFTER MULCH HAS BEEN INSTALLED.
25. ALL PLANTING AREAS ON SLOPES OVER 4:1 SHALL RECEIVE COCONUT FIBER EROSION CONTROL NETTING FROM ROLLS. NETTING SHALL BE KCT-125, AS MANUFACTURED BY NORTH AMERICAN GREEN (OR EQUAL). INSTALL AND STAKE PER MANUFACTURER'S SPECIFICATIONS. SEE ALSO THE CIVIL ENGINEER'S EROSION CONTROL PLAN.

TREE PROTECTION NOTES

1. "PROTECTED ZONE" FOR EXISTING TREES: BEFORE BEGINNING ANY DEMOLITION OR CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING AROUND ALL EXISTING TREES WITHIN THE CONSTRUCTION ZONE THAT ARE TO BE SAVED. THE FENCE SHALL BE INSTALLED NO CLOSER TO THE TREE THAN THE EDGE OF THE TREE'S PROTECTED ZONE, GENERALLY DEFINED AS THE AREA BEGINNING FIVE FEET OUTSIDE OF THE TREE'S DRIPLINE AND EXTENDING TOWARDS THE TREE (OR AS FAR AWAY FROM THE TRUNK AS PRACTICABLE). THE FENCING SHALL BE A MINIMUM OF 4' IN HEIGHT AND A MATERIAL ACCEPTABLE TO THE LANDSCAPE ARCHITECT. ALL CONTRACTORS AND THEIR CREWS SHALL NOT BE ALLOWED INSIDE THIS "PROTECTED ZONE" NOR SHALL THEY BE ALLOWED TO STORE OR DUMP FOREIGN MATERIALS WITHIN THIS AREA UNLESS FOR INSTALLATION OF LANDSCAPE MATERIAL AND DRIP SYSTEMS. NO WORK OF ANY KIND, INCLUDING TRENCHING, SHALL BE ALLOWED WITHIN THE PROTECTED ZONE EXCEPT AS DESCRIBED BELOW. THE FENCING SHALL REMAIN AROUND EACH TREE TO BE SAVED UNTIL THE COMPLETION OF CONSTRUCTION OPERATIONS.
2. TEMPORARY MULCH: TO ALLEVIATE SOIL COMPACTION IN ANTICIPATED AREAS OF HIGH CONSTRUCTION TRAFFIC, AND ONLY WHERE FENCING CANNOT BE SET FIVE FEET OUTSIDE OF THE DRIPLINE, THE CONTRACTOR SHALL INSTALL A LAYER OF DOUBLE SHREDDED CEDAR BARK MULCH, 9"-12" THICK, OVER ALL EXPOSED EARTH FROM THE TREE TRUNK TO 5' OUTSIDE OF THE DRIPLINE. THIS LAYER SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. WHEN PLANTING OPERATIONS ARE COMPLETED, THE MULCH SHALL BE REDISTRIBUTED THROUGHOUT ALL PLANTING AREAS DESINATED FOR BARK MULCH IN A 3" THICK "PERMANENT" MULCH LAYER.
3. NECESSARY WORK: WHEN IT BECOMES NECESSARY TO ENTER THE "PROTECTED ZONE", SUCH AS FOR FINE GRADING, IRRIGATION INSTALLATION, AND PLANTING OPERATIONS, THE CONTRACTOR SHALL STRICTLY ADHERE TO THE FOLLOWING RULES:
   - A. EVERY EFFORT SHALL BE MADE TO PRESERVE THE EXISTING GRADE AROUND PROTECTED TREES IN AS WIDE AN AREA AS POSSIBLE.
   - B. TRENCHING WITHIN THE PROTECTED ZONE OF EXISTING TREES SHALL BE PERFORMED BY HAND, AND WITH EXTREME CARE NOT TO SEVER ROOTS 1-1/2" IN DIAMETER AND LARGER. WHERE ROOTS 1-1/2" IN DIAMETER AND LARGER ARE ENCOUNTERED, THE CONTRACTOR SHALL TUNNEL UNDER SAID ROOTS. EXPOSED ROOTS THAT HAVE BEEN TUNNELED UNDER SHALL BE WRAPPED IN WET BURLAP AND KEPT MOIST WHILE THE TRENCH IS OPEN.
   - C. WHERE ROOTS 1-1/2" IN DIAMETER OR LARGER MUST BE CUT DUE TO EXTENSIVE GRADE CHANGES, THOSE ROOTS MUST BE EXPOSED BY HAND DIGGING AND CUT CLEANLY. RAGGED CUTS GENERALLY DO NOT HEAL PROPERLY, AND MAY LEAVE THE TREE OPEN TO PESTS AND PATHOGENS.
   - D. WHERE TRENCHING NEAR TREES HAS ALREADY OCCURRED FROM PREVIOUS CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL MAKE EVERY EFFORT TO CONFINE HIS TRENCHING OPERATIONS TO THE PREVIOUSLY-CREATED TRENCHES, WHILE ADHERING TO THE CONDITIONS SET FORTH IN 3B.
4. POTENTIAL CONFLICTS: THE CONTRACTOR SHALL NOTIFY THE OWNER, LANDSCAPE ARCHITECT, AND CITY'S ARBORIST SHOULD ANY POTENTIAL CONFLICTS ARISE BETWEEN THESE SPECIFICATIONS AND/OR LARGE ROOTS ENCOUNTERED IN THE FIELD, AND CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL NOT TAKE ANY ACTION IN SUCH CONFLICTS WITHOUT THE ARBORIST'S WRITTEN APPROVAL. THE CITY'S ARBORIST SHALL HAVE FINAL AUTHORITY OVER ALL METHODS NECESSARY TO HELP ENSURE THE PROTECTION AND SURVIVAL OF THE CITY'S EXISTING TREES.
5. PRUNING: PRUNE ONLY THE TREES THAT ARE INDICATED ON THE PLANS AS REQUIRING PRUNING. PRUNE TREES ACCORDING TO INTERNATIONAL SOCIETY OF ARBORICULTURE / ANSI A300 STANDARDS:
   - A. REMOVE ALL DEAD WOOD.
   - B. PRUNE LIVE WOOD FOR HEALTH OR STRUCTURAL REASONS ONLY, INCLUDING THE NEED TO ELIMINATE DISEASED OR DAMAGED GROWTH, ELIMINATE STRUCTURALLY UNSOUND GROWTH, REDUCE THE POTENTIAL FOR WIND TOPPLING OR WIND DAMAGE, OR TO MAINTAIN GROWTH WITHIN LIMITED SPACE. DO NOT REMOVE MORE THAN 25% OF ANY TREE'S LIVE FOLIAGE IN ANY ONE GROWING SEASON. PRUNE ONLY TO INTERNATIONAL SOCIETY OF ARBORICULTURE/ANSI A300 STANDARDS, AND ONLY UNDER THE DIRECT SUPERVISION OF A CERTIFIED ARBORIST.
   - C. FINAL CUTS SHALL BE MADE JUST OUTSIDE THE SHOULDER RING AREA. EXTREMELY FLUSHED CUTS WHICH PRODUCE LARGE WOUNDS SHALL NOT BE MADE.
   - D. ALL TRIMMING CUTS SHALL BE PERFORMED IN SUCH A MANNER AS TO PROMOTE THE NATURAL GROWTH AND SHAPE OF EACH TREE SPECIES.
   - E. IMPROPER PRUNING METHODS INCLUDING, BUT NOT LIMITED TO, "TOPPING", "TIPPING", "HEADING BACK", "DEHORNING", AND "LIONTAILING" WILL NOT BE ALLOWED. THE CONTRACTOR SHALL PAY FOR ALL WORK NECESSARY TO CORRECT SUCH PRUNING WHEN PERFORMED BY HIS CREWS OR SUBCONTRACTORS.
   - F. SHOULD THE CONTRACTOR REQUIRE MORE INFORMATION, THE CONTRACTOR SHALL CONTACT THE ISA AT (217) 355-9411 FOR A COPY OF THE ANSI A300 PRUNING STANDARDS. CONTRACTOR SHALL ADHERE TO THE METHODS AND PRACTICES SET FORTH IN THIS DOCUMENT.
6. GENERAL NOTES:
   - A. PROVIDE A SIGNIFICANT WATER SUPPLY TO EXISTING TREES FROM THE FIRST DAY OF CONSTRUCTION TO THE COMPLETION AND INSTALLATION OF A SITE IRRIGATION SYSTEM.
   - B. SPRAY TREES WITH PESTICIDES BEFORE CONSTRUCTION AND BEFORE EACH GROWING SEASON DURING CONSTRUCTION.
   - C. ROOT PRUNE DAMAGED ROOTS WITHIN ONE HOUR AFTER THE DAMAGE OCCURS.
   - D. EXAMINE THE PRESERVED PLANT MATERIAL A MINIMUM OF ONCE A MONTH DURING THE GROWING SEASON TO VERIFY THE CONDITION. ADJUST WATERING FREQUENCY AND QUANTITY AS NECESSARY TO INSURE PLANT SURVIVAL.

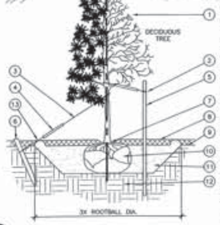
LANDSCAPE GUARANTEE AND MAINTENANCE

1. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL TREES, SHRUBS, PERENNIALS, SOD, SEEDED AREAS, AND IRRIGATION SYSTEMS FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE OWNER'S ACCEPTANCE. THE CONTRACTOR SHALL REPLACE, AT HIS OWN EXPENSE, ANY PLANTS WHICH DIE IN THAT TIME, OR REPAIR ANY PORTIONS OF THE IRRIGATION SYSTEM WHICH OPERATE IMPROPERLY. A PERFORMANCE GUARANTEE IS REQUIRED TO ENSURE COMPLETION OF LANDSCAPING.
2. THE LANDSCAPE CONTRACTOR SHALL MAINTAIN THE LANDSCAPE IN A NEAT, CLEAN, AND HEALTHY CONDITION FOR A PERIOD OF 90 DAYS. THIS SHALL INCLUDE PROPER PRUNING, MOWING AND AERATION OF LAWNS, WEEDING, RESEEDING AREAS WHICH HAVE NOT GERMINATED WELL, REPLACEMENT OF MULCH, REMOVAL OF LITTER, AND THE APPROPRIATE WATERING OF ALL PLANTINGS. IRRIGATION SHALL BE MAINTAINED IN PROPER WORKING ORDER, WITH SCHEDULING ADJUSTMENTS BY SEASON AND TO MAXIMIZE WATER CONSERVATION.
3. AFTER THE INITIAL MAINTENANCE PERIOD AND DURING THE GUARANTEE PERIOD, THE LANDSCAPE CONTRACTOR SHALL ONLY BE RESPONSIBLE FOR REPLACEMENT OF PLANTS WHEN PLANT DEATH CANNOT BE ATTRIBUTED DIRECTLY TO OVERWATERING OR OTHER DAMAGE BY HUMAN ACTIONS.
4. DURING THE LANDSCAPE MAINTENANCE PERIOD, THE LANDSCAPE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM STRUCTURES IN ALL LANDSCAPE AREAS AT THE MINIMUM SLOPE SPECIFIED IN THE GEOTECHNICAL REPORT. LANDSCAPE AREAS WHICH SETTLE AND CREATE THE POTENTIAL FOR PONDING SHALL BE REPAIRED TO ELIMINATE PONDING POTENTIAL AND BLEND IN WITH THE SURROUNDING GRADES. SHOULD ANY CONFLICTS AND/OR DISCREPANCIES ARISE BETWEEN THE GEOTECHNICAL REPORT, THE GRADING PLANS, THESE NOTES, AND ACTUAL CONDITIONS, THE CONTRACTOR SHALL IMMEDIATELY BRING SUCH ITEMS TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND OWNER.



1. SHRUB, PERENNIAL, OR ORNAMENTAL GRASS.
2. MULCH, TYPE AND DEPTH PER PLANS. PLACE NO MORE THAN 1" OF MULCH WITHIN 6" OF PLANT CENTER.
3. FINISH GRADE.
4. ROOT BALL.
5. BACKFILL. AMEND AND FERTILIZE ONLY AS RECOMMENDED IN SOIL FERTILITY ANALYSIS.
6. UNDISTURBED NATIVE SOIL.
7. 3" HIGH EARTHEN WATERING BASIN.

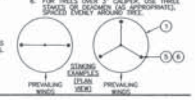
1 SHRUB AND PERENNIAL PLANTING
SCALE: NTS



1. TREE CANOPY.
2. NYLON TREE STRAPS AT ENDS OF WIRES - SECURE TO STAKE OR DEADMAN WITH NAILS.
3. 12 GAUGE GALVANIZED WIRE. SECURE TO TRUNK JUST ABOVE LOWEST MAJOR BRANCHES.
4. 24" X 3/4" P.V.C. MARKERS OVER WIRES.
5. PRESSURE-TREATED WOOD STAKE, 2" DIA. EXTEND STAKES 12" MIN. INTO UNDISTURBED SOIL.
6. PRESSURE-TREATED WOOD DEADMAN, TWO PER TREE (MIN.). BURY OUTSIDE OF PLANTING PIT AND 18" MIN. INTO UNDISTURBED SOIL.
7. TRUNK FLARE.
8. MULCH, TYPE AND DEPTH PER PLANS. DO NOT PLACE MULCH WITHIN 6" OF TRUNK.
9. FINISH GRADE.
10. ROOT BALL.
11. BACKFILL. AMEND AND FERTILIZE ONLY AS RECOMMENDED IN SOIL FERTILITY ANALYSIS.
12. UNDISTURBED NATIVE SOIL.
13. 4" HIGH EARTHEN WATERING BASIN.

NOTES:

1. SCARIFY SIDES OF PLANTING PIT PRIOR TO SETTING TREE.
2. REMOVE EXCESS SOIL APPLIED ON TOP OF THE ROOTBALL THAT COVERS THE ROOT FLARE. THE PLANTING HOLE DEPTH SHALL BE SUCH THAT THE ROOTBALL RESTS ON UNDISTURBED SOIL, AND THE ROOT FLARE IS 3"-5" ABOVE FINISH GRADE.
3. CUT OFF BOTTOM 1/3 OF WIRE BASKET BEFORE PLACING TREE IN HOLE. CUT OFF AND REMOVE REMAINDER OF BASKET AFTER TREE IS SET IN HOLE. REMOVE ALL NYLON TIES, TWINE, ROPE AND OTHER PACKING MATERIAL. REMOVE AS MUCH BURLAP FROM AROUND ROOTBALL AS IS PRACTICAL.
4. TREE WRAP IS NOT TO BE USED ON ANY NEW PLANTINGS, EXCEPT IN LATE FALL PLANTING SITUATIONS, AND ONLY THEN AFTER CONSULTATION WITH THE LANDSCAPE ARCHITECT. WHEN WRAPPING TREE, WRAP FROM TRUNK FLARE TO LOWEST MAJOR BRANCH.
5. REMOVE ALL NURSERY STAKES AFTER PLANTING.
6. FOR TREES OVER 3" CALIPER, USE THREE STAKES OR DEADMEN (AS APPROPRIATE), SPACED EVENLY AROUND TREE.



2 TREE PLANTING
SCALE: NTS

IRRIGATION CONCEPT

1. THE AUTOMATIC IRRIGATION SYSTEM SHALL BE INSTALLED AND OPERATIONAL BY THE TIME OF FINAL INSPECTION. THE ENTIRE IRRIGATION SYSTEM SHALL BE INSTALLED BY A QUALIFIED IRRIGATION CONTRACTOR.
2. THE IRRIGATION SYSTEM WILL OPERATE ON POTABLE WATER, AND THE SYSTEM WILL HAVE APPROPRIATE BACKFLOW PREVENTION DEVICES INSTALLED TO PREVENT CONTAMINATION OF THE POTABLE SOURCE.
3. ALL TURF (SOD) AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC POP-UP IRRIGATION SYSTEM. ALL SHRUB BEDS AND PERENNIAL BEDS TO BE IRRIGATED WITH AN AUTOMATIC DRIP IRRIGATION SYSTEM.
4. ALL PLANTS SHARING SIMILAR HYDROZONE CHARACTERISTICS SHALL BE PLACED ON A VALVE DEDICATED TO PROVIDE THE NECESSARY WATER REQUIREMENTS SPECIFIC TO THAT HYDROZONE.
5. THE IRRIGATION SYSTEM SHALL BE DESIGNED AND INSTALLED, TO THE MAXIMUM EXTENT POSSIBLE, TO CONSERVE WATER BY USING THE FOLLOWING DEVICES AND SYSTEMS: MATCHED PRECIPITATION RATE TECHNOLOGY ON ROTOR AND SPRAY HEADS (WHEREVER POSSIBLE), RAIN SENSORS, AND MULTI-PROGRAM COMPUTERIZED IRRIGATION CONTROLLERS FEATURING SENSORY INPUT CAPABILITIES.
6. ALL EXISTING IRRIGATION, WHERE EXISTING TURF AREAS HAVE BEEN MODIFIED, WILL GET A REVISED IRRIGATION SYSTEM.

LANDSCAPE TABLE

-TOTAL LOT LANDSCAPE SIZE (IN SF):	2,280 SF
-TOTAL R.O.W. LANDSCAPE SIZE (IN SF):	1,855 SF
-TOTAL LANDSCAPE SIZE (IN SF):	4,135 SF

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	REVISION	DES. BY	DRAWN BY	DATE
1	PER CITY COMMENTS	MFD	EVR	9/29/10

Galloway
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KING Soopers — King Soopers Supermarket Petroleum

KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF13
Sheet Scale:	1" = 10'
Designed By:	JLW
Drawn By:	JLW
Date:	AUGUST 10, 2010
Disk File:	KSF13_P_05-Land

LANDSCAPE PLAN

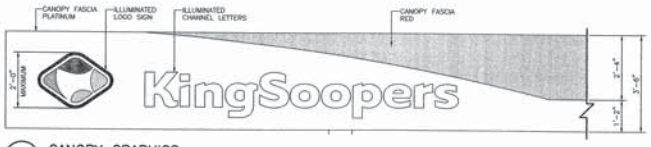
5 OF 7

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

DRAWING NUMBER

DRAWING NUMBER

King Soopers 1712 Plaza Dr.



1 CANOPY GRAPHICS
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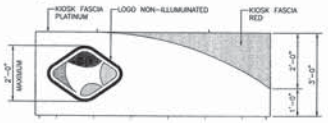
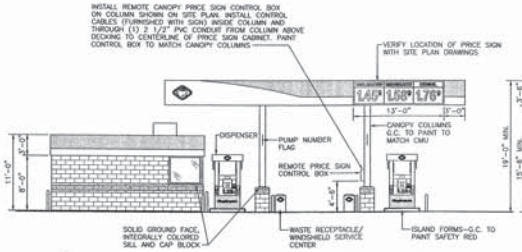
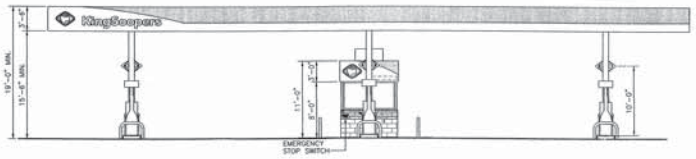


2 KIOSK GRAPHICS
SCALE: 1/2"=1'-0"

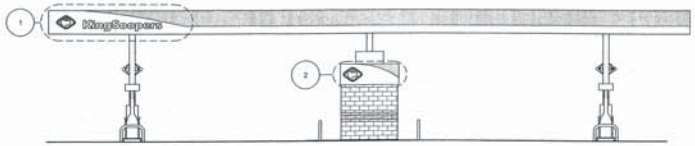


3 WEST ELEVATION
SCALE: 1/8"=1'-0"

4 EAST ELEVATION
SCALE: 1/8"=1'-0"



5 SOUTH ELEVATION
SCALE: 1/8"=1'-0"



6 NORTH ELEVATION
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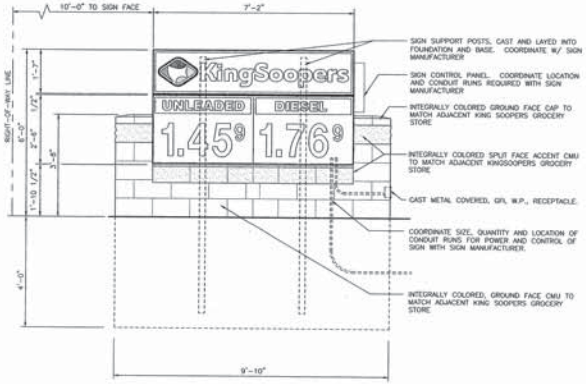
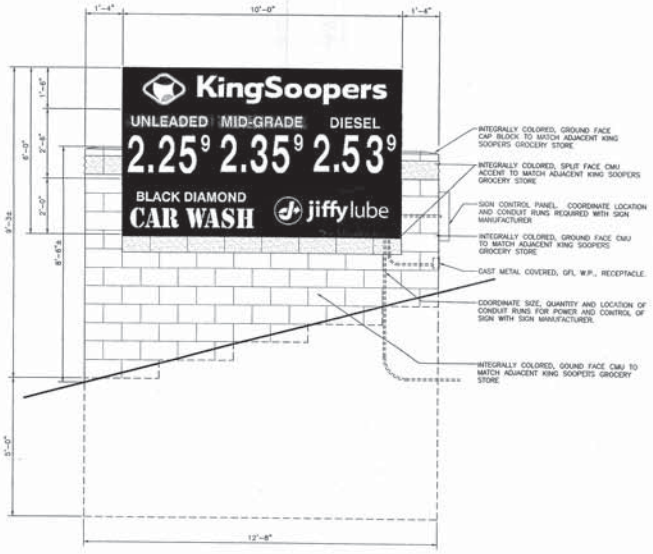


7 FUEL MONUMENT SIGN ELEVATION
SCALE: 1/2"=1'-0"



8 GROCERY MONUMENT SIGN ELEVATION
SCALE: 1/2"=1'-0"

No.	REVISION	DES. BY	DRAWN BY	DATE
1	PCR CITY COMMENTS	MFD	EVR	9/29/10

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KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF000013
Sheet Scale:	FULL
Designed By:	MDC
Drawn By:	ELS
Date:	AUGUST 10, 2010
Disk File:	KSF13_P_06-Elev

CANOPY AND KIOSK ELEVATIONS

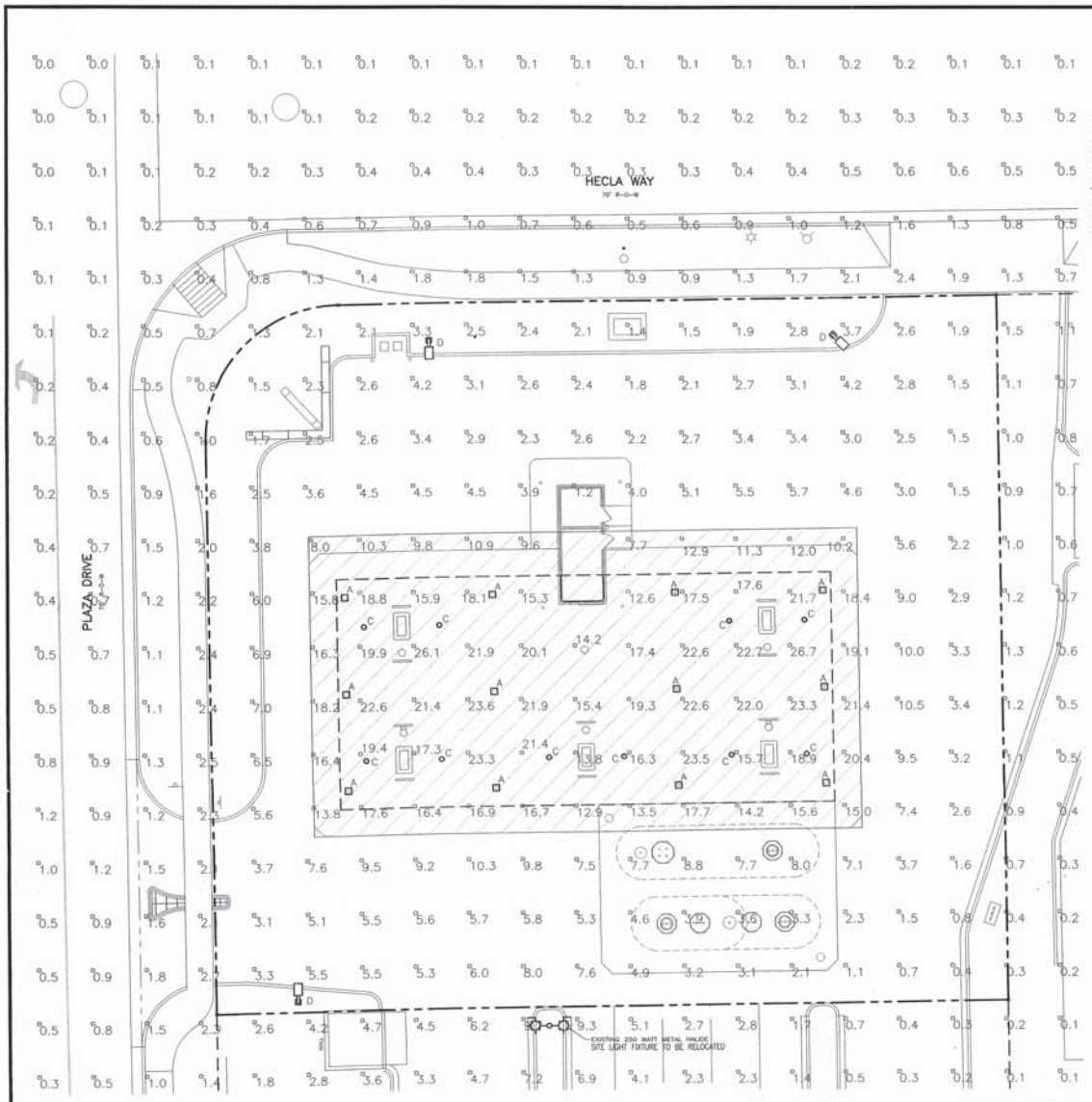
6 OF 7

Louisville Plaza
Filing No. 3, Lot 1
PUD Amendment

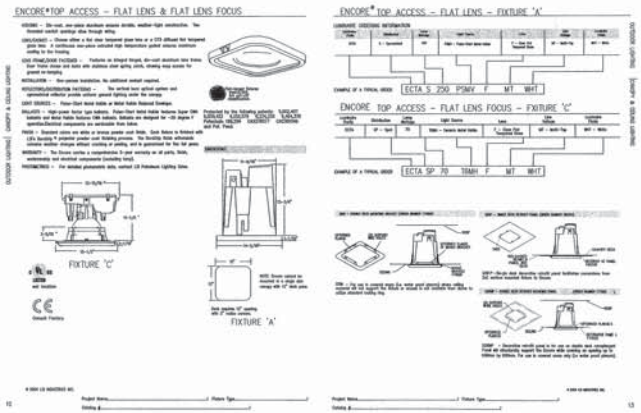
DRAWING NUMBER

DRAWING NUMBER

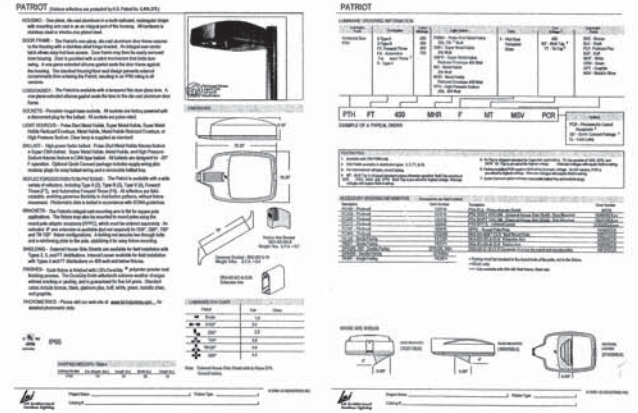
King Soopers
1712 Plaza Dr.



1 PHOTOMETRIC SITE PLAN
SCALE: 1"=10'-0"



FIXTURE 'A' & 'C' SPECIFICATION SHEET



FIXTURE 'D' SPECIFICATION SHEET

SCALE: 1"=10'

STATISTICAL AREA SUMMARY

LABEL	AVG	MAX	MIN	UNIFORMITY RATIOS AVG/MIN	UNIFORMITY RATIOS MAX/MIN
CANOPY REFLECTANCE	17.07	26.7	7.7	2.22	3.47

LUMINAIRE SCHEDULE

FIXTURE	SYMBOL	QTY	POLE HEIGHT/ MOUNTING HEIGHT	MOUNTING	INITIAL LUMENS	MAINTAINED AVERAGE	MANUFACTURER/CATALOG # (SEE NOTE 2 BELOW)	LAMP TYPE	WATTS
A		12	15'-6"	SURFACE	23500	0.72	LSI LIGHTING, ENCORE SERIES #ECTA-S-250-PSMV-F-MT-WHT	PULSE START METAL HALIDE	250
C		10	15'-6"	SURFACE	6600	0.72	LSI LIGHTING, ENCORE FOCUS #ECTA-SF-70-TBMH-F-MT-WHT	CERAMIC METAL HALIDE	70
D		3	24'-0"	POLE	22000	0.72	LSI LIGHTING, PATRIOT SERIES #PTH-FT-250-PSMH-F-MT-PLP	PULSE START METAL HALIDE	250

No.	REVISION	DES. BY	DRAWN BY	DATE
1	PER CITY COMMENTS	MFD	EVR	9/29/10

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King Soopers
Supermarket
Petroleum
Fuel Facility
Canopy & Kiosk
Hecla Way & Plaza Drive
Louisville, Colorado

KING SOOPERS
FUEL FACILITY
CANOPY AND KIOSK
STORE # 13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No: KSF13
Sheet Scale: 1" = 10'
Designed By: MFD
Drawn By: JMG
Date: AUGUST 10, 2010
Dsk File: KSF13_P_07-Lts

PHOTOMETRIC PLAN

7 OF 7

Moline moved and Howe seconded to continue the item to the August meeting.

Speedy Sparkle PUD Amendment: A request for approval of a Planned Unit Development Amendment to allow changes to the signage at 1414 Hecla Way. (Resolution 14, Series 2019)

- Applicant: Speedy Sparkle Car Wash – Louisville, LLC
- Case Manager: Felicity Selvoski, Planner/Historic Preservation

Rice asked for conflicts of interest. Hoefner stated that he was a customer at the Speedy Sparkle but did not think that disqualified him.

All notices met as required.

Selvoski presented the request to amend the sign code for three properties at Speedy Sparkle. The original PUD was approved in 2000 as the Black Diamond Car Wash with two monument signs. In 2010, the King Soopers Fueling Center PUD included a shared monument sign, as well. The PUD amendment included requests to modify and install a monument sign along Hecla Way, bring the installed menu signs into compliance, and build their own monument sign. This application did not include confirmation from the other two properties that they are okay with these changes.

The sign architecture is proposed for steel I-beams, a metal base cabinet, and an LED panel. The Hecla Way sign included the same steel I-beam architectural border. Staff used the CCDSG to evaluate the proposed signs. The materials are supposed to be compatible with the associated structure in terms of materials, color, and design, and staff does not feel that the signs meet this criteria. The Speedy Sparkle building does include steel I-beams, but staff did not find this to be a strong enough connection. This application would also result in three monument signs on the Speedy Sparkle property. Currently, the sign code allows for one and the original PUD allowed for two. The monument signs along South Boulder Road greatly exceed the 60 square feet. The proposed LED panel was not something permitted under the sign code. Finally, the proposed sign designs did not provide information to determine which sides were translucent and which were opaque and current sign code only allows the letters to be translucent; the sign background coloration did not match coloration elsewhere on the site; and the signs were not uniform in color, all of which is both are required in the current sign code.

Staff also addressed the draft sign code, though they did not use it to judge the application. One of the goals of the draft was to reduce sign clutter, which this application did not achieve. Electronic message centers are allowed in the draft code if there are exceptional circumstance and if they elevate the design. Staff did not feel they had enough information to determine this. This application also has signs taller than the maximum freestanding 5 feet height maximum on the existing PUD.

Staff recommends approval of the resolution, which would deny this application. The proposed PUD amendment did not meet the intent and requirements of our current design guidelines and any changes would need to be approved by the adjacent property owners that would be affected.

Rice asked if the current monument sign was at the maximum size or if it could be made bigger.

Zuccaro replied that the sign was likely built to what was allowed but he would confirm. He noted that at the time of the original PUD it made sense to combine the three signs from the three properties even though it required a waiver from the sign program.

Rice asked about the menu signs.

Selvoski replied that they were put in without going through the PUD process or a building permit and that they were not addressed under the current sign code.

Moline asked what it would take to modify the existing sign.

Selvoksi stated that it was already at the maximum size.

Zuccaro added that any change would require a PUD amendment because the sign did not currently adhere to the code.

Rice invited the applicant to make his presentation.

Robert Kearney, 549 North Fourth Street in Loveland, asked for a show of hands to who had been to the car wash and proceeded to hand out flyers. Vice Chair Rice informed Mr. Kearney that the Commission could not receive anything from the applicant at a public hearing. Kearney stated that the original PUD included all the property with the three owners. Under that PUD, the car wash was entitled to half of the joint sign on South Boulder Road. Speedy Sparkle occupied about half of the total property. The King Soopers PUD used to have a different sign requirement, but their PUD never had a signature from the car wash owner and the South Boulder Road sign is an off-premises sign to King Soopers. He did not want to diminish that sign, but they were asking for half of the signage space for Speedy Sparkle. He described that the other signs at King Soopers were larger than those at Speedy Sparkle. He stated that 54% of customers in a four-year study couldn't find signs due to being too small and customers complain that the lettering on signs was too small and that 81% of consumers appreciated LED signs. He listed other percentages to show that signage is important to businesses big and small. He and his business wanted to be treated fairly as King Soopers has been.

Chip Weincek from CWA Architecture described the history of the application, which had been started in September 2018. He believed that the proposal responded to the request to address the contextual built environment. They had had multiple meetings and revisions to their submittals and had not had much feedback from staff. Weincek proceeded to describe the application. The site plan showed that speedy sparkle was the largest property on the site. The shared signage, which was never recorded with the Speedy Sparkle property, was too small for the property. He showed that Speedy Sparkle and Jiffy Lube had 10 square feet on the shared sign each and King Soopers had 40 square feet. King Soopers also had a second monument sign for a total of 69 square feet. He showed the existing menu signs, reminding the Commission that the menu signs were not addressed in the code and the owner of Speedy Sparkle thought that that meant he could proceed to put them up. Weincek stated that the menu signs

had been very helpful for business. At first, they had requested a 12-foot sign and staff said that was too tall so they tried to lower it but thought that the 5-foot limit was too small. He showed the need for a sign on Hecla Way where customers enter the property. They were proposing to have Speedy Sparkle have its own monument sign, Jiffy Lube have 20 square feet, and King Soopers remain the same. He thought there was a good synergy of the owners in the area and they wanted to maintain that. They were also proposing to convert the flip-over numbers to LED, which is what King Soopers is doing for the fueling station. It was Weincek's understanding that staff supported turning the gas station numbers to LED. He stated that the code allows individual property owners to have up to 60 square feet of signage under the new sign code. He responded to staff's concerns about the architecture by pointing out that the architecture matched what was originally approved along Hecla and that the main architectural features of the Speedy Sparkle building was steel. He stated that the CDDSG allowed for multiple signs at multiple entries for identifying businesses. He noted that this was a critical part of the application, because the guidelines referred to signs and entries in the plural. 12 feet in a retail zone for monument signs were also allowed. Weincek showed a selection of other signs that had been approved under the current guidelines.

Weincek asked if it was possible to continue the application based on the Commission's deliberation.

Rice suggested that they proceed as normal and the applicant can request a continuance at the end if they chose.

Moline asked the applicant to walk through the incorporation of steel in the proposed signs.

Weincek showed the elements on the PowerPoint.

Moline asked about the requirement to have one sign per structure.

Weincek replied that they believed that came from Section 7.5.

Kearney added that Speedy Sparkle had an access point on Hecla Way and a curb cut between the car wash and the King Soopers fuel station.

Howe asked for clarification between the commercial and residential guidelines.

Zuccaro replied that the CDDSG applied to this property and this applicant was about being allowed to vary from the CDDSG.

Hoefner asked about the conversations that went on among Speedy Sparkle, King Soopers, and Jiffy Lube.

Kearney replied that the PUD addressed that shared sign, which was on the property line between Jiffy Lube and Speedy Sparkle. He noted that the various PUDs were in conflict. He and King Soopers were working together to try to fix this issues and as part

of that cooperation, King Soopers wanted to have the LED signs included in the amendment.

Hoefner asked how many monument signs they thought they were entitled to.

Chip replied that they thought they should be allowed one each for Speedy Sparkle, Jiffy Lube, and King Soopers. He added that they should also be allowed signs for each entry.

Hoefner asked if electronic message centers (EMCs) were allowed under the code.

Weincek replied that he understood that they were not allowed. He stated that the City needed to update its code on LED signs, because these were the future of commercial signs.

Hoefner asked what would happen if the Planning Commission granted the continuance, would the applicants be able to come to an agreement with smaller signs and no EMCs.

Weincek replied that he wanted to hear what the Commission had to say about the larger signs and the EMCs.

Kearney added that the original proposal tried to meet Director Zuccaro's goal of having fewer signs, but the signage was greater than 60 square feet. The applicants were happy with that at the time, but later they found out that the application was no longer acceptable. He believed that there was more than one way to make signage visibility happen.

Rice asked if the 2011 PUD amendment predated the applicants' ownership of the property.

Kearney stated that he had not been the owner at the time and that he could not speak to the original agreement among the property owners.

Zuccaro added that the boundary of the original PUD included all three of the properties and appeared to be validly approved by the City and recorded.

Rice replied that he wanted to make sure it was understood that there was still one PUD over the three properties.

Zuccaro replied that, as far as signage was concerned, yes.

Weincek stated that there was nothing about ownership of the current monument sign.

Rice replied that he did not think the Planning Commission could speak to property disputes. He invited members of the public to speak.

Laura Chenerock 1459 Hecla Way in Louisville, stated that she lived in the townhouse adjacent to the car wash and was a customer there. She stated that she represented

the people living in her building and other people in the area, some of whom had written to the Commission. She asked the Commission to consider the residential perspective, noting that the examples used in the presentations of other monument signs had not been near residential areas. She was concerned about the Hecla Way sign and thought it was out of balance with the residential area, especially given its size and lighting. She noted that the car wash stayed open after dark and their lights shined directly into her living room. She added that the sign might also be disruptive to wildlife given the light pollution. She appreciated the car wash's efforts in trying to blend in already, including planting trees.

Howe made a motion to include an email from the public in the record. Motion passed.

Zuccaro noted that the underlying code provided options to abandon the current sign program and go back to individual signs for each of the businesses. However, the applicants wanted to vary from the code. Staff therefore looked to the current policies on signage. Zuccaro noted one specific policy in the CDDSG, Section 7.2: "The size of the signs should be modest and provide businesses sufficient visibility and identification without becoming a dominant part of the landscape." When staff reviewed this outside of the context of what was allowed in the code, staff had to consider what worked within the context while also serving the business. Appropriate LED signs needed to be an improvement on what would be there without LED, as well, though staff was not the arbiter on what was appropriate for LED signs. Zuccaro also addressed Section 7.5 in the CDDSG about the plural of the monument signs, noting that they were allowed one monument sign per building. He explained that staff had view the Hecla Way sign in a residential context and signs in that context needed to be an improvement on the code. He concluded by stating that the Commission could approve, approve with conditions, or deny. He noted that it would be helpful for the Commission to have a discussion about their findings .

Hoefner asked for staff's perspective on the applicant's feeling that they had not provided sufficient feedback.

Zuccaro repied that staff intended to provide feedback so that applications could be ready to go before the Commission, but the applicant had to provide sufficient plans to comment on. In some cases, the applicant and staff did not agree on certain elements of the proposal, so staff was looking to the Commission to make those decisions. Zuccaro added that staff did not make designs, but they did try to provide feedback on proposals.

Hoefner asked about the allowance for one monument sign per building.

Zuccaro responded that with the existing PUD the car wash had received a waiver to have two different signs in 2010. There were other waivers for other property owners, as well. The property owners would have to abandon the PUD in order to have a monument sign on one of their road frontages. He did not think that would work sign gas stations and car washes would likely need sign frontage on South Boulder Road.

Hoefner asked about the initial iteration of the design where there were fewer, larger signs.

Zuccaro replied that the original proposal had a sign area of 120 square feet. Staff told the applicant that something over 60 square feet might work, but 120 square feet was too much.

Kearney stated that he appreciated staff's time and that the King Soopers PUD was not recorded on the car wash's property. He described the main issue as a fundamental matter of equity and following the code. King Soopers had many large signs, which the car wash did not want for themselves. They wanted to have decent signage exposure. He appreciated any direction from the Commission to work with staff to get decent signage for his one-acre property. Having increased signage would make a big difference for the business.

Rice asked for commissioner comments.

Howe appreciated Speedy Sparkle's requests and agreed with the right to have decent signage exposure. He saw the three different signs as three different matters. He thought that they were entitled to have a sign on South Boulder Road based on Section 7.2B. However, the sign that was proposed – though they were entitled to it – did not meet the guidelines as proposed due to its size and lighting. As for the menu signs, he thought that there was no issue with them since they were not referenced. As for the Hecla Way sign, Howe quoted Section 7.5, again finding that the applicant was entitled to a sign there but it had to be responsive to the "family of signs" as described in 7.5.

Hoefner stated that he was sympathetic to the fact that the existing sign was very small. He thought that the Commission needed to find a way to approve something bigger on South Boulder Road, but he did not think that the proposed sign was it. He did not think the Commission would approve an EMC and did not support it himself. He also thought the proposed sign on Hecla was too big given the residential context. He did not see any issues with the menu boards. As for the proposed materials for South Boulder, he thought that the I-beams blended in with the building. He did not think that the PUD issue was in the Commission's wheelhouse and the applicant needed to resolve that with King Soopers.

Moline stated that he wanted Speedy Sparkle to succeed and he hoped that they could find a way to make it work. He thought that staff and the Commission had spent a considerable amount of time reviewing the new sign code and had heard a lot of feedback from the community, and the proposal was in a space where the Commission was being influenced by community desires and the code that was being developed. He thought it was helpful to look toward the future code in the case of a PUD amendment.

Rice stated that in his view it was not the Commission's role to micromanage signs and some of the criticisms of this proposal were micromanaging. He saw that the applicant needed adequate signage. However, given the grouping of the signs, he thought they should be treated together and he was concerned that the signs were being treated piecemeal instead of with all the property owners. He thought it was doable to work with all the property owners at once. He believed that Louisville should be a business-friendly community with adequate signage. He stated that he thought that if there were going to be menu signs, they should be approved by the City and so they should be

addressed in the code. He noted that the Commission and the Council had not approved the new sign code and it could not be acted upon based on this application and he was therefore not prepared to approve any EMCs. He thought that a continuance was a good way to handle this so staff and the applicant could take another look at it. He was also sympathetic to the fact that it had already been a long process, so it should be a priority for staff and the applicant. He asked for a motion.

Zuccaro recommended continuing it to a date certain and suggested asking the applicant about a reasonable timeframe. The applicant agreed to a 60-day timeline.

Howe noted that there may be additional parties that might become involved in the process.

Rice added that they might need to bring a totally new application and that would require a new public hearing.

Zuccaro replied that the Commission could take no action if there should be a new application.

Chip thanked everyone for their feedback and thought that the new information would be helpful. He agreed that September 12th would be doable and that he did not want to make a new application.

Zuccaro noted that the new sign code may come into effect and that might make the process more complicated.

Rice stated that the Commission should continue it to September 12th and if any issues come up staff and the applicant could deal with that at that time.

Hoefner made a motion to continue this application consistent with the discussion tonight to September 12, 2019. Moline seconded. Voice vote. Motion carried unanimously.

5-minute recess.

824 South Street/957 Street PUD Extension and SRU Amendment: A request for a one-year extension to the 824 South Street/957 Main Street Planned Unit Development and an Amendment to the Special Review Use for outdoor sales of retail goods and eating and drinking establishments. (Resolution 15, Series 2019)

- Applicant: Hartronft Associates, P.C.
- Case Manager: Rob Zuccaro, Director of Planning and Building Safety

Public notice met as required.

Zuccaro presented two requests for 824 South. The applicant acquired the property in 2018 and was working with staff to make changes under administrative review, but the change in the 2016 SRU and the extension had to go through a public hearing. The applicant believed that the one-year extension would provide adequate time. To evaluate the extension, staff considered what had changed from 2016 had found that

7. Sign Design

Goal:

Signs should be consistent with project and overall development design but should be subordinate to architectural and landscape elements. Signs serve to identify, inform, direct, regulate and interpret. Each commercial building or group of commercial buildings should have a consistent and comprehensive sign program from project identification at the street through individual tenant suite identity. Placement, scale, and readability should be considered in developing a sign package.

7.1 Sign Materials

Policy:

Design and construct signs of durable, high quality architectural materials.

Standards and Guidelines:

A. The sign package must utilize materials, colors, and designs that are compatible with the associated structures. (S)
B. Sign materials must be of proven durability. (S)

7.2 A & B FLUSH MOUNTED SIGNS (SEE TEXT).

7.2 Sign Number and Area

Policy:

The size of signs should be modest and afford businesses sufficient visibility and identification without becoming a dominant part of the landscape or interfering with vehicular movement along the public streets.

Standards and Guidelines:

A. Number of Signs - Commercial / Retail
   1) The maximum number of building-mounted signs allowed for freestanding buildings is one per individual tenant building frontage, not to exceed three signs. (S)
B. Number of Signs - Commercial / Office
   1) One monument sign is permitted for each freestanding building. (S)
   2) Where a freestanding office building contains multiple tenants, or multiple accesses off a public right of way, an increase in the number of monument-

7.2 B FREESTANDING SIGNS (SEE TEXT).

signs may be permitted in the planned unit development plan process. (G)

3) Office building-mounted signs not exceeding 40 square feet of surface area each, and not exceeding 100 square feet total, are permitted. (S)

C. Area of Signs: Character Heights

1) Monument signs shall not exceed 60 square feet per face in retail zones nor 40 square feet in office zones. (S)
2) Maximum area of Commercial / Retail building-mounted signs shall be 1 square foot of sign area per linear foot of building frontage of the individual business. No individual sign shall exceed 200 square feet. (S)
3) Projecting signs may not exceed 4 square feet in area. (S)
4) Character heights for commercial retail and office signs shall be limited to a maximum height of 24 inches and a minimum height on monument signs of 8 inches. (S)
5) Character heights may be further limited through the PUD process based on architectural compatibility and site development context. (S)
6) Maximum area of commercial / office signs is as set forth in subsection B.3 above. (S)

7.3 Location/Placement/Visibility

Policy:

Signs should be located with visability from streets and paths without conflicting with safe vehicular movement.

Standards and Guidelines:

A. Signs shall be sufficiently visible from public streets so that site entrances can be readily identified by both pedestrians and persons in vehicles. (G)
B. Locate monument signs in a planter setting within a landscaped area. (S)
C. Locate signs a minimum of 10 feet from the right of way so as to not obstruct visibility at intersections. (S)
D. The placement of signs on roofs is not allowed. (S)

7.3 B LOCATE MONUMENT SIGNS IN A PLANTER SETTING WITHIN A LANDSCAPED AREA.

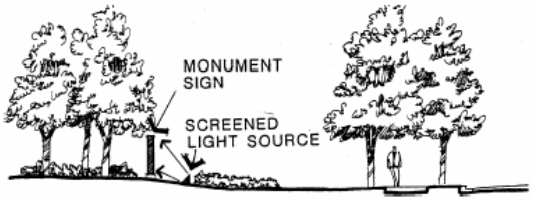
7.4 Sign Illumination

Policy:

Sign illumination should complement, not overpower, the image of the building and its immediate landscaping.

Standards and Guidelines:

A. Neon tubing is an acceptable method of sign illumination. (G)
B. Flashing signs are not permitted under any circumstances. (S)
C. The use of individually-cut, back-lit character signs is strongly encouraged. (G)
D. When external light sources are directed at the sign surface, conceal the light source from pedestrians' and motorists' "lines of sight". (S)
E. When using an internally illuminated sign cabinet, only that portion of the sign face dedicated to the trademark or characters may be translucent. The balance of the sign face shall be opaque. (S)
F. As used in this Chapter 7, "character" means and includes any graphic symbol used for sign text, included but not limited to letters, numbers and logos, provided that any character used for a sign must be a part of the name, service mark or trademark of the company or business.



7.4 D EXTERNAL LIGHT SOURCES DIRECTED AT SIGNS SHOULD BE CONCEALED FROM PEDESTRIANS' AND MOTORISTS' "LINES OF SIGHT".

7.5 Allowable Sign Types

Policy:

The type of sign used should reinforce the urban environment of commercial developments. Signs should be designed as a "family", incorporating similar, compatible materials that reinforce the design and style of the project architecture. The following standards and guidelines apply with regard to the listed sign types.

7.5 A MONUMENT SIGNS (SEE TEXT).

Standards and Guidelines:

A. Monument Signs
   1) For office zones project monument signs, if authorized, may be located at the street or primary entries to commercial developments to provide the overall project identity. (G) Such signs shall contain only the name of the project which it identifies, and shall not contain change, panels, advertising or names of individual tenants. (G)
   2) For retail zones individual monument signs may be located at primary entries to free-standing buildings to provide individual business identifications and building addresses. (G) Such sign shall contain only the name or trademark of the business served, and shall not contain change panels, advertising or names of individual tenants. (S)
   3) Affix monument signs to the ground in a continuous connection. (S)
   4) For multiple user projects such as shopping centers or office buildings, project identity

7.5 A 2 SMALLER SCALE MONUMENT SIGNS MAY BE LOCATED AT PRIMAR ENTRIES TO PROVIDE INDIVIDUAL BUSINESS IDENTIFICATIONS AN ADDRESSES.

signage requires additional variables that must be considered. Conceptual designs for signs serving these types of facilities must be submitted to the planning department.

The total measured area of a sign shall be measured using the smallest single square or rectangle that includes the area of all writing, representation, lines, emblems or figures contained within all modules, together with any air space, material or color forming an integral part or background of the display if used to differentiate such sign from the backdrop or structure (S)

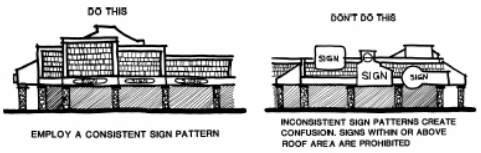
5) All monument signs using a sign cabinet design shall have an architectural boarder that integrates a minimum of two sides of the sign cabinet into the base. The architectural base and boarder shall be consistent with and/or compliment the building materials. (S)
6) All individual tenant panels shall be of a uniform size and a minimum of 5 square feet.
7) All monument signs shall be constructed of an opaque background and use a uniform color.

B. Building-mounted Signs
1) Locate building-mounted signs at the first floor level only for retail uses. (S) Building-mounted signs shall identify the individual business, building or building complex by name or trademark only. (S)
2) Building-mounted signs may not project more than 8 inches from the face of the building. (S)

C. Projecting Signs
1) Signs that project perpendicular from a building are allowed only for multi-tenant retail and office uses within a predominantly retail center. (S)
2) Projecting signs must be mounted above 7 feet from grade and may not project more than 5 feet from the wall. (S)

D. Pole-mounted Signs
1) Pole-mounted signs are allowed only as traffic regulation signs or to provide appropriate directions to loading and receiving areas, visitor parking, and other areas within each development site. (S)
2) Pole-mounted signs may not exceed 4 square feet in area and 6 feet in height measured from grade. (S)

E. Flashing or moving signs are not permitted. (S)



7.5 B LOCATE FLUSH-MOUNTED SIGNS ON BUILDINGS AT THE FIRST FLOOR LEVEL ONLY FOR RETAIL USES.

7.5 B FLUSH-MOUNTED SIGN AT THE FIRST LEVEL

7.5 C PROJECTING SIGNS (SEE TEXT)

Felicity Selvoski

From: Lisa Ritchie
Sent: Monday, July 8, 2019 2:54 PM
To: Felicity Selvoski
Subject: FW: SPEEDY SPARKLE PUD AMENDMENT #3 - Hearing date 7/11/19

From: Mark Cathcart [mailto:m_cathcart@yahoo.co.uk]
Sent: Monday, July 8, 2019 1:48 PM
To: Planning Commission <PlanningCommission@louisvilleco.gov>
Subject: SPEEDY SPARKLE PUD AMENDMENT #3 - Hearing date 7/11/19

Planning Commissioners,

My name is Mark Cathcart, I live at 1763 Sweet Clover Ln, Louisville. For transparency, I am a member of the Louisville Cultural Commission.

I am a regular customer at Speedy Sparkle Car Wash, I want them to be successful for both personal reasons, and for what they contribute to the city of Louisville.

I have reviewed this PUD amendment as it relates to their requested changes, both against the existing City of Louisville Sign Ordinance and the proposed, revised ordinance. While I don't have your expertise or knowledge, it seems to me this application, especially the sign proposed for Hecla Way meets neither version of the code.

The sign proposed for Hecla Way is also seriously out of character for a sign right on the transition between commercial and residential. Therefore I request you reject the proposed amendment.

++Mark.

_____
https://markcathcart.com/about/

Lisa Ritchie

From: Tzvetanka Gintchin <tagintchin@yahoo.com>
Sent: Thursday, July 4, 2019 9:17 AM
To: Planning
Subject: Re: Speedy Sparkle PUD Amendment

To Who It May Concern:

I am one of the residents of the 6 town homes across from Speedy Sparkle ad I am writing in opposition of the proposed new signage.

I ask that City of Louisville does not approve the Speedy Sparkle Signage application for the following reasons:

- It is a visual nuisance directly in the line of sight of our property and the additional homes that will be built. Such a sign will definitely decrease the aesthetic appeal of the area and negatively affect the property values of adjacent properties.
- This is an already a mixed commercial/residential space, which actually attracted me to the area, but this goes too far by placing it where proposed. An illuminated sign, especially will add unnecessary light pollution, considering the fact that we already have to deal with their current lit menu signs, overhead lights and noise.
- It is out of character and proportion for the location, given the proximity to the current and proposed residential properties.
- This may discourage future residential prospects. The new development, when it happens, will be good for everyone as it will increase property values and drive new traffic to the businesses, while a conspicuous and intrusive commercial sign will negatively affect the overall feel and look of the neighborhood and drive away potential future residents while triggering discontent in current residents.
-Finally, it will not be very effective because when the field is developed, the new buildings will block the sign. It will be much more effective if placed closer to S Boulder Road.

Thank you very much for your time and consideration.

Sincerely,

Tzvetanka Gintchin
1491 Hecla Way

Lisa Ritchie

From: Lazar Gintchin <lazar.gintchin@gmail.com>
Sent: Thursday, July 4, 2019 10:01 PM
To: Planning
Subject: Fw: Speedy Sparkle PUD Amendment

To Whom It May Concern:

I live on 1491 Hecla Way, Louisville CO and the purpose of this letter is to express my disagreement with the proposed new signage by Speedy Sparkle Car Wash.

My request is that City of Louisville declines the application made by Speedy Sparkle based on the following:

- Those of us who invested in a home in this neighborhood were attracted by the modern, high-class appearance which the home builder has created. Having a 12 foot tall sign would definitely change the look and feel, especially for those of us, who live directly across the street.
- I am not sure what value a sign adds, when placed in the middle between our street and S. Boulder Rd. Would it not attract more customers if placed on S. Boulder Rd?
- A brightly lit sign of this size will be very noticeable and unpleasant to look at, given that our homes, porches, and half of the balconies are facing in that direction. The carwash is noisy when operating, and it feels like too much to add a big visual on top of it.
- More residential buildings are still planned to be built, right on the East side of the carwash. I am concerned that potential buyers may be detracted from buying, resulting lowering of the property values in our neighborhood.

Thank you in advance for your consideration.

Sincerely,

Lazar Gintchin

--
Lazar Gintchin
lazar.gintchin@gmail.com

Felicity Selvoski

From:	David Chernikoff <davidchernikoff@icloud.com>
Sent:	Saturday, June 29, 2019 4:02 PM
To:	Planning
Subject:	residential comment: Speedy Sparkle PUD proposed sign
Follow Up Flag:	Follow up
Flag Status:	Flagged

To Whom it May Concern:

As one of the owners of a townhome at 1459 Hecla Way, which is located close to the Speedy Sparkle Car Wash at 1414 Hecla Way, I want to express my opposition to the proposed new sign in their PUD Amendment Application. The proposed sign will have a significant negative impact on the views from our building as well as those from other buildings in our neighborhood. In addition, when future structures are built on the vacant lot in accordance with current plans, these buildings will partially block the new sign that is being proposed and decrease its usefulness.

If the intention of the business owner(s) of the car wash is to attract interest from traffic on South Boulder Road, the proposed location will be of little value. The people living in the North End neighborhood will regularly drive by the car wash and will not need a sign to alert them to the existence of the car wash. While I recognize that we chose to buy a property that is located close to a business area and I accept the associated impacts on the neighborhood, this proposed sign is unnecessary and unlikely to serve its intended function. It makes much more sense for the car wash to attract business with additional signage that is closer to and clearly visible from South Boulder Road.

I'm further concerned about light pollution, which is an increasing problem throughout the Front Range. If Speedy Sparkle Car Wash is permitted to put up a new sign or to change their existing signs, I strongly oppose signage that is illuminated.

Thank you for considering this request and for doing what you can to preserve the quality of life in the North End neighborhood of Louisville.

Respectfully submitted, David Chernikoff

Felicity Selvoski

From:	Rob Zuccaro
Sent:	Monday, July 1, 2019 8:41 AM
To:	trudyturveypt@gmail.com
Cc:	Felicity Selvoski; Lisa Ritchie
Subject:	RE: Objection to Signage proposal

From: Trudy Turvey <trudyturveypt@gmail.com>
Date: June 29, 2019 at 12:41:21 PM EDT
To: CityCouncil@LouisvilleCo.gov
Subject: Objection to Signage proposal

I live on Hecla Way. Inasmuch as this is a residential area and signage that is proposed would further destroy the ambiance (not to mention the noise levels and congestion) I oppose further signage-the car wash gets plenty of business and it is VERY visible to motorists without further making this area look like a trashy shopping center. It is not clear from the drawings (hard to discern) if this would be a neon sign-I absolutely oppose this.

Trudy Turvey

Felicity Selvoski

From: Laura Chernikoff <lauraachernikoff@icloud.com>
Sent: Monday, July 1, 2019 12:14 PM
To: Felicity Selvoski
Cc: Planning
Subject: Re: Speedy Sparkle PUD Amendment - Resident Comment

Hi Felicity and the Planning Department,

Here are my revised comments based on the updated plan document:

I am a resident at 1459 Hecla Way, which is diagonally across from the Speedy Sparkle Car Wash at 1414 Hecla Way. I oppose the new 9' sign proposed in their PUD Amendment Application and I hope you will consider the perspective of the residents in my building and the North End neighborhood. The proposed Hecla Way sign is out of character and proportion for the location, given the proximity to the current and proposed residential properties. In particular, having an illuminated sign creates a light pollution nuisance for our neighborhood.

The proposed location of the new sign would be a visual nuisance every time we enter our neighborhood–not only for our 6 units, but also for the 12-unit condominium buildings nearby, and the future residences that are planned for the vacant lot. This is a residential area that is in close proximity to commercial properties. We already deal with the lit car wash menu signs, overhead lights, sound of their vacuums, traffic from their customers during work hours and employees before 7am and after 7pm every day. This proposed sign goes too far, particularly in scale and the proposed design.

The Hecla Way location does not seem effective at increasing traffic to the car wash business. There is not significant traffic heading east on Hecla Way, except the residents of the North End going to their homes. It's one thing to have signs centered around the commercial intersection at Plaza and Hecla Way, but it's another for these signs to be directly at the entrance of our neighborhood. Anyone on Hecla Way, at the King Soopers Gas Station, or Napa Tires businesses can already directly see that there is a car wash. It seems sufficient for the car wash to have the requested changes made to the signage on South Boulder Road. However, if a sign on Hecla Way is allowed, it should be much more in style with the other low-profile signs of the other businesses.

If the sign is allowed to be built, then I specifically strongly request that it not be lit or illuminated in any way as planned. Light pollution is a serious problem. In the winter hours, the car wash stays open for several hours after dark. We already have their illuminated menu signs and overhead lights shining directly at our homes in my building.

I hope you will consider the negative impact this proposal would have on the residents of this neighborhood. I worry that this unnecessary commercial encroachment would hurt our property values. This also could decrease the chances of attracting residential and commercial customers to the planned development on the vacant lot. This new development, when it happens, will be good for the neighborhood and will drive new traffic to the businesses.

Please confirm that you received this. I will also plan to attend the hearing on July 11.

Sincerely,

Laura Chernikoff

Felicity Selvoski

From: Marsha McClanahan <marshamccl@icloud.com>
Sent: Monday, July 1, 2019 12:16 PM
To: Felicity Selvoski
Cc: Planning
Subject: Re: Speedy Sparkle PUD Amendment, residential owner input

Re: Proposed additional sign for Speedy Sparkle Car Wash on Hecla Way.

I have just received notice of the amended proposal for a 9 foot high sign on Hecla Way adjacent to the entrance to my neighborhood. Both the location and the size of the sign are different than I previously understood so my previous comments can be disregarded. I am a property owner at 1459 Hecla Way.

I am against the addition of this proposed sign because it is proposed to be a lighted sign which will add additional light to the residential neighborhood, is out of proportion and very large for its parkway location and is out of character with the other signs for businesses nearby on Hecla Way. Additionally, it seems an unnecessary sign in that people going along Hecla either are already going to the carwash or are entering the neighborhood. The resident's in North End who drive regularly along Hecla Way certainly know from all the other Speedy Sparkle signs that the car wash is there and no additional signs are needed for them. If people are entering on Plaza to go to and leave the shopping center, they have already seen signs for the car wash.

Marsha McClanahan

Felicity Selvoski

From: Brady <bradymtb@gmail.com>
Sent: Monday, July 1, 2019 1:31 PM
To: Planning
Subject: Speedy Sparkle car wash-Hecla way sign

Good afternoon,

I would like to object to a new sign on Hecla way. We already have enough light pollution coming from the car wash and gas station. This sign would directly be visible from my living room, bedroom and balcony. There are new houses planned to be built next to the car wash, any further signage for the car wash on Hecla way would reduce the value of our homes and future homes. A sign on S. Boulder rd seems reasonable.

Brady Henderson
(970)222-9474

Felicity Selvoski

From: Tim Merkel <tim@bigcompass.com>
Sent: Monday, July 1, 2019 4:21 PM
To: Planning
Subject: Speedy Sparkle Signage

Dear Louisville Planning,

Thank you for the opportunity to comment on the proposed signage associated with the Speedy Sparkle PUD Amendment. Unfortunately I won't be able to attend the July 11th meeting. I hope my comments here will be taken into consideration.

The proposed 6' tall monument sign on Hecla way is completely out of character for this location. A sign of this size and this much color right next to a neighborhood disrupts the transition from commercial/retail on Plaza Drive. The previously approved sign that is smaller and constructed out of metal is a nice balance between the big Napa and King Soopers gas signs adjacent to Plaza.

I urge the planning commission to reject this plan and ask the developer to use the previously approved plans.

Many thanks,

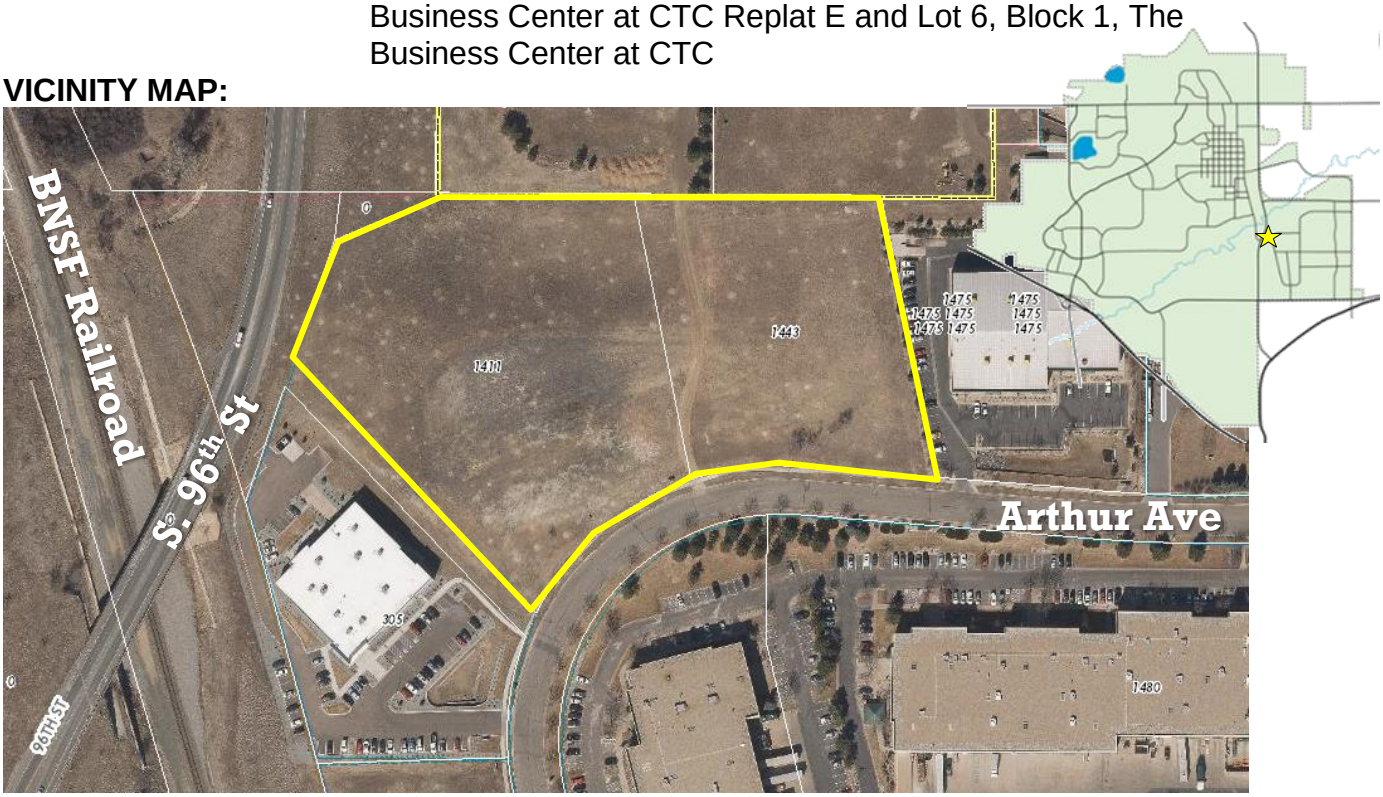
Tim Merkel
Partner, Big Compass

BIG COMPASS
destination solution

tim@bigcompass.com | bigcompass.com
M:303-591-4371 O:720 -328-1669

ITEM:	ZON-0219-2019, PLAT-0218-2019, & PUD-0220-2019 – Business Center at CTC General Development Plan Amendment G, Final Plat, and Final Planned Unit Development
PLANNER:	Lisa Ritchie, Senior Planner
OWNER:	CTC Gateway, LLC
REPRESENTATIVE:	Andy Johnson DAJ Design
EXISTING ZONING:	PCZD-I - Industrial
LOCATION:	1411 and 1443 S Arthur Avenue
TOTAL SITE AREA:	5.47 Acres
REQUEST:	Approval of Resolution No. 17, Series 2019, a request for a General Development Plan Amendment regarding allowed uses and development standards, a Final Plat to consolidate lots, and a Final Planned Unit Development for Lot 2, The Business Center at CTC Replat E and Lot 6, Block 1, The Business Center at CTC

VICINITY MAP:

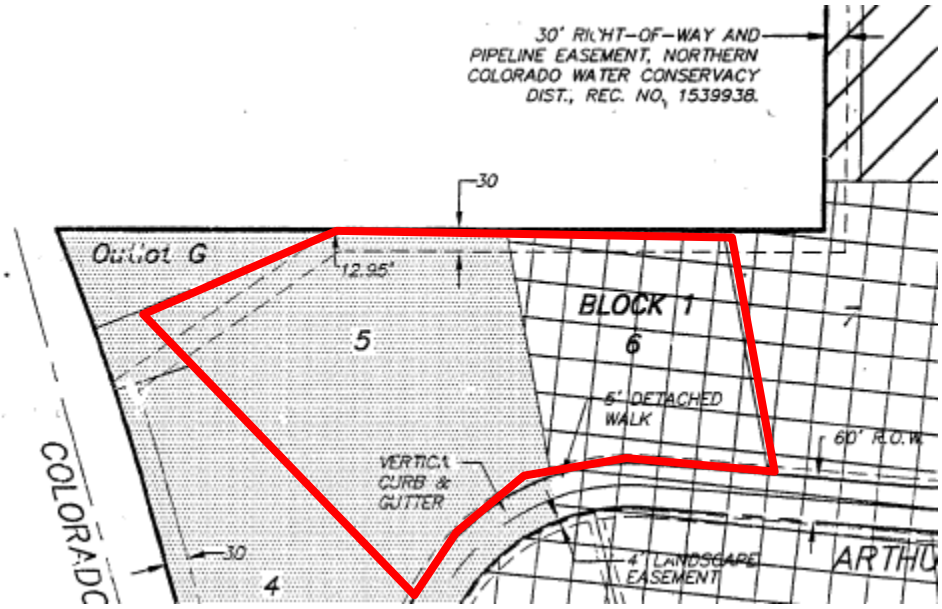


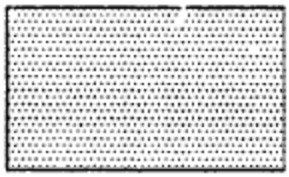
SUMMARY:
The owner, CTC Gateway, LLC, represented by DAJ Design, requests approval of General Development Plan (GDP) Amendment G regarding allowed uses and development standards, a Final Plat, and a Final Planned Unit Development (PUD) to allow the construction of an office building and associated site improvements.

BACKGROUND:
The City approved The Business Center at CTC plat in 1998. The City has approved a number of replats to this subdivision since the original approval, including Replat E in 2005, which replatted the western of the two subject lots. Along with the first plat in 1998, the City also approved The Business Center at CTC GDP, which established the zoning and development standards for the properties. The GDP was amended in 1999, The Business Center at CTC GDP Amendment A, to add additional property into the GDP. While the GDP was subsequently amended five additional times for other properties over the years, Amendment A is the GDP currently in effect for the subject properties.

Currently, GDP Amendment A has different allowed uses and development standards for the two subject lots. Recently, both lots were purchased by the applicant and the application proposes to amend the GDP to update the allowed uses and have consistent allowed uses and design standards on both lots.

Figure 1: The Business Center at CTC Amendment A





AREA TO BE USED ONLY FOR OFFICE, INDUSTRIAL, OR RESEARCH/OFFICE AND CORPORATE USES. IF OFFICE – THE LOUISVILLE COMMERCIAL DEVELOPMENT DESIGN STANDARDS AND GUIDELINES SHALL APPLY AS IN EFFECT FROM TIME TO TIME. IF INDUSTRIAL – CTC, CITY OR OTHER APPLICABLE INDUSTRIAL GUIDELINES SHALL APPLY AS IN EFFECT FROM TIME TO TIME.

THE FOLLOWING USES ARE USES BY SPECIAL REVIEW AND MAY BE PERMITTED, IF AUTHORIZED THROUGH THE CITY SPECIAL REVIEW USE APPLICATION PROCESS:

RESTAURANTS, INDOOR EATING AND DRINKING ESTABLISHMENTS, OUTDOOR DINING AND OTHER FOOD SERVICE USES INCLUDING BUT NOT LIMITED TO: DELICATESSENS, CATERING FACILITIES, BANQUET ROOMS, MEETING ROOMS, AND

MEDICAL AND DENTAL CLINICS AND FINANCIAL INSTITUTIONS, AND

STUDIOS FOR PROFESSIONAL WORK OR TEACHING OF ANY FORM OF FINE ARTS, PHOTOGRAPHY, MUSIC, DRAMA OR DANCE.

ALL OTHER USES BY SPECIAL REVIEW SHALL BE PROHIBITED. NO DRIVE THRU FACILITIES FOR RESTAURANT OR FINANCIAL INSTITUTIONS SHALL BE ALLOWED IN THIS SUB AREA.

ALL SPECIAL REVIEW USES IN THIS SUB AREA WILL BE REQUIRED TO MEET THE LOUISVILLE COMMERCIAL DEVELOPMENT DESIGN STANDARDS AND GUIDELINES AS MAY BE AMENDED FROM TIME TO TIME.

AREA TO BE INDUSTRIAL – CTC, CITY OR OTHER APPLICABLE INDUSTRIAL GUIDELINES SHALL APPLY, AS IN EFFECT FROM TIME TO TIME. SPECIAL REVIEW USE APPROVAL IS REQUIRED FOR ANY USE IDENTIFIED IN THE LOUISVILLE MUNICIPAL CODE AS A USE BY SPECIAL REVIEW IN THE CITY'S INDUSTRIAL (I) ZONE DISTRICT REGULATIONS, AS IN EFFECT FROM TIME TO TIME.

As shown above, the GDP in effect requires one lot to develop under the Commercial Development Design Standards and Guidelines (CDDSG) if it develops with office uses, and the other lot to develop under the Industrial Development Design Standards and Guidelines (IDDSG). Allowed uses also differ on the two lots.

In 2013, the City, CTC Metro District and CTC property owners conducted a feasibility study for a new connection from the CTC to S. 96th St. This study recommended a new

street connection between these properties and the property to the south, 305 S. Arthur. In 2016, the City approved a PUD for the property at 305 S Arthur, which was accompanied by a dedication of half the width for right-of-way for the recommended connection.

Figure 2: Recommended Alternative, 2013 CTC Connectivity Study

PROPOSAL:

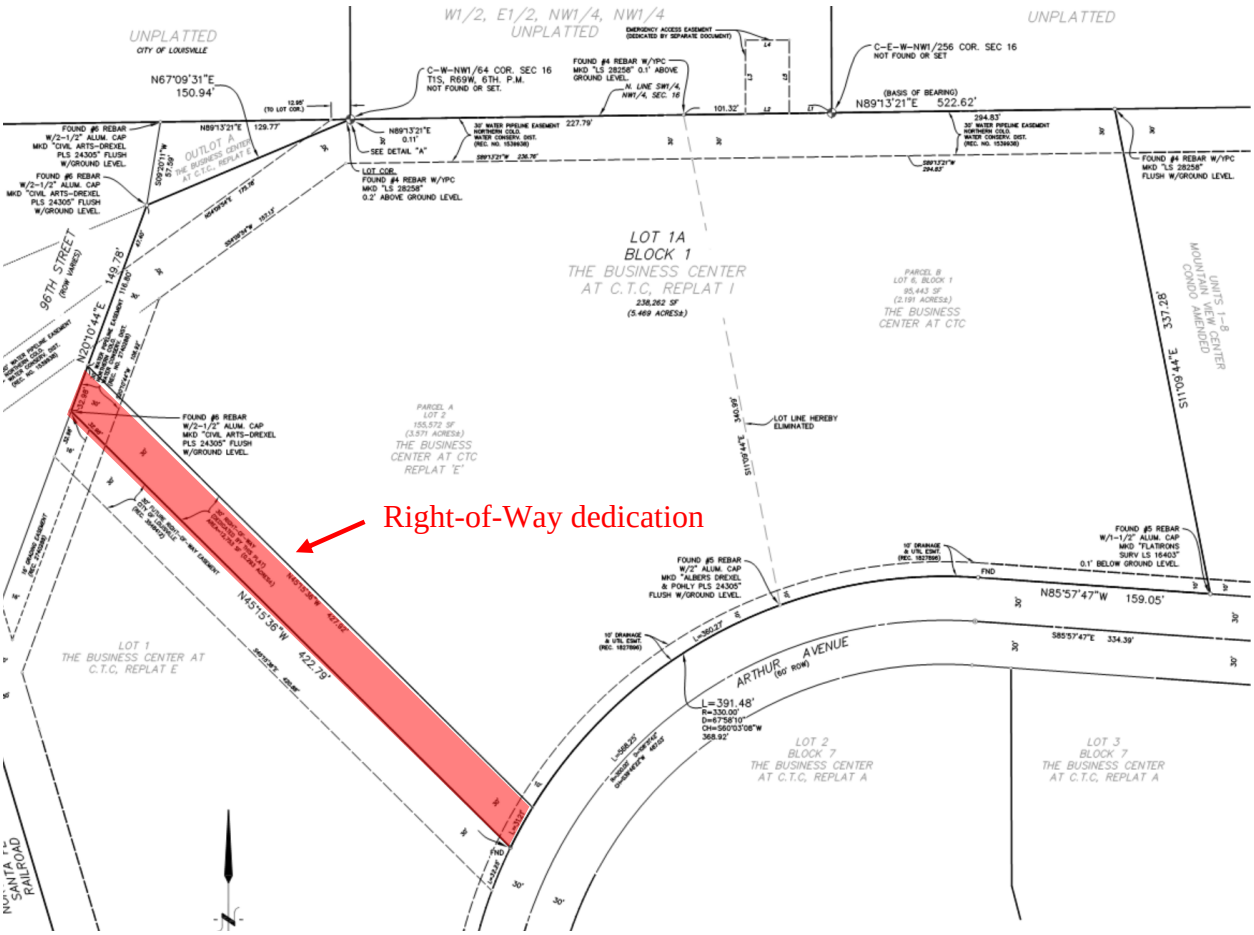
GDP Amendment

The applicant requests approval of The Business Center at CTC GDP Amendment G on both lots. This amendment requires that both lots develop under the CDDSG, which generally has higher quality architectural requirements more appropriate for office and other commercial uses. The applicant also proposes to amend the allowed uses on both lots to allow industrial, office, and limited commercial uses on both properties. The properties will maintain the PCZD-I zoning.

Final Plat

The applicant also requests approval of The Business Center at CTC Replat I to consolidate the two lots into one. The plat dedicates a 30-foot wide area along the southwestern property line for the other half of the right-of-way needed to complete a desired road connection between the CTC and S. 96th Street. This right-of-way dedication together with a pervious right of way dedication on the abutting property at 305 S. Arthur provides the needed right of way for the project. A previous City study on how to improve transit access into the CTC (the CTC Connectivity Study) concluded this connection would be beneficial. The connection is also included in the recently adopted Transportation Master Plan. Staff notes the construction of the right-of-way improvements are not currently within the CIP budget and timing is unknown. Additional engineering is needed to finalize the road design prior to its construction.

Figure 3: The Business Center at CTC Replat I



<u>Final PUD</u>

Finally, the applicant requests approval of a Final PUD to allow construction of a 102,000 sf office building and associated site improvements. As noted above, the associated request for the GDP Amendment requires development on this property in conformance with the CDDSG.

The lot fronts the north side of S. Arthur Avenue. The northern property line abuts two parcels in unincorporated Boulder County that are developed with single-family residences. The east and southwestern properties are developed with light industrial uses under the IDDSG, and the northwestern property line abuts S. 96th Street.

The applicant proposes a two-story U-Shaped structure on the western portion of the property. This orientation allows for maximization of mountain views to the west and visibility of the project from S. 96th St. Access to the site is from two drives off S. Arthur Ave. Parking is located on the central and eastern portions of the property, as well as in an underground garage below the structure.

The interior of the building includes 33 separate condo office units, intended for use by independent businesses. Some spaces within the building will be shared, including conference spaces, restrooms, a kitchen and eating spaces, patios, and underground bicycle and vehicular parking.

There is an existing sidewalk along the Arthur Ave frontage, and the site plan includes two pedestrian walkways into the site. Throughout the site, there are sidewalks providing pedestrian access from the parking areas to the entrances. A large plaza area is located near the front entrance, and each condo office has a separate private patio.

Emergency access meets requirements, however staff notes that a fire apparatus turn-around is proposed on the property to the north that will be secured by an easement. The Resolution includes a condition of approval requiring this easement be recorded prior to recordation of this PUD.

The applicant proposes high quality site amenities and design, including a reflecting pool on the west elevation, underground bicycle storage, underground parking, carports with green roofs, and numerous gathering spaces for occupants of the property. The site plan accommodates drainage through a series of connected detention ponds. The landscaping plan meets the standards in the CDDSG, including street trees along the newly dedicated CTC Connector right-of-way. A waiver for trees is required along a portion of the northern property line due to the Northern Colorado Water Conservancy District (NCWCD) easement that traverses the property.

The project architecture consists of cast-in-place concrete on the first floor, and a series of cantilevered units clad in metal with a wood finish on the second floor. Large panes of recessed glass and patios are provided on each elevation. The applicants request approval of a waiver for the use of these materials, which are not permitted in the CDDSG.

The CDDSG has a maximum height allowance of 35’ for buildings, and 42’ for mechanical enclosures. For context, the surrounding properties developed under the IDDSG, which allows structures up to 40’ tall. The applicants request approval of a height waiver to allow the structure to be up to 40’-6” tall. All screening for rooftop mechanical units is accommodated through the building design of the structure, and no additional need for screening is anticipated.

Parking on the site is accommodated through an underground garage that can accommodate 37 vehicles, and surface parking on a series of connected parking lots with 158 spaces, for a total of 195 spaces or 3.2 spaces/1,000 sf. The CDDSG requires a parking ratio of 4 spaces/1,000 sf for office uses, or 241 spaces for this site. Section 17.20.080 of the Louisville Municipal Code allows City Council to reduce the number of required parking spaces if certain factors are met. The applicants included a letter of request with the rationale to approve a reduction in parking based on the parking needs of the property. Staff supports this request due to the unique design and operational

intent of the property and believes the occupancy will be lower than a typical office project.

An additional waiver is requested for relief from the parking setback along the northern property line. A portion of the parking spaces encroach up to 1'-2" for a distance of roughly 75'. This request stems from existing grades in this area, and the need to maintain minimum ADA slopes in the parking lot while accommodating a drive ramp into the underground garage along with adequate width for emergency access.

Figure 4: Project Rendering, view from S. 96th Street

Figure 5: PUD Site Plan

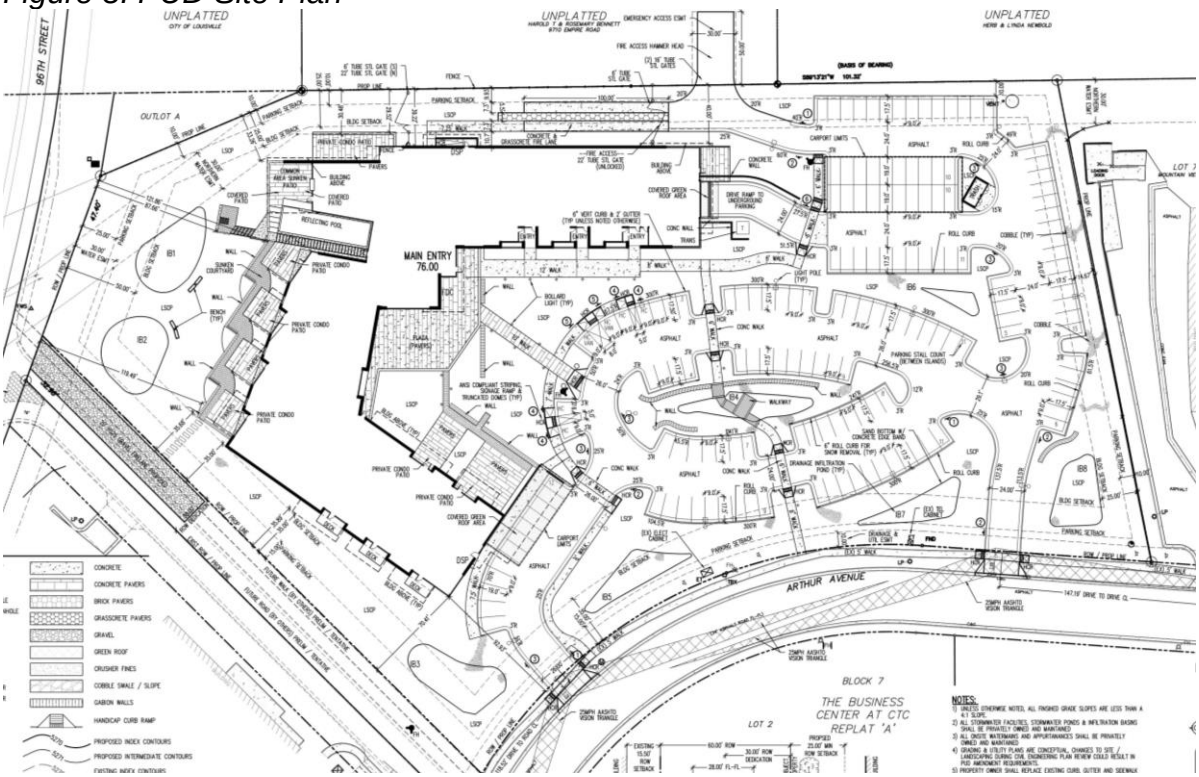


Figure 6: Aerial View Looking West

Figure 7: View looking west through private patios

ANALYSIS:

GDP Amendment

The GDP Amendment is subject to Section 17.72 *Planned Community Zone District* (PCZD) of the Louisville Municipal Code. Any amendments to a PCZD are subject to the same process and requirements as the initial approval. The purpose of the planned community zone district in Section 17.72.010 includes the following statements that apply to this application:

- *The purpose of the PCZD is to encourage, preserve and improve the health, safety and general welfare of the people of the city by encouraging the use of contemporary land planning principles and coordinated community design.*

- *The PCZD is created in recognition of the economic and cultural advantages that will accrue to the residents of an integrated, planned community development of sufficient size to provide related areas for various housing types, retail, service activities, recreation, schools and public facilities, and other uses of land.*

Section 17.72.030 includes the following applicability statement:

- *The PCZD may be applied only to such land as the city shall determine to be suitable for such a development.*

Staff finds the application meets the purpose and applicability statements in Chapter 17.72 of the Louisville Municipal Code, and finds that the GDP Amendment encourages coordinated community design by allowing higher architectural design on both lots. Additionally, the amendment accommodates more land uses that may now be viable due to the possible street connection between S. Arthur Ave and S. 96th St. The GDP Amendment provides additional economic opportunity for this area of the CTC in an integrated and coordinated manner.

Final Plat
The Final Plat is subject to the following standards in Section 16.12.075 of the Louisville Municipal Code.

1. *Whether the plat conforms to all of the requirements of this title;*
    - The application for The Business Center at CTC Replat I conforms in all respects to the requirements of Title 16 of the Louisville Municipal Code.

2. *Whether approval of the plat will be consistent with the city's comprehensive plan, applicable zoning requirements, and other applicable federal, state and city laws;*
    - Staff finds this application is consistent with the city's recently adopted Transportation Master Plan because it facilitates the construction of a connection into the CTC. It also facilitates a unique development concept in the CTC, which meets one of the city's comprehensive plan policies for the CTC, which is to "maintain a high quality employment center that responds to the needs of businesses."

3. *Whether the proposed subdivision will promote the purposes set forth in section 16.04.020 of this Code and comply with the standards set forth in chapter 16.16 of this Code and this title.*
    - The Final Plat promotes the purposes set forth in the LMC, including the assurance that public services are available, that character and economic

stability of the city is protected, that there is safe and efficient circulation of traffic, pedestrians and bikeways, and provides appropriate regulation of the use of land in the city.

Planned Unit Development
The PUD is subject to the CDDSG and Section 17.28.120 of the Louisville Municipal Code.

CDDSG: 1. Site Planning
The application complies with the standards in this section, including all minimum setbacks and building and site orientation standards, with noted waiver for the rear minimum parking setback. The proposal includes two new pedestrian connections to Arthur Ave, employee and visitor gathering areas, and appropriate screening of utilities. The proposal meets the standards for site grading and drainage in the CDDSG.

CDDSG: 2. Vehicular Circulation and Parking
The site is adjacent Arthur Ave on the south, S 96th St on the northwest, and private property on the north, east, and south. Access is accommodated through two drive aisles to connecting to Arthur Ave. The drive aisles can accommodate access for fire and service needs on the property. The parking lot meets design requirements, and is broken up into a series of connected areas. Where parking spaces abut sidewalks, additional width is provided to accommodate vehicular overhangs. As noted in the summary above, the applicant requests approval of a reduction of the minimum parking requirement under Sec. 17.20.080 of the Louisville Municipal Code.

CDDSG: 3. Pedestrian and Bicycle Circulation
The applicant proposes pedestrian connections and bicycle parking consistent with the standards of the CDDSG. The application includes interior protected bicycle storage. The plans include pedestrian access via two new sidewalks to S. Arthur Ave and throughout the site. The parking lot design locates parking spaces adjacent to sidewalks in some areas, however the sidewalks in these areas are at least 7-feet wide so that there is adequate width for car overhang.

CDDSG: 4. Architectural Design
The PUD provides for appropriate building relationships and compatibility by including landscaping and orientation that enhances the public areas of the site. The architecture of the building includes exceptional articulation and material variation, and properly locates entry and service areas. While the application includes the use of metal siding and unfinished cast-in-place concrete, it is of high quality, low maintenance and durable. The orientation of the building maximizes views to the west and appropriately screens service entries. The proposal includes carports and canopies with green roofs to add additional interest and meet sustainability goals.

CDDSG: 5. Landscape Design
The application complies with standards in the CDDSG for perimeter landscaping adjacent to abutting property (with noted waiver), parking lot landscaping, and building and loading and service area landscaping.

CDDSG: 6. Screen Walls and Fences
The application includes rock walls for site interest and privacy for the private patios. A wrought-iron fence is included near the rear of the property to enclose a small area for use by the property owners.

CDDSG: 7. Sign Design
The application does not address signs, and the property owner intends to submit sign permits in compliance with the draft Sign Code pending adoption this fall.

CDDSG: 8. Exterior Site Lighting
Staff finds the application complies with the CDDSG for the lighting design. The application includes wall mounted and pole mounted full cut-off LED light fixtures that will reduce light glare and safely light the property.

Waiver Compliance with 17.28.110
Section 17.28.110 of the Louisville Municipal Code sets forth the PUD waiver process and criteria. The application includes the following waiver requests:

- CDDSG 1.2.C. requirement for a 10'-0" parking setback. The application includes a request to allow a portion of the northern parking area to locate 8'-10" from the property line. This request stems from existing grades on the site, and the new grading associated with the underground parking garage and the need to maintain minimum ADA slopes in the parking lot areas. The plans include additional landscaping interest and buffering through shrubs in this area to mitigate the impact of the waiver request. Staff finds there is no negative impact to the spirit and intent of the development plan criteria, and that the waiver is warranted by the design and amenities incorporated into the development plan.
- CDDSG 4.2 requirement for a maximum building height of 35'. As noted above, the application requests approval of a waiver to allow a maximum building height of 40'-6". For comparison, the surrounding properties are subject to the IDDSG, which allows a maximum building height of 40' and the CDDSG allows a maximum height for mechanical enclosures of 42'. The applicant believes building design will screen any mechanical units and no additional height will be necessary. Staff finds there is no negative impact to the spirit and intent of the development plan criteria, and the waiver is warranted by the design of the building and quality of the proposal that will improve that area of the CTC.
- CDDSG 4.5.1.H prohibition on the use of painted metal and unfinished concrete. Staff finds there is no negative impact to the spirit and intent of the development plan criteria, and the waiver is warranted by the exceptional design of the building. Staff notes that the CDDSG has been in place for over 22 years, and

architectural materials once considered inappropriate have improved in quality and design and staff finds they are acceptable.

- CDDSG 5.2.A requirement for perimeter landscaping with 1 tree for every 40 feet of property boundary. A portion of the north property line is within the NCWCD easement area that does not allow trees. The application includes shrubs for buffering within this area. Staff supports this request and finds there in no negative impact on the spirit and intent of the development plan criteria and the waiver is warranted by the landscape design and amenities incorporated throughout the development plan.

Compliance with 17.28.120
Section 17.28.120 of the Louisville Municipal Code lists 28 criteria for PUDs that must be satisfied or found not applicable in order to approve a PUD. Analysis and staff's recommended finding of each criterion is provided in the attached appendix.

STAFF RECOMMENDATION:
Staff recommends approval of Resolution 17, Series 2019 recommending approval of a General Development Plan amendment, a Final Plat and a Final Planned Unit Development, with the following condition:

1. Prior to the recordation of the PUD, the applicant shall record an easement allowing emergency access onto the property to the north.

ATTACHMENTS:
1. Resolution No.17, Series 2019
2. Application Materials
3. The Business Center at CTC GDP Amendment G
4. The Business Center at CTC GDP A
5. Final Plat
6. Final Planned Unit Development
7. Parking reduction request
8. Applicant exhibits

APPENDIX: PUD Criteria Analysis – The Business Center at CTC Replat I PUD

Criteria 17.28.120 (A)	Finding	Narrative
1. An appropriate relationship to the surrounding area.	Compliant	The use is appropriate for the area and permitted in the PCZD-I zone district. The site and building design are compatible with other surrounding properties.
2. Circulation in terms of the internal street circulation system, designed for the type of traffic generated, safety, separation from living areas, convenience, access, and noise and exhaust control. Proper circulation in parking areas in terms of safety, convenience, separation and screening.	Compliant	The application provides for adequate and safe internal circulation. The City's engineering division and Fire District have reviewed the parking circulation and driveway locations and have not objections to the proposal.
3. Consideration and provision for low and moderate-income housing	Not applicable	The property is zoned PCZD-I. Residential uses are not allowed.
4. Functional open space in terms of optimum preservation of natural features, including trees and drainage areas, recreation, views, density relief and convenience of function	Compliant, with waiver	The PUD complies with landscape requirements in the CDDSG.
5. Variety in terms of housing types, densities, facilities and open space	Not applicable	The property is zoned PCZD-I. Residential uses are not allowed.
6. Privacy in terms of the needs of individuals, families and neighbors	Compliant	The PUD complies with site planning provisions in the CDDSG, assuring appropriate privacy of neighboring properties.
7. Pedestrian and bicycle traffic in terms of safety, separation, convenience, access points of destination and attractiveness	Compliant	The PUD complies with pedestrian and bicycle requirements in the CDDSG, ensuring adequate pedestrian and bicycle access. There are direct sidewalk connections provided between the building and adjacent public street.
8. Building types in terms of appropriateness to density, site relationship and bulk	Compliant, with waiver	The building is 40'-6' tall and while it requires a waiver from the CDDSG standards, the application is compatible with surrounding development and appropriate for the CTC.
9. Building design in terms of orientation, spacing, materials,	Compliant, with waiver	The PUD complies with the architectural design and site

color, texture, storage, signs and lighting		planning requirements in the CDDSG. The design incorporates adequate articulation, building materials and site configuration.
10. Landscaping of total site in terms of purpose, such as screening, ornamental types used, and materials used, if any; and maintenance, suitability and effect on the neighborhood	Compliant, with waiver	The PUD complies with landscape requirements in the CDDSG ensuring adequate screening and compatible landscaping for the CTC.
11. Compliance with all applicable development design standards and guidelines and all applicable regulations pertaining to matters of state interest, as specified in chapter 17.32	Compliant	The PUD complies with all applicable development design standards and guidelines.
12. None of the standards for annexation specified in chapter 16.32 have been violated	Not applicable	The property was annexed in 1976.
13. Services including utilities, fire and police protection, and other such services are available or can be made available to adequately serve the development specified in the final development plan	Compliant	The Public Works Department and Louisville Fire District reviewed the PUD and meets their requirements.

Criteria 17.28.120 (B)	Finding	Narrative
1. Development shall be in accordance with the adopted elements of the comprehensive development plan of the city, and in accordance with any adopted development design standards and guidelines.	Compliant	The PUD complies with the adopted elements of the comprehensive plan, and the adopted development design standards and guidelines.
2. No structures in a planned unit development shall encroach upon the floodplain. Existing bodies of water and existing stream courses shall not be channelized or altered in a planned unit development plan.	Compliant	The property is not located in a floodplain, nor are there any existing bodies of water in the area.
3. No occupied structure shall be located on ground showing severe subsidence potential without adequate design and study approved specifically by the city.	Compliant	There is no known subsidence on the property.

4. The proposal should utilize and preserve existing vegetation, land forms, waterways, and historical or archeological sites in the best manner possible. Steep slopes and important natural drainage systems shall not be disrupted. How the proposal meets this provision, including an inventory of how existing vegetation is included in the proposal, shall be set forth on the landscape plan submitted to the city.	Compliant	The PUD is appropriate for the context of the existing conditions of the property. The site is relatively flat and is within a developed industrial park and not adjacent to any preservation areas.
5. Visual relief and variety of visual sitings shall be located within a development in the overall site plan. Such relief shall be accomplished by building placements, shortened or interrupted street vistas, visual access to open space and other methods of design.	Compliant	The PUD complies with site planning requirements in the CDDSG, ensuring proper building placement, vistas and access to open space.
6. Open space within the project shall be located in such a manner as to facilitate pedestrian use and to create an area that is usable and accessible to residents of surrounding developments.	Compliant	The PUD complies with requirements in the CDDSG.
7. Street design should minimize through traffic passing residential units. Suggested standards with respect to paving widths, housing setbacks and landscaping are set forth in public works standards of the city and applicable development design standards and guidelines. The system of streets, including parking lots, shall aid the order and aesthetic quality of the development.	Compliant	The PUD complies with requirements in the CDDSG, ensuring properly designed landscaping adjacent to public streets.
8. There shall exist an internal pedestrian circulation system separate from the vehicular system such that allows access to adjacent parcels as well as to parks, open space or recreation	Compliant	The PUD complies with bicycle and pedestrian requirements in the CDDSG, ensuring adequate pedestrian and bicycle access.

facilities within the development. Pedestrian links to trail systems of the city shall be provided.		
9. The project and development should attempt to incorporate features which reduce the demand for water usage.	Compliant	The PUD proposes appropriate use of water. The internal areas of the lot include native seed mix for the landscape areas.
10. Landscape plans shall attempt to reduce heating and cooling demands of buildings through the selection and placement of landscape materials, paving, vegetation, earth forms, walls, fences, or other materials.	Compliant	The PUD complies with landscape requirements in the CDDSG, providing for shading of parking and pedestrian areas, and includes a green roof on the carport and canopies.
11. Proposed developments shall be buffered from collector and arterial streets. Such buffering may be accomplished by earthen berms, landscaping, leafing patterns, and other materials. Entrance islands defining traffic patterns along with landscaping shall be incorporated into entrances to developments.	Compliant	The PUD complies with the requirements of the CDDSG and includes adequate landscaping and buffering from adjacent streets.
12. There shall be encouraged the siting of lot arrangement, building orientation and roof orientation in developments so as to obtain the maximum use of solar energy for heating.	Compliant	The PUD provides unshaded roof structures so that solar energy may be utilized in the future.
13. The overall PUD shall provide a variety of housing types.	Not applicable	Housing is not proposed.
14. Neighborhoods within a PUD shall provide a range of housing size.	Not applicable	Housing is not proposed.
15. Architectural design of buildings shall be compatible in design with the contours of the site, compatible with surrounding designs and neighborhoods, shall promote harmonious transitions and scale in character in areas of different planned uses, and shall contribute to a mix of styles within the city.	Compliant	The PUD proposes architecture that is compatible in design with the contours of the site, with surrounding designs and neighborhoods.

RESOLUTION NO. 17
SERIES 2019

A RESOLUTION RECOMMENDING APPROVAL OF A REQUEST FOR AN AMENDMENT TO THE BUSINESS CENTER AT CTC GENERAL DEVELOPMENT PLAN REGARDING THE ALLOWED USES AND DEVELOPMENT STANDARDS, A FINAL PLAT TO CONSOLIDATE LOTS, AND A FINAL PLANNED UNIT DEVELOPMENT FOR LOT 2, THE BUSINESS CENTER AT CTC REPLAT E AND LOT 6, BLOCK 1, THE BUSINESS CENTER AT CTC, LOCATED AT 1411 AND 1443 S. ARTHUR AVENUE

WHEREAS, there has been submitted to the Louisville Planning Commission an application for an amendment to The Business Center at CTC General Development Plan regarding the allowed uses and development standards, a Final Plat to consolidate lots, and a Final Planned Unit Development to allow construction of an office building and associated site improvements.

WHEREAS, City staff has reviewed the information submitted and found that the application complies with the Louisville subdivision and zoning regulations and other applicable sections of the Louisville Municipal Code; and

WHEREAS, the Planning Commission has considered the application at a duly noticed public hearing on October 10, 2019, where evidence and testimony were entered into the record, including the findings in the Louisville Planning Commission staff report dated October 10, 2019 ; and

NOW THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Louisville, Colorado does hereby recommend approval of a request for an amendment to The Business Center at CTC General Development Plan regarding the allowed uses and development standards, a Final Plat to consolidate lots, and a Final Planned Unit Development to allow construction of an office building and associated site improvements, with the following condition:

1. Prior to recordation of the Planned Unit Development, the applicant shall record an easement on the property to the north securing emergency access.

PASSED AND ADOPTED this 10th day of October, 2019.

By: _____
Steve Brauneis, Chairperson
Planning Commission

Attest: _____
Debra Williams, Secretary
Planning Commission

DAJDESIGN
ARCHITECTURE+INTERIORS

June 6, 2019

Lisa Ritchie
City of Louisville
Planning & Building Safety
749 Main Street
Louisville, CO 80027

RE: Final PUD, GDP Amendment, Minor Subdivision for 1411 & 1443 S. Arthur

922A MAIN STREET
LOUISVILLE, CO 80027
T (303) 527-1100
INFO@DAJDESIGN.COM
WWW.DAJDESIGN.COM

Dear Ms. Ritchie,

CTC Gateway LLC is seeking approval to build a 100,013 sf, two-story office building with a subterranean basement level at the referenced address in Colorado Technology Center. The intent for the building is to house 32 individual executive office condominiums that would be sold individually to separate companies. The building amenities include a lobby area, fitness area, wine bar, 14,165 sf subterranean parking garage, and landscaped property that includes patios and common courtyard. All common building amenities are intended for building occupant use only – no public access.

The ground floor will contain office condominiums, lobby, and wine bar. The second floor will contain office condominiums and fitness area. All second floor office condominiums have outdoor balconies of varying sizes. The subterranean basement will contain 34 indoor parking spaces (32 standard spaces and 2 accessible spaces) with secured entry, 1000 sf of secure bike parking (20-40 spaces planned). An oversized elevator is planned to provide access to bike parking, and to facilitate moving furniture in and out of the building. There is a main entry off the courtyard that accesses the building's lobby area, and there is a secondary entry at the southeast corner of the building adjacent to the outdoor covered parking.

The building is oriented to take advantage of the immediate and distant surrounding views, and has a unique building footprint and shape with significant surface articulation to promote a high degree of architectural interest. Materials being used on the building include: exposed, natural gray concrete with panel-form pattern, wood-grained aluminum plank siding (to authentically mimic wood siding), clear glass windows and doors, clear glass railings, and a minimal use of pre-finished flat metal panels for accents. Building heights range from 37'-6" at the lowest point above grade and 43'-6" at the maximum point above grade for an average height of 40'-6". The CDDSG requires a maximum height of 35'-0" and 42'-0" to the top of mechanical screening. We are requesting a waiver through the PUD process to allow a 40'-6" high building.

Green roofs are planned for the covered entry to the parking garage and for the southeast covered parking spaces. Building setbacks, easements, site coverage, water quality control, and grading are being maintained per the CDDSG guidelines and standards.

Parking for the property is split between a subterranean parking garage, as mentioned above, and 150 outdoor, surface parking spaces for a total of 184 parking spaces. The CDDSG requires a parking ratio of 4:1000. The building area used for the parking calculations is 58,079 sf after exclusions were removed, which yields 232 required parking spaces. We are requesting a waiver through the PUD process to reduce the required parking by 48 spaces for a total of 184 planned parking spaces for a ratio of 3.17:1000. Bicycle and pedestrian circulation meet the intent of the CDDSG.

The landscape design exceeds the CDDSG guidelines and standards.

Please contact me if you have any questions.

Regards,

Andy Johnson, AIA

922A MAIN STREET
LOUISVILLE, CO 80027
T (303) 527-1100
INFO@DAJDESIGN.COM
WWW.DAJDESIGN.COM

City of Louisville
COLORADO • SINCE 1878

Department of Planning and Building Safety

749 Main Street • Louisville CO 80027 • 303.335.4592 • www.louisvilleco.gov

LAND USE APPLICATION

CASE NO. _____

APPLICANT INFORMATION

Firm: DAJ DESIGN, INC.
Contact: ANDY JOHNSON
Address: 922A MAIN STREET
LOUISVILLE, CO 80027
Mailing Address: (SAME)
Telephone: 303-527-1100
Fax: NA
Email: ANDY@DAJDESIGN.COM

OWNER INFORMATION

Firm: CTC GATEWAY LLC
Contact: JASON COLLIER
Address: 13907 BARBOUR STREET
BROOMFIELD, CO 80023
Mailing Address: (SAME)
Telephone: 720-308-6971
Fax: NA
Email: JASON.COLLIER@COLLIERHMG.COM

REPRESENTATIVE INFORMATION

Firm: DAJ DESIGN, INC.
Contact: ANDY JOHNSON
Address: 922A MAIN STREET
LOUISVILLE, CO 80027
Mailing Address: (SAME)
Telephone: 303-527-1100
Fax: NA
Email: ANDY@DAJDESIGN.COM

PROPERTY INFORMATION

Common Address: 1411 & 1443 S. ARTHUR CT.
Legal Description: Lot LOT 2 & 6 Blk 1
Subdivision THE BUSINESS CENTER AT CTC
Area: 251,007 Sq. Ft.

TYPE (S) OF APPLICATION

- ☐ Annexation
- ☒ Zoning
- ☐ Preliminary Subdivision Plat
- ☐ Final Subdivision Plat
- ☒ Minor Subdivision Plat
- ☐ Preliminary Planned Unit Development (PUD)
- ☒ Final PUD
- ☐ Amended PUD
- ☐ Administrative PUD Amendment
- ☐ Special Review Use (SRU)
- ☐ SRU Amendment
- ☐ SRU Administrative Review
- ☐ Temporary Use Permit: _____
- ☐ CMRS Facility: _____
- ☐ Other: (easement / right-of-way; floodplain; variance; vested right; 1041 permit; oil / gas production permit)

PROJECT INFORMATION

Summary: FINAL PUD, MINOR SUBDIVISION PLAT, AND GENERAL DEVELOPMENT PLAN AMENDMENT FOR A NEW TWO-STORY, 97,894 SQ. FT. COMMERCIAL OFFICE BUILDING WITH UNDER GROUND PARKING.

Current zoning: PCDZ-I Proposed zoning: PCDZ-I

SIGNATURES & DATE

Applicant: _____
Print: ANDY JOHNSON
Owner: _____
Print: JASON COLLIER
Representative: _____
Print: ANDY JOHNSON

CITY STAFF USE ONLY

- ☐ Fee paid: _____
- ☐ Check number: _____
- ☐ Date Received: _____

THE BUSINESS CENTER AT C.T.C.

GENERAL DEVELOPMENT PLAN AMENDMENT G

LOT 2, THE BUSINESS CENTER AT CTC REPLAT E & LOT 6, BLOCK 1, THE BUSINESS CENTER AT CTC

1411 S. ARTHUR AVE.

NORTHWEST $\frac{1}{4}$ OF SECTION 16, TOWNSHIP 1 SOUTH, RANGE 69 WEST, 6TH PRINCIPAL MERIDIAN,
CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

DAJDESIGN
922A MAIN STREET
LOUISVILLE, CO 80027
P. 303.527.1100
INFO@DAJDESIGN.COM

OWNERSHIP SIGNATURE BLOCK:

BY SIGNING THIS GDP, THE OWNER ACKNOWLEDGES AND ACCEPTS ALL THE REQUIREMENTS AND INTENT SET FORTH IN THIS GDP.
WITNESS MY / OUR HAND(S) SEAL(S) THIS _____ DAY OF _____ , 20 _____

_____
OWNER NAME AND SIGNATURE

_____ (NOTARY SEAL)
NOTARY NAME

_____
NOTARY SIGNATURE

MY COMMISSION EXPIRES _____

CITY COUNCIL CERTIFICATE:

APPROVED THIS _____ DAY OF _____ , 20 ____

BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO.

BY _____
MAYOR

BY _____
CITY CLERK

ORDINANCE NO. _____ , SERIES _____

CLERK AND RECORDER CERTIFICATE:

(COUNTY OF BOULDER, STATE OF COLORADO)

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED IN MY OFFICE AT _____ O'CLOCK ____ . M.

THIS _____ DAY OF _____ , 20 ____

AND IS RECORDED IN PLAN FILE _____ , FEE _____ PAID, _____ FILM NO. _____ RECEPTION

BY _____
CLERK & RECORDER

BY _____
DEPUTY

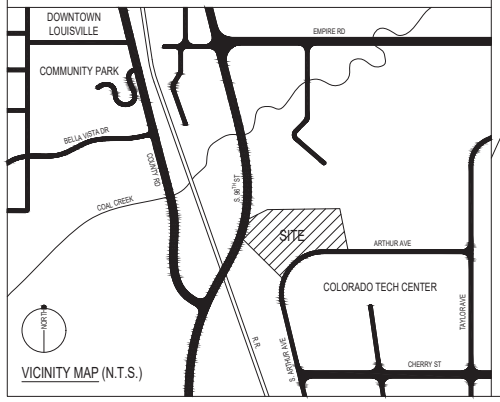
PLANNING COMMISSION CERTIFICATE:

APPROVED THIS _____ DAY OF _____ , 20 ____

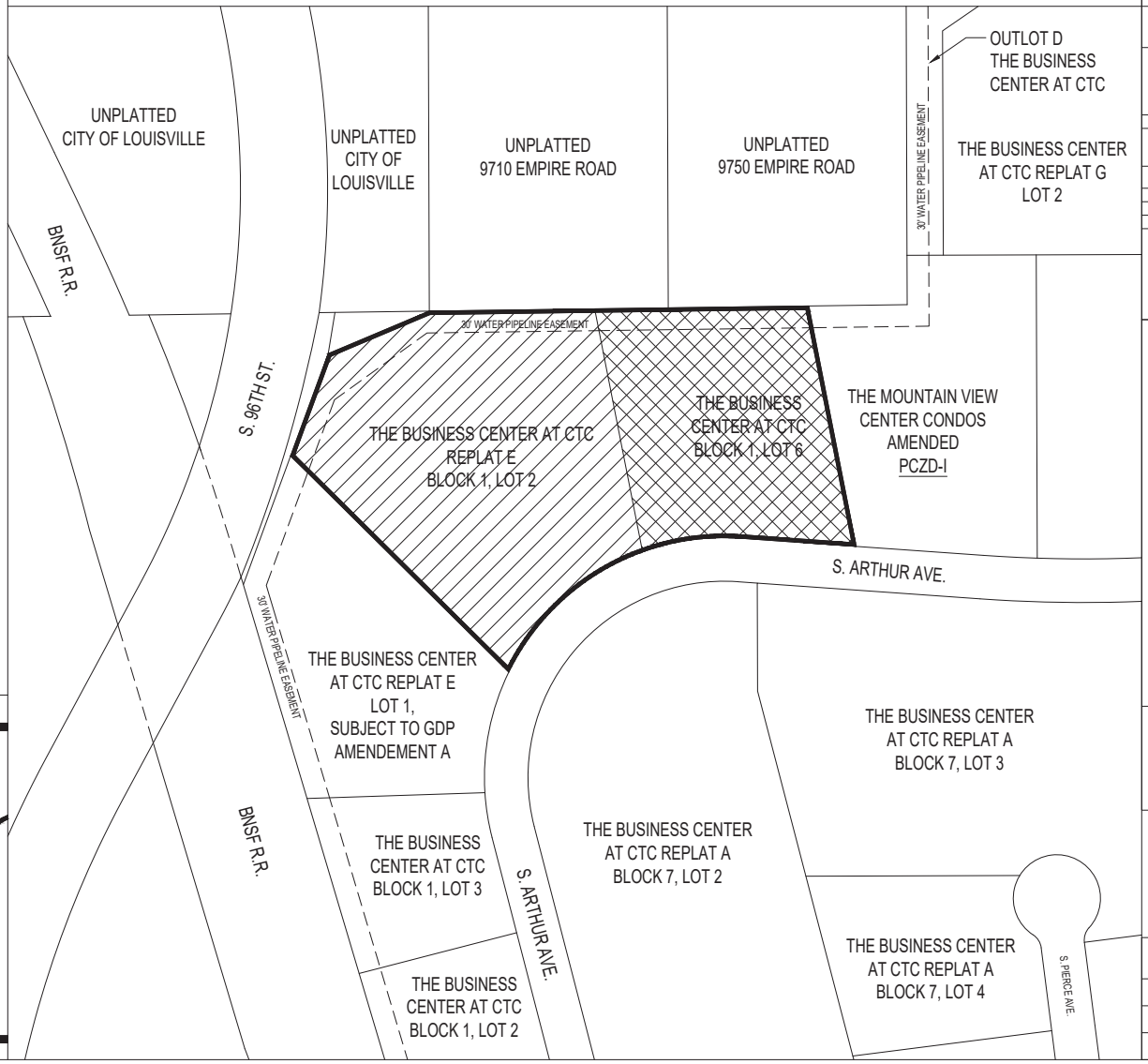
BY THE PLANNING COMMISSION OF THE CITY OF LOUISVILLE, COLORADO.

RESOLUTION NO. ____

SERIES _____



VICINITY MAP (N.T.S.)



THE PURPOSE OF THIS GDP AMENDMENT IS TO REVISE THE ALLOWED USES AND DEVELOPMENT STANDARDS ON LOT 1, BLOCK 6, THE BUSINESS CENTER AT CTC TO ALIGN WITH THE USES AND DEVELOPMENT STANDARDS ON LOT 2, BLOCK 1, THE BUSINESS CENTER AT CTC REPLAT E SO THAT THE TWO LOTS MAY DEVELOP UNDER ONE PLANNED UNIT DEVELOPMENT.

LAND USE SUMMARY

PROPERTY SUBJECT TO THIS GENERAL DEVELOPMENT PLAN:

LOT 2, THE BUSINESS CENTER AT CTC REPLAT E

LOT 6, BLOCK 1, THE BUSINESS CENTER AT CTC

	LOT 2	LOT 6
PRESENT ZONING:	PCZD-I SUBJECT TO THE BUSINESS CENTER AT CTC GDP AMENDMENT A	PCZD-I SUBJECT TO THE BUSINESS CENTER AT CTC GDP AMENDMENT A
PROPOSED ZONING:	PLANNED COMMUNITY ZONE DISTRICT (PCZD)	PLANNED COMMUNITY ZONE DISTRICT (PCZD)
LOT SIZE:	3.57 ACRES	2.19 ACRES
TOTAL AREA:	5.76 ACRES	

AREA TO BE COMMERCIAL - CTC, CITY, OR OTHER APPLICABLE COMMERCIAL GUIDELINES SHALL APPLY, AS IN EFFECT FROM TIME TO TIME. SPECIAL REVIEW USE APPROVAL IS REQUIRED FOR ANY USE IDENTIFIED IN THE LOUISVILLE MUNICIPAL CODE AS A USE BY SPECIAL REVIEW IN THE CITY'S INDUSTRIAL (I) ZONE DISTRICT REGULATIONS, AS IN EFFECT FROM TIME TO TIME. NOTE: AUTOMOBILE SERVICE STATIONS ARE PROHIBITED

THE DEVELOPMENT IN THIS GDP AMENDMENT SHALL BE SUBJECT TO THE COMMERCIAL DEVELOPMENT DESIGN STANDARDS AND GUIDELINES. THE FOLLOWING USES ARE PERMITTED, AS REFERRED TO IN SEC. 17.12.030 OF THE LOUISVILLE MUNICIPAL CODE:

24. PERSONAL SERVICES, INCLUDING BUT NOT LIMITED TO BARBERSHOPS AND BEAUTY SHOPS, DRY-CLEANING OUTLETS, SELF-SERVICE LAUNDRIES, SHOE REPAIR SHOPS AND SIMILAR ACTIVITIES OR A FACILITY OPERATED BY AN ACCREDITED MASSAGE THERAPIST FOR THE PURPOSE OF MASSAGE THERAPY AS DEFINED IN SECTION 5.16.010 ARE PERMITTED FOR UP TO 20% OF THE GROSS BUILDING AREA. ANY MORE THAN 20% OF THE GROSS BUILDING AREA REQUIRES APPROVAL OF A SPECIAL REVIEW USE
25. ESTABLISHMENTS FOR RETAILING OF CONVENIENCE GOODS, INCLUDING BUT NOT LIMITED TO VARIETY STORES, SUPERMARKETS, HARDWARE STORES, SPORTING GOOD STORES, SHOE STORES AND DRUGSTORES ARE PERMITTED FOR UP TO 20% OF THE GROSS BUILDING AREA. ANY MORE THAN 20% OF THE GROSS BUILDING AREA REQUIRES APPROVAL OF A SPECIAL REVIEW USE
29. MEDICAL AND DENTAL CLINICS, PROFESSIONAL AND BUSINESS OFFICES, FINANCIAL INSTITUTIONS, SMALL ANIMAL CLINICS
29b. MEDICAL MARIJUANA-INFUSED PRODUCTS MANUFACTURER
29c. MEDICAL MARIJUANA TESTING FACILITY
31. INDOOR EATING AND DRINKING ESTABLISHMENTS, OUTDOOR EATING AND DRINKING ESTABLISHMENTS AND OUTDOOR SALES OF RETAIL GOODS, FOR BUILDING OCCUPANTS ONLY
40. GENERAL RESEARCH FACILITIES
44. FACILITIES FOR THE MANUFACTURING, FABRICATION, PROCESSING, OR ASSEMBLY OF PRODUCTS, PROVIDED THAT SUCH FACILITIES ARE COMPLETELY ENCLOSED AND PROVIDED THAT NO EFFECTS FROM NOISE, SMOKE, GLARE, VIBRATION, FUMES OR OTHER ENVIRONMENTAL FACTORS ARE MEASURABLE AT THE PROPERTY LINE
52c. RETAIL MARIJUANA PRODUCTS MANUFACTURING FACILITY
52d. RETAIL MARIJUANA TESTING FACILITY
59. HEALTH OR ATHLETIC CLUBS, SPAS, DANCE STUDIOS, FITNESS STUDIOS

THE FOLLOWING USES ARE PERMITTED BY SPECIAL REVIEW:

9. PUBLIC AND PRIVATE SCHOOLS (OTHER THAN ITEMS 10, 11, AND 12 FROM SEC. 17.12.030), STUDIOS FOR PROFESSIONAL WORK OR TEACHING OF ANY FORM OF FINE ARTS, PHOTOGRAPHY, MUSIC, DRAMA, BUT NOT INCLUDING A COMMERCIAL GYMNASIUM
12. VOCATIONAL AND BUSINESS SCHOOLS
31. INDOOR EATING AND DRINKING ESTABLISHMENTS, OUTDOOR EATING AND DRINKING ESTABLISHMENTS AND OUTDOOR SALES OF RETAIL GOODS, FOR THE PUBLIC

LEGEND

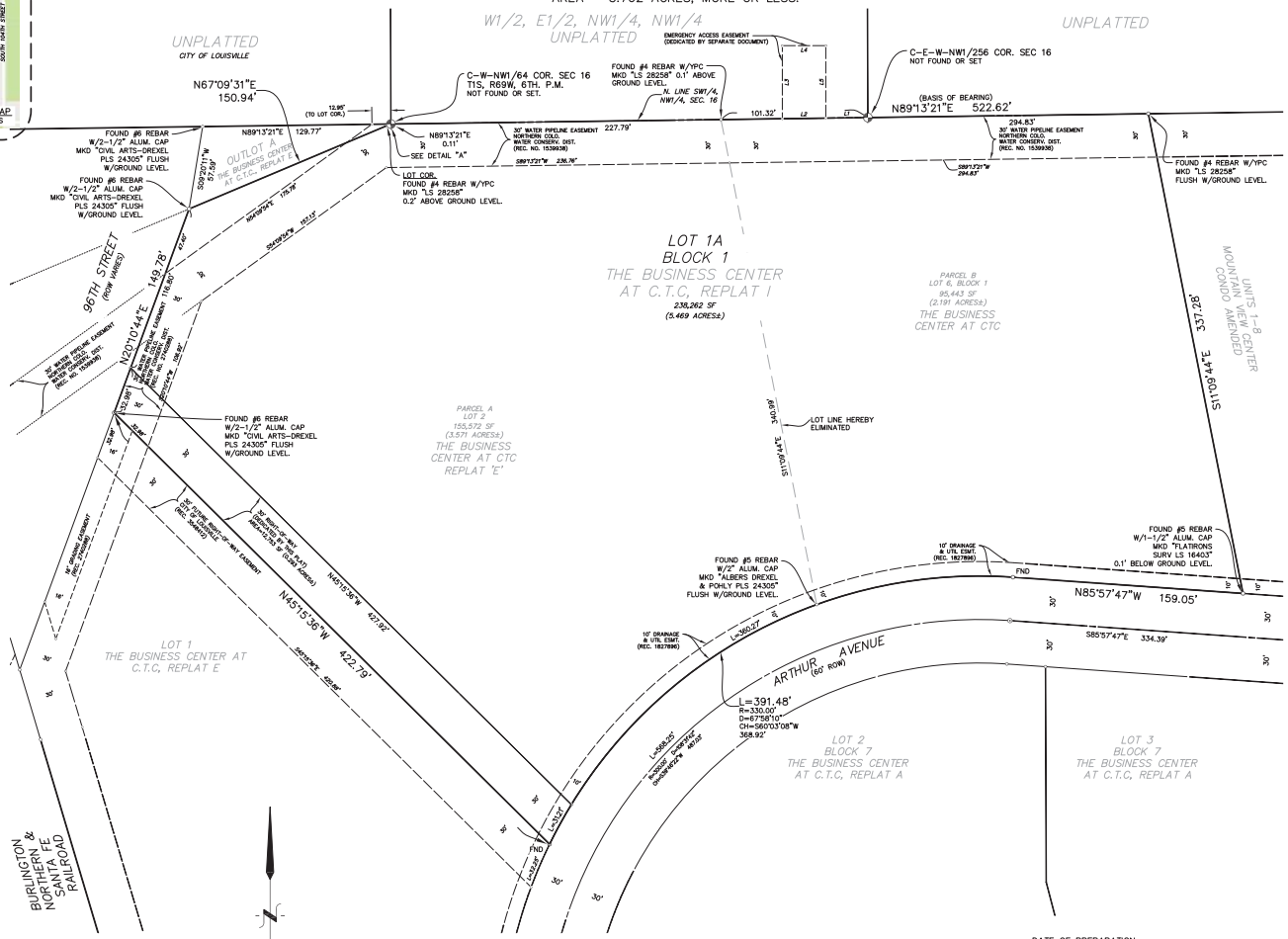
SITE	
EXISTING PCZD:	
NEW PCZD:	

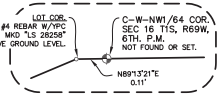
FINAL PLAT

THE BUSINESS CENTER AT C.T.C., REPLAT I

A REPLAT OF LOT 2, THE BUSINESS CENTER AT C.T.C., REPLAT E AND LOT 6, BLOCK 1, THE BUSINESS CENTER AT C.T.C.
A SUBDIVISION OF A PART OF THE NW1/4 OF SECTION 16, T1S, R69W OF THE 6TH P.M.,
CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO.

AREA = 5.762 ACRES, MORE OR LESS.





DETAIL "A"

DEDICATION

KNOW ALL MEN BY THESE PRESENTS, THAT THE UNDERSIGNED, CTC GATEWAY LLC, A COLORADO LIMITED LIABILITY COMPANY AND JUSTIN COLLIER, BEING THE OWNERS OF A TRACT OF LAND LOCATED IN THE NW1/4 OF SECTION 16, T1S, R69W OF THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

PARCEL A:
LOT 2, THE BUSINESS CENTER AT C.T.C. REPLAT E, COUNTY OF BOULDER, STATE OF COLORADO.

PARCEL B:
LOT 6, BLOCK 1, THE BUSINESS CENTER AT C.T.C., COUNTY OF BOULDER, STATE OF COLORADO.

AREA=251,014 SQUARE FEET (5.763 ACRES), MORE OR LESS.

HAVE LAID OUT, SUBDIVIDED AND PLATTED THE SAME INTO A LOT AS SHOWN HEREON UNDER THE NAME AND STYLE OF "THE BUSINESS CENTER AT C.T.C., REPLAT I", A SUBDIVISION OF A PART OF THE CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO, AND BY THESE PRESENTS DO HEREBY DEDICATE TO THE CITY OF LOUISVILLE AND THE PUBLIC, THE 30-FOOT RIGHT-OF-WAY AS SHOWN ON THE ACCOMPANYING PLAT FOR THE PUBLIC USE THEREOF FOREVER; AND DO FURTHER DEDICATE TO THE USE OF THE CITY OF LOUISVILLE AND ALL THE MUNICIPALLY OWNED AND/OR FRANCHISED UTILITIES AND SERVICES, THOSE PORTIONS OF SAID REAL PROPERTY WHICH ARE SO DESIGNATED AS EASEMENTS AND RIGHTS-OF-WAY FOR THE CONSTRUCTION, INSTALLATION, OPERATION, MAINTENANCE, REPAIR AND REPLACEMENT FOR ALL SERVICES, INCLUDING WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, TELEPHONE AND ELECTRIC LINES, WORKS, POLES AND UNDERGROUND CABLES, GAS PIPELINES, WATER PIPELINES, SANITARY SEWER LINES, STREET LIGHTS, CULVERTS, HYDRANTS, DRAINAGE DITCHES AND DRAINS AND ALL APPURTENANCES THERETO, IT BEING EXPRESSLY UNDERSTOOD AND AGREED BY THE UNDERSIGNED THAT ALL EXPENSES AND COSTS INVOLVED IN CONSTRUCTING AND INSTALLING SANITARY SEWER SYSTEM WORKS AND LINES, GAS SERVICE LINES, ELECTRICAL SERVICE WORKS AND LINES, STORM SEWERS AND DRAINS, STREET LIGHTING, GRADING AND LANDSCAPING, CURBS AND GUTTERS, STREET PAVEMENTS, SIDEWALKS AND OTHER SUCH UTILITIES AND SERVICES SHALL BE GUARANTEED AND PAID FOR BY THE SUBDIVIDER OR ARRANGEMENTS MADE BY THE SUBDIVIDER THEREOF WHICH ARE APPROVED BY THE CITY OF LOUISVILLE, COLORADO, AND SUCH SUMS SHALL NOT BE PAID BY THE CITY OF LOUISVILLE, COLORADO, AND THAT ANY ITEM SO CONSTRUCTED OR INSTALLED WHEN ACCEPTED BY THE CITY OF LOUISVILLE, COLORADO, SHALL BECOME THE SOLE PROPERTY OF SAID CITY OF LOUISVILLE, COLORADO, EXCEPT PRIVATE ROADWAY CURBS, GUTTER AND PAVEMENTS AND ITEMS OWNED MUNICIPALLY FRANCHISED UTILITIES WHICH WHEN CONSTRUCTED OR INSTALLED, SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL NOT BECOME THE PROPERTY OF THE CITY OF LOUISVILLE, COLORADO.

OWNER: CTC GATEWAY LLC, A COLORADO LIMITED LIABILITY COMPANY

BY: _____

AS _____ OF CTC GATEWAY LLC, A COLORADO LIMITED LIABILITY COMPANY

OWNER: JUSTIN COLLIER

BY: _____
JUSTIN COLLIER

ACKNOWLEDGEMENTS

STATE OF COLORADO)
)SS
COUNTY OF BOULDER)
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS

_____ DAY OF _____, 20____,

BY: _____ AS _____
OF CTC GATEWAY LLC, A COLORADO LIMITED LIABILITY COMPANY

WITNESS MY HAND AND OFFICIAL SEAL

_____
NOTARY PUBLIC
MY COMMISSION EXPIRES _____

STATE OF COLORADO)
)SS
COUNTY OF BOULDER)
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS

_____ DAY OF _____, 20____,

BY JUSTIN COLLIER

WITNESS MY HAND AND OFFICIAL SEAL

_____
NOTARY PUBLIC
MY COMMISSION EXPIRES _____

LINE TABLE		
LINE #	DIRECTION	LENGTH
L1	N89°13'21"E	29.00
L2	S89°13'21"W	30.00
L3	N00°00'00"E	50.41
L4	N90°00'00"E	30.00
L5	S00°00'00"E	50.00

LEGEND	
ALUM	ALUMINUM
BK	BOOK
COLO	COLORADO
ESMT	EASEMENT
MKD	MARKED
PG	PAGE
±	MORE OR LESS
REC	RECEPTION NO.
ROW	RIGHT-OF-WAY
SF	SQUARE FEET
YPC	YELLOW PLASTIC CAP
___I	PROPERTY CORNER

DATE OF PREPARATION

JUNE 12, 2019

DATE OF REVISION

AUGUST 30, 2019

SURVEYOR

CIVILARTS, INC.
1500 KANSAS AVENUE, SUITE 2-E
LONGMONT, CO 80501
303-682-1131
ATTN: PETER D. STEGER, PLS

NOTES

1. BEARINGS SHOWN ON THIS MAP ARE BASED ON THE ASSUMPTION THAT THE NORTH LINE OF LOT 1A, BLOCK 1 OF BUSINESS CENTER AT C.T.C., REPLAT I BEARS N89°13'21"E AS MONUMENTED AND SHOWN HEREON.
2. FOUND #5 REBAR WITH 2 INCH ALUMINUM CAP MARKED "CIVILARTS PLS 24305" FLUSH W/ GROUND LEVEL WHERE NOTED "FND". DID NOT FIND OR SET A MONUMENT WHERE NOTED "NFS".
3. RECORDED EASEMENTS AND RIGHTS-OF-WAY, IF ANY, ARE SHOWN ON THIS PLAT AS DISCLOSED IN LAND TITLE GUARANTEE COMPANY COMMITMENT NO. ABZ70570546-3, EFFECTIVE DATE MAY 9, 2018. NO ADDITIONAL RESEARCH WAS COMPLETED.

   LEGAL DESCRIPTION IS ACCORDING TO THE TITLE COMMITMENT, EXCEPT "THE" WAS ADDED TO THE NAME OF THE SUBDIVISION "THE BUSINESS CENTER AT C.T.C.".
4. FIELD WORK WAS COMPLETED ON APRIL 17, 2018.
5. LINEAR DIMENSIONS SHOWN ON THIS MAP ARE U.S. SURVEY FEET.

PLANNING COMMISSION CERTIFICATE

APPROVED THIS ____ DAY OF _____, 20____ BY THE PLANNING COMMISSION OF THE CITY OF LOUISVILLE, COLORADO

RESOLUTION NO. _____ SERIES _____

CITY COUNCIL CERTIFICATE

APPROVED THIS ____ DAY OF _____, 20____ BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO

RESOLUTION NO. _____ SERIES _____

_____
MAYOR'S SIGNATURE

_____
CITY CLERK SIGNATURE

NOTICE

ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVERED SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

SURVEYOR'S CERTIFICATE

I, PETER D. STEGER, A DULY REGISTERED LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS MAP REFLECTS THE RESULTS OF A SURVEY MADE UNDER MY RESPONSIBLE CHARGE IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE, AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF. THIS CERTIFICATION IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

COLORADO REGISTERED PETER D. STEGER 25379 PROFESSIONAL LAND SURVEYOR

_____
PETER D. STEGER
COLORADO REGISTERED PROFESSIONAL
LAND SURVEYOR NO. 25379

DATE: AUGUST 30, 2019

CLERK AND RECORDER'S CERTIFICATE

STATE OF COLORADO)
)SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED IN MY OFFICE AT ____ O'CLOCK ___M. THIS _____ DAY OF _____, 20____ AND IS RECORDED AT
RECEPTION NO. _____
FEES PAID $_____

_____
CLERK & RECORDER

_____
DEPUTY

CIVILARTS
ENGINEERING
PLANNING
SURVEYING
1500 Kansas Avenue, Suite 2-E
Longmont, CO 80501
P 303.682.1131
F 303.682.1149

PLOTTED:(R) (08/30/19 11:04AM BY:EILEEN HEINS
WORKING:(J:\1206-2_CSD\1206-2_CSD-1206-2\DWG\12062-P\12062-PA.DWG
DRAWING2:(1206-2_CSD\12062-P\12062-PA.DWG

THE BUSINESS CENTER AT C.T.C.

REPLAT I

1411 S. ARTHUR AVENUE

FINAL PLANNED UNIT DEVELOPMENT

DAJDESIGN
922A MAIN STREET
LOUISVILLE, CO 80027
P: 303.527.1100
INFO@DAJDESIGN.COM

NORTHWEST $\frac{1}{4}$ OF SECTION 16, TOWNSHIP 1 SOUTH, RANGE 69 WEST, 6TH PRINCIPAL MERIDIAN, CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

OWNERSHIP SIGNATURE BLOCK:

BY SIGNING THIS PUD, THE OWNER ACKNOWLEDGES AND ACCEPTS ALL THE REQUIREMENTS AND INTENT SET FORTH IN THIS PUD.
WITNESS MY / OUR HAND(S) SEAL(S) THIS _____ DAY OF _____ , 20 _____

_____
OWNER NAME AND SIGNATURE

_____ (NOTARY SEAL)
NOTARY NAME

_____
NOTARY SIGNATURE

MY COMMISSION EXPIRES _____

CITY COUNCIL CERTIFICATE:

APPROVED THIS _____ DAY OF _____ , 20 ____

BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO.

BY _____
MAYOR

BY _____
CITY CLERK

RESOLUTION NO. _____ , SERIES _____

CLERK AND RECORDER CERTIFICATE:

(COUNTY OF BOULDER, STATE OF COLORADO)

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED IN MY OFFICE AT _____ O'CLOCK ____ . M.

THIS _____ DAY OF _____ , 20 ____

AND IS RECORDED IN PLAN FILE _____ , FEE _____ PAID, _____ FILM NO. _____ RECEPTION

BY _____
CLERK & RECORDER

BY _____
DEPUTY

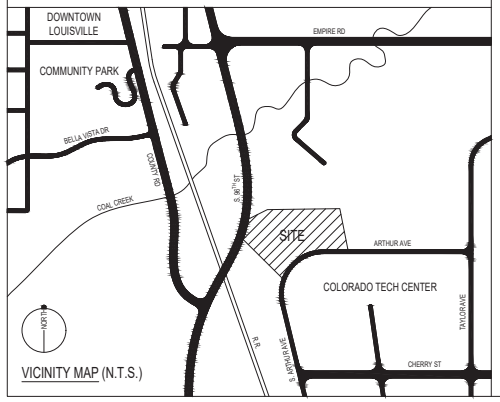
PLANNING COMMISSION CERTIFICATE:

APPROVED THIS _____ DAY OF _____ , 20 ____

BY THE PLANNING COMMISSION OF THE CITY OF LOUISVILLE, COLORADO.

RESOLUTION NO. ____

SERIES _____



VICINITY MAP (N.T.S.)

PROJECT DESCRIPTION:

OFFICE CONDOMINIUMS

WAIVER REQUESTS:

1. CDDSG STANDARDS SECTION 1.2 C FOR 8'-10" INTERNAL / COMMON PROPERTY BOUNDARY PARKING SETBACK AT THE NORTH BOUNDARY
2. CDDSG STANDARDS SECTION 4.2 FOR 40'-6" MAXIMUM AVERAGE BUILDING HEIGHT
3. CDDSG STANDARDS SECTION 4.5.1 H FOR PAINTED METAL & PLAIN UNFINISHED CONCRETE AS ACCEPTABLE MATERIALS
4. CDDSG STANDARDS SECTION 5.2 A FOR NO TREES IN THE NORTHERN COLORADO WATER CONSERVANCY DISTRICT EASEMENT AREA

GENERAL NOTES:

1. THE CITY OF LOUISVILLE IS NOT RESPONSIBLE FOR DAMAGE TO OR REPAIR OF MONUMENT SIGNS, PAVEMENT SURFACES, OR LANDSCAPING CAUSED DURING REPAIR OR MAINTENANCE OF UTILITIES LOCATED WITHIN PUBLIC UTILITY EASEMENTS
2. PROPERTY OWNER SHALL REPLACE EXISTING CURB AND GUTTER THAT HAS SETTLED OR IS OTHERWISE DAMAGED ADJACENT THE SITE
3. PROPERTY OWNER SHALL MAINTAIN, REPAIR, AND REPLACE THE ADA RAMPS AT THE S. ARTHUR AVE. DRIVE LOCATIONS, AS DIRECTED BY THE CITY

PROJECT DATA

OWNER INFO:	CTC GATEWAY LLC 13907 BARBOUR ST BROOMFIELD, CO 80023
OWNER CONTACT:	JASON COLLIER 720.308.6971 JASON.COLLIER@COLLIERHMG.COM
ZONING:	PLANNED COMMUNITY ZONE DISTRICT - INDUSTRIAL (P-I) SUBJECT TO THE BUSINESS CENTER AT C.T.C. GENERAL DEVELOPMENT PLAN AMENDMENT G
APPROVED CODES:	2018 INTERNATIONAL BUILDING CODE (2018 IBC) 2018 INTERNATIONAL ENERGY CONSERVATION CODE (2018 IECC) 2017 NATIONAL ELECTRIC CODE (2017 NEC)

SHEET INDEX

1	OF 14	COVER SHEET
2	OF 14	PUD DEVELOPMENT PLAN
3	OF 14	MASTER GRADING PLAN
4	OF 14	MASTER UTILITY PLAN
5	OF 14	ELEVATIONS
6	OF 14	ELEVATIONS
7	OF 14	ELEVATIONS
8	OF 14	ELEVATIONS
9	OF 14	ELEVATIONS
10	OF 14	TRASH ENCLOSURE & CARPORT ELEVATIONS
11	OF 14	LANDSCAPE PLAN
12	OF 14	LANDSCAPE NOTES & DETAILS
13	OF 14	PHOTOMETRIC PLAN
14	OF 14	PHOTOMETRIC SHEDULES & SPECIFICATIONS

SITE DATA TABLE

	REQUIRED / ALLOWED	PROPOSED
TOTAL SITE AREA:	NA	251,007 SF
BUILDING COVERAGE:	NA	38,495 SF
LANDSCAPE AREA:	75,302 SF (30% MIN.)	138,666 SF (55%)
HARDSCAPE AREA:	175,705 SF (70% MAX.)	112,341 SF (45%)
TOTAL:	251,007 SF (100%)	251,007 SF (100%)
BUILDING HEIGHT:		
MAXIMUM:	35' - 0"	43' - 6"
AVERAGE:	35' - 0"	40' - 6"
TOP OF MECHANICAL SCREEN:	42' - 0"	40' - 6"
BUILDING AREAS		
BASEMENT:	NA	19,846 SF
MAIN LEVEL:	NA	36,398 SF
UPPER LEVEL (INCLUDING MEZZANINES)	NA	46,149 SF
TOTAL:	NA	102,393 SF
BUILDING SETBACKS		
NORTH:	25' - 0"	28' - 8"
SOUTHWEST:	35' - 0"	35' - 0"
NORTHWEST:	50' - 0"	87' - 7"
SOUTH:	35' - 0"	92' - 11"
EAST:	25' - 0"	230' - 10"
PARKING SETBACKS		
NORTH:	10' - 0"	8' - 10"
SOUTHWEST:	15' - 0"	67' - 2"
NORTHWEST:	25' - 0"	346' - 11"
SOUTH:	15' - 0"	28' - 2"
EAST:	10' - 0"	14' - 9"

PARKING SPACES

	SURFACE PARKING	GARAGE PARKING	TOTAL PARKING	
	PROPOSED	PROPOSED	PROPOSED	REQUIRED
STANDARD:	152	35	187	235
ACCESSIBLE:				
REGULAR:	4	1	5	6
VAN:	2	1	3	3
TOTAL:	6	2	8	9
TOTAL:	158	37	195	241

PROJECT HISTORY LIST

PUD:	APPROVED:

SHEET NAME:	SHEET 1 OF 14
COVER SHEET	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

REPLAT I

1411 S. ARTHUR AVENUE

FINAL PLANNED UNIT DEVELOPMENT

CREATIVE CIVIL SOLUTION
940 KIMBARK STREET, SUITE 2
LONGMONT, CO 80027
P. 303.684.8484
WWW.CREATIVECIVIL.COM

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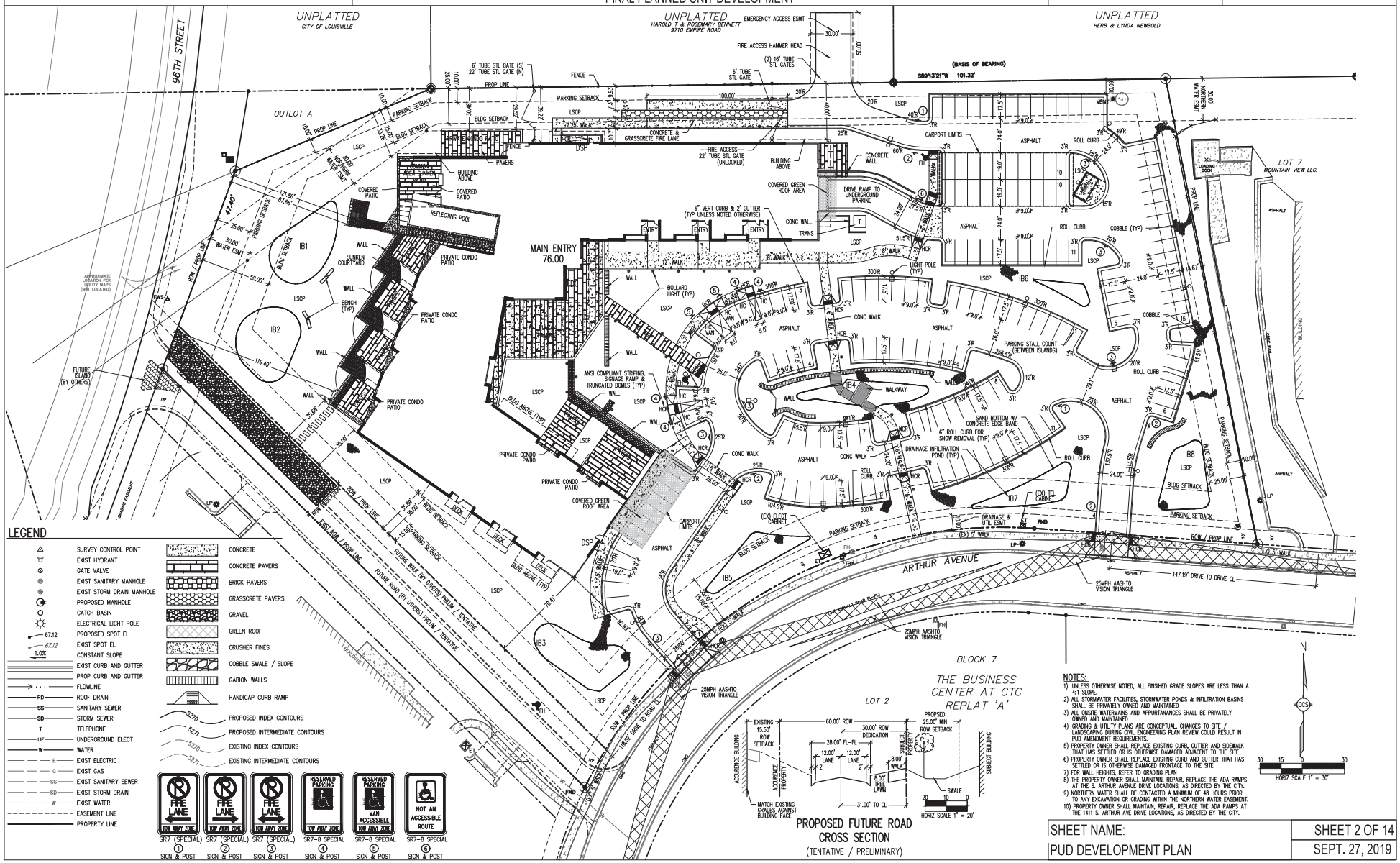

SHEET NAME:	SHEET 2 OF 14
PUD DEVELOPMENT PLAN	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

REPLAT I

1411 S. ARTHUR AVENUE

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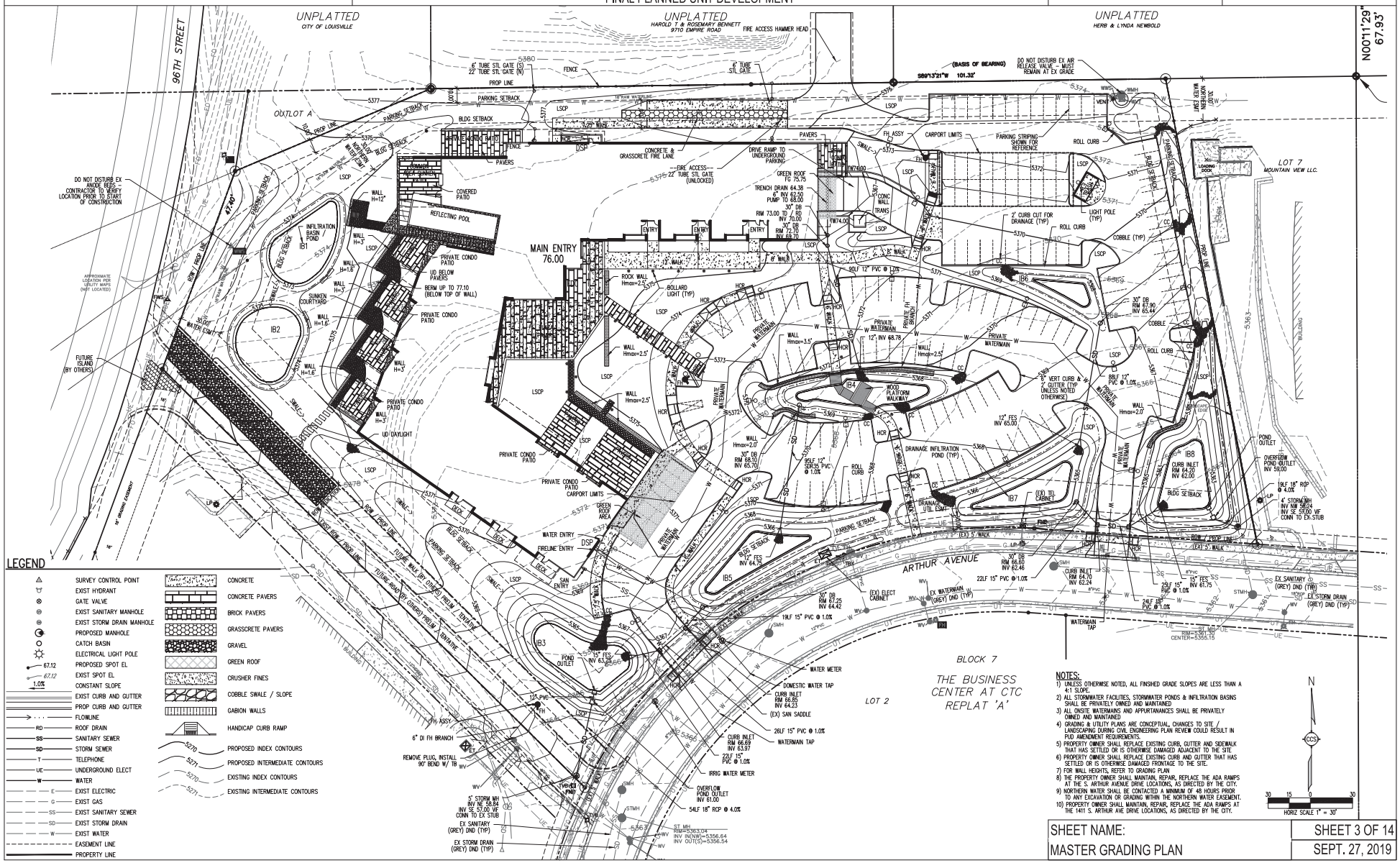

LEGEND

- SURVEY CONTROL POINT
- EXIST HYDRANT
- GATE VALVE
- EXIST SANITARY MANHOLE
- EXIST STORM DRAIN MANHOLE
- PROPOSED MANHOLE
- CATCH BASIN
- ELECTRICAL LIGHT POLE
- 67.12 PROPOSED SPOT EL
- 67.12 EXIST SPOT EL
- 1.0% CONSTANT SLOPE
- EXIST CURB AND GUTTER
- PROP CURB AND GUTTER
- FLOWLINE
- RD ROOF DRAIN
- SS SANITARY SEWER
- SD STORM SEWER
- T TELEPHONE
- UE UNDERGROUND ELECT
- W WATER
- E EXIST ELECTRIC
- G EXIST GAS
- SS EXIST SANITARY SEWER
- SD EXIST STORM DRAIN
- W EXIST WATER
- EASEMENT LINE
- PROPERTY LINE
- CONCRETE
- CONCRETE PAVERS
- BRICK PAVERS
- GRASSCRETE PAVERS
- GRAVEL
- GREEN ROOF
- CRUSHER FINES
- COBBLE SWALE / SLOPE
- GABION WALLS
- HANDICAP CURB RAMP
- 5270 PROPOSED INDEX CONTOURS
- 5271 PROPOSED INTERMEDIATE CONTOURS
- 5270 EXISTING INDEX CONTOURS
- 5271 EXISTING INTERMEDIATE CONTOURS

NOTES:

1) UNLESS OTHERWISE NOTED, ALL FINISHED GRADE SLOPES ARE LESS THAN A 4:1 SLOPE.
2) ALL STORMWATER FACILITIES, STORMWATER PONDS & INFILTRATION BASINS SHALL BE PRIVATELY OWNED AND MAINTAINED
3) ALL ONSITE WATERMAINS AND APPURTANANCES SHALL BE PRIVATELY OWNED AND MAINTAINED
4) GRADING & UTILITY PLANS ARE CONCEPTUAL, CHANGES TO SITE / LANDSCAPING DURING CIVIL ENGINEERING PLAN REVIEW COULD RESULT IN PUD AMENDMENT REQUIREMENTS.
5) PROPERTY OWNER SHALL REPLACE EXISTING CURB, GUTTER AND SIDEWALK THAT HAS SETTLED OR IS OTHERWISE DAMAGED ADJACENT TO THE SITE
6) PROPERTY OWNER SHALL REPLACE EXISTING CURB AND GUTTER THAT HAS SETTLED OR IS OTHERWISE DAMAGED FRONTAGE TO THE SITE.
7) FOR WALL HEIGHTS, REFER TO GRADING PLAN.
8) THE PROPERTY OWNER SHALL MAINTAIN, REPAIR, REPLACE THE ADA RAMPS AT THE S. ARTHUR AVENUE DRIVE LOCATIONS, AS DIRECTED BY THE CITY.
9) NORTHERN WATER SHALL BE CONTACTED A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION OR GRADING WITHIN THE NORTHERN WATER EASEMENT.
10) PROPERTY OWNER SHALL MAINTAIN, REPAIR, REPLACE THE ADA RAMPS AT THE 1411 S. ARTHUR AVE DRIVE LOCATIONS, AS DIRECTED BY THE CITY.

SHEET NAME:	SHEET 3 OF 14
MASTER GRADING PLAN	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

REPLAT I

1411 S. ARTHUR AVENUE

FINAL PLANNED UNIT DEVELOPMENT

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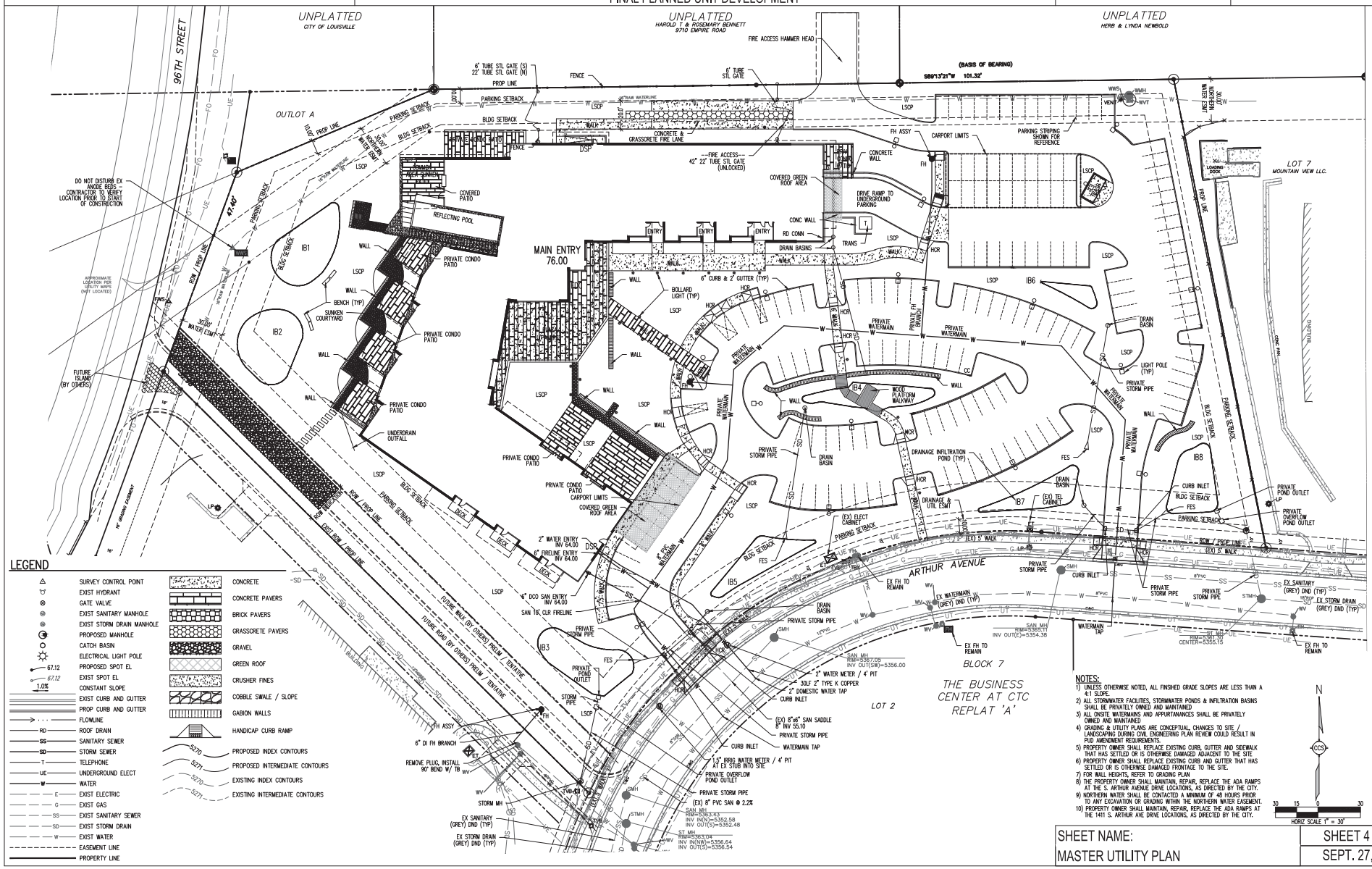

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10) PROPERTY OWNER SHALL MAINTAIN, REPAIR, REPLACE THE ADA RAMPS AT THE 1411 S. ARTHUR AVE DRIVE LOCATIONS, AS DIRECTED BY THE CITY.

SHEET NAME:	SHEET 4 OF 14
MASTER UTILITY PLAN	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

REPLAT I

1411 S. ARTHUR AVENUE

FINAL PLANNED UNIT DEVELOPMENT

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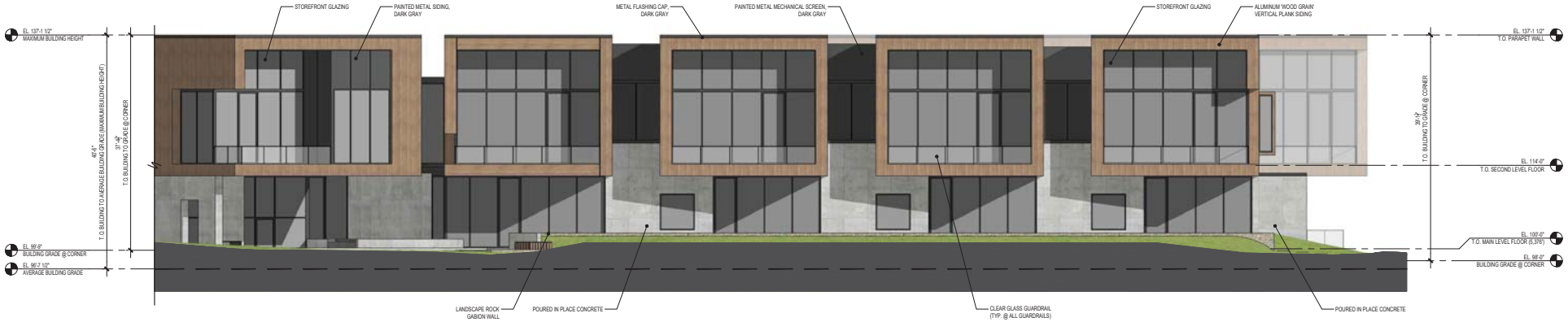
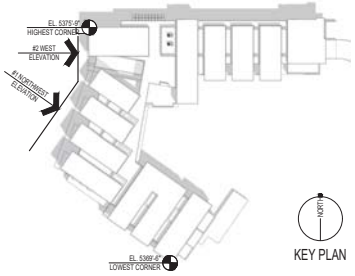


1 NORTHWEST ELEVATION
SCALE: 1/8" = 1'-0"

2 WEST ELEVATION
SCALE: 1/8" = 1'-0"



KEY PLAN

SHEET NAME:	SHEET 5 OF 14
ELEVATIONS	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

REPLAT I

1411 S. ARTHUR AVENUE

FINAL PLANNED UNIT DEVELOPMENT

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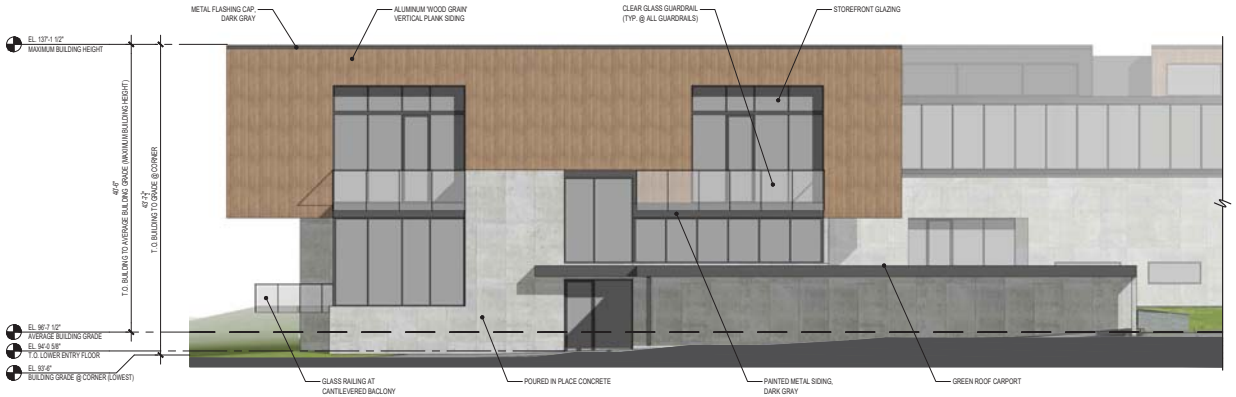
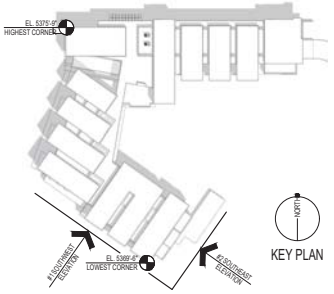
1 SOUTHWEST ELEVATION
SCALE: 1/8" = 1'-0"



2 SOUTHEAST ELEVATION
SCALE: 1/8" = 1'-0"



KEY PLAN

SHEET NAME:	SHEET 6 OF 14
ELEVATIONS	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

REPLAT I

1411 S. ARTHUR AVENUE

FINAL PLANNED UNIT DEVELOPMENT

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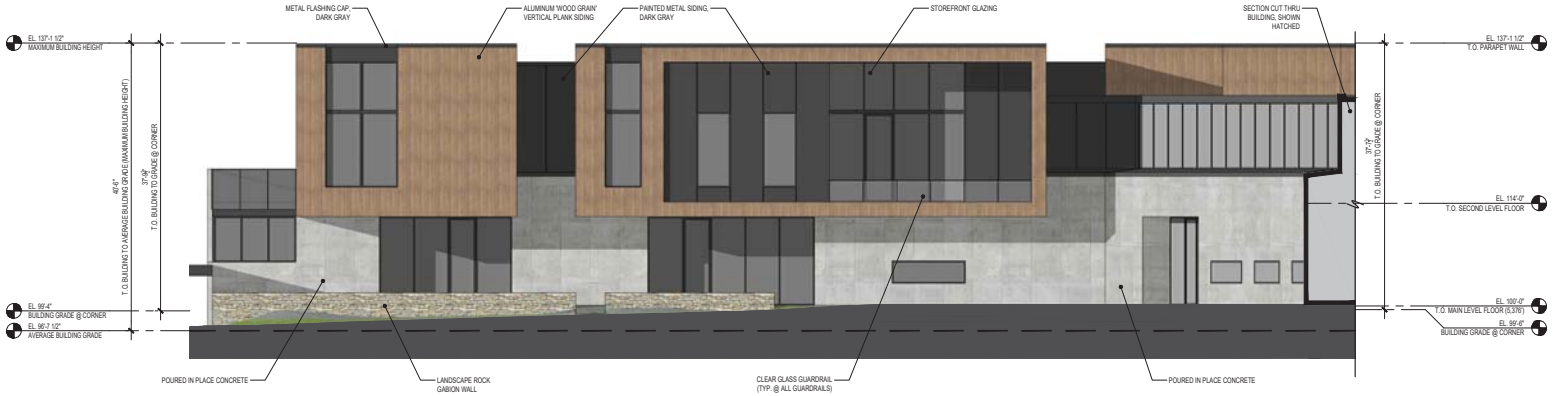
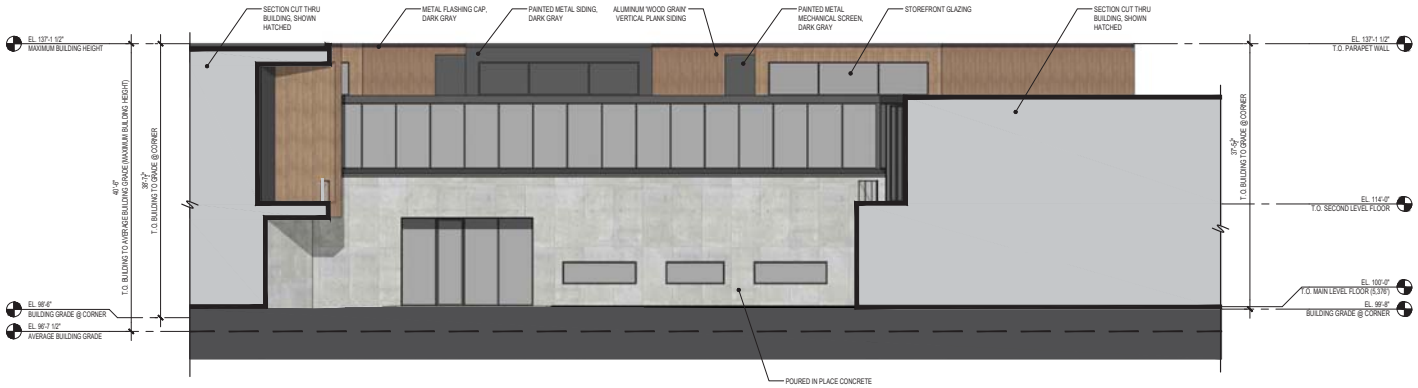
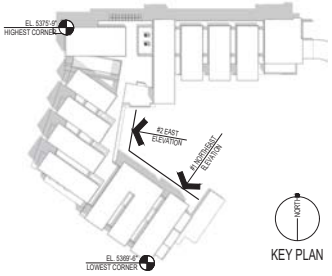


1 NORTHEAST ELEVATION
SCALE: 1/8" = 1'-0"



2 EAST ELEVATION
SCALE: 1/8" = 1'-0"



KEY PLAN

SHEET NAME:	SHEET 7 OF 14
ELEVATIONS	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

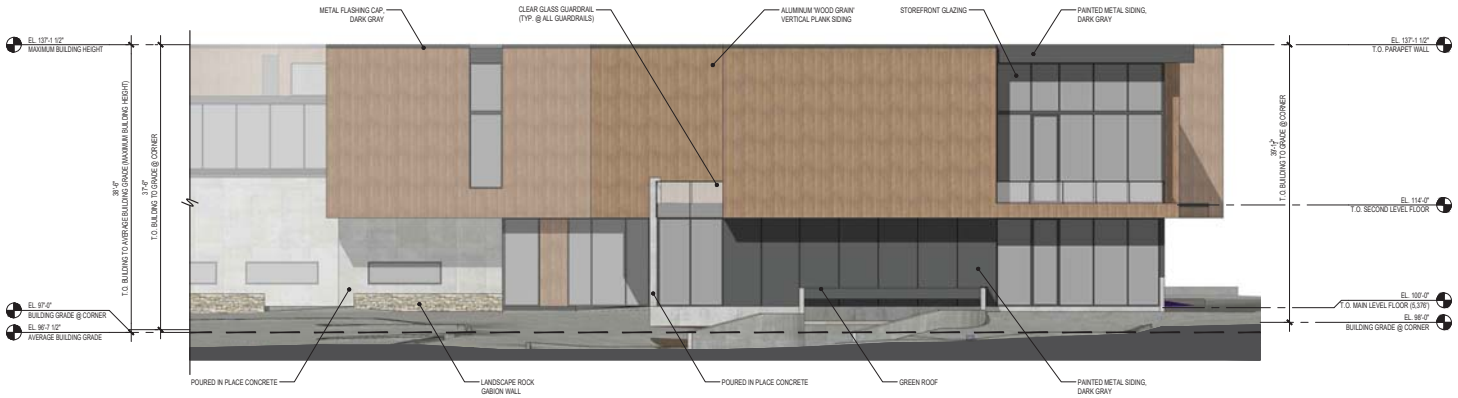
REPLAT I

1411 S. ARTHUR AVENUE

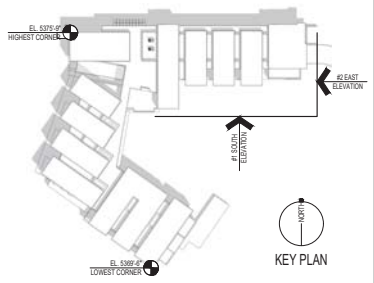
FINAL PLANNED UNIT DEVELOPMENT

DAJDESIGN
922A MAIN STREET
LOUISVILLE, CO 80027
P: 303.527.1100
INFO@DAJDESIGN.COM

1 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



2 EAST ELEVATION
SCALE: 1/8" = 1'-0"



KEY PLAN

SHEET NAME:	SHEET 8 OF 14
ELEVATIONS	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

REPLAT I

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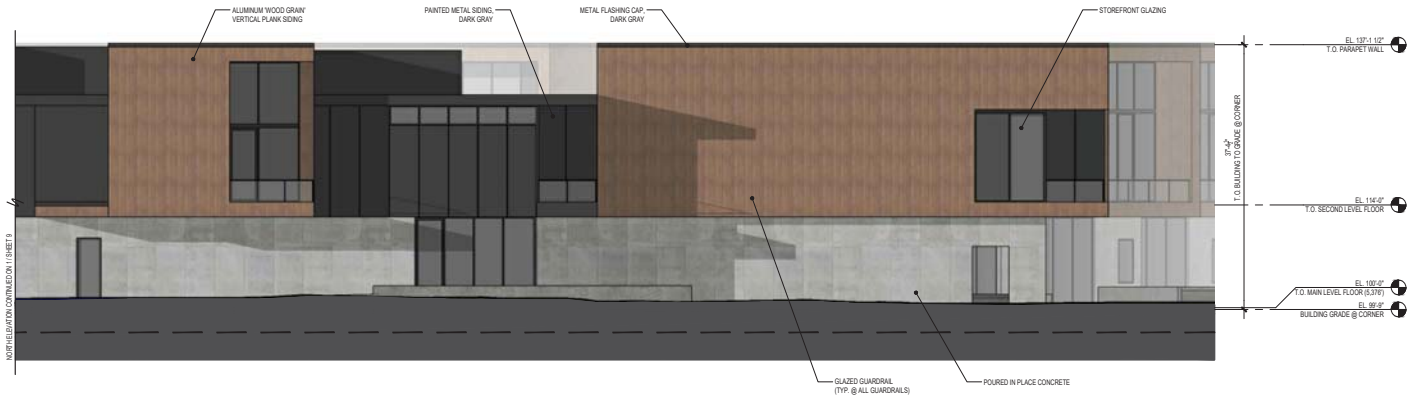
1 PARTIAL NORTH ELEVATION
SCALE: 1/8" = 1'-0"



2 PARTIAL NORTH ELEVATION
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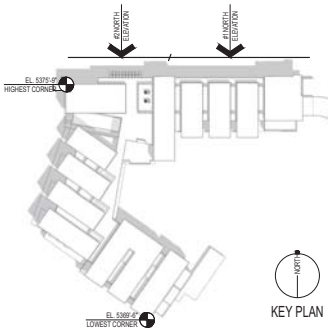

KEY PLAN

SHEET NAME:	SHEET 9 OF 14
ELEVATIONS	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

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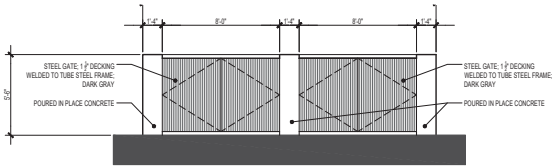
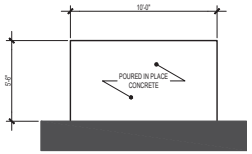
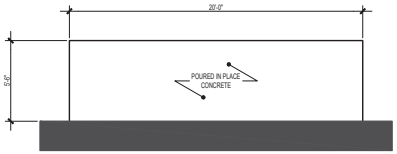


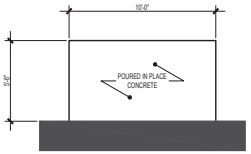
1 TRASH ENCLOSURE FRONT ELEVATION
SCALE: 1/8" = 1'-0"



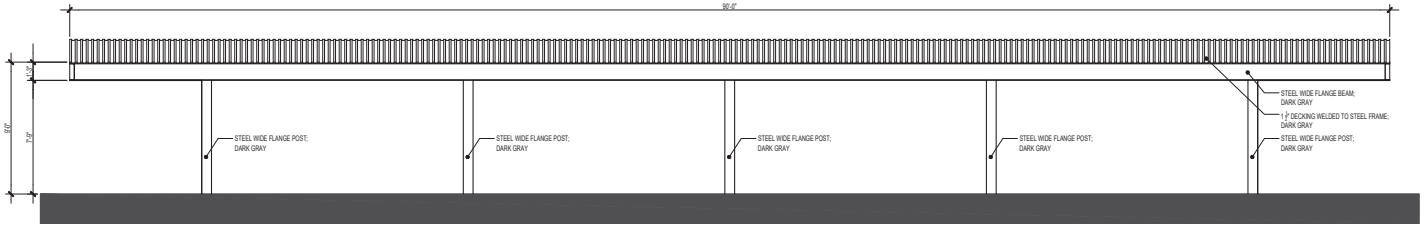
2 TRASH ENCLOSURE SIDE ELEVATION
SCALE: 1/8" = 1'-0"



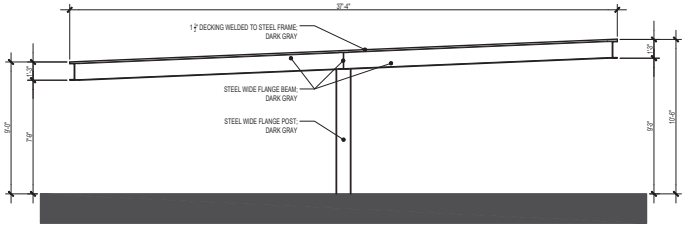
3 TRASH ENCLOSURE REAR ELEVATION
SCALE: 1/8" = 1'-0"



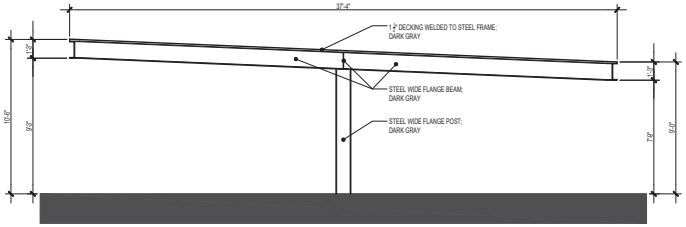
4 TRASH ENCLOSURE SIDE ELEVATION
SCALE: 1/8" = 1'-0"



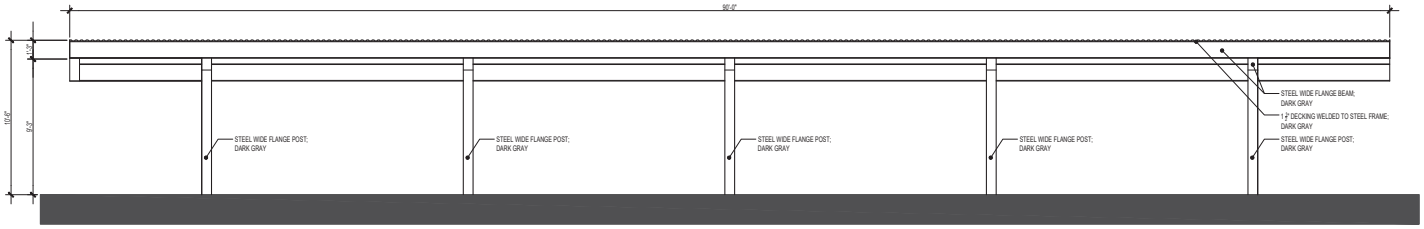
5 CARPORT REAR ELEVATION
SCALE: 1/8" = 1'-0"



6 CARPORT SIDE ELEVATION
SCALE: 1/8" = 1'-0"



7 CARPORT SIDE ELEVATION
SCALE: 1/8" = 1'-0"



8 CARPORT FRONT ELEVATION
SCALE: 1/8" = 1'-0"

SHEET NAME:	SHEET 10 OF 14
TRASH ENCLOSURE & CARPORT ELEVATIONS	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

REPLAT I

1411 S. ARTHUR AVENUE

FINAL PLANNED UNIT DEVELOPMENT

outside la
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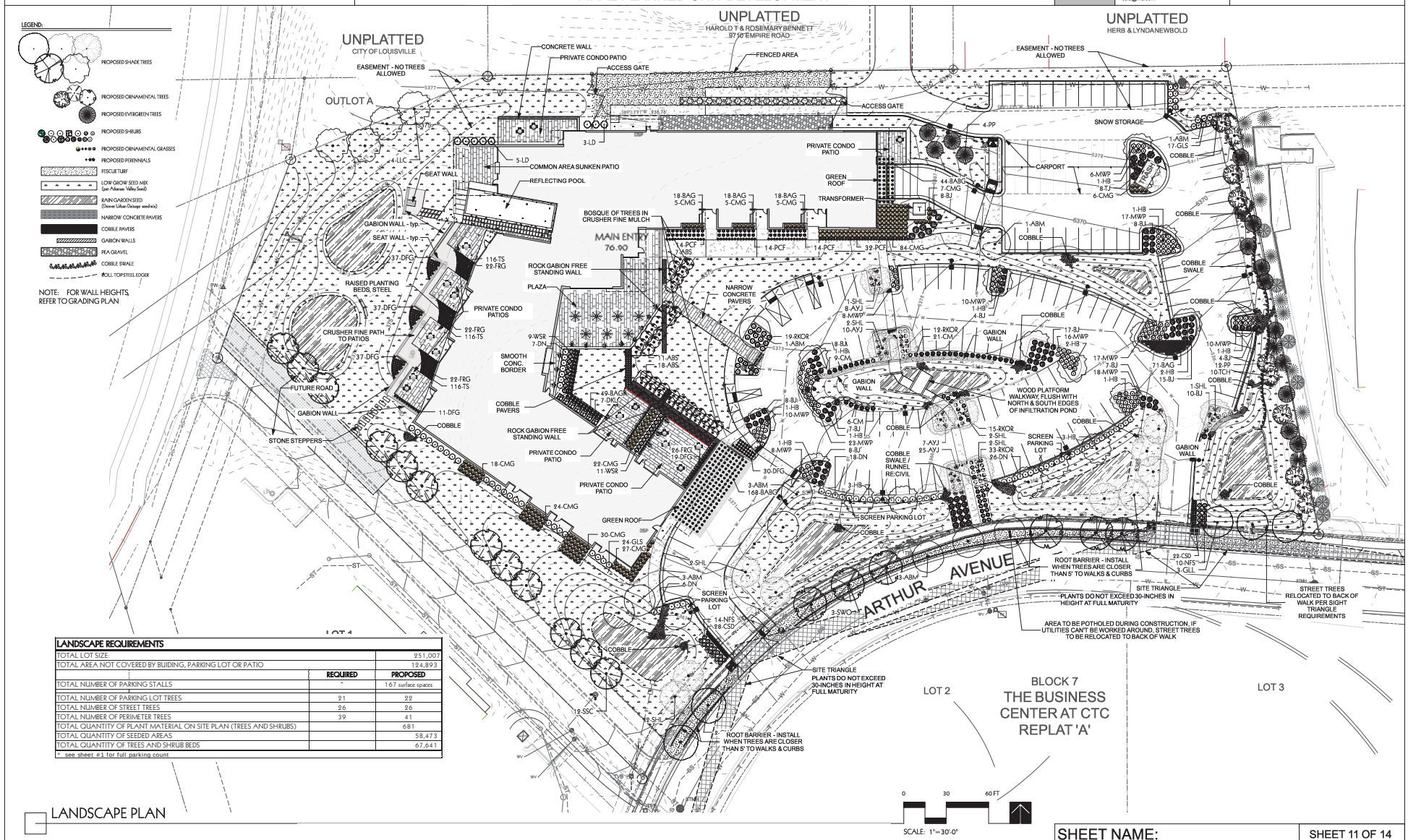

LANDSCAPE REQUIREMENTS		
TOTAL LOT SIZE		251,007
TOTAL AREA NOT COVERED BY BUIDING, PARKING LOT OR PATIO		124,893
	REQUIRED	PROPOSED
TOTAL NUMBER OF PARKING STALLS	*	167 surface spaces
TOTAL NUMBER OF PARKING LOT TREES	21	22
TOTAL NUMBER OF STREET TREES	26	26
TOTAL NUMBER OF PERIMETER TREES	39	41
TOTAL QUANTITY OF PLANT MATERIAL ON SITE PLAN (TREES AND SHRUBS)		681
TOTAL QUANTITY OF SEEDED AREAS		58,473
TOTAL QUANTITY OF TREES AND SHRUB BEDS		67,641

* see sheet #1 for full parking count

LANDSCAPE PLAN

SHEET NAME:	SHEET 11 OF 14
LANDSCAPE PLAN	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C.

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PLANT SCHEDULE - 9-28-19

ABBREV	SCIENTIFIC NAME	COMMON NAME	SIZE	QTY
CANOPY TREES:				
ABM	Acer fremanii 'Autumn Blaze'	Autumn Blaze Maple	2.5" cal.	12
GLL	Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden	2.5" cal.	5
HB	Celtis occidentalis	Hackberry	2.5" cal.	19
LLC	Populus x acuminata	Lanceleaf Cottonwood	2.5" cal.	4
SHL	Gleditsia triacanthos var. inermis 'Shademaster'	Shademaster Honeylocust	2.5" cal.	17
SWO	Quercus bicolor	Swamp White Oak	2.5" cal.	6
			TOTAL	63
EVERGREEN TREES:				
PP	Pinus edulis	Pinyon Pine	6'-8' ht.	16
			TOTAL	16
ORNAMENTAL TREES:				
ABS	Amelanchier x grandiflora'Autumn Brilliance'	Autumn Brilliance Serviceberry	6' ht. Clump	36
SSC	Malus x 'Spring Snow'	Spring Snow Crabapple	2" cal	12
TCH	Crataegus crus-galli inermis	Thornless Cockspur Hawthorn	2" cal	10
			TOTAL	58
SHRUBS:				
AYJ	Juniperus horizontalis 'Youngstown'	Andorra Youngstown Juniper	5 gal.	50
BJ	Juniperus sabina `Buffalo`	Buffalo Juniper	5 gal.	104
CM	Mahonia repens	Creeping Mahonia	5 gal.	36
DKL	Syringa meyeri 'Palibin'	Dwarf Korean Lilac	5 gal.	7
DN	Physocarpus opulifolius 'Nanus'	Dwarf Ninebark	5 gal.	51
FCBS	Caaryopteris x clandonensis 'First Choice'	First Choice Blue Spirea	5 gal.	8
GLS	Rhus aromatica 'Gro-Low'	Gro-Low Fragrant Sumac	5 gal.	50
LD	Ligustrum vulgare 'Lodense'	Lodense Privet	5 gal.	8
MWP	Potentilla fruticosa 'McKay's White'	Mckay's White Potentilla	5 gal.	143
NFS	Spiraea japonica 'Neon Flash'	Neon Flash Spirea	5 gal.	24
RKOR	Rosa x 'Radcor'	Rainbow Knock Out Rose	5 gal.	79
TJ	Juniperus sabina 'Tamariscifolia'	Tammy Juniper	5 gal.	8
WSR	Rosa Meidiland White	White Meidiland Landscape Rose	5 gal.	20
			TOTAL	588
PERENNIALS, ORNAMENTAL GRASSES, VINES:				
BABG	Bouteloua gracilis 'Blonde Ambition' P.P.A.F.	Blonde Ambition Blue Grama	1 gal.	212
BAG	Helictotrichon sempervirens	Blue Avena Grass	1 gal.	174
CMG	Miscanthus sinensis 'Arabesque'	Arabesque Maiden Grass	1 gal.	233
CSD	Leucanthemum x superbum 'Silver Princess'	Compact Shasta Daisy	1 gal.	90
DFG	Pennisetum alopecuroides 'Hameln'	Dwarf Fountain Grass	1 gal.	171
FRG	Calamagrostis x acutiflora `Karl Foerster`	Foerster Feather Reed Grass	1 gal.	92
PCF	Echinacea purpurea	Purple Coneflower	1 gal.	74
TS	Veronica liaanensis	Turkish Speedwell	1 gal.	348
			TOTAL	1394

Native Seed Mix

Common Name	Scientific Name	Lb/ac (PLS)*
Western wheatgrass	Pascopyrum smithii	3.5
Slender wheatgrass	Elymus trachycaulus	4
Sideoats grama	Bouteloua curtipendula	3
Blue grama	Bouteloua gracilis	1
Little bluestem	Schizachyrium scoparium	2
Needle and thread grass	Hesperostipa comata	2
Sand dropseed	Sporobolus cryptandrus	0.02
	Total	15.52

* Please note that the pounds per acre are in PLS (Pure Live Seed) and must be ordered that way.

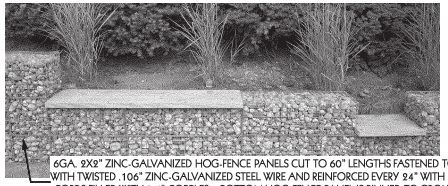
* This mix is based on 75 seeds/ square foot and is only calculated for one acre. This mix is based on the contractor using a drill seed application. Contractor is responsible for calculating the appropriate seed amounts to purchase. Mix should be doubled if hand applied.

PLANT NOTES:

REFERENCE: CITY OF LOUISVILLE, INDUSTRIAL DEVELOPMENT DESIGN STANDARDS AND GUIDELINES (IDDSG) , JANUARY, 2000.

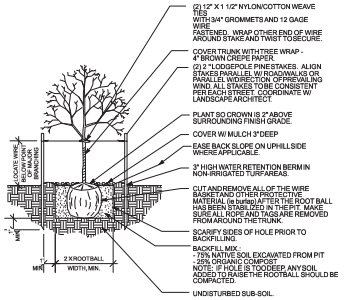
1. GRADES SHALL BE SET TO ALLOW FOR PROPER DRAINAGE AWAY FROM ALL STRUCTURES. GRADES SHALL MAINTAIN SMOOTH PROFILES AND BE FREE OF SURFACE DEBRIS, BUMPS, AND DEPRESSIONS.
2. REFER TO CIVIL ENGINEERING DRAWINGS FOR GRADING AND UTILITIES.
3. DEVELOPERS SHALL ENSURE THAT THE LANDSCAPE PLANS COORDINATED WITH THE PLANS DONE BY OTHER CONSULTANTS SO THAT THE PROPOSED GRADING, STORM DRAINAGE, OR OTHER CONSTRUCTION DOES NOT CONFLICT NOR PRECLUDE INSTALLATION AND MAINTENANCE OF LANDSCAPE ELEMENTS ON THIS PLAN.
4. DURING CONSTRUCTION, PREVENT CLEANING OF EQUIPMENT, THE STORAGE OR DISPOSAL OF WASTE BUILDING MATERIAL (I. E. PAINT, OILS, SOLVENTS, ASPHALT, CONCRETE, MORTAR) WITHIN THE DRIPLINE OF ANY PROTECTED TREE OR GROUPS OF TREES.
5. SITE PREPARATION & ALL PLANTING MUST BE COMPLETED IN ACCORDANCE WITH CHAPTERS 1 & 5 OF 1DDGS. PRIOR TO INSTALLATION OF PLANT MATERIAL, AREAS THAT HAVE BEEN COMPACTED OR DISTURBED BY CONSTRUCTION ACTIVITY SHALL BE THOROUGHLY LOOSENED, ORGANIC AMENDMENTS SUCH AS COMPOST, PEAL, OR AGED MANURE SHALL BE THOROUGHLY INCORPORATED AT THE RATE OF AT LEAST THREE (3) CUBIC YARDS OF AMENDMENT PER 1000 SQUARE FEET OF LANDSCAPE AREA.
6. ALL TREES & SHRUBS SHOWN AT APPROXIMATELY ½ OF MATURE SIZE.
7. CONTRACTOR SHALL VERIFY ALL MATERIALS QUANTITIES PRIOR TO INSTALLATION. ACTUAL NUMBER OF SYMBOLS SHALL HAVE PRIORITY OVER THE QUANTITY DESIGNATED.
8. LABELS THAT INDENTIFY THE BOTANICAL OR COMMON NAME WILL BE ON ALL TREES AT THE FINAL INSPECTION.
9. ALL PLANT MATERIALS WILL MEET THE FOLLOWING MINIMUM SIZES, AS NOTED IN SECT. 5-7:
   - DECIDUOUS SHADE/CANOPY TREES: 2.5" CALIPER
   - ORNAMENTAL: 2.0" CALIPER*
   - EVERGREEN TREES: 6'-8' HEIGHT (WITH A MINIMUM OF 25% 8' IN HEIGHT)
   - MULTI-STEM ORNAMENTALS: 8'-10' HEIGHT
   - SHRUBS: 5 GALLON CONTAINER
   - GROUND COVER/PERENNIALS: 2¼" POTS
   - VINES: 1 GALLON CONTAINER
10. ALL PLANT MATERIAL SHALL MEET SPECIFICATIONS OF THE AMERICAN ASSOCIATION OF NURSERYMEN (AAN) FOR NUMBER ONE GRADE. ALL TREES SHALL BE BALLED AND BURLAPPED OR EQUIVALENT.
11. DECIDUOUS TREES SHALL BE PLANTED A MINIMUM OF 5-FEET AND EVERGREEN TREES A MINIMUM OF 10-FEET FROM PUBLIC UTILITIES AND PUBLIC SIDEWALKS, UNLESS MODIFIED BY PUD STREET TREE PLANS. TREE PLANTING SHALL BE COORDINATED WITH PUBLIC SERVICE COMPANY. LOCATION OF ALL UTILITIES SHALL BE VERIFIED IN THE FIELD PRIOR TO PLANTING. A HORIZONTAL DISTANCE OF 40' BETWEEN STREET TREE AND STREET LIGHT SHALL BE MAINTAINED.
12. TEMPORARY MULCH WILL BE INSTALLED IN SHRUB, TREE, AND PERENNIAL PLANTING BEDS UNTIL FULL PLANT COVERAGE IS ACHIEVED.
13. PERMANENT MULCH, ASPEN-PINE, 3" DEEP, WILL BE INSTALLED IN SHRUB, TREE, AND PERENNIAL PLANTING BEDS WHERE THERE IS NO GROUNDCOVER SPECIFIED.
14. THE PROPERTY OWNER IS RESPONSIBLE FOR PROVIDING, PROTECTING AND MAINTAINING ALL LANDSCAPING IN A HEALTHY AND GROWING CONDITION, AND ADHERE TO ALL STANDARDS OF GUIDELINES OF SECTION 5.8 OF IDDSG. THE PROPERTY OWNER WILL REMOVE AND REPLACE DEAD PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE AND QUANTITY OR PLANT MATERIAL AS ORIGINALLY INSTALLED, UNLESS MATERIAL IS DISEASED OR INSECT-INFECTED.
15. ALL LANDSCAPE AREAS WILL BE IRRIGATED WITH PERMANENT AUTOMATIC IRRIGATION SYSTEM DESIGNED TO PROVIDE EFFICIENT IRRIGATION COVERAGE WITH MINIMAL OVER SPRAY ONTO NON-LANDSCAPED AREAS.
16. A SOIL SENSING DEVICE OR OTHER IRRIGATION MANAGEMENT SYSTEM WILL BE INSTALLED FOR IRRIGATION SYSTEMS IN TURF AREAS.
17. ALL SOD AREAS UNLESS OTHERWISE NOTED WILL BE SODDED WITH LOW-WATER DEMANDING BLEND. SEEDED AREAS UNLESS OTHERWISE NOTES WILL BE SEEDED WITH DRYLAND / NATIVE SEED TO SUIT SPECIFIC SOIL CONDITION AND MAINTANCE REQUIREMENTS.

ORNAMENTAL FENCING

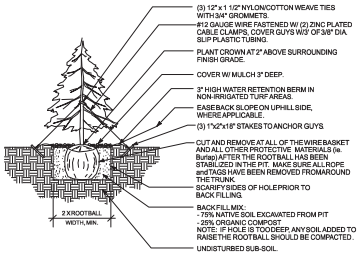


6GA. 9X9" ZINC-GALVANIZED HOG-FENCE PANELS CUT TO 60" LENGTHS FASTENED TOGETHER WITH TWISTED .106" ZINC-GALVANIZED STEEL WIRE AND REINFORCED EVERY 24" WITH METAL TIE CORDS FILLED WITH 3-4" COBBLES. BOTTOM HOG-FENCE PANEL IS PINNED TO GROUND WITH TWO #4 REBAR BENT TO U-SHAPE PIECES OVER 6" OF COMPACTED ROAD BASE.

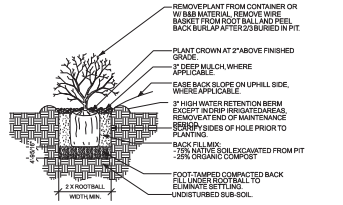
GABION WALL



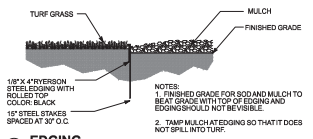
DECIDUOUS TREE PLANTING & STAKING
SCALE: NTS



EVERGREEN TREE PLANTING & STAKING
SCALE: NTS

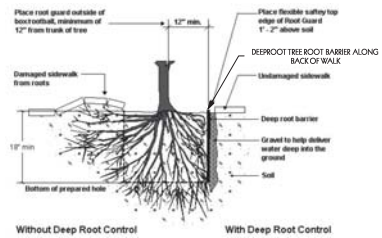


TYPICAL SHRUB PLANTING
SCALE: NTS



NOTES:
1. FINISHED GRADE FOR SOD AND MULCH TO BEAT GRADE WITH TOP OF EDGING AND EDGINGS SHOULD NOT BE VISIBLE.
2. TAMP MULCH AT EDGING SO THAT IT DOES NOT SPILL INTO TURF.

EDGING
SCALE: NTS



NOTE: INSTALL ROOT BARRIER WHEN TREES ARE LESS THAN 5' FROM EDGE OF WALK OR CURBS

ROOT BARRIER

SHEET NAME:	SHEET 12 OF 14
LANDSCAPE NOTES & DETAILS	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C

REPLAT I

1411 S. ARTHUR AVENUE

FINAL PLANNED UNIT DEVELOPMENT

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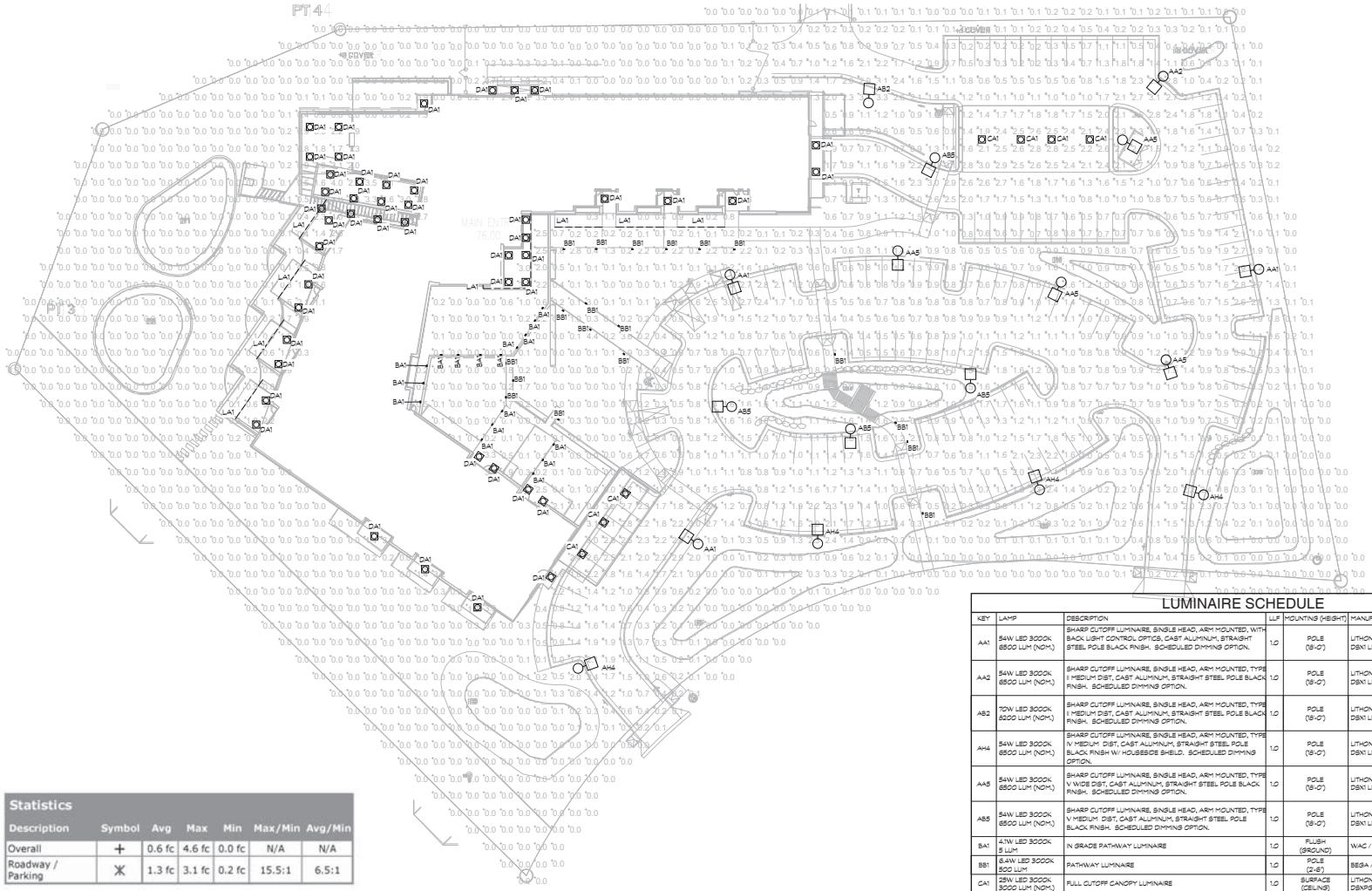

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Overall	+	0.6 fc	4.6 fc	0.0 fc	N/A	N/A
Roadway / Parking	✳	1.3 fc	3.1 fc	0.2 fc	15.5:1	6.5:1

LUMINAIRE SCHEDULE

KEY	LAMP	DESCRIPTION	LLF	MOUNTING (HEIGHT)	MANUFACTURER/#	QTY
AA1	54W LED 3000K 6500 LUM (NOM.)	SHARP CUTOFF LUMINAIRE, SINGLE HEAD, ARM MOUNTED, WITH BACK LIGHT CONTROL OPTICS, CAST ALUMINUM, STRAIGHT STEEL POLE BLACK FINISH. SCHEDULED DIMMING OPTION.	1.0	POLE (18'-0")	LITHONIA LIGHTING / DSX1 LED P1 30K BLC MVOLT	5
AA2	54W LED 3000K 6500 LUM (NOM.)	SHARP CUTOFF LUMINAIRE, SINGLE HEAD, ARM MOUNTED, TYPE II MEDIUM DIST, CAST ALUMINUM, STRAIGHT STEEL POLE BLACK FINISH. SCHEDULED DIMMING OPTION.	1.0	POLE (18'-0")	LITHONIA LIGHTING / DSX1 LED P1 30K T2M MVOLT	1
AB2	70W LED 3000K 8200 LUM (NOM.)	SHARP CUTOFF LUMINAIRE, SINGLE HEAD, ARM MOUNTED, TYPE II MEDIUM DIST, CAST ALUMINUM, STRAIGHT STEEL POLE BLACK FINISH. SCHEDULED DIMMING OPTION.	1.0	POLE (18'-0")	LITHONIA LIGHTING / DSX1 LED P2 30K T2M MVOLT	1
AH4	54W LED 3000K 6500 LUM (NOM.)	SHARP CUTOFF LUMINAIRE, SINGLE HEAD, ARM MOUNTED, TYPE IV MEDIUM DIST, CAST ALUMINUM, STRAIGHT STEEL POLE BLACK FINISH W/ HOUSESIDE SHIELD. SCHEDULED DIMMING OPTION.	1.0	POLE (18'-0")	LITHONIA LIGHTING / DSX1 LED P1 30K TFTM MVOLT HS	4
AA5	54W LED 3000K 6500 LUM (NOM.)	SHARP CUTOFF LUMINAIRE, SINGLE HEAD, ARM MOUNTED, TYPE V WIDE DIST, CAST ALUMINUM, STRAIGHT STEEL POLE BLACK FINISH. SCHEDULED DIMMING OPTION.	1.0	POLE (18'-0")	LITHONIA LIGHTING / DSX1 LED P1 30K T5W MVOLT	4
AB5	54W LED 3000K 6500 LUM (NOM.)	SHARP CUTOFF LUMINAIRE, SINGLE HEAD, ARM MOUNTED, TYPE V MEDIUM DIST, CAST ALUMINUM, STRAIGHT STEEL POLE BLACK FINISH. SCHEDULED DIMMING OPTION.	1.0	POLE (18'-0")	LITHONIA LIGHTING / DSX1 LED P1 30K T5M MVOLT	4
BA1	4.1W LED 3000K 5 LUM	IN GRADE PATHWAY LUMINAIRE	1.0	FLUSH (GROUND)	WAC / 2031-3CNX	17
BB1	6.4W LED 3000K 500 LUM	PATHWAY LUMINAIRE	1.0	POLE (2'-8")	BEGA / 77 218	14
CA1	28W LED 3000K 3000 LUM (NOM.)	FULL CUTOFF CANOPY LUMINAIRE	1.0	SURFACE (CEILING)	LITHONIA LIGHTING / DSXPS LED 20C 350 30K T3W MVOLT	5
DA1	8W LED 3000K 600 LUM (NOM.)	8" DOWNLIGHT (WET LOCATION)	1.0	FLUSH (CEILING)	LITHONIA LIGHTING / RSAL8 DSHW ESL 60CL 30K .8CSC	30
LA1	3.2 W/FT 2700K	TAPE LIGHT IN ALUMINUM EXTRUSION	1.0	SURFACE	KELVIN / PH27K-24V / CH-008 (ENT) / ULV96 (DRIVER)	8

NOTES: NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN MODEL NUMBERS AND DESCRIPTIONS PRIOR TO ORDERING
VERIFY CEILING INSULATION W/ GC AND NOTIFY ENGINEER OF ANY IC RATING CONFLICTS PRIOR TO ORDERING

SHEET NAME:	SHEET: 13 OF 14
PHOTOMETRIC PLAN	SEPT. 27, 2019

THE BUSINESS CENTER AT C.T.C

REPLAT I
1411 S. ARTHUR AVENUE
FINAL PLANNED UNIT DEVELOPMENT

BOULDER ENGINEERING
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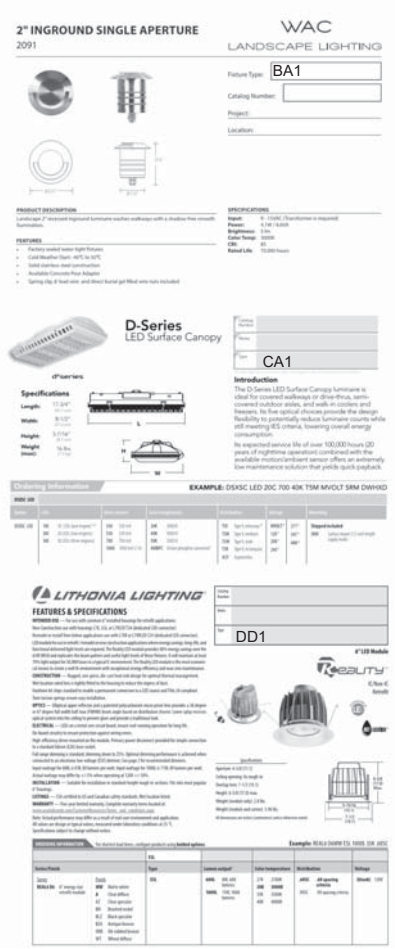

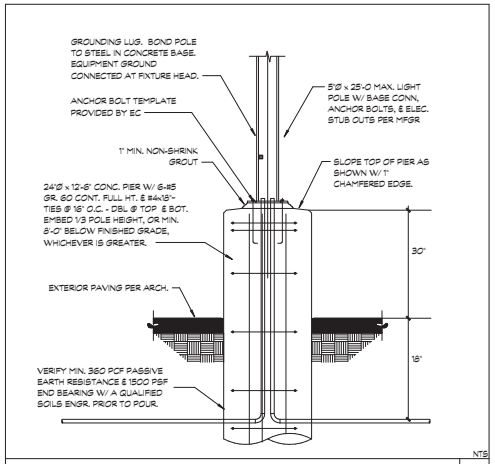

LIGHT POLE BASE DETAIL | 1

SHEET NAME:	SHEET: 14 OF 14
PHOTOMETRIC SCHEDULE & SPEC.	SEPT. 27, 2019

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September 27, 2019

Lisa Ritchie
Senior Planner
City of Louisville
Department of Planning and Building Safety
749 Main Street
Louisville, CO 80027

RE: 1st Review Comments, Business Center at C.T.C. GDP Amendment G, Business Center at C.T.C. Replat I, and PUD

Dear Ms. Ritchie,

Thank you for your consideration of the proposed parking for the CTC Office Condominium project. In the construction of the new building, the owners have requested a reduction in the required parking that includes surface parking and a subterrainean parking garage of 3.2/1000 from 4/1000.

The building's 33 office condos are designed and marketed as executive suites and have an estimated average occupancy of 5 per unit. Many of the smaller units (<1,200SF) will have only 1-2 occupants. It is expected that the building will have approximately 165 daily condo occupants and a range of 15-30 guest occupants throughout the day. Currently we are providing 187 parkings spaces between the subterranean parking garage and surface parking. One parking space per condominium will be designated to each condominium in the parking garage. Also included in the building is 1,000SF of secure, indoor bike parking to accommodate a total of 50 bike parking spaces. We estimate that approximately 15% of the building occupants will either carpool (10 occupants) or ride bikes (15 occupants) to work each day, which reduces the overall parking need by 20 spaces (10 carpool (10/2=5) + 15 bikes = 20 total). It is estimated that only 150 parking spaces will be required on a daily basis.

Below is a table outlining the proposed parking conditions.

# of occupants	**165**
Traveling by single occupant vehicle	145
Carpooling (assume 2/vehicle)	10 (reduction of 5 spaces)
Bicycle	15
Required Parking Spaces 4:1000	**235**
Planned Parking Spaces 3.2:1000	**187**
Indoor Parking Provided	35
Surface Parking Provided	152
Bike Parking Provided	50 (1000sf)

We are requesting a parking reduction from the required 235 spaces to 187 spaces. Please feel free to contact me if you have any questions. Thanks again for your consideration.

Regards,

Andy Johnson, AIA

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NORTH PROPERTY - LOOKING SOUTH

ARIAL VIEW - LOOKING WEST

96TH STREET - LOOKING EAST

ARTHUR AVENUE - LOOKING WEST

ARTHUR AVENUE - LOOKING NORTH

PARKING - LOOKING WEST

REFLECTING POOL - LOOKING WEST

INTERIOR COURTYARD - LOOKING NORTH

WEST COURTYARD - LOOKING NORTH

SHEET NAME:	EXHIBIT 2
PERSPECTIVE VIEWS	SEPT. 27, 2019

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1 PARKING GARAGE FLOOR PLAN
SCALE: 1/8" = 1'-0"

NORTH

LEGEND

- PRIVATE OFFICE
- BALCONIES
- COMMON SPACES (FITNESS, RESTROOMS AND LOUNGES)
- COMMON CIRCULATION
- VERTICAL CIRCULATION

SHEET NAME:	EXHIBIT 3
PARKING GARAGE FLOOR PLAN	SEPT. 27, 2019

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1 MAIN LEVEL FLOOR PLAN

SCALE: 1/8" = 1'-0"

LEGEND

- PRIVATE OFFICE
- BALCONIES
- COMMON SPACES (FITNESS, RESTROOMS AND LOUNGES)
- COMMON CIRCULATION
- VERTICAL CIRCULATION

SHEET NAME:	EXHIBIT 4
MAIN LEVEL FLOOR PLAN	SEPT. 27, 2019

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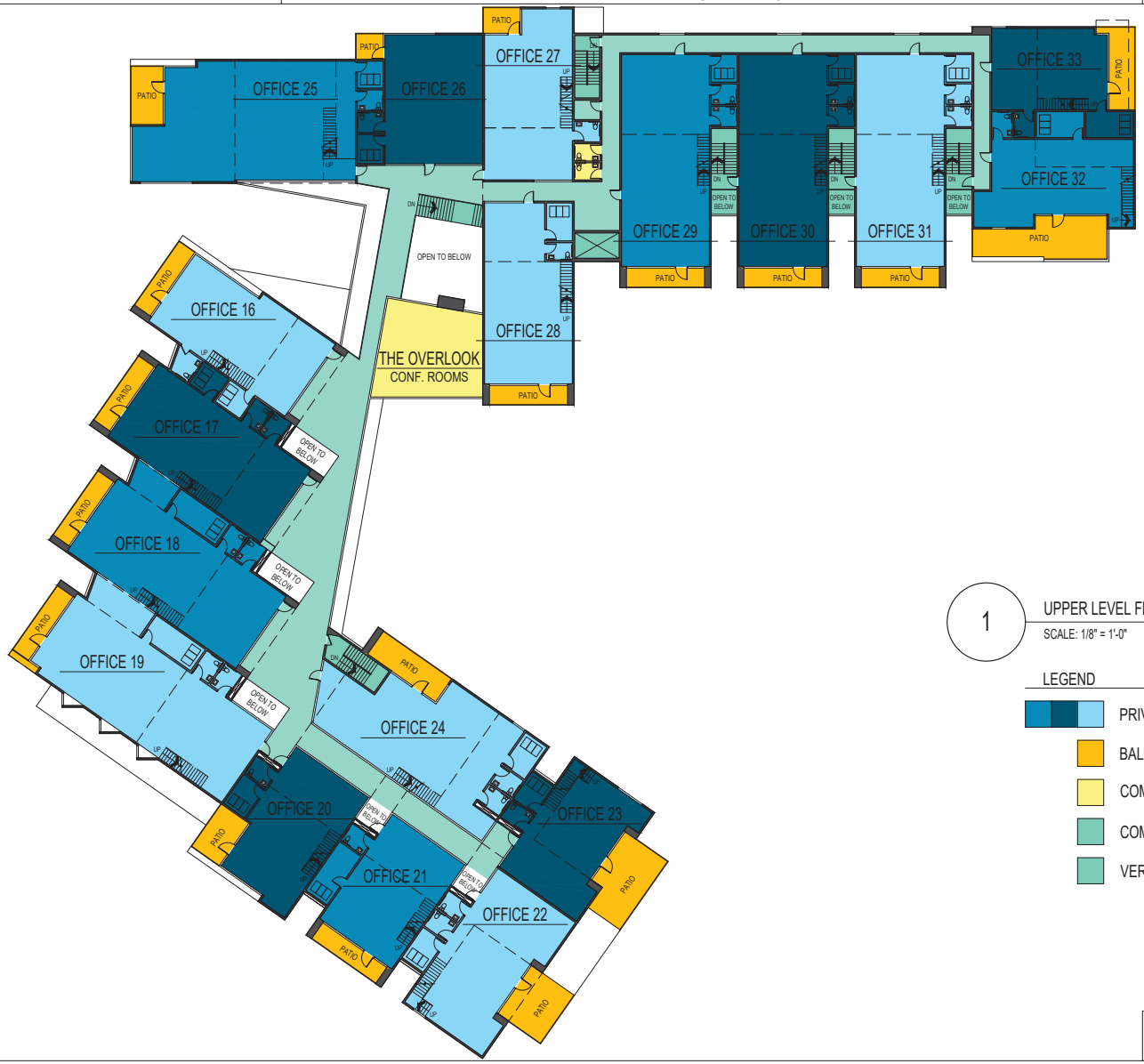

1 UPPER LEVEL FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH

LEGEND

- PRIVATE OFFICE
- BALCONIES
- COMMON SPACES (FITNESS, RESTROOMS AND LOUNGES)
- COMMON CIRCULATION
- VERTICAL CIRCULATION

SHEET NAME:	EXHIBIT 5
UPPER LEVEL FLOOR PLAN	SEPT. 27, 2019

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1 MEZZANINE FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH

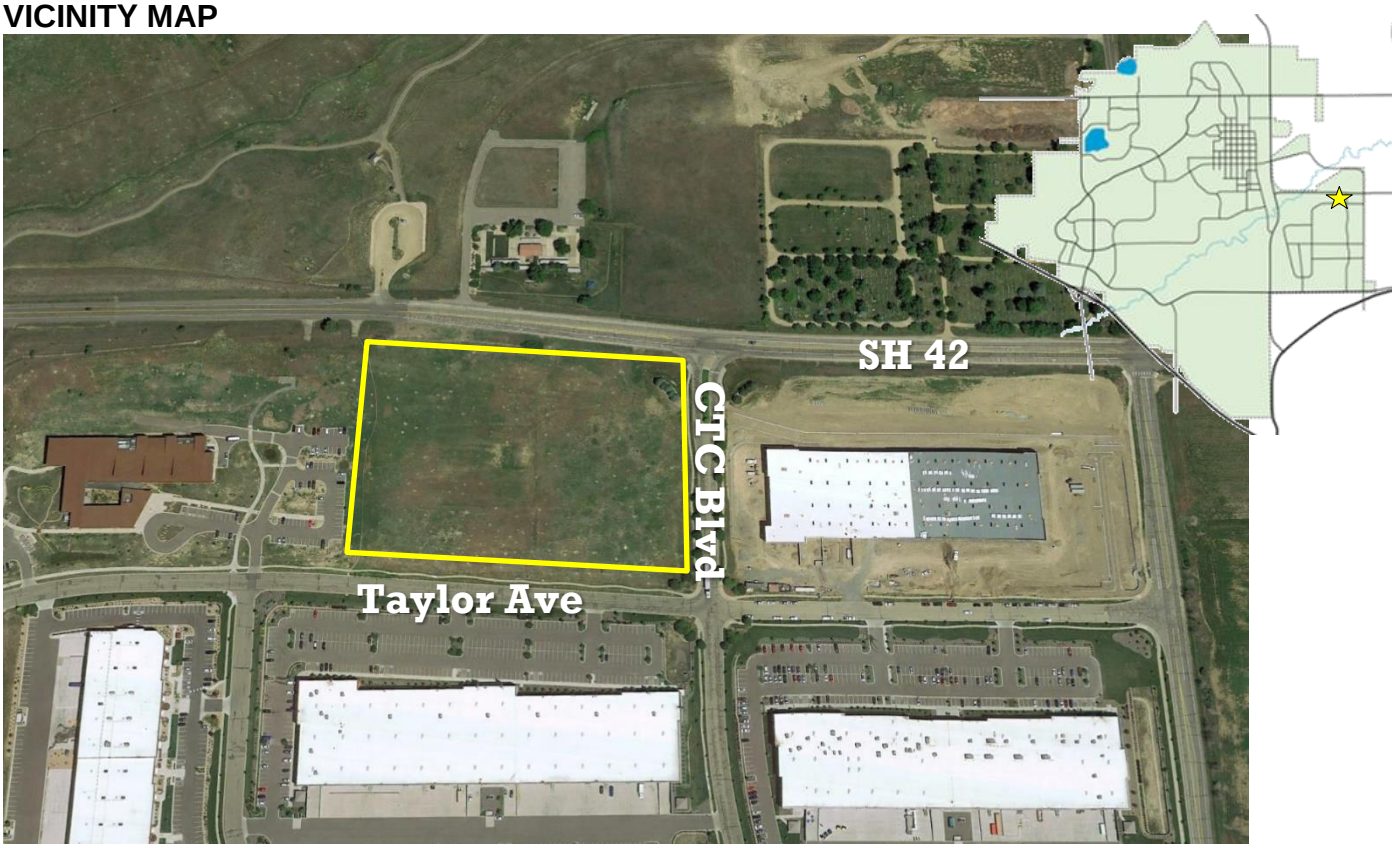
LEGEND

- PRIVATE OFFICE
- BALCONIES
- COMMON SPACES (FITNESS, RESTROOMS AND LOUNGES)
- COMMON CIRCULATION
- VERTICAL CIRCULATION

SHEET NAME:	EXHIBIT 6
MEZZANINE FLOOR PLAN	SEPT. 27, 2019

ITEM:	PUPL-0229-2019, PUD-0230-2019
PLANNER:	Harry Brennan, Planner II
APPLICANT:	Bob Van Pelt, RVP Architecture
EXISTING ZONING:	PCZD-I
LOCATION:	1875 and 1923 Taylor Avenue
TOTAL SITE AREA:	6.91 Acres
REQUEST:	Approval of Resolution 18, Series 2019 recommending approval of request for a Final Plat to consolidate lots and a Final Planned Unit Development for Lots 18 & 19, Block 1 of The Business Center at CTC. **REQUEST TO CONTINUE TO NOVEMBER 14, 2019**

VICINITY MAP



STAFF RECOMMENDATION:
Staff recommends that the Planning Commission continue the public hearing for a request for a Final Plat and Final Planned Unit Development at 1875 and 1923 Taylor Avenue to the November 14, 2019 Planning Commission meeting.